







- Chip type with 3.0mmL height.
- Designed for surface mounting on high density PC board.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).

Products which are scheduled to be discontinued. Not recommended for new designs



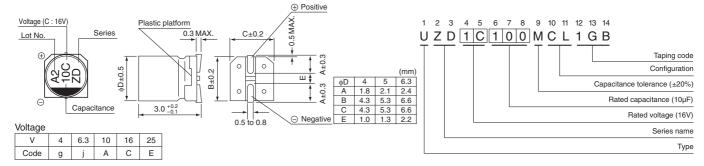


■Specifications

Item				Р	erformance	e Characteristi	cs		
Category Temperature Range	-40 to +85°C								
Rated Voltage Range	4 to 25V								
Rated Capacitance Range	2.2 to 100µF								
Capacitance Tolerance	±20% at 120Hz	z, 20°C							
Leakage Current	After 2 minutes	application of ra	ated voltage,	leakage cu	rrent is no	t more than 0.	.01 CV or	3 (μA) , whic	chever is greater.
	Rated vo	Itage (V)	4	6.3	10	16	25	120Hz 2	20°C
Tangent of loss angle (tan δ)	tan δ ((MAX.)	0.50	0.40	0.30	0.24	0.19		
	Rated vo	Itage (V)	4	6.3	10	16	25	120Hz	
Stability at Low	Impedance ratio	Z-25°C / Z+20°C	7	4	3	2	2		
Temperature	ZT / Z20 (MAX.)	Z-40°C / Z+20°C	15	8	8	4	4		
	The specification	ns listed at right	t shall be me	t when the		Capacitance	change	Within ±30%	% of the initial capacitance value
Endurance	capacitors are r			ed voltage is	;	tan δ		300% or les	s than the initial specified value
	applied for 1000) hours at 85°C.				Leakage cur	rent	Less than o	r equal to the initial specified value
Shelf Life	After storing the 20°C, they shall							reatment bas	sed on JIS C 5101-4 clause 4.1 at
Buring	The capacitors	are kept on a ho	ot plate for 30) seconds. w	hich is ma	intained at	Capacita	nce change	Within ±10% of the initial capacitance value
Resistance to soldering heat	250°C. The cap	acitors shall me	et the charac	cteristic requ	irements li		tan δ		Less than or equal to the initial specified value
Soluering neat	right when they	are removed fro	om the plate	and restored	to 20°C.		Leakage	current	Less than or equal to the initial specified value
Marking	Black print on th	ne case top.							

■Chip Type

Type numbering system (Example: 16V 10µF)



■Dimensions

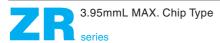
								1			
	V		4	6	.3	1	10	1	16	2	5
Cap. (μF)	Code	0	iG	C)J	1	1A	1	С	1	E
2.2	2R2				!		1			4	7
3.3	3R3				i		i		1	4	11
4.7	4R7				I I		1		1	4	16
5.6	5R6						1			5	18
6.8	6R8				i		i		i	5	20
10	100				ļ ļ		!	5	23	6.3	27
22	220	4	20	5	28	5	33	6.3	37		
33	330	5	28	5	37	6.3	41		İ		
47	470	5	33	6.3	45		1		!	Case size	Rated
100	101	6.3	56	6.3	70		1			Case size φD (mm)	ripple

Rated ripple current (mArms) at 85°C 120Hz

• Frequency coefficient of rated ripple current

Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Coefficient	0.70	1.00	1.17	1.36	1.50

- Taping specifications are given in page 23.
- Recommended land size soldering by reflow are given in page 18 19.
- Please refer to page 3 for the minimum order quantity.









- Chip type with 3.95mmLMAX height.
- Designed for surface mounting on high density PC board.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).

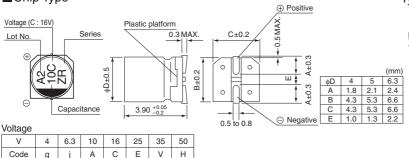


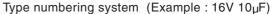


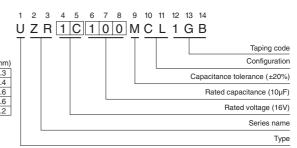
■Specifications

Item				Р	erformanc	e Characteristi	cs			
Category Temperature Range	-40 to +85°C									
Rated Voltage Range	4 to 50V									
Rated Capacitance Range	0.1 to 220μF									
Capacitance Tolerance	±20% at 120Hz	z, 20°C								
Leakage Current	After 2 minutes	application of ra	ated voltage	, leakage cu	rrent is no	t more than 0.	01 CV or	3 (µA) , whic	hever is great	er.
T (1	Rated vo	ltage (V)	4	6.3	10	16	25	35	50	120Hz 20°C
Tangent of loss angle (tan δ)	tan δ ((MAX.)	0.50	0.30	0.24	0.19	0.16	0.14	0.14	
0	Rated vol	tage (V)	4	6.3	10	16	25	35	50	120Hz
Stability at Low Temperature	Impedance ratio	Z-25°C / Z+20°C	7	4	3	2	2	2	2	
remperature	ZT / Z20 (MAX.)	Z-40°C / Z+20°C	15	8	8	4	4	3	3	
Endurance	capacitors are r	ons listed at right restored to 20°C 0 hours at 85°C.	after the rat		;	Capacitance tan δ Leakage cur	Ű	300% or les	s than the initi	capacitance value al specified value tial specified value
Shelf Life		e capacitors und ey shall meet the							nt based on JI	S C 5101-4 clause
Resistance to soldering heat	250°C. The cap	are kept on a ho acitors shall me emoved from the	et the chara	cteristic requ	irements I		tan δ	ance change	Less than or equal	ne initial capacitance value to the initial specified value to the initial specified value
Marking	Black print on th	ne case top.								









■Dimensions

	V	4	4	6	.3	1	0	1	6	2	25	3	5	5	0
Cap. (μF)	Code	0	G	C	J	1.	A	1	С	1	E	1	V	1	Н
0.1	0R1		!				l I		!		!		!	4	1.0
0.22	R22				i I		i I		i				i	4	2.0
0.33	R33		-		l I		l I		1				I I	4	2.8
0.47	R47						 							4	4.0
1	010				İ		i i							4	8.4
2.2	2R2				l I		l I				 		I I	4	13
3.3	3R3													4	17
4.7	4R7				İ		i I			4	16	4	18	5	20
10	100		-		l I		l I	4	23	5	27	5	29	6.3	33
22	220		1	4	28	5	33	5	37	6.3	42	6.3	46		
33	330	4	28	5	37	5	41	6.3	49	6.3	52		i		
47	470	4	33	5	45	6.3	52	6.3	58		[[I I		I I
100	101	5	56	6.3	70										
220	221	6.3	96		İ		İ		i				1	Case size φD (mm)	Rated ripple

Rated ripple current (mArms) at 85°C 120Hz

• Frequency coefficient of rated ripple current

Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Coefficient	0.70	1.00	1.17	1.36	1.50

- Taping specifications are given in page 23.
- Recommended land size soldering by reflow are given in page 18,19.
- Please refer to page 3 for the minimum order quantity.

3.95mmL MAX. Chip Type, Bi-polarized









Anti-Solve Feature



- Designed for surface mounting on high density PC board.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).

Products which are scheduled to be discontinued. Not recommended for new designs



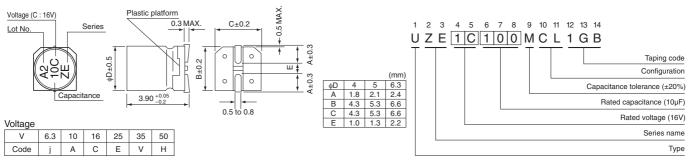


■Specifications

Item				Perf	ormance	Characte	eristics	3		
Category Temperature Range	-40 to +85°C									
Rated Voltage Range	6.3 to 50V									
Rated Capacitance Range	0.1 to 47μF									
Capacitance Tolerance	±20% at 120Hz, 20°C									
Leakage Current	After 2 minutes' application of	rated volta	ge, leaka	ge cui	rent is r	not more	than 0	.05 CV	or 10 (μ.	A), whichever is greater.
					Measure	ement freq	uency	: 120Hz	at 20°C	
Tangent of loss angle (tan δ)	Rated voltage (V)	6.3	10	1	16	25	35		50	
	tan δ (MAX.)	0.30	0.24	0.	.20	0.18	0.1	6 (0.16	
						Measurer	nent fr	equency	: 120Hz	
	Rated voltage (V)	6	5.3 1	0	16	25		35	50	
Stability at Low Temperature	Impedance ratio Z-25°C / Z+	-20°C	4 ;	3	2	2		2	2	
	ZT / Z20 (MAX.) Z-40°C / Z-	+20°C	8 8	3	4	4		3	3	
	The specifications listed at righ				Capa	citance ch	nange	Withir	1 ±30% o	f the initial capacitance value
Endurance	the capacitors are restored to 2				tan δ			300%	or less t	nan the initial specified value
	voltage is applied for 1000 hou polarity inverted every 250 hou		with the		Leaka	ige currer	nt	Less	than or e	qual to the initial specified value
Shelf Life	After storing the capacitors und clause 4.1 at 20°C, they shall r									reatment based on JIS C 5101-4 above.
Resistance to soldering heat	The capacitors are kept on a h is maintained at 250°C. The ca characteristic requirements list removed from the plate and res	pacitors shed at right	nall meet t when the	he	hich	Capacit tan δ Leakag			Less tha	2:10% of the initial capacitance value an or equal to the initial specified value an or equal to the initial specified value
Marking	Black print on the case top.									

■Chip Type

Type numbering system (Example: 16V 10µF)



■Dimensions

	V	6.	.3	1	0	1	6	2	5	3	5	5	0
Cap. (µF)	Code	0	J	1	A	1	С	1	E	1	V	1	Н
0.1	0R1				 		!					4	1.0
0.22	R22				İ		i					4	2.0
0.33	R33				l I		l I		l I		l I	4	2.8
0.47	R47											4	4.0
1	010				 		İ					4	8.4
2.2	2R2				l I		l I		l I	4	8.4	5	13
3.3	3R3				 		l I	5	12	5	16	5	17
4.7	4R7				 	4	12	5	16	5	18	6.3	20
10	100			4	17	5	23	6.3	27	6.3	29		
22	220	5	28	6.3	¦ 33	6.3	¦ 37				l I		
33	330	6.3	37	6.3	41	6.3	49						
47	470	6.3	45		i I		i I				1	Case size φD (mm)	Rated ripple

Rated ripple current (mArms) at 85°C 120Hz

• Frequency coefficient of rated ripple current

Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Coefficient	0.70	1.00	1.17	1.36	1.50

- Taping specifications are given in page 23.
- Recommended land size soldering by reflow are given in page 18,19.
- Please refer to page 3 for the minimum order quantity.









- Chip type with 3.95mmLMAX height. Operating over wide temperature range of -40 to +105°C.
- Designed for surface mounting on high density PC board.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).

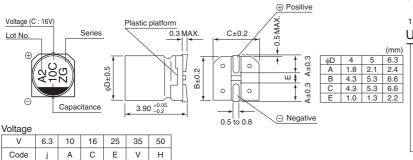




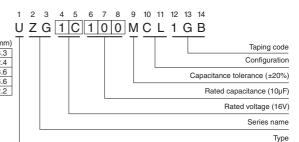
■Specifications

Item				Р	erformanc	e Characte	eristics	s						
Category Temperature Range	-40 to +105°C													
Rated Voltage Range	6.3 to 50V													
Rated Capacitance Range	0.1 to 100μF													
Capacitance Tolerance	±20% at 120Hz	z, 20°C												
Leakage Current	After 2 minutes	application of ra	ated voltage,	leakage cu	rrent is no	t more tha	an 0.0	1 CV or	3 (µA) ,	whiche	ver is greater.			
Tangent of loss angle /tan \$\	Rated vol	tage (V)	6.3	10	16	25	,	35		50	120Hz 20°C			
Tangent of loss angle (tan δ)	tan δ	(MAX.)	0.38	0.32	0.20	0.1	6	0.14	(0.14				
a	Rated vol	tage (V)	6.3	10	16	25	,	35		50	120Hz			
Stability at Low Temperature	Impedance ratio	Z-25°C / Z+20°C	6	5	3	3		3		3				
Temperature	ZT / Z20 (MAX.)	Z-40°C / Z+20°C	10	10	6	6		4		4				
Endurance	capacitors are r	ons listed at right restored to 20°C D hours at 105°C	after the rat		i	Capacita tan δ Leakage			300% o	r less th	the initial capacitance value an the initial specified value ual to the initial specified value			
Shelf Life		e capacitors und 0°C, they shall m									based on JIS C 5101-4			
Resistance to soldering heat	maintained at 2	are kept on a ho 50°C. The capac sted at right whe C.	citors shall m	neet the char	acteristic	and	tan 8	acitance		Less tha	±10% of the initial capacitance value an or equal to the initial specified value an or equal to the initial specified value			
Marking	Black print on th	ne case top.												

■Chip Type



Type numbering system (Example : $16V 10\mu F$)



Dimensions

	V	6.	.3	1	0	1	16	2	25	3	5	5	0
Cap. (µF)	Code	0	J	1	Α	1	C	1	E	1	V	1	Н
0.1	0R1											4	0.9
0.22	R22						i		i			4	2.2
0.33	R33						1		1		-	4	2.8
0.47	R47						-					4	3.3
1	010						i		i			4	5.4
2.2	2R2						1		1		1	4	9.6
3.3	3R3											4	12
4.7	4R7				i		İ	4	11	4	13	5	16
10	100				!	4	16	5	20	5	22	6.3	26
22	220	4	19	5	24	5	26	6.3	33	6.3	36		l
33	330	5	26	5	30	6.3	35	6.3	42		i I		
47	470	5	32	6.3	40	6.3	44		1		!		
100	101	6.3	52		İ		İ				İ	Case size	Rated ripple

Rated ripple current (mArms) at 105°C 120Hz

• Frequency coefficient of rated ripple current

Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Coefficient	0.70	1.00	1.17	1.36	1.50

- Taping specifications are given in page 23.
 - Recommended land size soldering by reflow are given in page 18,19.
- Please refer to page 3 for the minimum order quantity.

アルミニウム電解コンデンサ ALUMINUM ELECTROLYTIC CAPACITORS

7 チップ4.5 mmL 超小形化品 シリーズ

面実装タイプ製品高さ 4.5mmL 品。 キャリアテーピング包装により自動装着が可能。 RoHS 指令 (2011/65/EU)対応済。

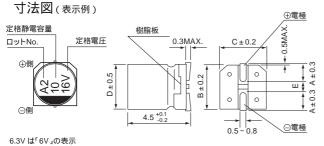


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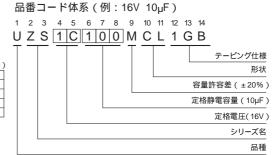


仕様

12 130										
項 目					性	Í	能			
カテゴリ温度範囲	- 40 ~ + 8	5								
定格電圧範囲	4 ~ 50V									
定格静電容量範囲	0.1 ~ 220µF	=								
定格静電容量許容差	± 20%(120	OHz , 20)								
漏れ電流	I = 0.01CV	または3(μA)いす	れか大きい	値以下(25	分値)					
損失角の正接	定村	各電圧(V)	4	6.3	10	16	25	35	50	120Hz 20
(tan)	tan	(MAX.)	0.50	0.30	0.24	0.19	0.16	0.14	0.14	
	定村	各電圧(V)	4	6.3	10	16	25	35	50	120Hz
温度特性	インピー ダンス比	Z - 25 /Z + 20	7	4	3	2	2	2	2	
	(MAX.)	Z - 40 /Z + 20	15	8	8	4	4	3	3	
	85 中におし	ハて 2000 時間定格電	[圧連続印加	後、20 に戻	ミし測定を行っ	ったとき、下	記項目を満足	する		
耐久性	静電容量変化	七率	初期値の ±	20%以内						
	tan		初期規格値	の 200%以下						
	漏れ電流		初期規格値	以下						
高温無負荷特性	85 1000	時間 無負荷放置後	20 にて	JIS C 5101-4	4 4.1 項によ	る電圧処理を	を行った後、	上記耐久性の	規格値を満	足する
	電極端子面を 250 の熱板上に 30 秒間放置後、20 に戻し測定を行ったとき、下記項目を満足する									
	静電容量変化	静電容量変化率 初期値の ± 10%以内								
はんだ耐熱性	tan		初期規格値	以下						
	漏れ電流	耐力・大学・イン・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・								
表示	ケース底に	- 入底に黒色表示								







寸法表

3,777															
	V		4	6	.3	1	0	1	16	2	25	3	35		50
定格静電容量(µF)	品番コード	0	G	C)J	1	A	1	C	1	ΙE	1	V		1H
0.1	0R1				1		1				1			4	1.0
0.22	R22										1		!	4	2.0
0.33	R33													4	2.8
0.47	R47												!	4	4.0
1	010		1						-				1	4	8.4
2.2	2R2		1		1		((1		1		1	4	13
3.3	3R3		! !		! !		! !		-		1		1 1 1	4	17
4.7	4R7		1		1		! !		-	4	16	4	18	5	20
10	100		1		! !		1	4	23	5	27	5	29	6.3	33
22	220			4	28	5	33	5	37	6.3	42	6.3	46		
33	330	4	28	5	37	5	41	6.3	49	6.3	52		!		
47	470	4	33	5	45	6.3	52	6.3	58				!		
100	101	5	56	6.3	70										
220	221	6.3	96						1		1		!	ケース [D 定格リプル

定格リプル電流 (mArms) at 85 120Hz

定格リプル電流の周波数補正係数

周 波 数	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz ~
補正係数	0.70	1.00	1.17	1.36	1.50

- ・テーピング仕様は21頁に掲載しております。
- ・はんだ付け推奨ランド寸法・推奨リフロー条件は17、18頁に掲載しております。
- ・高CV品についてはUR (148頁), UG (155頁) シリーズよりお選びください。
- ・ご発注単位は3頁を参照ください。











- Chip type with 4.5mm height.
- Designed for surface mounting on high density PC board.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).

Products which are scheduled to be discontinued. Not recommended for new designs



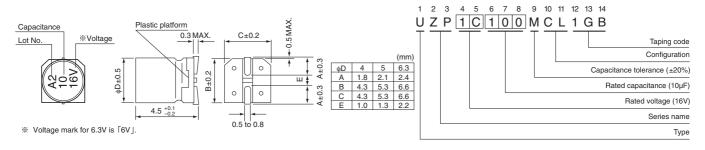


■Specifications

Item				Per	ormance	Characte	ristics					
Category Temperature Range	-40 to +85°C											
Rated Voltage Range	6.3 to 50V											
Rated Capacitance Range	0.1 to 47μF											
Capacitance Tolerance	±20% at 120Hz, 20°C											
Leakage Current	After 2 minutes' application of	rated volta	age, le	eakage cu	rrent is n	ot more t	han 0.0	05 CV	or 10 (μ.	A) , whichever is greater.		
					Measure	ment frequ	uency :	120Hz	at 20°C			
Tangent of loss angle (tan δ)	Rated voltage (V)	6.3	1	0	16	25	35		50			
, ,	tan δ (MAX.)	0.30	0.:	24 (.20	0.18	0.16		0.16			
						Measurem	nent free	quency	: 120Hz			
	Rated voltage (V)		6.3	10	16	25	3	5	50			
Stability at Low Temperature	Impedance ratio Z-25°C / Z-	+20°C	4	3	2	2	2	2	2			
	ZT / Z20 (MAX.) Z-40°C / Z-	+20°C	8	8	4	4	3	3	3			
	The specifications listed at righ				Capac	itance cha	ange	Within	n ±20% o	of the initial capacitance value		
Endurance	the capacitors are restored to				tan δ			300%	or less t	han the initial specified value		
	voltage is applied for 2000 hou polarity inverted every 250 hou		S with	the	Leaka	ge current	t	Less	than or e	qual to the initial specified value		
Shelf Life	After storing the capacitors unclause 4.1 at 20°C, they shall r									reatment based on JIS C 5101-4 above.		
	The capacitors are kept on a h				hich is	Capacita	ance ch	ange	Within :	±10% of the initial capacitance value		
Resistance to soldering	maintained at 250°C. The capa					tan δ		3.		an or equal to the initial specified value		
heat		racteristic requirements listed at right when they are noved from the plate and restored to 20°C. Leakage current Less than or equal to the initial specified value										
Marking	Black print on the case top.											

■Chip Type

Type numbering system (Example: 16V 10µF)



■Dimensions

	V	6.	.3	1	0	1	6	2	5	3	5	5	i0
Cap. (µF)	Code	0	J	1	A	1	С	1	E	1	V	1	Н
0.1	0R1											4	1.0
0.22	R22				l I				i I		1	4	2.0
0.33	R33				l I		i i		I I		 	4	2.8
0.47	R47				l I				l I			4	4.0
1	010				l I				İ			4	8.4
2.2	2R2				I I		İ		I I	4	8.4	5	13
3.3	3R3				 		!	5	12	5	16	5	17
4.7	4R7				 	4	12	5	16	5	18	6.3	20
10	100			4	17	5	23	6.3	27	6.3	29		
22	220	5	28	6.3	¦ 33	6.3	37		l I		1		l I
33	330	6.3	37	6.3	41	6.3	49		1				
47	470	6.3	45		i i				i I			Case size φD (mm)	Rated ripple

Rated ripple current (mArms) at 85°C 120Hz

• Frequency coefficient of rated ripple current

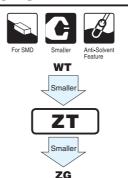
Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Coefficient	0.70	1.00	1.17	1.36	1.50

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please select WP(p.116), UN(p.162) series if high C/V products are regired.
- Please refer to page 3 for the minimum order quantity.



4.5mmL Chip Type, Wide Temperature Range

- ◆ Chip type with 4.5mm height, operating over wide temperature range of -40 to +105°C.
- Designed for surface mounting on high density PC board.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).

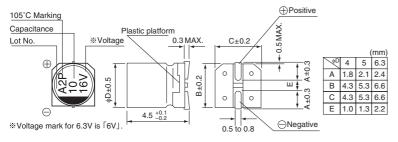




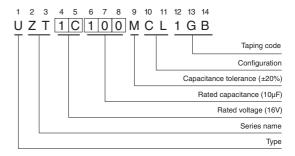
■Specifications

Item					Perfor	mance	Characteris	tics			
Category Temperature Range	-40 to +105°C										
Rated Voltage Range	6.3 to 50V										
Rated Capacitance Range	0.1 to 100μF										
Capacitance Tolerance	±20% at 120Hz, 20)°C									
Leakage Current	After 2 minutes' app	olication of r	ated volta	ige, lea	akage curr	ent is n	ot more tha	n 0.01CV	or 3 (µA)	, whichever is greater.	
					Me	easuren	nent frequenc	y : 120Hz	at 20°C		
Tangent of loss angle (tan δ)	Rated voltage (V)	6.3	10		16	25			50		
	tan δ (MAX.)										
	Measurement frequency : 120Hz										
Stability at Low Temperature		oltage (V)		6.3	10	16		35	50		
Stability at Low Temperature	Impedance ratio	Z-25°C / 2		6	5	3		3	3		
	ZT / Z20 (MAX.)	Z-40°C / 2	Z+20°C	10	10	6	6	4	4		
Endurance	The specifications I met when the capa				Capacitar change	ice				ance value (16V or less) ance value (25V or more)	
Endurance	20°C after the rated			r [tan δ		300% or les	s than initi	al specified	l value	
	1000 hours at 105°	C.		[Leakage	current	Less than or	equal to th	e initial spec	cified value	
Shelf Life	After storing the capacitors under no load at 105°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above.										
	The capacitors are kept on a hot plate for 30 seconds, which Capacitance change Within ±10% of the initial capacitance value										
Resistance to soldering heat	is maintained at 25						tan δ			or equal to the initial specif	
neat	characteristic requirements listed at right when they are removed from the plate and restored to 20°C. Leakage current Leas than or equal to the initial specified value										
Marking	Black print on the c	ase top.									

■Chip Type



Type numbering system (Example: 16V 10µF)



■Dimensions

	V	6	.3	1	0	1	6	2	.5	3	15	5	0
Cap. (µF)	Code	0	J	1	A	1	С	1	E	1	V	11	Н
0.1	0R1				 							4	0.9
0.22	R22		i		i I		i		i			4	2.2
0.33	R33		 		l I		i I		I I		i I	4	2.8
0.47	R47											4	3.3
1	010		i I		i I		i i		i		ĺ	4	5.4
2.2	2R2		 		 				Į.			4	9.6
3.3	3R3										[4	12
4.7	4R7		l		I I		i	4	11	4	13	5	16
10	100		 		 	4	16	5	20	5	22	6.3	26
22	220	4	19	5	24	5	26	6.3	33	6.3	36		
33	330	5	26	5	30	6.3	35	6.3	42		i i		
47	470	5	32	6.3	40	6.3	44		1		!		
100	101	6.3	52		l I		İ		İ		İ	Case size	Rated ripple

Rated ripple current (mArms) at 105°C 120Hz

• Frequency coefficient of rated ripple current

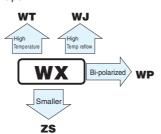
•			PP.0 00.		
Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Coefficient	0.70	1.00	1.17	1.36	1.50

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please select UX(p.154), UJ(p.160) series if high C/V products are regired.
- Please refer to page 3 for the minimum order quantity.





- Chip type with 5.5mm height.
- Designed for surface mounting on high density PC board.
- Applicable to automatic mounting machine fed with carrier tape.
- Load life of 2000 hours at 85°C.
- Compliant to the RoHS directive (2011/65/EU).

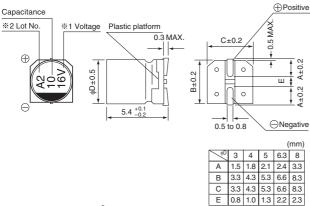




■ Specifications

Item					Pe	rforma	ance C	haracte	ristics				
Category Temperature Range	-40 to +85°C												
Rated Voltage Range	4 to 50V												
Rated Capacitance Range	0.1 to 330µF												
Capacitance Tolerance	±20% at 120Hz, 2	0°C											
Leakage Current	After 2 minutes' ap	plication o	of rated vol	tage, le	akage cu	rrent	is not	more th	nan 0.01	CV or 3	(μΑ) ,whic	heve	er is greater.
								Meası	ırement fı	equency	: 120Hz at	20°C	
Tangent of loss angle (tan δ)	Rated voltage (V)	4	6.3	10	1	6	25	;	35	50			
, ,	tan δ (MAX.)	0.35 (0.40)	0.26 (0.30)	0.20 (0.	24) 0.16	(0.19)	0.14 (0	0.16) 0.	12 (0.14)	0.12 (0.14)	Value	es in () applicable to WR, $\phi 3$ case size.
								N	1easuren	nent freq	uency: 12	0Hz	
	Rated vo	Itage (V)		4	6.3	1	0	16	25	35	50		
Stability at Low Temperature	Impedance ratio	Z-25°C /	Z+20°C	7	4	(3	2	2	2	2		
	ZT / Z20 (MAX.)	Z-40°C /	Z+20°C	15	8	3	3	4	4	3	3		
	The specifications				Ca	pacita	nce ch	nange	Within ±20	% of the initial	capacitance val	ue (With	nin ±25% for 4 V and \$3,WR series units)
Endurance	when the capacitor the rated voltage is				tan	δ			200% o	r less tha	an the initia	l spe	cified value
	85°C.	з аррпец п	or 2000 no	urs at	Lea	akage	Curre	nt	Less tha	n or equa	I to the initia	al spe	ecified value
Shelf Life	After storing the capacitors under no load at 85°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above.												
Resistance to soldering heat	The capacitors are maintained at 250 characteristic requiremoved from the	°C. The ca iirements l	pacitors sh listed at rig	nall mee ht wher	et the		is	tan δ	itance ch	ı	ess than o	r equ	the initial capacitance value al to the initial specified value al to the initial specified value
Marking	Black print on the	lack print on the case top.											

■ Chip Type

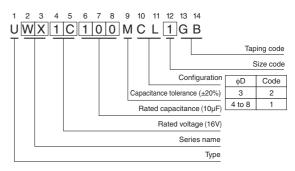


※ 1. Voltage mark for 6.3V is 「6V」.

In case of marking for \$3 units, "V" for rated voltage is omitted.

*2. In case of marking for \$4 units, Lot No.is expressed by a digit (month code).

Type numbering system (Example : 16V 10µF)



• In the case of size $\phi 3$ in (),parentheses, use WX in the 2nd and 3rd digit and put a 2 in the 12th digit of type numbering system.

Dimension table in next page.



Dimensions

	V	4	ļ	6	.3	1	10	1	6	2	!5	3	5	5	50
Cap. (µF)	Code	0	G	C)J	1	Α	1	С	1	E	1	V	1	Н
0.1	0R1										<u> </u>		 	4 (3)	1.0
0.22	R22								!					4 (3)	2.0
0.33	R33								! ! !				 	4 (3)	2.8
0.47	R47				!				!				!	4 (3)	4.0
1	010								 				 	4 (3)	8.4(8.0)
2.2	2R2				_				 			3	8.4	4 (3)	13 (10)
3.3	3R3				i		i		i			3	10	4	17
4.7	4R7								 	4 (3)	16 (12)	4	18	• 5	20 (18)
10	100				i		i	4 (3)	23 (18)	• 5	27 (24)	• 5	29 (24)	∘ 6.3	33 (30)
22	220	3	19	4 (3)	28 (21)	• 5	33 (30)	• 5	37 (30)	° 6.3	42 (38)	∘ 6.3	46 (39)	□8	52 (43)
33	330	4	28	• 5	37 (34)	• 5	41 (34)	∘ 6.3	49 (44)	∘ 6.3	52 (46)	□8	62 (53)	8	71
47	470	4	33	• 5	45 (40)	° 6.3	52 (47)	∘ 6.3	58 (52)	□ 8	70 (60)	8	80		
56	560	5	42	∘ 6.3	52 (46)	° 6.3	57 (50)	∘ 6.3	63 (57)	□8	76 (65)		 		
100	101	5	56	∘ 6.3	70 (47)	∘ 6.3	76 (54)	6.3	86	8	110		i i		i
150	151	6.3	79	6.3	71	□8	111 (76)		1				1		
220	221	6.3	96	□8	110 (74)	8	135		i		i		i	Case size	Rated
330	331	8	145	8	170				 				1	φD (mm)	ripple

^() is also available with $\phi 3mm$ upon request.

Rated ripple current (mArms) at 85°C 120Hz

Size $\phi 4$ is available for capacitors marked. " $^{\circ}$ " Size $\phi 5$ is available for capacitors marked. " $^{\circ}$ " $^{$

In such a case, WR will be put at 2nd and 3rd digit of type numbering system.

Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Coefficient	0.70	1.00	1.17	1.36	1.50

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please select UR(p.150), UG(p.158) series if high C/V products are reqired.
- Please refer to page 3 for the minimum order quantity.

[•] In the case of size φ3 in (),parentheses, use WX at 2nd and 3rd digit and put 2 at the 12th digit of type numbering system. () = φ3 units and WR Series



5.5mmL Chip Type High Temperature (260°C) Reflow





- Corresponding with 260°C peak reflow soldering Recomended reflow condition: 260°C peak 5 sec. 230°C over 60 sec.
 2 times
- Chip type with 5.5mm height.
- Designed for surface mounting on high density PC board.
- Applicable to automatic mounting machine fed with carrier tape.
- Load life of 2000 hours at 85°C
- Compliant to the RoHS directive (2011/65/EU).

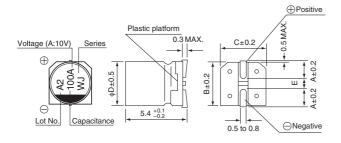




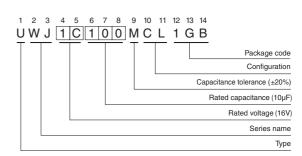
■Specifications

Item					Per	forman	ce Ch	aracte	ristics			
Category Temperature Range	-40 to +85°C											
Rated Voltage Range	6.3 to 50V											
Rated Capacitance Range	0.1 to 150μF											
Capacitance Tolerance	±20% at 120Hz, 20°0	С										
Leakage Current	After 2 minutes' appli	ication o	f rated vo	ltage, lea	kage cu	rrent is	not n	nore th	nan 0.01C\	/ or 3 (μA)	,whichever is greater.	
				_				120Hz	z at 20°C			
Tangent of loss angle (tan δ)	Rated voltage (V)	6.3	10	16	2		35		50			
	tan δ (MAX.)	an δ (MAX.) 0.26 0.20 0.16 0.14 0.12 0.12										
		Measurement frequency : 120Hz										
Stability at Low Temperature	Rated voltage (V)			6.3	10	16		25	35	50		
Stability at Low Temperature	poddiioo idiio	–25°C / 2		4	3	2		2	2	2		
	ZT / Z20 (MAX.) Z-	-40°C / 2	Z+20°C	8	8	4		4	3	3		
	The specifications list				Cai	oacitan	ce cha	ange	Within +2	0% of the ir	nitial capacitance value	
Endurance	when the capacitors				tan	δ					e initial specified value	
	the rated voltage is a 85°C.	ррпеа то	or 2000 no	ours at	Lea	akage C	urren	t	Less than	or equal to t	he initial specified value	
Shelf Life	After storing the capa clause 4.1 at 20°C, the										treatment based on JIS C 5101-4 l above.	
Resistance to soldering heat	maintained at 250°C. characteristic require	e capacitors are kept on a hot plate for 30 seconds, which is intained at 250°C. The capacitors shall meet the aracteristic requirements listed at right when they are noved from the plate and restored to 20°C.										
Marking	Black print on the cas	ck print on the case top.										

■Chip Type



Type numbering system (Example : 16V $10\mu F$)



Voltage						
V	6.3	10	16	25	35	50
Code	j	Α	С	Е	٧	Н

			(mm
φD	4	5	6.3
Α	1.8	2.1	2.4
В	4.3	5.3	6.6
С	4.3	5.3	6.6
E	1.0	1.3	2.2

Dimension table in next page.



■ Dimensions

	V	6.	3	1	0	1	6	2	5	3	5	50	
Cap. (µF)	Code	0	J	1.	A	1	С	1	E	1'	V	11	1
0.1	0R1						 					4	1.0
0.22	R22						 					4	2.0
0.33	R33						 					4	2.8
0.47	R47						 					4	4.0
1	010						 					4	8.4
2.2	2R2						1					4	13
3.3	3R3						 					4	17
4.7	4R7						 	4	16	4	18	5	20
10	100					4	23	5	27	5	29	6.3	33
22	220	4	28	5	33	5	37	6.3	42	6.3	45		
33	330	5	37	5	41	6.3	49	6.3	52				
47	470	5	45	6.3	52	6.3	58						
100	101	6.3	70	6.3	76	6.3	86					Case size	Rated
150	151	6.3	71				 					φD (mm)	ripple

Rated ripple current (mArms) at 85°C 120Hz

Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Coefficient	0.70	1.00	1.17	1.36	1.50

- Taping specifications are given in page 23.Recommended land size, soldering by reflow are given in page 18, 19.
- Please refer to page 3 for the minimum order quantity.









- Designed for surface mounting on high density PC board.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).



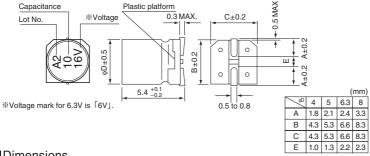


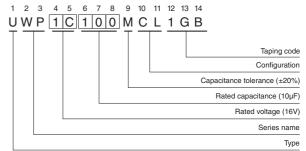
■ Specifications

Item					Performan	ice Charac	teristics						
Category Temperature Range	-40 to +85°C												
Rated Voltage Range	6.3 to 50V												
Rated Capacitance Range	0.1 to 100μF												
Capacitance Tolerance	±20% at 120Hz, 2	0°C											
Leakage Current	After 2 minutes' ap	plication of rat	ted volta	age, leaka	ge current is	not more	than 0.05C	V or 10 (µ	ıA) ,whichev	er is greater.			
							surement fre	quency : 1	20Hz at 20°C	;			
Tangent of loss angle (tan δ)	Rated voltage (V)												
	tan δ (MAX.)	tan δ (MAX.) 0.24 0.20 0.17 0.17 0.15 0.15											
		Measurement frequency : 120Hz											
	Rated voltage (V)		6.3	10	16	25	35	50					
Stability at Low Temperature	Impedance ratio	Z-25°C / Z+20°C		4	3	2	2	2	2				
	ZT / Z20 (MAX.)	Z-40°C / Z+	-20°C	8	6	4	4	3	3				
Endurance	The specifications when the capacito rated voltage is ap with the polarity in	rs are restored plied for 1000	to 20°0 hours a	C after the t 85°C	tan δ	tance chan	200%	or less tha	an the initial s	acitance value pecified value specified value			
Shelf Life	After storing the ca									pased on JIS C 5101-4			
Resistance to soldering heat	is maintained at 25 characteristic requ	The capacitors are kept on a hot plate for 30 seconds, which is maintained at 250°C. The capacitors shall meet the characteristic requirements listed at right when they are removed from the plate and restored to 20°C. Capacitance change Within ±10% of the initial capacitance value tan δ Less than or equal to the initial specified value Less than or equal to the initial specified value Less than or equal to the initial specified value Less than or equal to the initial specified value Less than or equal to the initial specified value Less than or equal to the initial specified value Less than or equal to the initial capacitance value Less than or equal to the initial											
Marking	Black print on the	lack print on the case top.											

■Chip Type

Type numbering system (Example : $16V 10\mu F$)





Dimensions

	V	6	.3	1	0	1	6	2	5	3	15	5	0
Cap. (µF)	Code)J	1	A	1	C	1	E	1	V	11	H
0.1	0R1		!		!						!	4	1.0
0.22	R22		i		i						i i	4	2.0
0.33	R33		i I		i I		I I				l I	4	2.8
0.47	R47				[1				1	4	4.0
1	010		i		İ		1				i	4	8.4
2.2	2R2		! !		!		!			4	8.4	5	13
3.3	3R3							5	12	5	16	5	17
4.7	4R7		i i		İ	4	12	5	16	5	18	6.3	20
10	100		! !	4	17	5	23	6.3	27	6.3	29	8	36
22	220	5	28	6.3	33	6.3	37	8	50	8	54		•
33	330	6.3	37	6.3	41	6.3	49	8	61		i I		
47	470	6.3	45	8	61	8	75				1		Rated
100	101	8	82		i		i				i	Case size	ripple

• Frequency coefficient of rated ripple current

Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Coefficient	0.70	1.00	1.17	1.36	1.50

- Rated ripple current (mArms) at 85°C 120Hz • Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please select UN(p.162) series if high C/V products are reqired.
- Please refer to page 3 for the minimum order quantity.





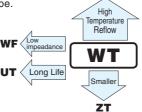
WZ

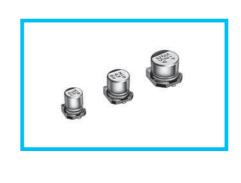
• Chip type operating over wide temperature range of to −55 to +105°C.

• Designed for surface mounting on high density PC board.

• Applicable to automatic mounting machine fed with carrier tape.

• Compliant to the RoHS directive (2011/65/EU).

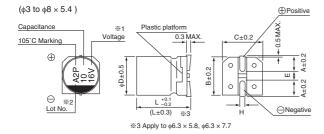


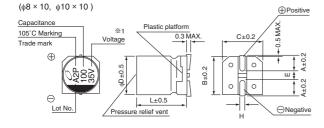


■Specifications

Item		Performance Characteristics											
Category Temperature Range	-55 to +105°C												
Rated Voltage Range	4 to 50V												
Rated Capacitance Range	0.1 to 1500μF												
Capacitance Tolerance	±20% at 120Hz, 2	0°C											
Leakage Current	After 2 minutes' ap	plication of	rated volta	age, lea	kage cur	rent is r	ot more than	0.01CV	or 3 (µA)), whiche	ver is greater.		
							Measuren	nent freque	ency : 120	0Hz at 20°C	;		
Tangent of loss angle (tan δ)	Rated voltage (V)												
,	tan δ (MAX.)												
		Measurement frequency : 120Hz											
	Rated voltage (V)			4	6.3	10	16	25	35	50]		
Stability at Low Temperature	Impedance ratio	Z-25°C / Z+20°C		7	4	3	2	2	2	2]		
	ZT / Z20 (MAX.)	Z-40°C /	Z+20°C	15	8	8	4	4	3	3			
Endurance	The specifications met when the capa 20°C after the rate	acitors are re	estored to		Capacita change tan δ	nce		of the initia	al capacita	ance value fo	tors of φ3mm unit, and or capacitors of 25V		
	1000 hours at 105				Leakage	current)		
Shelf Life		ter storing the capacitors under no load at 105°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 ause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above.											
Resistance to soldering heat	is maintained at 25 characteristic requ	e capacitors are kept on a hot plate for 30 seconds, which maintained at 250°C. The capacitors shall meet the aracteristic requirements listed at right when they are noved from the plate and restored to 20°C. Capacitance change Within ±10% of the initial capacitance value tan δ Less than or equal to the initial specified value Leakage current Less than or equal to the initial specified value Leakage current Less than or equal to the initial specified value Leakage current Less than or equal to the initial specified value Leakage current Less than or equal to the initial specified value Leakage current Leakage current Less than or equal to the initial specified value Leakage current Leakage											
Marking	Black print on the	ck print on the case top.											

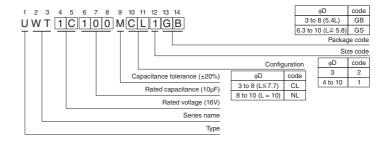
■Chip Type





- %1. Voltage mark for 6.3V is 「6V」. In case of marking for φ3 units, "V" for rated voltage is smitted.
- voltage is omitted. *2. In case of marking for \$\phi 3\$ units. Lot No is expressed by a digit (month code).

Type numbering system (Example : 16V $10\mu F$)



									(mm)
φD×L	3 × 5.4	4 × 5.4	5 × 5.4	6.3 × 5.4	6.3 × 5.8	6.3 × 7.7	8 × 5.4	8 × 10	10 × 10
Α	1.5	1.8	2.1	2.4	2.4	2.4	3.3	2.9	3.2
В	3.3	4.3	5.3	6.6	6.6	6.6	8.3	8.3	10.3
С	3.3	4.3	5.3	6.6	6.6	6.6	8.3	8.3	10.3
Е	0.8	1.0	1.3	2.2	2.2	2.2	2.3	3.1	4.5
L	5.4	5.4	5.4	5.4	5.8	7.7	5.4	10	10
Н	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.8 to 1.1	0.8 to 1.1

• Dimension table in next page.



■Dimensions

	V	4		6.3	3	10		16		25		35		50	
Cap. (µF)	Code	0G	i	0J		1A		1C		1E		1V		1H	
0.1	0R1													4 × 5.4 (3)	1.0
0.22	R22		_				 							4 × 5.4 (3)	2.6
0.33	R33		İ		İ								į	4 × 5.4 (3)	3.2
0.47	R47													4 × 5.4 (3)	3.8
1	010		 		1		 							4 × 5.4 (3)	6.3(5.9)
2.2	2R2		i i		i i		i I					3×5.4	7.5	4 × 5.4 (3)	11 (9)
3.3	3R3		 				 					3×5.4	9	4 × 5.4	14
4.7	4R7									4 × 5.4 (3)	13 (10)	4 × 5.4	15	5 × 5.4	19
10	100		į		į			4 × 5.4 (3)	18 (14)	5 × 5.4	23	5 × 5.4	25	6.3×5.4	30
22	220	4 × 5.4	22	4 × 5.4	22	5 × 5.4	27	5 × 5.4	30	6.3 × 5.4	38	6.3×5.4	42	•8×5.4	51 (45)
33	330	5 × 5.4	30	5 × 5.4	30	5 × 5.4	35	6.3 × 5.4	40	6.3×5.4	48	• 8 × 5.4	59 (52)	6.3×7.7	60
47	470	5 × 5.4	36	5 × 5.4	36	6.3×5.4	46	6.3 × 5.4	50	• 8 × 5.4	66 (59)	6.3×5.8	63	6.3×7.7	63
100	101	6.3×5.4	60	6.3×5.4	60	6.3×5.4	60	6.3 × 5.4	60	6.3×7.7	91	6.3×7.7	84	8 × 10	140
150	151	6.3×5.8	86	6.3×5.8	86	6.3×5.8	86	6.3 × 7.7	95	8 × 10	140	8 × 10	155	10 × 10	180
220	221	• 8 × 5.4	102 (91)	• 8 × 5.4	102 (91)	6.3×7.7	105	6.3×7.7	105	8 × 10	155	8 × 10	190	10 × 10	220
330	331	6.3 × 7.7	105	6.3×7.7	105	8 × 10	195	8 × 10	195	8 × 10	190	10 × 10	300		! !
470	471	8 × 10	210	8 × 10	210	8 × 10	210	8×10	230	10 × 10	300				
680	681	8 × 10	210	8 × 10	210	10 × 10	310	10×10	310						
1000	102	8 × 10	230	8 × 10	230	10 × 10	310							Case size	Rated
1500	152	10 × 10	310	10 × 10	310									$\phi D \times L (mm)$	ripple

Rated ripple current (mArms) at 105°C 120Hz

• Frequency coefficient of rated ripple current

Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Coefficient	0.70	1.00	1.17	1.36	1.50

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please select UX(p.154), UJ(p.160) series if high C/V products are reqired.
- Please refer to page 3 for the minimum order quantity.

^() is also available with \$3mm upon request. In such a case, ②will be put at 12th digit of type numbering system. Size \$6.3 × 5.8 is available for capacitors marked. " •" In such a case, [6] will be put at 12th digit of type numbering system.

Chip Type, Wide Temperature Range High Temperature (260°C) Reflow





- Corresponding with 260°C peak reflow soldering Recomended reflow condition : 260°C peak 5 sec 230°C over 60 sec 2 times $(\phi 8 \times 6.2, \phi 10 \times 10 : 1 \text{ time})$
- ◆ Chip type operating over wide temperature range of to -55 to +105°C.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).



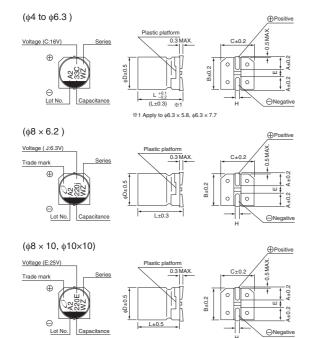
WT



■Specifications

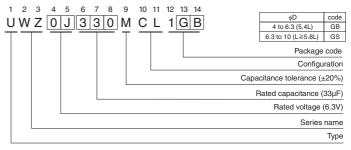
Item					Perfo	rmance	Characterist	ics					
Category Temperature Range	−55 to +105°C												
Rated Voltage Range	6.3 to 50V												
Rated Capacitance Range	0.1 to 1500μF												
Capacitance Tolerance	±20% at 120Hz, 2	0°C											
Leakage Current	After 2 minutes' ap	plication of	rated volta	ige, leal	kage cur	ent is r	ot more thar	0.01CV	or 3 (μΑ), whichever is greater.			
					M	easurem	ent frequency	/: 120Hz	at 20°C				
Tangent of loss angle (tan δ)	Rated voltage (V)												
	tan δ (MAX.)	an δ (MAX.) 0.30 0.24 0.20 0.16 0.14 0.14											
							Measuremen	t frequen	cy : 120H	z			
	Rated	voltage (V)		6.3	10	16	25	35	50				
Stability at Low Temperature	Impedance ratio	Z-25°C /	Z+20°C	4	3	2	2	2	2				
	ZT / Z20 (MAX.)	Z-40°C /	Z+20°C	8	8	4	4	3	3				
Endurance	The specifications met when the capa 20°C after the rate	acitors are re d voltage is	estored to		Capacita change tan δ	nce		of the init	al capacita	ance value for capacitors of 16V or less. ance value for capacitors of 25V or more. ified value			
	1000 hours at 105	°C.			Leakage	current	Less than or	equal to th	e initial sp	ecified value			
Shelf Life	After storing the ca									treatment based on JIS C 5101-4 above.			
		he capacitors are kept on a hot plate for 30 seconds, which is Capacitance change Within ±10% of the initial capacitance value											
Resistance to soldering	maintained at 250						tan δ			an or equal to the initial specified value			
heat	characteristic requ removed from the				ney are	[Leakage cu	rrent	Less th	an or equal to the initial specified value			
Marking	Black print on the	case top.											

■Chip Type



Dimension table in next page.

Type numbering system (Example: 6.3V 33µF)



								(mm)
φD×L	4 × 5.4	5 × 5.4	6.3 × 5.4	6.3 × 5.8	6.3 × 7.7	8 × 6.2	8×10	10 × 10
Α	1.8	2.1	2.4	2.4	2.4	3.3	2.9	3.2
В	4.3	5.3	6.6	6.6	6.6	8.3	8.3	10.3
С	4.3	5.3	6.6	6.6	6.6	8.3	8.3	10.3
E	1.0	1.3	2.2	2.2	2.2	2.3	3.1	4.5
L	5.4	5.4	5.4	5.4	7.7	6.2	10	10
Н	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.8 to 1.1	0.8 to 1.1

Voltage	
	\top

V	6.3	10	16	25	35	50
Code	j	Α	С	Е	٧	Н



■ Dimensions

	V	6.3		10		16		25		35		50	
Cap. (µF)	Code	0J		1A		1C		1E		1V		1H	
0.1	0R1											4 × 5.4	1.0
0.22	R22											4 × 5.4	2.6
0.33	R33											4 × 5.4	3.2
0.47	R47											4 × 5.4	3.8
1	010											4 × 5.4	6.3
2.2	2R2											4 × 5.4	11
3.3	3R3											4 × 5.4	14
4.7	4R7							4 × 5.4	13	4 × 5.4	15	5 × 5.4	19
10	100					4 × 5.4	18	5 × 5.4	23	5 × 5.4	25	6.3 × 5.4	30
22	220	4 × 5.4	22	5 × 5.4	27	5 × 5.4	30	6.3 × 5.4	38	6.3 × 5.4	42	8 × 6.2	51
33	330	5 × 5.4	30	5 × 5.4	35	6.3×5.4	40	6.3 × 5.4	48	8 × 6.2	59	6.3 × 7.7	60
47	470	5 × 5.4	36	6.3 × 5.4	46	6.3×5.4	50	8 × 6.2	66	6.3 × 5.8	63	6.3 × 7.7	63
100	101	6.3×5.4	60	6.3 × 5.4	60	6.3×5.4	60	6.3×7.7	91	6.3 × 7.7	84	8 × 10	140
150	151	6.3×5.8	86	6.3 × 5.8	86	6.3×7.7	95	8×10	140	8 × 10	155	10 × 10	180
220	221	8 × 6.2	102	6.3×7.7	105	6.3×7.7	105	8×10	155	10 × 10	190	10 × 10	220
330	331	6.3×7.7	105	8 × 10	195	8 × 10	195	10 × 10	190	10 × 10	300		
470	471	8 × 10	210	8×10	210	8 × 10	210	10×10	300				
680	681	8 × 10	210	10×10	310	10 × 10	310						
1000	102	10 × 10	230	10×10	310							Case size	Rated
1500	152	10 × 10	310									φD×L (mm)	ripple

Rated ripple current (mArms) at 105°C 120Hz

Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Coefficient	0.70	1.00	1.17	1.36	1.50

- Taping specifications are given in page 23.
 Recommended land size, soldering by reflow are
- given in page 18, 19.

 Please refer to page 3 for the minimum order quantity.









- Chip type, low impedance temperature range up to +105°C.
- Designed for surface mounting on high density PC board.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).

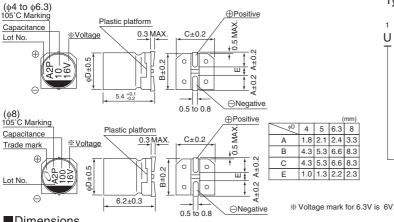




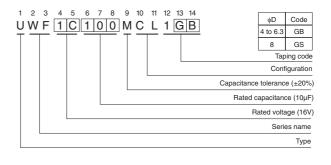
■Specifications

Item					Perf	rmance C	haracte	eristics						
Category Temperature Range	-55 to +105°C													
Rated Voltage Range	6.3 to 35V													
Rated Capacitance Range	1 to 220µF													
Capacitance Tolerance	±20% at 120Hz, 20°	Č												
Leakage Current	After 2 minutes' app	lication of rated	l voltage,	, leakaç	ge current is	not more t	han 0.01	1CV or	3 (µA), w	hichever is greater.				
		Measurement frequency : 120Hz at 20°C												
Tangent of loss angle (tan δ)	Rated voltage (V)													
, , ,	tan δ (MAX.)	an δ (MAX.) 0.22 0.19 0.16 0.14 0.12												
		Measurement frequency : 120Hz												
	Rated	Rated voltage (V) 6.3 10 16 25 35												
Stability at Low Temperature	Impedance ratio	Z-25°C / Z+2	20°C	2	2	2	2		2					
	ZT / Z20 (MAX.)	Z-55°C / Z+2	20°C	4	4	3	3		3					
	The specifications					Capacita	ance ch	ange		20% of the initial capacitance value				
Endurance	the capacitors are				ated	tan δ				less than the initial specified value				
	voltage is applied	for 1000 hours	s at 105	5°C.		Leakage	curren	t	Less than	n or equal to the initial specified value				
Shelf Life	After storing the cap 20°C, they shall mee									tment based on JIS C 5101-4 clause 4.1 at				
	The capacitors are					nich is	Capa	citanc	e change	Within ±10% of the initial capacitance value				
Resistance to soldering		aintained at 250°C. The capacitors shall meet the												
heat		haracteristic requirements listed at right when they are removed rom the plate and restored to 20°C. Leakage current Less than or equal to the initial specified value												
Marking			U C.											
Marking	Black print on the ca	ise iop.												

■Chip Type



Type numbering system (Example: 16V 10µF)



Dimensions

	V		6.3			10			16			25			35	
Cap. (µF)	Code		0J			1A			1C			1E			1V	
1	010		l 											4	5.0	50
1.5	1R5													4	5.0	50
2.2	2R2		l I	l I		I I	l I		l I	I I		l I	I I	4	5.0	50
3.3	3R3		 	l I		!	! !			!			!	4	5.0	50
4.7	4R7		l I			1	İ			1	4	5.0	50	4	5.0	50
6.8	6R8		i I	i I		i i	i I			i	4	5.0	50	5	2.6	80
10	100		 			! !	l !	4	5.0	50	5	2.6	80	5	2.6	80
15	150							5	2.6	80	6.3	1.3	115	6.3	1.3	115
22	220	4	5.0	50	5	2.6	80	5	2.6	80	6.3	1.3	115	6.3	1.3	115
33	330	5	2.6	80	5	2.6	l 80	6.3	1.3	115	6.3	1.3	115	8	0.8	150
47	470	5	2.6	80	6.3	1.3	115	6.3	1.3	115	8	0.8	150	8	0.8	150
68	680	6.3	1.3	115	6.3	1.3	115	8	0.8	150	8	0.8	150			
100	101	6.3	1.3	115	8	0.8	150	8	0.8	150			l I			
150	151	8	0.8	150	8	0.8	150							Case size	Impedance	Rated
220	221	8	0.8	150		İ	İ			i			i	φD (mm)	impedance	Rated ripple

• Frequency coefficient of rated ripple current

Frequency 300 Hz 10 kHz or more 50 Hz 120 Hz 1 kHz Coefficient 0.35 0.50 0.64 0.83 1.00

- Max. Impedance (Ω) at 20°C 100kHz Rated ripple current (mArms) at 105°C 100kHz
- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please select UJ(p.160) series if high C/V products are reqired. • Please refer to page 3 for the minimum order quantity.

Chip Type, Low Impedance



- ◆ Chip type, operating over wide temperature range of to −55 to +105°C.
- Designed for surface mounting on high density PC board.
 Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).

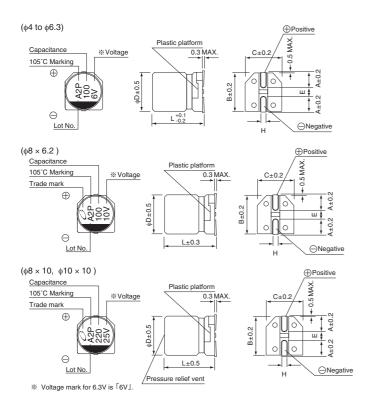




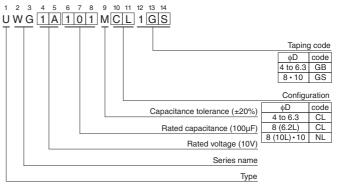
■Specifications

Item					Perf	ormance C	haracter	istics					
Category Temperature Range	−55 to +105°C												
Rated Voltage Range	6.3 to 50V												
Rated Capacitance Range	1 to 1500μF												
Capacitance Tolerance	±20% at 120Hz, 20°	С											
Leakage Current	After 2 minutes' app	olication o	of rated vo	oltage,	leakage	current is	s not mo	ore than	0.01C\	/ or 3 (μA), whichever is greater.			
					M	easuremer	t frequer	ncy : 120I	Hz at 20°	<u>c</u>			
Tangent of loss angle (tan δ)	Rated voltage (V)												
1	tan δ (MAX.)	an δ (MAX.) 0.26 0.19 0.16 0.14 0.12 0.12											
						Meas	urement	frequen	cy : 120H	z			
OLDER TO THE T	Rated vol	Itage (V)		6.3	10	16	25	35	50				
Stability at Low Temperature	Impedance ratio	Z-25°C /	Z+20°C	2	2	2	2	2	2				
	ZT / Z20 (MAX.)	Z-55°C /	Z+20°C	4	4	3	3	3	3				
	The specifications lis				Capacita	ince chang	e Withir	1 +20% 0	of the initia	al capacitance value			
Endurance	when the capacitors				tan δ					nitial specified value			
	after the rated voltage hours at 105°C.	e is applie	ea for 1000	, [Leakage	current	Less t	han or ec	ual to the	initial specified value			
Shelf Life	After storing the capa clause 4.1 at 20°C, the									age treatment based on JIS C 5101-4 sted above.			
	The capacitors are k	ept on a h	ot plate fo	r 30 se	conds, wl	nich is	Cana	acitance	change	Within ±10% of the initial capacitance value			
Resistance to soldering	maintained at 250°C						tan 8		onango	Less than or equal to the initial specified value			
heat	requirements listed a and restored to 20°C		en they ar	e remo	ved from	the plate		age curi	rent	Less than or equal to the initial specified value			
Marking	Black print on the cas	se top.											

■Chip Type



Type numbering system (Example : $10V 100\mu F$)



						(111111)
φD×L	4 × 5.4	5 × 5.4	6.3 × 5.4	8 × 6.2	8 × 10	10 × 10
A	1.8	2.1	2.4	3.3	2.9	3.2
В	4.3	5.3	6.6	8.3	8.3	10.3
С	4.3	5.3	6.6	8.3	8.3	10.3
E	1.0	1.3	2.2	2.3	3.1	4.5
L	5.4	5.4	5.4	6.2	10	10
Н	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.8 to 1.1	0.8 to 1.1

Dimension table in next page.



■Dimensions

Can	V 6.3					10			16	
(μF)	Code		OJ			1A			1C	
10	100							4×5.4	3.0	60
22	220	4 × 5.4	3.0	60			1	5×5.4	1.8	95
33	330				5×5.4	1.8	95		i I	İ
47	470	5×5.4	1.8	95		1		6.3×5.4	1.0	140
68	680	6.3 × 5.4	1.0	140		I I	1	8 × 6.2	0.4	230
100	101	6.3 × 5.4	1.0	140	8×6.2	0.4	230	8 × 6.2	0.4	230
150	151				8×6.2	0.4	230		I I I	1
220	221	8 × 6.2	0.4	230	8 × 10	0.3	450	10×10	0.15	670
330	331	8×10	0.3	450		i	i	10×10	0.15	670
470	471				10 × 10	0.15	670	10×10	0.15	670
680	681					I I	1	10×10	0.15	670
1000	102	10×10	0.15	670	10×10	0.15	670		·	İ
1500	152	10×10	0.15	670						

Con	V 25					35		50			
Cap. (μF)	Code		1E			1V			1H		
1	010			I I I	4 × 5.4	3.0	60	4 × 5.4	5.0	30	
2.2	2R2			 	4 × 5.4	3.0	60	4 × 5.4	5.0	30	
3.3	3R3				4 × 5.4	3.0	60	4 × 5.4	5.0	30	
4.7	4R7			I I I	4×5.4	3.0	60	5 × 5.4	3.0	50	
6.8	6R8	4 × 5.4	3.0	60	5 × 5.4	1.8	95				
10	100				5×5.4	1.8	95	6.3 × 5.4	2.0	70	
22	220	6.3 × 5.4	1.0	140	6.3 × 5.4	1.0	140	8 × 6.2	0.7	120	
33	330	6.3 × 5.4	1.0	140	8 × 6.2	0.4	230	8×10	0.6	300	
47	470	8 × 6.2	0.4	230	8 × 6.2	0.4	230	10×10	0.3	500	
68	680	8×10	0.3	450							
100	101	8×10	0.3	450	10×10	0.15	670	10×10	0.3	500	
220	221	10×10	0.15	670	10×10	0.15	670	10×10	0.3	500	
330	331	10×10	0.15	670	10×10	0.15	670	Case size	Immodence	Rated	
470	471	10×10	0.15	670				φD _× L(mm)	Impedance	ripple	

Max. Impedance $\,(\Omega)$ at 20°C 100kHz Rated ripple current (mArms) at 105°C 100kHz

• Frequency coefficient of rated ripple current

Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Coefficient	0.35	0.50	0.64	0.83	1.00

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please select UJ(p.160) series if high C/V products are regired.
- Please refer to page 3 for the minimum order quantity.

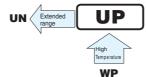








- Chip type, bi-polarized withstanding high temperature range up to +105°C.
- Designed for surface mounting on high density PC board.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).

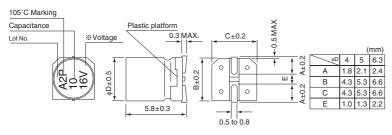




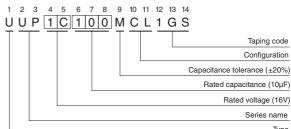
■ Specifications

Item					Performan	ice Cha	aracte	eristics				
Category Temperature Range	−55 to +105°C											
Rated Voltage Range	6.3 to 50V											
Rated Capacitance Range	0.1 to 47μF											
Capacitance Tolerance	±20% at 120Hz, 20)°C										
Leakage Current	After 2 minutes' ap	ter 2 minutes' application of rated voltage, leakage current is not more than 0.05 CV or 10 (µA), whichever is greater.										
		Measurement frequency : 120Hz at 20°C										
Tangent of loss angle (tan δ)	Rated voltage (V)	Rated voltage (V) 6.3 10 16 25 35 50										
	tan δ (MAX.)	tan δ (MAX.) 0.24 0.20 0.17 0.17 0.15 0.15										
								Measurer	ment freq	uency : 120Hz	,	
0	Rated v			6.3	10	16	6	25	35	50		
Stability at Low Temperature	Impedance ratio	Z-25°C / Z+	-20°C	4	3	2		2	2	2		
	ZT / Z20 (MAX.)	Z-40°C / Z+	-20°C	8	6	4		4	3	3		
	The specifications list				Capacitance ch	nange	Wit	thin ±20% of	f the initia	l capacitance v	alue	
Endurance	the rated voltage is				tan δ		200	0% or less th	nan the ini	itial specified va	alue	
	105°C with the polar			L	Leakage currer	nt	Les	ss than or equ	ual to the i	nitial specified v	alue	
Shelf Life	After storing the ca clause 4.1 at 20°C,										based on JIS C 5101-4	
	The capacitors are						Ca	pacitance c	hange	Within +10% of	f the initial capacitance value	
Resistance to soldering	maintained at 250°						tan		ago		al to the initial specified value	
heat	requirements listed at right when they are removed from the plate and restored to 20°C.										all to the initial specified value	
Marking	Black print on the o	Black print on the case top.										

■Chip Type



Type numbering system (Example : $16V 10\mu F$)



Dimensions

	V	6.	.3	1	0	1	6	2	:5	3	35	5	0
Cap.(µF)	Code	0	J	1	A	1	С	1	E	1	V	1	Н
0.1	0R1				!				!			4	1.0
0.22	R22											4	2.0
0.33	R33				i I		1		i i			4	2.8
0.47	R47				! !		!		! !		!	4	4.0
1	010				I				1			4	8.4
2.2	2R2				i I		i		i I	4	8.4	5	13
3.3	3R3				l I		1	5	12	5	16	5	17
4.7	4R7				1	4	12	5	16	5	18	6.3	20
10	100			4	17	5	23	6.3	27	6.3	29		
22	220	5	28	6.3	33	6.3	37		l I		1		
33	330	6.3	37	6.3	41	6.3	49						Rated
47	470	6.3	45				!				!	Case size	ripple

Rated ripple current (mArms) at 105°C 120Hz

• Frequency coefficient of rated ripple current

Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Coefficient	0.70	1.00	1.17	1.36	1.50

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please select UN(p.162) series if high CV products are required.
- Please refer to page 3 for the minimum order quantity.



6mmL Chip Type, Wide Temperature Range





- Chip type with load life 2000 hours at +105°C.
- Designed for surface mounting on high density PC board.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).





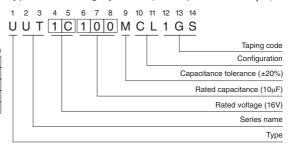
■Specifications

Item					Per	formance	Chara	acter	ristics							
Category Temperature Range	−55 to +105°C															
Rated Voltage Range	4 to 50V															
Rated Capacitance Range	0.1 to 100μF															
Capacitance Tolerance	±20% at 120Hz, 20)°C														
Leakage Current	After 2 minutes' ap	er 2 minutes' application of rated voltage, leakage current is not more than 0.01 CV or 3 (μA) , whichever is greater.														
	Measurement frequency :120Hz at 20°C															
Tangent of loss angle (tan δ)	Rated voltage (V)	4	6.3		10	16		25	3	35	50					
	tan δ (MAX.)	tan δ (MAX.) 0.37 0.28 0.24 0.20 0.16 0.13 0.12														
								Mea	suremen	t frequen	cy:120Hz					
Ctability at Law Tarana and was	Rated vo	ltage (V)		4	6.3	10	16	6	25	35	50					
Stability at Low Temperature	Impedance ratio	Z-25°C / 2	Z+20°C	6	3	3	2	!	2	2	2					
	ZT / Z20 (MAX.)	Z-40°C / Z	Z+20°C	12	8	5	4	.	3	3	3					
Endurance	The specifications when the capacitor the rated voltage is 105°C.	s are resto	red to 20°	C after	chan tan δ		ıt	With	nin ±20% o % or less	of the initi than the i						
Shelf Life	After storing the ca											nent based on JIS C 5101-4				
Resistance to soldering heat	The capacitors are kept on a hot plate for 30 seconds, which is maintained at 250° C. The capacitors shall meet the characteris requirements listed at right when they are removed from the pla and restored to 20° C.					racteristic tan 8 Less than 6				±10% of the initial capacitance value an or equal to the initial specified value an or equal to the initial specified value						
Marking	Black print on the o	ase top.					lack print on the case top.									

■Chip Type

⊕Positive 105°C Marking Capacitance Lot No. 5 6.3 A 1.8 2.1 2.4 0 В 4.3 5.3 6.6 B±0.2 4.3 5.3 6.6 0 1.0 1.3 2.2 ⊖Negative 0.5 to 0.8 5.8±0.3 % Voltage mark for 6.3V is $\lceil 6V \rfloor$.

Type numbering system (Example: 16V 10µF)



■ Dimensions

	V	4		6.	3	10)	10	6	2	5	35	5	50)
Cap.(µF)	Code	00	3	0,	J	1/	4	10	C	11	Ξ	1\	/	11-	1
0.1	0R1				1				1				1	4	1.0
0.22	R22		i		i I				i I		i		i	4	2.6
0.33	R33		 		 				 		I I		 	4	3.2
0.47	R47				1									4	3.8
1	010		i i		İ				İ		i		İ	4	6.2
2.2	2R2		!		!				!		!		!	4	11
3.3	3R3													4	14
4.7	4R7		i I		i I				i I	4	13	4	15	5	19
10	100		! !		 			4	18	5	23	5	25	6.3	30
22	220	4	22	4	22	5	27	5	30	6.3	38	6.3	42		
33	330	5	¦ 30	5	30	5	35	6.3	40	6.3	48		l I		
47	470	5	36	5	36	6.3	46	6.3	50				1		Rated
100	101	6.3	60	6.3	60	6.3	60							Case size φ D (mm)	ripple

Rated ripple current (mArms) at 105°C 120Hz

• Frequency coefficient of rated ripple current

Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Coefficient	0.70	1.00	1.17	1.36	1.50

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please select UX(p.154), UJ(p.160) series if high C/V products are required.
- Please refer to page 3 for the minimum order quantity.









- Chip type with load life of 3000 to 5000 hours at +105°C.
- Designed for surface mounting on high density PC board.
- Compliant to the RoHS directive (2011/65/EU).





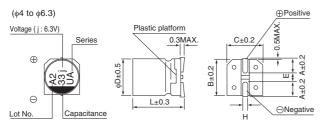


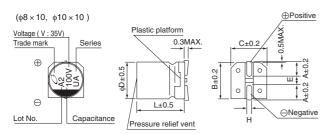


■ Specifications

Item	Performance	Performance Characteristics											
Category Temperature Range	−55 to +105°C												
Rated Voltage Range	6.3 to 50V												
Rated Capacitance Range	0.1 to 1000μF												
Capacitance Tolerance	±20% at 120Hz, 20°C												
Leakage Current	After 2 minutes' application of rated voltage, leakage current is no	fter 2 minutes' application of rated voltage, leakage current is not more than 0.01 CV or 3 (μA) , whichever is greater.											
	Measurement frequency : 120Hz at 20°C												
Tangent of loss angle (tan δ)	Rated voltage (V) 6.3 10 16 25 35 50												
	tan δ (MAX.) 0.28 0.24 0.20 0.16	tan δ (MAX.) 0.28 0.24 0.20 0.16 0.13 0.12											
	Mea	suremen	nt frequen	cy: 120Hz									
O. 1.35	Rated voltage (V) 6.3 10 16	25	35	50									
Stability at Low Temperature	Impedance ratio Z-25°C / Z+20°C 4 3 2	2	2	2									
	ZT / Z20 (MAX.) Z-55°C / Z+20°C 10 7 5	3	3	3									
	The specifications listed at right shall be met												
	when the capacitors are restored to 20°C Capacitance cha				ial capacitance value								
Endurance	after the rated voltage is applied for 5000 tan δ				initial specified value								
	hours (3000 hours for $\phi D = 4$, 5 and 6.3) at Leakage current	L	_ess than	or equal to the	e initial specified value								
	105°C.												
Shelf Life	After storing the capacitors under no load at 105°C for 1000 hour clause 4.1 at 20°C, they shall meet the specified values for the er												
	The capacitors are kept on a hot plate for 30 seconds, which is		:anacitar	nce change	Within ±10% of the initial capacitance value								
Resistance to soldering	maintained at 250°C. The capacitors shall meet the characteristic	ioc onange	Less than or equal to the initial specified value										
heat	requirements listed at right when they are removed from the plate and restored to 20°C.	— <u>⊢</u>	an δ _eakage (current	Less than or equal to the initial specified value								
Marking	Black print on the case top.												

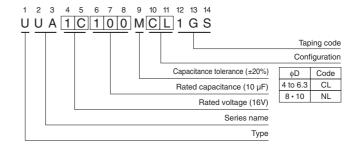
■Chip Type





vollage							
V	6.3	10	16	25	35	50	
Code	j	Α	С	Е	V	Н	
				•			

Type numbering system (Example : 16V $10\mu F$)



						(mm)
φD×L	4 × 5.8	5 × 5.8	6.3 × 5.8	6.3 × 7.7	8 × 10	10 × 10
Α	1.8	2.1	2.4	2.4	2.9	3.2
В	4.3	5.3	6.6	6.6	8.3	10.3
С	4.3	5.3	6.6	6.6	8.3	10.3
E	1.0	1.3	2.2	2.2	3.1	4.5
L	5.8	5.8	5.8	7.7	10	10
Н	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.8 to 1.1	0.8 to 1.1

Dimension table in next page.



■ Dimensions

	V	6.3		10		16		25		35		50	
Cap.(µF)	Code	0J		1A		1C	;	1E		1V		1H	
0.1	0R1		 		 							4×5.8	1
0.22	R22		 		 		 					4×5.8	2.6
0.33	R33		i		i		İ		İ		i	4×5.8	3.2
0.47	R47		 		 		 		 		I I	4×5.8	5
1	010		 		 						I I	4×5.8	8
2.2	2R2		i !		İ		İ		İ		į	4×5.8	12
3.3	3R3		 		 				i			4×5.8	17
4.7	4R7		 		 					4×5.8	16	5×5.8	22
10	100		ļ			4×5.8	18	5×5.8	27	5×5.8	27	6.3×5.8	32
22	220	4×5.8	22	5×5.8	30	5×5.8	30	6.3×5.8	44	6.3×5.8	44	6.3×7.7	58
33	330	5×5.8	35	5×5.8	35	6.3×5.8	48	6.3×5.8	50	6.3×7.7	57	8×10	140
47	470	5×5.8	38	6.3×5.8	50	6.3×5.8	50	6.3×7.7	63	8×10	92	8×10	170
100	101	6.3×5.8	69	6.3×7.7	81	6.3×7.7	81	8×10	116	10×10	151	10×10	310
220	221	6.3×7.7	120	8×10	141	10×10	216	10×10	320	10×10	375		
330	331	8×10	290	10×10	290	10×10	290	10×10	450				
470	471	10×10	320	10×10	320	10×10	320		i		i		Rated
1000	102	10×10	410		 							Case size φ D × L (mm)	ripple

Rated ripple current (mArms) at 105°C 120Hz

Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Coefficient	0.70	1.00	1.17	1.36	1.50

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19
- in page 18, 19.

 Please refer to page 3 for the minimum order quantity.









- Chip type with load life of 5000 hours at +105°C.
- Designed for surface mounting on high density PC board.
- Compliant to the RoHS directive (2011/65/EU).

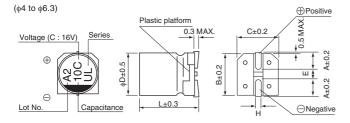


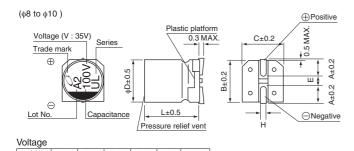


■Specifications

Item		Performance Characteristics										
Category Temperature Range	-40 to +105°C											
Rated Voltage Range	6.3 to 50V											
Rated Capacitance Range	0.1 to 1000μF											
Capacitance Tolerance	±20% at 120Hz, 2	0°C										
Leakage Current	After 2 minutes' ap	er 2 minutes' application of rated voltage, leakage current is not more than 0.01 CV or 3 (μA), Max										
		Measurement frequency: 120Hz at 20°C										
Tangent of loss angle (tan δ)	Rated voltage (V)	6.3	10	16		25	3.	5	50]		
	tan δ (MAX.)	0.32	0.24	0.20	(0.16	0.1	13	0.12			
	Measurement frequency : 120Hz											
	Rated vo	Itage (V)	6.3	10	16		25	35	50			
Stability at Low Temperature	Impedance ratio	Z-25°C / Z+20°C	4	3	2		2	2	2			
	ZT / Z20 (MAX.)	Z-40°C / Z+20°C	10	7	5		3	3	3			
	The specifications			-	Capacitance change			- '				
Endurance	when the capacito					300% or less than the initial specified value						
	rated voltage is ap	plied for 5000 ho	urs at 105°C.	Leakage	Leakage current Less than or equal to the initial specified va			l value				
Shelf Life	After storing the ca									d on JIS C 5101-4		
	The capacitors are					Capa	acitance cha	nge Wit	hin ±10% of the i	nitial capacitance value		
Resistance to soldering	maintained at 250°					tan δ		-		the initial specified value		
heat	requirements listed and restored to 20		ey are remove	d from the pl	ate	Leakage current Less than or equal to the initial specified value				·		
Marking	Black print on the	case top.										

■Chip Type





35 V 50

25 E

● Dimension table in next page.

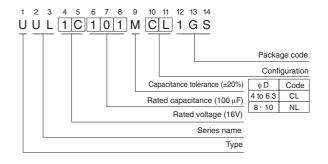
16

С

6.3 10

Α

Type numbering system (Example : $16V 100 \mu F$)



						(mm)
φD×L	4 × 5.8	5 × 5.8	6.3 × 5.8	6.3 × 7.7	8 × 10	10 × 10
Α	1.8	2.1	2.4	2.4	2.9	3.2
В	4.3	5.3	6.6	6.6	8.3	10.3
С	4.3	5.3	6.6	6.6	8.3	10.3
E	1.0	1.3	2.2	2.2	3.1	4.5
L	5.8	5.8	5.8	7.7	10	10
Н	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.8 to 1.1	0.8 to 1.1

CAT.8100D

V

Code i



■Dimensions

	V	6.	.3	1	0	16	6	2	5	3	5	5	60
Cap. (µF)	Code	0J		1	1A		1C		E	1	V	1	Н
0.1	0R1											4×5.8	1.0
0.22	R22											4×5.8	2.6
0.33	R33											4×5.8	3.2
0.47	R47											4×5.8	3.8
1	010											4×5.8	6.2
2.2	2R2											4×5.8	11
3.3	3R3											4×5.8	14
4.7	4R7									4×5.8	15	5×5.8	19
10	100					4×5.8	18	5 × 5.8	25	5×5.8	25	6.3 × 5.8	30
22	220			5×5.8	30	5×5.8	30	6.3 × 5.8	42	6.3×5.8	42	6.3×7.7	49
33	330	5×5.8	35	5×5.8	35	6.3×5.8	48	6.3 × 5.8	48	6.3×7.7	57	8 × 10	77
47	470	5×5.8	36	6.3×5.8	50	6.3×5.8	50	6.3×7.7	63	8×10	92	8×10	92
100	101	6.3×5.8	60	6.3×7.7	81	6.3×7.7	81	8×10	116	10×10	151	10×10	151
220	221	6.3×7.7	101	8×10	141	10×10	216	10×10	216	10×10	216		
330	331	8×10	160	10×10	238	10×10	238	10×10	238				
470	471	10×10	254	10×10	254	10×10	254						
1000	102	10×10	313									Case size ϕ D × L (mm)	Rated ripple

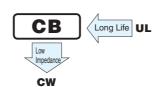
Rated ripple current (mArms) at 105°C 120Hz

Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Coefficient	0.70	1.00	1.17	1.36	1.50

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please refer to page 3 for the minimum order quantity.



- For SMD Long Life Anti-Solvent Feature
- Chip type with load life of 7000 hours at +105°C.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).

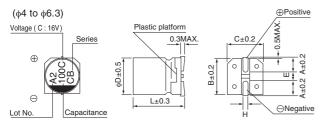


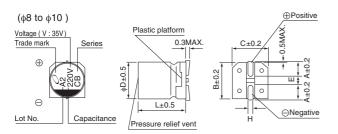


■ Specifications

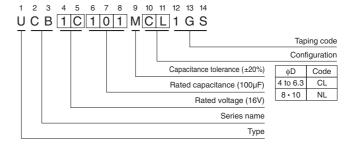
Item	Performance Characteristics									
Category Temperature Range	−25 to +105°C									
Rated Voltage Range	6.3 to 50V									
Rated Capacitance Range	0.1 to 1000μF									
Capacitance Tolerance	±20% at 120Hz, 20°C									
Leakage Current	er 2 minutes' application of rated voltage, leakage current is not more than 0.03 CV or 4 (μA) , whichever is greater.									
	Measurement frequency : 120Hz at 20°C									
Tangent of loss angle (tan δ)	Rated voltage (V) 6.3 10 16 25 35 50									
	tan δ (MAX.) 0.32 0.28 0.26 0.16 0.14 0.14									
	Measurement frequency : 120Hz									
	Rated voltage (V) 6.3 10 16 25 35 50									
Stability at Low Temperature	Impedance ratio Z-25°C / Z+20°C 4 3 2 2 2 2									
	The appelifications listed at right shall be mat									
	The specifications listed at right shall be met when the capacitors are restored to 20°C Capacitance change Within ±30% of the initial capacitance value 100% or less than the initial specified value 100% or less than the ini									
Endurance	ofter the reted voltage is applied for 7000									
	hours at 105°C. Leakage current Less than or equal to the initial specified value									
Shelf Life	After storing the capacitors under no load at 105°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above.									
	The capacitors are kept on a hot plate for 30 seconds, which is Capacitance change Within ±10% of the initial capacitance value									
Resistance to soldering	maintained at 250°C. The capacitors shall meet the characteristic									
heat	requirements listed at right when they are removed from the plate and restored to 20°C. Leakage current Less than or equal to the initial specified value									
Marking	Black print on the case top.									

■ Chip Type





Type numbering system (Example : $16V 100 \mu F$)



						(111111)
φD×L	4 × 7	5 × 7	6.3 × 7	6.3 × 8.7	8 × 10	10 × 10
А	1.8	2.1	2.4	2.4	2.9	3.2
В	4.3	5.3	6.6	6.6	8.3	10.3
С	4.3	5.3	6.6	6.6	8.3	10.3
E	1.0	1.3	2.2	2.2	3.1	4.5
L	7.0	7.0	7.0	8.7	10	10
Н	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.8 to 1.1	0.8 to 1.1

Voltage

V	6.3	10	16	25	35	50
Code	j	Α	С	E	V	Н

• Dimension table in next page.



Dimensions

	V	6.3		10		16	j	25		35		50	
Cap.(µF)	Code	0J		1A		10	;	1E		1V		1H	
0.1	0R1		 		 				 	4×7	1.0		
0.22	R22		 		 		1		l	4×7	2.6		
0.33	R33		i		İ		İ		İ	4×7	3.2		
0.47	R47		 		 					4×7	3.8		
1	010		 		 		1		1	4×7	6.2		1
2.2	2R2		į		į				İ	4×7	11		
3.3	3R3		 							4×7	14		
4.7	4R7		 							4×7	15		
10	100		į			4×7	18			5×7	25		
22	220	4×7	22			5×7	30		i	6.3×7	42		
33	330		 	5×7	35			6.3×7	48	6.3×8.7	57	8×10	77
47	470	5×7	36			6.3×7	50	6.3×8.7	63			8×10	92
100	101	6.3×7	60			6.3×8.7	81	8×10	116		į	10×10	151
220	221	6.3×8.7	101	8×10	141					10×10	216		
330	331	8×10	160										
470	471		i I		İ	10×10	254		i		İ	Case size	Rated
1000	102	10×10	313		 				 			$\phi D \times L (mm)$	ripple

Rated ripple current (mArms) at 105°C 120Hz

Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Coefficient	0.70	1.00	1.17	1.36	1.50

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please refer to page 3 for the minimum order quantity.





- Chip type with load life of 7000 hours at +105°C.
 Low impedance temperature range up to +105°C.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).

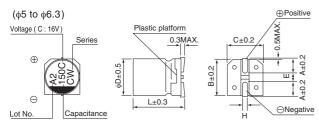


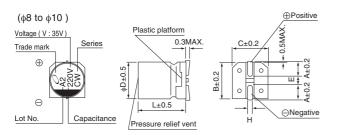


■ Specifications

Item	Performance Characteristics									
Category Temperature Range	−25 to +105°C									
Rated Voltage Range	6.3 to 50V									
Rated Capacitance Range	10 to 470μF									
Capacitance Tolerance	±20% at 120Hz, 20°C									
Leakage Current	er 2 minutes' application of rated voltage, leakage current is not more than 0.01 CV or 3 (μA) , whichever is greater.									
	Measurement frequency: 120Hz at 20°C									
Tangent of loss angle (tan δ)	Rated voltage (V) 6.3 10 16 25 35 50									
, ,	tan δ (MAX.) 0.32 0.28 0.26 0.16 0.14 0.14									
	Measurement frequency : 120Hz									
	Rated voltage (V) 6.3 10 16 25 35 50									
Stability at Low Temperature	Impedance ratio Z-25°C / Z+20°C 4 3 2 2 2 2									
	T									
	The specifications listed at right shall be met when the capacitors are restored to 20°C Capacitance change Within ±30% of the initial capacitance value 100% or less than the initial specified value 100% or less than the initial specified value 100% or less than the initial specified value									
Endurance	ofter the reted voltage is applied for 7000									
	hours at 105°C. Leakage current Less than or equal to the initial specified value									
Shelf Life	After storing the capacitors under no load at 105°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above.									
	The capacitors are kept on a hot plate for 30 seconds, which is Capacitance change Within ±10% of the initial capacitance value									
Resistance to soldering	maintained at 250°C. The capacitors shall meet the									
heat	characteristic requirements listed at right when they are removed from the plate and restored to 20°C. Less than or equal to the initial specified value Less than or equal to the initial specified value									
Marking	Black print on the case top.									

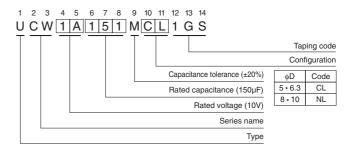
■ Chip Type





Voltage						
V	6.3	10	16	25	35	50
Code	j	Α	С	Е	V	Н

Type numbering system (Example: 10V 150µF)



					(mm)
φD×L	5 × 7	6.3 × 7	6.3 × 8.7	8 × 10	10 × 10
Α	2.1	2.4	2.4	2.9	3.2
В	5.3	6.6	6.6	8.3	10.3
С	5.3	6.6	6.6	8.3	10.3
E	1.3	2.2	2.2	3.1	4.5
L	7.0	7.0	8.7	10	10
Н	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.8 to 1.1	0.8 to 1.1

Dimension table in next page.



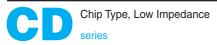
■Dimensions

Cara	V		6.3			10			16			25		;	35			50	
Cap. (µF)	Code		0J			1A			1C			1E			1V			1H	
10	100			! !		! ! !								5×7	2.2	95			
22	220		!			!	!	5×7	2.2	95	5×7	2.2	95	5×7	2.2	95			
33	330		i		5×7	2.2	95				6.3×7	1.1	140	6.3×8.7	1.0	230			i
47	470	5×7	2.2	95		 		6.3×7	1.1	140	6.3×7	1.1	140	6.3×8.7	1.0	230	8×10	0.53	350
100	101	6.3×7	1.1	140		İ	į	6.3×7	1.1	140	6.3 × 8.7	1.0	230				8×10	0.53	350
150	151				6.3×7	1.1	140	6.3×8.7	1.0	230									
220	221	6.3 × 8.7	1.0	230		 		6.3×8.7	1.0	230	8×10	0.22	600	8×10	0.22	600	10×10	0.35	670
330	331	6.3 × 8.7	1.0	230		i I	İ	8×10	0.22	600	8×10	0.22	600	10×10	0.16	850	Case size	Impedance	Rated
470	471	8×10	0.22	600		 	 	8×10	0.22	600	10×10	0.16	850				φD×L(mm)	impedance	ripple

 $\label{eq:max.max.max} \mbox{Max. impedance } (\Omega) \mbox{ at } 20^{\circ}\mbox{C 100kHz},$ Rated ripple current (mArms) at 105°C 100kHz

Trioquonoy ooo		i iatoa ii	ippio oui	10111	
Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Coefficient	0.35	0.50	0.64	0.83	1.00

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please refer to page 3 for the minimum order quantity.





- Chip type, low impedance temperature range up to +105C.
- Designed for surface mounting on high density PC board.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).

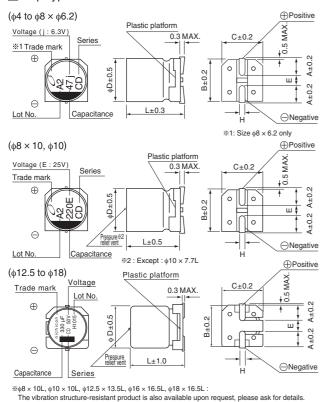




Specifications

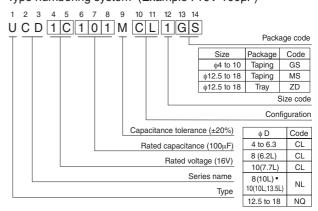
Item					Perform	ance Cha	ract	eristics					
Category Temperature Range	– 55 to +105°C												
Rated Voltage Range	6.3 to 100V												
Rated Capacitance Range	1 to 3300F												
Capacitance Tolerance	±20% at 120Hz, 2	0°C											
Leakage Current	After 2 minutes' ap	oplication of rated vol	tage, leak	age curre	nt is not i	nore than	0.01	CV or 3	(μA), v	vhichever	is greater.		
								Mea	asurem	nent freque	ency : 120	Hz at 20°C	
Tangent of loss angle (tan δ)	Rated voltage (V))	6.3	10	16	25	3	35	50	63	80	100	
rangent of loss angle (tail o)	tan δ (MAX.)		0.26	0.19	0.16	0.14	0.	.12	0.10	0.08	0.08	0.07	
	For capacitance of	f more than 1000μF,	add 0.02 f	or every ir	crease o	of 1000µF.							
		Measurement frequency : 120Hz											
	Rated voltage (V)												
Stability at Low Temperature	Impecance ratio	Decance ratio Z—25°C / Z+20°C 2 2 2 2 2 2 2 2 2											
	ZT / Z20 (MAX.)	ppecance ratio Z—40°C / Z+20°C 3 3 3 3 3 3 3 3 3 3 3											
	,	Z-55°C / Z+20°C	4	4	4	3		3	3	3	3	3	l
	The analifications			41	Capaci	tance Cha	nae	Within	± 30%	6 of the in	itial capa	citance val	ue
Endurance		listed at right shall be tored to 20°C after th			tan δ		<u> </u>					cified value	
Endurance	applied for 5000 h	ours (2000 hours for	L < 10 m	m: 50V	tan o			300%	or less	than the i	nitial spec	ified value	for 63V or more
	or less, and for L ≤	≦ 10mm: 63V or more	e) at 105°	C.	Leakaç	je current		Less t	han or	equal to	the initial	specified v	alue
Shelf Life	After storing the capacitors under no load at 105°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above.												
	The capacitors are	kept on a hot plate t	for 30 seco	onds, whic	h is	Capacitar	nce C	Change	Wi	thin ± 10%	% of the ir	nitial capac	itance value
Resistance to soldering	maintained at 250	°C. The capacitors sh	all meet tl	ne charac	teristic	tan δ	.50 0	90	_				specified value
heat		quirements listed at right when they are removed from the teakage current Leakage current Less than or equal to the initial specified value											
Marking	Black print on the	case top.											

■Chip Type



Dimension table in next page.

Type numbering system (Example : 16V 100μF)



φD×L	4 × 5.8	5 × 5.8	6.3 × 5.8	6.3 × 7.7	8 × 6.2	8 × 10	10 × 7.7	10 × 10	(mm)
Α	1.8	2.1	2.4	2.4	3.3	2.9	3.2	3.2	
В	4.3	5.3	6.6	6.6	8.3	8.3	10.3	10.3	
С	4.3	5.3	6.6	6.6	8.3	8.3	10.3	10.3	
Е	1.0	1.3	2.2	2.2	2.3	3.1	4.5	4.5	
L	5.8	5.8	5.8	7.7	6.2	10	7.7	10	
Н	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.8 to 1.1	0.8 to 1.1	0.8 to 1.1	

∮D×L	10 × 13.5	12.5 × 13.5	16 × 16.5	18 × 16.5
Α	3.2	4.8	5.4	6.4
В	10.3	13.6	17.1	19.1
С	10.3	13.6	17.1	19.1
Е	4.5	4.0	6.3	6.3
L	13.5	13.5	16.5	16.5
Н	0.8 to 1.1	1.0 to 1.4	1.0 to 1.4	1.0 to 1.4

Voltage									
V	6.3	10	16	25	35	50	63	80	100
Code	j	Α	С	Е	V	Н	J	K	2A



Dimensions

	V	6	.3		1	10			16		2	25		3	15		į	50	
Cap. (µF)	Code	C)J		1	ΙA			1C		1	E		1	V		1	1H	
1	010		1 1	1					1 1			1	1			1	4 × 5.8	2.70	60
2.2	2R2		1 1						1			İ	ı			l	4 × 5.8	2.70	60
3.3	3R3												!			1	4 × 5.8	2.70	60
4.7	4R7													4 × 5.8	1.35	90	4 × 5.8	2.70	60
	100		1					4 50	1 05		4 50	1	1	●4×5.8	1.35	90	● 5 × 5.8	1.50	90
10	100		1 1	1				4 × 5.8	1.35	90	4 × 5.8	11.35	1 90	5 × 5.8	0.70	160	6.3 × 5.8	0.86	170
15	150		1					4 × 5.8	1.35	90	5 × 5.8	0.70	160			1			1
	1							● 4 × 5.8	1.35	90		ļ	l !						
22	220	4 × 5.8	1.35	90	4 × 5.8	1.35	90	5 × 5.8	0.70	160	5 × 5.8	0.70	160	5 × 5.8	0.70	160	6.3 × 5.8	0.86	170
27	270	4 × 5.8	1.35	90	5 × 5.8	0.70	160	5 × 5.8	0.70	160	6.3 × 5.8	0.36	240			l I		1 1	
					• 4 × 5.8	1.35	90				●5×5.8	0.70	160				6.3 × 7.7	0.66	195
33	330	5 × 5.8	0.70	160	5 × 5.8	0.70	160	6.3 × 5.8	0.36	240	6.3 × 5.8	0.36	240	6.3 × 5.8	0.36	240	● 8 × 6.2	0.63	200
		● 4 × 5.8	1.35	90				● 5 × 5.8	0.70				!				6.3 × 7.7	0.66	195
47	470	5 × 5.8			6.3 × 5.8	0.36	240	6.3 × 5.8	0.36	240	6.3 × 5.8	0.36	240	6.3 × 5.8	0.36	240	● 8 × 6.2	0.63	200
56	560	5 × 5.8	0.70	160	6.3 × 5.8	0.36	240	6.3 × 5.8	0.36	240	6.3 × 5.8	0.36	240					 	
68	680	6.3 × 5.8	0.36	240	6.3 × 5.8	0.36	240	6.3 × 5.8	0.36	240	6.3 × 5.8	0.36	240	6.3 × 7.7	0.32	290		1 1	
	1	● 5 × 5.8										0.32	290	●6.3 × 7.7	0.32		8 × 10		
100	101	6.3 × 5.8			6.3 × 5.8	0.36	240	6.3 × 5.8	0.36	240		0.26	300	8 × 10	0.16	600		0.36	
450			1 000	1 040			0.40		1 0 00		8 × 10	0.16	600	8 × 10	0.16	600	10 10	1 1	
150	151	6.3 × 5.8	, 0.36	240	6.3 × 5.8	0.36	240	6.3 × 7.7	0.32	290	●10 × 7.7	0.18	600	● 10 × 7.7	0.18	600	10 × 10	0.16	700
	Ī		1 000	1 040	6.3 × 7.7	0.32	290	6.3 × 7.7	0.32	290	8 × 10	0.16	600	8 × 10	0.16	600	10 10	امدا	
220	221	6.3 × 5.8	0.36	240	●8×6.2	0.26	300	●8 × 6.2	0.26	300	●10 × 7.7	0.18	600	●10 × 7.7	0.18	600	10 × 10	0.16	700
	T	6.3 × 7.7	0.32	290	8 × 10	0.16	600	8 × 10	0.16	600	0 10	1	1 000				●10 × 13.5	0.14	800
330	331	●8×6.2	0.26	300	●10 × 7.7	0.18	600	●10 × 7.7	0.18	600	8 × 10	0.16	600	10 × 10	0.08	850	12.5 × 13.5	0.12	900
390	391											i					12.5 × 13.5	0.12	900
		8 × 10			8 × 10			8 × 10			10 10		050	●10 × 13.5				1 1	1010
470	471	●10 × 7.7			●10 × 7.7			●10 × 7.7			10 × 10	0.08		12.5 × 13.5			16 × 16.5	10.073	1610
	1	8 × 10																1	
680	681	●10 × 7.7	0.18		10 × 10	0.08	850	10 × 10	0.08	850	10 × 13.5	1 0.08	950	12.5 × 13.5	0.08	1100	16 × 16.5	10.073	1610
1000	102	8 × 10	0.16	600	10 × 10	0.08	850	10 × 13.5	0.08	950	12.5 × 13.5	0.08	1100	16 × 16.5	0.035	1800		1 1	
1500	152	10 × 10	0.08	850	10 × 13.5	0.08	950	12.5 × 13.5	0.08	1100		I I	l I			l I			
2200	222	10 × 13.5	0.08	950	12.5 × 13.5	0.08	1100		1 1		16 × 16.5	0.035	1800			l I	Case size	I Impedance	Rated
3300	332	12.5 × 13.5	0.08	1100					1			I I	l I			l I	$\phi D \times L$ (mm)	I I	ripple

	V	6	3			80		1	00	
Cap. (µF)	Code	1	J		-	1K		2	2A	
3.3	3R3		l I	l I	5 × 5.8	5.00	25		l I	
4.7	4R7	5 × 5.8	3.00	50	6.3 × 5.8	3.00	40		l I	
10	100	6.3 × 5.8	1 1 1.50	ı ^I 80	6.3 × 7.7	2.40	60		l I	_
10	100	0.3 X 3.6	1.50	ı 60	● 8 × 6.2	2.40	60		I I	
22	220	6.3 × 7.7	1.20	120	8 × 10	1 1 20	120	0 v 10	1.30	1 120
22	220	● 8 × 6.2	1.20	120	8 X 10	1.30	130	8 × 10	1.30	130
33	330	8 × 10	0.65	250	8 × 10	1.30	130	10 × 10	0.70	200
47	470	8 × 10	0.65	250	10 × 10	0.70	200	12.5 × 13.5	0.32	500
68	680	10 × 10	0.35	400	12.5 × 13.5	0.32	500	12.5 × 13.5	0.32	500
100	101	10 × 10	0.35	400	12.5 × 13.5	0.32	500	16 × 16.5	0.17	793
150	151	12.5 × 13.5	0.16	800	12.5 × 13.5	0.32	500	16 × 16.5	0.17	793
220	221	12.5 × 13.5	0.16	800		I		18 × 16.5	0.15	917
330	331		 	I	16 × 16.5	0.17	793	18 × 16.5	0.15	917
470	471	16 × 16.5	0.082	1410	18 × 16.5	0.15	917	Case size φD × L	I Impedance	Rated
680	681	18 × 16.5	0.08	1690				φD x L (mm)	Impedance I	ripple

Max. Impedance () at 20°C 100kHz, Rated ripple current (mArms) at 105°C 100kHz

•: In this case, 6 will be put at 12th digit of type numbering system.

• Frequency coefficient of rated ripple current

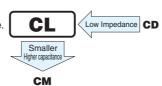
Frequency	50Hz	120Hz	300Hz	1kHz	10kHz or more
Coefficient	0.35	0.50	0.64	0.83	1.00

- Taping specifications are given in page 23.
- Recommended land size, soldering by refrow are given in page 18, 19.
- Please refer to page 3 for the minimum order quantity.





- Chip type, low impedance, temperature range up to +105°C.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).

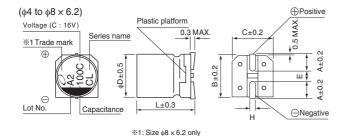


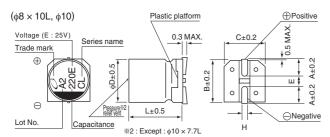


Specifications

Item				Perforn	nance Charact	eristics							
Category Temperature Range	– 55 to +105°C												
Rated Voltage Range	6.3 to 50V												
Rated Capacitance Range	10 to 2200μF												
Capacitance Tolerance	± 20% at 120Hz, 2	20°C											
Leakage Current	After 2 minutes' a	oplication of rated vol	tage, leakage cur	rent is not	more than 0.01	CV or 3	(μA), which	ever is greater.					
							Measur	ement frequency	y : 120Hz at 20°C				
Tangent of loss angle (tan δ)	Rated voltage (V)	6.3	10	16		25	35	50				
langon or loss angle (all s)	tan δ (MAX.)		0.26	0.19	0.16		0.14	0.12	0.10				
		Measurement frequency : 120Hz											
	Rated voltage (V	Rated voltage (V) 6.3 10 16 25 35 50											
Stability at Low Temperature	Impodonoo ratio	Z-25°C / Z+20°C 2 2 2 2 2 2 2 2 2											
	1 '	Impedance ratio											
	21 / 220 (111 011)	Z-55°C / Z+20°C	4	4	4		3	3	3				
	The enecifications	listed at right shall be	n met when the	Capac	itance Change	Within	± 30% of th	e initial capacita	ance value				
Endurance		tored to 20°C after the		tan δ				the initial specif					
	applied for 2000 h	ours at 105°C.		Leaka	ge current	Less t	han or equa	to the initial spe	ecified value				
Shelf Life	After storing the capacitors under no load at 105°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above.												
Resistance to soldering	The capacitors are kept on a hot plate for 30 seconds, which is maintained at 250°C. The capacitors shall meet the characteristic												
heat		requirements listed at right when they are removed from the plate											
		d restored to 20°C. Leakage current Less than or equal to the initial specified value											
Marking	Black print on the	case top.											

■Chip Type

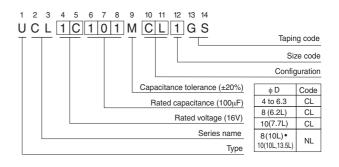




Voltage						
V	6.3	10	16	25	35	50
Code	j	А	С	Е	V	н

• Dimension table in next page.

Type numbering system (Example: 16V 100μF)



						_			(mm)
φDxL	4 × 5.8	5 × 5.8	6.3 × 5.8	6.3 × 7.7	8 × 6.2	8 × 10	10 × 7.7	10 × 10	10 × 13.5
Α	1.8	2.1	2.4	2.4	3.3	2.9	3.2	3.2	3.2
В	4.3	5.3	6.6	6.6	8.3	8.3	10.3	10.3	10.3
С	4.3	5.3	6.6	6.6	8.3	8.3	10.3	10.3	10.3
Е	1.0	1.3	2.2	2.2	2.3	3.1	4.5	4.5	4.5
L	5.8	5.8	5.8	7.7	6.2	10	7.7	10	13.5
Н	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.8 to 1.1	0.8 to 1.1	0.8 to 1.1	0.8 to 1.1



Specifications

	V	(6.3			10			16			25		;	35			50	
Cap. (µF)	Code		0J			1A			1C			1E			1V			1H	
10	100		1					4 × 5.8	0.85	160	4 × 5.8	0.85	160	• 4 × 5.8	0.85	160			
10	100										1 / 0.0	1 1	100	5 × 5.8	0.36	240			
22	220	4 × 5.8	0.85	160	4 × 5.8	0.85	160	• 4 × 5.8	·		5 × 5.8	0.36	240	5 × 5.8	0.36	240			
			1				<u> </u>	5 × 5.8	0.36	240		<u> </u>		0 / 0.0	1				
33	330		1		• 4 × 5.8	' '			 	! !	• 5 × 5.8	' '		6.3 × 5.8	0.26	300			
			I L		5 × 5.8	0.36	240		l L	l L	6.3 × 5.8	0.26	300	0.0 % 0.0	0.20				
47	470	• 4 × 5.8	I	L I	6.3 × 5.8	ا 0.26 ا	300	● 5 × 5.8	0.36	240	6.3 × 5.8	0.26	300	6.3 × 5.8	0.26	300		1 1	
		5 × 5.8	0.36	240				6.3 × 5.8	0.26	300				0.0 % 0.0	0.20				
68	680		I				l 	6.3 × 5.8	0.26	300	6.3 × 5.8	0.26	300	6.3 × 7.7	0.16	600			
100	101	● 5 × 5.8	0.36	240	6.3 × 5.8		300	6.3 × 5.8	0.26	300	6.3 × 7.7	0.16	600	●6.3 × 7.7	0.16	600	8 × 10	0 18	670
100	101	6.3 × 5.8	0.26	300	0.0 % 0.0	0.20	1	●6.3 × 7.7	0.16	600				8 × 10	0.08	850		1	
150	151				6.3 × 5.8	0.26	300	6.3 × 7.7	0.16	600	8 × 10		:		0.08	850			
100	101		1		0.0 % 0.0	0.20	1	0.0 × 7.7	1	1	●10 × 7.7	0.10	850	●10 × 7.7	0.10	850		1	
220	221	6.3 × 5.8	0.26	300	6.3 × 7.7	0.16	600	6.3 × 7.7	<u>-</u>		8 × 10	0.08	850	8 × 10	0.08	850	10 × 10	1 1 0 12	900
220	221		1		● 8 × 6.2	0.18	500	● 8 × 6.2	0.18	500	●10 × 7.7	¦ 0.10 ¦	850	●10 × 7.7	0.10	850	10 × 10	1 0.12	300
330	331	6.3 × 7.7	0.16	600	8 × 10	0.08	850	8 × 10	0.08	850	8 × 10	1008	850	10 × 10	0.06	1190		1 1	
	001	● 8 × 6.2	0.18	500	●10 × 7.7	0.10	850	●10 × 7.7	0.10	850	0 / 10	1 0.00		10 × 10	0.00				
390	391		 	l L			l 		 					10 × 10	0.08	850			
470	471	8 × 10	80.0	850	8 × 10	0.08	850	8 × 10	0.08	850	10 × 10	0.06		10 v 13 5	1 0 06	1100		1 1	
470	77.	●10 × 7.7	0.10	850	●10 × 7.7	0.10	850	●10 × 7.7			10 × 10	1 1	1130	10 × 13.5	0.00	1190		1	
560	561		i						i	i	10 × 10	0.08	850						
680	681		i		8 × 10	0.08	850	10 × 10	0.06	1190	10 × 13.5	0.06	1190		i				
820	821		1	1				10 × 10	0.08	850					1				
1000	102	8 × 10	0.08	850	10 × 10	0.06	1190	10 × 13.5	0.06	1190					1				
1200	122		I I	1	10 × 10	0.08	850		l I						I				
1500	152	10 × 10	0.06	1190	10 × 13.5	0.06	1190		1			1 1			1				
1800	182	10 × 10	0.08	850					l I	I I					I I		Case size	I Impedance	Rated
2200	222	10 × 13.5	0.06	1190											1		φD × L (mm)	I III III III III III III III III III	ripple

Max. Impedance () at 20C 100kHz, Rated ripple current (mArms) at 105°C 100kHz
•: In this case, 6 will be put at 12th digit of type numbering system.

• Frequency coefficient of rated ripple current

Frequency	50Hz	120Hz	300Hz	1kHz	10kHz or more
Coefficient	0.35	0.50	0.64	0.83	1.00

[•] Taping specifications are given in page 23.

Recommended land size, soldering by refrow are given in page 18, 19.

[•] Please refer to page 3 for the minimum order quantity.



Chip Type, Low Impedance







- Chip type, low impedance temperature range up to +105°C.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).





■ Specifications

Item					F	Performan	ce Cha	aracte	eristics				
Category Temperature Range	−55 to +105°C												
Rated Voltage Range	6.3 to 50V												
Rated Capacitance Range	10 to 2200μF												
Capacitance Tolerance	±20% at 120Hz, 2	20°C											
Leakage Current	After 2 minutes' a	pplication of	rated v	oltage, l	eakage	current is	not m	ore th	han 0.01	CV			
-	Rated voltage (V)	6.3	1	0	16	25	T	3	5	50	Measurement frequency : 120Hz at 20°C		
Tangent of loss angle (tan δ)	tan δ (MAX.)	0.26	0.	19	0.16	0.1	ļ.	0.1	12	0.10			
	Rated vo	oltage (V)		6.3	10	16	1 2	25	35	50	Measurement frequency : 120Hz		
Otalista at Law Tarana aratura		Z-25°C / Z-	+20°C	2	2	2	_	2	2	2			
Stability at Low Temperature	Impedance ratio ZT / Z20 (MAX.)	Z-40°C / Z-	+20°C	3	3	3		3	3	3			
	21 / 220 (M/ (X.)	Z-55°C / Z-	+20°C	4	4	4		3	3	3			
	The specifications					Capacita	nce cl	nange			he initial capacitance value		
Endurance	when the capacito					tan δ					an the initial specified value		
	rated voltage is ap	oplied for 200	00 hou	rs at 105	s°C.	Leakage	curre	nt	Less	than or equa	al to the initial specified value		
Shelf Life	After storing the c										ge treatment based on JIS C 5101-4 ed above.		
	The capacitors ar							С	Capacitar	nce change	Within ±10% of the initial capacitance value		
Resistance to soldering	maintained at 250								an δ		Less than or equal to the initial specified value		
heat	requirements liste and restored to 20	Jirements listed at right when they are removed from the plate											
Marking	Black print on the	k print on the case top.											

⊕Positive

<u>○Negative</u>

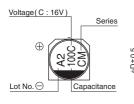
■Chip Type (φ4 to φ6.3)

 $(\phi 8 \times 10L, \phi 10)$

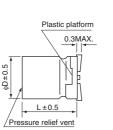
Voltage (E: 25V)

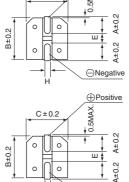
Trade mark

Lot No.⊖



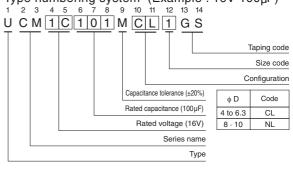






C ± 0.2

Ту	ре	nι	ım	be	rin	g	sys	ste	m	(E	xar	np	le :	16V	100µF)
1	2	3	4	5	6	7	8	9	10	11	12	13	14		



						(mm)
φDxL	4×5.8	5×5.8	6.3×5.8	6.3×7.7	8×10	10×10
Α	1.8	2.1	2.4	2.4	2.9	3.2
В	4.3	5.3	6.6	6.6	8.3	10.3
С	4.3	5.3	6.6	6.6	8.3	10.3
Е	1.0	1.3	2.2	2.2	3.1	4.5
L	5.8	5.8	5.8	7.7	10	10
Н	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.8 to 1.1	0.8 to 1.1

Voltage

V	6.3	10	16	25	35	50
Code	i	Δ	C	F	V	Н

Dimension table in next page.



Dimensions

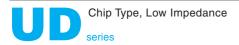
Can	V		6.3			10			16			25			35			50	
Cap. (µF)	Code		0J			1A			1C			1E			1V			1H	
10	100											1					4 × 5.8	2.30	85
			<u>i i</u>	i		<u>i i</u>			<u>i i</u>			i	i		<u>i i</u>		5 × 5.8	0.88	165
22	220								1 1		4 × 5.8	1.00	160	4 × 5.8	1.00	160	5 × 5.8	0.88	165
33	330								1 1	l	4 × 5.8	1.00	160	5 × 5.8	0.36	240		I I	r I
47	470		 	l I		1 1		4 × 5.8	1.00	160	5 × 5.8	0.36	240	5 × 5.8	0.36	240	6.3×5.8	0.68	195
68	680				4 × 5.8	1.00	160	5 × 5.8	0.36	240	5 × 5.8	0.36	240	6.3 × 5.8	0.26	300		I I	1
100	101	4 × 5.8	1.00	160				5 × 5.8	0.36	240	6.3 × 5.8	0.26	300	6.3×5.8	0.26	300	6.3×7.7	0.34	350
150	151				5 × 5.8	0.36	240	6.3 × 5.8	0.26	300	6.3 × 7.7	0.16	600	6.3 × 7.7	0.16	600		i	1
220	221	5 × 5.8	0.36	240	6.3 × 5.8	0.26	300	6.3 × 5.8	0.26	300	6.3 × 7.7	0.16	600				8 × 10	0.18	670
330	331	6.3×5.8	0.26	300	6.3 × 7.7	0.16	600	6.3 × 7.7	0.16	600				8 × 10	0.08	850	10 × 10	0.12	900
470	471	6.3 × 7.7	0.16	600	6.3 × 7.7	0.16	600				8 × 10	0.08	850					i	
560	561											İ		10 × 10	0.06	1190		İ) I
680	681	6.3×7.7	0.16	600				8 × 10	0.08	850		1			1 1			1	1
820	821								1 1		10 × 10	0.06	1190		1 1			1	(
1000	102	<u> </u>			8 × 10	0.08	850	10 × 10	0.06	1190		1		<u> </u>				1	
1500	152	8 × 10	0.08	850	10 × 10	0.06	1190		1 1			I I	_				Case size	I Impedance	Rated
2200	222	10 × 10	0.06	1190								1	l I				фD×L (mm)	I I	ripple

MAX. Impedance () at 20 100kHz, Rated ripple current(mArms) at 105 100kHz In this case, 6 will be put at 12th digit of type numbering system.

Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Coefficient	0.35	0.50	0.64	0.83	1.00

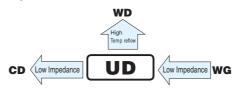
- \bullet Taping specifications are given in page 23.
- Recommended land size, soldering by refrow are given in page 18, 19.

 • Please refer to page 3 for the minimum order quantity.





- Chip type, low impedance temperature range up to +105°C.
- Designed for surface mounting on high density PC board.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).

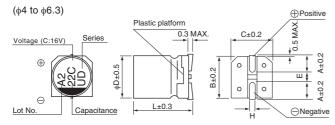


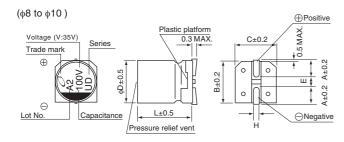


■ Specifications

Item	Performance Characteristics									
Category Temperature Range	−55 to +105°C									
Rated Voltage Range	6.3 to 50V									
Rated Capacitance Range	1 to 1500μF									
Capacitance Tolerance	±20% at 120Hz, 20°C									
Leakage Current	After 2 minutes' application of rated voltage, leakage current is not more than 0.01 CV or 3 (µA), whichever is greater.									
Tangent of loss angle (tan δ)	Measurement frequency : 120Hz at 20°C Rated voltage (V) 6.3 10 16 25 35 50 tan δ (MAX.) 0.26 (0.28) 0.20 (0.24) 0.16 (0.20) 0.14 (0.16) 0.12 (0.14) 0.12 (0.14) () is φ8 over									
	Measurement frequency: 120Hz									
Stability at Low Temperature	Rated voltage (V) 6.3 10 16 25 35 50									
Glability at Low Temperature	Impedance ratio Z-25°C / Z+20°C 3 2 2 2 2 2 2 2 2 2									
	The specifications listed at right shall be met when the capacitors are restored to 20°C after the									
Endurance	rated voltage is applied for 5000 hours (2000									
	hours for φD = 4, 5 and 6.3) at 105°C. Leakage current Less than or equal to the initial specified value									
Shelf Life	After storing the capacitors under no load at 105°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above.									
	The capacitors are kept on a hot plate for 30 seconds, which is Capacitance change Within ±10% of the initial capacitance value									
Resistance to soldering	maintained at 250°C. The capacitors shall meet the characteristic									
heat	requirements listed at right when they are removed from the plate and restored to 20°C. Less than or equal to the initial specified value									
Marking	Black print on the case top.									

■Chip Type



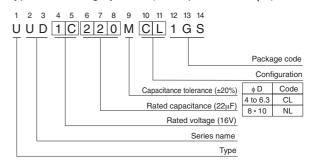


Voltage

V	6.3	10	16	25	35	50
Code	i	Α	С	E	V	Н

• Dimension table in next page.

Type numbering system (Example: 16V 22µF)



						(mm)
ψD×L	4 × 5.8	5 × 5.8	6.3 × 5.8	6.3 × 7.7	8 × 10	10 × 10
Α	1.8	2.1	2.4	2.4	2.9	3.2
В	4.3	5.3	6.6	6.6	8.3	10.3
С	4.3	5.3	6.6	6.6	8.3	10.3
E	1.0	1.3	2.2	2.2	3.1	4.5
L	5.8	5.8	5.8	7.7	10	10
Н	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.8 to 1.1	0.8 to 1.1



Cara	V	(6.3			10			16			25		;	35			50	
Cap. (µF)	Code		0J			1A			1C			1E			1V			1H	
1	010			! !					 	! !					! !		4×5.8	5.00	30
2.2	2R2			 						 							4×5.8	5.00	30
3.3	3R3								į	<u> </u>		<u> </u>					4 × 5.8	5.00	30
4.7	4R7			 					! ! !	 				4 × 5.8	1.80	80	5 × 5.8	1.52	85
10	100			 					 	 	4×5.8	1.80	80	5 × 5.8	0.76	150	6.3×5.8	0.88	165
15	150			i				4 × 5.8	1.80	80	5×5.8	0.76	150	5 × 5.8	0.76	150	6.3 × 5.8	0.88	165
22	220			! ! !	4×5.8	1.80	80	5 × 5.8	0.76	150	5 × 5.8	0.76	150	5 × 5.8	0.76	150	6.3 × 5.8	0.88	165
27	270	4 × 5.8	1.80	80	5×5.8	0.76	150	5 × 5.8	0.76	150	6.3×5.8	0.44	230	6.3×5.8	0.44	230	6.3×7.7	0.68	185
33	330	5×5.8	0.76	150	5×5.8	0.76	150	6.3 × 5.8	0.44	230	6.3 × 5.8	0.44	230	6.3×5.8	0.44	230	6.3×7.7	0.68	185
47	470	5×5.8	0.76	150	6.3×5.8	0.44	230	6.3 × 5.8	0.44	230	6.3×5.8	0.44	230	6.3×5.8	0.44	230	6.3×7.7	0.68	185
56	560	5×5.8	0.76	150	6.3×5.8	0.44	230	6.3 × 5.8	0.44	230	6.3×5.8	0.44	230	6.3×7.7	0.34	280	8 × 10	0.34	300
68	680	6.3×5.8	0.44	230	6.3×5.8	0.44	230	6.3 × 5.8	0.44	230	6.3×5.8	0.44	230	6.3×7.7	0.34	280	8 × 10	0.34	300
100	101	6.3×5.8	0.44	230	6.3×5.8	0.44	230	6.3 × 5.8	0.44	230	6.3×7.7	0.34	280	8 × 10	0.17	450	8×10	0.34	300
150	151	6.3×5.8	0.44	230	6.3×5.8	0.44	230	6.3×7.7	0.34	280	8×10	0.17	450	8 × 10	0.17	450	10×10	0.18	670
220	221	6.3×5.8	0.44	230	6.3×7.7	0.34	280	6.3×7.7	0.34	280	8×10	0.17	450	8 × 10	0.17	450	10×10	0.18	670
330	331	6.3×7.7	0.34	280	8 × 10	0.17	450	8 × 10	0.17	450	8×10	0.17	450	10 × 10	0.09	670		i i	ı
470	471	8 × 10	0.17	450	8 × 10	0.17	450	8×10	0.17	450	10×10	0.09	670						
680	681	8×10	0.17	450	10×10	0.09	670	10×10	0.09	670									
1000	102	8×10	0.17	450	10×10	0.09	670		i	i		i i			i		Case size	i i	Rated
1500	152	10×10	0.09	670					1	 					 		φD×L (mm)	Impedancei	ripple

 $\label{eq:max.mpedance} \mbox{Max. Impedance } (\Omega) \mbox{ at 20°C 100kHz},$ Rated ripple current (mArms) at 105°C 100kHz

Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more	
Coefficient	0.35	0.50	0.64	0.83	1.00	

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please refer to page 3 for the minimum order quantity.





- Corresponding with 260°C peak reflow soldering Recomended reflow condition: 260°C peak 5 sec. 230°C over 60 sec. 2 times (\(\phi 10 \times 10 : 1 \) time)
- Chip type, low impedance temperature range up to +105°C.
- Designed for surface mounting on high density PC board.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).



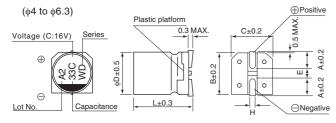


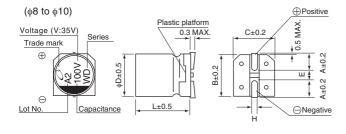


■ Specifications

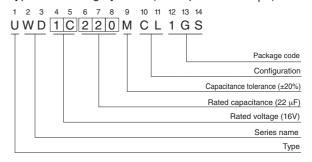
Item					Р	erformano	e Char	acter	ristics				
Category Temperature Range	−55 to +105°C												
Rated Voltage Range	6.3 to 50V												
Rated Capacitance Range	1 to 1500μF												
Capacitance Tolerance	±20% at 120Hz, 2	20°C											
Leakage Current	After 2 minutes' a	pplication of	rated v	voltage, le	eakage o	current is	not mo	re th	an 0.01	CV or 3 (µ	uA), whichever is greater.		
						/leasureme	nt frequ	uency	/ : 120Hz	at 20°C			
Tangent of loss angle (tan δ)	Rated voltage (V)		-	0	16	25		35		50			
	tan δ (MAX.)												
		Measurement frequency : 120Hz											
	Rated vo	oltage (V)		6.3	10	16	25	;	35	50			
Stability at Low Temperature	Impedance ratio	Z-25°C / Z	+20°C	3	2	2	2		2	2			
	ZT / Z20 (MAX.)	Z-55°C / Z	+20°C	5	4	4	3		3	3			
	The enecifications	listed at rial	ht abal	l ba mat									
	The specifications when the capacito				r tho	Capacitar	ice cha	ange			he initial capacitance value		
Endurance	rated voltage is an					tan δ					n the initial specified value		
	hours for $\phi D = 4$,					Leakage	current		Less 1	than or equa	al to the initial specified value		
					10500 (10001			,				
Shelf Life		ter storing the capacitors under no load at 105°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 ause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above.											
Budali i i i i i i i i i i i i i i i i i i		The capacitors are kept on a hot plate for 30 seconds, which is Capacitance change Within ±10% of the initial capacitance value											
Resistance to soldering		maintained at 250°C. The capacitors shall meet the characteristic tan δ Less than or equal to the initial specified value											
heat	and restored to 20	ulrements listed at right when they are removed from the plate											
Marking	Black print on the	case top.											

■Chip Type





Type numbering system (Example: 16V 22µF)



						(mm)
ΦD×L	4 × 5.8	5 × 5.8	6.3×5.8	6.3×7.7	8 × 10	10 × 10
Α	1.8	2.1	2.4	2.4	2.9	3.2
В	4.3	5.3	6.6	6.6	8.3	10.3
С	4.3	5.3	6.6	6.6	8.3	10.3
E	1.0	1.3	2.2	2.2	3.1	4.5
L	5.8	5.8	5.8	7.7	10	10
Н	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.8 to 1.1	0.8 to 1.1

Voltage

V	6.3	10	16	25	35	50
Code	j	Α	С	Е	V	Н

• Dimension table in next page.



Cara	V	6	6.3			10			16		:	25		;	35			50	
Cap. (µF)	Code	(0J			1A			1C			1E			1V			1H	
1	010														 		4×5.8	5.00	30
2.2	2R2																4×5.8	5.00	30
3.3	3R3																4×5.8	5.00	30
4.7	4R7													4 × 5.8	1.80	80	5×5.8	1.52	85
10	100										4 × 5.8	1.80	80	5×5.8	0.76	150	6.3 × 5.8	0.88	165
15	150							4 × 5.8	1.80	80	5 × 5.8	0.76	150	5×5.8	0.76	150	6.3 × 5.8	0.88	165
22	220				4×5.8	1.80	80	5 × 5.8	0.76	150	5 × 5.8	0.76	150	5 × 5.8	0.76	150	6.3 × 5.8	0.88	165
27	270	4 × 5.8	1.80	80	5×5.8	0.76	150	5 × 5.8	0.76	150	6.3×5.8	0.44	230	6.3×5.8	0.44	230	6.3×7.7	0.68	185
33	330	5 × 5.8	0.76	150	5 × 5.8	0.76	150	6.3 × 5.8	0.44	230	6.3 × 5.8	0.44	230	6.3×5.8	0.44	230	6.3×7.7	0.68	185
47	470	5 × 5.8	0.76	150	6.3 × 5.8	0.44	230	6.3 × 5.8	0.44	230	6.3×5.8	0.44	230	6.3×5.8	0.44	230	6.3×7.7	0.68	185
56	560	5 × 5.8	0.76	150	6.3×5.8	0.44	230	6.3 × 5.8	0.44	230	6.3×5.8	0.44	230	6.3×7.7	0.34	280	8×10	0.34	300
68	680	6.3 × 5.8	0.44	230	6.3 × 5.8	0.44	230	6.3 × 5.8	0.44	230	6.3 × 5.8	0.44	230	6.3×7.7	0.34	280	8×10	0.34	300
100	101	6.3 × 5.8	0.44	230	6.3 × 5.8	0.44	230	6.3 × 5.8	0.44	230	6.3×7.7	0.34	280	8 × 10	0.17	450	8×10	0.34	300
150	151	6.3 × 5.8	0.44	230	6.3 × 5.8	0.44	230	6.3 × 7.7	0.34	280	8 × 10	0.17	450	8 × 10	0.17	450	10×10	0.18	670
220	221	6.3 × 5.8	0.44	230	6.3×7.7	0.34	280	6.3 × 7.7	0.34	280	8 × 10	0.17	450	10 × 10	0.09	670	10×10	0.18	670
330	331	6.3×7.7	0.34	280	8×10	0.17	450	8×10	0.17	450	10×10	0.09	670	10 × 10	0.09	670		i i	
470	471	8×10	0.17	450	8×10	0.17	450	8×10	0.17	450	10×10	0.09	670		 				
680	681	8×10	0.17	450	10×10	0.09	670	10×10	0.09	670									
1000	102	10×10	0.09	670	10×10	0.09	670										Case size		Rated
1500	152	10×10	0.09	670													φD×L (mm)	Impedance 	ripple

 $\label{eq:max.mpedance} \mbox{Max. Impedance } (\Omega) \mbox{ at } 20^{\circ}\mbox{C 100kHz},$ Rated ripple current (mArms) at 105°C 100kHz

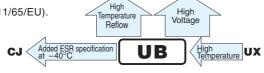
Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Coefficient	0.35	0.50	0.64	0.83	1.00

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please refer to page 3 for the minimum order quantity.



Chip type, high temperature range, for +125°C use.
Applicable to automatic mounting machine fed with carrier tape.

• Compliant to the RoHS directive (2011/65/EU).



WH

Anti-Solvent Feature (Through 50V only)

LT



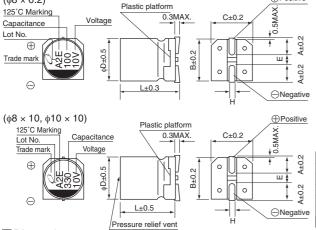
Specifications

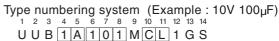
Item						Performa	nce Char	acteristics					
Category Temperature Range	-40 to +125°C					1 OHOHHO	anoc onai	dotoriotioo					
Rated Voltage Range	10 to 400V												
Rated Capacitance Range	1 to 330µF												
Capacitance Tolerance	±20% at 120Hz, 20°	6 at 120Hz, 20°C											
		Rated voltage (V) 10 to 50 160 to 400											
Leakage Current		Leakage Current After 1 minute's application of rated voltage, leakage current is not more than 0.03CV (µA). I = 0.04CV+100 (µA) max.(1 minute's)											
		Measurement frequency : 120Hz at 20°C											
Tangent of loss angle (tan δ)	Rated voltage (V)												
rangent er rees angre (tall e)	tan δ (MAX.)												
		Measurement frequency : 120Hz											
	Rated voltage	70 (\/)		10	16	25	35	50	160		250	-i	
Stability at Low Temperature	lana a da a a a satia			16	25	35	50	160	200	250	400		
	ZT / Z20 (MAX.)	40°C / Z+2	20°C	12	8	6	4	4	8	8	8	12	
	The specifications lis	eted at rig	ht ch	all he m	net when	the	Capaci	itance cha	nge	Within +30	% of the	e initial car	pacitance value
Endurance	capacitors are restor						tan δ	itarioo oria	gc				specified value
	applied for 2000 hou							ge current					ial specified value
Ob at the control of	After storing the cap	acitors un	der r	no load	at 125°C	for 1000 l	hours and	d then per	formin	yoltage t	reatme	nt based	on JIS C 5101-4
Shelf Life	clause 4.1 at 20°C, t												
	The capacitors are k	The capacitors are kept on a hot plate for 30 seconds											
Resistance to soldering	which is maintained	capacitance change Within ±10% of the initial capacitance value Capacitance change Within ±10% of the initial capacitance value											
heat	the characteristic red	quirement	s liste	ed at rig	ght when	they	tan δ						
	are removed from th	e plate an	id res	stored to	o 20°C.		Lеака	ge current		Less than	or equal	to the initi	ial specified value
Marking	Black print on the ca	se top.											

⊕Positive



 $(\phi 8 \times 6.2)$





Type

	8×6.2	8×10	10 × 10
Α	3.3	2.9	3.2
В	8.3	8.3	10.3
С	8.3	8.3	10.3
Е	2.3	3.1	4.5
L	6.2	10	10
Н	0.5 to 0.8	0.8 to 1.1	0.8 to 1.1
	B C E L	A 3.3 B 8.3 C 8.3 E 2.3 L 6.2	A 3.3 2.9 B 8.3 8.3 C 8.3 8.3 E 2.3 3.1 L 6.2 10

(mm)

Dimensions

	V	1	0	1	6	2	5	3:	5	50	
Cap.(µF)	Code	1.	A		С	1	E	1\	V	1H	
10	100									8×6.2	24
22	220									8 × 6.2	38
33	330						l	8×6.2	44	8×10	46
47	470					8×6.2	48	8×10	52	10×10	58
100	101	8×6.2	58	8 × 10	66	8×10	74	10×10	80		
220	221	8×10	90	10×10	102	10 × 10	116	i		Case size	Rated
330	331	10 × 10	112							φD×L(mm)	ripple

	V	16	60	20	00	25	50	400	
Cap.(µF)	Code	2C		2	D	2	E	20	G
1	010							8×10	26
1.8	1R8							8×10	27
2.2	2R2							10×10	36
3.3	3R3					8×10	28	10×10	38
4.7	4R7	i		8×10	36	10×10	59		
6.8	6R8	8×10	42	10×10	59			Case size	Rated
10	100	10×10	59	10×10	59			φD×L (mm)	ripple

Rated ripple current (mArms) at 125°C 120Hz

• Frequency coefficient of rated ripple current

7					
Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Coefficient	0.70	1.00	1.17	1.36	1.50

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please refer to page 3 for the minimum order quantity.









- Corresponding with 260°C peak reflow soldering Recomended reflow condition: 260°C peak 5 sec. 230°C over 60 sec. 2 times $(\phi 8 \times 6.2, \phi 10 \times 10 : 1 \text{ time})$
- Chip type high temperature range, for +125°C use.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).



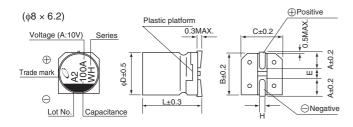


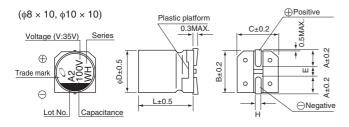


■ Specifications

Item	Performance Characteristics								
Category Temperature Range	-40 to +125°C								
Rated Voltage Range	10 to 50V								
Rated Capacitance Range) to 330μF								
Capacitance Tolerance	±20% at 120Hz, 20°C								
Leakage Current	After 1 minute's application of rated voltage, leakage current is not more than 0.03CV or 4(µA), whichever is greater.								
	Measurement frequency : 120Hz at 20°C								
Tangent of loss angle (tan δ)	Rated voltage (V) 10 16 25 35 50								
	tan δ (MAX.) 0.32 0.24 0.21 0.18 0.18								
	Measurement frequency : 120Hz								
Stability at Low Temperature	Rated voltage (V) 10 16 25 35 50								
Stability at Low Temperature	Impedance ratio Z-40°C / Z+20°C 12 8 6 4 4								
Endurance	The specifications listed at right shall be met when the capacitors are restored to 20°C after the rated voltage is applied for 1000 hours at 125°C. Capacitance change Within ±30% of the initial capacitance value tan δ 300% or less than the initial specified value Leakage current Less than or equal to the initial specified value								
Shelf Life	After storing the capacitors under no load at 125°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above.								
Resistance to soldering heat	The capacitors are kept on a hot plate for 30 seconds, which is naintained at 250°C. The capacitors shall meet the characteristic equirements listed at right when they are removed from the plate and restored to 20°C. Capacitance change Within ±10% of the initial capacitance value tan δ Less than or equal to the initial specified value Less than or equal to the initial sp								
Marking	Black print on the case top.								

■Chip Type

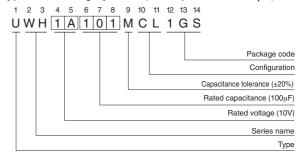




Voltage

V	10	16	25	35	50
Code	Α	С	E	V	Н

Type numbering system (Example: 10V 100µF)



			(mm)
φD×L	8×6.2	8×10	10×10
Α	3.3	2.9	3.2
В	8.3	8.3	10.3
С	8.3	8.3	10.3
E	2.3	3.1	4.5
L	6.2	10	10
Н	0.5 to 0.8	0.8 to 1.1	0.8 to 1.1

Dimension table in next page.



	V 10		0	1	16		25		35		0	
Cap.(µF)	Code	1	1A		1C		1E		1V		1H	
10	100				 		 			8×6.2	24	
22	220		 		1		 			8×6.2	38	
33	330							8×6.2	44	8×10	46	
47	470				! !	8×6.2	48	8×10	52	10×10	58	
100	101	8×6.2	58	8 × 10	66	8×10	74	10×10	80			
220	221	8×10	90	10×10	102	10 × 10	116			Case size	Rated	
330	331	10×10	112		 		 			φD _× L(mm)	ripple	

Rated ripple current (mArms) at 125°C 120Hz

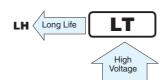
-					
Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Coefficient	0.70	1.00	1.17	1.36	1.50

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please refer to page 3 for the minimum order quantity.



- Chip type, high voltage and high temperature range.
- Load life of 2000 hours at +125°C.
- Applicable to automatic mounting machine using carrier tape.
- Compliant to the RoHS directive (2011/65/EU).





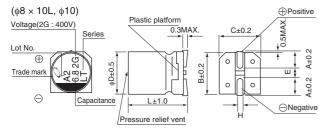
UB



■ Specifications

Item		Performance Characteristics											
Category Temperature Range	-40 to +125°C												
Rated Voltage Range	160 to 500V	30 to 500V											
Rated Capacitance Range	1.8 to 33µF	.8 to 33μF											
Capacitance Tolerance	±20% at 120Hz, 20°	20% at 120Hz, 20°C											
Leakage Current	Rated voltage (V)	Rated voltage (V) 160~450							500				
Leakage Current	-	0.04CV	+100(µA)	max.(1 mi	nute's)	0.040	V+200(µ	A)max	.(1 minute's)				
			Measure	ement frequ	ency : 120l	Hz at 20°C	;						
Tangent of loss angle (tan δ)	Rated voltage (V)	160	200	250	400	450	500						
	tan δ (MAX.)	0.20	0.20	0.25	0.25	0.30	0.30						
				Mea	surement	frequenc	y : 120Hz						
	Rated voltage	ge (V)	160	200	250	400	450	500					
Stability at Low Temperature	Impedance ratio ZT / Z20 (MAX.)	40°C / Z+20	°C 6	6	10	10	15	15					
Endurance	The specifications lis capacitors are restor applied for 2000 hou	ed to 20°C	after the			tan δ	tan δ 300% or			the initial capac an the intial spe ual to the initial			
Shelf Life	After storing the cap clause 4.1 at 20°C, t										JIS C 5101-4		
Resistance to soldering heat	The capacitors are kept on a hot plate for 30 seconds, which is maintained at 250°C and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the characteristic requirements listed at right when they are removed from the plate.					Capacitance change tan δ Leakage current			Within ±10% of Less than or eq Less than or eq	ual to the initial			
Marking	Black print on the ca	se top.											

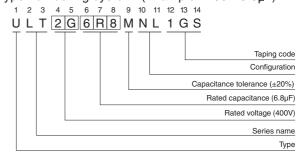
■Chip Type



				(mm)		
	[⊕] D×L	8×10	10×10	10 × 13.5		
	Α	2.9	3.2	3.2 10.3 10.3 4.5 13.5		
	В	8.3	10.3			
	С	8.3	10.3			
Ī	Ε	3.1	4.5			
	L	10	10			
	Н	0.8 to 1.1	0.8 to 1.1	0.8 to 1.1		

Voltage						
V	160	200	250	400	450	500
Code	2C	2D	2E	2G	2W	2H

Type numbering system (Example : $400V 6.8\mu F$)



■ Dimensions

	V		60	20		25		40		45		500	
Cap.(µF)	Code	2	:C	21	D	21	=	20	à	2V	V	21-	ł
1.8	1R8											8×10	20
3.3	3R3		!	!		!				8×10 !	20	10×10	35
3.9	3R9		i	i		i		8×10	30	i		i	
4.7	4R7											10 × 13.5	40
5.6	5R6		!							10×10	35	1	
6.8	6R8			l i				10×10	45	i			
7.5	7R5		!	!				-		10 × 13.5 ¦	40		
8.2	8R2		İ			8×10	30	į į		į į			
10	100							10 × 13.5	50				
12	120		1	8×10	45			1				1	
15	150	8 × 10	45	i		10×10	45	i		i		i	
18	180			10×10	60	10 × 13.5	50						
22	220	10×10	60										
27	270		i	10 × 13.5	65			i		i		Case size	Rated
33	330	10 × 13.5	65					!				φ D × L (mm)!	ripple

Rated ripple current (mArms) at 125°C 120Hz

• Frequency coefficient of rated ripple current

or requested sections or rated reprise carriers									
Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more				
Coefficient	0.70	1.00	1.17	1.36	1.50				

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please refer to page 3 for the minimum order quantity.





- Chip type, High voltage and High Reliability.
- Load life of 4000 hours at +125°C.
- Applicable to automatic mounting machine using carrier tape.
- Adapted to the RoHS directive (2011/65/EU).

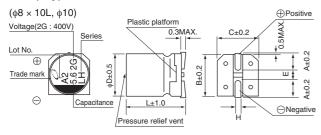




■ Specifications

Item	Performance Characteristics									
Category Temperature Range	-40 to +125°C									
Rated Voltage Range	60 to 450V									
Rated Capacitance Range	2 to 27μF									
Capacitance Tolerance	20% at 120Hz, 20°C									
Leakage Current	After 1 minute's application of rated voltage, leakage current is not more than 0.04CV+100 (µA).	ter 1 minute's application of rated voltage, leakage current is not more than 0.04CV+100 (μA).								
	Measurement frequency : 120Hz at 20°C									
Tangent of loss angle (tan δ)	Rated voltage (V) 160 200 250 400 450									
, ,	tan δ (MAX.) 0.20 0.20 0.25 0.25 0.30									
	Measurement frequency: 120Hz									
	Rated voltage (V) 160 200 250 400 450									
Stability at Low Temperature	Impedance ratio ZT / Z20 (MAX.) Z-40°C / Z+20°C 6 6 10 10 15									
Endurance	The specifications listed at right shall be met when the capacitors are restored to 20°C after the rated voltage is applied for 4000 hours at 125°C. Capacitance change Within $\pm 30\%$ of the initial capacitance value $\tan \delta$ 300% or less than the initial specified value Leakage current Less than or equal to the initial specified value									
Shelf Life	After storing the capacitors under no load at 125°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above.									
Resistance to soldering heat	The capacitors are kept on a hot plate for 30 seconds, which is maintained at 250°C and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the characteristic requirements listed at right when they are removed from the plate. Capacitance change Within $\pm 10\%$ of the initial capacitance value $\tan \delta$ Less than or equal to the initial specified value when they are removed from the plate.	_								
Marking	Black print on the case top.									

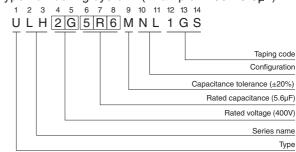
■Chip Type



			(mm)
øD×L	8×10	10×10	10 × 13.5
Α	2.9	3.2	3.2
В	8.3	10.3	10.3
С	8.3	10.3	10.3
Е	3.1	4.5	4.5
L	10	10	13.5
Н	0.8 to 1.1	0.8 to 1.1	0.8 to 1.1

Voltage					
V	160	200	250	400	450
Code	2C	2D	2E	2G	2W

Type numbering system (Example : $400V 5.6\mu F$)



Dimensions

	V		60		00	25		40		450	
Cap.(µF)			2	:D	2	E	20	G	2W	I	
2.2	2R2									8×10	20
3.3	3R3				1			8×10	30		
3.9	3R9				į					10×10	35
5.6	5R6		l I		i			10×10	45	10 × 13.5	40
7.5	7R5				1	8×10	30	10 × 13.5	50		
10	100			8 × 10	45			į į		į.	
12	120	8×10	45		1	10 × 10	45				
15	150		1	10×10	60	10 × 13.5	50			- 1	
18	180	10×10	60		į						
22	220		i	10 × 13.5	65			i		Case size	Rated
27	270	10 × 13.5	65							φD×L(mm) ¦	Rated ripple

Rated ripple current (mArms) at 125°C 120Hz

• Frequency coefficient of rated ripple current

		• •											
Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more								
Coefficient	0.70	1.00	1.17	1.36	1.50								

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please refer to page 3 for the minimum order quantity.



Chip Type, High Reliability. Low temperature ESR specification. series







- Chip type, high temperature range, for +125°C use.
- ◆ Added ESR specification after the test at −40°C (\$\phi6.3\$ sizes provide only for the first stage.)
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).

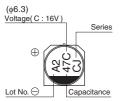




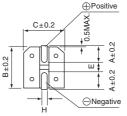
■ Specifications

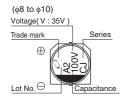
Item	Performance Characteristics											
Category Temperature Range	-40 to +125°C											
Rated Voltage Range	10 to 50V											
Rated Capacitance Range	10 to 470μF											
Capacitance Tolerance	±20% at 120Hz, 20°C											
Leakage Current	After 1 minute's application of rated voltage, leakage current is not more than 0.03CV or 4(µA), whichever is greater.											
	Measurement frequency : 120Hz at 20°C											
Tangent of loss angle (tan δ)	Rated voltage (V) 10 16 25 35 50											
	tan δ (MAX.) 0.32 0.24 0.21 0.18 0.18											
	Measurement frequency : 120Hz											
Stability at Low Temperature	Rated voltage (V) 10 16 25 35 50											
Stability at Low Temperature	Impedance ratio Z-40°C / Z+20°C 12 8 6 4 4											
Endurance	The specifications listed at right shall be met when the capacitors are restored to 20°C after the rated voltage is applied for 2000 hours at 125°C. Capacitance change Within ±30% of the initial capacitance value tan δ 300% or less than the initial specified value Leakage current Less than or equal to the initial specified value											
Shelf Life	After storing the capacitors under no load at 125°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above.											
Resistance to soldering heat	capacitors are kept on a hot plate for 30 seconds, ch is maintained at 250°C. The capacitors shall meet characteristic requirements listed at right when they removed from the plate and restored to 20°C. Capacitance change Within ±10% of the initial capacitance value tan δ Less than or equal to the initial specified value Leakage current Less than or equal to the initial specified value											
Marking	Black print on the case top.											

■ Chip Type

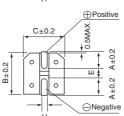


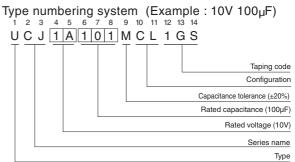












			(mm)
øD×L	6.3×8.7	8×10	10×10
Α	2.4	2.9	3.2
В	6.6	8.3	10.3
С	6.6	8.3	10.3
Е	2.2	3.1	4.5
L	8.7	10	10
Н	0.5 to 0.8	0.8 to 1.1	0.8 to 1.1

Rated \	/oltage)			
٧	10	16	25	35	50
Code	Α	С	E	V	Н

Dimensions

	V		10				16				25			35				50			
Cap.(µF)	Cap.(μF) Code 1A				1C				1E				1V			1H					
10	100													6.3 × 8.7	14	-	95	6.3 × 8.7	14	-	95
22	220							i		6.3×8.7	14	-	95	6.3 × 8.7	14	-	95	6.3×8.7	14	-	95
33	330				l I			I I		6.3×8.7	14	-	95	6.3×8.7	14	-	95	8 × 10	2.0	6.0	200
47	470					6.3 × 8.7	14	-	95	6.3 × 8.7	14	-	95	6.3 × 8.7	14	-	95	10×10	1.5	4.5	330
100	101	6.3 × 8.7	14	-	95	8×10	2.0	6.0	250	8×10	2.0	6.0	250	10×10	1.5	4.5	400	10×10	1.5	4.5	330
220	221	8×10	2.0	6.0	250	10 × 10	1.5	4.5	400	10×10	1.5	4.5	400	10×10	1.5	4.5	400	Case size	Initial	after	
330	331	10×10	1.5	4.5	400	10 × 10	1.5	4.5	400	10×10	1.5	4.5	400					ΨDΛL	millai	test	Hated ripple
470	471	10×10	1.5	4.5	400			i							į			(mm)	E	SR	,ppic

• Frequency coefficient of rated ripple current

. ,					
Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Coefficient	0.35	0.50	0.64	0.83	1.00

Max. ESR (Ω) at -40°C 100kHz, Rated ripple current (mArms) at 125°C 100kHz

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please refer to page 3 for the minimum order quantity.

CZ

Chip Type, High Reliability. Low temperature ESR specification.









- Chip type, high temperature range, for +125°C use.
- Added ESR specification after the test at -40°C.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).



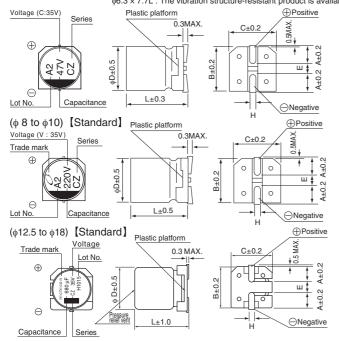


■ Specifications

Item	Performance Characteristics												
Category Temperature Range	-40 to +125°C												
Rated Voltage Range	10 to 100V												
Rated Capacitance Range	o 3300µF												
Capacitance Tolerance	±20% at 120Hz, 20°C												
Leakage Current	After 2 minutes' application of rated voltage, leakage current is not more than 0.01CV or 3µA, whichever is greater.												
	Measurement frequency : 120Hz at 20°C												
	Rated voltage (V) 10 16 25 35 50 63 80 100												
Tangent of loss angle (tan δ)	tan δ (MAX.) 0.30 0.23 0.18 0.16 0.16 0.12 0.12 0.10												
	For capacitance of more than 1000μF, add 0.02 for every increase of 1000μF.												
	Rated voltage (V) 10 16 25 35 50 63 80 100 Measurement frequency :												
Stability at Low Temperature	Impedance ratio ZT / Z20 (MAX.) Z-40°C / Z+20°C 12 8 6 4 4 3 3 3 3												
	After continuous application of rated voltage at 125°C and then restoring down to 20°C, the readings of measurements shall meet below.												
	Case size \$\phi 6.3 \times 5.8L \$\phi 6.3 \times 7.7L \$\phi 8\$ to \$\phi 12.5 \$\phi 16,18 \times 16.5L \$\phi 16,18 \times 21.5L \$												
	Endurance time 1000hrs. 2000hrs. 3000hrs. 3500hrs. 4000hrs.												
Endurance	Capacitance change Within ±30% of the initial capacitance value												
	tan δ 300% or less than the initial specified value												
	Leakage current Less than or equal to the initial specified value												
Shelf Life	After storing the capacitors under no load at 125°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above.												
	The capacitors are kept on a hot plate for 30 seconds, Capacitance change Within ±10% of the initial capacitance value												
Resistance to soldering	which is maintained at 250°C. The capacitors shall meet												
heat	the characteristic requirements listed at right when they are removed from the plate and restored to 20°C. Leakage current Less than or equal to the initial specified value Leakage current												
Marking	Black print on the case top.												

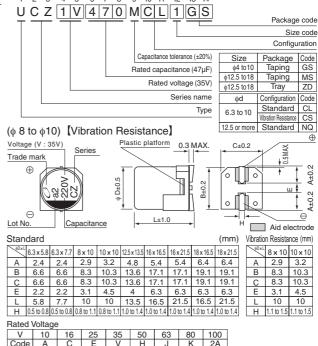
■Chip Type

(φ 6.3) [Standard] $\stackrel{\text{de}}{=} \stackrel{\text{de}$



※φ12.5 to φ18: The vibration structure-resistant product is also available upon request, please ask for details.

Type numbering system (Example : $35V 47\mu F$) 1 2 3 4 5 6 7 8 9 10 11 12 13 14





	V		10	1				16					25					35	;				50			
Cap. (µF)	Code		1A	١.				10					1E					1\	/				1H			
10	100		I I	l I	I	1		l I		l I	l I		1	l L	l I		6.3 × 5.8	1.60	24	¦ –	69	6.3 × 5.8	2.80	42	_	51
22	220		l I	l I	1	1		l I	l I	1	l I		l I	I I	 		6.3 × 5.8	1.60	24	¦ –	69	6.3 × 7.7	0.50	5 ¦	40	197
33	330		 	 	 	 - -		 	 	 	 	6.3 × 5.8	1.60	24	<u> </u>	69	6.3 × 7.7	0.45	5	40	197	6.3 × 7.7 8 × 10	0.50	1		197 270
			I	l I	I .	1		l <u> </u>	l	l I	l I		1	1	l 1	-	6.3 × 7.7	0.45	 E	1 40	1107	6.3 × 7.7			_	
47	470		l I	l I	I I		6.3 × 5.8	1.60	24	! -	69	Recom	mend	35V	二	>		0.45	L	ц – -				l — —I		
68	680			_	<u> </u>					<u> </u>	_			_		\vdash	8 x 10		-		-	8 × 10	0.25	3.5	0	270
00	080		-	-	-	-	0077	0.45	_	. 10	107	0077	. 0.45	-	40	107	8 X 10	-	1 3	-	-					-
100	101	Recom	mend	16\	/	\gt	6.3 × 7.7	+		+	197	6.3 × 7.7	1	· 5	40	197	8 × 10					10 × 10				
			-	1	+	1	8 × 10	0.20	3	1 4.5	12/0	8 × 10		_	_	_			1		-					-
220	221	8 × 10	0.20	3	4.5	270	8 × 10	0.20	3	4.5	270	8 x 10					10 × 10	0.15	2	3.5	500					1
			I	1	1	1		l I		l I	1	10 x 10	0.15	. 2	3.5	500		l I	l I	l I	1				1	1
330	331	8 × 10	<u>.</u>		<u> </u>		10 × 10	0.15	2	3.5	500	10 × 10	0.15	2	3.5	500			1	i I	1					
		10 × 10	0.15	2	3.5	500		!		<u>.</u>	<u>.</u>		<u> </u>	<u> </u>	!	<u>. </u>			i i	<u> </u>						
390	391		I I	! !	<u> </u>	<u> </u>		! !		<u> </u>			<u> </u>	! !	! !	<u>'</u>		<u> </u>	! !		<u> </u>	12.5 × 13.5	0.100	0.44	4.0	1300
470	471	10 × 10	0.15	2	¦ 3.5	500	10 × 10	0.15	2	3.5	¦500		l I	I I	l I		12.5 × 13.5	0.060	0.40	3.0	1700	16 × 16.5	0.080	0.34	2.6	2000
560	561		I I	l L	1			l L		 	l L		l L	I L	 	<u> </u>	12.5 x 13.5	0.060	0.40	3.0	1700	16 × 16.5	0.080	0.34	2.6	2000
680	681		l L	l L	1	1		l L	 	1	1		1	l L	l L		12.5 × 13.5	0.060	0.40	3.0	1700	18 × 16.5	0.078	0.32	2.6	2100
820	821		I	l	ĺ					i	i I	12.5 × 13.5	0.060	0.40	3.0	1700	16 × 16.5	0.047	0.28	1.4	2400	18 × 16.5	0.078	0.32	2.6	2100
1000	102			1	į					į		12.5 × 13.5	0.060	0.40	3.0	1700	16 × 16.5	0.047	0.28	1.4	2400	16 × 21.5	0.040	0.22	1.5	2800
1200	122		i									16 × 16.5	0.047	0.28	1.4	1700	18 × 16.5	0.045	0.28	1.4	2600	18 × 21.5	0.038	0.20	1.5	2900
1400	142			1	1								1	1			18 × 16.5	0.045	0.28	1.4	2600					
1600	162		I	ı	1			l I		ı	1	16 × 16.5	0.047	0.28	1.4	2400	16 × 21.5	0.034	0.20	0.6	3000					
2200	222		l I	l I	I I			 		l I	l I	18 × 16.5	0.045	0.23	1.3	2600	18 × 21.5	0.032	0.16	0.5	3250	Casa sizo	l Initial	I Initial I	after lendurance	
2700	272		l I	I I	I I	I I		l I		I I	I I	16 × 21.5	0.034	0.20	0.6	3000		l I	l I	l I	l I	Case size φD × L	20°C	1 -40 °C 1	test -40 C %	Rated ripple
3300	332		I L	I L	I L			l L		l L	I L	18 × 21.5	0.032	0.16	0.5	3250			I L	I L	l L	(mm)		ESR		i

	V		63					80				100					
Cap. (µF)	Code		1J					1K					2A				
10	100	6.3 × 7.7	2.00	100	-	60	8 × 10	0.75	50	_	70	8 × 10	0.75	50	-	70	
22	220	8 x 10	0.70	ا		100		0.75				8 × 10	0.75	50	_	70	
22	220		1			I		0.55				10 × 10	0.55	35	-	115	
33	330	8 × 10	0.70	35		100		0.75				10 × 10	0.55	25		115	
33	330	10 × 10	0.50	25	-	170	10 × 10	0.55	35	_	115	10 × 10	0.55	33	_	1113	
47	470	8 × 10	0.70	35		100	10 × 10	1 0 55 ¹	35		 115						
47	470	10 × 10	0.50	25	_	170	10 X 10	0.55	33		1 113 1						
82	820		I I		l L	l I		l			l I	12.5×13.5	0.28	1.9	22	700	
150	151	12.5 × 13.5	0.20	1.3	14	1000	12.5 × 13.5	0.28	1.9	14	700	16×16.5	0.19	1.4	4.8	1000	
180	181	12.5 × 13.5	0.20	1.3	14	1000					ı	18×16.5	0.17	1.1	3.9	1100	
220	221	12.5 × 13.5	0.20	1.3	14	1000						16×21.5	0.12	8.0	2.6	1600	
270	271					i	16 × 16.5	0.19	1.4	4.8	1000						
300	301		ı									18×21.5	0.11	0.7	2.4	1700	
330	331		! !			 	18 × 16.5	0.17	1.1	3.9	1100						
390	391	16 × 16.5	0.13	0.9	4.8	1900	16 × 21.5	0.12	0.8	2.6	1600		 				
470	471	18 × 16.5	0.11	0.82	3.9	2000											
520	521		l I			 	18 × 21.5	0.11	0.7	2.4	1700	Case size	ı Initial	Initial	after endurance		
560	561	16 × 21.5	0.07	0.46	2.0	2500					1	φD × L (mm)	20°C	-40 ℃ —	test -40 °C %	Hated ripple	
750	751	18 × 21.5	0.068	0.44	1.8	2600						(11111)		ESR			

% Guaranteed time of ESR after endurance test

Size	Guarant	eed time			
φ6.3 × 5.8L		-			
φ6.3 × 7.7L, φ8 × 10L	10 to 50V	2000hrs.			
$\phi 10 \times 10 L$	63 to 100V	_			
φ16,18 × 16.5L	200	Ohrs.			
φ16,18 × 21.5L	3000hrs.				

Max. ESR (Ω) at 20°C / -40°C 100kHz, Rated ripple Current (mArms) at 125°C 100kHz

• : In this case, ⑤ will be put at 12th digit of type numbering system.

• Frequency coefficient of rated ripple current

Frequency	50Hz	120Hz	300Hz	1kHz	10kHz or more
Coefficient	0.35	0.50	0.64	0.83	1.00

- Taping specifications are given in page 23.
 Recommended land size, soldering by reflow are given in page 18, 19.
- Please refer to page 3 for the minimum order quantity.

アルミニウム電解コンデンサ ALUMINUM ELECTROLYTIC CAPACITORS



チップ 高信頼性 低温ESR規定品



低温ESR / 耐久性試験後低温ESR規定品。 面実装タイプ製品温度135 品。 キャリアテーピング包装により自動装着が可能。 RoHS指令 (2011/65/EU) 対応済。





仕様

項目			性		能						
カテゴリ温度範囲	- 40 ~ + 135										
定格電圧範囲	10 ~ 50V										
定格静電容量範囲	47 ~ 3300 μ F										
定格静電容量許容差	± 20% (120Hz、20)										
漏れ電流	I = 0.01CV または3(μ A	() いずれか大きし	ハ値以下(2	2分値)							
損失角の正接(tan)	定格電圧(V)	10	16	25	35	50	120Hz 20			
損大用の正按(tdii)	tan (MA	(X.)	0.30	0.23	0.18	0.16	0.16				
温度特性	定格電圧(V)	10	16	25	35	50	120Hz			
/血及付注	インピーダンス比 (MAX.) Z	12	8	6	4	4					
	135 2000時間 定格電圧連続印加後、20 に戻し測定を行なったとき、下記項目を満足する										
 耐久性	静電容量変化率	初期値の±30%	以内								
	tan	初期規格値の30	0%以下								
	漏れ電流	初期規格値以下									
高温無負荷特性	135 1000時間 無負荷放	r置後、20 にてJ	IS C 5101-4	44.1項によ	る電圧処理を	を行った後、	上記耐久	性の規格値を満足する			
	電極端子面を250 の熱林	反上に30秒間放置	後、20 に	戻し測定を行	行った後、	下記項目を満	場足する				
1+4 だ配熱性	静電容量変化率	初期値の±10%	以内								
はんだ耐熱性 	tan	初期規格値以下						·			
	漏れ電流	初期規格値以下									
表示	ケース底に黒色表示										

寸法図(表示例)

(6.3)【耐振動構造品のみ】



6.3×10Lについては、耐振動構造品のみ対応しております。



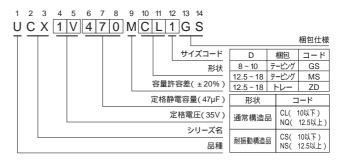




(単位:mm) 诵堂構诰品

VEE 1 12 14	5/C HH			(+ 12 · · · · · · · ,
D	8×10	10×10	12.5 × 13.5	16×16.5, 21.5	18 x 16.5, 21.5
Α	2.9	3.2	4.8	5.4	6.4
В	8.3	10.3	13.6	17.1	19.1
С	8.3	10.3	13.6	17.1	19.1
Е	3.1	4.5	4	6.3	6.3
L	10	10	13.5	16.5、21.5	16.5、21.5
Н	0.8 ~ 1.1	0.8 ~ 1.1	1.0 ~ 1.4	1.0 ~ 1.4	1.0 ~ 1.4

品番コード体系 (例:35V47µF)





(12.5~ 18)【耐振動構造品】

4.8

13.6

13.6

4

13.5

1.0 ~ 1.4

5.4

17.1

17.1

6.3

16.5、21.5 16.5、21.5

1.0 ~ 1.4 1.0 ~ 1.4



10×10

3.2

10.3

10.3

4.5

10

1.1 ~ 1.5

耐振動構造品

Α

В

С

Е

6.3×10

2.4

6.6

6.6

2.2

10

0.5 ~ 0.8

8×10

2.9

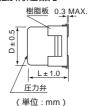
8.3

8.3

3.1

10

1.1 ~ 1.5

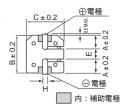


6.4

19.1

19.1

6.3



12.5 x 13.5 | 16x16.5, 21.5 | 18x16.5, 21.5

定格電圧							
V	10	16	25	35	50		
コード	Α	С	Е	V	Н		

寸法表は次頁に掲載しております。

アルミニウム電解コンデンサ ALUMINUM ELECTROLYTIC CAPACITORS



寸法表

	V	1	0				1	6				2	25				3	5				5	0		
(µF) 定格静電容量	番コード	1.	Ą				1	С				1	Е				1	V				1	Н		
47	470	 		 				 	 	 		 	 	 	[6.3 × 10 8 × 10		<u>- ٔ –</u>	1 +		8 x 10	0.25	3.5	15	270
68	680			1					İ			!	1	!	1	8 x 10	0.20	3	12	270					
100	101	1 1		 	 	6.3 × 10 8 × 10	0.20	3	12	270		0.20	3	1 12	270	6.3 × 10 8 × 10			i r		10 x 10	0.2	2.5	12	500
220	221	8 x 10 0.20	3	12	270	8 x 10	0.20	3	12	270	10 x 10	0.15	2	12	500	10 x 10	0.15	2	10	500			 		
330	331	8 × 10 0.20 10 × 10 0.15				10 × 10	0.15	1 1 2	10	500	10 × 10	0.15	2	1 10	500		 	 					 	 	
390	391	I I		 	I I			l I	I I	 		I I	 	I I	l I				I I I I		12.5 x 13.5	0.09	1.3	6.5	750
470	471	10 x 10 0.15	2	10	500	10 x 10	0.15	2	10	500		I I	 	I I	l I	12.5 x 13.5	0.07	1.0	5.0	750	16 x 16.5	0.07	0.70	3.5	1000
560	561	1 1		1				I I	I I	l I		1	1	1	I I	12.5 x 13.5	0.07	1.0	5.0	750	16 x 16.5	0.07	0.70	3.5	1000
680	681	i		1				l I	į.			1	1	1	1	12.5 x 13.5	0.07	1.0	5.0	750	18 x 16.5	0.07	0.70	3.5	1200
820	821			i					į	į	12.5 × 13.	5 0.07	1.0	5.0	750	16 x 16.5	0.05	0.50	2.5	1200	18 x 16.5	0.07	0.70	3.5	1200
1000	102			!						!	12.5 × 13.	5 0.07	1.0	5.0	750	16 x 16.5	0.05	0.50	2.5	1200	16 x 21.5	0.05	0.40	2.0	1600
1200	122			1					į		16 × 16.	5 0.05	0.50	2.5	1200	18 x 16.5	0.05	0.50	2.5	1400	18 × 21.5	0.04	0.32	1.6	1900
1500	152	1 1		1	i				i	i	16 × 16.	, , ,) 0 E0	2 5	1	16 x 21.5	0.04	0.32	1.6	1900	i				ı
1300	132			l I				l I	1	1	10 X 10.	1	1 0.30	1 2.5	1200 	18 x 16.5	0.05	0.50	2.5	1400					
1800	182			 				 	1	 	16 × 16.	5¦ 0.05	0.50	2.5	1200	18 x 21.5	0.035	0.28	1.4	2200			 		
2200	222			1				1	I I	1	18 × 16.	5 0.05	0.50	2.5	1400	18 × 21.5	0.035	0.28	1.4	2200	, _,,_,	20	1 1	耐久性	
2700	272	1 1		I I	1			I	I I	I I	16 × 21.	5¦ 0.04	0.32	1.6	1900						ケースサイズ DxL(mm)	20	- 40 	1000h後। - 40	正格
3300	332	1 1		l L					I I	 	18 × 21.	5¦0.035	0.28	1.4	2200				 		` ´i	ESR	(100k	Hz)	

ESR()MAX. at 20 / - 40 100kHz、定格リプル(mArms) at 135 100kHz 印:この場合は品番コード(12桁目)のサイズコードが6となります。

定格リプル電流の周波数補正係数

周 波 数	50Hz	120Hz	300Hz	1kHz	10kHz ~
補正係数	0.35	0.50	0.64	0.83	1.00

- ・テーピング仕様は 21 頁に掲載しております。 ・はんだ付け推奨ランド寸法・推奨リフロー条件は 17、18 頁に掲載しております。 ・ご発注単位は 3 頁を参照ください。

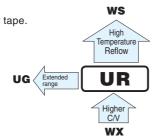








- Chip type, higher capacitance in larger case sizes.
 Designed for surface mounting on high density PC board.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).

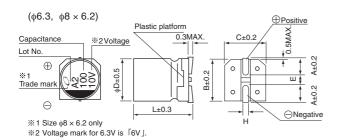


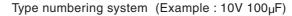


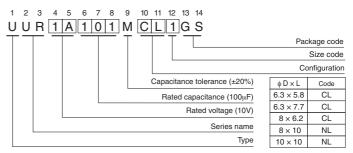
■ Specifications

Item			Perf	ormance	e Characterist	ics					
Category Temperature Range	-40 to +85°C										
Rated Voltage Range	4 to 100V	100V									
Rated Capacitance Range	3.3 to 1500μF	o 1500µF									
Capacitance Tolerance	±20% at 120Hz, 20°C	· % at 120Hz, 20°C									
Leakage Current	After 1 minute's application of r	ated voltage,	leakage cu	rrent is r	not more thar	n 0.03C	V (μA) .				
							Measu	rement f	requency: 12	20Hz at 20°C	
Tangent of loss angle (tan δ)	Rated voltage (V) 4	6.3	10	16	25			50	63	100	
	tan δ (MAX.) 0.35	0.28	0.24	0.20	0.16		0.14 0).12	0.12	0.12	
								Measur	ement freque	ency: 120Hz	
Stability at Low Temperature	Rated voltage (V)	4	6.3	10	16	25	35	50		100	
Clability at Low Temperature	Impedance ratio Z-25°C / Z+ ZT / Z20 (MAX.) Z-40°C / Z+		5 10	4	<u>3</u>	2	3	3	3	3	
	ZT / Z20 (MAX.) Z-40°C / Z+	20°C 15	10	8	6	4	3	3	3	3	
	-			Cana	citance chanc	10 \\/i	thin ±20% of	the initial	Loopooitopoo	volue	
Endurance	The specifications listed at righthe capacitors are restored to 2			tan δ	citarice criarig		0% or less tha				
Endurance	voltage is applied for 2000 hou		Taleu		age current		ss than or equ				
	3				3						
Shelf Life	After storing the capacitors under no load at 85°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above.										
	The capacitors are kept on a hot plate for 30 seconds, Capacitance change Within ±10% of the initial capacitance value								itanaa valua		
Resistance to soldering	which is maintained at 250°C.			_	tan δ	change				specified value	
heat	the characteristic requirements are removed from the plate and			<u> </u>	Leakage curr	ent		_ '		specified value	
Marking	Black print on the case top.	print on the case top.									

■Chip Type







$(\phi 8 \times 10, \ \phi 10 \times 10)$	
Lot No. Capacitance Trade mark Plastic plat Representation of the control of	O.3MAX. C±0.2 WW 50 C T OF W S

					(mm)
φD×L	6.3 × 5.8	6.3 × 7.7	8 × 6.2	8 × 10	10 × 10
Α	2.4	2.4	3.3	2.9	3.2
В	6.6	6.6	8.3	8.3	10.3
С	6.6	6.6	8.3	8.3	10.3
E	2.2	2.2	2.3	3.1	4.5
L	5.8	7.7	6.2	10	10
Н	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.8 to 1.1	0.8 to 1.1

Dimension table in next page.



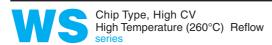
	V		4	6	.3	1	0	1	16	2	25	3	5	5	0	6	3	10	00
Cap.(µF)	Code	0	G	()J	1	Α	1	С	1	E	1	V	1	Н	1.	J	2.	Α
3.3	3R3																	6.3×5.8	29
4.7	4R7														 	6.3×5.8	31	● 8×6.2	40 (35)
10	100								 		 				 	8 x 6.2	46	8×10	77
22	220													6.3×5.8	45	8×10	96	8×10	100
33	330										İ	6.3×5.8	55	0 8×6.2	95 (94)	8×10	117	10×10	130
47	470									6.3×5.8	65	● 8×6.2	105 (94)	0 8 x 10	140 (105)	8×10	140	10×10	155
100	101					6.3×5.8	70	8×6.2	125	○ 8×6.2	145 (143)	○ 8 x 10	175 (132)	■10×10	195 (181)	10×10	232		
150	151					6.3×5.8	85	6.3×7.7	151	8 x 10	192	8×10	214	10×10	238				
220	221			●8×6.2	160 (143)	0 8 x 6.2	175 (173)	○8×10	215 (162)	■10×10	250 (232)	■10×10	265 (246)	10×10	289				
330	331	6.3×5.8	152	08×6.2	190 (188)	8×10	240	8 x 10	270	■10×10	305 (284)	10×10	324						
470	471	6.3×7.7	200	8×10	265	8×10	290	■10×10	330 (307)	10×10	393								
680	681	8×10	284	8×10	318	10×10	374	10×10	396		 				l I				
1000	102	8×10	344	■10×10	400 (372)	10×10	454											Case size	Rated
1500	152	10×10	347	10×10	489													φD×L (mm)	ripple

Size $\phi 6.3 \times 5.8$ is available for capacitors marked. " $^{\bullet}$ " Size $\phi 6.3 \times 7.7$ is available for capacitors marked. " $^{\circ}$ " Size $\phi 8 \times 10$ is available for capacitors marked. " $^{\blacksquare}$ " * In this case, $\boxed{6}$ will be put at 12th digit of type numbering system.

Rated ripple current (mArms) at 85°C 120Hz

Cap.(µF) Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Less than 47	0.80	1.00	1.15	1.40	1.67
100 to 1500	0.85	1.00	1.08	1.20	1.30

- Taping specifications are given in page 23.Recommended land size, soldering by reflow are given in page 18, 19.
- Please select UG(p.158) series if high CV products are required.
- Please refer to page 3 for the minimum order quantity.







- Corresponding with 260°C peak reflow soldering Recomended reflow condition: 260°C peak 5 sec. 230°C over 60 sec. 2 times (φ8 × 6.2, φ10 × 10:1 time)
- Chip type higher capacitance in large case size.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).



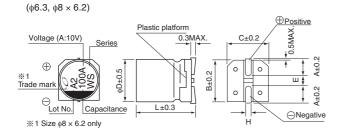


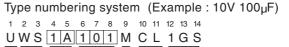


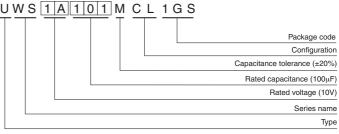
■ Specifications

Item	Performance Characteristics								
Category Temperature Range	-40 to +85°C								
Rated Voltage Range	6.3 to 50V								
Rated Capacitance Range	1500µF								
Capacitance Tolerance	±20% at 120Hz, 20°C								
Leakage Current	After 1 minute's application of rated voltage, leakage current is not more than 0.03CV (μA).								
	Measurement frequency : 120Hz at 20°C								
Tangent of loss angle (tan δ)	Rated voltage (V) 6.3 10 16 25 35 50								
	tan δ (MAX.) 0.28 0.24 0.20 0.16 0.14 0.12								
	Measurement frequency: 120Hz								
Stability at Low Temperature	Rated voltage (V) 6.3 10 16 25 35 50								
Classify at 2011 remperature	Impedance ratio Z-25°C / Z+20°C 5 4 3 2 2 2								
	217 220 (MMA.) 2-40 07 2720 0 10 0 0 7								
	The specifications listed at right shall be met when Capacitance change Within ±20% of the initial capacitance value								
Endurance	the capacitors are restored to 20°C after the rated tan \delta 200% or less than the initial specified value								
	voltage is applied for 2000 hours at 85°C. Leakage current Less than or equal to the initial specified value								
Shelf Life	After storing the capacitors under no load at 85°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above.								
	The capacitors are kept on a hot plate for 30 seconds, Capacitance change Within ±10% of the initial capacitance value								
Resistance to soldering	which is maintained at 250°C. The capacitors shall meet								
heat	the characteristic requirements listed at right when they are removed from the plate and restored to 20°C. Leakage current Less than or equal to the initial specified value								
Marking	Black print on the case top.								

■ Chip Type







$(\phi8\times10,\ \phi10\times10)$		
Voltage (V:35V) Series Trade mark Lot No. Capacitance	Plastic platform 0.3MAX.	C±0.2 Negative

					(111111)	
∮ DxL	6.3 × 5.8	6.3 × 7.7	8 × 6.2	8 × 10	10 × 10	
Α	2.4	2.4	3.3	2.9	3.2	
В	6.6	6.6	8.3	8.3	10.3	
С	6.6	6.6	8.3	8.3	10.3	
E	2.2	2.2	2.3	3.1	4.5	
L	5.8	7.7	6.2	10	10	
Н	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.8 to 1.1	0.8 to 1.1	

Voltage

vollage						
V	6.3	10	16	25	35	50
Code	i	Α	С	E	V	Н

●Dimension table in next page.



	V	6.	3	10	0	1	6	2	5	3	5	50	0
Cap. (µF)	ode	0.	J	1,	A	1	С	11	Ē	1'	V	11	Н
22	220											6.3 × 5.8	45
33	330									6.3 × 5.8	55	8 × 6.2	95
47	470							6.3 × 5.8	65	8 × 6.2	105	8 × 10	140
100	101			6.3 × 5.8	70	8 × 6.2	125	8 × 6.2	145	8 × 10	175	10 × 10	195
150	151			6.3 × 5.8	85	6.3 × 7.7	151	8 × 10	192	8 × 10	214	10 × 10	238
220	221	8 × 6.2	160	8 × 6.2	175	8 × 10	215	10 × 10	250	10 × 10	265	10 × 10	289
330	331	8 × 6.2	190	8 × 10	240	8 × 10	270	10 × 10	305	10×10	324		
470	471	8×10	265	8 × 10	290	10 × 10	330	10 × 10	393			į	
680	681	8×10	318	10 × 10	374	10 × 10	396						
1000	102	10 × 10	400	10 × 10	454							Case size	Rated
1500	152	10 × 10	489									φD×L (mm)	ripple

Rated ripple current (mArms) at 85°C 120Hz

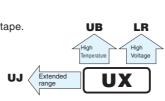
• Frequency coefficient of rated ripple current

Cap.(μF) Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Less than 47	0.80	1.00	1.15	1.40	1.67
100 to 1500	0.85	1.00	1.08	1.20	1.30

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please refer to page 3 for the minimum order quantity.

Chip Type, Wide Temperature Range

- Chip type, operating over wide temperature range of to -55 to +105°C.
- \bullet Designed for surface mounting on high density PC board.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).



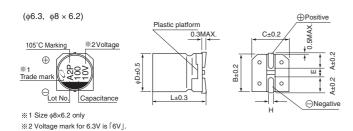


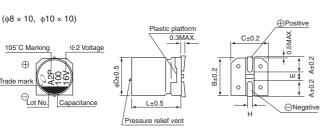
■Specifications

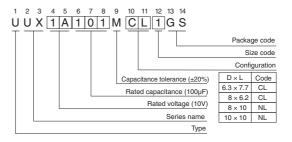
Item						Performa	2222	haraatar	istics						
1.7							ance C	naracter	ISTICS						
Category Temperature Range	−55 to +105°C (6.3	to 100V), -4	40 to +10)5°C (160	to 400V))									
Rated Voltage Range	6.3 to 400V														
Rated Capacitance Range	1 to 1000μF														
Capacitance Tolerance	±20% at 120Hz, 20°	°C													
Leakage Current	Rated voltage	. ,					6.3 to 1	00						0 to 400	
Leakage Current	Leakage Cu	ırrent	After 1	l minute's a	oplication o	of rated vol	tage, lea	kage curre	ent is not mor	e than 0.03	BCV (μA).	I = 0.04	CV+100	(μA) max.	(1 minute's)
											Measu	ırement	freque	ncy : 120l	Hz at 20°C
Tangent of loss angle (tan δ)	Rated voltage (V)	6.3	10	16	25	3		50	63	100	160		200	250	400
	tan δ (MAX.)	0.22	0.19	0.16	0.14	0.	12	0.10	0.10	0.08	0.20	0 0	.20	0.20	0.25
											Meas	uremen	t freque	ency: 120)Hz
O. 1. 1111	Rated vo	oltage (V)		6.3	10	16	25	35	50	63	100	160	200	250	400
Stability at Low Temperature	Impedance ratio	Z-55°C / Z	Z+20°C	4	4	3	3	3	2	3	4	_	_	T —	
	ZT / Z20 (MAX.)	Z-40°C / Z	Z+20°C	_	_	_	_		_	_	_	6	6	6	10
	The specifications	listed at rig	ght shall	l be met	when th	ie	Cap	acitance	change	Within	±20% o	of the initial capacitance value			
Endurance	capacitors are rest						tan	δ		200%	or less t	han the	intial sp	ecified va	alue
	applied for 2000 h	ours (160 t	o 400V	: 3000ho	urs) at	105°C.	Lea	kage cu	rrent	Less t	han or e	qual to t	he initia	l specified	d value
Shelf Life	After storing the ca	apacitors u	nder no	load at	105°C fo	or 1000	hours	and the	n perform	ing volta	ige treat	ment b	ased o	n JIS C	5101-4
Sileli Lile	clause 4.1 at 20°C	c, they shall	I meet th	ne specif	ied valu	es for th	ne end	urance (characteri	istics list	ed abov	e.			
	The capacitors are	e kent on a	hot plat	e for 30	seconds	3			1	NACH.:	100/	C 11			
Resistance to soldering	which is maintaine						_		e change					citance v	
heat		the characteristic requirements listed at right when they are													
	removed from the	plate and r	estored	to 20°C.			Lea	kage cu	rrent	Less t	nan or ed	quai to t	ne initia	specified	ı value
Marking	Black print on the ca	ee ton													

■ Chip Type

Type numbering system (Example : $10V 100 \mu F$)







				(111111)
. o D×L	6.3×7.7	8 × 6.2	8 × 10	10 × 10
Α	2.4	3.3	2.9	3.2
В	6.6	8.3	8.3	10.3
С	6.6	8.3	8.3	10.3
Е	2.2	2.3	3.1	4.5
L	7.7	6.2	10	10
Н	0.5 to 0.8	0.5 to 0.8	0.8 to 1.1	0.8 to 1.1

Dimension table in next page.



Can	V	6	.3	1	0	1	6	2	25	3	5	5	0	6	3	10	00
Cap. (μF)	Code	C)J	1	Α	1	С	1	E	1	V	1	Н	1	J	2.	A
4.7	4R7															8×6.2	42
10	100													8×6.2	51	8×10	75
22	220								}			O 8×6.2	67(64)	8×10	108	■10×10	150(121)
33	330									0 8×6.2	76(75)	8×10	133	■10×10	185(179)	10×10	180
47	470							0 8×6.2	79(78)	8×10	124	■10×10	180(167)	10×10	220	10×10	230
100	101			8×6.2	90	0 8×10	148(111)	8×10	181	■ 10×10	304(283)	10×10	310	10×10	320		
220	221	0 8×10	161(121)	8×10	173	■ 10×10	330(307)	■10×10	351(283)	10×10	450						
330	331	8×10	288	■10×10	318(296)	■ 10×10	441(410)	10×10	372								
470	471	■ 10×10	340(316)	■10×10	351(326)	10×10	489								1		
680	681	10×10	408	10×10	392											Case size	Rated
1000	102	10×10	495													φD × L (mm)	Rated ripple

Cap.	V	10	60	20	00	2	50	40	00	
(μF)	Code	2	:C	2	D	2	E	2G		
1	010		!					8×10	25	
1.8	1R8							8×10	26	
2.2	2R2							8×10	27	
3.3	3R3			8×10	31	8×10	31	10×10	38	
3.9	3R9			8×10	34	8×10	34	10×10	39	
4.7	4R7			8×10	37	8×10	37	10×10	40	
6.8	6R8			8×10	44	8×10	44			
10	100	8×10	57	10×10	64	10×10	64			
18	180	10×10	64							

Rated ripple current (mArms) at 105°C 120Hz

Size $\phi 6.3 \times 7.7$ is available for capacitors marked. "O" / Size $\phi 8 \times 10$ is available for capacitors marked. " \blacksquare " \circledast In this case, $\boxed{6}$ will be put at 12th digit of type numbering system.

• Frequency coefficient of rated ripple current

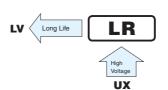
Cap.(µF) Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
1 to 47	0.80	1.00	1.15	1.40	1.67
100 to 1000	0.85	1.00	1.08	1.20	1.30

- Taping specifications are given in page 23.
 Recommended land size, soldering by reflow are given in page 18, 19.
- Please select UJ(p.160) series if high C/V products are
- Please refer to page 3 for the minimum order quantity.





- Chip Type, high Voltage.
- Applicable to automatic mounting machine using carrier tape.
- Adapted to the RoHS directive (2011/65/EU).

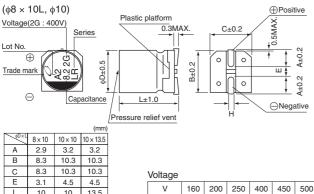




■Specifications

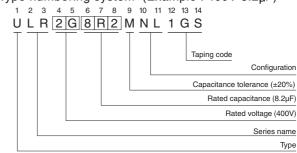
II										
Item	Performance Characteristics									
Category Temperature Range	−40 to +105°C									
Rated Voltage Range	160 to 500V									
Rated Capacitance Range	2.7 to 39µF									
Capacitance Tolerance	±20% at 120Hz, 20°C									
Leakage Current	1 minute's application of rated voltage, leakage current is not more than 0.04CV +100(µA).									
	Measurement frequency : 120Hz at 20°C									
Tangent of loss angle (tan δ)	Rated voltage (V) 160 200 250 400 450 500									
	an δ (MAX.) 0.20 0.20 0.25 0.25 0.30 0.30									
	Measurement frequency: 120Hz									
Chalailin and Laur Tanananananana	Rated voltage (V) 160 200 250 400 450 500									
Stability at Low Temperature	Impedance ratio ZT / Z20 (MAX.) Z-40°C / Z+20°C 6 6 10 10 15 15									
Endurance	The specifications listed at right shall be met when the capacitors are restored to 20°C after the rated voltage is applied for 3000 hours at 105°C. Capacitance change Within $\pm 20\%$ of the initial capacitance value $\tan \delta$ 200% or less than the initial specified value Leakage current Less than or equal to the initial specified value									
Shelf Life	fter storing the capacitors under no load at 105°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 ause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above.									
Resistance to soldering	The capacitors are kept on a hot plate for 30 seconds, which is maintained at 250°C and then performing voltage treatment based on									
heat	UIS C 5101-4 clause 4.1 at 20°C, they shall meet the characteristic requirements listed at right when they are removed from the plate.									
Marking	Black print on the case top.									

■Chip Type



(∋	Сар	acitance	Pressure re	1.0		-	H H	(⊝Nega	ative
			(mm)								
φD×L	8×10	10 × 10	10 × 13.5								
Α	2.9	3.2	3.2								
В	8.3	10.3	10.3								
С	8.3	10.3	10.3		Voltage						
Е	3.1	4.5	4.5								
L	10	10	13.5		V	160	200	250	400	450	500
Н	0.8 to 1.1	0.8 to 1.1	0.8 to 1.1		Code	2C	2D	2E	2G	2W	2H
	•	•		,							

Type numbering system (Example : $400V 8.2 \mu F$)



Dimensions

	V	16	60	20	00	25	50	40	0	45	0	50	0
Cap.(µF)	Code	2	С	21	D	2	2E		G .	2W		2H	
2.7	2R7											8×10	20
3.9	3R9									8×10 ¦	25	10×10	35
4.7	4R7			i		i		8×10	35	i		i	
5.6	5R6											10 × 13.5	40
6.8	6R8			!				!		10×10	40		
8.2	8R2							10×10	50	i			
10	100					8×10	35			10 × 13.5	45		
12	120			8×10	50			10 × 13.5 ¦	55	1		!	
15	150	8×10	50	i		10×10	50	i		i		i	
22	220			10×10	65	10 × 13.5	55						
27	270	10×10	65										
33	330			10 × 13.5	70			i		i		Case size	Rated
39	390	10 × 13.5	70									φD×L (mm)	ripple

Rated ripple current (mArms) at 105°C 120Hz

- Frequency coefficient of rated ripple current
- 50 Hz 120 Hz 300 Hz 1 kHz 10 kHz or more Frequency Coefficient 0.80 1.00 1.25 1.40 1.60

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please refer to page 3 for the minimum order quantity.









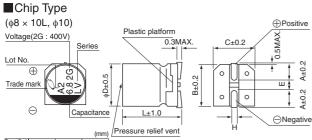
- Chip Type, high voltage and long life.
- Load life of 10000 hours at +105°C
- Applicable to automatic mounting machine using carrier tape.
- Adapted to the RoHS directive (2011/65/EU).





■Specifications

— - -												
Item	Performance Characteristics											
Category Temperature Range	−40 to +105°C											
Rated Voltage Range	160 to 500V											
Rated Capacitance Range	1.8 to 33µF											
Capacitance Tolerance	±20% at 120Hz, 20°C											
Leakage Current	Rated voltage (V) 160 to 450 500 - 0.04CV+100(µA)max.(1 minute's) 0.04CV+200(µA)max.(1 minute's)											
	Measurement frequency : 120Hz at 20°C											
Tangent of loss angle (tan δ)	ted voltage (V) 160 200 250 400 450 500 tan ô (MAX.) 0.20 0.25 0.25 0.30 0.30											
	Measurement frequency: 120Hz											
Stability at Low Temperature	Rated voltage (V) 160 200 250 400 450 500											
Stability at Low Temperature	Impedance ratio Z-40°C / Z+20°C 6 6 10 15 15											
Endurance	The specifications listed at right shall be met when the capacitors are restored to 20°C after the rated voltage is applied for 10000 hours at 105°C. Capacitance change Within ±30% of the initial capacitance value tan δ 300% or less than the initial specified value Leakage current Less than or equal to the initial specified value											
Shelf Life	After storing the capacitors under no load at 105°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above.											
Resistance to soldering heat	The capacitors are kept on a hot plate for 30 seconds, which is maintained at 250°C and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the characteristic requirements listed at right when they are removed from the plate. Capacitance change Within $\pm 10\%$ of the initial capacitance value $\tan \delta$ Less than or equal to the initial specified value Leakage current											
Marking	Black print on the case top.											



φD×L	8×10	10×10	10 × 13.5
Α	2.9	3.2	3.2
В	8.3	10.3	10.3
С	8.3	10.3	10.3
Е	3.1	4.5	4.5
L	10	10	13.5
Н	0.8 to 1.1	0.8 to 1.1	0.8 to 1.1

Voltage						
V	160	200	250	400	450	500
Code	2C	2D	2E	2G	2W	2H

Type numbering system (Example : 400V 6.8 μ F) U L V 2 G 6 R 8 M N L 1 G S Taping code Configuration Capacitance tolerance (±20%) Rated capacitance (6.8 μ F) Rated voltage (400V) Series name Type

Dimensions

	V	16	60	20	00	25	0	40	0	45	0	500	J
Cap.(µF)	Code	2	С	2	D	21	E	20	a .	2V	V	2H	1
1.8	1R8							ŀ		ŀ		8×10	25
3.3	3R3					!				8×10 !	25	10×10	40
3.9	3R9							8×10	35	i		i .	
4.7	4R7											10 × 13.5	45
5.6	5R6									10×10	40		
6.8	6R8					i		10×10	50				
7.5	7R5									10 × 13.5	45		
8.2	8R2					8×10	35	į		į			
10	100					i		10 × 13.5 ¦	55	i		i	
12	120			8×10	50								
15	150	8 × 10	50			10×10	50	i		i		i	
18	180			10×10	65	10 × 13.5	55						
22	220	10×10	65					-					
27	270			10 × 13.5	70	i		i		i		Case size	Rated
33	330	10 × 13.5	70							-		$\phi D \times L (mm)$	ripple

Rated ripple current (mArms) at 105°C 120Hz

• Frequency coefficient of rated ripple current

					-	
Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more	
Coefficient	0.80	1.00	1.25	1.40	1.60	

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please refer to page 3 for the minimum order quantity.





- Chip type acoustic series within the wide temperature range.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU)



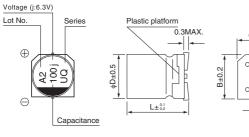


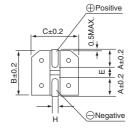
■ Specifications

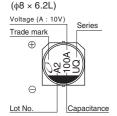
Item					Pei	forma	nce C	haracteris	stics			
Category Temperature Range	-40 to +105°C											
Rated Voltage Range	6.3 to 50V											
Rated Capacitance Range	0.1 to 1000μF											
Capacitance Tolerance	±20% (120Hz, 20°	C)										
Leakage Current	After 1 minute's ap	plication of	rated v	oltage a	t 20°C, le	akage	curre	nt is not	more	e thar	n 0.03 CV	or 4 (μA) , whichever is greater.
					N	/leasur	ement	t frequenc	y : 12	20Hz i	at 20°C	
Tangent of loss angle (tan δ)	Rated voltage (V)	6.3	10	0	16	2	5	35		5	50	
	tan δ (MAX.)	tan δ (MAX.) 0.30 0.26 0.22 0.16 0.13 0.12										
		Measurement frequency : 120Hz										:
	Rated vo	oltage (V)		6.3	10	10	6	25	3	35	50	
Stability at Low Temperature	Impedance ratio	Z-25°C / Z	25°C / Z+20°C		3	2	2	2 2		2	2	
	ZT / Z20 (MAX.)	Z-40°C / Z	+20°C	8	5	4	1	3	;	3	3	
	The specifications	listed at rigi	ht shall	be met	when	Cap	oacitar	nce chanç	je	With	in ±20% c	of the initial capacitance value
Endurance	the capacitors are				rated	tan	δ			200°	% or less t	than the initial specified value
	voltage is applied	for 1000 hou	urs at 1	05°C.		Lea	kage	current		Less	than or e	qual to the initial specified value
Shelf Life	After storing the ca											treatment based on JIS C 5101-4 above.
		The capacitors are kept on a hot plate for 30 seconds, Capacitance change Within ±10% of the initial capacitance value										
Resistance to soldering	which is maintaine						tan 8		iurig	_		or equal to the initial specified value
heat		characteristic requirements listed at right when they removed from the plate and restored to 20°C. Leakage current Less than or equal to the limital specified value Leakage current										
Marking	Black print on the	case top.										

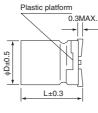
■Chip Type

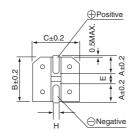
(φ4 to φ6.3)

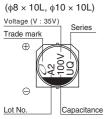


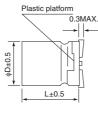


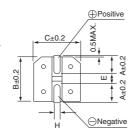




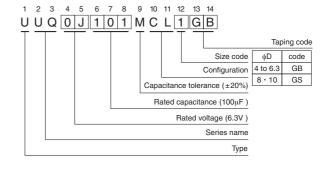








Type numbering system (Example : $6.3V 100 \mu F$)



						(mm)
φD×L	4 × 5.4	5 × 5.4	6.3 × 5.4	8 × 6.2	8 × 10	10 × 10
Α	1.8	2.1	2.4	3.3	2.9	3.2
В	4.3	5.3	6.6	8.3	8.3	10.3
С	4.3	5.3	6.6	8.3	8.3	10.3
E	1.0	1.3	2.2	2.3	3.1	4.5
L	5.4	5.4	5.4	6.2	10	10
Н	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.5 to 0.8	0.8 to 1.1	0.8 to 1.1

Rated vo	oltage					
V	6.3	10	16	25	35	50
Code	j	Α	С	Е	V	Н

Dimension table in next page.



	V	6.3		10		10	6	25		35		50	
Cap.(µF)	Code	0J		1A	ı	10	0	1E		1V		1H	
0.1	0R1								 			4 × 5.4	1.0
0.22	R22				!		-		 			4 × 5.4	2.6
0.33	R33		i				i		i i			4 × 5.4	3.2
0.47	R47		i						I I			4 × 5.4	3.8
1	010		l I						 			4 × 5.4	6.2
2.2	2R2		i						İ			4 × 5.4	11
3.3	3R3								 			4 × 5.4	14
4.7	4R7		I I		1		1	4 × 5.4	13	4 × 5.4	15	5 × 5.4	19
10	100		i	4 × 5.4	22	4 × 5.4	18	5 × 5.4	23	5 × 5.4	25	6.3 × 5.4	30
22	220	4 × 5.4	22	5 × 5.4	27	5 × 5.4	30	6.3 × 5.4	38	6.3 × 5.4	42	8 × 6.2	51
33	330	5 × 5.4	30	5 × 5.4	35	6.3 × 5.4	40	6.3 × 5.4	48	8 × 6.2	59	8 × 10	140
47	470	5 × 5.4	36	6.3 × 5.4	46	6.3 × 5.4	50	8 × 6.2	66	8 × 10	155	8 × 10	180
100	101	6.3 × 5.4	60	○6.3 × 5.4	60 (90)	● 8 × 6.2	102 (210)	8 × 10	155	10 × 10	300	10 × 10	220
220	221	● 8 × 6.2	102 (210)	● 8×6.2	102 (210)	△8×10	210 (310)	10 × 10	300	10 × 10	300		
330	331	● 8 × 6.2	102 (210)	△ 8×10	210 (310)	∆8×10	210 (310)						
470	471	△8×10	210 (310)	△ 8×10	210 (310)	△8×10	210 (310)		İ			Case size	Rated
1000	102	10 × 10	310									φD×L (mm)	ripple

Size $\varphi8\times6.2L$ is available for capacitors marked. " \circ "

Size $\varphi 8 \times 10 L$ is available for capacitors marked. " \bullet "

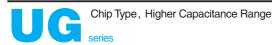
Size $\varphi 10 \times 10L$ is available for capacitors marked. " \triangle "

※ In this case, ⑥ will be put at 12th digit of type numbering system.

Rated ripple current (mArms) at 105°C 120Hz

Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
Coefficient	0.70	1.00	1.17	1.36	1.50

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please refer to page 3 for the minimum order quantity.







- \bullet Chip Type, higher capacitance in larger case sizes (\$\phi12.5\$, \$\phi16\$, \$\phi18\$, \$\phi20\$)
- Designed for surface mounting on high density PC board.
- Applicable to automatic mounting machine fed with carrier tape and tray.
- Compliant to the RoHS directive (2011/65/EU).



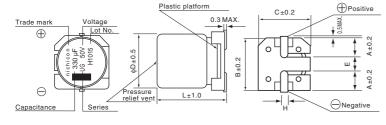


■ Specifications

Item						Performa	and	ce Character	istics					
Category Temperature Range	-40 to +85°C													
Rated Voltage Range	6.3 to 450V													
Rated Capacitance Range	4.7 to 10000µF													
Capacitance Tolerance	±20% at 120Hz, 20°0)												
	Rated voltage ((V)				6	6.3	3 to 100					160 to 45	0
Leakage Current	_	After 1 minute's application of rated voltage, leakage current is not more than 0.03CV or 4 (μ A), whichever is greater. I = 0.04CV+100 (μ A) max. (1 minute's)												
		Measurement frequency: 120Hz at 20°C											Hz at 20°C	
Tangent of less angle (ten %)	Rated voltage (V)	6.3	1	0	16	25		35	50	(63	100	160 to 250	400 • 450
Tangent of loss angle (tan δ)	tan δ (MAX.)	0.28	0.2	24	0.20	0.16	i	0.14	0.12	0	.10	80.0	0.20	0.25
	For capacitance of more	than 1000µ	ıF, add	0.02 for ev	ery increa	ase of 10	000)μF.						
											N	/leasuren	nent frequer	ncy: 120Hz
Stability at Low Temperature	Rated volta	0 ()		6.3	10	16	;	25	35	50	63	100	160 to 250	
Stability at Low Temperature		-25°C / Z+		5	4	3		2	2	2	2	2	3	6
	ZT / Z20 (MAX.) Z	_40°C / Z+	20°C	12	10	8		5	4	3	3	3	6	10
Endurance	The specifications lis						-	Capacitance an δ	change				apacitance v	
Endurance		capacitors are restored to 20°C after the rated voltage is applied for 2000 hours at 85°C. $\frac{\tan \delta}{\text{Leakage current}} = \frac{200\% \text{ or less than the initial specified value}}{\text{Less than or equal to the initial specified value}}$												
Shelf Life		fter storing the capacitors under no load at 85°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 ause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above.												
Marking	Black print on the case	top.												

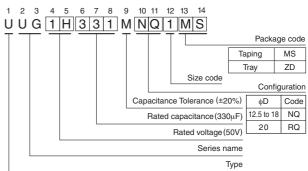
■ Chip Type

Type numbering system (Example : 50V 330µF)



(mm)	

φD	12.5×13.5	12.5×16	12.5×21	16×16.5	16×21.5	18×16.5	18×21.5	20×16.5	20×21.5
Α	4.8	4.8	4.8	5.4	5.4	6.4	6.4	6.2	6.2
В	13.6	13.6	13.6	17.1	17.1	19.1	19.1	21.1	21.1
С	13.6	13.6	13.6	17.1	17.1	19.1	19.1	21.1	21.1
Е	4.0	4.0	4.0	6.3	6.3	6.3	6.3	8.8	8.8
L	13.5	16.0	21.0	16.5	21.5	16.5	21.5	16.5	21.5
Н	1.0 to 1.4	1.0 to 1.4	1.0 to 1.4	1.0 to 1.4	1.0 to 1.4	1.0 to 1.4	1.0 to 1.4	1.3 to 1.7	1.3 to 1.7



 $\ensuremath{\,\times\,}$ The vibration structure-resistant product is also available upon request, please ask for details.

Dimension table in next page.



(µF)	V	6.3		10		16		25		35		50	
	Code	0J		1A		1C		1E		1V		1H	
220	221											12.5 × 13.5	450
330	331											12.5 × 13.5	520
470	471		l I					12.5 × 13.5	550	12.5 × 13.5	580	• 16 × 16.5	740
1000	102		 	12.5 × 13.5	620	12.5 × 13.5	710	12.5 × 16	820	• 16 × 16.5	1000	18 × 21.5	1150
2200	222	12.5 × 16	890	12.5 × 16	960	● 16 × 16.5	1150	∆18 × 16.5	1350	18 × 21.5	1550		
3300	332	● 16 × 16.5	1200	16 × 16.5	1300	∆18 × 16.5	1450	18 × 21.5	1700				
4700	472	16 × 16.5	1400	∆18 × 16.5	1500	18 × 21.5	1750		!				
6800	682	∆18 × 16.5	1650	18 × 21.5	1850		i						
10000	103	18 × 21.5	2000	□ 20 × 21.5	2200								

(µF)	V	63		100		160		200		250		400		450	
	Code	1J		2A		2C		2D		2E		2G		2W	
4.7	4R7						İ					12.5 × 13.5	115	12.5 × 13.5	115
10	100		!		!		!		!	12.5 × 13.5	150	• 16 × 16.5	140	● 16 × 16.5	140
22	220		İ		i		i i	12.5 × 13.5	235	12.5 × 16	240	∆18 × 16.5	280	16 × 21.5	275
33	330						 	12.5 × 16	310	• 16 × 16.5	340	18 × 21.5	350	18 × 21.5	345
47	470		İ		!	12.5 × 16	370	● 16 × 16.5	415	△ 18 × 16.5	415	□ 20 × 21.5	430		İ
68	680		i	12.5 × 13.5	350	• 16 × 16.5	500	△18 × 16.5	505	★ 18 × 21.5	490		i		İ
100	101	12.5 × 13.5	370	12.5 × 16	440	∆18 × 16.5	590	18 × 21.5	590						
220	221	12.5 × 16	580	△18 × 16.5	665		i i		İ		1		1		İ
330	331	• 16 × 16.5	680	18 × 21.5	825		i i						ļ	Case size	Rated
470	471	△18 × 16.5	850											$\phi D \times L (mm)$	ripple

Rated ripple current (mArms) at 85°C 120Hz

V	Cap.(μF) Frequency	50Hz	120Hz	300Hz	1kHz	10kHz or more
	68	0.75	1.00	1.35	1.57	2.00
6.3 to 100	100 to 470	0.80	1.00	1.23	1.34	1.50
	1000 to 10000	0.85	1.00	1.10	1.13	1.15
160 to 450	4.7 to 100	0.80	1.00	1.25	1.40	1.60

- Taping specifications are given in page 23. Recommended land size, soldering by reflow are given in page 18, 19.
- Please refer to page 3 for the minimum order quantity.

Size \$\phi12.5\times21\$ is available for capacitors marked," \$\phi\$". Size \$\phi16\times21.5L\$ is available for capacitors marked," \$\times^*\$. Size \$\phi18\times21.5L\$ is available for capacitors marks," \$\pi^*\$. Size \$\phi20\times16.5L\$ is available for capacitors marks," \$\pi\$".

^{*} In this case, 6 will be put at 12th digit of type numbering system.



Chip Type, Higher Capacitance Range

series



- Designed for surface mounting on high density PC board.
- Applicable to automatic mounting machine fed with carrier tape and tray.
- Compliant to the RoHS directive (2011/65/EU).







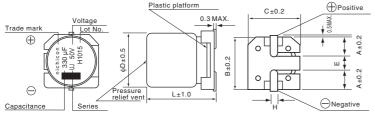
■Specifications

Item					Performa	and	ce Character	stics					
Category Temperature Range	-55 to +105°C (6.3 to 100V),	-40 to	+105°C	(160 to	450V)								
Rated Voltage Range	6.3 to 450V												
Rated Capacitance Range	3.3 to 6800µF												
Capacitance Tolerance	±20% at 120Hz, 20°C												
	Rated voltage (V)				6	6.3	3 to 100					160 to 45	0
Leakage Current	_		1 minute's 0.03CV or				l voltage, lea s greater.	kage curi	rent is no	t more	I = 0.04 (1 minu	4CV+100 (μ <i>Α</i> te's)	A) max.
		Measurement frequency : 120Hz at 20°C											
Tangent of less angle (ten %)	Rated voltage (V) 6.3	1	0	16	25		35	50	(63	100	160 to 250	400 • 450
Tangent of loss angle (tan δ)	tan δ (MAX.) 0.26	0.	22	0.18	0.16	;	0.14	0.12	. 0	.10	0.08	0.15	0.20
	For capacitance of more than 1000	μF, add	0.02 for ev	ery incre	ase of 10	000)μF.						
										ı	Measuren	nent frequer	ncy: 120Hz
Stability at Low Temperature	Rated voltage (V)		6.3	10	16	;	25	35	50	63	100	160 to 250	
Stability at Low Temperature	Impedance ratio Z-25°C / Z		5	4	3		2	2	2	2	2	3	6
	ZT / Z20 (MAX.) Z-40°C / Z-	+20°C	10	8	6		4	3	3	3	3	6	10
Endurance		specifications listed at right shall be met when the acitors are restored to 20°C after the rated voltage is ied for 5000 hours at 105°C. Capacitance change Within ±20% of the initial capacitance value tan δ 200% or less than the initial specified value Leakage current Less than or equal to the initial specified value											
Shelf Life		ter storing the capacitors under no load at 105°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 ause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above.											
Marking	Black print on the case top.												

(mm)

■Chip Type

Type numbering system (Example: 50V 330µF)



1 2	3 4	5 0	/ 0	9 10	- 11 1	12 13 1	+			
UU	J 1	H 3 3	3 1 N	ΜN	Q	1 M S	3			
$T \top$				Γ			-		Packa	ge code
								Ta	aping	MS
								-	Tray	ZD
							Size code			
									Confi	guration
						Capacita	nce Tolerance (±2	20%)	φD	Code
						Rate	d capacitance (33	0μF)	12.5 to 18	NQ
							Rated voltage (50V)	20	RQ
	'						Series n	ame		
								Туре		

φD 12.5×13.5 12.5×16 12.5×21 16×16.5 16×21.5 18×16.5 18×21.5 20×16.5 20×21.5 4.8 4.8 5.4 6.4 6.2 6.2 В 13.6 13.6 13.6 17.1 17.1 19.1 19.1 21.1 21.1 С 13.6 13.6 13.6 17.1 19.1 17.1 19.1 21.1 21.1 Е 4.0 4.0 6.3 6.3 6.3 8.8 8.8 4.0 6.3 13.5 16.0 21.0 16.5 21.5 16.5 21.5 16.5 21.5 H 1.0 to 1.4 1.0 to 1.4 1.0 to 1.4 1.0 to 1.4 1.0 to 1.4 1.0 to 1.4 1.0 to 1.4 1.0 to 1.4 1.3 to 1.7

Dimension table in next page.

^{**} The vibration structure-resistant product is also available upon request, please ask for details.



(μF)	V	6.3		10		16		25		35		50	
Cap.	Code	0J		1A		1C		1E		1V		1H	
220	221						 		 	12.5 × 13.5	280	12.5 × 16	320
330	331		 				 	12.5 × 13.5	320	12.5 × 16	360	• 16 × 16.5	440
470	471					12.5 × 13.5	360	12.5 × 16	400	• 16 × 16.5	490	△ 18 × 16.5	550
1000	102	12.5 × 13.5	440	12.5 × 16	500	• 16 × 16.5	630	△ 18 × 16.5	700	△ 18 × 16.5	750	18 × 21.5	820
2200	222	• 16 × 16.5	750	• 16 × 16.5	810	△ 18 × 16.5	930	18 × 21.5	1050	□ 20 × 21.5	1150		1
3300	332	△ 18 × 16.5	930	△ 18 × 16.5	1000	18 × 21.5	1150						
4700	472	★ 18 × 21.5	1100	18 × 21.5	1200		i						
6800	682	□ 20 × 21.5	1350	□ 20 × 21.5	1450		 		 		 		

(UE)	V	63		100		160		200		250		400		450	
(μF) Cap.	Code	1J		2A		2C		2D		2E		2G		2W	
3.3	3R3		 											12.5 × 13.5	40
4.7	4R7		l I				İ			12.5 × 13.5	65	12.5 × 16	50	12.5 × 16	50
10	100		i I		i		i	12.5 × 13.5	80	12.5 × 16	105	16 × 16.5	85	16 × 16.5	85
22	220		i					12.5 × 16	105	• 16 × 16.5	180	18 × 21.5	130	18 × 21.5	130
33	330		 		 	12.5 × 13.5	95	• 16 × 16.5	220	△ 18 × 16.5	230	□ 20 × 21.5	160	□ 20 × 21.5	160
47	470		i i	12.5 × 13.5	160	• 16 × 16.5	260	△ 18 × 16.5	270	★ 18 × 21.5	280		i		İ
68	680	12.5 × 13.5	175	12.5 × 16	205	△ 18 × 16.5	320	★ 18 × 21.5	330	□ 20 × 21.5	340		1		
100	101	12.5 × 16	225	• 16 × 16.5	285	★ 16 × 21.5	380	□ 20 × 21.5	410		! !		I I		
220	221	• 16 × 16.5	385	△ 18 × 16.5	440		İ		İ		İ		İ		1
330	331	△ 18 × 16.5	490	□ 20 × 21.5	500								i i	Case size	Rated
470	471	18 × 21.5	590		 		I I							φD×L (mm)	l ripple

Size $\phi 12.5 \times 21$ is available for capacitors marked," \bullet ".

Size $\varphi 16 \times 21.5L$ is available for capacitors marked," $\triangle^{\shortparallel}$

Size ϕ 18 × 21.5L is available for capacitors marked, "□". Size ϕ 20 × 16.5L is available for capacitors marks, "★".

* In this case, 6 will be put at 12th digit of type numbering system.

Rated ripple current (mArms) at 105°C 120Hz

V	Cap.(µF) Frequency	50Hz	120Hz	300Hz	1kHz	10kHz or more
	47 to 68	0.75	1.00	1.35	1.57	2.00
6.3 to 100	100 to 470	0.80	1.00	1.23	1.34	1.50
	1000 to 6800	0.85	1.00	1.10	1.13	1.15
160 to 450	3.3 to 100	0.80	1.00	1.25	1.40	1.60

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please refer to page 3 for the minimum order quantity.



Chip Type, Bi-Polarized, Higher Capacitance Range









- Designed for surface mounting on high density PC board.
- ullet Bi-polarized series for operations over wide temperature range of -55 to $+105^{\circ}$ C.
- Applicable to automatic mounting machine fed with carrier tape and tray.
- Compliant to the RoHS directive (2011/65/EU).

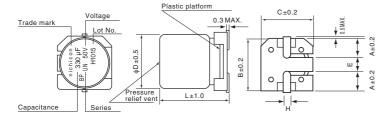




■Specifications

Item				F	erformance	Characteri	stics				
Category Temperature Range	-55 to +105°C										
Rated Voltage Range	6.3 to 100V										
Rated Capacitance Range	22 to 3300μF										
Capacitance Tolerance	±20% at 120Hz, 20)°C									
Leakage Current	After 1 minute's ap	plication of rate	ed voltage,	leakage cı	urrent is no	ot more tl	nan 0.03CV	or 4 (μΑ	A), whic	hever is	greater.
						Me	asurement fr	equency	: 120Hz	at 20°C	
Tangent of loss angle (tan δ)	Rated voltage (V		10	16	25	35	50	63		100	
langent of loss angle (tan 6)	tan δ (MAX.)	0.26	0.22	0.18	0.16	0.14	0.12	0.10)	0.09	
	For capacitance of n	nore than 1000µF,	add 0.02 fo	r every incre	ase of 1000µ	ıF.					
							Measu	rement f	requen	cy: 120Hz	Z
Stability at Low Temperature		oltage (V)	6.3	_	16	25	35	50	63	100	
Clability at Low Temperature	Impedance ratio	Z-25°C / Z+20		4	3	2	2	2	2	2	
	ZT / Z20 (MAX.)	Z-40°C / Z+20	0°C 10	8	6	4	3	3	3	3	<u> </u>
	The specifications I	istad at right sh	all be met	whon the	anacitore	0		Mithin	.000/	of the initio	l sonositones value
Endurance	are restored to 20°0	•			•	tan δ	ance change				al capacitance value nitial specified value
Endurance	hours at 105°C with		_				current				e initial specified value
	Tiodis at 105 0 with	r the polarity in	vertea ever	y 200 11001	J.	Lounage	, , , , , , , , , , , , , , , , , , , ,	2000 !!	1011 01 0	quai to tire	z minar opcomou varac
01-1111	After storing the ca	pacitors under	no load at	105°C for 1	000 hours	and then	performing	voltage	treatme	ent based	on JIS C 5101-4
Shelf Life	clause 4.1 at 20°C,	they shall mee	t the speci	fied values	for the end	durance c	haracteristic	s listed a	above.		
Marking	Black print on the o	ase top.									

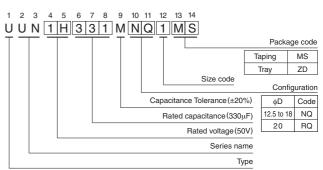
■Chip Type



(m	m	١

							, ,
φD	12.5×13.5	12.5×16	16×16.5	16×21.5	18×16.5	18×21.5	20×21.5
Α	4.8	4.8	5.4	5.4	6.4	6.4	6.2
В	13.6	13.6	17.1	17.1	19.1	19.1	21.1
С	13.6	13.6	17.1	17.1	19.1	19.1	21.1
Е	4.0	4.0	6.3	6.3	6.3	6.3	8.8
L	13.5	16.0	16.5	21.5	16.5	21.5	21.5
Н	1.0 to 1.4	1.0 to 1.4	1.0 to 1.4	1.0 to 1.4	1.0 to 1.4	1.0 to 1.4	1.3 to 1.7

Type numbering system (Example: 50V 330_uF)



 $\ensuremath{\underline{*}}$ The vibration structure-resistant product is also available upon request, please ask for details.

Dimension table in next page.



(µF)	V	6.3		10		16		25		35		50		63		100	
	Code	0J		1A		1C		1E		1V		1H		1J		2A	
22	220						ļ 		¦						<u> </u>	12.5 × 13.5	100
33	330				 		 		 							12.5 × 16	150
47	470								+			12.5 × 13.5	130	12.5 × 13.5	140	16 × 16.5	180
100	101						<u> </u> 		<u> </u> 	12.5 × 13.5	180	12.5 × 16	230	16 × 16.5	270	18 × 21.5	310
220	221							12.5 × 13.5	270	16 × 16.5	330	18 × 16.5 ▲ 16 × 21.5	i	18 × 21.5	440		
330	331					12.5 × 13.5	310	16 × 16.5	370	18 × 16.5 ▲16 × 21.5		18 × 21.5	+	20 × 21.5 1 8 × 21.5			+
470	471	12.5 × 13.5	270	12.5 × 13.5	340	16 × 16.5	420	16 × 16.5	490	18 × 21.5	590	20 × 21.5 A 18 × 21.5					
1000	102	12.5 × 16	500	16 × 16.5	600	18 × 16.5 ▲16 × 21.5	+		780								
2200	222	18 × 16.5			830		ļ 		ļ 				 		ļ		<u> </u>
3300	332	▲ 16 × 21.5	+		 		 								 	Case size	Rated

In this case, 6 will be put at 12th digit of type numbering system, "▲"

Rated ripple current (mArms) at 105°C 120Hz

• Frequency coefficient of rated ripple current

Cap.(µF) Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
22 to 47	0.75	1.00	1.35	1.57	2.00
100 to 470	0.80	1.00	1.23	1.34	1.50
1000 to 3300	0.85	1.00	1.10	1.13	1.15

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please refer to page 3 for the minimum order quantity.



Chip Type, Vibration Resistance









- Suited for automobile electronics where heavy duty services are indispensable.
- Compliant to the RoHS directive (2011/65/EU).

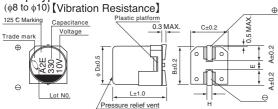




■ Specifications

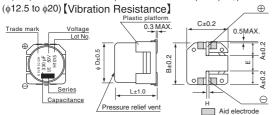
Item				Performanc	e Characteristics							
Category Temperature Range	-55 to +125°	C (\$12.5 to 20)	-40 to +125°C (φ8, φ10)								
Rated Voltage Range	10 to 50V	ov										
Rated Capacitance Range	33 to 4700µF	-700μF										
Capacitance Tolerance	±20% at 120	at 120Hz, 20°C										
Leakage Current	After 1 minut	I minute's application of rated voltage, leakage current is not more than 0.03CV or 4 (μA), whichever is greater.										
	For capacitar	nce of more than 1	000μF, add 0.02	for every increa	se of 1000µF.							
Tangent of loss angle	t of loss angle Rated voltage (V) 10 16 25 35 50 120Hz											
(tan δ)	tan δ	ф8 - ф10	0.26	0.20	0.16	0.14	0.14	20°C				
	(MAX)	φ 12.5 to φ 20	0.22	0.18	0.16	0.14	0.12					
	Rated	voltage (V)	10	16	25	35	50	120Hz				
Stability at Low Temperature	Impedance ratio Z-40°C / Z+20°C	$\varphi 8 \cdot \varphi 10$	10	8	6	4	4					
	(MAX)	φ 12.5 to φ 20	8	6	4	3	3					
Endurance		ations listed at right re restored to 20°0			Capacitance change tan δ		of the initial capac than the initial sp					
		000 hours (2000 h		•	Leakage current	Less than or	equal to the initial	specified value				
Shelf Life		•			rs and then performin			JIS C 5101-4				
Marking	Black print or	n the case top.										

■Chip Type

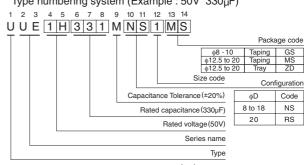


/Pressure relief vent H

68 to \$10 The standard structure product is also available upon request, please refer to page142(UB series).



Type numbering system (Example: 50V 330µF)



						(mm)
₩.	8	10	12.5	16	18	20
Α	2.9	3.2	4.8	5.4	6.4	6.2
В	8.3	10.3	13.6	17.1	19.1	21.1
С	8.3	10.3	13.6	17.1	19.1	21.1
E	3.1	4.5	4.0	6.3	6.3	8.8
L	10	10	13.5,16	16.5,21.5	16.5,21.5	21.5
Н	1.1 to 1.5	1.1 to 1.5	1.0 to 1.4	1.0 to 1.4	1.0 to 1.4	1.3 to 1.7

Dimensions

	V	10		16		25		35		50	
Cap.(μF)	Code	1A		1C		1E		1V		1H	
33	330		l I		1		I I			8×10	90
47	470		i i		1		i	8×10	100	10×10	130
100	101		i	8×10	140	8 × 10	140	10×10	150	12.5 × 13.5	500
220	221	8×10	140	10×10	190	10 × 10	190	12.5 × 13.5	550	16×16.5	850
330	331	10×10	190	12.5 × 13.5	750	12.5 × 13.5	750	16 × 16.5	1000	16×16.5	850
470	471	12.5 × 13.5	750	12.5 × 13.5	750	16×16.5	1000	16 × 16.5	1000	18 × 16.5	950
680	681	12.5 × 16	900	16×16.5	1000	18×16.5	1200	18 × 16.5	1200		
000	001					▲ 16×21.5	1200				
1000	102	12.5 × 16	900	18×16.5	1200	18×21.5	1550	20×21.5	1400		
1000	102		!		!			▲ 18×21.5	1400		
2200	222	▲ 18×16.5	1200	18×16.5	1200		i				
2200	222	16×21.5	1200		T		,		 	I	
3300	332	18×16.5	1200		1		l I		l I	Case size	Rated
4700	472	18 x 21 5	1550		1		İ			φD×L (mm)	ripple

* In this case, 6 will be put at 12th digit of type numbering system, "A"

• Frequency coefficient of rated ripple current

		.,			1.1.		
	φD	Cap.(µF)	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz or more
	φ8.φ10	33 to 330	0.47	0.67	0.78	0.91	1.00
	5 12.5 to 6 20	100 to 680	0.53	0.67	0.82	0.89	1.00
ľ	p 12.5 t0 φ 20	1000 to 4700	0.74	0.87	0.96	0.98	1.00

Rated ripple current (mArms) at 125°C 100kHz

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please refer to page 3 for the minimum order quantity.



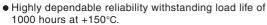
Chip Type, High Temperature Range, Vibration Resistance











- Suited for automobile electronics where heavy duty services are indispensable.
- Compliant to the RoHS directive (2011/65/EU).





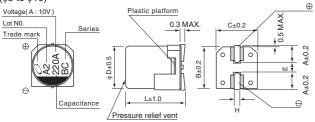


■Specifications

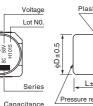
Item				Performanc	e Characteristics						
Category Temperature Range	-40 to +150°	C (\$ to 10), -5	55 to +150°C (φ	12.5 to 18)							
Rated Voltage Range	10 to 50V										
Rated Capacitance Range	33 to 3300µF	=									
Capacitance Tolerance	±20% at 120	20Hz, 20°C									
Leakage Current	After 1 minut	nute's application of rated voltage, leakage current is not more than 0.03CV or 4 (μA), whichever is greater.									
	Rated	voltage (V)	10	16	25	35	50	120Hz 20°C			
Tangent of less angle (tan \$)	tan δ	φ8 · φ10	0.26	0.20	0.16	0.14	0.14				
Tangent of loss angle (tan δ)	(MAX.)	φ 12.5 to φ 18	0.22	0.18	0.16	0.14	0.12				
	For capacitance of more than 1000μF, add 0.02 for every increase of 1000μF.										
	Rated	voltage (V)	10	16	25	35	50	120Hz			
Stability at Low Temperature	Impedance ratio	φ8 · φ10	10	8	6	4	4				
	Z-40°C / Z+20°C (MAX.)	φ12.5 to φ18	8	6	4	4	4				
	The specifica	tions listed at right	t shall be met wh	en the	Capacitance chang	e Within ±30%	of the initial capa	citance value			
Endurance	capacitors ar	e restored to 20°C	after the rated vo	oltage is	tan δ		than the initial s				
	applied for 10	d for 1000 hours at 150°C. Leakage current Less than or equal to the initial specified value									
Shelf Life	After storing	the capacitors und	er no load at 150	°C for 1000 hour	s and then performir	ng voltage treati	ment based on	JIS C 5101-4			
Sileli Lile	clause 4.1 at	20°C, they shall m	neet the specified	values for the er	ndurance characteris	tics listed above	e.				
Marking	Black print or	n the case top.									

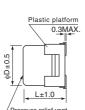
■Chip Type

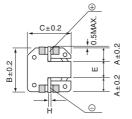






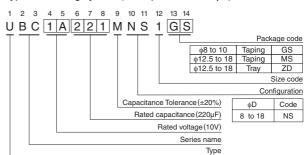






Aid electrode

Type numbering system (Example: 10V 220µF)



					(mm)
Φ₽	8	10	12.5	16	18
Α	2.9	3.2	4.8	5.4	6.4
В	8.3	10.3	13.6	17.1	19.1
С	8.3	10.3	13.6	17.1	19.1
Е	3.1	4.5	4.0	6.3	6.3
L	10	10	13.5	16.5,21.5	21.5
Н	1.1 to 1.5	1.1 to 1.5	1.0 to 1.4	1.0 to 1.4	1.0 to 1.4

Dimensions

Θ

_											
	V	10		16		25		35		50	
Cap.(μF)	Code	1A		1C		1E		1V		1H	
33	330									8×10	70
47	470		İ					8×10	80	10×10	100
100	101		I I	8×10	110	8 × 10	110	10×10	120	12.5 × 13.5	420
220	221	8×10	110	10×10	150	10×10	150	12.5 × 13.5	550	16×16.5	550
330	331	10×10	150			12.5 × 13.5	650	12.5 × 13.5	650	16×21.5	650
470	471			12.5 × 13.5	750	12.5 × 13.5	700	16 × 16.5	750	16×21.5	850
680	681	12.5 × 13.5	800	12.5 × 13.5	800	16 × 16.5	800	16 × 21.5	950	18 × 21.5	1100
1000	102	12.5 × 13.5	900	16 × 16.5	850	16 × 21.5	1000	18 × 21.5	1150		
2200	222	18×21.5	1350	18 × 21.5	1350		1			Case size	Rated
3300	332	18 × 21.5	1400						1	φD×L (mm)	ripple

• Frequency coefficient of rated ripple current

Frequency	120 Hz	300 Hz	1 kHz	10kHz or more
Coefficient	0.67	0.79	0.91	1.00

Rated ripple current (mArms) at 150°C 100kHz

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please refer to page 3 for the minimum order quantity.