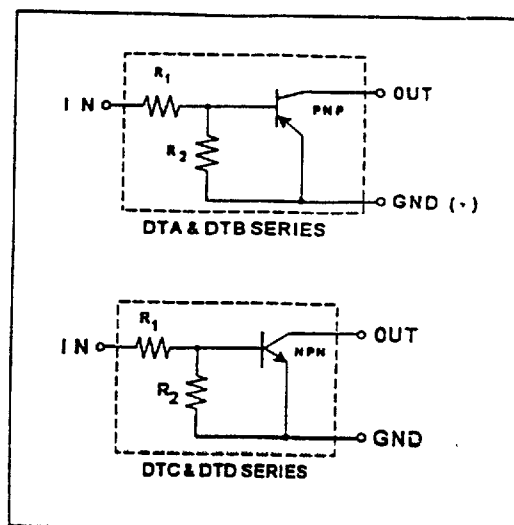


ROHM**DTA/DTB/DTC/DTD****DIGITAL TRANSISTOR****APPLICATION:**

- Inverter, Driver & Interface Circuits

FEATURES:

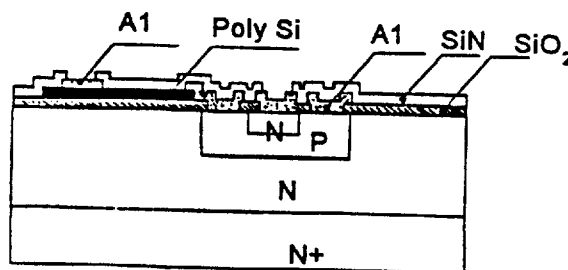
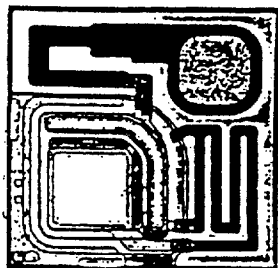
- Replaces up to three parts (1 transistor & 2 resistors) with one part
- Available in a variety of surface mount or leaded (thru-hole) packages
- High packing density requires less board space
- Cost savings due to fewer components to purchase & stock & handle
- Improved reliability due to reduced number of components
- Available in PNP & NPN polarities
- Available in 100 mA & 500 mA devices
- Decreased parasitic effects
- Double diffused silicon, Epitaxial Planar Transistor with thin film internal bias resistors

EQUIVALENT CIRCUITS:**MAXIMUM RATINGS:**

PARAMETER	PNP		NPN		UNITS
	DTA	DTB	DTC	DTD	
Power Supply Voltage (V_{cc})	50	50	50	50	Volts
Collector Current (I_c)	100	500	100	500	mA
Junction Temperature (T_j)	+125	+125	+125	+125	°C
Storage Temperature (T_{stg})	-55 to +125	-55 to +125	-55 to +125	-55 to +125	°C
Power Dissipation (P_d)	Rated by Package -- See Table Below				mW

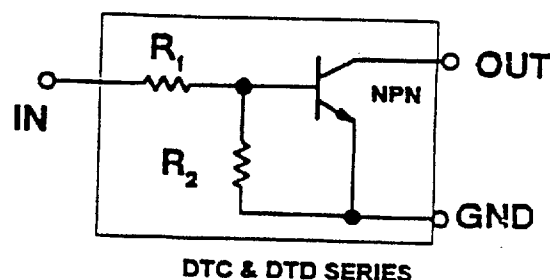
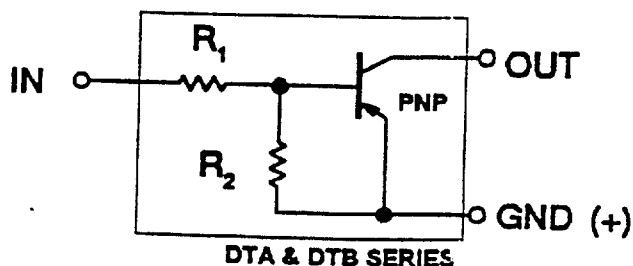
MAXIMUM POWER DISSIPATION BY PACKAGE: P_d (mW)

Test Condition	SURFACE MOUNT DEVICES				THRU-HOLE (LEADED) DEVICES				
	SST (SOT-23)	SMT (SC-59)	UMT	EM3	SPT (TO-92S)	ATR	ATV	FTR	FTL
Free Air/PCB	200	200	200	150	300	300	300	300	300
Ceramic Substrate	350	350	350	250	—	—	—	—	—

DIGITAL TRANSISTOR CONSTRUCTION:

ROHM CORPORATION, Rohm Electronics Division, 3034 Owen Dr., Antioch, TN 37013 (615)641-2020 FAX (615)641-2022

• Digital Transistor Summary Table



Resistor Values		PNP $I_c(\text{Max}) = 100 \mu\text{A}$ 2N3906	PNP $I_c(\text{Max}) = 500 \text{ mA}$ PN2907A/2N4403	NPN $I_c(\text{Max}) = 100 \text{ mA}$ 2N3904	NPN $I_c(\text{Max}) = 500 \text{ mA}$ PN2222A/2N4401
R_1	R_2				
1/K 1/K 1/K	1K NONE 10K	- DTA 113T DTA 113Z	DTB 113E - DTB 113Z	- - DTC 113Z	DTD 113E - DTD 113Z
10K 0 10K 10K 10K	10K 10K NONE 4.7K 47K	DTA 114E DTA 114G DTA 114T DTA 114W DTA 114Y/DTA 214Y	DTB 114E - DTB 114T - -	DTC 114E DTC 114G DTC 114T/DTC 314T * DTC 114W DTC 114Y	DTD 114E DTD 114G DTD 114T - -
100K 0 100K 100K	100K 100K NONE 10K	DTA 115E DTA 115G DTA 115T DTA 115U	- - - -	DTC 115E DTC 115G DTC 115T DTC 115U	- - - -
.22K	4.7K	-	DTB 122J	-	DTD 122J
2.2K 2.2K 2.2K 2.2K	2.2K NONE 47K 10K	DTA 123E - DTA 123J DTA 123Y	DTB 123E DTB 123T - DTB 123Y	DTC 123E DTC 323T * DTC 123J DTC 123Y	DTD 123E DTD 123T - DTD 123Y
2.7K	1K	DTA 1D3R	-	DTC 1D3R	-
22K 0 22K 22K	22K 22K NONE 47K	DTA 124E DTA 124G DTA 124T DTA 124X	- - - -	DTC 124E DTC 124G DTC 124T DTC 124X	- - - -
220K	NONE	DTA 125T	-	DTC 125T	-
3.3K	10K	-	DTB 133H	-	DTD 133H
4.7K 4.7K 4.7K 4.7K 4.7K	4.7K NONE 10K 22K 47K	DTA 143E DTA 143T DTA 143X DTA 143Y DTA 143Z	DTB 143E DTB 143T - - -	DTC 143E DTC 143T/DTC 343T * DTC 143X DTC 143Y DTC 143Z	DTD 143E DTD 143T - - -
47K 0 47K 47K 47K	47K 47K NONE 10K 22K	DTA 144E DTA 144G DTA 144T DTA 144V DTA 144W	- - - - -	DTC 144E DTC 144G DTC 144T DTC 144V DTC 144W	- - - - -
6.8K 6.8K	6.8K NONE	- -	- DTB 163T	DTC 363E * DTC 363T *	- DTD 163T

* $I_c = 600 \text{ mA}$

NOTE: See "How to Order" for complete part number

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DIGITAL TRANSISTOR: NPN

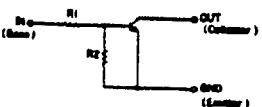
ELECTRICAL CHARACTERISTICS: 100 mA Series

PART NUMBER	TYP	RESISTOR VALUE		R2/R1			Ic Max (mA)	INPUT VOLT		hFE		Icbo		Icso		PART MARK	DIE TYPE	EQUIVALENT CIRCUIT	
		R1 (K)	R2 (K)	Min	Typ	Max		Min (V)	Max (V)	Min (V)	Vce (V)	Ic (mA)	Max (uA)	Vcb (V)	Max (uA)				Vce (V)
DTC113Z	NPN	1.0	10.0	8	10	12	100	-10	5	33	5	5	0.5	50	0.5	50	E12/121	C776	
DTC114E	NPN	10.0	10.0	0.8	1	1.2	100	-40	10	30	5	5	0.5	50	0.5	50	24	C766	
DTC114W	NPN	10.0	4.7	0.37	0.47	0.57	100	-30	10	24	5	10	0.5	50	0.5	50	84	C778	
DTC114Y	NPN	10.0	47.0	3.7	4.7	5.7	100	-40	8	68	5	5	0.5	50	0.5	50	64	C762	
DTC115E *	NPN	100.0	100.0	0.8	1	1.2	100	-40	10	82	5	5	0.5	50	0.5	50	29	D861	
DTC115U	NPN	100.0	10.0	0.08	0.1	0.12	100	-40	10	27	5	5	0.5	50	0.5	50	E89/189	D865	
DTC123E	NPN	2.2	2.2	0.8	1	1.2	100	-12	10	20	5	20	0.5	50	0.5	50	22	C733	
DTC123J	NPN	2.2	47.0	17	21	26	100	-12	5	80	5	10	0.5	50	0.5	50	E42/142	C774	
DTC123Y	NPN	2.2	10.0	3.6	4.5	5.5	100	-12	5	33	5	10	0.5	50	0.5	50	62	C777	
DTC124E	NPN	22.0	22.0	0.8	1	1.2	100	-40	10	56	5	5	0.5	50	0.5	50	25	C761	
DTC124X	NPN	22.0	47.0	1.7	2.1	2.6	100	-40	10	68	5	5	0.5	50	0.5	50	45	C770	
DTC143E	NPN	4.7	4.7	0.8	1	1.2	100	-30	10	20	5	10	0.5	50	0.5	50	23	C768	
DTC143X	NPN	4.7	10.0	1.7	2.1	2.6	100	-20	7	30	5	10	0.5	50	0.5	50	43	C769	
DTC143Y	NPN	4.7	22.0	3.7	4.7	5.7	100	-30	6	56	5	5	0.5	50	0.5	50	63	C785	
DTC143Z	NPN	4.7	47.0	8	10	12	100	-30	5	80	5	10	0.5	50	0.5	50	E23/123	C775	
DTC144E	NPN	47.0	47.0	0.8	1	1.2	100	-40	15	68	5	5	0.5	50	0.5	50	26	C782	
DTC144V	NPN	47.0	10.0	0.17	0.21	0.26	100			33	5	5	0.5	50	0.5	50	E66/166	C774	
DTC144W	NPN	47.0	22.0	0.37	0.47	0.57	100	-40	10	56	5	5	0.5	50	0.5	50	86	C767	
DTC214Y	NPN	10	47	3.7	4.7	5.7	100	-40	6	68	5	5	0.5	50	0.5	50	N24	C762	
DTC1D3R	NPN	2.7	1.0	0.33	0.37	0.41	100	-15	15	20	5	30	0.5	50	0.5	50	K4B	C784	

PART NUMBER	TYP	RESISTOR VALUE		Vcbo	Vceo	Vebo	Ic	Min	hFE			Icbo		Iebo		PART MARK	DIE TYPE	EQUIVALENT CIRCUIT
		R1 (K)	R2 (K)	Max (V)	Max (V)	Max (V)	Max (mA)		Typ	Max	Vce (V)	Ic (mA)	Max (uA)	Vcb (V)	Max (uA)			
DTC143T	NPN	4.7	NONE	50	50	5	100	100	250	600	5	1	0.5	50	0.5	4	3 C764	
DTC114T	NPN	10.0	NONE	50	50	5	100	100	250	600	5	1	0.5	50	0.5	4	4 C765	
DTC124T	NPN	22.0	NONE	50	50	5	100	100	250	600	5	1	0.5	50	0.5	4	5 C771	
DTC144T	NPN	47.0	NONE	50	50	5	100	100	250	600	5	1	0.5	50	0.5	4	6 C772	
DTC115T	NPN	100.0	NONE	50	50	5	100	100	250	600	5	1	0.5	50	0.5	4	9 D864	
DTC125T	NPN	200.0	NONE	50	50	5	100	100	250	600	5	1	0.5	50	0.5	4	0A D863	
DTC113T	NPN	1.0	NONE	50	50	5	100	100	250	600	5	1	0.5	50	0.5	4	1 C786	

PART NUMBER	TYP	RESISTOR VALUE		Vcbo	Vceo	Vebo	Ic	Min	hFE			Icbo		Icso		PART MARK	DIE TYPE	EQUIVALENT CIRCUIT
		R1 (K)	R2 (K)	Max (V)	Max (V)	Max (V)	Max (mA)		Typ	Max	Vce (V)	Ic (mA)	Max (uA)	Vcb (V)	Max (uA)			
DTC114G	NPN	0	10.0	50	50	5	100	30	-	-	5	5	0.5	50	580	4	K24 C780	
DTC124G	NPN	0	22.0	50	50	5	100	56	-	-	5	5	0.5	50	260	4	K25 C781	
DTC144G	NPN	0	47.0	50	50	5	100	68	-	-	5	5	0.5	50	130	4	K26 C782	
DTC115G	NPN	0	100.0	50	50	5	100	82	-	-	5	5	0.5	50	58	4	K29 D862	
DTD114G	NPN	0	10.0	50	50	5	500	56	-	-	5	100	0.5	50	0.5	4	L24 D726	

ELECTRICAL CHARACTERISTICS: 500 mA Series

PART NUMBER	TYP	RESISTOR VALUE			R2/R1			Ic Max (mA)	INPUT VOLT		hFE		Icbo		Icso		PART MARK	DIE TYPE	EQUIVALENT CIRCUIT
		R1 (K)	R2 (K)	Min	Typ	Max	Min (V)		Max (V)	Min	Vce (V)	Ic (mA)	Max (uA)	Vcb (V)	Max (uA)	Vce (V)			
DTD113E	NPN	1.0	1.0	0.8	1	1.2	500	-10	10	33	5	50	0.5	50	0.5	50	F21	D717	
DTD113Z	NPN	1.0	10.0	8	10	12	500	-10	5	56	5	50	0.5	50	0.5	50	G21	D718	
DTD114E	NPN	10.0	10.0	0.8	1	1.2	500	-40	10	56	5	50	0.5	50	0.5	50	F24	D714	
DTD123E	NPN	2.2	2.2	0.8	1	1.2	500	-12	10	39	5	50	0.5	50	0.5	50	F22	D712	
DTD143E	NPN	4.7	4.7	0.8	1	1.2	500	-30	10	47	5	50	0.5	50	0.5	50	F23	D713	
DTD123Y	NPN	2.2	10.0	3.6	4.5	5.5	500	-12	5	56	5	50	0.5	50	0.5	50	F62	D715	
DTD122J	NPN	0.22	4.7	17.1	21.3	25.6	500	-5	5	47	5	50	0.5	50	0.5	50	G4C	D725	
DTD133H	NPN	3.3	10.0	2.4	3	3.7	500	-20	6	56	5	50	0.5	50	0.5	50	G06	D719	

PART NUMBER	TYP	RESISTOR VALUE		Vcbo	Vceo	Vebo	Ic	Min	hFE			Icbo	Icso	Icso	Icso	PART MARK	DIE TYPE	EQUIVALENT CIRCUIT	
		R1 (K)	R2 (K)	Max (V)	Max (V)	Max (V)	Max (mA)		Typ	Max	Vce (V)	Ic (mA)	Max (uA)	Vcb (V)	Max (uA)				Veb (V)
DTD123T	NPN	2.2	NONE	50	50	5	500	100	250	600	5	50	0.5	50	0.5	4	E02		D723
DTD143T	NPN	4.7	NONE	50	50	5	500	100	250	600	5	50	0.5	50	0.5	4	F13		D720
DTD163T	NPN	6.8	NONE	50	50	5	500	100	250	600	5	50	0.5	50	0.5	4	E07	D721	
DTD114T	NPN	10.0	NONE	50	50	5	500	100	250	600	5	50	0.5	50	0.5	4	E04	D722	

Base R1 Collector

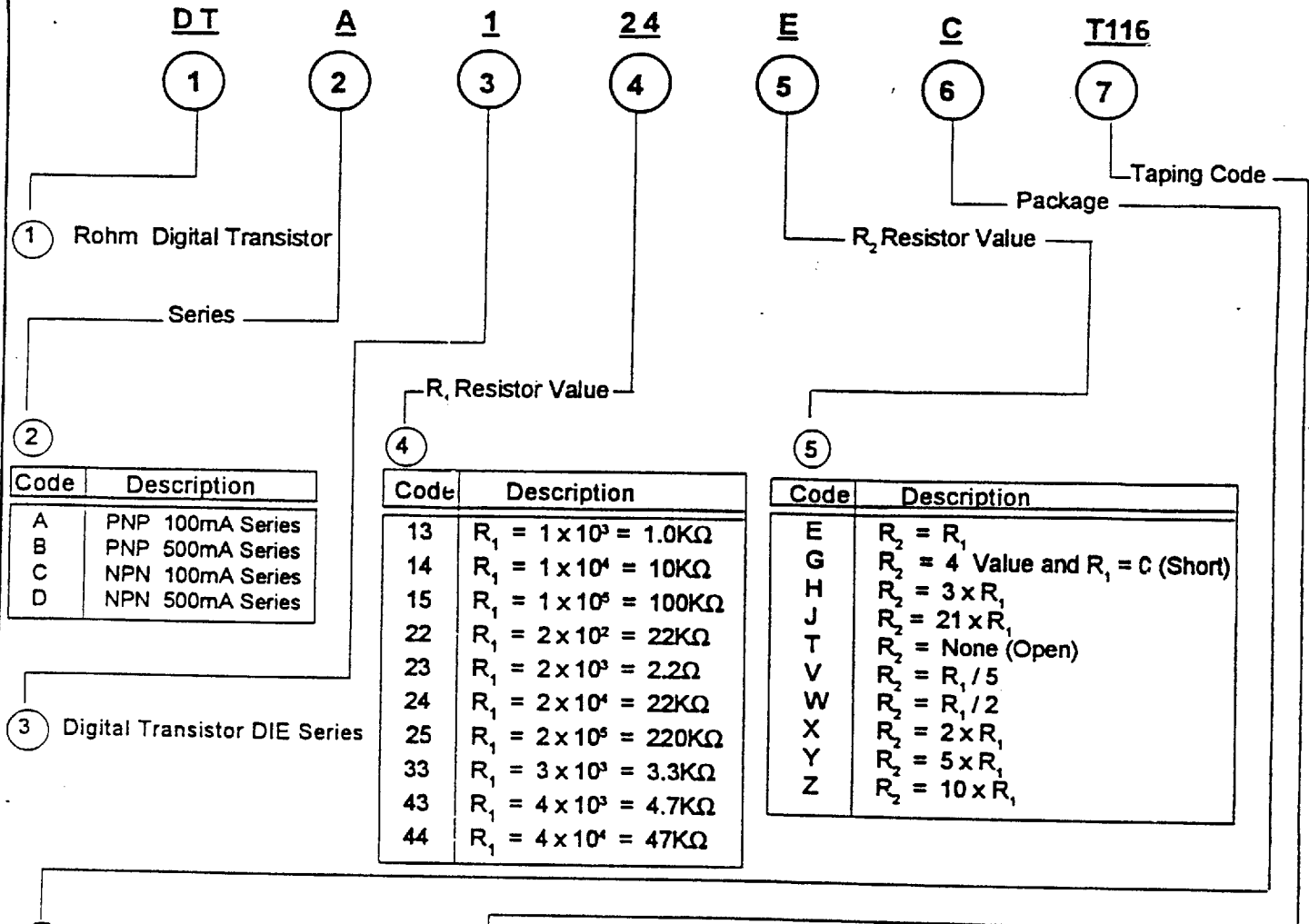
Emitter

TRANSISTORS

ROHM

• Digital Transistors

HOW TO ORDER:



	PKG	DESCRIPTION	TAPING CODE	DESCRIPTION	PKG. QTY.	PACKAGE SIZE
SURFACE MOUNT	K	SMT (SC-59/JAPANESE SOT-23)	* T146 * T147 * T246	1 PIN SIDE ON FEED HOLE SIDE 2 PIN SIDE ON FEED HOLE SIDE 1 PIN SIDE ON FEED HOLE SIDE	3,000 3,000 10,000	178mm/7" Reel 178mm/7" Reel 330mm/13" Reel
	C	SST (EUROPEAN SOT-23)	* T116 * T117 * T216	1 PIN SIDE ON FEED HOLE SIDE 2 PIN SIDE ON FEED HOLE SIDE 1 PIN SIDE ON FEED HOLE SIDE	3,000 3,000 10,000	178mm/7" Reel 178mm/7" Reel 330 mm/13" Reel
	U	UMT (DTA & DTC ONLY)	* T106 * T107	1 PIN SIDE ON FEED HOLE SIDE 2 PIN SIDE ON FEED HOLE SIDE	3,000 3,000	178 mm/7" Reel 178 mm/7" Reel
	E	EM3 (DTA & DTC ONLY)	* TL * TR	1 PIN SIDE ON FEED HOLE SIDE 2 PIN SIDE ON FEED HOLE SIDE	3,000 3,000	178 mm/7" Reel 178 mm/7" Reel
LEADED DEVICES	S	SPT (Short TO-92)	* TP * NONE	AMMO BOX RADIAL BULK	5,000 2,000	W-335/H-135/D-40(mm) Polyethylene Bag
	V	ATV	* TV2 * TV3	AMMO BOX RADIAL AMMO BOX RADIAL	2,500 2,500	W-334/H-280/D-41(mm) W-334/H-280/D-41(mm)
	L	FTL	* TL2 * TL3	AMMO BOX RADIAL AMMO BOX RADIAL	2,500 2,500	W-334/H-280/D-41(mm) W-334/H-280/D-41(mm)
	F	FTR	* NONE * C1	BULK TUBE	2,000 8,000	Polyethylene Bag L-565/W-4.2/H-11.5(mm)
	A	ATR	* NONE * C2	BULK TUBE	2,000 8,000	Polyethylene Bag L-565/W-4.2/H-12.6(mm)
		<i>Discontinued</i>				

Note: SOT-23, SC-59 and SPT packages are standard products.

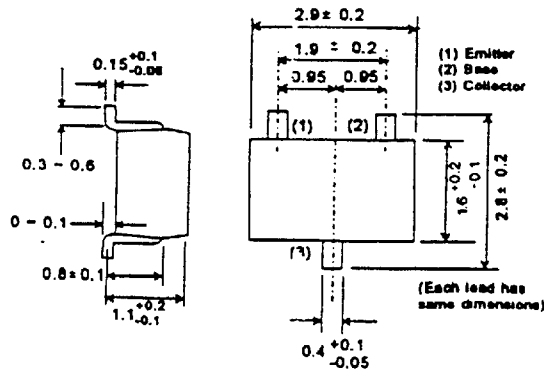
• Standard Taping Codes

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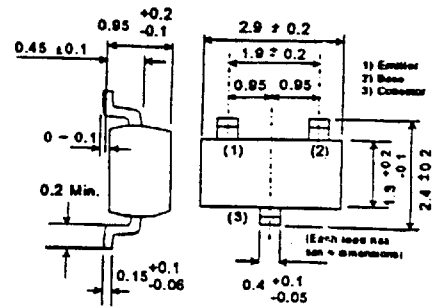
TRANSISTORS

ROHM

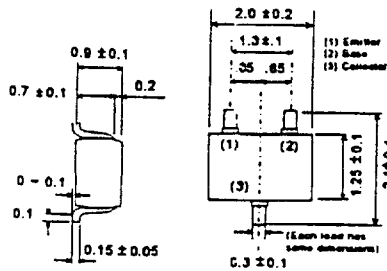
• Surface Mount Packages: Unit (mm)



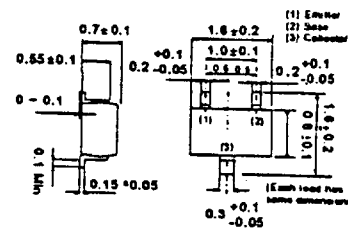
SMT (SC-59/Japanese SOT-23)



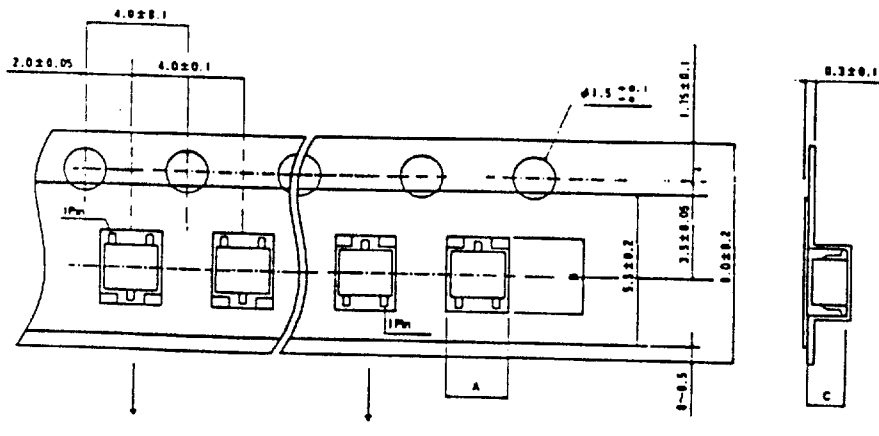
SST (European SOT-23)



UMT



EM3

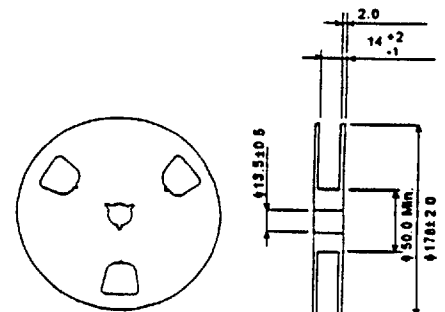


Package	Code
SMT	T147
SST	T117
UMT	T107
EM3	TR

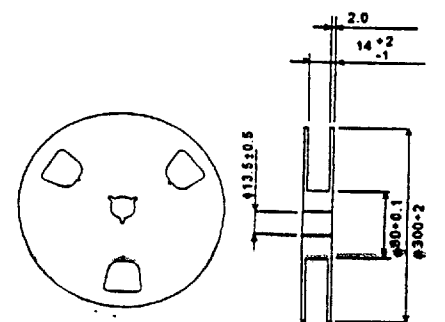
Package	Code
SMT	T146/T246
SST	T116/T216
UMT	T106/T206
EM3	TL

Package	Size		
	A	B	C
SMT	3.1 ± 0.2	3.2 ± 0.2	1.35 ± 0.1
SST	3.1 ± 0.2	2.8 ± 0.2	1.25 ± 0.2
UMT	2.2 ± 0.1	2.4 ± 0.1	1.15 ± 0.1
EM3	1.8 ± 0.1	1.8 ± 0.2	0.9 ± 0.2

Tape and Reel Dimensions



178 mm/7" Reel



330 mm/13" Reel

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