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(-)50V, (-)10A, Low VCE(sat), (PNP)NPN Single TP/TP-FA

- Relay drivers, lamp drivers, motor drivers

- Adoption of MBIT processes
- Low collector-to-emitter saturation voltage
- Large current capacity
- High-speed switching

Absolute Maximum Ratings at Ta=25°C

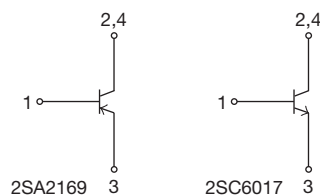
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2SA2169-TL-E
2SC6017-TL-E

1 : Base
2 : Collector
3 : Emitter
4 : Collector

TP-FA

- Package : TP-FA
- JEITA, JEDEC : SC-63, TO-252
- Minimum Packing Quantity : 700 pcs./reel



2SA2169 / 2SC6017

Continued from preceding page.

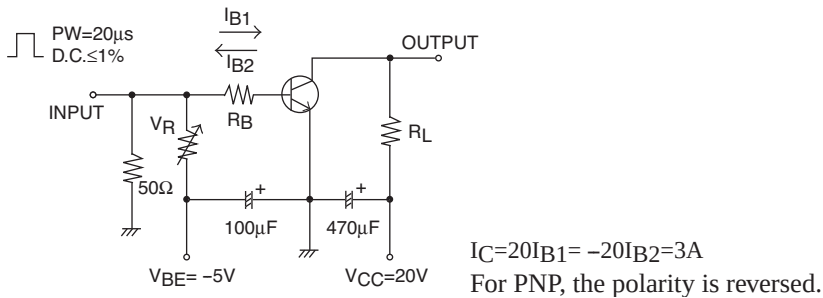
Parameter	Symbol	Conditions	Ratings	Unit
Base Current	I_B		(-)2	A
Collector Dissipation	P_C		0.95	W
		$T_C=25^{\circ}\text{C}$	20	W
Junction Temperature	T_J		150	$^{\circ}\text{C}$
Storage Temperature	T_{stg}		-55 to +150	$^{\circ}\text{C}$

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Electrical Characteristics at $T_a=25^{\circ}\text{C}$

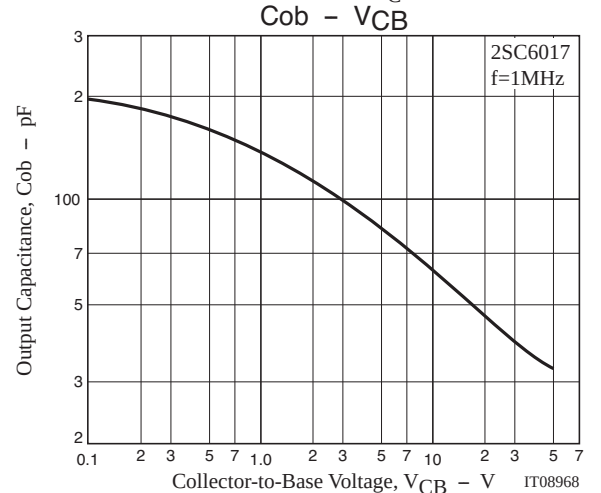
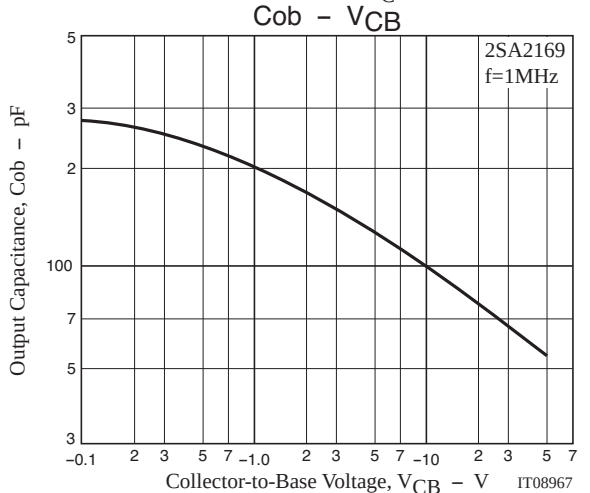
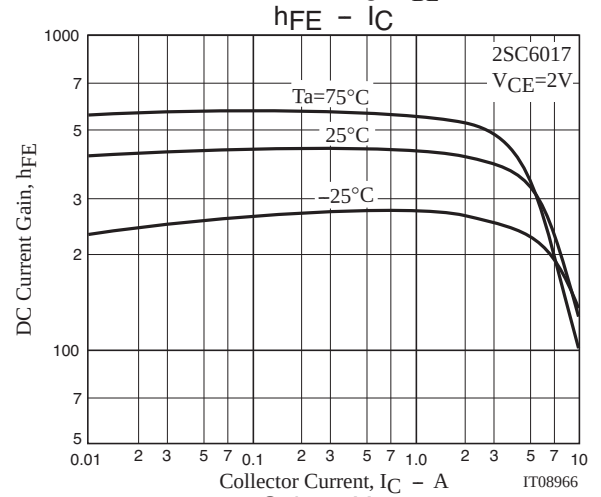
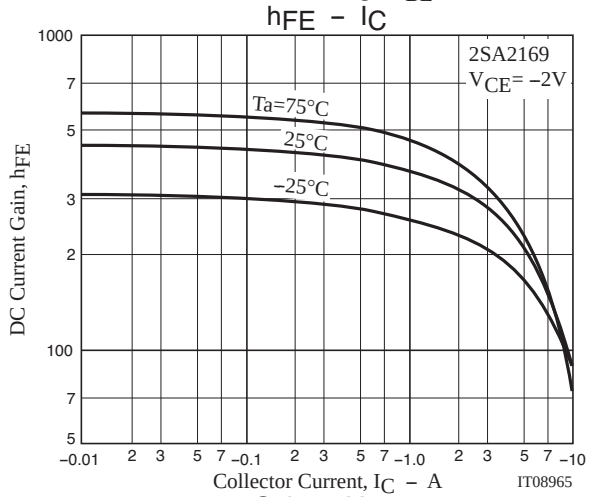
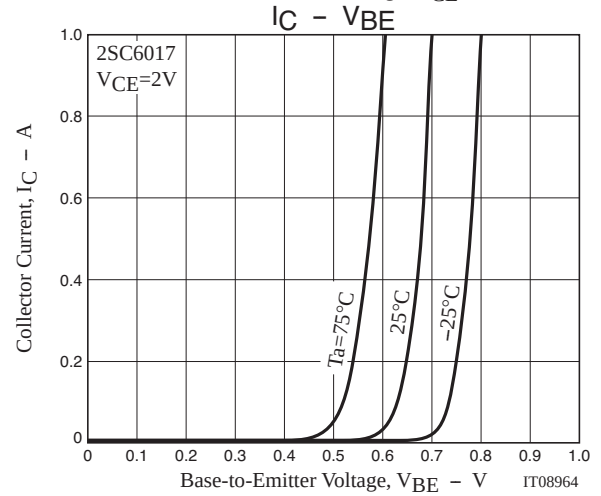
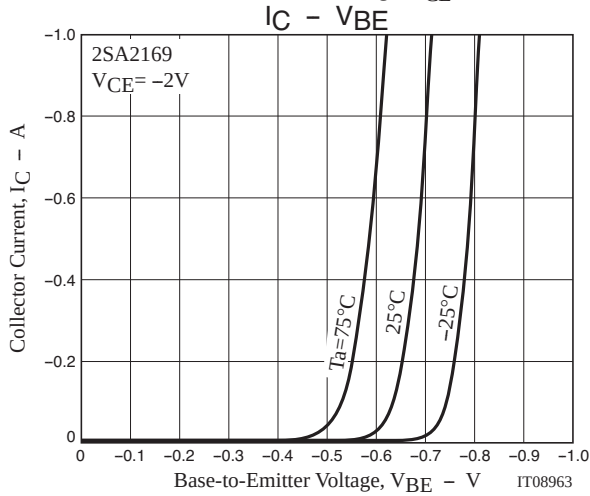
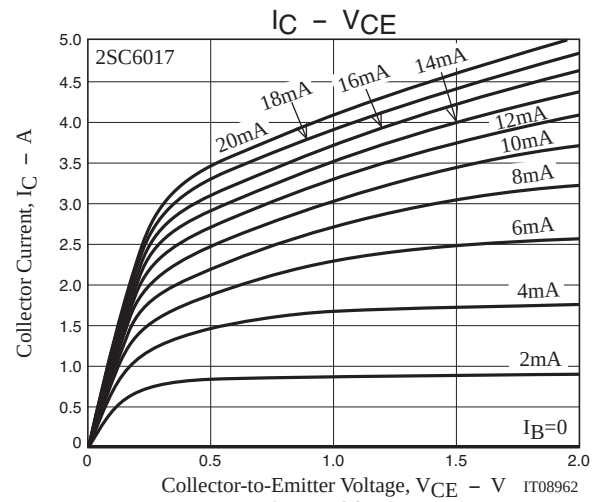
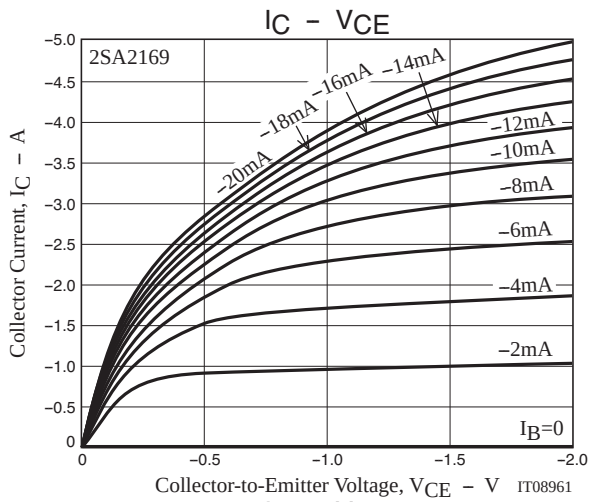
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	$V_{CB}=(-)40\text{V}$, $I_E=0\text{A}$			(-)10	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=(-)4\text{V}$, $I_C=0\text{A}$			(-)10	μA
DC Current Gain	h_{FE}	$V_{CE}=(-)2\text{V}$, $I_C=(-)1\text{A}$	200		(560)700	
Gain-Bandwidth Product	f_T	$V_{CE}=(-)5\text{V}$, $I_C=(-)1\text{A}$		(130)200		MHz
Output Capacitance	C_{ob}	$V_{CB}=(-)10\text{V}$, $f=1\text{MHz}$		(90)60		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)5\text{A}$, $I_B=(-)250\text{mA}$		(-290)180	(-580)360	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)5\text{A}$, $I_B=(-)250\text{mA}$		(-)0.93	(-)1.4	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)100\mu\text{A}$, $I_E=0\text{A}$	(-50)100			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=(-)1\text{mA}$, $R_{BE}=\infty$	(-)50			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=(-)100\mu\text{A}$, $I_C=0\text{A}$	(-)6			V
Turn-On Time	t_{on}	See specified Test Circuit.		(70)40		ns
Storage Time	t_{stg}			(650)1000		ns
Fall Time	t_f			(60)80		ns

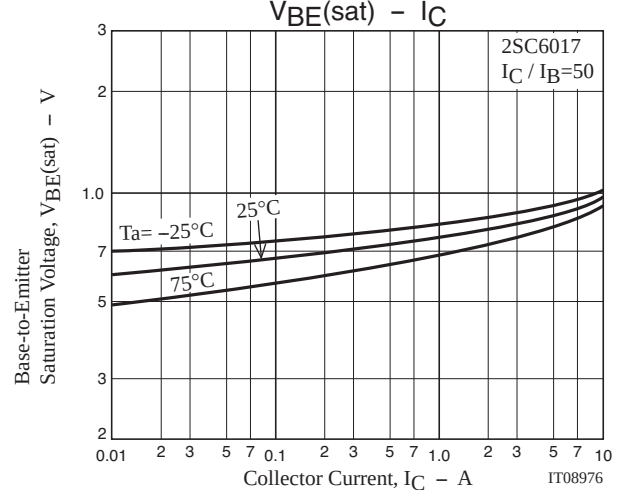
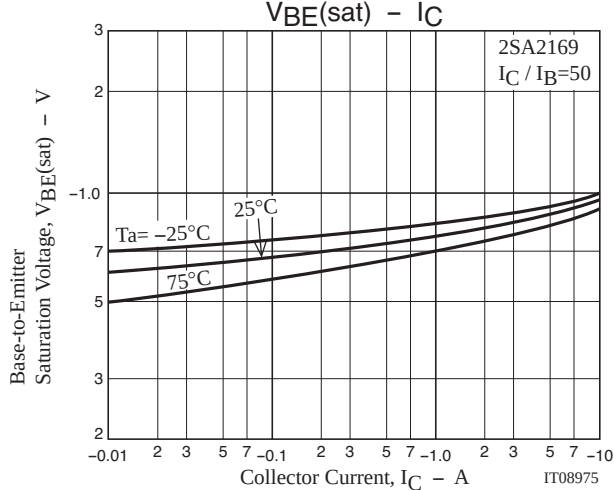
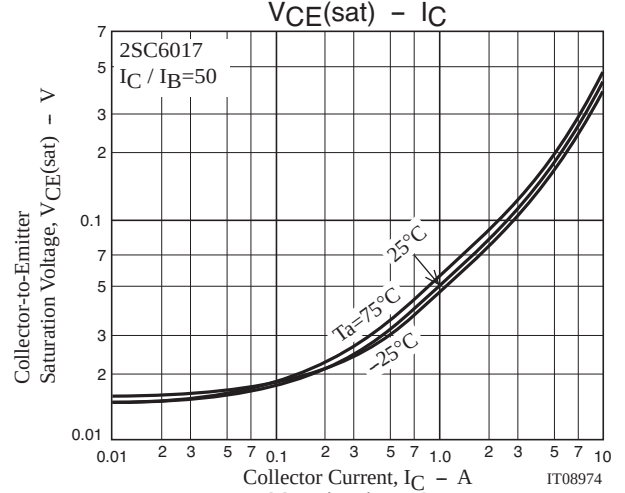
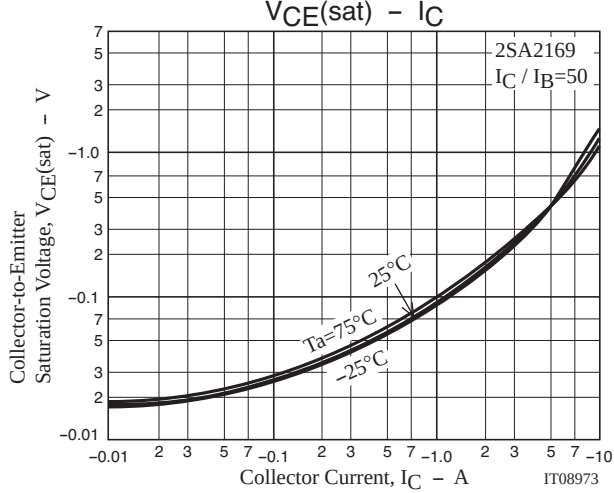
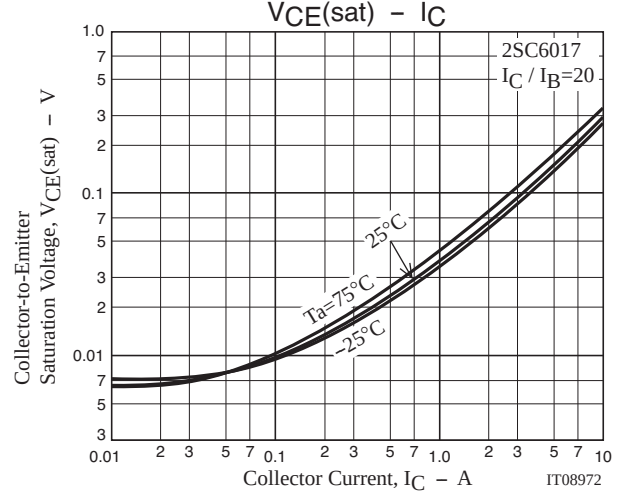
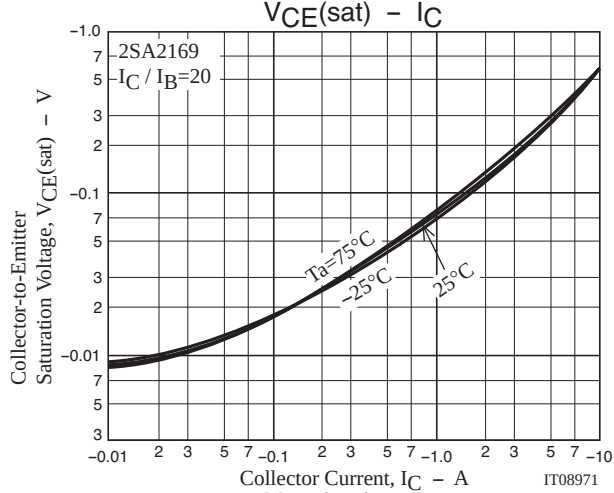
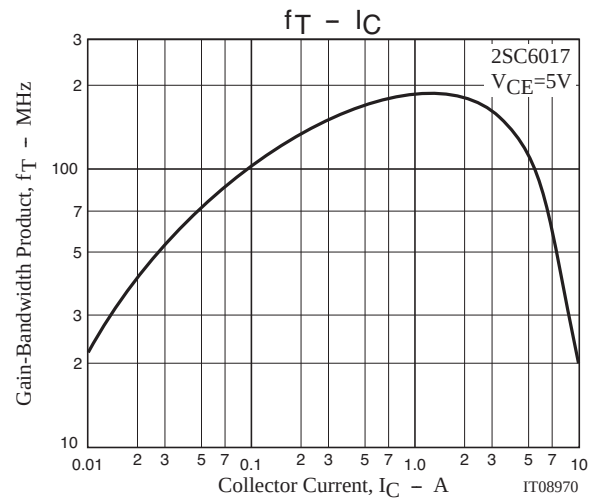
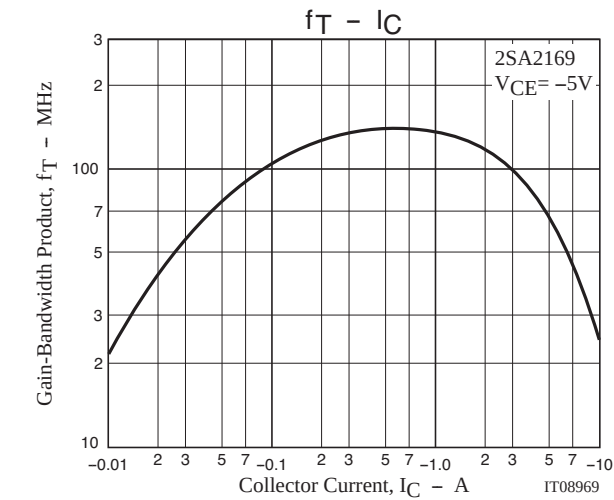
Switching Time Test Circuit

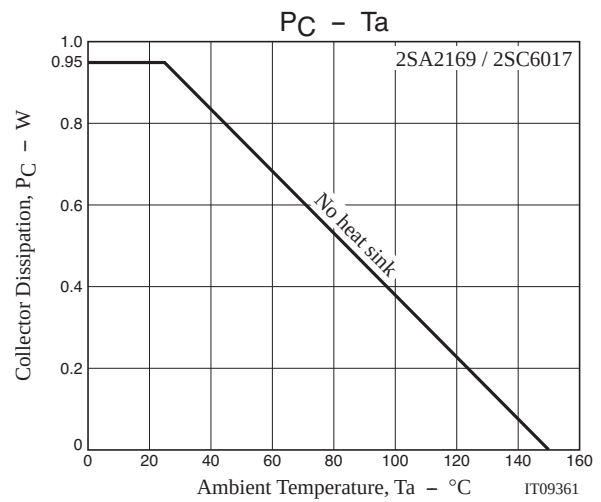
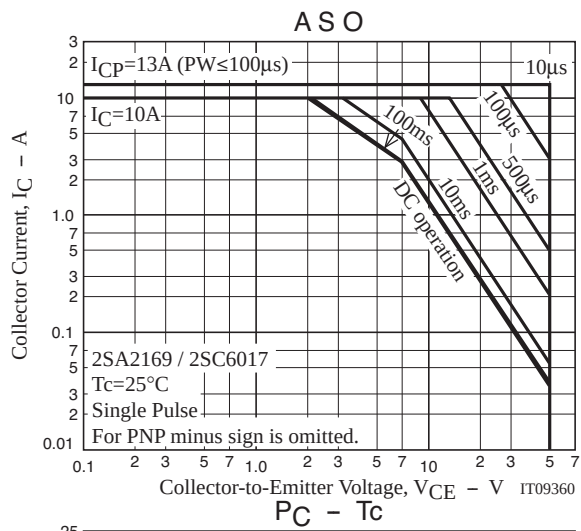


Ordering Information

Device	Package	Shipping	memo
2SA2169-E	TP	500pcs./bag	Pb Free
2SC6017-E	TP	500pcs./bag	
2SA2169-TL-E	TP-FA	700pcs./reel	
2SC6017-TL-E	TP-FA	700pcs./reel	







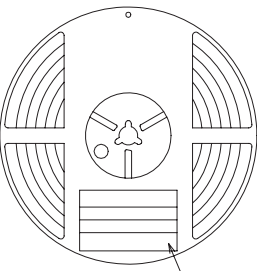
Taping Specification

2SA2169-TL-E, 2SC6017-TL-E

Packing Format

Package Name	Carrier Tape Type	Maximum Number of devices contained (pcs)			Packing format	
		Reel	Inner box	Outer box	Inner BOX (C-1)	Outer BOX (A-7)
TP-FA	TP	700	2,100	12,600	3 reels contained Dimensions:mm (external) 183×72×185	6 inner boxes contained Dimensions:mm (external) 440×195×210

Packing method



Type No.
LOT No.
Quantity
Origin

Reel label

Reel label, Inner box label
(unit:mm)

(P) TYPE	000000000
(1) LOT	00
(Q) QTY	0,000 (1) LEAD FREE *
(Z) SPECIAL	*20722005310C*
ASSEMBLY:****	(DIFFUSION:****)

Outer box label

It is a label at the time of factory shipments.
The form of a label may change in physical
distribution process.

TYPE CODE	
TYPE	○○○○○○○○
QTY	0,000 PCS (1) LEAD FREE *
LOT	○○○○○○○○
PACKAGE	○○○○○○○○
SPECIAL	
ASSEMBLY:****	(DIFFUSION:****)

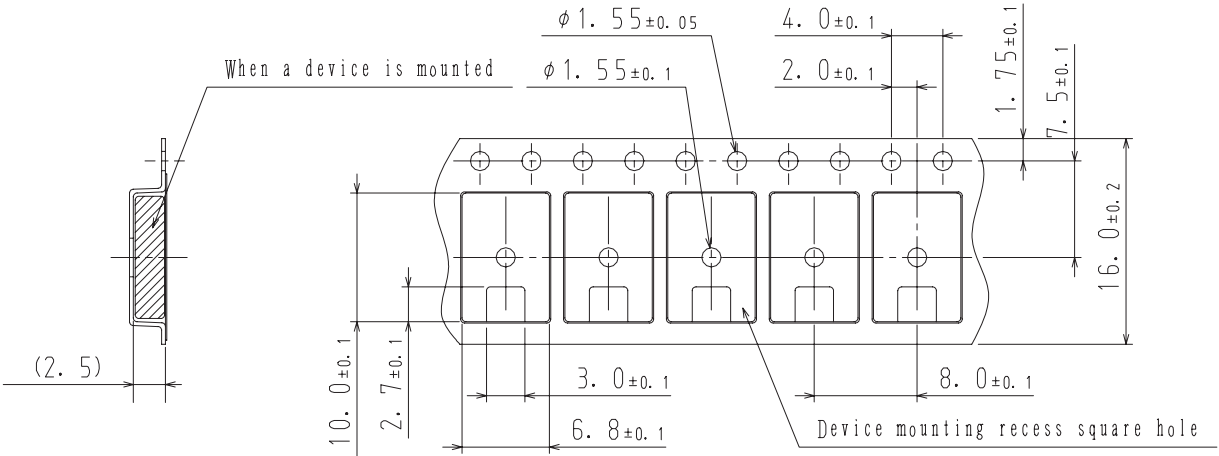
NOTE (1)

The LEAD FREE * description shows that the surface
treatment of the terminal is lead free.

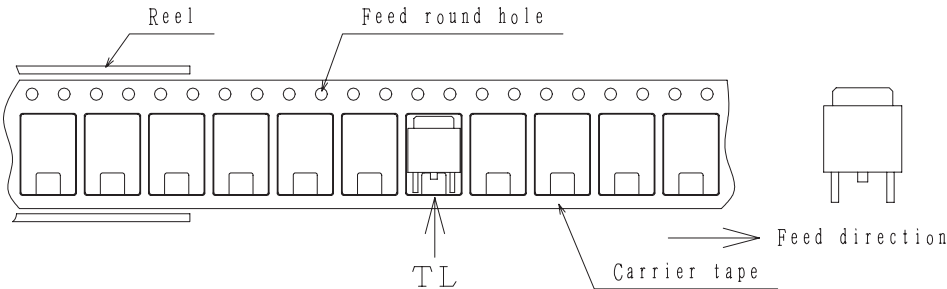
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

Taping configuration

1. Carrier tape size (unit:mm)

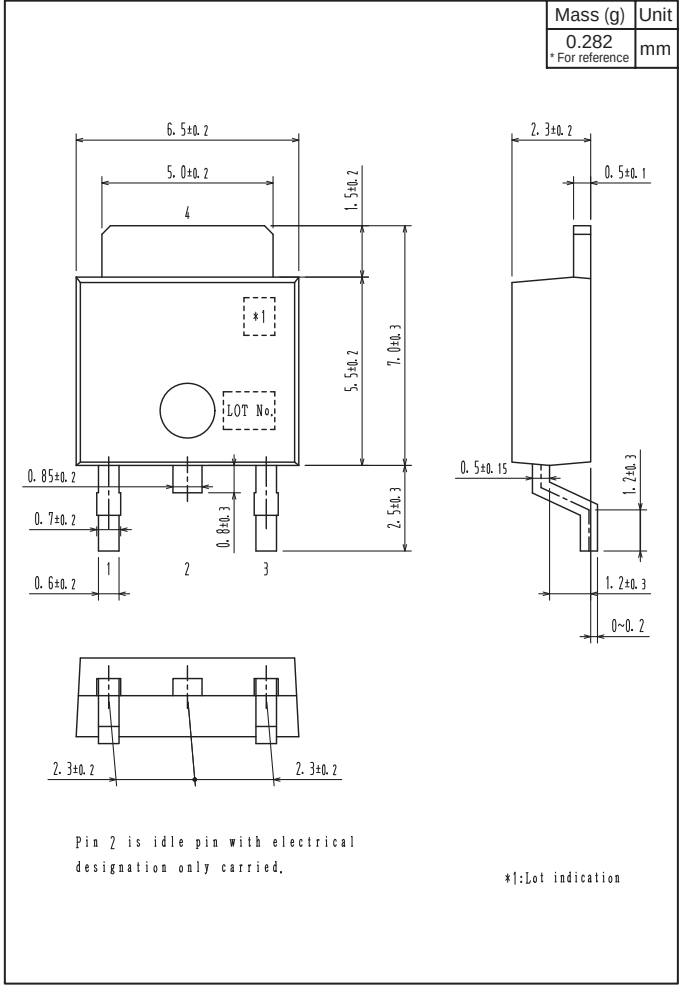


2. Device placement direction

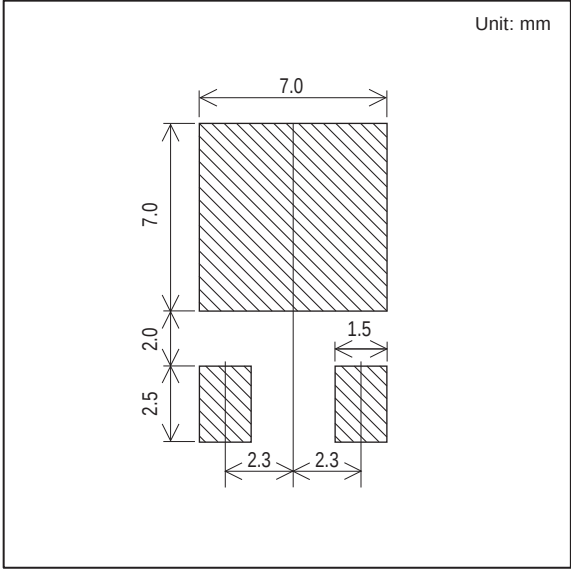


Outline Drawing

2SA2169-TL-E, 2SC6017-TL-E



Land Pattern Example



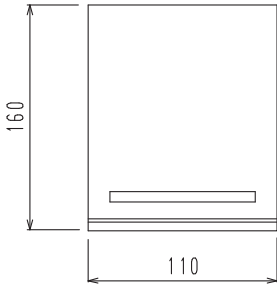
Bag Packing Specification

2SA2169-E, 2SC6017-E

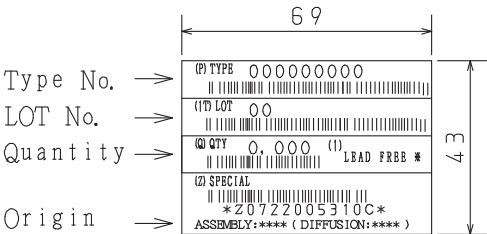
1. Packing Format

Package Name	Maximum Number of devices contained (pcs)			
	Bag	Inner box	Outer box	
TP	500	B-1	A-1	A-2
		10, 000	50, 000	30, 000
		Packing format (Dimensions:mm (external))		
		Inner box	Outer box	
		B-1	A-1	A-2
		445×225×55	470×250×300	470×250×190

2. Bag dimensions
(unit:mm)



3. Bag label, Inner box label
(unit:mm)

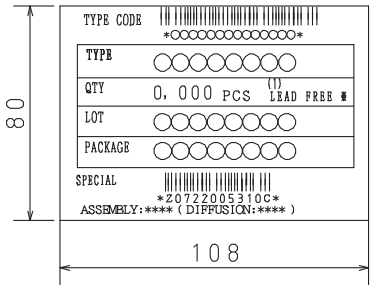


4. Outer box label
(unit:mm)

It is a label at the time of factory shipments.
The form of a label may change in physical
distribution process,

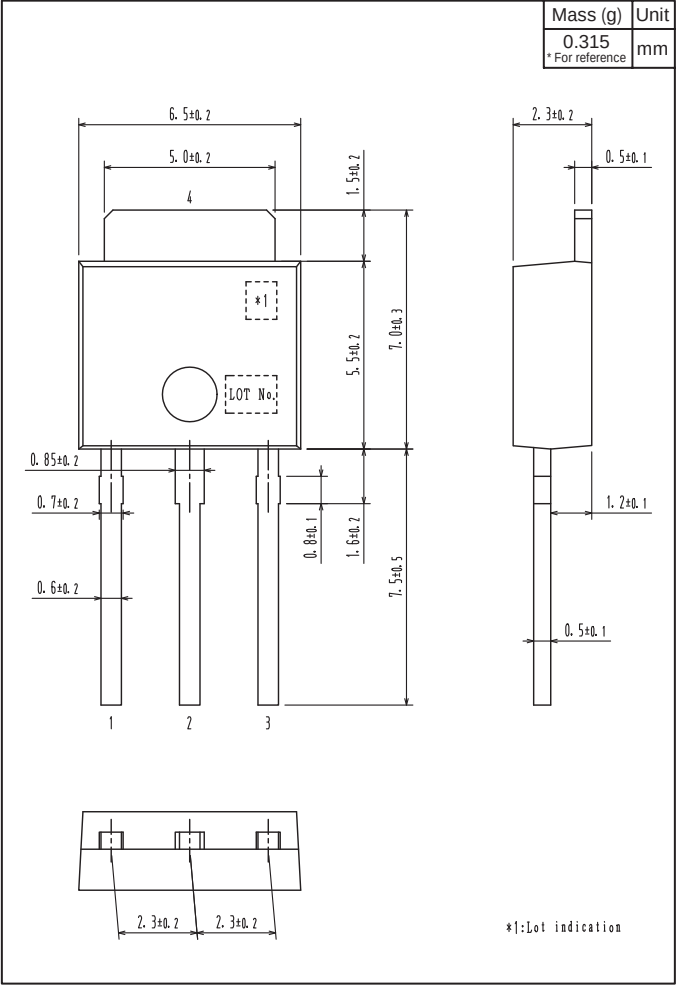
NOTE (1)
The LEAD FREE * description shows that the
surface treatment of the terminal is lead free.

Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3



Outline Drawing

2SA2169-E, 2SC6017-E



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