



# 2SA1419/2SC3649

## Bipolar Transistor

(-)-160V, (-)-1.5A, Low  $V_{CE(sat)}$ , (PNP)NPN Single PCP

ON Semiconductor®

<http://onsemi.com>

### Features

- Adoption of FBET, MBIT processes
- High breakdown voltage and large current capacity
- Ultrasmall size making it easy to provide high-density, small-sized hybrid IC's

### Specifications ( ) : 2SA1419

Absolute Maximum Ratings at  $T_a=25^\circ\text{C}$

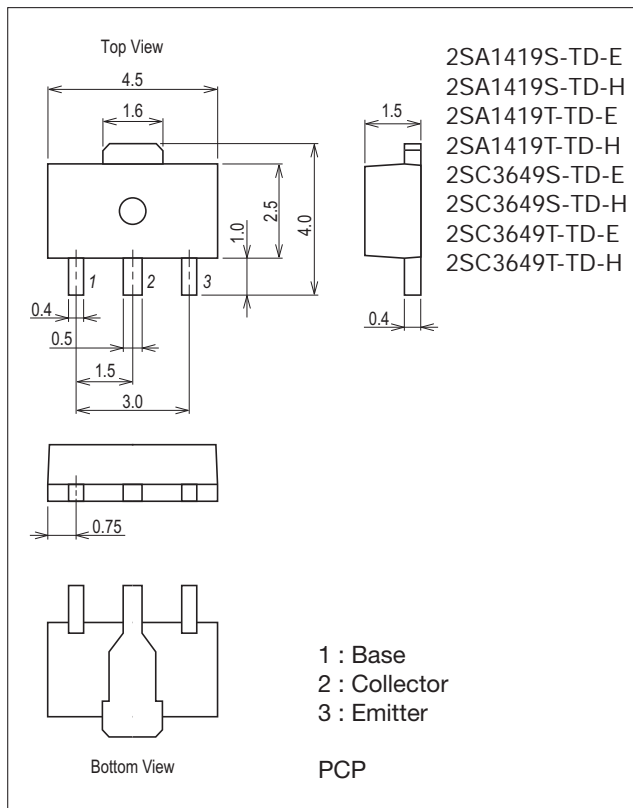
Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CBO}$		(-)-180	V
Collector-to-Emitter Voltage	$V_{CEO}$		(-)-160	V
Emitter-to-Base Voltage	$V_{EBO}$		(-)-6	V
Collector Current	$I_C$		(-)-1.5	A
Collector Current (Pulse)	$I_{CP}$		(-)-2.5	A
Collector Dissipation	$P_C$		500	mW
		When mounted on ceramic substrate (250mm <sup>2</sup> x0.8mm)	1.5	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.

### Package Dimensions

unit : mm (typ)

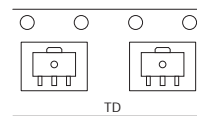
7007B-004



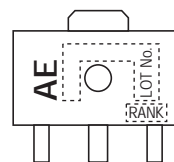
### Product & Package Information

- Package : PCP
- JEITA, JEDEC : SC-62, SOT-89, TO-243
- Minimum Packing Quantity : 1,000 pcs./reel

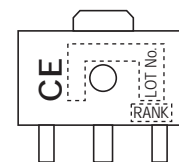
### Packing Type: TD



### Marking

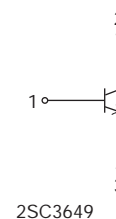
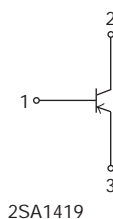


2SA1419



2SC3649

### Electrical Connection



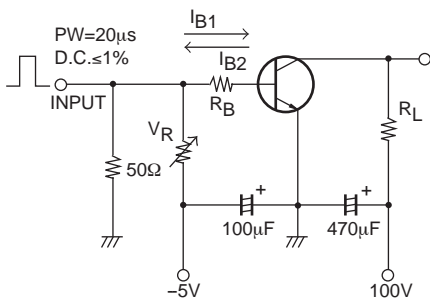
Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	ICBO	V <sub>CB</sub> =(-)120V, I <sub>E</sub> =0A			(-)1	μA
Emitter Cutoff Current	IEBO	V <sub>EB</sub> =(-)4V, I <sub>C</sub> =0A			(-)1	μA
DC Current Gain	h <sub>FE1</sub>	V <sub>CE</sub> =(-)5V, I <sub>C</sub> =(-)100mA	100*		400*	
	h <sub>FE2</sub>	V <sub>CE</sub> =(-)5V, I <sub>C</sub> =(-)10mA	80			
Gain-Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> =(-)10V, I <sub>C</sub> =(-)50mA		120		MHz
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =(-)10V, f=1MHz		(22)14		pF
Collector-to-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =(-)500mA, I <sub>B</sub> =(-)50mA		(-200)130	(-500)450	mV
Base-to-Emitter Saturation Voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =(-)500mA, I <sub>B</sub> =(-)50mA		(-)0.85	(-)1.2	V
Collector-to-Base Breakdown Voltage	V(BR)CBO	I <sub>C</sub> =(-)10μA, I <sub>E</sub> =0A	(-)180			V
Collector-to-Emitter Breakdown Voltage	V(BR)CEO	I <sub>C</sub> =(-)1mA, R <sub>BE</sub> =∞	(-)160			V
Emitter-to-Base Breakdown Voltage	V(BR)EBO	I <sub>E</sub> =(-)10μA, I <sub>C</sub> =0A	(-)6			V
Turn-ON Time	t <sub>on</sub>	See specified Test Circuit.		(40)40		ns
Storage Time	t <sub>stg</sub>			(0.7)1.2		μs
Fall Time	t <sub>f</sub>			(40)80		ns

\* : The 2SA1419 / 2SC3649 are classified by 100mA h<sub>FE</sub> as follows :

Rank	R	S	T
h <sub>FE</sub>	100 to 200	140 to 280	200 to 400

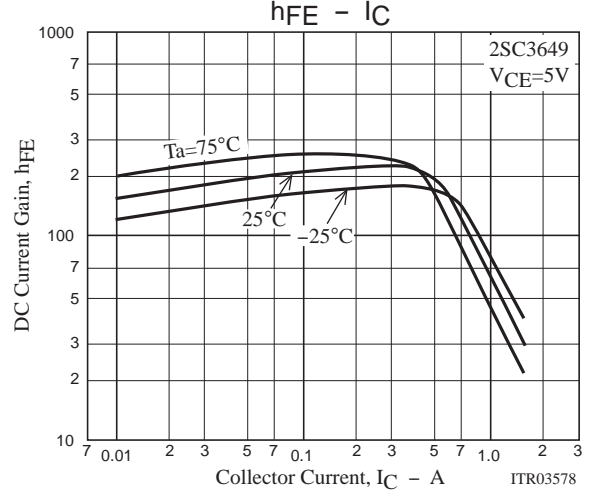
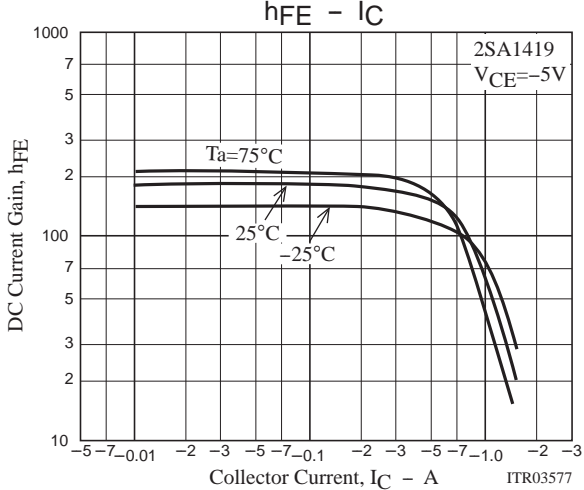
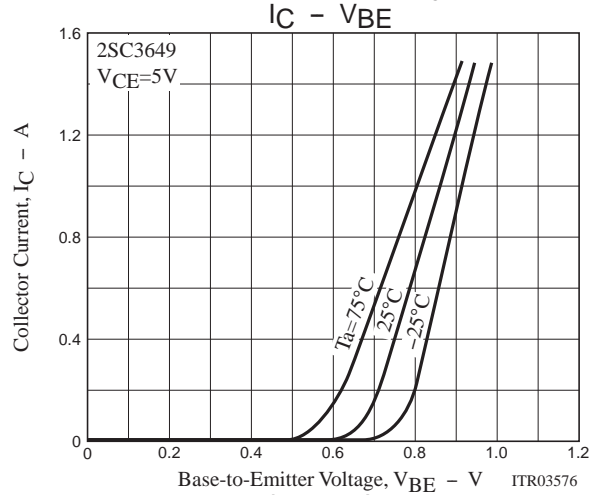
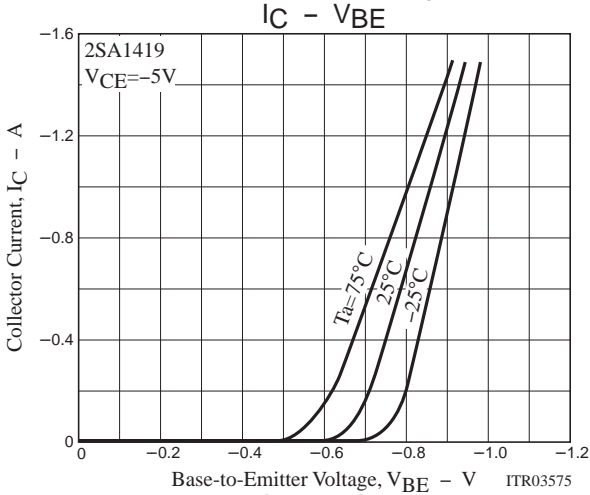
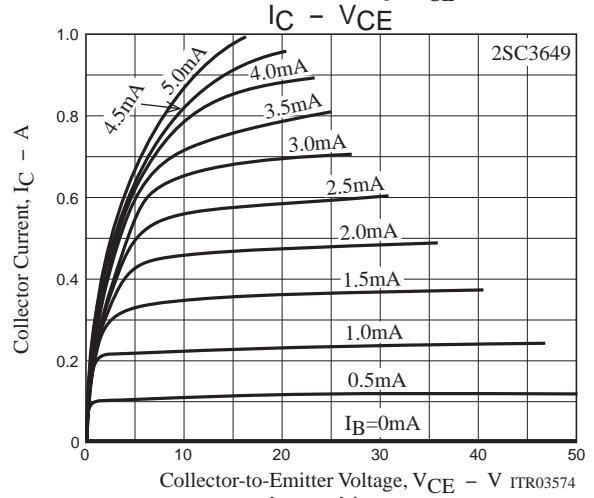
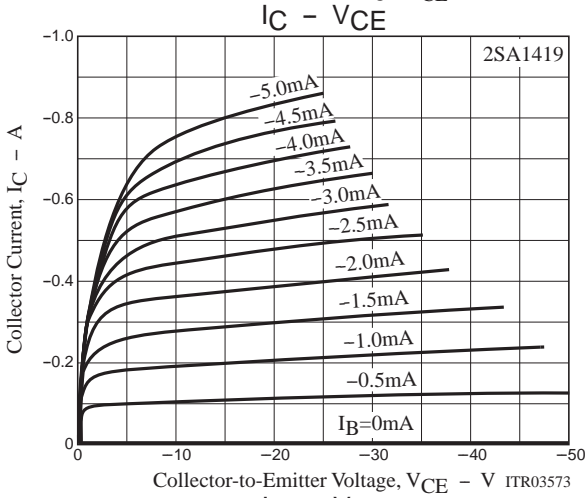
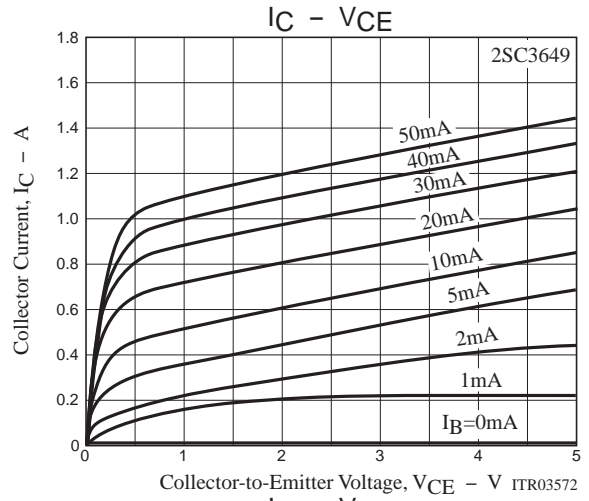
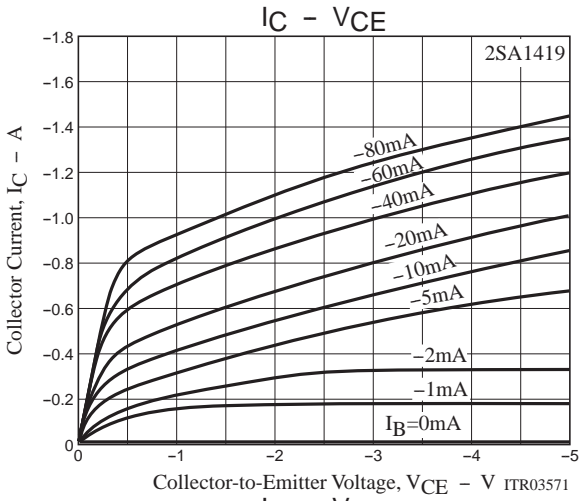
Switching Time Test Circuit

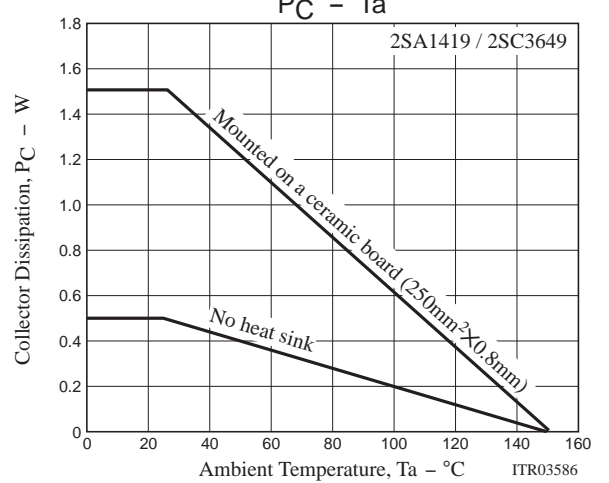
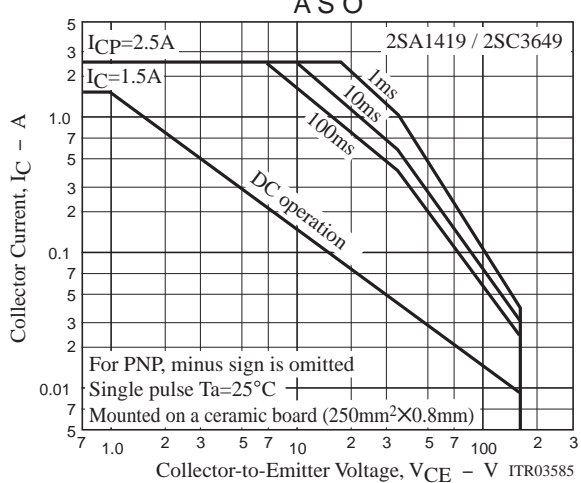
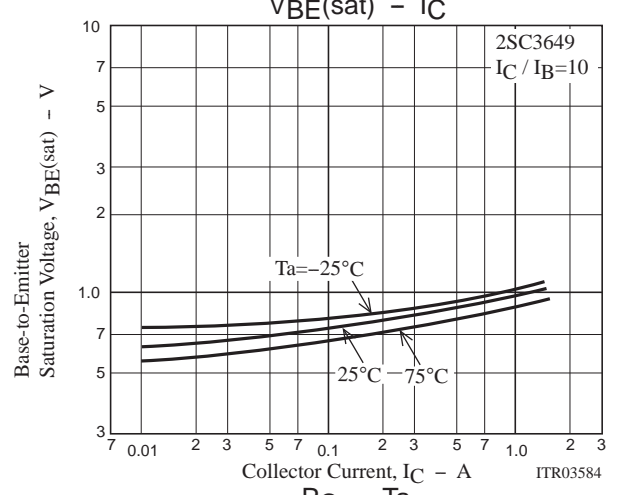
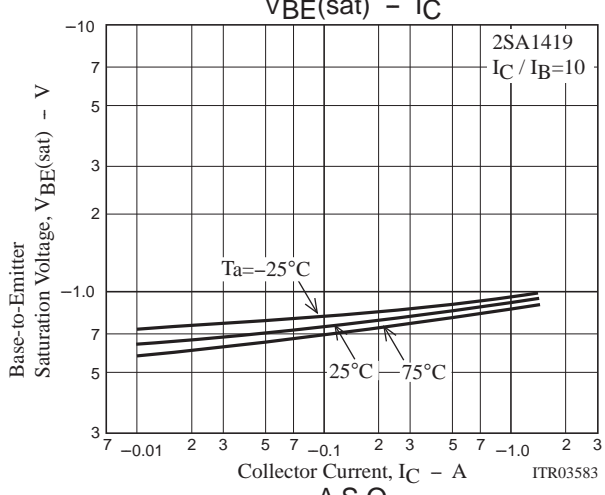
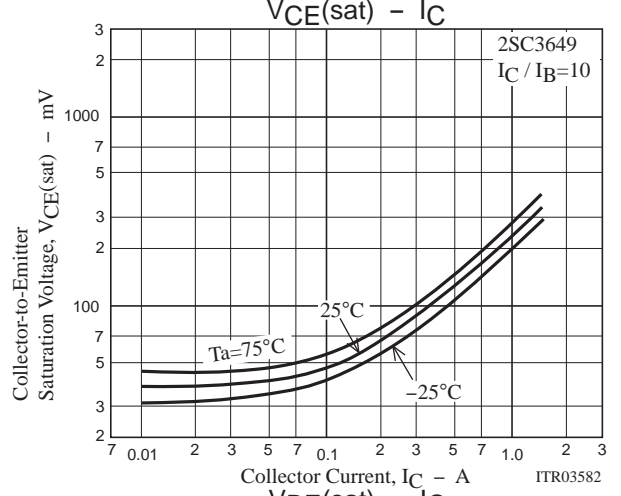
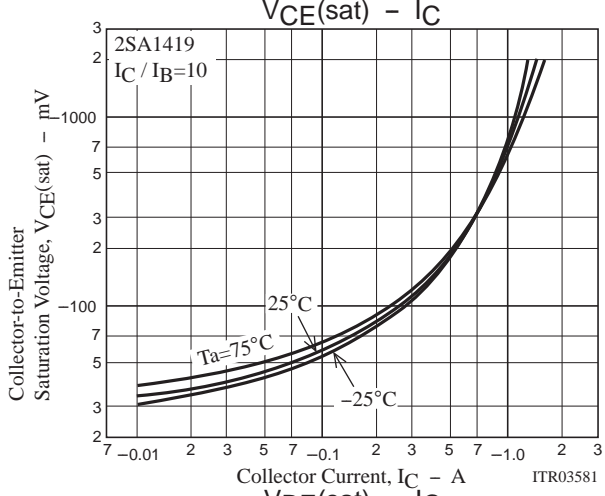
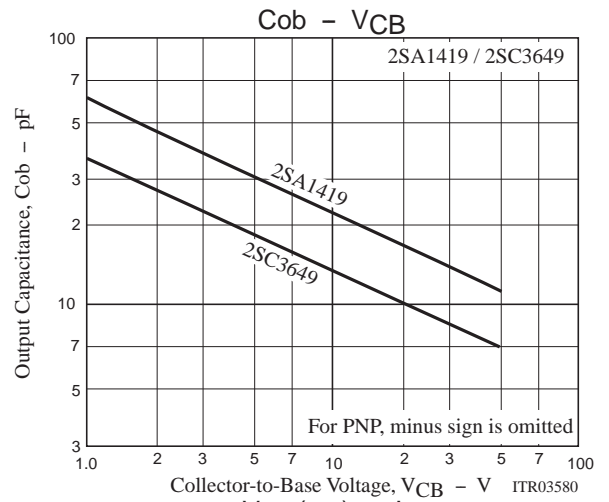
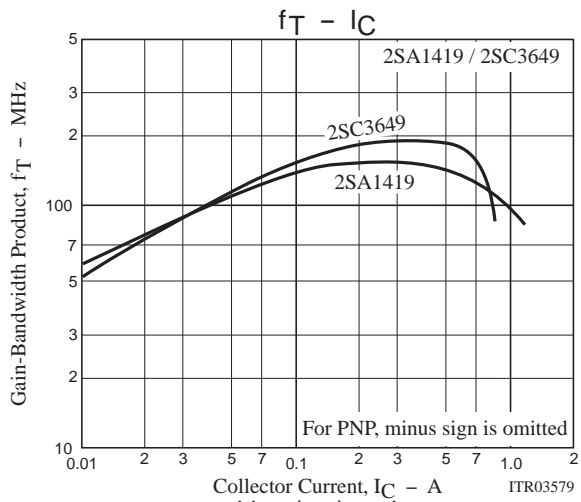


IC=10IB1=-10IB2=0.7A  
(For PNP, the polarity is reversed)

Ordering Information

Device	Package	Shipping	memo
2SA1419S-TD-E	PCP	1,000pcs./reel	Pb Free
2SA1419S-TD-H	PCP	1,000pcs./reel	Pb Free and Halogen Free
2SA1419T-TD-E	PCP	1,000pcs./reel	Pb Free
2SA1419T-TD-H	PCP	1,000pcs./reel	Pb Free and Halogen Free
2SC3649S-TD-E	PCP	1,000pcs./reel	Pb Free
2SC3649S-TD-H	PCP	1,000pcs./reel	Pb Free and Halogen Free
2SC3649T-TD-E	PCP	1,000pcs./reel	Pb Free
2SC3649T-TD-H	PCP	1,000pcs./reel	Pb Free and Halogen Free





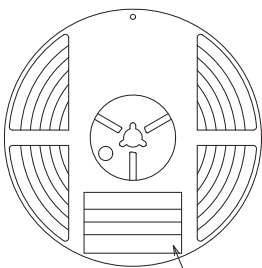
Bag Packing Specification

2SA1419S-TD-E, 2SA1419S-TD-H, 2SA1419T-TD-E, 2SA1419T-TD-H, 2SC3649S-TD-E, 2SC3649S-TD-H, 2SC3649T-TD-E, 2SC3649T-TD-H

1. 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)
PCP	PCP	1,000	4,000	24,000	4 reels contained Dimensions:mm (external) 183×72×185	6 inner boxes contained Dimensions:mm (external) 440×195×210

Packing method



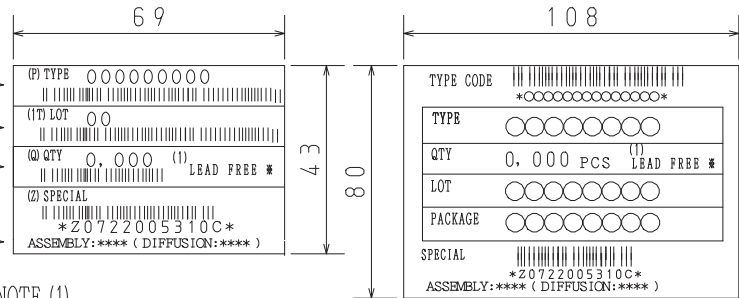
Type No.  
LOT No.  
Quantity  
Origin

Reel label

Reel label, Inner box label  
(unit: mm)

Outer box label

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



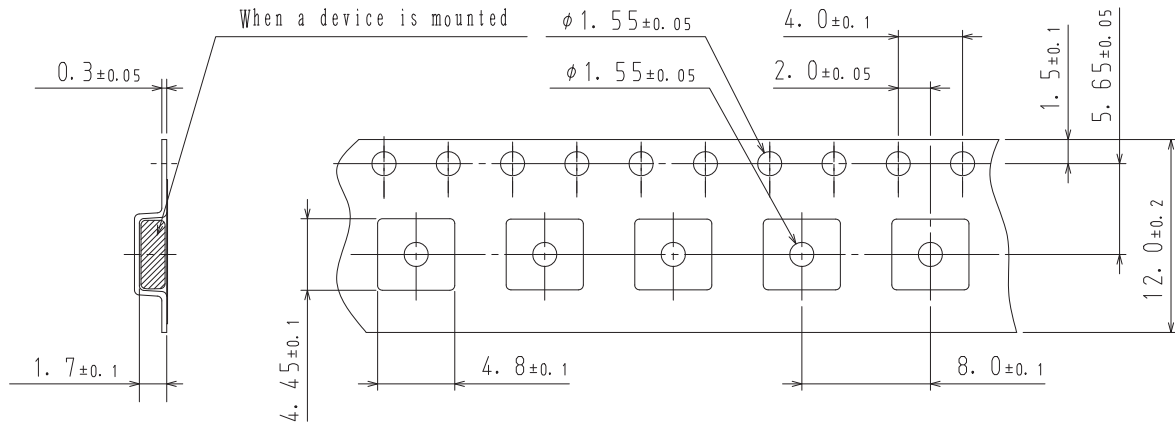
NOTE (1)

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

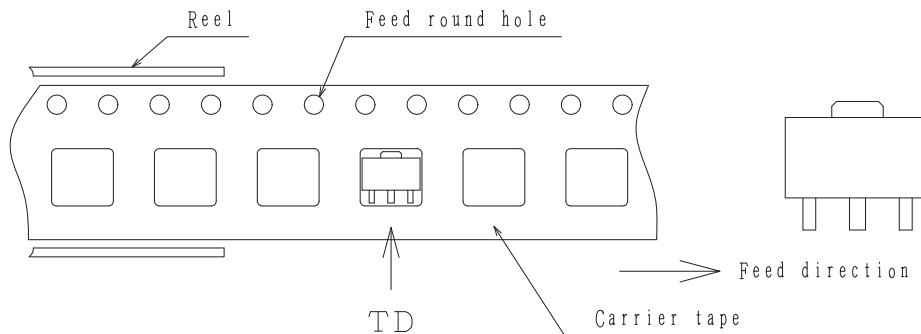
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

2-1. Carrier tape size (unit:mm)



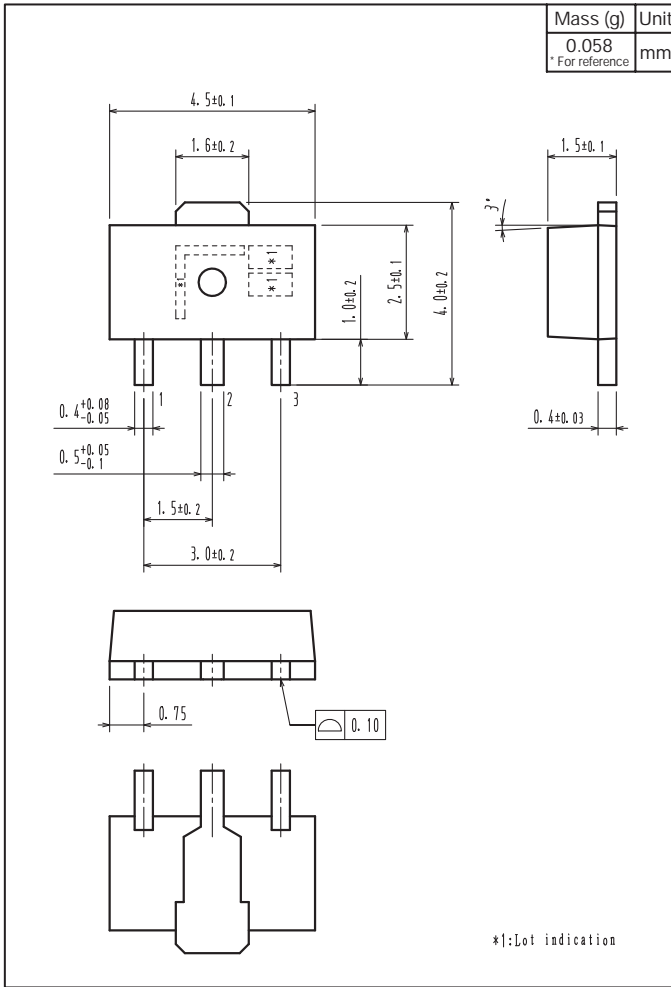
2-2. Device placement direction



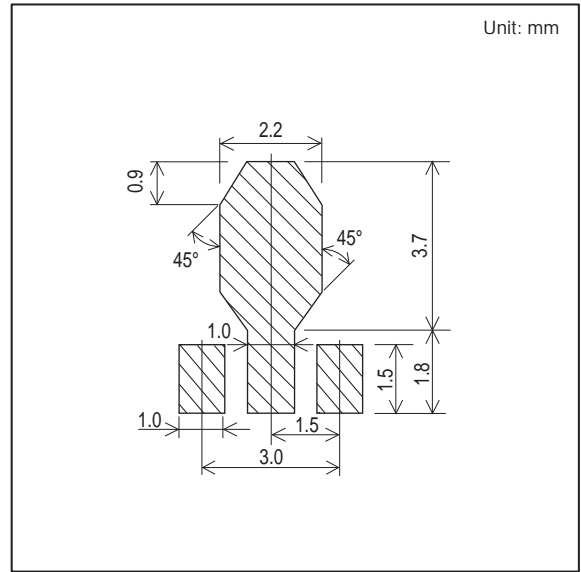
Those with pin 1 index on the feed hole side.....TD

Outline Drawing

2SA1419S-TD-E, 2SA1419S-TD-H, 2SA1419T-TD-E, 2SA1419T-TD-H, 2SC3649S-TD-E, 2SC3649S-TD-H, 2SC3649T-TD-E, 2SC3649T-TD-H



Land Pattern Example



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