



2SA2013/2SC5566

Bipolar Transistor (-50V, (-)4A, Low VCE(sat), (PNP)NPN Single PCP

ON Semiconductor®

<http://onsemi.com>

Applicaitons

- Relay drivers, lamp drivers, motor drivers, flash

Features

- Adoption of FBET and MBIT processes
- Low collector-to-emitter saturation voltage
- Ultrasmall package facilitates miniaturization in end products
- High allowable power dissipation
- Large current capacity
- High-speed switching

()2SA2013

Specifications

Absolute Maximum Ratings at Ta=25°C

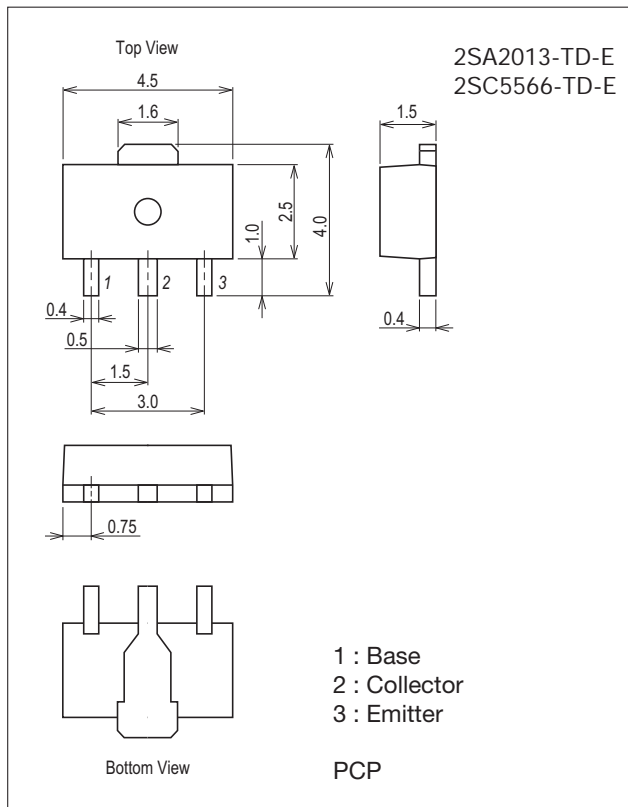
Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	VCBO		(-50)100	V
Collector-to-Emitter Voltage	VCES		(-50)100	V
Collector-to-Emitter Voltage	VCEO		(-)50	V
Emitter-to-Base Voltage	VEBO		(-)6	V

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Package Dimensions

unit : mm (typ)

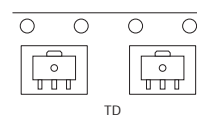
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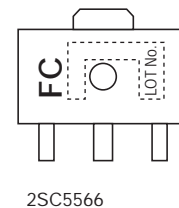
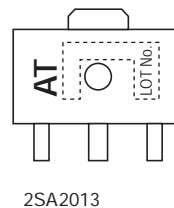
Product & Package Information

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

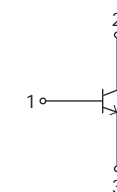
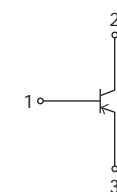
Packing Type: TD



Marking



Electrical Connection



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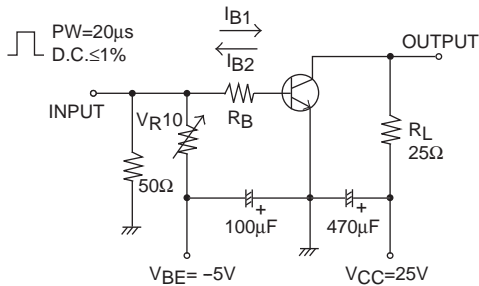
Parameter	Symbol	Conditions	Ratings	Unit
Collector Current	I_C		(-) 4	A
Collector Current (Pulse)	I_{CP}		(-) 7	A
Base Current	I_B		(-) 600	mA
Collector Dissipation	P_C	When mounted on ceramic substrate (250mm ² ×0.8mm)	1.3	W
		$T_c=25^\circ\text{C}$	3.5	W
Junction Temperature	T_j		150	$^\circ\text{C}$
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.

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

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	$V_{CB}=-40\text{V}, I_E=0\text{A}$			(-) 1	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=-4\text{V}, I_C=0\text{A}$			(-) 1	μA
DC Current Gain	h_{FE}	$V_{CE}=-2\text{V}, I_C=(-)500\text{mA}$	200		560	
Gain-Bandwidth Product	f_T	$V_{CE}=-10\text{V}, I_C=(-)500\text{mA}$		(360)400		MHz
Output Capacitance	C_{ob}	$V_{CB}=-10\text{V}, f=1\text{MHz}$		(24)15		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)1}$	$I_C=(-)1\text{A}, I_B=(-)50\text{mA}$		(-105)85	(-180)130	mV
	$V_{CE(sat)2}$	$I_C=(-)2\text{A}, I_B=(-)100\text{mA}$		(-200)150	(-340)225	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)2\text{A}, I_B=(-)100\text{mA}$		(-) 0.89	(-) 1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)10\mu\text{A}, I_E=0\text{A}$	(-) 50	100		V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CES}$	$I_C=(-)100\mu\text{A}, R_{BE}=0\Omega$	(-) 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	$V_{(BR)EBO}$	$I_E=(-)10\mu\text{A}, I_C=0\text{A}$	(-) 6			V
Turn-ON Time	t_{on}			(30)35		ns
Storage Time	t_{stg}	See specified Test Circuit.		(230)300		ns
Fall Time	t_f			(15)20		ns

Switching Time Test Circuit

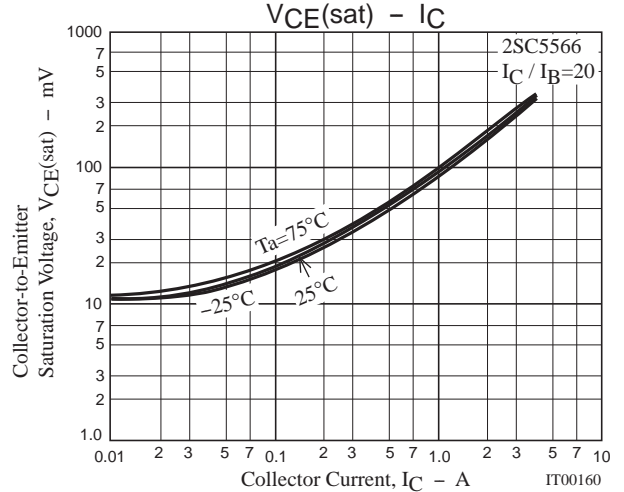
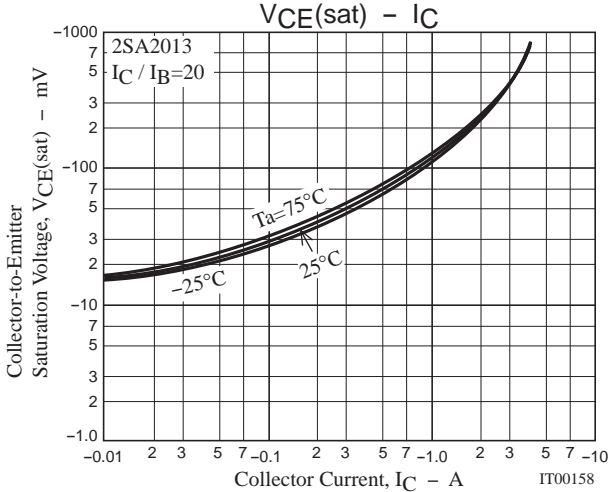
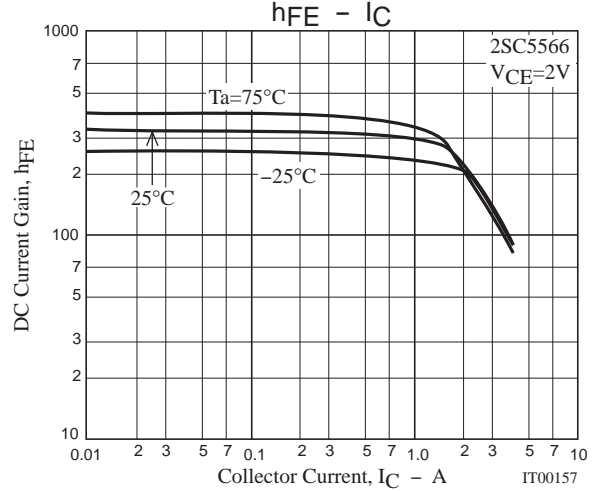
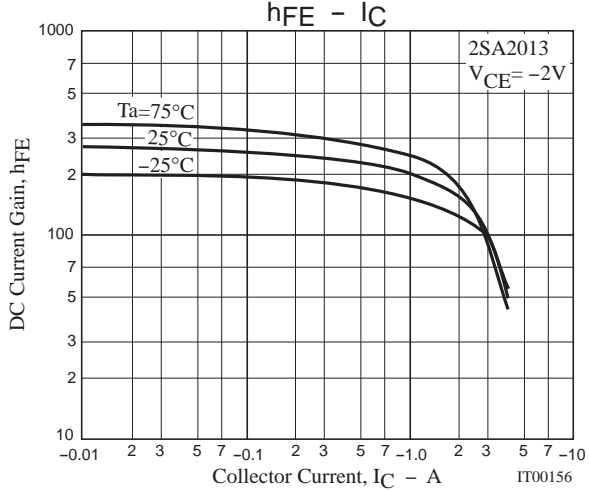
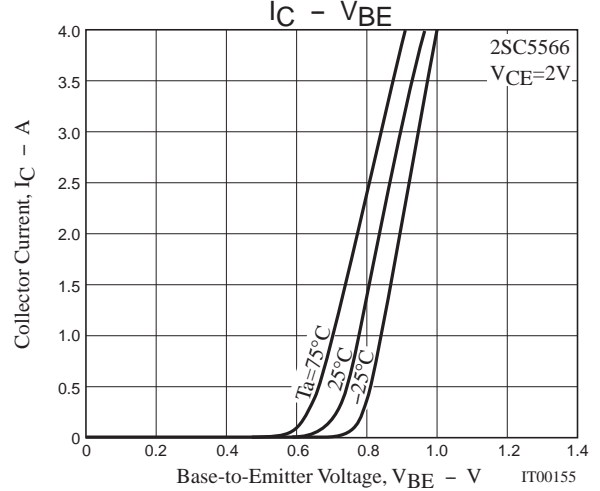
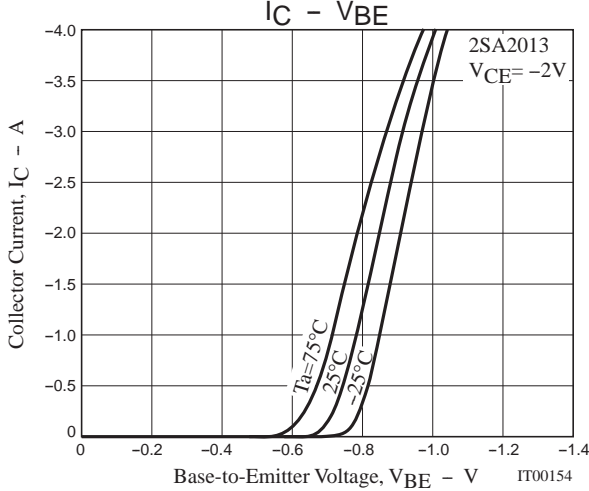
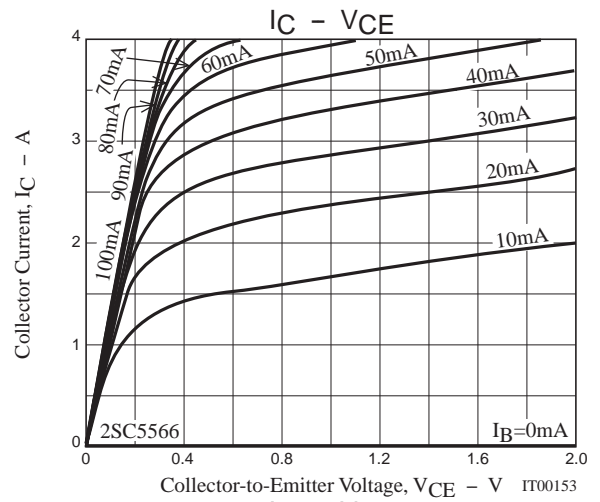
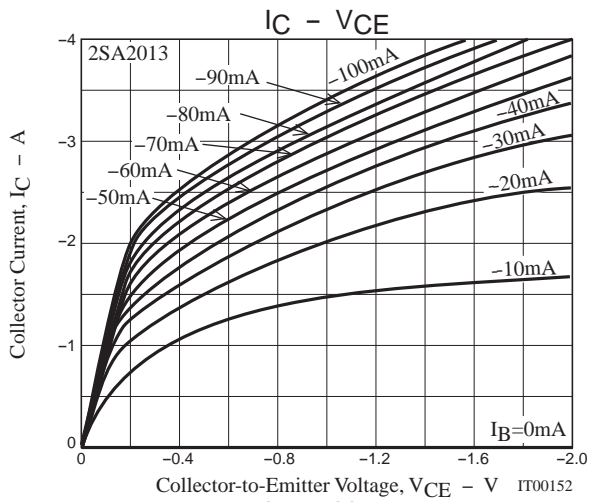


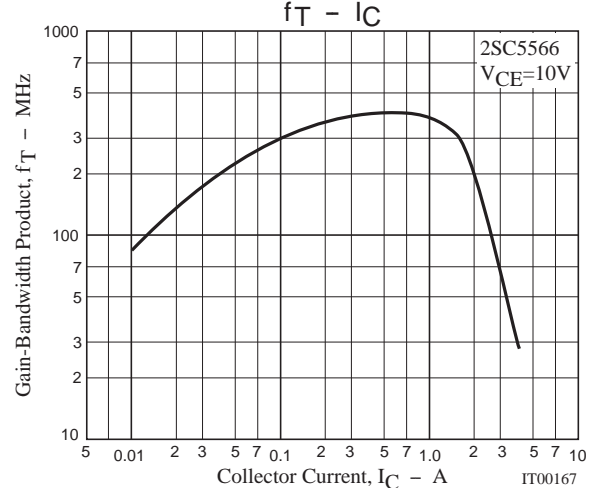
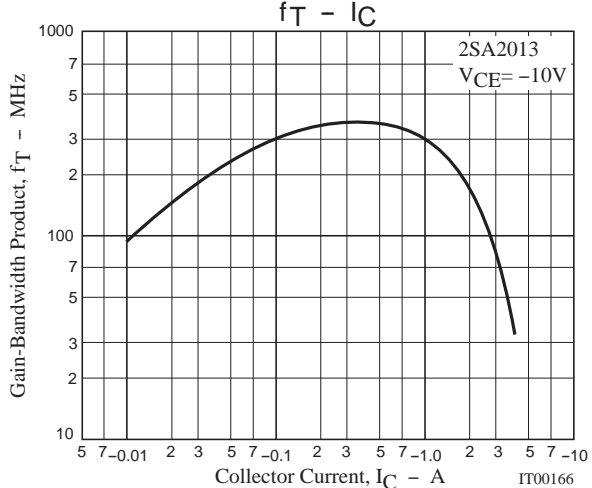
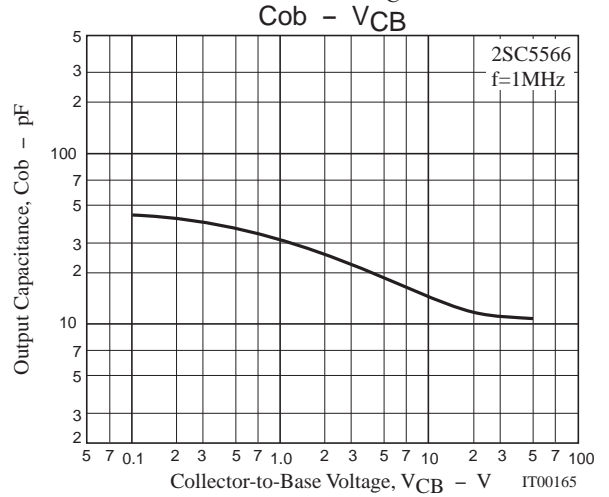
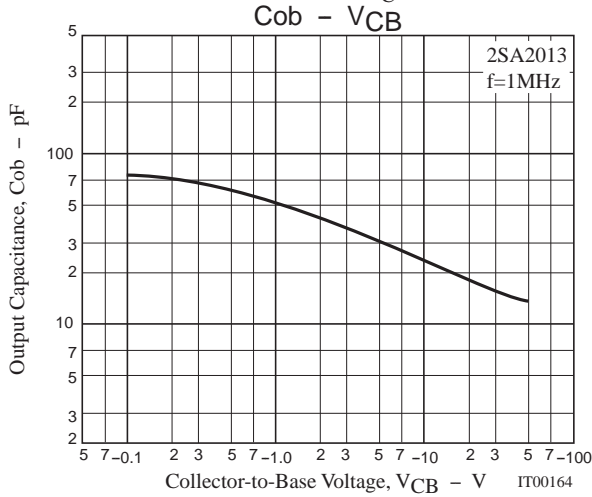
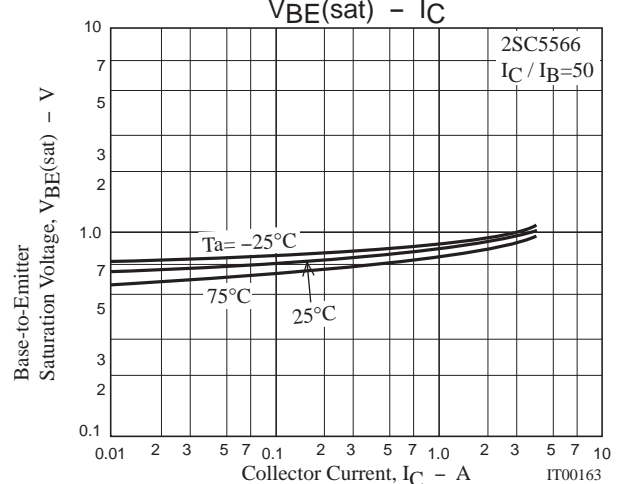
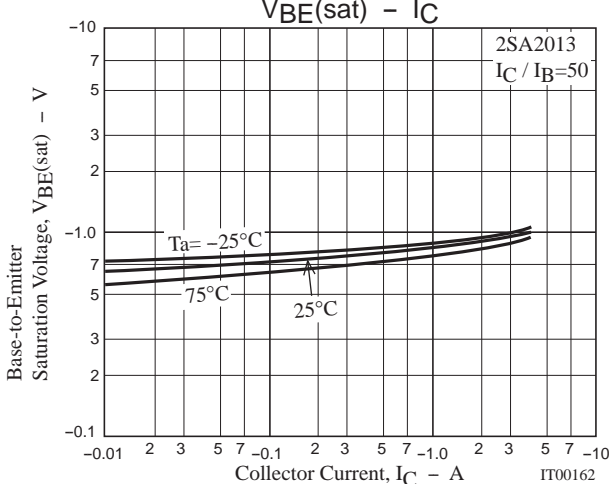
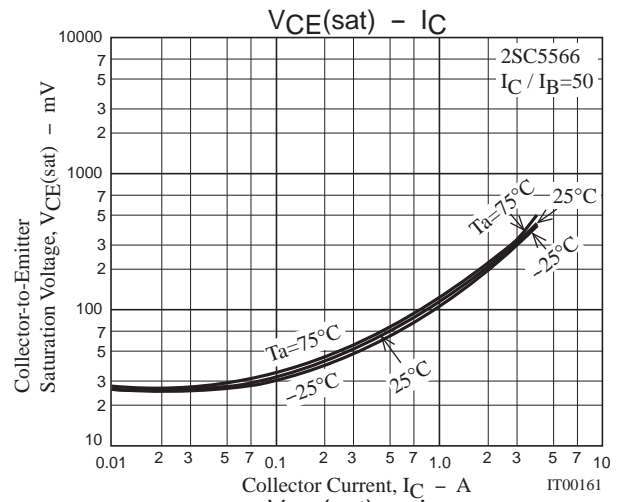
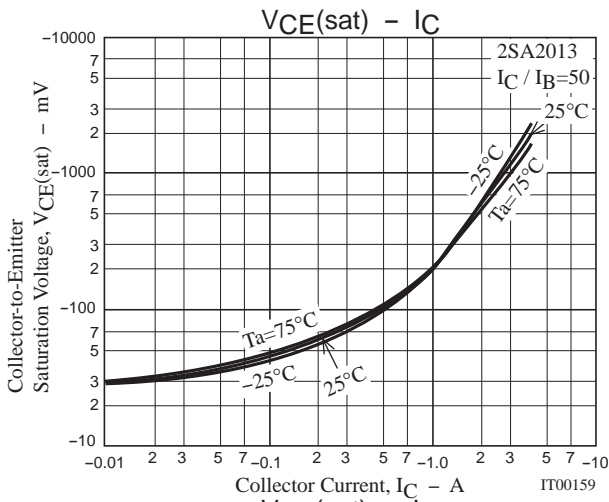
$$I_C=10I_{B1}=-10I_{B2}=1\text{A}$$

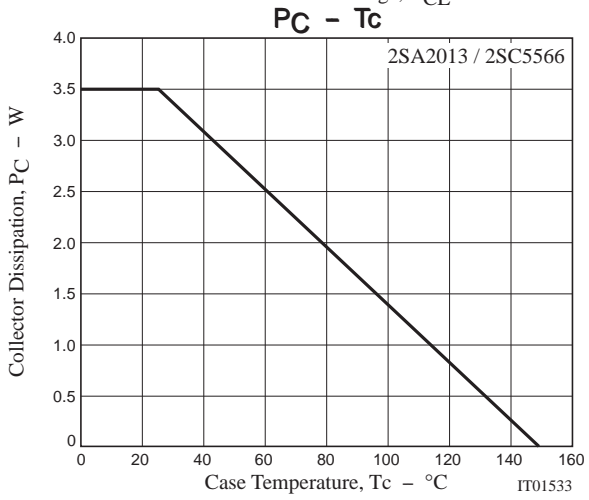
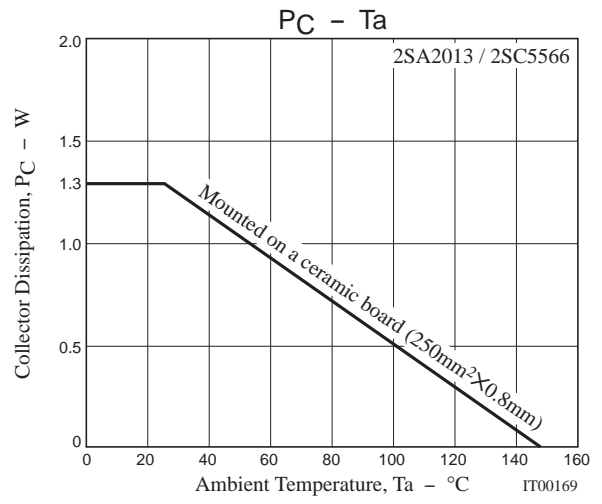
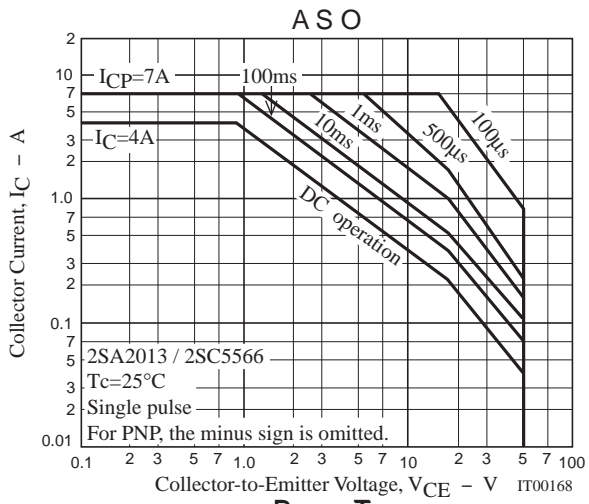
For PNP, the polarity is reversed.

Ordering Information

Device	Package	Shipping	memo
2SA2013-TD-E	PCP	1,000pcs./reel	Pb Free
2SC5566-TD-E	PCP	1,000pcs./reel	







Bag Packing Specification

2SA2013-TD-E, 2SC5566-TD-E

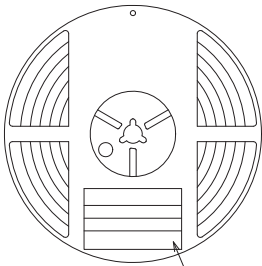
1. Packing Format

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

Reel label, Inner box label
(unit : mm)

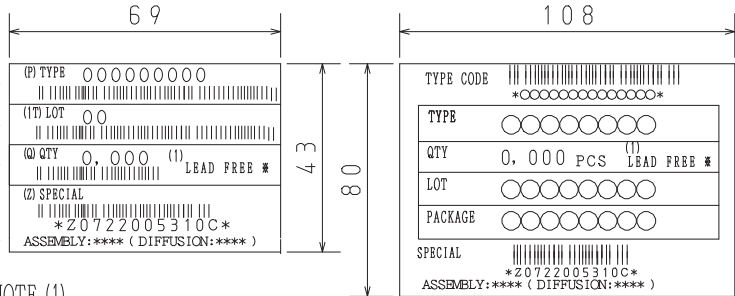
Outer box label
It is a label at the time of factory shipments.
The form of a label may change in physical distribution process.

Packing method



Type No.
LOT No.
Quantity
Origin

Reel label



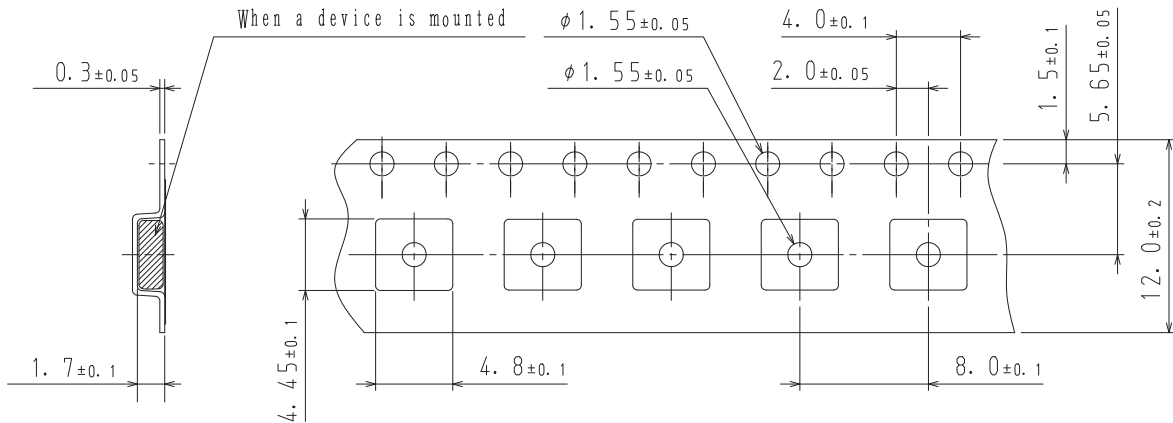
NOTE (1)

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

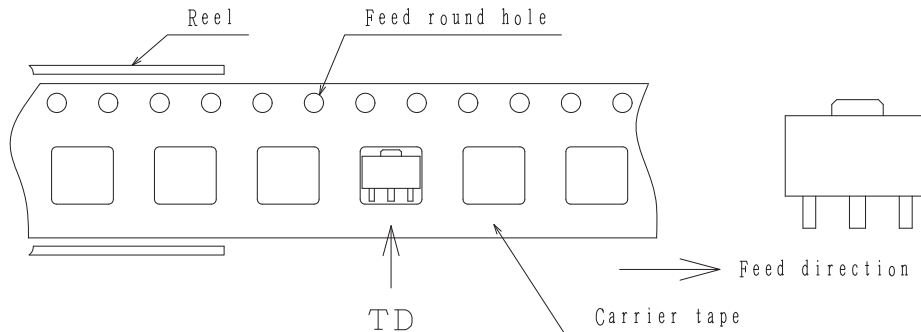
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



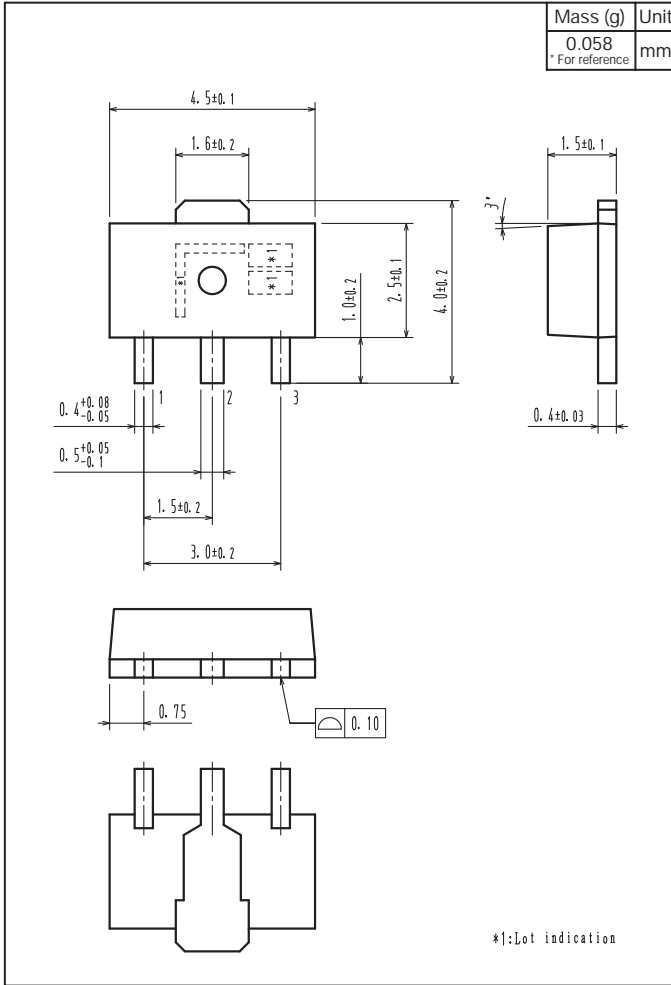
2-2. Device placement direction



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

Outline Drawing

2SA2013-TD-E, 2SC5566-TD-E



Land Pattern Example



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