Ordering number : EN6309D

SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

2SA2016/2SC5569 — PNP / NPN Epitaxial Planar Silicon Transistor

DC / DC Converter Applications

Applicaitons

- Relay drivers, lamp drivers, motor drivers, flash

Features

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

( )2SA2016

Specifications

Absolute Maximum Ratings at Ta=25°C

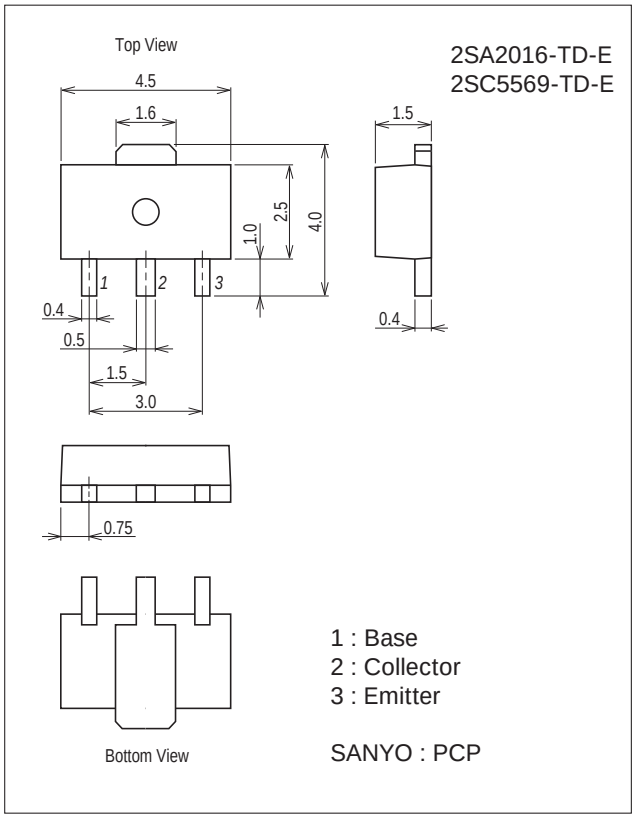
Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(-50)100	V
Collector-to-Emitter Voltage	V_{CES}		(-50)100	V
Collector-to-Emitter Voltage	V_{CEO}		(–)50	V
Emitter-to-Base Voltage	V_{EBO}		(–)6	V

Continued on next page.

Package Dimensions

unit : mm (typ)

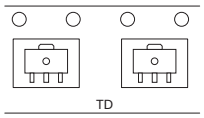
7008B-003



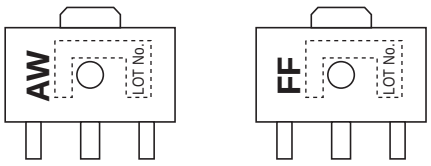
Product & Package Information

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

Packing Type: TD

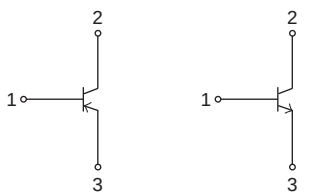


Marking



2SA2016 2SC5569

Electrical Connection



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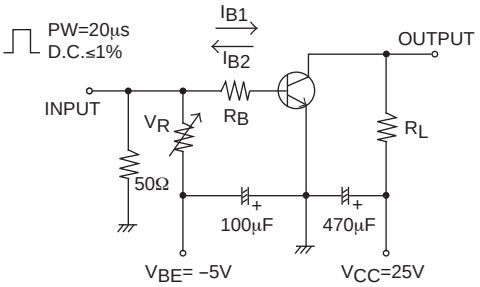
Continued from preceding page.

Parameter	Symbol	Conditions	Ratings	Unit
Collector Current	I_C		(–)7	A
Collector Current (Pulse)	I_{CP}		(–)10	A
Base Current	I_B		(–)1.2	A
Collector Dissipation	P_C	When mounted on ceramic substrate (250mm^2×0.8mm)	1.3	W
		Tc=25°C	3.5	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		–55 to +150	°C

Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=(–)40V, I_E=0A			(–)0.1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(–)4V, I_C=0A			(–)0.1	μA
DC Current Gain	h_{FE}	V_{CE}=(–)2V, I_C=(–)500mA	200		560	
Gain-Bandwidth Product	f_T	V_{CE}=(–)10V, I_C=(–)500mA		(290)330		MHz
Output Capacitance	Cob	V_{CB}=(–)10V, f=1MHz		(50)28		pF
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)1	I_C=(–)3.5A, I_B=(–)175mA		(–230)160	(–390)240	mV
	V_{CE}(sat)2	I_C=(–)2A, I_B=(–)40mA		(–240)110	(–400)170	mV
Base-to-Emitter Saturation Voltage	V_{BE}(sat)	I_C=(–)2A, I_B=(–)40mA		(–)0.83	(–)1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(–)10μA, I_E=0A	(–50)100			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CES}$	I_C=(–)100μA, R_{BE}=0Ω	(–50)100			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=(–)1mA, R_{BE}=∞	(–)50			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=(–)10μA, I_C=0A	(–)6			V
Turn-On Time	t_{on}	See specified Test Circuit.		(40)30		ns
Storage Time	t_{stg}			(225)420		ns
Fall Time	t_f			25		ns

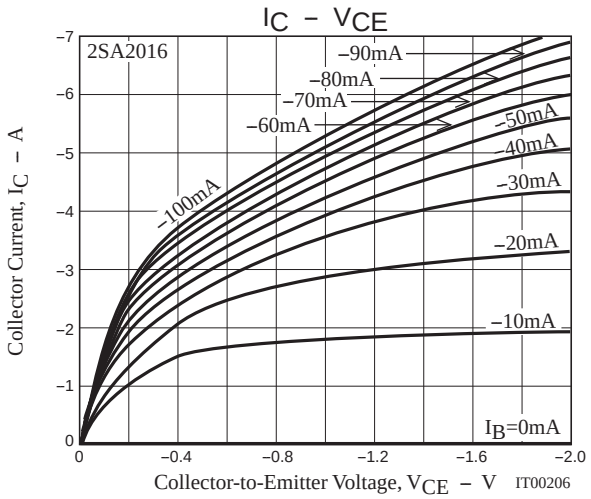
Switching Time Test Circuit

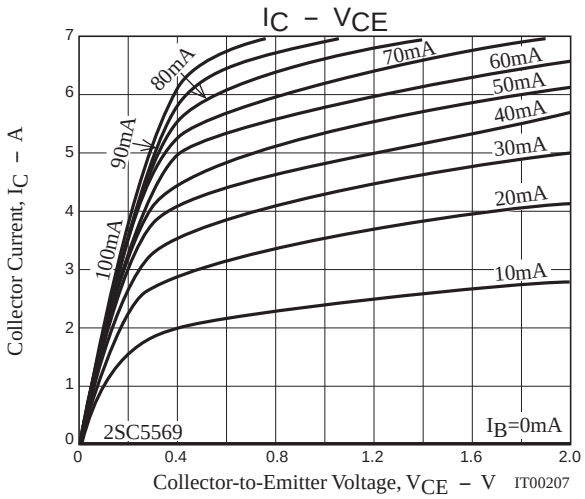


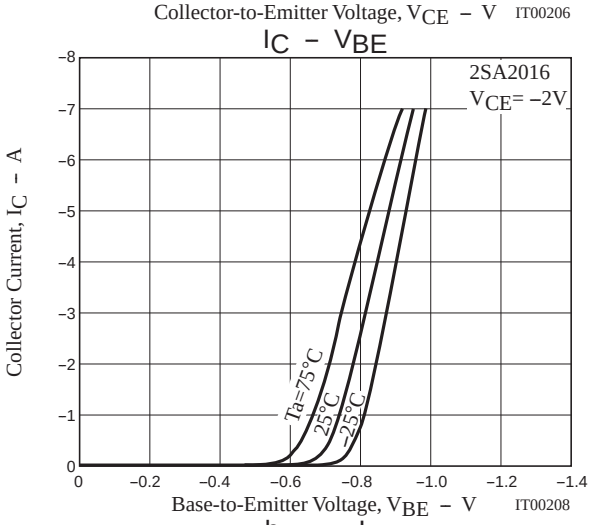
I_C=20I_{B1}= –20I_{B2}=2.5A
For PNP, the polarity is reversed.

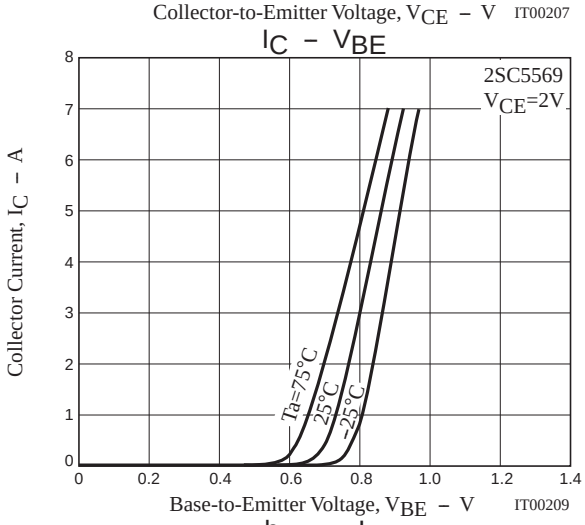
Ordering Information

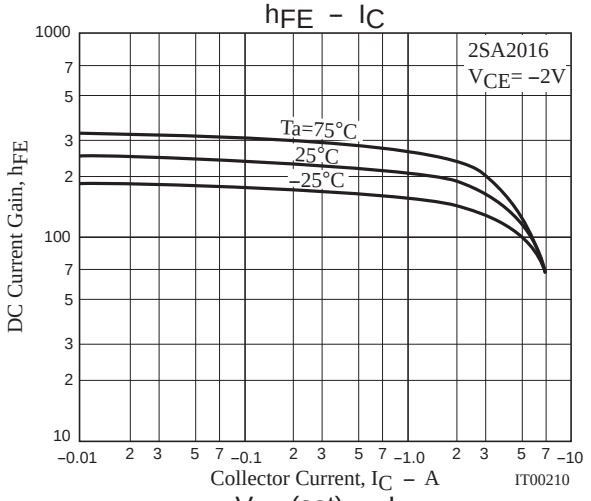
Device	Package	Shipping	memo
2SA2016-TD-E	PCP	1,000pcs./reel	Pb Free
2SC5569-TD-E	PCP	1,000pcs./reel	

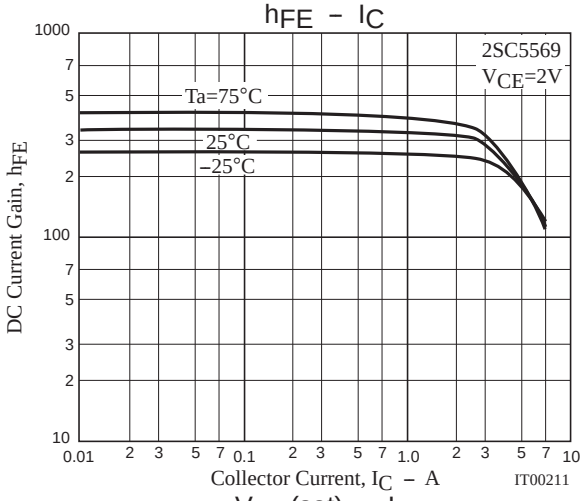

IC – VCE
2SA2016
–90mA
–80mA
–70mA
–60mA
–50mA
–40mA
–30mA
–20mA
–10mA
–100mA
IB=0mA
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT00206

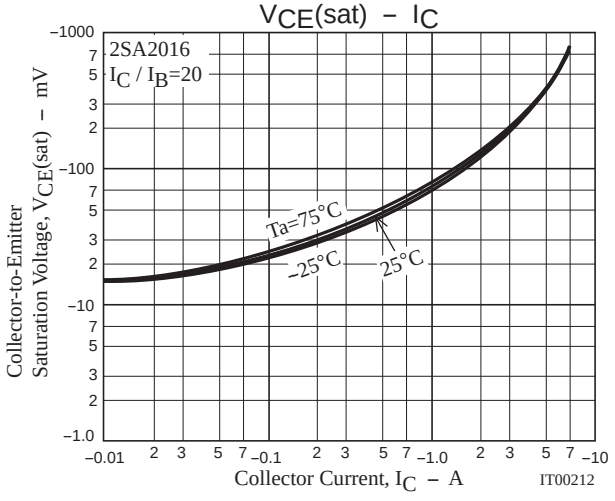

IC – VCE
2SC5569
80mA
70mA
60mA
50mA
40mA
30mA
20mA
10mA
90mA
100mA
IB=0mA
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT00207

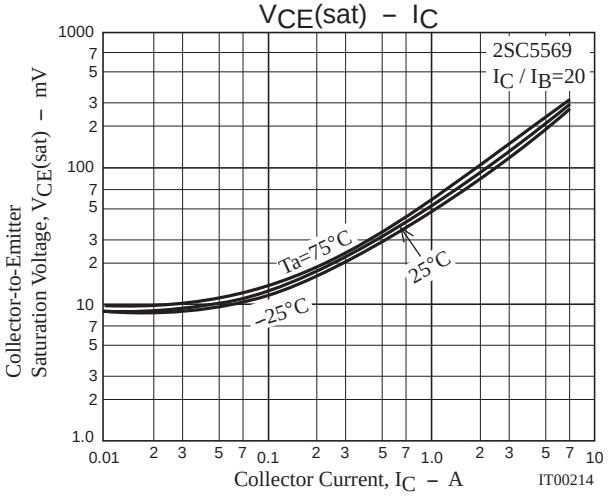

IC – VBE
2SA2016
VCE= –2V
Ta=75°C
25°C
–25°C
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
IT00208

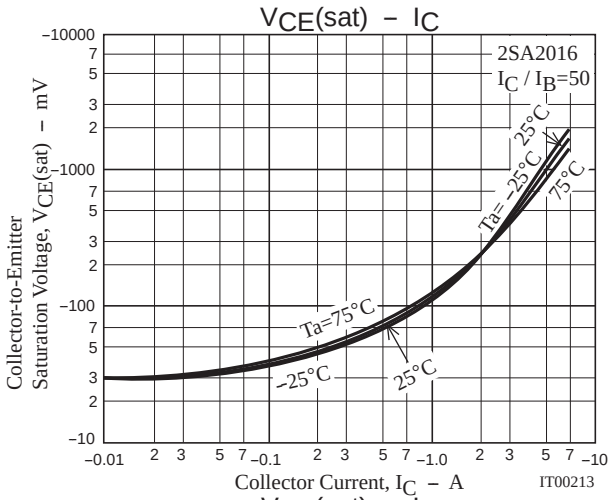

IC – VBE
2SC5569
VCE=2V
Ta=75°C
25°C
–25°C
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
IT00209

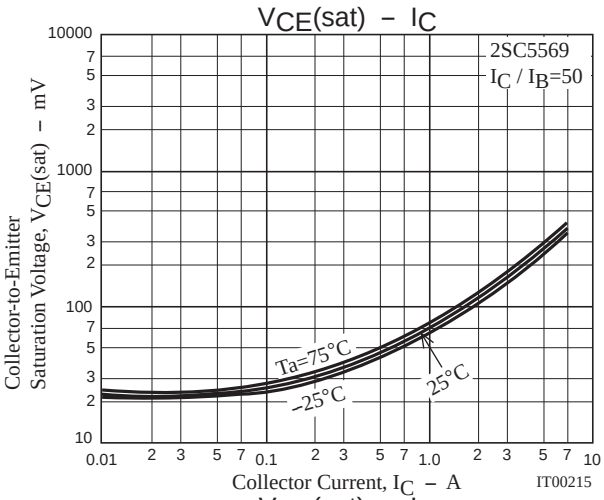

hFE – IC
2SA2016
VCE= –2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
IT00210

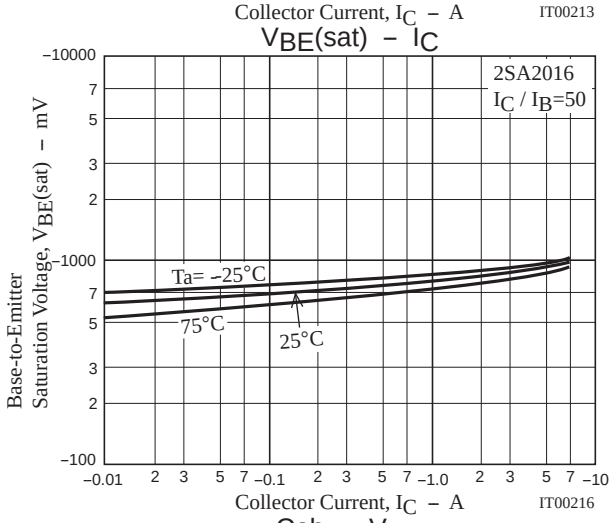

hFE – IC
2SC5569
VCE=2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
IT00211

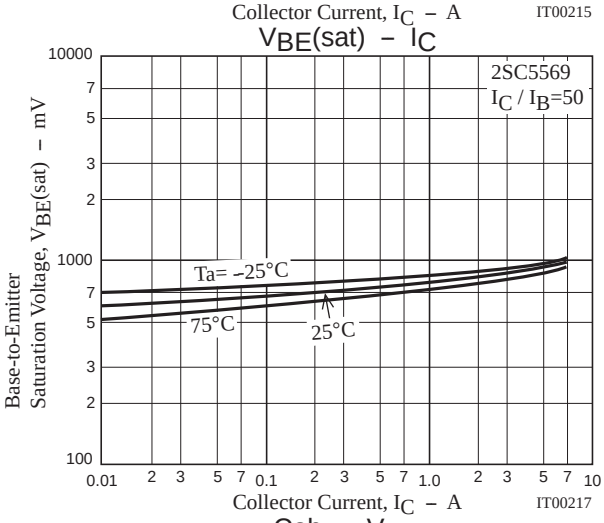

VCE(sat) – IC
2SA2016
IC / IB=20
Ta=75°C
–25°C
25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT00212

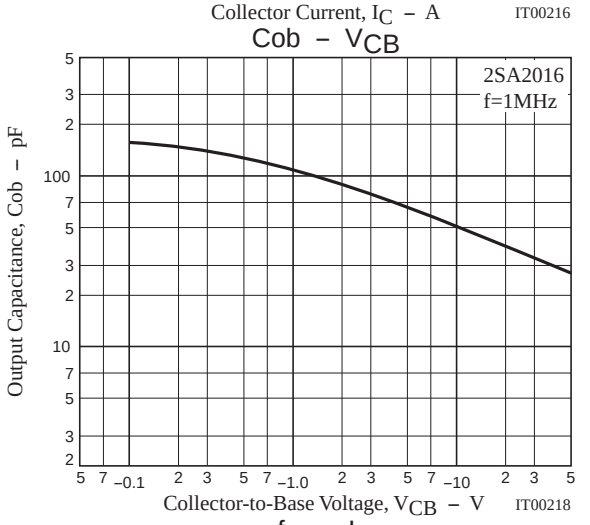

VCE(sat) – IC
2SC5569
IC / IB=20
Ta=75°C
–25°C
25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT00214

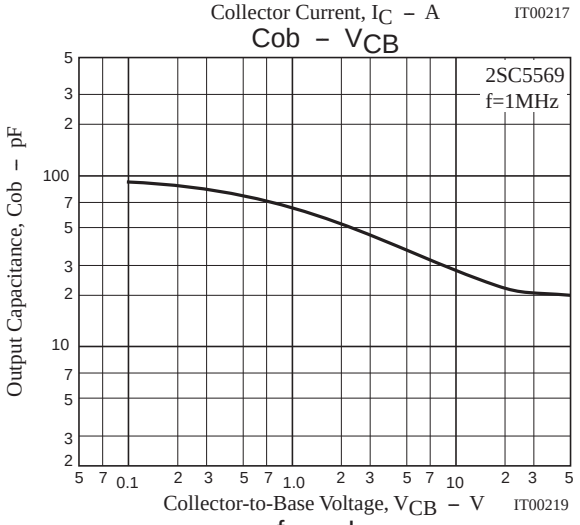

VCE(sat) – IC
2SA2016
IC / IB=50
Ta=75°C
25°C
–25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT00213

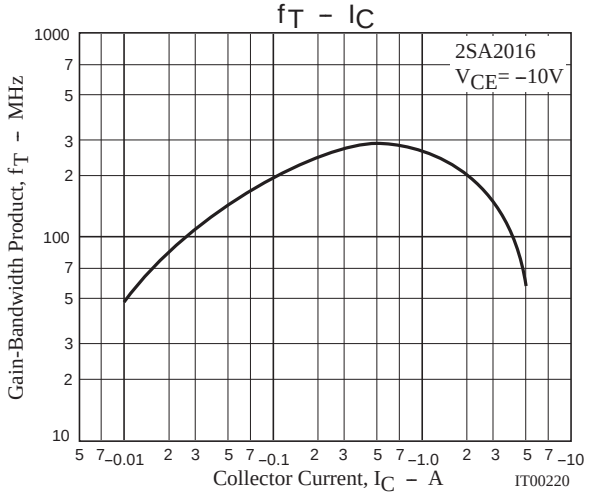

VCE(sat) – IC
2SC5569
IC / IB=50
Ta=75°C
25°C
–25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT00215

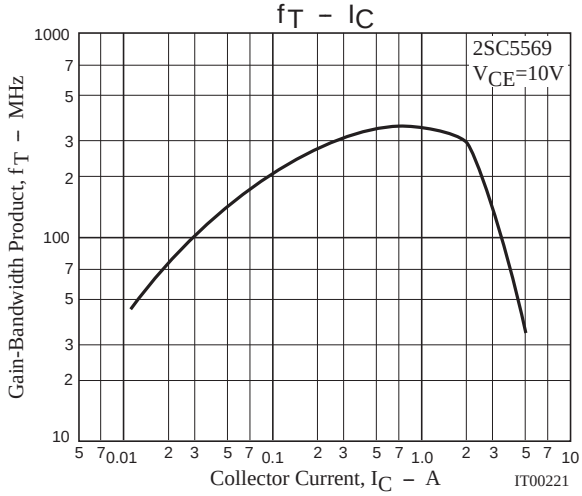

VBE(sat) – IC
2SA2016
IC / IB=50
Ta= –25°C
75°C
25°C
Base-to-Emitter Saturation Voltage, VBE(sat) – mV
Collector Current, IC – A
IT00216

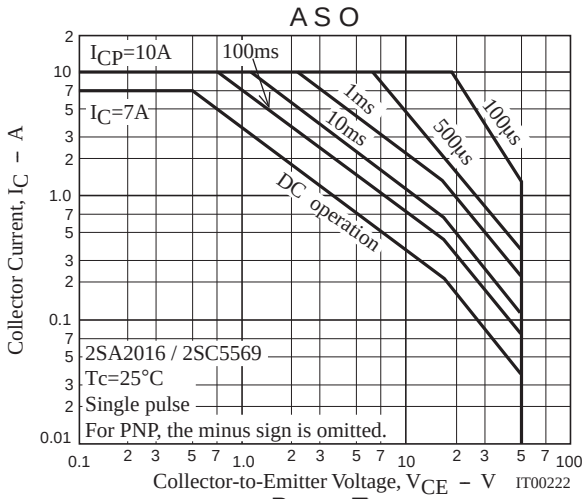

VBE(sat) – IC
2SC5569
IC / IB=50
Ta= –25°C
75°C
25°C
Base-to-Emitter Saturation Voltage, VBE(sat) – mV
Collector Current, IC – A
IT00217

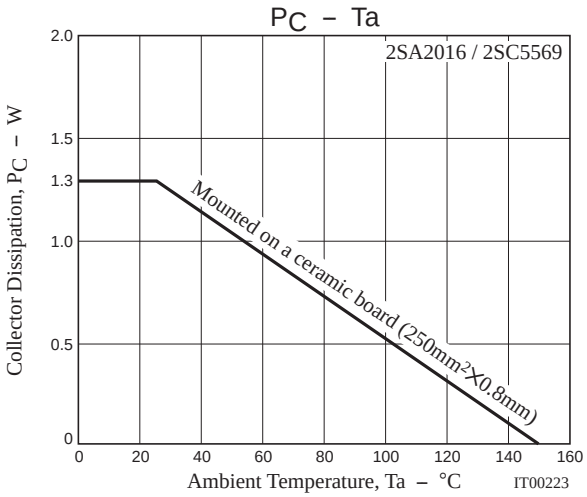

Cob – VCB
2SA2016
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT00218

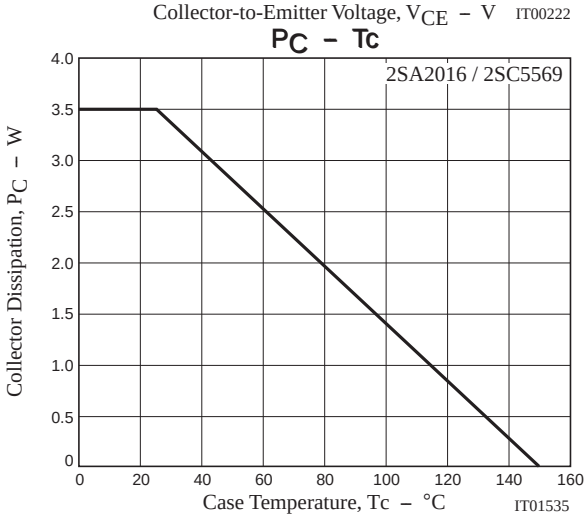

Cob – VCB
2SC5569
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT00219


fT – IC
2SA2016
VCE= –10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT00220


fT – IC
2SC5569
VCE=10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT00221


A S O
I_{CP}=10A
100ms
I_C=7A
1ms
10ms
500µs
100µs
DC operation
2SA2016 / 2SC5569
Tc=25°C
Single pulse
For PNP, the minus sign is omitted.
Collector Current, I_C – A
Collector-to-Emitter Voltage, V_{CE} – V
IT00222


P_C – Ta
2SA2016 / 2SC5569
Mounted on a ceramic board (250mm²X0.8mm)
Collector Dissipation, P_C – W
Ambient Temperature, Ta – °C
IT00223


P_C – Tc
2SA2016 / 2SC5569
Collector Dissipation, P_C – W
Case Temperature, Tc – °C
IT01535

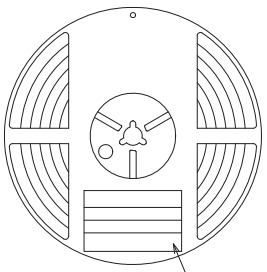
Bag Packing Specification

2SA2016-TD-E, 2SC5569-TD-E

1. Packing Format

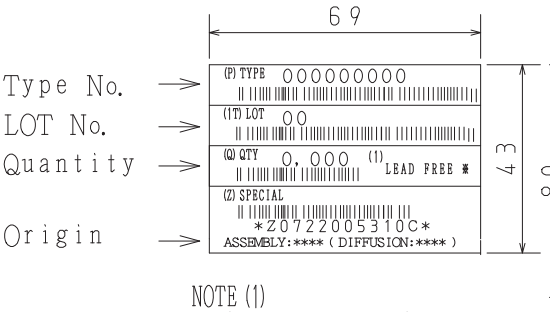
Package Name	Carrier Tape Type	Maximum Number of devices contained (pcs)			Packing format	
		Reel	Inner box	Outer box	Inner BOX (C-1)	Outer BOX (A-7)
PCP	PCP	1,000	4,000	24,000	4 reels contained Dimensions:mm (external) 183×72×185	6 inner boxes contained Dimensions:mm (external) 440×195×210

Packing method



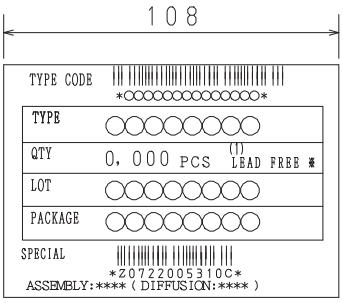
Reel label

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.

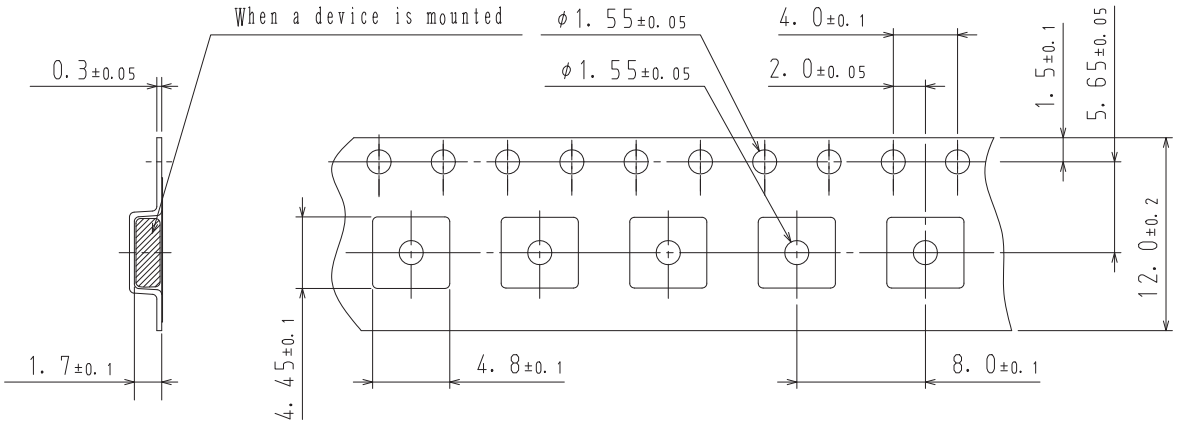


NOTE (1)
The LEAD FREE ※ description shows that the surface treatment of the terminal is lead free.

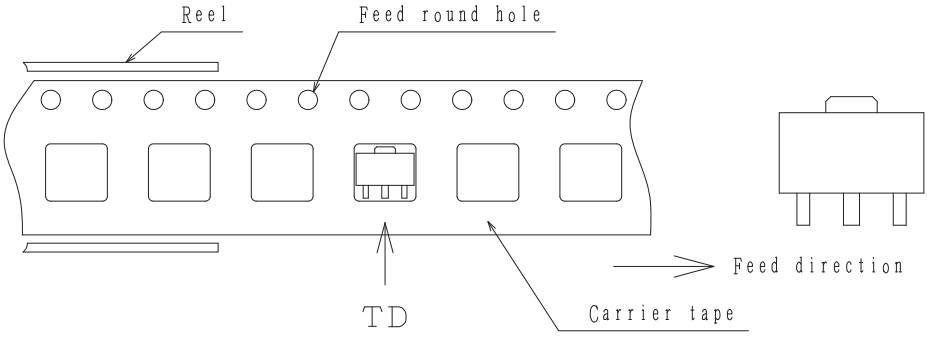
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



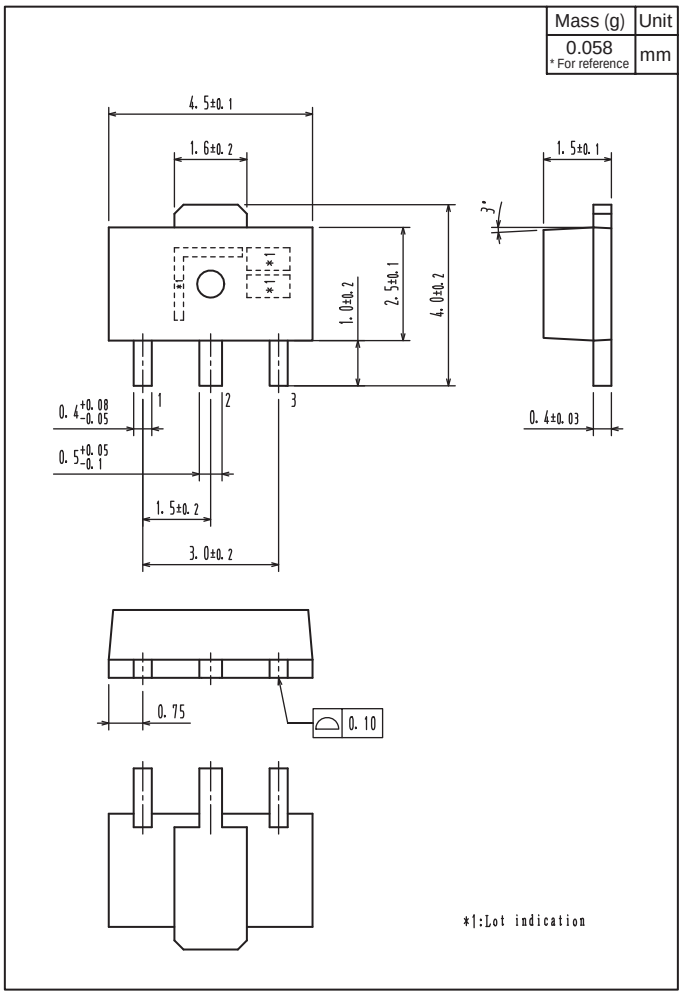
2-2. Device placement direction



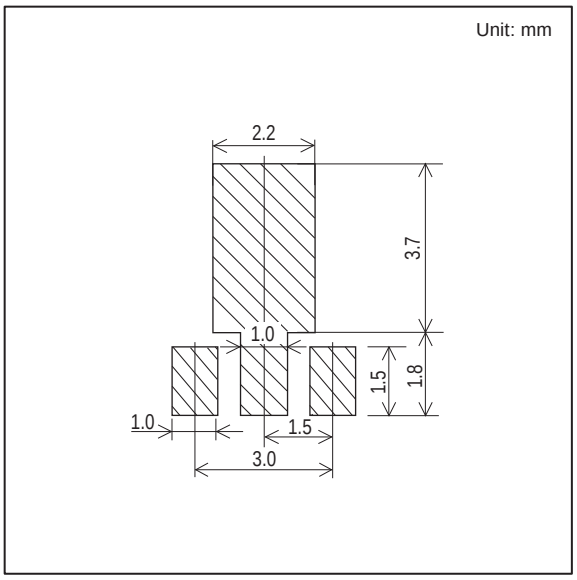
Those with pin 1 index on the feed hole side·····TD

Outline Drawing

2SA2016-TD-E, 2SC5569-TD-E



Land Pattern Example



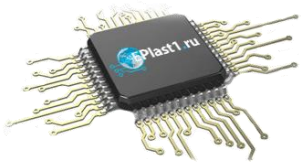
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)
Факс: 8 (812) 320-02-42
Электронная почта: org@eplast1.ru
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.