



SANYO Semiconductors

# DATA SHEET

An ON Semiconductor Company

## 2SC5994 — NPN Epitaxial Planar Silicon Transistor High-Current Switching Applications

### Applications

- Voltage regulators, relay drivers, lamp drivers, electrical equipment

### Features

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

### Specifications

Absolute Maximum Ratings at Ta=25°C

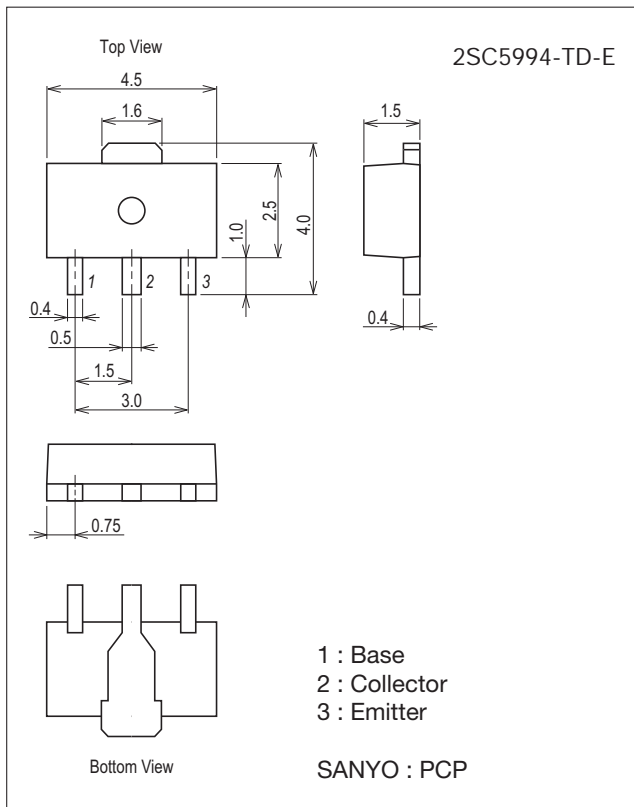
Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	VCBO		100	V
Collector-to-Emitter Voltage	VCES		100	V
	VCEO		50	V
Emitter-to-Base Voltage	VEBO		6	V
Collector Current	IC		2	A
Collector Current (Pulse)	ICP		4	A
Base Current	IB		400	mA

Continued on next page.

### Package Dimensions

unit : mm (typ)

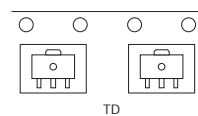
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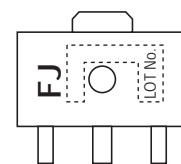
### Product & Package Information

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

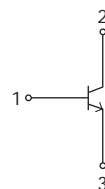
### Packing Type: TD



### Marking



### Electrical Connection



## 2SC5994

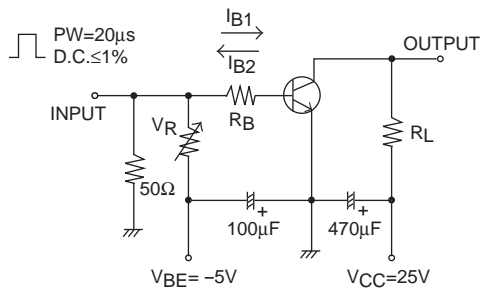
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Parameter	Symbol	Conditions	Ratings	Unit
Collector Dissipation	PC	When mounted on ceramic substrate (450mm <sup>2</sup> ×0.8mm)	1.3	W
		T <sub>c</sub> =25°C	3.5	W
Junction Temperature	T <sub>j</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +150	°C

### Electrical Characteristics at T<sub>a</sub>=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I <sub>CBO</sub>	V <sub>CB</sub> =50V, I <sub>E</sub> =0A			1	μA
Emitter Cutoff Current	I <sub>EBO</sub>	V <sub>EB</sub> =4V, I <sub>C</sub> =0A			1	μA
DC Current Gain	h <sub>FE1</sub>	V <sub>CE</sub> =2V, I <sub>C</sub> =100mA	200		560	
	h <sub>FE2</sub>	V <sub>CE</sub> =2V, I <sub>C</sub> =1.5A	40			
Gain-Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> =10V, I <sub>C</sub> =300mA		420		MHz
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =10V, f=1MHz		9		pF
Collector-to-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =1A, I <sub>B</sub> =50mA	135		300	mV
Base-to-Emitter Saturation Voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =1A, I <sub>B</sub> =50mA	0.9		1.2	V
Collector-to-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> =10μA, I <sub>E</sub> =0A	100			V
Collector-to-Emitter Breakdown Voltage	V <sub>(BR)CES</sub>	I <sub>C</sub> =100μA, R <sub>BE</sub> =0Ω	100			V
	V <sub>(BR)CEO</sub>	I <sub>C</sub> =1mA, R <sub>BE</sub> =∞	50			V
Emitter-to-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> =10μA, I <sub>C</sub> =0A	6			V
Turn-ON Time	t <sub>on</sub>	See specified Test Circuit.		30		ns
Storage Time	t <sub>stg</sub>			330		ns
Fall Time	t <sub>f</sub>			40		ns

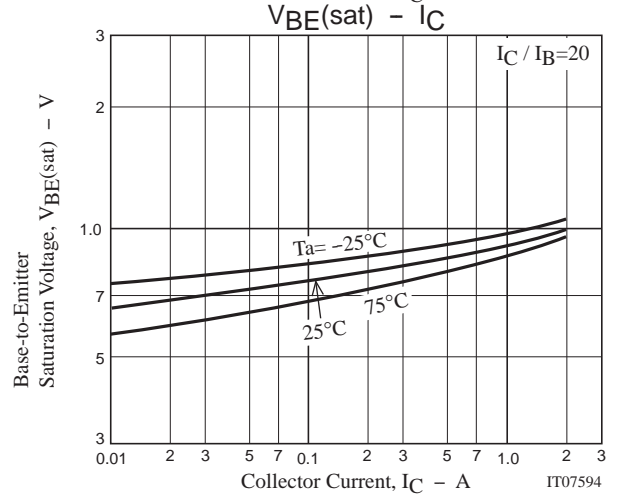
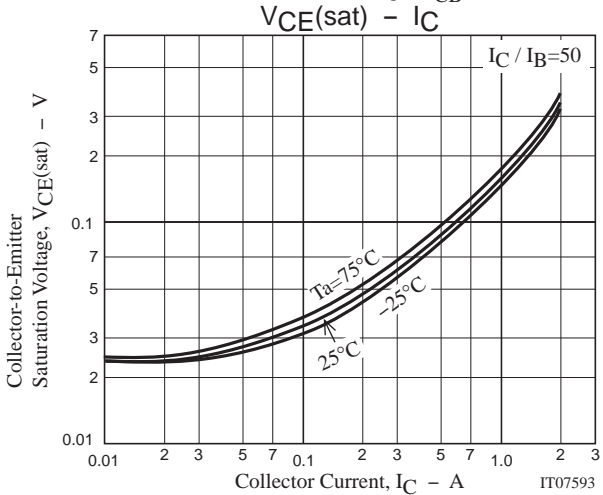
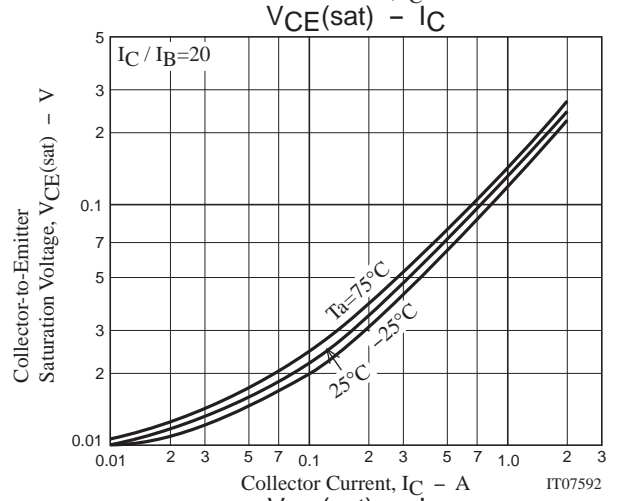
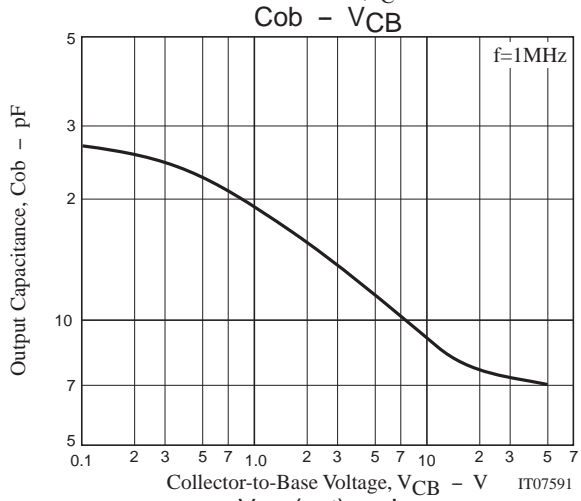
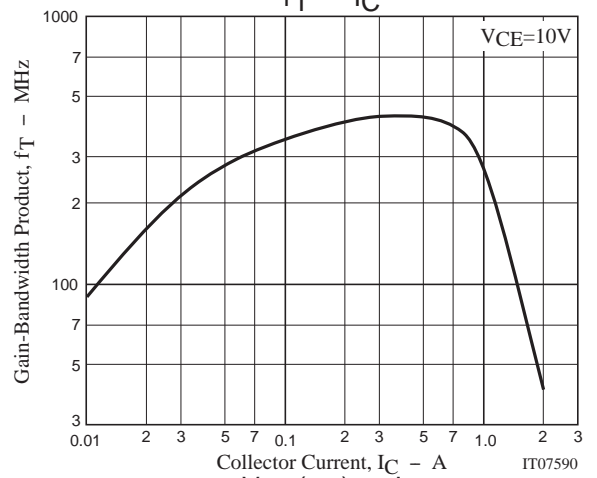
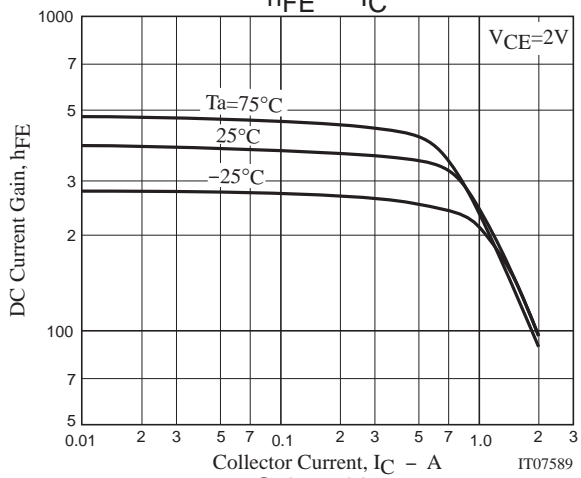
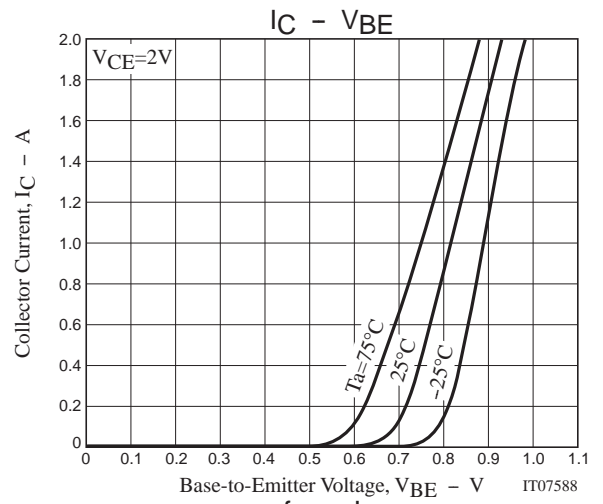
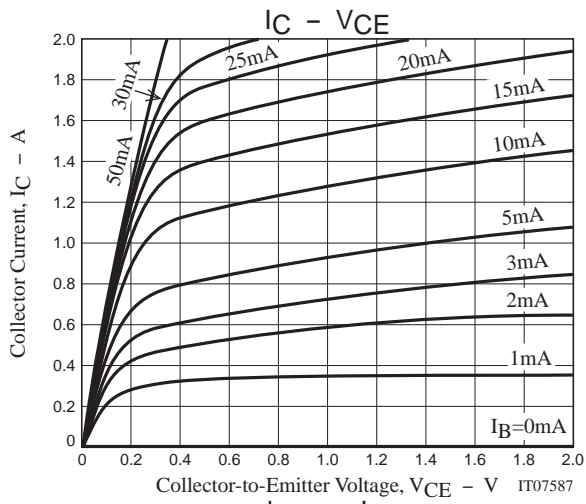
### Switching Time Test Circuit

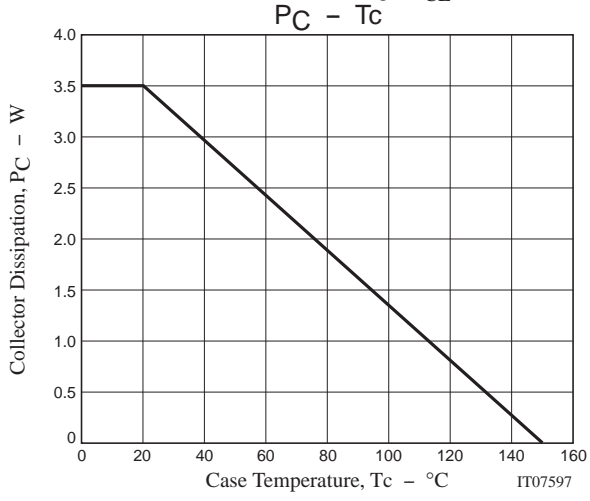
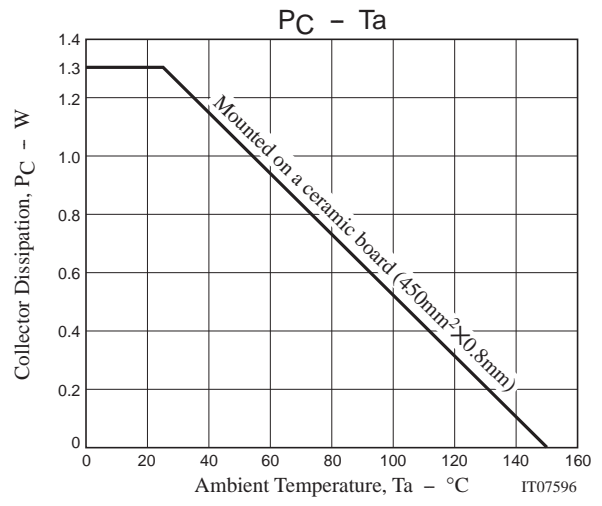
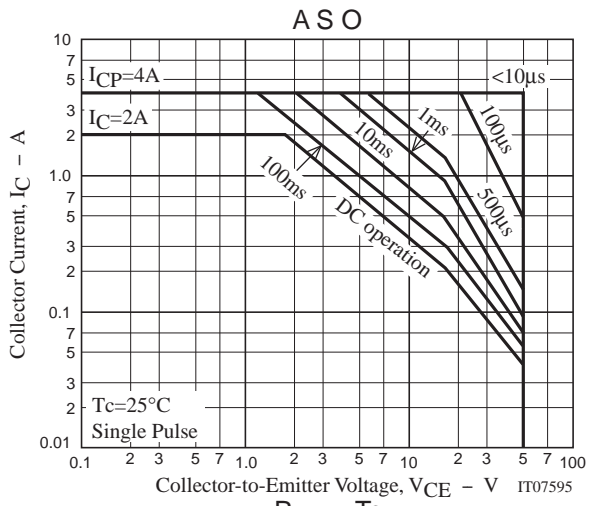


$$I_C = 10I_{B1} = -10I_{B2} = 700\text{mA}$$

### Ordering Information

Device	Package	Shipping	memo
2SC5994-TD-E	PCP	1,000pcs./reel	Pb Free





Embossed Taping Specification

2SC5994-TD-E

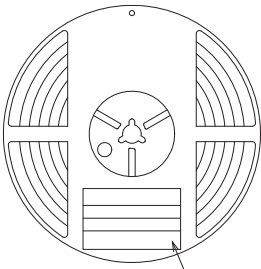
1. Packing Format

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)

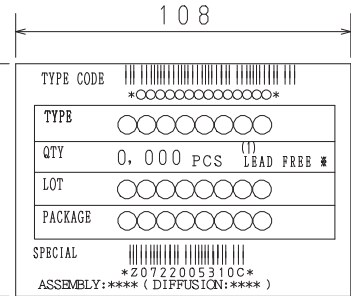
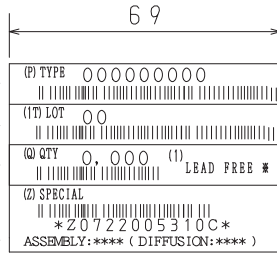
Outer box label  
It is a label at the time of factory shipments.  
The form of a label may change in physical distribution process.

Packing method



Reel label

Type No.  
LOT No.  
Quantity  
Origin



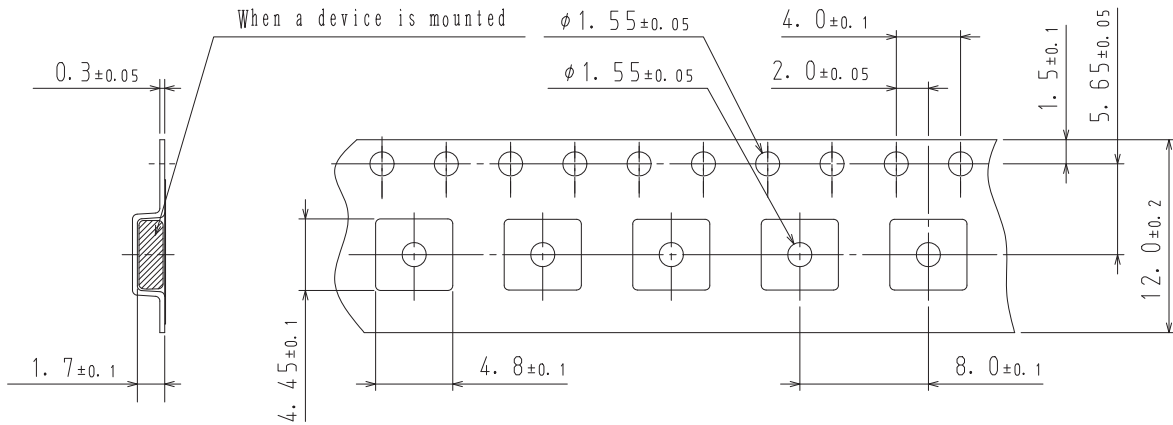
NOTE (1)

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

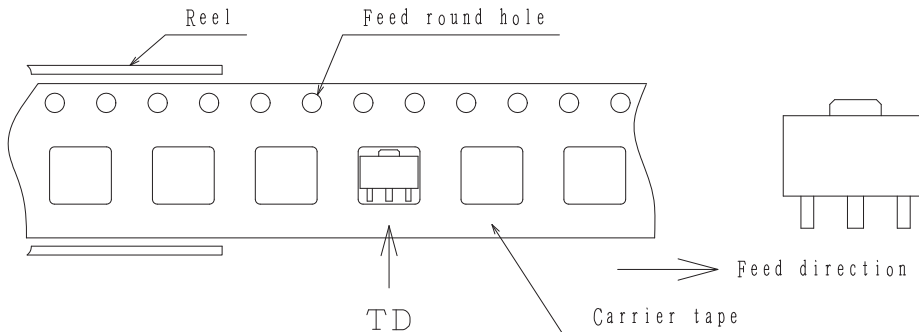
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



2-2. Device placement direction

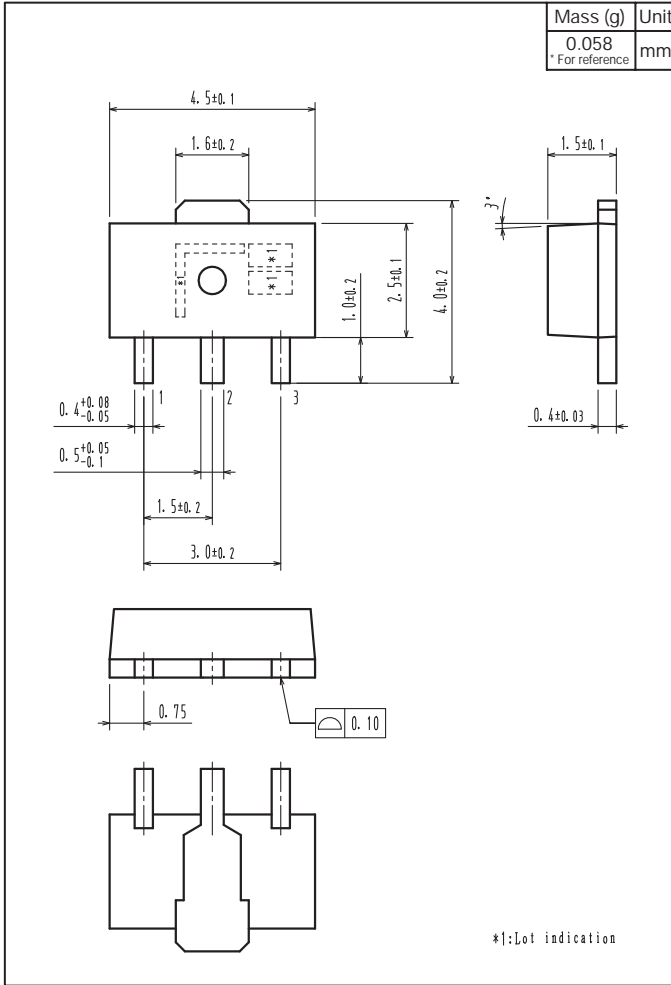


Those with pin 1 index on the feed hole side.....TD

# 2SC5994

## Outline Drawing

2SC5994-TD-E



## Land Pattern Example



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