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# 2SC5994

## Bipolar Transistor 50V, 2A, Low VCE(sat), NPN Single



ON Semiconductor®

www.onsemi.com

### Features

- Adoption of MBIT Process
- Low Collector to Emitter Saturation Voltage
- Large Current Capacity
- High Speed Switching

### Typical Applications

- Voltage Regulators
- Relay Drivers
- Lamp Drivers
- Electrical Equipment

### SPECIFICATIONS

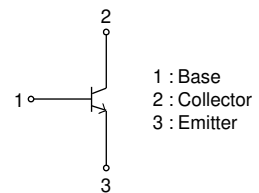
#### ABSOLUTE MAXIMUM RATING at Ta = 25°C (Note 1, 2)

Parameter	Symbol	Value	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
Collector Dissipation	(Note 2)	1.3	W
	Tc=25°C	3.5	W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	-55 to +150	°C

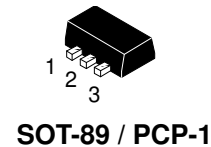
Note 1 : Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

Note 2 : Surface mounted on ceramic substrate(450mm<sup>2</sup> × 0.8mm)

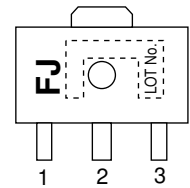
### ELECTRICAL CONNECTION



### MARKING



SOT-89 / PCP-1



### ORDERING INFORMATION

See detailed ordering and shipping information on page 5 of this data sheet.

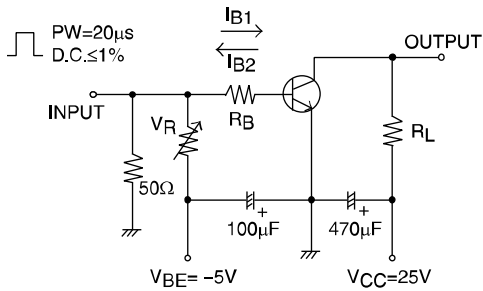
## 2SC5994

### ELECTRICAL CHARACTERISTICS at Ta = 25°C (Note 3)

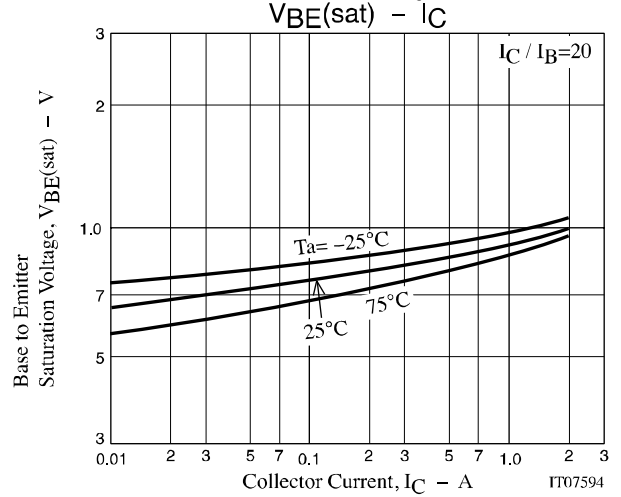
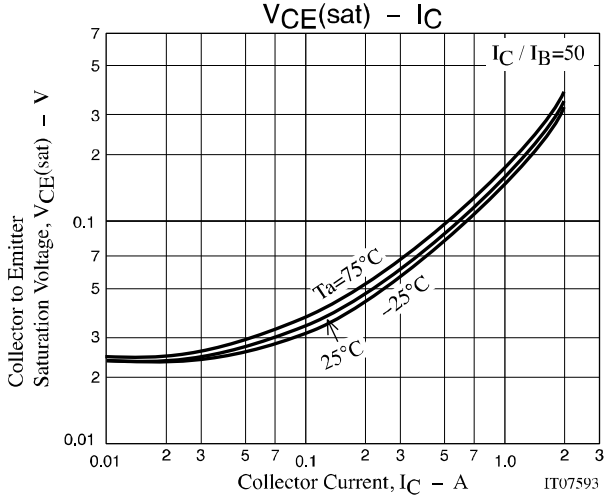
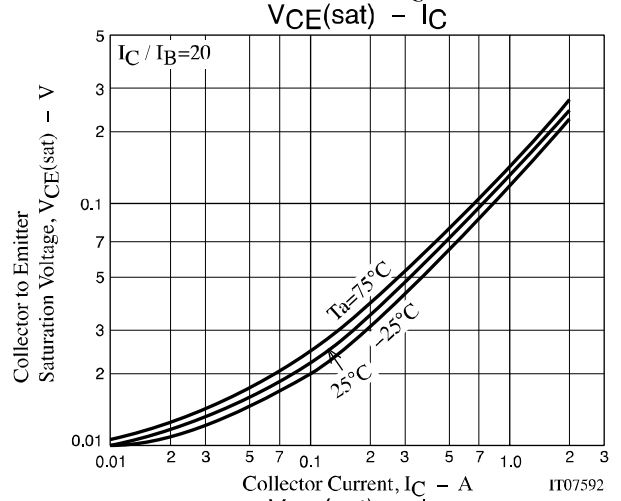
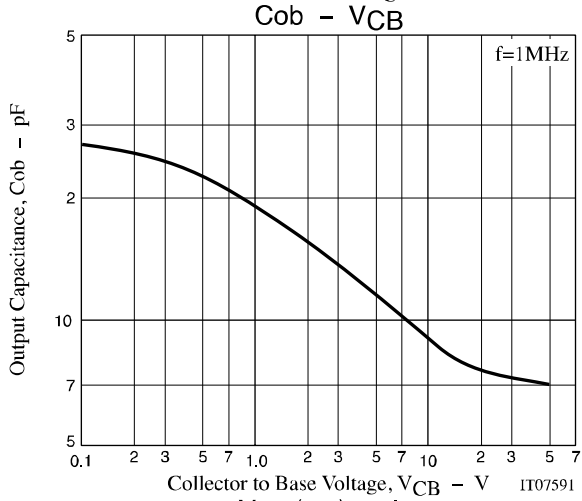
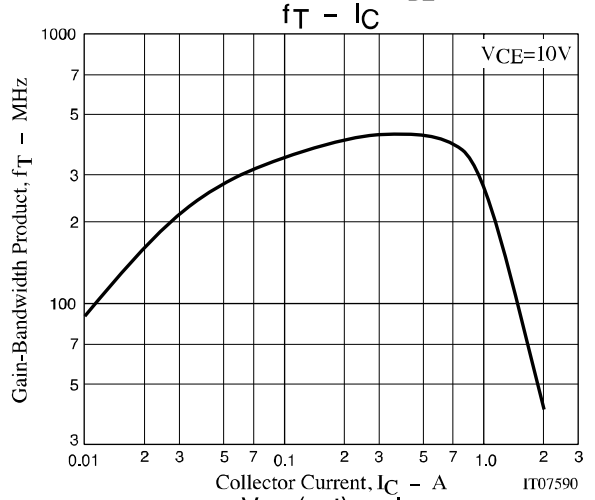
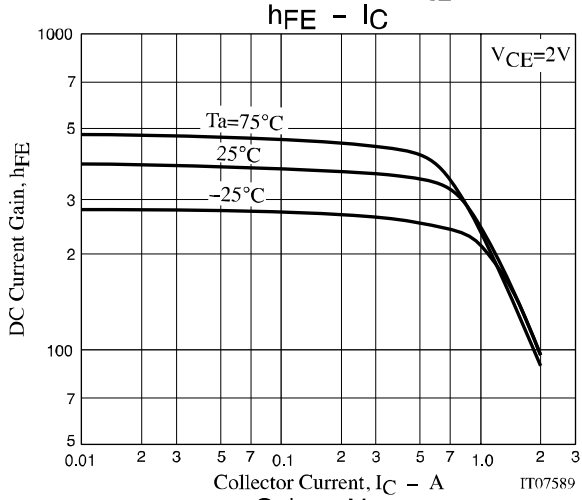
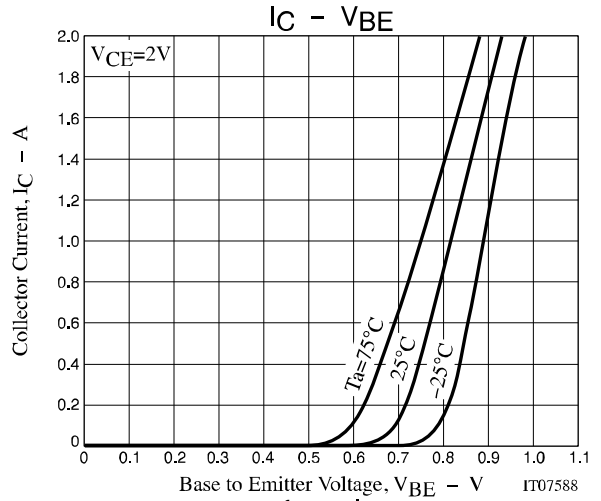
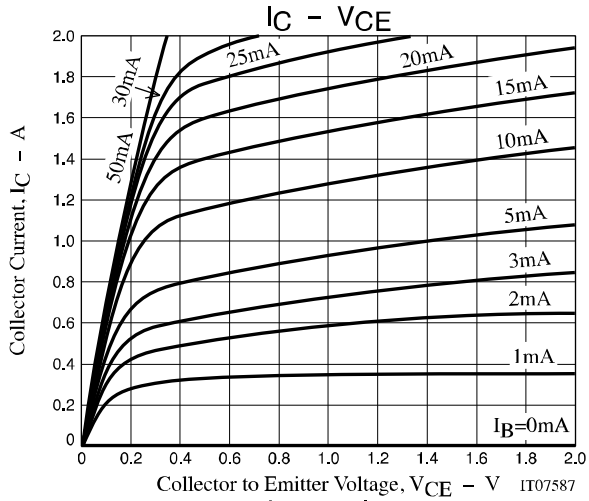
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Collector Cutoff Current	ICBO	V <sub>CB</sub> =50V, I <sub>E</sub> =0A			1	μA
Emitter Cutoff Current	IEBO	V <sub>EB</sub> =4V, I <sub>C</sub> =0A			1	μA
DC Current Gain	hFE1	V <sub>CE</sub> =2V, I <sub>C</sub> =100mA	200		560	
	hFE2	V <sub>CE</sub> =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

Note 3 : Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

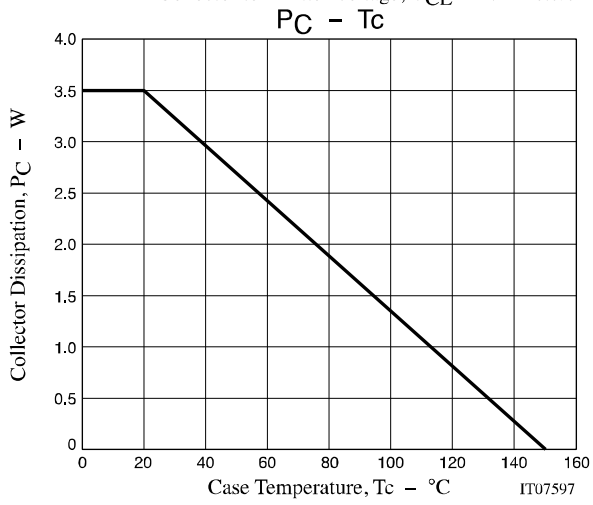
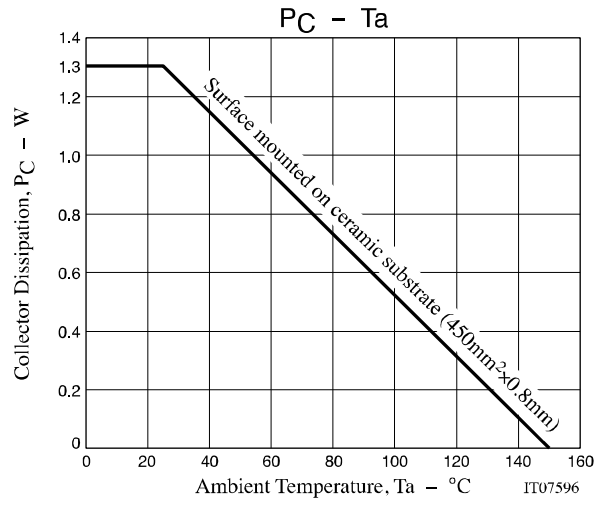
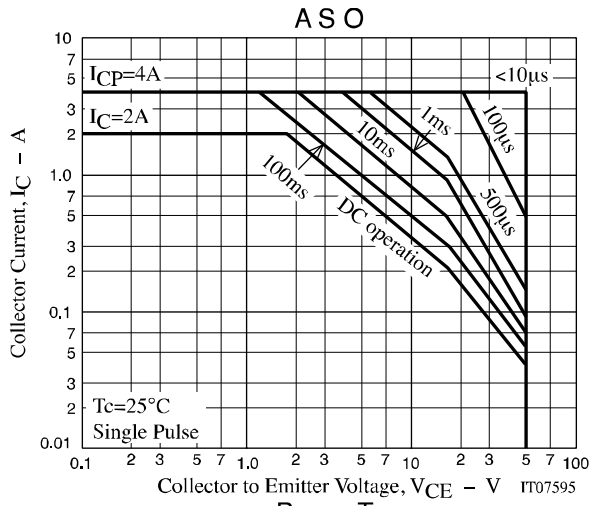
### Switching Time Test Circuit



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



# 2SC5994



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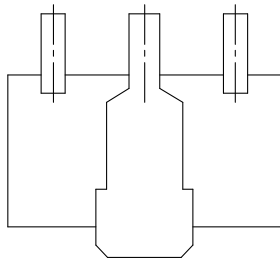
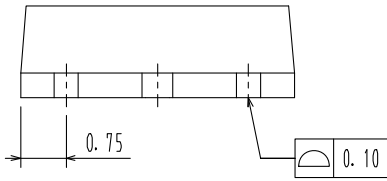
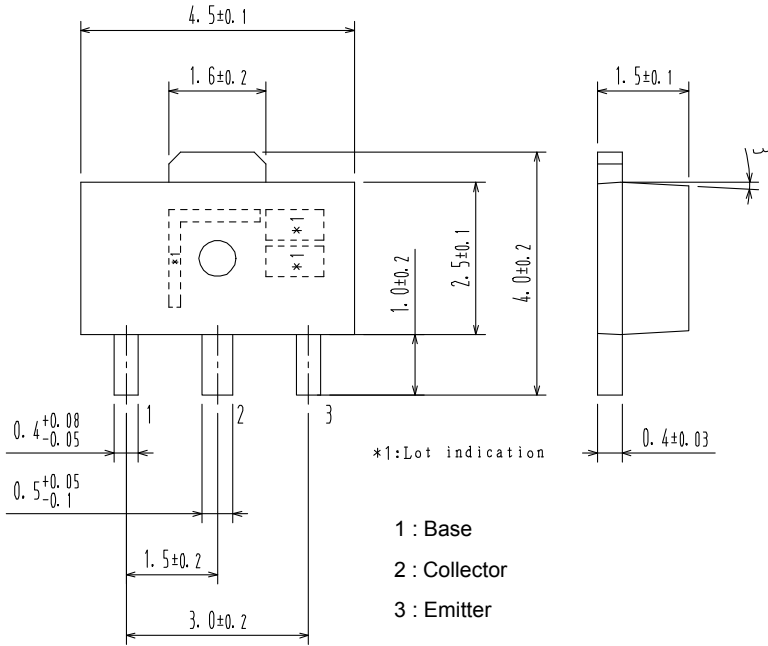
## PACKAGE DIMENSIONS

unit : mm

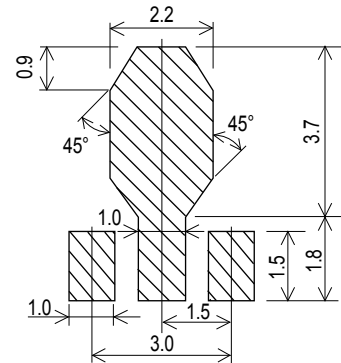
SOT-89 / PCP-1

CASE 419AU

ISSUE 0



## Recommended Soldering Footprint



## ORDERING INFORMATION

Device	Marking	Package	Shipping (Qty / Packing)
2SC5994-TD-E	FJ	SOT-89 / PCP-1 (Pb-Free)	1,000 / Tape & Reel

† For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D. [http://www.onsemi.com/pub\\_link/Collateral/BRD8011-D.PDF](http://www.onsemi.com/pub_link/Collateral/BRD8011-D.PDF)

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