onsemi

Bipolar Transistor

50 V, 2 A, Low V_{CE}(sat), NPN Single

2SC5994

Features

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

Applications

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

SPECIFICATIONS ABSOLUTE MAXIMUM RATINGS at Ta = 25°C

Parameter	Symbol	Value	Unit
Collector to Base Voltage	V _{CBO}	100	V
Collector to Emitter Voltage	V _{CES}	100	V
	V _{CEO}	50	V
Emitter to Base Voltage	V _{EBO}	6	V
Collector Current	۱ _C	2	А
Collector Current (Pulse)	I _{CP}	4	А
Base Current	Ι _Β	400	mA
Collector Dissipation (Note 1) $T_{C} = 25^{\circ}C$	P _C	1.3 3.5	W
Junction Temperature	Т _Ј	150	°C
Storage Temperature	T _{STG}	–55 to +150	°C

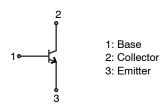
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Surface mounted on ceramic substrate (450 mm² x 0.8 mm).

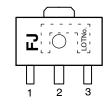


SOT-89 / PCP-1 CASE 419AU

ELECTRICAL CONNECTION



MARKING DIAGRAM



FJ = Specific Device Code

ORDERING INFORMATION

Device	Package	Shipping [†]
2SC5994-TD-E	SOT-89 / PCP-1	1000 / 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, <u>BRD8011/D</u>.

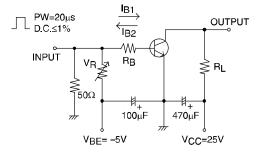
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ELECTRICAL CHARACTERISTICS at $T_A = 25^{\circ}C$

Parameter			Value			
	Symbol	Conditions	Min	Тур	Max	Unit
Collector Cutoff Current	I _{CBO}	$V_{CB} = 50 \text{ V}, I_E = 0 \text{ A}$			1	μA
Emitter Cutoff Current	I _{EBO}	$V_{EB} = 4 V, I_{C} = 0 A$			1	μA
DC Current Gain	h _{FE} 1	$V_{CE} = 2 \text{ V}, \text{ I}_{C} = 100 \text{ mA}$	200		560	
	h _{FE} 2	$V_{CE} = 2 \text{ V}, \text{ I}_{C} = 1.5 \text{ A}$	40			
Gain-Bandwidth Product	f _T	V_{CE} = 10 V, I _C = 300 mA		420		MHz
Output Capacitance	Cob	V _{CB} = 10 V, f = 1 MHz		9		pF
Collector to Emitter Saturation Voltage	V _{CE} (sat)	I _C = 1 A, I _B = 50 mA		135	300	mV
Base to Emitter Saturation Voltage	V _{BE} (sat)	I _C = 1 A, I _B = 50 mA		0.9	1.2	V
Collector to Base Breakdown Voltage	V _{(BR)CBO}	I _C = 10 μA, I _E = 0 A	100			V
Collector to Emitter Breakdown Voltage	V _{(BR)CES}	I_{C} = 100 μA, R_{BE} = 0 Ω	100			V
	V _{(BR)CEO}	I_{C} = 1 mA, R_{BE} = ∞	50			V
Emitter to Base Breakdown Voltage	V _{(BR)EBO}	I _E = 10 μA, I _C = 0 A	6			V
Turn-On Time	t _{on}	See specified Test Circuit		30		ns
Storage Time	t _{stg}]		330		ns
Fall Time	t _f	1		40		ns

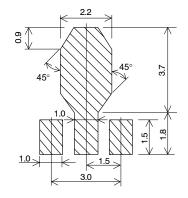
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

Switching Time Test Circuit



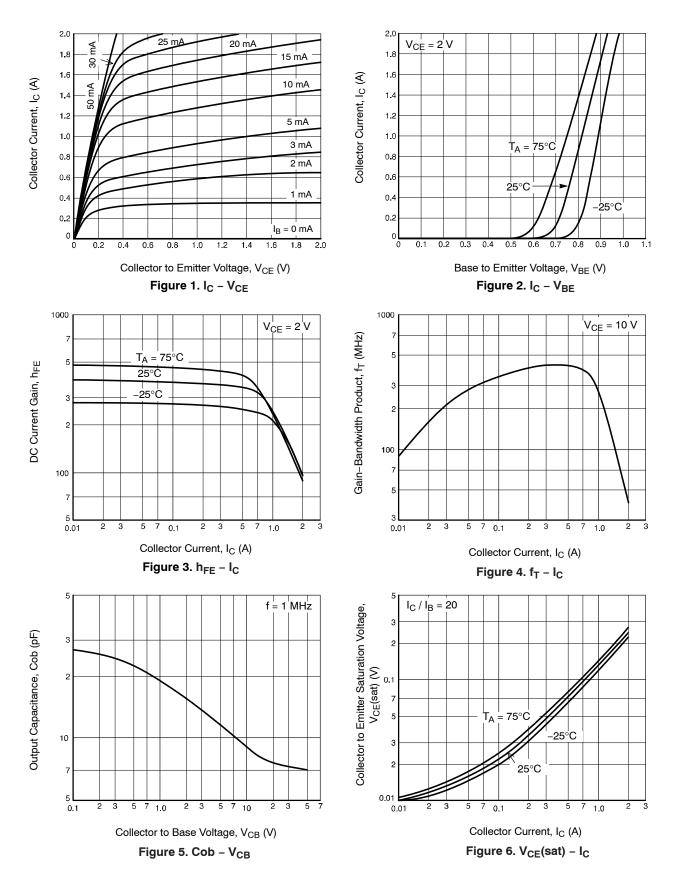
 $I_{C} = 10 I_{B1} = -10 I_{B2} = 700 \text{ mA}$

Recommended Soldering Footprint



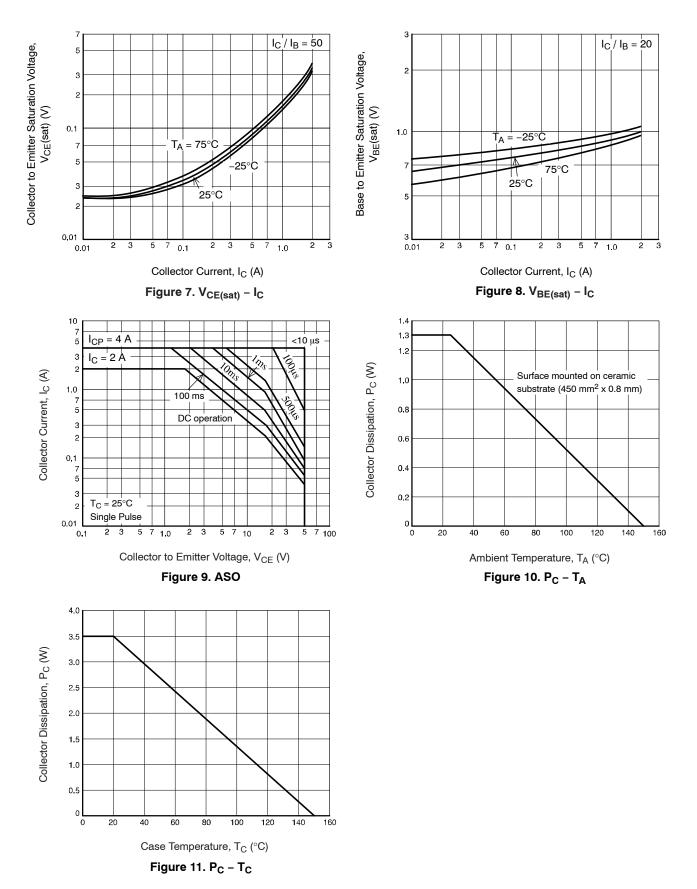
2SC5994

TYPICAL CHARACTERISTICS



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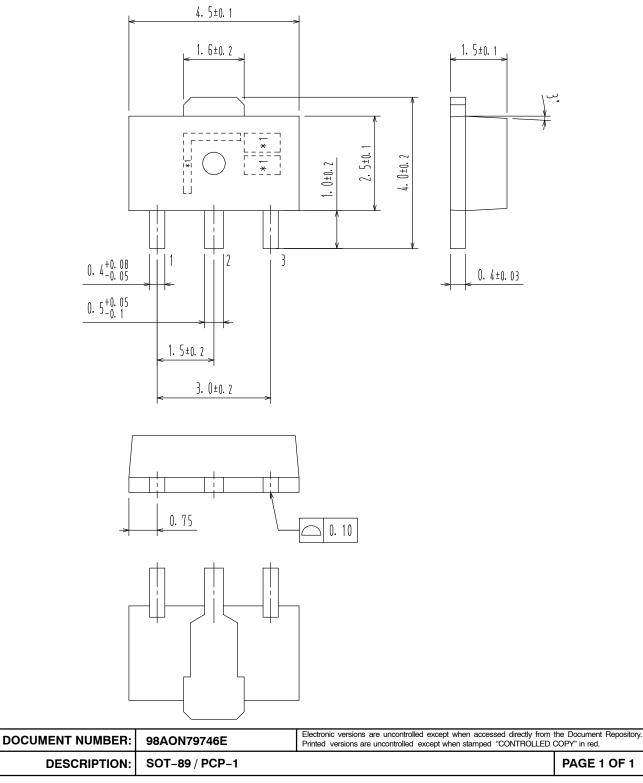
TYPICAL CHARACTERISTICS (continued)





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DATE 30 APR 2012



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