2SC5994

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

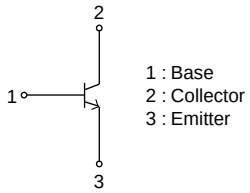
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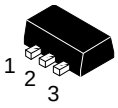
Features
- Adoption of MBIT Process
- Low Collector to Emitter Saturation Voltage
- Large Current Capacity
- High Speed Switching

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

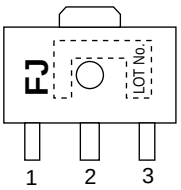
ELECTRICAL CONNECTION



MARKING



SOT-89 / PCP-1



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

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

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		I_C	2	A
Collector Current (Pulse)		I_{CP}	4	A
Base Current		I_B	400	mA
Collector Dissipation	(Note 2)	P_C	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($450mm^2 \times 0.8mm$)

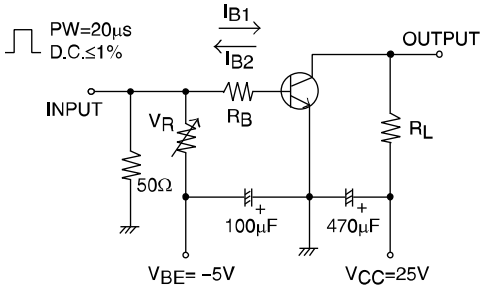
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ELECTRICAL CHARACTERISTICS at Ta = 25°C (Note 3)

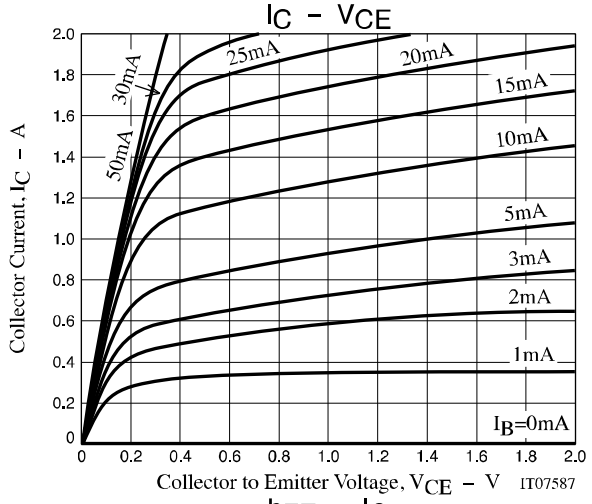
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=50V, I_E=0A			1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=4V, I_C=0A			1	μA
DC Current Gain	$h_{FE}1$	V_{CE}=2V, I_C=100mA	200		560	
	$h_{FE}2$	V_{CE}=2V,I_C=1.5A	40			
Gain-Bandwidth Product	f_T	V_{CE}=10V, I_C=300mA		420		MHz
Output Capacitance	Cob	V_{CB}=10V, f=1MHz		9		pF
Collector to Emitter Saturation Voltage	V_{CE}(sat)	I_C=1A, I_B=50mA		135	300	mV
Base to Emitter Saturation Voltage	V_{BE}(sat)	I_C=1A, I_B=50mA		0.9	1.2	V
Collector to Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=10μA, I_E=0A	100			V
Collector to Emitter Breakdown Voltage	$V_{(BR)CES}$	I_C=100μA, R_{BE}=0Ω	100			V
	$V_{(BR)CEO}$	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		30		ns
Storage Time	t_{stg}			330		ns
Fall Time	t_f			40		ns

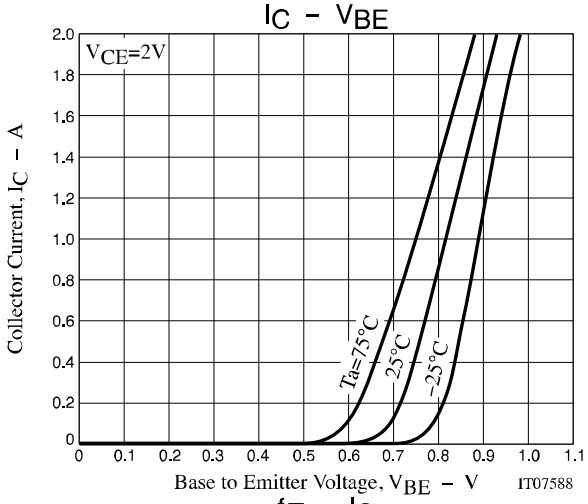
Note 3 : Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

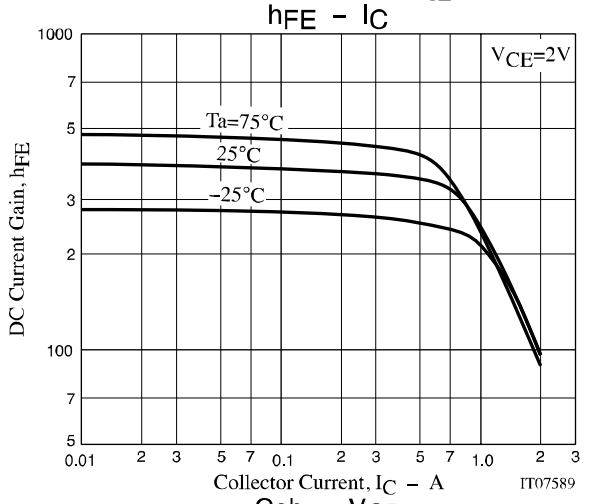
Switching Time Test Circuit

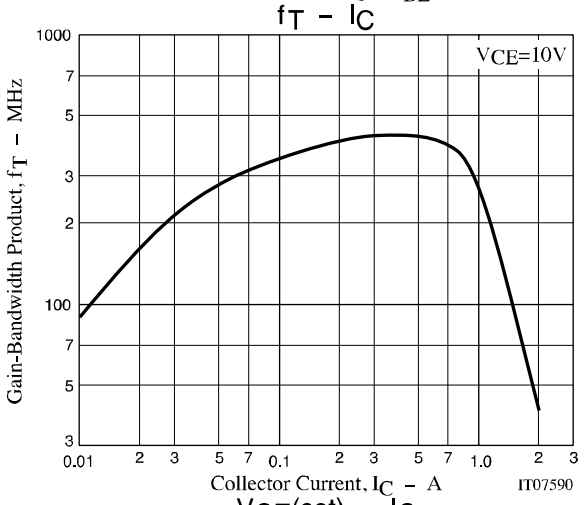


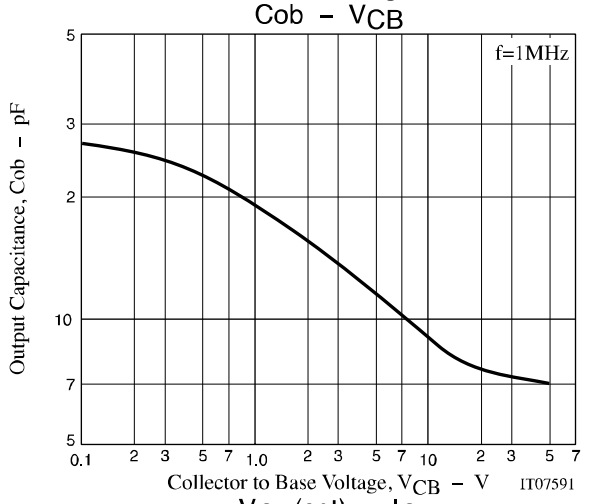
I_C=10I_{B1}= −10I_{B2}=700mA

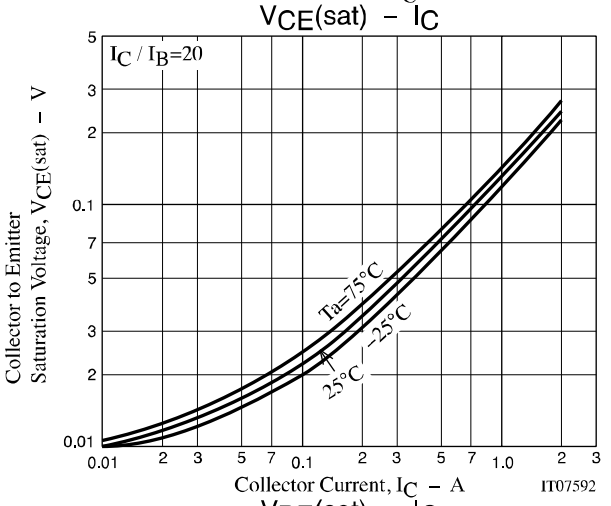

IC – VCE
Collector Current, IC – A
Collector to Emitter Voltage, VCE – V
IT07587
30mA
50mA
25mA
20mA
15mA
10mA
5mA
3mA
2mA
1mA
IB=0mA

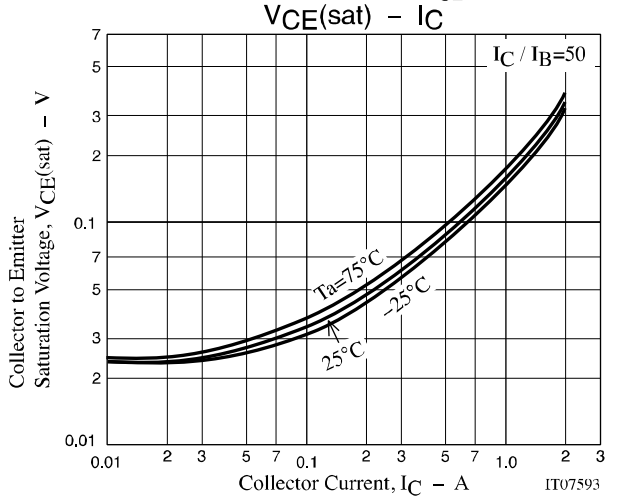

IC – VBE
VCE=2V
Collector Current, IC – A
Base to Emitter Voltage, VBE – V
IT07588
Ta=75°C
25°C
–25°C

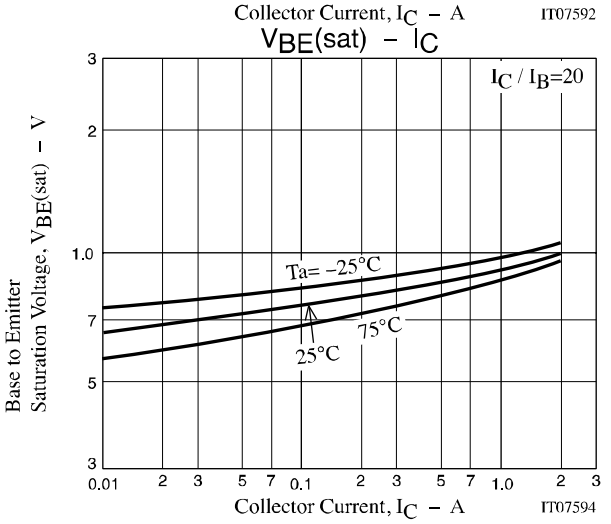

hFE – IC
VCE=2V
DC Current Gain, hFE
Collector Current, IC – A
IT07589
Ta=75°C
25°C
–25°C

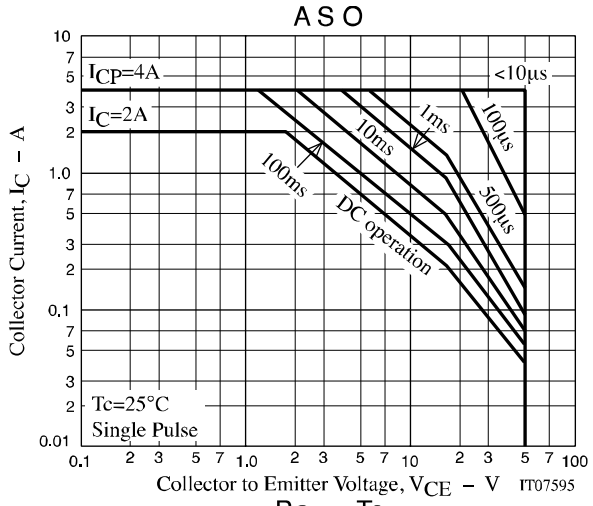

fT – IC
VCE=10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT07590

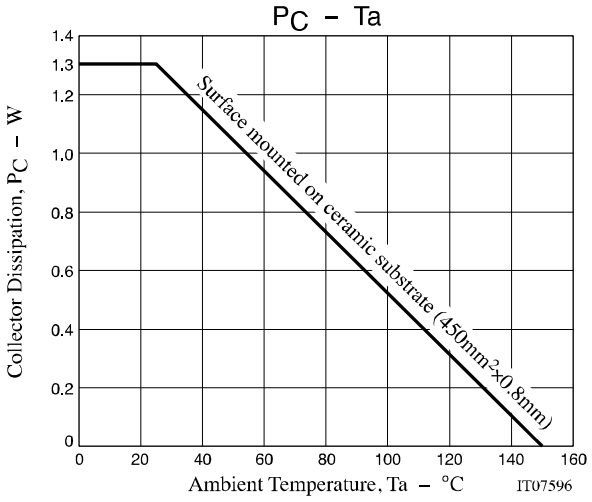

Cob – VCB
f=1MHz
Output Capacitance, Cob – pF
Collector to Base Voltage, VCB – V
IT07591

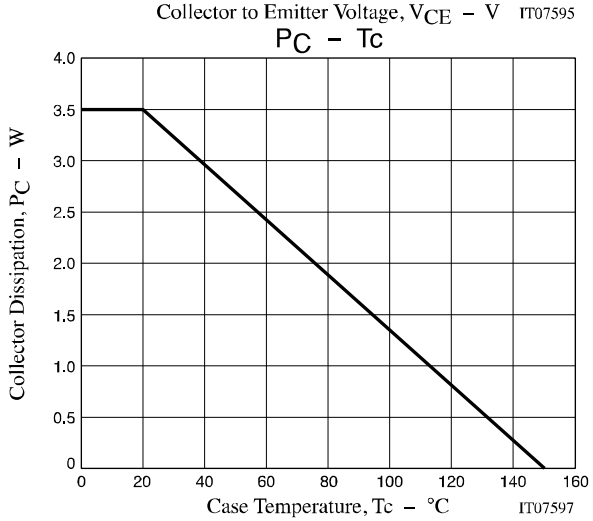

VCE(sat) – IC
IC / IB=20
Collector to Emitter
Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
IT07592
Ta=75°C
25°C
–25°C


VCE(sat) – IC
IC / IB=50
Collector to Emitter
Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
IT07593
Ta=75°C
25°C
–25°C


VBE(sat) – IC
IC / IB=20
Base to Emitter
Saturation Voltage, VBE(sat) – V
Collector Current, IC – A
IT07594
Ta= –25°C
25°C
75°C


A S O
Collector Current, I_C – A
I_{CP}=4A
I_C=2A
<10µs
1ms
10ms
100µs
500µs
100ms
DC operation
Tc=25°C
Single Pulse
Collector to Emitter Voltage, V_{CE} – V
IT07595

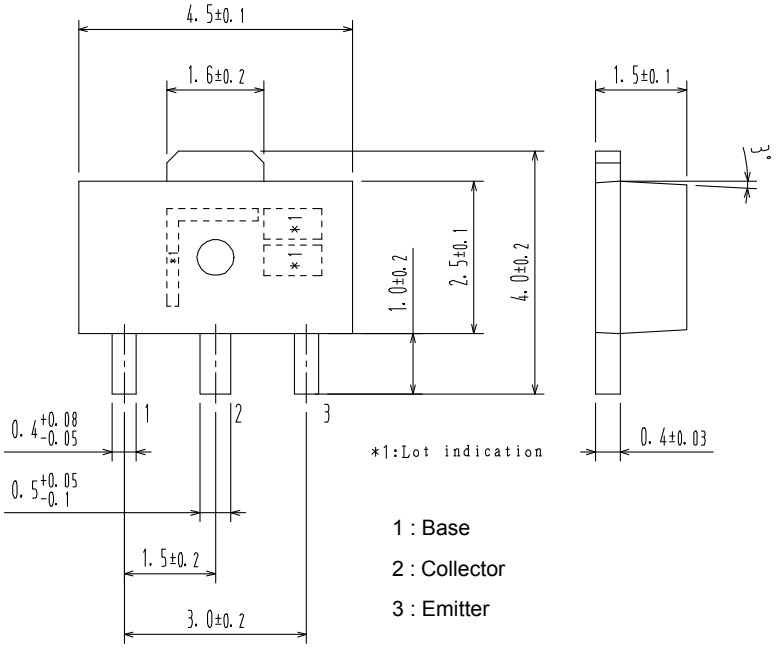

P_C – Ta
Collector Dissipation, P_C – W
Surface mounted on ceramic substrate (450mm²×0.8mm)
Ambient Temperature, Ta – °C
IT07596

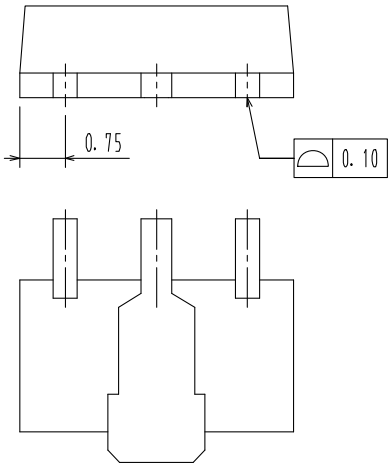

P_C – Tc
Collector Dissipation, P_C – W
Case Temperature, Tc – °C
IT07597

PACKAGE DIMENSIONS

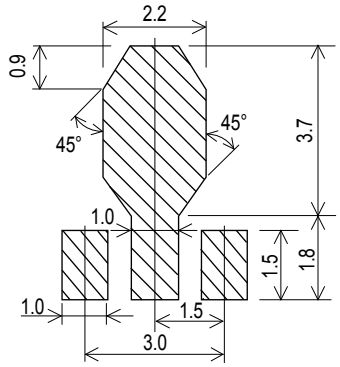
unit : mm

SOT-89 / PCP-1
CASE 419AU
ISSUE O





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

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