NEC

SILICON TRANSISTORS
2SC4942

NPN SILICON TRIPLE DIFFUSED TRANSISTOR FOR HIGH-SPEED HIGH-VOLTAGE SWITCHING

The 2SC4942 is a transistor developed for high-speed high-voltage switching. This transistor is ideal for use in switching devices such as switching regulators and DC/DC converters.

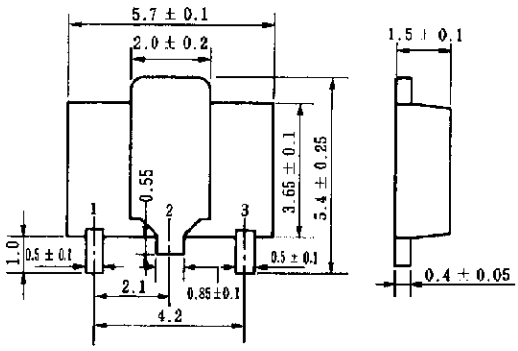
FEATURES

- New package with dimensions in between those of small signal and power signal package
- High voltage
- Fast switching speed
- Complementary transistor with the 2SA1871

QUALITY GRADES

- Standard
  Please refer to “Quality Grades on NEC Semiconductor Devices” (Document No. C11531E) published by NEC Corporation to know the specification of quality grade on the devices and its recommended applications.

PACKAGE DRAWING (UNIT: mm)



Electrode connection
1. Emitter
2. Collector
3. Base

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Parameter	Symbol	Conditions	Ratings	Unit
Collector to base voltage	V_{CBO}		600	V
Collector to emitter voltage	V_{CEO}		600	V
Emitter to base voltage	V_{EBO}		7.0	V
Collector current (DC)	$I_{D(DC)}$		1.0	A
Collector current (pulse)	$I_{D(pulse)}$	PW ≤ 10 ms, duty cycle ≤ 50 %	2.0	A
Total power dissipation	P_T	7.5 cm^2 × 0.7 mm ceramic board mounted	2.0	W
Junction temperature	T_j		150	°C
Storage temperature	T_{stg}		–55 to +150	°C

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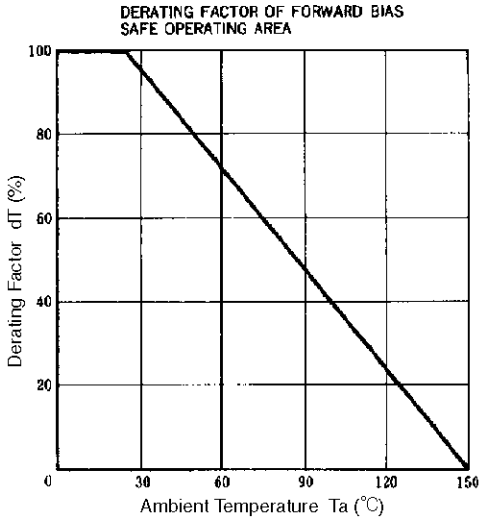
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

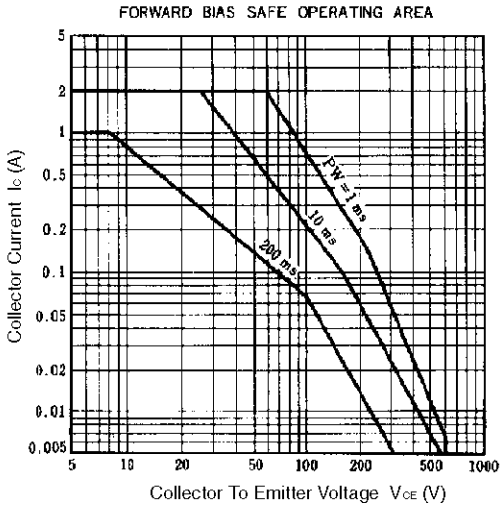
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I_{CBO}	V_{CB} = 600 V, I_E = 0			10	μA
Emitter cutoff current	I_{EBO}	V_{EB} = 7.0 V, I_C = 0			10	μA
DC current gain	h_{FE1}	V_{CE} = 5.0 V, I_C = 0.1 A	30	55	120	–
DC current gain	h_{FE2}	V_{CE} = 5.0 V, I_C = 0.5 A	5	10		–
Collector saturation voltage	$V_{CE(sat)}$	I_C = 400 mV, I_B = 80 mA		0.35	1.0	V
Base saturation voltage	$V_{BE(sat)}$	I_C = 400 mV, I_B = 80 mA		0.9	1.2	V
Gain bandwidth product	f_T	V_{CE} = 5.0 V, I_E = –50 mA		30		MHz
Output capacitance	C_{ob}	V_{CB} = 10 V, I_E = 0, f = 1.0 MHz		15		pF
Turn-on time	t_{ON}	I_C = 0.5 A, V_{CC}= 250 V I_{B1} = –I_{B2} = 0.1 A R_L = 500 Ω		0.1	0.5	μs
Storage time	t_{stg}			4.0	5.0	μs
Fall time	t_f			0.2	0.5	μs

h_{FE} CLASSIFICATION

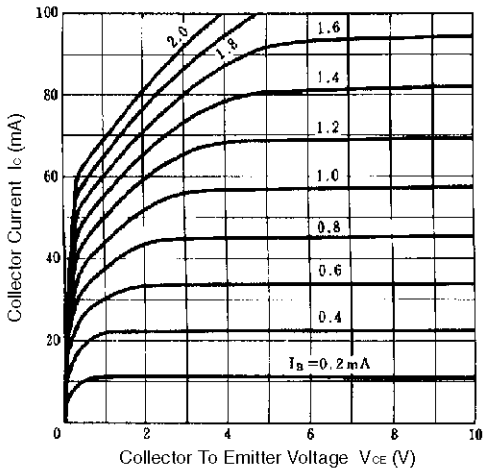
Marking	AA1	AA2	AA3
h_{FE1}	30 to 60	40 to 80	60 to 120

TYPICAL CHARACTERISTICS (Ta = 25°C)

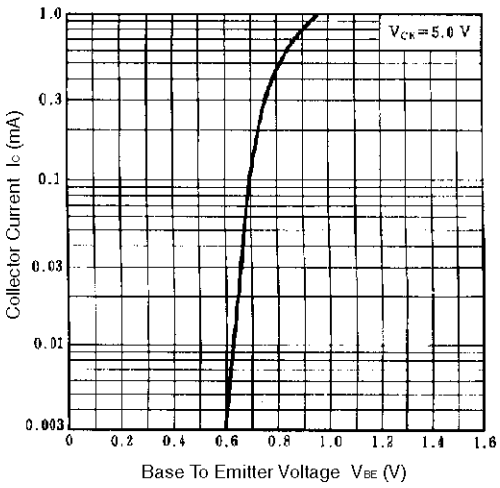




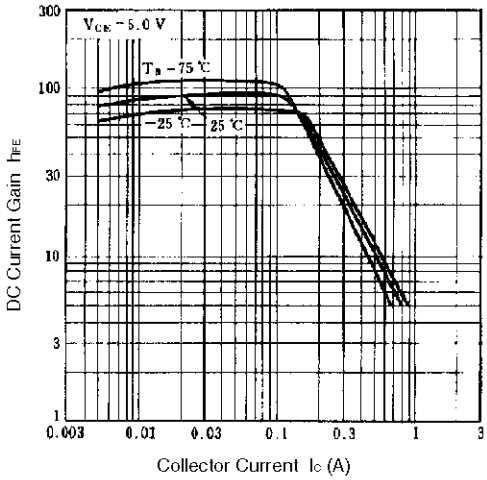
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



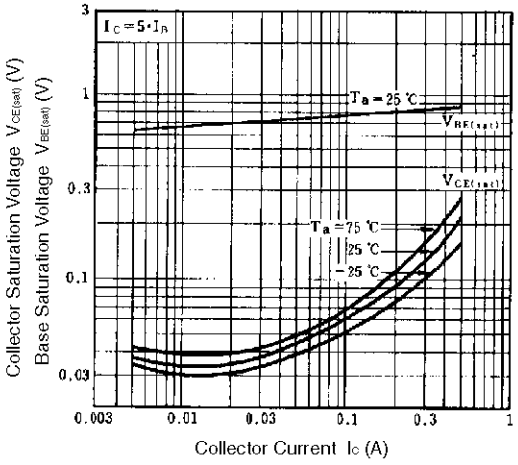
COLLECTOR CURRENT vs.
BASE TO EMITTER VOLTAGE



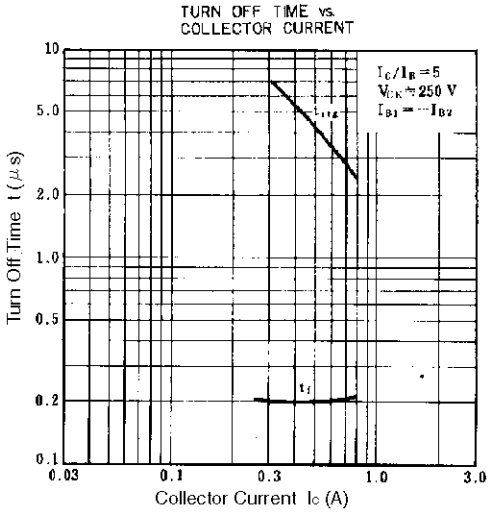
DC CURRENT GAIN vs.
COLLECTOR CURRENT



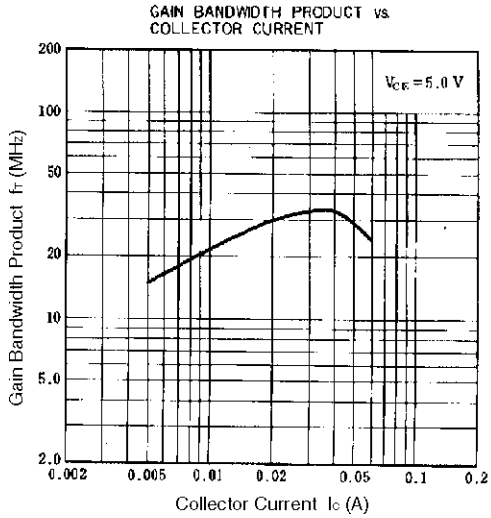
COLLECTOR AND BASE SATURATION
VOLTAGE vs. COLLECTOR CURRENT

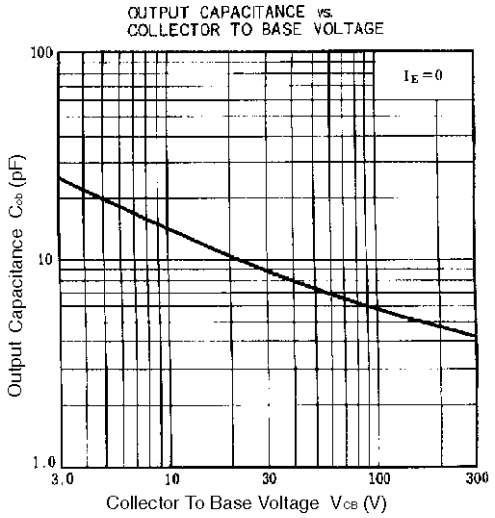


TURN OFF TIME vs.
COLLECTOR CURRENT



GAIN BANDWIDTH PRODUCT vs.
COLLECTOR CURRENT




OUTPUT CAPACITANCE vs.
COLLECTOR TO BASE VOLTAGE
$I_E = 0$
Output Capacitance C_{ob} (pF)
100
10
1.0
3.0
10
30
100
300
Collector To Base Voltage V_{CB} (V)

[MEMO]

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