NEC

SILICON TRANSISTOR
2SA1871

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

The 2SA1871 is a transistor developed for high-speed high-voltage switching and is ideal for use in switching elements such as switching regulators and DC/DC converters.

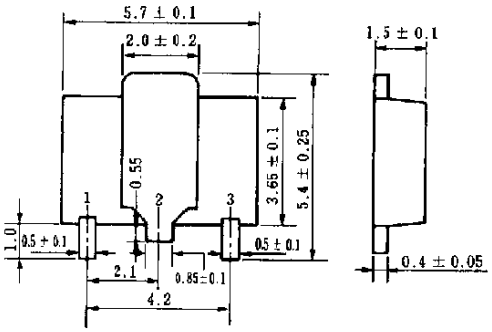
FEATURES

- New package with dimensions in between those of small signal and power signal package
- High voltage
- Fast switching speed
- Complementary transistor with 2SC4942

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)	$I_{C(DC)}$		–1.0	A
Collector current (pulse)	$I_{C(pulse)}$	PW ≤ 10 ms, duty cycle ≤ 50 %	–2.0	A
Total power dissipation	P_T	7.5 cm^2 × 0.7 mm ceramic board used	2.0	W
Junction temperature	T_j		150	°C
Storage temperature	T_{stg}		–55 to +150	°C

Document No. D16144EJ1V0DS00 (1st edition)
Date Published April 2002 N CP(K)
Printed in Japan

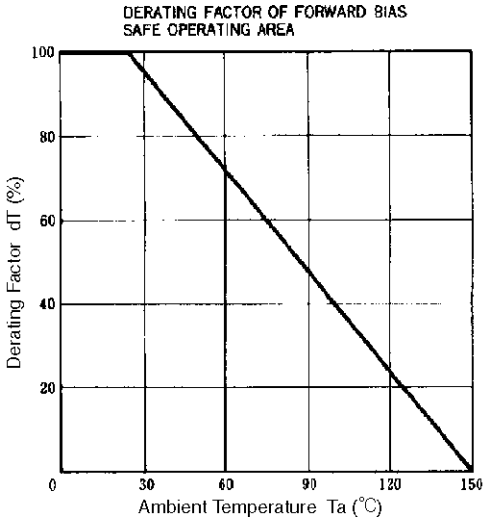
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

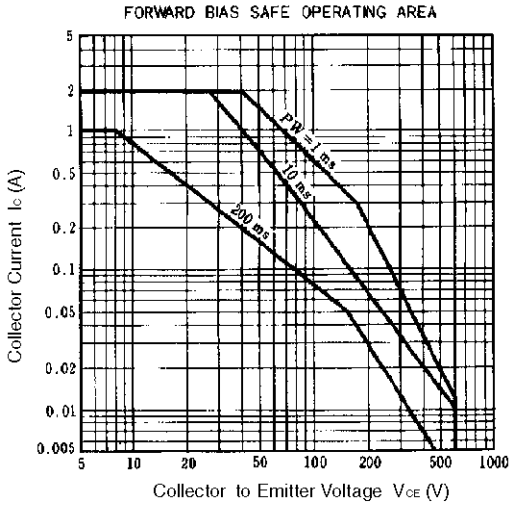
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I_{CBO}	V_{CB} = –600 V, I_E = 0			–10	μA
Emitter cutoff current	I_{EBO}	V_{EB} = –7.0 V, I_C = 0			–10	μA
DC current gain	h_{FE1}	V_{CE} = –5.0 V, I_C = –0.1 A	30	60	120	–
DC current gain	h_{FE2}	V_{CE} = –5.0 V, I_C = –0.5 A	5	20		–
Collector saturation voltage	$V_{CE(sat)}$	I_C = –300 mA, I_B = –60 mA		–0.3	–1.0	V
Base saturation voltage	$V_{BE(sat)}$	I_C = –300 mA, I_B = –60 mA		–0.85	–1.2	V
Gain bandwidth product	f_T	V_{CE} = –10 V, I_E = 50 mA		30		MHz
Output capacitance	C_{ob}	V_{CB} = –10 V, I_E = 0, f = 1.0 MHz		40		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}			3.5	5.0	μs
Fall time	t_f			0.1	0.5	μs

h_{FE} CLASSIFICATION

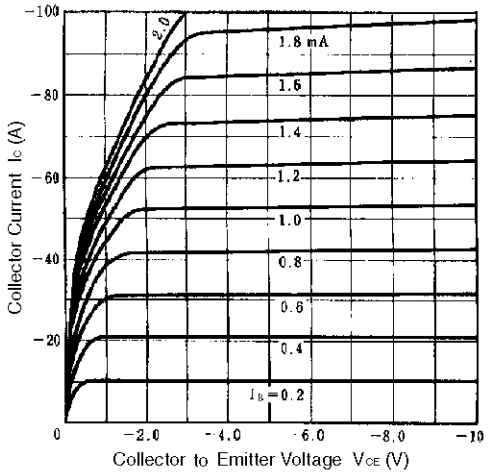
Marking	GA1	GA2	GA3
h_{FE1}	30 to 60	40 to 80	60 to 120

TYPICAL CHARACTERISTICS (Ta = 25°C)

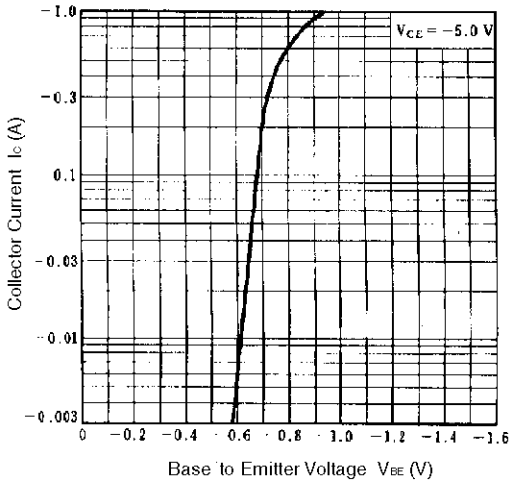




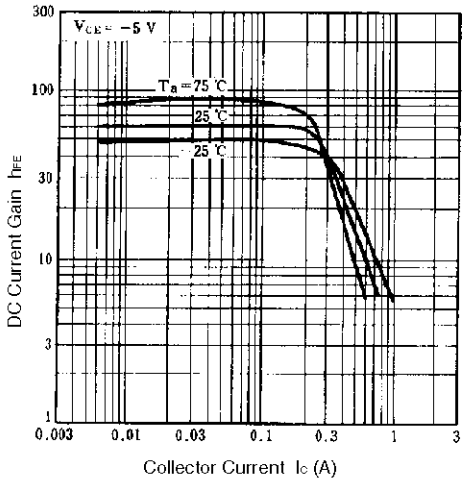
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



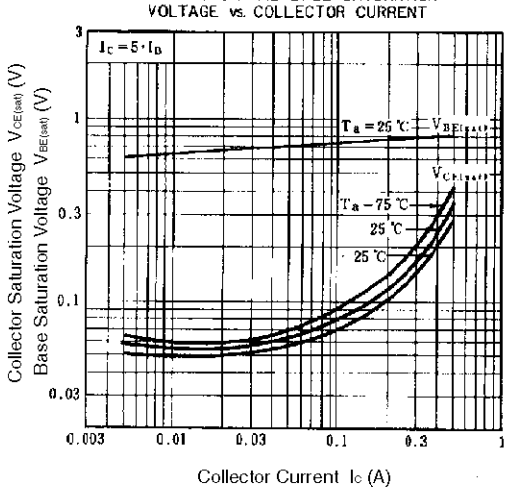
COLLECTOR CURRENT vs.
BASE TO EMITTER VOLTAGE



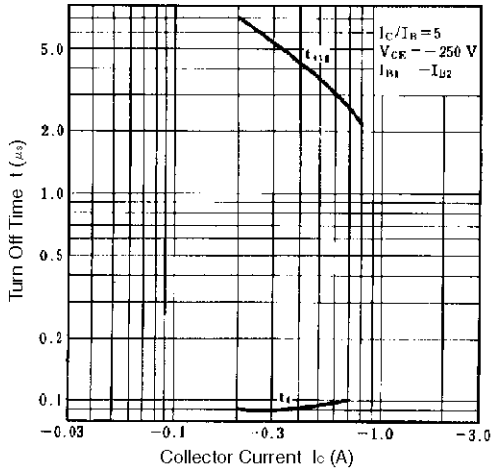
DC CURRENT GAIN vs.
COLLECTOR CURRENT



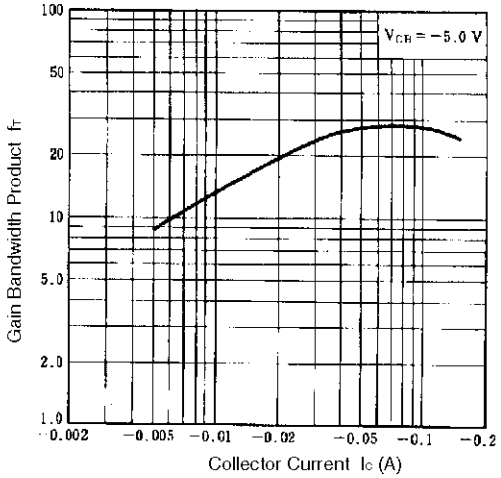
COLLECTOR AND BASE SATURATION
VOLTAGE vs. COLLECTOR CURRENT

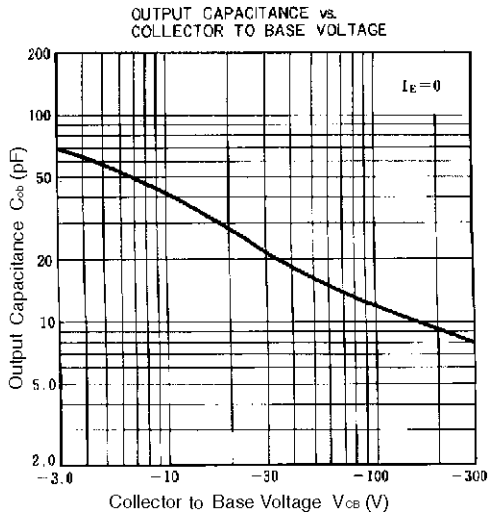


TURN OFF TIME vs.
COLLECTOR CURRENT



GAIN BANDWIDTH PRODUCT vs.
COLLECTOR CURRENT




OUTPUT CAPACITANCE vs.
COLLECTOR TO BASE VOLTAGE
$I_E = 0$
Output Capacitance C_{ob} (pF)
200
100
50
20
10
5.0
2.0
−3.0
−10
−30
−100
−300
Collector to Base Voltage V_{CB} (V)

[MEMO]

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