To our customers,

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Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

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DATA SHEET

RENESAS

SILICON TRANSISTOR
2SD2402

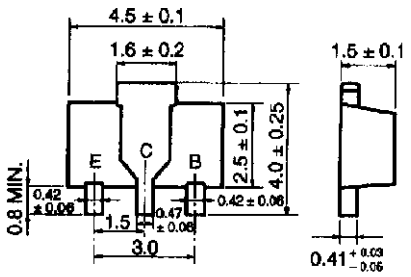
NPN SILICON EPITAXIAL TRANSISTOR FOR LOW-FREQUENCY POWER AMPLIFIERS AND MID-SPEED SWITCHING

The 2SD2402 is a transistor featuring high current capacitance in small dimension. This transistor is ideal for DC/DC converters and motor drivers.

FEATURES

- High current capacitance
- Low collector saturation voltage
- Complementary transistor with 2SB1571

PACKAGE DRAWING (UNIT: mm)



Electrode Connection

E : Emitter
C : Collector(Fin)
B : Base

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Parameter	Symbol	Conditions	Ratings	Unit
Collector to base voltage	V_{CBO}		50	V
Collector to emitter voltage	V_{CEO}		30	V
Emitter to base voltage	V_{EBO}		6.0	V
Collector current (DC)	$I_{C(DC)}$		5.0	A
Collector current (pulse)	$I_{C(pulse)}$	PW ≤ 10 ms duty cycle ≤ 50 %	8.0	A
Base current (DC)	$I_{B(DC)}$		0.2	A
Base current (pulse)	$I_{B(pulse)}$	PW ≤ 10 ms duty cycle ≤ 50 %	0.4	A
Total power dissipation	P_T	16 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

Document No. D16155EJ2V0DS00 (2nd edition)
Date Published April 2002 N CP(K)
Printed in Japan

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

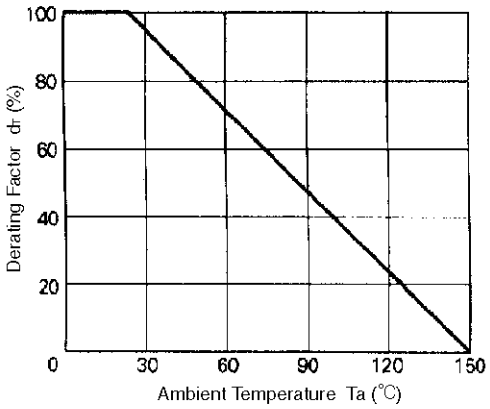
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I_{CBO}	V_{CB} = 50 V, I_E = 0			100	nA
Emitter cutoff current	I_{EBO}	V_{EB} = 6.0 V, I_C = 0			100	nA
DC current gain	h_{FE1}	V_{CE} = 1.0 V, I_C = 1.0 A	80			–
DC current gain	h_{FE2}	V_{CE} = 1.0 V, I_C = 2.0 A	100	200	400	–
DC base voltage	V_{BE}	V_{CE} = 1.0 V, I_C = 0.1 A	600	650	700	mV
Collector saturation voltage	$V_{CE(sat)1}$	I_C = 3.0 V, I_B = 0.15 A		140	300	mV
Collector saturation voltage	$V_{CE(sat)2}$	I_C = 5.0 V, I_B = 0.25 A		230	500	mV
Base saturation voltage	$V_{BE(sat)}$	I_C = 3.0 V, I_B = 0.15 A		0.88	1.2	V
Gain bandwidth product	f_T	V_{CE} = 10 V, I_E = –0.5 A		170		MHz
Output capacitance	C_{ob}	V_{CB} = 10 V, I_E = 0, f = 1 MHz		60		pF
Turn-on time	t_{on}	I_C = 2.0 A, V_{CC}= 10 V I_{B1} = –I_{B2} = 0.1 A R_L = 500 Ω		275		ns
Storage time	t_{stg}			485		ns
Fall time	t_f			45		ns

h_{FE} CLASSIFICATION

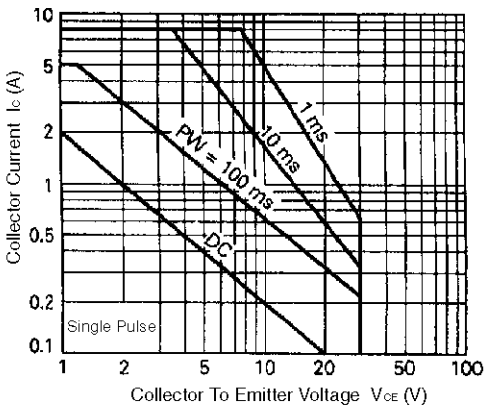
Marking	EX	EY	EZ
h_{FE2}	100 to 200	160 to 320	200 to 400

TYPICAL CHARACTERISTICS (Ta = 25°C)

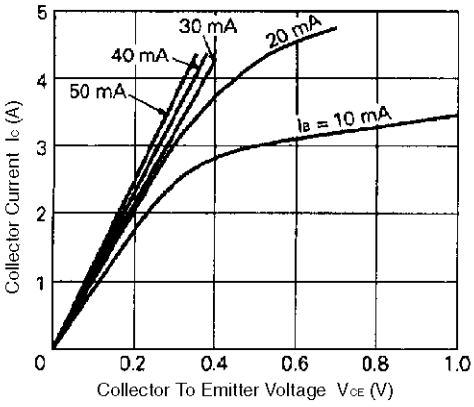
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



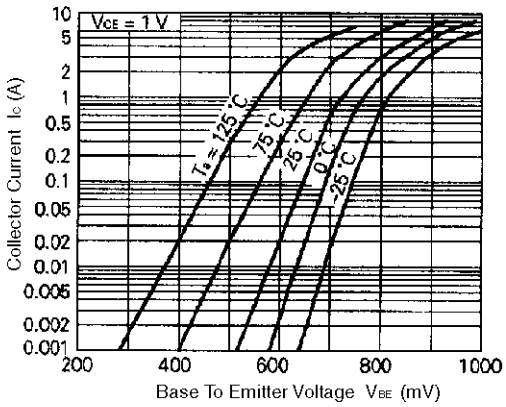
FORWARD BIAS SAFE OPERATING AREA



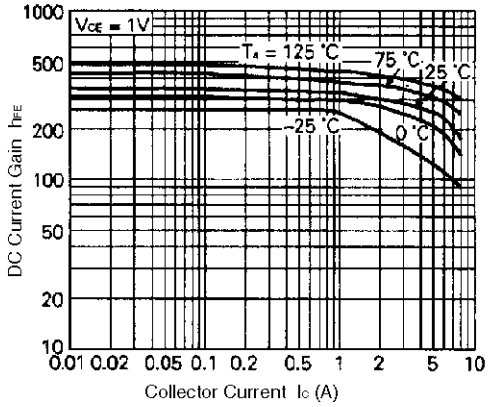
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



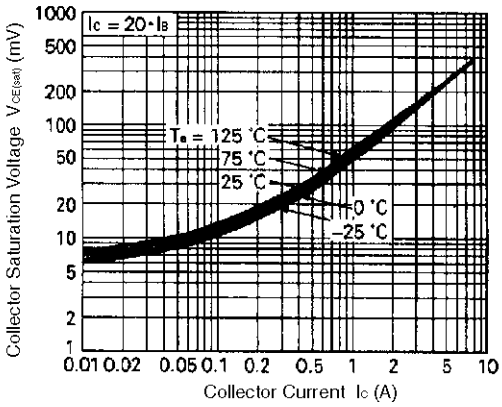
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



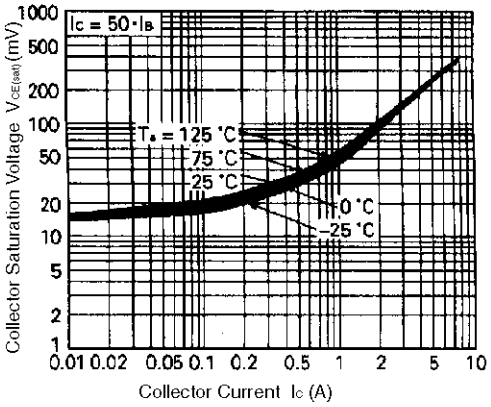
DC CURRENT GAIN vs. COLLECTOR CURRENT



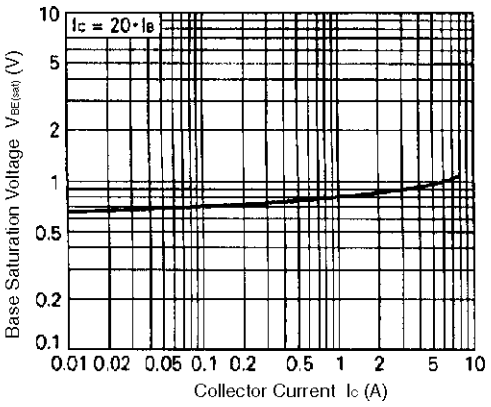
COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



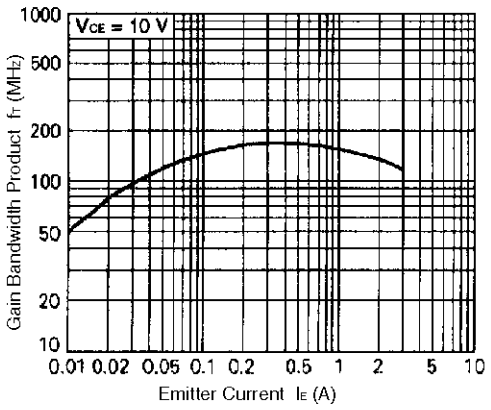
COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



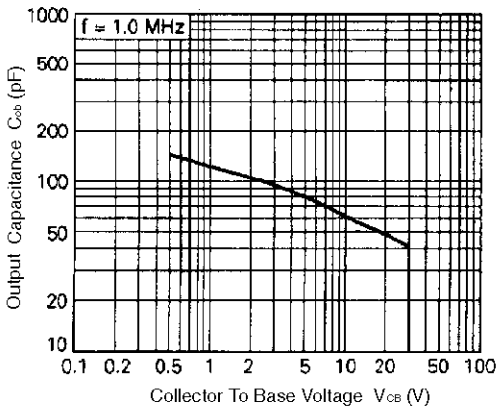
BASE SATURATION VOLTAGE vs. COLLECTOR CURRENT



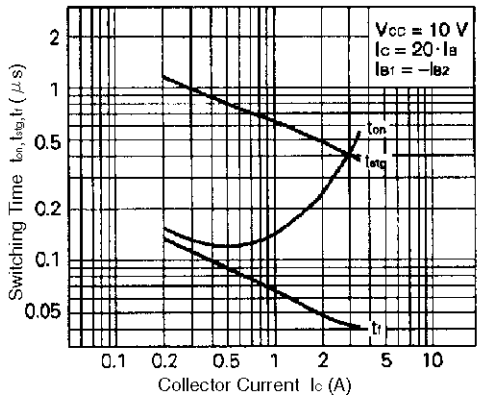
GAIN BANDWIDTH PRODUCT vs. EMITTER CURRENT



OUTPUT CAPACITANCE vs. REVERSE VOLTAGE



SWITCHING CHARACTERISTICS



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