To our customers,

Old Company Name in Catalogs and Other Documents

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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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RENESAS

SILICON TRANSISTOR

2SB1657

AUDIO FREQUENCY AMPLIFIER, SWITCHING
PNP SILICON EPITAXIAL TRANSISTORS

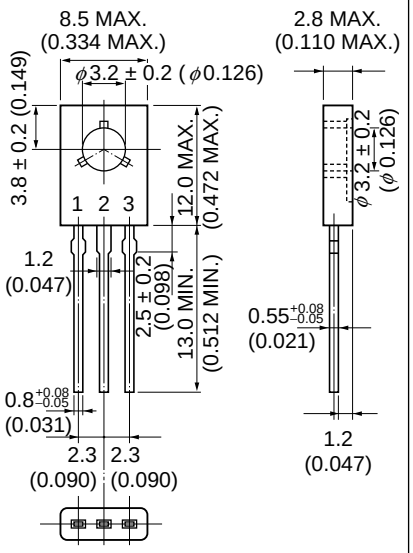
FEATURES

- Low $V_{CE(sat)}$
  $V_{CE(sat)}$ = –0.15 V Max (@I_C/I_B = 0.5 A/25 mA)
- High DC Current Gain
  h_{FE} = 150 to 600 (@V_{CE} = –2.0 V, I_C = –0.5 A)

ABSOLUTE MAXIMUM RATINGS

Maximum Voltage and Current (T_A = 25 °C)		
Collector to Base Voltage	V_{CB0}	–30 V
Collector to Emitter Volteage	V_{CE0}	–30 V
Emitter to Base Voltage	V_{EB0}	–6.0 V
Collector Current (DC)	$I_{C(DC)}$	–5.0 A
Collector Current (Pulse)*	$I_{C(Pulse)}$	–8.0 A
Base Current (DC)	$I_{B(DC)}$	–1.0 A
* PW ≤ 10ms, Duty Cycle ≤ 10 %		
Maximum Power Dissipation		
Total Power Dissipation (T_C = 25 °C)	P_T	10 W
Total Power Dissipation (T_A = 25 °C)	P_T	1.0 W
Maximum Temperature		
Junction Temperature	T_j	150 °C
Storage Temperature	T_{stg}	–55 to 150 °C

PACKAGE DIMENSIONS
in millimeters (inches)



1. Emitter
2. Collector connected to mounting plane
3. Base

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

characteristics	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Collector Cutoff Currnet	I_{CB0}	V_{CB} = –30 V, I_E = 0			–100	nA
Emitter Cutoff Current	I_{EB0}	V_{EB} = –6.0 V, I_C = 0			–100	nA
DC Current Gain	h_{FE1}	V_{CE} = –2.0 V, I_C = –0.5 A	150		600	—
DC Current Gain	h_{FE2}	V_{CE} = –2.0 V, I_C = –3.0 A	70			—
Collector Saturation Voltage	$V_{CE(sat)1}$	I_C = –0.5 A, I_B = –25 mA		–0.08	–0.15	V
Collector Saturation Voltage	$V_{CE(sat)2}$	I_C = –1.0 A, I_B = –50 mA		–0.13	–0.25	V
Collector Saturation Voltage	$V_{CE(sat)3}$	I_C = –2.0 A, I_B = –100 mA		–0.24	–0.40	V
Collector Saturation Voltage	$V_{CE(sat)4}$	I_C = –3.0 V, I_B = –75 mA		–0.46	–1.0	V
Base Saturation Voltage	$V_{BE(sat)}$	I_C = –1.0 A, I_B = –50 mA		–0.83	–1.50	V
Gain Bandwidth Product	f_T	V_{CE} = –10 V, I_E = –50 mA		75		MHz
Output Capacitance	C_{ob}	V_{CB} = –10 V, I_E = 0, f = 1 MHz		60		pF

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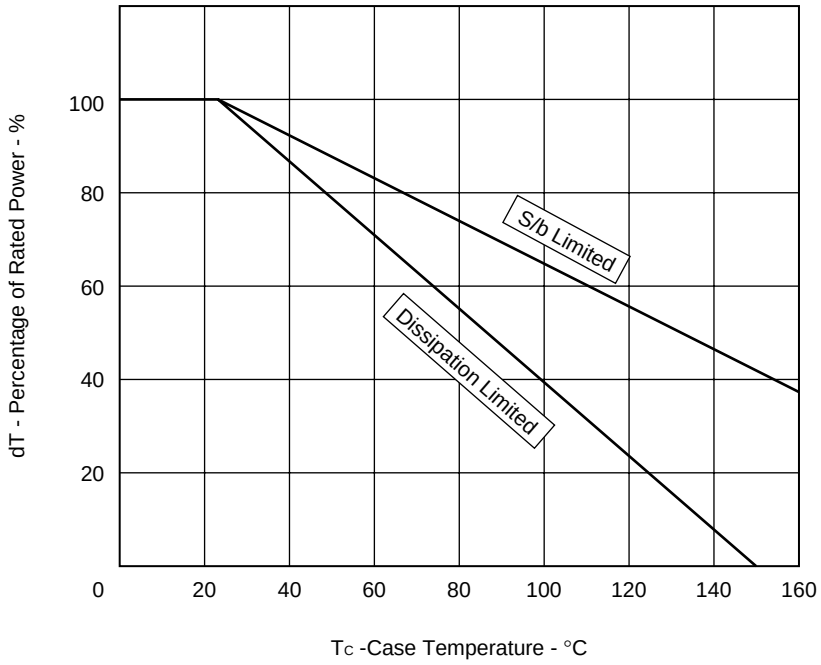
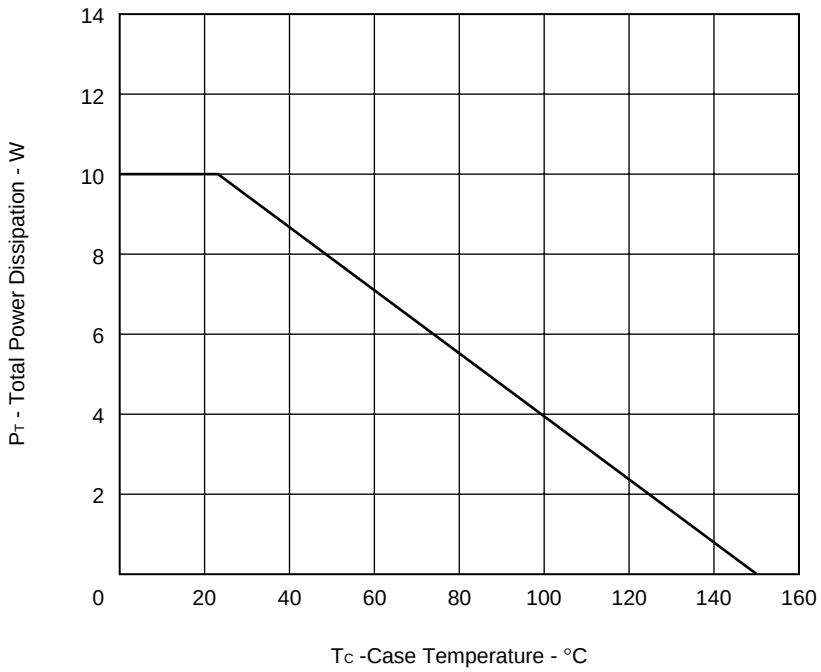
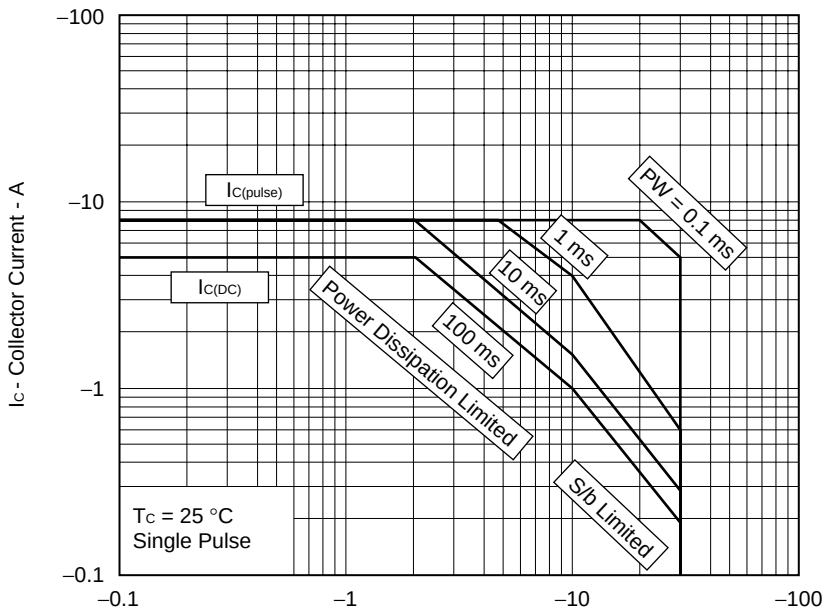
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



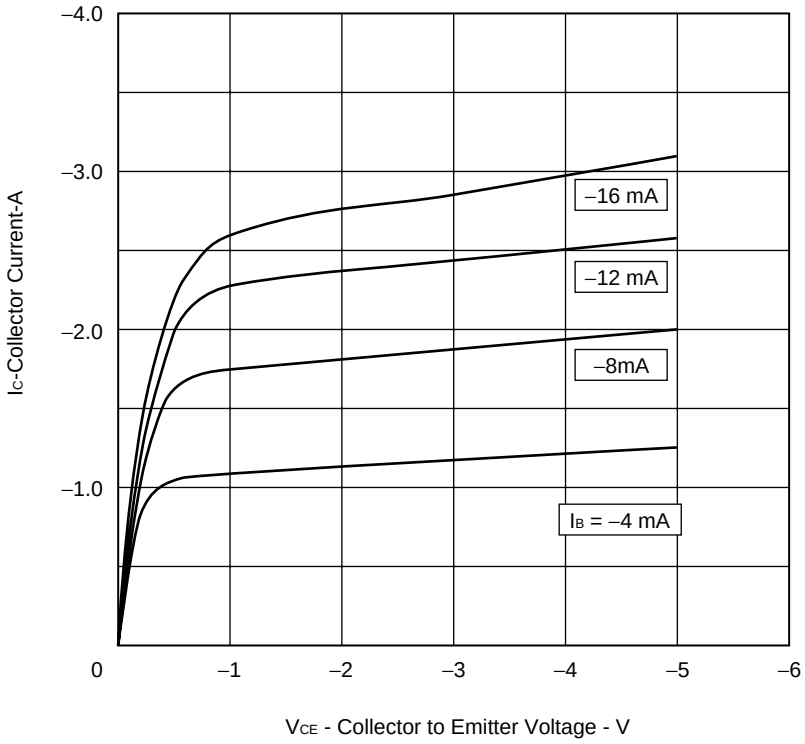
TOTAL POWER DISSIPATION vs. CASE TEMPERATURE



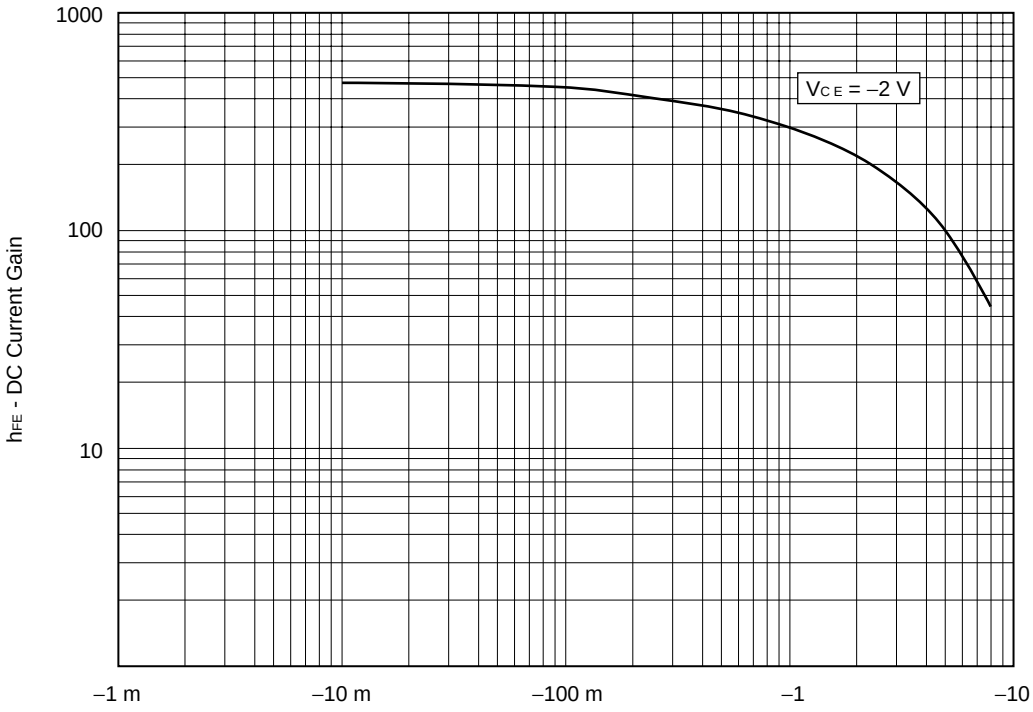
FORWARD BIAS SAFE OPERATING AREA



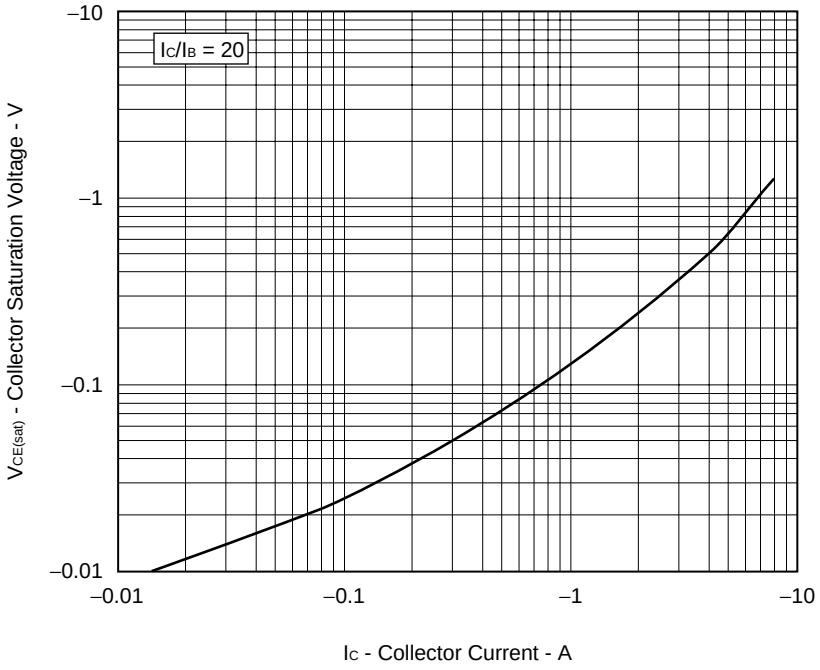
COLLECTOR TO EMITTER VOLTAGE vs COLLECTOR CURRENT



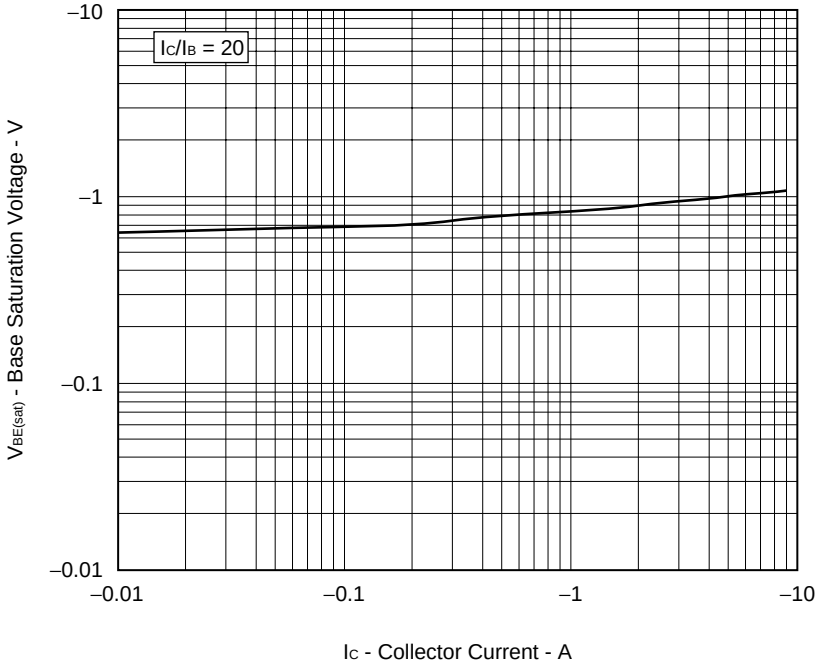
DC CURRENT GAIN vs COLLECTOR CURRENT



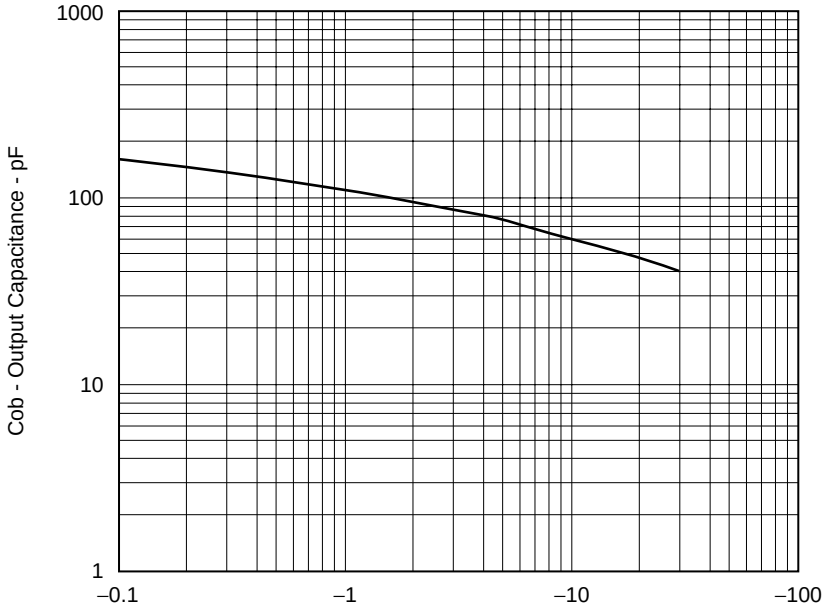
COLLECTOR SATURATION VOLTAGE vs COLLECTOR CURRENT



BASE SATURATION VOLTAGE vs COLLECTOR CURRENT



OUTPUT CAPACITANCE vs COLLECTOR TO BASE VOLTAGE



REFERENCE

Document Name	Document No.
NEC semiconductor device reliability/quality control system	TEI-1202
Quality grade on NEC semiconductor devices	IEI-1209
Semiconductor device mounting technology manual	C10535E
Semiconductor device package manual	C10943X
Guide to quality assurance for semiconductor devices	MEI-1202
Semiconductor selection guide	X10679E

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