

To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

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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SILICON POWER TRANSISTOR

2SD1899-Z

NPN SILICON EPITAXIAL TRANSISTOR

DESCRIPTION

The 2SD1899-Z is designed for Audio Frequency Amplifier and Switching, especially in Hybrid Integrated Circuits.

FEATURES

- High h_{FE} : $h_{FE} = 100$ to 400
- Low $V_{CE(sat)}$: $V_{CE(sat)} \leq 0.25$ V

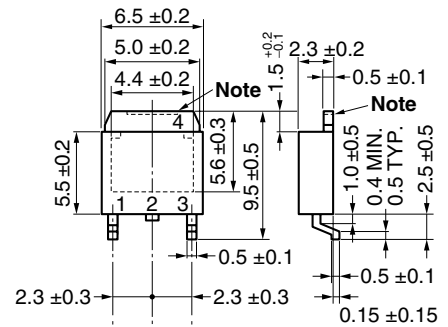
ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

Collector to Base Voltage	V_{CBO}	60	V
Collector to Emitter Voltage	V_{CEO}	60	V
Base to Emitter Voltage	V_{EBO}	7.0	V
Collector Current (DC)	$I_{C(DC)}$	3.0	A
Collector Current (pulse) ^{Note 1}	$I_{C(pulse)}$	5.0	A
Base Current (DC)	$I_{B(DC)}$	0.5	A
Total Power Dissipation ($T_A = 25^\circ\text{C}$) ^{Note 2}	P_{T1}	2.0	W
Total Power Dissipation ($T_C = 25^\circ\text{C}$)	P_{T2}	10	W
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

Notes 1. $PW \leq 10$ ms, Duty Cycle $\leq 50\%$

2. When mounted on ceramic substrate of $7.5\text{ cm}^2 \times 0.7\text{ mm}$

PACKAGE DRAWING (Unit: mm)



TO-252 (MP-3Z)

1. Base
2. Collector
3. Emitter
4. Collector Fin

Note The depth of notch at the top of the fin is from 0 to 0.2 mm.

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ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

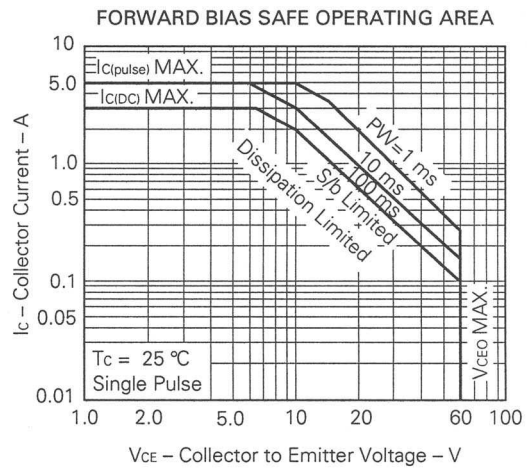
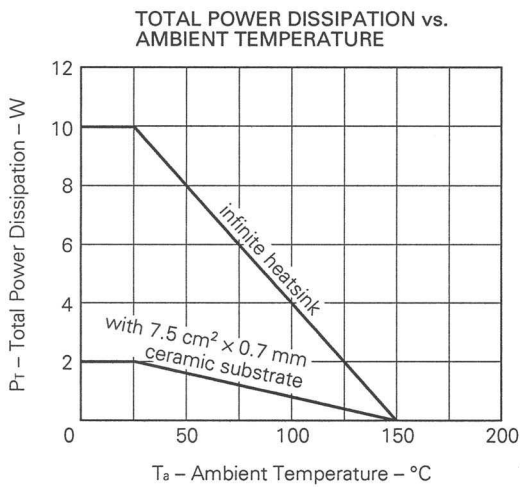
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I _{CEO}			10	μA	V _{CB} = 60 V, I _E = 0
Emitter Cutoff Current	I _{EB0}			10	μA	V _{EB} = 7.0 V, I _C = 0
DC Current Gain	h _{FE1} *	60				V _{CE} = 2.0 V, I _C = 0.2 A
DC Current Gain	h _{FE2} *	100		400		V _{CE} = 2.0 V, I _C = 0.6 A
DC Current Gain	h _{FE3} *	50				V _{CE} = 2.0 V, I _C = 2.0 A
Collector Saturation Voltage	V _{CE(sat)} *		0.14	0.25	V	I _C = 1.5 A, I _B = 0.15 A
Base Saturation Voltage	V _{BE(sat)} *		0.93	1.2	V	I _C = 1.5 A, I _B = 0.15 A
Gain Bandwidth Product	f _T		120		MHz	V _{CE} = 5.0 V, I _E = -1.5 A
Output Capacitance	C _{ob}		30		pF	V _{CB} = 10 V, I _E = 0, f = 1.0 MHz
Turn-on Time	t _{on}		0.15	0.5	μs	I _C = 1 A, V _{CC} = 10 V, R _L = 10 Ω I _{B1} = -I _{B2} = 0.1 A
Storage Time	t _{stg}		0.75	2.0	μs	
Fall Time	t _f		0.2	0.5	μs	

* Pulsed: PW ≤ 350 μs, Duty Cycle ≤ 2 %

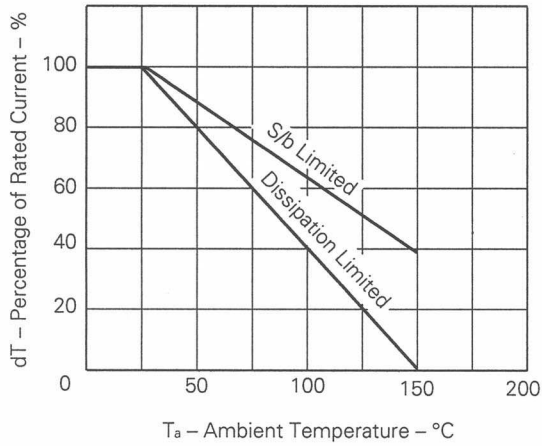
h_{FE} Classification

MARKING	M	L	K
h _{FE2}	100 to 200	160 to 320	200 to 400

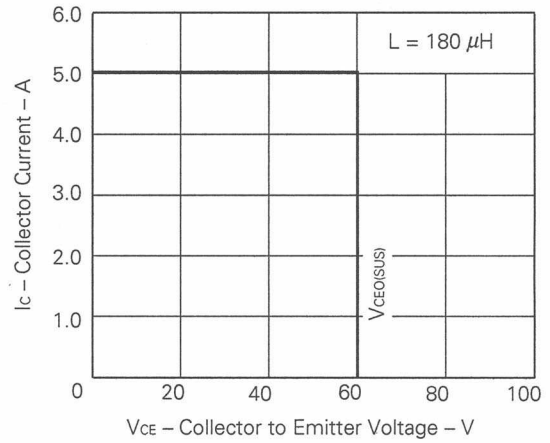
TYPICAL CHARACTERISTICS (T_a = 25 °C)



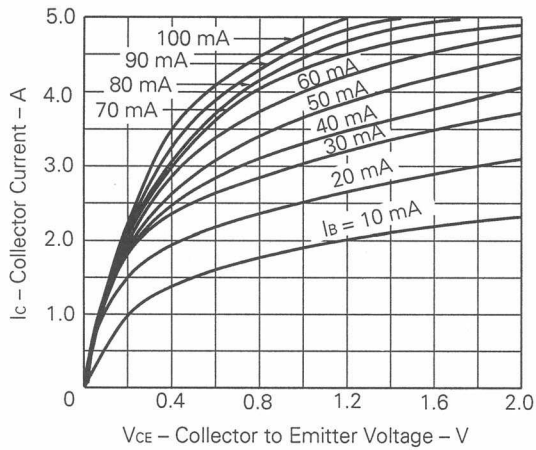
DERATING CURVE OF SAFE OPERATING AREA



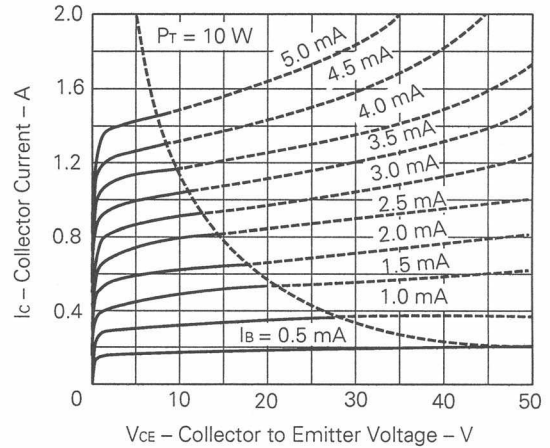
REVERSE BIAS SAFE OPERATING AREA



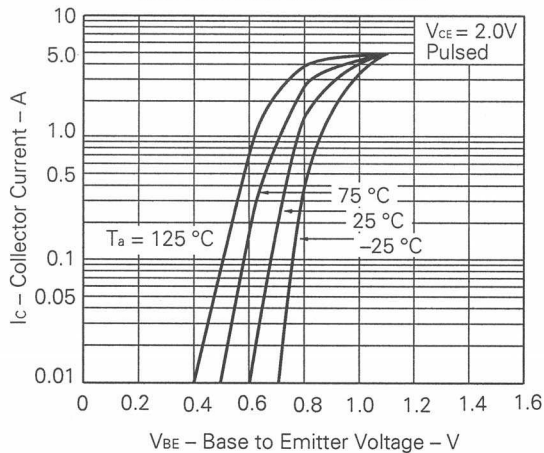
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



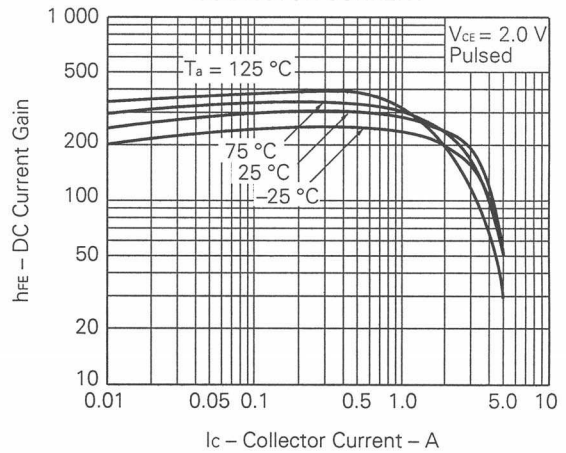
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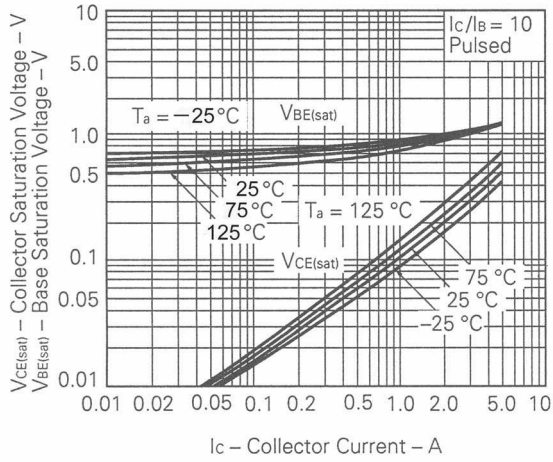
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



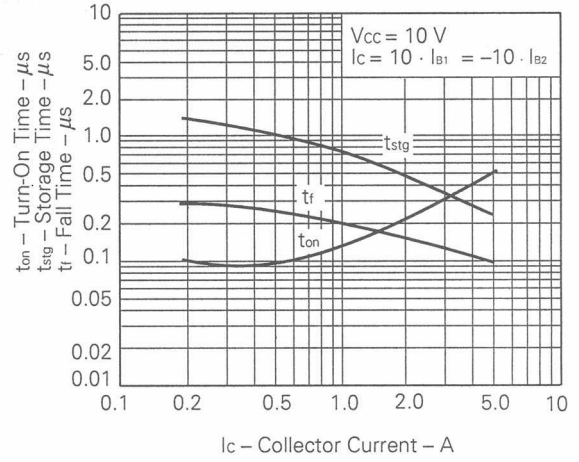
DC CURRENT GAIN vs. COLLECTOR CURRENT



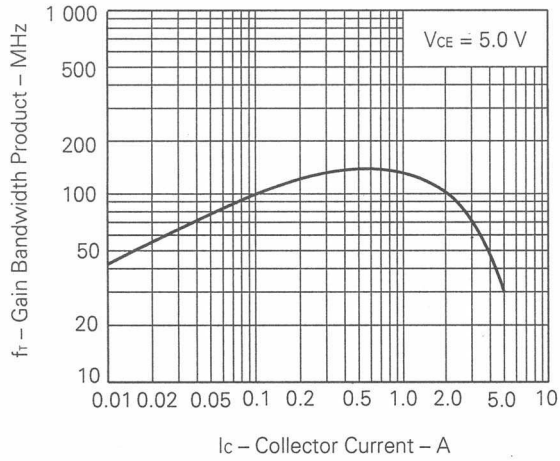
<R> BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



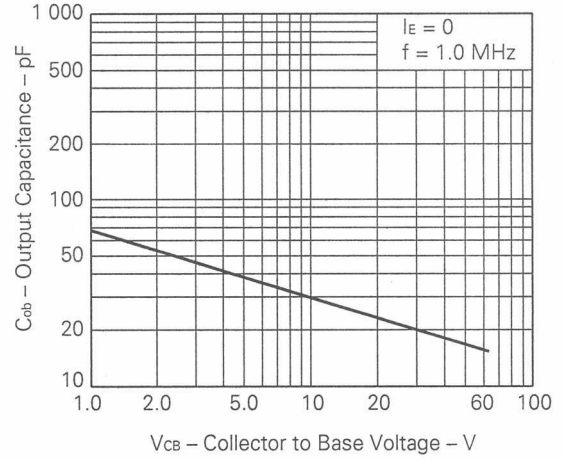
FALL, STORAGE AND TURN ON TIME vs. COLLECTOR CURRENT



GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT



OUTPUT CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE



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