RENESAS

SILICON POWER TRANSISTOR

Phase-out/Discontinued

2SD1583-Z

NPN SILICON EPITAXIAL TRANSISTOR

DESCRIPTION

The 2SD1583-Z is designed for Audio Frequency Amplifier and Switching, especially in Hybrid Integrated Circuits.

FEATURES

- High h_{FE}: h_{FE} = 800 to 3200
- Low $V_{CE(sat)}$: $V_{CE(sat)}$ = 0.18 V TYP.

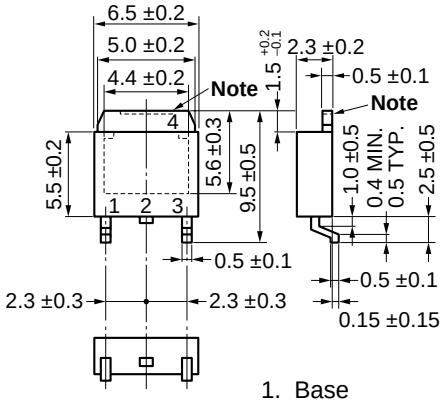
ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Collector to Base Voltage	V_{CBO}	30	V
Collector to Emitter Voltage	V_{CEO}	20	V
Base to Emitter Voltage	V_{EBO}	5	V
Collector Current (DC)	$I_{C(DC)}$	2	A
Collector Current (pulse) Note 1	$I_{C(pulse)}$	3	A
Total Power Dissipation (T_A = 25°C) Note 2	P_T	2.0	W
Junction Temperature	T_j	150	°C
Storage Temperature	T_{stg}	–55 to +150	°C

Notes 1. PW ≤ 10 ms, Duty Cycle ≤ 50%

2. When mounted on ceramic substrate of 7.5 cm^2 × 0.7 mm

<R> **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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The mark <R> shows major revised points.

The revised points can be easily searched by copying an "<R>" in the PDF file and specifying it in the "Find what:" field.

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I_{CBO}			10	μA	V_{CB} = 20 V, I_E = 0
Emitter Cutoff Current	I_{EBO}			10	μA	V_{EB} = 5.0 V, I_C = 0
DC Current Gain	h_{FE1}*	600	2 000			V_{CE} = 5.0 V, I_C = 50 mA
DC Current Gain	h_{FE2}*	800	2 000	3 200		V_{CE} = 5.0 V, I_C = 0.5 A
DC Current Gain	h_{FE3}*	500	1 400			V_{CE} = 5.0 V, I_C = 2.0 A
Collector Saturation Voltage	$V_{CE(sat)}$*		0.18	0.5	V	I_C = 1.0 A, I_B = 10 mA
Base Saturation Voltage	$V_{BE(sat)}$*		0.85	1.2	V	I_C = 1.0 A, I_B = 10 mA
Gain Bandwidth Product	f_T		270		MHz	V_{CE} = 5.0 V, I_E = 100 mA
Output Capacitance	C_{ob}		20		pF	V_{CB} = 10 V, I_E = 0, f ≒ 1.0 MHz
Turn-on Time	t_{on}		0.6		μs	I_C = 1A, V_{CC} ≒ 10 V I_{B1} = −I_{B2} = 10 mA
Storage Time	t_{stg}		1.5		μs	
Fall Time	t_f		0.3		μs	

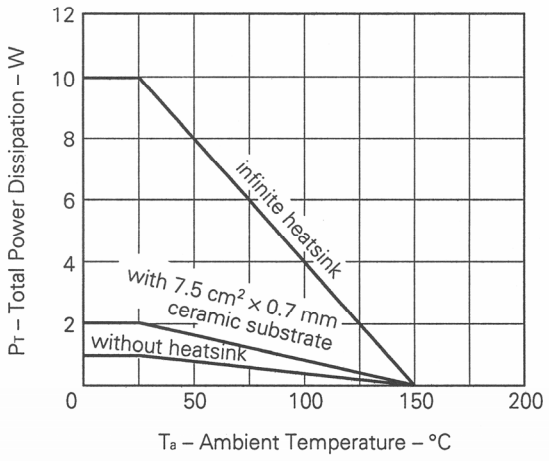
* Pulsed: PW ≦ 350 μs, Duty Cycle ≦ 2 %

h_{FE} Classification

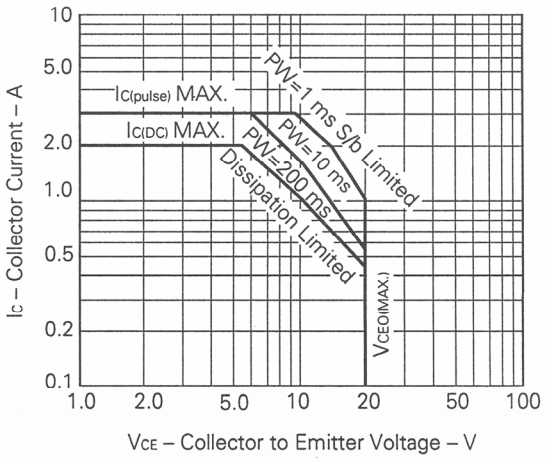
MARKING	M	L	K
h_{FE2}	800 to 1 600	1 000 to 2 000	1 600 to 3 200

TYPICAL CHARACTERISTICS (T_a = 25 °C)

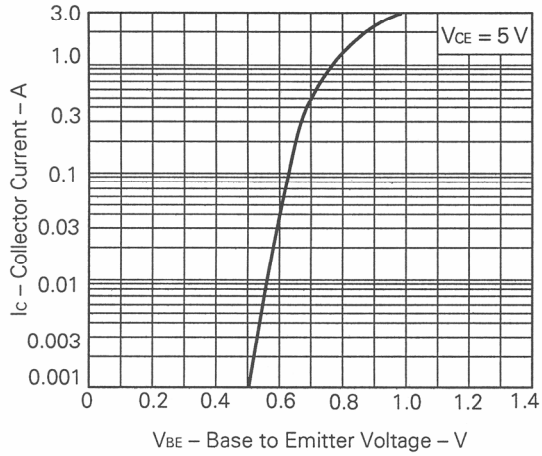
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



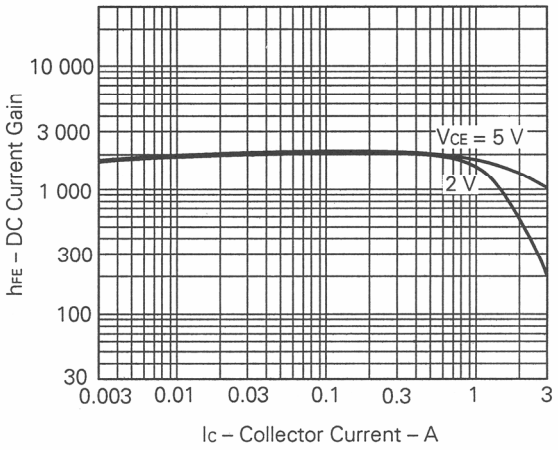
SAFE OPERATING AREA



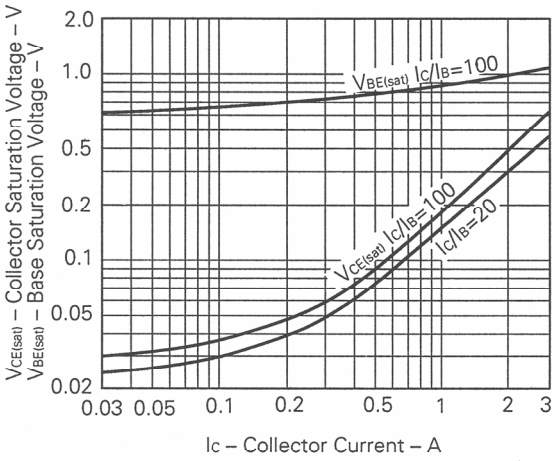
BASE TO EMITTER VOLTAGE vs. COLLECTOR CURRENT



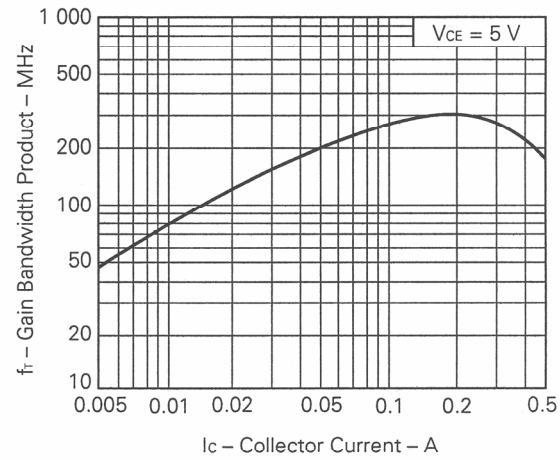
DC CURRENT GAIN vs. COLLECTOR CURRENT



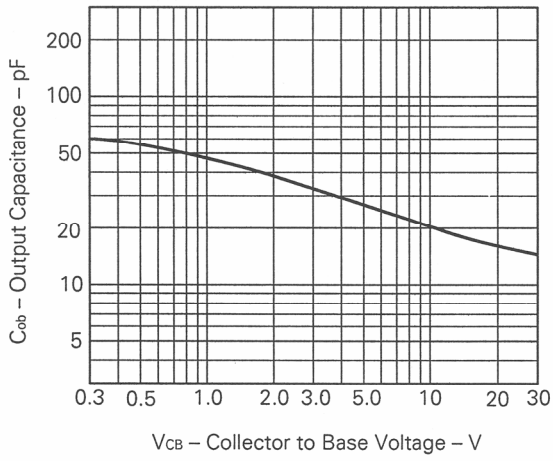
COLLECTOR TO BASE SATURATION VOLTAGE vs. COLLECTOR CURRENT



GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT



OUTPUT CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE



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