RENESAS

SILICON POWER TRANSISTOR
2SB963-Z

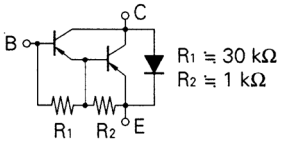
PNP SILICON EPITAXIAL TRANSISTOR (DARLINGTON CONNECTION)

DESCRIPTION

The 2SB963-Z is designed for switching, especially in Hybrid Integrated Circuits.

FEATURES

- High Gain h_{FE} = 2000 to 3000
- Complement to 2SD1286-Z



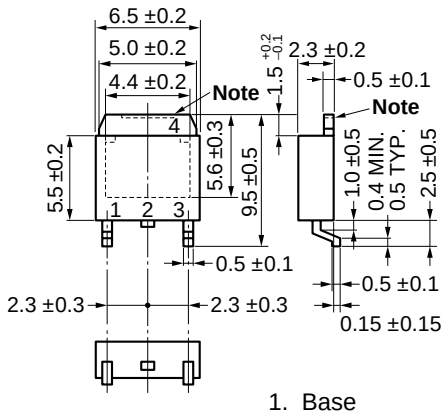
ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Collector to Base voltage	V_{CBO}	−60	V
Collector to Emitter voltage	V_{CEO}	−60	V
Emitter to Base voltage	V_{EBO}	−8	V
Collector Current (DC)	$I_{C(DC)}$	∓1.0	A
Collector Current (pulse) Note 1	$I_{C(pulse)}$	∓2.0	A
Total Power Dissipation Note 2	P_T (T_A = 25°C)	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} = −60 V, I_E = 0
Emitter Cutoff Current	I_{EBO}			−1.0	μA	V_{EB} = −5.0 V, I_C = 0
DC Current Gain	h_{FE1}***	1 000				V_{CE} = −2.0 V, I_C = −0.2 A
DC Current Gain	h_{FE2}***	2 000		30 000		V_{CE} = −2.0 V, I_C = −0.5 A
Collector Saturation Voltage	$V_{CE(sat)}$***			−1.5	V	I_C = −0.5 A, I_B = −50 mA
Base Saturation Voltage	$V_{BE(sat)}$***			−2.0	V	I_C = −0.5 A, I_B = −50 mA
Turn On Time	t_{on}		0.5		μs	I_C = −0.5 A, R_L = 100 Ω
Storage Time	t_{stg}		1.0		μs	I_{B1} = −I_{B2} = −0.1 mA
Fall Time	t_f		1.0		μs	V_{CC} = −50 V

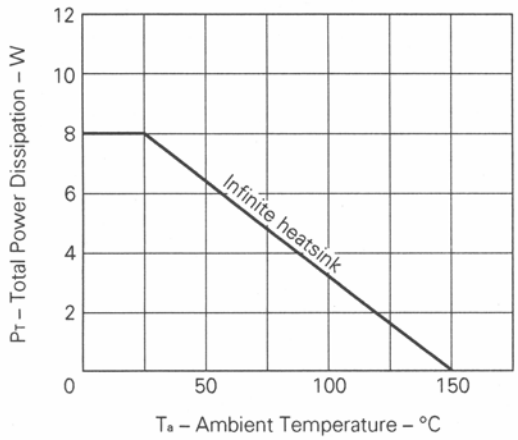
*** Pulsed: PW ≦ 350 μs, Duty Cycle ≦ 2 %

h_{FE} Classification

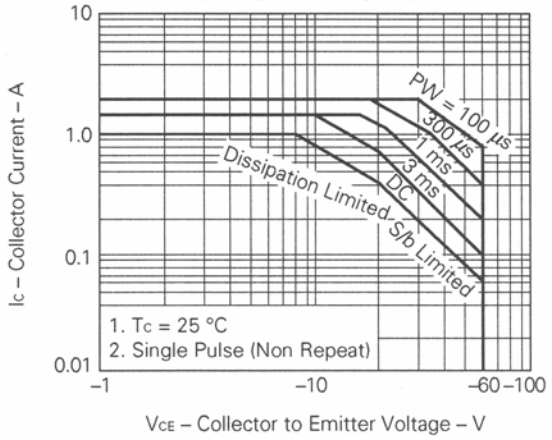
MARKING	M	L	K
h_{FE2}	2 000 to 5 000	4 000 to 10 000	8 000 to 30 000

TYPICAL CHARACTERISTICS (T_a = 25 °C)

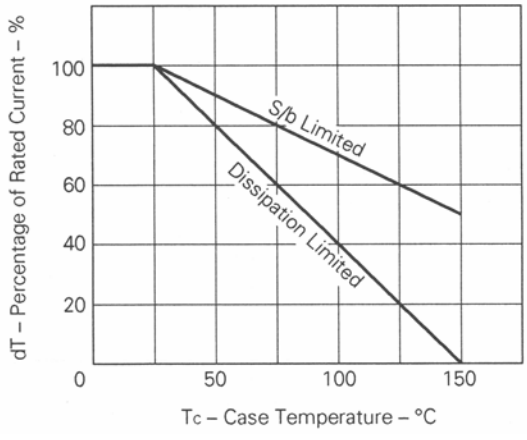
TOTAL POWER DISSIPATION vs. CASE TEMPERATURE



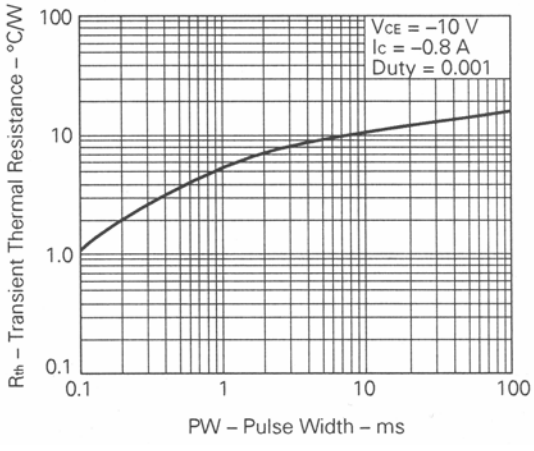
SAFE OPERATING AREA



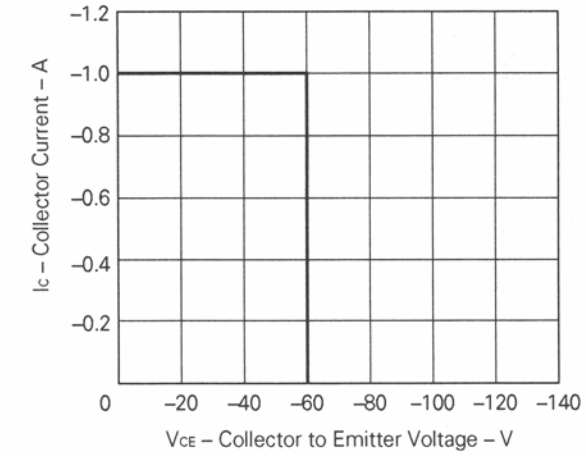
DERATING CURVE OF SAFE OPERATING AREA



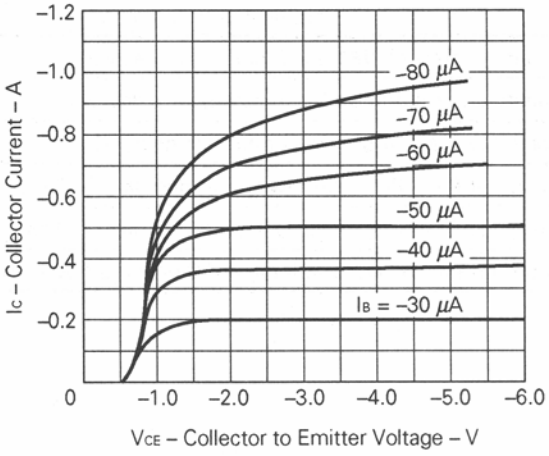
TRANSIENT THERMAL RESISTANCE



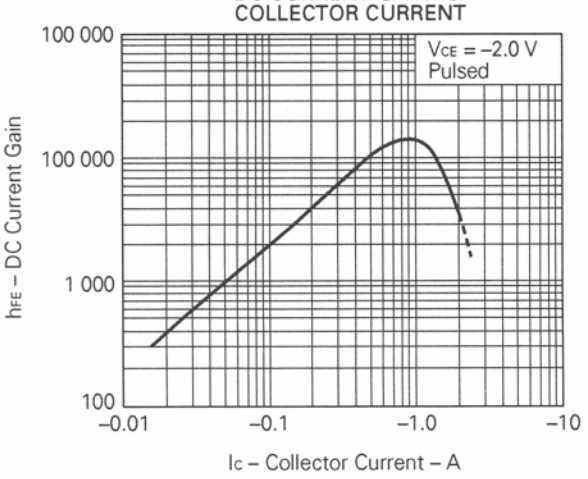
REVERSE BIAS SAFE OPERATING AREA



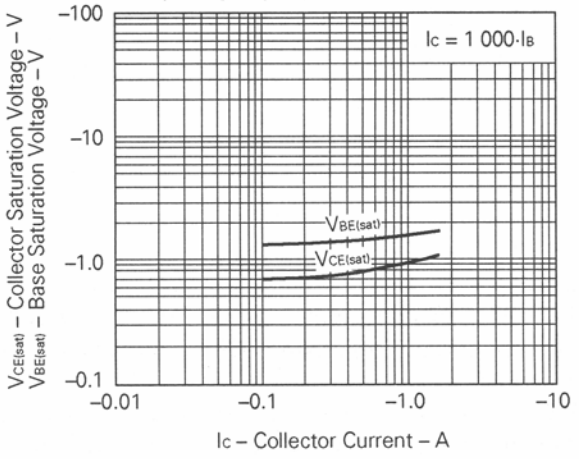
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



DC CURRENT GAIN vs.
COLLECTOR CURRENT



BASE AND COLLECTOR SATURATION
VOLTAGE vs. COLLECTOR CURRENT



SWITCHING TIME (t_{on}, t_{stg}, t_f) TEST CIRCUIT