DATA SHEET

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

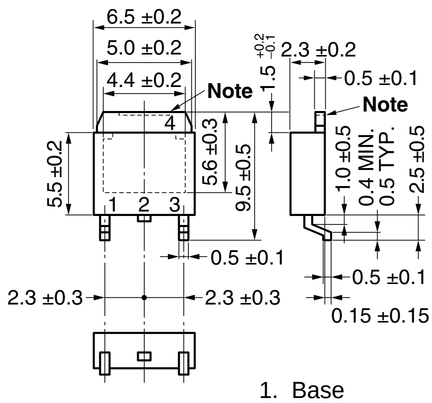
ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

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°C) Note 2	P_{T1}	2.0	W
Total Power Dissipation (T_C = 25°C)	P_{T2}	10	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

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}			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	

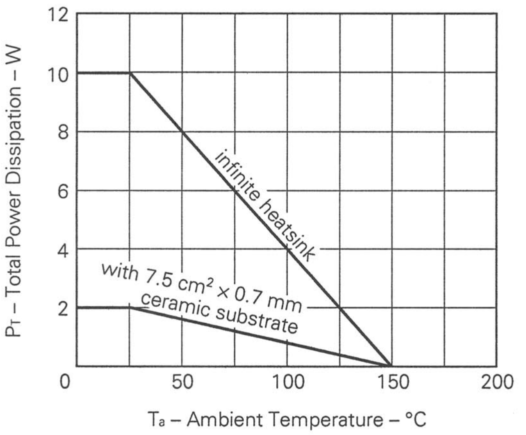
* Pulsed: PW ≦ 350 μs, Duty Cycle ≦ 2 %

h_{FE} Classification

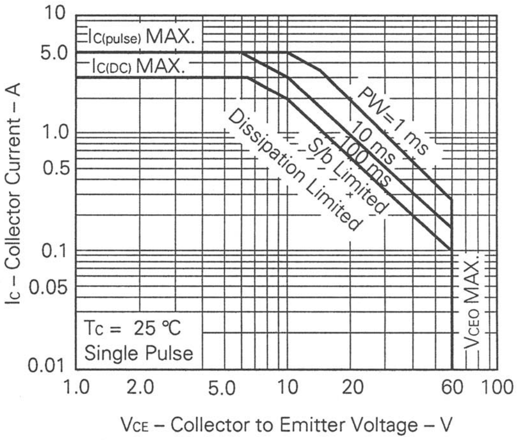
MARKING	M	L	K
h_{FE2}	100 to 200	160 to 320	200 to 400

TYPICAL CHARACTERISTICS (T_a = 25 °C)

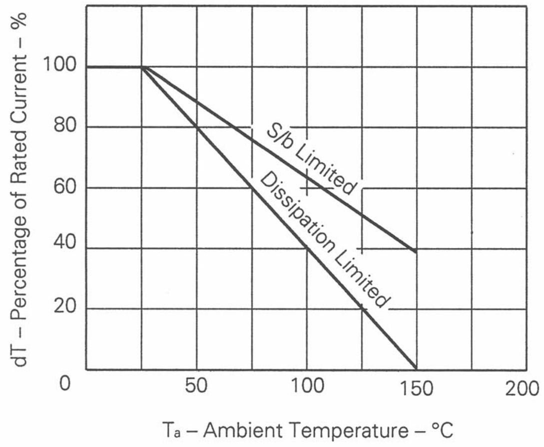
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



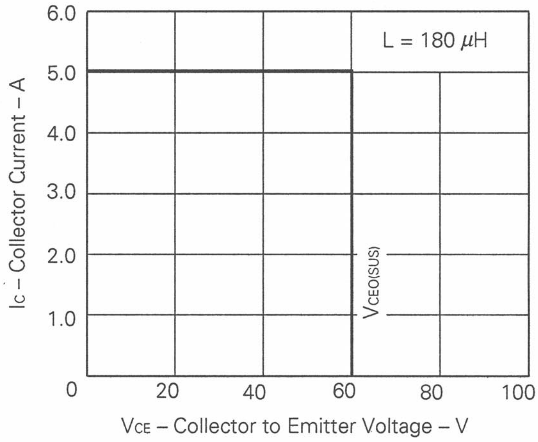
FORWARD BIAS SAFE OPERATING AREA



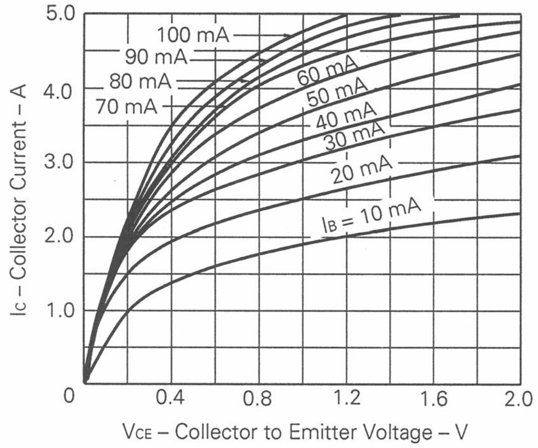
DERATING CURVE OF SAFE OPERATING AREA



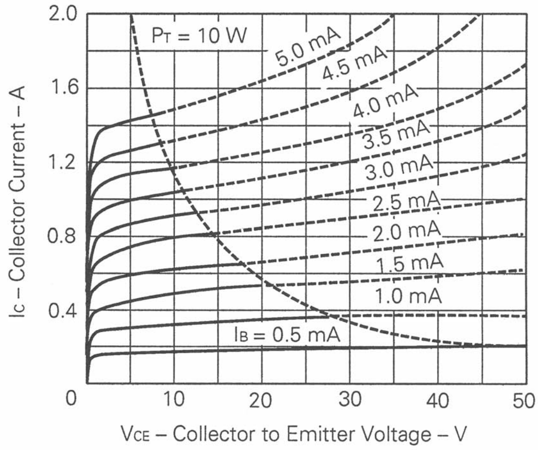
REVERSE BIAS SAFE OPERATING AREA



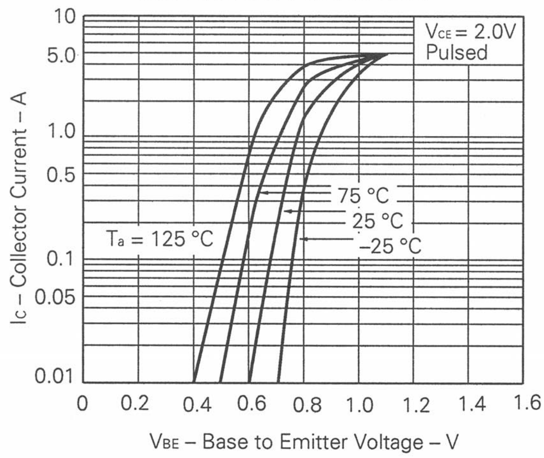
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



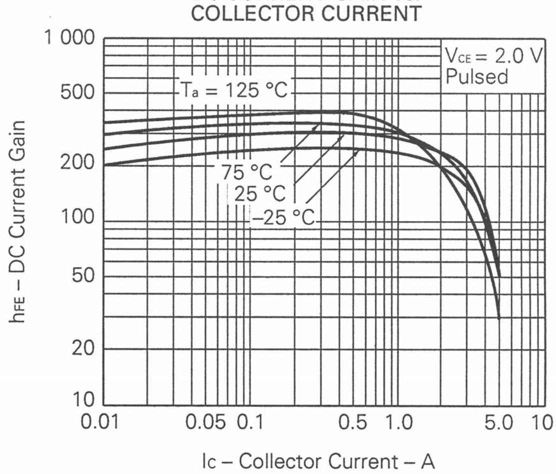
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



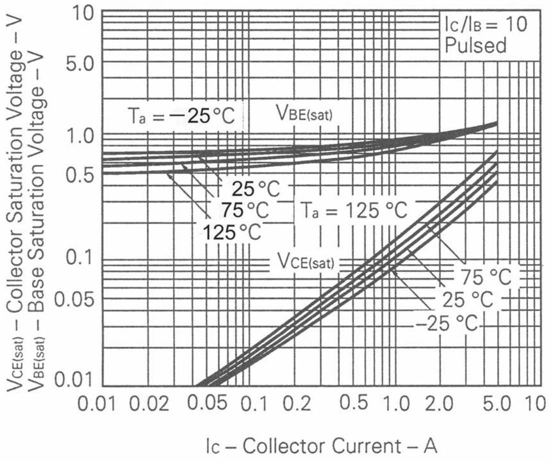
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



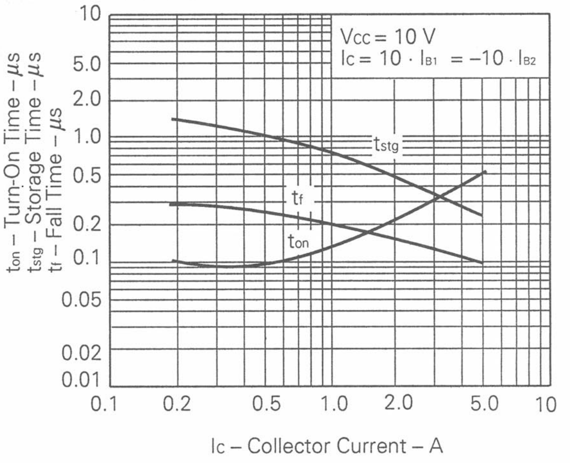
DC CURRENT GAIN vs. COLLECTOR CURRENT



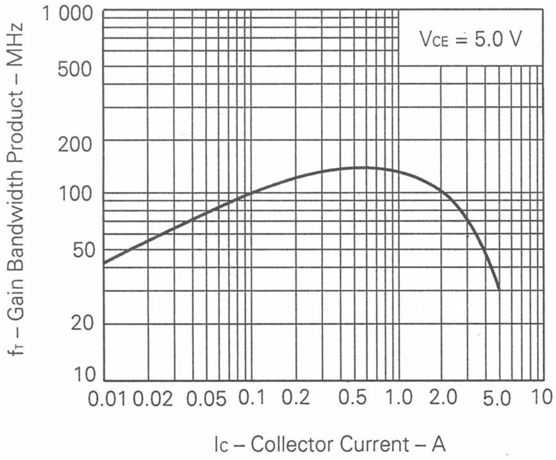
<R> BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



FALL, STORAGE AND TURN ON TIME vs. COLLECTOR CURRENT



GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT



OUTPUT CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE