

PNP SILICON EPITAXIAL TRANSISTOR  
MP-3

## DESCRIPTION

2SA1385-Z is designed for Audio Frequency Amplifier and Switching, especially in Hybrid Integrated Circuits.

## FEATURES

- Low  $V_{CE(sat)}$  :  $V_{CE(sat)} = -0.18$  V TYP.
- Complement to 2SC3518-Z

## QUALITY GRADE

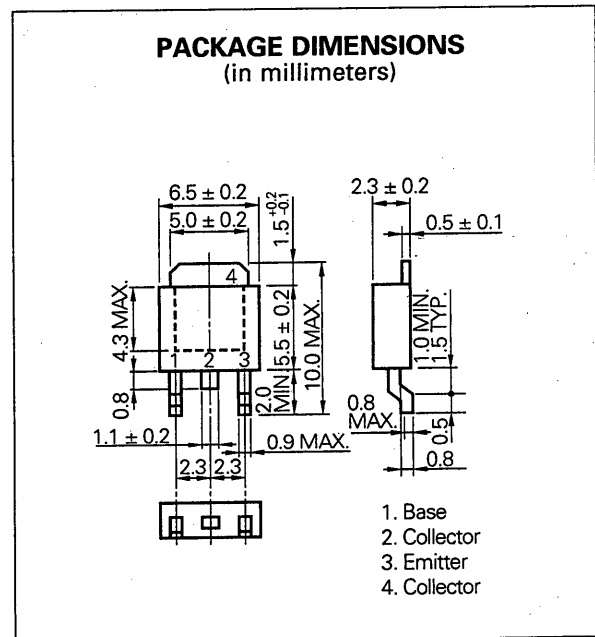
Standard

Please refer to "Quality grade on NEC Semiconductor Devices" (Document number IEI-1209) published by NEC Corporation to know the specification of quality grade on the devices and its recommended applications.

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	$V_{EBO}$	-7	V
Collector Current (DC)	$I_c$	-5	A
Collector Current (Pulse)*	$I_c$	-7	A
Total Power Dissipation ( $T_c = 25$ °C)	$P_T$	10	W
Junction Temperature	$T_j$	150	°C
Storage Temperature	$T_{stg}$	-55 to +150	°C

\*  $PW \leq 10$  ms, Duty Cycle  $\leq 50$  %

PACKAGE DIMENSIONS  
(in millimeters)

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

**ELECTRICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C)**

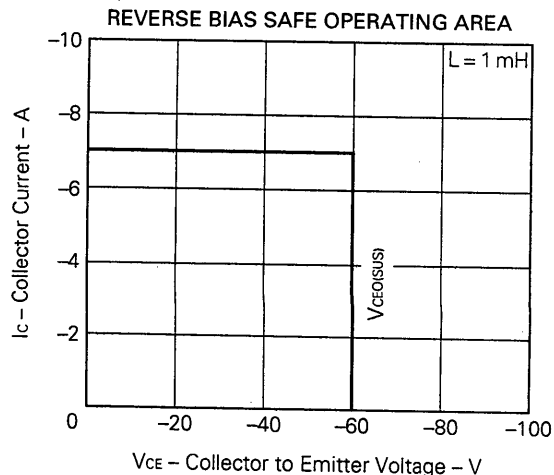
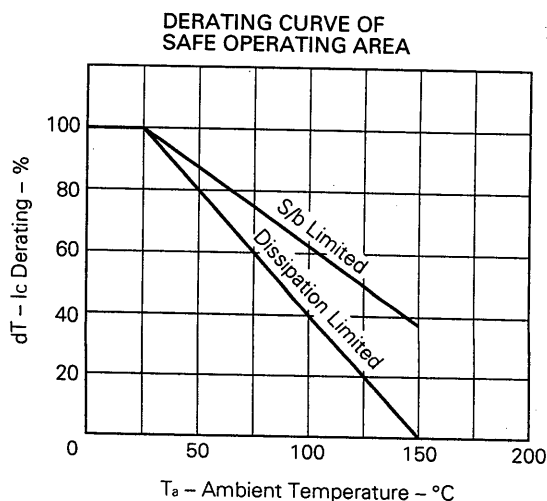
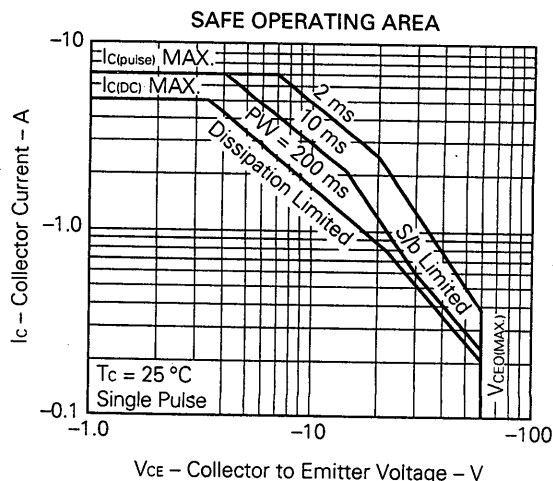
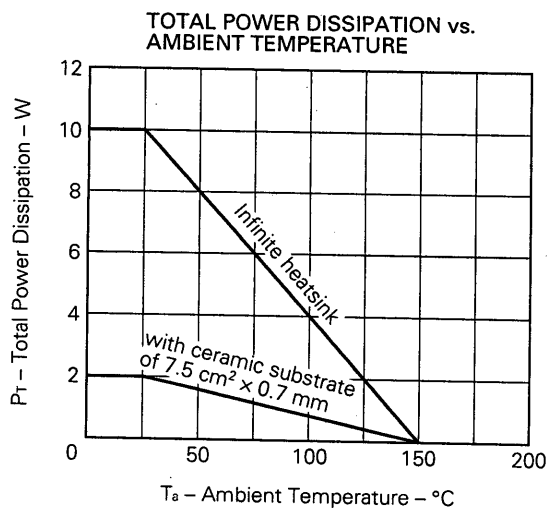
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I <sub>CB0</sub>			-10	μA	V <sub>CB</sub> = -50 V, I <sub>E</sub> = 0
Emitter Cutoff Current	I <sub>EB0</sub>			-10	μA	V <sub>EB</sub> = -7.0 V, I <sub>C</sub> = 0
DC Current Gain	h <sub>FE1</sub> *	100	200	400		V <sub>CE</sub> = -1.0 V, I <sub>C</sub> = -2.0 A
DC Current Gain	h <sub>FE2</sub> *	50	100			V <sub>CE</sub> = -1.0 V, I <sub>C</sub> = -5.0 A
Collector Saturation Voltage	V <sub>CE(sat)</sub> *		-0.18	-0.3	V	I <sub>C</sub> = -2.0 A, I <sub>B</sub> = -0.2 A
Base Saturation Voltage	V <sub>BE(sat)</sub> *			-1.2	V	I <sub>C</sub> = -2.0 A, I <sub>B</sub> = -0.2 A
Gain Bandwidth Product	f <sub>T</sub>		140		MHz	V <sub>CE</sub> = -10 V, I <sub>C</sub> = -0.5 A
Turn-on Time	t <sub>on</sub>		0.08	1.0	μs	I <sub>C</sub> = -2.0 A, V <sub>CC</sub> = -10 V R <sub>L</sub> = 50 Ω I <sub>B1</sub> = -I <sub>B2</sub> = -0.2 A
Storage Time	t <sub>stg</sub>		0.55	2.5	μs	
Fall time	t <sub>f</sub>		0.18	1.0	μs	

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

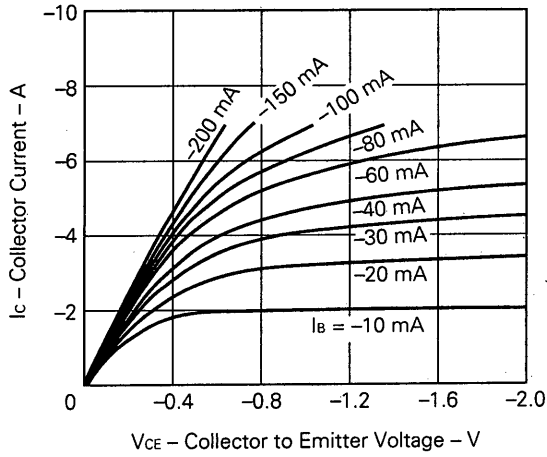
**h<sub>FE</sub> Classification**

MARKING	M	L	K
h <sub>FE1</sub>	100 to 200	160 to 320	200 to 400

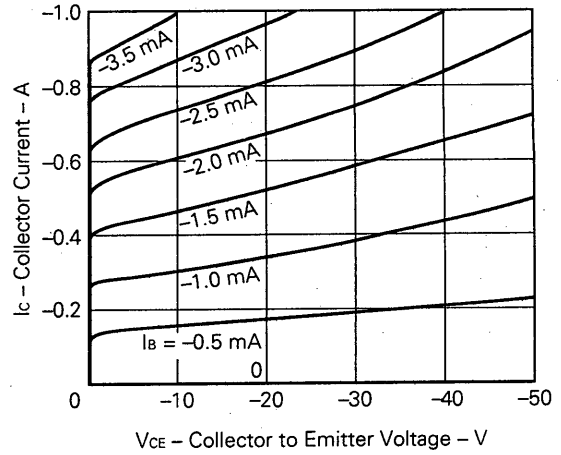
**TYPICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C)**



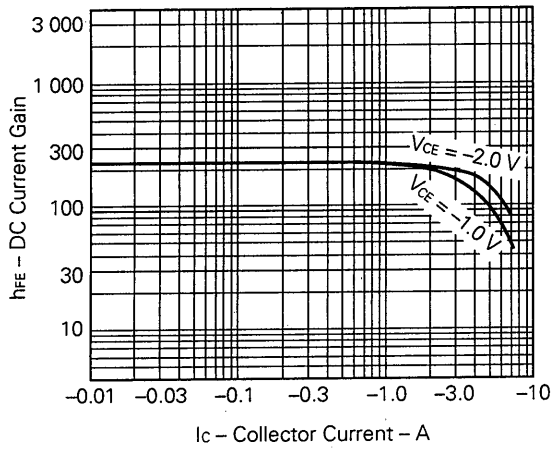
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



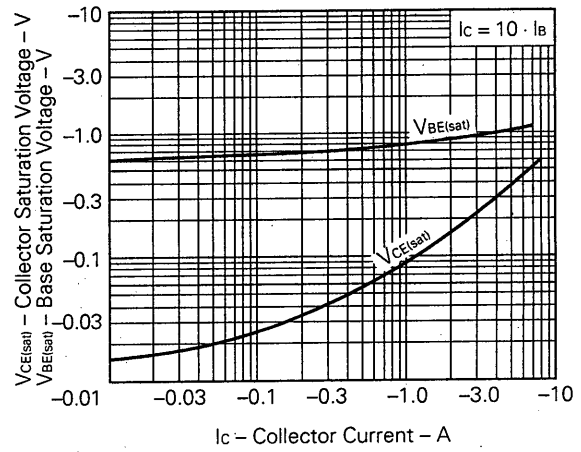
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



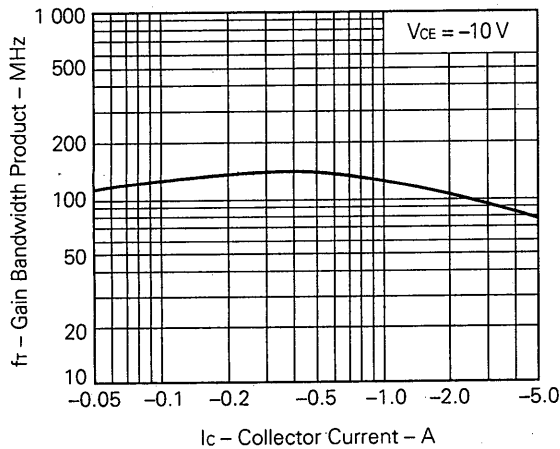
DC CURRENT GAIN vs. COLLECTOR CURRENT



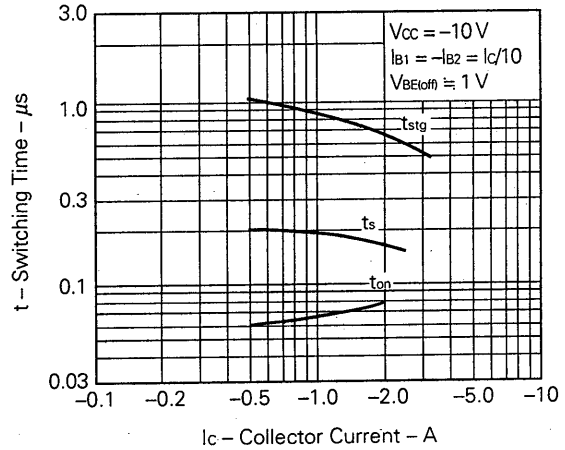
COLLECTOR AND BASE SATURATION VOLTAGE vs. COLLECTOR CURRENT



GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT



SWITCHING TIME vs. COLLECTOR CURRENT



**Reference**

Application note name	No.
Quality control of NEC semiconductors devices.	TEI-1202
Quality control guide of semiconductors devices.	MEI-1202
Assembly manual of semiconductors devices.	IEI-1207
Design of Push-Pull Type Switching Regulators (Basic).	TEB-1002
Design of Push-Pull Type Switching Regulators (Applications).	TEB-1003
Optimum Base Drive Conditions of Switching Power Transistors.	TEB-1014

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Application examples recommended by NEC Corporation.

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