NEC

SILICON TRANSISTOR
2SA1400-Z

PNP SILICON TRIPLE DIFFUSED TRANSISTOR
MP-3

DESCRIPTION

2SA1400-Z is designed for High Voltage Switching, especially in Hybrid Integrated Circuits.

FEATURES

- High Voltage : V_{CEO} = –400 V
- High Speed : $t_f \leqq 1.0$ μs
- Complement to 2SC3588-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.

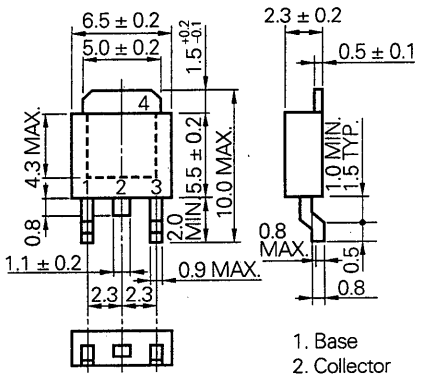
ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

Collector to Base Voltage	V_{CBO}	–400	V
Collector to Emitter Voltage	V_{CEO}	–400	V
Emitter to Base Voltage	V_{EBO}	–7	V
Collector Current (DC)	I_C	–0.5	A
Collector Current (Pulse)*	I_C	–1.0	A
Total Power Dissipation (T_a = 25 °C)**	P_T	2.0	W
Junction Temperature	T_j	150	°C
Storage Temperature	T_{stg}	–55 to +150	°C

* PW ≦ 300 μs, Duty Cycle ≦ 10 %

** When mounted on ceramic substrate of 7.5 cm² × 0.7 mm

PACKAGE DIMENSIONS
(in millimeters)



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

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ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I_{CBO}			−100	μA	V_{CB} = −400 V, I_E = 0
Emitter Cutoff Current	I_{EBO}			−10	μA	V_{EB} = −5.0 V, I_C = 0
DC Current Gain	h_{FE}*	30		200		V_{CE} = −5.0 V, I_C = −50 mA
Collector Saturation Voltage	$V_{CE(sat)}$*			−1.0	V	I_C = −100 mA, I_B = −10 mA
Base Saturation Voltage	$V_{BE(sat)}$*			−1.2	V	I_C = −100 mA, I_B = −10 mA
Turn-on Time	t_{on}			1.0	μs	I_C = −100 mA, R_L = 1.5 kΩ I_{B1} = −I_{B2} = −10 mA, V_{CC} ≒ −150 V PW ≦ 50 μs, Duty Cycle ≦ 2 %
Storage Time	t_{stg}			5.0	μs	
Fall time	t_f			1.0	μs	

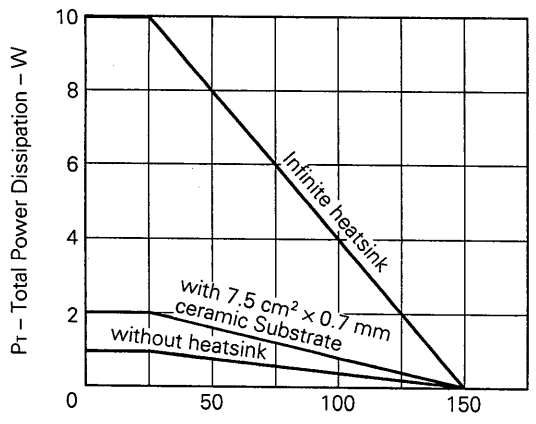
* Pulsed: PW ≦ 350 μs, Duty Cycle ≦ 2 %

h_{FE} Classification

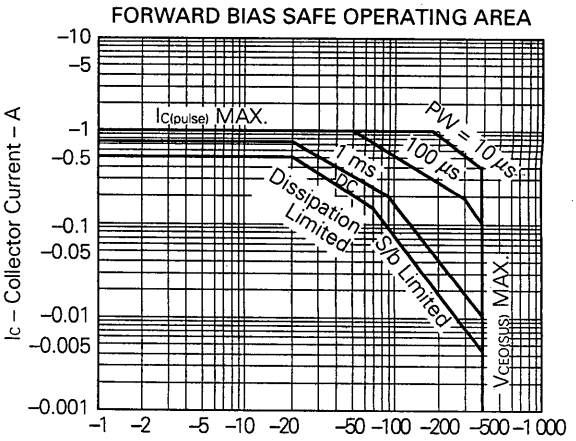
MARKING	N	M	L	K
h_{FE}	30 to 60	40 to 80	60 to 120	100 to 200

TYPICAL CHARACTERISTICS (T_a = 25 °C)

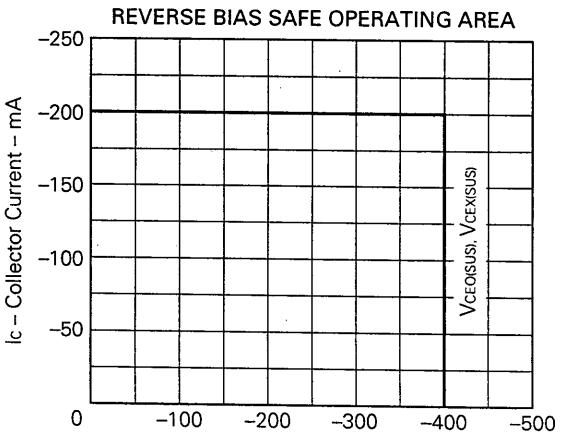
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



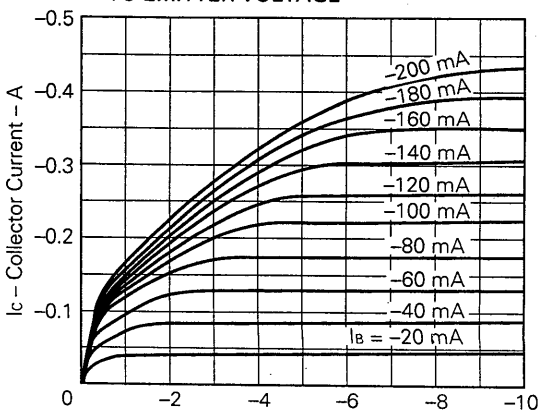
FORWARD BIAS SAFE OPERATING AREA



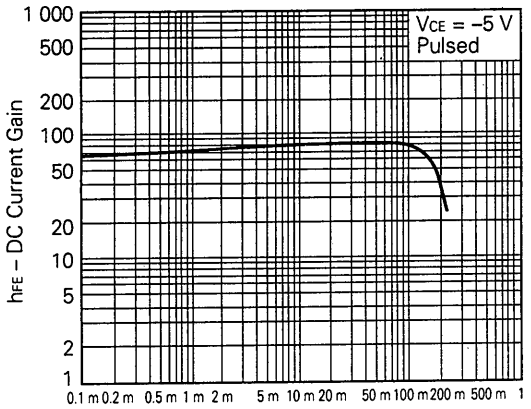
REVERSE BIAS SAFE OPERATING AREA



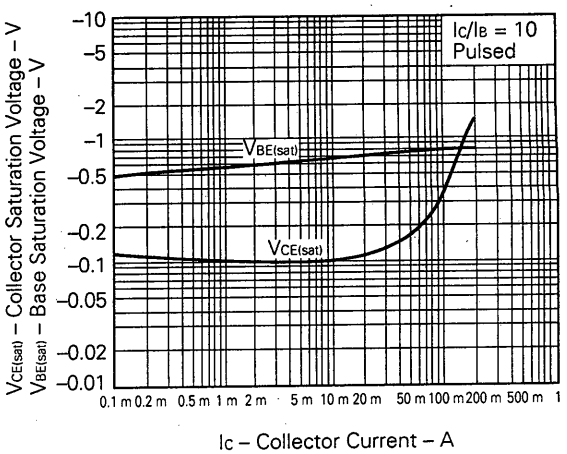
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



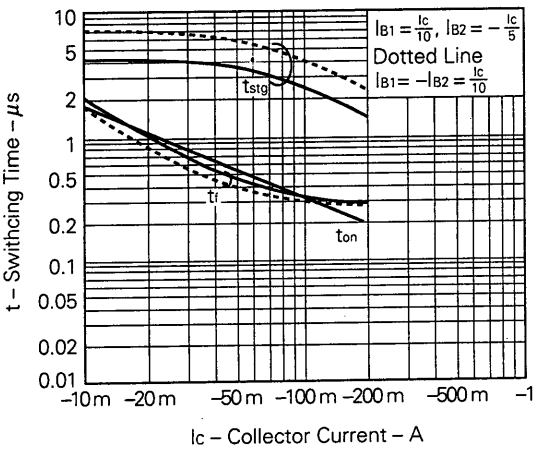
DC CURRENT GAIN vs.
COLLECTOR CURRENT



BASE COLLECTOR SATURATION
VOLTAGE vs. COLLECTOR CURRENT



TURN ON TIME, STORAGE TIME AND
FALL 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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