

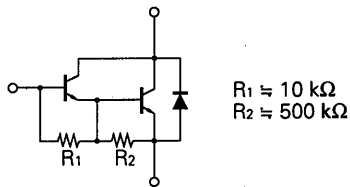
NPN SILICON EPITAXIAL TRANSISTOR
MP-3

DESCRIPTION

2SD1164-Z is designed for Low Frequency Amplifier and Switching, especially in Hybrid Integrated Circuits.

FEATURES

- High $h_{FE} = 2\ 000$ to $30\ 000$



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.

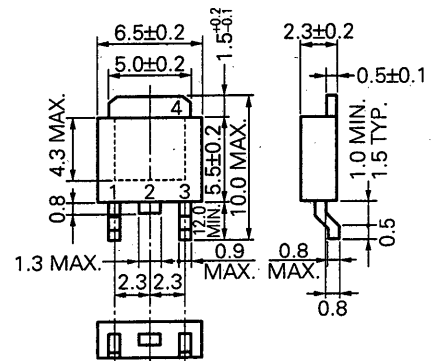
ABSOLUTE MAXIMUM RATINGS ($T_a = 25\ ^\circ C$)

Collector to Base Voltage	V_{CBO}	150	V
Collector to Emitter Voltage	V_{CEO}	60	V
Emitter to Base Voltage	V_{EBO}	8.0	V
Collector Current (DC)	I_C	2	A
Collector Current (Pulse)*	I_C	4	A
Total Power Dissipation ($T_a = 25\ ^\circ C$)**	P_T	2.0	W
Junction Temperature	T_j	150	$^\circ C$
Storage Temperature	T_{stg}	-55 to +150	$^\circ C$

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

**When mounted on ceramic substrate of $7.5\ cm^2 \times 0.7\ mm$

PACKAGE DIMENSIONS
(in millimeters)



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

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

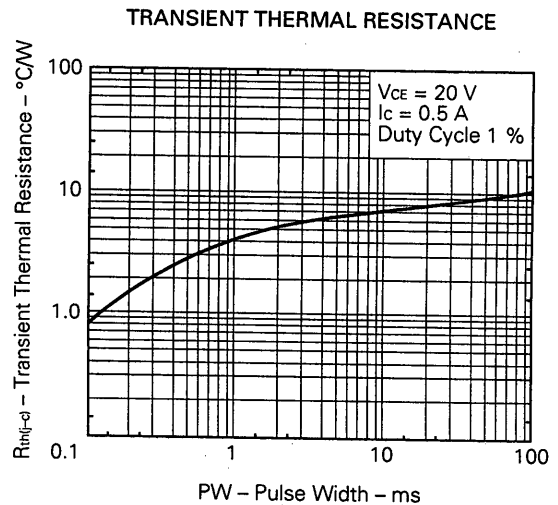
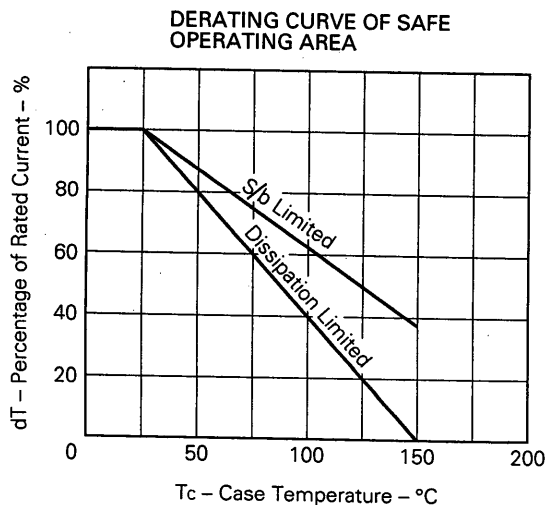
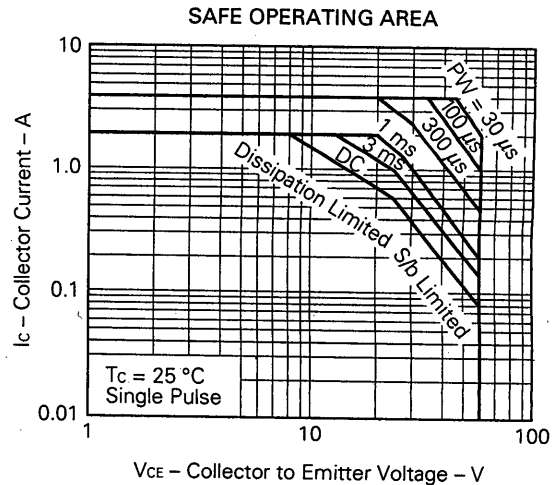
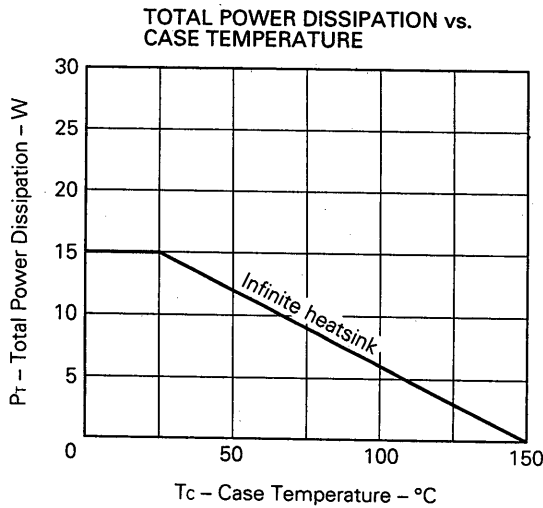
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I _{cBO}			10	μA	V _{CE} = 60 V, I _E = 0
Emitter Cutoff Current	I _{EBO}			1.0	mA	V _{EB} = 5.0 V, I _C = 0
DC Current Gain	h _{FE1} *	1 000				V _{CE} = 2.0 V, I _C = 0.5 A
DC Current Gain	h _{FE2} *	2 000		30 000		V _{CE} = 2.0 V, I _C = 1.0 A
Collector Saturation Voltage	V _{CE(sat)} *			1.5	V	I _C = 1.0 A, I _B = 1.0 mA
Base Saturation Voltage	V _{BE(sat)} *			2.0	V	I _C = 1.0 A, I _B = 1.0 mA
Turn-on Time	t _{on}		0.5		μs	I _C = 1.0 A, I _{B1} = -I _{B2} = 1.0 mA V _{CC} ≅ 50 V, R _L = 50 Ω
Storage Time	t _{stg}		1.0		μs	
Fall Time	t _f		1.0		μs	

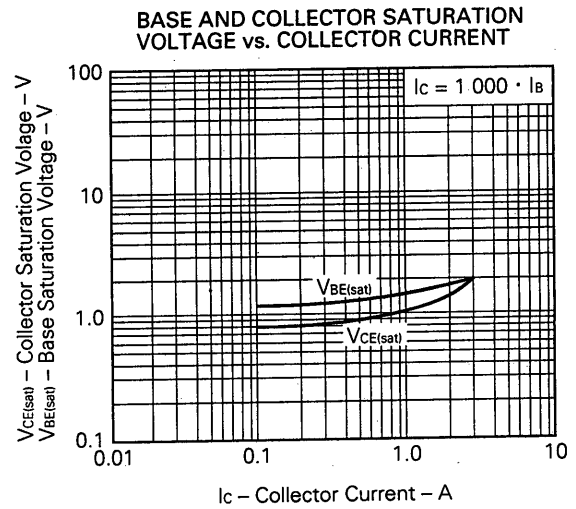
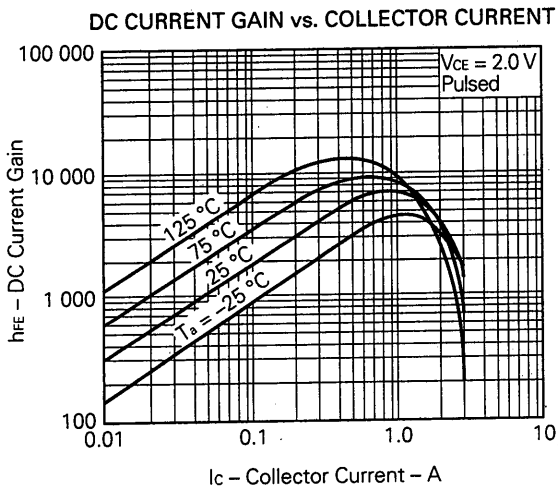
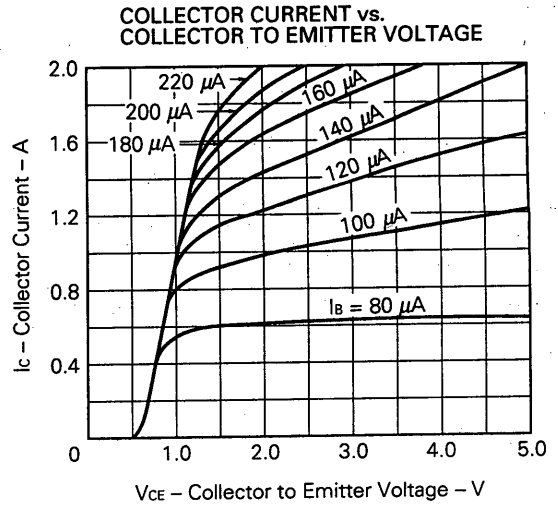
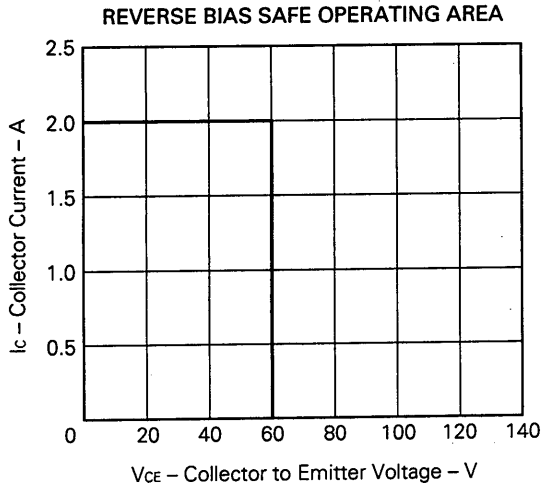
*Pulsed: PW ≤ 350 μs, Duty Cycle ≤ 2 %

h_{FE} Classification

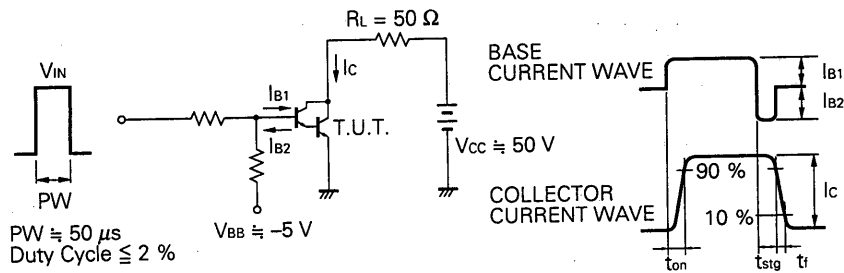
MARKING	M	L	K
h _{FE2}	2 000 to 5 000	4 000 to 10 000	8 000 to 30 000

TYPICAL CHARACTERISTICS (T_a = 25 °C)





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



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.

Standard: Computer, Office equipment, Communication equipment, Test and Measurement equipment, Machine tools, Industrial robots, Audio and Visual equipment, Other consumer products, etc.

Special: Automotive and Transportation equipment, Traffic control systems, Antidisaster systems, Anticrime systems, etc.