

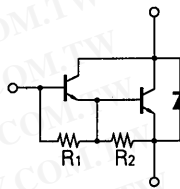
**NPN SILICON EPITAXIAL TRANSISTOR  
MP-3**

**DESCRIPTION**

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

**FEATURES**

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



$R_1 \approx 10\ k\Omega$   
 $R_2 \approx 500\ k\Omega$

**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.

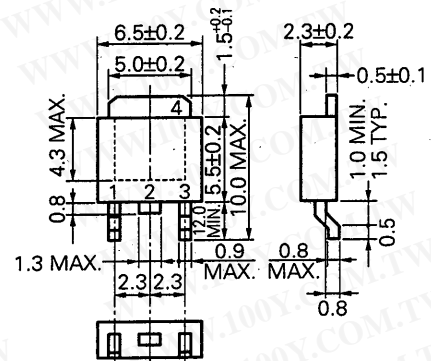
**ABSOLUTE MAXIMUM RATINGS ( $T_a = 25\ ^\circ C$ )**

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

勝特力材料 886-3-5753170  
勝特力电子(上海) 86-21-54151736  
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[Http://www.100y.com.tw](http://www.100y.com.tw)

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

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I <sub>cBO</sub>			10	μA	V <sub>CE</sub> = 60 V, I <sub>E</sub> = 0
Emitter Cutoff Current	I <sub>EBO</sub>			1.0	mA	V <sub>EB</sub> = 5.0 V, I <sub>C</sub> = 0
DC Current Gain	h <sub>FE1</sub> *	1 000				V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 0.5 A
DC Current Gain	h <sub>FE2</sub> *	2 000		30 000		V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 1.0 A
Collector Saturation Voltage	V <sub>CE(sat)</sub> *			1.5	V	I <sub>C</sub> = 1.0 A, I <sub>B</sub> = 1.0 mA
Base Saturation Voltage	V <sub>BE(sat)</sub> *			2.0	V	I <sub>C</sub> = 1.0 A, I <sub>B</sub> = 1.0 mA
Turn-on Time	t <sub>on</sub>		0.5		μs	I <sub>C</sub> = 1.0 A, I <sub>B1</sub> = -I <sub>B2</sub> = 1.0 mA V <sub>CC</sub> ≅ 50 V, R <sub>L</sub> = 50 Ω
Storage Time	t <sub>stg</sub>		1.0		μs	
Fall Time	t <sub>f</sub>		1.0		μs	

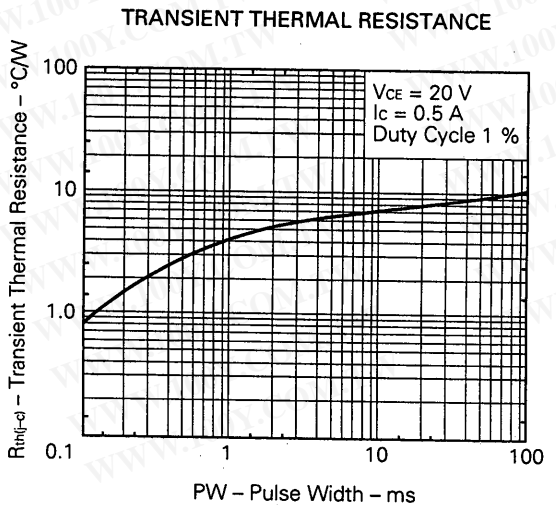
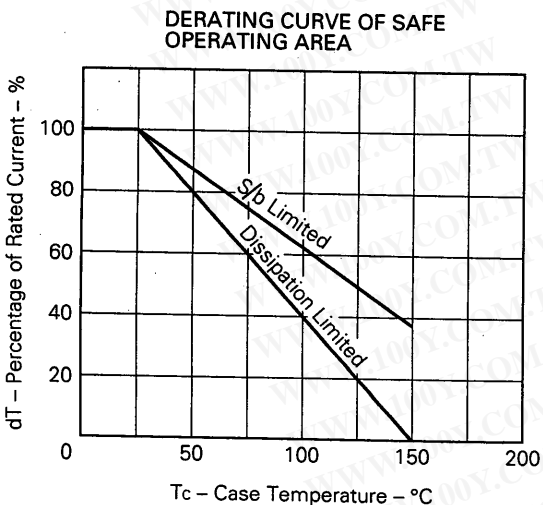
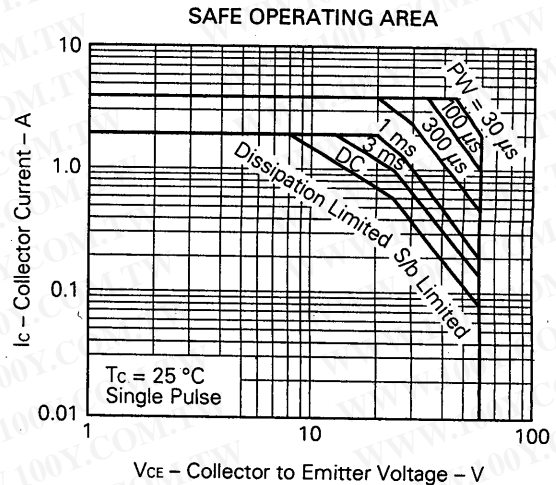
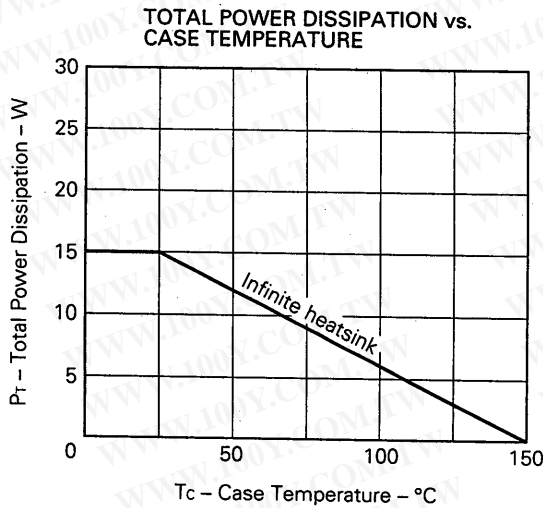
\*Pulsed: PW ≤ 350 μs, Duty Cycle ≤ 2 %

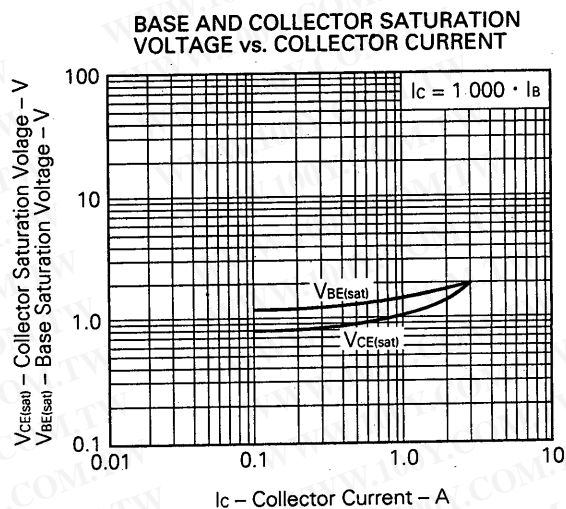
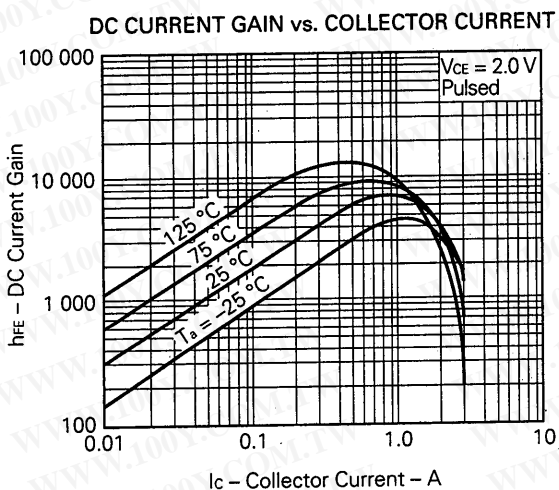
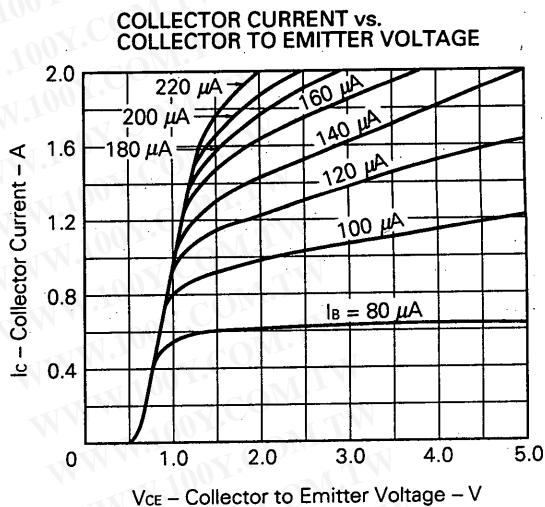
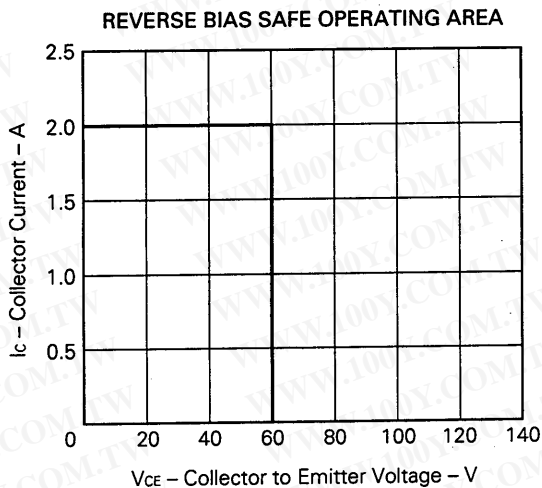
**h<sub>FE</sub> Classification**

MARKING	M	L	K
h <sub>FE2</sub>	2 000 to 5 000	4 000 to 10 000	8 000 to 30 000

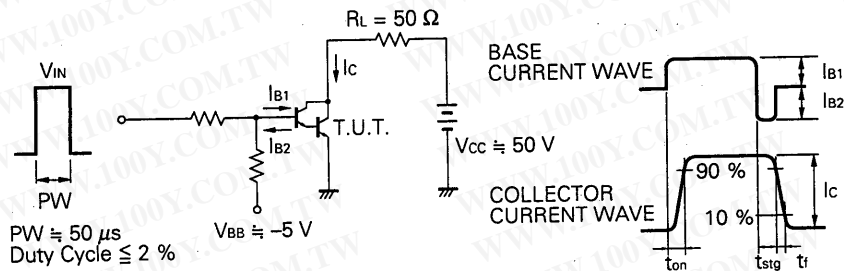
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**TYPICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C)**





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



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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.