

# SILICON POWER TRANSISTOR 2SA1008

### PNP SILICON EPITAXIAL TRANSISTOR FOR HIGH-SPEED SWITCHING

The 2SA1008 is a mold power transistor developed for high-speed switching, and is ideal for use as a driver in devices such as switching regulators, DC/DC converters, and high-frequency power amplifiers.

#### ORDERING INFORMATION

Part No.	Package
2SA1008	TO-220AB

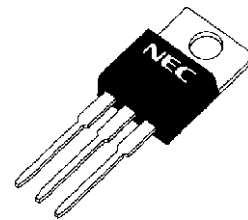
#### FEATURES

- Low collector saturation voltage
- Fast switching speed
- Complementary transistor: 2SC2331

#### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25°C)

Parameter	Symbol	Conditions	Ratings	Unit
Collector to base voltage	V <sub>CBO</sub>		-100	V
Collector to emitter voltage	V <sub>CEO</sub>		-100	V
Emitter to base voltage	V <sub>EBO</sub>		-7.0	V
Collector current (DC)	I <sub>C(DC)</sub>		-2.0	A
Collector current (pulse)	I <sub>C(pulse)</sub>	PW ≤ 300 μs, duty cycle ≤ 10%	-4.0	A
Base current (DC)	I <sub>B(DC)</sub>		-1.0	A
Total power dissipation	P <sub>T</sub>	T <sub>C</sub> = 25°C	15	W
		T <sub>A</sub> = 25°C	1.5	W
Junction temperature	T <sub>j</sub>		150	°C
Storage temperature	T <sub>stg</sub>		-55 to +150	°C

(TO-220AB)



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

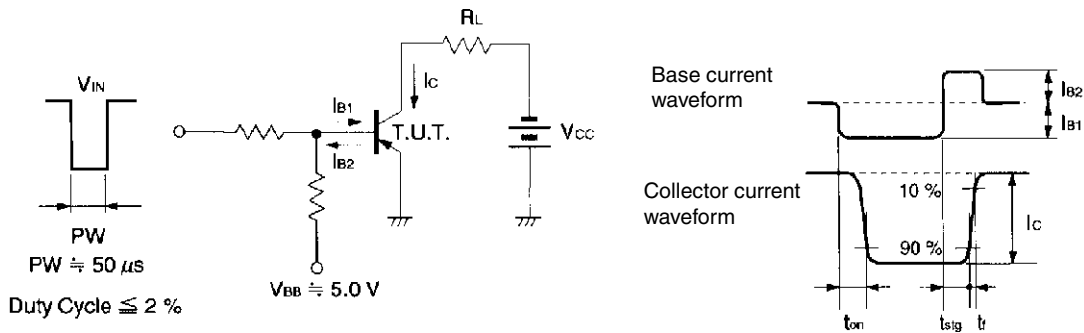
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector to emitter voltage	V <sub>CE0(SUS)</sub>	I <sub>C</sub> = -1.0 A, I <sub>B1</sub> = -0.1 A, L = 1 mH	-100			V
Collector to emitter voltage	V <sub>CEx(SUS)1</sub>	I <sub>C</sub> = -1.0 A, I <sub>B1</sub> = -I <sub>B2</sub> = -0.1 A, V <sub>BE(OFF)</sub> = 5.0 V, L = 180 μH, clamped	-100			V
Collector to emitter voltage	V <sub>CEx(SUS)2</sub>	I <sub>C</sub> = -2.0 A, I <sub>B1</sub> = -0.2 A, I <sub>B2</sub> = 0.1 A, V <sub>BE(OFF)</sub> = 5.0 V, L = 180 μH, clamped	-100			V
Collector cutoff current	I <sub>CBO</sub>	V <sub>CB</sub> = -100 V, I <sub>E</sub> = 0 A			-10	μA
Collector cutoff current	I <sub>CER</sub>	V <sub>CE</sub> = -100 V, R <sub>BE</sub> = 51 Ω, T <sub>A</sub> = 125°C			-1.0	mA
Collector cutoff current	I <sub>CEx1</sub>	V <sub>CE</sub> = -100 V, V <sub>BE(OFF)</sub> = 1.5 V			-10	μA
Collector cutoff current	I <sub>CEx2</sub>	V <sub>CE</sub> = -100 V, V <sub>BE(OFF)</sub> = 1.5 V, T <sub>A</sub> = 125°C			-1.0	mA
Emitter cutoff current	I <sub>EBO</sub>	V <sub>EB</sub> = -5.0 V, I <sub>C</sub> = 0 A			-10	μA
DC current gain	h <sub>FE1</sub>	V <sub>CE</sub> = -5.0 V, I <sub>C</sub> = -0.1 A <sup>Note</sup>	40			
DC current gain	h <sub>FE2</sub>	V <sub>CE</sub> = -5.0 V, I <sub>C</sub> = -1.0 A <sup>Note</sup>	40		200	
Collector saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> = -1.0 A, I <sub>B</sub> = -0.1 A <sup>Note</sup>			-0.6	V
Base saturation voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> = -1.0 A, I <sub>B</sub> = -0.1 A <sup>Note</sup>			-1.5	V
Turn-on time	t <sub>on</sub>	I <sub>C</sub> = -1.0 A, R <sub>L</sub> = 50 Ω, I <sub>B1</sub> = -I <sub>B2</sub> = -0.1 A, V <sub>CC</sub> ≅ -50 V Refer to the test circuit.			0.5	μs
Storage time	t <sub>stg</sub>				1.5	μs
Fall time	t <sub>f</sub>				0.5	μs

**Note** Pulse test PW ≤ 350 μs, duty cycle ≤ 2%

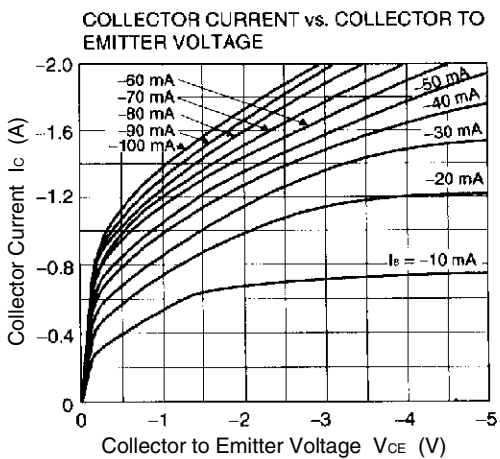
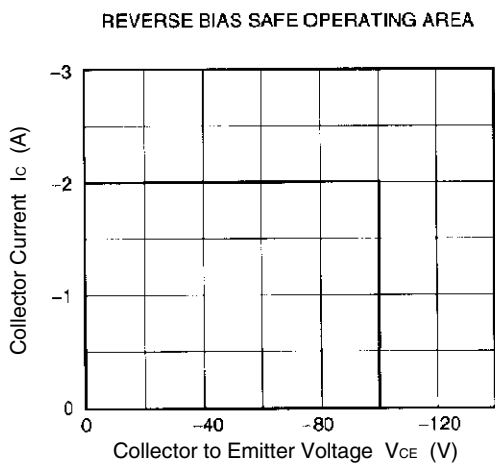
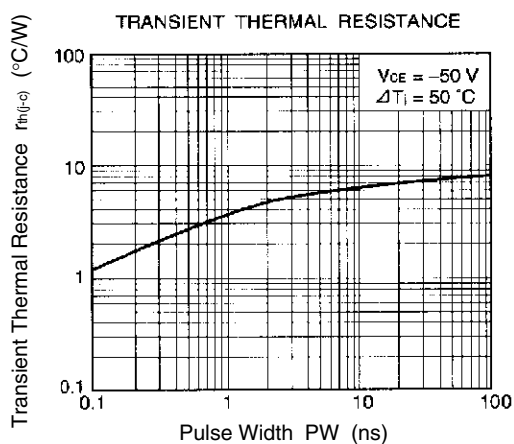
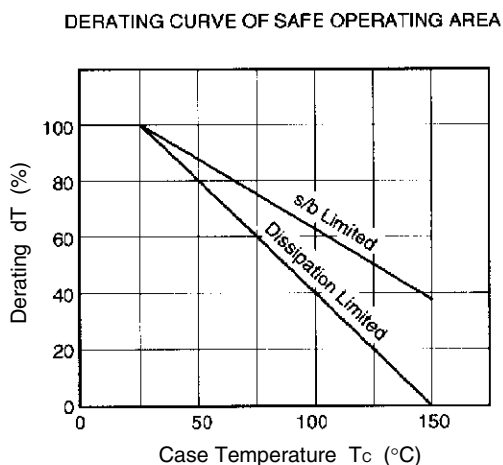
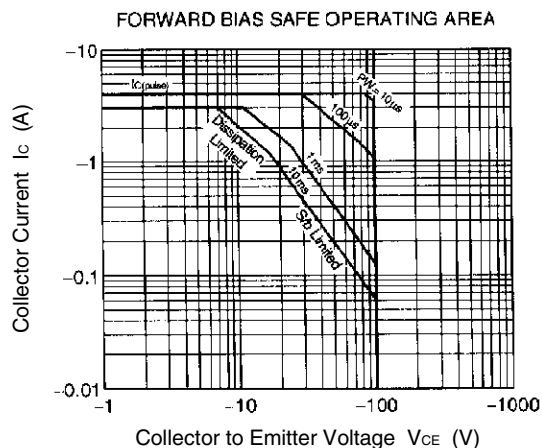
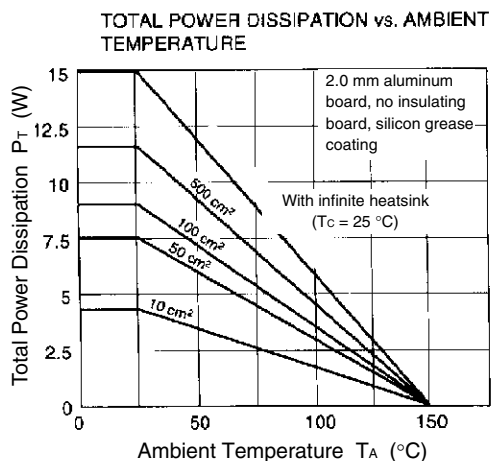
**h<sub>FE</sub> CLASSIFICATION**

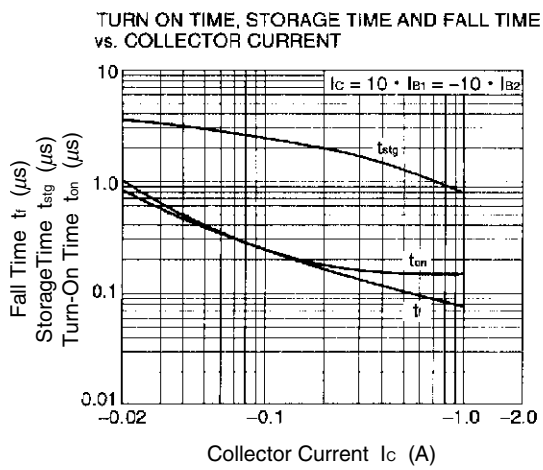
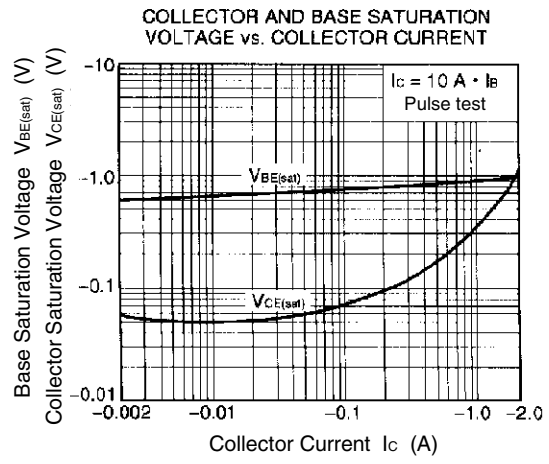
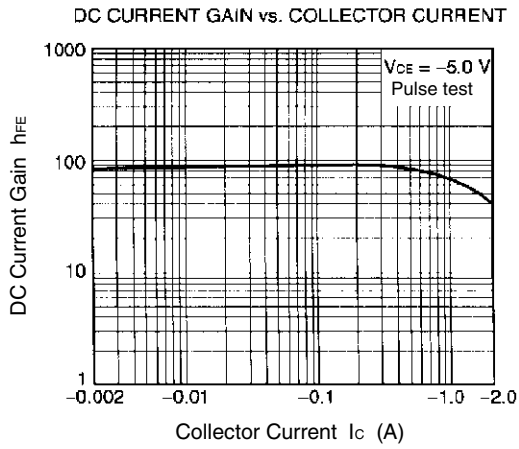
Marking	M	L	K
h <sub>FE2</sub>	40 to 80	60 to 120	100 to 200

**SWITCHING TIME (t<sub>on</sub>, t<sub>stg</sub>, t<sub>f</sub>) TEST CIRCUIT**



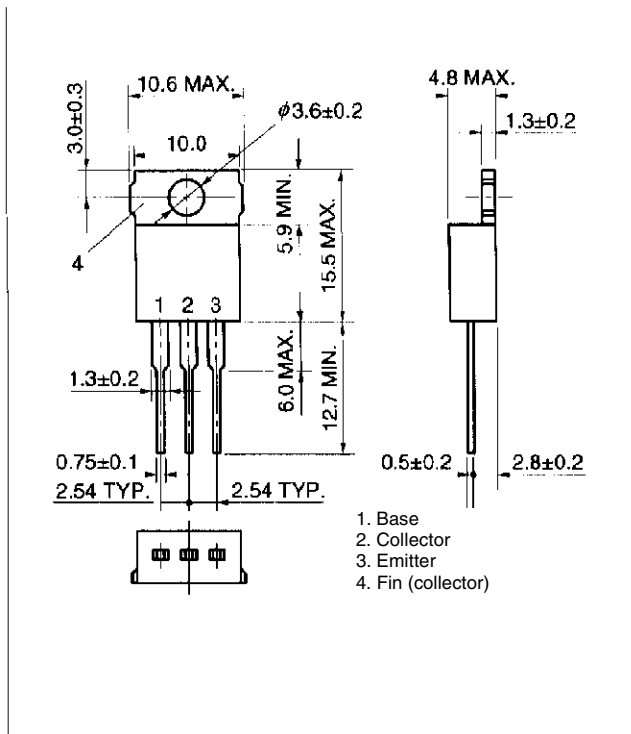
TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )





PACKAGE DRAWING (UNIT: mm)

TO-220AB (MP-25)



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