

# SILICON POWER TRANSISTORS 2SA1069, 1069A

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

The 2SA1069/1069A are the mold power transistors 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.

#### FEATURES

- Low collector saturation voltage
- Fast switching speed

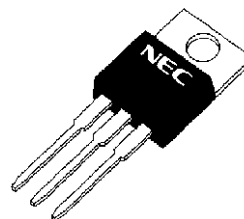
#### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25°C)

Parameter	Symbol	Conditions	Ratings	Unit
Collector to base voltage	V <sub>CBO</sub>		-80	V
Collector to emitter voltage	V <sub>CEO</sub>		-60/-80	V
Emitter to base voltage	V <sub>EBO</sub>		-12	V
Collector current (DC)	I <sub>C(DC)</sub>		-5.0	A
Collector current (pulse)	I <sub>C(pulse)</sub>	PW ≤ 300 μs, duty cycle ≤ 10%	-10	A
Base current (DC)	I <sub>B(DC)</sub>		-2.5	A
Total power dissipation	P <sub>T</sub>	T <sub>C</sub> = 25°C	30	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

#### ORDERING INFORMATION

Part No.	Package
2SA1069	TO-220AB
2SA1069A	

(TO-220AB)



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Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.

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

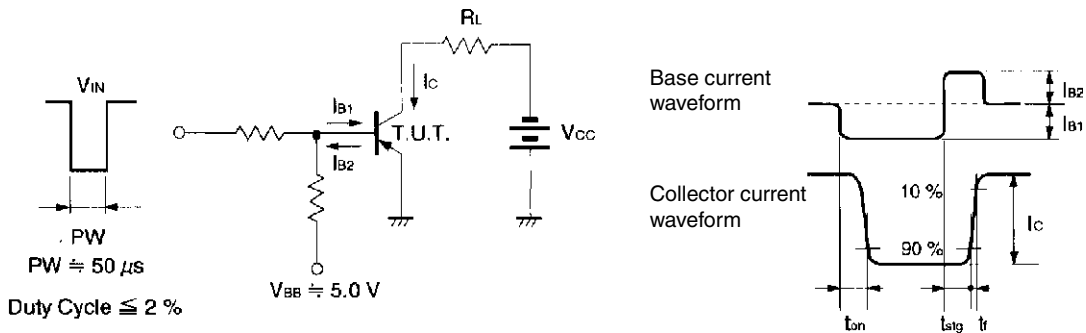
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector to emitter voltage	V <sub>CE0(SUS)</sub>	I <sub>C</sub> = -3.0 V, I <sub>B1</sub> = -0.3 A, L = 1 mH	-60/-80			V
Collector to emitter voltage	V <sub>CEX(SUS)1</sub>	I <sub>C</sub> = -3.0 A, I <sub>B1</sub> = -I <sub>B2</sub> = -0.3 A, V <sub>BE(OFF)</sub> = 5.0 V, L = 180 μH, clamped	-60/-80			V
Collector to emitter voltage	V <sub>CEX(SUS)2</sub>	I <sub>C</sub> = -6.0 A, I <sub>B1</sub> = -0.6 A, I <sub>B2</sub> = 0.3 A, V <sub>BE(OFF)</sub> = 5.0 V, L = 180 μH, clamped	-60/-80			V
Collector cutoff current	I <sub>CBO</sub>	V <sub>CB</sub> = -60/-80 V, I <sub>E</sub> = 0 A			-10	μA
Collector cutoff current	I <sub>CER</sub>	V <sub>CE</sub> = -60/-80 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> = -60/-80 V, V <sub>BE(OFF)</sub> = 1.5 V			-10	μA
Collector cutoff current	I <sub>CEx2</sub>	V <sub>CE</sub> = -60/-80 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> = -0.3 A <sup>Note</sup>	40			
DC current gain	h <sub>FE2</sub>	V <sub>CE</sub> = -5.0 V, I <sub>C</sub> = -0.3 A <sup>Note</sup>	40		200	
Collector saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> = -3.0 A, I <sub>B</sub> = -0.3 A <sup>Note</sup>			-0.6	V
Base saturation voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> = -3.0 A, I <sub>B</sub> = -0.3 A <sup>Note</sup>			-1.5	V
Turn-on time	t <sub>on</sub>	I <sub>C</sub> = -3.0 A, R <sub>L</sub> = 17 Ω, I <sub>B1</sub> = -I <sub>B2</sub> = -0.3 A, V <sub>CC</sub> ≅ -50 V			0.5	μs
Storage time	t <sub>stg</sub>	Refer to the test circuit.			2.5	μs
Fall time	t <sub>f</sub>				0.5	μs

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

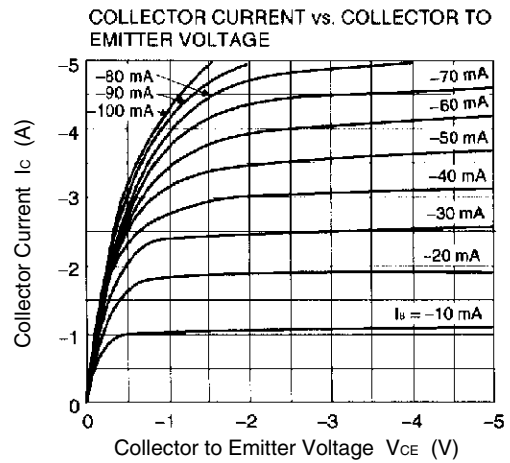
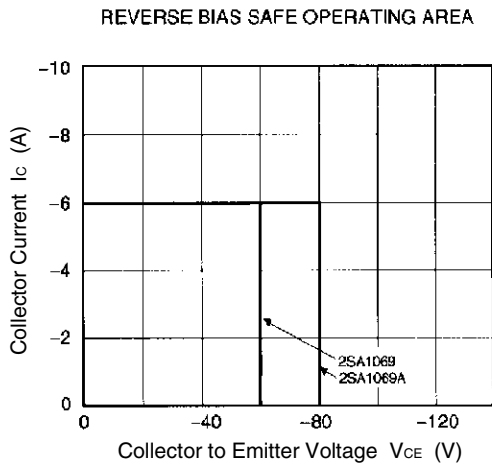
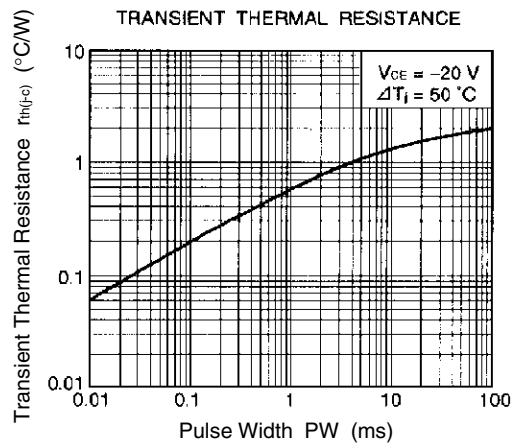
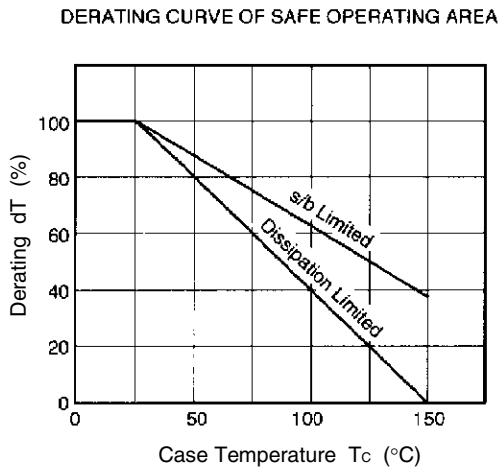
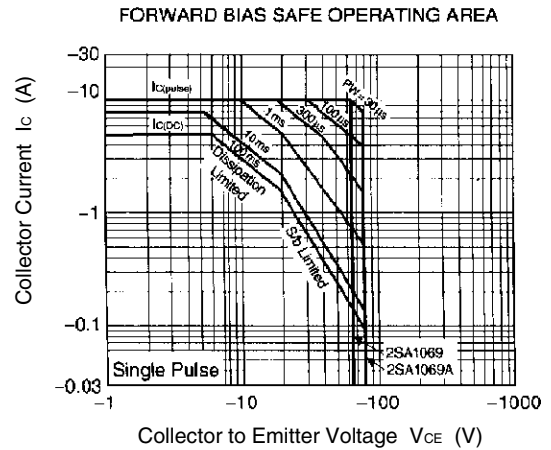
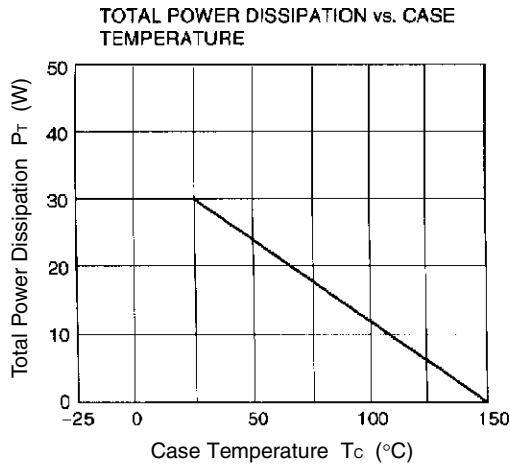
**h<sub>FE</sub> CLASSIFICATION**

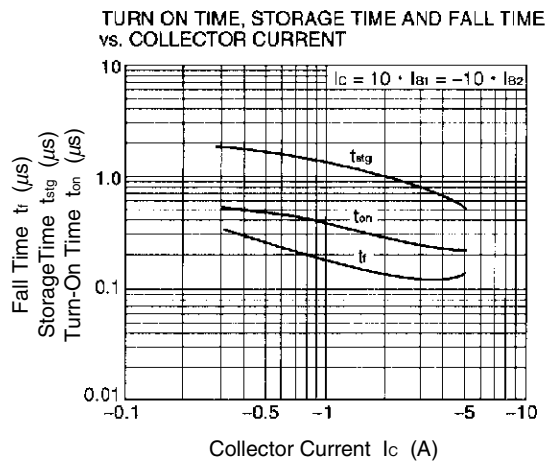
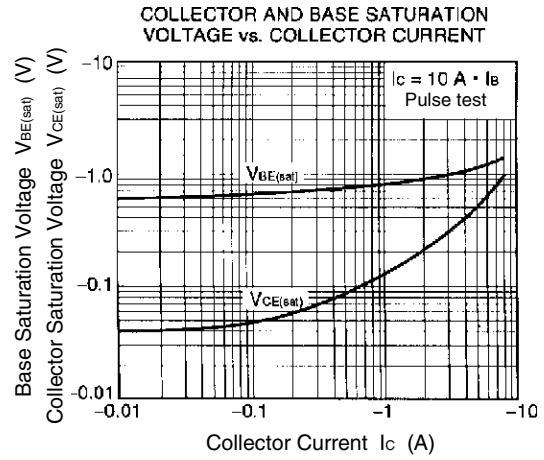
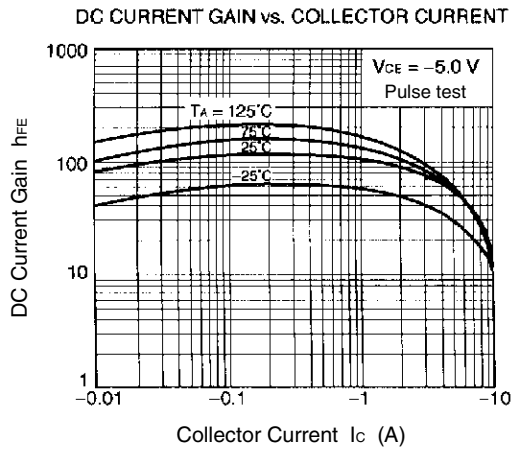
Marking	M	L	K
h <sub>FE2</sub>	40 to 80	60 to 120	100 to 200

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



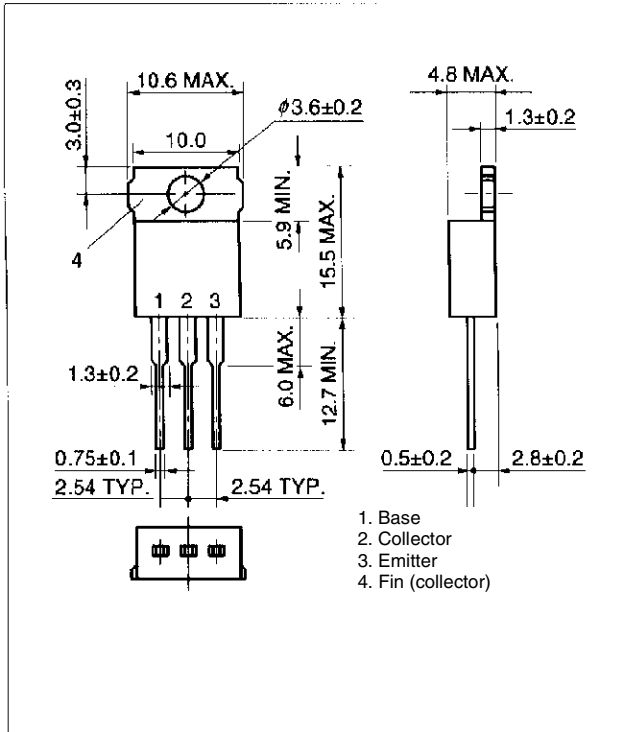
TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)





PACKAGE DRAWING (UNIT: mm)

TO-220AB (MP-25)



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