

PNP SILICON POWER TRANSISTORS

2SA1009, 2SA1009A

DESCRIPTION	The 2SA1009, 2SA1009A are PNP triple diffused transistors designed for switching regulator, DC-DC converter and high frequency power amplifier application.
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FEATURES

- Low Collector Saturation Voltage.
- High Speed Switching.
- Wide Reverse Bias Safe Operating Area.

ABSOLUTE MAXIMUM RATINGS

Maximum Temperatures

Storage Temperature **–55 to +150 °C**

Junction Temperature 150 °C Maximum

Maximum Power Dissipation ($T_c = 25^\circ\text{C}$)

Total Power Dissipation 15 W

Maximum Voltages and Currents ($T_a = 25^\circ\text{C}$)

2SA1009/2SA1009A

V_{CB0} Collector to Base Voltage -350/ -400 V

V_{CEO} Collector to Emitter Voltage . . -350/ -400 V

V_{EBO}	Emitter to Base Voltage	-7.0	V
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$I_{C(DC)}$ Collector Current (DC) -2.0 A

$I_{C(pulse)}$	Collector Current (pulse)*	—4.0	A
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I_B (DC)	Base Current (DC)		-1.0	A
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* PW $\leq$ 300 μ s, Duty Cycle $\leq$ 10 %

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT.	TEST CONDITIONS
t _{on}	Turn-on Time			1.0	μs	(I _C = -0.3 A, I _{B1} = -I _{B2} = -60 mA R _L = 500 Ω, V _{CC} ≐ -150 V)
t _{stg}	Storage Time			2.5	μs	
t _f	Fall Time			1.0	μs	
h _{FE1}	DC Current Gain**	20		200	—	V _{CE} = -5.0 V, I _C = -0.1 A
h _{FE2}	DC Current Gain**	10		—	—	V _{CE} = -5.0 V, I _C = -0.3 A
V _{CE(sat)}	Collector Saturation Voltage**			-1.0	V	I _C = -0.3 A, I _B = -60 mA
V _{BE(sat)}	Base Saturation Voltage**			-1.2	V	I _C = -0.3 A, I _B = -60 mA
V _{CEO(SUS)}	Collector to Emitter Sustaining Voltage	-350/-400			V	I _C = -0.3 A, I _B = -60 mA, L = 1 mH
V _{CEX(SUS)1}	Collector to Emitter Sustaining Voltage	-350/-400			V	I _C = -0.3 A, I _{B1} = -I _{B2} = -60 mA, L = 180 μH, Clamped
V _{CEX(SUS)2}	Collector to Emitter Sustaining Voltage	-350/-400			V	I _C = -0.6 A, I _{B1} = -0.2 A, -I _{B2} = 60 mA, L = 180 μH, Clamped
I _{CBO}	Collector Cutoff Current			-10	μA	V _{CB} = -350/-400 V, I _E = 0
I _{CER}	Collector Cutoff Current			-1.0	mA	V _{CE} = -350/-400 V, R _{BE} = 51 Ω, T _a = 125 °C
I _{CEX1}	Collector Cutoff Current			-10	μA	V _{CE} = -350/-400 V, V _{BE(OFF)} = 1.5 V
I _{CEX2}	Collector Cutoff Current			-1.0	mA	V _{CE} = -350/-400 V, V _{BE(OFF)} = 1.5 V, T _a = 125 °C
I _{EB0}	Emitter Cutoff Current			-10	μA	V _{EB} = -5.0 V, I _C = 0

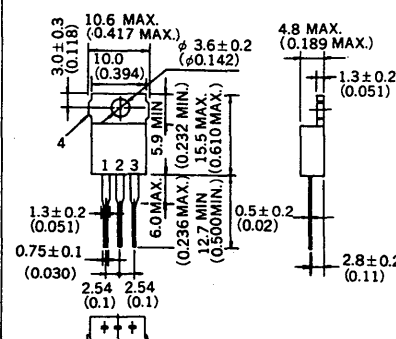
****PW $\leq 350 \mu s$. Duty Cycle $\leq 2\%$**

Classification of hFE1

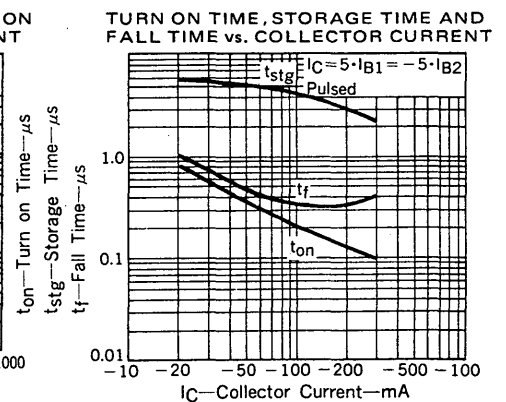
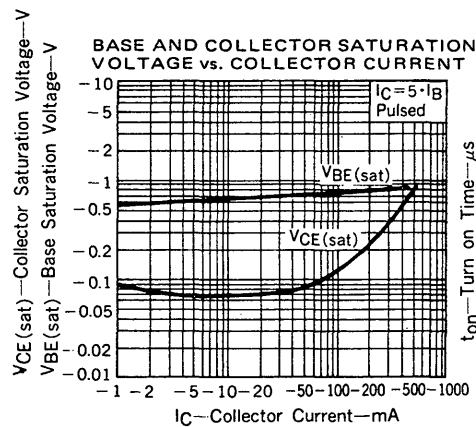
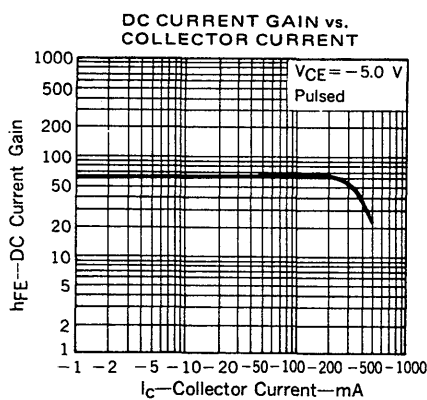
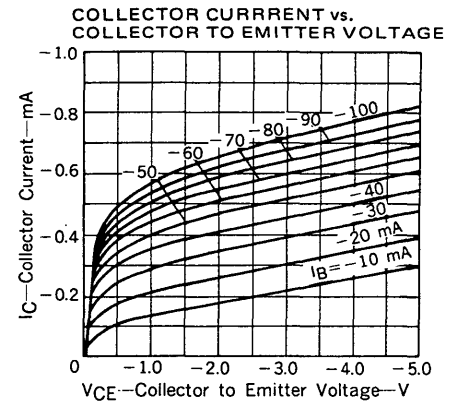
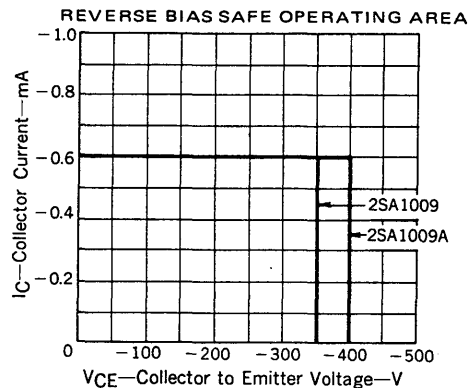
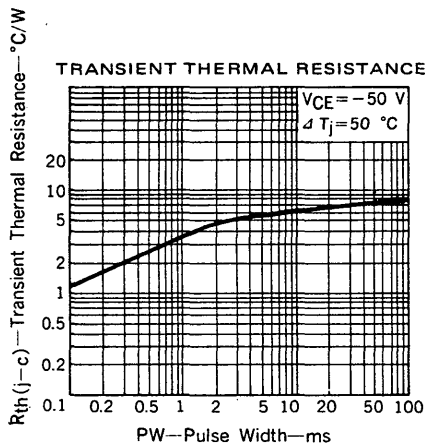
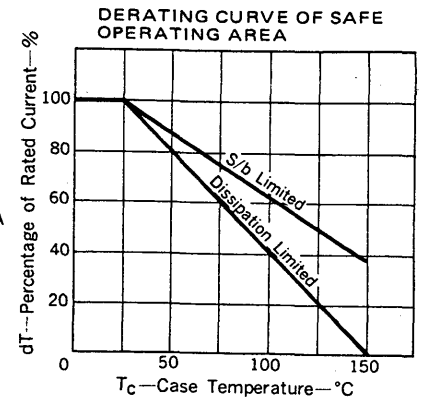
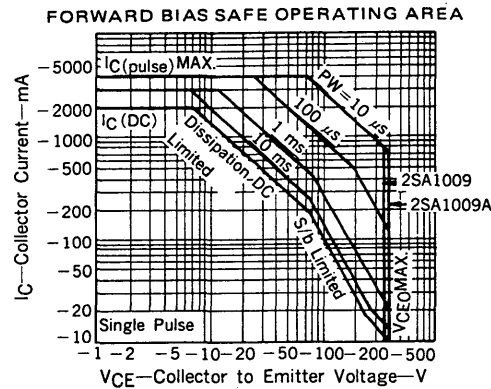
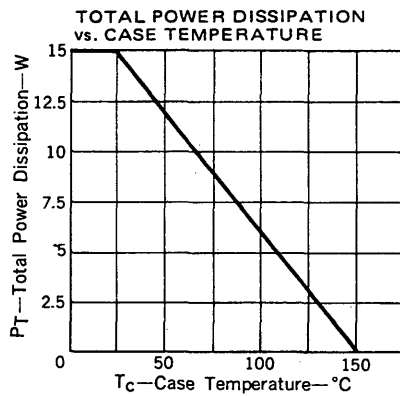
Rank	M	L	K	J	H
Range	20 to 40	30 to 60	40 to 80	60 to 120	100 to 200

Test Conditions: $V_{CE} = -5.0 \text{ V}$, $I_C = -0.1 \text{ A}$

PACAKGE DIMENSIONS



- 1. Base (B)
 - 2. Collector (C)
 - 3. Emitter (E)
 - 4. Fin (Collector)
- JEDEC: TO-220AB

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

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

