NEC

PNP SILICON POWER TRANSISTORS 2SA1009,2SA1009A

DESCRIPTION

The 2SA1009, 2SA1009A are PNP triple diffused transistors de-

signed for switching regulator, DC-DC converter and high frequency

power amplifier application.

FEATURES

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

ABSOLUTE MAXIMUM RATINGS

Maximum Temperatures

Maximum Power Dissipation ($T_c = 25$ °C)

Maximum Voltages and Currents ($T_a = 25$ °C)

2SA1009/2SA1009A

| V _{CBO} | Collector to Base Voltage350/ -400 | ٧ |
|-----------------------|--|---|
| V_{CEO} | Collector to Emitter Voltage350/ -400 | ٧ |
| V_{EBO} | Emitter to Base Voltage −7.0 | ٧ |
| (DC) | Collector Current (DC)2.0 | Α |
| I _{C(pulse)} | Collector Current (pulse)*4.0 | Α |
| IB(DC) | Base Current (DC) · · · · · · · · -1.0 | Α |

* PW \leq 300 μ s, Duty Cycle \leq 10 %

PACAKGE DIMENSIONS in millimeters (inches) 10.6 MAX. (0.417 MAX.) (0.142) (0.051)

4. Fin (Collector)
JEDEC: TO-220AB

ELECTRICAL CHARACTERISTICS (Ta = 25 °C)

| SYMBOL | CHARACTERISTIC | MIN. | TYP. | MAX. | UNIT. | TEST CONDITIONS | |
|----------------------|---|-----------|------|------|-------|---|--|
| ton | Turn-on Time | | | 1.0 | μs | /IC=-0.3 A, IB1=-IB2=-60 mA | |
| t _{stg} | Storage Time | ٠ | | 2.5 | μs | $R_L = 500 \Omega, V_{CC} = -150 V$ | |
| tf | Fall Time | | | 1.0 | μs | (HL - 200 32, VCC 120 V | |
| hFE1 | DC Current Gain** | 20 | | 200 | - | $V_{CE} = -5.0 \text{ V, } I_{C} = -0.1 \text{ A}$ | |
| hFE2 | DC Current Gain** | 10 | | | - | $V_{CE} = -5.0 \text{ V, } I_{C} = -0.3 \text{ A}$ | |
| V _{CE(sat)} | Collector Saturation Voltage** | | | -1.0 | V | $I_{C} = -0.3 \text{ A}, I_{B} = -60 \text{ mA}$ | |
| V _{BE(sat)} | Base Saturation Voltage** | | | -1.2 | V | $1_{C} = -0.3 \text{ A, } 1_{B} = -60 \text{ mA}$ | |
| VCEO(SUS) | Collector to Emitter Sustaining Voltage | -350/-400 | | | V | $I_C = -0.3 \text{ A}, I_B = -60 \text{ mA}, L = 1 \text{ mH}$ | |
| VCEX(SUS)1 | Collector to Emitter Sustaining Voltage | -350/-400 | | | V | $I_C = -0.3 \text{ A, } I_{B1} = -I_{B2} = -60 \text{ mA,}$ L = 180 μ H, Clamped | |
| VCEX (SUS)2 | Collector to Emitter Sustaining Voltage | -350/-400 | | | v | $I_C = -0.6 \text{ A}, I_{B1} = -0.2 \text{ A}, -I_{B2} = 60 \text{ mA},$ L = 180 μ H, Clamped | |
| Ісво | Collector Cutoff Current | | | -10 | μΑ | $V_{CB} = -350/-400 \text{ V, I}_{E} = 0$ | |
| CER | Collector Cutoff Current | | | -1.0 | mA | $V_{CE} = -350/-400 \text{ V, R}_{BE} = 51 \Omega$, $T_a = 125 ^{\circ}\text{C}$ | |
| ICEX1 | Collector Cutoff Current | | | -10 | μΑ | $V_{CE} = -350/-400 \text{ V}, V_{BE(OFF)} = 1.5 \text{ V}$ | |
| CEX2 | Collector Cutoff Current | | | -1.0 | mA | $V_{CE} = -350/-400 \text{ V}, V_{BE(OFF)} = 1.5 \text{ V},$ $T_a = 125 ^{\circ}\text{C}$ | |
| 1EBO | Emitter Cutoff Current | | | -10 | μΑ | V _{EB} = -5.0 V, I _C = 0 | |

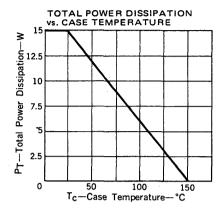
^{**}PW \leq 350 μ s, Duty Cycle \leq 2 %

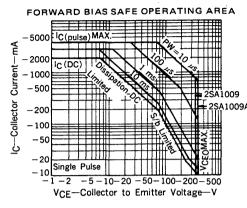
Classification of heet

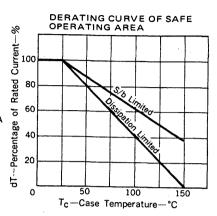
| Rank | М | L | Κ | J | Н |
|-------|----------|----------|----------|-----------|------------|
| Range | 20 to 40 | 30 to 60 | 40 to 80 | 60 to 120 | 100 to 200 |

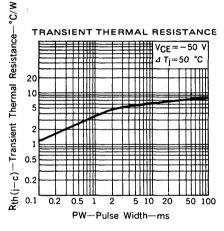
Test Conditions: VCE = -5.0 V, IC = -0.1 A

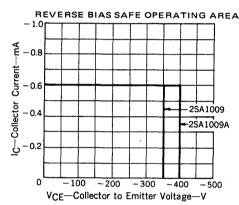
TYPICAL CHARACTERISTICS (Ta = 25 °C)

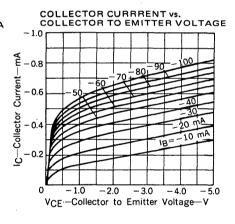


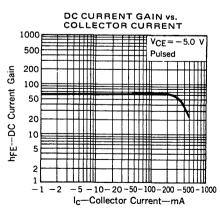


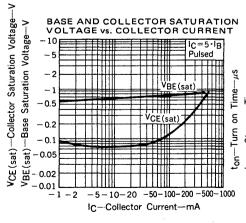


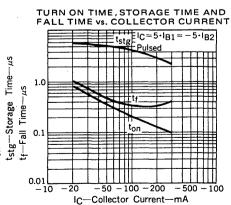












SWITCHING TIME (t_{on} , t_{stg} , t_{f}) TEST CIRCUIT

