

New Jersey Semi-Conductor Products, Inc.

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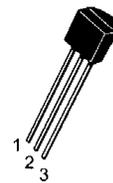
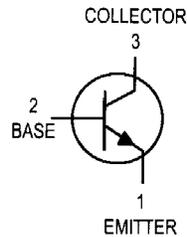
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Switching Transistors

NPN Silicon

MPS2369
MPS2369A*

*Motorola Preferred Device



TO-92

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|--|----------------|-------------|----------------------------|
| Collector-Emitter Voltage | V_{CEO} | 15 | Vdc |
| Collector-Emitter Voltage | V_{CES} | 40 | Vdc |
| Collector-Base Voltage | V_{CBO} | 40 | Vdc |
| Emitter-Base Voltage | V_{EBO} | 4.5 | Vdc |
| Collector Current — Continuous | I_C | 200 | mAdc |
| Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 625 5.0 | mW mW/ $^\circ\text{C}$ |
| Operating and Storage Junction Temperature Range | T_J, T_{stg} | -55 to +150 | $^\circ\text{C}$ |

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|---|-----------------|-----|---------------------------|
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 200 | $^\circ\text{C}/\text{W}$ |

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|----------------|--------|-----|-----|-----|------|
|----------------|--------|-----|-----|-----|------|

OFF CHARACTERISTICS

| | | | | | | |
|---|-----------|---------------|-----|---|-----------|-----------------|
| Collector-Emitter Breakdown Voltage ⁽¹⁾ ($I_C = 10 \text{ mAdc}, I_B = 0$) | MPS2369A | $V_{(BR)CEO}$ | 15 | — | — | Vdc |
| Collector-Emitter Breakdown Voltage ($I_C = 10 \mu\text{Adc}, V_{BE} = 0$) | MPS2369,A | $V_{(BR)CES}$ | 40 | — | — | Vdc |
| Collector-Base Breakdown Voltage ($I_C = 10 \mu\text{Adc}, I_E = 0$) | MPS2369,A | $V_{(BR)CBO}$ | 40 | — | — | Vdc |
| Emitter-Base Breakdown Voltage ($I_E = 10 \mu\text{Adc}, I_C = 0$) | MPS2369,A | $V_{(BR)EBO}$ | 4.5 | — | — | Vdc |
| Collector Cutoff Current ($V_{CB} = 20 \text{ Vdc}, I_E = 0$) ($V_{CB} = 20 \text{ Vdc}, I_E = 0, T_A = 125^\circ\text{C}$) | MPS2369,A | I_{CBO} | — | — | 0.4 30 | μAdc |
| Collector Cutoff Current ($V_{CE} = 20 \text{ Vdc}, V_{BE} = 0$) | MPS2369,A | I_{CES} | — | — | 0.4 | μAdc |

1. Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

Quality Semi-Conductors

MPS2369 MPS2369A

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted) (Continued)

| Characteristic | Symbol | Min | Typ | Max | Unit | |
|--|---|---------------|---|--------------------------------------|--|-----|
| ON CHARACTERISTICS | | | | | | |
| DC Current Gain ⁽¹⁾ ($I_C = 10\text{ mAdc}$, $V_{CE} = 1.0\text{ Vdc}$) ($I_C = 10\text{ mAdc}$, $V_{CE} = 1.0\text{ Vdc}$, $T_A = -55^\circ\text{C}$) ($I_C = 10\text{ mAdc}$, $V_{CE} = 1.0\text{ Vdc}$) ($I_C = 10\text{ mAdc}$, $V_{CE} = 0.35\text{ Vdc}$) ($I_C = 10\text{ mAdc}$, $V_{CE} = 0.35\text{ Vdc}$, $T_A = -55^\circ\text{C}$) ($I_C = 30\text{ mAdc}$, $V_{CE} = 0.4\text{ Vdc}$) ($I_C = 100\text{ mAdc}$, $V_{CE} = 2.0\text{ Vdc}$) ($I_C = 100\text{ mAdc}$, $V_{CE} = 1.0\text{ Vdc}$) | MPS2369A MPS2369 MPS2369 MPS2369A MPS2369A MPS2369A MPS2369 MPS2369A | h_{FE} | — 20 40 40 20 30 20 20 | — — — — — — — — | 120 — 120 — — — — — | — |
| Collector–Emitter Saturation Voltage ⁽¹⁾ ($I_C = 10\text{ mAdc}$, $I_B = 1.0\text{ mAdc}$) ($I_C = 10\text{ mAdc}$, $I_B = 1.0\text{ mAdc}$) ($I_C = 10\text{ mAdc}$, $I_B = 1.0\text{ mAdc}$, $T_A = +125^\circ\text{C}$) ($I_C = 30\text{ mAdc}$, $I_B = 3.0\text{ mAdc}$) ($I_C = 100\text{ mAdc}$, $I_B = 10\text{ mAdc}$) | MPS2369 MPS2369A MPS2369A MPS2369A MPS2369A | $V_{CE(sat)}$ | — — — — — | — — — — — | 0.25 0.20 0.30 0.25 0.50 | Vdc |
| Base–Emitter Saturation Voltage ⁽¹⁾ ($I_C = 10\text{ mAdc}$, $I_B = 1.0\text{ mAdc}$) ($I_C = 10\text{ mAdc}$, $I_B = 1.0\text{ mAdc}$, $T_A = +125^\circ\text{C}$) ($I_C = 10\text{ mAdc}$, $I_B = 1.0\text{ mAdc}$, $T_A = -55^\circ\text{C}$) ($I_C = 30\text{ mAdc}$, $I_B = 3.0\text{ mAdc}$) ($I_C = 100\text{ mAdc}$, $I_B = 10\text{ mAdc}$) | MPS2369 MPS2369A MPS2369A MPS2369A MPS2369A | $V_{BE(sat)}$ | 0.7 0.5 — — — | — — — — — | 0.85 — 1.02 1.15 1.60 | Vdc |
| SMALL–SIGNAL CHARACTERISTICS | | | | | | |
| Output Capacitance ($V_{CB} = 5.0\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$) | MPS2369,A | C_{obo} | — | — | 4.0 | pF |
| Small–Signal Current Gain ($I_C = 10\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$, $f = 100\text{ MHz}$) | MPS2369,A | h_{fe} | 5.0 | — | — | — |
| SWITCHING CHARACTERISTICS | | | | | | |
| Storage Time ($I_{B1} = I_{B2} = I_C = 10\text{ mAdc}$) (Figure 3) | MPS2369,A | t_s | — | 5.0 | 13 | ns |
| Turn–On Time ($V_{CC} = 3.0\text{ Vdc}$, $I_C = 10\text{ mAdc}$, $I_{B1} = 3.0\text{ mAdc}$) (Figure 1) | MPS2369,A | t_{on} | — | 8.0 | 12 | ns |
| Turn–Off Time ($V_{CC} = 3.0\text{ Vdc}$, $I_C = 10\text{ mAdc}$, $I_{B1} = 3.0\text{ mAdc}$, $I_{C3} = 2.0\text{ mAdc}$, $I_{B3} = 3.0\text{ mAdc}$) | MPS2369,A | t_{off} | — | 10 | 18 | ns |