



Micro Commercial Components



Micro Commercial Components
20736 Marilla Street Chatsworth
CA 91311
Phone: (818) 701-4933
Fax: (818) 701-4939

MMS9013-L MMS9013-H

NPN Silicon Plastic-Encapsulate Transistor

Features

- SOT-23 Plastic-Encapsulate Transistors
- Capable of 0.3Watts($T_{amb}=25^{\circ}C$) of Power Dissipation.
- Collector-current 0.5A
- Collector-base Voltage 40V
- Operating and storage junction temperature range: $-55^{\circ}C$ to $+150^{\circ}C$
- Marking : J3
- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1

Electrical Characteristics @ 25°C Unless Otherwise Specified

| Symbol | Parameter | Min | Max | Units |
|--------|-----------|-----|-----|-------|
|--------|-----------|-----|-----|-------|

OFF CHARACTERISTICS

| | | | | |
|---------------|--|-----|-----|---------|
| $V_{(BR)CBO}$ | Collector-Base Breakdown Voltage ($I_C=100\mu A$, $I_E=0$) | 40 | --- | Vdc |
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage ($I_C=0.1mA$, $I_B=0$) | 25 | --- | Vdc |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage ($I_E=100\mu A$, $I_C=0$) | 5.0 | --- | Vdc |
| I_{CBO} | Collector Cutoff Current ($V_{CB}=40Vdc$, $I_E=0$) | --- | 0.1 | μA |
| I_{CEO} | Collector Cutoff Current ($V_{CE}=20Vdc$, $I_B=0$) | --- | 0.1 | μA |
| I_{EBO} | Emitter Cutoff Current ($V_{EB}=5.0Vdc$, $I_C=0$) | --- | 0.1 | μA |

ON CHARACTERISTICS

| | | | | |
|---------------|--|-----|-----|-----|
| $h_{FE(1)}$ | DC Current Gain ($I_C=50mA$, $V_{CE}=1.0Vdc$) | 120 | 350 | --- |
| $h_{FE(2)}$ | DC Current Gain ($I_C=500mA$, $V_{CE}=1.0Vdc$) | 40 | --- | --- |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage ($I_C=500mA$, $I_B=50mA$) | --- | 0.6 | Vdc |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage ($I_C=500mA$, $I_B=50mA$) | --- | 1.2 | Vdc |
| V_{EB} | Base- Emitter Voltage ($I_E=100mA$) | --- | 1.4 | Vdc |

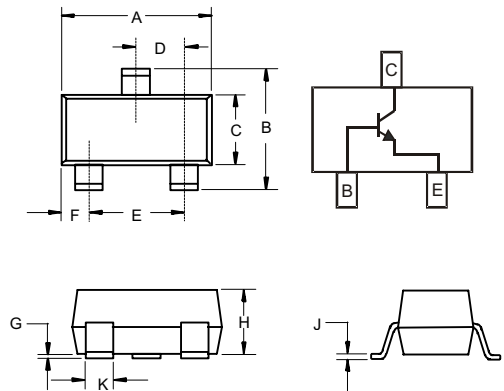
SMALL-SIGNAL CHARACTERISTICS

| | | | | |
|-------|--|-----|-----|-----|
| f_T | Transistor Frequency ($I_C=20mA$, $V_{CE}=6.0Vdc$, $f=30MHz$) | 150 | --- | MHz |
|-------|--|-----|-----|-----|

CLASSIFICATION OF $h_{FE(1)}$

| | | |
|-------|---------|---------|
| Rank | L | H |
| Range | 120-200 | 200-350 |

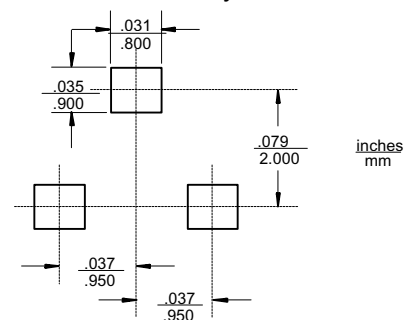
SOT-23



DIMENSIONS

| DIM | INCHES | | MM | | NOTE |
|-----|--------|-------|------|------|------|
| | MIN | MAX | MIN | MAX | |
| A | .110 | .120 | 2.80 | 3.04 | |
| B | .083 | .104 | 2.10 | 2.64 | |
| C | .047 | .055 | 1.20 | 1.40 | |
| D | .035 | .041 | .89 | 1.03 | |
| E | .070 | .081 | 1.78 | 2.05 | |
| F | .018 | .024 | .45 | .60 | |
| G | .0005 | .0039 | .013 | .100 | |
| H | .035 | .044 | .89 | 1.12 | |
| J | .003 | .007 | .085 | .180 | |
| K | .015 | .020 | .37 | .51 | |

Suggested Solder Pad Layout





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Ordering Information :

| Device | Packing |
|----------------|-----------------------|
| Part Number-TP | Tape&Reel; 3Kpcs/Reel |

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