# MSD42WT1, MSD42T1

Preferred Device

# NPN Silicon General Purpose High Voltage Transistors

This NPN Silicon Planar Transistor is designed for general purpose amplifier applications. This device is housed in the SC-70/SOT-323 and SC−59 packages which are designed for low power surface mount applications.

### Features

- Pb−Free Package is Available

### MAXIMUM RATINGS ($T_A$ = 25°C)

| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Collector-Base Voltage | $V_{(BR)CBO}$ | 300 | Vdc |
| Collector-Emitter Voltage | $V_{(BR)CEO}$ | 300 | Vdc |
| Emitter-Base Voltage | $V_{(BR)EBO}$ | 6.0 | Vdc |
| Collector Current − Continuous | $I_C$ | 150 | mAdc |

### THERMAL CHARACTERISTICS

| Rating | Symbol | Max | Unit |
|---|---|---|---|
| Power Dissipation (Note 1) | $P_D$ | 150 | mW |
| Junction Temperature | $T_J$ | 150 | °C |
| Storage Temperature Range | $T_{stg}$ | −55∼+150 | °C |

### ELECTRICAL CHARACTERISTICS

| Characteristic | Symbol | Min | Max | Unit |
|---|---|---|---|---|
| Collector-Emitter Breakdown Voltage ($I_C$ = 1.0 mAdc, $I_B$ = 0) | $V_{(BR)CEO}$ | 300 | − | Vdc |
| Collector-Base Breakdown Voltage ($I_C$ = 100 μAdc, $I_E$ = 0) | $V_{(BR)CBO}$ | 300 | − | Vdc |
| Emitter-Base Breakdown Voltage ($I_E$ = 100 μAdc, $I_E$ = 0) | $V_{(BR)EBO}$ | 6.0 | − | Vdc |
| Collector-Base Cutoff Current ($V_{CB}$ = 200 Vdc, $I_E$ = 0) | $I_{CBO}$ | − | 0.1 | μA |
| Emitter−Base Cutoff Current ($V_{EB}$ = 6.0 Vdc, $I_B$ = 0) | $I_{EBO}$ | − | 0.1 | μA |
| DC Current Gain (Note 2) ($V_{CE}$ = 10 Vdc, $I_C$ = 1.0 mAdc) ($V_{CE}$ = 10 Vdc, $I_C$ = 30 mAdc) | $h_{FE1}$ $h_{FE2}$ | 25 40 | − − | − |
| Collector-Emitter Saturation Voltage (Note 2) ($I_C$ = 20 mAdc, $I_B$ = 2.0 mAdc) | $V_{CE(sat)}$ | − | 0.5 | Vdc |

1. Device mounted on a FR-4 glass epoxy printed circuit board using the minimum recommended footprint.
2. Pulse Test: Pulse Width ≤ 300 μs, D.C. ≤ 2%.

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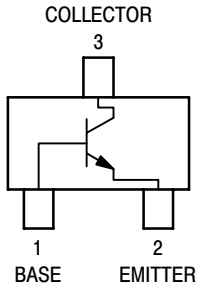
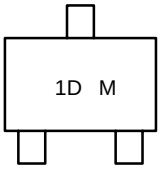


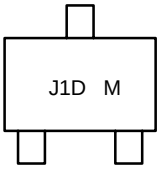


SC−70 (SOT−323)
CASE 419
(SCALE 2:1)


SC−59
CASE 318D
(SCALE 2:1)

### MARKING DIAGRAMS




1D = Device Marking Code
M = Date Code

### ORDERING INFORMATION

| Device | Package | Shipping† |
|---|---|---|
| MSD42WT1 | SC−70/SOT−323 | 3000/Tape & Reel |
| MSD42WT1G | SC−70/SOT−323 | 3000/Tape & Reel |
| MSD42T1 | SC−59 | 3000/Tape & Reel |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

**Preferred** devices are recommended choices for future use and best overall value.

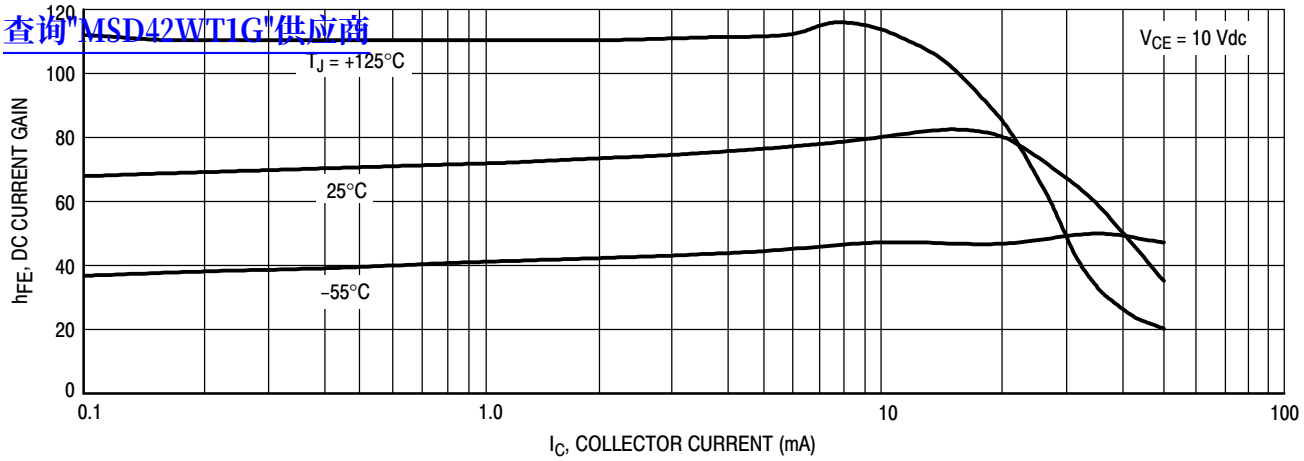



**Figure 1. DC Current Gain**

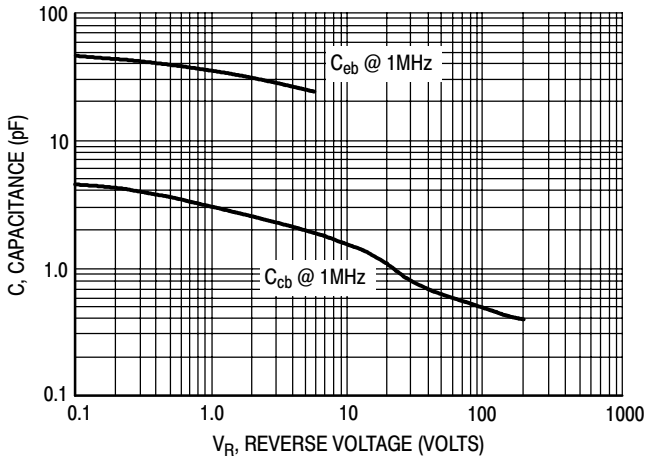



**Figure 2. Capacitance**

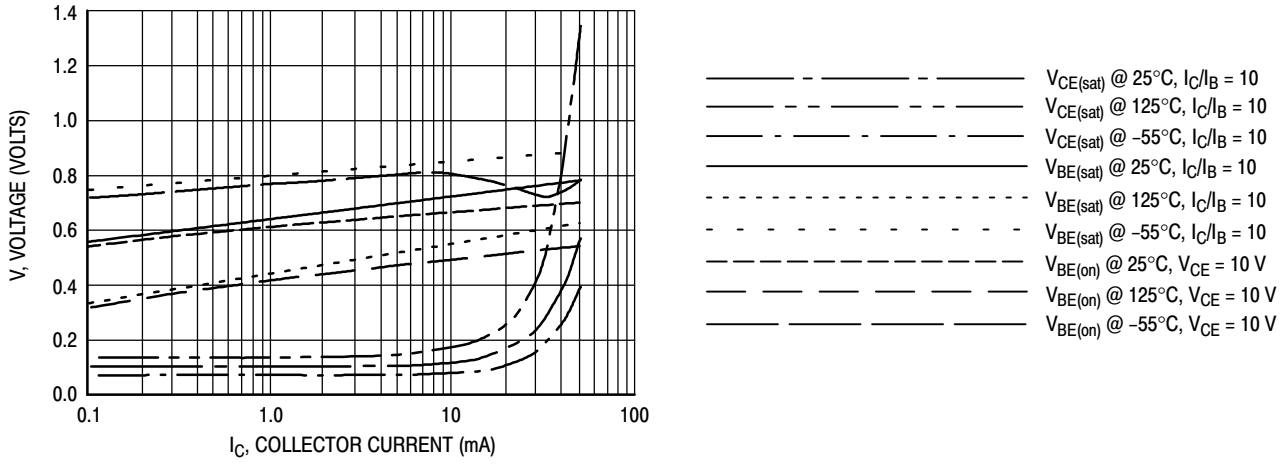
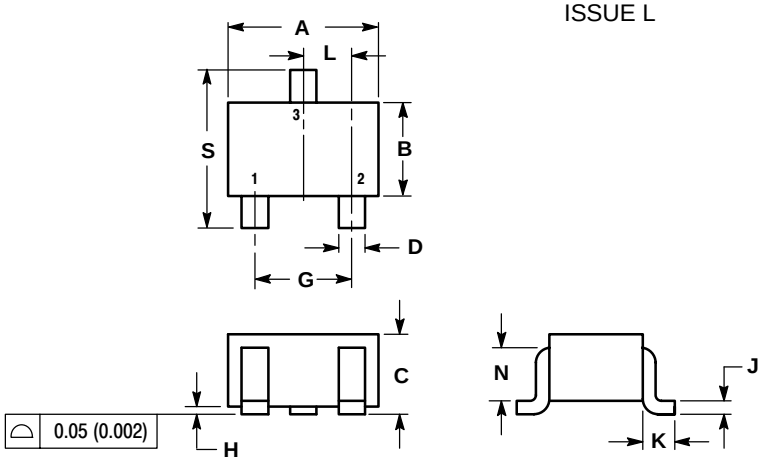



**Figure 3. “ON” Voltages**

## PACKAGE DIMENSIONS

**SC−70 (SOT−323)**
CASE 419−04
ISSUE L

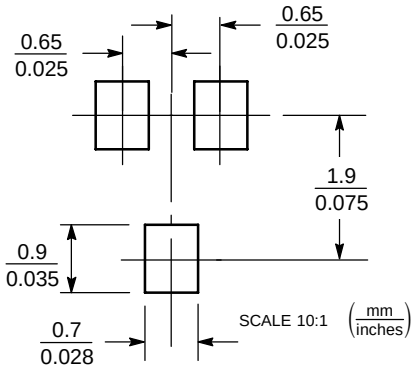



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | MIN | MAX | MIN | MAX |
| A | 0.071 | 0.087 | 1.80 | 2.20 |
| B | 0.045 | 0.053 | 1.15 | 1.35 |
| C | 0.032 | 0.040 | 0.80 | 1.00 |
| D | 0.012 | 0.016 | 0.30 | 0.40 |
| G | 0.047 | 0.055 | 1.20 | 1.40 |
| H | 0.000 | 0.004 | 0.00 | 0.10 |
| J | 0.004 | 0.010 | 0.10 | 0.25 |
| K | 0.017 REF | | 0.425 REF | |
| L | 0.026 BSC | | 0.650 BSC | |
| N | 0.028 REF | | 0.700 REF | |
| S | 0.079 | 0.095 | 2.00 | 2.40 |

STYLE 3:
PIN 1. BASE
2. EMITTER
3. COLLECTOR

**SOLDERING FOOTPRINT***

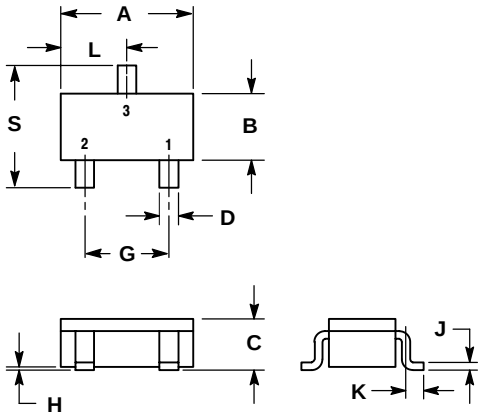



**SC−70/SOT−323**

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

## PACKAGE DIMENSIONS

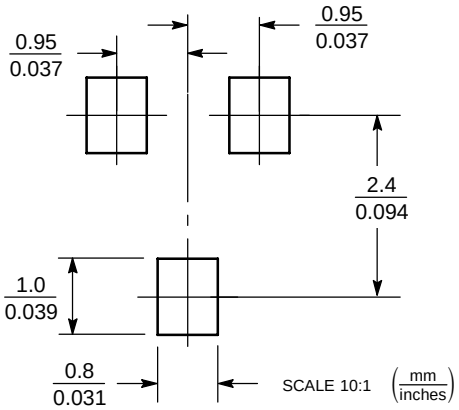
**SC−59**
CASE 318D−04
ISSUE F




NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.

| | MILLIMETERS | | INCHES | |
|---|---|---|---|---|
| DIM | MIN | MAX | MIN | MAX |
| A | 2.70 | 3.10 | 0.1063 | 0.1220 |
| B | 1.30 | 1.70 | 0.0512 | 0.0669 |
| C | 1.00 | 1.30 | 0.0394 | 0.0511 |
| D | 0.35 | 0.50 | 0.0138 | 0.0196 |
| G | 1.70 | 2.10 | 0.0670 | 0.0826 |
| H | 0.013 | 0.100 | 0.0005 | 0.0040 |
| J | 0.09 | 0.18 | 0.0034 | 0.0070 |
| K | 0.20 | 0.60 | 0.0079 | 0.0236 |
| L | 1.25 | 1.65 | 0.0493 | 0.0649 |
| S | 2.50 | 3.00 | 0.0985 | 0.1181 |

## SOLDERING FOOTPRINT*




**SC−59**

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



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