

MSD602-RT1G

General Purpose NPN Amplifier Transistor

Features

- S Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant*

MAXIMUM RATINGS (T_A = 25°C)

| Rating | Symbol | Value | Unit |
|--------------------------------|----------------------|-------|------|
| Collector-Base Voltage | V _{(BR)CBO} | 60 | Vdc |
| Collector-Emitter Voltage | V _{(BR)CEO} | 50 | Vdc |
| Emitter-Base Voltage | V _{(BR)EBO} | 7.0 | Vdc |
| Collector Current – Continuous | I _C | 500 | mAdc |
| Collector Current – Peak | I _{C(P)} | 1.0 | Adc |

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|----------------------|------------------|------------|------|
| Power Dissipation | P _D | 200 | mW |
| Junction Temperature | T _J | 150 | °C |
| Storage Temperature | T _{stg} | -55 ~ +150 | °C |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

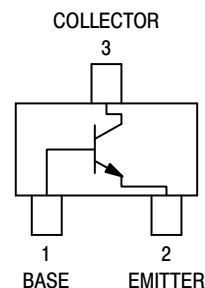


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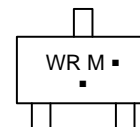
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**SC-59
CASE 318D
STYLE 1**



MARKING DIAGRAM



WR = Specific Device Code
M = Date Code
▪ = Pb-Free Package
(Note: Microdot may be in either location)

ORDERING INFORMATION

| Device | Package | Shipping† |
|--------------|--------------------|---------------------|
| MSD-602RT1G | SC-59 (Pb-Free) | 3,000 / Tape & Reel |
| SMSD-602RT1G | SC-59 (Pb-Free) | 3,000 / 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.

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

MSD602–RT1G

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

| Characteristic | Symbol | Min | Max | Unit |
|--|--------------------------------------|-----------|----------|------|
| Collector–Emitter Breakdown Voltage (I _C = 10 mA, I _B = 0) | V _{(BR)CEO} | 50 | – | V |
| Collector–Base Breakdown Voltage (I _C = 10 μA, I _E = 0) | V _{(BR)CBO} | 60 | – | V |
| Emitter–Base Breakdown Voltage (I _E = 10 μA, I _C = 0) | V _{(BR)EBO} | 7.0 | – | V |
| Collector–Base Cutoff Current (V _{CB} = 20 V, I _E = 0) | I _{CBO} | – | 0.1 | μA |
| DC Current Gain (Note 1) (V _{CE} = 10 V, I _C = 150 mA) (V _{CE} = 10 V, I _C = 500 mA) | h _{FE1} h _{FE2} | 120 40 | 240 – | – |
| Collector–Emitter Saturation Voltage (I _C = 300 mA, I _B = 30 mA) | V _{CE(sat)} | – | 0.6 | V |
| Base–Emitter On Voltage (I _C = 300 mA, V _{CE} = 5 V) | V _{BE(on)} | – | 1.0 | V |
| Base–Emitter Saturation Voltage (I _C = 300 mA, I _B = 30 mA) | V _{BE(sat)} | – | 1.0 | V |
| Output Capacitance (V _{CB} = 10 V, I _E = 0, f = 1.0 MHz) | C _{ob} | – | 15 | pF |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

1. Pulse Test: Pulse Width ≤ 300 μs, D.C. ≤ 2%.

TYPICAL CHARACTERISTICS

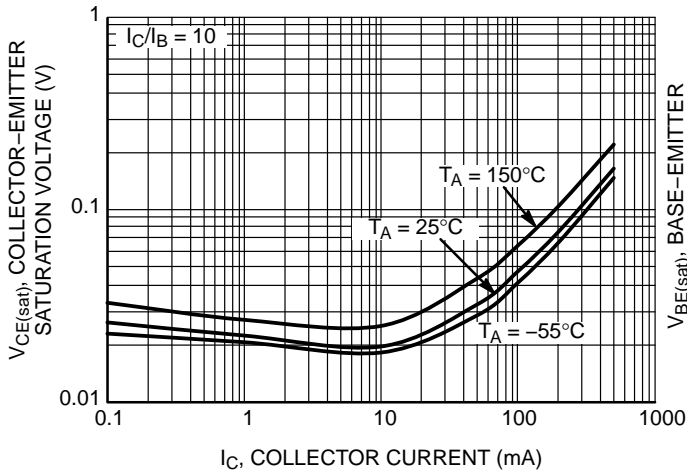


Figure 1. Collector-Emitter Saturation Voltage vs. Collector Current

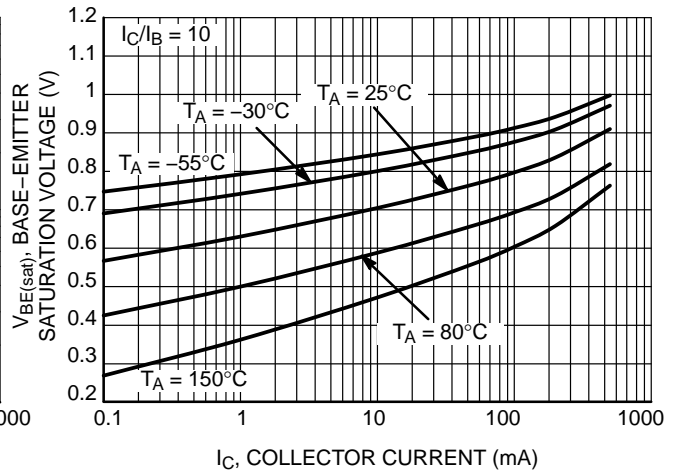


Figure 2. Base-Emitter Saturation Voltage vs. Collector Current

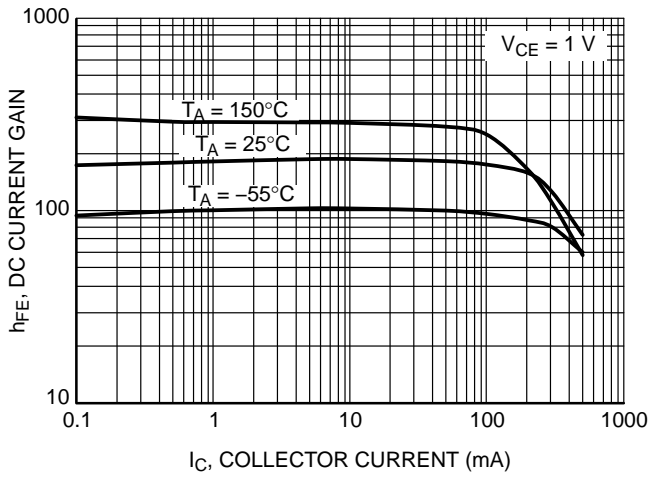


Figure 3. DC Current Gain vs. Collector Current

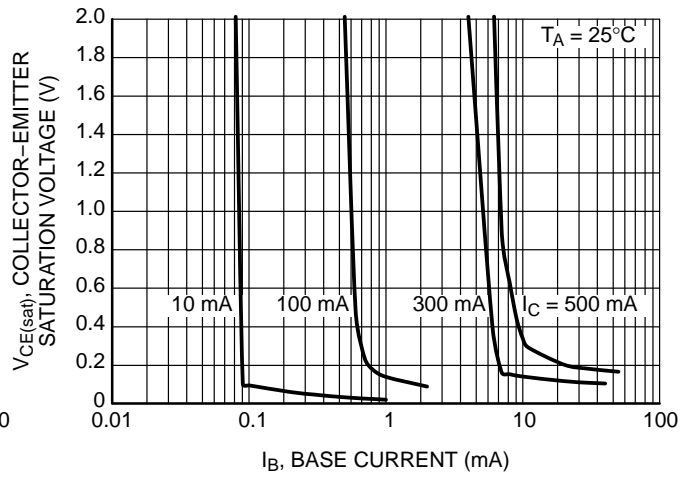


Figure 4. Saturation Region

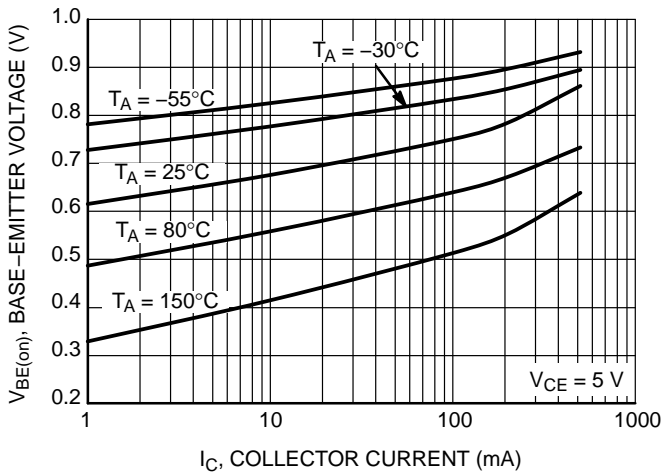


Figure 5. Base-Emitter Turn-On Voltage vs. Collector Current

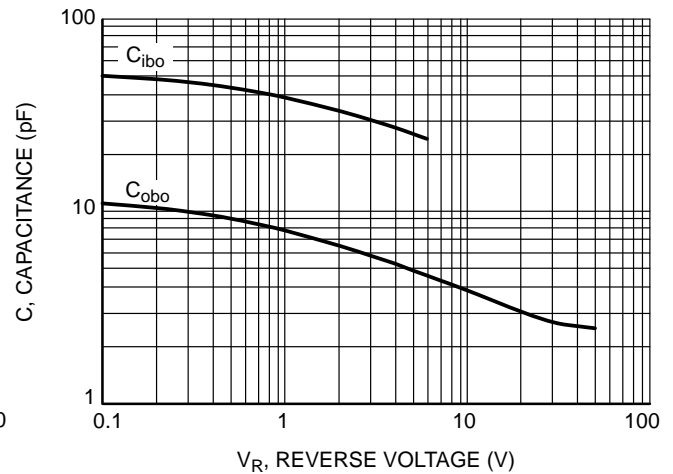


Figure 6. Capacitance

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TYPICAL CHARACTERISTICS

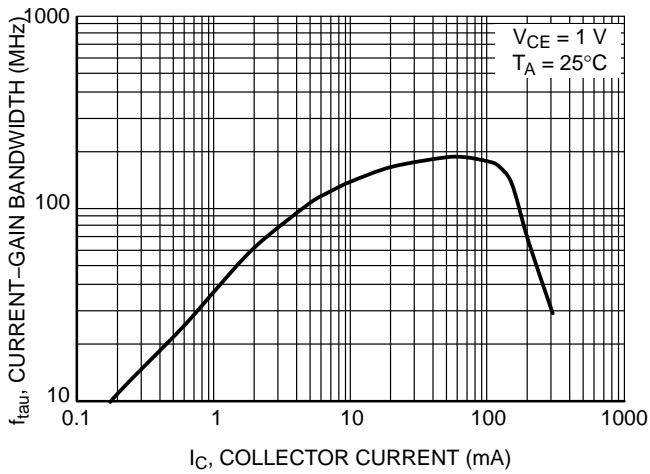


Figure 7. Current Gain Bandwidth Product vs. Collector Current

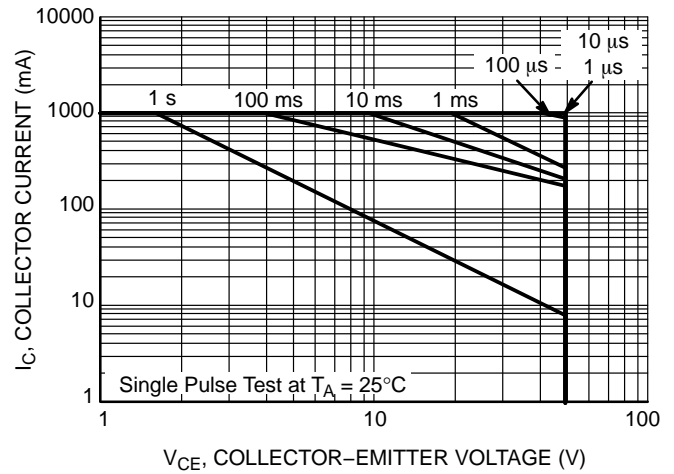


Figure 8. Safe Operating Area

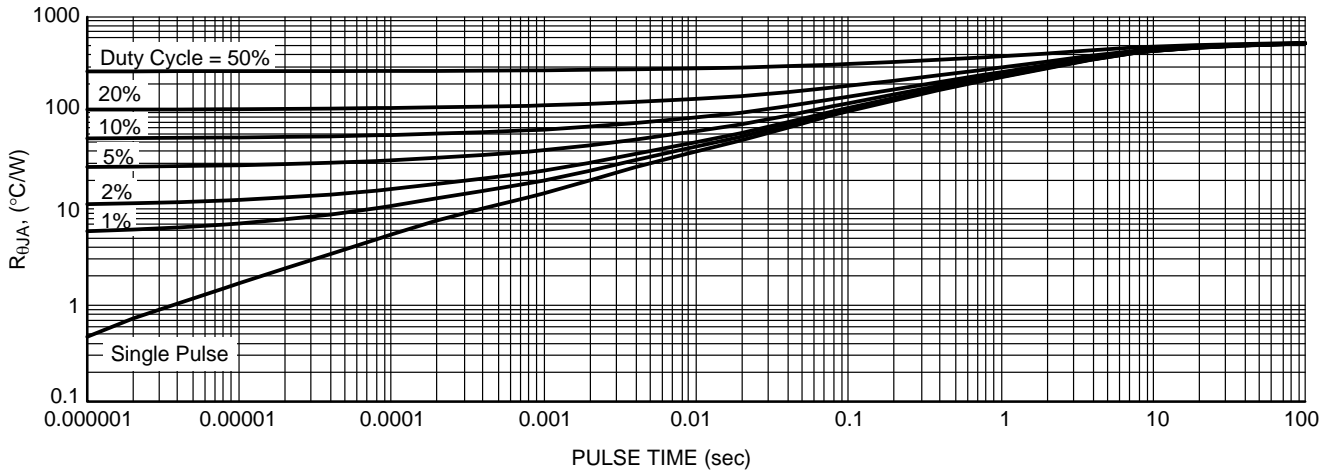


Figure 9. Thermal Response

MECHANICAL CASE OUTLINE

PACKAGE DIMENSIONS

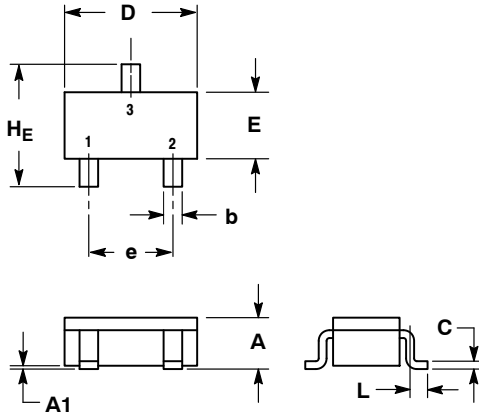
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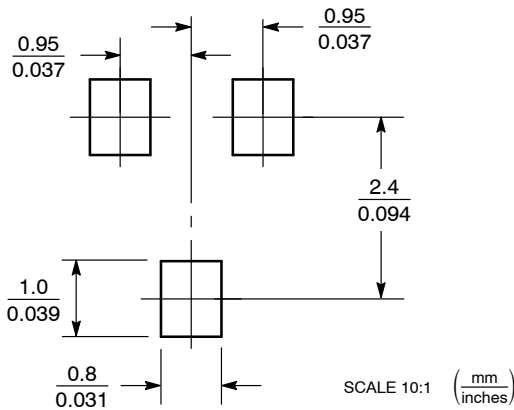
SC-59
CASE 318D-04
ISSUE H

DATE 28 JUN 2012

SCALE 2:1



SOLDERING FOOTPRINT*

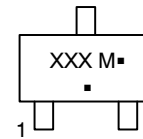


*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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

| DIM | MILLIMETERS | | | INCHES | | |
|-----|-------------|------|------|--------|-------|-------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 1.00 | 1.15 | 1.30 | 0.039 | 0.045 | 0.051 |
| A1 | 0.01 | 0.06 | 0.10 | 0.001 | 0.002 | 0.004 |
| b | 0.35 | 0.43 | 0.50 | 0.014 | 0.017 | 0.020 |
| c | 0.09 | 0.14 | 0.18 | 0.003 | 0.005 | 0.007 |
| D | 2.70 | 2.90 | 3.10 | 0.106 | 0.114 | 0.122 |
| E | 1.30 | 1.50 | 1.70 | 0.051 | 0.059 | 0.067 |
| e | 1.70 | 1.90 | 2.10 | 0.067 | 0.075 | 0.083 |
| L | 0.20 | 0.40 | 0.60 | 0.008 | 0.016 | 0.024 |
| HE | 2.50 | 2.80 | 3.00 | 0.099 | 0.110 | 0.118 |

GENERIC MARKING DIAGRAM



XXX = Specific Device Code
M = Date Code
▪ = Pb-Free Package*

(*Note: Microdot may be in either location)

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present.

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

STYLE 2: PIN 1. ANODE
2. N.C.
3. CATHODE

STYLE 3: PIN 1. ANODE
2. ANODE
3. CATHODE

STYLE 4: PIN 1. CATHODE
2. N.C.
3. ANODE

STYLE 5: PIN 1. CATHODE
2. CATHODE
3. ANODE

STYLE 6: PIN 1. ANODE
2. CATHODE
3. ANODE/CATHODE

| | | |
|-------------------------|--------------------|--|
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| DESCRIPTION: | SC-59 | PAGE 1 OF 1 |

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