

# MSD601-RT1, MSD601-ST1

Preferred Device

## NPN General Purpose Amplifier Transistors Surface Mount

### Features

- Pb-Free Packages are Available

### MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ )

| 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 | $I_C$         | 100   | mAdc |
| Collector Current – Peak       | $I_{C(P)}$    | 200   | mAdc |

### THERMAL CHARACTERISTICS

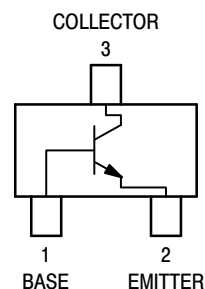
| Characteristic       | Symbol    | Max             | Unit             |
|----------------------|-----------|-----------------|------------------|
| Power Dissipation    | $P_D$     | 200             | mW               |
| Junction Temperature | $T_J$     | 150             | $^\circ\text{C}$ |
| Storage Temperature  | $T_{stg}$ | $-55 \sim +150$ | $^\circ\text{C}$ |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.



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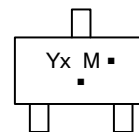
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### MARKING DIAGRAM



SC-59  
CASE 318D



x = R for RT1  
S for ST1  
M = Date Code  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

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

# MSD601-RT1, MSD601-ST1

## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )

| Characteristic  | Symbol                     | Min              | Max             | Unit            |
|---|----------------------------|------------------|-----------------|-----------------|
| Collector – Emitter Breakdown Voltage<br>( $I_C = 2.0\text{ mAdc}$ , $I_E = 0$ )  | $V_{(BR)CEO}$              | 50               | –               | Vdc             |
| Collector – Base Breakdown Voltage<br>( $I_C = 10\text{ }\mu\text{Adc}$ , $I_E = 0$ )   | $V_{(BR)CBO}$              | 60               | –               | Vdc             |
| Emitter – Base Breakdown Voltage<br>( $I_E = 10\text{ }\mu\text{Adc}$ , $I_C = 0$ )   | $V_{(BR)EBO}$              | 7.0              | –               | Vdc             |
| Collector – Base Cutoff Current<br>( $V_{CB} = 45\text{ Vdc}$ , $I_E = 0$ )   | $I_{CBO}$                  | –                | 0.1             | $\mu\text{Adc}$ |
| Collector – Emitter Cutoff Current<br>( $V_{CE} = 10\text{ Vdc}$ , $I_B = 0$ )  | $I_{CEO}$                  | –                | 100             | nAdc            |
| DC Current Gain (Note 1)<br>( $V_{CE} = 10\text{ Vdc}$ , $I_C = 2.0\text{ mAdc}$ )<br>MSD601-RT1<br>MSD601-ST1<br>( $V_{CE} = 2.0\text{ Vdc}$ , $I_C = 100\text{ mAdc}$ ) | $h_{FE1}$<br><br>$h_{FE2}$ | 210<br>290<br>90 | 340<br>460<br>– | –               |
| Collector – Emitter Saturation Voltage<br>( $I_C = 100\text{ mAdc}$ , $I_B = 10\text{ mAdc}$ )  | $V_{CE(sat)}$              | –                | 0.5             | Vdc             |

1. Pulse Test: Pulse Width  $\leq 300\text{ }\mu\text{s}$ , D.C.  $\leq 2\%$ .

## ORDERING INFORMATION

| Device      | Package            | Shipping <sup>†</sup> |
|-------------|--------------------|-----------------------|
| MSD-601RT1  | SC-59              | 3000 / Tape & Reel    |
| MSD-601RT1G | SC-59<br>(Pb-Free) | 3000 / Tape & Reel    |
| MSD-601ST1  | SC-59              | 3000 / Tape & Reel    |
| MSD-601ST1G | SC-59<br>(Pb-Free) | 3000 / Tape & Reel    |

<sup>†</sup>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.

# MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS

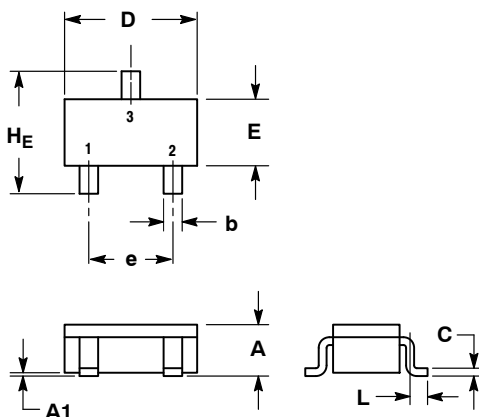
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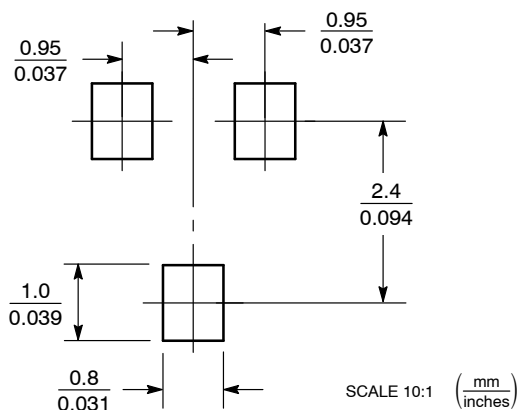
SCALE 2:1

SC-59  
CASE 318D-04  
ISSUE H

DATE 28 JUN 2012



## SOLDERING FOOTPRINT\*

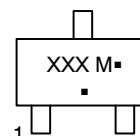


\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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 |
| H_E | 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:<br>PIN 1. BASE<br>2. EMITTER<br>3. COLLECTOR | STYLE 2:<br>PIN 1. ANODE<br>2. N.C.<br>3. CATHODE    | STYLE 3:<br>PIN 1. ANODE<br>2. ANODE<br>3. CATHODE         |
| STYLE 4:<br>PIN 1. CATHODE<br>2. N.C.<br>3. ANODE     | STYLE 5:<br>PIN 1. CATHODE<br>2. CATHODE<br>3. ANODE | STYLE 6:<br>PIN 1. ANODE<br>2. CATHODE<br>3. ANODE/CATHODE |

DOCUMENT NUMBER: 98ASB42664B

DESCRIPTION: SC-59

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