

General Purpose NPN Amplifier Transistor

MSD602-RT1G

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

Rating	Symbol	Value	Unit
Collector-Base Voltage	$V_{(BR)CB}$ O	60	Vdc
Collector-Emitter Voltage	$V_{(BR)CE}$ O	50	Vdc
Emitter-Base Voltage	$V_{(BR)EB}$ O	7.0	Vdc
Collector Current – Continuous	I_C	500	mAdc
Collector Current – Peak	$I_{C(P)}$	1.0	Adc

THERMAL CHARACTERISTICS

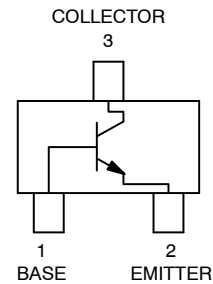
Characteristic	Symbol	Max	Unit
Power Dissipation	P_D	200	mW
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	$-55 \sim +150$	$^\circ\text{C}$

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.

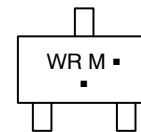
* For additional information on our Pb-Free strategy and soldering details, please download the onsemi Soldering and Mounting Techniques Reference Manual, [SOLDDRRM/D](#).



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 Specification Brochure, [BRD8011/D](#).

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

Characteristic	Symbol	Min	Max	Unit
Collector-Emitter Breakdown Voltage ($I_C = 10\text{ mA}$, $I_B = 0$)	$V_{(BR)CEO}$	50	–	V
Collector-Base Breakdown Voltage ($I_C = 10\text{ }\mu\text{A}$, $I_E = 0$)	$V_{(BR)CBO}$	60	–	V
Emitter-Base Breakdown Voltage ($I_E = 10\text{ }\mu\text{A}$, $I_C = 0$)	$V_{(BR)EBO}$	7.0	–	V
Collector-Base Cutoff Current ($V_{CB} = 20\text{ V}$, $I_E = 0$)	I_{CBO}	–	0.1	μA
DC Current Gain (Note 1) ($V_{CE} = 10\text{ V}$, $I_C = 150\text{ mA}$) ($V_{CE} = 10\text{ V}$, $I_C = 500\text{ mA}$)	h_{FE1} h_{FE2}	120 40	240 –	–
Collector-Emitter Saturation Voltage ($I_C = 300\text{ mA}$, $I_B = 30\text{ mA}$)	$V_{CE(sat)}$	–	0.6	V
Base-Emitter On Voltage ($I_C = 300\text{ mA}$, $V_{CE} = 5\text{ V}$)	$V_{BE(on)}$	–	1.0	V
Base-Emitter Saturation Voltage ($I_C = 300\text{ mA}$, $I_B = 30\text{ mA}$)	$V_{BE(sat)}$	–	1.0	V
Output Capacitance ($V_{CB} = 10\text{ V}$, $I_E = 0$, $f = 1.0\text{ MHz}$)	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 $\leq 300\text{ }\mu\text{s}$, D.C. $\leq 2\%$.



TYPICAL CHARACTERISTICS

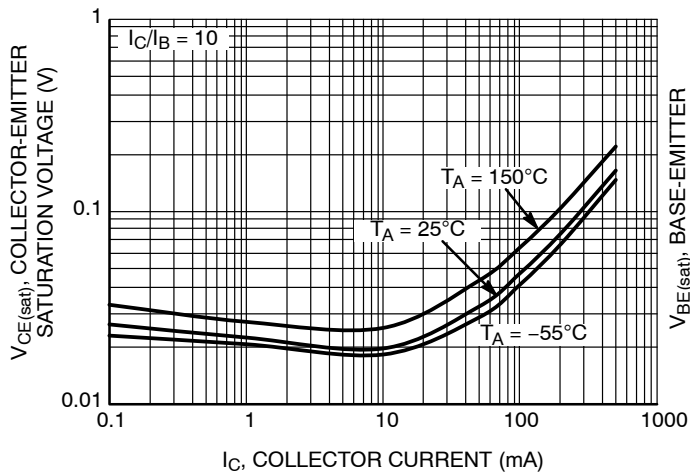


Figure 1. Collector-Emitter Saturation Voltage vs. Collector Current

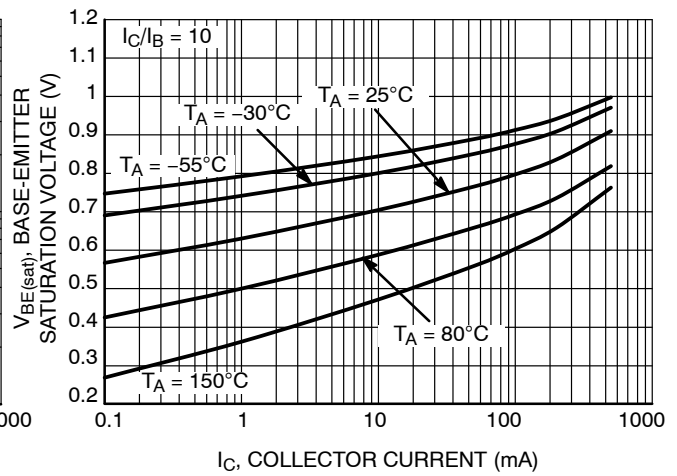


Figure 2. Base-Emitter Saturation Voltage vs. Collector Current

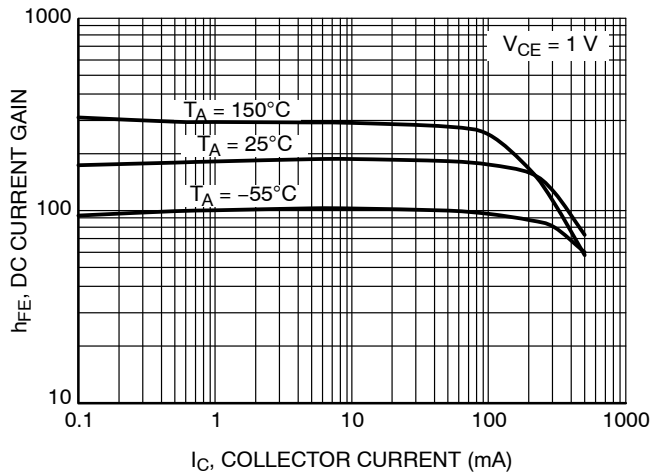


Figure 3. DC Current Gain vs. Collector Current

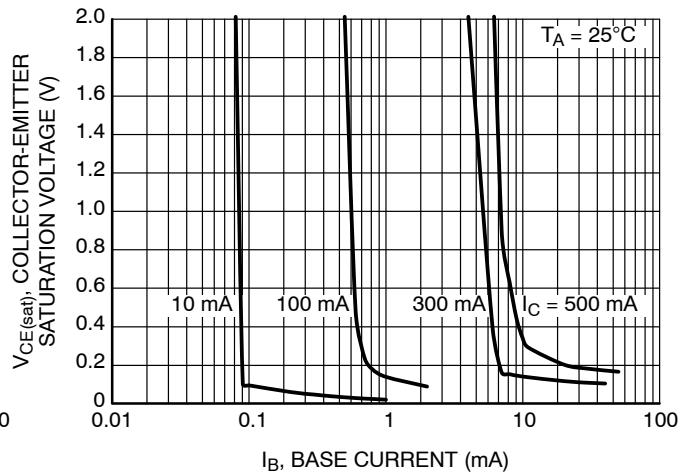


Figure 4. Saturation Region

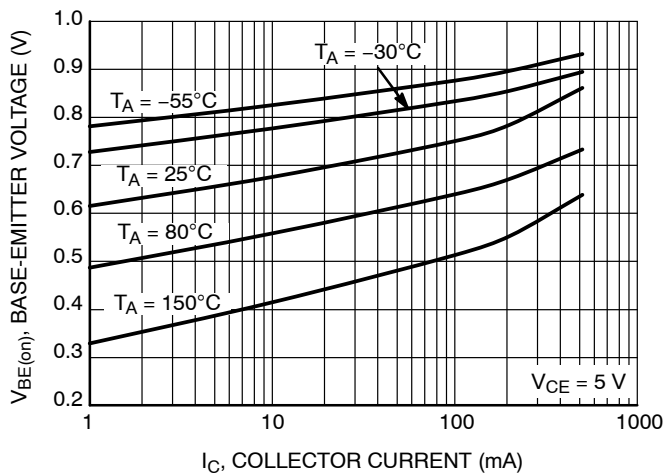


Figure 5. Base-Emitter Turn-On Voltage vs. Collector Current

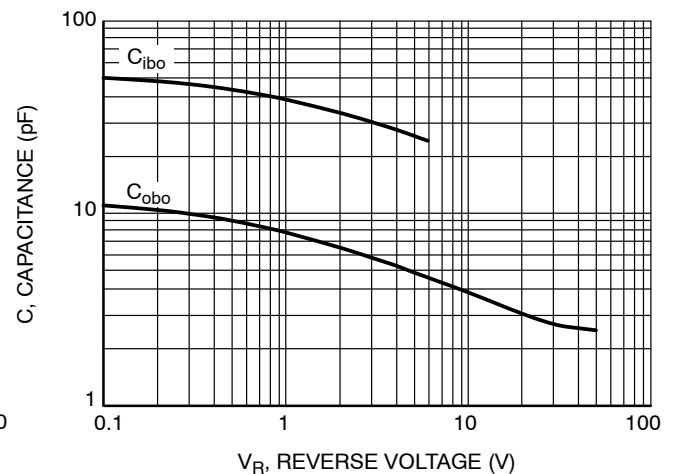


Figure 6. Capacitance

TYPICAL CHARACTERISTICS

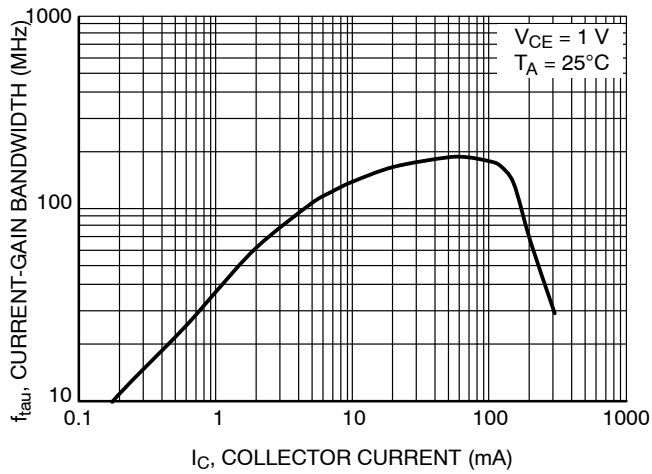


Figure 7. Current Gain Bandwidth Product vs. Collector Current

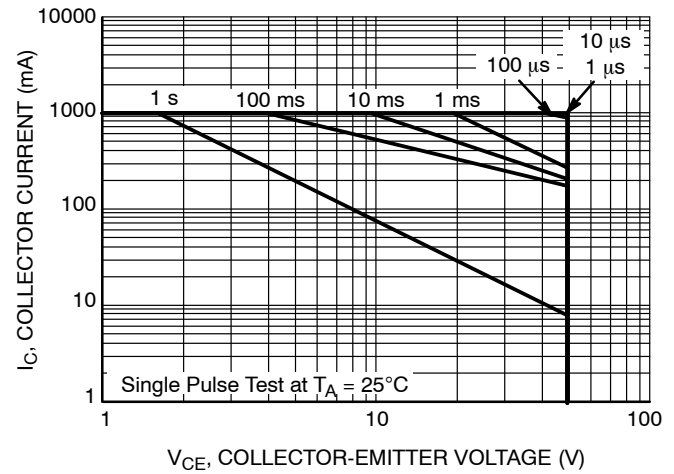


Figure 8. Safe Operating Area

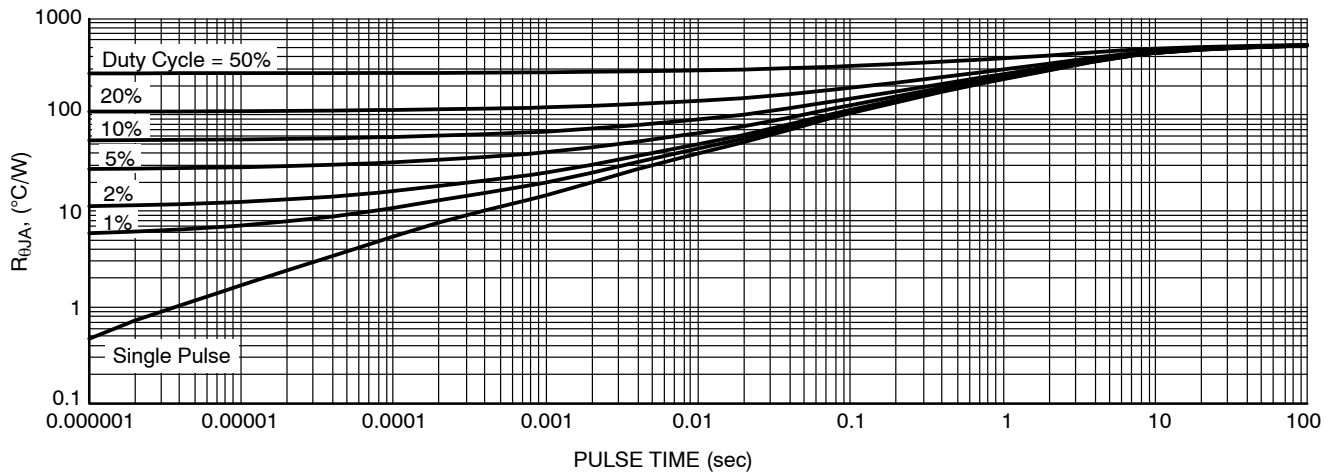


Figure 9. Thermal Response

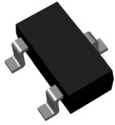
MSD602-RT1G

REVISION HISTORY

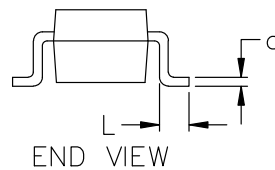
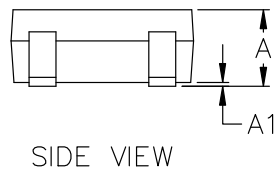
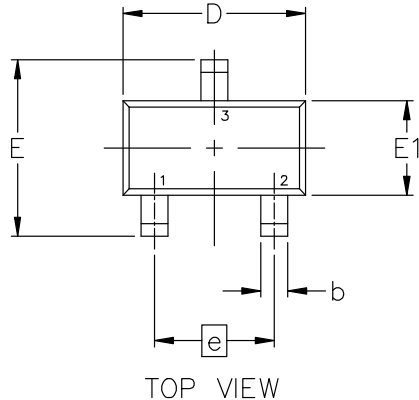
Revision	Description of Changes	Date
11	Rebranded the Data Sheet to onsemi format.	2/25/2026

This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.




SC-59-3 2.90x1.50x1.15, 1.90P
CASE 318D
ISSUE J

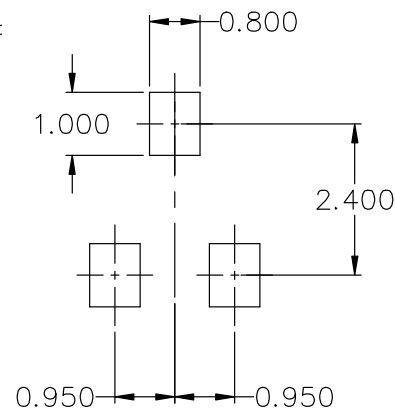
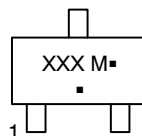
DATE 15 FEB 2024



NOTES:

1. DIMENSIONING AND TOLERANCING CONFORM TO ASME Y14.5-2018.
2. ALL DIMENSION ARE IN MILLIMETERS.

DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	1.00	1.15	1.30
A1	0.01	0.06	0.10
b	0.35	0.43	0.50
c	0.09	0.14	0.18
D	2.70	2.90	3.10
E	2.50	2.80	3.00
E1	1.30	1.50	1.70
e	1.90 BSC		
L	0.20	0.40	0.60


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. Some products may not follow the Generic Marking.

* FOR ADDITIONAL INFORMATION ON OUR Pb-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ON SEMICONDUCTOR SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERRM/D.

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-59-3 2.90x1.50x1.15, 1.90P	PAGE 1 OF 1

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