

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 °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

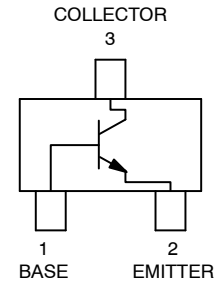
Characteristic	Symbol	Max	Unit
Power Dissipation	P _D	200	mW
Junction Temperature	T _J	150	°C
Storage Temperature	T _{stg}	-55 ~ +150	°C

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.

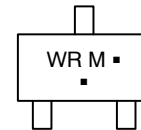
* For additional information on our Pb-Free strategy and soldering details, please download the **onsemi** Soldering and Mounting Techniques Reference Manual, [SOLDERRM/D](#).



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](#).

MSD602-RT1G

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

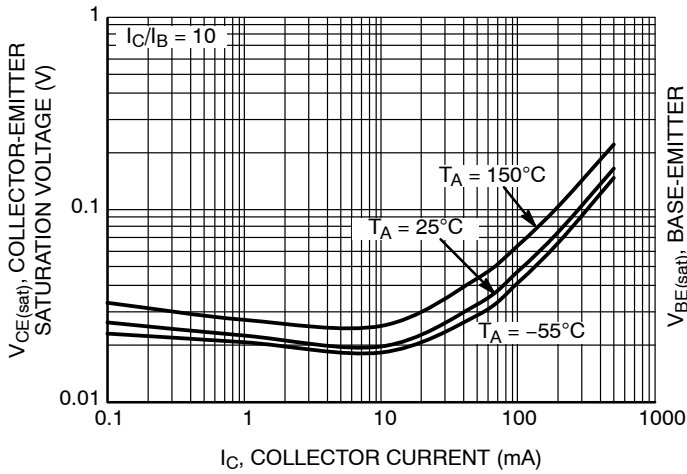


Figure 1. Collector-Emitter Saturation Voltage vs. Collector Current

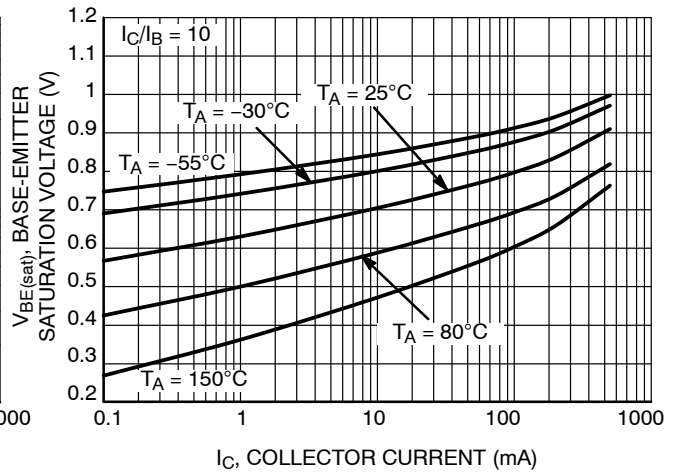


Figure 2. Base-Emitter Saturation Voltage vs. Collector Current

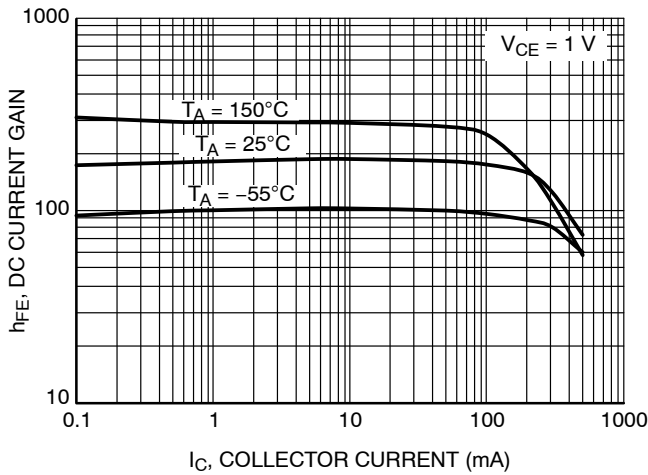


Figure 3. DC Current Gain vs. Collector Current

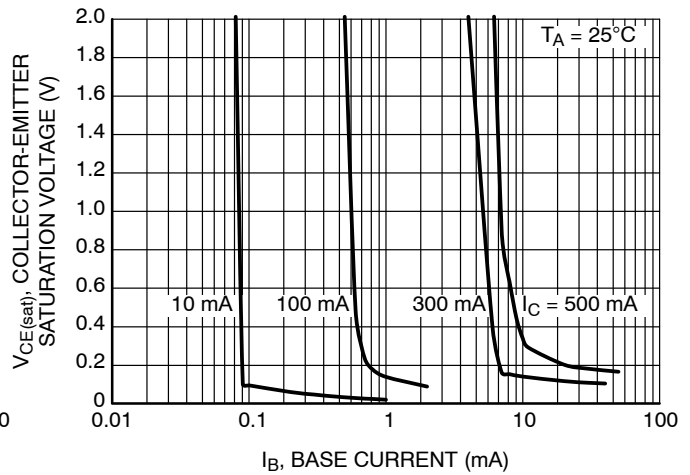


Figure 4. Saturation Region

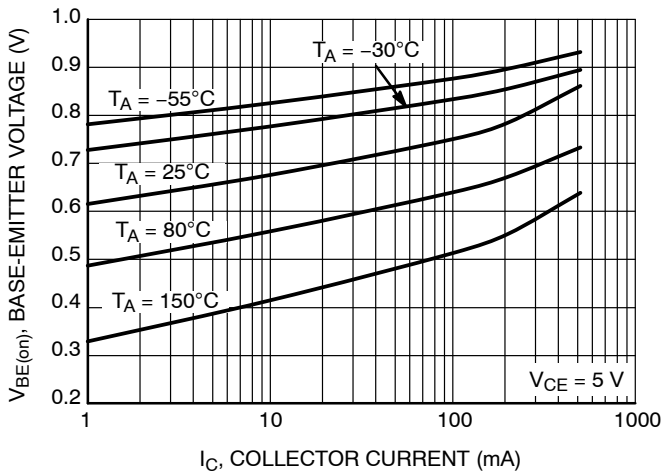


Figure 5. Base-Emitter Turn-On Voltage vs. Collector Current

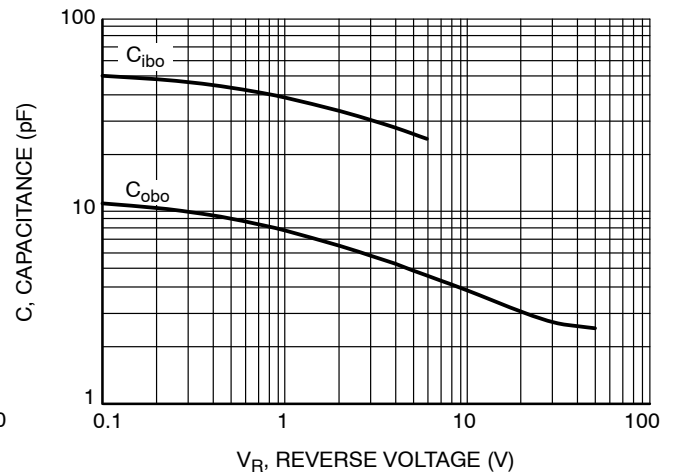


Figure 6. Capacitance

MSD602-RT1G

TYPICAL CHARACTERISTICS

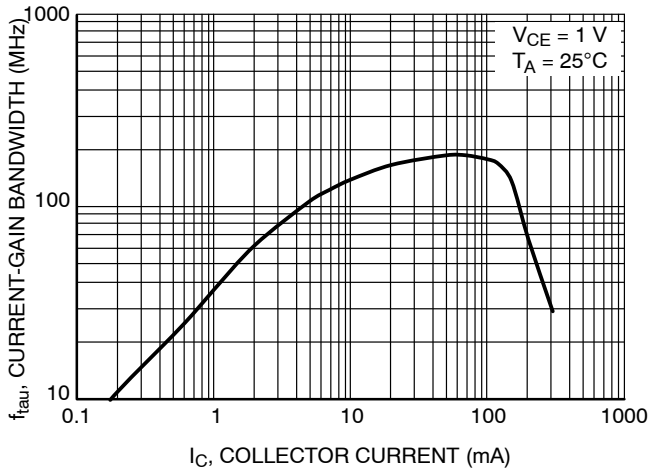


Figure 7. Current Gain Bandwidth Product vs. Collector Current

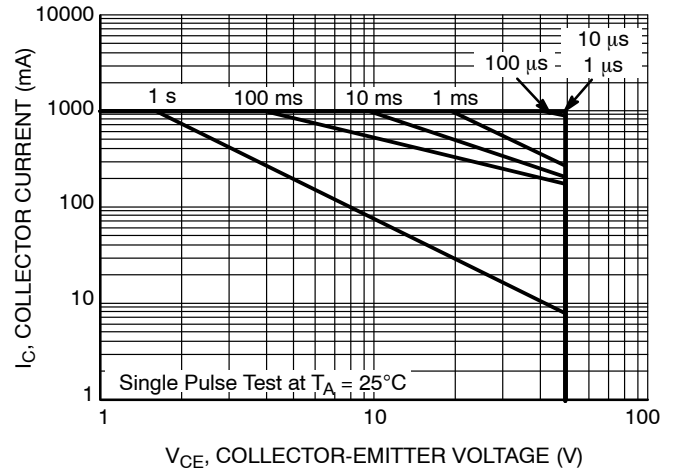


Figure 8. Safe Operating Area

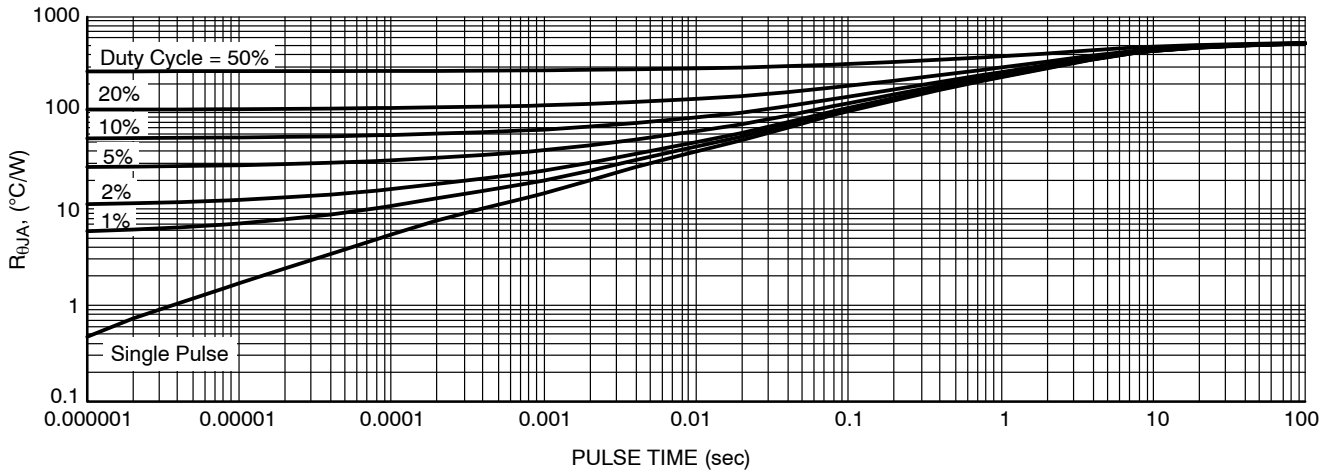


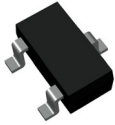
Figure 9. Thermal Response

MSD602-RT1G

REVISION HISTORY

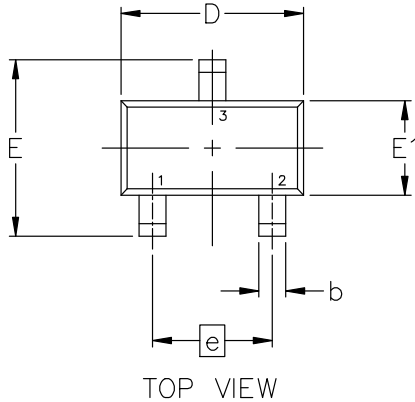
Revision	Description of Changes	Date
11	Rebranded the Data Sheet to onsemi format.	2/25/2026

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.

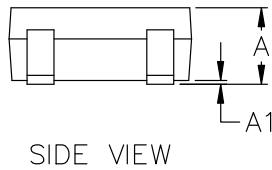


SC-59-3 2.90x1.50x1.15, 1.90P
CASE 318D
ISSUE J

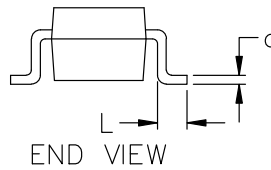
DATE 15 FEB 2024



TOP VIEW



SIDE VIEW

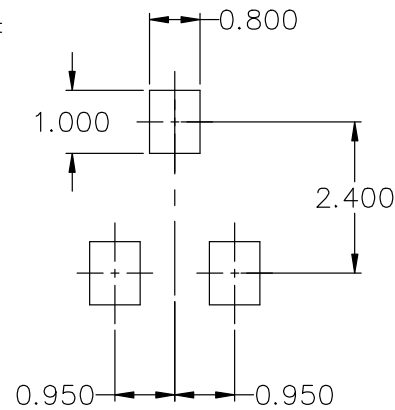


END VIEW

NOTES:

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

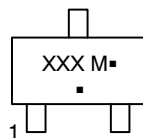
DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	1.00	1.15	1.30
A1	0.01	0.06	0.10
b	0.35	0.43	0.50
c	0.09	0.14	0.18
D	2.70	2.90	3.10
E	2.50	2.80	3.00
E1	1.30	1.50	1.70
e	1.90 BSC		
L	0.20	0.40	0.60



RECOMMENDED MOUNTING 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.

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.

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

DOCUMENT NUMBER:	98ASB42664B	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	SC-59-3 2.90x1.50x1.15, 1.90P	PAGE 1 OF 1

onsemi and ONSEMI are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves the right to make changes without further notice to any products herein. onsemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. onsemi does not convey any license under its patent rights nor the rights of others.

onsemi, **Onsemi**, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:

Technical Library: www.onsemi.com/design/resources/technical-documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support

For additional information, please contact your local Sales Representative at www.onsemi.com/support/sales

