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

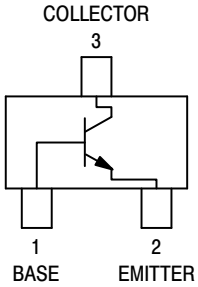
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

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

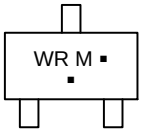
ON Semiconductor®

http://onsemi.com

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.

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

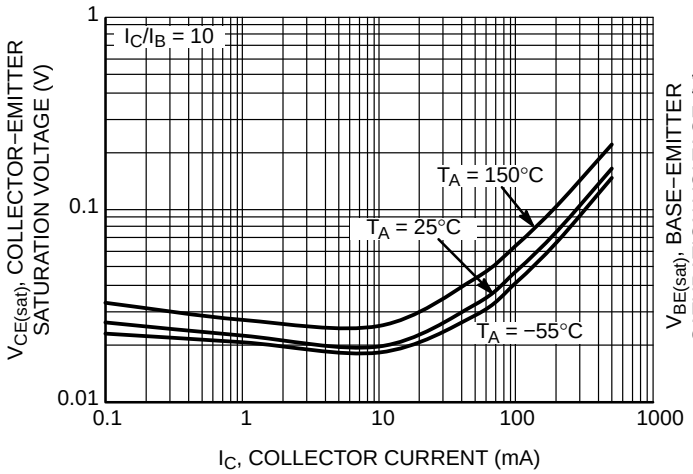


Figure 1. Collector−Emitter Saturation Voltage vs. Collector Current

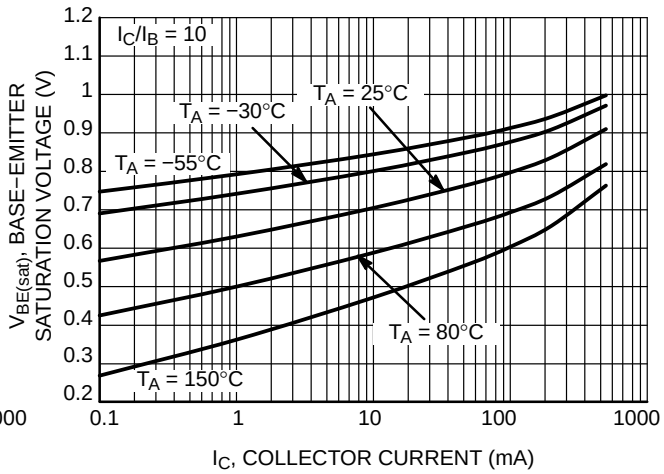


Figure 2. Base−Emitter Saturation Voltage vs. Collector Current

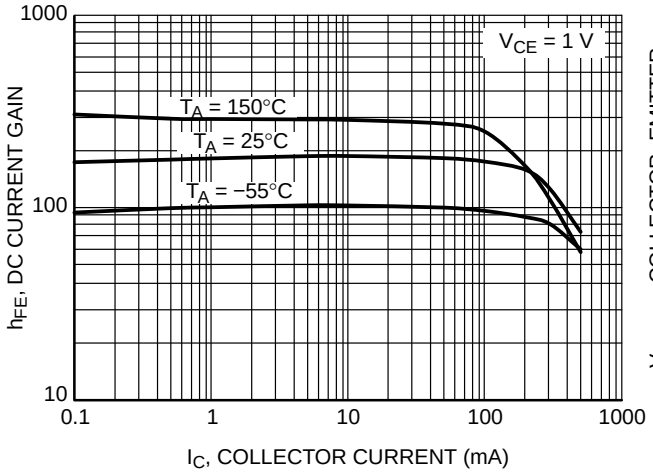


Figure 3. DC Current Gain vs. Collector Current

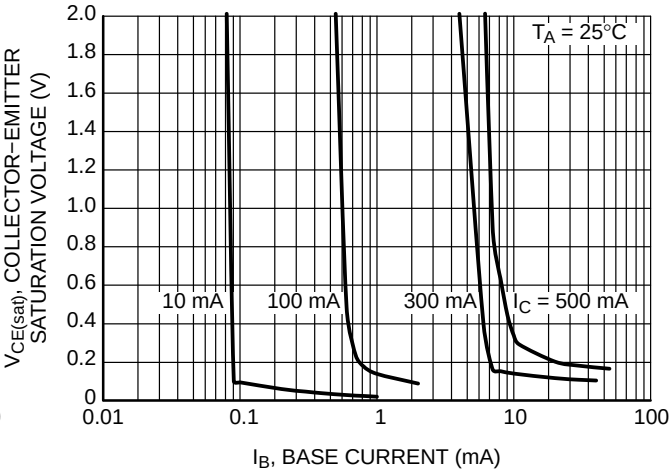


Figure 4. Saturation Region

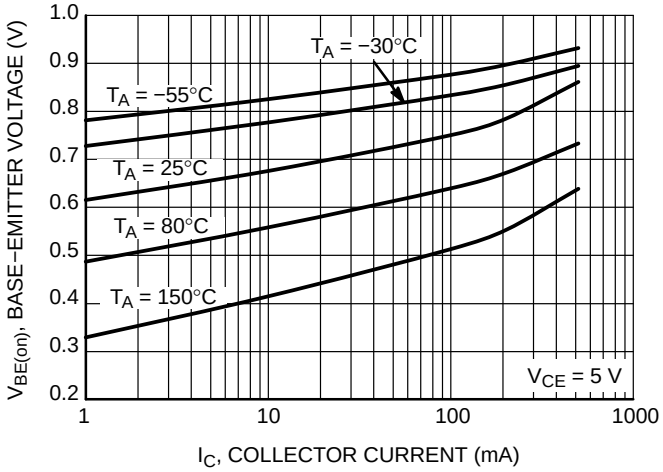


Figure 5. Base−Emitter Turn−On Voltage vs. Collector Current

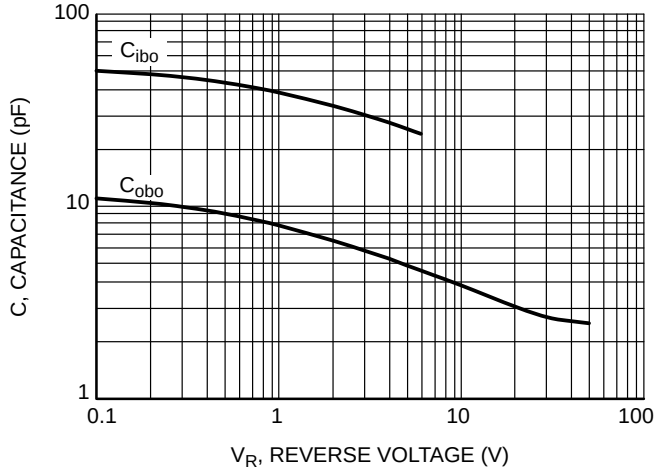


Figure 6. Capacitance

TYPICAL CHARACTERISTICS

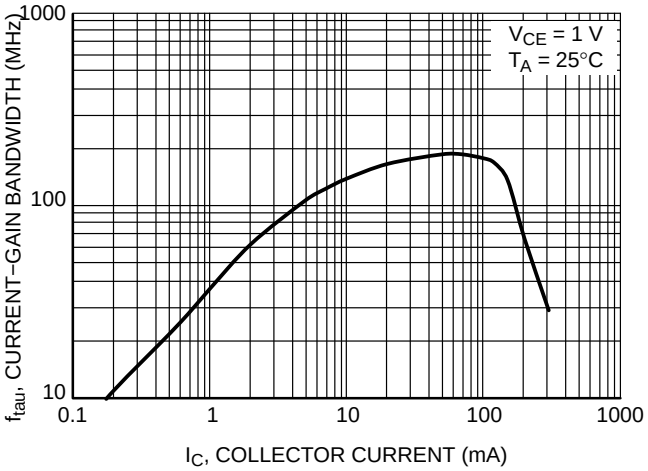


Figure 7. Current Gain Bandwidth Product vs. Collector Current

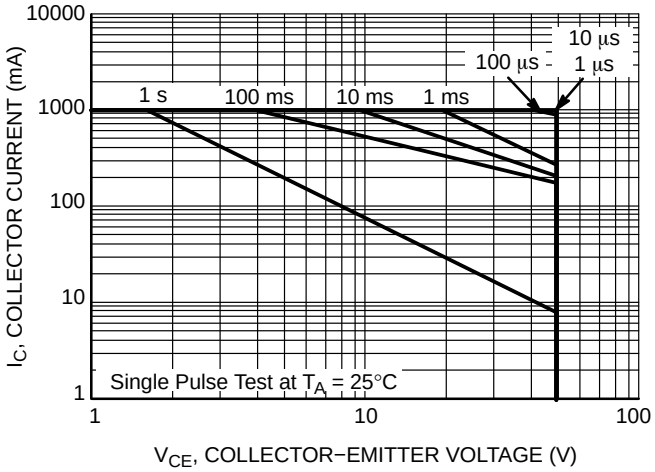


Figure 8. Safe Operating Area

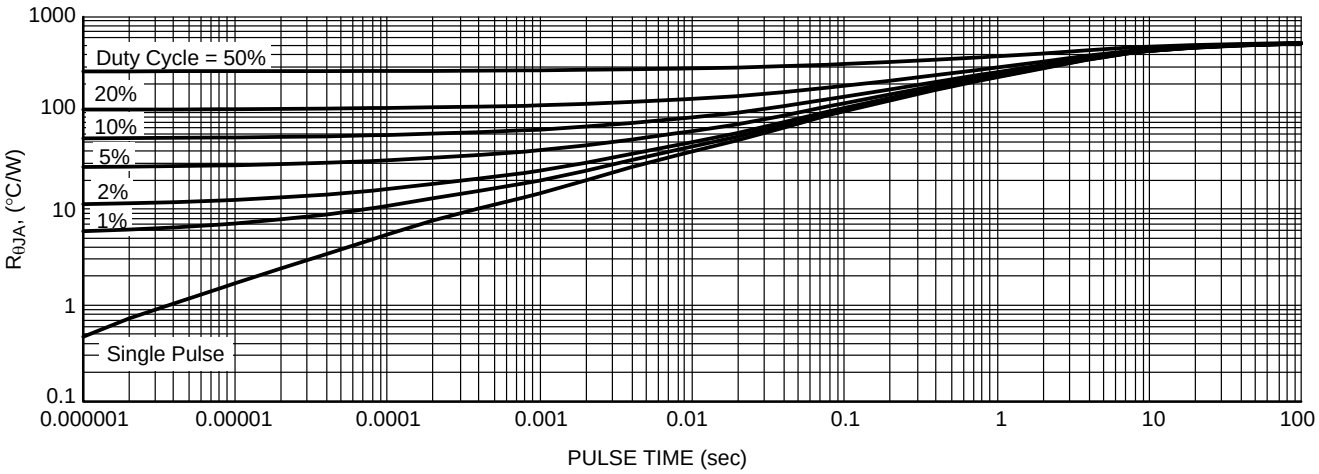
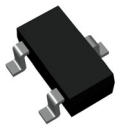


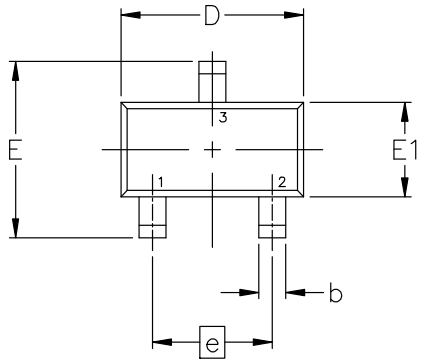
Figure 9. Thermal Response

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

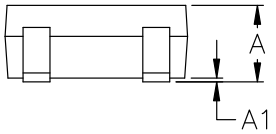


SC−59−3 2.90x1.50x1.15, 1.90P
CASE 318D
ISSUE J

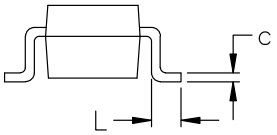
DATE 15 FEB 2024



TOP VIEW



SIDE VIEW

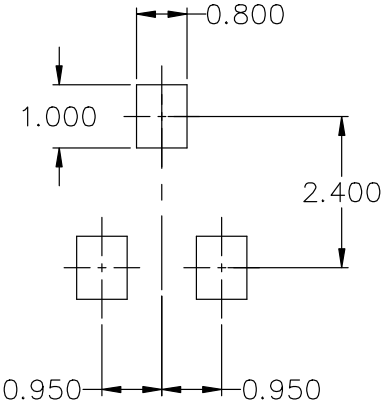


END VIEW

NOTES:

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

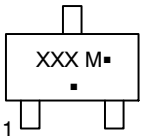
	MILLIMETERS		
DIM	MIN.	NOM.	MAX.
A	1.00	1.15	1.30
A1	0.01	0.06	0.10
b	0.35	0.43	0.50
c	0.09	0.14	0.18
D	2.70	2.90	3.10
E	2.50	2.80	3.00
E1	1.30	1.50	1.70
e	1.90 BSC		
L	0.20	0.40	0.60



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**

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