

NPN High Voltage Transistors

MSD42WT1G, NSVMSD42WT1G

This NPN Silicon Planar Transistor is designed for general purpose amplifier applications. This device is housed in the SC-70/SOT-323 package which is designed for low power surface mount applications.

Features

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

MAXIMUM RATINGS (T_A = 25°C)

Symbol	Rating	Value	Unit
V _{(BR)CBO}	Collector-Base Voltage	300	V
V _{(BR)CEO}	Collector-Emitter Voltage	300	V
V _{(BR)EBO}	Emitter-Base Voltage	6.0	V
I _C	Collector Current – Continuous	150	mA

THERMAL CHARACTERISTICS

Symbol	Rating	Max	Unit
P _D	Power Dissipation (Note 1)	450	mW
R _{θJA}	Thermal Resistance, Junction-to-Ambient (Note 1)	274	°C/W
T _J , T _{stg}	Junction and Storage Temperature Range	-55 to +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.

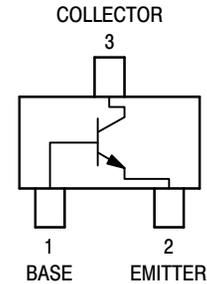
ELECTRICAL CHARACTERISTICS

Symbol	Characteristic	Min	Max	Unit
V _{(BR)CEO}	Collector-Emitter Breakdown Voltage (I _C = 1.0 mA, I _B = 0)	300	-	V
V _{(BR)CBO}	Collector-Base Breakdown Voltage (I _C = 100 μA, I _E = 0)	300	-	V
V _{(BR)EBO}	Emitter-Base Breakdown Voltage (I _E = 100 μA, I _E = 0)	6.0	-	V
I _{CBO}	Collector-Base Cutoff Current (V _{CB} = 200 V, I _E = 0)	-	0.1	μA
I _{EBO}	Emitter-Base Cutoff Current (V _{EB} = 6.0 V, I _B = 0)	-	0.1	μA
h _{FE1} h _{FE2}	DC Current Gain (Note 2) (V _{CE} = 10 V, I _C = 1.0 mA) (V _{CE} = 10 V, I _C = 30 mA)	25 40	- -	-
V _{CE(sat)}	Collector-Emitter Saturation Voltage (Note 2) (I _C = 20 mA, I _B = 2.0 mA)	-	0.5	V

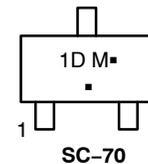
1. FR-4 @ 10 mm², 1 oz. Copper traces.
2. Pulse Test: Pulse Width ≤ 300 μs, D.C. ≤ 2%.



SC-70 (SOT-323)
CASE 419
STYLE 3



MARKING DIAGRAM



- 1D = Specific Device Code
- M = Date Code
- = Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

Device	Package	Shipping†
MSD42WT1G	SC-70 (Pb-Free)	3,000 / Tape & Reel
NSVMSD42WT1G	SC-70 (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](#).

MSD42WT1G, NSVMSD42WT1G

TYPICAL CHARACTERISTICS

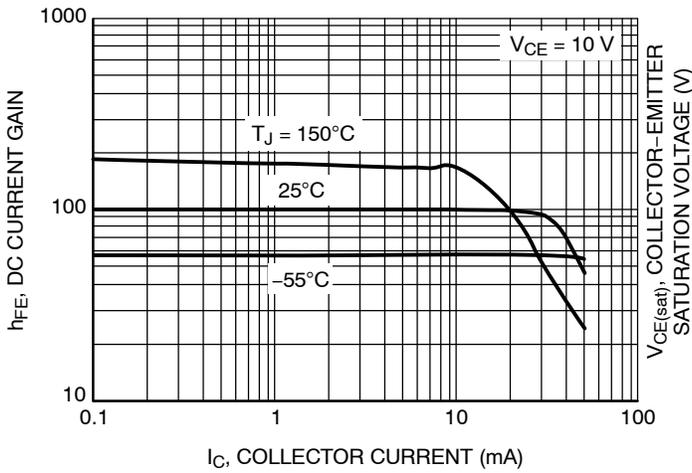


Figure 1. DC Current Gain

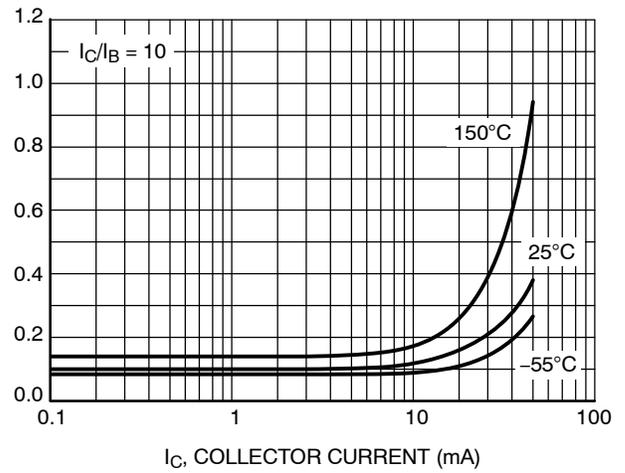


Figure 2. Collector-Emitter Saturation Voltage vs. Collector Current

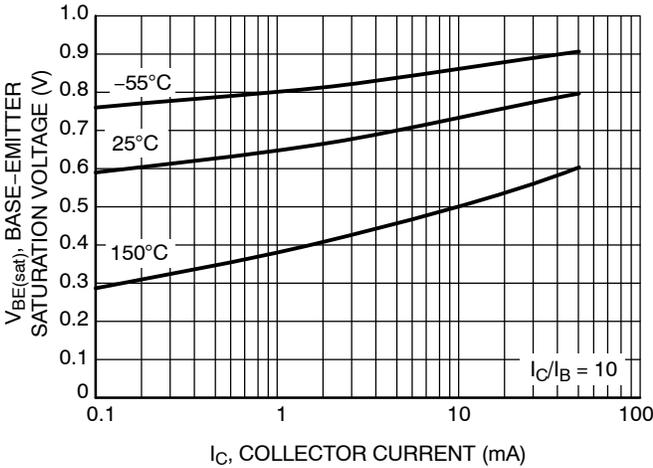


Figure 3. Base-Emitter Saturation Voltage vs. Collector Current

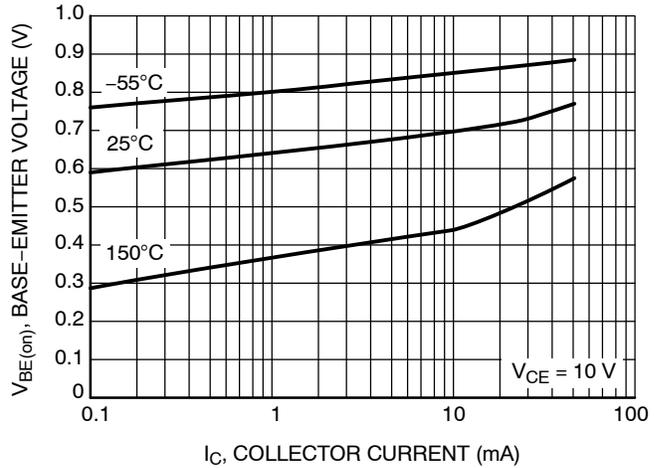


Figure 4. Base-Emitter On Voltage vs. Collector Current

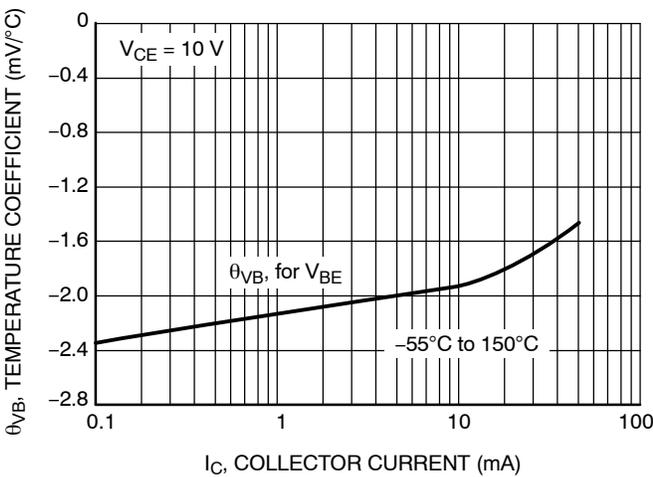


Figure 5. Base-Emitter Temperature Coefficient

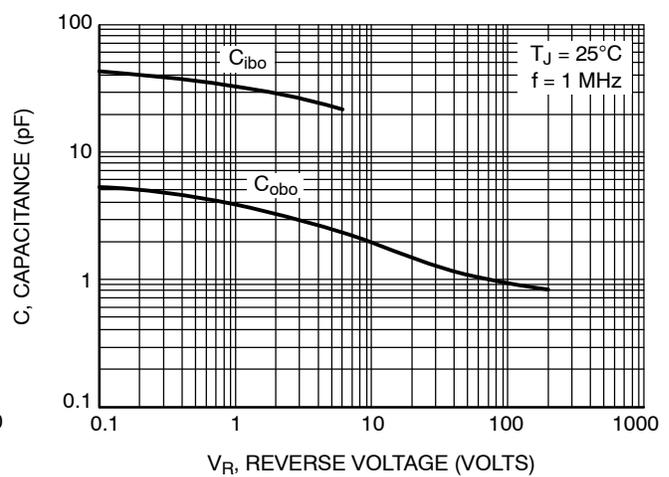


Figure 6. Capacitance

MSD42WT1G, NSVMSD42WT1G

TYPICAL CHARACTERISTICS (continued)

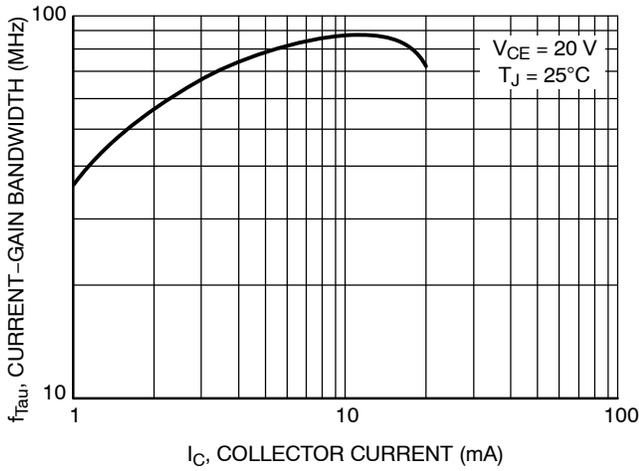


Figure 7. Current-Gain — Bandwidth Product

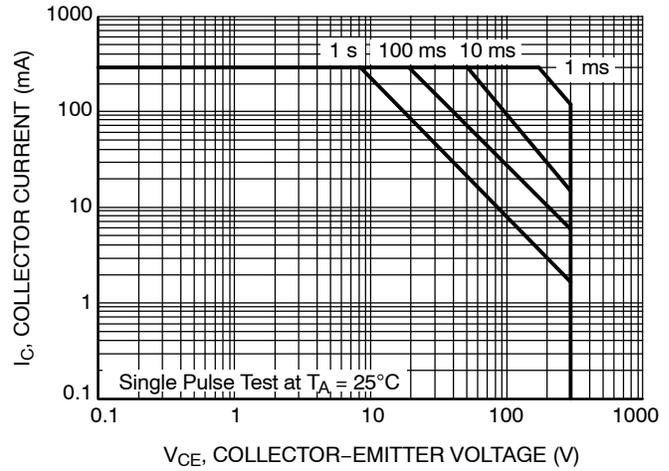


Figure 8. Safe Operating Area

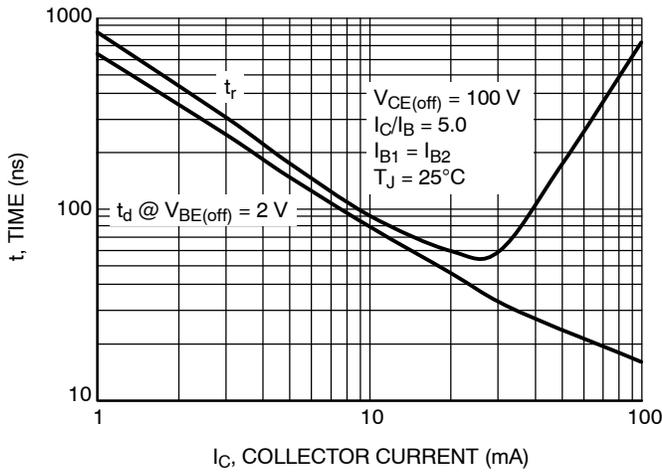


Figure 9. Turn-On Time

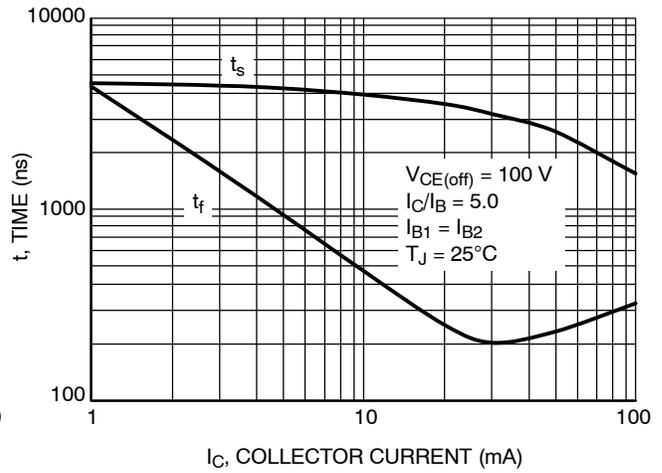
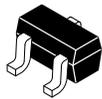


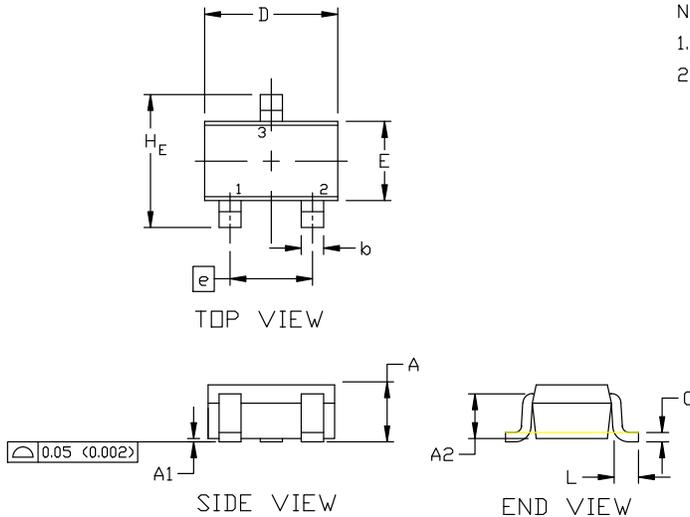
Figure 10. Turn-Off Time



SCALE 4:1

SC-70 (SOT-323)
CASE 419
ISSUE R

DATE 11 OCT 2022

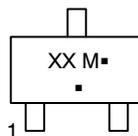


NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH

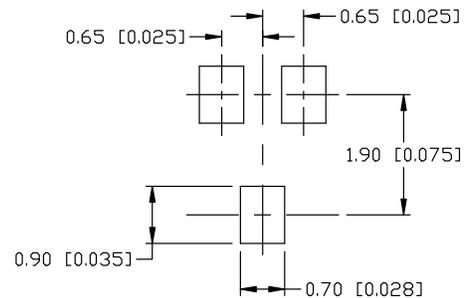
DIM	MILLIMETERS			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.80	0.90	1.00	0.032	0.035	0.040
A1	0.00	0.05	0.10	0.000	0.002	0.004
A2	0.70 REF			0.028 BSC		
b	0.30	0.35	0.40	0.012	0.014	0.016
c	0.10	0.18	0.25	0.004	0.007	0.010
D	1.80	2.00	2.20	0.071	0.080	0.087
E	1.15	1.24	1.35	0.045	0.049	0.053
e	1.20	1.30	1.40	0.047	0.051	0.055
e1	0.65 BSC			0.026 BSC		
L	0.20	0.38	0.56	0.008	0.015	0.022
H _E	2.00	2.10	2.40	0.079	0.083	0.095

GENERIC MARKING DIAGRAM



- XX = Specific Device Code
- M = Date Code
- = Pb-Free Package

*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.

SOLDERING FOOTPRINT

- STYLE 1: CANCELLED
- STYLE 2: PIN 1. ANODE, 2. N.C., 3. CATHODE
- STYLE 3: PIN 1. BASE, 2. EMITTER, 3. COLLECTOR
- STYLE 4: PIN 1. CATHODE, 2. CATHODE, 3. ANODE
- STYLE 5: PIN 1. ANODE, 2. ANODE, 3. CATHODE
- STYLE 6: PIN 1. EMITTER, 2. BASE, 3. COLLECTOR
- STYLE 7: PIN 1. BASE, 2. EMITTER, 3. COLLECTOR
- STYLE 8: PIN 1. GATE, 2. SOURCE, 3. DRAIN
- STYLE 9: PIN 1. ANODE, 2. CATHODE, 3. CATHODE-ANODE
- STYLE 10: PIN 1. CATHODE, 2. ANODE, 3. ANODE-CATHODE
- STYLE 11: PIN 1. CATHODE, 2. CATHODE, 3. CATHODE

DOCUMENT NUMBER:	98ASB42819B	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-70 (SOT-323)	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

