

# 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<sub>A</sub> = 25°C)

Symbol	Rating	Value	Unit
V <sub>(BR)CBO</sub>	Collector-Base Voltage	300	V
V <sub>(BR)CEO</sub>	Collector-Emitter Voltage	300	V
V <sub>(BR)EBO</sub>	Emitter-Base Voltage	6.0	V
I <sub>C</sub>	Collector Current – Continuous	150	mA

### THERMAL CHARACTERISTICS

Symbol	Rating	Max	Unit
P <sub>D</sub>	Power Dissipation (Note 1)	450	mW
R <sub>θJA</sub>	Thermal Resistance, Junction-to-Ambient (Note 1)	274	°C/W
T <sub>J</sub> , T <sub>stg</sub>	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.

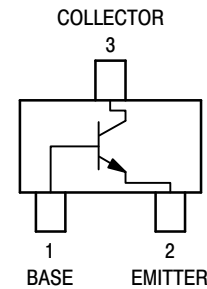
### ELECTRICAL CHARACTERISTICS

Symbol	Characteristic	Min	Max	Unit
V <sub>(BR)CEO</sub>	Collector-Emitter Breakdown Voltage (I <sub>C</sub> = 1.0 mA, I <sub>B</sub> = 0)	300	-	V
V <sub>(BR)CBO</sub>	Collector-Base Breakdown Voltage (I <sub>C</sub> = 100 μA, I <sub>E</sub> = 0)	300	-	V
V <sub>(BR)EBO</sub>	Emitter-Base Breakdown Voltage (I <sub>E</sub> = 100 μA, I <sub>E</sub> = 0)	6.0	-	V
I <sub>CBO</sub>	Collector-Base Cutoff Current (V <sub>CB</sub> = 200 V, I <sub>E</sub> = 0)	-	0.1	μA
I <sub>EBO</sub>	Emitter-Base Cutoff Current (V <sub>EB</sub> = 6.0 V, I <sub>B</sub> = 0)	-	0.1	μA
h <sub>FE1</sub> h <sub>FE2</sub>	DC Current Gain (Note 2) (V <sub>CE</sub> = 10 V, I <sub>C</sub> = 1.0 mA) (V <sub>CE</sub> = 10 V, I <sub>C</sub> = 30 mA)	25 40	- -	-
V <sub>CE(sat)</sub>	Collector-Emitter Saturation Voltage (Note 2) (I <sub>C</sub> = 20 mA, I <sub>B</sub> = 2.0 mA)	-	0.5	V

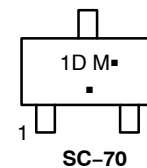
1. FR-4 @ 10 mm<sup>2</sup>, 1 oz. Copper traces.
2. Pulse Test: Pulse Width ≤ 300 μs, D.C. ≤ 2%.



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

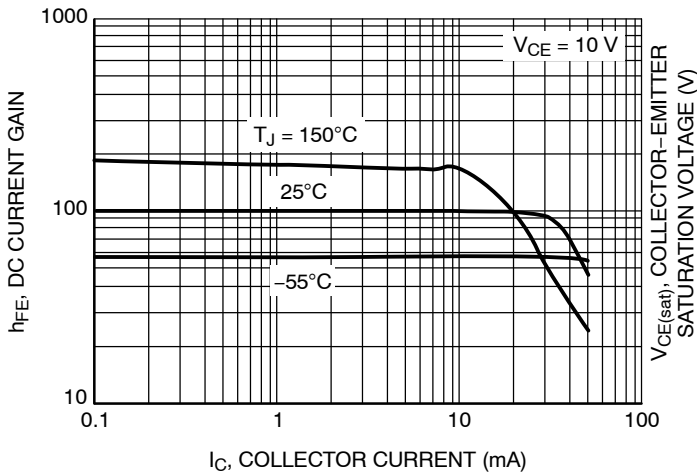


Figure 1. DC Current Gain

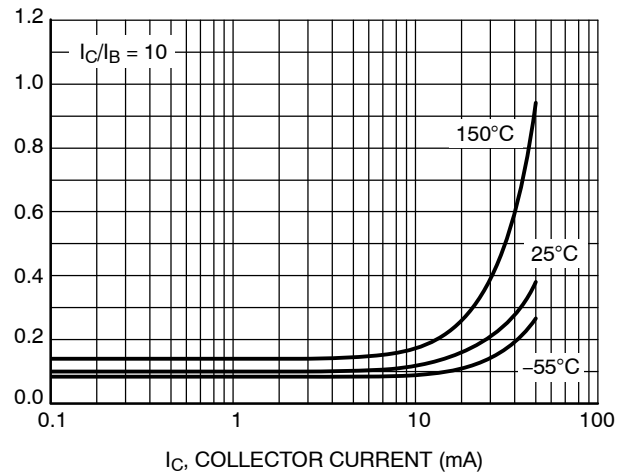


Figure 2. Collector-Emitter Saturation Voltage vs. Collector Current

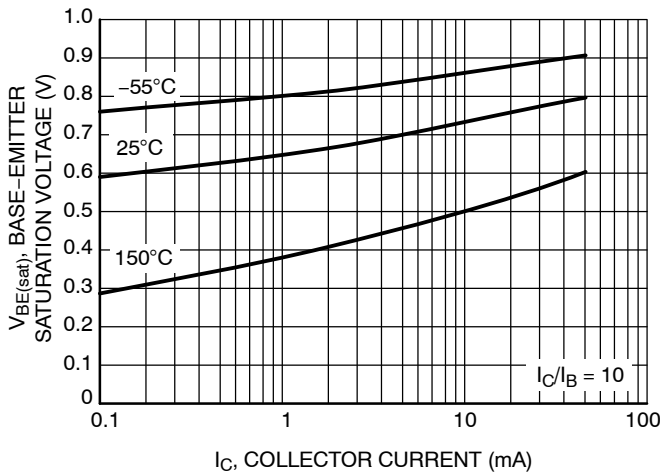


Figure 3. Base-Emitter Saturation Voltage vs. Collector Current

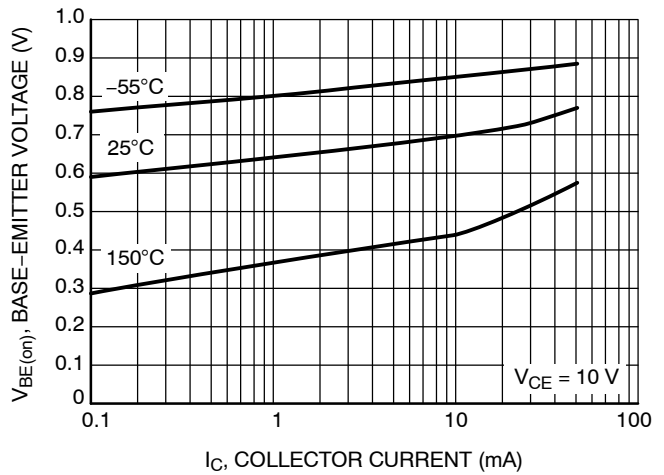


Figure 4. Base-Emitter On Voltage vs. Collector Current

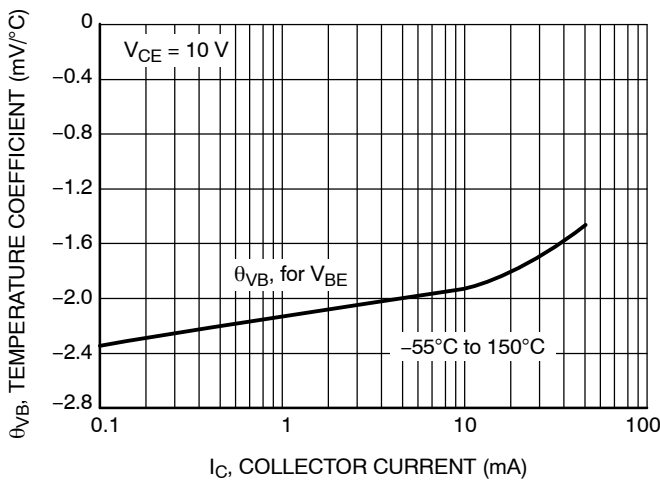


Figure 5. Base-Emitter Temperature Coefficient

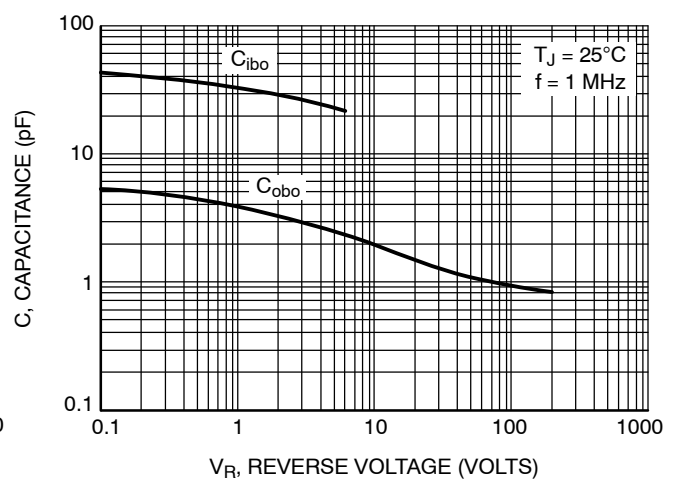


Figure 6. Capacitance

# MSD42WT1G, NSVMSD42WT1G

## TYPICAL CHARACTERISTICS (continued)

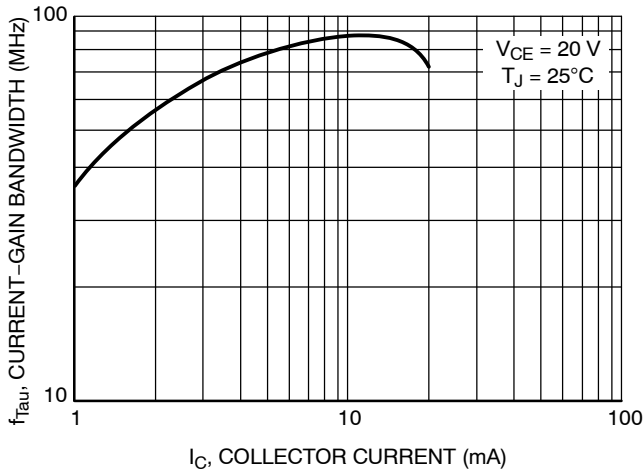


Figure 7. Current-Gain — Bandwidth Product

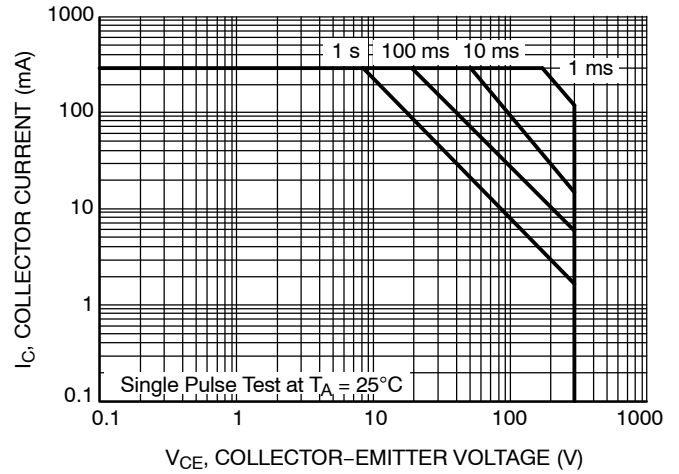


Figure 8. Safe Operating Area

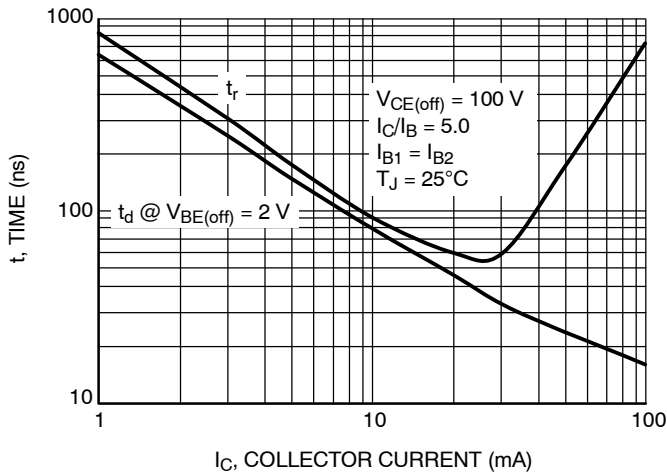


Figure 9. Turn-On Time

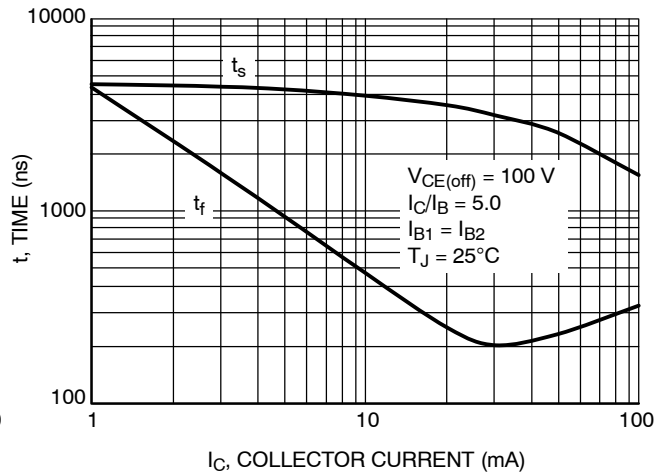
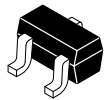


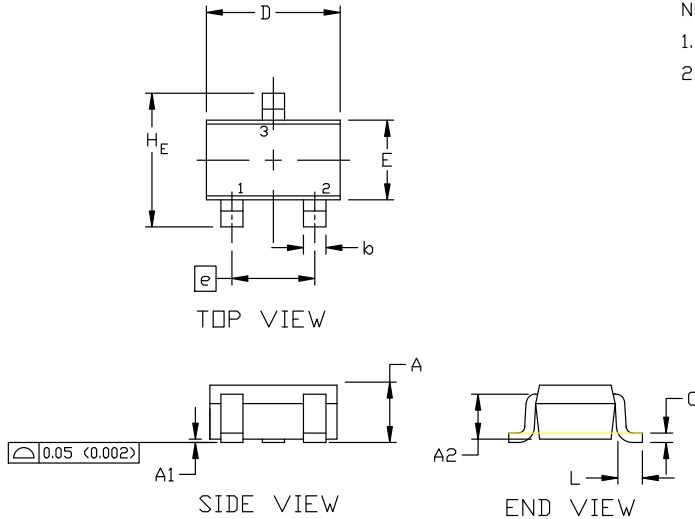
Figure 10. Turn-Off Time



SCALE 4:1

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

DATE 11 OCT 2022

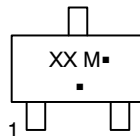


NOTES:

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

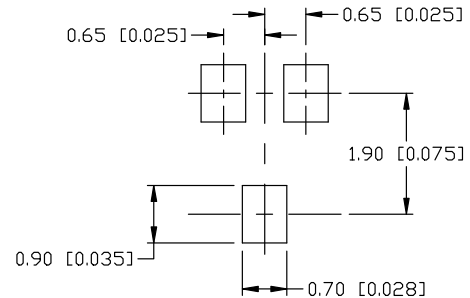
DIM	MILLIMETERS			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.80	0.90	1.00	0.032	0.035	0.040
A1	0.00	0.05	0.10	0.000	0.002	0.004
A2	0.70 REF			0.028 BSC		
b	0.30	0.35	0.40	0.012	0.014	0.016
c	0.10	0.18	0.25	0.004	0.007	0.010
D	1.80	2.00	2.20	0.071	0.080	0.087
E	1.15	1.24	1.35	0.045	0.049	0.053
e	1.20	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 <sub>E</sub>	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:<br>CANCELLED                                 | STYLE 2:<br>PIN 1. ANODE<br>2. N.C.<br>3. CATHODE     | STYLE 3:<br>PIN 1. BASE<br>2. EMITTER<br>3. COLLECTOR | STYLE 4:<br>PIN 1. CATHODE<br>2. CATHODE<br>3. ANODE       | STYLE 5:<br>PIN 1. ANODE<br>2. ANODE<br>3. CATHODE          |                                                         |
| STYLE 6:<br>PIN 1. EMITTER<br>2. BASE<br>3. COLLECTOR | STYLE 7:<br>PIN 1. BASE<br>2. EMITTER<br>3. COLLECTOR | STYLE 8:<br>PIN 1. GATE<br>2. SOURCE<br>3. DRAIN      | STYLE 9:<br>PIN 1. ANODE<br>2. CATHODE<br>3. CATHODE-ANODE | STYLE 10:<br>PIN 1. CATHODE<br>2. ANODE<br>3. ANODE-CATHODE | STYLE 11:<br>PIN 1. CATHODE<br>2. CATHODE<br>3. CATHODE |

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