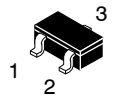
NPN Silicon General Purpose High Voltage Transistors

MSD42T1G

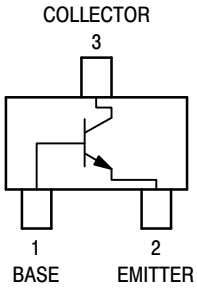
This NPN Silicon Planar Transistor is designed for general purpose amplifier applications. This device is housed in the SC−59 package which is designed for low power surface mount applications.

Features

- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant



SC−59
CASE 318D
STYLE 1



MAXIMUM RATINGS (T_A = 25°C)

Symbol	Rating	Value	Unit
$V_{(BR)CBO}$	Collector-Base Voltage	300	Vdc
$V_{(BR)CEO}$	Collector-Emitter Voltage	300	Vdc
$V_{(BR)EBO}$	Emitter-Base Voltage	6.0	Vdc
I_C	Collector Current − Continuous	150	mAdc

THERMAL CHARACTERISTICS

Symbol	Rating	Max	Unit
P_D	Power Dissipation (Note 1)	450	mW
$R_{\theta JA}$	Thermal Resistance, Junction−to−Ambient	274	°C/W
T_J, T_{stg}	Junction and Storage Temperature Range	−55 to +150	°C

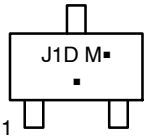
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

ELECTRICAL CHARACTERISTICS

Symbol	Characteristic	Min	Max	Unit
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage (I_C = 1.0 mAdc, I_B = 0)	300	−	Vdc
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0)	300	−	Vdc
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage (I_E = 100 μAdc, I_E = 0)	6.0	−	Vdc
I_{CBO}	Collector-Base Cutoff Current (V_{CB} = 200 Vdc, I_E = 0)	−	0.1	μA
I_{EBO}	Emitter−Base Cutoff Current (V_{EB} = 6.0 Vdc, I_B = 0)	−	0.1	μA
h_{FE1} h_{FE2}	DC Current Gain (Note 2) (V_{CE} = 10 Vdc, I_C = 1.0 mAdc) (V_{CE} = 10 Vdc, I_C = 30 mAdc)	 25 40	 − −	−
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage (Note 2) (I_C = 20 mAdc, I_B = 2.0 mAdc)	−	0.5	Vdc

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

MARKING DIAGRAM



SC−59

J1D = Specific Device Code
M = Date Code
▪ = Pb−Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

Device	Package	Shipping†
MSD42T1G	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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TYPICAL CHARACTERISTICS

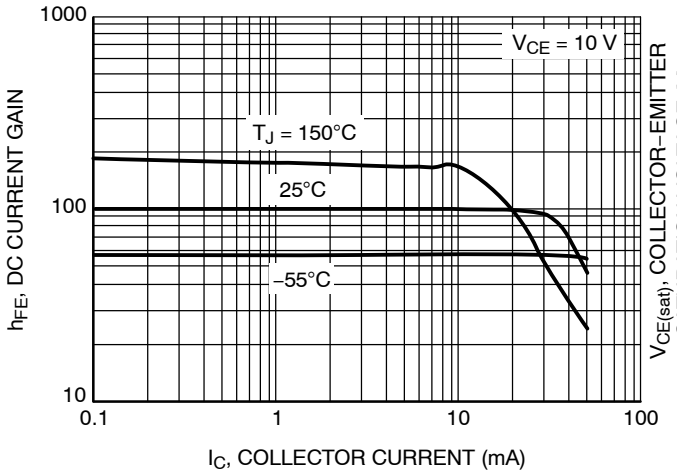


Figure 1. DC Current Gain

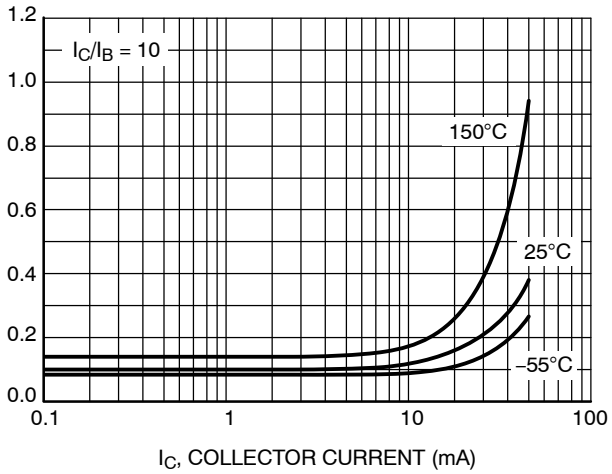


Figure 2. Collector−Emitter Saturation Voltage vs. Collector Current

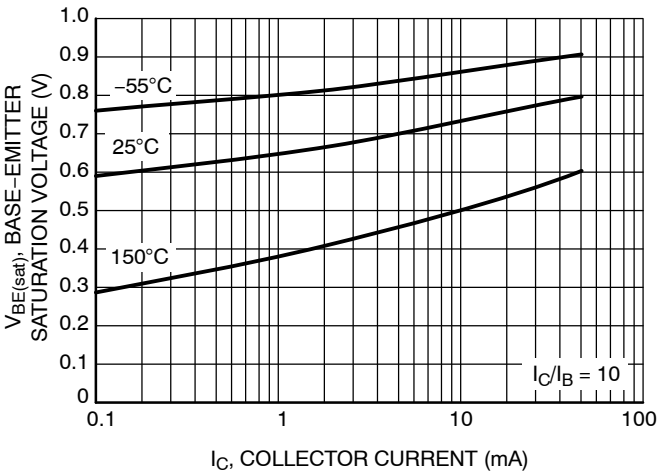


Figure 3. Base−Emitter Saturation Voltage vs. Collector Current

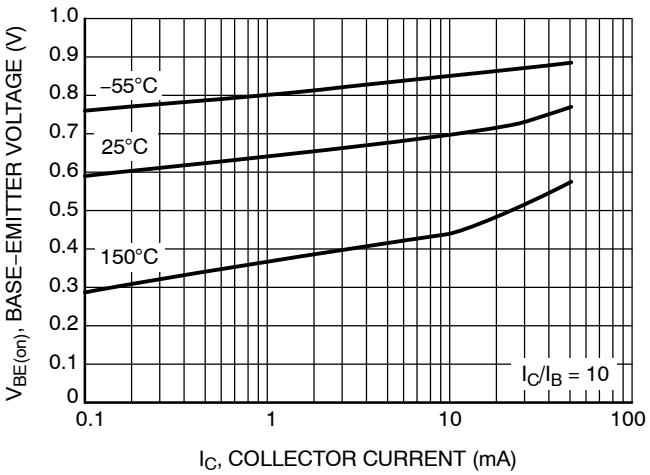


Figure 4. Base−Emitter On Voltage vs. Collector Current

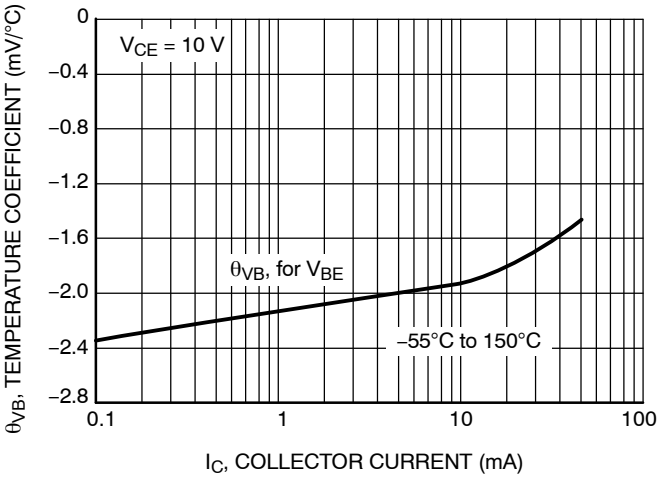


Figure 5. Base−Emitter Temperature Coefficient

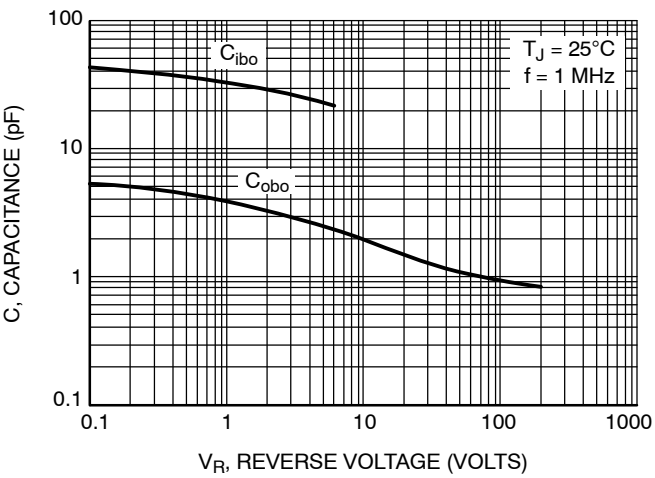


Figure 6. Capacitance

TYPICAL CHARACTERISTICS (continued)

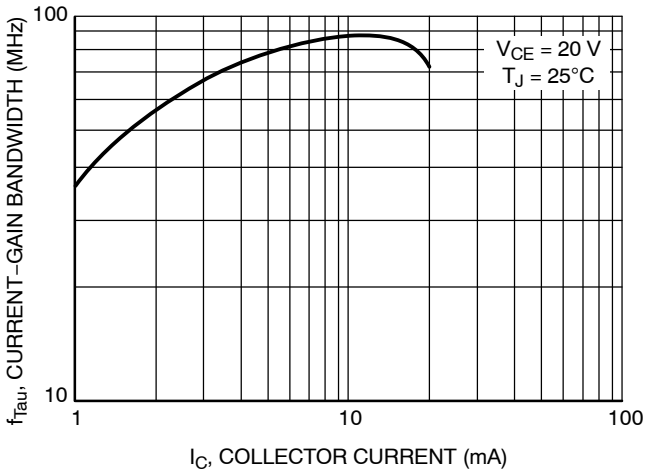


Figure 7. Current−Gain — Bandwidth Product

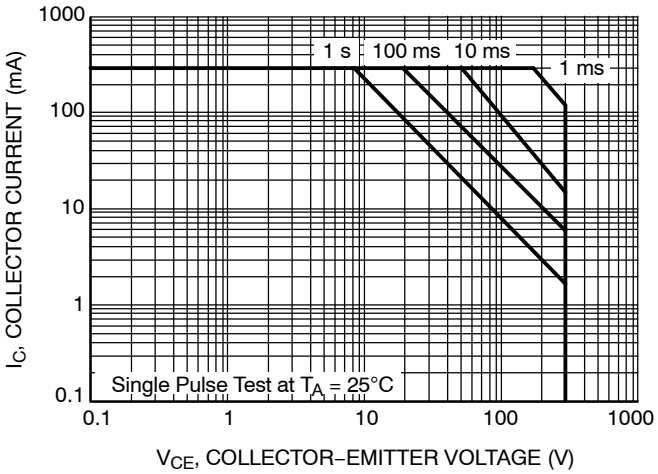
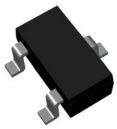
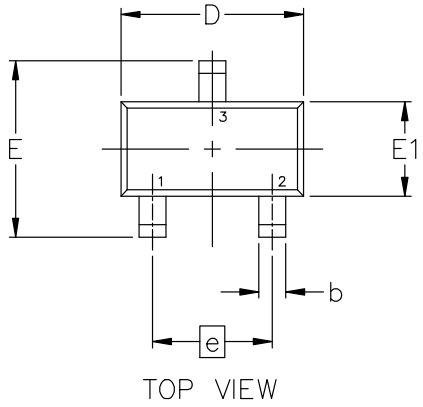


Figure 8. Safe Operating Area

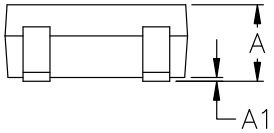


SC−59−3 2.90x1.50x1.15, 1.90P
CASE 318D
ISSUE J

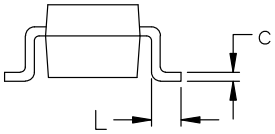
DATE 15 FEB 2024



TOP VIEW



SIDE VIEW

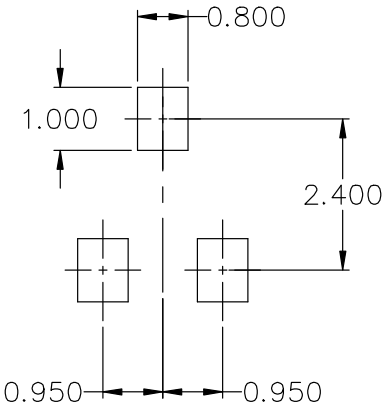


END VIEW

NOTES:

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

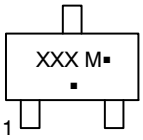
DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	1.00	1.15	1.30
A1	0.01	0.06	0.10
b	0.35	0.43	0.50
c	0.09	0.14	0.18
D	2.70	2.90	3.10
E	2.50	2.80	3.00
E1	1.30	1.50	1.70
e	1.90 BSC		
L	0.20	0.40	0.60



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

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DESCRIPTION:	**SC−59−3 2.90x1.50x1.15, 1.90P**	**PAGE 1 OF 1**

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