

# MSD1819A-RT1

## General Purpose Amplifier Transistor

### NPN Silicon Surface Mount

This NPN Silicon Epitaxial 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

- High  $h_{FE}$ , 210 - 460
- Low  $V_{CE(sat)}$ , < 0.5 V
- Moisture Sensitivity Level 1
- ESD Protection: Human Body Model > 4000 V  
Machine Model > 400 V
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

#### MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ )

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	$I_C$	100	mA
Collector Current - Peak	$I_{C(P)}$	200	mA

#### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Power Dissipation (Note 1)	$P_D$	150	mW
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55 to +150	$^\circ\text{C}$

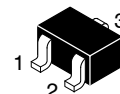
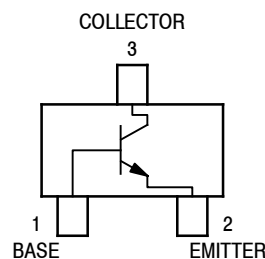
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. Device mounted on a FR-4 glass epoxy printed circuit board using the minimum recommended footprint.



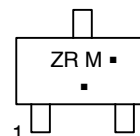
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SC-70 (SOT-323)  
CASE 419  
STYLE 3

#### MARKING DIAGRAM



ZR = Device Code  
M = Date Code\*  
▪ = Pb-Free Package

(Note: Microdot may be in either location)  
\*Date Code orientation may vary depending upon manufacturing location.

#### ORDERING INFORMATION

Device	Package	Shipping†
MSD1819A-RT1G	SC-70/ SOT-323 (Pb-Free)	3000/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.

# MSD1819A-RT1

## ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Min	Max	Unit
Collector-Emitter Breakdown Voltage ( $I_C = 2.0 \text{ mAdc}$ , $I_B = 0$ )	$V_{(BR)CEO}$	50	-	Vdc
Collector-Base Breakdown Voltage ( $I_C = 10 \text{ } \mu\text{Adc}$ , $I_E = 0$ )	$V_{(BR)CBO}$	60	-	Vdc
Emitter-Base Breakdown Voltage ( $I_E = 10 \text{ } \mu\text{Adc}$ , $I_C = 0$ )	$V_{(BR)EBO}$	7.0	-	Vdc
Collector-Base Cutoff Current ( $V_{CB} = 20 \text{ Vdc}$ , $I_E = 0$ )	$I_{CBO}$	-	0.1	$\mu\text{A}$
Collector-Emitter Cutoff Current ( $V_{CE} = 10 \text{ Vdc}$ , $I_B = 0$ )	$I_{CEO}$	-	0.1	$\mu\text{A}$
DC Current Gain (Note 2) ( $V_{CE} = 10 \text{ Vdc}$ , $I_C = 2.0 \text{ mAdc}$ ) ( $V_{CE} = 2.0 \text{ Vdc}$ , $I_C = 100 \text{ mAdc}$ )	$h_{FE1}$ $h_{FE2}$	210 90	340 -	-
Collector-Emitter Saturation Voltage (Note 2) ( $I_C = 100 \text{ mAdc}$ , $I_B = 10 \text{ mAdc}$ )	$V_{CE(sat)}$	-	0.5	Vdc

2. Pulse Test: Pulse Width  $\leq 300 \text{ } \mu\text{s}$ , D.C.  $\leq 2\%$ .

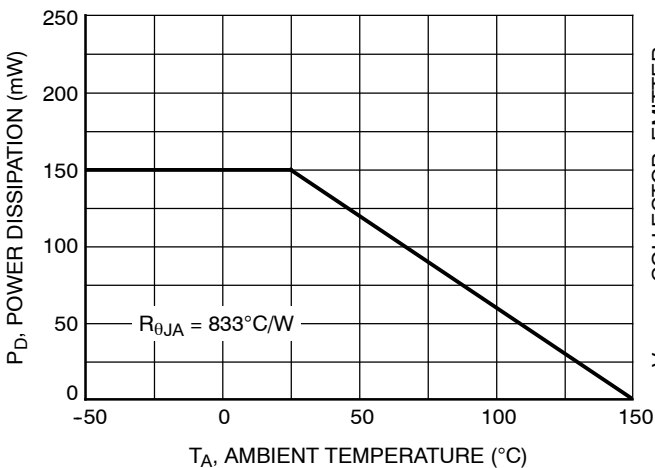


Figure 1. Derating Curve

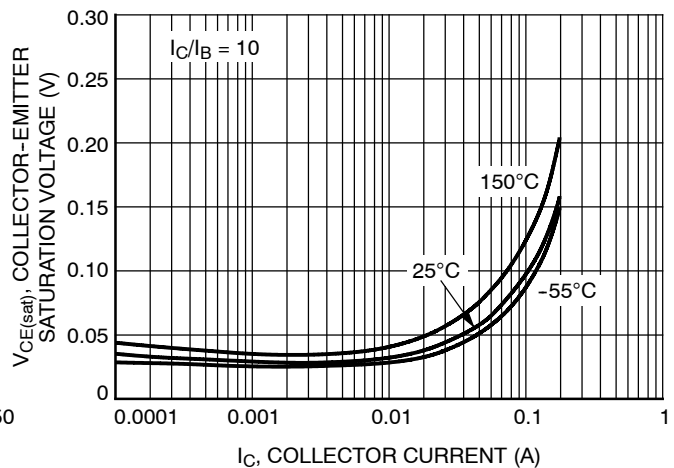


Figure 2. Collector Emitter Saturation Voltage vs. Collector Current

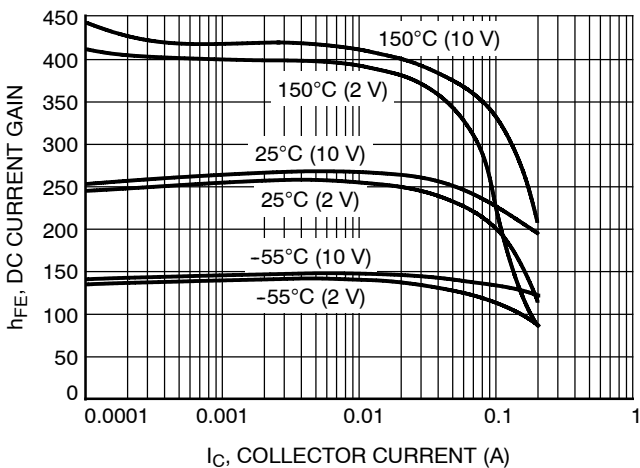


Figure 3. DC Current Gain vs. Collector Current

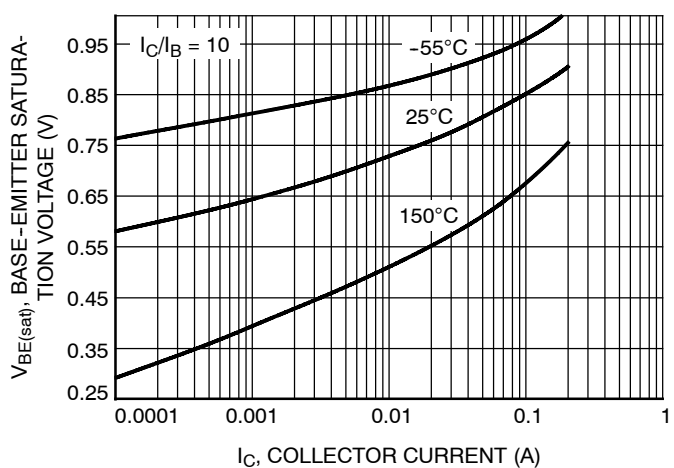
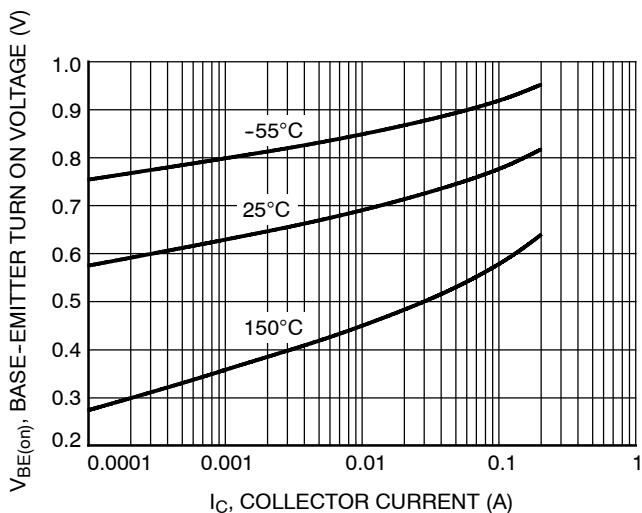
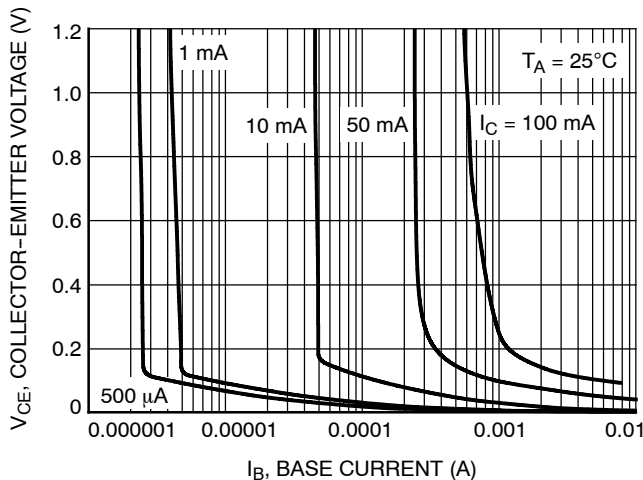


Figure 4. Base Emitter Saturation Voltage vs. Collector Current

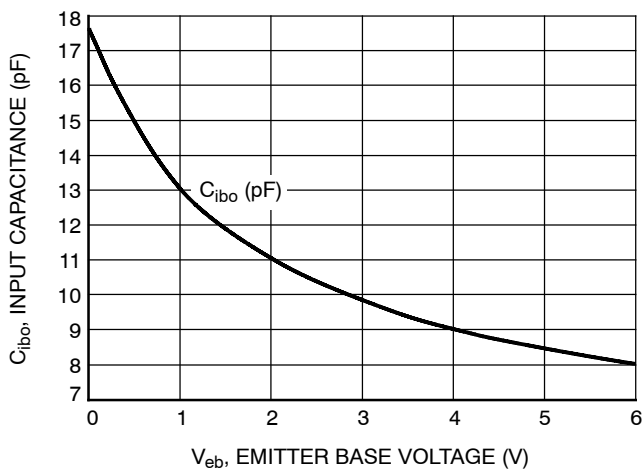
# MSD1819A-RT1



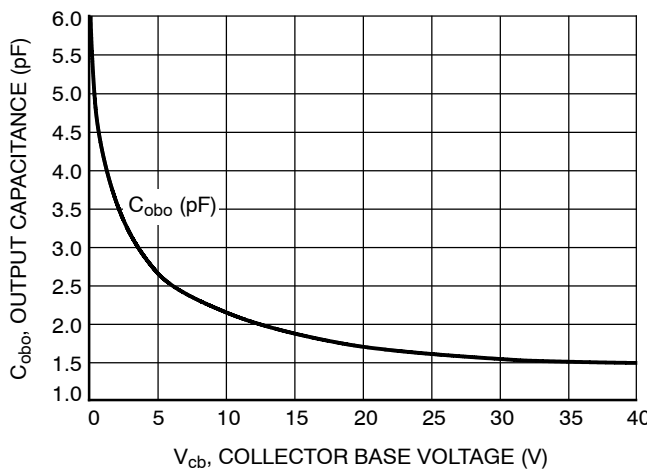
**Figure 5. Base Emitter Turn-On Voltage vs. Collector Current**



**Figure 6. Collector Saturation Region**



**Figure 7. Input Capacitance**

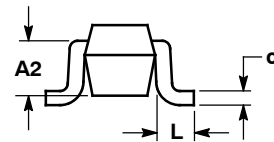
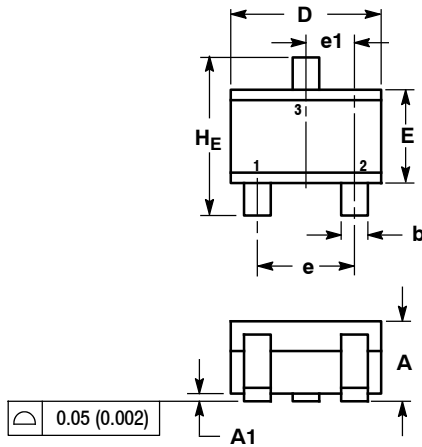


**Figure 8. Output Capacitance**

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## PACKAGE DIMENSIONS

### SC-70 (SOT-323) CASE 419-04 ISSUE N



NOTES:

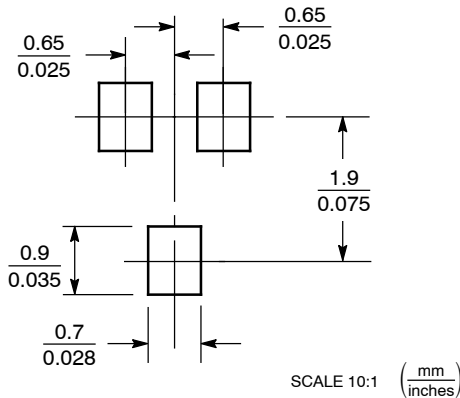
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

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 REF		
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	2.10	2.20	0.071	0.083	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
HE	2.00	2.10	2.40	0.079	0.083	0.095

STYLE 3:

1. BASE
2. EMITTER
3. COLLECTOR

### SOLDERING 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.

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