

# IMD10AMT1G

## Dual Bias Resistor Transistor

### NPN and PNP Silicon Surface Mount Transistors with Monolithic Bias Resistor Network

- High Current:  $I_C = 500$  mA max
- NSV 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 ( $T_A = 25^\circ\text{C}$ )

Rating	Symbol	Value	Unit
Collector-Base Voltage	$V_{(BR)CBO}$	50	Vdc
Collector-Emitter Voltage	$V_{(BR)CEO}$	50	Vdc
Emitter-Base Voltage	$V_{(BR)EBO}$	5.0	Vdc
Collector Current - Continuous	$I_C$	500	mAdc

#### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Power Dissipation*	$P_D$	285	mW
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

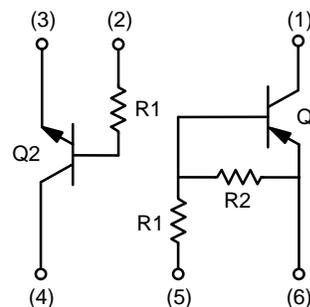
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

\*Total for both Transistors.



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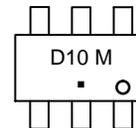


SC-74

#### MARKING DIAGRAM



SC-74R  
318AA  
Style 21



D10 = Specific Device Code  
M = Date Code  
■ = Pb-Free Package

#### ORDERING INFORMATION

Device	Package	Shipping†
IMD10AMT1G	SC-74R (Pb-Free)	3000 / Tape & Reel
NSVIMD10AMT1G	SC-74R (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.

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## ELECTRICAL CHARACTERISTICS

( $T_A = 25^\circ\text{C}$  unless otherwise noted, common for Q<sub>1</sub> and Q<sub>2</sub>, – minus sign for Q<sub>1</sub>(PNP) omitted)

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector–Base Breakdown Voltage ( $I_C = 50\ \mu\text{Adc}$ , $I_E = 0\ \text{A}$ )	$V_{(BR)CBO}$	50	–	Vdc
Collector–Emitter Breakdown Voltage ( $I_C = 1.0\ \text{mAdc}$ , $I_B = 0\ \text{A}$ )	$V_{(BR)CEO}$	50	–	Vdc
Emitter–Base Breakdown Voltage ( $I_E = 50\ \mu\text{Adc}$ , $I_C = 0\ \text{A}$ )	$V_{(BR)EBO}$	5.0	–	Vdc
Collector–Base Cutoff Current ( $V_{CB} = 50\ \text{Vdc}$ , $I_E = 0\ \text{A}$ )	$I_{CBO}$	–	100	nA
Emitter–Base Cutoff Current Q1 (PNP) ( $V_{EB} = 6.0\ \text{Vdc}$ , $I_C = 0\ \text{A}$ ) Q2 (NPN)	$I_{EBO}$	– –	1.0 0.5	mA
Collector–Emitter Cutoff Current ( $V_{CE} = 15\ \text{Vdc}$ , $I_B = 0\ \text{A}$ )	$I_{CEO}$	–	500	nA
Collector–Emitter Cutoff Current ( $V_{CE} = 25\ \text{Vdc}$ , $I_B = 0\ \text{A}$ )	$I_{CES}$	–	100	nA

## ON CHARACTERISTICS (Note 1)

DC Current Gain ( $V_{CE} = 5.0\ \text{V}$ , $I_C = 100\ \text{mA}$ ) Q1(PNP) ( $V_{CE} = 5.0\ \text{V}$ , $I_C = 1.0\ \text{mA}$ ) Q2(NPN)	$h_{FE}$	68 100	– 600	
Collector–Emitter Saturation Voltage ( $I_C = 10\ \text{mA}$ , $I_B = 1.0\ \text{mA}$ )	$V_{CE(sat)}$	–	0.3	Vdc
Output Voltage (on) ( $V_{CC} = 5.0\ \text{V}$ , $V_B = 2.5\ \text{V}$ , $R_L = 1.0\ \text{k}\Omega$ )	$V_{OL}$	–	0.2	Vdc
Output Voltage (off) ( $V_{CC} = 5.0\ \text{V}$ , $V_B = 0.25\ \text{V}$ , $R_L = 1.0\ \text{k}\Omega$ )	$V_{OH}$	4.9	–	Vdc
Input Resistor Q1(PNP) Q2(NPN)	R1	70 7.0	130 13	$\Omega$ k $\Omega$
Resistor Ratio Q1(PNP) Q2(NPN)	R1/R2	0.008 –	0.012 –	

1. Pulse Test: Pulse Width  $\leq 300\ \mu\text{s}$ , Duty Cycle  $< 2.0\%$ .

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## TYPICAL CHARACTERISTICS (NPN)

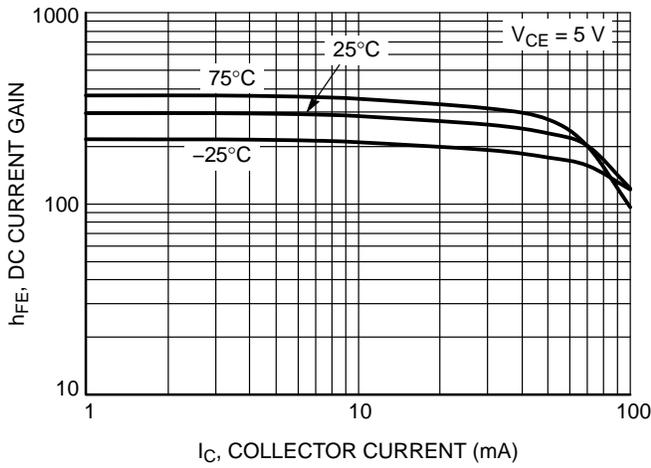


Figure 1. DC Current Gain

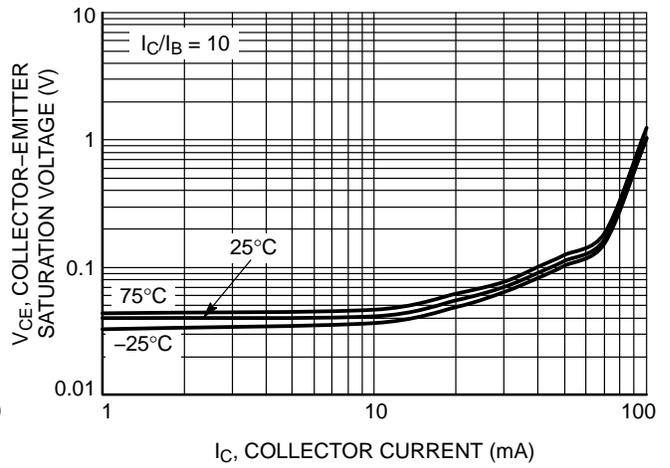


Figure 2. Collector-Emitter Saturation Voltage

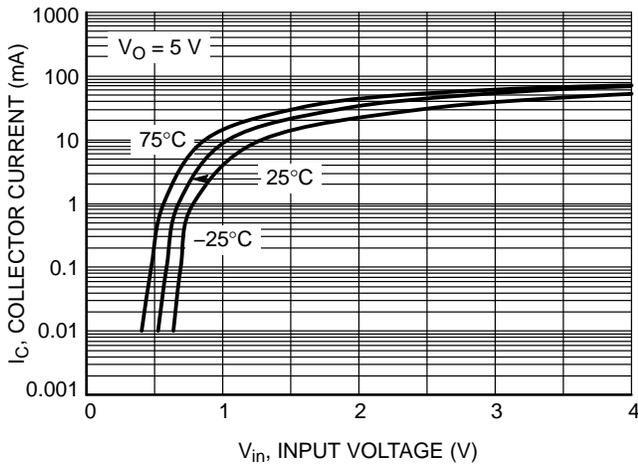


Figure 3. Output Current vs. Input Voltage

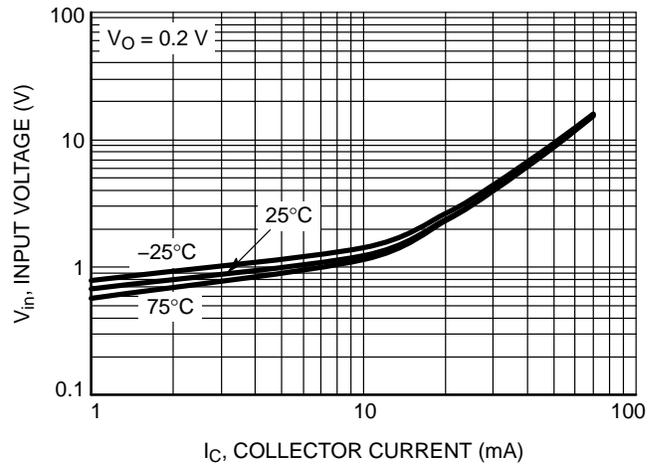


Figure 4. Input Voltage vs. Output Current

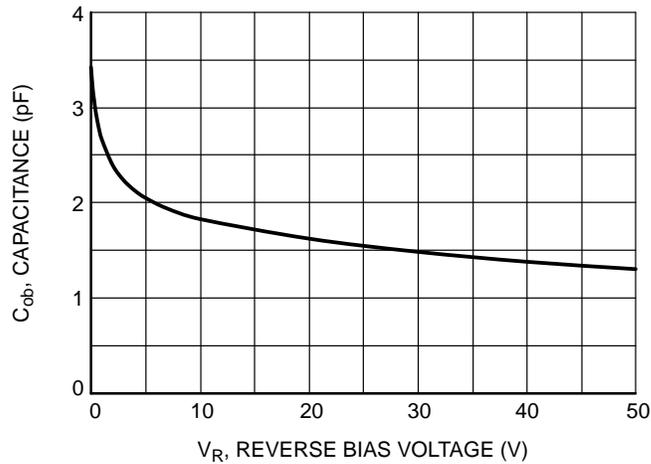


Figure 5. Output Capacitance

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## TYPICAL CHARACTERISTICS (PNP)

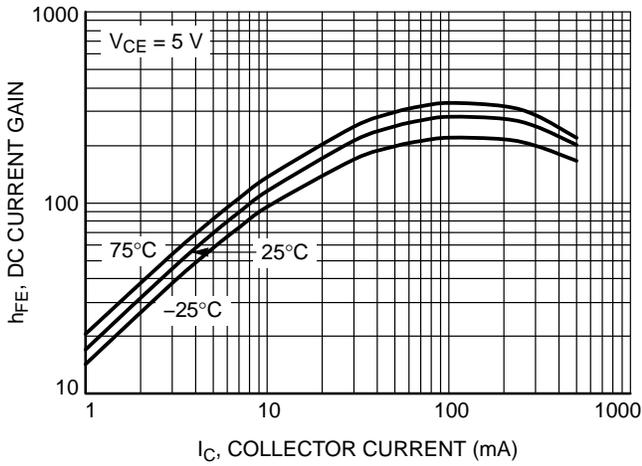


Figure 6. DC Current Gain

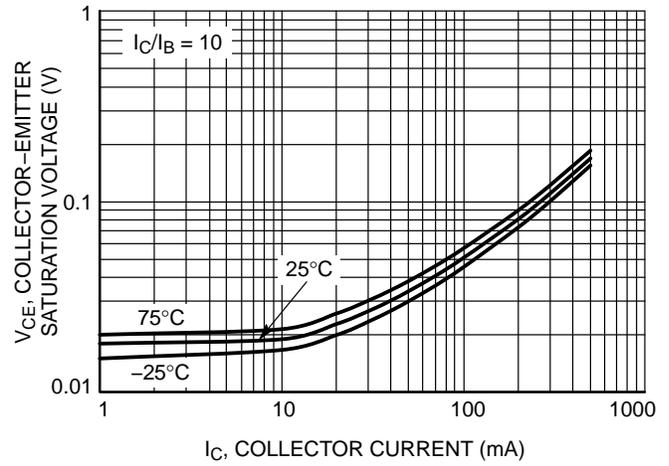


Figure 7. Collector-Emitter Saturation Voltage

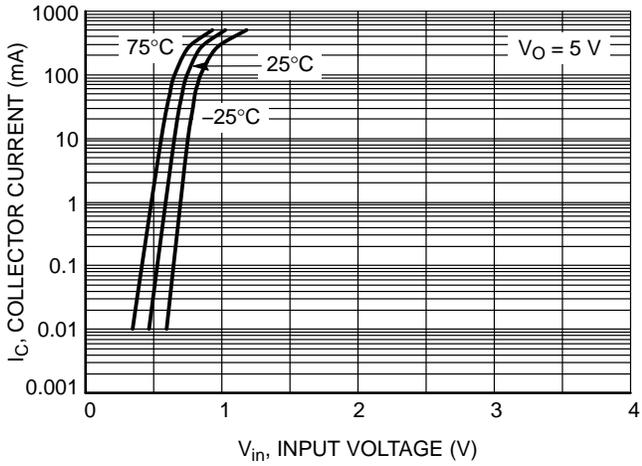


Figure 8. Output Current vs. Input Voltage

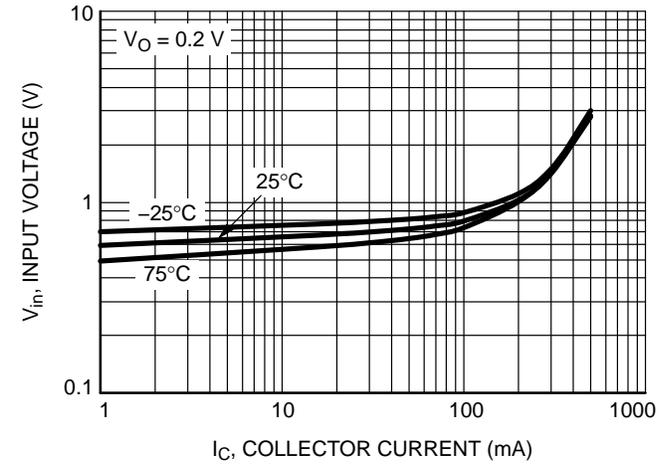


Figure 9. Input Voltage vs. Output Current

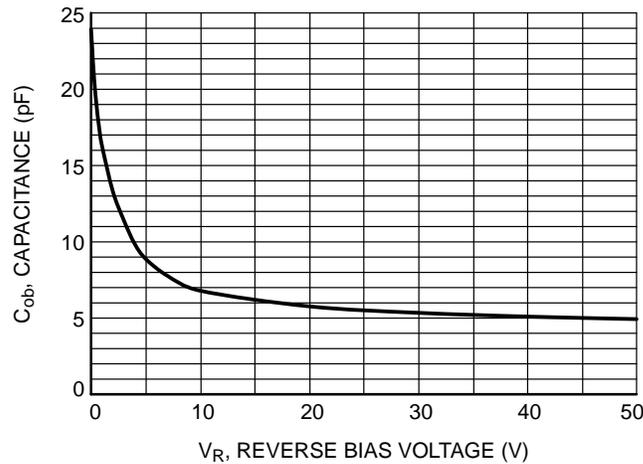
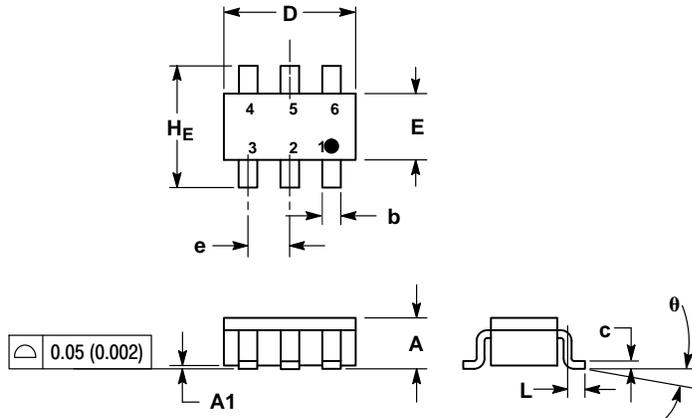


Figure 10. Output Capacitance

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## PACKAGE DIMENSIONS

### SC-74R CASE 318AA ISSUE B

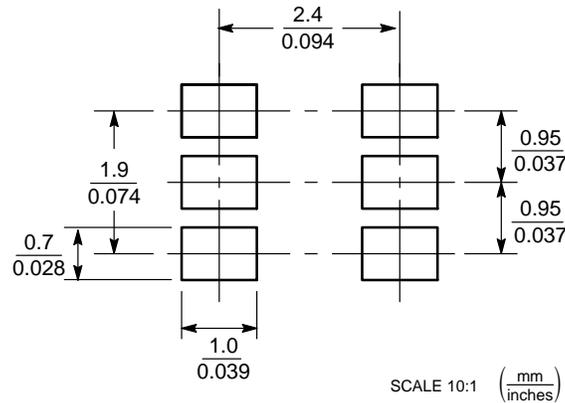


- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.90	1.00	1.10	0.035	0.039	0.043
A1	0.01	0.06	0.10	0.001	0.002	0.004
b	0.25	0.37	0.50	0.010	0.015	0.020
c	0.10	0.18	0.26	0.004	0.007	0.010
D	2.90	3.00	3.10	0.114	0.118	0.122
E	1.30	1.50	1.70	0.051	0.059	0.067
e	0.85	0.95	1.05	0.034	0.037	0.041
L	0.20	0.40	0.60	0.008	0.016	0.024
HE	2.50	2.75	3.00	0.099	0.108	0.118
theta						

- STYLE 21:
- |                    |     |    |     |
|--------------------|-----|----|-----|
| PIN 1. COLLECTOR 1 | 10° | 0° | 10° |
| 2. EMITTER 2       |     |    |     |
| 3. BASE 2          |     |    |     |
| 4. COLLECTOR 2     |     |    |     |
| 5. EMITTER 1       |     |    |     |
| 6. BASE 1          |     |    |     |

### 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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