

Dual Bias Resistor Transistor

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



ON Semiconductor®

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IMD10AMT1G

- 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 ($T_A = 25^\circ\text{C}$)

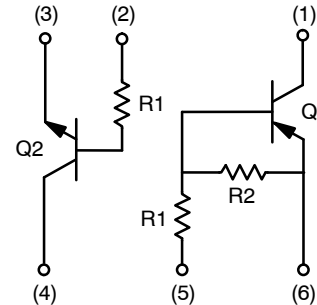
| Rating | Symbol | Value | Unit |
|--------------------------------|---------------|-------|------|
| Collector-Base Voltage | $V_{(BR)CBO}$ | 50 | Vdc |
| Collector-Emitter Voltage | $V_{(BR)CEO}$ | 50 | Vdc |
| Emitter-Base Voltage | $V_{(BR)EBO}$ | 5.0 | Vdc |
| Collector Current - Continuous | I_C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

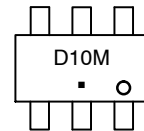


SC-74

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.

IMD10AMT1G

ELECTRICAL CHARACTERISTICS

($T_A = 25^\circ\text{C}$ unless otherwise noted, common for Q₁ and Q₂, – minus sign for Q₁(PNP) omitted)

| Characteristic | Symbol | Min | Max | Unit |
|----------------------------------------------------------------------------------------------------------|---------------|--------|------------|------|
| OFF CHARACTERISTICS | | | | |
| Collector–Base Breakdown Voltage ($I_C = 50\ \mu\text{A}$, $I_E = 0\ \text{A}$) | $V_{(BR)CBO}$ | 50 | – | Vdc |
| Collector–Emitter Breakdown Voltage ($I_C = 1.0\ \text{mA}$, $I_B = 0\ \text{A}$) | $V_{(BR)CEO}$ | 50 | – | Vdc |
| Emitter–Base Breakdown Voltage ($I_E = 50\ \mu\text{A}$, $I_C = 0\ \text{A}$) | $V_{(BR)EBO}$ | 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 ($V_{CE} = 25\ \text{Vdc}$, $I_B = 0\ \text{A}$) | 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 | Ω k Ω |
| 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)

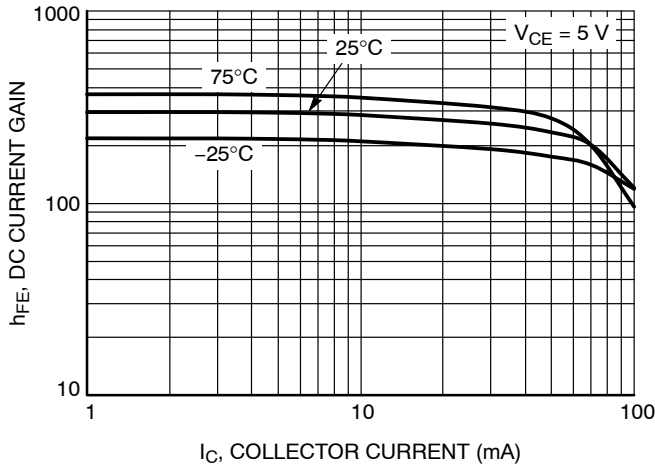


Figure 1. DC Current Gain

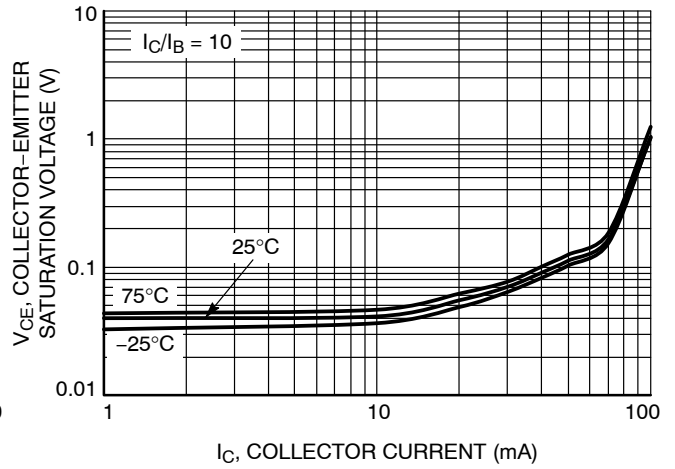


Figure 2. Collector-Emitter Saturation Voltage

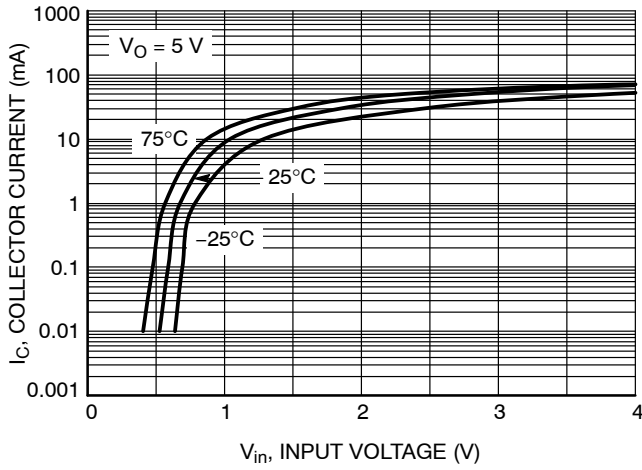


Figure 3. Output Current vs. Input Voltage

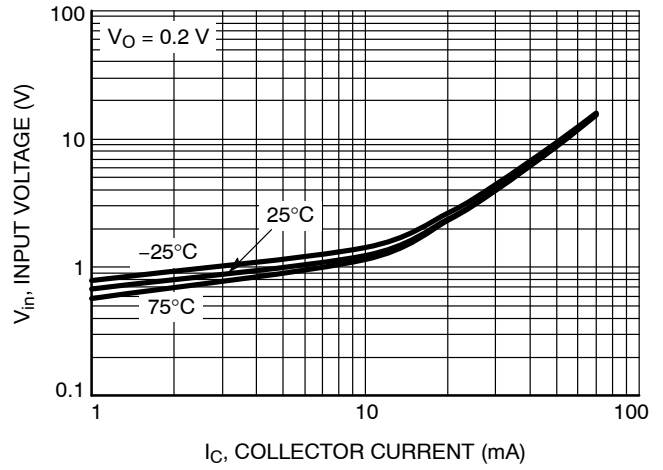


Figure 4. Input Voltage vs. Output Current

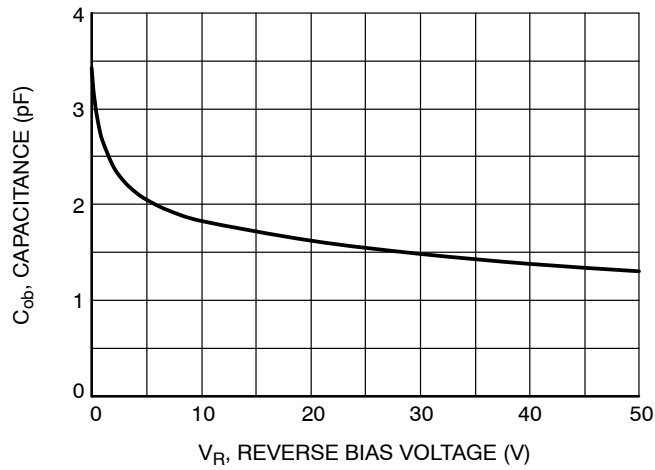


Figure 5. Output Capacitance

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TYPICAL CHARACTERISTICS (PNP)

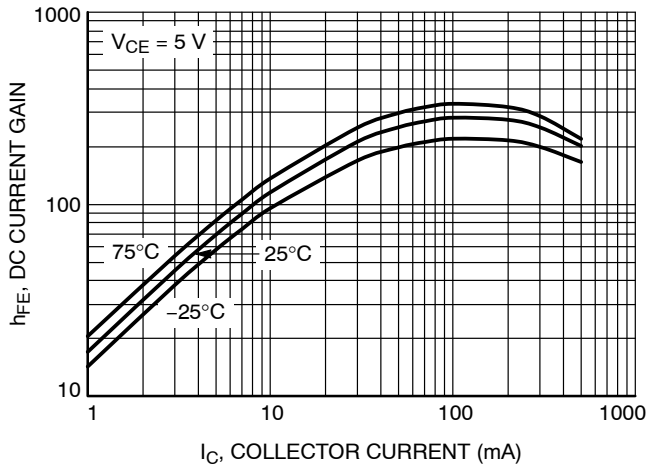


Figure 6. DC Current Gain

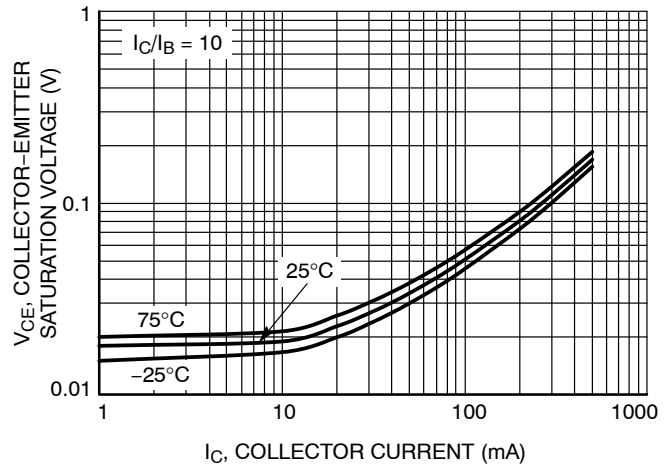


Figure 7. Collector-Emitter Saturation Voltage

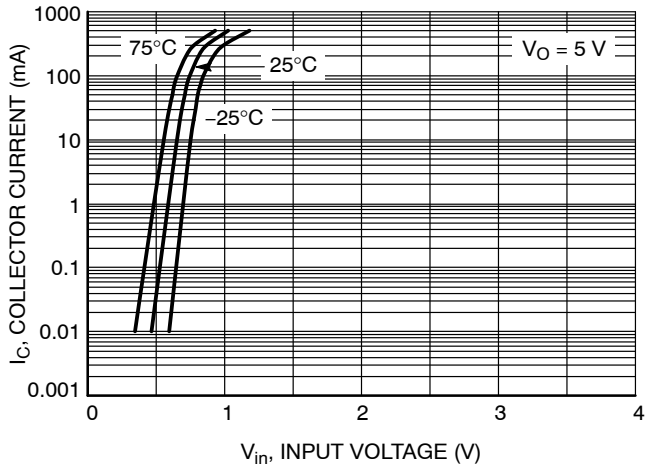


Figure 8. Output Current vs. Input Voltage

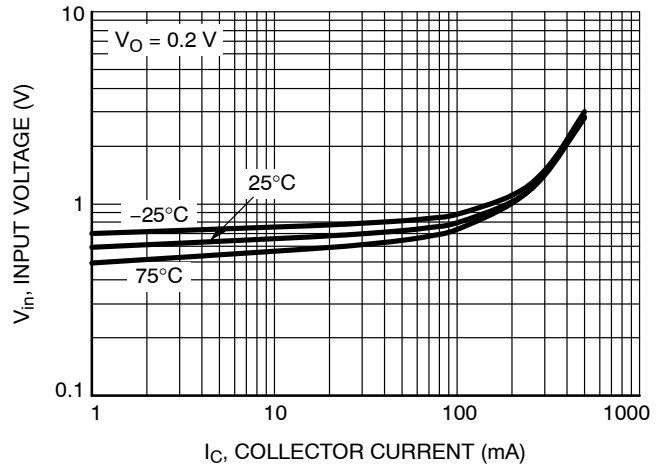


Figure 9. Input Voltage vs. Output Current

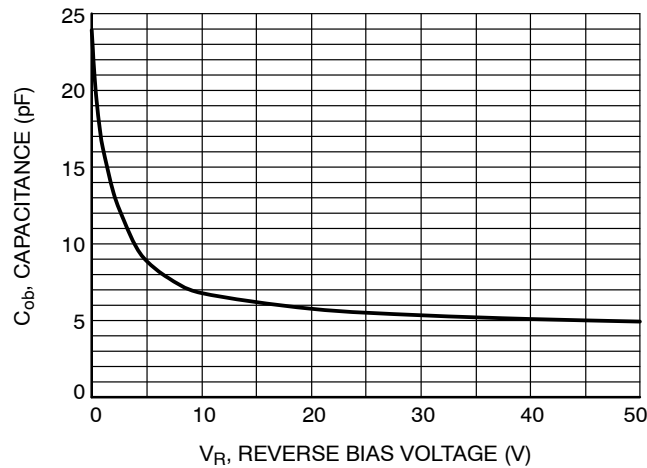


Figure 10. Output Capacitance

MECHANICAL CASE OUTLINE

PACKAGE DIMENSIONS

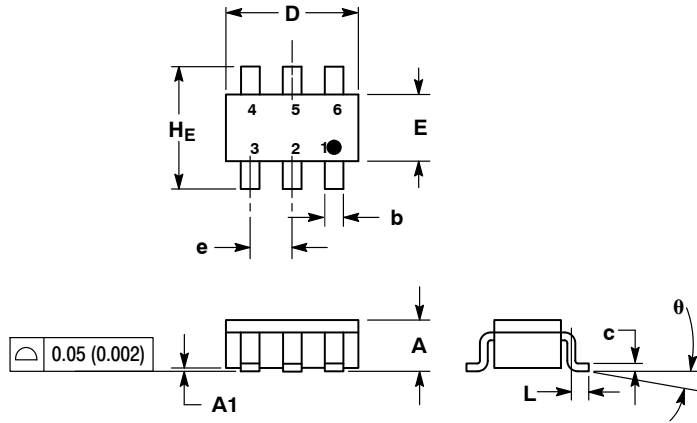
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SCALE 2:1

SC-74R
CASE 318AA-01
ISSUE B

DATE 27 MAY 2005

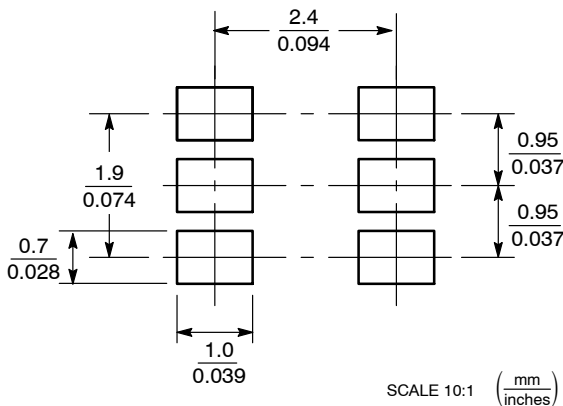


NOTES:

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.

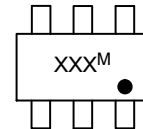
| DIM | MILLIMETERS | | | INCHES | | |
|-----|-------------|------|------|--------|-------|-------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.90 | 1.00 | 1.10 | 0.035 | 0.039 | 0.043 |
| A1 | 0.01 | 0.06 | 0.10 | 0.001 | 0.002 | 0.004 |
| b | 0.25 | 0.37 | 0.50 | 0.010 | 0.015 | 0.020 |
| c | 0.10 | 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 |
| θ | 0° | - | 10° | 0° | - | 10° |

SOLDERING FOOTPRINT*



SCALE 10:1 (mm/inches)

GENERIC MARKING DIAGRAM*



- XXX = 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.

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

- STYLE 20:
PIN 1. COLLECTOR 1
2. BASE 2
3. EMITTER 2
4. COLLECTOR 2
5. BASE 1
6. EMITTER 1

- STYLE 21:
PIN 1. COLLECTOR 1
2. EMITTER 2
3. BASE 2
4. COLLECTOR 2
5. EMITTER 1
6. BASE 1

| | | |
|-------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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| DESCRIPTION: | SC-74R | PAGE 1 OF 1 |

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[SMUN5235T1G](#) [SMUN5330DW1T1G](#) [SSVMUN5312DW1T2G](#) [RN1303\(TE85L,F\)](#) [RN4605\(TE85L,F\)](#) [TTEPROTOTYPE79](#)
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[NSVMUN2237T1G](#) [NSVDTC143ZM3T5G](#) [SMUN5335DW1T2G](#) [SMUN5216DW1T1G](#)