

# UMA4NT1, UMA6NT1

Preferred Devices

## Dual Common Emitter Bias Resistor Transistors

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

The BRT (Bias Resistor Transistor) contains a single transistor with a monolithic bias network consisting of two resistors; a series base resistor and a base-emitter resistor. These digital transistors are designed to replace a single device and its external resistor bias network. The BRT eliminates these individual components by integrating them into a single device. In the UMC2NT1 series, two BRT devices are housed in the SOT-353 package which is ideal for low power surface mount applications where board space is at a premium.

#### Features

- Simplifies Circuit Design
- Reduces Board Space
- Reduces Component Count
- Pb-Free Packages are Available

**MAXIMUM RATINGS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted, common for  $Q_1$  and  $Q_2$ , – minus sign for  $Q_1$  (PNP) omitted)

| Rating                    | Symbol    | Value | Unit |
|---------------------------|-----------|-------|------|
| Collector-Base Voltage    | $V_{CBO}$ | 50    | Vdc  |
| Collector-Emitter Voltage | $V_{CEO}$ | 50    | Vdc  |
| Collector Current         | $I_C$     | 100   | mAdc |

#### THERMAL CHARACTERISTICS

|                                                               |                 |             |                    |
|---------------------------------------------------------------|-----------------|-------------|--------------------|
| Thermal Resistance, Junction-to-Ambient (Surface Mounted)     | $R_{\theta JA}$ | 833         | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range                       | $T_J, T_{stg}$  | -65 to +150 | $^\circ\text{C}$   |
| Total Package Dissipation @ $T_A = 25^\circ\text{C}$ (Note 1) | $P_D$           | 150         | mW                 |

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.

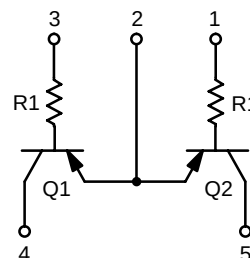
#### DEVICE RESISTOR VALUES

| Device  | R1 (K) | R2 (K)   |
|---------|--------|----------|
| UMA4NT1 | 10     | $\infty$ |
| UMA6NT1 | 47     | $\infty$ |



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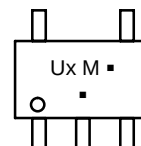
<http://onsemi.com>



#### MARKING DIAGRAM



SC-88A/SOT-353  
CASE 419A  
STYLE 7



Ux = Device Code  
x = 0 or 1

M = Date Code

■ = Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

| Device   | Package           | Shipping <sup>†</sup> |
|----------|-------------------|-----------------------|
| UMA4NT1  | SOT-353           | 3000/Tape & Reel      |
| UMA4NT1G | SOT-353 (Pb-Free) | 3000/Tape & Reel      |
| UMA6NT1  | SOT-353           | 3000/Tape & Reel      |
| UMA6NT1G | SOT-353 (Pb-Free) | 3000/Tape & Reel      |

<sup>†</sup>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.

**Preferred** devices are recommended choices for future use and best overall value.

# UMA4NT1, UMA6NT1

## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic                                                                                          | Symbol        | Min        | Typ        | Max        | Unit       |
|---------------------------------------------------------------------------------------------------------|---------------|------------|------------|------------|------------|
| <b>OFF CHARACTERISTICS</b>                                                                              |               |            |            |            |            |
| Collector-Base Cutoff Current<br>( $V_{CB} = 50\text{ V}$ , $I_E = 0$ )                                 | $I_{CBO}$     | –          | –          | 100        | nAdc       |
| Collector-Emitter Cutoff Current<br>( $V_{CB} = 50\text{ V}$ , $I_B = 0$ )                              | $I_{CEO}$     | –          | –          | 500        | nAdc       |
| Emitter-Base Cutoff Current<br>( $V_{EB} = 6.0$ , $I_C = 5.0\text{ mA}$ )                               | $I_{EBO}$     | –          | –          | 0.9<br>0.2 | mAdc       |
| <b>ON CHARACTERISTICS</b>                                                                               |               |            |            |            |            |
| Collector-Base Breakdown Voltage<br>( $I_C = 10\text{ }\mu\text{A}$ , $I_E = 0$ )                       | $V_{(BR)CBO}$ | 50         | –          | –          | Vdc        |
| Collector-Emitter Breakdown Voltage<br>( $I_C = 2.0\text{ mA}$ , $I_B = 0$ )                            | $V_{(BR)CEO}$ | 50         | –          | –          | Vdc        |
| DC Current Gain<br>( $V_{CE} = 10\text{ V}$ , $I_C = 5.0\text{ mA}$ )                                   | $h_{FE}$      | 160<br>160 | 250<br>250 | –<br>–     |            |
| Collector-Emitter Saturation Voltage<br>( $I_C = 10\text{ mA}$ , $I_B = 0.3\text{ mA}$ )                | $V_{CE(SAT)}$ | –          | –          | 0.25       | Vdc        |
| Output Voltage (on)<br>( $V_{CC} = 5.0\text{ V}$ , $V_B = 2.5\text{ V}$ , $R_L = 1.0\text{ k}\Omega$ )  | $V_{OL}$      | –          | –          | 0.2        | Vdc        |
| Output Voltage (off)<br>( $V_{CC} = 5.0\text{ V}$ , $V_B = 0.5\text{ V}$ , $R_L = 1.0\text{ k}\Omega$ ) | $V_{OH}$      | 4.9        | –          | –          | Vdc        |
| Input Resistor                                                                                          | $R_1$         | 7.0<br>33  | 10<br>47   | 13<br>61   | k $\Omega$ |

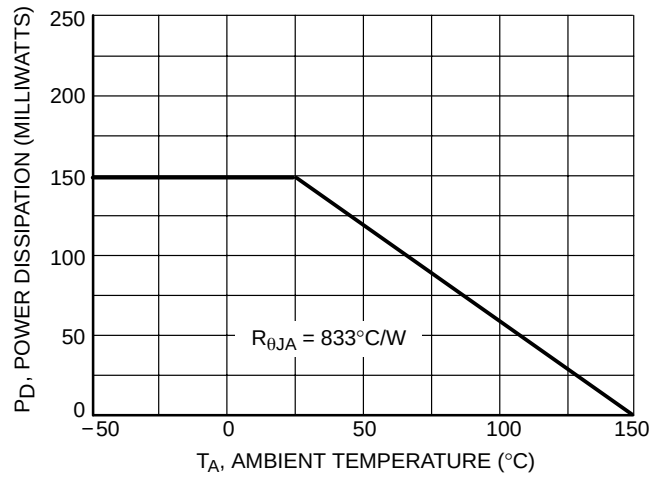
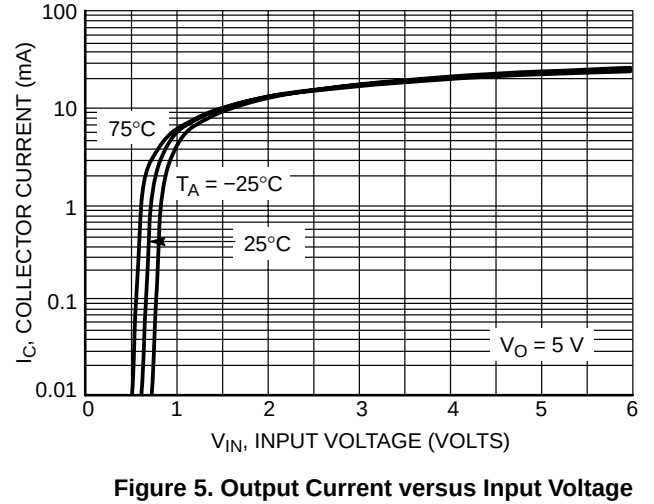
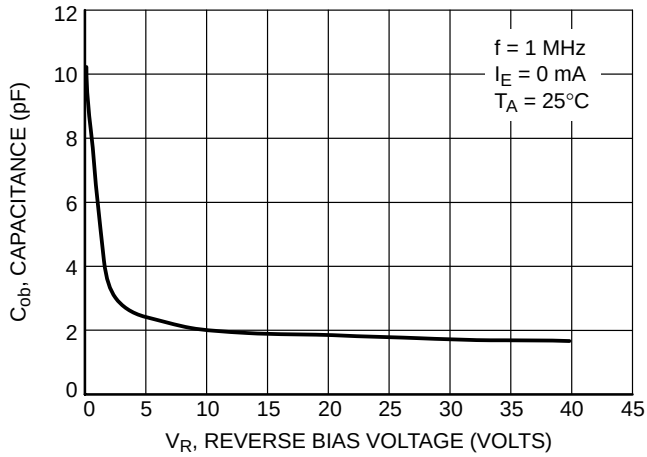
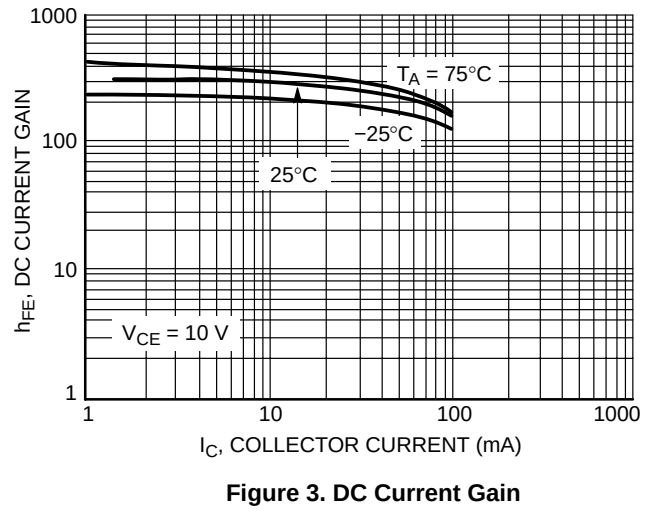
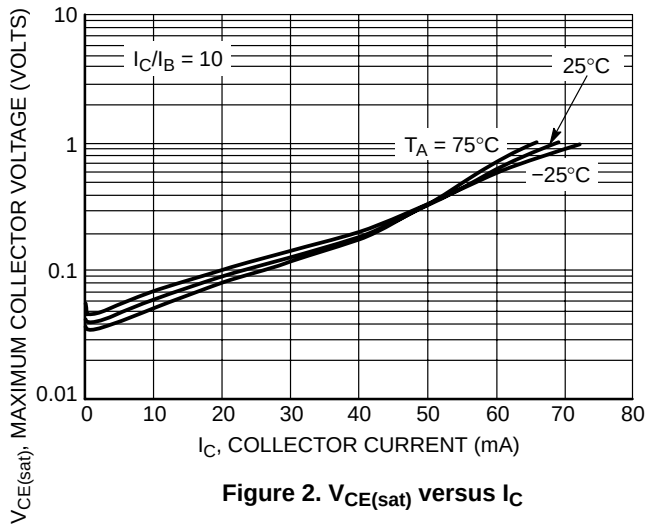


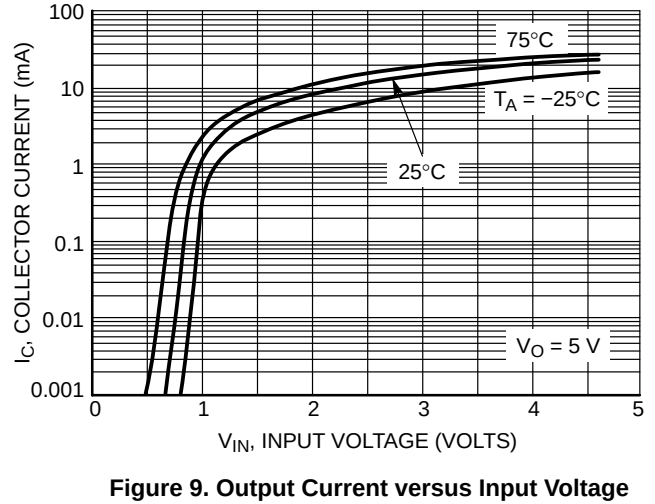
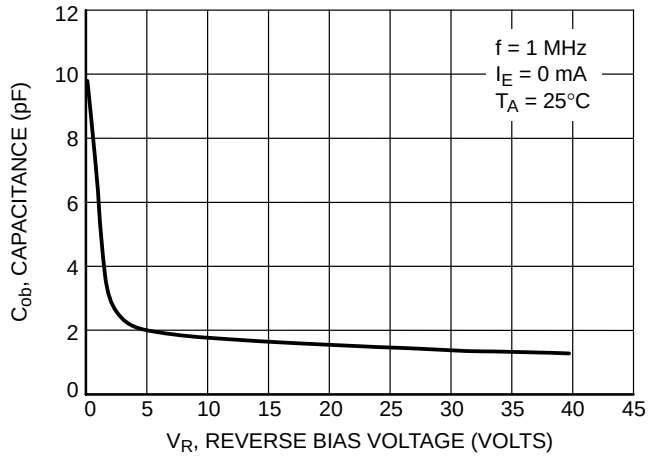
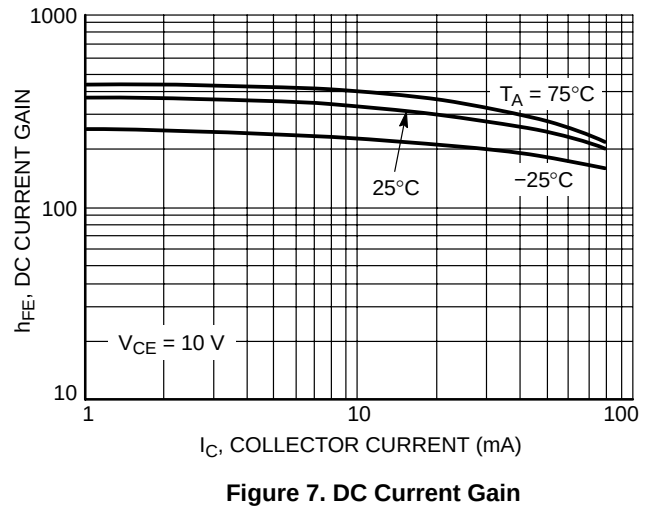
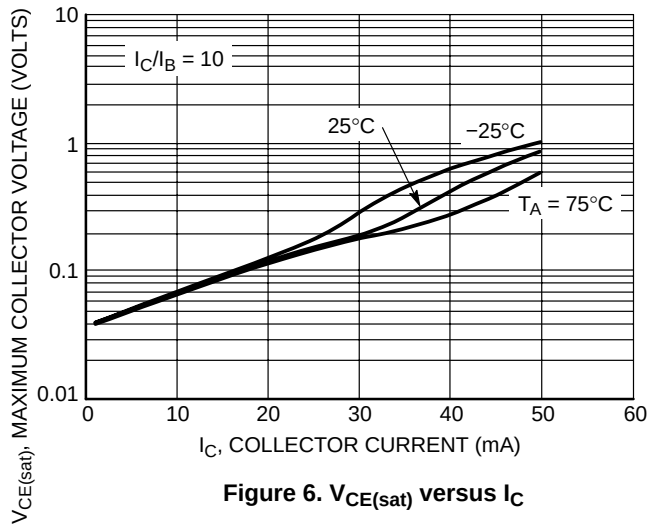
Figure 1. Derating Curve

# UMA4NT1, UMA6NT1

## TYPICAL ELECTRICAL CHARACTERISTICS – UMA4NT1



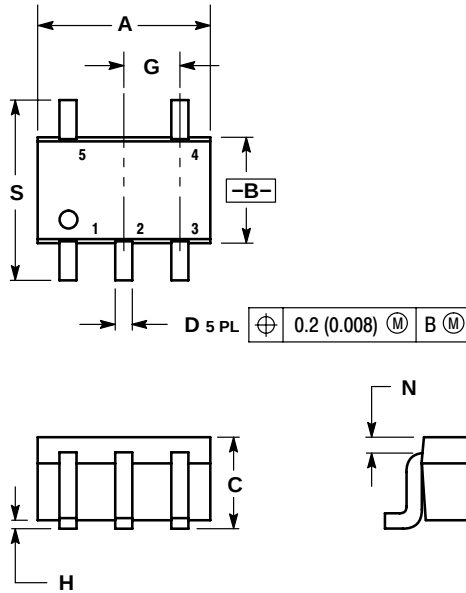
TYPICAL ELECTRICAL CHARACTERISTICS – UMA6NT1



# UMA4NT1, UMA6NT1

## PACKAGE DIMENSIONS

SC-88A / SOT-353 / SC-70  
CASE 419A-02  
ISSUE J



### NOTES:

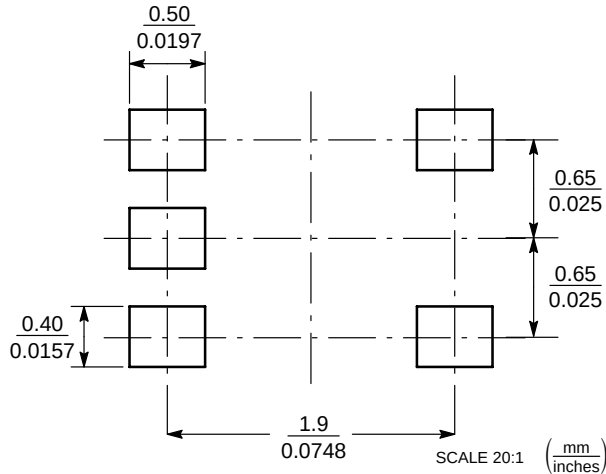
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 419A-01 OBSOLETE. NEW STANDARD 419A-02.
4. DIMENSIONS A AND B DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

| DIM | INCHES    |       | MILLIMETERS |      |
|-----|-----------|-------|-------------|------|
|     | MIN       | MAX   | MIN         | MAX  |
| A   | 0.071     | 0.087 | 1.80        | 2.20 |
| B   | 0.045     | 0.053 | 1.15        | 1.35 |
| C   | 0.031     | 0.043 | 0.80        | 1.10 |
| D   | 0.004     | 0.012 | 0.10        | 0.30 |
| G   | 0.026 BSC |       | 0.65 BSC    |      |
| H   | ---       | 0.004 | ---         | 0.10 |
| J   | 0.004     | 0.010 | 0.10        | 0.25 |
| K   | 0.004     | 0.012 | 0.10        | 0.30 |
| N   | 0.008 REF |       | 0.20 REF    |      |
| S   | 0.079     | 0.087 | 2.00        | 2.20 |

### STYLE 7:

- PIN 1. BASE
- EMITTER
- BASE
- COLLECTOR
- 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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