

# MUN5232DW1, NSBC143EDXV6, NSBC143EDP6

## Dual NPN Bias Resistor Transistors R1 = 4.7 kΩ, R2 = 4.7 kΩ

### NPN Transistors with Monolithic Bias Resistor Network

This series of digital transistors is designed to replace a single device and its external resistor bias network. The Bias Resistor Transistor (BRT) contains a single transistor with a monolithic bias network consisting of two resistors; a series base resistor and a base-emitter resistor. The BRT eliminates these individual components by integrating them into a single device. The use of a BRT can reduce both system cost and board space.

#### Features

- Simplifies Circuit Design
- Reduces Board Space
- Reduces Component Count
- S and 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<sub>A</sub> = 25°C, common for Q<sub>1</sub> and Q<sub>2</sub>, unless otherwise noted)

| Rating                         | Symbol               | Max | Unit |
|--------------------------------|----------------------|-----|------|
| Collector-Base Voltage         | V <sub>CBO</sub>     | 50  | Vdc  |
| Collector-Emitter Voltage      | V <sub>CEO</sub>     | 50  | Vdc  |
| Collector Current – Continuous | I <sub>C</sub>       | 100 | mAdc |
| Input Forward Voltage          | V <sub>IN(fwd)</sub> | 30  | Vdc  |
| Input Reverse Voltage          | V <sub>IN(rev)</sub> | 10  | Vdc  |

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.

#### ORDERING INFORMATION

| Device                           | Package | Shipping†         |
|----------------------------------|---------|-------------------|
| MUN5232DW1T1G,<br>SMUN5232DW1T1G | SOT-363 | 3,000/Tape & Reel |
| NSBC143EDXV6T1G                  | SOT-563 | 4,000/Tape & Reel |
| NSBC143EDP6T5G                   | SOT-963 | 8,000/Tape & Reel |

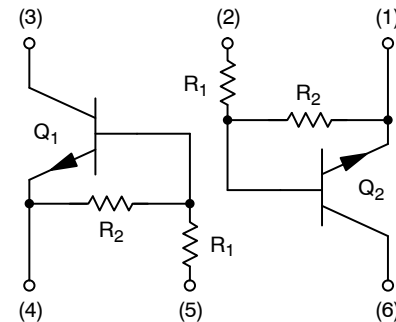
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.



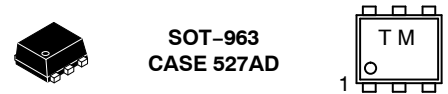
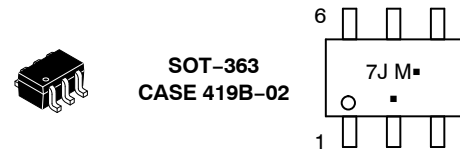
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#### PIN CONNECTIONS



#### MARKING DIAGRAMS



7J/T = Specific Device Code  
M = Date Code\*  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

\*Date Code orientation may vary depending upon manufacturing location.

# MUN5232DW1, NSBC143EDXV6, NSBC143EDP6

## THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|----------------|--------|-----|------|
|----------------|--------|-----|------|

### MUN5232DW1 (SOT-363) ONE JUNCTION HEATED

|   |                 |                          |                                |
|---|-----------------|--------------------------|--------------------------------|
| Total Device Dissipation<br>$T_A = 25^\circ\text{C}$ (Note 37)<br>(Note 38)<br>Derate above $25^\circ\text{C}$ (Note 37)<br>(Note 38) | $P_D$           | 187<br>256<br>1.5<br>2.0 | mW<br><br>mW/ $^\circ\text{C}$ |
| Thermal Resistance,<br>Junction to Ambient (Note 37)<br>(Note 38)   | $R_{\theta JA}$ | 670<br>490               | $^\circ\text{C/W}$             |

### MUN5232DW1 (SOT-363) BOTH JUNCTION HEATED (Note 39)

|   |                 |                          |                                |
|---|-----------------|--------------------------|--------------------------------|
| Total Device Dissipation<br>$T_A = 25^\circ\text{C}$ (Note 37)<br>(Note 38)<br>Derate above $25^\circ\text{C}$ (Note 37)<br>(Note 38) | $P_D$           | 250<br>385<br>2.0<br>3.0 | mW<br><br>mW/ $^\circ\text{C}$ |
| Thermal Resistance,<br>Junction to Ambient (Note 37)<br>(Note 38)   | $R_{\theta JA}$ | 493<br>325               | $^\circ\text{C/W}$             |
| Thermal Resistance,<br>Junction to Lead (Note 37)<br>(Note 38)  | $R_{\theta JL}$ | 188<br>208               | $^\circ\text{C/W}$             |
| Junction and Storage Temperature Range  | $T_J, T_{stg}$  | -55 to +150              | $^\circ\text{C}$               |

### NSBC143EDXV6 (SOT-563) ONE JUNCTION HEATED

|   |                 |            |                            |
|---|-----------------|------------|----------------------------|
| Total Device Dissipation<br>$T_A = 25^\circ\text{C}$ (Note 37)<br>Derate above $25^\circ\text{C}$ (Note 37) | $P_D$           | 357<br>2.9 | mW<br>mW/ $^\circ\text{C}$ |
| Thermal Resistance,<br>Junction to Ambient (Note 37)  | $R_{\theta JA}$ | 350        | $^\circ\text{C/W}$         |

### NSBC143EDXV6 (SOT-563) BOTH JUNCTION HEATED (Note 39)

|   |                 |             |                            |
|---|-----------------|-------------|----------------------------|
| Total Device Dissipation<br>$T_A = 25^\circ\text{C}$ (Note 37)<br>Derate above $25^\circ\text{C}$ (Note 37) | $P_D$           | 500<br>4.0  | mW<br>mW/ $^\circ\text{C}$ |
| Thermal Resistance,<br>Junction to Ambient (Note 37)  | $R_{\theta JA}$ | 250         | $^\circ\text{C/W}$         |
| Junction and Storage Temperature Range  | $T_J, T_{stg}$  | -55 to +150 | $^\circ\text{C}$           |

### NSBC143EDP6 (SOT-963) ONE JUNCTION HEATED

|   |                 |                          |                                |
|---|-----------------|--------------------------|--------------------------------|
| Total Device Dissipation<br>$T_A = 25^\circ\text{C}$ (Note 40)<br>(Note 41)<br>Derate above $25^\circ\text{C}$ (Note 40)<br>(Note 41) | $P_D$           | 231<br>269<br>1.9<br>2.2 | MW<br><br>mW/ $^\circ\text{C}$ |
| Thermal Resistance,<br>Junction to Ambient (Note 40)<br>(Note 41)   | $R_{\theta JA}$ | 540<br>464               | $^\circ\text{C/W}$             |

### NSBC143EDP6 (SOT-963) BOTH JUNCTION HEATED (Note 39)

|   |                 |                          |                                |
|---|-----------------|--------------------------|--------------------------------|
| Total Device Dissipation<br>$T_A = 25^\circ\text{C}$ (Note 40)<br>(Note 41)<br>Derate above $25^\circ\text{C}$ (Note 40)<br>(Note 41) | $P_D$           | 339<br>408<br>2.7<br>3.3 | MW<br><br>mW/ $^\circ\text{C}$ |
| Thermal Resistance,<br>Junction to Ambient (Note 40)<br>(Note 41)   | $R_{\theta JA}$ | 369<br>306               | $^\circ\text{C/W}$             |
| Junction and Storage Temperature Range  | $T_J, T_{stg}$  | -55 to +150              | $^\circ\text{C}$               |

37. FR-4 @ Minimum Pad.

38. FR-4 @ 1.0 x 1.0 Inch Pad.

39. Both junction heated values assume total power is sum of two equally powered channels.

40. FR-4 @ 100 mm<sup>2</sup>, 1 oz. copper traces, still air.

41. FR-4 @ 500 mm<sup>2</sup>, 1 oz. copper traces, still air.

# MUN5232DW1, NSBC143EDXV6, NSBC143EDP6

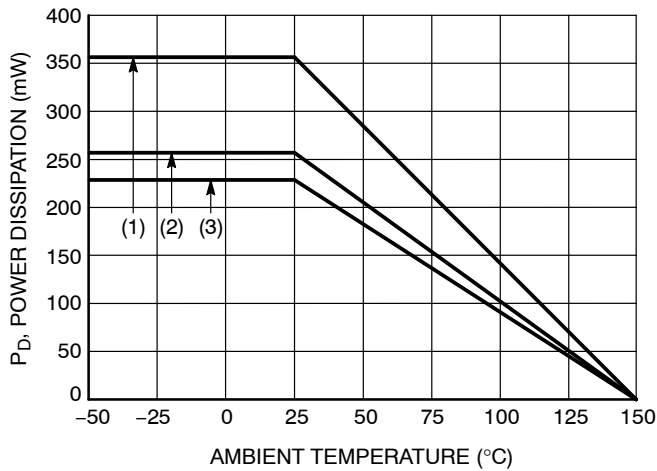
## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ , common for Q<sub>1</sub> and Q<sub>2</sub>, unless otherwise noted)

| 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>( $V_{CE} = 50\text{ V}$ , $I_B = 0$ )             | $I_{CEO}$     | -   | -   | 500 | nAdc |
| Emitter-Base Cutoff Current<br>( $V_{EB} = 6.0\text{ V}$ , $I_C = 0$ )                 | $I_{EBO}$     | -   | -   | 1.5 | mAdc |
| Collector-Base Breakdown Voltage<br>( $I_C = 10\ \mu\text{A}$ , $I_E = 0$ )            | $V_{(BR)CBO}$ | 50  | -   | -   | Vdc  |
| Collector-Emitter Breakdown Voltage (Note 42)<br>( $I_C = 2.0\text{ mA}$ , $I_B = 0$ ) | $V_{(BR)CEO}$ | 50  | -   | -   | Vdc  |

## ON CHARACTERISTICS

|  |               |     |     |      |            |
|--|---------------|-----|-----|------|------------|
| DC Current Gain (Note 42)<br>( $I_C = 5.0\text{ mA}$ , $V_{CE} = 10\text{ V}$ )                          | $h_{FE}$      | 15  | 30  | -    |            |
| Collector-Emitter Saturation Voltage (Note 42)<br>( $I_C = 10\text{ mA}$ , $I_B = 1.0\text{ mA}$ )       | $V_{CE(sat)}$ | -   | -   | 0.25 | V          |
| Input Voltage (Off)<br>( $V_{CE} = 5.0\text{ V}$ , $I_C = 100\ \mu\text{A}$ )                            | $V_{i(off)}$  | -   | 1.2 | -    | Vdc        |
| Input Voltage (On)<br>( $V_{CE} = 0.2\text{ V}$ , $I_C = 20\text{ mA}$ )                                 | $V_{i(on)}$   | -   | 2.4 | -    | 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>( $V_{CC} = 5.0\text{ V}$ , $V_B = 0.25\text{ V}$ , $R_L = 1.0\text{ k}\Omega$ ) | $V_{OH}$      | 4.9 | -   | -    | Vdc        |
| Input Resistor   | R1            | 3.3 | 4.7 | 6.1  | k $\Omega$ |
| Resistor Ratio   | $R_1/R_2$     | 0.8 | 1.0 | 1.2  |            |

42. Pulsed Condition: Pulse Width = 300 ms, Duty Cycle  $\leq$  2%.



- (1) SOT-363; 1.0 × 1.0 Inch Pad
- (2) SOT-563; Minimum Pad
- (3) SOT-963; 100 mm<sup>2</sup>, 1 oz. Copper Trace

Figure 98. Derating Curve

TYPICAL CHARACTERISTICS  
MUN5232DW1, NSBC143EDXV6

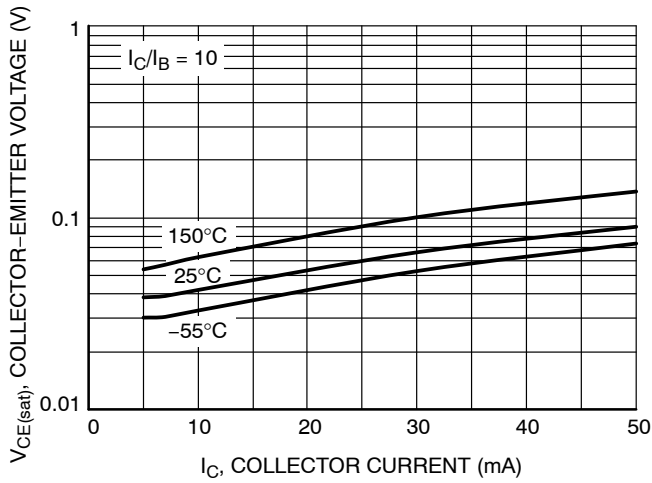


Figure 99.  $V_{CE(sat)}$ , vs.  $I_C$

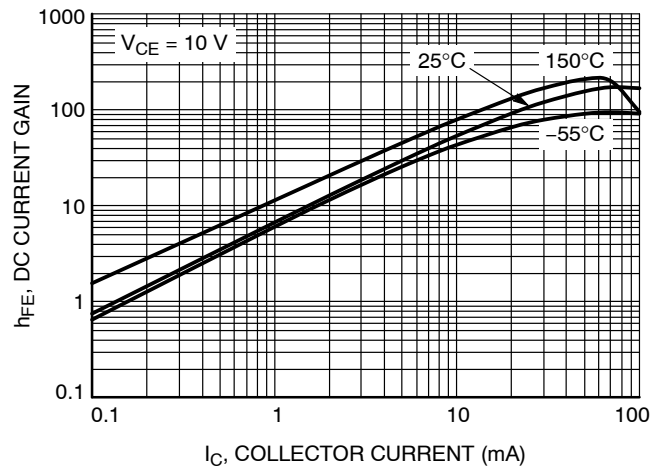


Figure 100. DC Current Gain

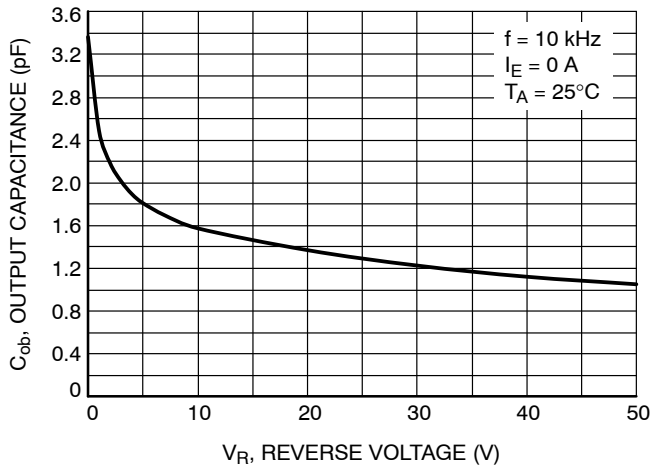


Figure 101. Output Capacitance

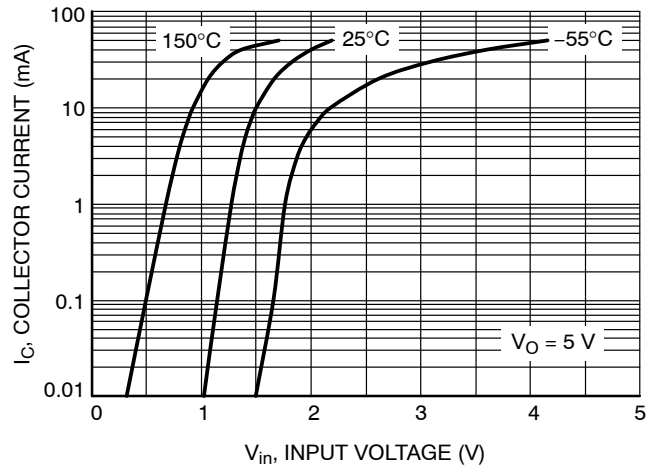


Figure 102. Output Current vs. Input Voltage

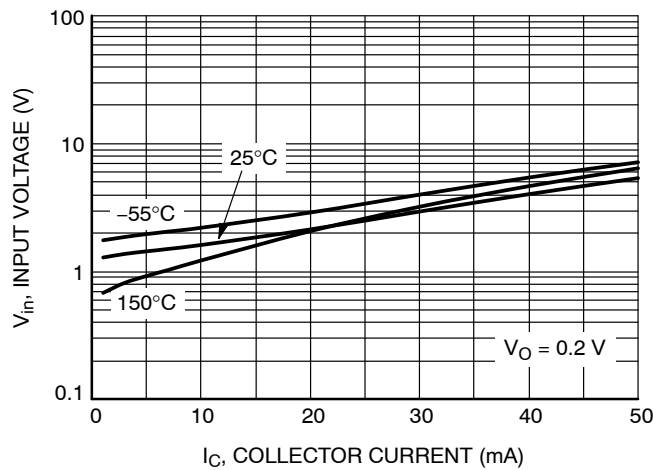


Figure 103. Input Voltage vs. Output Current

TYPICAL CHARACTERISTICS  
NSBC143EDP6

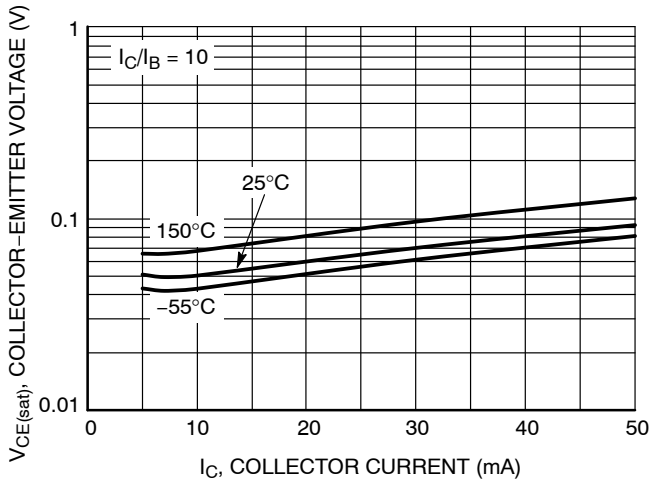


Figure 104.  $V_{CE(sat)}$ , vs.  $I_C$

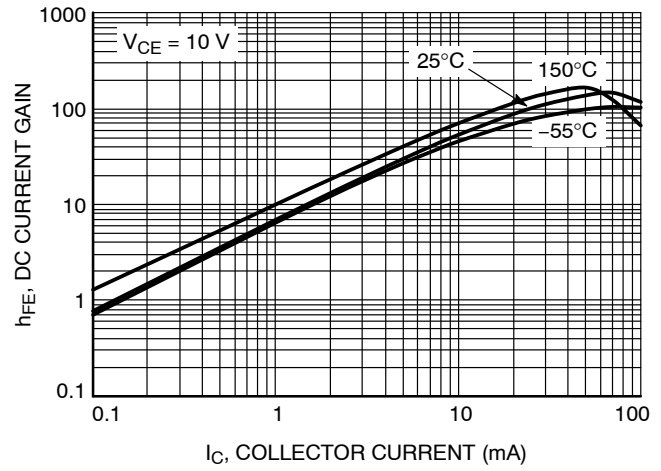


Figure 105. DC Current Gain

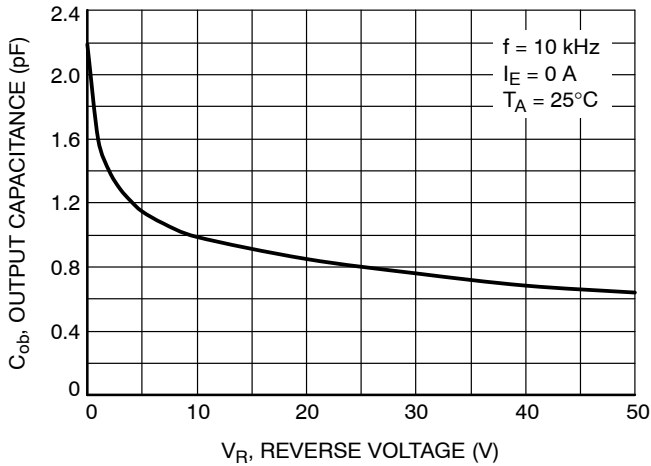


Figure 106. Output Capacitance

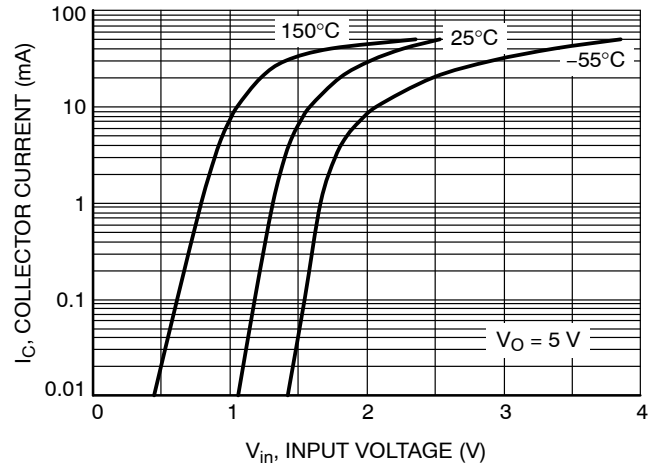


Figure 107. Output Current vs. Input Voltage

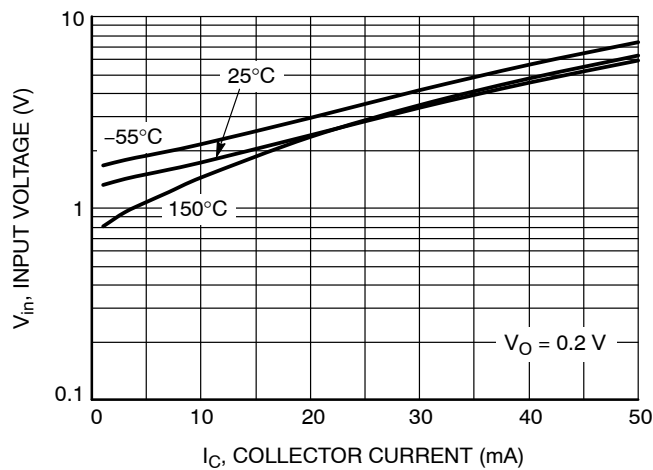


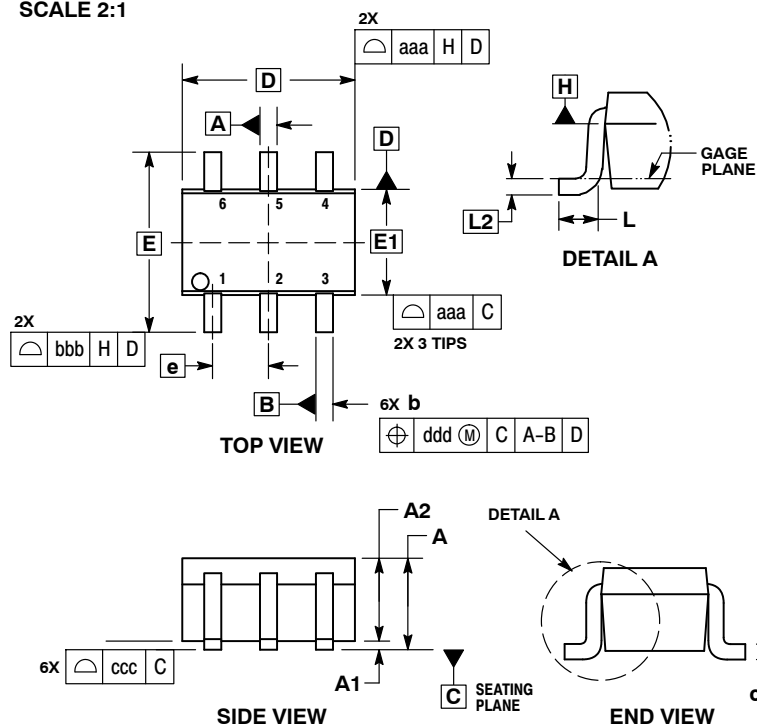
Figure 108. Input Voltage vs. Output Current



1  
 SCALE 2:1

SC-88/SC70-6/SOT-363  
 CASE 419B-02  
 ISSUE Y

DATE 11 DEC 2012



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
  2. CONTROLLING DIMENSION: MILLIMETERS.
  3. DIMENSIONS D AND E1 DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.20 PER END.
  4. DIMENSIONS D AND E1 AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY AND DATUM H.
  5. DATUMS A AND B ARE DETERMINED AT DATUM H.
  6. DIMENSIONS b AND c APPLY TO THE FLAT SECTION OF THE LEAD BETWEEN 0.08 AND 0.15 FROM THE TIP.
  7. DIMENSION b DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.08 TOTAL IN EXCESS OF DIMENSION b AT MAXIMUM MATERIAL CONDITION. THE DAMBAR CANNOT BE LOCATED ON THE LOWER RADIUS OF THE FOOT.

| DIM | MILLIMETERS |      |      | INCHES    |       |       |
|-----|-------------|------|------|-----------|-------|-------|
|     | MIN         | NOM  | MAX  | MIN       | NOM   | MAX   |
| A   | ---         | ---  | 1.10 | ---       | ---   | 0.043 |
| A1  | 0.00        | ---  | 0.10 | 0.000     | ---   | 0.004 |
| A2  | 0.70        | 0.90 | 1.00 | 0.027     | 0.035 | 0.039 |
| b   | 0.15        | 0.20 | 0.25 | 0.006     | 0.008 | 0.010 |
| C   | 0.08        | 0.15 | 0.22 | 0.003     | 0.006 | 0.009 |
| D   | 1.80        | 2.00 | 2.20 | 0.070     | 0.078 | 0.086 |
| E   | 2.00        | 2.10 | 2.20 | 0.078     | 0.082 | 0.086 |
| E1  | 1.15        | 1.25 | 1.35 | 0.045     | 0.049 | 0.053 |
| e   | 0.65 BSC    |      |      | 0.026 BSC |       |       |
| L   | 0.26        | 0.36 | 0.46 | 0.010     | 0.014 | 0.018 |
| L2  | 0.15 BSC    |      |      | 0.006 BSC |       |       |
| aaa | 0.15        |      |      | 0.006     |       |       |
| bbb | 0.30        |      |      | 0.012     |       |       |
| ccc | 0.10        |      |      | 0.004     |       |       |
| ddd | 0.10        |      |      | 0.004     |       |       |

**GENERIC MARKING DIAGRAM\***



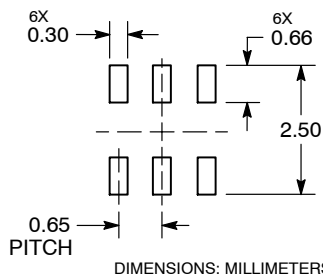
- XXX = Specific Device Code
- M = Date Code\*
- = Pb-Free Package

(Note: Microdot may be in either location)

\*Date Code orientation and/or position may vary depending upon manufacturing 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.

**RECOMMENDED SOLDERING FOOTPRINT\***



DIMENSIONS: MILLIMETERS

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

**STYLES ON PAGE 2**

|                         |                             |  |
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**SC-88/SC70-6/SOT-363**  
**CASE 419B-02**  
**ISSUE Y**

DATE 11 DEC 2012

|   |   |  |  |  |  |
|---|---|--|--|--|--|
| <b>STYLE 1:</b><br>PIN 1. EMITTER 2<br>2. BASE 2<br>3. COLLECTOR 1<br>4. EMITTER 1<br>5. BASE 1<br>6. COLLECTOR 2 | <b>STYLE 2:</b><br>CANCELLED  | <b>STYLE 3:</b><br>CANCELLED   | <b>STYLE 4:</b><br>PIN 1. CATHODE<br>2. CATHODE<br>3. COLLECTOR<br>4. EMITTER<br>5. BASE<br>6. ANODE               | <b>STYLE 5:</b><br>PIN 1. ANODE<br>2. ANODE<br>3. COLLECTOR<br>4. EMITTER<br>5. BASE<br>6. CATHODE                 | <b>STYLE 6:</b><br>PIN 1. ANODE 2<br>2. N/C<br>3. CATHODE 1<br>4. ANODE 1<br>5. N/C<br>6. CATHODE 2          |
| <b>STYLE 7:</b><br>PIN 1. SOURCE 2<br>2. DRAIN 2<br>3. GATE 1<br>4. SOURCE 1<br>5. DRAIN 1<br>6. GATE 2           | <b>STYLE 8:</b><br>CANCELLED  | <b>STYLE 9:</b><br>PIN 1. EMITTER 2<br>2. EMITTER 1<br>3. COLLECTOR 1<br>4. BASE 1<br>5. BASE 2<br>6. COLLECTOR 2  | <b>STYLE 10:</b><br>PIN 1. SOURCE 2<br>2. SOURCE 1<br>3. GATE 1<br>4. DRAIN 1<br>5. DRAIN 2<br>6. GATE 2           | <b>STYLE 11:</b><br>PIN 1. CATHODE 2<br>2. CATHODE 2<br>3. ANODE 1<br>4. CATHODE 1<br>5. CATHODE 1<br>6. ANODE 2   | <b>STYLE 12:</b><br>PIN 1. ANODE 2<br>2. ANODE 2<br>3. CATHODE 1<br>4. ANODE 1<br>5. ANODE 1<br>6. CATHODE 2 |
| <b>STYLE 13:</b><br>PIN 1. ANODE<br>2. N/C<br>3. COLLECTOR<br>4. EMITTER<br>5. BASE<br>6. CATHODE                 | <b>STYLE 14:</b><br>PIN 1. VREF<br>2. GND<br>3. GND<br>4. IOUT<br>5. VEN<br>6. VCC                            | <b>STYLE 15:</b><br>PIN 1. ANODE 1<br>2. ANODE 2<br>3. ANODE 3<br>4. CATHODE 3<br>5. CATHODE 2<br>6. CATHODE 1     | <b>STYLE 16:</b><br>PIN 1. BASE 1<br>2. EMITTER 2<br>3. COLLECTOR 2<br>4. BASE 2<br>5. EMITTER 1<br>6. COLLECTOR 1 | <b>STYLE 17:</b><br>PIN 1. BASE 1<br>2. EMITTER 1<br>3. COLLECTOR 2<br>4. BASE 2<br>5. EMITTER 2<br>6. COLLECTOR 1 | <b>STYLE 18:</b><br>PIN 1. VIN1<br>2. VCC<br>3. VOUT2<br>4. VIN2<br>5. GND<br>6. VOUT1                       |
| <b>STYLE 19:</b><br>PIN 1. IOUT<br>2. GND<br>3. GND<br>4. V CC<br>5. V EN<br>6. V REF                             | <b>STYLE 20:</b><br>PIN 1. COLLECTOR<br>2. COLLECTOR<br>3. BASE<br>4. EMITTER<br>5. COLLECTOR<br>6. COLLECTOR | <b>STYLE 21:</b><br>PIN 1. ANODE 1<br>2. N/C<br>3. ANODE 2<br>4. CATHODE 2<br>5. N/C<br>6. CATHODE 1               | <b>STYLE 22:</b><br>PIN 1. D1 (i)<br>2. GND<br>3. D2 (i)<br>4. D2 (c)<br>5. VBUS<br>6. D1 (c)                      | <b>STYLE 23:</b><br>PIN 1. Vn<br>2. CH1<br>3. Vp<br>4. N/C<br>5. CH2<br>6. N/C                                     | <b>STYLE 24:</b><br>PIN 1. CATHODE<br>2. ANODE<br>3. CATHODE<br>4. CATHODE<br>5. CATHODE<br>6. CATHODE       |
| <b>STYLE 25:</b><br>PIN 1. BASE 1<br>2. CATHODE<br>3. COLLECTOR 2<br>4. BASE 2<br>5. EMITTER<br>6. COLLECTOR 1    | <b>STYLE 26:</b><br>PIN 1. SOURCE 1<br>2. GATE 1<br>3. DRAIN 2<br>4. SOURCE 2<br>5. GATE 2<br>6. DRAIN 1      | <b>STYLE 27:</b><br>PIN 1. BASE 2<br>2. BASE 1<br>3. COLLECTOR 1<br>4. EMITTER 1<br>5. EMITTER 2<br>6. COLLECTOR 2 | <b>STYLE 28:</b><br>PIN 1. DRAIN<br>2. DRAIN<br>3. GATE<br>4. SOURCE<br>5. DRAIN<br>6. DRAIN                       | <b>STYLE 29:</b><br>PIN 1. ANODE<br>2. ANODE<br>3. COLLECTOR<br>4. EMITTER<br>5. BASE/ANODE<br>6. CATHODE          | <b>STYLE 30:</b><br>PIN 1. SOURCE 1<br>2. DRAIN 2<br>3. DRAIN 2<br>4. SOURCE 2<br>5. GATE 1<br>6. DRAIN 1    |

Note: Please refer to datasheet for style callout. If style type is not called out in the datasheet refer to the device datasheet pinout or pin assignment.

|                         |                             |  |
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| <b>DESCRIPTION:</b>     | <b>SC-88/SC70-6/SOT-363</b> | <b>PAGE 2 OF 2</b>   |

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# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

ON Semiconductor®



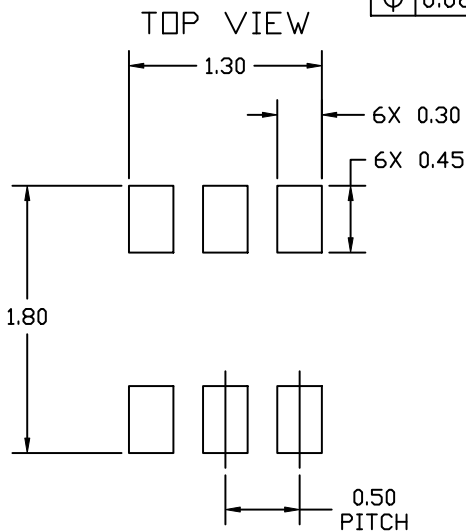
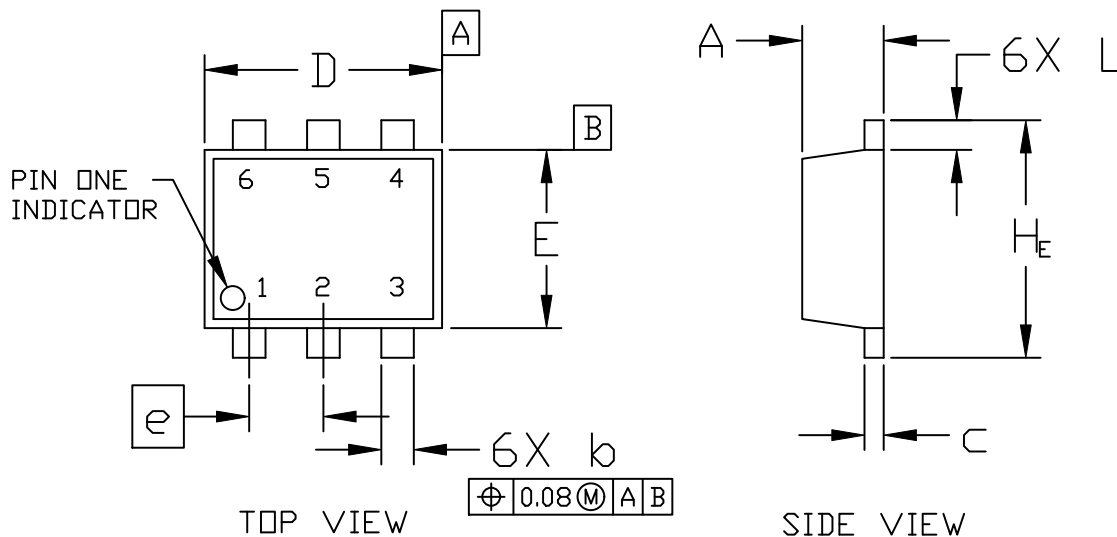
SCALE 4:1

**SOT-563, 6 LEAD**  
CASE 463A  
ISSUE H

DATE 26 JAN 2021

**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
2. CONTROLLING DIMENSION: MILLIMETERS
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.



| DIM            | MILLIMETERS |      |      |
|----------------|-------------|------|------|
|                | MIN.        | NOM. | MAX. |
| A              | 0.50        | 0.55 | 0.60 |
| b              | 0.17        | 0.22 | 0.27 |
| c              | 0.08        | 0.13 | 0.18 |
| D              | 1.50        | 1.60 | 1.70 |
| E              | 1.10        | 1.20 | 1.30 |
| e              | 0.50 BSC    |      |      |
| L              | 0.10        | 0.20 | 0.30 |
| H <sub>E</sub> | 1.50        | 1.60 | 1.70 |

**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.

|                         |                        |  |
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| <b>DESCRIPTION:</b>     | <b>SOT-563, 6 LEAD</b> | <b>PAGE 1 OF 2</b>   |

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**SOT-563, 6 LEAD**  
CASE 463A  
ISSUE H

DATE 26 JAN 2021

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

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

STYLE 3:  
PIN 1. CATHODE 1  
2. CATHODE 1  
3. ANODE/ANODE 2  
4. CATHODE 2  
5. CATHODE 2  
6. ANODE/ANODE 1

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

STYLE 5:  
PIN 1. CATHODE  
2. CATHODE  
3. ANODE  
4. ANODE  
5. CATHODE  
6. CATHODE

STYLE 6:  
PIN 1. CATHODE  
2. ANODE  
3. CATHODE  
4. CATHODE  
5. CATHODE  
6. CATHODE

STYLE 7:  
PIN 1. CATHODE  
2. ANODE  
3. CATHODE  
4. CATHODE  
5. ANODE  
6. CATHODE

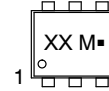
STYLE 8:  
PIN 1. DRAIN  
2. DRAIN  
3. GATE  
4. SOURCE  
5. DRAIN  
6. DRAIN

STYLE 9:  
PIN 1. SOURCE 1  
2. GATE 1  
3. DRAIN 2  
4. SOURCE 2  
5. GATE 2  
6. DRAIN 1

STYLE 10:  
PIN 1. CATHODE 1  
2. N/C  
3. CATHODE 2  
4. ANODE 2  
5. N/C  
6. ANODE 1

STYLE 11:  
PIN 1. EMITTER 2  
2. BASE 2  
3. COLLECTOR 1  
4. EMITTER 1  
5. BASE 1  
6. COLLECTOR 2

**GENERIC  
MARKING DIAGRAM\***



XX = Specific Device Code  
M = Month 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. Some products may not follow the Generic Marking.

|                         |                        |   |
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# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

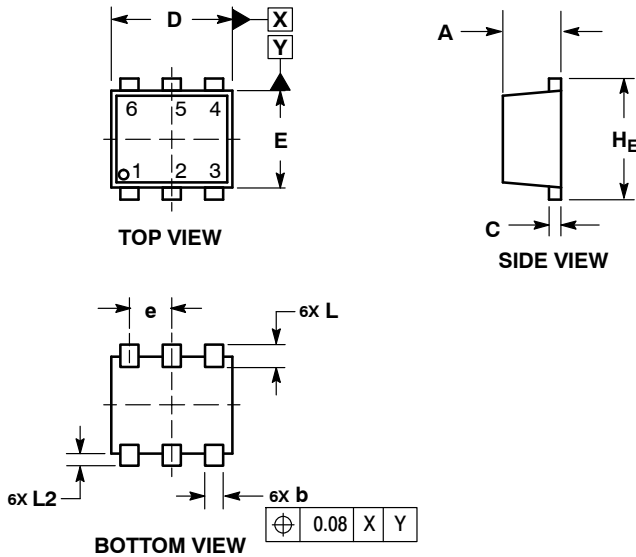
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SCALE 4:1

**SOT-963**  
CASE 527AD-01  
ISSUE E

DATE 09 FEB 2010

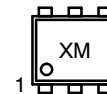


**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

| MILLIMETERS    |          |      |      |
|----------------|----------|------|------|
| DIM            | MIN      | NOM  | MAX  |
| A              | 0.34     | 0.37 | 0.40 |
| b              | 0.10     | 0.15 | 0.20 |
| C              | 0.07     | 0.12 | 0.17 |
| D              | 0.95     | 1.00 | 1.05 |
| E              | 0.75     | 0.80 | 0.85 |
| e              | 0.35 BSC |      |      |
| H <sub>E</sub> | 0.95     | 1.00 | 1.05 |
| L              | 0.19 REF |      |      |
| L2             | 0.05     | 0.10 | 0.15 |

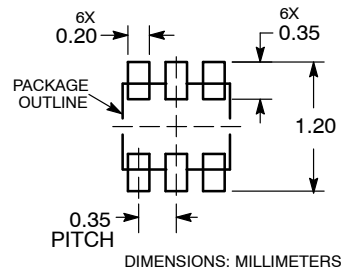
**GENERIC MARKING DIAGRAM\***



X = Specific Device Code  
M = Month Code

\*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.

**RECOMMENDED MOUNTING FOOTPRINT**



- STYLE 1:**  
PIN 1. EMITTER 1  
2. BASE 1  
3. COLLECTOR 2  
4. EMITTER 2  
5. BASE 2  
6. COLLECTOR 1
- STYLE 2:**  
PIN 1. EMITTER 1  
2. EMITTER2  
3. BASE 2  
4. COLLECTOR 2  
5. BASE 1  
6. COLLECTOR 1
- STYLE 3:**  
PIN 1. CATHODE 1  
2. CATHODE 1  
3. ANODE/ANODE 2  
4. CATHODE 2  
5. CATHODE 2  
6. ANODE/ANODE 1
- STYLE 4:**  
PIN 1. COLLECTOR  
2. COLLECTOR  
3. BASE  
4. EMITTER  
5. COLLECTOR  
6. COLLECTOR
- STYLE 5:**  
PIN 1. CATHODE  
2. CATHODE  
3. ANODE  
4. ANODE  
5. CATHODE  
6. CATHODE
- STYLE 6:**  
PIN 1. CATHODE  
2. ANODE  
3. CATHODE  
4. CATHODE  
5. CATHODE  
6. CATHODE
- STYLE 7:**  
PIN 1. CATHODE  
2. ANODE  
3. CATHODE  
4. CATHODE  
5. ANODE  
6. CATHODE
- STYLE 8:**  
PIN 1. DRAIN  
2. DRAIN  
3. GATE  
4. SOURCE3  
5. DRAIN  
6. DRAIN
- STYLE 9:**  
PIN 1. SOURCE 1  
2. GATE 1  
3. DRAIN 2  
4. SOURCE 2  
5. GATE 2  
6. DRAIN 1
- STYLE 10:**  
PIN 1. CATHODE 1  
2. N/C  
3. CATHODE 2  
4. ANODE 2  
5. N/C  
6. ANODE 1

|                         |                            |   |
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