

# Dual NPN General Purpose Amplifier Transistor

## EMX1DXV6T1G, EMX1DXV6T5G

This NPN transistor is designed for general purpose amplifier applications. This device is housed in the SOT-563 package which is designed for low power surface mount applications, where board space is at a premium.

### Features

- Reduces Board Space
- High  $h_{FE}$ , 210–460 (Typical)
- Low  $V_{CE(sat)}$ , < 0.5 V
- 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         | $V_{(BR)CBO}$ | 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   | mAdc |

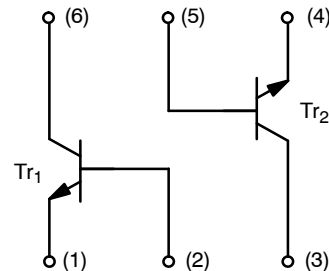
### THERMAL CHARACTERISTICS

| Characteristic<br>(One Junction Heated)                                                 | Symbol          | Max                          | Unit                       |
|-----------------------------------------------------------------------------------------|-----------------|------------------------------|----------------------------|
| Total Device Dissipation<br>$T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$           | 357 (Note 1)<br>2.9 (Note 1) | mW<br>mW/ $^\circ\text{C}$ |
| Thermal Resistance –<br>Junction-to-Ambient                                             | $R_{\theta JA}$ | 350 (Note 1)                 | $^\circ\text{C}/\text{W}$  |
| Characteristic<br>(Both Junctions Heated)                                               | Symbol          | Max                          | Unit                       |
| Total Device Dissipation<br>$T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$           | 500 (Note 1)<br>4.0 (Note 1) | mW<br>mW/ $^\circ\text{C}$ |
| Thermal Resistance –<br>Junction-to-Ambient                                             | $R_{\theta JA}$ | 250 (Note 1)                 | $^\circ\text{C}/\text{W}$  |
| Junction and Storage<br>Temperature Range                                               | $T_J, T_{stg}$  | –55 to +150                  | $^\circ\text{C}$           |

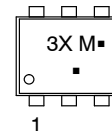
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. FR-4 @ Minimum Pad

## DUAL NPN GENERAL PURPOSE AMPLIFIER TRANSISTORS SURFACE MOUNT



### MARKING DIAGRAM



3X = Specific Device Code  
M = Month Code  
■ = Pb-Free Package  
(Note: Microdot may be in either location)

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

# EMX1DXV6T1G, EMX1DXV6T5G

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)

| Characteristic                                                                                         | Symbol               | Min | Typ | Max | Unit |
|--------------------------------------------------------------------------------------------------------|----------------------|-----|-----|-----|------|
| Collector-Base Breakdown Voltage<br>(I <sub>C</sub> = 50 µAdc, I <sub>E</sub> = 0)                     | V <sub>(BR)CBO</sub> | 60  | –   | –   | Vdc  |
| Collector-Emitter Breakdown Voltage<br>(I <sub>C</sub> = 1.0 mAdc, I <sub>B</sub> = 0)                 | V <sub>(BR)CEO</sub> | 50  | –   | –   | Vdc  |
| Emitter-Base Breakdown Voltage<br>(I <sub>E</sub> = 50 µAdc, I <sub>C</sub> = 0)                       | V <sub>(BR)EBO</sub> | 7.0 | –   | –   | Vdc  |
| Collector-Base Cutoff Current<br>(V <sub>CB</sub> = 60 Vdc, I <sub>E</sub> = 0)                        | I <sub>CBO</sub>     | –   | –   | 0.5 | µA   |
| Emitter-Base Cutoff Current<br>(V <sub>EB</sub> = 7.0 Vdc, I <sub>B</sub> = 0)                         | I <sub>EBO</sub>     | –   | –   | 0.5 | µA   |
| Collector-Emitter Saturation Voltage (Note 2)<br>(I <sub>C</sub> = 50 mAdc, I <sub>B</sub> = 5.0 mAdc) | V <sub>CE(sat)</sub> | –   | –   | 0.4 | Vdc  |
| DC Current Gain (Note 3)<br>(V <sub>CE</sub> = 6.0 Vdc, I <sub>C</sub> = 1.0 mAdc)                     | h <sub>FE</sub>      | 120 | –   | 560 | –    |
| Transition Frequency<br>(V <sub>CE</sub> = 12 Vdc, I <sub>C</sub> = 2.0 mAdc, f = 30 MHz)              | f <sub>T</sub>       | –   | 180 | –   | MHz  |
| Output Capacitance<br>(V <sub>CB</sub> = 12 Vdc, I <sub>C</sub> = 0 Adc, f = 1 MHz)                    | C <sub>OB</sub>      | –   | 2.0 | –   | pF   |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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

3. Pulse Test: Pulse Width ≤ 300 µs, D.C. ≤ 2%.

## ORDERING INFORMATION

| Device                      | Package              | Shipping†                |
|-----------------------------|----------------------|--------------------------|
| EMX1DXV6T1G, NSVEMX1DXV6T1G | SOT-563<br>(Pb-Free) | 4000 Units / Tape & Reel |
| EMX1DXV6T5G                 | SOT-563<br>(Pb-Free) | 8000 Units / 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.

# EMX1DXV6T1G, EMX1DXV6T5G

## TYPICAL ELECTRICAL CHARACTERISTICS

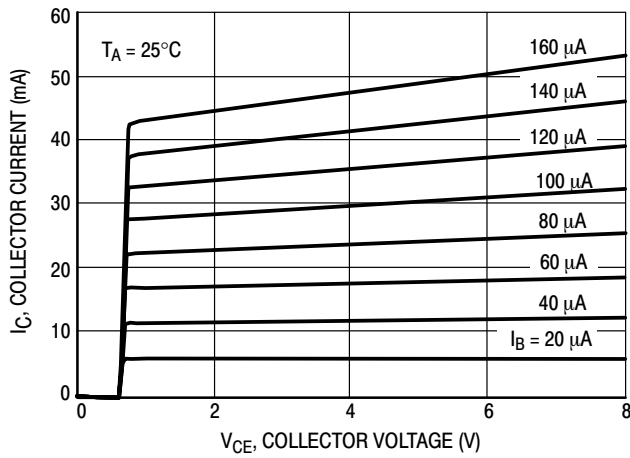


Figure 1.  $I_C - V_{CE}$

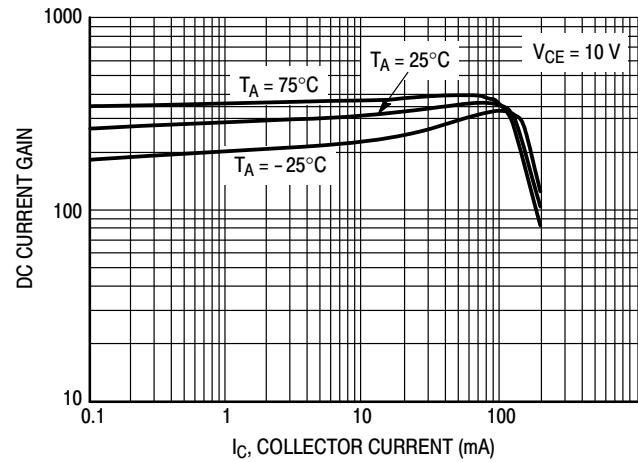


Figure 2. DC Current Gain

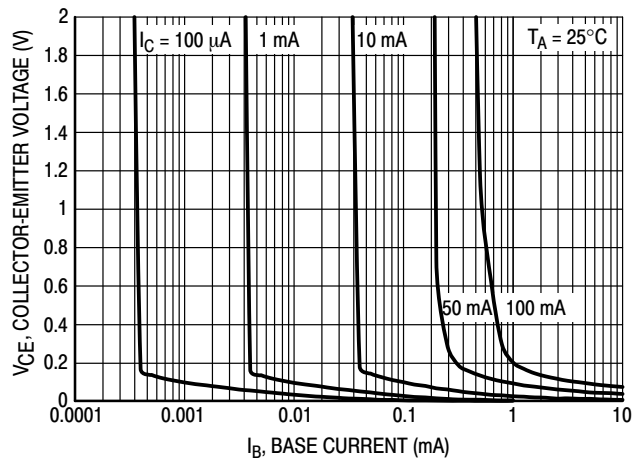


Figure 3. Collector Saturation Region

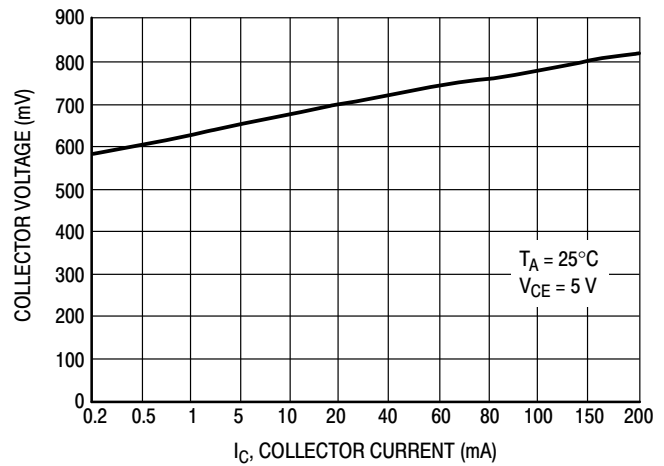


Figure 4. On Voltage

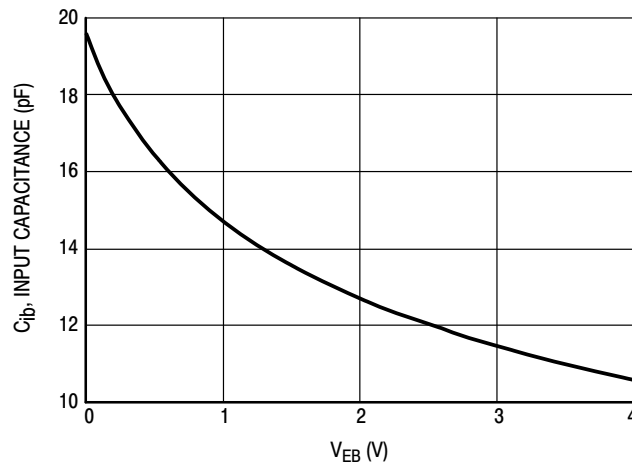


Figure 5. Capacitance

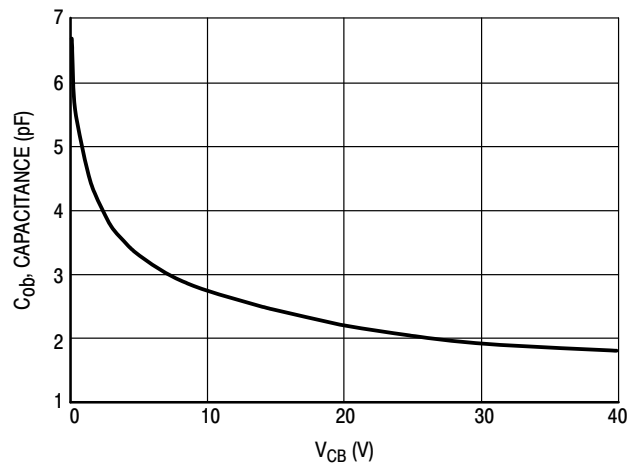


Figure 6. Capacitance



**SOT-563-6 1.60x1.20x0.55, 0.50P**  
**CASE 463A**  
**ISSUE J**

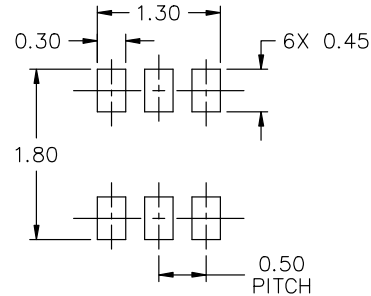
DATE 15 FEB 2024

NOTES:

1. DIMENSIONING AND TOLERANCING CONFORM TO ASME Y14.5-2018.
2. ALL DIMENSION ARE IN 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    |      |      |
| H   | 1.50        | 1.60 | 1.70 |
| L   | 0.10        | 0.20 | 0.30 |



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

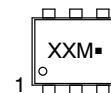
STYLE 9:  
PIN 1. SOURCE 1  
2. GATE 1  
3. DRAIN 2  
4. SOURCE 2  
5. GATE 2  
6. DRAIN 1

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

\* FOR ADDITIONAL INFORMATION ON OUR Pb-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ON SEMICONDUCTOR SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERM/D.

**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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| <b>DESCRIPTION:</b>     | <b>SOT-563-6 1.60x1.20x0.55, 0.50P</b> | <b>PAGE 1 OF 1</b>                                                                                                                                                               |

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