

# EMZ1DXV6T1, EMZ1DXV6T5

## Dual General Purpose Transistors

### NPN/PNP Dual (Complementary)

This transistor is designed for general purpose amplifier applications. It is housed in the SOT-563 which is designed for low power surface mount applications.

#### Features

- Lead-Free Solder Plating
- Low  $V_{CE(SAT)}$ ,  $< 0.5$  V
- These are Pb-Free Devices

#### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CEO}$	-60	V
Collector-Base Voltage	$V_{CBO}$	-50	V
Emitter-Base Voltage	$V_{EBO}$	-6.0	V
Collector Current - Continuous	$I_C$	-100	mAdc

#### THERMAL CHARACTERISTICS

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

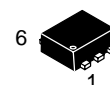
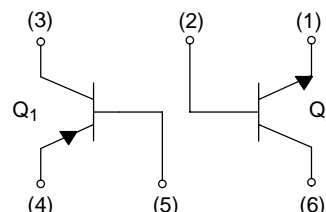
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. FR-4 @ Minimum Pad.



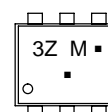
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SOT-563  
CASE 463A  
STYLE 1

#### MARKING DIAGRAM



3Z = 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.

# EMZ1DXV6T1, EMZ1DXV6T5

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

Characteristic	Symbol	Min	Typ	Max	Unit
<b>Q1: PNP</b>					
Collector-Base Breakdown Voltage (I <sub>C</sub> = -50 μAdc, I <sub>E</sub> = 0)	V <sub>(BR)CBO</sub>	-60	-	-	Vdc
Collector-Emitter Breakdown Voltage (I <sub>C</sub> = -1.0 mAdc, I <sub>B</sub> = 0)	V <sub>(BR)CEO</sub>	-50	-	-	Vdc
Emitter-Base Breakdown Voltage (I <sub>E</sub> = -50 μAdc, I <sub>E</sub> = 0)	V <sub>(BR)EBO</sub>	-6.0	-	-	Vdc
Collector-Base Cutoff Current (V <sub>CB</sub> = -30 Vdc, I <sub>E</sub> = 0)	I <sub>CBO</sub>	-	-	-0.5	nA
Emitter-Base Cutoff Current (V <sub>EB</sub> = -5.0 Vdc, I <sub>B</sub> = 0)	I <sub>EBO</sub>	-	-	-0.5	μA
Collector-Emitter Saturation Voltage (Note 2) (I <sub>C</sub> = -50 mAdc, I <sub>B</sub> = -5.0 mAdc)	V <sub>CE(sat)</sub>	-	-	-0.5	Vdc
DC Current Gain (Note 2) (V <sub>CE</sub> = -6.0 Vdc, I <sub>C</sub> = -1.0 mAdc)	h <sub>FE</sub>	120	-	560	-
Transition Frequency (V <sub>CE</sub> = -12 Vdc, I <sub>C</sub> = -2.0 mAdc, f = 30 MHz)	f <sub>T</sub>	-	140	-	MHz
Output Capacitance (V <sub>CB</sub> = -12 Vdc, I <sub>E</sub> = 0 Adc, f = 1 MHz)	C <sub>OB</sub>	-	3.5	-	pF

## Q2: NPN

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

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

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

## ORDERING INFORMATION

Device	Package	Shipping†
EMZ1DXV6T1	SOT-563*	4000 Units / Tape & Reel
EMZ1DXV6T1G	SOT-563*	4000 Units / Tape & Reel
EMZ1DXV6T5	SOT-563*	8000 Units / Tape & Reel
EMZ1DXV6T5G	SOT-563*	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.

\*This package is inherently Pb-Free.

# EMZ1DXV6T1, EMZ1DXV6T5

## TYPICAL ELECTRICAL CHARACTERISTICS – Q1, PNP

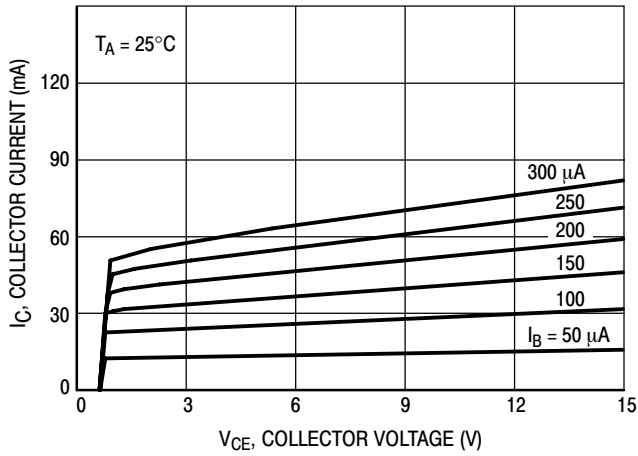


Figure 1.  $I_C - V_{CE}$

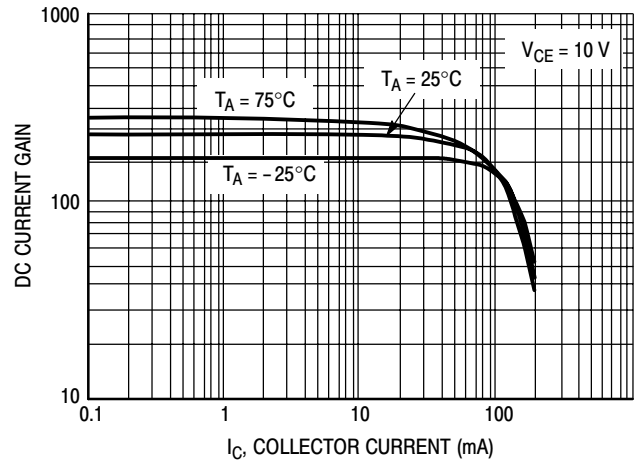


Figure 2. DC Current Gain

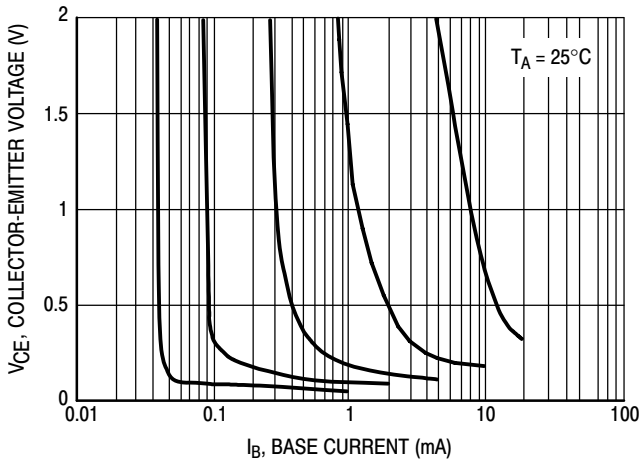


Figure 3. Collector Saturation Region

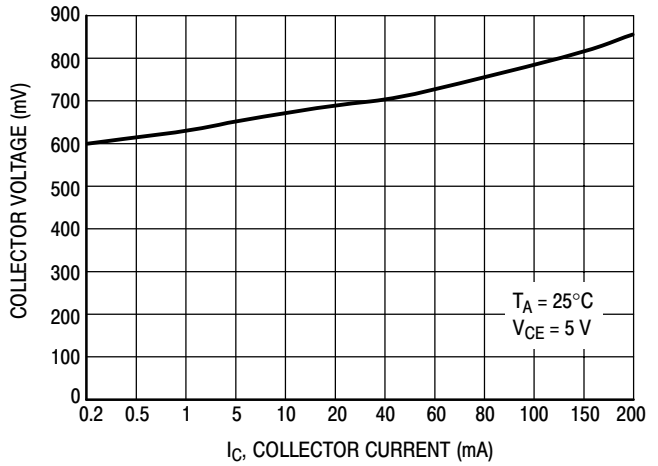


Figure 4. On Voltage

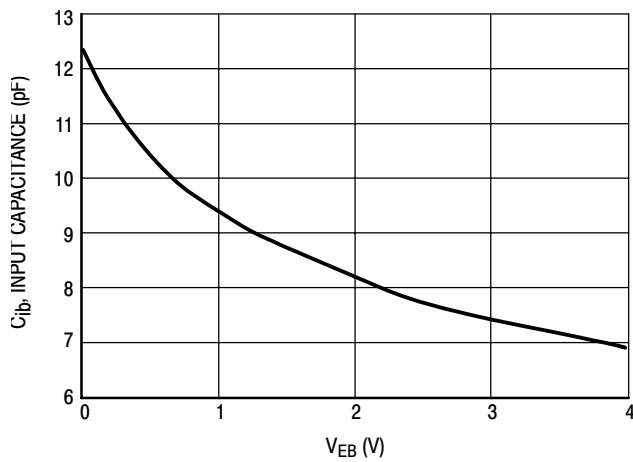


Figure 5. Capacitance

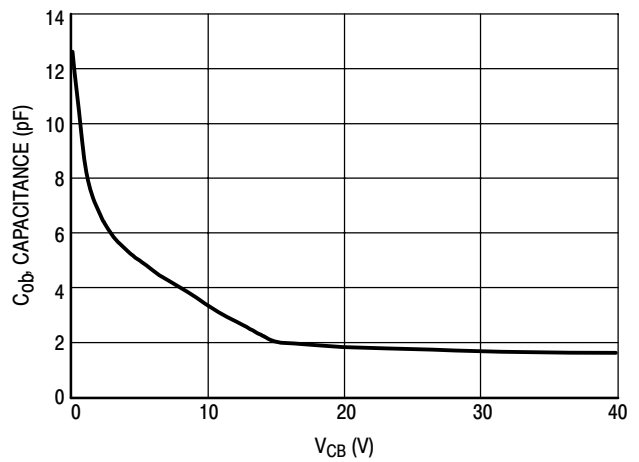


Figure 6. Capacitance

# EMZ1DXV6T1, EMZ1DXV6T5

## TYPICAL ELECTRICAL CHARACTERISTICS – Q2, NPN

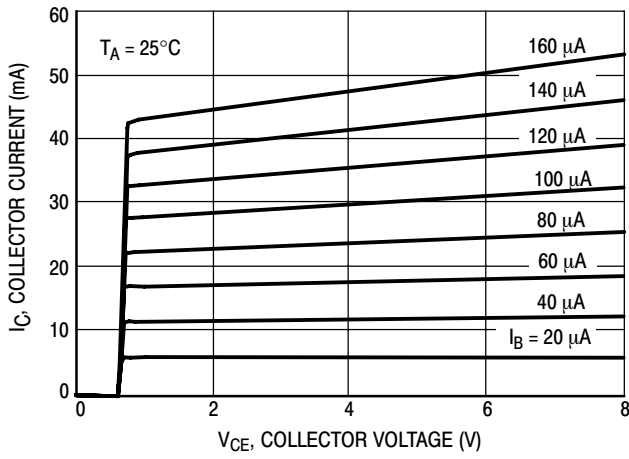


Figure 1.  $I_C - V_{CE}$

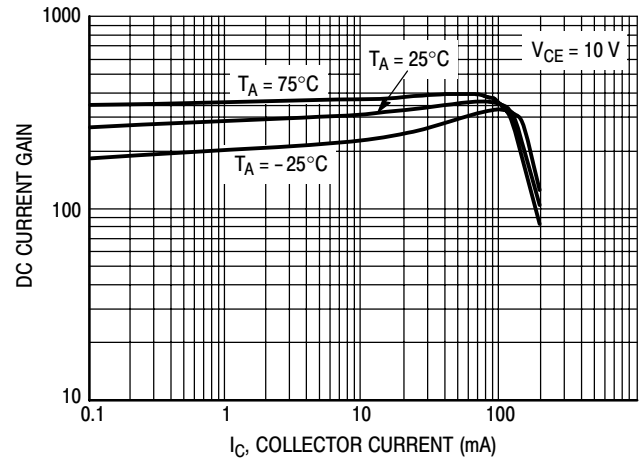


Figure 2. DC Current Gain

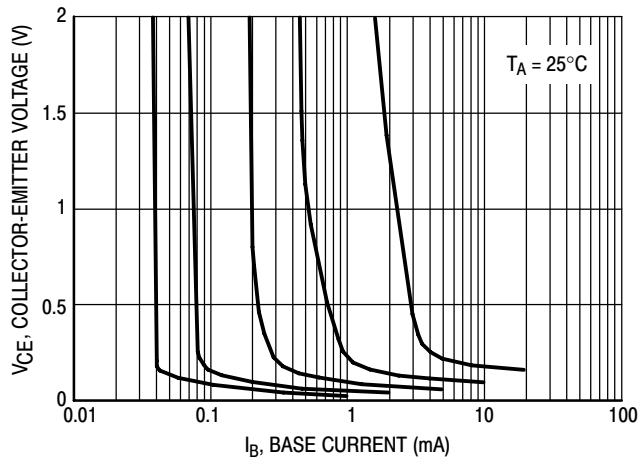


Figure 3. Collector Saturation Region

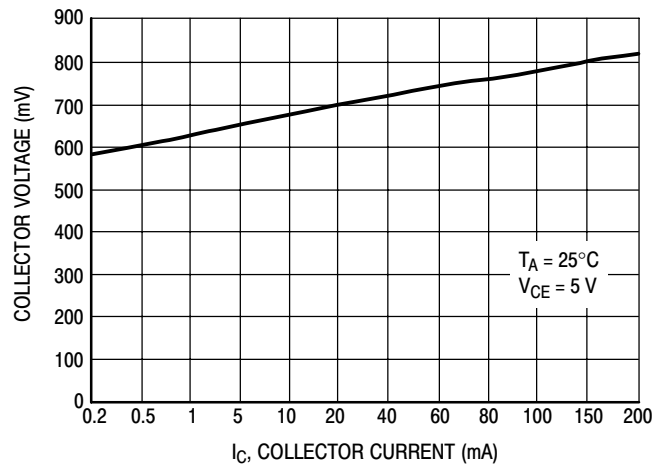


Figure 4. On Voltage

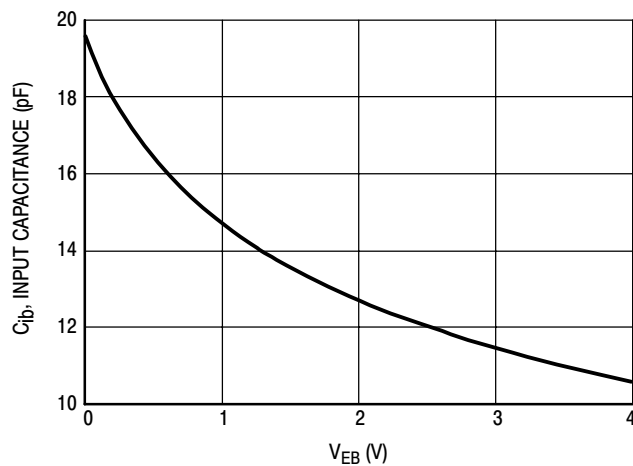


Figure 5. Capacitance

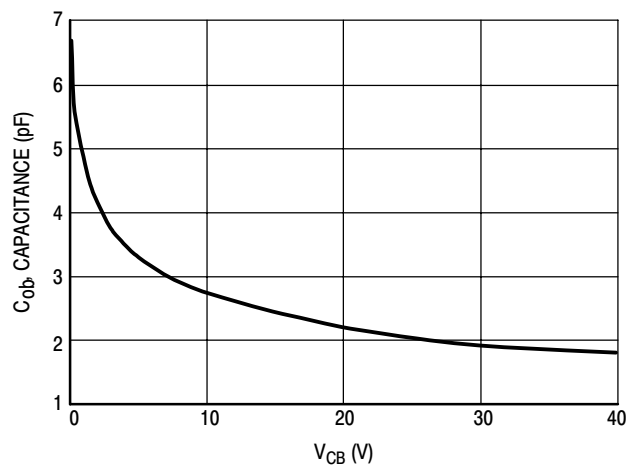


Figure 6. Capacitance

# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

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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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**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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