## MJE2955T (PNP), MJE3055T (NPN)

# **Complementary Silicon Plastic Power Transistors**

These devices are designed for use in general—purpose amplifier and switching applications.

#### **Features**

- High Current Gain Bandwidth Product
- These Devices are Pb-Free and are RoHS Compliant\*

#### **MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V <sub>CEO</sub>	60	Vdc
Collector-Base Voltage	V <sub>CB</sub>	70	Vdc
Emitter-Base Voltage	V <sub>EB</sub>	5.0	Vdc
Collector Current	Ic	10	Adc
Base Current	I <sub>B</sub>	6.0	Adc
Total Device Dissipation  @ T <sub>C</sub> = 25°C  Derate above 25°C	P <sub>D</sub> (Note 1)	75 0.6	W W/°C
Operating and Storage Junction Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to +150	°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.

 Safe Area Curves are indicated by Figure 1. Both limits are applicable and must be observed.

#### THERMAL CHARACTERISTICS

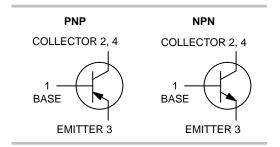
Characteristics	Symbol	Max	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.67	°C/W



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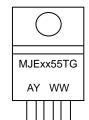
www.onsemi.com

# 10 AMPERE COMPLEMENTARY SILICON POWER TRANSISTORS 60 VOLTS – 75 WATTS





#### **MARKING DIAGRAM**



MJExx55T = Device Code xx = 29 or 30 G = Pb-Free Pac

G = Pb-Free Package A = Assembly Location

Y = Year WW = Work Week

#### **ORDERING INFORMATION**

Device	Package	Shipping
MJE2955TG	TO-220 (Pb-Free)	50 Units / Rail
MJE3055TG	TO-220 (Pb-Free)	50 Units / Rail

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

### **MJE2955T (PNP), MJE3055T (NPN)**

#### **ELECTRICAL CHARACTERISTICS** (T<sub>C</sub> = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS	•		•	1
Collector–Emitter Sustaining Voltage (Note 2) (I <sub>C</sub> = 200 mAdc, I <sub>B</sub> = 0)	V <sub>CEO(sus)</sub>	60	-	Vdc
Collector Cutoff Current (V <sub>CE</sub> = 30 Vdc, I <sub>B</sub> = 0)	I <sub>CEO</sub>	-	700	μAdc
Collector Cutoff Current $(V_{CE} = 70 \text{ Vdc}, V_{EB(off)} = 1.5 \text{ Vdc})$ $(V_{CE} = 70 \text{ Vdc}, V_{EB(off)} = 1.5 \text{ Vdc}, T_{C} = 150^{\circ}\text{C})$	I <sub>CEX</sub>	- -	1.0 5.0	mAdc
Collector Cutoff Current $(V_{CB} = 70 \text{ Vdc}, I_E = 0)$ $(V_{CB} = 70 \text{ Vdc}, I_E = 0, T_C = 150^{\circ}\text{C})$	I <sub>CBO</sub>	- -	1.0 10	mAdc
Emitter Cutoff Current (V <sub>BE</sub> = 5.0 Vdc, I <sub>C</sub> = 0)	I <sub>EBO</sub>	-	5.0	mAdc
ON CHARACTERISTICS				
DC Current Gain (Note 2) $(I_C = 4.0 \text{ Adc}, V_{CE} = 4.0 \text{ Vdc})$ $(I_C = 10 \text{ Adc}, V_{CE} = 4.0 \text{ Vdc})$	h <sub>FE</sub>	20 5.0	100 -	-
Collector–Emitter Saturation Voltage (Note 2) ( $I_C = 4.0$ Adc, $I_B = 0.4$ Adc) ( $I_C = 10$ Adc, $I_B = 3.3$ Adc)	V <sub>CE(sat)</sub>	- -	1.1 8.0	Vdc
Base–Emitter On Voltage (Note 2) (I <sub>C</sub> = 4.0 Adc, V <sub>CE</sub> = 4.0 Vdc)	V <sub>BE(on)</sub>	-	1.8	Vdc
DYNAMIC CHARACTERISTICS				
Current–Gain–Bandwidth Product (I <sub>C</sub> = 500 mAdc, V <sub>CE</sub> = 10 Vdc, f = 500 kHz)	f <sub>T</sub>	2.0	-	MHz

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. Pulse Test: Pulse Width ≤ 300 µs, Duty Cycle ≤ 20%.

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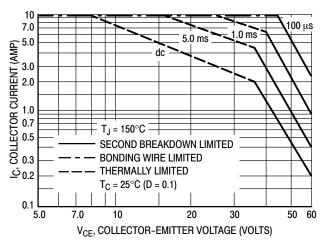


Figure 1. Active-Region Safe Operating Area

There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown. Safe operating area curves indicate  $I_C - V_{CE}$  limits of the transistor that must be observed for reliable operation; i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data of Figure 1 is based on  $T_{J(pk)} = 150^{\circ}C$ .  $T_{C}$  is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided  $T_{J(pk)} \le 150^{\circ}C$ . At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

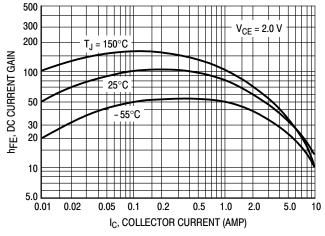


Figure 2. DC Current Gain

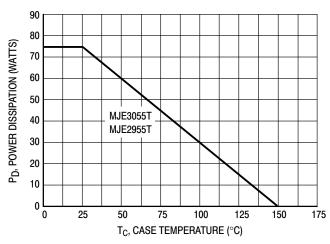
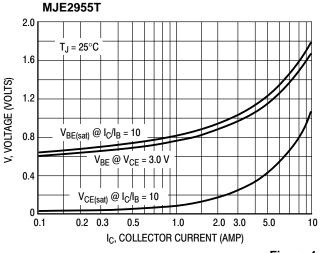


Figure 3. Power Derating



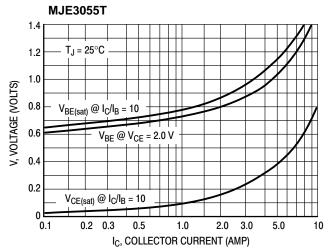


Figure 4. "On" Voltages

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