

# Complementary Silicon Power Transistors

## MJE270G (NPN), MJE271G (PNP)

### Features

- High Safe Operating Area  
 $I_{S/B} @ 40 \text{ V}, 1.0 \text{ s} = 0.375 \text{ A}$
- Collector–Emitter Sustaining Voltage  
 $V_{CEO(sus)} = 100 \text{ Vdc (Min)}$
- High DC Current Gain  
 $h_{FE} @ 120 \text{ mA}, 10 \text{ V} = 1500 \text{ (Min)}$
- These Devices are Pb–Free and are RoHS Compliant

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	$V_{CEO}$	100	Vdc
Collector–Base Voltage	$V_{CB}$	100	Vdc
Emitter–Base Voltage	$V_{EB}$	5.0	Vdc
Collector Current – Continuous	$I_C$	2.0	Adc
Collector Current – Peak	$I_{CM}$	4.0	Adc
Base Current	$I_B$	0.1	Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	15 0.12	W W/ $^\circ\text{C}$
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	1.5 0.012	W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	–65 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.

### THERMAL CHARACTERISTICS

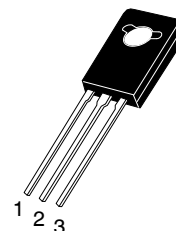
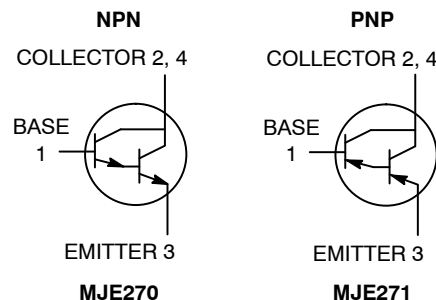
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction–to–Case	$R_{\theta JC}$	8.33	$^\circ\text{C/W}$
Thermal Resistance, Junction–to–Ambient	$R_{\theta JA}$	83.3	$^\circ\text{C/W}$



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## 2.0 AMPERE COMPLEMENTARY POWER DARLINGTON TRANSISTORS 100 VOLTS, 15 WATTS



TO-225  
CASE 77-09  
STYLE 3

### MARKING DIAGRAM



Y = Year  
WW = Work Week  
JE27x = Specific Device Code  
x = 0 or 1  
G = Pb–Free Package

### ORDERING INFORMATION

Device	Package	Shipping
MJE270G	TO-225 (Pb–Free)	500 Units / Box
MJE270TG	TO-225 (Pb–Free)	50 Units / Rail
MJE271G	TO-225 (Pb–Free)	500 Units / Box

# MJE270G (NPN), MJE271G (PNP)

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

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector-Emitter Sustaining Voltage (Note 1) ( $I_C = 10\text{ mAdc}$ , $I_B = 0$ )	$V_{CE(sus)}$	100	-	Vdc
Collector Cutoff Current ( $V_{CE} = 100\text{ Vdc}$ , $I_B = 0$ )	$I_{CEO}$	-	1.0	mAdc
Collector Cutoff Current ( $V_{CB} = 100\text{ Vdc}$ , $I_E = 0$ )	$I_{CBO}$	-	0.3	mAdc
Emitter Cutoff Current ( $V_{BE} = 5.0\text{ Vdc}$ , $I_C = 0$ )	$I_{EBO}$	-	0.1	mAdc

## SECOND BREAKDOWN

Second Breakdown Collector Current with Base Forward Biased ( $V_{CE} = 40\text{ Vdc}$ , $t = 1.0\text{ s}$ , Non-repetitive)	$I_{S/b}$	375	-	Adc
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## ON CHARACTERISTICS (Note 1)

DC Current Gain ( $I_C = 20\text{ mAdc}$ , $V_{CE} = 3.0\text{ Vdc}$ ) ( $I_C = 120\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ )	$h_{FE}$	500 1500	- -	-
Collector-Emitter Saturation Voltage ( $I_C = 20\text{ mAdc}$ , $I_B = 0.2\text{ mAdc}$ ) ( $I_C = 120\text{ mAdc}$ , $I_B = 1.2\text{ mAdc}$ )	$V_{CE(sat)}$	- -	2.0 3.0	Vdc
Base-Emitter On Voltage ( $I_C = 120\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ )	$V_{BE(on)}$	-	2.0	Vdc

## DYNAMIC CHARACTERISTICS

Current Gain – Bandwidth Product (Note 2) ( $I_C = 0.05\text{ Adc}$ , $V_{CE} = 5.0\text{ Vdc}$ , $f_{test} = 1.0\text{ MHz}$ )	$f_T$	6.0	-	MHz
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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.

1. Pulse Test: Pulse Width  $\leq 300\ \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .
2.  $f_T = |h_{fe}| \cdot f_{test}$ .

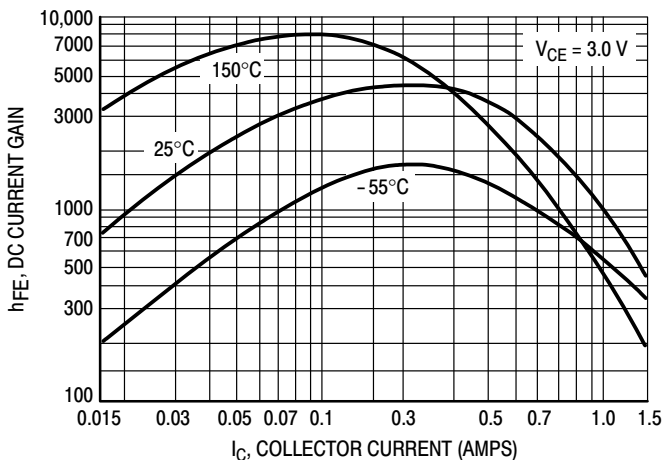


Figure 1. DC Current Gain

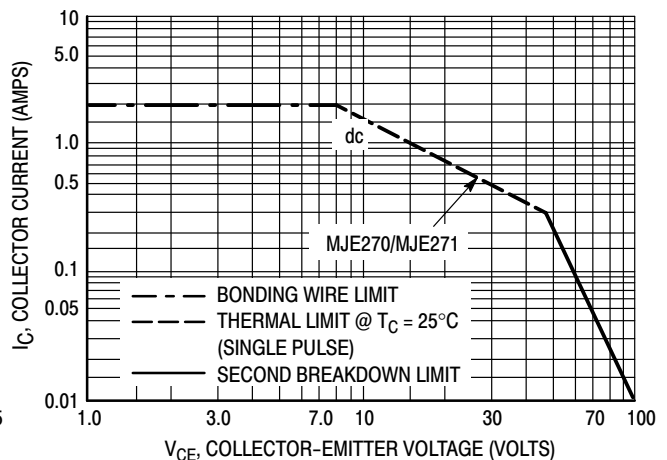
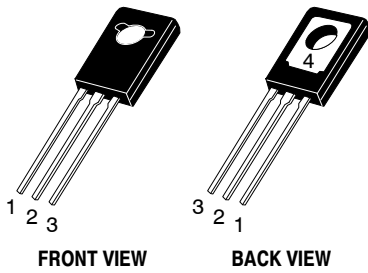


Figure 2. Safe Operating Area

# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

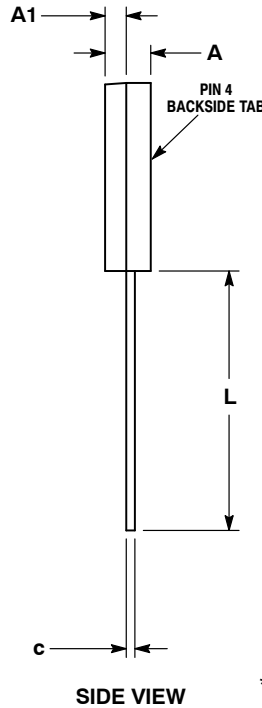
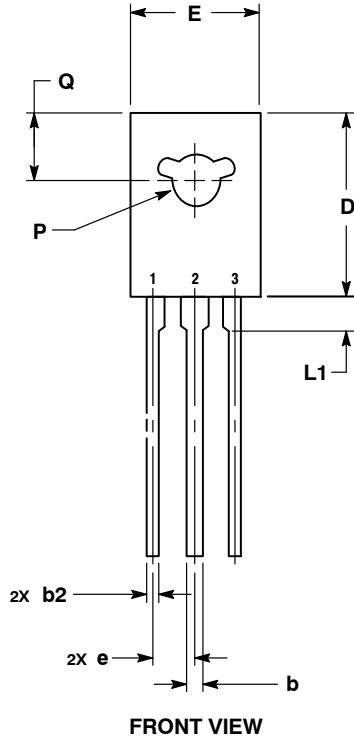
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**TO-225**  
CASE 77-09  
ISSUE AD

DATE 25 MAR 2015

SCALE 1:1

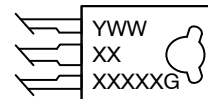


**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. NUMBER AND SHAPE OF LUGS OPTIONAL.

DIM	MILLIMETERS	
	MIN	MAX
A	2.40	3.00
A1	1.00	1.50
b	0.60	0.90
b2	0.51	0.88
c	0.39	0.63
D	10.60	11.10
E	7.40	7.80
e	2.04	2.54
L	14.50	16.63
L1	1.27	2.54
P	2.90	3.30
Q	3.80	4.20

**GENERIC MARKING DIAGRAM\***



- Y = Year
- WW = Work Week
- XXXXX = Device Code
- G = Pb-Free Package

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "µ", may or may not be present.

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|---|---|---|---|---|
| <p>STYLE 1:<br/>PIN 1. EMITTER<br/>2., 4. COLLECTOR<br/>3. BASE</p> | <p>STYLE 2:<br/>PIN 1. CATHODE<br/>2., 4. ANODE<br/>3. GATE</p> | <p>STYLE 3:<br/>PIN 1. BASE<br/>2., 4. COLLECTOR<br/>3. EMITTER</p> | <p>STYLE 4:<br/>PIN 1. ANODE 1<br/>2., 4. ANODE 2<br/>3. GATE</p> | <p>STYLE 5:<br/>PIN 1. MT 1<br/>2., 4. MT 2<br/>3. GATE</p>     |
| <p>STYLE 6:<br/>PIN 1. CATHODE<br/>2., 4. GATE<br/>3. ANODE</p>     | <p>STYLE 7:<br/>PIN 1. MT 1<br/>2., 4. GATE<br/>3. MT 2</p>     | <p>STYLE 8:<br/>PIN 1. SOURCE<br/>2., 4. GATE<br/>3. DRAIN</p>      | <p>STYLE 9:<br/>PIN 1. GATE<br/>2., 4. DRAIN<br/>3. SOURCE</p>    | <p>STYLE 10:<br/>PIN 1. SOURCE<br/>2., 4. DRAIN<br/>3. GATE</p> |

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