

# MJE270 (NPN), MJE271 (PNP)

## Complementary Silicon Power Transistors

### 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  
 $h_{FE} @ 120 \text{ mA}, 10 \text{ V} = 1500 \text{ (Min)}$
- Pb–Free Packages are Available\*

### 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 – Peak	$I_C$	2.0 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	$^\circ\text{C}$

### 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	$^\circ\text{C/W}$

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

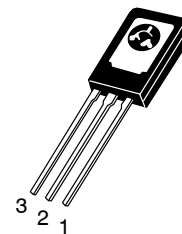
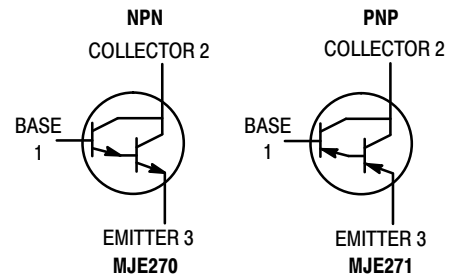
\*For additional information on our Pb–Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



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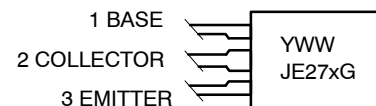
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## 2.0 AMPERE COMPLEMENTARY POWER DARLINGTON TRANSISTORS 100 VOLTS, 15 WATTS



TO–225  
CASE 77  
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
MJE270	TO–225	500 Units/Box
MJE270G	TO–225 (Pb–Free)	500 Units/Box
MJE271	TO–225	500 Units/Box
MJE271G	TO–225 (Pb–Free)	500 Units/Box

# MJE270 (NPN), MJE271 (PNP)

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

Characteristic	Symbol	Min	Max	Unit
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### OFF CHARACTERISTICS

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

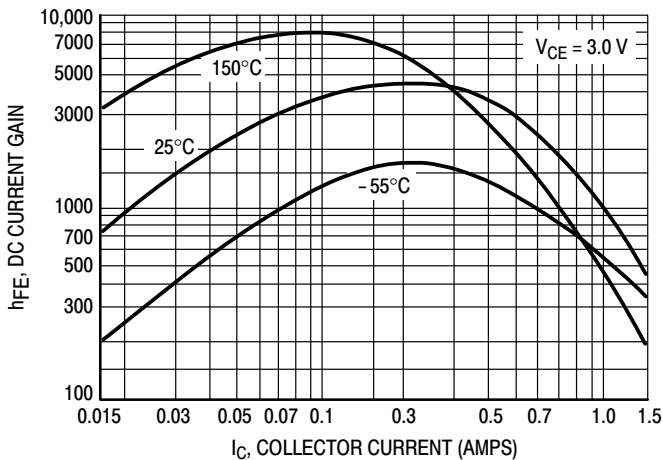


Figure 1. DC Current Gain

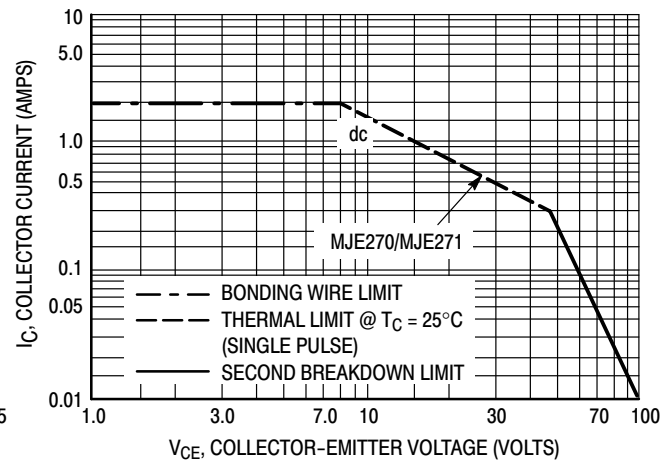
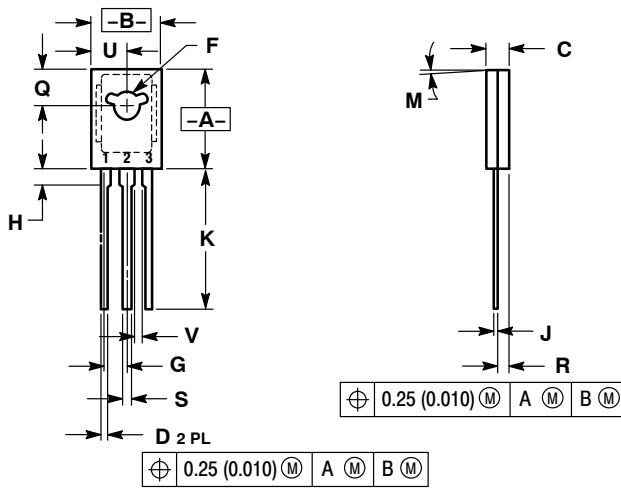


Figure 2. Safe Operating Area

# MJE270 (NPN), MJE271 (PNP)

## PACKAGE DIMENSIONS

TO-225  
CASE 77-09  
ISSUE Z



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 077-01 THRU -08 OBSOLETE, NEW STANDARD 077-09.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.425	0.435	10.80	11.04
B	0.295	0.305	7.50	7.74
C	0.095	0.105	2.42	2.66
D	0.020	0.026	0.51	0.66
F	0.115	0.130	2.93	3.30
G	0.094 BSC		2.39 BSC	
H	0.050	0.095	1.27	2.41
J	0.015	0.025	0.39	0.63
K	0.575	0.655	14.61	16.63
M	5° TYP		5° TYP	
Q	0.148	0.158	3.76	4.01
R	0.045	0.065	1.15	1.65
S	0.025	0.035	0.64	0.88
U	0.145	0.155	3.69	3.93
V	0.040	---	1.02	---

STYLE 3:

- PIN 1. BASE
2. COLLECTOR
3. EMITTER

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