MJE270 (NPN), MJE271 (PNP)

Complementary Silicon Power Transistors

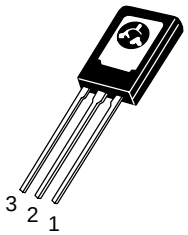
ON Semiconductor®

http://onsemi.com

2.0 AMPERE COMPLEMENTARY POWER DARLINGTON TRANSISTORS 100 VOLTS, 15 WATTS

Features

- High Safe Operating Area
  $I_{S/B}$ @ 40 V, 1.0 s = 0.375 A
- Collector−Emitter Sustaining Voltage
  $V_{CEO(sus)}$ = 100 Vdc (Min)
- High DC Current Gain
  h_{FE} @ 120 mA, 10 V = 1500 (Min)
- Pb−Free Packages are Available*



TO−225
CASE 77
STYLE 3

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°C Derate above 25°C	P_D	15 0.12	W W/°C
Total Power Dissipation @ T_A = 25°C Derate above 25°C	P_D	1.5 0.012	W W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +150	°C

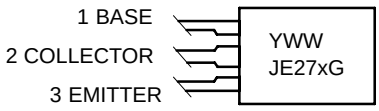
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction−to−Case	$R_{\theta JC}$	8.33	°C/W
Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$	83.3	°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.

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

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ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector−Emitter Sustaining Voltage (Note 1) (I_C = 10 mAdc, I_B = 0)	$V_{CEO(sus)}$	100	−	Vdc
Collector Cutoff Current (V_{CE} = 100 Vdc, I_B = 0)	I_{CEO}	−	1.0	mAdc
Collector Cutoff Current (V_{CB} = 100 Vdc, I_E = 0)	I_{CBO}	−	0.3	mAdc
Emitter Cutoff Current (V_{BE} = 5.0 Vdc, I_C = 0)	I_{EBO}	−	0.1	mAdc
SECOND BREAKDOWN				
Second Breakdown Collector Current with Base Forward Biased (V_{CE} = 40 Vdc, t = 1.0 s, Non−repetitive)	$I_{S/b}$	375	−	Adc
ON CHARACTERISTICS (Note 1)				
DC Current Gain (I_C = 20 mAdc, V_{CE} = 3.0 Vdc) (I_C = 120 mAdc, V_{CE} = 10 Vdc)	h_{FE}	500 1500	− −	−
Collector−Emitter Saturation Voltage (I_C = 20 mAdc, I_B = 0.2 mAdc) (I_C = 120 mAdc, I_B = 1.2 mAdc)	$V_{CE(sat)}$	− −	2.0 3.0	Vdc
Base−Emitter On Voltage (I_C = 120 mAdc, V_{CE} = 10 Vdc)	$V_{BE(on)}$	−	2.0	Vdc
DYNAMIC CHARACTERISTICS				
Current Gain − Bandwidth Product (Note 2) (I_C = 0.05 Adc, V_{CE} = 5.0 Vdc, f_{test} = 1.0 MHz)	f_T	6.0	−	MHz

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.
2. $f_T = |h_{fe}| \bullet f_{test}$.

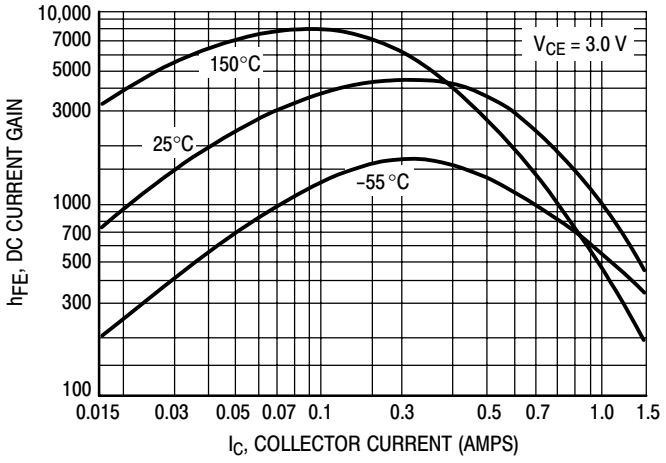


Figure 1. DC Current Gain

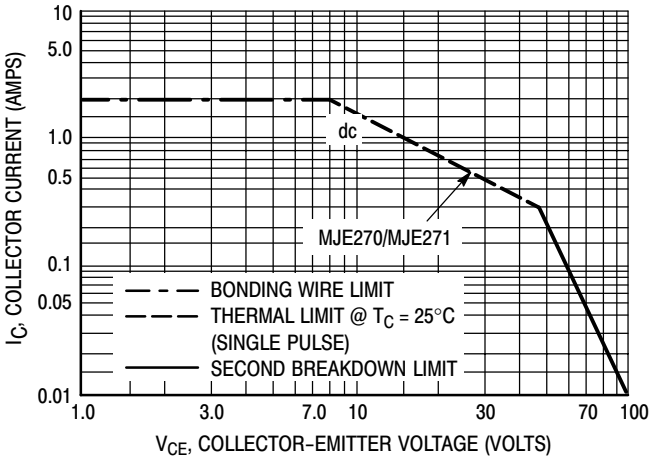
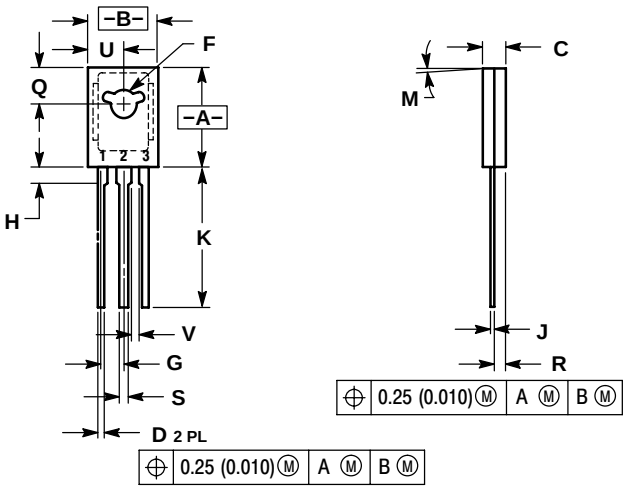


Figure 2. Safe Operating Area

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.

	INCHES		MILLIMETERS	
DIM	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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