Complementary Silicon Power Transistors

MJE270G (NPN), MJE271G (PNP)

ON Semiconductor®

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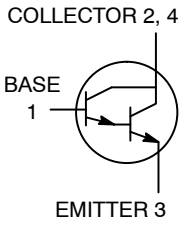
2.0 AMPERE COMPLEMENTARY POWER DARLINGTON TRANSISTORS 100 VOLTS, 15 WATTS

Features

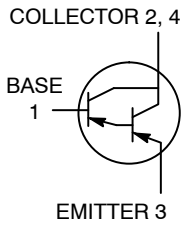
- High Safe Operating Area
  $I_{S/B}$ @ 40 V, 1.0 s = 0.375 A
- Collector−Emitter Sustaining Voltage
  $V_{CEO(sus)}$ = 100 Vdc (Min)
- High DC Current Gain
  h_{FE} @ 120 mA, 10 V = 1500 (Min)
- These Devices are Pb−Free and are RoHS Compliant

NPN

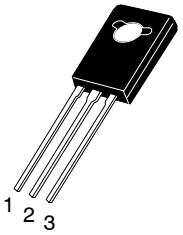


MJE270

PNP



MJE271



TO−225
CASE 77−09
STYLE 3

MAXIMUM RATINGS

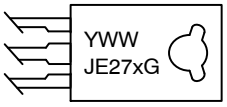
Rating	Symbol	Value	Unit
Collector−Emitter Voltage	V_{CEO}	100	Vdc
Collector−Base Voltage	V_{CB}	100	Vdc
Emitter−Base Voltage	V_{EB}	5.0	Vdc
Collector Current − Continuous	I_C	2.0	Adc
Collector Current − Peak	I_{CM}	4.0	Adc
Base Current	I_B	0.1	Adc
Total Power Dissipation @ T_C = 25°C Derate above 25°C	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

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	°C/W
Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$	83.3	°C/W

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

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

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

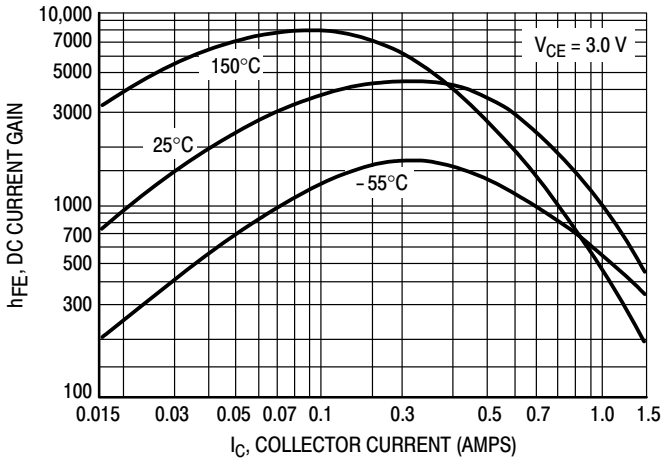


Figure 1. DC Current Gain

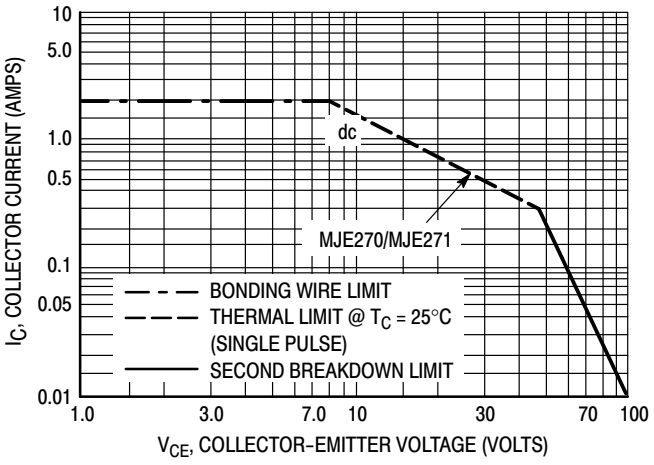


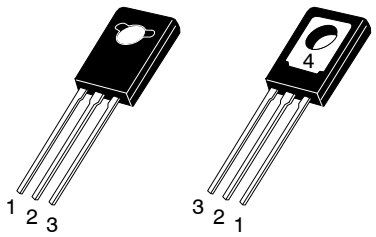
Figure 2. Safe Operating Area

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

ON Semiconductor®

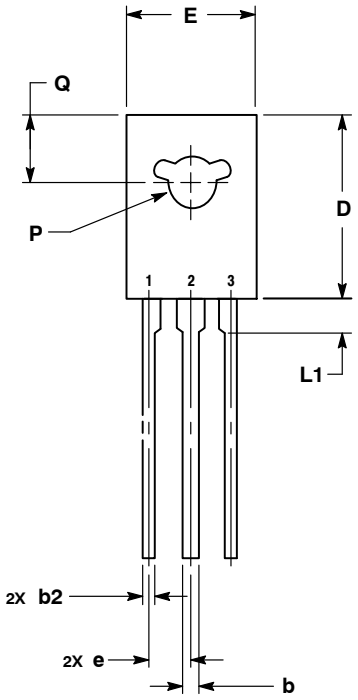
TO−225
CASE 77−09
ISSUE AD

DATE 25 MAR 2015

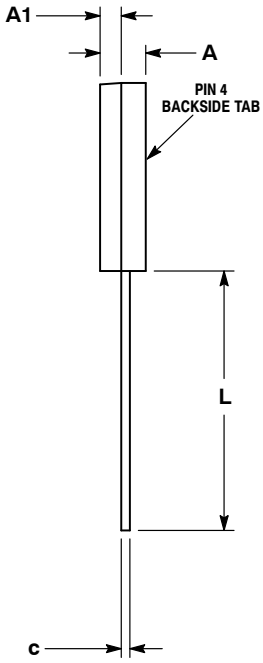


FRONT VIEW **BACK VIEW**

SCALE 1:1



FRONT VIEW

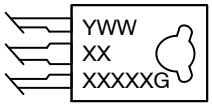


SIDE VIEW

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

	MILLIMETERS	
DIM	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 “ ▪”, may or may not be present.

STYLE 1:
PIN 1. EMITTER
2., 4. COLLECTOR
3. BASE

STYLE 2:
PIN 1. CATHODE
2., 4. ANODE
3. GATE

STYLE 3:
PIN 1. BASE
2., 4. COLLECTOR
3. EMITTER

STYLE 4:
PIN 1. ANODE 1
2., 4. ANODE 2
3. GATE

STYLE 5:
PIN 1. MT 1
2., 4. MT 2
3. GATE

STYLE 6:
PIN 1. CATHODE
2., 4. GATE
3. ANODE

STYLE 7:
PIN 1. MT 1
2., 4. GATE
3. MT 2

STYLE 8:
PIN 1. SOURCE
2., 4. GATE
3. DRAIN

STYLE 9:
PIN 1. GATE
2., 4. DRAIN
3. SOURCE

STYLE 10:
PIN 1. SOURCE
2., 4. DRAIN
3. GATE

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DESCRIPTION:	**TO−225**	**PAGE 1 OF 1**

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