

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°C	P_D	15 0.12	W W/ $^\circ\text{C}$
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°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

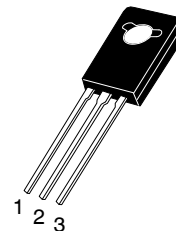
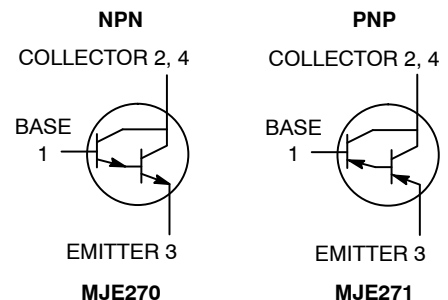
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction–to–Case	$R_{\theta JC}$	8.33	$^\circ\text{C/W}$
Thermal Resistance, Junction–to–Ambient	$R_{\theta JA}$	83.3	$^\circ\text{C/W}$



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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
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OFF CHARACTERISTICS

Collector-Emitter Sustaining Voltage (Note 1) ($I_C = 10\text{ mAdc}$, $I_B = 0$)	$V_{CEO(sus)}$	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 $\leq 300\text{ }\mu\text{s}$, Duty Cycle $\leq 2.0\%$.
2. $f_T = |h_{fe}| \cdot f_{test}$.

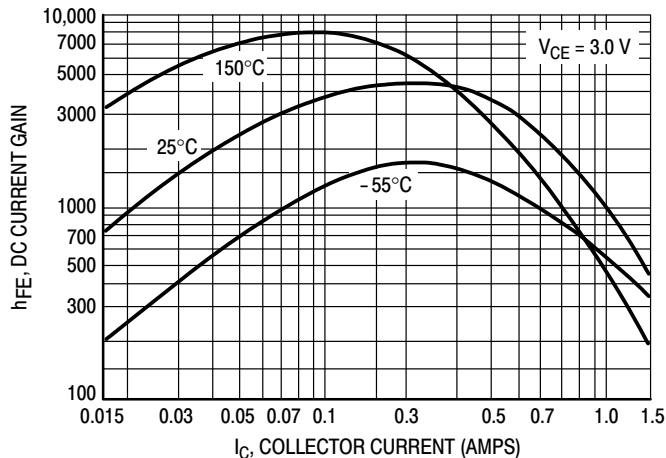


Figure 1. DC Current Gain

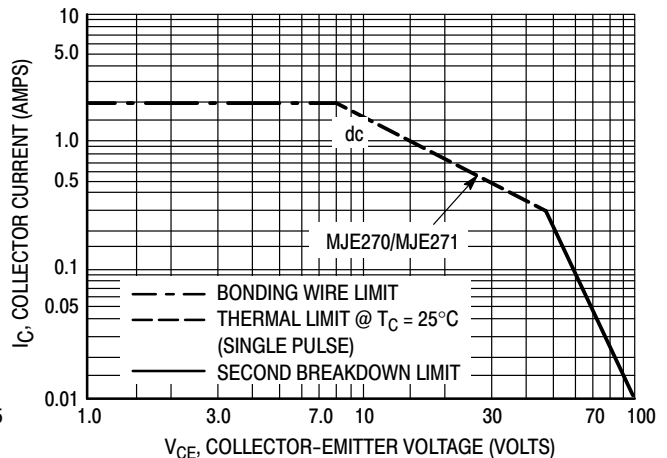
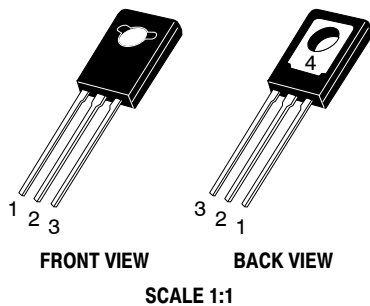


Figure 2. Safe Operating Area

MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS

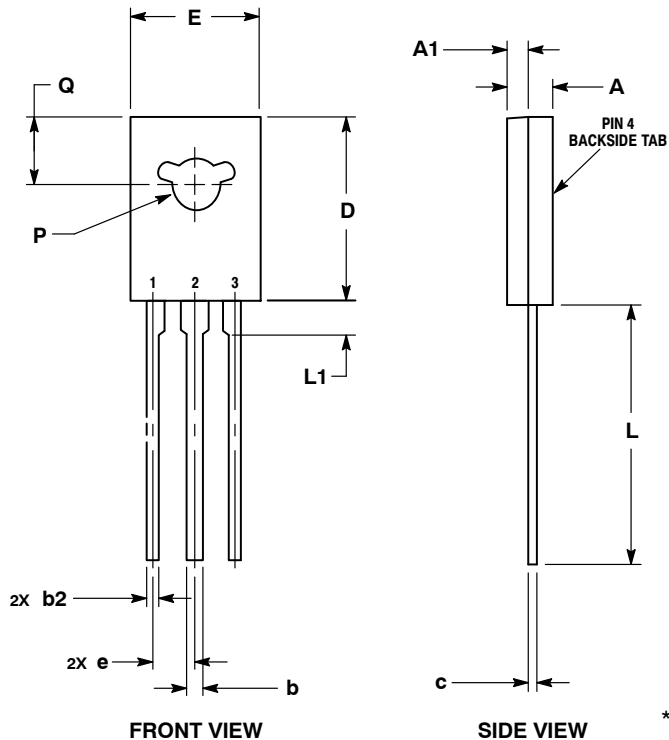
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TO-225
CASE 77-09
ISSUE AD

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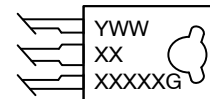


NOTES:

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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