

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°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	$^\circ\text{C}$

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.

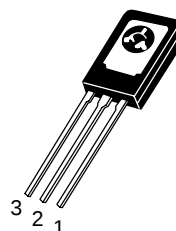
*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



ON Semiconductor®

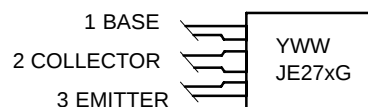
<http://onsemi.com>

**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
----------------	--------	-----	-----	------

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
--	-----------	-----	---	-----

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
--	-------	-----	---	-----

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

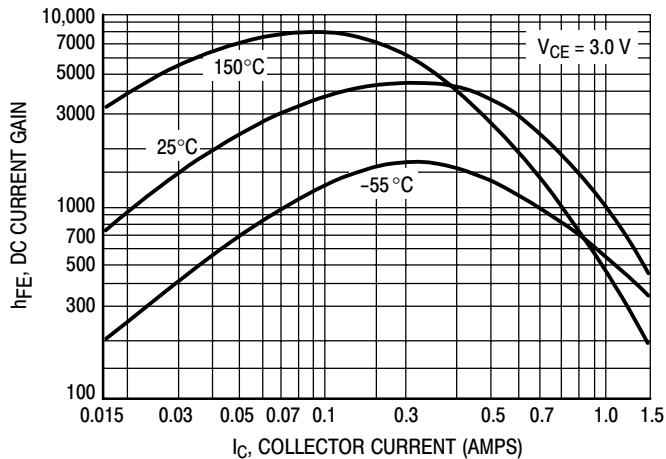


Figure 1. DC Current Gain

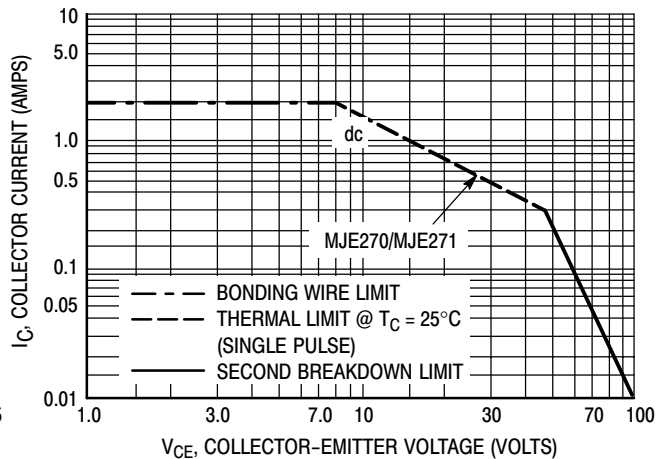
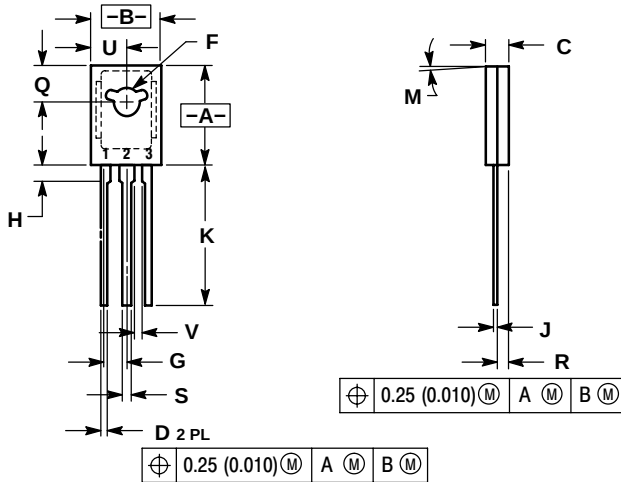


Figure 2. Safe Operating Area

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:

1. BASE
2. COLLECTOR
3. EMITTER

ON Semiconductor and  are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor
P.O. Box 61312, Phoenix, Arizona 85082-1312 USA
Phone: 480-829-7710 or 800-344-3860 Toll Free USA/Canada
Fax: 480-829-7709 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada

Japan: ON Semiconductor, Japan Customer Focus Center
2-9-1 Kamimeguro, Meguro-ku, Tokyo, Japan 153-0051
Phone: 81-3-5773-3850

ON Semiconductor Website: <http://onsemi.com>

Order Literature: <http://www.onsemi.com/litorder>

For additional information, please contact your local Sales Representative.

MJE270/D