

MJE200 - NPN, MJE210 - PNP

Preferred Device

Complementary Silicon Power Plastic Transistors

These devices are designed for low voltage, low-power, high-gain audio amplifier applications.

Features

- Collector-Emitter Sustaining Voltage -
 $V_{CEO(sus)} = 25 \text{ Vdc (Min) @ } I_C = 10 \text{ mAdc}$
- High DC Current Gain -
 $h_{FE} = 70 \text{ (Min) @ } I_C = 500 \text{ mAdc}$
 $= 45 \text{ (Min) @ } I_C = 2.0 \text{ Adc}$
 $= 10 \text{ (Min) @ } I_C = 5.0 \text{ Adc}$
- Low Collector-Emitter Saturation Voltage -
 $V_{CE(sat)} = 0.3 \text{ Vdc (Max) @ } I_C = 500 \text{ mAdc}$
 $= 0.75 \text{ Vdc (Max) @ } I_C = 2.0 \text{ Adc}$
- High Current-Gain - Bandwidth Product -
 $f_T = 65 \text{ MHz (Min) @ } I_C$
 $= 100 \text{ mAdc}$
- Annular Construction for Low Leakage -
 $I_{CBO} = 100 \text{ nAdc @ Rated } V_{CB}$
- Pb-Free Packages are Available*

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	40	Vdc
Collector-Base Voltage	V_{CB}	25	Vdc
Emitter-Base Voltage	V_{EB}	8.0	Vdc
Collector Current - Continuous - Peak	I_C	5.0 10	Adc
Base Current	I_B	1.0	Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	15 0.12	W mW/ $^\circ\text{C}$
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	1.5 0.012	W mW/ $^\circ\text{C}$
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	θ_{JC}	8.34	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient	θ_{JA}	83.4	$^\circ\text{C/W}$

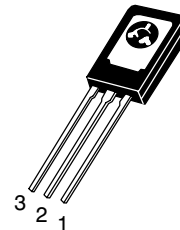
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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



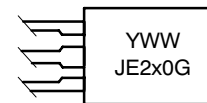
ON Semiconductor®

5.0 AMPERES POWER TRANSISTORS COMPLEMENTARY SILICON 25 VOLTS, 15 WATTS



TO-225
CASE 77
STYLE 1

MARKING DIAGRAM



Y = Year
WW = Work Week
JE2x0 = Device Code
x = 0 or 1
G = Pb-Free Package

ORDERING INFORMATION

Device	Package	Shipping
MJE200	TO-225	500 Units/Box
MJE200G	TO-225 (Pb-Free)	500 Units/Box
MJE210	TO-225	500 Units/Box
MJE210G	TO-225 (Pb-Free)	500 Units/Box
MJE210T	TO-225	50 Units/Rail
MJE210TG	TO-225 (Pb-Free)	50 Units/Rail

Preferred devices are recommended choices for future use and best overall value.

MJE200 – NPN, MJE210 – PNP

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 mA, I _B = 0)	V _{CEO(sus)}	25	-	Vdc
Collector Cutoff Current (V _{CB} = 40 Vdc, I _E = 0) (V _{CB} = 40 Vdc, I _E = 0, T _J = 125°C)	I _{CBO}	-	100	nAdc μAdc
Emitter Cutoff Current (V _{BE} = 8.0 Vdc, I _C = 0)	I _{EBO}	-	100	nAdc

ON CHARACTERISTICS

DC Current Gain (Note 1) (I _C = 500 mA, V _{CE} = 1.0 Vdc) (I _C = 2.0 Adc, V _{CE} = 1.0 Vdc) (I _C = 5.0 Adc, V _{CE} = 2.0 Vdc)	h _{FE}	70 45 10	- 180 -	-
Collector-Emitter Saturation Voltage (Note 1) (I _C = 500 mA, I _B = 50 mA) (I _C = 2.0 Adc, I _B = 200 mA) (I _C = 5.0 Adc, I _B = 1.0 Adc)	V _{CE(sat)}	- - -	0.3 0.75 1.8	Vdc
Base-Emitter Saturation Voltage (Note 1) (I _C = 5.0 Adc, I _B = 1.0 Adc)	V _{BE(sat)}	-	2.5	Vdc
Base-Emitter On Voltage (Note 1) (I _C = 2.0 Adc, V _{CE} = 1.0 Vdc)	V _{BE(on)}	-	1.6	Vdc

DYNAMIC CHARACTERISTICS

Current-Gain – Bandwidth Product (Note 2) (I _C = 100 mA, V _{CE} = 10 Vdc, f _{test} = 10 MHz)	f _T	65	-	MHz
Output Capacitance (V _{CB} = 10 Vdc, I _E = 0, f = 0.1 MHz)	C _{ob}	-	80 120	pF

1. Pulse Test: Pulse Width = 300 μs, Duty Cycle ≈ 2.0%.
2. f_T = |h_{fe}| • f_{test}.

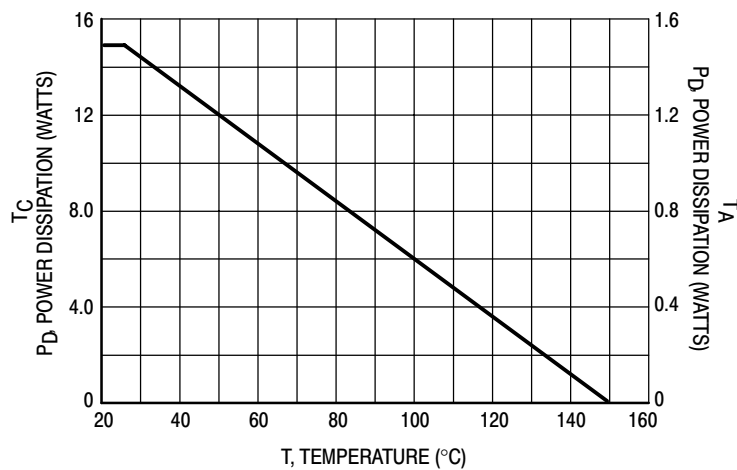
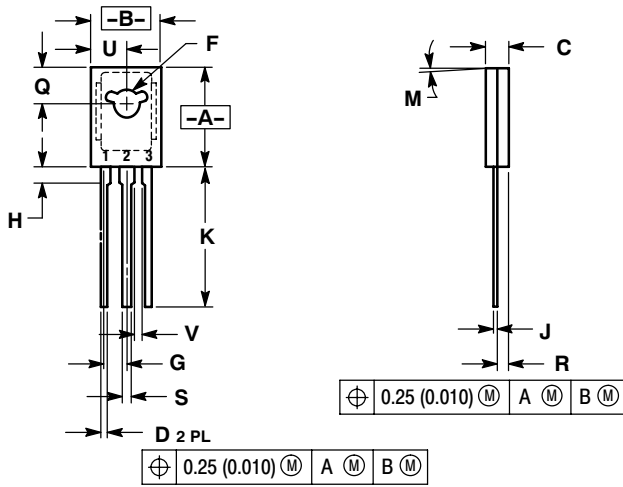


Figure 1. Power Derating

MJE200 - NPN, MJE210 - 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 1:

1. EMITTER
2. COLLECTOR
3. BASE