# MJE243 - NPN, MJE253 - PNP

**Preferred Device**

# Complementary Silicon Power Plastic Transistors

These devices are designed for low power audio amplifier and low−current, high−speed switching applications.

### Features

- High Collector−Emitter Sustaining Voltage −
  $V_{CEO(sus)}$ = 100 Vdc (Min)
- High DC Current Gain @ $I_C$ = 200 mAdc
  $h_{FE}$ = 40 − 200
  = 40 − 120
- Low Collector−Emitter Saturation Voltage −
  $V_{CE(sat)}$ = 0.3 Vdc (Max) @ $I_C$ = 500 mAdc
- High Current Gain Bandwidth Product −
  $f_T$ = 40 MHz (Min) @ $I_C$ = 100 mAdc
- Annular Construction for Low Leakages
  $I_{CBO}$ = 100 nAdc (Max) @ Rated $V_{CB}$
- 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 | $V_{EB}$ | 7.0 | Vdc |
| Collector Current − Continuous<br>− Peak | $I_C$ | 4.0<br>8.0 | Adc |
| Base Current | $I_B$ | 10 | Adc |
| Total Power Dissipation @ $T_C$ = 25°C<br>Derate above 25°C | $P_D$ | 15<br>120 | W<br>mW/°C |
| Total Power Dissipation @ $T_C$ = 25°C<br>Derate above 25°C | $P_D$ | 1.5<br>12 | W<br>mW/°C |
| Operating and Storage Junction Temperature Range | $T_J$, $T_{stg}$ | −65 to +150 | °C |

### THERMAL CHARACTERISTICS

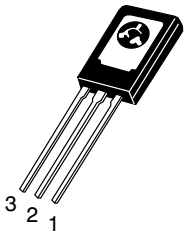
| Characteristic | Symbol | Max | Unit |
|---|---|---|---|
| Thermal Resistance, Junction−to−Case | $\theta_{JC}$ | 8.34 | °C/W |
| Thermal Resistance, Junction−to−Ambient | $\theta_{JA}$ | 83.4 | °C/W |

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.

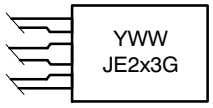
ON Semiconductor®

## 4.0 AMPERES POWER TRANSISTORS COMPLEMENTARY SILICON 100 VOLTS, 15 WATTS




**TO−225**
**CASE 77**
**STYLE 1**

### MARKING DIAGRAM




Y = Year
WW = Work Week
JE2x3 = Device Code
x = 4 or 5
G = Pb−Free Package

### ORDERING INFORMATION

| Device | Package | Shipping |
|---|---|---|
| MJE243 | TO−225 | 500 Units/Box |
| MJE243G | TO−225 (Pb−Free) | 500 Units/Box |
| MJE253 | TO−225 | 500 Units/Box |
| MJE253G | TO−225 (Pb−Free) | 500 Units/Box |

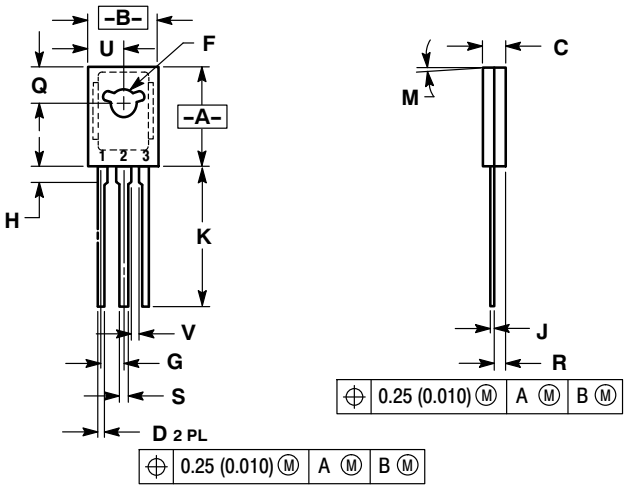
**Preferred** devices are recommended choices for future use and best overall value.

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

| Characteristic | Symbol | Min | Max | Unit |
|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | |
| Collector–Emitter Sustaining Voltage ($I_C$ = 10 mAdc, $I_B$ = 0) | $V_{CEO(sus)}$ | 100 | – | Vdc |
| Collector Cutoff Current<br>($V_{CB}$ = 100 Vdc, $I_E$ = 0)<br>($V_{CE}$ = 100 Vdc, $I_E$ = 0, $T_C$ = 125°C) | $I_{CBO}$ | <br>–<br>– | <br>0.1<br>0.1 | μAdc |
| Emitter Cutoff Current ($V_{BE}$ = 7.0 Vdc, $I_C$ = 0) | $I_{EBO}$ | – | 0.1 | μAdc |
| **ON CHARACTERISTICS** | | | | |
| DC Current Gain<br>($I_C$ = 200 mAdc, $V_{CE}$ = 1.0 Vdc)<br>($I_C$ = 1.0 Adc, $V_{CE}$ = 1.0 Vdc) | $h_{FE}$ | <br>40<br>15 | <br>180<br>– | – |
| Collector–Emitter Saturation Voltage<br>($I_C$ = 500 mAdc, $I_B$ = 50 mAdc)<br>($I_C$ = 1.0 Adc, $I_B$ = 100 mAdc) | $V_{CE(sat)}$ | <br>–<br>– | <br>0.3<br>0.6 | Vdc |
| Base–Emitter Saturation Voltage ($I_C$ = 2.0 Adc, $I_B$ = 200 mAdc) | $V_{BE(sat)}$ | – | 1.8 | Vdc |
| Base–Emitter On Voltage ($I_C$ = 500 mAdc, $V_{CE}$ = 1.0 Vdc) | $V_{BE(on)}$ | – | 1.5 | Vdc |
| **DYNAMIC CHARACTERISTICS** | | | | |
| Current–Gain – Bandwidth Product ($I_C$ = 100 mAdc, $V_{CE}$ = 10 Vdc, $f_{test}$ = 10 MHz) | $f_T$ | 40 | – | MHz |
| Output Capacitance ($V_{CB}$ = 10 Vdc, $I_E$ = 0, f = 0.1 MHz) | $C_{ob}$ | – | 50 | pF |

## 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 1:
PIN 1. EMITTER
2. COLLECTOR
3. BASE