

Plastic NPN Silicon Medium-Power Transistors

... useful for medium voltage applications requiring high f_T such as converters and extended range amplifiers.

MAXIMUM RATINGS

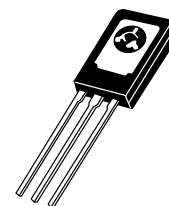
| Rating | Symbol | MJE341 | MJE344 | Unit |
|---|----------------|-------------|--------|------------------------------|
| Collector-Emitter Voltage | V_{CE0} | 150 | 200 | Vdc |
| Collector-Base Voltage | V_{CB} | 175 | 200 | Vdc |
| Emitter-Base Voltage | V_{EB} | 3.0 | 5.0 | Vdc |
| Collector Current — Continuous | I_C | 500 | | mAdc |
| Base Current | I_B | 250 | | mAdc |
| Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C | P_D | 20 | 0.16 | Watts 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 | θ_{JC} | 6.25 | $^\circ\text{C/W}$ |

MJE341
MJE344

0.5 AMPERE
POWER TRANSISTORS
NPN SILICON
150-200 VOLTS
20 WATTS



CASE 77-08
TO-225AA TYPE

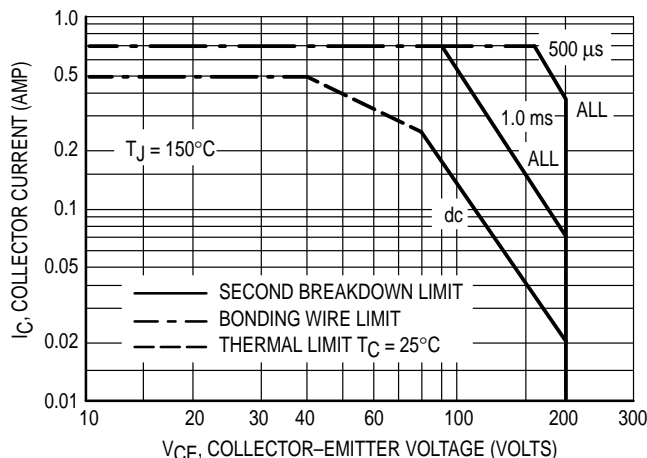


Figure 1. Active Region Safe Operating Area

There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown. Safe operating area curves indicate $I_C - V_{CE}$ limits of the transistor that must be observed for reliable operation; i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data of Figure 1 is based on $T_{J(pk)} = 150^\circ\text{C}$; T_C is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(pk)} \leq 150^\circ\text{C}$. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

MJE341 MJE344

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic | Symbol | Min | Max | Unit |
|---|--|----------------------|----------------------|------|
| OFF CHARACTERISTICS | | | | |
| Collector–Emitter Sustaining Voltage ($I_C = 1.0\text{ mAdc}$, $I_B = 0$) | MJE341 MJE344 $V_{CE(sus)}$ | 150 200 | — — | Vdc |
| Collector Cutoff Current ($V_{CE} = 150\text{ Vdc}$, $I_B = 0$) ($V_{CE} = 200\text{ Vdc}$, $I_B = 0$) | MJE341 MJE344 I_{CEO} | — — | 1.0 1.0 | mAdc |
| Collector Cutoff Current ($V_{CB} = 175\text{ Vdc}$, $I_E = 0$) ($V_{CB} = 200\text{ Vdc}$, $I_E = 0$) | MJE341 MJE344 I_{CBO} | — — | 0.3 0.1 | mAdc |
| Emitter Cutoff Current ($V_{EB} = 3.0\text{ Vdc}$, $I_C = 0$) ($V_{EB} = 5.0\text{ Vdc}$, $I_C = 0$) | MJE341 MJE344 I_{EBO} | — — | 0.1 0.1 | mAdc |
| ON CHARACTERISTICS | | | | |
| DC Current Gain ($I_C = 10\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$) ($I_C = 50\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$) ($I_C = 150\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$) | MJE341 MJE341 MJE344 MJE341 h_{FE} | 20 25 30 20 | — 200 300 — | — |
| Collector–Emitter Saturation Voltage ($I_C = 50\text{ mAdc}$, $I_B = 5.0\text{ mAdc}$) ($I_C = 150\text{ mAdc}$, $I_B = 15\text{ mAdc}$) | MJE344 MJE341 $V_{CE(sat)}$ | — — | 1.0 2.3 | Vdc |
| Base–Emitter On Voltage ($I_C = 50\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$) | $V_{BE(on)}$ | — | 1.0 | Vdc |
| DYNAMIC CHARACTERISTICS | | | | |
| Current–Gain — Bandwidth Product ($I_C = 50\text{ mAdc}$, $V_{CE} = 25\text{ Vdc}$, $f = 10\text{ MHz}$) | f_T | 15 | — | MHz |
| Output Capacitance ($V_{CB} = 20\text{ Vdc}$, $I_E = 0$, $f = 100\text{ kHz}$) | C_{ob} | — | 15 | pF |
| Small–Signal Current Gain ($I_C = 50\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$, $f = 1.0\text{ kHz}$) | h_{fe} | 25 | — | — |

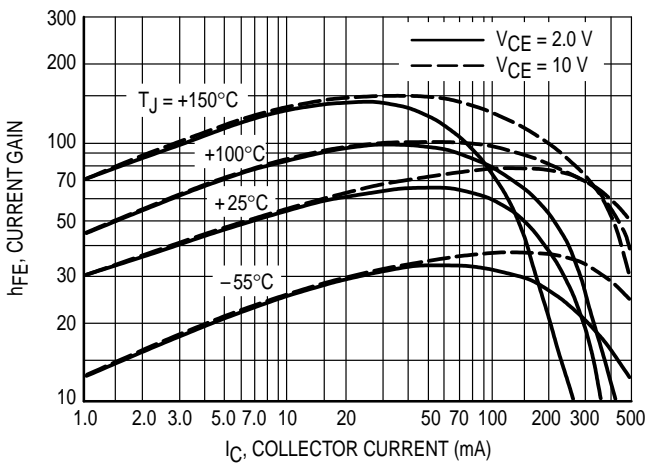


Figure 2. DC Current Gain

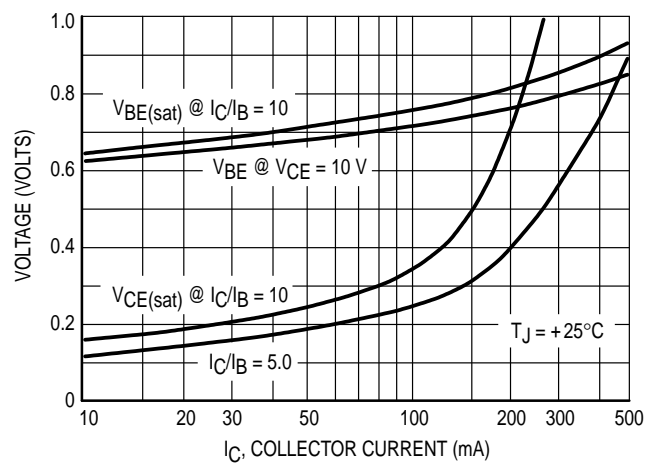
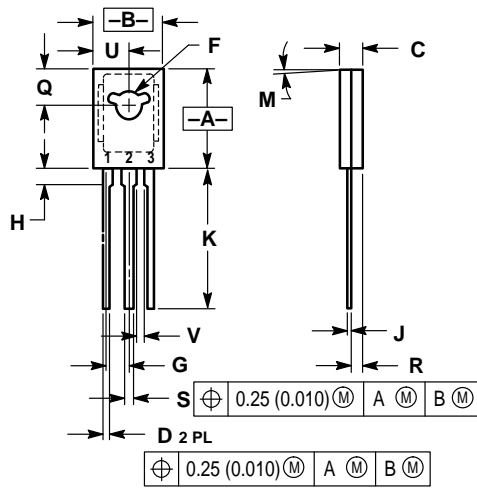


Figure 3. "On" Voltages

PACKAGE DIMENSIONS




- NOTES:
 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.

| 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 | 0.055 | 1.15 | 1.39 |
| 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

CASE 77-08
 TO-225AA TYPE
 ISSUE V

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