

COMPLEMENTARY SILICON POWER TRANSISTORS

...designed for use in general-purpose amplifier and switching applications

FEATURES:

- * Power Dissipation - $P_D = 75 \text{ W} @ T_C = 25^\circ\text{C}$
- * DC Current Gain $h_{FE} = 20 \sim 100 @ I_C = 4.0 \text{ A}$
- * $V_{CE(sat)} = 1.1 \text{ V (Max.)} @ I_C = 4.0 \text{ A}, I_B = 400 \text{ mA}$

MAXIMUM RATINGS

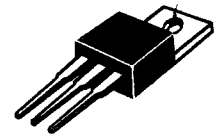
| Characteristic | Symbol | Rating | Unit |
|---|----------------|--------------|--------------------------|
| Collector-Emitter Voltage | V_{CEO} | 60 | V |
| Collector-Base Voltage | V_{CBO} | 70 | V |
| Emitter-Base Voltage | V_{EBO} | 5.0 | V |
| Collector Current-Continuous | I_C | 10 | A |
| Base Current | I_B | 6.0 | A |
| Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C | P_D | 75 0.6 | W W/ $^\circ\text{C}$ |
| Operating and Storage Junction Temperature Range | T_J, T_{STG} | - 55 to +150 | $^\circ\text{C}$ |

THERMAL CHARACTERISTICS

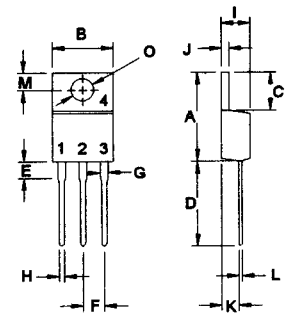
| Characteristic | Symbol | Max | Unit |
|-------------------------------------|-----------------|------|--------------------|
| Thermal Resistance Junction to Case | $R_{\theta jc}$ | 1.67 | $^\circ\text{C/W}$ |

PNP NPN
MJE2955T MJE3055T

**10 AMPERE
COMPLEMENTARY SILICON
POWER TRANSISTORS
60 VOLTS
75 WATTS**



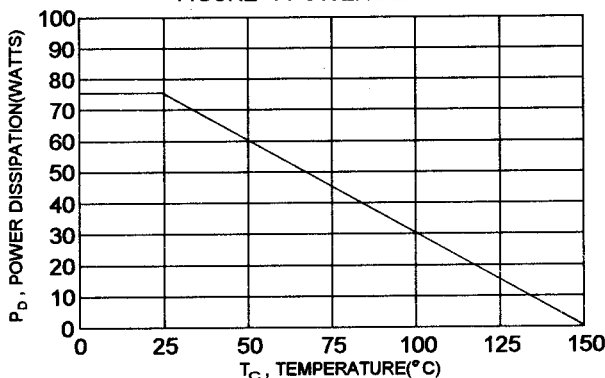
TO-220



PIN 1.BASE
2.COLLECTOR
3.EMITTER
4.COLLECTOR(CASE)

| DIM | MILLIMETERS | |
|-----|-------------|-------|
| | MIN | MAX |
| A | 14.68 | 15.31 |
| B | 9.78 | 10.42 |
| C | 5.01 | 6.52 |
| D | 13.06 | 14.62 |
| E | 3.57 | 4.07 |
| F | 2.42 | 3.66 |
| G | 1.12 | 1.36 |
| H | 0.72 | 0.96 |
| I | 4.22 | 4.98 |
| J | 1.14 | 1.38 |
| K | 2.20 | 2.97 |
| L | 0.33 | 0.55 |
| M | 2.48 | 2.98 |
| O | 3.70 | 3.90 |

FIGURE -1 POWER DERATING



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

| Characteristic | Symbol | Min | Max | Unit |
|----------------|--------|-----|-----|------|
|----------------|--------|-----|-----|------|

OFF CHARACTERISTICS

| | | | | |
|--|---------------|----|------------|----|
| Collector - Emitter Sustaining Voltage (1) ($I_C = 200\text{ mA}$, $I_B = 0$) | $V_{CE(sus)}$ | 60 | | V |
| Collector Cutoff Current ($V_{CE} = 30\text{ V}$, $I_B = 0$) | I_{CEO} | | 0.7 | mA |
| Collector Cutoff Current ($V_{CE} = 70\text{ V}$, $V_{BE(off)} = 1.5\text{ V}$) ($V_{CE} = 70\text{ V}$, $V_{BE(off)} = 1.5\text{ V}$, $T_C = 150^\circ\text{C}$) | I_{CEX} | | 1.0 5.0 | mA |
| Collector Cutoff Current ($V_{CB} = 70\text{ V}$, $I_E = 0$) ($V_{CB} = 70\text{ V}$, $I_E = 0$, $T_C = 150^\circ\text{C}$) | I_{CBO} | | 1.0 10 | mA |
| Emitter Cutoff Current ($V_{EB} = 5.0\text{ V}$, $I_C = 0$) | I_{EBO} | | 5.0 | mA |

ON CHARACTERISTICS (1)

| | | | | |
|---|---------------|-----------|------------|---|
| DC Current Gain ($I_C = 4.0\text{ A}$, $V_{CE} = 4.0\text{ V}$) ($I_C = 10\text{ A}$, $V_{CE} = 4.0\text{ V}$) | hFE | 20 5.0 | 100 | |
| Collector - Emitter Saturation Voltage ($I_C = 4.0\text{ A}$, $I_B = 0.4\text{ A}$) ($I_C = 10\text{ A}$, $I_B = 3.3\text{ A}$) | $V_{CE(sat)}$ | | 1.1 8.0 | V |
| Base - Emitter On Voltage ($I_C = 4.0\text{ A}$, $V_{CE} = 4.0\text{ V}$) | $V_{BE(on)}$ | | 1.8 | V |

DYNAMIC CHARACTERISTICS

| | | | | |
|---|-------|-----|--|-----|
| Current Gain - Bandwidth Product (2) ($I_C = 500\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 500\text{ KHz}$) | f_T | 2.0 | | MHz |
|---|-------|-----|--|-----|

(1) Pulse Test: Pulse width = 300 us , Duty Cycle $\leq 2.0\%$

(2) $f_T = |h_{fe}| \cdot f_{test}$

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FIG-2 "ON" VOLTAGE

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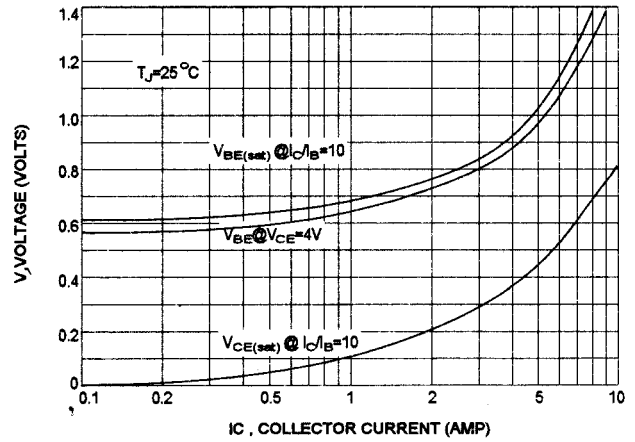
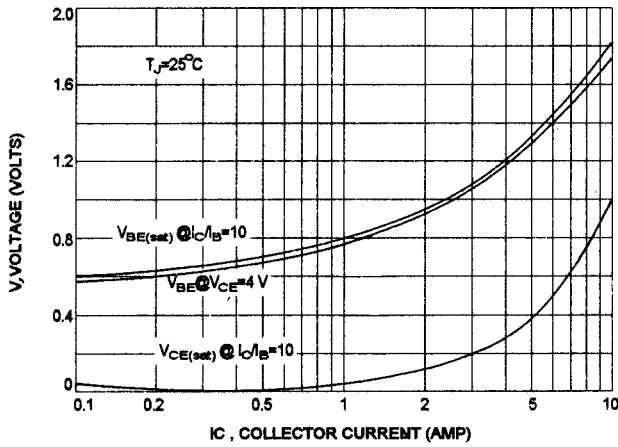
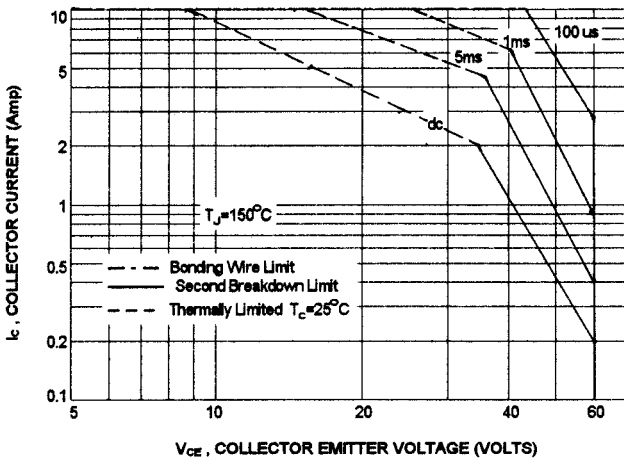


FIG-3 ACTIVE-REGION SAFE OPERATING AREA



There are two limitation 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 curves indicate.

The data of FIG-3 is base 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 limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

FIG-4 DC CURRENT GAIN

