

COMPLEMENTARY SILICON POWER TRANSISTORS

...designed for various specific and general purpose application such as; output and driver stages of amplifiers operating at frequencies from DC to greater than 1.0MHz series, shunt and switching regulators; low and high frequency inverters/converters and many others.

FEATURES:

- * Very Low Collector Saturation Voltage
- * Excellent Linearity
- * Fast Switching
- * PNP Values are Negative, Observe Proper Polarity.

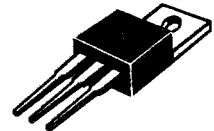
NPN
D44C
Series

PNP
D45C
Series

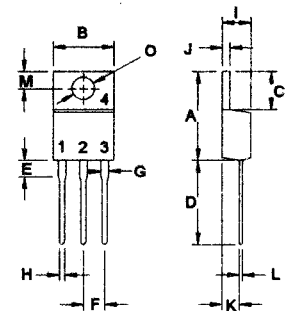
4 AMPERE
COMPLEMENTARY SILICON
POWER TRANSISTORS
30-80 VOLTS
30 WATTS

MAXIMUM RATINGS

| Characteristic | Symbol | D44C1,2,3 D45C1,2,3 | D44C4,5,6 D45C4,5,6 | D44C7,8,9 D45C7,8,9 | D44C10,11,12 D45C10,11,12 | Unit |
|--|-------------------|------------------------|------------------------|------------------------|------------------------------|--------------------------|
| Collector-Emitter Voltage | V_{CEO} | 30 | 45 | 60 | 80 | V |
| Collector-Emitter Voltage | V_{CES} | 40 | 55 | 70 | 90 | V |
| Emitter-Base Voltage | V_{EBO} | 5.0 | | | | V |
| Collector Current - Continuous Peak | I_C I_{CM} | 4.0 6.0 | | | | A |
| Base Current | I_B | 1.0 | | | | A |
| Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C | P_D | 30 0.24 | | | | W W/ $^\circ\text{C}$ |
| Operating and Storage Junction Temperature Range | T_J, T_{STG} | -55 to +150 | | | | $^\circ\text{C}$ |



TO-220

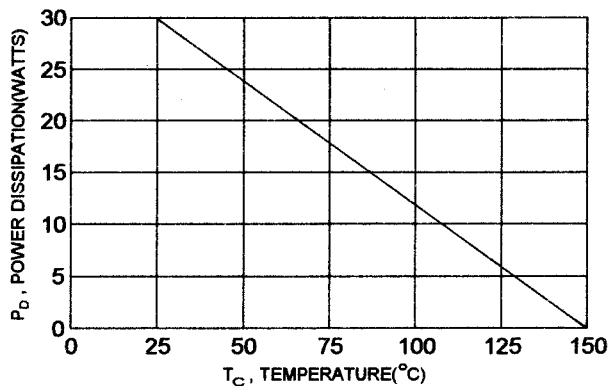


PIN 1.BASE
2.COLLECTOR
3.EMITTER
4.COLLECTOR(CASE)

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|-------------------------------------|-----------------|-----|--------------------|
| Thermal Resistance Junction to Case | $R_{\theta JC}$ | 4.2 | $^\circ\text{C/W}$ |

FIGURE -1 POWER DERATING



| 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 |

D44C Series NPN / D45C Series PNP

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

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

OFF CHARACTERISTICS

| | | | | |
|--|-----------|--|-----|---------------|
| Collector-Base Cutoff Current ($V_{CE} = \text{Rated } V_{CES}$) | I_{CES} | | 10 | μA |
| Emitter-Base Cutoff Current ($V_{EB} = 5.0\text{ V}$, $I_C = 0$) | I_{EBO} | | 100 | μA |

ON CHARACTERISTICS(1)

| | | | | | |
|---|--|---------------|-----------------|-------------------|---|
| DC Current Gain ($I_C = 0.2\text{ A}$, $V_{CE} = 1.0\text{ V}$) | D44C3,6,9,12/ D45C3,6,9,12 D44C2,5,8,11 D45C2,5,8,11 | h_{FE} | 40 100 40 | 120 220 120 | |
| ($I_C = 1.0\text{ A}$, $V_{CE} = 1.0\text{ V}$) | D44C1,4,7,10/D45C1,4,7,10 D44C1,4,7,10/D45C1,4,7,10 D45C2,5,8,11 | | 25 10 20 | | |
| ($I_C = 2.0\text{ A}$, $V_{CE} = 1.0\text{ V}$) | D44C3,6,9,12/ D45C3,6,9,12 D44C2,5,8,11 | | 20 20 | | |
| Collector-Emitter Saturation Voltage ($I_C = 1.0\text{ A}$, $I_B = 50\text{ mA}$) | D44C2,3,5,6,8,9,11,12 D45C2,3,5,6,8,9,11,12 | $V_{CE(sat)}$ | | 0.5 0.5 | V |
| ($I_C = 1.0\text{ A}$, $I_B = 100\text{ mA}$) | D44C1,4,7,10/D45C1,4,7,10 | | | 0.5 | |
| Base-Emitter Saturation Voltage ($I_C = 1.0\text{ A}$, $I_B = 100\text{ mA}$) | All Devices | $V_{BE(sat)}$ | | 1.3 | V |

DYAMIC CHARATERISTICS

| | | | | | |
|---|----------------------------|-------|--------------------|--|-----|
| Current-Gain Bandwidth Product (2) ($I_C = 20\text{ mA}$, $V_{CE} = 4.0\text{ V}$, $f = 1.0\text{ MHz}$) | D44C Series D45C Series | f_T | 50(typ) 40(typ) | | MHz |
|---|----------------------------|-------|--------------------|--|-----|

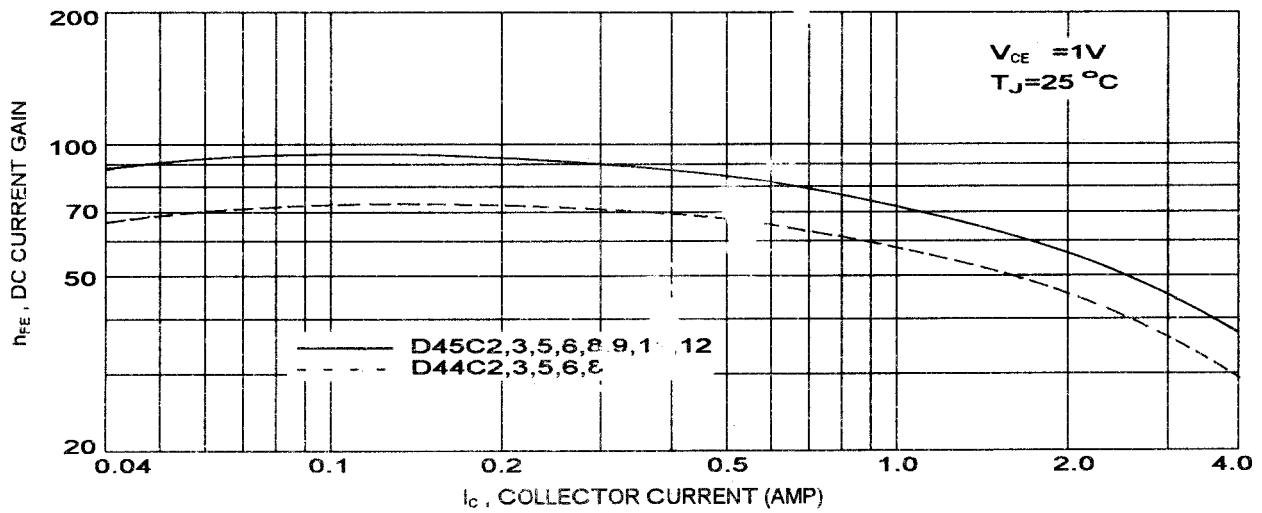
SWITCHING CHARATERISTICS

| | | | | | | |
|--------------|------------------------------------|----------------------------|-------|--|------------|---------------|
| Rise Time | $V_{CC} = 20\text{ V}$ | D44C Series D45C Series | t_r | | 0.3 0.2 | μs |
| Storage Time | $I_C = 1.0\text{ A}$, | D44C Series D45C Series | t_s | | 0.7 0.6 | μs |
| Fall Time | $I_{B1} = -I_{B2} = 100\text{ mA}$ | D44C Series D45C Series | t_f | | 0.4 0.3 | μs |

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

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

DC CURRENT GAIN



FORWARD BIAS SAFE OPERATING AREA

