## 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.

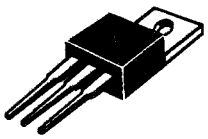
FEATURES:

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

**Boca Semiconductor Corp.**
**BSC**
**http://www.bocasemi.com**

| NPN | PNP |
|---|---|
| D44C Series | D45C Series |

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



TO-220

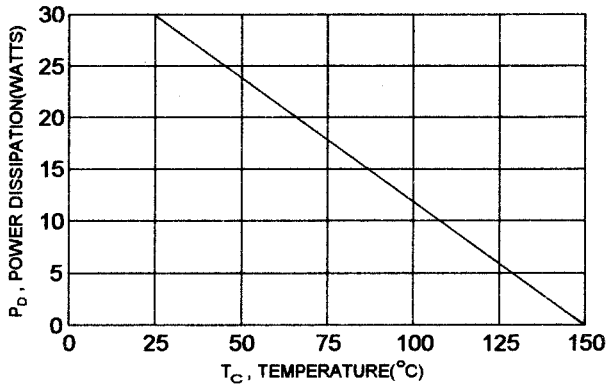
### MAXIMUM RATINGS

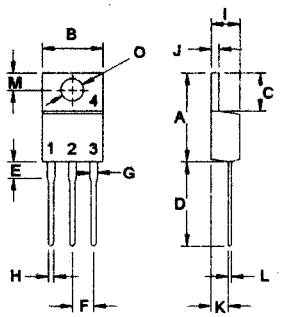
| Characteristic | Symbol | D44C1,2,3 D45C1,2,3 | D44C4,5,6 D45C4,5,6 | D44C7,8,9 D45C7,8,9 | D44C10,11,12 D45C10,11,12 | Unit |
|---|---|---|---|---|---|---|
| Collector-Emitter Voltage | $V_{CEO}$ | 30 | 45 | 60 | 80 | V |
| Collector-Emitter Voltage | $V_{CES}$ | 40 | 55 | 70 | 90 | V |
| Emitter-Base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

### THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|---|---|---|---|
| Thermal Resistance Junction to Case | RθjC | 4.2 | °C/W |

FIGURE -1 POWER DERATING




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 |

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

| Characteristic | | Symbol | Min | Max | Unit |
|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | |
| Collector-Base Cutoff Current ( $V_{CE}$= Rated $V_{CES}$ ) | | $I_{CES}$ | | 10 | uA |
| Emitter-Base Cutoff Current ( $V_{EB}$= 5.0 V, $I_C$ = 0 ) | | $I_{EBO}$ | | 100 | uA |
| **ON CHARACTERISTICS(1)** | | | | | |
| DC Current Gain | | hFE | | | |
| ( $I_C$= 0.2 A, $V_{CE}$= 1.0 V ) | D44C3,6,9,12/ D45C3,6,9,12 | | 40 | 120 | |
| | D44C2,5,8,11 | | 100 | 220 | |
| | D45C2,5,8,11 | | 40 | 120 | |
| | D44C1,4,7,10/D45C1,4,7,10 | | 25 | | |
| ( $I_C$= 1.0 A, $V_{CE}$= 1.0 V ) | D44C1,4,7,10/D45C1,4,7,10 | | 10 | | |
| | D45C2,5,8,11 | | 20 | | |
| ( $I_C$= 2.0 A, $V_{CE}$= 1.0 V ) | D44C3,6,9,12/ D45C3,6,9,12 | | 20 | | |
| | D44C2,5,8,11 | | 20 | | |
| Collector-Emitter Saturation Voltage | | $V_{CE(sat)}$ | | | V |
| ( $I_C$= 1.0 A, $I_B$= 50 mA ) | D44C2,3,5,6,8,9,11,12 | | | 0.5 | |
| | D45C2,3,5,6,8,9,11,12 | | | 0.5 | |
| ( $I_C$= 1.0 A, $I_B$= 100 mA ) | D44C1,4,7,10/D45C1,4,7,10 | | | 0.5 | |
| Base-Emitter Saturation Voltage ( $I_C$= 1.0 A, $I_B$= 100 mA ) | All Devices | $V_{BE(sat)}$ | | 1.3 | V |
| **DYAMIC CHARATERISTICS** | | | | | |
| Current-Gain Bandwidth Product (2) ( $I_C$= 20 mA, $V_{CE}$= 4.0 V, f = 1.0 MHz ) | D44C Series | $f_T$ | 50(typ) | | MHz |
| | D45C Series | | 40(typ) | | |

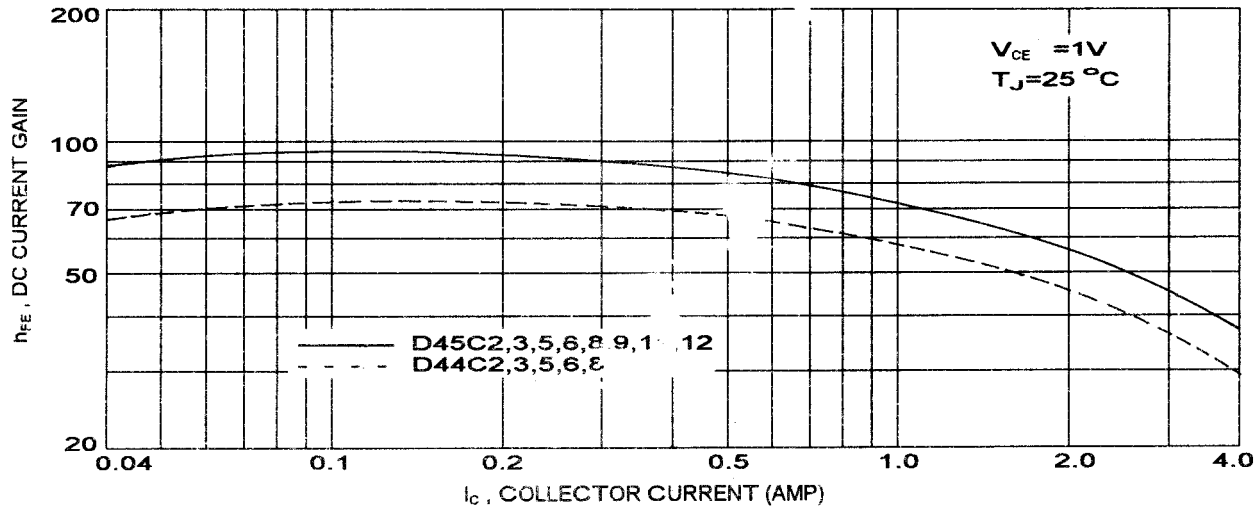
## SWITCHING CHARATERISTICS

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

(1) Pulse Test: Pulse width = 300 us , Duty Cycle ≦ 2.0%

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

DC CURRENT GAIN




FORWARD BIAS SAFE OPERATING AREA