



# SOLID STATE INC.

46 FARRAND STREET  
BLOOMFIELD, NEW JERSEY 07003

www.solidstateinc.com

## 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.

<b>NPN</b>	<b>PNP</b>
<b>D44C</b>	<b>D45C</b>
<b>Series</b>	<b>Series</b>

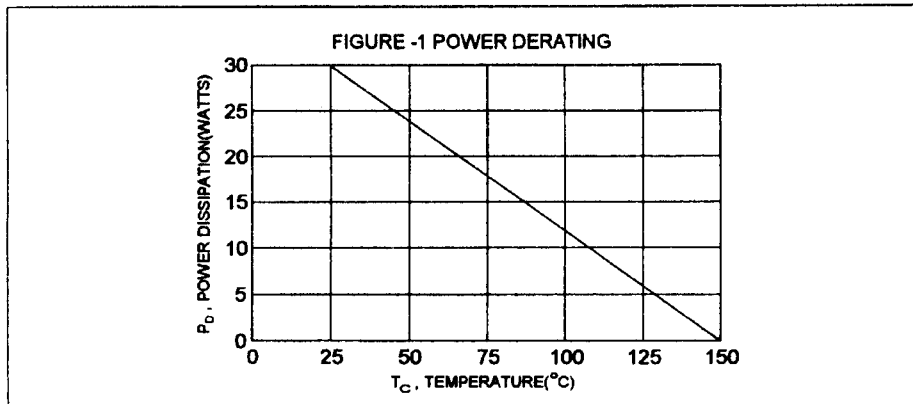
**4 AMPERE**  
**COMPLEMENTARY SILICON**  
**POWER TRANSISTORS**  
**30-80 VOLTS**  
**30 WATTS**

## 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	$I_C$	4.0				A
Peak	$I_{CM}$	6.0				
Base Current	$I_B$	1.0				A
Total Power Dissipation @ $T_C = 25^\circ C$ Derate above $25^\circ C$	$P_D$	30				W
		0.24				$W/^\circ C$
Operating and Storage Junction Temperature Range	$T_J, T_{STG}$	-55 to +150				$^\circ C$

## THERMAL CHARACTERISTICS

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



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	$\mu\text{A}$
Emitter-Base Cutoff Current ( $V_{EB} = 5.0 \text{ V}, I_C = 0$ )	$I_{EBO}$		100	$\mu\text{A}$

**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

**DYNAMIC CHARACTERISTICS**

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
--	----------------------------	-------	--------------------	--	-----

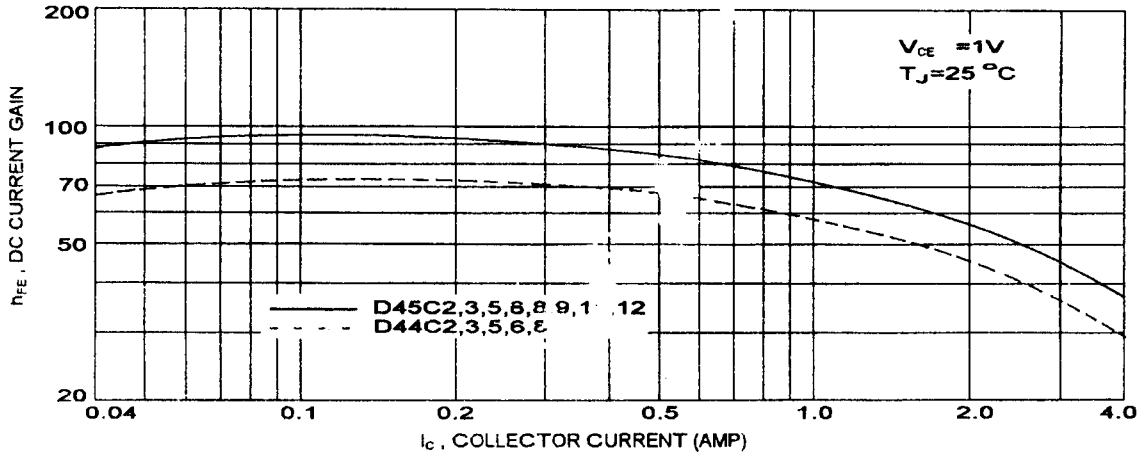
**SWITCHING CHARACTERISTICS**

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

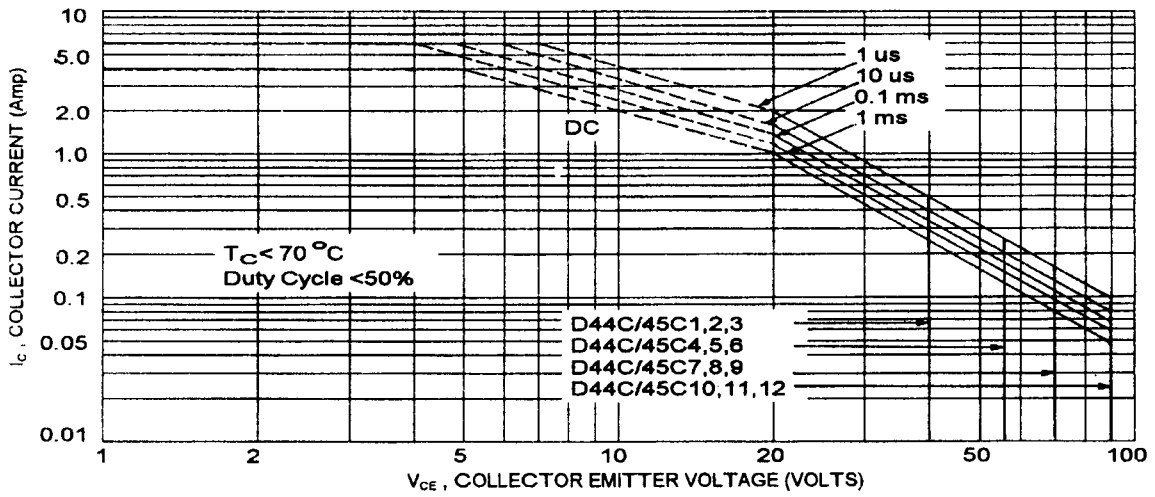
(1) Pulse Test: Pulse width = 300  $\mu\text{s}$  , Duty Cycle  $\leq 2.0\%$

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

DC CURRENT GAIN

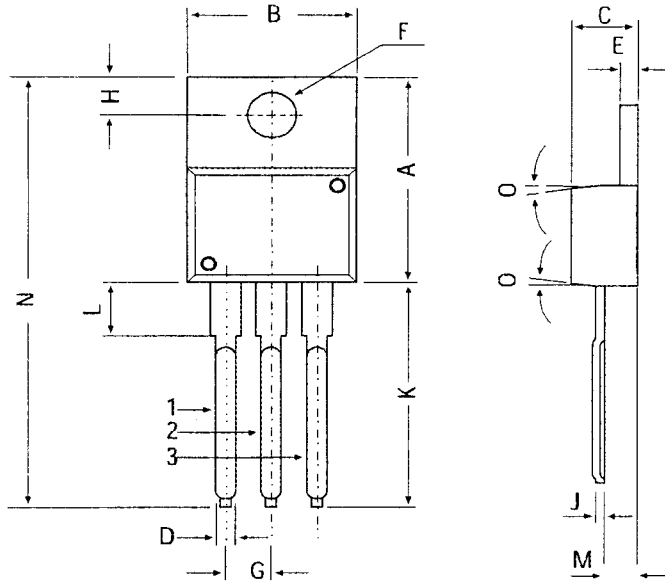


FORWARD BIAS SAFE OPERATING AREA



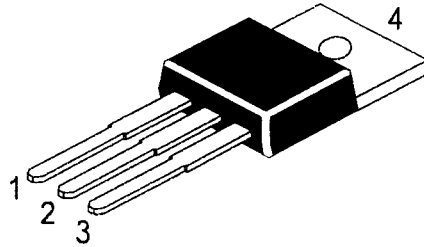
**TO-220  
Plastic Package**

**TO-220 Plastic Package**



DIM	MIN	MAX
A	14.42	16.51
B	9.63	10.67
C	3.56	4.83
D	—	0.90
E	1.15	1.40
F	3.75	3.88
G	2.29	2.79
H	2.54	3.43
J	—	0.56
K	12.70	14.73
L	2.80	4.07
M	2.03	2.92
N	—	31.24
O	7 DEG	

All dimensions in mm.



**Pin Configuration**

1. Base
2. Collector
3. Emitter
4. Collector