

## 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:

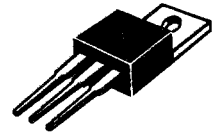
- \* Very Low Collector Saturation Voltage
- \* Excellent Linearity
- \* Fast Switching
- \* PNP Values are Negative, Observe Proper Polarity.

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

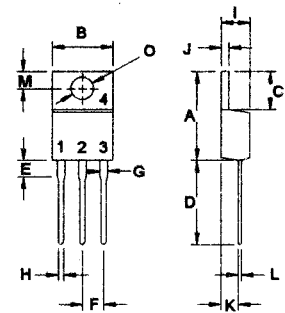
**4 AMPERE**  
**COMPLEMENTARY SILICON**  
**POWER TRANSISTORS**  
**30-80 VOLTS**  
**30 WATTS**

### 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 @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	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



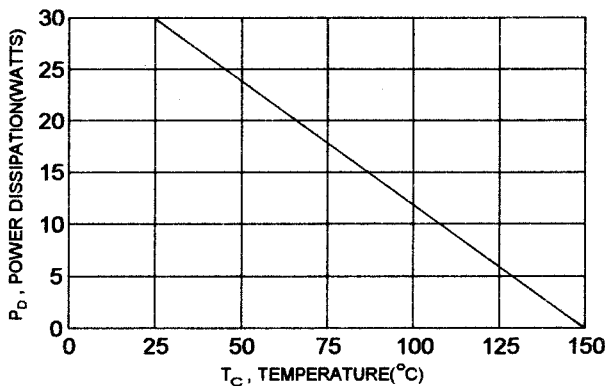
PIN 1.BASE  
 2.COLLECTOR  
 3.EMITTER  
 4.COLLECTOR(CASE)

### THERMAL CHARACTERISTICS

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

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



D44C Series NPN / D45C Series PNP

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

Characteristic	Symbol	Min	Max	Unit
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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
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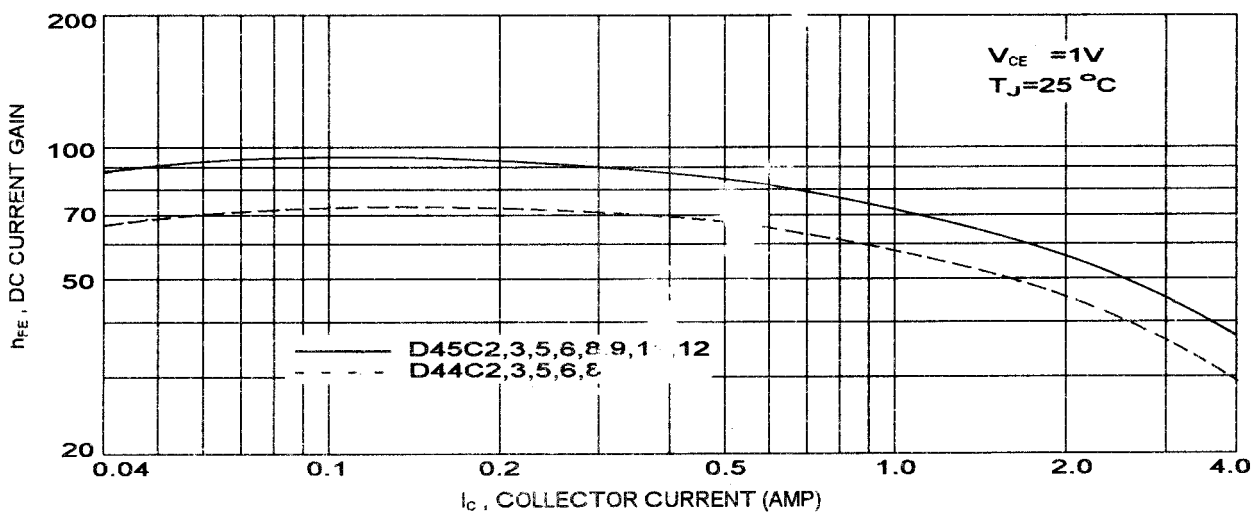
SWITCHING CHARACTERISTICS

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

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

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

DC CURRENT GAIN



FORWARD BIAS SAFE OPERATING AREA

