Complementary Silicon Power Transistors

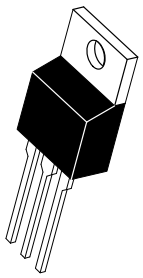
NPN
D44H Series*
PNP
D45H Series*

*Motorola Preferred Device

. . . for general purpose power amplification and switching such as output or driver stages in applications such as switching regulators, converters and power amplifiers.

- Low Collector–Emitter Saturation Voltage
  $V_{CE(sat)}$ = 1.0 V (Max) @ 8.0 A
- Fast Switching Speeds
- Complementary Pairs Simplifies Designs

10 AMPERE COMPLEMENTARY SILICON POWER TRANSISTORS 60, 80 VOLTS



CASE 221A–06
TO–220AB

MAXIMUM RATINGS

Rating	Symbol	D44H or D45H		Unit
		8	10, 11	
Collector–Emitter Voltage	V_{CEO}	60	80	Vdc
Emitter Base Voltage	V_{EB}	5.0		Vdc
Collector Current — Continuous — Peak (1)	I_C	10 20		Adc
Total Power Dissipation @ T_C = 25°C @ T_A = 25°C	P_D	 50 1.67		Watts
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	$R_{\theta JC}$	2.5	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	75	°C/W
Maximum Lead Temperature for Soldering Purposes: 1/8″ from Case for 5 Seconds	T_L	275	°C

(1) Pulse Width ≤ 6.0 ms, Duty Cycle ≤ 50%.

ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
DC Current Gain (V_{CE} = 1.0 Vdc, I_C = 2.0 Adc)	D44H10 D45H10	h_{FE}	35	—	—
	D44H8,11 D44H8,11		60	—	
(V_{CE} = 1.0 Vdc, I_C = 4.0 Adc)	D44H10 D45H10		20	—	
	D44H8,11 D45H8,11		40	—	

Preferred devices are Motorola recommended choices for future use and best overall value.

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

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector Cutoff Current (V_{CE} = Rated V_{CEO}, V_{BE} = 0)		I_{CES}	—	—	10	μA
Emitter Cutoff Current (V_{EB} = 5.0 Vdc)		I_{EBO}	—	—	100	μA
ON CHARACTERISTICS						
Collector–Emitter Saturation Voltage		$V_{CE(sat)}$				Vdc
(I_C = 8.0 Adc, I_B = 0.4 Adc)	D44H/D45H8,11		—	—	1.0	
(I_C = 8.0 Adc, I_B = 0.8 Adc)	D44H/D45H10		—	—	1.0	
Base–Emitter Saturation Voltage (I_C = 8.0 Adc, I_B = 0.8 Adc)		$V_{BE(sat)}$	—	—	1.5	Vdc
DYNAMIC CHARACTERISTICS						
Collector Capacitance		C_{cb}				pF
(V_{CB} = 10 Vdc, f_{test} = 1.0 MHz)	D44H Series		—	130	—	
	D45H Series		—	230	—	
Gain Bandwidth Product		f_T				MHz
(I_C = 0.5 Adc, V_{CE} = 10 Vdc, f = 20 MHz)	D44H Series		—	50	—	
	D45H Series		—	40	—	
SWITCHING TIMES						
Delay and Rise Times		$t_d + t_r$				ns
(I_C = 5.0 Adc, I_{B1} = 0.5 Adc)	D44H Series		—	300	—	
	D45H Series		—	135	—	
Storage Time		t_s				ns
(I_C = 5.0 Adc, I_{B1} = I_{B2} = 0.5 Adc)	D44H Series		—	500	—	
	D45H Series		—	500	—	
Fall Time		t_f				ns
(I_C = 5.0 Adc, I_{B1} = 102 = 0.5 Adc)	D44H Series		—	140	—	
	D45H Series		—	100	—	

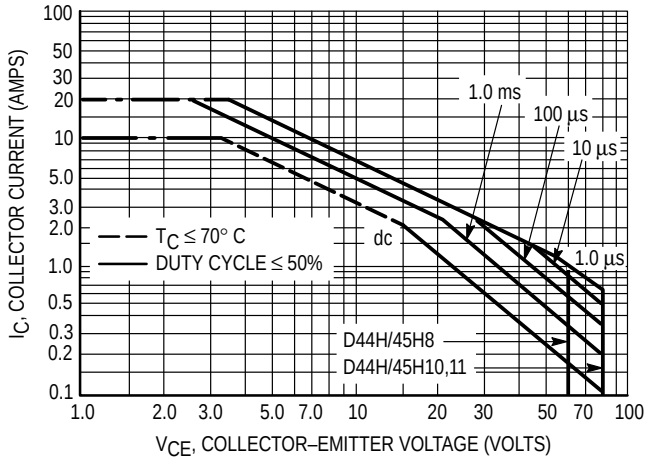
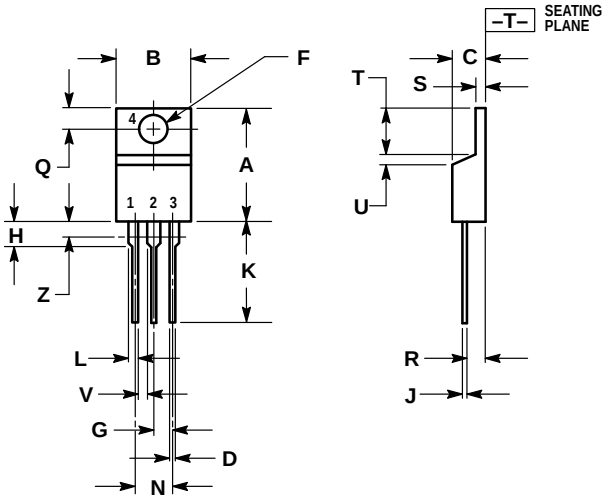


Figure 1. Maximum Rated Forward Bias Safe Operating Area

PACKAGE DIMENSIONS



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.570	0.620	14.48	15.75
B	0.380	0.405	9.66	10.28
C	0.160	0.190	4.07	4.82
D	0.025	0.035	0.64	0.88
F	0.142	0.147	3.61	3.73
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.018	0.025	0.46	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.15	1.39
T	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
V	0.045	—	1.15	—
Z	—	0.080	—	2.04

STYLE 1:
PIN 1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

CASE 221A–06
TO–220AB
ISSUE Y

How to reach us:
USA / EUROPE: Motorola Literature Distribution;
P.O. Box 20912; Phoenix, Arizona 85036. 1–800–441–2447

MFAX: RMFAX0@email.sps.mot.com – TOUCHTONE (602) 244–6609
INTERNET: http://Design–NET.com

JAPAN: Nippon Motorola Ltd.; Tatsumi–SPD–JLDC, Toshikatsu Otsuki,
6F Seibu–Butsuryu–Center, 3–14–2 Tatsumi Koto–Ku, Tokyo 135, Japan. 03–3521–8315

HONG KONG: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852–26629298