

Complementary Silicon Power Transistors

... 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
 $V_{CE(sat)} = 1.0 \text{ V (Max) @ } 8.0 \text{ A}$
- Fast Switching Speeds
- Complementary Pairs Simplifies Designs

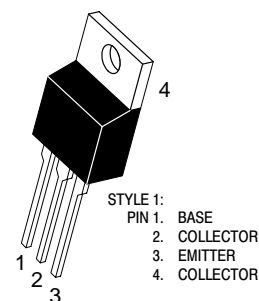
**NPN
D44H Series*
PNP
D45H Series***

*ON Semiconductor Preferred Device

**10 AMPERE
COMPLEMENTARY
SILICON
POWER TRANSISTORS
60, 80 VOLTS**

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 @ $T_C = 25^\circ\text{C}$ @ $T_A = 25^\circ\text{C}$ | P_D | 50 1.67 | | Watts |
| Operating and Storage Junction Temperature Range | T_J, T_{stg} | –55 to 150 | | $^\circ\text{C}$ |



**CASE 221A–06
TO–220AB**

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|---|-----------------|-----|--------------------|
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 2.5 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 75 | $^\circ\text{C/W}$ |
| Maximum Lead Temperature for Soldering Purposes: 1/8" from Case for 5 Seconds | T_L | 275 | $^\circ\text{C}$ |

(1) Pulse Width $\leq 6.0 \text{ ms}$, Duty Cycle $\leq 50\%$.

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

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

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

D44H Series D45H Series

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

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

OFF CHARACTERISTICS

| | | | | | |
|--|-----------|---|---|-----|---------------|
| Collector Cutoff Current ($V_{CE} = \text{Rated } V_{CEO}, V_{BE} = 0$) | I_{CES} | — | — | 10 | μA |
| Emitter Cutoff Current ($V_{EB} = 5.0 \text{ Vdc}$) | I_{EBO} | — | — | 100 | μA |

ON CHARACTERISTICS

| | | | | | | |
|--|------------------------------|----------------------|---|---|-----|-----|
| Collector–Emitter Saturation Voltage ($I_C = 8.0 \text{ Adc}, I_B = 0.4 \text{ Adc}$) ($I_C = 8.0 \text{ Adc}, I_B = 0.8 \text{ Adc}$) | | $V_{CE(\text{sat})}$ | — | — | 1.0 | Vdc |
| | D44H/D45H8,11 D44H/D45H10 | | | | 1.0 | |
| Base–Emitter Saturation Voltage ($I_C = 8.0 \text{ Adc}, I_B = 0.8 \text{ Adc}$) | | $V_{BE(\text{sat})}$ | — | — | 1.5 | Vdc |

DYNAMIC CHARACTERISTICS

| | | | | | | |
|--|----------------------------|----------|---|-----|---|-----|
| Collector Capacitance ($V_{CB} = 10 \text{ Vdc}, f_{\text{test}} = 1.0 \text{ MHz}$) | | C_{cb} | — | 130 | — | pF |
| | D44H Series D45H Series | | | 230 | — | |
| Gain Bandwidth Product ($I_C = 0.5 \text{ Adc}, V_{CE} = 10 \text{ Vdc}, f = 20 \text{ MHz}$) | | f_T | — | 50 | — | MHz |
| | D44H Series D45H Series | | | 40 | — | |

SWITCHING TIMES

| | | | | | | |
|--|----------------------------|-------------|---|-----|---|----|
| Delay and Rise Times ($I_C = 5.0 \text{ Adc}, I_{B1} = 0.5 \text{ Adc}$) | | $t_d + t_r$ | — | 300 | — | ns |
| | D44H Series D45H Series | | | 135 | — | |
| Storage Time ($I_C = 5.0 \text{ Adc}, I_{B1} = I_{B2} = 0.5 \text{ Adc}$) | | t_s | — | 500 | — | ns |
| | D44H Series D45H Series | | | 500 | — | |
| Fall Time ($I_C = 5.0 \text{ Adc}, I_{B1} = I_{B2} = 0.5 \text{ Adc}$) | | t_f | — | 140 | — | ns |
| | D44H Series D45H Series | | | 100 | — | |

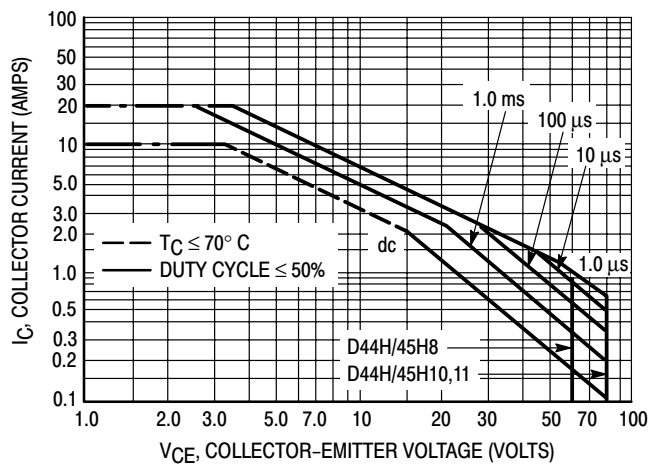
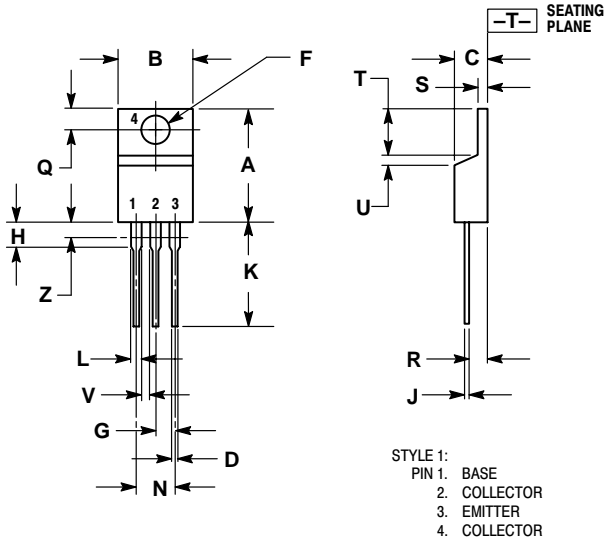


Figure 1. Maximum Rated Forward Bias Safe Operating Area

D44H Series D45H Series

PACKAGE DIMENSIONS

TO-220 CASE 221A-09 ISSUE AA




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.

| DIM | INCHES | | MILLIMETERS | |
|-----|--------|-------|-------------|-------|
| | 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 |

D44H Series D45H Series

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