

Complementary Silicon Power Transistors

These complementary silicon power transistors are designed for high-speed switching applications, such as switching regulators and high frequency inverters. The devices are also well-suited for drivers for high power switching circuits.

- Fast Switching —
 $t_f = 90 \text{ ns (Max)}$
- Key Parameters Specified @ 100°C
- Low Collector-Emitter Saturation Voltage —
 $V_{CE(sat)} = 1.0 \text{ V (Max) @ 8.0 A}$
- Complementary Pairs Simplify Circuit Designs

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|--|----------------|------------|-------|
| Collector-Emitter Voltage | V_{CEO} | 80 | Vdc |
| Collector-Emitter Voltage | V_{CEV} | 100 | Vdc |
| Emitter Base Voltage | V_{EB} | 7.0 | Vdc |
| Collector Current — Continuous | I_C | 15 | Adc |
| — Peak (1) | I_{CM} | 20 | |
| Total Power Dissipation @ $T_C = 25^\circ\text{C}$ | P_D | 83 | Watts |
| Derate above 25°C | | 0.67 | W/°C |
| Operating and Storage Junction Temperature Range | T_J, T_{stg} | -55 to 150 | °C |

THERMAL CHARACTERISTICS

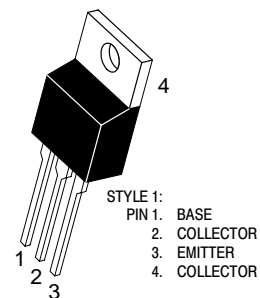
| Characteristic | Symbol | Max | Unit |
|--|-----------------|------|------|
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 1.5 | °C/W |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 62.5 | °C/W |
| Maximum Lead Temperature for Soldering Purposes: 1/8" from Case for 5 Seconds | T_L | 275 | °C |

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

NOTE: All polarities are shown for NPN transistors. For PNP transistors, reverse polarities.

**NPN
D44VH
PNP
D45VH**

**15 AMPERE
COMPLEMENTARY
SILICON
POWER TRANSISTORS
80 VOLTS
83 WATTS**



**CASE 221A-09
TO-220AB**

D44VH D45VH

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

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

OFF CHARACTERISTICS

| | | | | | |
|--|-----------------------|----|---|-----------|------------------|
| Collector–Emitter Sustaining Voltage (2) (I _C = 25 mA _{dc} , I _B = 0) | V _{CEO(sus)} | 80 | — | — | V _{dc} |
| Collector–Emitter Cutoff Current (V _{CE} = Rated V _{CEV} , V _{BE(off)} = 4.0 V _{dc}) (V _{CE} = Rated V _{CEV} , V _{BE(off)} = 4.0 V _{dc} , T _C = 100°C) | I _{CEV} | — | — | 10 100 | μA _{dc} |
| Emitter Base Cutoff Current (V _{EB} = 7.0 V _{dc} , I _C = 0) | I _{EBO} | — | — | 10 | μA _{dc} |

ON CHARACTERISTICS (2)

| | | | | | |
|---|----------------------|------------------|------------------|--------------------------|-----------------|
| DC Current Gain (I _C = 2.0 A _{dc} , V _{CE} = 1.0 V _{dc}) (I _C = 4.0 A _{dc} , V _{CE} = 1.0 V _{dc}) | h _{FE} | 35 20 | — — | — — | — |
| Collector–Emitter Saturation Voltage (I _C = 8.0 A _{dc} , I _B = 0.4 A _{dc}) (I _C = 8.0 A _{dc} , I _B = 0.8 A _{dc}) (I _C = 15 A _{dc} , I _B = 3.0 A _{dc} , T _C = 100°C) | V _{CE(sat)} | — — — — | — — — — | 0.4 1.0 0.8 1.5 | V _{dc} |
| Base–Emitter Saturation Voltage (I _C = 8.0 A _{dc} , I _B = 0.4 A _{dc}) (I _C = 8.0 A _{dc} , I _B = 0.8 A _{dc}) (I _C = 8.0 A _{dc} , I _B = 0.4 A _{dc} , T _C = 100°C) (I _C = 8.0 A _{dc} , I _B = 0.8 A _{dc} , T _C = 100°C) | V _{BE(sat)} | — — — — | — — — — | 1.2 1.0 1.1 1.5 | V _{dc} |

DYNAMIC CHARACTERISTICS

| | | | | | |
|--|-----------------|--------|------------|--------|-----|
| Current Gain Bandwidth Product (I _C = 0.1 A _{dc} , V _{CE} = 10 V _{dc} , f = 20 MHz) | f _T | — | 50 | — | MHz |
| Output Capacitance (V _{CB} = 10 V _{dc} , I _C = 0, f _{test} = 1.0 MHz) | C _{ob} | — — | 120 275 | — — | pF |

SWITCHING CHARACTERISTICS

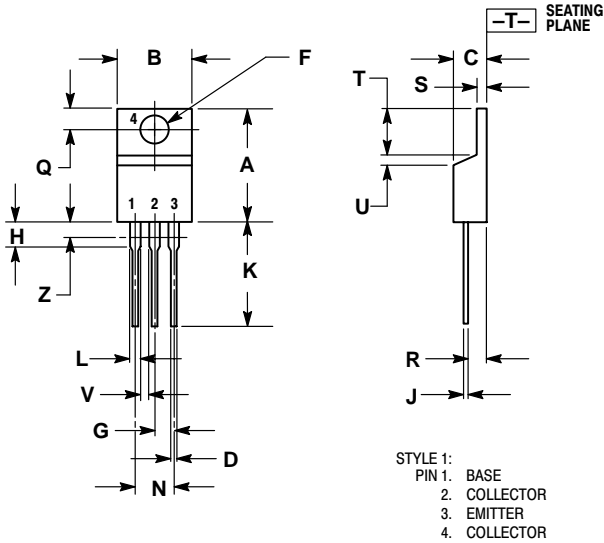
| | | | | | | |
|--------------|---|----------------|---|---|-----|----|
| Delay Time | (V _{CC} = 20 V _{dc} , I _C = 8.0 A _{dc} , I _{B1} = I _{B2} = 0.8 A _{dc}) | t _d | — | — | 50 | ns |
| Rise Time | | t _r | — | — | 250 | |
| Storage Time | | t _s | — | — | 700 | |
| Fall Time | | t _f | — | — | 90 | |

(2) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.

D44VH D45VH

PACKAGE DIMENSIONS


TO-220AB 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 |

D44VH D45VH

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