

BUX85

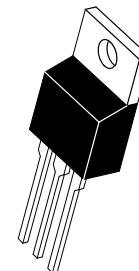
**2 AMPERES
POWER TRANSISTOR
NPN SILICON
450 VOLTS
50 WATTS**

**SWITCHMODE
NPN Silicon Power Transistors**

The BUX85 is designed for high voltage, high speed power switching applications like converters, inverters, switching regulators, motor control systems.

SPECIFICATIONS FEATURES:

- $V_{CEO(sus)}$ 450 V
- $V_{CES(sus)}$ 1000 V
- Fall time = 0.3 μ s (typ) at $I_C = 1.0$ A
- $V_{CE(sat)}$ = 1.0 V (max) at $I_C = 1.0$ A, $I_B = 0.2$ A



**CASE 221A-06
TO-220AB**

MAXIMUM RATINGS

| Rating | Symbol | BUX84 | BUX85 | Unit |
|---|-------------------|-------------|-------|-------------------------------|
| Collector–Emitter Voltage | $V_{CEO(sus)}$ | 400 | 450 | Vdc |
| Collector–Emitter Voltage | V_{CES} | 800 | 1000 | Vdc |
| Emitter Base Voltage | V_{EBO} | 5 | | Vdc |
| Collector Current — Continuous — Peak (1) | I_C I_{CM} | 2 3.0 | | Adc |
| Base Current — Continuous — Peak (1) | I_B I_{BM} | 0.75 1.0 | | Adc |
| Reverse Base Current — Peak | I_{BM} | 1 | | Adc |
| Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C | P_D | 50 400 | | Watts mW/ $^\circ\text{C}$ |
| Operating and Storage Junction Temperature Range | T_J, T_{stg} | –65 to +150 | | $^\circ\text{C}$ |

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|---|-----------------|------|---------------------------|
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 2.5 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 62.5 | $^\circ\text{C}/\text{W}$ |
| Maximum Lead Temperature for Soldering Purpose: 1/8" from Case for 5 Seconds | T_L | 275 | $^\circ\text{C}$ |

(1) Pulse Test: Pulse Width = 5 ms, Duty Cycle \leq 10%.

SWITCHMODE is a trademark of Motorola, Inc.

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BUX85**ELECTRICAL CHARACTERISTICS** ($T_C = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|--|----------------|--------|--------|------------|------|
| OFF CHARACTERISTICS (1) | | | | | |
| Collector–Emitter Sustaining Voltage ($I_C = 100\text{ mAdc}$, $L = 25\text{ mH}$) See fig. 1 | $V_{CEO(sus)}$ | 450 | — | — | Vdc |
| Collector Cutoff Current ($V_{CES} = \text{Rated Value}$) ($V_{CES} = \text{Rated Value}$, $T_C = 125^\circ\text{C}$) | I_{CES} | — — | — — | 0.2 1.5 | mAdc |
| Emitter Cutoff Current ($V_{EB} = 5\text{ Vdc}$, $I_C = 0$) | I_{EBO} | — | — | 1 | mAdc |

ON CHARACTERISTICS (1)

| | | | | | |
|---|---------------|--------|--------|----------|-----|
| DC Current Gain ($I_C = 0.1\text{ Adc}$, $V_{CE} = 5\text{ V}$) | h_{FE} | 30 | 50 | — | — |
| Collector–Emitter Saturation Voltage ($I_C = 0.3\text{ Adc}$, $I_B = 30\text{ mAdc}$) ($I_C = 1\text{ Adc}$, $I_B = 200\text{ mAdc}$) | $V_{CE(sat)}$ | — — | — — | 0.8 1 | Vdc |
| Base–Emitter Saturation Voltage ($I_C = 1\text{ Adc}$, $I_B = 0.2\text{ Adc}$) | $V_{BE(sat)}$ | — | — | 1.1 | Vdc |

DYNAMIC CHARACTERISTICS

| | | | | | |
|---|-------|---|---|---|-----|
| Current–Gain — Bandwidth Product ($I_C = 500\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$, $f = 1\text{ MHz}$) | f_T | 4 | — | — | MHz |
|---|-------|---|---|---|-----|

SWITCHING CHARACTERISTICS

| | | | | | | |
|--------------|---|--|-------|-----|-----|---------------|
| Turn–on Time | $V_{CC} = 250\text{ Vdc}$, $I_C = 1\text{ A}$ $I_{B1} = 0.2\text{ A}$, $I_{B2} = 0.4\text{ A}$ See fig. 2 | t_{on} | — | 0.3 | 0.5 | μs |
| Storage Time | | t_s | — | 2 | 3.5 | μs |
| Fall Time | | t_f | — | 0.3 | — | μs |
| Fall Time | | Same above cond. at $T_C = 95^\circ\text{C}$ | t_f | — | — | 1.4 |

(1) Pulse Test: $PW = 300\ \mu\text{s}$, Duty Cycle $\leq 2\%$.

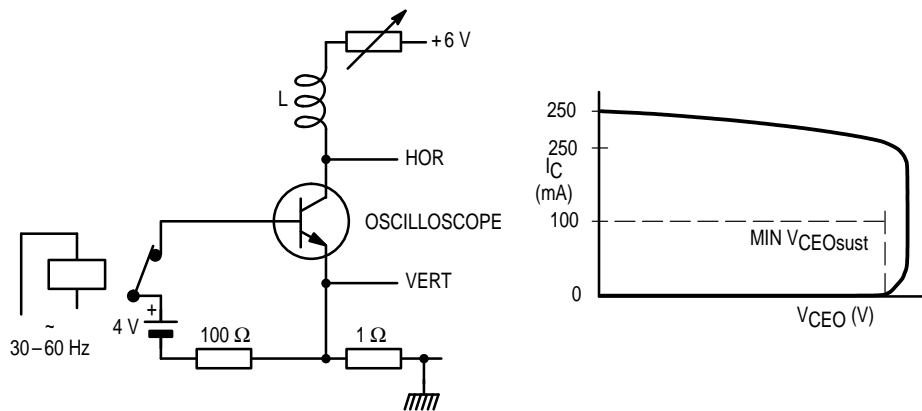


Figure 1. Test Circuit for $V_{CEOsust}$

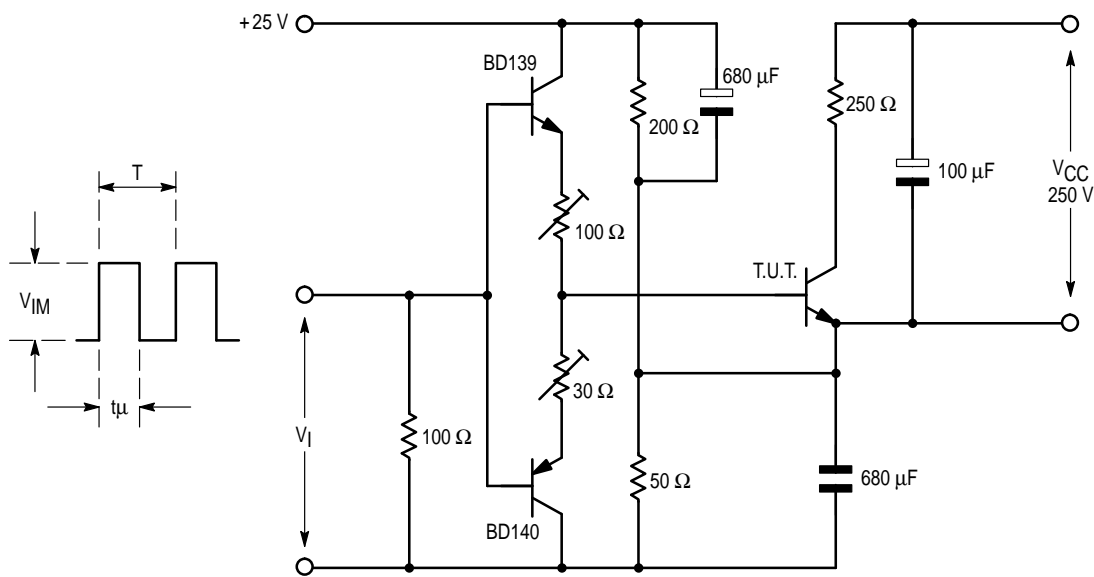
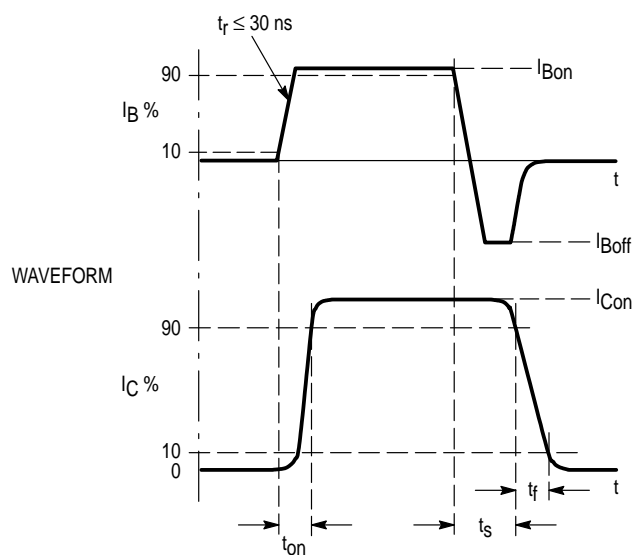
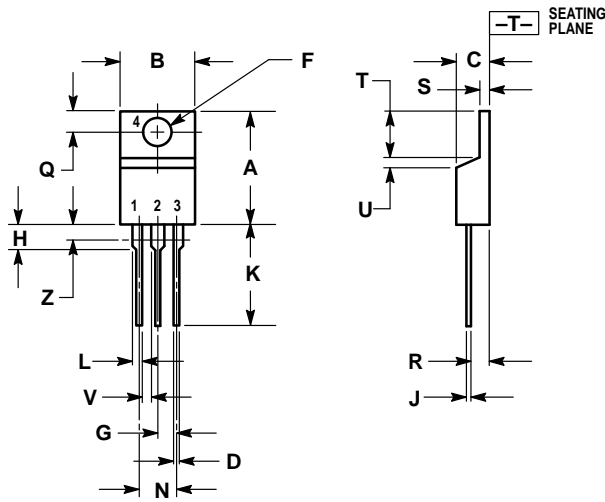


Figure 2. Switching Times/Test Circuit

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.

| 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 |

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

**CASE 221A-06
 TO-220AB
 ISSUE Y**

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