

# BUX85G

## SWITCHMODE™ NPN Silicon Power Transistors

The BUX85G is designed for high voltage, high speed power switching applications like converters, inverters, switching regulators, motor control systems.

### Features

- $V_{CEO(sus)}$  – 450 V
- $V_{CES(sus)}$  – 1000 V
- Fall time = 0.3  $\mu$ 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
- These Devices are Pb-Free and are RoHS Compliant\*

### MAXIMUM RATINGS

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

### THERMAL CHARACTERISTICS

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

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

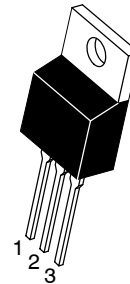
1. Pulse Test: Pulse Width = 5 ms, Duty Cycle  $\leq$  10%.



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**2.0 AMPERES  
POWER TRANSISTOR  
NPN SILICON  
450 VOLTS, 50 WATTS**



TO-220AB  
CASE 221A-09  
STYLE 1

### MARKING DIAGRAM



BUX85 = Device Code  
A = Assembly Location  
Y = Year  
WW = Work Week  
G = Pb-Free Package

### ORDERING INFORMATION

Device	Package	Shipping
BUX85G	TO-220 (Pb-Free)	50 Units / Rail

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

# BUX85G

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

Characteristic	Symbol	Min	Typ	Max	Unit	
<b>OFF CHARACTERISTICS</b> (Note 2)						
Collector–Emitter Sustaining Voltage ( $I_C = 100\text{ mA}$ , $L = 25\text{ mH}$ ) See Figure 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	
<b>ON CHARACTERISTICS</b> (Note 2)						
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	
<b>DYNAMIC CHARACTERISTICS</b>						
Current–Gain – Bandwidth Product ( $I_C = 500\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 1\text{ MHz}$ )	$f_T$	4	–	–	MHz	
<b>SWITCHING CHARACTERISTICS</b>						
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 Figure 2	$t_{on}$	–	0.3	0.5	$\mu\text{s}$
Storage Time		$t_s$	–	2	3.5	$\mu\text{s}$
Fall Time		$t_f$	–	0.3	–	$\mu\text{s}$
Fall Time		Same above cond. at $T_C = 95^\circ\text{C}$	$t_f$	–	–	1.4

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

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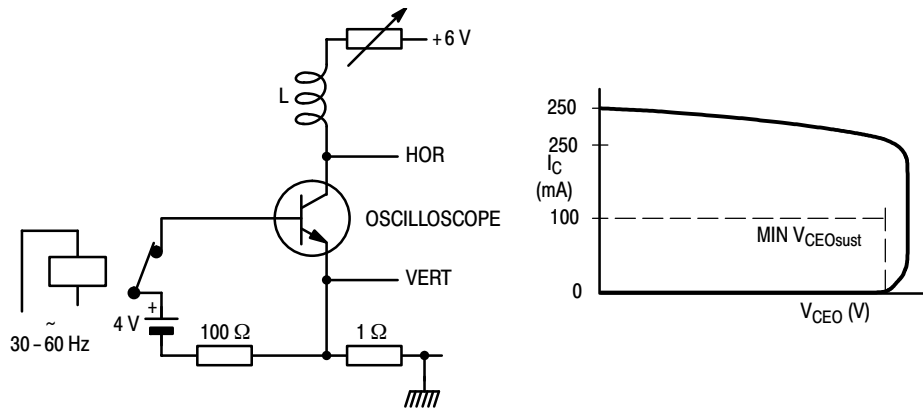


Figure 1. Test Circuit for  $V_{CEOsust}$

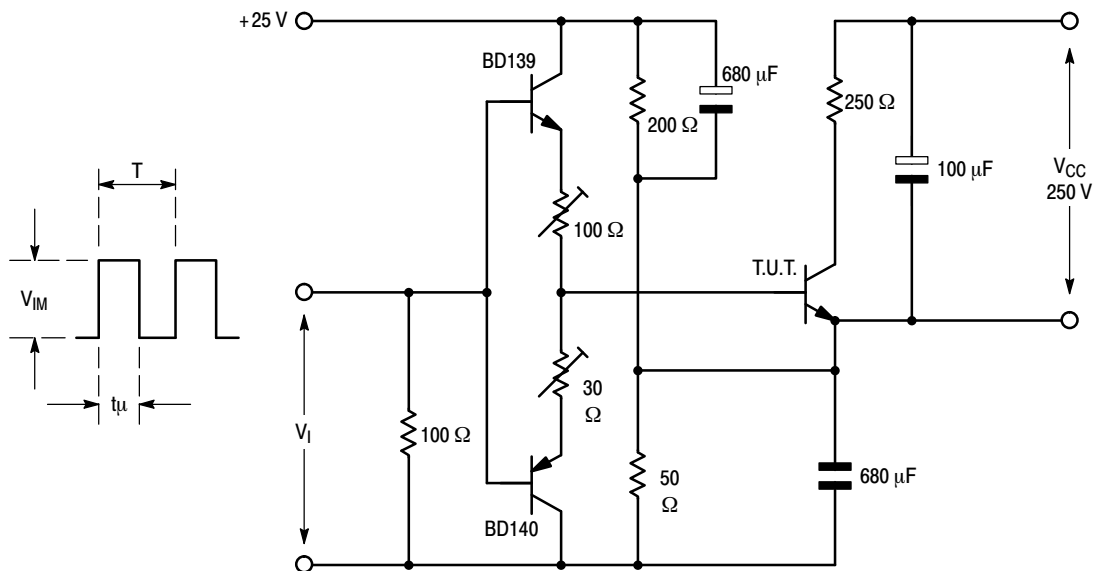
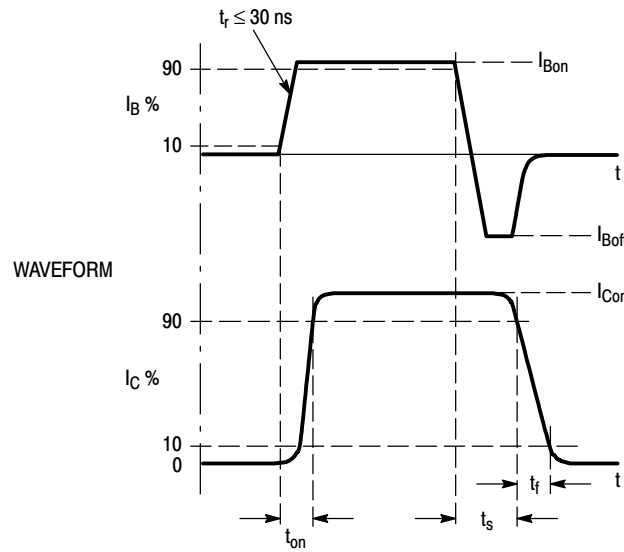
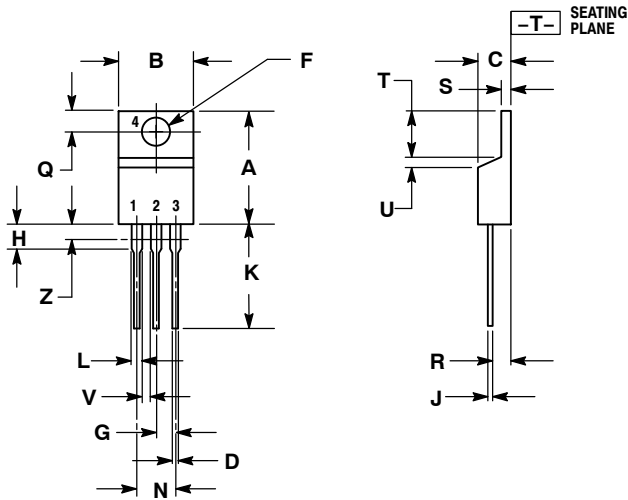


Figure 2. Switching Times/Test Circuit

# BUX85G

## PACKAGE DIMENSIONS

TO-220AB  
CASE 221A-09  
ISSUE AF



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	0.161	3.61	4.09
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.014	0.025	0.36	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:

1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

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