Switch-mode NPN Silicon Power Transistors

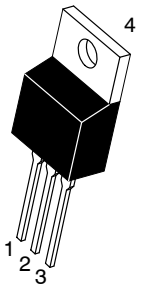
BUX85G

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

Features

- These Devices are Pb−Free and are RoHS Compliant*

2.0 AMPERES
POWER TRANSISTOR
NPN SILICON
450 VOLTS, 50 WATTS



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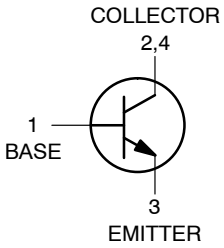
CASE 221A
STYLE 1



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	I_C	2	Adc
Collector Current − Peak (Note 1)	I_{CM}	3.0	Adc
Base Current − Continuous	I_B	0.75	Adc
Base Current − Peak (Note 1)	I_{BM}	1.0	Adc
Reverse Base Current − Peak	I_{BM}	1	Adc
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	50 0.4	W W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +150	°C

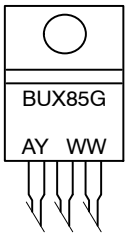
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.
1. Pulse Test: Pulse Width = 5 ms, Duty Cycle ≤ 10%.

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max	Unit
Thermal Resistance, Junction−to−Case	$R_{\theta JC}$	2.5	°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

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

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

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS (Note 2)					
Collector−Emitter Sustaining Voltage (I_C = 100 mAdc, (L = 25 mH) See Figure 1	$V_{CEO(sus)}$	450	–	–	Vdc
Collector Cutoff Current (V_{CES} = Rated Value) (V_{CES} = Rated Value, T_C = 125°C)	I_{CES}	 – –	 – –	 0.2 1.5	mAdc
Emitter Cutoff Current (V_{EB} = 5 Vdc, I_C = 0)	I_{EBO}	–	–	1	mAdc
ON CHARACTERISTICS (Note 2)					
DC Current Gain (I_C = 0.1 Adc, V_{CE} = 5 V)	h_{FE}	30	50	–	–
Collector−Emitter Saturation Voltage (I_C = 0.3 Adc, I_B = 30 mAdc) (I_C = 1 Adc, I_B = 200 mAdc)	$V_{CE(sat)}$	 – –	 – –	 0.8 1	Vdc
Base−Emitter Saturation Voltage (I_C = 1 Adc, I_B = 0.2 Adc)	$V_{BE(sat)}$	–	–	1.1	Vdc
DYNAMIC CHARACTERISTICS					
Current−Gain − Bandwidth Product (I_C = 500 mAdc, V_{CE} = 1 0 Vdc, f = 1 MHz)	f_T	4	–	–	MHz
SWITCHING CHARACTERISTICS					
Turn−on Time	V_{CC} = 250 Vdc, I_C = 1 A I_{B1} = 0.2 A, I_{B2} = 0.4 A See Figure 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°C	t_f	–	–	1.4	μs

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

2. Pulse Test: PW = 300 μs, Duty Cycle ≤2%.

TYPICAL CHARACTERISTICS

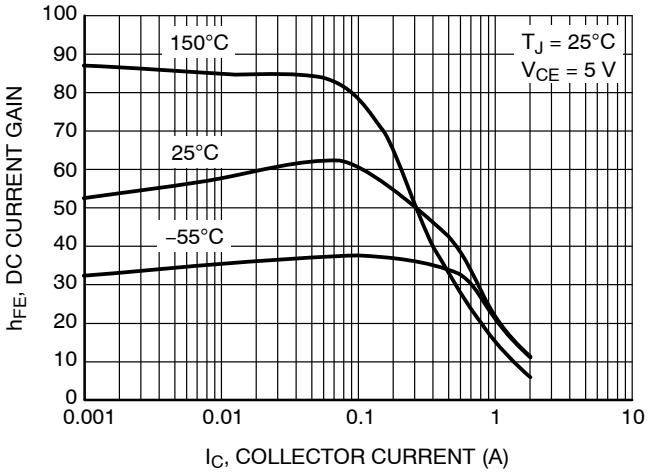


Figure 1. DC Current Gain

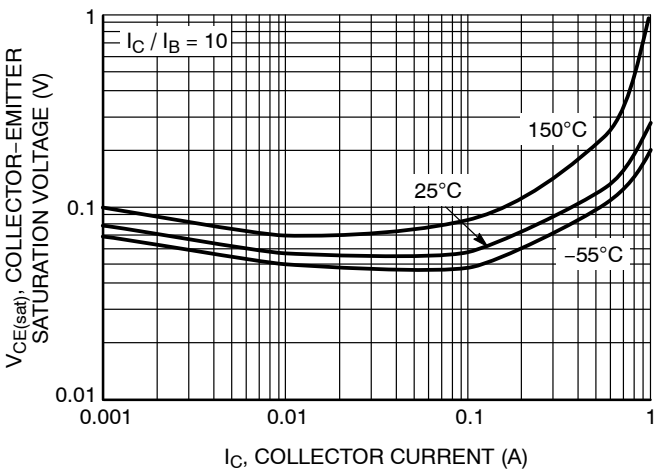


Figure 2. $V_{CE(sat)}$, Collector Emitter Saturation Voltage

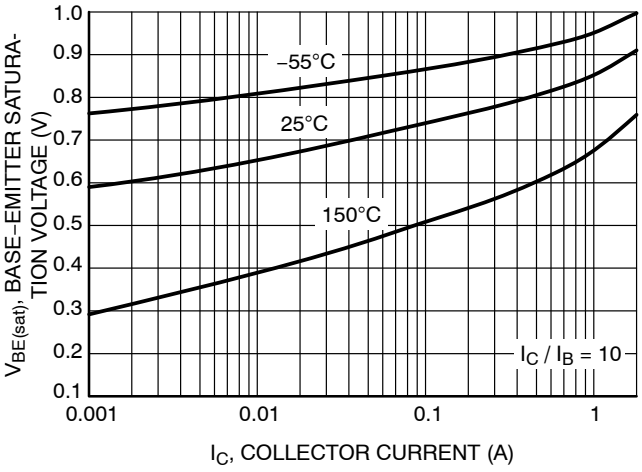


Figure 3. $V_{BE(sat)}$, Base Emitter Saturation Voltage

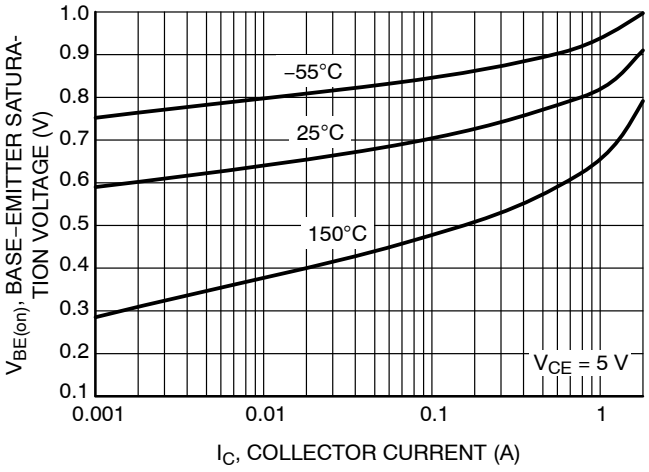


Figure 4. $V_{BE(on)}$, Base Emitter On Voltage

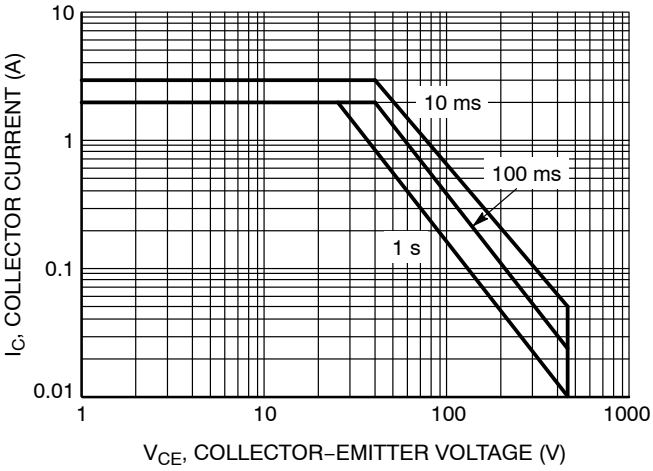


Figure 5. Safe Operating Area (SOA)

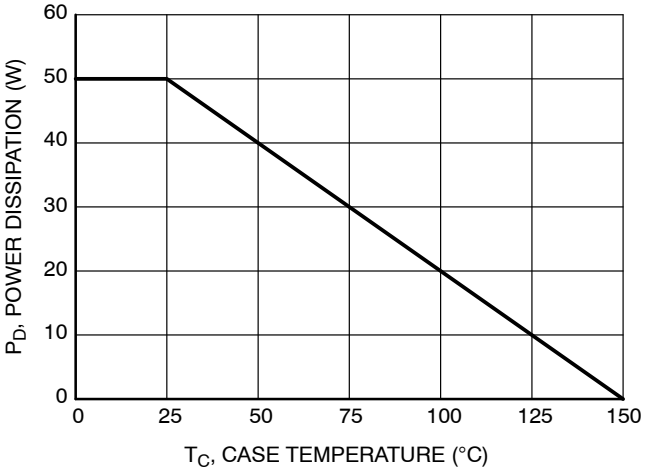


Figure 6. Power Derating

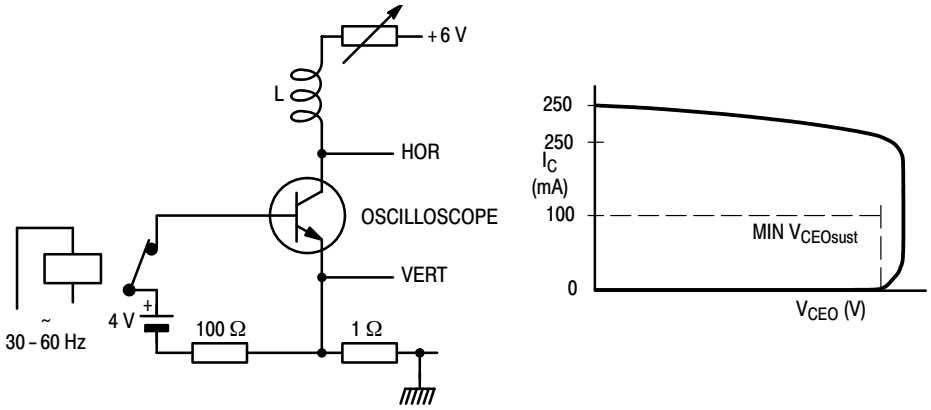


Figure 1. Test Circuit for $V_{CEOsust}$

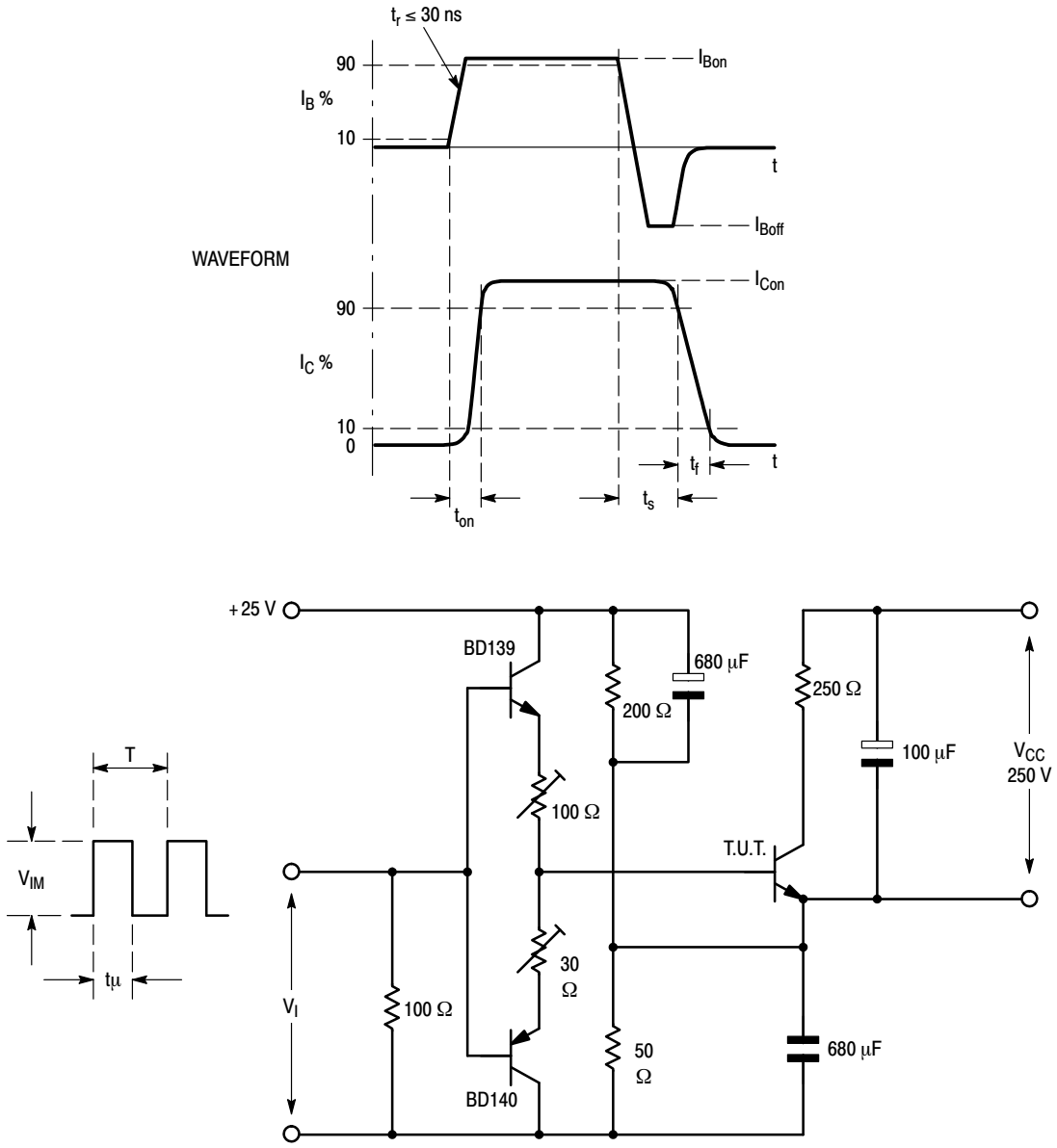


Figure 2. Switching Times/Test Circuit

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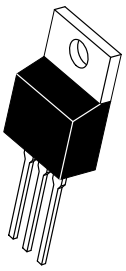
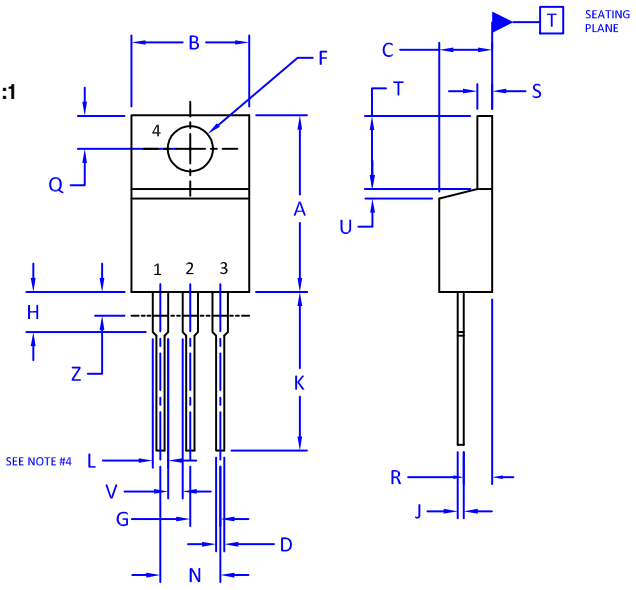


SCALE 1:1



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 2009.
2. CONTROLLING DIMENSION: INCHES
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.
4. MAX WIDTH FOR F102 DEVICE = 1.35MM

	INCHES		MILLIMETERS	
DIM	MIN.	MAX.	MIN.	MAX.
A	0.570	0.620	14.48	15.75
B	0.380	0.415	9.66	10.53
C	0.160	0.190	4.07	4.83
D	0.025	0.038	0.64	0.96
F	0.142	0.161	3.60	4.09
G	0.095	0.105	2.42	2.66
H	0.110	0.161	2.80	4.10
J	0.014	0.024	0.36	0.61
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	1.41
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

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

STYLE 3:
PIN 1. CATHODE
2. ANODE
3. GATE
4. ANODE

STYLE 4:
PIN 1. MAIN TERMINAL 1
2. MAIN TERMINAL 2
3. GATE
4. MAIN TERMINAL 2

STYLE 5:
PIN 1. GATE
2. DRAIN
3. SOURCE
4. DRAIN

STYLE 6:
PIN 1. ANODE
2. CATHODE
3. ANODE
4. CATHODE

STYLE 7:
PIN 1. CATHODE
2. ANODE
3. CATHODE
4. ANODE

STYLE 8:
PIN 1. CATHODE
2. ANODE
3. EXTERNAL TRIP/DELAY
4. ANODE

STYLE 9:
PIN 1. GATE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

STYLE 10:
PIN 1. GATE
2. SOURCE
3. DRAIN
4. SOURCE

STYLE 11:
PIN 1. DRAIN
2. SOURCE
3. GATE
4. SOURCE

STYLE 12:
PIN 1. MAIN TERMINAL 1
2. MAIN TERMINAL 2
3. GATE
4. NOT CONNECTED

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