

# SWITCHMODE SERIES NPN POWER TRANSISTORS

... designed for use in high-voltage, high-speed, power switching regulators, converters, inverters, motor control system application.

## FEATURES:

\*Collector-Emitter Sustaining Voltage-

$V_{CE(SUS)} = 400 \text{ V (Min)}$  -BUX84  
 $=450 \text{ V (Min)}$  -BUX85

\* Collector-Emitter Saturation Voltage -

$V_{CE(sat)} = 1.0 \text{ V (Max.)}$  @  $I_C = 1.0 \text{ A}$ ,  $I_B = 0.2 \text{ A}$

\* Switching Time -  $t_f = 0.6 \text{ us (Max.)}$  @  $I_C = 1.0 \text{ A}$

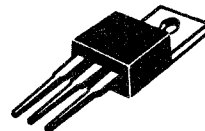
**Boca Semiconductor Corp.**  
**BSC**

**NPN**  
**BUX84**  
**BUX85**

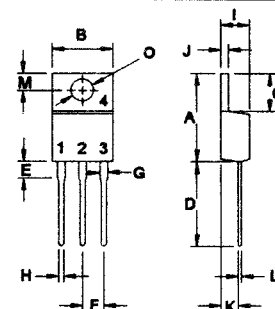
**2 AMPERE**  
**POWER**  
**TRANSISTORS**  
**400 - 450 VOLTS**  
**40 WATTS**

## MAXIMUM RATINGS

Characteristic	Symbol	BUX84	BUX85	Unit
Collector-Emitter Voltage	$V_{CEO}$	400	450	V
Collector-Emitter Voltage ( $V_{BE}=0$ )	$V_{CES}$	800	1000	V
Emitter-Base Voltage	$V_{EBO}$	10		V
Collector Current - Continuous	$I_C$	2.0		A
- Peak	$I_{CM}$	3.0		
Base current	$I_B$	0.75		A
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	40	0.32	W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{STG}$	-65 to +150		$^\circ\text{C}$



**TO-220**

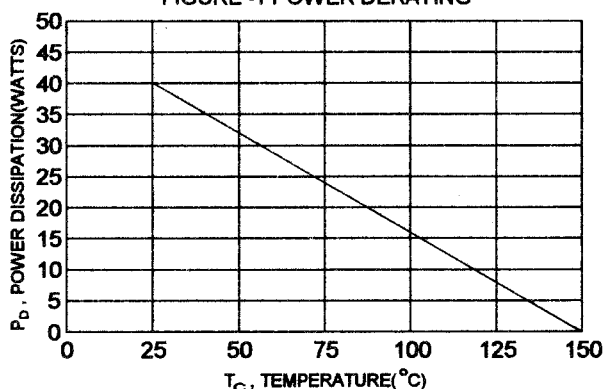


PIN 1. BASE  
 2. COLLECTOR  
 3. EMITTER  
 4. COLLECTOR(CASE)

## THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	3.125	$^\circ\text{C/W}$

**FIGURE -1 POWER DERATING**



DIM	MILLIMETERS	
	MIN	MAX
A	14.68	15.31
B	9.78	10.42
C	5.01	6.52
D	13.06	14.62
E	3.57	4.07
F	2.42	3.66
G	1.12	1.36
H	0.72	0.96
I	4.22	4.98
J	1.14	1.38
K	2.20	2.97
L	0.33	0.55
M	2.48	2.98
O	3.70	3.90

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

Characteristic	Symbol	Min	Max	Unit
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## OFF CHARACTERISTICS

Collector-Emitter Sustaining Voltage ( $I_C = 0.2\text{ A}$ , $I_B = 0$ , $L = 25\text{ mH}$ )	BUX84 BUX85	$V_{CE(sus)}$	400 450	V
Collector Cutoff Current ( $V_{CE} = V_{CES}$ , $V_{BE} = 0$ ) ( $V_{CE} = V_{CES}$ , $V_{BE} = 0$ , $T_c = 125^\circ\text{C}$ )		$I_{CES}$	0.2 1.5	mA
Emitter Cutoff Current ( $V_{EB} = 5.0\text{ V}$ , $I_C = 0$ )		$I_{EBO}$	1.0	mA

## ON CHARACTERISTICS (1)

DC Current Gain ( $I_C = 100\text{ mA}$ , $V_{CE} = 5.0\text{ V}$ )		hFE	30(typ)	
Collector-Emitter Saturation Voltage ( $I_C = 0.3\text{ A}$ , $I_B = 30\text{ mA}$ ) ( $I_C = 1.0\text{ A}$ , $I_B = 0.2\text{ A}$ )		$V_{CE(sat)}$	0.8 1.0	V
Base-Emitter Saturation Voltage ( $I_C = 1.0\text{ A}$ , $I_B = 0.2\text{ A}$ )		$V_{BE(sat)}$	1.1	V

## DYNAMIC CHARACTERISTICS

Current-Gain-Bandwidth Product ( $I_C = 0.2\text{ A}$ , $V_{CE} = 10\text{ V}$ , $f = 1.0\text{ MHz}$ )		$f_T$	20 (typ)	MHz
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## SWITCHING CHARACTERISTICS

On Time	$V_{CC} = 250\text{ V}$ , $I_C = 1.0\text{ A}$ $I_{B1} = 0.2\text{ A}$ , $I_{B2} = -0.4\text{ A}$	$t_{on}$	0.5	us
Storage Time		$t_s$	3.5	us
Fall Time		$t_f$	0.6	us

(1) Pulse Test: Pulse Width = 300 us, Duty Cycle  $\leq 2.0\%$