

## 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-

$$V_{CE(sus)} = 400 \text{ V (Min) --BUX48}$$

$$= 450 \text{ V (Min) --BUX48A}$$

\* Collector-Emitter Saturation Voltage -

$$V_{CE(sat)} = 1.5 \text{ V (Max.) @ } I_C = 10 \text{ A--BUX48}$$

$$I_C = 8 \text{ A--BUX48A}$$

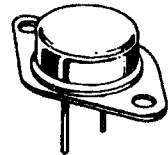
\* Switching Time -  $t_r = 0.8 \text{ us (Max.) @ } I_C = 10 \text{ A --BUX48}$   
 $I_C = 8 \text{ A--BUX48A}$

**NPN**  
**BUX48**  
**BUX48A**

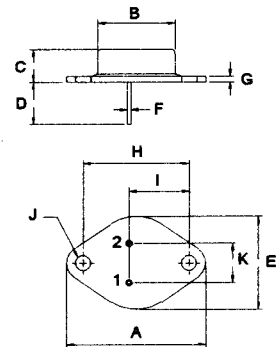
**15 AMPERE**  
**POWER**  
**TRANSISTORS**  
**400 - 450 VOLTS**  
**175 WATTS**

### MAXIMUM RATINGS

Characteristic	Symbol	BUX48	BUX48A	Unit
Collector-Emitter Voltage	$V_{CEO}$	400	450	V
Collector-Emitter Voltage ( $V_{BE} = -2.5V$ )	$V_{CEX}$	800	1000	V
Emitter-Base Voltage	$V_{EBO}$	7		V
Collector Current - Continuous - Peak	$I_C$ $I_{CM}$	15 30		A
Base current	$I_B$	4		A
Total Power Dissipation @ $T_C = 25^\circ C$ Derate above $25^\circ C$	$P_D$	175 1.0		W W/ $^\circ C$
Operating and Storage Junction Temperature Range	$T_J, T_{STG}$	-65 to +200		$^\circ C$



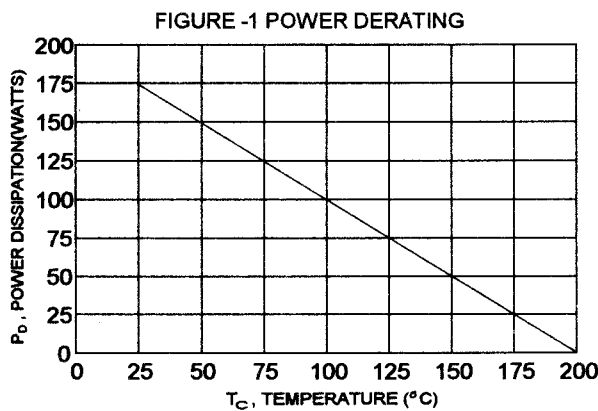
TO-3



PIN 1. BASE  
 2. EMITTER  
 COLLECTOR (CASE)

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1.0	$^\circ C/W$



DIM	MILLIMETERS	
	MIN	MAX
A	38.75	39.96
B	19.28	22.23
C	7.96	9.28
D	11.18	12.19
E	25.20	26.67
F	0.92	1.09
G	1.38	1.62
H	29.90	30.40
I	16.64	17.30
J	3.88	4.36
K	10.67	11.18

**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 (1) ( $I_C = 200\text{ mA}$ , $I_B = 0$ , $L = 25\text{ mH}$ ) BUX48 BUX48A	$V_{CE(sus)}$	400 450		V
Collector Cutoff Current ( $V_{CE} = V_{CEX}$ , $V_{BE} = -2.5\text{ V}$ ) ( $V_{CE} = V_{CEX}$ , $V_{BE} = -2.5\text{ V}$ , $T_C = 125^\circ\text{C}$ )	$I_{CEX}$		0.2 2.0	mA
Collector Cutoff Current ( $V_{CE} = V_{CEX}$ , $R_{BE} < 10\text{ ohm}$ ) ( $V_{CE} = V_{CEX}$ , $R_{BE} < 10\text{ ohm}$ , $T_C = 125^\circ\text{C}$ )	$I_{CER}$		0.5 4.0	mA
Emitter Cutoff Current ( $V_{EB} = 5.0\text{ V}$ , $I_C = 0$ )	$I_{EBO}$		1.0	mA

**ON CHARACTERISTICS (1)**

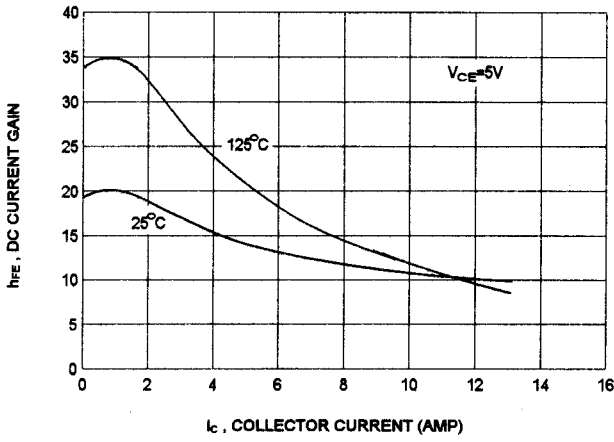
Collector - Emitter Saturation Voltage ( $I_C = 10\text{ A}$ , $I_B = 2.0\text{ A}$ ) ( $I_C = 8.0\text{ A}$ , $I_B = 1.6\text{ A}$ ) ( $I_C = 15\text{ A}$ , $I_B = 3.0\text{ A}$ ) ( $I_C = 12\text{ A}$ , $I_B = 2.4\text{ A}$ ) BUX48 BUX48A BUX48 BUX48A	$V_{CE(sat)}$		1.5 1.5 5.0 5.0	V
Base - Emitter Saturation Voltage ( $I_C = 10\text{ A}$ , $I_B = 2.0\text{ A}$ ) ( $I_C = 8.0\text{ A}$ , $I_B = 1.6\text{ A}$ ) BUX48 BUX48A	$V_{BE(sat)}$		1.6 1.6	V

**SWITCHING CHARACTERISTICS**

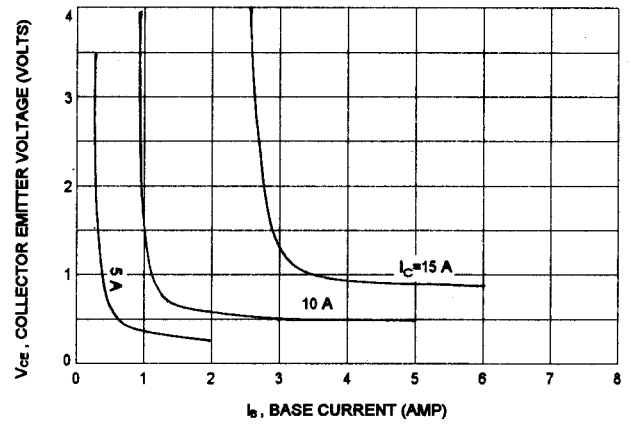
Turn On Time	$I_C = 10\text{ A}$ , $I_{B1} = 2.0\text{ A}$ , $I_{B2} = -2.0\text{ A}$ BUX48 $V_{CC} = 150\text{ V}$ $I_C = 8\text{ A}$ , $I_{B1} = 1.6\text{ A}$ , $I_{B2} = -1.6\text{ A}$ BUX48A	$t_{on}$	1.0	us
Storage Time		$t_s$	3.0	us
Fall Time		$t_f$	0.8	us

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

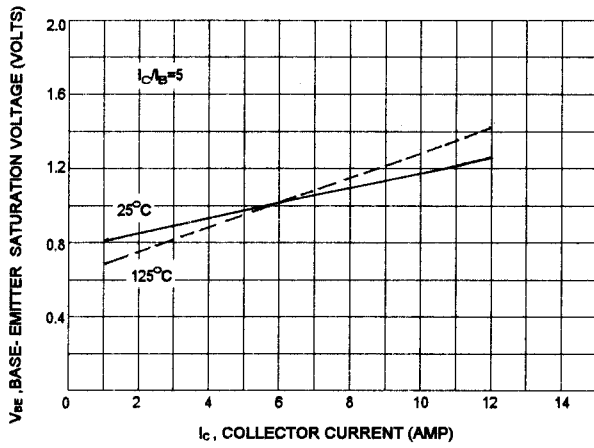
DC CURRENT GAIN



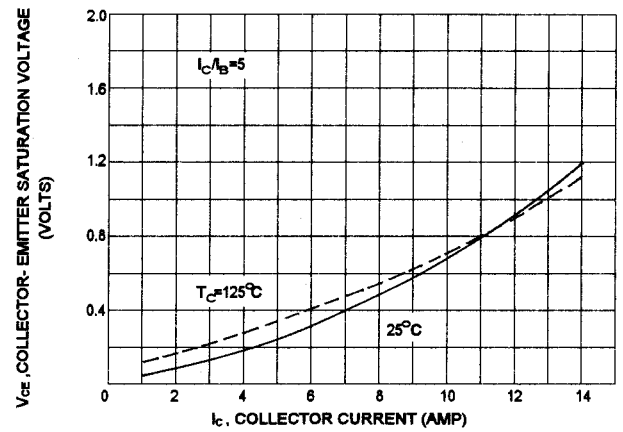
COLLECTOR SATURATION REGION



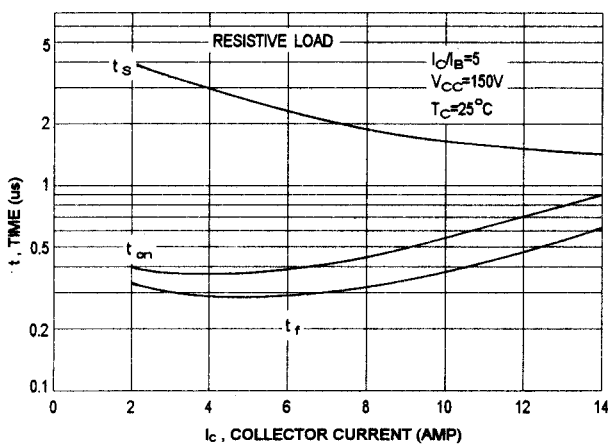
BASE-EMITTER SATURATION VOLTAGE



COLLECTOR-EMITTER SATURATION VOLTAGE



SWITCHING TIME



ACTIVE-REGION SAFE OPERATING AREA

