

## SWITCHMODE SERIES NPN POWER TRANSISTORS

... designed for use in high-voltage, high-speed, power switching in inductive circuit, they are particularly suited for 220 V switchmode power supply, DC and AC motor control.

### FEATURES:

\*Collector-Emitter Sustaining Voltage-

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

\* Collector-Emitter Saturation Voltage -

$$V_{CE(sat)} = 1.5 \text{ V (Max.) @ } I_C = 5.0 \text{ A, } I_B = 1.0 \text{ A}$$

\* Switching Time -  $t_f = 0.8 \text{ us (Max.) @ } I_C = 5.0 \text{ A}$

**NPN**

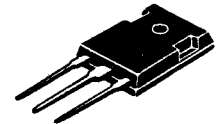
**BUV47**

**BUV47B**

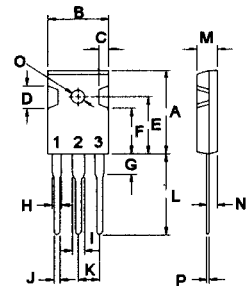
**9 AMPERE  
POWER  
TRANSISTORS  
400 VOLTS  
90 WATTS**

### MAXIMUM RATINGS

Characteristic	Symbol	BUV47, BUV47B	Unit
Collector-Emitter Voltage	$V_{CEO}$	400	V
Collector-Base Voltage	$V_{CBO}$	850	V
Emitter-Base Voltage	$V_{EBO}$	7.0	V
Collector Current - Continuous - Peak	$I_C$ $I_{CM}$	9.0 15	A
Base current	$I_B$	3.0	A
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	90 0.72	W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{STG}$	-65 to +150	$^\circ\text{C}$



**TO-247(3P)**



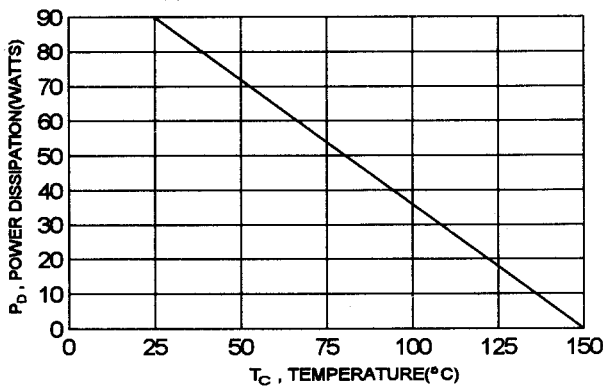
PIN 1.BASE  
2.COLLECTOR  
3.EMITTER

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1.38	$^\circ\text{C/W}$

DIM	MILLIMETERS	
	MIN	MAX
A	20.63	22.38
B	15.38	16.20
C	1.90	2.70
D	5.10	6.10
E	14.81	15.22
F	11.72	12.84
G	4.20	4.50
H	1.82	2.46
I	2.92	3.23
J	0.89	1.53
K	5.26	5.66
L	18.50	21.50
M	4.68	5.36
N	2.40	2.80
O	3.25	3.65
P	0.55	0.70

**FIGURE -1 POWER DERATING**



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

Characteristic	Symbol	Min	Max	Unit
----------------	--------	-----	-----	------

**OFF CHARACTERISTICS**

Collector-Emitter Sustaining Voltage ( $I_c = 0.2\text{ A}$ , $I_B = 0$ , $L = 25\text{ mH}$ )	$V_{CE(sus)}$	400		V
Collector Cutoff Current ( $V_{CE} = 850\text{ V}$ , $R_{BE} = 10\text{ ohm}$ )	$I_{CER}$		400	$\mu\text{A}$
Collector Cutoff Current ( $V_{CE} = 850\text{ V}$ , $V_{BE} = -2.5\text{ V}$ )	$I_{CEX}$		150	$\mu\text{A}$
Emitter Cutoff Current ( $V_{EB} = 5.0\text{ V}$ , $I_c = 0$ )	$I_{EBO}$		1.0	mA

**ON CHARACTERISTICS (1)**

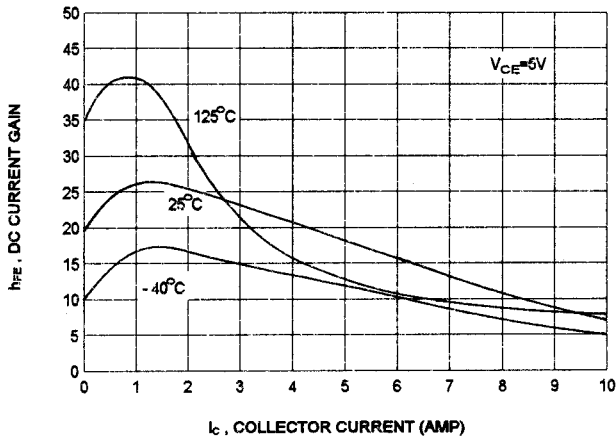
Collector-Emitter Saturation Voltage ( $I_c = 5.0\text{ A}$ , $I_B = 1.0\text{ A}$ ) ( $I_c = 6.0\text{ A}$ , $I_B = 1.2\text{ A}$ ) ( $I_c = 8.0\text{ A}$ , $I_B = 2.5\text{ A}$ ) ( $I_c = 9.0\text{ A}$ , $I_B = 3.0\text{ A}$ )	BUV47 BUV47B BUV47 BUV47B	$V_{CE(sat)}$		1.5 1.5 3.0 3.0	V
Base-Emitter Saturation Voltage ( $I_c = 5.0\text{ A}$ , $I_B = 1.0\text{ A}$ ) ( $I_c = 6.0\text{ A}$ , $I_B = 1.2\text{ A}$ )	BUV47 BUV47B	$V_{BE(sat)}$		1.6 1.6	V

**SWITCHING CHARACTERISTICS**

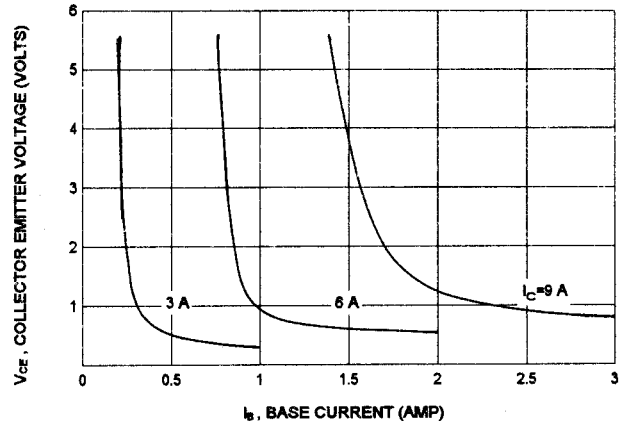
On Time	$V_{CC} = 150\text{ V}$ , $I_c = 5.0\text{ A}$ $I_{B1} = -I_{B2} = 1.0\text{ A}$	$t_{on}$		1.0	$\mu\text{s}$
Storage Time		$t_s$		3.0	$\mu\text{s}$
Fall Time		$t_f$		0.8	$\mu\text{s}$

(1) Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

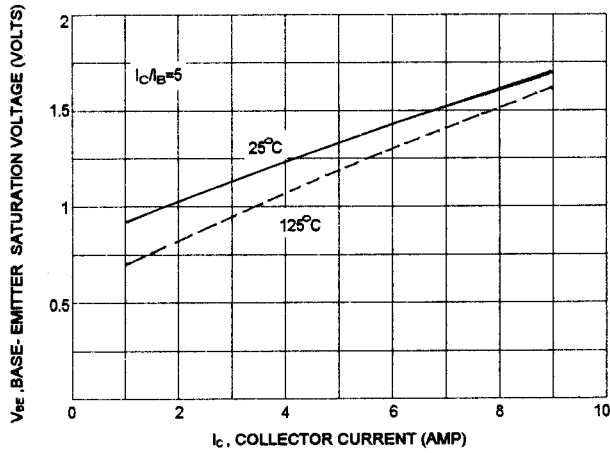
DC CURRENT GAIN



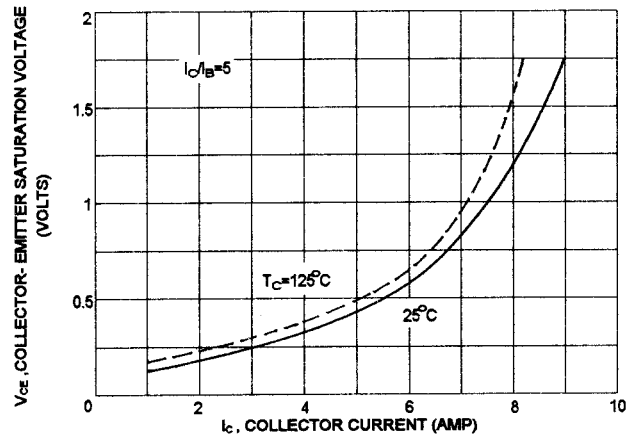
COLLECTOR SATURATION REGION



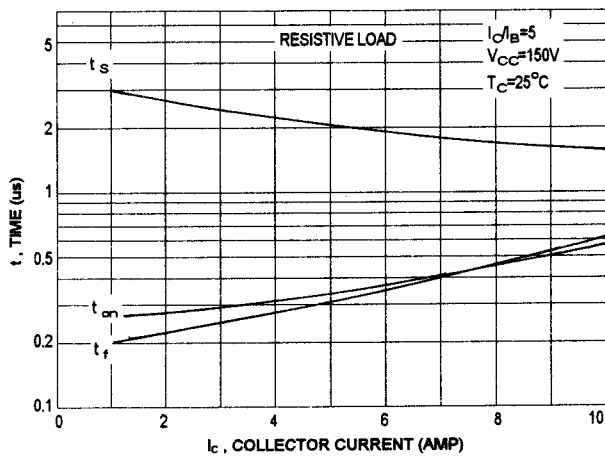
BASE-EMITTER SATURATION VOLTAGE



COLLECTOR-EMITTER SATURATION VOLTAGE



SWITCHING TIME



ACTIVE-REGION SAFE OPERATING AREA

