

SILICON PLANAR NPN

BUY 47
BUY 48

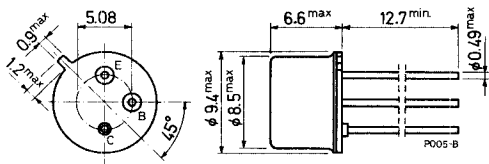
HIGH VOLTAGE, HIGH CURRENT SWITCH

The BUY 47 and BUY 48 are silicon planar epitaxial NPN transistors in Jedec TO-39 metal case. They are used in high-voltage, high-current switching applications up to 5 A.

ABSOLUTE MAXIMUM RATINGS		BUY 47	BUY 48
V_{CBO}	Collector-base voltage ($I_E = 0$)	150 V	200 V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	120 V	170 V
V_{EBO}	Emitter-base voltage ($I_C = 0$)	6 V	
→ I_C	Collector current	7 A	
→ I_{CM}	Collector peak current (repetitive)	10 A	
P_{tot}	Total power dissipation at $T_{amb} \leq 25\text{ }^{\circ}\text{C}$	1 W	
	at $T_{case} \leq 25\text{ }^{\circ}\text{C}$	7 W	
T_{stg}	Storage temperature	-55 to 200 $^{\circ}\text{C}$	
T_j	Junction temperature	200 $^{\circ}\text{C}$	

MECHANICAL DATA

Dimensions in mm



(sim. to **TO-39**)

BUY 47

BUY 48

THERMAL DATA

$R_{th\ j-case}$	Thermal resistance junction-case	max	25	°C/W
$R_{th\ j-amb}$	Thermal resistance junction-ambient	max	175	°C/W

ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ °C}$ unless otherwise specified)

Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CBO} Collector cutoff current ($I_E = 0$)	for BUY 47 $V_{CB} = 80\text{ V}$ $V_{CB} = 80\text{ V } T_{amb} = 125\text{ °C}$ for BUY 48 $V_{CB} = 100\text{ V}$ $V_{CB} = 100\text{ V } T_{amb} = 125\text{ °C}$			10 1 10 1	μA mA μA mA
$V_{(BR)CBO}^*$ Collector-base breakdown voltage ($I_E = 0$)	$I_C = 1\text{ mA}$ for BUY 47 for BUY 48	150 200			V V
$V_{(BR)CEO}^*$ Collector-emitter breakdown voltage ($I_B = 0$)	$I_C = 20\text{ mA}$ for BUY 47 for BUY 48	120 170			V V
$V_{(BR)EBO}^*$ Emitter-base breakdown voltage ($I_C = 0$)	$I_E = 1\text{ mA}$	6			V
$V_{CE(sat)}^*$ Collector-emitter saturation voltage	$I_C = 0.5\text{ A } I_B = 50\text{ mA}$ $I_C = 2\text{ A } I_B = 0.2\text{ A}$ $I_C = 5\text{ A } I_B = 0.5\text{ A}$		0.1 0.2 0.55		V V V

ELECTRICAL CHARACTERISTICS (continued)

Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{BE(sat)}^*$ Base-emitter saturation voltage	$I_C = 0.5\text{ A}$ $I_B = 50\text{ mA}$ $I_C = 2\text{ A}$ $I_B = 0.2\text{ A}$ $I_C = 5\text{ A}$ $I_B = 0.5\text{ A}$		0.75 1 1.15		V V V
h_{FE}^* DC current gain	$I_C = 50\text{ mA}$ $V_{CE} = 5\text{ V}$ $I_C = 0.5\text{ A}$ $V_{CE} = 5\text{ V}$ $I_C = 2\text{ A}$ $V_{CE} = 5\text{ V}$ $I_C = 5\text{ A}$ $V_{CE} = 5\text{ V}$		130 40 40 15		— — — —
f_T Transition frequency	$I_C = 100\text{ mA}$ $V_{CE} = 10\text{ V}$		90		MHz
C_{CBO} Collector-base capacitance	$I_E = 0$ $V_{CB} = 50\text{ V}$		45	80	pF
t_{on} Turn-on time	$I_C = 5\text{ A}$ $I_{B1} = 0.5\text{ A}$		0.5	1	μs
t_{off} Turn-off time	$I_C = 5\text{ A}$ $I_{B1} = -I_{B2} = 0.5\text{ A}$		1.2	2	μs

* Pulsed: pulse duration = 300 μs , duty factor = 1 %