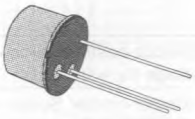
SGS-THOMSON MICROELECTRONICS

BUY47
BUY48

HIGH VOLTAGE, HIGH CURRENT SWITCH

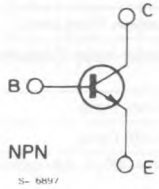
DESCRIPTION

The BUY47 and BUY48 are silicon epitaxial planar NPN transistors in Jedec TO-39 metal case. They are used in high-voltage, high-current switching applications up to 7 A.



TO-39

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value		Unit
		BUY 47	BUY 48	
V_{CBO}	Collector-base Voltage (I_E = 0)	150	200	V
V_{CEO}	Collector-emitter Voltage (I_B = 0)	120	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 $T_{amb} \leq 25$ °C $T_{case} \leq 50$ °C	1 10		W W
T_{stg}	Storage Temperature	– 65 to 200		°C
T_j	Junction Temperature	200		°C

THERMAL DATA

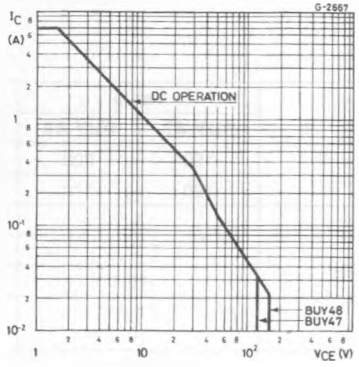
$R_{th\ j\text{-}case}$	Thermal Resistance Junction-case	Max	15	°C/W
$R_{th\ j\text{-}amb}$	Thermal Resistance Junction-ambient	Max	175	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

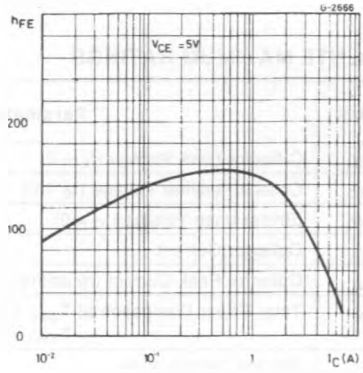
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cutoff Current (I_E = 0)	for **BUY 47**					
		V_{CB} = 80 V				10	μA
		V_{CB} = 80 V	T_{case} = 125 °C			1	mA
		for **BUY 48**					
		V_{CB} = 100 V				10	μA
		V_{CB} = 100 V	T_{case} = 125 °C			1	mA
$V_{(BR)CBO}$*	Collector-base Breakdown Voltage (I_E = 0)	I_C = 1 mA	for **BUY 47**	150			V
			for **BUY 48**	200			V
$V_{CEO(sus)}$*	Collector-emitter Sustaining Voltage (I_B = 0)	I_C = 20 mA	for **BUY 47**	120			V
			for **BUY 48**	170			V
V_{EBO}*	Emitter-base Voltage (I_C = 0)	I_E = 1 mA		6			V
$V_{CE(sat)}$*	Collector-emitter Saturation Voltage	I_C = 0.5 A	I_B = 50 mA		0.05		V
		I_C = 2 A	I_B = 0.2 A			0.45	V
		I_C = 5 A	I_B = 0.5 A			1	V
$V_{BE(sat)}$*	Base-emitter Saturation Voltage	I_C = 0.5 A	I_B = 50 mA		0.8		V
		I_C = 2 A	I_B = 0.2 A			1.1	V
		I_C = 5 A	I_B = 0.5 A			1.5	V
h_{FE}*	DC Current Gain	I_C = 50 mA	V_{CE} = 5 V		130		
		I_C = 0.5 A	V_{CE} = 5 V	40	150		
		I_C = 2 A	V_{CE} = 5 V	40	130		
		I_C = 5 A	V_{CE} = 5 V	15	45		
f_T	Transition Frequency	I_C = 100 mA	V_{CE} = 10 V		90		MHz
C_{CBO}	Collector-base Capacitance	I_E = 0	V_{CB} = 50 V		45	80	pF
		f = 1 MHz					
t_{on}	Turn-on Time	I_C = 5 A	V_{CC} = 40 V			1	μs
t_{off}	Turn-off Time	I_{B1} = − I_{B2} = 0.5 A				2	μs

* Pulsed : pulse duration = 300 μs, duty cycle = 1.5 %.

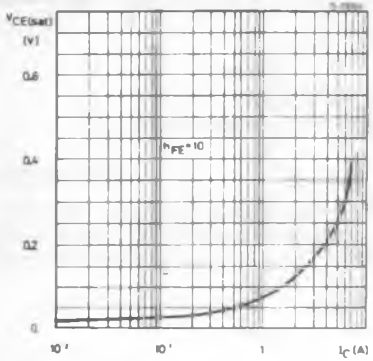
Safe Operating Areas.



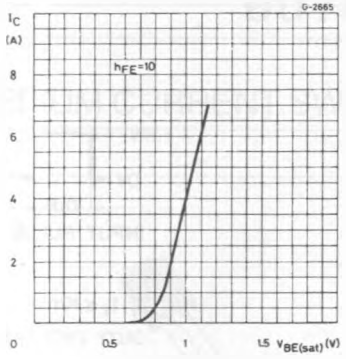
DC Current Gain.



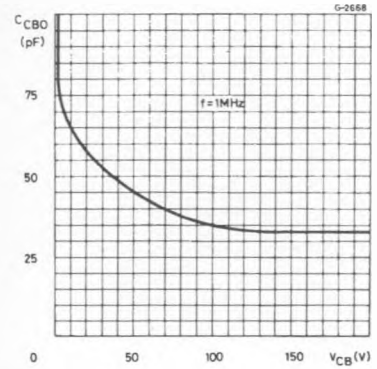
Collector-emitter Saturation Voltage.



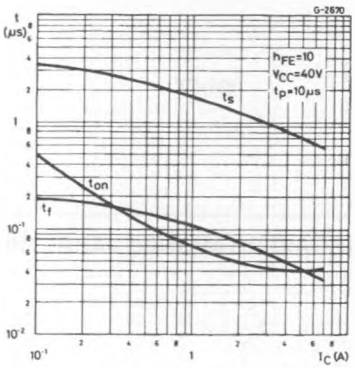
Base-emitter Saturation Voltage.



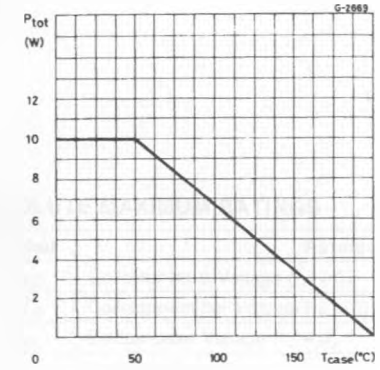
Collector-base Capacitance.



Saturated Switching Characteristics.



Power Rating Chart.



Switching Time Test Circuit.