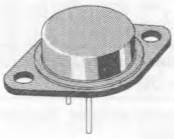
SGS-THOMSON MICROELECTRONICS

BUW44/BUW45 BUW46

HIGH VOLTAGE, HIGH CURRENT POWER SWITCH

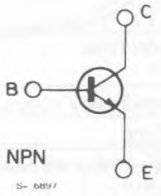
DESCRIPTION

The BUW44, BUW45 and BUW46 are multiepitaxial mesa NPN transistors in Jedec TO-3 metal case intended in fast switching applications for high output powers.



TO-3

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value			Unit
		BUW44	BUW45	BUW46	
V_{CES}	Collector-emitter Voltage (V_{BE} = 0)	500	800	900	V
V_{CEO}	Collector-emitter Voltage (I_B = 0)	400	400	450	V
V_{EBO}	Emitter-base Voltage (I_C = 0)	7			V
I_C	Collector Current	15			A
I_{CM}	Collector Peak Current	30			A
I_B	Base Current	10			A
P_{tot}	Total Power Dissipation at $T_{case} \leq 25$ °C	175			W
T_{stg}	Storage Temperature	– 65 to 200			°C
T_j	Junction Temperature	200			°C

THERMAL DATA

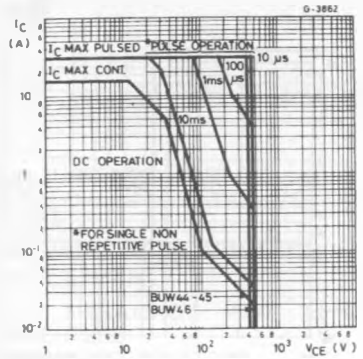
$R_{th\ j\text{-}case}$	Thermal Resistance Junction-case	max	1	°C/W

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

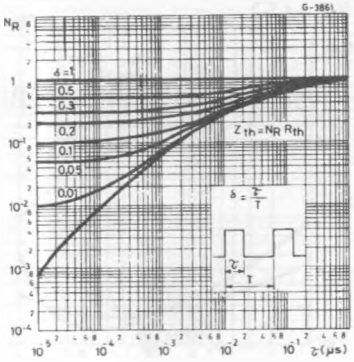
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector Cutoff Current (V_{BE} = 0)	for **BUW44** V_{CE} = 500V			500	µA
		for **BUW45** V_{CE} = 800V			500	µA
		for **BUW46** V_{CE} = 900V			500	µA
		T_{case} = 125°C				
		for **BUW44** V_{CE} = 500V			3	mA
		for **BUW45** V_{CE} = 800V			3	mA
		for **BUW46** V_{CE} = 900V			3	mA
I_{EBO}	Emitter Cutoff Current (I_C = 0)	V_{EB} = 7V			1	mA
$V_{CEO(sus)}$*	Collector-emitter Sustaining Voltage	I_C = 100mA for **BUW44**	400			V
		for **BUW45**	400			V
		for **BUW46**	450			V
$V_{CE(sat)}$*	Collector-emitter Saturation Voltage	for **BUW44**				
		I_C = 10A I_B = 2A			3	V
		I_C = 6A I_B = 1A			1.5	V
		for **BUW45** and **BUW46**				
		I_C = 10A I_S = 2A			1.5	V
		I_C = 7A I_B = 1A			1.5	V
$V_{BE(sat)}$*	Base-emitter Saturation Voltage	for **BUW44**				
		I_C = 10A I_B = 2A			1.8	V
		I_C = 6A I_B = 1A			1.4	V
		for **BUW45** and **BUW46**				
		I_C = 10A I_B = 2A			1.8	V
		I_C = 7A I_B = 1A			1.4	V
t_{on}	Turn-on Time	I_C = 10A I_{B1} = 2A V_{CC} = 250V			0.75	µs
t_s	Storage Time	I_C = 10A I_{B1} = 2A			3	µs
t_f	Fall Time	I_{B2} = − 2A V_{CC} = 250V			0.8	µs

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

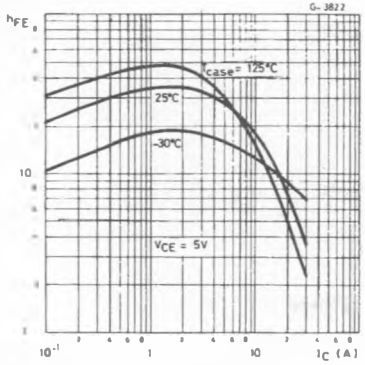
Safe Operating Areas.



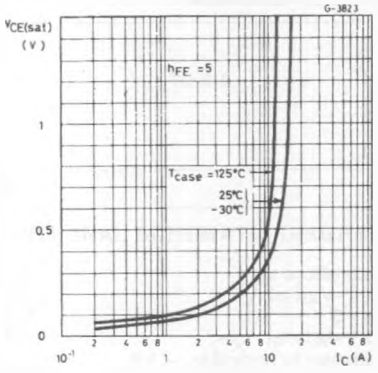
Thermal Transient Response.



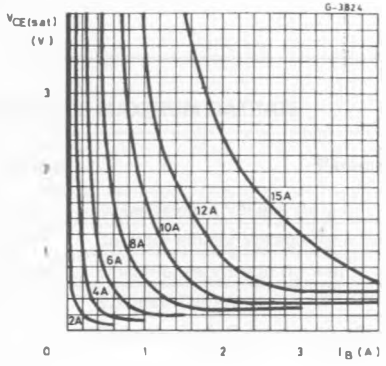
DC Current Gain.



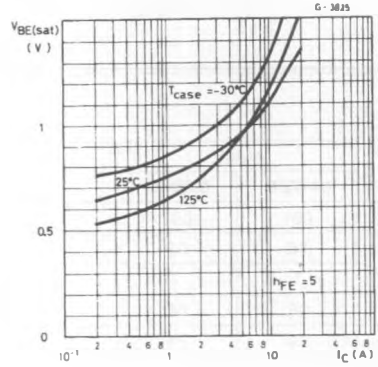
Collector-emitter Saturation Voltage.



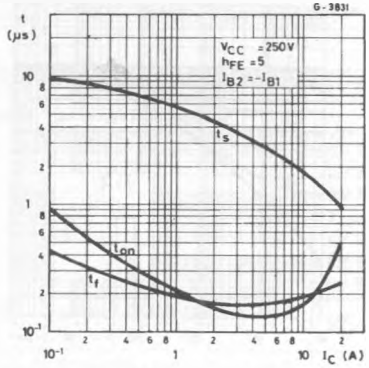
Collector-emitter Saturation Voltage.



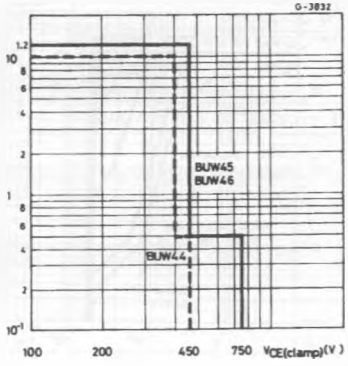
Base-emitter Saturation Voltage.



Saturated Switching Characteristics.



Clamped Reverse Bias Safe Operating Areas.



Clamped $E_{s/b}$ Test Circuit.

Test conditions :
$5\ V \geq |-V_{BB}| \geq 2\ V$
$I_C / I_B = 5$
$2I_{B1} > |-I_{B2}| > I_{B1}$
t_p = adjusted for nominal I_C
R_{BB} = adjusted for I_{B2}