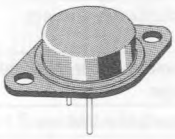
SGS-THOMSON MICROELECTRONICS

BUX12

HIGH CURRENT, HIGH SPEED, HIGH POWER

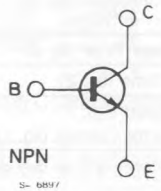
DESCRIPTION

The BUX12 is a silicon multiepitaxial planar NPN transistor in Jedec TO-3 metal case, intended for use in switching and linear applications in military and industrial equipment.



TO-3

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base Voltage (I_E = 0)	300	V
V_{CEX}	Collector-emitter Voltage (V_{BE} = – 1.5 V)	300	V
V_{CEO}	Collector-emitter Voltage (I_B = 0)	250	V
V_{EBO}	Emitter-base Voltage (I_C = 0)	7	V
I_C	Collector Current	20	A
I_{CM}	Collector Peak Current (t_p = 10 ms)	25	A
I_B	Base Current	4	A
P_{tot}	Total Power Dissipation at $T_{case} \leq 25$ °C	150	W
T_{stg}	Storage Temperature	– 65 to 200	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

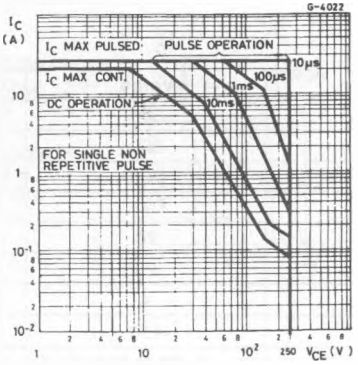
$R_{th\ j\text{-}case}$	Thermal Resistance Junction-case	Max	1.17	°C/W

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

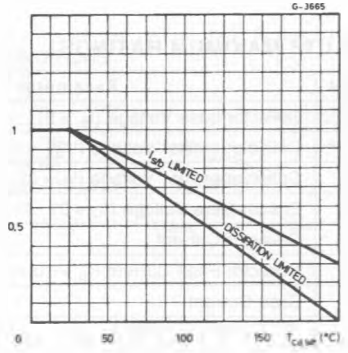
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CEO}	Collector Cutoff Current (I_B = 0)	V_{CE} = 200 V			1.5	mA
I_{CEX}	Collector Cutoff Current	V_{CE} = 300 V V_{BE} = − 1.5 V T_{case} = 125 °C V_{CE} = 300 V V_{BE} = − 1.5 V			1.5 6	mA mA
I_{EBO}	Emitter Cutoff Current (I_C = 0)	V_{EB} = 5 V			1	mA
$V_{CEO(sus)}$*	Collector-emitter Sustaining Voltage	I_C = 200 mA	250			V
V_{EBO}	Emitter-base Voltage (I_C = 0)	I_E = 50 mA	7			V
$V_{CE(sat)}$*	Collector-emitter Saturation Voltage	I_C = 5 A I_B = 0.5 A I_C = 10 A I_B = 1.25 A		0.22 0.5	1 1.5	V V
$V_{BE(sat)}$*	Base-emitter Saturation Voltage	I_C = 10 A I_B = 1.25 A		1.23	1.5	V
h_{FE}*	DC Current Gain	I_C = 5 A V_{CE} = 4 V I_C = 10 A V_{CE} = 4 V	20 10		60	
$I_{s/b}$	Second Breakdown Collector Current	V_{CE} = 30 V t = 1 s V_{CE} = 140 V t = 1 s	5 0.15			A A
f_T	Transition Frequency	I_C = 1 A V_{CE} = 15 V f = 10 MHz	8			MHz
t_{on}	Turn-on Time (fig. 2)	I_C = 10 A I_{B1} = 1.25 A V_{CC} = 150 V		0.28	1	µs
t_s	Storage Time (fig. 2)	I_C = 10 A I_{B1} = 1.25 A		1.45	2	µs
t_f	Fall Time (fig. 2)	I_{B2} = − 1.25 A V_{CC} = 150 V		0.23	0.5	µs
	Clamped $E_{s/b}$ Collector Current (fig. 1)	V_{clamp} = 250 V L = 500 µH	10			A

* Pulsed : pulse duration = 300 µs, duty cycle ≤ 2 %.

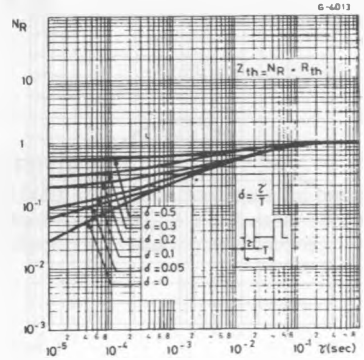
Safe Operating Areas.



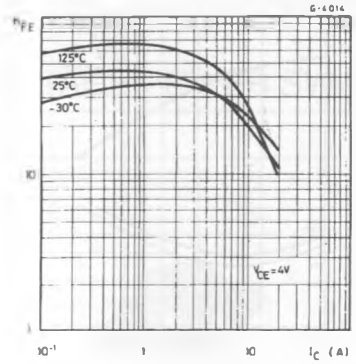
Derating Curves.



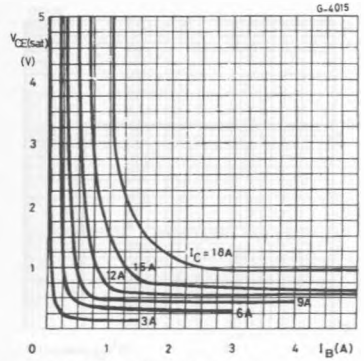
Thermal Transient Response.



DC Current Gain.



Collector-emitter Saturation Voltage.



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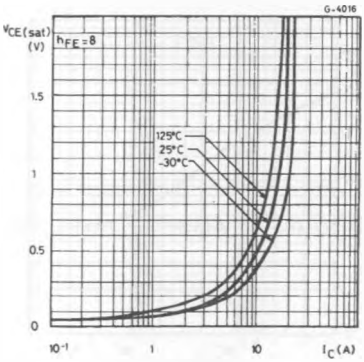
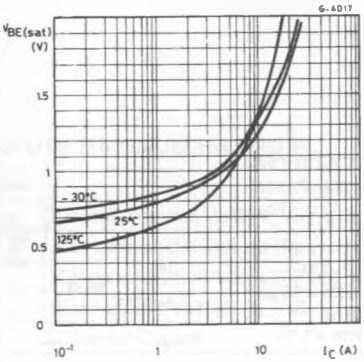
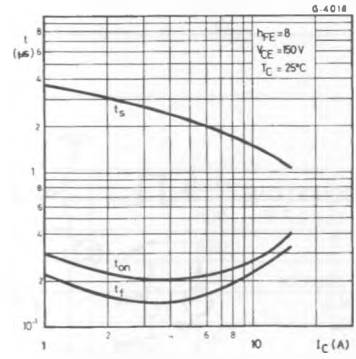


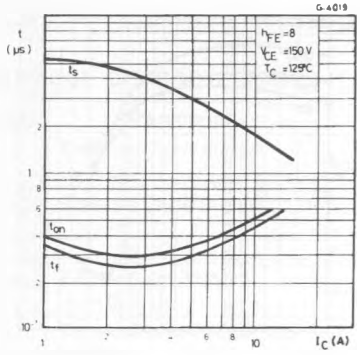
Base-emitter Saturation Voltage.



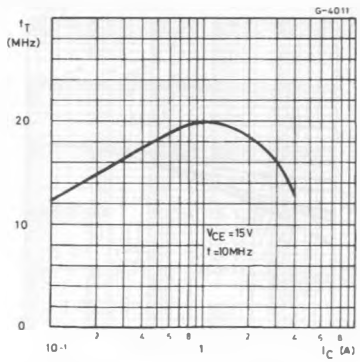
Saturated Switching Characteristics.



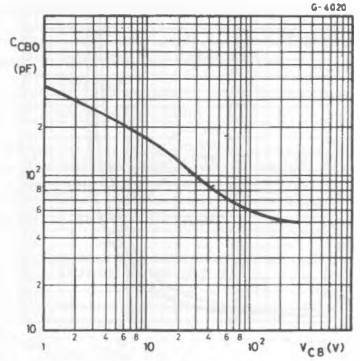
Saturated Switching Characteristics.



Transition Frequency.



Collector-base Capacitance.



Clamped Reverse Bias Safe Operating Area.

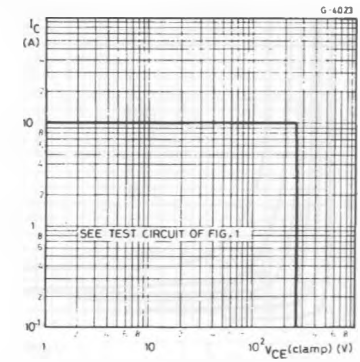


Figure 1 : Clamped $E_{s/b}$ Test Circuit.

Figure 2 : Switching Times Test Circuit (resistive load).