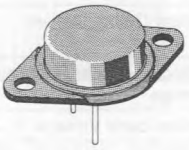
SGS-THOMSON MICROELECTRONICS

BUX21

HIGH CURRENT, HIGH SPEED, HIGH POWER TRANSISTOR

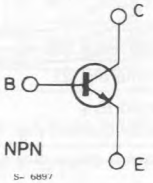
DESCRIPTION

The BUX21 is a silicon multiepitaxial planar NPN transistor in modified 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)	250	V
V_{CEX}	Collector-emitter Voltage (V_{BE} = – 1.5 V)	250	V
V_{CEO}	Collector-emitter Voltage (I_B = 0)	200	V
V_{EBO}	Emitter-base Voltage (I_C = 0)	7	V
I_C	Collector Current	40	A
I_{CM}	Collector Peak Current (t_p = 10 ms)	50	A
I_B	Base Current	8	A
P_{tot}	Total Power Dissipation at $T_{case} \leq 25$ °C	350	W
T_{stg}	Storage Temperature	– 65 to 200	°C
T_j	Junction Temperature	200	°C

THERMAL DATA

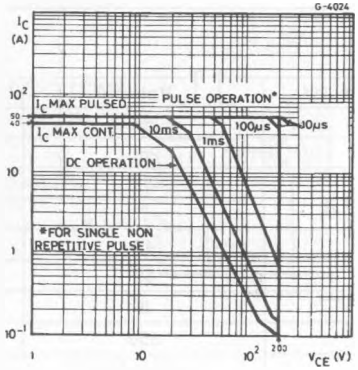
$R_{th\ j\text{-}case}$	Thermal Resistance Junction-case	Max	0.5	°C/W

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

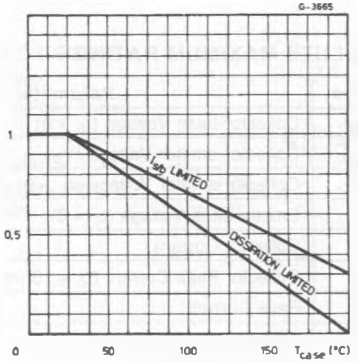
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CEO}	Collector Cutoff Current (I_B = 0)	V_{CE} = 160 V			3	mA
I_{CEX}	Collector Cutoff Current	V_{CE} = 250 V V_{BE} = − 1.5 V			3	mA
		T_{case} = 125 °C V_{CE} = 250 V V_{BE} = − 1.5 V			12	mA
I_{EBO}	Emitter Cutoff Current (I_C = 0)	V_{EB} = 5 V			1	mA
$V_{CEO(sus)}$*	Collector-emitter Sustaining Voltage	I_C = 200 mA	200			V
V_{EBO}	Emitter-base Voltage (I_C = 0)	I_E = 50 mA	7			V
$V_{CE(sat)}$*	Collector-emitter Saturation Voltage	I_C = 12 A I_B = 1.2 A I_C = 25 A I_B = 3 A		0.22 0.4	0.6 1.5	V V
$V_{BE(sat)}$*	Base-emitter Saturation Voltage	I_C = 25 A I_B = 3 A		1.2	1.5	V
h_{FE}*	DC Current Gain	I_C = 12 V_{CE} = 2 V I_C = 25 V_{CE} = 4 V	20 10		60	
$I_{s/b}$	Second Breakdown Collector Current	V_{CE} = 140 V t = 1 s V_{CE} = 20 V t = 1 s	0.15 17.5			A A
f_T	Transition Frequency	V_{CE} = 15 V I_C = 2 A f = 10 MHz	8			MHz
t_{on}	Turn-on Time (fig. 2)	I_C = 25 A I_{B1} = 3 A V_{CC} = 100 V		0.24	1.2	µs
t_s	Storage Time (fig. 2)	I_C = 25 A I_{B1} = 3 A		1.3	1.8	µs
t_f	Fall Time (fig. 2)	I_{B2} = − 3 A V_{CC} = 100 V		0.18	0.4	µs
	Clamped $E_{s/b}$ Collector Current (fig. 1)	V_{clamp} = 200 V L = 500 µH	30			A

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

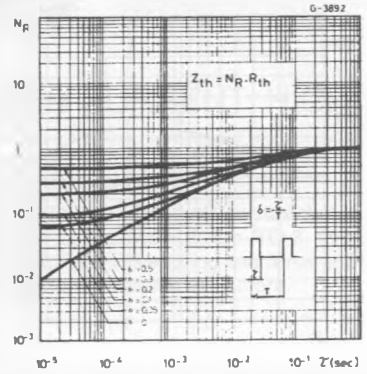
Safe Operating Areas.



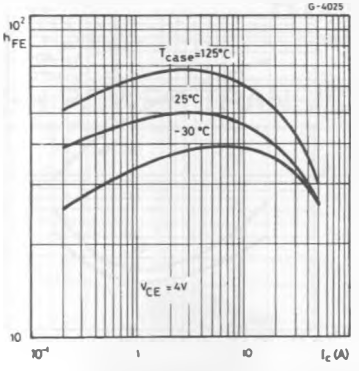
Derating Curves.



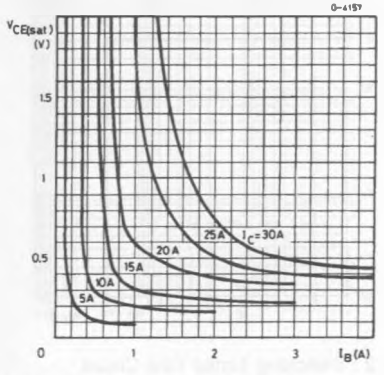
Thermal Transient Response.



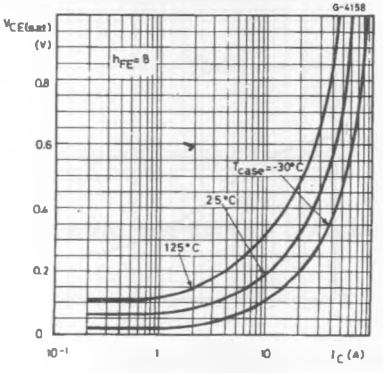
DC Current Gain.



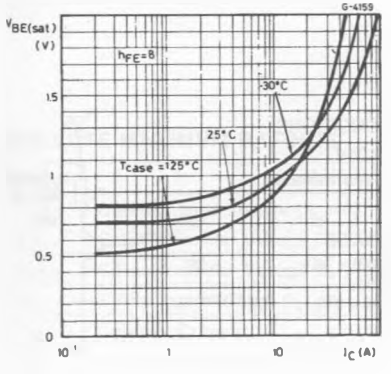
Collector-emitter Saturation Voltage.



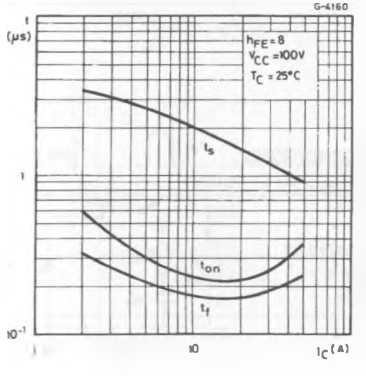
Collector-emitter Saturation Voltage.



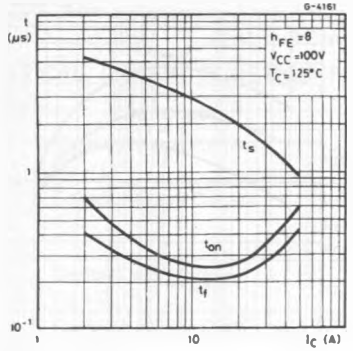
Base-emitter Saturation Voltage.



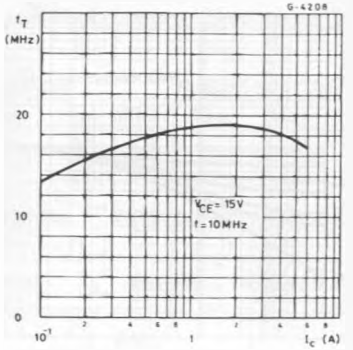
Saturated Switching Characteristics.



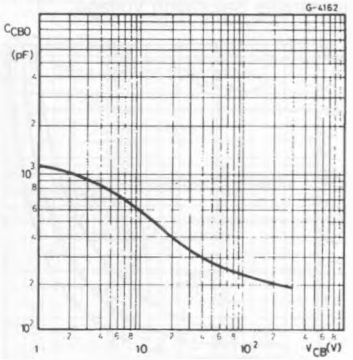
Saturated Switching Characteristics.



Transition Frequency.



Collector-base Capacitance.



Clamped Reverse Bias Safe Operating Area.

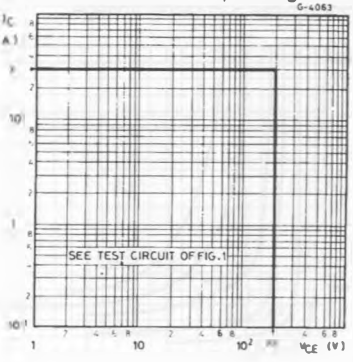


Figure 1 : Clamped $E_{s/b}$ Test Circuit.

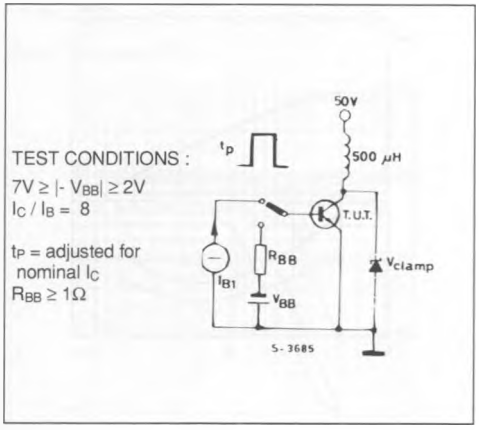


Figure 2 : Switching Times Test Circuit (resistive load).