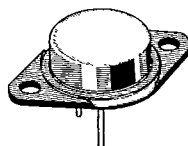


SGS-THOMSON 30E D
HIGH CURRENT, HIGH SPEED, HIGH POWER TRANSISTOR

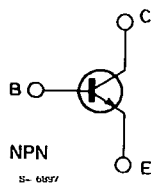
DESCRIPTION

The BUX21 is a silicon multi-epitaxial 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
 S G S-THOMSON

30E D

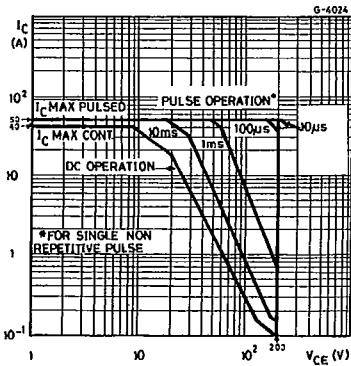
$R_{th \text{ J-case}}$	Thermal Resistance Junction-case	Max	0.5	°C/W
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ELECTRICAL CHARACTERISTICS
 ($T_{case} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

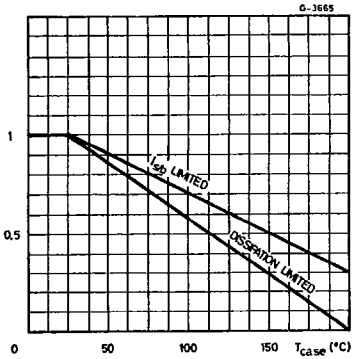
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CEO}	Collector Cutoff Current ($I_B = 0$)	$V_{CE} = 160\text{ V}$			3	mA
I_{CEX}	Collector Cutoff Current	$V_{CE} = 250\text{ V}$ $V_{BE} = -1.5\text{ V}$ $T_{case} = 125\text{ }^{\circ}\text{C}$ $V_{CE} = 250\text{ V}$ $V_{BE} = -1.5\text{ V}$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

* Pulsed : pulse duration = 300 μs , duty cycle $\leq 2\%$.

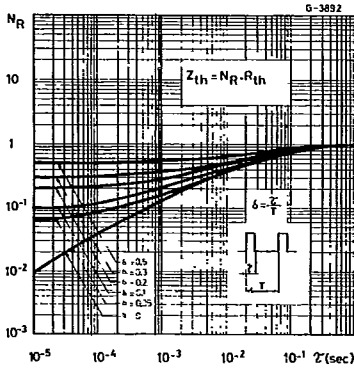
Safe Operating Areas.



Derating Curves.

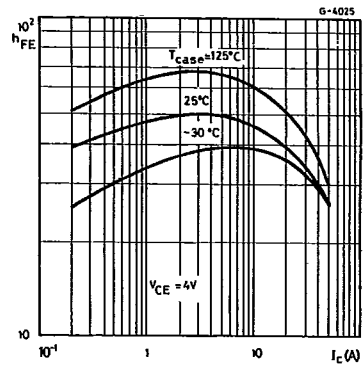


Thermal Transient Response.

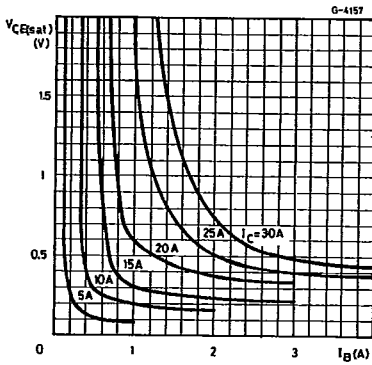


DC Current Gain

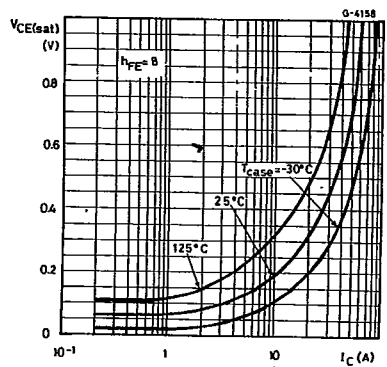
T-33-15



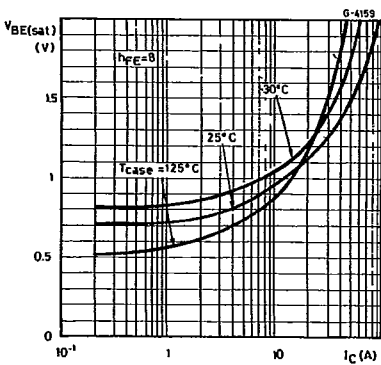
Collector-emitter Saturation Voltage.



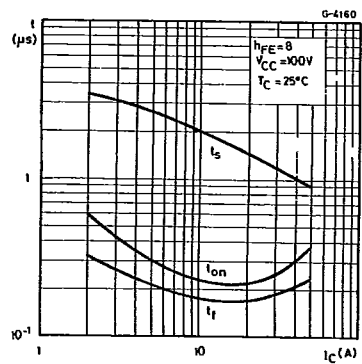
Collector-emitter Saturation Voltage.



Base-emitter Saturation Voltage.



Saturated Switching Characteristics.

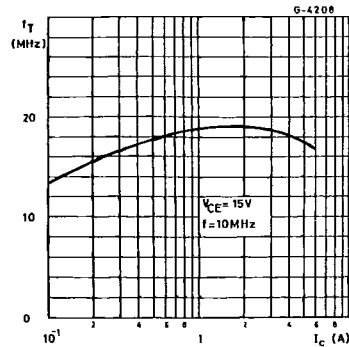


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Transition Frequency.



Clamped Reverse Bias Safe Operating Area.

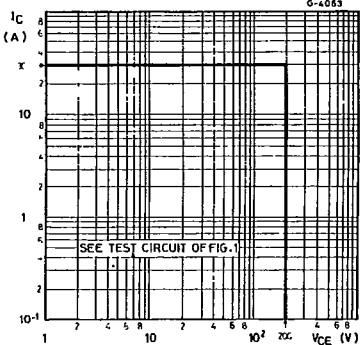


Figure 2 : Switching Times Test Circuit (resistive load).

