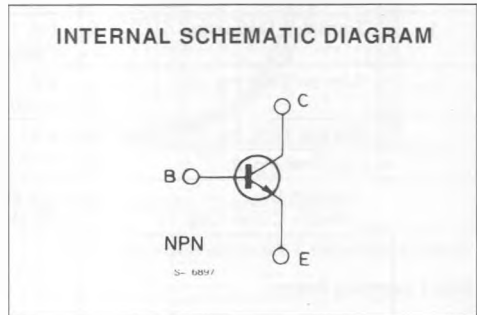
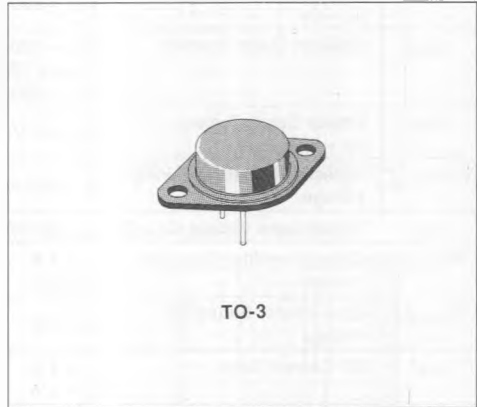


**HIGH CURRENT, HIGH SPEED, HIGH POWER TRANSISTOR**

**DESCRIPTION**

The BUX42 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.



**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	12	A
$I_{CM}$	Collector Peak Current ( $t_p = 10$ ms)	15	A
$I_B$	Base Current	2.4	A
$P_{tot}$	Total Power Dissipation at $T_{case} \leq 25$ °C	120	W
$T_{stg}$	Storage Temperature	-65 to 200	°C
$T_J$	Junction Temperature	200	°C

**THERMAL DATA**

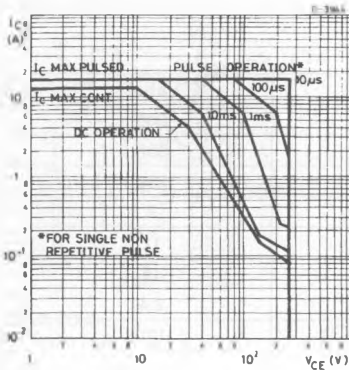
$R_{th\ j-case}$	Thermal Resistance Junction-case	Max	1.46	°C/W
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**ELECTRICAL CHARACTERISTICS** ( $T_{case} = 25\text{ °C}$  unless otherwise specified)

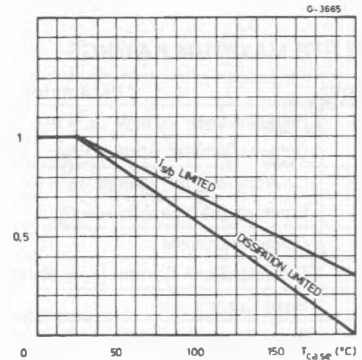
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CEO}$	Collector Cutoff Current ( $I_B = 0$ )	$V_{CE} = 200\text{ V}$			1	mA
$I_{CEX}$	Collector Cutoff Current	$V_{CE} = 300\text{ V}$ $V_{BE} = -1.5\text{ V}$			1	mA
		$T_{case} = 125\text{ °C}$ $V_{CE} = 300\text{ V}$ $V_{BE} = -1.5\text{ V}$			5	mA
$I_{EBO}$	Emitter Cutoff Current ( $I_C = 0$ )	$V_{EB} = 5\text{ V}$			1	mA
$V_{CEO(sus)}^*$	Collector-emitter Sustaining Voltage	$I_C = 200\text{ mA}$	250			V
$V_{EBO}$	Emitter-base Voltage ( $I_C = 0$ )	$I_E = 50\text{ mA}$	7			V
$V_{CE(sat)}^*$	Collector-emitter Saturation Voltage	$I_C = 4\text{ A}$ $I_B = 0.4\text{ A}$		0.33	1.2	V
		$I_C = 6\text{ A}$ $I_B = 0.75\text{ A}$		0.45	1.6	V
$V_{BE(sat)}^*$	Base-emitter Saturation Voltage	$I_C = 6\text{ A}$ $I_B = 0.75\text{ A}$		1.23	2	V
$h_{FE}^*$	DC Current Gain	$I_C = 4\text{ A}$ $V_{CE} = 4\text{ V}$	15		45	
		$I_C = 6\text{ A}$ $V_{CE} = 4\text{ V}$	8			
$I_{s/b}$	Second Breakdown Collector Current	$V_{CE} = 135\text{ V}$ $t = 1\text{ s}$	0.15			A
		$V_{CE} = 30\text{ V}$ $t = 1\text{ s}$	4			A
$f_T$	Transition Frequency	$I_C = 1\text{ A}$ $V_{CE} = 15\text{ V}$ $f = 10\text{ MHz}$	8			MHz
$t_{on}$	Turn-on Time (fig. 2)	$I_C = 6\text{ A}$ $I_{B1} = 0.75\text{ A}$ $V_{CC} = 150\text{ V}$		0.23	1	μs
$t_s$	Storage Time (fig. 2)	$I_C = 6\text{ A}$ $I_{B1} = 0.75\text{ A}$		1.5	2	μs
$t_f$	Fall Time (fig. 2)	$I_{B2} = -0.75\text{ A}$ $V_{CC} = 150\text{ V}$		0.2	1.2	μs
	Clamped $E_{s/b}$ Collector Current (fig. 1)	$V_{clamp} = 250\text{ V}$ $L = 500\text{ μH}$	6			A

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

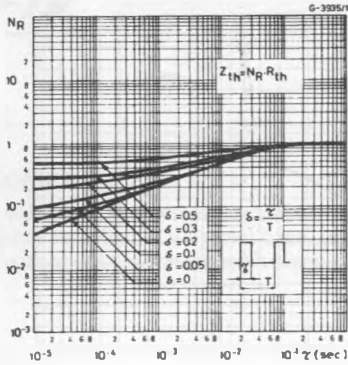
**Safe Operating Areas.**



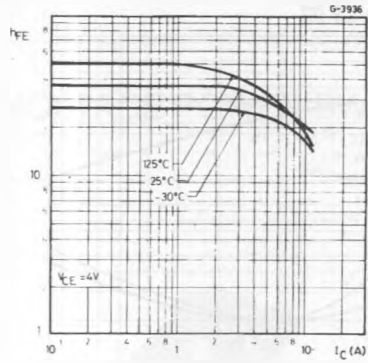
**Derating Curves.**



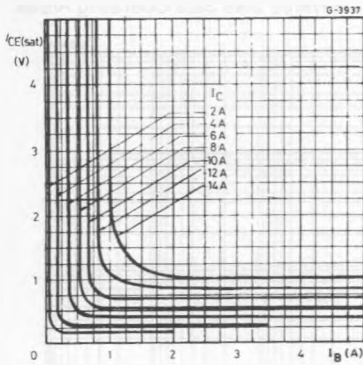
Thermal Transient Response.



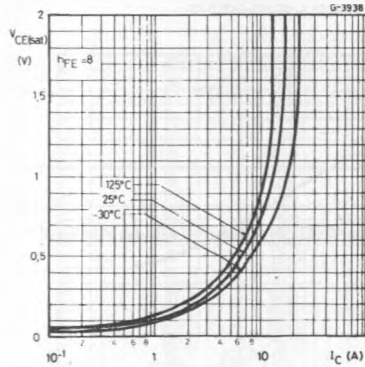
DC Current Gain.



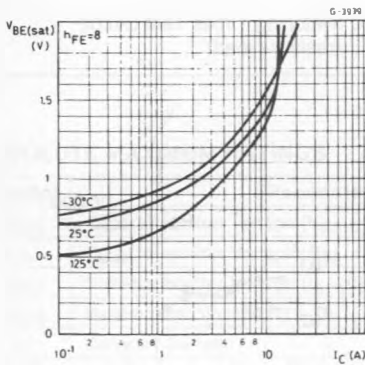
Collector-emitter Saturation Voltage.



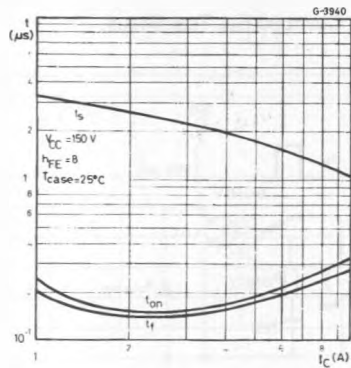
Collector-emitter Saturation Voltage.



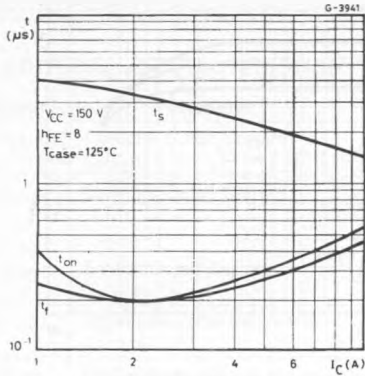
Base-emitter Saturation Voltage.



Saturated Switching Characteristics.



Saturated Switching Characteristics.



Collector-base Capacitance.

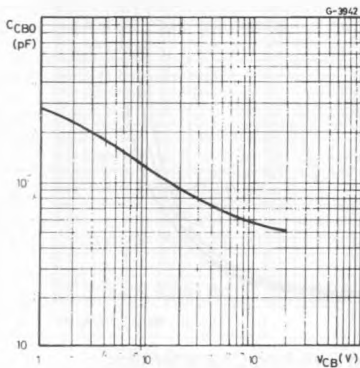
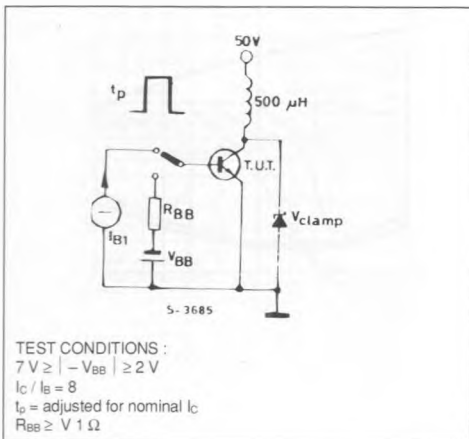
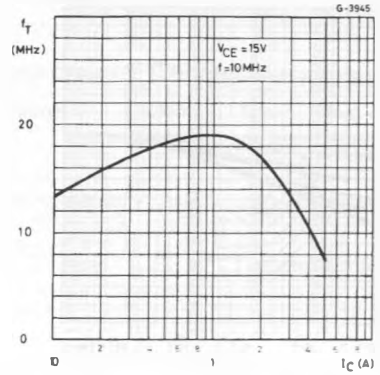


Figure 1 : Clamped  $E_{S/b}$  Test Circuit.



Transition Frequency.



Clamped Reverse Bias Safe Operating Areas.

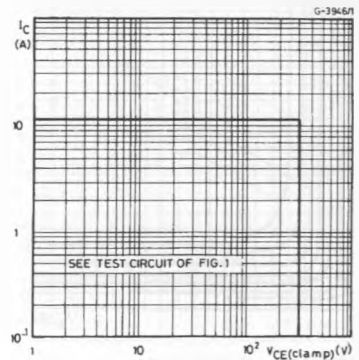


Figure 2 : Switching Times Test Circuit (resistive load).

