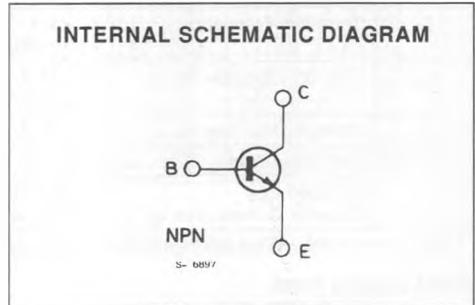
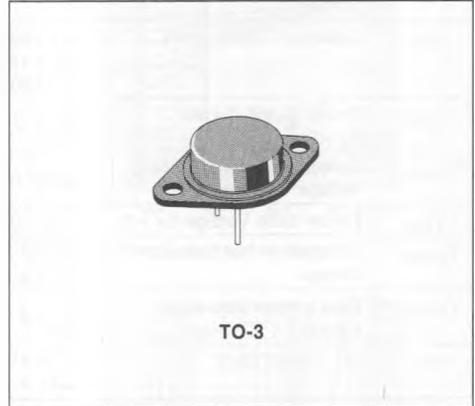


HIGH CURRENT, HIGH SPEED, HIGH POWER TRANSISTOR

DESCRIPTION

The BUX40 is a silicon multiepitaxial planar NPN transistor in Jedec TO-3 metal case, intended for use in switching and linear applications in military equipment.



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base Voltage ($I_E = 0$)	160	V
V_{CEX}	Collector-emitter Voltage ($V_{BE} = -1.5$ V)	160	V
V_{CEO}	Collector-emitter Voltage ($I_B = 0$)	125	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)	28	A
I_B	Base Current	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	$^{\circ}C/W$
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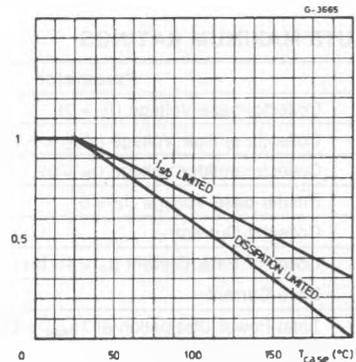
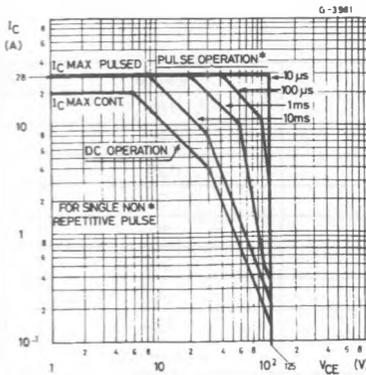
ELECTRICAL CHARACTERISTICS ($T_{case} = 25^{\circ}C$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CEO}	Collector Cutoff Current ($I_B = 0$)	$V_{CE} = 100 V$			1	mA
I_{CEX}	Collector Cutoff Current	$V_{CE} = 160 V$ $V_{BE} = -1.5 V$ $T_{case} = 125^{\circ}C$ $V_{CE} = 160 V$ $V_{BE} = -1.5 V$			1 5	mA
I_{EBO}	Emitter Cutoff Current ($I_C = 0$)	$V_{EB} = 5 V$			1	mA
$V_{CEO(sus)}^*$	Collector-emitter Sustaining Voltage	$I_C = 200 mA$	125			V
V_{EBO}	Emitter-base Voltage ($I_C = 0$)	$I_E = 50 mA$	7			V
$V_{CE(sat)}^*$	Collector-emitter Saturation Voltage	$I_C = 10 A$ $I_B = 1 A$ $I_C = 15 A$ $I_B = 1.88 A$		0.6 0.9	1.2 1.6	V
$V_{BE(sat)}^*$	Base-emitter Saturation Voltage	$I_C = 15 A$ $I_B = 1.88 A$		1.7	2	V
h_{FE}^*	DC Current Gain	$I_C = 10 A$ $V_{CE} = 4 V$ $I_C = 15 A$ $V_{CE} = 4 V$	15 8		45	
$I_{s/b}$	Second Breakdown Collector Current	$V_{CE} = 30 V$ $t = 1 s$ $V_{CE} = 50 V$ $t = 1 s$	4 1			A
f_T	Transition Frequency	$I_C = 1 A$ $V_{CE} = 15 V$ $f = 10 MHz$	8			MHz
t_{on}	Turn-on Time (see fig. 2)	$I_C = 15 A$ $I_{B1} = 1.88 A$ $V_{CC} = 30 V$		0.35	1.2	μs
t_s	Storage Time (see fig. 2)	$I_C = 15 A$ $I_{B1} = -I_{B2} = 1.88 A$ $V_{CC} = 30 V$		0.85	1	μs
t_f	Fall Time (see fig. 2)			0.14	0.4	μs
	Clamped $E_{s/b}$ Collector Current (see fig. 1)	$V_{clamp} = 125 V$ $L = 500 \mu H$	15			A

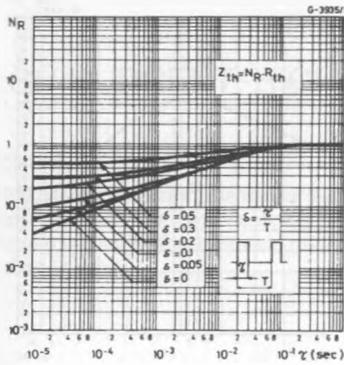
* Pulsed : pulse duration = 300 μs , duty cycle $\leq 2\%$.

Safe Operating Areas.

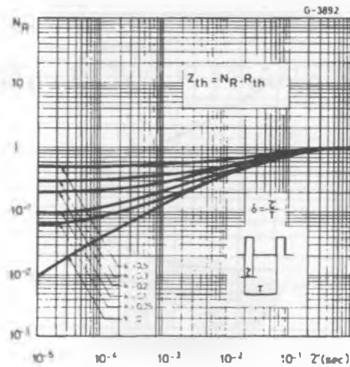
Derating Curves.



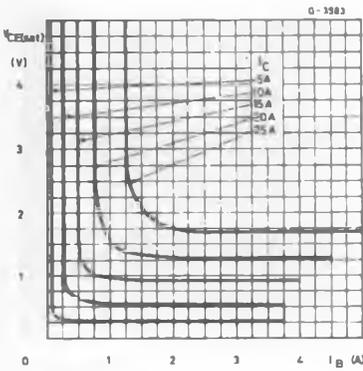
Thermal Transient Response.



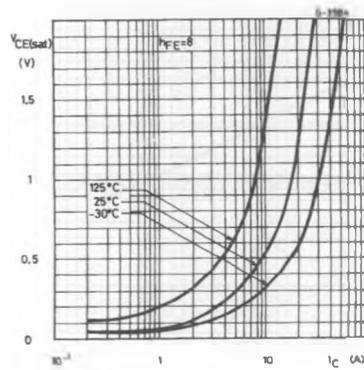
DC Current Gain.



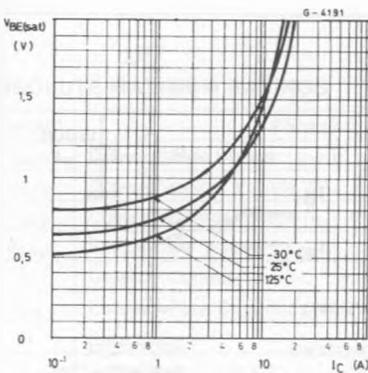
Collector-emitter Saturation Voltage.



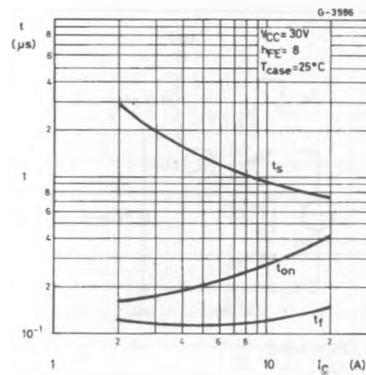
Collector-emitter Saturation Voltage.



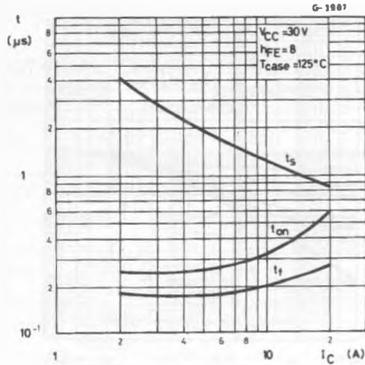
Base-emitter Saturation Voltage.



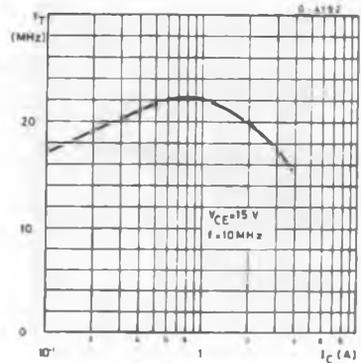
Saturated Switching Characteristics.



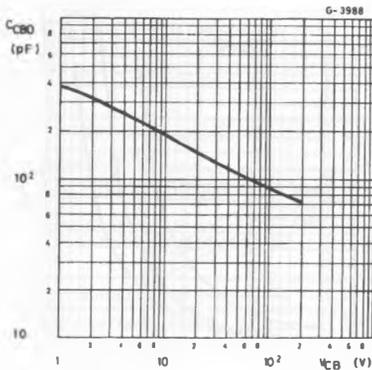
Saturated Switching Characteristics.



Transition Frequency.



Collector-base Capacitance.



Clamped Reverse Bias Safe Operating Areas.

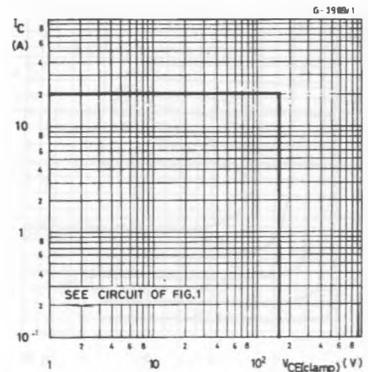


Figure 1 : Clamped $E_{s/b}$ Test Circuit.

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

