

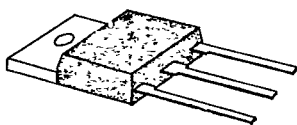
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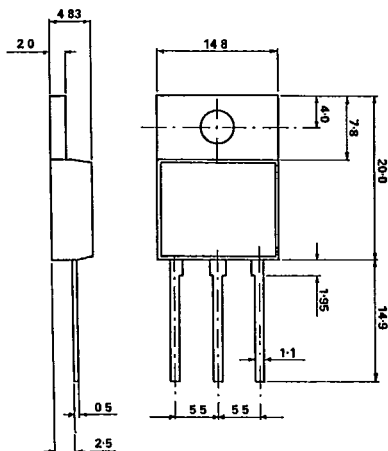
BUW 90

NPN MULTI-EPITAXIAL POWER TRANSISTOR

Suitable for designs requiring devices
with very low saturation voltage and
high gain for reduced load operation

MECHANICAL DATA

Dimensions in mm



FEATURES

- LOW $V_{CE(SAT)}$
- FAST SWITCHING
- HIGH RELIABILITY

APPLICATIONS

- POWER SWITCHING CIRCUITS

SOT93

(ALSO AVAILABLE IN CHIP FORM)

ABSOLUTE MAXIMUM RATINGS ($T_{CASE} = 25^\circ\text{C}$ unless otherwise stated)

V_{CEX}	Collector-emitter voltage ($V_{BE} = -1.5\text{V}$)	250V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	125V
V_{EBO}	Emitter-base voltage	7V
I_C	Collector current	20A
$I_{C(PK)}$	Peak collector current	30A
I_B	Base current	4A
$I_{B(PK)}$	Peak base current	6A
P_{tot}	Total dissipation at $T_{CASE} = 25^\circ\text{C}$	125W
T_{stg}	Storage temperature	-55 to 200°C
T_j	Maximum operating junction temperature	200°C
R_{th}	Thermal resistance (junction-case)	Max. 1.2°C/W

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ELECTRICAL CHARACTERISTICS ($T_{CASE} = 25^{\circ}\text{C}$ unless otherwise stated)

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{CE(sus)}$ Collector-emitter sustaining voltage	$I_B = 0, I_C = 0.2\text{A}$ $L = 25\text{mH}$	125			V
$V_{(BR)EBO}$ Emitter base breakdown voltage	$I_C = 0$ $I_E = 50\text{mA}$	7			V
I_{CEX} Collector cut-off current	$V_{BE} = -1.5\text{V}$ $V_{CE} = V_{CEX}$ $T_J = 100^{\circ}\text{C}$			1.0 5.0	mA mA
I_{CER} Collector cut-off current	$R_{BE} = 10\Omega$ $V_{CE} = V_{CEX}$ $T_J = 100^{\circ}\text{C}$			1.0 5.0	mA mA
I_{EBO} Emitter cut-off current	$I_C = 0$ $V_{BE} = -5\text{V}$			1.0	mA
$V_{CE(sat)}$ * Collector-emitter saturation voltage	$I_C = 11\text{A}$ $I_B = 1.1\text{A}$ $T_J = 100^{\circ}\text{C}$		0.65	0.9	V
	$I_C = 5.5\text{A}$ $I_B = 0.35\text{A}$ $T_J = 100^{\circ}\text{C}$		0.8	1.2	V
			0.5	0.8	V
			0.5	0.9	V
$V_{BE(sat)}$ * Emitter-base saturation voltage	$I_C = 11\text{A}$ $I_B = 1.1\text{A}$ $T_J = 100^{\circ}\text{C}$		1.3	1.6	V
			1.35	1.7	V

SWITCHING CHARACTERISTICS ($T_{CASE} = 25^{\circ}\text{C}$ unless otherwise stated)

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
SWITCHING TIMES ON RESISTIVE LOAD					
t_r Rise time	$I_C = 15\text{A}$ $V_{CC} = 100\text{V}$		0.4	1.0	μs
t_s Storage time	$V_{BB} = -5\text{V}$ $R_{B2} = 1.3\Omega$		0.6	1.0	μs
t_f Fall time	$t_p = 30\mu\text{s}$ $I_{B1} = 1.8\text{A}$		0.14	0.3	μs
TURN-ON SWITCHING CHARACTERISTICS					
di/dt On state collector current current rate of rise	$R_C = 0$ $V_{CC} = 100\text{V}$ $I_{B1} = 1.65\text{A}$ $T_J = 100^{\circ}\text{C}$	35 30	45 40		$\text{A}/\mu\text{s}$ $\text{A}/\mu\text{s}$
$V_{CE(2\mu\text{s})}$ Collector-emitter voltage after applied base drive	$V_{CC} = 100\text{V}$ $R_C = 9\Omega$ $I_{B1} = 1.1\text{A}$ $T_J = 100^{\circ}\text{C}$		2.0 2.6 1.1 1.6	2.5 4.0 2.0 2.5	V V V V
TURN-OFF SWITCHING CHARACTERISTICS - INDUCTIVE LOAD, WITH NEGATIVE BIAS					
t_{si} Carrier storage time	$I_C = 11\text{A}$ $V_{clamp} = 125\text{V}$ $T_J = 100^{\circ}\text{C}$		0.75 0.95	1.4 1.7	μs μs
t_{fi} Fall time	$I_B = 1.1\text{A}$ $L_C = 0.25\text{mH}$ $V_{CC} = 100\text{V}$ $R_{B2} = 2.3\Omega$ $T_J = 100^{\circ}\text{C}$		0.08 0.14	0.2 0.3	μs μs
t_c V_{CE}/I_C Crossover time	$V_{BB} = -5\text{V}$ $T_J = 100^{\circ}\text{C}$		0.15 0.3	0.3 0.5	μs μs
TURN-OFF SWITCHING CHARACTERISTICS - INDUCTIVE LOAD, WITHOUT NEGATIVE BIAS					
t_{si} Carrier storage time	$I_C = 11\text{A}$ $V_{clamp} = 125\text{V}$ $I_B = 1.1\text{A}$ $L_C = 0.25\text{mH}$ $T_J = 100^{\circ}\text{C}$		1.8 2.5		μs μs
t_{fi} Fall time	$V_{CC} = 10\text{V}$ $R_{B2} = 4.7\Omega$ $V_{BB} = 0\text{V}$ $T_J = 100^{\circ}\text{C}$		0.7 1.0		μs μs

* Pulse test $t_p = 300\mu\text{s}$ $\delta \leq 2\%$