

HIGH CURRENT NPN SILICON TRANSISTOR

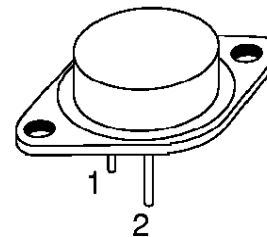
- SGS-THOMSON PREFERRED SALESTYPES
- NPN TRANSISTOR
- HIGH CURRENT CAPABILITY
- FAST SWITCHING SPEED
- HIGH RUGGEDNESS

APPLICATIONS

- LINEAR AND SWITCHING INDUSTRIAL EQUIPMENT
- SWITCHING REGULATORS

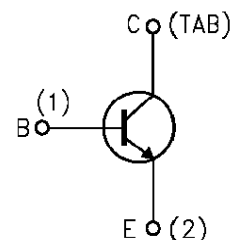
DESCRIPTION

The BUV20, BUV21 and BUV22 are silicon multiepitaxial planar NPN transistor in jedec TO-3 metal case, intended for use in switching and linear applications in military and industrial equipment.



TO-3
(version "S")

INTERNAL SCHEMATIC DIAGRAM



SC08820

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value			Unit
		BUV20	BUV21	BUV22	
V_{CBO}	Collector-Base Voltage ($I_E = 0$)	160	250	300	V
V_{CER}	Collector-Emitter Voltage ($R_{BE} = 100\Omega$)	150	240	290	V
V_{CEX}	Collector-Emitter Voltage ($V_{BE} = -1.5V$)	160	250	300	V
V_{CEO}	Collector-Emitter Voltage ($I_B = 0$)	125	200	250	V
V_{EBO}	Emitter-Base Voltage ($I_C = 0$)	7	7	7	V
I_C	Collector Current	50	40	40	A
I_{CM}	Collector Peak Current	60	50	50	A
I_B	Base Current	10	8	8	A
P_{10t}	Total Power Dissipation at $T_{case} \leq 25^\circ C$	250			W
T_{sig}	Storage Temperature	-65 to 200			$^\circ C$
T_j	Junction Temperature	200			$^\circ C$

THERMAL DATA

$R_{thj-case}$	Thermal Resistance Junction-case	Max	0.7	°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_{CEX}	Collector Cut-off Current ($V_{BE} = -1.5V$)	$V_{CE} = V_{CEX}$ for BUV20 for BUV21 for BUV22 at $T_{case} = 125\text{ °C}$ for BUV20 for BUV21 for BUV22			3 3 3 12 12 12	mA mA mA mA mA mA
I_{CEO}	Collector Cut-off Current ($I_B = 0$)	for BUV20 $V_{CE} = 100\text{ V}$ for BUV21 $V_{CE} = 160\text{ V}$ for BUV22 $V_{CE} = 200\text{ V}$			3 3 3	mA mA mA
I_{EBO}	Emitter Cut-off Current ($I_C = 0$)	$V_{EB} = 5\text{ V}$			1	mA
$V_{CEO(sus)*}$	Collector-Emitter Sustaining Voltage ($I_B = 0$)	$I_C = 200\text{ mA}$ $L = 25\text{ mH}$ for BUV20 for BUV21 for BUV22	125 200 250			V V V
$V_{(BR)EB0*}$	Emitter-base Breakdown Voltage ($I_C = 0$)	$I_E = 50\text{ mA}$	7			V
$V_{CE(sat)*}$	Collector-Emitter Saturation Voltage	for BUV20 $I_C = 25\text{ A}$ $I_B = 2.5\text{ A}$ $I_C = 50\text{ A}$ $I_B = 5\text{ A}$ for BUV21 $I_C = 12\text{ A}$ $I_B = 1.2\text{ A}$ $I_C = 25\text{ A}$ $I_B = 3\text{ A}$ for BUV22 $I_C = 10\text{ A}$ $I_B = 1\text{ A}$ $I_C = 20\text{ A}$ $I_B = 2.5\text{ A}$		0.3 0.7 0.2 0.9 0.2 0.5	0.6 1.2 0.6 1.5 1 1.5	V V V V V V
$V_{BE(sat)*}$	Base-Emitter Saturation Voltage	for BUV20 $I_C = 50\text{ A}$ $I_B = 5\text{ A}$ for BUV21 $I_C = 25\text{ A}$ $I_B = 3\text{ A}$ for BUV22 $I_C = 40\text{ A}$ $I_B = 4\text{ A}$		1.4 1.2 1.2	2 1.5 1.5	V V V
h_{FE*}	DC Current Gain	for BUV20 $V_{CE} = 2\text{ V}$ $I_C = 25\text{ A}$ $V_{CE} = 4\text{ V}$ $I_C = 50\text{ A}$ for BUV21 $V_{CE} = 2\text{ V}$ $I_C = 12\text{ A}$ $V_{CE} = 4\text{ V}$ $I_C = 25\text{ A}$ for BUV22 $V_{CE} = 4\text{ V}$ $I_C = 10\text{ A}$ $V_{CE} = 4\text{ V}$ $I_C = 20\text{ A}$	20 10 20 10 20 10		60 60 60	
f_T	Transition frequency	$V_{CE} = 15\text{ V}$ $I_C = 2\text{ A}$ $f = 100\text{ MHz}$	8			MHz

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

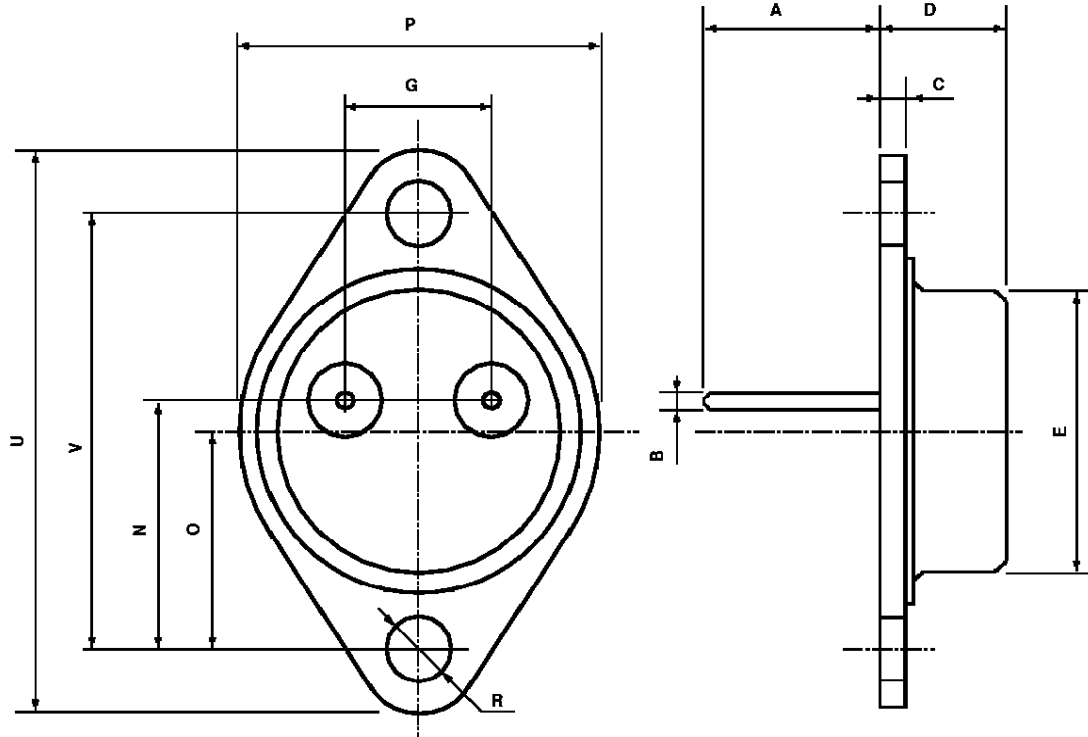
ELECTRICAL CHARACTERISTICS (continued)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t_{on}	Turn-on Time	for BUV20 $I_C = 50\text{ A}$ $I_B = 5\text{ A}$ for BUV21 $I_C = 25\text{ A}$ $I_B = 3\text{ A}$ for BUV22 $I_C = 20\text{ A}$ $I_B = 2.5\text{ A}$			1.5 1.2 1.3	μs μs μs
t_f	Fall time	for BUV20 $I_C = 50\text{ A}$ $I_{B1} = - I_{B2} = 5\text{ A}$ for BUV21 $I_C = 25\text{ A}$ $I_{B1} = - I_{B2} = 3\text{ A}$ for BUV22 $I_C = 20\text{ A}$ $I_{B1} = - I_{B2} = 2.5\text{ A}$			0.3 0.4 0.5	μs μs μs
t_s	Storage Time	for BUV20 $I_C = 50\text{ A}$ $I_{B1} = - I_{B2} = 5\text{ A}$ for BUV21 $I_C = 25\text{ A}$ $I_{B1} = - I_{B2} = 3\text{ A}$ for BUV22 $I_C = 20\text{ A}$ $I_{B1} = - I_{B2} = 2.5\text{ A}$			1.2 1.8 2	μs μs μs

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

TO-3 (version S) MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	11.00		13.10	0.433		0.516
B	1.47		1.60	0.058		0.063
C	1.50		1.65	0.059		0.065
D	8.32		8.92	0.327		0.351
E	19.00		20.00	0.748		0.787
G	10.70		11.10	0.421		0.437
N	16.50		17.20	0.649		0.677
P	25.00		26.00	0.984		1.023
R	4.00		4.09	0.157		0.161
U	38.50		39.30	1.515		1.547
V	30.00		30.30	1.187		1.193



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