

## HIGH CURRENT NPN SILICON TRANSISTOR

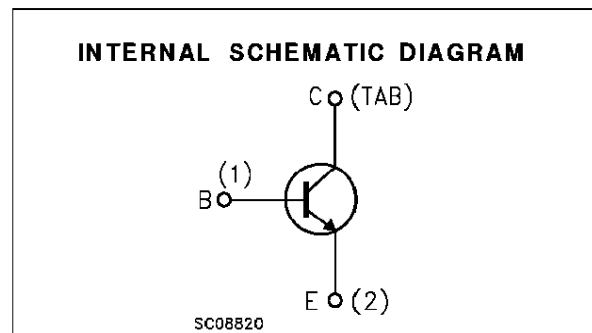
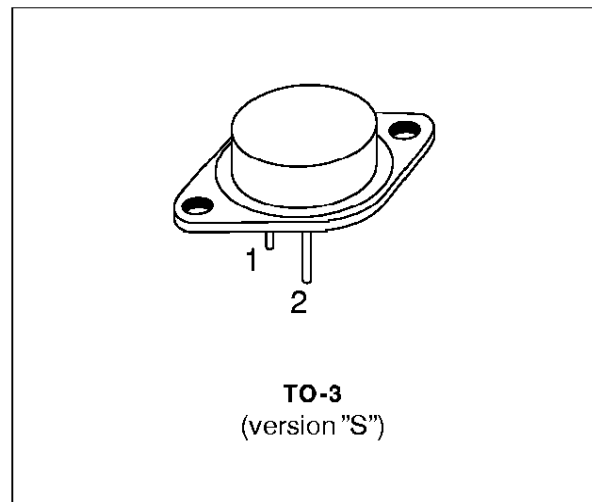
- SGS-THOMSON PREFERRED SALESTYPES
- NPN TRANSISTOR
- HIGH CURRENT CAPABILITY
- FAST SWITCHING SPEED
- HIGH RUGGEDNESS

### 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.



### 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			$^\circ C$

## BUV20/BUV21/BUV22

### THERMAL DATA

$R_{thj-case}$	Thermal Resistance Junction-case	Max	0.7	$^{\circ}\text{C}/\text{W}$
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### ELECTRICAL CHARACTERISTICS ( $T_{case} = 25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CEX}$	Collector Cut-off Current ( $V_{BE} = -1.5\text{V}$ )	$V_{CE} = V_{CEX}$ for <b>BUV20</b> for <b>BUV21</b> for <b>BUV22</b> at $T_{case} = 125^{\circ}\text{C}$ for <b>BUV20</b> for <b>BUV21</b> for <b>BUV22</b>			3 3 3  12 12 12	mA mA mA  mA mA mA
$I_{CEO}$	Collector Cut-off Current ( $I_B = 0$ )	for <b>BUV20</b> $V_{CE} = 100\text{ V}$ for <b>BUV21</b> $V_{CE} = 160\text{ V}$ for <b>BUV22</b> $V_{CE} = 200\text{ V}$			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 <b>BUV20</b> for <b>BUV21</b> for <b>BUV22</b>	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 <b>BUV20</b> $I_C = 25\text{ A}$ $I_B = 2.5\text{ A}$ $I_C = 50\text{ A}$ $I_B = 5\text{ A}$ for <b>BUV21</b> $I_C = 12\text{ A}$ $I_B = 1.2\text{ A}$ $I_C = 25\text{ A}$ $I_B = 3\text{ A}$ for <b>BUV22</b> $I_C = 10\text{ A}$ $I_B = 1\text{ A}$ $I_C = 20\text{ A}$ $I_B = 2.5\text{ A}$		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 <b>BUV20</b> $I_C = 50\text{ A}$ $I_B = 5\text{ A}$ for <b>BUV21</b> $I_C = 25\text{ A}$ $I_B = 3\text{ A}$ for <b>BUV22</b> $I_C = 40\text{ A}$ $I_B = 4\text{ A}$		1.4 1.2 1.2	2 1.5 1.5	V V V
$h_{FE}^*$	DC Current Gain	for <b>BUV20</b> $V_{CE} = 2\text{ V}$ $I_C = 25\text{ A}$ $V_{CE} = 4\text{ V}$ $I_C = 50\text{ A}$ for <b>BUV21</b> $V_{CE} = 2\text{ V}$ $I_C = 12\text{ A}$ $V_{CE} = 4\text{ V}$ $I_C = 25\text{ A}$ for <b>BUV22</b> $V_{CE} = 4\text{ V}$ $I_C = 10\text{ A}$ $V_{CE} = 4\text{ V}$ $I_C = 20\text{ A}$	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  $\mu\text{s}$ , duty cycle  $\leq 2\%$

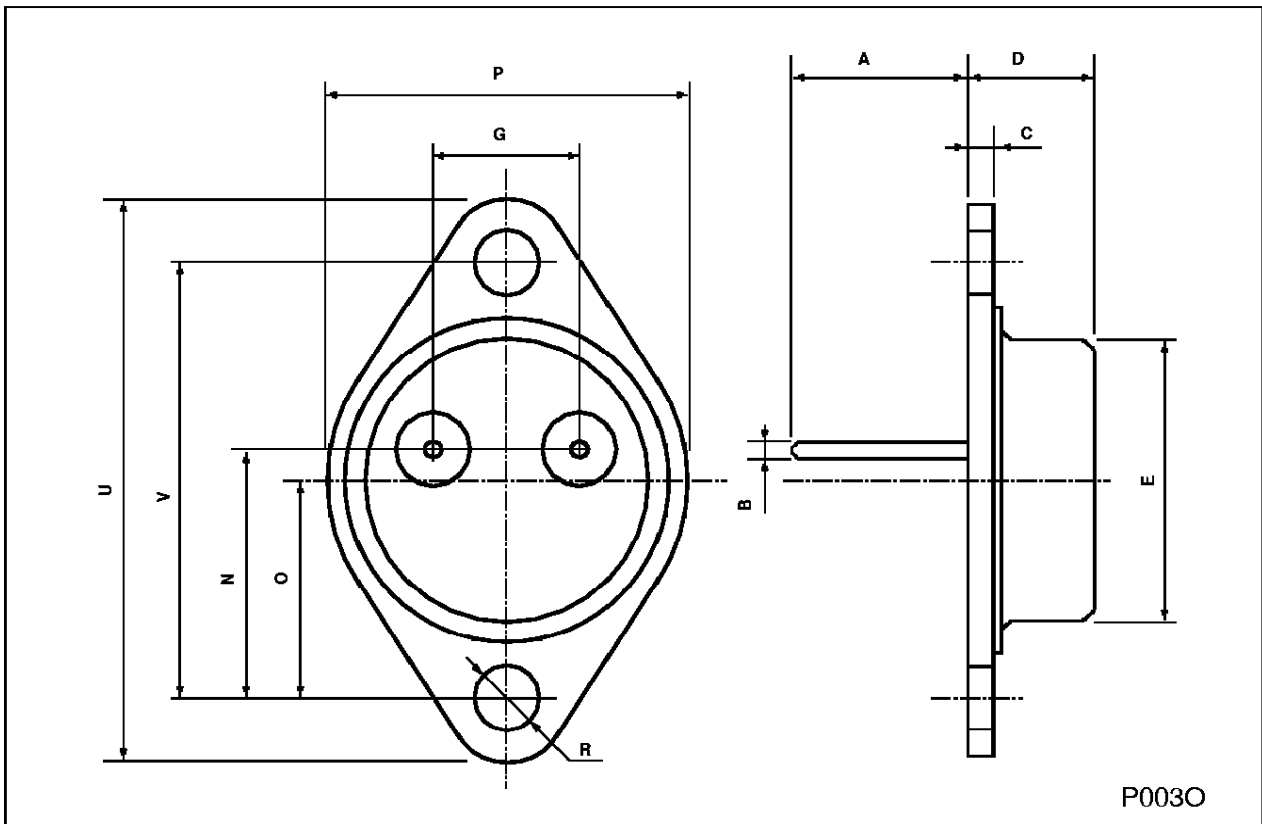
**ELECTRICAL CHARACTERISTICS** (continued)

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

\* Pulsed: Pulse duration = 300  $\mu\text{s}$ , 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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