

HIGH POWER NPN SILICON TRANSISTOR

- SGS-THOMSON PREFERRED SALESTYPE
- NPN TRANSISTOR
- HIGH CURRENT CAPABILITY
- FAST SWITCHING SPEED
- FULLY CHARACTERIZED AT 125°C

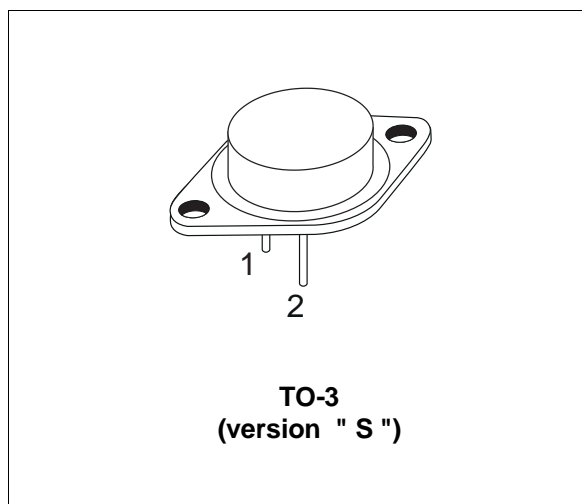
APPLICATION

- SWITCHING REGULATORS
- MOTOR CONTROL

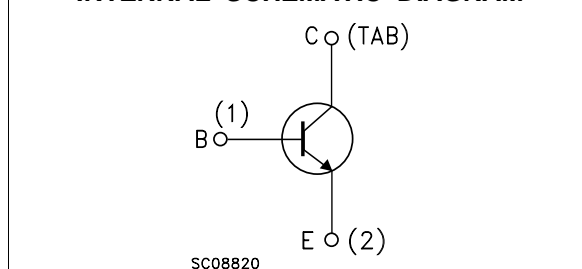
DESCRIPTION

The BUV61 is a Multiepitaxial planar NPN transistor in TO-3 metal case.

It's intended for use in high frequency and efficiency converters such as motor controllers and industrial equipment.



INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CEV}	Collector-emitter Voltage ($V_{BE} = -1.5V$)	300	V
V_{CEO}	Collector-emitter Voltage ($I_B = 0$)	200	V
V_{EBO}	Emitter-Base Voltage ($I_C = 0$)	7	V
I_C	Collector Current	50	A
I_{CM}	Collector Peak Current	75	A
I_B	Base Current	8	A
I_{BM}	Base Peak Current	15	A
P_{Base}	Reverse Bias Base Dissipation (B.E. junction in avalanche)	2	W
P_{tot}	Total Power Dissipation at $T_{case} < 25\text{ }^\circ\text{C}$	250	W
T_{stg}	Storage Temperature	-65 to 200	°C
T_j	Max Operating Junction Temperature	200	°C

BUV61

THERMAL DATA

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CER}	Collector Cut-off Current ($R_{BE} = 10\Omega$)	$V_{CE} = V_{CEV}$ $V_{CE} = V_{CEV} \quad T_C = 100^{\circ}C$			1 5	mA mA
I_{CEV}	Collector Cut-off Current	$V_{CE} = V_{CEV} \quad V_{BE} = -1.5V$ $V_{CE} = V_{CEV} \quad V_{BE} = -1.5V \quad T_C = 100^{\circ}C$			1 4	mA mA
I_{EBO}	Emitter Cut-off Current ($I_C = 0$)	$V_{EB} = 5V$			1	mA
$V_{CEO(sus)*}$	Collector-Emitter Sustaining Voltage	$I_C = 0.2A$ $L = 25mH$	200			V
V_{EBO}	Emitter-base Voltage ($I_C = 0$)	$I_E = 50mA$	7			V
$V_{CE(sat)*}$	Collector-Emitter Saturation Voltage	$I_C = 12.5A \quad I_B = 0.625A$ $I_C = 25A \quad I_B = 2.5A$ $I_C = 40A \quad I_B = 5A$ $I_C = 12.5A \quad I_B = 0.625A \quad T_j = 100^{\circ}C$ $I_C = 25A \quad I_B = 2.5A \quad T_j = 100^{\circ}C$ $I_C = 40A \quad I_B = 5A \quad T_j = 100^{\circ}C$		0.65 0.4 0.6 0.5 0.5 0.75	0.9 0.9 1.2 1.2 1.5 1.9	V V V V V V
$V_{BE(sat)*}$	Base-Emitter Saturation Voltage	$I_C = 25A \quad I_B = 2.5A$ $I_C = 40A \quad I_B = 5A$ $I_C = 25A \quad I_B = 2.5A \quad T_j = 100^{\circ}C$ $I_C = 40A \quad I_B = 5A \quad T_j = 100^{\circ}C$		1.05 1.35 1.1 1.35	1.4 1.8 1.7 1.8	V V V V
di_c/d_t*	Rated of Rise of on-state Collector Current	$V_{CC} = 160V \quad R_C = 0$ $I_{B1} = 3.75A$ $T_j = 25^{\circ}C$ $T_j = 100^{\circ}C$	70 60	130 110		A/ μs A/ μs
$V_{CE(2\mu s)}$	Collector Emitter Dynamic Voltage	$V_{CC} = 160V$ $R_C = 6.4\Omega$ $I_{B1} = 2.5A$ $T_j = 25^{\circ}C$ $T_j = 100^{\circ}C$		1.3 1.8	3 5	V V
$V_{CE(4\mu s)}$	Collector Emitter Dynamic Voltage	$V_{CC} = 160V$ $R_C = 6.4\Omega$ $I_{B1} = 2.5A$ $T_j = 25^{\circ}C$ $T_j = 100^{\circ}C$		0.95 1.1	2 3	V V

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

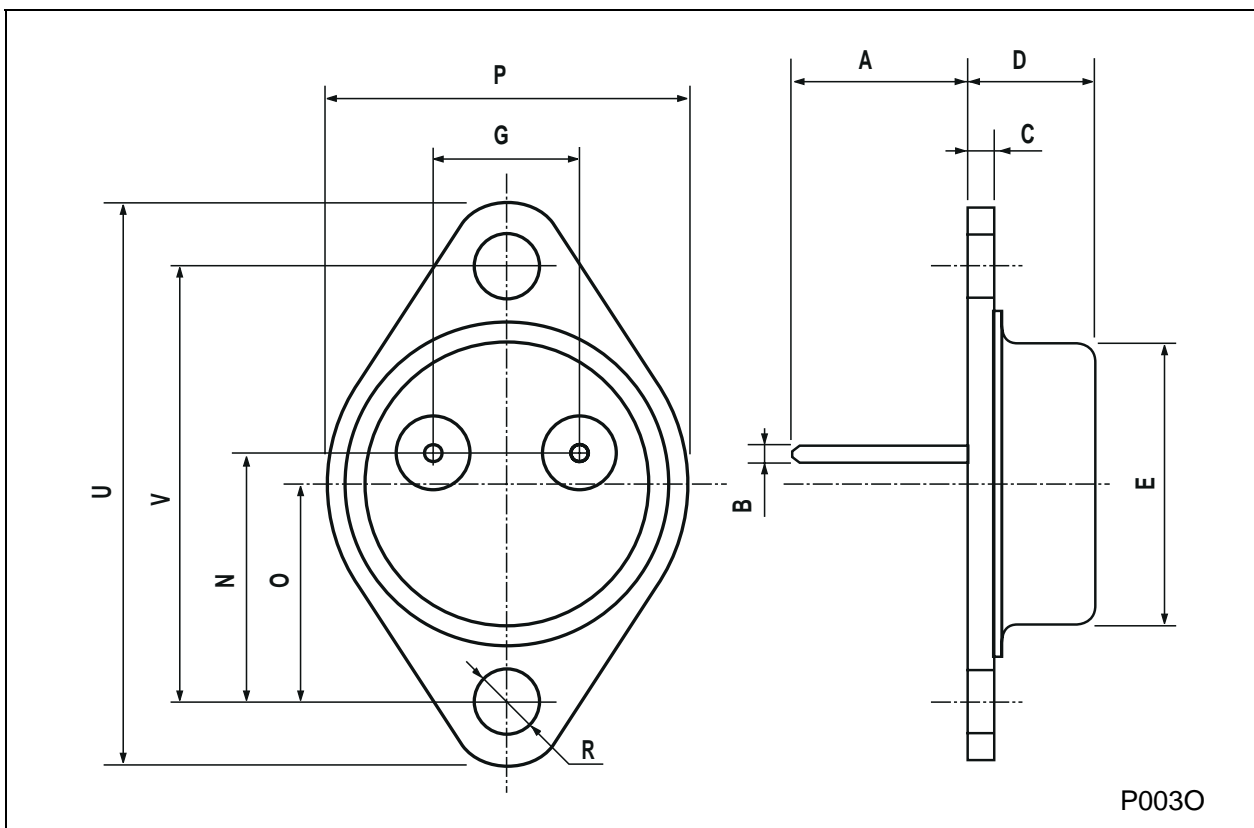
ELECTRICAL CHARACTERISTICS (continued)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
	RESISTIVE LOAD						
t_r	Rise Time	$V_{CC} = 160V$	$I_C = 40A$		0.55	0.7	μs
t_s	Storage Time	$V_{BB} = -5V$	$I_{B1} = 5A$		0.6	1.2	μs
t_f	Fall Time	$R_{B2} = 0.5\Omega$	$T_p = 30\mu s$		0.07	0.3	μs
	INDUCTIVE LOAD						
t_s	Storage Time	$V_{CC} = 160V$	$V_{clamp} = 200V$		0.85	1.9	μs
t_f	Fall Time	$I_C = 25A$	$I_B = 2.5A$		0.06	0.15	μs
t_t	Tail Time in Turn-on	$V_{BB} = -5V$	$R_{B2} = 1\Omega$		0.01	0.07	μs
t_c	Crossover Time	$L_C = 0.32mH$			0.11	0.3	μs
t_s	Storage Time	$V_{CC} = 160V$	$V_{clamp} = 200V$		1.1	2.4	μs
t_f	Fall Time	$I_C = 25A$	$I_B = 2.5A$		0.08	0.25	μs
t_t	Tail Time in Turn-on	$V_{BB} = -5V$	$R_{B2} = 1\Omega$		0.02	0.15	μs
t_c	Crossover Time	$L_C = 0.32mH$	$T_j = 100^\circ C$		0.15	0.5	μs
t_s	Storage Time	$V_{CC} = 160V$	$V_{clamp} = 200V$		1.6		μs
t_f	Fall Time	$I_C = 25A$	$I_B = 2.5A$		0.7		μs
t_t	Tail Time in Turn-on	$V_{BB} = 0$	$R_{B2} = 2.7\Omega$		0.2		μs
		$L_C = 0.32mH$					
t_s	Storage Time	$V_{CC} = 160V$	$V_{clamp} = 200V$		2.7		μs
t_f	Fall Time	$I_C = 25A$	$I_B = 2.5A$		1		μs
t_t	Tail Time in Turn-on	$V_{BB} = 0$	$R_{B2} = 2.7\Omega$		0.3		μs
		$L_C = 0.32mH$	$T_j = 100^\circ C$				

* Pulsed: Pulse duration = 300 μs , duty cycle = 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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