BUV61

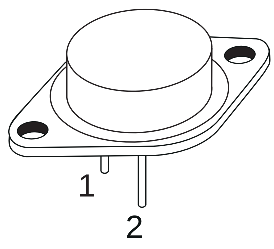
HIGH POWER NPN SILICON TRANSISTOR

- NPN TRANSISTOR
- HIGH CURRENT CAPABILITY
- FAST SWITCHING SPEED
- FULLY CHARACTERIZED AT 125°C

APPLICATION
- SWITCHING REGULATORS
- MOTOR CONTROL

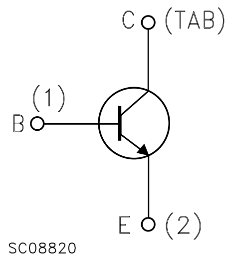
DESCRIPTION
The BUV61 is a Multi-Epitaxial planar NPN transistor in TO-3 metal case.

It is intented for use in high frequency and efficiency converters such us motor controllers and industrial equipment.



TO-3
(version " S ")

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 °C	250	W
T_{stg}	Storage Temperature	-65 to 200	°C
T_j	Max Operating Junction Temperature	200	°C

THERMAL DATA

$R_{thj-case}$	Thermal Resistance Junction-case	Max	0.7	$^oC/W$

ELECTRICAL CHARACTERISTICS (T_{case} = 25 ^oC unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CER}	Collector Cut-off Current (R_{BE} = 10Ω)	V_{CE} = 300 V V_{CE} = 300 V T_C = 100^{o}C			1 5	mA mA
I_{CEV}	Collector Cut-off Current (V_{BE} = -1.5V)	V_{CE} = 300V V_{CE} = 300V T_C=100^{o}C			1 4	mA mA
I_{EBO}	Emitter Cut-off Current (I_C = 0)	V_{EB} = 5 V			1	mA
$V_{CEO(sus)}$∗	Collector-Emitter Sustaining Voltage (I_B = 0)	I_C = 0.2A L = 25 mH	200			V
V_{EBO}	Emitter-base Voltage (I_C = 0)	I_E = 50 mA	7			V
$V_{CE(sat)}$∗	Collector-Emitter Saturation Voltage	I_C = 12.5A I_B = 0.625A I_C = 25A I_B = 2.5A I_C = 40A I_B = 5A I_C = 12.5A I_B = 0.625A T_j = 100^{o}C I_C = 25A I_B = 2.5A T_j = 100^{o}C I_C = 40A I_B = 5A T_j = 100^{o}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
$V_{BE(sat)}$∗	Base-Emitter Saturation Voltage	I_C = 25A I_B = 2.5A I_C = 40A I_B = 5A I_C = 25A I_B = 2.5A T_j = 100^{o}C I_C = 40A I_B = 5A T_j = 100^{o}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 R_C = 0 I_{B1} =3.75A T_j = 25^{o}C T_j = 100^{o}C	 70 60	 130 110		 A/µs A/µs
$V_{CE(2µs)}$	Collector Emitter Dynamic Voltage	V_{CC} = 160V R_C = 6.4Ω I_{B1} =2.5A T_j = 25^{o}C T_j = 100^{o}C		 1.3 1.8	 3 5	 V V
$V_{CE(4µs)}$	Collector Emitter Dynamic Voltage	V_{CC} = 160V R_C = 6.4Ω I_{B1} =2.5A T_j = 25^{o}C T_j = 100^{o}C		 0.95 1.1	 2 3	 V V

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

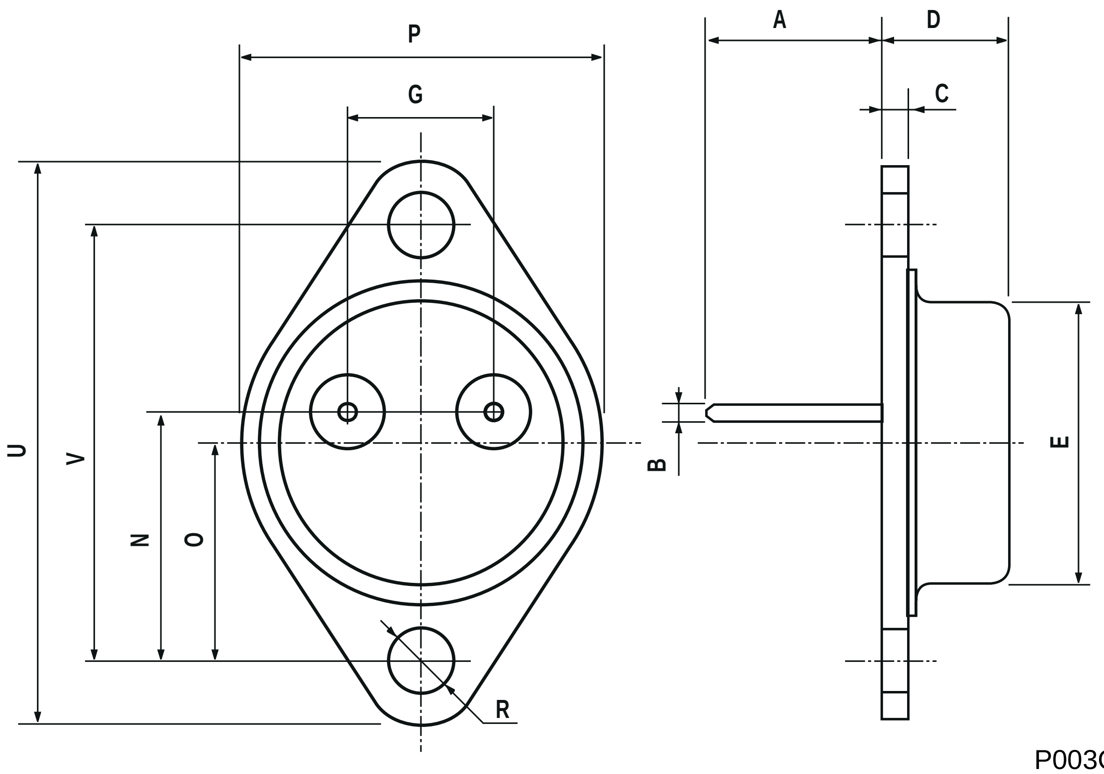
ELECTRICAL CHARACTERISTICS (continued)

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} = 0.5Ω	T_p = 30µs		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} = 1Ω		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} = 1Ω		0.02	0.15	µs
t_c	Crossover Time	L_C = 0.32mH	T_j = 100°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} = 2.7Ω		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} = 2.7Ω		0.3		µs
		L_C = 0.32mH	T_j = 100°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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