

HIGH POWER NPN SILICON TRANSISTOR

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

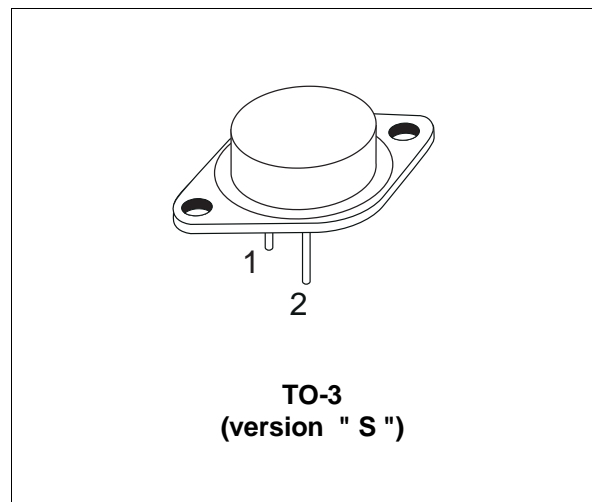
APPLICATION

- SWITCHING REGULATORS
- MOTOR CONTROL

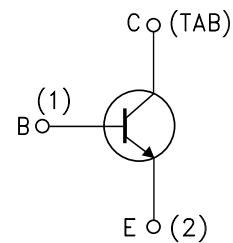
DESCRIPTION

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

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



INTERNAL SCHEMATIC DIAGRAM



SC08820

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	°C/W
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ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C 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°C			1 5	mA mA
I _{CEV}	Collector Cut-off Current (V _{BE} = -1.5V)	V _{CE} = 300V V _{CE} = 300V T _C =100°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°C I _C = 25A I _B = 2.5A T _j = 100°C I _C = 40A I _B = 5A T _j = 100°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 I _B = 2.5A I _C = 40A I _B = 5A I _C = 25A I _B = 2.5A T _j = 100°C I _C = 40A I _B = 5A T _j = 100°C		1.05 1.35 1.1 1.35	1.4 1.8 1.7 1.8	V V V V
di _c /dt*	Rated of Rise of on-state Collector Current	V _{CC} = 160V R _C = 0 I _{B1} = 3.75A T _j = 25°C T _j = 100°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°C T _j = 100°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°C T _j = 100°C		0.95 1.1	2 3	V V

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

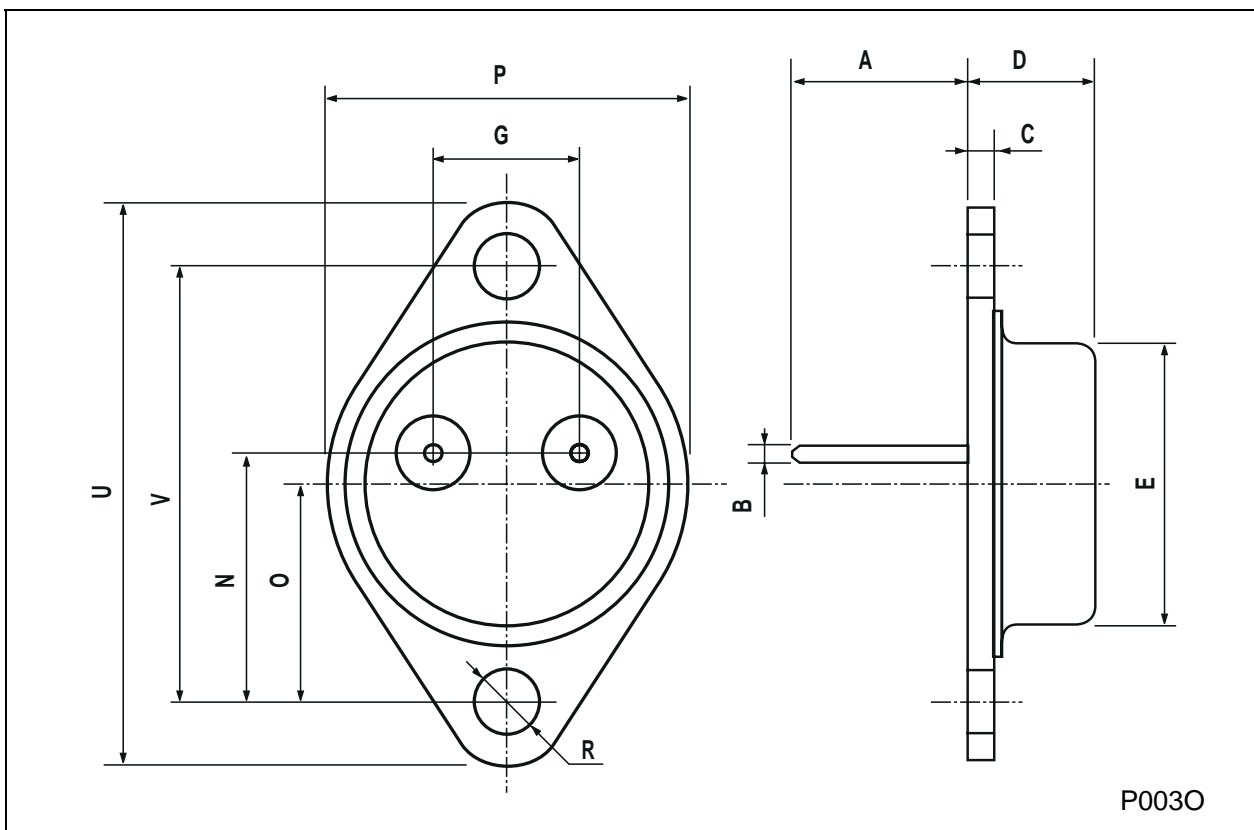
ELECTRICAL CHARACTERISTICS (continued)

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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