

HIGH POWER NPN SILICON TRANSISTORS

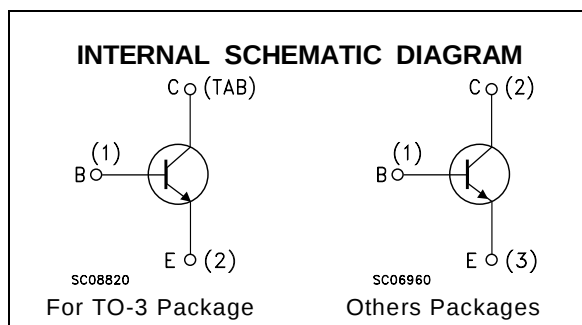
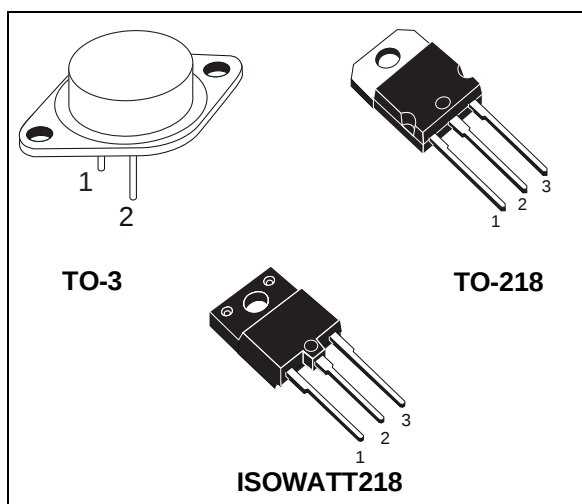
- STMicroelectronics PREFERRED SALESTYPES
- NPN TRANSISTOR
- HIGH VOLTAGE CAPABILITY
- HIGH CURRENT CAPABILITY
- FAST SWITCHING SPEED

APPLICATIONS

- SWITCH MODE POWER SUPPLIES
- FLYBACK AND FORWARD SINGLE TRANSISTOR LOW POWER CONVERTERS

DESCRIPTION

The BUX48/A, BUV48A and BUV48AFI are silicon Multiepitaxial Mesa NPN transistors mounted respectively in TO-3 metal case, TO-218 plastic package and ISOWATT218 fully isolated package. They are particularly intended for switching and industrial applications from single and three-phase mains.



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value			Unit
		BUX48	BUX48A BUV48A BUV48AFI		
V_{CER}	Collector-Emitter Voltage ($R_{BE} = 10\Omega$)	850	1000		V
V_{CES}	Collector-Emitter Voltage ($V_{BE} = 0$)	850	1000		V
V_{CEO}	Collector-Emitter Voltage ($I_B = 0$)	400	450		V
V_{EBO}	Emitter-Base Voltage ($I_C = 0$)	7			V
I_C	Collector Current	15			A
I_{CM}	Collector Peak Current	30			A
I_{CP}	Collector Peak Current non repetitive ($t_p < 20\mu s$)	55			A
I_B	Base Current	4			A
I_{BM}	Base Peak Current	20			A
		TO-3	TO-218	ISOWATT218	
P_{tot}	Total Dissipation at $T_c = 25^\circ C$	175	125	55	W
T_{stg}	Storage Temperature	-65 to 200	-65 to 150	-65 to 150	$^\circ C$
T_j	Max. Operating Junction Temperature	200	150	150	$^\circ C$

BUX48 / BUX48A / BUV48A / BUV48AFI

THERMAL DATA

		TO-3	TO-218	ISOWATT218	
R _{thj-case}	Thermal Resistance Junction-case Max	1	1	2.2	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I _{CES}	Collector Cut-off Current (V _{BE} = 0)	V _{CE} = rated V _{CES} V _{CE} = rated V _{CES} , T _c = 125 °C			200 2	μA mA
I _{CER}	Collector Cut-off Current (R _{BE} = 10 Ω)	V _{CE} = rated V _{CER} V _{CE} = rated V _{CER} , T _c = 125 °C			500 4	μA 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 = 200 mA L = 25mH for BUX48 for BUX48A/V48A/V48AFI	400 450			V V
V _{EBO}	Emitter-Base Voltage (I _C = 0)	I _E = 50 mA	7		30	V
V _{CE(sat)*}	Collector-Emitter Saturation Voltage	for BUX48 I _C = 10 A I _B = 2 A I _C = 15 A I _B = 4 A I _C = 15 A I _B = 3 A for BUX48A/V48A/V48AFI I _C = 8 A I _B = 1.6 A I _C = 12 A I _B = 2.4 A			1.5 3.5 5 1.5 5	V V V V V
V _{BE(sat)*}	Base-Emitter Saturation Voltage	for BUX48 I _C = 10 A I _B = 2 A for BUX48A/V48A/V48AFI I _C = 8 A I _B = 1.6 A			1.6 1.6	V V

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

RESISTIVE SWITCHING TIMES

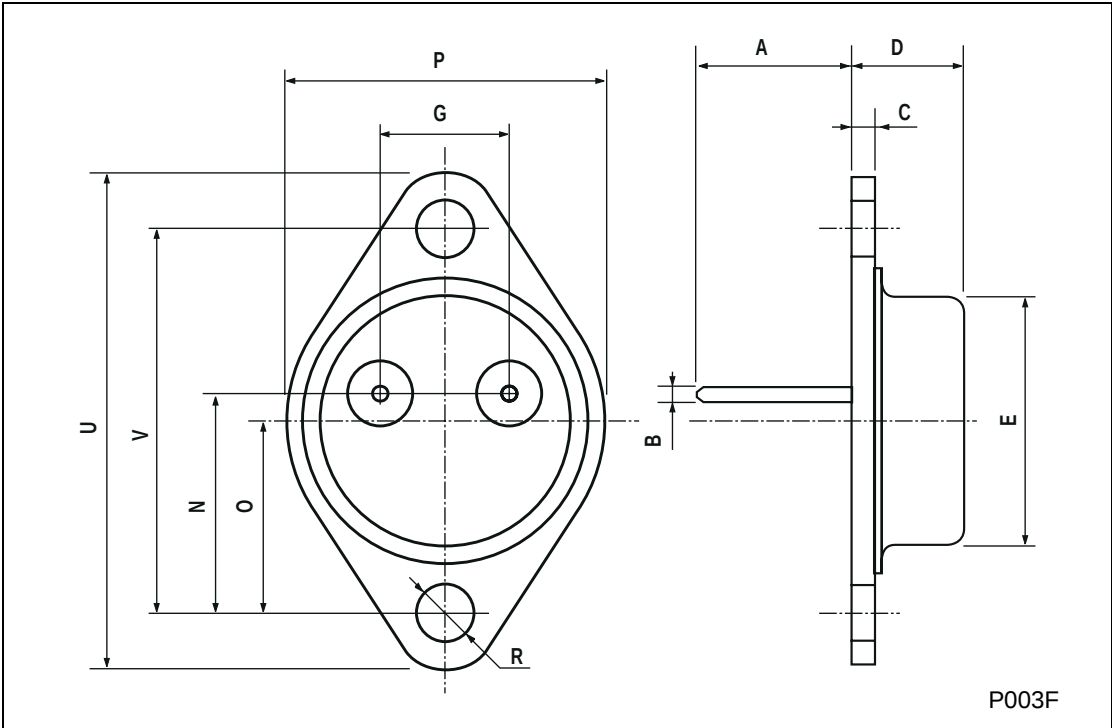
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t _{on}	Turn-on Time	for BUX48 V _{CC} = 150 V I _C = 10 A I _{B1} = 2 A for BUX48A/V48A/V48AFI V _{CC} = 150 V I _C = 8 A I _{B1} = 1.6 A			1 1	μs μs
t _s	Storage Time	for BUX48 V _{CC} = 150 V I _C = 10 A I _{B1} = - I _{B2} = 2 A for BUX48A/V48A/V48AFI V _{CC} = 150 V I _C = 8 A I _{B1} = - I _{B2} = 1.6 A			3 3	μs μs
t _f	Fall Time	for BUX48 V _{CC} = 150 V I _C = 10 A I _{B1} = - I _{B2} = 2 A for BUX48A/V48A/V48AFI V _{CC} = 150 V I _C = 8 A I _{B1} = - I _{B2} = 1.6 A			0.8 0.8	μs μs

INDUCTIVE SWITCHING TIMES

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t_s	Storage Time	for BUX48 $V_{CC} = 300\text{ V}$ $I_C = 10\text{ A}$ $L_B = 3\text{ }\mu\text{H}$ $V_{BE} = -5\text{ V}$ $I_{B1} = 2\text{ A}$ same conditions at $T_c = 125\text{ }^\circ\text{C}$ for BUX48A/V48A/V48AFI $V_{CC} = 300\text{ V}$ $I_C = 8\text{ A}$ $L_B = 3\text{ }\mu\text{H}$ $V_{BE} = -5\text{ V}$ $I_{B1} = 1.6\text{ A}$ same conditions at $T_c = 125\text{ }^\circ\text{C}$		2.7	5	μs μs
t_f	Fall Time	for BUX48 $V_{CC} = 300\text{ V}$ $I_C = 10\text{ A}$ $L_B = 3\text{ }\mu\text{H}$ $V_{BE} = -5\text{ V}$ $I_{B1} = 2\text{ A}$ same conditions at $T_c = 125\text{ }^\circ\text{C}$ for BUX48A/V48A/V48AFI $V_{CC} = 300\text{ V}$ $I_C = 8\text{ A}$ $L_B = 3\text{ }\mu\text{H}$ $V_{BE} = -5\text{ V}$ $I_{B1} = 1.6\text{ A}$ same conditions at $T_c = 125\text{ }^\circ\text{C}$		0.16 0.13	0.4 0.4	μs μs μs μs

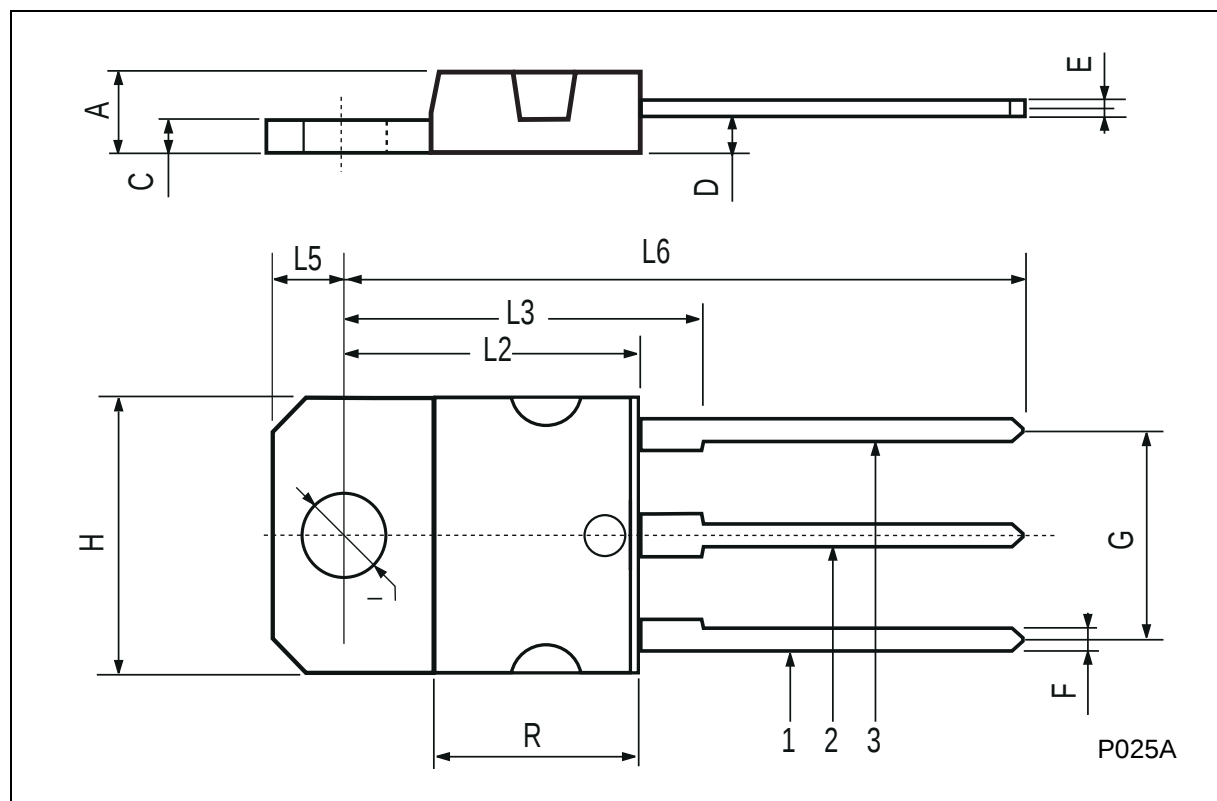
TO-3 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	11.00		13.10	0.433		0.516
B	0.97		1.15	0.038		0.045
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



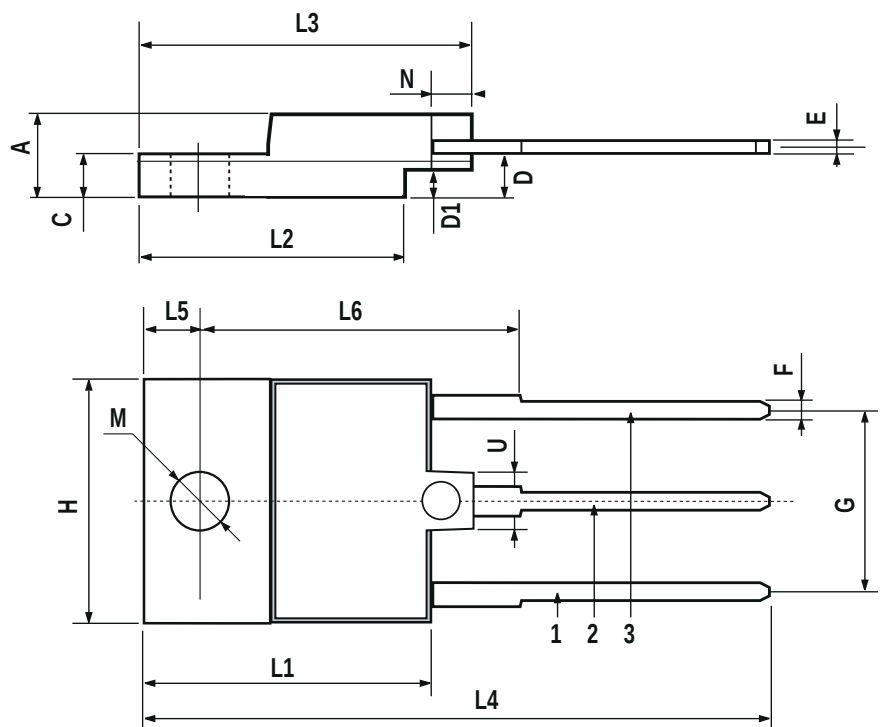
TO-218 (SOT-93) MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.7		4.9	0.185		0.193
C	1.17		1.37	0.046		0.054
D		2.5			0.098	
E	0.5		0.78	0.019		0.030
F	1.1		1.3	0.043		0.051
G	10.8		11.1	0.425		0.437
H	14.7		15.2	0.578		0.598
L2	–		16.2	–		0.637
L3		18			0.708	
L5	3.95		4.15	0.155		0.163
L6		31			1.220	
R	–		12.2	–		0.480
Ø	4		4.1	0.157		0.161



ISOWATT218 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	5.35		5.65	0.210		0.222
C	3.3		3.8	0.130		0.149
D	2.9		3.1	0.114		0.122
D1	1.88		2.08	0.074		0.081
E	0.75		1	0.029		0.039
F	1.05		1.25	0.041		0.049
G	10.8		11.2	0.425		0.441
H	15.8		16.2	0.622		0.637
L1	20.8		21.2	0.818		0.834
L2	19.1		19.9	0.752		0.783
L3	22.8		23.6	0.897		0.929
L4	40.5		42.5	1.594		1.673
L5	4.85		5.25	0.190		0.206
L6	20.25		20.75	0.797		0.817
M	3.5		3.7	0.137		0.145
N	2.1		2.3	0.082		0.090
U		4.6			0.181	



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