



STPS745D/F/G/FP

POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

I_{F(AV)}	7.5 A
V_{RRM}	45 V
T_{j (max)}	175 °C
V_{F (max)}	0.57 V

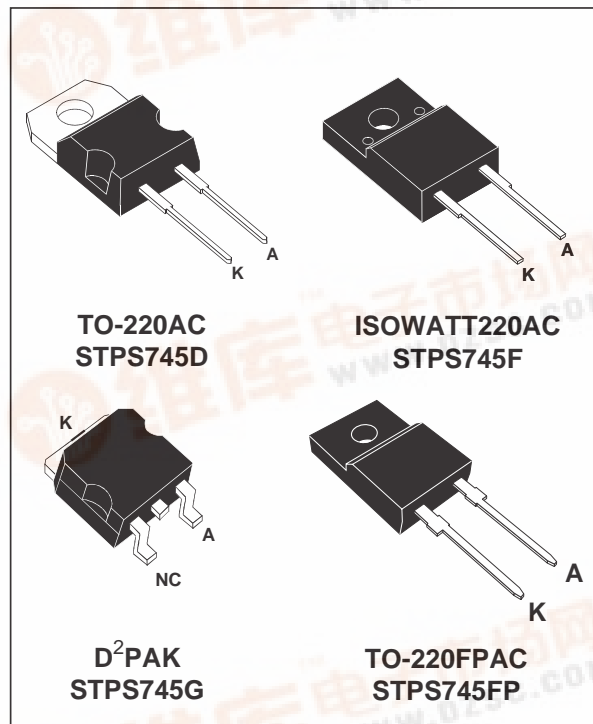
FEATURES AND BENEFITS

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- EXTREMELY FAST SWITCHING
- INSULATED PACKAGE: ISOWATT220AC, TO-220FPAC
Insulating voltage = 2000V DC
Capacitance = 12pF
- AVALANCHE CAPABILITY SPECIFIED

DESCRIPTION

Single Schottky rectifier suited for Switch Mode Power Supply and high frequency DC to DC converters.

Packaged either in TO-220AC, ISOWATT220AC, TO-220FPAC or D²PAK, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.



ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit	
V _{RRM}	Repetitive peak reverse voltage		45	V	
I _{F(RMS)}	RMS forward current		20	A	
I _{F(AV)}	Average forward current δ = 0.5	TO-220AC / D ² PAK	T _c = 160°C	7.5	A
		ISOWATT220AC / TO-220FPAC	T _c = 145°C		
I _{FSM}	Surge non repetitive forward current	tp = 10 ms sinusoidal	150	A	
I _{R(RM)}	Repetitive peak reverse current	tp = 2 μs square F = 1kHz	1	A	
I _{R(SM)}	Non repetitive peak reverse current	tp = 100 μs square	2	A	
P _{ARM}	Repetitive peak avalanche power	tp = 1μs T _j = 25°C	2700	W	
T _{stg}	Storage temperature range		- 65 to + 175	°C	
T _j	Maximum operating junction temperature *		175	°C	
dV/dt	Critical rate of rise of reverse voltage		10000	V/μs	

* : $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$ thermal runaway condition for a diode on its own heatsink

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THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	TO-220AC / D ² PAK	3.0	°C/W
		ISOWATT220AC/ TO-220FPAC	5.5	

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
I_R^*	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			100	μA
		$T_j = 125^\circ\text{C}$			5	15	mA
V_F^*	Forward voltage drop	$T_j = 125^\circ\text{C}$	$I_F = 7.5\text{ A}$		0.5	0.57	V
		$T_j = 25^\circ\text{C}$	$I_F = 15\text{ A}$			0.84	
		$T_j = 125^\circ\text{C}$	$I_F = 15\text{ A}$		0.65	0.72	

Pulse test : * $t_p = 380\ \mu\text{s}$, $\delta < 2\%$

To evaluate the conduction losses use the following equation :

$$P = 0.42 \times I_{F(AV)} + 0.020 I_{F(RMS)}^2$$

Fig. 1: Average forward power dissipation versus average forward current.

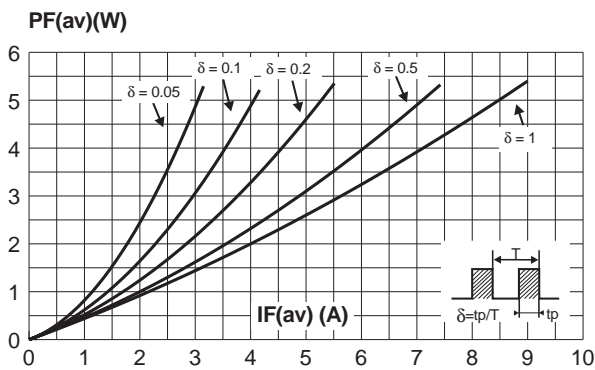


Fig. 2: Average current versus ambient temperature ($\delta = 0.5$).

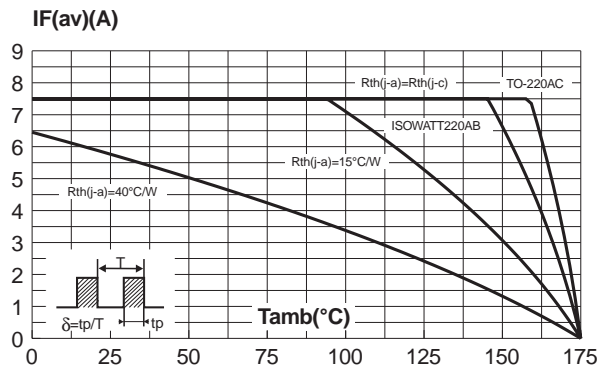


Fig. 3: Normalized avalanche power derating versus pulse duration.

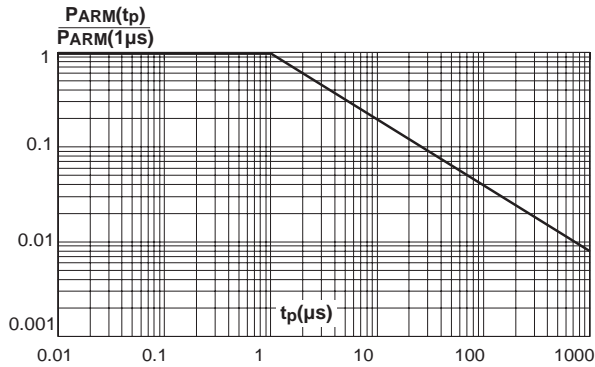


Fig. 4: Normalized avalanche power derating versus junction temperature.

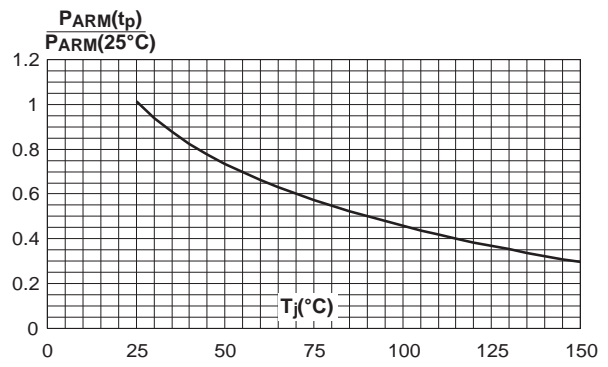


Fig. 5-1: Non repetitive surge peak forward current versus overload duration (maximum values) (TO-220AC and D²PAK).

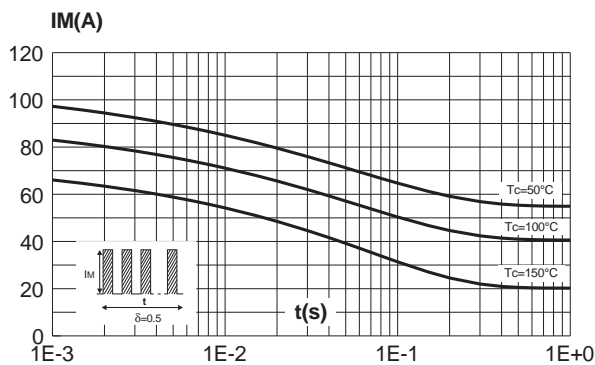


Fig. 5-2: Non repetitive surge peak forward current versus overload duration (maximum values) (ISOWATT220AC/TO-220FPAC).

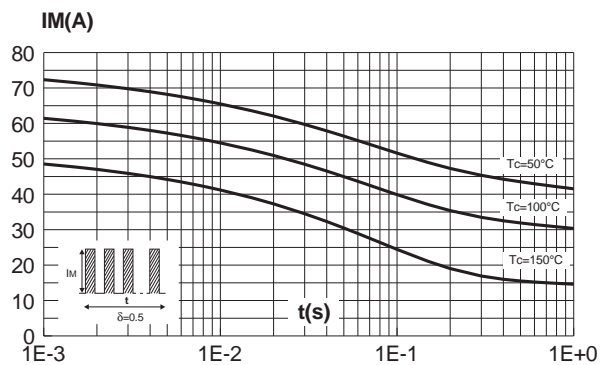


Fig. 6-1: Relative variation of thermal transient impedance junction to case versus pulse duration (TO-220AC and D²PAK).

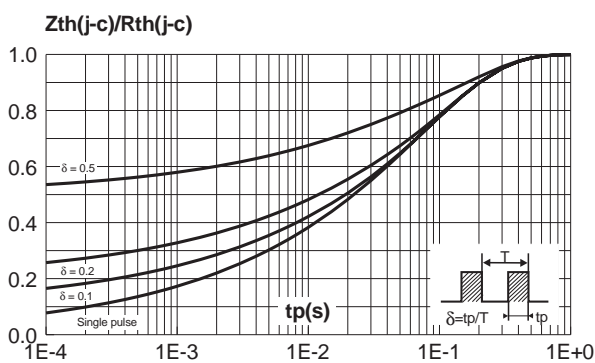


Fig. 6-2: Relative variation of thermal transient impedance junction to case versus pulse duration (ISOWATT220AC/TO-220FPAC).

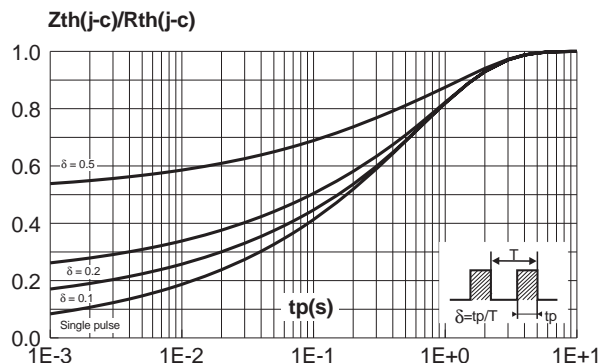


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values).

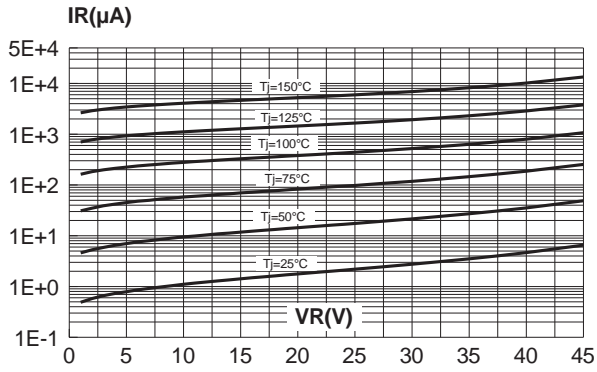


Fig. 8: Junction capacitance versus reverse voltage applied (typical values).

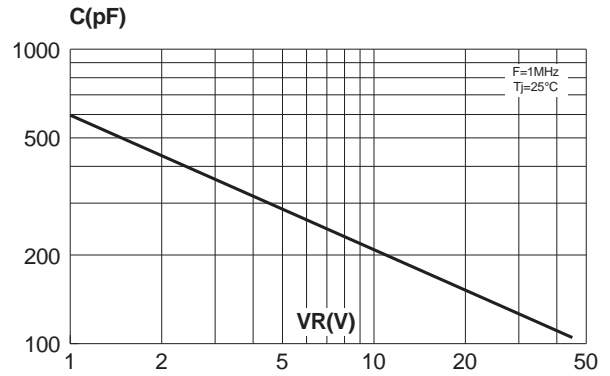


Fig. 9: Forward voltage drop versus forward current (maximum values).

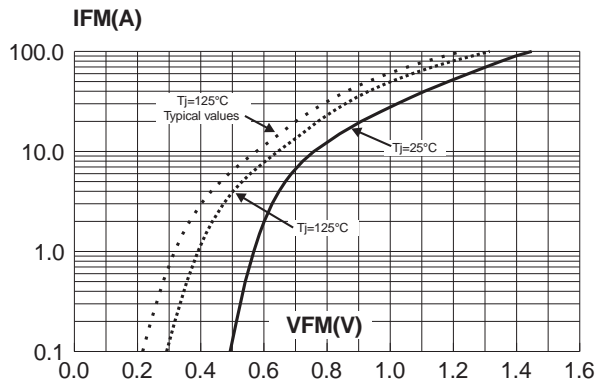
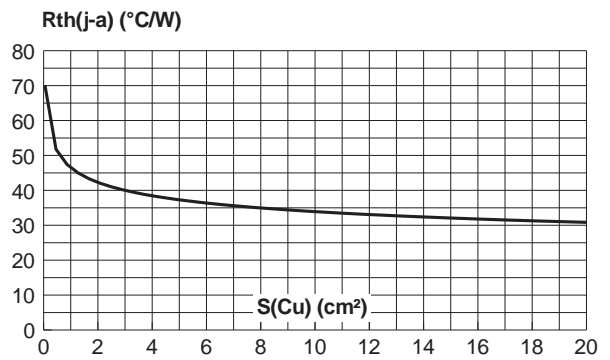
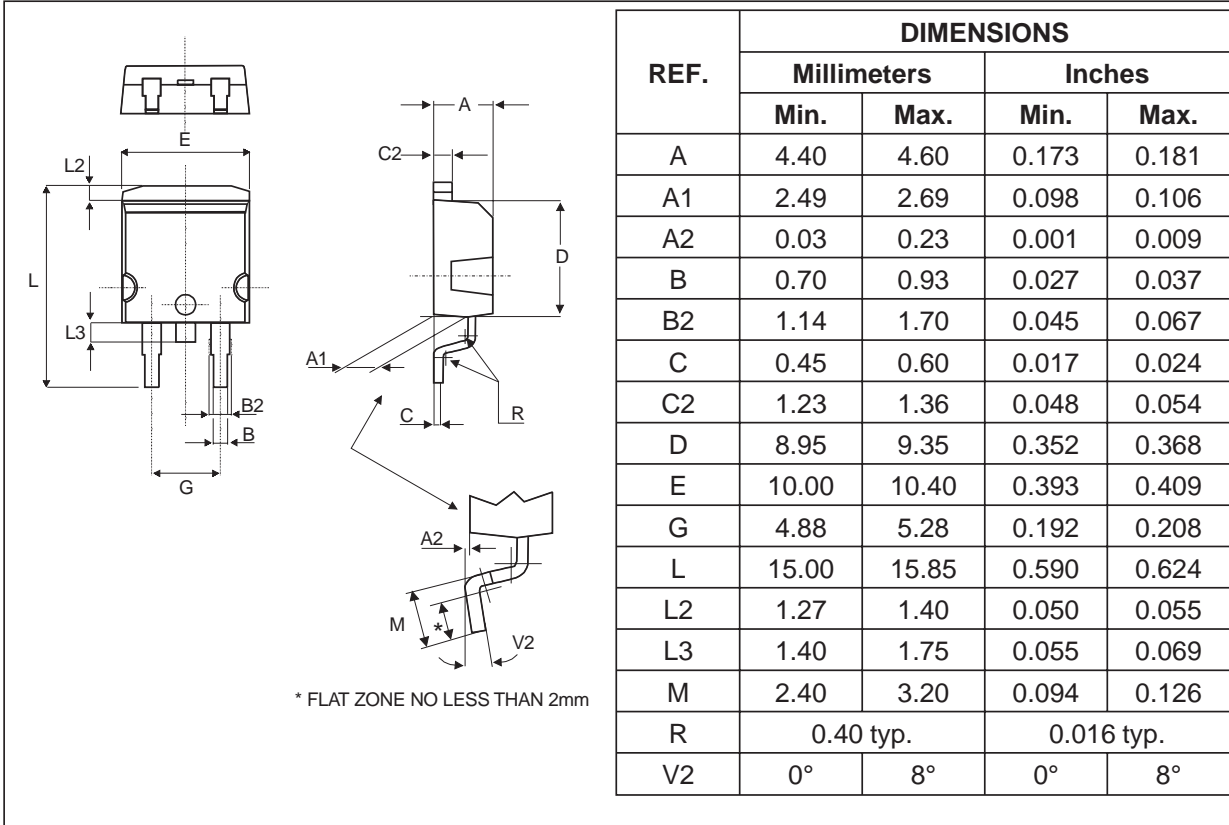


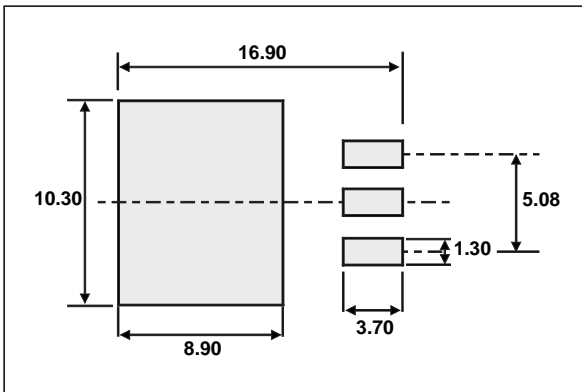
Fig. 10: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board, copper thickness: $35\mu m$).



PACKAGE MECHANICAL DATA
D²PAK (Plastic)

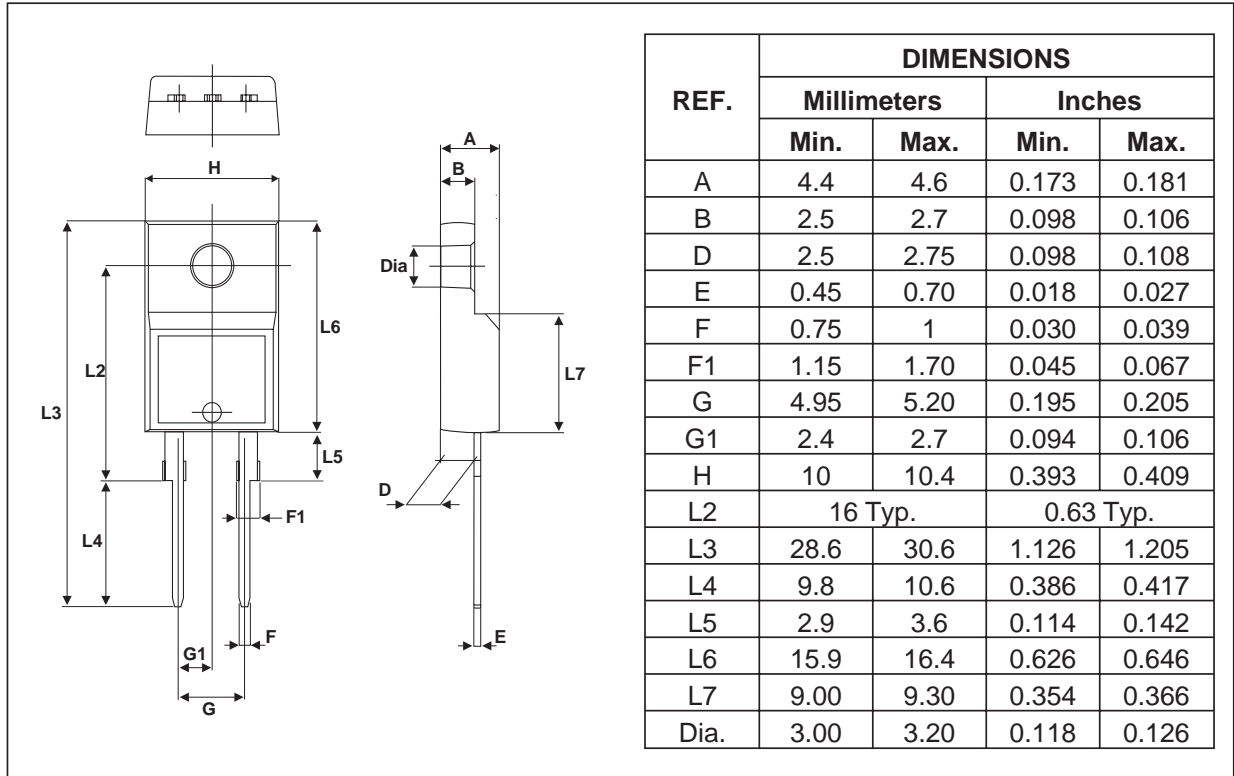


FOOTPRINT DIMENSIONS (in millimeters)

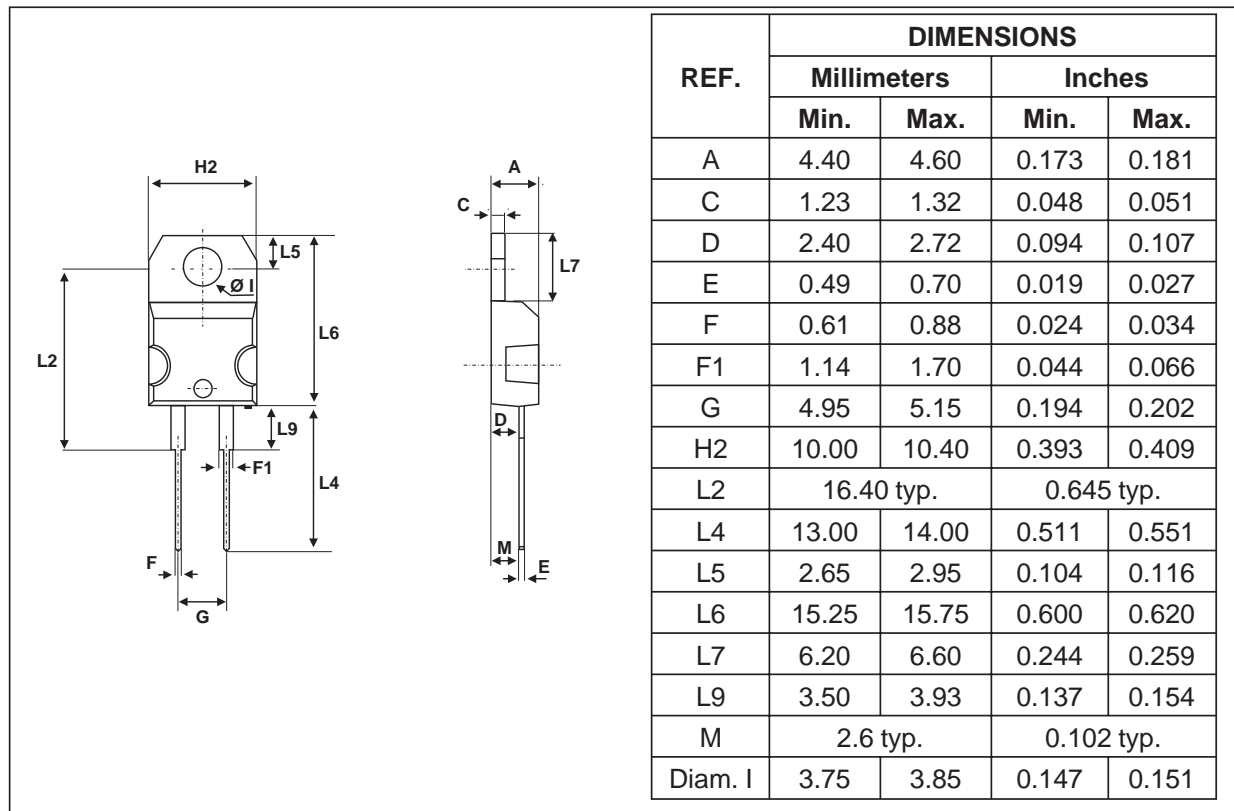


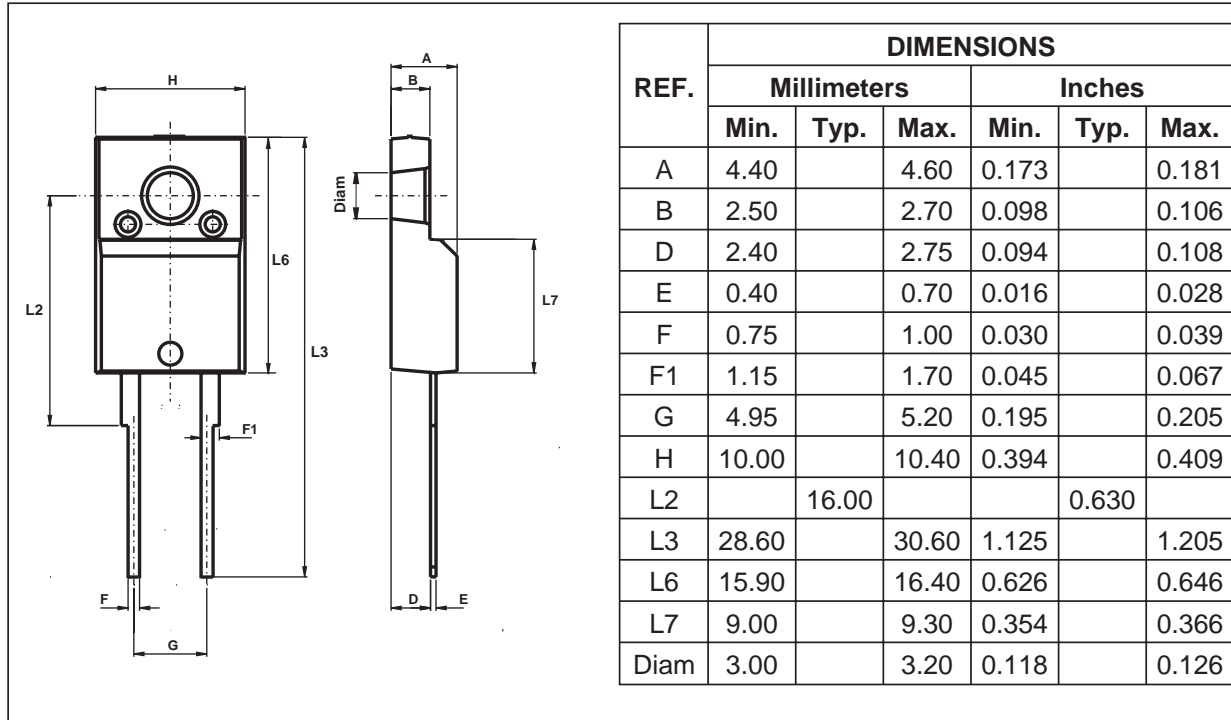
STPS745D/F/G/FP

PACKAGE MECHANICAL DATA
TO-220FPAC



PACKAGE MECHANICAL DATA
TO-220AC



PACKAGE MECHANICAL DATA
 ISOWATT220AC


Type	Marking	Package	Weight	Base qty	Delivery mode
STPS745D	STPS745D	TO-220AC	1.86 g.	50	Tube
STPS745F	STPS745F	ISOWATT220AC	2 g.	50	Tube
STPS745G	STPS745G	D ² PAK	1.48 g.	50	Tube
STPS745G-TR	STPS745G	D ² PAK	1.48 g.	1000	Tape & reel
STPS745FP	STPS745FP	TO-220FPAC	1.9 g.	50	Tube

- Cooling method: by conduction (C)
- Recommended torque value: 0.55 N.m
- Maximum torque value: 0.7 N.m.
- Epoxy meets UL94,V0

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