



STPS10L45CT/CG/CF/CFP

LOW DROP POWER SCHOTTKY RECTIFIER

MAIN PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	2x5 A
V_{RRM}	45 V
$T_j(\text{max})$	150°C
$V_F(\text{max})$	0.46 V

FEATURES AND BENEFITS

- LOW FORWARD VOLTAGE DROP MEANING VERY SMALL CONDUCTION LOSSES
- LOW SWITCHING LOSSES ALLOWING HIGH FREQUENCY OPERATION
- INSULATED PACKAGE: ISOWATT220AB, TO-220FPAB
Insulating voltage = 2000V DC
Capacitance = 12pF
- AVALANCHE CAPABILITY SPECIFIED

DESCRIPTION

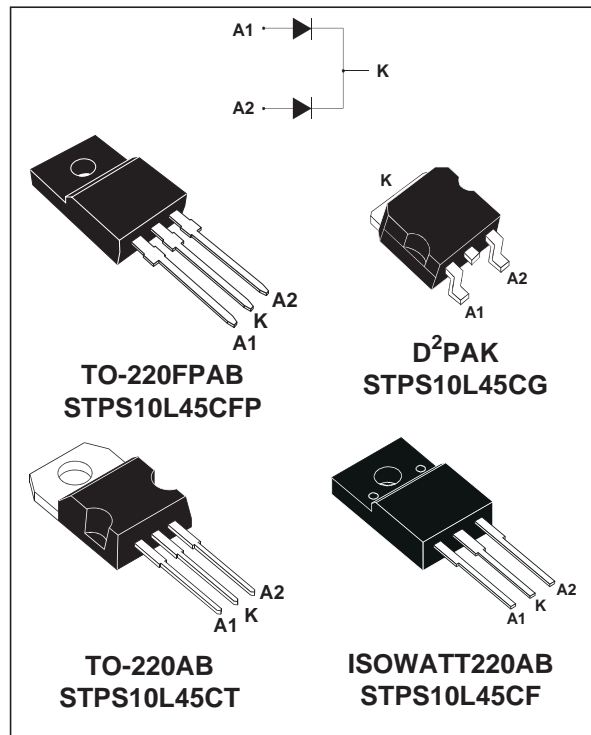
Dual center tap Schottky rectifiers suited for Switched Mode Power Supplies and high frequency DC to DC converters.

Packaged in TO-220AB, ISOWATT220AB, TO-220FPAB and D²PAK, these devices are intended for use in low voltage, high frequency inverters, free-wheeling and polarity protection applications.

ABSOLUTE RATINGS (limiting values, per diode)

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	TO-220AB D ² PAK	$T_c = 135^\circ\text{C}$ $\delta = 0.5$	Per diode Per device	5 10	A		
		ISOWATT220AB TO-220FPAB	$T_c = 115^\circ\text{C}$ $\delta = 0.5$	Per diode Per device	5 10	A		
I_{FSM}	Surge non repetitive forward current			$t_p = 10 \text{ ms}$	Sinusoidal	150	A	
I_{RRM}	Repetitive peak reverse current			$t_p = 2 \mu\text{s}$	square	F=1kHz	1	A
I_{RSM}	Non repetitive peak reverse current			$t_p = 100 \mu\text{s}$	square		2	A
P_{ARM}	Repetitive peak avalanche power			$t_p = 1 \mu\text{s}$	$T_j = 25^\circ\text{C}$		2700	W
T_{stg}	Storage temperature range					- 65 to + 150	°C	
T_j	Maximum operating junction temperature *					150	°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-220AB D ² PAK	Per diode	3 1.7	°C/W
$R_{th(c)}$			Total		
$R_{th(c)}$	Junction to case	ISOWATT220AB TO-220FPAB	Coupling	0.35	
$R_{th(j-c)}$			Per diode	5 3.8	°C/W
$R_{th(c)}$			Coupling	2.5	

When the diodes 1 and 2 are used simultaneously :
 $\Delta T_{j(\text{diode } 1)} = P(\text{diode } 1) \times R_{th(j-c)}(\text{Per diode}) + P(\text{diode } 2) \times R_{th(c)}$

STATIC ELECTRICAL CHARACTERISTICS (per diode)

Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
I_R^*	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			0.15	mA
		$T_j = 125^\circ\text{C}$			45	90	mA
V_F^*	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 5\text{ A}$			0.53	V
		$T_j = 125^\circ\text{C}$		$I_F = 5\text{ A}$		0.36	
		$T_j = 25^\circ\text{C}$	$I_F = 10\text{ A}$			0.67	
		$T_j = 125^\circ\text{C}$		$I_F = 10\text{ A}$		0.49	

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

To evaluate the conduction losses use the following equation :
 $P = 0.33 \times I_{F(AV)} + 0.026 I_F^2(\text{RMS})$

Fig. 1: Average forward power dissipation versus average forward current (per diode).

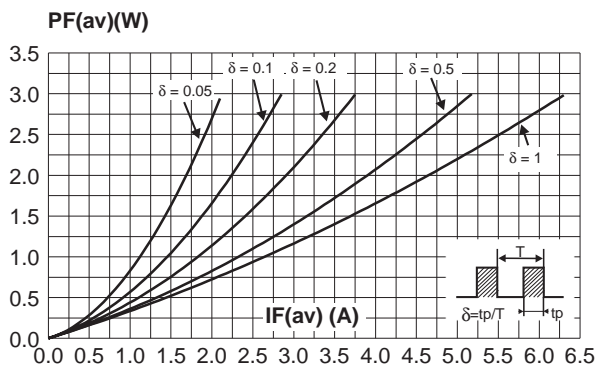


Fig. 2: Average forward current versus ambient temperature ($\delta=0.5$, per diode).

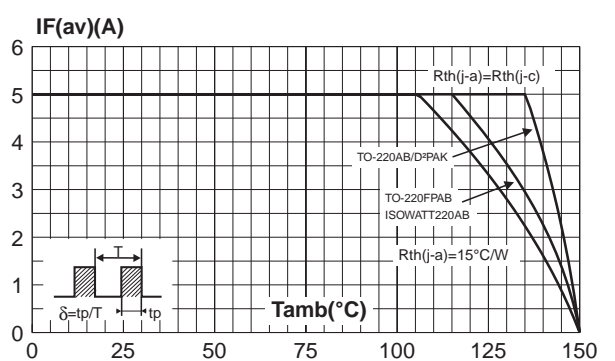


Fig. 3: Normalized avalanche power derating versus pulse duration.

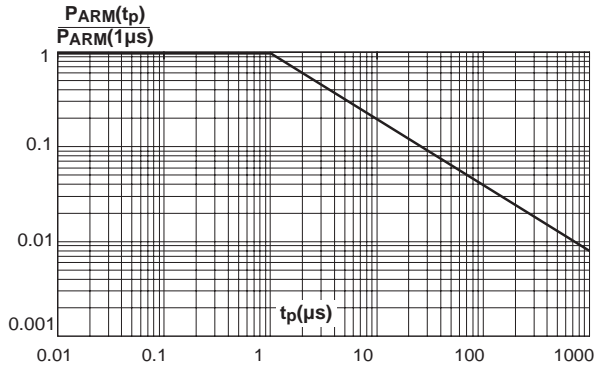


Fig. 4: Normalized avalanche power derating versus junction temperature.

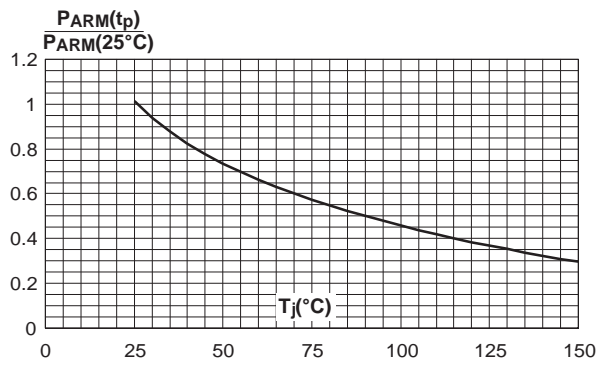


Fig. 5-1: Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TO-220AB and D²PAK).

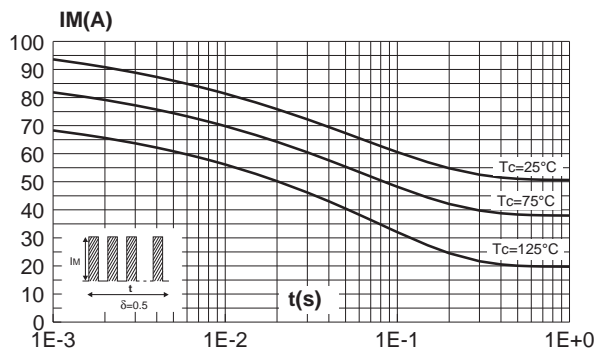


Fig. 5-2: Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (ISOWATT220AB, TO-220FPAB).

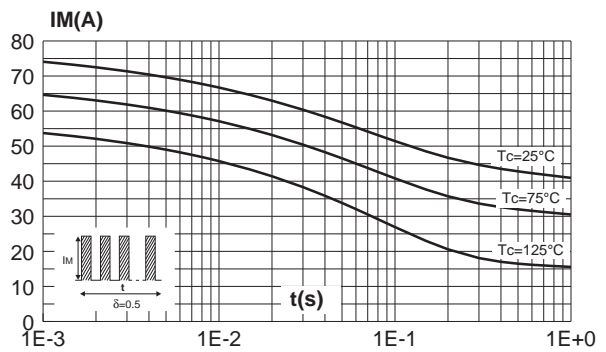


Fig. 6-1: Relative variation of thermal impedance junction to case versus pulse duration. (TO-220AB and D²PAK).

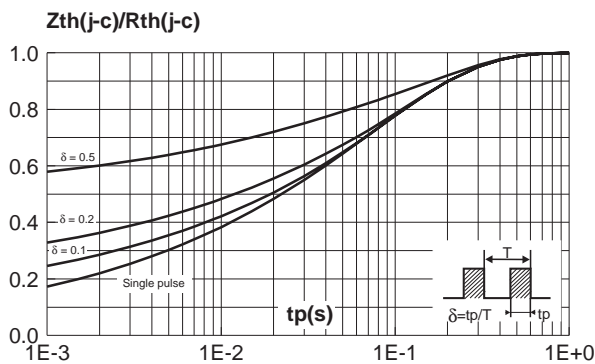


Fig. 6-2: Relative variation of thermal impedance junction to case versus pulse duration. (ISOWATT220AB, TO-220FPAB).

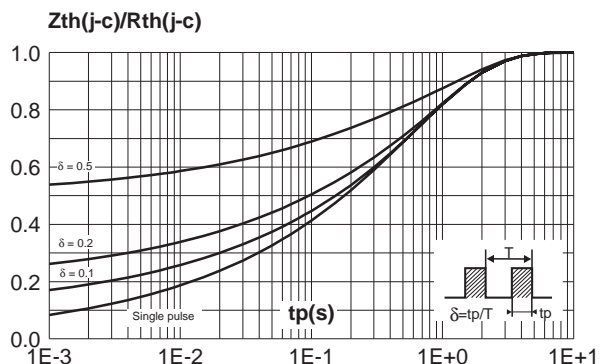


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values, per diode).

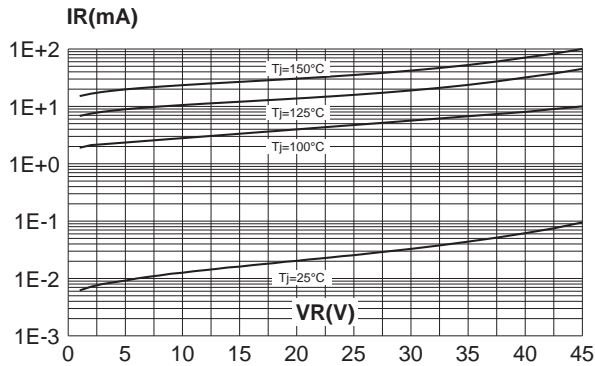


Fig. 8: Junction capacitance versus reverse voltage applied (typical values, per diode).

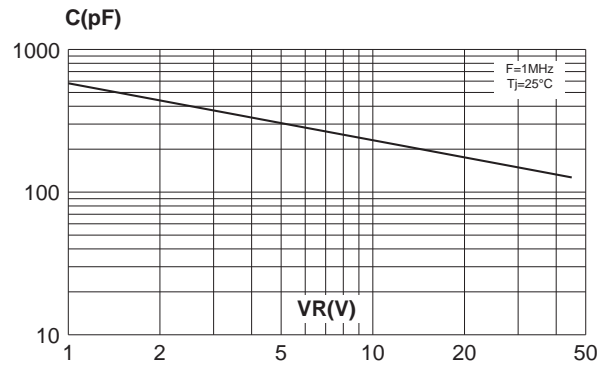


Fig. 9: Forward voltage drop versus forward current (maximum values, per diode).

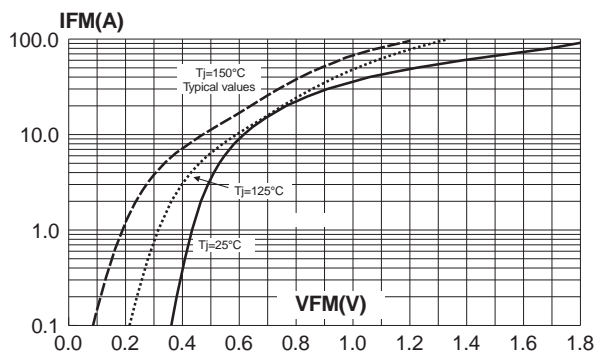
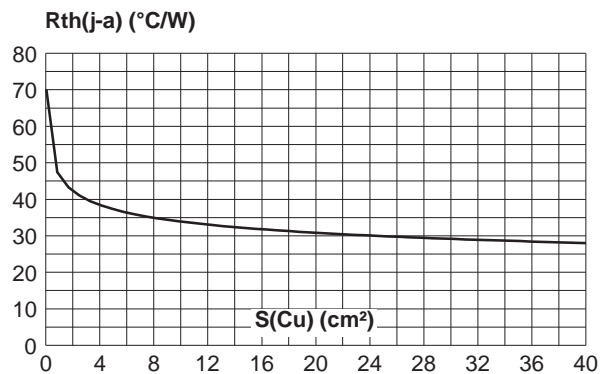
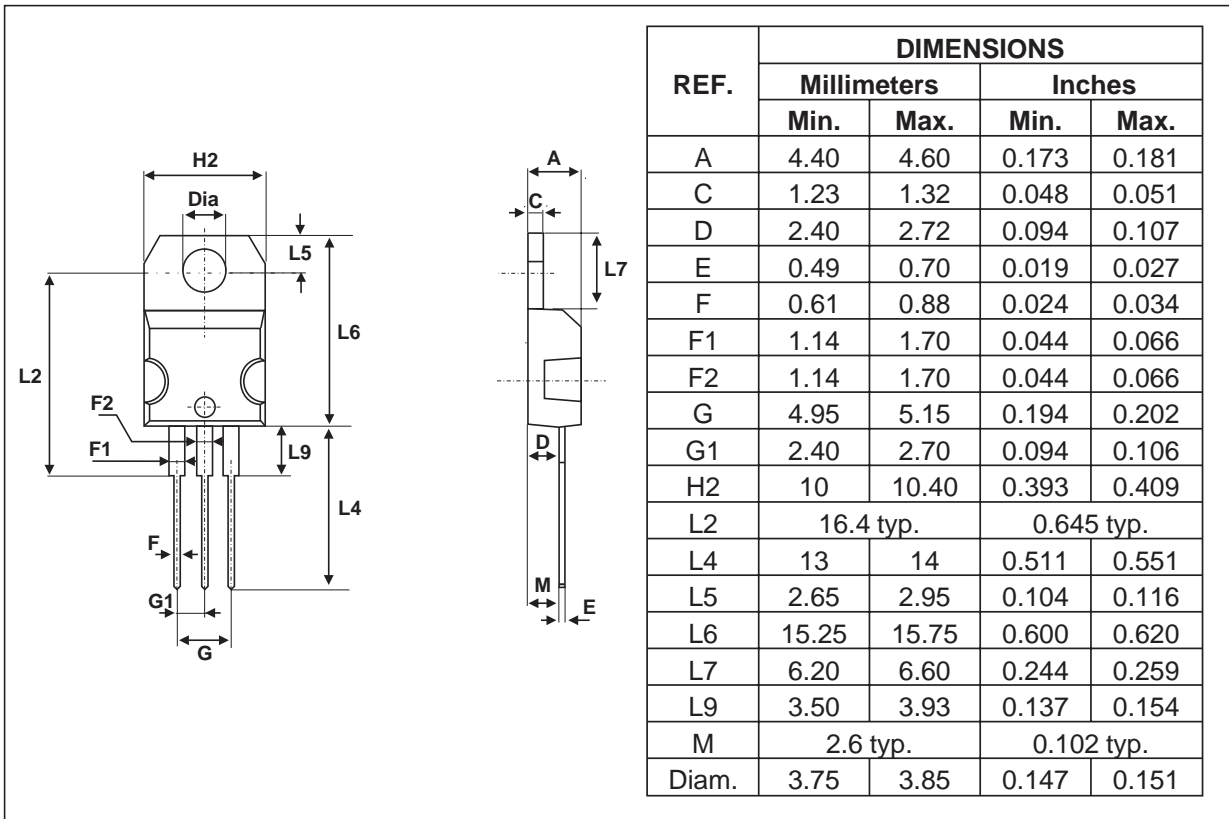


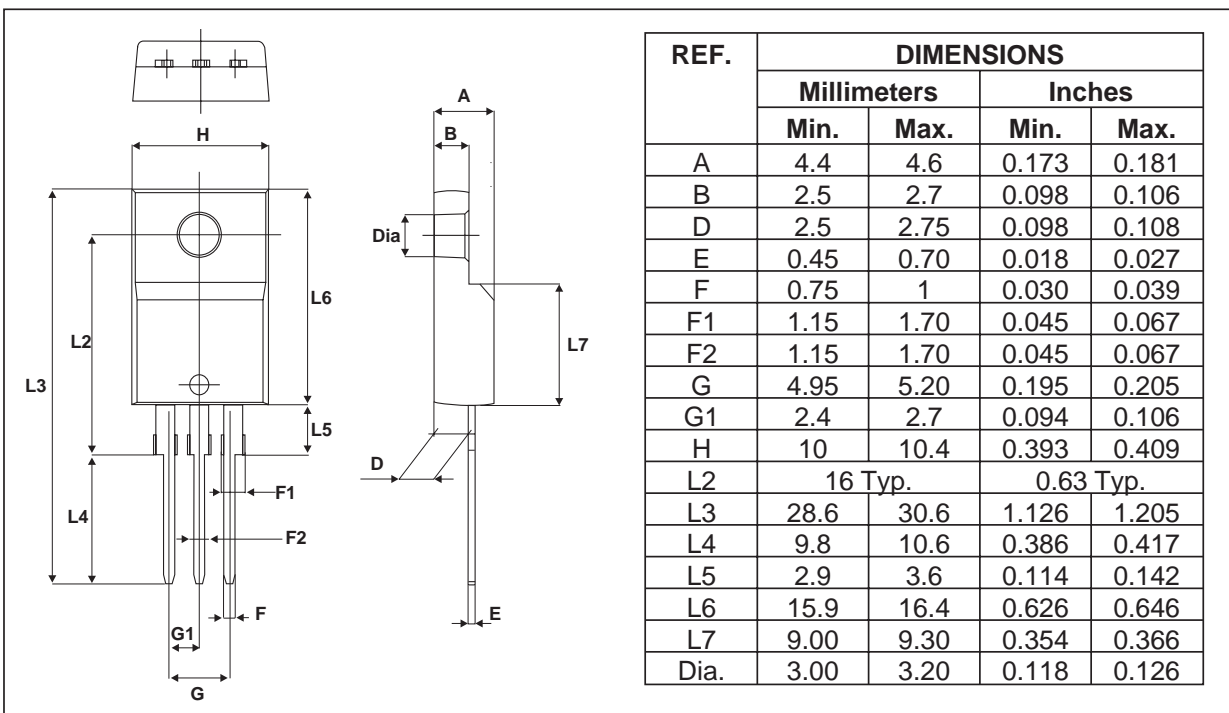
Fig. 10: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35µm)(D²PAK).



PACKAGE MECHANICAL DATA
TO-220AB

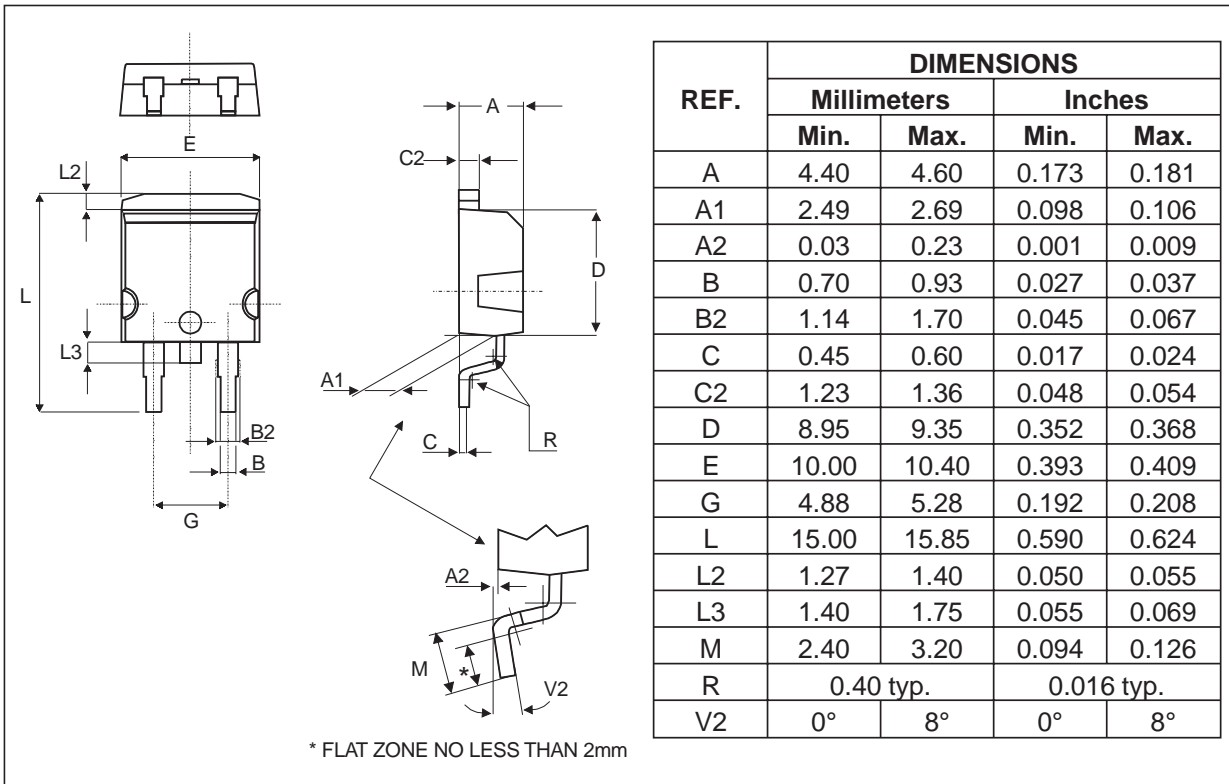


PACKAGE MECHANICAL DATA
TO-220FPAB

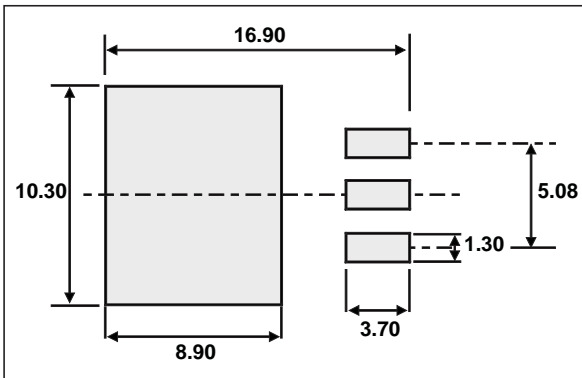


STPS10L45CT/CG/CF/CFP

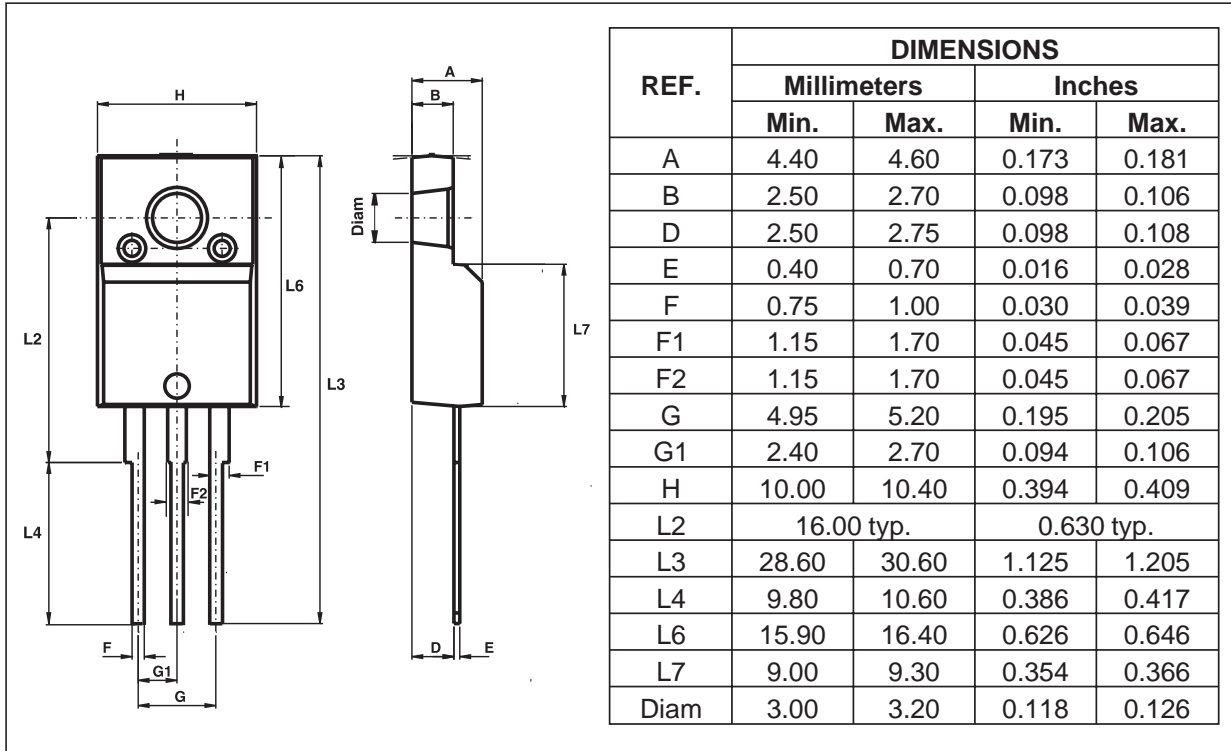
PACKAGE MECHANICAL DATA
D²PAK



FOOT PRINT DIMENSIONS (in millimeters)



PACKAGE MECHANICAL DATA
ISOWATT220AB



Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS10L45CT	STPS10L45CT	TO-220AB	2.23g	50	Tube
STPS10L45CFP	STPS10L45CFP	TO-220FPAB	2 g	50	Tube
STPS10L45CG	STPS10L45CG	D ² PAK	1.48g	50	Tube
STPS10L45CG-TR	STPS10L45CG	D ² PAK	1.48g	1000	Tape & reel
STPS10L45CF	STPS10L45CF	ISOWATT220AB	2.08g	50	Tube

- Cooling method : by conduction (C)
- Recommended torque value : 0.55 N.m.
- Maximum torque value : 0.70 N.m.
- Epoxy meets UL94,V0

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