



STPS10L40CT/CG/CF/CFP

LOW DROP POWER SCHOTTKY RECTIFIER

MAIN PRODUCTS CHARACTERISTICS

I_{F(AV)}	2x5 A
V_{RRM}	40 V
T_{j (max)}	150°C
V_{F (max)}	0.46 V

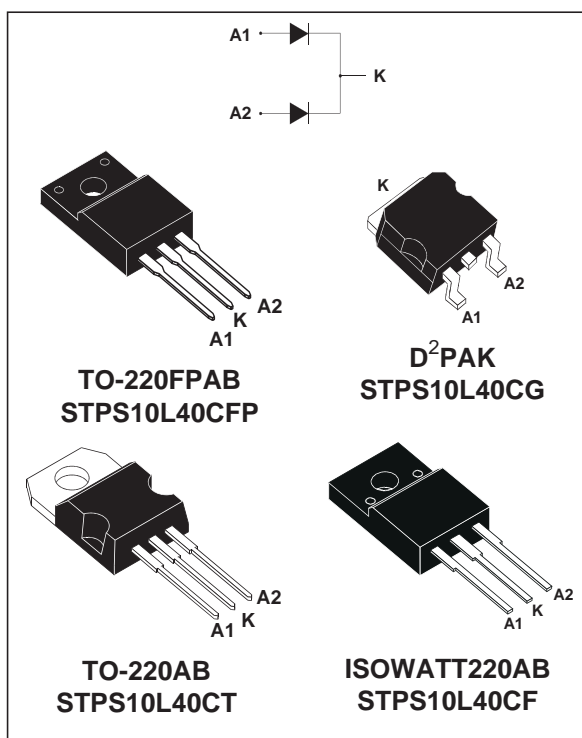
FEATURES AND BENEFITS

- LOW FORWARD VOLTAGE DROP MEANING VERY SMALL CONDUCTION LOSSES
- LOW DYNAMIC LOSSES AS A RESULT OF THE SCHOTTKY BARRIER
- 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			40	V	
I _{F(RMS)}	RMS forward current			20	A	
I _{F(AV)}	Average forward current	TO-220AB D ² PAK	T _c = 135°C δ = 0.5	Per diode Per device	5 10	A
		ISOWATT220AB TO-220FPAB	T _c = 115°C δ = 0.5	Per diode Per device	5 10	A
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 = 1 μs T _j = 25°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	°C/W
$R_{th(c)}$			Total		
$R_{th(j-c)}$	Junction to case	ISOWATT220AB TO-220FPAB	Coupling	0.35	
$R_{th(c)}$			Per diode	5	°C/W
			Total	3.8	
			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	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			0.2	mA
		$T_j = 100^\circ\text{C}$			8	25	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	0.46	
		$T_j = 25^\circ\text{C}$	$I_F = 10\text{ A}$			0.67	
		$T_j = 125^\circ\text{C}$	$I_F = 10\text{ A}$		0.49	0.59	

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

To evaluate the conduction losses use the following equation :

$$P = 0.33 \times I_{F(AV)} + 0.026 I_{F(RMS)}^2$$

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

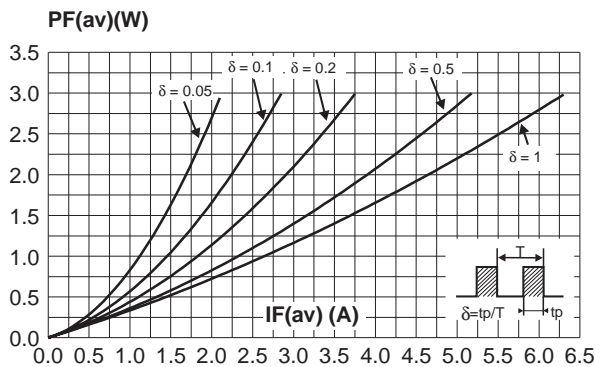


Fig. 2: Average forward current versus ambient temperature ($\delta=0.5$, per diode).

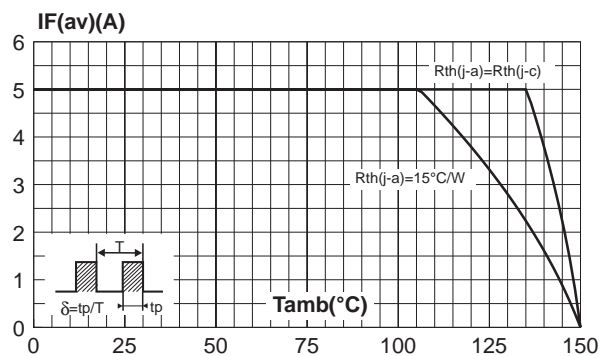


Fig. 3: Normalized avalanche power derating versus pulse duration.

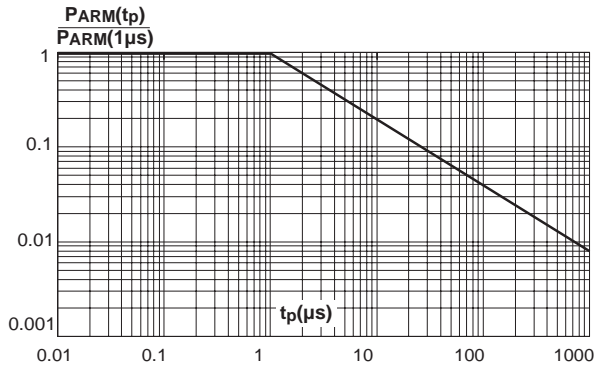


Fig. 4: Normalized avalanche power derating versus junction temperature.

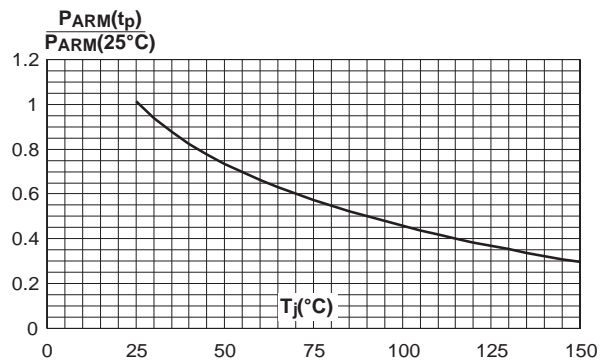


Fig. 5-1: Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TO-220AB and D²PAK).

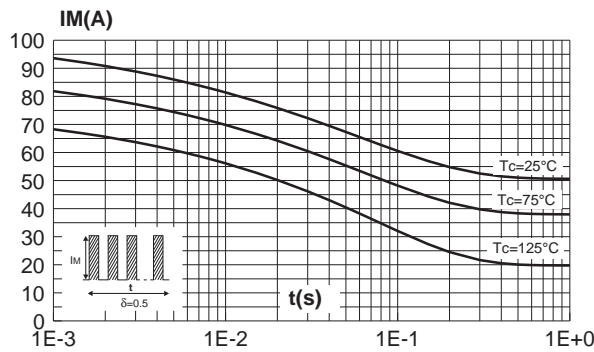


Fig. 5-2: Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (ISOWATT220AB, TO-220FPAB).

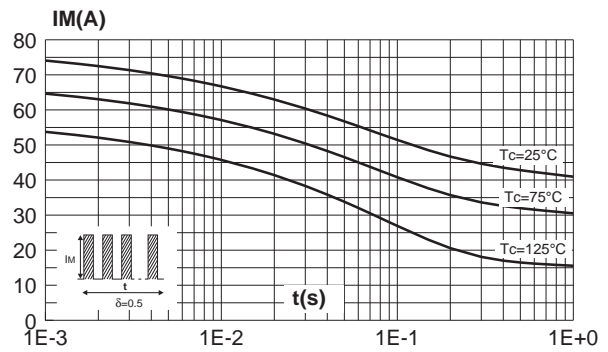


Fig. 6-1: Relative variation of thermal impedance junction to case versus pulse duration. (TO-220AB and D²PAK).

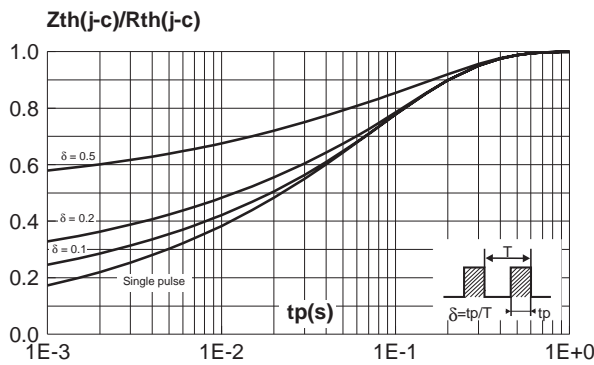


Fig. 6-2: Relative variation of thermal impedance junction to case versus pulse duration. (ISOWATT220AB, TO-220FPAB).

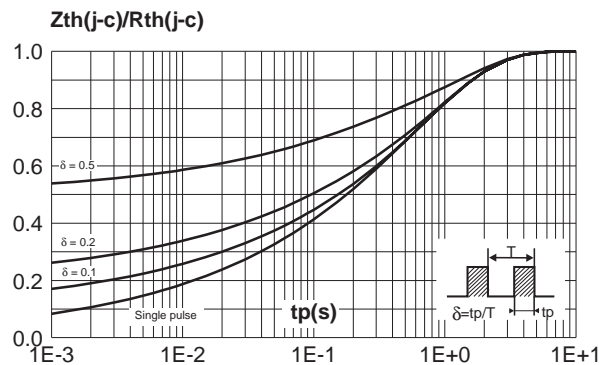


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values, per diode).

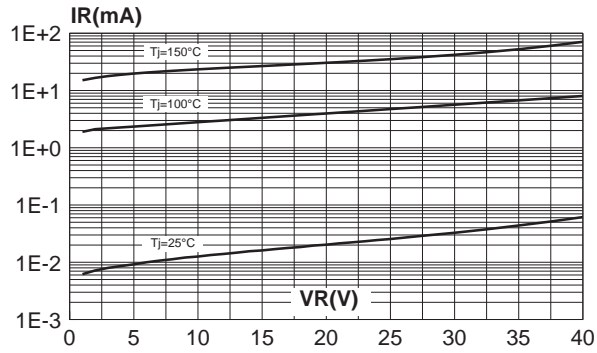


Fig. 8: Junction capacitance versus reverse voltage applied (typical values, per diode).

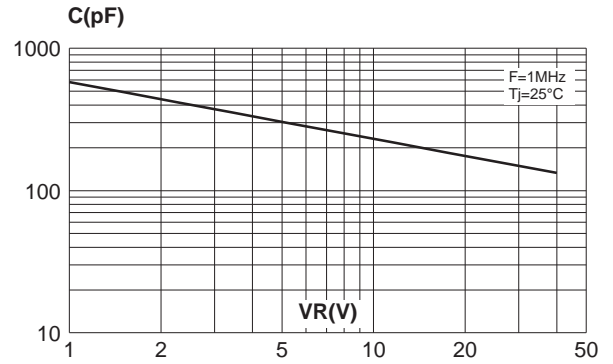


Fig. 9: Forward voltage drop versus forward current (maximum values, per diode).

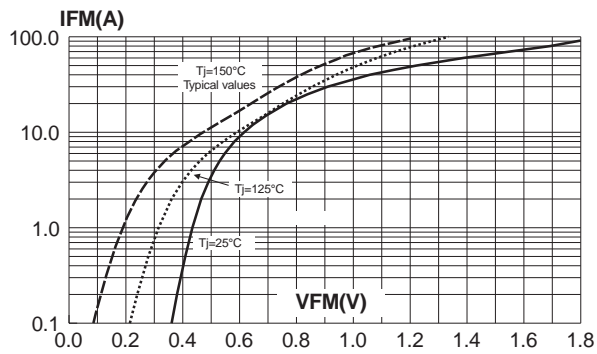
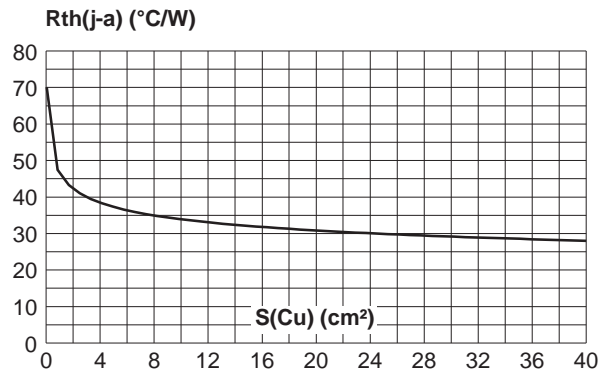
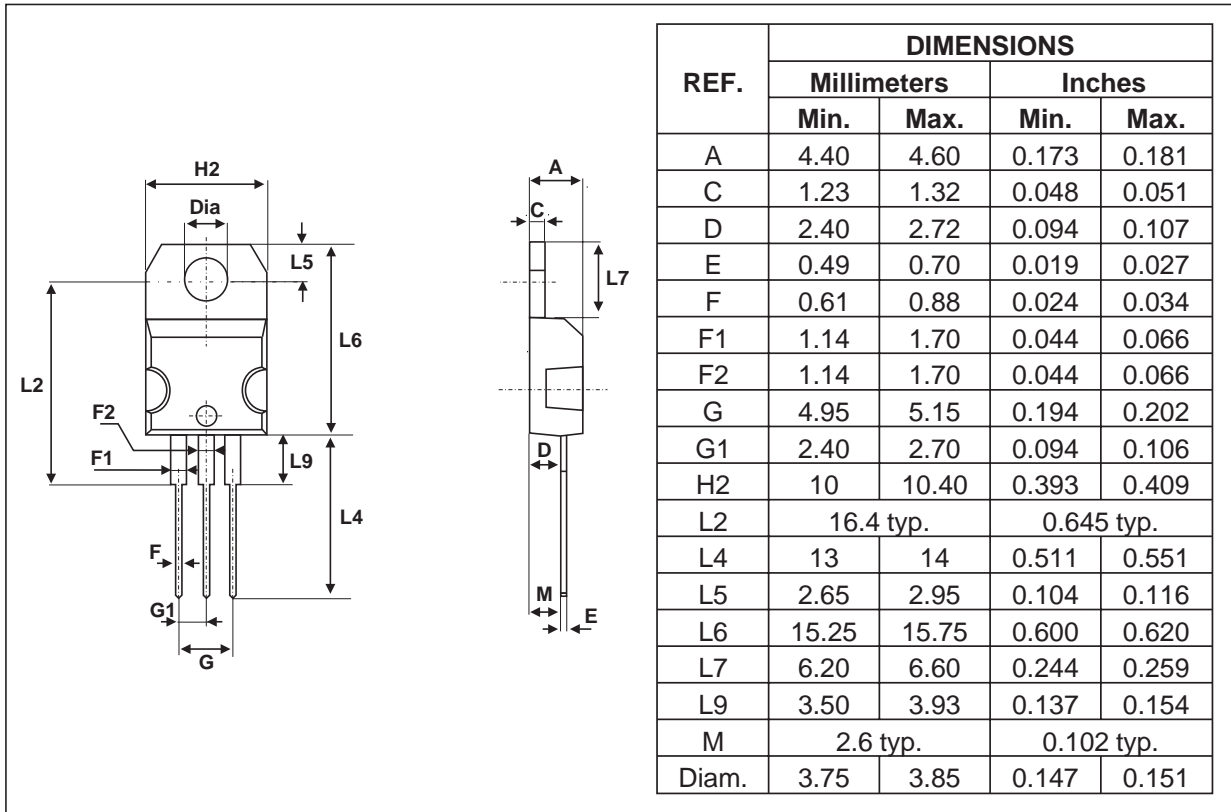


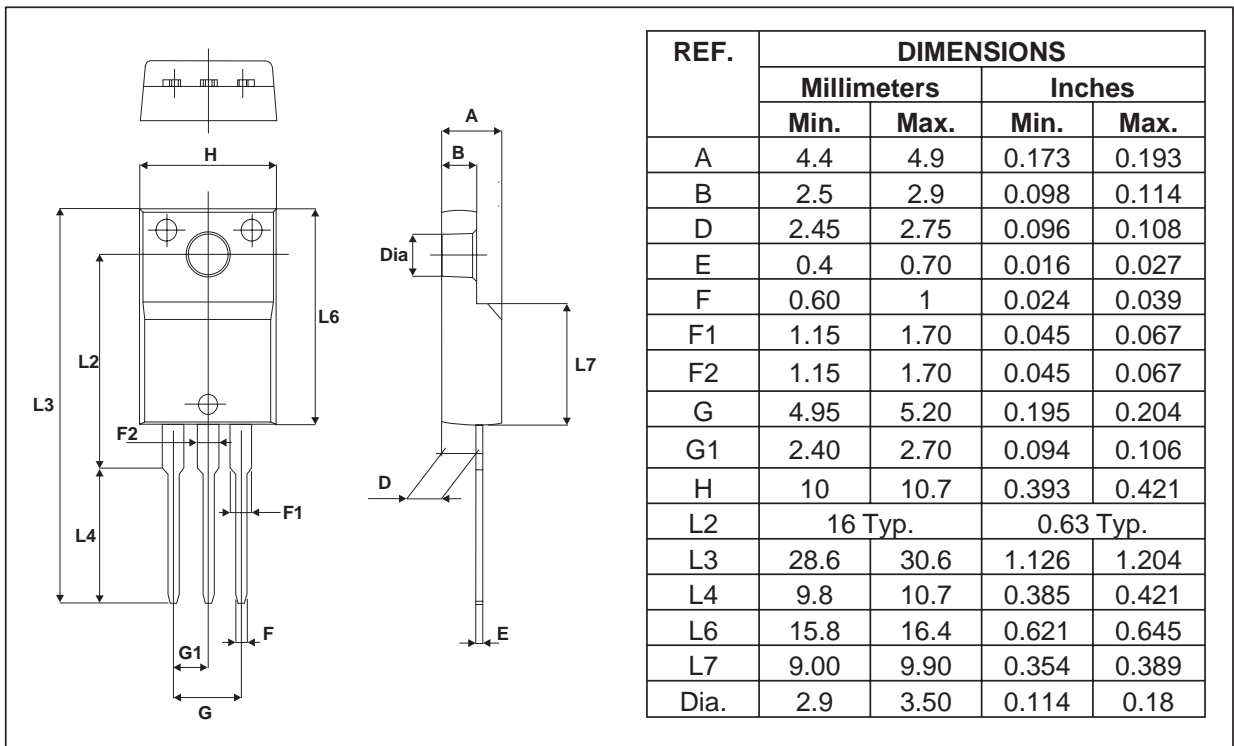
Fig. 10: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35µm)(D²PAK).



PACKAGE MECHANICAL DATA
TO-220AB

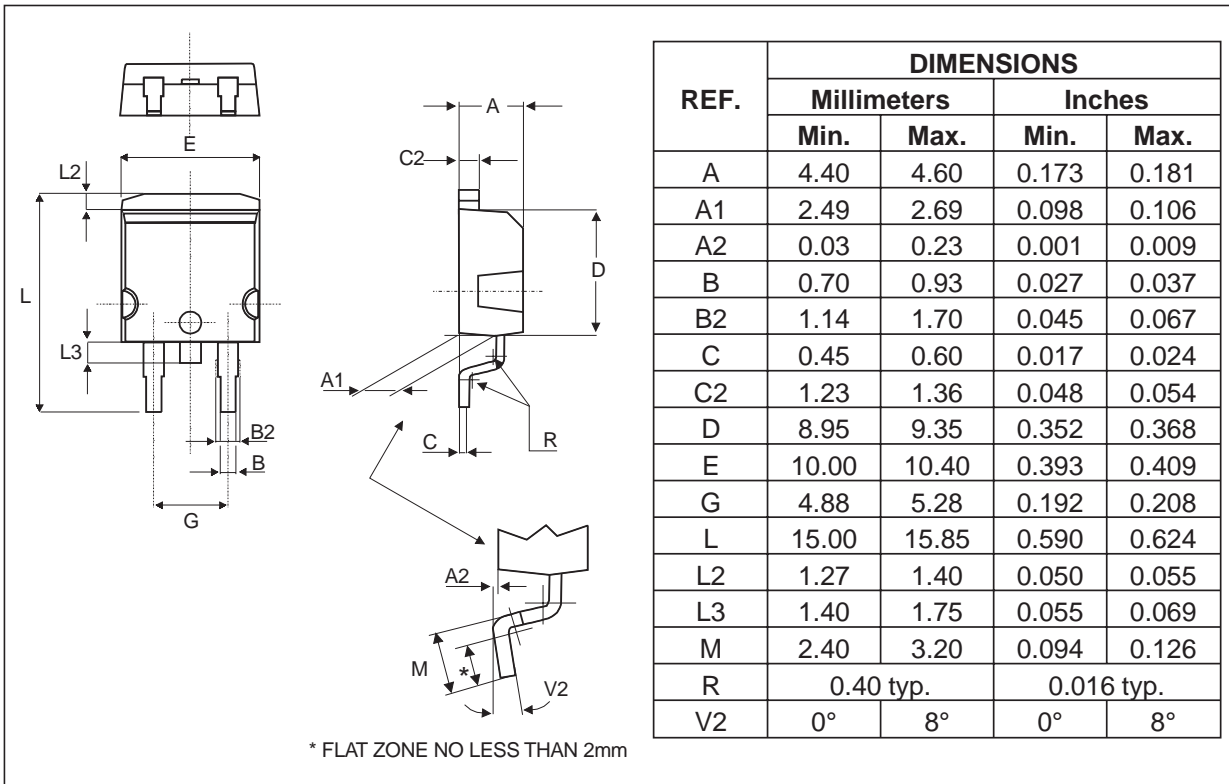


PACKAGE MECHANICAL DATA
TO-220FPAB

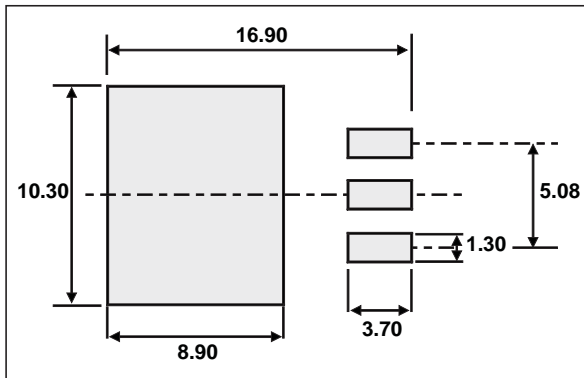


STPS10L40CT/CG/CF/CFP

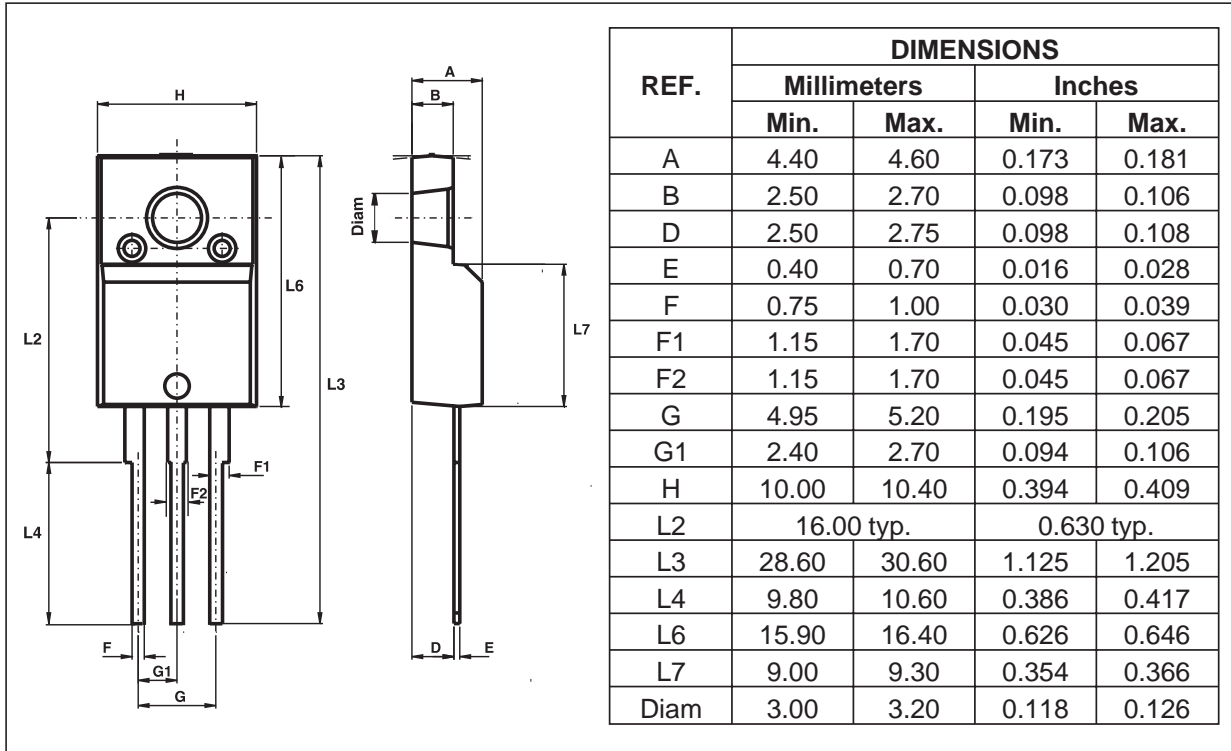
PACKAGE MECHANICAL DATA
D²PAK



FOOT PRINT DIMENSIONS (in millimeters)



PACKAGE MECHANICAL DATA
ISOWATT220AB



Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS10L40CT	STPS10L40CT	TO-220AB	2.23g	50	Tube
STPS10L40CFP	STPS10L40CFP	TO-200FPAB	2 g	50	Tube
STPS10L40CG	STPS10L40CG	D ² PAK	1.48g	50	Tube
STPS10L40CG-TR	STPS10L40CG	D ² PAK	1.48g	1000	Tape & reel
STPS10L40CF	STPS10L40CF	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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