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STPS10H100CT/CG/CR/CFP

HIGH VOLTAGE POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

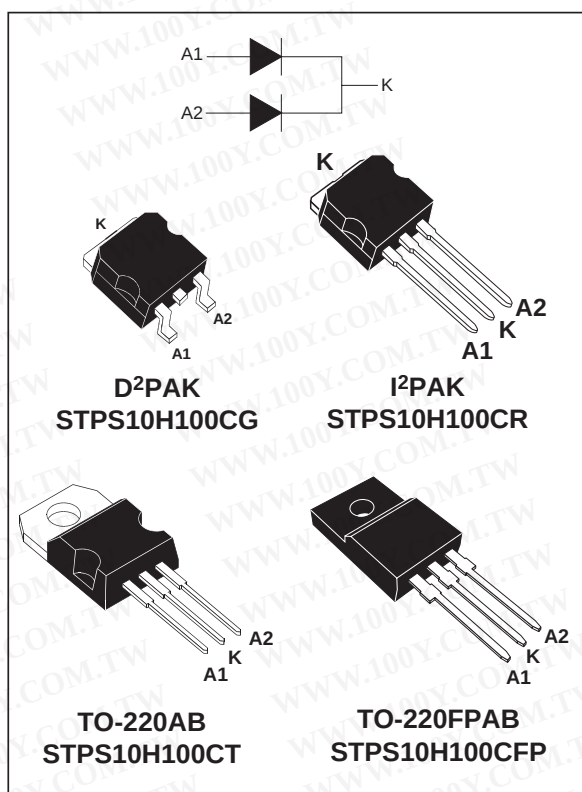
$I_{F(AV)}$	2 x 5 A
V_{RRM}	100 V
T_j	175°C
$V_F(max)$	0.61 V

FEATURES AND BENEFITS

- HIGH JUNCTION TEMPERATURE CAPABILITY FOR CONVERTERS LOCATED IN CONFINED ENVIRONMENT
- LOW LEAKAGE CURRENT AT HIGH TEMPERATURE
- LOW STATIC AND DYNAMIC LOSSES AS A RESULT OF THE SCHOTTKY BARRIER
- AVALANCHE CAPABILITY SPECIFIED

DESCRIPTION

Schottky barrier rectifier designed for high frequency miniature Switched Mode Power Supplies such as adaptators and on board DC/DC converters. Packaged in TO-220AB, TO-220FPAB, D²PAK and I²PAK.



ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			100	V
$I_{F(RMS)}$	RMS forward current			10	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	TO-220AB	$T_c = 165^\circ\text{C}$	5	A
		D ² PAK / I ² PAK			
		TO-220FPAB	$T_c = 160^\circ\text{C}$	10	
I_{FSM}	Surge non repetitive forward current		$t_p = 10\text{ ms}$ sinusoidal	180	A
I_{RRM}	Repetitive peak reverse current		$t_p = 2\text{ }\mu\text{s}$ square F = 1kHz	1	A
P_{ARM}	Repetitive peak avalanche power		$t_p = 1\text{ }\mu\text{s}$ $T_j = 25^\circ\text{C}$	7200	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	D2PAK / I2PAK TO-220AB	Per diode	2.2
			Total	1.3
$R_{th(c)}$			Coupling	0.3
$R_{th(j-c)}$	Junction to case	TO-220FPAB	Per diode	4.5
			Total	3.5
$R_{th(c)}$			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	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			3.5	μA
		$T_j = 125^\circ\text{C}$			1.3	4.5	mA
V_F^{**}	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 5\text{ A}$			0.73	V
		$T_j = 125^\circ\text{C}$			0.57	0.61	
		$T_j = 25^\circ\text{C}$	$I_F = 10\text{ A}$			0.85	
		$T_j = 125^\circ\text{C}$			0.66	0.71	

Pulse test : * $t_p = 5\text{ ms}$, $\delta < 2\%$

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

To evaluate the maximum conduction losses use the following equation :

$$P = 0.51 \times I_{F(AV)} + 0.02 \times I_{F(RMS)}^2$$

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

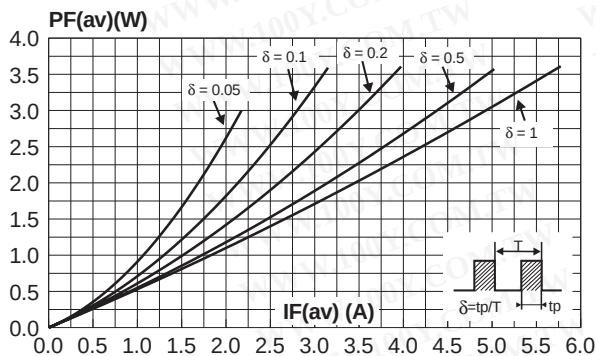


Fig. 2: Average forward current versus ambient temperature ($\delta=0.5$, per diode).

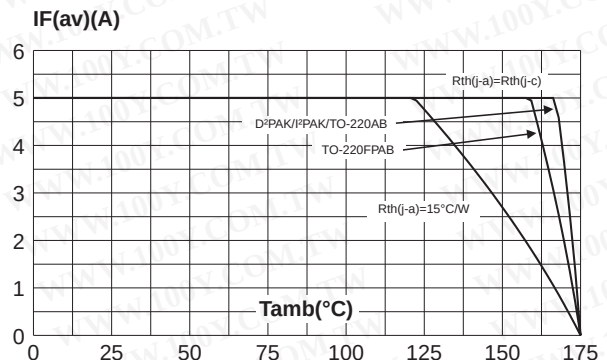


Fig. 3: Normalized avalanche power derating versus pulse duration.

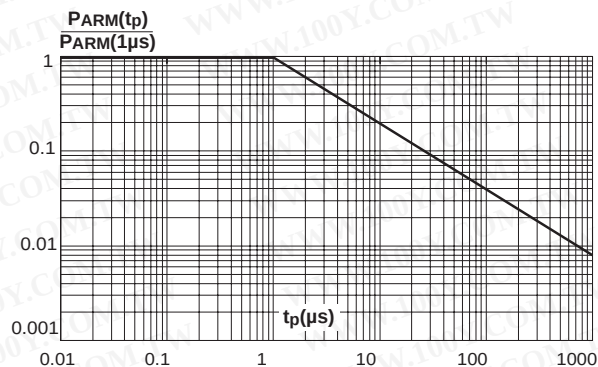


Fig. 4: Normalized avalanche power derating versus junction temperature.

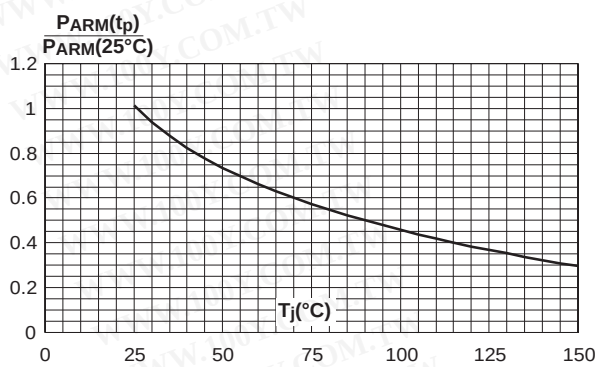


Fig. 5-1: Non repetitive surge peak forward current versus overload duration (maximum values, per diode)

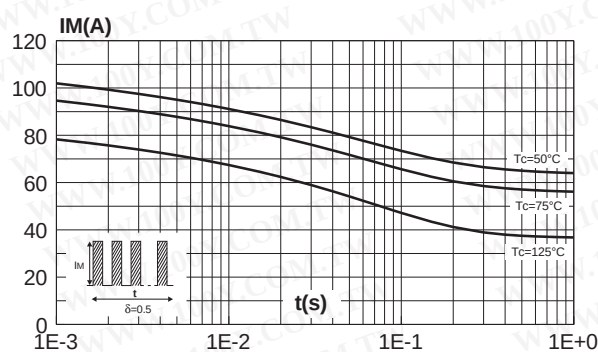


Fig. 5-2: Non repetitive surge peak forward current versus overload duration (maximum values, per diode)(TO-220FPAB)

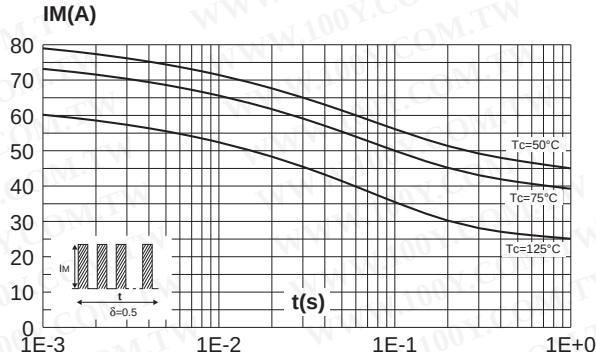


Fig. 6-1: Relative variation of thermal impedance junction to case versus pulse duration (per diode).

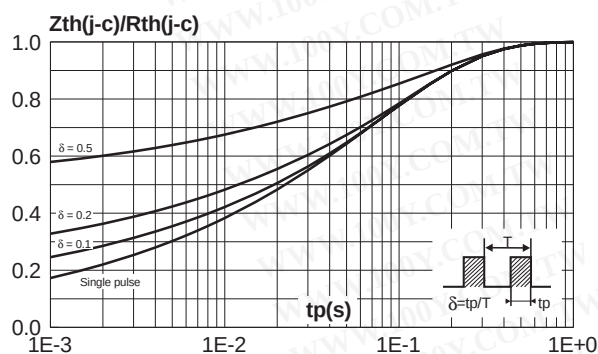


Fig. 6-2: Relative variation of thermal impedance junction to case versus pulse duration (per diode).(TO-220FPAB)

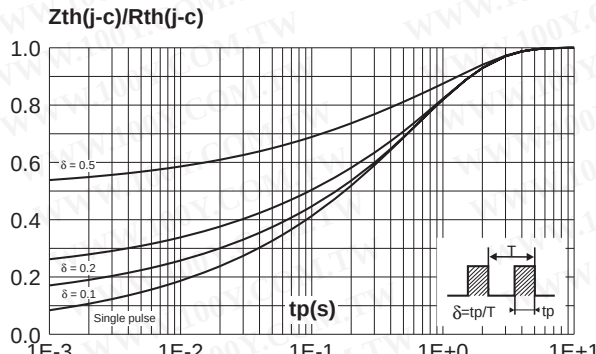


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values, per diode).

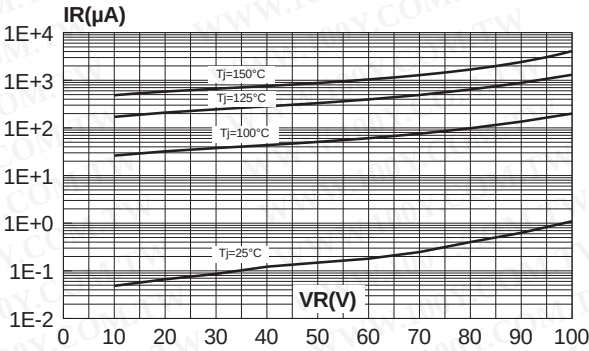


Fig. 8: Junction capacitance versus reverse voltage applied (typical values, per diode).

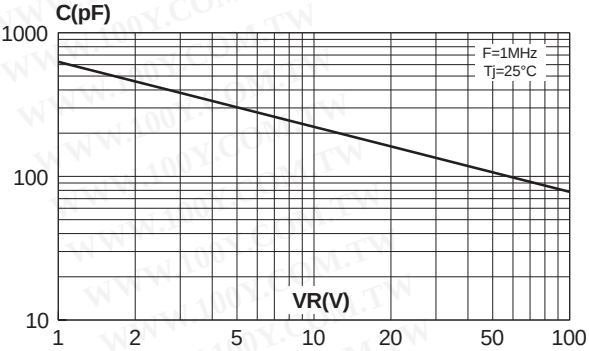


Fig. 9: Forward voltage drop versus forward current (maximum values, per diode).

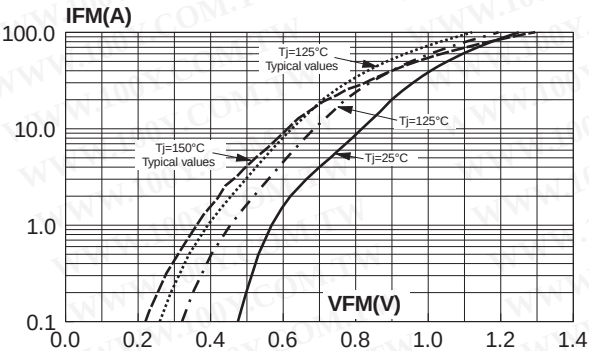
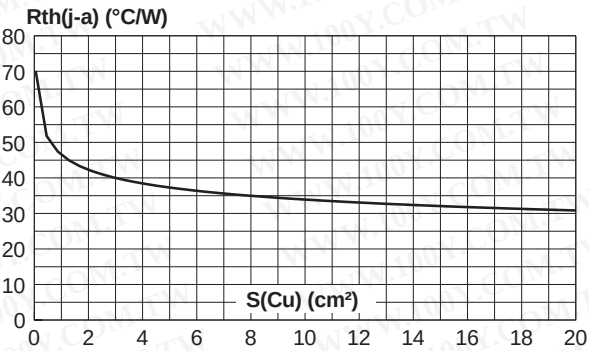
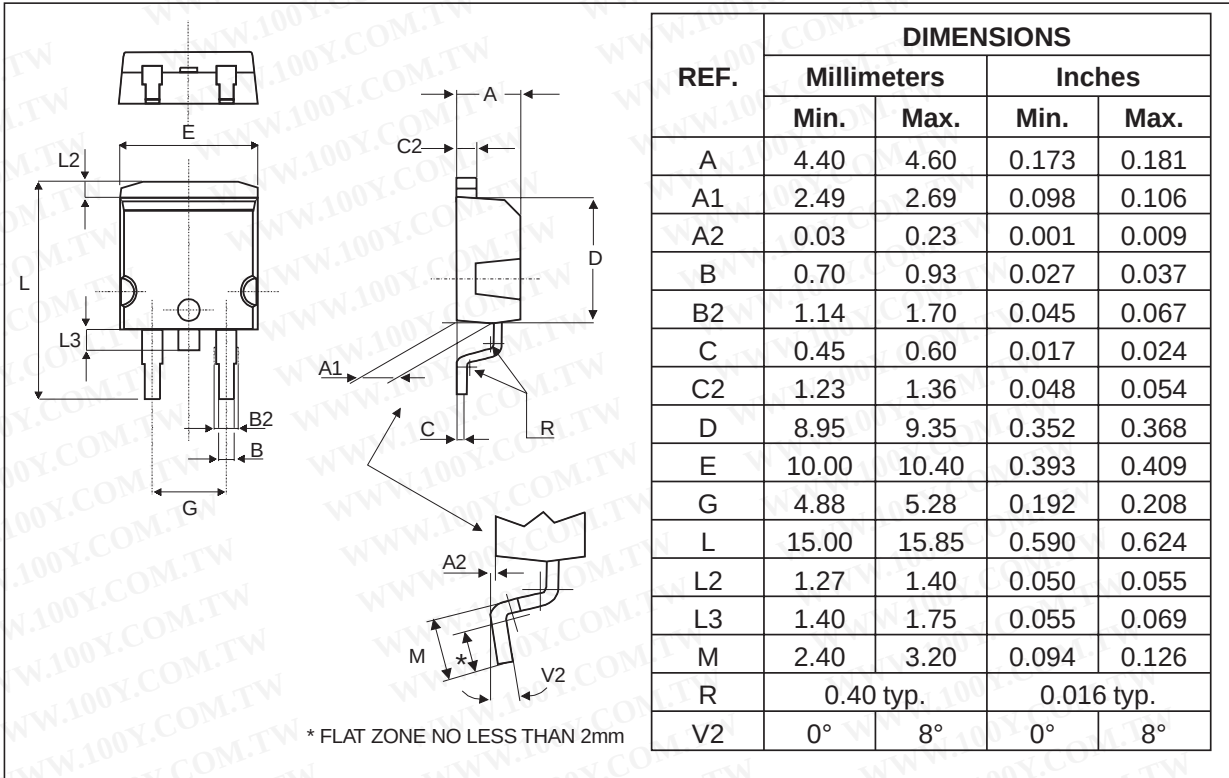


Fig. 10: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35 μm)

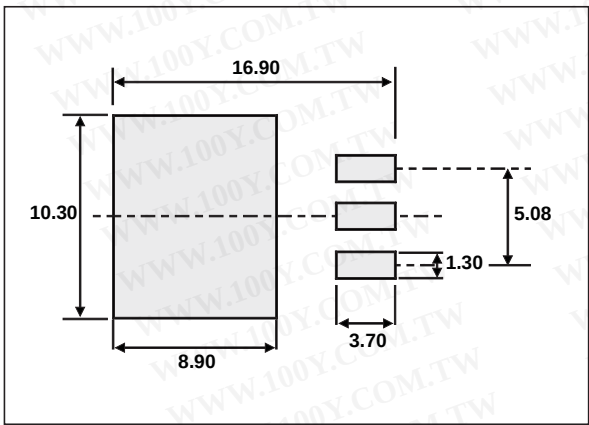


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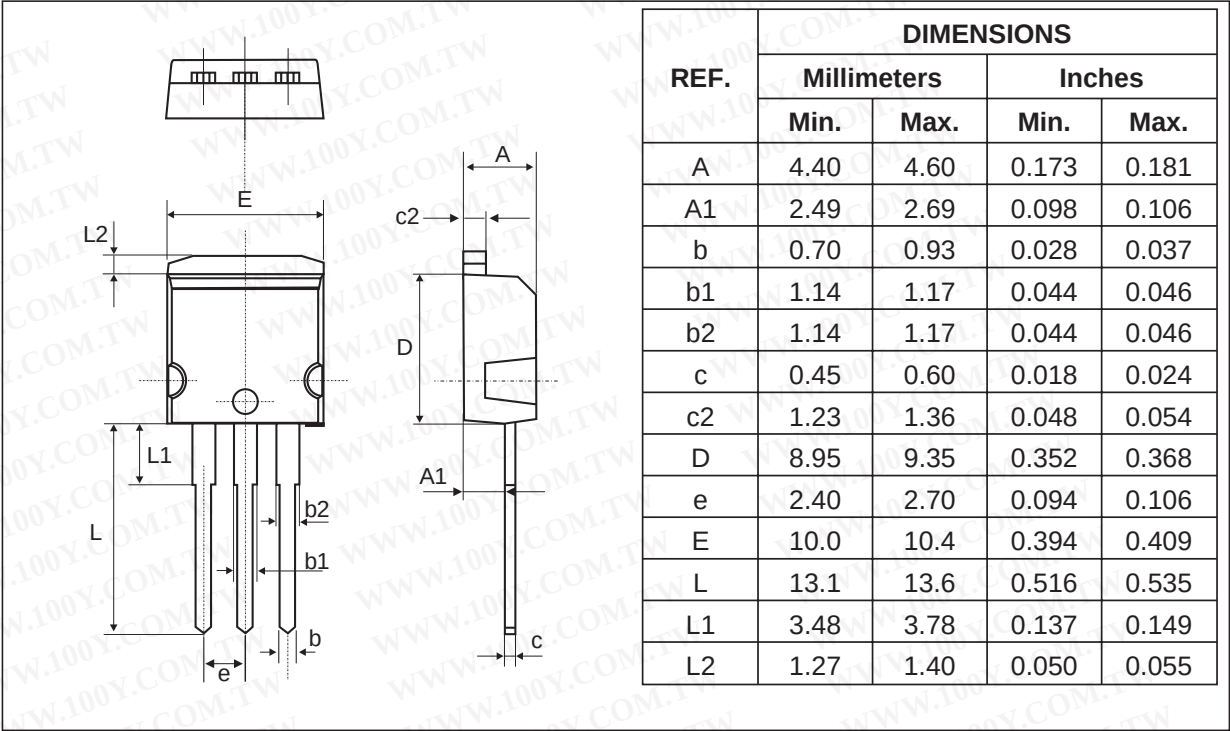
PACKAGE MECHANICAL DATA
D²PAK



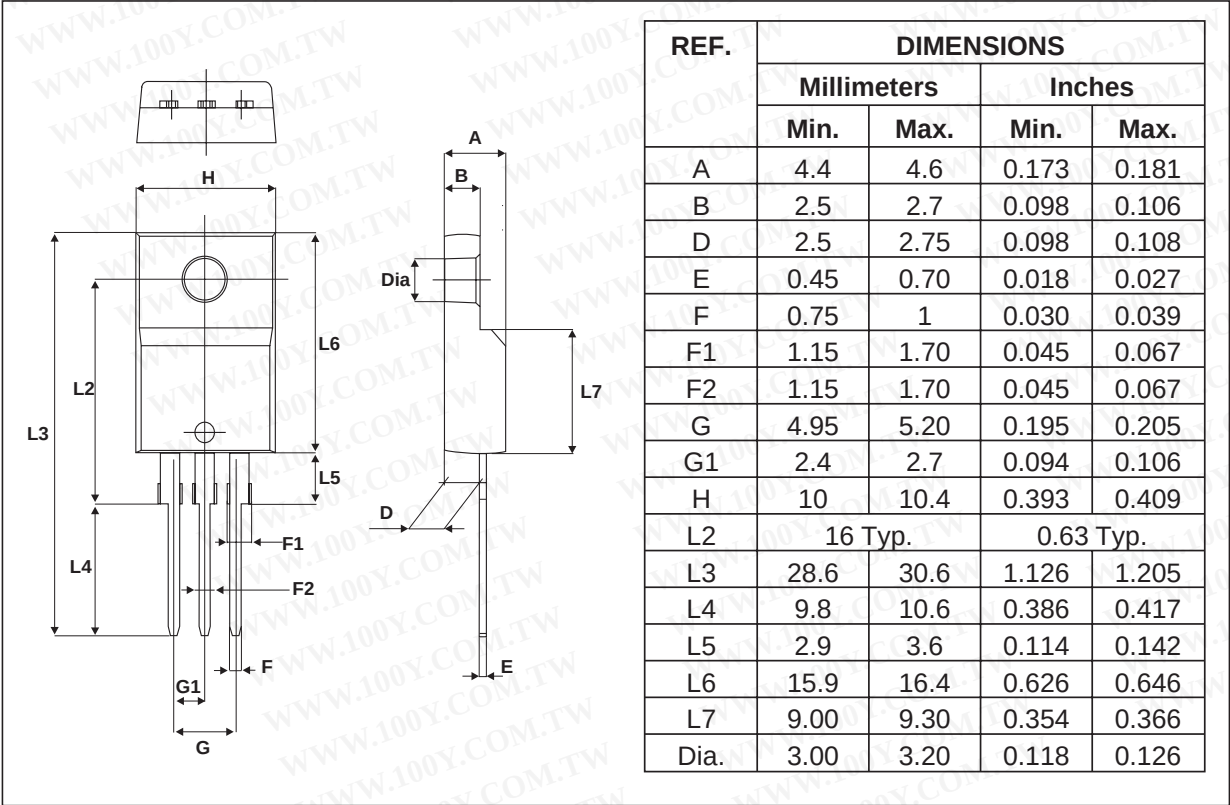
FOOT PRINT in millimeters



PACKAGE MECHANICAL DATA
I²PAK

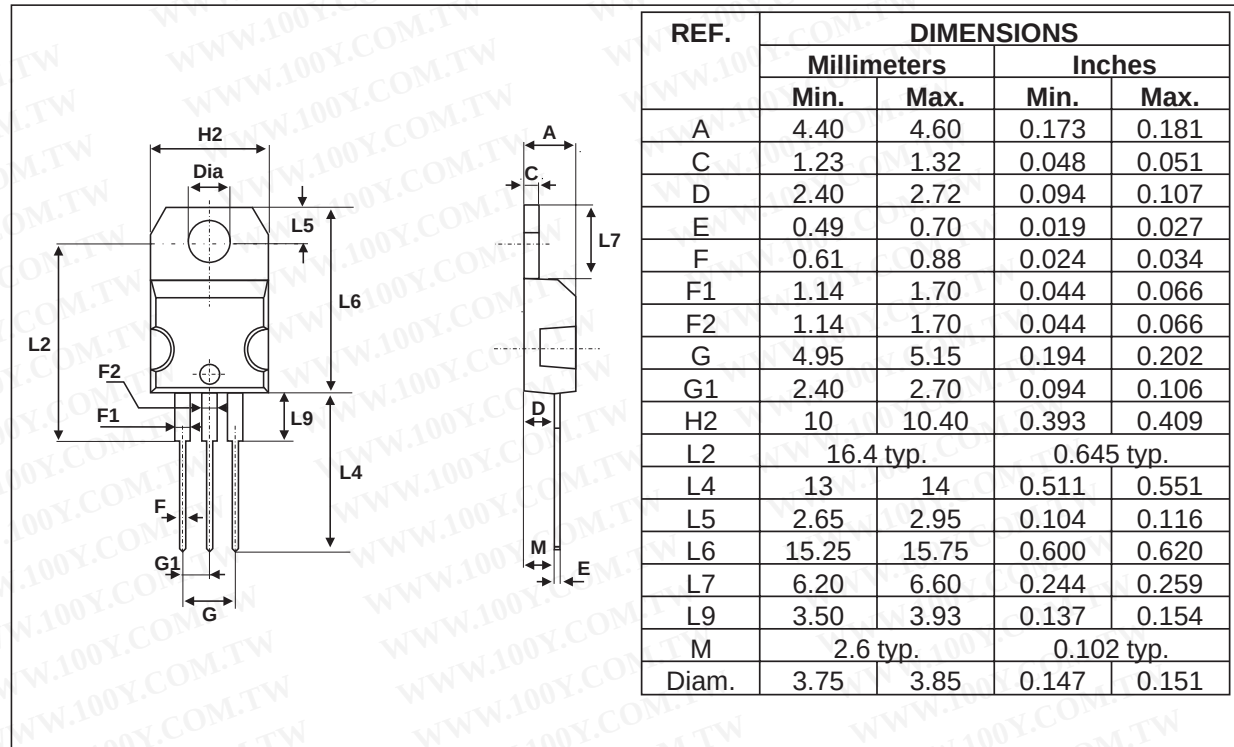


PACKAGE MECHANICAL DATA
TO-220FPAB



STPS10H100CT/CG/CR/CFP

PACKAGE MECHANICAL DATA TO-220AB



- Cooling method: C.
- Recommended torque value: 0.55 m.N
- Maximum torque value 0.70 m.N

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS10H100CT	STPS10H100CT	TO-220AB	2.20g	50	Tube
STPS10H100CFP	STPS10H100CFP	TO-220FPAB	2.0 g	50	Tube
STPS10H100CG	STPS10H100CG	D ² PAK	1.48g	50	Tube
STPS10H100CG-TR	STPS10H100CG	D ² PAK	1.48g	1000	Tape and reel
STPS10H100CR	STPS10H100CR	I ² PAK	1.49g	50	Tube

- Epoxy meets UL94,V0

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