

HIGH VOLTAGE POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

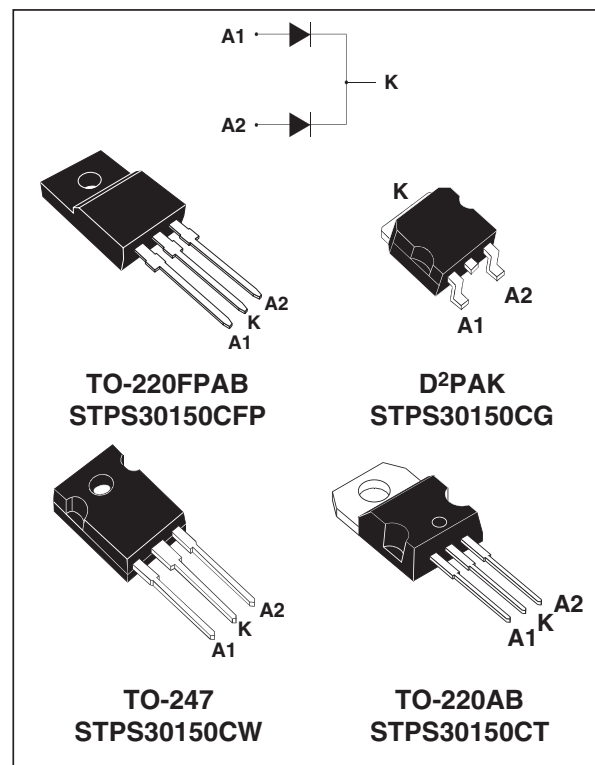
$I_{F(AV)}$	2 x 15 A
V_{RRM}	150 V
T_j	175°C
$V_F(\text{max})$	0.75 V

FEATURES AND BENEFITS

- HIGH JUNCTION TEMPERATURE CAPABILITY
- GOOD TRADE OFF BETWEEN LEAKAGE CURRENT AND FORWARD VOLTAGE DROP
- LOW LEAKAGE CURRENT
- INSULATED PACKAGE: TO-220FPAB
Insulating voltage: 2000V DC
Capacitance: 45pF
- AVALANCHE CAPABILITY SPECIFIED

DESCRIPTION

Dual center tap schottky rectifier designed for high frequency Switched Mode Power Supplies.



ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter			Value	Unit	
V_{RRM}	Repetitive peak reverse voltage			150	V	
$I_{F(RMS)}$	RMS forward current			30	A	
$I_{F(AV)}$	Average forward current $\delta = 0.5$	TO-220FPAB	$T_c = 120^\circ\text{C}$	per diode per device	15	A
		TO-220AB/D ² PAK	$T_c = 155^\circ\text{C}$			
		TO-247		30		
I_{FSM}	Surge non repetitive forward current		$t_p = 10 \text{ ms}$ sinusoidal	220	A	
P_{ARM}	Repetitive peak avalanche power		$t_p = 1 \mu\text{s}$ $T_j = 25^\circ\text{C}$	10500	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

THERMAL RESISTANCES

Symbol	Parameter			Value	Unit
R _{th(j-c)}	Junction to case	TO-220FPAB	Per diode	4	°C/W
			Total	3.3	
		TO-220AB/D ² PAK	Per diode	1.6	
	Total	0.85			
	TO-247	Per diode	1.5		
		Total	0.8		
R _{th(c)}		TO-220FPAB	Coupling	2.6	
		TO-220AB/D ² PAK	Coupling	0.1	
		TO-247	Coupling	0.1	

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°C	V _R = V _{RRM}			6.5	μA
		T _j = 125°C				8	mA
V _F **	Forward voltage drop	T _j = 25°C	I _F = 15 A			0.92	V
		T _j = 125°C	I _F = 15 A		0.69	0.75	
		T _j = 25°C	I _F = 30 A			1	
		T _j = 125°C	I _F = 30 A		0.8	0.86	

Pulse test : * t_p = 5 ms, δ < 2%
 ** t_p = 380 μs, δ < 2%

To evaluate the conduction losses use the following equation:

$$P = 0.64 \times I_{F(AV)} + 0.0073 I_{F(RMS)}^2$$

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

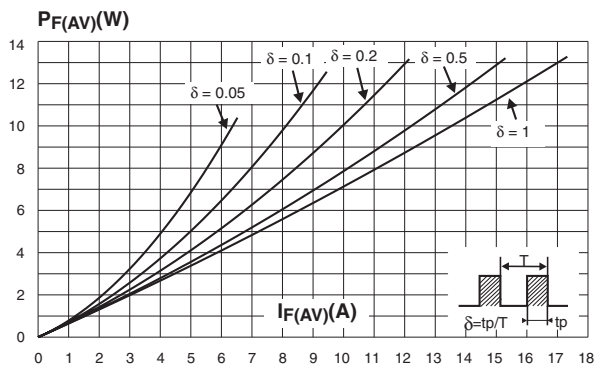


Fig. 2: Average forward current versus ambient temperature (δ = 0.5, per diode).

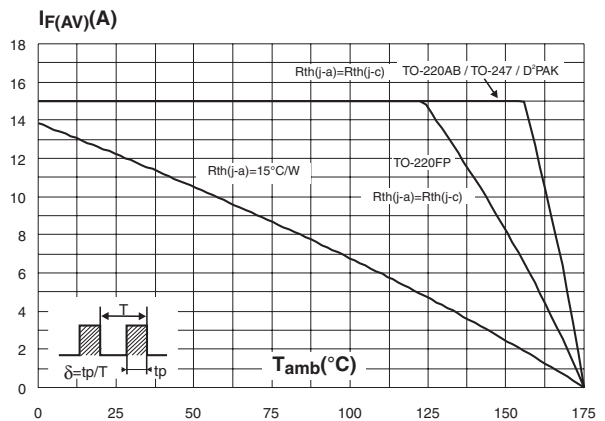


Fig. 3: Normalized avalanche power derating versus pulse duration.

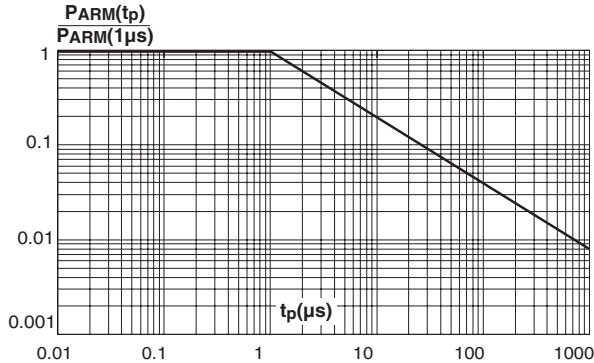


Fig. 4: Normalized avalanche power derating versus junction temperature.

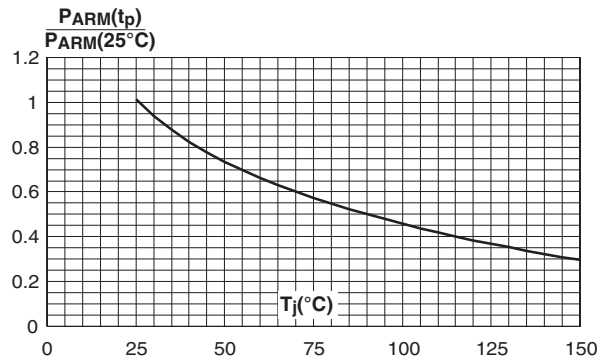


Fig. 5-1: Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TO-220AB, TO-247, D²PAK).

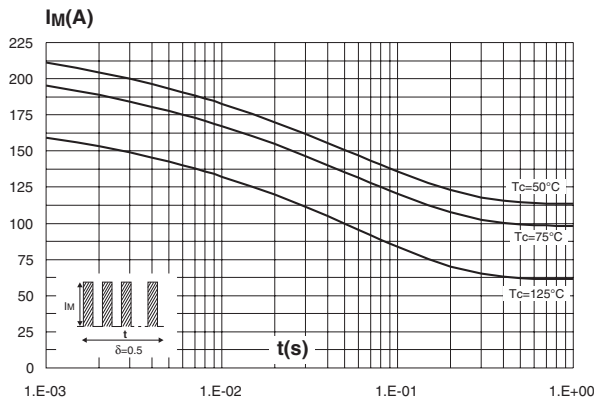


Fig. 5-2: Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TO-220FPAB).

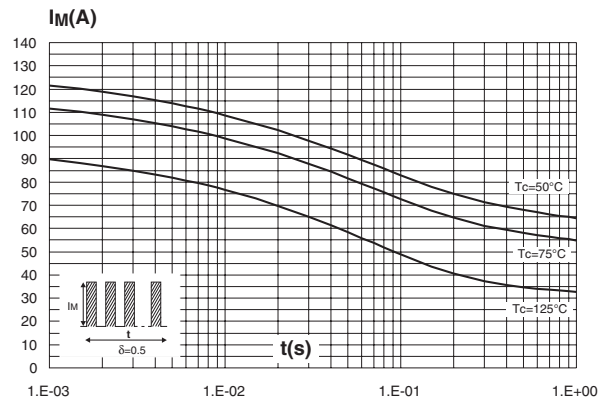


Fig. 6-1: Relative variation of thermal impedance junction to case versus pulse duration (per diode) (TO-220AB, TO-247, D²PAK).

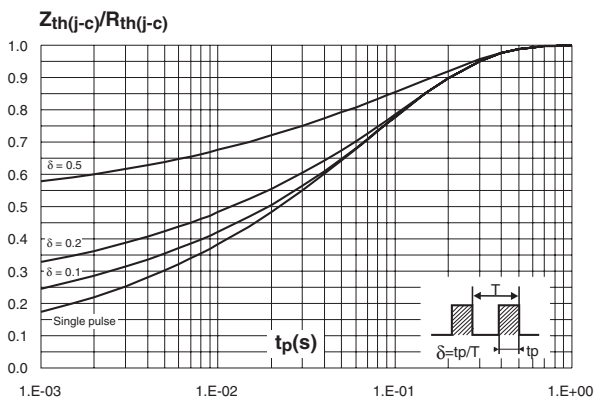


Fig. 6-2: Relative variation of thermal impedance junction to case versus pulse duration. (TO-220FPAB)

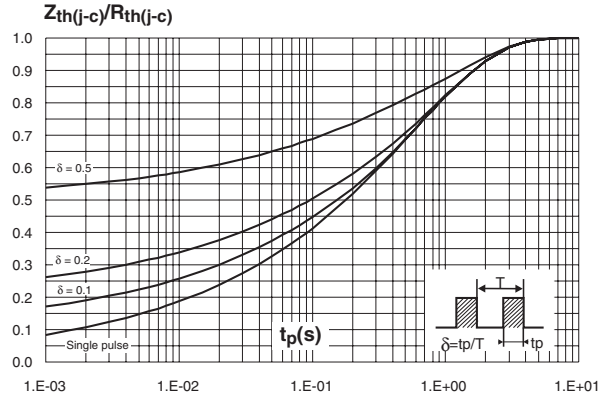


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values, per diode).

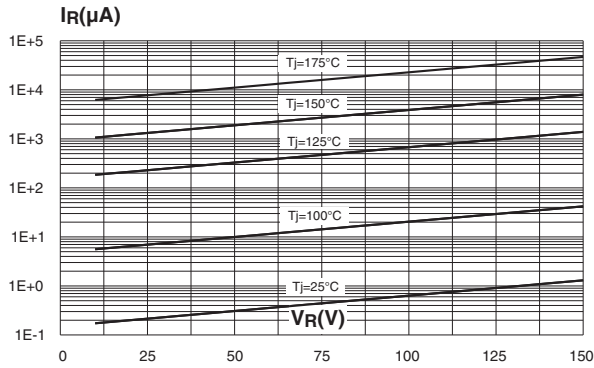


Fig. 8: Junction capacitance versus reverse voltage applied (typical values, per diode).

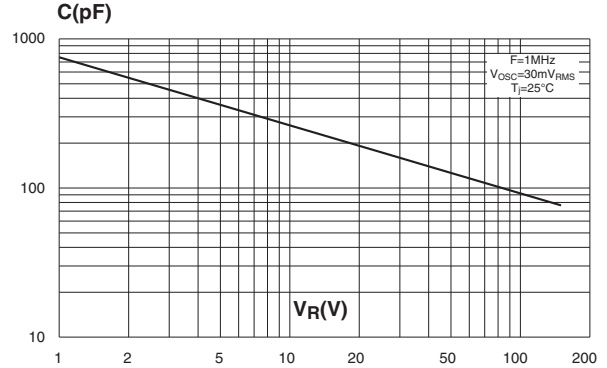


Fig. 9: Forward voltage drop versus forward current (maximum values, per diode).

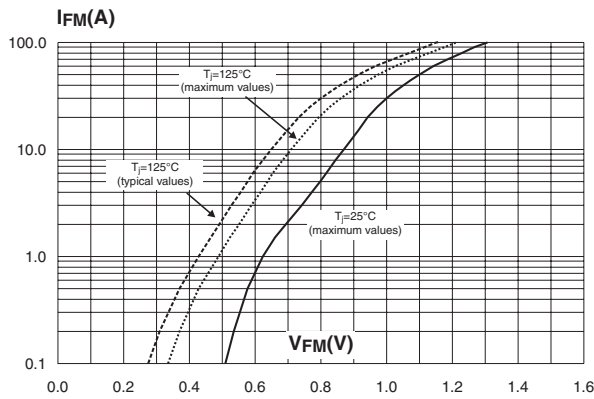
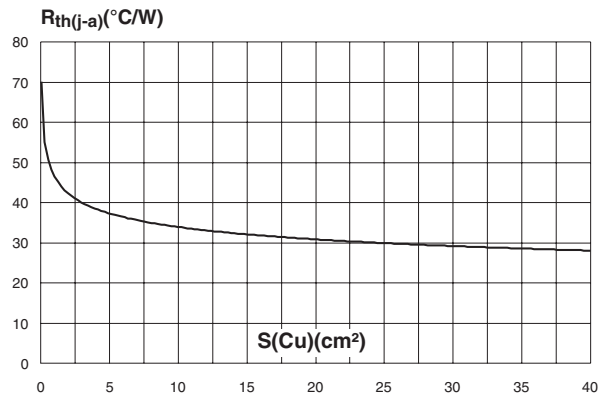
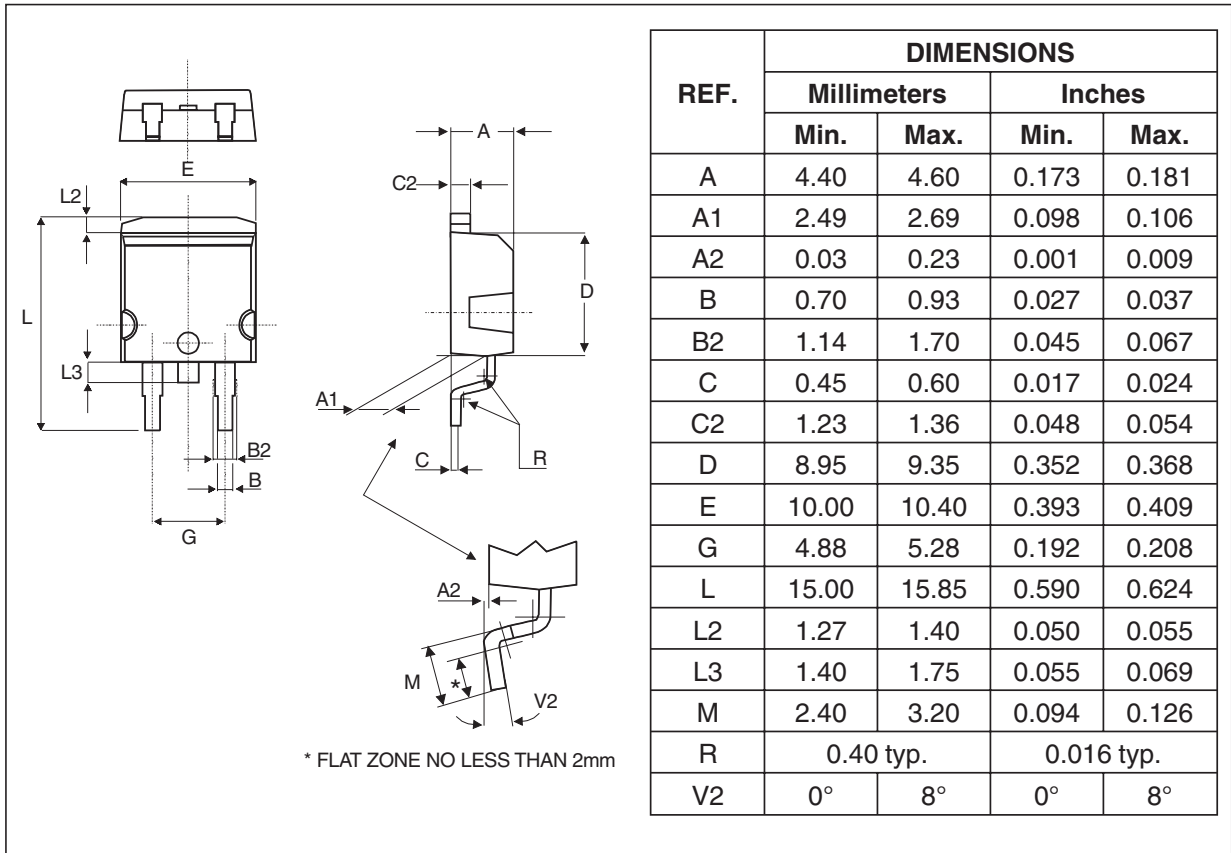


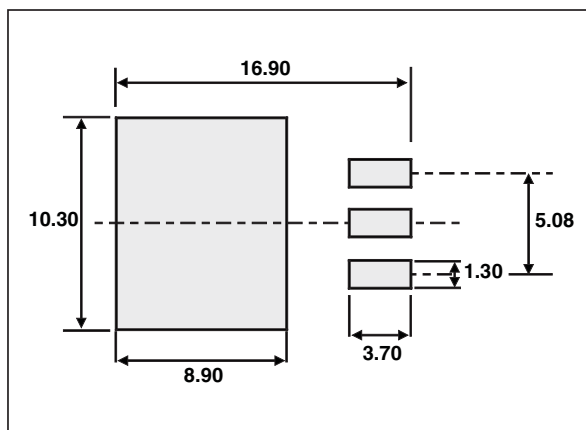
Fig. 10: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board, copper thickness: 35 μm) (TO-220FPAB).



PACKAGE MECHANICAL DATA
D²PAK

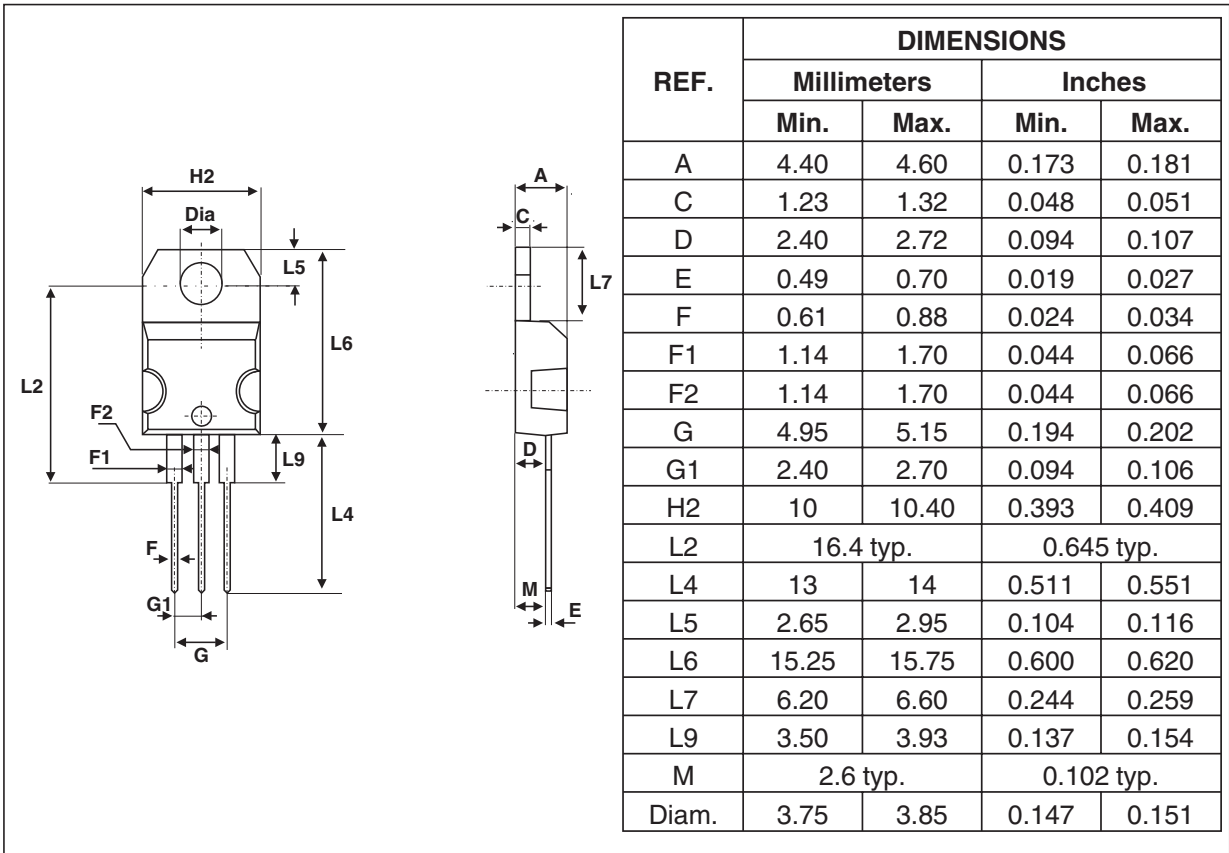


FOOT PRINT DIMENSIONS (in millimeters)

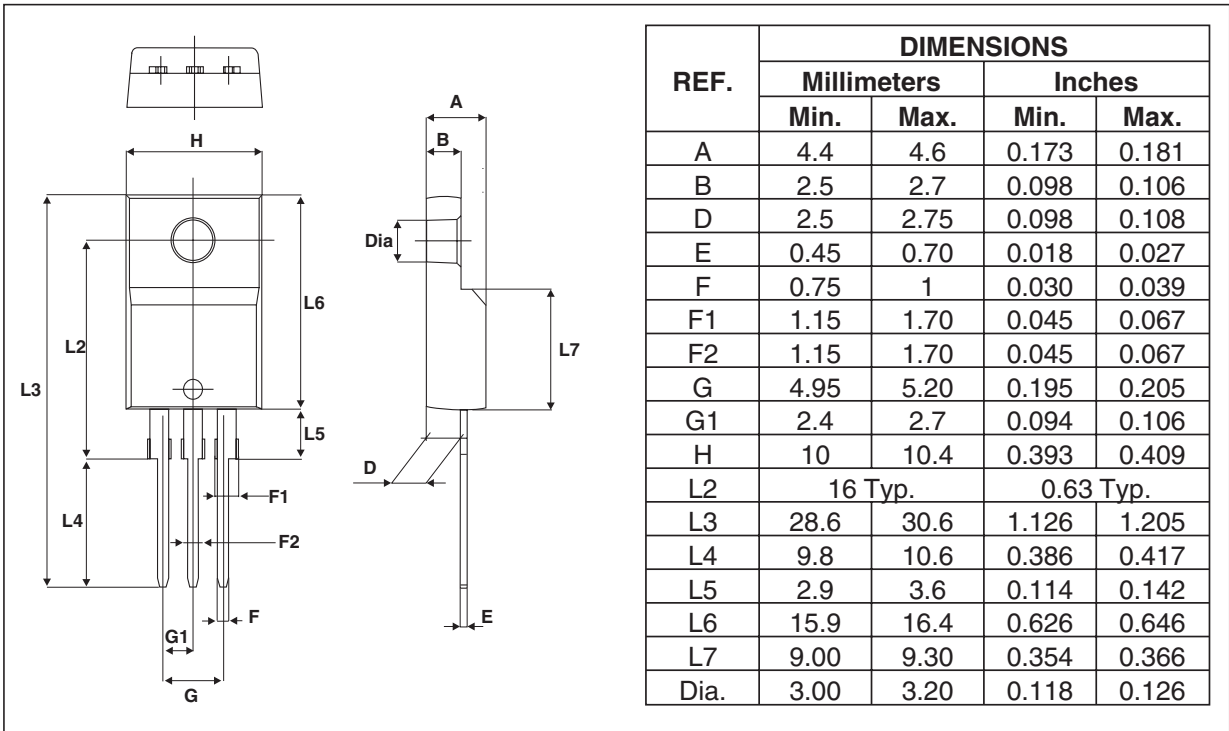


STPS30150C

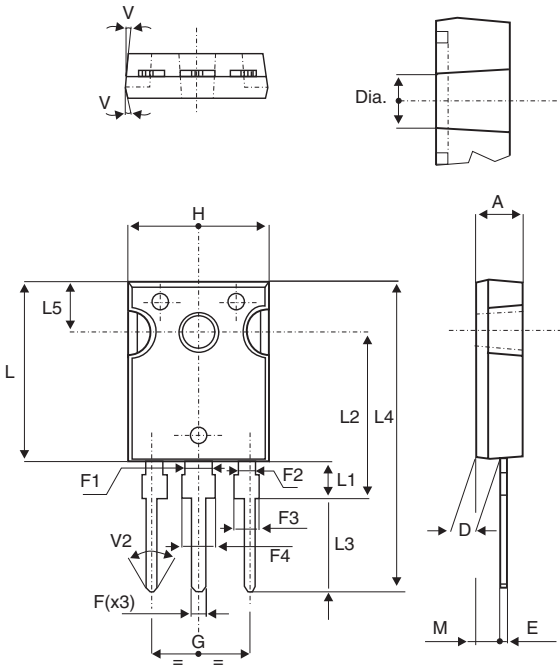
PACKAGE MECHANICAL DATA
TO-220AB



PACKAGE MECHANICAL DATA
TO-220FPAB



PACKAGE MECHANICAL DATA
 TO-247



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.85		5.15	0.191		0.203
D	2.20		2.60	0.086		0.102
E	0.40		0.80	0.015		0.031
F	1.00		1.40	0.039		0.055
F1		3.00			0.118	
F2		2.00			0.078	
F3	2.00		2.40	0.078		0.094
F4	3.00		3.40	0.118		0.133
G		10.90			0.429	
H	15.45		15.75	0.608		0.620
L	19.85		20.15	0.781		0.793
L1	3.70		4.30	0.145		0.169
L2		18.50			0.728	
L3	14.20		14.80	0.559		0.582
L4		34.60			1.362	
L5		5.50			0.216	
M	2.00		3.00	0.078		0.118
V		5°			5°	
V2		60°			60°	
Dia.	3.55		3.65	0.139		0.143

- Cooling method : C
- Recommended torque value : 0.8m.N
- Maximum torque value : 1.0m.N

Ordering Type	Marking	Package	Weight	Base qty	Delivery mode
STPS30150CT	STPS30150CT	TO-220AB	2 g	50	Tube
STPS30150CFP	STPS30150CFP	TO-220FPAB	1.9 g	50	Tube
STPS30150CW	STPS30150CW	TO-247	4.4 g	30	Tube
STPS30150CG	STPS30150CG	D ² PAK	1.48 g	50	Tube
STPS30150CG-TR	STPS30150CG	D ² PAK	1.48 g	1000	Tape & reel

- Epoxy meets UL94, V0

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