



STPR1020CB/CG/CT/CF

ULTRA-FAST RECOVERY RECTIFIER DIODES

MAIN PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	2 x 5 A
V_{RRM}	200 V
$T_j(max)$	150°C
$V_F(max)$	0.99 V
$t_{rr}(max)$	30 ns

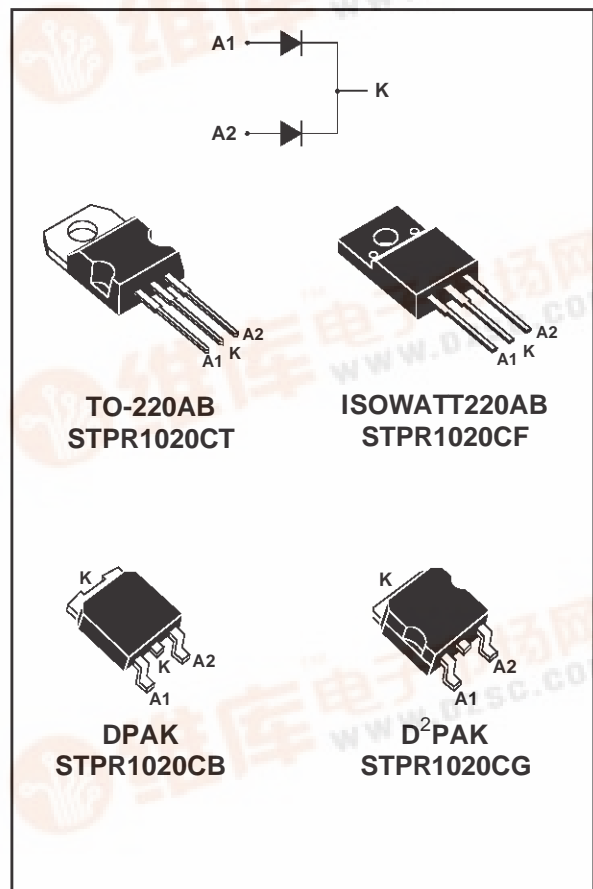
FEATURES

- SUITED FOR SMPS
- LOW LOSSES
- LOW FORWARD AND REVERSE RECOVERY TIME
- HIGH SURGE CURRENT CAPABILITY
- INSULATED PACKAGE: ISOWATT220AB
Insulating Voltage = 2500V_(RMS)
Capacitance = 45 pF

DESCRIPTION

Dual rectifier suited for switch mode and high frequency DC to DC converters.

Packaged in DPAK, D²PAK, TO-220AB or ISOWATT220AB, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.



ABSOLUTE MAXIMUM (limiting values, per diode)

Symbol	Parameter			Value	Unit	
V_{RRM}	Repetitive peak reverse voltage			200	V	
$I_{F(RMS)}$	RMS forward current	D ² PAK / TO-220AB / ISOWATT220AB		10	A	
		DPAK		6	A	
$I_{F(AV)}$	Average forward current $\delta = 0.5$	D ² PAK / DPAK	$T_c = 125^\circ\text{C}$	Per diode	5	A
		TO-220AB	$T_c = 115^\circ\text{C}$	Per device	10	
I_{FSM}	Surge non repetitive forward current		$t_p = 10\text{ms}$ sinusoidal	50	A	
T_{stg}	Storage temperature range			- 65 to + 150	°C	
T_j	Maximum operating junction temperature			150	°C	

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THERMAL RESISTANCES

Symbol	Parameter		Value	Unit	
R _{th(j-c)}	Junction to case	TO-220AB / D ² PAK / DPAK	Per diode Total Coupling	4.0 2.4 0.7	°C/W
		ISOWATT220AB	Per diode Total Coupling	6.0 4.0 2.0	

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	Parameters	Test conditions		Min.	Typ.	Max.	Unit
I _R *	Reverse leakage current	T _j = 25°C	V _R = V _{RRM}			50	μA
		T _j = 100°C				0.6	mA
V _F **	Forward voltage drop	T _j = 125°C	I _F = 5 A		0.8	0.99	V
		T _j = 125°C	I _F = 10 A		0.95	1.20	
		T _j = 25°C	I _F = 10 A			1.25	

Pulse test : * t_p = 5 ms, δ < 2 %

** t_p = 380 μs, δ < 2 %

To evaluate the conduction losses use the following equation :

$$P = 0.78 \times I_{F(AV)} + 0.042 \times I_{F(RMS)}^2$$

RECOVERY CHARACTERISTICS

Symbol	Test conditions		Min.	Typ.	Max.	Unit
t _{rr}	T _j = 25°C	I _F = 0.5A I _R = 1A	I _{rr} = 0.25A		30	ns
t _{fr}	T _j = 25°C	I _F = 1A V _{FR} = 1.1 x V _F max	dI _F /dt = 50 A/μs	20		ns
V _{FP}	T _j = 25°C	I _F = 1A	dI _F /dt = 50 A/μs	3		V

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

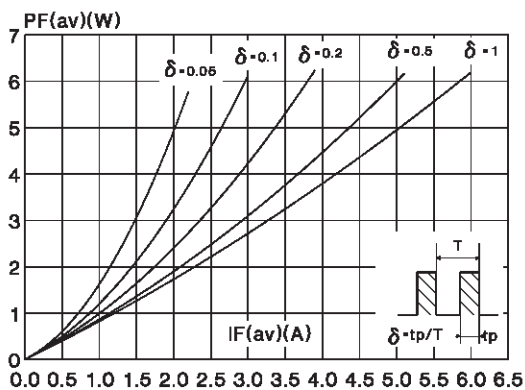


Fig. 2: Peak current versus form factor (per diode).

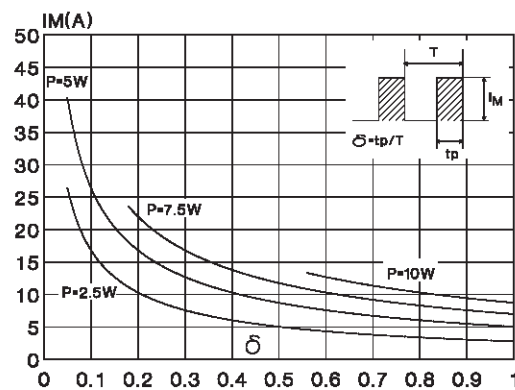


Fig. 3: Average current versus ambient temperature (δ : 0.5, TO-220AB, DPAK, D²PAK).

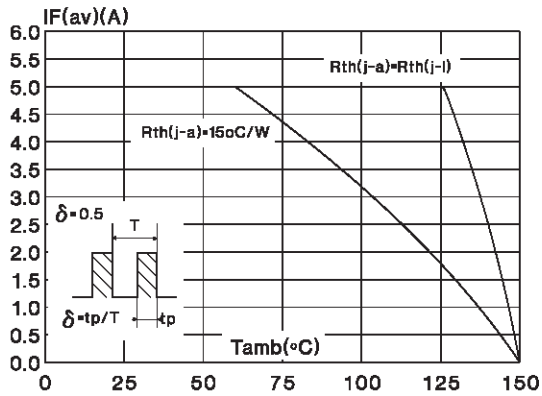


Fig. 4: Average current versus ambient temperature (δ : 0.5, ISOWATT220AB).

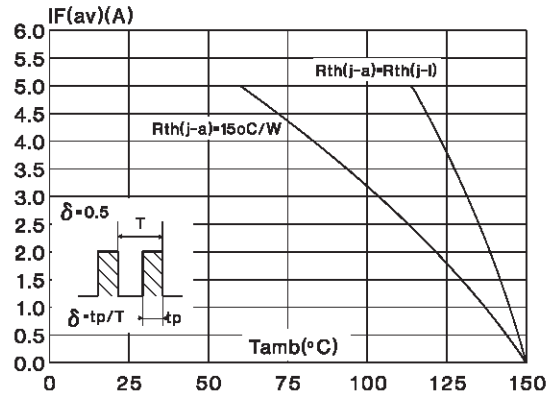


Fig. 5: Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TO-220AB, DPAK and D²PAK).

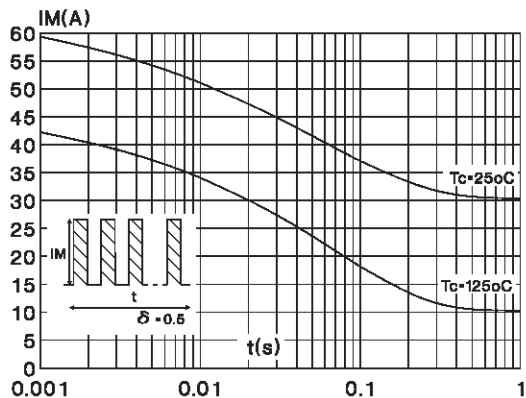


Fig. 6: Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (ISOWATT220AB).

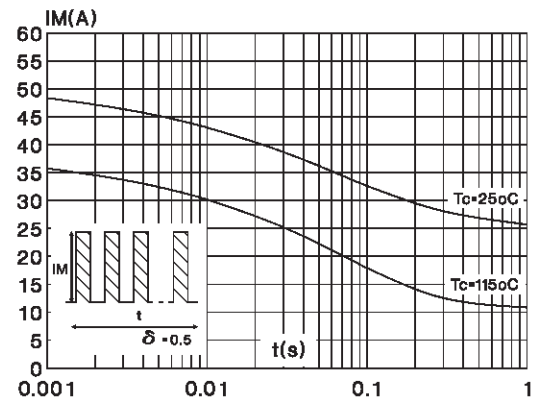


Fig. 7: Relative variation of thermal transient impedance junction to case versus pulse duration (per diode) (TO-220AB, DPAK and D²PAK).

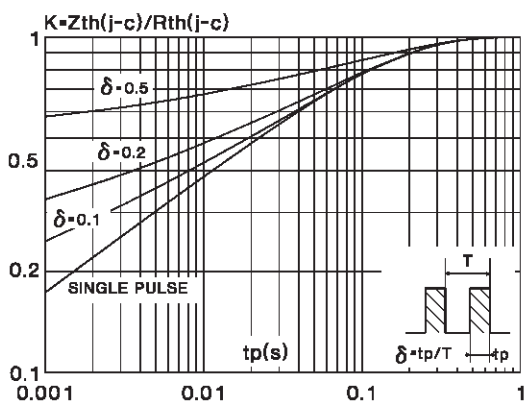
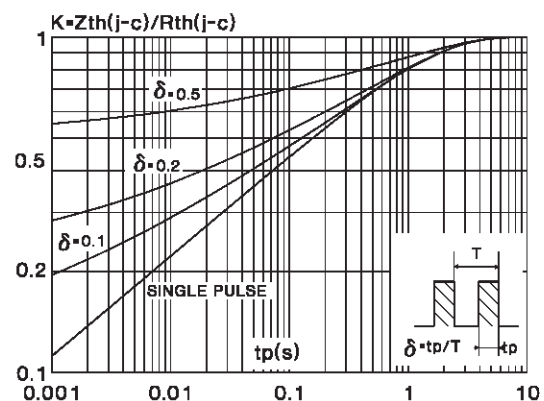


Fig. 8: Relative variation of thermal transient impedance junction to case versus pulse duration (per diode) (ISOWATT220AB).



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Fig. 9: Forward voltage drop versus forward current.

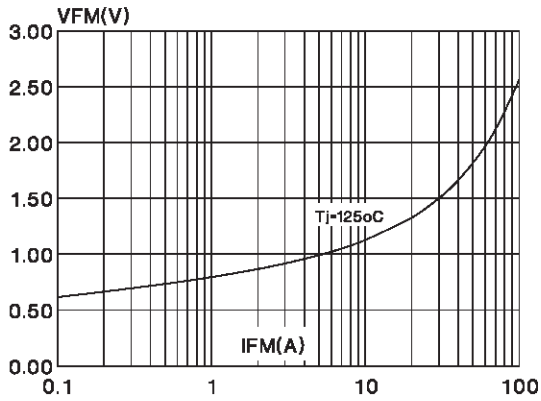


Fig. 10: Junction capacitance versus reverse voltage applied (typical values, per diode).

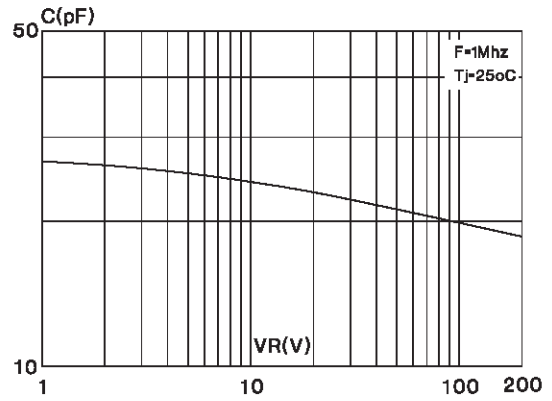


Fig. 11: Recovery charges versus dI_F/dt (per diode).

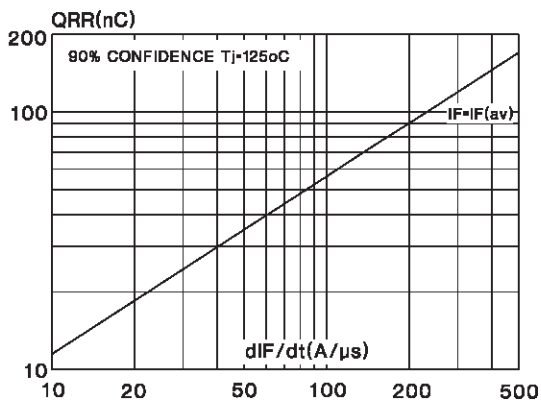


Fig. 12: Peak reverse current versus dI_F/dt (per diode).

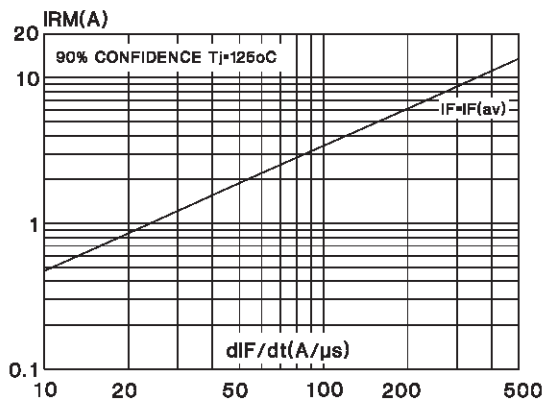
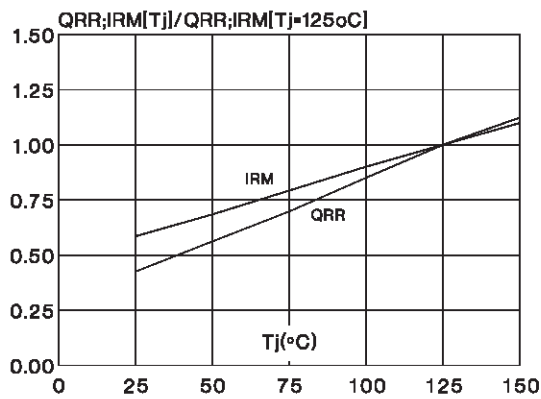
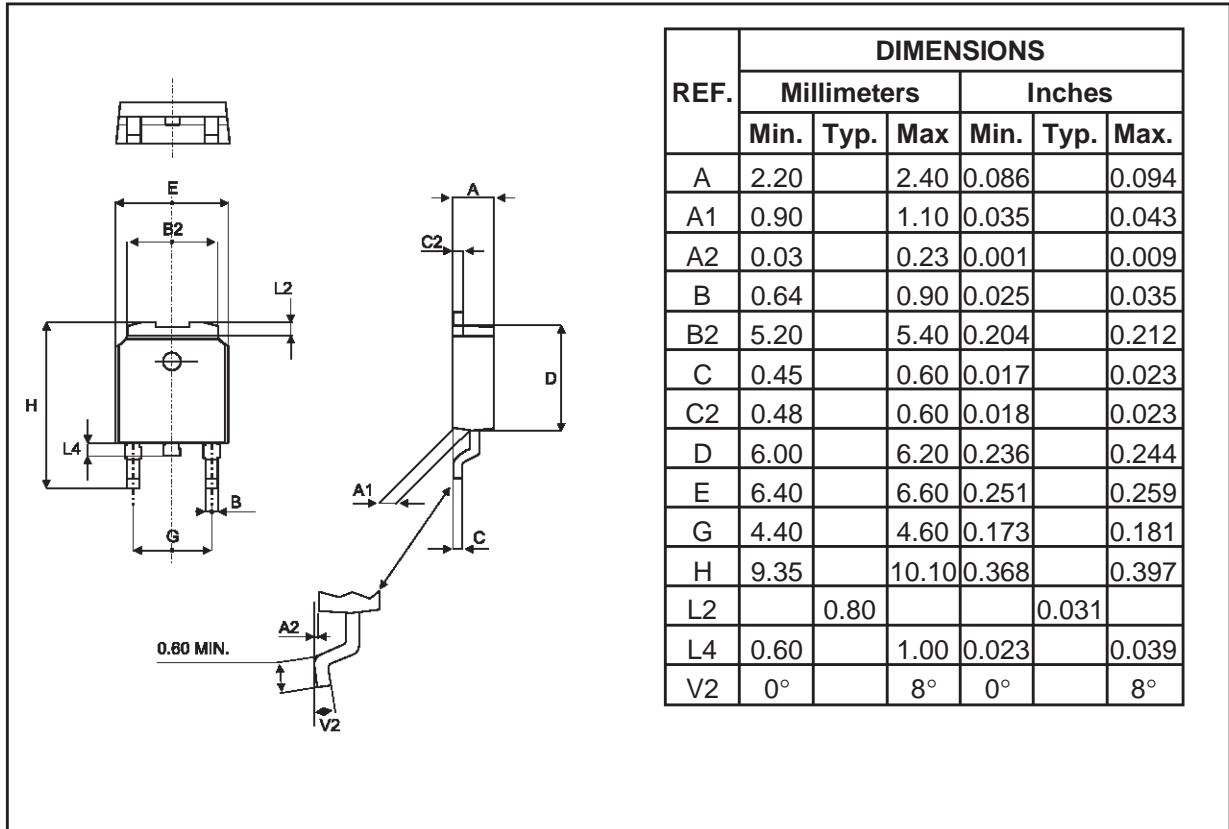


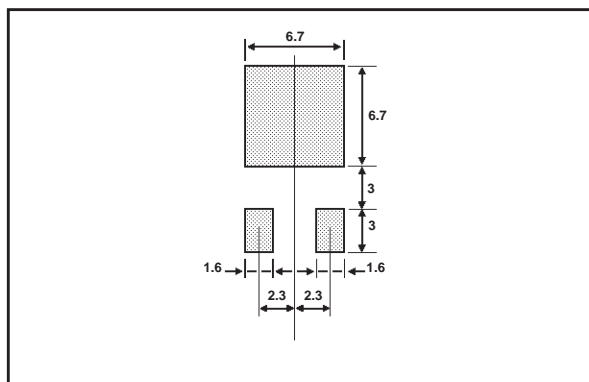
Fig. 13: Dynamic parameters versus junction temperature (per diode).



PACKAGE MECHANICAL DATA
DPAK

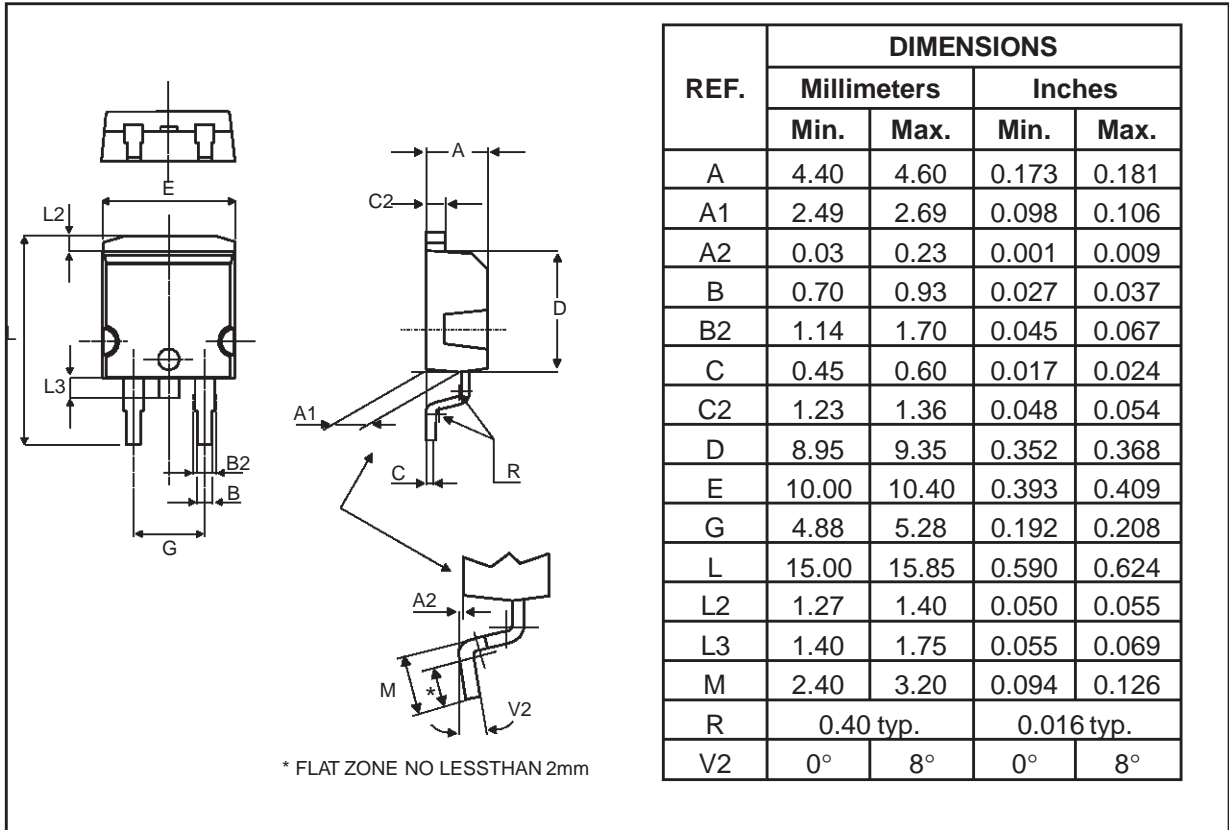


FOOT PRINT (in millimeters)
DPAK

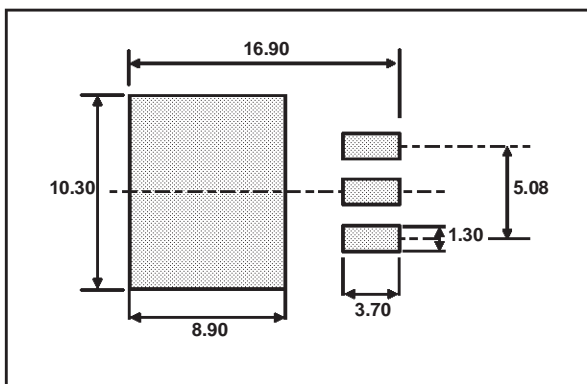


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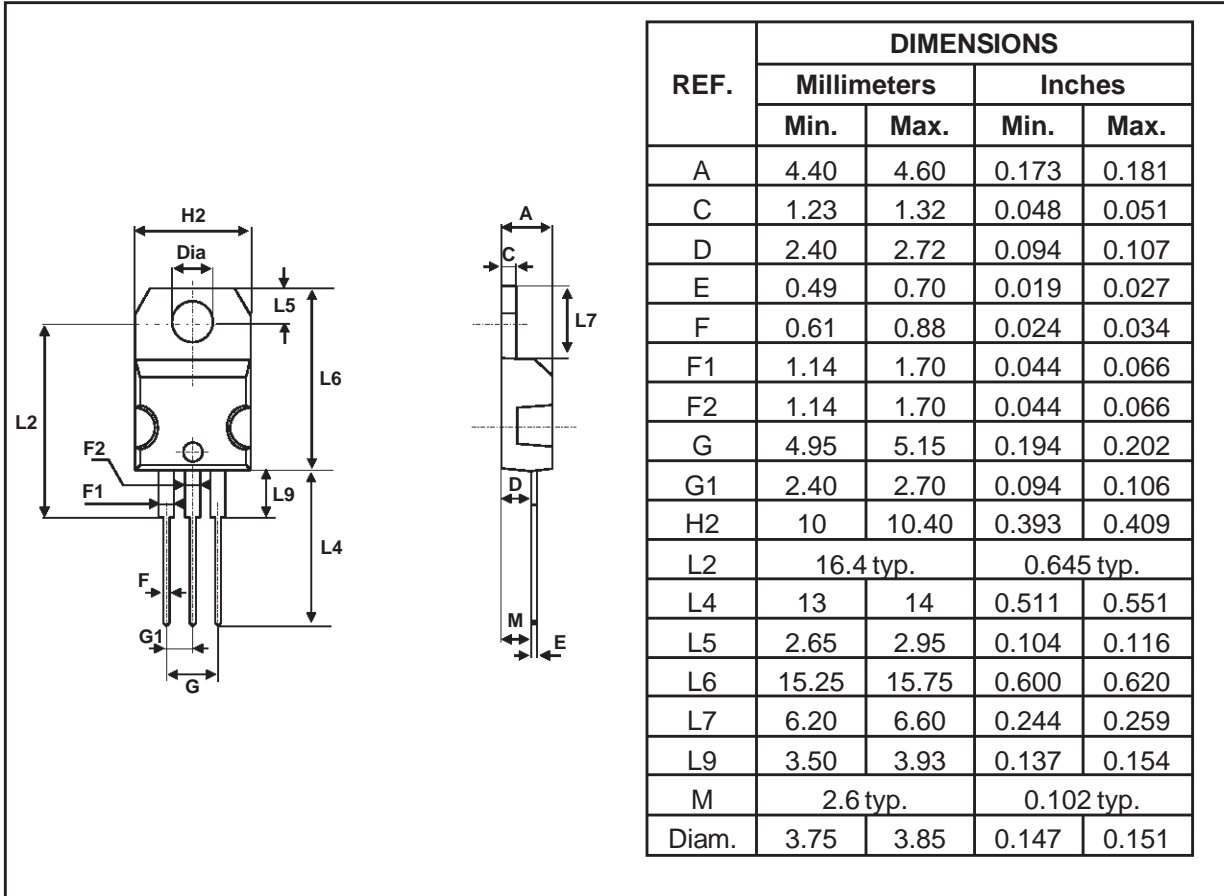
PACKAGE MECHANICAL DATA
D²PAK



FOOT PRINT (in milliteters)
D²PAK

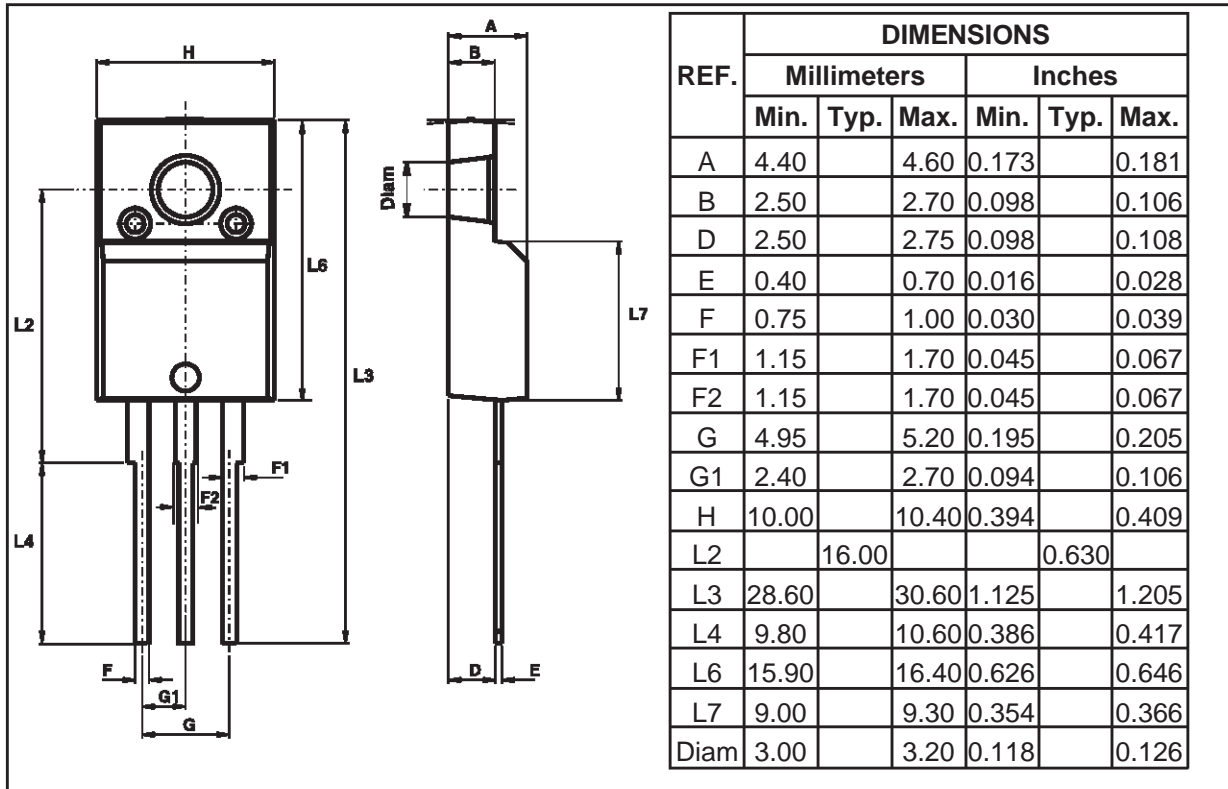


PACKAGE MECHANICAL DATA
TO-220AB (JEDEC outline)



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PACKAGE MECHANICAL DATA ISOWATT220AB (JEDEC outline)



Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPR1020CB	STPR1020CB	DPAK	0.3g	75	Tube
STPR1020CB-TR	STPR1020CB	DPAK	0.3g	2500	Tape & reel
STPR1020CT	STPR1020CT	TO-220AB	2.23g	50	Tube
STPR1020CF	STPR1020CF	ISOWATT220AB	2.2g	50	Tube
STPR1020CG	STPR1020CG	D ² PAK	1.48g	50	Tube

- Cooling method : by conduction (C)
- Recommended torque value (ISOWATT220AB): 0.55 N.m.
- Maximum torque value (ISOWATT220AB): 0.70 N.m.
- Recommended torque value (TO-220AB): 0.8 N.m
- Maximum torque value (TO-220AB): 1.0 N.m.
- Epoxy meets UL94,V0

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