

HIGH EFFICIENCY FAST RECOVERY DIODES

MAIN PRODUCT CHARACTERISTICS

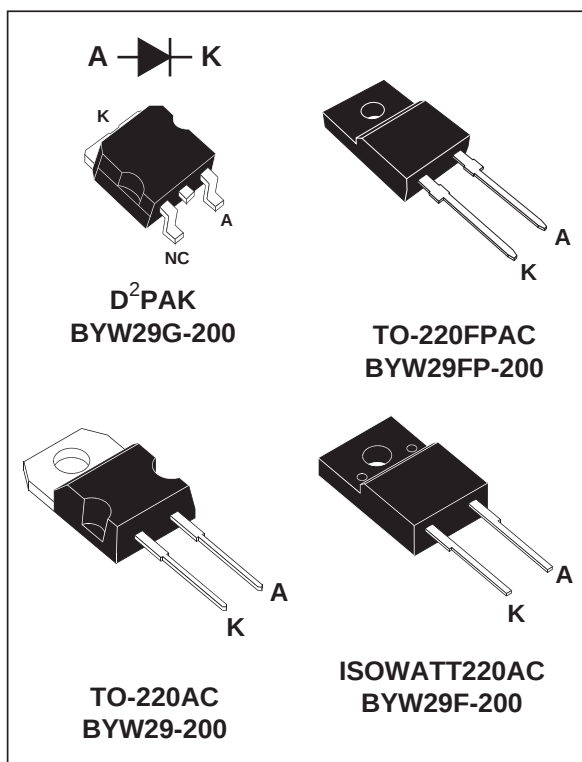
$I_{F(AV)}$	8 A
V_{RRM}	200 V
$t_{rr} (max)$	25 ns
$V_F (max)$	0.85 V

FEATURES AND BENEFITS

- Very Low Forward Losses
- Negligible switching losses
- High surge current capability
- Insulated packages (ISOWATT220AC, TO-220FPAC):
Insulation voltage: 2000 VDC
Typical insulation capacitance = 12 pF

DESCRIPTION

Single rectifier suited for Switch Mode Power Supply and high frequency DC to DC converters. Packaged in TO-220AC, ISOWATT220AC, TO-220FPAC and D²PAK, this device is intended for use in high frequency inverters, free wheeling and polarity protection applications.



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			200	V
$I_{F(RMS)}$	RMS forward current			16	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	D ² PAK / TO-220AC	$T_c = 120^\circ\text{C}$	8	A
		ISOWATT220AC TO-220FPAC	$T_c = 100^\circ\text{C}$		
I_{FSM}	Surge non repetitive forward current (All pins connected)		$t_p = 10\text{ms}$ sinusoidal	80	A
T_{stg}	Storage and junction temperature range			- 65 to + 150	$^\circ\text{C}$
T_j	Maximum operating junction temperature			+ 150	

THERMAL RESISTANCE

Symbol	Parameter		Value	Unit
Rth (j-c)	Junction to case thermal resistance	TO-220AC D2PAK	2.8	°C/W
		ISOWATT220AC	5	
		TO-220FPAC	5.5	

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I _R *	Reverse leakage current	V _R = V _{RRM}	T _j = 25°C			10	μA
			T _j = 100°C			0.6	mA
V _F **	Forward voltage drop	I _F = 5 A	T _j = 125°C			0.85	V
		I _F = 10 A	T _j = 125°C			1.05	
		I _F = 10 A	T _j = 25°C			1.15	

Pulse test : * tp = 5 ms, duty cycle < 2 %

** tp = 380 μs, duty cycle < 2 %

To evaluate the conduction losses use the following equation :

$$P = 0.65 \times I_{F(AV)} + 0.040 I_F^2 (RMS)$$

RECOVERY CHARACTERISTICS

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
t _{rr}	Reverse recovery time	T _j = 25°C I _{rr} = 0.25 A	I _F = 0.5A I _R = 1A			25	ns
		T _j = 25°C dI _F /dt = -50A/μs	I _F = 1A V _R = 30V			35	
t _{fr}	Forward recovery time	T _j = 25°C dI _F /dt = 100A/μs V _{FR} = 1.1 x V _F max	I _F = 1A		15		ns
V _{FP}	Peak forward voltage	T _j = 25°C dI _F /dt = 100A/μs	I _F = 1A		2		V

Fig.1 : Average forward power dissipation versus average forward current.

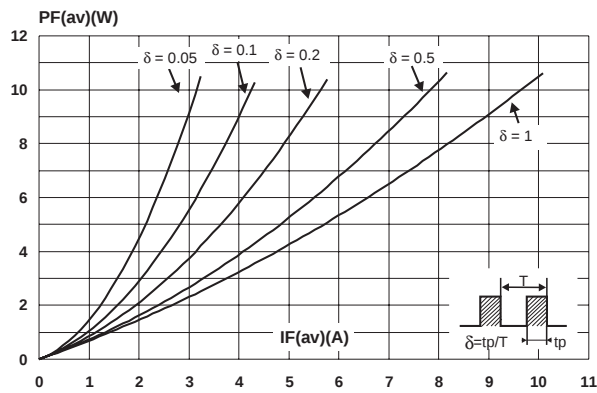


Fig.2 : Peak current versus form factor.

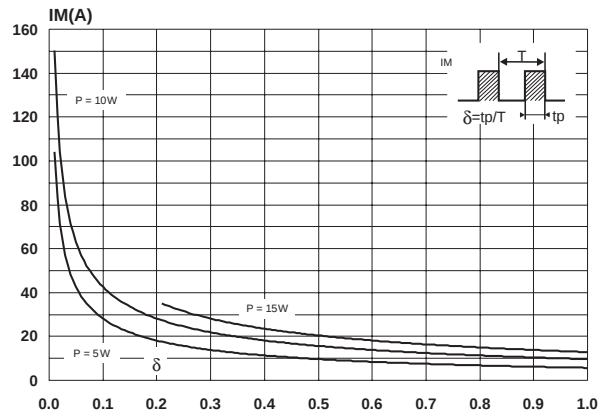


Fig.3 : Forward voltage drop versus forward current (maximum values).

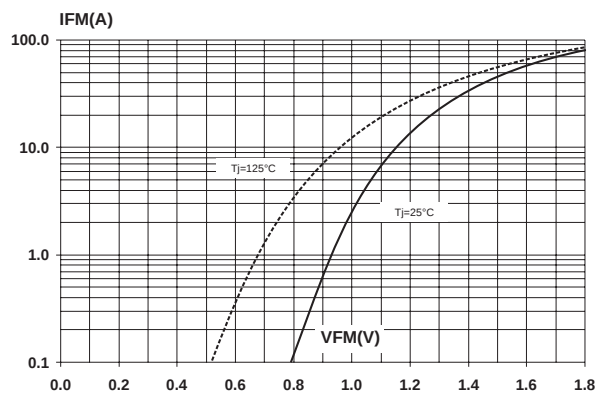


Fig.4-1 : Relative variation of thermal impedance junction to case versus pulse duration (TO-220AC, D²PAK).

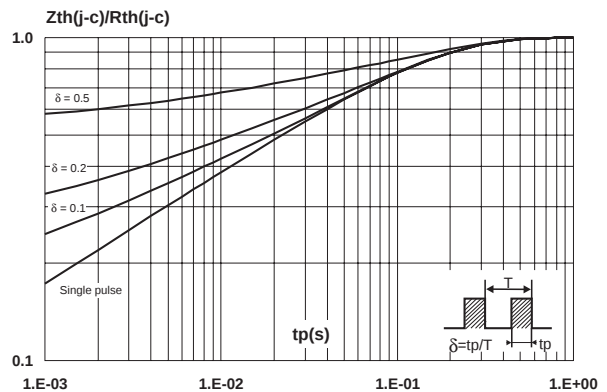


Fig.4-2 : Relative variation of thermal impedance junction to case versus pulse duration (TO-220FPAC, ISOWATT220AC).

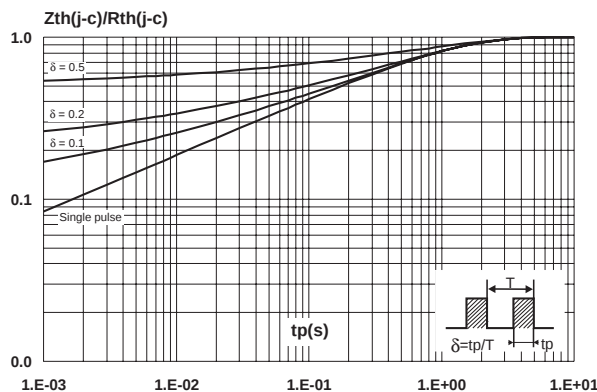


Fig.5-1 : Non repetitive surge peak forward current versus overload duration (TO-220AC, D²PAK).

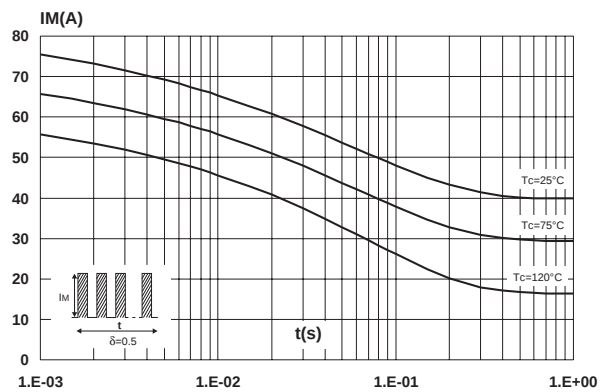


Fig.5-2 : Non repetitive surge peak forward current versus overload duration (TO-220FPAC, ISOWATT220AC).

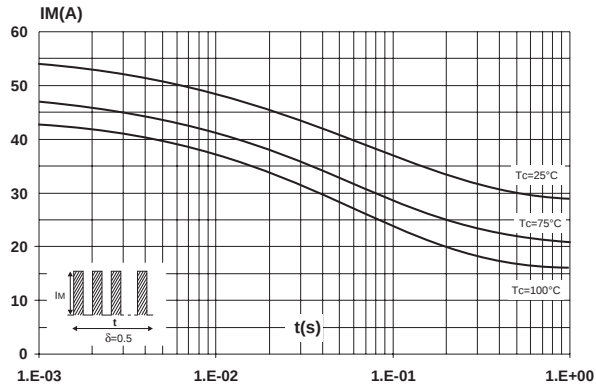


Fig.6 : Average current versus ambient temperature. ($\delta = 0.5$)

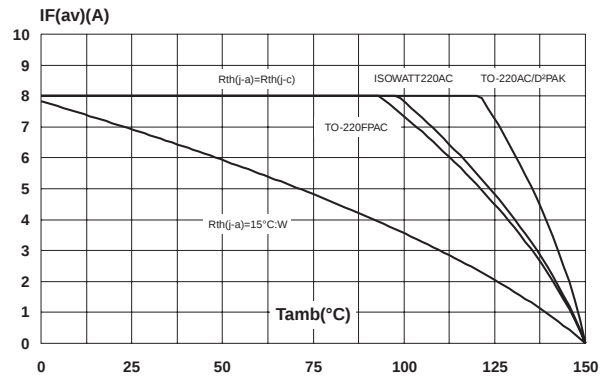


Fig.7 : Junction capacitance versus reverse voltage applied (Typical values).

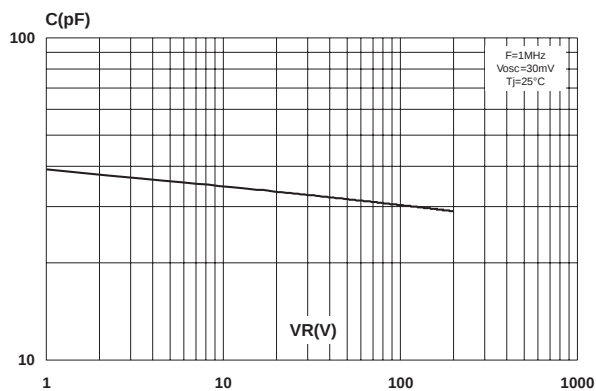


Fig.8 : Reverse recovery charges versus dI_F/dt (90% confidence).

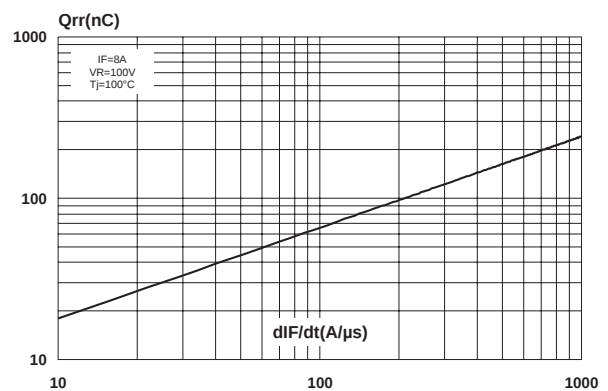


Fig.9 : Peak reverse recovery current versus dI_F/dt (90% confidence).

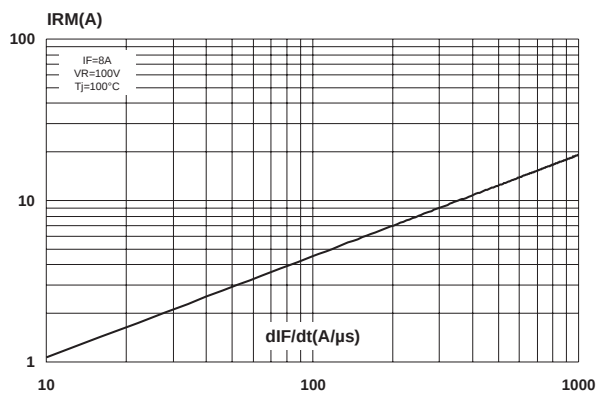


Fig.10 : Dynamic parameters versus junction temperature.

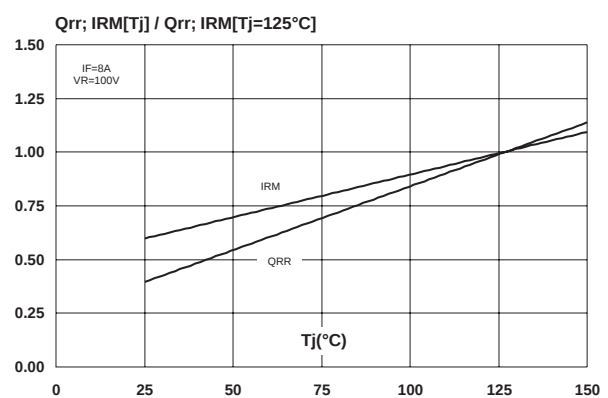
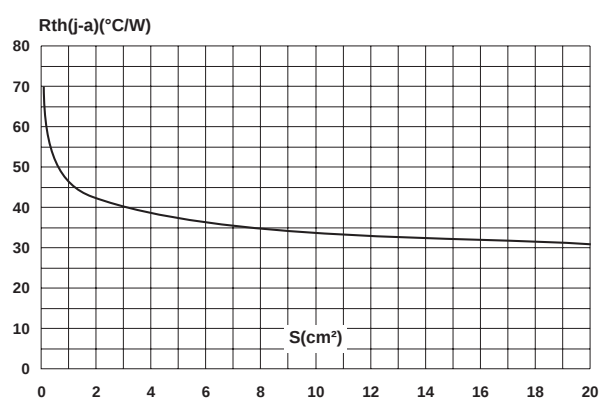


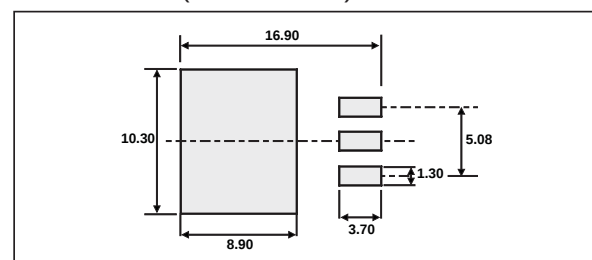
Fig.11 : Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35 μ m) for D²PAK.



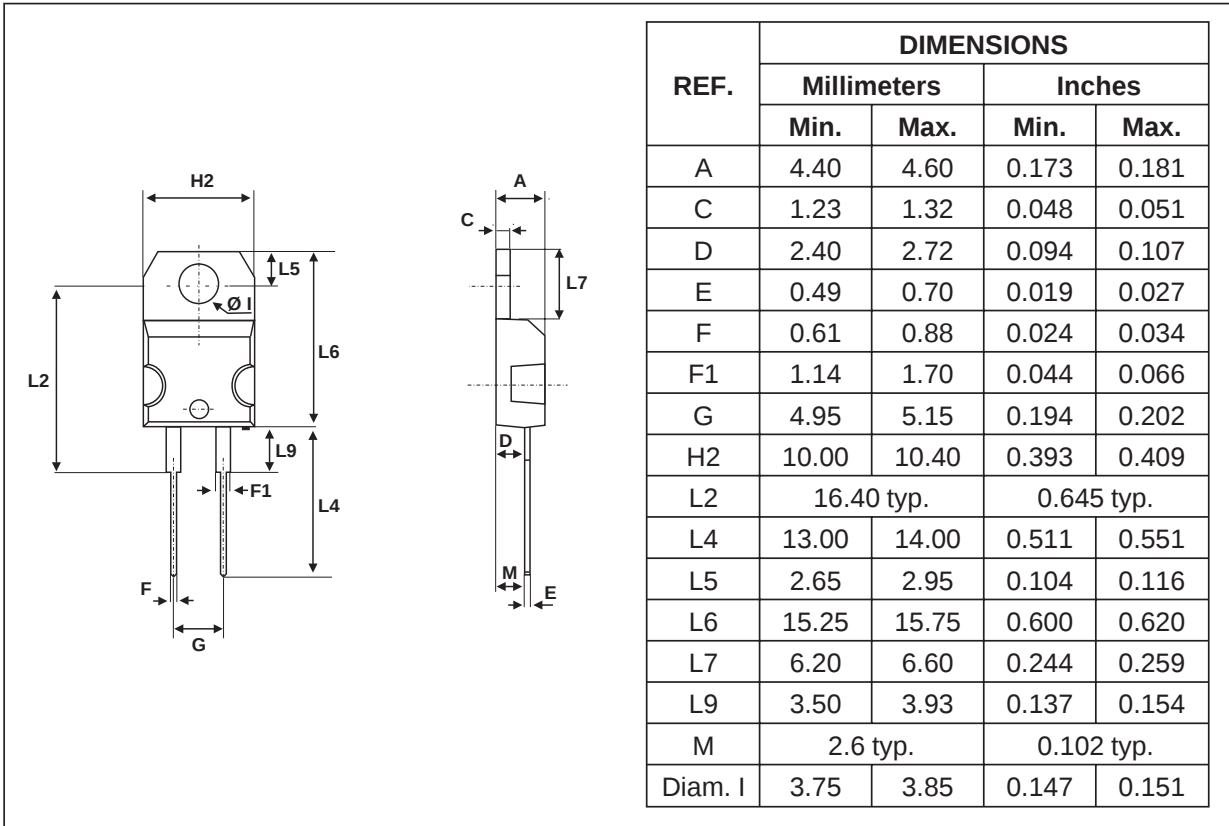
PACKAGE MECHANICAL DATA **D²PAK (Plastic)**

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
A1	2.49	2.69	0.098	0.106
A2	0.03	0.23	0.001	0.009
B	0.70	0.93	0.027	0.037
B2	1.14	1.70	0.045	0.067
C	0.45	0.60	0.017	0.024
C2	1.23	1.36	0.048	0.054
D	8.95	9.35	0.352	0.368
E	10.00	10.40	0.393	0.409
G	4.88	5.28	0.192	0.208
L	15.00	15.85	0.590	0.624
L2	1.27	1.40	0.050	0.055
L3	1.40	1.75	0.055	0.069
M	2.40	3.20	0.094	0.126
R	0.40 typ.		0.016 typ.	
V2	0°	8°	0°	8°

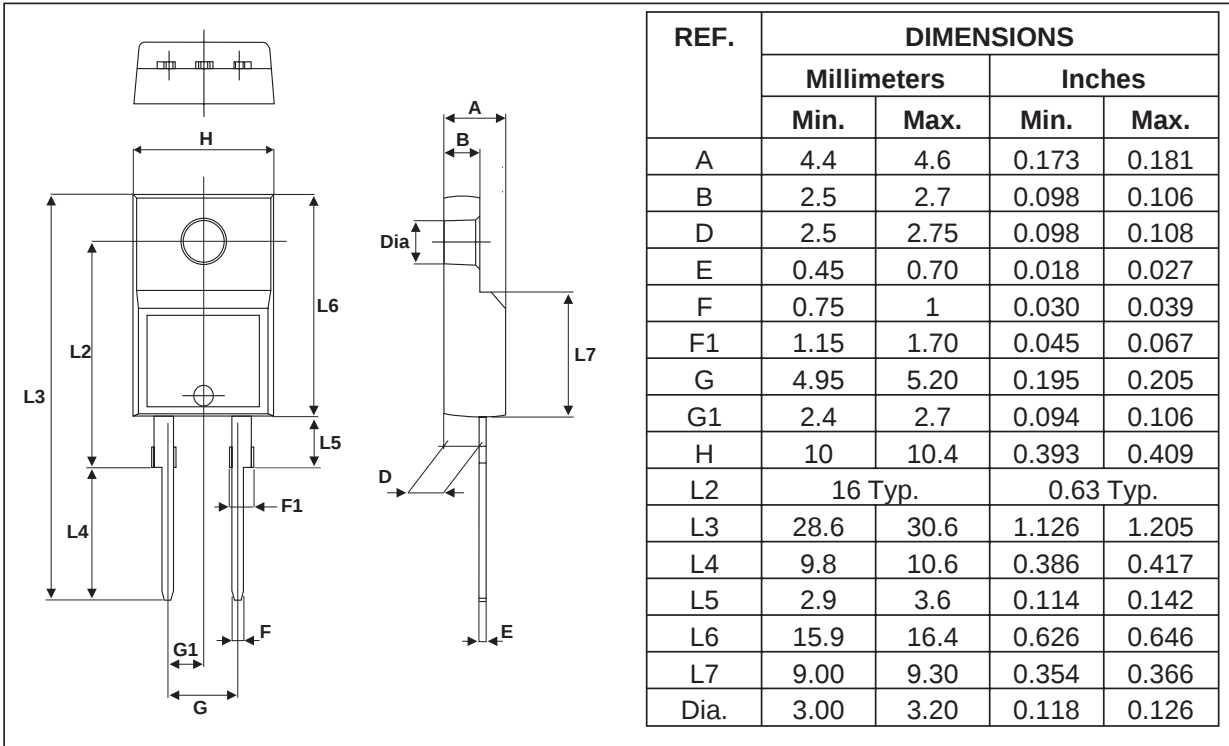
FOOT PRINT (in millimeters)

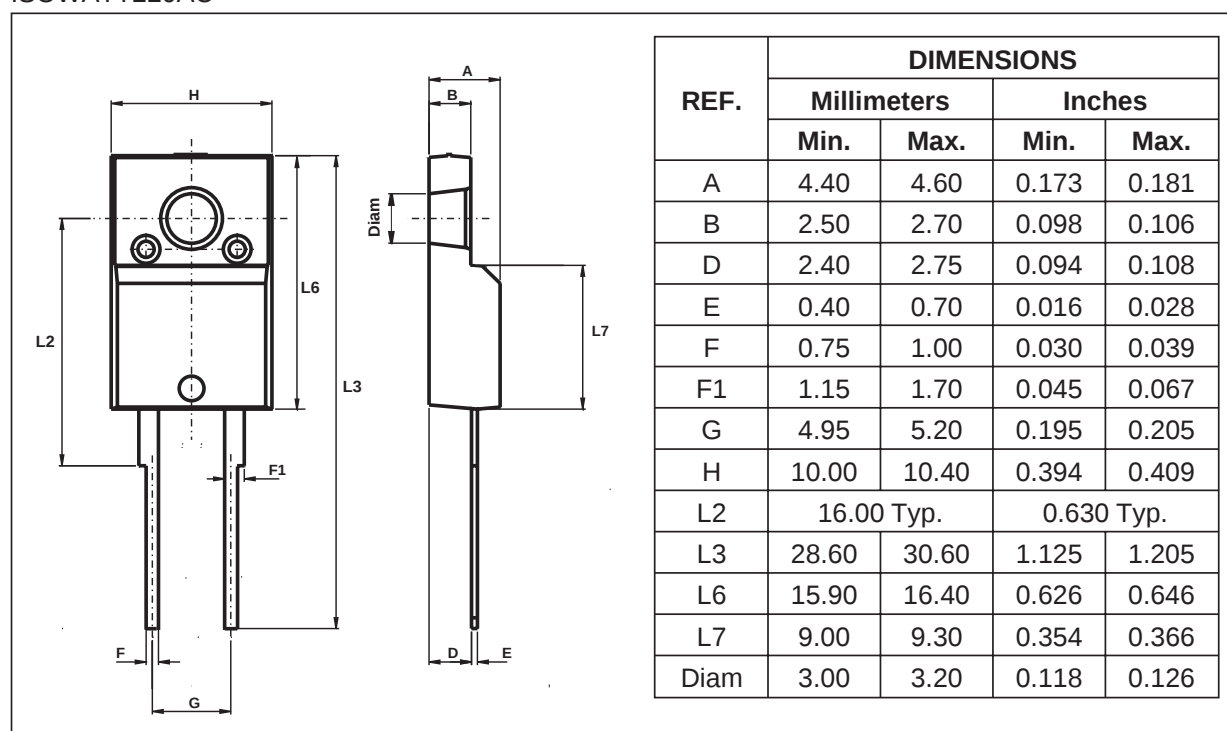


PACKAGE MECHANICAL DATA
TO-220AC



PACKAGE MECHANICAL DATA
TO-220FPAC



PACKAGE MECHANICAL DATA
ISOWATT220AC


Type	Marking	Package	Weight	Base Qty	Delivery Mode
BYW29-200	BYW29-200	TO-220AC	1.86 g	50	Tube
BYW29F-200	BYW29F-200	ISOWATT220AC	2.2 g	50	Tube
BYW29FP-200	BYW29FP-200	TO-220FPAC	2 g	50	Tube
BYW29G-200	BYW29G-200	D ² PAK	1.48 g	50	Tube

- Cooling method: by conduction (C)
- Recommended torque value (ISOWATT220AC, TO-220FPAC): 0.55 N.m
- Maximum torque value: 0.7 N.m
- Recommended torque value (TO-220AC): 0.8 N.m
- Maximum torque value: 1.0 N.m
- Epoxy meets UL94, V0

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