

## HIGH EFFICIENCY FAST RECOVERY DIODES

### MAIN PRODUCT CHARACTERISTICS

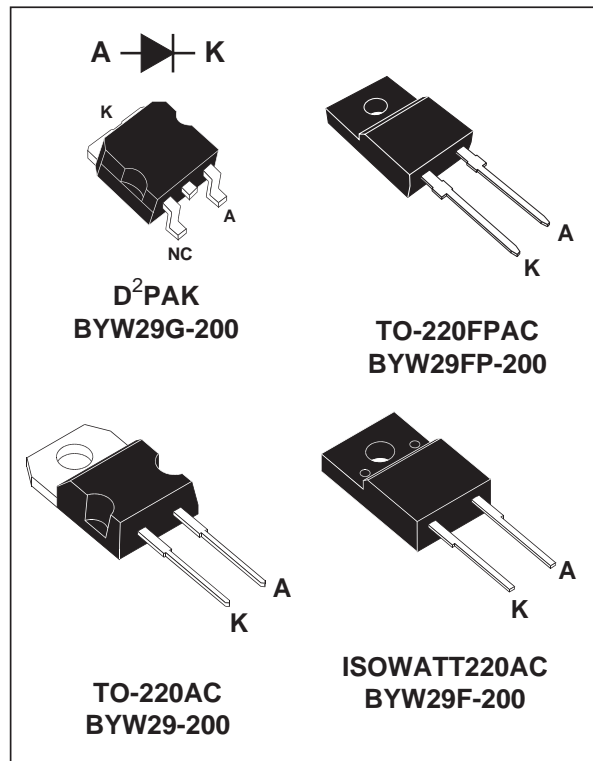
$I_{F(AV)}$	8 A
$V_{RRM}$	200 V
$t_{rr} (max)$	25 ns
$V_F (max)$	0.85 V

### 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 D<sup>2</sup>PAK, 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 <sup>2</sup> 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	°C	
$T_j$	Maximum operating junction temperature		+ 150		

**BYW29/F/FP/G-200****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 <sub>R</sub> *	Reverse leakage current	V <sub>R</sub> = V <sub>RRM</sub>	T <sub>j</sub> = 25°C			10	μA
			T <sub>j</sub> = 100°C			0.6	mA
V <sub>F</sub> **	Forward voltage drop	I <sub>F</sub> = 5 A	T <sub>j</sub> = 125°C			0.85	V
		I <sub>F</sub> = 10 A	T <sub>j</sub> = 125°C			1.05	
		I <sub>F</sub> = 10 A	T <sub>j</sub> = 25°C			1.15	

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

\*\* tp = 380 μs, duty cycle < 2 %

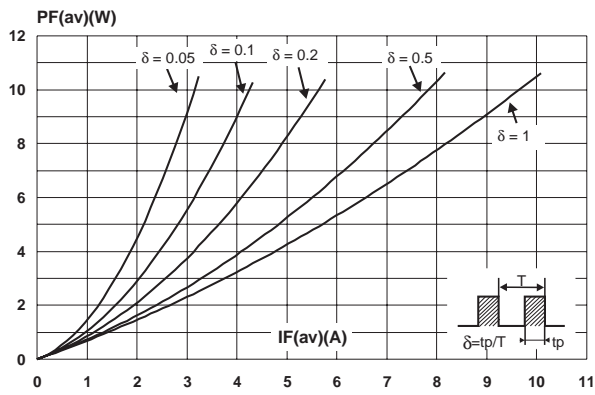
To evaluate the conduction losses use the following equation :

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

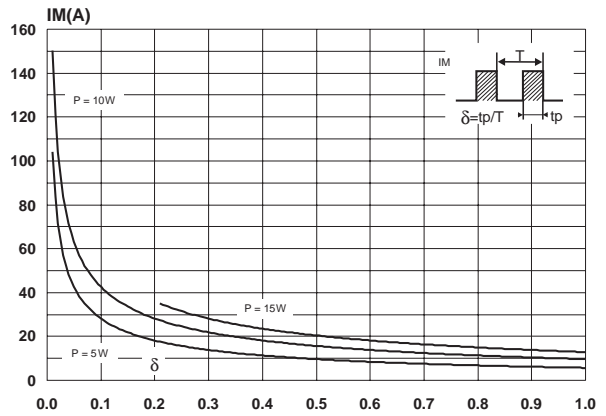
**RECOVERY CHARACTERISTICS**

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
t <sub>rr</sub>	Reverse recovery time	T <sub>j</sub> = 25°C	I <sub>F</sub> = 0.5A			25	ns
		I <sub>rr</sub> = 0.25 A	I <sub>R</sub> = 1A				
t <sub>fr</sub>	Forward recovery time	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1A		15		ns
		dI <sub>F</sub> /dt = -50A/μs	V <sub>R</sub> = 30V				
V <sub>FP</sub>	Peak forward voltage	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1A		2		V
		dI <sub>F</sub> /dt = 100A/μs					

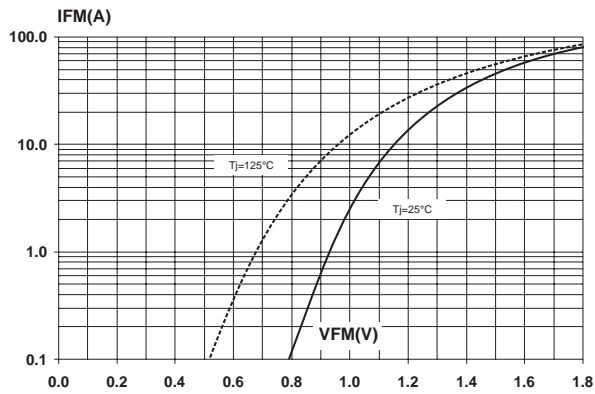
**Fig.1 :** Average forward power dissipation versus average forward current.



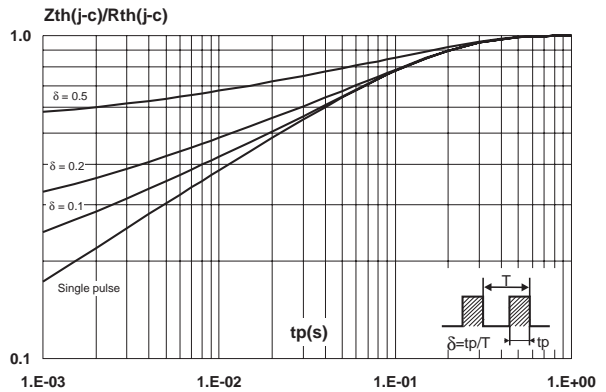
**Fig.2 :** Peak current versus form factor.



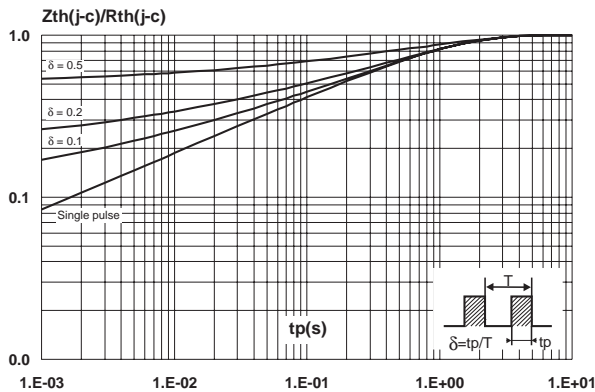
**Fig.3 :** Forward voltage drop versus forward current (maximum values).



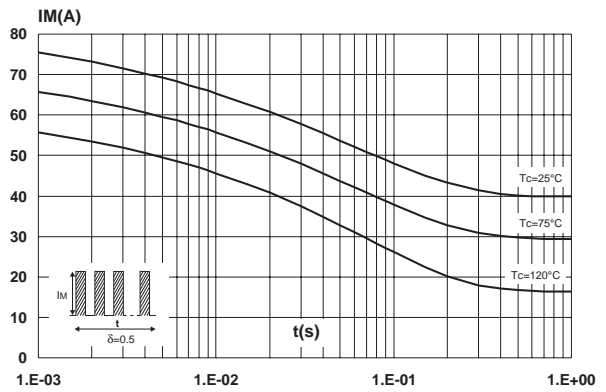
**Fig.4-1 :** Relative variation of thermal impedance junction to case versus pulse duration (TO-220AC, D<sup>2</sup>PAK).



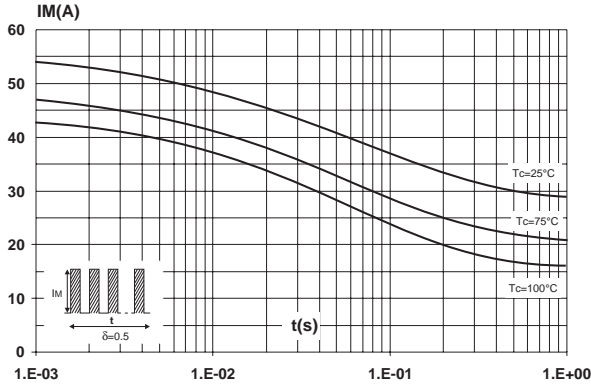
**Fig.4-2 :** Relative variation of thermal impedance junction to case versus pulse duration (TO-220FPAC, ISOWATT220AC).



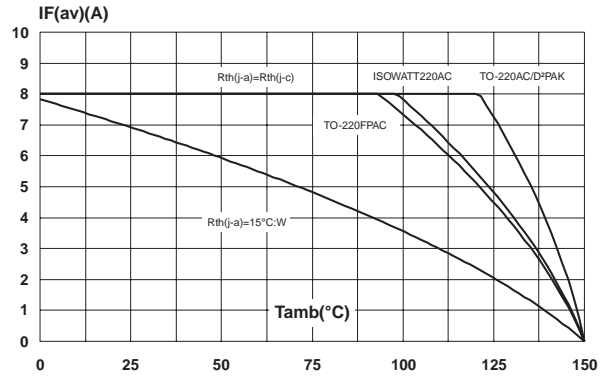
**Fig.5-1 :** Non repetitive surge peak forward current versus overload duration (TO-220AC, D<sup>2</sup>PAK).



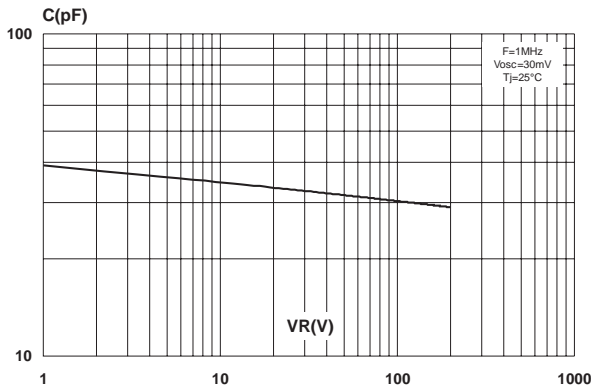
**Fig.5-2 :** Non repetitive surge peak forward current versus overload duration (TO-220FPAC, ISOWATT220AC).



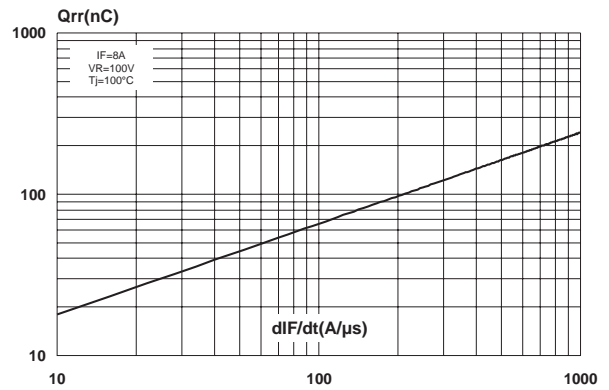
**Fig.6 :** Average current versus ambient temperature. ( $\delta = 0.5$ )



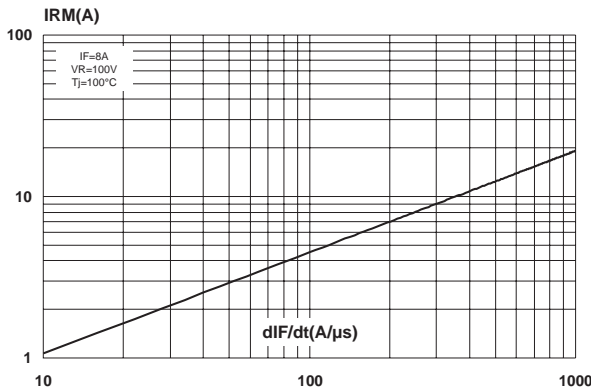
**Fig.7 :** Junction capacitance versus reverse voltage applied (Typical values).



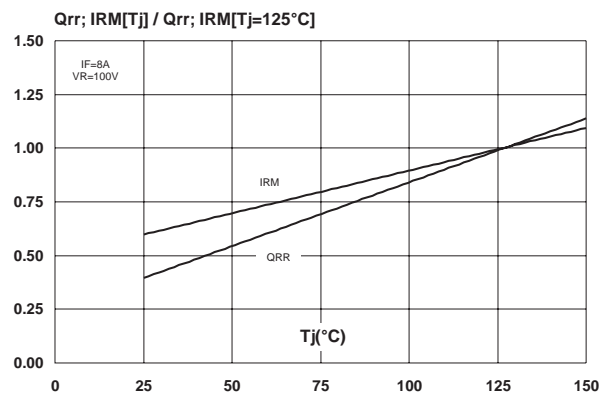
**Fig.8 :** Reverse recovery charges versus  $dI_F/dt$  (90% confidence).



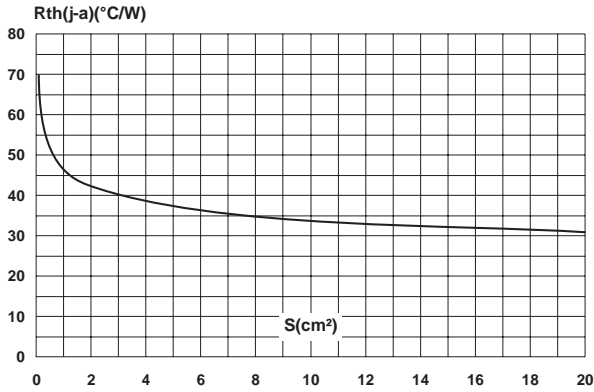
**Fig.9 :** Peak reverse recovery current versus  $dI_F/dt$  (90% confidence).



**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: 35µm) for D<sup>2</sup>PAK.

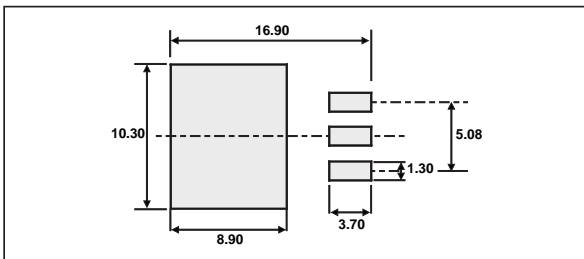


**PACKAGE MECHANICAL DATA**  
D<sup>2</sup>PAK (Plastic)

\* FLAT ZONE NO LESS THAN 2mm

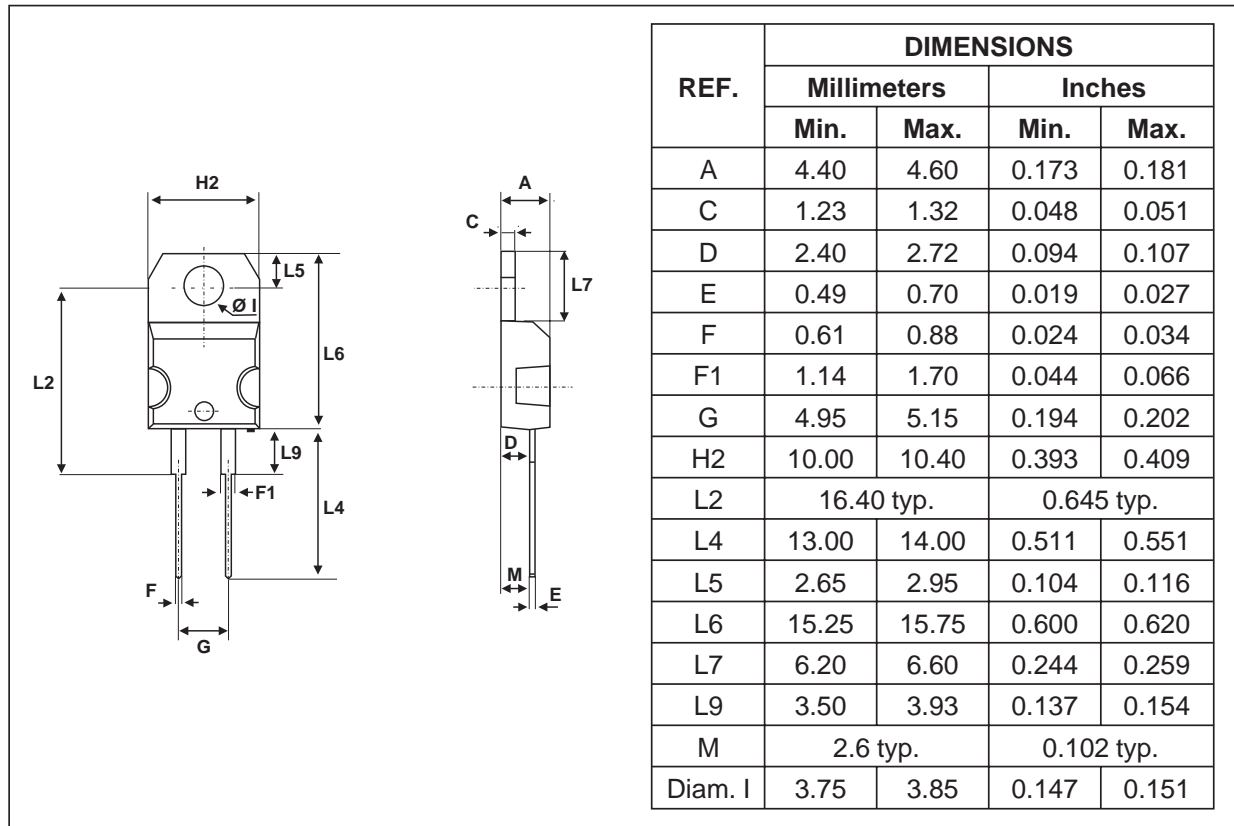
REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
A1	2.49	2.69	0.098	0.106
A2	0.03	0.23	0.001	0.009
B	0.70	0.93	0.027	0.037
B2	1.14	1.70	0.045	0.067
C	0.45	0.60	0.017	0.024
C2	1.23	1.36	0.048	0.054
D	8.95	9.35	0.352	0.368
E	10.00	10.40	0.393	0.409
G	4.88	5.28	0.192	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)**

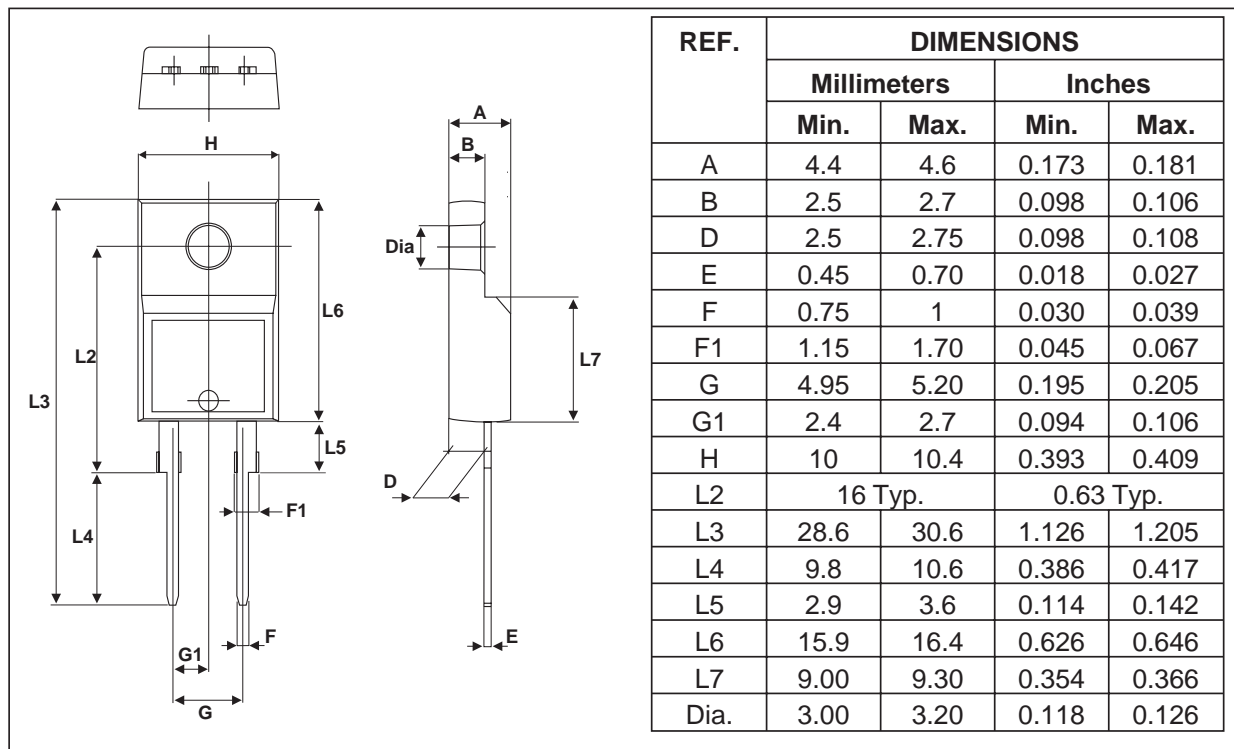


**BYW29/F/FP/G-200**

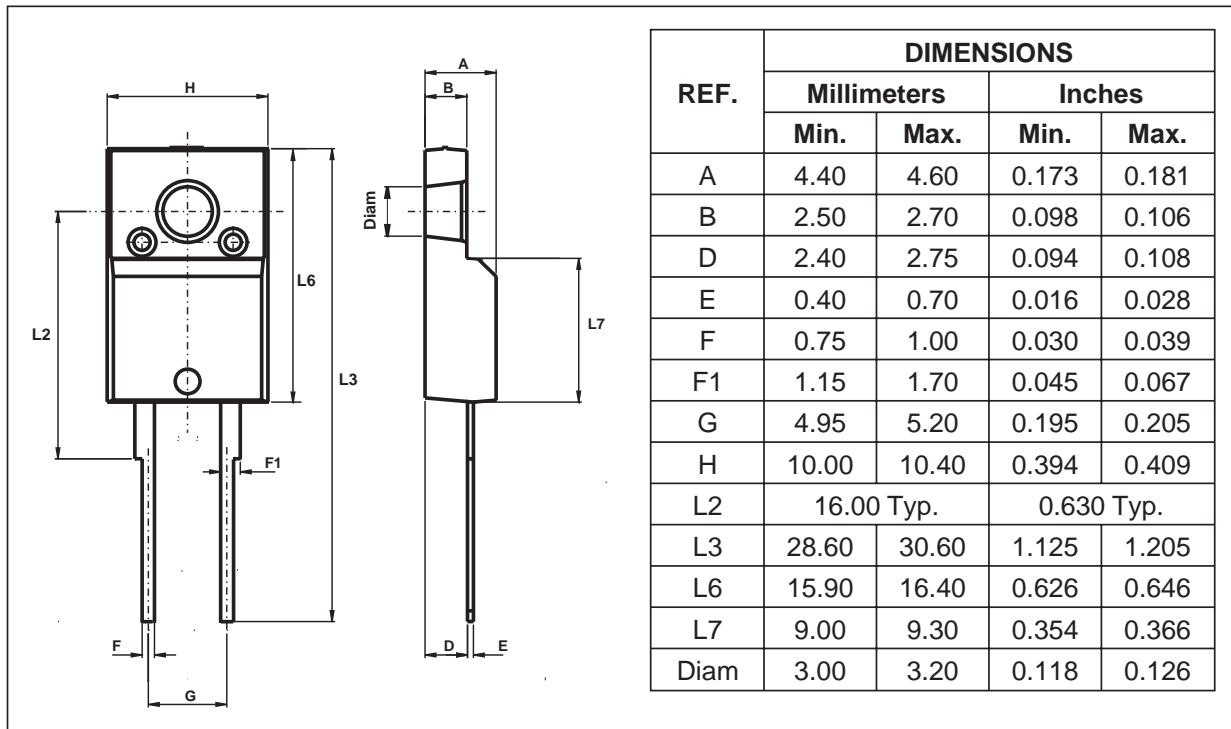
**PACKAGE MECHANICAL DATA**  
TO-220AC



**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 <sup>2</sup> 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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