BYW29/F/FP/G-200

HIGH EFFICIENCY FAST RECOVERY DIODES

MAIN PRODUCT CHARACTERISTICS

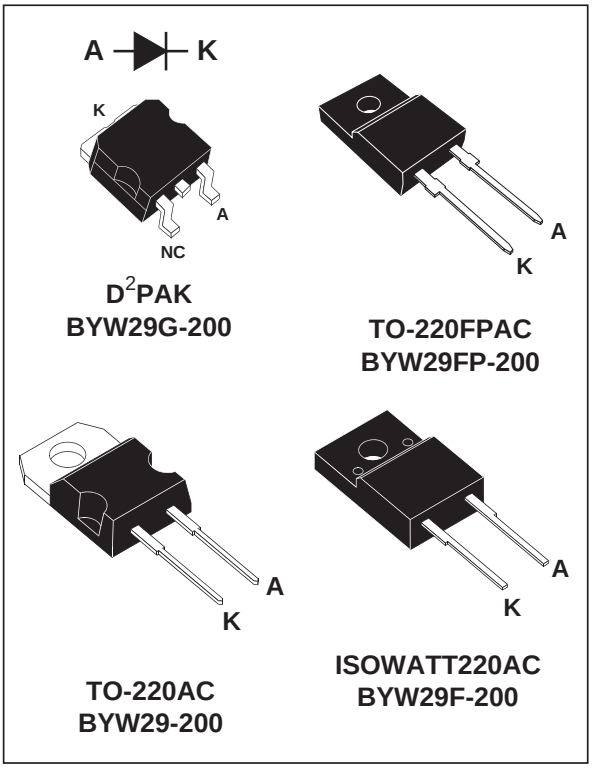
$I_{F(AV)}$	8 A
V_{RRM}	200 V
trr (max)	25 ns
V_F (max)	0.85 V

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^2PAK, this device is intended for use in high frequency inverters, free wheeling and polarity protection applications.



D^2PAK
BYW29G-200

TO-220FPAC
BYW29FP-200

TO-220AC
BYW29-200

ISOWATT220AC
BYW29F-200

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^2PAK / TO-220AC	Tc =120°C	8	A
		ISOWATT220AC TO-220FPAC	Tc = 100°C		
I_{FSM}	Surge non repetitive forward current (All pins connected)		tp=10ms sinusoidal	80	A
Tstg	Storage and junction temperature range			- 65 to + 150	°C
Tj	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_F = 0.5A Irr = 0.25 A I_R = 1A			25	ns
		T_j = 25°C I_F = 1A dI_F/dt = -50A/µs V_R = 30V			35	
t_{fr}	Forward recovery time	T_j = 25°C I_F = 1A dI_F/dt = 100A/µs V_{FR} = 1.1 x V_F max		15		ns
V_{FP}	Peak forward voltage	T_j = 25°C I_F = 1A dI_F/dt = 100A/µs		2		V

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

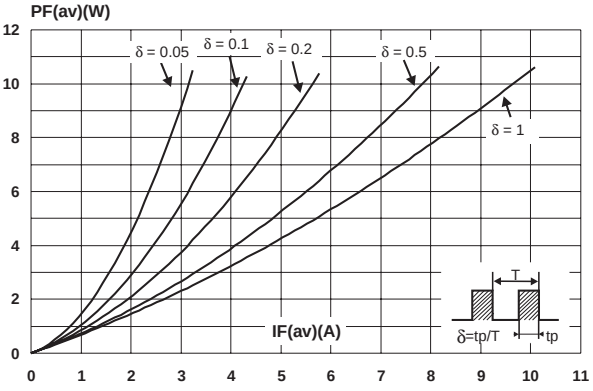


Fig.2 : Peak current versus form factor.

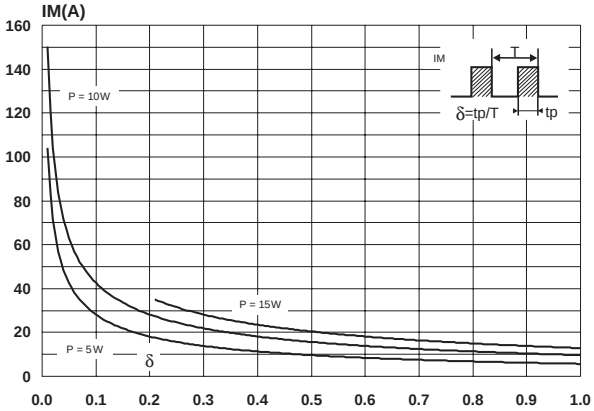


Fig.3 : Forward voltage drop versus forward current (maximum values).

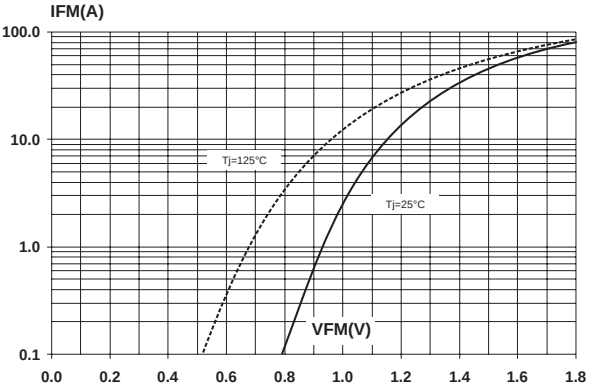


Fig.4-1 : Relative variation of thermal impedance junction to case versus pulse duration (TO-220AC, D^2PAK).

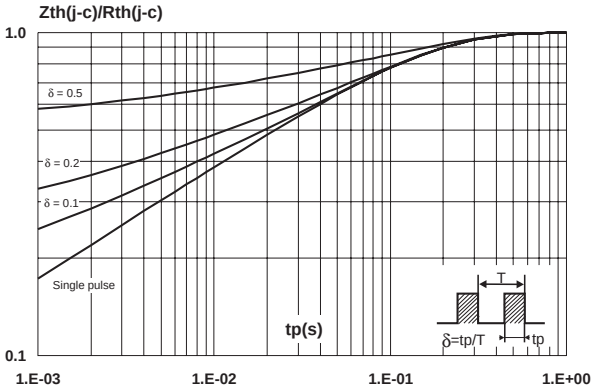


Fig.4-2 : Relative variation of thermal impedance junction to case versus pulse duration (TO-220FPAC, ISOWATT220AC).

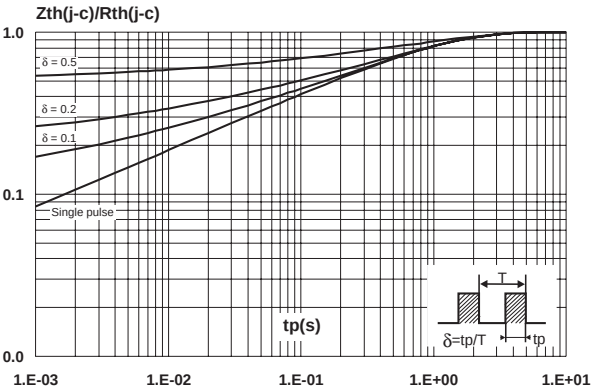


Fig.5-1 : Non repetitive surge peak forward current versus overload duration (TO-220AC, D^2PAK).

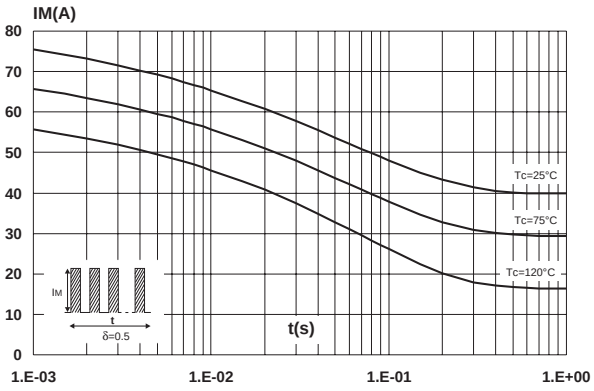


Fig.5-2 : Non repetitive surge peak forward current versus overload duration (TO-220FPAC, ISOWATT220AC).

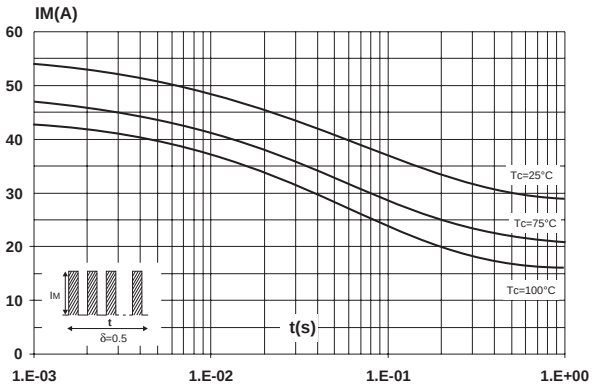


Fig.6 : Average current versus ambient temperature. ($\delta = 0.5$)

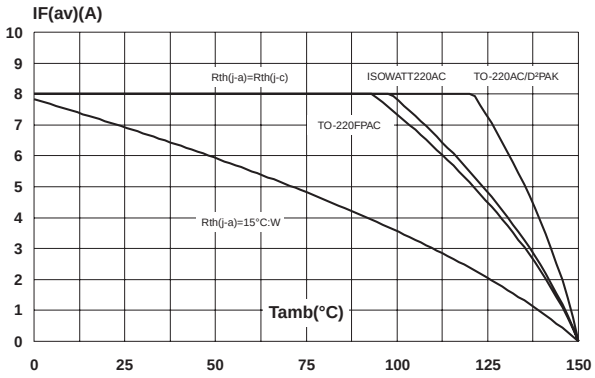


Fig.7 : Junction capacitance versus reverse voltage applied (Typical values).

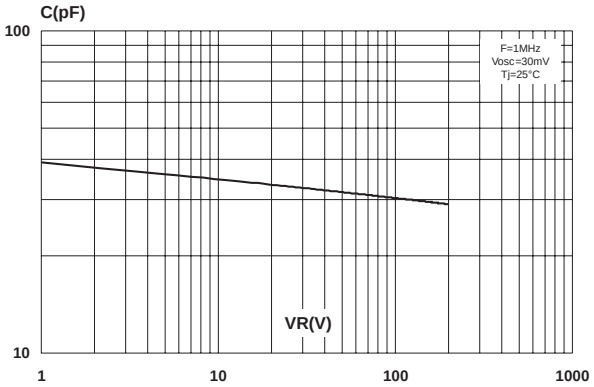


Fig.8 : Reverse recovery charges versus dI_F/dt (90%confidence).

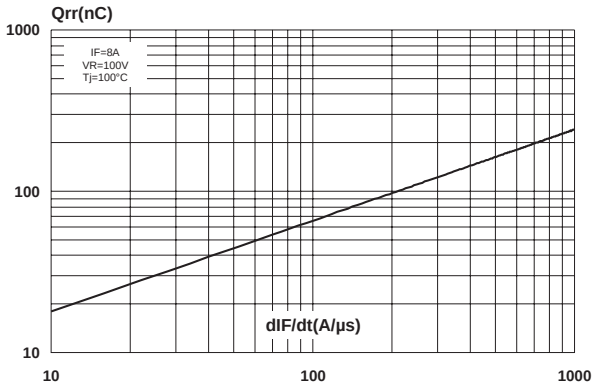


Fig.9 : Peak reverse recovery current versus dIF/dt (90% confidence).

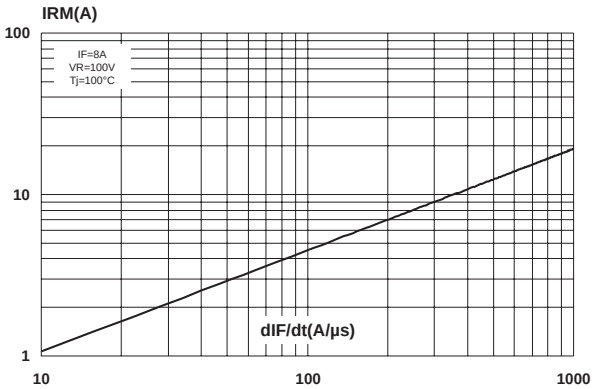


Fig.10 : Dynamic parameters versus junction temperature.

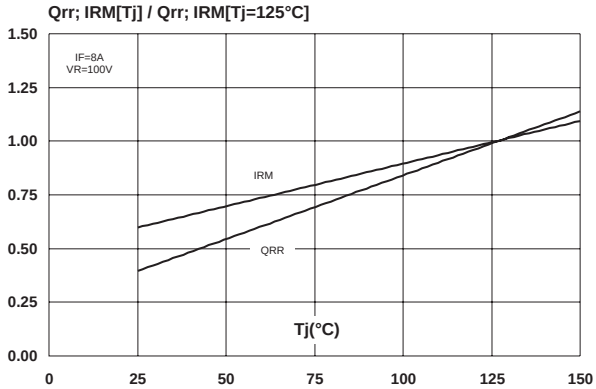
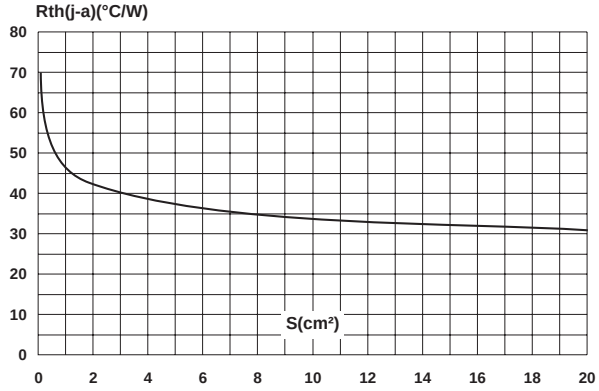
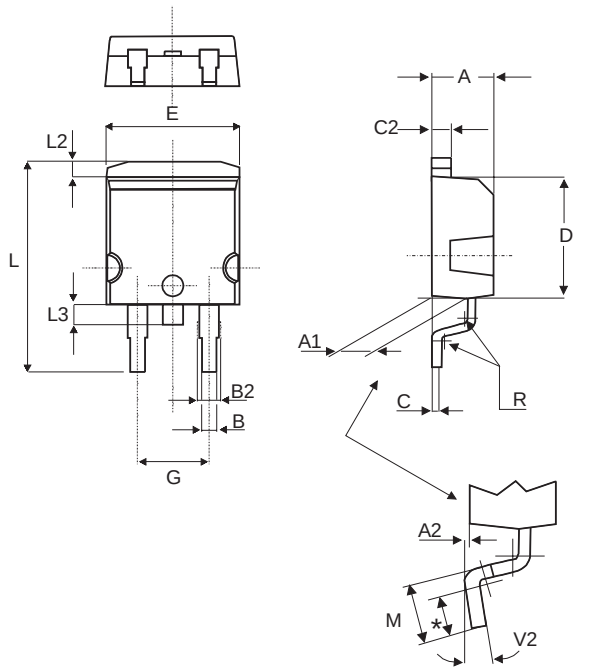


Fig.11 : Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35µm) for D^2PAK.



PACKAGE MECHANICAL DATA

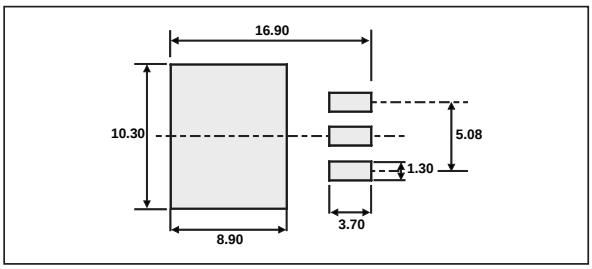
D^2PAK (Plastic)



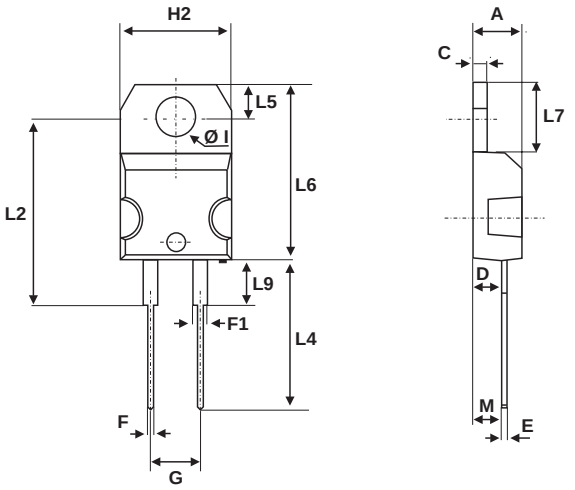
* FLAT ZONE NO LESS THAN 2mm

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)

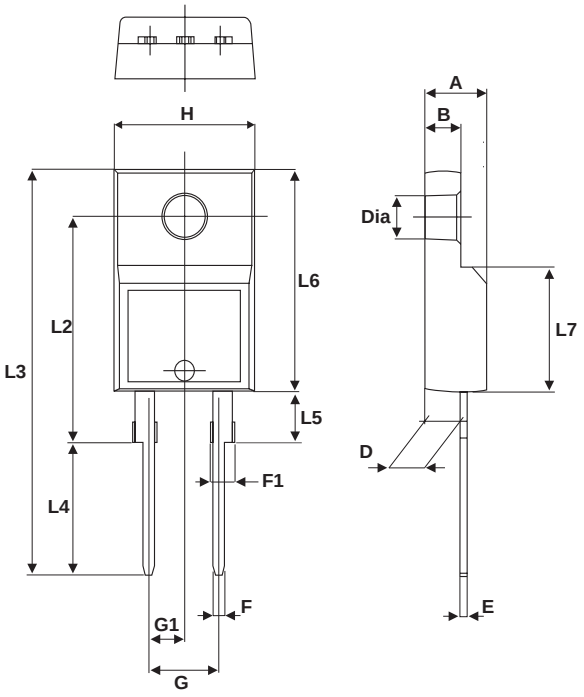


PACKAGE MECHANICAL DATA
TO-220AC



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
C	1.23	1.32	0.048	0.051
D	2.40	2.72	0.094	0.107
E	0.49	0.70	0.019	0.027
F	0.61	0.88	0.024	0.034
F1	1.14	1.70	0.044	0.066
G	4.95	5.15	0.194	0.202
H2	10.00	10.40	0.393	0.409
L2	16.40 typ.		0.645 typ.	
L4	13.00	14.00	0.511	0.551
L5	2.65	2.95	0.104	0.116
L6	15.25	15.75	0.600	0.620
L7	6.20	6.60	0.244	0.259
L9	3.50	3.93	0.137	0.154
M	2.6 typ.		0.102 typ.	
Diam. I	3.75	3.85	0.147	0.151

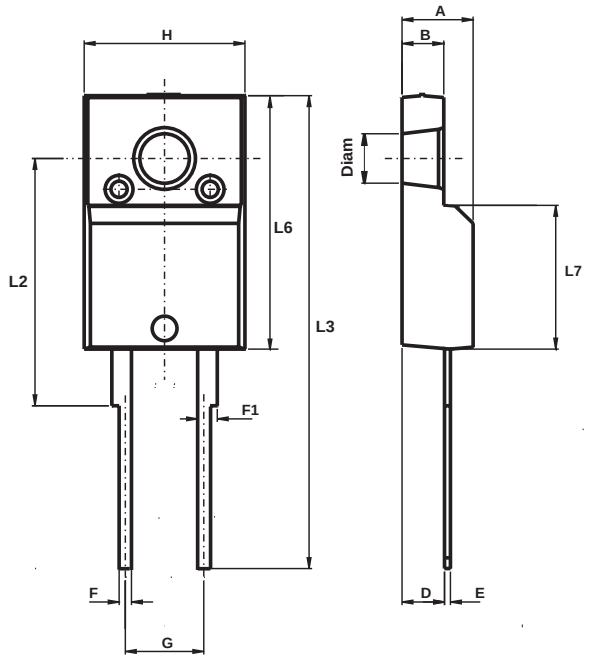
PACKAGE MECHANICAL DATA
TO-220FPAC



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.4	4.6	0.173	0.181
B	2.5	2.7	0.098	0.106
D	2.5	2.75	0.098	0.108
E	0.45	0.70	0.018	0.027
F	0.75	1	0.030	0.039
F1	1.15	1.70	0.045	0.067
G	4.95	5.20	0.195	0.205
G1	2.4	2.7	0.094	0.106
H	10	10.4	0.393	0.409
L2	16 Typ.		0.63 Typ.	
L3	28.6	30.6	1.126	1.205
L4	9.8	10.6	0.386	0.417
L5	2.9	3.6	0.114	0.142
L6	15.9	16.4	0.626	0.646
L7	9.00	9.30	0.354	0.366
Dia.	3.00	3.20	0.118	0.126

PACKAGE MECHANICAL DATA

ISOWATT220AC



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
B	2.50	2.70	0.098	0.106
D	2.40	2.75	0.094	0.108
E	0.40	0.70	0.016	0.028
F	0.75	1.00	0.030	0.039
F1	1.15	1.70	0.045	0.067
G	4.95	5.20	0.195	0.205
H	10.00	10.40	0.394	0.409
L2	16.00 Typ.		0.630 Typ.	
L3	28.60	30.60	1.125	1.205
L6	15.90	16.40	0.626	0.646
L7	9.00	9.30	0.354	0.366
Diam	3.00	3.20	0.118	0.126

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^2PAK	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