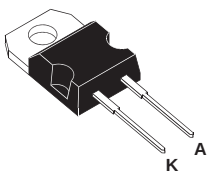
BYW80F/FP-200

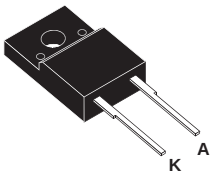
HIGH EFFICIENCY FAST RECOVERY RECTIFIER DIODES

MAIN PRODUCTS CHARACTERISTICS

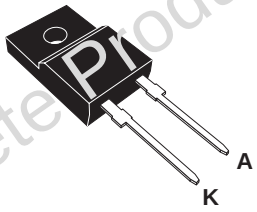
$I_{F(AV)}$	20 A
V_{RRM}	200 V
Tj (max)	150°C
V_F (max)	0.85 V
trr (max)	35 ns



TO-220AC
BYW80-200



ISOWATT220AC
BYW80F-200



TO-220FPAC
BYW80FP-200

FEATURES

- Suited for SMPS
- Very low forward losses
- Negligible switching losses
- High surge current capability
- Insulated packages:
  ISOWATT220AC / TO-220FPAC:
  Insulation voltage = 2000 V DC
  Capacitance = 12 pF

DESCRIPTION

Single chip rectifier suited for Switch Mode Power Supplies and high frequency DC to DC converters.

Packaged in TO-220AC, ISOWATT220AC and TO-220FPAC this device is intended for use in low voltage, 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			20	A
$I_{F(AV)}$	Average forward current δ = 0.5	TO-220AC	Tc=120°C	10	A
		ISOWATT220AC TO-220FPAC	Tc=95°C	10	
I_{FSM}	Surge non repetitive forward current		tp=10ms sinusoidal	100	A
Tstg	Storage and junction temperature range			- 65 to + 150	°C
Tj	Maximum operating temperature range			+ 150	°C

THERMAL RESISTANCE

Symbol	Parameter		Value	Unit
Rth (j-c)	Junction to case	TO-220AC	2.5	°C/W
		ISOWATT220AC / TO-220FPAC	4.7	

ELECTRICAL CHARACTERISTICS
STATIC CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
I_R *	T_j = 25°C	$V_R = V_{RRM}$			10	µA
	T_j = 100°C				1	mA
V_F **	T_j = 125°C	I_F = 7 A			0.85	V
	T_j = 125°C	I_F = 15 A			1.05	
	T_j = 25°C	I_F = 15 A			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 :

$P = 0.65 \times I_{F(AV)} + 0.027 \times I_{F^2(RMS)}$

RECOVERY CHARACTERISTICS

Symbol	Test Conditions			Min.	Typ.	Max.	Unit
trr	T_j = 25°C	I_F = 0.5A I_R = 1A	Irr = 0.25A			25	ns
		I_F = 1A V_R = 30V	dI_F/dt = -50A/µs			35	
tfr	T_j = 25°C	I_F = 1A $V_{FR} = 1.1 \times V_F$	tr = 10 ns		15		ns
V_{FP}	T_j = 25°C	I_F = 1A	tr = 10 ns		2		V

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

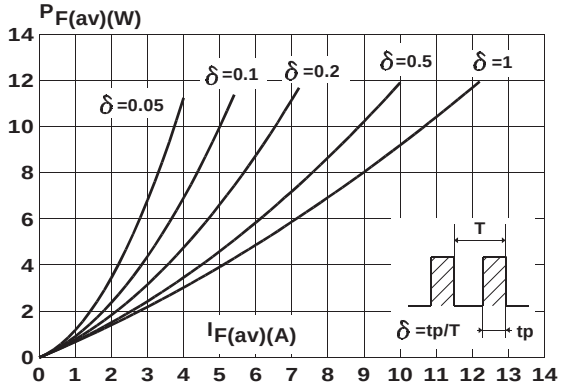


Fig. 2: Peak current versus form factor

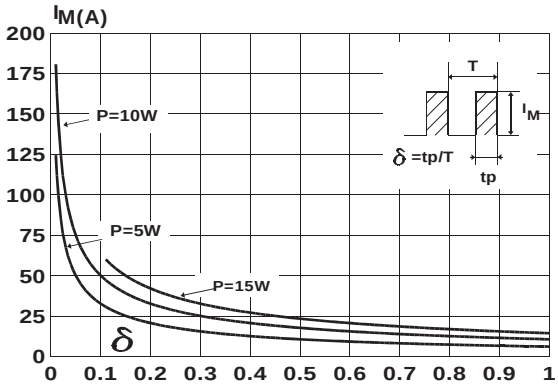


Fig. 3: Forward voltage drop versus forward current (maximum values)

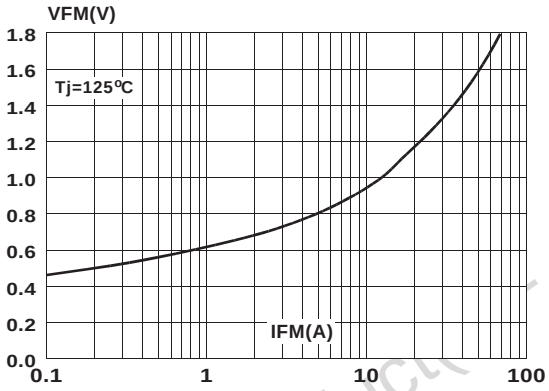


Fig. 4: Relative variation of thermal impedance junction to case versus pulse duration (TO-220AC)

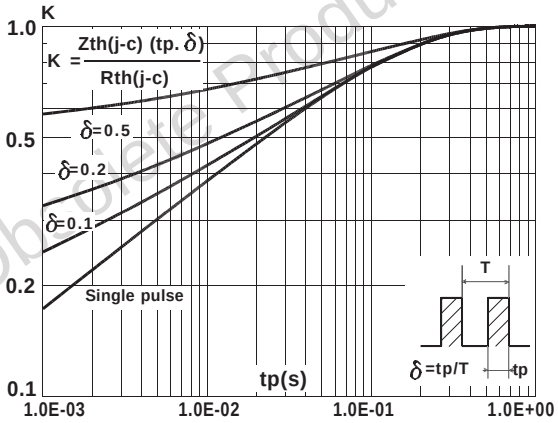


Fig. 5: Relative variation of thermal impedance junction to case versus pulse duration. (ISOWATT220AC / TO-220FPAC)

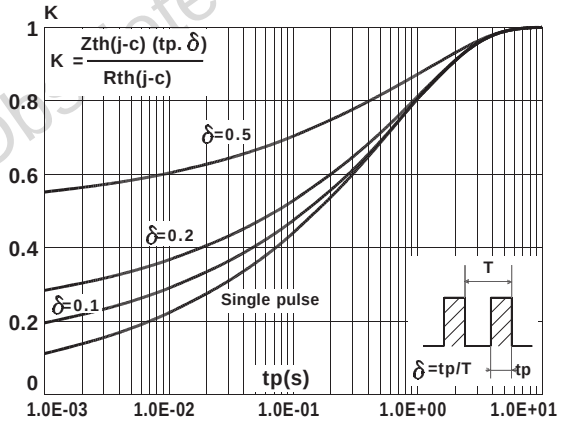


Fig. 6: Non repetitive surge peak forward current versus overload duration (TO-220AC)

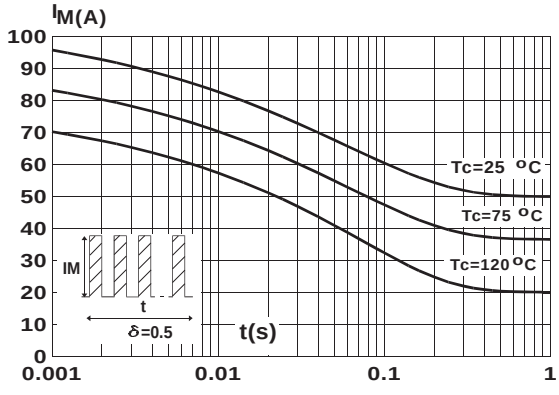


Fig. 7: Non repetitive surge peak forward current versus overload duration (ISOWATT220AC / TO-220FPAC)

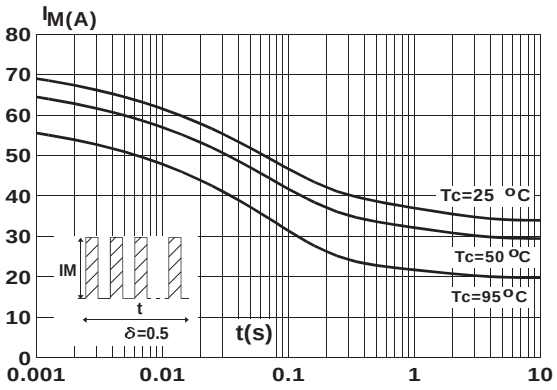


Fig. 8: Average current versus ambient temperature (duty cycle : 0.5) (TO-220AC)

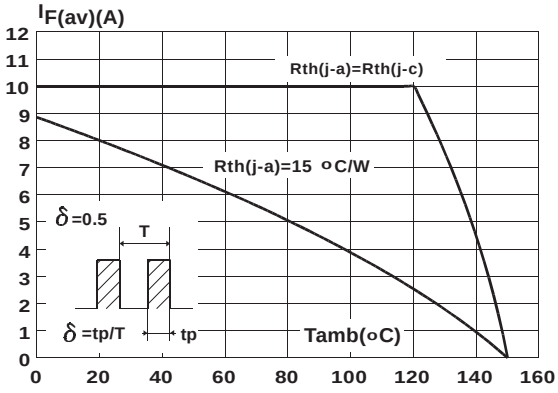


Fig. 9: Average current versus ambient temperature (duty cycle: 0.5) (ISOWATT220AC / TO-220FPAC)

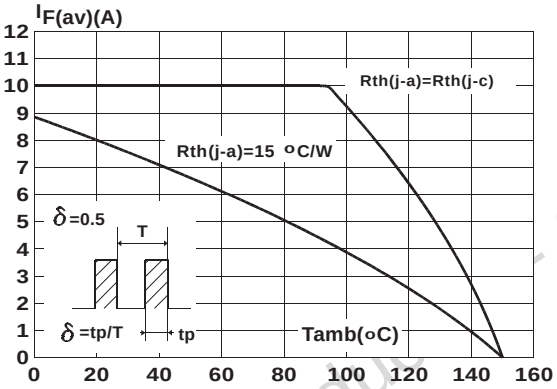


Fig. 10: Junction capacitance versus reverse voltage applied (Typical values)

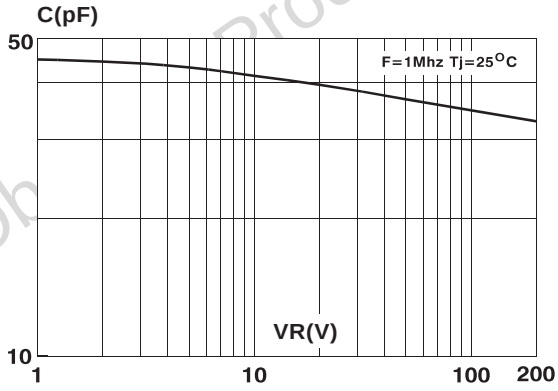


Fig. 11: Recovery charges versus dI_F/dt.

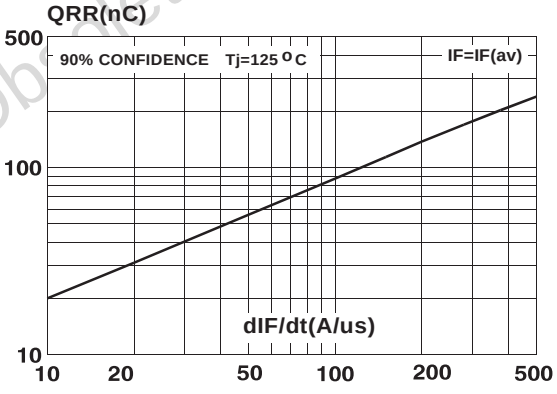


Fig. 12: Peak reverse current versus dI_F/dt.

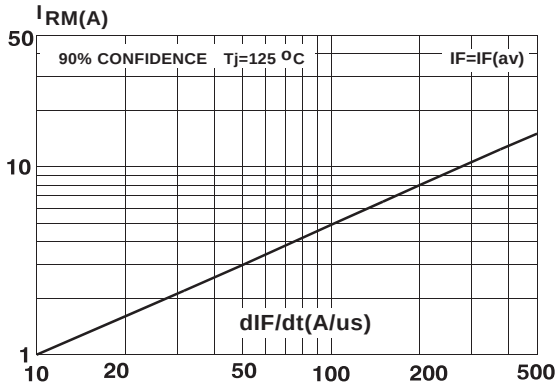
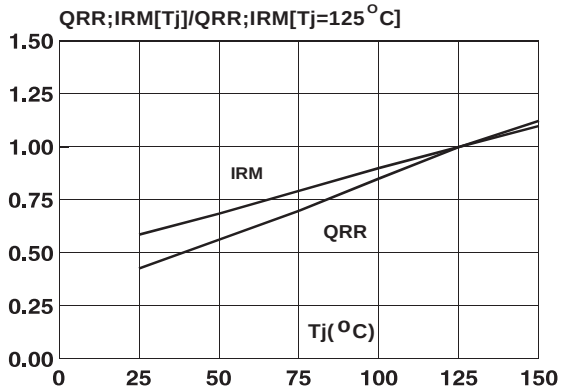
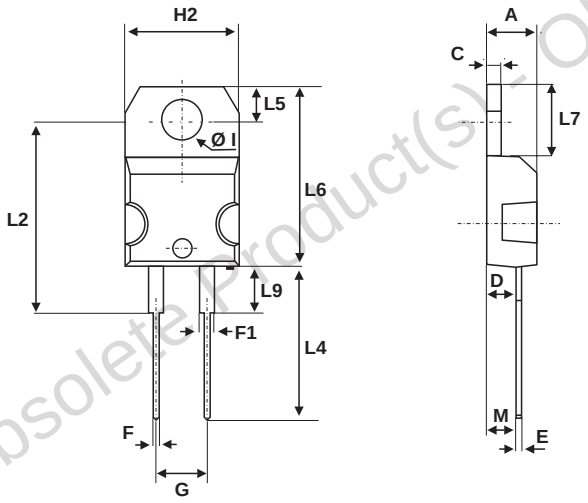


Fig. 13: Dynamic parameters versus junction temperature



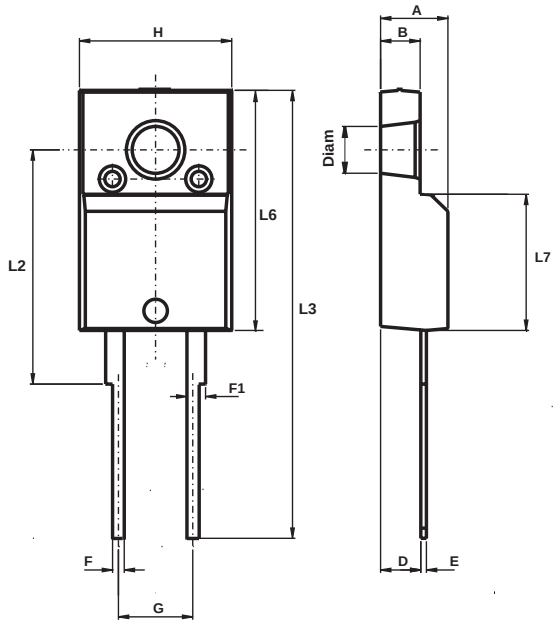
PACKAGE MECHANICAL DATA

TO-220AC (JEDEC outline)



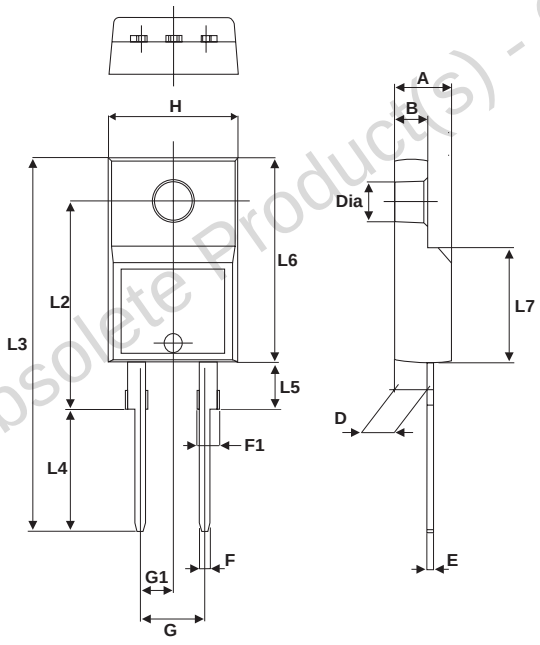
REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
C	1.23	1.32	0.048	0.051
D	2.40	2.72	0.094	0.107
E	0.49	0.70	0.019	0.027
F	0.61	0.88	0.024	0.034
F1	1.14	1.70	0.044	0.066
G	4.95	5.15	0.194	0.202
H2	10.00	10.40	0.393	0.409
L2	16.40 typ.		0.645 typ.	
L4	13.00	14.00	0.511	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
ISOWATT220AC (JEDEC outline)



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.		0.63 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

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

Type	Marking	Package	Weight	Base Qty	Delivery mode
BYW80-200	BYW80-200	TO-220AC	2.3 g	50	Tube
BYW80F-200	BYW80F-200	ISOWATT220AC	2 g	50	Tube
BYW80FP-200	BYW80FP-200	TO-220FPAC	1.8 g	50	Tube

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