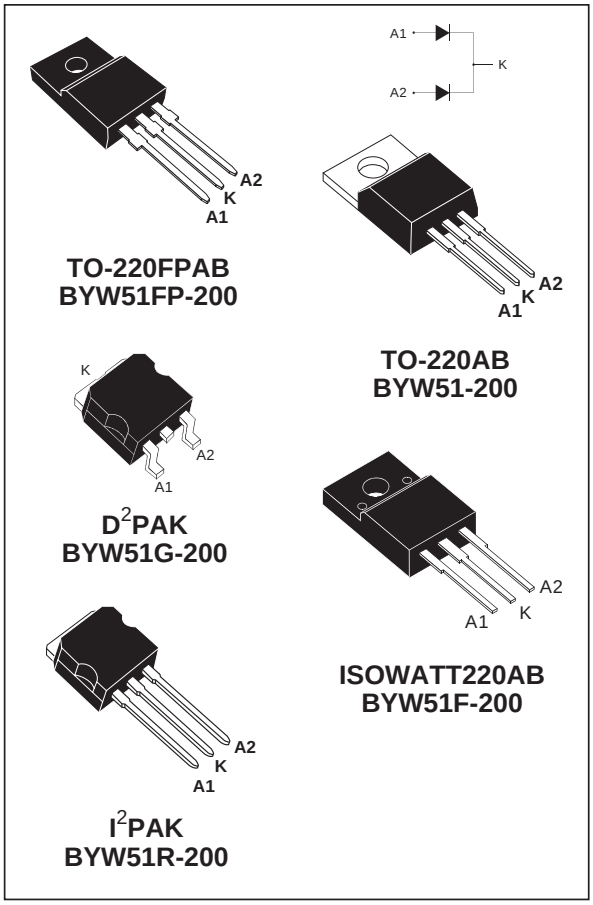
BYW51/F/G/FP/R-200

HIGH EFFICIENCY FAST RECOVERY RECTIFIER DIODES

MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	2 x 10 A
V_{RRM}	200 V
Tj (max)	150 °C
V_F (max)	0.85 V
trr (max)	25 ns



TO-220FPAB
BYW51FP-200

TO-220AB
BYW51-200

D^2PAK
BYW51G-200

ISOWATT220AB
BYW51F-200

I^2PAK
BYW51R-200

FEATURES AND BENEFITS

- SUITED FOR SMPS
- VERY LOW FORWARD LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- HIGH SURGE CURRENT CAPABILITY
- INSULATED PACKAGES (ISOWATT220AB / TO-220FP) :
  Insulation voltage = 2000 V DC
  Capacitance = 12 pF

DESCRIPTION

Dual center tap rectifier suited for Switched Mode Power Supplies and high frequency DC to DC converters.
Packaged in TO-220AB, ISOWATT220AB, TO-220FP, D^2PAK or I^2PAK, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.

ABSOLUTE RATINGS (limiting values, per diode)

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 $\delta = 0.5$	TO-220AB / D^2PAK I^2PAK	Tc=120°C	Per diode	10	A
				Per device	20	
		ISOWATT220AB	Tc=95°C	Per diode	10	
				Per device	20	
		TO-220FPAB	Tc=85°C	Per diode	10	
				Per device	20	
I_{FSM}	Surge non repetitive forward current		tp=10ms sinusoidal		100	A
Tstg	Storage temperature range				- 65 to + 150	°C
Tj	Maximum operating junction temperature				150	°C

THERMAL RESISTANCES

Symbol	Parameter			Value	Unit
$R_{th\ (j-c)}$	Junction to case	TO-220AB / D^2PAK / I^2PAK	Per diode	2.5	°C/W
			Total	1.4	
		ISOWATT220AB	Per diode	5.1	
			Total	4.05	
		TO-220FPAB	Per diode	5.7	
			Total	4.6	
$R_{th\ (c)}$	Coupling	TO-220AB / D^2PAK / I^2PAK		0.25	°C/W
		ISOWATT220AB		3.0	
		TO-220FPAB		3.5	

When diodes 1 and 2 are used simultaneously :
ΔTc (diode 1) = P(diode 1) x $R_{th(j-c)}$ (Per diode) + P(diode 2) x $R_{th(c)}$

STATIC ELECTRICAL CHARACTERISTICS (Per diode)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_R *	Reverse leakage current	T_j = 25°C	$V_R = V_{RRM}$			15	µA
		T_j = 100°C				1	mA
V_F **	Forward voltage drop	T_j = 125°C	I_F = 8 A			0.85	V
		T_j = 125°C	I_F = 16 A			1.05	
		T_j = 25°C	I_F = 16 A			1.15	

Pulse test :* tp = 5 ms, δ < 2 %
** tp = 380 µs, δ < 2 %

To evaluate the conduction losses use the following equation :
$P = 0.65 \times I_{F(AV)} + 0.025 \times I_F{}^2{}_{(RMS)}$

RECOVERY CHARACTERISTICS

Symbol	Test Conditions			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 $V_{FR} = 1.1 \times V_F$ max	dI_F/dt = -50A/µs	15		ns
V_{FP}	T_j = 25°C	I_F = 1A	dI_F/dt = -50A/µs	2		V

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

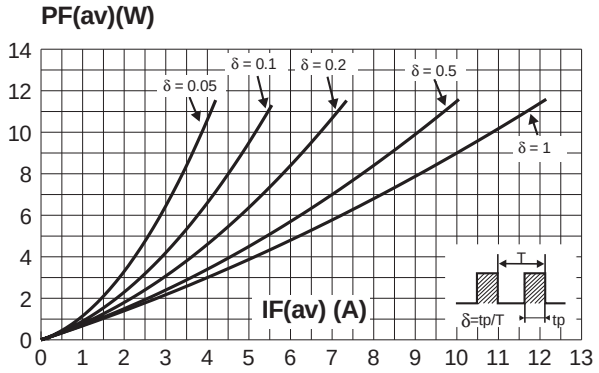


Fig. 2: Peak current versus form factor (per diode).

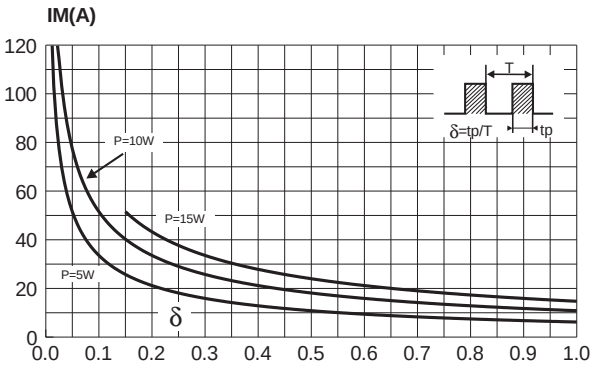


Fig. 3-1: Average forward current versus ambient temperature (δ = 0.5, D²PAK, TO-220AB).

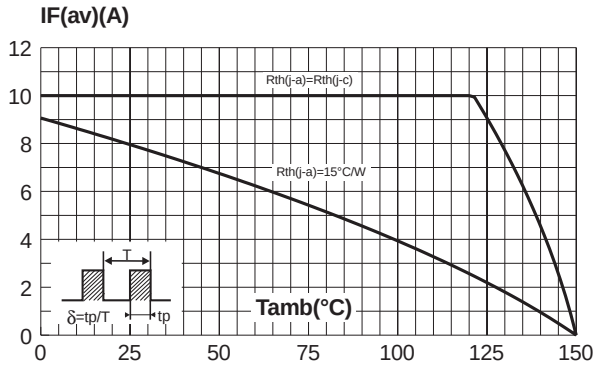


Fig. 3-2: Average forward current versus ambient temperature (δ = 0.5, ISOWATT220AB, TO-220FPAB).

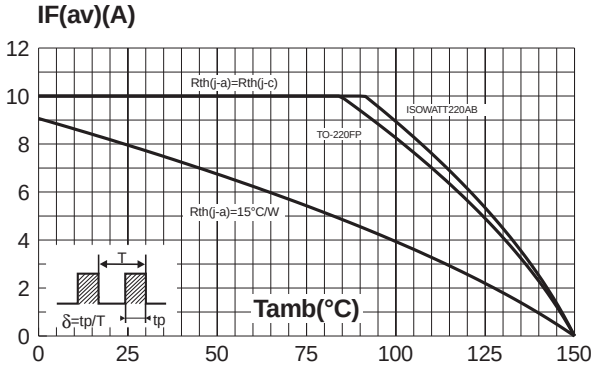


Fig. 4-1: Non repetitive surge peak forward current versus overload duration (D²PAK, TO-220AB)

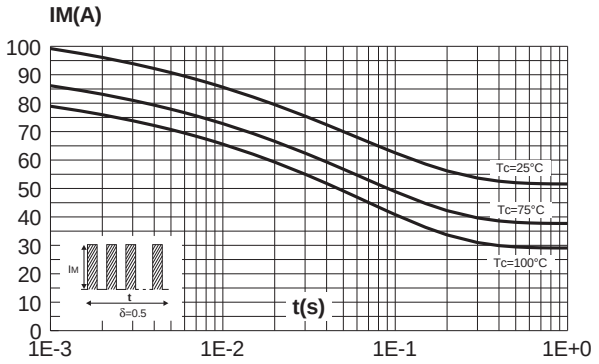


Fig. 4-2: Non repetitive surge peak forward current versus overload duration (ISOWATT220AB).

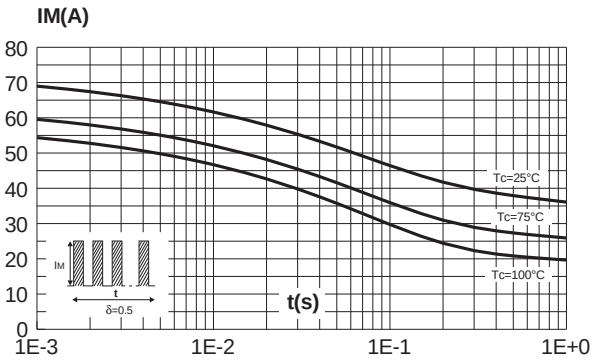


Fig. 4-3: Non repetitive surge peak forward current versus overload duration (TO-220FPAB).

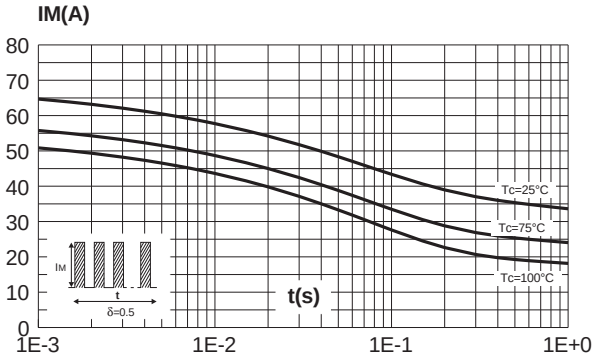


Fig. 5-1: Relative variation of thermal impedance junction to case versus pulse duration (D^2PAK, TO-220AB).

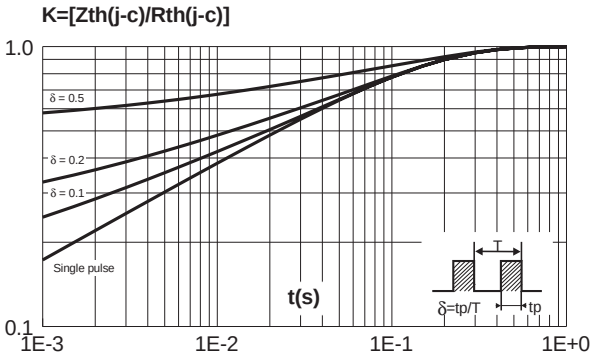


Fig. 5-2: Relative variation of thermal impedance junction to case versus pulse duration (ISOWATT220AB, TO-220FPAB).

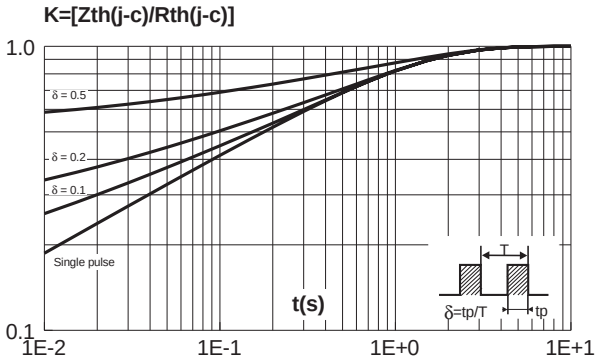


Fig. 6: Forward voltage drop versus forward current (maximum values, per diode).

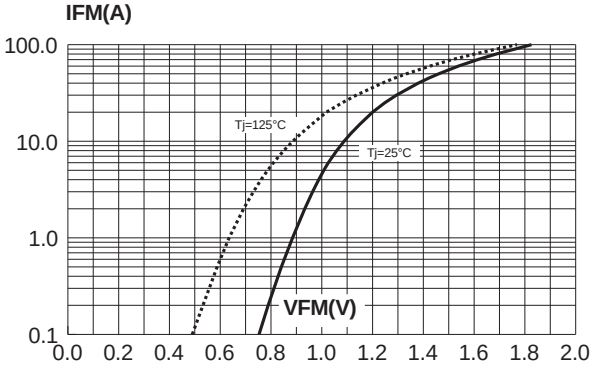


Fig. 7: Junction capacitance versus reverse voltage applied (typical values, per diode).

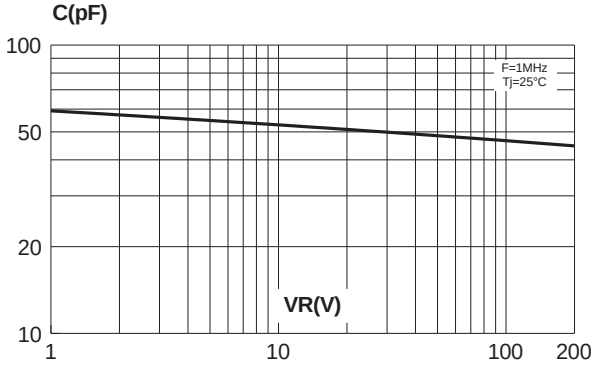
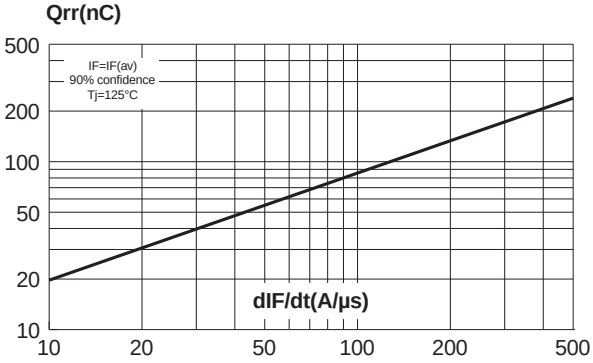


Fig. 8: Reverse recovery charges versus dI_F/dt (per diode).



Ordering code	Marking	Package	Weight	Base qty	Delivery mode
BYW51-200	BYW51-200	TO220AB	2.2 g.	50	Tube
BYW51F-200	BYW51F-200	ISOWATT220AB	2.08 g.	50	Tube
BYW51G-200	BYW51G-200	D^2PAK	1.48 g.	50	Tube
BYW51FP-200	BYW51FP-200	TO-220FPAB	2g	50	Tube
BYW51R-200	BYW51R-200	I^2PAK	1.49 g	50	Tube

- Recommended torque value (TO-220AB): 0.8 N.m.
- Maximum torque value (TO-220AB): 1.0 N.m.
- Recommended torque value (ISOWATT220AB / TO-220FPAB): 0.55 N.m.
- Maximum torque value (ISOWATT220AB / TO-220FPAB): 0.70 N.m.
- Epoxy meets UL94,V0