



## FAST RECOVERY RECTIFIER DIODES

PRELIMINARY DATASHHET

### MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	2 x 30 A
$V_{RRM}$	400 V
$T_j(max)$	150°C
$V_F(max)$	1.3 V

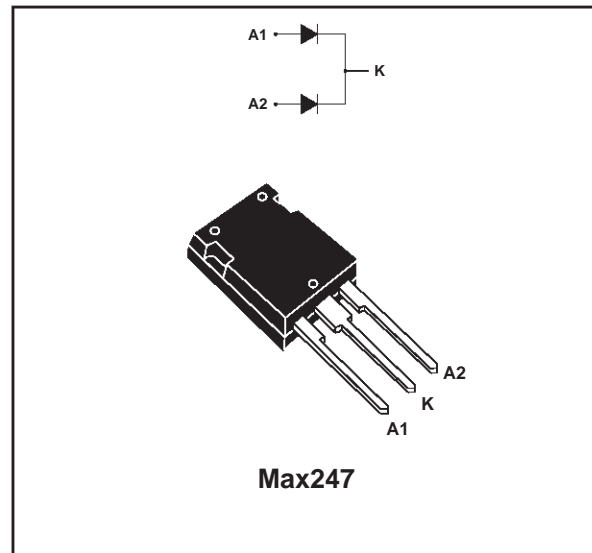
### FEATURES AND BENEFITS

- VERY LOW REVERSE RECOVERY TIME
- VERY LOW SWITCHING LOSSES
- LOW NOISE TURN-OFF SWITCHING

### DESCRIPTION

Dual 400V rectifiers suited for Switch Mode Power Supplies and other converters.

Packaged in Max247, this device is also intended for use in welding equipment and telecom power supplies.



### ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter		Value	Unit	
$V_{RRM}$	Repetitive peak reverse voltage		400	V	
$I_{FRM}$	Repetitive peak forward current	$t_p=5\mu s$ $F=5kHz$	380	A	
$I_{F(RMS)}$	RMS forward current		50	A	
$I_{F(AV)}$	Average forward current	$T_c = 105^\circ C$ $\delta = 0.5$	Per diode	30	A
			Per device	60	
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10 ms$ Sinusoidal	300	A	
$T_{stg}$	Storage temperature range		- 55 to + 150	°C	
$T_j$	Maximum operating junction temperature		150	°C	

## BYT230Y-400

### THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
R <sub>th(j-c)</sub>	Junction to case	Per diode	0.95	°C/W
		Total	0.55	
R <sub>th(c)</sub>		Coupling	0.15	°C/W

When the diodes 1 and 2 are used simultaneously:

$$\Delta T_j(\text{diode } 1) = P(\text{diode } 1) \times R_{th(j-c)}(\text{Per diode}) + P(\text{diode } 2) \times R_{th(c)}$$

### STATIC ELECTRICAL CHARACTERISTICS (per diode)

Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
I <sub>R</sub> *	Reverse leakage current	T <sub>j</sub> = 25°C	V <sub>R</sub> = V <sub>RRM</sub>			35	μA
		T <sub>j</sub> = 125°C			3	12	mA
V <sub>F</sub> **	Forward voltage drop	T <sub>j</sub> = 25°C	I <sub>F</sub> = 30 A			1.5	V
		T <sub>j</sub> = 125°C	I <sub>F</sub> = 30 A		0.9	1.3	
		T <sub>j</sub> = 25°C	I <sub>F</sub> = 60 A			1.7	
		T <sub>j</sub> = 125°C	I <sub>F</sub> = 60 A		1.1	1.6	

Pulse test : \* t<sub>p</sub> = 5 ms, δ < 2%

\*\* t<sub>p</sub> = 380 μs, δ < 2%

To evaluate the conduction losses use the following equation:

$$P = 1.0 \times I_{F(AV)} + 0.01 I_{F(RMS)}^2$$

### RECOVERY CHARACTERISTICS

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
t <sub>rr</sub>	T <sub>j</sub> = 25°C	I <sub>F</sub> = 0.5A I <sub>R</sub> = 1A I <sub>rr</sub> = 0.25A			50	ns
		I <sub>F</sub> = 1A V <sub>R</sub> = 30V dI <sub>F</sub> /dt = - 15A/μs			100	

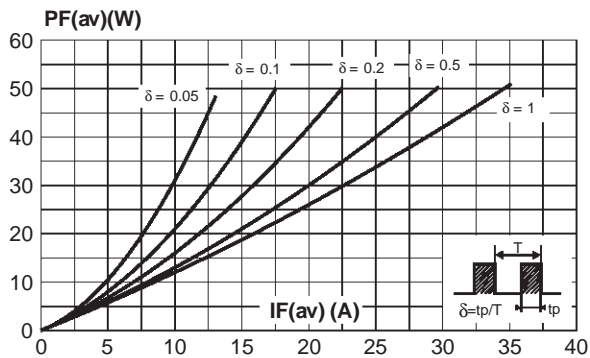
### TURN-OFF SWITCHING CHARACTERISTICS (without serie inductance)

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
t <sub>IRM</sub>	dI <sub>F</sub> /dt = - 120A/μs	V <sub>CC</sub> = 200 V I <sub>F</sub> = 30A L <sub>p</sub> = 0.05μH T <sub>j</sub> = 100°C			75	ns
	dI <sub>F</sub> /dt = - 240A/μs			50		
I <sub>RM</sub>	dI <sub>F</sub> /dt = - 120A/μs				9	A
	dI <sub>F</sub> /dt = - 240A/μs			12		

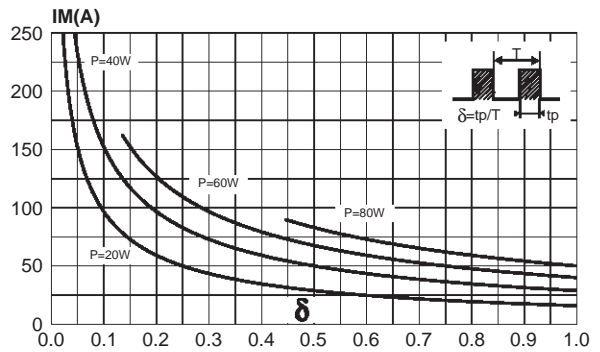
### TURN-OFF OVERVOLTAGE CORFFICIENT (with serie inductance)

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
C = $\frac{V_{RP}}{V_{CC}}$	T <sub>j</sub> = 100°C V <sub>CC</sub> = 60V I <sub>F</sub> = I <sub>F(AV)</sub> dI <sub>F</sub> /dt = - 30A/μs L <sub>p</sub> = 1μH			3.3		/

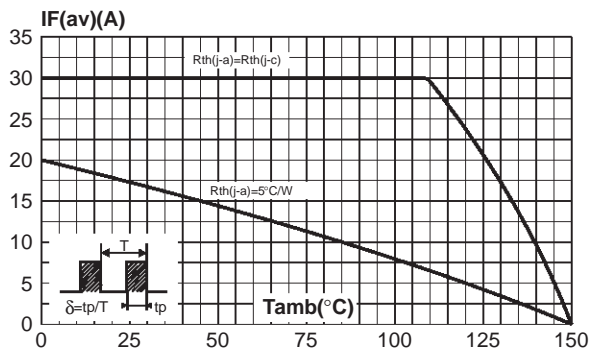
**Fig. 1:** Average forward power dissipation versus average forward current (per diode).



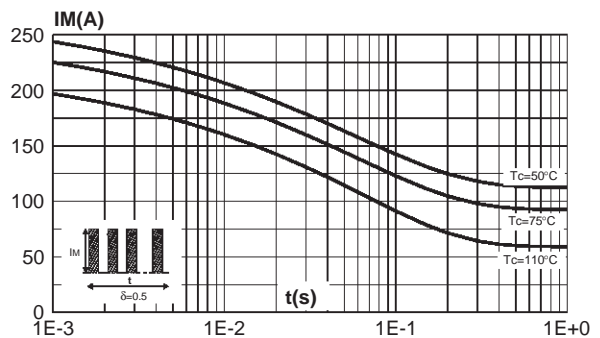
**Fig. 2:** Peak current versus form factor (per diode).



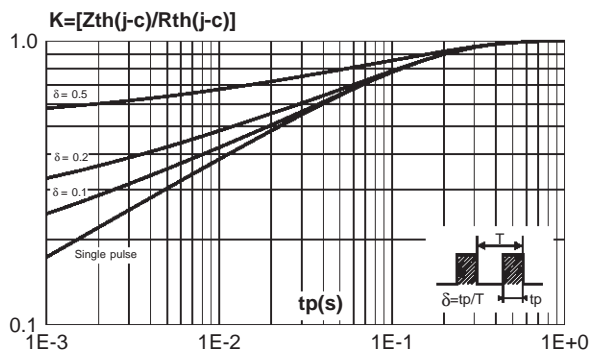
**Fig. 3:** Average forward current versus ambient temperature ( $\delta=0.5$ , per diode).



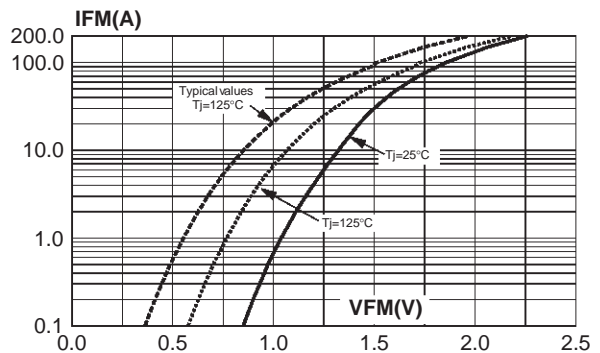
**Fig. 4:** Non repetitive surge peak forward current versus overload duration (per diode).



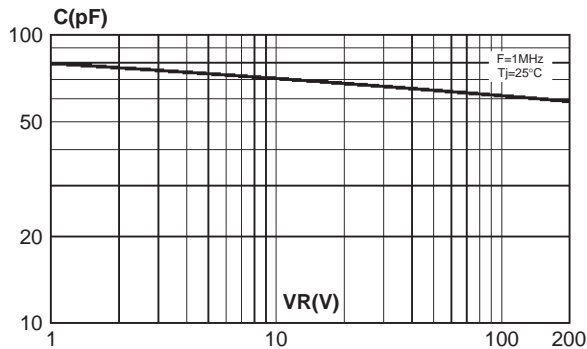
**Fig. 5:** Relative variation of thermal impedance junction to case versus pulse duration (per diode).



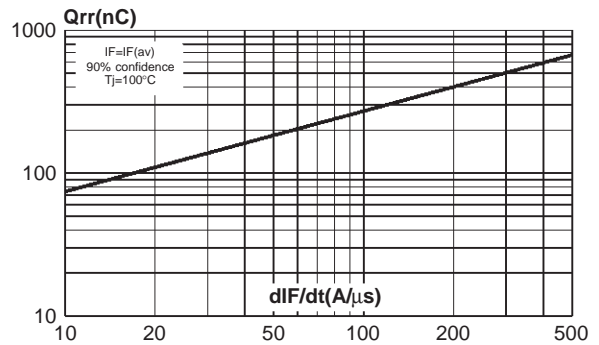
**Fig. 6:** Forward voltage drop versus forward current (maximum values, per diode).



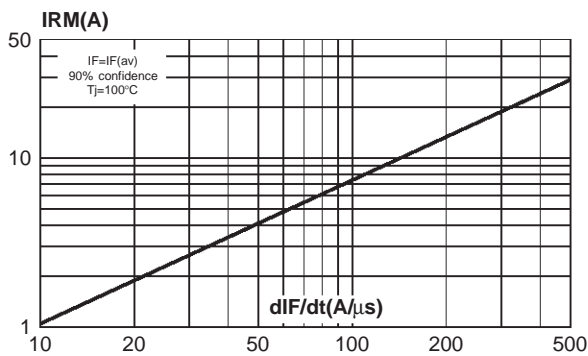
**Fig. 7:** Junction capacitance versus reverse voltage applied (typical values, per diode).



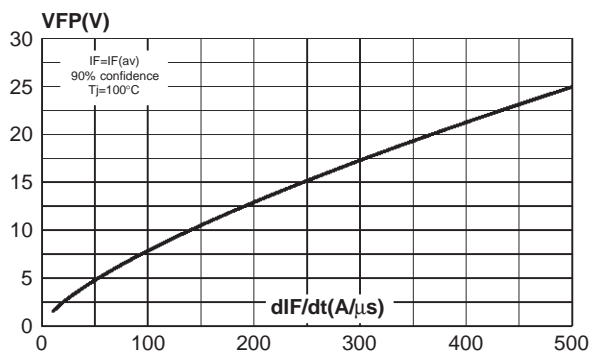
**Fig. 8:** Recovery charges versus  $dI_F/dt$  (per diode).



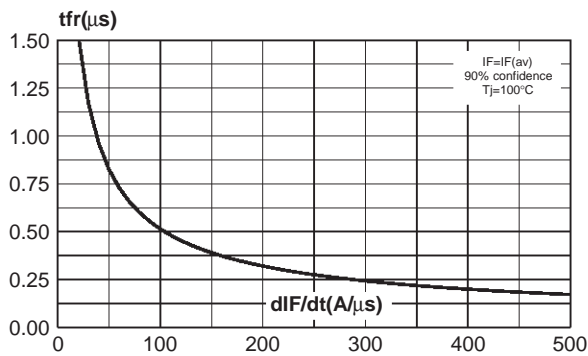
**Fig. 9:** Recovery current versus  $dI_F/dt$  (per diode).



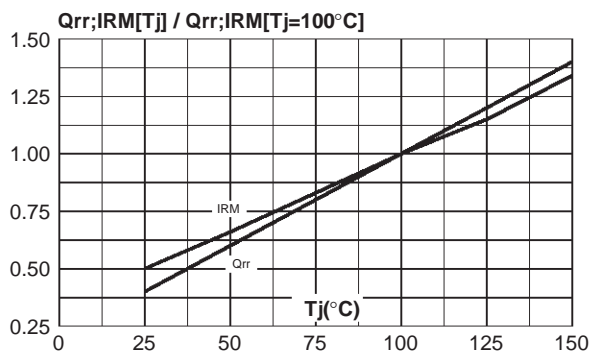
**Fig. 10:** Transient peak forward versus  $dI_F/dt$  (per diode).



**Fig. 11:** Forward recovery time versus  $dI_F/dt$  (per diode).

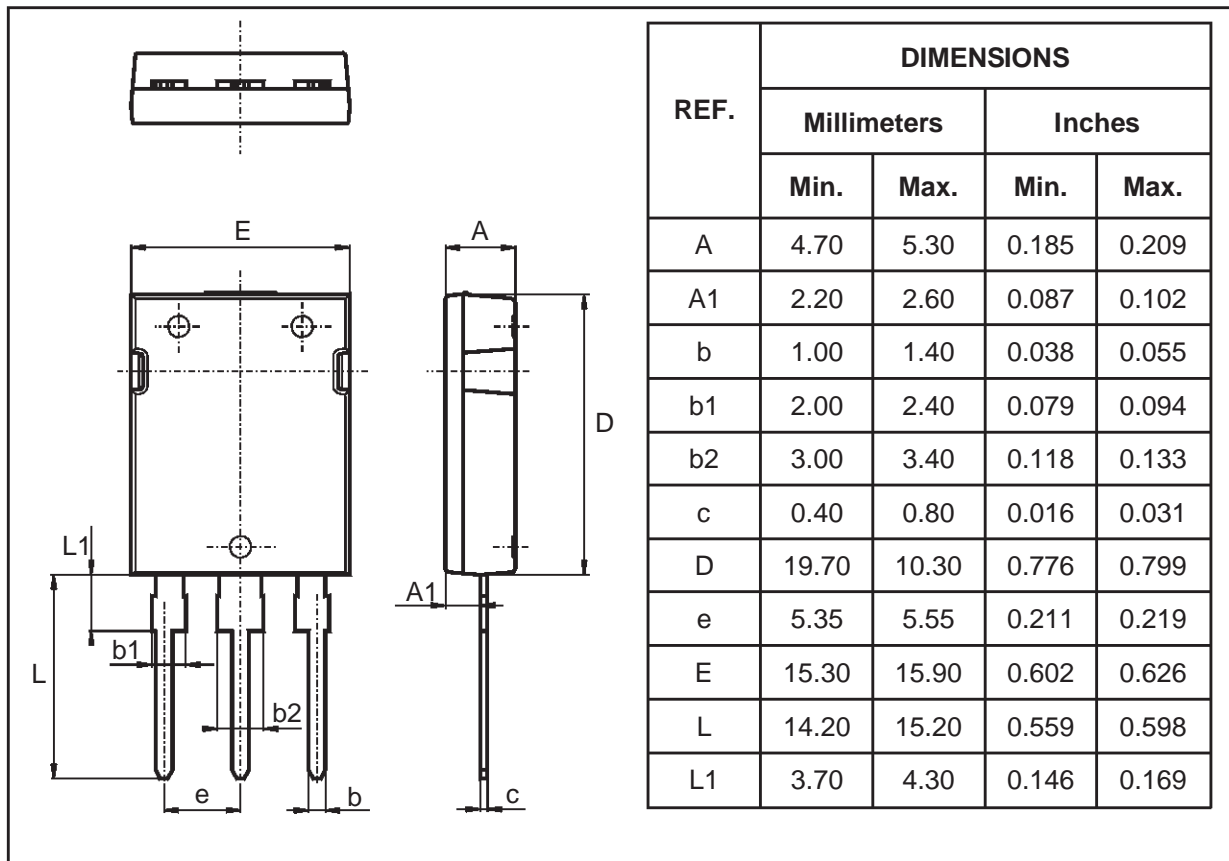


**Fig. 12:** Dynamic parameters versus junction temperature.



## PACKAGE MECHANICAL DATA

Max247



Ordering type	Marking	Package	Weight	Base qty	Delivery mode
BYT230Y-400	BYT230Y-400	Max247	5 g.	30	Tube

■ Epoxy meets UL94,V0

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