Ultrafast Power Rectifiers

BYT230PIV-1000M

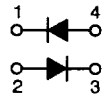
Dual high voltage rectifiers suited for Switchmode Power Supplies and other power converters.

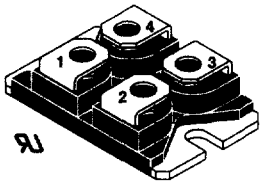
- Very Low Reverse Recovery Time
- Very Low Switching Losses
- Low Noise Turn–Off Switching
- Insulated Package:
  Insulating voltage = 2500 V_{RMS}
  Capacitance = 45 pF
- UL — UL Recognized, File #E69369

ULTRAFAST RECTIFIERS 60 AMPS 1000 VOLTS

Mechanical Characteristics

- Case: Molded epoxy with isolated metal base
- Weight: 28 g (approximately)
- Finish: All External Surfaces Corrosion Resistant
- Shipped 10 units per plastic tube
- Marking: BYT230PIV–1000M





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MAXIMUM RATINGS

Rating		Symbol	Max	Unit
Peak Repetitive Reverse Voltage		V_{RRM}	1000	V
Average Rectified Current T_C = 55°C	Per Device Per Diode	$I_{F(AV)}$	60 30	A
Peak Repetitive Forward Current, Per Diode t_p < 10 µs		I_{FRM}	375	A
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)		I_{FSM}	200	A
Operating Junction Temperature		T_J	−40 to +150	°C
Storage Temperature		T_{stg}	−40 to +150	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction to Case Coupling	Per Diode Per Device	$R_{\theta JC}$ $R_{\theta JC}$ $R_{\theta C}$	1.5 0.8 0.1	°C/W

ELECTRICAL CHARACTERISTICS PER DIODE

Instantaneous Forward Voltage (1) I_F = 30 A, T_C = 25°C I_F = 30 A, T_C = 100°C	V_F	 1.9 1.8	V
Instantaneous Reverse Current (2) V_R = 1000 V, T_C = 25°C V_R = 1000 V, T_C = 100°C	I_R	 100 5	 µA mA

(1) Pulse Test: Pulse Width = 380 µs, Duty Cycle ≤ 2%
(2) Pulse Test: Pulse Width = 5 ms, Duty Cycle < 2%

RECOVERY CHARACTERISTICS

Test Conditions	Symbol	Typ	Max	Unit
I_F = 1 A, V_R = 30 V, dIF/dt = –15 A/μs	t_{rr}	—	165	ns
I_F = 0.5 A, I_R = 1 A, I_{rr} = 0.25 A		—	70	

TURN–OFF SWITCHING CHARACTERISTICS (without series inductance)

Test Conditions	Symbol	Typ	Max	Unit
V_{CC} = 200 V, I_F = 30 A, T_J = 100°C, L_p < 0.05 μH (See Figure 11)	t_{IRM}			ns
dIF/dt = –120 A/μs		—	200	
dIF/dt = –240 A/μs		120	—	
dIF/dt = –120 A/μs	I_{RM}	—	19.5	A
dIF/dt = –240 A/μs		22	—	

TURN–OFF OVERVOLTAGE COEFFICIENT (with series inductance)

Test Conditions	Symbol	Typ	Max	Unit
T_J = 100°C, V_{CC} = 200 V, I_F = $I_{F(AV)}$ dIF/dt = –30 A/μs, L_p = 5 μH (See Figure 12)	$C = \frac{V_{RP}}{V_{CC}}$	—	4.5	

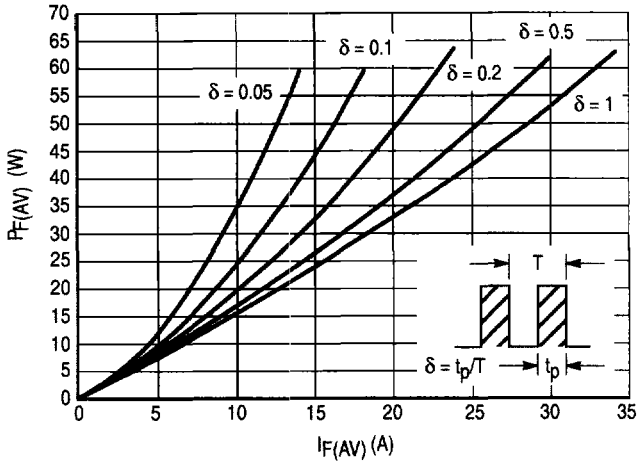


Figure 1. Low Frequency Power Losses versus Average Current

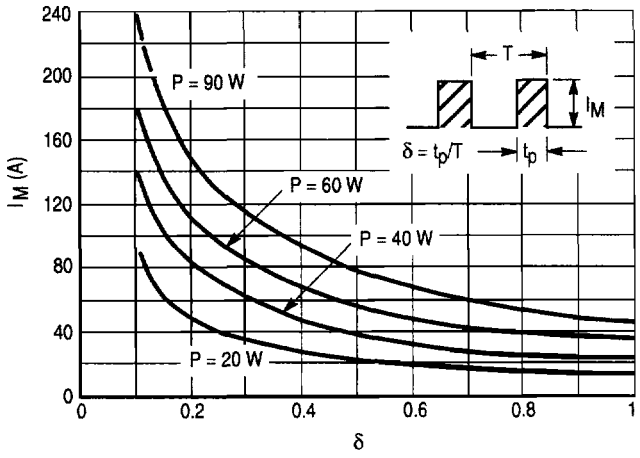


Figure 2. Peak Current versus Form Factor

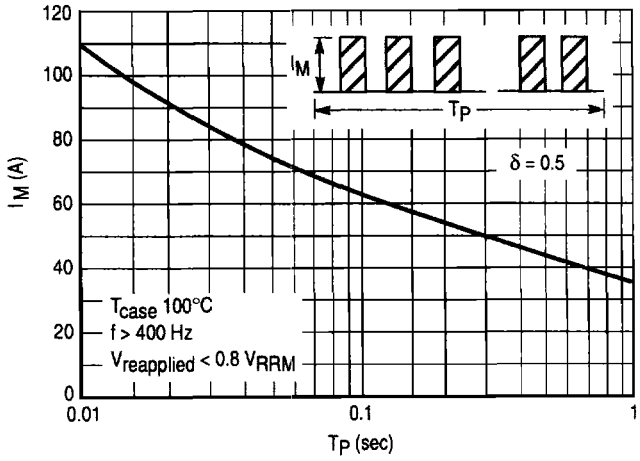


Figure 3. Non–Repetitive Peak Surge Current versus Overload Duration

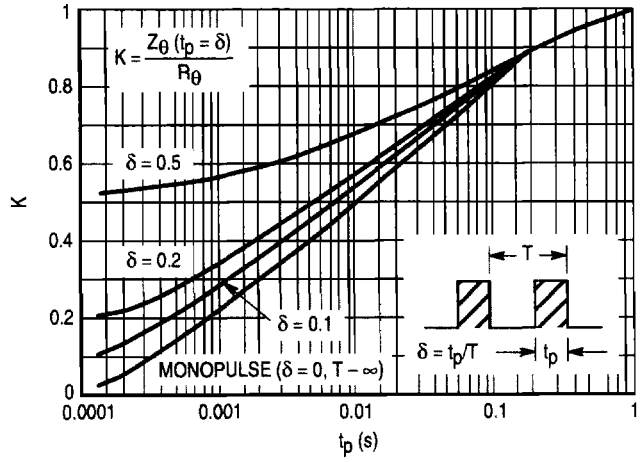


Figure 4. Relative Variation of Thermal Impedance Junction to Case versus Pulse Duration

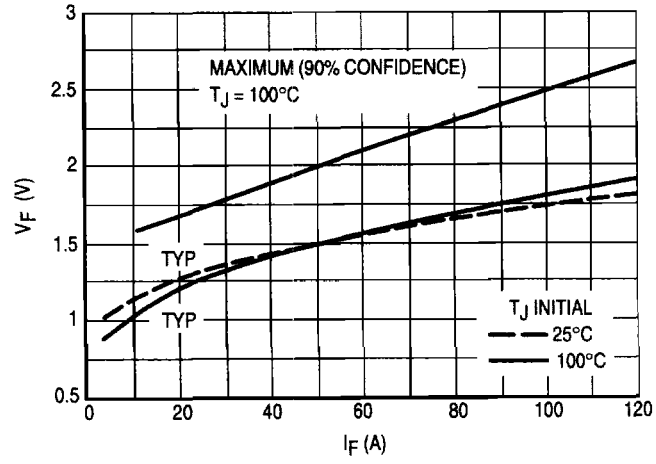


Figure 5. Voltage Drop versus Forward Current

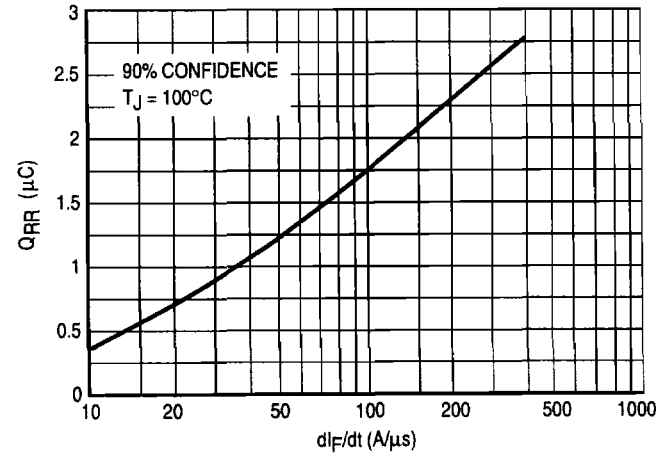


Figure 6. Recovery Charge versus dIF/dt

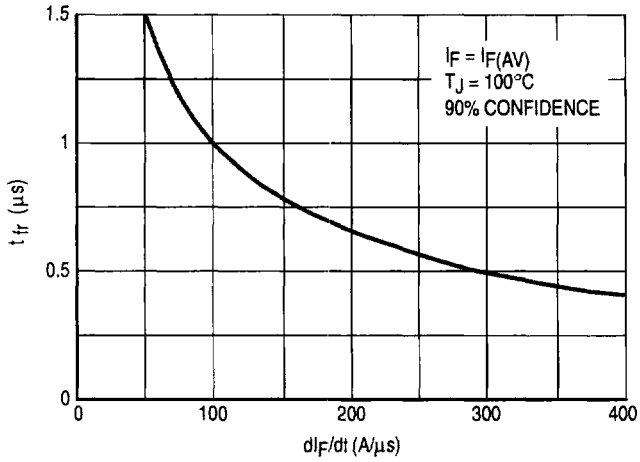


Figure 7. Recovery Time versus dI_F/dt

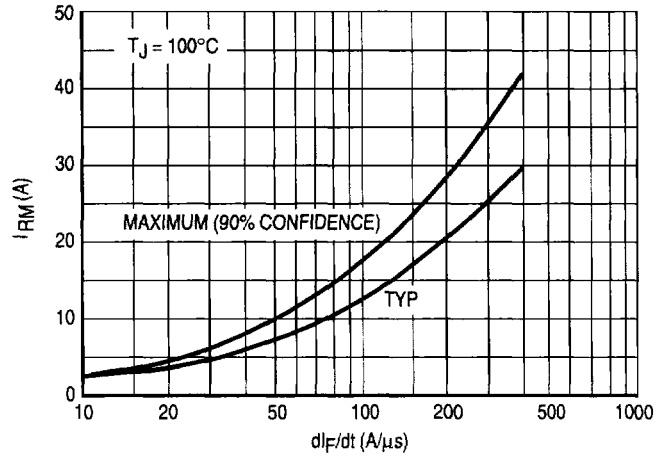


Figure 8. Peak Reverse Current versus dI_F/dt

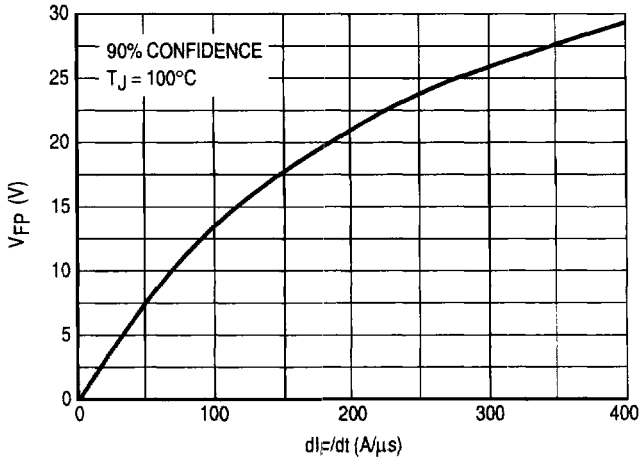


Figure 9. Peak Forward Voltage versus dI_F/dt

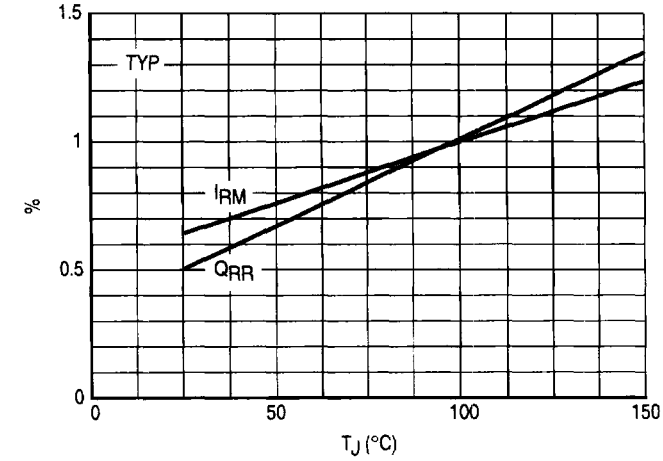


Figure 10. Dynamic Parameters versus Junction Temperature

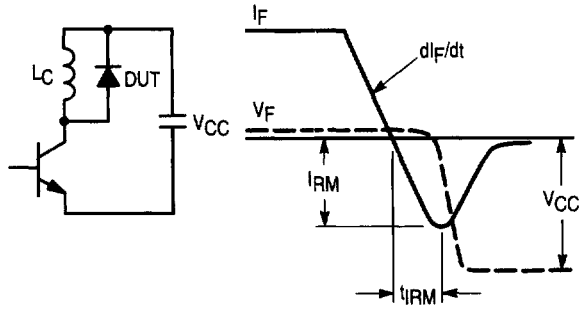


Figure 11. Turn–Off Switching Characteristics (Without series inductance)

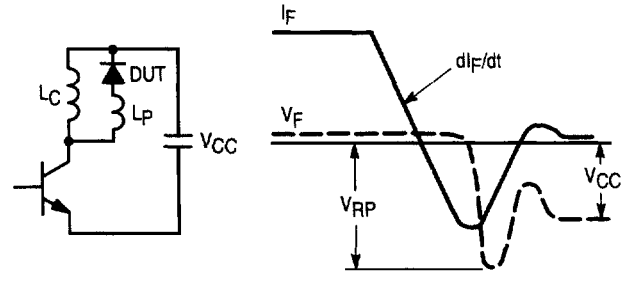
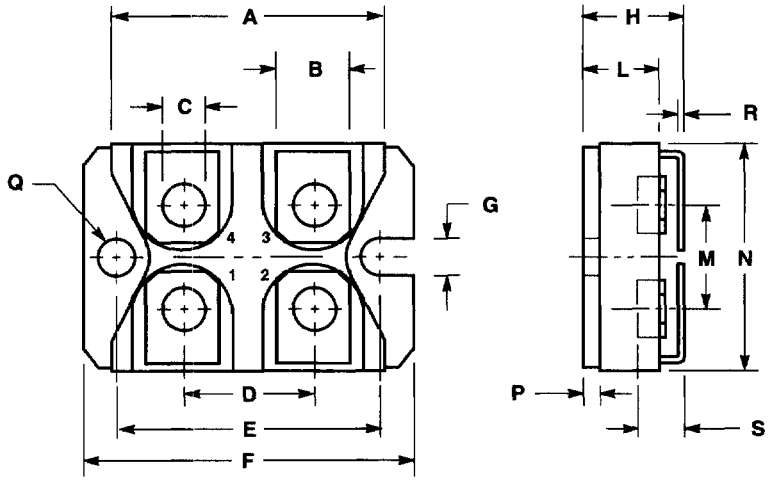


Figure 12. Turn–Off Switching Characteristics (With series inductance)

PACKAGE DIMENSIONS



Recommended screw torque: 1.3 ± 0.2 Nm
Maximum screw torque: 1.5 Nm

NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS.

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	31.50	31.70	1.240	1.248
B	7.80	8.20	0.307	0.322
C	4.10	4.30	0.161	0.169
D	14.90	15.10	0.586	0.590
E	30.10	30.30	1.185	1.193
F	38.00	38.20	1.496	1.503
G	4.00	—	0.157	—
H	11.80	12.20	0.464	0.480
L	8.90	9.10	0.350	0.358
M	12.60	12.80	0.496	0.503
N	25.20	25.40	0.992	1.000
P	1.95	2.05	0.076	0.080
Q	4.10	—	0.157	—
R	0.75	0.85	0.030	0.033
S	5.50	—	0.217	—

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NOTES

NOTES

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