

BYW51-200

SWITCHMODE™ Power Rectifier

This state-of-the-art device is designed for use in switching power supplies.

Features

- Ultrafast 35 Nanosecond Recovery Time
- 175°C Operating Junction Temperature
- Popular TO-220 Package
- Epoxy Meets UL 94 V-0 @ 0.125 in
- High Temperature Glass Passivated Junction
- Current Derating @ Both Case and Ambient Temperatures
- Pb-Free Package is Available*

Mechanical Characteristics

- Case: Epoxy, Molded
- Weight: 1.9 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max. for 10 Seconds

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	200	V
Average Rectified Forward Current Total Device, (Rated V_R), $T_C = 150^\circ\text{C}$ Per Leg Total Device	$I_{F(AV)}$	8.0 16	A
Peak Rectified Forward Current (Rated V_R , Square Wave, 20 kHz), $T_C = 150^\circ\text{C}$ – Per Diode Leg	I_{FM}	16	A
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	I_{FSM}	100	A
Operating Junction Temperature and Storage Temperature	T_J, T_{stg}	-65 to +175	°C

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

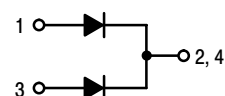
*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



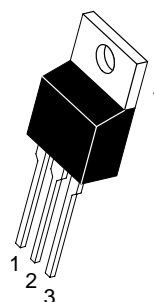
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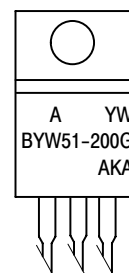
ULTRAFAST RECTIFIER 16 AMPERES 200 VOLTS



MARKING DIAGRAM



TO-220AB
CASE 221A
PLASTIC



A = Assembly Location
Y = Year
W = Work Week
BYW51-200 = Device Code
G = Pb-Free Package
AKA = Diode Polarity

ORDERING INFORMATION

Device	Package	Shipping
BYW51-200	TO-220	50 Units/Rail
BYW51-200G	TO-220 (Pb-Free)	50 Units/Rail

THERMAL CHARACTERISTICS (Per Diode Leg)

Characteristic	Symbol	Value	Unit
Maximum Thermal Resistance, Junction to Case	R_{JC}	3.0	$^{\circ}\text{C}/\text{W}$

ELECTRICAL CHARACTERISTICS (Per Diode Leg)

Maximum Instantaneous Forward Voltage (Note 1) ($I_F = 8.0$ Amps, $T_C = 100^{\circ}\text{C}$) ($I_F = 8.0$ Amps, $T_C = 25^{\circ}\text{C}$)	V_F	0.89 0.97	V
Maximum Instantaneous Reverse Current (Note 1) (Rated dc Voltage, $T_C = 100^{\circ}\text{C}$) (Rated dc Voltage, $T_C = 25^{\circ}\text{C}$)	I_R	1.0 10	mA
Maximum Reverse Recovery Time ($I_F = 1.0$ Amp, $di/dt = 50$ Amps/s) ($I_F = 0.5$ Amp, $I_R = 1.0$ Amp, $I_{REC} = 0.25$ Amp)	t_{rr}	35 25	ns

1. Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$

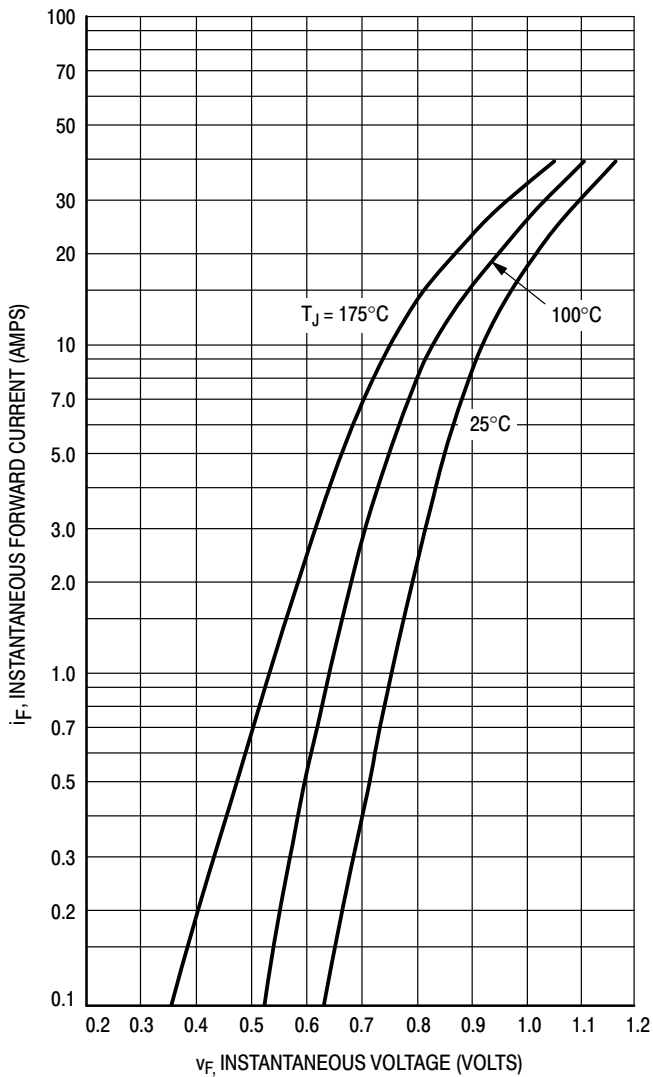


Figure 1. Typical Forward Voltage, Per Leg

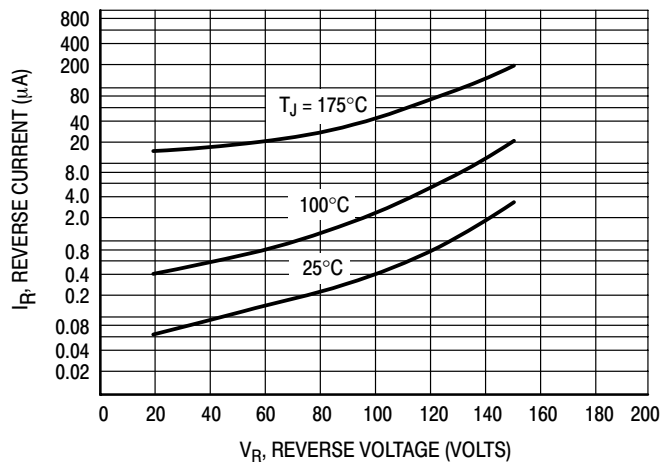


Figure 2. Typical Reverse Current, Per Leg*

* The curves shown are typical for the highest voltage device in the voltage grouping. Typical reverse current for lower voltage selections can be estimated from these same curves if V_R is sufficiently below rated V_R .

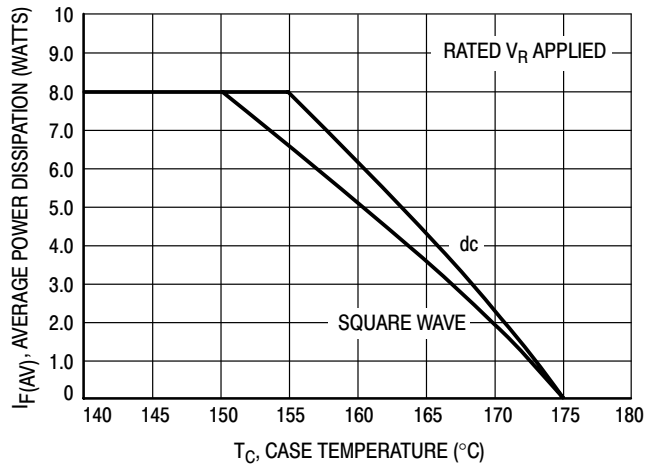


Figure 3. Current Derating, Case, Per Leg

BYW51-200

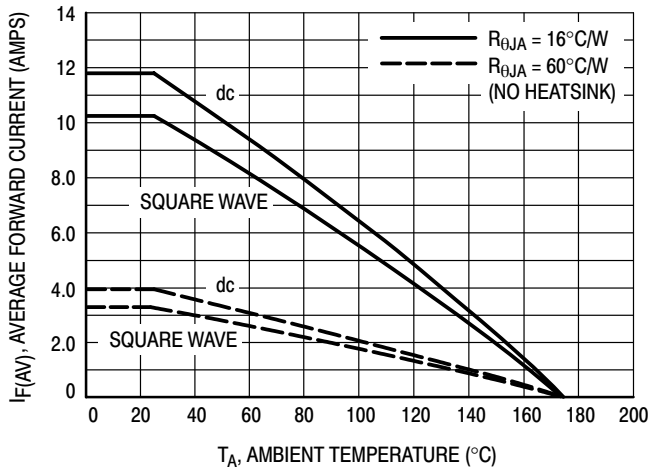


Figure 4. Current Derating, Ambient, Per Leg

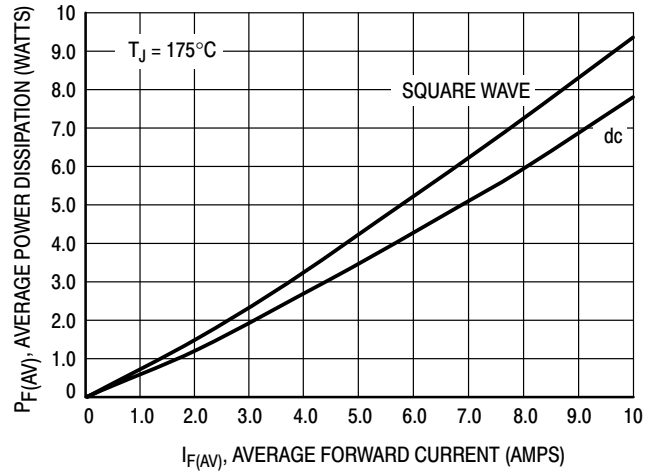


Figure 5. Power Dissipation, Per Leg

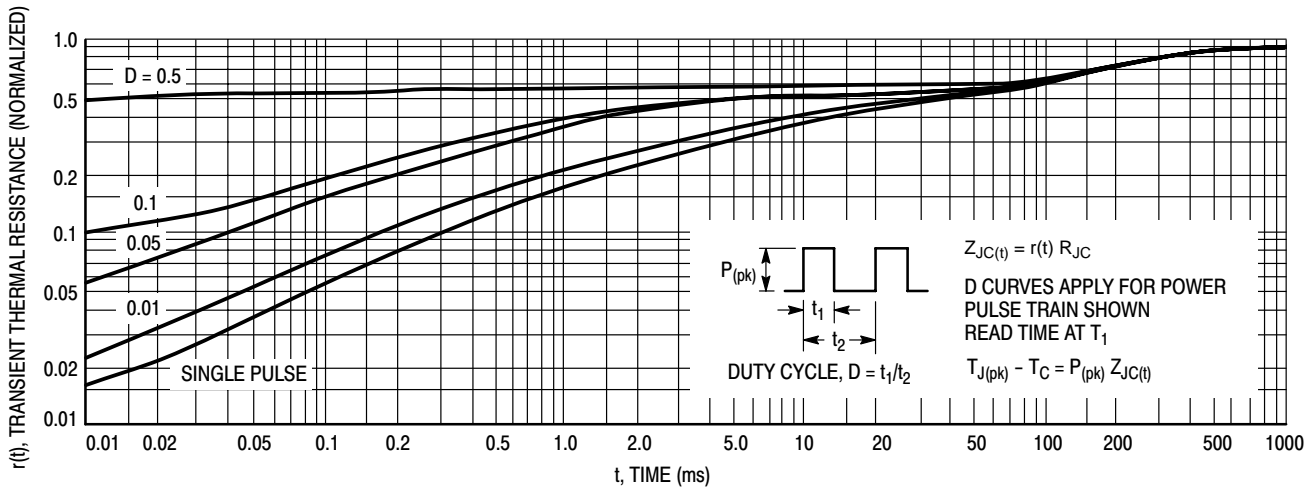


Figure 16. Thermal Response

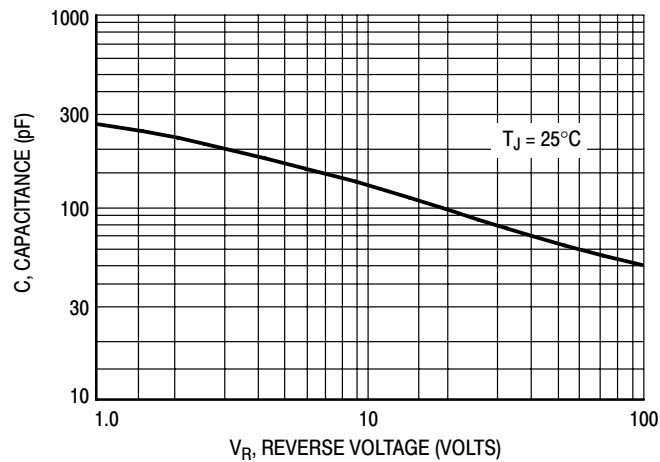
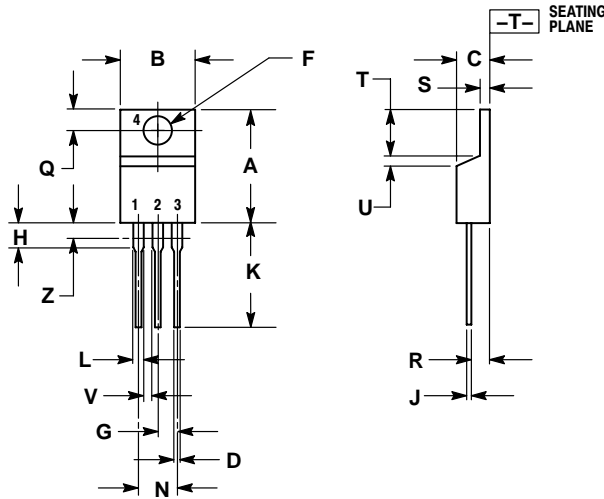


Figure 17. Typical Capacitance, Per Leg

BYW51-200

PACKAGE DIMENSIONS


TO-220AB
CASE 221A-09
ISSUE AA



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.570	0.620	14.48	15.75
B	0.380	0.405	9.66	10.28
C	0.160	0.190	4.07	4.82
D	0.025	0.035	0.64	0.88
F	0.142	0.147	3.61	3.73
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.018	0.025	0.46	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.15	1.39
T	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
V	0.045	---	1.15	---
Z	---	0.080	---	2.04

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