

August 1995

8A, 100V - 200V Ultrafast Dual Diodes

Features

- Ultra Fast Recovery Time (<35ns)
- Low Forward Voltage
- Low Thermal Resistance
- Planar Design
- Wire-Bonded Construction

Applications

- General Purpose
- Power Switching Circuits to 100kHz
- Full-Wave Rectification

Description

The BYW51 series devices are low forward voltage drop, ultra-fast-recovery rectifiers ($t_{RR} < 35\text{ns}$). They use a planar ion-implanted epitaxial construction.

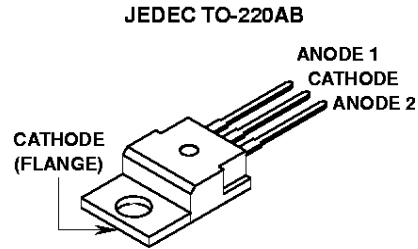
These devices are intended for use as output rectifiers and fly-wheel diodes in a variety of high-frequency pulse-width-modulated and switching regulators. Their low stored charge and attendant fast reverse-recovery behavior minimize electrical noise generation and in many circuits markedly reduce the turn-on dissipation of the associated power switching transistors.

PACKAGING AVAILABILITY

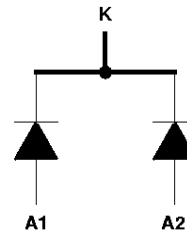
PART NUMBER	PACKAGE	BRAND
BYW51-100	TO-220AB	BYW51100
BYW51-150	TO-220AB	BYW51150
BYW51-200	TO-220AB	BYW51200

NOTE: When ordering, use the entire part number.

Package



Symbol



Absolute Maximum Ratings Per Junction

	BYW51-100	BYW51-150	BYW51-200	UNITS
Maximum Peak Repetitive Reverse Voltage V_{RRM}	100	150	200	V
Maximum Peak Surge Voltage V_{RSM}	110	165	220	V
Repetitive Peak Surge Current I_{FRM} , $t_p < 10\mu\text{s}$	100	100	100	A
Nonrepetitive Peak Surge Current $I_F(\text{RMS})$, Total	20	20	20	A
Average Rectified forward Current $I_{F(AV)}$, Total $T_C = +125^\circ\text{C}$, $a = 0.5$	8	8	8	A
Repetitive Peak Surge Current I_{FSM} $t_p = 10\text{ms}$, Sinusoidal	100	100	100	A
Maximum Power Dissipation P_D , $T_C = +125^\circ\text{C}$	20	20	20	W
Operating and Storage Temperature T_J	-40 + 150	-40 + 150	-40 + 150	$^\circ\text{C}$
T_L (Lead Temperature During Soldering) At Distance > 1/8 in. (3.17mm) From Case For 10s max.	260	260	260	$^\circ\text{C}$

Specifications BYW51-100, BYW51-150, BYW51-200

Electrical Specifications Per Junction

SYMBOL	TEST CONDITIONS			LIMITS						UNITS	
	T _J °C	VOLTAGE V _R V	CURRENT i _F A	BYW51-100		BYW51-150		BYW51-200			
				MIN	MAX	MIN	MAX	MIN	MAX		
I _R	25	100	-	-	5	-	-	-	-	μA	
		150	-	-	-	-	5	-	-	μA	
		200	-	-	-	-	-	-	5	μA	
	100	100	-	-	1	-	-	-	-	mA	
		150	-	-	-	-	-	1	-	-	mA
		200	-	-	-	-	-	-	1	mA	
V _F	25	-	8	-	0.95	-	0.95	-	0.95	V	
	100	-	8	-	0.89	-	0.89	-	0.89	V	
t _{RR}	25	-	1 (Note 1)	-	35	-	35	-	35	ns	
R _{θJC} , Per Leg		-	-	-	2.5	-	2.5	-	2.5	°C/W	
R _{θJC} , Total		-	-	-	1.3	-	1.3	-	1.3	°C/W	
R _{θJA}		-	-	-	60	-	60	-	60	°C/W	
C _J	25	10	0	All types (typ.) 40						pF	

NOTE:

1. $di_F/dt > 50A/\mu s$, $I_{RM}(rec) < 1A$, $I_{RR} = 0.25A$.

Typical Performance Curves

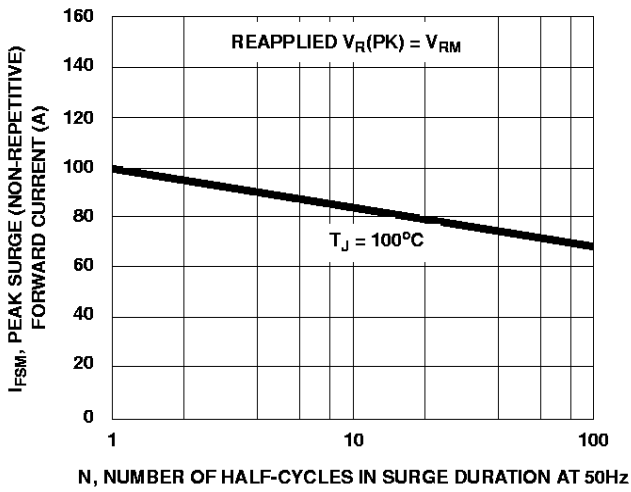


FIGURE 1. PEAK SURGE FORWARD CURRENT vs SURGE DURATION

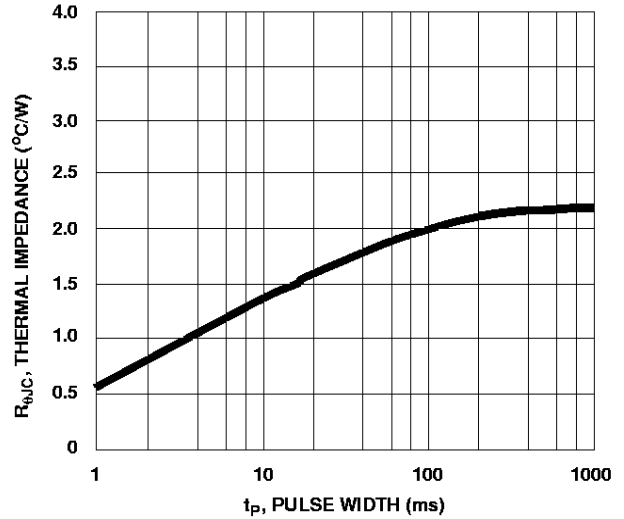


FIGURE 2. THERMAL IMPEDANCE vs PULSE WIDTH (PER JUNCTION)

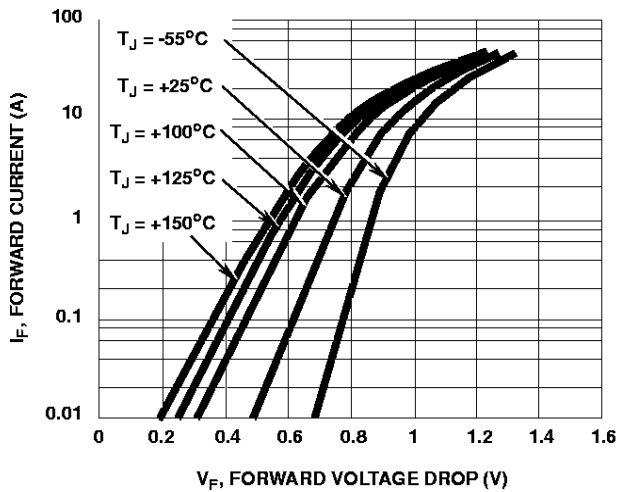


FIGURE 3. TYPICAL FORWARD CURRENT vs FORWARD VOLTAGE DROP

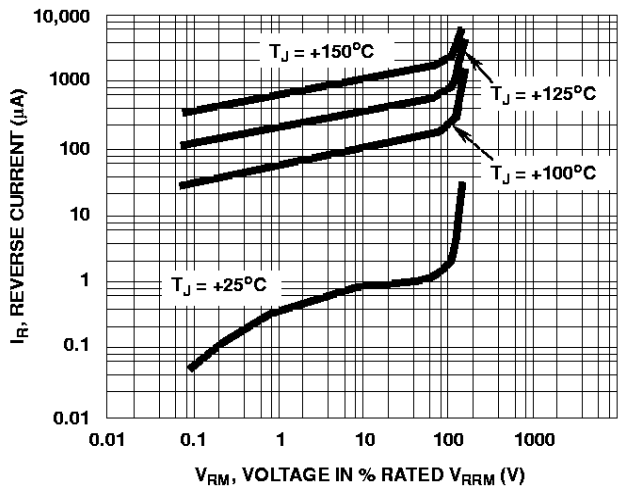


FIGURE 4. TYPICAL REVERSE CURRENT vs VOLTAGE