

## HIGH EFFICIENCY FAST RECOVERY RECTIFIER DIODES

### FEATURES

- SUITED FOR SMPS
- VERY LOW FORWARD LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- HIGH SURGE CURRENT CAPABILITY
- HIGH AVALANCHE ENERGY CAPABILITY
- SURFACE MOUNT DEVICE

### DESCRIPTION

Single chip rectifier suited for Switch Mode Power Supply and high frequency DC to DC converters. Packaged in SOD15, this surface mount device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter		Value	Unit
$I_{F(RMS)}$	RMS forward current		10	A
$I_{F(AV)}$	Average forward current	$T_I=70^{\circ}\text{C}$ $\delta = 0.5$	4	A
$I_{FSM}$	Non repetitive surge peak forward current	$t_p=10\text{ms}$ sinusoidal	70	A
$T_{stg}$ $T_j$	Storage and junction temperature range		- 40 to + 150 - 40 to + 150	$^{\circ}\text{C}$ $^{\circ}\text{C}$

Symbol	Parameter	SMBYW04-				Unit
		50	100	150	200	
$V_{RRM}$	Repetitive peak reverse voltage	50	100	150	200	V

### THERMAL RESISTANCE

Symbol	Parameter	Value	Unit
$R_{th(j-l)}$	Junction-leads	20	$^{\circ}\text{C/W}$

**ELECTRICAL CHARACTERISTICS  
STATIC CHARACTERISTICS**

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
V <sub>F</sub> *	T <sub>j</sub> = 25°C	I <sub>F</sub> = 12 A			1.25	V
	T <sub>j</sub> = 100°C	I <sub>F</sub> = 4 A			0.85	
I <sub>R</sub> **	T <sub>j</sub> = 25°C	V <sub>R</sub> = V <sub>RRM</sub>			20	μA
	T <sub>j</sub> = 100°C				0.5	mA

Pulse test : \* tp = 380 μs, duty cycle < 2 %

\*\* tp = 5 ms, duty cycle < 2 %

**RECOVERY CHARACTERISTICS**

Symbol	Test Conditions		Min.	Typ.	Max.	Unit
t <sub>rr</sub>	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1A V <sub>R</sub> = 30V dI <sub>F</sub> /dt = -50A/μs			35	ns
t <sub>fr</sub>	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1A V <sub>FR</sub> = 1.1 x V <sub>F</sub> tr = 10 ns		20		ns
V <sub>FP</sub>	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1A tr = 10 ns		5		V

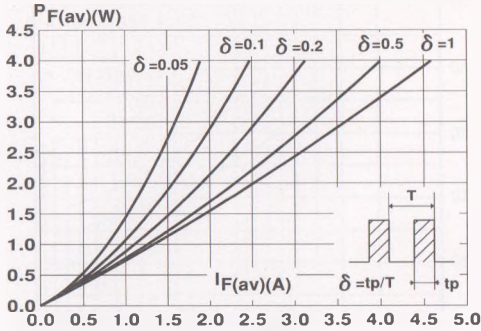
To evaluate the conduction losses use the following equation :

$$P = 0.7 \times I_{F(AV)} + 0.037 \times I_{F(RMS)}^2$$

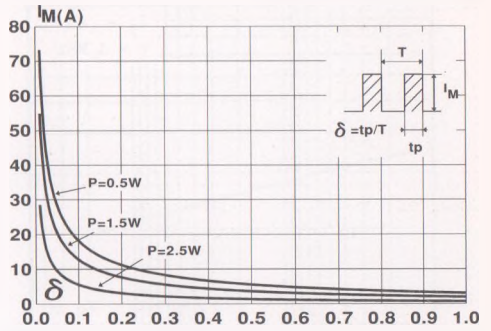
<b>Voltage (V)</b>	50	100	150	200
<b>Marking</b>	D05	D10	D15	D20

Laser marking  
Logo indicates cathode

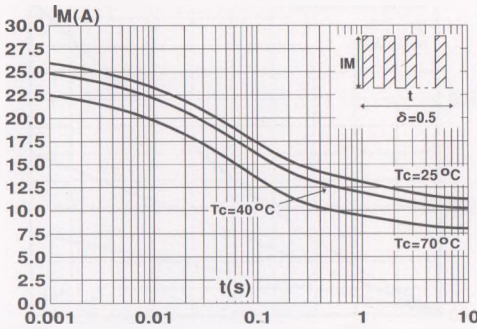
**Fig.1** : Low frequency power losses versus average current.



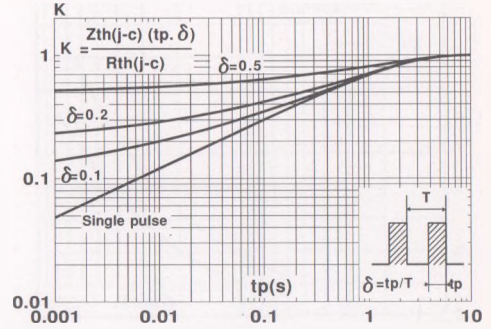
**Fig.2** : Peak current versus form factor.



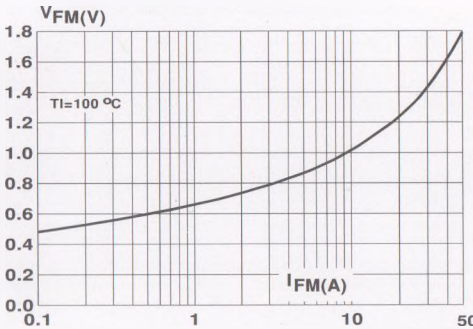
**Fig.3** : Non repetitive surge peak forward current versus overload duration.



**Fig.4** : Relative variation of thermal impedance junction to lead versus pulse duration.



**Fig.5** : Voltage drop versus forward current. (Maximum values)



**Fig.6** : Average current versus ambient temperature. (duty cycle : 0.5)

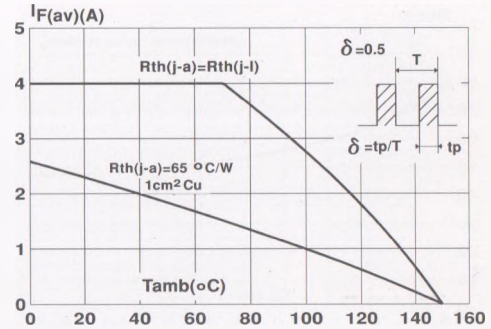


Fig.7 : Capacitance versus reverse voltage applied.

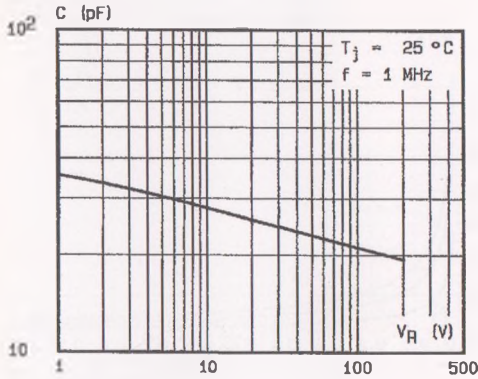


Fig.8 : Recovery time versus diF/dt.

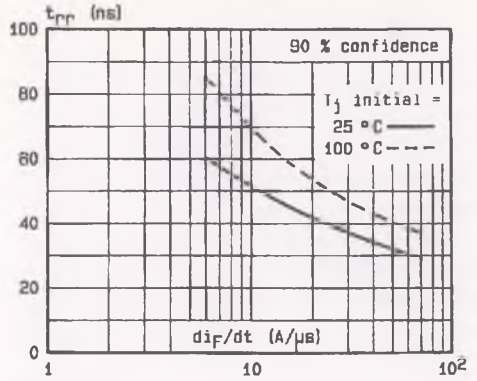


Fig.9 : Peak reverse current versus diF/dt.

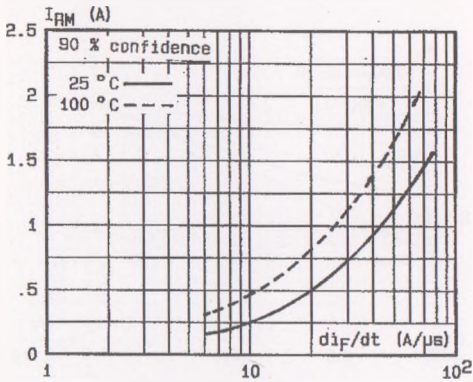


Fig.10 : Dynamic parameters versus junction temperature.

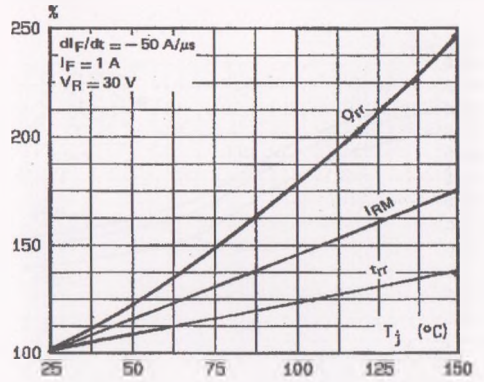


Fig.11 : Thermal resistance junction to ambient versus copper surface under each lead.

