SEMICONDUCTOR

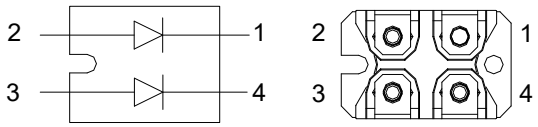
JK2U240 -20 Series

240A Ultrafast Rectifier Module

FEATURES

- Two fully independent diodes
- Fully insulated package
- Ultrafast ,soft reverse recovery,with high operation junction temperature (175℃ T_j)
- Low forward voltage drop
- Optimized for power conversion:welding and industrial SMPS applications
- Easy to use and parallel
- Industry standard outline
- Designed and qualified for industrial level

SOT-227



DESCRIPTION

The JK2U240-20 insutlated modules integrate two state of the Art Ultrafast recovery rectifiers in the compact,industry standard SOT-227 package. The diodes structure,and its life time contril,Provide an ultrasoft recovery current shape,together with the best over all perfor mance,ruggedness and reliability characteristics.

These devices are thus intended for high frequency applicationsIn which the switching energy is designed not to be predominant Portion of the total energy ,such as in the output rectification stage Of welding machines,SMPS, DC/DC converters.Therir extremely Optimized stored charge and low recoverycurrent reduce both over Dissipation in the switching elements (and snubbers) and EMI/RFI.

PRODUCT SUMMARY		
TYPE	**$I_{F(AV)}$**	**VR**
JK2U240-20	240A	200V

ABSOLUTE MAXIMUM RATINGS				
PARAMETE	**SYMBOL**	**TEST CONDITIONS**	**MAX**	**UNIT**
Cathode to anode voltage	V_R		200	V
Continuous forward current per diode	I_F(1)	T_C=95℃	175	A
Single pulse forward current per diode	I_{FSM}	T_C=25℃	1700	A
Maximum power dissipation per module	P_D	T_C=95℃	372	w
RMS isolation voltage	Visol	Any terminal to case,t=1 minute	2500	V
Operating junction and storage temperatures	T_J,T_{stg}		-55to175	℃

NOTE

(1)Maximum continuous forward current must be limited to 100A to do not exceed the maxium temperature of power terminates.

J K2U240 -20 Series

ELECTRICAL SPECIFICATIONS						
PARAMETE	**SYMBOL**	**TEST CONDITIONS**	**MIN**	**TYP**	**MAX**	**UNITS**
Cathode to anode breakdown voltage	V_{BR}	I_R=100μA	200	-	-	V
Forward voltage	V_{FM}	I_F=120 A	-	0.9	1.3	
		I_F=120 A T_J=175℃	-	0.8	0.90	
Reverse leakage current	I_{RM}	V_R=V_R rated	-	1	50	μA
		V_R=V_R rated T_J=175℃	0.36	-	4	mA
Junction capacitance	C_T	V_R=200V		100		pF

DYNAMIC RECOVERY CHARACTERISTICS (T_J=25℃ unless otherwise specified)							
PARAMETE	**SYMBOL**	**TEST CONDITIONS**		**MIN**	**TYP**	**MAX**	**UNITS**
Reverse recovery time	trr	I_F=0.5A,I_R=1A,I_{RR}=0.25A T_J=25℃		-	85	100	nS
Peak recovery current	I_{RRM}	T_J=25℃			5.1		A
		T_J=125℃			10.3		
Reverse recovery charge	Qrr	T_J=25℃			87		nC
		T_J=125℃			300		

THERMAL-MECHANICAL SPECIFICATIONS						
PARAMETE	**SYMBOL**	**TEST CONDITIONS**	**MIN**	**TYP**	**MAX**	**UNITS**
Junction to case ,single leg conducting	R_{thjc}		-	-	0.43	℃/w
Junction to case ,both leg conducting			-	-	0.215	
Case to heatsink	R_{thcs}	Flat,greased surface		0.05		
Weight				30		g
Mounting torque				1.3		Nm
Case style			SOT-227			

Ordering Information Tabel

Device code

J	K2	U	240	/	20
①	②	③	④		⑤

① JH 's power module

② Circuit configuration (2 separate diodes ,parallel pin-out)

③ U for Ultrafast rectifier

④ Maximum average forward current (240A)

⑤ Voltage rating (20 = 200V)

Performance Curves

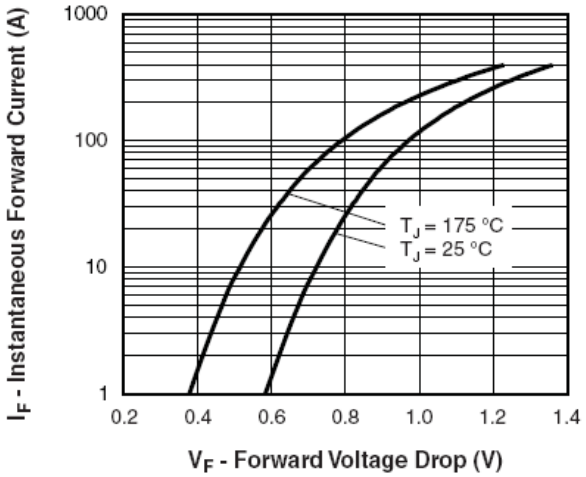


Fig. 1 - Typical Forward Voltage Drop Characteristics (Per Diode)

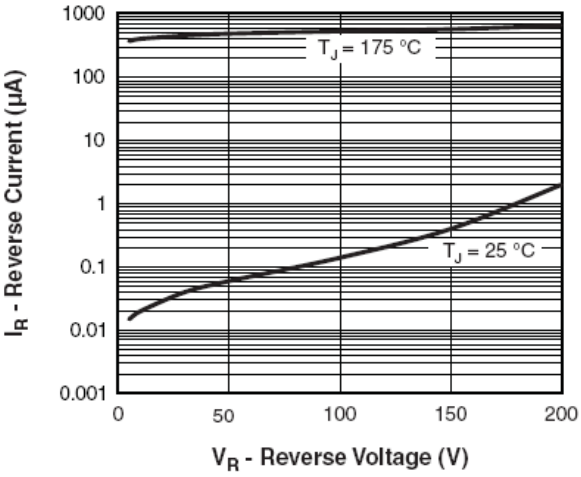


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

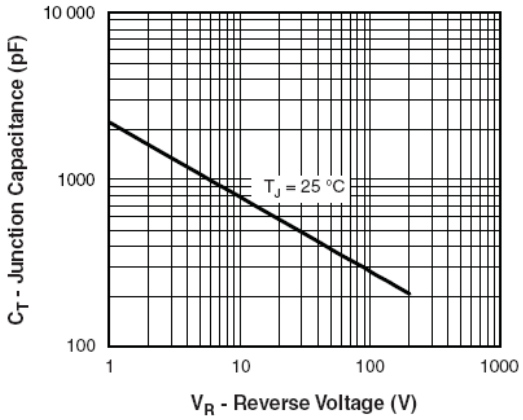


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

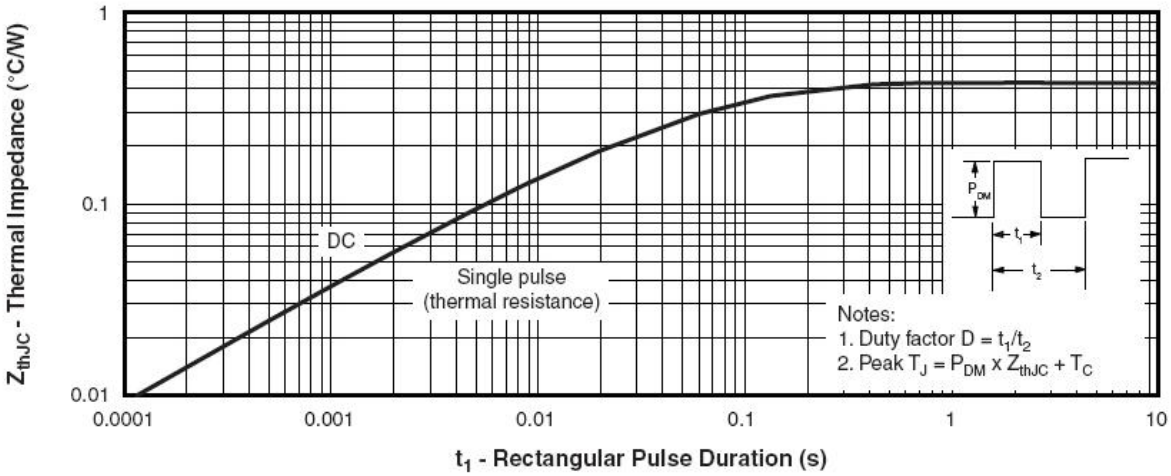


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

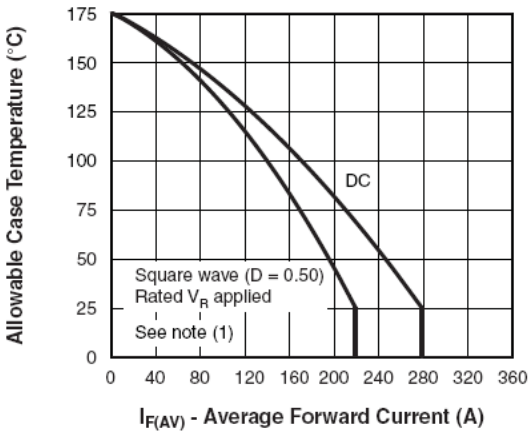


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

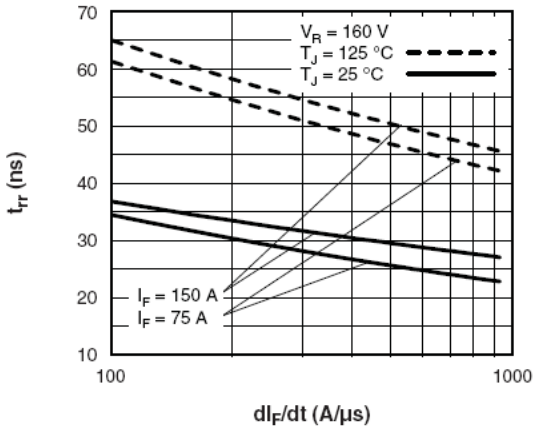


Fig. 7 - Typical Reverse Recovery Time vs. dI_F/dt

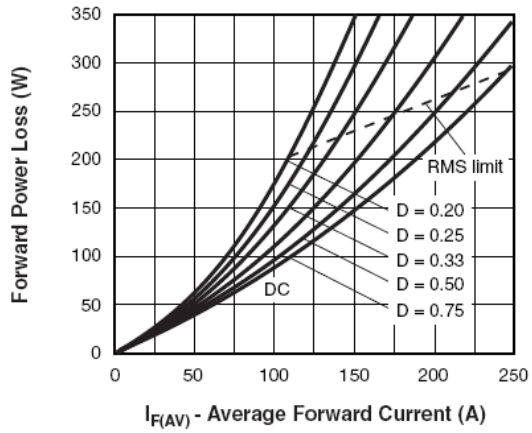


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

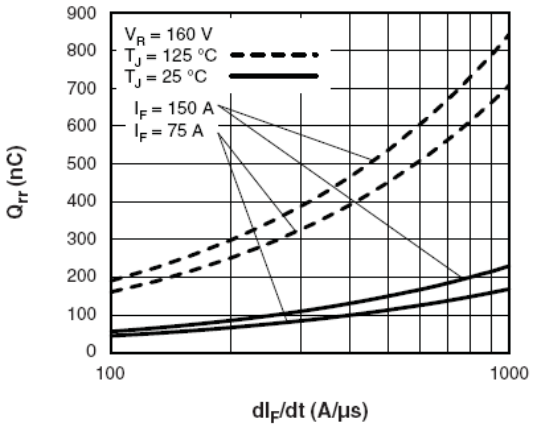


Fig. 8 - Typical Stored Charge vs. dI_F/dt

Note

(1) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
Pd = Forward power loss = $I_{F(AV)} \times V_{FM}$ at ($I_{F(AV)}/D$) (see fig. 6);
Pd_{REV} = Inverse power loss = $V_{R1} \times I_R$ (1 - D); I_R at V_{R1} = 80 % rated V_R

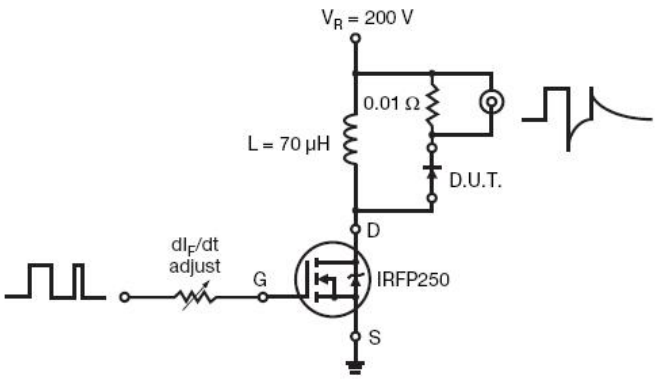
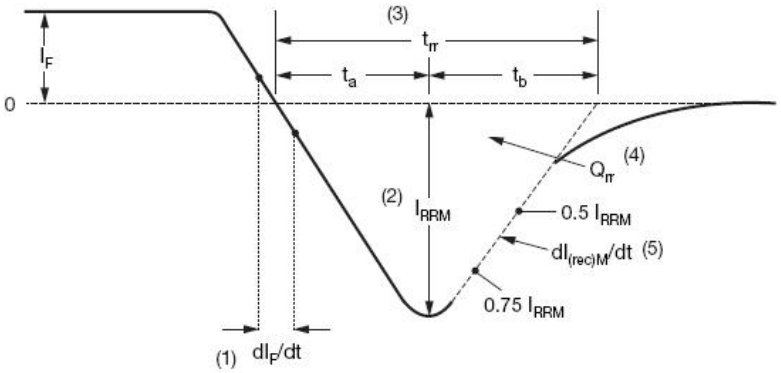


Fig. 9 - Reverse Recovery Parameter Test Circuit



(1) dI_F/dt - rate of change of current through zero crossing

(2) I_{RRM} - peak reverse recovery current

(3) t_{rr} - reverse recovery time measured from zero crossing point of negative going I_F to point where a line passing through 0.75 I_{RRM} and 0.50 I_{RRM} extrapolated to zero current.

(4) Q_{rr} - area under curve defined by t_{rr} and I_{RRM}

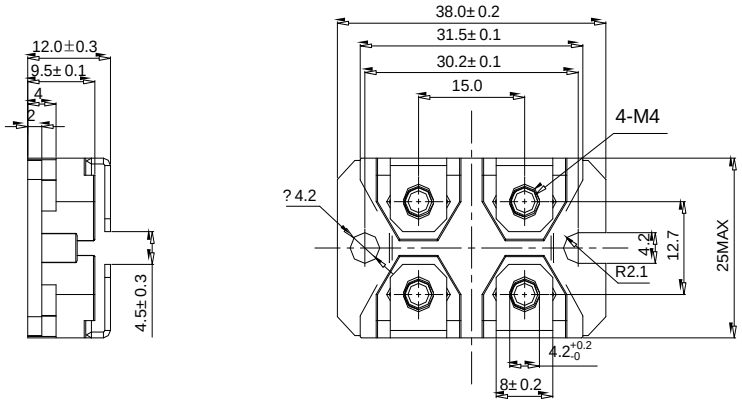
$$Q_{rr} = \frac{t_{rr} \times I_{RRM}}{2}$$

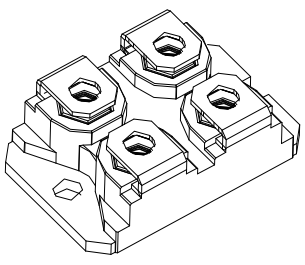
(5) $dI_{(rec)M}/dt$ - peak rate of change of current during t_b portion of t_{rr}

Fig. 10 - Reverse Recovery Waveform and Definitions

DIMENSIONS in millimeters

SOT-227 package





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