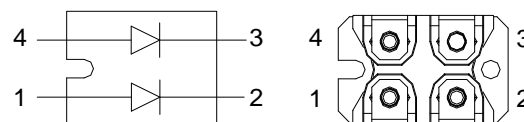


### FEATURES

- Two fully independent diodes
- Fully insulated package
- Ultrafast ,soft reverse recovery,with high operation junction temperature (175°C T<sub>j</sub>)
- 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 insulated 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 control, provide an ultrasoft recovery current shape, together with the best overall performance, ruggedness and reliability characteristics.

These devices are thus intended for high frequency applications in 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. Their extremely optimized stored charge and low recovery current reduce both over dissipation in the switching elements (and snubbers) and EMI/RFI.

### PRODUCT SUMMARY

TYPE	I <sub>F(AV)</sub>	VR
JK2U240-20	240A	200V

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	MAX	UNIT
Cathode to anode voltage	VR		200	V
Continuous forward current per diode	I <sub>F</sub> <sup>(1)</sup>	T <sub>C</sub> =95°C	175	A
Single pulse forward current per diode	I <sub>FSM</sub>	T <sub>C</sub> =25°C	1700	A
Maximum power dissipation per module	PD	T <sub>C</sub> =95°C	372	W
RMS isolation voltage	V <sub>isol</sub>	Any terminal to case, t=1 minute	2500	V
Operating junction and storage temperatures	T <sub>J</sub> , T <sub>stg</sub>		-55 to 175	°C

### NOTE

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

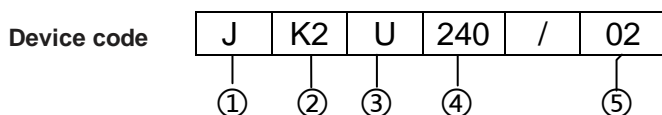
# J K2U240 -20 Series

ELECTRICAL SPECIFICATIONS						
PARAMETE	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
Cathode to anode breakdown voltage	VBR	IR=100μA	200	-	-	V
Forward voltage	VFM	IF=120 A	-	0.9	1.3	
		IF=120 A TJ=175°C	-	0.8	0.90	
Reverse leakage current	IRM	VR=VR rated	-	1	50	μA
		VR=VR rated TJ=175°C	0.36	-	4	mA
Junction capacitance	CT	VR=200V		100		pF

DYNAMIC RECOVERY CHARACTERISTICS (TJ=25°C unless otherwise specified)						
PARAMETE	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
Reverse recovery time	trr	IF=0.5A,IR=1A,IRR=0.25A TJ=25°C	-	85	100	nS
Peak recovery current	IRRM	TJ=25°C		5.1		A
		TJ=125°C		10.3		
Reverse recovery charge	Qrr	TJ=25°C		87		nC
		TJ=125°C		300		

THERMAL-MECHANICAL SPECIFICATIONS						
PARAMETE	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
Junction to case ,single leg conducting	Rthjc		-	-	0.43	°C/w
Junction to case ,both leg conducting			-	-	0.215	
Case to heatsink	Rthcs	Flat,greased surface		0.05		
Weight				30		g
Mounting torque				1.3		Nm
Case style			SOT-227			

## Ordering Information Tabel



- 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 (02 = 200V)

# J K2U240 -20 Series

## Performance Curves

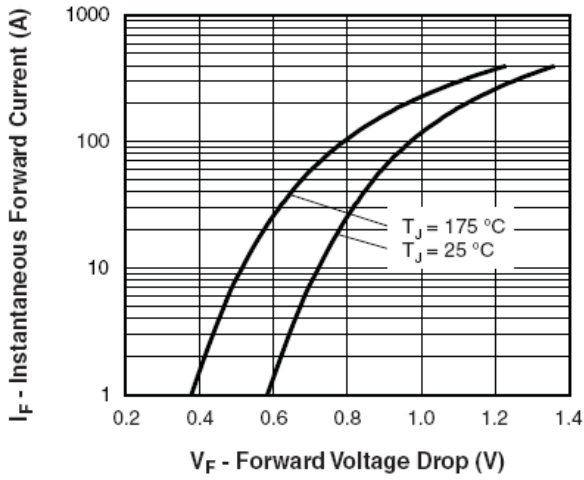


Fig. 1 - Typical Forward Voltage Drop Characteristics (Per Diode)

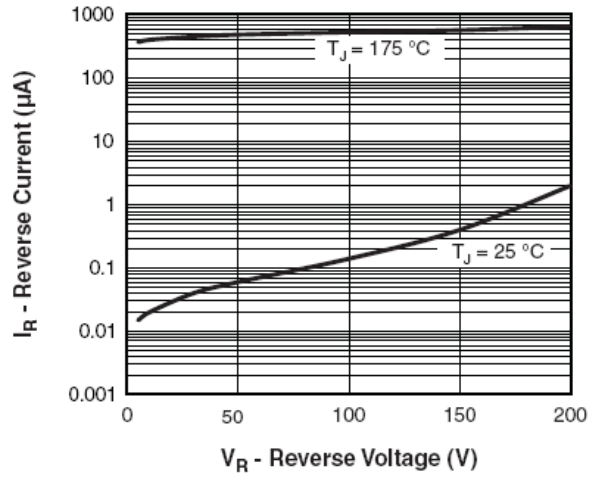


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

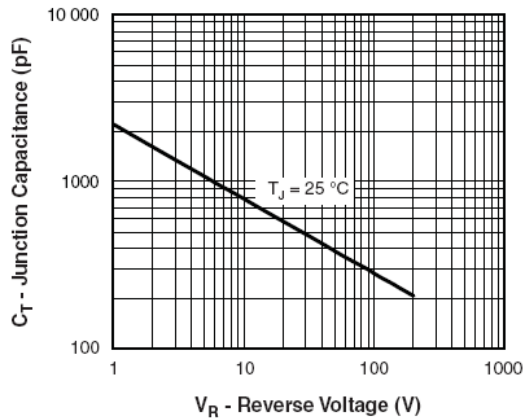


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

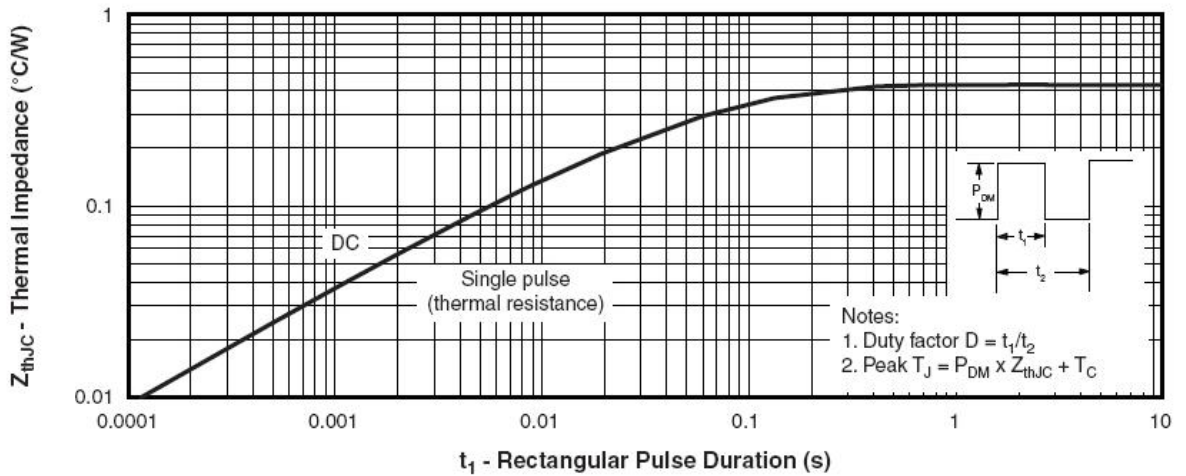


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

# JK2U240 -20 Series

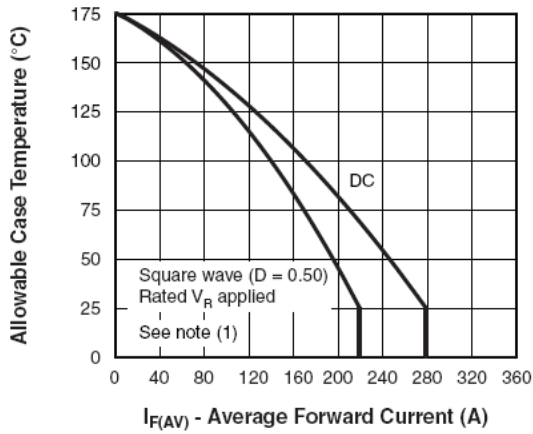


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

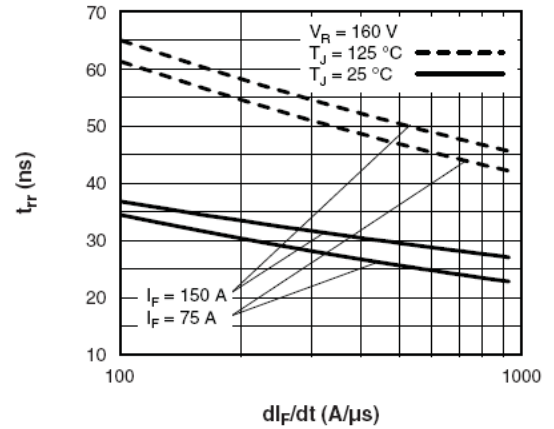


Fig. 7 - Typical Reverse Recovery Time vs.  $di_F/dt$

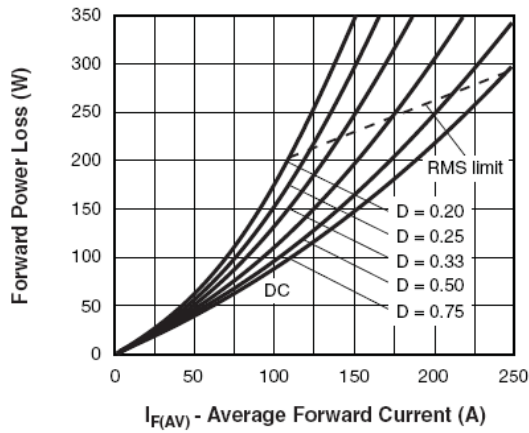


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

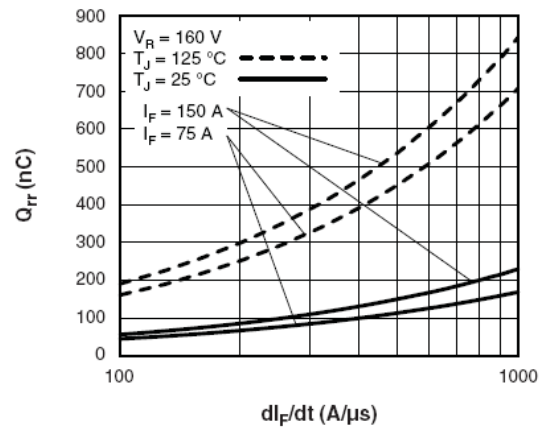


Fig. 8 - Typical Stored Charge vs.  $di_F/dt$

## 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  $V_R$

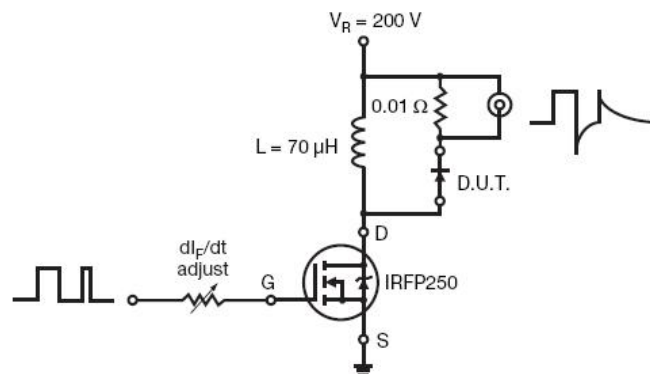
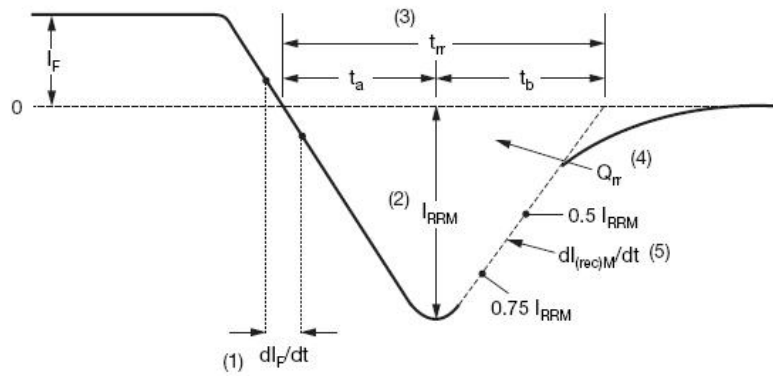


Fig. 9 - Reverse Recovery Parameter Test Circuit

# JK2U240 -20 Series



(1)  $dl_F/dt$  - 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  $I_{RRM}$

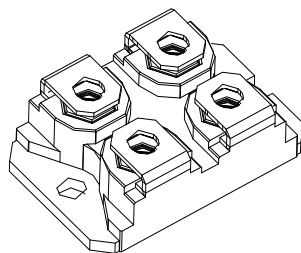
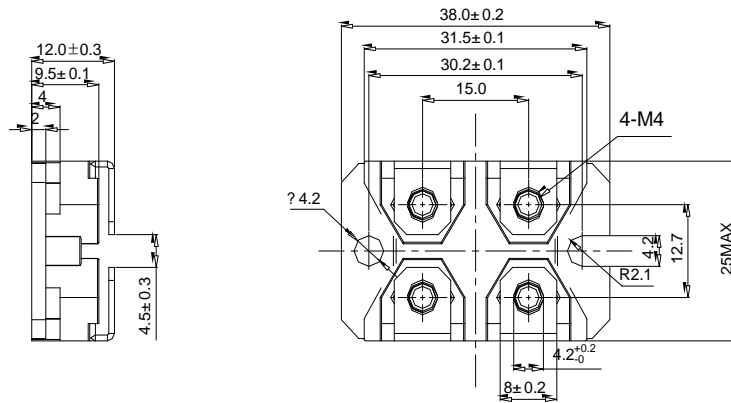
$$Q_{rr} = \frac{t_{rr} \times I_{RRM}}{2}$$

(5)  $dl_{(rec)M}/dt$  - 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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