

ULTRA-FAST RECOVERY RECTIFIER DIODES

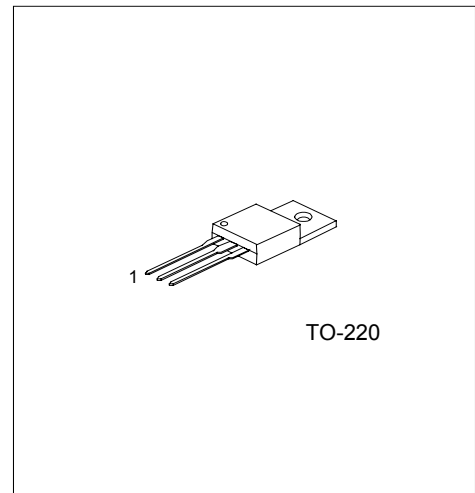
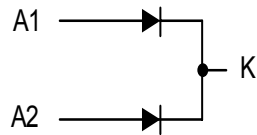
**DESCRIPTION**

SFR1020 is dual center tap rectifier suited for high frequency Switching Mode Power Supplies applications.

**FEATURES**

- \* HIGH SURGE CURRENT CAPABILITY
- \* SUITED FOR SMPS, DC ~ DC CONVERTERS
- \* LOW FORWARD AND REVERSE RECOVERY TIME
- \* LOW LOSSES

**CONNECTION DIAGRAM**



TO-220

1: A1 2: K 3: A2

\*Pb-free plating product number: SFR1020L

**ABSOLUTE MAXIMUM RATINGS**

(limiting values, per diode)

PARAMETER	SYMBOL	RATINGS	UNIT
Repetitive peak reverse voltage	$V_{RRM}$	200	V
RMS forward current	$I_{F(RMS)}$	10	A
Average forward current $\delta=0.5$ $T_C=125^\circ\text{C}$ (Per diode)	$I_{F(AV)}$	5	A
Surge non repetitive forward current $t_p=10\text{ms}$ sinusoidal	$I_{FSM}$	50	A
Storage temperature range	$T_{stg}$	-60 ~ +150	$^\circ\text{C}$

**ELECTRICAL CHARACTERISTICS**

(per diode)

PARAMETER	SYMBOL	TEST CONDITONS	MIN	TYP	MAX	UNIT
Reverse leakage current	$I_R^*$	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$		50	$\mu\text{A}$
		$T_j = 100^\circ\text{C}$			0.6	mA
Forward voltage drop	$V_F^{**}$	$T_j = 125^\circ\text{C}$	$I_F = 5\text{ A}$		0.8	V
		$T_j = 125^\circ\text{C}$	$I_F = 10\text{ A}$		0.95	
		$T_j = 25^\circ\text{C}$	$I_F = 10\text{ A}$		1.25	

\*  $t_p = 5\text{ ms}$ ,  $\delta < 2\%$

\*\*  $t_p = 380\ \mu\text{s}$ ,  $\delta < 2\%$

To evaluate the conduction losses use the following equation:  $P = 0.78 \times I_{F(AV)} + 0.042 \times I_F^2(\text{RMS})$

**RECOVERY CHARACTERISTICS**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Reverse recovery time	$t_{rr}$	$T_j = 25^\circ\text{C}$ , $I_F = 0.5\text{ A}$ , $I_{rr} = 0.25\text{ A}$ , $I_R = 1\text{ A}$			30	ns
Formard recovery time	$t_{fr}$	$T_j = 25^\circ\text{C}$ , $I_F = 1\text{ A}$ , $dI_F/dt = 50\text{ A}/\mu\text{s}$		20		ns
		$V_{FR} = 1.1 \times V_{F\text{ max}}$				
	$V_{FP}$	$T_j = 25^\circ\text{C}$ , $I_F = 1\text{ A}$ , $dI_F/dt = 50\text{ A}/\mu\text{s}$		3		V

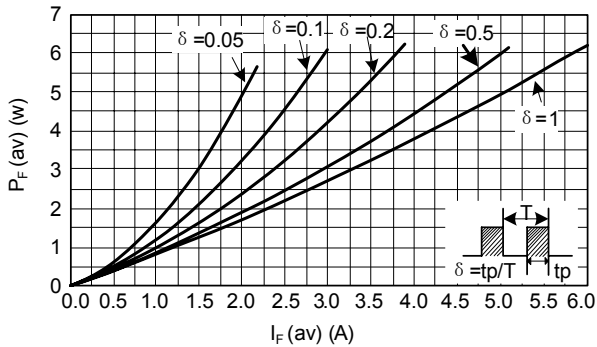
**THERMAL RESISTANCES**

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to case	Per diode	4.0	$^\circ\text{C}/\text{W}$
	Total	2.4	
Coupling	$R_{th(c)}$	0.7	

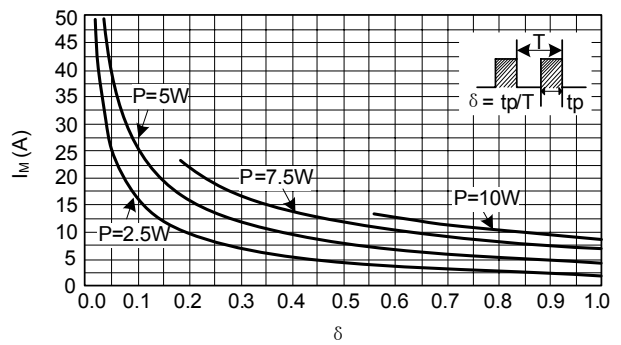
When diodes 1 and 2 are used simultaneously :

$$\Delta T_j (\text{diode } 1) = P(\text{diode } 1) \times R_{th(j-c)}(\text{Per diode}) + P(\text{diode } 2) \times R_{th(c)}$$

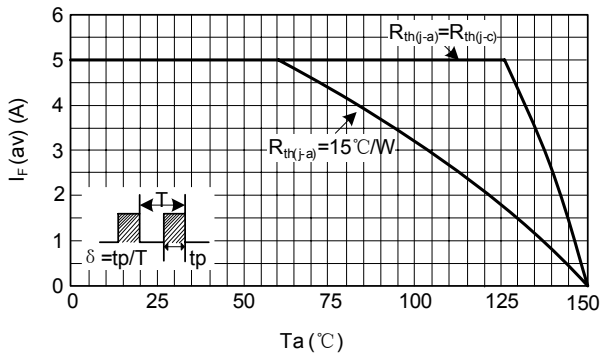
Average forward power dissipation versus average forward current (per diode)



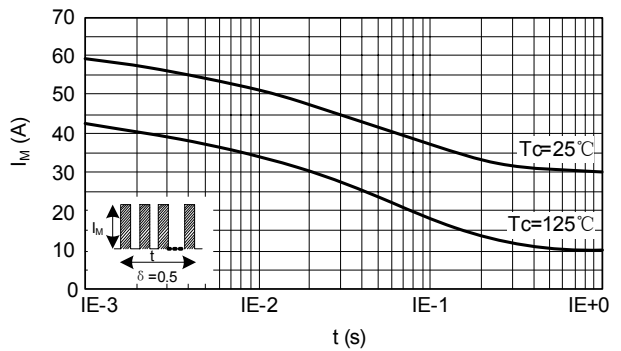
Peak current versus form factor (per diode)



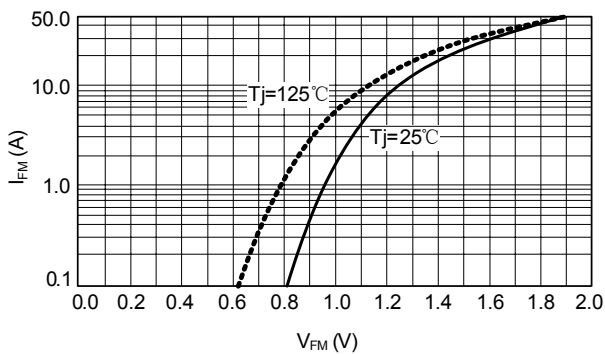
Average forward current versus ambient temperature



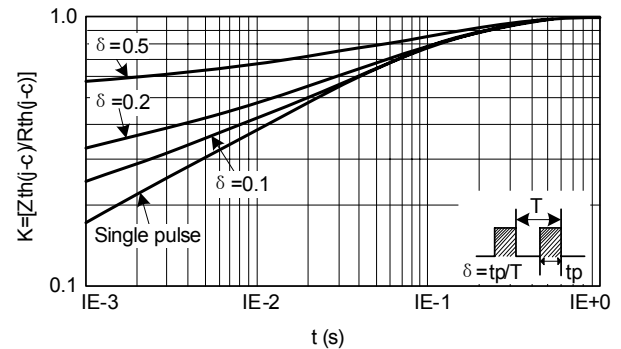
Non repetitive surge peak forward current versus overload duration



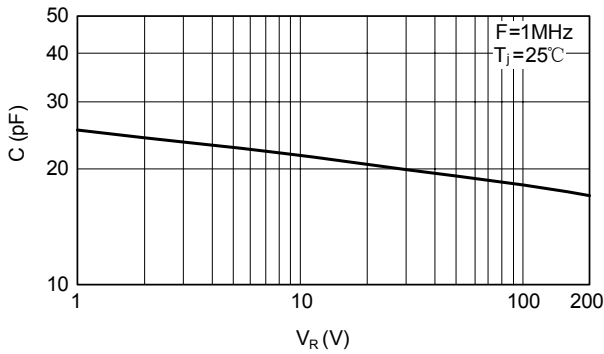
Forward voltage drop versus forward current (maximum values, per diode)



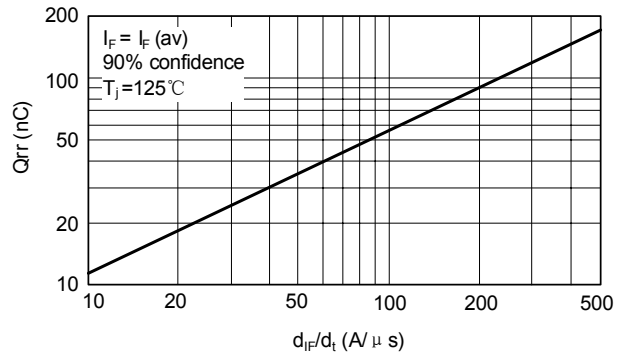
Relative variation of thermal versus impedance junction to case versus pulse duration



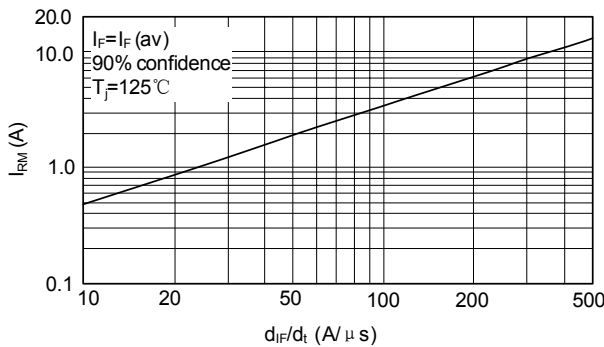
Junction capacitance versus reverse voltage applied (typical values, per diode).



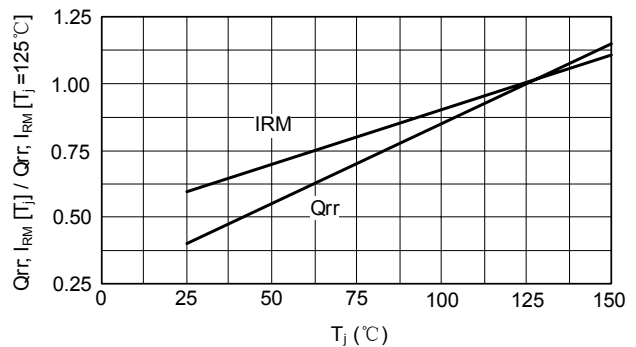
Reverse recovery charges versus  $dI_F/dt$  (per diode).



Peak reverse recovery current versus  $dI_F/dt$  (per diode).



Dynamic parameters versus junction temperature (per diode)



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