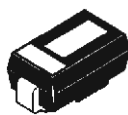


Schottky Rectifier, 2.1 A


SMA


FEATURES

- Small foot print, surface mountable
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Lead (Pb)-free ("PbF" suffix)
- Designed and qualified for industrial level


RoHS
COMPLIANT

DESCRIPTION

The 20MQ040NPbF surface mount Schottky rectifier has been designed for applications requiring low forward drop and very small foot prints on PC boards. Typical applications are in disk drives, switching power supplies, converters, freewheeling diodes, battery charging, and reverse battery protection.

PRODUCT SUMMARY

$I_{F(AV)}$	2.1 A
V_R	40 V

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	2.1	A
V_{RRM}		40	V
I_{FSM}	$t_p = 5 \mu s$ sine	120	A
V_F	2 Apk, $T_J = 125^\circ C$	0.63	V
T_J	Range	- 55 to 150	$^\circ C$

VOLTAGE RATINGS

PARAMETER	SYMBOL	20MQ040NPbF	UNITS
Maximum DC reverse voltage	V_R	40	V
Maximum working peak reverse voltage	V_{RWM}		

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current See fig. 4	$I_{F(AV)}$	50 % duty cycle at $T_C = 110^\circ C$, rectangular waveform On PC board 9 mm ² island (0.013 mm thick copper pad area)	2.1	A
Maximum peak one cycle non-repetitive surge current See fig. 6	I_{FSM}	5 μs sine or 3 μs rect. pulse	120	A
		10 ms sine or 6 ms rect. pulse	30	
Non-repetitive avalanche energy	E_{AS}	$T_J = 25^\circ C$, $I_{AS} = 1 A$, $L = 6 mH$	3	mJ
Repetitive avalanche current	I_{AR}		1.0	A

ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop See fig. 1	V _{FM} ⁽¹⁾	2 A	T _J = 25 °C	0.69	V
		1.5 A		0.62	
		1 A		0.54	
		2 A	T _J = 125 °C	0.63	
		1.5 A		0.56	
		1 A		0.49	
Maximum reverse leakage current See fig. 2	I _{RM} ⁽¹⁾	T _J = 25 °C	V _R = Rated V _R	0.5	mA
		T _J = 125 °C		26	
Threshold voltage	V _{F(TO)}	T _J = T _J maximum		0.36	V
Forward slope resistance	r _t			104	mΩ
Typical junction capacitance	C _T	V _R = 10 V _{DC} , T _J = 25 °C, test signal = 1 MHz		38	pF
Typical series inductance	L _S	Measured lead to lead 5 mm from package body		2.0	nH
Maximum voltage rate of change	dV/dt	Rated V _R		10 000	V/μs

Note(1) Pulse width < 300 μ s, duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range	T _J ⁽¹⁾ , T _{Stg}		- 55 to 150	°C
Maximum thermal resistance, junction to ambient	R _{thJA}	DC operation	80	°C/W
Approximate weight			0.07	g
			0.002	oz.
Marking device		Case style SMA (similar D-64)	V2F	

Note(1) $\frac{dP_{tot}}{dT_J} < \frac{1}{R_{thJA}}$ thermal runaway condition for a diode on its own heatsink

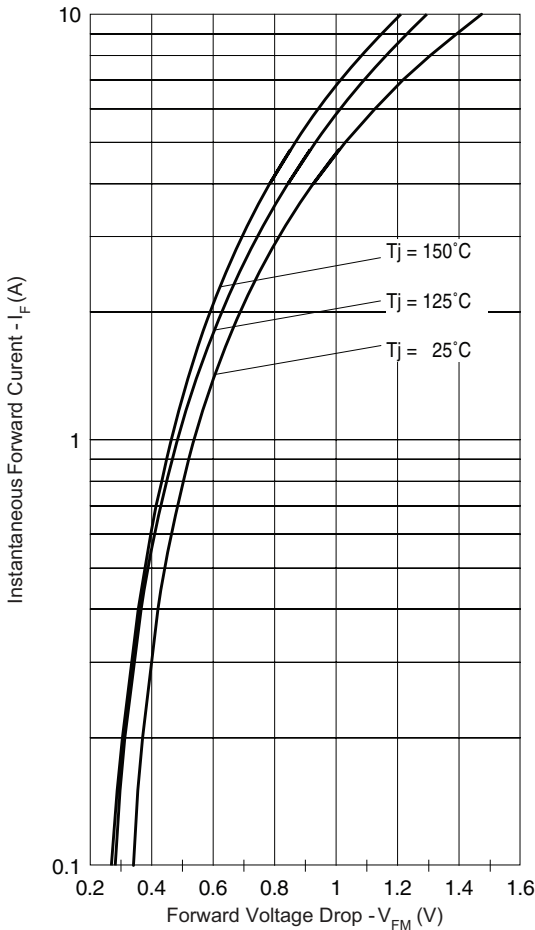


Fig. 1 - Maximum Forward Voltage Drop Characteristics

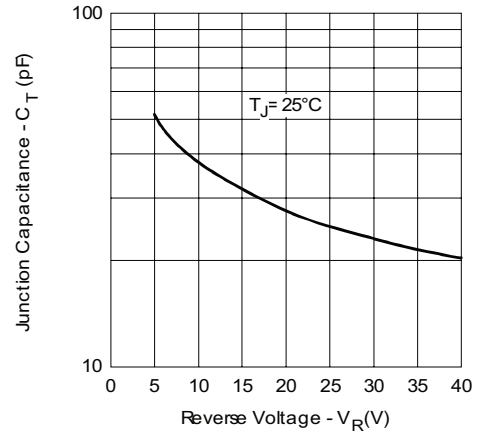


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

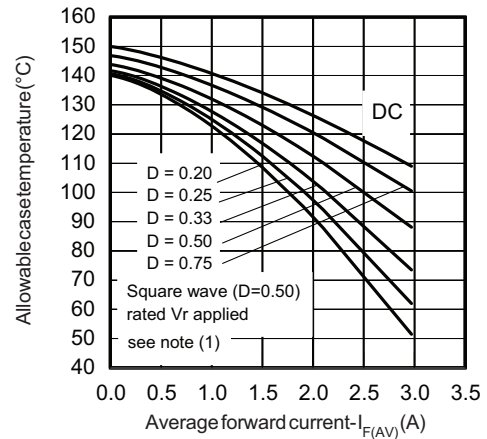


Fig. 4 - Maximum Average Forward Current vs. Allowable Lead Temperature

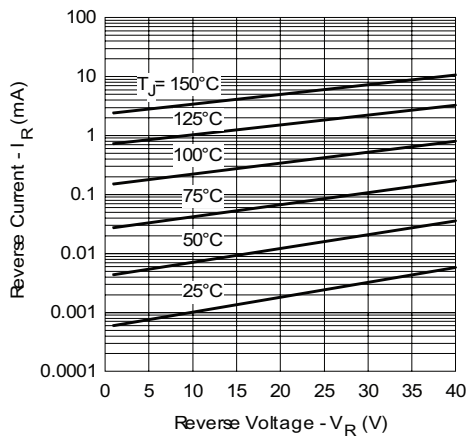


Fig. 2 - Typical Peak Reverse Current vs. Reverse Voltage

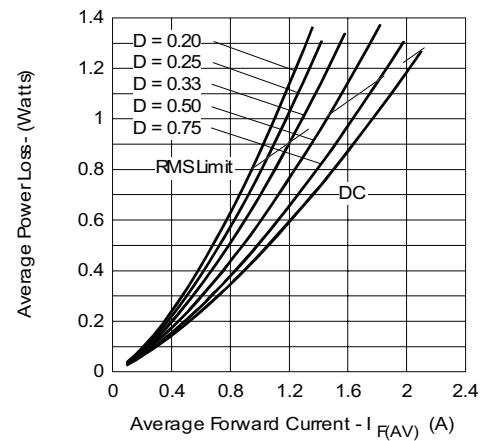


Fig. 5 - Maximum Average Forward Dissipation vs. Average Forward Current

Note

(1) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$

P_d = Forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6); $P_{d_{REV}}$ = Inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at $V_{R1} = 80\%$ rated V_R

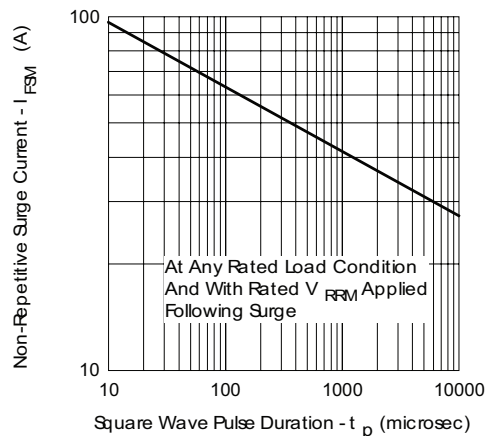


Fig. 6 - Maximum Peak Surge Forward Current vs. Pulse Duration

ORDERING INFORMATION TABLE

Device code

20	M	Q	040	N	TR	PbF
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1 2 3 4 5 6 7

- 1 - Current rating
- 2 - M = SMA
- 3 - Q = Schottky "Q" series
- 4 - Voltage rating (040 = 40 V)
- 5 - N = New SMA
- 6 -
 - None = Box (1000 pieces)
 - TR = Tape and reel (7500 pieces)
- 7 - PbF = Lead (Pb)-free

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95018
Part marking information	http://www.vishay.com/doc?95029
Packaging information	http://www.vishay.com/doc?95034



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