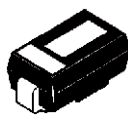


Schottky Rectifier, 2.1 A



SMA



FEATURES

- Small foot print, surface mountable
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Compliant to RoHS directive 2002/95/EC
- Designed and qualified for industrial level


RoHS
COMPLIANT

DESCRIPTION

The 10MQ040NPbF 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	DC	2.1	A
V_{RRM}		40	V
I_{FSM}	$t_p = 5 \mu s$ sine	120	A
V_F	1.5 Apk, $T_J = 125^\circ C$	0.56	V
T_J	Range	- 55 to 150	$^\circ C$

VOLTAGE RATINGS

PARAMETER	SYMBOL	10MQ040NPbF	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 $T_L = 123^\circ C$, rectangular waveform On PC board 9 mm ² island (0.013 mm thick copper pad area)	1.5	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	3.0	mJ
Repetitive avalanche current	I_{AR}	Current decaying linearly to zero in 1 μs Frequency limited by T_J maximum $V_A = 1.5 \times V_R$ typical	1.0	A

ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop See fig. 1	V _{FM} ⁽¹⁾	1 A	T _J = 25 °C	0.54	V
		1.5 A		0.62	
		1 A	T _J = 125 °C	0.49	
		1.5 A		0.56	
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 μs, 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)	V1F	

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

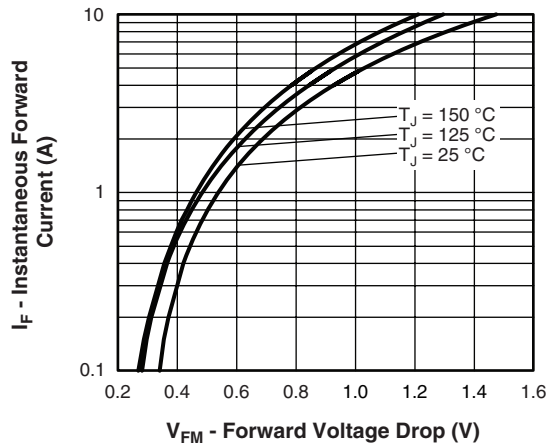


Fig. 1 - Maximum Forward Voltage Drop Characteristics

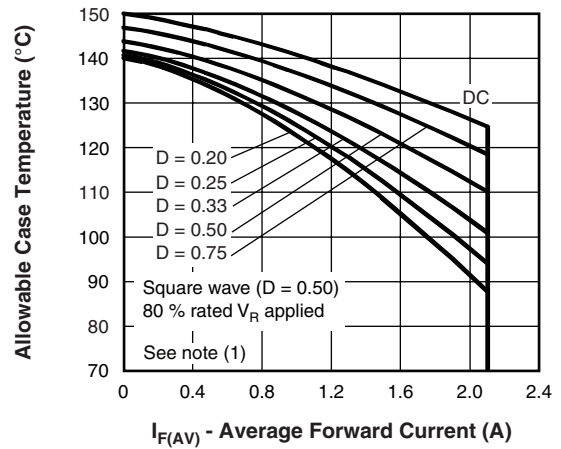


Fig. 4 - Maximum Average Forward Current vs. Allowable Lead Temperature

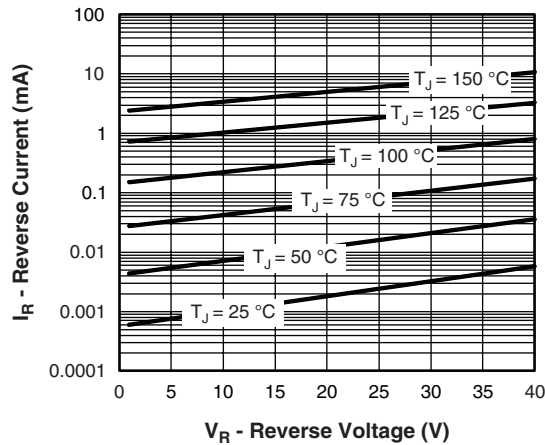


Fig. 2 - Typical Peak Reverse Current vs. Reverse Voltage

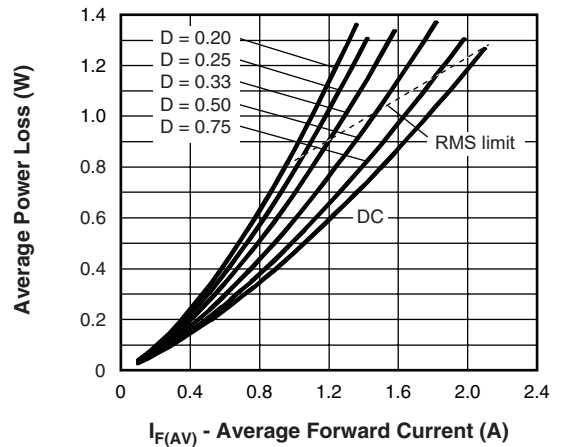


Fig. 5 - Maximum Average Forward Dissipation vs. Average Forward Current

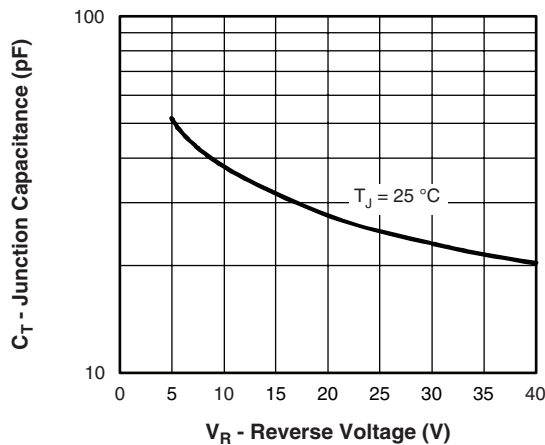


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

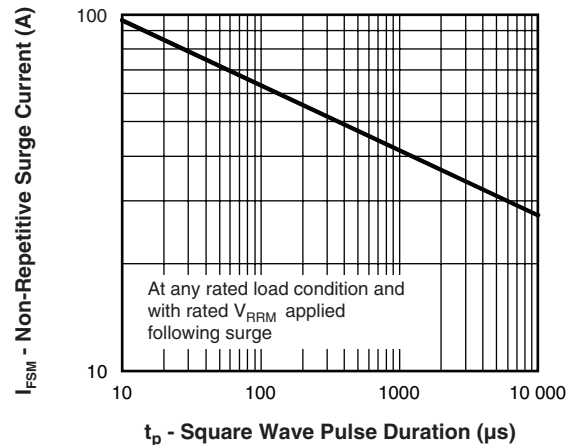


Fig. 6 - Maximum Peak Surge Forward Current vs. Pulse Duration

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

ORDERING INFORMATION TABLE

Device code	10	M	Q	040	N	TR	PbF
	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 | - | <ul style="list-style-type: none"> • None = Box (1000 pieces) • TR = Tape and reel (7500 pieces) |
| 7 | - | PbF = Lead (Pb)-free |

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95018
Part marking information	www.vishay.com/doc?95029
Packaging information	www.vishay.com/doc?95034
SPICE model	www.vishay.com/doc?95277



Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.