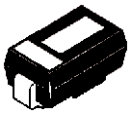
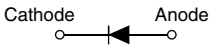
Schottky Rectifier, 3 A





SMA

FEATURES

- Surface mountable
- Extremely low forward voltage
- Compact size
- Improved reverse blocking voltage capability relative to other similar size Schottky
- Compliant to RoHS directive 2002/95/EC
- Designed and qualified for industrial level

RoHS COMPLIANT

APPLICATIONS

- Switching power supplies
- Meter protection
- Reverse protection for power input to PC board circuits
- Battery isolation and charging
- Low threshold voltage diode
- Freewheeling or by-pass diode
- Low voltage clamp

DESCRIPTION

The 15MQ040NPbF Schottky rectifier is designed to be used for low-power applications where a reverse voltage of 40 V is encountered and surface mountable is required.

PRODUCT SUMMARY	
$I_{F(AV)}$	3 A
V_R	40 V

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	DC	3	A
V_{RRM}		40	V
I_{FSM}	t_p = 5 µs sine	330	A
V_F	2 Apk, T_J = 125 °C	0.43	V
T_J	Range	- 40 to 150	°C

VOLTAGE RATINGS			
PARAMETER	SYMBOL	15MQ040NPbF	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 = 105 °C, rectangular waveform On PC board 9 mm² 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	Following any rated load condition and with rated V_{RRM} applied	330	A
		10 ms sine or 6 ms rect. pulse		140	
Non-repetitive avalanche energy	E_{AS}	T_J = 25 °C, I_{AS} = 1 A, L = 12 mH		6.0	mJ
Repetitive avalanche current	I_{AR}	Current decaying linearly to zero in 1 µs Frequency limited by T_J maximum V_A = 1.5 x 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	0.42	V
		2 A		0.49	
		1 A	T_J = 125 °C	0.34	
		2 A		0.43	
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		20	
Threshold voltage	$V_{F(TO)}$	T_J = T_J maximum		0.26	V
Forward slope resistance	r_t			64.6	mΩ
Typical junction capacitance	C_T	V_R = 10 V_{DC}, T_J = 25 °C, test signal = 1 MHz		134	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}		- 40 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)	V3F	

Note

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

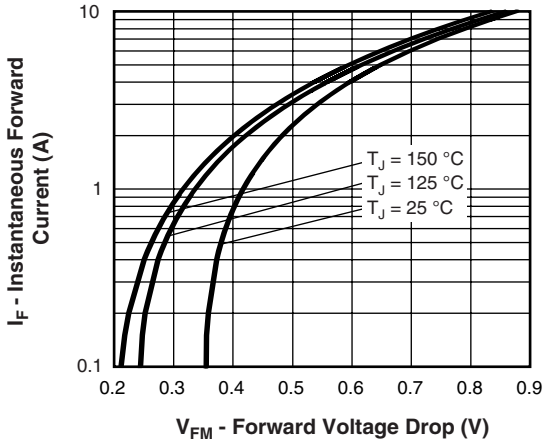


Fig. 1 - Maximum Forward Voltage Drop Characteristics

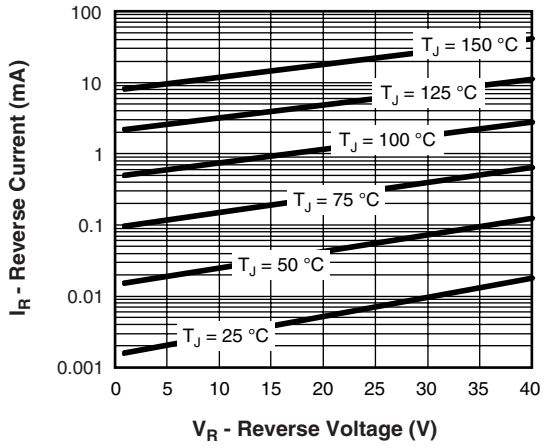


Fig. 2Typical Peak Reverse Current vs. Reverse Voltage

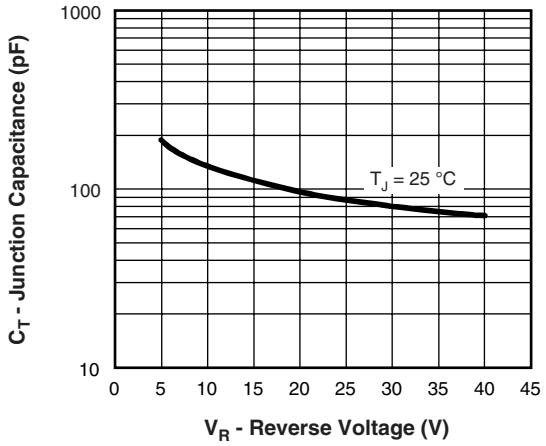


Fig. 3Typical Junction Capacitance vs. Reverse Voltage

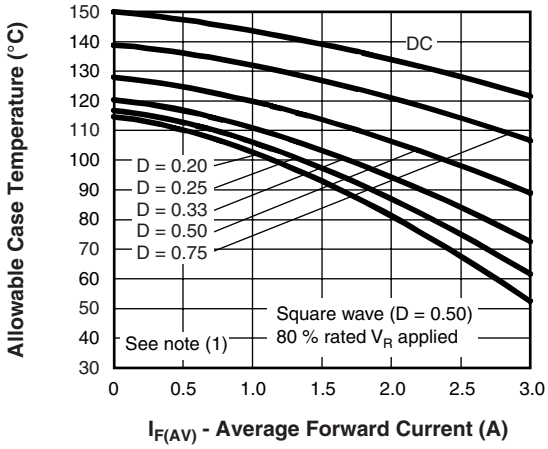


Fig. 4 - Maximum Average Forward Current vs. Allowable Lead Temperature

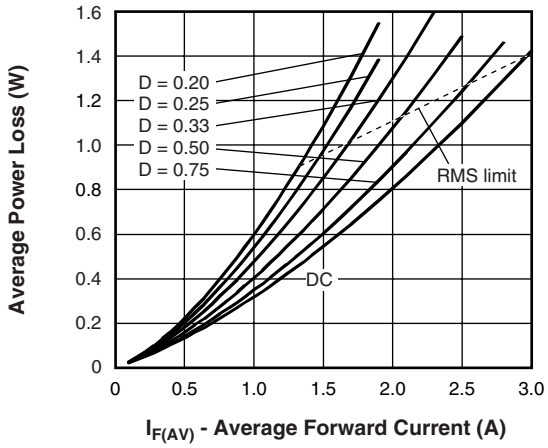


Fig. 5Maximum Average Forward Dissipation vs. Average Forward Current

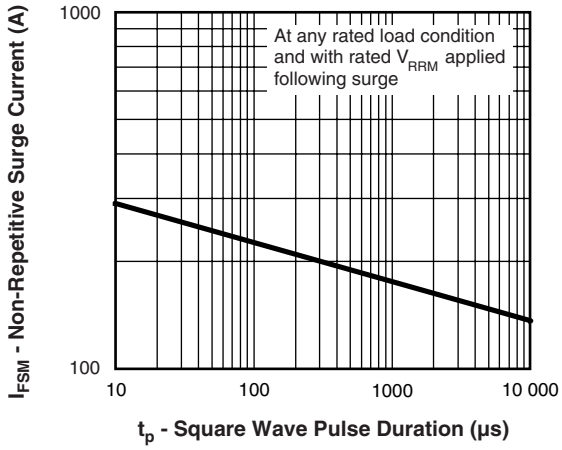


Fig. 6Maximum Peak Surge Forward Current vs. Pulse Duration

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

ORDERING INFORMATION TABLE

Device code

15	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 - • 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?95273

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