

Excellent Integrated System Limited

Stocking Distributor

Click to view price, real time Inventory, Delivery & Lifecycle Information:

[Vishay Semiconductor/Diodes Division](#)
[VS-20MQ060-M3/5AT](#)

For any questions, you can email us directly:

sales@integrated-circuit.com



www.vishay.com

VS-20MQ060-M3

Vishay Semiconductors

Schottky Rectifier, 2 A



DO-214AC (SMA)



FEATURES

- Low forward voltage drop
- Guard ring for enhanced ruggedness and long term reliability
- Halogen-free according to IEC 61249-2-21 definition
- Small foot print, surface mountable
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Compliant to RoHS Directive 2002/95/EC



RoHS
COMPLIANT
HALOGEN
FREE

PRODUCT SUMMARY	
Package	DO-214AC (SMA)
$I_{F(AV)}$	2 A
V_R	60 V
V_F at I_F	0.68 V
I_{RM}	7.5 mA at 125 °C
T_J max.	150 °C
Diode variation	Single die
E_{AS}	2.0 mJ

DESCRIPTION

The VS-20MQ060-M3 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.

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	2	A
V_{RRM}		60	V
I_{FSM}	$t_p = 5 \mu s$ sine	40	A
V_F	2 A _{pk} , $T_J = 125 \text{ °C}$	0.68	V
T_J	Range	- 55 to 150	°C

VOLTAGE RATINGS			
PARAMETER	SYMBOL	VS-20MQ060-M3	UNITS
Maximum DC reverse voltage	V_R	60	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 $T_L = 107 \text{ °C}$, rectangular waveform On PC board 9 mm ² island (0.013 mm thick copper pad area)	2.1	A	
		50 % duty cycle at $T_L = 110 \text{ °C}$, rectangular waveform On PC board 9 mm ² island (0.013 mm thick copper pad area)	2		
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	40	A
		10 ms sine or 6 ms rect. pulse		10	
Non-repetitive avalanche energy	E_{AS}	$T_J = 25 \text{ °C}$, $I_{AS} = 1 \text{ A}$, $L = 4 \text{ mH}$	2.0	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	



www.vishay.com

VS-20MQ060-M3

Vishay Semiconductors

ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop See fig. 1	$V_{FM}^{(1)}$	2 A	$T_J = 25\text{ }^\circ\text{C}$	0.78	V
		1.5 A		0.71	
		1 A		0.63	
		2 A	$T_J = 125\text{ }^\circ\text{C}$	0.68	
		1.5 A		0.63	
		1 A		0.57	
Maximum reverse leakage current See fig. 2	I_{RM}	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	0.5	mA
		$T_J = 125\text{ }^\circ\text{C}$		7.5	
Threshold voltage	$V_{F(TO)}$	$T_J = T_J \text{ maximum}$		0.45	V
Forward slope resistance	r_t			86.8	m Ω
Typical junction capacitance	C_T	$V_R = 10\text{ }V_{DC}, T_J = 25\text{ }^\circ\text{C}, \text{ test signal} = 1\text{ MHz}$		31	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/ μ s

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	$^\circ\text{C}$
Maximum thermal resistance, junction to ambient	R_{thJA}	DC operation		80	$^\circ\text{C/W}$
Approximate weight				0.07	g
				0.002	oz.
Marking device		Case style SMA (similar D-64)		2H	

Note

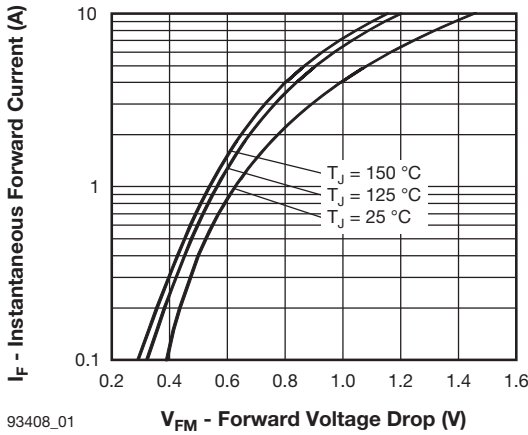
(1) $\frac{dP_{tot}}{dT_J} < \frac{1}{R_{thJA}}$ thermal runaway condition for a diode on its own heatsink



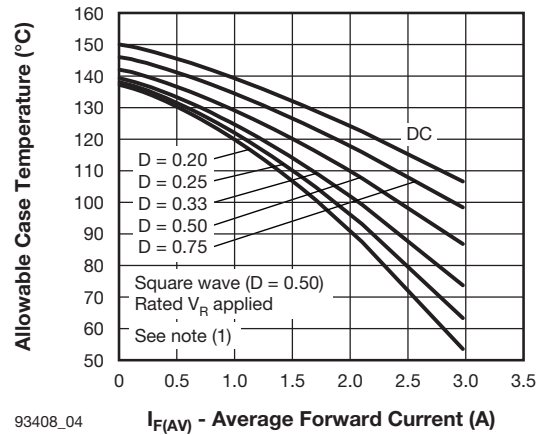
www.vishay.com

VS-20MQ060-M3

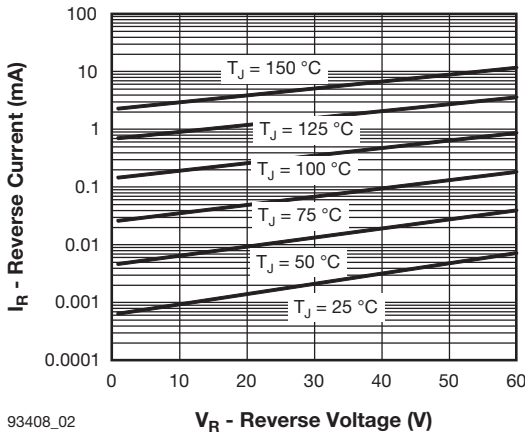
Vishay Semiconductors



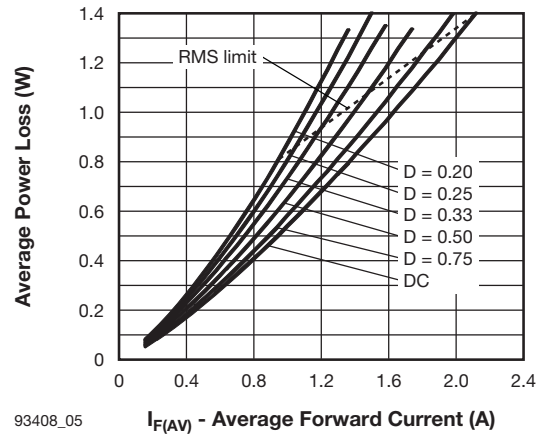
93408_01 **V_{FM} - Forward Voltage Drop (V)**
Fig. 1 - Maximum Forward Voltage Drop Characteristics



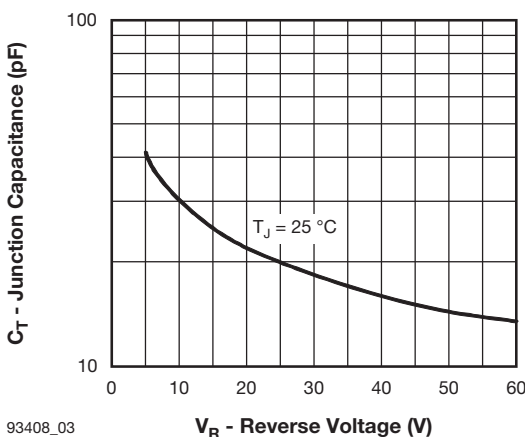
93408_04 **I_{F(AV)} - Average Forward Current (A)**
Fig. 4 - Maximum Average Forward Current vs. Allowable Lead Temperature



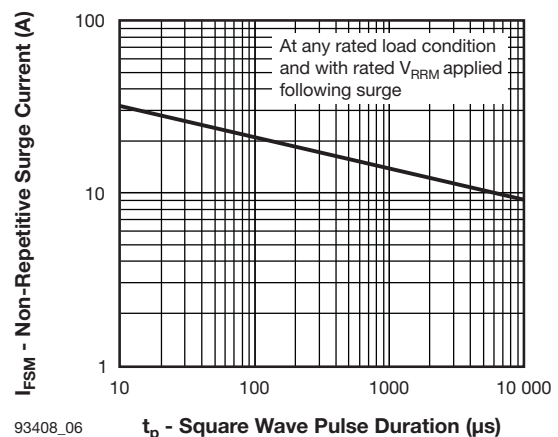
93408_02 **V_R - Reverse Voltage (V)**
Fig. 2 - Typical Peak Reverse Current vs. Reverse Voltage



93408_05 **I_{F(AV)} - Average Forward Current (A)**
Fig. 5 - Maximum Average Forward Dissipation vs. Average Forward Current



93408_03 **V_R - Reverse Voltage (V)**
Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage



93408_06 **t_p - Square Wave Pulse Duration (μs)**
Fig. 6 - Maximum 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



www.vishay.com

VS-20MQ060-M3

Vishay Semiconductors

ORDERING INFORMATION TABLE

Device code	VS-	20	M	Q	060	-M3
	①	②	③	④	⑤	⑥

- 1** - Vishay Semiconductors product suffix
- 2** - Current rating
- 3** - M = SMA
- 4** - Q = Schottky "Q" series
- 5** - Voltage rating (060 = 60 V)
- 6** - Environmental digit:
-M3 = Halogen-free, RoHS compliant and terminations lead (Pb)-free

ORDERING INFORMATION (Example)			
PREFERRED P/N	PREFERRED PACKAGE CODE	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-20MQ060-M3/5AT	5AT	7500	13" diameter plastic tape and reel

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95400
Part marking information	www.vishay.com/doc?95403
Packaging information	www.vishay.com/doc?95404

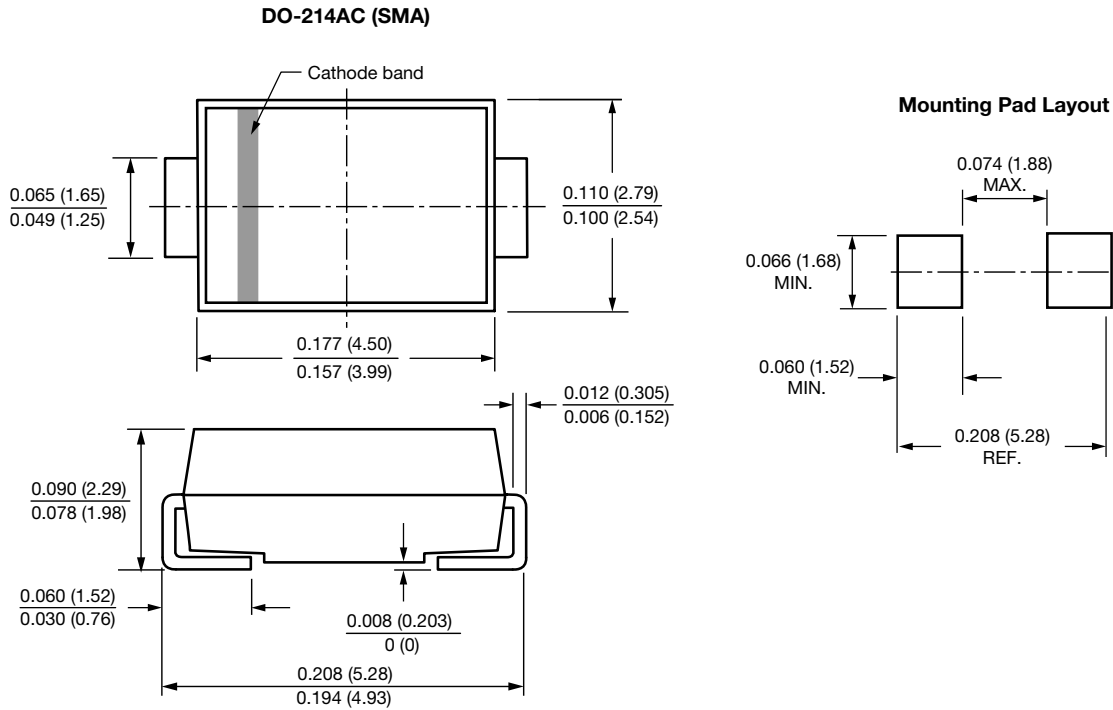


Outline Dimensions

Vishay Semiconductors

SMA

DIMENSIONS in inches (millimeters)





Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

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 in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

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