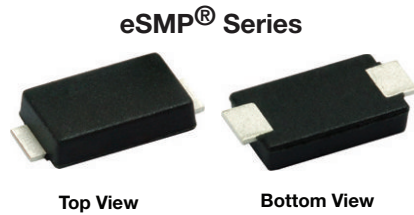


# 1200 V Gen 3 Power SiC Merged PIN Schottky Diode, 1 A



Top View

Bottom View

**SlimSMA HV (DO-221AC)**

Cathode Anode

**LINKS TO ADDITIONAL RESOURCES**


3D Models

PRIMARY CHARACTERISTICS	
$I_F$	1 A
$V_R$	1200 V
$V_F$ at $I_F$ at 25 °C, typ.	1.35 V
$T_J$ max.	175 °C
$I_R$ at $V_R$ at 175 °C	4.5 $\mu$ A
$Q_C$ ( $V_R = 800$ V)	7.5 nC
Package	SlimSMA HV (DO-221AC)
Circuit configuration	Single

**FEATURES**

- Minimum creepage distance 3.2 mm guaranteed by design
- Comparative Tracking Index: CTI  $\geq$  600
- High CTI molding compound provides excellent electrical insulation at relevant working voltages
- Positive  $V_F$  temperature coefficient for easy paralleling
- Virtually no recovery tail and no switching losses
- Temperature invariant switching behavior
- 175 °C maximum operating junction temperature
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- MPS structure for high ruggedness to forward current surge events
- Meets JESD 201 class 2 whisker test
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
 COMPLIANT  
 HALOGEN  
**FREE**
**DESCRIPTION / APPLICATIONS**

Wide band gap SiC based 1200 V Schottky diode, designed for high performance and ruggedness.

Optimized for extreme high-speed hard switching over a wide temperature range. It is suited for demanding applications, such as bootstrap and anti-parallel diodes in AC/DC and DC/DC converters.

**MECHANICAL DATA**

**Case:** SlimSMA HV (DO-221AC)

Molding compound meets UL 94 V-0 flammability rating  
 Base P/N-M3 - halogen-free, RoHS-compliant

**Terminals:** matte tin plated leads, solderable per J-STD-002

MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise specified)				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Peak repetitive reverse voltage	$V_{RRM}$		1200	V
Continuous forward current	$I_F$	$T_M = 150$ °C (DC) <sup>(1)</sup>	1	A
DC blocking voltage	$V_{DC}$		1200	V
Repetitive peak forward current	$I_{FRM}$	$T_M = 25$ °C, $f = 50$ Hz, square wave, DC = 25 %	4.9	A
Non-repetitive peak forward surge current	$I_{FSM}$	$T_M = 25$ °C, $t_p = 10$ ms, half sine wave	12.5	
		$T_M = 110$ °C, $t_p = 10$ ms, half sine wave	10.5	
Power dissipation	$P_{tot}$ <sup>(1)</sup>	$T_M = 25$ °C	12.5	W
		$T_M = 110$ °C	5.4	
	$P_{tot}$ <sup>(2)</sup>	$T_M = 25$ °C	9.7	W
		$T_M = 110$ °C	4.2	
$I^2t$ value	$\int i^2 dt$	$T_M = 25$ °C	0.8	A <sup>2</sup> s
		$T_M = 110$ °C	0.6	
Operating junction and storage temperatures	$T_J$ <sup>(3)</sup> , $T_{Stg}$		-55 to +175	°C

**Notes**

<sup>(1)</sup> Based on typical  $R_{th}$

<sup>(2)</sup> Based on maximum  $R_{th}$

<sup>(3)</sup> The heat generated must be less than the thermal conductivity from junction-to-ambient:  $dP_D/dT_J < 1/R_{\theta JA}$

<b>ELECTRICAL SPECIFICATIONS</b> ( $T_J = 25\text{ }^\circ\text{C}$ unless otherwise specified)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Forward voltage	$V_F$	$I_F = 1\text{ A}$	-	1.35	1.50	V
		$I_F = 1\text{ A}, T_J = 150\text{ }^\circ\text{C}$	-	1.73	2.00	
		$I_F = 1\text{ A}, T_J = 175\text{ }^\circ\text{C}$	-	1.85	-	
Reverse leakage current	$I_R$	$V_R = V_R\text{ rated}$	-	0.12	10	$\mu\text{A}$
		$V_R = V_R\text{ rated}, T_J = 150\text{ }^\circ\text{C}$	-	0.70	20	
		$V_R = V_R\text{ rated}, T_J = 175\text{ }^\circ\text{C}$	-	4.5	-	
Total capacitance	C	$V_R = 1\text{ V}, f = 1\text{ MHz}$	-	67	-	pF
		$V_R = 800\text{ V}, f = 1\text{ MHz}$	-	6.0	-	
Total capacitive charge	$Q_C$	$V_R = 800\text{ V}, f = 1\text{ MHz}$	-	7.5	-	nC

<b>THERMAL AND MECHANICAL SPECIFICATIONS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise specified)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Thermal resistance, junction to mount	$R_{thJM}^{(1)}$		-	12	15.5	$^\circ\text{C/W}$
Marking device				C112		

**Note**

(1) Thermal resistance junction to mount follows JEDEC® 51-14 transient dual interface test method (TDIM)

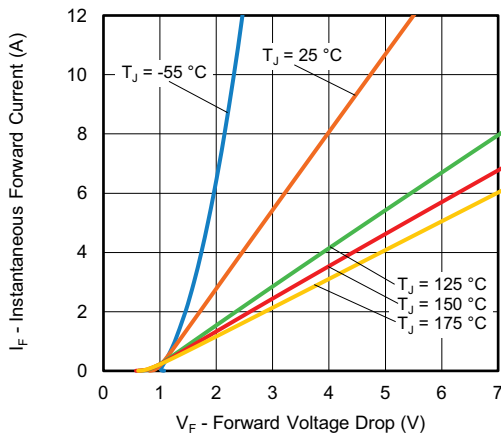


Fig. 1 - Typical Forward Voltage Drop Characteristics

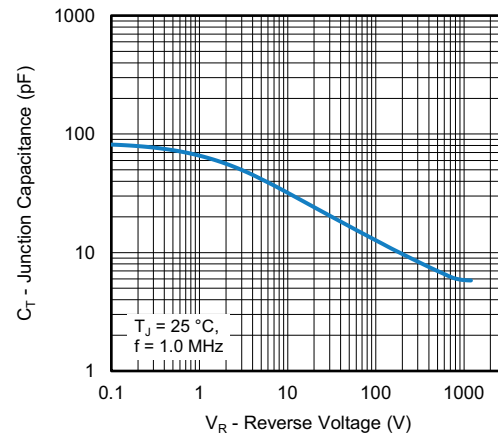


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

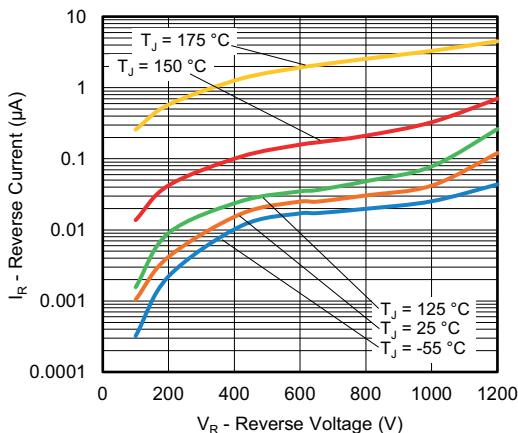


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

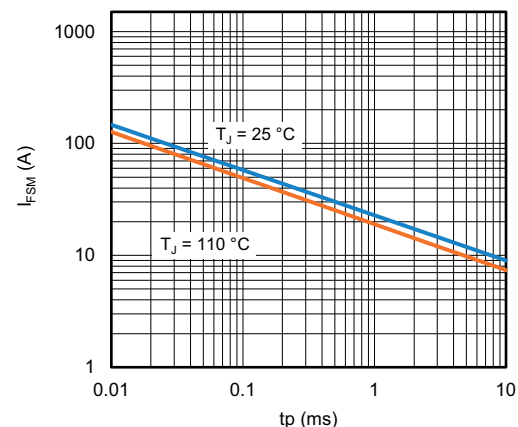


Fig. 4 - Non-Repetitive Peak Forward Surge Current vs. Pulse Duration (Square Wave)

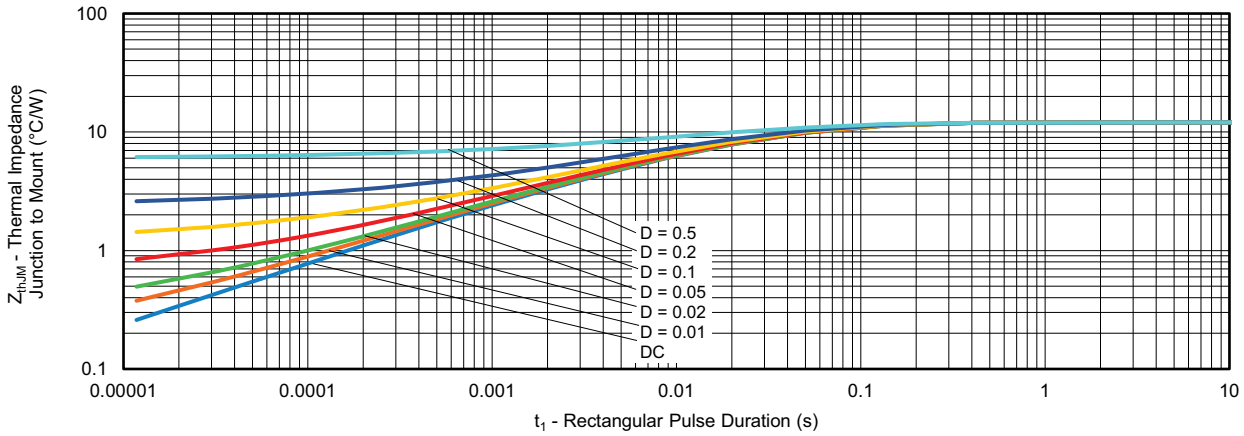


Fig. 5 - Typical Thermal Impedance  $Z_{thJM}$  Characteristics

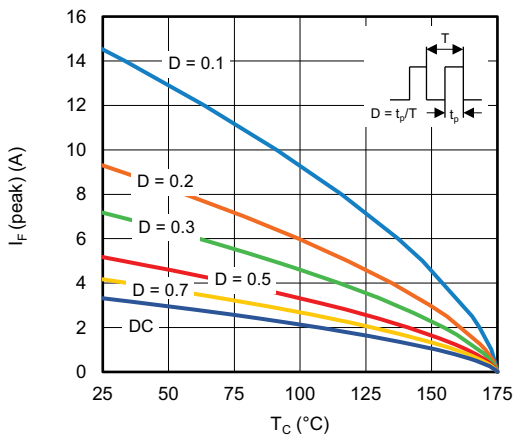


Fig. 6 - Peak Forward Current vs. Maximum Allowable Mount Temperature

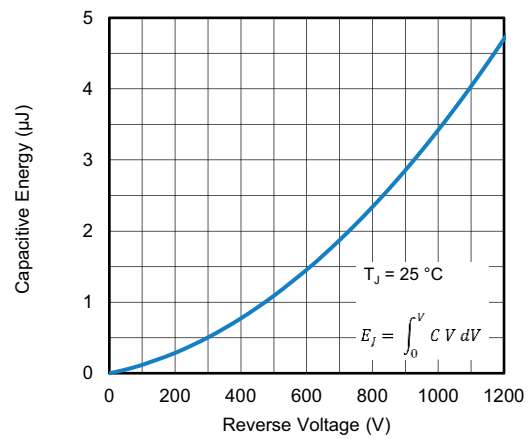


Fig. 8 - Typical Capacitive Energy vs. Reverse Voltage

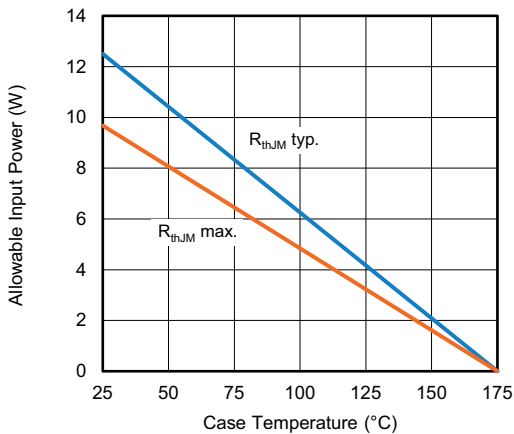


Fig. 7 - Forward Power Loss Characteristics

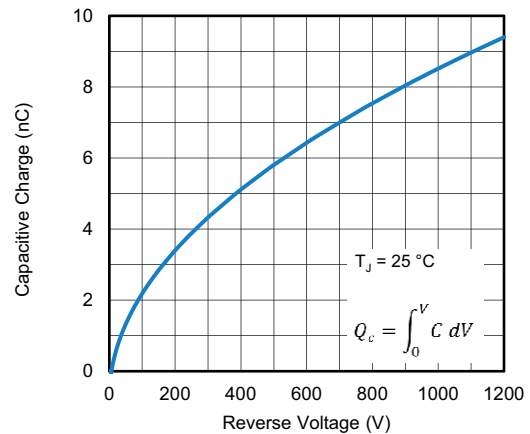
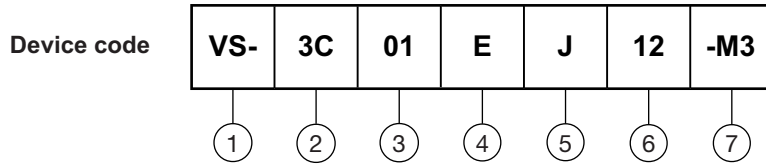


Fig. 9 - Typical Capacitive Charge vs. Reverse Voltage



### ORDERING INFORMATION TABLE



- 1** - Vishay Semiconductors product
- 2** - 3C = SiC diode, generation 3
- 3** - Current rating (01 = 1 A)
- 4** - E = single diode
- 5** - J = SlimSMA HV package
- 6** - Voltage rating: (12 = 1200 V)
- 7** - Environmental digit:  
-M3 = halogen-free, RoHS-compliant, and termination lead (Pb)-free

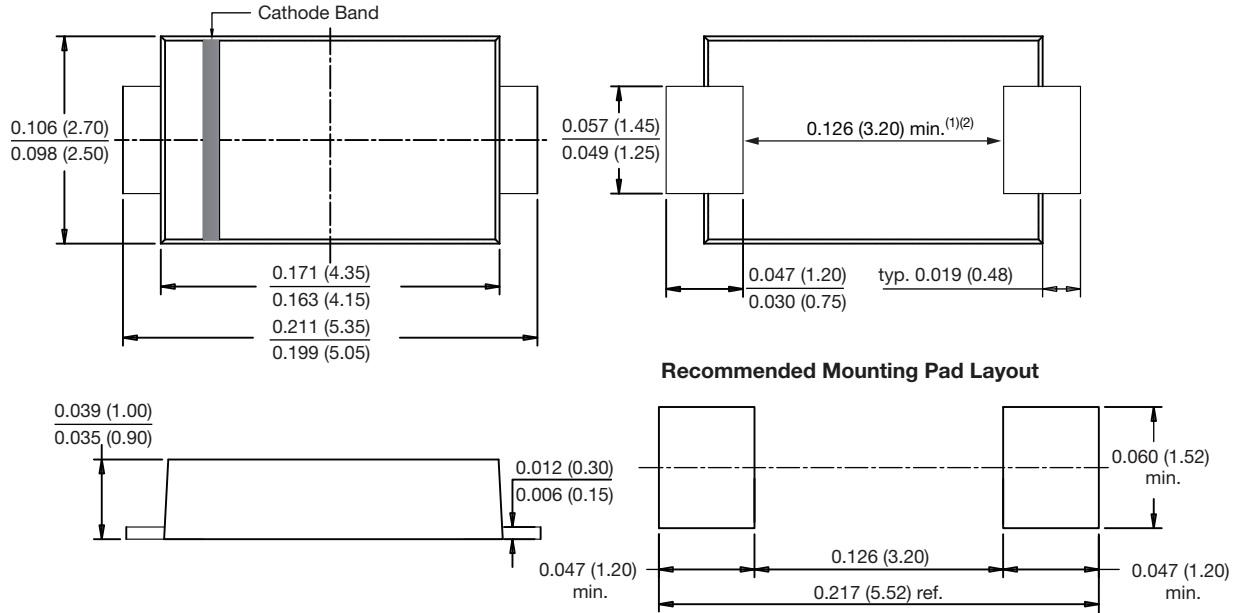
ORDERING INFORMATION			
PREFERRED P/N	UNIT WEIGHT (g)	BASE QUANTITY	PACKAGING DESCRIPTION
VS-3C01EJ12-M3/H	0.032	3500 per reel	7" diameter plastic tape and reel
VS-3C01EJ12-M3/I	0.032	14 000 per reel	13" diameter plastic tape and reel

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?97278">www.vishay.com/doc?97278</a>
Part marking information	<a href="http://www.vishay.com/doc?98699">www.vishay.com/doc?98699</a>
Packaging information	<a href="http://www.vishay.com/doc?98714">www.vishay.com/doc?98714</a>



## SlimSMA HV (DO-221AC)

**DIMENSIONS** in inches (millimeters)



### Notes

- (1) Minimum creepage distance is defined and guaranteed by design
- (2) For high voltage applications, end users should consider the relevant guidelines and normative on creepage and clearance distances between device terminals and PCB pads.



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