

Surface-Mount Glass Passivated Rectifier



SMC (DO-214AB)

Cathode  Anode

LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	12 A
V_{RRM}	1200 V
I_{FSM}	300 A
I_R	10 μ A
V_F at $I_F = 12$ A ($T_J = 125$ °C)	0.90 V
T_J max.	150 °C
Package	SMC (DO-214AB)
Circuit configurations	Single

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated pellet chip junction
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
 - Automotive ordering code: base P/NHM3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters, and freewheeling diodes for consumer, automotive, and telecommunication.

MECHANICAL DATA

Case: SMC (DO-214AB)

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

Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 and HM3 suffix meets JESD 201 class 2 whisker test

Polarity: color band denotes cathode end

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)			
PARAMETER	SYMBOL	S12CQ	UNIT
Device marking code		12Q	
Maximum repetitive peak reverse voltage	V_{RRM}	1200	V
Maximum RMS voltage	V_{RMS}	840	V
Maximum DC blocking voltage	V_{DC}	1200	V
Maximum average forward rectified current	$I_{F(AV)}$ ⁽¹⁾	12	A
	$I_{F(AV)}$ ⁽²⁾	2	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	300	A
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +150	°C

Notes

(1) Mounted on aluminum PCB 10 mm x 10 mm with aluminum heatsink

(2) Free air, mounted on recommended copper pad area



ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I _F = 6.0 A	T _J = 25 °C	V _F ⁽¹⁾	0.92	-	V
	I _F = 12.0 A			1.0	1.1	
	I _F = 6.0 A	T _J = 125 °C		0.81	-	
	I _F = 12.0 A			0.90	-	
Reverse current	Rated V _R	T _J = 25 °C	I _R ⁽²⁾	-	10	μA
		T _J = 125 °C		104	350	
Typical reverse recovery time	I _F = 0.5 A, I _R = 1.0 A, I _{rr} = 0.25 A		t _{rr}	5	-	μs
Typical junction capacitance	4.0 V, 1 MHz		C _J	79	-	pF

Notes

- (1) Pulse test: 300 μs pulse width; 1 % duty cycle
 (2) Pulse test: pulse width $\leq 40\text{ ms}$

THERMAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	S12CQ	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)(2)}$	87	$^{\circ}\text{C/W}$
	$R_{\theta JM}^{(3)}$	4	

Notes

- (1) The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$
 (2) Thermal resistance junction-to-ambient to follow JEDEC® 51-2A, device mounted on FR4 PCB, 2 oz.
 (3) Thermal resistance junction-to-mount to follow JEDEC® 51-14 transient dual interface test method (TDIM)

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
S12CQ-M3/I	0.257	I	3500	13" diameter plastic tape and reel
S12CQH3/I ⁽¹⁾	0.257	I	3500	13" diameter plastic tape and reel

Note

- (1) AEC-Q101 qualified

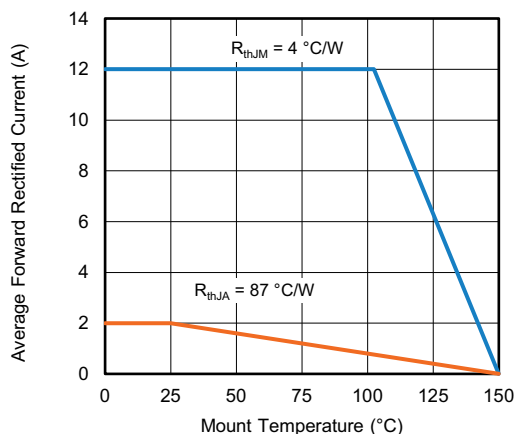
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)


Fig. 1 - Forward Current Derating Curve

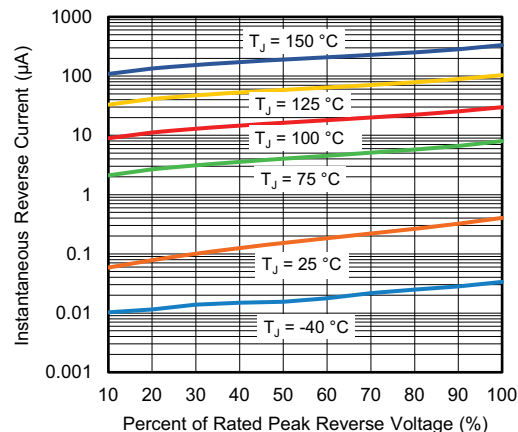


Fig. 4 - Typical Reverse Characteristics

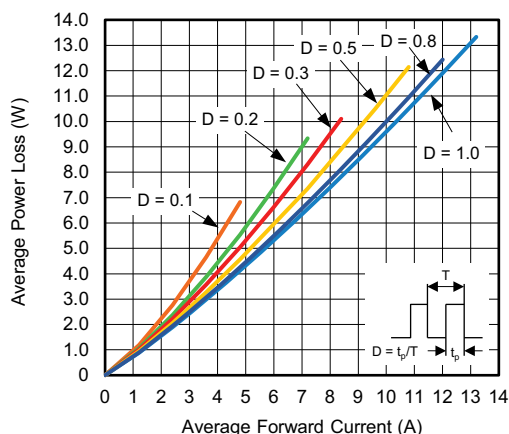


Fig. 2 - Average Power Loss Characteristics

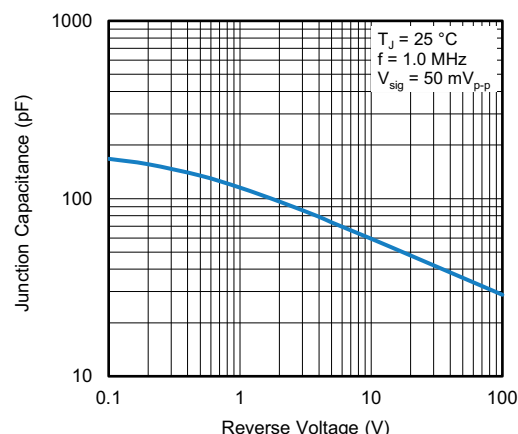


Fig. 5 - Typical Junction Capacitance

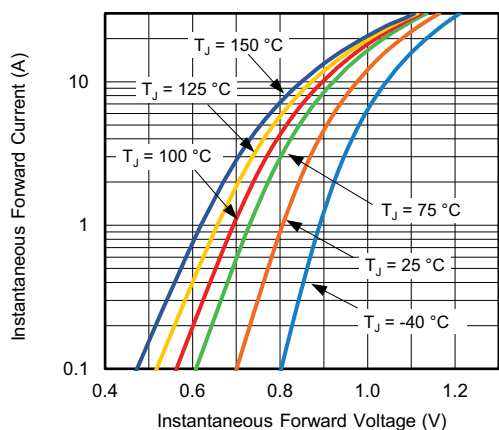


Fig. 3 - Typical Instantaneous Forward Characteristics

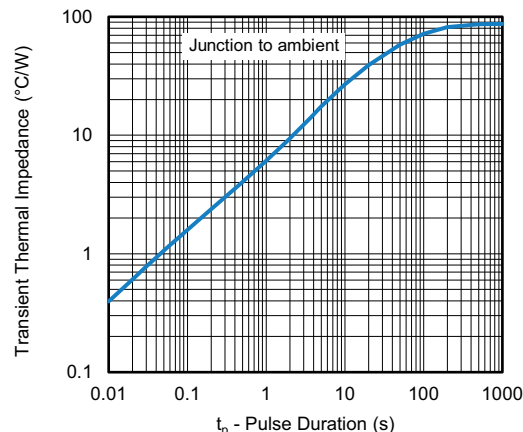
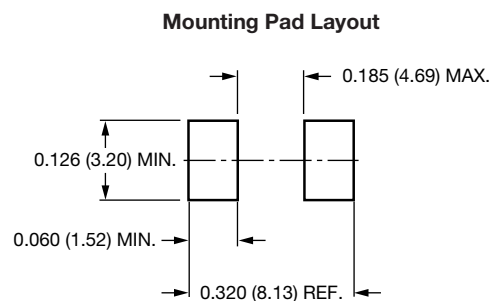
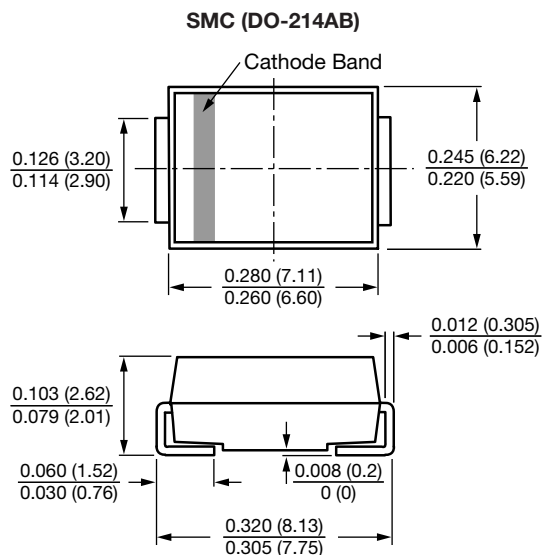


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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