

5 Amp Ultra Low Forward Voltage Schottky Rectifier

HSM540J–HSM5100JE3, HSM540G–HSM5100GE3



Product Overview

The HSM5xx series provides a 5 Amp Schottky surface mount rectifier with low forward voltage and low leakage current. The SMCJ J-bend design in the DO-214AB package allows for greater PC board mounting density. The SMCG Gull-wing design in the DO-215AB package is ideal for visible solder connections. For critical applications requiring very fast switching, these very low forward voltage Schottkys with their “hot carrier” features provide extremely fast switching to replace conventional ultrafast rectifiers.

Features

- Schottky Barrier Rectifier
- Surface mount plastic package
- Guard ring for reverse protection
- High surge capability
- Ultra low forward voltage
- Schottky OR'ing diode
- RoHS compliant versions are available with an e3 suffix
- Moisture classification is level 1 with no dry pack required per IPC/JEDEC J-STD-020F

Applications/Benefits

- Silicon Schottky (hot carrier) rectifier for minimal t_{rr} and elimination of reverse-recovery oscillations to reduce need for EMI filtering
- For use in high-frequency switching power supplies, inverters, freewheeling, polarity protection, and “OR'ing” applications
- Low forward power loss and high efficiency

Figure 1. DO-215AB (SMCG) Package

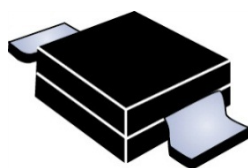


Figure 2. DO-214AB (SMCJ) Package



Note: All SMC series are equivalent to prior SMM package identifications.

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1. Maximum Ratings

Table 1-1. Maximum Ratings at 25°C Unless Otherwise Noted

Parameters/Test Conditions	Symbol	Value	Unit
Storage Temperature	T_{STG}	–55 to +150	°C
Junction Temperature	T_J	–55 to +150	°C
Thermal Resistance Junction-to-Lead	$R_{\theta JL}$	22	°C/W
Forward Surge Current ⁽¹⁾	I_{FSM}	200	A
Average Rectified Forward Current (Square wave)	I_O	5.0	A
Solder Temperature at 10 s		260	°C

Note: At 8.3 ms single half-sine waveform superimposed on rated load (JEDEC method), $T_J=150^{\circ}\text{C}$.

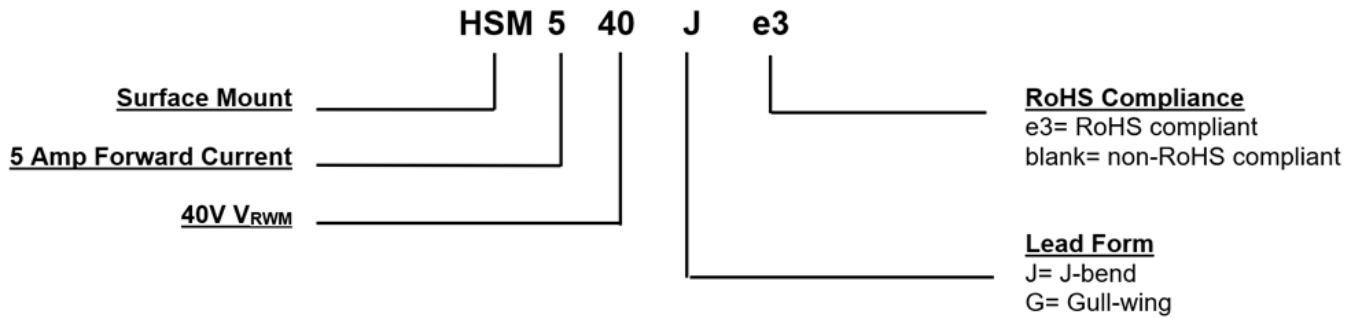
1.1. Mechanical and Packaging

- Case: Void-free transfer molded thermosetting epoxy body meeting UL94V-0.
- Terminals: Tin-lead or RoHS compliant annealed matte-tin plating, readily solderable per MIL-STD-750, method 2026.
- Polarity: Indicated by cathode band.
- Tape-And-Reel: Standard per EIA-481-B (add “TR” suffix to part number). Consult factory for quantities.
- Weight: Approximately 0.13 grams.

Note: See [Package Dimensions](#).

2. Part Nomenclature

Figure 2-1. Part Nomenclature



2.1. Symbols and Definitions

Table 2-1. Symbols and Definitions

Symbol	Definition
C_J	Junction Capacitance: The total small signal capacitance between the diode terminals of a complete device.
I_F	Forward Current: The forward current dc value, no alternating component.
I_{FSM}	Maximum Forward Surge Current: The forward current, surge peak or rated forward surge current.
I_O	Average Rectified Forward Current: The current averaged over a full cycle with a 180 degree conduction angle (square wave).
I_R	Reverse Current: The maximum reverse (leakage) current that will flow at the specified voltage and temperature.
V_F	Maximum Forward Voltage: The maximum forward voltage the device will exhibit at a specified current.
V_R	Reverse Voltage: The reverse voltage dc value, no alternating component.
V_{RRM}	Repetitive Peak Reverse Voltage: The peak reverse voltage including all repetitive transient voltages but excluding all non-repetitive transient voltages.
V_{RWM}	Working Peak Reverse Voltage: The maximum peak voltage that can be applied over the operating temperature range excluding all transient voltages (ref JE5D282-B). Also sometimes known as PIV.

2.2. Electrical Characteristics

Table 2-2. Electrical Characteristics at 25°C Unless Otherwise Stated

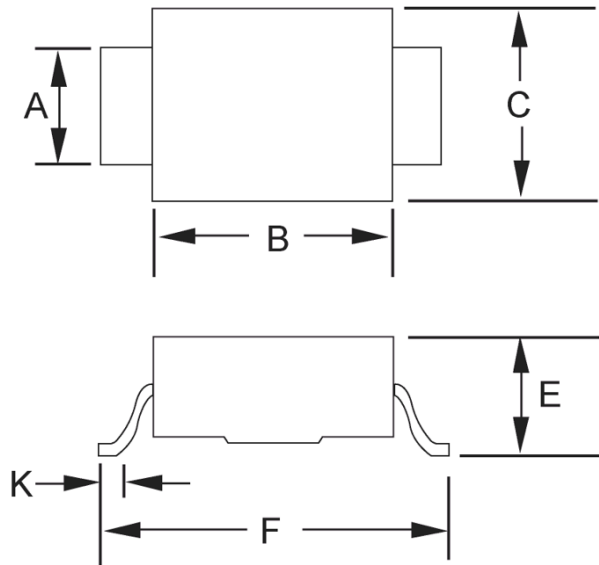
Part Number	Device Marking	Working Peak Reverse Voltage	Reverse Current	Peak Forward Voltage ⁽¹⁾	Peak Forward Voltage ⁽¹⁾	Junction Capacitance
		V _{RWM}	I _R	V _F at 1A	V _F at 5A	at 5V
			T _J = 25°C	T _J = 25°C	T _J = 25°C	
			at V _{RWM}	V _{FM}	V _{FM}	C _J
		Volts	μA	Volts	Volts	pF
		MAX	MAX	MAX	MAX	Typical
HSM540(G/J)(e3)	H540	40	250	0.60	0.80	380
HSM550(G/J)(e3)	H550	50	250	0.60	0.80	380
HSM560(G/J)(e3)	H560	60	250	0.60	0.80	380
HSM580(G/J)(e3)	H580	80	250	0.60	0.80	280
HSM590(G/J)(e3)	H590	90	250	0.60	0.80	280
HSM5100(G/J)(e3)	H5100	100	250	0.60	0.80	280

Note: Obtained through square wave pulse with a pulse width of 300 μs and a 2% duty cycle.

3. Package Dimensions

3.1. SMCG (DO-215AB)

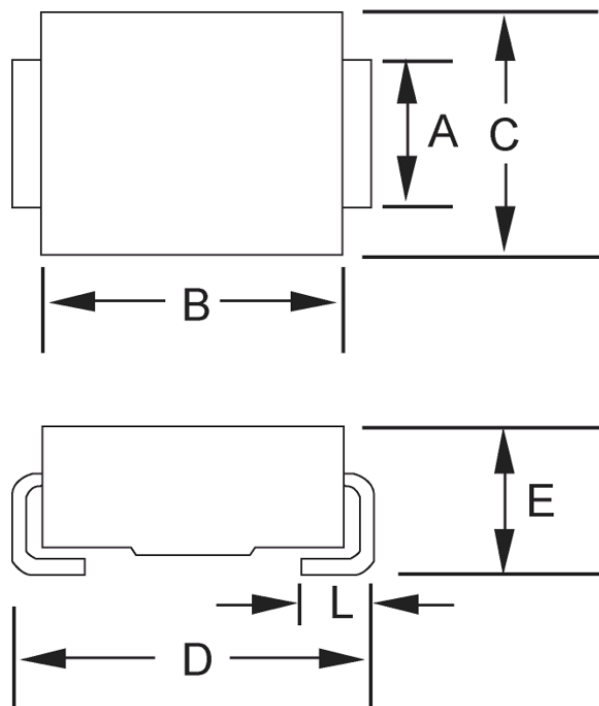
Figure 3-1. SMCG (DO-215AB)



Ltr	Dimensions			
	Inch		Millimeters	
	Min	Max	Min	Max
A	0.117	0.123	2.97	3.12
B	0.260	0.280	6.60	7.11
C	0.220	0.245	5.59	6.22
E	0.075	0.095	1.91	2.41
F	0.380	0.400	9.65	10.16
K	0.025	0.040	0.640	1.02

3.2. SMCJ (DO-214AB)

Figure 3-2. SMCJ (DO-214AB)

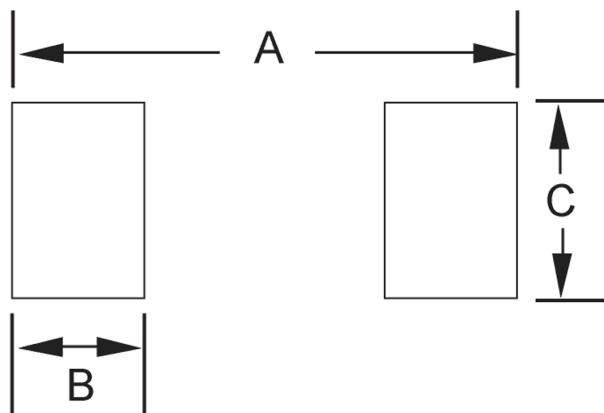


Ltr	Dimensions			
	Inch		Millimeters	
	Min	Max	Min	Max
A	0.117	0.123	2.97	3.12
B	0.260	0.280	6.60	7.11
C	0.220	0.245	5.59	6.22
D	0.307	0.322	7.80	8.18
E	0.075	0.095	1.91	2.41
L	0.030	0.060	0.760	1.52

4. Pad Layout

4.1. SMCG (DO-215AB)

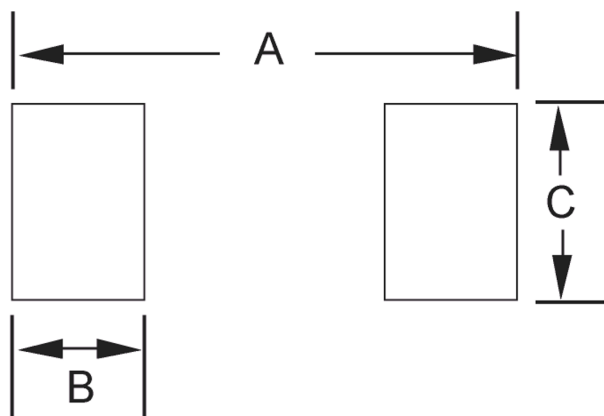
Figure 4-1. SMCG (DO-215AB)



Ltr	Inch	Millimeters
A	0.510	12.95
B	0.110	2.79
C	0.150	3.81

4.2. SMCJ (DO-214AB)

Figure 4-2. SMCJ (DO-214AB)



Ltr	Inch	Millimeters
A	0.390	9.90
B	0.110	2.79
C	0.150	3.81

5. Revision History

Revision Level	Date	Description
A	9/2025	Initial version created in the Microchip template. Legacy document number is RF01326.

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