

GB2X100MPS12-227

1200V 200A SiC Schottky MPS™ Diode



Silicon Carbide Schottky Diode

V_{RRM}	=	1200 V
$I_F (T_C = 100^\circ\text{C})$	=	304 A *
Q_C	=	220 nC *

Features

- High Avalanche (UIS) Capability
- Enhanced Surge Current Capability
- Superior Figure of Merit Q_C/I_F
- 3000 V Isolation with Low Thermal Resistance
- 175 °C Maximum Operating Temperature
- Temperature Independent Switching Behavior
- Positive Temperature Coefficient of V_F
- Extremely Fast Switching Speed

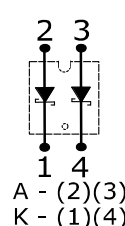
Advantages

- Low Standby Power Losses
- Improved Circuit Efficiency (Lower Overall Cost)
- Low Switching Losses
- Ease of Paralleling without Thermal Runaway
- Smaller Heat Sink Requirements
- Low Reverse Recovery Current
- Low Device Capacitance
- Low Reverse Leakage Current

Package



SOT-227 (Isolated Base)



A - (2)(3)
K - (1)(4)



Applications

- Boost Diode in Power Factor Correction (PFC)
- Switched Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Motor Drives
- Freewheeling / Anti-parallel Diode in Inverters
- Solar Inverters
- Electric Vehicles (EV) & DC Fast Charging
- Induction Heating & Welding

Absolute Maximum Ratings (At $T_C = 25^\circ\text{C}$ Unless Otherwise Stated)

Parameter	Symbol	Conditions	Values	Unit
Repetitive Peak Reverse Voltage (Per Leg)	V_{RRM}		1200	V
Continuous Forward Current (Per Leg / Per Device)	I_F	$T_C = 25^\circ\text{C}, D = 1$	228 / 456	A
		$T_C = 100^\circ\text{C}, D = 1$	152 / 304	
		$T_C = 138^\circ\text{C}, D = 1$	100 / 200	
Non-Repetitive Peak Forward Surge Current, Half Sine Wave (Per Leg)	$I_{F,SM}$	$T_C = 25^\circ\text{C}, t_P = 10\text{ ms}$	800	A
		$T_C = 150^\circ\text{C}, t_P = 10\text{ ms}$	640	
Repetitive Peak Forward Surge Current, Half Sine Wave (Per Leg)	$I_{F,RM}$	$T_C = 25^\circ\text{C}, t_P = 10\text{ ms}$	480	A
		$T_C = 150^\circ\text{C}, t_P = 10\text{ ms}$	336	
Non-Repetitive Peak Forward Surge Current (Per Leg)	$I_{F,max}$	$T_C = 25^\circ\text{C}, t_P = 10\text{ }\mu\text{s}$	4000	A
i^2t Value (Per Leg)	$\int i^2 dt$	$T_C = 25^\circ\text{C}, t_P = 10\text{ ms}$	3200	A ² s
Non-Repetitive Avalanche Energy (Per Leg)	E_{AS}	$L = 0.3\text{ mH}, I_{AS} = 100\text{ A}$	1200	mJ
Diode Ruggedness (Per Leg)	dV/dt	$V_R = 0 \sim 960\text{ V}$	200	V/ns
Power Dissipation (Per Leg / Per Device)	P_{tot}	$T_C = 25^\circ\text{C}$	777 / 1554	W
Operating and Storage Temperature	T_J, T_{stg}		-55 to 175	°C

* Per Device

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Electrical Characteristics (Per Leg)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Diode Forward Voltage	V_F	$I_F = 100 \text{ A}, T_j = 25^\circ\text{C}$		1.5	1.8	V
		$I_F = 100 \text{ A}, T_j = 175^\circ\text{C}$		2	2.4	
Reverse Current	I_R	$V_R = 1200 \text{ V}, T_j = 25^\circ\text{C}$		10	50	μA
		$V_R = 1200 \text{ V}, T_j = 175^\circ\text{C}$		100	500	
Total Capacitive Charge	Q_C	$V_R = 400 \text{ V}$		156		nC
		$I_F \leq I_{F,MAX}$ $di_F/dt = 200 \text{ A}/\mu\text{s}$ $T_j = 175^\circ\text{C}$ $V_R = 800 \text{ V}$		220		
Switching Time	t_s	$V_R = 400 \text{ V}$		< 10		ns
		$V_R = 800 \text{ V}$				
Total Capacitance	C	$V_R = 1 \text{ V}, f = 1 \text{ MHz}$		452		pF
		$V_R = 800 \text{ V}, f = 1 \text{ MHz}$		326		

Thermal / Package Characteristics

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Thermal Resistance, Junction – Case (Per Leg)	R_{thJC}			0.193		$^\circ\text{C}/\text{W}$
Weight	W_T			28		g
Mounting Torque	T_M	Screws to Heatsink			1.5	Nm
		Terminal Connection (M4)			1.3	
Isolation Voltage (RMS)	V_{ISO}	$t = 1 \text{ s (50 / 60 Hz)}$	3000			V
		$t = 60 \text{ s (50 / 60 Hz)}$	2500			
Creepage Distance on Surface	d_{Ctt}	Terminal to Terminal	10.5			mm
	d_{Ctb}	Terminal to Backside	8.5			
Striking Distance Through Air	d_{Stt}	Terminal to Terminal	3.2			mm
	d_{Stb}	Terminal to Backside	6.8			

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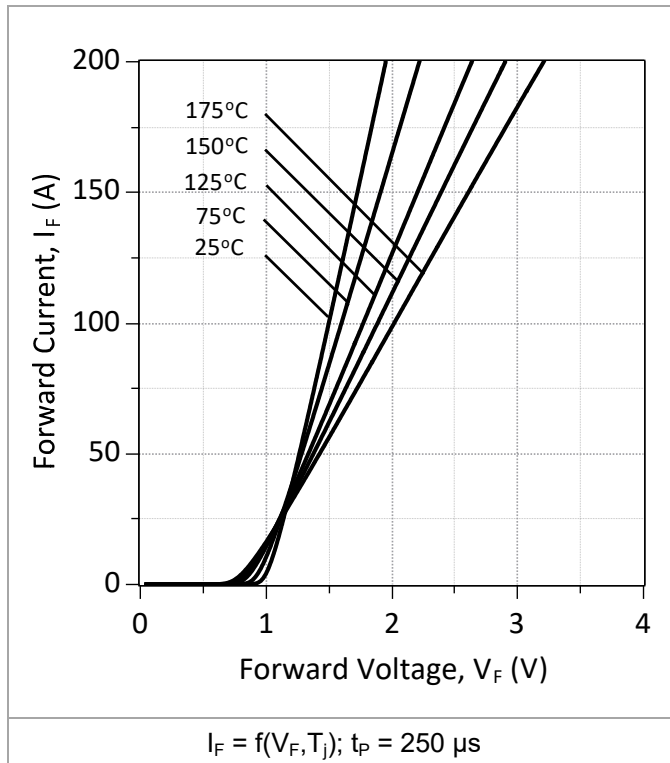


Figure 1: Typical Forward Characteristics (Per Leg)

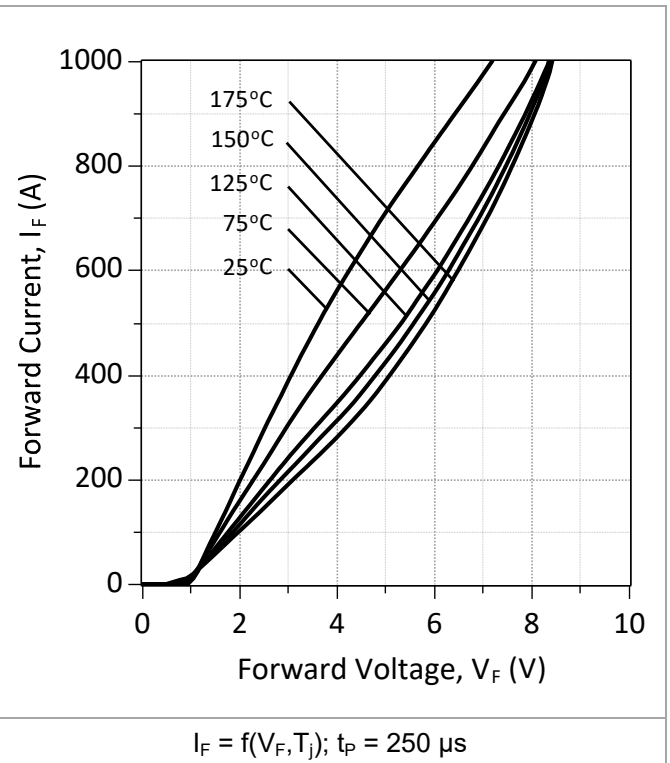


Figure 2: Typical High Current Forward Characteristics (Per Leg)

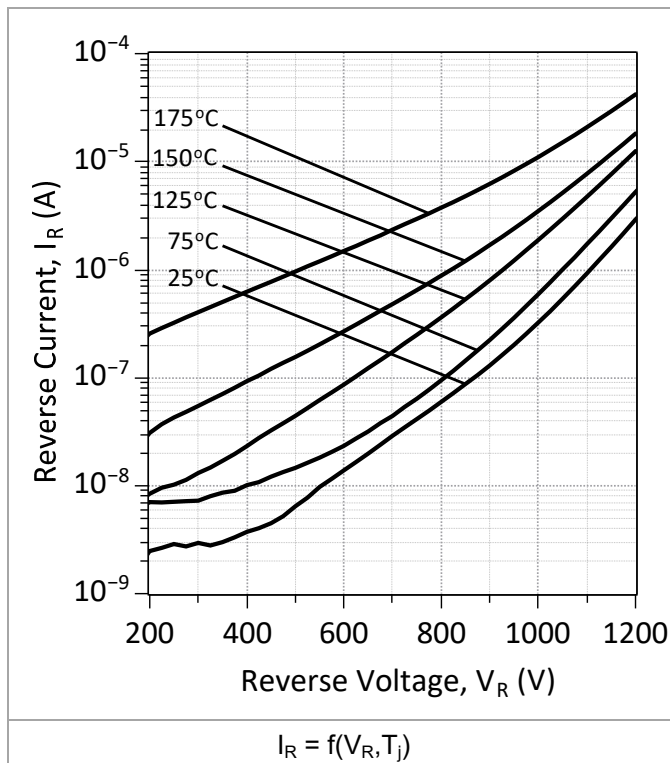


Figure 3: Typical Reverse Characteristics (Per Leg)

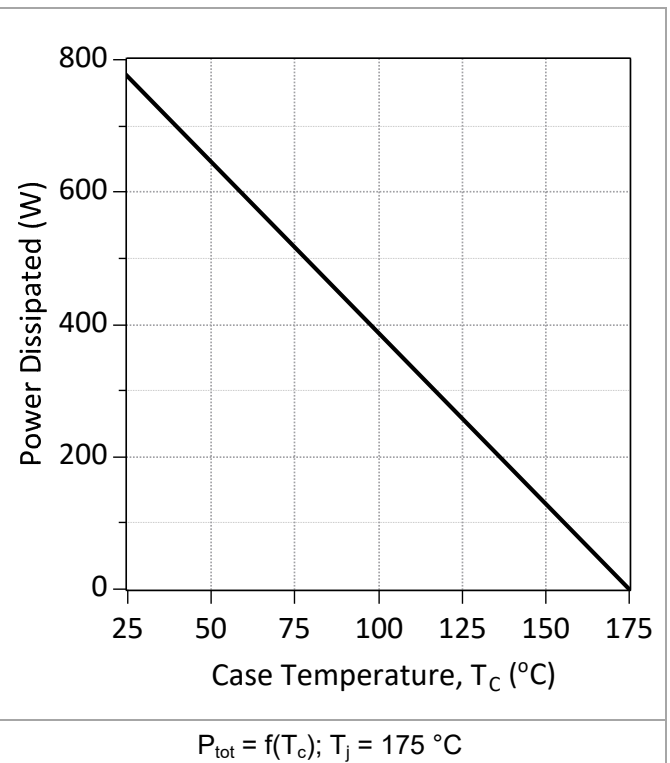


Figure 4: Power Derating Curve (Per Leg)

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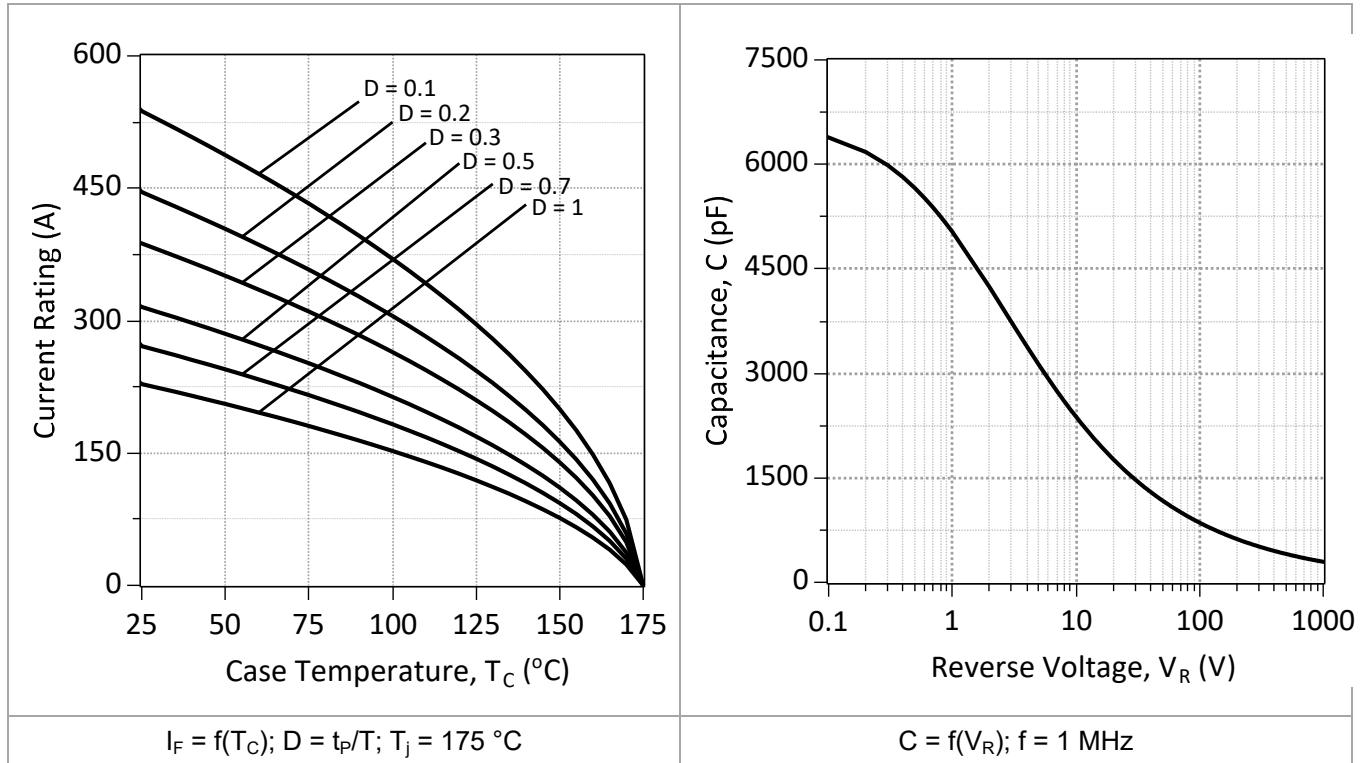


Figure 5: Current Derating Curves (Per Leg)

Figure 6: Typical Junction Capacitance vs. Reverse Voltage Characteristics (Per Leg)

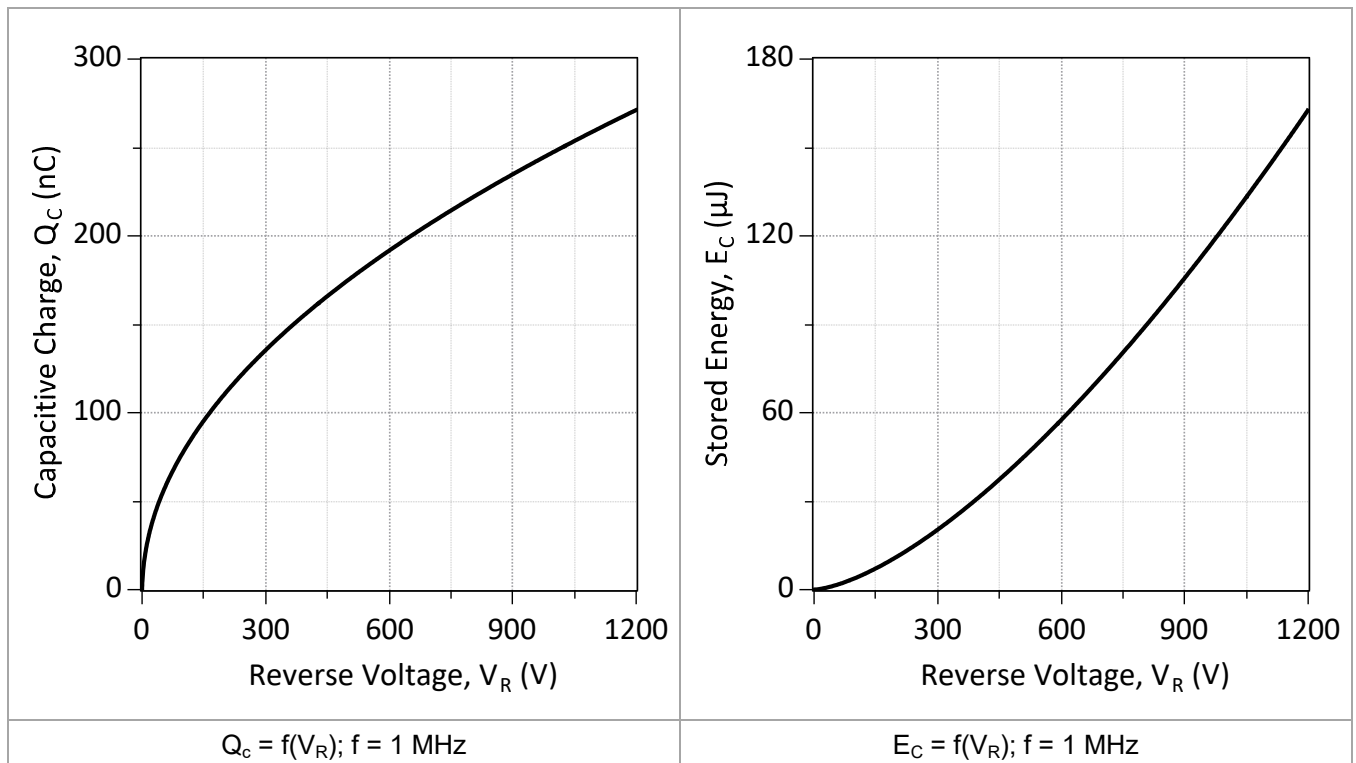


Figure 7: Typical Capacitive Charge vs. Reverse Voltage Characteristics (Per Leg)

Figure 8: Typical Capacitive Energy vs. Reverse Voltage Characteristics (Per Leg)

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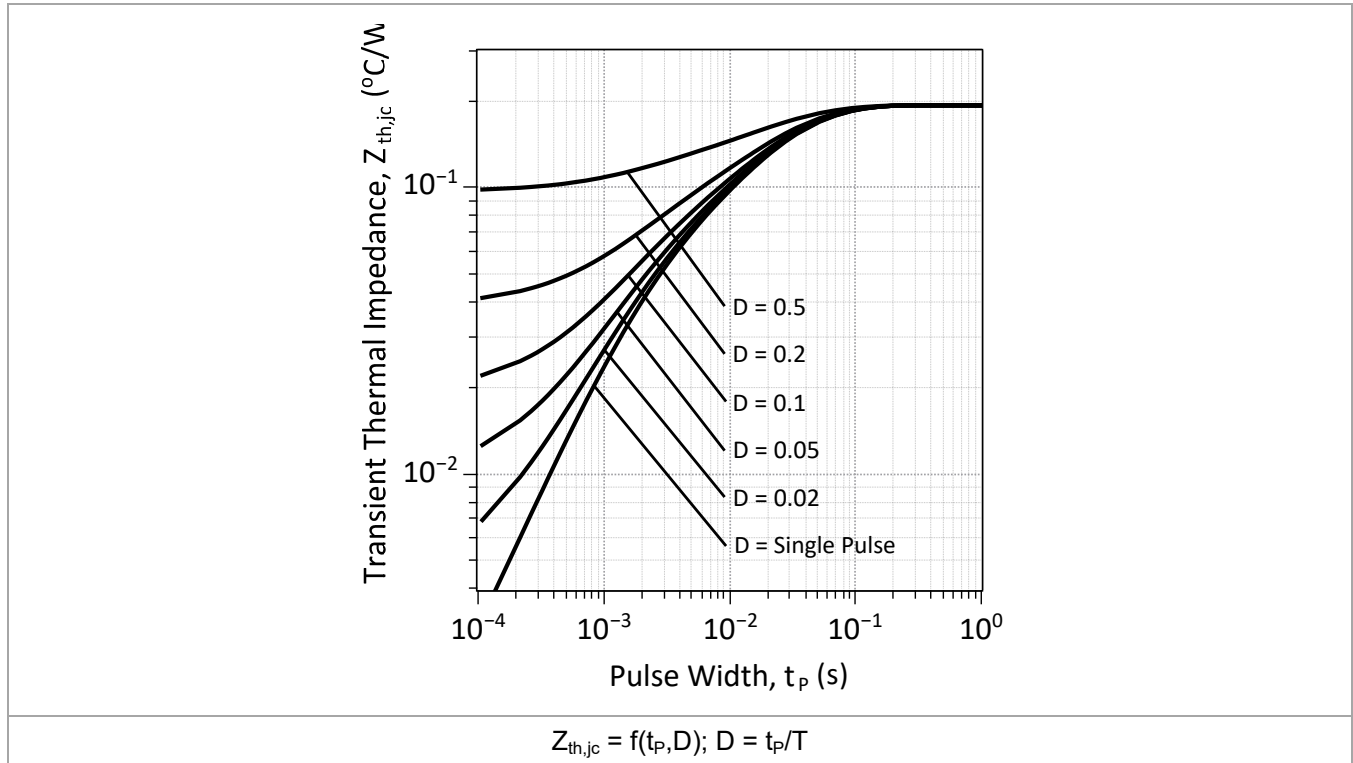


Figure 9: Transient Thermal Impedance (Per Leg)

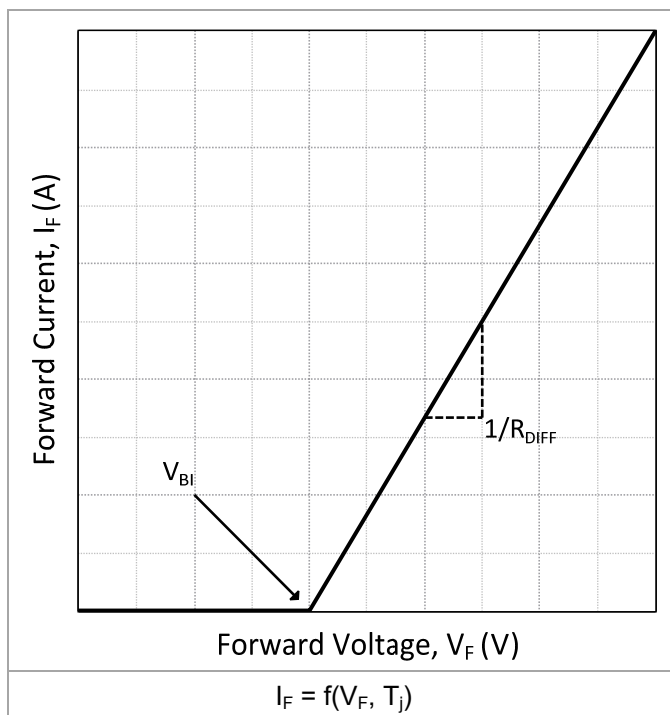


Figure 10: Forward Curve Model (Per Leg)

$$I_F = (V_F - V_{BI})/R_{DIFF} \text{ (A)}$$

Built-In Voltage (V_{BI}):

$$V_{BI}(T_j) = m \cdot T_j + n \text{ (V)},$$

$$m = -1.47e-03, n = 1.08$$

Differential Resistance (R_{DIFF}):

$$R_{DIFF}(T_j) = a \cdot T_j^2 + b \cdot T_j + c \text{ (}\Omega\text{)};$$

$$a = 2.87e-07, b = 3.40e-05, c = 0.0076$$

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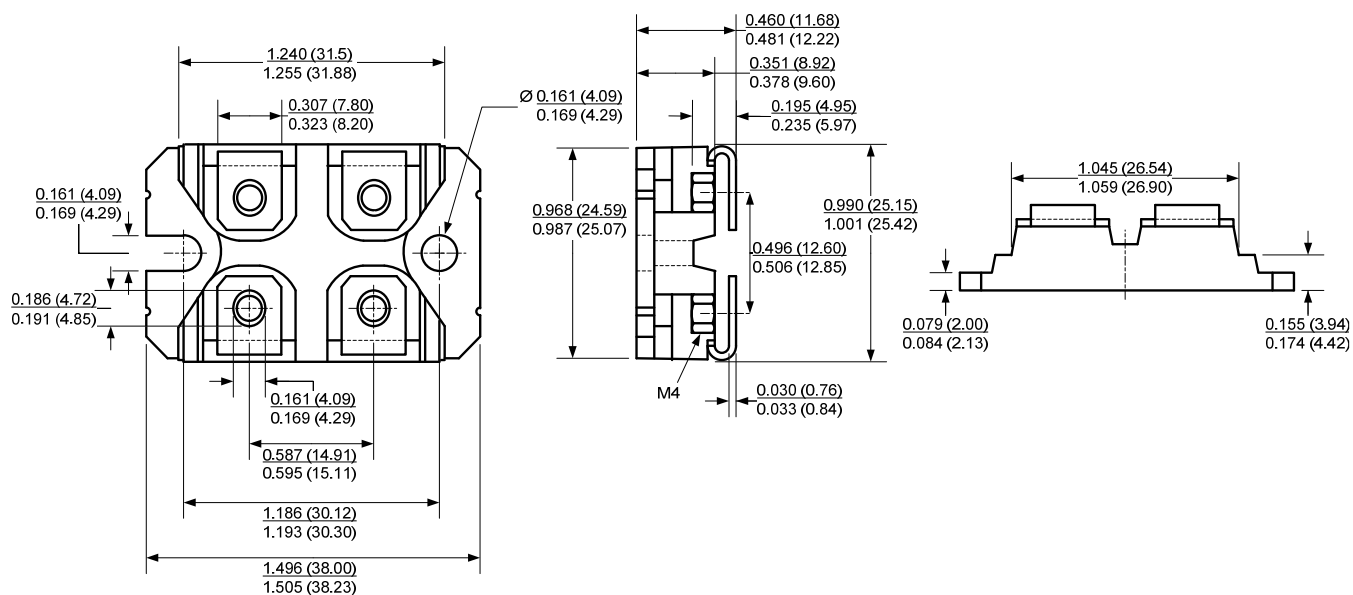
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Package Dimensions

SOT-227

Package Outline



NOTE

1. CONTROLLED DIMENSION IS INCH. DIMENSION IN BRACKET IS MILLIMETER.
2. DIMENSIONS DO NOT INCLUDE END FLASH, MOLD FLASH, MATERIAL PROTRUSIONS

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RoHS Compliance

The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU Directive 2011/65/EC (RoHS 2), as adopted by EU member states on January 2, 2013 and amended on March 31, 2015 by EU Directive 2015/863. RoHS Declarations for this product can be obtained from your GeneSiC representative.

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Related Links

- SPICE Models: <https://www.genesicsemi.com/schottky-mps>
- Evaluation Boards: <https://www.genesicsemi.com/technical-support>
- Quality Manual: <https://www.genesicsemi.com/technical-support/quality-manual>
- Compliance: <https://www.genesicsemi.com/technical-support/compliance>
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Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

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На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru

moschip.ru_4

moschip.ru_6

moschip.ru_9