

Full Silicon Carbide Power Module

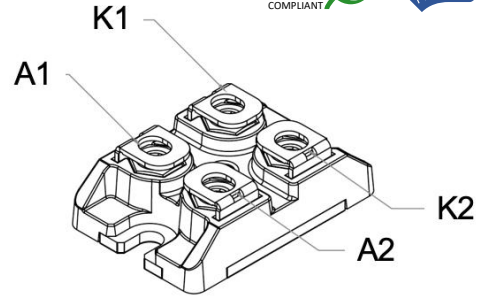
1200V, 100A, Dual Paralleled MPS Diodes



Product Information:

Cathode1 Anode1

Cathode2 Anode2



Features

- Low Capacitive Charge (Q_C)
- Zero Forward Recovery
- Zero Reverse Recovery
- Ultra-Low Switching Loss
- Optimized for High Speed Applications
- Optimized for High Power Density Applications
- RoHS Compliant and Halogen Free

Benefits

- Higher System Efficiency
- Increase Parallel Device Convenience
- Temperature Independent Switching Behavior
- Allow High Frequency Operation
- Realize Compact and Lightweight Systems

Key Performance Parameters

Parameter	Symbol	Value	Unit
DC Blocking Voltage	V_R	1200	V
Nominal Forward Current	$I_{F,NOM}$	100	A
Total Capacitive Charge	Q_C	301	nC
Capacitance Stored Energy	E_C	81	μ J
Junction & Storage Temperature	T_J, T_{stg}	-55 to 175	$^{\circ}$ C
I^2t Value	$\int i^2 dt$	TBD	A^2s
Power Dissipation	P_{tot}	TBD	W

SOT-227

Terminal	Packaging Type
	SOT-227
Anode1	A1
Cathode1	K1
Anode1	A2
Cathode1	K2

Potential Applications

- Switching Mode Power Supply
- PFC
- UPS
- Motor Drives
- Flywheel diode in Power Inverters
- Solar/Wind Renewable Energy

Part Number	Package	Marking
FP12100S27DC2X	SOT-227	FP12100S27DC2X

For further information about comparable products, please contact (www.fastsic.com).

Maximum Ratings (Per Leg):

($T_j = 25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Continuous Forward Current	I_F	--	--	100	A	$T_c \leq 75^\circ\text{C}$, $Duty=100\%$
Non-Repetitive Forward Surge Current, Sinusoidal Halfwave	$I_{F,SM}$	--	--	300		$T_c = 25^\circ\text{C}$, $t_p = 10\text{ms}$
Non-Repetitive Peak Forward Surge Current	$I_{F,max}$	--	--	12k		$T_c = 25^\circ\text{C}$, $t_p = 10\mu\text{s}$
I^2t Value	$\int i^2 dt$	--	--	TBD	A ² s	$T_c = 25^\circ\text{C}$, $t_p = 10\text{ms}$
Repetitive Peak Reverse Voltage	V_{RRM}	--	--	1200	V	$T_c = 25^\circ\text{C}$
Power Dissipation	P_{tot}	--	--	TBD	W	$T_c = 25^\circ\text{C}$
Junction Temperature	T_j	-55	--	175	°C	--
Storage Temperature	T_{stg}	-55	--	175		--

Electrical Characteristics (Per Leg):

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions	
DC Characteristics							
DC Blocking Voltage	V_{DC}	1200	--	--	V	$T_j = 25^\circ\text{C}$	
Forward Voltage	V_F	--	1.56 2.4	1.8 --		$I_F = 100\text{A}$, $T_j = 25^\circ\text{C}$ $I_F = 100\text{A}$, $T_j = 175^\circ\text{C}$	
Reverse Current	I_R	--	0.1 1.0	0.5 --	mA	$V_R = 1200\text{V}$, $T_j = 25^\circ\text{C}$ $V_R = 1200\text{V}$, $T_j = 175^\circ\text{C}$	
AC Characteristics							
Total Capacitive Charge	Q_C	--	301	--	nC	$V_R = 800\text{V}$, $T_j = 25^\circ\text{C}$	
Total Capacitance	C_j	--	3411 292 225	--	pF	$V_R = 1\text{V}$, $f = 1\text{MHz}$, $T_j = 25^\circ\text{C}$ $V_R = 400\text{V}$, $f = 1\text{MHz}$, $T_j = 25^\circ\text{C}$ $V_R = 800\text{V}$, $f = 1\text{MHz}$, $T_j = 25^\circ\text{C}$	
Capacitance Stored Energy	E_C	--	81	--		μJ	$V_R = 800\text{V}$, $T_j = 25^\circ\text{C}$

Thermal Characteristics (Per Leg):

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Thermal Impedance, junction – case	R_{th-jc}	--	TBD	--	K/W	--

Package Characteristics:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Isolation Test Voltage	V_{isol}		>2.5		kV	AC, 50Hz (R.M.S), $t = 1\text{minute}$
Terminal connection Torque	τ_{tc}		1.3		Nm	Recommended (M4 screw)
Weight	G		30		g	
Comparative tracking index	CTI		>200			

Electrical Characteristics Diagrams

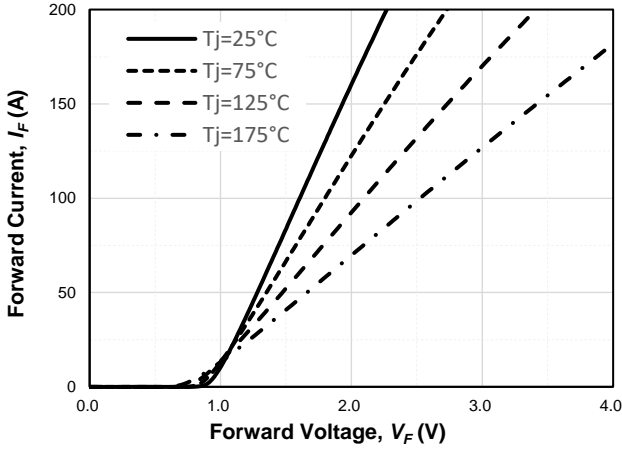


Fig. 1 Forward Characteristics

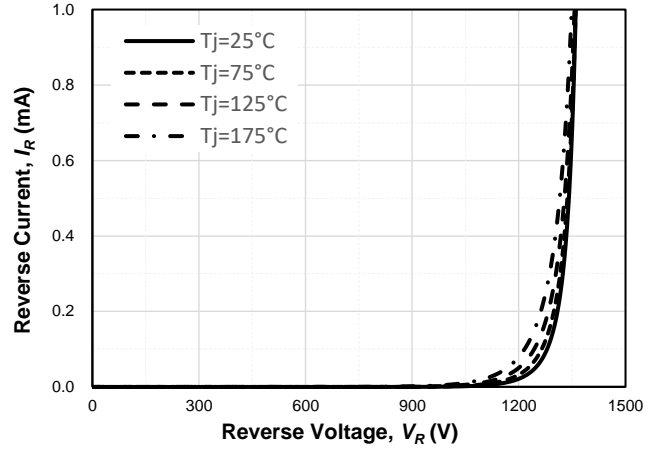


Fig. 2 Reverse Characteristics

TBD

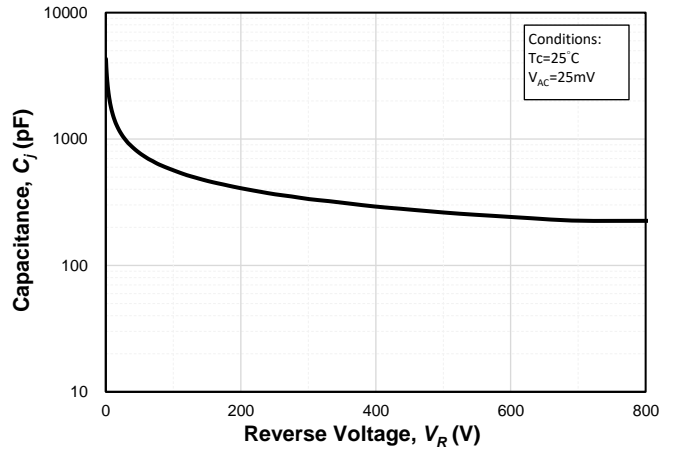


Fig. 4 Capacitance vs. Reverse Voltage

Fig. 3 Non-repetitive Peak Forward Surge Current vs. Pulse Width

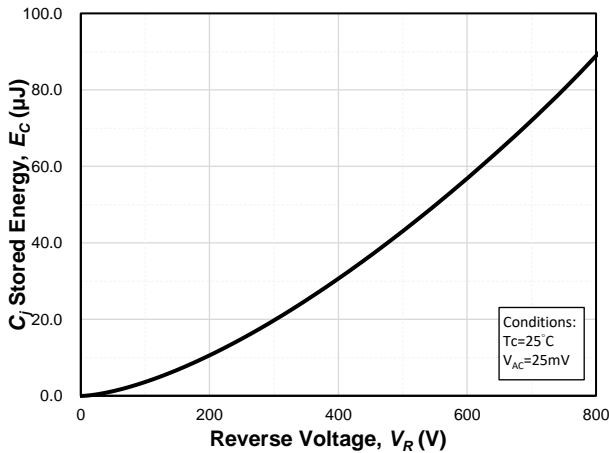


Fig. 5 Capacitance Stored Energy vs. Reverse Voltage

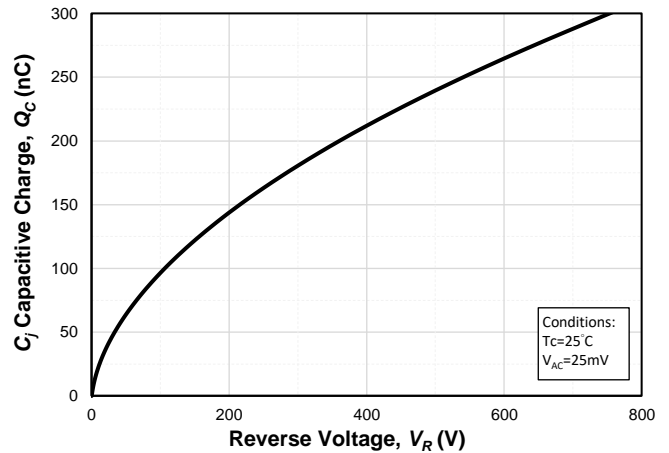
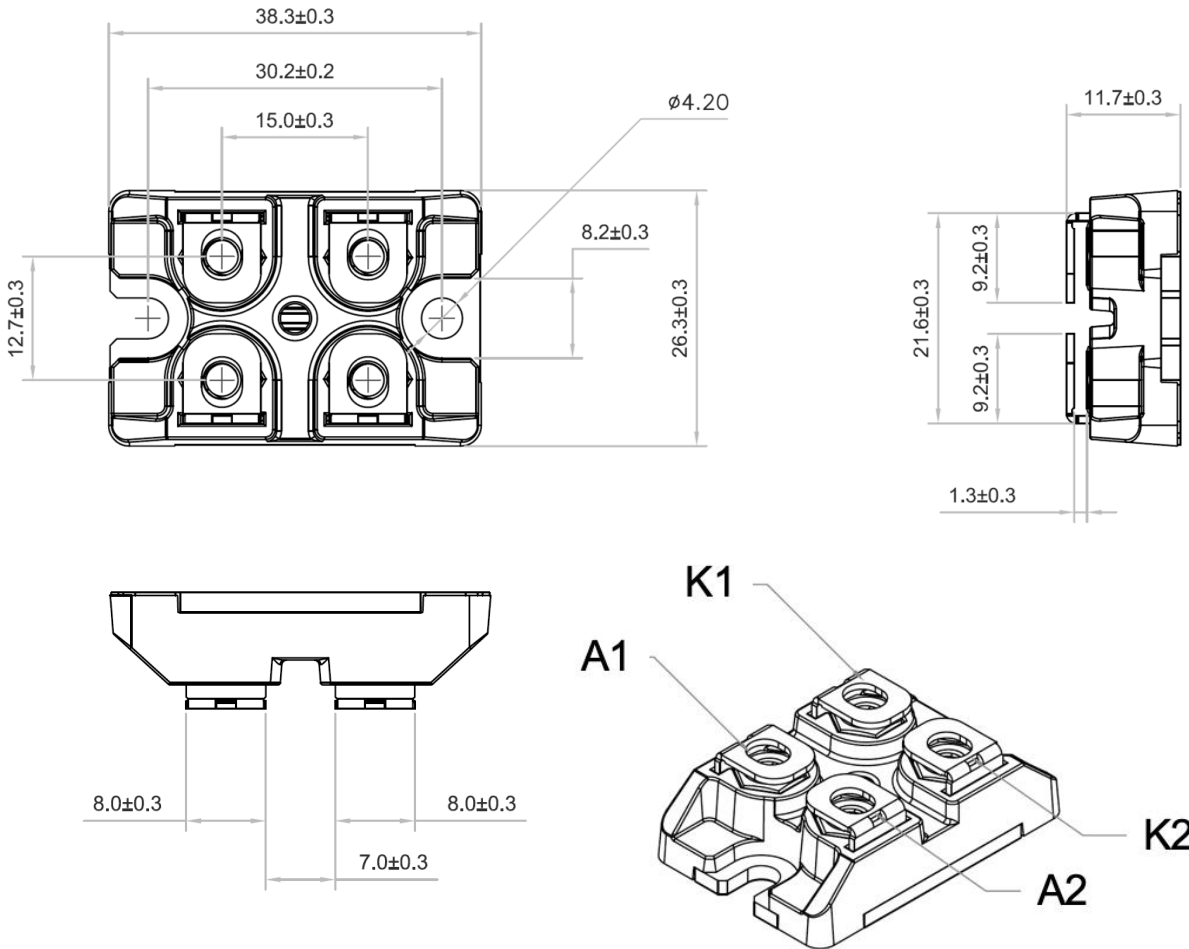


Fig. 6 Capacitive Charge vs. Reverse Voltage

Package Outline



Revision History

Date	Revision	Changes
24.05	Tentative	1 st issue

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