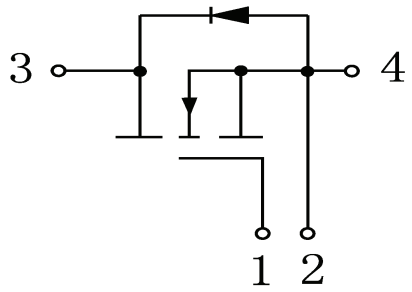
RSC35SD120B5H

Preliminary Data

1.2kV, 35A Silicon Carbide Single Switch Module

Features：

- Ultra Low Loss
- Lower Capacitance
- High System Efficiency
- High-Frequency Operation
- Reliable Body Diode
- Cu Baseplate, Si_3N_4 DBC



Applications：

- UPS、SMPS
- Motor Drives
- Solar Inverters

SiC MOSFET

Absolute Maximum Ratings (T_C=25℃ unless otherwise specified)

Symbol	Description		Values	Unit
V_{DSS}	Drain-Source Blocking Voltage		1200	V
V_{GSmax}	Gate-Source Voltage	Absolute Maximum Values	-10/+22	V
V_{GSop}		Recommended Operational Values	-5/+18	V
I_D	Continuous Drain Current	T_C=25℃	35	A
		T_C=100℃	26	A
$I_{D(pluse)}$	Pulsed Drain Current	Pulse Width is Limited by Tjmax	80	A
P_D	Maximum Power Dissipation	T_C=25℃ T_{Jmax}=175℃	168	W

Electrical Characteristics of MOSFET (T_C=25℃ unless otherwise specified)

Symbol	Description	Conditions	Min.	Typ.	Max.	Units
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=1mA	1200			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=5mA	2.0	3.0	4.5	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=1200V, V_{GS}=0V			1	mA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=+22V/-10V, V_{DS}=0V			±100	nA
$R_{DS(on)}$	On State Resistance	V_{GS}=18V, I_{DS}=15A		80	104	mΩ
		V_{GS}=18V, I_{DS}=15A, T_J=175˚C		128		mΩ
g_{fs}	Transconductance	V_{DS}=20V, I_{DS}=15A		11.4		S
C_{iss}	Input Capacitance	V_{DS}=800V, f=1MHz, V_{GS}=0V		985		pF
C_{oss}	Output Capacitance			66		pF
C_{rss}	Reverse Transfer Capacitance			5		pF
E_{oss}	C_{oss} Stored Energy			26		μJ
Q_G	Total Gate Charge	V_{DS}=800V, V_{GS}=-5V to +18V, I_D=15A		50		nC
Q_{GS}	Gate-Source Charge			13		nC
Q_{GD}	Gate-Drain Charge			17		nC
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=800V, V_{GS}=-5V to +18V, I_D=15A, R_G=2Ω		14		ns
t_r	Rise Time			28		ns
$t_{d(off)}$	Turn-off Delay Time			24		ns
t_f	Fall Time			9		ns
E_{on}	Turn-on Switching Energy			251		mJ
E_{off}	Turn-off Switching Energy			42		mJ
$R_{G(int)}$	Internal Gate Resistance			4.0		Ω
$R_{\theta JC}$	Thermal Resistance Junction-to-Case				0.89	℃/W

Built-in SiC Body Diode
Electrical Characteristics of Diode (T_C=25℃ unless otherwise specified)

Symbol	Description	Conditions	Min.	Typ.	Max.	Units
I_S	Inverse Diode Continuous, Forward Current				30	A
I_{SM}	Inverse Diode Direct Current, Pulsed				80	A
V_{SD}	Diode Forward Voltage	I_{SD}=15A, V_{GS}=-5V		4.1		V
t_{rr}	Reverse Recovery Time	I_{SD}=15A, V_R=800V, V_{GS}=0V, di/dt=1000A/μs		34		ns
Q_{rr}	Reverse Recovery Charge			112		nC

Free-Wheeling SiC Schottky Diode
Maximum Rated Values (T_C=25℃ unless otherwise specified)

V_{RRM}	Repetitive Peak Reverse Voltage	1200	V
I_F	Diode Continuous Forward Current	T_C=150℃	15	A
I_{FM}	Diode Maximum Forward Current	T_C=150℃	30	A

Electrical Characteristics of Diode (T_C=25℃ unless otherwise specified)

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
V_{SD}	Forward Voltage	I_{SD}=15A	T_C=25℃		1.45		V
			T_C=175℃		2.00		V
I_R	Reverse Current	V_R=1200V, T_C=25℃			3.50		uA
		V_R=1200V, T_C=175℃			15.0		uA
$R_{\theta JC}$	Diode Thermal Resistance: Junction-to-Case diode					0.90	℃/W

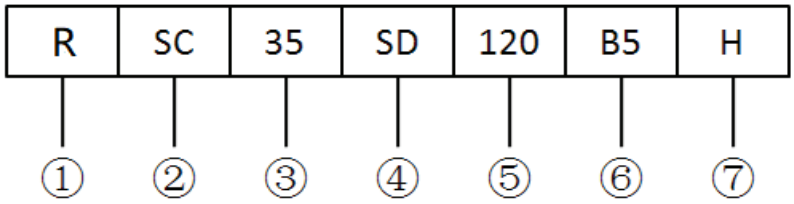
Module

Symbol	Description		Min.	Typ.	Max.	Units
V_{ISO}	Isolation Voltage (All Terminals Shorted)	f=50Hz, 30s	4500			V
Internal Isolation			Si_3N_4			

T_J	Maximum Junction Temperature			175	℃
T_{JOP}	Maximum Operating Junction Temperature Range	-55		+175	℃
T_{stg}	Storage Temperature	-55		+175	℃
$R_{\theta CS}$	Case-to-Sink Thermally (Conductive Grease Applied)			0.21	℃/W
CTI	Comparative Tracking Index	200			
T	Power Terminals Screw:M4	1.1		1.5	N·m
T	Mounting Screw:M4	1.1		1.5	N·m
G	Weight		30		g

Ordering Information Table

Device code



① - MOSFET Module
② - SiC MOSFET
③ - Rated Current (35=35A)
④ - Circuit Configuration (Single Switch)
⑤ - Rated Voltage (120=1200V)
⑥ - Package Type
⑦ - Test Level (Pass the Important Reliability Test-Industrial Grade)

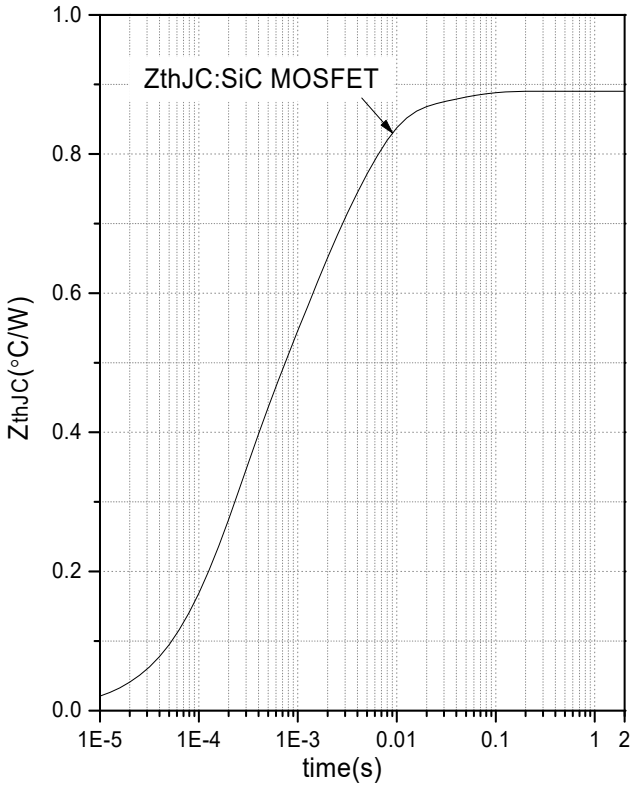


Fig.1 Transient Thermal Impedance (MOSFET)

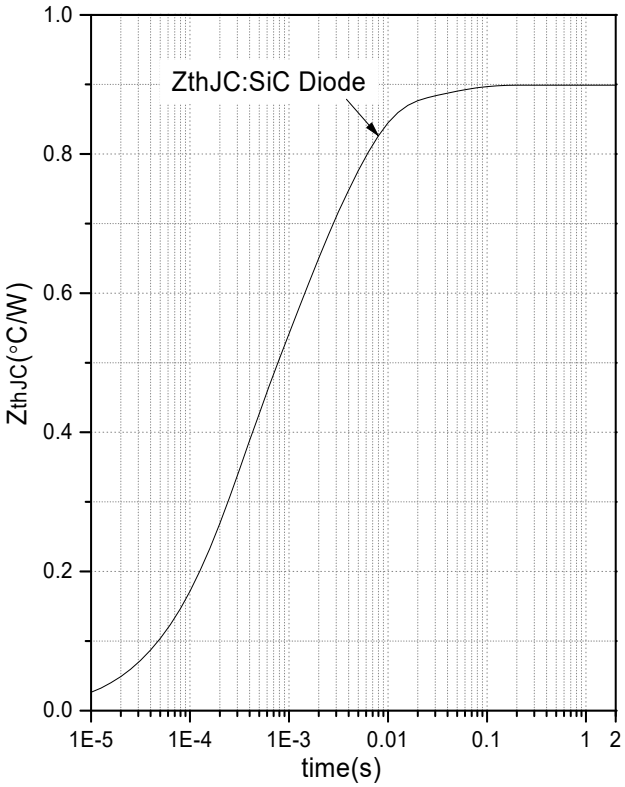
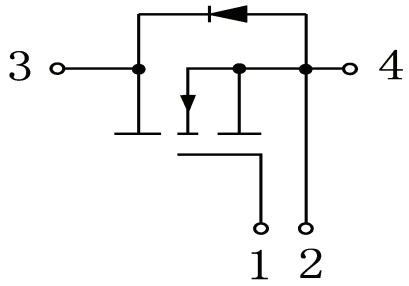


Fig.2 Transient Thermal Impedance (Diode)

Internal Circuit:



Package Outline (Unit: mm):