SiC MOSFET N-channel 1200V/80A

Parameter	Value	Unit
BVDSS	1200	V
RDS(ON),typ.(20V)	25	mΩ
VGS(TH)	2.0 ~ 4.0	V
Eon	2.2	mJ
Eoff	0.5	mJ
ID (at TC=25℃)	80	A

FEATURES

- High Blocking Voltage with Low On-Resistance
- High Speed Switching with Low Capacitance
- Easy to Parallel and Simple to Drive
- Avalanche Ruggedness

APPLICATIONS

- Solar Inverters
- Switch Mode Power Supplies
- High Voltage DC/DC Converters
- Battery Chargers
- Motor Drives

MAXIMUM RATED VALUES (at TJ = 25 °C, unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions
VDSmax	Drain - Source Voltage	1200	V	VGS=0V,ID=100μA
VGSmax	Gate - Source Voltage	-10/+25	V	Absolute maximum values
VGSop	Gate - Source Voltage	-5/+20	V	Recommended operational values
ID	Continuous Drain Current	80 60	A	VGS=20V, TC=25˚C VGS=20V, TC=100˚C
PD	Power Dissipation	419	W	TC=25˚C, TJ=150˚C
TJ,Tstg	Operating Junction and Storage Temperature	-55 to +150	℃	

THERMAL CHARACTERISTICS

Symbol	Parameter	Typ	Unit	Test Conditions
RθJC	Thermal Resistance from Junction to Case	0.3	℃/W	
RθJA	Thermal Resistance From Junction to Ambient	40		

ELECTRICAL CHARACTERISTICS (at TJ = 25°C unless otherwise specified)

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
V(BR)DSS	Drain-Source Breakdown Voltage	1200			V	VGS=0V,ID=100μA
VGS(th)	Gate Threshold Voltage	2.0	2.5	4.0	V	VGS=VDS, IDS=15mA,TC=25˚C

			1.8			$V_{GS}=V_{DS}$, I_{DS}=15mA,T_C=150˚C
I_{DSS}	Zero Gate Voltage Drain Current		2	100	μA	V_{DS}=1200V, V_{GS}=0V
I_{GSS+}	Gate-Source Leakage Current		20	250	nA	V_{GS}=20V, V_{DS}=0V
I_{GSS-}	Gate-Source Leakage Current		20	250	nA	V_{GS}=-10V, V_{DS}=0V
$R_{DS(on)}$	Drain-Source on- state Resistance		25	38	mΩ	V_{GS}=20V, I_D=50A, T_C=25˚C
			43			V_{GS}=20V, I_D=50A, T_C=150˚C
gfs	Transconductance		14.6		S	V_{GS}=20V, I_D=50A, T_J=25 ˚C
			14.3			V_{GS}=20V, I_D=50A, T_J=150 ˚C
Ciss	Input Capacitance		6700		pF	V_{GS}=0V, V_{DS}=1000 V, f=1MHz V_{AC}=25mV
Coss	Output Capacitance		188			
Crss	Reverse Transfer Capacitance		42.8			
EAS	Avalanche Energy, Single plus		2.6			
EON	Turn-OnSwitching Energy		2.2		mJ	V_{DS}=800V, V_{GS}=-5/20V, I_D=50A
EOFF	Turn-Off Switching Energy		0.5			
td(on)	Turn-On Delay Time		62		ns	V_{DD}=800V, V_{GS}=-5/20V, I_D=50A
tr	Rise Time		93			
td(off)	Turn-Off Delay Time		60			
tf	Fall Time		39			
RG(int)	Internal Gate Resistance		0.8		Ω	f=1MHz, V_{AC}=25mV
Qgs	Gate to Source Charge		58		nC	V_{DS}=800V, V_{GS}=-5/20V, I_D=50A
Qgd	Gate to Drain Charge		90			
Qg	Total Gate Charge		185			

Diode Characteristics

Symbol	Parameter	Typ	Max	Unit	Test Conditions
VSD	Diode Forward Voltage	3.63		V	V_{GS}=-5V, I_{SD}=25A, T_J=25°C
		3.45		V	V_{GS}=-5V, I_{SD}=25A, T_J=150°C
IS	Continuous Diode Forward Current		80	A	T_C=25˚C
trr	Reverse Recovery Time	45		ns	V_{GS}=-5V, I_{SD}=50A, T_J=25°C,V_{DS}=800V
Qrr	Reverse Recovery Charge	480		nC	
Irrm	Peak Reverse Recovery Current	13.5		A	

TYPICAL CHARACTERISTICS CURVES

Figure 1. Output Characteristics TJ = -55 °C

Figure 2. Output Characteristics TJ = 25 °C

Figure 3. Output Characteristics TJ =150 °C

Figure 4. On-Resistance For Various Gate Voltage

Figure 5. Transfer Characteristic for Various Junction Temperatures

Figure 6. Threshold Voltage vs. Temperature

Figure 7.Body Diode Characteristics

Figure 8. Body Diode Characteristics

Figure 9.Power Dissipation

Figure 10.Safe Operating Area

Figure 11. Power Dissipation Derating

Figure 12. Transient Thermal Impendance

PACKAGE OUTLINES

SYMBOL	MM		
	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.21	2.41	2.61
A2	1.80	2.00	2.20
b	1.06	1.21	1.36
b1	2.33	2.63	2.93
b3	1.07	1.30	1.60
c	0.51	0.61	0.75
D	23.30	23.45	23.60
D1	16.25	16.55	16.85
E	15.74	15.94	16.14
E1	13.72	14.02	14.32
T1	2.35	2.50	2.65
e	2.54BSC		
e1	5.08BSC		
Q	5.49	5.79	6.09
L	17.27	17.57	17.87
L1	3.99	4.19	4.39
ΦP	3.40	3.60	3.80
ΦP1	7.19REF		

***Important Usage Information and Disclaimer**

The specifications of Zhuhai Hypersemi Co., Ltd. products are not guarantees of product characteristics. They reflect typical performance expected in standard applications, which may vary with specific uses. Users must conduct prior testing for their applications and make necessary adjustments.

Users are responsible for the safety of applications utilizing our products and must implement adequate safety measures to prevent physical injury, fire, or other risks in case of product failure. It is the user's duty to ensure that application designs comply with all applicable laws and standards. Our products must not be used in any applications where a product failure could reasonably result in personal injury, unless specifically authorized in a signed document by Zhuhai Hypersemi Co., Ltd.

No representations or warranties are made regarding the accuracy or completeness of this information, including any claims of non-infringement of third-party intellectual property rights. Zhuhai Hypersemi Co., Ltd. assumes no liability for any applications or uses of its products and does not grant any licenses to its intellectual property rights or those of others. We also make no claims regarding non-infringement of third-party intellectual property rights that may arise from applications.

Due to technical requirements, our products may contain hazardous substances. For details, please contact your nearest sales office. This document replaces all previous information and may be updated. We reserve the right to make changes.