

CMHG120R080-4

1200V, 89mΩ typ., 30A N-Channel Silicon Carbide Power MOSFET

General Description

This silicon carbide Power MOSFET device has been developed using Cmos's advanced SiC MOSFET technology. The device features a very low $R_{DS(on)}$ over the entire temperature range combined with low capacitances and very high switching operations, which improve application performance in frequency, energy efficiency, system size and weight reduction.

Features

- 100% Avalanche Tested
- High switching speed with a low gate charge
- Fast intrinsic diode with low reverse recovery
- RoHS Compliant

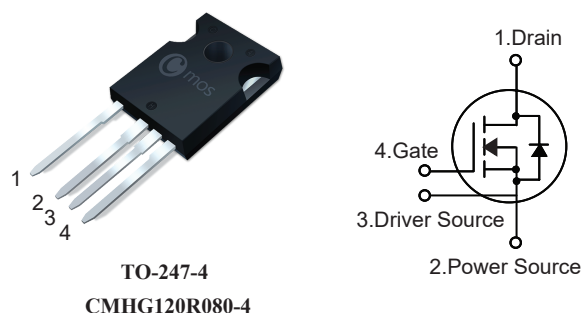
Product Summary

BVDSS	$R_{DS(on)}$ max.	ID
1200V	110mΩ	30A

Applications

- inverter
- EV charging infrastructure
- uninterruptable power supplies

TO-247-4 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	1200	V
V_{GS}	Absolute maximum values	-10/+22	V
V_{GSop}	Recommended operational values	-5/+18	V
$I_D@T_C=25^{\circ}C$	Continuous Drain Current	30	A
$I_D@T_C=100^{\circ}C$	Continuous Drain Current	21	A
I_{DM}	Pulsed Drain Current	80	A
$P_D@T_C=25^{\circ}C$	Total Power Dissipation	150	W
T_{STG}	Storage Temperature Range	-55 to 175	$^{\circ}C$
T_J	Operating Junction Temperature Range	-55 to 175	$^{\circ}C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient	---	40	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance Junction-case	---	1	$^{\circ}C/W$

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Electrical Characteristics (T_J=25°C , unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =1mA	1200	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =18V, I _D =15A	---	89	110	mΩ
		V _{GS} =18V, I _D =15A, T _J =175°C	---	130	---	
		V _{GS} =15V, I _D =15A	---	125	---	
		V _{GS} =15V, I _D =15A, T _J =175°C	---	180	---	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =5mA (tested after V _{GS} =22V, 1ms pulse)	2.0	3.6	5.0	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =1200V, V _{GS} =0V	---	1	100	μA
		V _{DS} =1200V, V _{GS} =0V, T _J =175°C	---	5	---	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =+22V, V _{DS} =0V	---	---	+250	nA
		V _{GS} =-10V, V _{DS} =0V	---	---	-250	
g _{fs}	Forward Transconductance	V _{DS} =20V, I _D =15A	---	3.6	---	S
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	4.0	---	Ω
Q _{g(tot)}	Total Gate Charge	V _{DS} =800V, I _D =15A V _{GS} =-5V to 18V	---	52	---	nC
Q _{gs}	Gate-Source Charge		---	13	---	
Q _{gd}	Gate-Drain Charge		---	17	---	
E _{oss}	Stored Energy in Output Capacitance	V _{GS} =0V, V _{DS} =0V to 800V	---	26	---	μJ
C _{o(er)}	Energy Related Output Capacitance		---	80	---	pF
C _{o(tr)}	Time Related Output Capacitance		---	142	---	
E _{on}	Turn-on Switching Energy	V _{DS} =800V I _D =15A V _{GS} =-5V / 18V R _G =2Ω FWD = 1200V 10A SiC Diode Inductive load	---	75	---	μJ
E _{off}	Turn-off Switching Energy		---	47	---	
E _{tot}	Total Switching Energy		---	122	---	
T _{d(on)}	Turn-On Delay Time		---	14	---	ns
T _r	Rise Time		---	9	---	
T _{d(off)}	Turn-Off Delay Time		---	24	---	
T _f	Fall Time		---	8	---	
C _{iss}	Input Capacitance	V _{DS} =800V, V _{GS} =0V, f=250kHz	---	880	---	pF
C _{oss}	Output Capacitance		---	65	---	
C _{rss}	Reverse Transfer Capacitance		---	5	---	

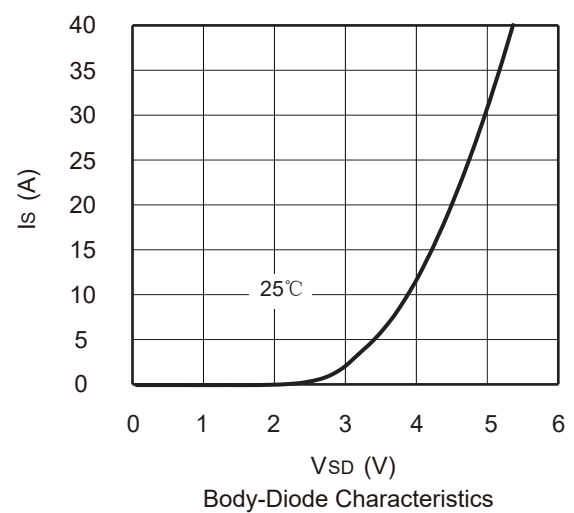
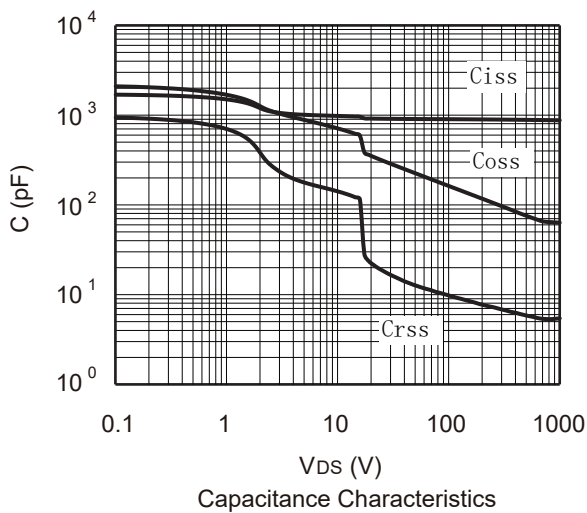
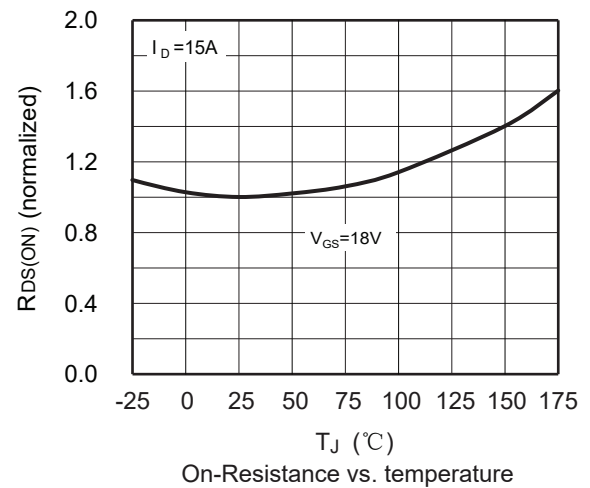
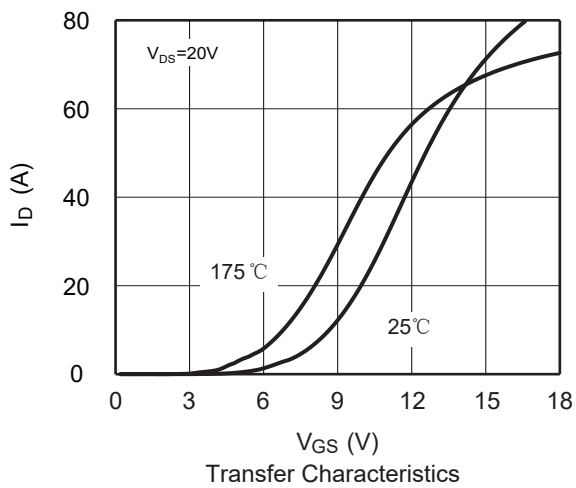
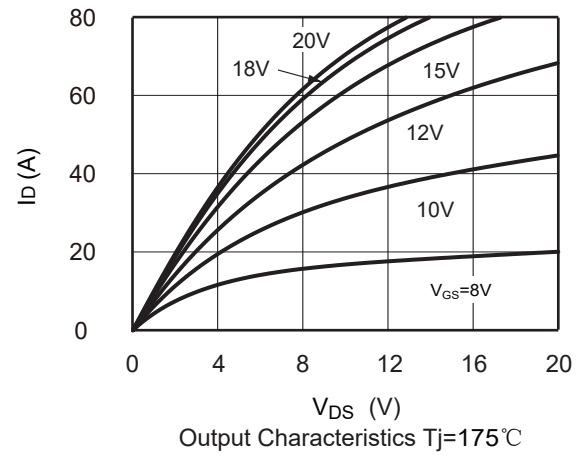
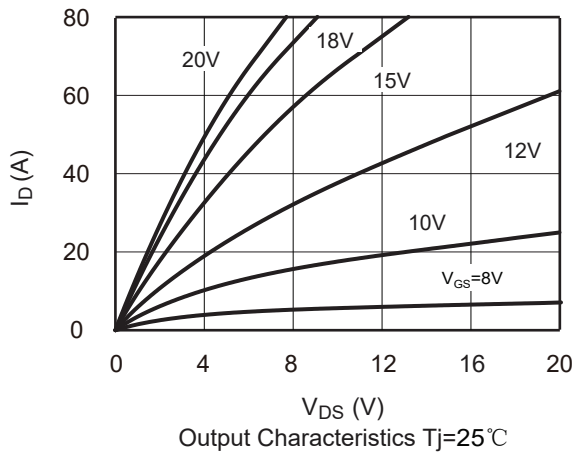
Diode Characteristics

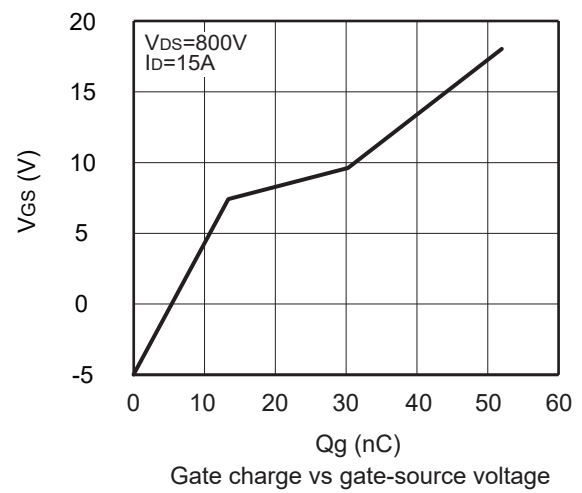
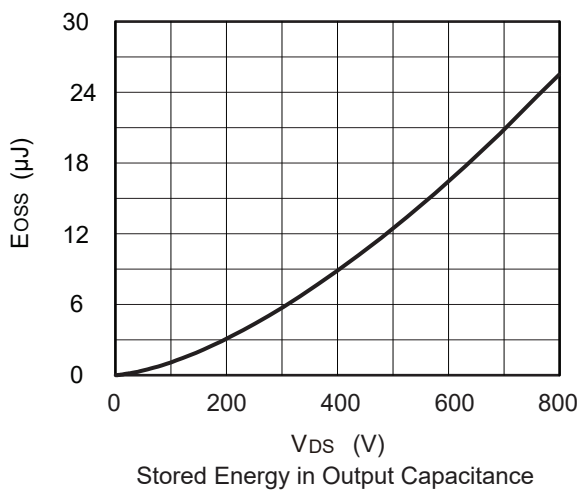
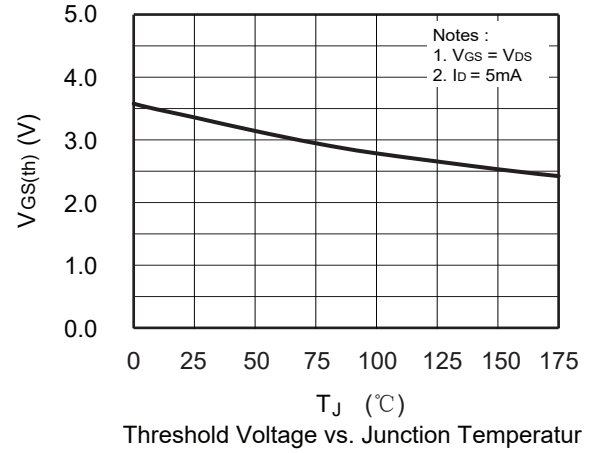
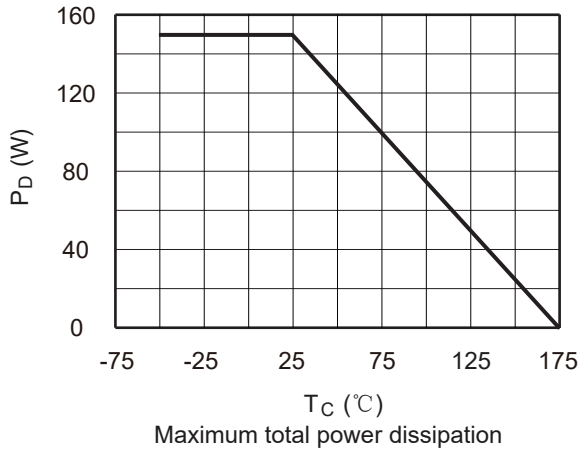
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	30	A
I _{SM}	Pulsed Source Current		---	---	80	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _{SD} =15A, T _J =25°C	---	4.3	---	V
t _{rr}	Reverse Recovery Time	di/dt=3000A/μs, Includes Q _{oss}	---	12	---	ns
Q _{rr}	Reverse Recovery Charge	V _{DD} =800V, I _{SD} =15A, T _J =25°C	---	122	---	nC

Note :

This product has been designed and qualified for the consumer market.
Cmos assumes no liability for customers' product design or applications.
Cmos reserves the right to improve product design, functions and reliability without notice. Please refer to the latest version of specification.

Typical Characteristics



Typical Characteristics


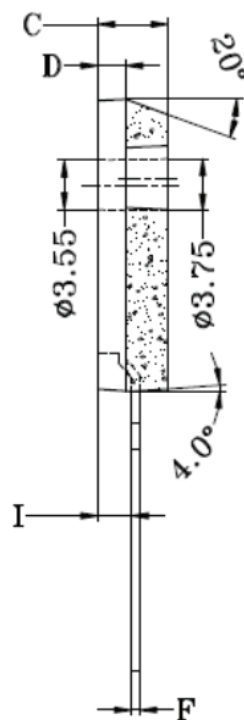
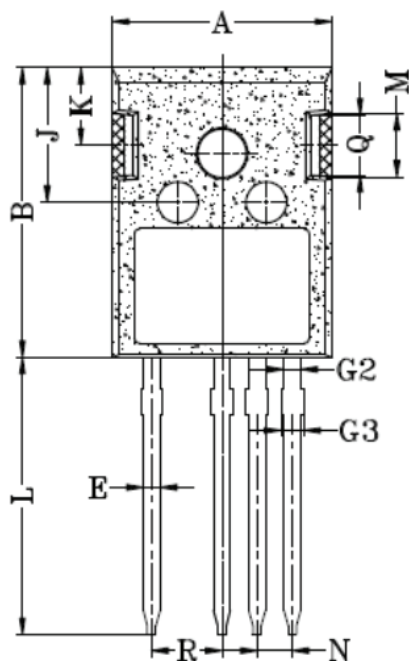
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Package Dimension

TO-247-4

Unit :mm



Symbol	Dimensions in Millimeter	
	MIN	MAX
A	15.80	16.00
B	20.90	21.10
C	4.90	5.10
D	1.90	2.10
E	1.10	1.30
F	0.50	0.70
G2	1.10	1.30
G3	1.18	1.38
H	4.18	4.38
I	2.30	2.50
J	9.65	9.85
K	5.54	5.74
L	19.80	20.20
M	4.50	4.70
N	2.34	2.74
Φ P	3.40	3.60
Q	4.232	4.432
R	4.88	5.28

