CMHG65R020-4

800V, 22mΩ typ., 100A 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.

Product Summary

BVDSS	$R_{DS(on)}$ max.	ID
800V	26mΩ	100A

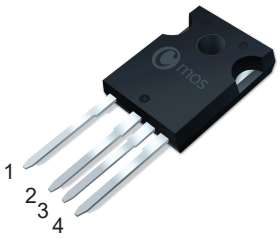
Applications

- inverter
- EV charging infrastructure
- uninterruptable power supplies

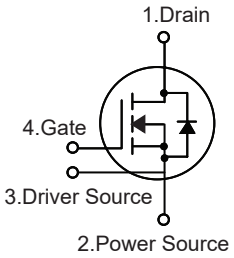
Features

- Wide Bandgap SiC MOSFET Technology
- Easy to Parallel and Simple to Drive
- Low On-Resistance with High Blocking Voltage
- RoHS Compliant

TO-247-4 Pin Configuration



TO-247-4
CMHG65R020-4



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	800	V
V_{GS}	Absolute maximum values	-10/+22	V
V_{GSop}	Recommended operational values	0/+18	V
I_D@T_C=25℃	Continuous Drain Current	100	A
I_D@T_C=100℃	Continuous Drain Current	70	A
I_{DM}	Pulsed Drain Current	300	A
EAS	Single Pulse Avalanche Energy (Note 1)	3153	mJ
P_D@T_C=25℃	Total Power Dissipation	350	W
T_{STG}	Storage Temperature Range	-55 to 175	℃
T_J	Operating Junction Temperature Range	-55 to 175	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient	---	40	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-case	---	0.43	℃/W

800V, 22mΩ typ., 100A N-Channel Silicon Carbide Power MOSFET

Electrical Characteristics (T_J=25℃ , unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=100μA	800	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=18V , I_D=30A	---	22	26	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =11.7mA (tested after V_{GS}=V_{DS} ,1ms pulse)	2.5	3.1	4.5	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=650V , V_{GS} =0V	---	---	10	μA
		V_{DS}=650V , V_{GS} =0V , T_J=150℃	---	10	---	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=-10V to 22V , V_{DS} =0V	---	---	±250	nA
gfs	Forward Transconductance	V_{DS}=20V , I_D =30A	---	1	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	0.8	---	Ω
$Q_{g(tot)}$	Total Gate Charge	V_{DS} =500V , I_D=60A V_{GS}=-5V to 18V	---	125	---	nC
Q_{gs}	Gate-Source Charge		---	35	---	
Q_{gd}	Gate-Drain Charge		---	17	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DS} =500V I_D =20A V_{GS}=0V to 18V R_G =10Ω	---	21	---	ns
T_r	Rise Time		---	76	---	
$T_{d(off)}$	Turn-Off Delay Time		---	70	---	
T_f	Fall Time		---	37	---	
C_{iss}	Input Capacitance	V_{DS}=100V , V_{GS}=0V , f=1MHz	---	3500	---	pF
C_{oss}	Output Capacitance		---	470	---	
C_{rss}	Reverse Transfer Capacitance		---	35	---	

Diode Characteristics

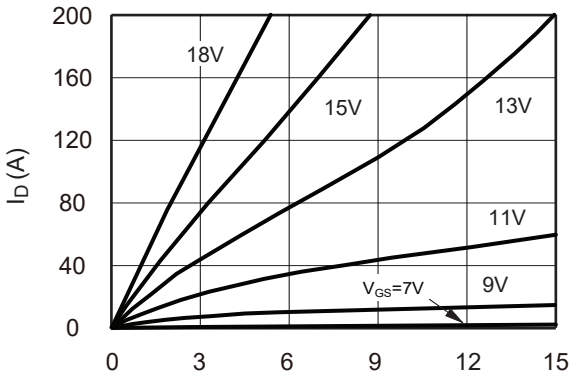
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	100	A
I_{SM}	Pulsed Source Current		---	---	300	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_{SD}=10A ,T_J=25℃	---	3.4	---	V
t_{rr}	Reverse Recovery Time	di/dt=400A/μs , V_{GS}=0V V_{DD}=500V , I_F =60A , T_J =25℃	---	35	---	ns
Q_{rr}	Reverse Recovery Charge		---	13	---	nC

Note :

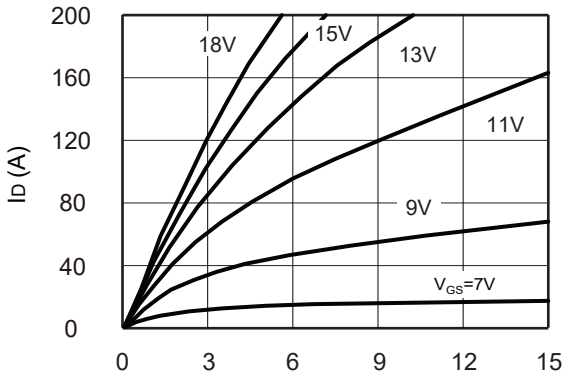
1.The EAS data shows Max. rating . The test condition is V_{DD}=80V , V_{GS}=10V , L=5mH , I_{AS}=33.5A.

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Cmos assumes no liability for customers' product design or applications.
Cmos reserver the right to improve product design ,functions and reliability wihtout notice.Please refer to the latest version of specification.

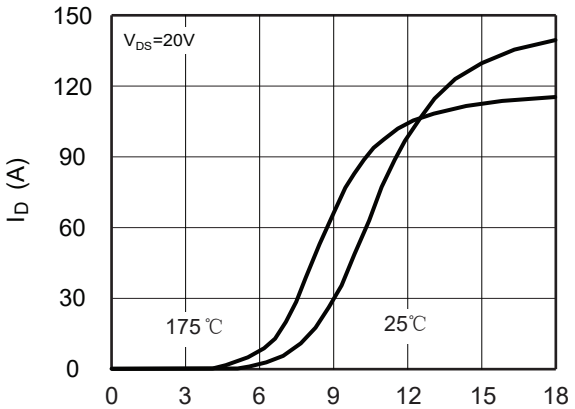
Typical Characteristics



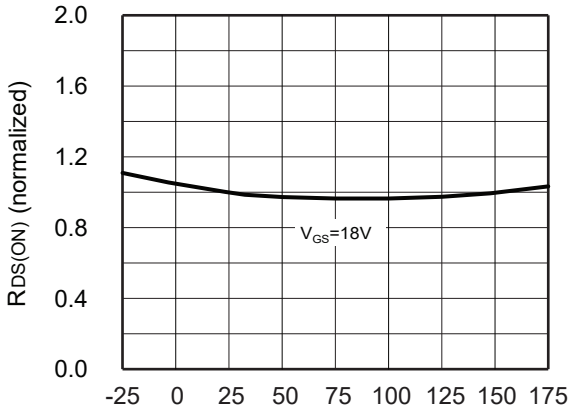
Output Characteristics Tj=25℃



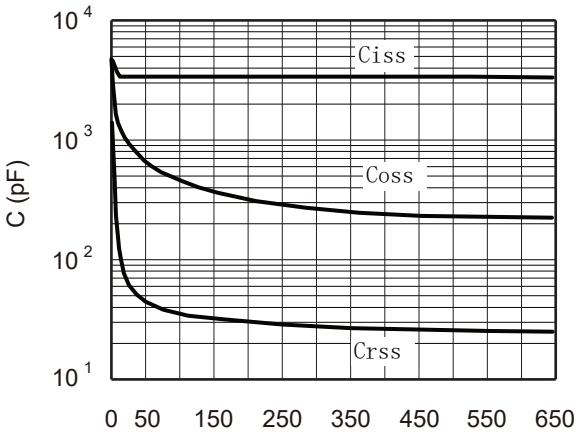
Output Characteristics Tj=175℃



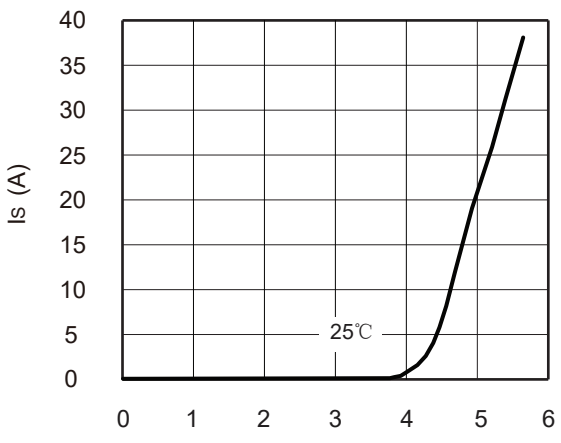
Transfer Characteristics



On-Resistance vs. temperature

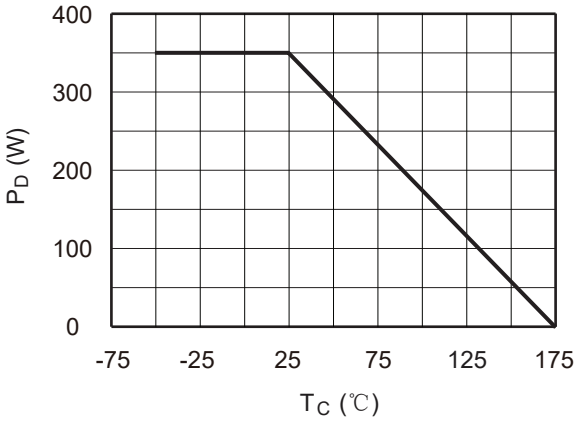


Capacitance Characteristics

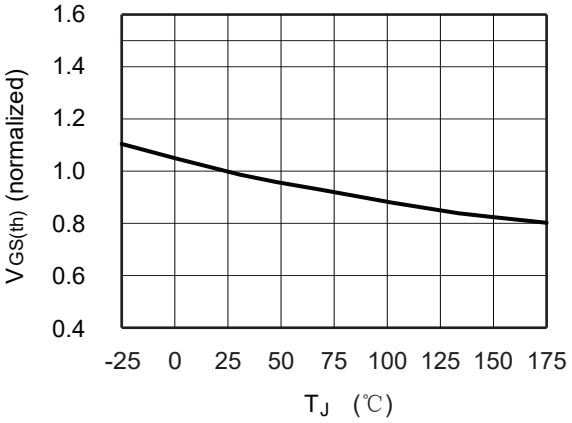


Body-Diode Characteristics

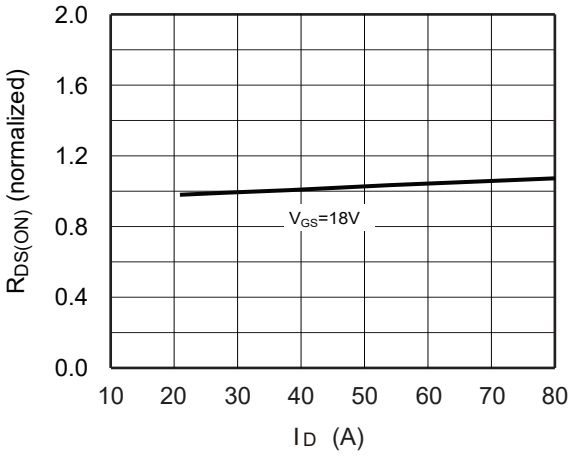
Typical Characteristics



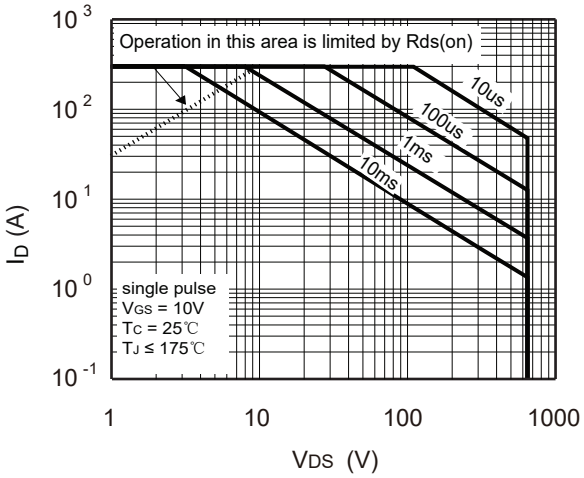
Maximum total power dissipation



Threshold Voltage vs. Junction Temperatur



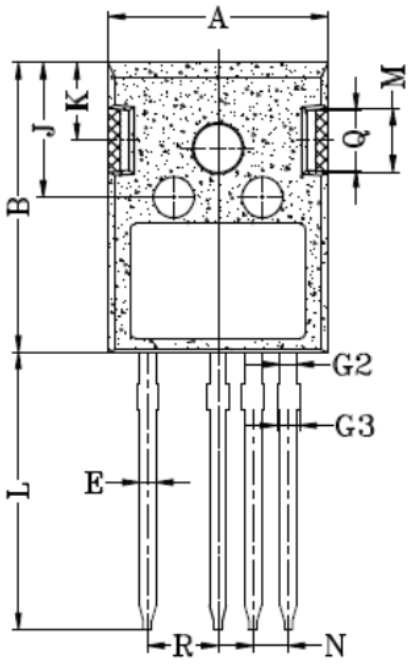
On-Resistance vs. Drain Current

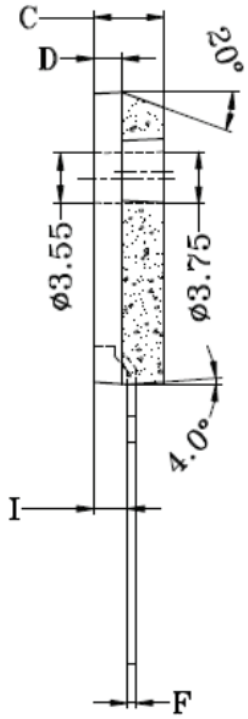


Maximum Safe Operating Area

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

