

CMHG65R020-4

650V, 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.

Features

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

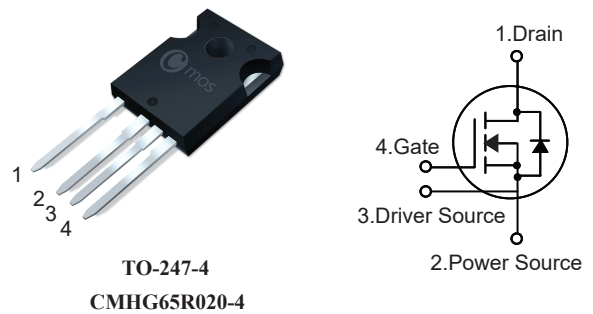
Product Summary

BVDSS	$R_{DS(on)}$ max.	ID
650V	26mΩ	100A

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	650	V
V_{GS}	Absolute maximum values	-10/+22	V
V_{GSop}	Recommended operational values	0/+18	V
$I_D@T_C=25^\circ C$	Continuous Drain Current	100	A
$I_D@T_C=100^\circ C$	Continuous Drain Current	70	A
I_{DM}	Pulsed Drain Current	300	A
EAS	Single Pulse Avalanche Energy (Note 1)	3153	mJ
$P_D@T_C=25^\circ C$	Total Power Dissipation	350	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	---	0.43	$^\circ C/W$

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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 =100μA	650	---	---	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°C	---	10	---	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =-10V to 22V , V _{DS} =0V	---	---	±250	nA
g _{fs}	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	---	21	---	ns
T _r	Rise Time	I _D =20A	---	76	---	
T _{d(off)}	Turn-Off Delay Time	V _{GS} =0V to 18V	---	70	---	
T _f	Fall Time	R _G =10Ω	---	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°C	---	3.4	---	V
t _{rr}	Reverse Recovery Time	di/dt=400A/μs , V _{GS} =0V	---	35	---	ns
Q _{rr}	Reverse Recovery Charge	V _{DD} =500V , I _F =60A , T _J =25°C	---	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.

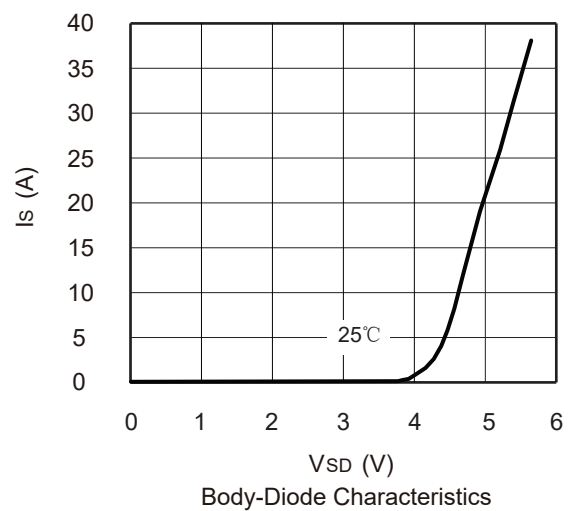
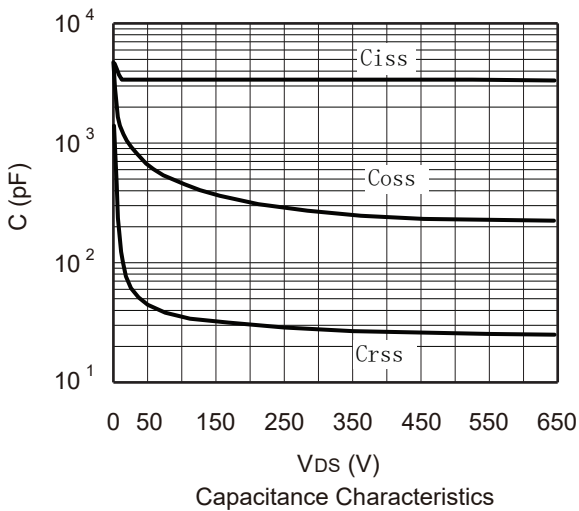
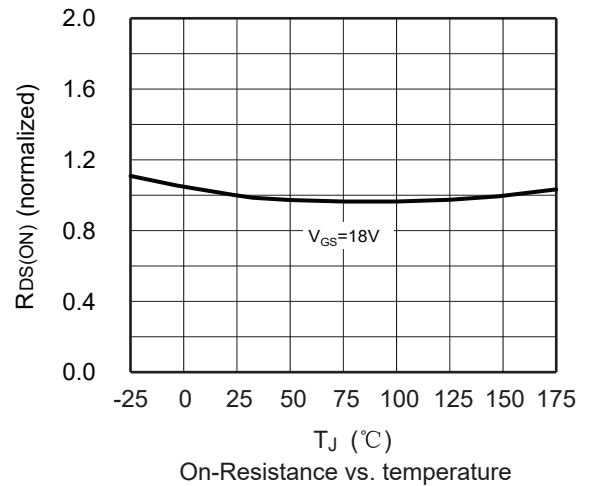
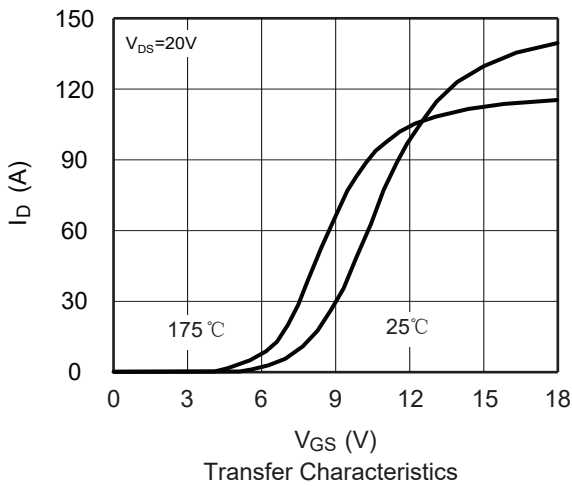
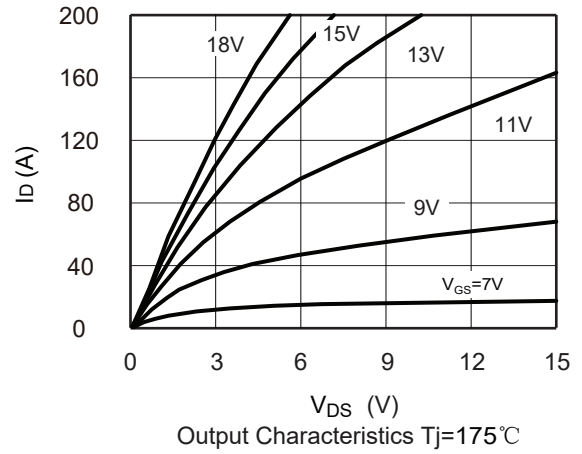
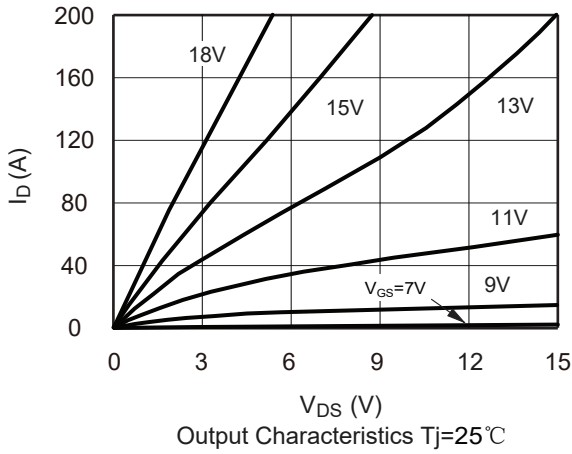
This product has been designed and qualified for the consumer market.

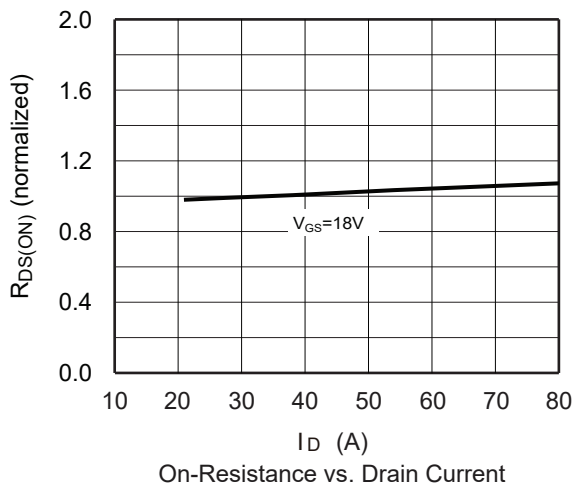
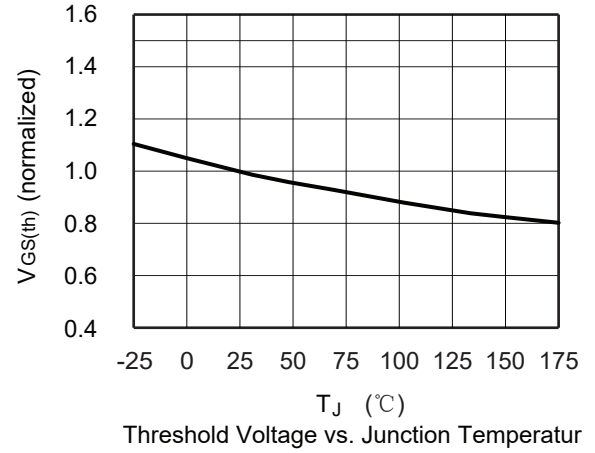
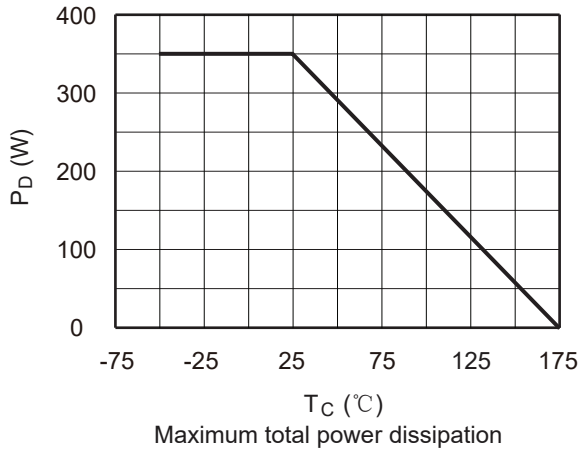
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Cmos reserves the right to improve product design ,functions and reliability without notice.Please refer to the latest version of specification.

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Typical Characteristics



Typical Characteristics


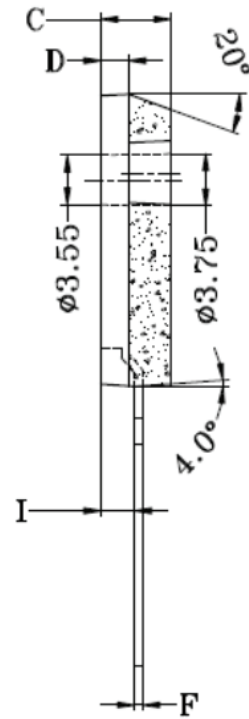
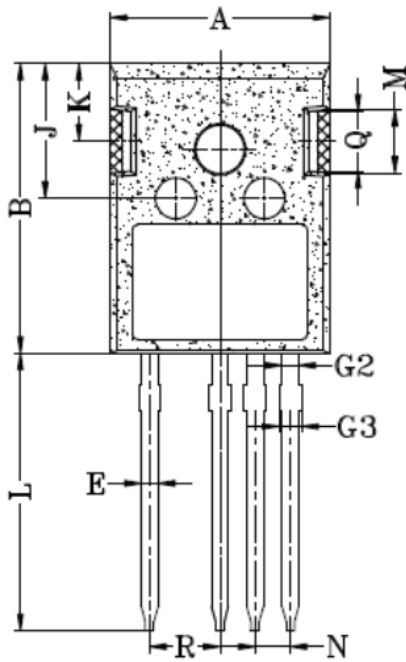
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Package Dimension

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

