CMDG65R380/CMUG65R380

800V, 280mΩ typ., 11A 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	320mΩ	11A

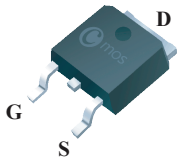
Applications

- Motor Drives
- Battery Chargers
- Switch Mode Power Supplies

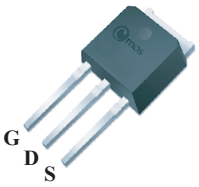
Features

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

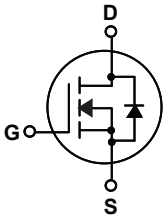
TO-252/TO-251 Pin Configuration



TO-252
(CMDG65R380)



TO-251
(CMUG65R380)



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	11	A
I_D@T_C=175℃	Continuous Drain Current	9	A
I_{DM}	Pulsed Drain Current	22	A
P_D@T_C=175℃	Total Power Dissipation	70	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
$R_{\theta JC}$	Thermal Resistance Junction-case	---	2.14	℃/W

800V, 280mΩ typ., 11A N-Channel Silicon Carbide Power MOSFET

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

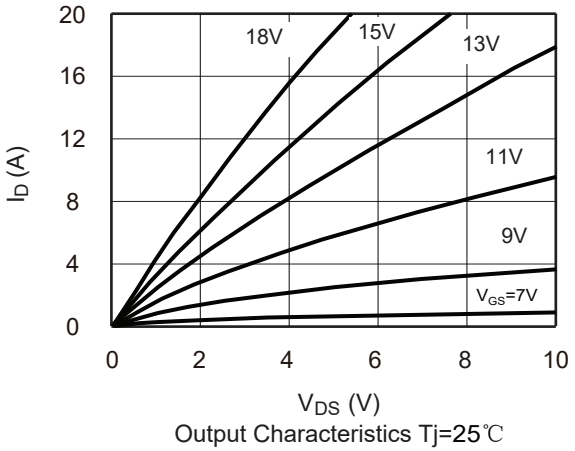
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=500μA	800	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=18V , I_D=5A	---	280	320	mΩ
		V_{GS}=18V , I_D=5A , T_J=175℃	---	300	---	
		V_{GS}=15V , I_D=5A	---	400	500	
		V_{GS}=15V , I_D=5A , T_J=175℃	---	350	---	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =1.8mA (tested after V_{GS}=22V,1ms pulse)	2.0	3.1	5.0	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=650V , V_{GS} =0V	---	1	10	μA
		V_{DS}=650V , V_{GS} =0V , T_J=175℃	---	20	---	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=+22V , V_{DS} =0V	---	---	+250	nA
		V_{GS}= -10V , V_{DS} =0V	---	---	-250	
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	3.4	---	Ω
$Q_{g(tot)}$	Total Gate Charge	V_{DS} =500V , I_D=5A V_{GS}= 0V to 15V	---	21.3	---	nC
Q_{gs}	Gate-Source Charge		---	6.7	---	
Q_{gd}	Gate-Drain Charge		---	11.5	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DS} =500V I_D =5A V_{GS}=0V / 15V R_G =10Ω	---	24	---	ns
T_r	Rise Time		---	42	---	
$T_{d(off)}$	Turn-Off Delay Time		---	26.8	---	
T_f	Fall Time		---	76	---	
C_{iss}	Input Capacitance	V_{DS}=100V , V_{GS}=0V , f=1MHz	---	280	---	pF
C_{oss}	Output Capacitance		---	50	---	
C_{rss}	Reverse Transfer Capacitance		---	11	---	

Diode Characteristics

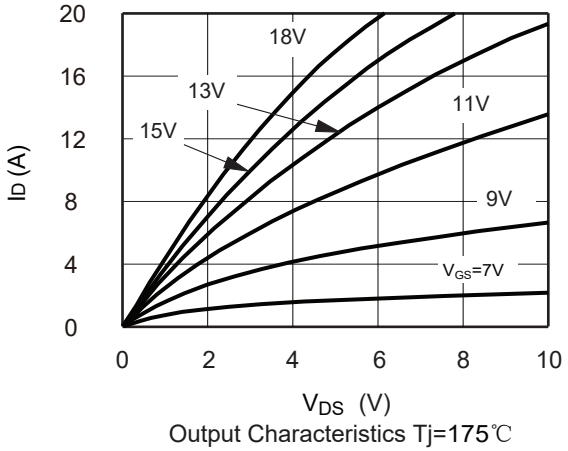
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	11	A
I_{SM}	Pulsed Source Current		---	---	22	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_{SD}=3A ,T_J=25℃	---	4.3	---	V
t_{rr}	Reverse Recovery Time	di/dt=530A/μs , V_{GS} =0V V_{DD} =500V , I_{SD} =5A , T_J =25℃	---	17.8	---	ns
Q_{rr}	Reverse Recovery Charge		---	33.7	---	nC
I_{rrm}	Peak Reverse Recovery Current		---	3.5	---	A

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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.

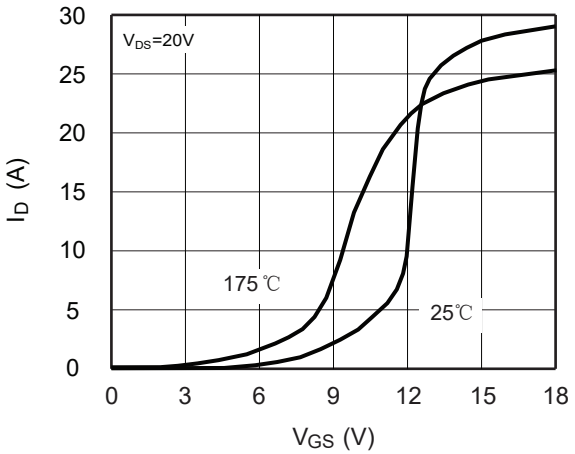
Typical Characteristics



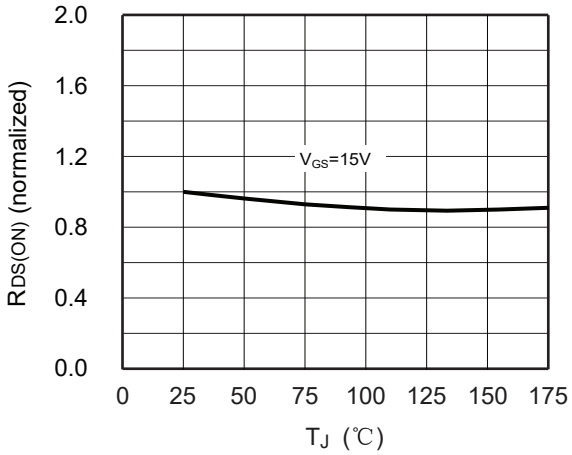
Output Characteristics Tj=25℃



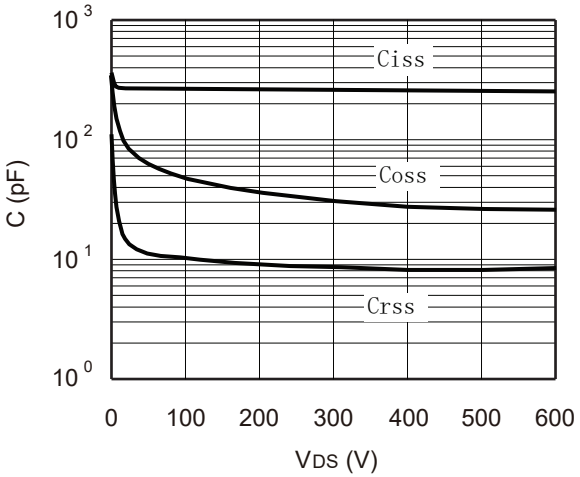
Output Characteristics Tj=175℃



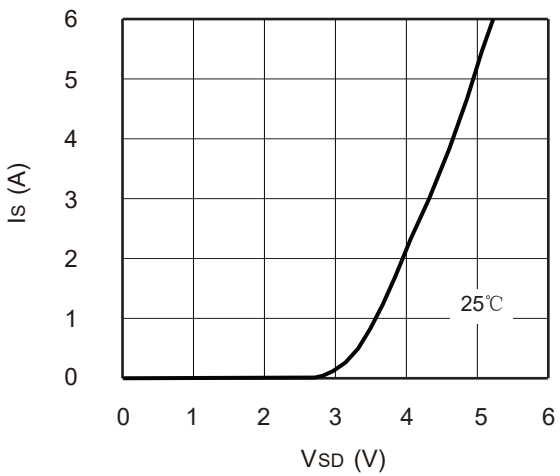
Transfer Characteristics



On-Resistance vs. temperature

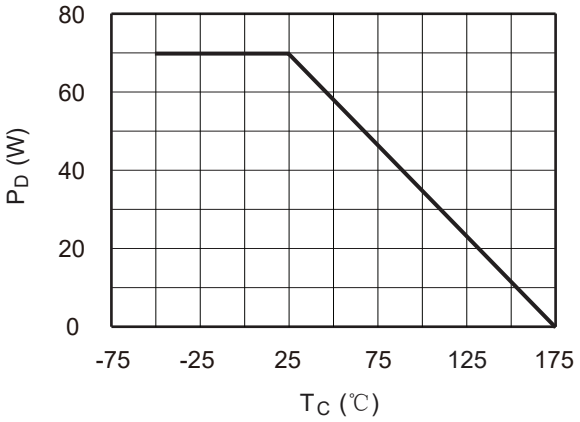


Capacitance Characteristics

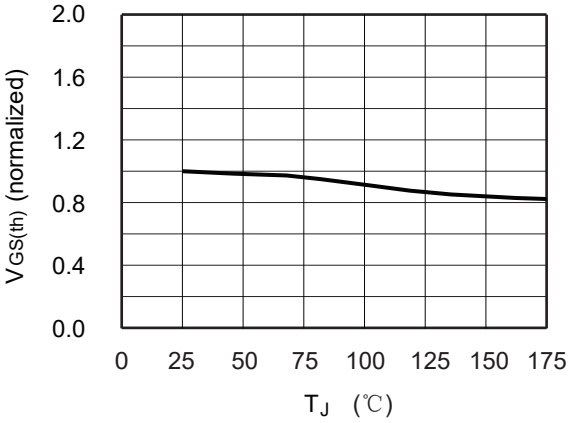


Body-Diode Characteristics

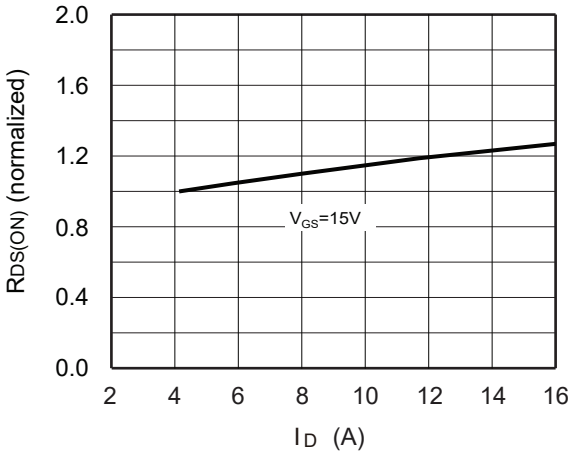
Typical Characteristics



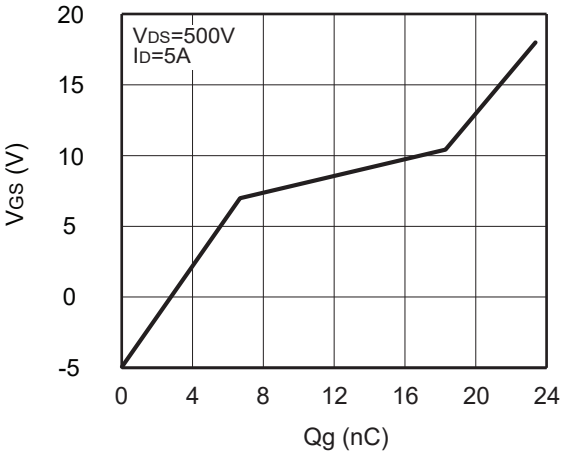
Maximum total power dissipation



Threshold Voltage vs. Junction Temperatur



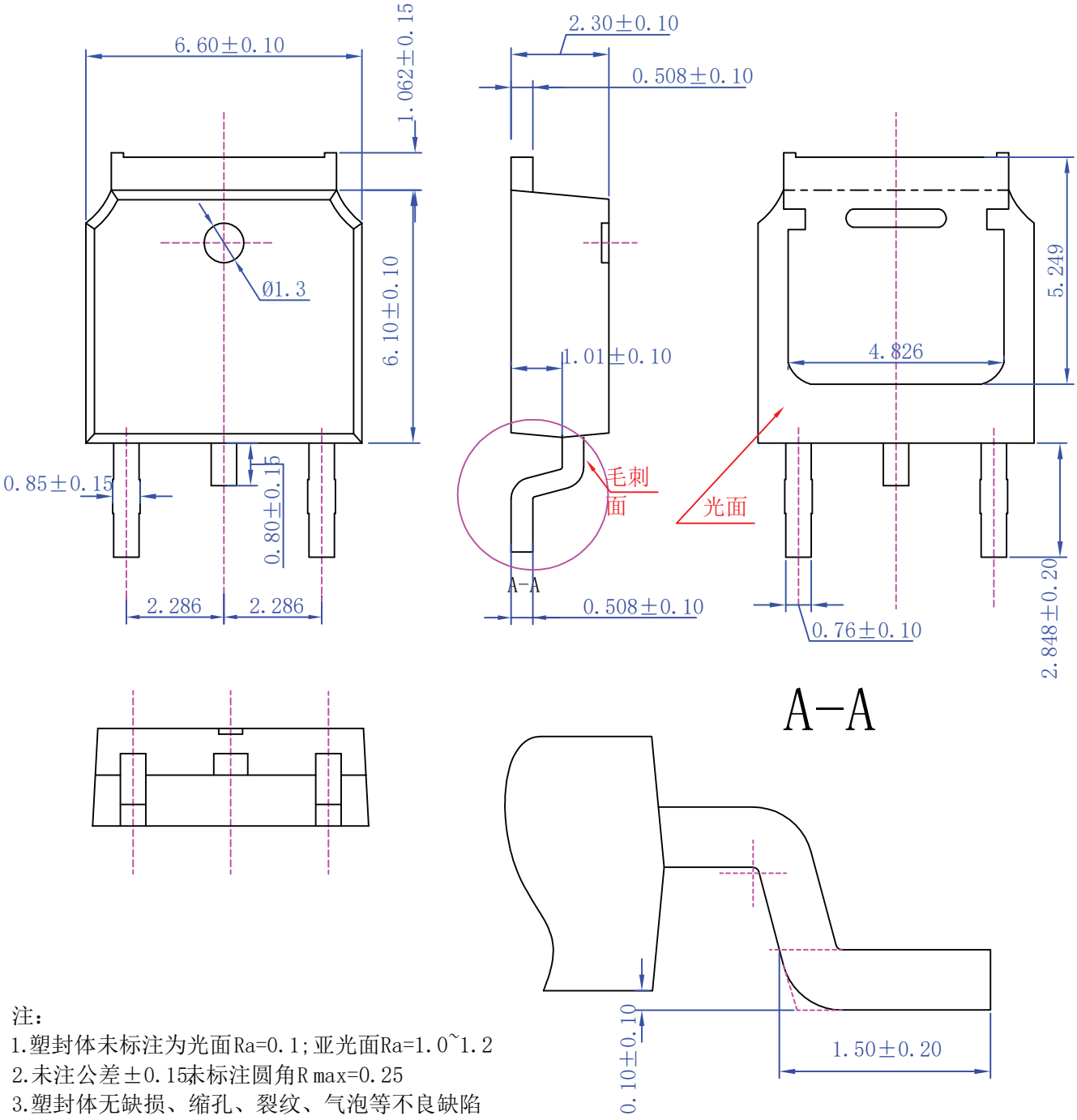
On-Resistance vs. Drain Current



Gate charge vs gate-source voltage

Package Dimension

TO-252 Unit :mm



注：

1.塑封体未标注为光面Ra=0.1;亚光面Ra=1.0~1.2
2.未注公差±0.15未标注圆角R max=0.25
3.塑封体无缺损、缩孔、裂纹、气泡等不良缺陷
4.标注单位mm
5.顶针孔不允许凸出塑封体表面

Package Dimension

TO-251A Unit :mm

