

CMDG65R380/CMUG65R380

650V, 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.

Features

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

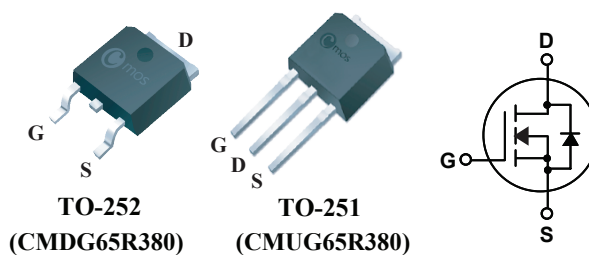
Product Summary

BVDSS	$R_{DS(on)}$ max.	ID
650V	320mΩ	11A

Applications

- Motor Drives
- Battery Chargers
- Switch Mode Power Supplies

TO-252/TO-251 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	11	A
$I_D@T_C=175^{\circ}C$	Continuous Drain Current	9	A
I_{DM}	Pulsed Drain Current	22	A
$P_D@T_C=175^{\circ}C$	Total Power Dissipation	70	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
$R_{\theta JC}$	Thermal Resistance Junction-case	---	2.14	$^{\circ}C/W$

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Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=500\mu A$	650	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=18V$, $I_D=5A$	---	280	320	mΩ
		$V_{GS}=18V$, $I_D=5A$, $T_J=175^{\circ}\text{C}$	---	300	---	
		$V_{GS}=15V$, $I_D=5A$	---	400	500	
		$V_{GS}=15V$, $I_D=5A$, $T_J=175^{\circ}\text{C}$	---	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
		$V_{DS}=650V$, $V_{GS}=0V$, $T_J=175^{\circ}\text{C}$	---	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	$V_{DS}=500V$	---	24	---	ns
T_r	Rise Time	$I_D=5A$	---	42	---	
$T_{d(off)}$	Turn-Off Delay Time	$V_{GS}=0V$ / $15V$	---	26.8	---	
T_f	Fall Time	$R_G=10\Omega$	---	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

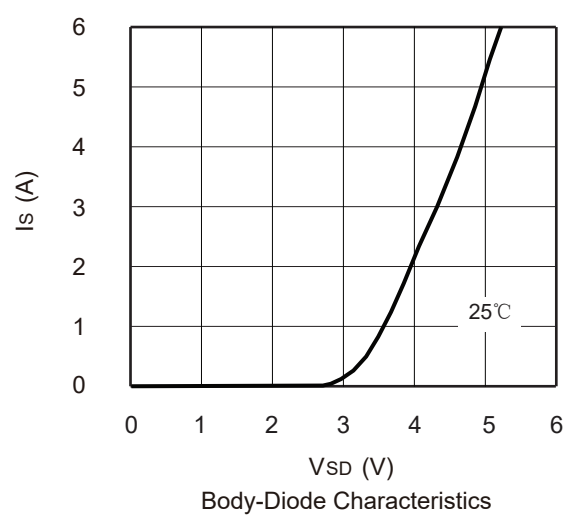
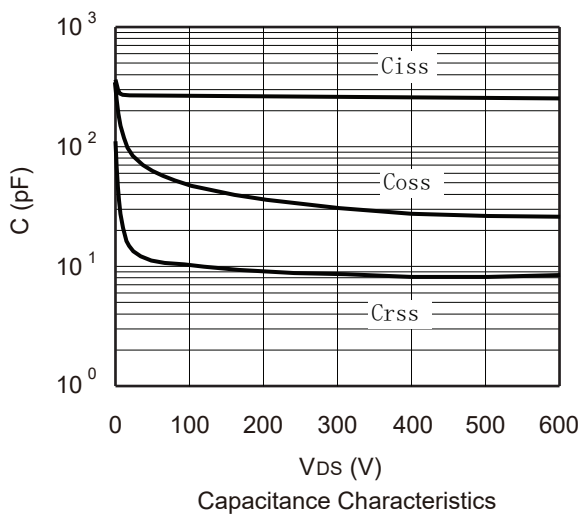
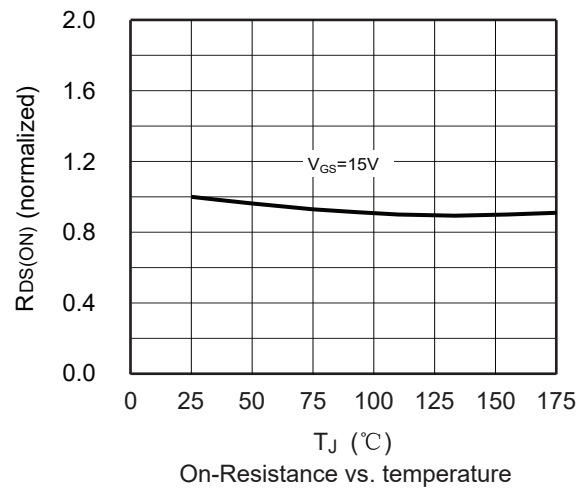
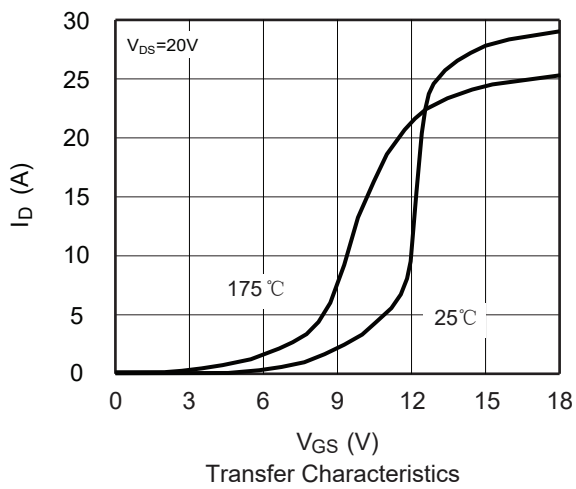
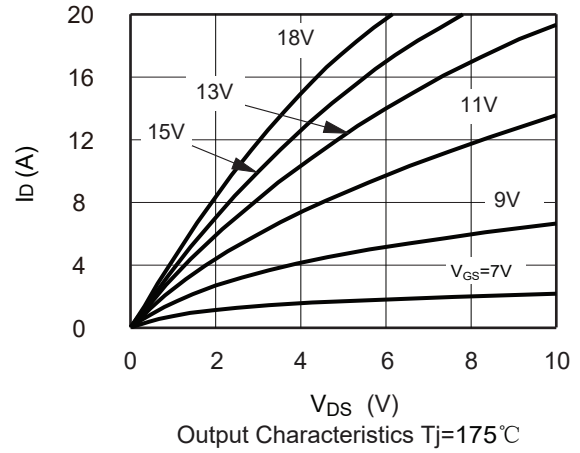
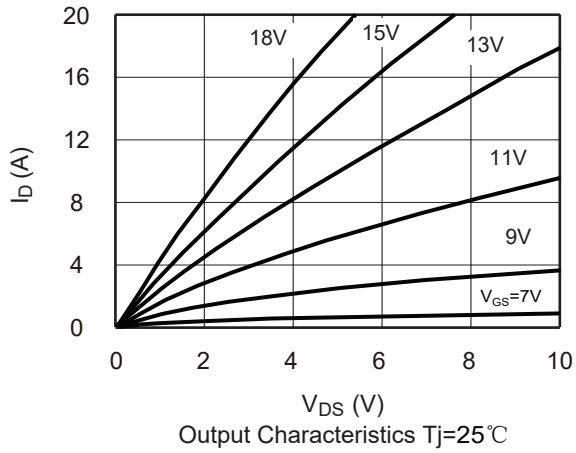
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	11	A
I_{SM}	Pulsed Source Current		---	---	22	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_{SD}=3A$, $T_J=25^{\circ}\text{C}$	---	4.3	---	V
t_{rr}	Reverse Recovery Time	$di/dt=530A/\mu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

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

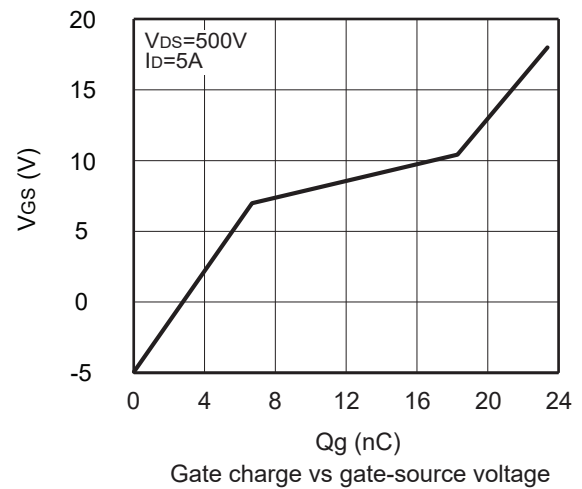
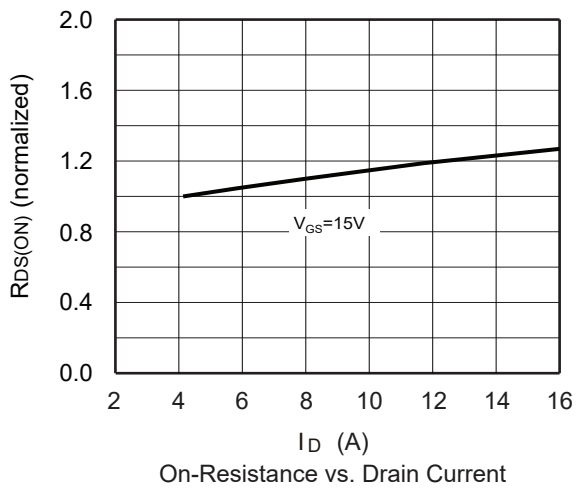
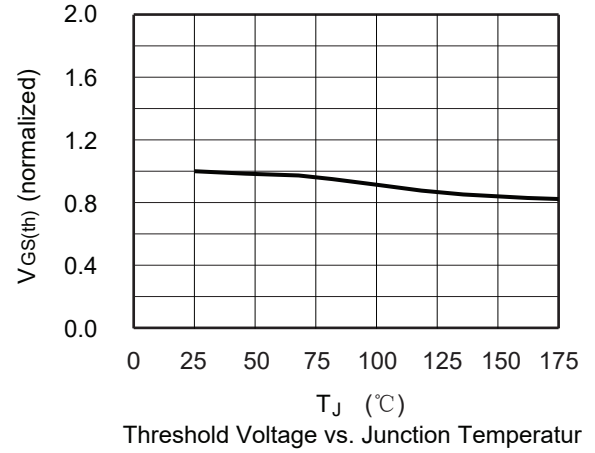
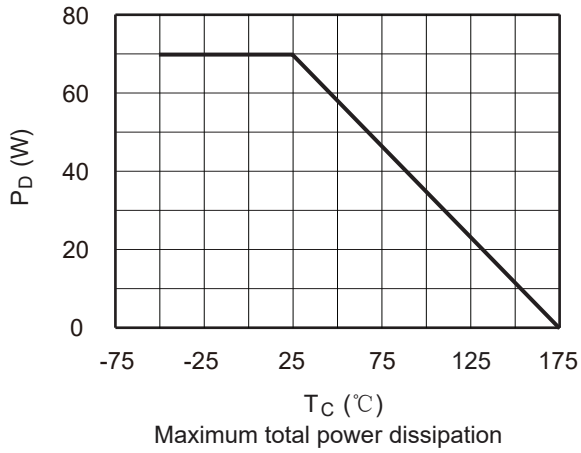
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Cmos reserves the right to improve product design, functions and reliability without notice. Please refer to the latest version of specification.

Typical Characteristics



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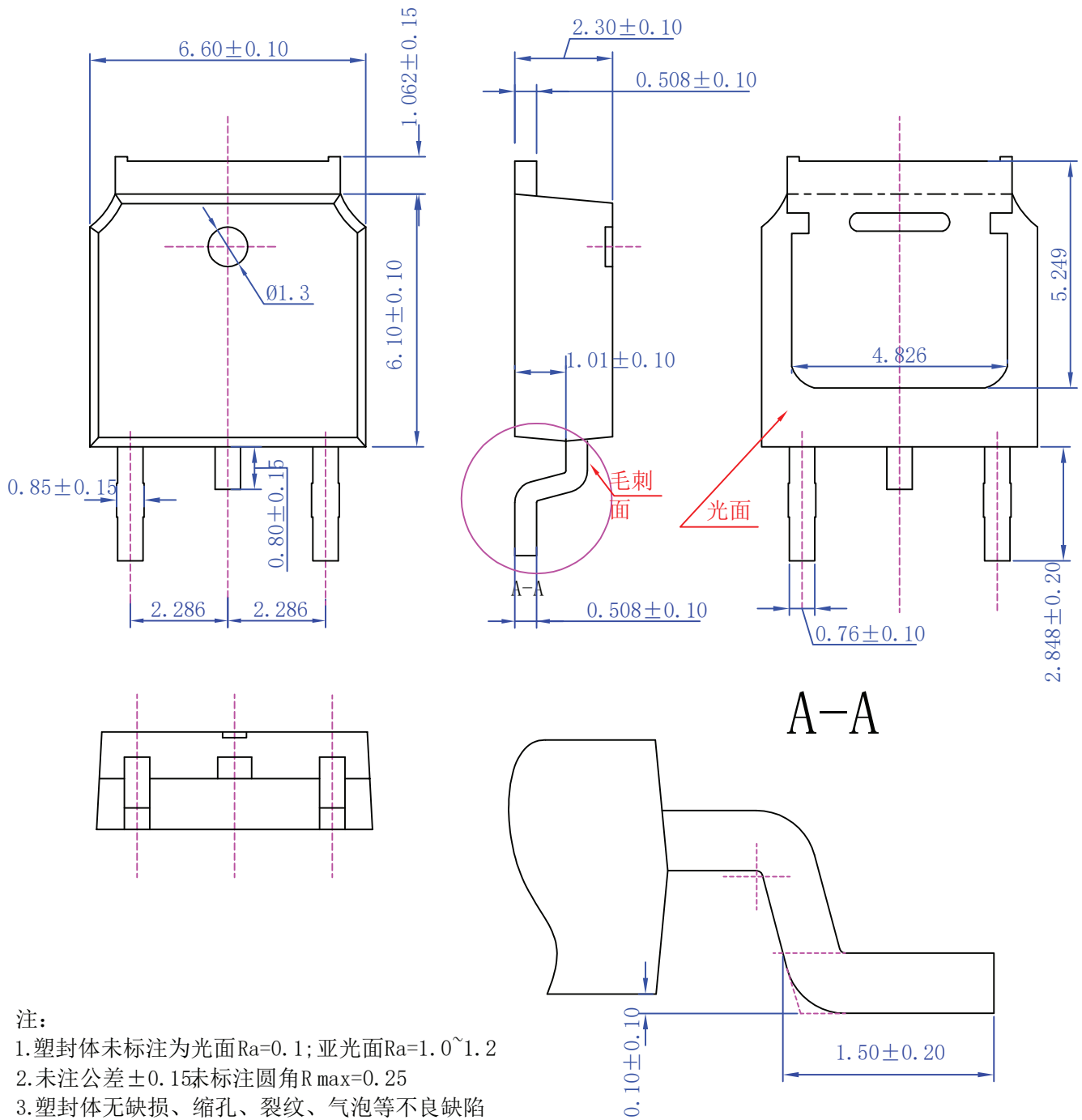
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Package Dimension

TO-252

Unit :mm



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Package Dimension

TO-251A

Unit :mm

