

CMDG65R670/CMUG65R670

650V, 670mΩ typ., 6A 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

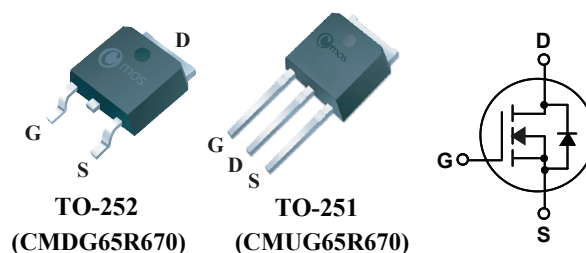
Product Summary

BVDSS	$R_{DS(on)}$ max.	ID
650V	0.75Ω	6A

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	6	A
$I_D@T_C=100^{\circ}C$	Continuous Drain Current	4	A
I_{DM}	Pulsed Drain Current	12	A
EAS	Single Pulse Avalanche Energy ¹	48	mJ
$P_D@T_C=25^{\circ}C$	Total Power Dissipation	50	W
T_{STG}	Storage Temperature Range	-55 to 175	°C
T_J	Operating Junction Temperature Range	-55 to 175	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JC}$	Thermal Resistance Junction-case	---	3	°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 =500μA	650	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =18V, I _D =1.8A	---	0.67	0.75	Ω
		V _{GS} =18V, I _D =1.8A, T _J =175°C	---	0.63	---	
		V _{GS} =15V, I _D =1.8A	---	1	---	
		V _{GS} =15V, I _D =1.8A, T _J =175°C	---	0.78	---	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =0.65mA (tested after V _{GS} =V _{DS} , 1ms pulse)	2.7	3.7	5.0	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =650V, V _{GS} =0V	---	---	10	μA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =-10V to 22V, V _{DS} =0V	---	---	±250	nA
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	15	---	Ω
Q _g	Total Gate Charge	V _{DS} =500V, I _D =2A V _{GS} =0V to 15V	---	18	---	nC
Q _{gs}	Gate-Source Charge		---	7	---	
Q _{gd}	Gate-Drain Charge		---	7	---	
T _{d(on)}	Turn-On Delay Time	V _{DS} =500V	---	13	---	ns
T _r	Rise Time	I _D =2A	---	37	---	
T _{d(off)}	Turn-Off Delay Time	V _{GS} =0V to 18V	---	24	---	
T _f	Fall Time	R _G =2Ω	---	108	---	
C _{iss}	Input Capacitance	V _{DS} =100V, V _{GS} =0V, f=1MHz	---	140	---	pF
C _{oss}	Output Capacitance		---	28	---	
C _{rss}	Reverse Transfer Capacitance		---	8.5	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	6	A
I _{SM}	Pulsed Source Current		---	---	12	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _{SD} =1.1A, T _J =25°C	---	4.7	---	V
t _{rr}	Reverse Recovery Time	di/dt=465A/μs, V _{GS} =0V	---	11	---	ns
Q _{rr}	Reverse Recovery Charge	V _R =500V, I _{SD} =2A, T _J =25°C	---	17	---	nC

Note :

1.The EAS data shows Max. rating . The test condition is V_{DD}=100V, V_{GS}=10V, L=30mH, I_{AS}=1.8A.

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

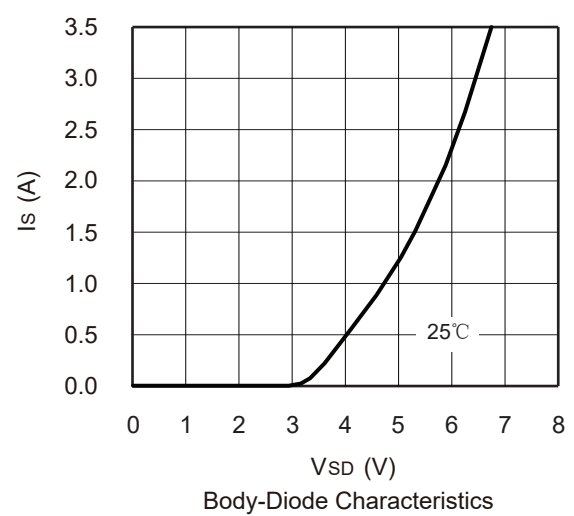
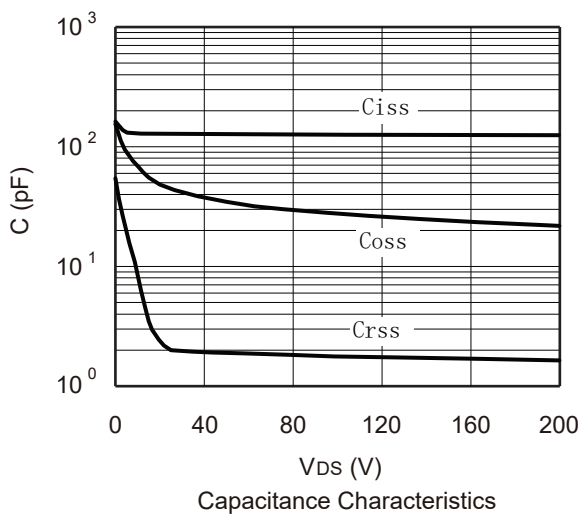
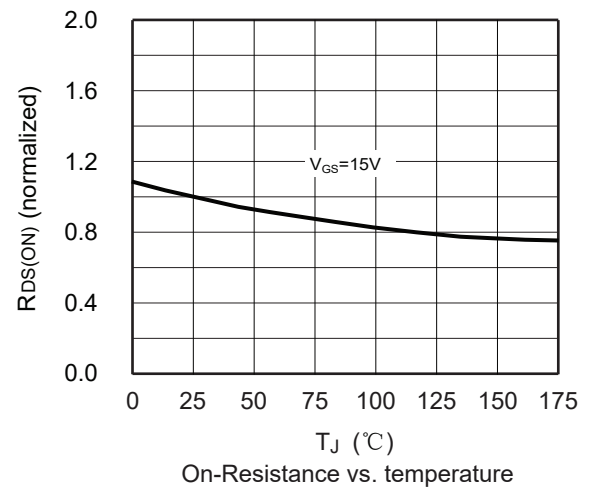
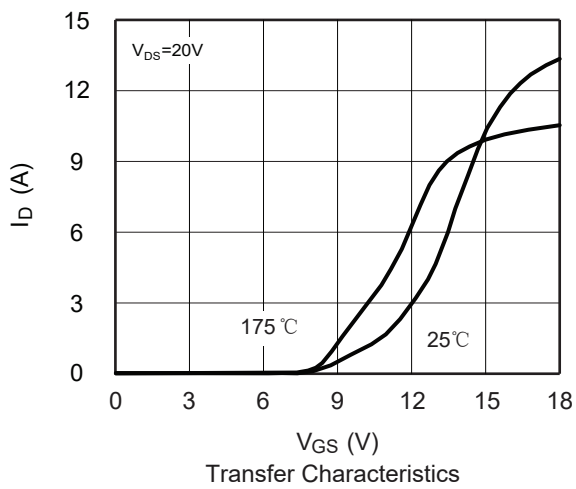
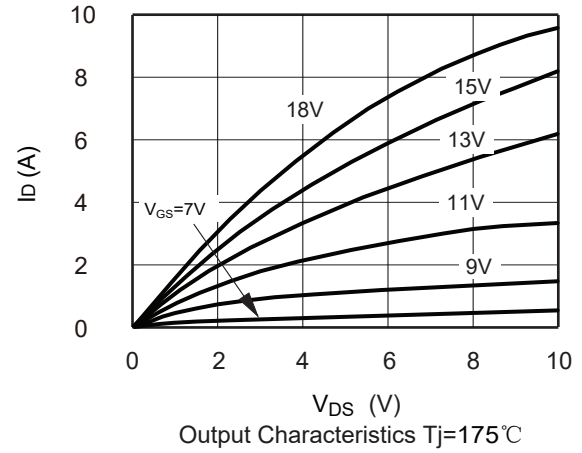
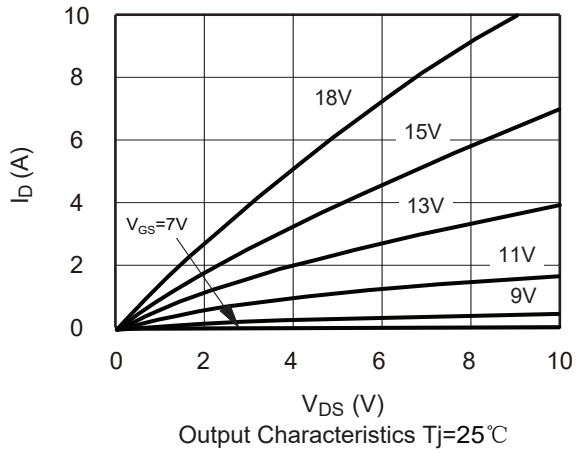
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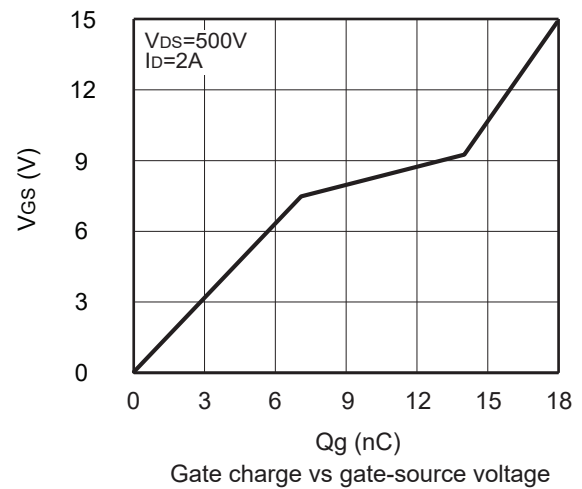
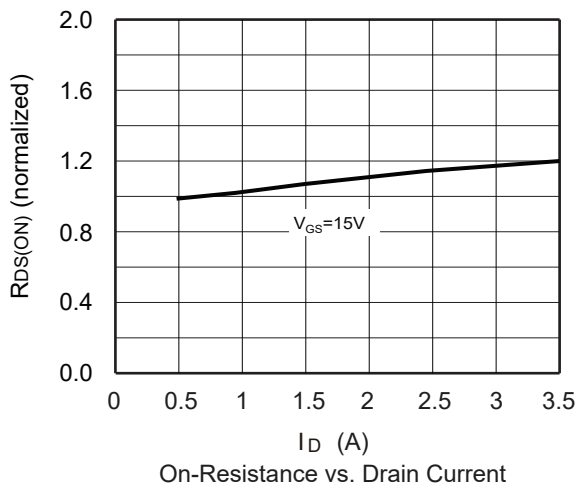
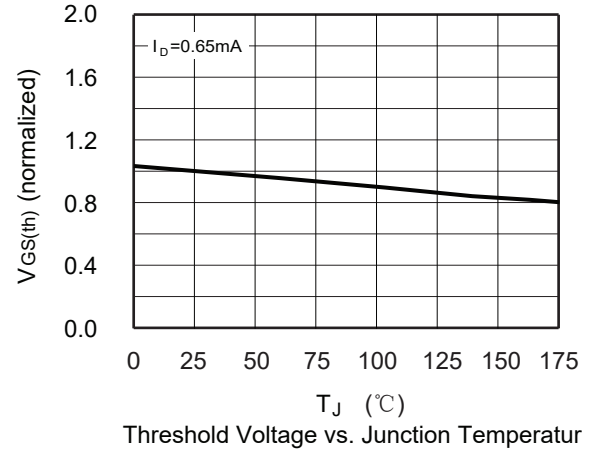
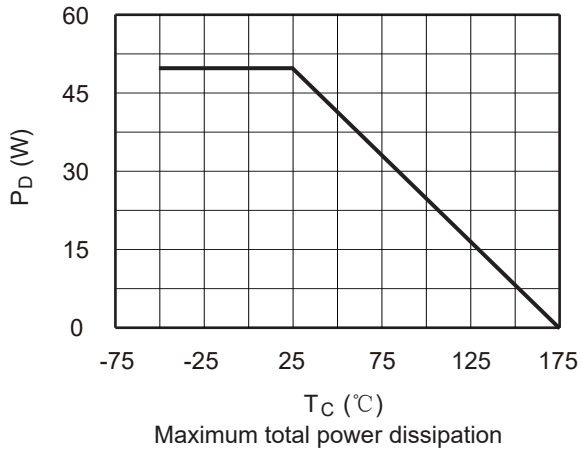
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Typical Characteristics



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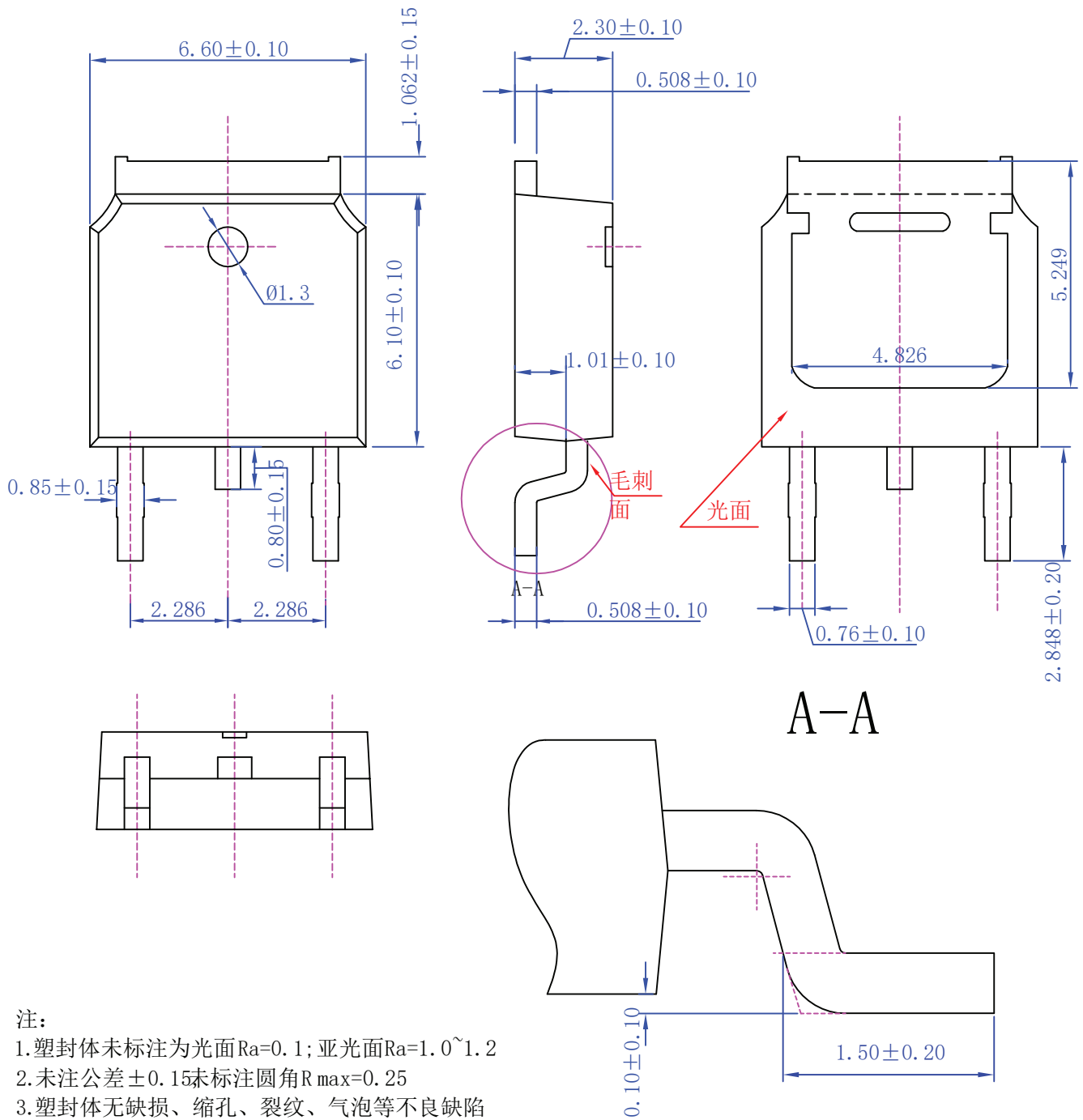
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Package Dimension

TO-252

Unit :mm



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650V, 670mΩ typ., 6A N-Channel Silicon Carbide Power MOSFET

Package Dimension

TO-251A

Unit :mm

