

# CMSC6683A

-20V, 8.5mΩ typ., -54A P-Channel MOSFET

## General Description

The CMSC6683A uses advanced trench technology to provide excellent RDS(ON). This device is ideal for load switch and battery protection applications.

## Features

- P-Channel MOSFET
- Low ON-resistance
- Surface Mount Package
- RoHS Compliant

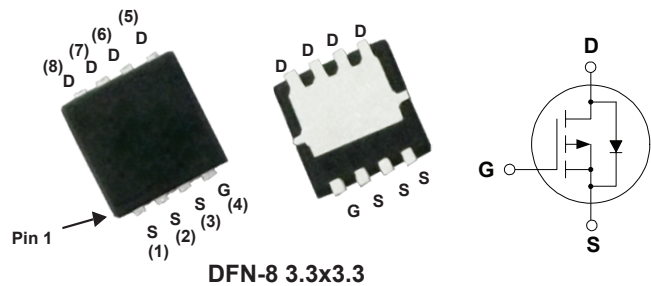
## Product Summary

BVDSS	R <sub>DS(on)</sub> max.	ID
-20V	10mΩ	-54A

## Applications

- Load/Power Switching in Portable Devices

## DFN-8 3.3x3.3 Pin Configuration



Type	Package	Marking
CMSC6683A	DFN-8 3.3x3.3	6683A

## Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	-20	V
V <sub>GS</sub>	Gate-Source Voltage	±12	V
I <sub>D</sub> @T <sub>C</sub> =25°C	Continuous Drain Current	-54	A
I <sub>D</sub> @T <sub>C</sub> =100°C	Continuous Drain Current	-25	A
I <sub>DM</sub>	Pulsed Drain Current	-162	A
EAS	Single Pulse Avalanche Energy <sup>1</sup>	90	mJ
P <sub>D</sub> @T <sub>C</sub> =25°C	Total Power Dissipation	55	W
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 150	°C

## Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R <sub>θJA</sub>	Thermal Resistance Junction-ambient(Steady State)	---	81	°C/W
R <sub>θJC</sub>	Thermal Resistance Junction-case	---	2.27	°C/W

**Electrical Characteristics (T<sub>J</sub>=25°C , unless otherwise noted)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V , I <sub>D</sub> =-250μA	-20	---	---	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =-4.5V , I <sub>D</sub> =-10A	---	8.5	10	mΩ
		V <sub>GS</sub> =-2.5V , I <sub>D</sub> =-5A	---	11.5	15	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> = -250μA	-0.4	---	-1.0	V
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =-16V , V <sub>GS</sub> =0V	---	---	-1	μA
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> =±12V , V <sub>DS</sub> =0V	---	---	±100	nA
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =-5V , I <sub>D</sub> =-10A	---	28	---	S
R <sub>g</sub>	Gate Resistance	V <sub>DS</sub> =0V , V <sub>GS</sub> =0V , f=1MHz	---	12	---	Ω
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =-10V , I <sub>D</sub> =-13A V <sub>GS</sub> =-4.5V (Note 2)	---	40	---	nC
Q <sub>gs</sub>	Gate-Source Charge		---	9	---	
Q <sub>gd</sub>	Gate-Drain Charge		---	11	---	
T <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> =-10V , V <sub>GS</sub> = -4.5V R <sub>L</sub> = 10Ω , R <sub>G</sub> = 6Ω , I <sub>D</sub> =-1A (Note 2)	---	35	---	ns
T <sub>r</sub>	Rise Time		---	60	---	
T <sub>d(off)</sub>	Turn-Off Delay Time		---	120	---	
T <sub>f</sub>	Fall Time		---	80	---	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =-10V , V <sub>GS</sub> =0V , f=1MHz	---	3360	---	pF
C <sub>oss</sub>	Output Capacitance		---	470	---	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	320	---	

**Diode Characteristics**

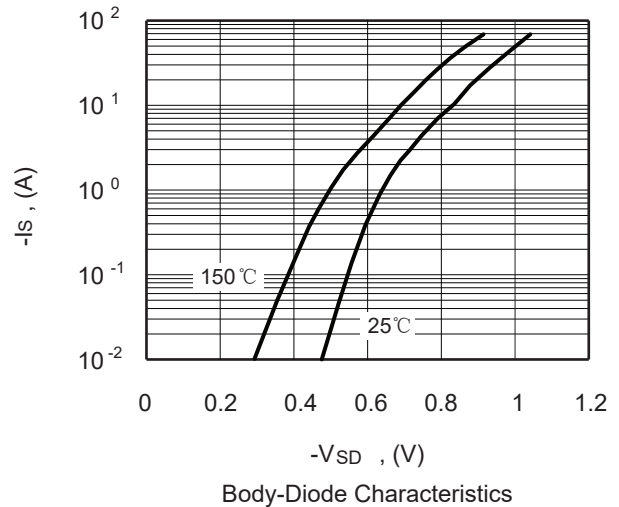
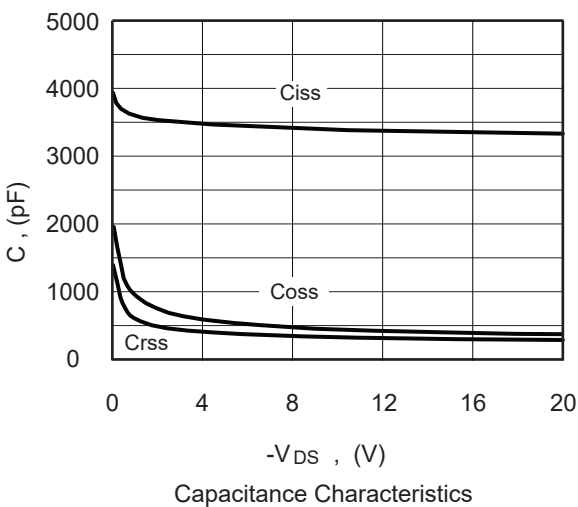
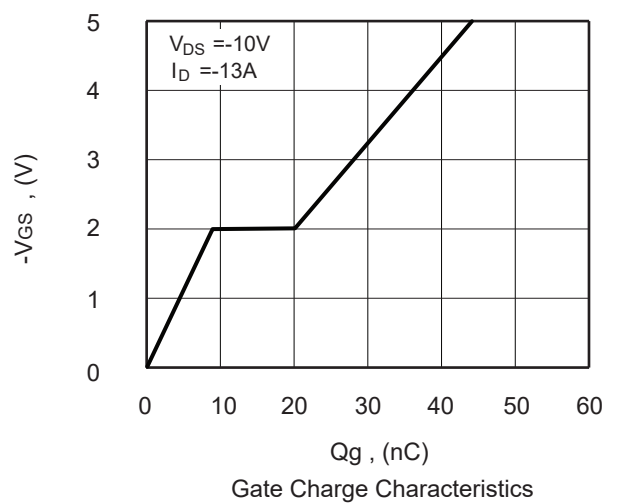
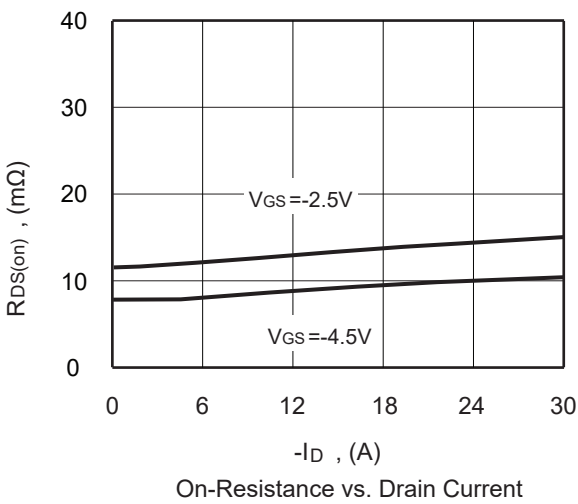
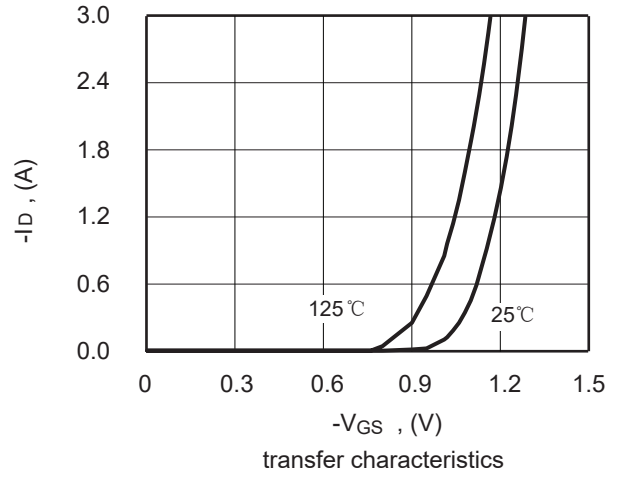
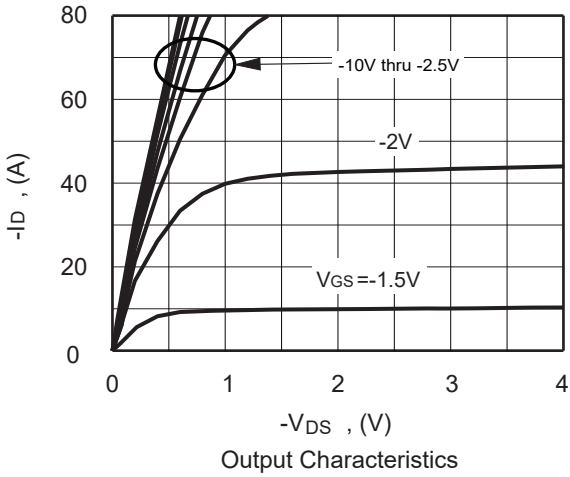
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V , Force Current	---	---	-54	A
I <sub>SM</sub>	Pulsed Source Current		---	---	-162	A
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V , I <sub>S</sub> =-20A , T <sub>J</sub> =25°C	---	-0.89	-1.2	V

Note :

- The EAS data shows Max. rating . The test condition is V<sub>DD</sub>=-20V , V<sub>GS</sub>=-10V , L=0.5mH , I<sub>AS</sub>=-19A.
- Defined by design, not subject to production.

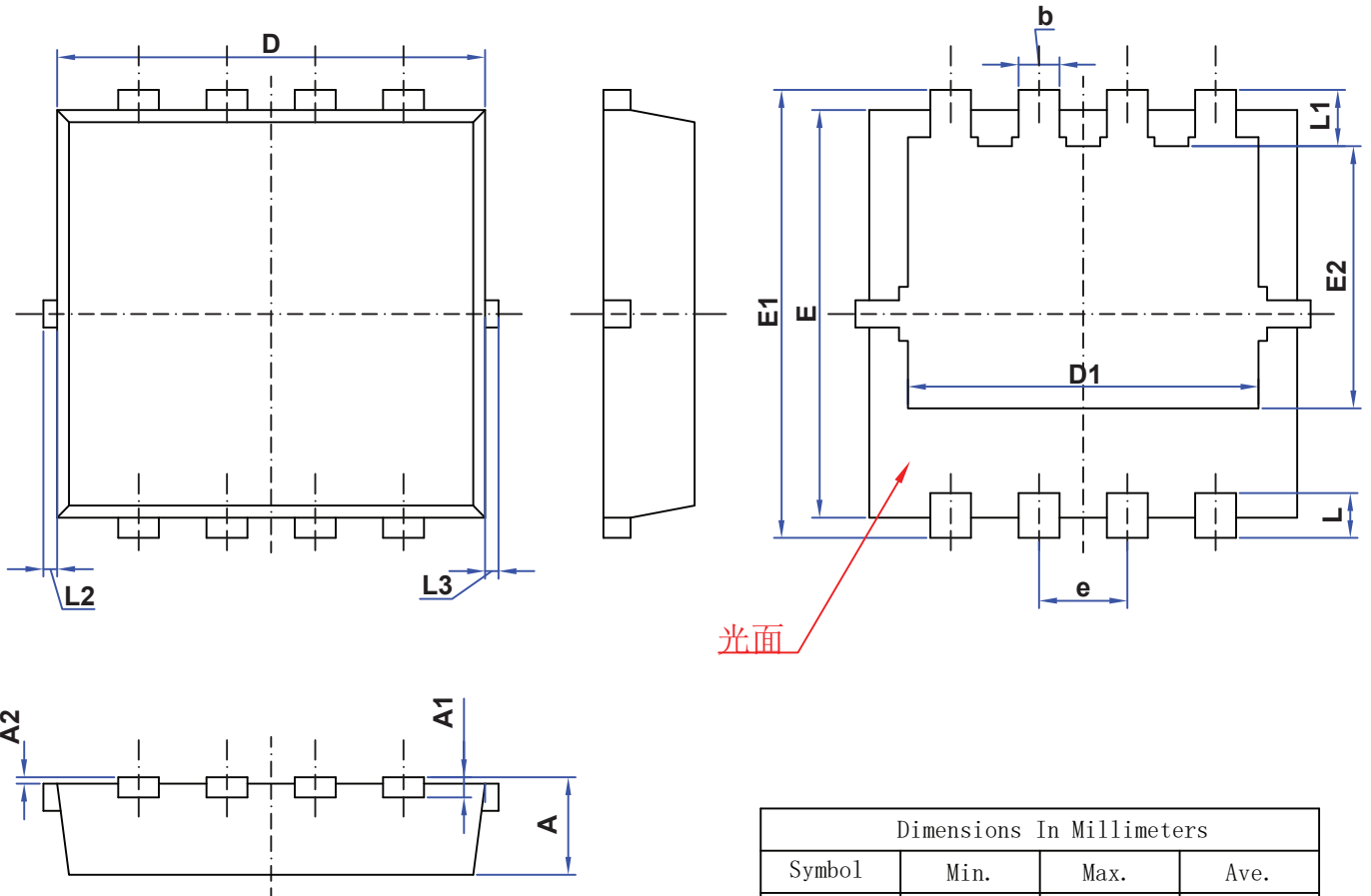
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Cmos assumes no liability for customers' product design or applications.  
Cmos reserves the right to improve product design ,functions and reliability without notice.Please refer to the latest version of specification.

Typical Characteristics



Package Dimension

DFN-8 3.3x3.3 Unit :mm



- 注:
1. 未注公差±0.10,
  2. 塑封体无缺损、缩孔、裂纹、气泡等不良缺陷
  3. 标注单位mm

Dimensions In Millimeters			
Symbol	Min.	Max.	Ave.
A	0.700	0.900	0.800
A1	0.100	0.200	0.150
A2	-	0.050	-
D	3.000	3.200	3.100
D1	2.350	2.550	2.450
E	3.000	3.200	3.100
E1	3.200	3.600	3.400
E2	1.635	1.835	1.735
b	0.200	0.400	0.300
e	0.550	0.750	0.650
L	0.250	0.650	0.450
L1	0.345	0.745	0.545
L2	0~0.100		
L3	0~0.100		