CMSC1402

20V, 3.8mΩ typ., 16A N-Channel MOSFET

General Description

The CMSC1402 is designed to provide a high efficiency synchronous buck power stage with optimal layout and board space utilization. This device is well suited for use in compact DC/DC converter applications.

Features

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

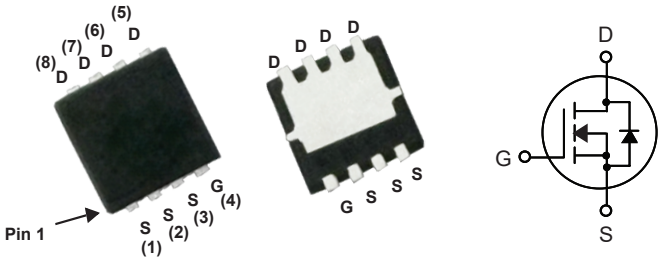
Product Summary

BVDSS	$R_{DS(on)}$ max.	ID
20V	4mΩ	16A

Applications

- DC/DC Converters in Computing, Servers, and POL
- Isolated DC/DC Converters in Telecom and Industrial

DFN-8 3.3x3.3 Pin Configuration



DFN-8 3.3x3.3

Type	Package	Marking
CMSC1402	DFN-8 3.3x3.3	1402

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D@T_C=25℃	Continuous Drain Current	16	A
I_D@T_C=100℃	Continuous Drain Current	13	A
I_{DM}	Pulsed Drain Current	48	A
EAS	Single Pulse Avalanche Energy [1]	170	mJ
P_D@T_C=25℃	Total Power Dissipation	40	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient	---	60	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-case	---	3.13	℃/W

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=250μA	20	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=8A	---	3.8	4	mΩ
		V_{GS}= 4.5V, I_D=6A	---	4.2	4.5	
		V_{GS}= 2.5V, I_D=5A	---	5.3	6	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D = 250μA	0.5	---	1.5	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=16V , V_{GS}=0V	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS} = ±12V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V, I_D=5A	---	25	---	S
Q_g	Total Gate Charge	V_{DD}=10V , I_D= 16A V_{GS}=0 to 4.5V	---	45	---	nC
Q_{gs}	Gate-Source Charge		---	9	---	
Q_{gd}	Gate-Drain Charge		---	10	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=10V , V_{GS}=10V , R_G=6Ω I_D= 16A	---	15	---	ns
T_r	Rise Time		---	10	---	
$T_{d(off)}$	Turn-Off Delay Time		---	30	---	
T_f	Fall Time		---	8	---	
C_{iss}	Input Capacitance	V_{DS}= 15V, V_{GS}=0V , f=1MHz	---	2100	---	pF
C_{oss}	Output Capacitance		---	350	---	
C_{rss}	Reverse Transfer Capacitance		---	280	---	

Diode Characteristics

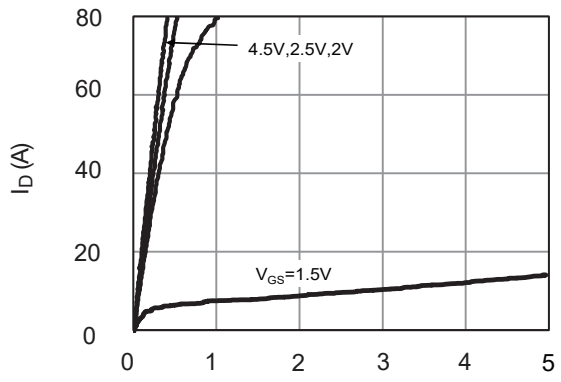
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Diode continuous forward current	V_G=V_D=0V , Force Current	---	---	16	A
$I_{S,pulse}$	Diode pulse current		---	---	48	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_F=16A , Tj=25℃	---	0.83	1.2	V

Note :

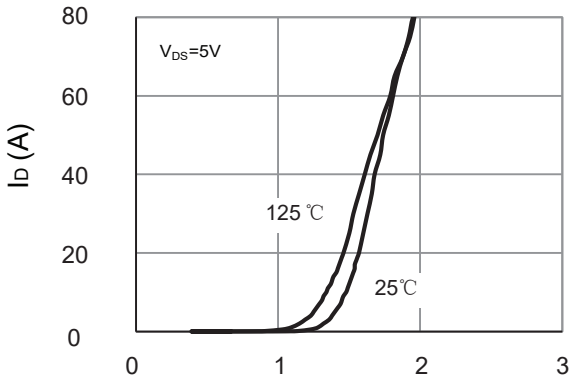
1.The EAS data shows Max. rating . The test condition is V_{DD}=15V,V_{GS}=10V,L=1mH,I_{AS}=18.5A.

This product has been designed and qualified for the counsumer market.
Cmos assumes no liability for customers' product design or applications.
Cmos reserver the right to improve product design ,functions and reliability wihtout notice.

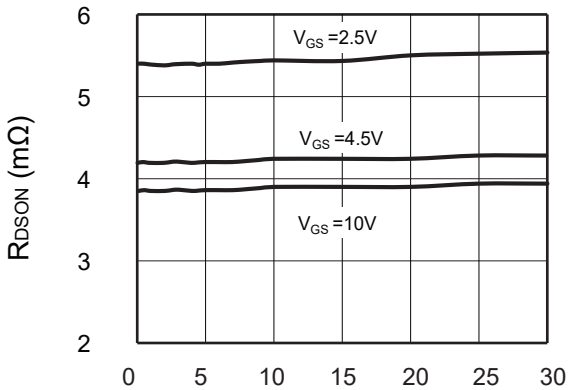
Typical Characteristics



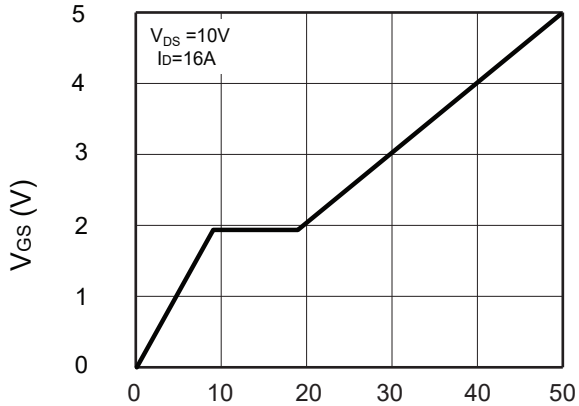
Output Characteristics



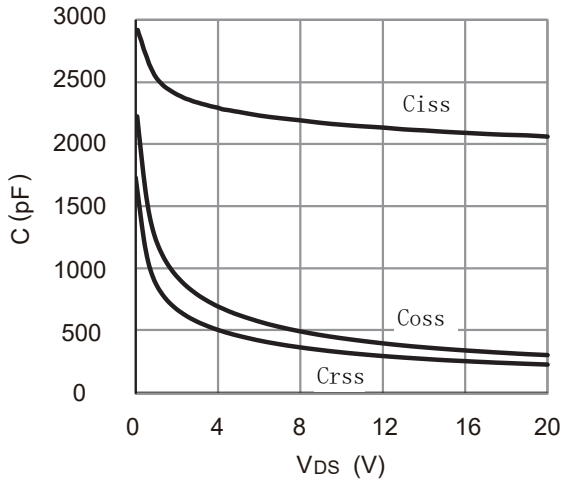
transfer characteristics



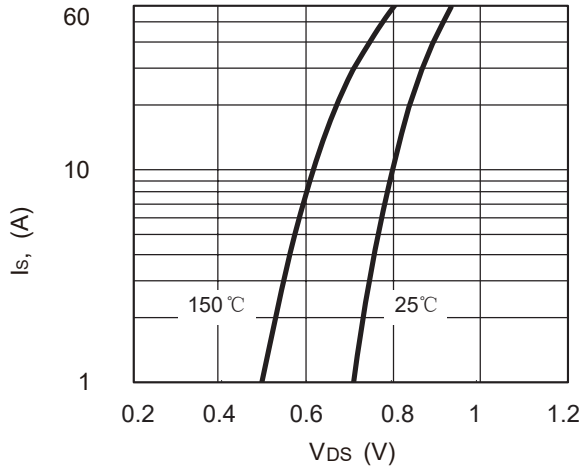
drain-source on-resistance



Gate charge vs gate-source voltage



Capacitance Characteristics



Body-Diode Characteristics