

## N-Channel Enhancement Mode 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

### Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	20	V
$V_{GS}$	Gate-Source Voltage	$\pm 12$	V
$I_D@T_C=25^\circ C$	Continuous Drain Current	16	A
$I_D@T_C=100^\circ C$	Continuous Drain Current	13	A
$I_{DM}$	Pulsed Drain Current	48	A
EAS	Single Pulse Avalanche Energy	170	mJ
$P_D@T_C=25^\circ C$	Total Power Dissipation	2	W
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$

### Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient	---	60	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-case	---	4	$^\circ C/W$

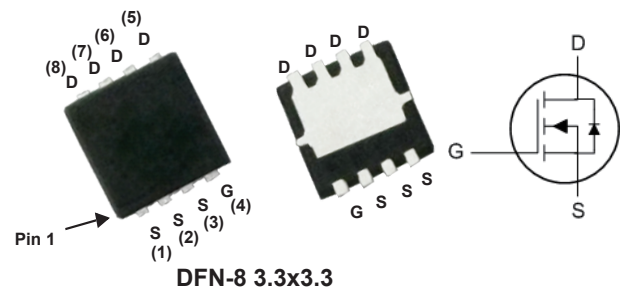
### Product Summary

BVDSS	RDSON	ID
20V	4m $\Omega$	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



Type	Package	Marking
CMSC1402	DFN-8 3.3*3.3	1402

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	20	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=20A$	---	---	4	m $\Omega$
		$V_{GS}= 4.5V, I_D=20A$	---	---	4.5	
		$V_{GS}= 2.5V, I_D=20A$	---	---	6	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D = 250\mu A$	0.5	---	1.5	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=16V, V_{GS}=0V$	---	---	1	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS} = \pm 12V$	---	---	$\pm 100$	nA
$g_{fs}$	Forward Transconductance	$V_{DS}=5V, I_D=20A$	---	40	---	S
$Q_g$	Total Gate Charge	$V_{DD}=10V, I_D= 16.5A$ $V_{GS}=0$ to $4.5V$	---	45	---	nC
$Q_{gs}$	Gate-Source Charge		---	9	---	
$Q_{gd}$	Gate-Drain Charge		---	10	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=10V, V_{GS}=10V, R_G=6\Omega$ $I_D= 16.5A$	---	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	$V_G=V_D=0V, \text{Force Current}$	---	---	16	A
$I_{S,pulse}$	Diode pulse current		---	---	48	A
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V, I_F=20A, T_J=25^{\circ}\text{C}$	---	---	1.2	V

Note :

This product has been designed and qualified for the consumer market.  
 Cmos assumes no liability for customers' product design or applications.  
 Cmos reserves the right to improve product design ,functions and reliability without notice.