

Dual N-Channel Enhancement Mode MOSFET

General Description

The CMSC22DN04 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

- Low On-Resistance
- 100% avalanche tested
- Fast switching
- RoHS Compliant

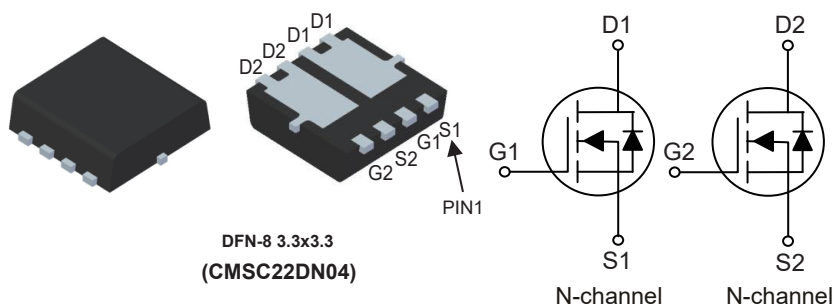
Product Summary

BVDSS	RDSON	ID
40V	25mΩ	20A

Applications

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

DFN-8 3.3x3.3 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C = 25^\circ\text{C}$	Continuous Drain Current	20	A
$I_D @ T_C = 100^\circ\text{C}$		13	A
I_{DM}	Pulsed Drain Current	60	A
EAS	Single Pulse Avalanche Energy ¹	56	mJ
$P_D @ T_C = 25^\circ\text{C}$	Total Power Dissipation	24	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient	---	53	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction-case	---	5.1	$^\circ\text{C}/\text{W}$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DS}	Drain-Source Breakdown Voltage	$V_{GS}=0\text{V}$, $I_D=250\mu\text{A}$	40	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10\text{V}$, $I_D=8\text{A}$	---	20	25	$\text{m}\Omega$
		$V_{GS}=4.5\text{V}$, $I_D=5\text{A}$	---	24	32	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu\text{A}$	1	---	3	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=32\text{V}$, $V_{GS}=0\text{V}$	---	---	1	μA
		$V_{DS}=32\text{V}$, $V_{GS}=0\text{V}$, $T_J=55^{\circ}\text{C}$	---	---	5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20\text{V}$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=5\text{V}$, $I_D=8\text{A}$	---	11	---	S
Q_g	Total Gate Charge	$V_{DS}=20\text{V}$, $I_D=7\text{A}$ $V_{GS}=0$ to 10V	---	14	---	nC
Q_{gs}	Gate-Source Charge		---	2	---	
Q_{gd}	Gate-Drain Charge		---	2.5	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=20\text{V}$, $V_{GS}=10\text{V}$, $R_G=6\Omega$ $I_D=7\text{A}$	---	7	---	ns
T_r	Rise Time		---	3	---	
$T_{d(off)}$	Turn-Off Delay Time		---	20	---	
T_f	Fall Time		---	2	---	
C_{iss}	Input Capacitance	$V_{DS}=25\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$	---	850	---	pF
C_{oss}	Output Capacitance		---	90	---	
C_{rss}	Reverse Transfer Capacitance		---	50	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Diode continuous forward current	$V_G=V_D=0\text{V}$, Force Current	---	---	20	A
$I_{S,pulse}$	Diode pulse current		---	---	60	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0\text{V}$, $I_F=10\text{A}$, $T_J=25^{\circ}\text{C}$	---	0.89	1.2	V

Notes:

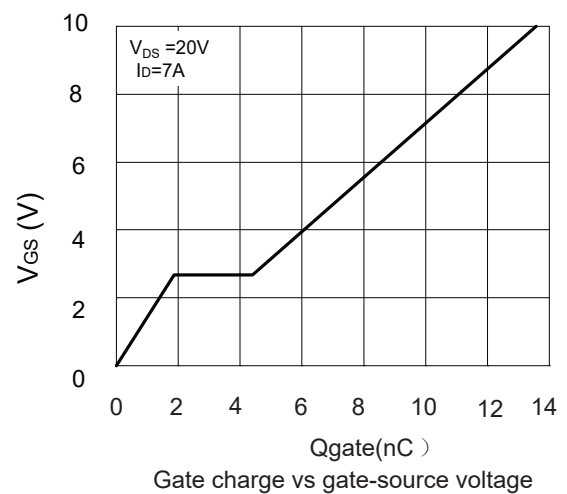
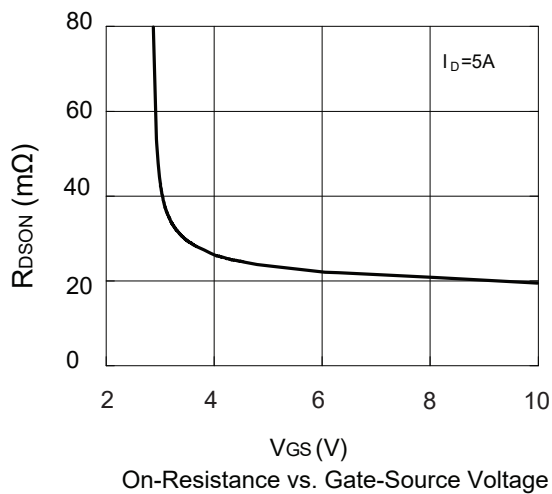
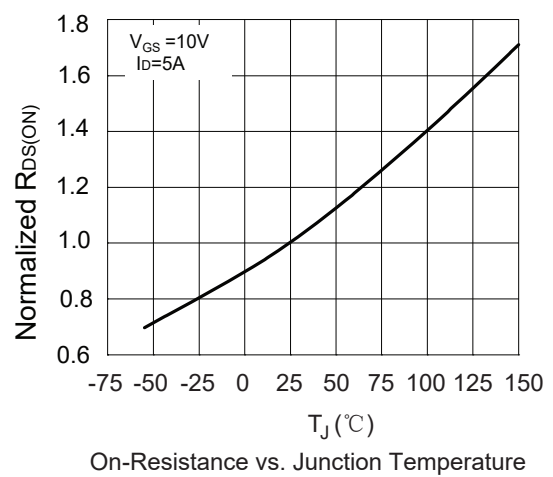
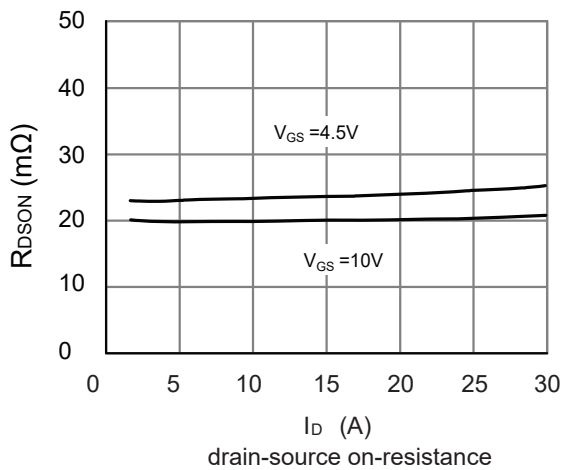
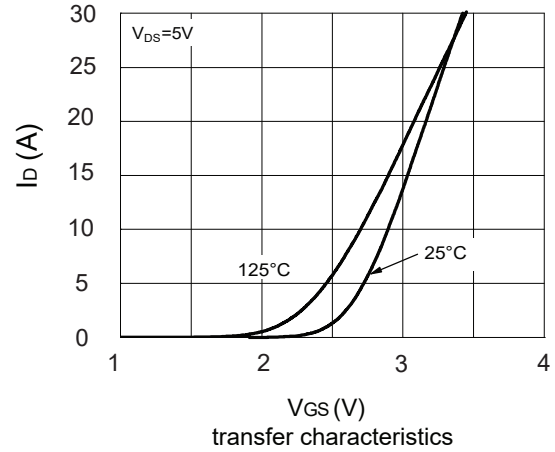
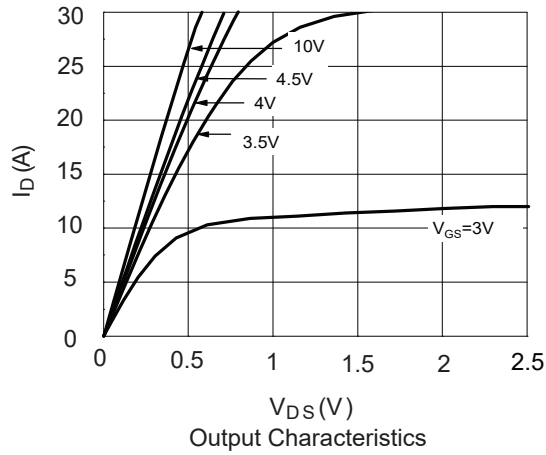
1.The EAS data shows Max. rating .The test condition is $V_{DS}=30\text{V}$, $V_{GS}=10\text{V}$, $L=0.5\text{mH}$, $I_{AS}=15\text{A}$.

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.

Typical Characteristics



Typical Characteristics

