CMSC22DN04

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.

Product Summary

BVDSS	$R_{DS(on)}$ max.	ID
40V	25mΩ	20A

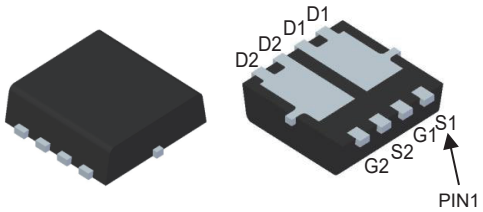
Applications

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

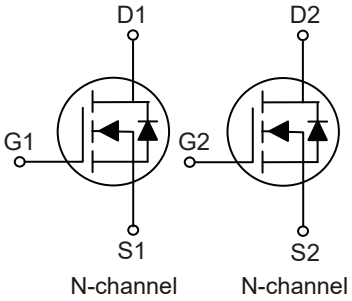
Features

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

DFN-8 3.3x3.3 Pin Configuration



DFN-8 3.3x3.3
(CMSC22DN04)



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℃	Continuous Drain Current	20	A
I_D@T_C=100℃		13	A
I_{DM}	Pulsed Drain Current	60	A
EAS	Single Pulse Avalanche Energy [1]	56	mJ
P_D@T_C=25℃	Total Power Dissipation	24	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	---	53	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-case	---	5.1	℃/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=250uA	40	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=8A	---	20	25	mΩ
		V_{GS}=4.5V , I_D=5A	---	24	32	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D = 250μA	1	---	3	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=32V , V_{GS}=0V	---	---	1	uA
		V_{DS}=32V , V_{GS}=0V , T_J=55℃	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS} = ±20V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V, I_D=8A	---	11	---	S
Q_g	Total Gate Charge	V_{DS}=20V , I_D=7A 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}=20V , V_{GS}=10V , R_G=6Ω I_D =7A	---	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}= 25V, V_{GS}=0V , f=1MHz	---	850	---	pF
C_{oss}	Output Capacitance		---	90	---	
C_{rss}	Reverse Transfer Capacitance		---	50	---	

Diode Characteristics

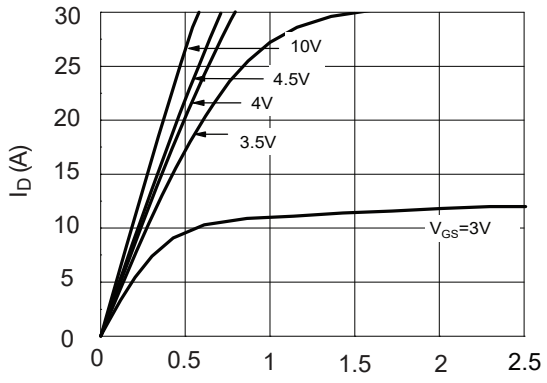
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Diode continuous forward current	V_G=V_D=0V , Force Current	---	---	20	A
$I_{S,pulse}$	Diode pulse current		---	---	60	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_F=10A , Tj=25℃	---	0.89	1.2	V

Notes:

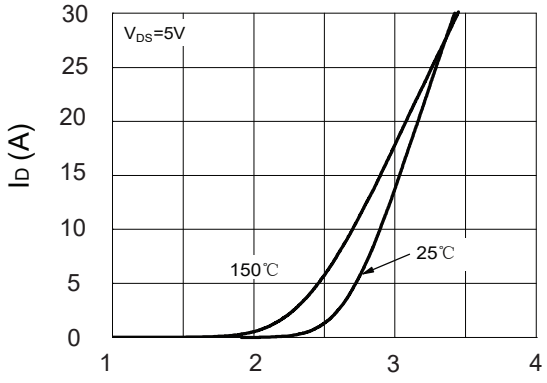
1.The EAS data shows Max. rating .The test condition is V_{DS}=30V , V_{GS}=10V , L=0.5mH , I_{AS}=15A.

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Cmos reserver the right to improve product design ,functions and reliability wihtout notice.Please refer to the latest version of specification.

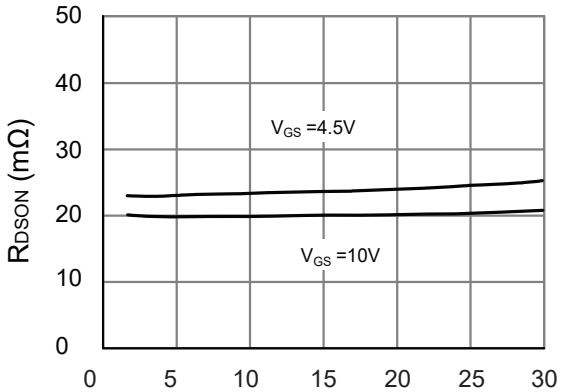
Typical Characteristics



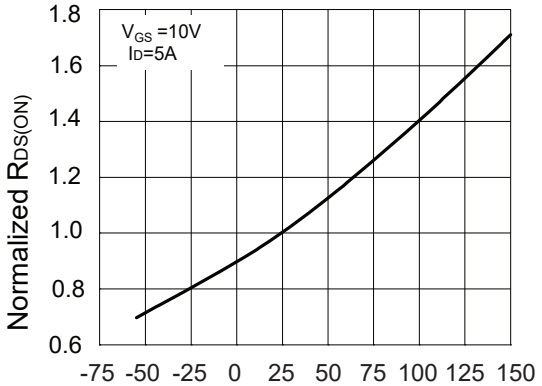
Output Characteristics



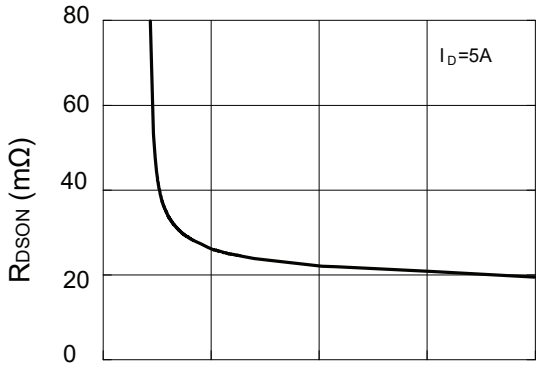
transfer characteristics



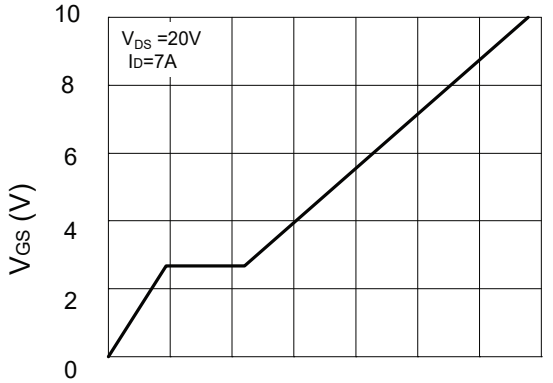
drain-source on-resistance



On-Resistance vs. Junction Temperature

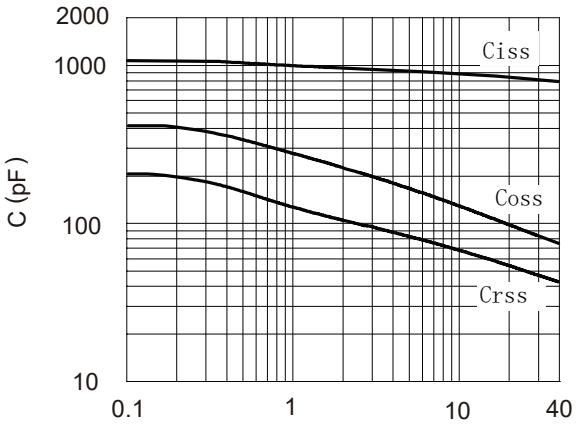


On-Resistance vs. Gate-Source Voltage

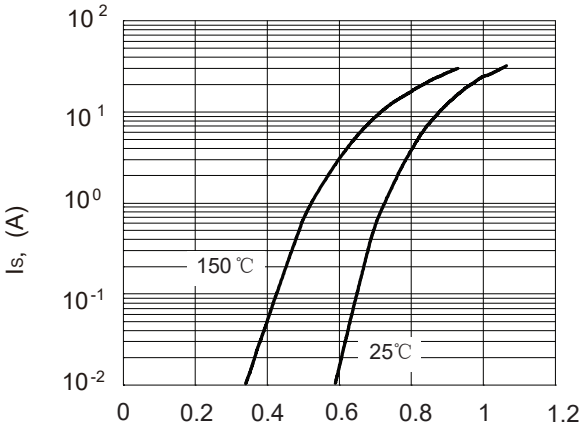


Gate charge vs gate-source voltage

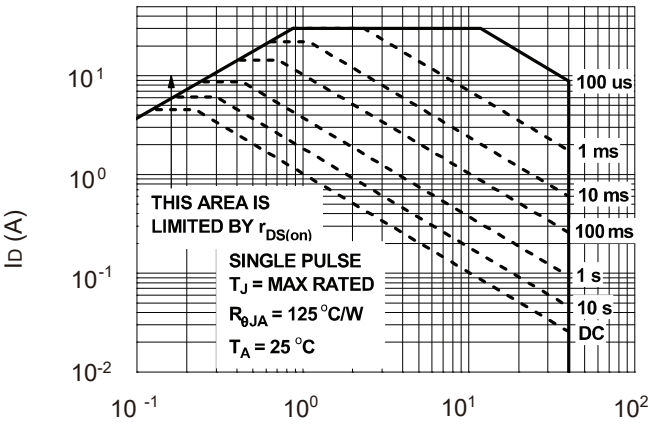
Typical Characteristics



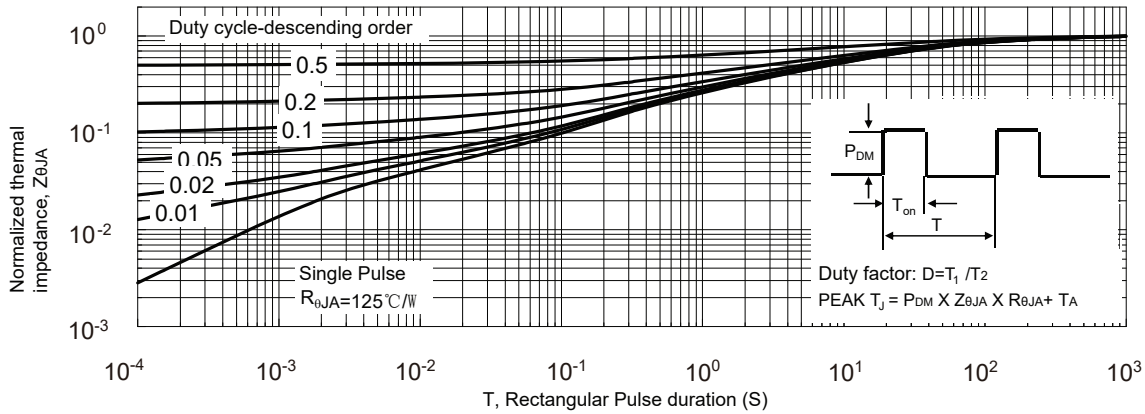
Capacitance Characteristics



Body-Diode Characteristics



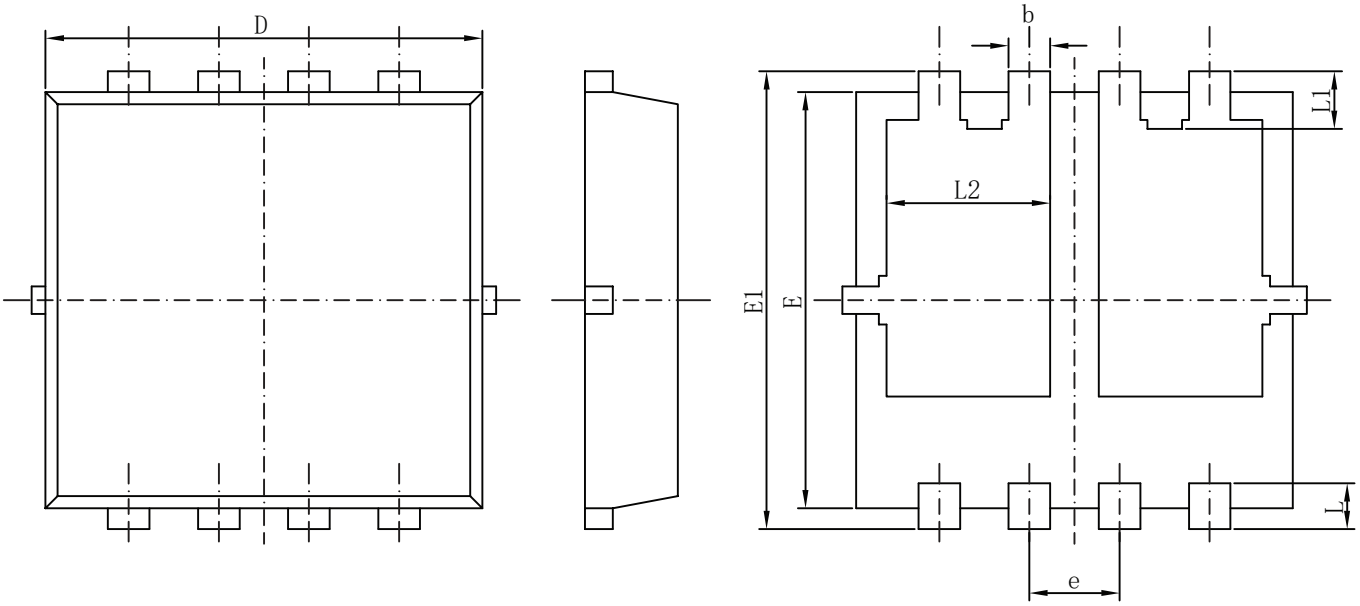
Safe operating area

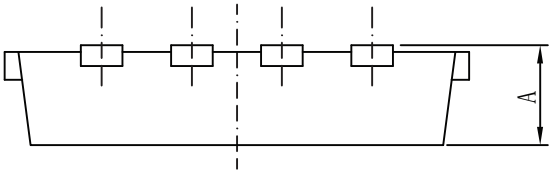


Junction-to-Ambient Transient Thermal Response Curve

Package Dimension

DFN-8 3.3x3.3 Unit :mm





Dimensions In Millimeters			
Symbol	Min.	Max.	Ave.
A	0.700	0.900	0.800
D	3.000	3.200	3.100
E	3.000	3.200	3.100
E1	3.200	3.600	3.400
b	0.200	0.400	0.300
e	0.550	0.750	0.650
L	0.300	0.600	0.450
L1	0.395	0.695	0.545
L2	0.885	1.185	1.035

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