

N-Channel Enhancement Mode MOSFET

General Description

The CMSC7404D 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	± 12	V
$I_D @ T_C = 25^\circ\text{C}$	Continuous Drain Current	40	A
$I_D @ T_C = 100^\circ\text{C}$	Continuous Drain Current	32	A
I_{DM}	Pulsed Drain Current	120	A
EAS	Single Pulse Avalanche Energy ¹	125	mJ
$P_D @ T_C = 25^\circ\text{C}$	Total Power Dissipation	40	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	---	75	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction-case	---	3.1	$^\circ\text{C}/\text{W}$

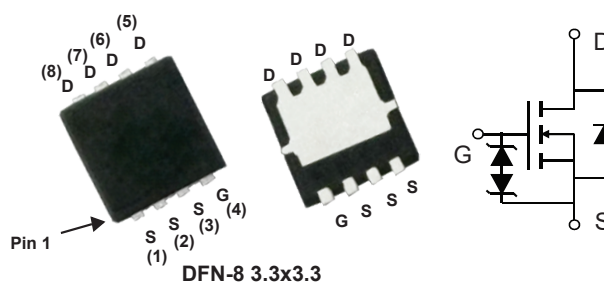
Product Summary

BVDSS	RDSON	ID
20V	6.5m Ω	40A

Applications

- Synchronous Rectification
- Synchronous Buck

DFN-8 3.3x3.3 Pin Configuration



Type	Package	Marking
CMSC7404D	DFN-8 3.3*3.3	7404D

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	40	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=4.5V$, $I_D=20A$	---	---	6.5	$m\Omega$
		$V_{GS}=2.5V$, $I_D=20A$	---	---	9	
$V_{GS(th)}$	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	μA
		$V_{DS}=16V$, $V_{GS}=0V$, $T_J=55^{\circ}\text{C}$	---	---	5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V$	---	---	± 8	μA
g_{fs}	Forward Transconductance	$V_{DS}=5V$, $I_D=20A$	---	30	---	S
$Q_g(4.5V)$	Total Gate Charge	$V_{DS}=10V$, $I_D=20A$ $V_{GS}=10V$	---	35	---	nC
Q_{gs}	Gate-Source Charge		---	10	---	
Q_{gd}	Gate-Drain Charge		---	13	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=10V$, $V_{GS}=10V$, $R_L=0.56\Omega$ $R_{GEN}=3\Omega$	---	8	---	ns
T_r	Rise Time		---	9	---	
$T_{d(off)}$	Turn-Off Delay Time		---	71	---	
T_f	Fall Time		---	19	---	
C_{iss}	Input Capacitance	$V_{DS}=10V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	1100	---	pF
C_{oss}	Output Capacitance		---	740	---	
C_{rss}	Reverse Transfer Capacitance		---	580	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Diode continuous forward current	$V_G=V_D=0V$, Force Current	---	---	40	A
$I_{S,pulse}$	Diode pulse current		---	---	120	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_F=20A$, $T_J=25^{\circ}\text{C}$	---	---	1.2	V

Note :

1.EAS condition: $T_J=25^{\circ}\text{C}$, $V_{DD}=15V$, $V_{GS}=10V$, $I_D=15A$, $L=1.5\text{mH}$.

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Cmos reserves the right to improve product design ,functions and reliability without notice.