# CMSC012N06

N-Channel Enhancement Mode MOSFET

## General Description

The CMSC012N06 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 | RDSON | ID |
|---|---|---|
| 60V | 11mΩ | 20A |

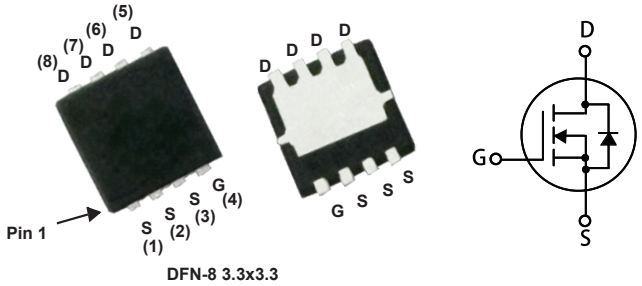
## Applications

- High efficiency power supply
- Secondary synchronous rectifier

## Features

- N-Channel MOSFET
- Low Gate Charge
- Surface Mount Package
- RoHS Compliant

## DFN-8 3.3x3.3 Pin Configuration




DFN-8 3.3x3.3

| Type | Package | Marking |
|---|---|---|
| CMSC012N06 | DFN-8 3.3x3.3 | 012N06 |

## Absolute Maximum Ratings

| Symbol | Parameter | Rating | Units |
|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | 60 | V |
| $V_{GS}$ | Gate-Source Voltage | ±20 | V |
| $I_D$@$T_C$=25℃ | Continuous Drain Current | 20 | A |
| $I_D$@$T_C$=100℃ | | 16 | |
| $I_{DM}$ | Pulsed Drain Current | 60 | A |
| EAS | Single Pulse Avalanche Energy | 45 | mJ |
| $P_D$@$T_C$=25℃ | Total Power Dissipation | 50 | W |
| $T_{STG}$ | Storage Temperature Range | -55 to 150 | ℃ |
| $T_J$ | Operating Junction Temperature Range | -55 to 150 | ℃ |

## Thermal Characteristics

| Symbol | Parameter | Typ. | Max. | Unit |
|---|---|---|---|---|
| $R_{\theta JA}$ | Thermal Resistance Junction-ambient(Steady-State) | --- | 60 | ℃/W |
| $R_{\theta JC}$ | Thermal Resistance Junction -Case(Steady-State) | --- | 2.5 | ℃/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 | 60 | --- | --- | V |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance | $V_{GS}$=10V , $I_D$=20A | --- | --- | 11 | mΩ |
| | | $V_{GS}$=4.5V , $I_D$=15A | --- | --- | 17.5 | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS}$=$V_{DS}$ , $I_D$ = 250μA | 1 | --- | 3 | V |
| $I_{DSS}$ | Drain-Source Leakage Current | $V_{DS}$=60V , $V_{GS}$=0V | --- | --- | 1 | uA |
| $I_{GSS}$ | Gate-Source Leakage Current | $V_{GS}$ = ±20V | --- | --- | ±100 | nA |
| gfs | Forward Transconductance | $V_{DS}$=10V , $I_D$=20A | --- | 15 | --- | S |
| $Q_g$ | Total Gate Charge | $V_{DS}$=30V , $I_D$=20A<br>$V_{GS}$=10V | --- | 26 | --- | nC |
| $Q_{gs}$ | Gate-Source Charge | | --- | 11 | --- | |
| $Q_{gd}$ | Gate-Drain Charge | | --- | 2 | --- | |
| $T_{d(on)}$ | Turn-On Delay Time | $V_{DS}$=30V , $V_{GS}$=10V , $R_{GEN}$ =3Ω<br>$I_D$=20A | --- | 11 | --- | ns |
| $T_r$ | Rise Time | | --- | 78 | --- | |
| $T_{d(off)}$ | Turn-Off Delay Time | | --- | 15 | --- | |
| $T_f$ | Fall Time | | --- | 7 | --- | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$= 30V, $V_{GS}$=0V , f=1MHz | --- | 860 | --- | pF |
| $C_{oss}$ | Output Capacitance | | --- | 440 | --- | |
| $C_{rss}$ | Reverse Transfer Capacitance | | --- | 18 | --- | |

## 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 , $I_F$=28A , Tj=25℃ | --- | --- | 1 | V |

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