# CMN3416AM

**20V, 14.5mΩ typ., 6.5A N-Channel MOSFET**

## General Description

The CMN3416AM uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. This device is suitable for use as a load switch or in PWM applications. It is ESD protected.

## Features

- RDS(ON)<17mΩ @ VGS=4.5V
- RDS(ON)<21mΩ @ VGS=2.5V
- SOT-23-3L Package
- ESD Protected：2000V

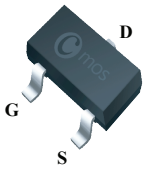
## Product Summary

| BVDSS | $R_{DS(on)}$ max. | ID |
|---|---|---|
| 20V | 17mΩ | 6.5A |

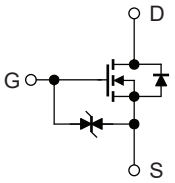
## Applications

- DC/DC Converter
- Load Switch
- Power Management
- Battery Powered System

## SOT-23-3L Pin Configuration

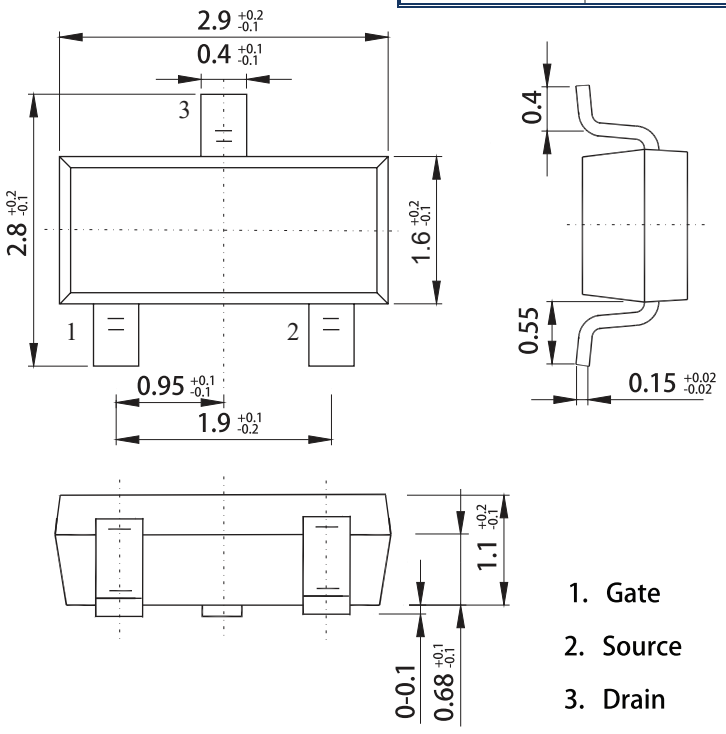


SOT-23-3L




| Type | Package | Marking |
|---|---|---|
| CMN3416AM | SOT-23-3L | 3416AM |

Unit: mm




1. Gate
2. Source
3. Drain

20V, 14.5mΩ typ., 6.5A N-Channel MOSFET

## Absolute Maximum Ratings

| Symbol | Parameter | Rating | Units |
|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | 20 | V |
| $V_{GS}$ | Gate-Source Voltage | ±8 | V |
| $I_D$ | Continuous Drain Current | 6.5 | A |
| $I_{DM}$ | Pulsed Drain Current | 30 | A |
| $P_D$ @$T_A$=25℃ | Total Power Dissipation | 1.4 | W |
| $T_{STG}$ | Storage Temperature Range | -55 to 150 | ℃ |
| $T_J$ | Operating Junction Temperature Range | -55 to 150 | ℃ |

## Thermal Data

| Symbol | Parameter | Rating | Unit |
|---|---|---|---|
| $R_{\theta JA}$ | Thermal Resistance Junction-ambient (t≤10s) | 90 | ℃/W |

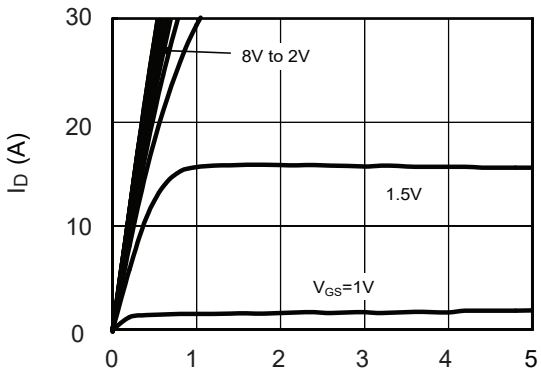
## Electrical Characteristics ($T_a$=25℃ , unless otherwise noted)

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V , $I_D$=250uA | 20 | --- | --- | V |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance | $V_{GS}$=4.5V , $I_D$=6.5A | --- | 14.5 | 17 | mΩ |
| | | $V_{GS}$=2.5V , $I_D$=5.5A | --- | 17 | 21 | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS}$=$V_{DS}$ , $I_D$ =250uA | 0.4 | --- | 1.0 | V |
| $I_{DSS}$ | Drain-Source Leakage Current | $V_{DS}$=16V , $V_{GS}$=0V | --- | --- | 1 | μA |
| $I_{GSS}$ | Gate-Source Leakage Current | $V_{GS}$ =±8V , $V_{DS}$=0V | --- | --- | ±10 | μA |
| $R_g$ | Gate Resistance | $V_{DS}$=0V , $V_{GS}$=0V , f=1MHz | --- | 1.1 | --- | Ω |
| $Q_g$ | Total Gate Charge | $I_D$=6.5A<br>$V_{DS}$=10V<br>$V_{GS}$=4.5V | --- | 10 | --- | nC |
| $Q_{gs}$ | Gate-Source Charge | | --- | 0.9 | --- | |
| $Q_{gd}$ | Gate-Drain Charge | | --- | 3 | --- | |
| $T_{d(on)}$ | Turn-On Delay Time | $V_{DS}$=10V<br>$R_L$=1.5Ω<br>$R_{GEN}$=3Ω<br>$V_{GS}$=5V | --- | 250 | --- | ns |
| $T_r$ | Rise Time | | --- | 420 | --- | |
| $T_{d(off)}$ | Turn-Off Delay Time | | --- | 3950 | --- | |
| $T_f$ | Fall Time | | --- | 3700 | --- | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=10V , $V_{GS}$=0V , f=1MHz | --- | 170 | --- | pF |
| $C_{oss}$ | Output Capacitance | | --- | 90 | --- | |
| $C_{rss}$ | Reverse Transfer Capacitance | | --- | 2 | --- | |

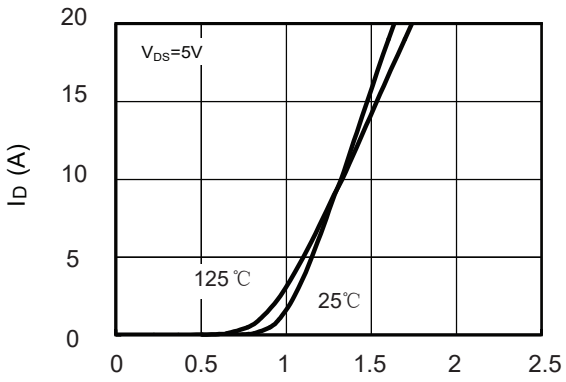
## Diode Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_{SD}$ | Diode Forward Voltage | $V_{GS}$=0V , $I_S$=1A | --- | 0.71 | 1.2 | V |

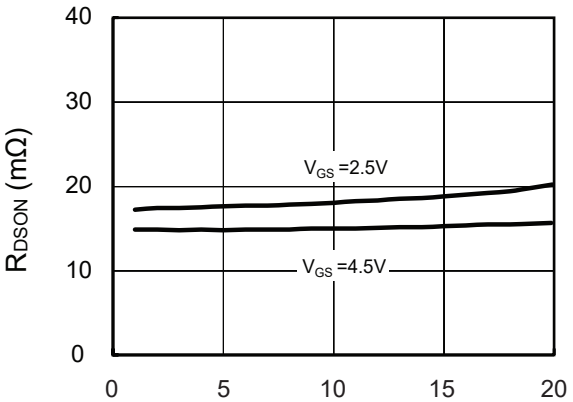
## Typical Characteristics



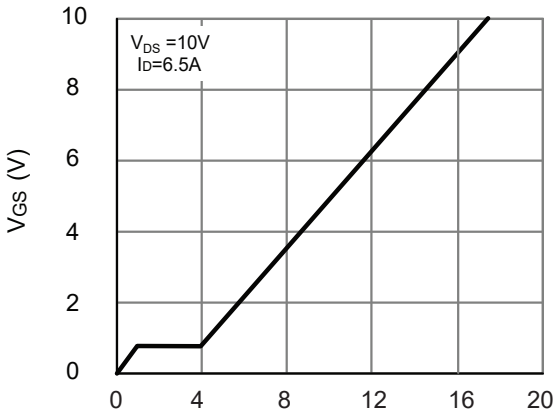

Output Characteristics



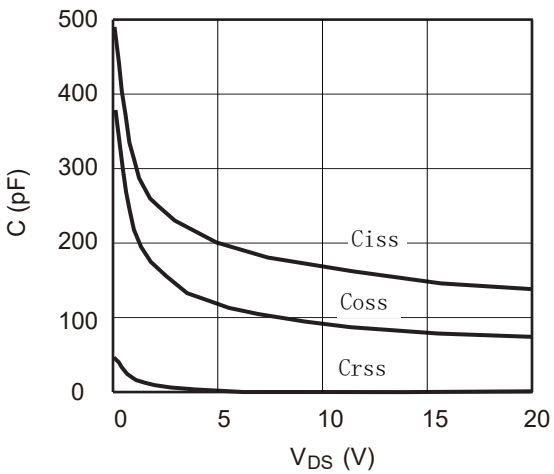

transfer characteristics



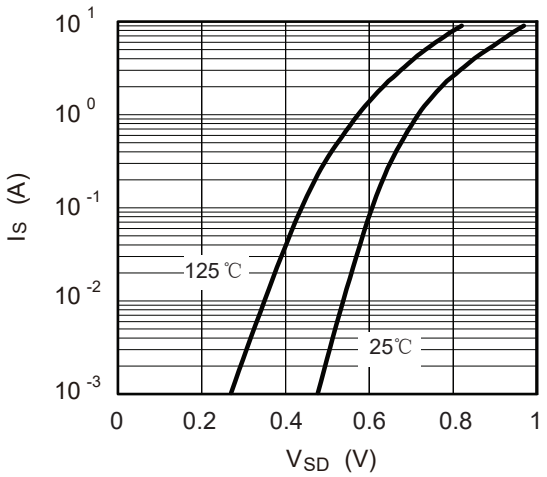

drain-source on-resistance




Gate charge vs gate-source voltage




Capacitance Characteristics




Body-Diode Characteristics