

# CMH4127

200V, 17mΩ typ., 100A N-Channel MOSFET

## General Description

The CMH4127 uses advanced trench technology and design to provide excellent RDS(ON).

It can be used in a wide variety of applications.

## Features

- Fast switching
- 100% avalanche tested
- Improve dv/dt capability
- RoHS compliant

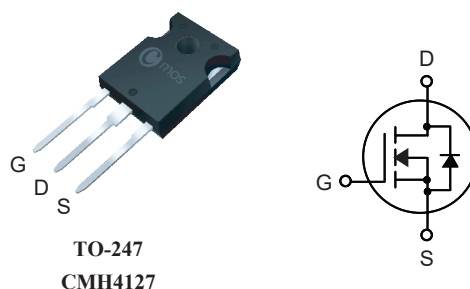
## Product Summary

| BVDSS | R <sub>DS(on)</sub> max. | ID   |
|-------|--------------------------|------|
| 200V  | 20mΩ                     | 100A |

## Applications

- Uninterruptible power supplies
- DC/DC converter
- DC/AC inverter

## TO-247 Pin Configuration



## Absolute Maximum Ratings

| Symbol                                | Parameter                                  | Rating     | Units |
|---------------------------------------|--------------------------------------------|------------|-------|
| V <sub>DS</sub>                       | Drain-Source Voltage                       | 200        | V     |
| V <sub>GS</sub>                       | Gate-Source Voltage                        | ±20        | V     |
| I <sub>D</sub> @T <sub>C</sub> =25°C  | Continuous Drain Current                   | 100        | A     |
| I <sub>D</sub> @T <sub>C</sub> =100°C | Continuous Drain Current                   | 70         | A     |
| I <sub>DM</sub>                       | Pulsed Drain Current <sup>1</sup>          | 400        | A     |
| EAS                                   | Single Pulse Avalanche Energy <sup>2</sup> | 1690       | mJ    |
| P <sub>D</sub> @T <sub>C</sub> =25°C  | Total Power Dissipation                    | 400        | W     |
| T <sub>STG</sub>                      | Storage Temperature Range                  | -55 to 175 | °C    |
| T <sub>J</sub>                        | Operating Junction Temperature Range       | -55 to 175 | °C    |

## Thermal Data

| Symbol           | Parameter                           | Typ. | Max. | Unit |
|------------------|-------------------------------------|------|------|------|
| R <sub>θJA</sub> | Thermal Resistance Junction-ambient | ---  | 62   | °C/W |
| R <sub>θJC</sub> | Thermal Resistance Junction-case    | ---  | 0.38 | °C/W |

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

| Symbol       | Parameter                         | Conditions                                   | Min. | Typ. | Max. | Unit |
|--------------|-----------------------------------|----------------------------------------------|------|------|------|------|
| $BV_{DSS}$   | Drain-Source Breakdown Voltage    | $V_{GS}=0V$ , $I_D=250\mu A$                 | 200  | ---  | ---  | V    |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance | $V_{GS}=10V$ , $I_D=20A$                     | ---  | 17   | 20   | mΩ   |
| $V_{GS(th)}$ | Gate Threshold Voltage            | $V_{GS}=V_{DS}$ , $I_D=250\mu A$             | 3    | ---  | 5    | V    |
| $I_{DSS}$    | Drain-Source Leakage Current      | $V_{DS}=200V$ , $V_{GS}=0V$                  | ---  | ---  | 1    | μA   |
| $I_{GSS}$    | Gate-Source Leakage Current       | $V_{GS}=\pm 20V$ , $V_{DS}=0V$               | ---  | ---  | ±100 | nA   |
| $g_{fs}$     | Forward Transconductance          | $V_{DS}=10V$ , $I_D=20A$                     | ---  | 44   | ---  | S    |
| $R_g$        | Gate Resistance                   | $V_{DS}=0V$ , $V_{GS}=0V$ , $f=1\text{MHz}$  | ---  | 1.5  | ---  | Ω    |
| $Q_g$        | Total Gate Charge                 | $I_D=59A$                                    | ---  | 160  | ---  | nC   |
| $Q_{gs}$     | Gate-Source Charge                | $V_{DD}=160V$                                | ---  | 45   | ---  |      |
| $Q_{gd}$     | Gate-Drain Charge                 | $V_{GS}=10V$                                 | ---  | 75   | ---  |      |
| $T_{d(on)}$  | Turn-On Delay Time                | $V_{DD}=100V$                                | ---  | 25   | ---  | ns   |
| $T_r$        | Rise Time                         | $V_{GS}=10V$                                 | ---  | 160  | ---  |      |
| $T_{d(off)}$ | Turn-Off Delay Time               | $I_D=59A$                                    | ---  | 40   | ---  |      |
| $T_f$        | Fall Time                         | $R_G=1.2\Omega$                              | ---  | 80   | ---  |      |
| $C_{iss}$    | Input Capacitance                 | $V_{DS}=25V$ , $V_{GS}=0V$ , $f=1\text{MHz}$ | ---  | 9000 | ---  | pF   |
| $C_{oss}$    | Output Capacitance                |                                              | ---  | 840  | ---  |      |
| $C_{rss}$    | Reverse Transfer Capacitance      |                                              | ---  | 160  | ---  |      |

**Diode Characteristics**

| Symbol   | Parameter                 | Conditions                                         | Min. | Typ. | Max. | Unit |
|----------|---------------------------|----------------------------------------------------|------|------|------|------|
| $I_S$    | Continuous Source Current | $V_G=V_D=0V$ , Force Current                       | ---  | ---  | 100  | A    |
| $I_{SM}$ | Pulsed Source Current     |                                                    | ---  | ---  | 400  | A    |
| $V_{SD}$ | Diode Forward Voltage     | $V_{GS}=0V$ , $I_S=20A$ , $T_J=25^{\circ}\text{C}$ | ---  | 0.77 | 1.5  | V    |

Note :

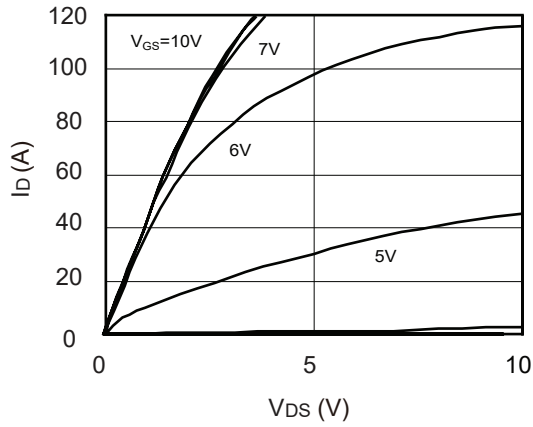
1.Repetitive rating; pulse width limited by maximum junction temperature.

2.The EAS data shows Max. rating . The test condition is  $V_{DD}=50V$  ,  $V_{GS}=10V$  ,  $L=5\text{mH}$  ,  $I_{AS}=26A$ .

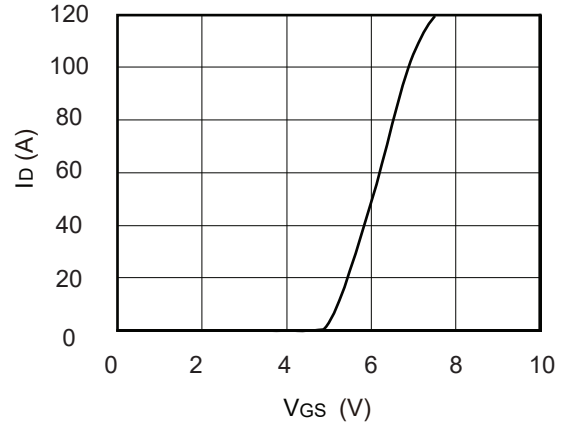
This product has been designed and qualified for the consumer market.

Cmos assumes no liability for customers' product design or applications.

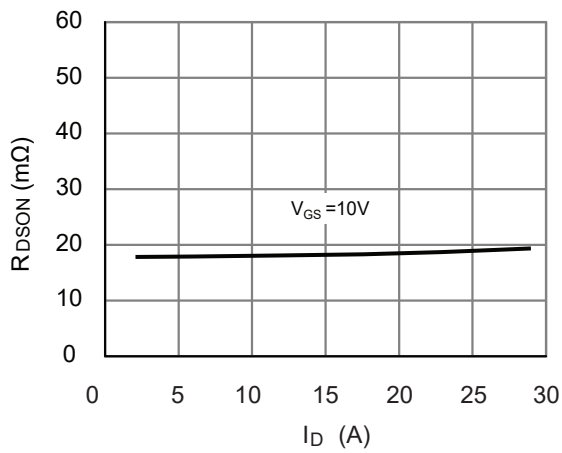
Cmos reserves the right to improve product design ,functions and reliability without notice.

**Typical Characteristics**


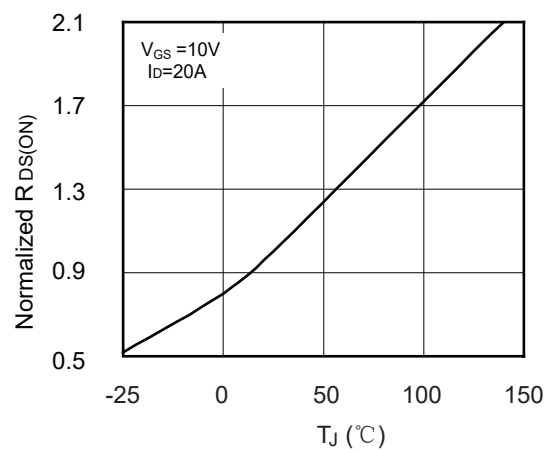
Output Characteristics



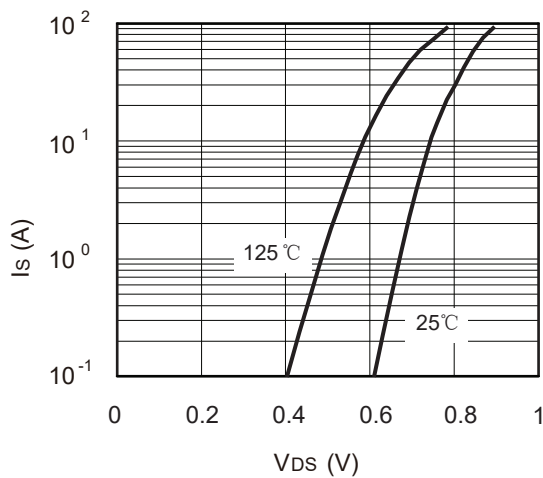
transfer characteristics



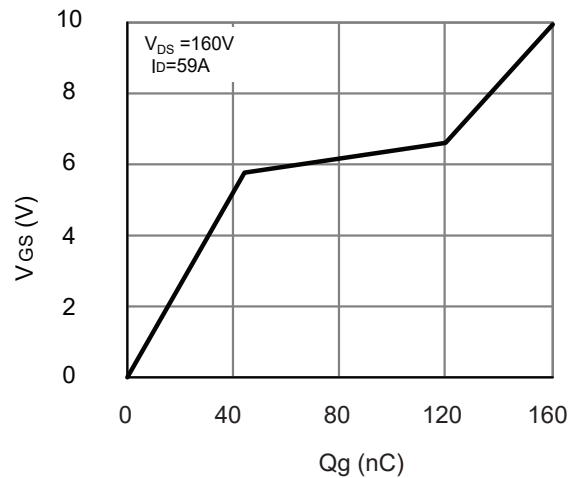
drain-source on-resistance



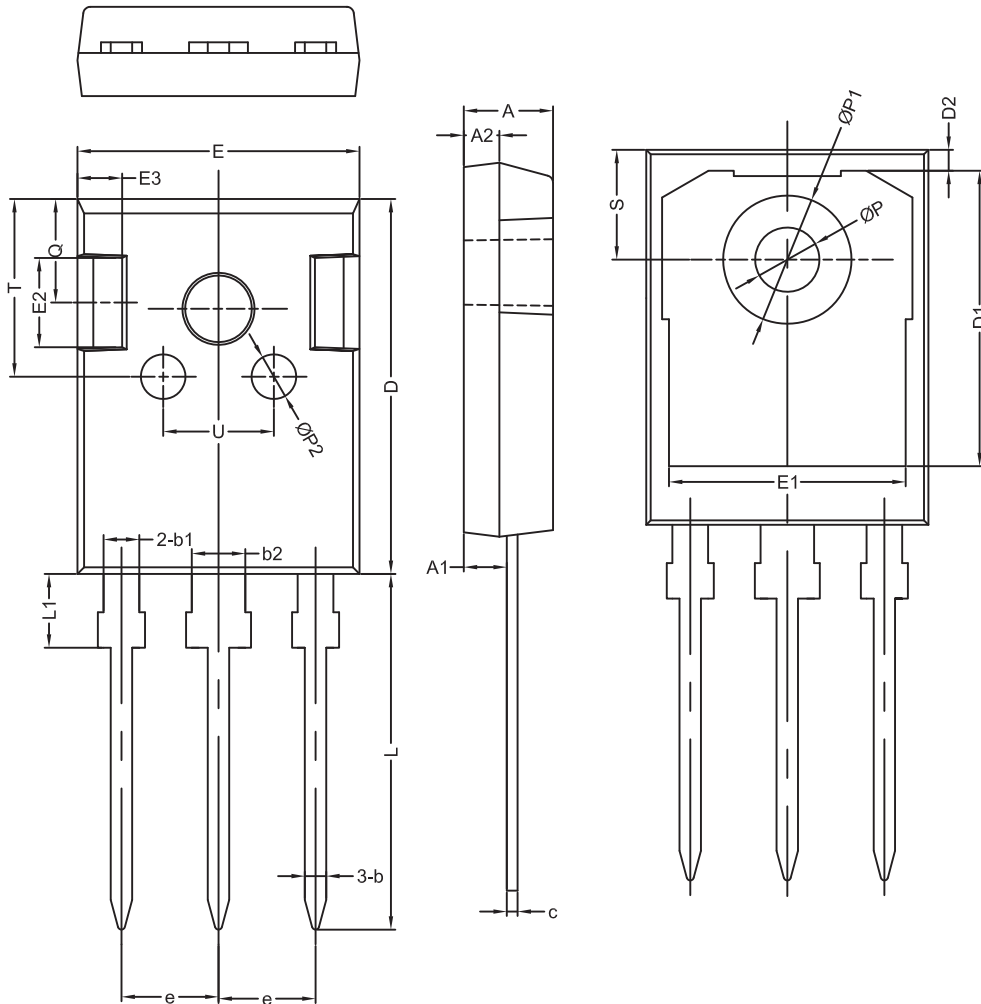
On-Resistance vs. Junction Temperature



Body-Diode Characteristics



Gate charge vs gate-source voltage

**Package Dimension**
**TO-247**
**Unit :mm**


| 符号 | 机械尺寸/mm |       |       | 符号 | 机械尺寸/mm |       |       |
|----|---------|-------|-------|----|---------|-------|-------|
|    | 最小值     | 典型值   | 最大值   |    | 最小值     | 典型值   | 最大值   |
| A  | 4.80    | 5.00  | 5.20  | E2 |         | 5.00  |       |
| A1 | 2.21    | 2.41  | 2.61  | E3 |         | 2.50  |       |
| A2 | 1.90    | 2.00  | 2.10  | e  |         | 5.44  |       |
| b  | 1.10    | 1.20  | 1.35  | L  | 19.42   | 19.92 | 20.42 |
| b1 |         | 2.00  |       | L1 |         | 4.13  |       |
| b2 |         | 3.00  |       | P  | 3.50    | 3.60  | 3.70  |
| c  | 0.55    | 0.60  | 0.75  | P1 |         | 7.19  |       |
| D  | 20.80   | 21.00 | 21.20 | P2 |         | 2.50  |       |
| D1 |         | 16.55 |       | Q  |         | 5.80  |       |
| D2 |         | 1.20  |       | S  | 6.05    | 6.15  | 6.25  |
| E  | 15.60   | 15.80 | 16.0  | T  |         | 10.00 |       |
| E1 |         | 13.30 |       | U  |         | 6.20  |       |