# CMB029N10-7

**100V, 1.9mΩ typ., 200A N-Channel MOSFET**

## General Description

The CMB029N10-7 uses advanced SGT technology to provide excellent $R_{DS(ON)}$. This technology has been optimized to minimize on-state resistance and yet maintain superior switching performance.

## Product Summary

| BVDSS | $R_{DS(on)}$ max. | ID |
|---|---|---|
| 100V | 2.3mΩ | 200A |

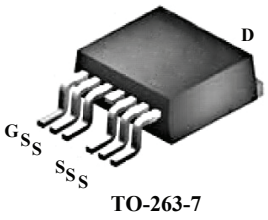
## Applications

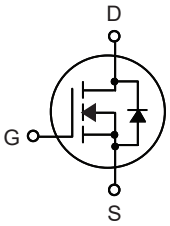
- DC Motor Drive
- Uninterruptible Power Supply
- High Speed Power Switching

## Features

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

## TO-263-7 Pin Configuration




| Type | Package | Marking |
|---|---|---|
| CMB029N10-7 | TO-263-7 | CMB029N10-7 |

## Absolute Maximum Ratings

| Symbol | Parameter | Rating | Units |
|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | 100 | V |
| $V_{GS}$ | Gate-Source Voltage | ±20 | V |
| $I_D$@$T_C$=25℃ | Continuous Drain Current | 200 | A |
| $I_D$@$T_C$=100℃ | Continuous Drain Current | 140 | A |
| $I_{DM}$ | Pulsed Drain Current | 800 | A |
| EAS | Single Pulse Avalanche Energy[1] | 4622 | mJ |
| $P_D$@$T_C$=25℃ | Total Power Dissipation | 400 | 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(min. footprint) | --- | 62 | ℃/W |
| $R_{\theta JC}$ | Thermal Resistance Junction-case | --- | 0.31 | ℃/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 | 100 | --- | --- | V |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance | $V_{GS}$=10V , $I_D$=100A | --- | 1.9 | 2.3 | mΩ |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS}$=$V_{DS}$ , $I_D$ =250uA | 2 | --- | 4 | V |
| $I_{DSS}$ | Drain-Source Leakage Current | $V_{DS}$=100V, $V_{GS}$=0V | --- | --- | 1 | uA |
| $I_{GSS}$ | Gate-Source Leakage Current | $V_{GS}$ =±20V , $V_{DS}$=0V | --- | --- | ±100 | nA |
| gfs | Forward Transconductance | $V_{DS}$=10V, $I_D$ =20A | --- | 55 | --- | S |
| $R_g$ | Gate Resistance | $V_{DS}$=0V , $V_{GS}$=0V , f=1MHz | --- | 2 | --- | Ω |
| $Q_g$ | Total Gate Charge | $I_D$ =90A<br>$V_{DS}$=50V<br>$V_{GS}$=10V | --- | 169 | --- | nC |
| $Q_{gs}$ | Gate-Source Charge | | --- | 67 | --- | |
| $Q_{gd}$ | Gate-Drain Charge | | --- | 30 | --- | |
| $T_{d(on)}$ | Turn-On Delay Time | $V_{DD}$=50V<br>$R_G$=3Ω<br>$V_{GS}$=10V | --- | 35 | --- | ns |
| $T_r$ | Rise Time | | --- | 111 | --- | |
| $T_{d(off)}$ | Turn-Off Delay Time | | --- | 84 | --- | |
| $T_f$ | Fall Time | | --- | 112 | --- | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=25V , $V_{GS}$=0V , f=1MHz | --- | 14300 | --- | pF |
| $C_{oss}$ | Output Capacitance | | --- | 4700 | --- | |
| $C_{rss}$ | Reverse Transfer Capacitance | | --- | 370 | --- | |

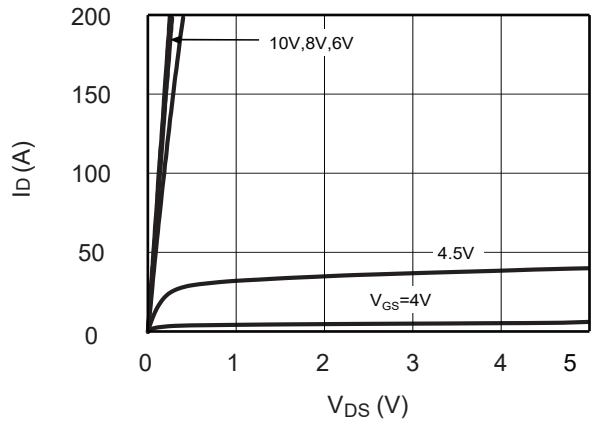
## Diode Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_S$ | Continuous Source Current | $V_G$=$V_D$=0V , Force Current | --- | --- | 200 | A |
| $I_{SM}$ | Pulsed Source Current | | --- | --- | 800 | A |
| $V_{SD}$ | Diode Forward Voltage | $V_{GS}$=0V , $I_S$=100A ,$T_J$=25℃ | --- | 0.86 | 1.4 | V |
| $t_{rr}$ | Reverse Recovery Time | di/dt = 100A/μs<br>$T_J$ =25℃ , $I_F$ =90A | --- | 101 | --- | ns |
| $Q_{rr}$ | Reverse Recovery Charge | | --- | 338 | --- | nC |

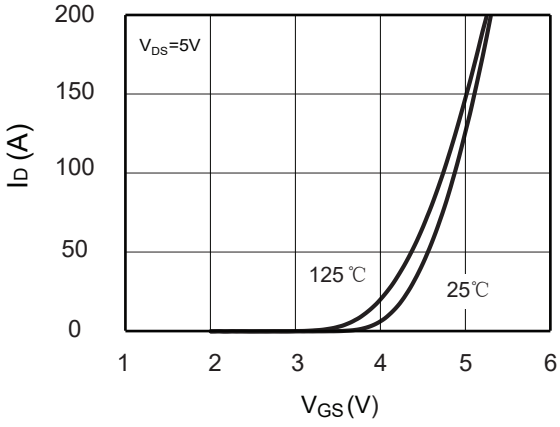
Note :

1.The EAS data shows Max. rating . The test condition is $V_{DD}$=100V , $V_{GS}$=10V , L=5mH , $I_{AS}$=43A.

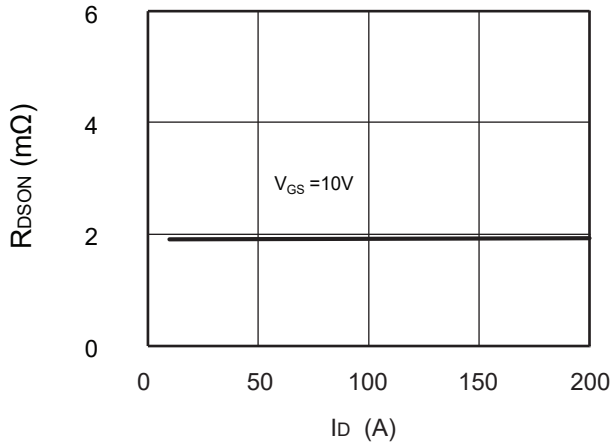
## Typical Characteristics



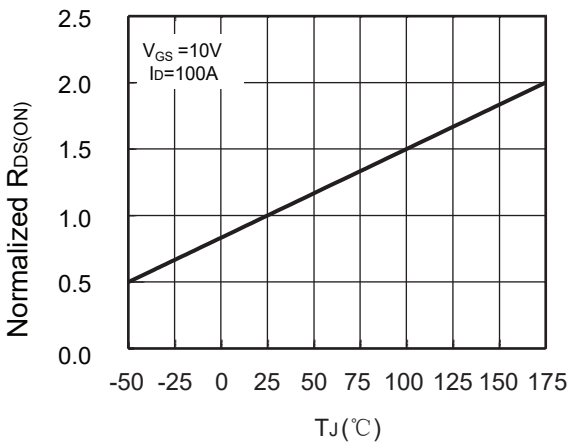

Output Characteristics



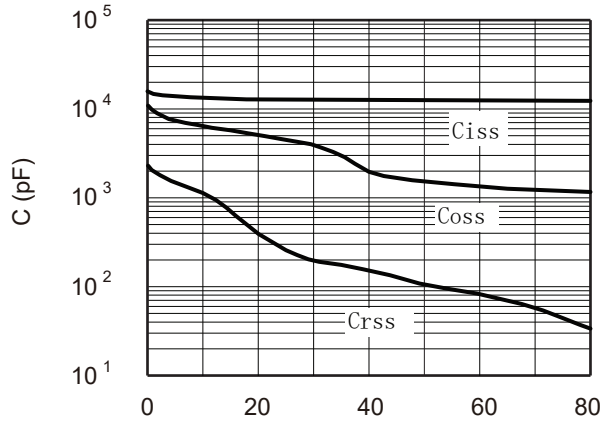

transfer characteristics



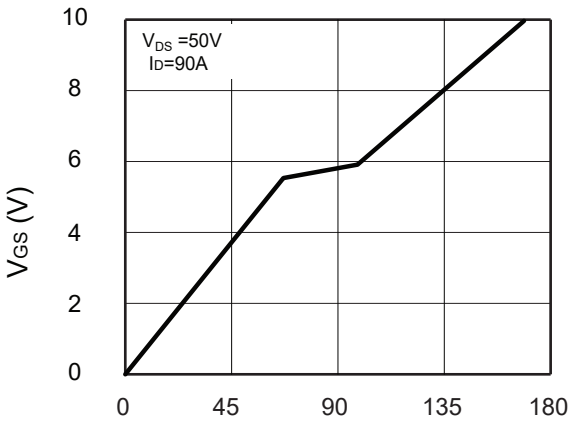

drain-source on-resistance




On-Resistance vs. Junction Temperature



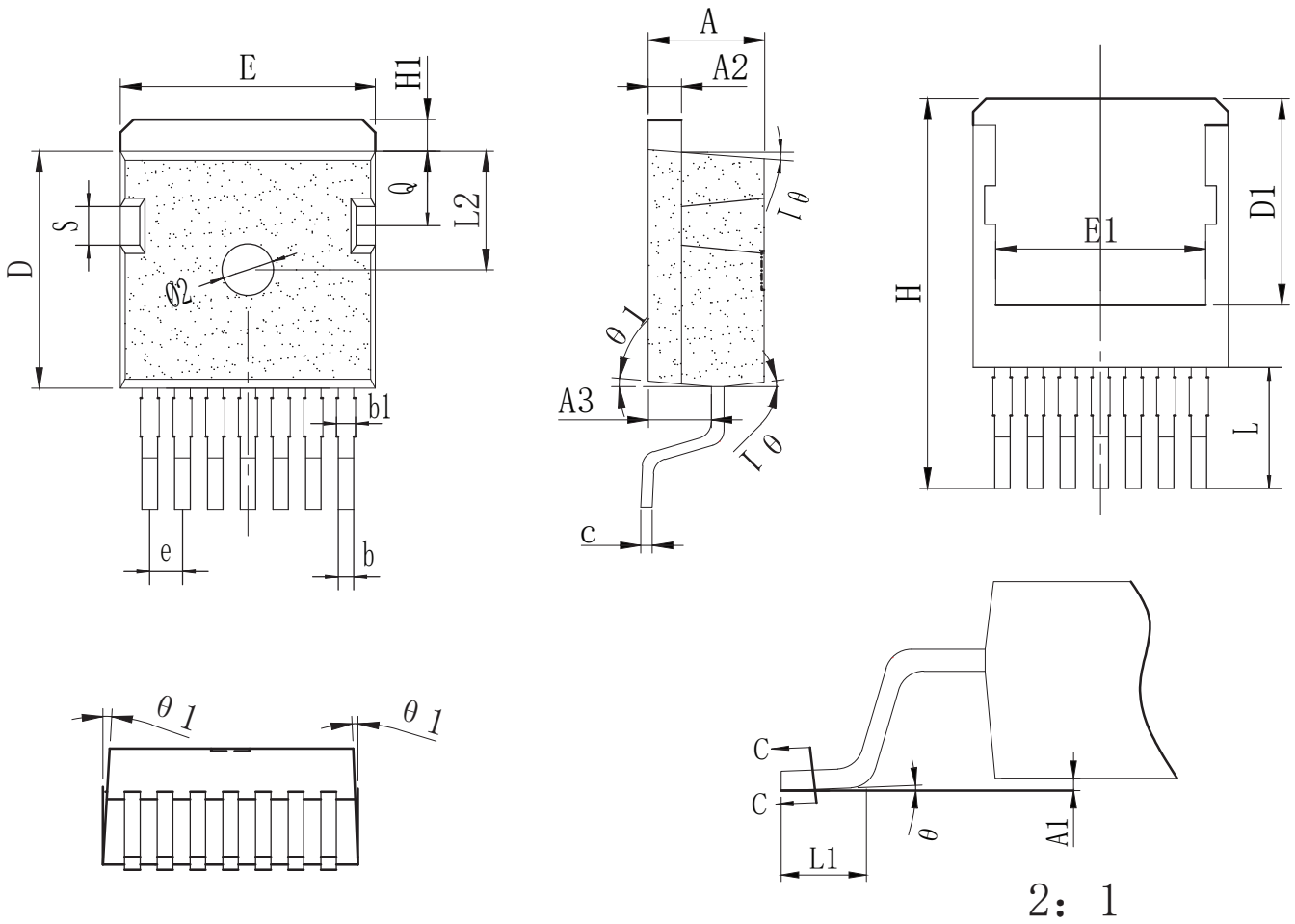

Capacitance Characteristics




Gate charge vs gate-source voltage

## Package Dimension

TO-263-7 Unit :mm




| SYMBOL | mm | | | SYMBOL | mm | | |
|---|---|---|---|---|---|---|---|
| | MIN | NOM | MAX | | MIN | NOM | MAX |
| ✻A | 4.30 | 4.40 | 4.50 | E1 | 8.20 | 8.40 | 8.60 |
| ✻A1 | 0.00 | 0.10 | 0.20 | ✻e | 1.25 | 1.27 | 1.29 |
| ✻A2 | 1.22 | 1.27 | 1.32 | ✻H | 14.85 | 15.00 | 15.15 |
| ✻A3 | 2.30 | 2.40 | 2.50 | H1 | 1.10 | 1.20 | 1.30 |
| ✻b | 0.50 | 0.60 | 0.70 | ✻L | 4.50 | 4.70 | 4.90 |
| ✻b1 | - | - | 0.63 | L1 | 1.70 | 2.00 | 2.30 |
| ✻c | 0.45 | 0.50 | 0.55 | L2 | 4.55 | 4.65 | 4.75 |
| ✻D | 9.15 | 9.30 | 9.45 | S | 1.40 | 1.50 | 1.60 |
| D1 | 规格A：8.00REF | | | Q | 2.80 | 2.90 | 3.00 |
| | 规格B：5.70REF | | | ✻θ | 0° | 2.5° | 8° |
| ✻E | 10.12 | 10.16 | 10.20 | θ1 | 5° | 7° | 9° |