

## Features

- Uses CRM(CQ) advanced SkyMOS4 technology
- Extremely low on-resistance  $R_{DS(on)}$
- Excellent  $Q_g \times R_{DS(on)}$  product(FOM)

## Product Summary

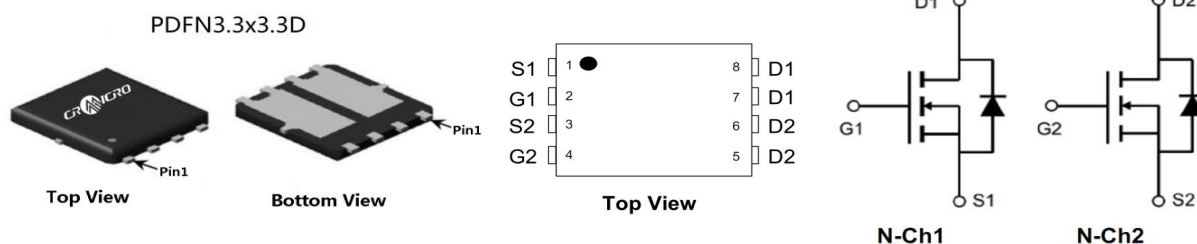
| Symbol            | N-Ch1        | N-Ch1        |
|-------------------|--------------|--------------|
| $V_{DS}$          | 100V         | 100V         |
| $R_{DS(on)}$ typ. | 30m $\Omega$ | 30m $\Omega$ |
| $I_D$             | 11A          | 11A          |

## Applications

- Battery management

**100% DVDS Tested**

**100% Avalanche Tested**



## Package Marking and Ordering Information

| Part #    | Marking | Package      | Packing | Reel Size | Tape Width | Qty     |
|-----------|---------|--------------|---------|-----------|------------|---------|
| CRMB1006D | B1006D  | PDFN3.3x3.3D | Taping  | 13inch    | 12mm       | 5000pcs |

## Absolute Maximum Ratings

| Parameter                                                                       | Symbol               | Maximum    |          | Unit             |
|---------------------------------------------------------------------------------|----------------------|------------|----------|------------------|
|                                                                                 |                      | N-Ch1      | N-Ch2    |                  |
| Drain-source voltage                                                            | $V_{DS}$             | 100        | 100      | V                |
| Continuous drain current $T_C = 25^\circ\text{C}$ (Silicon limit)               | $I_D$                | 14         | 14       | A                |
| Continuous drain current $T_C = 25^\circ\text{C}$ (Package limit)               | $I_D$                | 11         | 11       | A                |
| Pulsed drain current ( $T_C = 25^\circ\text{C}$ , $t_p$ limited by $T_{jmax}$ ) | $I_{D\text{ pulse}}$ | 43         | 43       | A                |
| Avalanche energy, single pulse ( $L=0.5\text{mH}$ , $R_g=25\Omega$ )            | $E_{AS}$             | 19         | 19       | mJ               |
| Gate-Source voltage                                                             | $V_{GS}$             | $\pm 20$   | $\pm 20$ | V                |
| Power dissipation ( $T_C = 25^\circ\text{C}$ )                                  | $P_{tot}$            | 12.4       | 12.4     | W                |
| Operating junction and storage temperature                                      | $T_j, T_{stg}$       | -55...+150 |          | $^\circ\text{C}$ |

**Thermal Resistance**

| Parameter                                              | Symbol     | Typ  | Max   | Unit |
|--------------------------------------------------------|------------|------|-------|------|
| Thermal resistance, junction – case.                   | $R_{thJC}$ | 7.2  | 10.1  | °C/W |
| SMD version, device on PCB <sup>1</sup>                |            |      |       |      |
| Thermal resistance, junction – ambient(min. footprint) | $R_{thJA}$ | 86.2 | 103.4 | °C/W |

NOTE:

1.The value of  $R_{thJA}$  is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25^{\circ}\text{C}$ . The value in any given application depends on the user's specific board design.

**N-Channel Electrical Characteristic (at  $T_J = 25^{\circ}\text{C}$ , unless otherwise specified)**

| Parameter | Symbol | Value |      |      | Unit | Test Condition |
|-----------|--------|-------|------|------|------|----------------|
|           |        | min.  | typ. | max. |      |                |

**Static Characteristic**

|                                  |              |     |          |           |            |                                                      |
|----------------------------------|--------------|-----|----------|-----------|------------|------------------------------------------------------|
| Drain-source breakdown voltage   | $BV_{DSS}$   | 100 | -        | -         | V          | $V_{GS}=0V, I_D=250\mu A$                            |
| Gate threshold voltage           | $V_{GS(th)}$ | 1.5 | 2.1      | 3         | V          | $V_{DS}=V_{GS}, I_D=250\mu A$                        |
| Zero gate voltage drain current  | $I_{DSS}$    | -   | 0.08     | 1         | $\mu A$    | $V_{DS}=100V, V_{GS}=0V$<br>$T_J=25^{\circ}\text{C}$ |
|                                  |              | -   | -        | 5         |            | $T_J=125^{\circ}\text{C}$                            |
| Gate-source leakage current      | $I_{GSS}$    | -   | $\pm 10$ | $\pm 100$ | nA         | $V_{GS}=\pm 20V, V_{DS}=0V$                          |
| Drain-source on-state resistance | $R_{DS(on)}$ | -   | 38.0     | 45.6      | m $\Omega$ | $V_{GS}=4.5V, I_D=5A$                                |
|                                  |              | -   | 30.0     | 36.0      |            | $V_{GS}=10V, I_D=5A$                                 |
| Transconductance                 | $g_{fs}$     | -   | 14       | -         | S          | $V_{DS}=10V, I_D=5A$                                 |

**Dynamic Characteristic**

|                              |              |   |       |   |          |                                                             |
|------------------------------|--------------|---|-------|---|----------|-------------------------------------------------------------|
| Input Capacitance            | $C_{iss}$    | - | 478.0 | - | pF       | $V_{GS}=0V, V_{DS}=100V, f=1\text{MHz}$                     |
| Output Capacitance           | $C_{oss}$    | - | 63.2  | - |          |                                                             |
| Reverse Transfer Capacitance | $C_{rss}$    | - | 5.2   | - |          |                                                             |
| Gate Total Charge            | $Q_G$        | - | 9.8   | - | nC       | $V_{GS}=10V, V_{DS}=50V,$<br>$I_D=5A, f=1\text{MHz}$        |
| Gate-Source charge           | $Q_{gs}$     | - | 2.7   | - |          |                                                             |
| Gate-Drain charge            | $Q_{gd}$     | - | 2.2   | - |          |                                                             |
| Turn-on delay time           | $t_{d(on)}$  | - | 2.5   | - | ns       | $V_{GS}=10V, V_{DD}=50V, R_{G\_ext}=2.7\Omega,$<br>$I_D=5A$ |
| Rise time                    | $t_r$        | - | 22.4  | - |          |                                                             |
| Turn-off delay time          | $t_{d(off)}$ | - | 8.0   | - |          |                                                             |
| Fall time                    | $t_f$        | - | 16.8  | - |          |                                                             |
| Gate resistance              | $R_G$        | - | 0.7   | - | $\Omega$ | $V_{GS}=0V, V_{DS}=0V, f=1\text{MHz}$                       |

## Body Diode Characteristic

| Parameter                          | Symbol   | Value |      |      | Unit | Test Condition             |
|------------------------------------|----------|-------|------|------|------|----------------------------|
|                                    |          | min.  | typ. | max. |      |                            |
| Body Diode Forward Voltage         | $V_{SD}$ | -     | 0.92 | 1.2  | V    | $V_{GS}=0V, I_{SD}=10A$    |
| Body Diode Reverse Recovery Time   | $t_{rr}$ | -     | 42.8 | -    | ns   | $I_F=5A, dI/dt=100A/\mu s$ |
| Body Diode Reverse Recovery Charge | $Q_{rr}$ | -     | 35.9 | -    | nC   |                            |

## N-Channel Typical Performance Characteristics

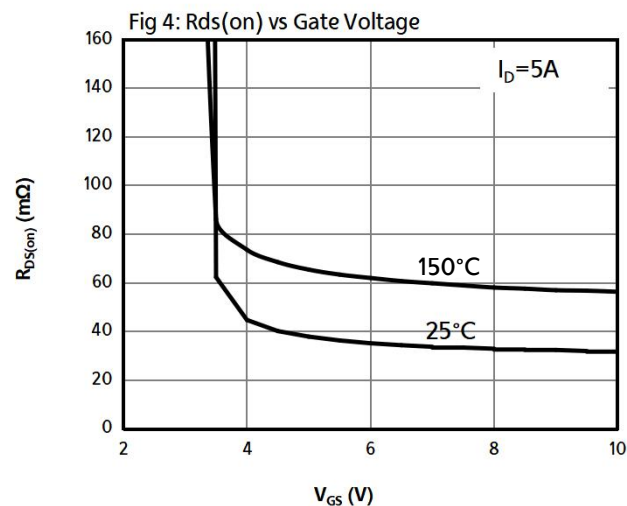
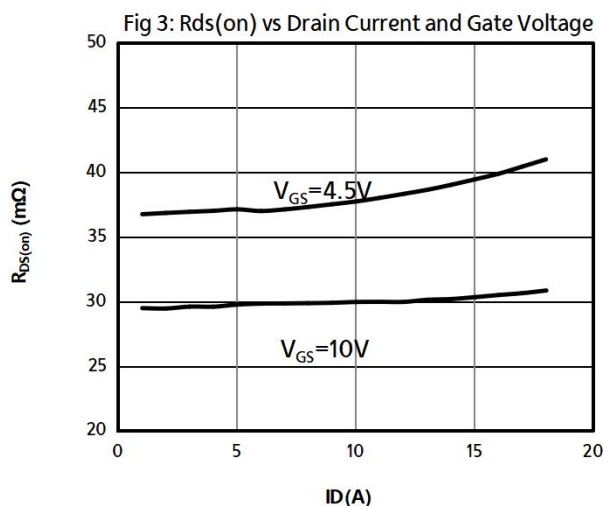
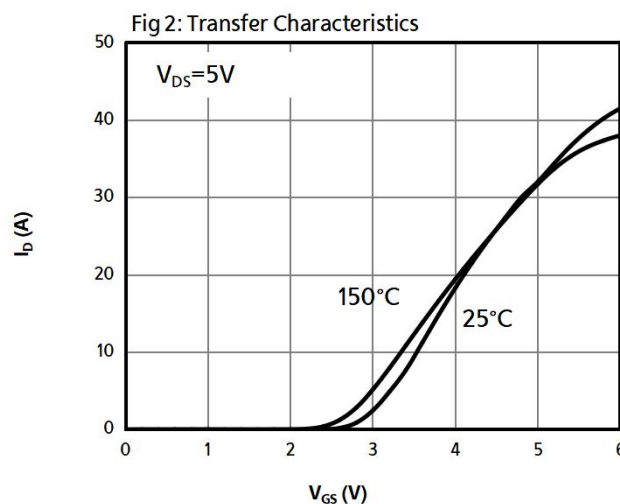
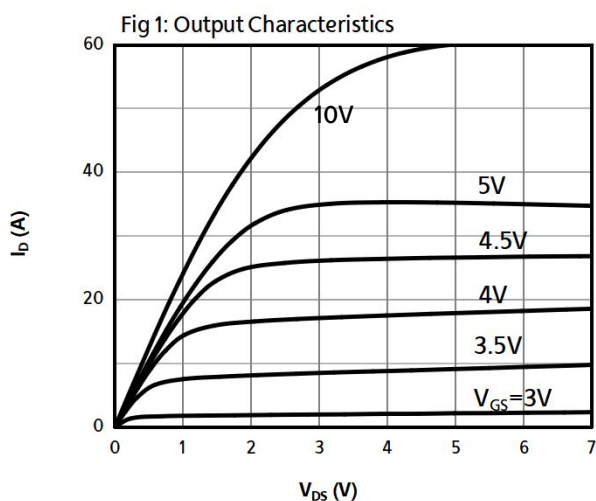


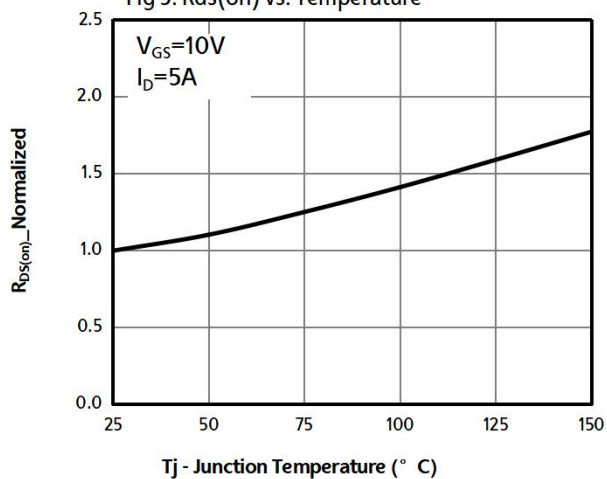
Fig 5:  $R_{DS(on)}$  vs. Temperature


Fig 6: Capacitance Characteristics

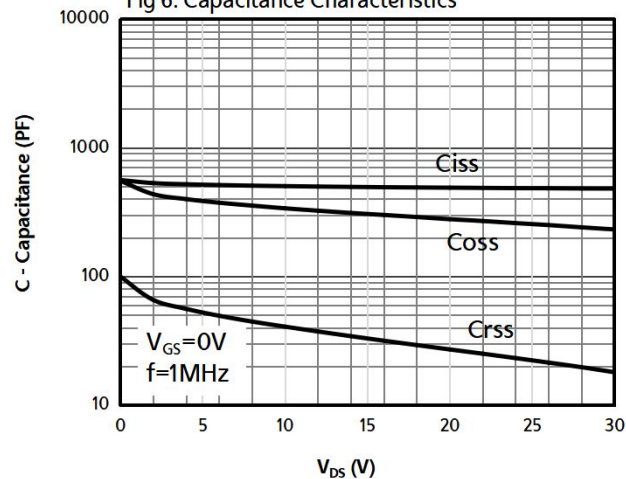


Fig 7: Gate Charge Characteristics

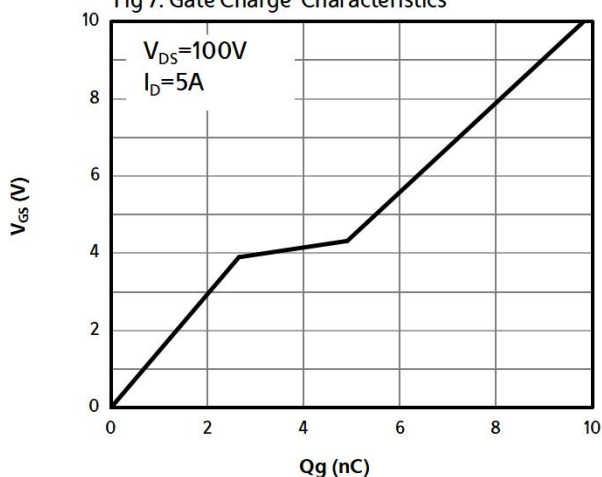


Fig 8: Body-diode Forward Characteristics

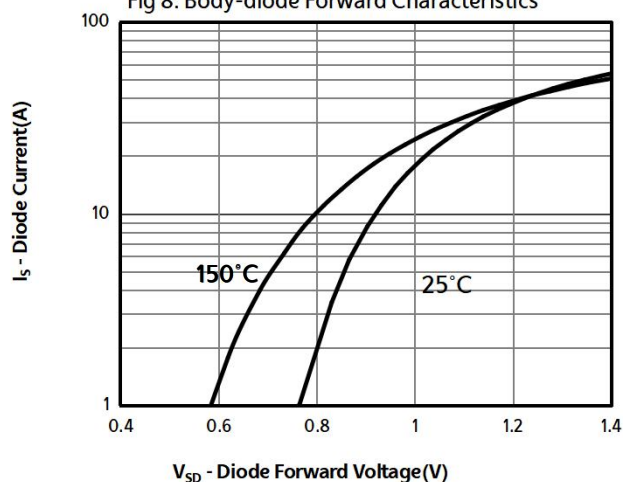


Fig 9: Safe Operating Area

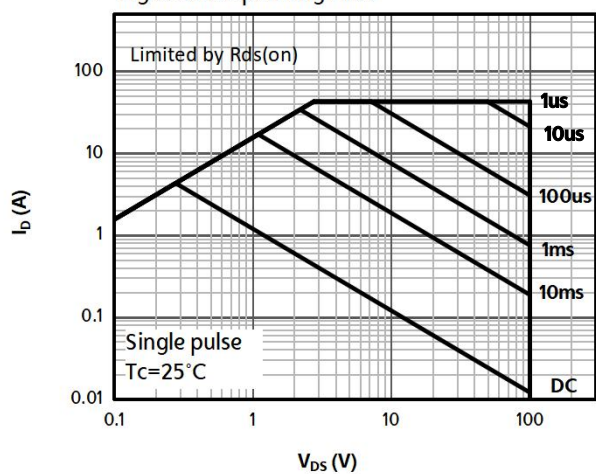
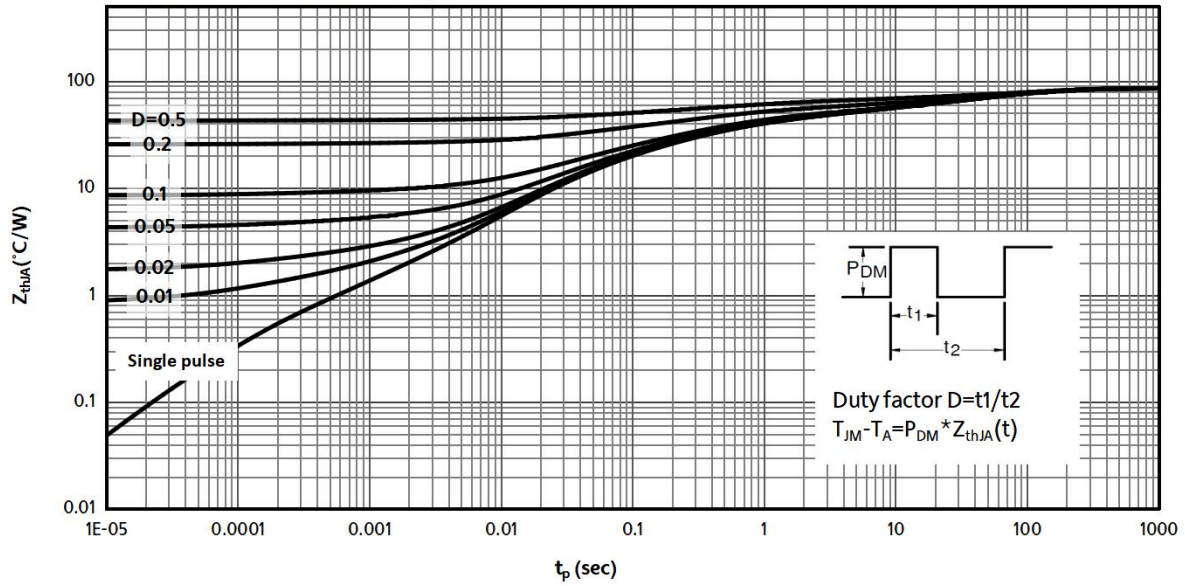
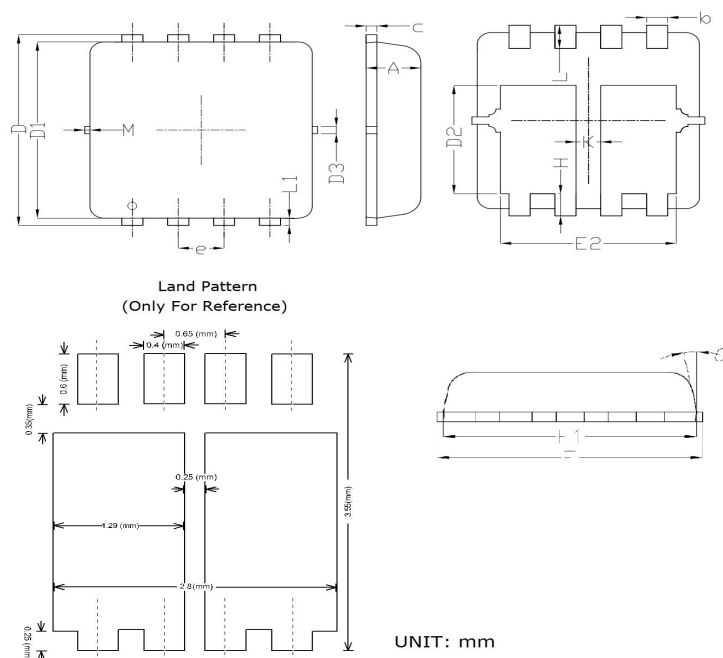


Fig 10: Max. Transient Thermal Impedance



**Package Outline: DFN3x3**


| SYMBOLS | DIMENSIONS IN MILLIMETERS |      |      | DIMENSIONS IN INCHES |       |       |
|---------|---------------------------|------|------|----------------------|-------|-------|
|         | MIN                       | NOM  | MAX  | MIN                  | NOM   | MAX   |
| A       | 0.70                      | 0.75 | 0.80 | 0.028                | 0.030 | 0.031 |
| b       | 0.25                      | 0.30 | 0.35 | 0.010                | 0.012 | 0.014 |
| c       | 0.10                      | 0.15 | 0.25 | 0.004                | 0.006 | 0.010 |
| D       | 3.25                      | 3.35 | 3.45 | 0.128                | 0.132 | 0.136 |
| D1      | 3.00                      | 3.10 | 3.20 | 0.118                | 0.122 | 0.126 |
| D2      | 1.78                      | 1.88 | 1.98 | 0.070                | 0.074 | 0.078 |
| D3      | ----                      | 0.13 | ---- | ----                 | 0.005 | ----  |
| E       | 3.20                      | 3.30 | 3.40 | 0.126                | 0.130 | 0.134 |
| E1      | 3.00                      | 3.15 | 3.20 | 0.118                | 0.124 | 0.126 |
| E2      | 2.39                      | 2.49 | 2.59 | 0.094                | 0.098 | 0.102 |
| e       | 0.65 BSC                  |      |      | 0.026 BSC            |       |       |
| H       | 0.30                      | 0.39 | 0.50 | 0.012                | 0.015 | 0.020 |
| L       | 0.30                      | 0.40 | 0.50 | 0.012                | 0.016 | 0.020 |
| L1      |                           | 0.13 |      | ----                 | 0.005 | ----  |
| K       | 0.30                      | ---- | ---- | 0.012                | ----  | ----  |
| θ       | 0°                        | ---- | 12°  | 0°                   | ----  | 12°   |
| M       | ----                      | ---- | 0.15 | ----                 | ----  | 0.006 |

**NOTE**

- 1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.  
MOLD FLASH AT THE NON-LEAD SIDES SHOULD BE LESS THAN 6 MILS EACH.
- 2.CONTROLLING DIMENSION IS MILLIMETER.  
CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.

**Revision History**

| Revision | Date      | Major changes             |
|----------|-----------|---------------------------|
| 1.0      | 2025/9/17 | Release of formal version |

**Disclaimer**

Unless otherwise specified in the datasheet, the product is designed and qualified as a standard commercial product and is not intended for use in applications that require extraordinary levels of quality and reliability, such as automotive, aviation/aerospace and life-support devices or systems.

Any and all semiconductor products have certain probability to fail or malfunction, which may result in personal injury, death or property damage. Customer are solely responsible for providing adequate safe measures when design their systems.

This product is suitable for reflow soldering up to 260℃, not very suitable for wave soldering.

The reliability of this product is not guaranteed under specific conditions when accepted by customers.

CRM(CQ) reserves the right to improve product design, function and reliability without notice.