# CRMPBL4407A

## P-Channel -30V, 8mΩ Typ. Power MOSFET

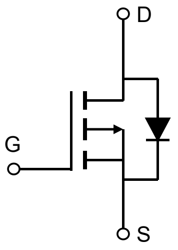
## Description

### Features

- -30V, -16A

  $R_{DS(ON)}$ Typ = 8mΩ @ $V_{GS}$ = -10V

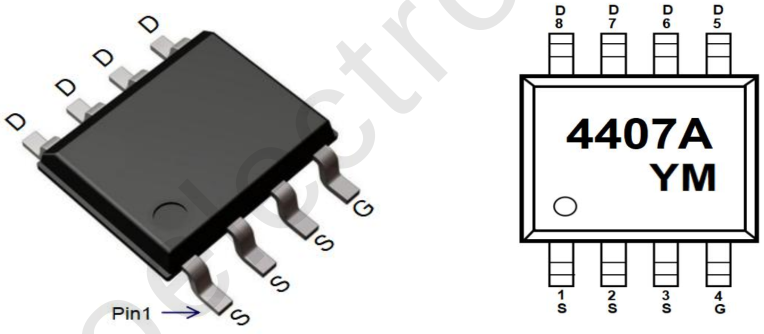
  $R_{DS(ON)}$ Typ = 14mΩ @ $V_{GS}$ = -4.5V
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free
- 100% UIS TESTED!



Schematic Diagram

### Application

- Load Switch
- PWM Application
- Power Management



Marking and Pin Assignment

### Package Marking and Ordering Information

| Device | Marking | Package | Outline | Reel Size | Reel (pcs) | Per Carton (pcs) |
|---|---|---|---|---|---|---|
| CRMPBL4407A | 4407A | SOP-8 | TAPING | 13" | 4000 | 40000 |

### Absolute Maximum Ratings (@ $T_J$ = 25°C unless otherwise specified)

| Symbol | Parameter | | Value | Units |
|---|---|---|---|---|
| $V_{DS}$ | Drain-to-Source Voltage | | -30 | V |
| $V_{GS}$ | Gate-to-Source Voltage | | ±20 | V |
| $I_D$ | Continuous Drain Current | $T_C$ = 25°C | -16 | A |
| | | $T_C$ = 100°C | -9.6 | A |
| $I_{DM}$ | Pulsed Drain Current (1) | | -64 | A |
| $E_{AS}$ | Single Pulsed Avalanche Energy (2) | | 100 | mJ |
| $P_D$ | Power Dissipation | $T_C$ = 25°C | 4.1 | W |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient(3) | | 30 | °C/W |
| $T_J$, $T_{STG}$ | Junction & Storage Temperature Range | | -55 to 150 | °C |

## Electrical Characteristics ($T_J$ = 25°C unless otherwise specified)

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | $I_D$ = -250µA, $V_{GS}$ = 0V | -30 | - | - | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$ = -30V, $V_{GS}$ = 0V | - | - | -1.0 | µA |
| $I_{GSS}$ | Gate-Body Leakage Current | $V_{DS}$ = 0V, $V_{GS}$ = ±20V | - | - | ±100 | nA |
| **On Characteristics** | | | | | | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$ = $V_{GS}$, $I_D$ = -250µA | -1 | -1.6 | -2.5 | V |
| $R_{DS(ON)}$ | Static Drain-Source ON-Resistance$^{(4)}$ | $V_{GS}$ = -10V, $I_D$ = -15A | - | 8 | 11 | mΩ |
| | | $V_{GS}$ = -4.5V, $I_D$ = -10A | - | 14 | 18 | mΩ |
| **Dynamic Characteristics** | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{GS}$ = 0V, $V_{DS}$ = -15V, f = 1MHz | - | 1799 | - | pF |
| $C_{oss}$ | Output Capacitance | | - | 321 | - | pF |
| $C_{rss}$ | Reverse Transfer Capacitance | | - | 262 | - | pF |
| $Q_g$ | Total Gate Charge | $V_{GS}$ = 0 to -10V<br>$V_{DS}$ = -15V, $I_D$ = -10A | - | 30 | - | nC |
| $Q_{gs}$ | Gate Source Charge | | - | 5 | - | nC |
| $Q_{gd}$ | Gate Drain("Miller") Charge | | - | 7.5 | - | nC |
| **Switching Characteristics** | | | | | | |
| $t_{d(on)}$ | Turn-On DelayTime | $V_{GS}$ = -10V, $V_{DD}$ = -15V<br>$I_D$= -10A, $R_{GEN}$ = 3Ω | - | 14 | - | ns |
| $t_r$ | Turn-On Rise Time | | - | 20 | - | ns |
| $t_{d(off)}$ | Turn-Off DelayTime | | - | 94 | - | ns |
| $t_f$ | Turn-Off Fall Time | | - | 65 | - | ns |
| **Drain-Source Diode Characteristics and Max Ratings** | | | | | | |
| $I_S$ | Maximum Continuous Drain to Source Diode Forward Current | | - | - | -16 | A |
| $I_{SM}$ | Maximum Pulsed Drain to Source Diode Forward Current | | - | - | -64 | A |
| $V_{SD}$ | Drain to Source Diode Forward Voltage | $V_{GS}$ = 0V, $I_S$ = -10A | - | - | -1.2 | V |
| trr | Body Diode Reverse Recovery Time | $I_F$ = -10A, di/dt = -100A/us | - | 19 | - | ns |
| Qrr | Body Diode Reverse Recovery Charge | | - | 9 | - | nC |

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. $E_{AS}$ condition: Starting $T_J$=25°C, $V_{DD}$=30V, $V_G$=10V, $R_G$=25ohm, L=0.5mH, $I_{AS}$=-20A
3. $R_{\theta JA}$ is measured with the device mounted on a 1inch$^2$ pad of 2oz copper FR4 PCB
4. Pulse Test: Pulse Width⩽300µs, Duty Cycle⩽0.5%.

## Test Circuit

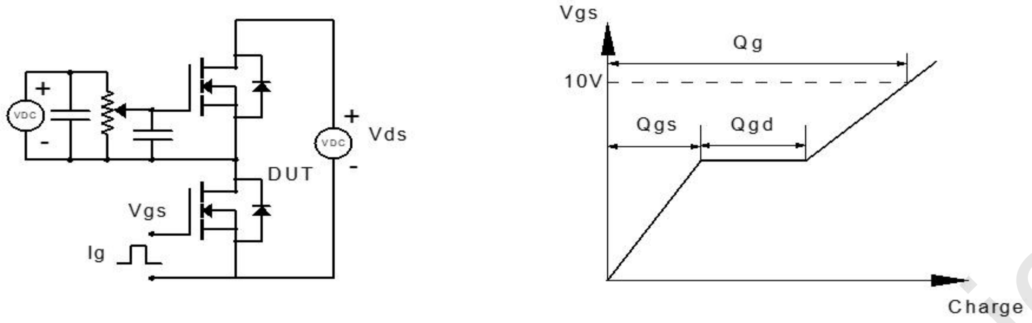


Figure 1: Gate Charge Test Circuit & Waveform

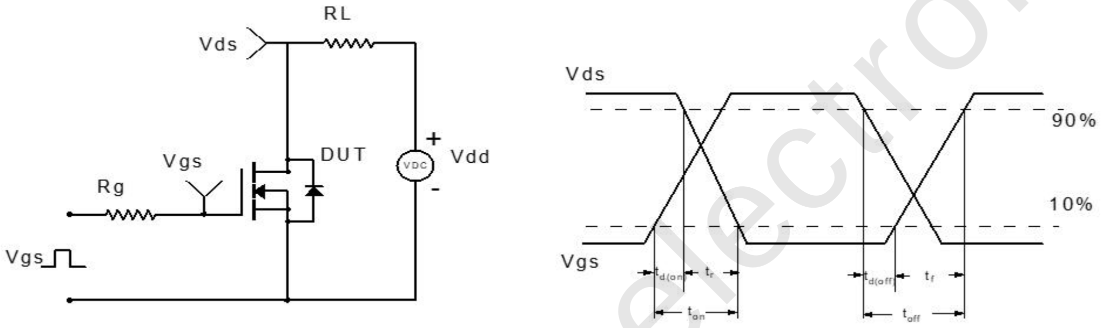


Figure 2: Resistive Switching Test Circuit & Waveform

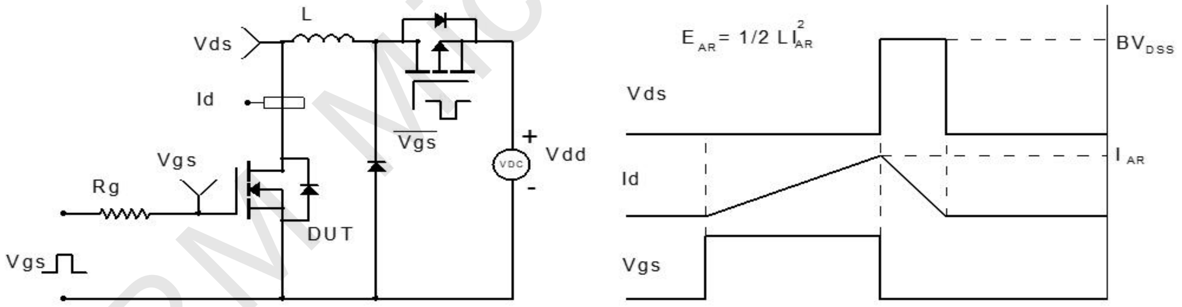


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

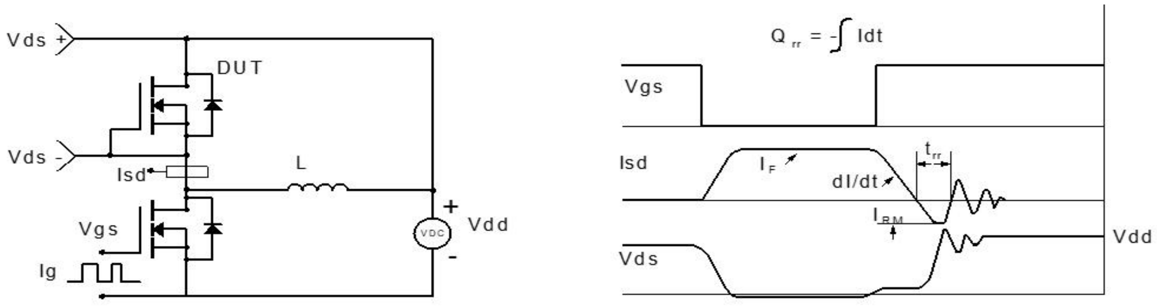
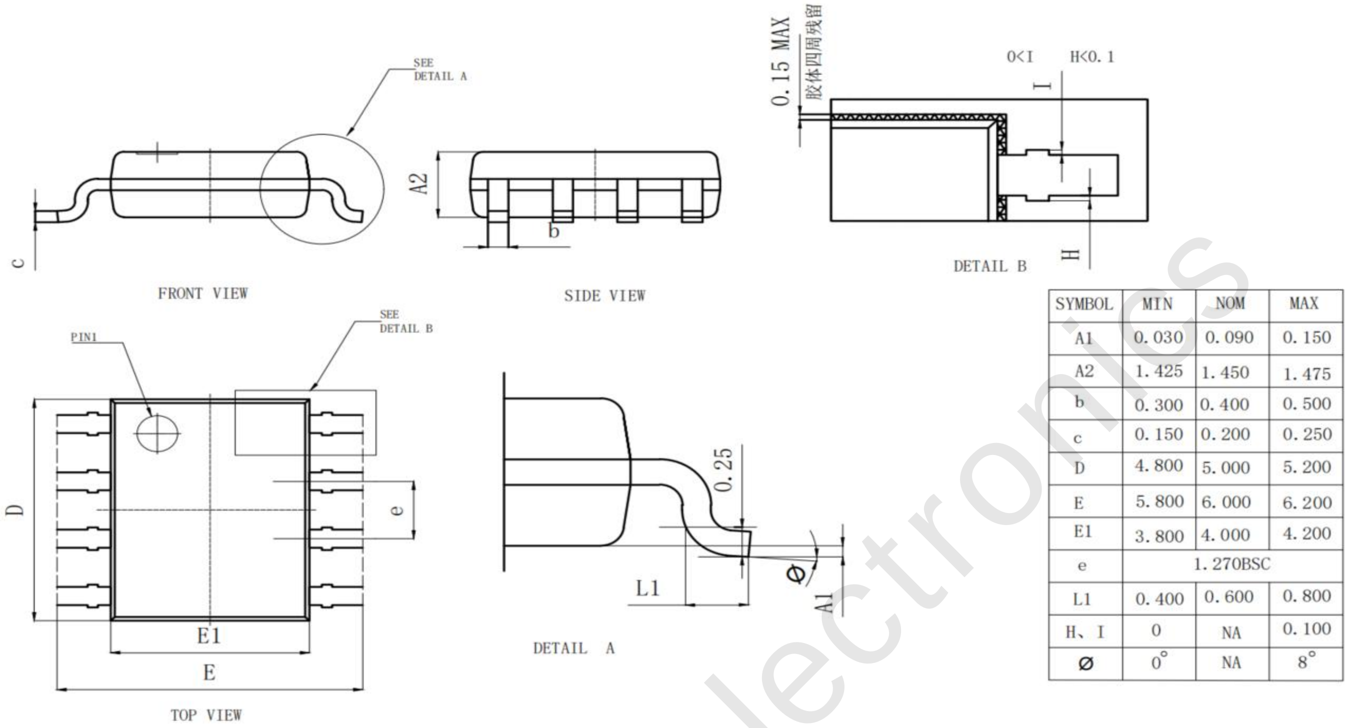


Figure 4: Diode Recovery Test Circuit & Waveform

## Package Mechanical Data(SOP-8)



| SYMBOL | MIN | NOM | MAX |
|---|---|---|---|
| A1 | 0.030 | 0.090 | 0.150 |
| A2 | 1.425 | 1.450 | 1.475 |
| b | 0.300 | 0.400 | 0.500 |
| c | 0.150 | 0.200 | 0.250 |
| D | 4.800 | 5.000 | 5.200 |
| E | 5.800 | 6.000 | 6.200 |
| E1 | 3.800 | 4.000 | 4.200 |
| e | 1.270BSC | | |
| L1 | 0.400 | 0.600 | 0.800 |
| H、I | 0 | NA | 0.100 |
| Ø | 0° | NA | 8° |

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## Contact information

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