# CRMVGL0303A

## N-Channel 30V, 5.4mΩ Typ. Power MOSFET

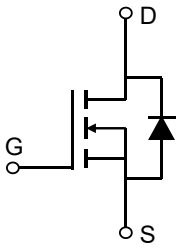
## Description

### Features

- 30V, 25A

  $R_{DS(ON)}$ Typ = 5.4mΩ @ $V_{GS}$ = 10V

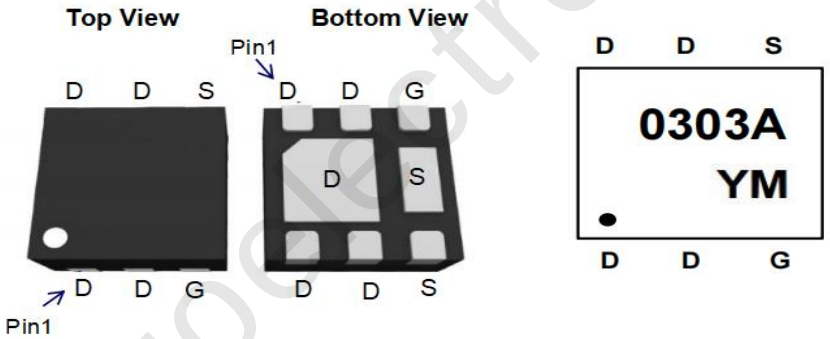
  $R_{DS(ON)}$ Typ = 7.4mΩ @ $V_{GS}$ = 4.5V
- Advanced Split Gate Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free




**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) |
|---|---|---|---|---|---|---|
| CRMVGL0303A | 0303A | DFN2020-6L | TAPING | 7" | 3000 | 120000 |

### 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 | 25 | A |
| | | $T_C$ = 100°C | 15 | A |
| $I_{DM}$ | Pulsed Drain Current (1) | | 100 | A |
| $P_D$ | Power Dissipation | $T_C$ = 25°C | 7.5 | W |
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case | | 16.6 | °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 | 1.2 | 2 | 2.4 | V |
| $R_{DS(ON)}$ | Static Drain-Source ON-Resistance(2) | $V_{GS}$ = 10V, $I_D$ = 5A | - | 5.4 | 7 | mΩ |
| | | $V_{GS}$ = 4.5V, $I_D$ = 3A | - | 7.4 | 9.6 | mΩ |
| **Dynamic Characteristics** | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{GS}$ = 0V, $V_{DS}$ = 15V, f = 1MHz | - | 920 | - | pF |
| $C_{oss}$ | Output Capacitance | | - | 793 | - | pF |
| $C_{rss}$ | Reverse Transfer Capacitance | | - | 47 | - | pF |
| $Q_g$ | Total Gate Charge | $V_{GS}$ = 0 to 10V $V_{DS}$ = 15V, $I_D$ = 20A | - | 16 | - | nC |
| $Q_{gs}$ | Gate Source Charge | | - | 3 | - | nC |
| $Q_{gd}$ | Gate Drain("Miller") Charge | | - | 3.3 | - | nC |
| **Switching Characteristics** | | | | | | |
| $t_{d(on)}$ | Turn-On DelayTime | $V_{GS}$ = 10V, $V_{DD}$ = 15V $I_D$= 20A, $R_{GEN}$ = 3Ω | - | 6.3 | - | ns |
| $t_r$ | Turn-On Rise Time | | - | 3.2 | - | ns |
| $t_{d(off)}$ | Turn-Off DelayTime | | - | 18 | - | ns |
| $t_f$ | Turn-Off Fall Time | | - | 3.6 | - | ns |
| **Drain-Source Diode Characteristics and Max Ratings** | | | | | | |
| $I_S$ | Maximum Continuous Drain to Source Diode Forward Current | | - | - | 25 | A |
| $I_{SM}$ | Maximum Pulsed Drain to Source Diode Forward Current | | - | - | 100 | A |
| $V_{SD}$ | Drain to Source Diode Forward Voltage | $V_{GS}$ = 0V, $I_S$ = 5A | - | - | 1.2 | V |
| trr | Body Diode Reverse Recovery Time | $I_F$ = 15A, di/dt = 100A/us | - | 27 | - | ns |
| Qrr | Body Diode Reverse Recovery Charge | | - | 11 | - | nC |

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

## Test Circuit

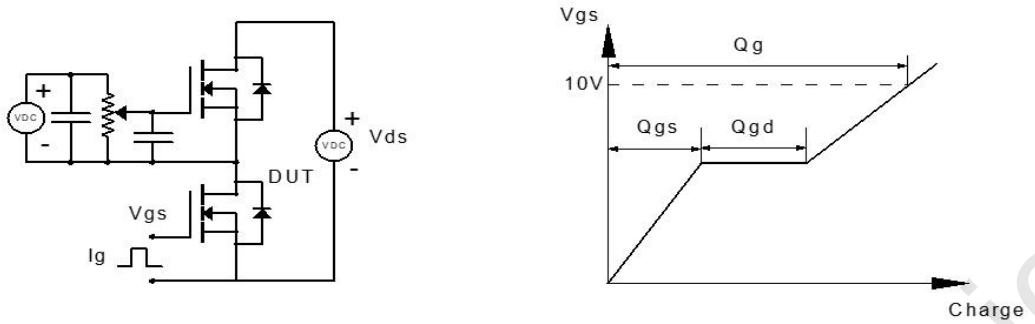



**Figure 1: Gate Charge Test Circuit & Waveform**

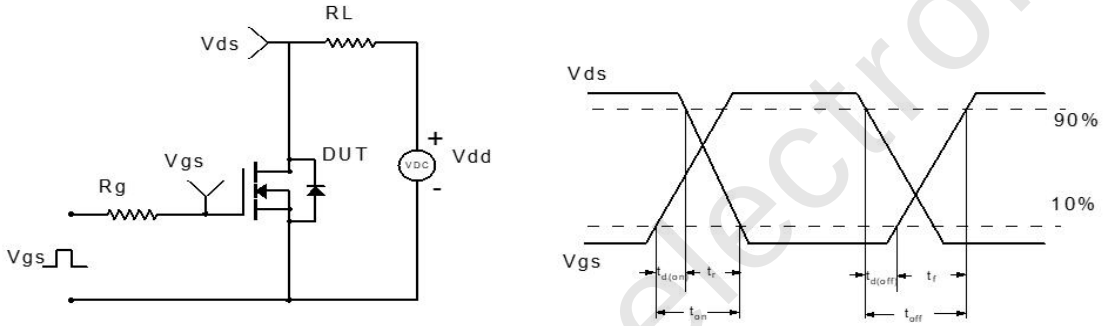



**Figure 2: Resistive Switching Test Circuit & Waveform**

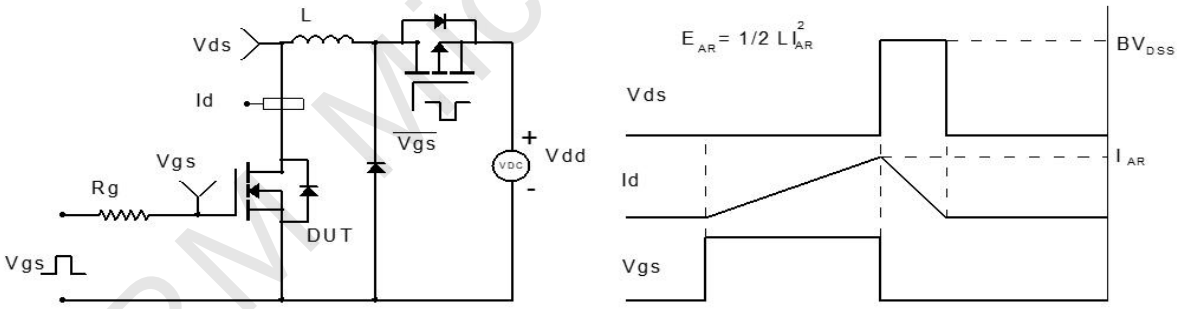



**Figure 3: Unclamped Inductive Switching Test Circuit& Waveform**

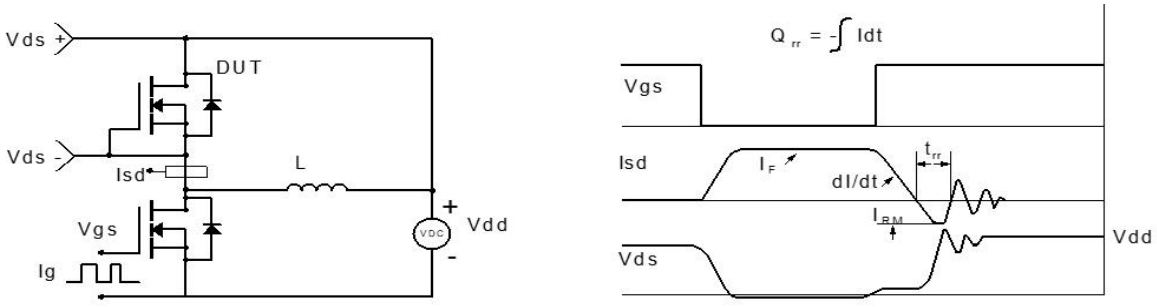
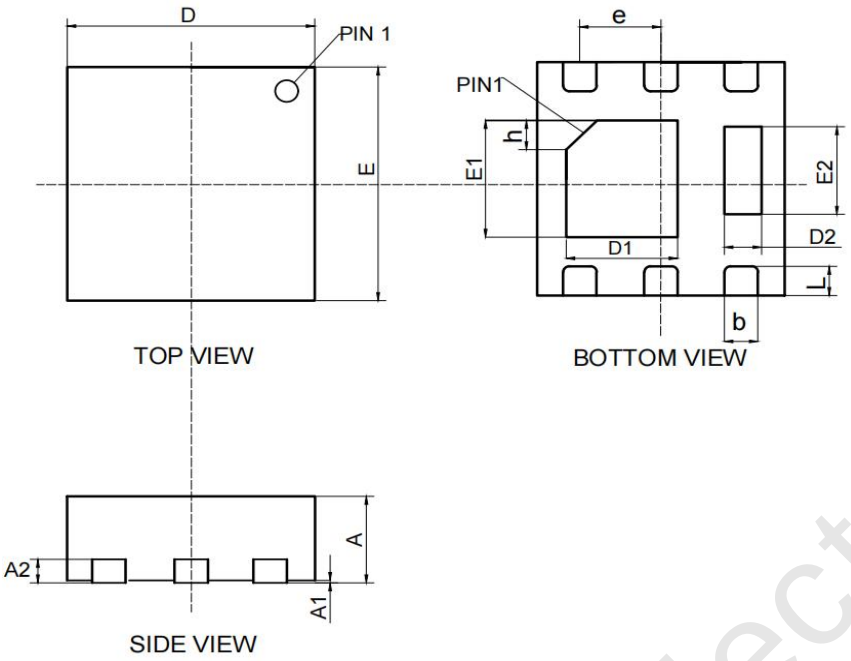



**Figure 4: Diode Recovery Test Circuit & Waveform**

## Package Mechanical Data(DFN2020-6L)




| SYMBOL | MIN | NOM | MAX |
|---|---|---|---|
| A | 0.70 | 0.75 | 0.80 |
| A1 | NA | 0.02 | 0.05 |
| A2 | 0.18 | 0.20 | 0.25 |
| b | 0.20 | 0.27 | 0.34 |
| D | 1.95 | 2.00 | 2.05 |
| E | 1.95 | 2.00 | 2.05 |
| D1 | 0.80 | 0.90 | 1.00 |
| E1 | 0.90 | 1.00 | 1.10 |
| D2 | 0.20 | 0.30 | 0.40 |
| E2 | 0.65 | 0.75 | 0.85 |
| L | 0.20 | 0.25 | 0.35 |
| h | 0.20 | 0.25 | 0.30 |
| e | 0.65 BSC | | |

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