

### Description

#### Features

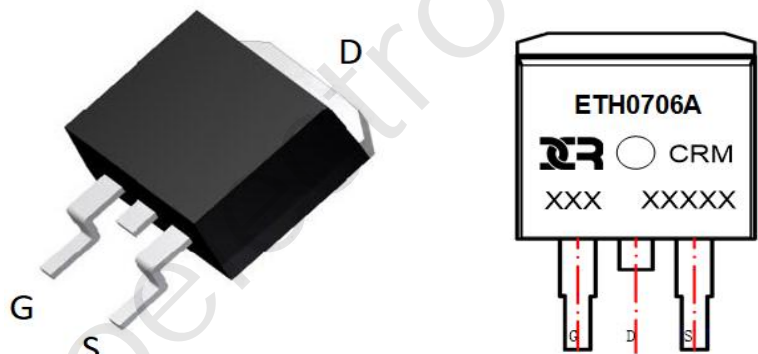
- 68V, 115A  
 $R_{DS(ON)}$  Typ = 6.1mΩ @  $V_{GS} = 10V$   
 Advanced Trench Technology
- Excellent  $R_{DS(ON)}$  and Low Gate Charge
- 100% UIS TESTED!
- 100%  $\Delta V_{ds}$  TESTED!



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) |
|-------------|-------------|-----------|---------|-----------|------------|------------------|
| CRMETH0706A | CRMETH0706A | TO-263-3L | TAPING  | 13"       | 800        | 4000             |

#### Absolute Maximum Ratings (@ $T_J = 25^\circ\text{C}$ unless otherwise specified)

| Symbol                            | Parameter                                     | Value                  | Units |   |
|-----------------------------------|---|------------------------|-------|---|
| V <sub>DS</sub>                   | Drain-to-Source Voltage                       | 68                     | V     |   |
| V <sub>GS</sub>                   | Gate-to-Source Voltage                        | ±20                    | V     |   |
| I <sub>D</sub>                    | Continuous Drain Current                      | T <sub>C</sub> = 25°C  | 115   | A |
|                                   |   | T <sub>C</sub> = 100°C | 69    | A |
| I <sub>DM</sub>                   | Pulsed Drain Current <sup>(1)</sup>           | 460                    | A     |   |
| E <sub>AS</sub>                   | Single Pulsed Avalanche Energy <sup>(2)</sup> | 272                    | mJ    |   |
| P <sub>D</sub>                    | Power Dissipation                             | T <sub>C</sub> = 25°C  | 178   | W |
| R <sub>θJC</sub>                  | Thermal Resistance, Junction to Case          | 0.7                    | °C/W  |   |
| T <sub>J</sub> , T <sub>STG</sub> | Junction & Storage Temperature Range          | -55 to 150             | °C    |   |

## Electrical Characteristics ( $T_J = 25^\circ\text{C}$ unless otherwise specified)

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|--------|-----------|------------|------|------|------|------|
|--------|-----------|------------|------|------|------|------|

### Off Characteristics

|               |                                 |  |    |   |           |               |
|---------------|---------------------------------|--|----|---|-----------|---------------|
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage  | $I_D = 250\mu\text{A}$ , $V_{GS} = 0\text{V}$    | 68 | - | -         | V             |
| $I_{DSS}$     | Zero Gate Voltage Drain Current | $V_{DS} = 68\text{V}$ , $V_{GS} = 0\text{V}$     | -  | - | 1.0       | $\mu\text{A}$ |
| $I_{GSS}$     | Gate-Body Leakage Current       | $V_{DS} = 0\text{V}$ , $V_{GS} = \pm 20\text{V}$ | -  | - | $\pm 100$ | nA            |

### On Characteristics

|              |  |  |     |     |     |    |
|--------------|--|--|-----|-----|-----|----|
| $V_{GS(th)}$ | Gate Threshold Voltage                           | $V_{DS} = V_{GS}$ , $I_D = 250\mu\text{A}$ | 2.4 | 3   | 3.6 | V  |
| $R_{DS(ON)}$ | Static Drain-Source ON-Resistance <sup>(3)</sup> | $V_{GS} = 10\text{V}$ , $I_D = 20\text{A}$ | -   | 6.1 | 7.9 | mΩ |

### Dynamic Characteristics

|           |                              |  |   |      |   |    |
|-----------|------------------------------|--|---|------|---|----|
| $C_{iss}$ | Input Capacitance            | $V_{GS} = 0\text{V}$ , $V_{DS} = 25\text{V}$ ,<br>$f = 1\text{MHz}$        | - | 4960 | - | pF |
| $C_{oss}$ | Output Capacitance           |  | - | 328  | - | pF |
| $C_{rss}$ | Reverse Transfer Capacitance |  | - | 203  | - | pF |
| $Q_g$     | Total Gate Charge            | $V_{GS} = 0$ to $10\text{V}$<br>$V_{DS} = 30\text{V}$ , $I_D = 20\text{A}$ | - | 45   | - | nC |
| $Q_{gs}$  | Gate Source Charge           |  | - | 17   | - | nC |
| $Q_{gd}$  | Gate Drain("Miller") Charge  |  | - | 11   | - | nC |

### Switching Characteristics

|              |                    |   |   |    |   |    |
|--------------|--------------------|---|---|----|---|----|
| $t_{d(on)}$  | Turn-On DelayTime  | $V_{GS} = 10\text{V}$ , $V_{DD} = 30\text{V}$<br>$I_D = 30\text{A}$ , $R_{GEN} = 3\Omega$ | - | 22 | - | ns |
| $t_r$        | Turn-On Rise Time  |   | - | 80 | - | ns |
| $t_{d(off)}$ | Turn-Off DelayTime |   | - | 50 | - | ns |
| $t_f$        | Turn-Off Fall Time |   | - | 28 | - | ns |

### Drain-Source Diode Characteristics and Max Ratings

|          |  |   |   |    |     |    |
|----------|--|---|---|----|-----|----|
| $I_S$    | Maximum Continuous Drain to Source Diode Forward Current | $V_{GS} = 0\text{V}$ , $I_S = 20\text{A}$ | - | -  | 115 | A  |
| $I_{SM}$ | Maximum Pulsed Drain to Source Diode Forward Current     |   | - | -  | 460 | A  |
| $V_{SD}$ | Drain to Source Diode Forward Voltage                    |   | - | -  | 1.2 | V  |
| $t_{rr}$ | Body Diode Reverse Recovery Time                         |   | - | 35 | -   | ns |
| $Q_{rr}$ | Body Diode Reverse Recovery Charge                       |   | - | 54 | -   | nC |

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2.  $E_{AS}$  condition: Starting  $T_J = 25^\circ\text{C}$ ,  $V_{DD} = 30\text{V}$ ,  $V_G = 10\text{V}$ ,  $R_G = 25\Omega$ ,  $L = 0.5\text{mH}$ ,  $I_{AS} = 33\text{A}$
3. Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 0.5\%$ .

## Test Circuit

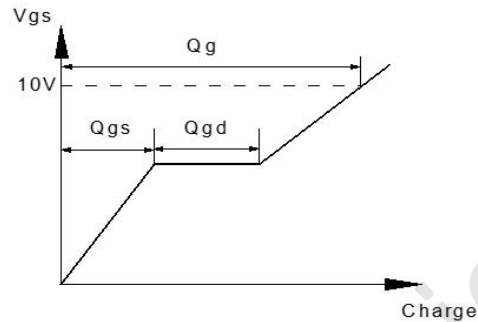


Figure 1: Gate Charge Test Circuit & Waveform



Figure 2: Resistive Switching Test Circuit & Waveform



Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

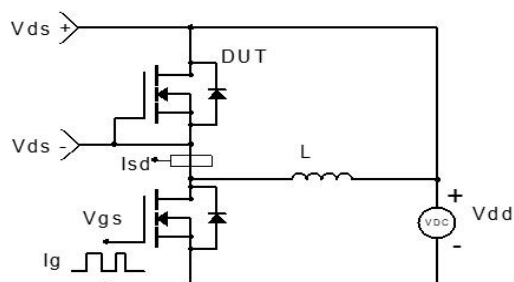
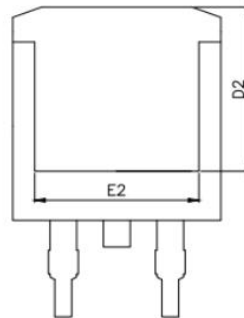
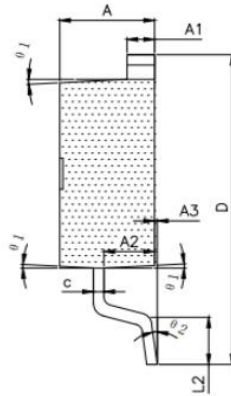
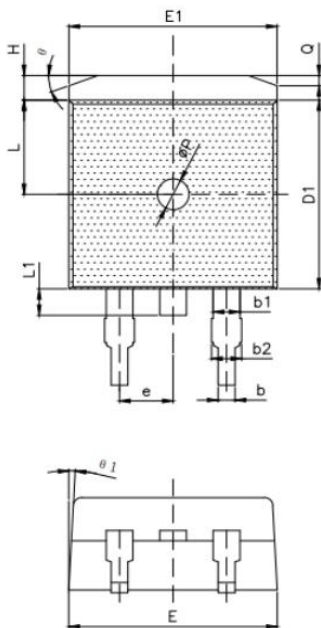


Figure 4: Diode Recovery Test Circuit & Waveform

### Package Mechanical Data(TO-263-3L)




| SYMBOL | MILLIMETER |       |       |
|--------|------------|-------|-------|
|        | MIN        | NOM   | MAX   |
| A      | 4.40       | 4.50  | 4.60  |
| A1     | 1.20       | 1.30  | 1.40  |
| A2     | 2.30       | 2.40  | 2.50  |
| A3     | 0.03       | 0.13  | 0.23  |
| b      | 0.70       | 0.80  | 0.90  |
| b1     | 1.21       | 1.27  | 1.40  |
| b2     | 1.25       | 1.35  | 1.45  |
| c      | 0.40       | 0.50  | 0.60  |
| D      | 14.80      | 15.10 | 15.40 |
| D1     | 9.10       | 9.20  | 9.30  |
| D2     | 8.00       | —     | —     |
| E      | 9.70       | 9.90  | 10.20 |
| E1     | 9.68       | 9.88  | 10.08 |
| E2     | 7.80       | —     | —     |
| e      | 2.54 (BSC) |       |       |
| H      | 1.00       | 1.20  | 1.40  |
| L      | 4.30       | 4.60  | 4.90  |
| L1     | 1.10       | 1.30  | 1.50  |
| L2     | 2.10       | 2.30  | 2.50  |
| φP     | 1.40       | 1.50  | 1.60  |
| Q      | 0.50 (REF) |       |       |
| θ      | 16°        | 20°   | 24°   |
| θ1     | 1°         | 3°    | 5°    |
| θ2     | 0°         | —     | 9°    |

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