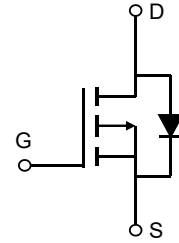


### Description

#### Features

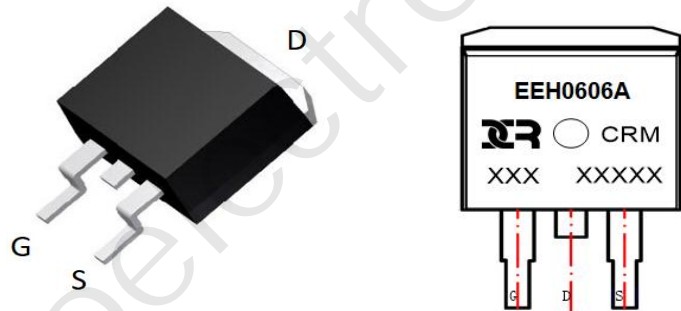
- -60V, -95A
- $R_{DS(ON)}$  Typ = 7.3mΩ @  $V_{GS} = -10V$
- Advanced Split Gate Trench Technology
- Excellent  $R_{DS(ON)}$  and Low Gate Charge
- 100% UIS TESTED!
- 100%  $\Delta V_d$ s TESTED!



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) |
|-------------|-------------|-----------|---------|-----------|------------|------------------|
| CRMEEH0606A | CRMEEH0606A | 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                       | -60                    | V     |   |
| V <sub>GS</sub>                   | Gate-to-Source Voltage                        | ±20                    | V     |   |
| I <sub>D</sub>                    | Continuous Drain Current                      | T <sub>C</sub> = 25°C  | -95   | A |
|                                   |   | T <sub>C</sub> = 100°C | -57   | A |
| I <sub>DM</sub>                   | Pulsed Drain Current <sup>(1)</sup>           | -380                   | A     |   |
| E <sub>AS</sub>                   | Single Pulsed Avalanche Energy <sup>(2)</sup> | 333                    | mJ    |   |
| P <sub>D</sub>                    | Power Dissipation                             | T <sub>C</sub> = 25°C  | 146   | W |
| R <sub>θJC</sub>                  | Thermal Resistance, Junction to Case          | 0.85                   | °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  | $I_D = -250\mu\text{A}$ , $V_{GS} = 0\text{V}$   | -60 | - | -         | V             |
| $I_{DSS}$     | Zero Gate Voltage Drain Current | $V_{DS} = -60\text{V}$ , $V_{GS} = 0\text{V}$    | -   | - | -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> | $V_{GS} = -10\text{V}$ , $I_D = -30\text{A}$ | -    | 7.3 | 9.5  | mΩ |

#### Dynamic Characteristics

|           |                              |   |   |      |   |    |
|-----------|------------------------------|---|---|------|---|----|
| $C_{iss}$ | Input Capacitance            | $V_{GS} = 0\text{V}$ , $V_{DS} = -30\text{V}$ ,<br>$f = 1\text{MHz}$          | - | 3220 | - | pF |
| $C_{oss}$ | Output Capacitance           |   | - | 1020 | - | pF |
| $C_{rss}$ | Reverse Transfer Capacitance |   | - | 60   | - | pF |
| $Q_g$     | Total Gate Charge            | $V_{GS} = 0$ to $-10\text{V}$<br>$V_{DS} = -30\text{V}$ , $I_D = -20\text{A}$ | - | 46.5 | - | nC |
| $Q_{gs}$  | Gate Source Charge           |   | - | 9.5  | - | nC |
| $Q_{gd}$  | Gate Drain("Miller") Charge  |   | - | 22   | - | nC |

#### Switching Characteristics

|              |                    |  |   |      |   |    |
|--------------|--------------------|--|---|------|---|----|
| $t_{d(on)}$  | Turn-On DelayTime  | $V_{GS} = -10\text{V}$ , $V_{DD} = -30\text{V}$<br>$I_D = -20\text{A}$ , $R_{GEN} = 3\Omega$ | - | 4.3  | - | ns |
| $t_r$        | Turn-On Rise Time  |  | - | 2.8  | - | ns |
| $t_{d(off)}$ | Turn-Off DelayTime |  | - | 16.5 | - | ns |
| $t_f$        | Turn-Off Fall Time |  | - | 6    | - | ns |

#### Drain-Source Diode Characteristics and Max Ratings

|          |  |  |   |     |      |    |
|----------|--|--|---|-----|------|----|
| $I_S$    | Maximum Continuous Drain to Source Diode Forward Current | $V_{GS} = 0\text{V}$ , $I_S = -30\text{A}$ | - | -   | -95  | A  |
| $I_{SM}$ | Maximum Pulsed Drain to Source Diode Forward Current     |  | - | -   | -380 | A  |
| $V_{SD}$ | Drain to Source Diode Forward Voltage                    |  | - | -   | -1.2 | V  |
| $t_{rr}$ | Body Diode Reverse Recovery Time                         |  | - | 65  | -    | ns |
| $Q_{rr}$ | Body Diode Reverse Recovery Charge                       |  | - | 120 | -    | nC |

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2.  $E_{AS}$  condition: Starting  $T_J = 25^\circ\text{C}$ ,  $V_{DD} = -30\text{V}$ ,  $V_G = -10\text{V}$ ,  $R_G = 25\Omega$ ,  $L = 0.5\text{mH}$ ,  $I_{AS} = -36.5\text{A}$
3. Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 0.5\%$ .

## Test Circuit

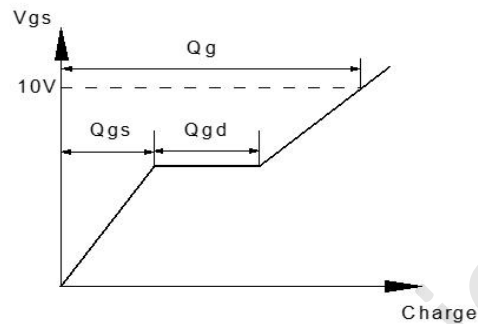
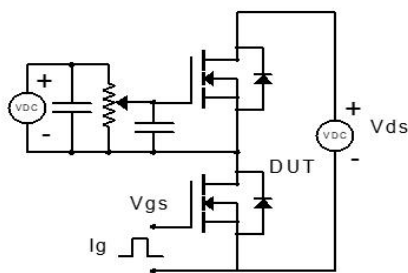


Figure 1: Gate Charge Test Circuit & Waveform

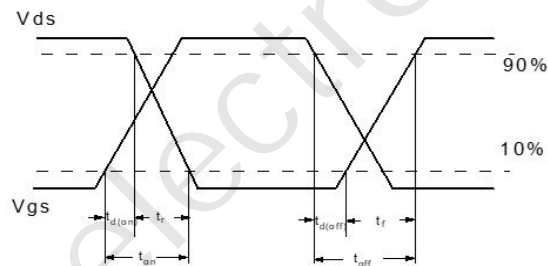
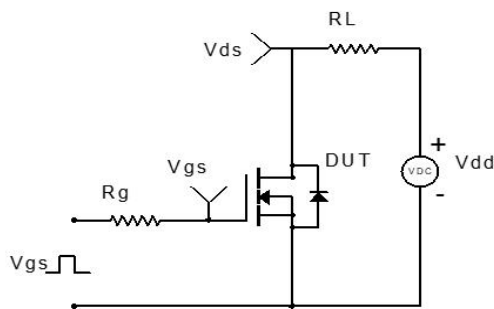


Figure 2: Resistive Switching Test Circuit & Waveform

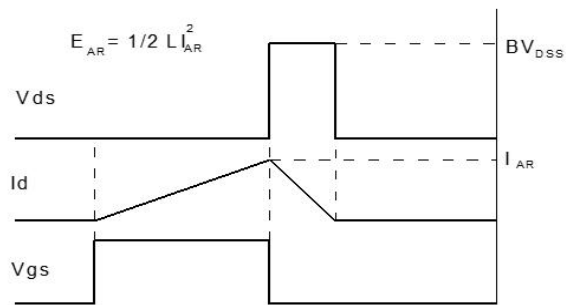
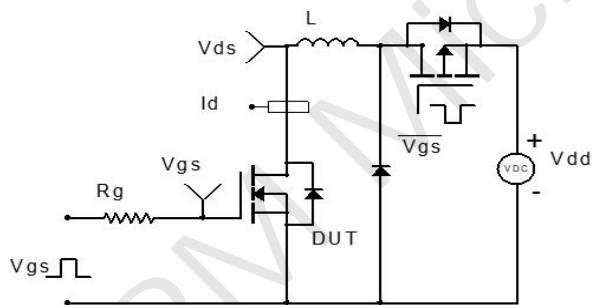


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

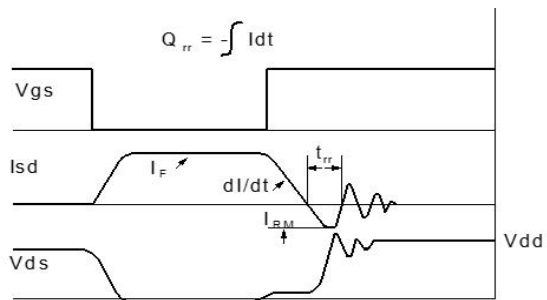
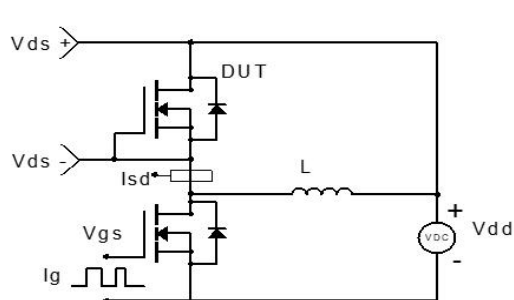
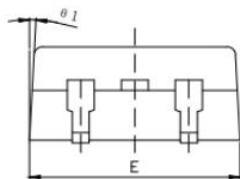
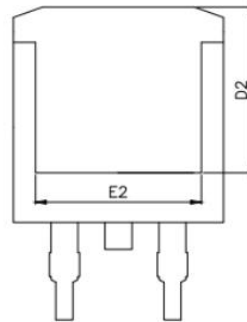
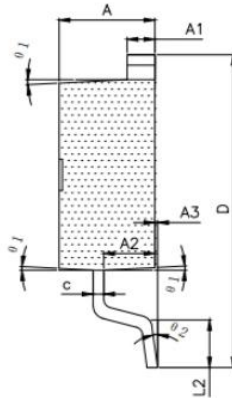
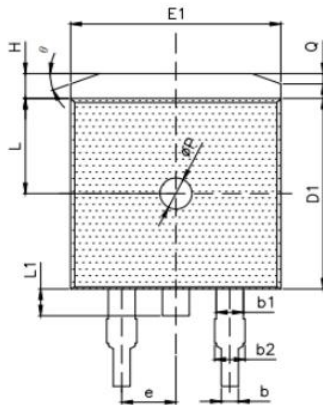


Figure 4: Diode Recovery Test Circuit & Waveform

### 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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