



## Description

### JMT Dual N-channel Enhancement Mode Power MOSFET

#### Features

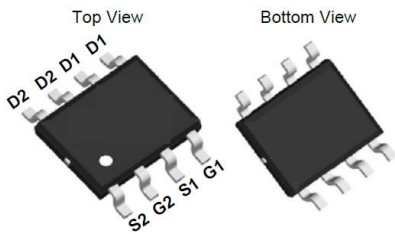
- 60V,11A  
 $R_{DS(ON)} < 14m\Omega @ V_{GS} = 10V$   
 $R_{DS(ON)} < 18m\Omega @ V_{GS} = 4.5V$
- Advanced Trench Technology
- Provide Excellent  $R_{DS(ON)}$  and Low Gate Charge
- Lead free product is acquired

#### Application

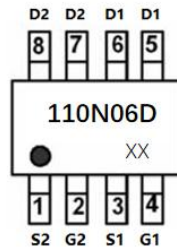
- Load Switch
- PWM Application
- Power management



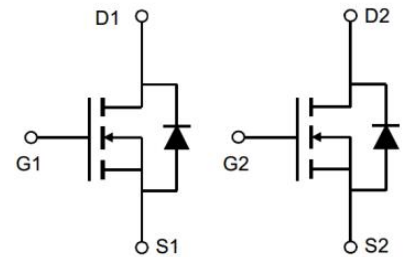
*100% UIS TESTED!*  
*100% ΔVds TESTED!*



SOP-8(Dual)



Marking and pin Assignment



Schematic Diagram

## Package Marking and Ordering Information

| Device Marking | Device      | OUTLINE | Device Package | Reel Size | Reel (PCS) | Per Carton (PCS) |
|----------------|-------------|---------|----------------|-----------|------------|------------------|
| 110N06D        | JMTP110N06D | TAPING  | SOP-8          | 13inch    | 4000       | 48000            |

## Absolute Maximum Ratings (T<sub>A</sub>=25°C unless otherwise specified)

| Symbol                            | Parameter                                       | Max.                   | Units |
|-----------------------------------|---|------------------------|-------|
| V <sub>DSS</sub>                  | Drain-Source Voltage                            | 60                     | V     |
| V <sub>GSS</sub>                  | Gate-Source Voltage                             | ±20                    | V     |
| I <sub>D</sub>                    | Continuous Drain Current                        | T <sub>A</sub> = 25°C  | 11    |
|                                   |   | T <sub>A</sub> = 100°C | 7.2   |
| I <sub>DM</sub>                   | Pulsed Drain Current <sup>note1</sup>           | 44                     | A     |
| EAS                               | Single Pulsed Avalanche Energy <sup>note2</sup> | 81                     | mJ    |
| P <sub>D</sub>                    | Power Dissipation                               | T <sub>A</sub> = 25°C  | 3.1   |
| R <sub>θJA</sub>                  | Thermal Resistance, Junction to Ambient         | 40                     | °C/W  |
| T <sub>J</sub> , T <sub>STG</sub> | Operating and Storage Temperature Range         | -55 to +150            | °C    |



## Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise specified)

| Symbol  | Parameter   | Test Condition   | Min. | Typ. | Max. | Units |
|---|---|--|------|------|------|-------|
| <b>Off Characteristic</b>                                     |   |  |      |      |      |       |
| V <sub>(BR)DSS</sub>  | Drain-Source Breakdown Voltage                            | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA   | 60   | -    | -    | V     |
| I <sub>DSS</sub>  | Zero Gate Voltage Drain Current                           | V <sub>DS</sub> =60V, V <sub>GS</sub> =0V,   | -    | -    | 1.0  | μA    |
| I <sub>GSS</sub>  | Gate to Body Leakage Current                              | V <sub>DS</sub> =0V, V <sub>GS</sub> = ±20V  | -    | -    | ±100 | nA    |
| <b>On Characteristics</b>                                     |   |  |      |      |      |       |
| V <sub>GS(th)</sub>   | Gate Threshold Voltage                                    | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                                 | 1.0  | -    | 2.5  | V     |
| R <sub>DS(on)</sub>   | Static Drain-Source on-Resistance<br><small>note3</small> | V <sub>GS</sub> =10V, I <sub>D</sub> =11A  | -    | 11   | 14   | mΩ    |
|   |   | V <sub>GS</sub> =4.5V, I <sub>D</sub> =8A  | -    | 13   | 18   |       |
| <b>Dynamic Characteristics</b>                                |   |  |      |      |      |       |
| C <sub>iss</sub>  | Input Capacitance   | V <sub>DS</sub> =25V, V <sub>GS</sub> =0V,<br>f=1.0MHz                                   | -    | 4605 | -    | pF    |
| C <sub>oss</sub>  | Output Capacitance  |  | -    | 215  | -    | pF    |
| C <sub>rss</sub>  | Reverse Transfer Capacitance                              |  | -    | 191  | -    | pF    |
| Q <sub>g</sub>  | Total Gate Charge   | V <sub>DS</sub> =30V, I <sub>D</sub> =6A,<br>V <sub>GS</sub> =10V                        | -    | 77   | -    | nC    |
| Q <sub>gs</sub>   | Gate-Source Charge  |  | -    | 9    | -    | nC    |
| Q <sub>gd</sub>   | Gate-Drain("Miller") Charge                               |  | -    | 23   | -    | nC    |
| <b>Switching Characteristics</b>                              |   |  |      |      |      |       |
| t <sub>d(on)</sub>  | Turn-on Delay Time  | V <sub>DS</sub> =30V, I <sub>D</sub> =11A,<br>R <sub>G</sub> =1.8Ω, V <sub>GS</sub> =10V | -    | 7.1  | -    | ns    |
| t <sub>r</sub>  | Turn-on Rise Time   |  | -    | 5.3  | -    | ns    |
| t <sub>d(off)</sub>   | Turn-off Delay Time                                       |  | -    | 27.2 | -    | ns    |
| t <sub>f</sub>  | Turn-off Fall Time  |  | -    | 6.2  | -    | ns    |
| <b>Drain-Source Diode Characteristics and Maximum Ratings</b> |   |  |      |      |      |       |
| I <sub>S</sub>  | Maximum Continuous Drain to Source Diode Forward Current  |  | -    | -    | 11   | A     |
| I <sub>SM</sub>   | Maximum Pulsed Drain to Source Diode Forward Current      |  | -    | -    | 44   | A     |
| V <sub>SD</sub>   | Drain to Source Diode Forward Voltage                     | V <sub>GS</sub> =0V, I <sub>S</sub> =11A   | -    | -    | 1.2  | V     |
| trr   | Body Diode Reverse Recovery Time                          | I <sub>F</sub> =11A,<br>dI/dt=100A/μs  | -    | 29   | -    | ns    |
| Qrr   | Body Diode Reverse Recovery Charge                        |  | -    | 45   | -    | nC    |

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

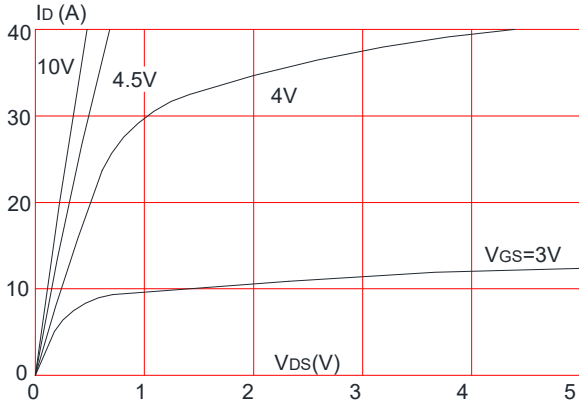
2. EAS condition : T<sub>J</sub>=25°C, V<sub>DD</sub>=30V, V<sub>G</sub>=10V, L=0.5mH, R<sub>G</sub>=25Ω, I<sub>AS</sub>=18A

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

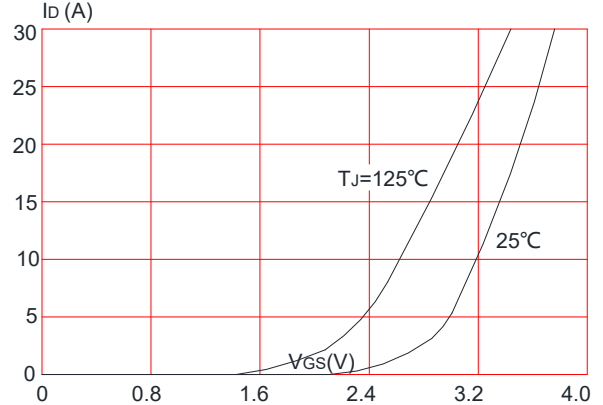


## Typical Performance Characteristics

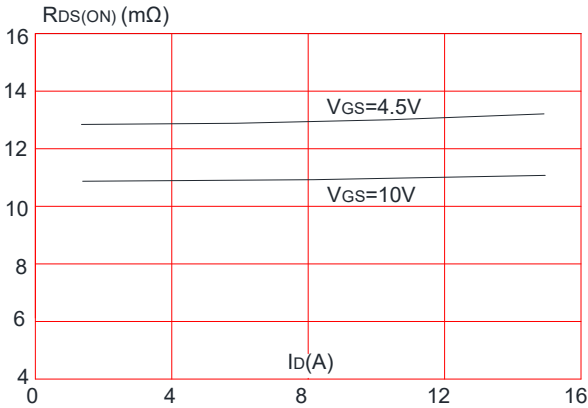
**Figure 1: Output Characteristics**



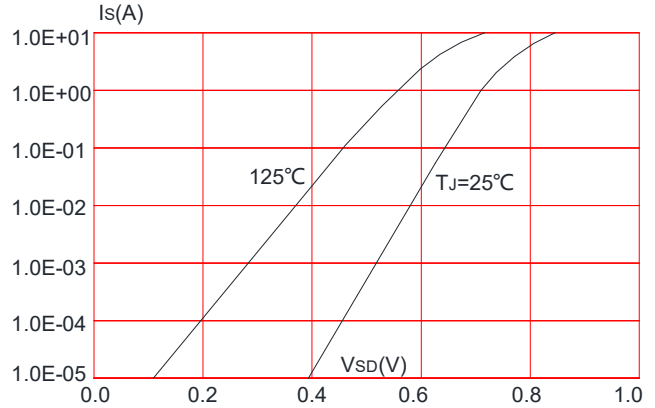
**Figure 2: Typical Transfer Characteristics**



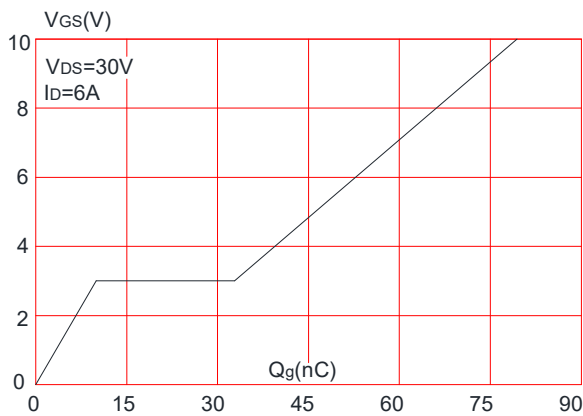
**Figure 3: On-resistance vs. Drain Current**



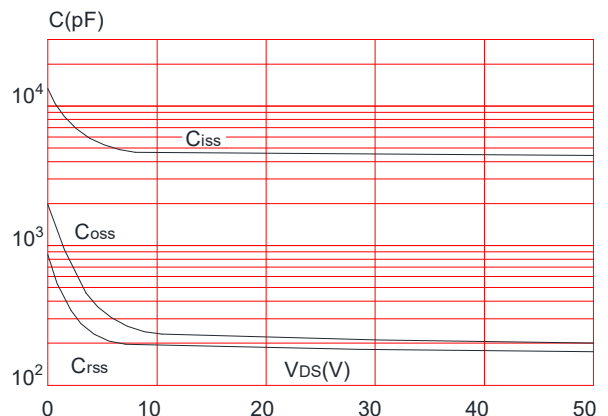
**Figure 4: Body Diode Characteristics**



**Figure 5: Gate Charge Characteristics**

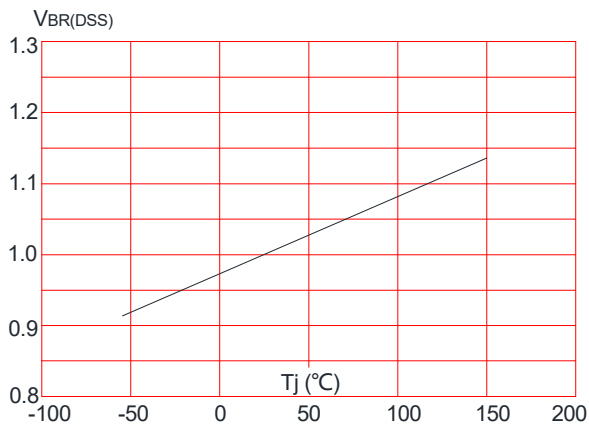


**Figure 6: Capacitance Characteristics**

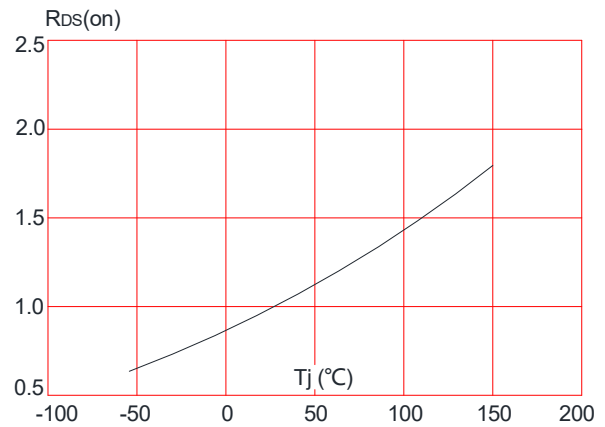




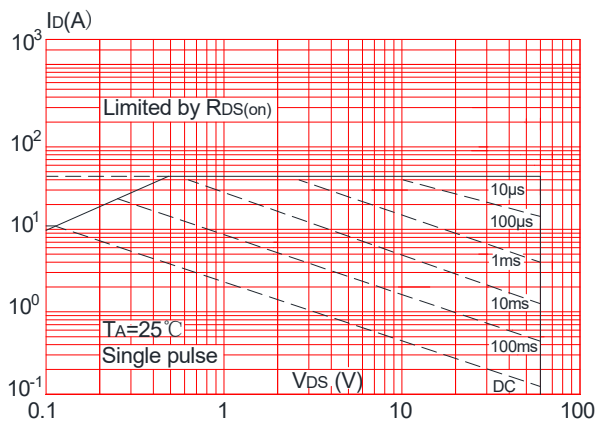
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



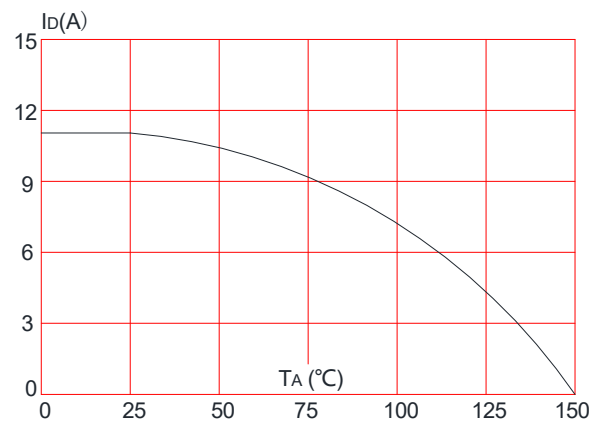
**Figure 8:** Normalized on Resistance vs. Junction Temperature



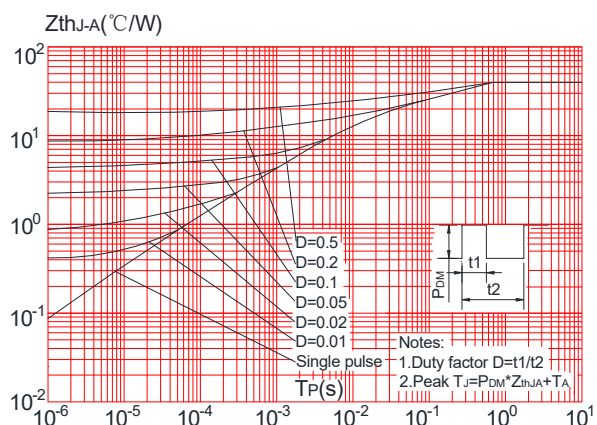
**Figure 9:** Maximum Safe Operating Area



**Figure 10:** Maximum Continuous Drain Current vs. Ambient Temperature



**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



## Test Circuit

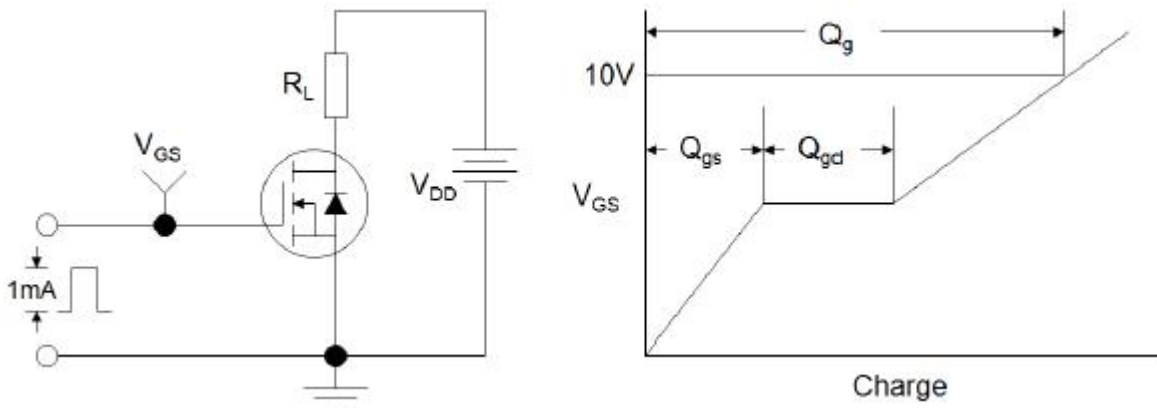


Figure1:Gate Charge Test Circuit & Waveform

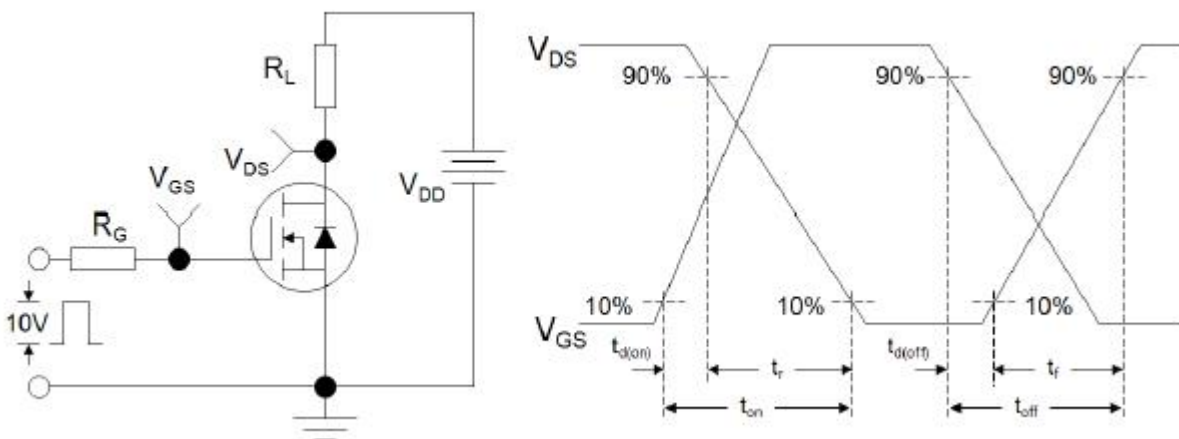


Figure 2: Resistive Switching Test Circuit & Waveforms

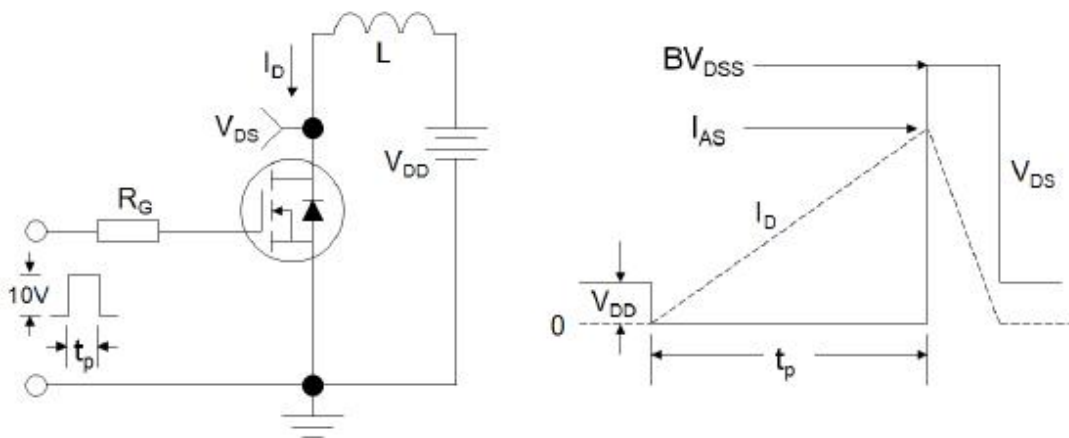
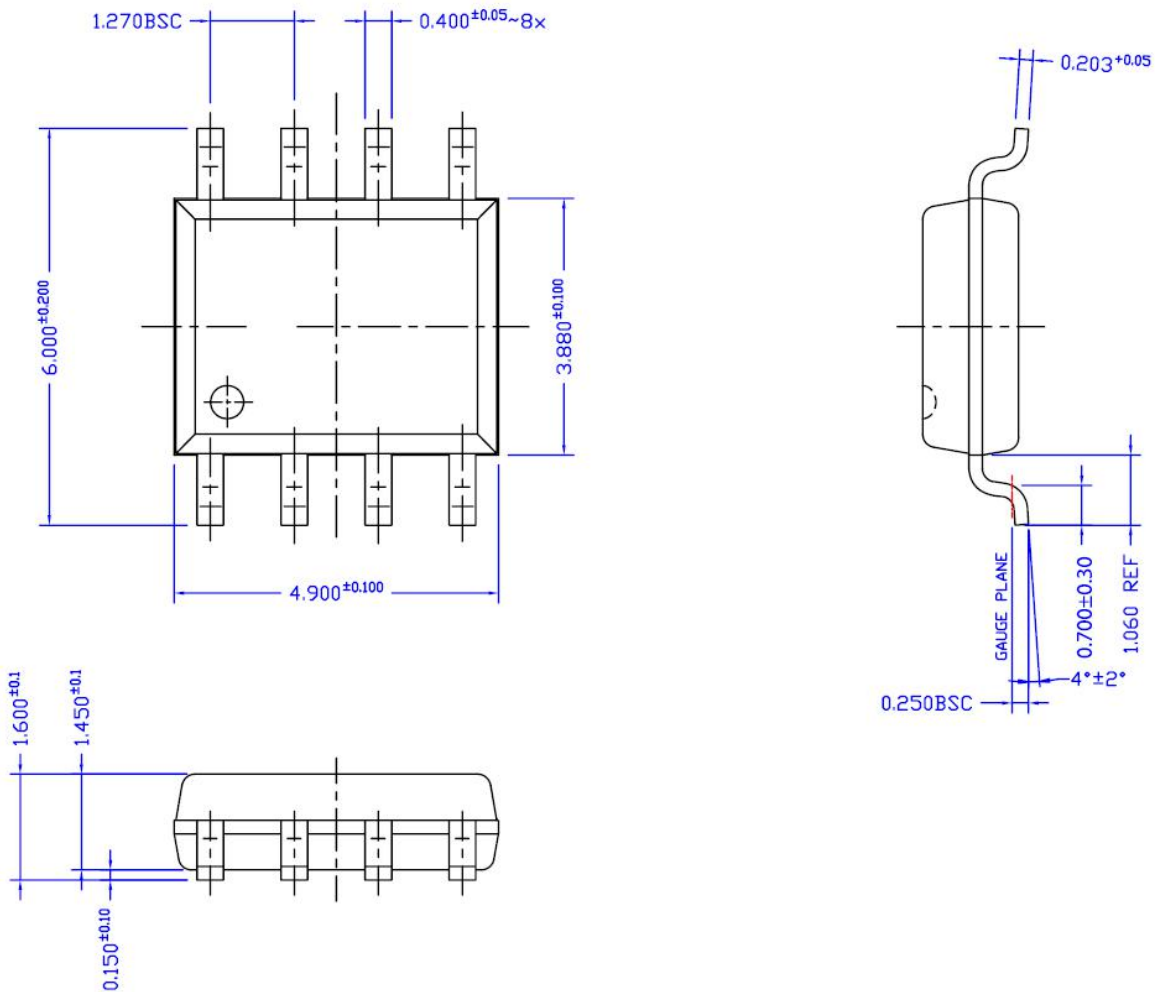


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms



## Package Mechanical Data-SOP-8



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