



## Description

### JMT P-channel Enhancement Mode Power MOSFET

#### Features

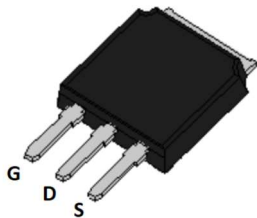
- $V_{DS} = -30V$ ,  $I_D = -60A$   
 $R_{DS(ON)} < 7.5m\Omega$  @  $V_{GS} = -10V$   
 $R_{DS(ON)} < 12.6m\Omega$  @  $V_{GS} = -4.5V$
- Advanced Trench Technology
- Excellent  $R_{DS(ON)}$  and Low Gate Charge
- Lead free product is acquired

#### Application

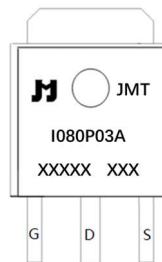
- PWM Applications
- Load Switch
- Power Management



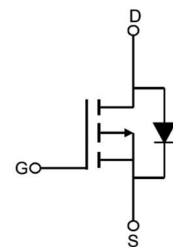
*100% UIS TESTED!*  
*100% ΔVds TESTED!*



TO-251-4R top view



Marking and pin Assignment



Schematic Diagram

## Package Marking and Ordering Information

| Device Marking | Device      | OUTLINE | Device Package | TUBE (PCS) | Inner Box (PCS) | Per Carton (PCS) |
|----------------|-------------|---------|----------------|------------|-----------------|------------------|
| JMTI080P03A    | JMTI080P03A | TUBE    | TO-251-4R      | 75         | 4,950           | 29,700           |

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

| Symbol                            | Parameter                                       | Max.                   | Units |
|-----------------------------------|---|------------------------|-------|
| V <sub>DSS</sub>                  | Drain-Source Voltage                            | -30                    | V     |
| V <sub>GSS</sub>                  | Gate-Source Voltage                             | ±20                    | V     |
| I <sub>D</sub>                    | Continuous Drain Current                        | T <sub>C</sub> = 25°C  | -60   |
|                                   |   | T <sub>C</sub> = 100°C | -39   |
| I <sub>DM</sub>                   | Pulsed Drain Current <sup>note1</sup>           | -240                   | A     |
| E <sub>AS</sub>                   | Single Pulsed Avalanche Energy <sup>note2</sup> | 144                    | mJ    |
| P <sub>D</sub>                    | Power Dissipation                               | 54                     | W     |
| R <sub>θJC</sub>                  | Thermal Resistance, Junction to Case            | 2.8                    | °C/W  |
| T <sub>J</sub> , T <sub>STG</sub> | Operating and Storage Temperature Range         | -55 to +175            | °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   | -30  | -    | -    | V     |
| I <sub>DSS</sub>  | Zero Gate Voltage Drain Current                           | V <sub>DS</sub> = -30V, V <sub>GS</sub> =0V,   | -    | -    | -1   | 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 | -1.5 | -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> = -30A  | -    | 5.8  | 7.5  | mΩ    |
|   |   | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -20A   | -    | 9    | 12.6 |       |
| <b>Dynamic Characteristics</b>                                |   |  |      |      |      |       |
| C <sub>iss</sub>  | Input Capacitance   | V <sub>DS</sub> = -15V, V <sub>GS</sub> =0V,<br>f=1.0MHz   | -    | 4650 | -    | pF    |
| C <sub>oss</sub>  | Output Capacitance  |  | -    | 550  | -    | pF    |
| C <sub>rss</sub>  | Reverse Transfer Capacitance                              |  | -    | 486  | -    | pF    |
| Q <sub>g</sub>  | Total Gate Charge   | V <sub>DS</sub> = -15V, I <sub>D</sub> = -20A,<br>V <sub>GS</sub> = -10V                         | -    | 45   | -    | nC    |
| Q <sub>gs</sub>   | Gate-Source Charge  |  | -    | 8    | -    | nC    |
| Q <sub>gd</sub>   | Gate-Drain("Miller") Charge                               |  | -    | 12   | -    | nC    |
| <b>Switching Characteristics</b>                              |   |  |      |      |      |       |
| t <sub>d(on)</sub>  | Turn-on Delay Time  | V <sub>DD</sub> = -15V, I <sub>D</sub> = -30A,<br>V <sub>GS</sub> = -10V, R <sub>GEN</sub> =2.5Ω | -    | 19   | -    | ns    |
| t <sub>r</sub>  | Turn-on Rise Time   |  | -    | 15   | -    | ns    |
| t <sub>d(off)</sub>   | Turn-off Delay Time                                       |  | -    | 65   | -    | ns    |
| t <sub>f</sub>  | Turn-off Fall Time  |  | -    | 36   | -    | ns    |
| <b>Drain-Source Diode Characteristics and Maximum Ratings</b> |   |  |      |      |      |       |
| I <sub>S</sub>  | Maximum Continuous Drain to Source Diode Forward Current  |  | -    | -    | -60  | A     |
| I <sub>SM</sub>   | Maximum Pulsed Drain to Source Diode Forward Current      |  | -    | -    | -240 | A     |
| V <sub>SD</sub>   | Drain to Source Diode Forward Voltage                     | V <sub>GS</sub> =0V, I <sub>S</sub> = -30A   | -    | -0.8 | -1.2 | V     |

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

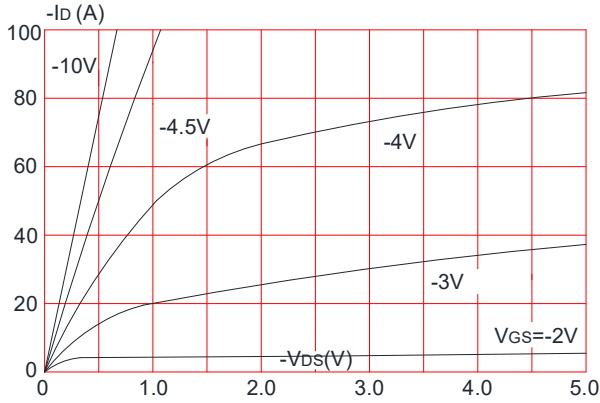
2. E<sub>AS</sub> condition: T<sub>J</sub>=25°C, V<sub>DD</sub>= -15V, V<sub>G</sub>= -10V, R<sub>G</sub>=25Ω, L=0.5mH, I<sub>AS</sub>= -24A

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

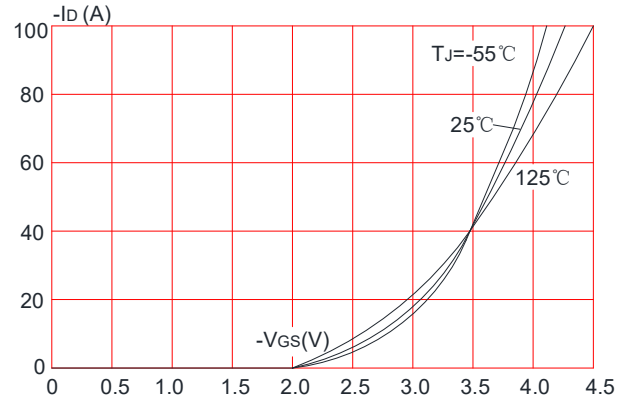


## Typical Performance Characteristics

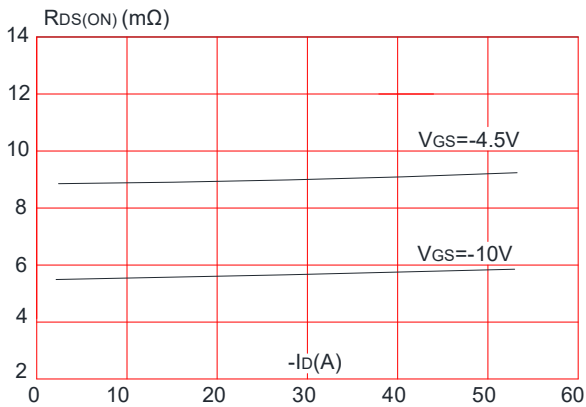
**Figure 1: Output Characteristics**



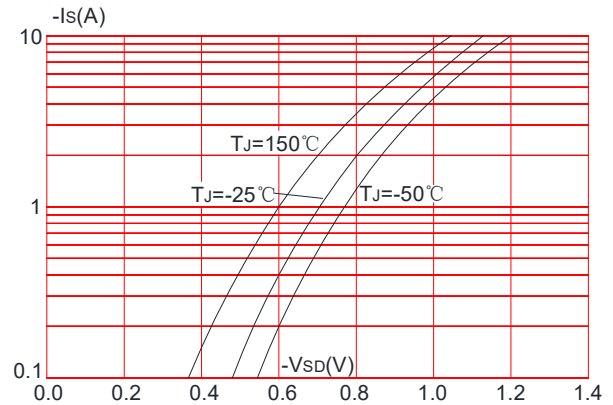
**Figure 2: Typical Transfer Characteristics**



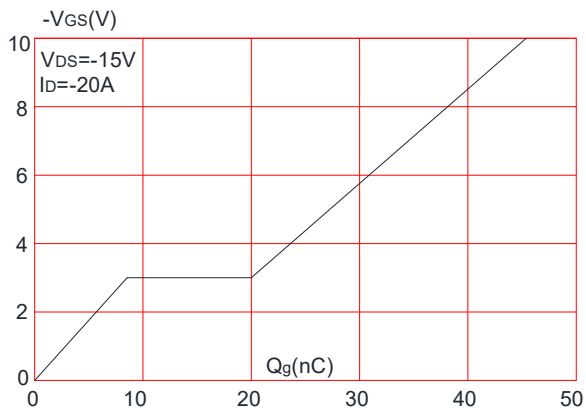
**Figure 3: On-resistance vs. Drain Current**



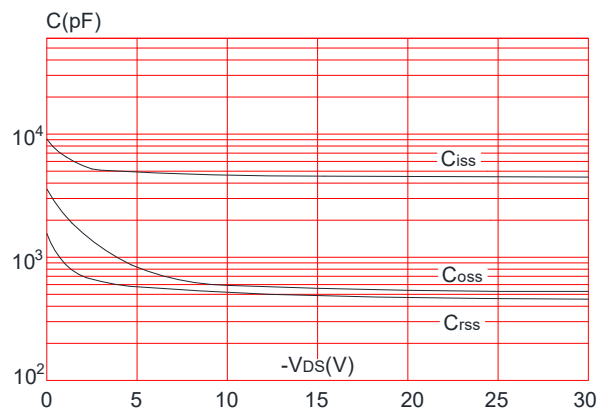
**Figure 4: Body Diode Characteristics**



**Figure 5: Gate Charge Characteristics**

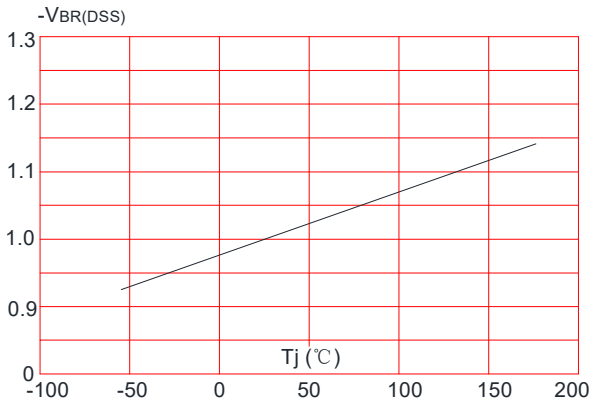


**Figure 6: Capacitance Characteristics**

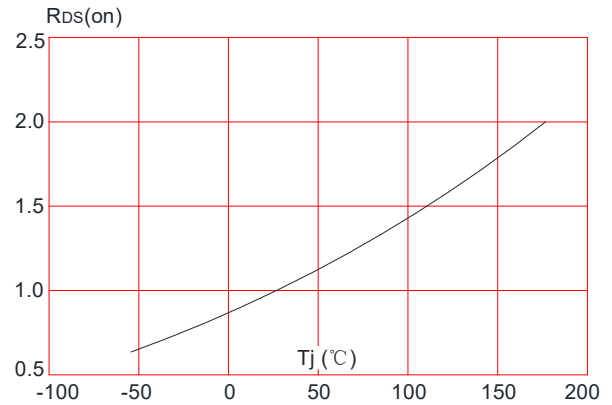




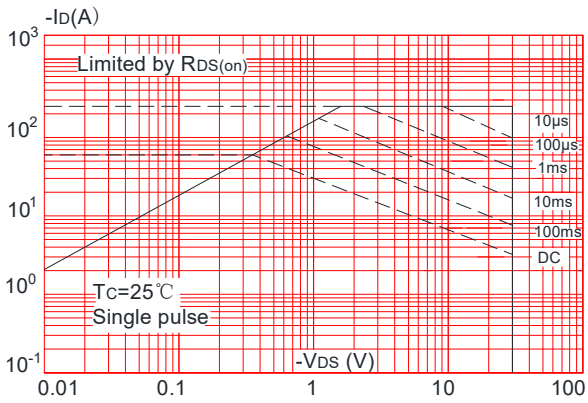
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



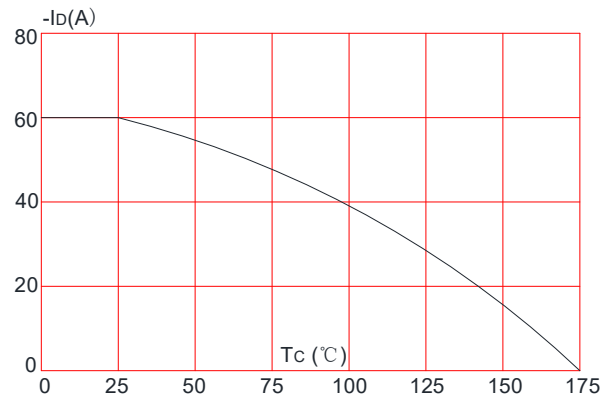
**Figure 8:** Normalized on Resistance vs. Junction Temperature



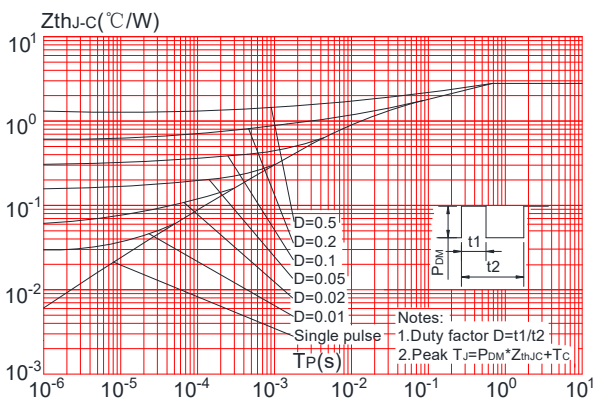
**Figure 9:** Maximum Safe Operating Area



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

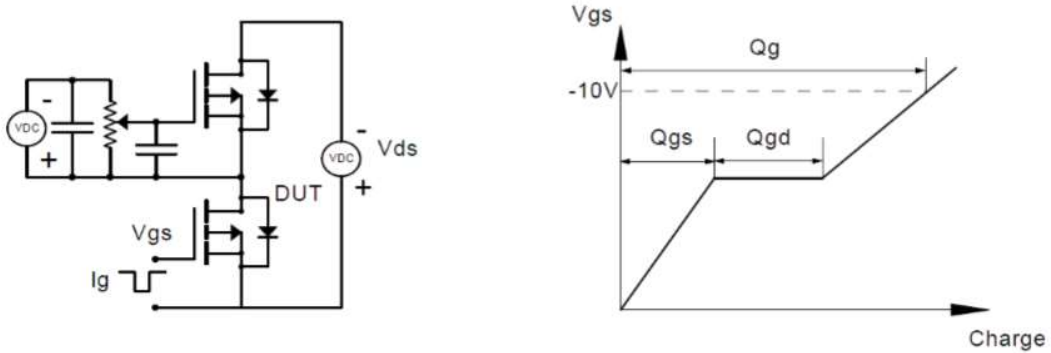


**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Case

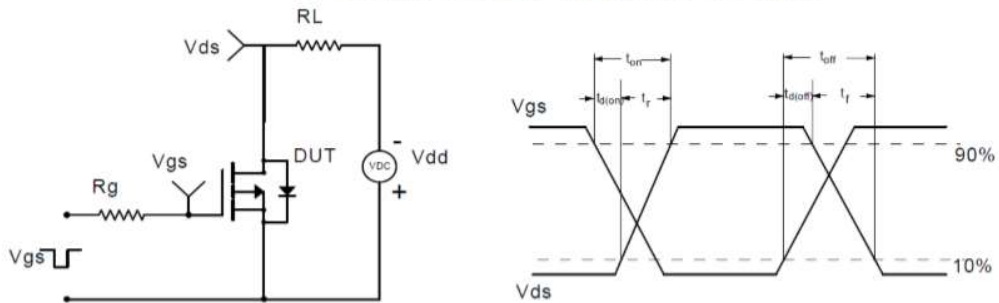


## Test Circuit

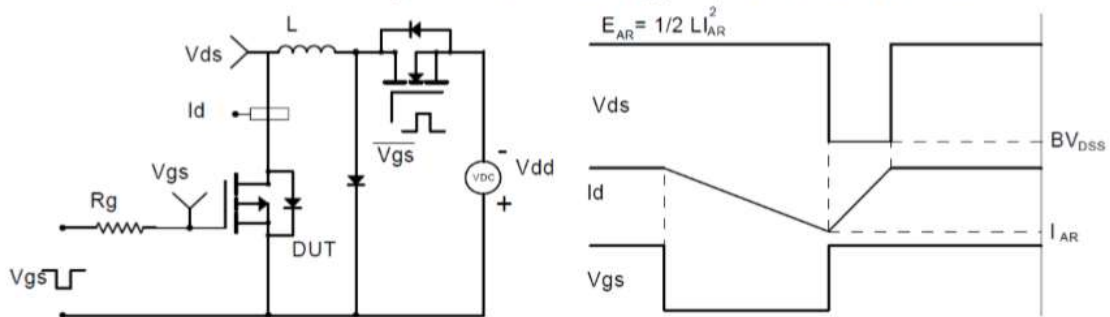
### Gate Charge Test Circuit & Waveform



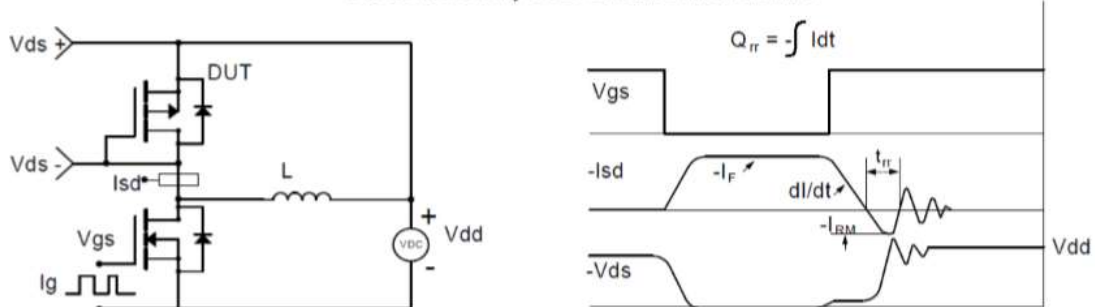
### Resistive Switching Test Circuit & Waveforms



### Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

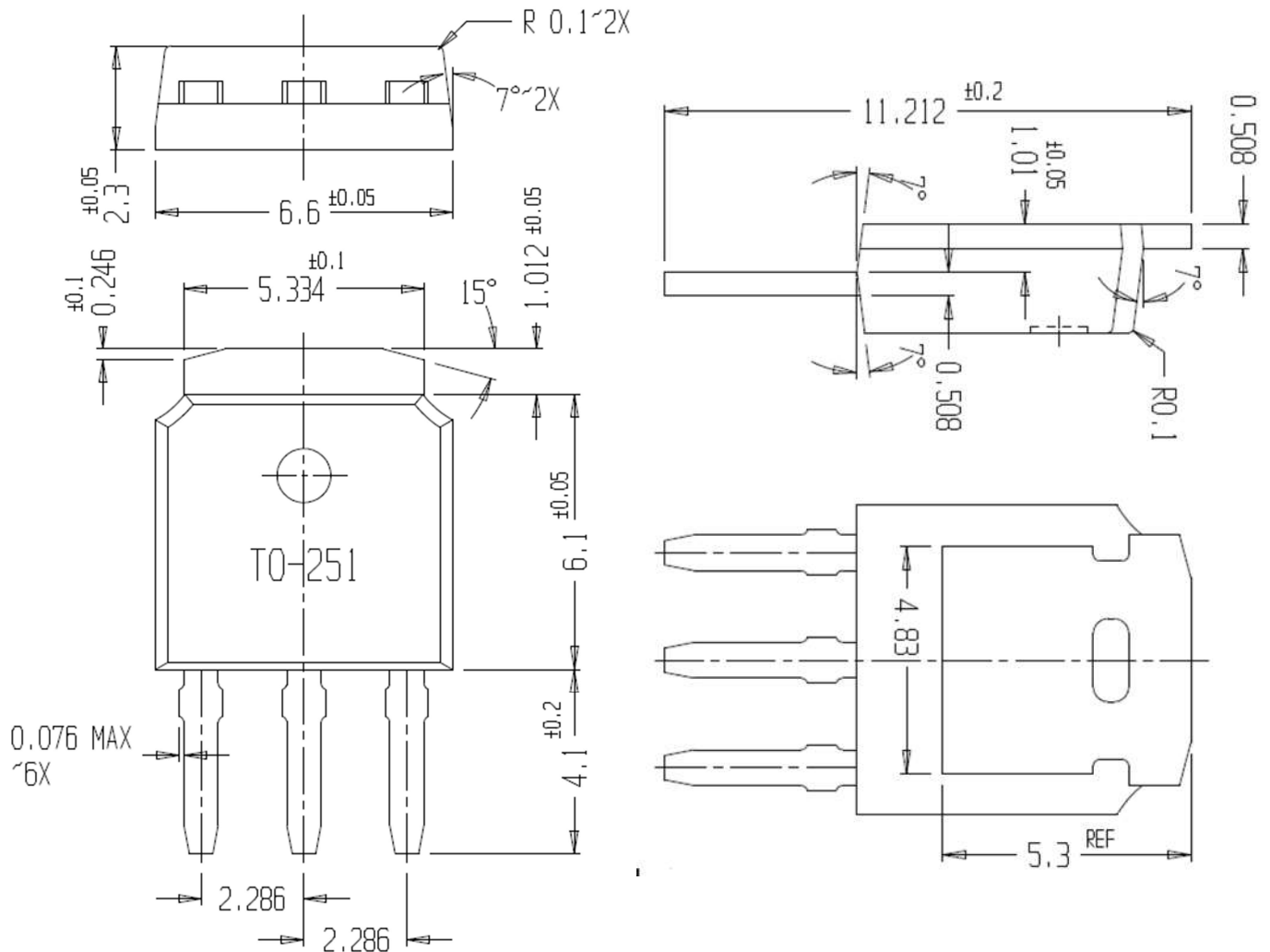


### Diode Recovery Test Circuit & Waveforms





## Package Mechanical Data-TO-251-4R




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