

## Description

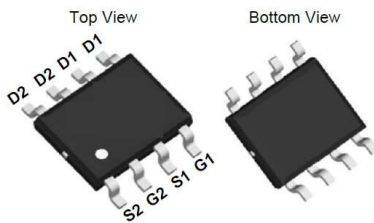
### JMT Dual P-channel Enhancement Mode Power MOSFET

#### Features

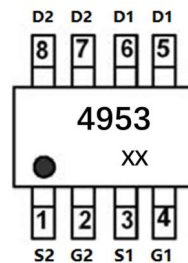
- $V_{DS} = -30V$ ,  $I_D = -5.1A$   
 $R_{DS(ON)} < 55m\Omega$  @  $V_{GS} = -10V$   
 $R_{DS(ON)} < 90m\Omega$  @  $V_{GS} = -4.5V$
- Advanced Trench Technology
- Excellent  $R_{DS(ON)}$  and Low Gate Charge
- Lead free product is acquired

#### Application

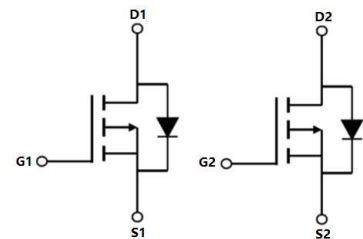
- PWM Applications
- Load Switch
- Power Management



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) |
|----------------|-----------|---------|----------------|-----------|------------|------------------|
| 4953           | JMTP4953A | TAPING  | SOP-8          | 13inch    | 4000       | 48000            |

## Absolute Maximum Ratings ( $T_A = 25^\circ C$ unless otherwise specified)

| Symbol          | Parameter                                 | Max.                | Units        |   |
|-----------------|---|---------------------|--------------|---|
| $V_{DSS}$       | Drain-Source Voltage                      | -30                 | V            |   |
| $V_{GSS}$       | Gate-Source Voltage                       | $\pm 20$            | V            |   |
| $I_D$           | Continuous Drain Current                  | $T_A = 25^\circ C$  | -5.1         | A |
|                 |   | $T_A = 100^\circ C$ | -3.3         | A |
| $I_{DM}$        | Pulsed Drain Current <small>note1</small> | -20.4               | A            |   |
| $P_D$           | Power Dissipation                         | $T_A = 25^\circ C$  | 2.15         | W |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient   | 58                  | $^\circ C/W$ |   |
| $T_J, T_{STG}$  | Operating and Storage Temperature Range   | -55 to +150         | $^\circ C$   |   |



## 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 | -1.6 | -2.5  | V     |
| R <sub>DS(on)</sub>   | Static Drain-Source on-Resistance<br><small>note2</small> | V <sub>GS</sub> = -10V, I <sub>D</sub> = -5A  | -    | 43   | 55    | mΩ    |
|   |   | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -4A   | -    | 66   | 90    |       |
| <b>Dynamic Characteristics</b>                                |   |   |      |      |       |       |
| C <sub>iss</sub>  | Input Capacitance   | V <sub>DS</sub> = -15V, V <sub>GS</sub> =0V,<br>f=1.0MHz  | -    | 580  | -     | pF    |
| C <sub>oss</sub>  | Output Capacitance  |   | -    | 98   | -     | pF    |
| C <sub>rss</sub>  | Reverse Transfer Capacitance                              |   | -    | 74   | -     | pF    |
| Q <sub>g</sub>  | Total Gate Charge   | V <sub>DS</sub> = -15V, I <sub>D</sub> = -5.1A,<br>V <sub>GS</sub> = -10V                       | -    | 6.8  | -     | nC    |
| Q <sub>gs</sub>   | Gate-Source Charge  |   | -    | 1    | -     | nC    |
| Q <sub>gd</sub>   | Gate-Drain("Miller") Charge                               |   | -    | 1.4  | -     | nC    |
| <b>Switching Characteristics</b>                              |   |   |      |      |       |       |
| t <sub>d(on)</sub>  | Turn-on Delay Time  | V <sub>DD</sub> = -15V, I <sub>D</sub> = -1A,<br>V <sub>GS</sub> = -10V, R <sub>GEN</sub> =2.5Ω | -    | 14   | -     | ns    |
| t <sub>r</sub>  | Turn-on Rise Time   |   | -    | 61   | -     | ns    |
| t <sub>d(off)</sub>   | Turn-off Delay Time                                       |   | -    | 19   | -     | ns    |
| t <sub>f</sub>  | Turn-off Fall Time  |   | -    | 10   | -     | ns    |
| <b>Drain-Source Diode Characteristics and Maximum Ratings</b> |   |   |      |      |       |       |
| I <sub>S</sub>  | Maximum Continuous Drain to Source Diode Forward Current  |   | -    | -    | -5.1  | A     |
| I <sub>SM</sub>   | Maximum Pulsed Drain to Source Diode Forward Current      |   | -    | -    | -20.4 | A     |
| V <sub>SD</sub>   | Drain to Source Diode Forward Voltage                     | V <sub>GS</sub> =0V, I <sub>S</sub> = -5.1A   | -    | -0.8 | -1.2  | V     |

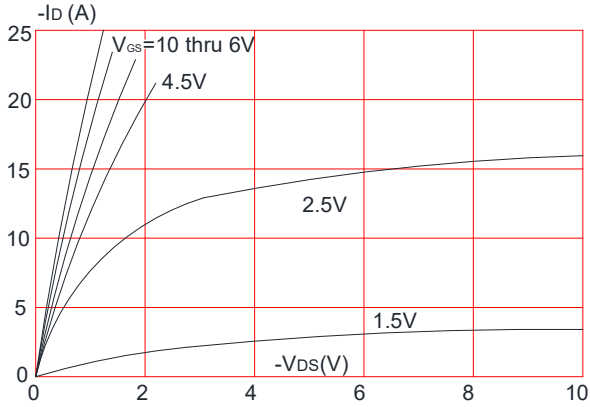
Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

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

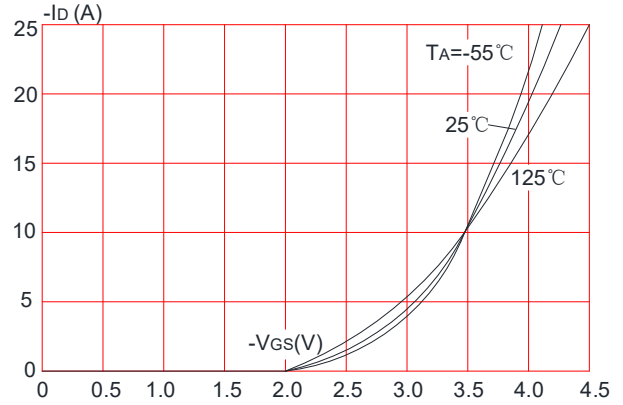


## Typical Performance Characteristics

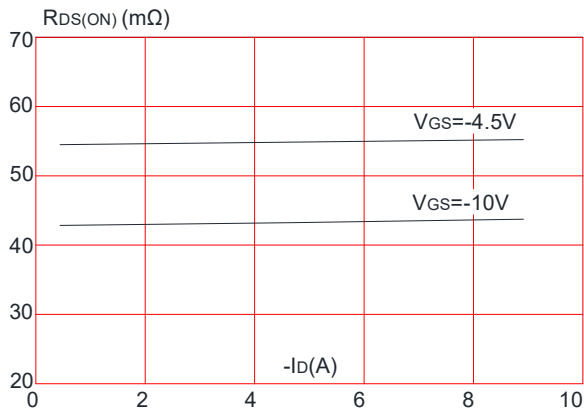
**Figure 1: Output Characteristics**



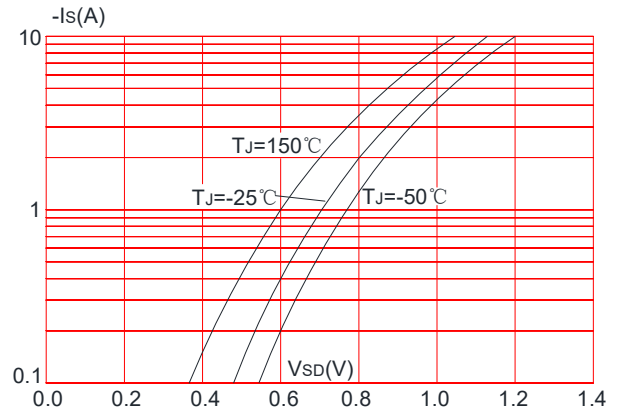
**Figure 2: Typical Transfer Characteristics**



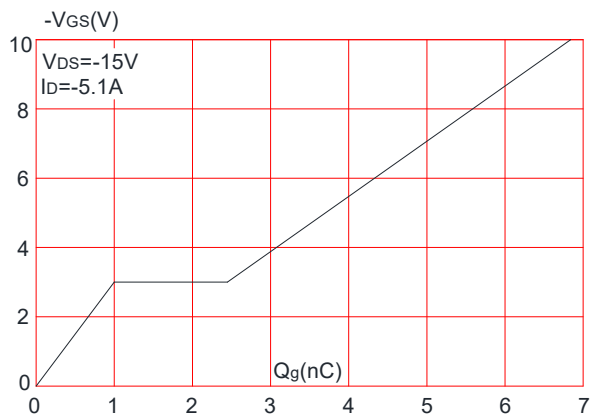
**Figure 3: On-resistance vs. Drain Current**



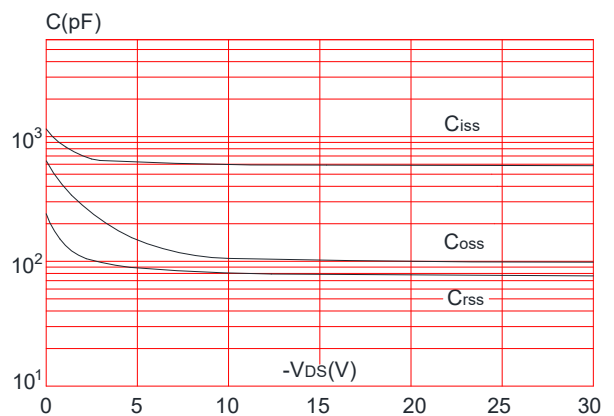
**Figure 4: Body Diode Characteristics**



**Figure 5: Gate Charge Characteristics**

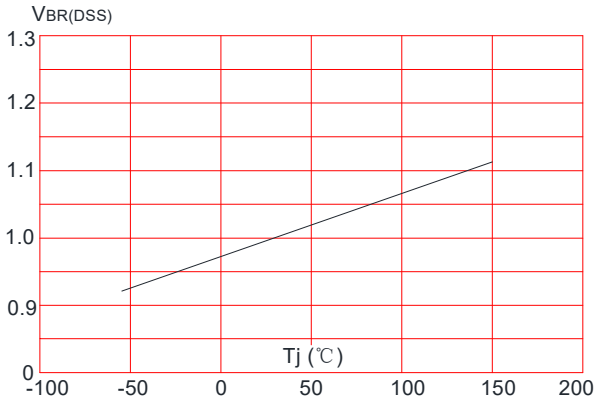


**Figure 6: Capacitance Characteristics**

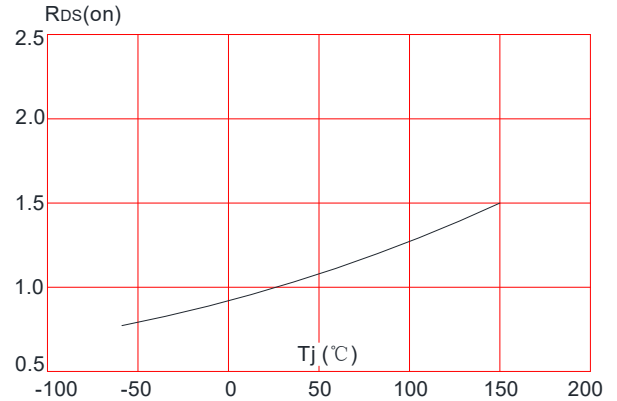




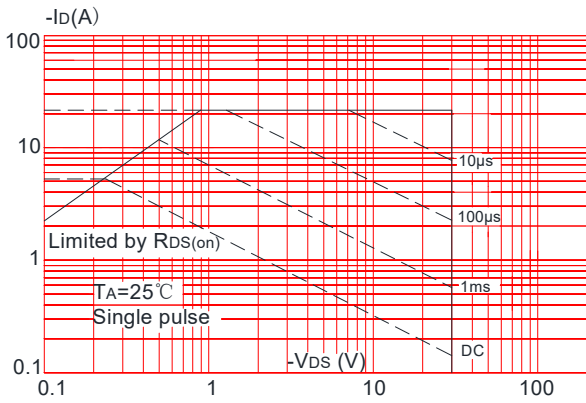
**Figure 7: Normalized Breakdown Voltage vs. Junction Temperature**



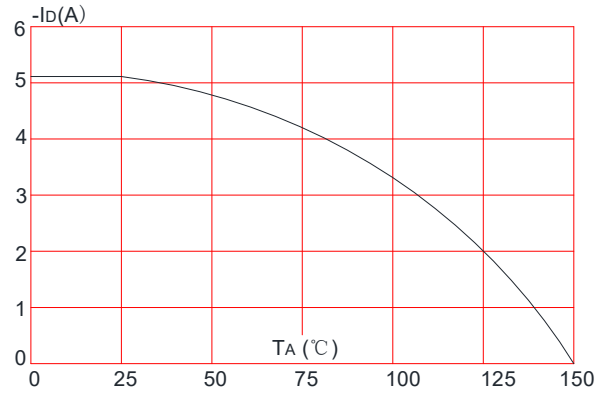
**Figure 8: Normalized on Resistance vs. Junction Temperature**



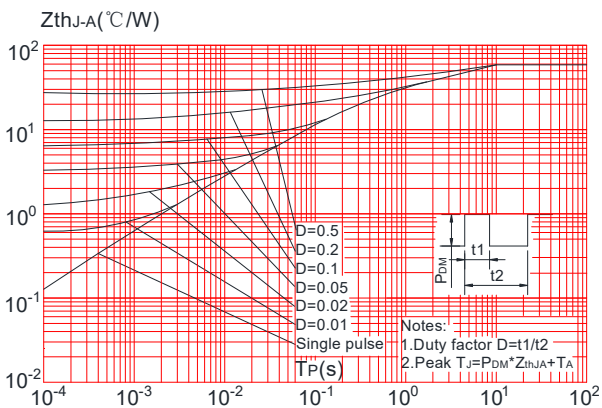
**Figure 9: Maximum Safe Operating Area**



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

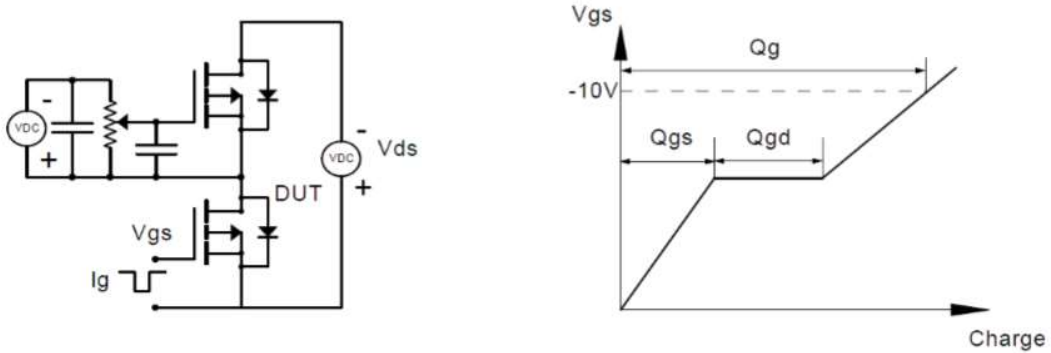


**Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient**

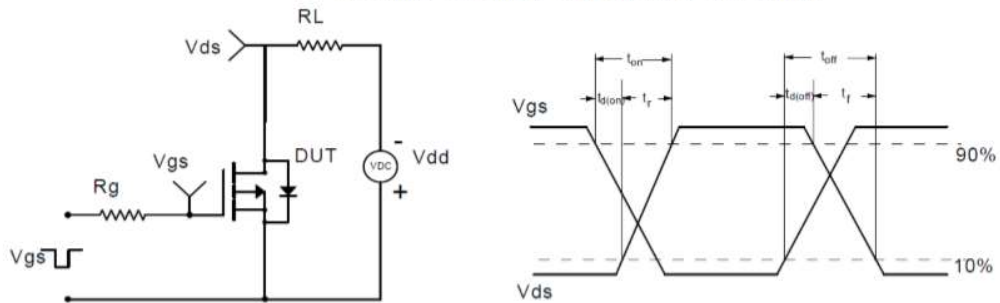


## Test Circuit

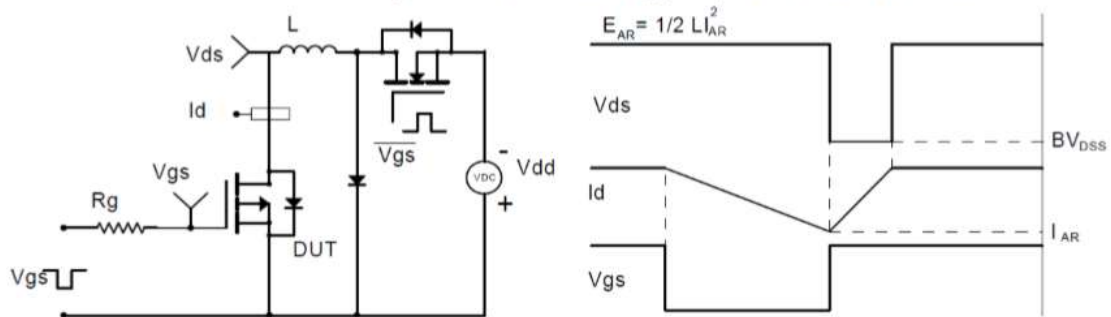
### Gate Charge Test Circuit & Waveform



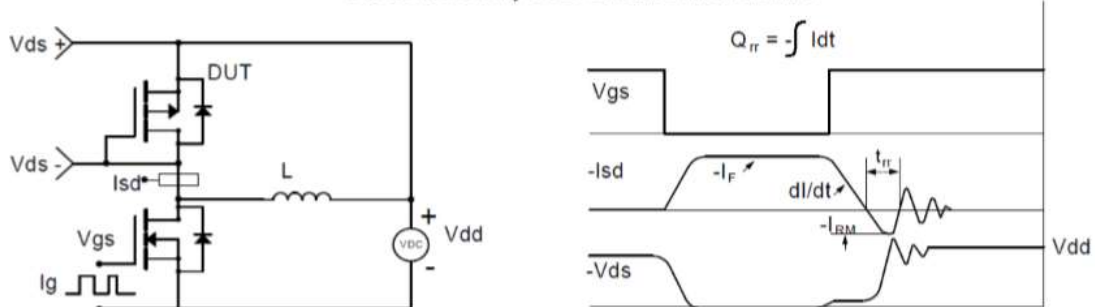
### Resistive Switching Test Circuit & Waveforms



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

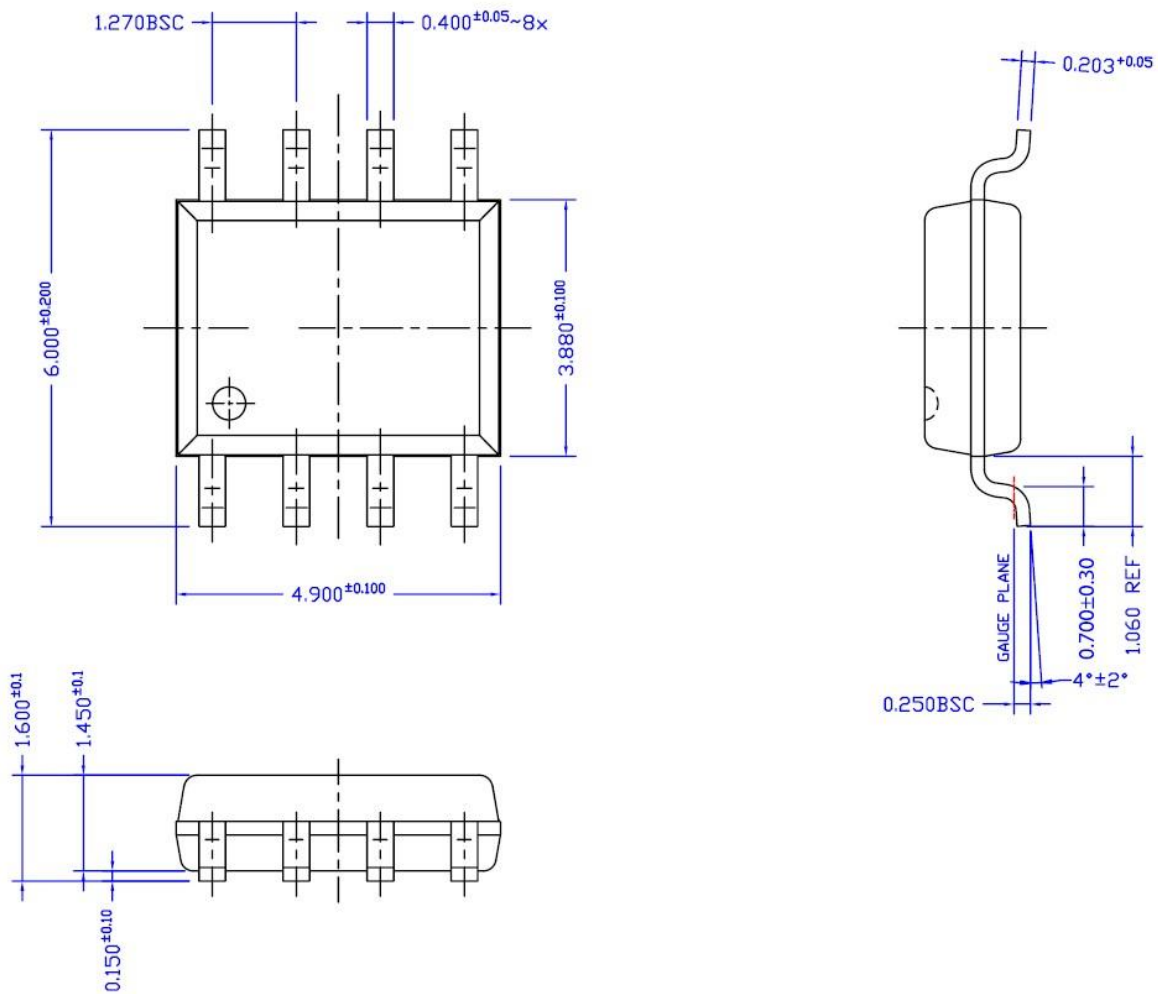


### Diode Recovery Test Circuit & Waveforms





## Package Mechanical Data-SOP-8



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