



Description

JMG N-channel Advanced Mode Power MOSFET

Features

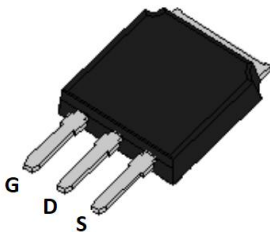
- 100V, 80A
 $R_{DS(ON)} < 10m\Omega @ V_{GS} = 10V$
 $R_{DS(ON)} < 14m\Omega @ V_{GS} = 4.5V$
- Advanced Split Gate Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired

Application

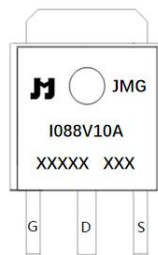
- Load Switch
- PWM Application
- Power management



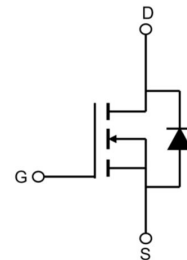
100% UIS TESTED!
100% ΔVds TESTED!



TO-251-3L 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) |
|----------------|-------------|---------|----------------|------------|-----------------|------------------|
| JMGI088V10A | JMGI088V10A | TAPING | TO-251-3L | 75 | 4950 | 29700 |

Absolute Maximum Ratings (T_C=25°C unless otherwise specified)

| Symbol | Parameter | Max. | Units |
|-----------------------------------|---|------------------------|-------|
| V _{DSS} | Drain-Source Voltage | 100 | V |
| V _{GSS} | Gate-Source Voltage | ±20 | V |
| I _D | Continuous Drain Current | T _C = 25°C | 80 |
| | | T _C = 100°C | 52 |
| I _{DM} | Pulsed Drain Current ^{note1} | 320 | A |
| E _{AS} | Single Pulsed Avalanche Energy ^{note2} | 90 | mJ |
| P _D | Power Dissipation | T _C = 25°C | 127 |
| R _{θJC} | Thermal Resistance, Junction to Case | 1.2 | °C/W |
| T _J , T _{STG} | Operating and Storage Temperature Range | -55 to +175 | °C |



Electrical Characteristics (T_J=25°C unless otherwise specified)

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Units |
|---|---|--|------|------|------|-------|
| Off Characteristic | | | | | | |
| V _{(BR)DSS} | Drain-Source Breakdown Voltage | V _{GS} =0V, I _D =250μA | 100 | - | - | V |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} =100V, V _{GS} =0V, | - | - | 1.0 | μA |
| I _{GSS} | Gate to Body Leakage Current | V _{DS} =0V, V _{GS} = ±20V | - | - | ±100 | nA |
| On Characteristics | | | | | | |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _D =250μA | 1.0 | 1.6 | 2.5 | V |
| R _{DS(on)} | Static Drain-Source on-Resistance <small>note3</small> | V _{GS} =10V, I _D =20A | - | 7.7 | 10 | mΩ |
| | | V _{GS} =4.5V, I _D =10A | - | 9.4 | 14 | |
| Dynamic Characteristics | | | | | | |
| C _{iss} | Input Capacitance | V _{DS} =50V, V _{GS} =0V, f=1.0MHz | - | 2046 | - | pF |
| C _{oss} | Output Capacitance | | - | 865 | - | pF |
| C _{rss} | Reverse Transfer Capacitance | | - | 25 | - | pF |
| Q _g | Total Gate Charge | V _{DS} =50V, I _D =30A, V _{GS} =10V | - | 39.4 | - | nC |
| Q _{gs} | Gate-Source Charge | | - | 5.2 | - | nC |
| Q _{gd} | Gate-Drain("Miller") Charge | | - | 9.8 | - | nC |
| Switching Characteristics | | | | | | |
| t _{d(on)} | Turn-on Delay Time | V _{DD} =50V, I _D =25A, R _G =6Ω, V _{GS} =10V | - | 20 | - | ns |
| t _r | Turn-on Rise Time | | - | 5.2 | - | ns |
| t _{d(off)} | Turn-off Delay Time | | - | 49 | - | ns |
| t _f | Turn-off Fall Time | | - | 12 | - | ns |
| Drain-Source Diode Characteristics and Maximum Ratings | | | | | | |
| I _S | Maximum Continuous Drain to Source Diode Forward Current | | - | - | 80 | A |
| I _{SM} | Maximum Pulsed Drain to Source Diode Forward Current | | - | - | 320 | A |
| V _{SD} | Drain to Source Diode Forward Voltage | V _{GS} =0V, I _S =30A | - | - | 1 | V |
| t _{rr} | Body Diode Reverse Recovery Time | T _J =25°C, I _F =12A, dI/dt=100A/μs | - | 49 | - | ns |
| Q _{rr} | Body Diode Reverse Recovery Charge | | - | 85 | - | nC |

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

2. EAS condition: T_J=25°C, V_{DD}=50V, V_G=10V, R_G=25Ω, L=0.5mH, I_{AS}=19A

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



Typical Performance Characteristics

Figure 1: Output Characteristics

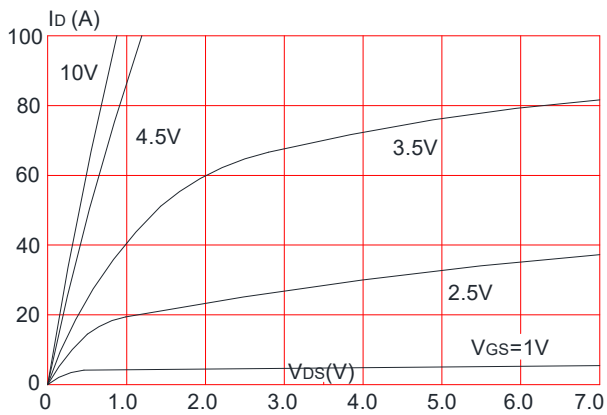


Figure 2: Typical Transfer Characteristics

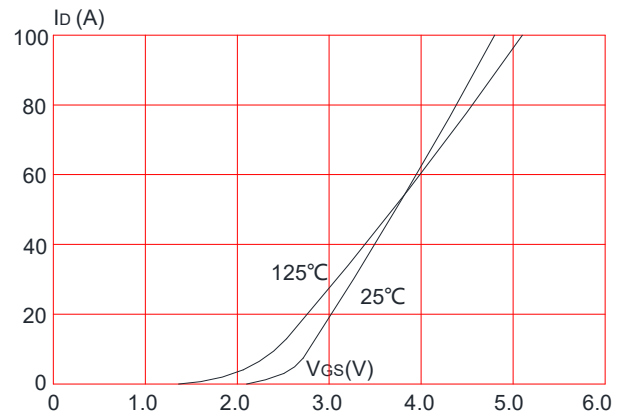


Figure 3: On-resistance vs. Drain Current

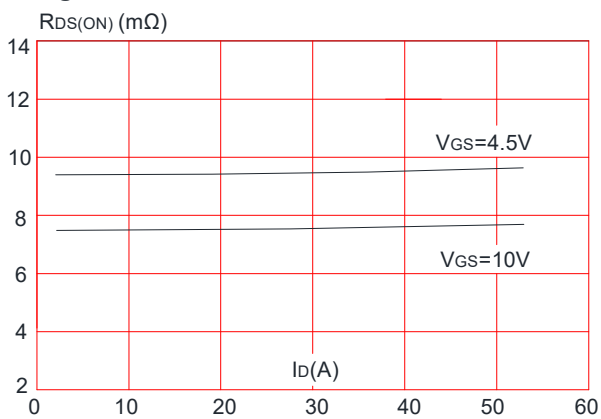


Figure 4: Body Diode Characteristics

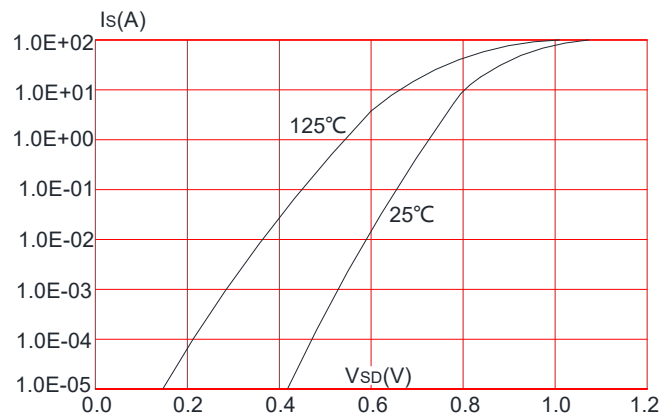


Figure 5: Gate Charge Characteristics

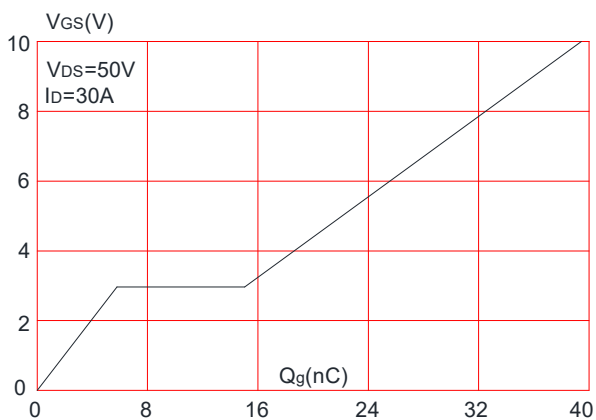


Figure 6: Capacitance Characteristics

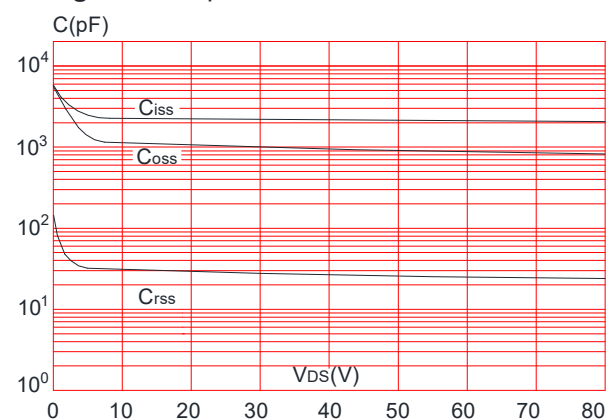




Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

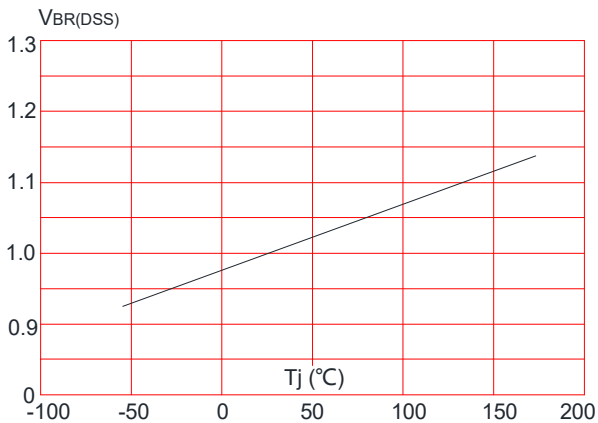


Figure 8: Normalized on Resistance vs. Junction Temperature

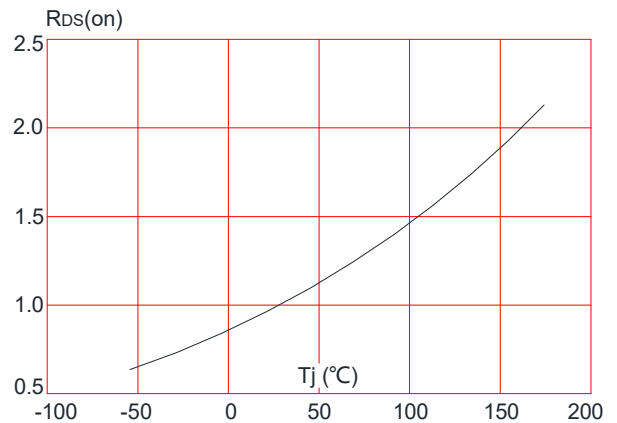


Figure 9: Maximum Safe Operating Area

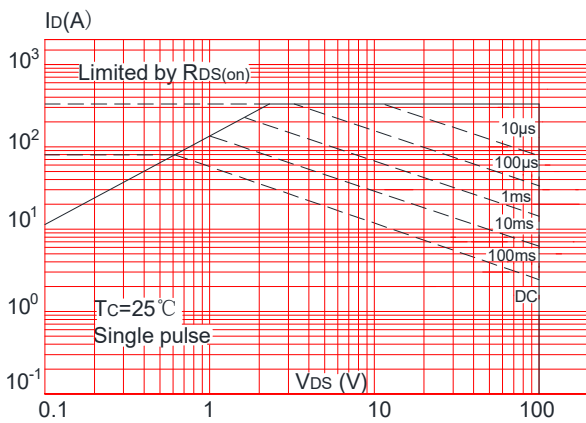


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

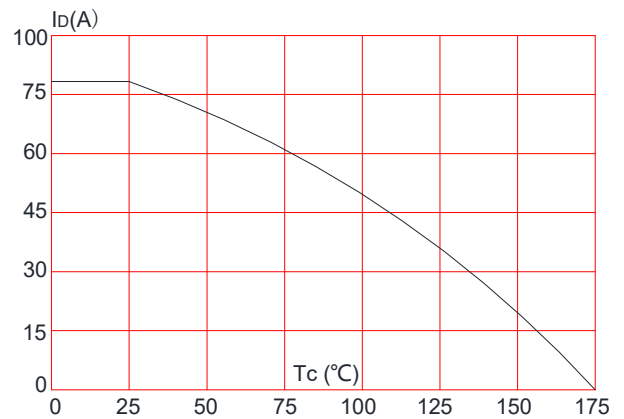
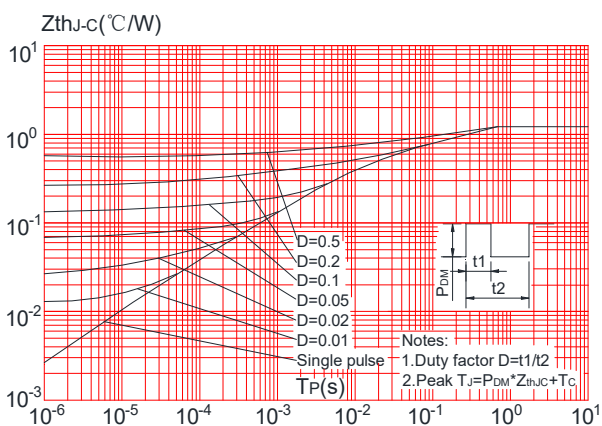


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Test Circuit

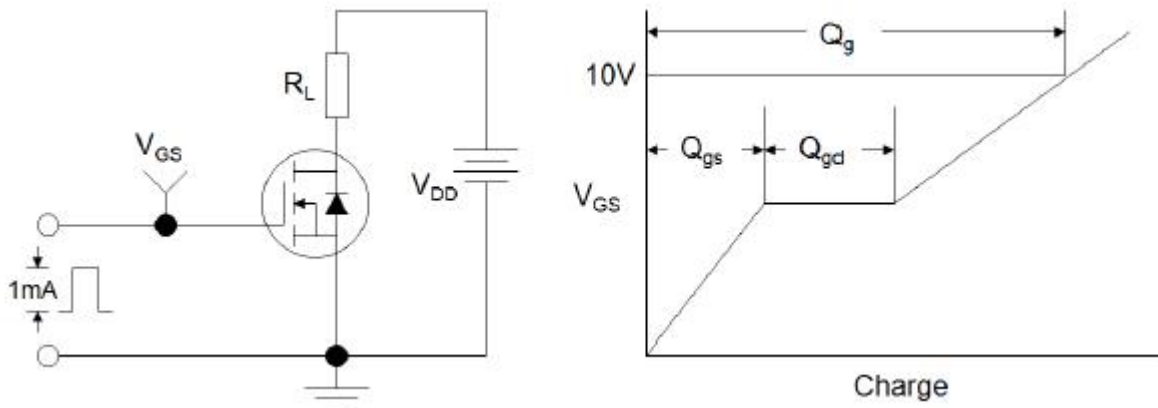


Figure1:Gate Charge Test Circuit & Waveform

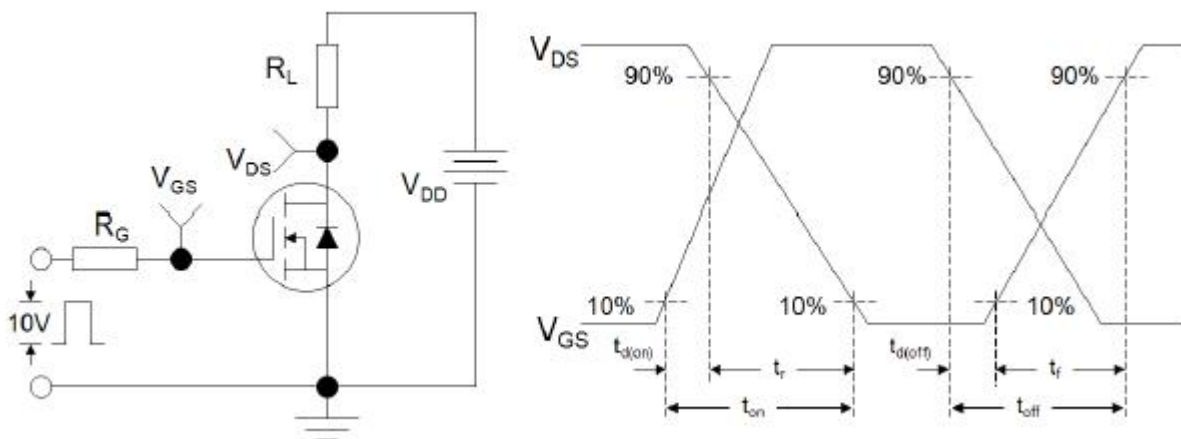


Figure 2: Resistive Switching Test Circuit & Waveforms

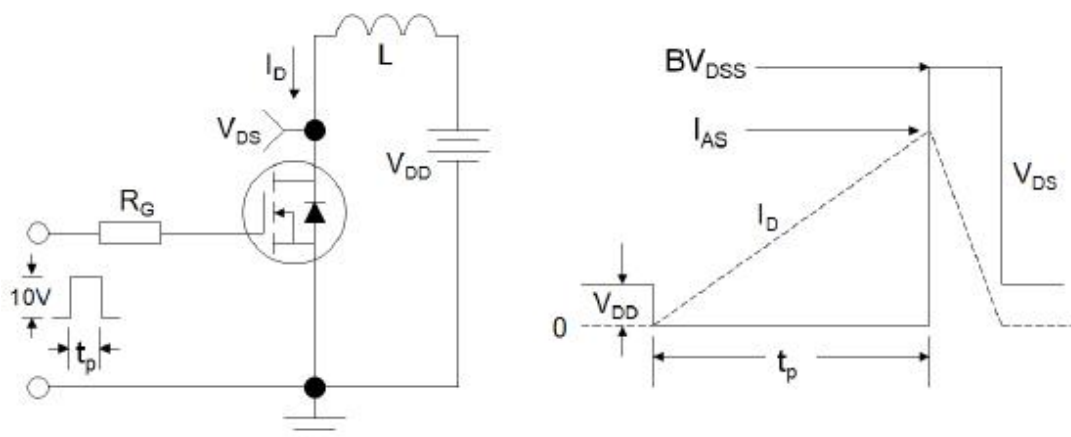
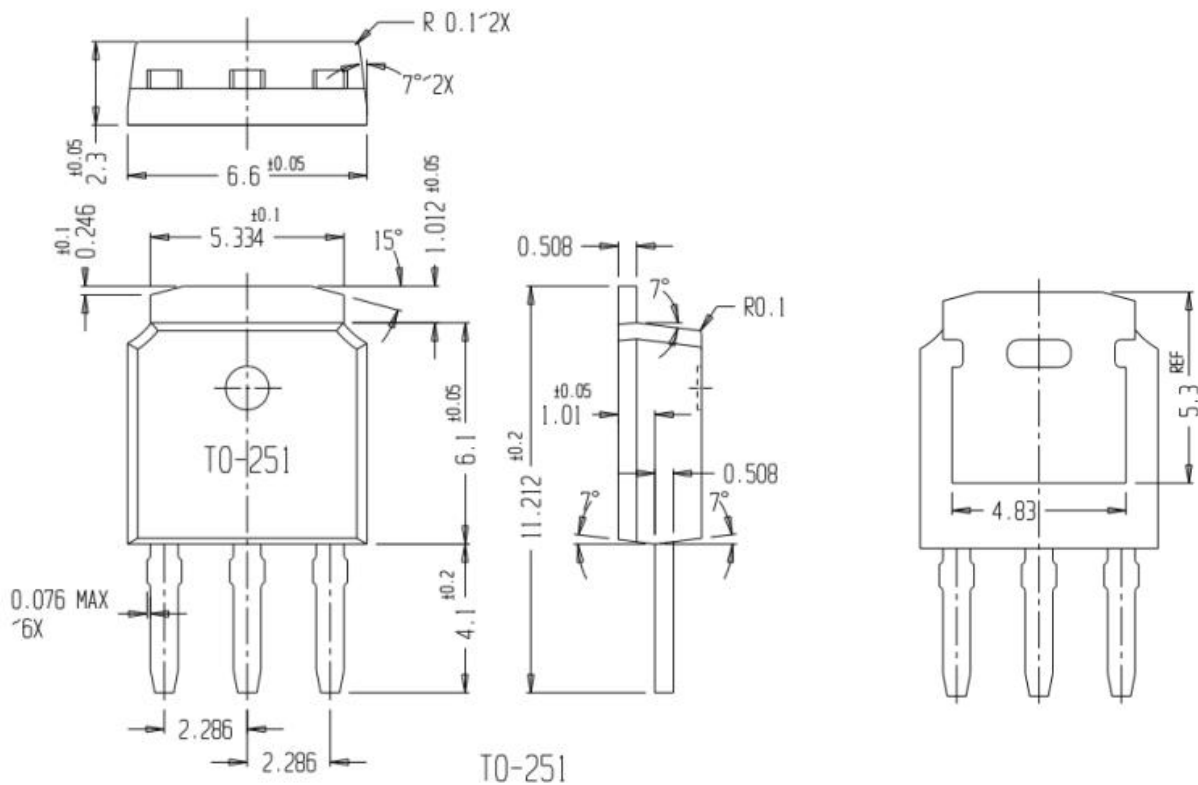


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms



Package Mechanical Data-TO-251-3L



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