



Description

JMT N-channel Enhancement Mode Power MOSFET

Features

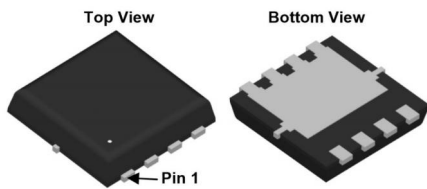
- 30V,50A
 $R_{DS(ON)} < 4.7m\Omega @ V_{GS} = 10V$
 $R_{DS(ON)} < 7.0m\Omega @ V_{GS} = 4.5V$
- Advanced Trench Technology
- Provide Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired

Application

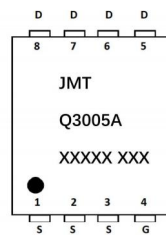
- Load Switch
- PWM Application
- Power management



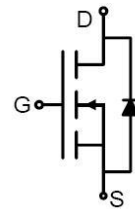
100% UIS TESTED!
100% ΔVds TESTED!



PDFN3x3-8L



Marking and pin Assignment



Schematic Diagram

Package Marking and Ordering Information

| Device Marking | Device | OUTLINE | Device Package | Reel Size | Reel (PCS) | Per Carton (PCS) |
|----------------|-----------|---------|----------------|-----------|------------|------------------|
| JMTQ3005A | JMTQ3005A | TAPING | PDFN3x3-8L | 13inch | 5000 | 50000 |

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

| Symbol | Parameter | Max. | Units |
|-----------------------------------|---|------------------------|-------|
| V _{DSS} | Drain-Source Voltage | 30 | V |
| V _{GSS} | Gate-Source Voltage | ±20 | V |
| I _D | Continuous Drain Current | T _C = 25°C | 50 |
| | | T _C = 100°C | 33 |
| I _{DM} | Pulsed Drain Current ^{note1} | 200 | A |
| E _{AS} | Single Pulsed Avalanche Energy ^{note2} | 81 | mJ |
| P _D | Power Dissipation | T _C = 25°C | 26 |
| R _{θJC} | Thermal Resistance, Junction to Case | 4.8 | °C/W |
| T _J , T _{STG} | Operating and Storage Temperature Range | -55 to +150 | °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 | 30 | - | - | V |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} =30V, 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 | 1.5 | 2.5 | V |
| R _{DS(on)} | Static Drain-Source on-Resistance <small>note3</small> | V _{GS} =10V, I _D =30A | - | 3.7 | 4.7 | mΩ |
| | | V _{GS} =4.5V, I _D =20A | - | 5.5 | 7.0 | |
| Dynamic Characteristics | | | | | | |
| C _{iss} | Input Capacitance | V _{DS} =15V, V _{GS} =0V, f=1.0MHz | - | 2100 | - | pF |
| C _{oss} | Output Capacitance | | - | 326 | - | pF |
| C _{rss} | Reverse Transfer Capacitance | | - | 282 | - | pF |
| Q _g | Total Gate Charge | V _{DS} =15V, I _D =30A, V _{GS} =10V | - | 45 | - | nC |
| Q _{gs} | Gate-Source Charge | | - | 3 | - | nC |
| Q _{gd} | Gate-Drain("Miller") Charge | | - | 15 | - | nC |
| Switching Characteristics | | | | | | |
| t _{d(on)} | Turn-on Delay Time | V _{DS} =15V, I _D =30A, R _{GEN} =3Ω, V _{GS} =10V | - | 21 | - | ns |
| t _r | Turn-on Rise Time | | - | 32 | - | ns |
| t _{d(off)} | Turn-off Delay Time | | - | 59 | - | ns |
| t _f | Turn-off Fall Time | | - | 34 | - | ns |
| Drain-Source Diode Characteristics and Maximum Ratings | | | | | | |
| I _S | Maximum Continuous Drain to Source Diode Forward Current | | - | - | 50 | A |
| I _{SM} | Maximum Pulsed Drain to Source Diode Forward Current | | - | - | 200 | A |
| V _{SD} | Drain to Source Diode Forward Voltage | V _{GS} =0V, I _S =30A | - | - | 1.2 | V |
| trr | Body Diode Reverse Recovery Time | I _F =20A, di/dt=100A/μs | - | 15 | - | ns |
| Q _{rr} | Body Diode Reverse Recovery Charge | | - | 4 | - | nC |

- Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
 2. EAS condition: T_J=25°C, V_{DD}=15V, V_{GS}=10V, R_G=25Ω, L=0.5mH, I_{AS}=18A
 3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%



Typical Performance Characteristics

Figure 1: Output Characteristics

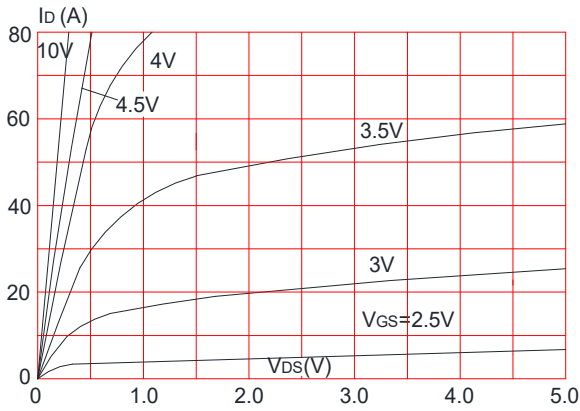


Figure 2: Typical Transfer Characteristics

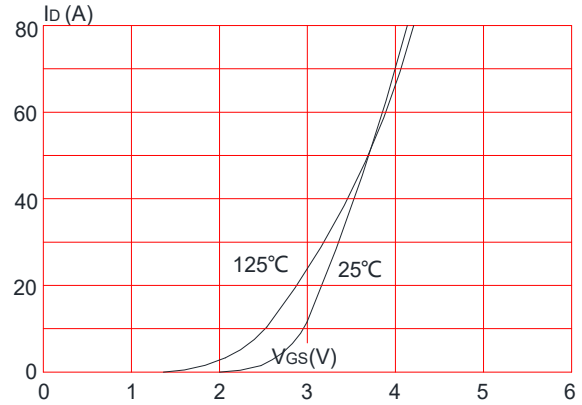


Figure 3: On-resistance vs. Drain Current

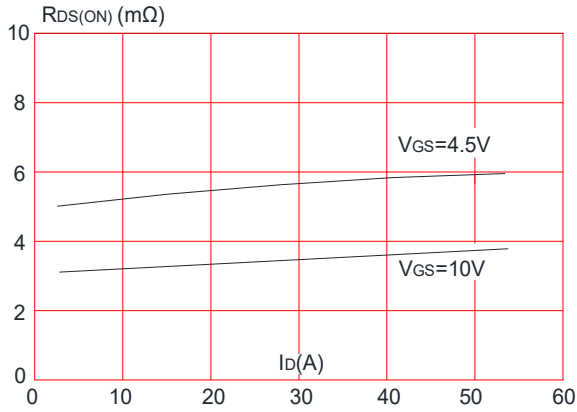


Figure 4: Body Diode Characteristics

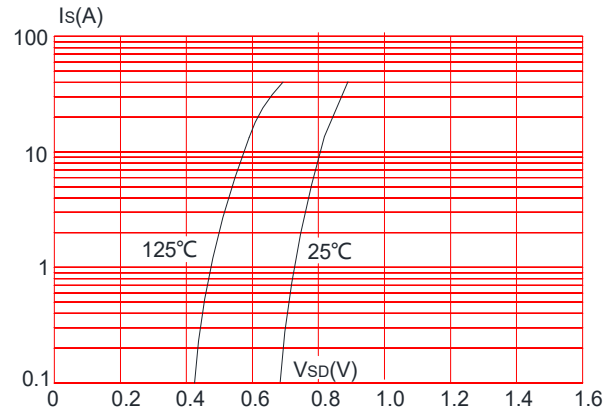


Figure 5: Gate Charge Characteristics

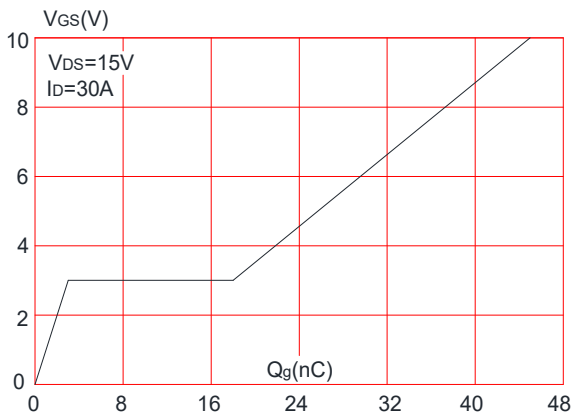


Figure 6: Capacitance Characteristics

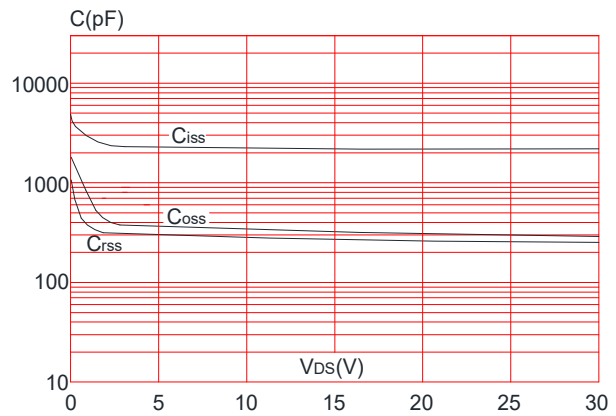




Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

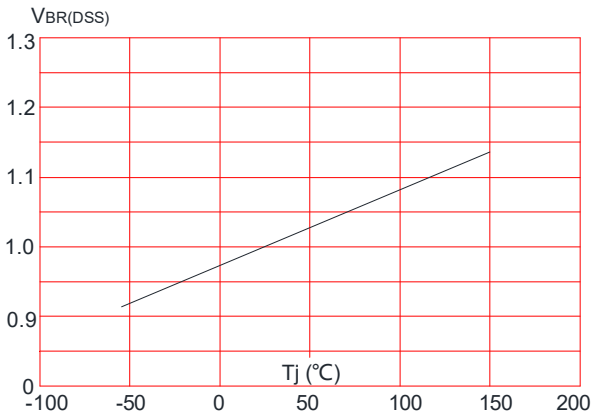


Figure 8: Normalized on Resistance vs. Junction Temperature

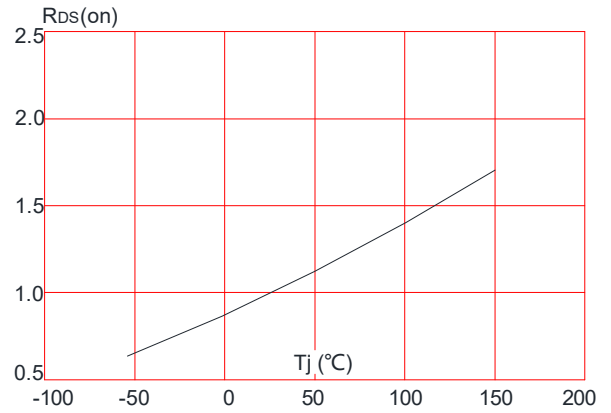


Figure 9: Maximum Safe Operating Area

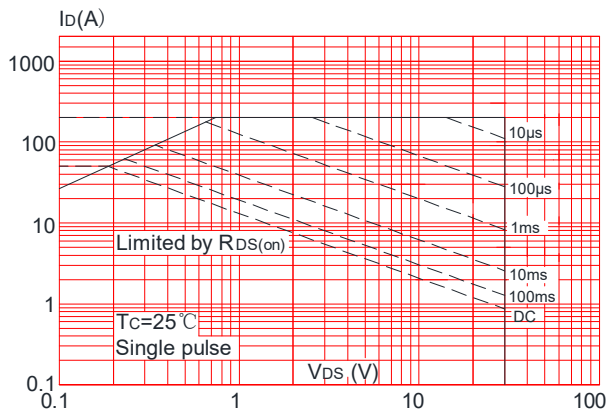


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

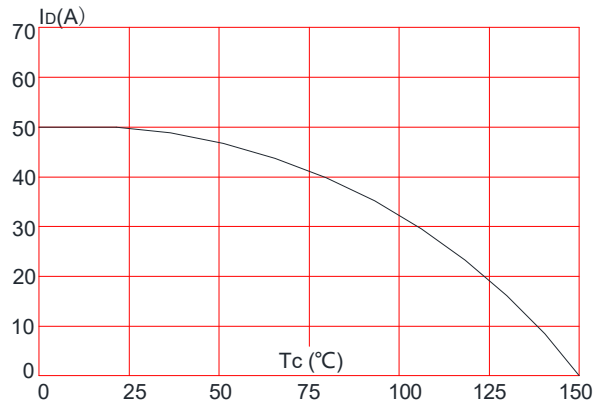
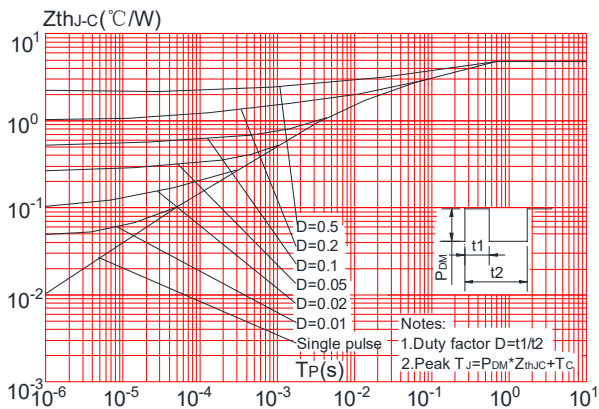


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Test Circuit



Figure1:Gate Charge Test Circuit & Waveform

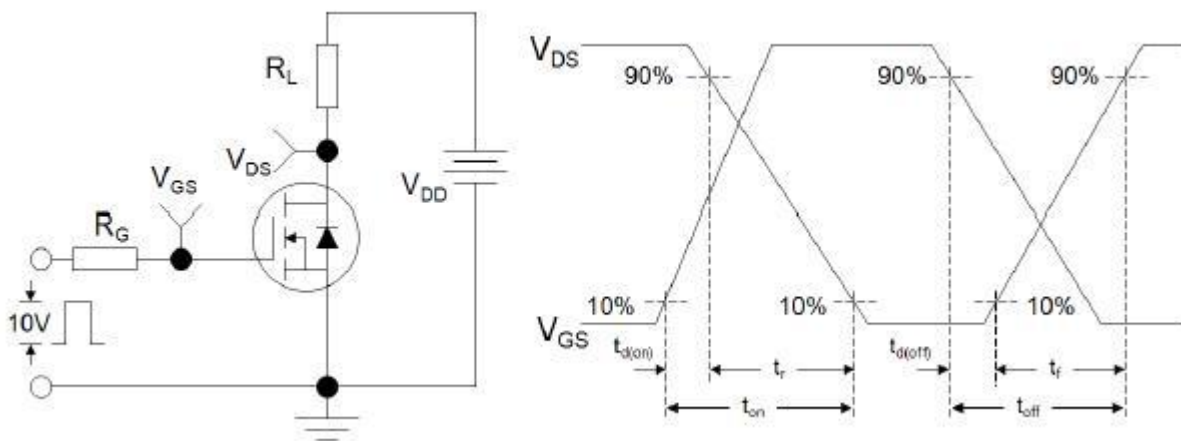


Figure 2: Resistive Switching Test Circuit & Waveforms

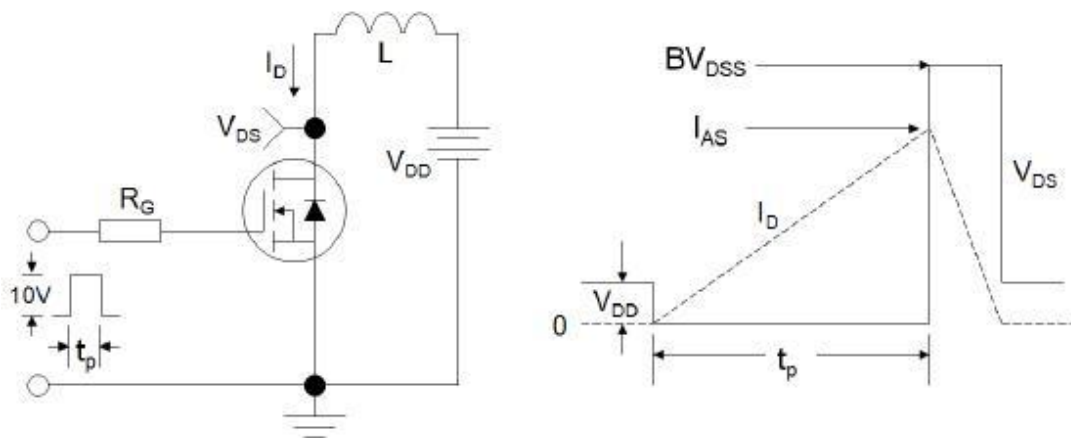
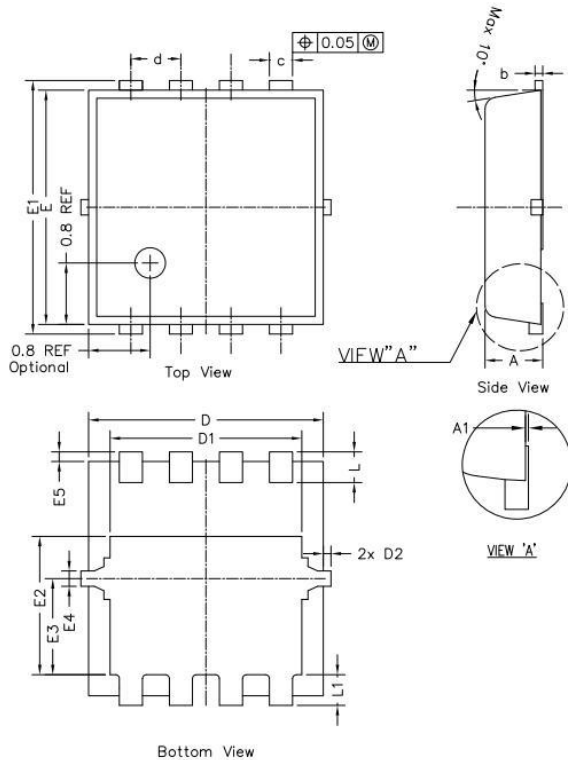


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms



Package Mechanical Data-PDFN3x3-8L



| SYMBOLS | DIMENSION IN MM | | | DIMENSION IN INCHES | | |
|---------|-----------------|-------|-------|---------------------|-------|-------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.700 | 0.750 | 0.800 | 0.028 | 0.030 | 0.031 |
| A1 | --- | --- | 0.050 | ---- | ---- | 0.002 |
| b | 0.144 | 0.152 | 0.202 | 0.006 | 0.006 | 0.008 |
| c | 0.250 | 0.300 | 0.350 | 0.010 | 0.012 | 0.014 |
| d | 0.65 BSC | | | 0.026 BSC | | |
| D | 2.950 | 3.050 | 3.150 | 0.116 | 0.120 | 0.124 |
| D1 | 2.390 | 2.490 | 2.590 | 0.094 | 0.098 | 0.102 |
| D2 | --- | --- | 0.125 | --- | --- | 0.005 |
| E | 2.950 | 3.050 | 3.150 | 0.116 | 0.120 | 0.124 |
| E1 | 3.200 | 3.300 | 3.400 | 0.126 | 0.130 | 0.134 |
| E2 | 1.700 | 1.800 | 1.900 | 0.067 | 0.071 | 0.075 |
| E3 | 1.150 | 1.250 | 1.350 | 0.045 | 0.049 | 0.053 |
| E4 | 0.150 | 0.200 | 0.250 | 0.006 | 0.008 | 0.010 |
| E5 | 0.075 | 0.125 | 0.175 | 0.003 | 0.005 | 0.007 |
| L | 0.300 | 0.400 | 0.500 | 0.01 | 0.02 | 0.02 |
| L1 | 0.300 | 0.400 | 0.500 | 0.01 | 0.02 | 0.02 |

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