



Description

JMT P-channel Enhancement Mode Power MOSFET

Features

- $V_{DS} = -30V$, $I_D = -12A$
 $R_{DS(ON)} < 21m\Omega @ V_{GS} = -10V$
 $R_{DS(ON)} < 36m\Omega @ V_{GS} = -4.5V$
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired

Application

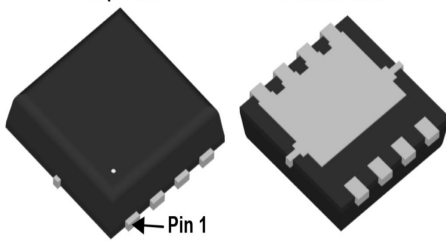
- PWM Applications
- Load Switch
- Power Management



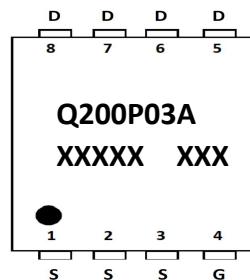
100% UIS TESTED!
100% ΔVds TESTED!

Top View

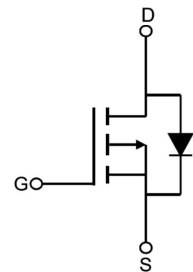
Bottom View



PDFN3.3X3.3-8L



Marking and pin Assignment



Schematic Diagram

Package Marking and Ordering Information

| Device Marking | Device | OUTLINE | Device Package | Reel Size | Reel (PCS) | Per Carton (PCS) |
|----------------|-------------|---------|----------------|-----------|------------|------------------|
| Q200P03A | JMTQ200P03A | TAPING | PDFN3.3X3.3-8L | 13inch | 5000 | 50000 |

Absolute Maximum Ratings ($T_C = 25^\circ C$ 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 | $T_C = 25^\circ C$ | -12 |
| | | $T_C = 100^\circ C$ | -7.8 |
| I_{DM} | Pulsed Drain Current ^{note1} | -48 | A |
| E_{AS} | Single Pulsed Avalanche Energy ^{note2} | 25 | mJ |
| P_D | Power Dissipation | $T_C = 25^\circ C$ | 4.8 |
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case | 26 | $^\circ C/W$ |
| T_J, T_{STG} | Operating and Storage Temperature Range | -55 to +150 | $^\circ C$ |



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 | 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 = -10A | - | 16 | 21 | mΩ |
| | | V _{GS} = -4.5V, I _D = -5A | - | 26 | 36 | |
| Dynamic Characteristics | | | | | | |
| C _{iss} | Input Capacitance | V _{DS} = -15V, V _{GS} =0V, f=1.0MHz | - | 1610 | - | pF |
| C _{oss} | Output Capacitance | | - | 195 | - | pF |
| C _{rss} | Reverse Transfer Capacitance | | - | 166 | - | pF |
| Q _g | Total Gate Charge | V _{DS} = -15V, I _D = -9.1A, V _{GS} = -10V | - | 30 | - | nC |
| Q _{gs} | Gate-Source Charge | | - | 5.3 | - | nC |
| Q _{gd} | Gate-Drain("Miller") Charge | | - | 7.6 | - | nC |
| Switching Characteristics | | | | | | |
| t _{d(on)} | Turn-on Delay Time | V _{DD} = -15V, I _D = -6A, V _{GS} = -10V, R _{GEN} =2.5Ω | - | 14 | - | ns |
| t _r | Turn-on Rise Time | | - | 20 | - | ns |
| t _{d(off)} | Turn-off Delay Time | | - | 95 | - | ns |
| t _f | Turn-off Fall Time | | - | 65 | - | ns |
| Drain-Source Diode Characteristics and Maximum Ratings | | | | | | |
| I _S | Maximum Continuous Drain to Source Diode Forward Current | | - | - | -12 | A |
| I _{SM} | Maximum Pulsed Drain to Source Diode Forward Current | | - | - | -48 | A |
| V _{SD} | Drain to Source Diode Forward Voltage | V _{GS} =0V, I _S = -30A | - | -0.8 | -1.2 | V |

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

2. E_{AS} condition: T_J=25°C, V_{DD}= -15V, V_G= -10V, R_G=25Ω, L=0.5mH, I_{AS}= -10A

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



Typical Performance Characteristics

Figure 1: Output Characteristics

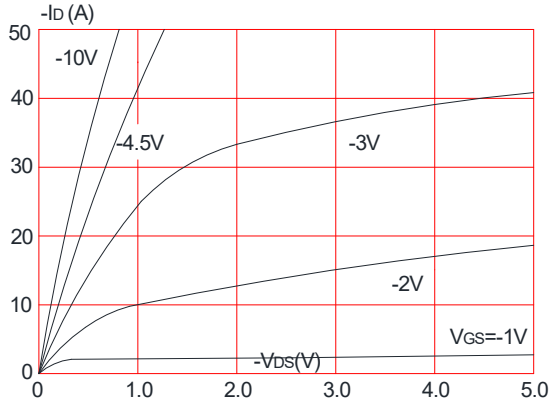


Figure 2: Typical Transfer Characteristics

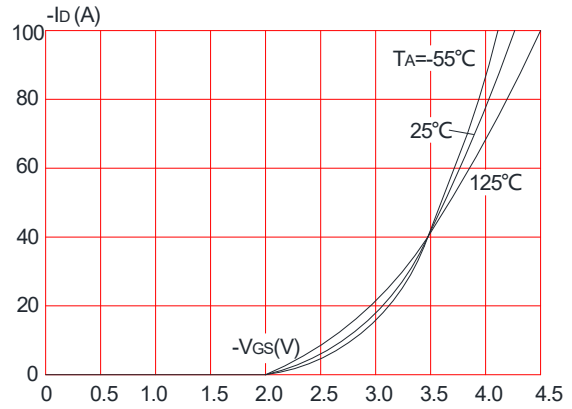


Figure 3: On-resistance vs. Drain Current

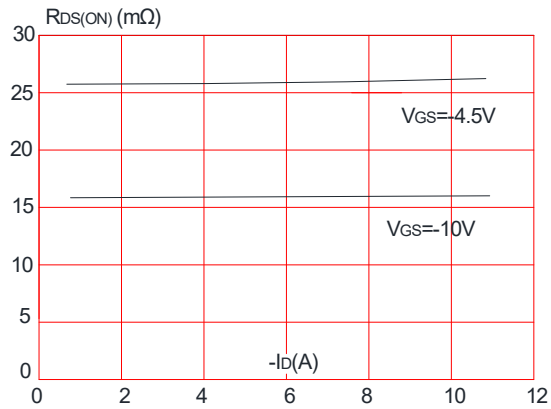


Figure 4: Body Diode Characteristics

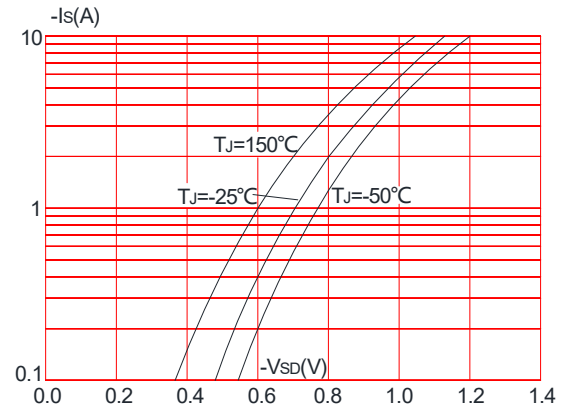


Figure 5: Gate Charge Characteristics

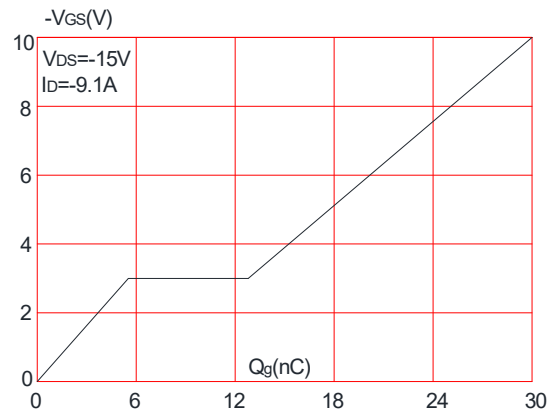


Figure 6: Capacitance Characteristics

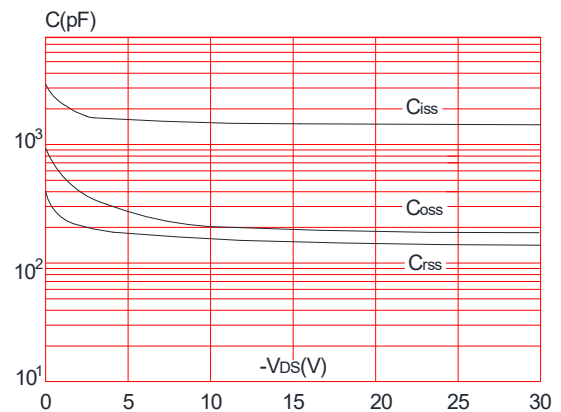




Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

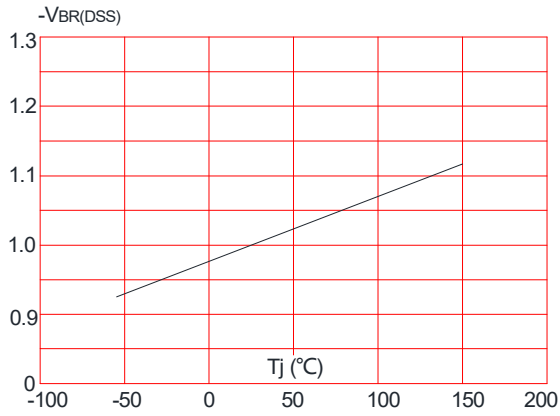


Figure 8: Normalized on Resistance vs. Junction Temperature

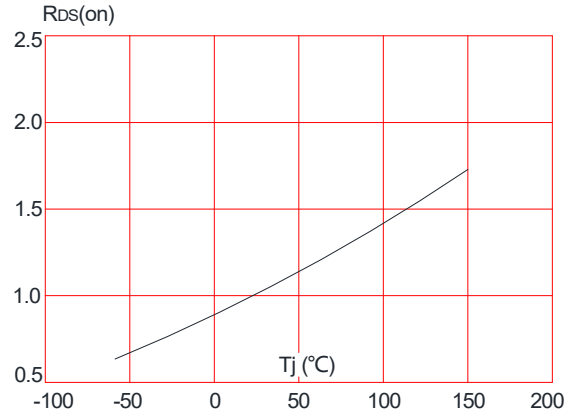


Figure 9: Maximum Safe Operating Area

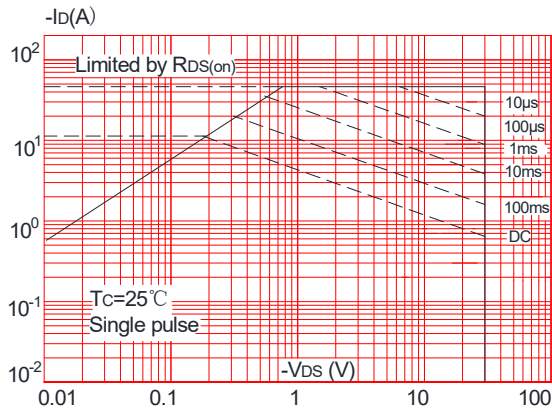


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

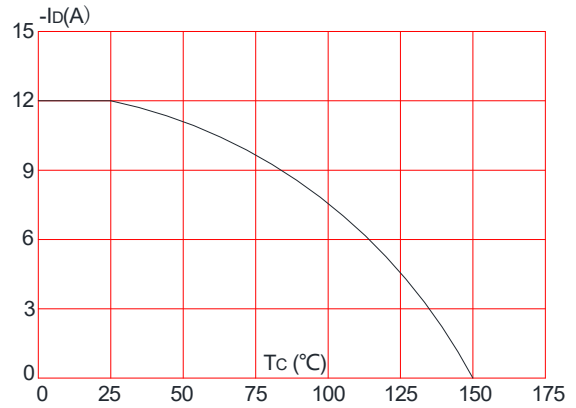
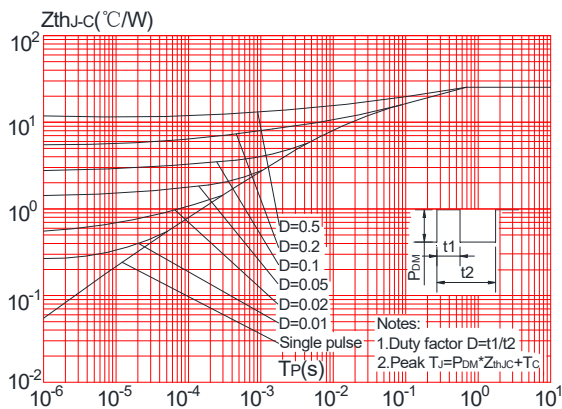
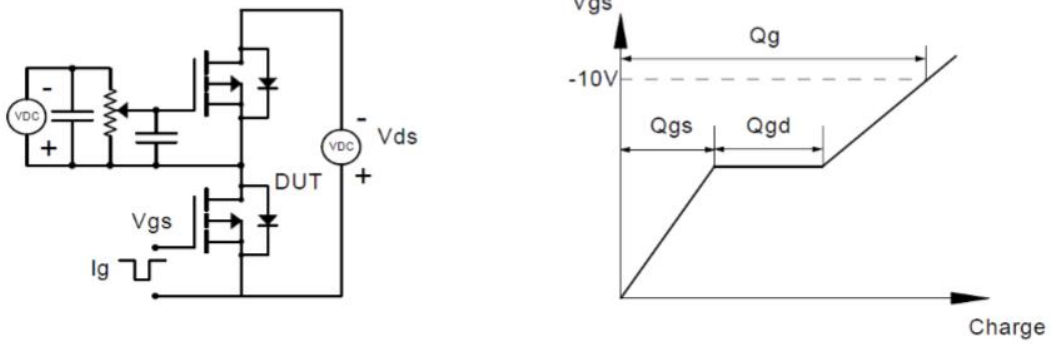


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

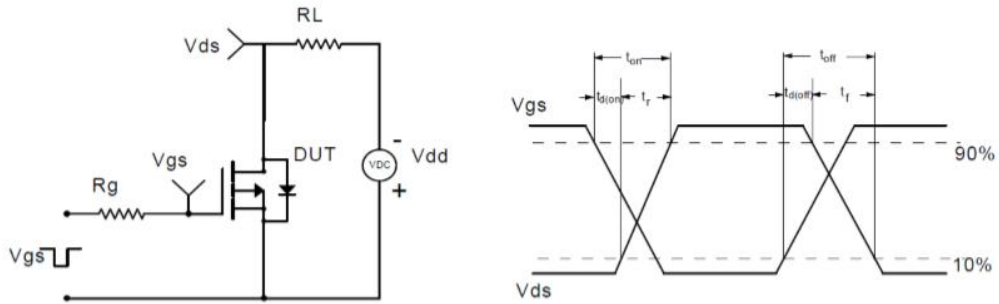


Test Circuit

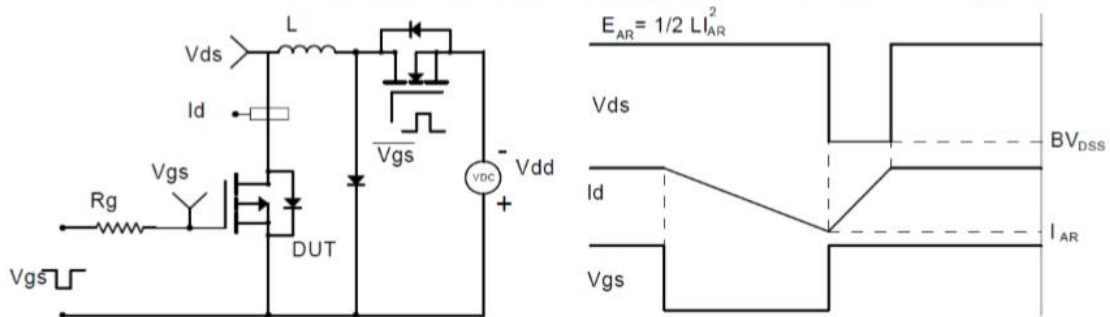
Gate Charge Test Circuit & Waveform



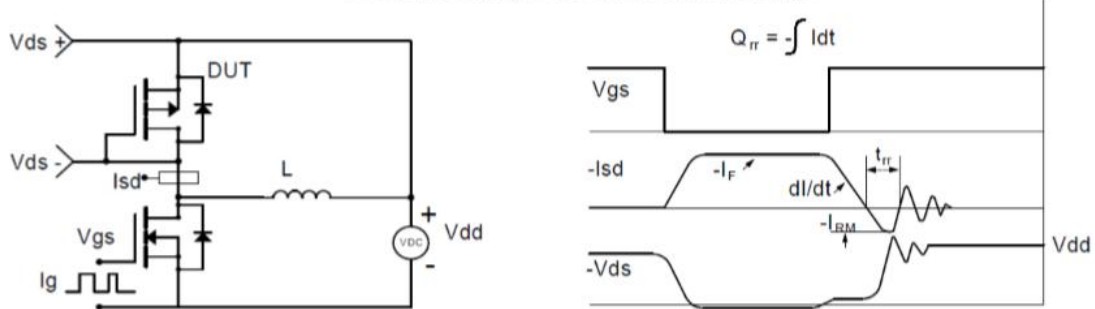
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

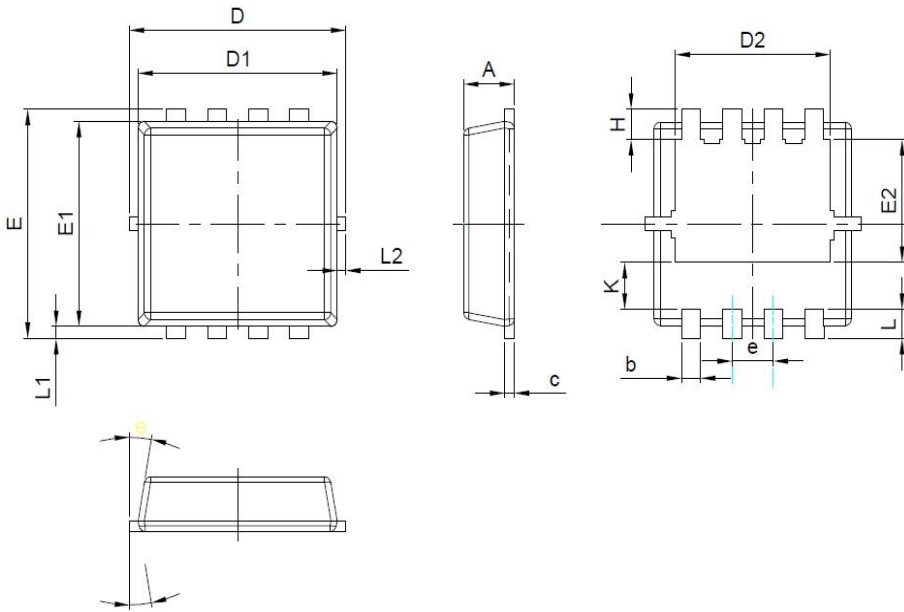


Diode Recovery Test Circuit & Waveforms





Package Mechanical Data-PDFN3.3X3.3-8L



| SYMBOL | MIN | NOM | MAX |
|--------|----------|-------|-------|
| A | 0.70 | 0.80 | 0.90 |
| b | 0.25 | 0.30 | 0.39 |
| c | 0.14 | 0.15 | 0.25 |
| D | 3.20 | 3.30 | 3.40 |
| D1 | 3.00 | 3.15 | 3.30 |
| D2 | 2.35 | 2.45 | 2.55 |
| e | 0.65 BSC | | |
| E | 3.25 | 3.35 | 3.45 |
| E1 | 2.85 | 3.00 | 3.15 |
| E2 | 1.635 | 1.735 | 1.835 |
| H | 0.33 | 0.48 | 0.63 |
| K | 0.585 | 0.685 | 0.785 |
| L | 0.30 | 0.40 | 0.50 |
| L1 | 0.05 | 0.15 | 0.25 |
| L2 | - | - | 0.15 |
| Θ | 8° | 10° | 12° |

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