



Description

JMG P-channel Advanced Mode Power MOSFET

Features

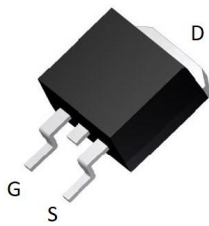
- 100V, -35A
 $R_{DS(ON)} < 47m\Omega @ V_{GS} = -10V$
 $R_{DS(ON)} < 57m\Omega @ V_{GS} = -4.5V$
- Advanced Split Gate Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired

Application

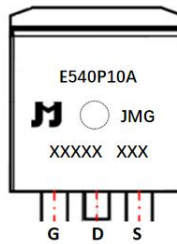
- Load Switch
- PWM Application
- Power management



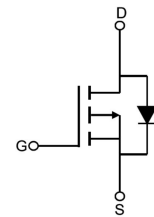
100% UIS TESTED!
100% ΔVds TESTED!



TO-263-3L top view



Marking and pin Assignment



Schematic Diagram

Package Marking and Ordering Information

| Device Marking | Device | OUTLINE | Device Package | Reel Size | Reel (PCS) | Per Carton (PCS) |
|----------------|-------------|---------|----------------|-----------|------------|------------------|
| JMGE540P10A | JMGE540P10A | TAPING | TO-263-3L | 13inch | 800 | 4000 |

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 | -35 |
| | | T _C = 100°C | -23 |
| I _{DM} | Pulsed Drain Current ^{note1} | -140 | 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 | - | 36 | 47 | mΩ |
| | | V _{GS} =-4.5V, I _D =-10A | - | 41 | 57 | |
| Dynamic Characteristics | | | | | | |
| C _{iss} | Input Capacitance | V _{DS} =-50V, V _{GS} =0V, f=1.0MHz | - | 2120 | - | pF |
| C _{oss} | Output Capacitance | | - | 194 | - | pF |
| C _{rss} | Reverse Transfer Capacitance | | - | 13 | - | pF |
| Q _g | Total Gate Charge | V _{DS} =-50V, I _D =-5A, V _{GS} =-10V | - | 34 | - | nC |
| Q _{gs} | Gate-Source Charge | | - | 5 | - | nC |
| Q _{gd} | Gate-Drain("Miller") Charge | | - | 6 | - | nC |
| Switching Characteristics | | | | | | |
| t _{d(on)} | Turn-on Delay Time | V _{DD} =-50V, I _D =-5A, R _G =6Ω, V _{GS} =-10V | - | 9 | - | ns |
| t _r | Turn-on Rise Time | | - | 18 | - | ns |
| t _{d(off)} | Turn-off Delay Time | | - | 116 | - | ns |
| t _f | Turn-off Fall Time | | - | 152 | - | ns |
| Drain-Source Diode Characteristics and Maximum Ratings | | | | | | |
| I _S | Maximum Continuous Drain to Source Diode Forward Current | | - | - | -35 | A |
| I _{SM} | Maximum Pulsed Drain to Source Diode Forward Current | | - | - | -140 | A |
| V _{SD} | Drain to Source Diode Forward Voltage | V _{GS} =0V, I _S =-30A | - | - | -1.2 | V |
| t _{rr} | Body Diode Reverse Recovery Time | T _J =25°C, I _F =-5A, dl/dt=100A/μs | - | 48 | - | ns |
| Q _{rr} | Body Diode Reverse Recovery Charge | | - | 80 | - | 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

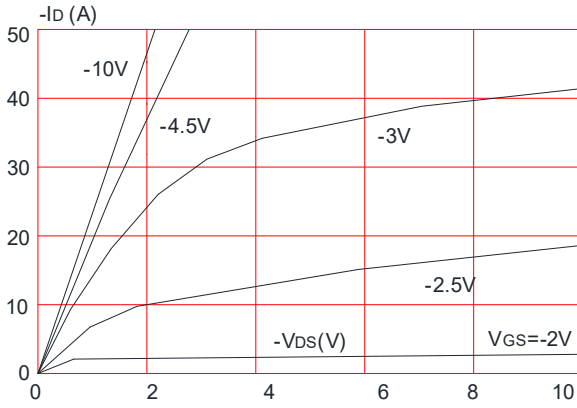


Figure 2: Typical Transfer Characteristics

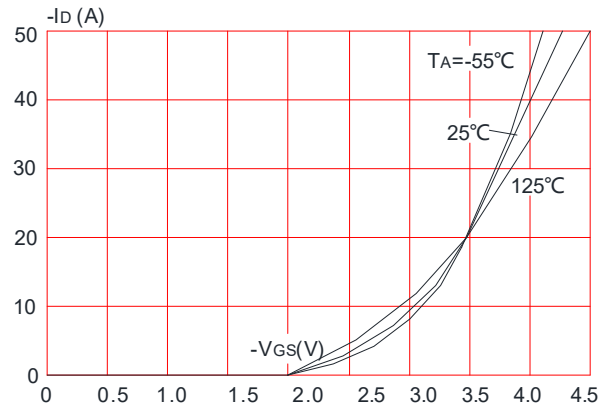


Figure 3: On-resistance vs. Drain Current

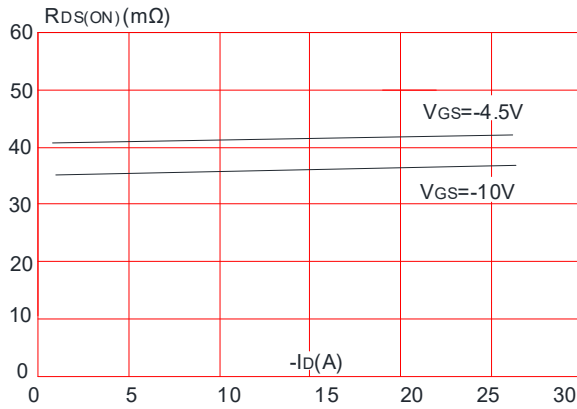


Figure 4: Body Diode Characteristics

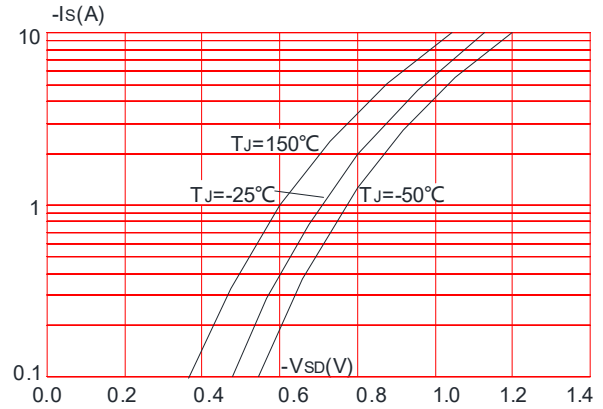


Figure 5: Gate Charge Characteristics

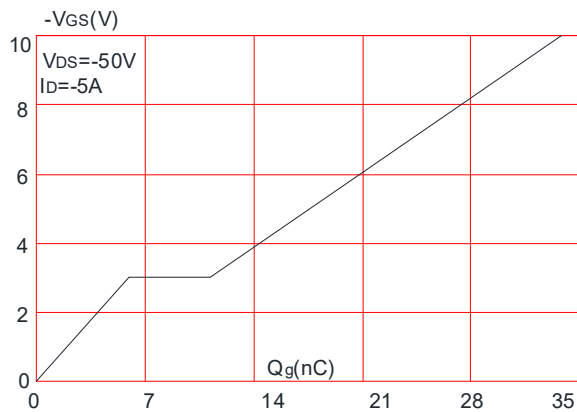


Figure 6: Capacitance Characteristics

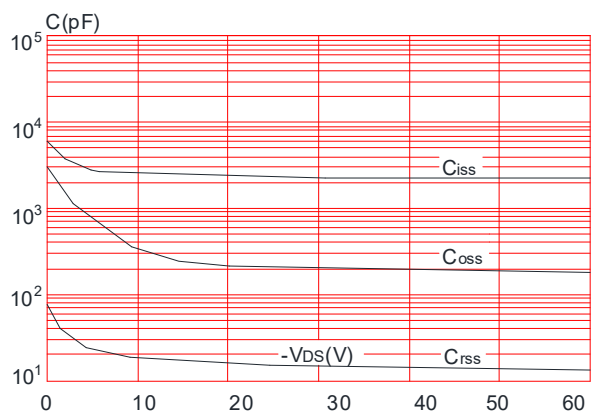




Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

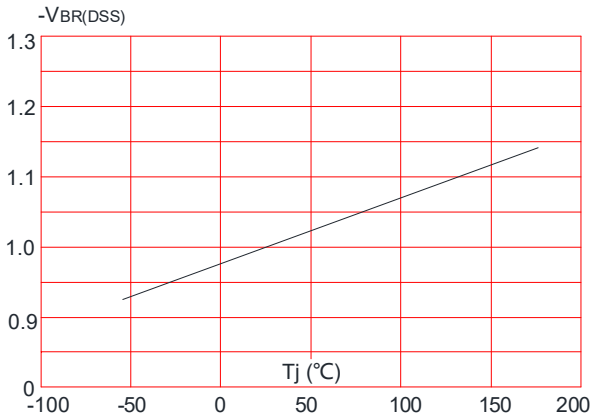


Figure 8: Normalized on Resistance vs. Junction Temperature

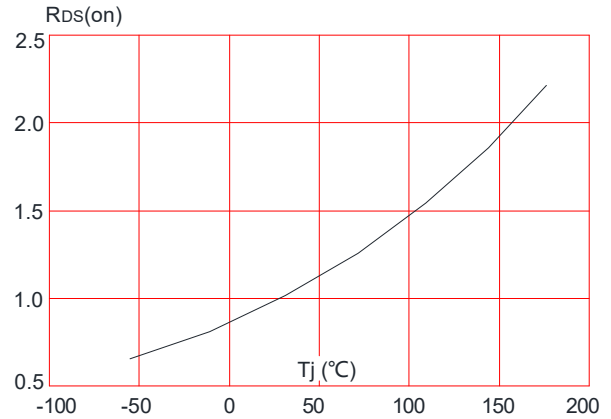


Figure 9: Maximum Safe Operating Area

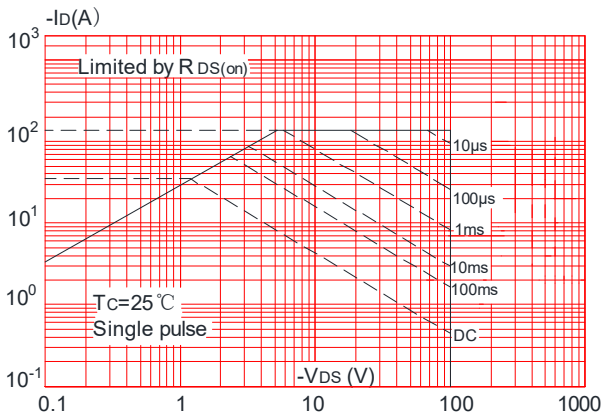


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

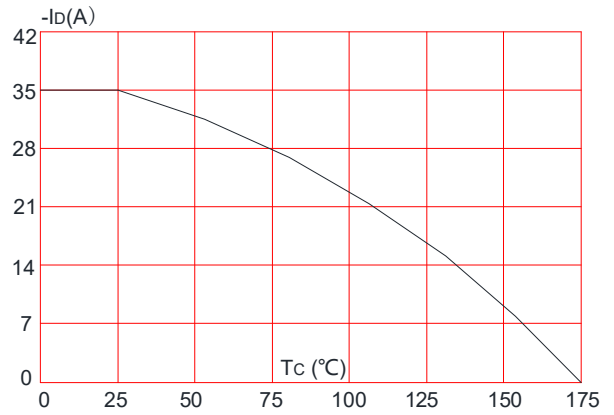
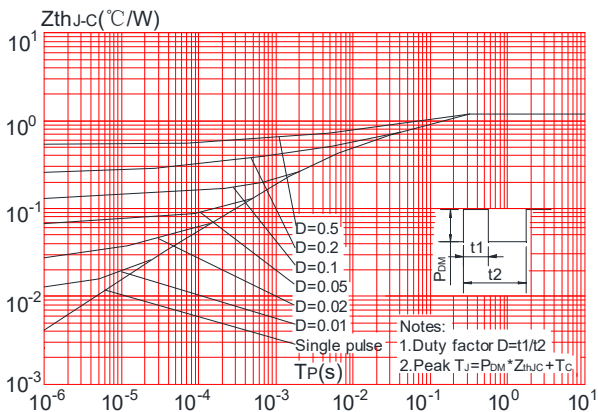


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Test Circuit



Figure1:Gate Charge Test Circuit & Waveform

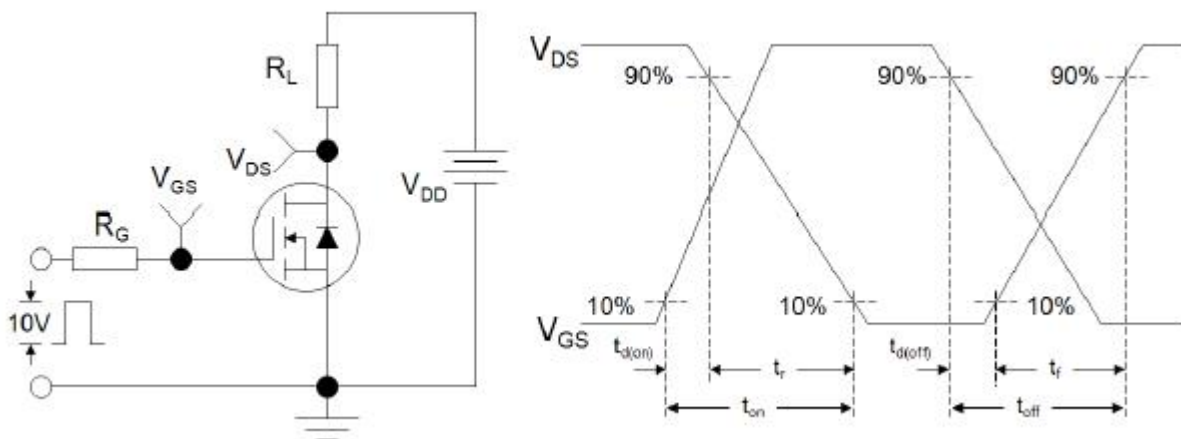


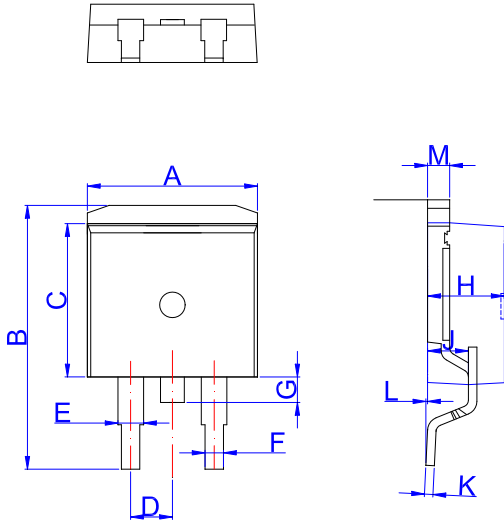
Figure 2: Resistive Switching Test Circuit & Waveforms



Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms



Package Mechanical Data-TO-263-3L



TO-263

| Ref. | Dimensions | | | | | |
|------|-------------|------|-------|--------|-------|-------|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 9.90 | | 10.20 | 0.390 | | 0.402 |
| B | 14.70 | | 15.80 | 0.579 | | 0.622 |
| C | 9.4 | | 9.6 | 0.37 | | 0.378 |
| D | | 2.54 | | | 0.100 | |
| E | 1.20 | | 1.40 | 0.047 | | 0.055 |
| F | 0.75 | | 0.85 | 0.029 | | 0.033 |
| G | | | 1.75 | | | 0.069 |
| H | 4.40 | | 4.70 | 0.173 | | 0.185 |
| J | 2.30 | | 2.70 | 0.091 | | 0.106 |
| K | 0.38 | | 0.55 | 0.015 | | 0.022 |
| L | 0 | 0.10 | 0.25 | 0 | 0.004 | 0.010 |
| M | 1.25 | | 1.35 | 0.049 | | 0.053 |

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