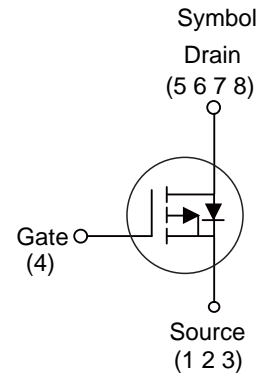


■ PRODUCT CHARACTERISTICS

| | |
|--|------|
| V _{DSS} | -30V |
| R _{DS(ON)} Typ(@V _{GS} =-10V) | 10mΩ |
| R _{DS(ON)} Typ(@V _{GS} =-4.5V) | 16mΩ |
| I _D | -20A |

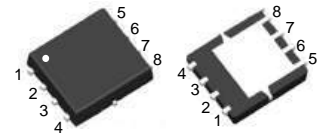


■ APPLICATIONS

- * Electronic lamp ballasts based on half bridge
- * Load Switching, Quick/Wireless Charge.
- * Motor Driving

■ FEATURE

- * Low Gate Charge
- * Pb-Free Lead Plating



PDFN3X3

■ ORDER INFORMATION

| Order Codes | | Package | Packing |
|--------------|----------|---------|------------------|
| Halogen-Free | Halogen | | |
| N/A | MOT3712J | PDFN3X3 | 5000 pieces/Reel |

■ ABSOLUTE MAXIMUM RATINGS(T_A=25°C, unless otherwise specified)

| Parameter | Symbol | Ratings | Unit |
|---|------------------|-----------|------|
| Drain-Source Voltage | V _{DSS} | -30 | V |
| Gate-Source Voltage | V _{GSS} | ±20 | V |
| Drain Current Continuous(@V _{GS} =10V, T _A =25°C) | I _D | -20 | A |
| Drain Current Pulsed | I _{DM} | -80 | A |
| Avalanche Energy | E _{AS} | 144 | mJ |
| Power Dissipation | P _D | 35 | W |
| Junction Temperature | T _J | +150 | °C |
| Storage Temperature | T _{STG} | -55~ +150 | °C |

■ THERMAL CHARACTERISTICS

| Parameter | Symbol | Typ | Unit |
|------------------|-------------------|------|------|
| Junction to Case | R _{thJC} | 3.57 | °C/W |

■ ELECTRICAL CHARACTERISTICS ($T_C=25^{\circ}\text{C}$, unless otherwise noted)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---------------------------------------|--------------|---|-----|-------|------|---------------|
| Off characteristics | | | | | | |
| Drain to Source Breakdown Voltage | V_{DS} | $V_{GS}=0\text{V}, I_D=-250\mu\text{A}$ | -30 | - | - | V |
| Drain to Source Leakage Current | I_{DSS} | $V_{DS}=-30\text{V}, V_{GS}=0\text{V}$ | - | - | -1 | μA |
| Gate to Source Forward Leakage | $I_{GSS(F)}$ | $V_{GS}=+20\text{V}, V_{DS}=0\text{V}$ | - | - | 100 | nA |
| Gate to Source Reverse Leakage | $I_{GSS(R)}$ | $V_{GS}=-20\text{V}, V_{DS}=0\text{V}$ | - | - | -100 | nA |
| On characteristics | | | | | | |
| Drain to Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}=-10\text{V}, I_D=-20\text{A}$ | - | 10 | 14 | m Ω |
| | | $V_{GS}=-4.5\text{V}, I_D=-10\text{A}$ | - | 16 | 20 | m Ω |
| Gate Threshold Voltage | $V_{GS(TH)}$ | $V_{DS}=V_{GS}, I_D=-250\mu\text{A}$ | -1 | -1.7 | -2.5 | V |
| Dynamic characteristics | | | | | | |
| Gate capacitance | R_g | $V_{GS}=0\text{V}, V_{DS}=0\text{V}, f=1.0\text{MHz}$ | - | 7.1 | - | Ω |
| Forward Transconductance | g_{fs} | $V_{DS}=-10\text{V}, I_D=-3\text{A}$ | - | 10 | - | S |
| Input Capacitance | C_{iss} | $V_{DS}=-20\text{V}, V_{GS}=0\text{V}$ $f=1.0\text{MHz}$ | - | 2400 | - | pF |
| Output Capacitance | C_{oss} | | - | 238 | - | pF |
| Reverse Transfer Capacitance | C_{rss} | | - | 192 | - | pF |
| Resistive Switching Characteristics | | | | | | |
| Turn-on Delay Time | $t_{d(ON)}$ | $V_{GS}=-10\text{V}, V_{DS}=-15\text{V},$ $I_D=-20\text{A}, R_G=1\Omega$ | - | 12 | - | ns |
| Rise Time | t_r | | - | 10 | - | ns |
| Turn-off Delay Time | $t_{d(OFF)}$ | | - | 25 | - | ns |
| Fall Time | t_f | | - | 13 | - | ns |
| Total Gate Charge | Q_g | $I_D=-20\text{A}, V_{DS}=-15\text{V}$ $V_{GS}=-10\text{V}$ | - | 11 | - | nC |
| Gate to Source Charge | Q_{gs} | | - | 2 | - | nC |
| Gate to Drain("Miller") Charge | Q_{gd} | | - | 2.7 | - | nC |
| Source-Drain Diode Characteristics | | | | | | |
| Continuous Source Current(Body Diode) | I_S | | - | - | -20 | A |
| Maximum Pulsed Current(Body Diode) | I_{SM} | | - | - | -80 | A |
| Diode Forward Voltage | V_{SD} | $I_{SD}=-1\text{A}, V_{GS}=0\text{V}$ | - | -0.73 | -1.2 | V |
| Reverse Recovery Time | t_{rr} | $I_{SD}=-20\text{A}, T_J=25^{\circ}\text{C}$ $di/dt=100\text{A}/\mu\text{s}$ | - | 15 | - | ns |
| Reverse Recovery Charge | Q_{rr} | | - | 12 | - | nC |

■ TYPICAL CHARACTERISTICS

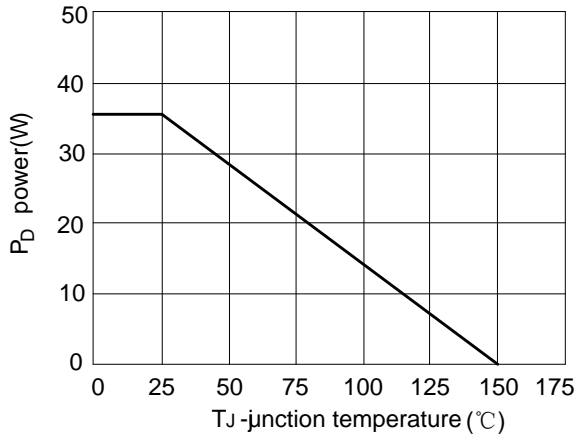


Fig.1 power dissipation

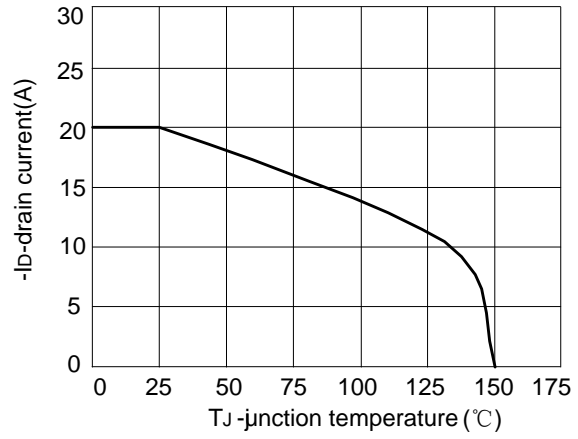


Fig.2 current vs junction temperature

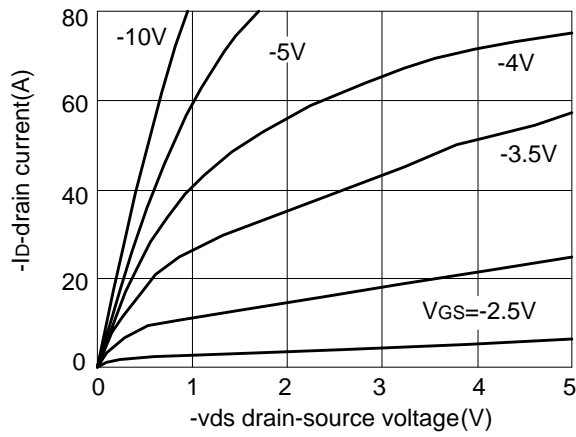


Fig.3 output characteristics

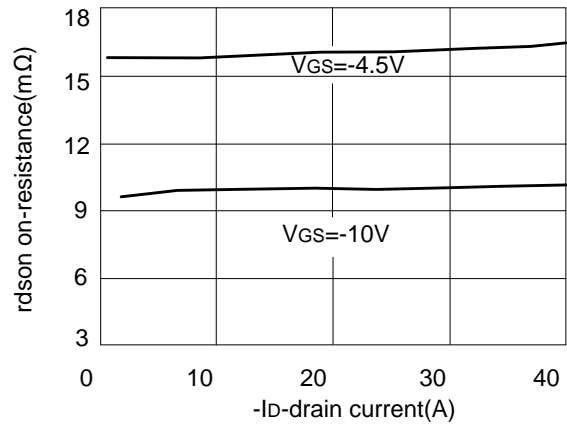


Fig.4 drain-source on-resistance

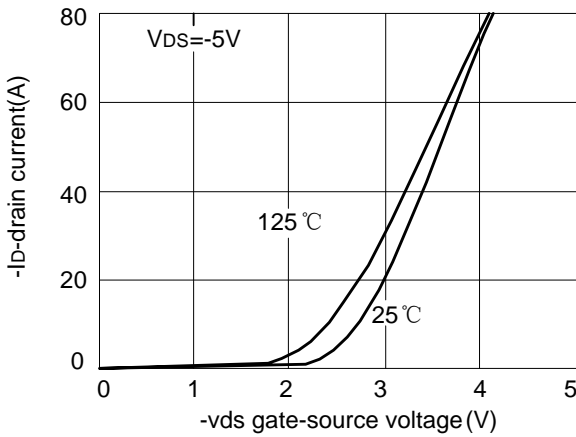


Fig.5 transfer characteristics

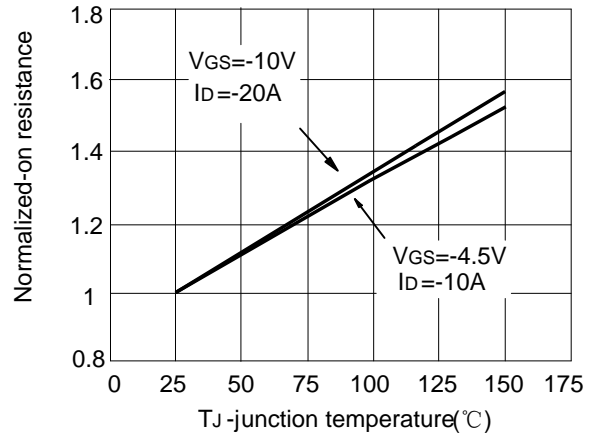


Fig.6 drain-source on-resistance

■ TYPICAL CHARACTERISTICS(Cont.)

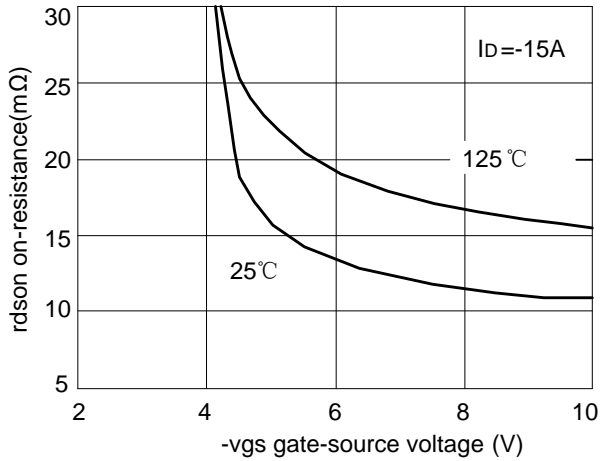


Fig.7 rds(on) vs vgs

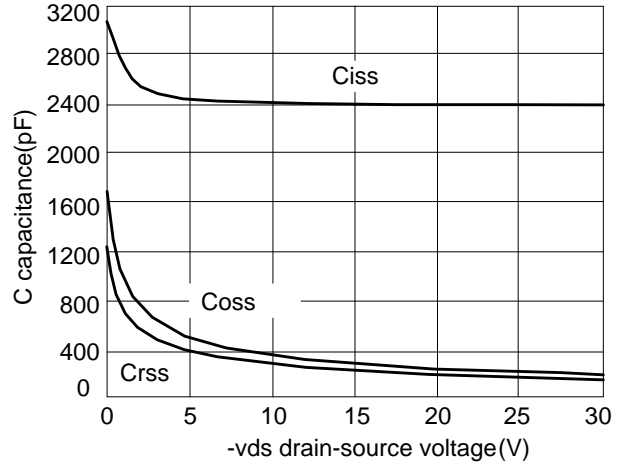


Fig.8 capacitance vs vds

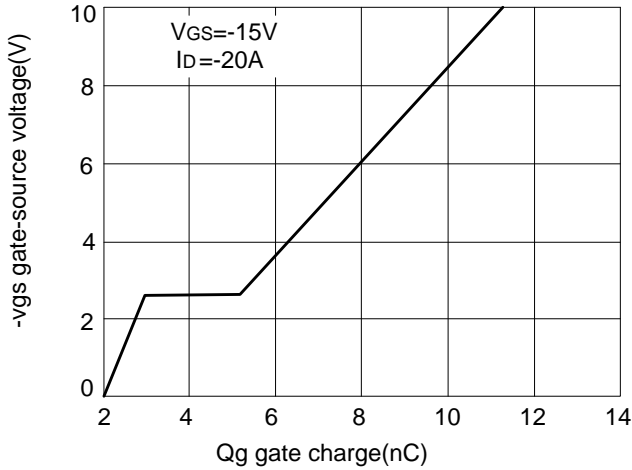


Fig.9 gate charge

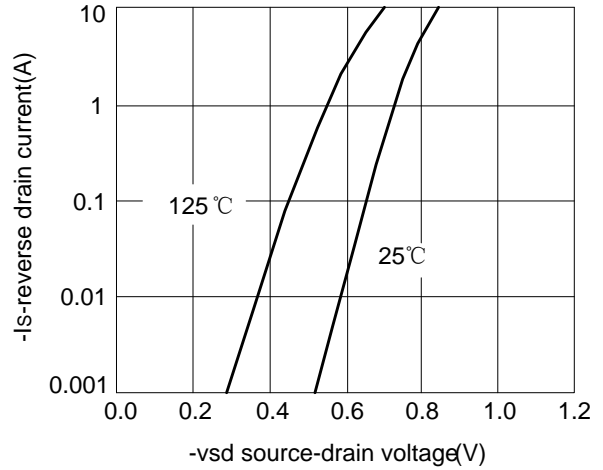


Fig.10 -source-drain diode forward

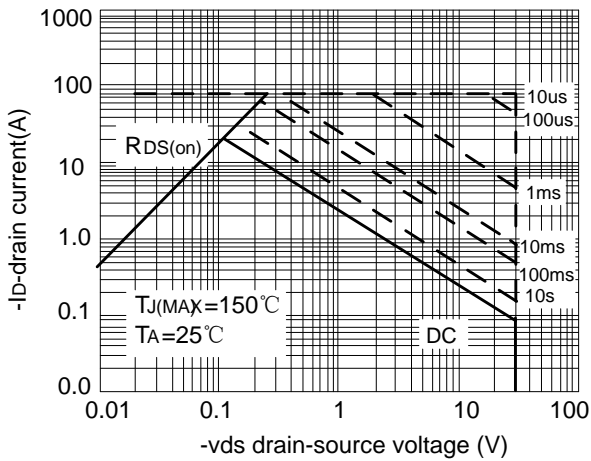


Fig.11 safe operation area

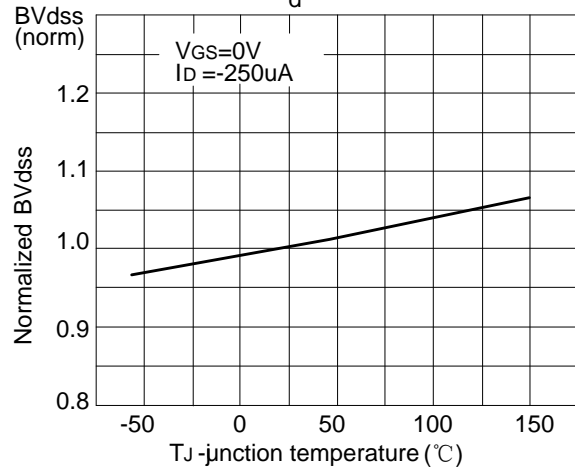
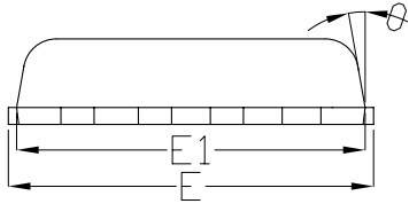
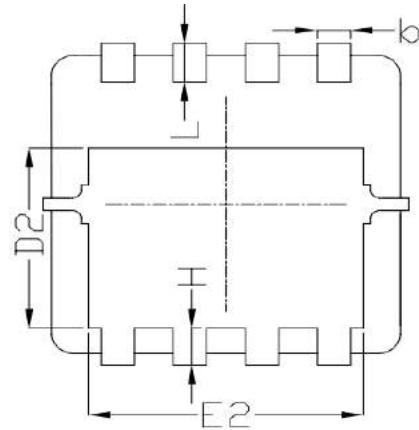
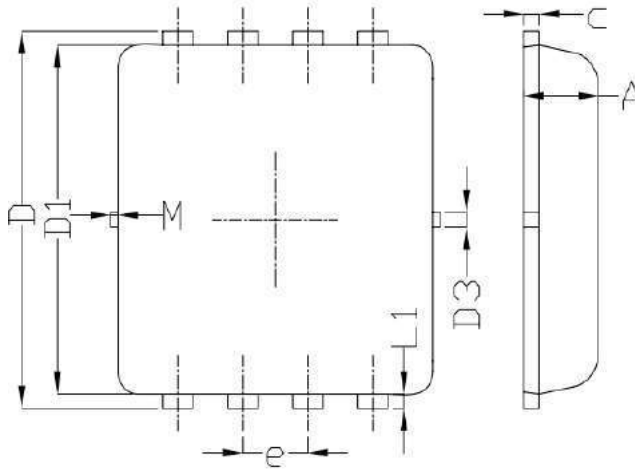
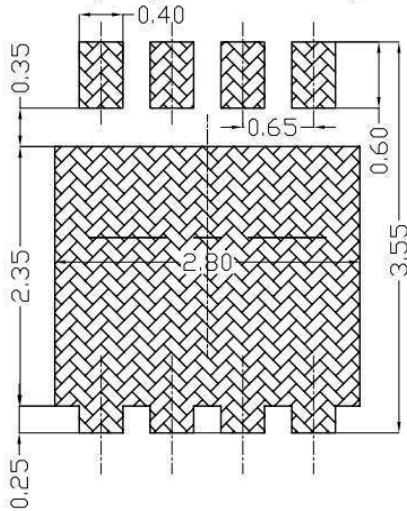


Fig.12 BVdss vs junction temperature

■ PDFN3X3 PACKAGE OUTLINE DIMENSIONS



Land Pattern
(Only for Reference)



| SYMBOL | DIMENSIONAL REOMTS | | |
|-----------------|--------------------|------|------|
| | MIN | NOM | MAX |
| A | 0.70 | 0.75 | 0.80 |
| b | 0.25 | 0.30 | 0.35 |
| c | 0.10 | 0.15 | 0.25 |
| D | 3.25 | 3.35 | 3.45 |
| D1 | 3.00 | 3.10 | 3.20 |
| D2 | 1.78 | 1.88 | 1.98 |
| D3 | --- | 0.13 | --- |
| E | 3.20 | 3.30 | 3.40 |
| E1 | 3.00 | 3.15 | 3.20 |
| E2 | 2.39 | 2.49 | 2.59 |
| e | 0.65BSC | | |
| H | 0.30 | 0.39 | 0.50 |
| L | 0.30 | 0.40 | 0.50 |
| L1 | --- | 0.13 | --- |
| θ | --- | 10° | 12° |
| M | * | * | 0.15 |
| * Not specified | | | |