

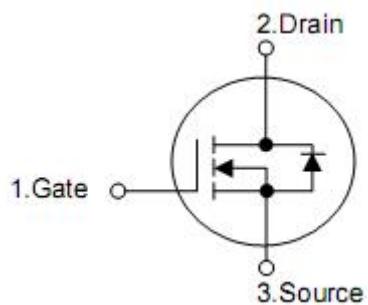
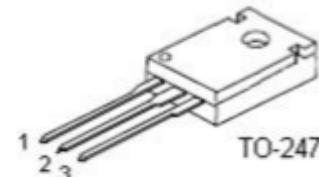
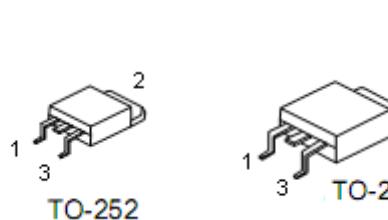
1. Features

- $R_{DS(ON)}=6.2\text{m}\Omega @ V_{GS}=10\text{V}$
- Lead free and green device available
- Low Rds-on to minimize conductive loss
- High avalanche current

2. Applications

- Power supply
- DC-DC converters

3. Pin configuration



| Pin | Function |
|-----|----------|
| 1 | Gate |
| 2 | Drain |
| 3 | Source |

4. Absolute maximum ratings

| Parameter | Symbol | Maximum | | | Units | |
|--------------------------------------|-----------------------------------|------------------------------|--------|--------|-------|----|
| | | TO-252 | TO-263 | TO-247 | | |
| Drain-source voltage | V _{DSS} | 80 | | | V | |
| Gate-source voltage | V _{GSS} | +25 | | | V | |
| Continuous drain current | T _C =25 °C | I _D ³ | 80* | 80 | 80 | A |
| | T _C =100 °C | | 70* | 70 | 70 | A |
| Pulse drain current | T _C =25 °C | I _{DP} ⁴ | 340 | | | A |
| Avalanche current | | I _{AS} ⁵ | 20 | | | A |
| Avalanche energy | | E _{AS} ⁵ | 410 | | | mJ |
| Maximum power dissipation | T _C =25 °C | P _D | 120 | 240 | 288 | W |
| | T _C =100 °C | | 60 | 100 | 144 | W |
| Junction & storage temperature range | T _J , T _{STG} | -55~175 | | | °C | |

*Drain current limited by maximum junction temperature.

5. Thermal characteristics

| Parameter | Symbol | Typical | | | Units |
|--|------------------|---------|--------|--------|-------|
| | | TO-252 | TO-263 | TO-247 | |
| Thermal resistance-junction to case | R _{θjc} | 1.04 | 0.52 | 0.44 | °C/W |
| Thermal resistance-junction to ambient | R _{θja} | 55 | | | |

6. Electrical characteristics

($T_A=25^\circ\text{C}$,unless otherwise noted)

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|--|------------------------------|--|-----|------|-----------|------------------|
| Static characteristics | | | | | | |
| Drain-source breakdown voltage | BV_{DSS} | $V_{\text{GS}}=0\text{V}, I_{\text{DS}}=250\mu\text{A}$ | 80 | - | - | V |
| Zero gate voltage drain current | I_{DSS} | $V_{\text{DS}}=64\text{V}, V_{\text{GS}}=0\text{V}$ | - | - | 1 | μA |
| | | $T_J=125^\circ\text{C}$ | - | - | 100 | |
| Gate threshold voltage | $V_{\text{GS}(\text{th})}$ | $V_{\text{DS}}=V_{\text{GS}}, I_{\text{DS}}=250\mu\text{A}$ | 2 | 3 | 4 | V |
| Gate leakage current | I_{GSS} | $V_{\text{GS}}=\pm 25\text{V}, V_{\text{DS}}=0\text{V}$ | - | - | ± 100 | nA |
| Drain-source on-state resistance | $R_{\text{DS}(\text{on})}^1$ | $V_{\text{GS}}=10\text{V}, I_{\text{DS}}=30\text{A}$ | - | 6.2 | 9 | $\text{m}\Omega$ |
| Diode characteristics | | | | | | |
| Diode forward voltage | V_{SD}^1 | $I_{\text{SD}}=40\text{A}, V_{\text{GS}}=0\text{V}$ | - | - | 1.3 | V |
| Diode continuous forward current | I_S^3 | | - | - | 80 | A |
| Reverse recovery time | t_{rr} | $I_F=40\text{A}, dI/dt=100\text{A}/\mu\text{s}$ | - | 25 | - | nS |
| Reverse recovery charge | Q_{rr} | | - | 18.5 | - | nC |
| Dynamic characteristics ² | | | | | | |
| Gate resistance | R_G | $V_{\text{GS}}=0\text{V}, V_{\text{DS}}=0\text{V}, F=1\text{MHz}$ | - | 1.3 | - | Ω |
| Input capacitance | C_{iss} | $V_{\text{GS}}=0\text{V}, V_{\text{DS}}=25\text{V}, F=1.0\text{MHz}$ | - | 3110 | - | pF |
| Output capacitance | C_{oss} | | - | 445 | - | |
| Reverse transfer capacitance | C_{rss} | | - | 270 | - | |
| Turn-on delay time | $t_{\text{d}(\text{ON})}$ | $V_{\text{DD}}=37.5\text{V}, I_{\text{D}}=40\text{A}, V_{\text{GS}}=10\text{V}, R_G=6.8\Omega$ | - | 20.4 | - | nS |
| Turn-on rise time | t_r | | - | 63 | - | |
| Turn-off delay time | $t_{\text{d}(\text{OFF})}$ | | - | 67 | - | |
| Turn-off fall time | t_f | | - | 43 | - | |
| Gate charge characteristics ² | | | | | | |
| Total gate charge | Q_g | $V_{\text{DS}}=37.5\text{V}, V_{\text{GS}}=10\text{V}, I_{\text{D}}=40\text{A},$ | - | 76 | - | nC |
| Gate-source charge | Q_{gs} | | - | 9.5 | - | |
| Gate-drain charge | Q_{gd} | | - | 40 | - | |

Note:1. Pulse test; pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

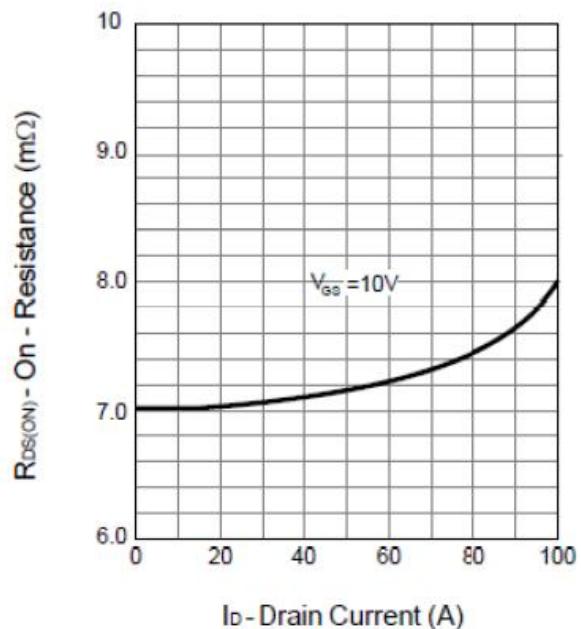
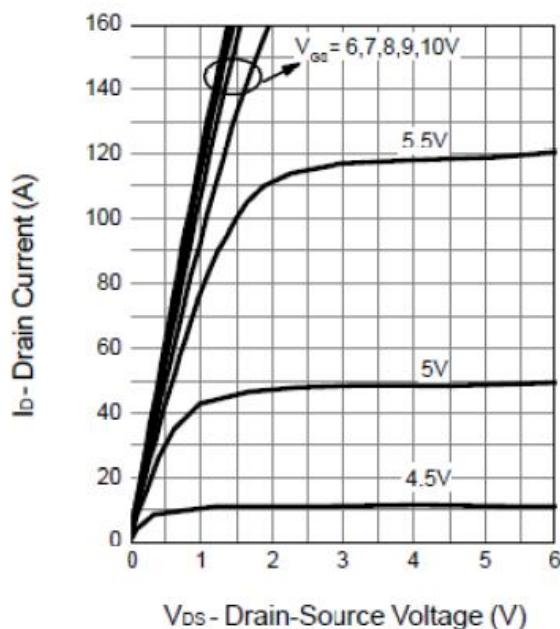
2.Guaranteed by design,not subject to production testing.

3.Package limitation current is 50A. Calculated continuous current based on maximum allowable junction temperature.

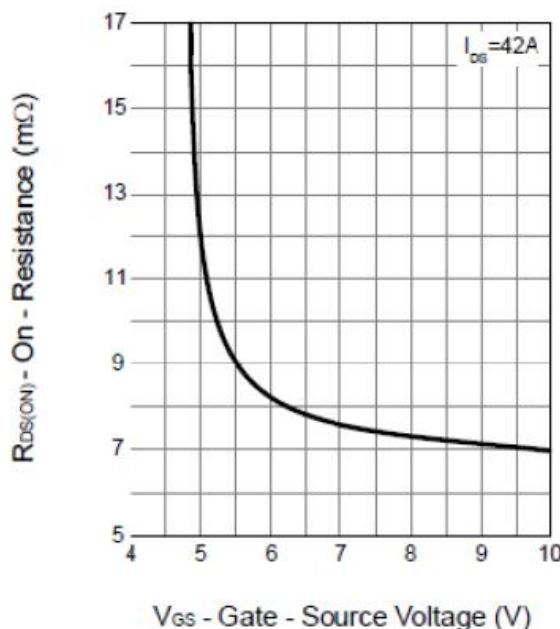
4.Repetitive rating, pulse width limited by max junction temperature.

5.Starting $T_J=25^\circ\text{C}$, $L=1\text{mH}, I_{\text{AS}}=40\text{A}$.

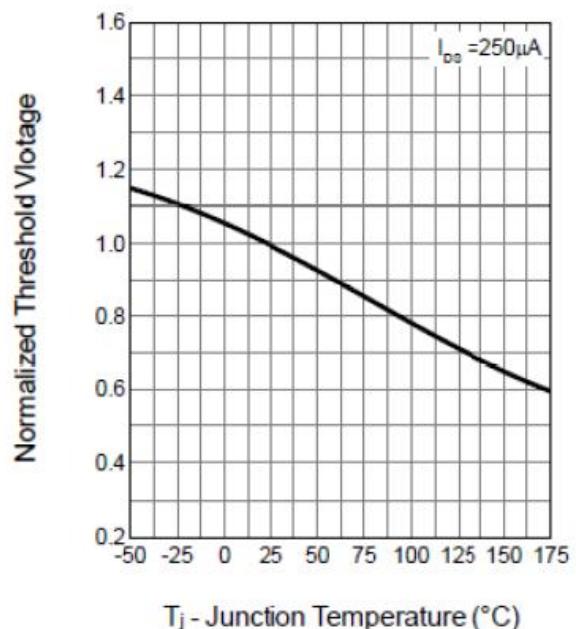
7. Test circuits and waveforms

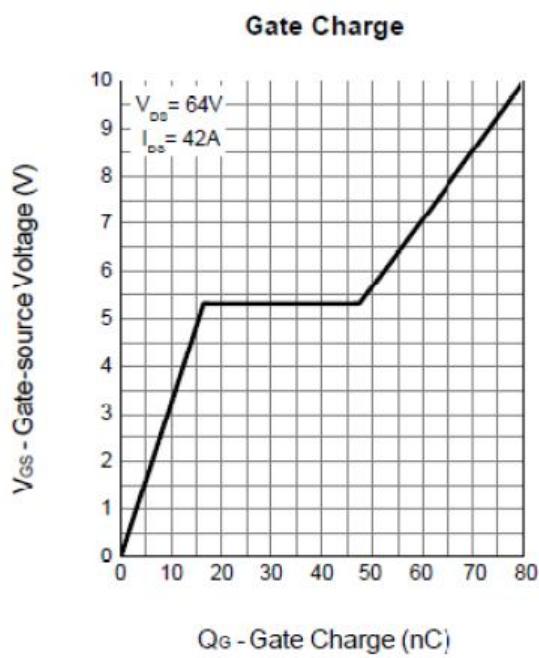
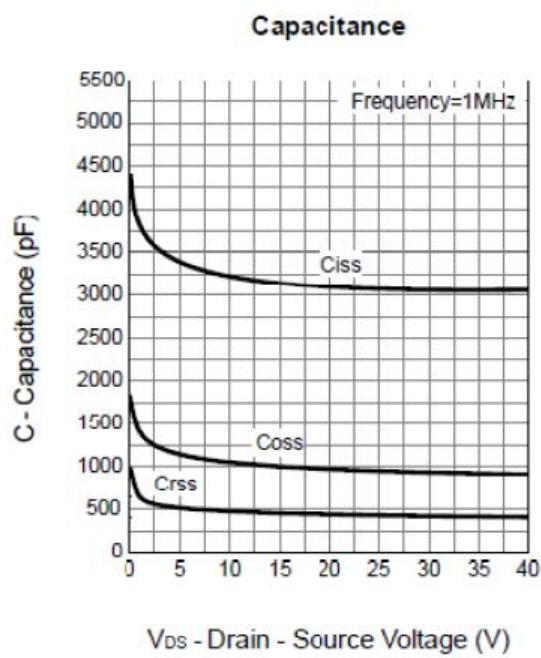
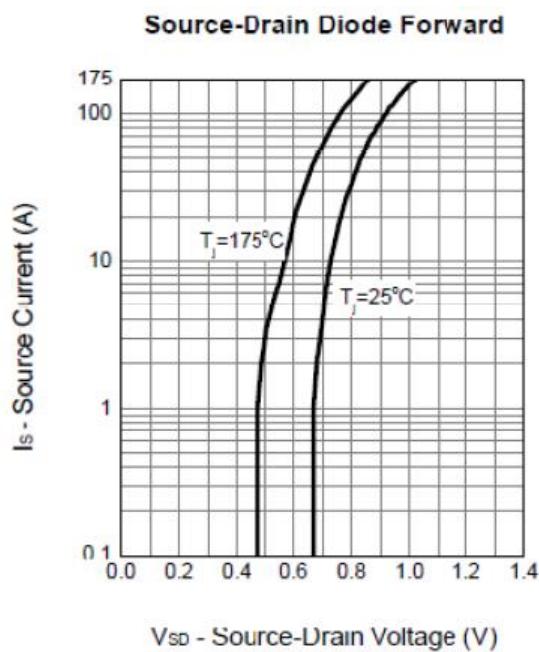
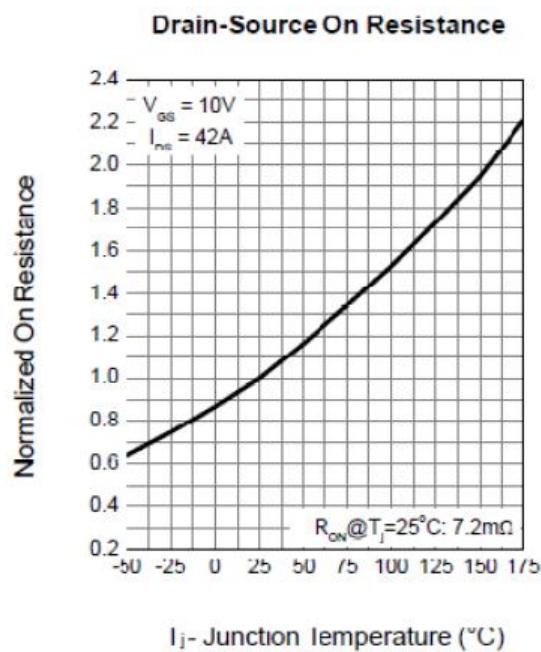


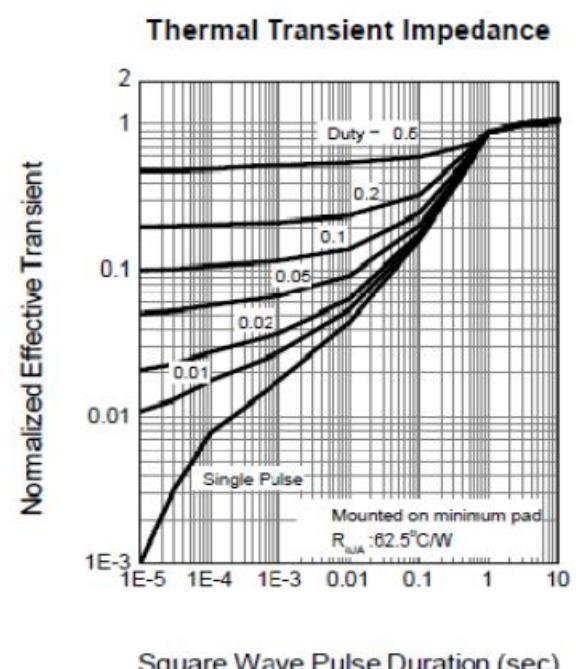
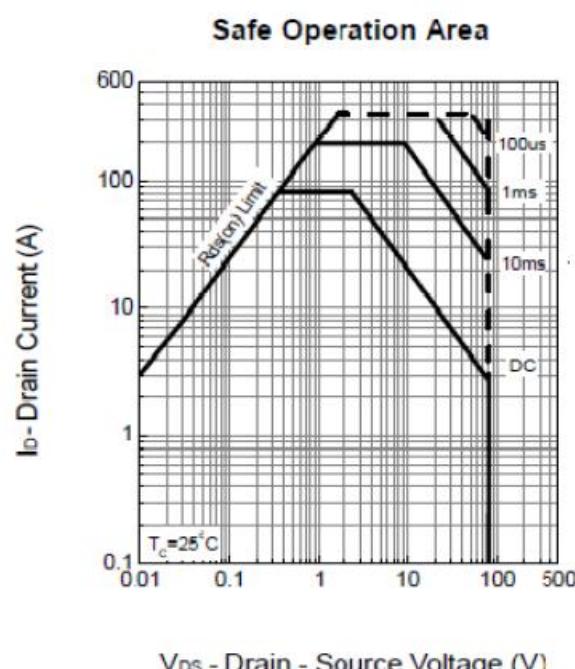
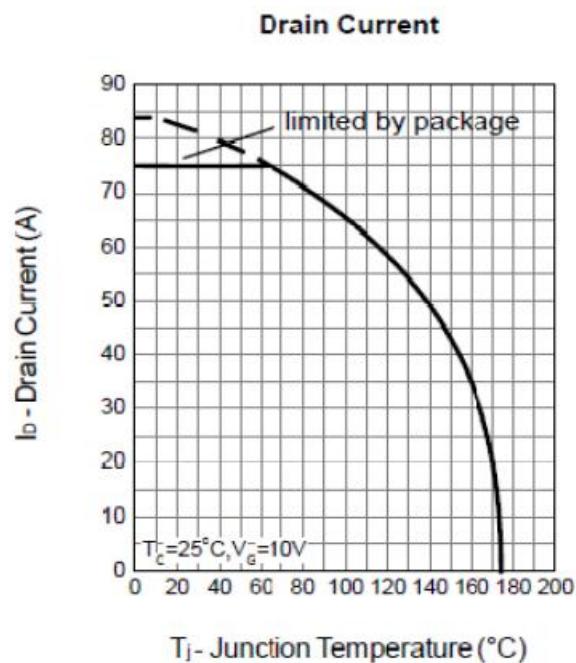
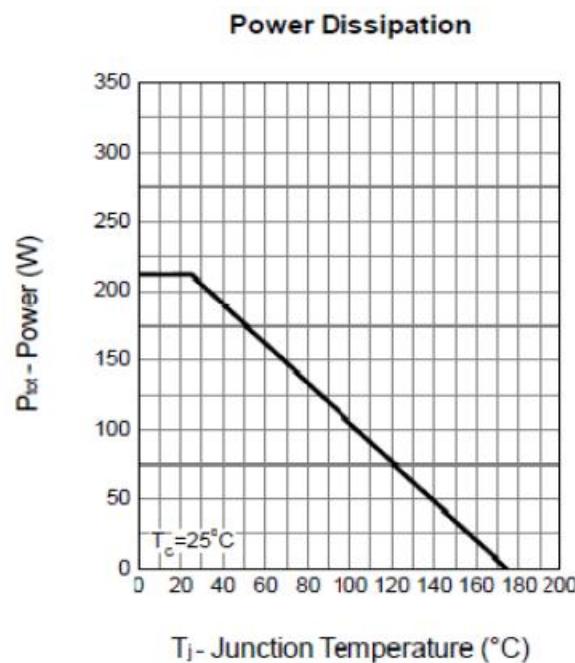
Drain-Source On Resistance

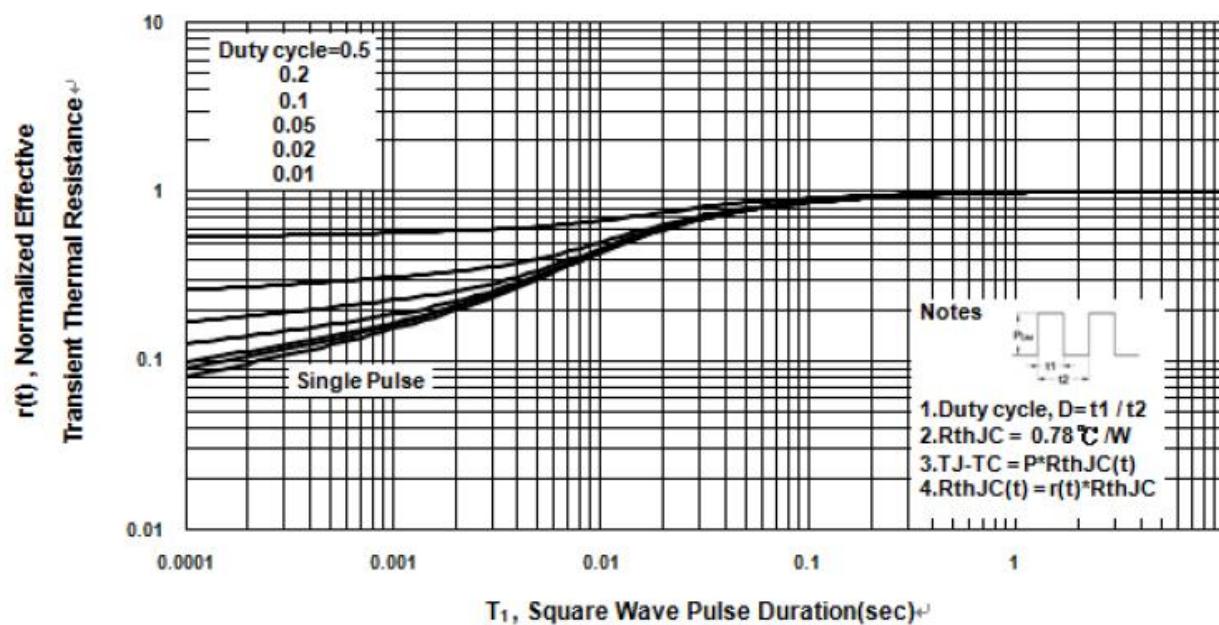


Gate Threshold Voltage









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