

N-Channel MOSFET

Features

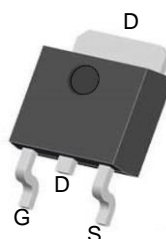
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

Application

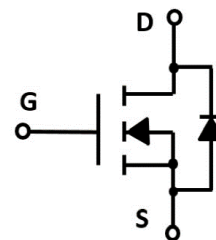
- Power Management in Note book
- DC/DC Converter
- Load Switch
- LCD Display inverter

Product Summary

| V_{DS} | $R_{DS(ON)}$ MAX | I_D MAX |
|----------|------------------|-----------|
| 100V | 80mΩ@10V | 20A |
| | 110mΩ@4.5V | |



TO-252 top view



Schematic diagram



Absolute Maximum Ratings (TA=25°C unless otherwise noted)

| Symbol | Parameter | Rating | Unit |
|--------|-----------|--------|------|
|--------|-----------|--------|------|

Common Ratings (TC=25°C Unless Otherwise Noted)

| | | | |
|-----------|----------------------------------|------------|----|
| V_{DS} | Drain-Source Breakdown Voltage | 100 | V |
| V_{GS} | Gate-Source Voltage | ±20 | V |
| T_J | Maximum Junction Temperature | 150 | °C |
| T_{STG} | Storage Temperature Range | -50 to 155 | °C |
| I_S | Diode Continuous Forward Current | 20 | A |

Mounted on Large Heat Sink

| | | | |
|----------|---------------------------------|------------------------------|----|
| I_{DM} | Pulse Drain Current Tested | 75 | A |
| I_D | Continuous Drain Current@GS=10V | $T_c=25^\circ\text{C}$ 20 | A |
| P_D | Maximum Power Dissipation | $T_c=25^\circ\text{C}$ 45 | W |
| EAS | Single pulse Avalanche Energy | 15.3 | mJ |

| Electrical Characteristics (T _J =25°C unless otherwise noted) | | | | | | |
|--|----------------------------------|--|-----|------|------|------|
| Symbol | Parameter | Condition | Min | Typ | Max | Unit |
| Static Electrical Characteristics @ T_J = 25°C (unless otherwise stated) | | | | | | |
| BV _{(BR)DSS} | Drain-Source Breakdown Voltage | VGS=0V, ID=250μA | 100 | -- | -- | V |
| I _{DSS} | Zero Gate Voltage Drain Current | VDS=100V, VGS=0V | -- | -- | 1.0 | μA |
| I _{GSS} | Gate-Body Leakage Current | VGS=±20V, VDS=0V | -- | -- | ±100 | nA |
| V _{GS(th)} | Gate Threshold Voltage | VDS=VGS, ID=250μA | 1.0 | 1.5 | 2.5 | V |
| R _{DS(on)} | Drain-Source On-State Resistance | VGS=10V, ID=12A | -- | 70.0 | 80.0 | mΩ |
| | | VGS=4.5V, ID=10A | -- | 80.0 | 95.0 | |
| Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated) | | | | | | |
| C _{ISS} | Input Capacitance | VDS=15V, VGS=0V, f=1MHz | -- | 1125 | -- | pF |
| C _{OSS} | Output Capacitance | | -- | 85 | -- | pF |
| C _{RSS} | Reverse Transfer Capacitance | | -- | 55 | -- | pF |
| Switching Characteristics | | | | | | |
| Q _g | Total Gate Charge | VDD=80V, ID=15A, VGS=10V | -- | 17 | -- | nC |
| Q _{gs} | Gate Source Charge | | -- | 7.5 | -- | nC |
| Q _{gd} | Gate Drain Charge | | -- | 10 | -- | nC |
| t _{d(on)} | Turn-on Delay Time | VDD=50V, RL=3.3Ω, VGS=5V, RG=4.7Ω | -- | 25 | -- | nS |
| t _r | Turn-on Rise Time | | -- | 430 | -- | nS |
| t _{d(off)} | Turn-Off Delay Time | | -- | 45 | -- | nS |
| t _f | Turn-Off Fall Time | | -- | 92 | -- | nS |
| Source- Drain Diode Characteristics | | | | | | |
| V _{SD} | Forward on voltage | T _J =25°C, I _S =15A, | -- | -- | 1.2 | V |

Typical Operating Characteristics

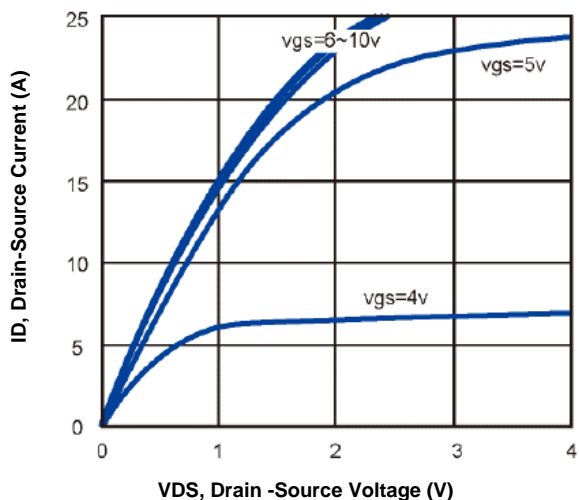


Fig1. Typical Output Characteristics

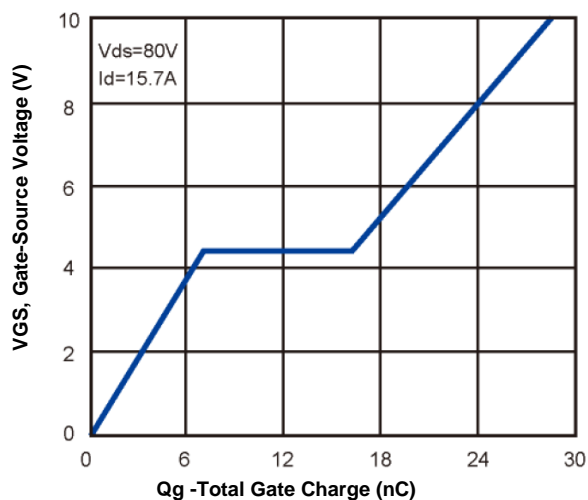


Fig2. Typical Gate Charge Vs. Gate-Source Voltage

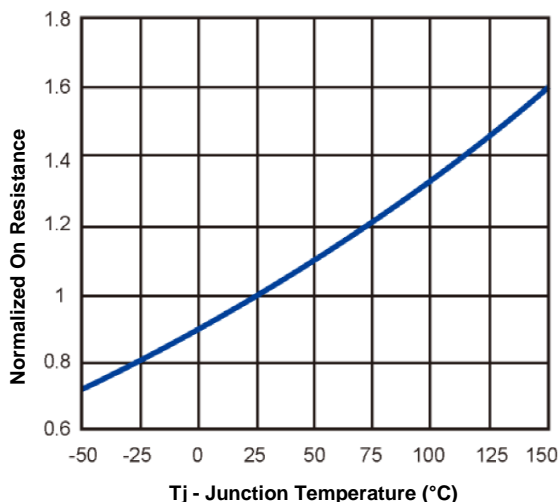


Fig3. Normalized On-Resistance Vs. Temperature

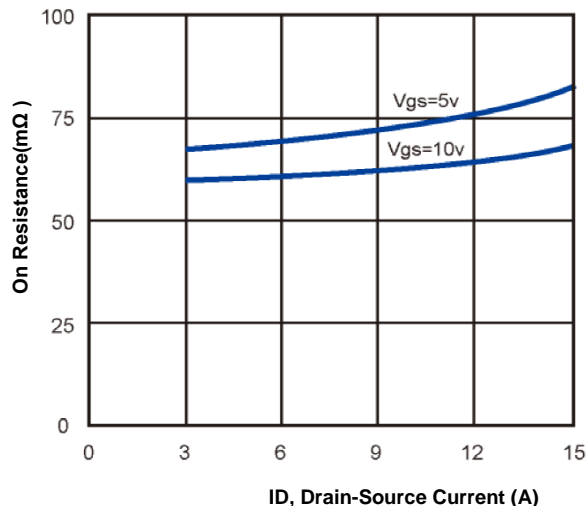


Fig4. On-Resistance Vs. Drain-Source Current

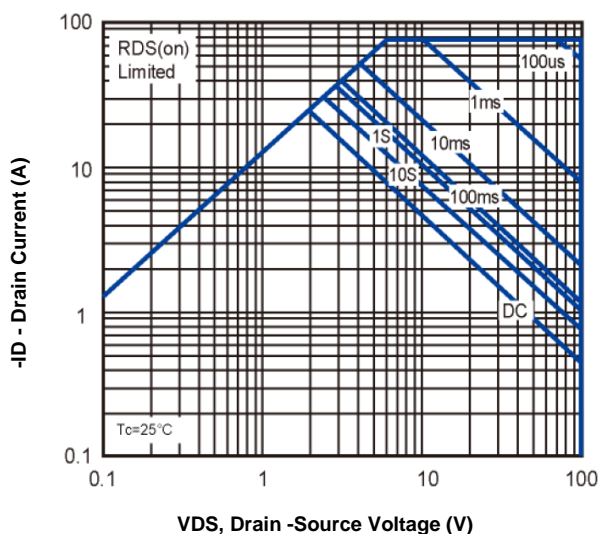


Fig7. Maximum Safe Operating Area

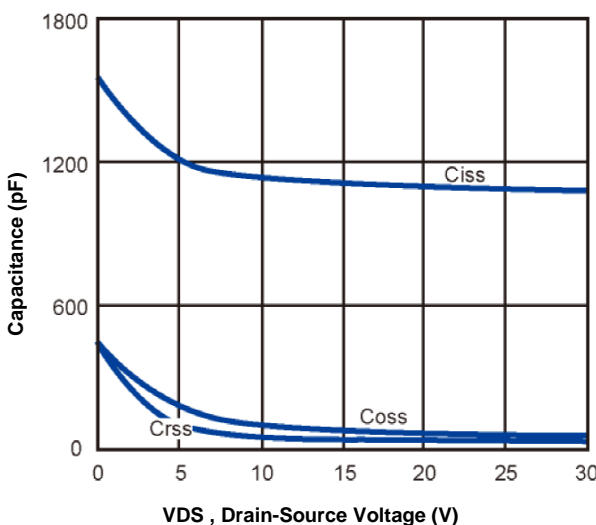
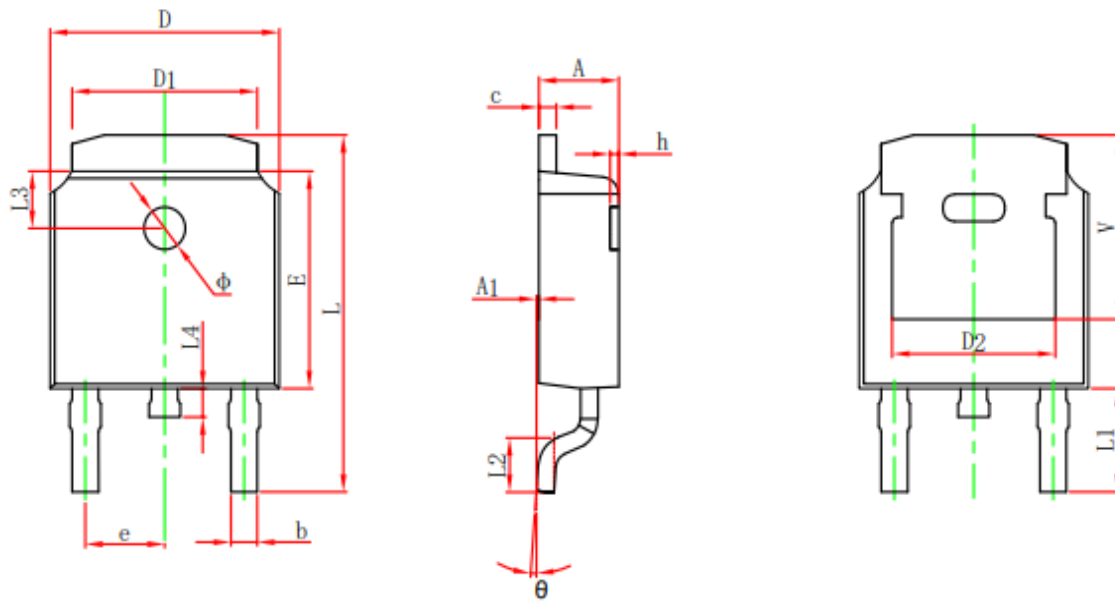


Fig6 Typical Capacitance Vs. Drain-Source Voltage

TO-252 Package information



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|----------|---------------------------|--------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 2.200 | 2.400 | 0.087 | 0.094 |
| A1 | 0.000 | 0.127 | 0.000 | 0.005 |
| b | 0.635 | 0.770 | 0.025 | 0.030 |
| c | 0.460 | 0.580 | 0.018 | 0.023 |
| D | 6.500 | 6.700 | 0.256 | 0.264 |
| D1 | 5.100 | 5.460 | 0.201 | 0.215 |
| D2 | 4.830 REF. | | 0.190 REF. | |
| E | 6.000 | 6.200 | 0.236 | 0.244 |
| e | 2.186 | 2.386 | 0.086 | 0.094 |
| L | 9.712 | 10.312 | 0.382 | 0.406 |
| L1 | 2.900 REF. | | 0.114 REF. | |
| L2 | 1.400 | 1.700 | 0.055 | 0.067 |
| L3 | 1.600 REF. | | 0.063 REF. | |
| L4 | 0.600 | 1.000 | 0.024 | 0.039 |
| Φ | 1.100 | 1.300 | 0.043 | 0.051 |
| θ | 0° | 8° | 0° | 8° |
| h | 0.000 | 0.300 | 0.000 | 0.012 |
| V | 5.250 REF. | | 0.207 REF. | |