

N-Channel Enhancement Mode Power MOSFET

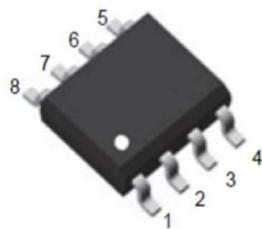
Features

- $V_{DS} = 30V$, $I_D = 18 A$
- $R_{DS(ON)} < 4 m\Omega @ V_{GS} = 10V$
- $R_{DS(ON)} < 7 m\Omega @ V_{GS} = 4.5V$

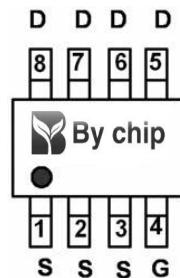
General Features

- Advanced Trench Technology
- Provide Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free and Green Available

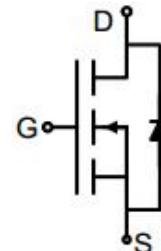
100% UIS TESTED!
100% ΔV_{ds} TESTED!



SOP-8



pin assignment



Schematic diagram

Absolute Maximum Ratings $T_C = 25^\circ C$, unless otherwise noted

| Parameter | Symbol | Value | Unit |
|--------------------------------------------------|----------------|------------|------------|
| Drain-Source Voltage | V_{DS} | 30 | V |
| Continuous Drain Current | I_D | 18 | A |
| Pulsed Drain Current (note1) | I_{DM} | 72 | A |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Power Dissipation | P_D | 2.1 | W |
| Single pulse avalanche energy (note2) | E_{AS} | 64 | mJ |
| Operating Junction and Storage Temperature Range | T_J, T_{stg} | -55 To 150 | $^\circ C$ |

Thermal Resistance

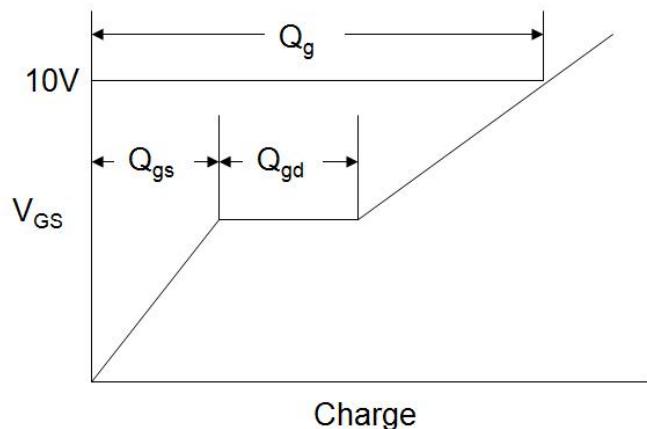
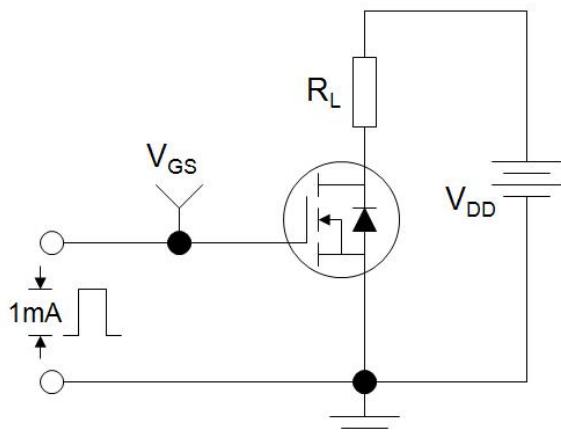
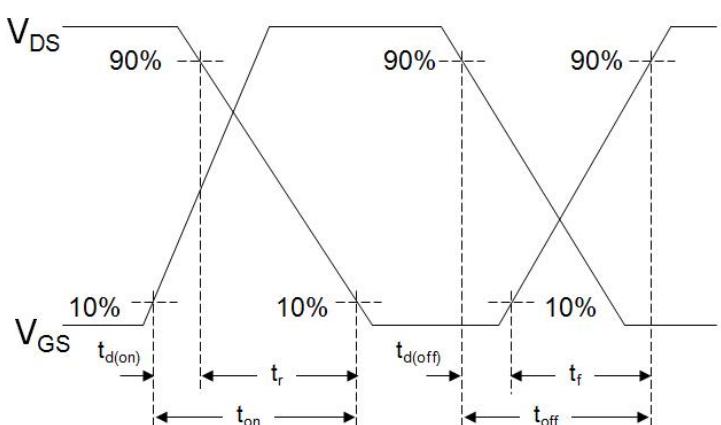
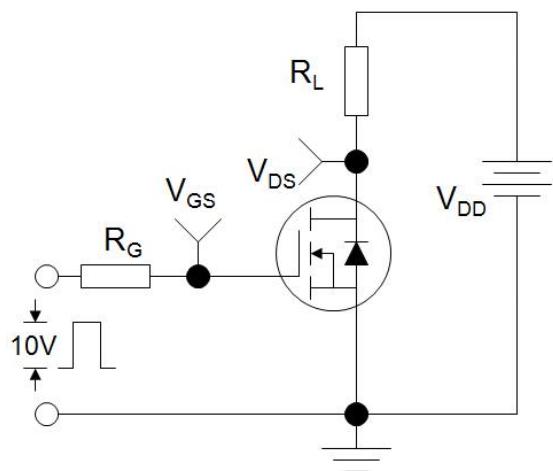
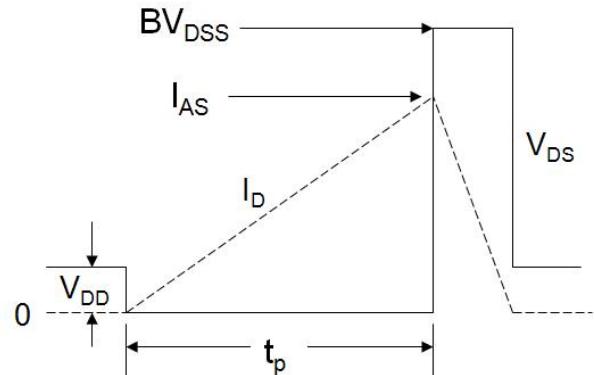
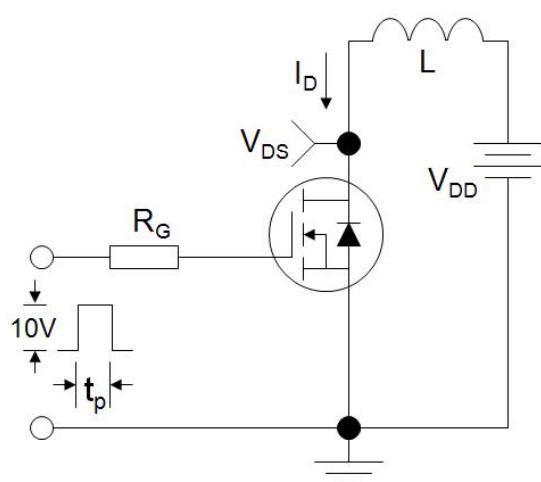
| Parameter | Symbol | Value | Unit |
|-----------------------------------------|------------|-------|--------------|
| Thermal Resistance, Junction-to-Ambient | R_{thJA} | 59 | $^\circ C/W$ |

Specifications $T_J = 25^\circ\text{C}$, unless otherwise noted

| Parameter | Symbol | Test Conditions | Value | | | Unit |
|------------------------------------------------|-----------------------------|---------------------------------------------------------------------------------|-------|------|-----------|------------------|
| | | | Min. | Typ. | Max. | |
| Static Parameters | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(\text{BR})\text{DSS}}$ | $V_{\text{GS}} = 0\text{V}, I_D = 250\mu\text{A}$ | 30 | -- | -- | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{\text{DS}} = 30\text{V}, V_{\text{GS}} = 0\text{V}$ | -- | -- | 1 | μA |
| Gate-Source Leakage | I_{GSS} | $V_{\text{GS}} = \pm 20\text{V}$ | -- | -- | ± 100 | nA |
| Gate-Source Threshold Voltage | $V_{\text{GS}(\text{th})}$ | $V_{\text{DS}} = V_{\text{GS}}, I_D = 250\mu\text{A}$ | 1.0 | | 3.0 | V |
| Drain-Source On-Resistance | $R_{\text{DS}(\text{on})}$ | $V_{\text{GS}} = 10\text{V}, I_D = 10\text{A}$ | -- | | 4 | $\text{m}\Omega$ |
| | | $V_{\text{GS}} = 4.5\text{V}, I_D = 10\text{A}$ | -- | | 7 | |
| Forward Transconductance | g_{FS} | $V_{\text{GS}} = 5\text{V}, I_D = 10\text{A}$ | -- | 30 | -- | S |
| Dynamic Parameters | | | | | | |
| Input Capacitance | C_{iss} | $V_{\text{GS}} = 0\text{V}, V_{\text{DS}} = 15\text{V}, f = 1.0\text{MHz}$ | -- | 1714 | -- | pF |
| Output Capacitance | C_{oss} | | -- | 339 | -- | |
| Reverse Transfer Capacitance | C_{rss} | | -- | 326 | -- | |
| Total Gate Charge | Q_g | $V_{\text{DD}} = 15\text{V}, I_D = 10\text{A}, V_{\text{GS}} = 10\text{V}$ | -- | 37 | -- | nC |
| Gate-Source Charge | Q_{gs} | | -- | 4.8 | -- | |
| Gate-Drain Charge | Q_{gd} | | -- | 11 | -- | |
| Turn-on Delay Time | $t_{\text{d}(\text{on})}$ | $V_{\text{DD}} = 15\text{V}, I_D = 10\text{A}, R_G = 3\Omega$ | -- | 8.6 | -- | ns |
| Turn-on Rise Time | t_r | | -- | 8.1 | -- | |
| Turn-off Delay Time | $t_{\text{d}(\text{off})}$ | | -- | 29 | -- | |
| Turn-off Fall Time | t_f | | -- | 8 | -- | |
| Drain-Source Body Diode Characteristics | | | | | | |
| Continuous Body Diode Current | I_S | $T_C = 25^\circ\text{C}$ | -- | -- | 18 | A |
| Body Diode Voltage | V_{SD} | $T_J = 25^\circ\text{C}, I_{\text{SD}} = 10\text{A}, V_{\text{GS}} = 0\text{V}$ | -- | -- | 1.2 | V |
| Reverse Recovery Charge | Q_{rr} | $I_F = 10\text{A}, V_{\text{GS}} = 0\text{V}$ $dI/dt = 500\text{A/us}$ | -- | 40 | -- | nC |
| Reverse Recovery Time | T_{rr} | | -- | 14 | -- | ns |

Notes

- Repetitive Rating: Pulse width limited by maximum junction temperature
- EAS condition : $T_J=25^\circ\text{C}$, $V_{\text{DD}}=30\text{V}$, $V_{\text{GS}}=10\text{V}$, $L=0.5\text{mH}$, $R_G=25\Omega$
- Identical low side and high side switch with identical R_G

Gate Charge Test Circuit**Switch Time Test Circuit****EAS Test Circuit**

Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 1. Output Characteristics

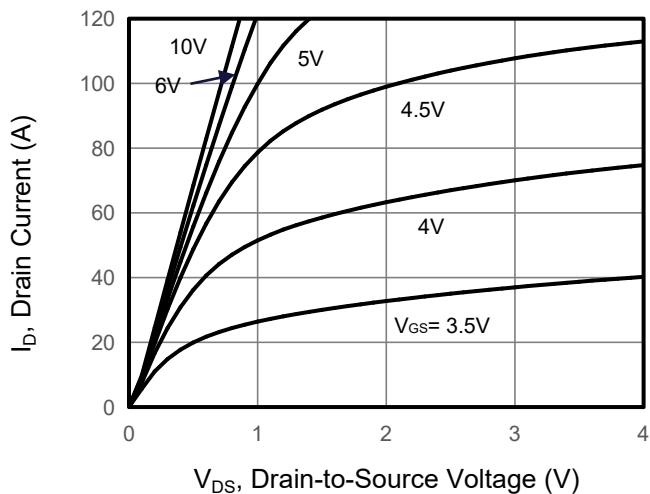


Figure 2. Transfer Characteristics

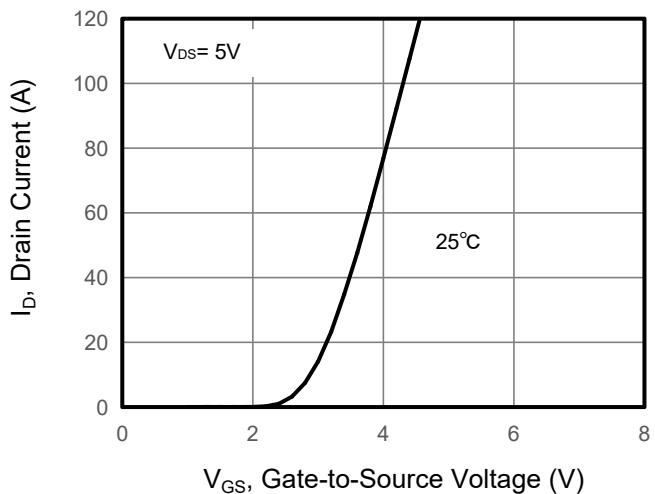


Figure 3. Drain Source On Resistance

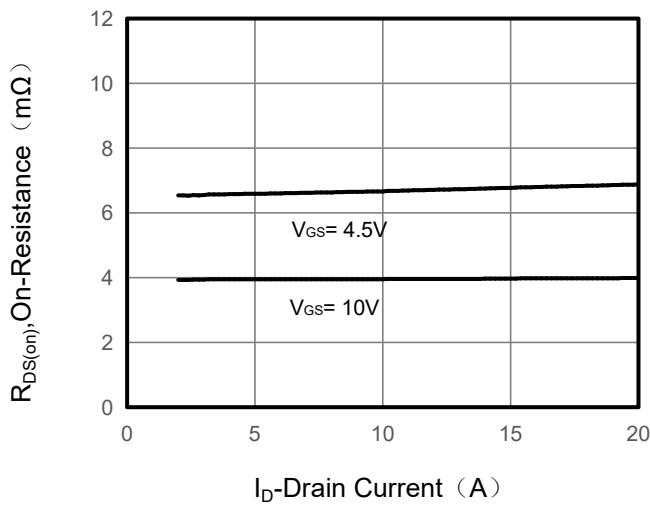


Figure 4. Gate Charge

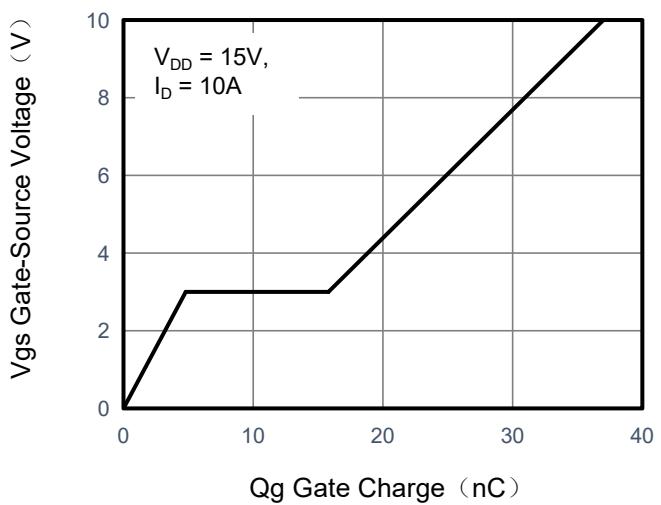


Figure 5. Capacitance

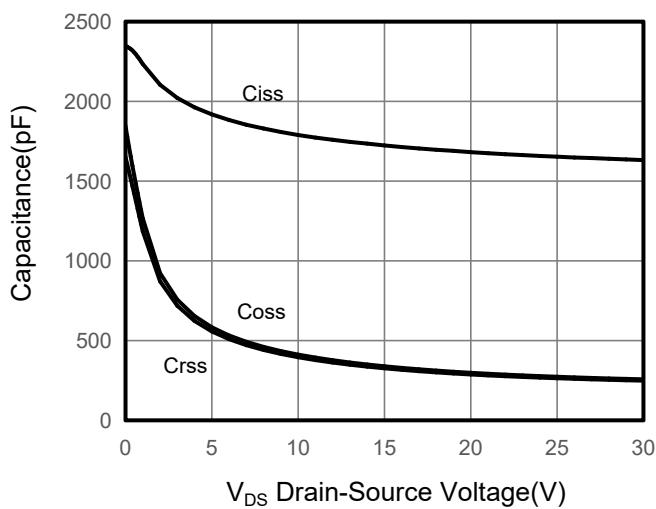
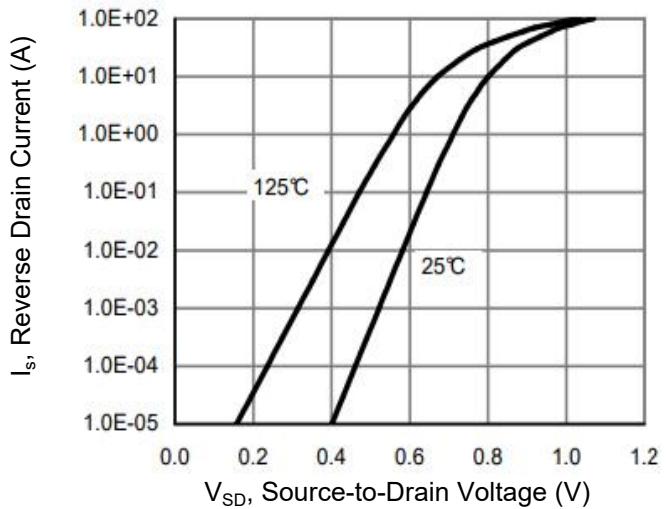


Figure 6. Source-Drain Diode Forward



Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 7. Drain-Source On-Resistance

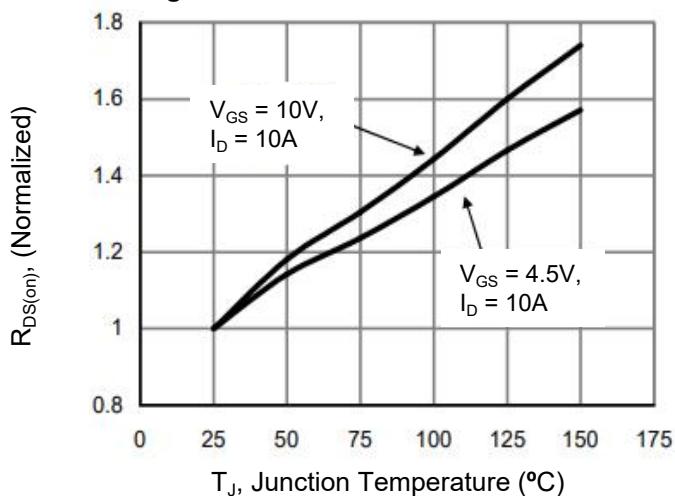


Figure 8. Safe Operation Area

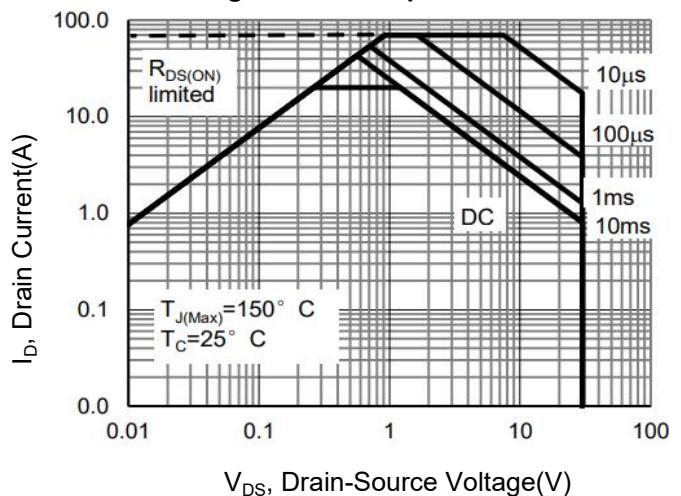


Figure 9. Normalized Maximum Transient Thermal Impedance

