

## N-Channel Enhancement Mode Power MOSFET

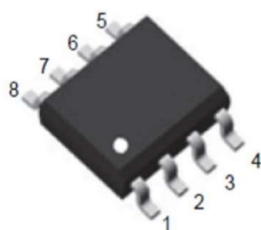
### Features

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

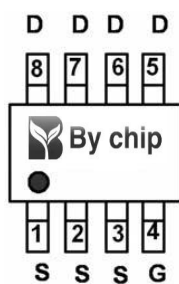
### General Features

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

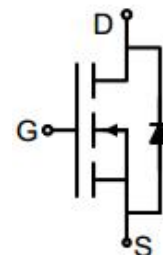
100% UIS TESTED!  
 100%  $\Delta V_{ds}$  TESTED!



SOP-8



pin assignment



Schematic diagram

### Absolute Maximum Ratings $T_C = 25^\circ\text{C}$ , 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                              | $V_{GS}$       | $\pm 20$   | 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 | $^\circ\text{C}$ |

### Thermal Resistance

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

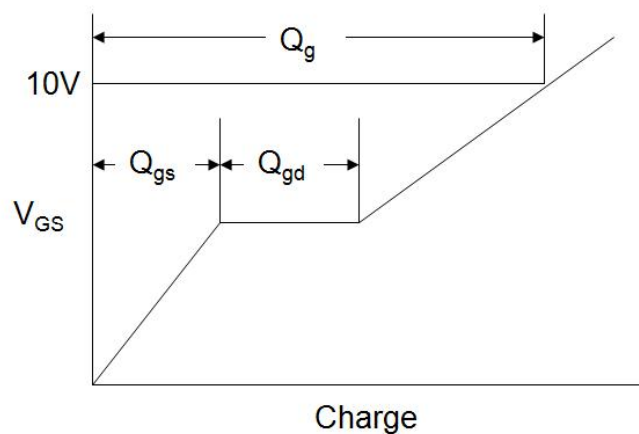
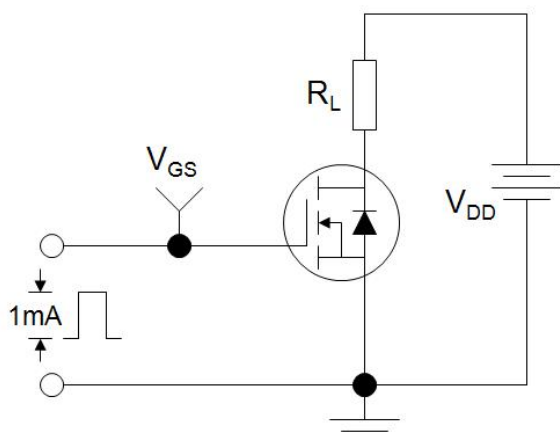
**Specifications**  $T_J = 25^{\circ}\text{C}$ , unless otherwise noted

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

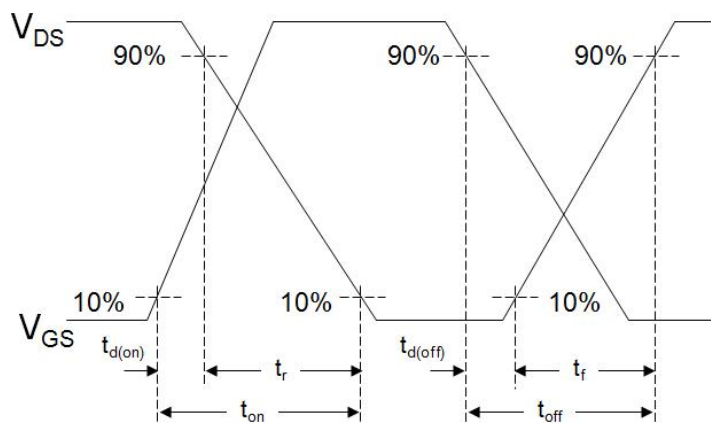
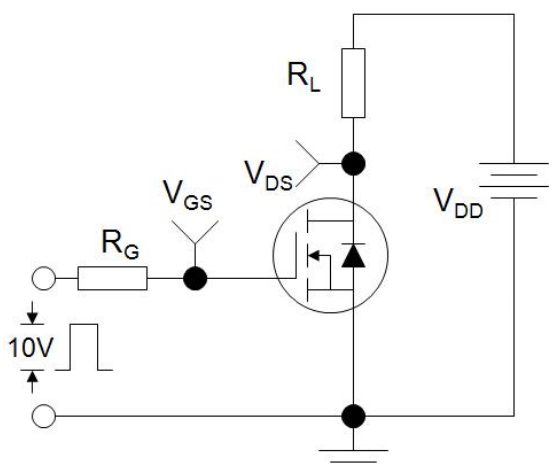
**Notes**

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

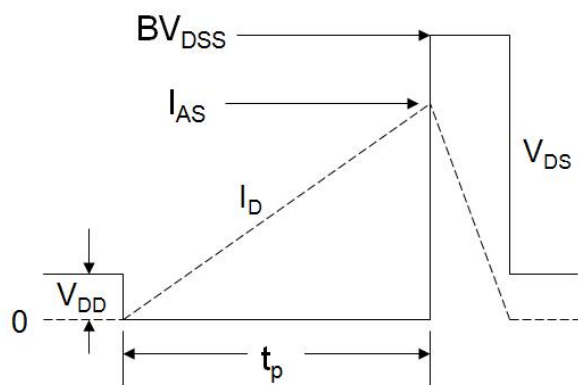
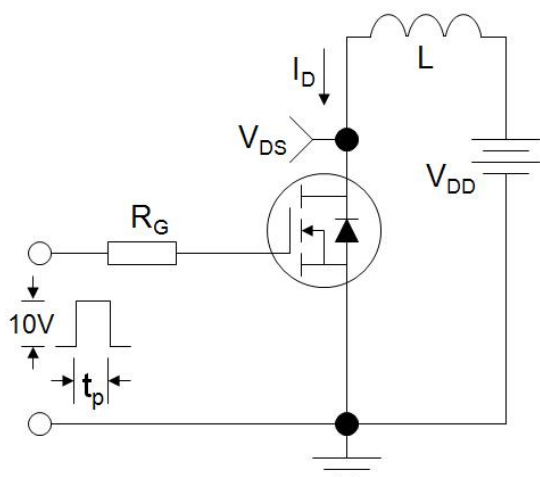
### Gate Charge Test Circuit



### Switch Time Test Circuit



### EAS Test Circuit



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

Figure 1. Output Characteristics

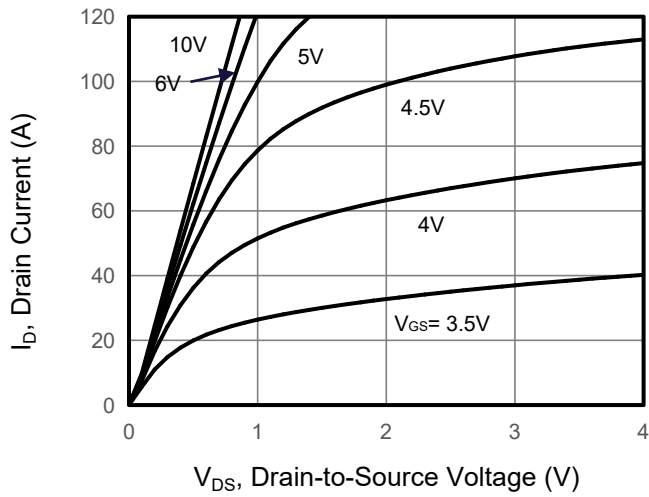


Figure 2. Transfer Characteristics

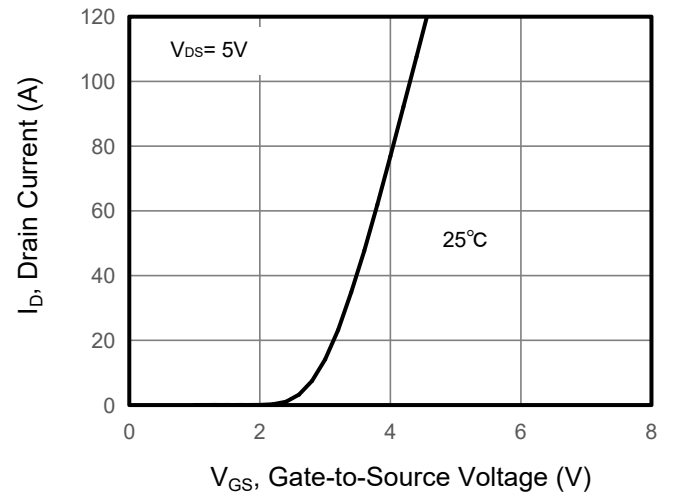


Figure 3. Drain Source On Resistance

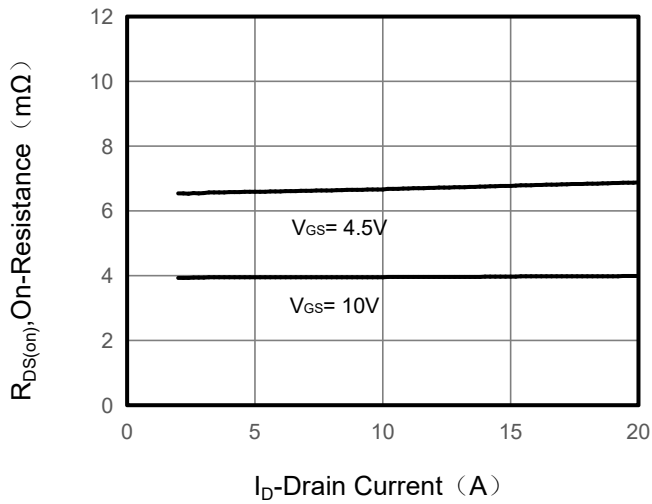


Figure 4. Gate Charge

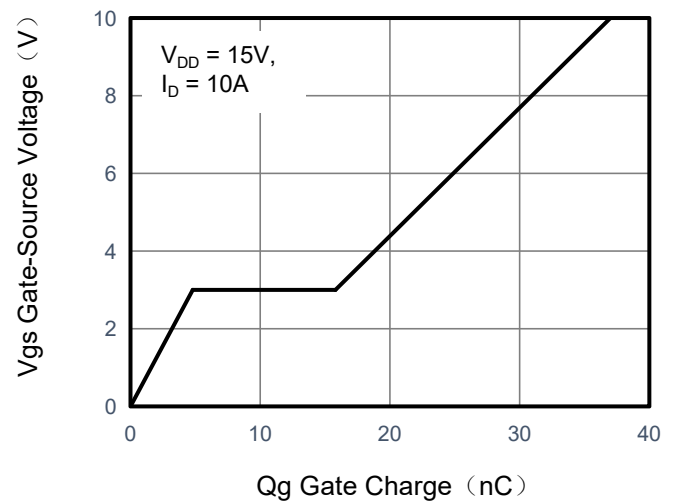


Figure 5. Capacitance

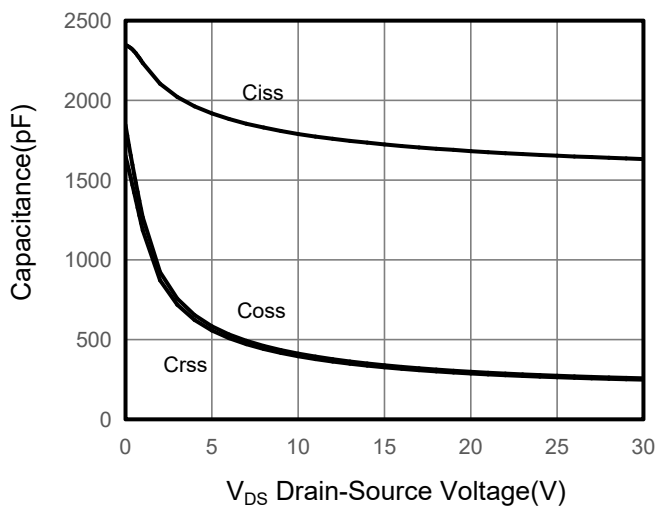
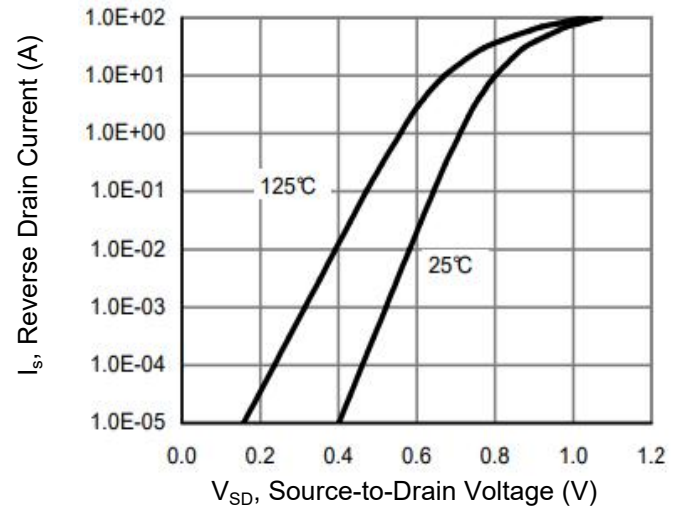
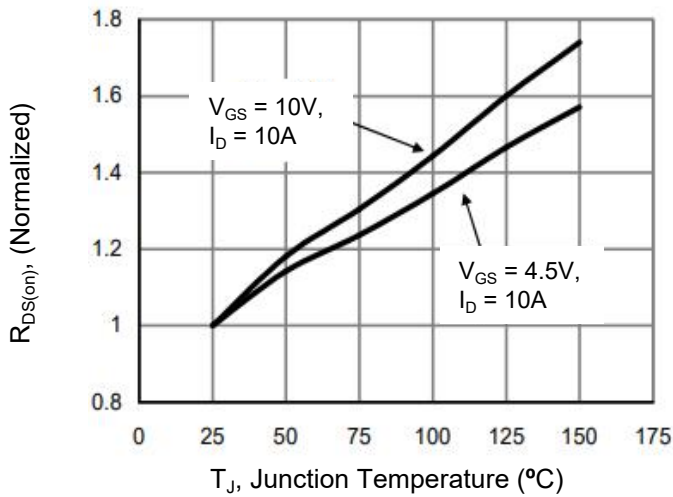


Figure 6. Source-Drain Diode Forward

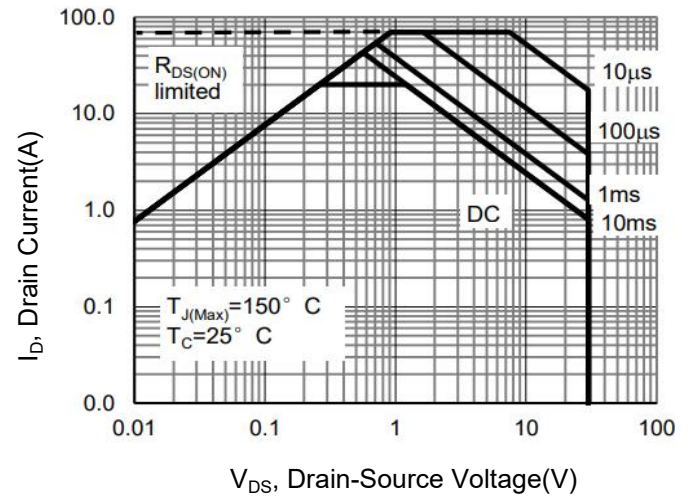


# Typical Characteristics $T_J = 25^\circ\text{C}$ , unless otherwise noted

## Figure 7. Drain-Source On-Resistance



## Figure 8. Safe Operation Area



## Figure 9. Normalized Maximum Transient Thermal Impedance

