

## Dual P-channel Enhancement Mode Power MOSFET

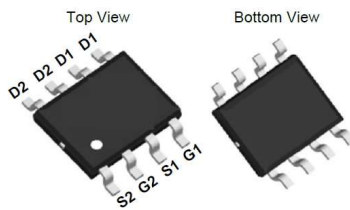
### Features

- $V_{DS} = -30V$ ,  $I_D = -9A$   
 $R_{DS(ON)} < 15m\Omega @ V_{GS} = -10V$   
 $R_{DS(ON)} < 20m\Omega @ V_{GS} = -4.5V$

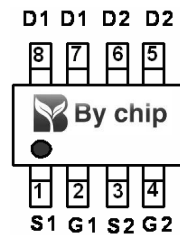
### General Features

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

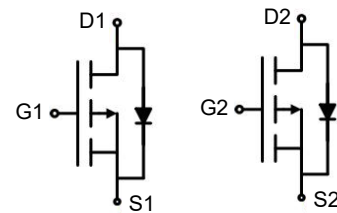
100% UIS TESTED!  
 100%  $\Delta V_{ds}$  TESTED!



SOP-8 (Dual)



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   | $I_D$          | -9         | A          |
| Pulsed Drain Current (note1)   | $I_{DM}$       | -36        | A          |
| Gate-Source Voltage  | $V_{GS}$       | $\pm 20$   | V          |
| Power Dissipation  | $P_D$          | 1.4        | W          |
| Operating Junction and Storage Temperature Range                     | $T_J, T_{stg}$ | -55 To 150 | $^\circ C$ |

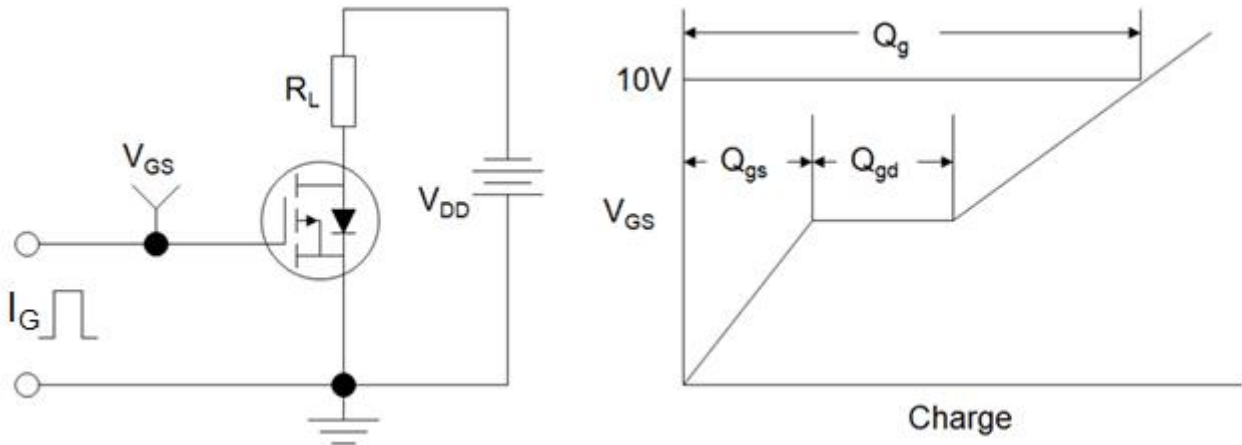
| Thermal Resistance                      |            |       |              |
|---|------------|-------|--------------|
| Parameter                               | Symbol     | Value | Unit         |
| Thermal Resistance, Junction-to-Ambient | $R_{thJA}$ | 90    | $^\circ C/W$ |

| Specifications $T_J = 25^\circ\text{C}$ , unless otherwise noted |               |   |       |      |           |            |
|--|---------------|---|-------|------|-----------|------------|
| Parameter  | Symbol        | Test Conditions                                       | Value |      |           | Unit       |
|  |               |   | Min.  | Typ. | Max.      |            |
| <b>Static Parameters</b>   |               |   |       |      |           |            |
| 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    |      | -3.0      | V          |
| Drain-Source On-Resistance                                       | $R_{DS(on)}$  | $V_{GS} = -10V, I_D = -5A$                            | --    |      | 15        | m $\Omega$ |
|  |               | $V_{GS} = -4.5V, I_D = -5A$                           | --    |      | 20        |            |
| Forward Transconductance   | $g_{FS}$      | $V_{DS} = -5V, I_D = -5A$                             | --    | 12   | --        | S          |
| <b>Dynamic Parameters</b>  |               |   |       |      |           |            |
| Input Capacitance  | $C_{iss}$     | $V_{GS} = 0V,$<br>$V_{DS} = -4.5V,$<br>$f = 1.0MHz$   | --    | 1786 | --        | pF         |
| Output Capacitance   | $C_{oss}$     |   | --    | 237  | --        |            |
| Reverse Transfer Capacitance                                     | $C_{rss}$     |   | --    | 208  | --        |            |
| Total Gate Charge  | $Q_g$         | $V_{DD} = -15V,$<br>$I_D = -4.5A,$<br>$V_{GS} = -10V$ | --    | 18   | --        | nC         |
| Gate-Source Charge   | $Q_{gs}$      |   | --    | 3.4  | --        |            |
| Gate-Drain Charge  | $Q_{gd}$      |   | --    | 3    | --        |            |
| Turn-on Delay Time   | $t_{d(on)}$   | $V_{DD} = -15V,$<br>$I_D = -4.5A,$<br>$R_G = 1\Omega$ | --    | 6    | --        | ns         |
| Turn-on Rise Time  | $t_r$         |   | --    | 3    | --        |            |
| Turn-off Delay Time  | $t_{d(off)}$  |   | --    | 21   | --        |            |
| Turn-off Fall Time   | $t_f$         |   | --    | 3    | --        |            |
| <b>Drain-Source Body Diode Characteristics</b>                   |               |   |       |      |           |            |
| Continuous Body Diode Current                                    | $I_S$         | $T_C = 25^\circ\text{C}$                              | --    | --   | -9        | A          |
| Body Diode Voltage   | $V_{SD}$      | $T_J = 25^\circ\text{C}, I_{SD} = -5A, V_{GS} = 0V$   | --    | --   | -1.2      | V          |
| Reverse Recovery Charge  | $Q_{rr}$      | $I_F = -4.5A, V_{GS} = 0V$<br>$di/dt = -500A/\mu s$   | --    | 13   | --        | nC         |
| Reverse Recovery Time  | $T_{rr}$      |   | --    | 8.5  | --        | ns         |

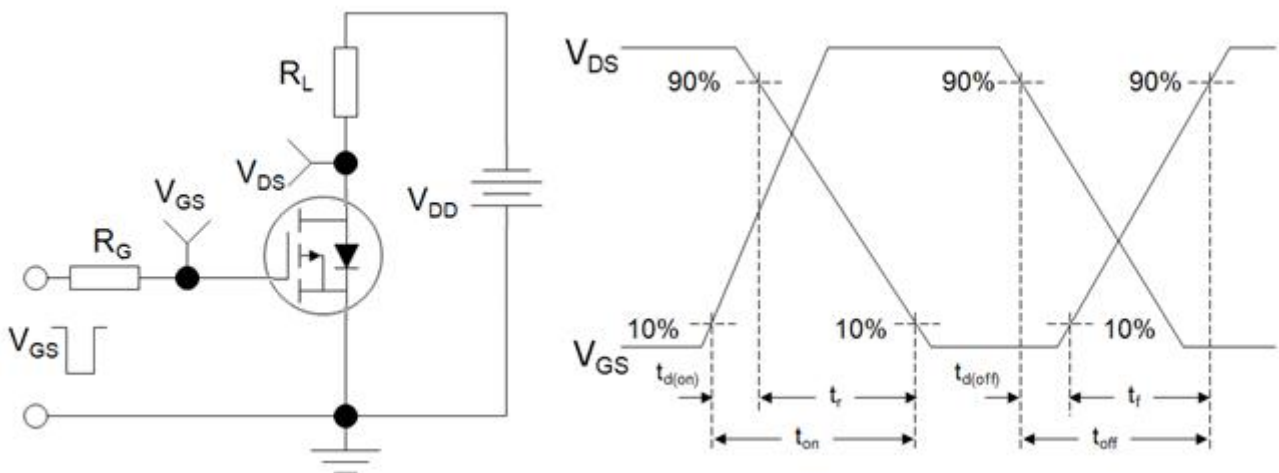
**Notes**

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Identical low side and high side switch with identical  $R_G$

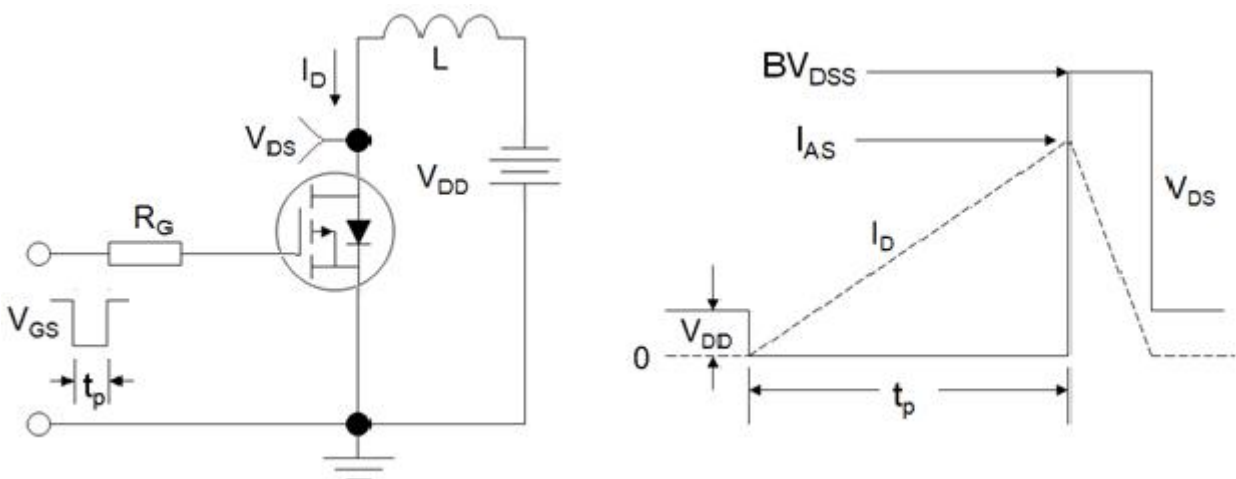
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



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

Figure 1. Output Characteristics

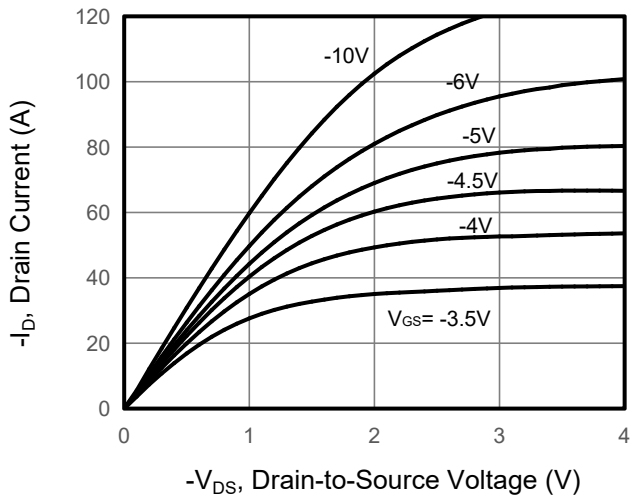


Figure 2. Transfer Characteristics

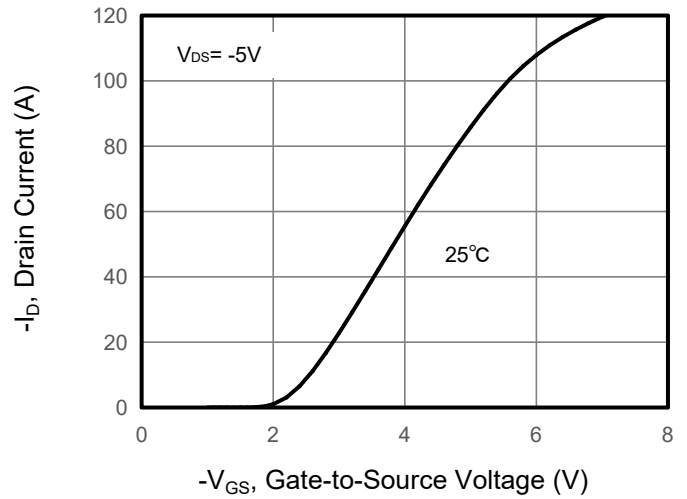


Figure 3. Drain Source On Resistance

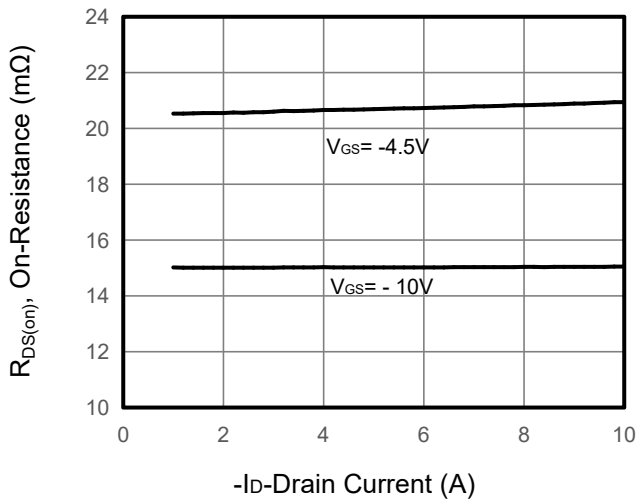


Figure 4. Gate Charge

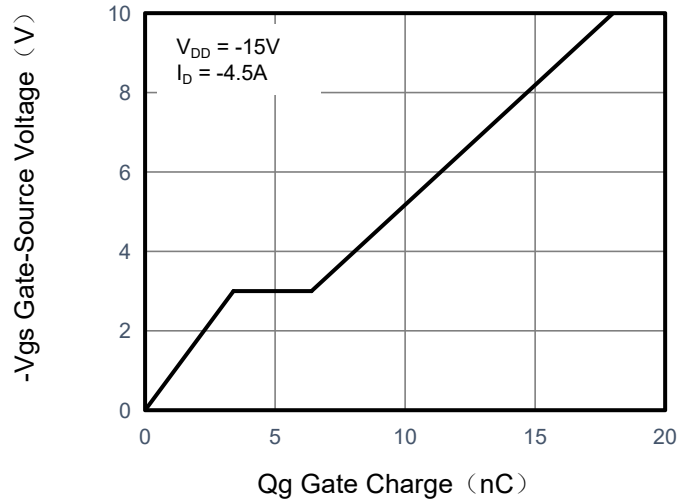


Figure 5. Capacitance

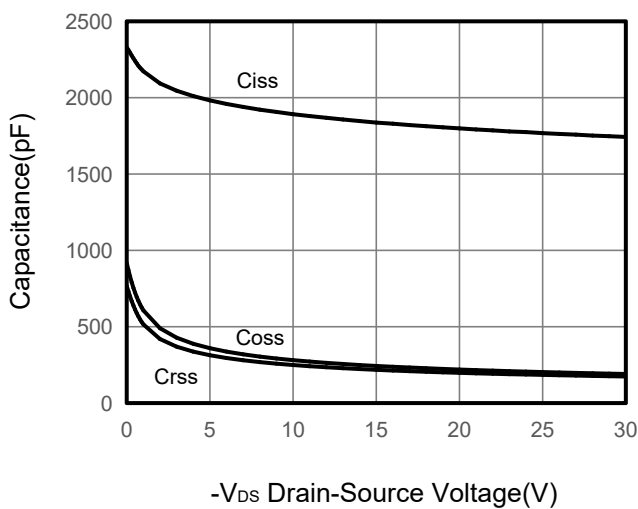
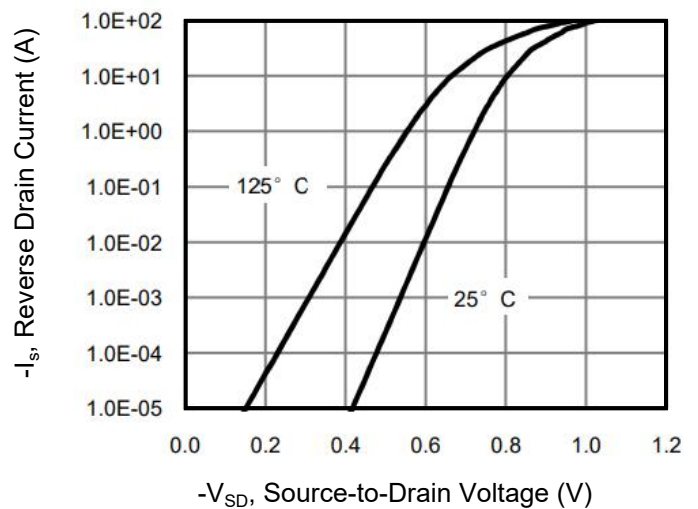


Figure 6. Source-Drain Diode Forward



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

Figure 7. Drain-Source On-Resistance

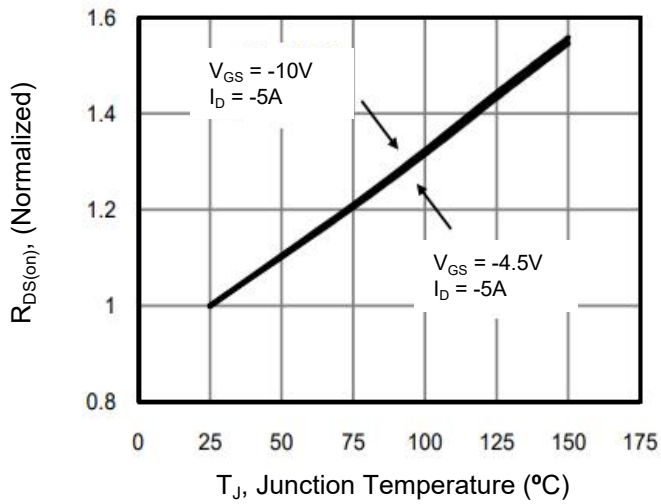


Figure 10. Safe Operation Area

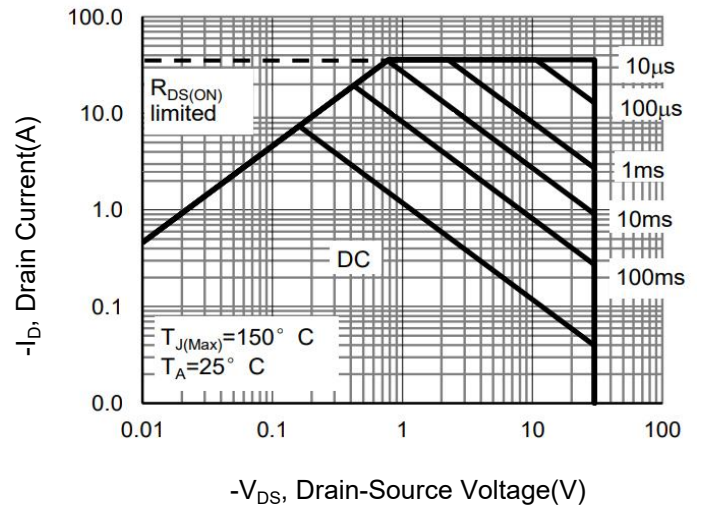


Figure 9. Normalized Maximum Transient Thermal Impedance

