

## Dual N-channel Enhancement Mode Power MOSFET

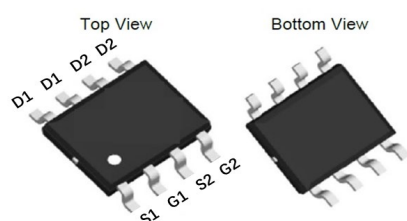
### Features

- $V_{DS} = 30V$ ,  $I_D = 6.5 A$   
 $R_{DS(ON)} < 25 m\Omega @ V_{GS} = 10V$   
 $R_{DS(ON)} < 27 m\Omega @ V_{GS} = 4.5V$

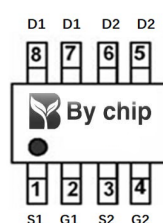
### General Features

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

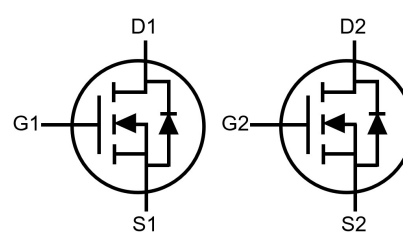
100% UIS TESTED!  
100%  $\Delta V_{ds}$  TESTED!



SOP-8 (Dual)



Pin Assignment



Schematic diagram

### Absolute Maximum Ratings ( $T_A = 25^\circ C$ unless otherwise noted)

| Parameter                                        | ymbol              | Limit      | Unit       |
|--------------------------------------------------|--------------------|------------|------------|
| Drain-Source Voltage                             | $V_{DS}$           | 30         |            |
| Gate-Source Voltage                              | $V_{GS}$           | $\pm 12$   |            |
| Drain Current-Continuous                         | $I_D$              | 6.5        |            |
| Drain Current-Continuous( $T_C = 100^\circ C$ )  | $I_D(100^\circ C)$ | 4.         | A          |
| Pulsed Drain Current                             | $I_{DM}$           | 26         |            |
| Maximum Power Dissipation                        | $P_D$              | 2          |            |
| Operating Junction and Storage Temperature Range | $T_J, T_{STG}$     | -55 To 150 | $^\circ C$ |

### Thermal Characteristic

| Parameter                                                   | ymbol           | Typ  | Max | Unit         |
|-------------------------------------------------------------|-----------------|------|-----|--------------|
| Thermal Resistance, Junction-to-Ambient <sup>(Note 2)</sup> | $R_{\theta JA}$ | 62.5 | 85  | $^\circ C/W$ |

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

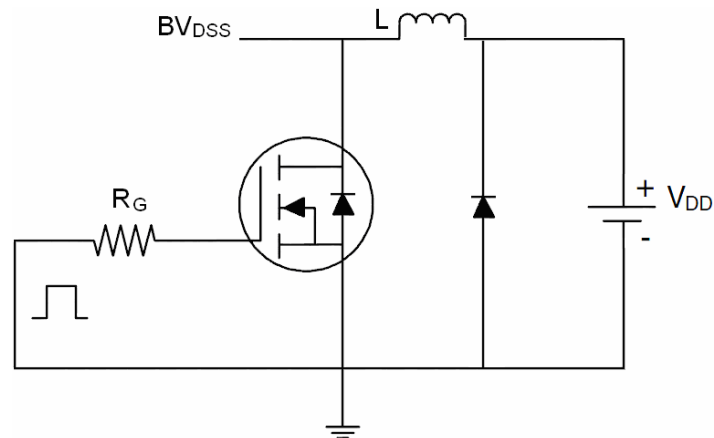
| Parameter                                     | Symbol              | Condition                                                                            | Min | Typ | Max  | Unit |
|-----------------------------------------------|---------------------|--------------------------------------------------------------------------------------|-----|-----|------|------|
| Off Characteristics                           |                     |                                                                                      |     |     |      |      |
| Drain-Source Breakdown Voltage                | BV <sub>DSS</sub>   | V <sub>GS</sub> =0V I <sub>D</sub> =250μA                                            | 30  | -   | -    | V    |
| Zero Gate Voltage Drain Current               | I <sub>DSS</sub>    | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V                                            | -   | -   | 1    | μA   |
| Gate-Body Leakage Current                     | I <sub>GSS</sub>    | V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V                                           | -   | -   | ±100 | nA   |
| On Characteristics <sup>(Note 3)</sup>        |                     |                                                                                      |     |     |      |      |
| Gate Threshold Voltage                        | V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                             | 0.5 |     | 2.0  | V    |
| Drain-Source On-State Resistance              | R <sub>DS(ON)</sub> | V <sub>GS</sub> =10V, I <sub>D</sub> =5A                                             | -   |     | 25   | mΩ   |
|                                               |                     | V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A                                            | -   |     | 27   |      |
|                                               |                     | V <sub>GS</sub> =2.5V, I <sub>D</sub> =5A                                            | -   |     | 33   |      |
| Forward Transconductance                      | g <sub>FS</sub>     | V <sub>DS</sub> =5V, I <sub>D</sub> =5A                                              | -   | 10  | -    | S    |
| Dynamic Characteristics <sup>(Note4)</sup>    |                     |                                                                                      |     |     |      |      |
| Input Capacitance                             | C <sub>ISS</sub>    | V <sub>DS</sub> =15V, V <sub>GS</sub> =0V,<br>F=1.0MHz                               | -   | 595 | -    | PF   |
| Output Capacitance                            | C <sub>OSS</sub>    |                                                                                      | -   | 39  | -    | PF   |
| Reverse Transfer Capacitance                  | C <sub>RSS</sub>    |                                                                                      | -   | 36  | -    | PF   |
| Switching Characteristics <sup>(Note 4)</sup> |                     |                                                                                      |     |     |      |      |
| Turn-on Delay Time                            | t <sub>d(on)</sub>  | V <sub>DD</sub> =15V, R <sub>L</sub> =3Ω<br>V <sub>GS</sub> =10V, R <sub>G</sub> =3Ω | -   | 3.0 | -    | nS   |
| Turn-on Rise Time                             | t <sub>r</sub>      |                                                                                      | -   | 4.5 | -    | nS   |
| Turn-Off Delay Time                           | t <sub>d(off)</sub> |                                                                                      | -   | 25  | -    | nS   |
| Turn-Off Fall Time                            | t <sub>f</sub>      |                                                                                      | -   | 3.8 | -    | nS   |
| Total Gate Charge                             | Q <sub>g</sub>      | V <sub>DS</sub> =15V, I <sub>D</sub> =5A,<br>V <sub>GS</sub> =4.5V                   | -   | 9.3 | -    | nC   |
| Gate-Source Charge                            | Q <sub>gs</sub>     |                                                                                      | -   | 1.6 | -    | nC   |
| Gate-Drain Charge                             | Q <sub>gd</sub>     |                                                                                      | -   | 2.1 | -    | nC   |
| Drain-Source Diode Characteristics            |                     |                                                                                      |     |     |      |      |
| Diode Forward Voltage <sup>(Note 3)</sup>     | V <sub>SD</sub>     | V <sub>GS</sub> =0V, I <sub>S</sub> =5A                                              | -   | -   | 1.2  | V    |
| Diode Forward Current <sup>(Note 2)</sup>     | I <sub>S</sub>      |                                                                                      | -   | -   | 6.5  | A    |

### Notes:

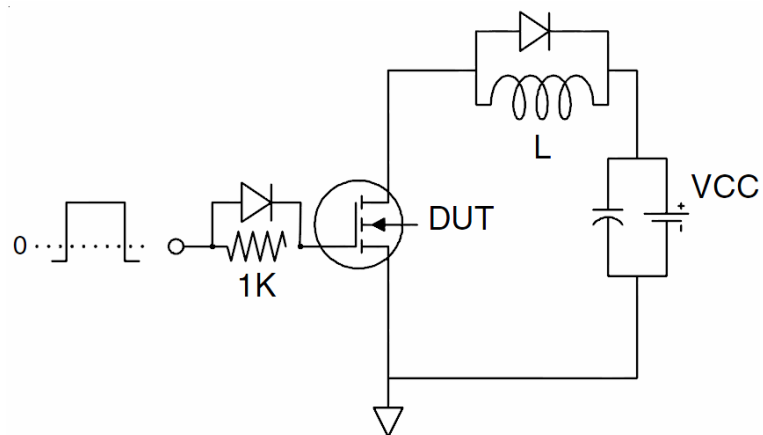
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^{\circ}\text{C}$ . The value in any given application depends on the user's specific board design. Surface Mounted on FR4 Board,  $t \leq 10$  sec. The current rating is based on the  $t \leq 10s$  thermal resistance rating.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production.

## Test Circuit

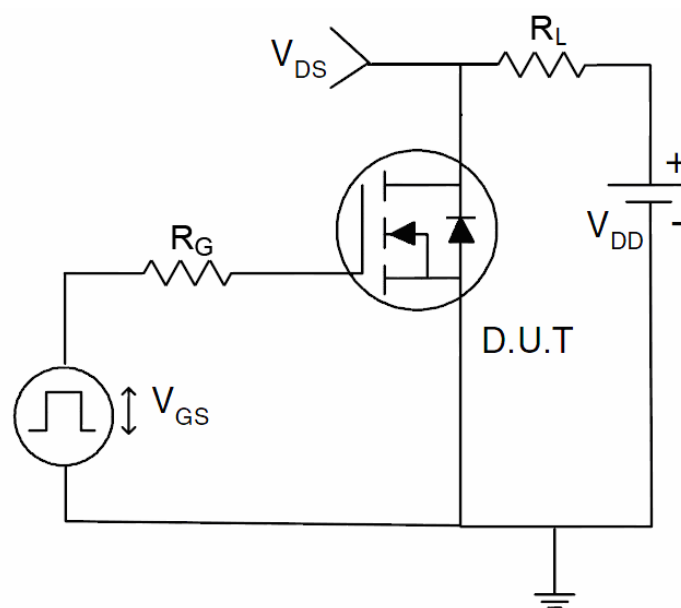
### 1) $E_{AS}$ Test Circuits



### 2) Gate Charge Test Circuit:



### 3) Switch Time Test Circuit:



## Typical Electrical and Thermal Characteristics (Curves)

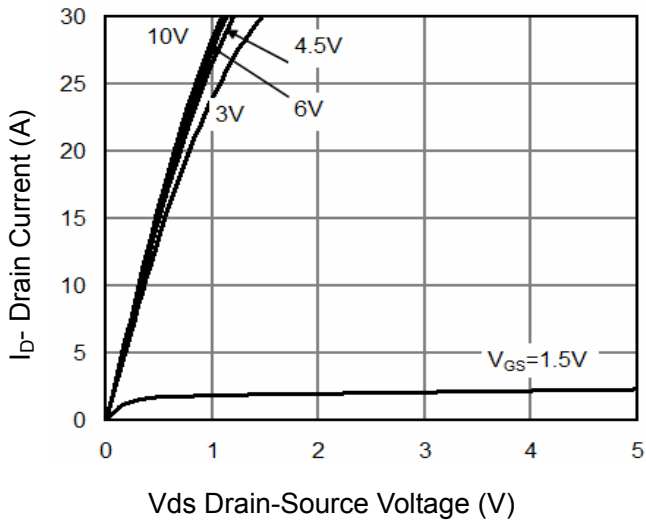


Figure 1 Output Characteristics

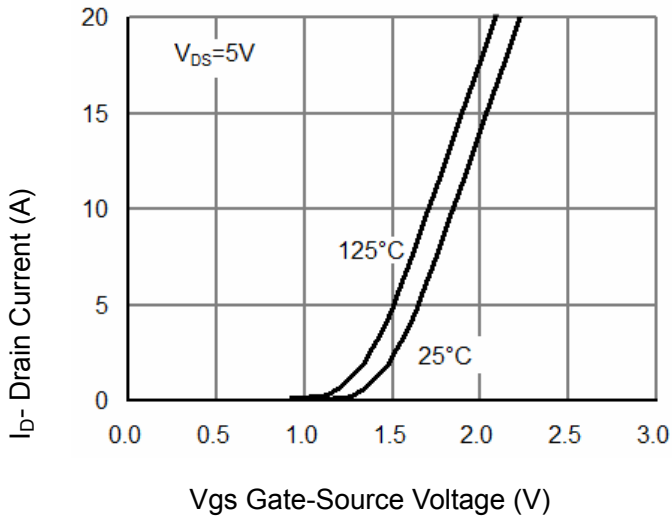


Figure 2 Transfer Characteristics

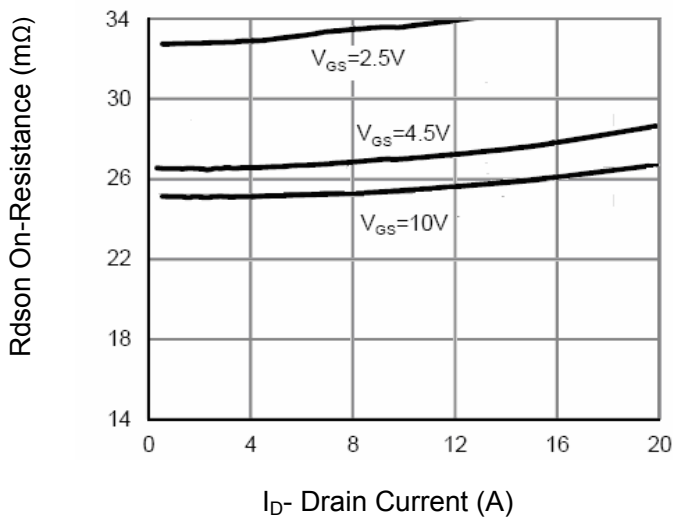


Figure 3  $R_{DS(on)}$ - Drain Current

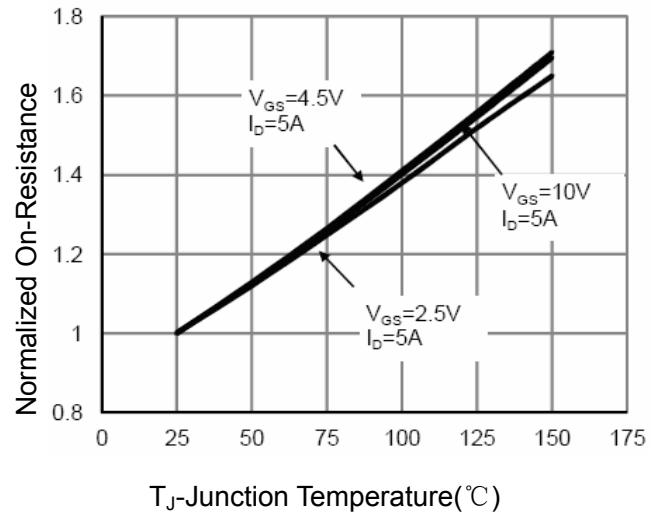


Figure 4  $R_{DS(on)}$ -Junction Temperature

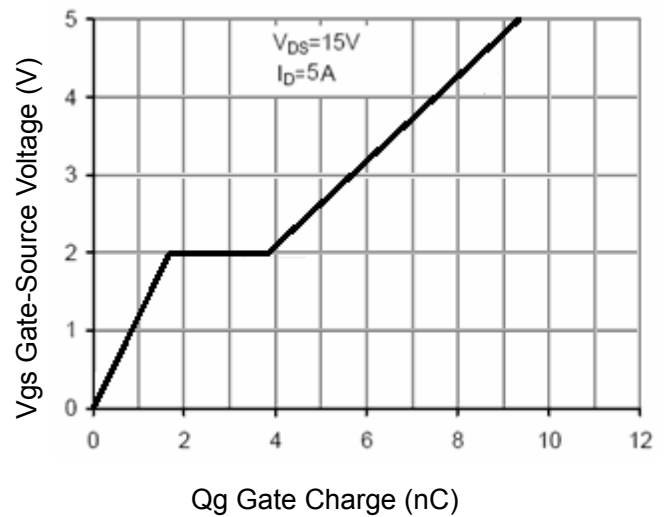


Figure 5 Gate Charge

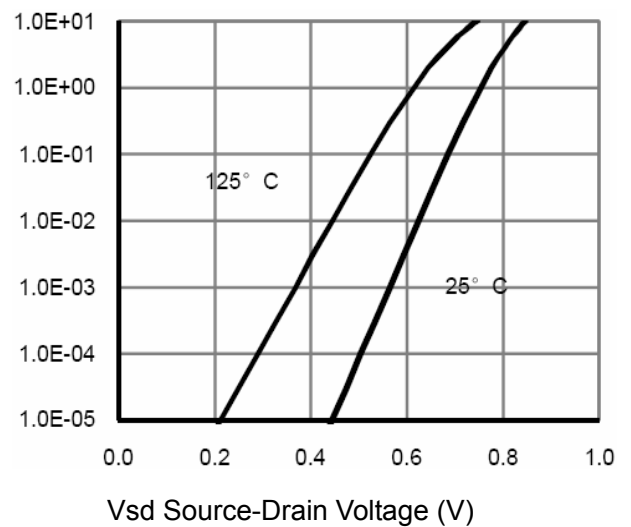


Figure 6 Source- Drain Diode Forward

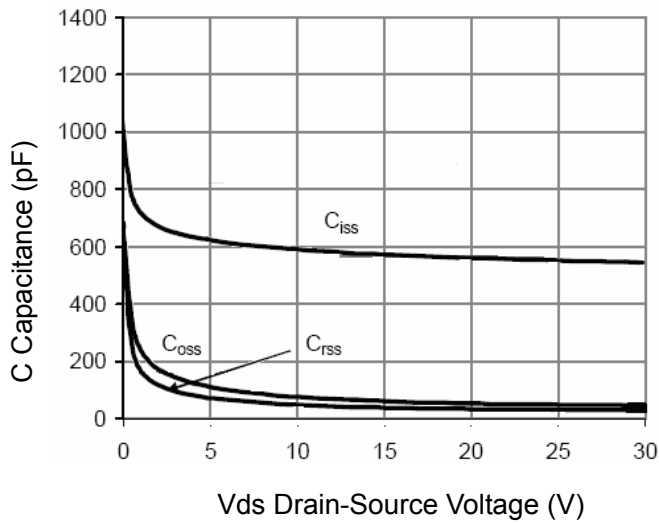


Figure 7 Capacitance vs Vds

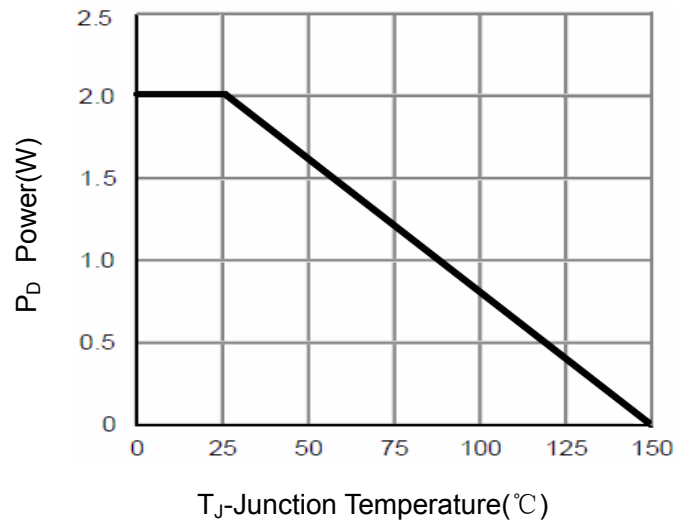


Figure 9 Power Dissipation

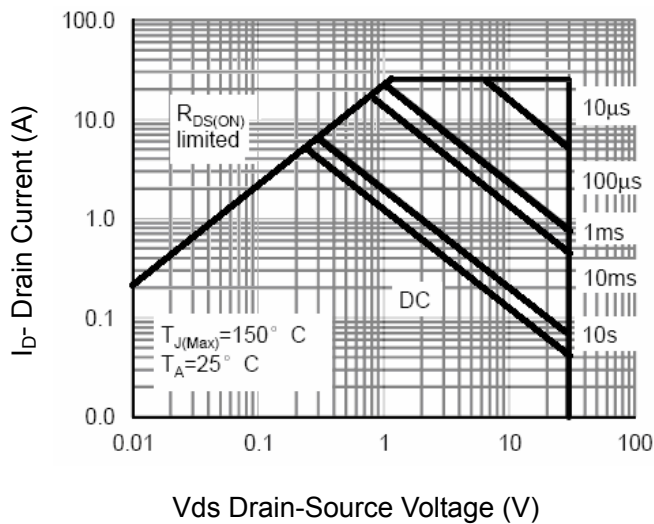


Figure 8 Safe Operation Area

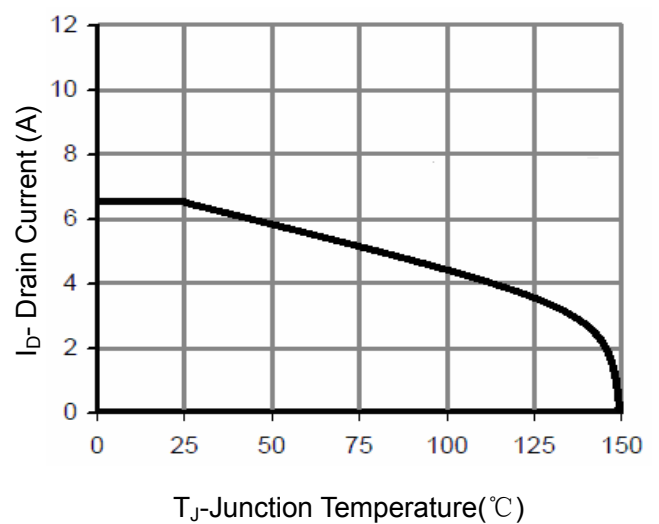


Figure 10 Current De-rating

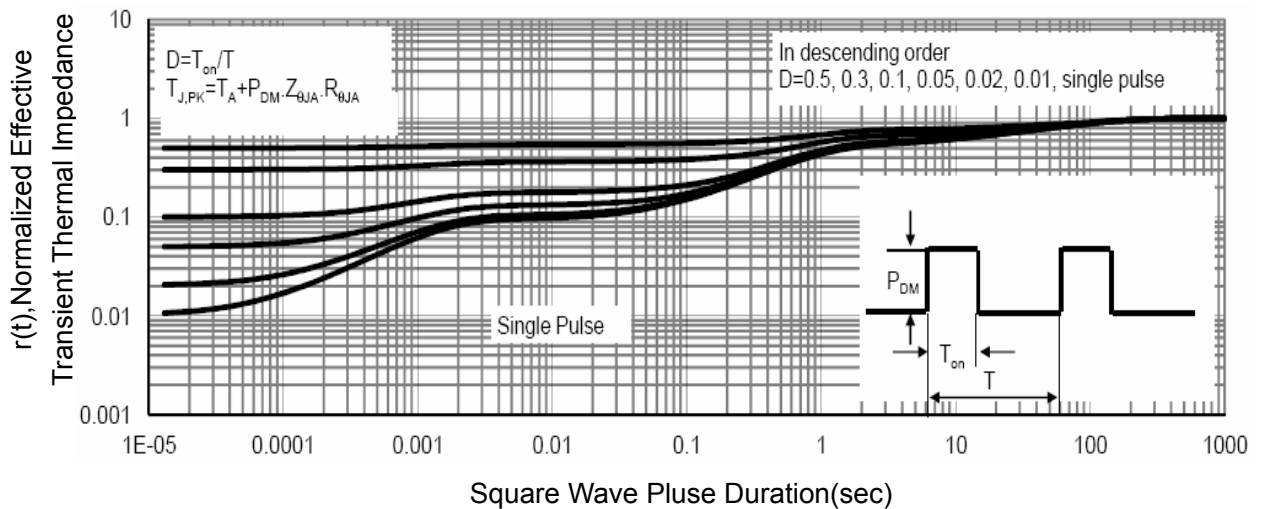


Figure 11 Normalized Maximum Transient Thermal Impedance