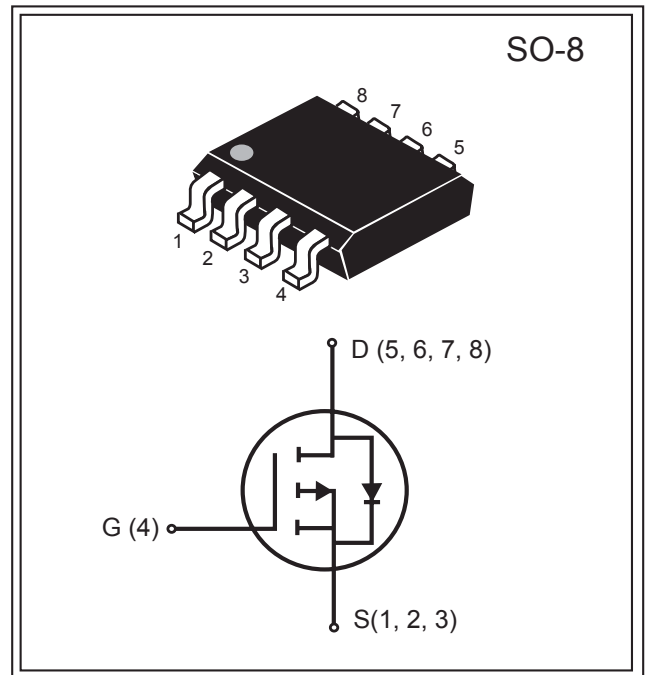




| Product Summary     |                    |                               |
|---------------------|--------------------|-------------------------------|
| V <sub>DS</sub> (V) | I <sub>D</sub> (A) | R <sub>DS(ON)</sub> (mΩ) Max  |
| - 30V               | - 5.5A             | 70 @V <sub>GS</sub> = - 10V   |
|                     |                    | 125 @V <sub>GS</sub> = - 5V   |
|                     |                    | 145 @V <sub>GS</sub> = - 4.5V |



### FEATURES

- ◆ Super high dense cell design for low R<sub>DS(ON)</sub>.
- ◆ Rugged and reliable.
- ◆ Surface Mount package.

### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25°C unless otherwise noted)

| Parameter   | Symbol                            | Limit       | Unit |
|---|-----------------------------------|-------------|------|
| Drain-Source Voltage                              | V <sub>DS</sub>                   | - 30        | V    |
| Gate-Source Voltage                               | V <sub>GS</sub>                   | ± 25        | V    |
| Drain Current-Continuous @ T <sub>J</sub> = 125°C | I <sub>D</sub>                    | - 5.5       | A    |
| -Pulsed <sup>b</sup>                              | I <sub>DM</sub>                   | - 25        | A    |
| Drain-Source Diode Forward Current <sup>a</sup>   | I <sub>S</sub>                    | - 1.5       | A    |
| Maximum Power Dissipation <sup>a</sup>            | P <sub>D</sub>                    | 2.5         | W    |
| Operating Junction and Storage Temperature Range  | T <sub>J</sub> , T <sub>STG</sub> | - 55 to 150 | °C   |

### THERMAL CHARACTERISTICS

|  |                  |    |      |
|--|------------------|----|------|
| Thermal Resistance, Junction-to-Ambient <sup>a</sup> | R <sub>θJA</sub> | 50 | °C/W |
|--|------------------|----|------|

South Sea Semiconductor reserves the right to make changes to improve reliability or manufacturability without advance notice.

South Sea Semiconductor, October 2007 (Rev 2.2)



| P-Channel Electrical Characteristics (TA = 25°C unless otherwise noted) |                     |   |      |                  |       |      |
|---|---------------------|---|------|------------------|-------|------|
| Parameter   | Symbol              | Condition   | Min  | Typ <sup>c</sup> | Max   | Unit |
| Drain-Source Breakdown Voltage  | BV <sub>DSS</sub>   | V <sub>GS</sub> =0V, I <sub>D</sub> = - 250 μA  | - 30 |                  |       | V    |
| Zero Gate Voltage Drain Current   | I <sub>DSS</sub>    | V <sub>DS</sub> = - 24V, V <sub>GS</sub> =0V  |      |                  | - 1   | μA   |
| Gate-Body Leakage   | I <sub>GSS</sub>    | V <sub>GS</sub> = ±25V, V <sub>DS</sub> =0V   |      |                  | ±100  | nA   |
| Gate Threshold Voltage  | V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> = - 250 μA  | - 1  | - 1.9            | - 2.5 | V    |
| Drain-Source On-State Resistance  | R <sub>DS(ON)</sub> | V <sub>GS</sub> = - 10V, I <sub>D</sub> = - 5.0A  |      | 60               | 70    | mΩ   |
|   |                     | V <sub>GS</sub> = - 5V, I <sub>D</sub> = - 3.0A   |      | 115              | 125   |      |
|   |                     | V <sub>GS</sub> = - 4.5V, I <sub>D</sub> = - 1.8A   |      | 130              | 145   |      |
| On-State Drain Current  | I <sub>D(ON)</sub>  | V <sub>DS</sub> = - 5V, V <sub>GS</sub> = - 10V   | - 20 |                  |       | A    |
| Forward Transconductance  | g <sub>FS</sub>     | V <sub>DS</sub> = - 15V, I <sub>D</sub> = - 5.5A  |      | 6                |       | S    |
| Input Capacitance   | C <sub>ISS</sub>    | V <sub>DS</sub> = - 15V   |      | 450              |       | pF   |
| Output Capacitance  | C <sub>OSS</sub>    | V <sub>GS</sub> =0V   |      | 110              |       |      |
| Reverse Transfer Capacitance  | C <sub>RSS</sub>    | f=1.0MHz  |      | 60               |       |      |
| Turn-On Delay Time  | t <sub>D(ON)</sub>  | V <sub>DD</sub> = - 15V,<br>I <sub>D</sub> = - 1A,<br>V <sub>GEN</sub> = - 10V,<br>R <sub>GEN</sub> =6Ω,<br>R <sub>L</sub> =15Ω |      | 8                |       | ns   |
| Rise Time   | t <sub>r</sub>      |   |      | 7                |       |      |
| Turn-Off Delay Time   | t <sub>D(OFF)</sub> |   |      | 35               |       |      |
| Fall Time   | t <sub>f</sub>      |   |      | 23               |       |      |
| Total Gate Charge   | Q <sub>g</sub>      | V <sub>DS</sub> = - 15V, I <sub>D</sub> = - 5.5A, V <sub>GS</sub> = - 10V   |      | 9                |       | nC   |
|   |                     | V <sub>DS</sub> = - 15V, I <sub>D</sub> = - 5.5A, V <sub>GS</sub> = - 4.5V  |      | 5                |       |      |
| Gate-Source Charge  | Q <sub>gs</sub>     | V <sub>DS</sub> = - 15V,<br>I <sub>D</sub> = - 5.5A,<br>V <sub>GS</sub> = - 10V   |      | 1.5              |       |      |
| Gate-Drain Charge   | Q <sub>gd</sub>     |   |      | 2.5              |       |      |
| Diode Forward Voltage   | V <sub>SD</sub>     | V <sub>GS</sub> =0V, I <sub>D</sub> = - 1.0A  |      | - 0.8            | - 1.2 | V    |

Notes :

- a. Surface Mounted on FR4 Board, t ≤ 10 sec.
- b. Pulse Test : Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.
- c. Guaranteed by design, not subject to production testing.

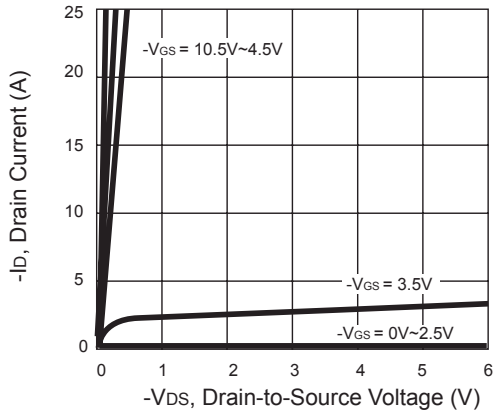


Figure 1. Output Characteristics

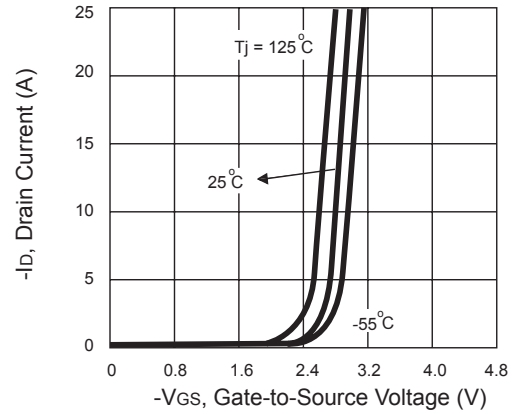


Figure 2. Transfer Characteristics

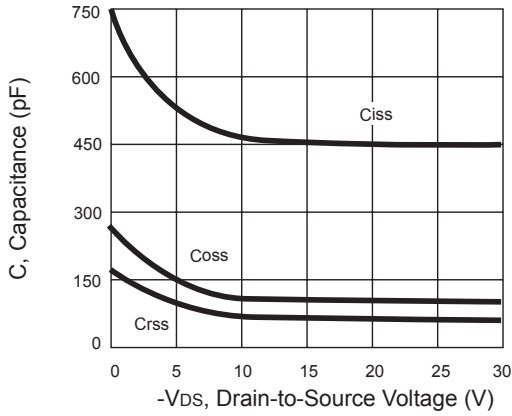


Figure 3. Capacitance

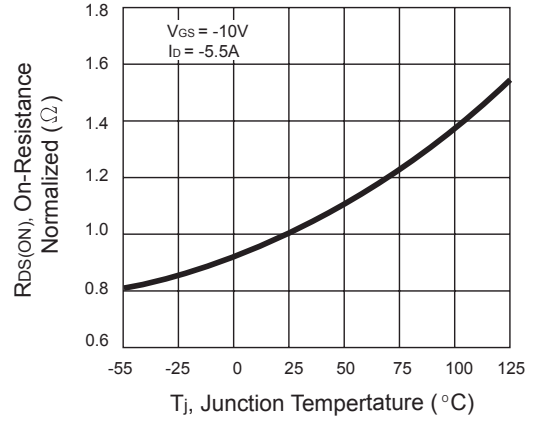


Figure 4. On-Resistance Variation with Temperature

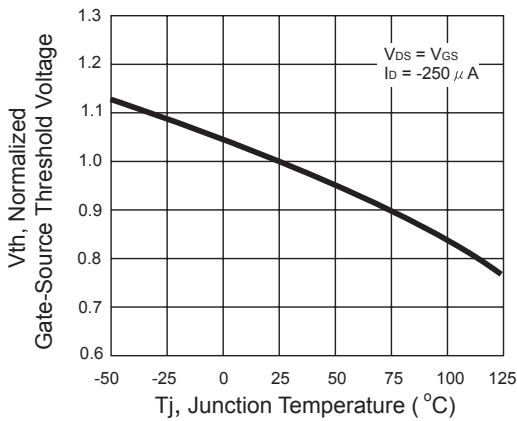


Figure 5. Gate Threshold Variation with Temperature

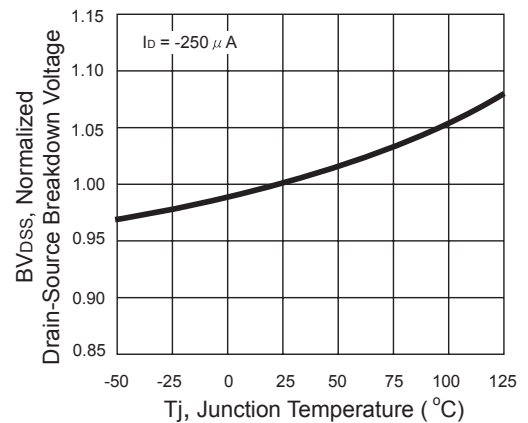
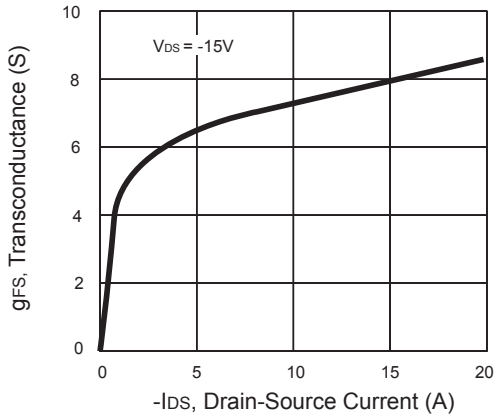
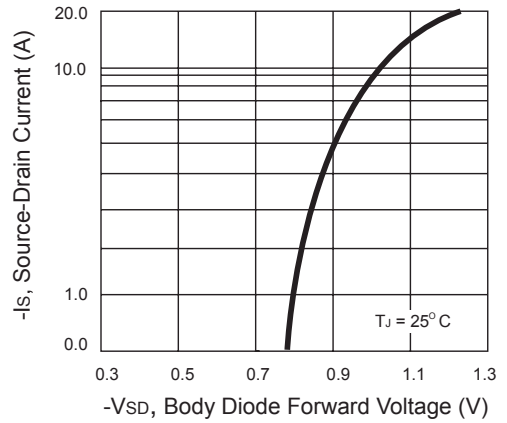


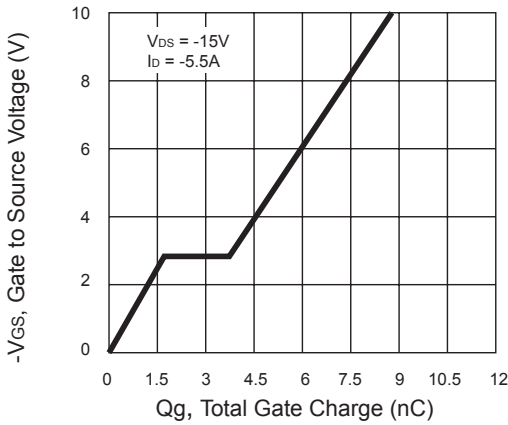
Figure 6. Breakdown Voltage Variation with Temperature



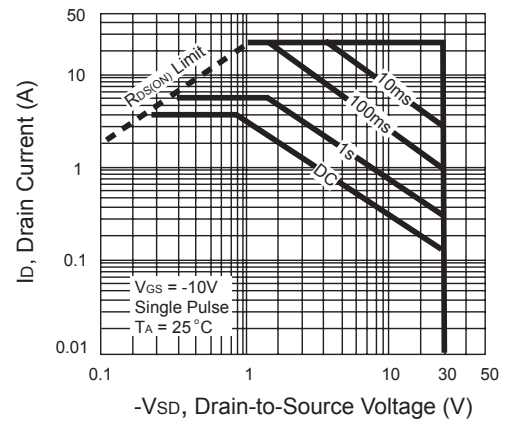
**Figure 7. Transconductance Variation with Drain Current**



**Figure 8. Body Diode Forward Voltage Variation with Source Current**



**Figure 9. Gate Charge**



**Figure 10. Maximum Safe Operating Area**

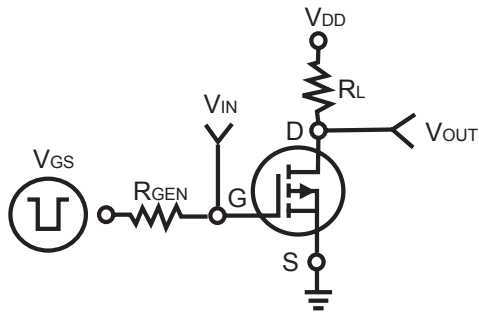


Figure 11. Switching Test Circuit

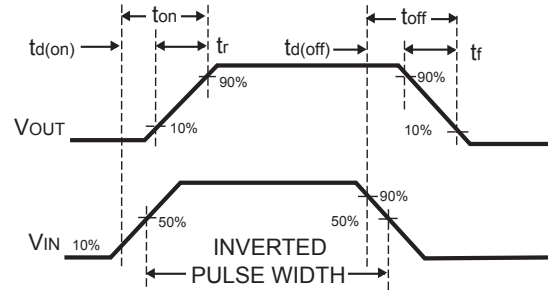


Figure 12. Switching Waveforms

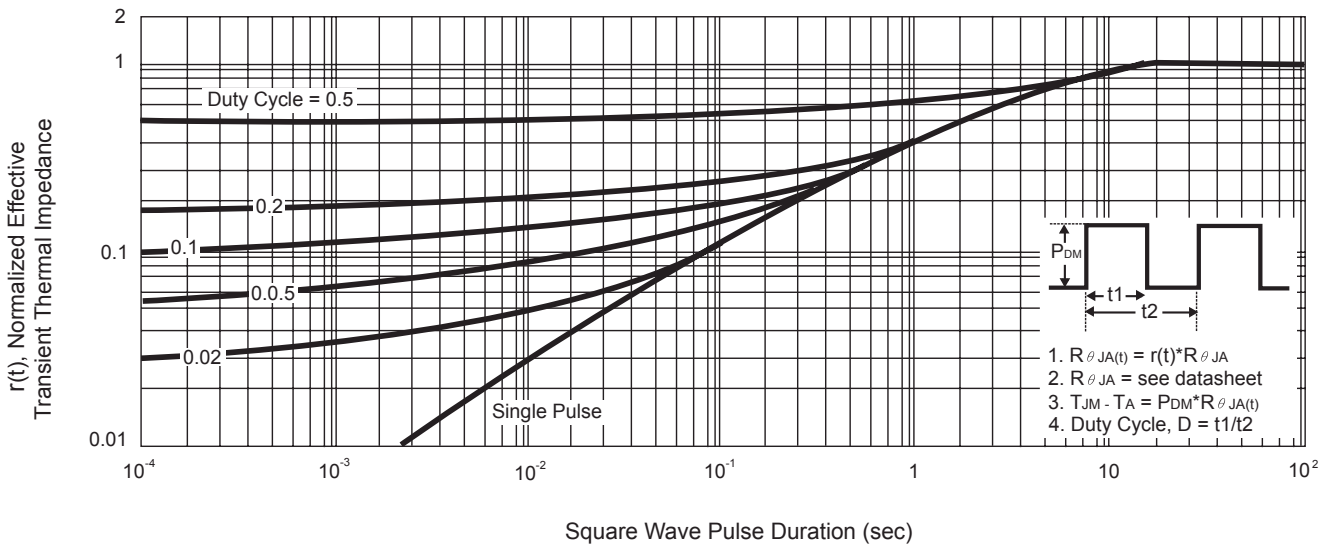


Figure 13. Normalized Thermal Transient Impedance Curve