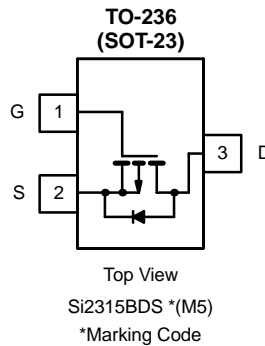




## P-Channel 1.25-W, 1.8-V (G-S) MOSFET

**TrenchFET®**  
Power MOSFETs  
1.8-V Rated

| PRODUCT SUMMARY |                           |           |
|-----------------|---------------------------|-----------|
| $V_{DS}$ (V)    | $r_{DS(on)}$ ( $\Omega$ ) | $I_D$ (A) |
| -12             | 0.050 @ $V_{GS} = -4.5$ V | -3.2      |
|                 | 0.065 @ $V_{GS} = -2.5$ V | -2.8      |
|                 | 0.100 @ $V_{GS} = -1.8$ V | -2.6      |



| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED) |                          |            |              |                  |   |
|---|--------------------------|------------|--------------|------------------|---|
| Parameter   | Symbol                   | 5 sec      | Steady State | Unit             |   |
| Drain-Source Voltage  | $V_{DS}$                 | -20        |              | V                |   |
| Gate-Source Voltage   | $V_{GS}$                 | $\pm 8$    |              |                  |   |
| Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>         | $T_A = 25^\circ\text{C}$ | $I_D$      | -3.2         | -2.8             | A |
|   | $T_A = 70^\circ\text{C}$ |            | -2.4         | -2.1             |   |
| Pulsed Drain Current <sup>a</sup>   |                          | $I_{DM}$   | -12          |                  |   |
| Continuous Source Current (Diode Conduction) <sup>a</sup>                   |                          | $I_S$      | -0.65        | -0.45            |   |
| Power Dissipation <sup>a</sup>  | $T_A = 25^\circ\text{C}$ | $P_D$      | 0.77         | 0.57             | W |
|   | $T_A = 70^\circ\text{C}$ |            | 0.42         | 0.31             |   |
| Operating Junction and Storage Temperature Range                            | $T_J, T_{stg}$           | -55 to 150 |              | $^\circ\text{C}$ |   |

| THERMAL RESISTANCE RATINGS               |                 |            |         |      |                    |
|--|-----------------|------------|---------|------|--------------------|
| Parameter                                | Symbol          | Typical    | Maximum | Unit |                    |
| Maximum Junction-to-Ambient <sup>a</sup> | $t \leq 5$ sec. | $R_{thJA}$ | 115     | 140  | $^\circ\text{C/W}$ |
|  | Steady State    |            | 140     | 175  |                    |
| Maximum Junction-to-Foot (Drain)         | Steady State    | $R_{thJF}$ | 60      | 75   |                    |

Notes

- a. Surface Mounted on FR4 Board.
- b.  $t \leq 5$  sec.

For SPICE model information via the Worldwide Web: <http://www.vishay.com/www/product/spice.htm>

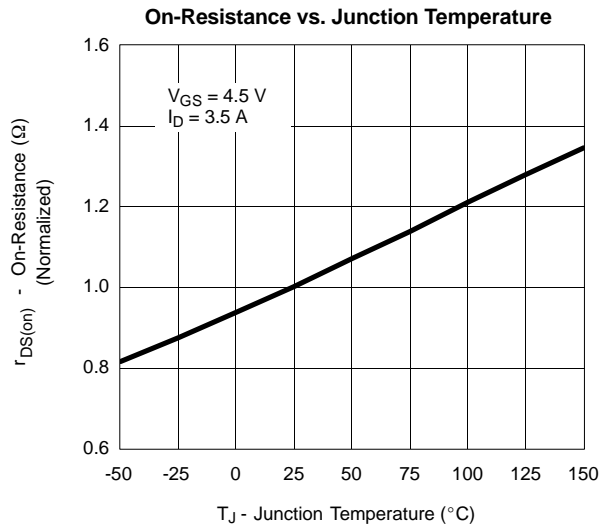
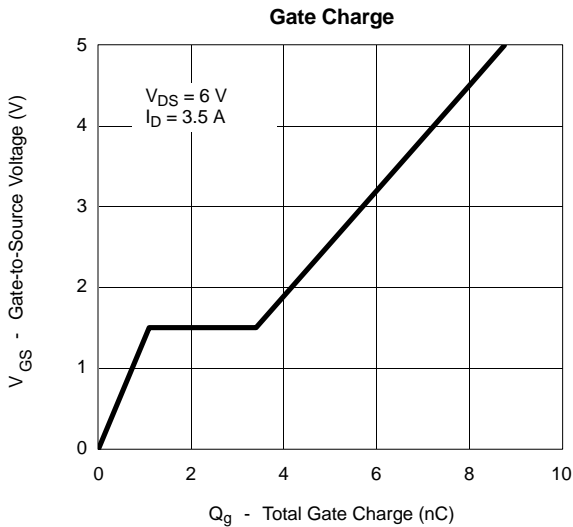
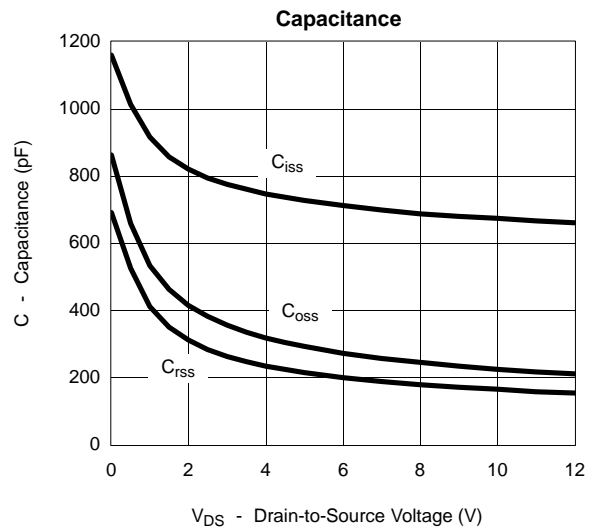
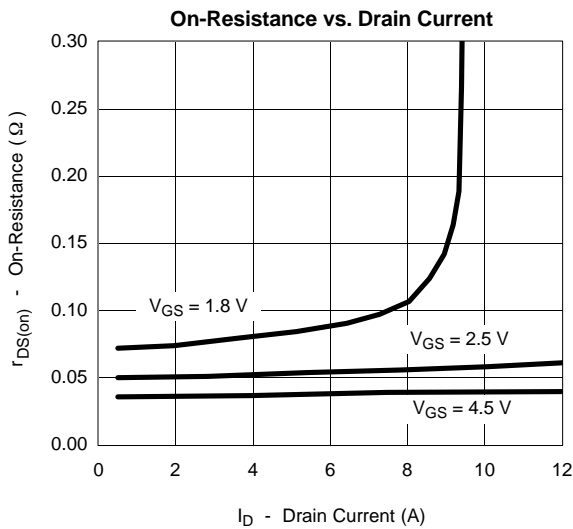
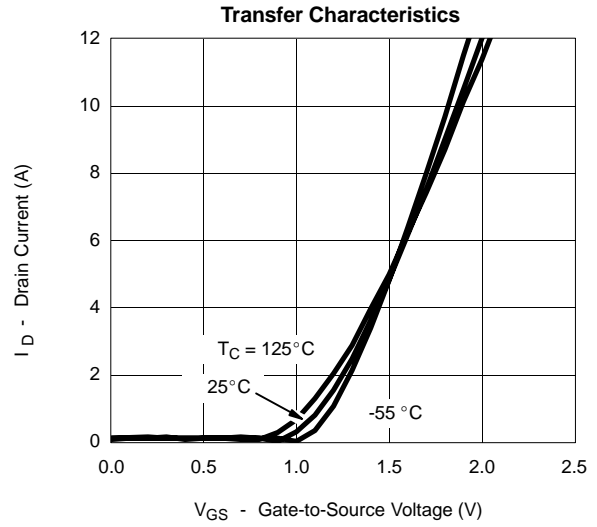
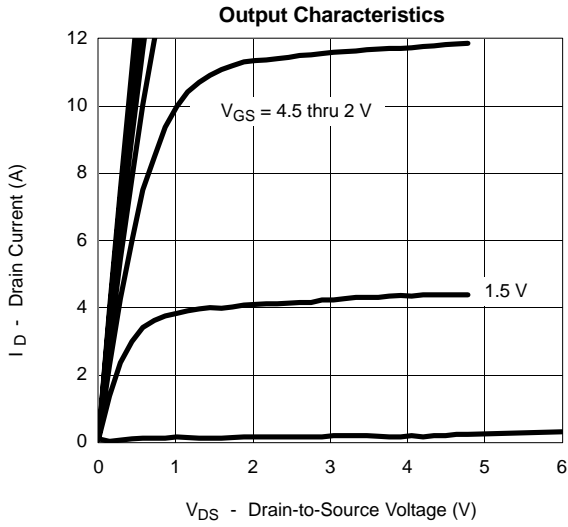
| SPECIFICATIONS (T <sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED) |                      |  |        |       |       |      |
|--|----------------------|--|--------|-------|-------|------|
| Parameter  | Symbol               | Test Conditions  | Limits |       |       | Unit |
|  |                      |  | Min    | Typ   | Max   |      |
| <b>Static</b>  |                      |  |        |       |       |      |
| Drain-Source Breakdown Voltage                                 | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0 V, I <sub>D</sub> = -10 μA   | -12    |       |       | V    |
| Gate-Threshold Voltage   | V <sub>GS(th)</sub>  | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250 μA   | -0.45  |       | -0.90 |      |
| Gate-Body Leakage  | I <sub>GSS</sub>     | V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±8 V  |        |       | ±100  | nA   |
| Zero Gate Voltage Drain Current                                | I <sub>DSS</sub>     | V <sub>DS</sub> = -9.6 V, V <sub>GS</sub> = 0 V  |        |       | -1    | μA   |
|  |                      | V <sub>DS</sub> = -9.6 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55 °C  |        |       | -10   |      |
| On-State Drain Current <sup>a</sup>                            | I <sub>D(on)</sub>   | V <sub>DS</sub> ≤ -5 V, V <sub>GS</sub> = -4.5 V   | -6     |       |       | A    |
|  |                      | V <sub>DS</sub> ≤ -5 V, V <sub>GS</sub> = -2.5 V   | -3     |       |       |      |
| Drain-Source On-Resistance <sup>a</sup>                        | r <sub>DS(on)</sub>  | V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -3.2 A  |        | 0.040 | 0.050 | Ω    |
|  |                      | V <sub>GS</sub> = -2.5 V, I <sub>D</sub> = -2.8 A  |        | 0.050 | 0.065 |      |
|  |                      | V <sub>GS</sub> = -1.8 V, I <sub>D</sub> = -2.6 A  |        | 0.071 | 0.100 |      |
| Forward Transconductance <sup>a</sup>                          | g <sub>fs</sub>      | V <sub>DS</sub> = -5 V, I <sub>D</sub> = -3.2 A  |        | 7     |       | S    |
| Diode Forward Voltage  | V <sub>SD</sub>      | I <sub>S</sub> = -1.6 A, V <sub>GS</sub> = 0 V   |        |       | -1.2  | V    |
| <b>Dynamic<sup>b</sup></b>                                     |                      |  |        |       |       |      |
| Total Gate Charge  | Q <sub>g</sub>       | V <sub>DS</sub> = -6 V, V <sub>GS</sub> = -4.5 V<br>I <sub>D</sub> ≅ -3.2 A  |        | 8     | 15    | nC   |
| Gate-Source Charge   | Q <sub>gs</sub>      |  |        | 1.1   |       |      |
| Gate-Drain Charge  | Q <sub>gd</sub>      |  |        | 2.3   |       |      |
| Input Capacitance  | C <sub>iss</sub>     | V <sub>DS</sub> = -6 V, V <sub>GS</sub> = 0, f = 1 MHz   |        | 715   |       | pF   |
| Output Capacitance   | C <sub>oss</sub>     |  |        | 275   |       |      |
| Reverse Transfer Capacitance                                   | C <sub>riss</sub>    |  |        | 200   |       |      |
| <b>Switching<sup>b</sup></b>                                   |                      |  |        |       |       |      |
| Turn-On Time   | t <sub>d(on)</sub>   | V <sub>DD</sub> = -6 V, R <sub>L</sub> = 6 Ω<br>I <sub>D</sub> ≅ -1.0 A, V <sub>GEN</sub> = -4.5 V<br>R <sub>G</sub> = 6 Ω |        | 15    | 20    | ns   |
|  | t <sub>r</sub>       |  |        | 35    | 50    |      |
| Turn-Off Time  | t <sub>d(off)</sub>  |  |        | 50    | 70    |      |
|  | t <sub>f</sub>       |  |        | 50    | 75    |      |

## Notes

- For DESIGN AID ONLY, not subject to production testing.
- Pulse test: PW ≤ 300 μs duty cycle ≤ 2%.
- Switching time is essentially independent of operating temperature.

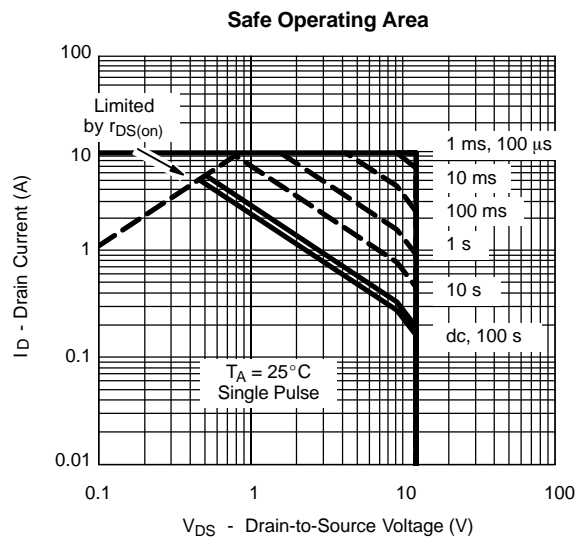
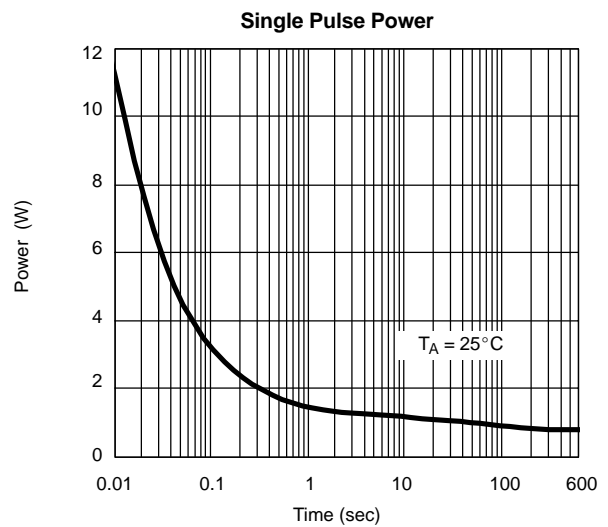
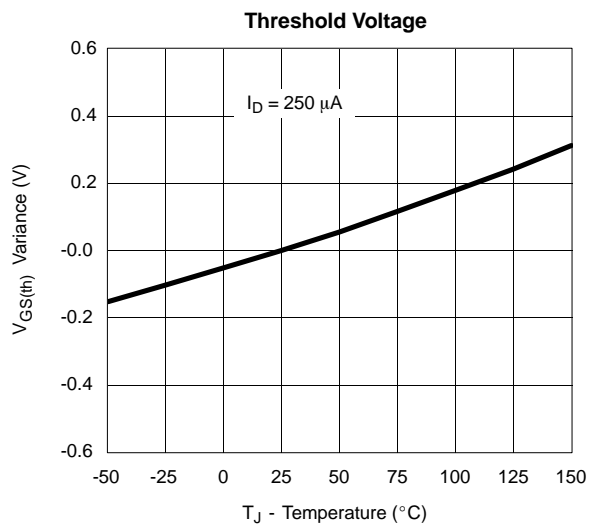
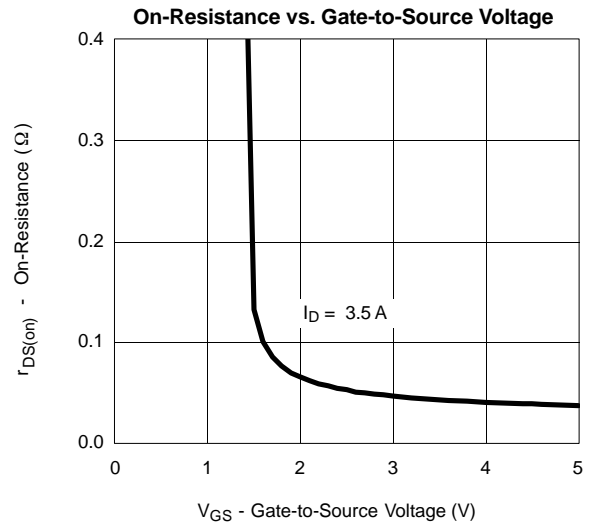
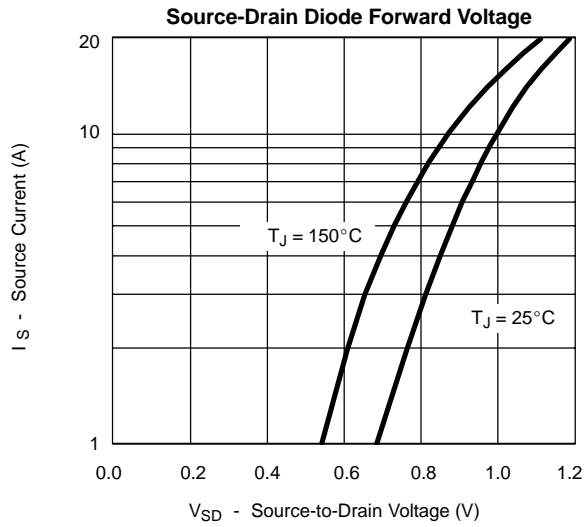


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**





### TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)





**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

