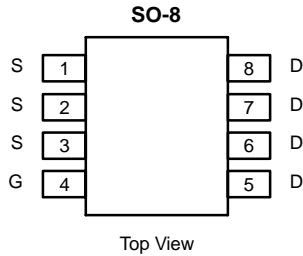


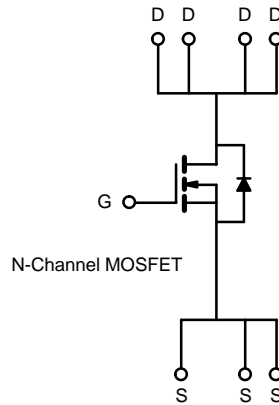


## N-Channel Reduced $Q_g$ , Fast Switching MOSFET

| PRODUCT SUMMARY |                           |           |
|-----------------|---------------------------|-----------|
| $V_{DS}$ (V)    | $r_{DS(on)}$ ( $\Omega$ ) | $I_D$ (A) |
| 30              | 0.020 @ $V_{GS} = 10$ V   | 9         |
|                 | 0.033 @ $V_{GS} = 4.5$ V  | 7         |



Ordering Information: Si4800



| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED) |  |                          |          |      |
|---|--|--------------------------|----------|------|
| Parameter   |  | Symbol                   | Limit    | Unit |
| Drain-Source Voltage  |  | $V_{DS}$                 | 30       | V    |
| Gate-Source Voltage   |  | $V_{GS}$                 | $\pm 25$ |      |
| Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a, b</sup>      |  | $T_A = 25^\circ\text{C}$ | $I_D$    | 9    |
| Pulsed Drain Current (10 $\mu\text{s}$ Pulse Width)                         |  |                          |          |      |
| Continuous Source Current (Diode Conduction) <sup>a, b</sup>                |  |                          | $I_S$    | 2.3  |
| Maximum Power Dissipation <sup>a, b</sup>                                   |  | $T_A = 25^\circ\text{C}$ | $P_D$    | 2.5  |
| Operating Junction and Storage Temperature Range                            |  |                          |          |      |

| THERMAL RESISTANCE RATINGS                        |                 |            |         |         |                    |
|---|-----------------|------------|---------|---------|--------------------|
| Parameter   |                 | Symbol     | Typical | Maximum | Unit               |
| Maximum Junction-to-Ambient (MOSFET) <sup>a</sup> | $t \leq 10$ sec | $R_{thJA}$ |         | 50      | $^\circ\text{C/W}$ |
|   | Steady State    |            | 70      |         |                    |

Notes

- a. Surface Mounted on FR4 Board.
- b.  $t \leq 10$  sec.



| <b>MOSFET SPECIFICATIONS (T<sub>J</sub> = 25° C UNLESS OTHERWISE NOTED)</b> |                     |  |     |      |       |      |
|---|---------------------|--|-----|------|-------|------|
| Parameter   | Symbol              | Test Condition   | Min | Typ  | Max   | Unit |
| <b>Static</b>   |                     |  |     |      |       |      |
| Gate Threshold Voltage  | V <sub>GS(th)</sub> | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA  | 0.8 |      |       | V    |
| Gate-Body Leakage   | I <sub>GSS</sub>    | V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ± 20 V  |     |      | ± 100 | nA   |
| Zero Gate Voltage Drain Current   | I <sub>DSS</sub>    | V <sub>DS</sub> = 24 V, V <sub>GS</sub> = 0 V  |     |      | 1     | μA   |
| On-State Drain Current <sup>a</sup>   | I <sub>D(on)</sub>  | V <sub>DS</sub> ≥ 5 V, V <sub>GS</sub> = 10 V  | 30  |      |       | A    |
| Drain-Source On-State Resistance <sup>a</sup>                               | r <sub>DS(on)</sub> | V <sub>GS</sub> = 10 V, I <sub>D</sub> = 9 A   |     |      | 0.020 | Ω    |
|   |                     | V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 7 A  |     |      | 0.033 |      |
| Forward Transconductance <sup>a</sup>                                       | g <sub>fs</sub>     | V <sub>DS</sub> = 15 V, I <sub>D</sub> = 9 A   |     | 16   |       | S    |
| Diode Forward Voltage <sup>a</sup>  | V <sub>SD</sub>     | I <sub>S</sub> = 2.3 A, V <sub>GS</sub> = 0 V  |     | 0.71 | 1.2   | V    |
| <b>Dynamic<sup>b</sup></b>  |                     |  |     |      |       |      |
| Total Gate Charge   | Q <sub>g</sub>      | V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 5.0 V, I <sub>D</sub> = 9 A  |     | 8.7  | 13    | nC   |
| Gate-Source Charge  | Q <sub>gs</sub>     |  |     | 2.25 |       |      |
| Gate-Drain Charge   | Q <sub>gd</sub>     |  |     | 4.2  |       |      |
| Gate Resistance   | R <sub>g</sub>      |  | 0.5 | 1.5  | 2.6   | Ω    |
| Turn-On Delay Time  | t <sub>d(on)</sub>  | V <sub>DD</sub> = 15 V, R <sub>L</sub> = 15 Ω<br>I <sub>D</sub> ≅ 1 A, V <sub>GEN</sub> = 10 V, R <sub>G</sub> = 6 Ω |     | 11   | 16    | ns   |
| Rise Time   | t <sub>r</sub>      |  |     | 8    | 15    |      |
| Turn-Off Delay Time   | t <sub>d(off)</sub> |  |     | 22   | 30    |      |
| Fall Time   | t <sub>f</sub>      |  |     | 9    | 15    |      |
| Source-Drain Reverse Recovery Time  | t <sub>rr</sub>     | I <sub>F</sub> = 2.3 A, di/dt = 100 A/μs   |     | 50   | 80    |      |

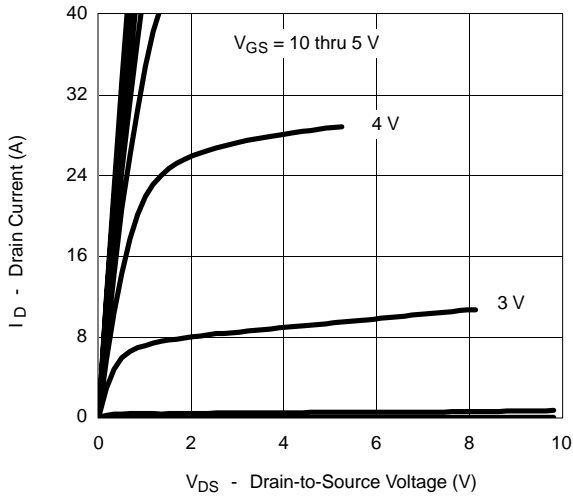
Notes

- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- b. Guaranteed by design, not subject to production testing.

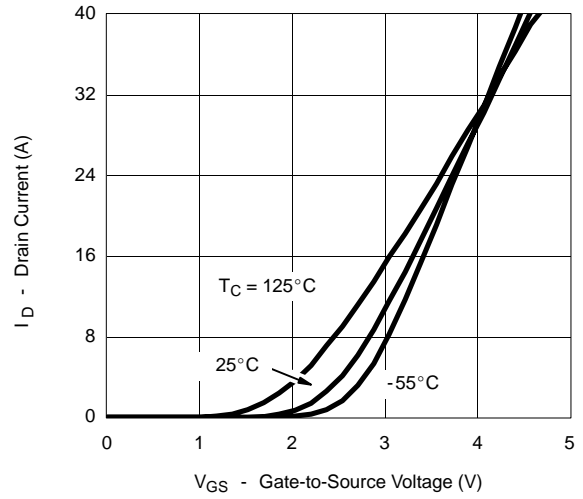


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

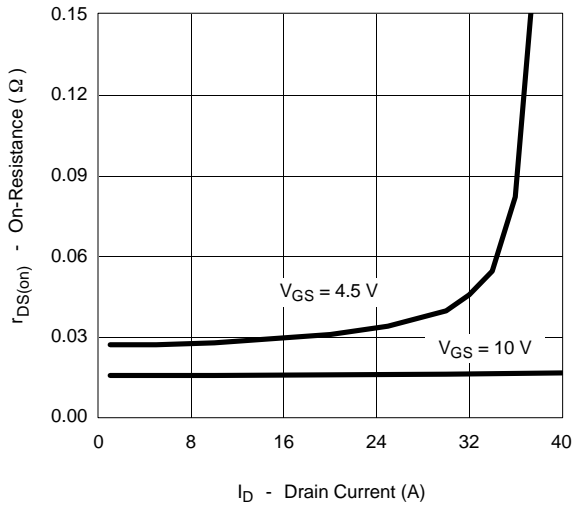
**Output Characteristics**



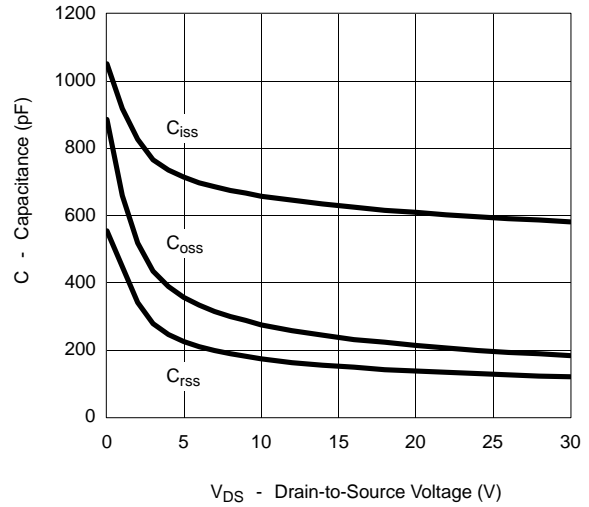
**Transfer Characteristics**



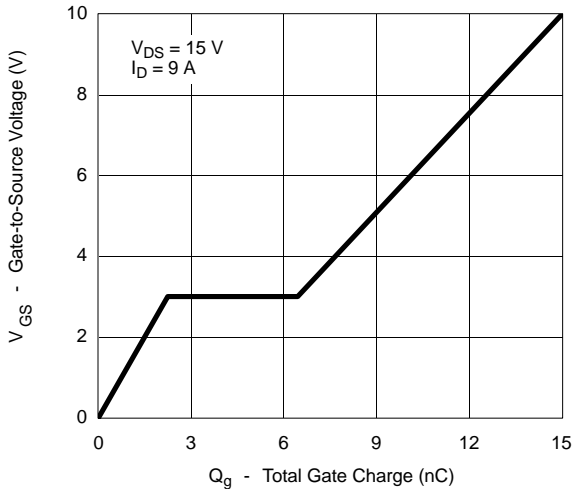
**On-Resistance vs. Drain Current**



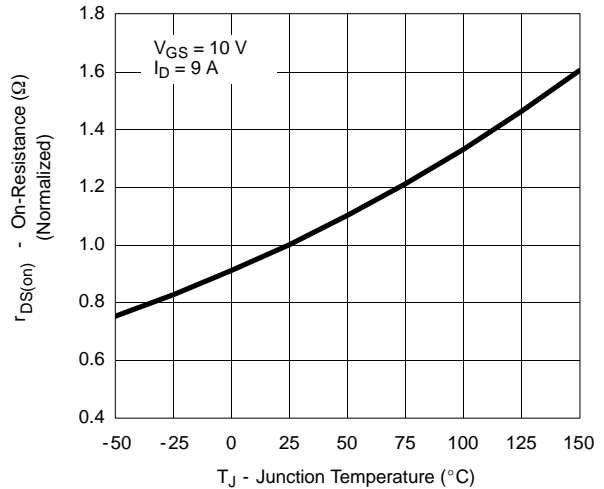
**Capacitance**



**Gate Charge**



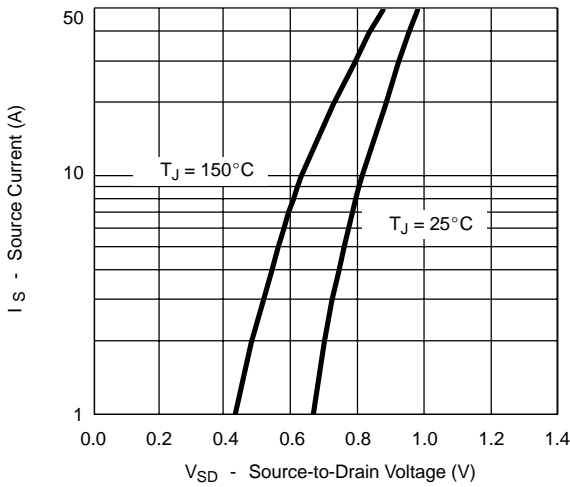
**On-Resistance vs. Junction Temperature**



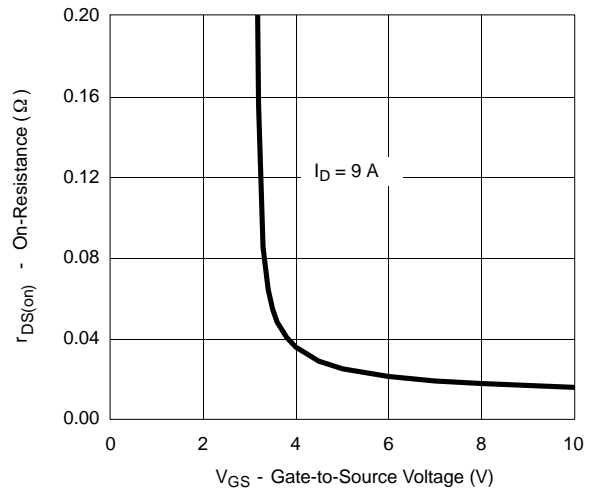


**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**

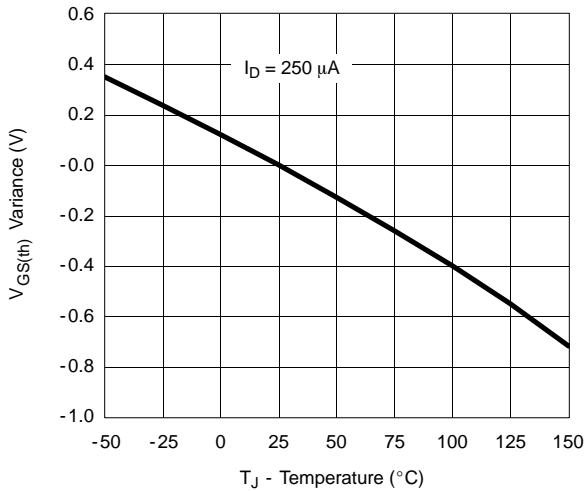
Source-Drain Diode Forward Voltage



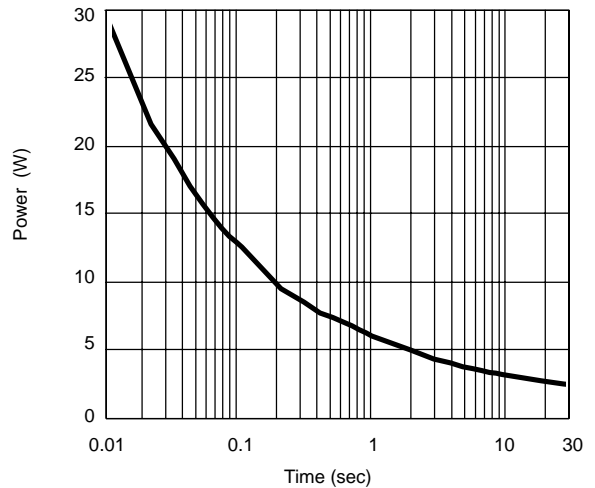
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient

