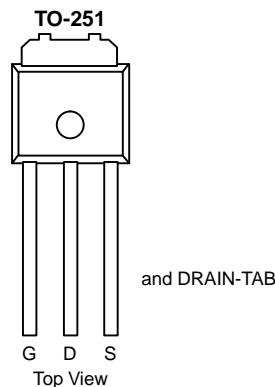




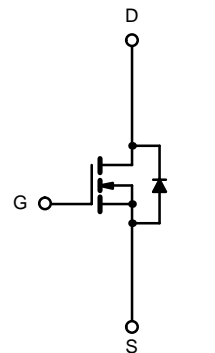
## N-Channel 30-V (D-S) 175°C MOSFET

| PRODUCT SUMMARY     |                                 |                                    |
|---------------------|---------------------------------|------------------------------------|
| V <sub>DS</sub> (V) | r <sub>DS(on)</sub> (Ω)         | I <sub>D</sub> (A) <sup>a, b</sup> |
| 30                  | 0.007 @ V <sub>GS</sub> = 10 V  | 25                                 |
|                     | 0.010 @ V <sub>GS</sub> = 4.5 V | 18                                 |

**175°C Rated**  
Maximum Junction Temperature  
**TrenchFET®**  
Power MOSFETS



Order Number:  
SUU50N03-07



| 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>                   | ±20                    |                     |    |
| Continuous Drain Current (T <sub>J</sub> = 175°C) <sup>a, b</sup>       | I <sub>D</sub>                    | T <sub>A</sub> = 25°C  | A                   |    |
|   |                                   | T <sub>A</sub> = 100°C |                     | 18 |
| Pulsed Drain Current  | I <sub>DM</sub>                   | 100                    | A                   |    |
| Continuous Source Current (Diode Conduction) <sup>a, b</sup>            | I <sub>S</sub>                    | 25                     |                     |    |
| Maximum Power Dissipation   | P <sub>D</sub>                    | T <sub>C</sub> = 25°C  | 88                  | W  |
|   |                                   | T <sub>A</sub> = 25°C  | 8.3 <sup>a, b</sup> |    |
| Operating Junction and Storage Temperature Range                        | T <sub>J</sub> , T <sub>stg</sub> | -55 to 175             | °C                  |    |

| THERMAL RESISTANCE RATINGS       |                   |              |         |      |
|----------------------------------|-------------------|--------------|---------|------|
| Parameter                        | Symbol            | Typical      | Maximum | Unit |
| Junction-to-Ambient <sup>a</sup> | R <sub>thJA</sub> | t ≤ 10 sec   | 15      | °C/W |
|                                  |                   | Steady State | 40      |      |
| Junction-to-Case                 | R <sub>thJC</sub> | 1.4          | 1.7     |      |

Notes

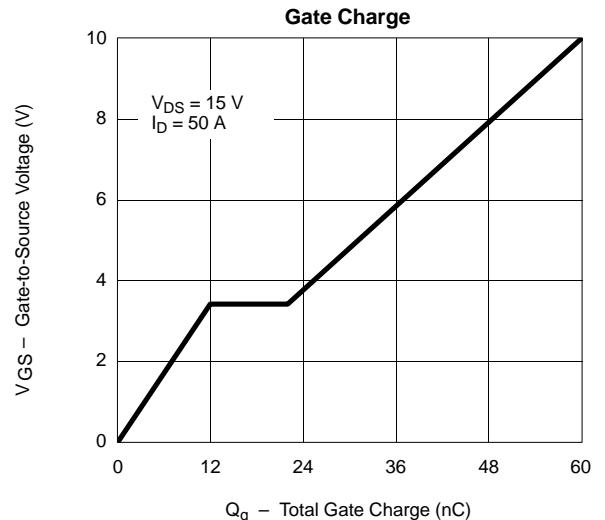
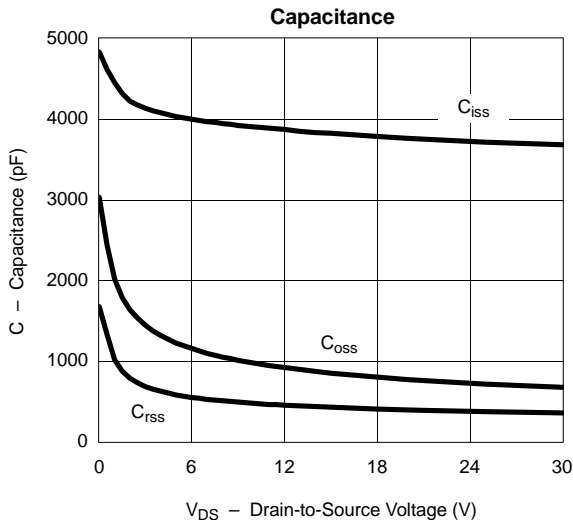
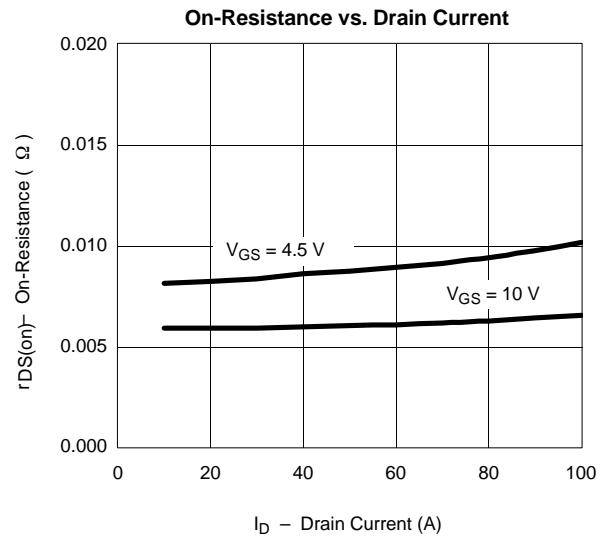
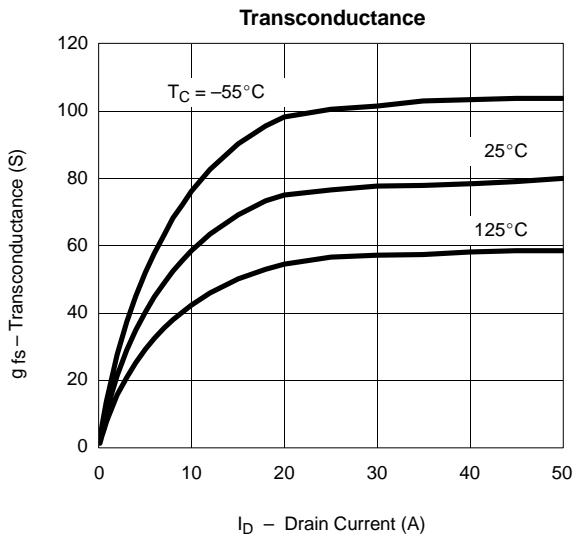
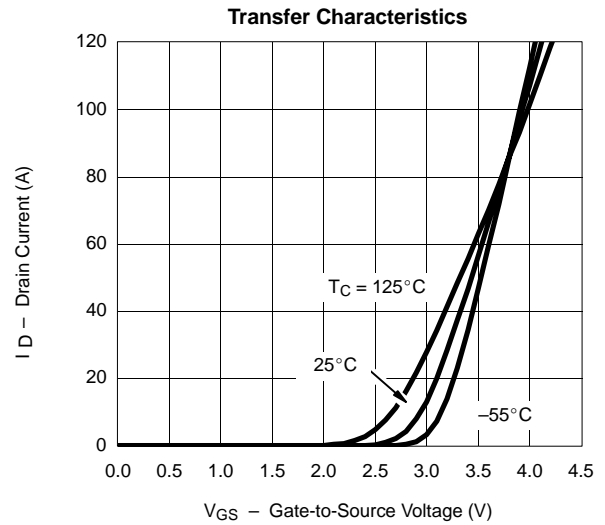
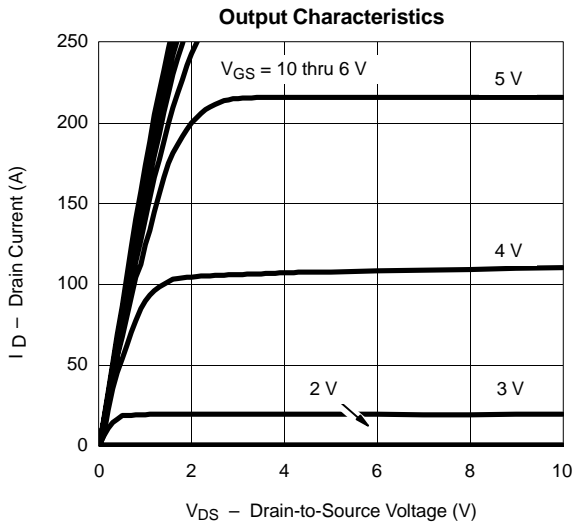
- a. Surface Mounted on 1" x1" FR4 Board.
- b. t ≤ 10 sec.



| SPECIFICATIONS ( $T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)                          |               |  |     |                  |           |               |
|--|---------------|--|-----|------------------|-----------|---------------|
| Parameter  | Symbol        | Test Condition   | Min | Typ <sup>a</sup> | Max       | Unit          |
| <b>Static</b>  |               |  |     |                  |           |               |
| Drain-Source Breakdown Voltage   | $V_{(BR)DSS}$ | $V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$  | 30  |                  |           | V             |
| Gate Threshold Voltage   | $V_{GS(th)}$  | $V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$  | 1.0 | 2.0              |           |               |
| Gate-Body Leakage  | $I_{GSS}$     | $V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$  |     |                  | $\pm 100$ | nA            |
| Zero Gate Voltage Drain Current  | $I_{DSS}$     | $V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}$  |     |                  | 1         | $\mu\text{A}$ |
|  |               | $V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}, T_J = 125^\circ\text{C}$   |     |                  | 50        |               |
| On-State Drain Current <sup>b</sup>  | $I_{D(on)}$   | $V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$  | 50  |                  |           | A             |
| Drain-Source On-State Resistance <sup>b</sup>  | $r_{DS(on)}$  | $V_{GS} = 10\text{ V}, I_D = 20\text{ A}$  |     |                  | 0.007     | $\Omega$      |
|  |               | $V_{GS} = 10\text{ V}, I_D = 20\text{ A}, T_J = 125^\circ\text{C}$   |     |                  | 0.011     |               |
|  |               | $V_{GS} = 4.5\text{ V}, I_D = 20\text{ A}$   |     |                  | 0.010     |               |
| Forward Transconductance <sup>b</sup>  | $g_{fs}$      | $V_{DS} = 15\text{ V}, I_D = 20\text{ A}$  | 20  |                  |           | S             |
| <b>Dynamic<sup>a</sup></b>   |               |  |     |                  |           |               |
| Input Capacitance  | $C_{iss}$     | $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, F = 1\text{ MHz}$  |     | 3720             |           | pF            |
| Output Capacitance   | $C_{oss}$     |  |     | 715              |           |               |
| Reverse Transfer Capacitance   | $C_{rss}$     |  |     | 370              |           |               |
| Total Gate Charge <sup>c</sup>   | $Q_g$         | $V_{DS} = 15\text{ V}, V_{GS} = 10\text{ V}, I_D = 50\text{ A}$  |     | 60               | 120       | nC            |
| Gate-Source Charge <sup>c</sup>  | $Q_{gs}$      |  |     | 12               |           |               |
| Gate-Drain Charge <sup>c</sup>   | $Q_{gd}$      |  |     | 10               |           |               |
| Turn-On Delay Time <sup>c</sup>  | $t_{d(on)}$   | $V_{DD} = 15\text{ V}, R_L = 0.3\ \Omega$<br>$I_D \cong 50\text{ A}, V_{GEN} = 10\text{ V}, R_G = 2.5\ \Omega$ |     | 11               | 25        | ns            |
| Rise Time <sup>c</sup>   | $t_r$         |  |     | 6                | 15        |               |
| Turn-Off Delay Time <sup>c</sup>   | $t_{d(off)}$  |  |     | 50               | 100       |               |
| Fall Time <sup>c</sup>   | $t_f$         |  |     | 11               | 20        |               |
|  |               |  |     |                  |           |               |
| <b>Source-Drain Diode Ratings and Characteristic (<math>T_C = 25^\circ\text{C}</math>)</b> |               |  |     |                  |           |               |
| Pulsed Current   | $I_{SM}$      |  |     |                  | 100       | A             |
| Diode Forward Voltage <sup>b</sup>   | $V_{SD}$      | $I_F = 100\text{ A}, V_{GS} = 0\text{ V}$  |     | 1.2              | 1.5       | V             |
| Source-Drain Reverse Recovery Time   | $t_{rr}$      | $I_F = 50\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$  |     | 45               | 100       | ns            |

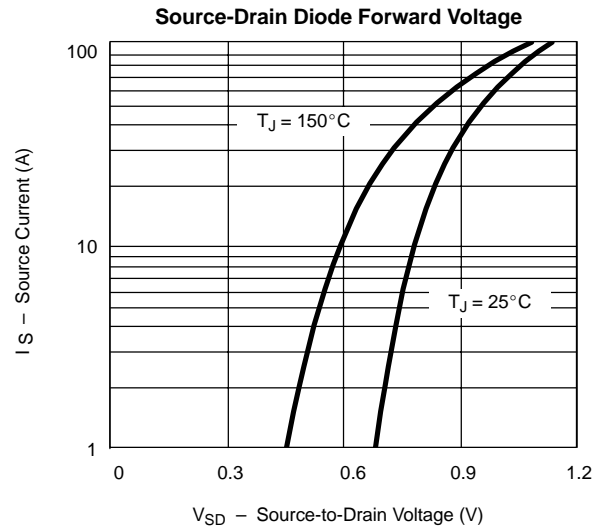
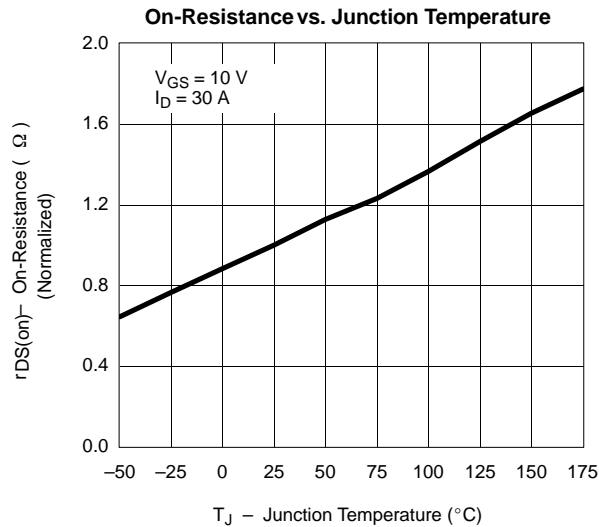
## Notes

- Guaranteed by design, not subject to production testing.
- Pulse test; pulse width  $\leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$ .
- Independent of operating temperature.

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




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



### THERMAL RATINGS

