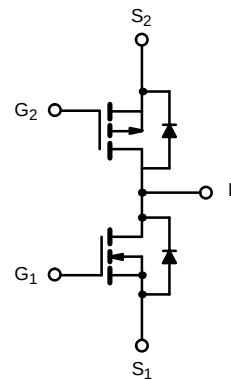
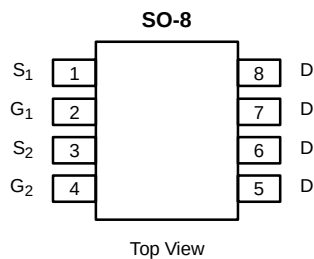




## N- and P-Channel 30-V (D-S) MOSFET

| PRODUCT SUMMARY |              |                           |           |
|-----------------|--------------|---------------------------|-----------|
|                 | $V_{DS}$ (V) | $r_{DS(on)}$ ( $\Omega$ ) | $I_D$ (A) |
| N-Channel       | 30           | 0.035 @ $V_{GS} = 10$ V   | $\pm 6.5$ |
|                 |              | 0.050 @ $V_{GS} = 4.5$ V  | $\pm 5.4$ |
| P-Channel       | -30          | 0.045 @ $V_{GS} = -10$ V  | $\pm 5.7$ |
|                 |              | 0.090 @ $V_{GS} = -4.5$ V | $\pm 4.0$ |

**TrenchFET®**  
Power MOSFETs



| ABSOLUTE MAXIMUM RATINGS (T <sub>A</sub> = 25 °C UNLESS OTHERWISE NOTED) |                        |                                   |            |           |      |
|--------------------------------------------------------------------------|------------------------|-----------------------------------|------------|-----------|------|
| Parameter                                                                |                        | Symbol                            | N-Channel  | P-Channel | Unit |
| Drain-Source Voltage                                                     |                        | V <sub>DS</sub>                   | 30         | −30       | V    |
| Gate-Source Voltage                                                      |                        | V <sub>GS</sub>                   | ± 20       | ± 20      |      |
| Continuous Drain Current (T <sub>J</sub> = 150 °C) <sup>a</sup>          | T <sub>A</sub> = 25 °C | I <sub>D</sub>                    | ± 6.5      | ± 5.7     | A    |
|                                                                          | T <sub>A</sub> = 70 °C |                                   | ± 5.4      | ± 4.0     |      |
| Pulsed Drain Current                                                     |                        | I <sub>DM</sub>                   | ± 20       | ± 20      |      |
| Continuous Source Current (Diode Conduction) <sup>a</sup>                |                        | I <sub>S</sub>                    | 1.7        | −1.7      |      |
| Maximum Power Dissipation <sup>a</sup>                                   | T <sub>A</sub> = 25 °C | P <sub>D</sub>                    | 2.4        |           | W    |
|                                                                          | T <sub>A</sub> = 70 °C |                                   | 1.5        |           |      |
| Operating Junction and Storage Temperature Range                         |                        | T <sub>J</sub> , T <sub>stg</sub> | −55 to 150 |           | °C   |

| THERMAL RESISTANCE RATINGS               |            |                 |                    |
|------------------------------------------|------------|-----------------|--------------------|
| Parameter                                | Symbol     | N- or P-Channel | Unit               |
| Maximum Junction-to-Ambient <sup>a</sup> | $R_{thJA}$ | 52              | $^\circ\text{C/W}$ |

Notes

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

| SPECIFICATIONS (T <sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED) |                     |                                                                                                                                                                                                                                                                               |              |      |       |              |      |
|----------------------------------------------------------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------|-------|--------------|------|
| Parameter                                                      | Symbol              | Test Condition                                                                                                                                                                                                                                                                |              | Min  | Typ   | Max          | Unit |
| Static                                                         |                     |                                                                                                                                                                                                                                                                               |              |      |       |              |      |
| Gate Threshold Voltage                                         | V <sub>GS(th)</sub> | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA                                                                                                                                                                                                                   | N-Ch         | 1.0  |       |              | V    |
|                                                                |                     | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = −250 μA                                                                                                                                                                                                                  | P-Ch         | −1.0 |       |              |      |
| Gate-Body Leakage                                              | I <sub>GSS</sub>    | V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±20 V                                                                                                                                                                                                                                | N-Ch<br>P-Ch |      |       | ±100<br>±100 | nA   |
| Zero Gate Voltage Drain Current                                | I <sub>DSS</sub>    | V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0 V                                                                                                                                                                                                                                 | N-Ch         |      |       | 1            | μA   |
|                                                                |                     | V <sub>DS</sub> = −30 V, V <sub>GS</sub> = 0 V                                                                                                                                                                                                                                | P-Ch         |      |       | −1           |      |
|                                                                |                     | V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55 °C                                                                                                                                                                                                         | N-Ch         |      |       | 5            |      |
|                                                                |                     | V <sub>DS</sub> = −30 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55 °C                                                                                                                                                                                                        | P-Ch         |      |       | −5           |      |
| On-State Drain Current <sup>a</sup>                            | I <sub>D(on)</sub>  | V <sub>DS</sub> ≥ 5 V, V <sub>GS</sub> = 10 V                                                                                                                                                                                                                                 | N-Ch         | 20   |       |              | A    |
|                                                                |                     | V <sub>DS</sub> ≥ −5 V, V <sub>GS</sub> = −10 V                                                                                                                                                                                                                               | P-Ch         | −20  |       |              |      |
|                                                                |                     | V <sub>DS</sub> ≥ 5 V, V <sub>GS</sub> = 4.5 V                                                                                                                                                                                                                                | N-Ch         | 5    |       |              |      |
|                                                                |                     | V <sub>DS</sub> ≥ −5 V, V <sub>GS</sub> = −4.5 V                                                                                                                                                                                                                              | P-Ch         | −5   |       |              |      |
| Drain-Source On-State Resistance <sup>a</sup>                  | r <sub>DS(on)</sub> | V <sub>GS</sub> = 10 V, I <sub>D</sub> = 6.5 A                                                                                                                                                                                                                                | N-Ch         |      | 0.027 | 0.035        | Ω    |
|                                                                |                     | V <sub>GS</sub> = −10 V, I <sub>D</sub> = −5.7 A                                                                                                                                                                                                                              | P-Ch         |      | 0.036 | 0.045        |      |
|                                                                |                     | V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 5.4 A                                                                                                                                                                                                                               | N-Ch         |      | 0.038 | 0.050        |      |
|                                                                |                     | V <sub>GS</sub> = −4.5 V, I <sub>D</sub> = −4.0 A                                                                                                                                                                                                                             | P-Ch         |      | 0.060 | 0.090        |      |
| Forward Transconductance <sup>a</sup>                          | g <sub>fs</sub>     | V <sub>DS</sub> = 15 V, I <sub>D</sub> = 6.5 A                                                                                                                                                                                                                                | N-Ch         |      | 15    |              | S    |
|                                                                |                     | V <sub>DS</sub> = −15 V, I <sub>D</sub> = −5.7 A                                                                                                                                                                                                                              | P-Ch         |      | 9     |              |      |
| Diode Forward Voltage <sup>a</sup>                             | V <sub>SD</sub>     | I <sub>S</sub> = 1.7 A, V <sub>GS</sub> = 0 V                                                                                                                                                                                                                                 | N-Ch         |      | 0.75  | 1.2          | V    |
|                                                                |                     | I <sub>S</sub> = −1.7 A, V <sub>GS</sub> = 0 V                                                                                                                                                                                                                                | P-Ch         |      | −0.75 | −1.2         |      |
| Dynamic <sup>b</sup>                                           |                     |                                                                                                                                                                                                                                                                               |              |      |       |              |      |
| Total Gate Charge                                              | Q <sub>g</sub>      | N-Channel<br>V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 6.5 A<br><br>P-Channel<br>V <sub>DS</sub> = −15 V, V <sub>GS</sub> = −10 V, I <sub>D</sub> = −5.7 A                                                                                             | N-Ch         |      | 18    | 35           | nC   |
| Gate-Source Charge                                             | Q <sub>gs</sub>     |                                                                                                                                                                                                                                                                               | P-Ch         |      | 19    | 40           |      |
|                                                                |                     |                                                                                                                                                                                                                                                                               | N-Ch         |      | 4.2   |              |      |
| Gate-Drain Charge                                              | Q <sub>gd</sub>     |                                                                                                                                                                                                                                                                               | P-Ch         |      | 4.5   |              |      |
|                                                                |                     | N-Ch                                                                                                                                                                                                                                                                          |              | 3.5  |       |              |      |
| Turn-On Delay Time                                             | t <sub>d(on)</sub>  | P-Ch                                                                                                                                                                                                                                                                          |              | 3.6  |       |              |      |
|                                                                |                     | N-Channel<br>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<br><br>P-Channel<br>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 | N-Ch         |      | 13    | 30           | ns   |
| P-Ch                                                           |                     |                                                                                                                                                                                                                                                                               | 13           | 30   |       |              |      |
| Rise Time                                                      | t <sub>r</sub>      |                                                                                                                                                                                                                                                                               | N-Ch         |      | 12    | 30           |      |
|                                                                |                     |                                                                                                                                                                                                                                                                               | P-Ch         |      | 15    | 30           |      |
| Turn-Off Delay Time                                            | t <sub>d(off)</sub> | N-Ch                                                                                                                                                                                                                                                                          |              | 31   | 60    |              |      |
|                                                                |                     | P-Ch                                                                                                                                                                                                                                                                          |              | 37   | 70    |              |      |
| Fall Time                                                      | t <sub>f</sub>      | N-Ch                                                                                                                                                                                                                                                                          |              | 10   | 30    |              |      |
|                                                                |                     | P-Ch                                                                                                                                                                                                                                                                          |              | 14   | 30    |              |      |
| Source-Drain Reverse Recovery Time                             | t <sub>rr</sub>     | I <sub>F</sub> = 1.7 A, di/dt = 100 A/μs                                                                                                                                                                                                                                      | N-Ch         |      | 30    | 70           |      |
|                                                                |                     | I <sub>F</sub> = −1.7 A, di/dt = 100 A/μs                                                                                                                                                                                                                                     | P-Ch         |      | 35    | 70           |      |

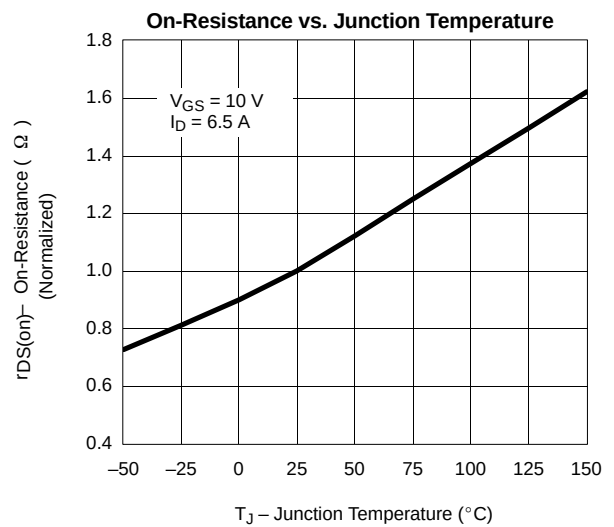
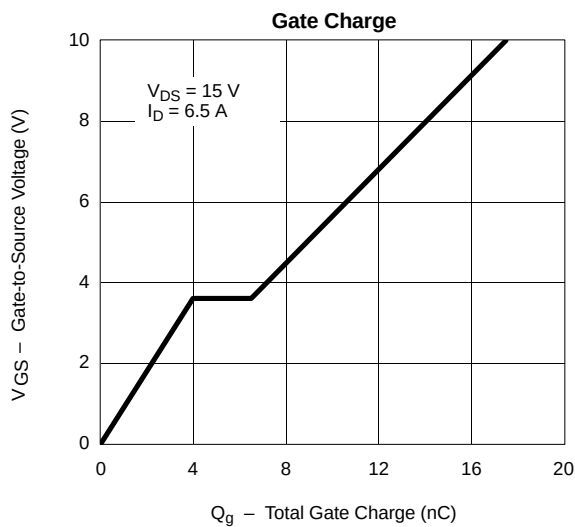
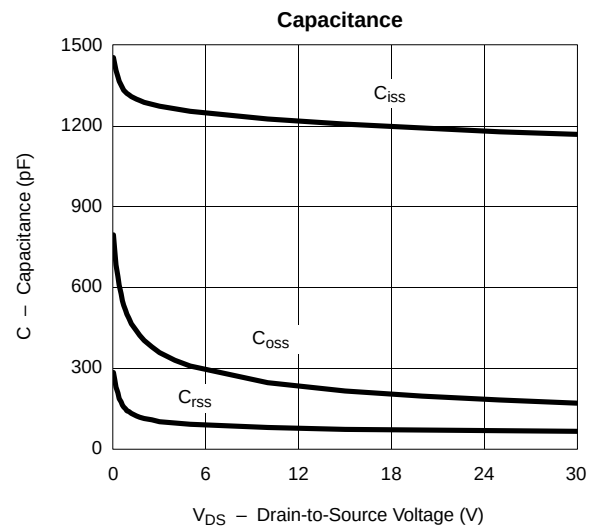
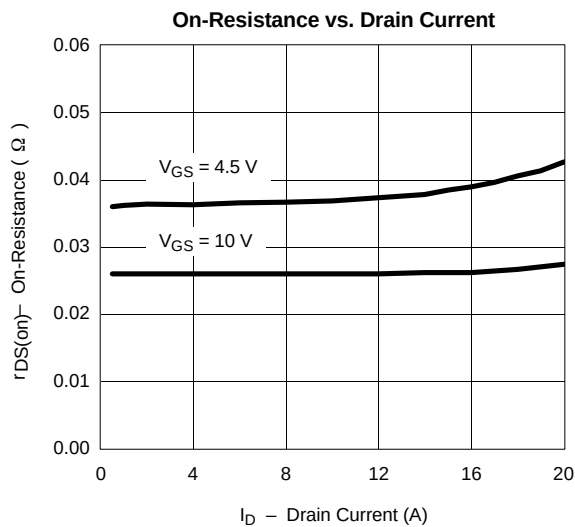
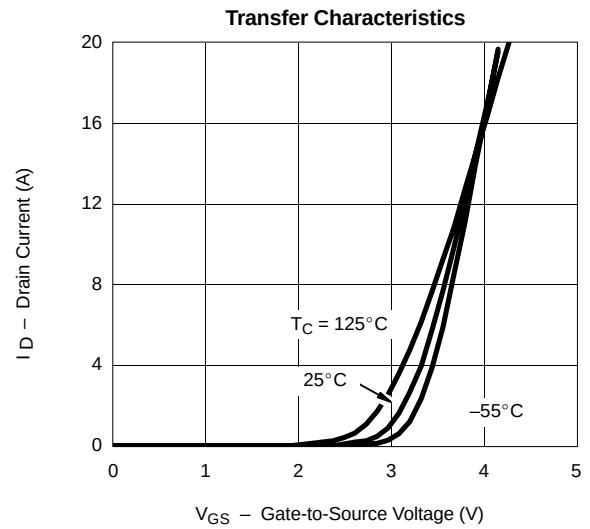
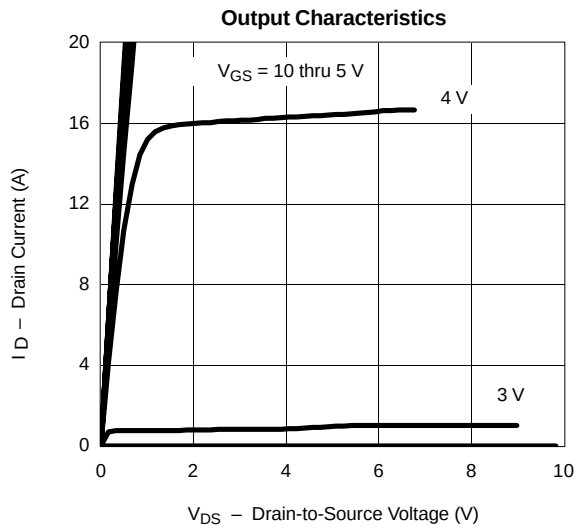
Notes

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



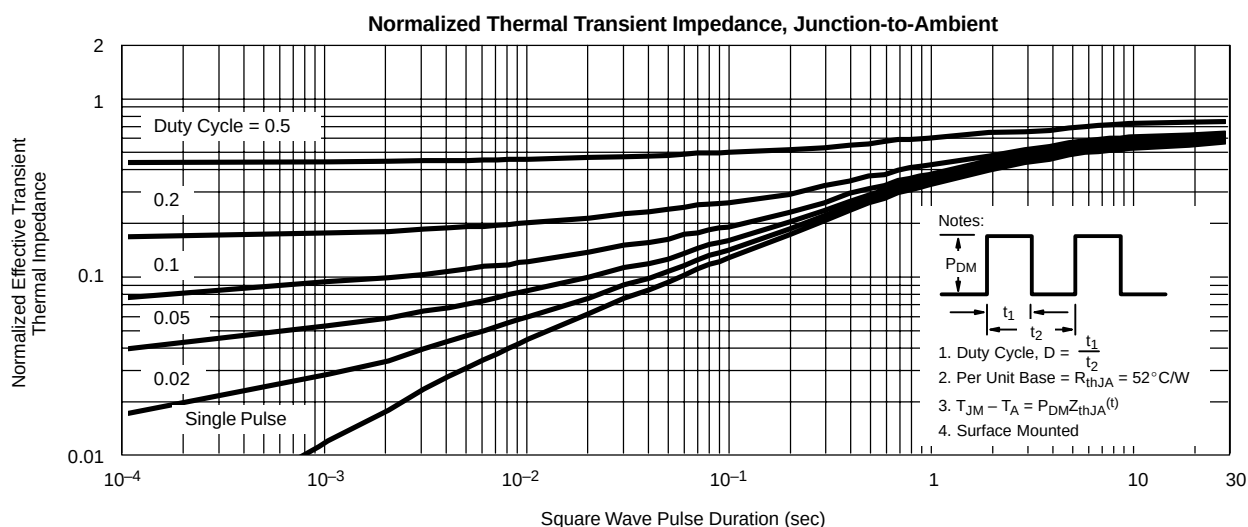
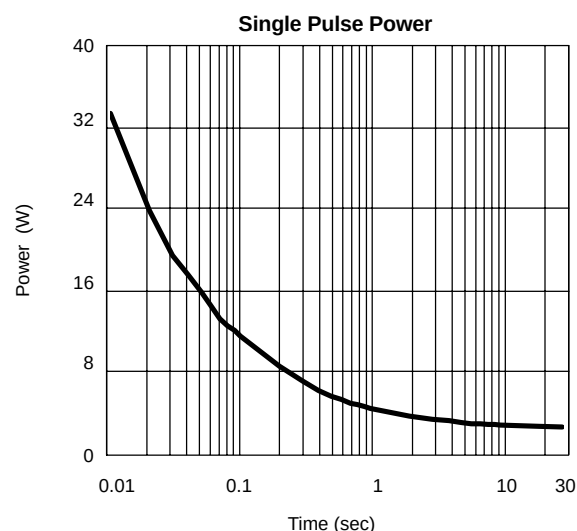
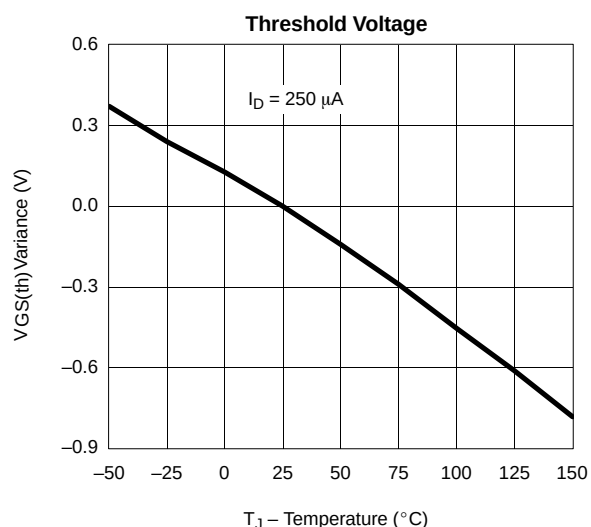
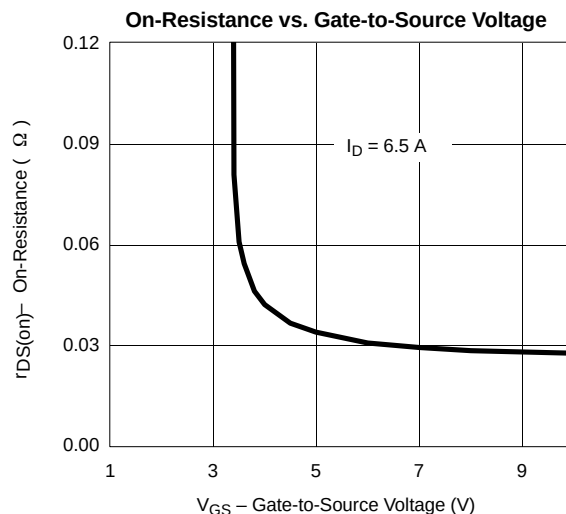
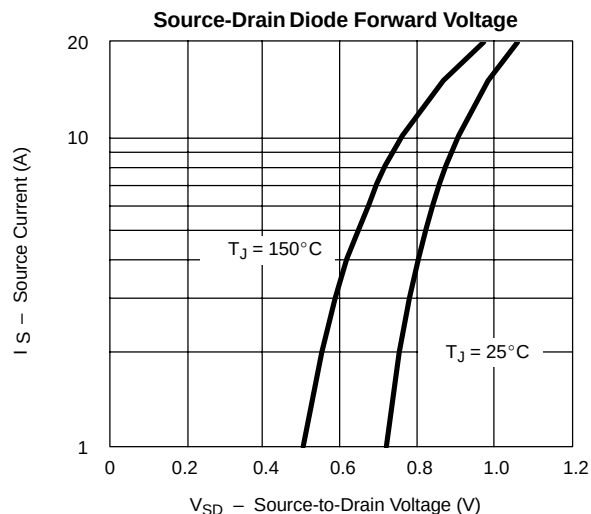
**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

**N-CHANNEL**



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

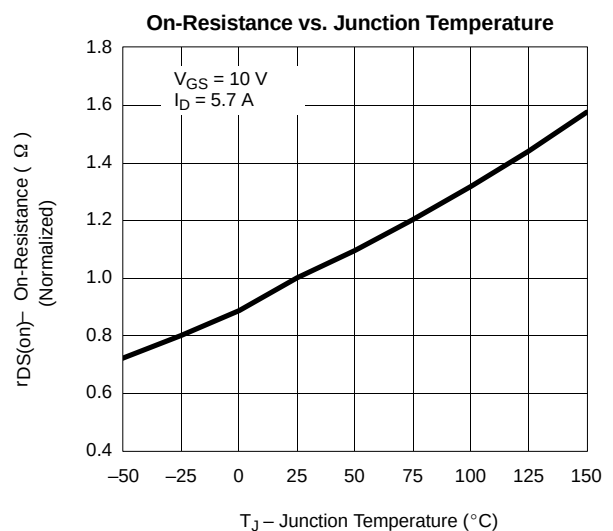
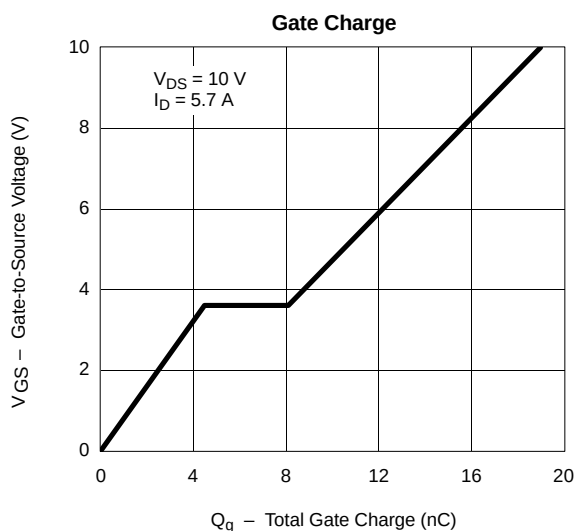
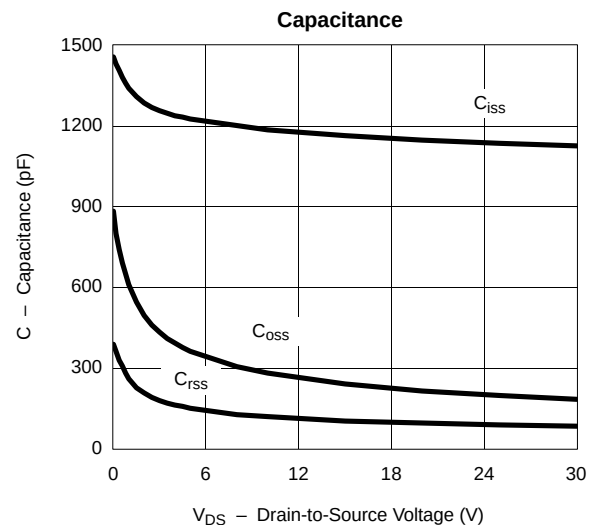
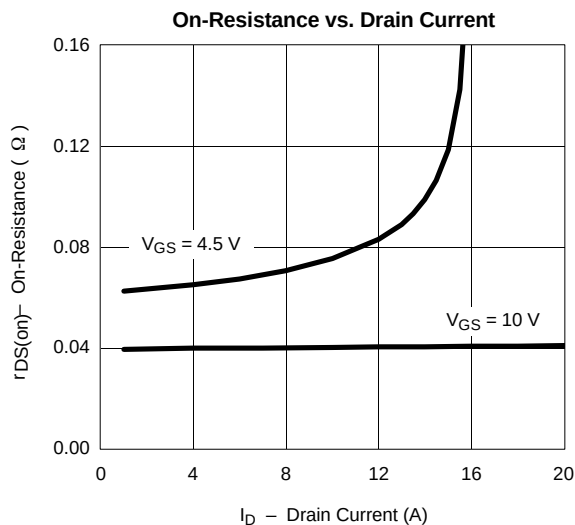
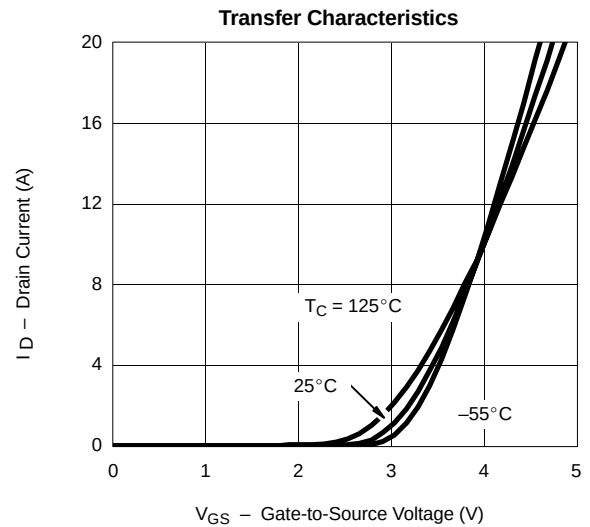
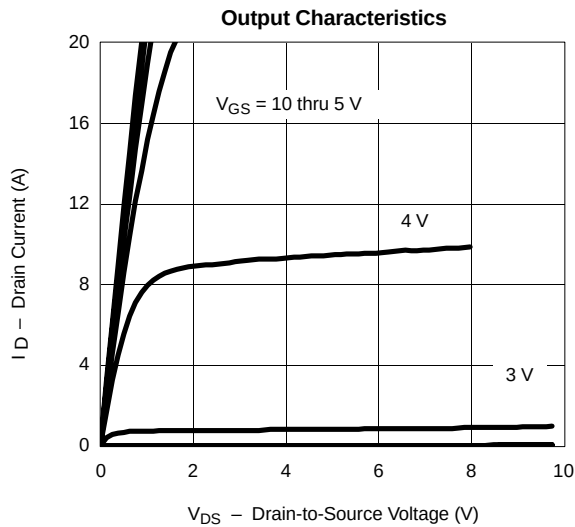
**N-CHANNEL**





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

**P-CHANNEL**



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

**P-CHANNEL**

