

## Dual P-Channel 20-V (D-S) MOSFET

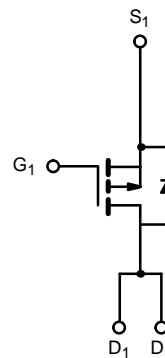
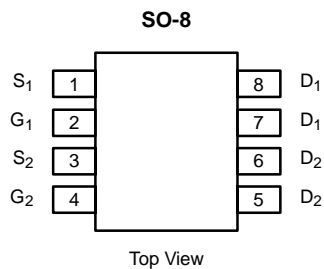
| PRODUCT SUMMARY |                           |           |
|-----------------|---------------------------|-----------|
| $V_{DS}$ (V)    | $r_{DS(on)}$ ( $\Omega$ ) | $I_D$ (A) |
| -20             | 0.019 @ $V_{GS} = -10$ V  | -8.4      |
|                 | 0.030 @ $V_{GS} = -4.5$ V | -6.7      |

### FEATURES

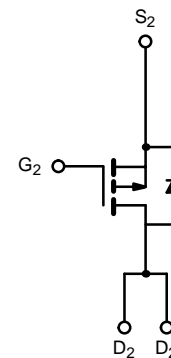
- TrenchFET® Power MOSFET

### APPLICATIONS

- Load Switching
  - Computer
  - Game Systems
- Battery Switching
  - 2-Cell Li-Ion



P-Channel MOSFET



P-Channel MOSFET

| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED) |                |                          |              |                  |   |
|---|----------------|--------------------------|--------------|------------------|---|
| Parameter   | Symbol         | 10 secs                  | Steady State | Unit             |   |
| Drain-Source Voltage  | $V_{DS}$       | -20                      |              | V                |   |
| Gate-Source Voltage   | $V_{GS}$       | $\pm 20$                 |              |                  |   |
| Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>         | $I_D$          | $T_A = 25^\circ\text{C}$ | -8.4         | -6.3             | A |
|   |                | $T_A = 70^\circ\text{C}$ | -6.7         | -5.1             |   |
| Pulsed Drain Current  | $I_{DM}$       | -30                      |              |                  |   |
| continuous Source Current (Diode Conduction) <sup>a</sup>                   | $I_S$          | -1.7                     | -0.9         |                  |   |
| Maximum Power Dissipation <sup>a</sup>                                      | $P_D$          | $T_A = 25^\circ\text{C}$ | 2.0          | 1.1              | W |
|   |                | $T_A = 70^\circ\text{C}$ | 1.3          | 0.7              |   |
| 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> | $R_{thJA}$ | $t \leq 10$ sec | 45      | 62.5 | $^\circ\text{C/W}$ |
|  |            | Steady State    | 85      | 110  |                    |
| Maximum Junction-to-Foot (Drain)         | $R_{thJF}$ | 26              | 35      |      |                    |

Notes

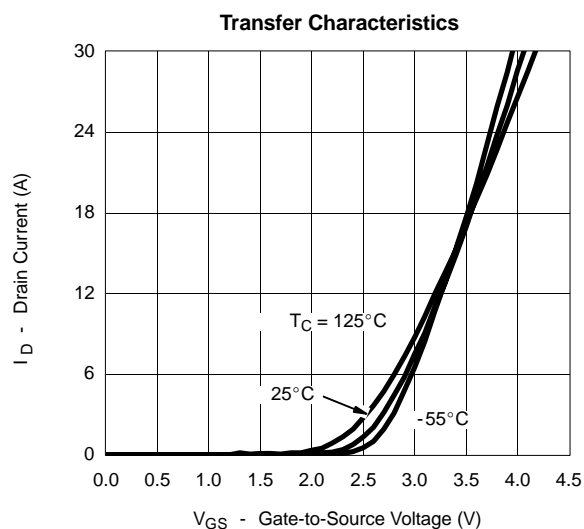
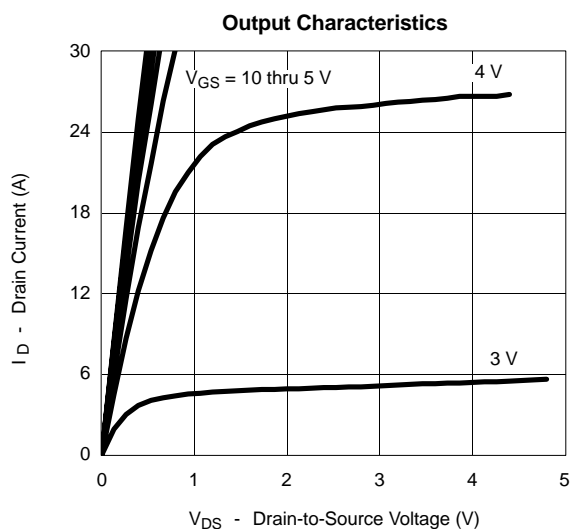
a. Surface Mounted on 1" x 1" FR4 Board.

**SPECIFICATIONS (T<sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)**

| 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  | -1  |       |       | 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> = -16 V, V <sub>GS</sub> = 0 V  |   |       | -1    | μA   |
|   |                     | V <sub>DS</sub> = -16 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55 °C  |   |       | -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   | -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> = -8.4 A  |   | 0.016 | 0.019 | Ω    |
|   |                     | V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -6.7 A   |   | 0.025 | 0.030 |      |
| Forward Transconductance <sup>a</sup>         | g <sub>fs</sub>     | V <sub>DS</sub> = -10 V, I <sub>D</sub> = -8.4 A  |   | 18    |       | S    |
| Diode Forward Voltage <sup>a</sup>            | V <sub>SD</sub>     | I <sub>S</sub> = -1.7 A, V <sub>GS</sub> = 0 V  |   | -0.8  | -1.2  | V    |
| <b>Dynamic<sup>b</sup></b>                    |                     |   |   |       |       |      |
| Total Gate Charge                             | Q <sub>g</sub>      | V <sub>DS</sub> = -10 V, V <sub>GS</sub> = -10 V, I <sub>D</sub> = -8.4 A   |   | 36    | 54    | nC   |
| Gate-Source Charge                            | Q <sub>gs</sub>     |   |   | 6.8   |       |      |
| Gate-Drain Charge                             | Q <sub>gd</sub>     |   |   | 5.0   |       |      |
| Turn-On Delay Time                            | t <sub>d(on)</sub>  | V <sub>DD</sub> = -10 V, R <sub>L</sub> = 10 Ω<br>I <sub>D</sub> ≅ -1 A, V <sub>GEN</sub> = -10 V, R <sub>G</sub> = 6 Ω |   | 11    | 17    | ns   |
| Rise Time                                     | t <sub>r</sub>      |   |   | 24    | 38    |      |
| Turn-Off Delay Time                           | t <sub>d(off)</sub> |   |   | 56    | 85    |      |
| Fall Time                                     | t <sub>f</sub>      |   |   | 30    | 45    |      |
| Source-Drain Reverse Recovery Time            | t <sub>rr</sub>     |   | I <sub>F</sub> = -1.7 A, di/dt = 100 A/μs |       | 50    |      |

## Notes

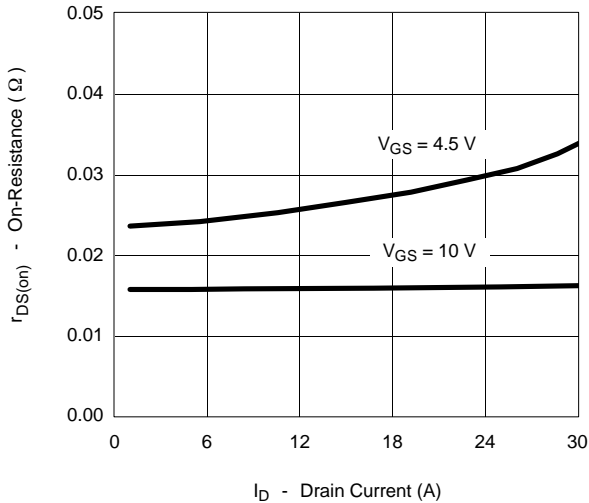
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.  
b. Guaranteed by design, not subject to production testing.

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

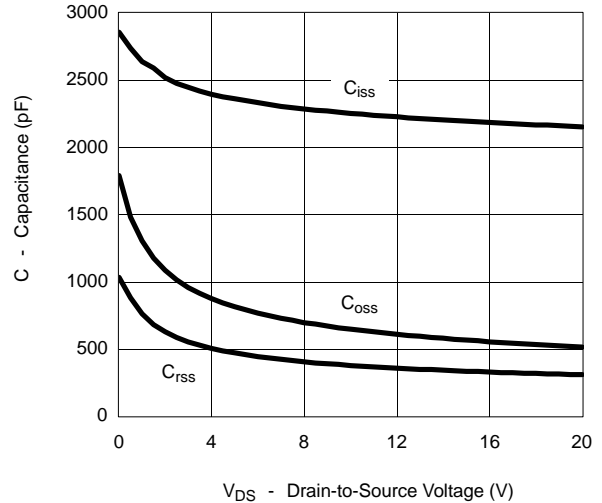


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

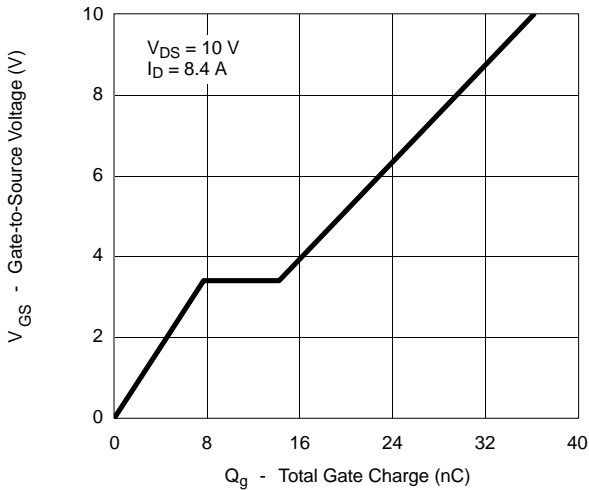
On-Resistance vs. Drain Current



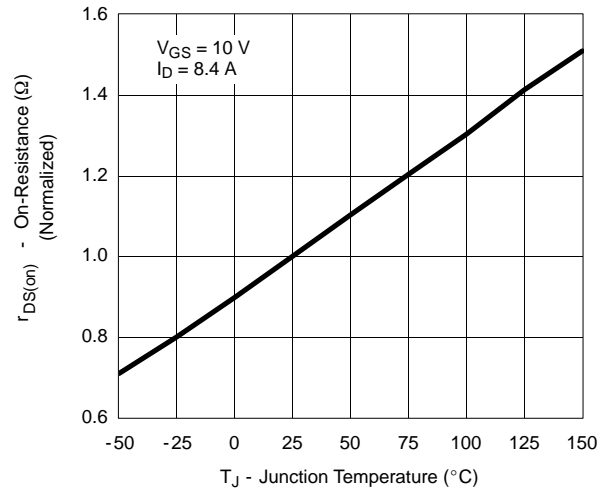
Capacitance



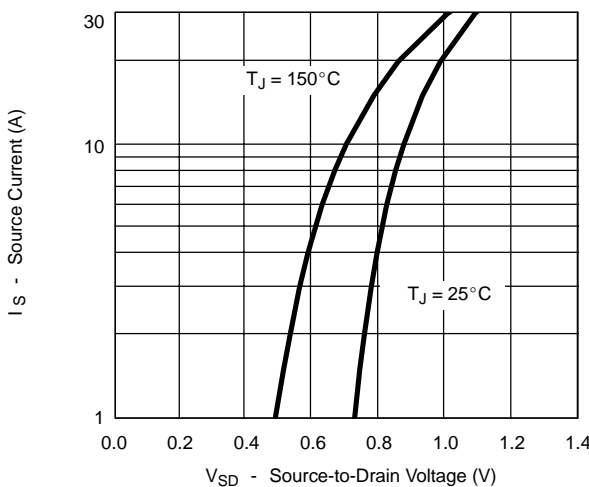
Gate Charge



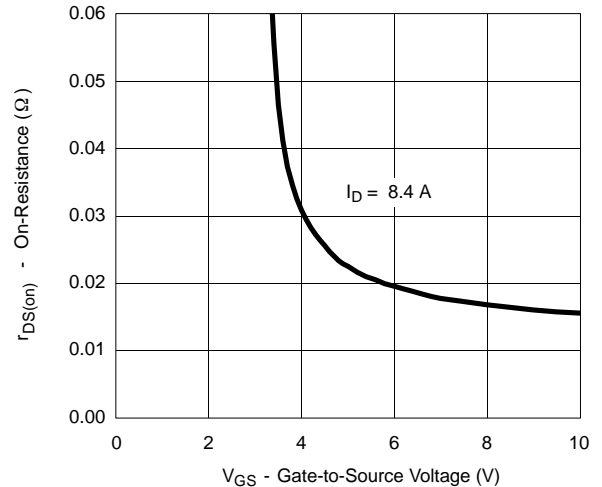
On-Resistance vs. Junction Temperature



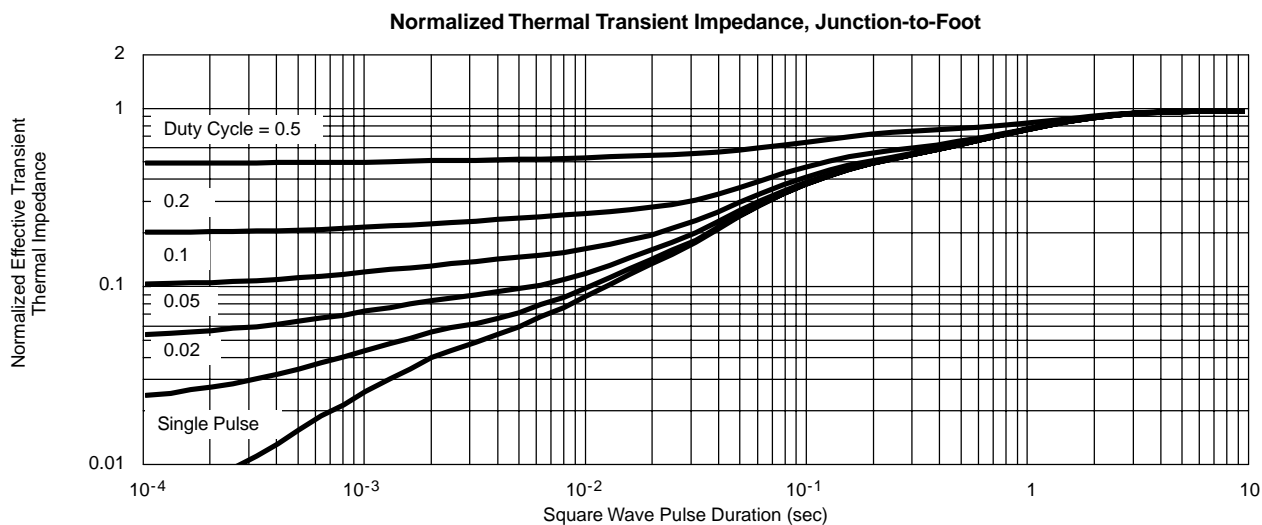
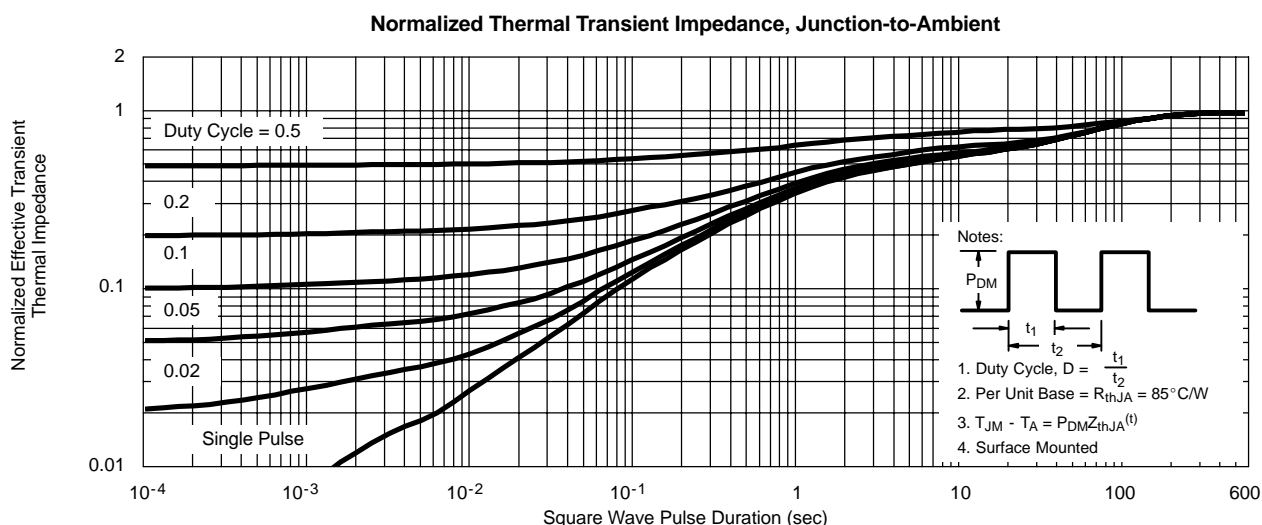
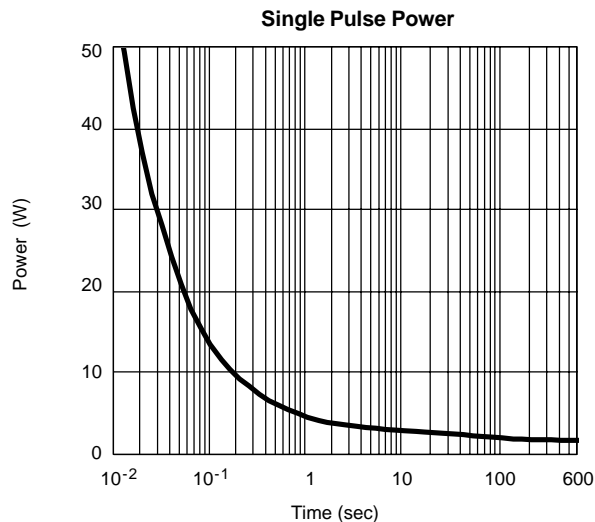
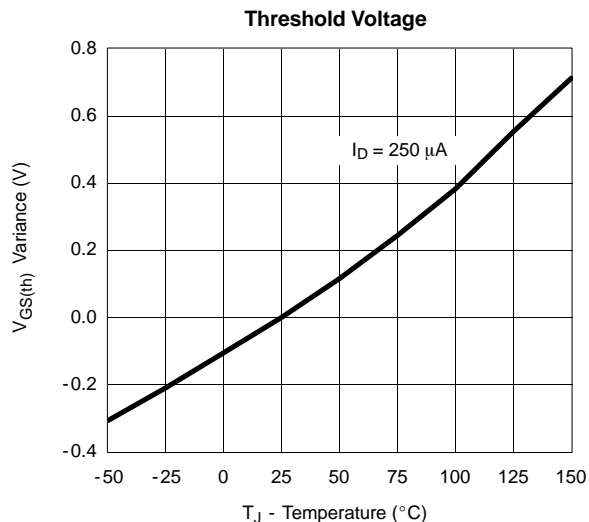
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



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





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