

## P-Channel 100-V (D-S) MOSFET

### Key Features:

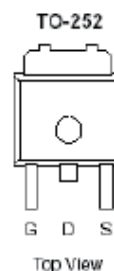
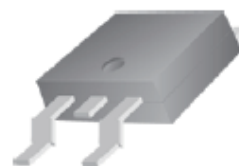
- Low  $r_{DS(on)}$  trench technology
- Low thermal impedance
- Fast switching speed

### Typical Applications:

- PoE Power Sourcing Equipment
- PoE Powered Devices
- Telecom DC/DC converters
- White LED boost converters



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**



| PRODUCT SUMMARY |                            |           |
|-----------------|----------------------------|-----------|
| $V_{DS}$ (V)    | $r_{DS(on)}$ (m $\Omega$ ) | $I_D$ (A) |
| -100            | 295 @ $V_{GS} = -10V$      | -11       |
|                 | 590 @ $V_{GS} = -4.5V$     | -8        |

| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ C$ UNLESS OTHERWISE NOTED) |                    |                |            |            |
|-----------------------------------------------------------------------|--------------------|----------------|------------|------------|
| Parameter                                                             |                    | Symbol         | Limit      | Units      |
| Drain-Source Voltage                                                  |                    | $V_{DS}$       | -100       | V          |
| Gate-Source Voltage                                                   |                    | $V_{GS}$       | $\pm 20$   |            |
| Continuous Drain Current                                              | $T_C = 25^\circ C$ | $I_D$          | -11        | A          |
| Pulsed Drain Current <sup>b</sup>                                     |                    | $I_{DM}$       | -40        |            |
| Continuous Source Current (Diode Conduction)                          |                    | $I_S$          | -15        | A          |
| Power Dissipation                                                     | $T_C = 25^\circ C$ | $P_D$          | 50         | W          |
| Operating Junction and Storage Temperature Range                      |                    | $T_J, T_{stg}$ | -55 to 175 | $^\circ C$ |

| THERMAL RESISTANCE RATINGS               |                 |         |              |
|------------------------------------------|-----------------|---------|--------------|
| Parameter                                | Symbol          | Maximum | Units        |
| Maximum Junction-to-Ambient <sup>a</sup> | $R_{\theta JA}$ | 40      | $^\circ C/W$ |
| Maximum Junction-to-Case                 | $R_{\theta JC}$ | 3       |              |

### Notes

- Surface Mounted on 1" x 1" FR4 Board.
- Pulse width limited by maximum junction temperature

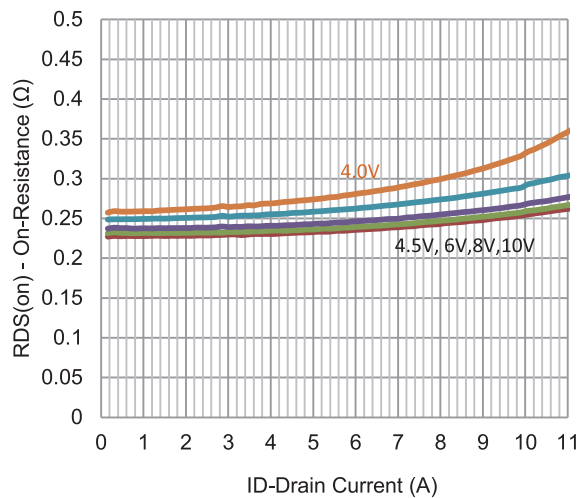
## Typical Electrical Characteristics

| Parameter                       | Symbol       | Test Conditions                                                                         | Min  | Typ  | Max       | Unit       |
|---------------------------------|--------------|-----------------------------------------------------------------------------------------|------|------|-----------|------------|
| <b>Static</b>                   |              |                                                                                         |      |      |           |            |
| Gate-Source Threshold Voltage   | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = -250 \mu A$                                                     | -1   |      |           | V          |
| Gate-Body Leakage               | $I_{GSS}$    | $V_{DS} = 0 V, V_{GS} = \pm 20 V$                                                       |      |      | $\pm 100$ | nA         |
| Zero Gate Voltage Drain Current | $I_{DSS}$    | $V_{DS} = -80 V, V_{GS} = 0 V$                                                          |      |      | -1        | $\mu A$    |
|                                 |              | $V_{DS} = -80 V, V_{GS} = 0 V, T_J = 55^\circ C$                                        |      |      | -10       |            |
| On-State Drain Current          | $I_{D(on)}$  | $V_{DS} = -5 V, V_{GS} = -10 V$                                                         | -5.5 |      |           | A          |
| Drain-Source On-Resistance      | $r_{DS(on)}$ | $V_{GS} = -10 V, I_D = -5 A$                                                            |      |      | 295       | m $\Omega$ |
|                                 |              | $V_{GS} = -4.5 V, I_D = -4 A$                                                           |      |      | 590       |            |
| Forward Transconductance        | $g_{fs}$     | $V_{DS} = -15 V, I_D = -5 A$                                                            |      | 8    |           | S          |
| Diode Forward Voltage           | $V_{SD}$     | $I_S = -7.5 A, V_{GS} = 0 V$                                                            |      | -0.7 |           | V          |
| <b>Dynamic</b>                  |              |                                                                                         |      |      |           |            |
| Total Gate Charge               | $Q_g$        | $V_{DS} = -50 V, V_{GS} = -10 V, I_D = -5 A$                                            |      | 19   |           | nC         |
| Gate-Source Charge              | $Q_{gs}$     |                                                                                         |      | 4.2  |           |            |
| Gate-Drain Charge               | $Q_{gd}$     |                                                                                         |      | 4.5  |           |            |
| Turn-On Delay Time              | $t_{d(on)}$  | $V_{DD} = -50 V, R_L = 10 \Omega, I_D = -5 A,$<br>$V_{GEN} = -10 V, R_{GEN} = 6 \Omega$ |      | 10   |           | nS         |
| Rise Time                       | $t_r$        |                                                                                         |      | 14   |           |            |
| Turn-Off Delay Time             | $t_{d(off)}$ |                                                                                         |      | 68   |           |            |
| Fall Time                       | $t_f$        |                                                                                         |      | 57   |           |            |
| Input Capacitance               | $C_{iss}$    | $V_{DS} = -15 V, V_{GS} = 0 V, f = 1 MHz$                                               |      | 1222 |           | pF         |
| Output Capacitance              | $C_{oss}$    |                                                                                         |      | 128  |           |            |
| Reverse Transfer Capacitance    | $C_{rss}$    |                                                                                         |      | 63   |           |            |

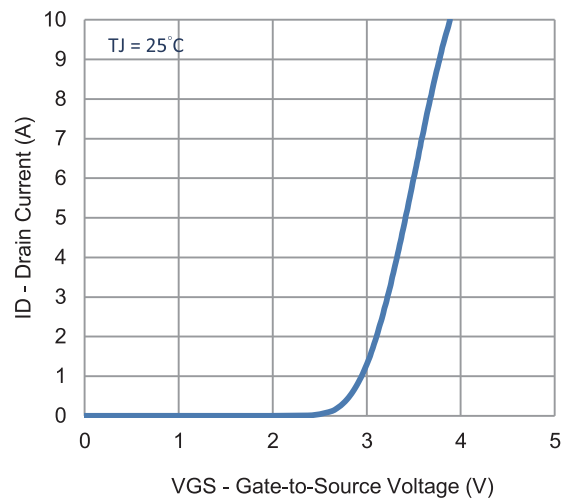
### Notes

- Pulse test: PW  $\leq 300 \mu s$  duty cycle  $\leq 2\%$ .
- Guaranteed by design, not subject to production testing.

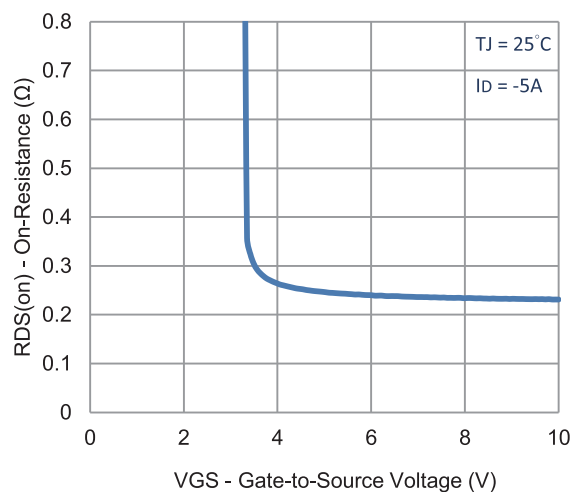
## Typical Electrical Characteristics



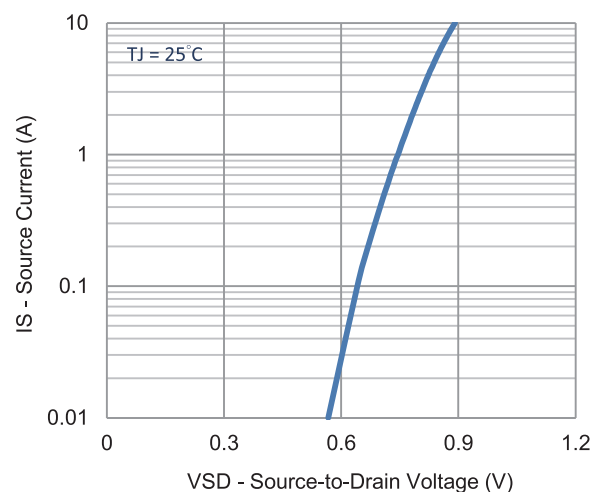
1. On-Resistance vs. Drain Current



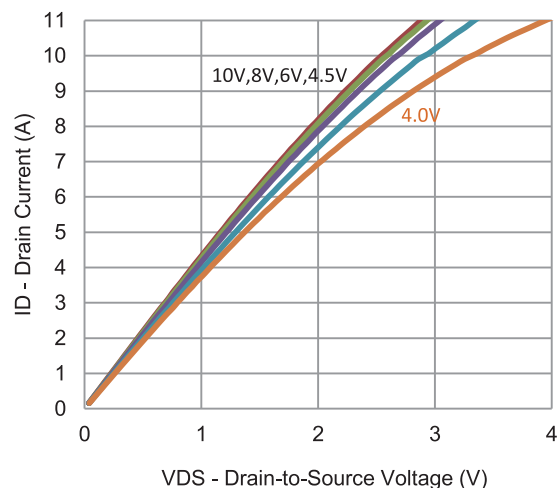
2. Transfer Characteristics



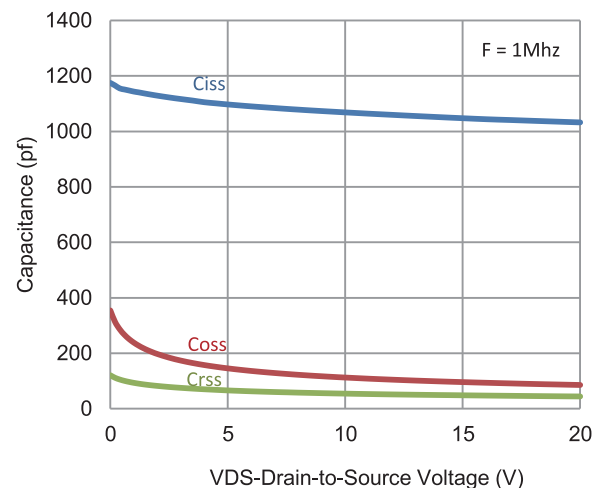
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage



5. Output Characteristics



6. Capacitance

## Typical Electrical Characteristics

