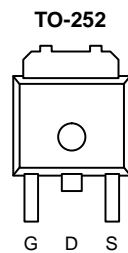


N-Channel 60-V (D-S), 175 °C MOSFET, Logic Level

| PRODUCT SUMMARY | | |
|------------------------|---------------------------|-----------|
| V_{DS} (V) | $r_{DS(on)}$ (Ω) | I_D (A) |
| 60 | 0.065 @ $V_{GS} = 10$ V | 15 |
| | 0.090 @ $V_{GS} = 4.5$ V | 14 |

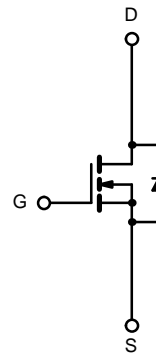
175 °C Rated
Maximum Junction Temperature
TrenchFET®
Power MOSFETS



Top View

 Order Number:
SUD15N06-90L

Drain Connected to Tab



N-Channel MOSFET

| ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED) | | | |
|--|----------------|---------------------------|------------------|
| Parameter | Symbol | Limit | Unit |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current ($T_J = 175^\circ\text{C}$) | I_D | $T_C = 25^\circ\text{C}$ | 15 |
| | | $T_C = 100^\circ\text{C}$ | 12 |
| Pulsed Drain Current | I_{DM} | 30 | A |
| Continuous Source Current (Diode Conduction) | I_S | 15 | |
| Avalanche Current | I_{AR} | 15 | |
| Repetitive Avalanche Energy (Duty Cycle $\leq 1\%$) | E_{AR} | 11 | mJ |
| Maximum Power Dissipation | P_D | $T_C = 25^\circ\text{C}$ | 37 |
| | | $T_A = 25^\circ\text{C}$ | 2 ^a |
| Operating Junction and Storage Temperature Range | T_J, T_{stg} | -55 to 175 | $^\circ\text{C}$ |

| THERMAL RESISTANCE RATINGS | | | | |
|--|------------|---------|---------|--------------------|
| Parameter | Symbol | Typical | Maximum | Unit |
| Junction-to-Ambient Free Air, FR4 Board Mount ^a | R_{thJA} | 60 | 70 | $^\circ\text{C/W}$ |
| Junction-to-Case | R_{thJC} | 3.7 | 4.0 | |

Notes:

a. 1.36 x 2.1 surface mounted on 1" x 1" FR4 Board.



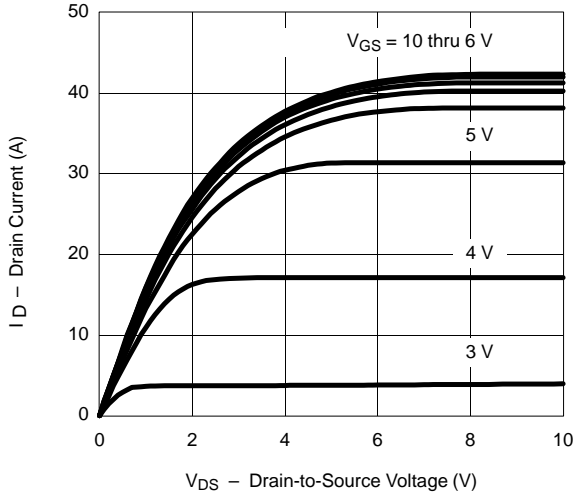
| SPECIFICATIONS (T _J = 25 °C UNLESS OTHERWISE NOTED) | | | | | | |
|---|----------------------|--|-----|------------------|-------|------|
| Parameter | Symbol | Test Condition | Min | Typ ^a | Max | Unit |
| Static | | | | | | |
| Drain-Source Breakdown Voltage | V _{(BR)DSS} | V _{GS} = 0 V, I _D = 250 μA | 60 | | | V |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = 250 μA | 1.0 | 2.0 | 3.0 | |
| Gate-Body Leakage | I _{GSS} | V _{DS} = 0 V, V _{GS} = ±20 V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} = 60 V, V _{GS} = 0 V | | | 1 | μA |
| | | V _{DS} = 60 V, V _{GS} = 0 V, T _J = 125 °C | | | 50 | |
| | | V _{DS} = 60 V, V _{GS} = 0 V, T _J = 175 °C | | | 150 | |
| On-State Drain Current ^b | I _{D(on)} | V _{DS} = 5 V, V _{GS} = 10 V | 15 | | | A |
| Drain-Source On-State Resistance ^b | r _{DS(on)} | V _{GS} = 10 V, I _D = 10 A | | 0.050 | 0.065 | Ω |
| | | V _{GS} = 10 V, I _D = 10 A, T _J = 125 °C | | | 0.12 | |
| | | V _{GS} = 10 V, I _D = 10 A, T _J = 175 °C | | | 0.15 | |
| | | V _{GS} = 4.5 V, I _D = 5 A | | 0.065 | 0.090 | |
| Forward Transconductance ^b | g _{fs} | V _{DS} = 15 V, I _D = 10 A | | 11 | | S |
| Dynamic | | | | | | |
| Input Capacitance | C _{iss} | V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz | | 524 | | pF |
| Output Capacitance | C _{oss} | | | 98 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 28 | | |
| Total Gate Charge ^c | Q _g | V _{DS} = 30 V, V _{GS} = 10 V, I _D = 15 A | | 12 | 20 | nC |
| Gate-Source Charge ^c | Q _{gs} | | | 2 | | |
| Gate-Drain Charge ^c | Q _{gd} | | | 3.5 | | |
| Turn-On Delay Time ^c | t _{d(on)} | I _D ≅ 15 A, V _{DD} = 30 V, R _L = 2 Ω V _{GEN} = 10 V, R _G = 2.5 Ω | | 7 | 20 | ns |
| Rise Time ^c | t _r | | | 8 | 25 | |
| Turn-Off Delay Time ^c | t _{d(off)} | | | 15 | 40 | |
| Fall Time ^c | t _f | | | 7 | 20 | |
| Source-Drain Diode Ratings and Characteristics (T_C = 25 °C) | | | | | | |
| Pulsed Current | I _{SM} | | | | 30 | A |
| Diode Forward Voltage | V _{SD} | I _F = 15 A, V _{GS} = 0 V | | 0.9 | 1.2 | V |
| Reverse Recovery Time | t _{rr} | I _F = 15 A, di/dt = 100 A/μs | | 29 | 60 | ns |

Notes:

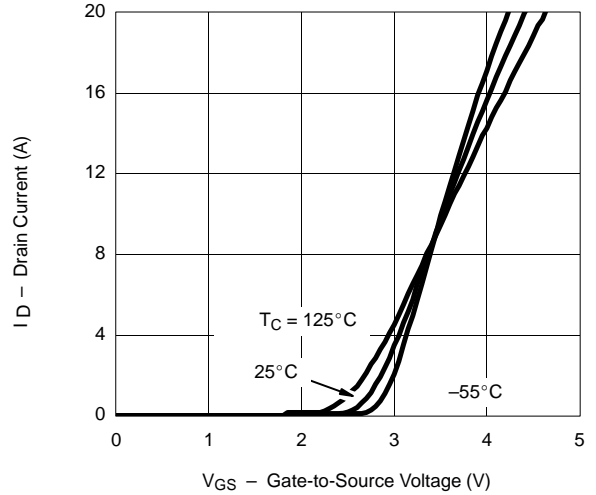
- For design aid only; not subject to production testing.
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- Independent of operating temperature.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

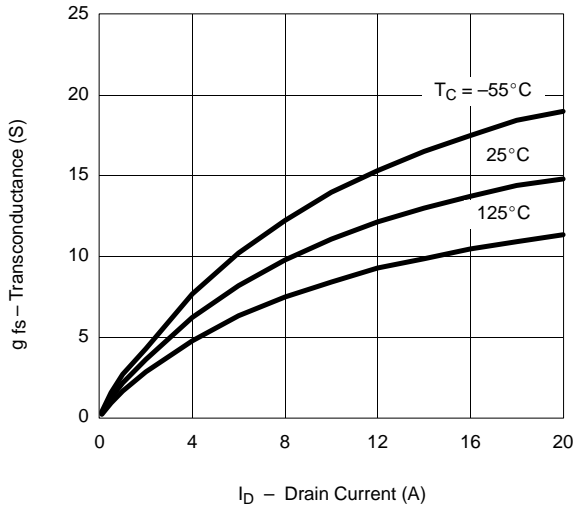
Output Characteristics



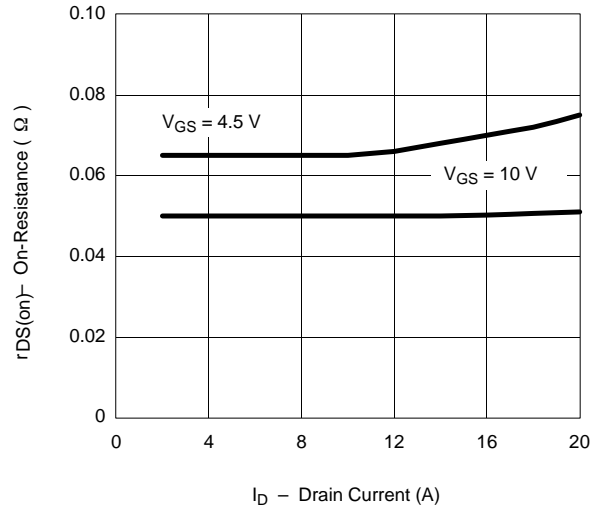
Transfer Characteristics



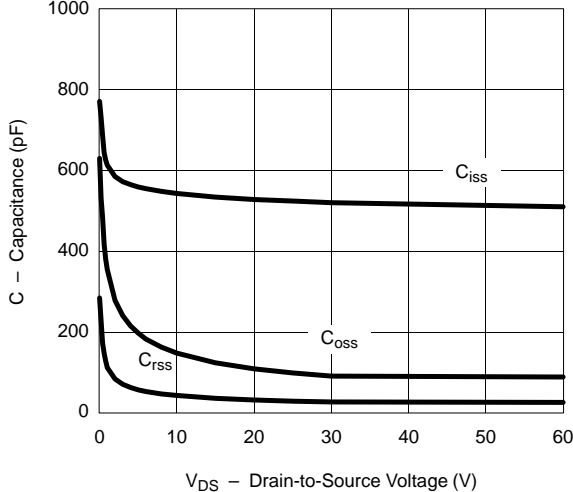
Transconductance



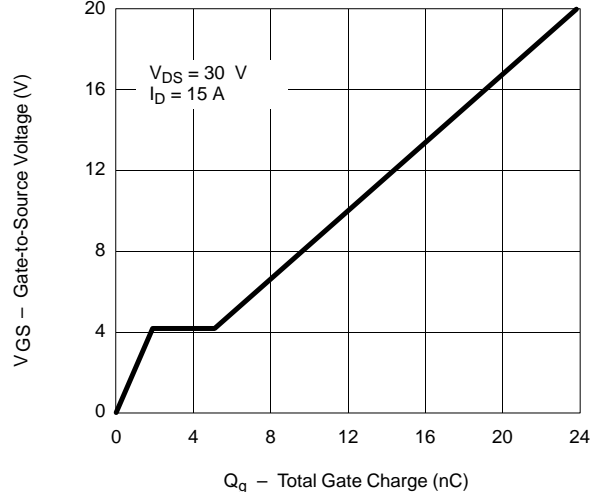
On-Resistance vs. Drain Current



Capacitance

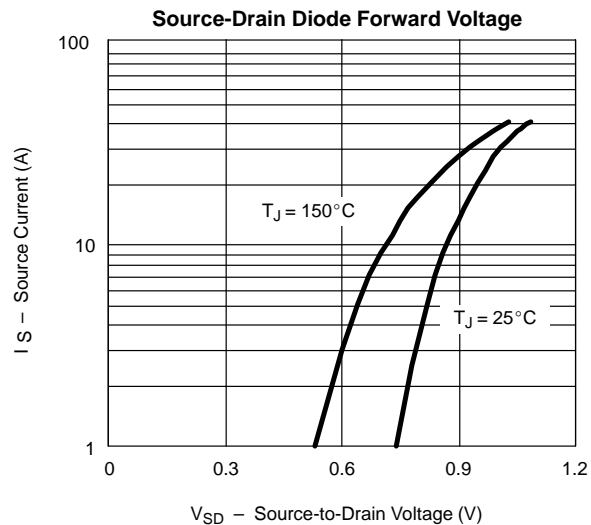
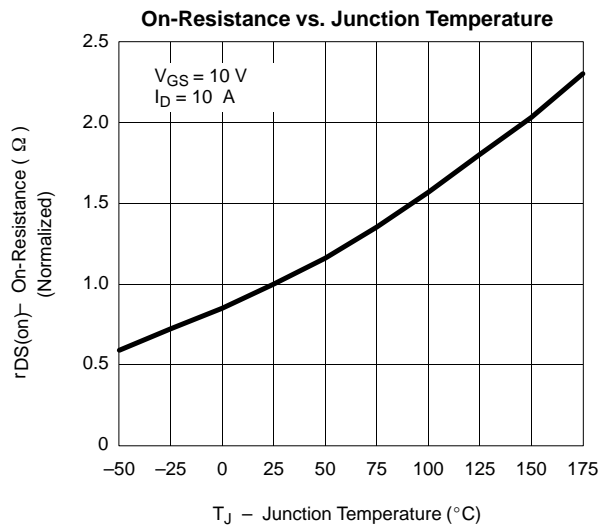


Gate Charge





TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



THERMAL RATINGS

