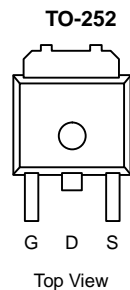
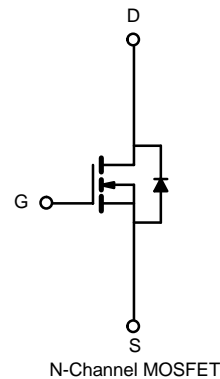


| PRODUCT SUMMARY | | |
|-------------------|---------------------------|------------------------|
| $V_{(BR)DSS}$ (V) | $r_{DS(on)}$ (Ω) | I_D (A) ^a |
| 40 | 0.010 @ $V_{GS} = 10$ V | 40 |
| | 0.014 @ $V_{GS} = 4.5$ V | 40 |



Order Number:
SUD40N04-10A

Drain Connected to Tab



| ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED) | | | |
|---|--------------------------|---------------------------|------------------|
| Parameter | Symbol | Limit | Unit |
| Drain-Source Voltage | V_{DS} | 40 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | |
| Continuous Drain Current ($T_J = 175^\circ\text{C}$) | I_D | $T_C = 25^\circ\text{C}$ | 40 ^a |
| | | $T_C = 100^\circ\text{C}$ | 40 ^a |
| Pulsed Drain Current | I_{DM} | 100 | A |
| Avalanche Current | I_{AR} | 30 | |
| Repetitive Avalanche Energy ^b | E_{AR} | 45 | mJ |
| | $L = 0.1$ mH | | |
| Power Dissipation | P_D | 71 ^c | W |
| | $T_C = 25^\circ\text{C}$ | | |
| 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 ^d | R_{thJA} | $t \leq 10$ sec. | 15 | 18 | $^\circ\text{C/W}$ |
| | | Steady State | 40 | 50 | |
| Junction-to-Case | R_{thJC} | 1.75 | 2.1 | | |

Notes:

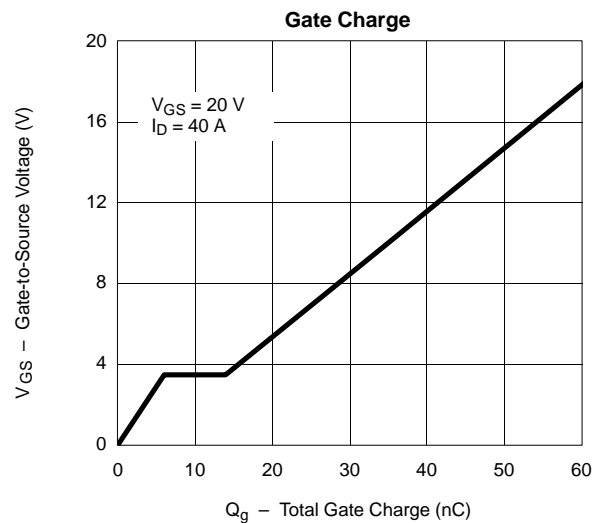
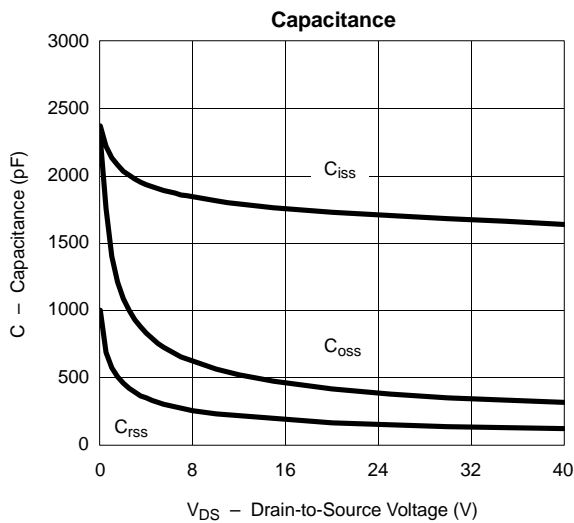
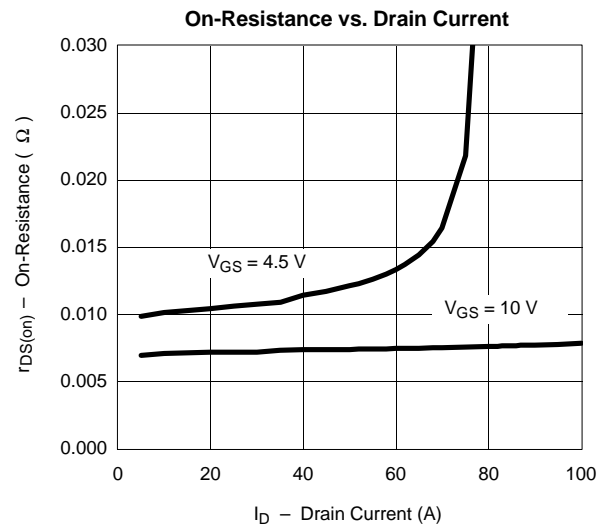
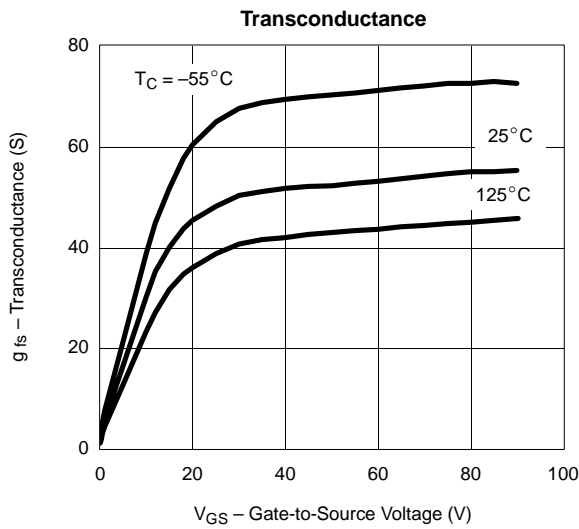
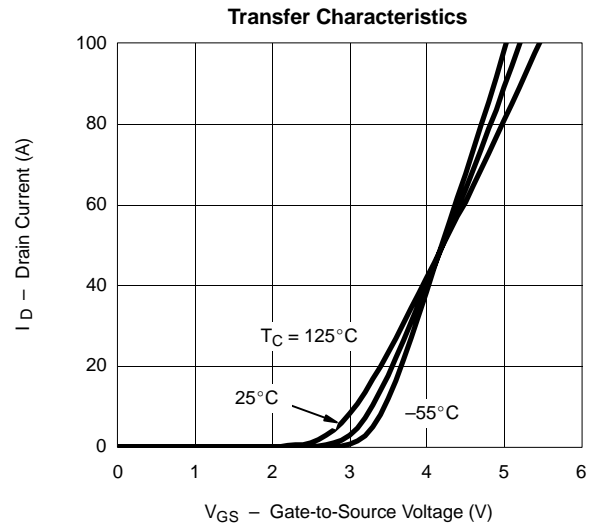
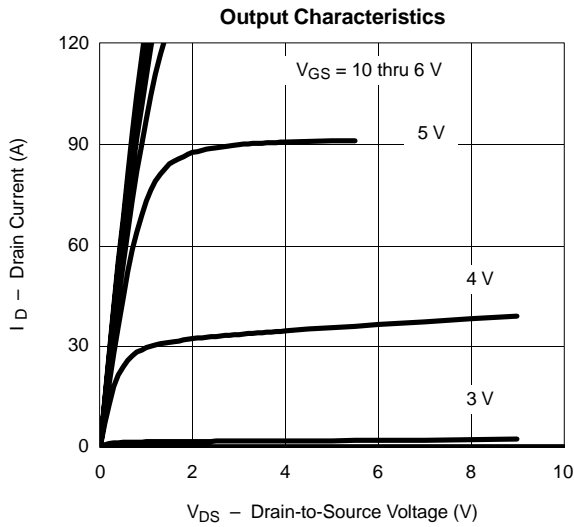
- Package limited.
- Duty cycle $\leq 1\%$.
- See SOA curve for voltage derating.
- Surface mounted on 1" FR4 board.

| SPECIFICATIONS (T_J = 25 °C UNLESS OTHERWISE NOTED) | | | | | | |
|---|----------------------|--|-----|--------|-------|------|
| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
| Static | | | | | | |
| Drain-Source Breakdown Voltage | V _{(BR)DSS} | V _{GS} = 0 V, I _D = 250 μA | 40 | | | V |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _{DS} = 250 μA | 1 | | 3 | |
| Gate-Body Leakage | I _{GSS} | V _{DS} = 0 V, V _{GS} = ±20 V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} = 32 V, V _{GS} = 0 V | | | 1 | μA |
| | | V _{DS} = 32 V, V _{GS} = 0 V, T _J = 125 °C | | | 50 | |
| | | V _{DS} = 32 V, V _{GS} = 0 V, T _J = 175 °C | | | 150 | |
| On-State Drain Current ^a | I _{D(on)} | V _{DS} = 5 V, V _{GS} = 10 V | 40 | | | A |
| Drain-Source On-State Resistance ^a | r _{DS(on)} | V _{GS} = 10 V, I _D = 40 A | | 0.0075 | 0.010 | Ω |
| | | V _{GS} = 10 V, I _D = 40 A, T _J = 125 °C | | 0.012 | 0.016 | |
| | | V _{GS} = 10 V, I _D = 40 A, T _J = 175 °C | | 0.015 | 0.020 | |
| | | V _{GS} = 4.5 V, I _D = 10 A | | 0.011 | 0.014 | |
| | | V _{GS} = 4.5 V, I _D = 10 A, T _J = 125 °C | | 0.018 | 0.022 | |
| Forward Transconductance ^a | g _{fs} | V _{DS} = 15 V, I _D = 40 A | 20 | 40 | | S |
| Dynamic^b | | | | | | |
| Input Capacitance | C _{iss} | V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz | | 1700 | | pF |
| Output Capacitance | C _{oss} | | | 370 | | |
| Reversen Transfer Capacitance | C _{rss} | | | 145 | | |
| Total Gate Charge ^c | Q _g | V _{DS} = 20 V, V _{GS} = 10 V, I _D = 40 A | | 35 | | nC |
| Gate-Source Charge ^c | Q _{gs} | | | 6 | | |
| Gate-Drain Charge ^c | Q _{gd} | | | 8 | | |
| Turn-On Delay Time ^c | t _{d(on)} | V _{DD} = 20 V, R _L = 0.5 Ω I _D = 40 A, V _{GEN} = 10 V, R _G = 2.5 Ω | | 14 | 30 | ns |
| Rise Time ^c | t _r | | | 7.5 | 15 | |
| Turn-Off Delay Time ^c | t _{d(off)} | | | 30 | 60 | |
| Fall Time ^c | t _f | | | 14 | 30 | |
| Source-Drain Ciode Ratings and Characteristics (T_C = 25 °C)^b | | | | | | |
| Continuous Current | I _s | | | | 40 | A |
| Pulsed Current | I _{SM} | | | | 100 | |
| Forward Voltage ^a | V _{SD} | I _F = 40 A, V _{GS} = 0 V | | 1.0 | 1.50 | V |
| Reverse Recovery Time | t _{rr} | I _F = 40 A, di/dt = 100 A/μs | | 30 | 60 | ns |

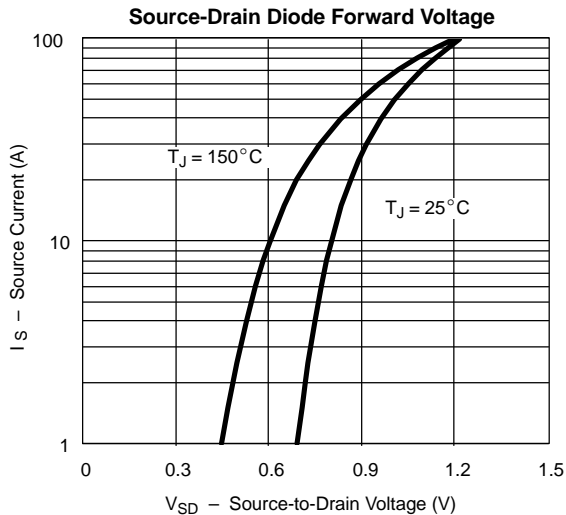
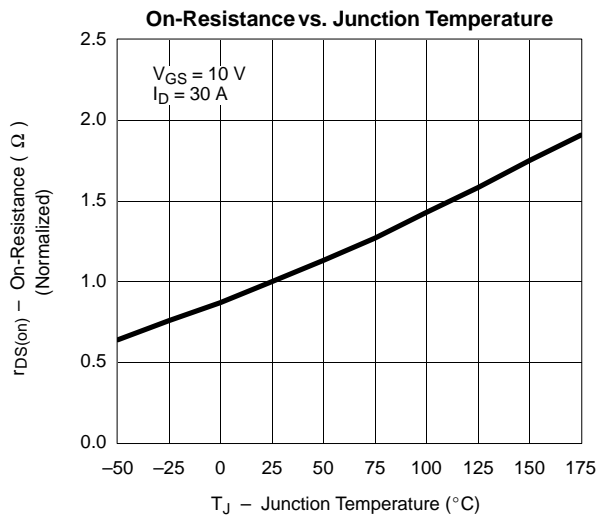
Notes:

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

TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



THERMAL RATINGS

