

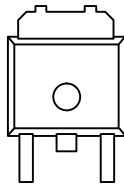
N-Channel 80-V (D-S) 175°C MOSFET

| PRODUCT SUMMARY | | |
|-----------------|---------------------------|-----------|
| V_{DS} (V) | $r_{DS(on)}$ (Ω) | I_D (A) |
| 80 | 0.016 @ $V_{GS} = 10$ V | 40 |

FEATURES

- TrenchFET® Power MOSFET
- 175°C Maximum Junction Temperature
- 100% R_g Tested

TO-252



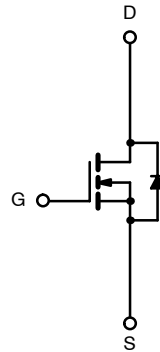
G D S

Top View

Ordering Information:

SUD40N08-16
SUD40N08-16—E3 (Lead Free)

Drain Connected to Tab



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

| Parameter | Symbol | Limit | Unit | |
|---|----------------|---------------------------|------------------|----|
| Drain-Source Voltage | V_{DS} | 80 | V | |
| Gate-Source Voltage | V_{GS} | ± 20 | | |
| Continuous Drain Current ($T_J = 175^\circ\text{C}$) ^b | I_D | $T_C = 25^\circ\text{C}$ | 40 | |
| | | $T_C = 125^\circ\text{C}$ | 30 | |
| Pulsed Drain Current | I_{DM} | 60 | A | |
| Continuous Source Current (Diode Conduction) | I_S | 40 | | |
| Avalanche Current | I_{AR} | 40 | | |
| Repetitive Avalanche Energy (Duty Cycle $\leq 1\%$) | $L = 0.1$ mH | E_{AR} | 80 | mJ |
| Maximum Power Dissipation | P_D | $T_C = 25^\circ\text{C}$ | 136 ^b | W |
| | | $T_A = 25^\circ\text{C}$ | 3 ^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 ^a | R_{thJA} | $t \leq 10$ sec | 15 | $^\circ\text{C}/\text{W}$ |
| | | Steady State | 40 | |
| Junction-to-Case | R_{thJC} | 0.85 | 1.1 | |

Notes

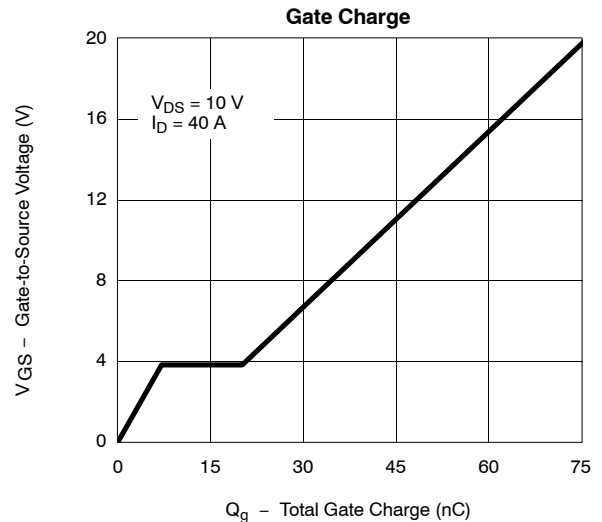
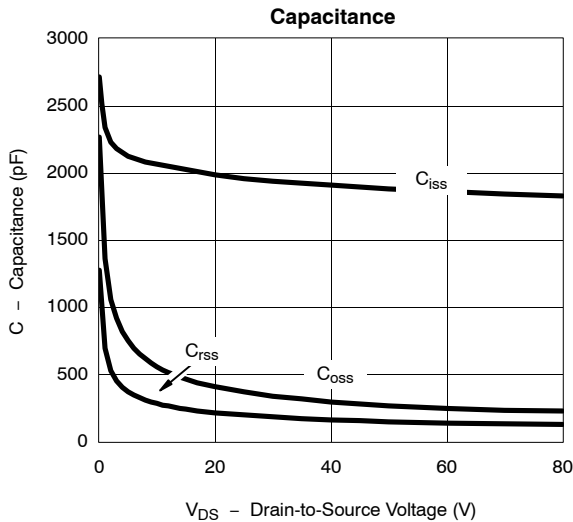
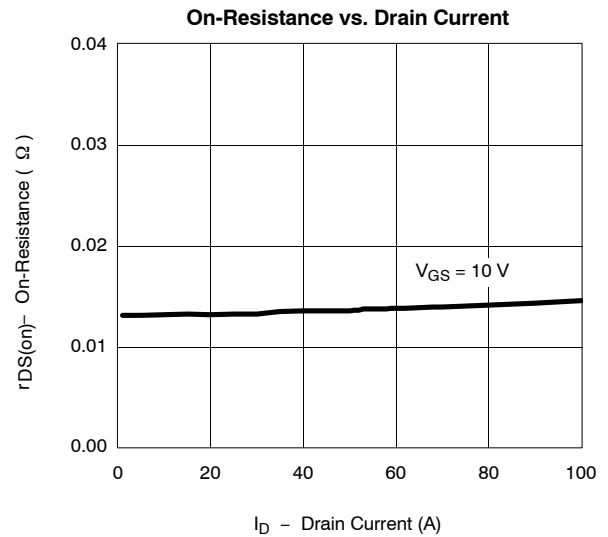
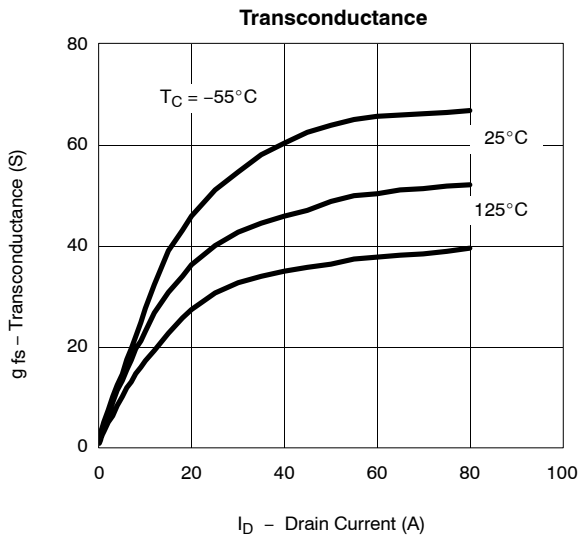
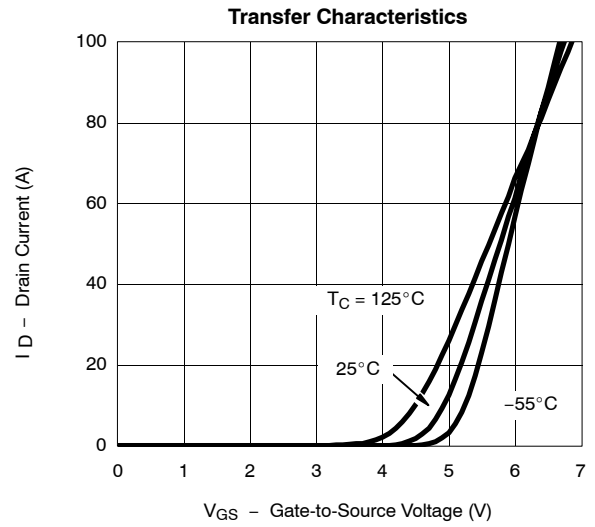
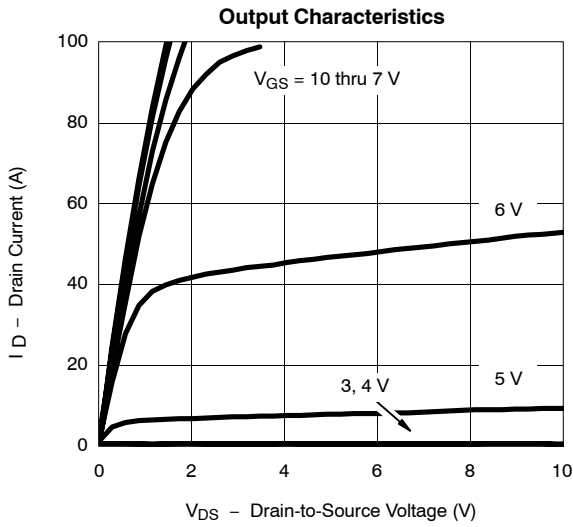
- Surface Mounted on 1" x 1" FR4 Board.
- See SOA curve for voltage derating.

| 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 | 80 | | | V |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = 250 μA | 2.0 | | 4.0 | |
| Gate-Body Leakage | I _{GSS} | V _{DS} = 0 V, V _{GS} = ±20 V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} = 80 V, V _{GS} = 0 V | | | 1 | μA |
| | | V _{DS} = 80 V, V _{GS} = 0 V, T _J = 125 °C | | | 50 | |
| | | V _{DS} = 80 V, V _{GS} = 0 V, T _J = 175 °C | | | 250 | |
| On-State Drain Current ^b | I _{D(on)} | V _{DS} = 5 V, V _{GS} = 10 V | 60 | | | A |
| Drain-Source On-State Resistance ^b | r _{DS(on)} | V _{GS} = 10 V, I _D = 40 A | | 0.013 | 0.016 | Ω |
| | | V _{GS} = 10 V, I _D = 40 A, T _J = 125 °C | | | 0.027 | |
| | | V _{GS} = 10 V, I _D = 40 A, T _J = 175 °C | | | 0.037 | |
| Forward Transconductance ^b | g _{fs} | V _{DS} = 15 V, I _D = 40 A | | 45 | | S |
| Dynamic^a | | | | | | |
| Input Capacitance | C _{iss} | V _{GS} = 0 V, V _{DS} = 25 V, F = 1 MHz | | 1960 | | pF |
| Output Capacitance | C _{oss} | | | 370 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 200 | | |
| Total Gate Charge ^c | Q _g | V _{DS} = 40 V, V _{GS} = 10 V, I _D = 40 A | | 42 | 60 | nC |
| Gate-Source Charge ^c | Q _{gs} | | | 7 | | |
| Gate-Drain Charge ^c | Q _{gd} | | | 13 | | |
| Gate Resistance | R _g | | 0.5 | | 2.7 | Ω |
| Turn-On Delay Time ^c | t _{d(on)} | V _{DD} = 40 V, R _L = 1.0 Ω I _D = 40 A, V _{GEN} = 10 V, R _g = 2.5 Ω | | 12 | 20 | ns |
| Rise Time ^c | t _r | | | 52 | 80 | |
| Turn-Off Delay Time ^c | t _{d(off)} | | | 25 | 38 | |
| Fall Time ^c | t _f | | | 10 | 15 | |
| Source-Drain Diode Ratings and Characteristic (T_C = 25 °C) | | | | | | |
| Pulsed Current | I _{SM} | | | | 60 | A |
| Diode Forward Voltage ^b | V _{SD} | I _F = 40 A, V _{GS} = 0 V | | 1.0 | 1.5 | V |
| Source-Drain Reverse Recovery Time | t _{rr} | I _F = 40 A, di/dt = 100 A/μs | | 45 | 70 | ns |

Notes

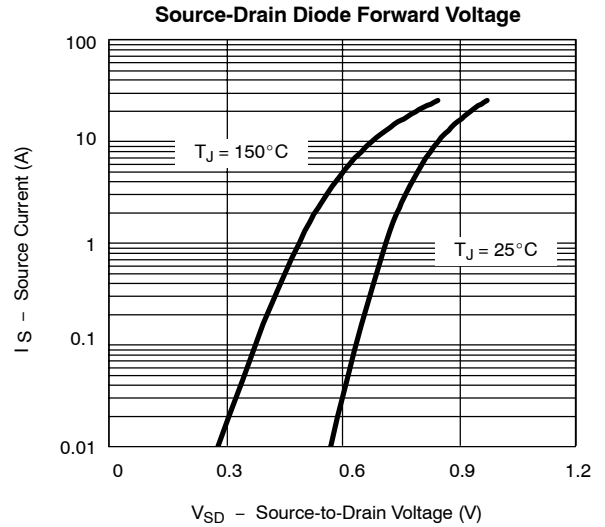
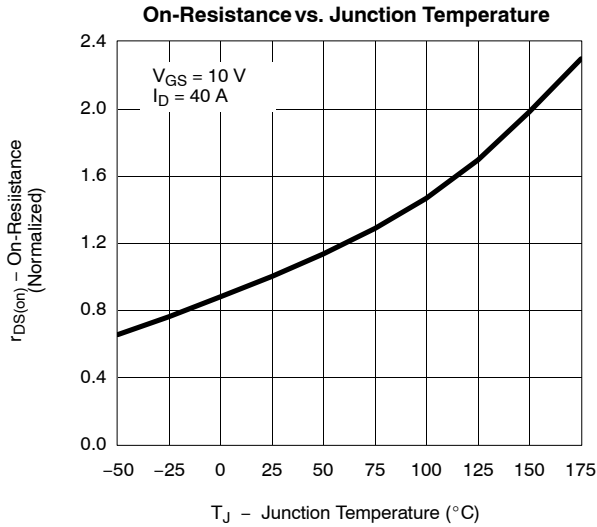
- Guaranteed by design, not subject to production testing.
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- Independent of operating temperature.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

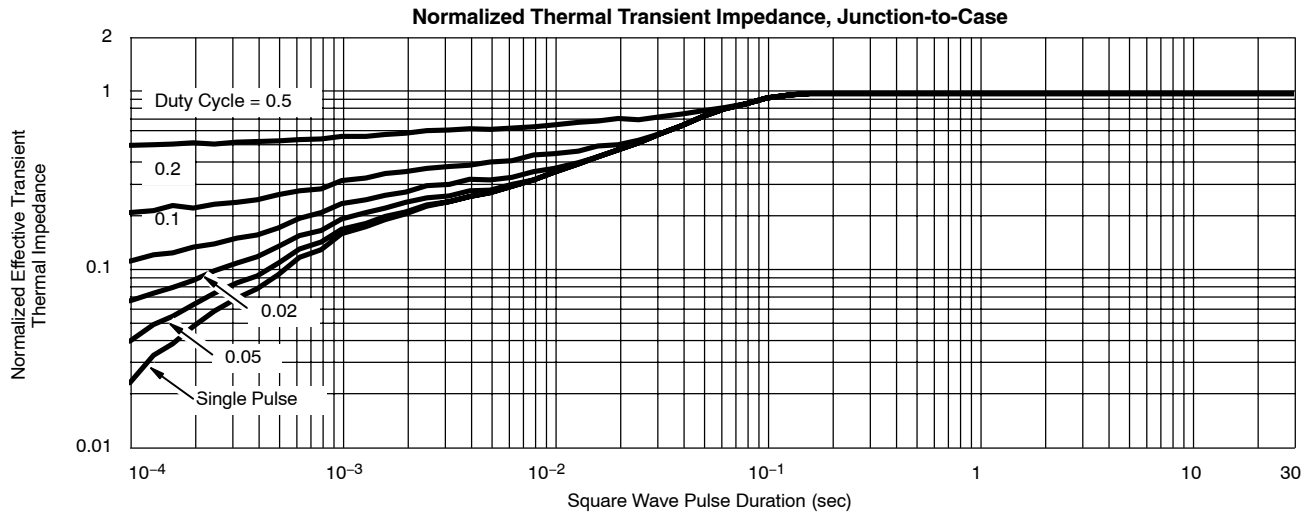
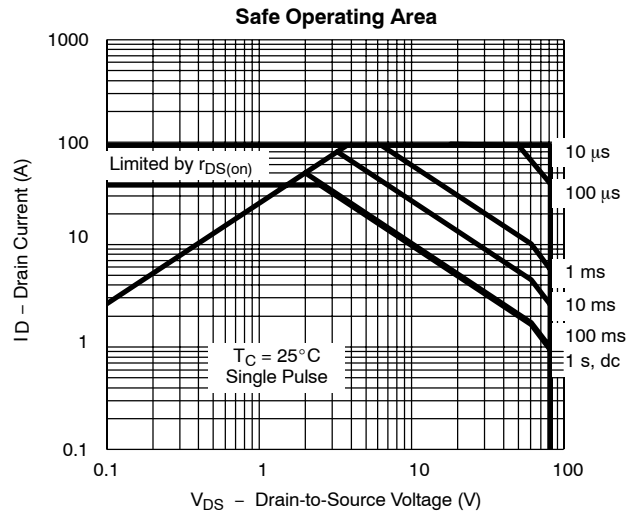
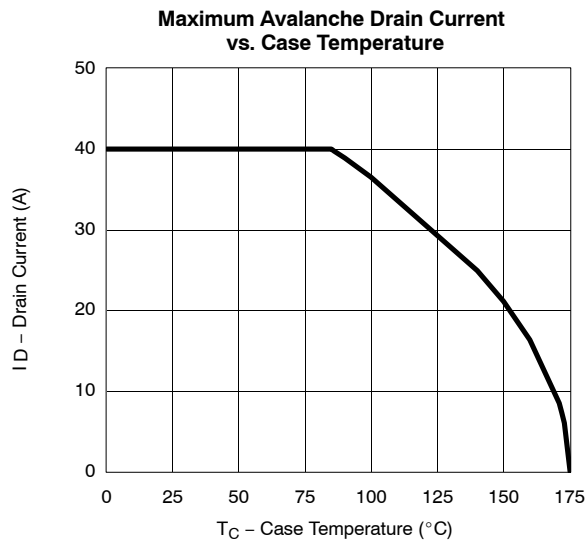




TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



THERMAL RATINGS





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