

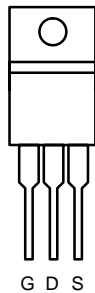


N-Channel 75-V (D-S), 175 °C MOSFET

| PRODUCT SUMMARY | | |
|-------------------|---------------------------|------------|
| $V_{(BR)DSS}$ (V) | $r_{DS(on)}$ (Ω) | I_D (A) |
| 75 | 0.009 @ $V_{GS} = 10$ V | $\pm 75^a$ |
| | 0.011 @ $V_{GS} = 4.5$ V | |

175 °C Rated
Maximum Junction Temperature
TrenchFET®
Power MOSFETs

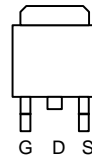
TO-220AB



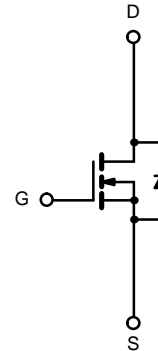
Top View
SUP75N08-09L

DRAIN connected to TAB

TO-263



Top View
SUB75N08-09L



N-Channel MOSFET

| ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED) | | | | |
|---|----------------|--|------------------|------------------|
| Parameter | Symbol | Limit | Unit | |
| Drain-Source Voltage | V_{DS} | 75 | V | |
| Gate-Source Voltage | V_{GS} | ± 20 | | |
| Continuous Drain Current ($T_J = 175^\circ\text{C}$) | I_D | $T_C = 25^\circ\text{C}$ | $\pm 75^a$ | A |
| | | $T_C = 125^\circ\text{C}$ | ± 66 | |
| Pulsed Drain Current | I_{DM} | ± 240 | | |
| Avalanche Current | I_{AR} | ± 75 | | |
| Repetitive Avalanche Energy ^b | | $L = 0.1$ mH | E_{AR} | mJ |
| Maximum Power Dissipation ^b | P_D | $T_C = 25^\circ\text{C}$ (TO-220AB and TO-263) | 250 ^c | W |
| | | $T_A = 25^\circ\text{C}$ (TO-263) ^d | 3.7 | |
| Operating Junction and Storage Temperature Range | T_J, T_{stg} | -55 to 175 | | $^\circ\text{C}$ |

| THERMAL RESISTANCE RATINGS | | | | |
|----------------------------|------------|---------------------------------|------|--------------------|
| Parameter | Symbol | Limit | Unit | |
| Junction-to-Ambient | R_{thJA} | PCB Mount (TO-263) ^d | 40 | $^\circ\text{C/W}$ |
| | | Free Air (TO-220AB) | 62.5 | |
| Junction-to-Case | R_{thJC} | 0.6 | | |

- Notes
a. Package limited.
b. Duty cycle $\leq 1\%$.
c. See SOA curve for voltage derating.
d. When mounted on 1" square PCB (FR-4 material).



| 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 _{DS} = 0 V, I _D = 250 μA | 75 | | | V |
| Gate-Threshold Voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = 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} = 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 | | | 250 | |
| On-State Drain Current ^a | I _{D(on)} | V _{DS} ≥ 5 V, V _{GS} = 10 V | 120 | | | A |
| Drain-Source On-State Resistance ^a | r _{DS(on)} | V _{GS} = 10 V, I _D = 30 A | | 0.0076 | 0.009 | Ω |
| | | V _{GS} = 4.5 V, I _D = 20 A | | | 0.011 | |
| | | V _{GS} = 10 V, I _D = 30 A, T _J = 125 °C | | | 0.016 | |
| | | V _{GS} = 10 V, I _D = 30 A, T _J = 175 °C | | | 0.021 | |
| Forward Transconductance ^a | g _{fs} | V _{DS} = 15 V, I _D = 30 A | 30 | | | S |
| Dynamic^b | | | | | | |
| Input Capacitance | C _{iss} | V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz | | 5600 | | pF |
| Output Capacitance | C _{oss} | | | 820 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 275 | | |
| Total Gate Charge ^c | Q _g | V _{DS} = 30 V, V _{GS} = 10 V, I _D = 75 A | | 121 | 150 | nC |
| Gate-Source Charge ^c | Q _{gs} | | | 20 | | |
| Gate-Drain Charge ^c | Q _{gd} | | | 25 | | |
| Turn-On Delay Time ^c | t _{d(on)} | V _{DD} = 30 V, R _L = 0.47 Ω I _D ≅ 75 A, V _{GEN} = 10 V, R _G = 2.5 Ω | | 11 | 20 | ns |
| Rise Time ^c | t _r | | | 10 | 20 | |
| Turn-Off Delay Time ^c | t _{d(off)} | | | 107 | 200 | |
| Fall Time ^c | t _f | | | 22 | 40 | |
| Source-Drain Diode Ratings and Characteristics (T_C = 25 °C)^b | | | | | | |
| Continuous Current | I _S | | | | 75 | A |
| Pulsed Current | I _{SM} | | | | 240 | |
| Forward Voltage ^a | V _{SD} | I _F = 75 A, V _{GS} = 0 V | | 1.0 | 1.3 | V |
| Reverse Recovery Time | t _{rr} | I _F = 75 A, di/dt = 100 A/μs | | 80 | 120 | ns |
| Peak Reverse Recovery Current | I _{RM(REC)} | | | 4 | 9 | A |
| Reverse Recovery Charge | Q _{rr} | | | 0.32 | 0.54 | μC |

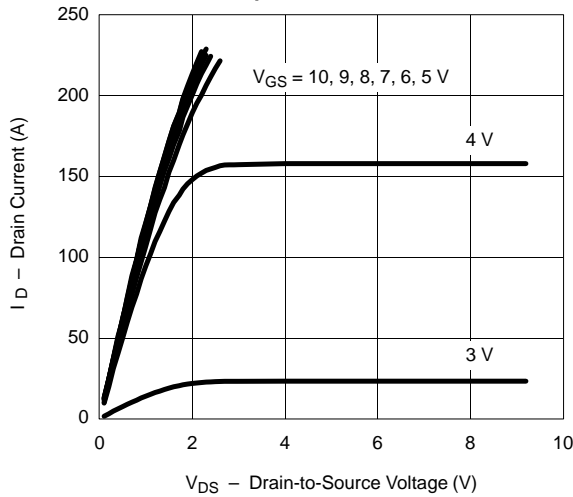
Notes

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

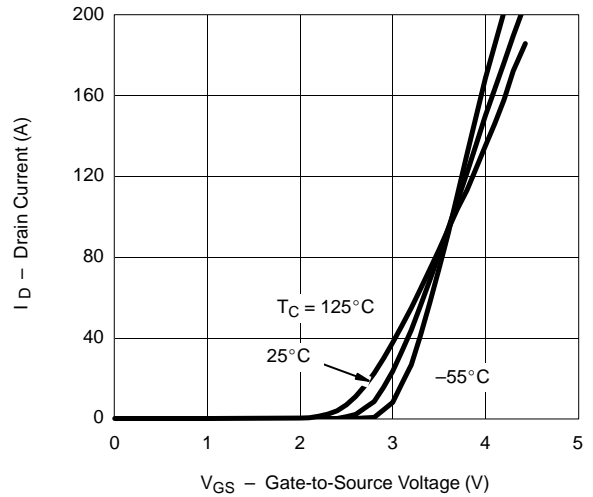


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

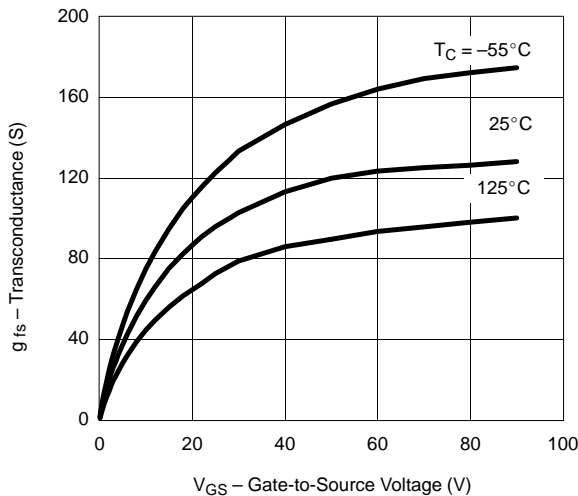
Output Characteristics



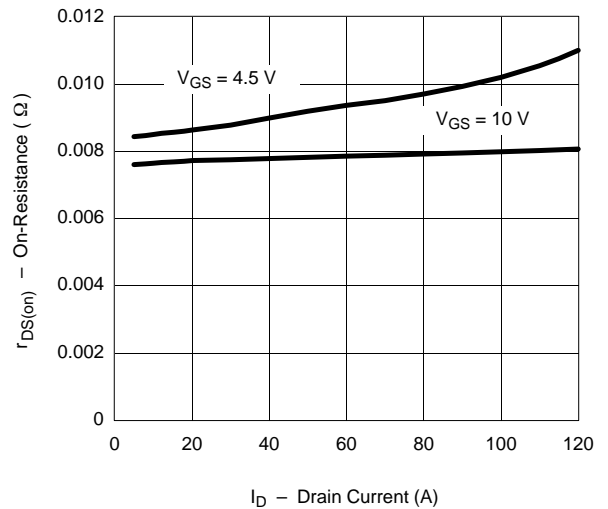
Transfer Characteristics



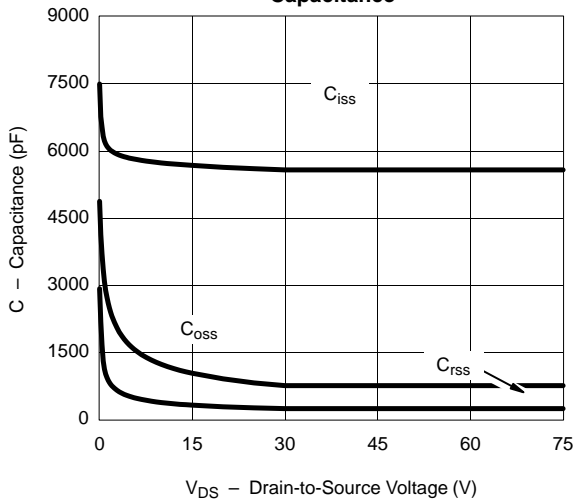
Transconductance



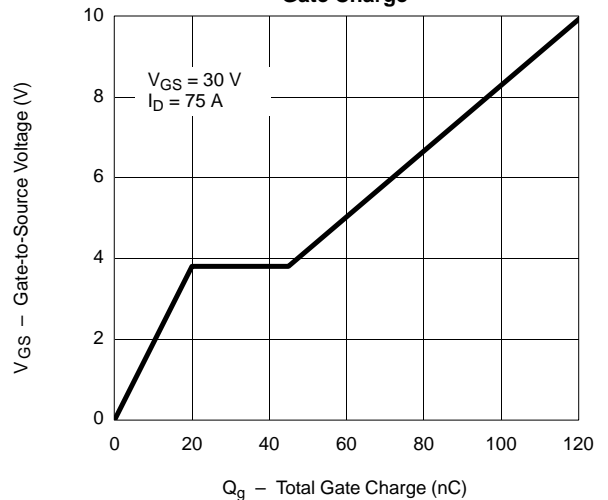
On-Resistance vs. Drain Current



Capacitance

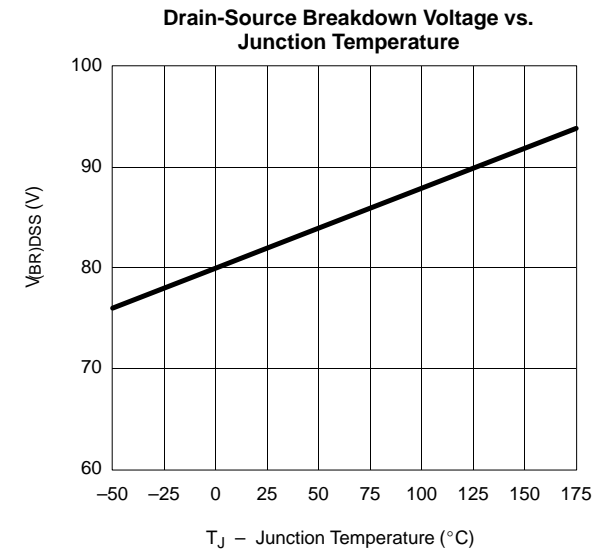
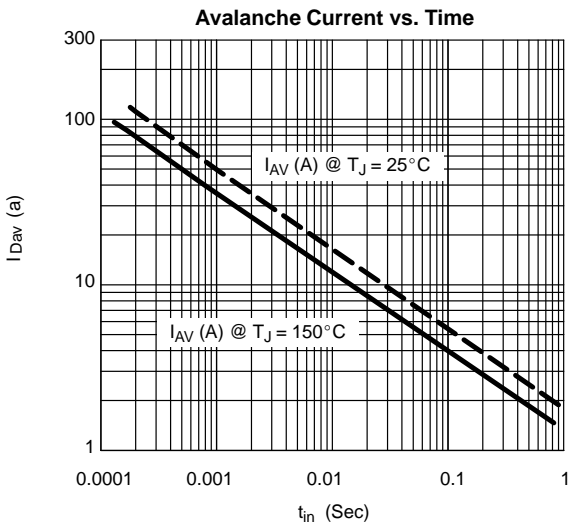
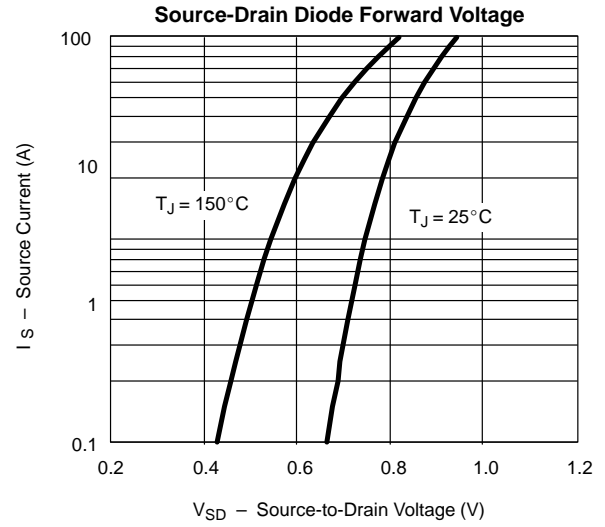
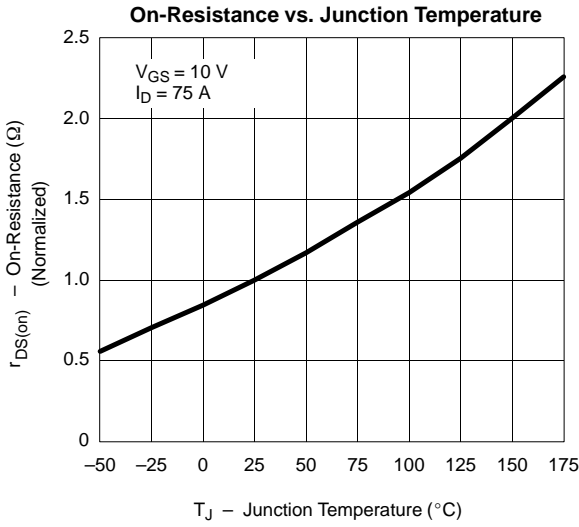


Gate Charge





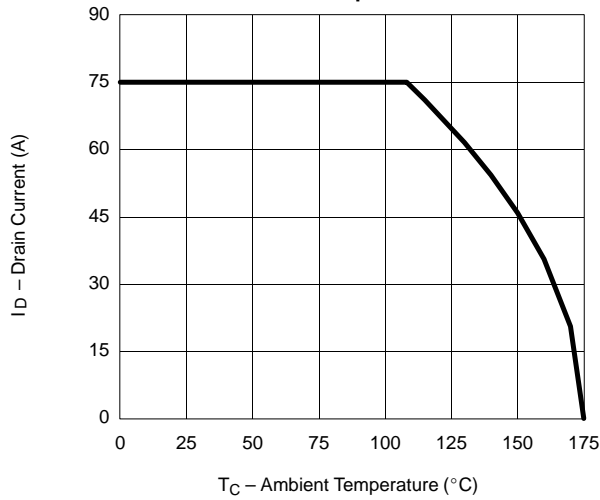
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



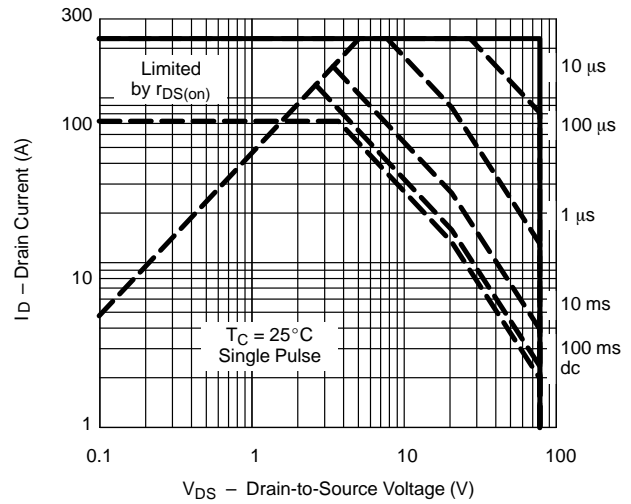


THERMAL RATINGS

Maximum Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

