



Dual P-Channel 20-V (D-S) MOSFET

TrenchFET[®] MOSFETs 1.8-V Rated



ESD Protected 2000 V

| PRODUCT SUMMARY | | |
|---------------------|--------------------------------|---------------------|
| V _{DS} (V) | r _{DS(on)} (Ω) | I _D (mA) |
| -20 | 1.2 @ V _{GS} = -4.5 V | -350 |
| | 1.6 @ V _{GS} = -2.5 V | -300 |
| | 2.7 @ V _{GS} = -1.8 V | -150 |

FEATURES

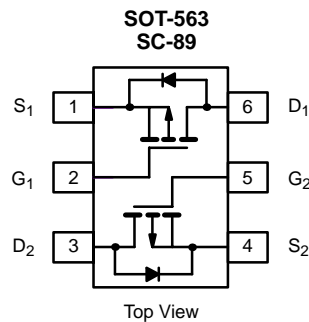
- Very Small Footprint
- High-Side Switching
- Low On-Resistance: 1.2 Ω
- Low Threshold: 0.8 V (typ)
- Fast Switching Speed: 14 ns
- 1.8-V Operation
- Gate-Source ESD Protection

BENEFITS

- Ease in Driving Switches
- Low Offset (Error) Voltage
- Low-Voltage Operation
- High-Speed Circuits
- Low Battery Voltage Operation

APPLICATIONS

- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories
- Battery Operated Systems
- Power Supply Converter Circuits
- Load/Power Switching Cell Phones, Pages



Marking Code: B

| ABSOLUTE MAXIMUM RATINGS (T _A = 25 °C UNLESS OTHERWISE NOTED) | | | | | |
|--|-----------------------------------|------------------------|--------------|------|----|
| Parameter | Symbol | 5 secs | Steady State | Unit | |
| Drain-Source Voltage | V _{DS} | -20 | | V | |
| Gate-Source Voltage | V _{GS} | ±6 | | | |
| Continuous Drain Current (T _J = 150 °C) ^a | I _D | T _A = 25 °C | -390 | -370 | mA |
| | | T _A = 85 °C | -280 | -265 | |
| Pulsed Drain Current ^b | I _{DM} | -650 | | | |
| Continuous Source Current (diode conduction) ^a | I _S | -450 | -380 | | |
| Maximum Power Dissipation ^a | P _D | T _A = 25 °C | 280 | 250 | mW |
| | | T _A = 85 °C | 145 | 130 | |
| Operating Junction and Storage Temperature Range | T _J , T _{stg} | -55 to 150 | | °C | |
| Gate-Source ESD Rating (HBM, Method 3015) | ESD | 2000 | | V | |

Notes

- a. Surface Mounted on FR4 Board.
- b. Pulse width limited by maximum junction temperature.

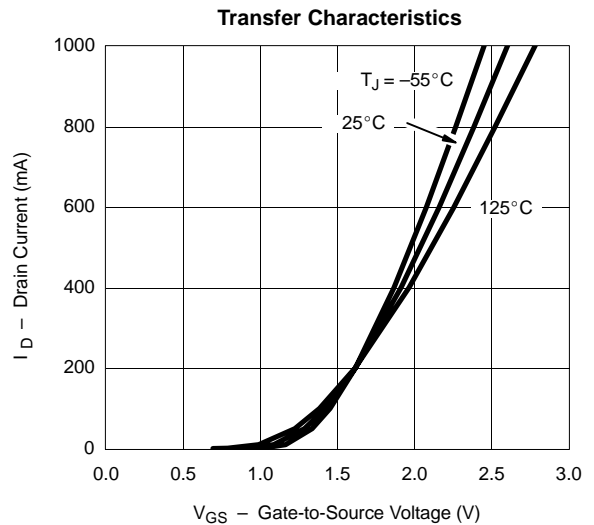
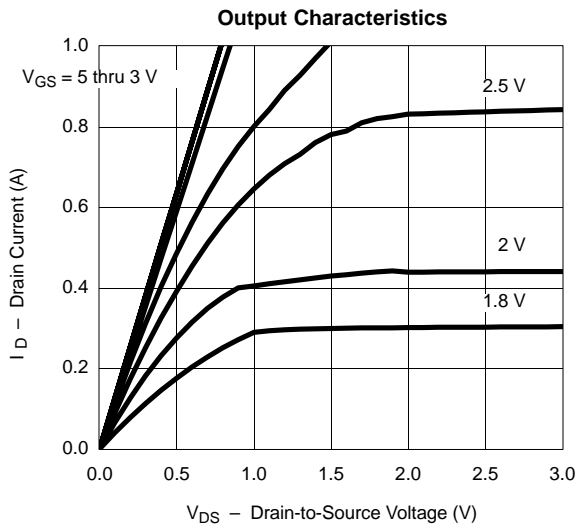
| SPECIFICATIONS (T _J = 25 °C UNLESS OTHERWISE NOTED) | | | | | | |
|--|---------------------|--|-------|------|------|------|
| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
| Static | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = -250 μA | -0.45 | | | V |
| Gate-Body Leakage | I _{GSS} | V _{DS} = 0 V, V _{GS} = ±4.5 V | | ±1 | ±2 | μA |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} = -16 V, V _{GS} = 0 V | | -0.3 | -100 | nA |
| | | V _{DS} = -16 V, V _{GS} = 0 V, T _J = 85 °C | | | -5 | μA |
| On-State Drain Current ^a | I _{D(on)} | V _{DS} = -5 V, V _{GS} = -4.5 V | -700 | | | mA |
| Drain-Source On-State Resistance ^a | r _{DS(on)} | V _{GS} = -4.5 V, I _D = -350 mA | | 0.8 | 1.2 | Ω |
| | | V _{GS} = -2.5 V, I _D = -300 mA | | 1.2 | 1.6 | |
| | | V _{GS} = -1.8 V, I _D = -150 mA | | 1.8 | 2.7 | |
| Forward Transconductance ^a | g _{fs} | V _{DS} = -10 V, I _D = -250 mA | | 0.4 | | S |
| Diode Forward Voltage ^a | V _{SD} | I _S = -150 mA, V _{GS} = 0 V | | -0.8 | -1.2 | V |
| Dynamic^b | | | | | | |
| Total Gate Charge | Q _g | V _{DS} = -10 V, V _{GS} = -4.5 V, I _D = -250 mA | | 1500 | | pC |
| Gate-Source Charge | Q _{gs} | | | 150 | | |
| Gate-Drain Charge | Q _{gd} | | | 450 | | |
| Turn-On Time | t _{ON} | V _{DD} = -10 V, R _L = 47 Ω I _D ≅ -200 mA, V _{GEN} = -4.5 V, R _G = 10 Ω | | 14 | | ns |
| Turn-Off Time | t _{OFF} | | | 46 | | |

Notes

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

TYPICAL CHARACTERISTICS (T_A = 25 °C UNLESS NOTED)

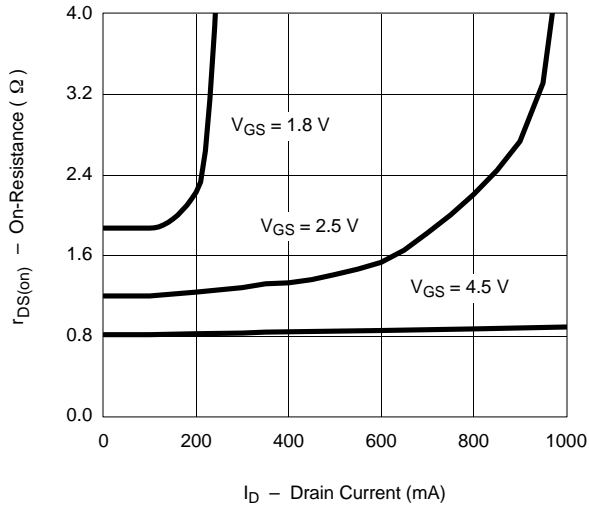
For the following graphs, p-channel negative polarities for all voltage and current values are represented as positive values.



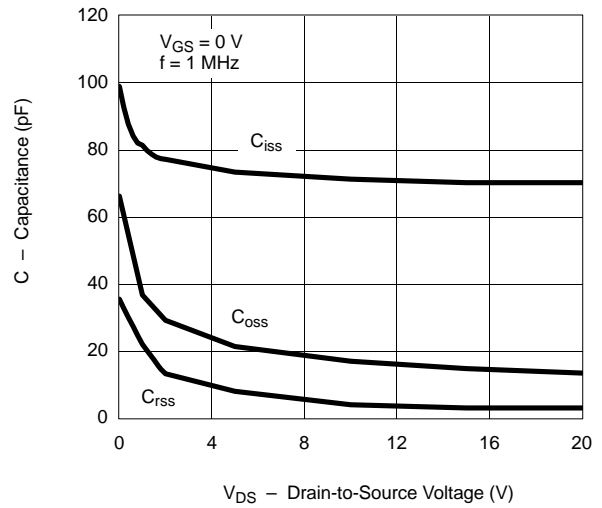


TYPICAL CHARACTERISTICS (T_A = 25°C UNLESS NOTED)

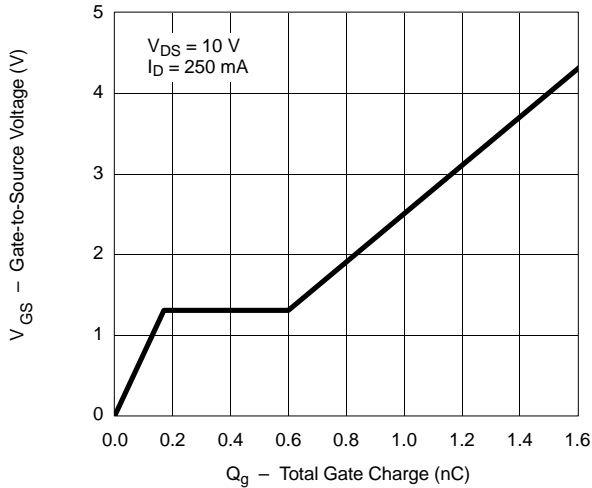
On-Resistance vs. Drain Current



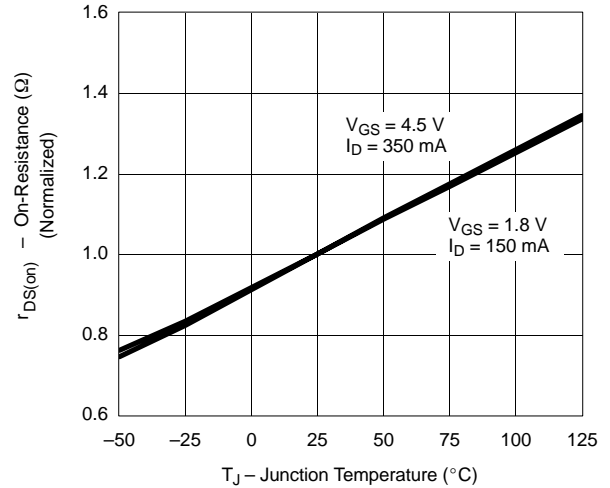
Capacitance



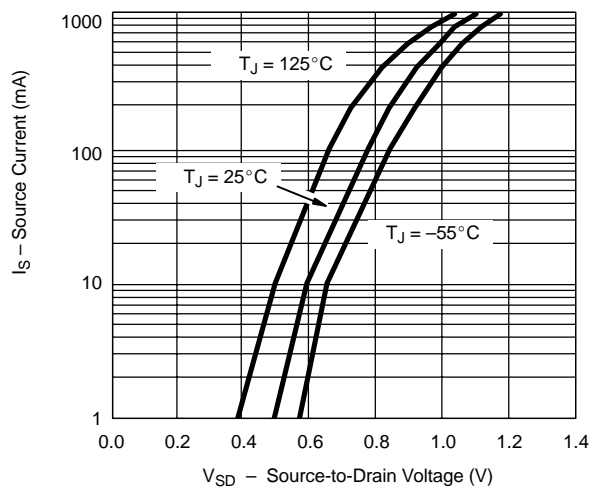
Gate Charge



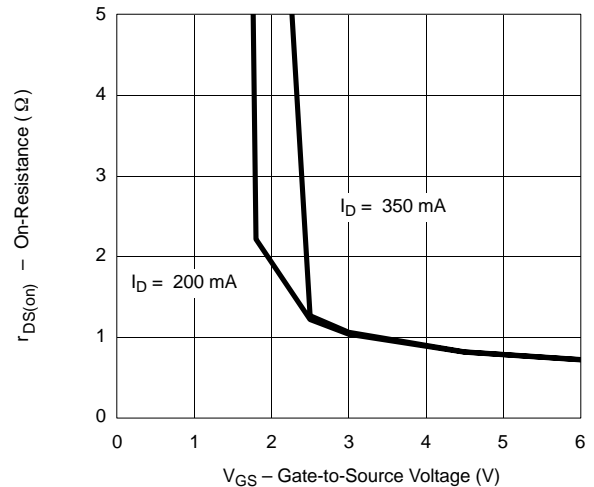
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ UNLESS NOTED)

