



N-Channel 30-V (D-S) MOSFET

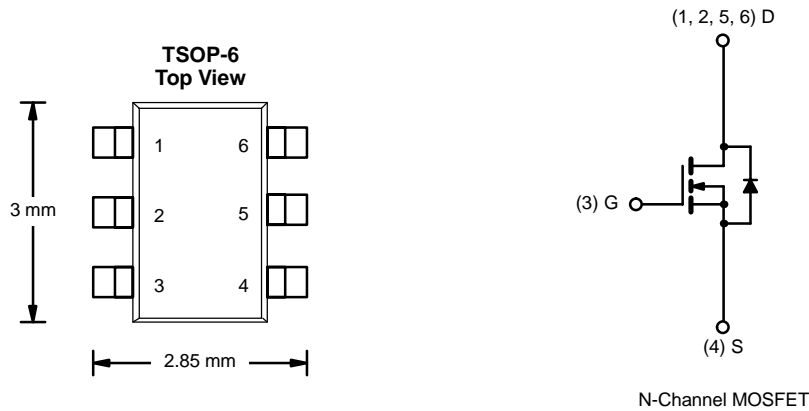
| PRODUCT SUMMARY | | |
|---------------------|---------------------------------|--------------------|
| V _{DS} (V) | r _{DS(on)} (Ω) | I _D (A) |
| 30 | 0.034 @ V _{GS} = 4.5 V | 6.1 |
| | 0.050 @ V _{GS} = 2.5 V | 5.0 |

FEATURES

- TrenchFET® Power MOSFET
- 2.5-V Rating for 30-V N-Channel
- Low r_{DS(on)} for Footprint Area

APPLICATIONS

- Li-Ion Battery Protection



| ABSOLUTE MAXIMUM RATINGS (T _A = 25 °C UNLESS OTHERWISE NOTED) | | | | | |
|--|------------------------|-----------------------------------|------------|--------------|------|
| Parameter | | Symbol | 5 secs | Steady State | Unit |
| Drain-Source Voltage | | V _{DS} | 30 | | V |
| Gate-Source Voltage | | V _{GS} | ± 12 | | |
| Continuous Drain Current (T _J = 150 °C) ^a | T _A = 25 °C | I _D | 6.1 | 4.6 | A |
| | T _A = 70 °C | | 4.9 | 3.6 | |
| Pulsed Drain Current | | I _{DM} | 30 | | |
| Continuous Source Current (Diode Conduction) ^a | | I _S | 1.7 | 1.0 | W |
| Maximum Power Dissipation ^a | T _A = 25 °C | P _D | 2.0 | 1.14 | |
| | T _A = 70 °C | | 1.3 | 0.73 | |
| Operating Junction and Storage Temperature Range | | T _J , T _{stg} | -55 to 150 | | °C |

| THERMAL RESISTANCE RATINGS | | | | | |
|--|--------------|-------------------|---------|---------|------|
| Parameter | | Symbol | Typical | Maximum | Unit |
| Maximum Junction-to-Ambient ^a | t ≤ 5 sec | R _{thJA} | 40 | 62.5 | °C/W |
| | Steady State | | 90 | 110 | |
| Maximum Junction-to-Foot (Drain) | Steady State | R _{thJF} | 25 | 30 | |

Notes
a. Surface Mounted on 1" x 1" FR4 Board.

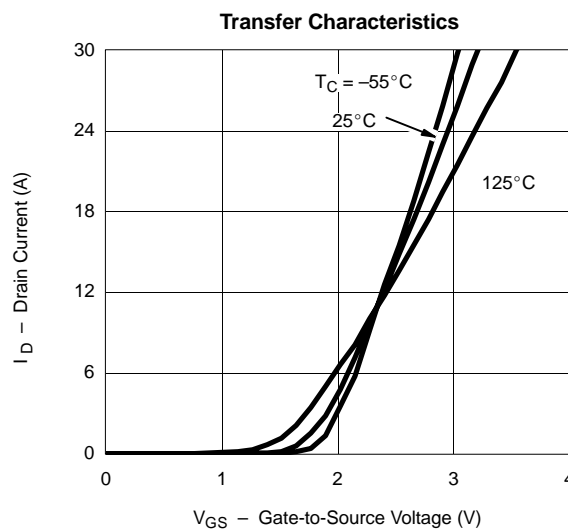
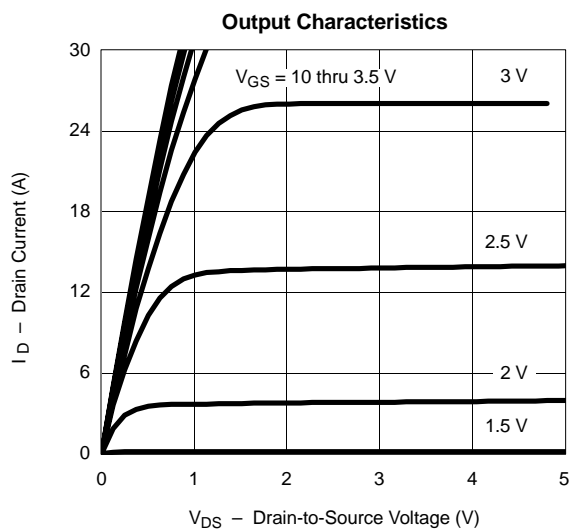
SPECIFICATIONS (T_J = 25 °C UNLESS OTHERWISE NOTED)

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|---------------------|---|-----|-------|-------|------|
| Static | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = 1 mA | 0.6 | | | V |
| Gate-Body Leakage | I _{GSS} | V _{DS} = 0 V, V _{GS} = ± 12 V | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} = 24 V, V _{GS} = 0 V | | | 1 | μA |
| | | V _{DS} = 24 V, V _{GS} = 0 V, T _J = 70 °C | | | 5 | |
| On-State Drain Current ^a | I _{D(on)} | V _{DS} ≥ 5 V, V _{GS} = 4.5 V | 30 | | | A |
| Drain-Source On-State Resistance ^a | r _{DS(on)} | V _{GS} = 4.5 V, I _D = 6.1 A | | 0.028 | 0.034 | Ω |
| | | V _{GS} = 2.5 V, I _D = 2 A | | 0.042 | 0.050 | |
| Forward Transconductance ^a | g _{fs} | V _{DS} = 10 V, I _D = 6.1 A | | 20 | | S |
| Diode Forward Voltage ^a | V _{SD} | I _S = 1.7 A, V _{GS} = 0 V | | 0.8 | 1.2 | V |
| Dynamic^b | | | | | | |
| Total Gate Charge | Q _g | V _{DS} = 15 V, V _{GS} = 4.5 V, I _D = 6.1 A | | 8 | 12 | nC |
| Gate-Source Charge | Q _{gs} | | | 1.9 | | |
| Gate-Drain Charge | Q _{gd} | | | 2.6 | | |
| Turn-On Delay Time | t _{d(on)} | V _{DD} = 15 V, R _L = 15 Ω I _D ≅ 1 A, V _{GEN} = 4.5 V, R _G = 6 Ω | | 21 | 40 | ns |
| Rise Time | t _r | | | 45 | 90 | |
| Turn-Off Delay Time | t _{d(off)} | | | 40 | 80 | |
| Fall Time | t _f | | | 30 | 60 | |
| Source-Drain Reverse Recovery Time | t _{rr} | I _F = 1.7 A, di/dt = 100 A/μs | | 40 | 80 | |

Notes

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

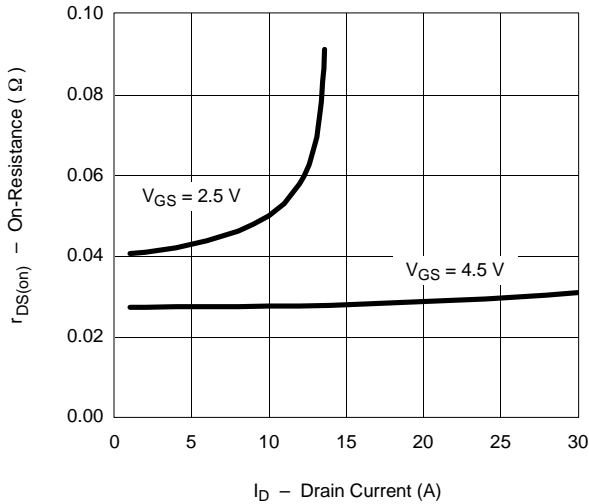
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



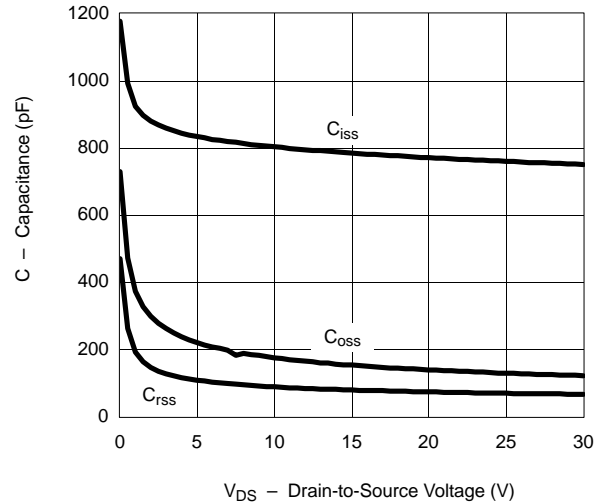


TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

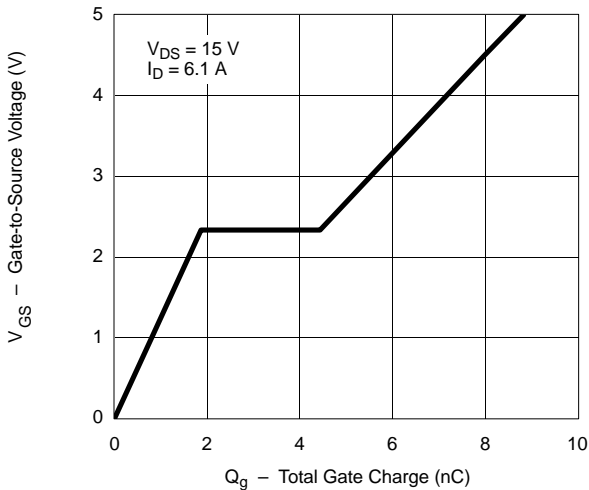
On-Resistance vs. Drain Current



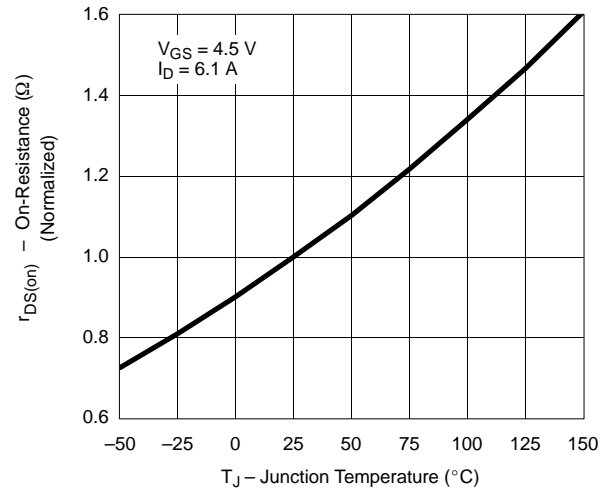
Capacitance



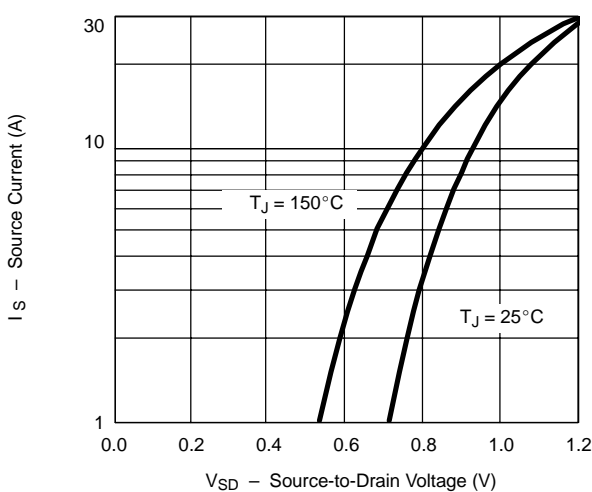
Gate Charge



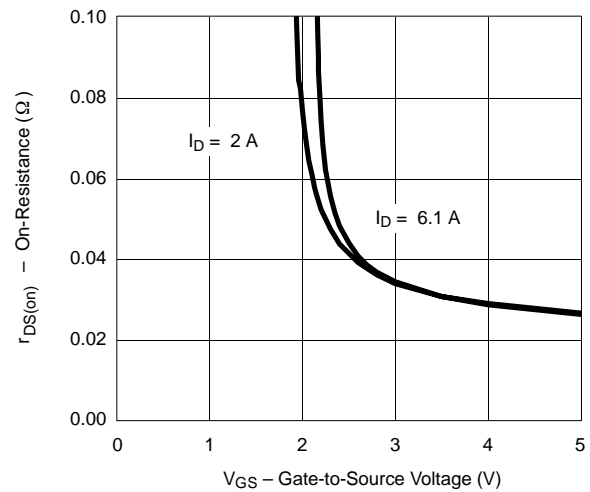
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

