



N-Channel 200-V (D-S) MOSFET

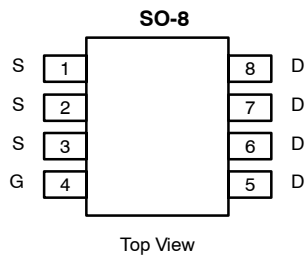
| PRODUCT SUMMARY | | |
|---------------------|---------------------------------|--------------------|
| V _{DS} (V) | r _{DS(on)} (Ω) | I _D (A) |
| 200 | 0.130 @ V _{GS} = 10 V | 3 |
| | 0.142 @ V _{GS} = 6.0 V | 2.8 |

FEATURES

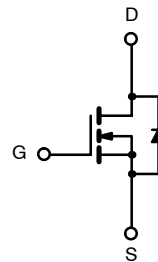
- TrenchFET® Power MOSFET
- 100% Rg Tested

APPLICATIONS

- Primary Side Switch



Ordering Information: Si4418DY—E3
Si4418DY-T1—E3 (with Tape and Reel)



| ABSOLUTE MAXIMUM RATINGS (T _A = 25°C UNLESS OTHERWISE NOTED) | | | | | |
|---|-----------------------------------|-----------------------|----------------|------|----|
| Parameter | Symbol | 10 secs | Steady State | Unit | |
| Drain-Source Voltage | V _{DS} | 200 | | V | |
| Gate-Source Voltage | V _{GS} | ± 20 | | | |
| Continuous Drain Current (T _J = 150°C) ^a | I _D | T _A = 25°C | 3 | 2.3 | A |
| | | T _A = 85°C | 2.1 | 1.6 | |
| Pulsed Drain Current | I _{DM} | 12 | | | |
| Avalanche Current | I _{AS} | 6 | | | |
| Single Avalanche Energy (Duty Cycle ≤ 1%) | E _{AS} | L = 0.1 mH | 1.8 | | mJ |
| Continuous Source Current (Diode Conduction) ^a | | | I _S | 2.1 | |
| Maximum Power Dissipation ^a | P _D | T _A = 25°C | 2.5 | 1.5 | W |
| | | T _A = 85°C | 1.3 | 0.8 | |
| 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 | R _{thJA} | t ≤ 10 sec | 36 | 50 | °C/W |
| | | Steady State | 71 | 85 | |
| Maximum Junction-to-Foot (Drain) | R _{thJF} | 15 | 20 | | |

Notes

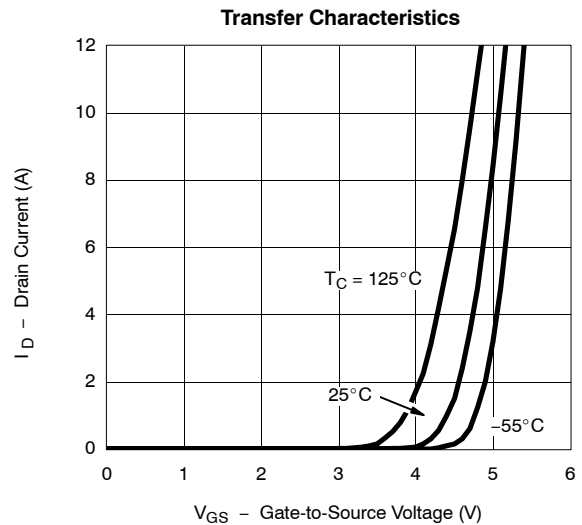
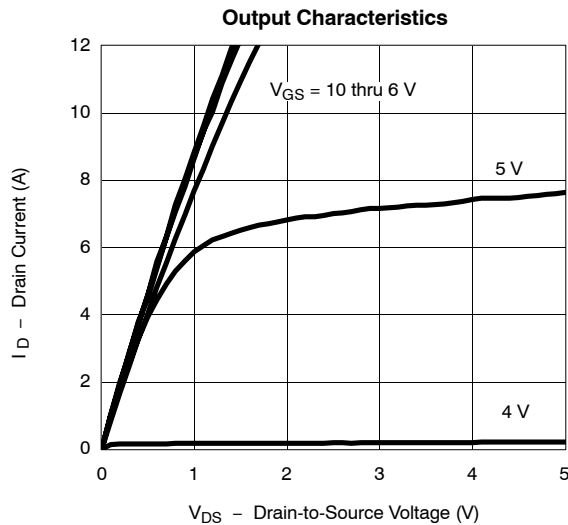
a. Surface Mounted on 1" x 1" FR4 Board.

| 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 = 250 μA | 2 | | 4 | V |
| Gate-Body Leakage | I _{GSS} | V _{DS} = 0 V, V _{GS} = ±20 V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} = 200 V, V _{GS} = 0 V | | | 1 | μA |
| | | V _{DS} = 200 V, V _{GS} = 0 V, T _J = 85 °C | | | 20 | |
| On-State Drain Current ^a | I _{D(on)} | V _{DS} ≥ 5 V, V _{GS} = 10 V | 12 | | | A |
| Drain-Source On-State Resistance ^a | r _{DS(on)} | V _{GS} = 10 V, I _D = 3 A | | 0.110 | 0.130 | Ω |
| | | V _{GS} = 6.0 V, I _D = 2.8 A | | 0.120 | 0.142 | |
| Forward Transconductance ^a | g _{fs} | V _{DS} = 15 V, I _D = 3 A | | 13 | | S |
| Diode Forward Voltage ^a | V _{SD} | I _S = 2.1 A, V _{GS} = 0 V | | 0.8 | 1.2 | V |
| Dynamic^b | | | | | | |
| Total Gate Charge | Q _g | V _{DS} = 100 V, V _{GS} = 10 V, I _D = 3 A | | 20 | 30 | nC |
| Gate-Source Charge | Q _{gs} | | 4.5 | | | |
| Gate-Drain Charge | Q _{gd} | | 6.5 | | | |
| Gate Resistance | R _g | f = 1 MHz | 1 | 2 | 3.4 | Ω |
| Turn-On Delay Time | t _{d(on)} | V _{DD} = 100 V, R _L = 100 Ω I _D ≅ 1 A, V _{GEN} = 10 V, R _G = 6 Ω | | 15 | 25 | ns |
| Rise Time | t _r | | 15 | 25 | | |
| Turn-Off Delay Time | t _{d(off)} | | 40 | 60 | | |
| Fall Time | t _f | | 20 | 30 | | |
| Source-Drain Reverse Recovery Time | t _{rr} | I _F = 2.1 A, di/dt = 100 A/μs | | 70 | 110 | |

Notes

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

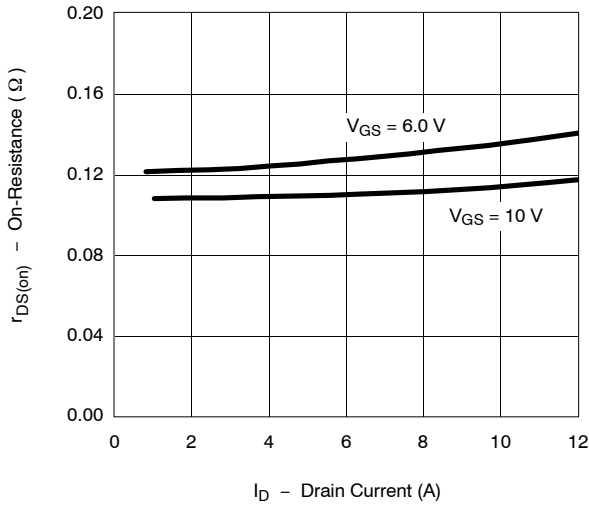
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



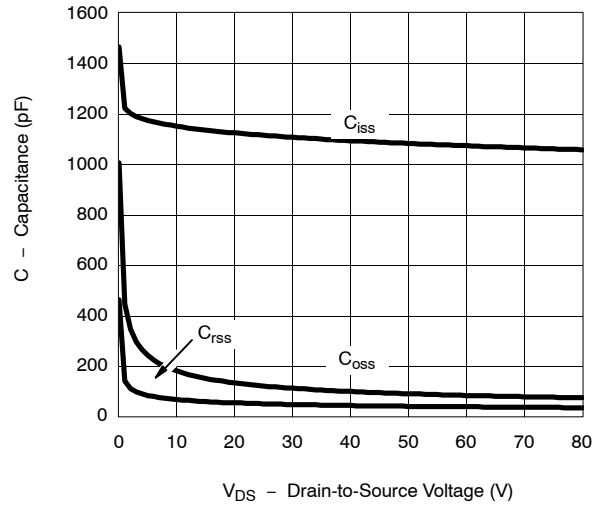


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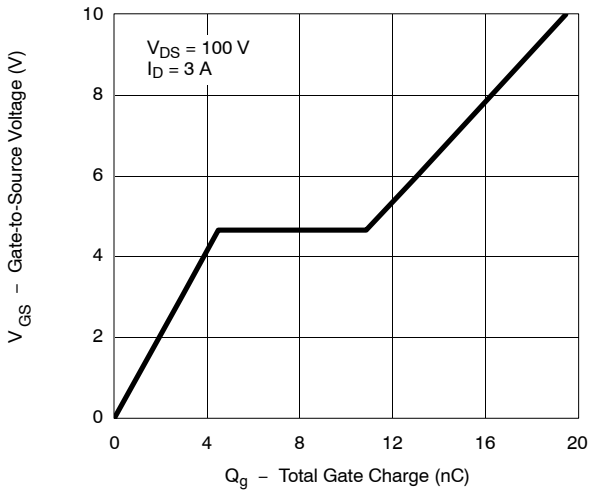
On-Resistance vs. Drain Current



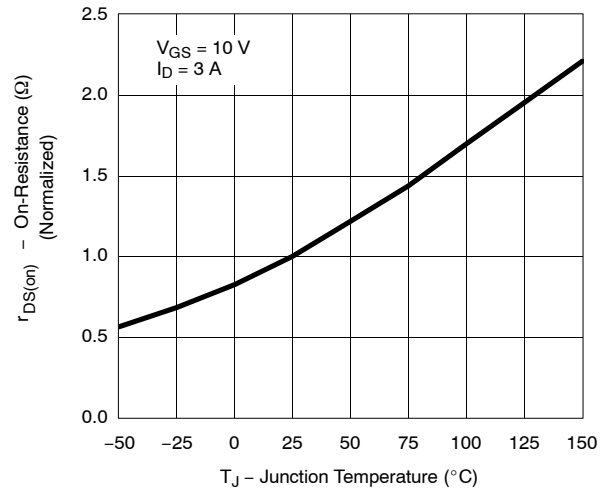
Capacitance



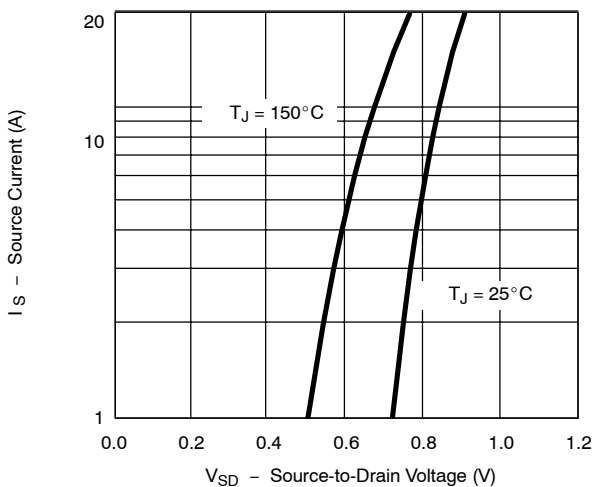
Gate Charge



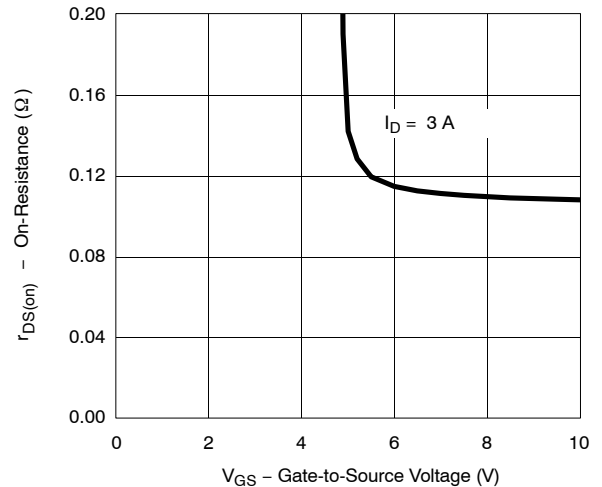
On-Resistance vs. Junction Temperature



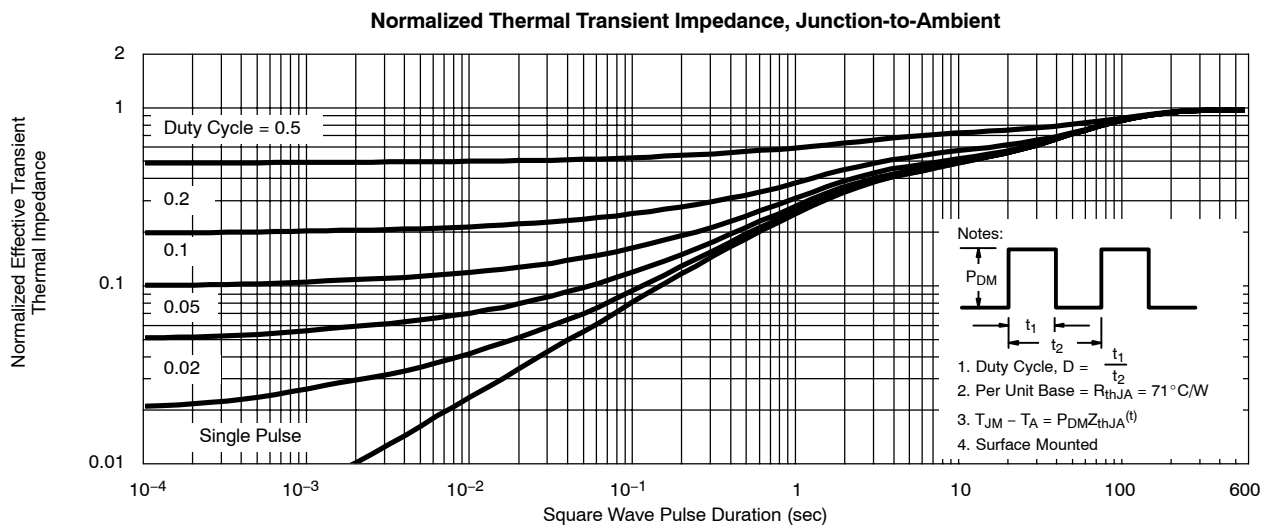
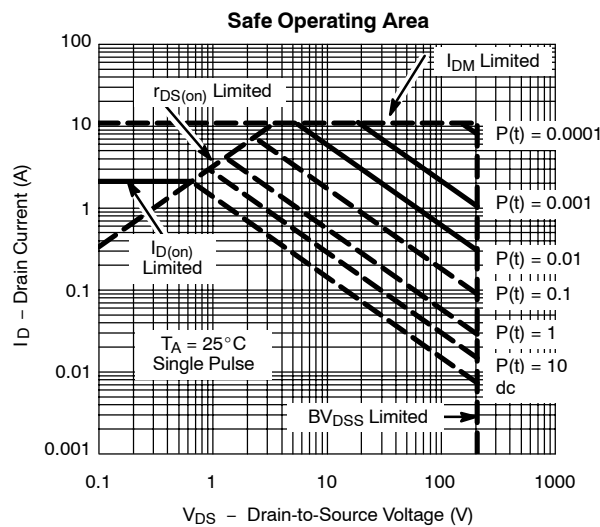
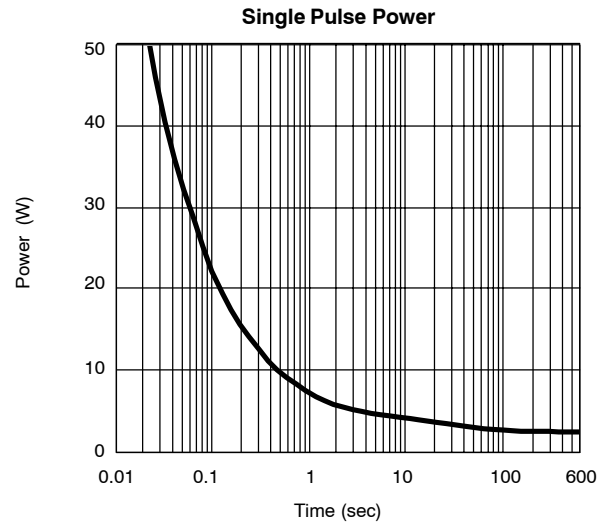
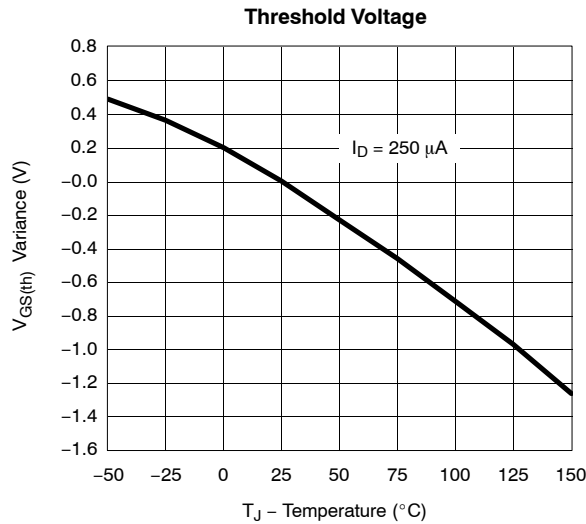
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)





TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

Normalized Thermal Transient Impedance, Junction-to-Foot

