



N-Channel Reduced Q_{gd} , Fast Switching WFET™

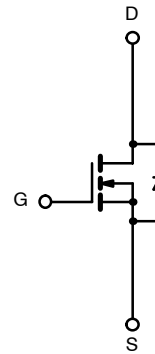
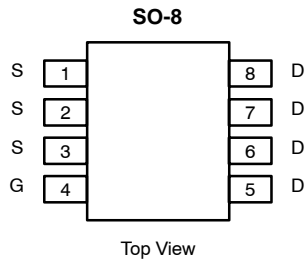
| PRODUCT SUMMARY | | |
|------------------------|----------------------------|-----------|
| V_{DS} (V) | $r_{DS(on)}$ (Ω) | I_D (A) |
| 30 | 0.00975 @ $V_{GS} = 10$ V | 12.5 |
| | 0.01375 @ $V_{GS} = 4.5$ V | 10.0 |

FEATURES

- Extremely Low Q_{gd} WFET Technology for Switching Losses
- TrenchFET® Power MOSFET
- 100% R_g Tested

APPLICATIONS

- High-Side DC/DC Conversion
 - Notebook
 - Server



Ordering Information: Si4392DY
 Si4392DY-T1 (with Tape and Reel)
 Si4392DY—E3 (Lead (Pb)-Free)
 Si4392DY-T1—E3 (Lead (Pb)-Free with Tape and Reel)

| ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)^a | | | | |
|--|--------------------------|----------------|------------|------|
| Parameter | | Symbol | Limits | Unit |
| Drain-Source Voltage | | V_{DS} | 30 | A |
| Gate-Source Voltage | | V_{GS} | ± 20 | |
| Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^a | $T_A = 25^\circ\text{C}$ | I_D | 12.5 | |
| | $T_A = 70^\circ\text{C}$ | | 10 | |
| Pulsed Drain Current | | I_{DM} | 50 | |
| Continuous Source Current (Diode Conduction) ^a | | I_S | 2.7 | |
| Maximum Power Dissipation ^a | $T_A = 25^\circ\text{C}$ | P_D | 3.0 | W |
| | $T_A = 70^\circ\text{C}$ | | 1.9 | |
| Operating Junction and Storage Temperature Range | | T_J, T_{stg} | -55 to 150 | |

| THERMAL RESISTANCE RATINGS^a | | | | |
|---|------------|---------|---------|--------------------|
| Parameter | | Typical | Maximum | Unit |
| Maximum Junction-to-Ambient | R_{thJA} | 33 | 42 | $^\circ\text{C/W}$ |
| Maximum Junction-to-Foot (Drain) | R_{thJF} | 16 | 20 | |

Notes
 a. Surface Mounted on 1" x 1" FR4 Board, $t \leq 10$ sec

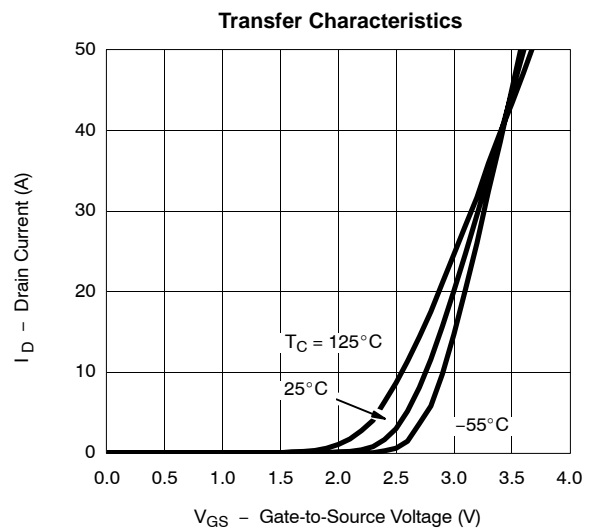
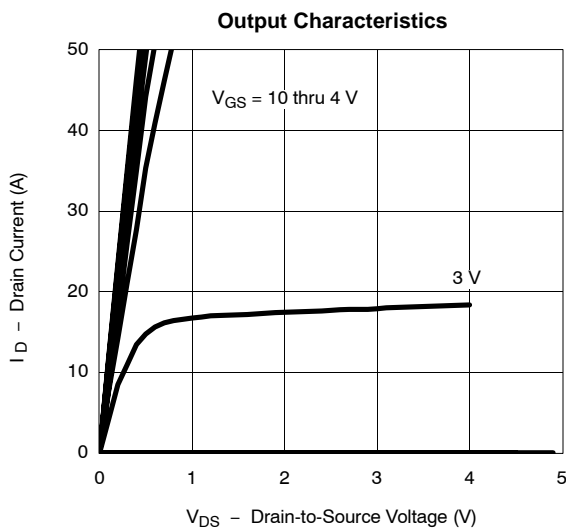


| SPECIFICATIONS (T_J = 25 °C UNLESS OTHERWISE NOTED) | | | | | | |
|--|---------------------|--|-----|-------|---------|------|
| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
| Static | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = 250 μA | 1.0 | | 3.0 | 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} = 30 V, V _{GS} = 0 V | | | 1 | μA |
| | | V _{DS} = 30 V, V _{GS} = 0 V, T _J = 55 °C | | | 5 | |
| On-State Drain Current ^a | I _{D(on)} | V _{DS} ≥ 5 V, V _{GS} = 10 V | 30 | | | A |
| Drain-Source On-State Resistance ^a | r _{DS(on)} | V _{GS} = 10 V, I _D = 12.5 A | | 0.008 | 0.00975 | Ω |
| | | V _{GS} = 4.5 V, I _D = 10.0 A | | 0.011 | 0.01375 | |
| Forward Transconductance ^a | g _{fs} | V _{DS} = 15 V, I _D = 12.5 A | | 40 | | S |
| Diode Forward Voltage ^a | V _{SD} | I _S = 2.7 A, V _{GS} = 0 V | | 0.73 | 1.1 | V |
| Dynamic^b | | | | | | |
| Total Gate Charge | Q _g | V _{DS} = 15 V, V _{GS} = 4.5 V, I _D = 12.5 A | | 10 | 15 | nC |
| Gate-Source Charge | Q _{gs} | | | 3.5 | | |
| Gate-Drain Charge | Q _{gd} | | | 2.6 | | |
| Gate Resistance | R _g | | 0.5 | 1.6 | 2.7 | Ω |
| Turn-On Delay Time | t _{d(on)} | V _{DD} = 15 V, R _L = 15 Ω I _D ≅ 1 A, V _{GEN} = 10 V, R _g = 6 Ω | | 15 | 25 | ns |
| Rise Time | t _r | | | 5 | 10 | |
| Turn-Off Delay Time | t _{d(off)} | | | 45 | 70 | |
| Fall Time | t _f | | | 8 | 15 | |
| Source-Drain Reverse Recovery Time | t _{rr} | I _F = 2.7 A, di/dt = 100 A/μs | | 30 | 60 | |

Notes

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

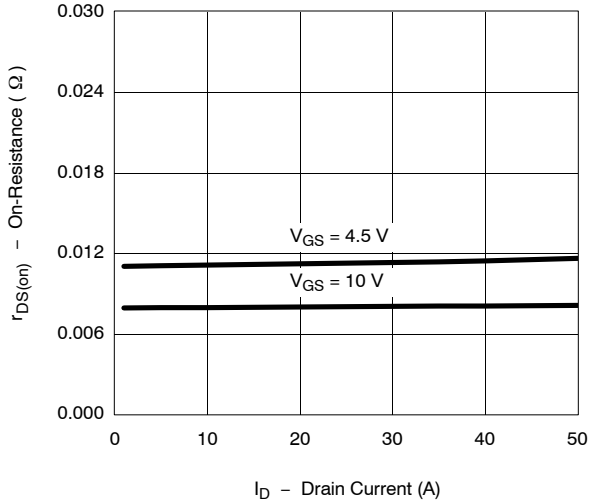
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



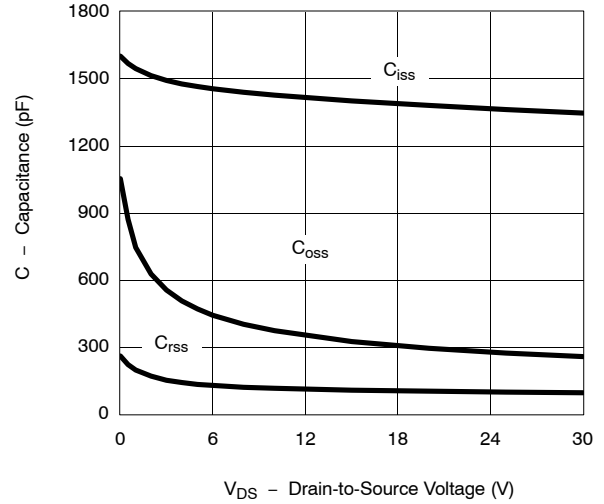


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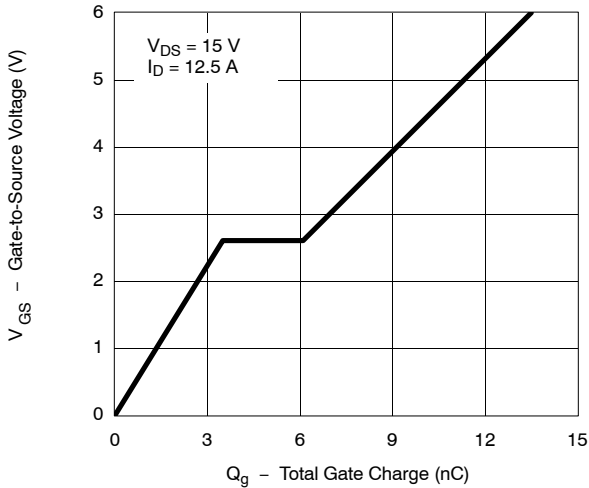
On-Resistance vs. Drain Current



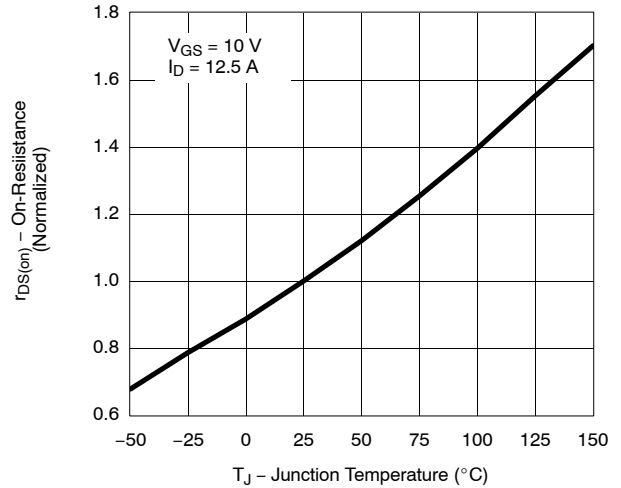
Capacitance



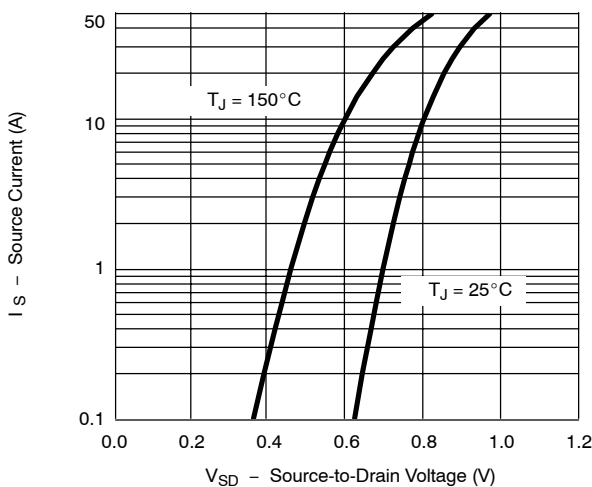
Gate Charge



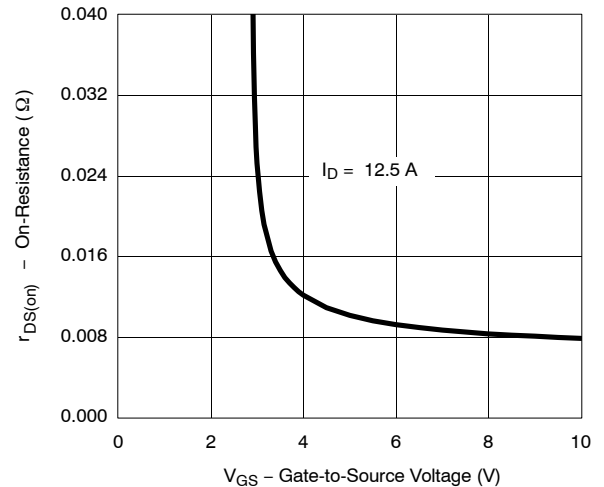
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

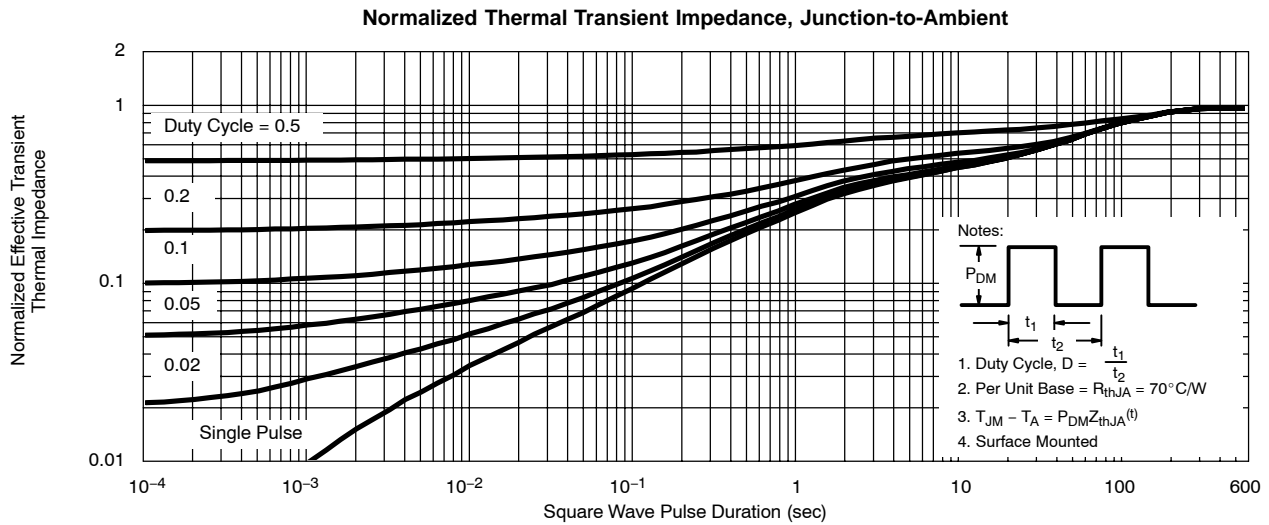
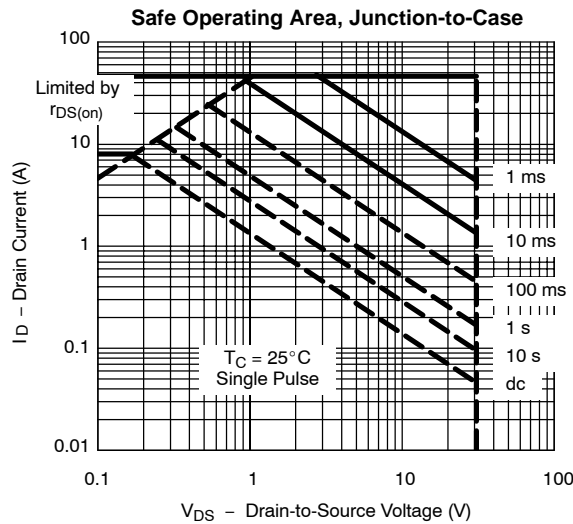
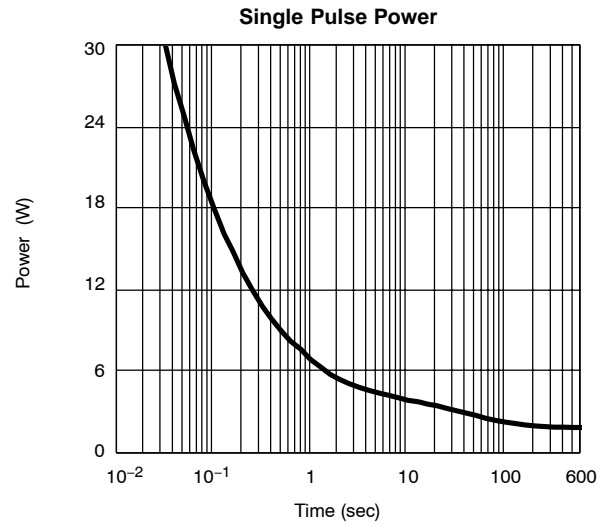
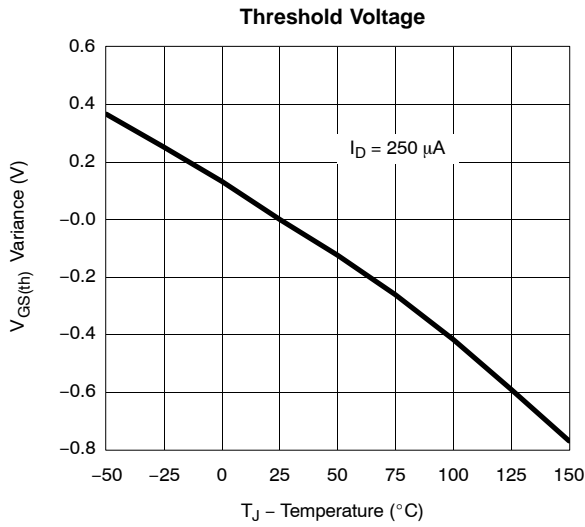


On-Resistance vs. Gate-to-Source Voltage





TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)





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