



N-Channel Reduced Q_g , Fast Switching MOSFET



RoHS
COMPLIANT

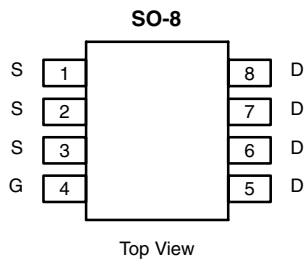
| PRODUCT SUMMARY | | |
|-----------------|----------------------------|-----------|
| V_{DS} (V) | $r_{DS(on)}$ (Ω) | I_D (A) |
| 30 | 0.0047 at $V_{GS} = 10$ V | 20 |
| | 0.0062 at $V_{GS} = 4.5$ V | 18 |

FEATURES

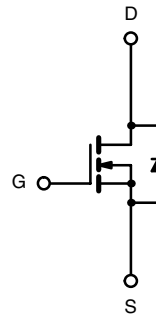
- Ultra Low On-Resistance Using High Density TrenchFET® Gen II Power MOSFET Technology
- Q_g Optimized
- 100 % R_g Tested

APPLICATIONS

- Synchronous Buck Low-Side
 - Notebook
 - Server
 - Workstation
- Synchronous Rectifier, POL



Ordering Information: Si4382DY-T1-E3 (Lead (Pb)-Free)



N-Channel MOSFET

| ABSOLUTE MAXIMUM RATINGS ($T_A = 25$ °C UNLESS OTHERWISE NOTED) | | | | |
|--|----------------|---------------|--------------|------|
| Parameter | Symbol | 10 secs | Steady State | Unit |
| Drain-Source Voltage | V_{DS} | 30 | | V |
| Gate-Source Voltage | V_{GS} | ± 20 | | |
| Continuous Drain Current ($T_J = 150$ °C) ^a | I_D | $T_A = 25$ °C | 20 | A |
| | | $T_A = 70$ °C | 16 | |
| Pulsed Drain Current | I_{DM} | ± 50 | | A |
| Continuous Source Current (Diode Conduction) ^a | I_S | 3.0 | 1.40 | |
| Maximum Power Dissipation ^a | P_D | $T_A = 25$ °C | 3.5 | W |
| | | $T_A = 70$ °C | 2.2 | |
| 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 (MOSFET) ^a | R_{thJA} | $t \leq 10$ sec | 29 | °C/W |
| | | Steady State | 67 | |
| Maximum Junction-to-Foot (Drain) | R_{thJF} | 13 | 16 | |

Notes

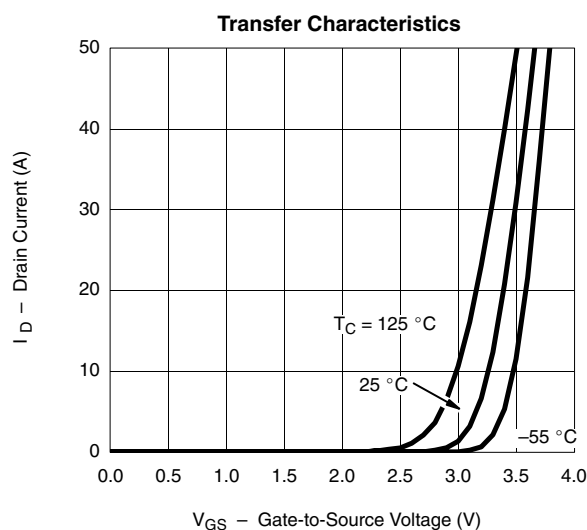
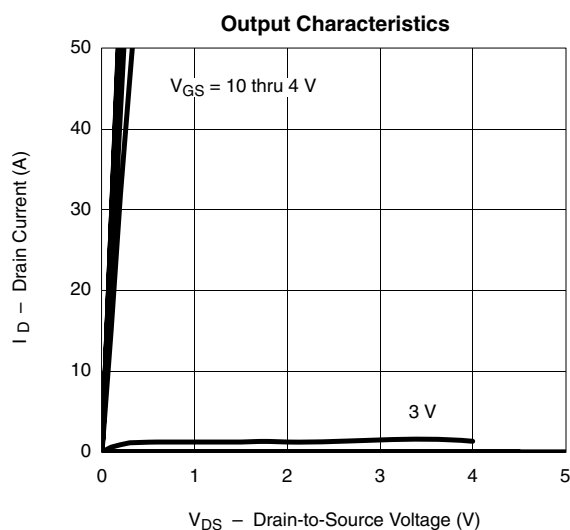
a. Surface Mounted on 1" x 1" FR4 Board.

MOSFET 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 | 1.3 | | 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 = 70 °C | | | 10 | |
| On-State Drain Current ^a | I _{D(on)} | V _{DS} ≥ 5 V, V _{GS} = 10 V | 40 | | | A |
| Drain-Source On-State Resistance ^a | r _{DS(on)} | V _{GS} = 10 V, I _D = 20 A | | 0.0037 | 0.0047 | Ω |
| | | V _{GS} = 4.5 V, I _D = 18 A | | 0.005 | 0.0062 | |
| Forward Transconductance ^a | g _{fs} | V _{DS} = 15 V, I _D = 20 A | | 80 | | S |
| Diode Forward Voltage ^a | V _{SD} | I _S = 3 A, V _{GS} = 0 V | | 0.75 | 1.1 | V |
| Dynamic^b | | | | | | |
| Total Gate Charge | Q _g | V _{DS} = 15 V, V _{GS} = 4.5 V, I _D = 20 A | | 27 | 40 | nC |
| Gate-Source Charge | Q _{gs} | | | 11 | | |
| Gate-Drain Charge | Q _{gd} | | | 9.5 | | |
| Gate-Resistance | R _g | | 0.47 | 0.95 | 1.43 | 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 | | 18 | 30 | ns |
| Rise Time | t _r | | | 16 | 25 | |
| Turn-Off Delay Time | t _{d(off)} | | | 67 | 100 | |
| Fall Time | t _f | | | 20 | 30 | |
| Source-Drain Reverse Recovery Time | t _{rr} | I _F = 3 A, di/dt = 100 A/μs | | 35 | 60 | |

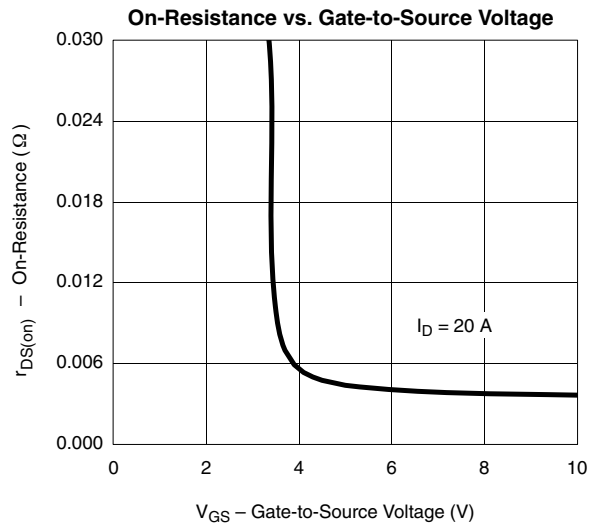
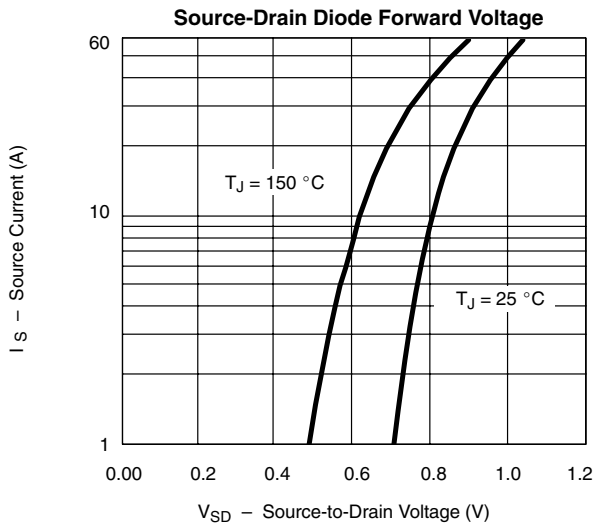
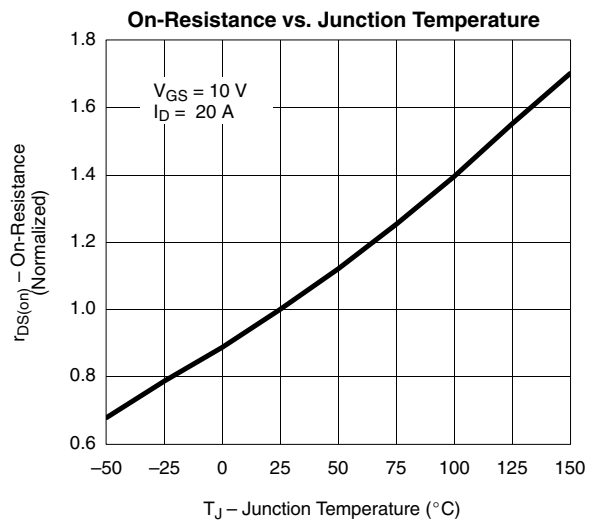
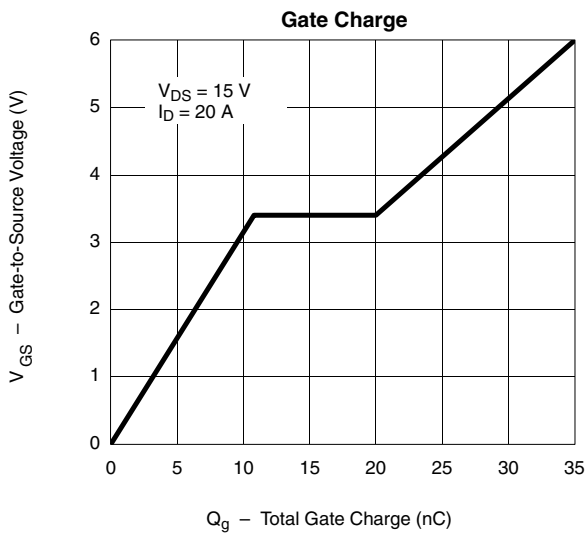
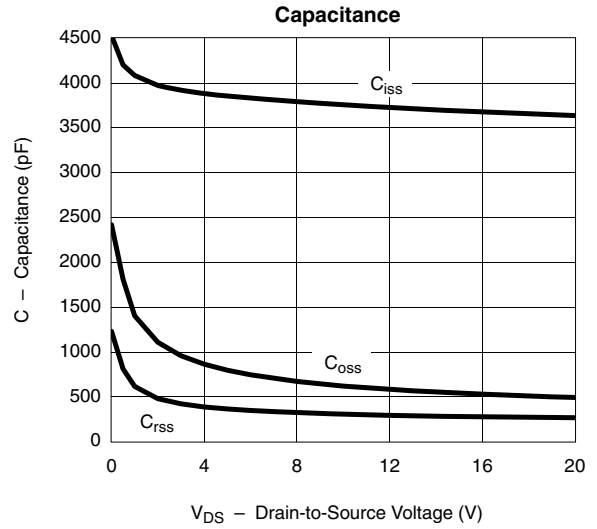
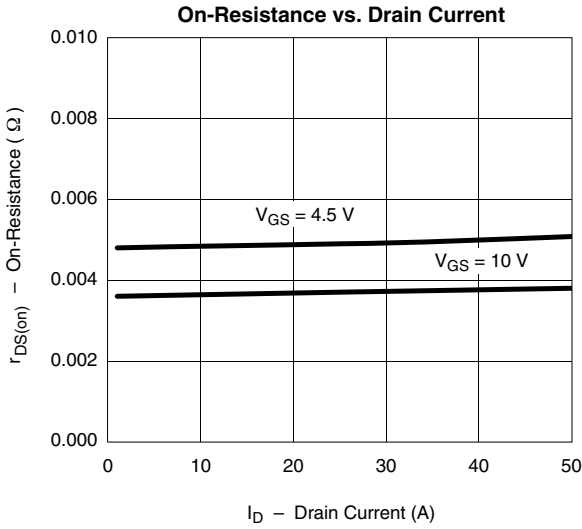
Notes

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

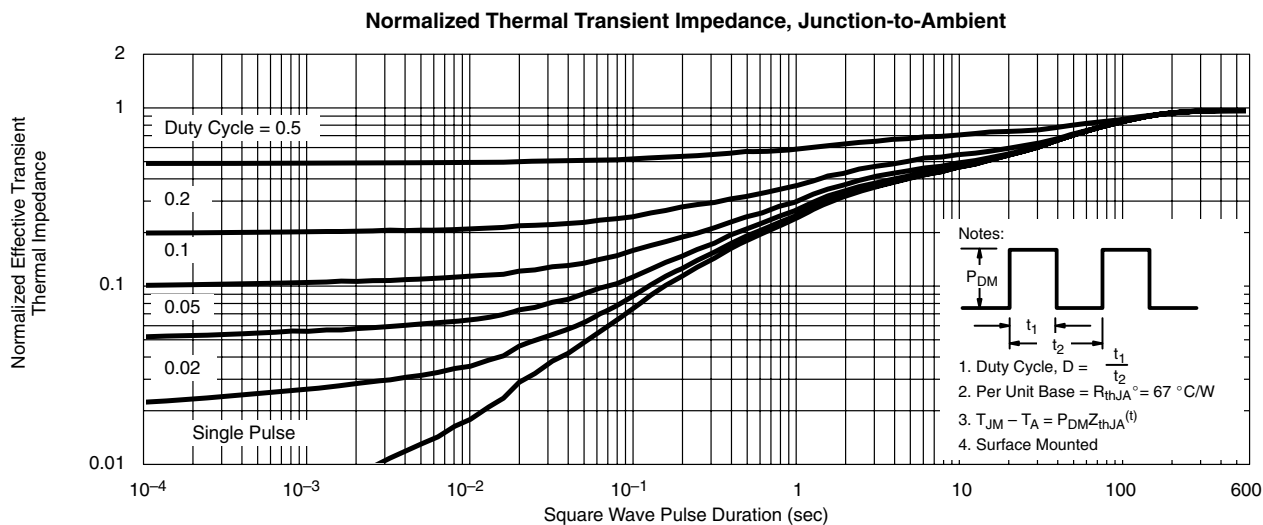
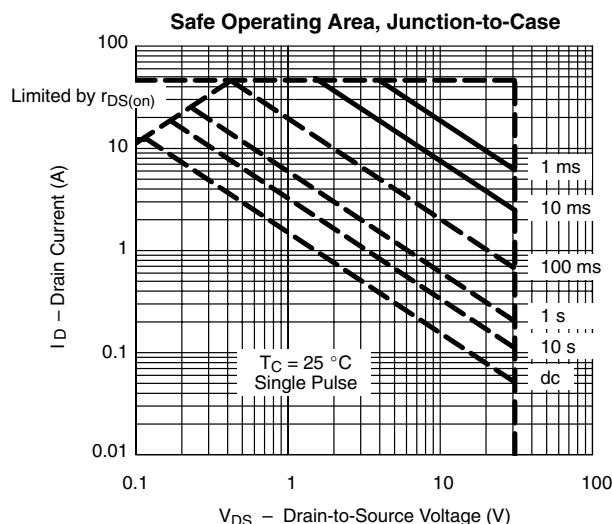
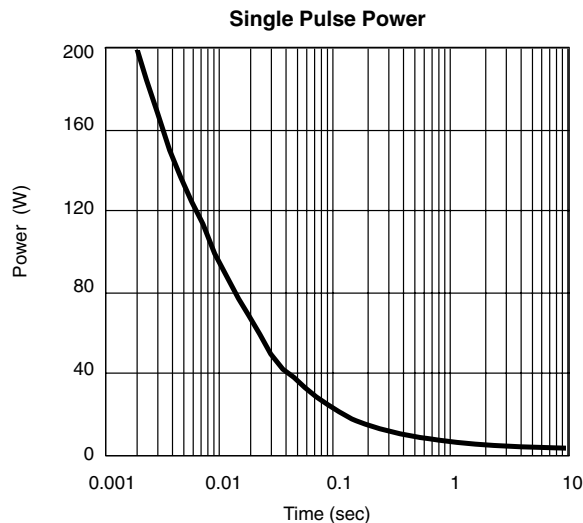
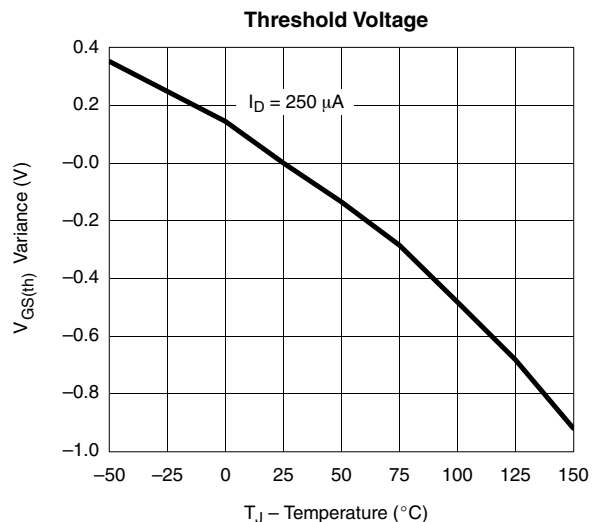
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



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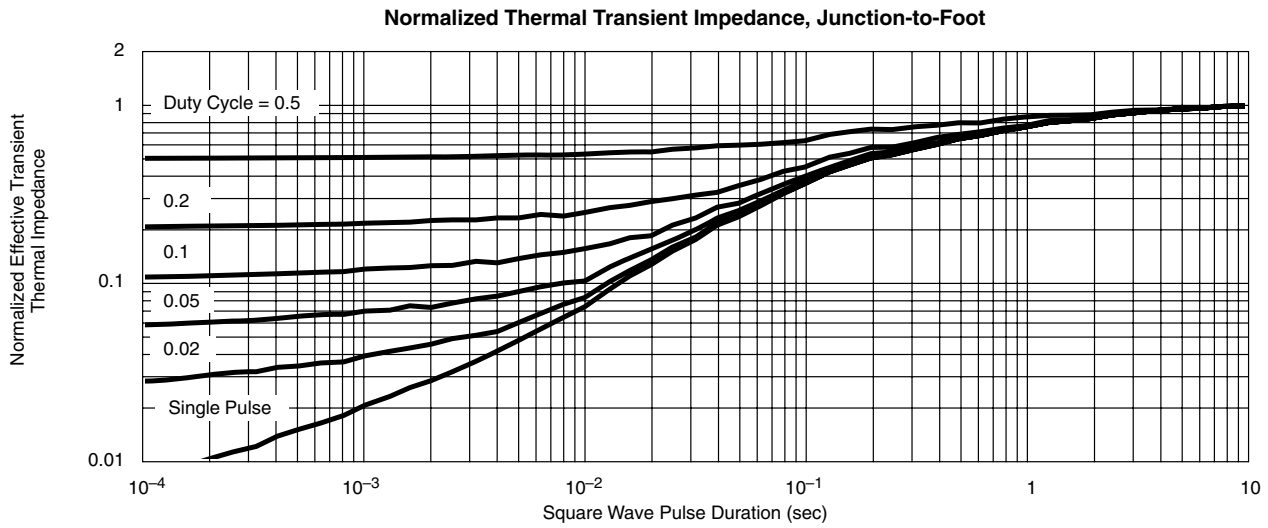


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TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)





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