



P-Channel 150-V (D-S) MOSFET

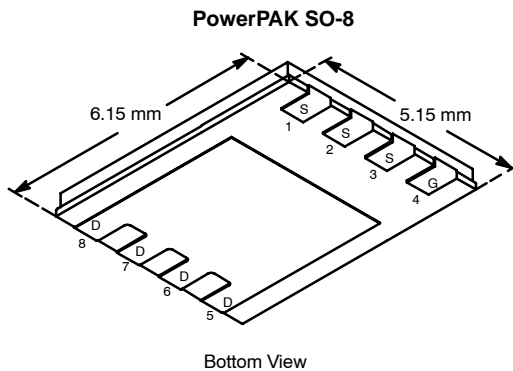
| PRODUCT SUMMARY | | |
|-----------------|---------------------------|-----------|
| V_{DS} (V) | $r_{DS(on)}$ (Ω) | I_D (A) |
| -150 | 0.090 @ $V_{GS} = -10$ V | -5.2 |
| | 0.095 @ $V_{GS} = -6$ V | -5.0 |

FEATURES

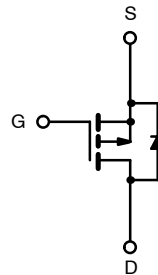
- TrenchFET® Power MOSFETS
- Ultra-Low On-Resistance Critical for Application
- Low Thermal Resistance PowerPAK® Package with Low 1.07-mm Profile
- 100% R_{θ} and Avalanche Tested

APPLICATIONS

- Active Clamp in Intermediate DC/DC Power Supplies



Ordering Information: Si7439DP-T1—E3



P-Channel MOSFET

| ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED) | | | | | |
|---|----------------|--------------------------|--------------|------------------|----|
| Parameter | Symbol | 10 secs | Steady State | Unit | |
| Drain-Source Voltage | V_{DS} | -150 | | V | |
| Gate-Source Voltage | V_{GS} | ± 20 | | | |
| Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^a | I_D | $T_A = 25^\circ\text{C}$ | -5.2 | -3.0 | A |
| | | $T_A = 70^\circ\text{C}$ | -4.1 | -2.4 | |
| Pulsed Drain Current | I_{DM} | -50 | | | |
| Continuous Source Current (Diode Conduction) ^a | I_S | -4.2 | -1.6 | | |
| Single Pulse Avalanche Current | I_{AS} | L = 0.1 mH | -40 | | mJ |
| Single Pulse Avalanche Energy | | | E_{AS} | 80 | |
| Maximum Power Dissipation ^a | P_D | $T_A = 25^\circ\text{C}$ | 5.4 | 1.9 | W |
| | | $T_A = 70^\circ\text{C}$ | 3.4 | 1.2 | |
| Operating Junction and Storage Temperature Range | T_J, T_{stg} | -55 to 150 | | $^\circ\text{C}$ | |

| THERMAL RESISTANCE RATINGS | | | | | |
|--|------------|-----------------|---------|------|--------------------|
| Parameter | Symbol | Typical | Maximum | Unit | |
| Maximum Junction-to-Ambient ^a | R_{thJA} | $t \leq 10$ sec | 18 | 23 | $^\circ\text{C/W}$ |
| | | Steady State | 50 | 65 | |
| Maximum Junction-to-Case (Drain) | R_{thJC} | 1.0 | 1.5 | | |

Notes

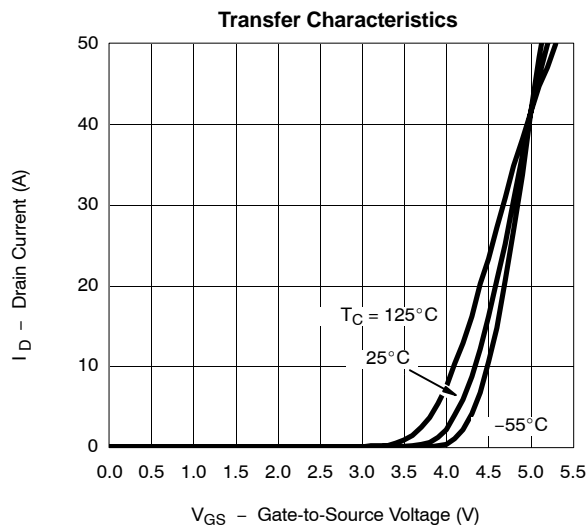
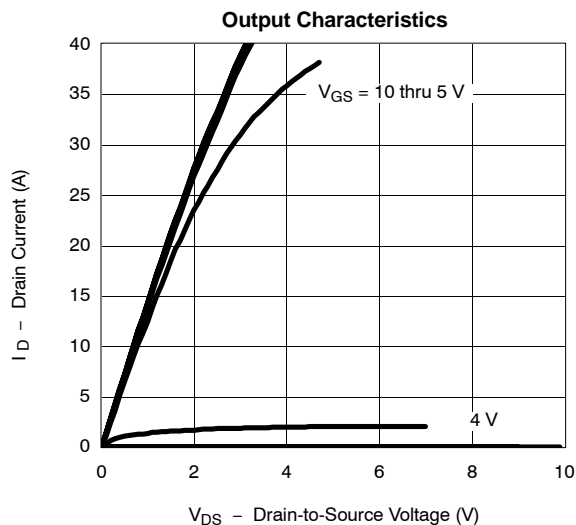
a. Surface Mounted on 1" x 1" FR4 Board.

| 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 | -2.0 | | -4.0 | 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} = -150 V, V _{GS} = 0 V | | | -1 | μA |
| | | V _{DS} = -150 V, V _{GS} = 0 V, T _J = 70 °C | | | -10 | |
| On-State Drain Current ^a | I _{D(on)} | V _{DS} = -10 V, V _{GS} = -10 V | -30 | | | A |
| Drain-Source On-State Resistance ^a | r _{DS(on)} | V _{GS} = -10 V, I _D = -5.2 A | | 0.073 | 0.090 | Ω |
| | | V _{GS} = -6 V, I _D = -5.0 A | | 0.077 | 0.095 | |
| Forward Transconductance ^a | g _{fs} | V _{DS} = -15 V, I _D = -5.2 A | | 19 | | S |
| Diode Forward Voltage ^a | V _{SD} | I _S = -4.2 A, V _{GS} = 0 V | | -0.78 | -1.2 | V |
| Dynamic^b | | | | | | |
| Total Gate Charge | Q _g | V _{DS} = -75 V, V _{GS} = -10 V, I _D = -5.2 A | | 88 | 135 | nC |
| Gate-Source Charge | Q _{gs} | | 17.5 | | | |
| Gate-Drain Charge | Q _{gd} | | 26.5 | | | |
| Gate Resistance | R _g | | 1.5 | 3 | 4.5 | Ω |
| Turn-On Delay Time | t _{d(on)} | V _{DD} = -75 V, R _L = 15.5 Ω I _D ≅ -4.8 A, V _{GEN} = -10 V, R _g = 6 Ω | | 25 | 40 | ns |
| Rise Time | t _r | | 46 | 70 | | |
| Turn-Off Delay Time | t _{d(off)} | | 115 | 180 | | |
| Fall Time | t _f | | 64 | 100 | | |
| Source-Drain Reverse Recovery Time | t _{rr} | I _F = -2.9 A, di/dt = 100 A/μs | | 100 | 150 | |

Notes

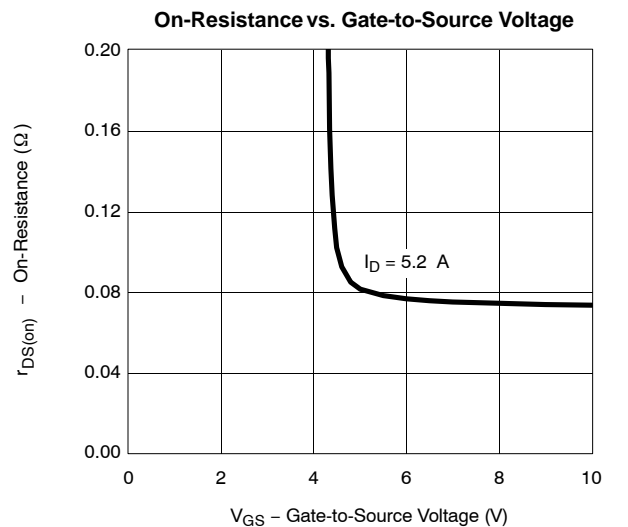
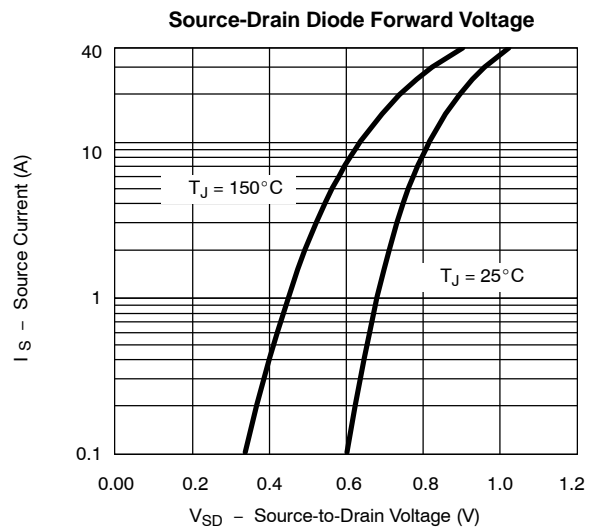
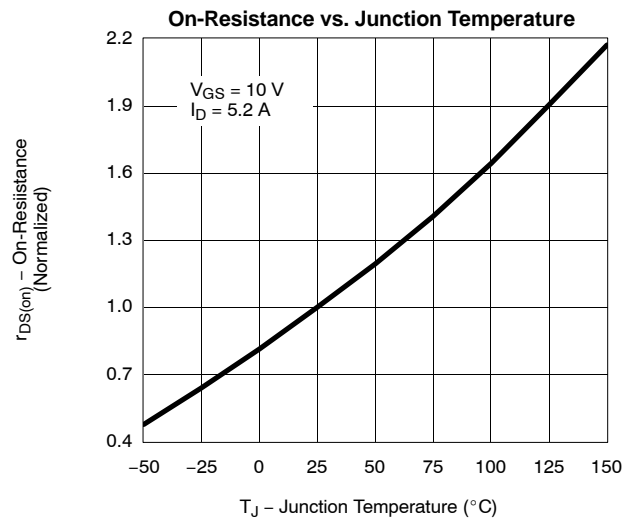
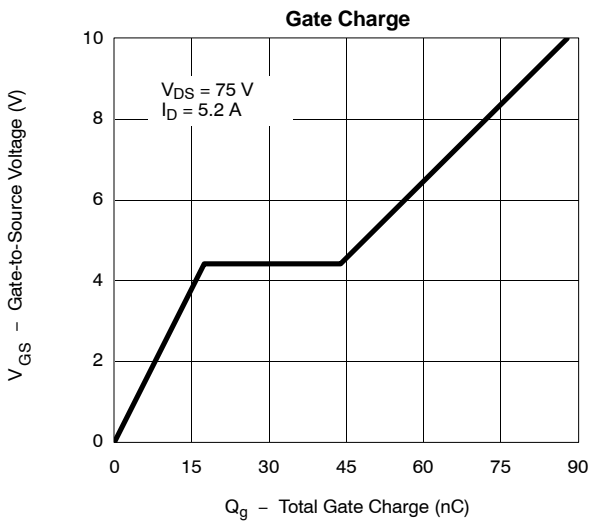
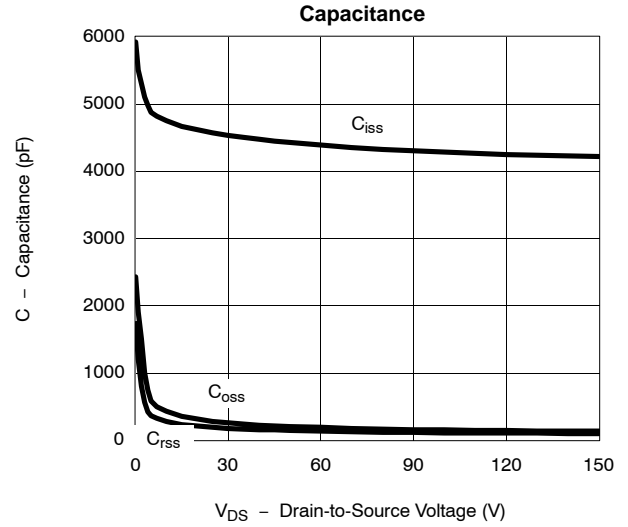
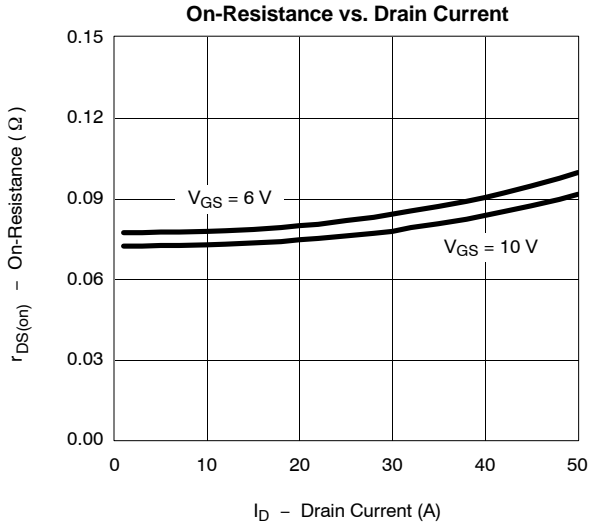
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
 b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

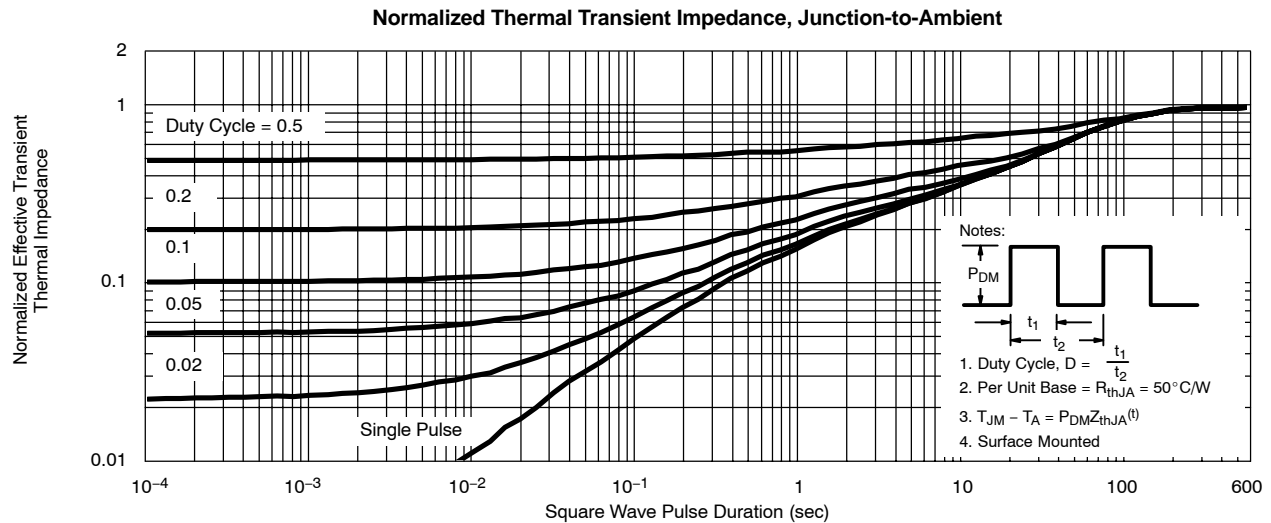
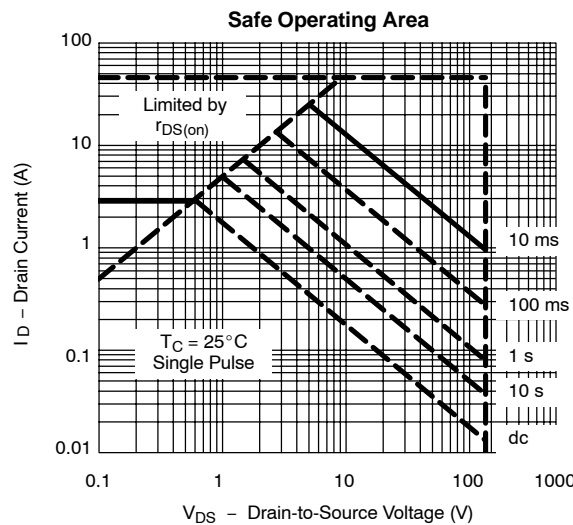
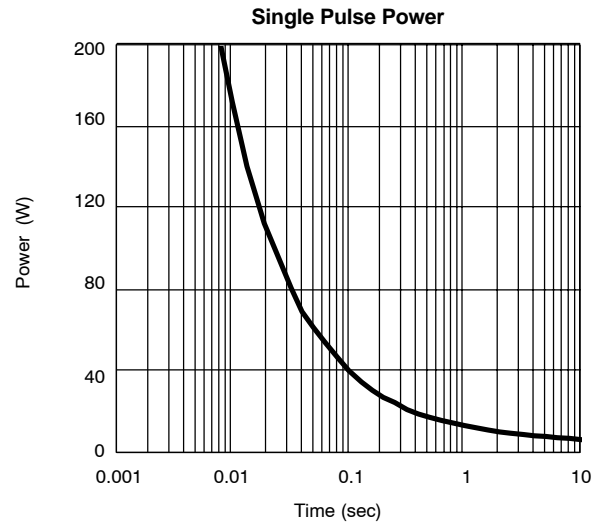
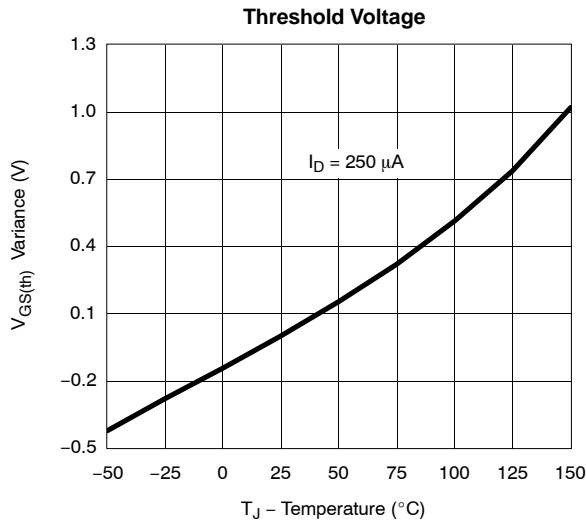




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