



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

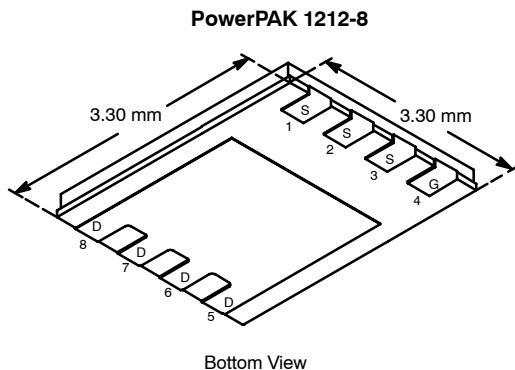
| PRODUCT SUMMARY | | |
|-----------------|---------------------------|-----------|
| V_{DS} (V) | $r_{DS(on)}$ (Ω) | I_D (A) |
| -30 | 0.018 @ $V_{GS} = -10$ V | -11.7 |
| | 0.030 @ $V_{GS} = -4.5$ V | -9.0 |

FEATURES

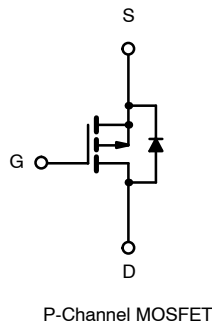
- TrenchFET® Power MOSFET
- New PowerPAK® Package
 - Low Thermal Resistance, R_{thJC}
 - Low 1.07-mm Profile

APPLICATIONS

- Battery Switch



Ordering Information: Si7423DN-T1—E3



| ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ 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 ($T_J = 150^\circ\text{C}$) ^a | I_D | $T_A = 25^\circ\text{C}$ | -11.7 | -7.4 | A |
| | | $T_A = 85^\circ\text{C}$ | -8.4 | -5.4 | |
| Pulsed Drain Current | I_{DM} | -30 | | | |
| continuous Source Current (Diode Conduction) ^a | I_S | -3.2 | -1.3 | | |
| Maximum Power Dissipation ^a | P_D | $T_A = 25^\circ\text{C}$ | 3.8 | 1.5 | W |
| | | $T_A = 85^\circ\text{C}$ | 2.0 | 0.8 | |
| 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 | 26 | 33 | $^\circ\text{C}/\text{W}$ |
| | | Steady State | 65 | 81 | |
| Maximum Junction-to-Case | R_{thJC} | 1.9 | 2.4 | | |

Notes

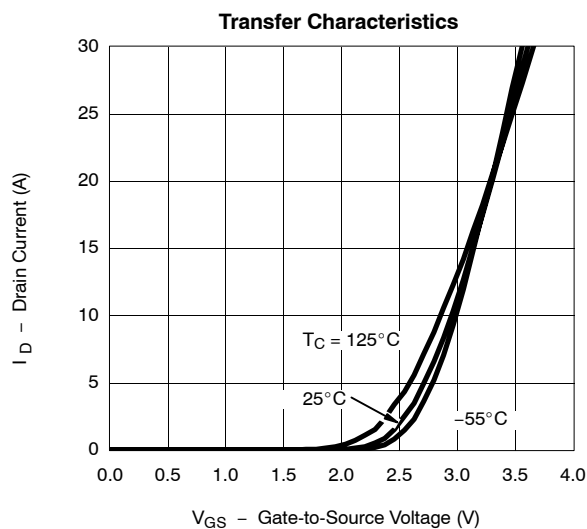
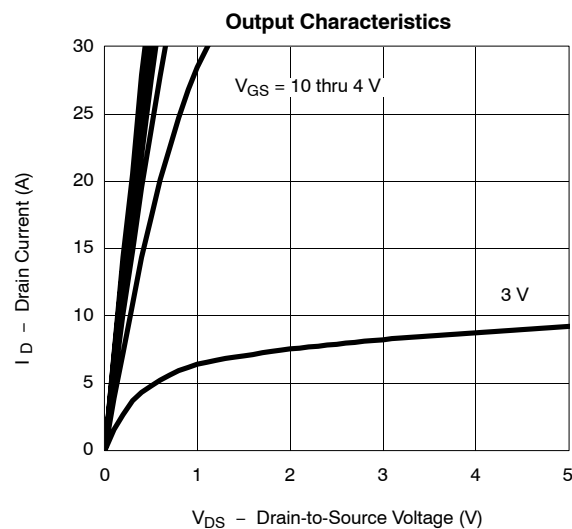
a. Surface Mounted on 1" x 1" FR4 Board.

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 | -1 | | -3 | 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 = 85 °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 = -11.7 A | | 0.014 | 0.018 | Ω |
| | | V _{GS} = -4.5 V, I _D = -9.0 A | | 0.023 | 0.030 | |
| Forward Transconductance ^a | g _{fs} | V _{DS} = -15 V, I _D = -11.7 A | | 29 | | S |
| Diode Forward Voltage ^a | V _{SD} | I _S = -3.2 A, V _{GS} = 0 V | | -0.76 | -1.2 | V |
| Dynamic^b | | | | | | |
| Total Gate Charge | Q _g | V _{DS} = -15 V, V _{GS} = -10 V, I _D = -11.7 A | | 37.5 | 56 | nC |
| Gate-Source Charge | Q _{gs} | | | 5.8 | | |
| Gate-Drain Charge | Q _{gd} | | | 9.6 | | |
| Gate Resistance | R _g | f = 1 MHz | | 5 | | 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 | | 11 | 20 | ns |
| Rise Time | t _r | | | 10 | 15 | |
| Turn-Off Delay Time | t _{d(off)} | | | 74 | 110 | |
| Fall Time | t _f | | | 50 | 75 | |
| Source-Drain Reverse Recovery Time | t _{rr} | I _F = -3.2 A, di/dt = 100 A/μs | | 30 | | |

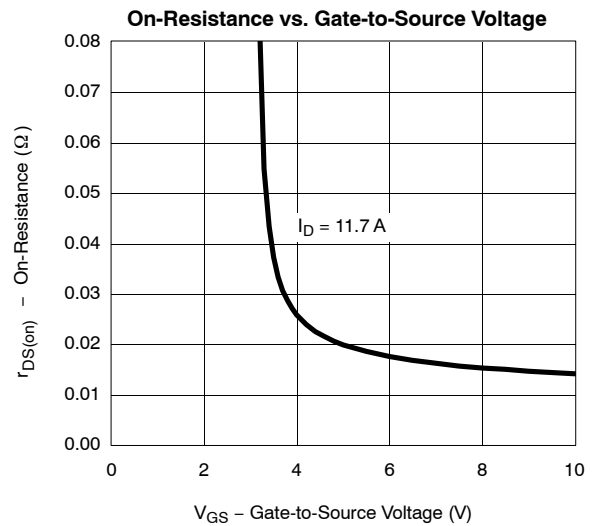
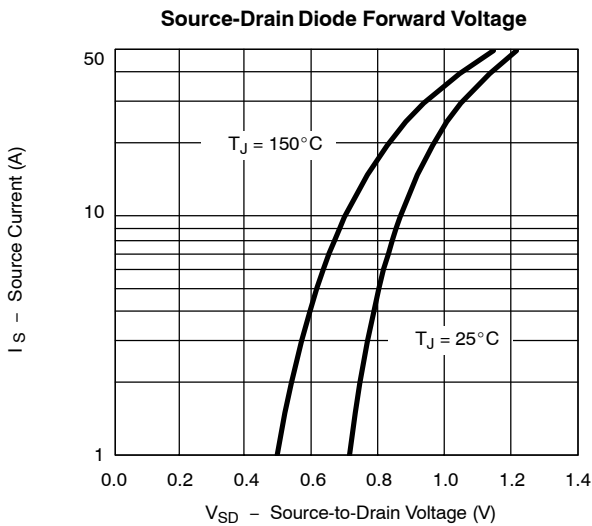
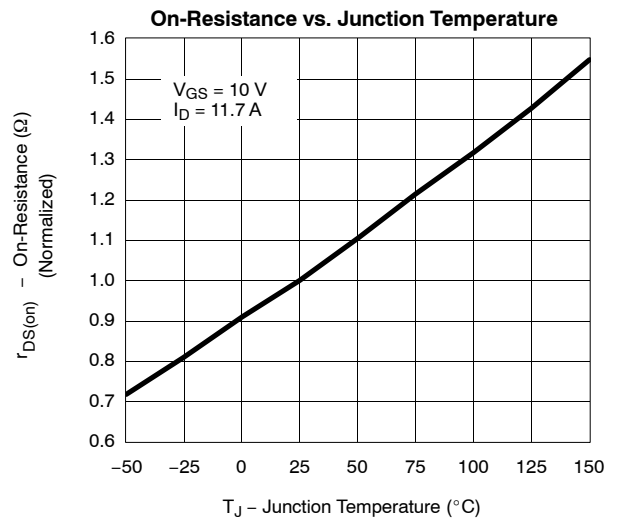
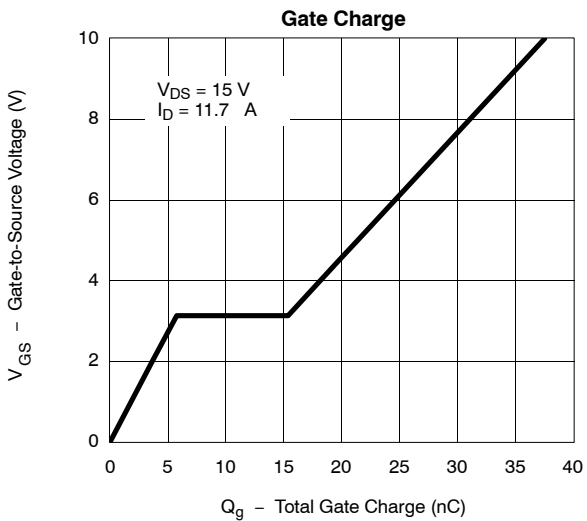
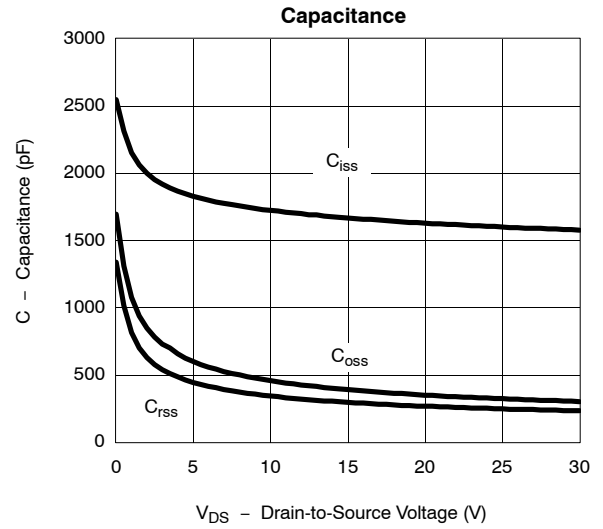
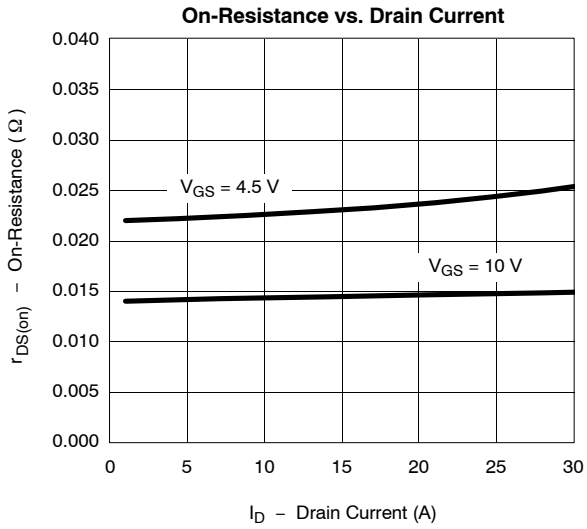
Notes

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

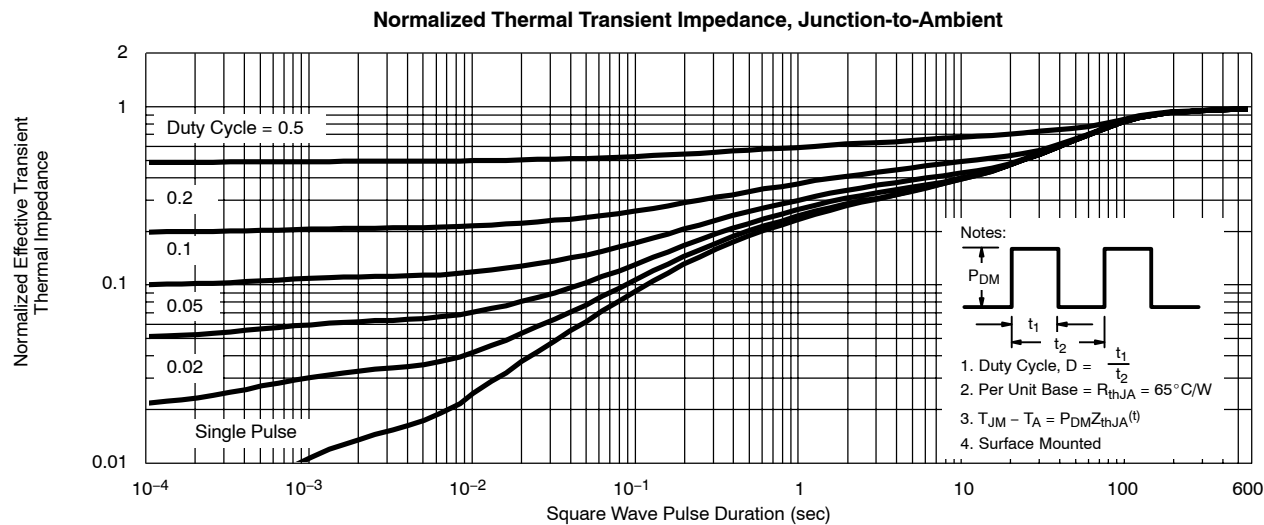
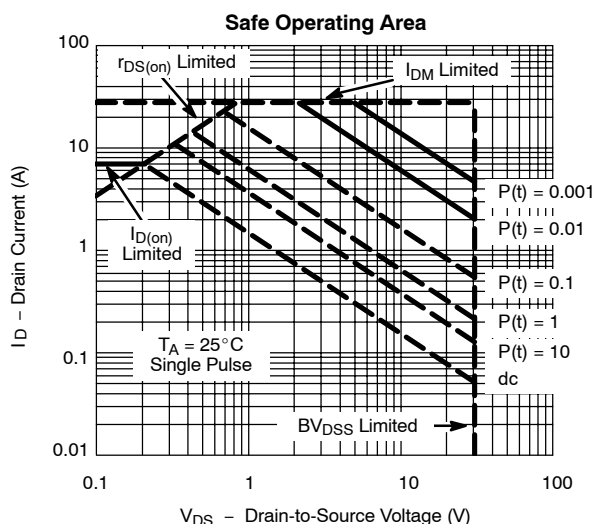
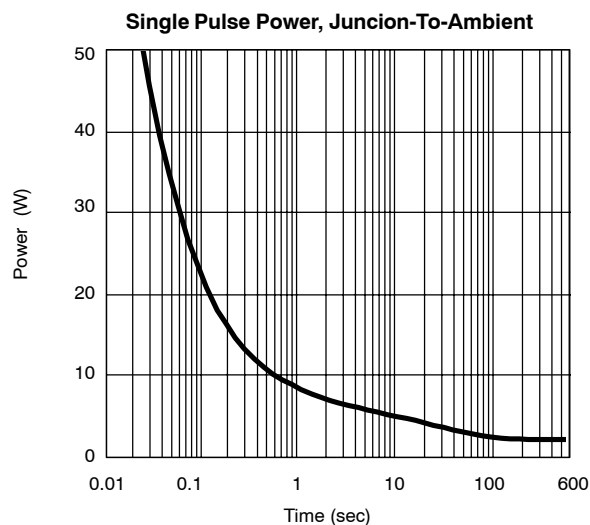
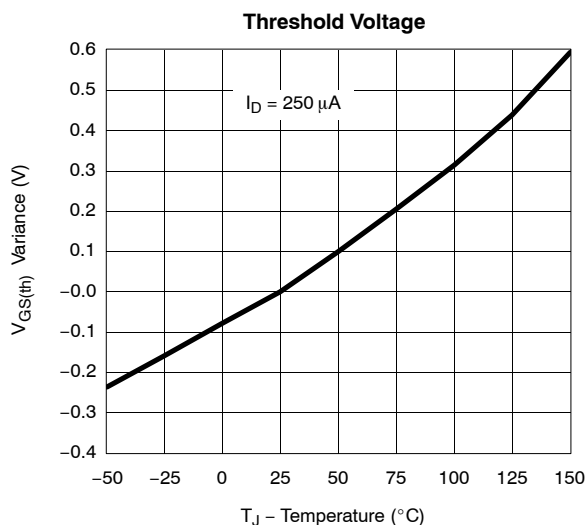
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



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TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

Normalized Thermal Transient Impedance, Junction-to-Case

