

N-Channel 60-V (D-S) Fast Switching MOSFET

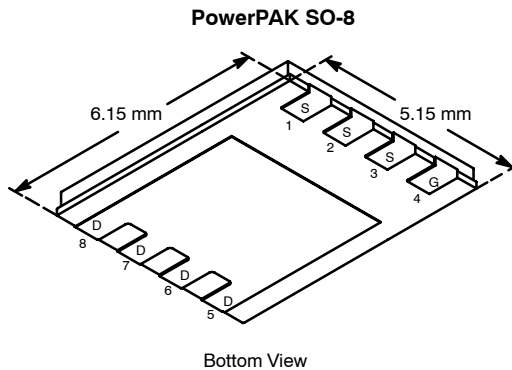
| PRODUCT SUMMARY | | |
|-----------------|---------------------------|-----------|
| V_{DS} (V) | $r_{DS(on)}$ (Ω) | I_D (A) |
| 60 | 0.0096 @ $V_{GS} = 10$ V | 18 |
| | 0.012 @ $V_{GS} = 4.5$ V | 16 |

FEATURES

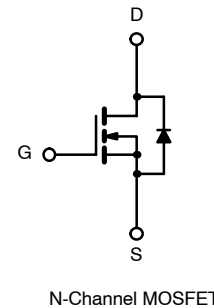
- TrenchFET® Power MOSFET
- New Low Thermal Resistance PowerPAK® Package with Low 1.07-mm Profile

APPLICATIONS

- Automotive 12/24-V Battery
 - ABS
 - ECU
 - Motor Drives



Ordering Information: Si7460DP-T1



| ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED) | | | | |
|---|----------------|--------------------------|--------------|------------------|
| Parameter | Symbol | 10 secs | Steady State | Unit |
| Drain-Source Voltage | V_{DS} | 60 | | V |
| Gate-Source Voltage | V_{GS} | ± 20 | | |
| Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^a | I_D | $T_A = 25^\circ\text{C}$ | 18 | 11 |
| | | $T_A = 70^\circ\text{C}$ | 14 | 8 |
| Pulsed Drain Current | I_{DM} | 40 | | A |
| Continuous Source Current (Diode Conduction) ^a | I_S | 4.3 | 1.6 | |
| Avalanche Current | I_{AS} | 50 | | |
| Avalanche Energy | E_{AS} | 125 | | mJ |
| Maximum Power Dissipation ^a | P_D | $T_A = 25^\circ\text{C}$ | 5.4 | 1.9 |
| | | $T_A = 70^\circ\text{C}$ | 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 |
| | | Steady State | 52 | 65 |
| Maximum Junction-to-Case (Drain) | R_{thJC} | 1.0 | 1.3 | $^\circ\text{C/W}$ |

Notes

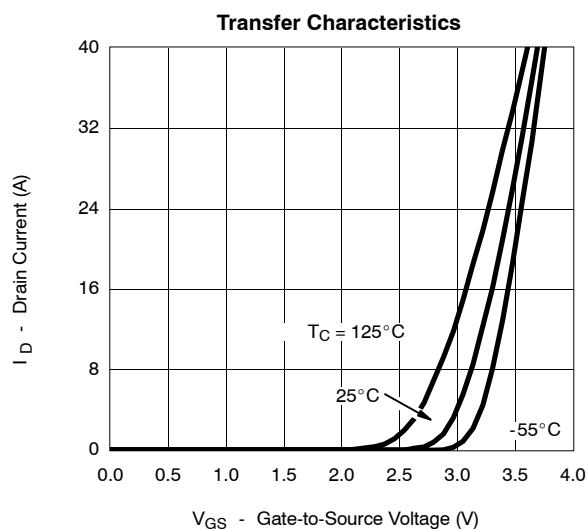
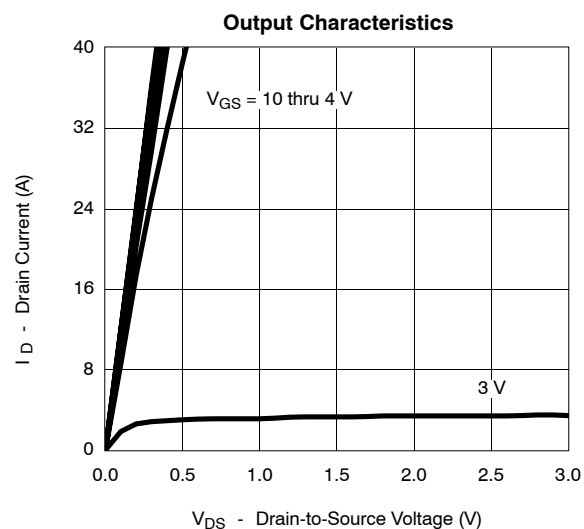
a. Surface Mounted on 1" x 1" FR4 Board.

MOSFET SPECIFICATIONS (T_J = 25 °C UNLESS OTHERWISE NOTED)

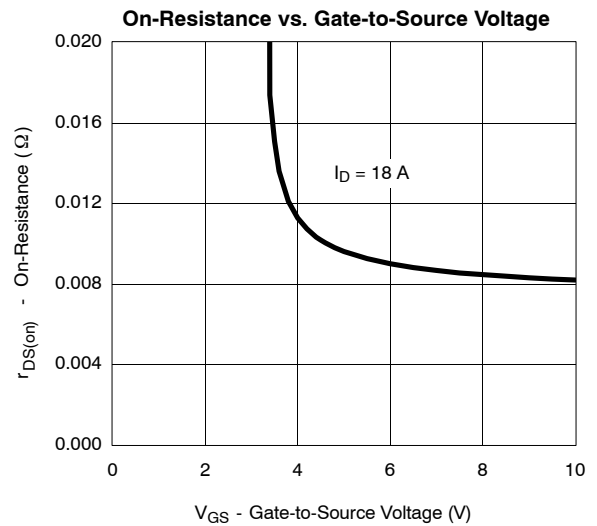
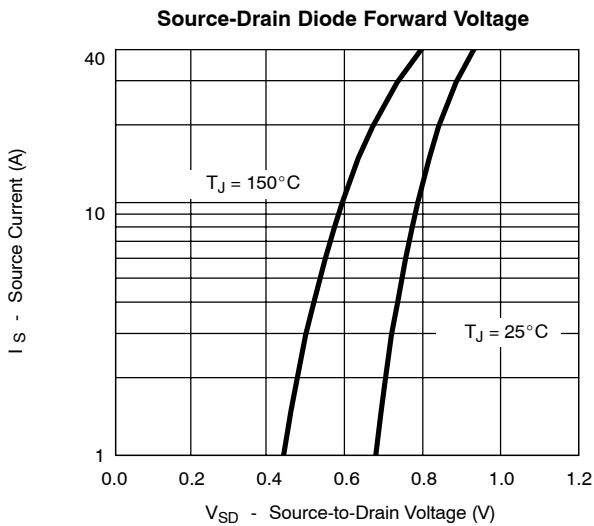
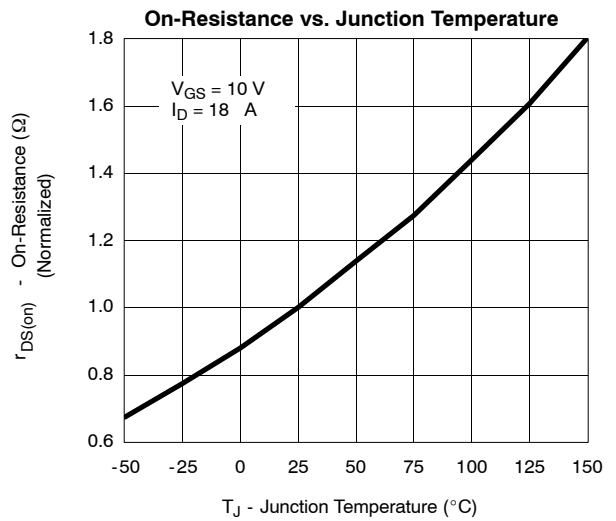
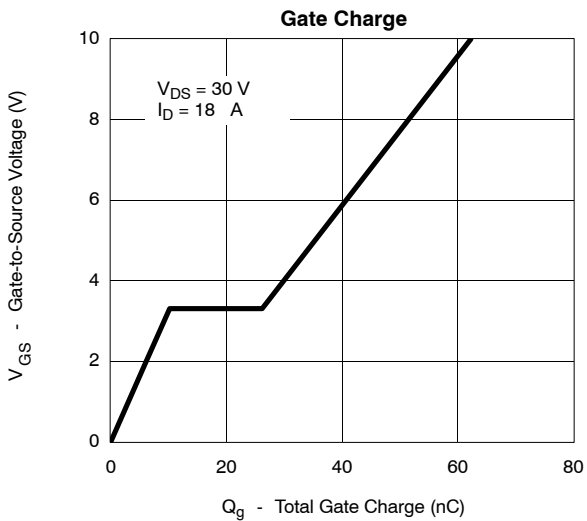
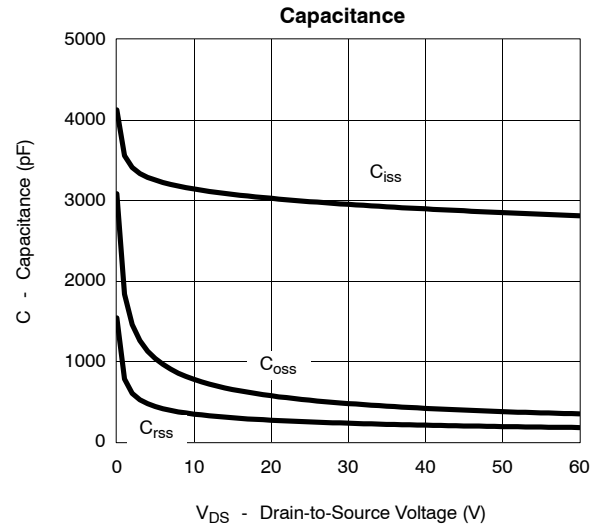
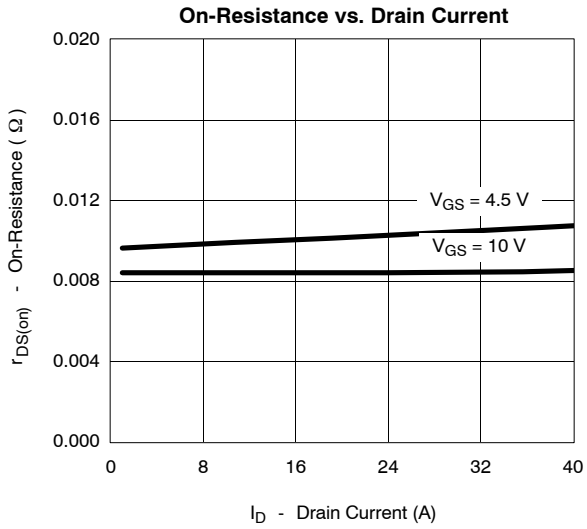
| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|--|---------------------|--|-----|-------|--------|------|
| Static | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = 250 μA | 1.0 | | 3 | V |
| Gate-Body Leakage | I _{GSS} | V _{DS} = 0 V, V _{GS} = ±20 V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} = 48 V, V _{GS} = 0 V | | | 1 | μA |
| | | V _{DS} = 48 V, V _{GS} = 0 V, T _J = 55 °C | | | 5 | |
| On-State Drain Current ^{NO TAG} | I _{D(on)} | V _{DS} ≥ 5 V, V _{GS} = 10 V | 40 | | | A |
| Drain-Source On-State Resistance ^{NO TAG} | r _{DS(on)} | V _{GS} = 10 V, I _D = 18 A | | 0.008 | 0.0096 | Ω |
| | | V _{GS} = 4.5 V, I _D = 16 A | | 0.010 | 0.012 | |
| Forward Transconductance ^{NO TAG} | g _{fs} | V _{DS} = 15 V, I _D = 18 A | | 60 | | S |
| Diode Forward Voltage ^{NO TAG} | V _{SD} | I _S = 4.3 A, V _{GS} = 0 V | | 0.72 | 1.2 | V |
| Dynamic^{NO TAG} | | | | | | |
| Total Gate Charge | Q _g | V _{DS} = 30 V, V _{GS} = 10 V, I _D = 18 A | | 65 | 100 | nC |
| Gate-Source Charge | Q _{gs} | | | 10.5 | | |
| Gate-Drain Charge | Q _{gd} | | | 16 | | |
| Turn-On Delay Time | t _{d(on)} | V _{DD} = 30 V, R _L = 30 Ω I _D ≅ 1 A, V _{GEN} = 10 V, R _G = 6 Ω | | 20 | 30 | ns |
| Rise Time | t _r | | | 16 | 25 | |
| Turn-Off Delay Time | t _{d(off)} | | | 75 | 120 | |
| Fall Time | t _f | | | 30 | 45 | |
| Source-Drain Reverse Recovery Time | t _{rr} | I _F = 4.3 A, di/dt = 100 A/μs | | 41 | 65 | |

Notes

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

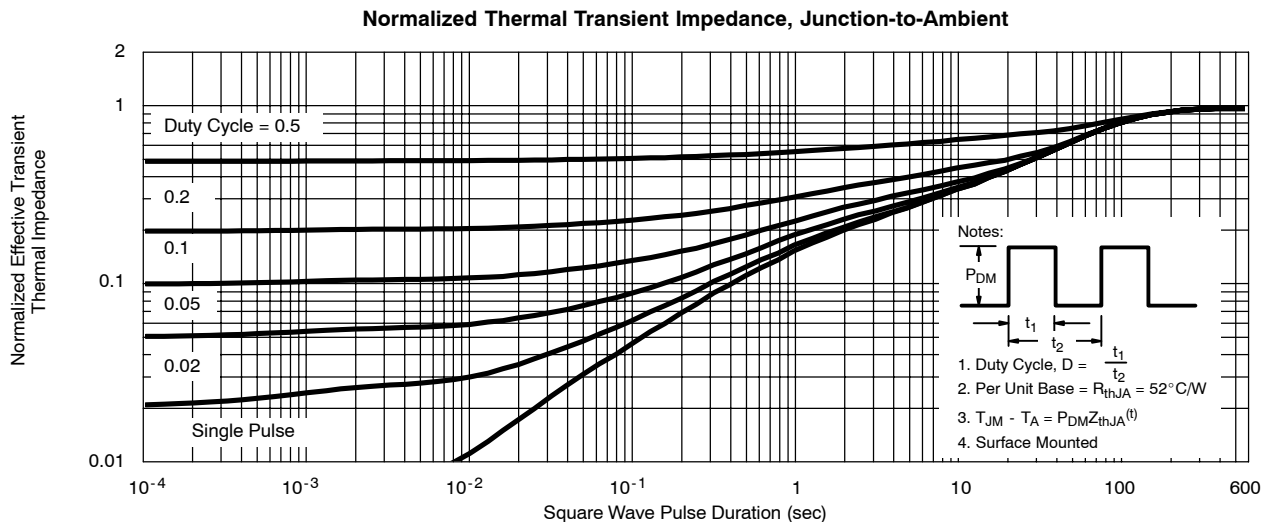
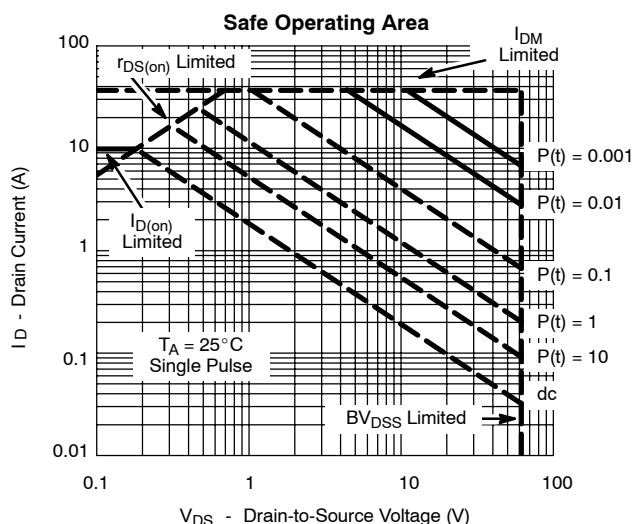
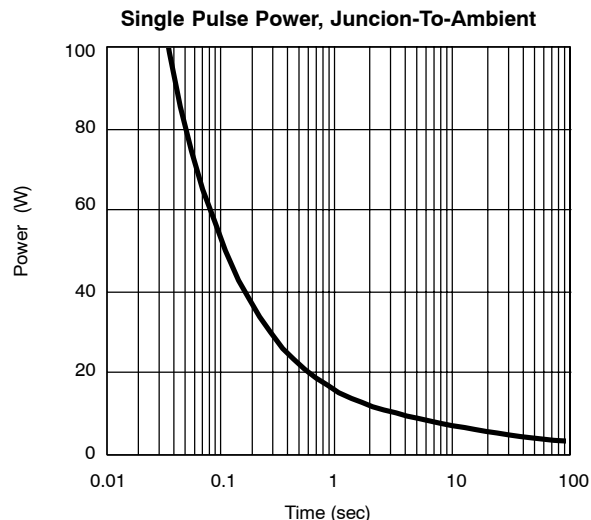
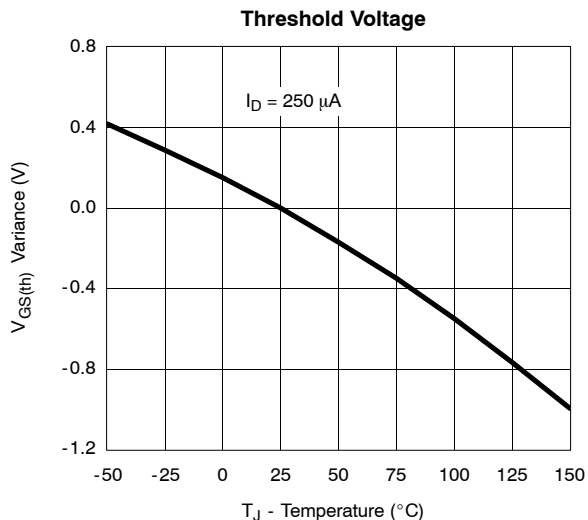
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

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