



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

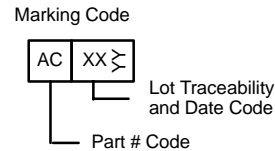
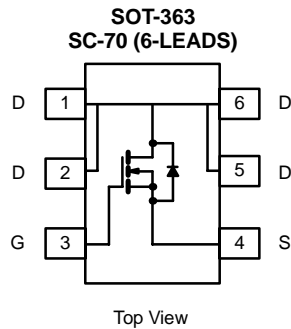
| PRODUCT SUMMARY | | |
|-----------------|---------------------------|-----------|
| V_{DS} (V) | $r_{DS(on)}$ (Ω) | I_D (A) |
| 30 | 0.075 @ $V_{GS} = 10$ V | 3.6 |
| | 0.115 @ $V_{GS} = 4.5$ V | 2.9 |

FEATURES

- TrenchFET® Power MOSFET
- Thermally Enhanced SC-70 Package
- PWM Optimized

APPLICATIONS

- Boost Converter in Portable Devices
 - Low Gate Charge (3 nC)
- Low Current Synchronous Rectifier



| ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED) | | | | |
|---|----------------|--------------------------|--------------|------------------|
| Parameter | Symbol | 5 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 | $T_A = 25^\circ\text{C}$ | 3.6 | A |
| | | $T_A = 85^\circ\text{C}$ | 2.6 | |
| Pulsed Drain Current | I_{DM} | 10 | | A |
| Continuous Diode Current (Diode Conduction) ^a | I_S | 1.3 | 0.8 | |
| Maximum Power Dissipation ^a | P_D | $T_A = 25^\circ\text{C}$ | 1.6 | W |
| | | $T_A = 85^\circ\text{C}$ | 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} | $t \leq 5$ sec | 60 | $^\circ\text{C/W}$ |
| | | Steady State | 100 | |
| Maximum Junction-to-Foot (Drain) | R_{thJF} | 34 | 45 | |

Notes

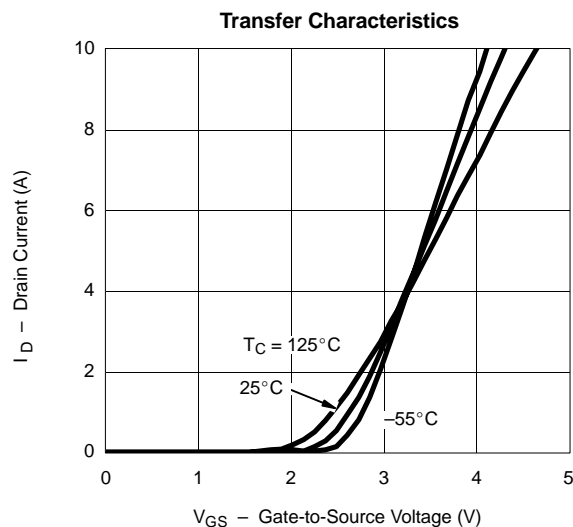
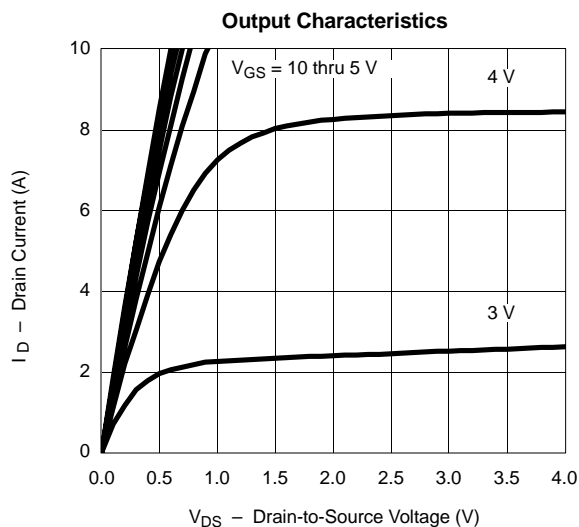
a. Surface Mounted on 1" x 1" FR4 Board.


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 | 0.80 | | 2.5 | 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} = 24 V, V _{GS} = 0 V | | | 1 | μA |
| | | V _{DS} = 24 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 | 10 | | | A |
| Drain-Source On-State Resistance ^a | r _{DS(on)} | V _{GS} = 10 V, I _D = 3.6 A | | 0.061 | 0.075 | Ω |
| | | V _{GS} = 4.5 V, I _D = 2.0 A | | 0.092 | 0.115 | |
| Forward Transconductance ^a | g _{fs} | V _{DS} = 10 V, I _D = 3.6 A | | 5 | | S |
| Diode Forward Voltage ^a | V _{SD} | I _S = 1.3 A, V _{GS} = 0 V | | 0.78 | 1.2 | V |
| Dynamic^b | | | | | | |
| Total Gate Charge | Q _g | V _{DS} = 15 V, V _{GS} = 4.5 V, I _D = 3.6 A | | 1.9 | 3 | nC |
| Gate-Source Charge | Q _{gs} | | | 0.75 | | |
| Gate-Drain Charge | Q _{gd} | | | 0.75 | | |
| 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 | | 10 | 15 | ns |
| Rise Time | t _r | | | 12 | 18 | |
| Turn-Off Delay Time | t _{d(off)} | | | 15 | 22 | |
| Fall Time | t _f | | | 9 | 15 | |
| Source-Drain Reverse Recovery | t _{rr} | | I _F = 1.4 A, di/dt = 100/μs | | 40 | |

Notes

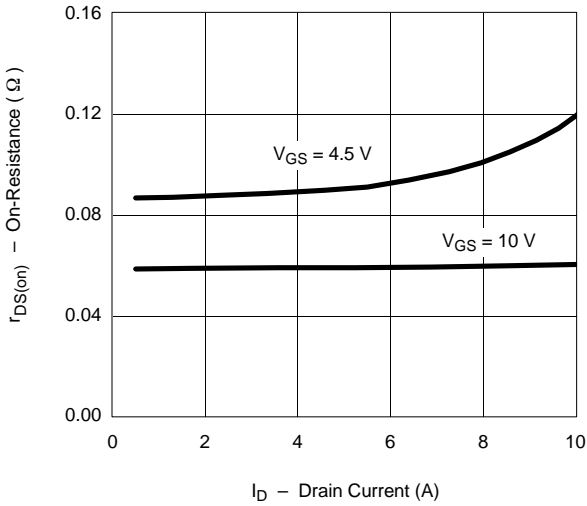
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
 b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)


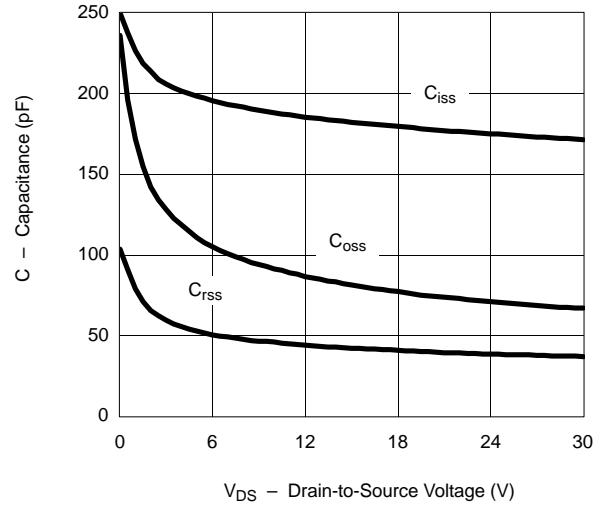


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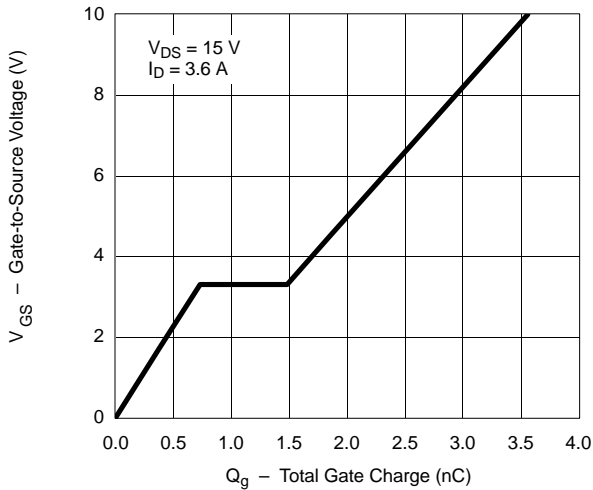
On-Resistance vs. Drain Current



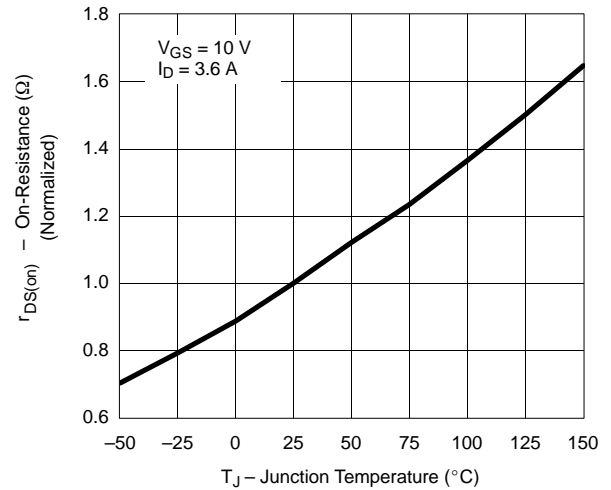
Capacitance



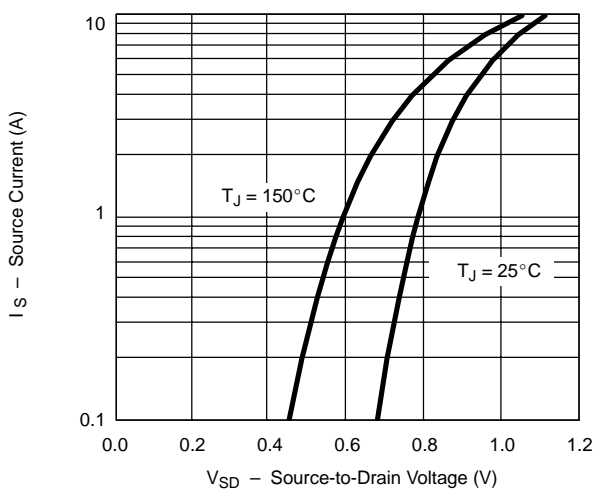
Gate Charge



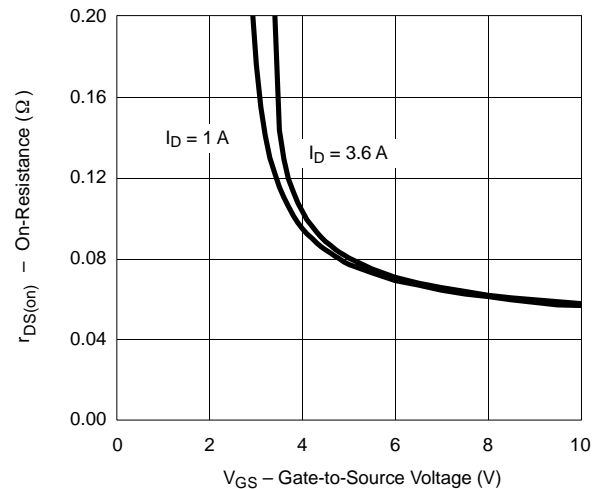
On-Resistance vs. Junction Temperature



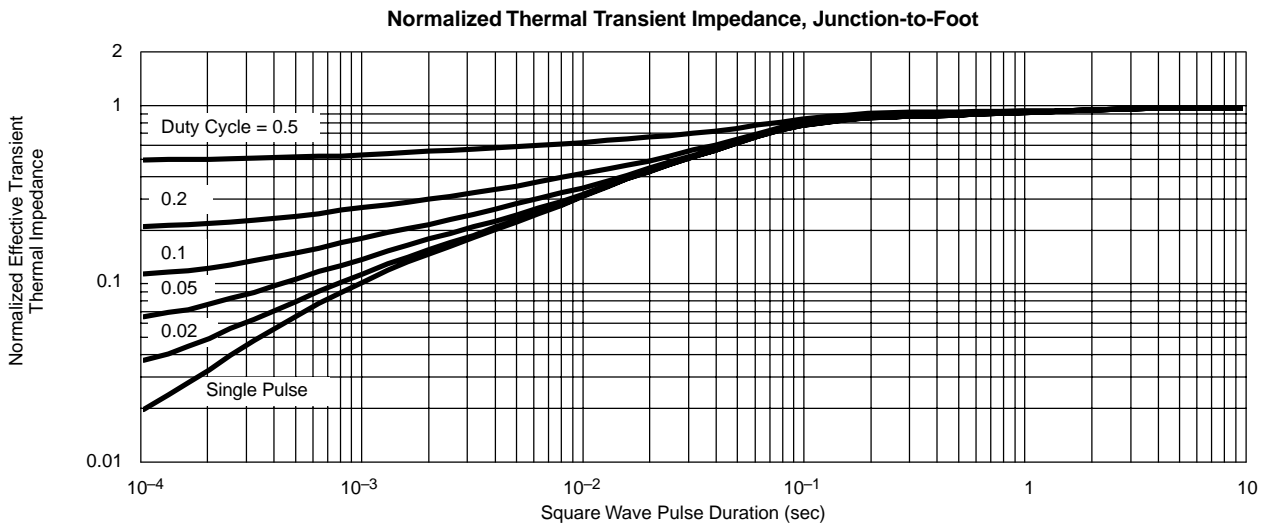
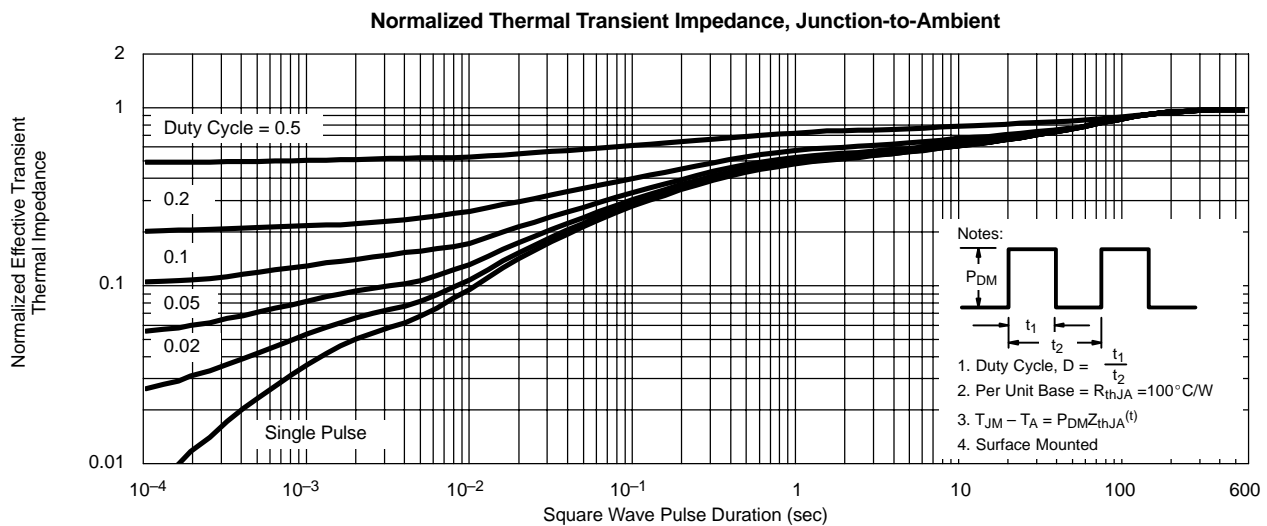
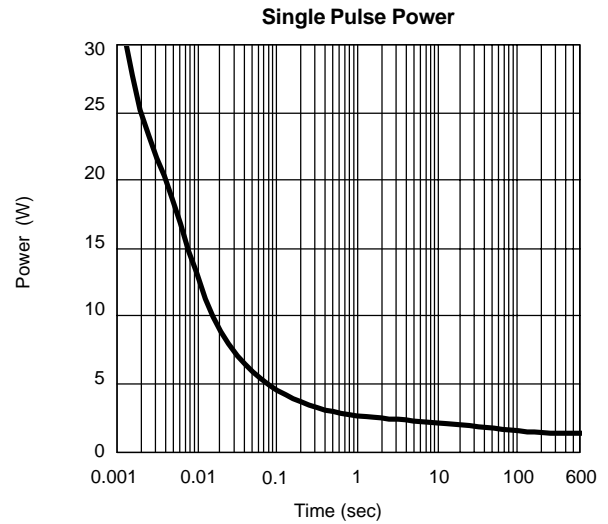
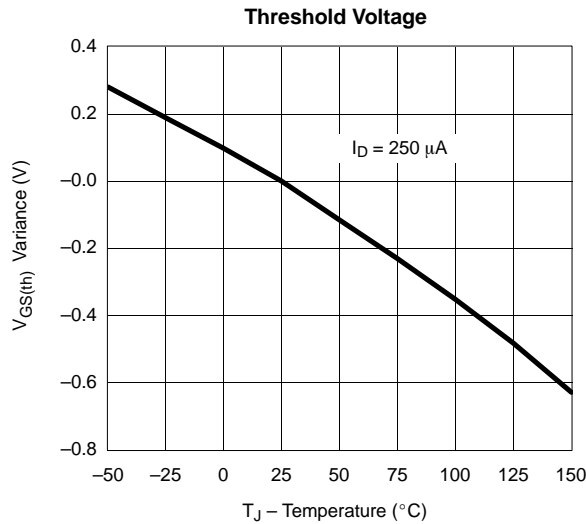
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)





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