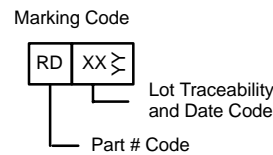
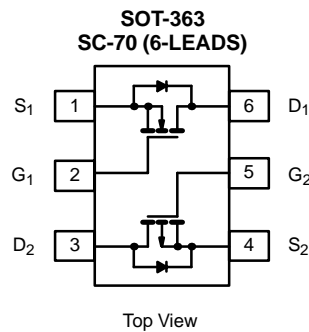


Complementary 20-V (D-S) MOSFET

| PRODUCT SUMMARY | | | |
|-----------------|---------------------|----------------------------------|--------------------|
| | V _{DS} (V) | r _{DS(on)} (Ω) | I _D (A) |
| N-Channel | 20 | 1.9 @ V _{GS} = 4.5 V | 0.30 |
| | | 3.7 @ V _{GS} = 2.7 V | 0.22 |
| | | 4.2 @ V _{GS} = 2.5 V | 0.21 |
| P-Channel | -20 | 0.995 @ V _{GS} = -4.5 V | -0.44 |
| | | 1.600 @ V _{GS} = -2.7 V | -0.34 |
| | | 1.800 @ V _{GS} = -2.5 V | -0.32 |

TrenchFET®
Power MOSFETS
2.5-V Rated



| ABSOLUTE MAXIMUM RATINGS (T _A = 25 °C UNLESS OTHERWISE NOTED) | | | | | | |
|--|-----------------------------------|------------|--------------|-----------|--------------|------|
| Parameter | Symbol | N-Channel | | P-Channel | | Unit |
| | | 5 secs | Steady State | 5 secs | Steady State | |
| Drain-Source Voltage | V _{DS} | 20 | | -20 | | V |
| Gate-Source Voltage | V _{GS} | ± 12 | | | | |
| Continuous Drain Current (T _J = 150 °C) ^a | T _A = 25 °C | 0.30 | 0.29 | -0.44 | -0.41 | A |
| | T _A = 85 °C | 0.22 | 0.21 | -0.31 | -0.30 | |
| Pulsed Drain Current | I _{DM} | 0.6 | | -1.0 | | |
| Continuous Source Current (Diode Conduction) ^a | I _S | 0.25 | 0.23 | -0.25 | -0.23 | |
| Maximum Power Dissipation ^a | T _A = 25 °C | 0.30 | 0.27 | 0.30 | 0.27 | W |
| | T _A = 85 °C | 0.16 | 0.14 | 0.16 | 0.14 | |
| 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 ^a | t ≤ 5 sec | R _{thJA} | 360 | 415 | °C/W |
| | Steady State | | 400 | 460 | |
| Maximum Junction-to-Foot (Drain) | Steady State | R _{thJF} | 300 | 350 | |

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

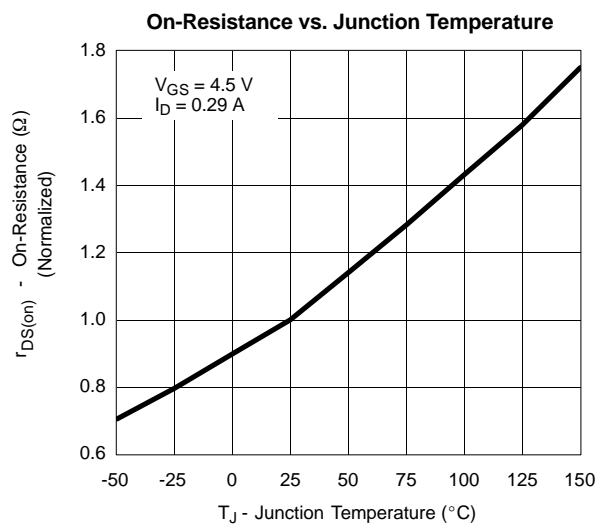
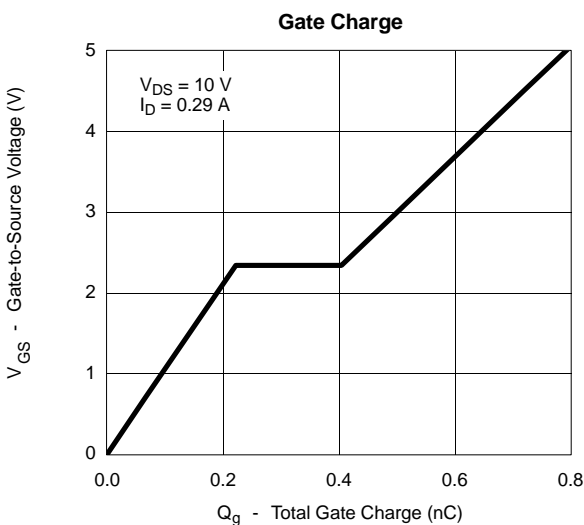
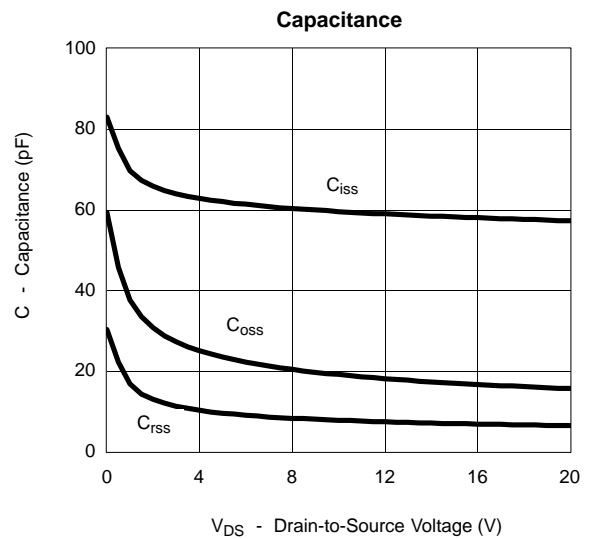
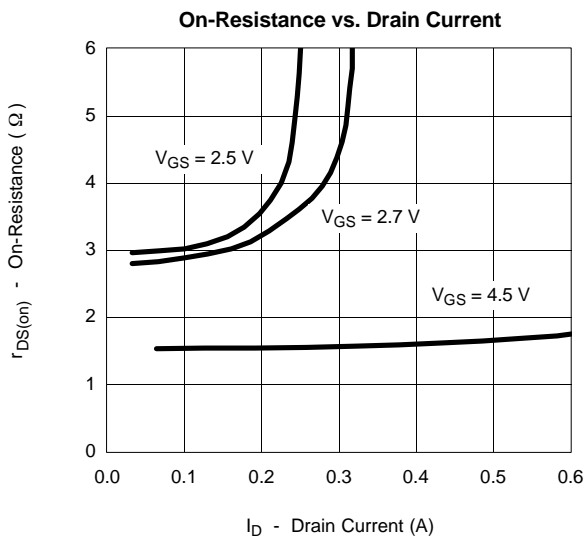
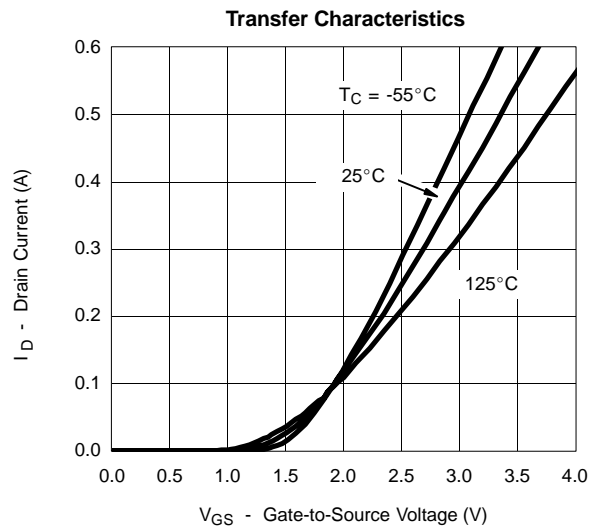
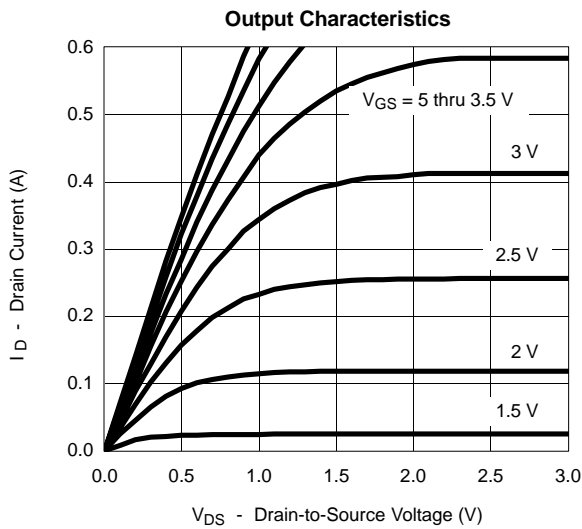
| SPECIFICATIONS (T _J = 25 °C UNLESS OTHERWISE NOTED) | | | | | | | |
|--|---------------------|---|------|------|-------|-------|------|
| Parameter | Symbol | Test Condition | | Min | Typ | Max | Unit |
| Static | | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = 250 μA | N-Ch | 0.6 | | | V |
| | | V _{DS} = V _{GS} , I _D = -250 μA | P-Ch | -0.6 | | | |
| Gate-Body Leakage | I _{GSS} | V _{DS} = 0 V, V _{GS} = ±12 V | N-Ch | | | ±100 | nA |
| | | | P-Ch | | | ±100 | |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} = 16 V, V _{GS} = 0 V | N-Ch | | | 1 | μA |
| | | V _{DS} = -16 V, V _{GS} = 0 V | P-Ch | | | -1 | |
| | | V _{DS} = 16 V, V _{GS} = 0 V, T _J = 85 °C | N-Ch | | | 5 | |
| | | V _{DS} = -16 V, V _{GS} = 0 V, T _J = 85 °C | P-Ch | | | -5 | |
| On-State Drain Current ^a | I _{D(on)} | V _{DS} ≥ 5 V, V _{GS} = 4.5 V | N-Ch | 0.6 | | | A |
| | | V _{DS} ≤ -5 V, V _{GS} = -4.5 V | P-Ch | -1.0 | | | |
| Drain-Source On-State Resistance ^a | r _{DS(on)} | V _{GS} = 4.5 V, I _D = 0.29 A | N-Ch | | 1.55 | 1.9 | Ω |
| | | V _{GS} = -4.5 V, I _D = -0.41 A | P-Ch | | 0.850 | 0.995 | |
| | | V _{GS} = 2.7 V, I _D = 0.1 A | N-Ch | | 2.8 | 3.7 | |
| | | V _{GS} = -2.7 V, I _D = -0.25 A | P-Ch | | 1.23 | 1.600 | |
| | | V _{GS} = 2.5 V, I _D = 0.1 A | N-Ch | | 3.0 | 4.2 | |
| | | V _{GS} = -2.5 V, I _D = -0.25 A | P-Ch | | 1.4 | 1.800 | |
| Forward Transconductance ^a | g _{fs} | V _{DS} = 10 V, I _D = 0.29 A | N-Ch | | 0.3 | | S |
| | | V _{DS} = -10 V, I _D = -0.41 A | P-Ch | | 0.8 | | |
| Diode Forward Voltage ^a | V _{SD} | I _S = 0.23 A, V _{GS} = 0 V | N-Ch | | 0.8 | 1.2 | V |
| | | I _S = -0.23 A, V _{GS} = 0 V | P-Ch | | -0.8 | -1.2 | |
| Dynamic^b | | | | | | | |
| Total Gate Charge | Q _g | N-Channel V _{DS} = 10 V, V _{GS} = 4.5 V, I _D = 0.29 A P-Channel V _{DS} = -10 V, V _{GS} = -4.5 V, I _D = -0.41 A | N-Ch | | 0.72 | 1.5 | nC |
| | | | P-Ch | | 0.52 | 1.8 | |
| Gate-Source Charge | Q _{gs} | | N-Ch | | 0.22 | | |
| | | | P-Ch | | 0.11 | | |
| Gate-Drain Charge | Q _{gd} | | N-Ch | | 0.13 | | |
| | | | P-Ch | | 0.14 | | |
| Turn-On Delay Time | t _{d(on)} | N-Channel V _{DD} = 10 V, R _L = 20 Ω I _D ≅ 0.5 A, V _{GEN} = 4.5 V, R _G = 6 Ω P-Channel V _{DD} = -10 V, R _L = 20 Ω I _D ≅ -0.5 A, V _{GEN} = -4.5 V, R _G = 6 Ω | N-Ch | | 23 | 40 | ns |
| | | | P-Ch | | 7.5 | 15 | |
| Rise Time | t _r | | N-Ch | | 30 | 60 | |
| | | | P-Ch | | 20 | 40 | |
| Turn-Off Delay Time | t _{d(off)} | | N-Ch | | 10 | 20 | |
| | | | P-Ch | | 8.5 | 17 | |
| Fall Time | t _f | | N-Ch | | 15 | 30 | |
| | | | P-Ch | | 12 | 24 | |
| Source-Drain Reverse Recovery Time | t _{rr} | I _F = 0.23 A, di/dt = 100 A/μs | N-Ch | | 20 | 40 | |
| | | I _F = -0.23 A, di/dt = 100 A/μs | P-Ch | | 25 | 40 | |

Notes

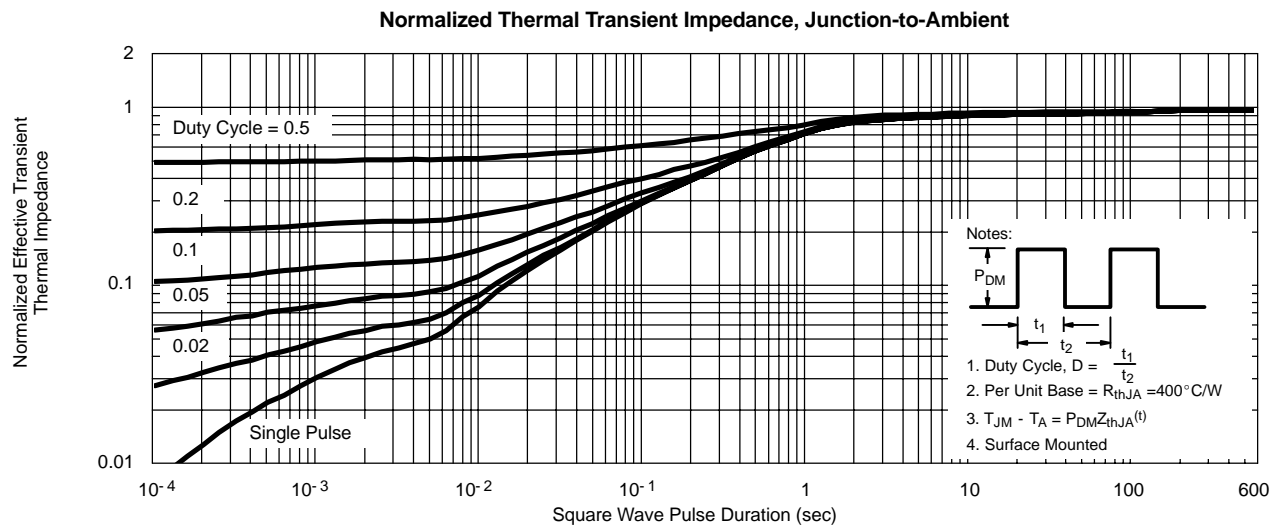
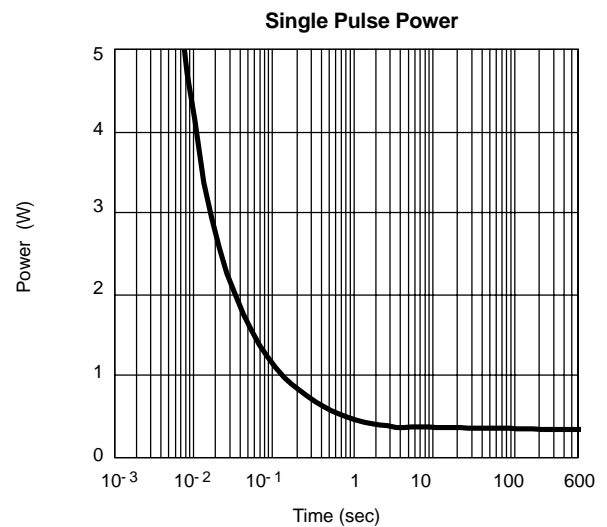
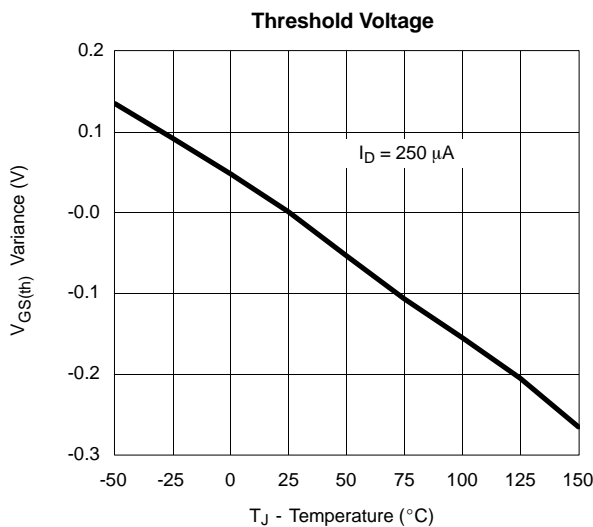
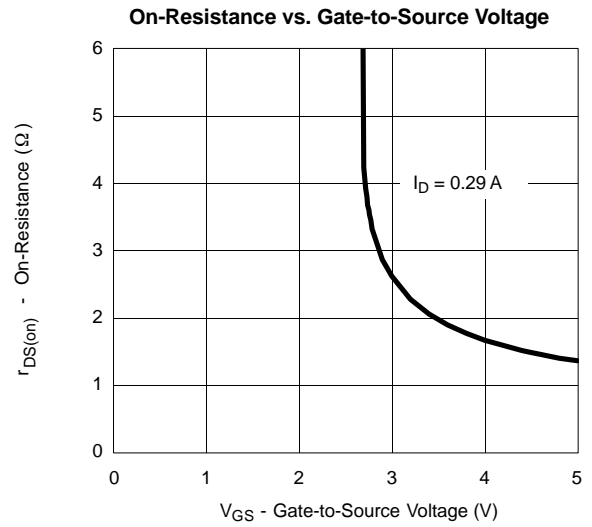
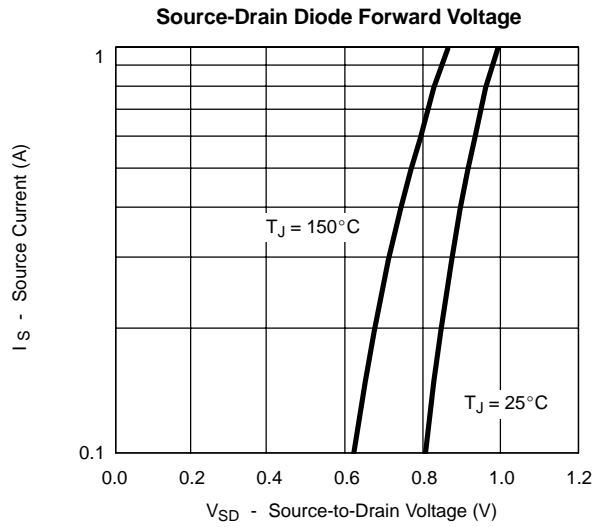
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

N-CHANNEL



TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED) N-CHANNEL

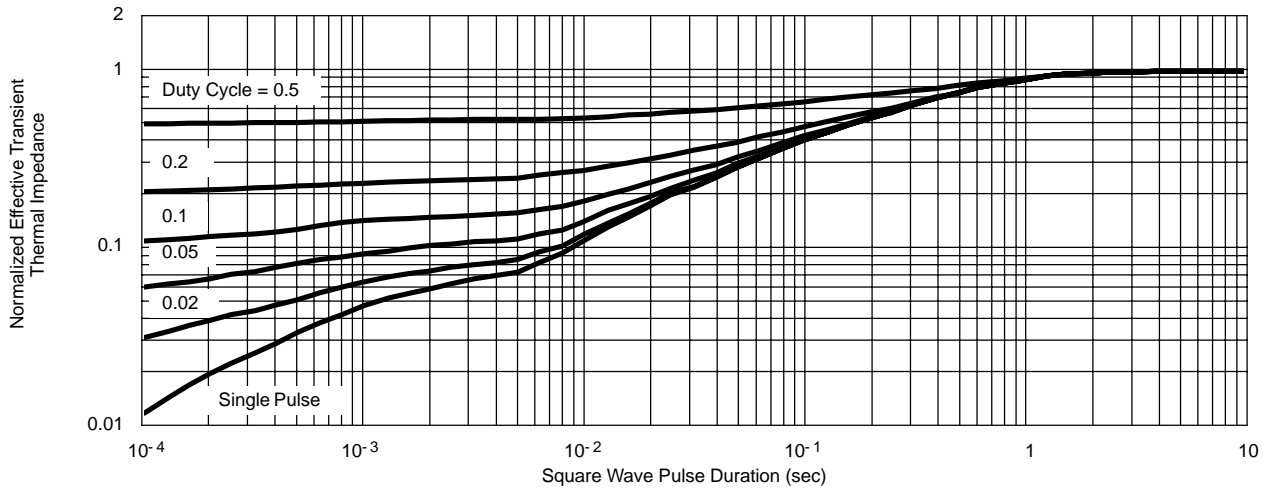




TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

N-CHANNEL

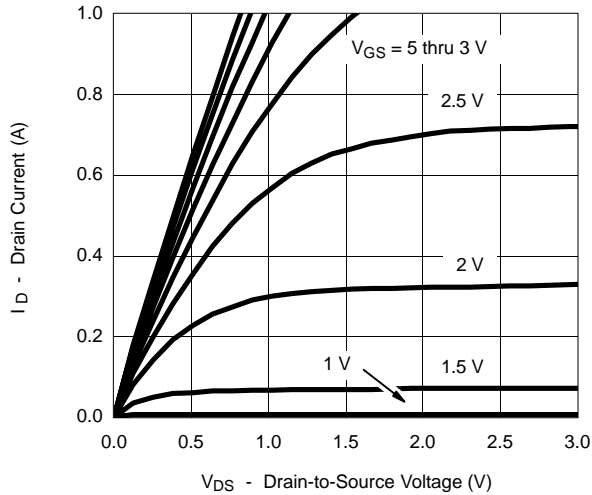
Normalized Thermal Transient Impedance, Junction-to-Foot



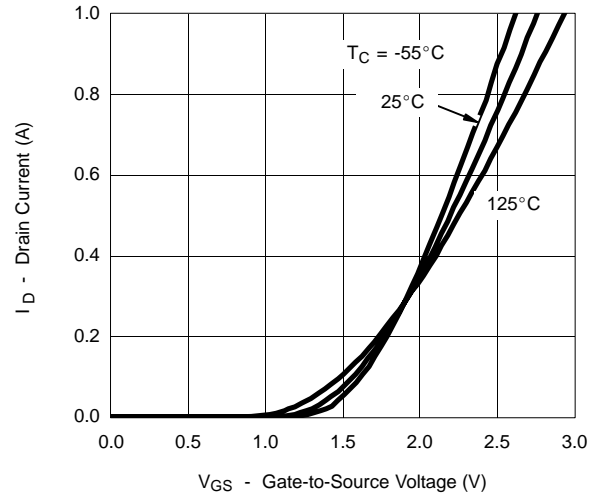
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

P-CHANNEL

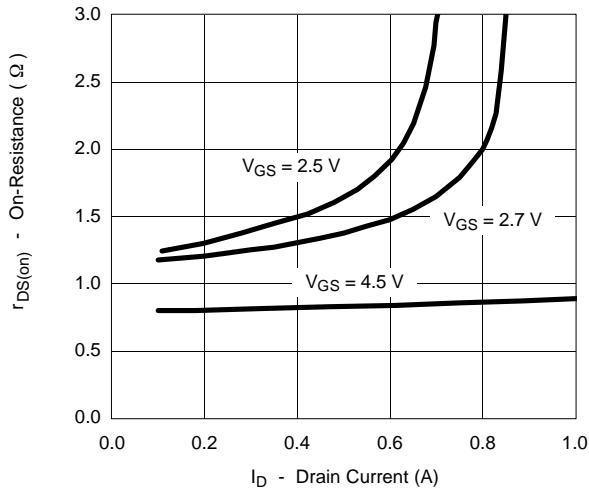
Output Characteristics



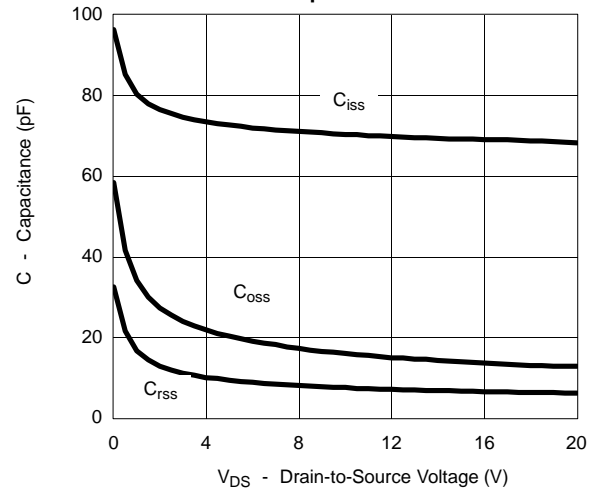
Transfer Characteristics



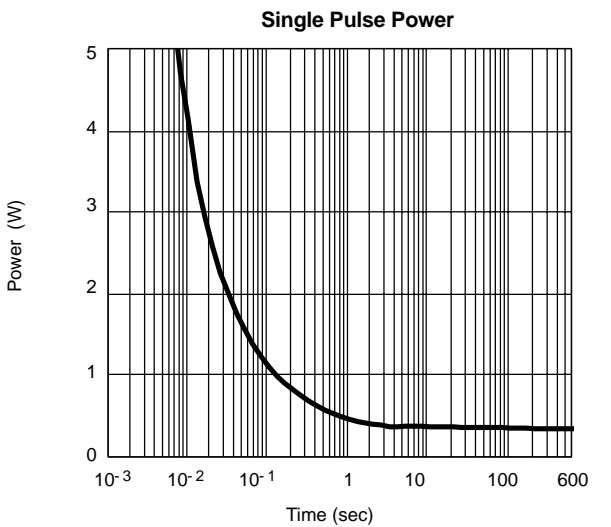
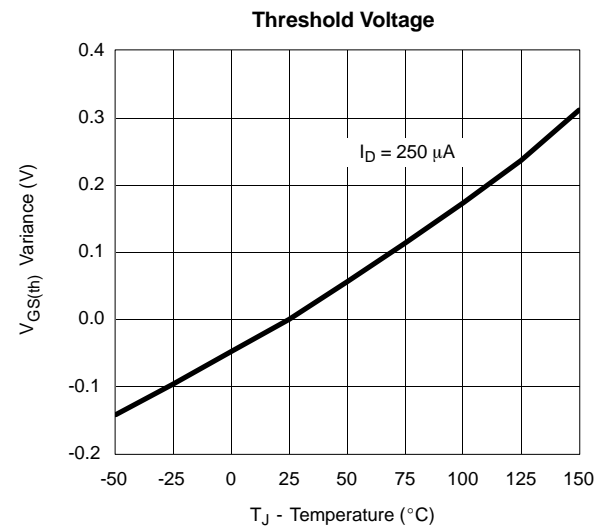
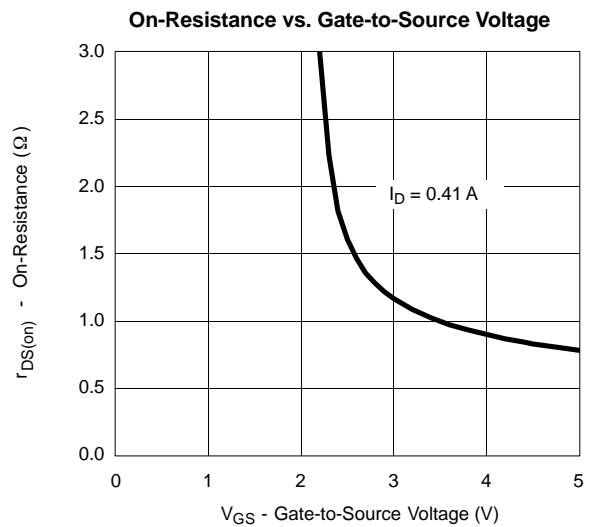
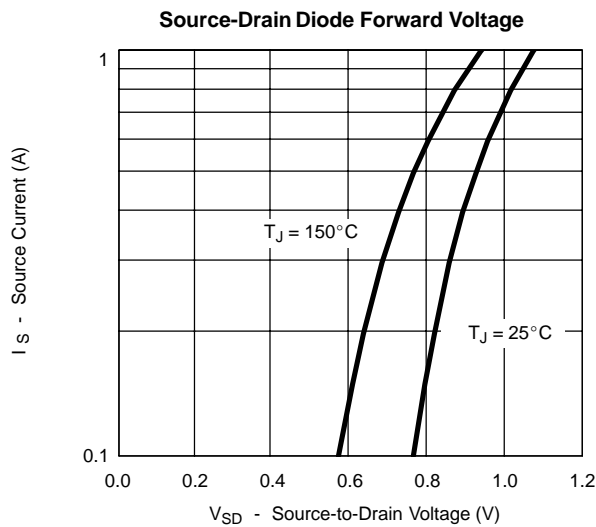
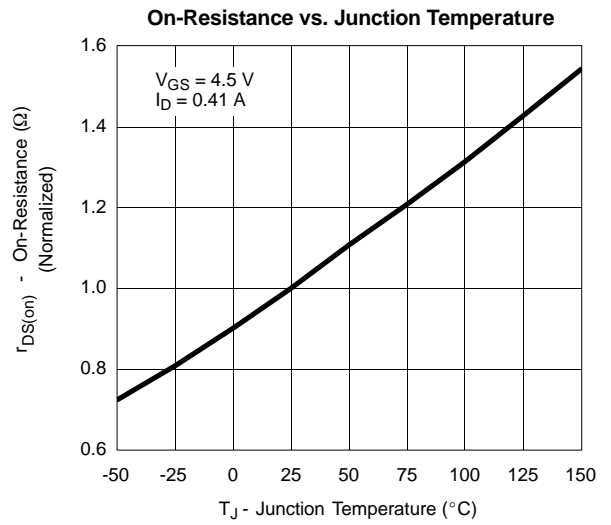
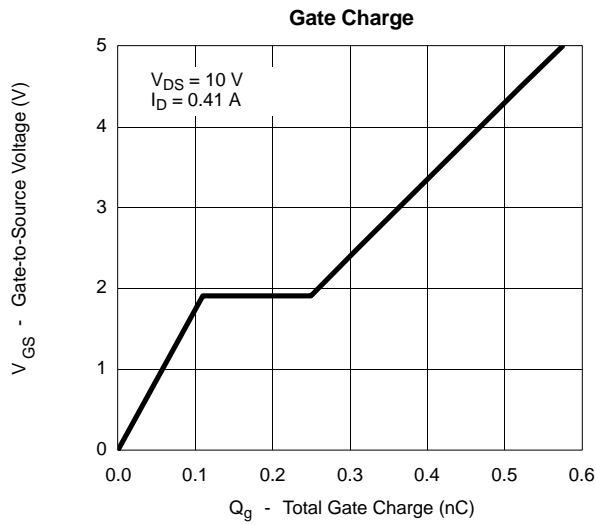
On-Resistance vs. Drain Current



Capacitance



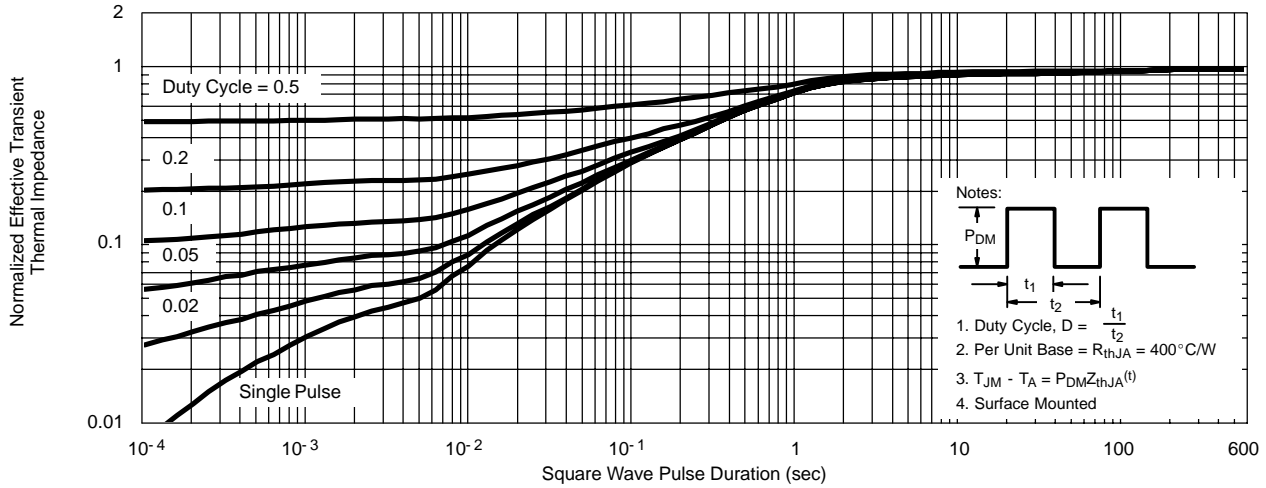
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED) P-CHANNEL



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

P-CHANNEL

Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

