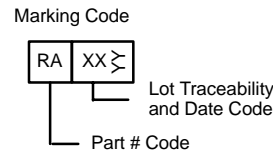
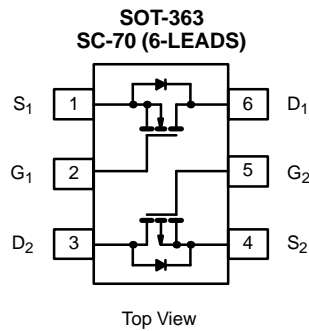




## Complementary 2.5-V (G-S) MOSFET

**TrenchFET®**  
Power MOSFETs  
2.5-V Rated

PRODUCT SUMMARY			
	$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
N-Channel	20	0.385 @ $V_{GS} = 4.5$ V	$\pm 0.70$
		0.630 @ $V_{GS} = 2.5$ V	$\pm 0.54$
P-Channel	-20	0.995 @ $V_{GS} = -4.5$ V	$\pm 0.44$
		1.800 @ $V_{GS} = -2.5$ V	$\pm 0.32$



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ 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	$V_{GS}$	$\pm 12$					
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>	$T_A = 25^\circ\text{C}$	$\pm 0.70$	$\pm 0.66$	$\pm 0.44$	$\pm 0.41$	A	
	$T_A = 85^\circ\text{C}$	$\pm 0.50$	$\pm 0.48$	$\pm 0.31$	$\pm 0.30$		
Pulsed Drain Current	$I_{DM}$	$\pm 1.0$					
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	0.25	0.23	-0.25	-0.23		
Maximum Power Dissipation <sup>a</sup>	$T_A = 25^\circ\text{C}$	0.30	0.27	0.30	0.27	W	
	$T_A = 85^\circ\text{C}$	0.16	0.14	0.16	0.14		
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150					

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient <sup>a</sup>	$t \leq 5$ sec	$R_{thJA}$	360	415	$^\circ\text{C/W}$
	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 <sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)								
Parameter	Symbol	Test Condition		Min	Typ	Max	Unit	
<b>Static</b>								
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	N-Ch	0.6			V	
		V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250 μA	P-Ch	-0.6				
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±12 V	N-Ch P-Ch			±100 ±100	nA	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 16 V, V <sub>GS</sub> = 0 V	N-Ch			1	μA	
		V <sub>DS</sub> = -16 V, V <sub>GS</sub> = 0 V	P-Ch			-1		
		V <sub>DS</sub> = 16 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 85 °C	N-Ch			5		
		V <sub>DS</sub> = -16 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 85 °C	P-Ch			-5		
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> ≥ 5 V, V <sub>GS</sub> = 4.5 V	N-Ch	1.0			A	
		V <sub>DS</sub> ≤ -5 V, V <sub>GS</sub> = -4.5 V	P-Ch	-1.0				
Drain-Source On-State Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 0.66 A	N-Ch		0.320	0.385	Ω	
		V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -0.41 A	P-Ch		0.850	0.995		
		V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 0.40 A	N-Ch		0.560	0.630		
		V <sub>GS</sub> = -2.5 V, I <sub>D</sub> = -0.25 A	P-Ch		1.4	1.800		
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 0.66 A	N-Ch		1.5		S	
		V <sub>DS</sub> = -10 V, I <sub>D</sub> = -0.41 A	P-Ch		0.8			
Diode Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>S</sub> = 0.23 A, V <sub>GS</sub> = 0 V	N-Ch		0.8	1.2	V	
		I <sub>S</sub> = -0.23 A, V <sub>GS</sub> = 0 V	P-Ch		-0.8	-1.2		
<b>Dynamic<sup>b</sup></b>								
Total Gate Charge	Q <sub>g</sub>	<b>N-Channel</b> V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 0.66 A <b>P-Channel</b> V <sub>DS</sub> = -10 V, V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -0.41 A	N-Ch		0.8	1.2	nC	
Gate-Source Charge	Q <sub>gs</sub>		N-Ch		0.06			
Gate-Drain Charge	Q <sub>gd</sub>		P-Ch		0.45			
			N-Ch		0.30			
Turn-On Delay Time	t <sub>d(on)</sub>	<b>N-Channel</b> V <sub>DD</sub> = 10 V, R <sub>L</sub> = 20 Ω I <sub>D</sub> ≅ 0.5 A, V <sub>GEN</sub> = 4.5 V, R <sub>G</sub> = 6 Ω <b>P-Channel</b> V <sub>DD</sub> = -10 V, R <sub>L</sub> = 20 Ω I <sub>D</sub> ≅ -0.5 A, V <sub>GEN</sub> = -4.5 V, R <sub>G</sub> = 6 Ω	N-Ch		10	20	ns	
Rise Time	t <sub>r</sub>		P-Ch		7.5	15		
Turn-Off Delay Time	t <sub>d(off)</sub>		N-Ch		16	30		
			P-Ch		20	40		
Fall Time	t <sub>f</sub>		N-Ch		10	20		
			P-Ch		8.5	17		
Source-Drain Reverse Recovery Time	t <sub>rr</sub>		I <sub>F</sub> = 0.23 A, di/dt = 100 A/μs	N-Ch		20		40
			I <sub>F</sub> = -0.23 A, di/dt = 100 A/μs	P-Ch		25		40

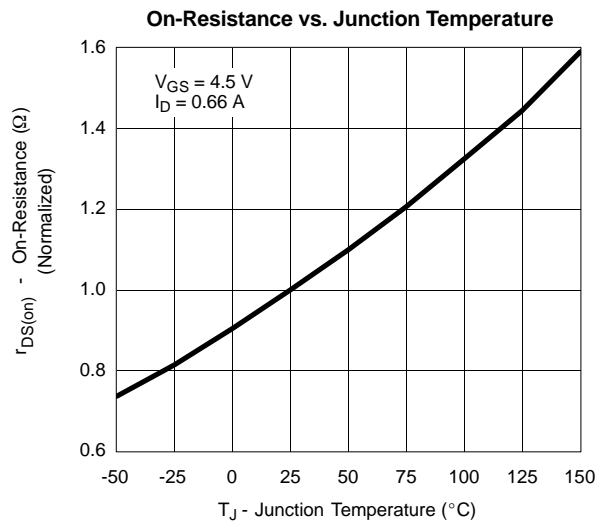
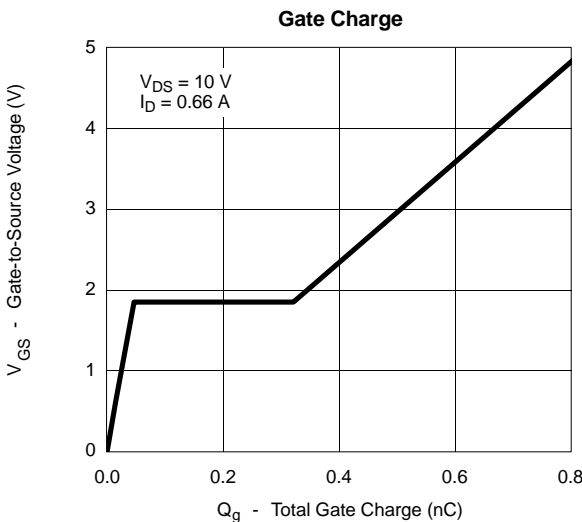
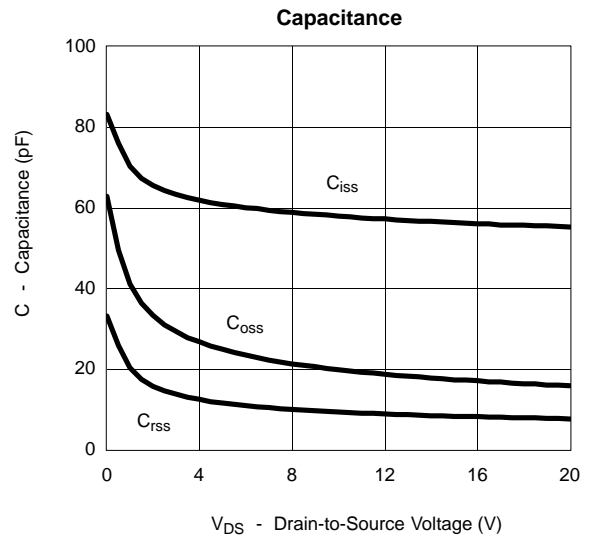
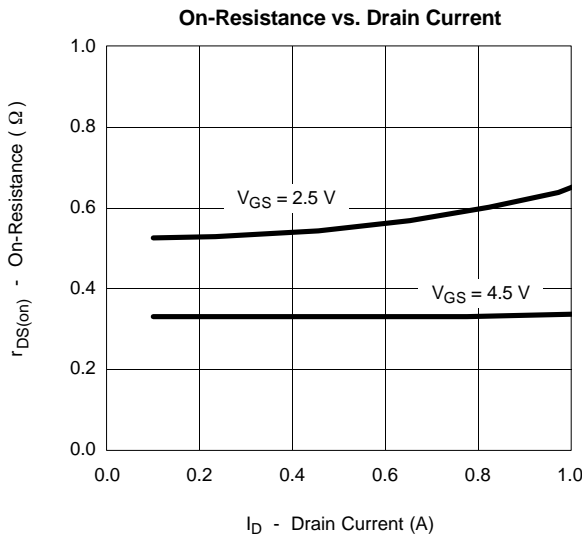
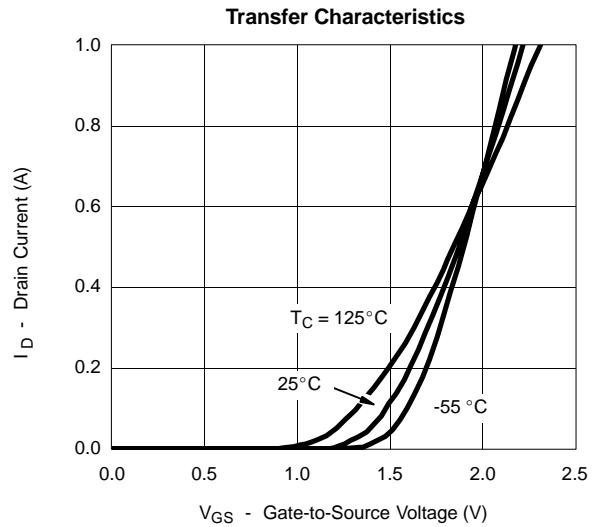
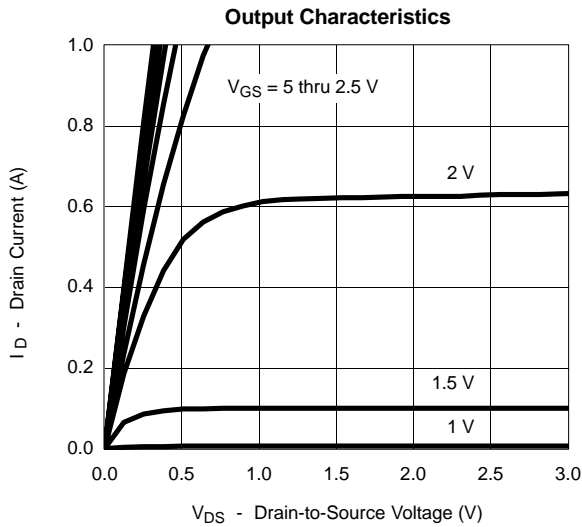
## Notes

- 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)**

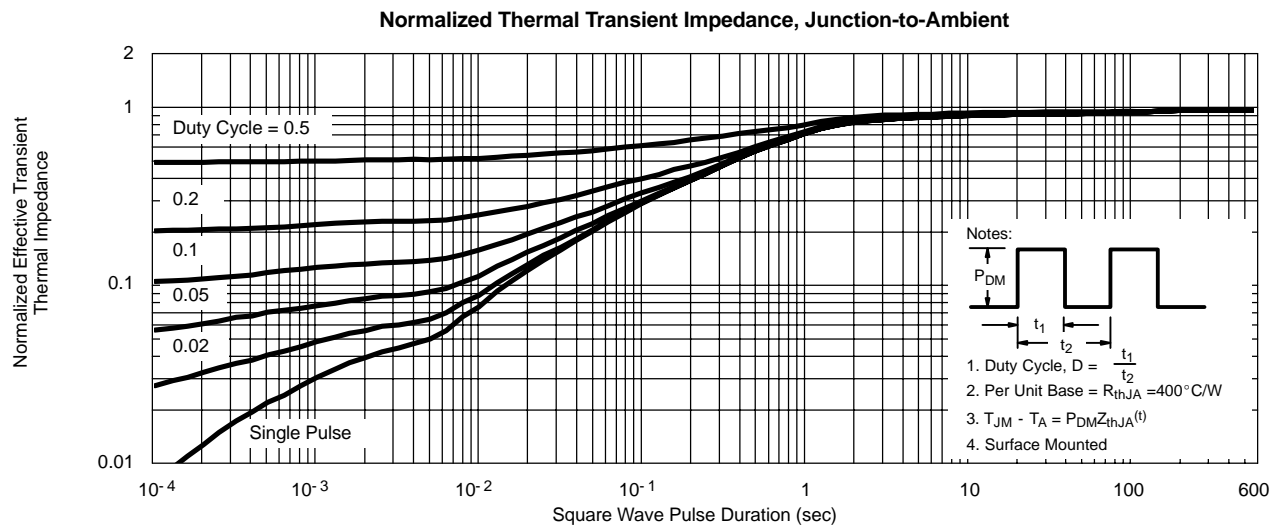
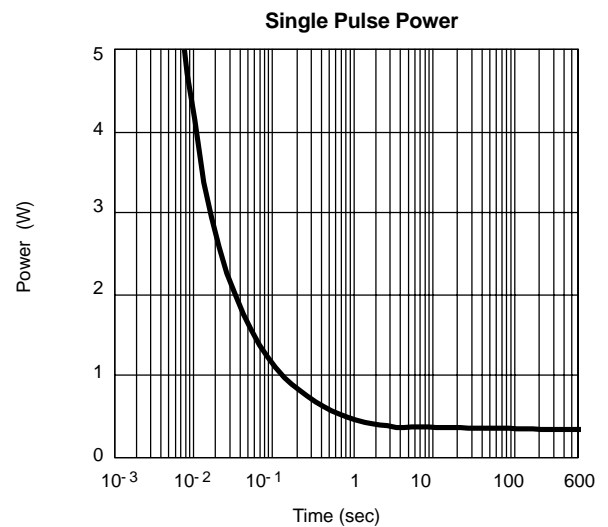
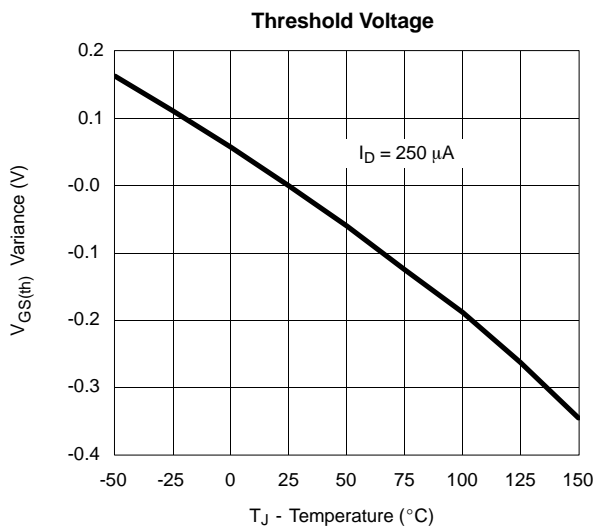
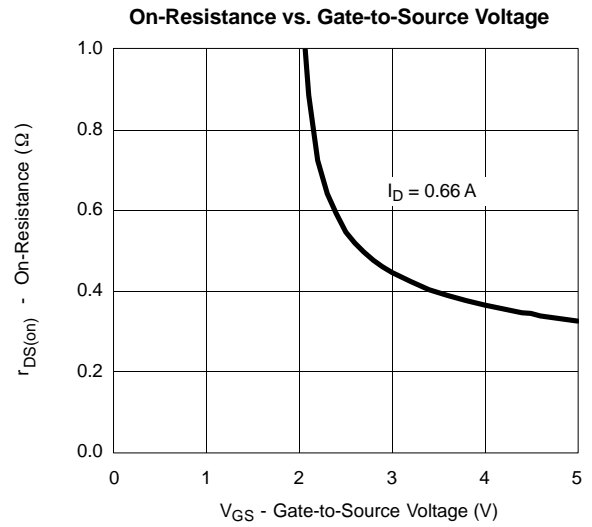
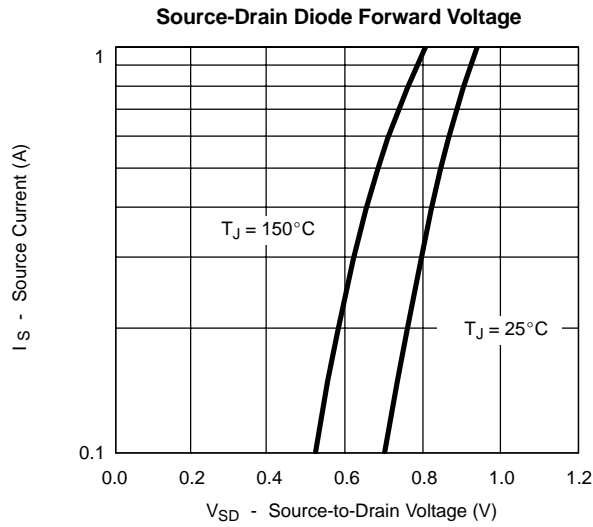
**N-CHANNEL**





**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**

**N-CHANNEL**

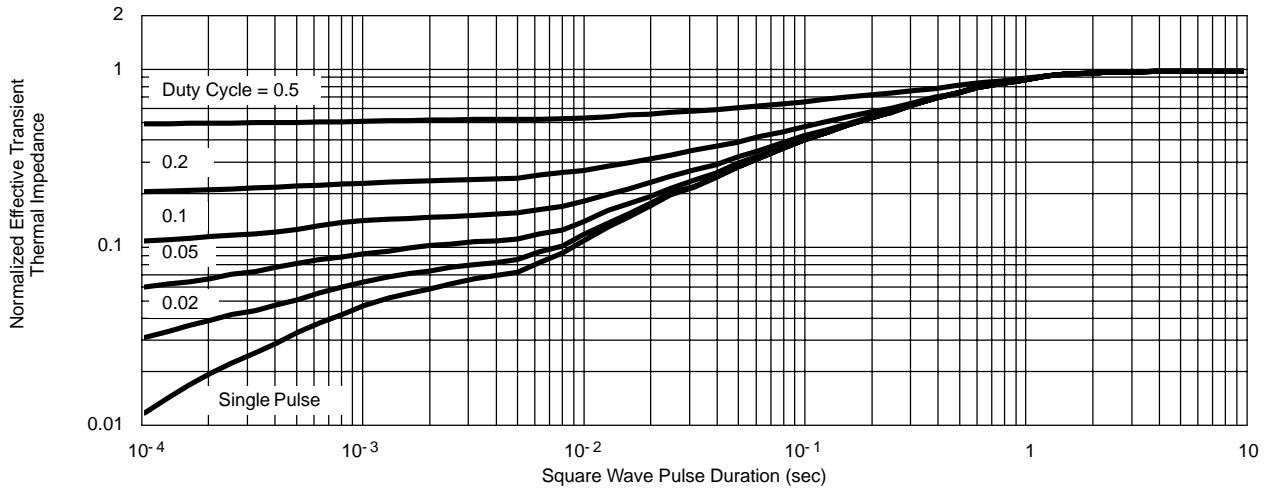




**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

**N-CHANNEL**

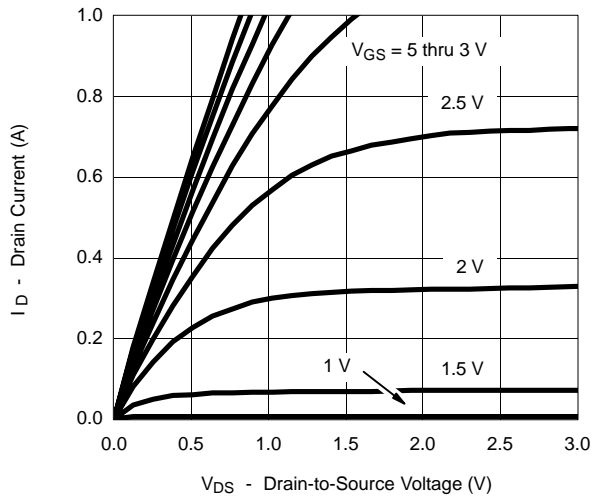
Normalized Thermal Transient Impedance, Junction-to-Foot



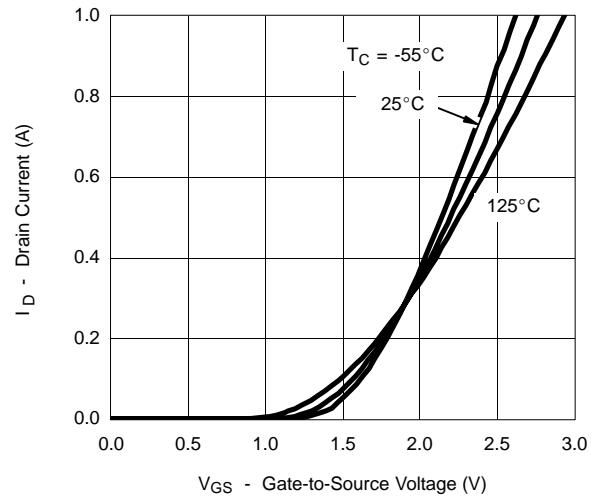
**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

**P-CHANNEL**

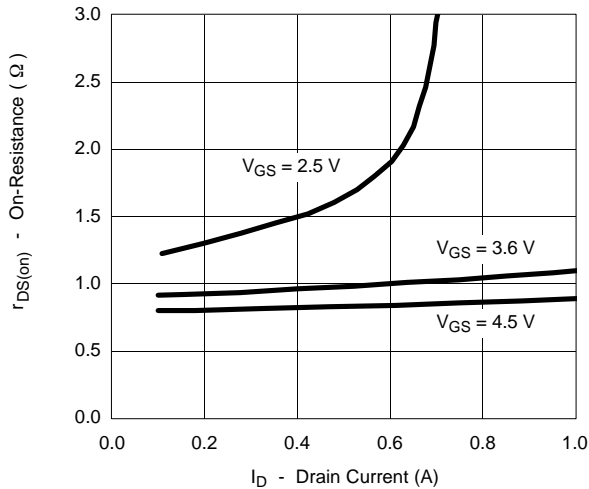
Output Characteristics



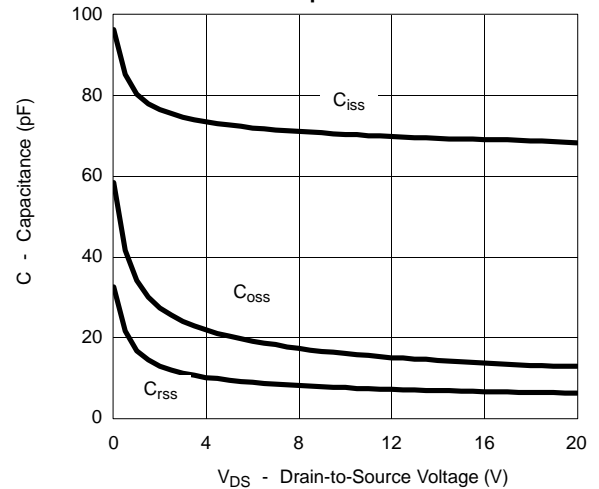
Transfer Characteristics



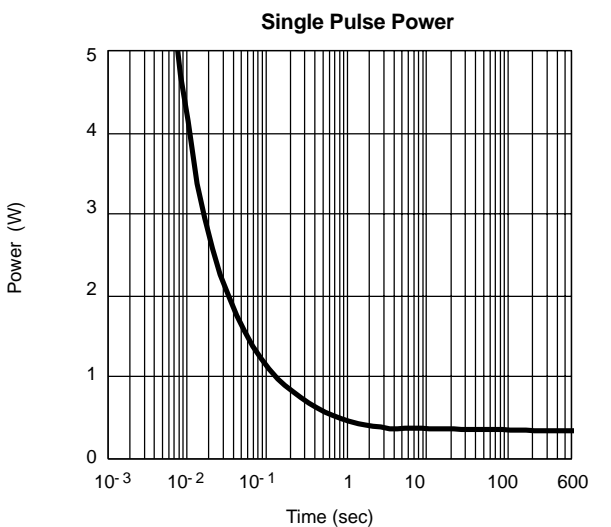
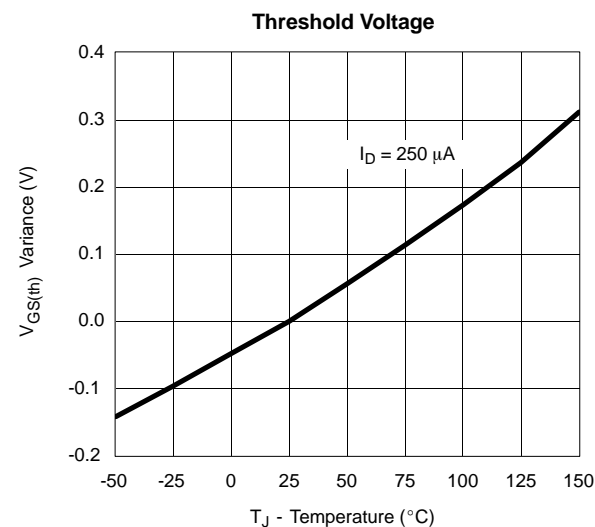
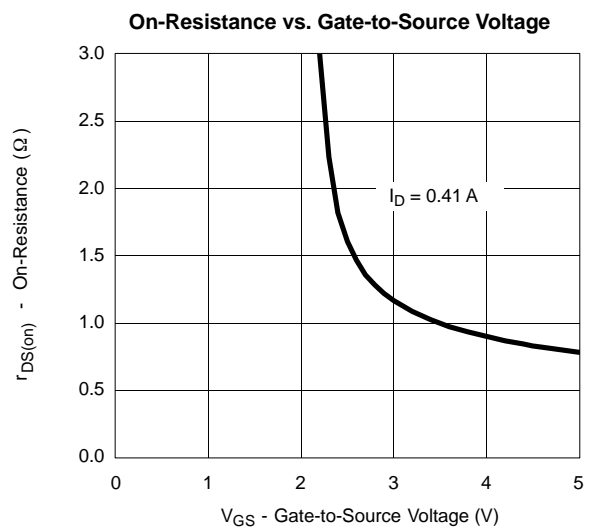
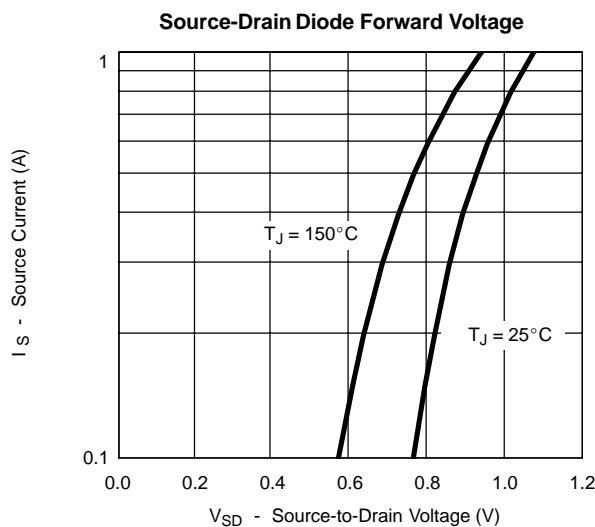
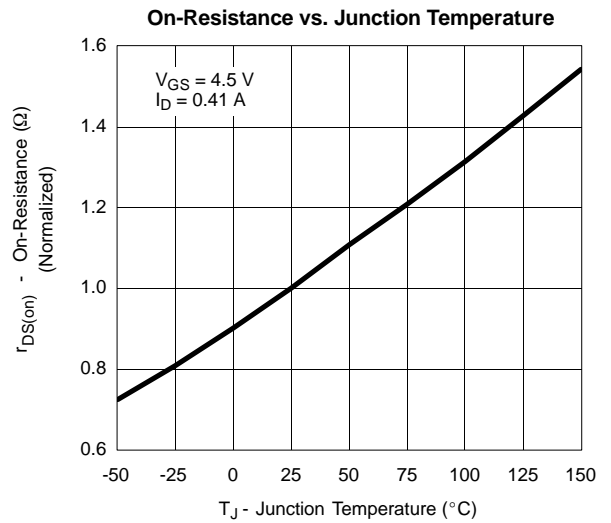
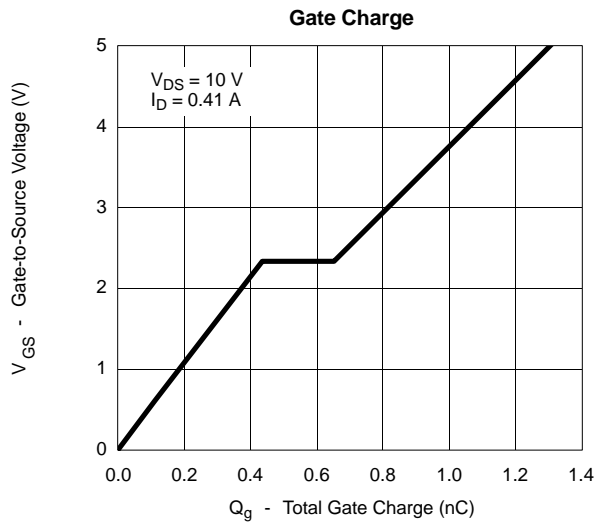
On-Resistance vs. Drain Current



Capacitance



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

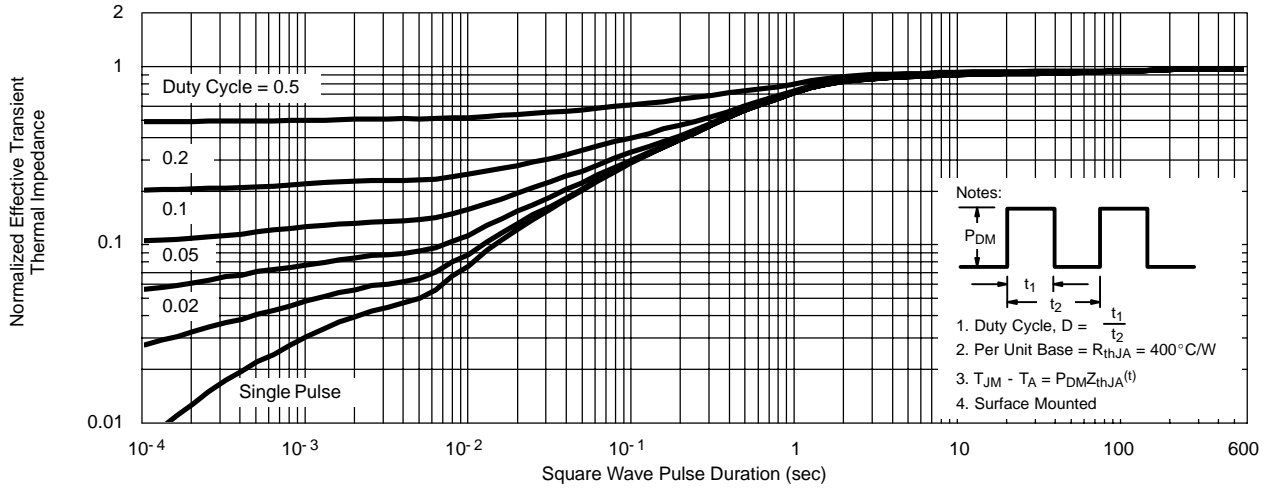




**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

**P-CHANNEL**

**Normalized Thermal Transient Impedance, Junction-to-Ambient**



**Normalized Thermal Transient Impedance, Junction-to-Foot**

