



## N- and P-Channel 1.8-V (G-S) MOSFET

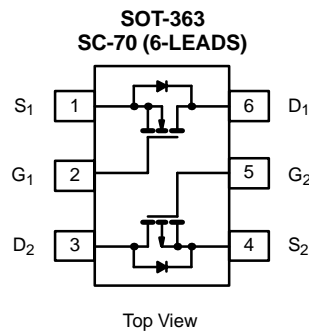
PRODUCT SUMMARY			
	V <sub>DS</sub> (V)	r <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A)
N-Channel	12	0.235 @ V <sub>GS</sub> = 4.5 V	1.3
		0.280 @ V <sub>GS</sub> = 2.5 V	1.2
		0.340 @ V <sub>GS</sub> = 1.8 V	1.0
P-Channel	-12	0.535 @ V <sub>GS</sub> = -4.5 V	-0.86
		0.880 @ V <sub>GS</sub> = -2.5 V	-0.67
		1.26 @ V <sub>GS</sub> = -1.8 V	-0.56

### FEATURES

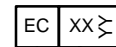
- TrenchFET® Power MOSFETs
- Thermally Enhanced SC-70 Package
- Fast Switching to Minimize Gate and Switching Losses

### APPLICATIONS

- Baseband DC/DC Converter Switch for Portable Electronics



Marking Code



Lot Traceability  
and Date Code

Part # Code

ABSOLUTE MAXIMUM RATINGS (T <sub>A</sub> = 25 °C UNLESS OTHERWISE NOTED)							
Parameter	Symbol	N-Channel		P-Channel		Unit	
		5 secs	Steady State	5 secs	Steady State		
Drain-Source Voltage	V <sub>DS</sub>	12		-12		V	
Gate-Source Voltage	V <sub>GS</sub>	±8					
Continuous Drain Current (T <sub>J</sub> = 150°C) <sup>a</sup>	I <sub>D</sub>	T <sub>A</sub> = 25 °C	1.3	1.2	-0.86	-0.77	A
		T <sub>A</sub> = 85 °C	0.9	0.8	-0.62	-0.55	
Pulsed Drain Current	I <sub>DM</sub>	3		-2		W	
Continuous Source Current (Diode Conduction) <sup>a</sup>	I <sub>S</sub>	0.5	0.39	-0.5	-0.39		
Maximum Power Dissipation <sup>a</sup>	P <sub>D</sub>	T <sub>A</sub> = 25 °C	0.6	0.47	0.6	0.47	W
		T <sub>A</sub> = 85 °C	0.3	0.25	0.3	0.25	
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to 150				°C	

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient <sup>a</sup>	t ≤ 5 sec	R <sub>thJA</sub>	170	210	°C/W
	Steady State		220	265	
Maximum Junction-to-Foot (Drain)	Steady State	R <sub>thJF</sub>	105	125	

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> = 100 μA	N-Ch	0.45		1	V
		V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -100 μA	P-Ch	-0.45		1	
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±8 V	N-Ch P-Ch			±100 ±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 9.6 V, V <sub>GS</sub> = 0 V	N-Ch			1	μA
		V <sub>DS</sub> = -9.6 V, V <sub>GS</sub> = 0 V	P-Ch			-1	
		V <sub>DS</sub> = 9.6 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 85 °C	N-Ch			5	
		V <sub>DS</sub> = -9.6 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	3			A
		V <sub>DS</sub> ≤ -5 V, V <sub>GS</sub> = -4.5 V	P-Ch	-2			
Drain-Source On-State Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 1.2 A	N-Ch		0.195	0.235	Ω
		V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -0.77 A	P-Ch		0.445	0.535	
		V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 1.0 A	N-Ch		0.230	0.280	
		V <sub>GS</sub> = -2.5 V, I <sub>D</sub> = -0.6 A	P-Ch		0.735	0.880	
		V <sub>GS</sub> = 1.8 V, I <sub>D</sub> = 0.2 A	N-Ch		0.284	0.340	
		V <sub>GS</sub> = -1.8 V, I <sub>D</sub> = -0.2 A	P-Ch		1.05	1.26	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 5 V, I <sub>D</sub> = 1.2 A	N-Ch		0.8		S
		V <sub>DS</sub> = -5 V, I <sub>D</sub> = -0.77 A	P-Ch		1.2		
Diode Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>S</sub> = 0.39 A, V <sub>GS</sub> = 0 V	N-Ch		0.8	1.2	V
		I <sub>S</sub> = -0.39 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> = 6 V, V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 1.2 A  <b>P-Channel</b> V <sub>DS</sub> = -6 V, V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -0.1 A	N-Ch		0.8	1.2	nC
Gate-Source Charge	Q <sub>gs</sub>		P-Ch		1.1	1.8	
Gate-Drain Charge	Q <sub>gd</sub>		N-Ch		0.15		
Turn-On Delay Time	t <sub>d(on)</sub>	<b>N-Channel</b> V <sub>DD</sub> = 6 V, R <sub>L</sub> = 12 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> = -6 V, R <sub>L</sub> = 12 Ω I <sub>D</sub> ≅ -0.5 A, V <sub>GEN</sub> = -4.5 V, R <sub>G</sub> = 6 Ω	N-Ch		15	25	ns
			P-Ch		17	25	
Rise Time	t <sub>r</sub>		N-Ch		25	40	
			P-Ch		30	45	
Turn-Off Delay Time	t <sub>d(off)</sub>		N-Ch		25	40	
			P-Ch		15	25	
Fall Time	t <sub>f</sub>	N-Ch		10	15		
		P-Ch		10	15		
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 0.39 A, di/dt = 100 A/μs	N-Ch		20	40	
		I <sub>F</sub> = -0.39 A, di/dt = 100 A/μs	P-Ch		25	40	

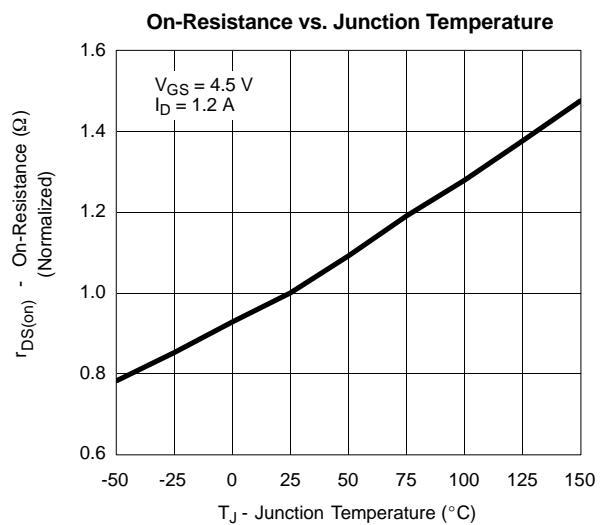
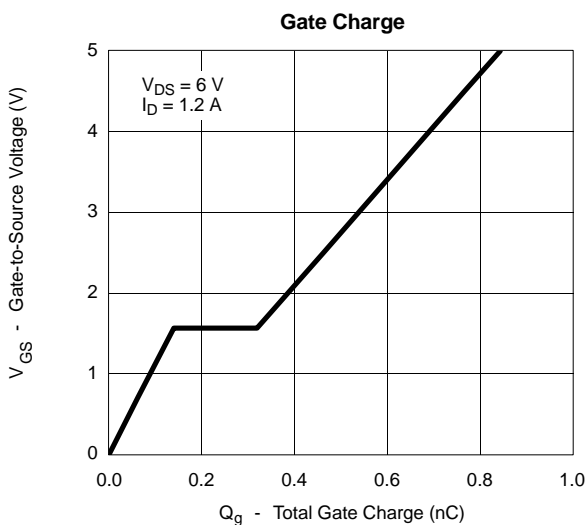
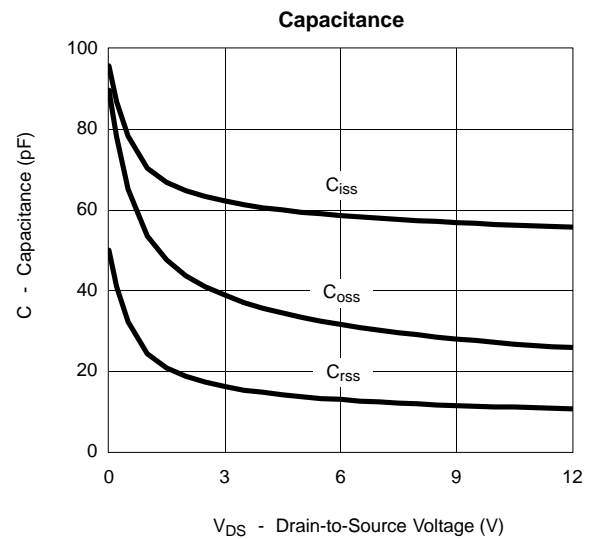
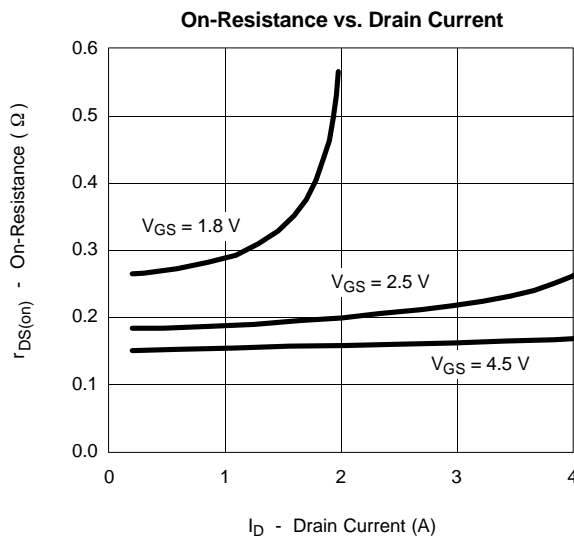
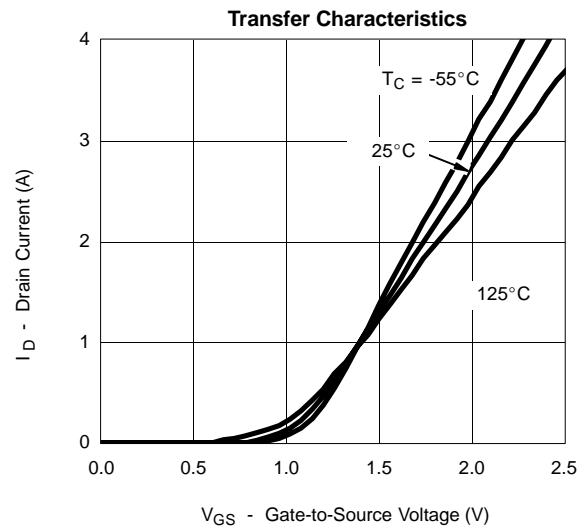
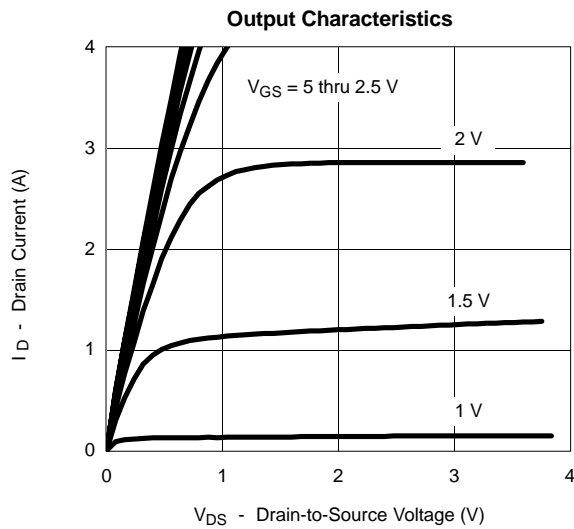
## Notes

- 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)**

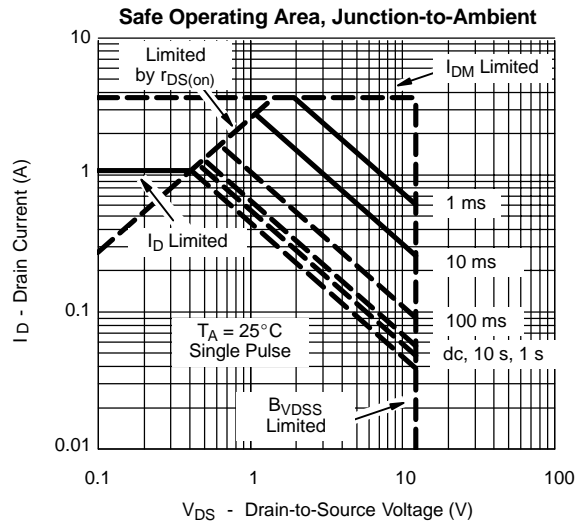
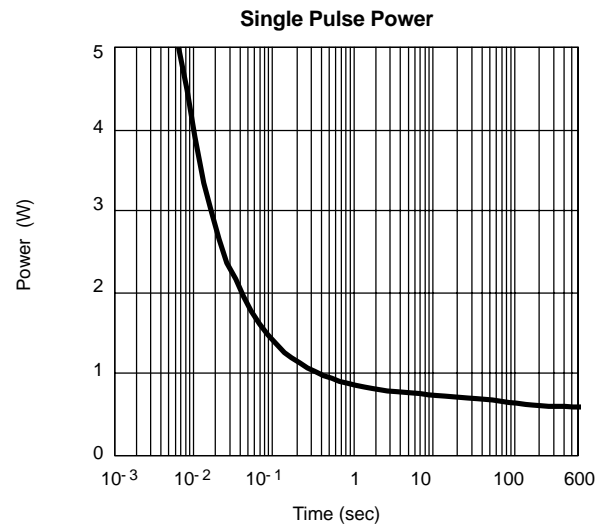
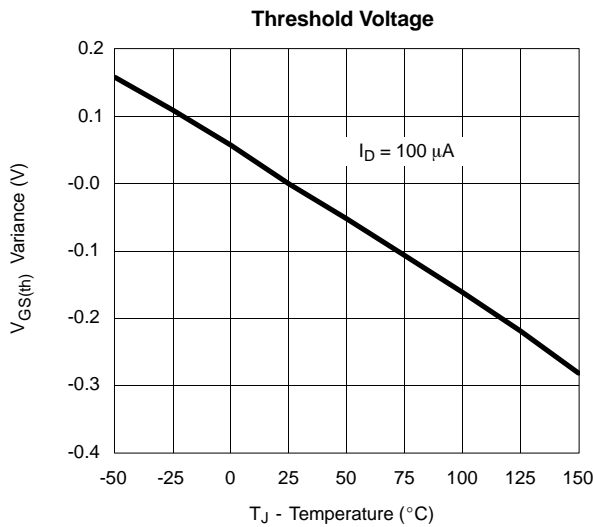
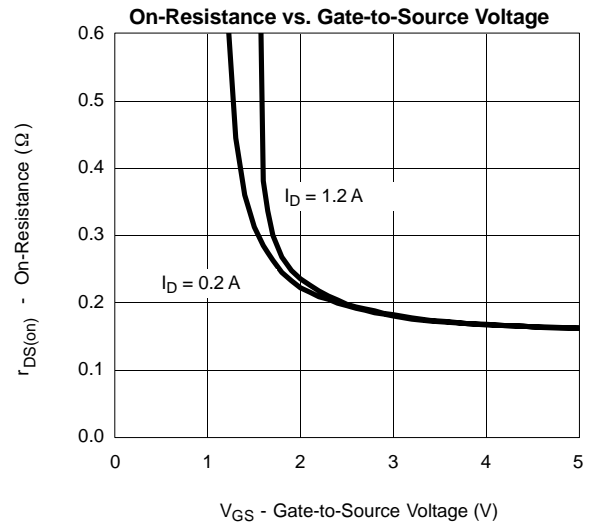
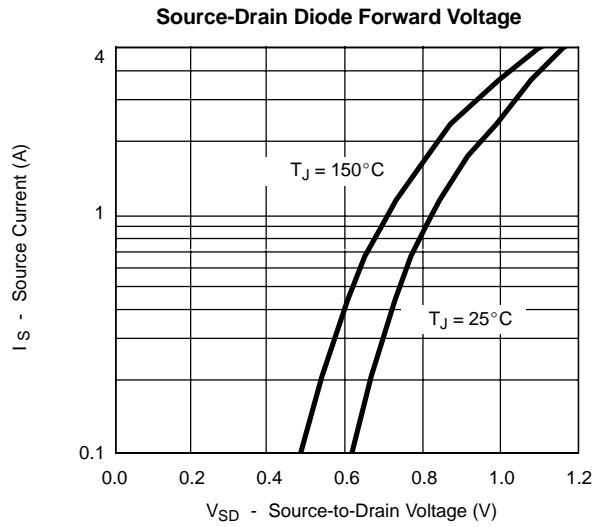
**N-CHANNEL**





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

**N-CHANNEL**

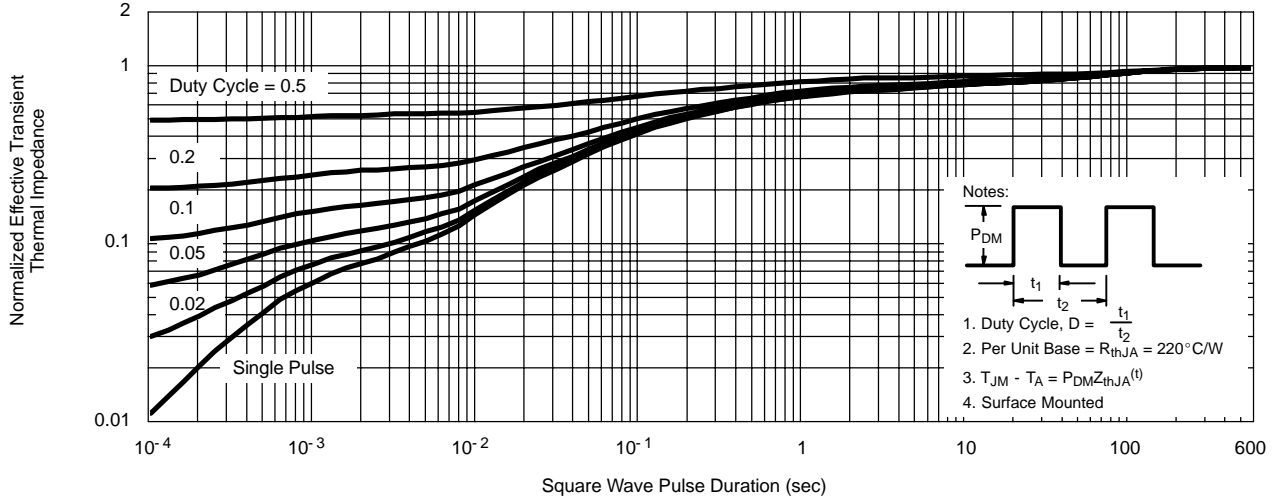




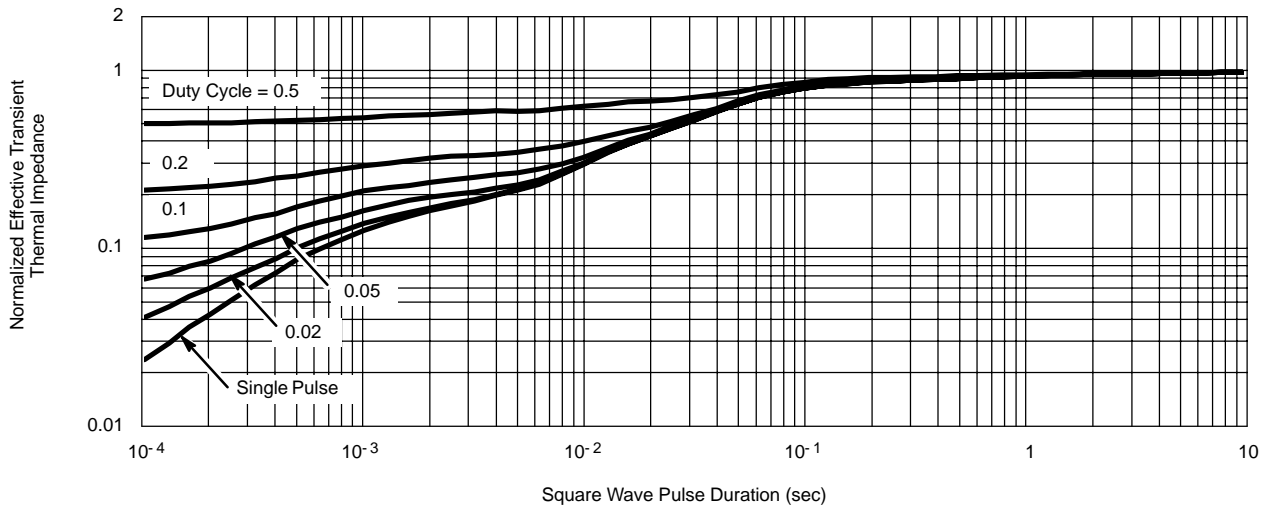
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

N-CHANNEL

Normalized Thermal Transient Impedance, Junction-to-Ambient



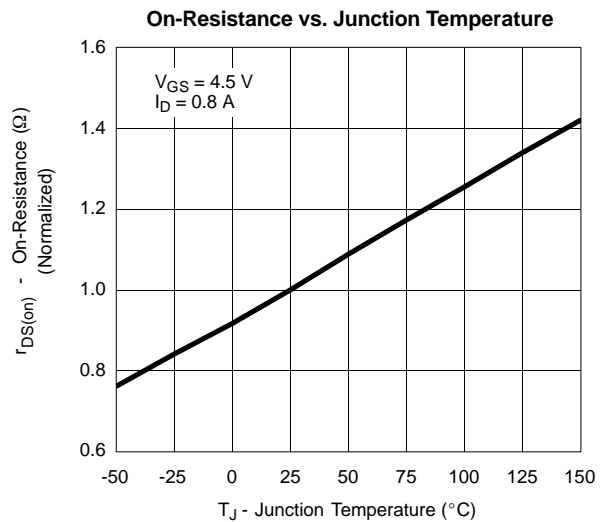
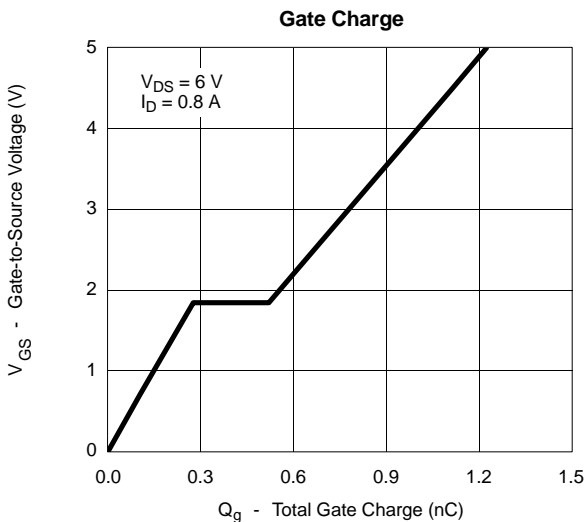
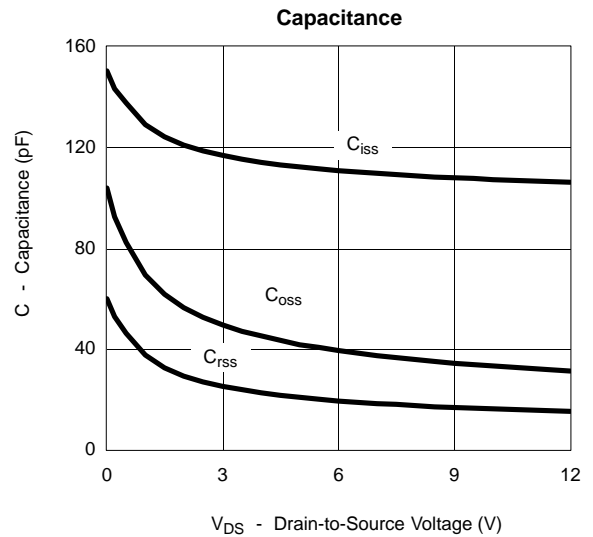
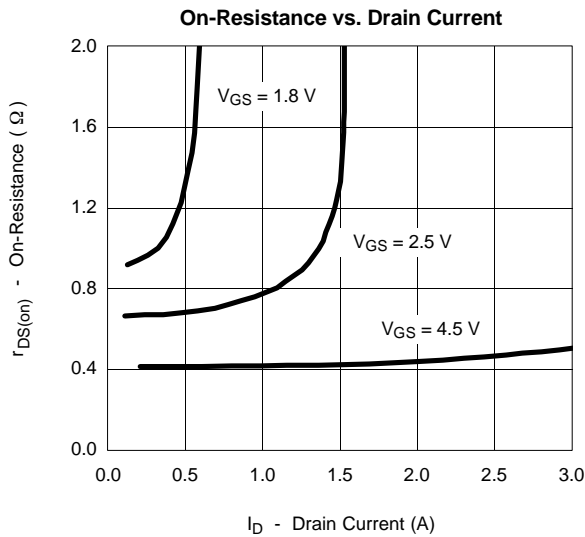
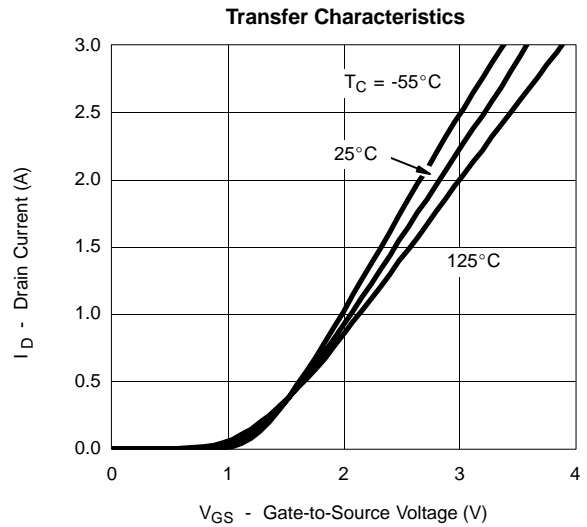
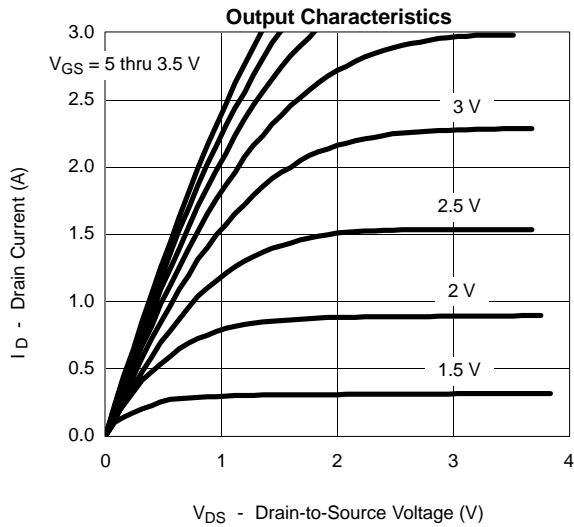
Normalized Thermal Transient Impedance, Junction-to-Foot





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

**P-CHANNEL**

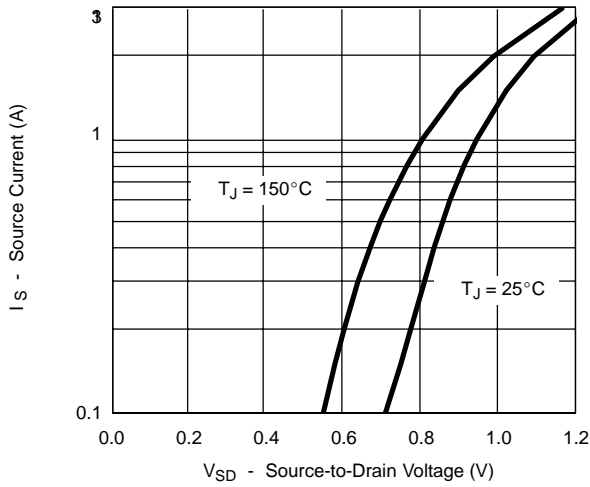




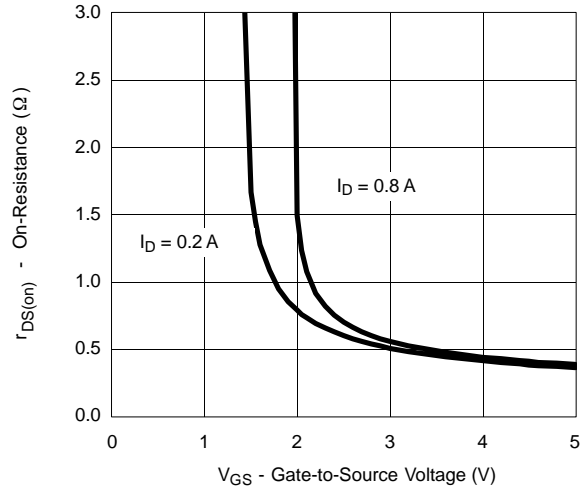
**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

**P-CHANNEL**

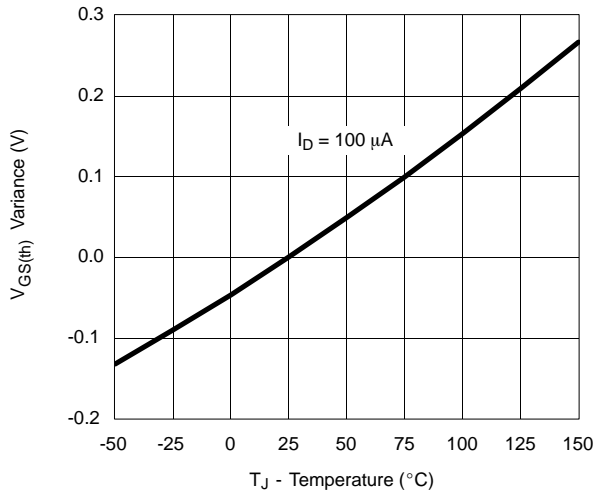
Source-Drain Diode Forward Voltage



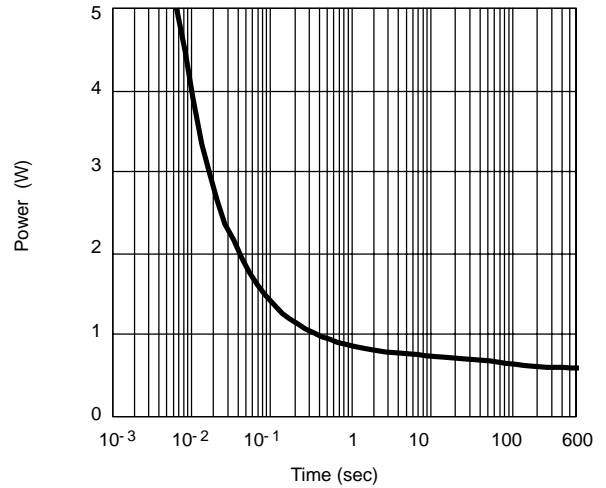
On-Resistance vs. Gate-to-Source Voltage



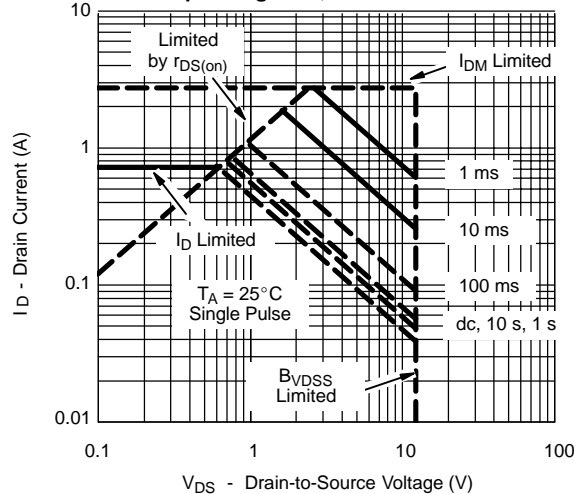
Threshold Voltage



Single Pulse Power



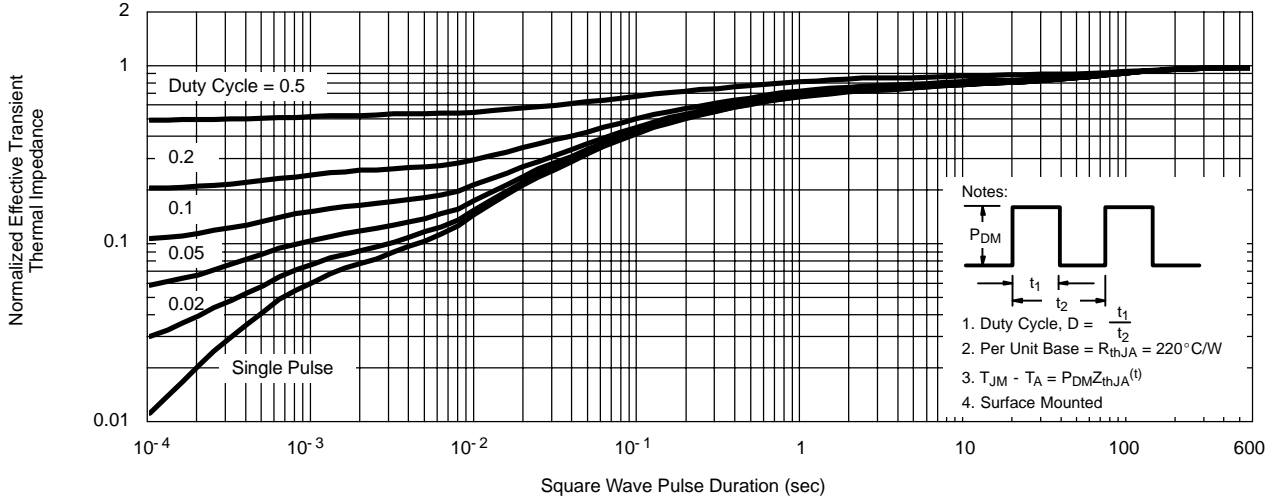
Safe Operating Area, Junction-to-Ambient





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

Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

