



## N- and P-Channel MOSFET

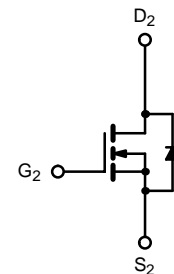
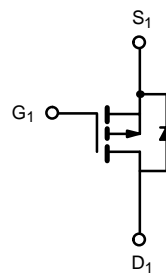
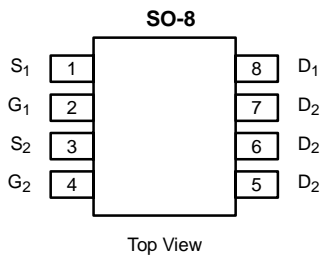
PRODUCT SUMMARY			
	V <sub>DS</sub> (V)	r <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A)
N-Channel (Channel 2)	30	0.018 @ V <sub>GS</sub> = 10 V	8.8
		0.027 @ V <sub>GS</sub> = 4.5 V	7.2
P-Channel (Channel 1)	-8	0.042 @ V <sub>GS</sub> = -4.5 V	-4.5
		0.060 @ V <sub>GS</sub> = -2.5 V	-3.7

### FEATURES

- TrenchFET® Power MOSFET

### APPLICATIONS

- Level Shift
- Load Switch



ABSOLUTE MAXIMUM RATINGS (T <sub>A</sub> = 25°C UNLESS OTHERWISE NOTED)							
Parameter	Symbol	N-Channel		P-Channel		Unit	
		10 sec.	Steady State	10 sec.	Steady State		
Drain-Source Voltage	V <sub>DS</sub>	30		-8		V	
Gate-Source Voltage	V <sub>GS</sub>	±20		±8			
Continuous Drain Current (T <sub>J</sub> = 150°C) <sup>a, b</sup>	I <sub>D</sub>	T <sub>A</sub> = 25°C	8.8	6.5	-4.5	-3.8	A
		T <sub>A</sub> = 70°C	7.0	5.2	-3.6	-3.0	
Pulsed Drain Current	I <sub>DM</sub>	30		-20		W	
Continuous Source Current (Diode Conduction) <sup>a, b</sup>	I <sub>S</sub>	2.0	1.1	-1.2	0.9		
Maximum Power Dissipation <sup>a, b</sup>	P <sub>D</sub>	T <sub>A</sub> = 25°C	2.27	1.25	1.38	1.0	W
		T <sub>A</sub> = 70°C	1.45	0.8	0.88	0.64	
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to 150				°C	

THERMAL RESISTANCE RATINGS							
Parameter	Symbol	N-Channel		P-Channel		Unit	
		Typ	Max	Typ	Max		
Maximum Junction-to-Ambient <sup>a</sup>	t ≤ 10 sec	45	55	75	90	°C/W	
	Steady-State	85	100	100	125		
Maximum Junction-to-Foot (Drain)	Steady-State	R <sub>thJF</sub>	25	30	53	65	

Notes

- a. Surface Mounted on FR4 Board.
- b. t ≤ 10 sec

**SPECIFICATIONS (T<sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)**

Parameter	Symbol	Test Condition	Min	Typ <sup>a</sup>	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	0.8		V	
		V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250 μA	P-Ch	-0.45			
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±20 V	N-Ch		±100	nA	
		V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±8 V	P-Ch		±100		
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 24 V, V <sub>GS</sub> = 0 V	N-Ch		1	μA	
		V <sub>DS</sub> = -6.4 V, V <sub>GS</sub> = 0 V	P-Ch		-1		
		V <sub>DS</sub> = 24 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55 °C	N-Ch		5		
		V <sub>DS</sub> = -6.4 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55 °C	P-Ch		-5		
On-State Drain Current <sup>b</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> = 5 V, V <sub>GS</sub> = 10 V	N-Ch	30		A	
		V <sub>DS</sub> = -5 V, V <sub>GS</sub> = -4.5 V	P-Ch	-20			
Drain-Source On-State Resistance <sup>b</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 8.8 A	N-Ch		0.015	0.018	Ω
		V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -4.5 A	P-Ch		0.034	0.042	
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 7.2 A	N-Ch		0.022	0.027	
		V <sub>GS</sub> = -2.5 V, I <sub>D</sub> = -3.7 A	P-Ch		0.048	0.060	
Forward Transconductance <sup>b</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 8.8 A	N-Ch		20	S	
		V <sub>DS</sub> = -15 V, I <sub>D</sub> = -4.5 A	P-Ch		13		
Diode Forward Voltage <sup>b</sup>	V <sub>SD</sub>	I <sub>S</sub> = 2.0 A, V <sub>GS</sub> = 0 V	N-Ch		0.71	1.1	V
		I <sub>S</sub> = -1.2 A, V <sub>GS</sub> = 0 V	P-Ch		-0.70	-1.1	
<b>Dynamic<sup>a</sup></b>							
Total Gate Charge	Q <sub>g</sub>	N-Channel V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 5 V, I <sub>D</sub> = 8.8 A P-Channel V <sub>DS</sub> = -4 V, V <sub>GS</sub> = -5 V, I <sub>D</sub> = -4.5 A	N-Ch		14.5	20	nC
Gate-Source Charge	Q <sub>gs</sub>		N-Ch		15	25	
			P-Ch		3.3		
Gate-Drain Charge	Q <sub>gd</sub>		N-Ch		3.0		
		P-Ch		6.6			
Turn-On Delay Time	t <sub>d(on)</sub>	N-Channel V <sub>DD</sub> = 15 V, R <sub>L</sub> = 15 Ω I <sub>D</sub> ≅ 1 A, V <sub>GEN</sub> = 10 V, R <sub>G</sub> = 6 Ω P-Channel V <sub>DD</sub> = -4 V, R <sub>L</sub> = 4 Ω I <sub>D</sub> ≅ -1 A, V <sub>GEN</sub> = -4.5 V, R <sub>G</sub> = 6 Ω	N-Ch		13	20	ns
Rise Time	t <sub>r</sub>		P-Ch		20	40	
			N-Ch		9	18	
Turn-Off Delay Time	t <sub>d(off)</sub>		P-Ch		50	100	
			N-Ch		35	50	
Fall Time	t <sub>f</sub>		P-Ch		110	220	
			N-Ch		17	30	
Source-Drain Reverse Recovery Time	t <sub>rr</sub>		P-Ch		60	120	
		N-Ch		35	70		
		P-Ch		60	100		

## Notes

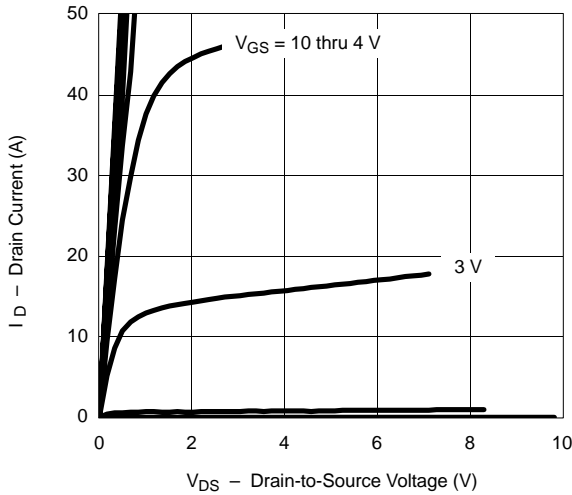
- a. Guaranteed by design, not subject to production testing.  
b. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.



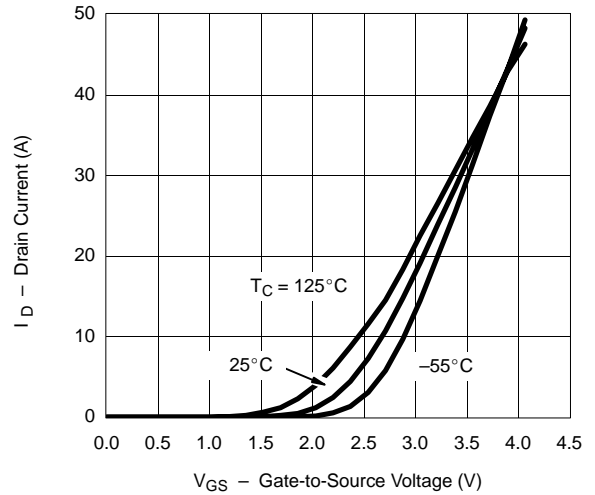
**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

**N-CHANNEL**

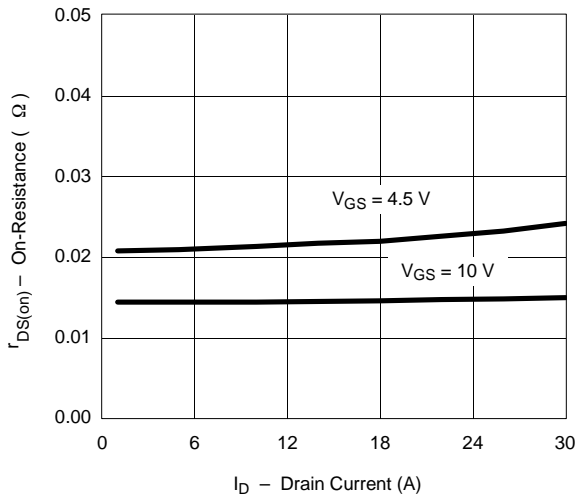
**Output Characteristics**



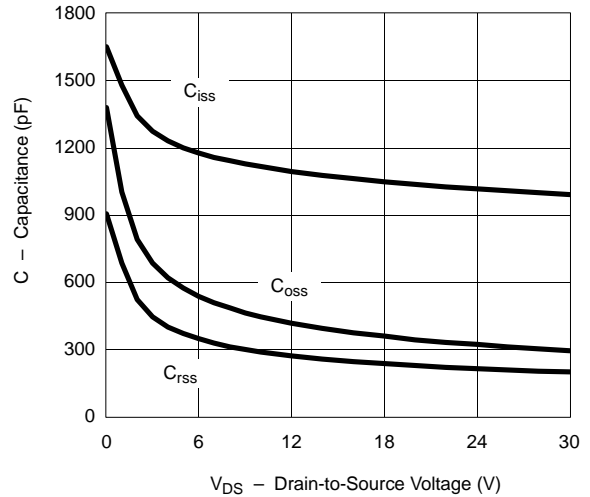
**Transfer Characteristics**



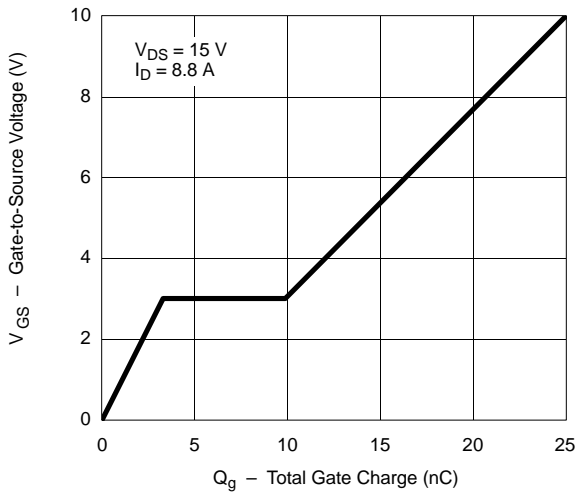
**On-Resistance vs. Drain Current**



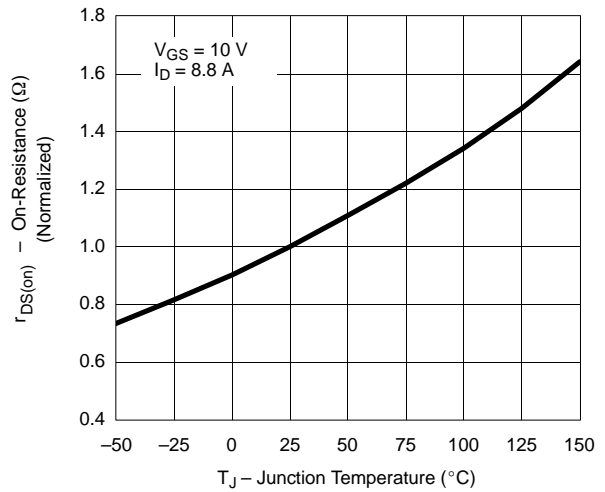
**Capacitance**



**Gate Charge**

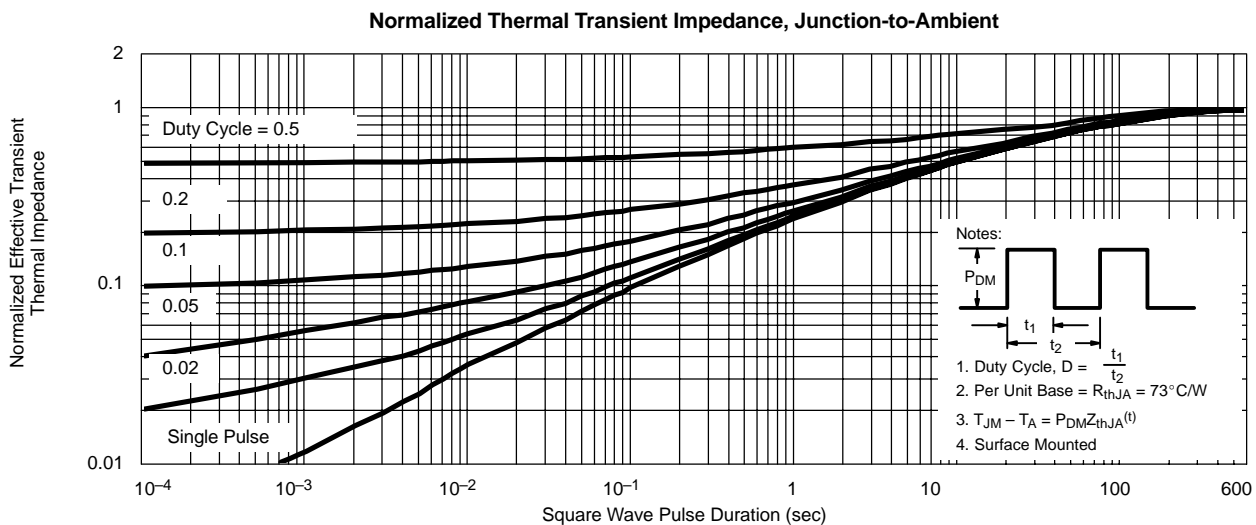
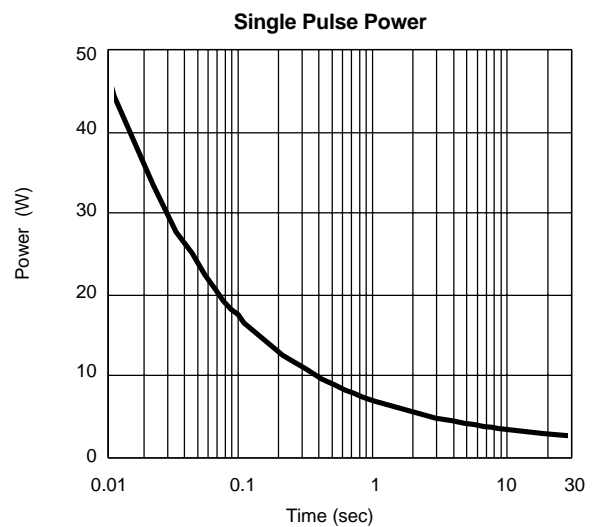
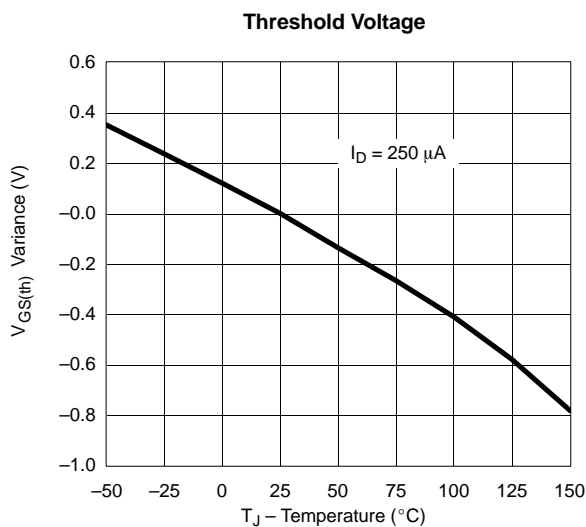
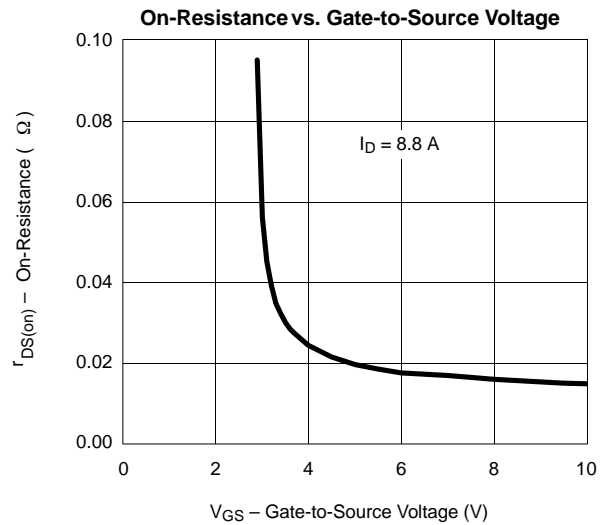
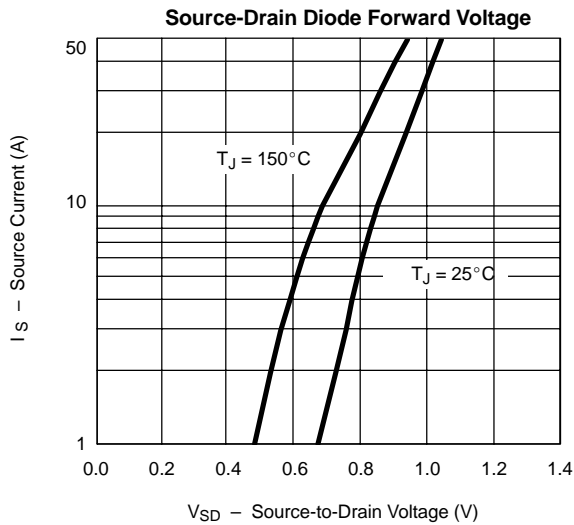


**On-Resistance vs. Junction Temperature**



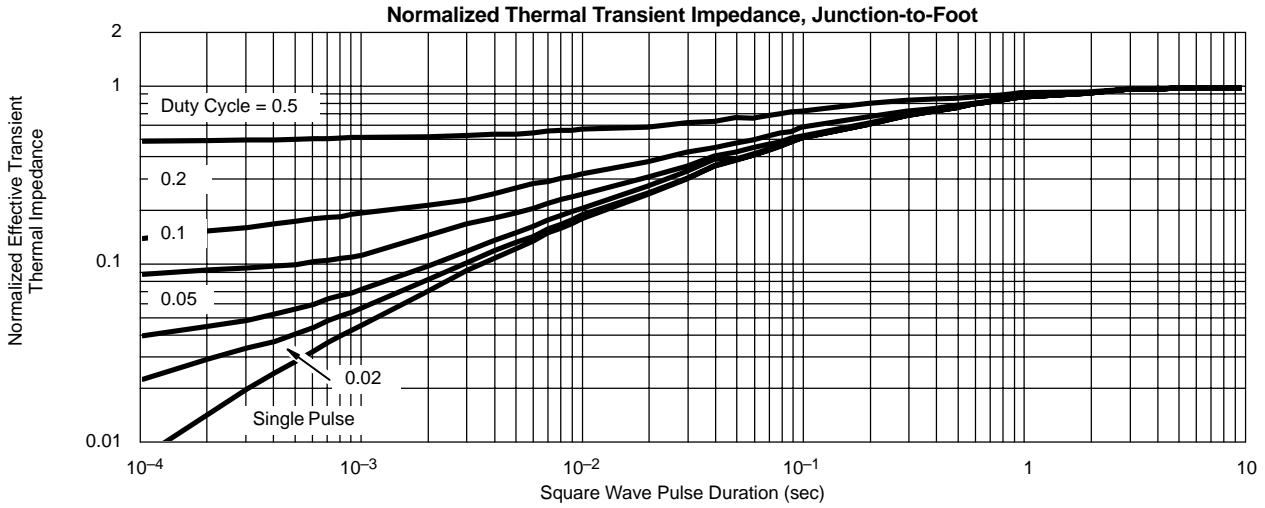
**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

**N-CHANNEL**

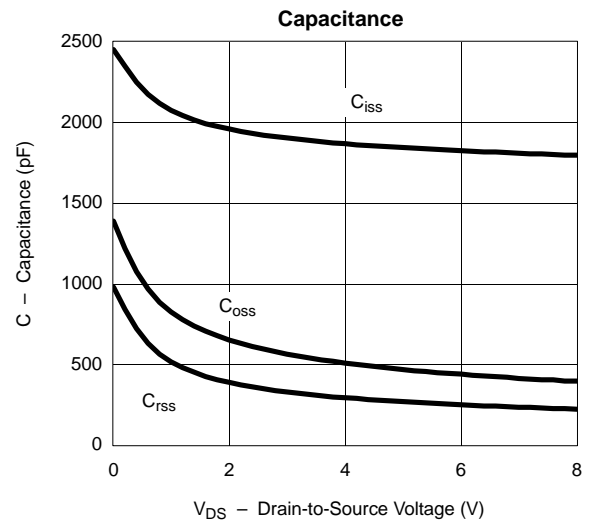
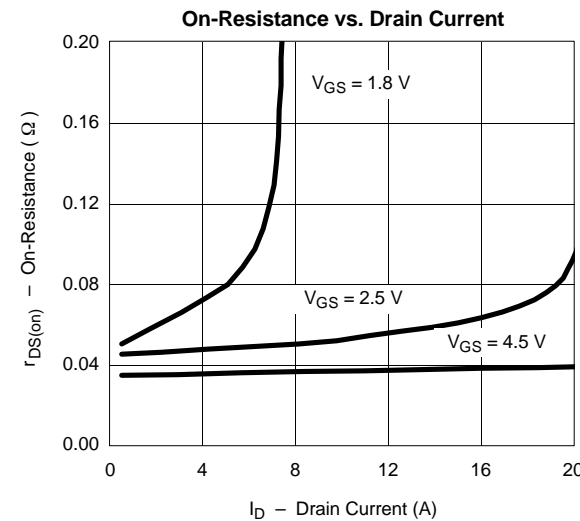
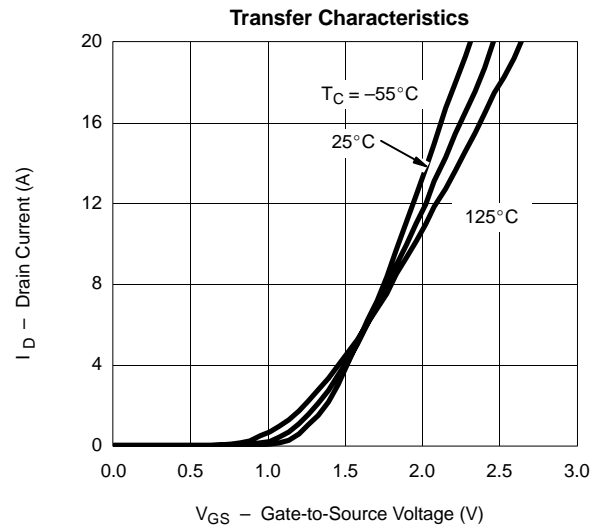
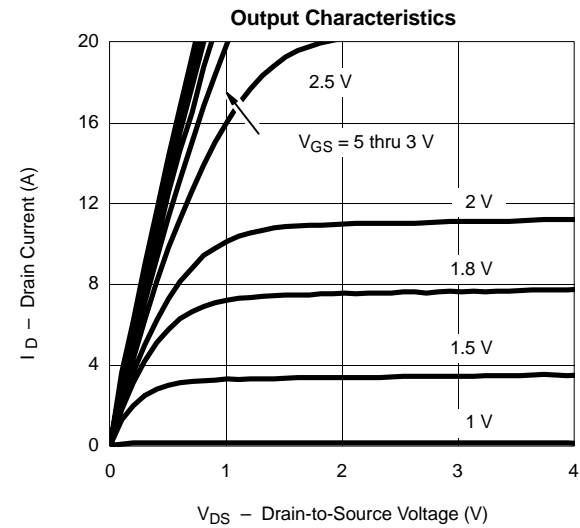




**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) N-CHANNEL**

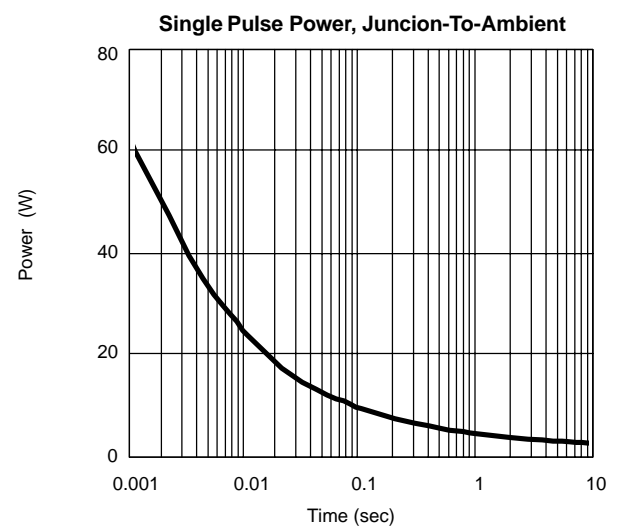
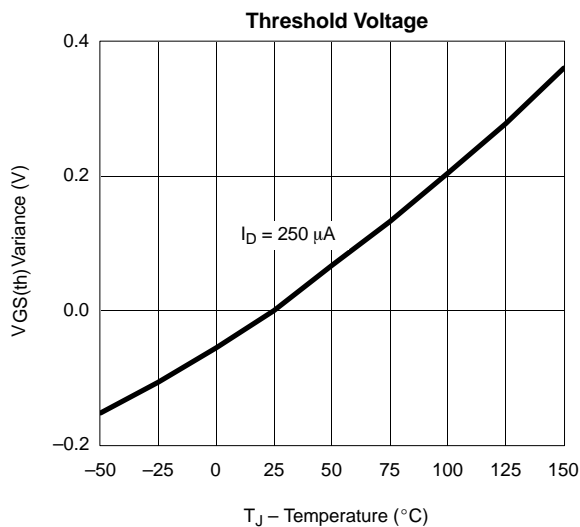
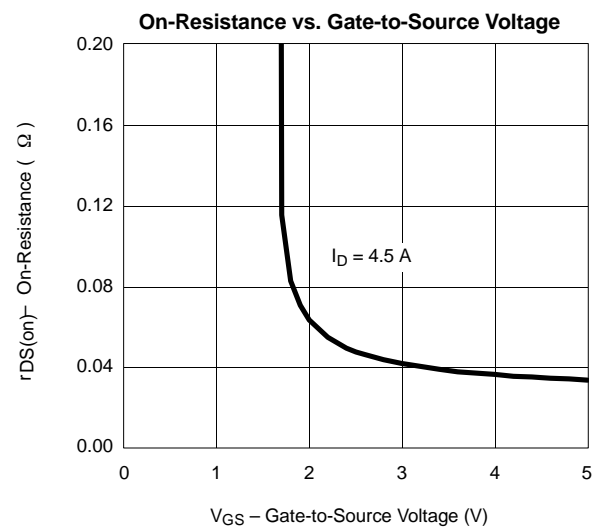
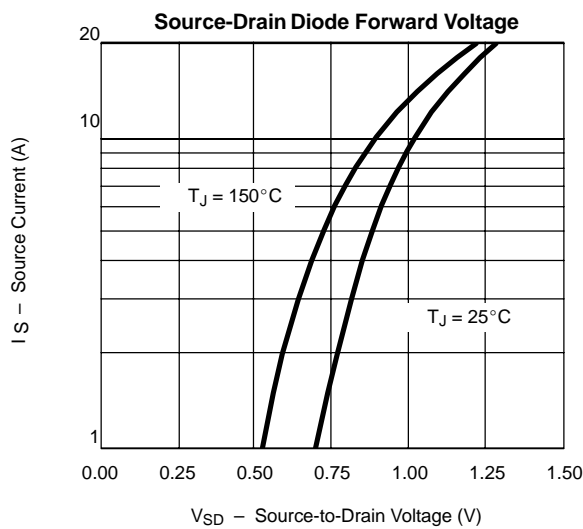
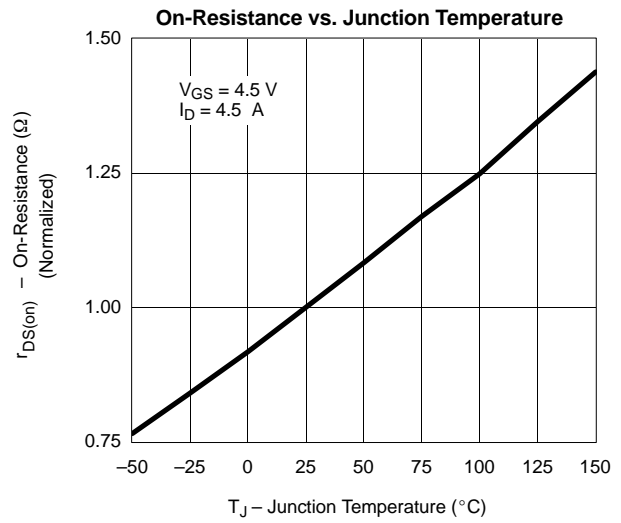
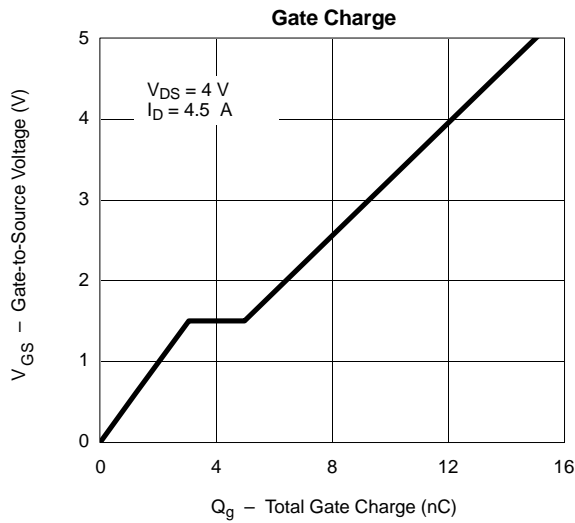


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) P-CHANNEL**



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

**P-CHANNEL**





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

