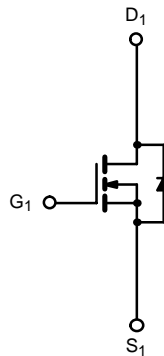
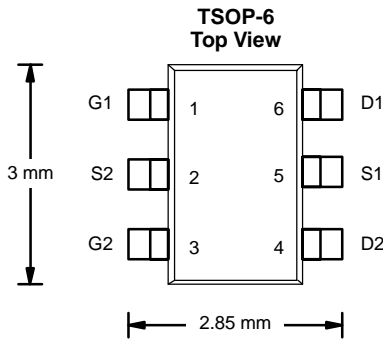


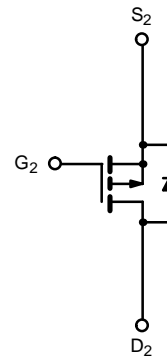
## N- and P-Channel 20-V (D-S) MOSFET

PRODUCT SUMMARY			
	$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
N-Channel	20	0.080 @ $V_{GS} = 4.5$ V	3.0
		0.100 @ $V_{GS} = 2.5$ V	2.6
		0.128 @ $V_{GS} = 1.8$ V	2.3
P-Channel	-20	0.145 @ $V_{GS} = -4.5$ V	-2.2
		0.200 @ $V_{GS} = -2.5$ V	-1.8
		0.300 @ $V_{GS} = -1.8$ V	-1.5

**TrenchFET<sup>®</sup>**  
Power MOSFETs  
1.8-V Rated



N-Channel MOSFET



P-Channel MOSFET

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	$V_{GS}$	$\pm 8$					
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>	$T_A = 25^\circ\text{C}$	3.0	2.5	-2.2	-0.57	A	
	$T_A = 70^\circ\text{C}$	2.3	2.0	-1.8	-1.5		
Pulsed Drain Current	$I_{DM}$	$\pm 8$					
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	1.05	0.75	-1.05	-0.75		
Maximum Power Dissipation <sup>a</sup>	$T_A = 25^\circ\text{C}$	1.15	0.83	1.15	0.083	W	
	$T_A = 70^\circ\text{C}$	0.73	0.53	0.73	0.53		
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 <sup>a</sup>	$t \leq 5$ sec	$R_{thJA}$	93	110	$^\circ\text{C/W}$
	Steady State		130	150	
Maximum Junction-to-Foot (Drain)	Steady State	$R_{thJF}$	90	90	

Notes

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

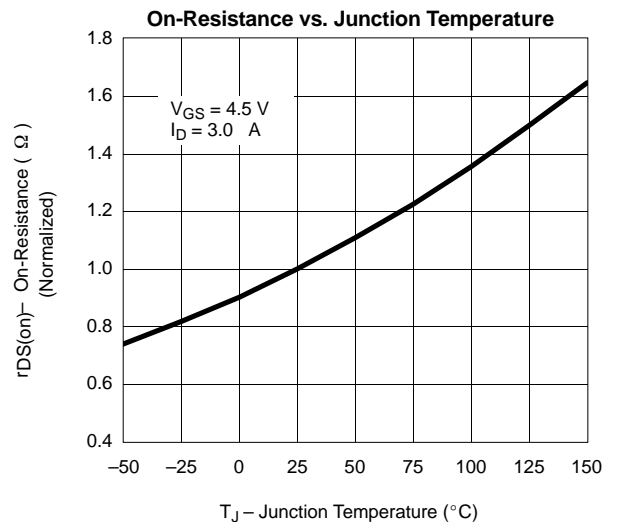
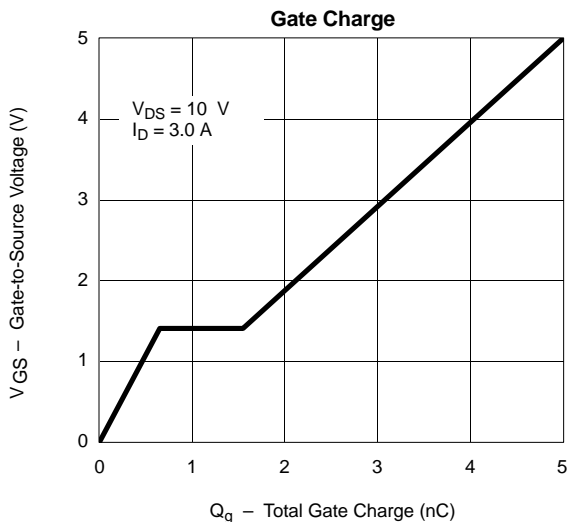
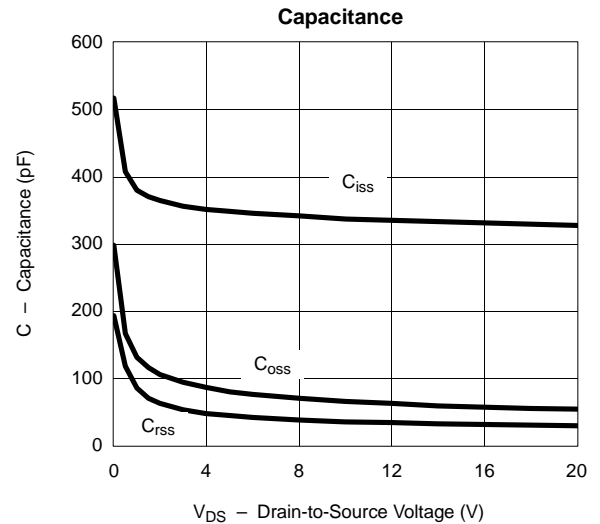
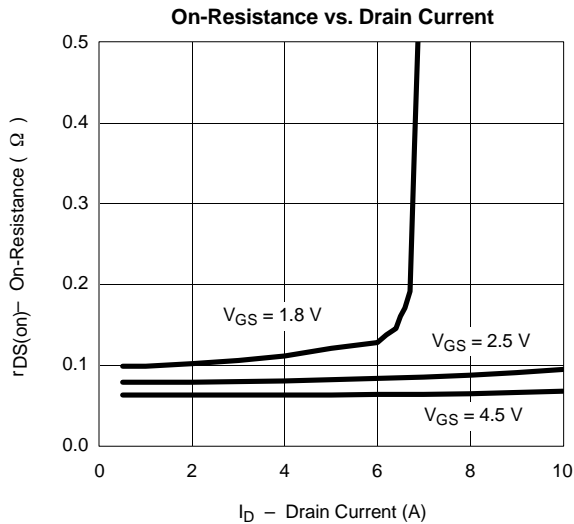
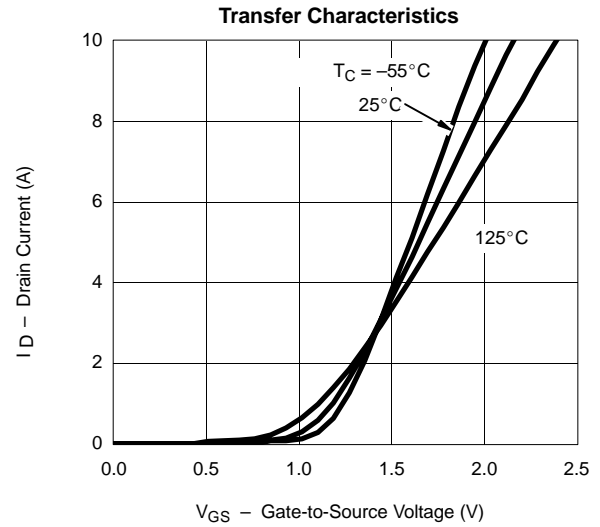
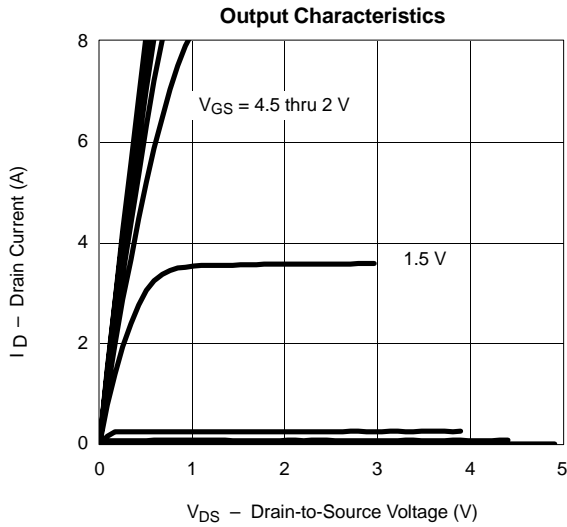
SPECIFICATIONS (T <sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)							
Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
<b>Static</b>							
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	N-Ch	0.45			V
		V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250 μA	P-Ch	-0.45			
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±8 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> = 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			10	
		V <sub>DS</sub> = -16 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 85 °C	P-Ch			-10	
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	5			A
		V <sub>DS</sub> ≤ -5 V, V <sub>GS</sub> = -4.5 V	P-Ch	-5			
Drain-Source On-State Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 3 A	N-Ch		0.064	0.080	Ω
		V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -2.2 A	P-Ch		0.115	0.145	
		V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 2.6 A	N-Ch		0.080	0.100	
		V <sub>GS</sub> = -2.5 V, I <sub>D</sub> = -1.8 A	P-Ch		0.163	0.200	
		V <sub>GS</sub> = 1.8 V, I <sub>D</sub> = 2.3 A	N-Ch		0.104	0.128	
		V <sub>GS</sub> = -1.8 V, I <sub>D</sub> = -1.0 A	P-Ch		0.240	0.300	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 5 V, I <sub>D</sub> = 3 A	N-Ch		9		S
		V <sub>DS</sub> = -5 V, I <sub>D</sub> = -2.2 A	P-Ch		5		
Diode Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>S</sub> = 1.05 A, V <sub>GS</sub> = 0 V	N-Ch		0.8	1.1	V
		I <sub>S</sub> = -1.05 A, V <sub>GS</sub> = 0 V	P-Ch		-0.8	-1.1	
<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> = 3 A  <b>P-Channel</b> V <sub>DS</sub> = -10 V, V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -2.2 A	N-Ch		5	7.5	nC
Gate-Source Charge	Q <sub>gs</sub>		P-Ch		5	7.5	
Gate-Drain Charge	Q <sub>gd</sub>		N-Ch		0.65		
Turn-On Delay Time	t <sub>d(on)</sub>	<b>N-Channel</b> V <sub>DD</sub> = 10 V, R <sub>L</sub> = 10 Ω I <sub>D</sub> ≅ 1 A, V <sub>GEN</sub> = 4.5 V, R <sub>G</sub> = 6 Ω  <b>P-Channel</b> V <sub>DD</sub> = -4 V, R <sub>L</sub> = 8 Ω I <sub>D</sub> ≅ -1 A, V <sub>GEN</sub> = -4.5 V, R <sub>G</sub> = 6 Ω	N-Ch		12	20	ns
			P-Ch		12	20	
Rise Time	t <sub>r</sub>		N-Ch		30	50	
			P-Ch		29	50	
Turn-Off Delay Time	t <sub>d(off)</sub>		N-Ch		28	50	
			P-Ch		24	45	
Fall Time	t <sub>f</sub>	N-Ch		12	20		
		P-Ch		30	50		
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 1.05 A, di/dt = 100 A/μs	N-Ch		20	40	
		I <sub>F</sub> = -1.05 A, di/dt = 100 A/μs	P-Ch		20	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)**

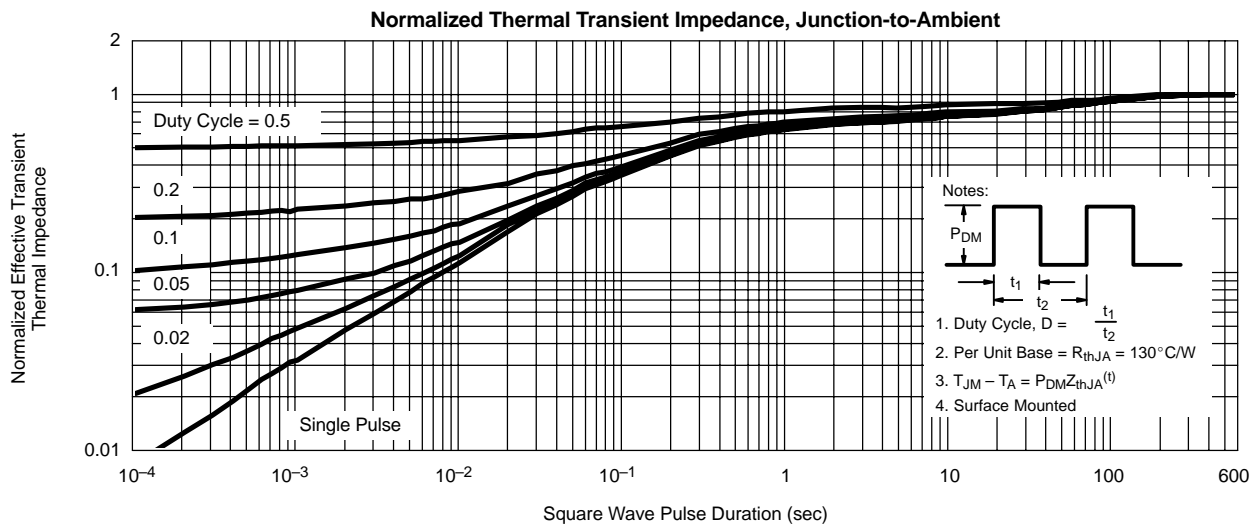
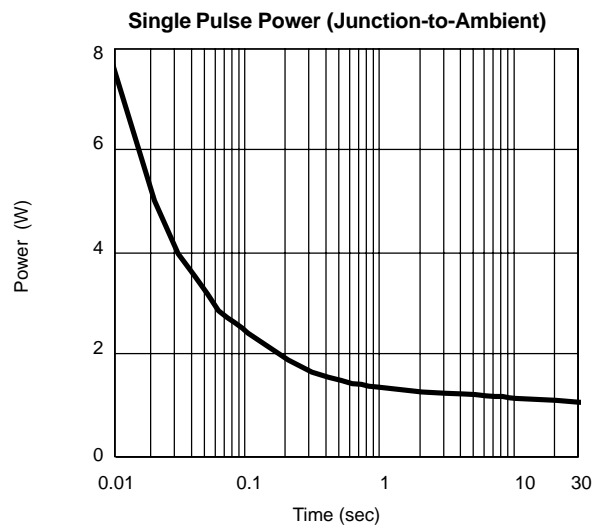
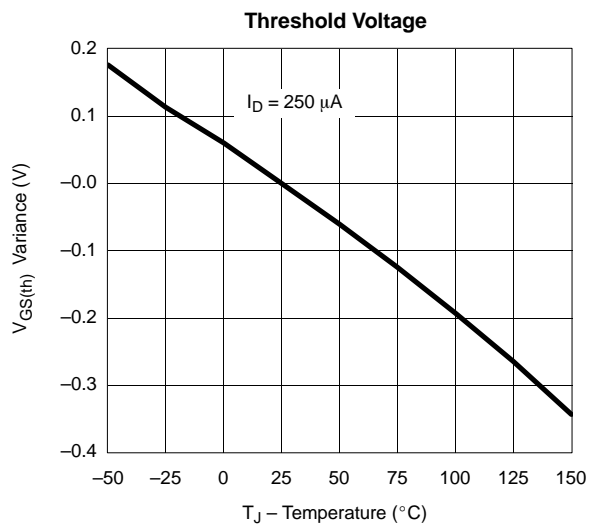
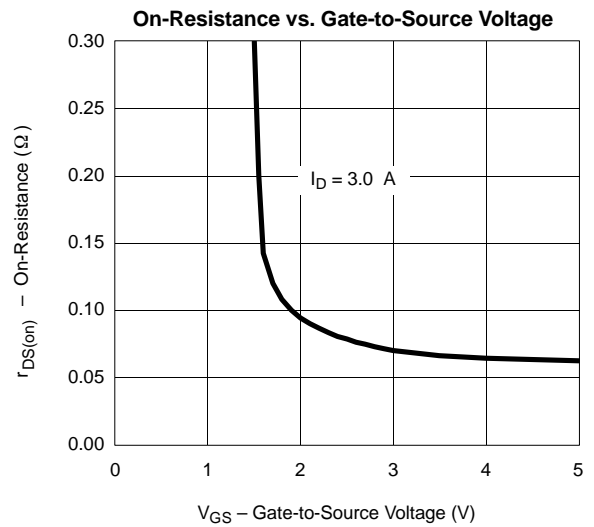
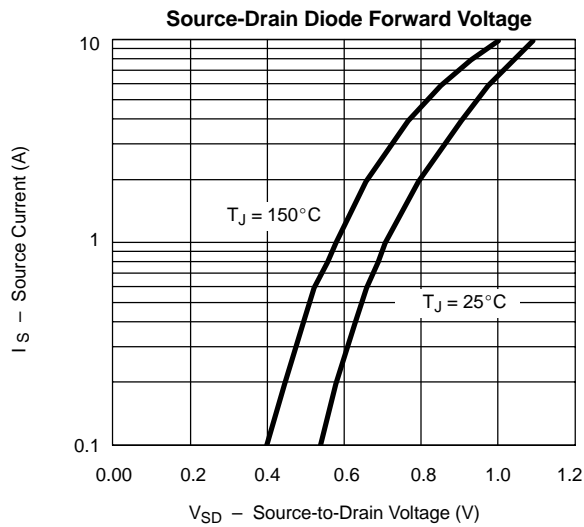
**N-CHANNEL**





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

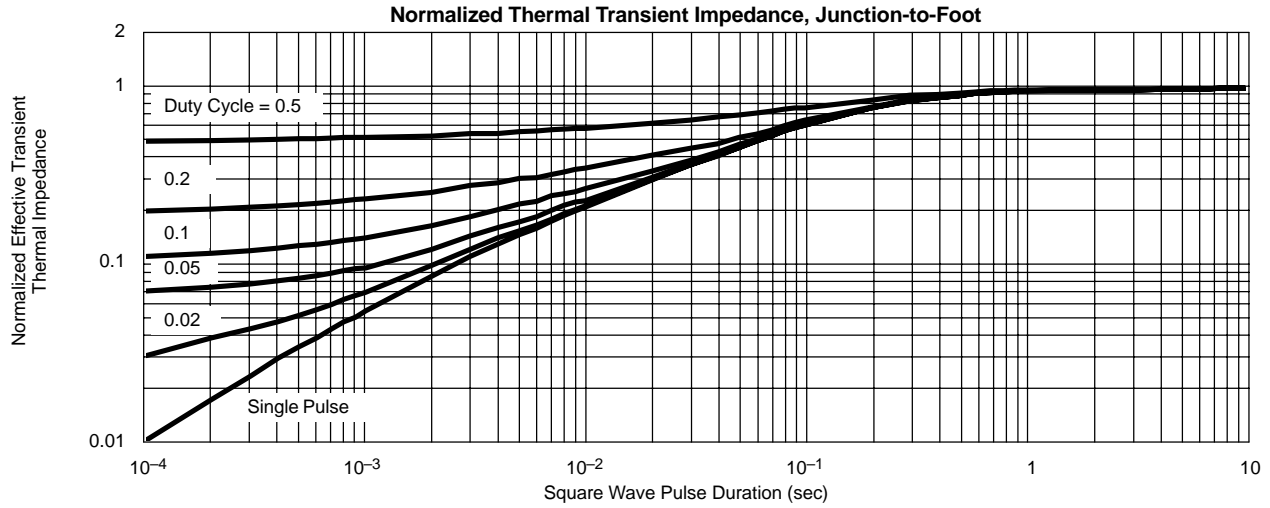
#### N-CHANNEL





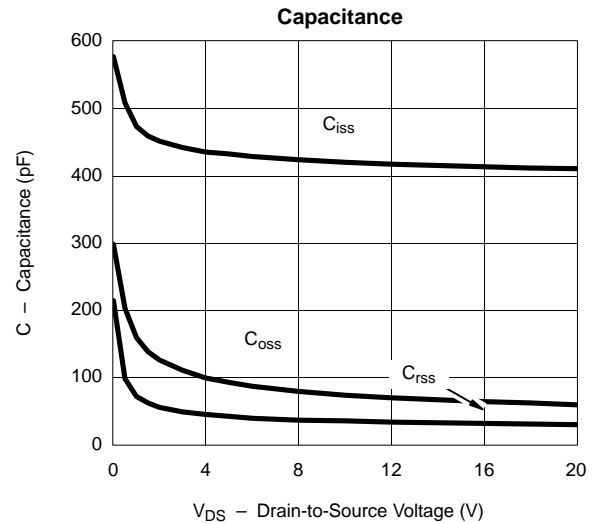
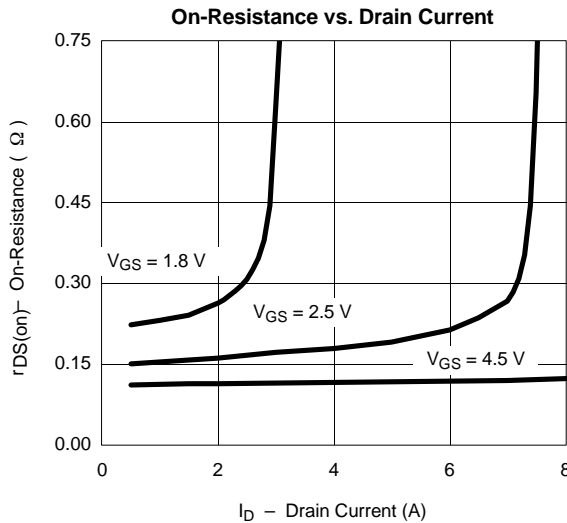
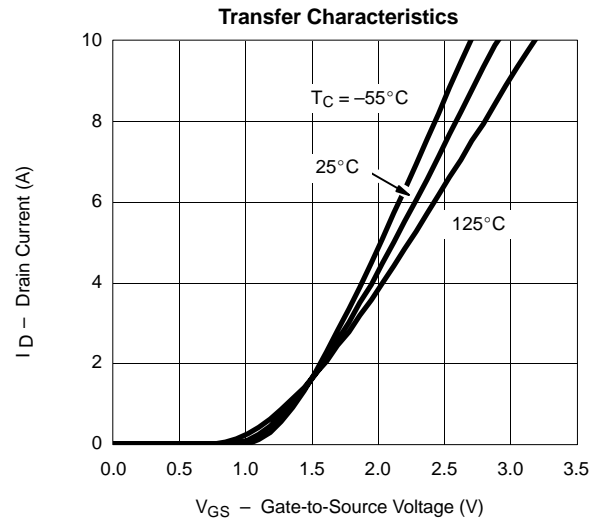
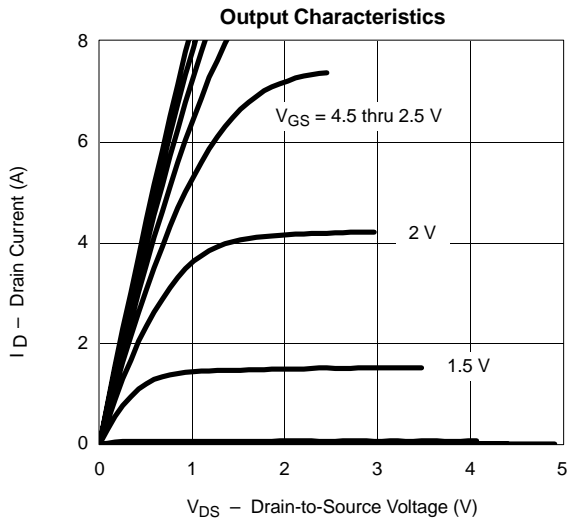
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

N-CHANNEL



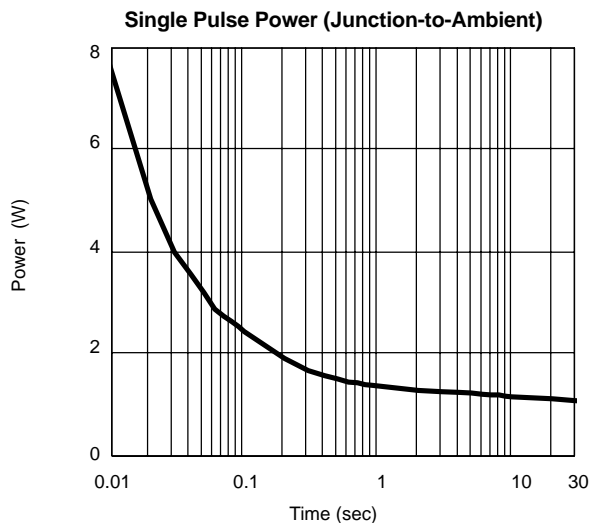
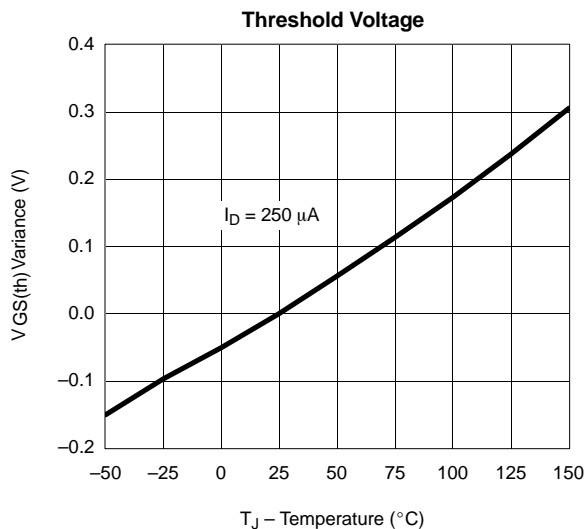
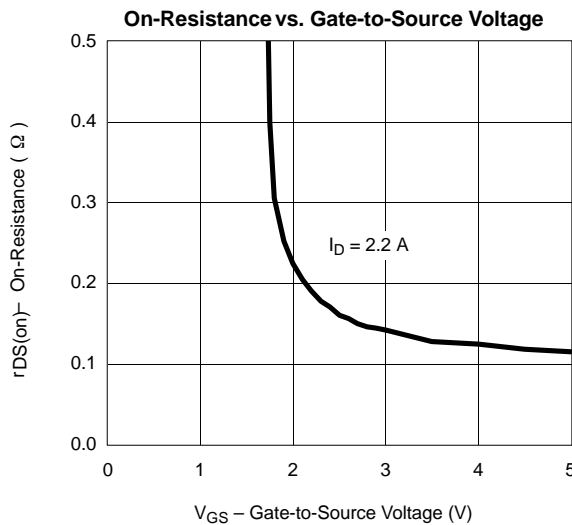
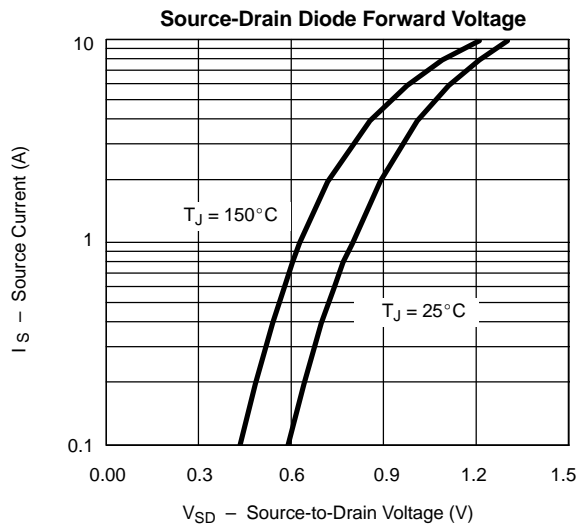
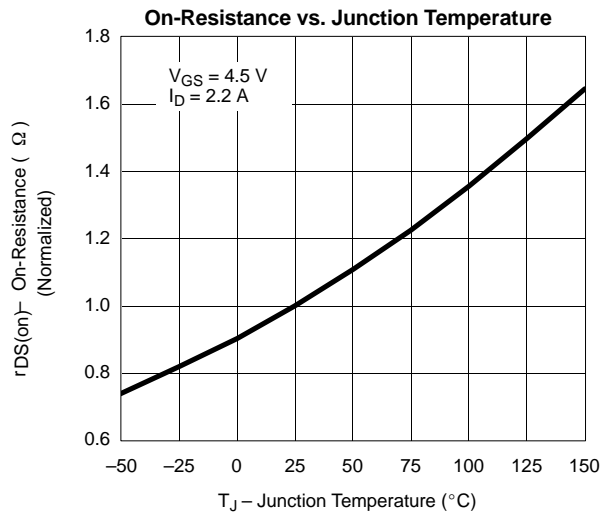
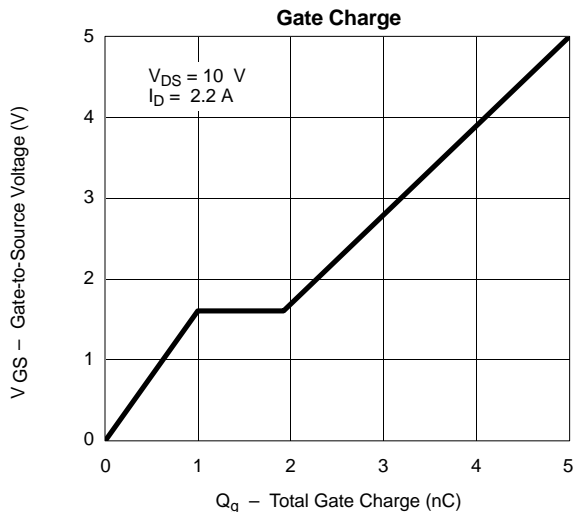
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

P-CHANNEL



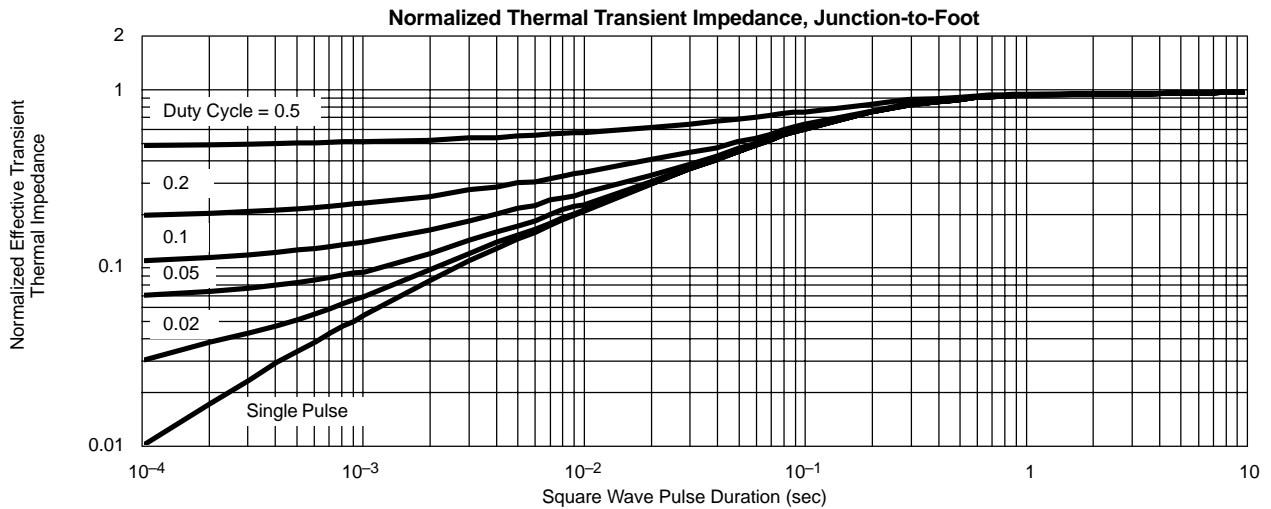
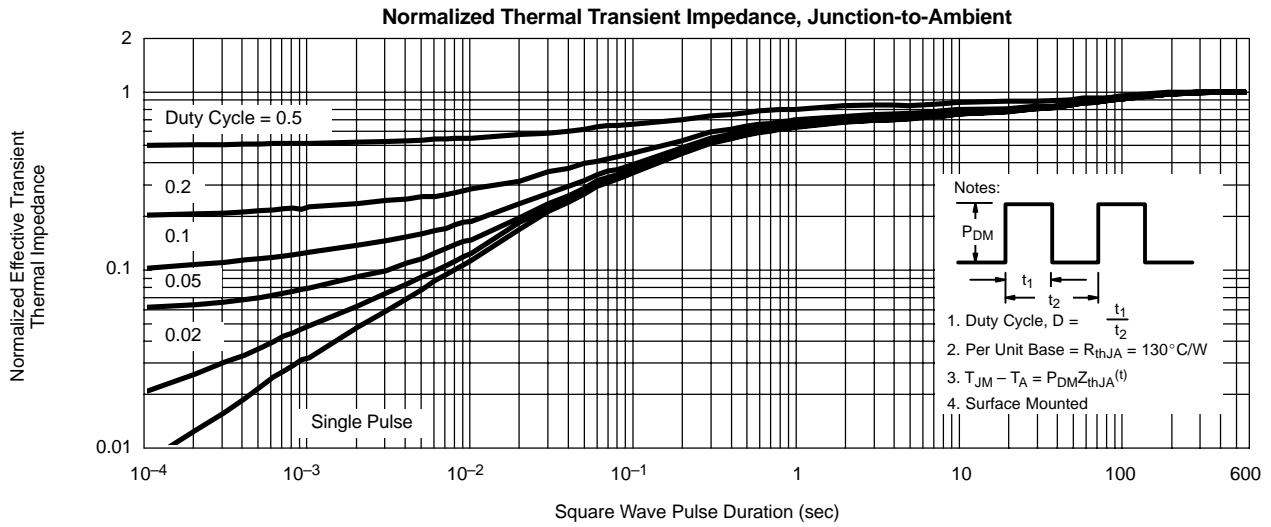
**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**

**P-CHANNEL**





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





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