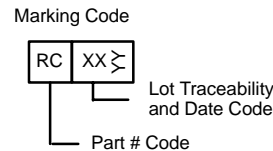
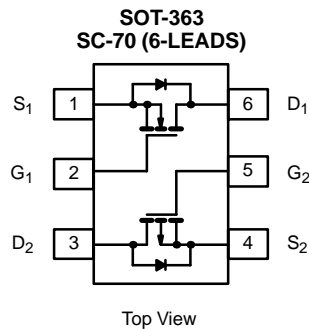




## Complementary 30-V (D-S) MOSFET

**TrenchFET®**  
Power MOSFETS

PRODUCT SUMMARY			
	$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
N-Channel	30	0.480 @ $V_{GS} = 10$ V	0.63
		0.700 @ $V_{GS} = 4.5$ V	0.52
P-Channel	-30	0.940 @ $V_{GS} = -10$ V	-0.45
		1.700 @ $V_{GS} = -4.5$ V	-0.33



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	$V_{DS}$	30		-30		V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$					
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>	$T_A = 25^\circ\text{C}$	0.63	0.54	-0.45	-0.42	A	
	$T_A = 85^\circ\text{C}$	0.45	0.43	-0.32	-0.31		
Pulsed Drain Current	$I_{DM}$	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	1.0			V
		V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250 μA	P-Ch	-1.0			
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±20 V	N-Ch			±100	nA
			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> = -24 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> = 85 °C	N-Ch			5	
		V <sub>DS</sub> = -24 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> = 10 V	N-Ch	1.0			A
		V <sub>DS</sub> ≤ -5 V, V <sub>GS</sub> = -10 V	P-Ch	-1.0			
Drain-Source On-State Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 0.59 A	N-Ch		0.410	0.480	Ω
		V <sub>GS</sub> = -10 V, I <sub>D</sub> = -0.42 A	P-Ch		0.800	0.940	
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 0.2 A	N-Ch		0.600	0.700	
		V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -0.2 A	P-Ch		1.5	1.700	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 0.59 A	N-Ch		0.75		S
		V <sub>DS</sub> = -15 V, I <sub>D</sub> = -0.42 A	P-Ch		0.5		
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		-0.86	-1.2	
<b>Dynamic<sup>b</sup></b>							
Total Gate Charge	Q <sub>g</sub>	<b>N-Channel</b> V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 0.59 A <b>P-Channel</b> V <sub>DS</sub> = -15 V, V <sub>GS</sub> = -10 V, I <sub>D</sub> = -0.42 A	N-Ch		0.86	1.4	nC
			P-Ch		0.9	1.4	
Gate-Source Charge	Q <sub>gs</sub>		N-Ch		0.24		
			P-Ch		0.21		
Gate-Drain Charge	Q <sub>gd</sub>		N-Ch		0.08		
			P-Ch		0.17		
Turn-On Delay Time	t <sub>d(on)</sub>	<b>N-Channel</b> V <sub>DD</sub> = 15 V, R <sub>L</sub> = 30 Ω I <sub>D</sub> ≅ 0.5 A, V <sub>GEN</sub> = 10 V, R <sub>G</sub> = 6 Ω <b>P-Channel</b> V <sub>DD</sub> = -15 V, R <sub>L</sub> = 30 Ω I <sub>D</sub> ≅ -0.5 A, V <sub>GEN</sub> = -10 V, R <sub>G</sub> = 6 Ω	N-Ch		5	10	ns
			P-Ch		4	10	
Rise Time	t <sub>r</sub>		N-Ch		8	15	
			P-Ch		8	15	
Turn-Off Delay Time	t <sub>d(off)</sub>		N-Ch		8	15	
			P-Ch		5	10	
Fall Time	t <sub>f</sub>		N-Ch		7	15	
			P-Ch		7	15	
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 0.23 A, di/dt = 100 A/μs	N-Ch		15	30	
		I <sub>F</sub> = -0.23 A, di/dt = 100 A/μs	P-Ch		20	40	

## Notes

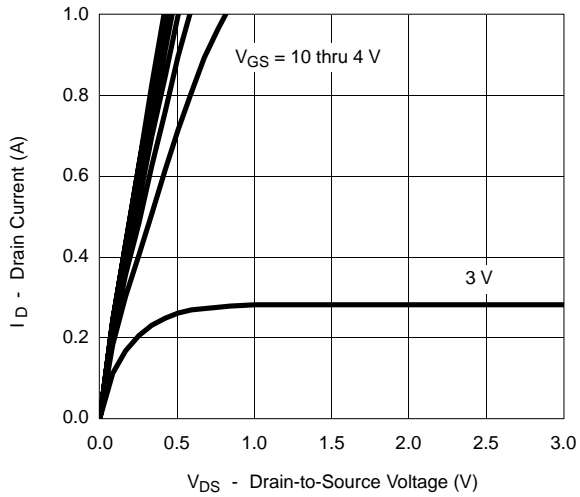
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.  
b. Guaranteed by design, not subject to production testing.



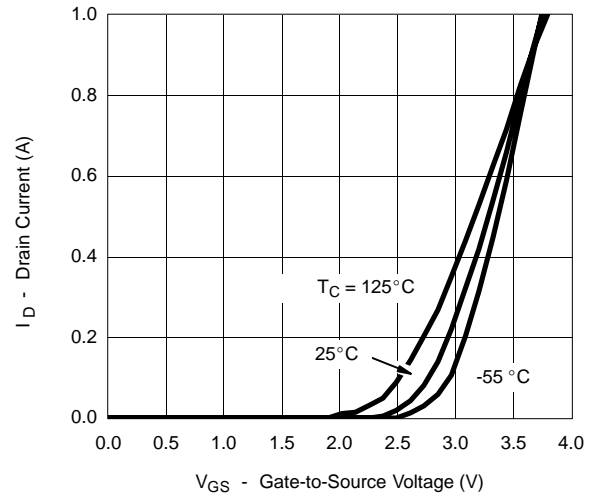
**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

**N-CHANNEL**

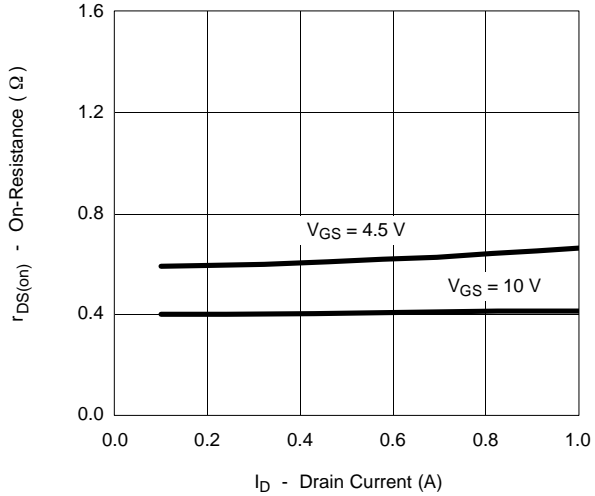
**Output Characteristics**



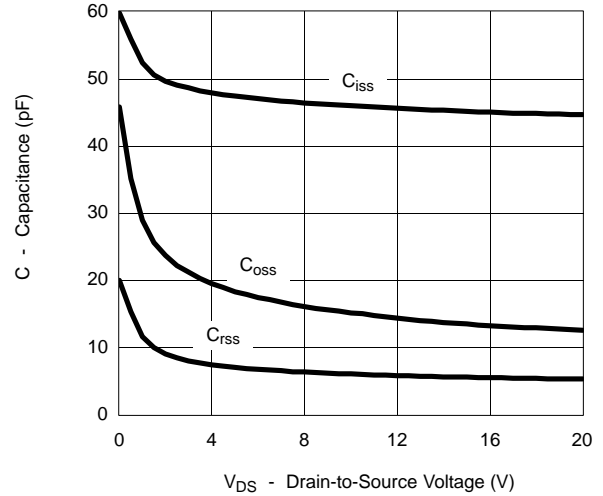
**Transfer Characteristics**



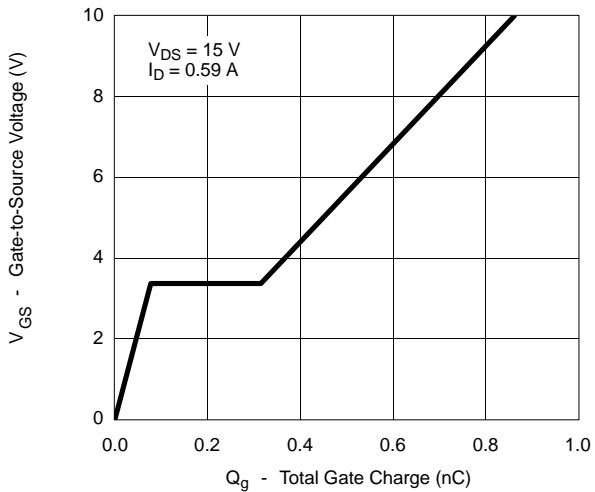
**On-Resistance vs. Drain Current**



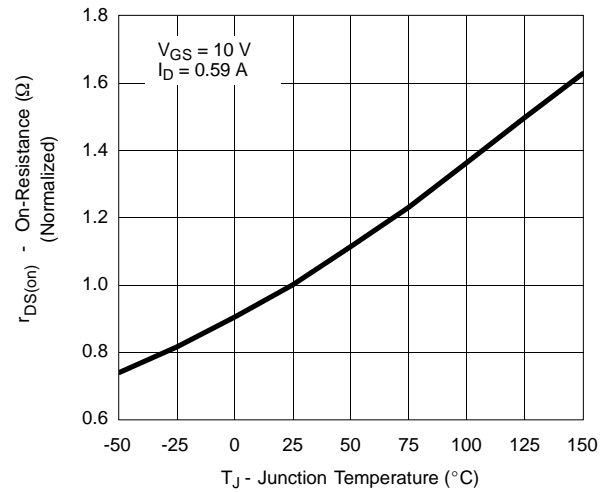
**Capacitance**



**Gate Charge**



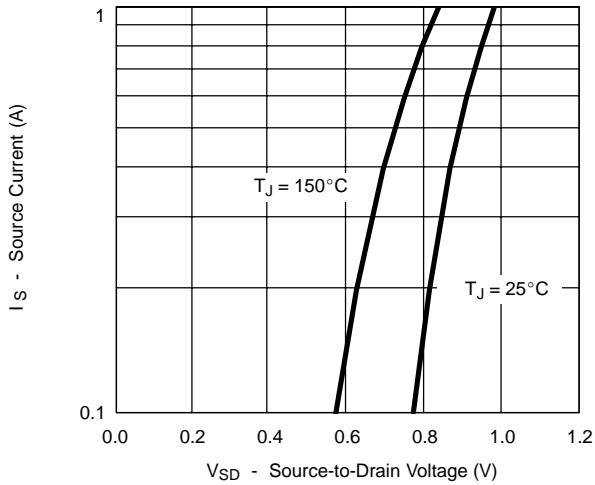
**On-Resistance vs. Junction Temperature**



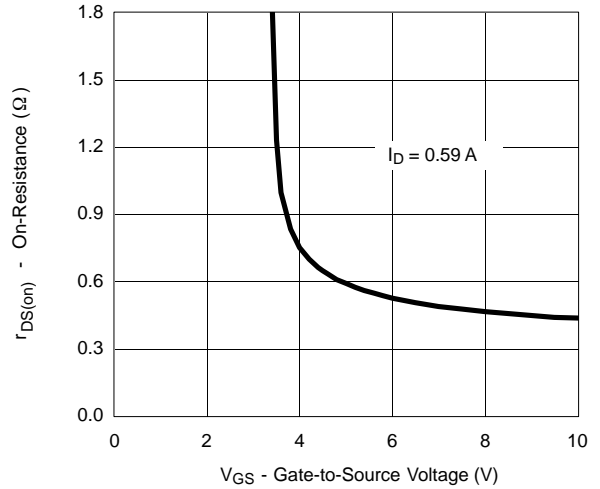
**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**

**N-CHANNEL**

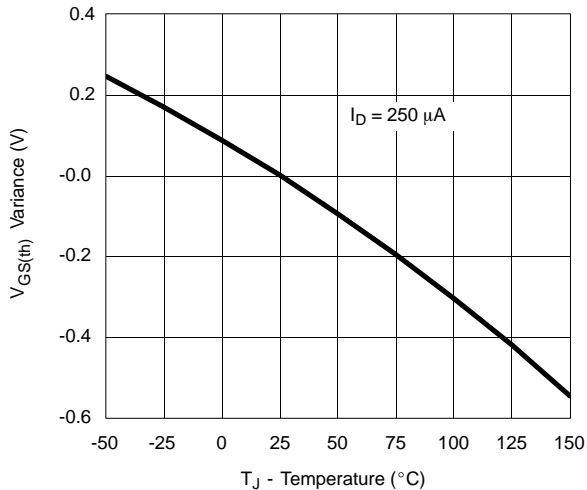
Source-Drain Diode Forward Voltage



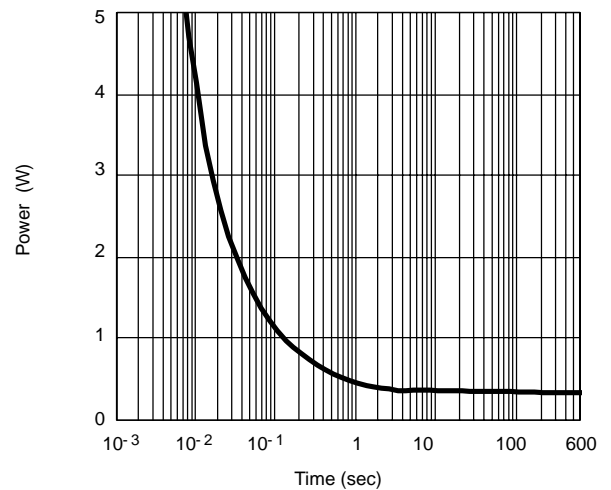
On-Resistance vs. Gate-to-Source Voltage



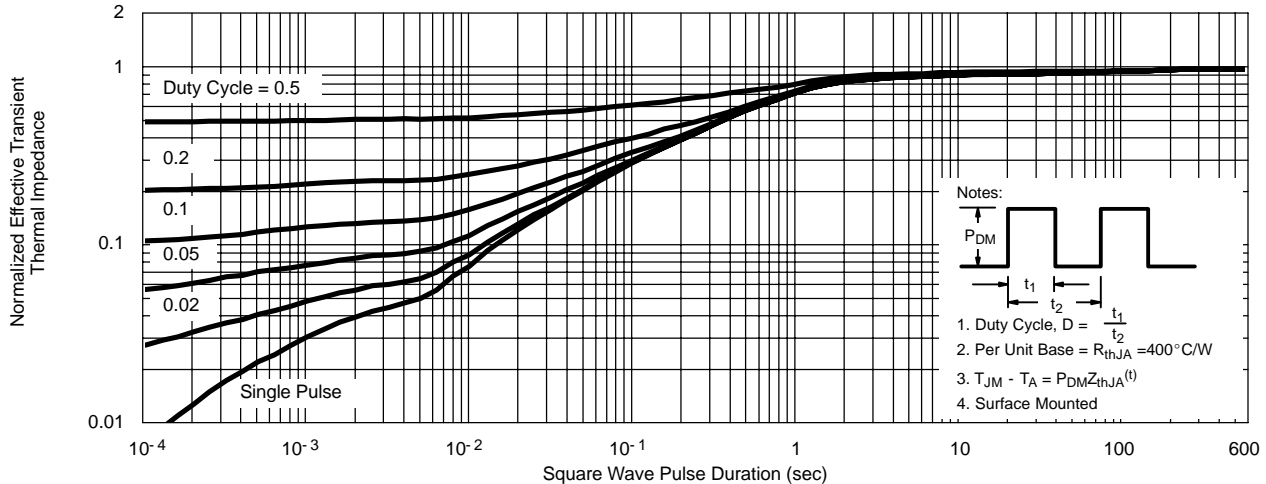
Threshold Voltage



Single Pulse Power



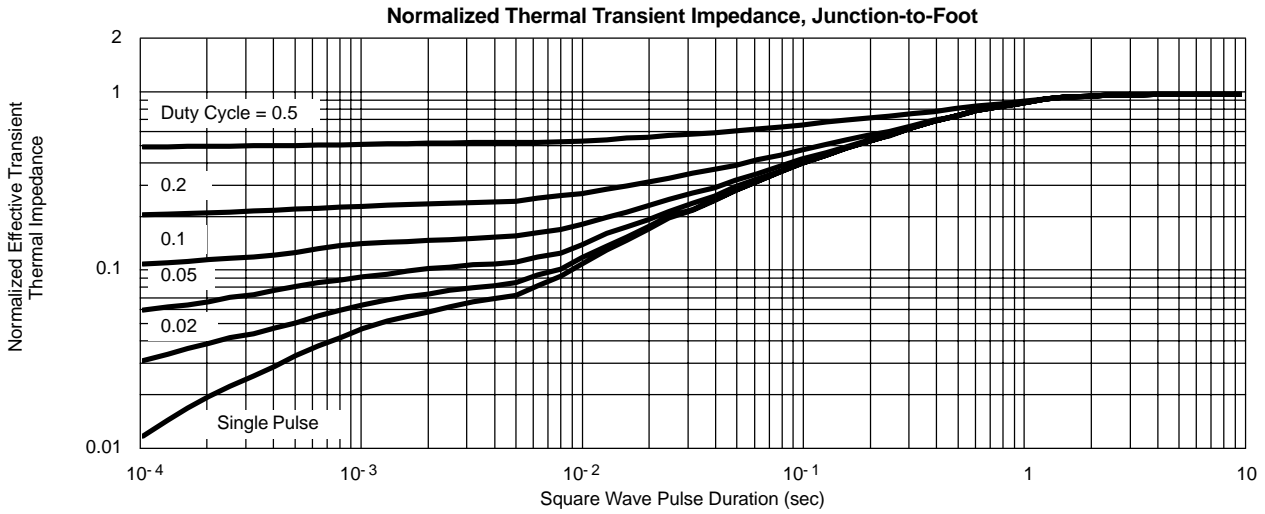
Normalized Thermal Transient Impedance, Junction-to-Ambient





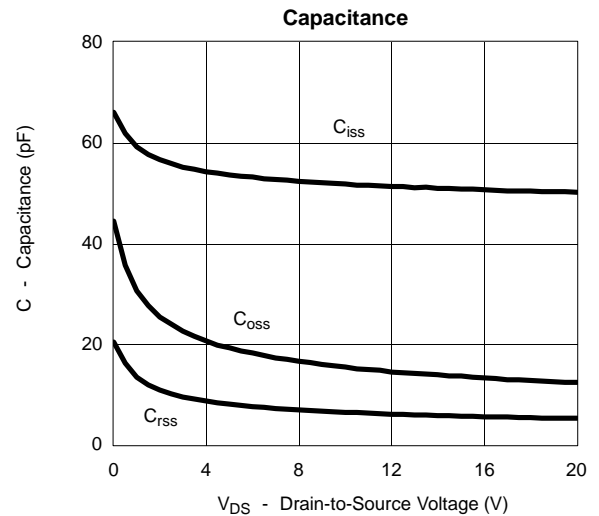
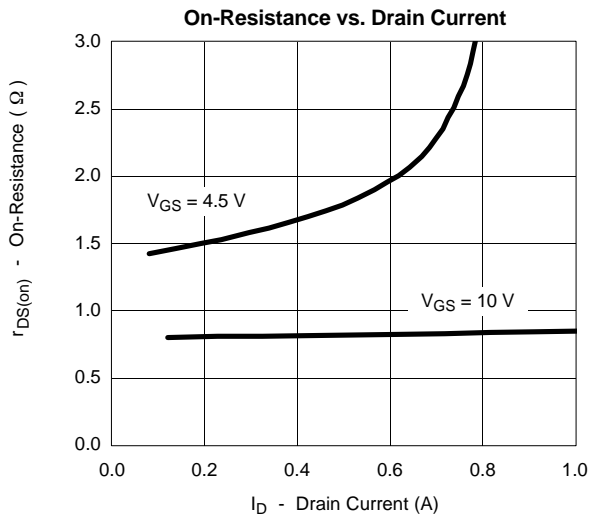
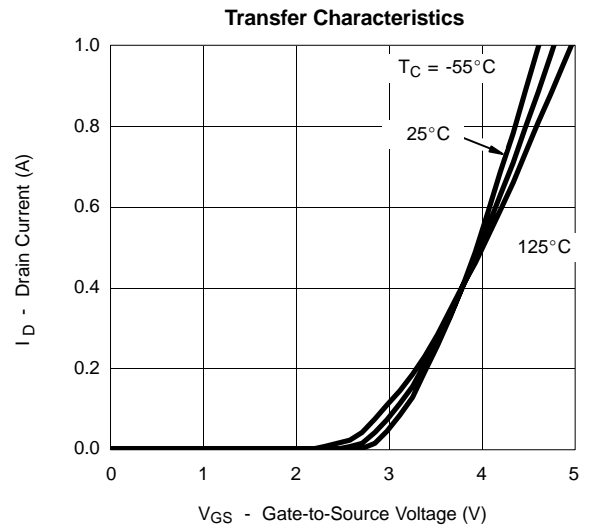
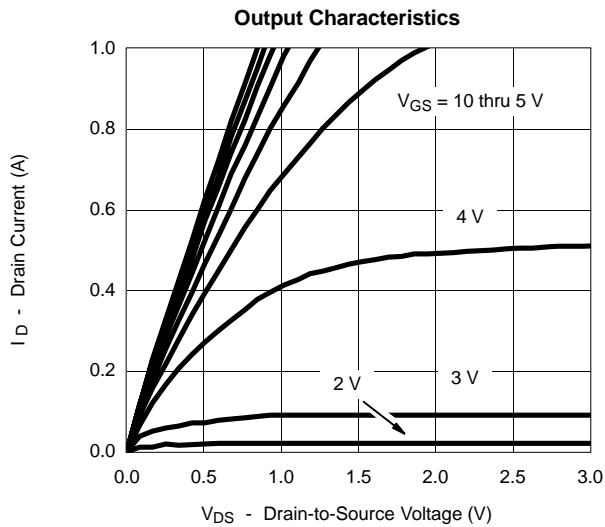
**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

**N-CHANNEL**

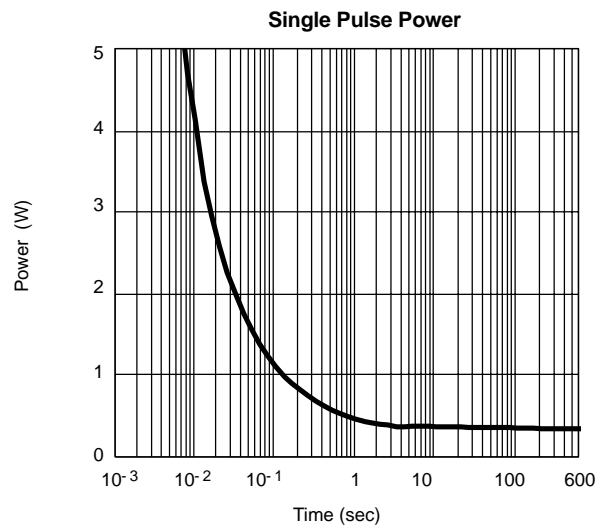
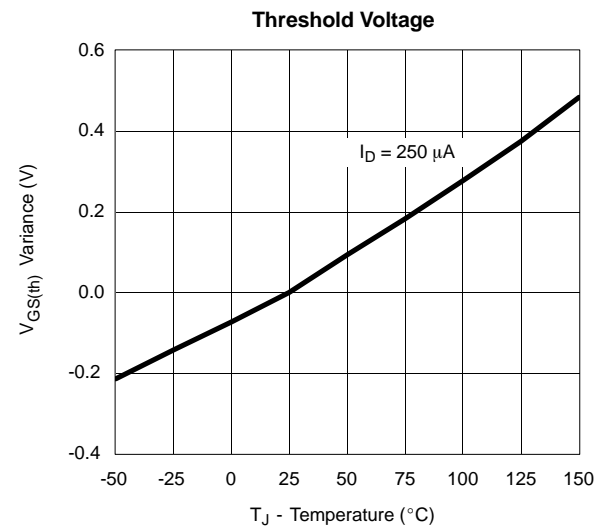
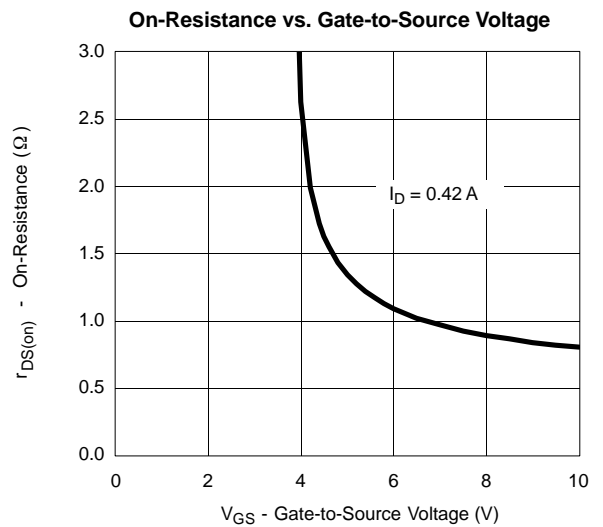
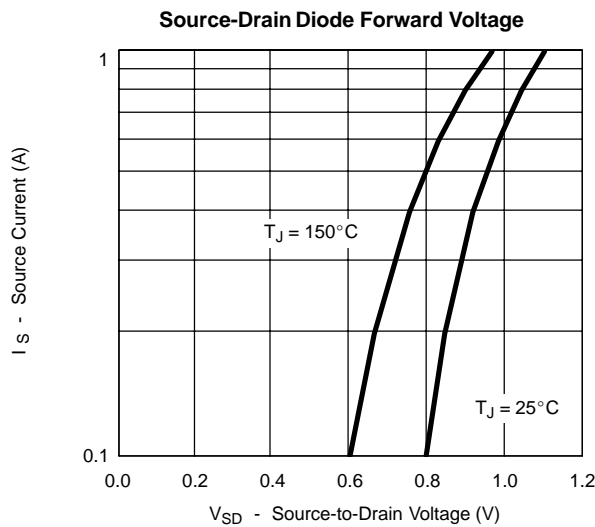
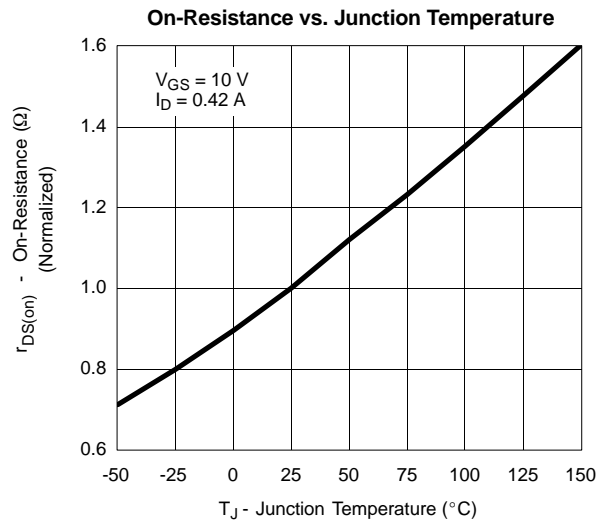
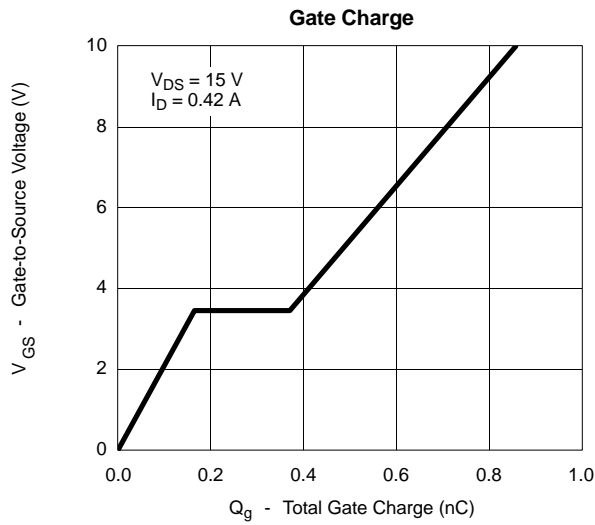


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

**P-CHANNEL**



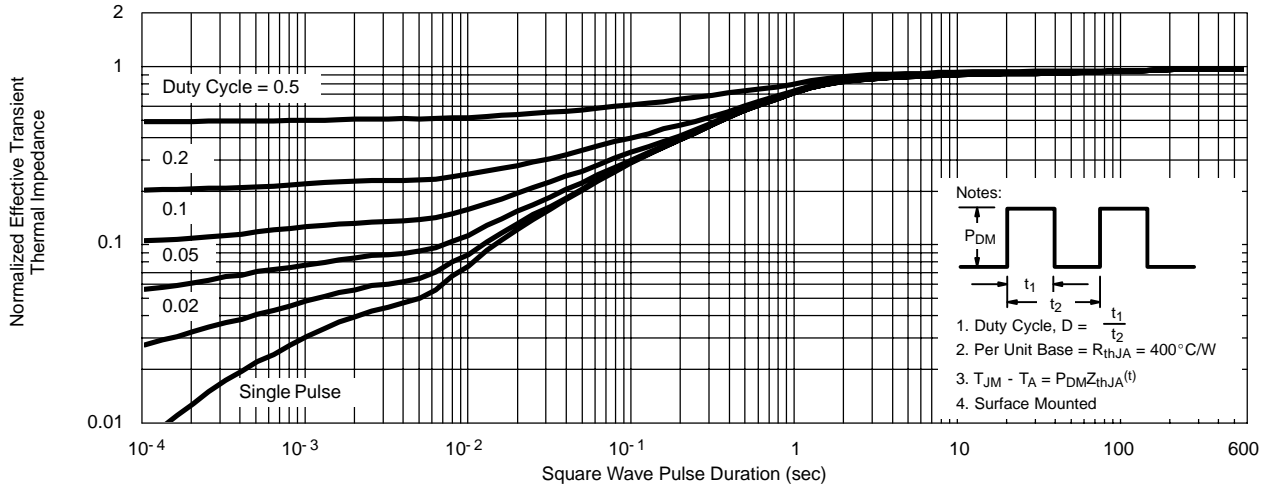
**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED) P-CHANNEL**



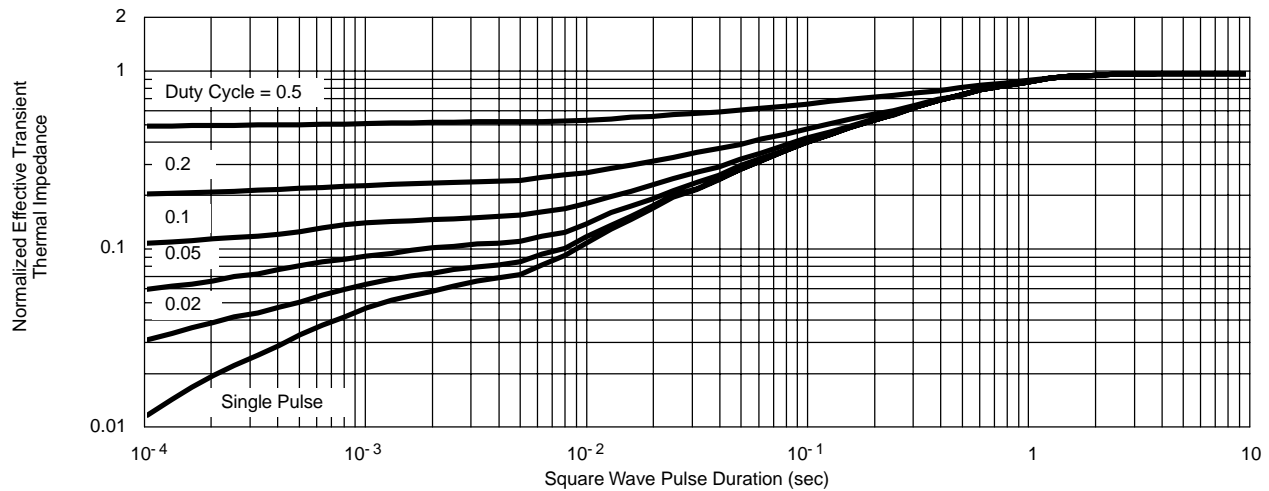


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) P-CHANNEL**

Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot





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