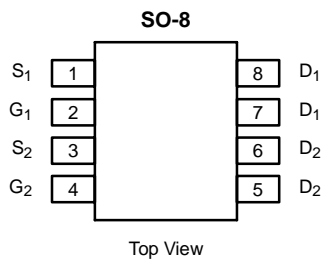


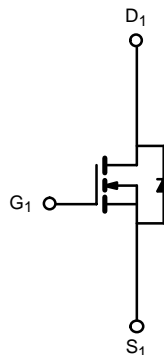
N- and P-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY			
	V _{DS} (V)	r _{DS(on)} (Ω)	I _D (A)
N-Channel	30	0.036 @ V _{GS} = 10 V	5.9
		0.053 @ V _{GS} = 4.5 V	4.9
P-Channel	-30	0.053 @ V _{GS} = -10 V	-4.9
		0.090 @ V _{GS} = -4.5 V	-3.7

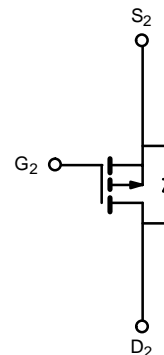
TrenchFET®
Power MOSFETS



Ordering Information: Si4539ADY
Si4539ADY-T1 (with Tape and Reel)



N-Channel MOSFET



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T _A = 25 °C UNLESS OTHERWISE NOTED)							
Parameter	Symbol	N-Channel		P-Channel		Unit	
		10 secs	Steady State	10 secs	Steady State		
Drain-Source Voltage	V _{DS}	30		-30		V	
Gate-Source Voltage	V _{GS}	±20		±20		V	
Continuous Drain Current (T _J = 150 °C) ^a	I _D	T _A = 25 °C	5.9	4.4	-4.9	-3.7	A
		T _A = 70 °C	4.7	3.6	-3.9	-2.9	
Pulsed Drain Current	I _{DM}	30				A	
Continuous Source Current (Diode Conduction) ^a	I _S	1.7	0.9	-1.7	-0.9	A	
Maximum Power Dissipation ^a	P _D	T _A = 25 °C	2.0	1.1	2	1.1	W
		T _A = 70 °C	1.3	0.7	1.3	0.7	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-55 to 150				°C	

THERMAL RESISTANCE RATINGS							
Parameter	Symbol	N-Channel		P-Channel		Unit	
		Typ	Max	Typ	Max		
Maximum Junction-to-Ambient ^a	R _{thJA}	t ≤ 10 sec	50	62.5	52	62.5	°C/W
		Steady State	90	110	90	110	
Maximum Junction-to-Foot (Drain)	R _{thJF}	32	40	32	40	°C/W	

Notes

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

SPECIFICATIONS (T _J = 25 °C UNLESS OTHERWISE NOTED)							
Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
Static							
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	N-Ch	1.0			V
		V _{DS} = V _{GS} , I _D = -250 μA	P-Ch	-1.0			
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V	N-Ch			±100	nA
		V _{DS} = 0 V, V _{GS} = ±20 V	P-Ch			±100	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 24 V, V _{GS} = 0 V	N-Ch			1	μA
		V _{DS} = -24 V, V _{GS} = 0 V	P-Ch			-1	
		V _{DS} = 24 V, V _{GS} = 0 V, T _J = 55 °C	N-Ch			5	
		V _{DS} = -24 V, V _{GS} = 0 V, T _J = 55 °C	P-Ch			-5	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 5 V, V _{GS} = 10 V	N-Ch	30			A
		V _{DS} ≤ -5 V, V _{GS} = -10 V	P-Ch	-30			
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 10 V, I _D = 5.9 A	N-Ch		0.032	0.036	Ω
		V _{GS} = -10 V, I _D = -4.9 A	P-Ch		0.043	0.053	
		V _{GS} = 4.5 V, I _D = 4.9 A	N-Ch		0.042	0.053	
		V _{GS} = -4.5 V, I _D = -3.7 A	P-Ch		0.075	0.090	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 5.9 A	N-Ch		15		S
		V _{DS} = -15 V, I _D = -4.9 A	P-Ch		9		
Diode Forward Voltage ^a	V _{SD}	I _S = 1.7 A, V _{GS} = 0 V	N-Ch		0.80	1.2	V
		I _S = -1.7 A, V _{GS} = 0 V	P-Ch		-0.80	-1.2	
Dynamic^b							
Total Gate Charge	Q _g	N-Channel V _{DS} = 15 V, V _{GS} = 10 V, I _D = 5.9 A P-Channel V _{DS} = -15 V, V _{GS} = -10 V, I _D = -4.9 A	N-Ch		13	20	nC
			P-Ch		15	25	
Gate-Source Charge	Q _{gs}		N-Ch		2.3		
			P-Ch		4		
Gate-Drain Charge	Q _{gd}		N-Ch		2		
			P-Ch		2.0		
Gate Resistance	R _g	N-Ch	0.5		2.2	Ω	
		P-Ch	5		12.6		
Turn-On Delay Time	t _{d(on)}	N-Ch		6	12	ns	
		P-Ch		7	15		
Rise Time	t _r	N-Ch		14	25		
		P-Ch		10	20		
Turn-Off Delay Time	t _{d(off)}	N-Ch		30	60		
		P-Ch		40	80		
Fall Time	t _f	N-Ch		5	10		
		P-Ch		20	40		
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 1.7 A, di/dt = 100 A/μs	N-Ch		30	60	
		I _F = -1.7 A, di/dt = 100 A/μs	P-Ch		30	60	

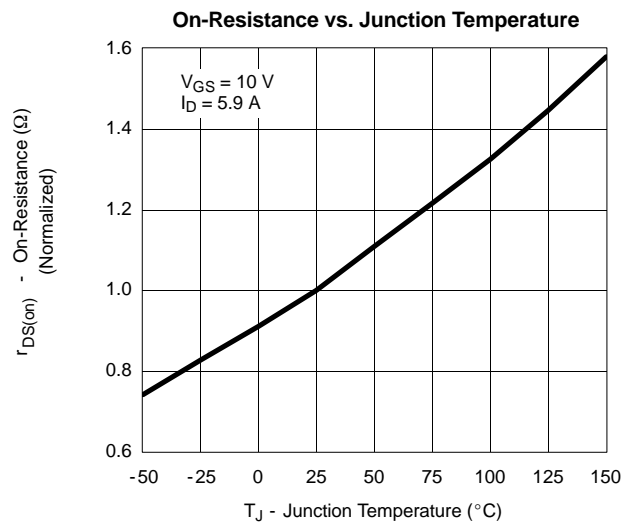
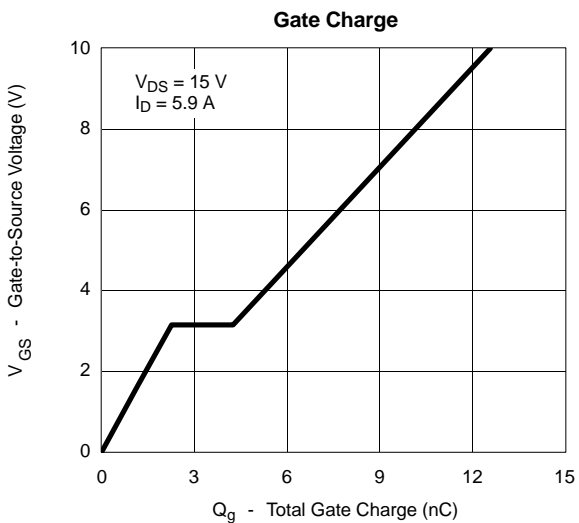
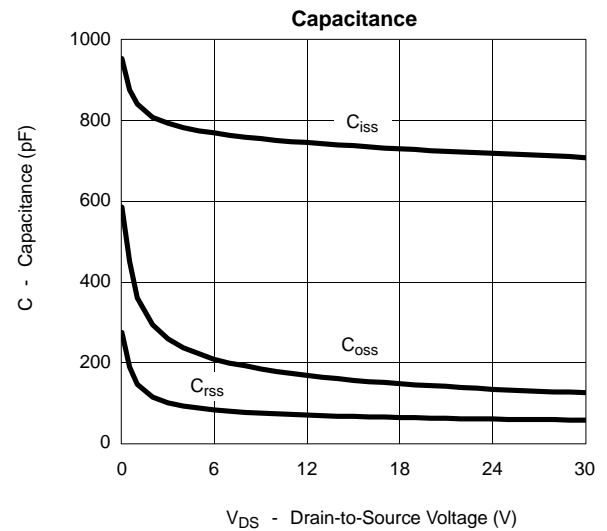
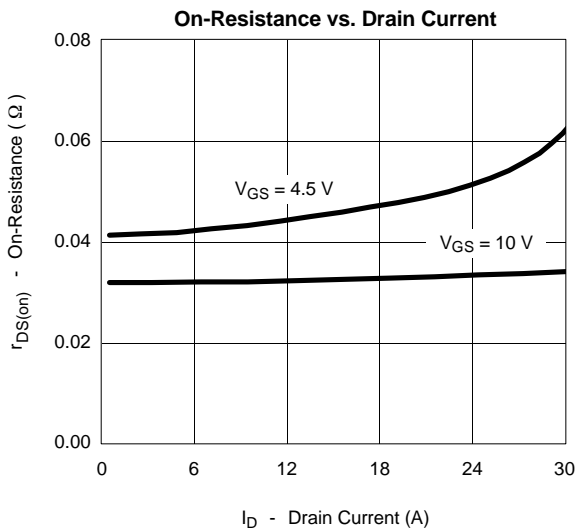
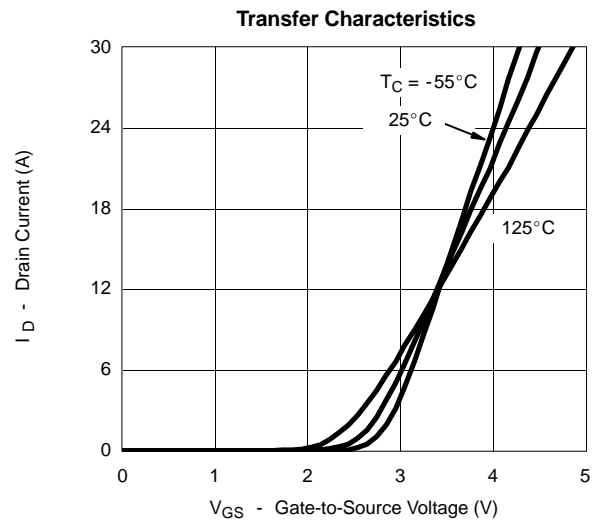
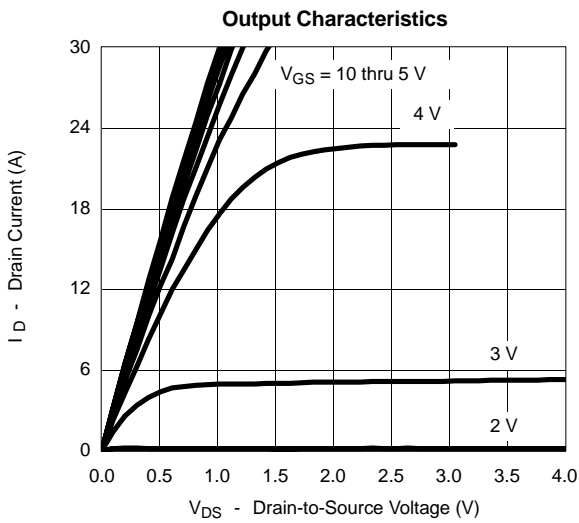
Notes

- 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)

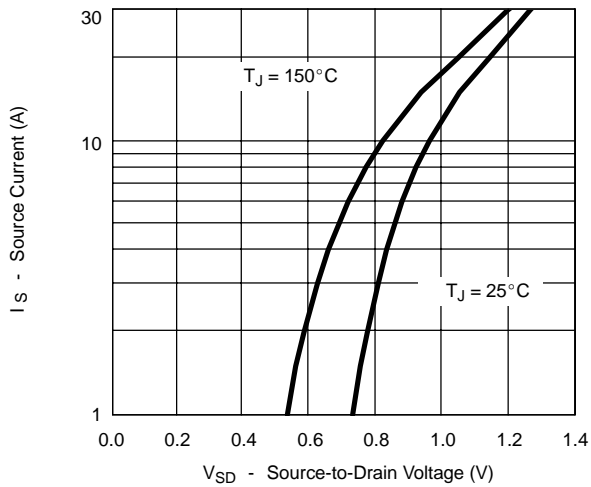
NCHANNEL



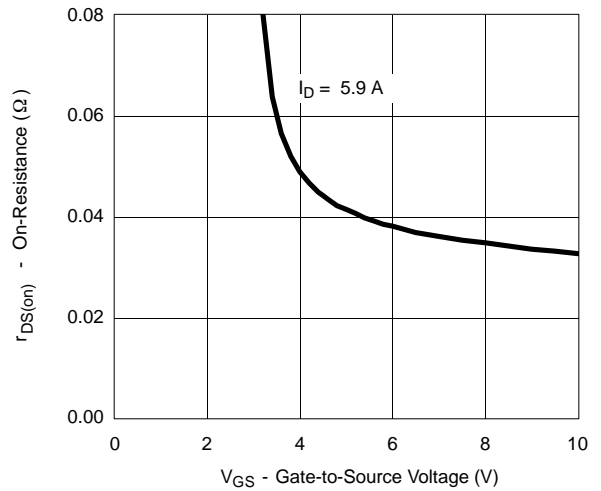
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

NCHANNEL

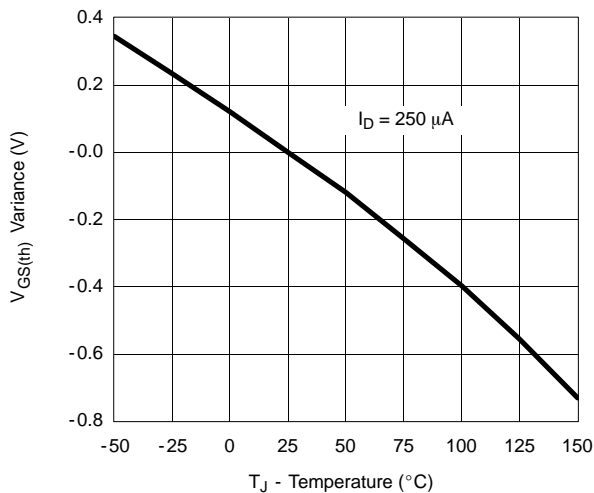
Source-Drain Diode Forward Voltage



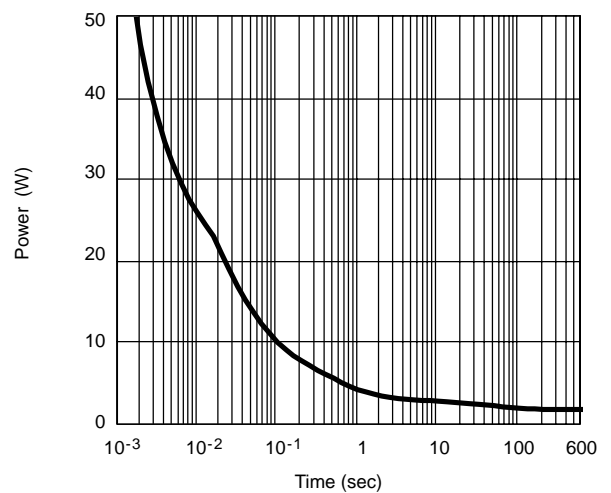
On-Resistance vs. Gate-to-Source Voltage



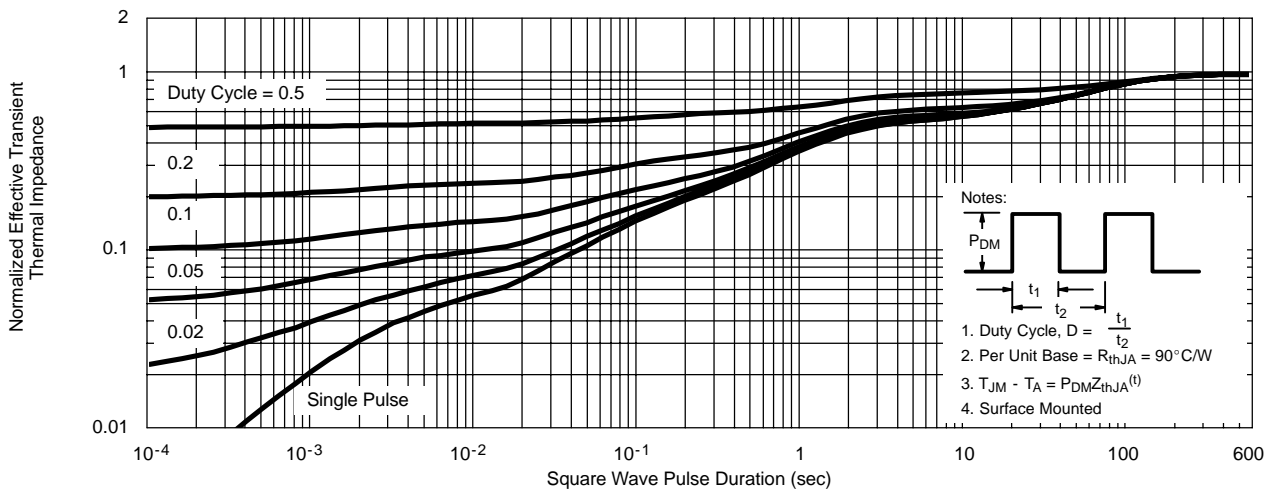
Threshold Voltage



Single Pulse Power



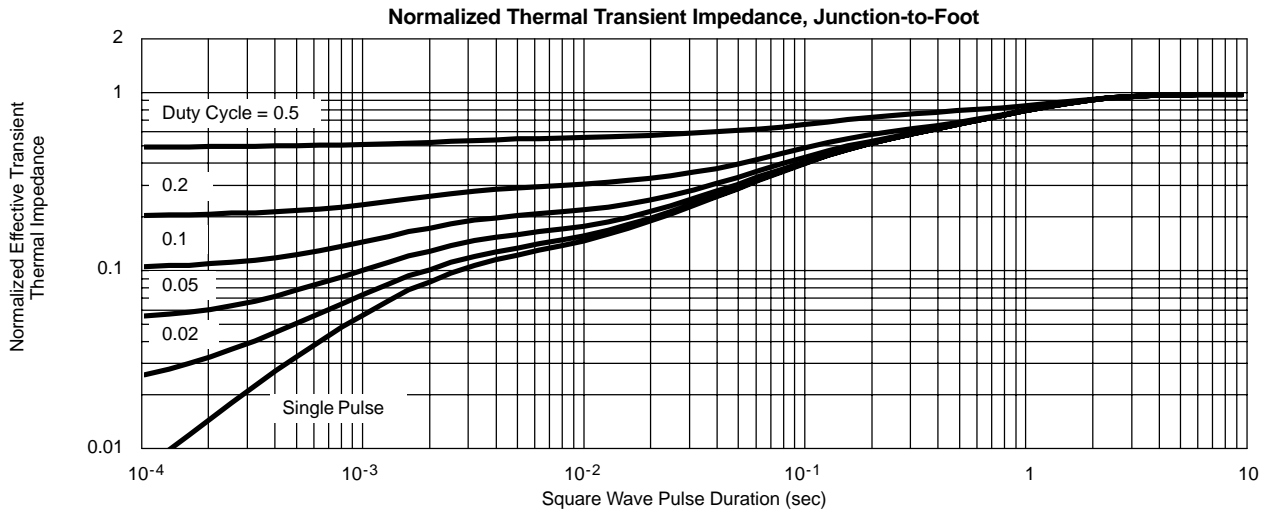
Normalized Thermal Transient Impedance, Junction-to-Ambient





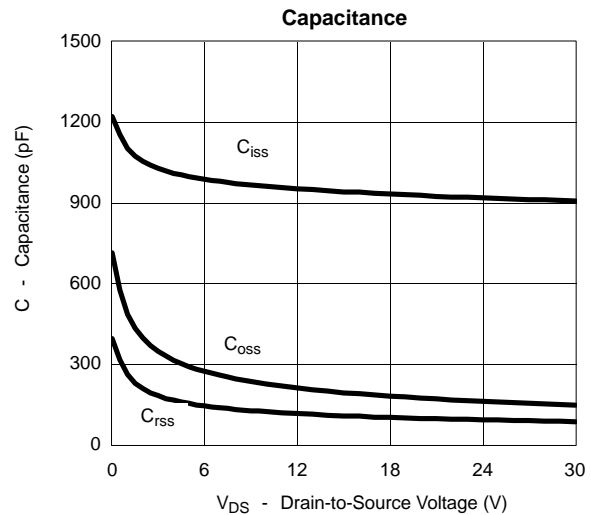
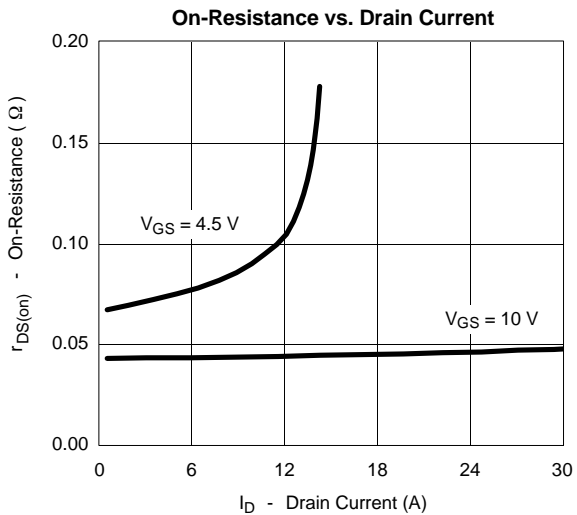
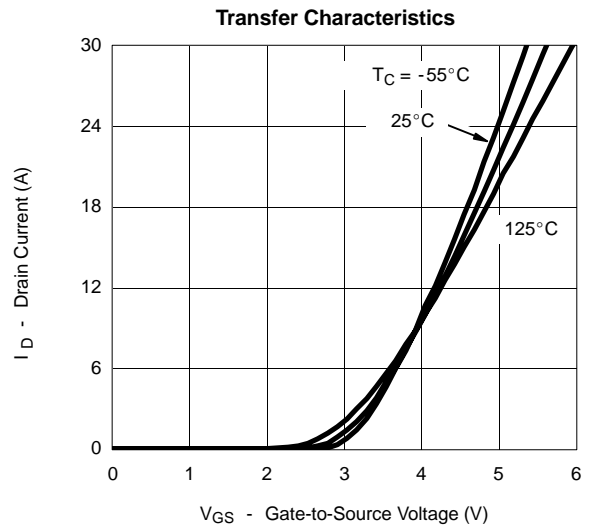
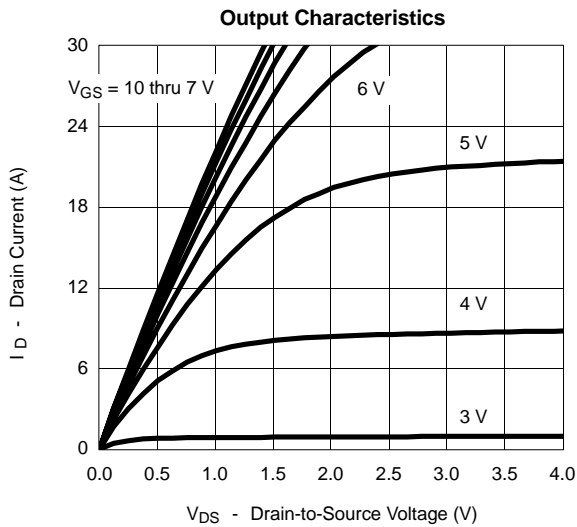
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

NCHANNEL



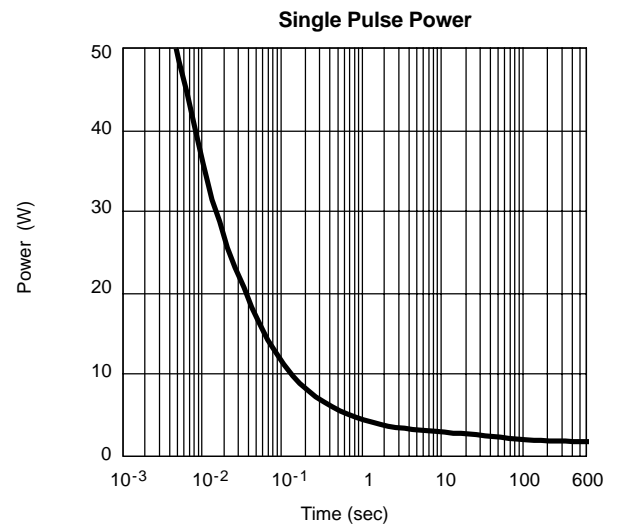
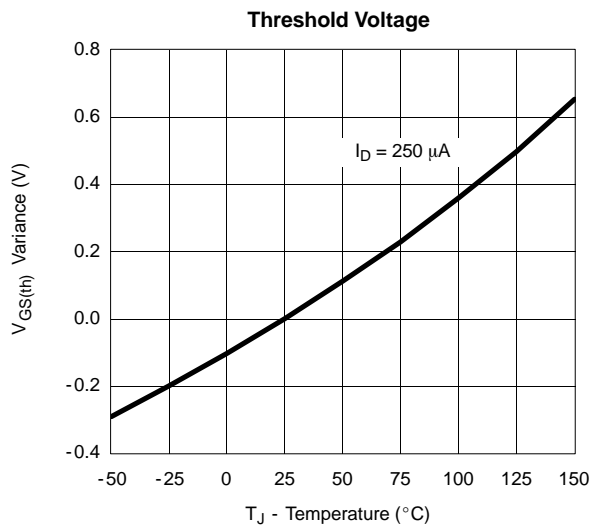
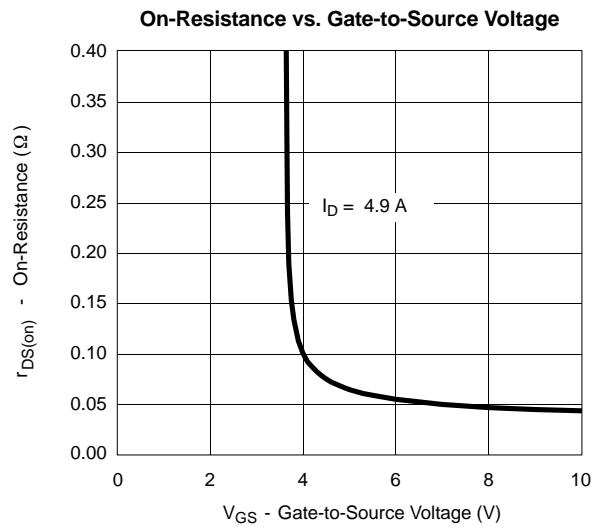
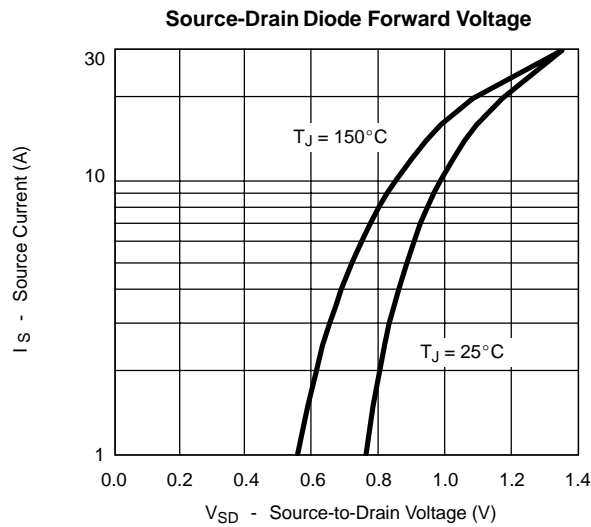
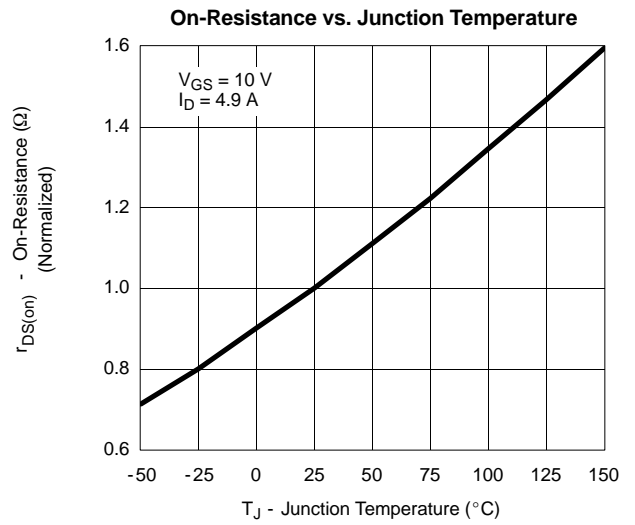
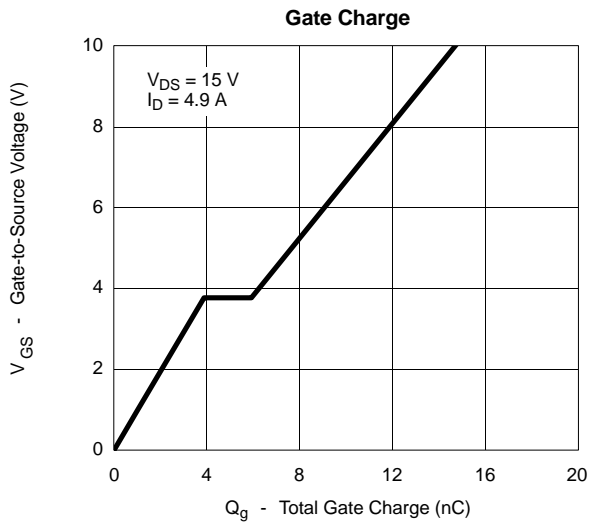
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

PCHANNEL



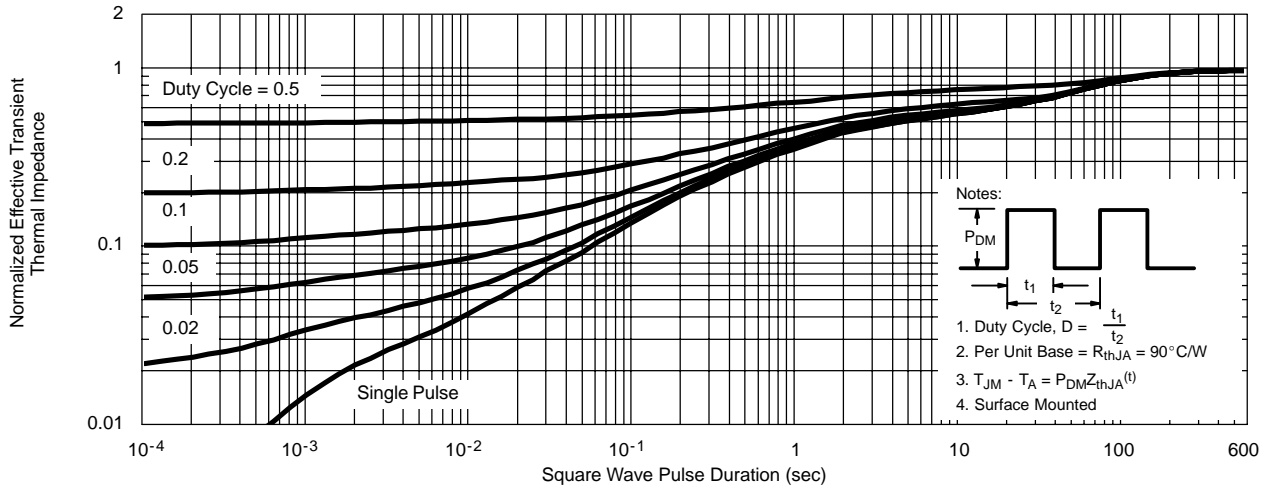
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

PCHANNEL



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) PCHANNEL

Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

