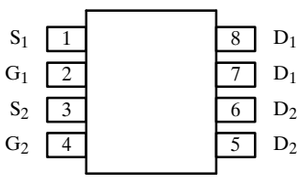
Si4539DY

Dual Enhancement-Mode MOSFETs (N- and P-Channel)

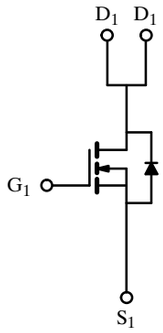
Product Summary

	V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
N-Channel	30	0.037 @ V_{GS} = 10 V	±5.8
		0.055 @ V_{GS} = 4.5 V	±4.7
P-Channel	−30	0.053 @ V_{GS} = −10 V	±4.9
		0.095 @ V_{GS} = −4.5 V	±3.6

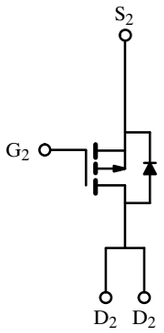
SO-8



Top View



N-Channel MOSFET



P-Channel MOSFET

Absolute Maximum Ratings (T_A = 25°C Unless Otherwise Noted)

Parameter		Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage		V_{DS}	30	−30	V
Gate-Source Voltage		V_{GS}	±20	±20	
Continuous Drain Current (T_J = 150°C)[a]	T_A = 25°C	I_D	±5.8	±4.9	A
	T_A = 70°C		±4.6	±3.9	
Pulsed Drain Current		I_{DM}	±30	±30	
Continuous Source Current (Diode Conduction)[a]		I_S	1.7	−1.7	
Maximum Power Dissipation[a]	T_A = 25°C	P_D	2.0	2.0	W
	T_A = 70°C		1.3	1.3	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	−55 to 150		°C

Thermal Resistance Ratings

Parameter	Symbol	N- or P-Channel	Unit
Maximum Junction-to-Ambient[a]	R_{thJA}	62.5	°C/W

Notes
a. Surface Mounted on FR4 Board, t ≤ 10 sec.

Subsequent updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #1234.

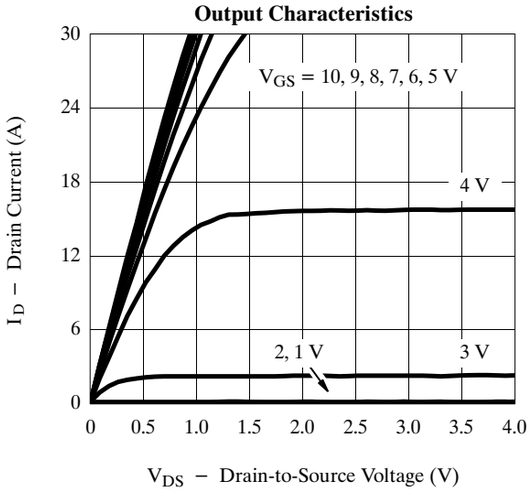
Specifications (T_J = 25°C Unless Otherwise Noted)

Parameter	Symbol	Test Condition		Min	Typ[a]	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
			P-Ch			±100	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 30 V, V_{GS} = 0 V	N-Ch			1	µA
		V_{DS} = −30 V, V_{GS} = 0 V	P-Ch			−1	
		V_{DS} = 30 V, V_{GS} = 0 V, T_J = 55°C	N-Ch			25	
		V_{DS} = −30 V, V_{GS} = 0 V, T_J = 55°C	P-Ch			−25	
On-State Drain Current[b]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 10 V	N-Ch	20			A
		V_{DS} ≤ −5 V, V_{GS} = −10 V	P-Ch	−20			
Drain-Source On-State Resistance[b]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 5.8 A	N-Ch		0.030	0.037	Ω
		V_{GS} = −10 V, I_D = −4.9 A	P-Ch		0.043	0.053	
		V_{GS} = 4.5 V, I_D = 4.7 A	N-Ch		0.042	0.055	
		V_{GS} = −4.5 V, I_D = −3.6 A	P-Ch		0.070	0.095	
Forward Transconductance[b]	g_{fs}	V_{DS} = 15 V, I_D = 5.8 A	N-Ch		13		S
		V_{DS} = −15 V, I_D = −4.9 A	P-Ch		10		
Diode Forward Voltage[b]	V_{SD}	I_S = 1.7 A, V_{GS} = 0 V	N-Ch		0.8	1.2	V
		I_S = −1.7 A, V_{GS} = 0 V	P-Ch		−0.8	−1.2	
Dynamic[a]							
Total Gate Charge	Q_g	N-Channel V_{DS} = 15 V, V_{GS} = 10 V, I_D = 5.8 A P-Channel V_{DS} = −15 V, V_{GS} = −10 V, I_D = −4.9 A	N-Ch		18	25	nC
			P-Ch		16	25	
Gate-Source Charge	Q_{gs}		N-Ch		4.5		
			P-Ch		5		
Gate-Drain Charge	Q_{gd}		N-Ch		2.5		
			P-Ch		2		
Turn-On Delay Time	$t_{d(on)}$	N-Channel V_{DD} = 15 V, R_L = 15 Ω I_D ≅ 1 A, V_{GEN} = 10 V, R_G = 6 Ω P-Channel V_{DD} = −15 V, R_L = 15 Ω I_D ≅ −1 A, V_{GEN} = −10 V, R_G = 6 Ω	N-Ch		10	16	ns
			P-Ch		9	15	
Rise Time	t_r		N-Ch		20	16	
			P-Ch		13	20	
Turn-Off Delay Time	$t_{d(off)}$		N-Ch		27	40	
			P-Ch		25	40	
Fall Time	t_f		N-Ch		24	35	
			P-Ch		15	25	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 1.7 A, di/dt = 100 A/µs	N-Ch		45	80	
		I_F = −1.7 A, di/dt = 100 A/µs	P-Ch		60	90	

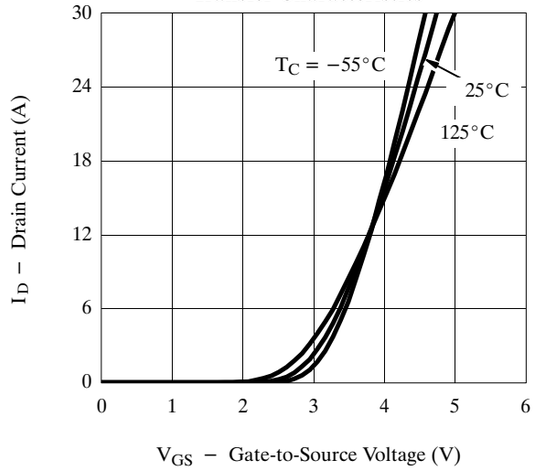
Notes
a. For design aid only; not subject to production testing.
b. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.

Typical Characteristics (25°C Unless Noted) N-Channel

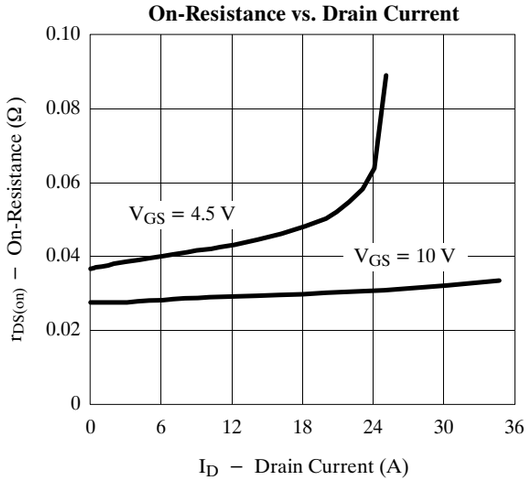
Output Characteristics



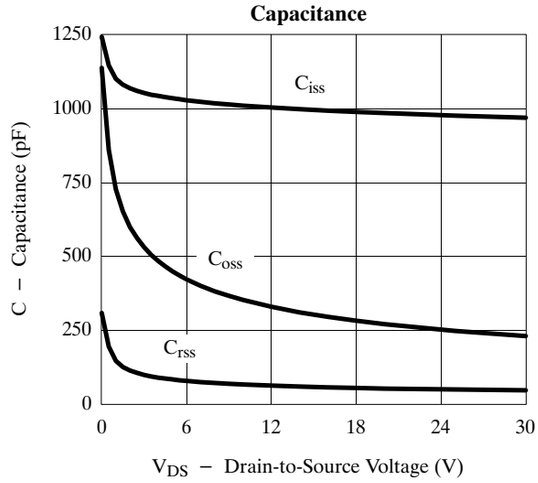
Transfer Characteristics



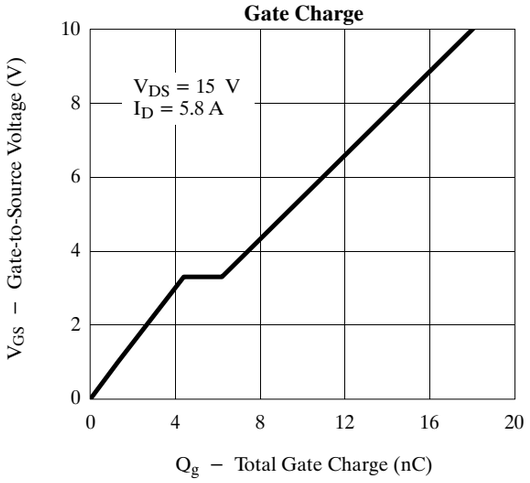
On-Resistance vs. Drain Current



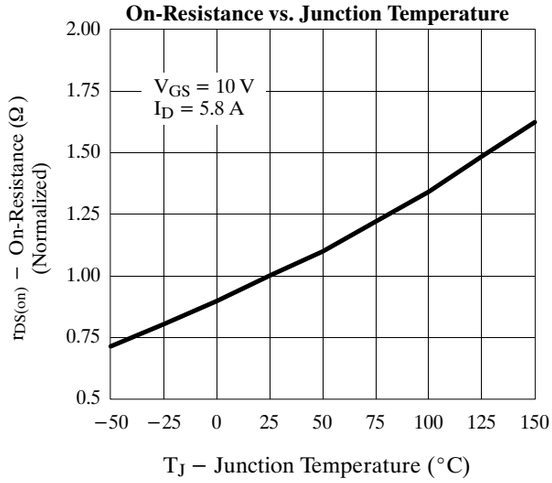
Capacitance



Gate Charge



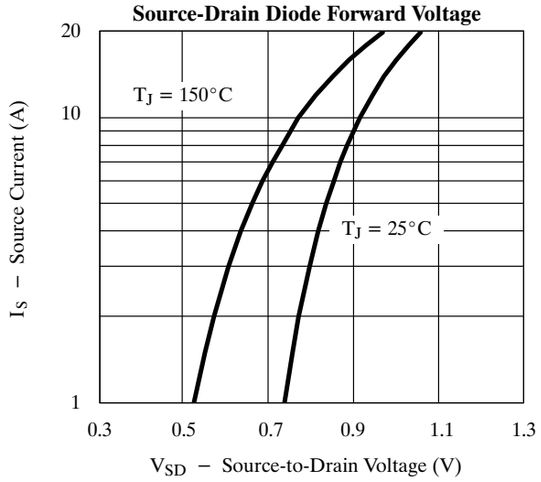
On-Resistance vs. Junction Temperature



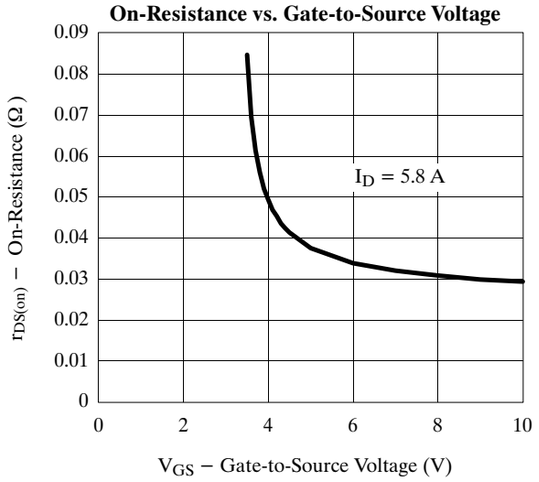
Si4539DY

Typical Characteristics (25°C Unless Noted) N-Channel

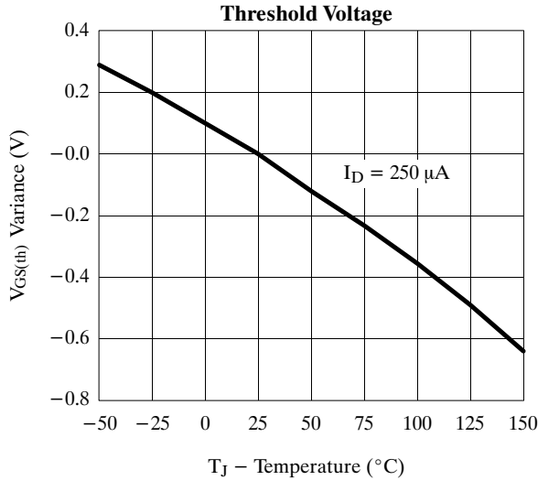
Source-Drain Diode Forward Voltage



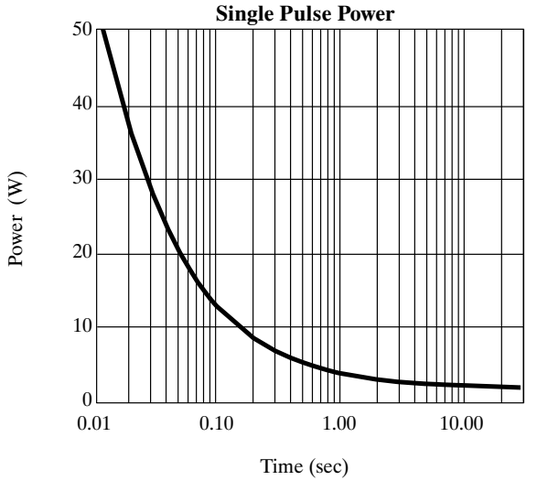
On-Resistance vs. Gate-to-Source Voltage



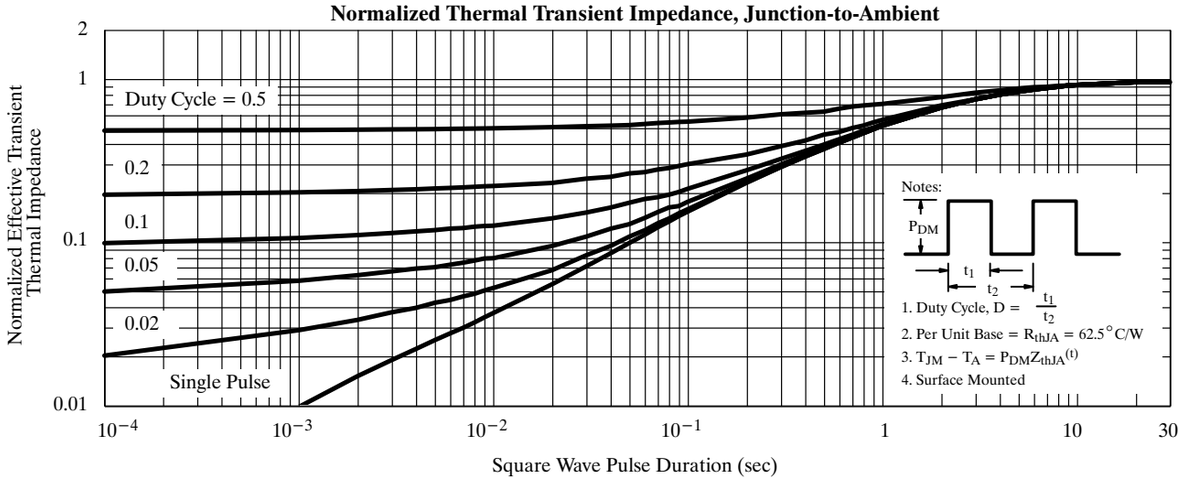
Threshold Voltage



Single Pulse Power

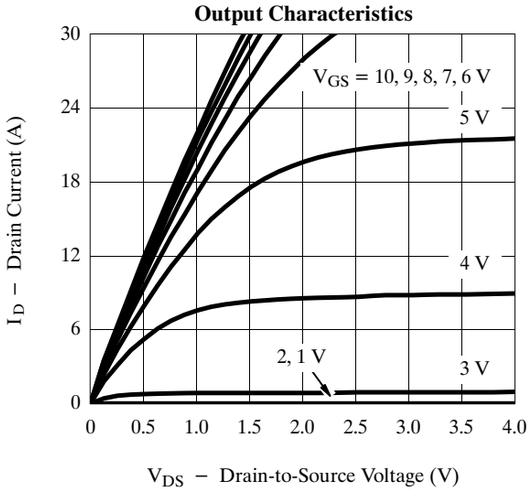


Normalized Thermal Transient Impedance, Junction-to-Ambient

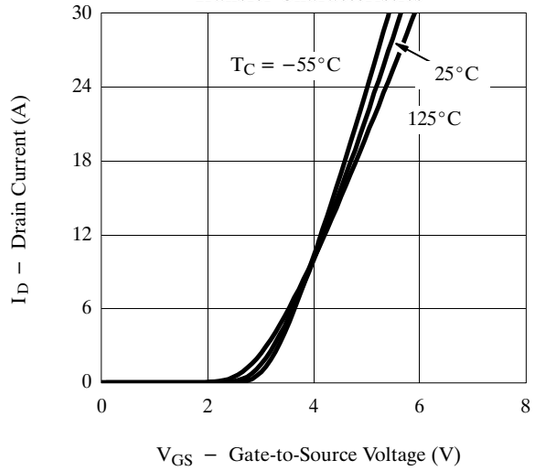


Typical Characteristics (25°C Unless Noted) P-Channel

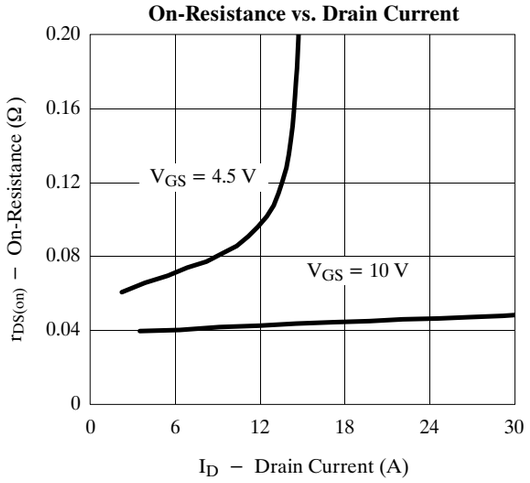
Output Characteristics



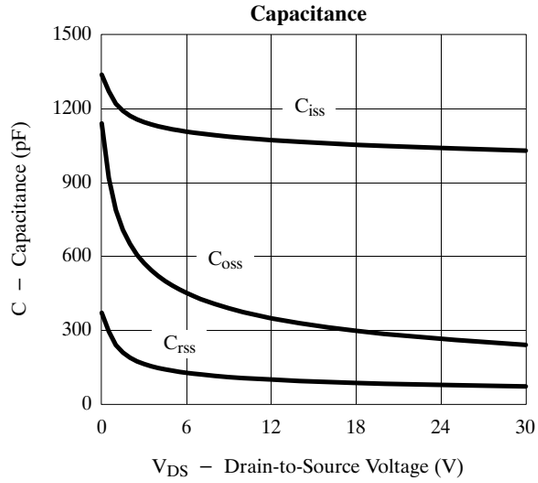
Transfer Characteristics



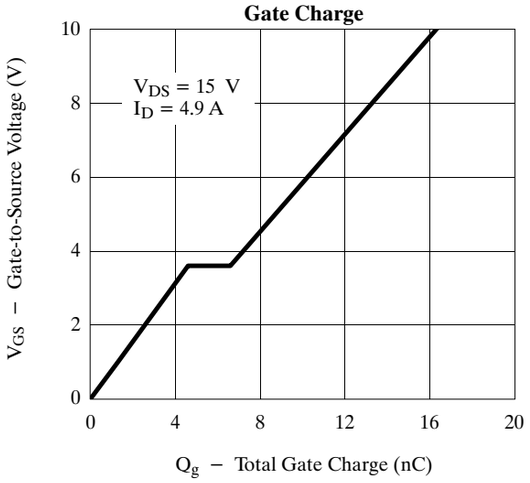
On-Resistance vs. Drain Current



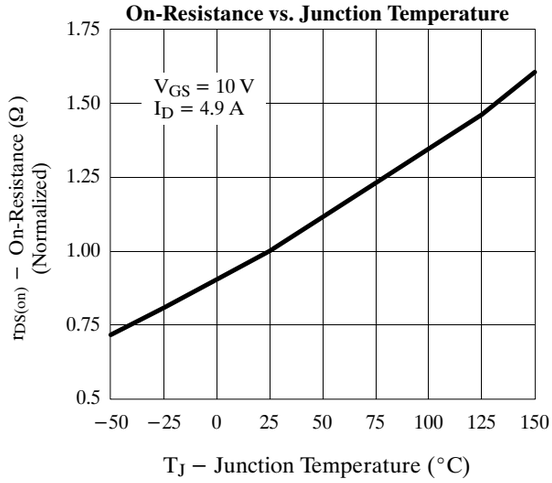
Capacitance



Gate Charge

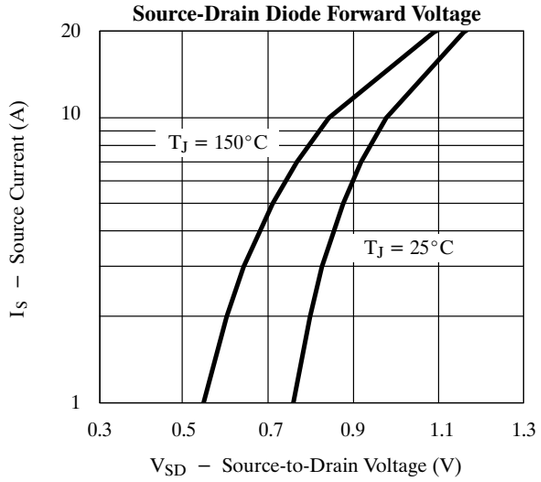


On-Resistance vs. Junction Temperature

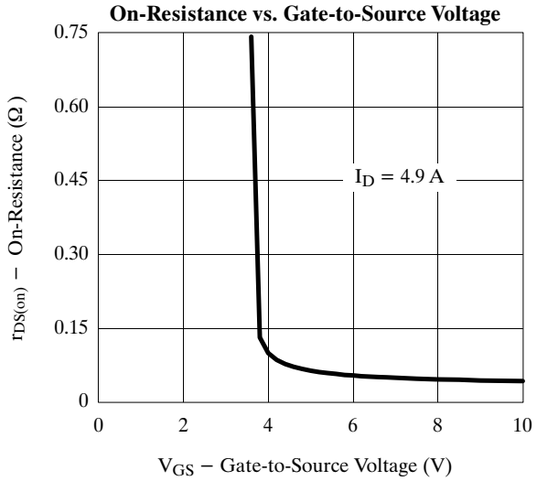


Typical Characteristics (25°C Unless Noted) P-Channel

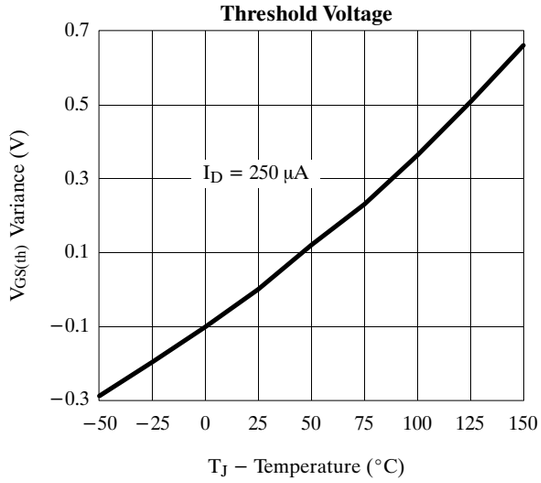
Source-Drain Diode Forward Voltage



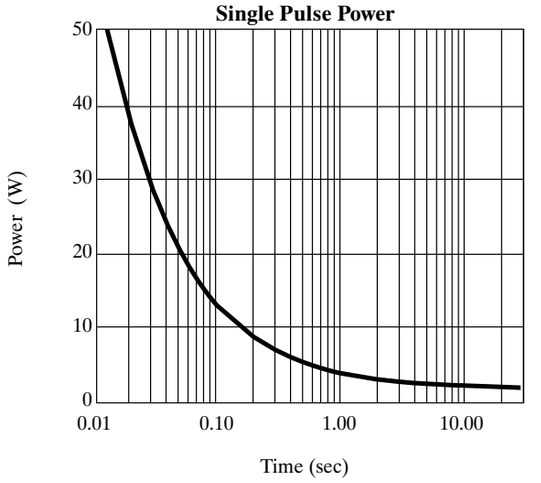
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient