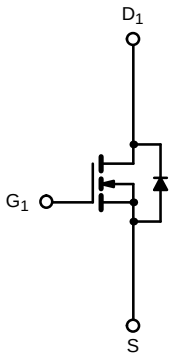
Dual N- and P-Channel 20-V (D-S) MOSFET

PRODUCT SUMMARY

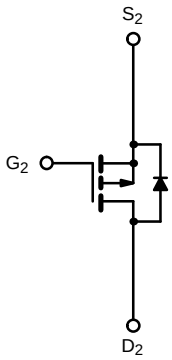
	V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
N-Channel	20	0.09 @ V_{GS} = 10 V	±2.5
		0.175 @ V_{GS} = 4.5 V	±1.8
P-Channel	–20	0.17 @ V_{GS} = –10 V	±1.9
		0.32 @ V_{GS} = –4.5 V	±1.3

TSSOP-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}	20	–20	V
Gate-Source Voltage		V_{GS}	±20	±20	
Continuous Drain Current (T_J = 150°C)[a]	T_A = 25°C	I_D	±2.5	±1.9	A
	T_A = 70°C		±2.0	±1.5	
Pulsed Drain Current		I_{DM}	±20	±15	
Continuous Source Current (Diode Conduction)[a]		I_S	1.25	–1.25	
Maximum Power Dissipation[a]	T_A = 25°C	P_D	1.0		W
	T_A = 70°C		0.64		
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}	125	°C/W

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

For SPICE model information via the Worldwide Web: http://www.vishay.com/www/product/spice.htm

SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

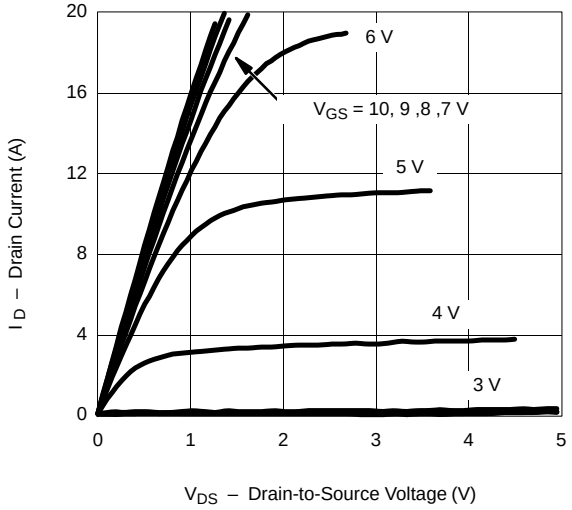
Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
Static							
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	N-Ch	1.0			V
		V_{DS} = V_{GS}, I_D = –250 μA	P-Ch	–1.0			
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V				±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 20 V, V_{GS} = 0 V	N-Ch			1	μA
		V_{DS} = –20 V, V_{GS} = 0 V	P-Ch			–1	
		V_{DS} = 20 V, V_{GS} = 0 V, T_J = 55°C	N-Ch			25	
		V_{DS} = –20 V, V_{GS} = 0 V, T_J = 55°C	P-Ch			–25	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} = 5 V, V_{GS} = 10 V	N-Ch	14			A
		V_{DS} = –5 V, V_{GS} = –10 V	P-Ch	–10			
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 2.5 A	N-Ch		0.065	0.09	Ω
		V_{GS} = –10 V, I_D = 1.9 A	P-Ch		0.13	0.17	
		V_{GS} = 4.5 V, I_D = 1.8 A	N-Ch		0.100	0.175	
		V_{GS} = –4.5 V, I_D = 1.3 A	P-Ch		0.26	0.32	
Forward Transconductance[a]	g_{fs}	V_{DS} = 15 V, I_D = 2.5 A	N-Ch		5		S
		V_{DS} = –15 V, I_D = – 1.9 A	P-Ch		3		
Diode Forward Voltage[a]	V_{SD}	I_S = 1.25 A, V_{GS} = 0 V	N-Ch		0.8	1.2	V
		I_S = –1.25 A, V_{GS} = 0 V	P-Ch		0.8	–1.2	
Dynamic[b]							
Total Gate Charge	Q_g	N-Channel V_{DS} = 10 V, V_{GS} = 10 V, I_D = 2.5 A P-Channel V_{DS} = –10 V, V_{GS} = –10 V, I_D = –1.9 A	N-Ch		7	10	nC
			P-Ch		7	10	
Gate-Source Charge	Q_{gs}		N-Ch		0.9		
			P-Ch		1.3		
Gate-Drain Charge	Q_{gd}		N-Ch		2.1		
			P-Ch		1.7		
Turn-On Delay Time	$t_{d(on)}$	N-Channel V_{DD} = 10 V, R_L = 10 Ω, I_D ≅ 1 A, V_{GEN} = 10 V, R_G = 6 Ω P-Channel V_{DD} = –10 V, R_L = 10 Ω, I_D ≅ –1 A, V_{GEN} = –10 V, R_G = 6 Ω	N-Ch		11	20	ns
			P-Ch		9	20	
Rise Time	t_r		N-Ch		11	20	
			P-Ch		12	25	
Turn-Off Delay Time	$t_{d(off)}$		N-Ch		16	30	
			P-Ch		17	30	
Fall Time	t_f		N-Ch		6	15	
			P-Ch		6	15	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 1.25 A, di/dt = 100 A/μs	N-Ch		45	70	
		I_F = –1.25 A, di/dt = 100 A/μs	P-Ch		35	70	

Notes

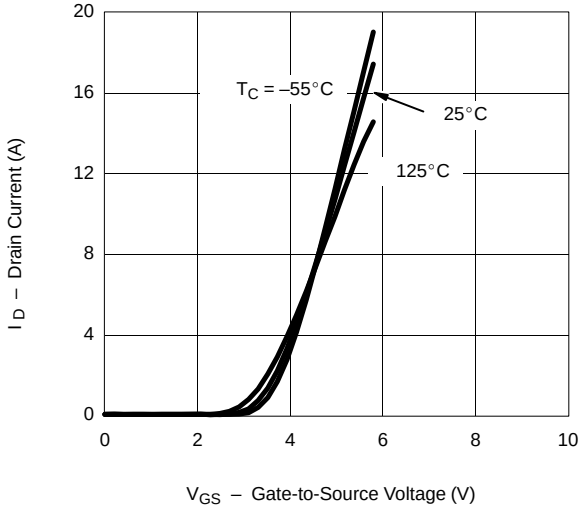
a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

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

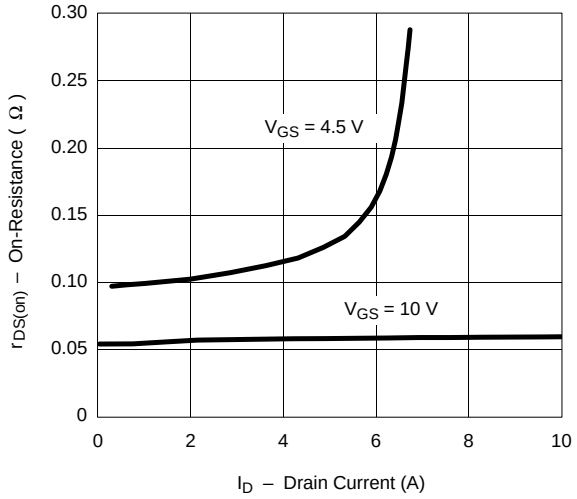
Output Characteristics



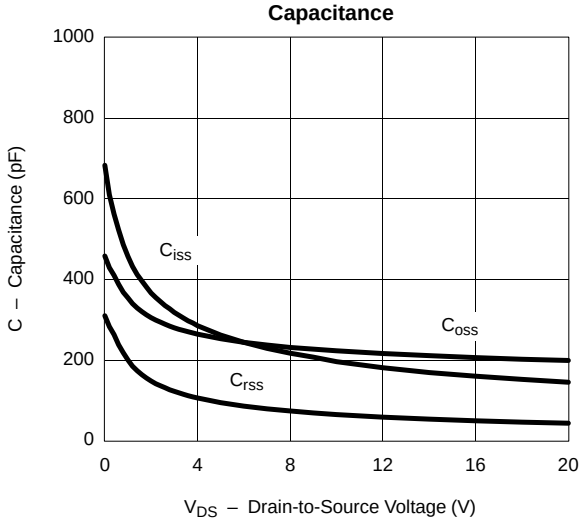
Transfer Characteristics



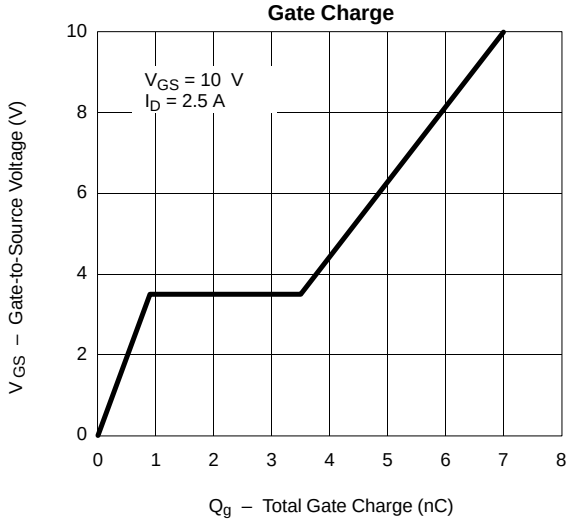
On-Resistance vs. Drain Current



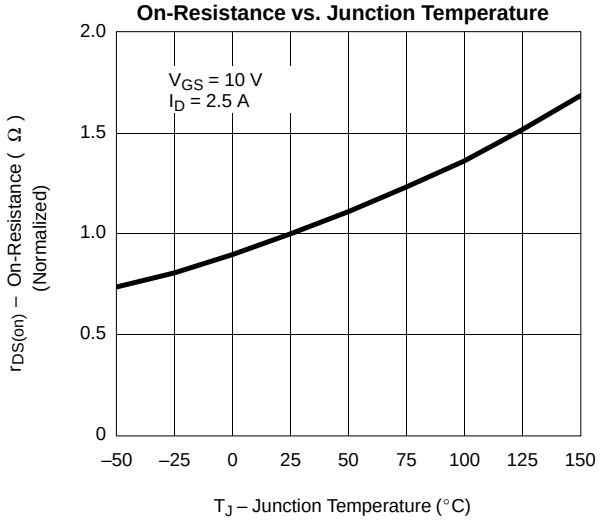
Capacitance



Gate Charge

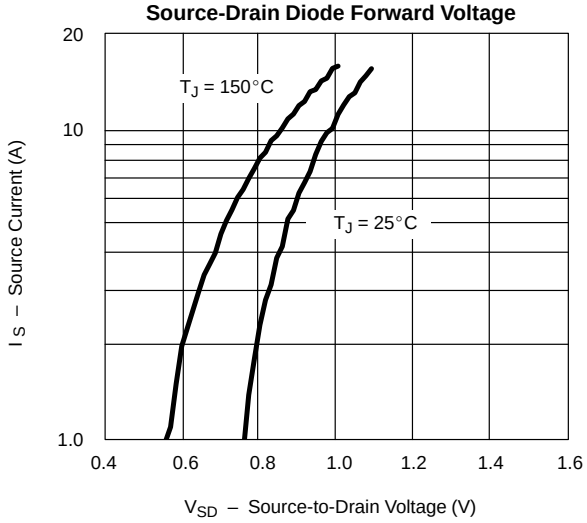


On-Resistance vs. Junction Temperature

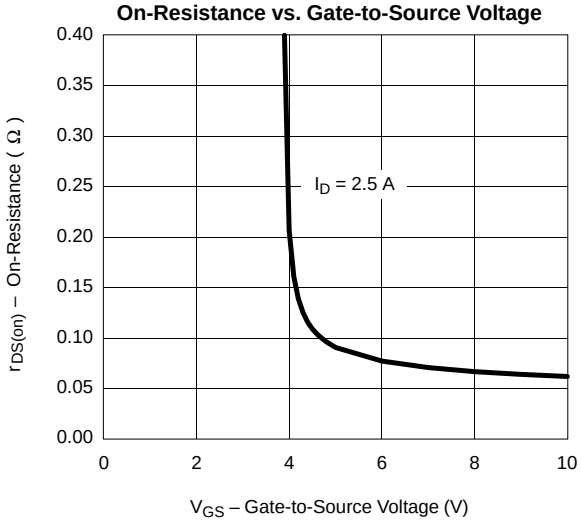


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) N-CHANNEL

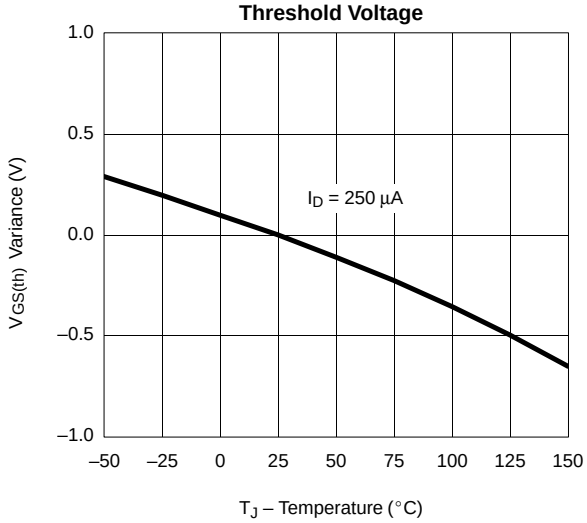
Source-Drain Diode Forward Voltage



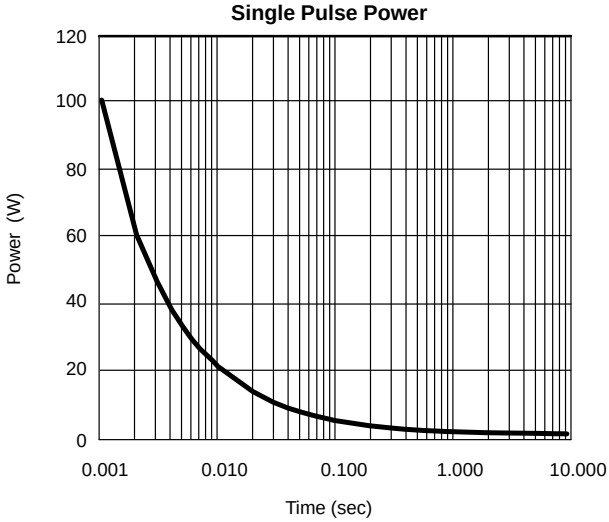
On-Resistance vs. Gate-to-Source Voltage



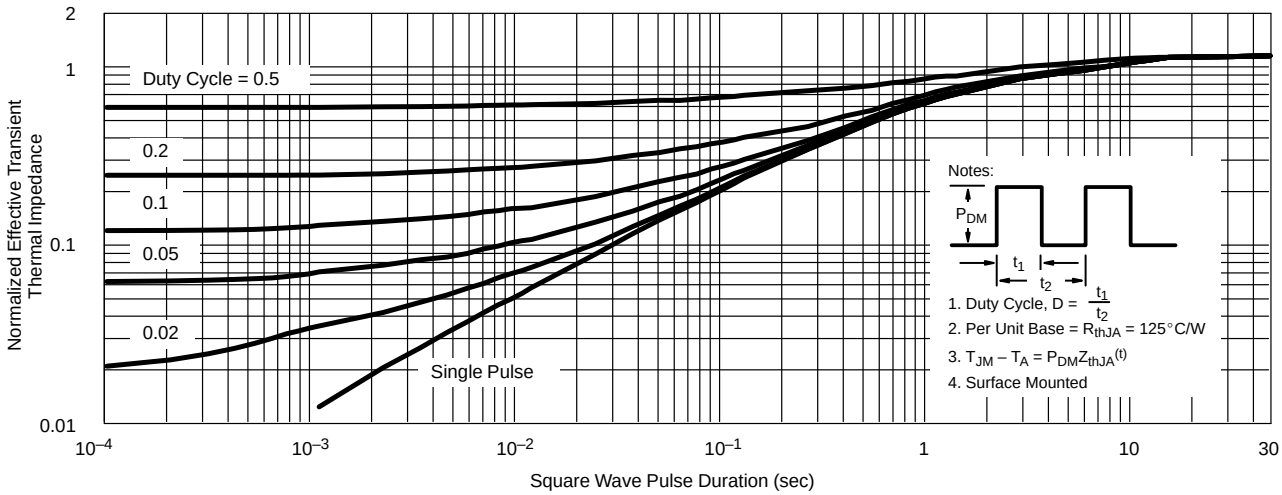
Threshold Voltage



Single Pulse Power

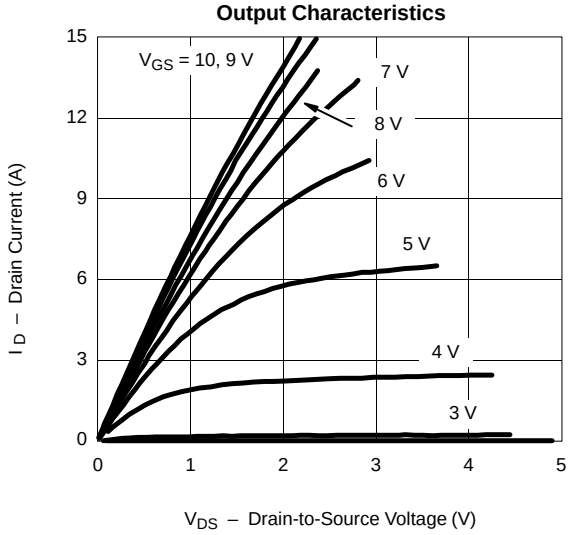


Normalized Thermal Transient Impedance, Junction-to-Ambient

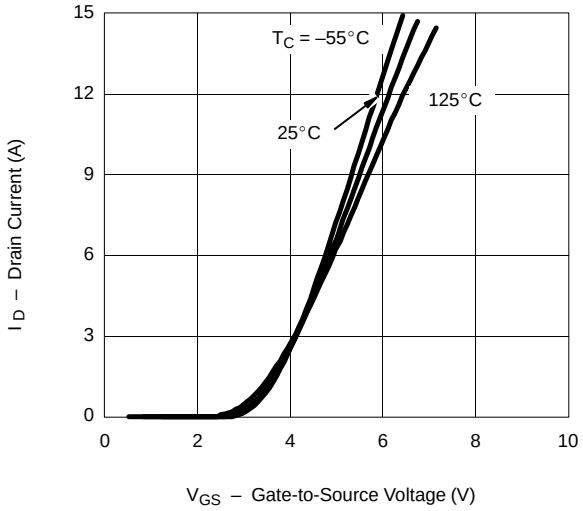


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) P-CHANNEL

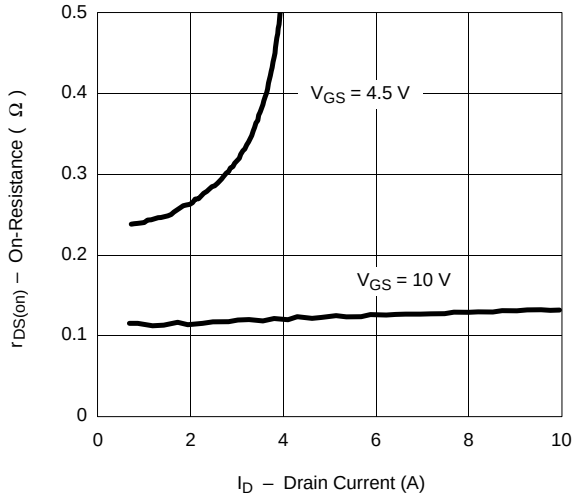
Output Characteristics



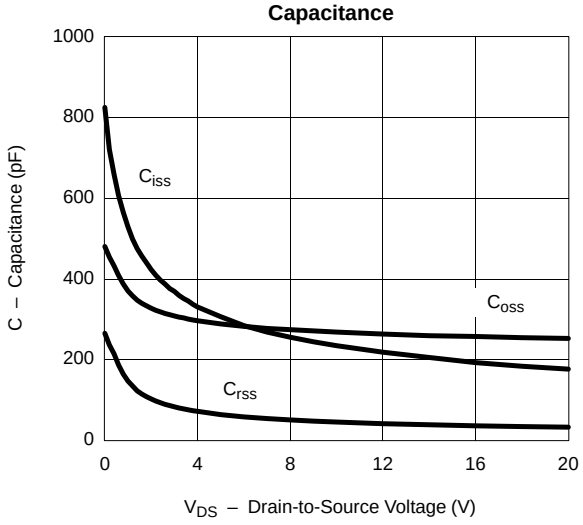
Transfer Characteristics



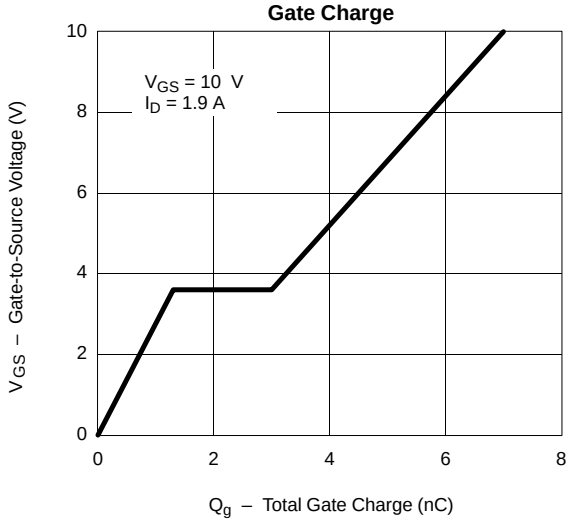
On-Resistance vs. Drain Current



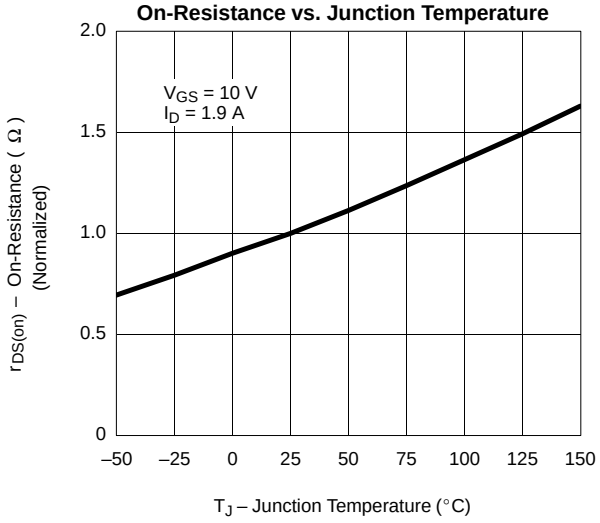
Capacitance



Gate Charge

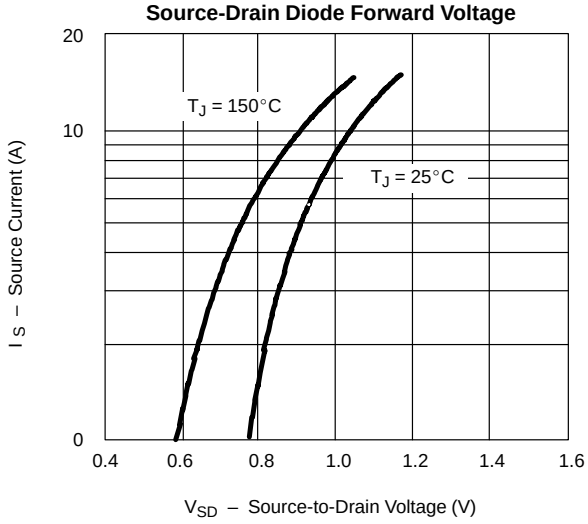


On-Resistance vs. Junction Temperature

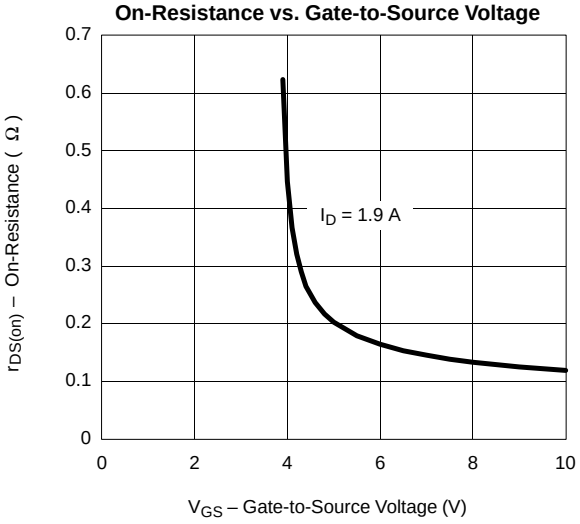


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) P-CHANNEL

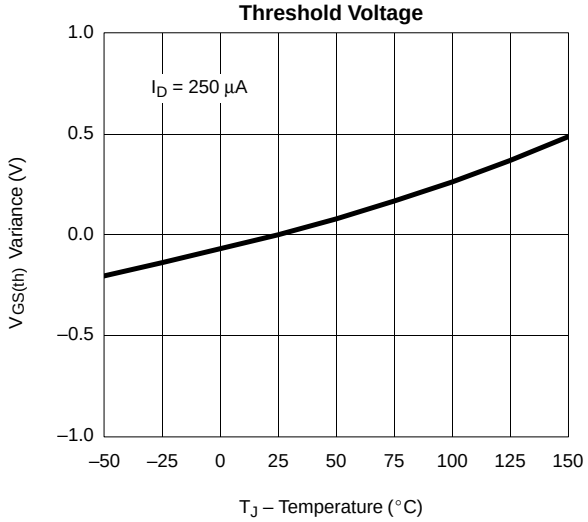
Source-Drain Diode Forward Voltage



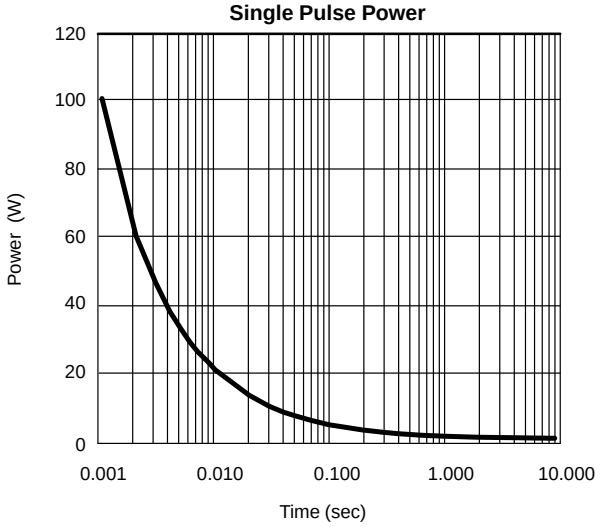
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient