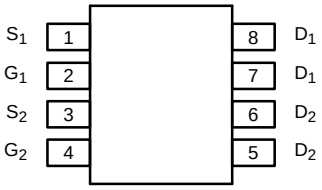
N- and P-Channel 2.5-V (G-S) MOSFET

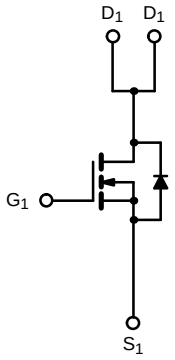
PRODUCT SUMMARY			
	V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
N-Channel	20	0.025 @ V_{GS} = 4.5 V	±7.1
		0.035 @ V_{GS} = 2.5 V	±6.0
P-Channel	–20	0.033 @ V_{GS} = –4.5 V	±6.2
		0.050 @ V_{GS} = –2.5 V	±5.0

TrenchFET® Power MOSFETs
2.5-V Rated

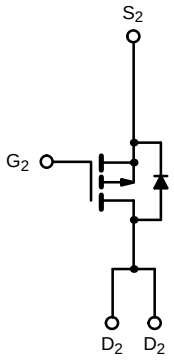
SO-8



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}	20	–20	V
Gate-Source Voltage		V_{GS}	±12	±12	
Continuous Drain Current (T_J = 150°C)[a]	T_A = 25°C	I_D	±7.1	±6.2	A
	T_A = 70°C		±5.7	±4.9	
Pulsed Drain Current		I_{DM}	±40	±40	
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.

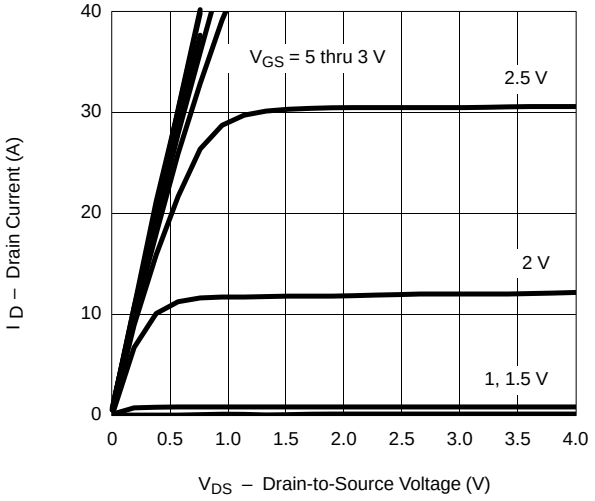
SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

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	0.6			V
		V_{DS} = V_{GS}, I_D = –250 µA	P-Ch	–0.6			
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±12 V	N-Ch			±100	nA
			P-Ch			±100	
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			5	
		V_{DS} = –20 V, V_{GS} = 0 V, T_J = 55°C	P-Ch			–5	
On-State Drain Current[b]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 4.5 V	N-Ch	20			A
		V_{DS} ≤ –5 V, V_{GS} = –4.5 V	P-Ch	–20			
Drain-Source On-State Resistance[b]	$r_{DS(on)}$	V_{GS} = 4.5 V, I_D = 7.1 A	N-Ch		0.019	0.025	Ω
		V_{GS} = –4.5 V, I_D = –6.2 A	P-Ch		0.027	0.033	
		V_{GS} = 2.5 V, I_D = 6.0 A	N-Ch		0.025	0.035	
		V_{GS} = –2.5 V, I_D = –5.0 A	P-Ch		0.040	0.050	
Forward Transconductance[b]	g_{fs}	V_{DS} = 10 V, I_D = 7.1 A	N-Ch		27		S
		V_{DS} = –10 V, I_D = –6.2 A	P-Ch		20		
Diode Forward Voltage[b]	V_{SD}	I_S = 1.7 A, V_{GS} = 0 V	N-Ch			1.2	V
		I_S = –1.7 A, V_{GS} = 0 V	P-Ch			–1.2	
Dynamic[a]							
Total Gate Charge	Q_g	N-Channel V_{DS} = 10 V, V_{GS} = 4.5 V, I_D = 7.1 A; P-Channel V_{DS} = –10 V, V_{GS} = –4.5 V, I_D = –6.2 A	N-Ch		25	50	nC
			P-Ch		22	35	
Gate-Source Charge	Q_{gs}		N-Ch		6.5		
			P-Ch		7		
Gate-Drain Charge	Q_{gd}		N-Ch		4		
			P-Ch		3.5		
Turn-On Delay Time	$t_{d(on)}$	N-Channel V_{DD} = 10 V, R_L = 10 Ω, I_D ≅ 1 A, V_{GEN} = 4.5 V, R_G = 6 Ω; P-Channel V_{DD} = –10 V, R_L = 10 Ω, I_D ≅ –1 A, V_{GEN} = –4.5 V, R_G = 6 Ω	N-Ch		40	60	ns
			P-Ch		27	50	
Rise Time	t_r		N-Ch		40	60	
			P-Ch		32	50	
Turn-Off Delay Time	$t_{d(off)}$		N-Ch		90	150	
			P-Ch		95	150	
Fall Time	t_f		N-Ch		40	60	
			P-Ch		45	70	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 1.7 A, di/dt = 100 A/µs	N-Ch		40	80	
		I_F = –1.7 A, di/dt = 100 A/µs	P-Ch		40	80	

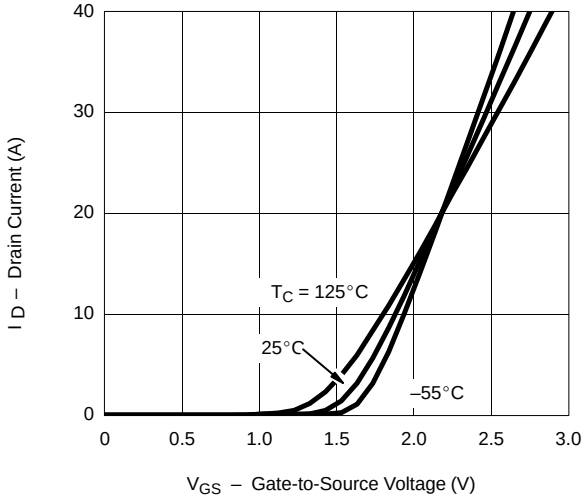
Notes
a. For design aid only; not subject to production testing.
b. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.

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

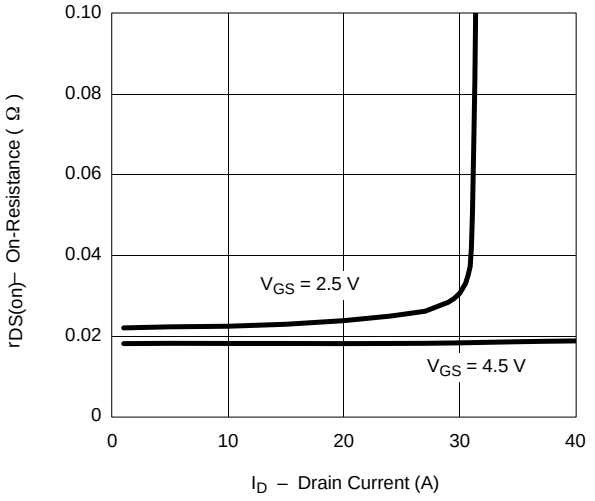
Output Characteristics



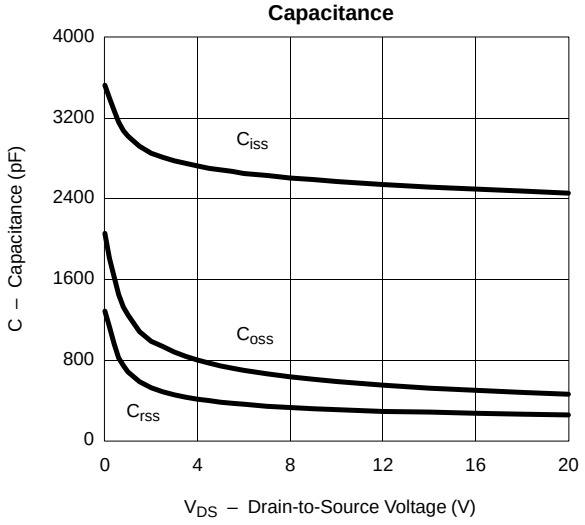
Transfer Characteristics



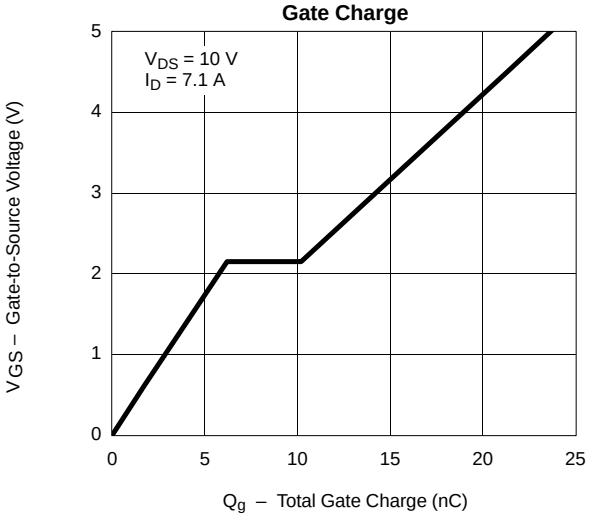
On-Resistance vs. Drain Current



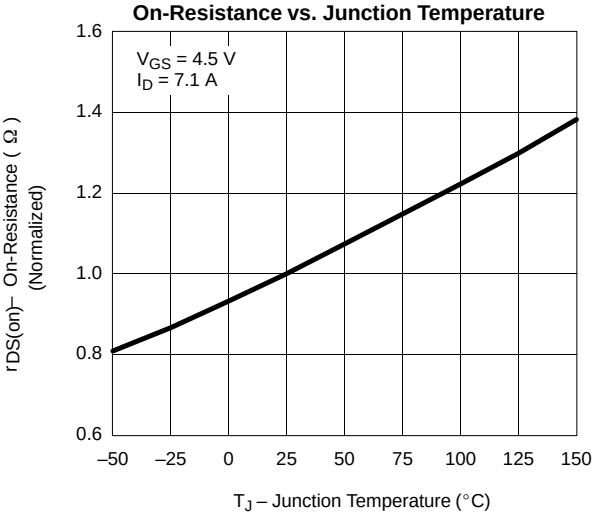
Capacitance



Gate Charge

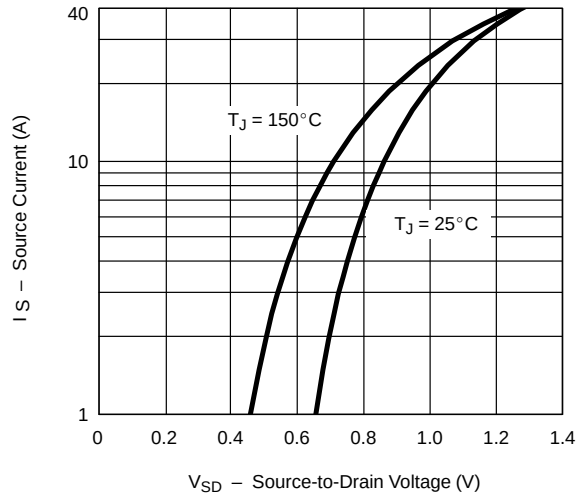


On-Resistance vs. Junction Temperature

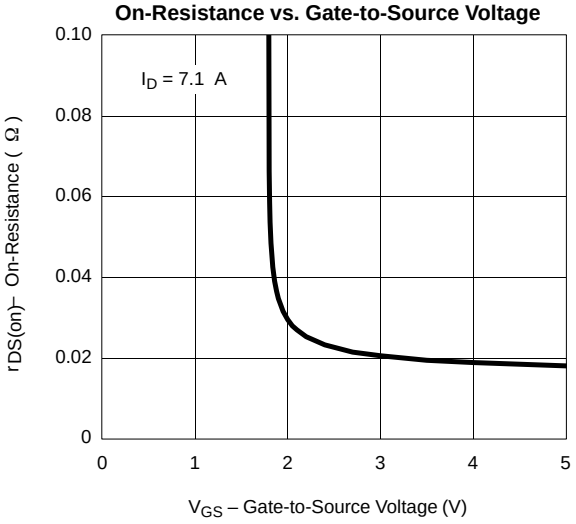


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) N-CHANNEL

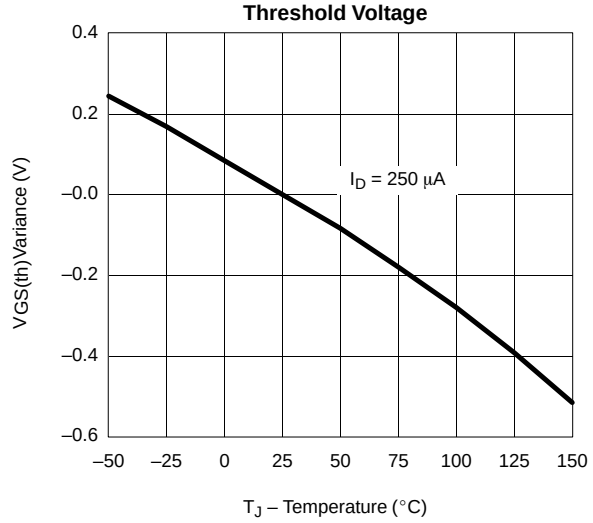
Source-Drain Diode Forward Voltage



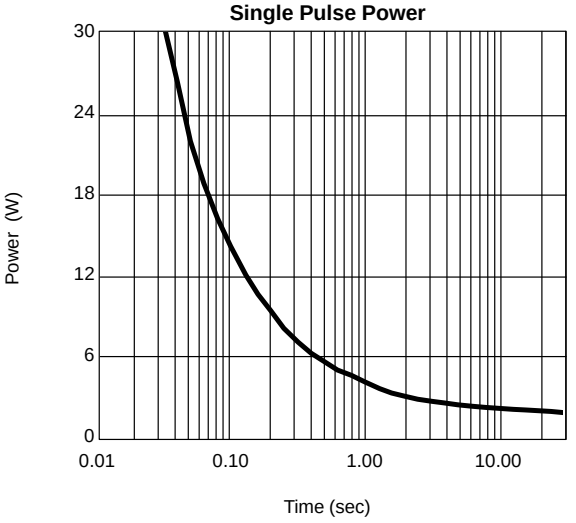
On-Resistance vs. Gate-to-Source Voltage



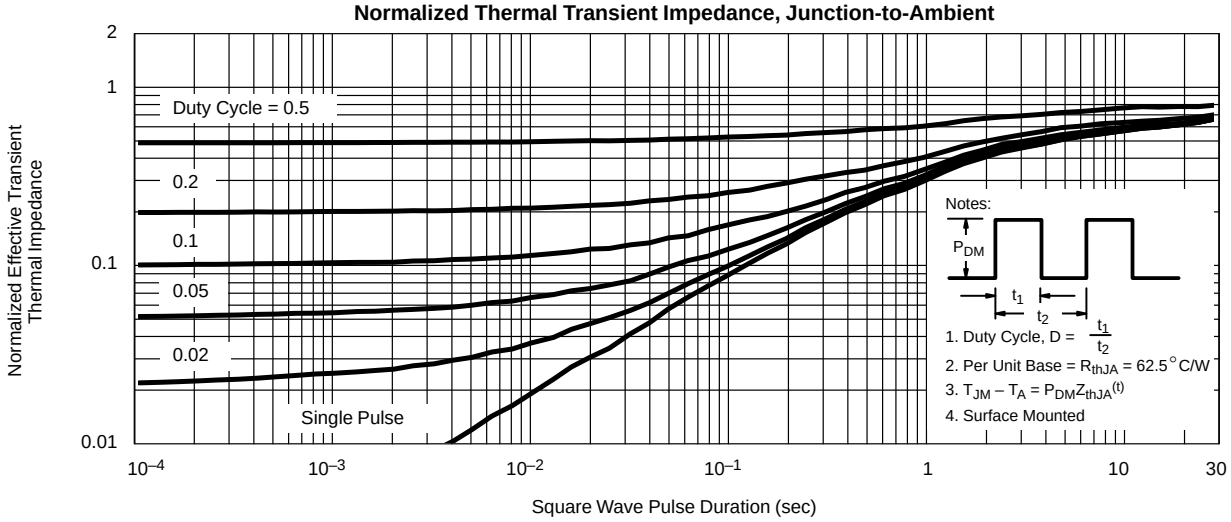
Threshold Voltage



Single Pulse Power

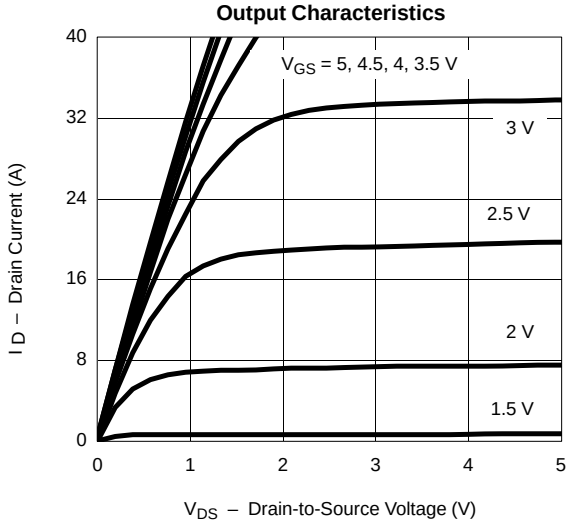


Normalized Thermal Transient Impedance, Junction-to-Ambient

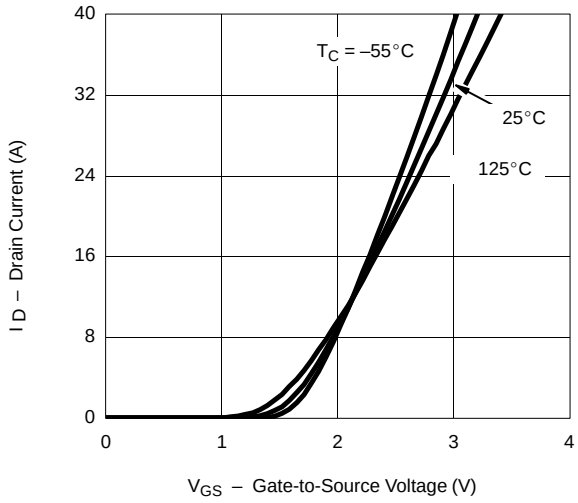


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) P-CHANNEL

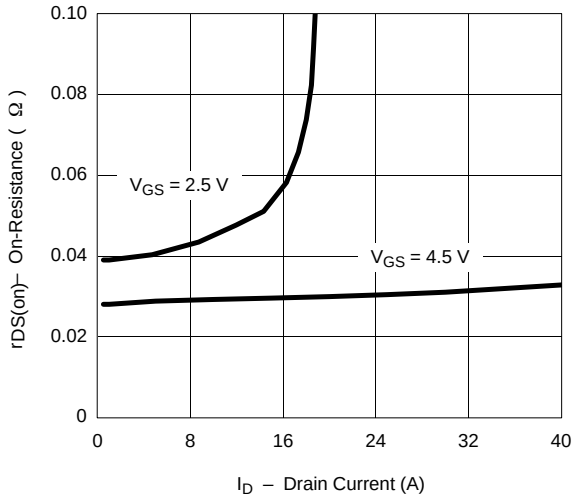
Output Characteristics



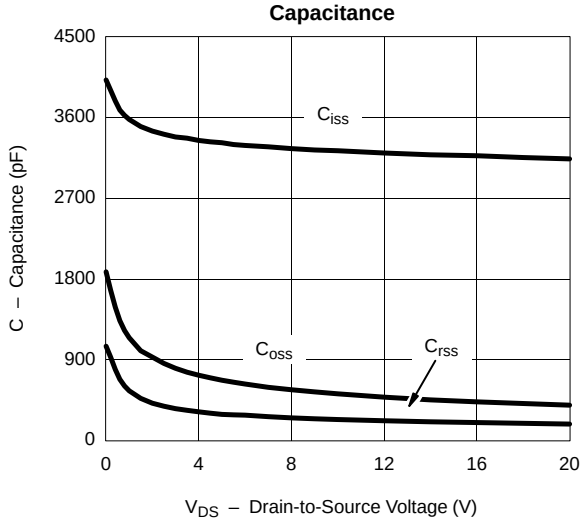
Transfer Characteristics



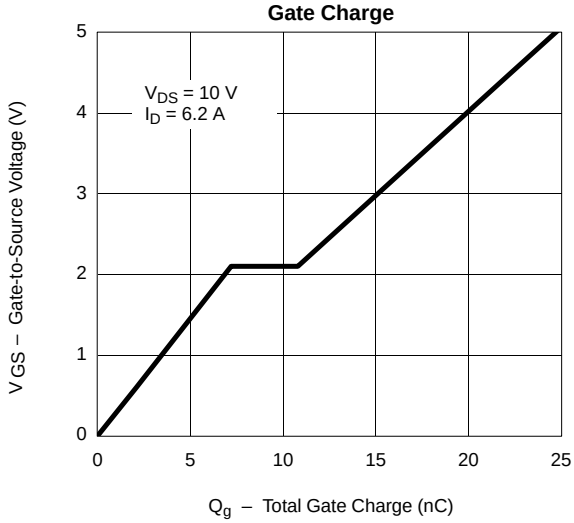
On-Resistance vs. Drain Current



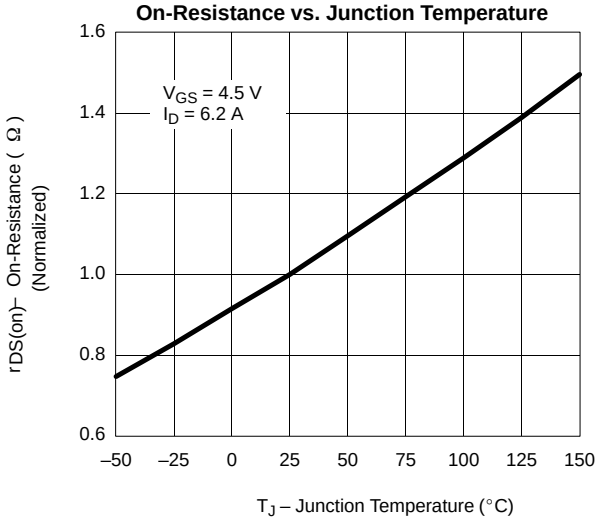
Capacitance



Gate Charge

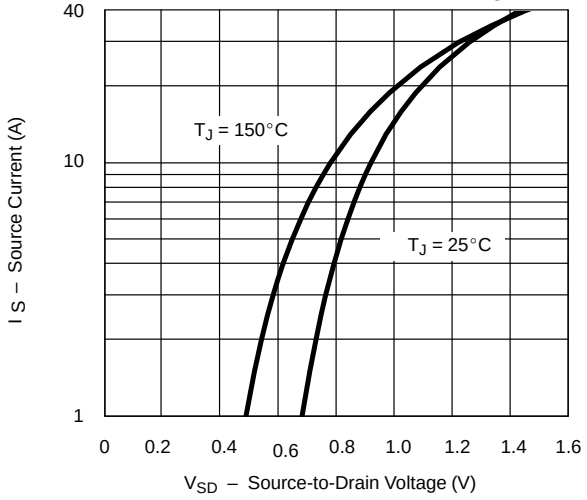


On-Resistance vs. Junction Temperature

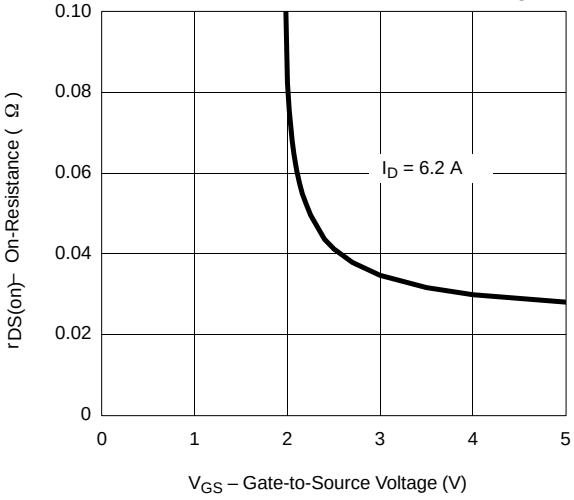


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) P-CHANNEL

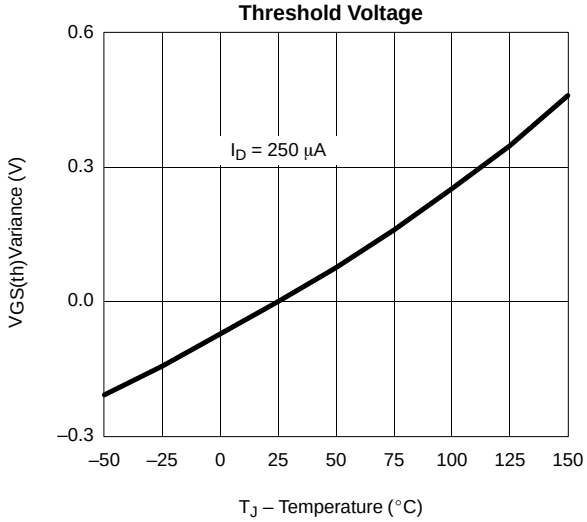
Source-Drain Diode Forward Voltage



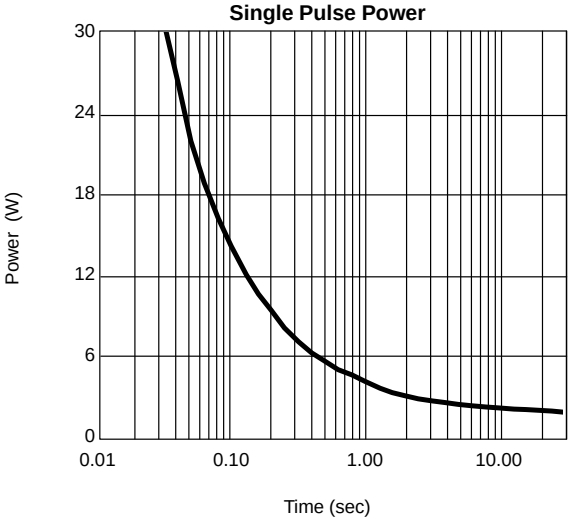
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient