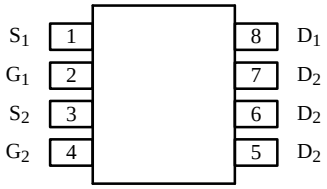
Asymmetrical Dual N-Channel 30-V (D-S) Rated MOSFET

Product Summary

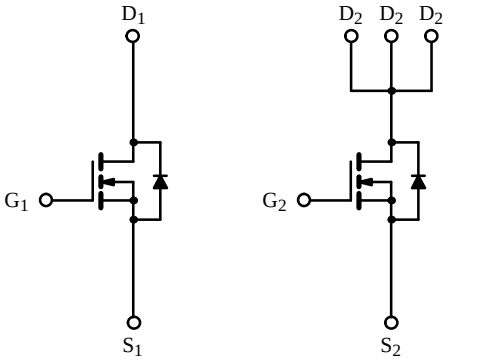
	V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
N-Channel 1	30	0.065 @ V_{GS} = 10 V	± 3.0
		0.095 @ V_{GS} = 4.5 V	± 2.5
N-Channel 2		0.028 @ V_{GS} = 10 V	± 6.7
		0.042 @ V_{GS} = 4.5 V	± 5.4

TrenchFET™ Power MOSFETs

SO-8



Top View



N-Channel MOSFET 1 N-Channel MOSFET 2

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

Parameter		Symbol	N-Channel 1	N-Channel 2	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	± 3.0	± 6.7	A
	T_A = 70°C		± 2.4	± 5.4	
Pulsed Drain Current		I_{DM}	± 20	± 30	
Continuous Source Current (Diode Conduction)[a]		I_S	1.25	2.0	
Maximum Power Dissipation[a]	T_A = 25°C	P_D	1.0	2.25	W
	T_A = 70°C		0.64	1.5	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	–55 to 150	–55 to 150	°C

Thermal Resistance Ratings

Parameter	Symbol	N-Channel 1	N-Channel 2	Unit
Maximum Junction-to-Ambient[a]	R_{thJA}	125	55	°C/W

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

Updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #70632. A SPICE Model data sheet is available for this product (FaxBack document #70561).

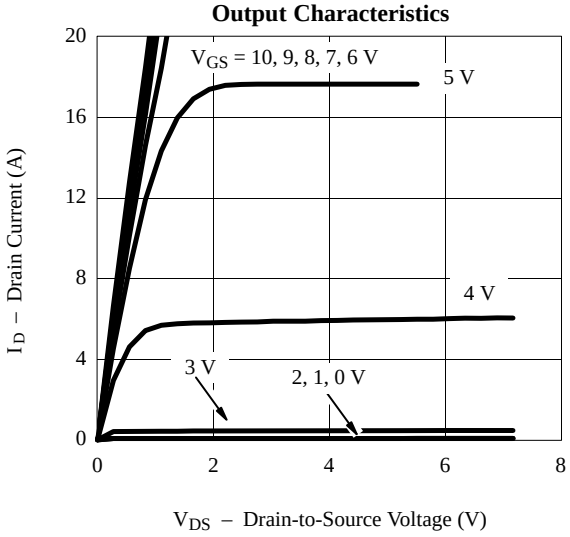
Specifications (T_J = 25°C Unless Otherwise Noted)

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	1.0			V
			N-Ch 2	1.0			
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V	N-Ch 1			±100	nA
			N-Ch 2			±100	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 30 V, V_{GS} = 0 V	N-Ch 1			1	µA
			N-Ch 2			1	
		V_{DS} = 30 V, V_{GS} = 0 V, T_J = 55°C	N-Ch 1			25	
			N-Ch 2			25	
On-State Drain Current[b]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 10 V	N-Ch 1	20			A
			N-Ch 2	30			
Drain-Source On-State Resistance[b]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 3.0 A	N-Ch 1		0.043	0.065	Ω
		V_{GS} = 10 V, I_D = 6.7 A	N-Ch 2		0.021	0.028	
		V_{GS} = 4.5 V, I_D = 2.5 A	N-Ch 1		0.073	0.095	
		V_{GS} = 4.5 V, I_D = 5.4 A	N-Ch 2		0.032	0.042	
Forward Transconductance[b]	g_{fs}	V_{DS} = 15 V, I_D = 3.0 A	N-Ch 1		6.0		S
		V_{DS} = 15 V, I_D = 6.7 A	N-Ch 2		15.5		
Diode Forward Voltage[b]	V_{SD}	I_S = 1.25 A, V_{GS} = 0 V	N-Ch 1		0.75	1.2	V
		I_S = 2.0 A, V_{GS} = 0 V	N-Ch 2		0.8	1.2	
Dynamic[a]							
Total Gate Charge	Q_g	N-Channel 1 V_{DS} = 15 V, V_{GS} = 10 V, I_D = 3.0 A N-Channel 2 V_{DS} = 15 V, V_{GS} = 10 V, I_D = 6.7 A	N-Ch 1		10	15	nC
			N-Ch 2		24	30	
Gate-Source Charge	Q_{gs}		N-Ch 1		2.1		
			N-Ch 2		4.8		
Gate-Drain Charge	Q_{gd}		N-Ch 1		1.7		
			N-Ch 2		4.6		
Turn-On Delay Time	$t_{d(on)}$	N-Channel 1 V_{DD} = 15 V, R_L = 15 Ω I_D ≅ 1 A, V_{GEN} = 10 V, R_G = 6 Ω N-Channel 2 V_{DD} = 15 V, R_L = 15 Ω I_D ≅ 1 A, V_{GEN} = 10 V, R_G = 6 Ω	N-Ch 1		10	15	ns
			N-Ch 2		14	20	
Rise Time	t_r		N-Ch 1		8	15	
			N-Ch 2		10	20	
Turn-Off Delay Time	$t_{d(off)}$		N-Ch 1		19	30	
			N-Ch 2		36	55	
Fall Time	t_f		N-Ch 1		8	15	
			N-Ch 2		12	20	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 1.25 A, di/dt = 100 A/µs	N-Ch 1		45	80	
		I_F = 2.0 A, di/dt = 100 A/µs	N-Ch 2		48	80	

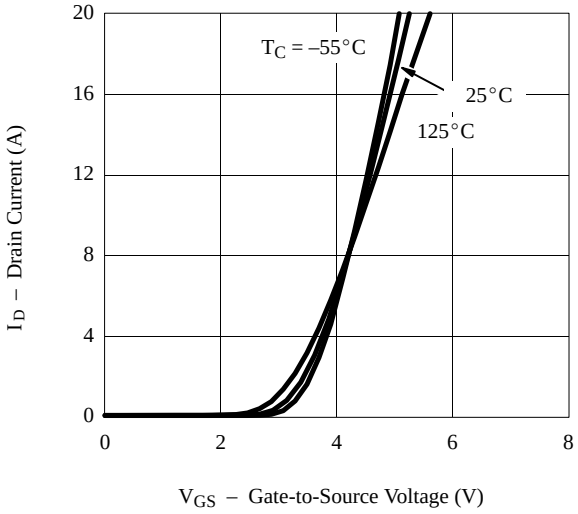
Notes
a. For design aid only; not subject to production testing.
b. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.

Typical Characteristics (25°C Unless Noted) N-Channel 1

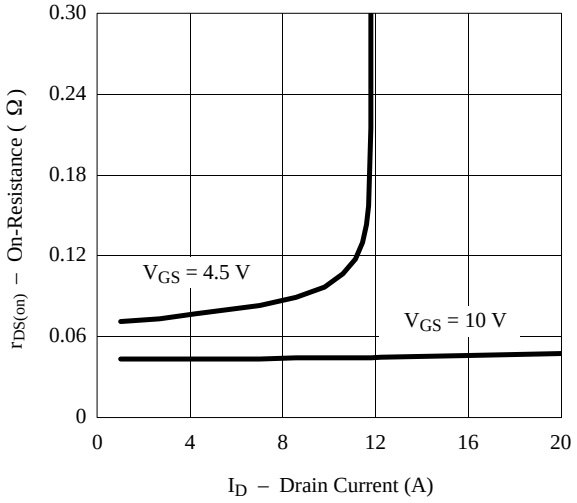
Output Characteristics



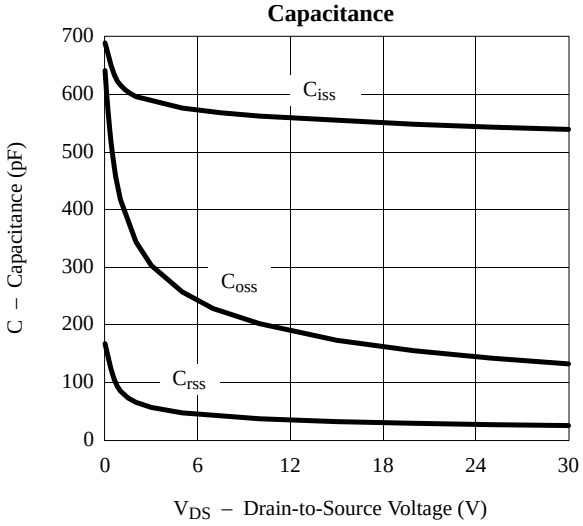
Transfer Characteristics



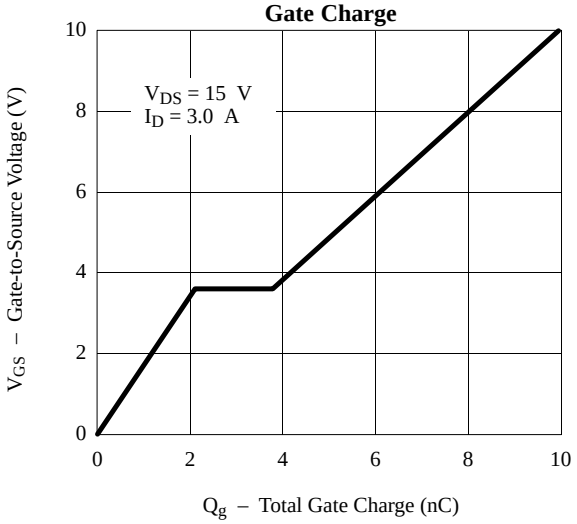
On-Resistance vs. Drain Current



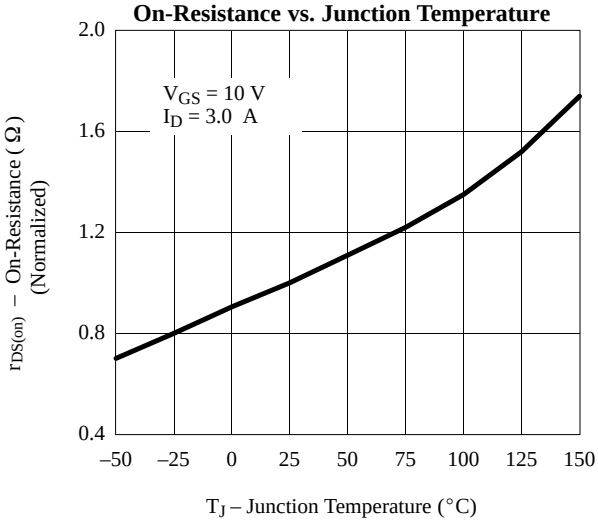
Capacitance



Gate Charge

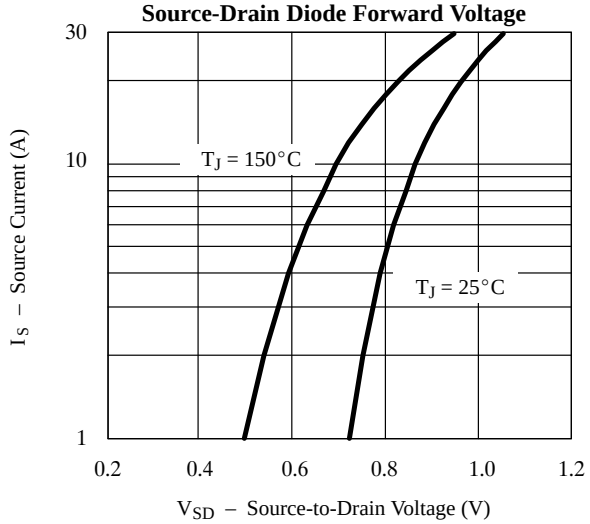


On-Resistance vs. Junction Temperature

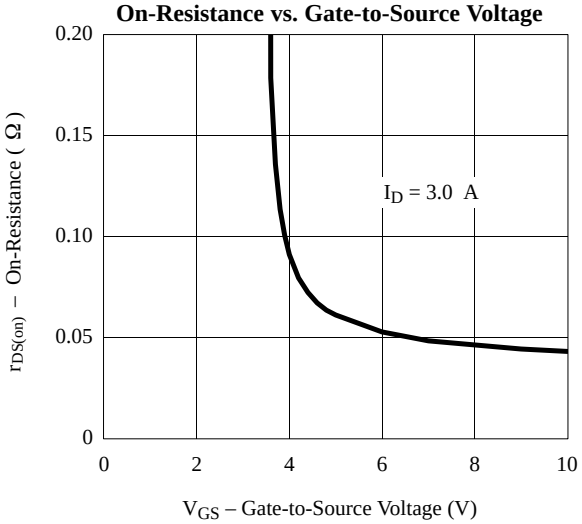


Typical Characteristics (25°C Unless Noted) N-Channel 1

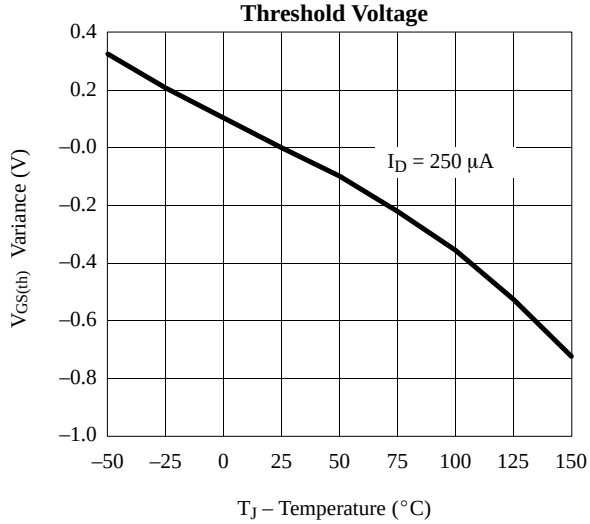
Source-Drain Diode Forward Voltage



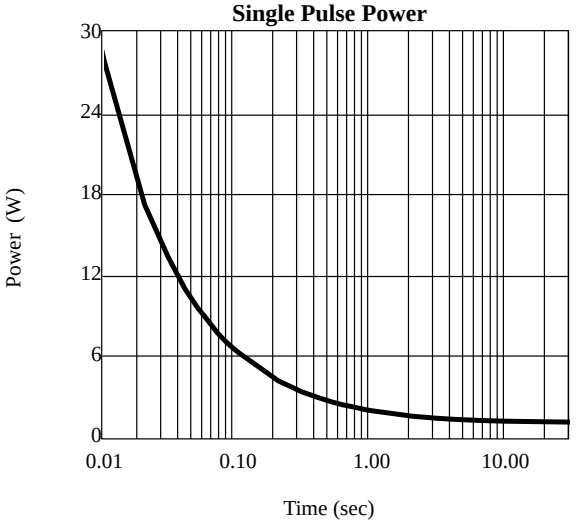
On-Resistance vs. Gate-to-Source Voltage



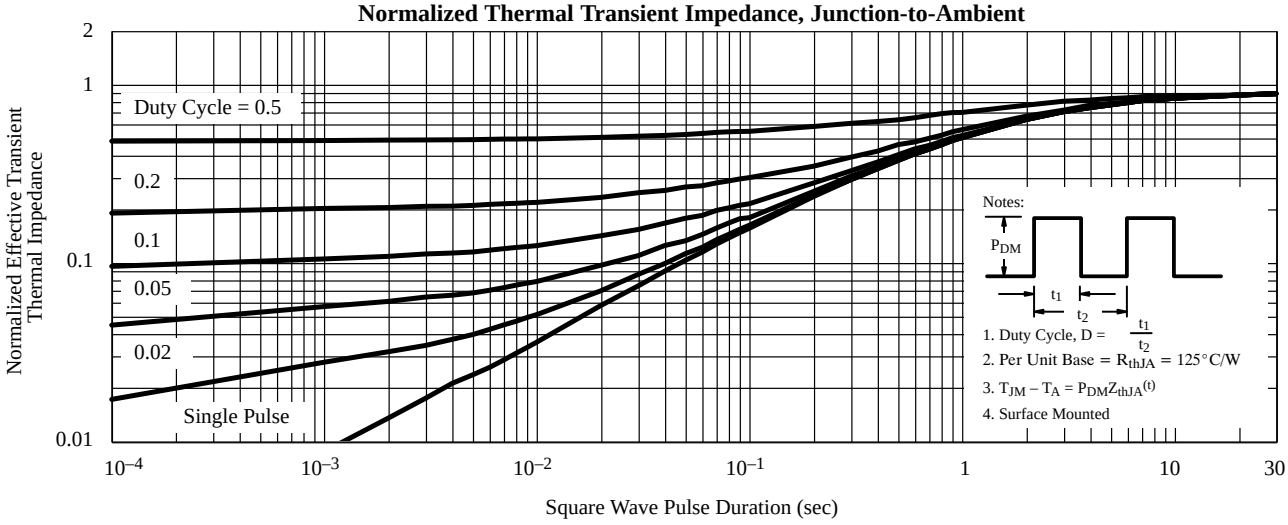
Threshold Voltage



Single Pulse Power

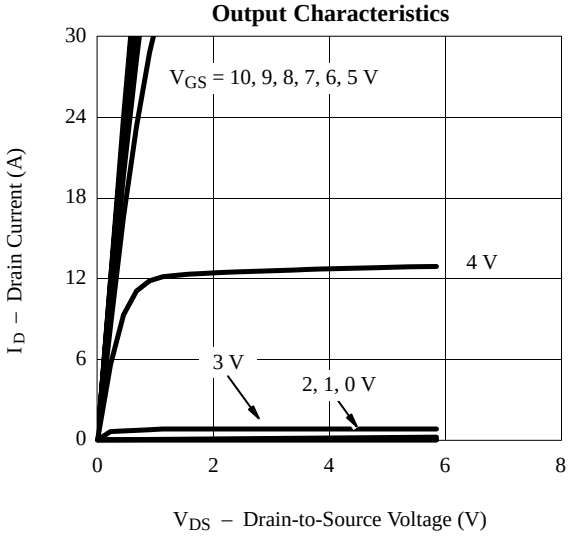


Normalized Thermal Transient Impedance, Junction-to-Ambient

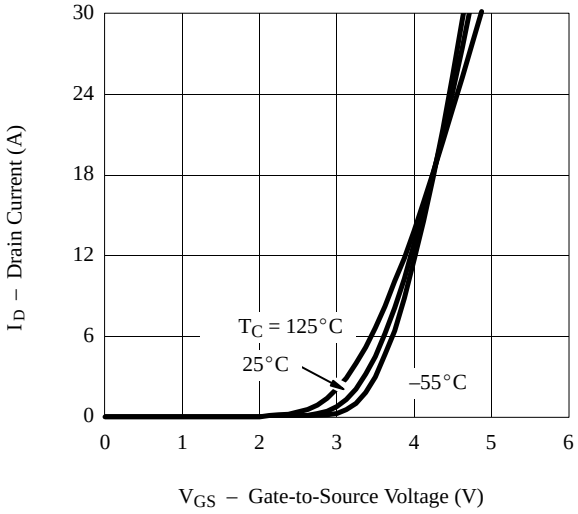


Typical Characteristics (25°C Unless Noted) N-Channel 2

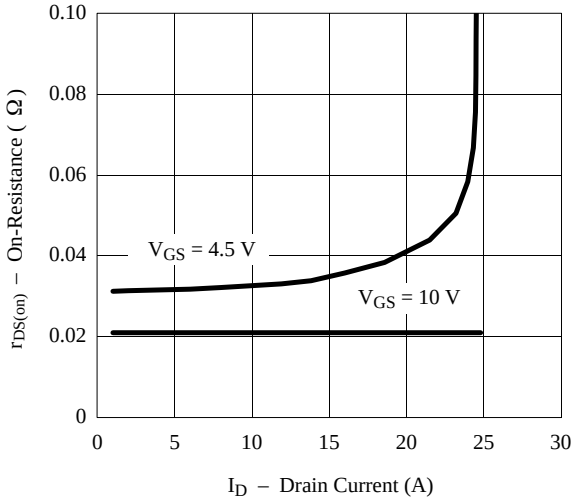
Output Characteristics



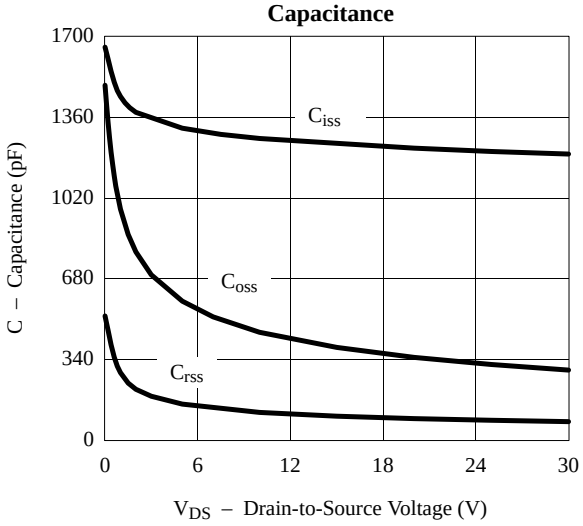
Transfer Characteristics



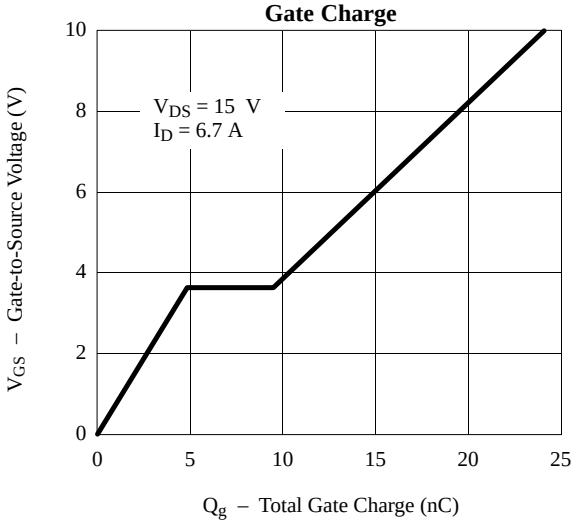
On-Resistance vs. Drain Current



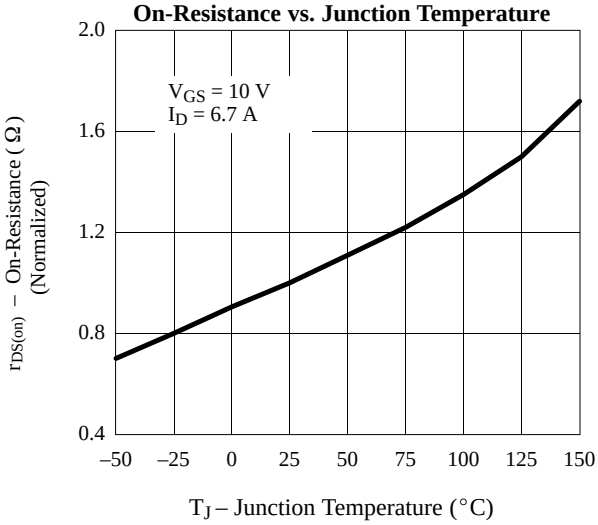
Capacitance



Gate Charge

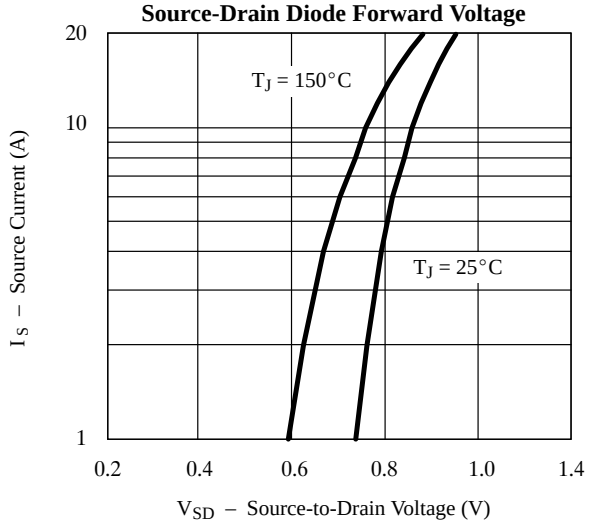


On-Resistance vs. Junction Temperature

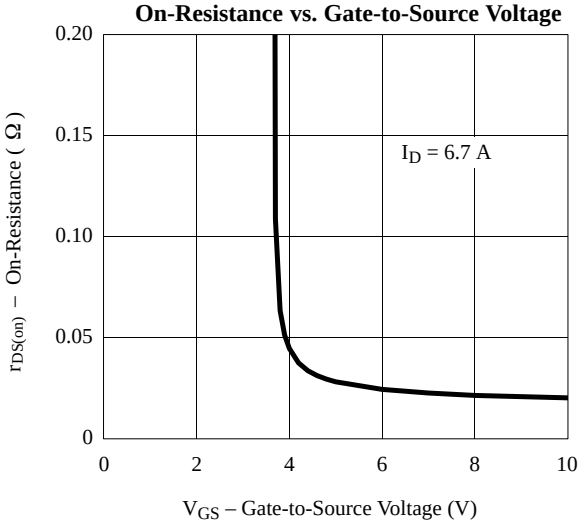


Typical Characteristics (25°C Unless Noted) N-Channel 2

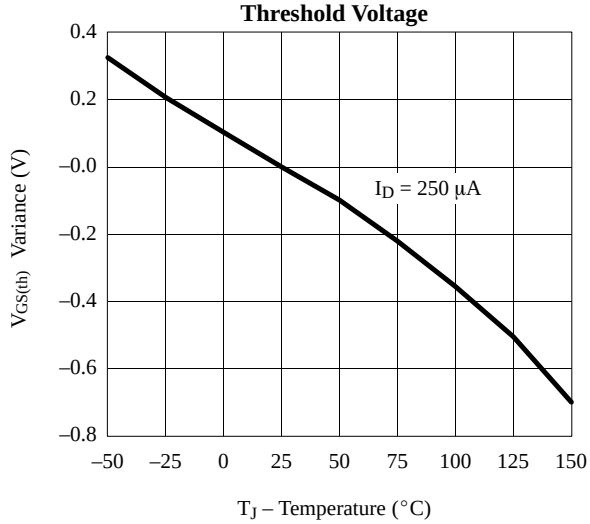
Source-Drain Diode Forward Voltage



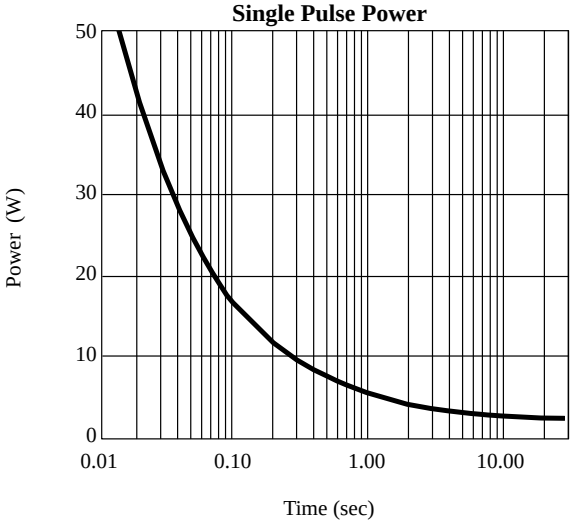
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient