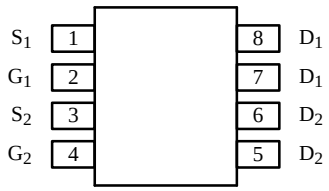
Dual Enhancement-Mode MOSFET (N- and P-Channel)

Product Summary

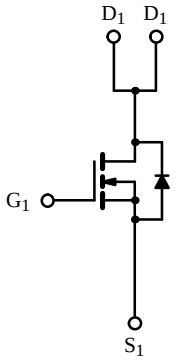
	V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
N-Channel	20	0.05 @ V_{GS} = 4.5 V	± 5.0
		0.06 @ V_{GS} = 3.0 V	± 4.2
		0.08 @ V_{GS} = 2.7 V	± 3.6
P-Channel	–20	0.11 @ V_{GS} = –4.5 V	± 3.4
		0.15 @ V_{GS} = –3.0 V	± 2.9
		0.19 @ V_{GS} = –2.7 V	± 2.6

Recommended upgrade: Si9529DY
Lower profile/smaller size—see LITE FOOT® equivalent: Si6552DQ

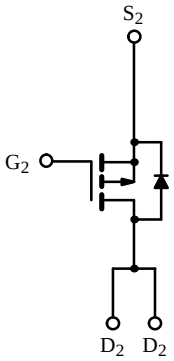
SO-8



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	± 5.0	± 3.4	A
	T_A = 70°C		± 4.0	± 2.8	
Pulsed Drain Current		I_{DM}	± 10	± 10	
Continuous Source Current (Diode Conduction)[a]		I_S	2.0	–2.0	
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 #1225.

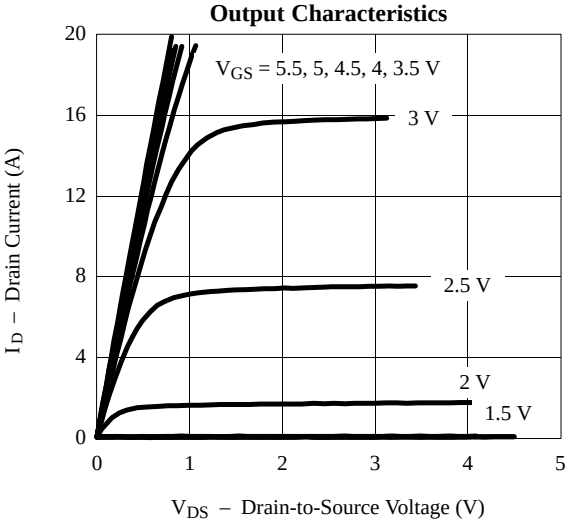
Specifications (T_J = 25°C Unless Otherwise Noted)

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	0.8	1.2		V
		V_{DS} = V_{GS}, I_D = –250 µA	P-Ch	–0.8	–1.1		
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} = 16 V, V_{GS} = 0 V	N-Ch			1	µA
		V_{DS} = – 16 V, V_{GS} = 0 V	P-Ch			–1	
		V_{DS} = 10 V, V_{GS} = 0 V, T_J = 70°C	N-Ch			5	
		V_{DS} = –10 V, V_{GS} = 0 V, T_J = 70°C	P-Ch			–5	
On-State Drain Current[b]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 4.5 V	N-Ch	10			A
		V_{DS} ≤ –5 V, V_{GS} = –4.5 V	P-Ch	–10			
Drain-Source On-State Resistance[b]	$r_{DS(on)}$	V_{GS} = 4.5 V, I_D = 5.0 A	N-Ch		0.041	0.05	Ω
		V_{GS} = –4.5 V, I_D = –3.2 A	P-Ch		0.087	0.11	
		V_{GS} = 3.0 V, I_D = 3.9 A	N-Ch		0.052	0.06	
		V_{GS} = –3.0 V, I_D = –2.0 A	P-Ch		0.120	0.15	
		V_{GS} = 2.7 V, I_D = 1.0 A	N-Ch		0.060	0.08	
		V_{GS} = –2.7 V, I_D = –1.0 A	P-Ch		0.135	0.19	
Forward Transconductance[b]	g_{fs}	V_{DS} = 10 V, I_D = 5.0 A	N-Ch		13		S
		V_{DS} = –9 V, I_D = –3.2 A	P-Ch		8		
Diode Forward Voltage[b]	V_{SD}	I_S = 5.0 A, V_{GS} = 0 V	N-Ch		0.9	1.2	V
		I_S = –2.0 A, V_{GS} = 0 V	P-Ch		–0.9	–1.2	
Dynamic[a]							
Total Gate Charge	Q_g	N-Channel V_{DS} = 6 V, V_{GS} = 4.5 V, I_D = 5.0 A P-Channel V_{DS} = –6 V, V_{GS} = –4.5 V, I_D = –3.2 A	N-Ch		10	20	nC
			P-Ch		8	20	
Gate-Source Charge	Q_{gs}		N-Ch		2.6		
			P-Ch		1.6		
Gate-Drain Charge	Q_{gd}		N-Ch		3.7		
			P-Ch		3.5		
Turn-On Delay Time	$t_{d(on)}$	N-Channel V_{DD} = 6 V, R_L = 6 Ω I_D ≅ 1 A, V_{GEN} = 4.5 V, R_G = 6 Ω P-Channel V_{DD} = –6 V, R_L = 6 Ω I_D ≅ –1 A, V_{GEN} = –4.5 V, R_G = 6 Ω	N-Ch		13	30	ns
			P-Ch		22	40	
Rise Time	t_r		N-Ch		9	40	
			P-Ch		43	80	
Turn-Off Delay Time	$t_{d(off)}$		N-Ch		30	60	
			P-Ch		35	70	
Fall Time	t_f		N-Ch		9	30	
			P-Ch		20	40	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 5.0 A, di/dt = 100 A/µs	N-Ch		100	150	
		I_F = –2.0 A, di/dt = 100 A/µs	P-Ch		75	100	

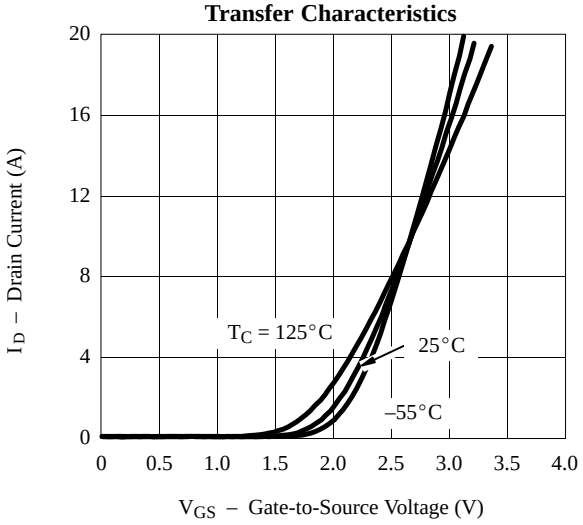
Notes
a. For design aid only; not subject to production testing.
b. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.

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

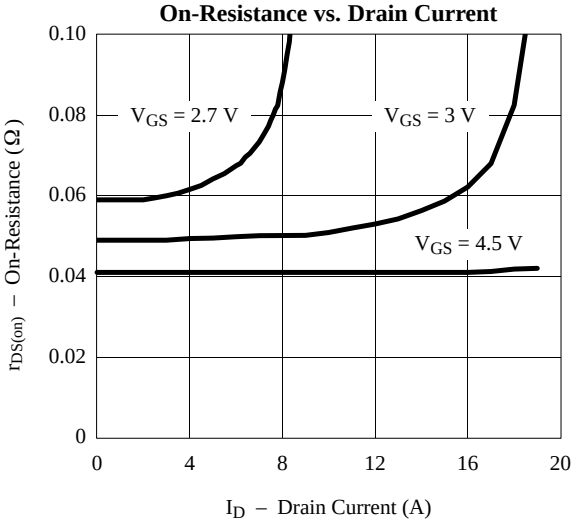
Output Characteristics



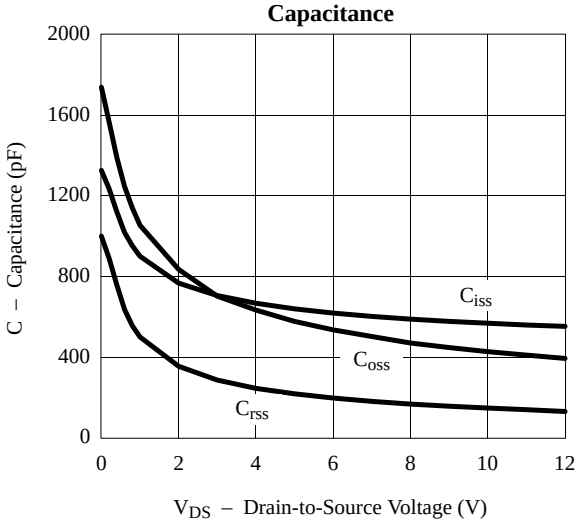
Transfer Characteristics



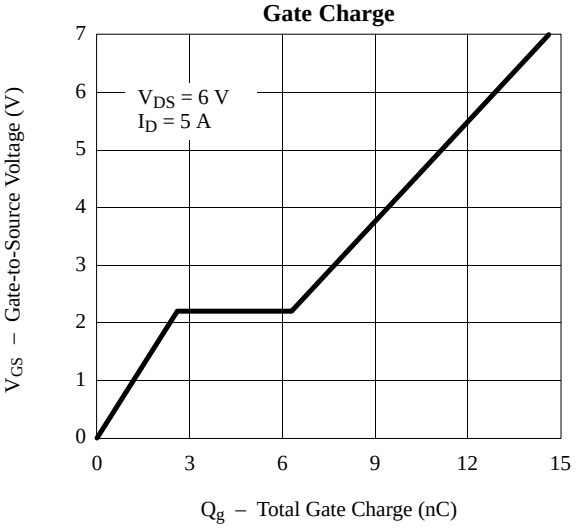
On-Resistance vs. Drain Current



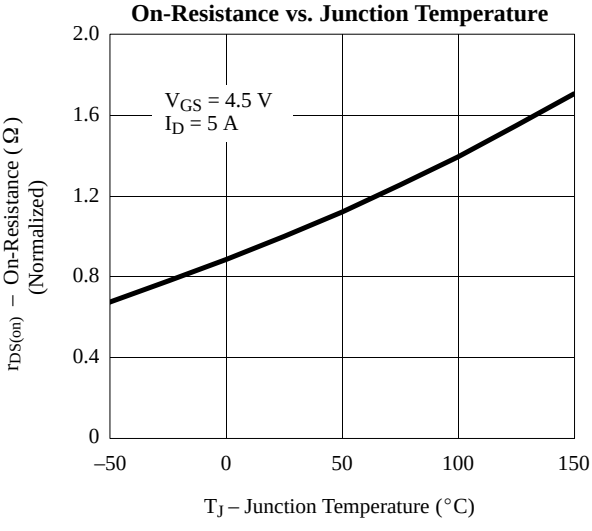
Capacitance



Gate Charge

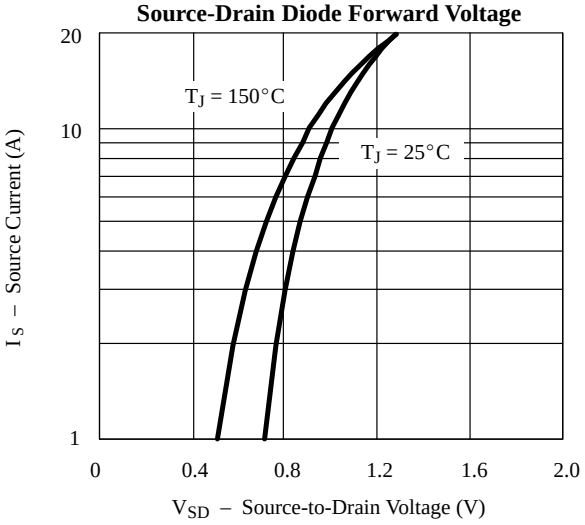


On-Resistance vs. Junction Temperature

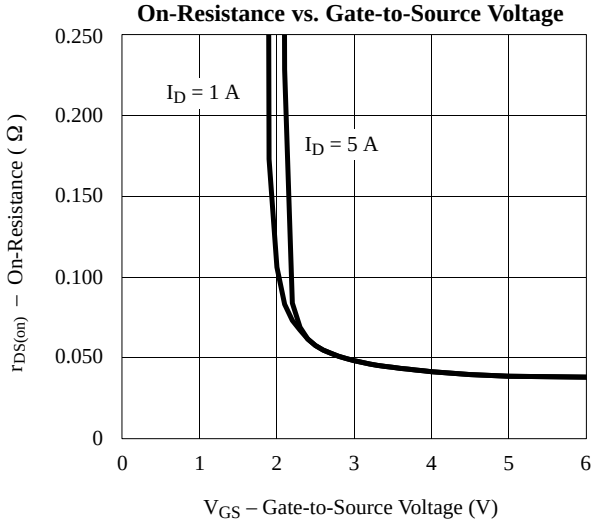


Typical Characteristics (25°C Unless Noted) N-Channel

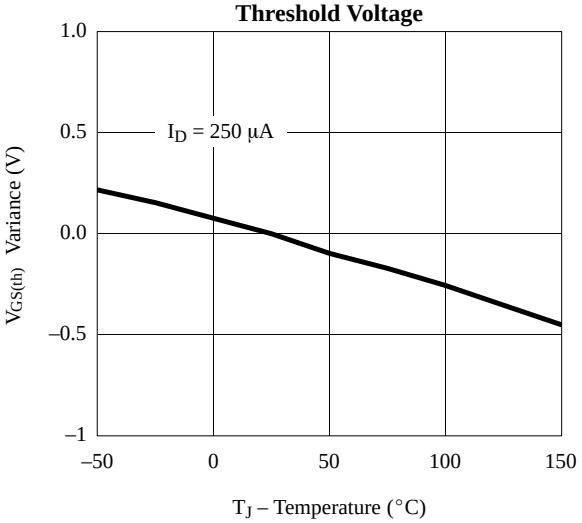
Source-Drain Diode Forward Voltage



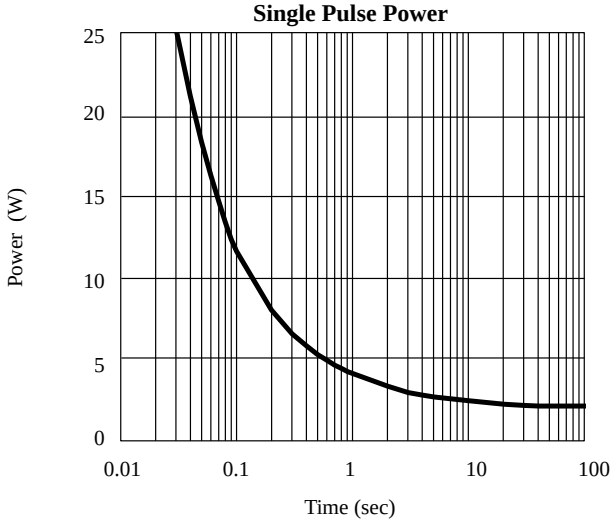
On-Resistance vs. Gate-to-Source Voltage



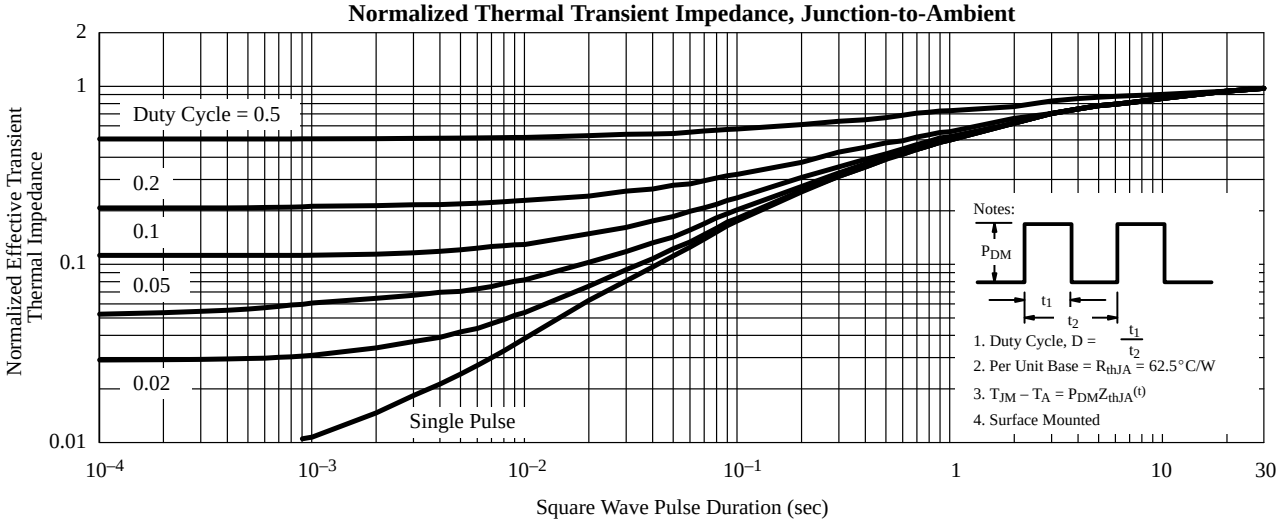
Threshold Voltage



Single Pulse Power

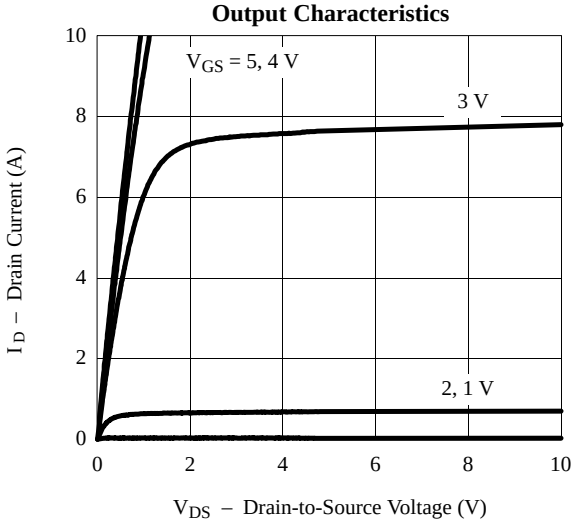


Normalized Thermal Transient Impedance, Junction-to-Ambient

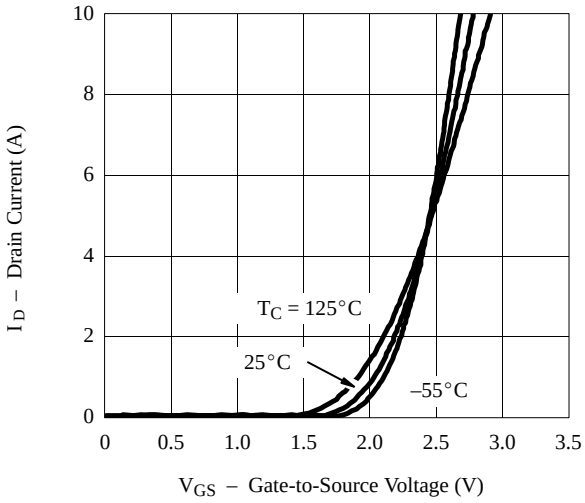


Typical Characteristics (25°C Unless Noted) P-Channel

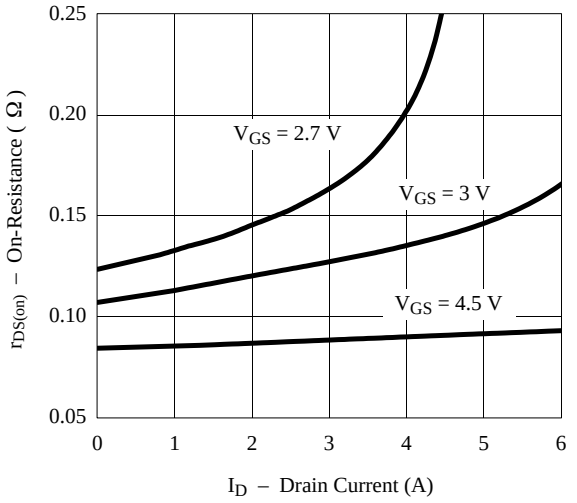
Output Characteristics



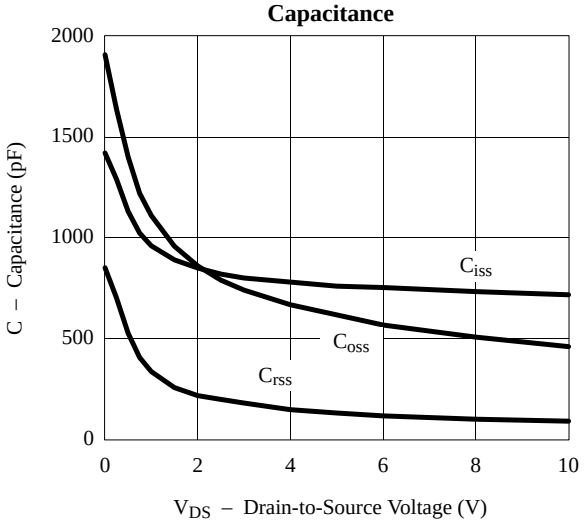
Transfer Characteristics



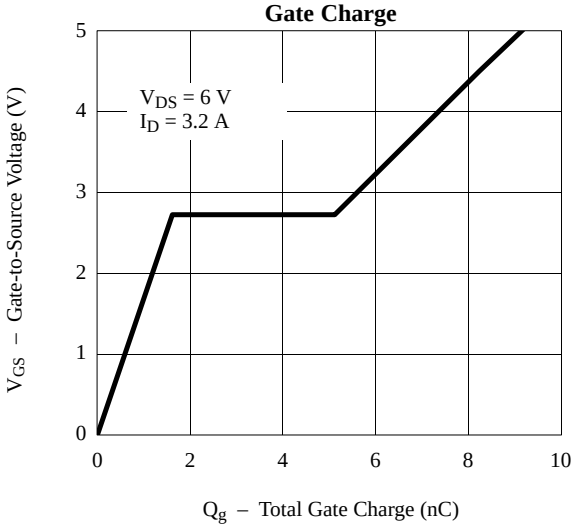
On-Resistance vs. Drain Current



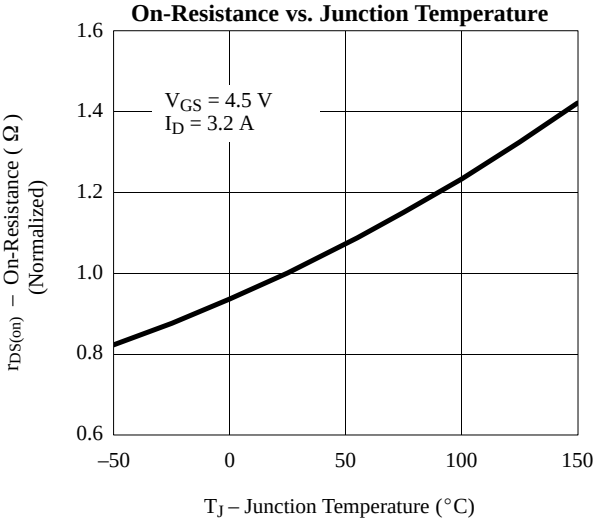
Capacitance



Gate Charge

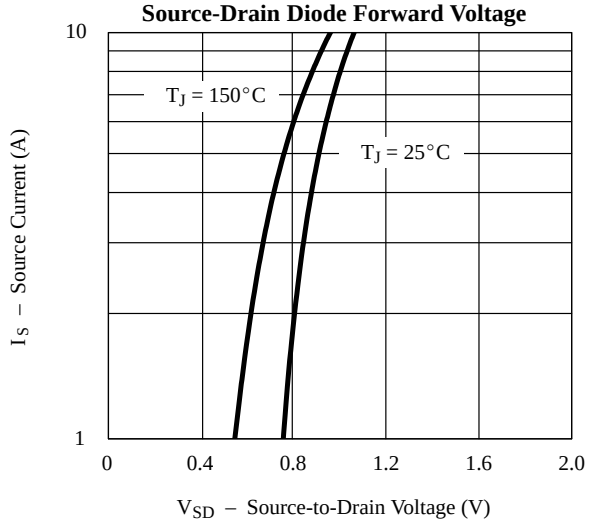


On-Resistance vs. Junction Temperature

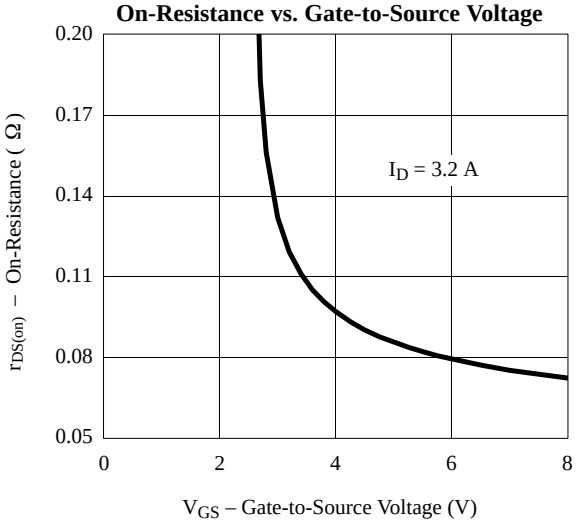


Typical Characteristics (25°C Unless Noted) P-Channel

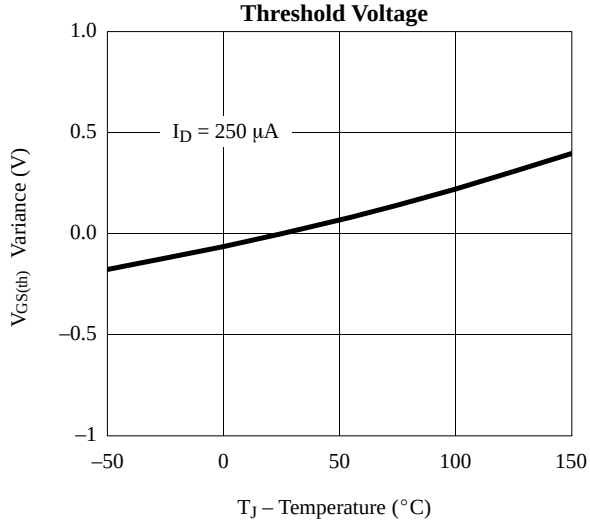
Source-Drain Diode Forward Voltage



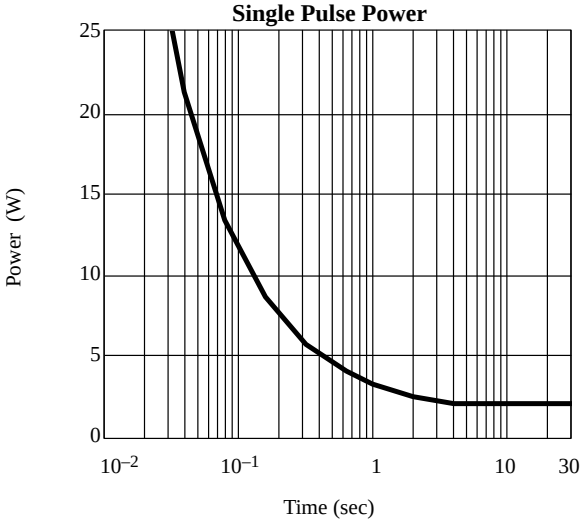
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient