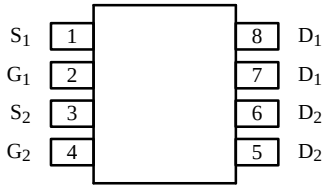
Dual Enhancement-Mode MOSFET (N- and P- Channel)

Product Summary

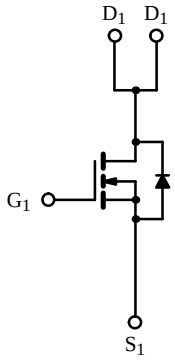
	V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
N-Channel	20	0.10 @ V_{GS} = 10 V	± 3.5
		0.12 @ V_{GS} = 6 V	± 3
		0.15 @ V_{GS} = 4.5 V	± 2.5
P-Channel	–20	0.10 @ V_{GS} = –10 V	± 3.5
		0.12 @ V_{GS} = –6V	± 3
		0.19 @ V_{GS} = –4.5 V	± 2.5

Recommended upgrade: Si4532DY or Si4539DY
Lower profile/smaller size—see LITE FOOT® equivalent: Si6543DQ

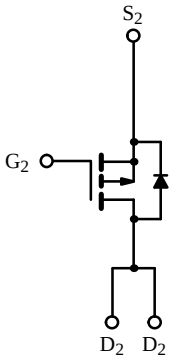
SO-8



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}	± 20	± 20	
Continuous Drain Current (T_J = 150°C)[a]	T_A = 25°C	I_D	± 3.5	± 3.5	A
	T_A = 70°C		± 2.8	± 2.8	
Pulsed Drain Current		I_{DM}	± 14	± 14	
Continuous Source Current (Diode Conduction)[a]		I_S	1.7	–1.7	
Maximum Power Dissipation[a]	T_A = 25°C	P_D	2.0		W
	T_A = 70°C		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 #1223. A SPICE Model data sheet is available for this product (FaxBack document #5115).

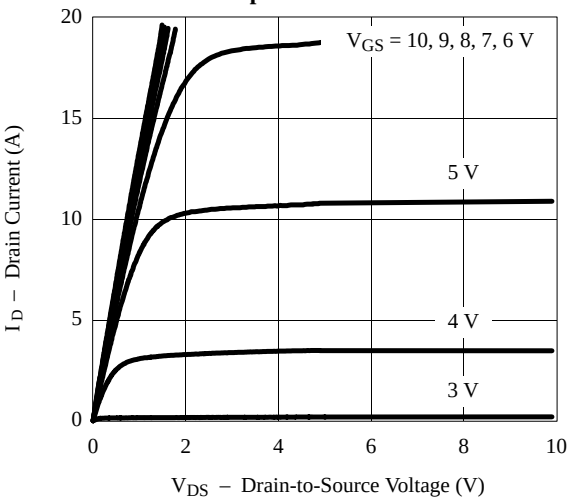
Specifications (T_J = 25°C Unless Otherwise Noted)

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				±100	nA
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} = 10 V	N-Ch	14			A
		V_{DS} ≤ –5 V, V_{GS} = –10 V	P-Ch	–14			
		V_{DS} ≥ 5 V, V_{GS} = 4.5 V	N-Ch	3.5			
		V_{DS} ≤ –5 V, V_{GS} = –4.5 V	P-Ch	–2.5			
Drain-Source On-State Resistance[b]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 3.5 A	N-Ch			0.10	Ω
		V_{GS} = –10 V, I_D = 3.5 A	P-Ch	0.05		0.10	
		V_{GS} = 6 V, I_D = 3 A	N-Ch			0.12	
		V_{GS} = – 6 V, I_D = 3 A	P-Ch	0.08		0.12	
		V_{GS} = 4.5 V, I_D = 2 A	N-Ch			0.15	
		V_{GS} = –4.5 V, I_D = 2 A	P-Ch			0.19	
Forward Transconductance[b]	g_{fs}	V_{DS} = 15 V, I_D = 3.5 A	N-Ch		5.6		S
		V_{DS} = –15 V, I_D = –3.5 A	P-Ch		4.0		
Diode Forward Voltage[b]	V_{SD}	I_S = 1.7 A, V_{GS} = 0 V	N-Ch		0.9	1.2	V
		I_S = –1.7 A, V_{GS} = 0 V	P-Ch		–0.9	–1.2	
Dynamic[a]							
Total Gate Charge	Q_g	N-Channel V_{DS} = 10 V, V_{GS} = 10 V, I_D = 3.5 A P-Channel V_{DS} = –10 V, V_{GS} = –10 V, I_D = –3.5 A	N-Ch		9	30	nC
			P-Ch		13	30	
Gate-Source Charge	Q_{gs}		N-Ch		1.0		
			P-Ch		2.0		
Gate-Drain Charge	Q_{gd}		N-Ch		3.1		
			P-Ch		5.4		
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		5	10	ns
			P-Ch		21	40	
Rise Time	t_r		N-Ch		12	25	
			P-Ch		12	25	
Turn-Off Delay Time	$t_{d(off)}$		N-Ch		17	30	
			P-Ch		12	30	
Fall Time	t_f		N-Ch		9	20	
			P-Ch		11	20	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 3.5 A, di/dt = 100 A/µs	N-Ch		60	100	
			P-Ch		50	100	

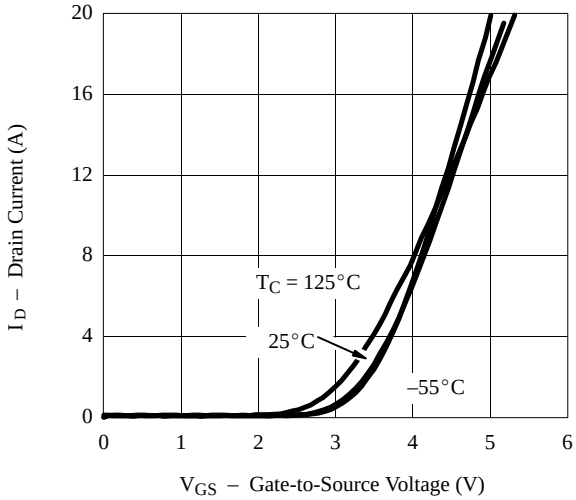
Notes
a. Guaranteed by design, not subject to production testing.
b. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.

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

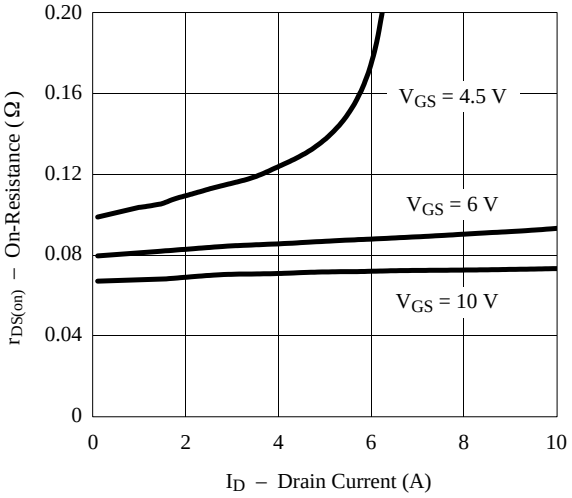
Output Characteristics



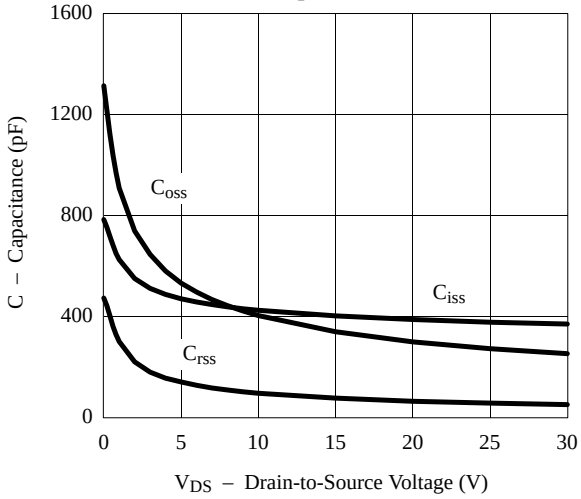
Transfer Characteristics



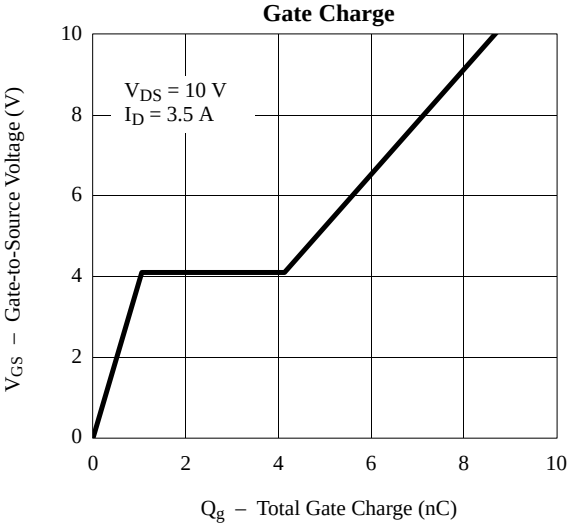
On-Resistance vs. Drain Current



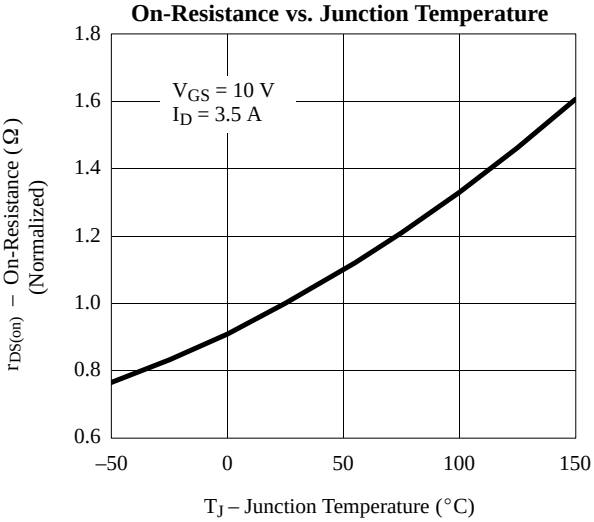
Capacitance



Gate Charge

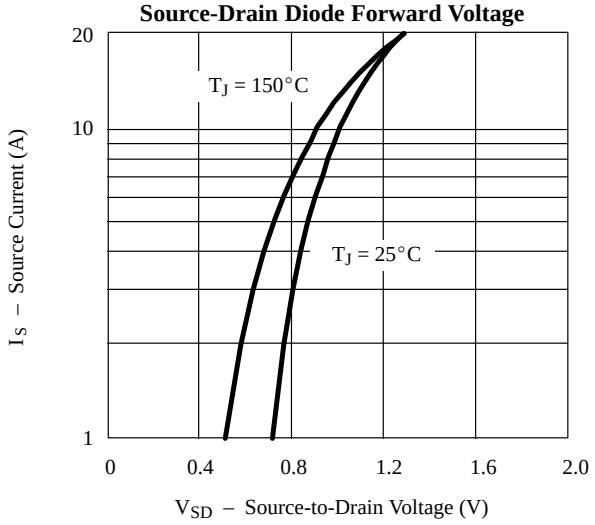


On-Resistance vs. Junction Temperature

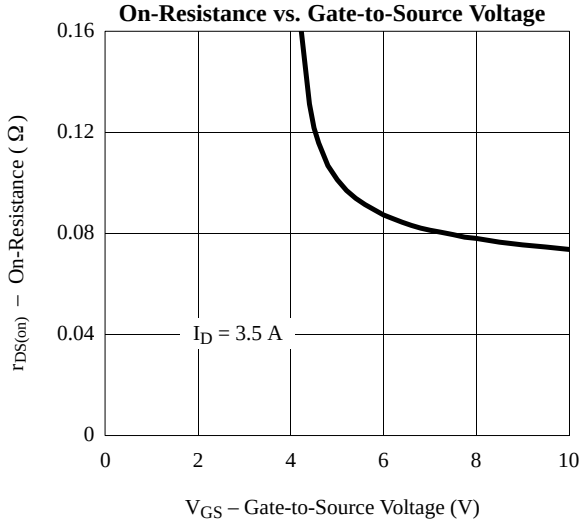


Typical Characteristics (25°C Unless Otherwise Noted) N-Channel

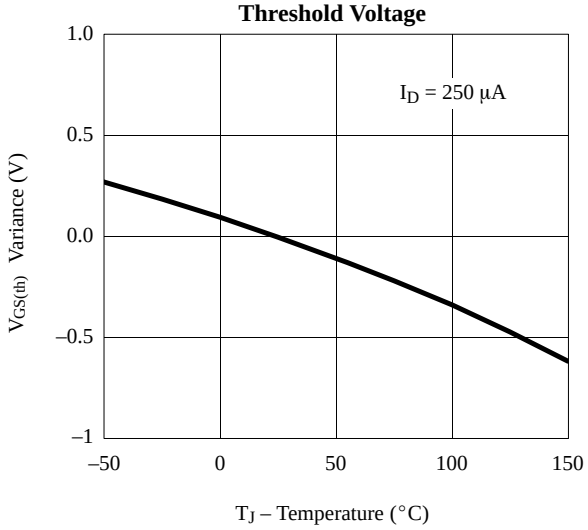
Source-Drain Diode Forward Voltage



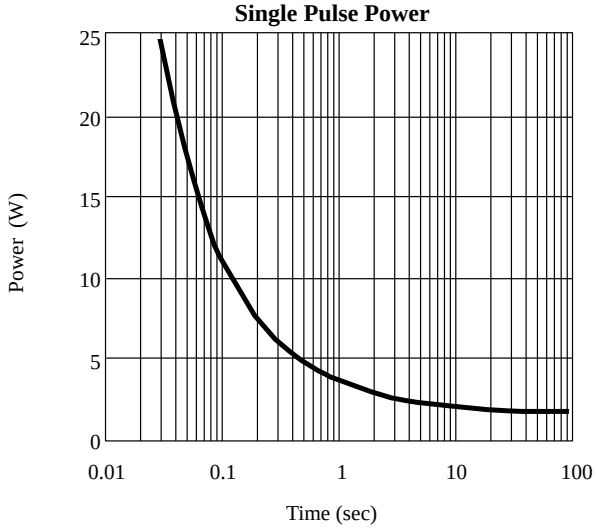
On-Resistance vs. Gate-to-Source Voltage



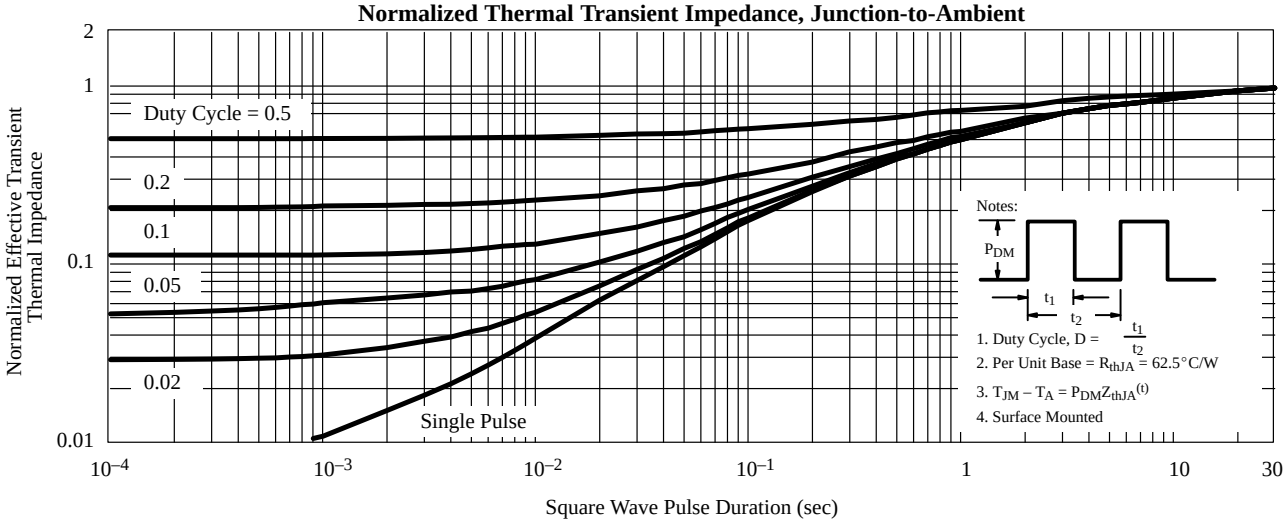
Threshold Voltage



Single Pulse Power

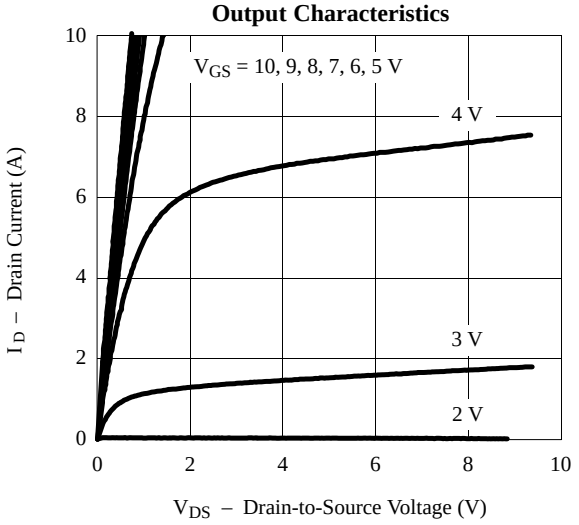


Normalized Thermal Transient Impedance, Junction-to-Ambient

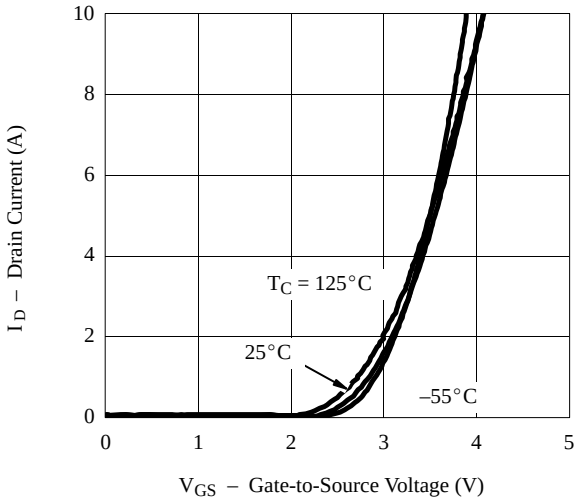


Typical Characteristics (25°C Unless Otherwise Noted) P-Channel

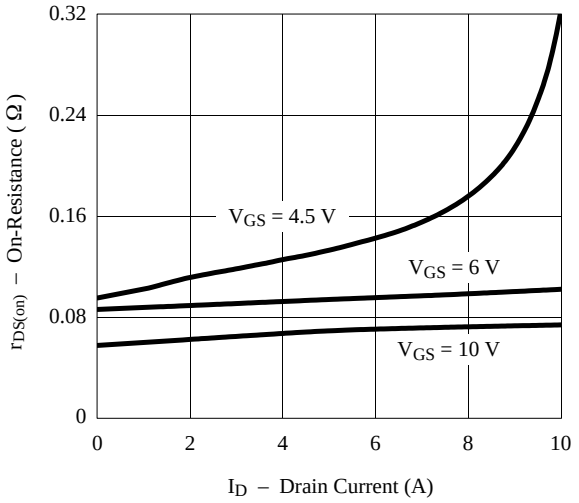
Output Characteristics



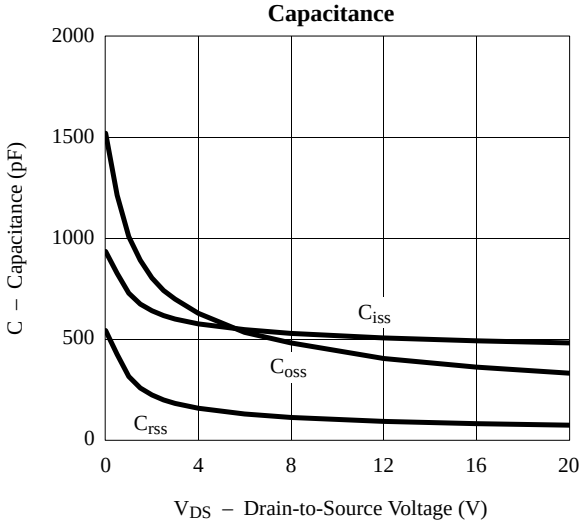
Transfer Characteristics



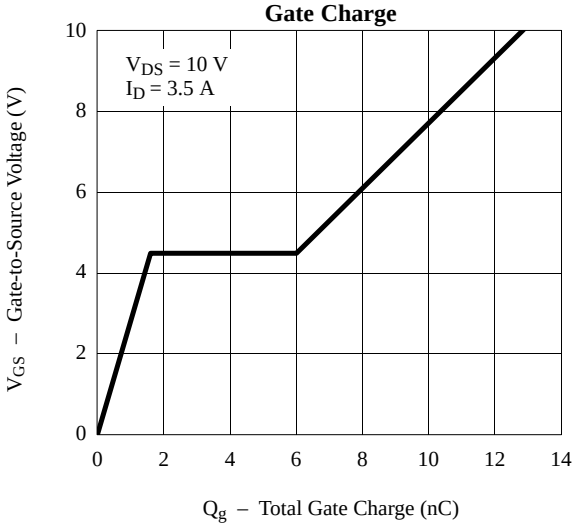
On-Resistance vs. Drain Current



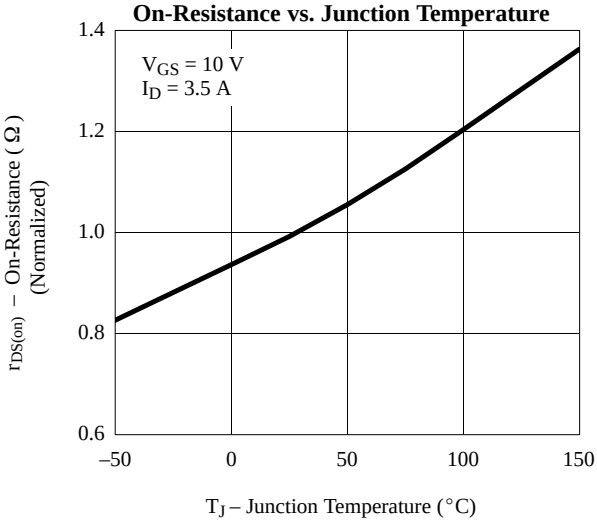
Capacitance



Gate Charge

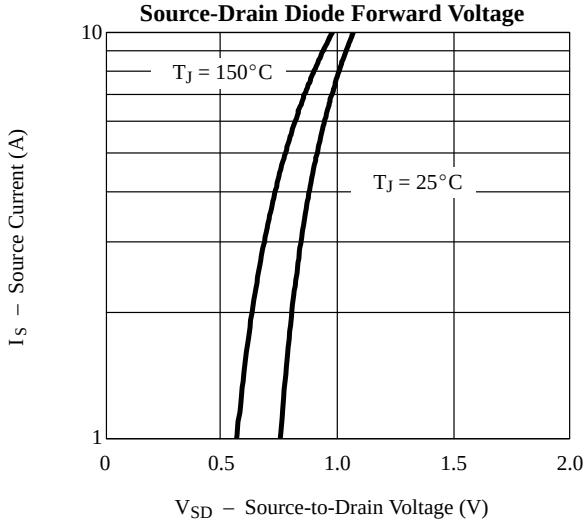


On-Resistance vs. Junction Temperature

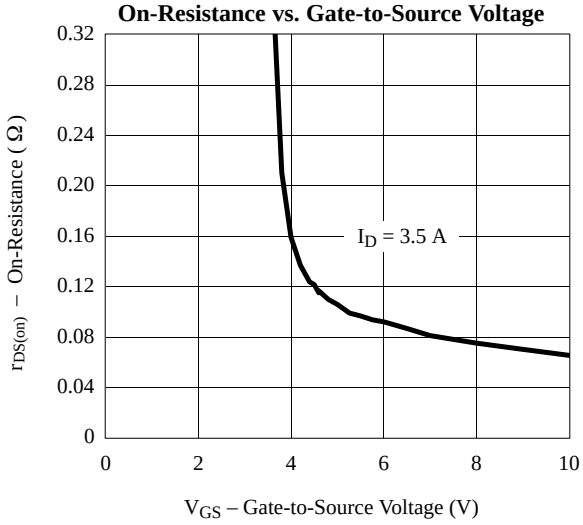


Typical Characteristics (25°C Unless Otherwise Noted) P-Channel

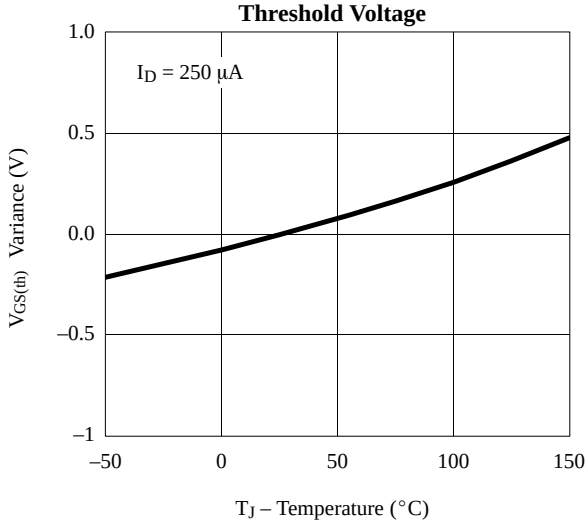
Source-Drain Diode Forward Voltage



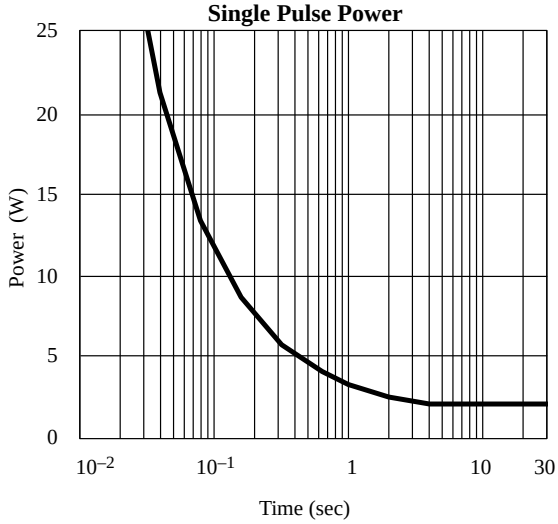
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient