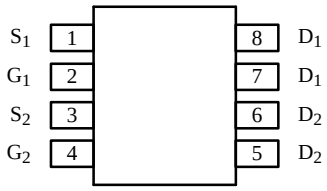
Dual Enhancement-Mode MOSFET (N- and P-Channel)

Product Summary

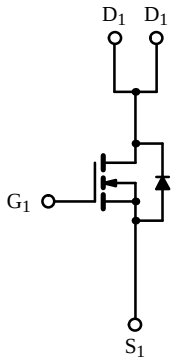
	V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
N-Channel	25	0.10 @ V_{GS} = 10 V	± 3.5
		0.15 @ V_{GS} = 4.5 V	± 2.0
P-Channel	–25	0.25 @ V_{GS} = –10 V	± 2.3
		0.40 @ V_{GS} = –4.5 V	± 1.8

Recommended upgrade: Si4532DY, Si4539DY or Si9939DY
Lower profile/smaller size—see LITE FOOT® equivalent: Si6542DQ or Si6543DQ

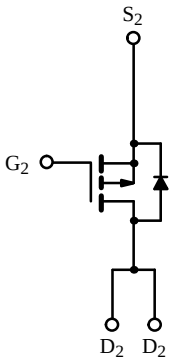
SO-8



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}	25	–25	V
Gate-Source Voltage		V_{GS}	± 20	± 20	
Continuous Drain Current (T_J = 150°C)[a]	T_A = 25°C	I_D	± 3.5	± 2.3	A
	T_A = 70°C		± 2.8	± 1.9	
Pulsed Drain Current		I_{DM}	± 14	± 9.2	
Continuous Source Current (Diode Conduction)[a]		I_S	1.7	–1.6	
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 #70137. A SPICE Model data sheet is available for this product (FaxBack document #70519).

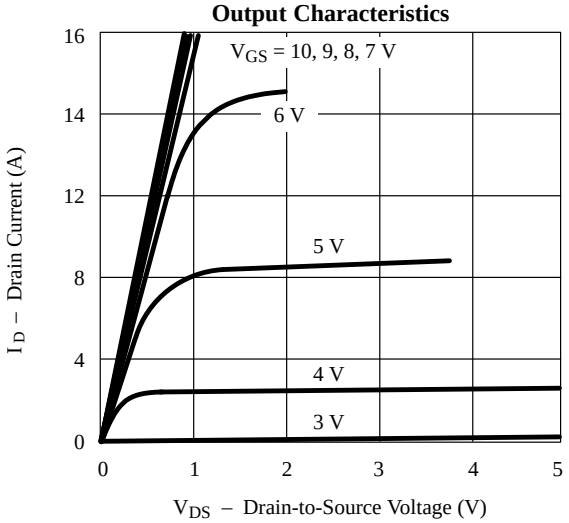
Specifications (T_J = 25°C Unless Otherwise Noted)

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} = 20 V, V_{GS} = 0 V	N-Ch			2	µA
		V_{DS} = –20 V, V_{GS} = 0 V	P-Ch			–2	
		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[b]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 10 V	N-Ch	3.5			A
		V_{DS} ≤ –5 V, V_{GS} = –10 V	P-Ch	–2.3			
Drain-Source On-State Resistance[b]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 1 A	N-Ch		0.08	0.10	Ω
		V_{GS} = –10 V, I_D = 1 A	P-Ch		0.13	0.25	
		V_{GS} = 4.5 V, I_D = 0.5 A	N-Ch		0.12	0.15	
		V_{GS} = –4.5 V, I_D = 0.5 A	P-Ch		0.20	0.40	
Forward Transconductance[b]	g_{fs}	V_{DS} = 15 V, I_D = 3.5 A	N-Ch		5.0		S
		V_{DS} = –15 V, I_D = –3.5 A	P-Ch		3.2		
Diode Forward Voltage[b]	V_{SD}	I_S = 1.25 A, V_{GS} = 0 V	N-Ch		1.1	1.4	V
		I_S = –1.25 A, V_{GS} = 0 V	P-Ch		–1.2	–1.6	
Dynamic[a]							
Total Gate Charge	Q_g	N-Channel V_{DS} = 12.5 V, V_{GS} = 10 V, I_D = 2.3 A P-Channel V_{DS} = –12.5 V, V_{GS} = –10 V, I_D = –2.3 A	N-Ch		9.4	27	nC
			P-Ch		8.4	25	
Gate-Source Charge	Q_{gs}		N-Ch		1.6		
			P-Ch		1.3		
Gate-Drain Charge	Q_{gd}		N-Ch		3.1		
			P-Ch		3.0		
Turn-On Delay Time	$t_{d(on)}$	N-Channel V_{DD} = 25 V, R_L = 25 Ω I_D ≅ 1 A, V_{GEN} = 10 V, R_G = 6 Ω P-Channel V_{DD} = –25 V, R_L = 25 Ω I_D ≅ –1 A, V_{GEN} = –10 V, R_G = 6 Ω	N-Ch		9	20	ns
			P-Ch		12	40	
Rise Time	t_r		N-Ch		8	20	
			P-Ch		19	40	
Turn-Off Delay Time	$t_{d(off)}$		N-Ch		45	90	
			P-Ch		42	90	
Fall Time	t_f		N-Ch		25	50	
			P-Ch		27	50	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 1.25 A, di/dt = 100 A/µs	N-Ch			75	
			P-Ch		69	100	

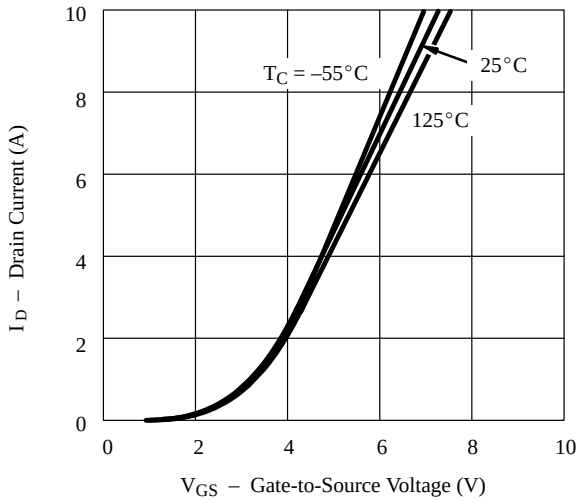
Notes
a. Guaranteed by design, not subject to production testing.
b. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.

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

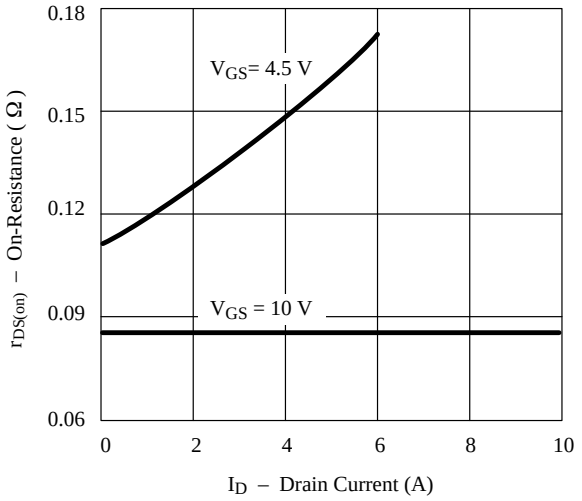
Output Characteristics



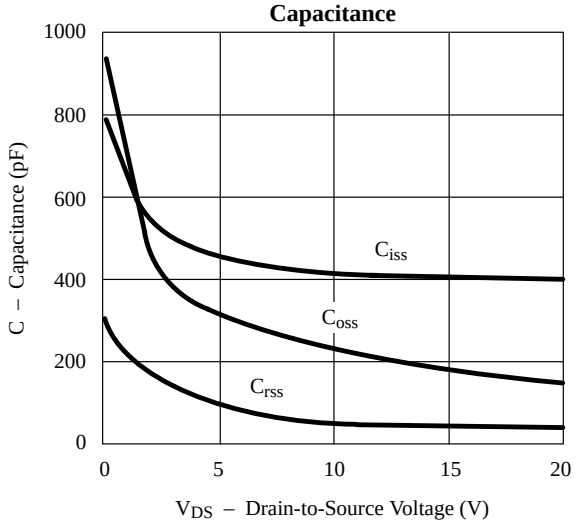
Transfer Characteristics



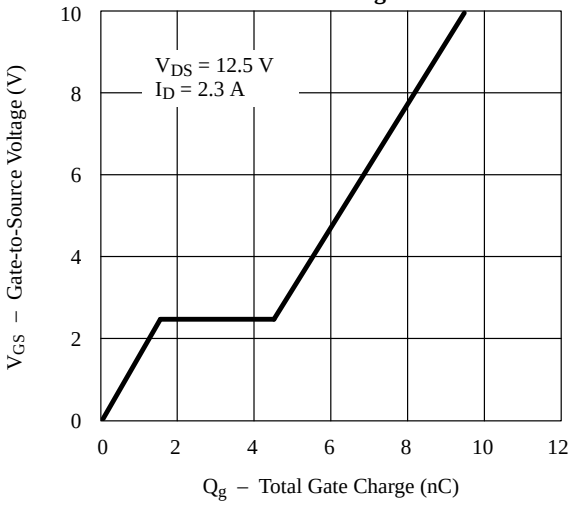
On-Resistance vs. Drain Current



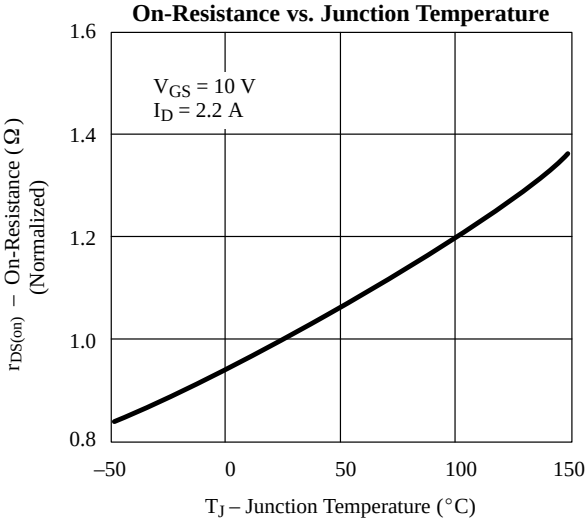
Capacitance



Gate Charge

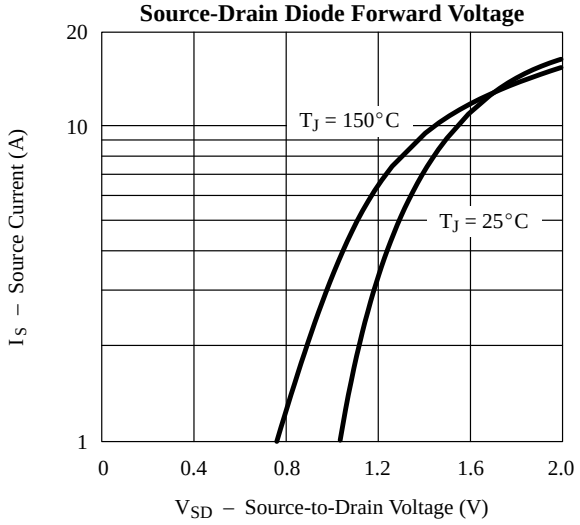


On-Resistance vs. Junction Temperature

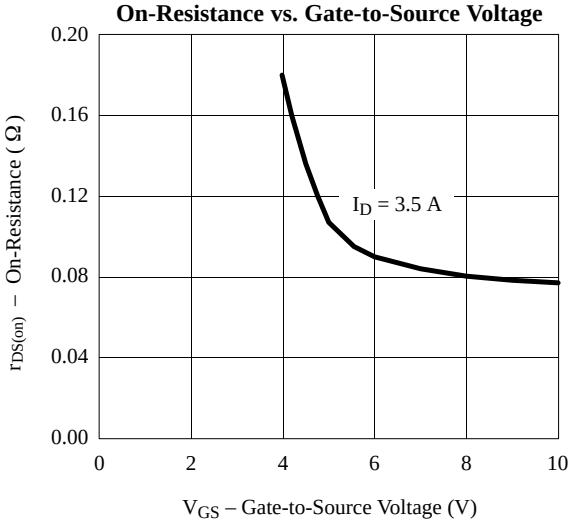


Typical Characteristics (25°C Unless Otherwise Noted) N-Channel

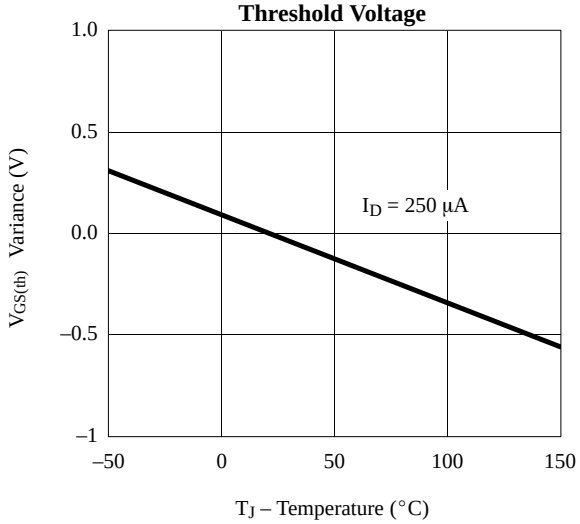
Source-Drain Diode Forward Voltage



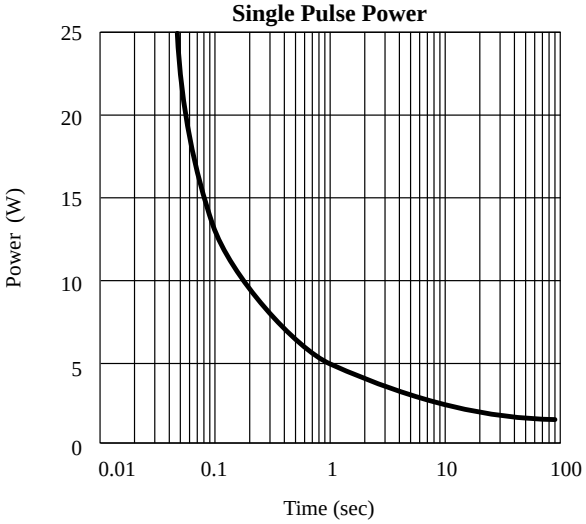
On-Resistance vs. Gate-to-Source Voltage



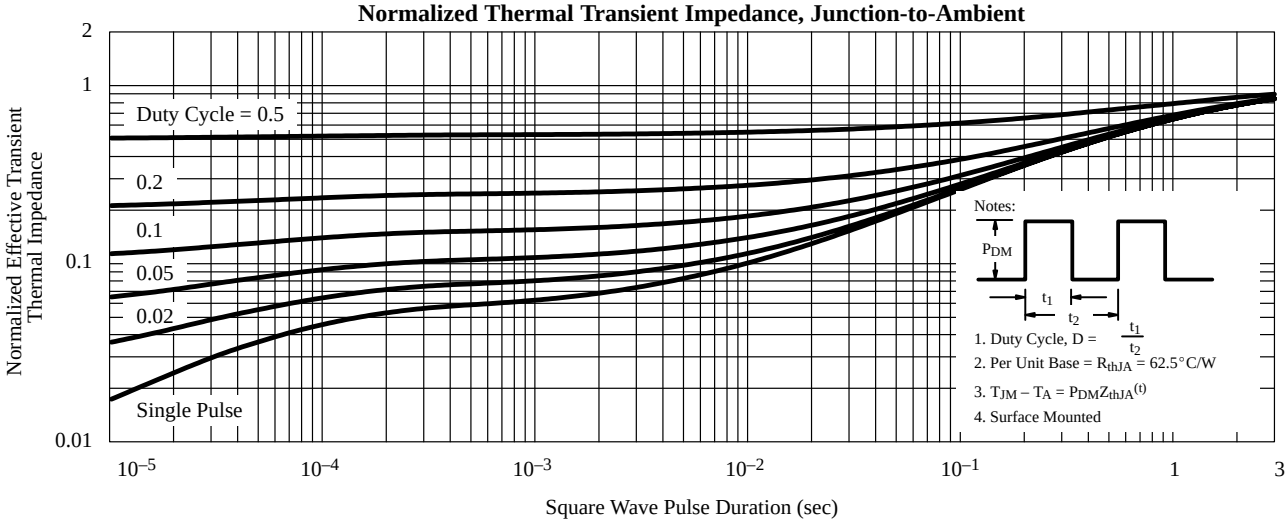
Threshold Voltage



Single Pulse Power

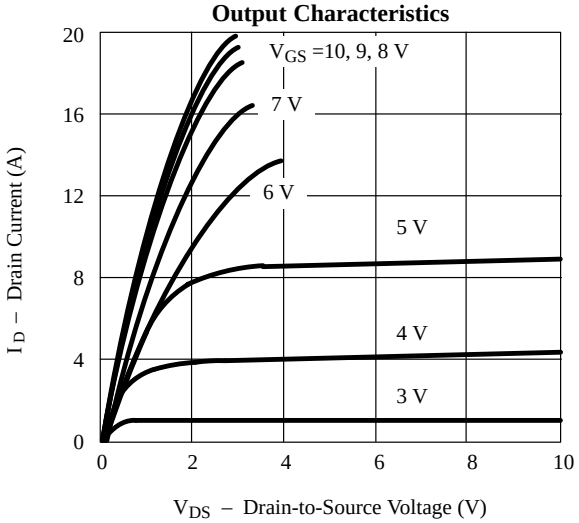


Normalized Thermal Transient Impedance, Junction-to-Ambient

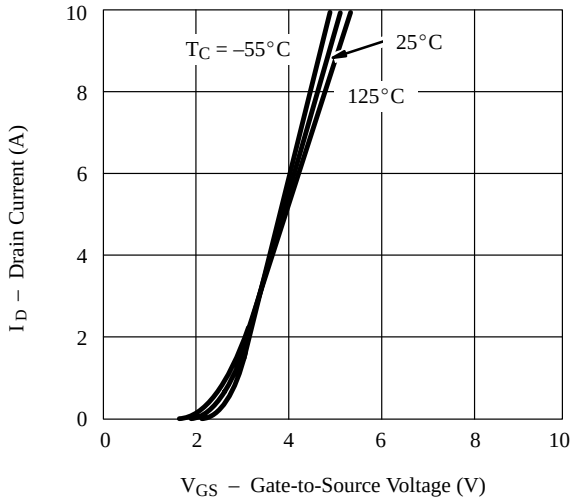


Typical Characteristics (25°C Unless Otherwise Noted) P-Channel

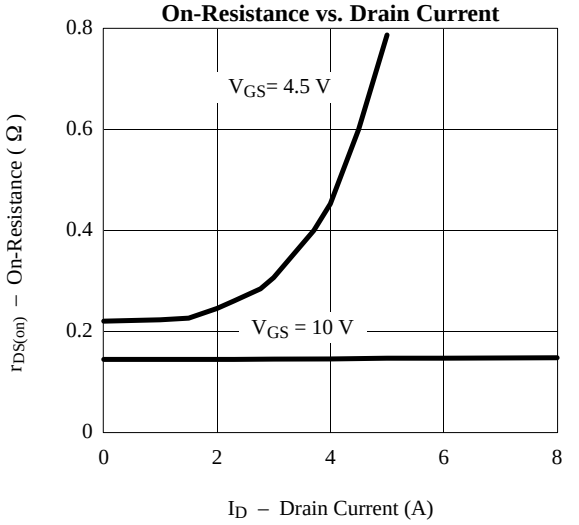
Output Characteristics



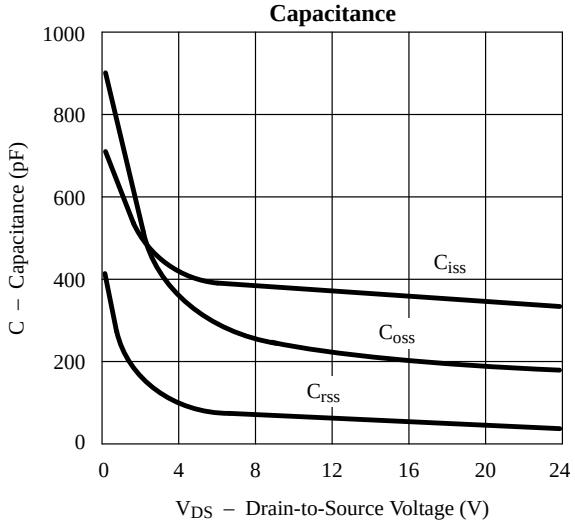
Transfer Characteristics



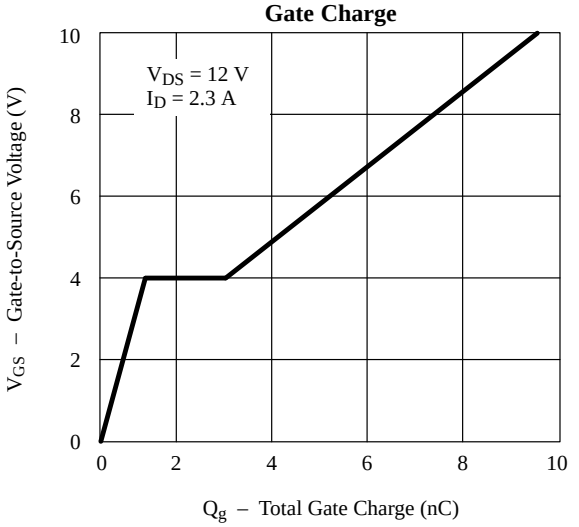
On-Resistance vs. Drain Current



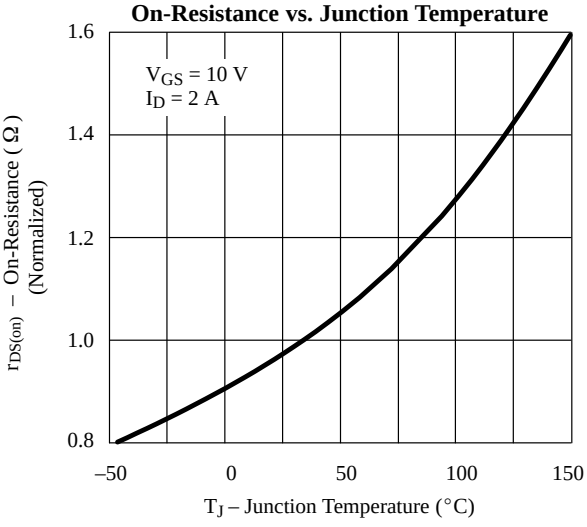
Capacitance



Gate Charge

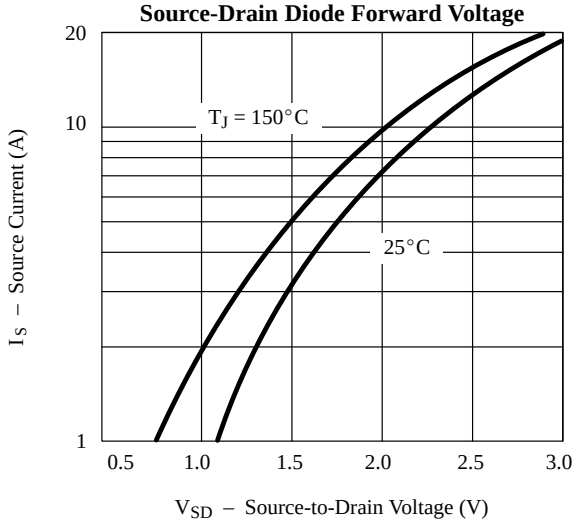


On-Resistance vs. Junction Temperature

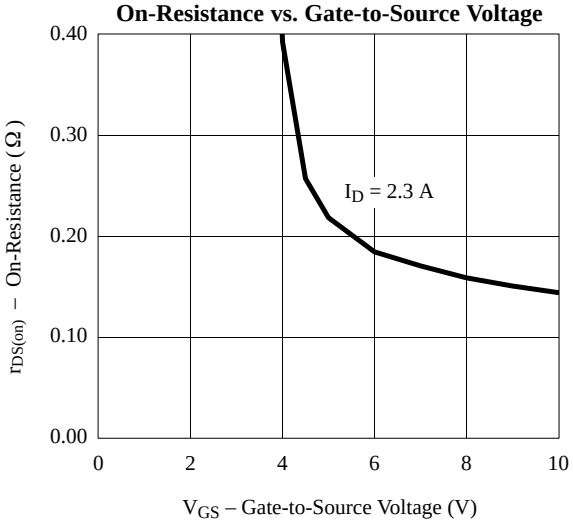


Typical Characteristics (25°C Unless Otherwise Noted) P-Channel

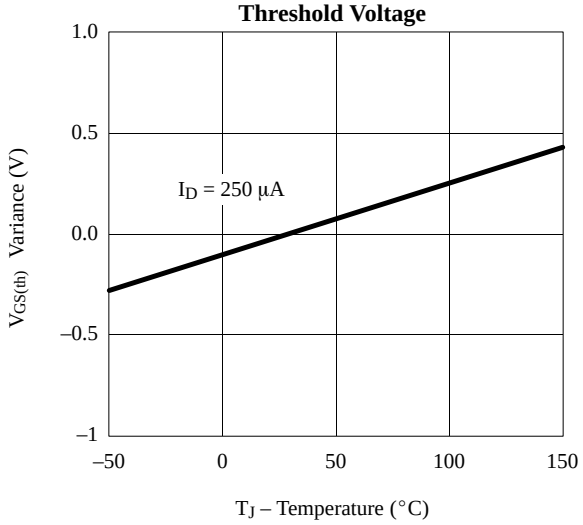
Source-Drain Diode Forward Voltage



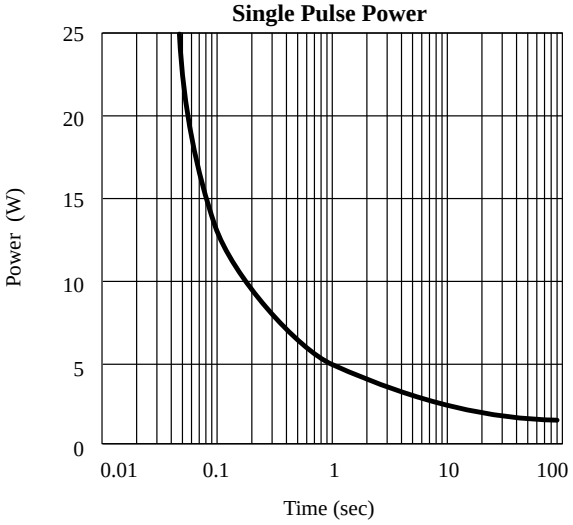
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient