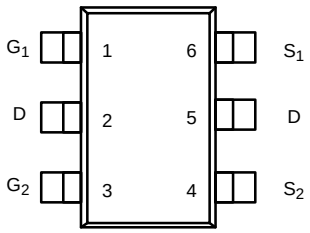
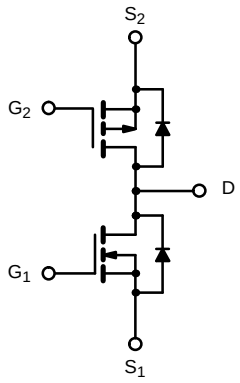
Complementary MOSFET Half-Bridge (N- and P-Channel)

PRODUCT SUMMARY			
	V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
N-Channel	20	0.500 @ V_{GS} = 4.5 V	±1.2
		0.750 @ V_{GS} = 3.0 V	±1.0
P-Channel	–20	1.00 @ V_{GS} = –4.5 V	±0.85
		1.30 @ V_{GS} = –3.0 V	±0.75

TSOP-6
Top View





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)	T_A = 25°C	I_D	±1.2	±0.85	A
	T_A = 70°C		±0.95	±0.65	
Pulsed Drain Current		I_{DM}	±3.5	±2.5	
Continuous Source Current (Diode Conduction)		I_S	1	–1	
Maximum Power Dissipation (Surface Mounted on FR4 Board)	T_A = 25°C	P_D	1.25		W
	T_A = 70°C		0.8		
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 (Surface Mounted on FR4 Board, ± ≤ 10 sec)	R_{thJA}	100	°C/W

For SPICE model information via the Worldwide Web: http://www.vishay.com/www/product/spice.htm

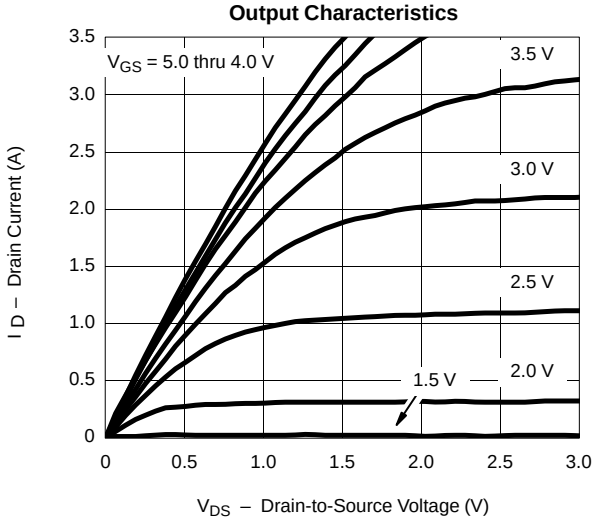
SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition		Min	Typ	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				±100	nA
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 = 70°C	N-Ch			10	
		V_{DS} = –20 V, V_{GS} = 0 V, T_J = 70°C	P-Ch			–10	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} = 5 V, V_{GS} = 4.5 V	N-Ch	3.0			A
		V_{DS} = –5 V, V_{GS} = –4.5 V	P-Ch	–2.0			
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	V_{GS} = 4.5 V, I_D = 0.5 A	N-Ch		0.38	0.500	Ω
		V_{GS} = –4.5 V, I_D = –0.5 A	P-Ch		0.70	1.00	
		V_{GS} = 3.0 V, I_D = 0.5 A	N-Ch		0.55	0.750	
		V_{GS} = –3.0 V, I_D = –0.5 A	P-Ch		1.10	1.30	
Forward Transconductance[a]	g_{fs}	V_{DS} = 10 V, I_D = 1.2 A	N-Ch		2.7		S
		V_{DS} = –10 V, I_D = –0.85 A	P-Ch		1.2		
Diode Forward Voltage[a]	V_{SD}	I_S = 1 A, V_{GS} = 0 V	N-Ch			1.2	V
		I_S = –1 A, V_{GS} = 0 V	P-Ch			–1.2	
Dynamic[b]							
Total Gate Charge	Q_g	N-Channel V_{DS} = 10 V, V_{GS} = 4.5 V, I_D = 1.2 A P-Channel V_{DS} = –10 V, V_{GS} = –4.5 V, I_D = –0.85 A	N-Ch		0.8	2.0	nC
			P-Ch		1.10	2.5	
Gate-Source Charge	Q_{gs}		N-Ch		0.25		
			P-Ch		0.50		
Gate-Drain Charge	Q_{gd}		N-Ch		0.2		
			P-Ch		0.2		
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		10	20	ns
			P-Ch		8	15	
Rise Time	t_r		N-Ch		20	40	
			P-Ch		20	40	
Turn-Off Delay Time	$t_{d(off)}$		N-Ch		20	40	
			P-Ch		10	20	
Fall Time	t_f		N-Ch		16	30	
			P-Ch		8	15	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 1 A, di/dt = 100 A/µs	N-Ch		40	80	
		I_F = –1 A, di/dt = 100 A/µs	P-Ch		40	80	

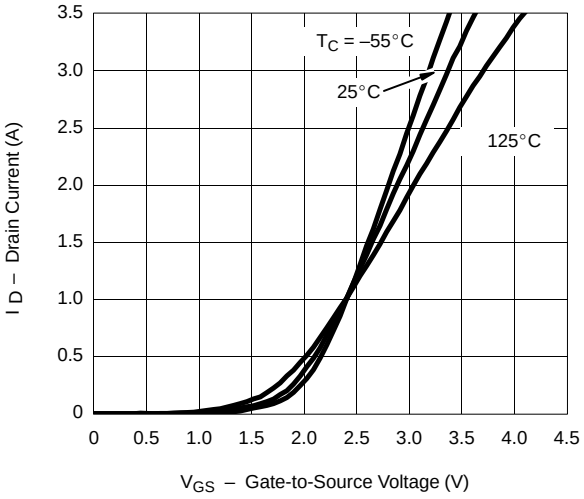
Notes
a. Guaranteed by design, not subject to production testing.
b. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.

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

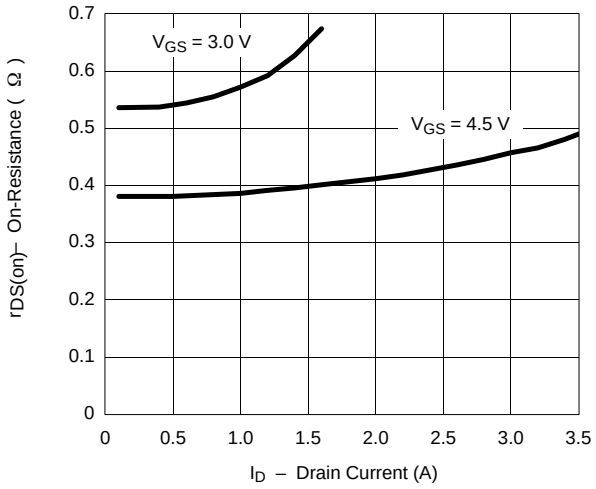
Output Characteristics



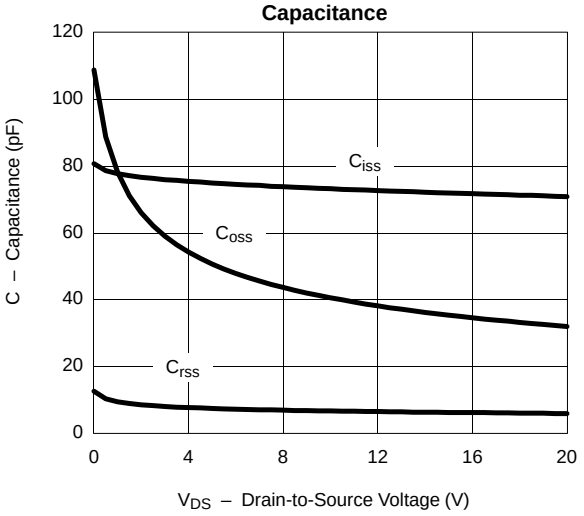
Transfer Characteristics



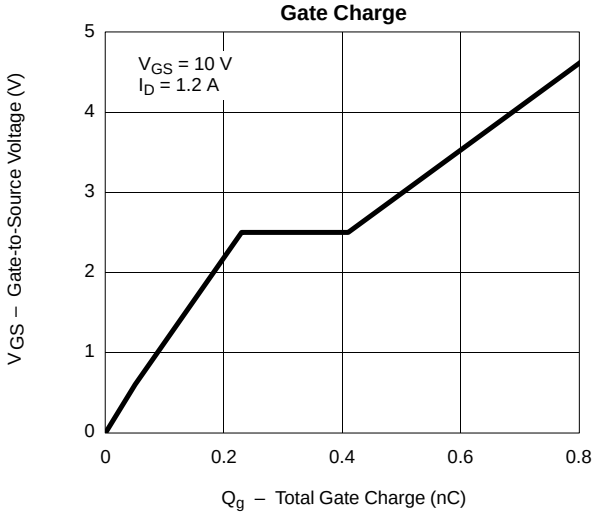
On-Resistance vs. Drain Current



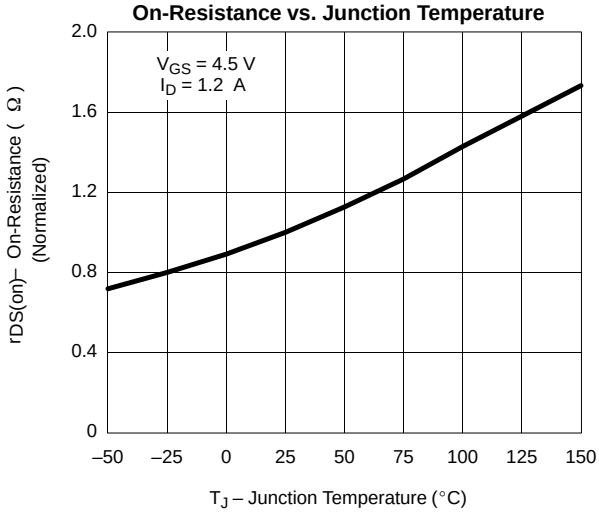
Capacitance



Gate Charge

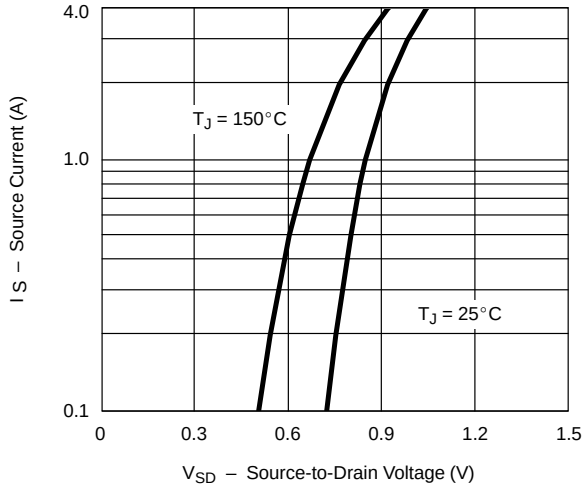


On-Resistance vs. Junction Temperature

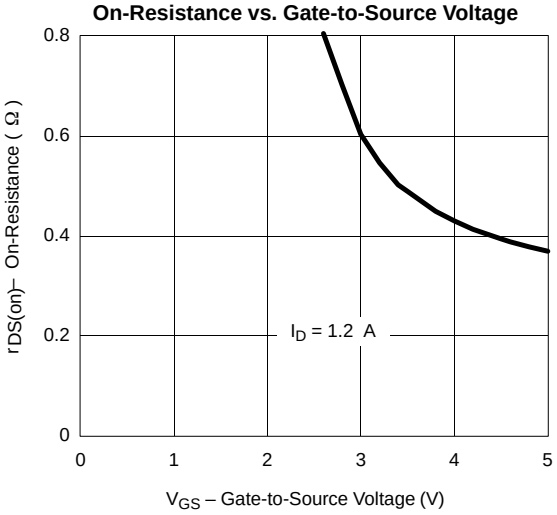


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) N-CHANNEL

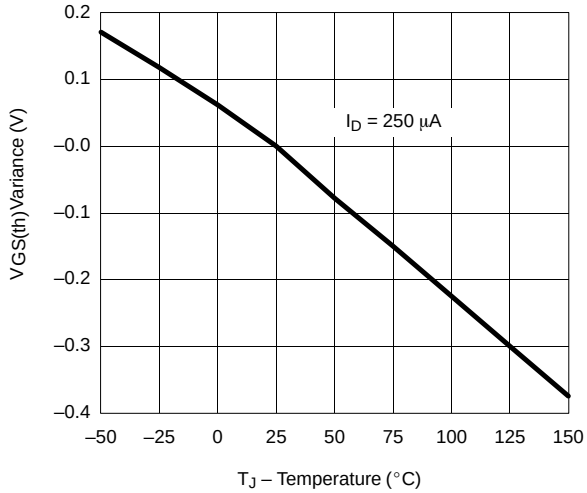
Source-Drain Diode Forward Voltage



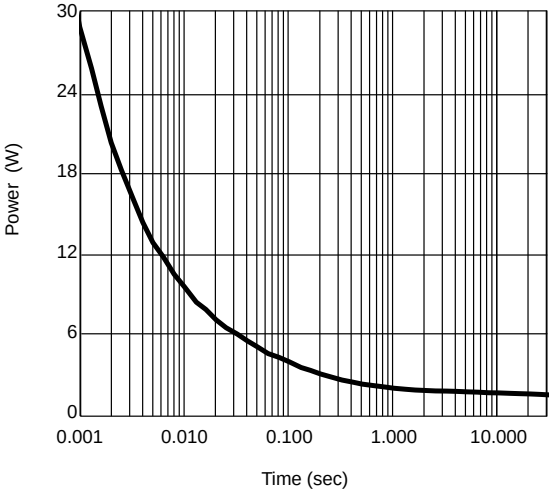
On-Resistance vs. Gate-to-Source Voltage



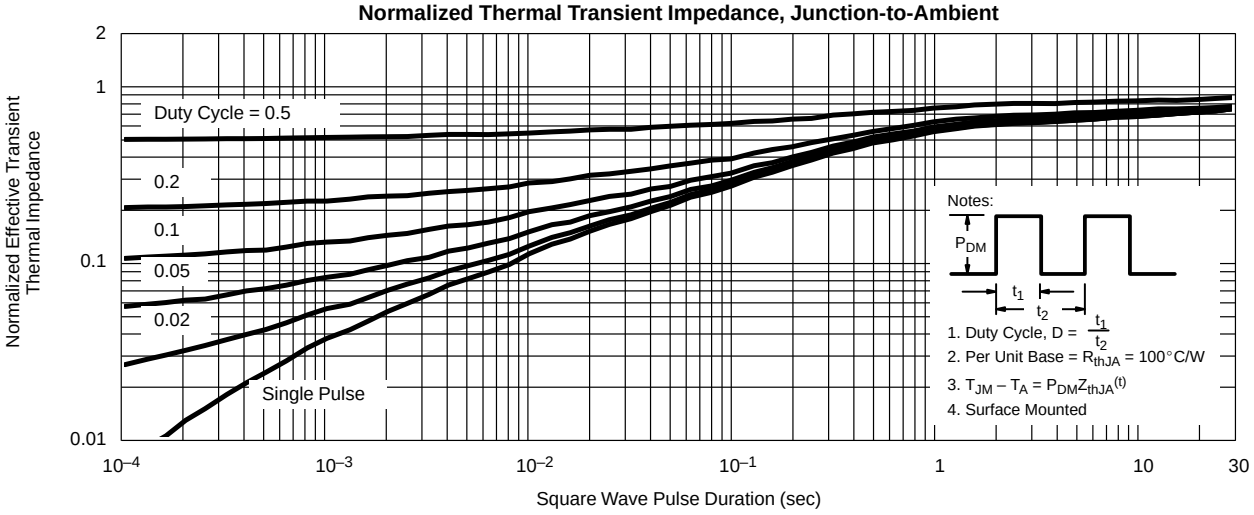
Threshold Voltage



Single Pulse Power

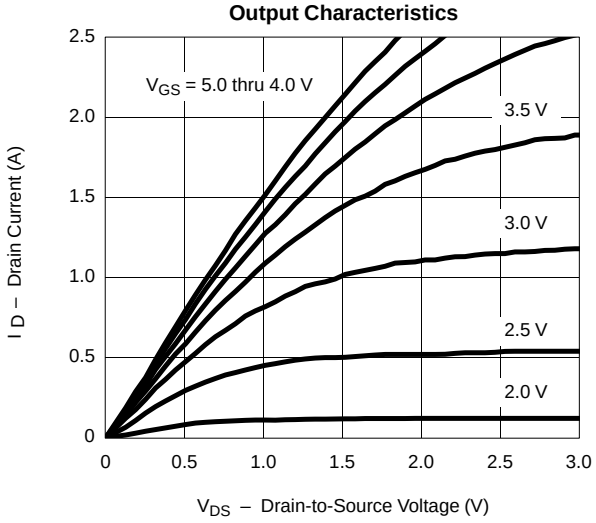


Normalized Thermal Transient Impedance, Junction-to-Ambient

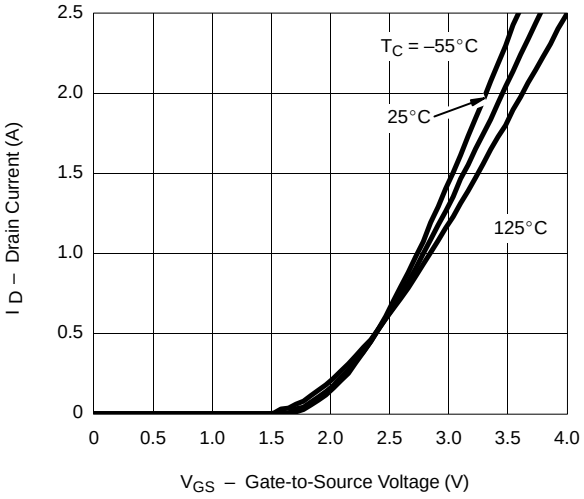


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) P-CHANNEL

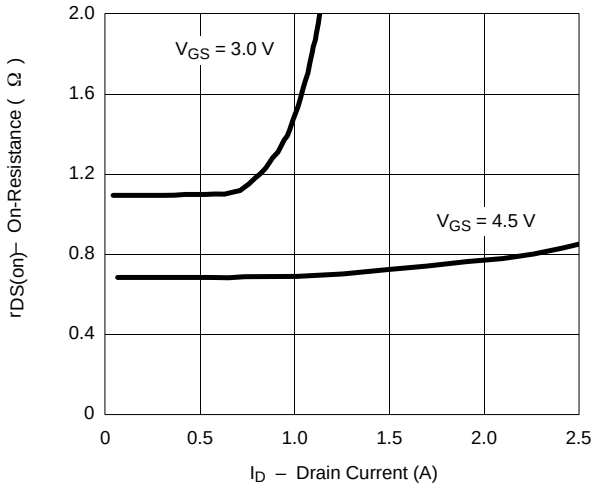
Output Characteristics



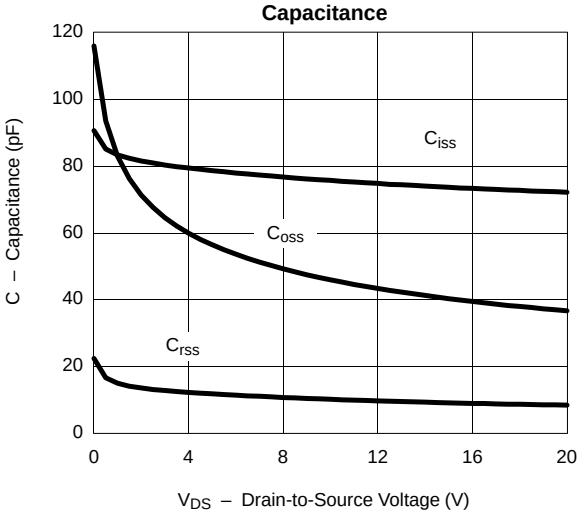
Transfer Characteristics



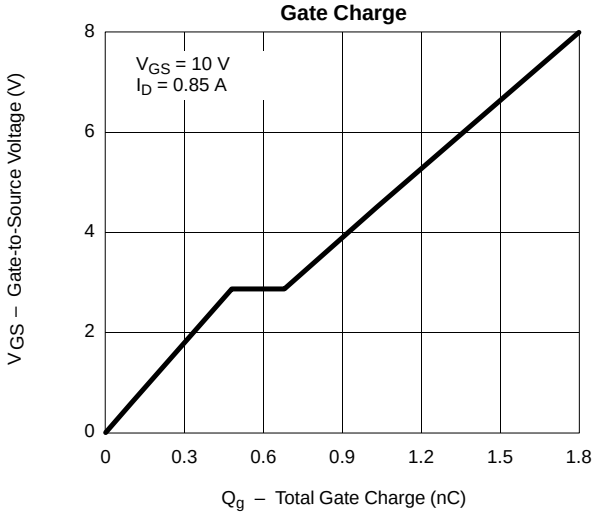
On-Resistance vs. Drain Current



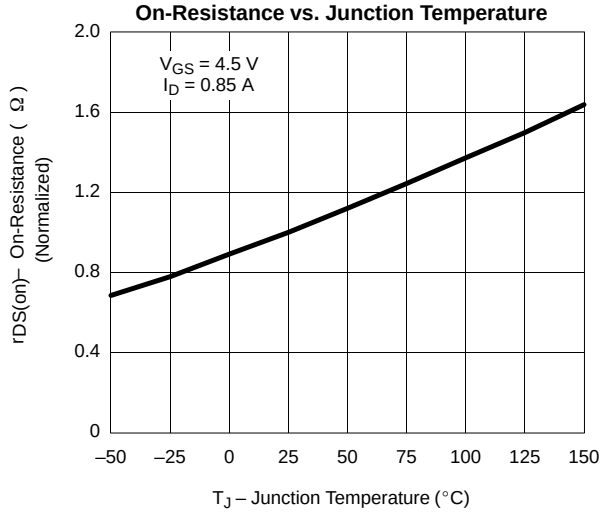
Capacitance



Gate Charge

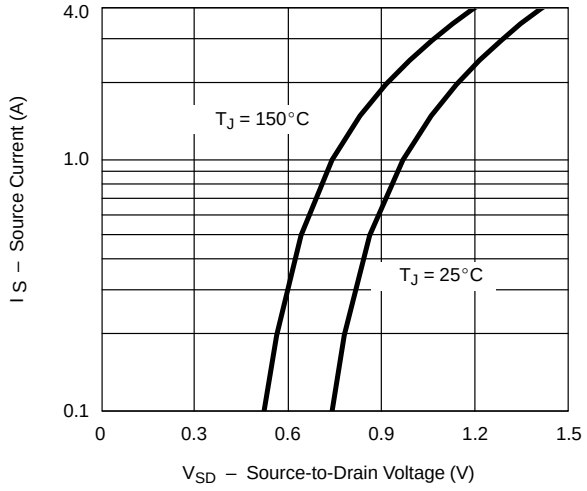


On-Resistance vs. Junction Temperature

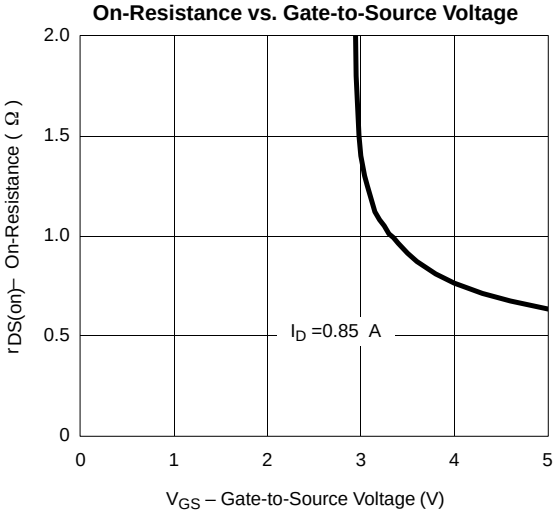


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) P-CHANNEL

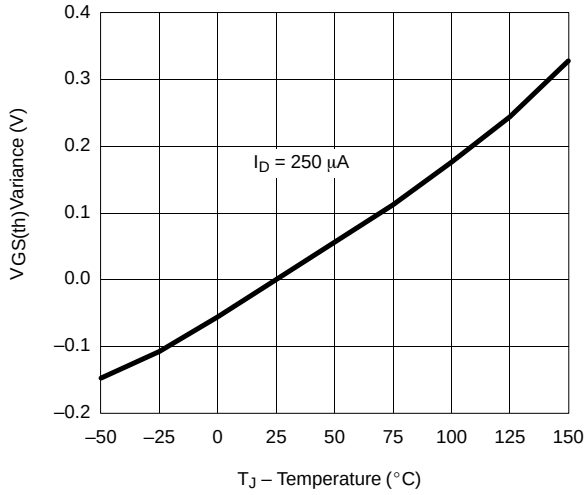
Source-Drain Diode Forward Voltage



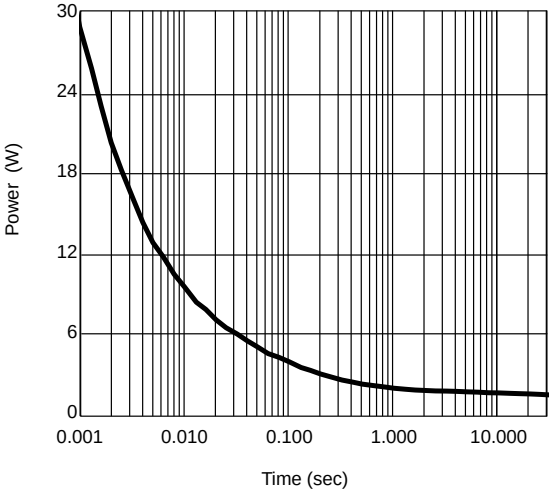
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient