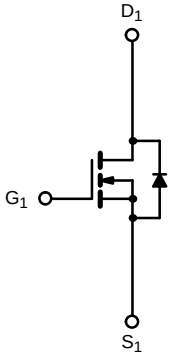
N- and P-Channel 2.5-V (G-S) MOSFET

PRODUCT SUMMARY			
	V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
N-Channel	20	0.030 @ V_{GS} = 4.5 V	±4.5
		0.040 @ V_{GS} = 2.5 V	±3.9
P-Channel	–20	0.050 @ V_{GS} = –4.5 V	±3.5
		0.085 @ V_{GS} = –2.5 V	±2.7

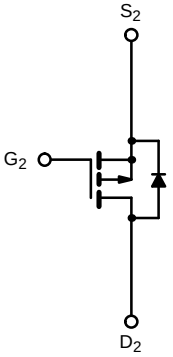
TrenchFET® Power MOSFETs
2.5-V Rated

TSSOP-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	±4.5	±3.5	A
	T_A = 70°C		±3.6	±2.7	
Pulsed Drain Current		I_{DM}	±30	±30	
Continuous Source Current (Diode Conduction)[a]		I_S	1.25	–1.25	
Maximum Power Dissipation[a]	T_A = 25°C	P_D	1.0		W
	T_A = 70°C		0.64		
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}	125	°C/W

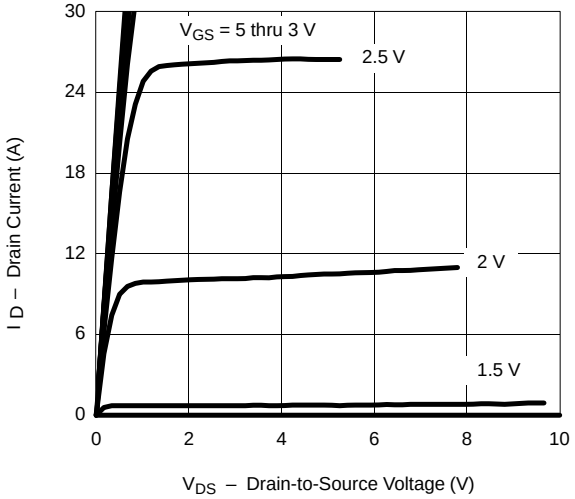
Notes
a. Surface Mounted on FR4 Board, t ≤ 10 sec.

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, $V_{GS} = \pm 12$ V	N-Ch			±100	nA
			P-Ch			±100	
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, $T_J = 55°C$	N-Ch			25	
		$V_{DS} = -20$ V, $V_{GS} = 0$ V, $T_J = 55°C$	P-Ch			–25	
On-State Drain Current[a]	$I_{D(on)}$	$V_{DS} \geq 5$ V, $V_{GS} = 4.5$ V	N-Ch	30			A
		$V_{DS} \geq -5$ V, $V_{GS} = -4.5$ V	P-Ch	–30			
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	$V_{GS} = 4.5$ V, $I_D = 4.5$ A	N-Ch		0.023	0.030	Ω
		$V_{GS} = -4.5$ V, $I_D = -3.5$ A	P-Ch		0.040	0.050	
		$V_{GS} = 2.5$ V, $I_D = 3.9$ A	N-Ch		0.030	0.040	
		$V_{GS} = -2.5$ V, $I_D = -2.7$ A	P-Ch		0.060	0.085	
Forward Transconductance[a]	g_{fs}	$V_{DS} = 10$ V, $I_D = 4.5$ A	N-Ch		20		S
		$V_{DS} = -10$ V, $I_D = -3.5$ A	P-Ch		10		
Diode Forward Voltage[a]	V_{SD}	$I_S = 1.25$ A, $V_{GS} = 0$ V	N-Ch		0.65	1.2	V
		$I_S = -1.25$ A, $V_{GS} = 0$ V	P-Ch		0.72	–1.2	
Dynamic[b]							
Total Gate Charge	Q_g	N-Channel $V_{DS} = 15$ V, $V_{GS} = 4.5$ V, $I_D = 4.5$ A; P-Channel $V_{DS} = -15$ V, $V_{GS} = -4.5$ V, $I_D = -3.5$ A	N-Ch		13	25	nC
			P-Ch		14.5	25	
Gate-Source Charge	Q_{gs}		N-Ch		3.0		
			P-Ch		3.5		
Gate-Drain Charge	Q_{gd}		N-Ch		3.3		
			P-Ch		3.5		
Turn-On Delay Time	$t_{d(on)}$	N-Channel $V_{DD} = 10$ V, $R_L = 10$ Ω, $I_D \cong 1$ A, $V_{GEN} = 10$ V, $R_G = 6$ Ω; P-Channel $V_{DD} = -10$ V, $R_L = 10$ Ω, $I_D \cong -1$ A, $V_{GEN} = -10$ V, $R_G = 6$ Ω	N-Ch		22	50	ns
			P-Ch		27	50	
Rise Time	t_r		N-Ch		40	80	
			P-Ch		30	60	
Turn-Off Delay Time	$t_{d(off)}$		N-Ch		50	100	
			P-Ch		57	100	
Fall Time	t_f		N-Ch		20	40	
			P-Ch		21	40	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 1.25$ A, di/dt = 100 A/µs	N-Ch		30	60	
		$I_F = -1.25$ A, di/dt = 100 A/µs	P-Ch		60	100	

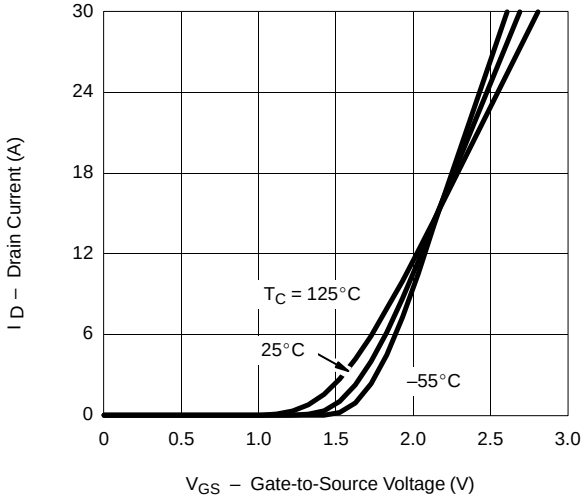
Notes
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

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

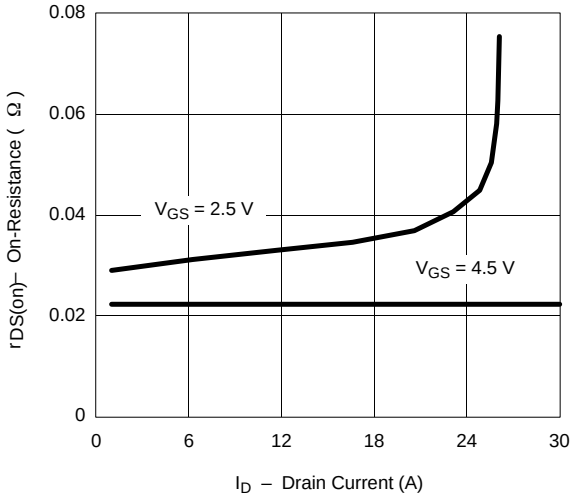
Output Characteristics



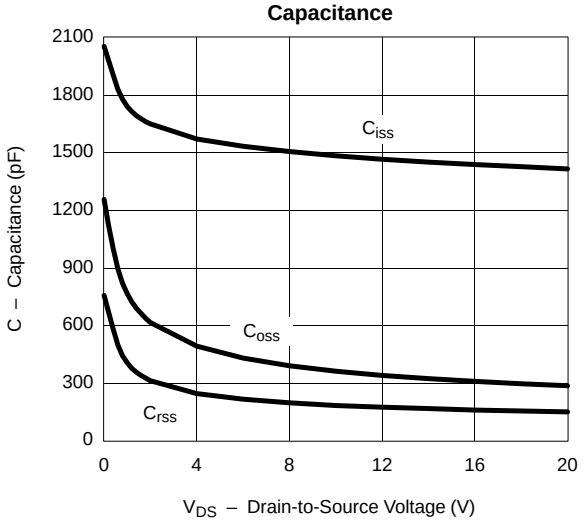
Transfer Characteristics



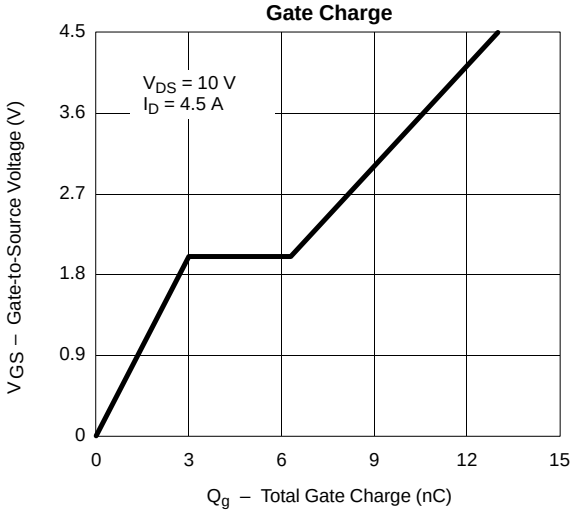
On-Resistance vs. Drain Current



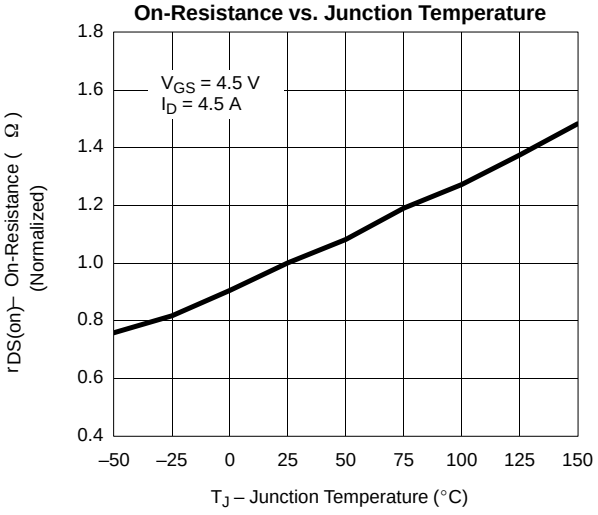
Capacitance



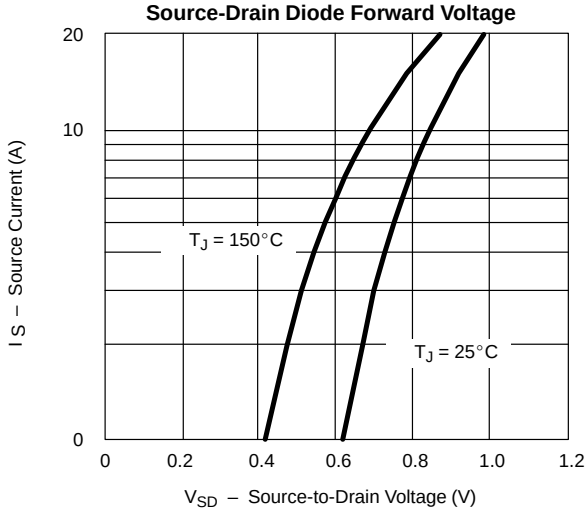
Gate Charge

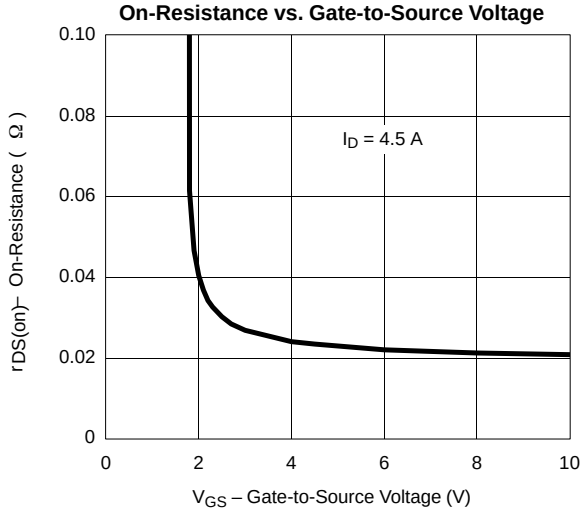


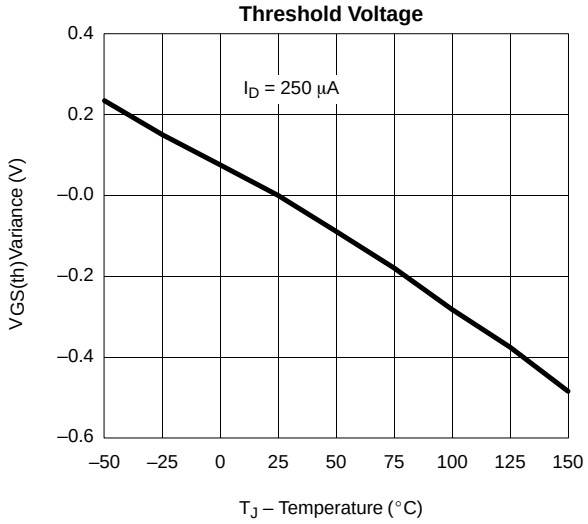
On-Resistance vs. Junction Temperature

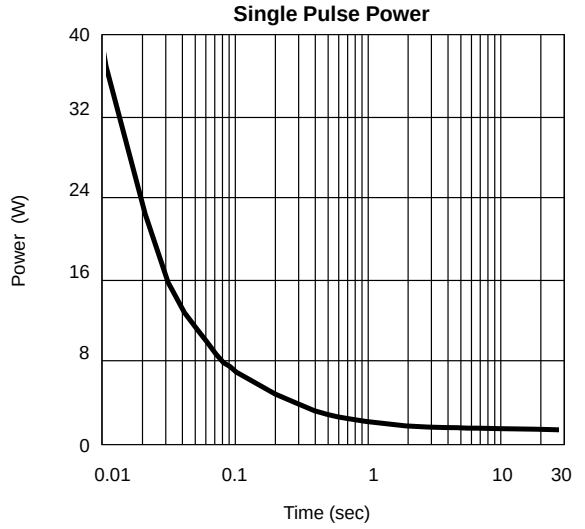


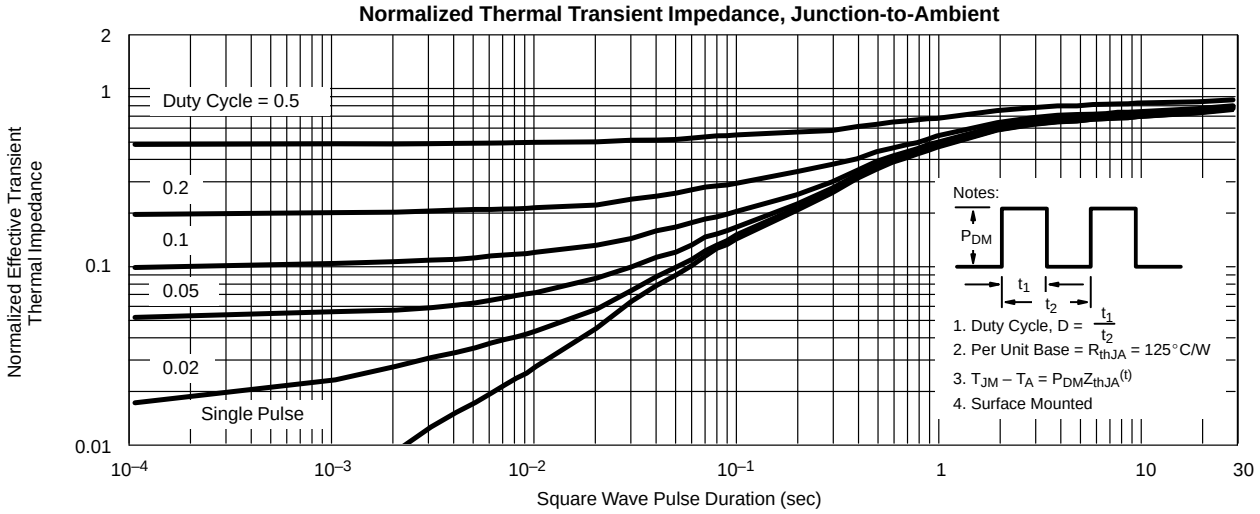
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) N-CHANNEL



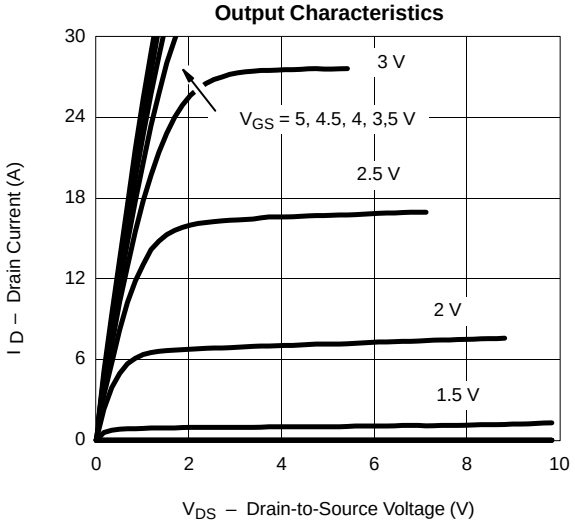


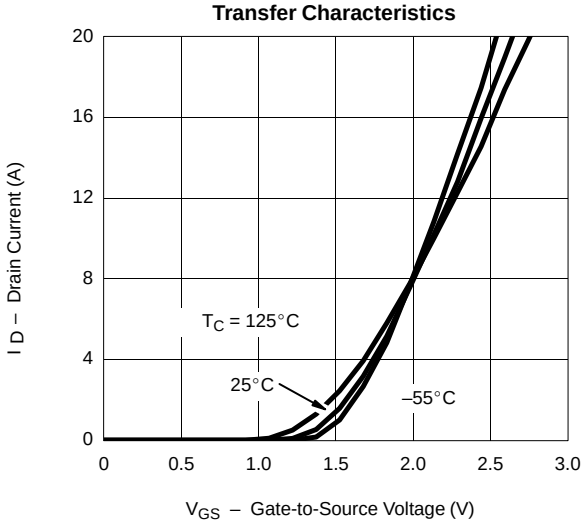


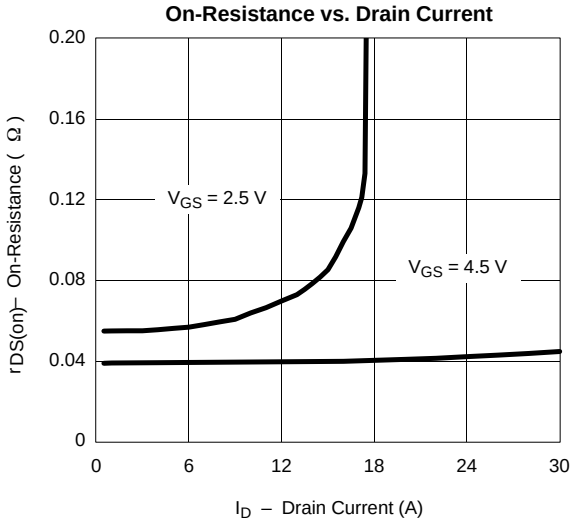


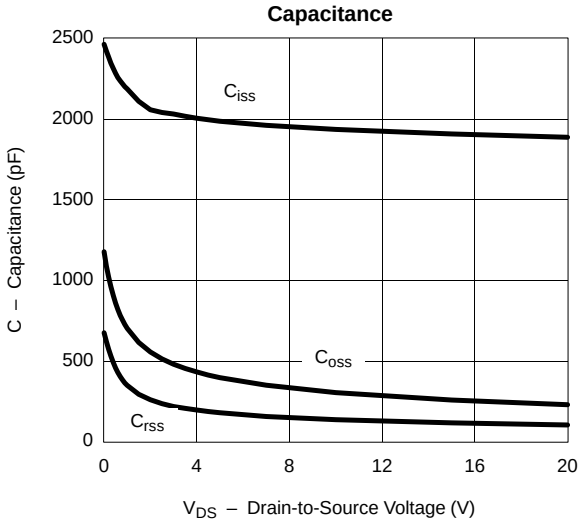


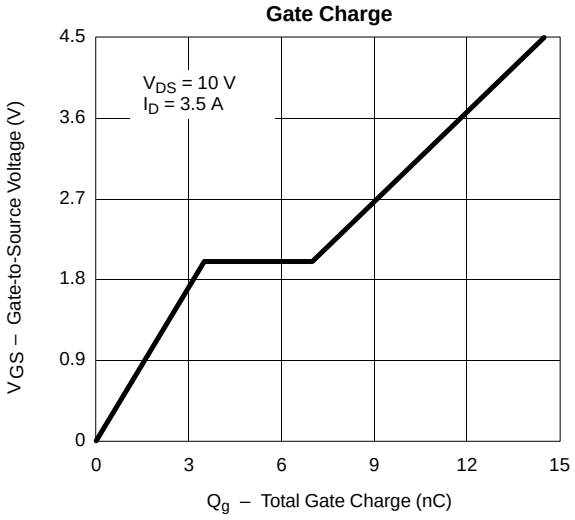
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) P-CHANNEL

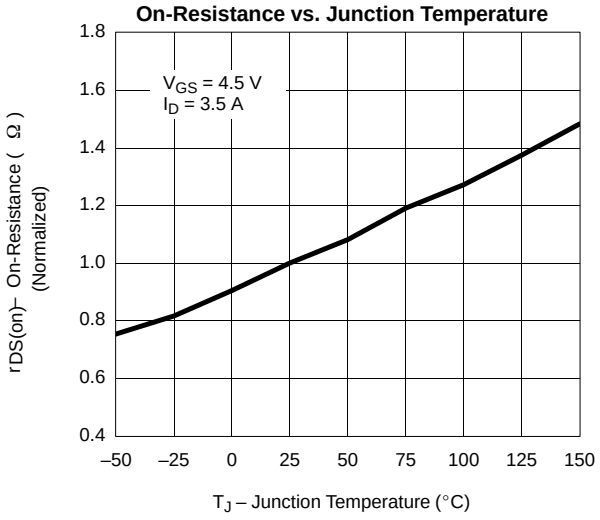






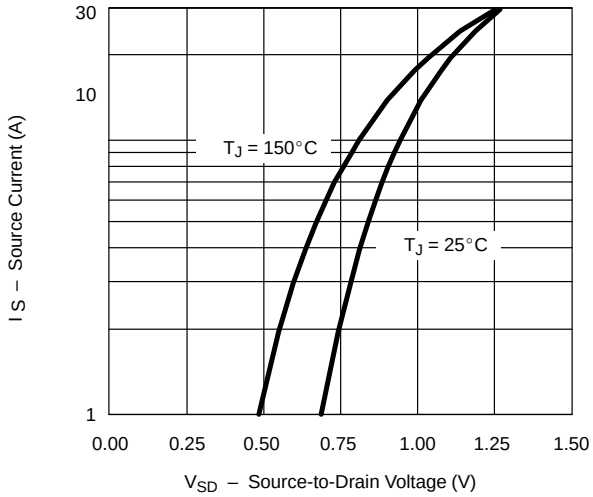




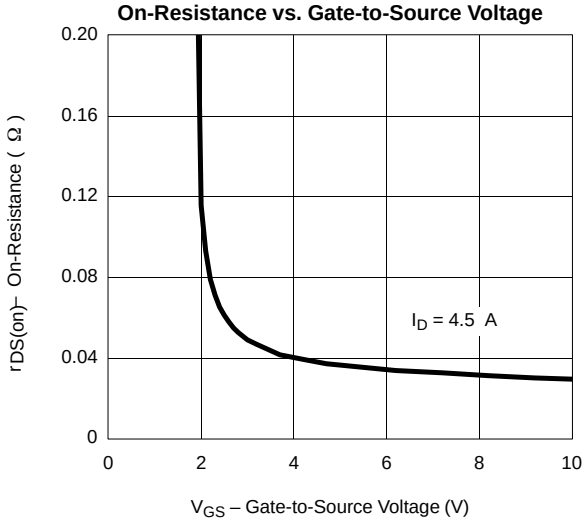


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) P-CHANNEL

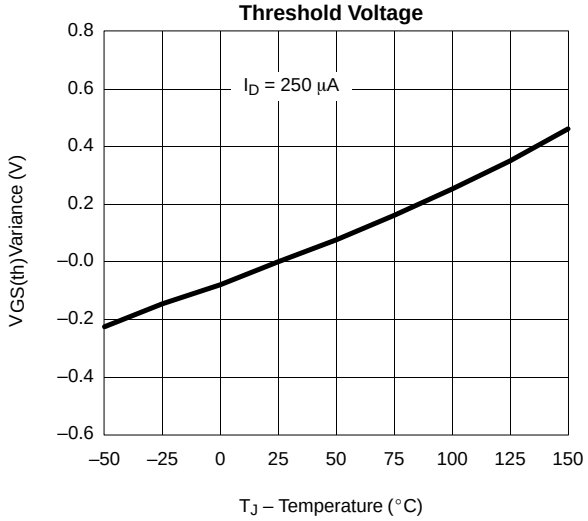
Source-Drain Diode Forward Voltage



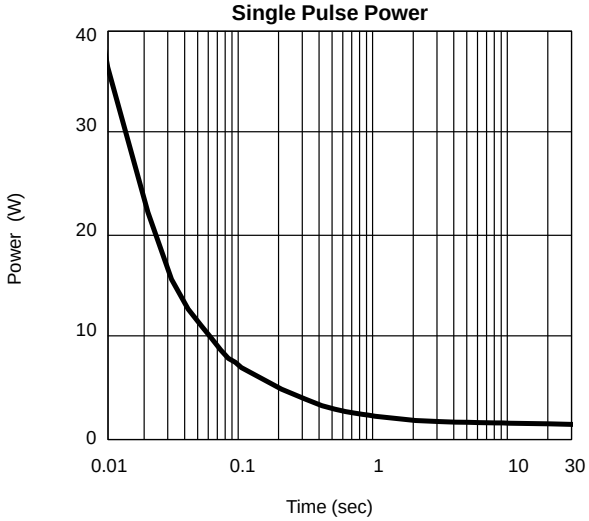
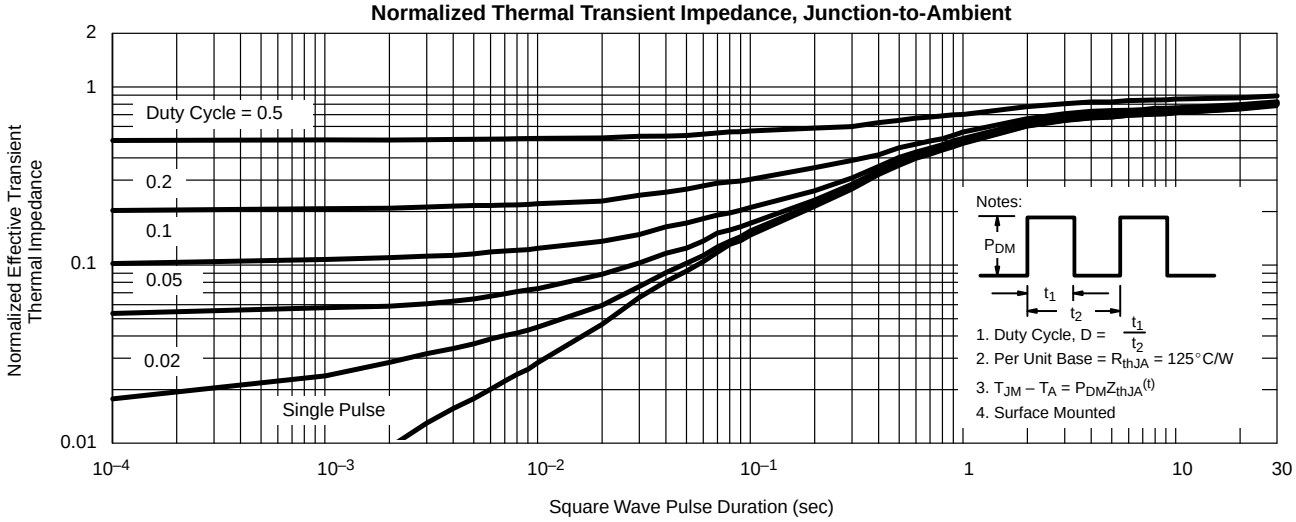
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient