



New Product

Si4503DY
Vishay Siliconix

N- and P-Channel MOSFET

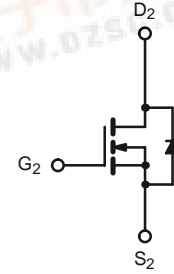
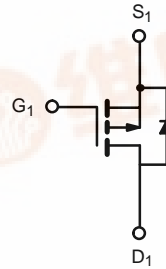
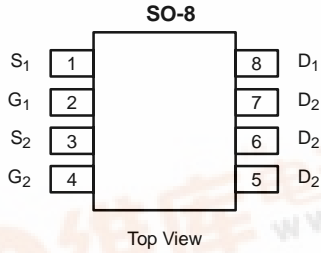
PRODUCT SUMMARY			
	V _{DS} (V)	r _{DS(on)} (Ω)	I _D (A)
N-Channel (Channel 2)	30	0.018 @ V _{GS} = 10 V	8.8
		0.027 @ V _{GS} = 4.5 V	7.2
P-Channel (Channel 1)	-8	0.042 @ V _{GS} = -4.5 V	-4.5
		0.060 @ V _{GS} = -2.5 V	-3.7

FEATURES

- TrenchFET® Power MOSFET

APPLICATIONS

- Level Shift
- Load Switch



ABSOLUTE MAXIMUM RATINGS (T _A = 25°C UNLESS OTHERWISE NOTED)							
Parameter	Symbol	N-Channel		P-Channel		Unit	
		10 sec.	Steady State	10 sec.	Steady State		
Drain-Source Voltage	V _{DS}	30		-8		V	
Gate-Source Voltage	V _{GS}	±20		±8			
Continuous Drain Current (T _J = 150°C) ^{a, b}	I _D	T _A = 25°C	8.8	6.5	-4.5	-3.8	A
		T _A = 70°C	7.0	5.2	-3.6	-3.0	
Pulsed Drain Current	I _{DM}	30		-20		A	
Continuous Source Current (Diode Conduction) ^{a, b}	I _S	2.0	1.1	-1.2	0.9		
Maximum Power Dissipation ^{a, b}	P _D	T _A = 25°C	2.27	1.25	1.38	1.0	W
		T _A = 70°C	1.45	0.8	0.88	0.64	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-55 to 150				°C	

THERMAL RESISTANCE RATINGS							
Parameter	Symbol	N-Channel		P-Channel		Unit	
		Typ	Max	Typ	Max		
Maximum Junction-to-Ambient ^a	R _{thJA}	t ≤ 10 sec	45	55	75	90	°C/W
		Steady-State	85	100	100	125	
Maximum Junction-to-Foot (Drain)	R _{thJF}	25	30	53	65		

Notes:
^a Surface Mounted on FR4 Board.
^b t ≤ 10 sec

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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			V
		V _{DS} = V _{GS} , I _D = -250 μA	P-Ch	-0.45			
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V	N-Ch			±100	nA
		V _{DS} = 0 V, V _{GS} = ±8 V	P-Ch			±100	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 24 V, V _{GS} = 0 V	N-Ch			1	μA
		V _{DS} = -6.4 V, V _{GS} = 0 V	P-Ch			-1	
		V _{DS} = 24 V, V _{GS} = 0 V, T _J = 55 °C	N-Ch			5	
		V _{DS} = -6.4 V, V _{GS} = 0 V, T _J = 55 °C	P-Ch			-5	
On-State Drain Current ^b	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 10 V	N-Ch	30			A
		V _{DS} = -5 V, V _{GS} = -4.5 V	P-Ch	-20			
Drain-Source On-State Resistance ^b	r _{DS(on)}	V _{GS} = 10 V, I _D = 8.8 A	N-Ch		0.015	0.018	Ω
		V _{GS} = -4.5 V, I _D = -4.5 A	P-Ch		0.034	0.042	
		V _{GS} = 4.5 V, I _D = 7.2 A	N-Ch		0.022	0.027	
		V _{GS} = -2.5 V, I _D = -3.7 A	P-Ch		0.048	0.060	
Forward Transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 8.8 A	N-Ch		20		S
		V _{DS} = -15 V, I _D = -4.5 A	P-Ch		13		
Diode Forward Voltage ^b	V _{SD}	I _S = 2.0 A, V _{GS} = 0 V	N-Ch		0.71	1.1	V
		I _S = -1.2 A, V _{GS} = 0 V	P-Ch		-0.70	-1.1	
Dynamic^a							
Total Gate Charge	Q _g	N-Channel V _{DS} = 15 V, V _{GS} = 5 V, I _D = 8.8 A P-Channel V _{DS} = -4 V, V _{GS} = -5 V, I _D = -4.5 A	N-Ch		14.5	20	nC
Gate-Source Charge	Q _{gs}		P-Ch		15	25	
			N-Ch		3.3		
Gate-Drain Charge	Q _{gd}		P-Ch		3.0		
			N-Ch		6.6		
Turn-On Delay Time	t _{d(on)}		P-Ch		2.0		
		N-Ch		13	20		
Rise Time	t _r	N-Channel V _{DD} = 15 V, R _L = 15 Ω I _D ≅ 1 A, V _{GEN} = 10 V, R _G = 6 Ω	N-Ch		9	18	ns
		P-Channel V _{DD} = -4 V, R _L = 4 Ω I _D ≅ -1 A, V _{GEN} = -4.5 V, R _G = 6 Ω	P-Ch		50	100	
Turn-Off Delay Time	t _{d(off)}	N-Ch		35	50		
		P-Ch		110	220		
Fall Time	t _f	N-Ch		17	30		
		P-Ch		60	120		
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 1.7 A, di/dt = 100 A/μs	N-Ch		35	70	
			P-Ch		60	100	

Notes

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



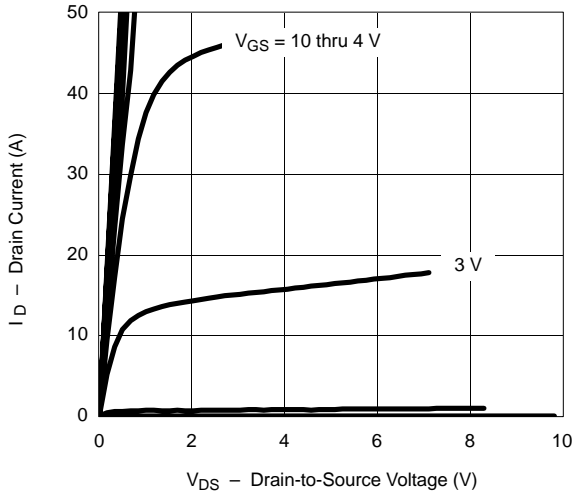
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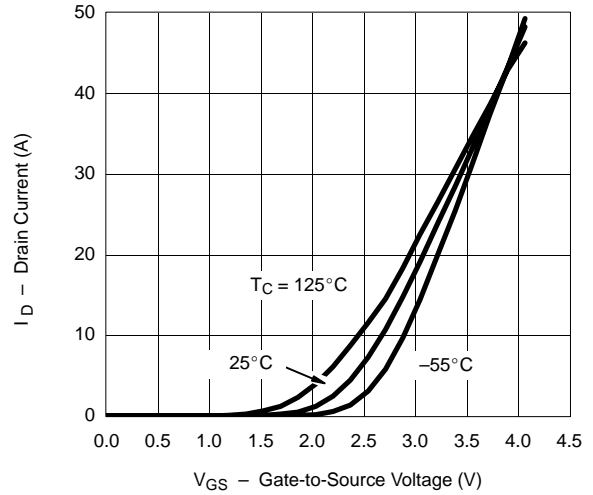
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

N-CHANNEL

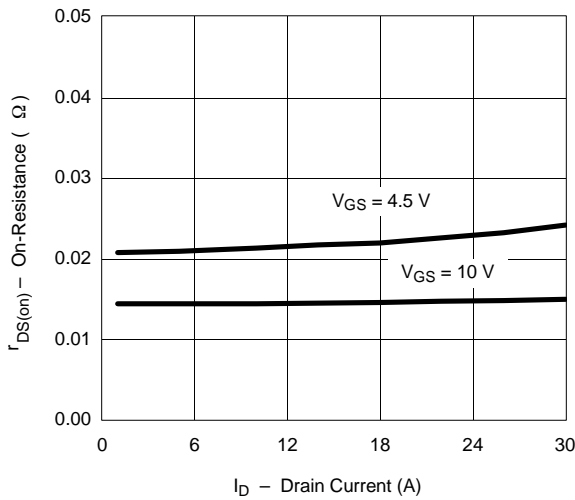
Output Characteristics



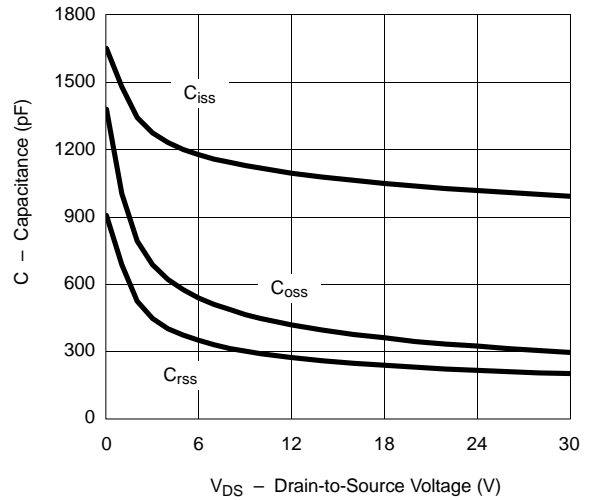
Transfer Characteristics



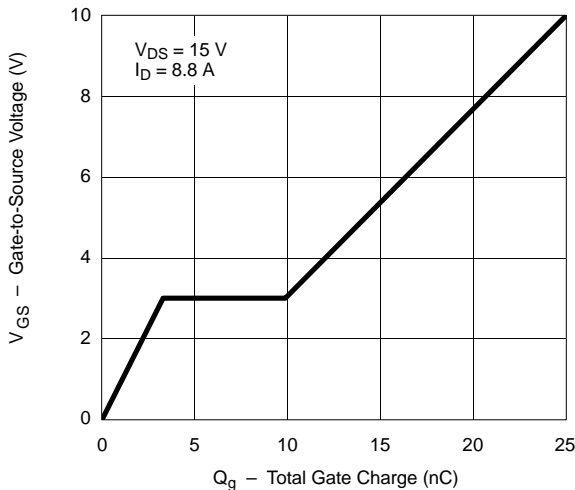
On-Resistance vs. Drain Current



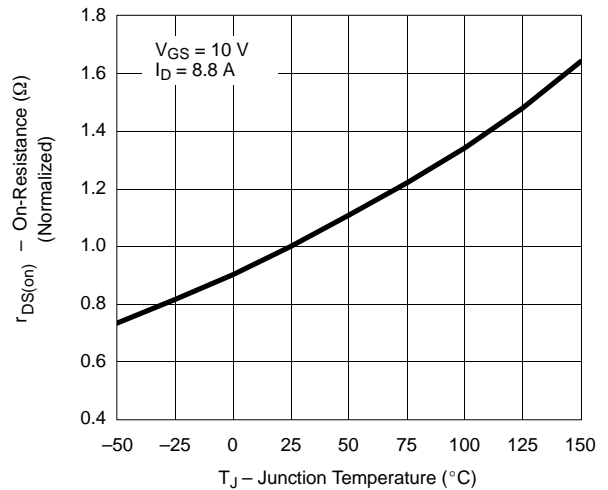
Capacitance



Gate Charge



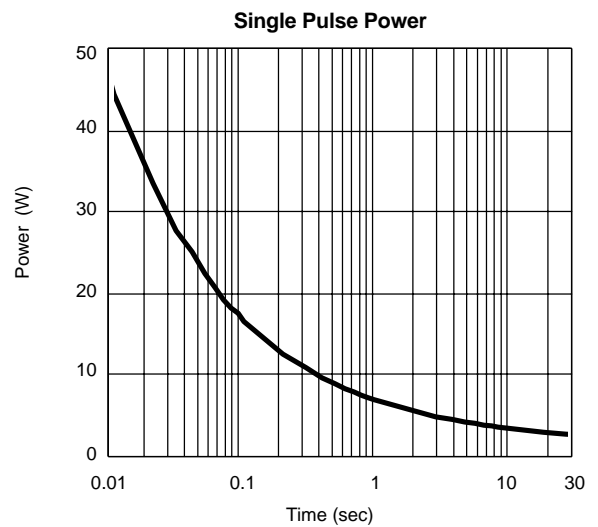
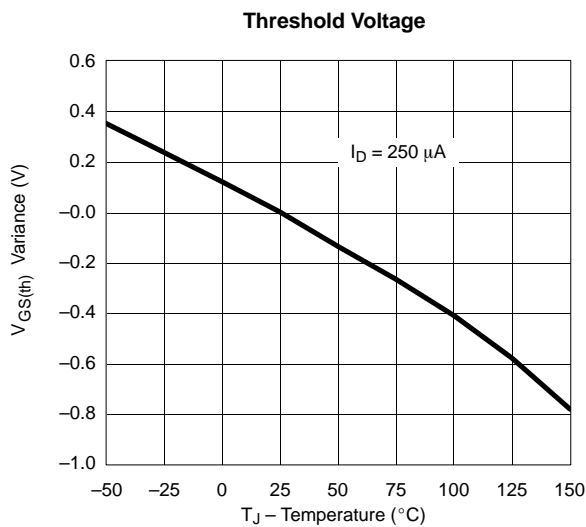
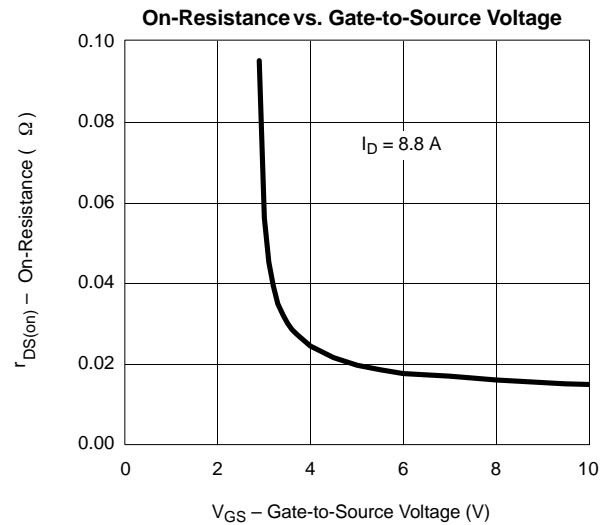
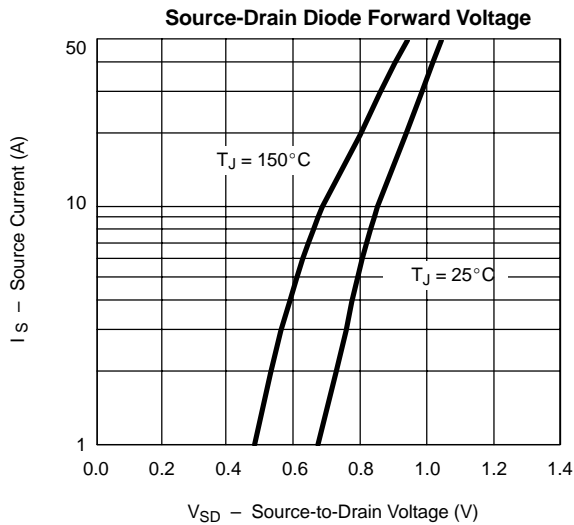
On-Resistance vs. Junction Temperature



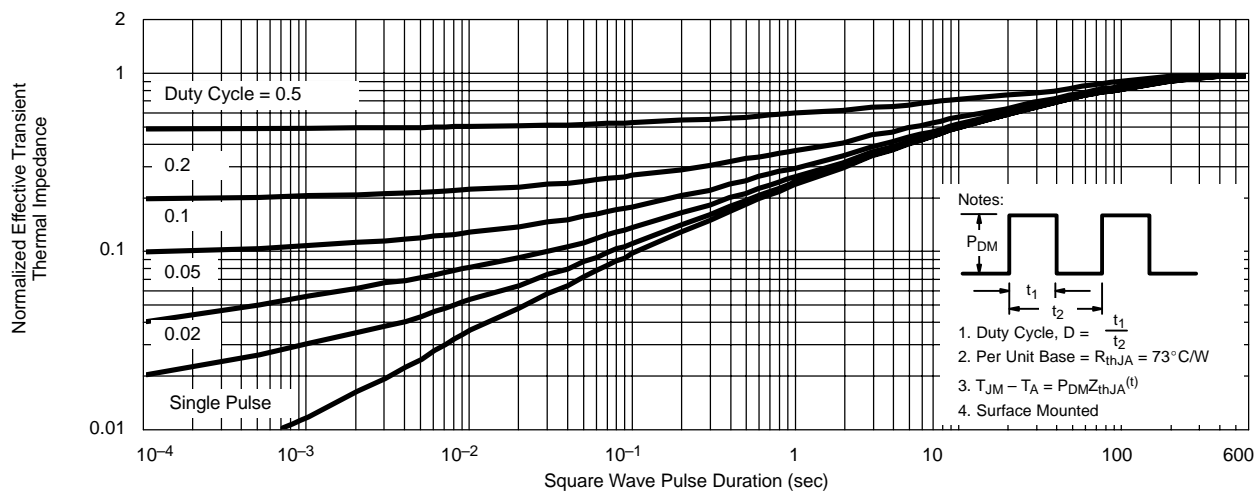


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N-CHANNEL



Normalized Thermal Transient Impedance, Junction-to-Ambient



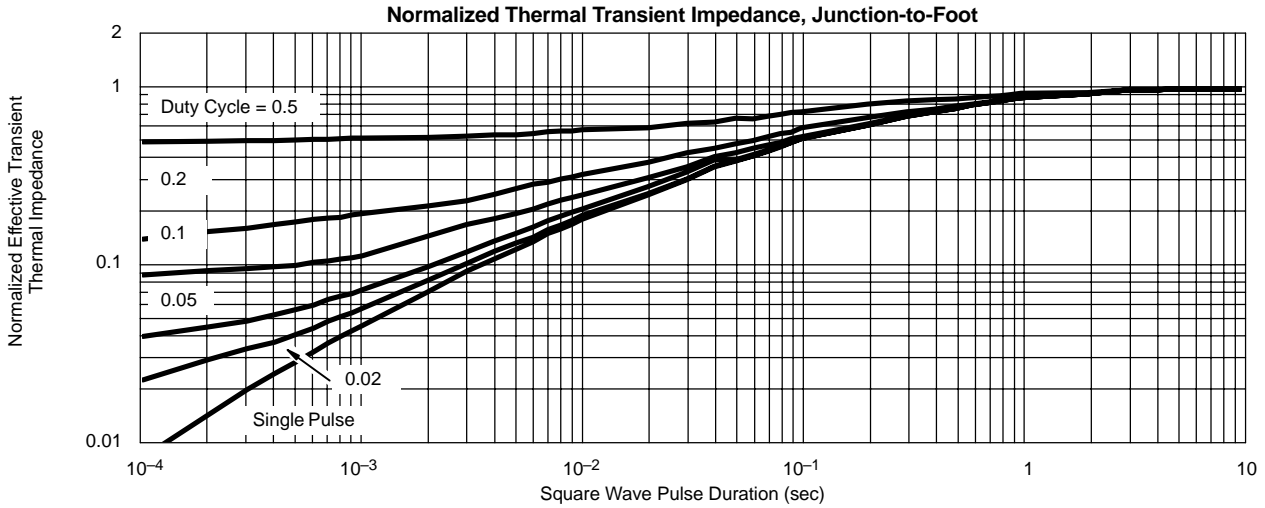


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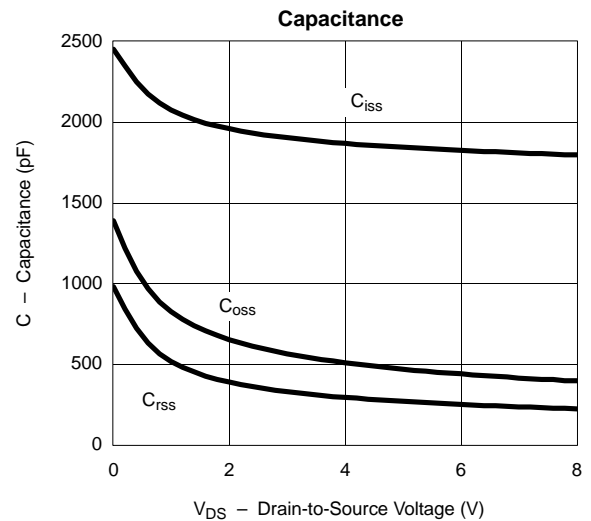
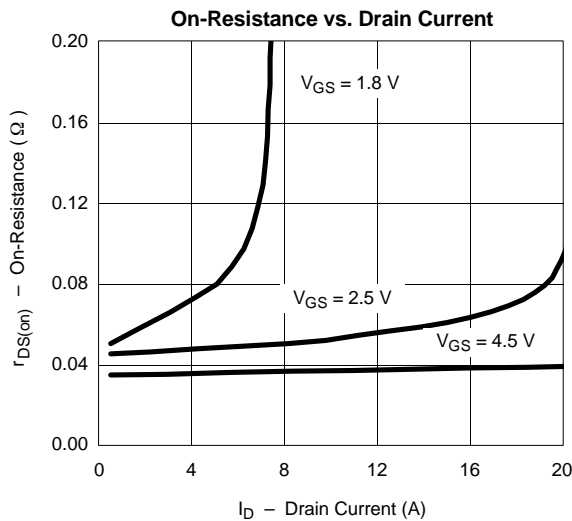
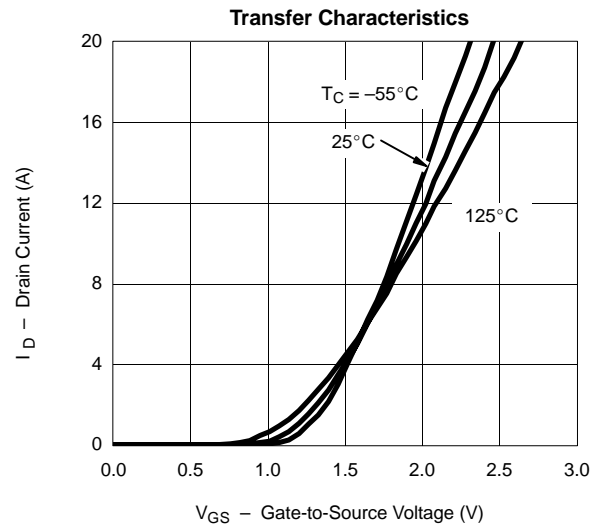
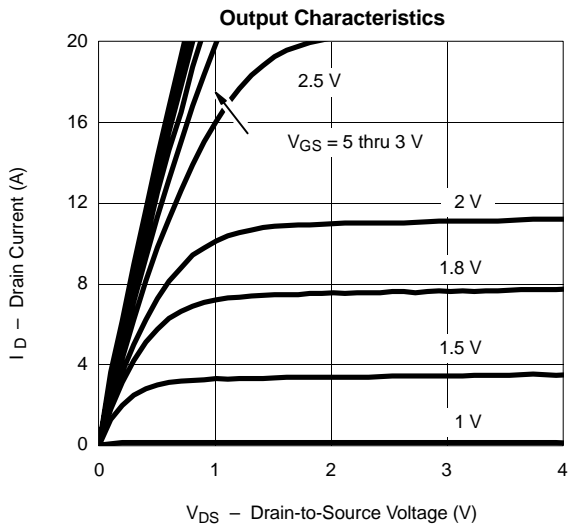
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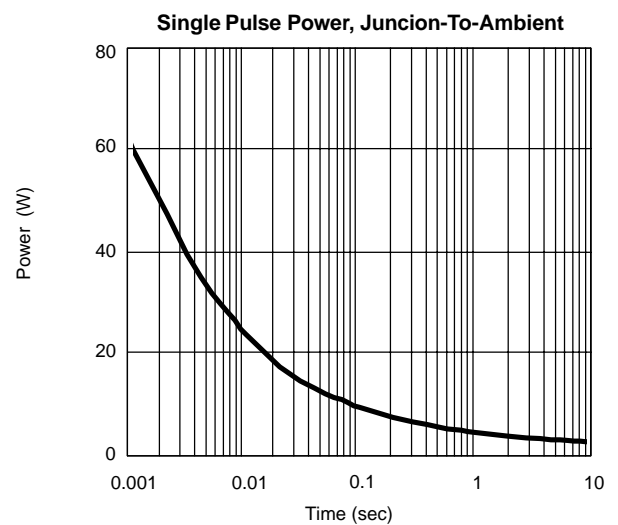
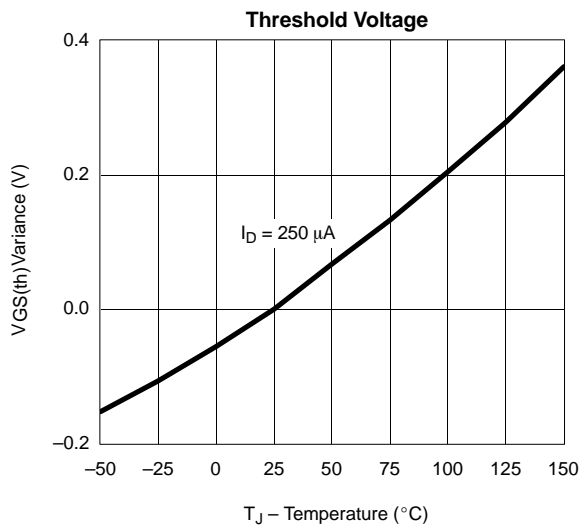
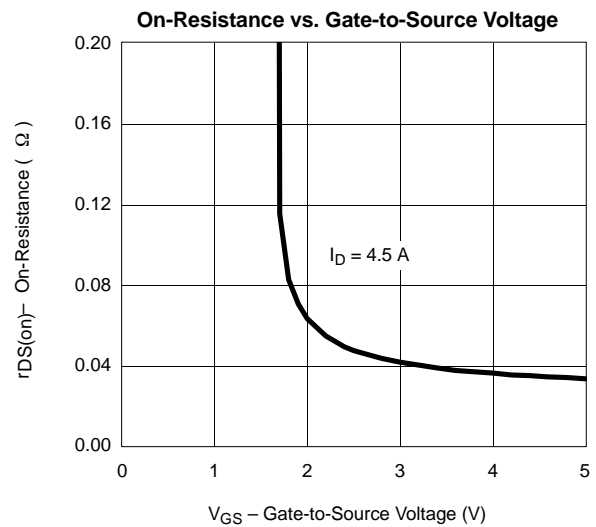
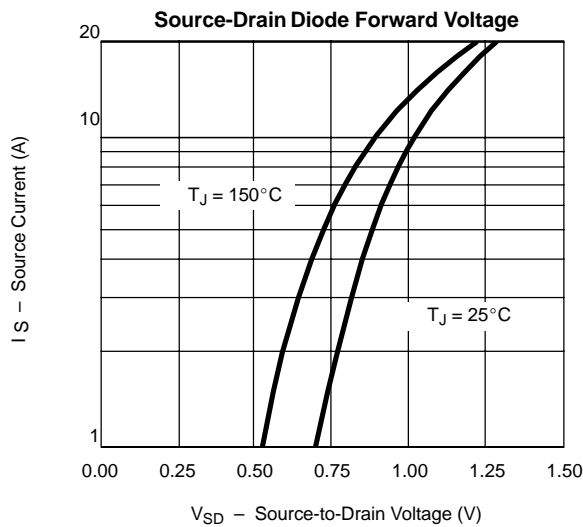
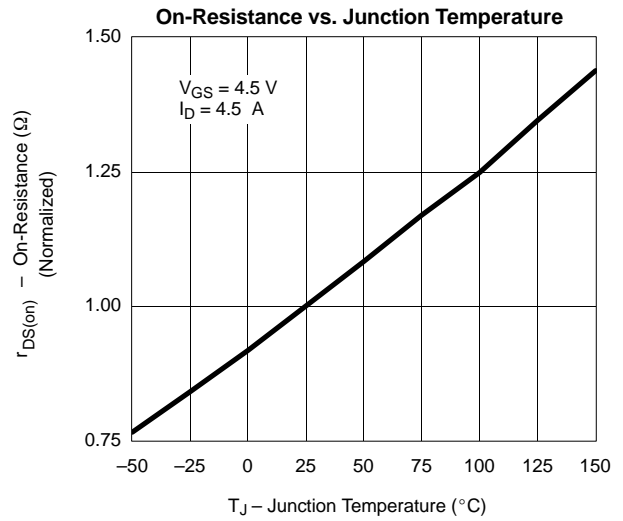
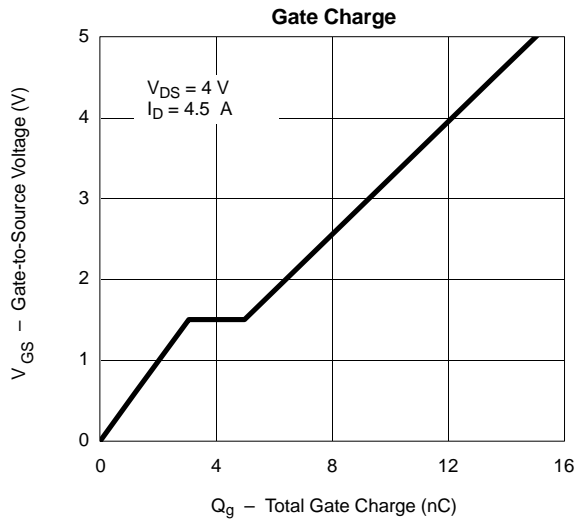
P-CHANNEL





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