



Complementary Low-Threshold MOSFET Pair

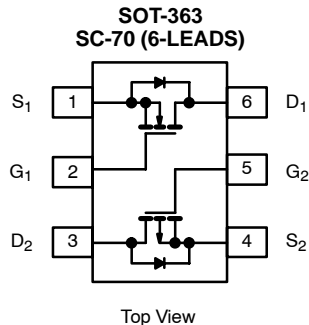


Pb-free
Available

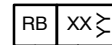
PRODUCT SUMMARY			
	V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
N-Channel	20	0.385 @ $V_{GS} = 4.5$ V	0.70
		0.630 @ $V_{GS} = 2.5$ V	0.54
P-Channel	-8	0.600 @ $V_{GS} = -4.5$ V	-0.60
		0.850 @ $V_{GS} = -2.5$ V	-0.50
		1.200 @ $V_{GS} = -1.8$ V	-0.42

FEATURES

- TrenchFET® Power MOSFET



Marking Code



Lot Traceability
and Date Code

Part # Code

Ordering Information: Si1555DL-T1
Si1555DL-T1—E3 (Lead (Pb)-Free)

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)							
Parameter	Symbol	N-Channel		P-Channel		Unit	
		5 secs	Steady State	5 secs	Steady State		
Drain-Source Voltage	V_{DS}	20		-8		V	
Gate-Source Voltage	V_{GS}	± 12		± 8			
Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^a	I_D	$T_A = 25^\circ\text{C}$	± 0.70	± 0.66	-0.60	-0.57	A
		$T_A = 85^\circ\text{C}$	± 0.50	± 0.48	-0.43	-0.41	
Pulsed Drain Current	I_{DM}	± 1.0					
Continuous Source Current (Diode Conduction) ^a	I_S	0.25	0.23	-0.25	-0.23		
Maximum Power Dissipation ^a	P_D	$T_A = 25^\circ\text{C}$	0.30	0.27	0.30	0.27	W
		$T_A = 85^\circ\text{C}$	0.16	0.14	0.16	0.14	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150				$^\circ\text{C}$	

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^a	$t \leq 5$ sec	R_{thJA}	360	415	$^\circ\text{C/W}$
	Steady State		400	460	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	300	350	

Notes

a. Surface Mounted on 1" x 1" FR4 Board.

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		1.4	V
		V _{DS} = V _{GS} , I _D = -250 μA	P-Ch	-0.45		-1.0	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±12 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} = 20 V, V _{GS} = 0 V	N-Ch			1	μA
		V _{DS} = -8 V, V _{GS} = 0 V	P-Ch			-1	
		V _{DS} = 20 V, V _{GS} = 0 V, T _J = 85 °C	N-Ch			5	
		V _{DS} = -8 V, V _{GS} = 0 V, T _J = 85 °C	P-Ch			-5	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 5 V, V _{GS} = 4.5 V	N-Ch	1.0			A
		V _{DS} ≤ -5 V, V _{GS} = -4.5 V	P-Ch	-1.0			
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 4.5 V, I _D = 0.66 A	N-Ch		0.320	0.385	Ω
		V _{GS} = -4.5 V, I _D = -0.57 A	P-Ch		0.510	0.600	
		V _{GS} = 2.5 V, I _D = 0.40 A	N-Ch		0.560	0.630	
		V _{GS} = -2.5 V, I _D = -0.48 A	P-Ch		0.720	0.850	
		V _{GS} = -1.8 V, I _D = -0.20 A	P-Ch		1.00	1.200	
Forward Transconductance ^a	g _{fs}	V _{DS} = 10 V, I _D = 0.66 A	N-Ch		1.5		S
		V _{DS} = -4 V, I _D = -0.57 A	P-Ch		1.2		
Diode Forward Voltage ^a	V _{SD}	I _S = 0.23 A, V _{GS} = 0 V	N-Ch		0.8	1.2	V
		I _S = -0.23 A, V _{GS} = 0 V	P-Ch		-0.8	-1.2	
Dynamic^b							
Total Gate Charge	Q _g	N-Channel V _{DS} = 10 V, V _{GS} = 4.5 V, I _D = 0.66 A P-Channel V _{DS} = -4 V, V _{GS} = -4.5 V, I _D = -0.57 A	N-Ch		0.8	1.2	nC
Gate-Source Charge	Q _{gs}		N-Ch		0.06		
			P-Ch		0.17		
Gate-Drain Charge	Q _{gd}	N-Ch		0.30			
		P-Ch		0.16			
Turn-On Delay Time	t _{d(on)}	N-Channel V _{DD} = 10 V, R _L = 20 Ω I _D ≅ 0.5 A, V _{GEN} = 4.5 V, R _g = 6 Ω P-Channel V _{DD} = -4 V, R _L = 8 Ω I _D ≅ -0.5 A, V _{GEN} = -4.5 V, R _g = 6 Ω	N-Ch		10	20	ns
Rise Time	t _r		N-Ch		16	30	
			P-Ch		25	50	
Turn-Off Delay Time	t _{d(off)}		N-Ch		10	20	
			P-Ch		10	20	
Fall Time	t _f		N-Ch		10	20	
			P-Ch		10	20	
Source-Drain Reverse Recovery Time	t _{rr}		I _F = 0.23 A, di/dt = 100 A/μs	N-Ch		20	
		I _F = -0.23 A, di/dt = 100 A/μs	P-Ch		20	40	

Notes

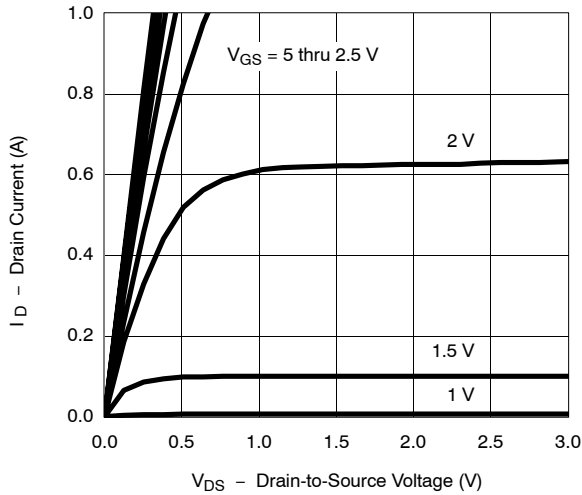
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

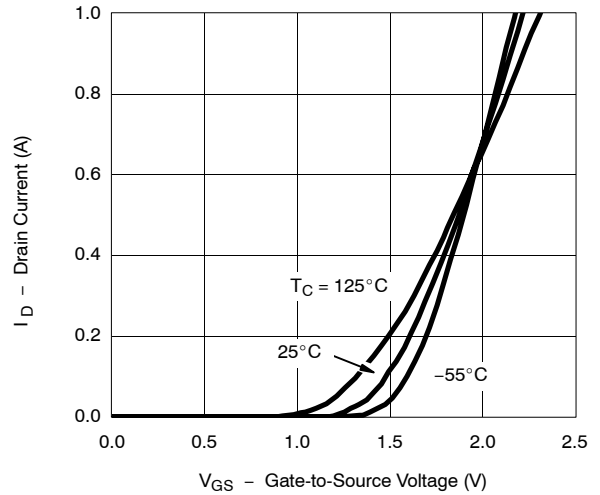


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) N-CHANNEL

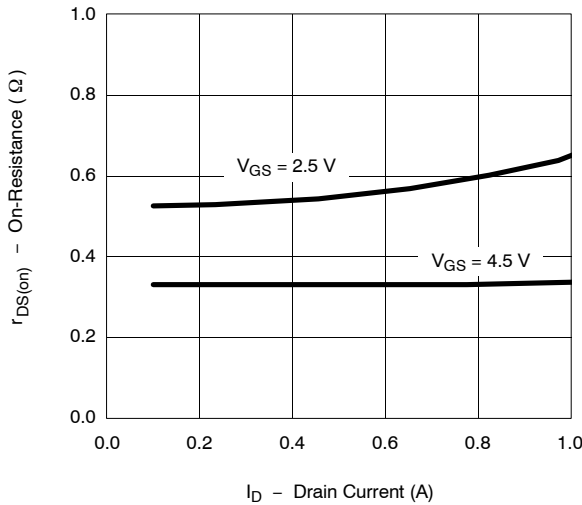
Output Characteristics



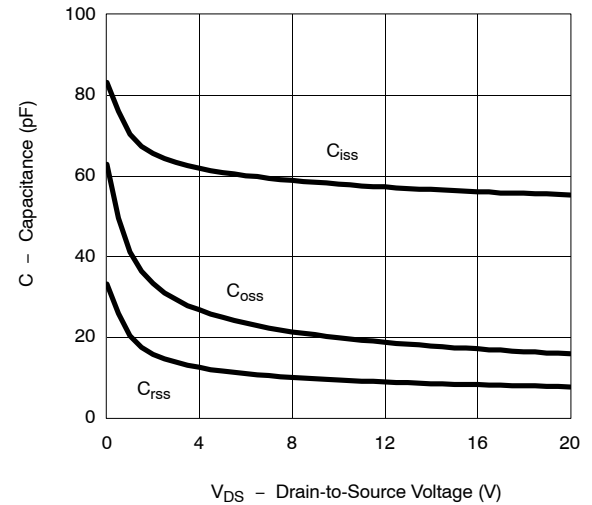
Transfer Characteristics



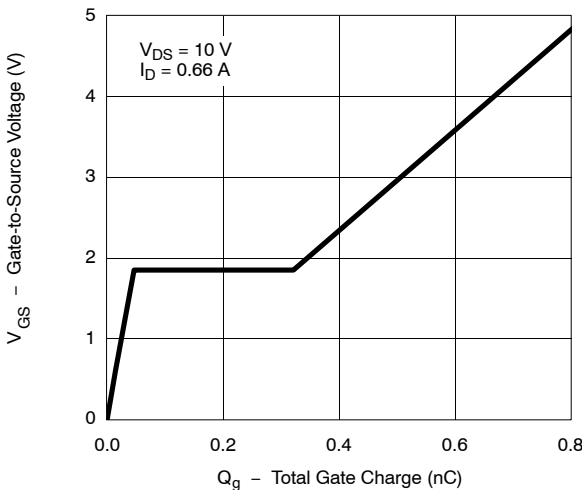
On-Resistance vs. Drain Current



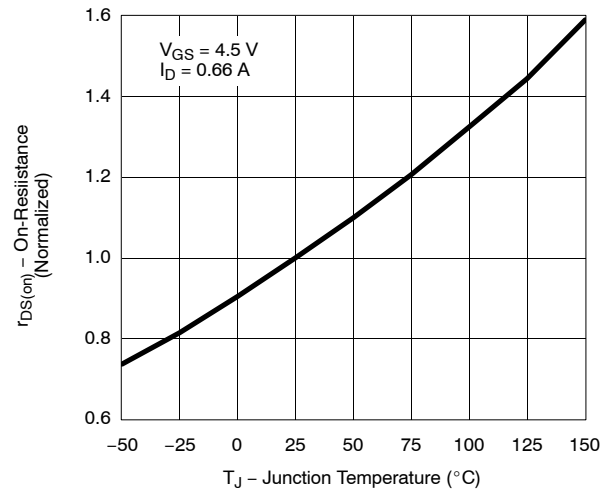
Capacitance



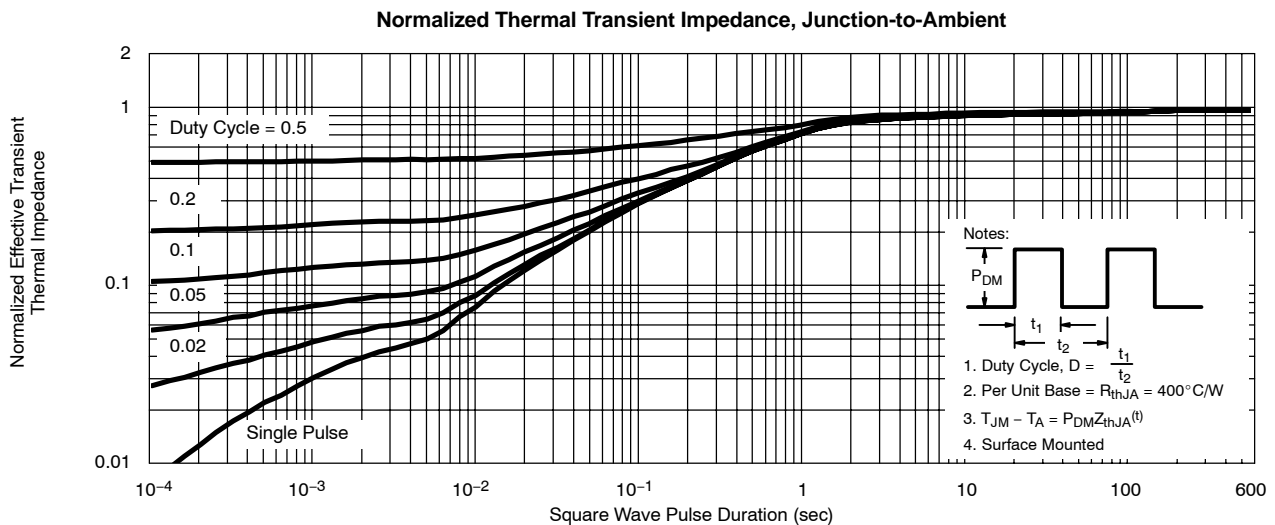
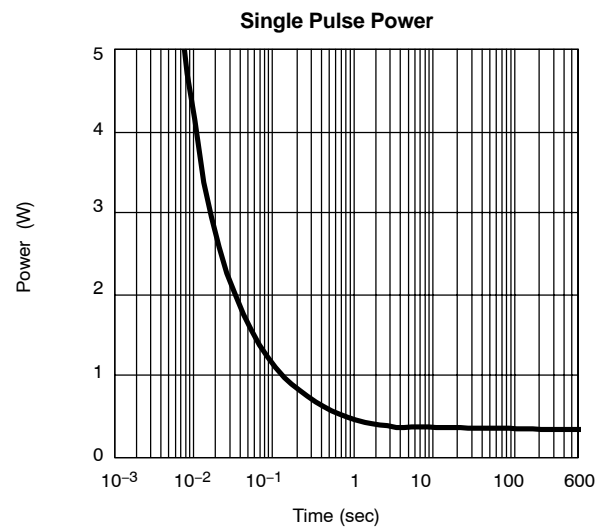
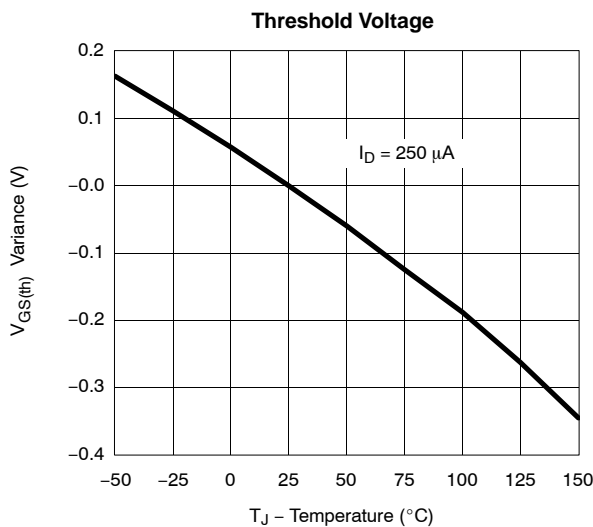
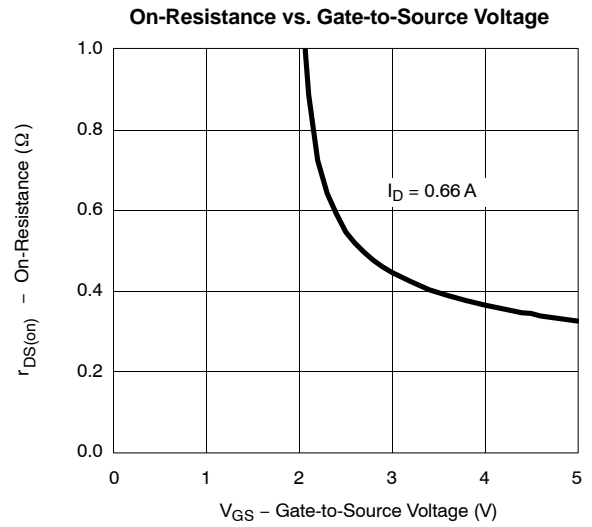
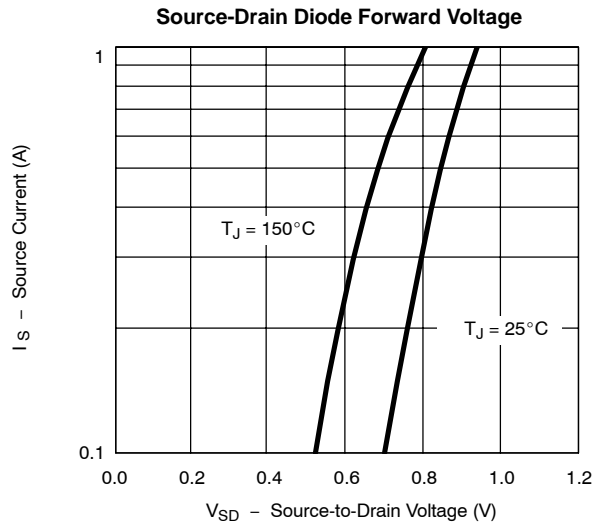
Gate Charge



On-Resistance vs. Junction Temperature



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

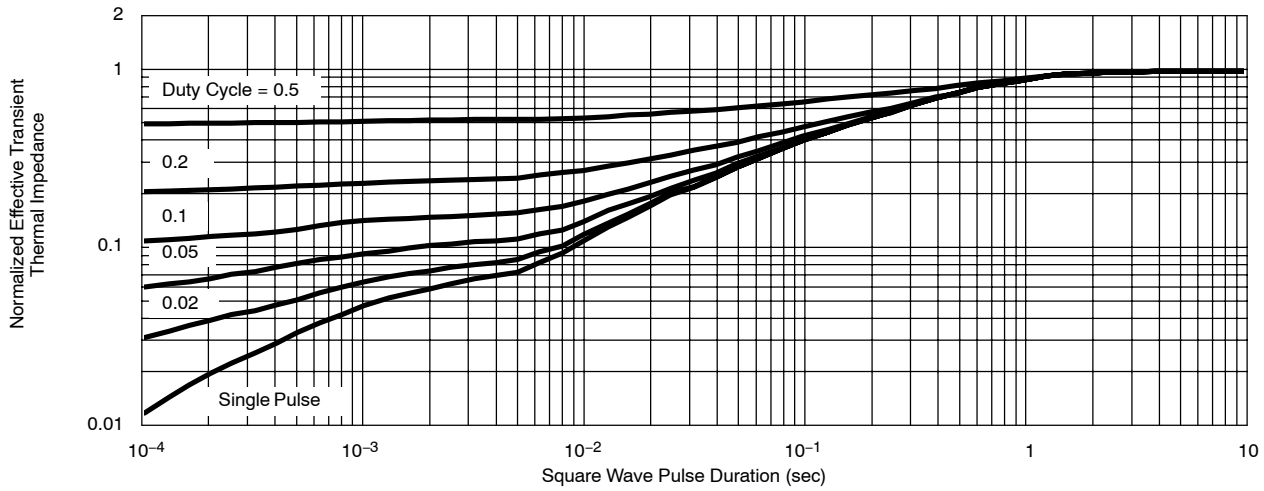




TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

N-CHANNEL

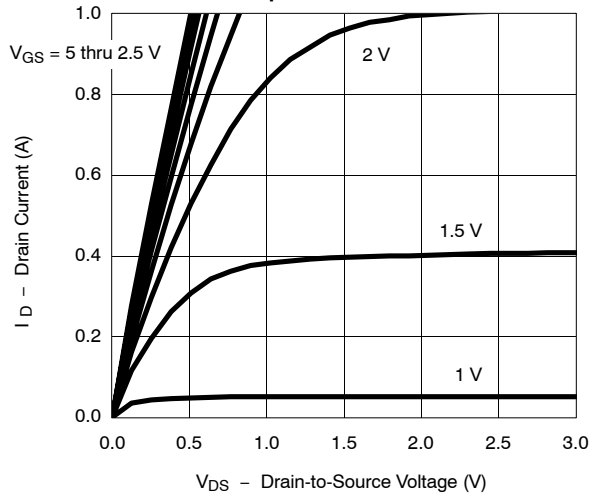
Normalized Thermal Transient Impedance, Junction-to-Foot



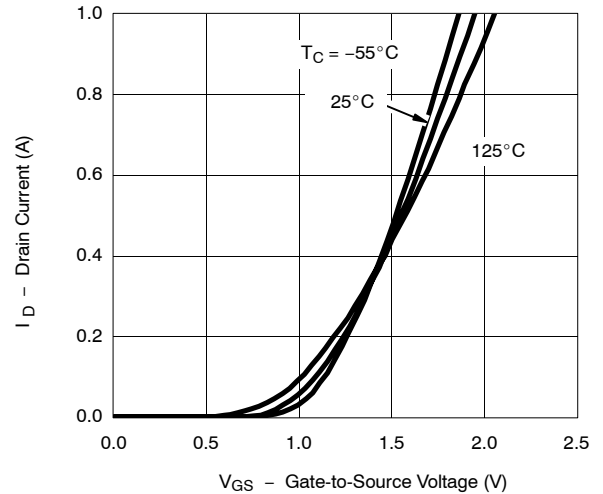
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

P-CHANNEL

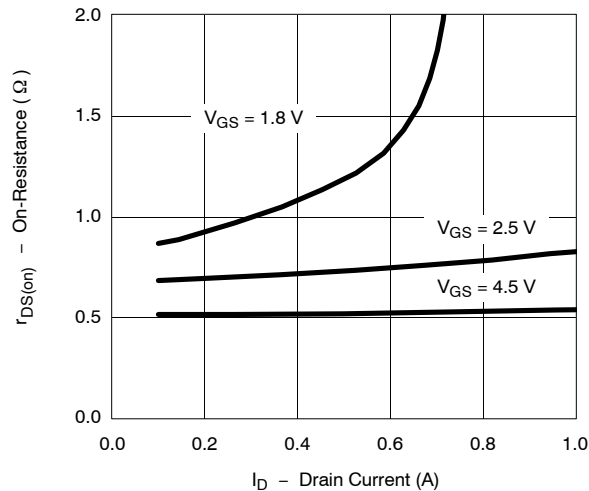
Output Characteristics



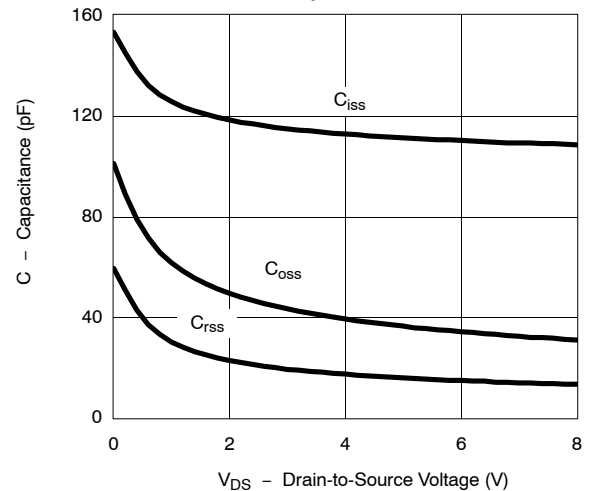
Transfer Characteristics



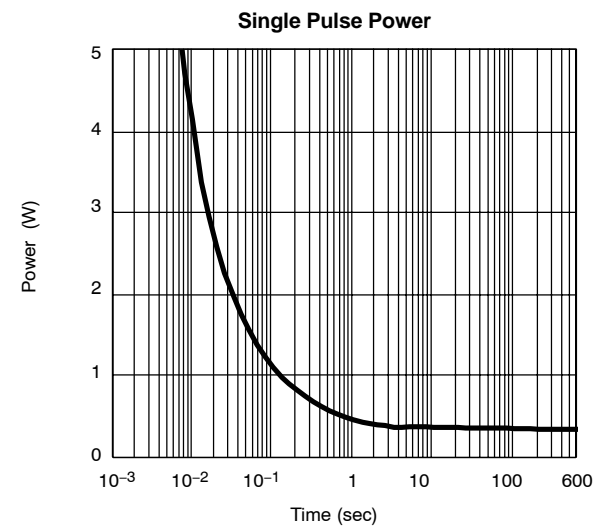
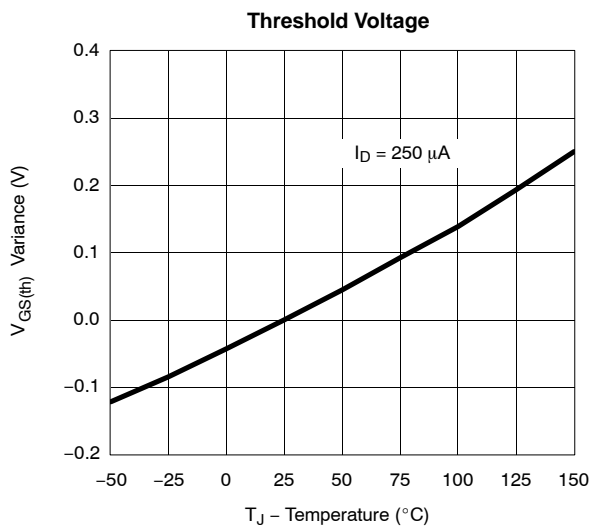
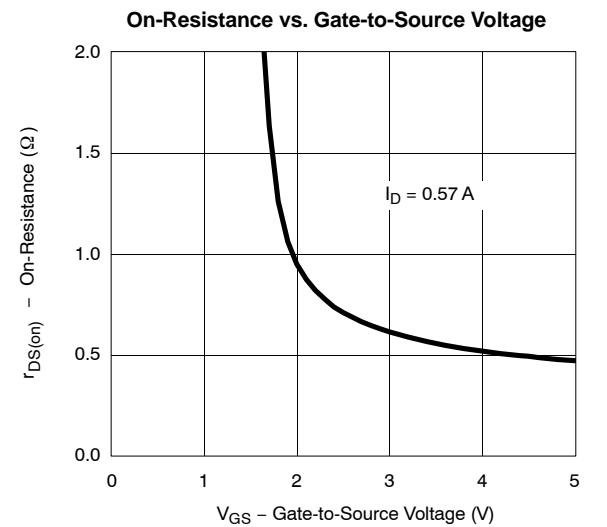
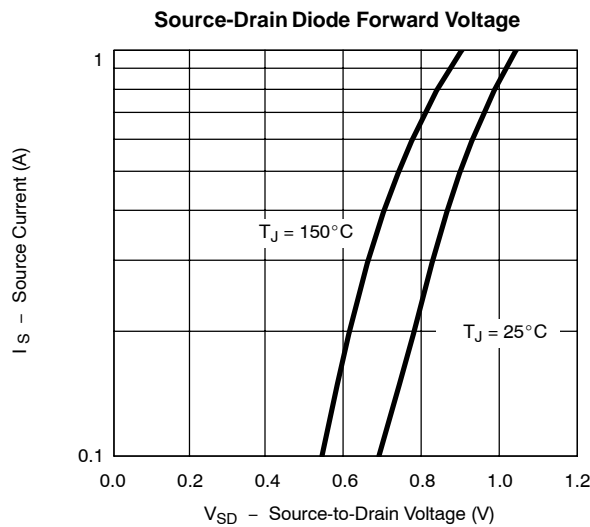
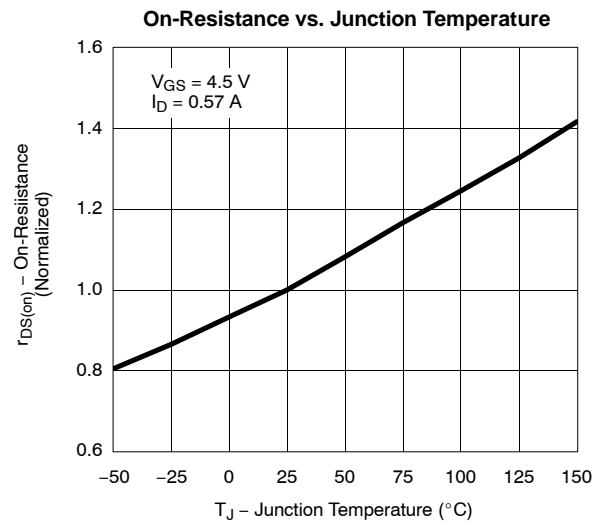
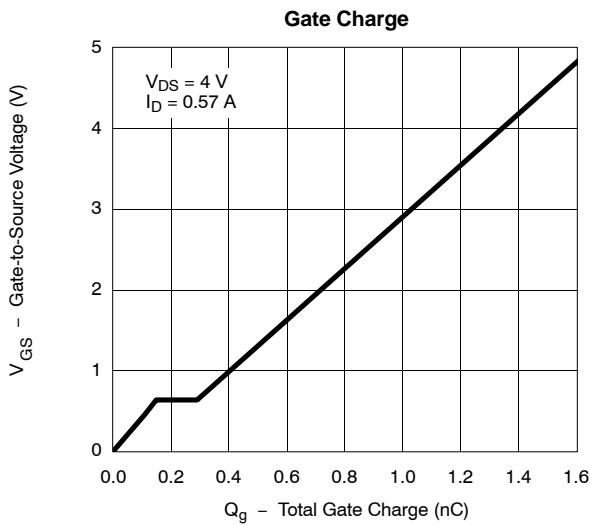
On-Resistance vs. Drain Current



Capacitance

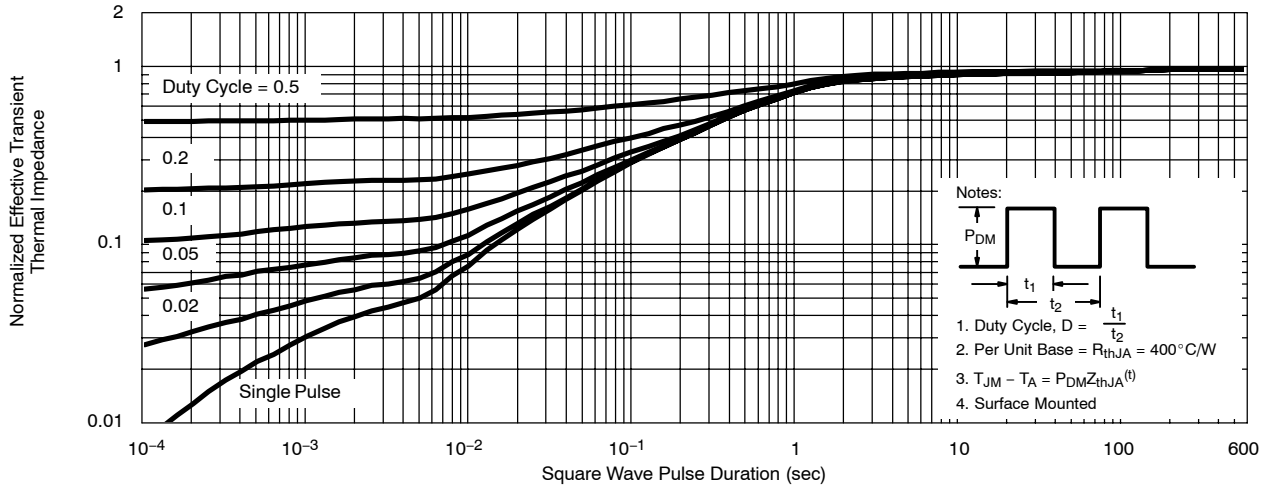


TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED) P-CHANNEL

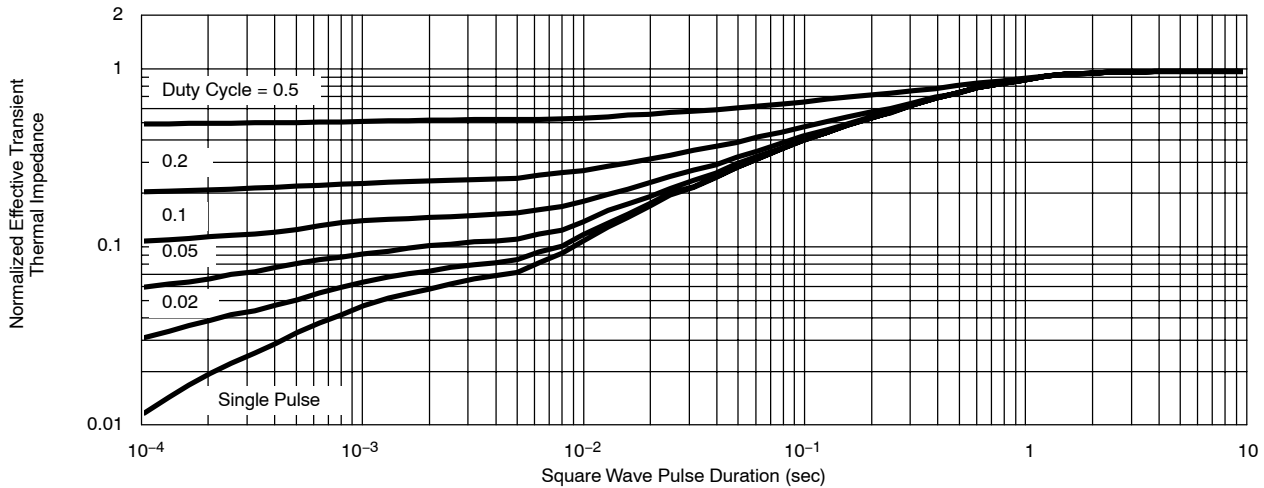


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) P-CHANNEL

Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot



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