

Complementary 2.5 V (G-S) MOSFET

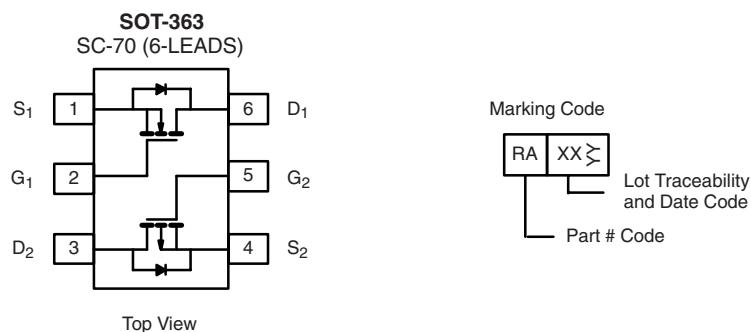
PRODUCT SUMMARY			
	V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A)
N-Channel	20	0.385 at V _{GS} = 4.5 V	± 0.70
		0.630 at V _{GS} = 2.5 V	± 0.54
P-Channel	- 20	0.995 at V _{GS} = - 4.5 V	± 0.44
		1.800 at V _{GS} = - 2.5 V	± 0.32

FEATURES

- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET® Power MOSFET
- Compliant to RoHS Directive 2002/95/EC



RoHS
COMPLIANT
HALOGEN
FREE
Available



Ordering Information: Si1553DL-T1-E3 (Lead (Pb)-free)
Si1553DL-T1-GE3 (Lead (Pb)-free and Halogen-free)

ABSOLUTE MAXIMUM RATINGS T _A = 25 °C, unless otherwise noted						
Parameter	Symbol	N-Channel		P-Channel		Unit
		5 s	Steady State	5 s	Steady State	
Drain-Source Voltage	V _{DS}		20		- 20	V
Gate-Source Voltage	V _{GS}			± 12		
Continuous Drain Current (T _J = 150 °C) ^a	I _D	± 0.70	± 0.66	± 0.44	± 0.41	A
		± 0.50	± 0.48	± 0.31	± 0.30	
Pulsed Drain Current	I _{DM}			± 1		A
Continuous Source Current (Diode Conduction) ^a	I _S	0.25	0.23	- 0.25	- 0.23	
Maximum Power Dissipation ^a	P _D	0.30	0.27	0.30	0.27	W
		0.16	0.14	0.16	0.14	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to 150				°C

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical		Maximum	Unit
Maximum Junction-to-Ambient ^a	R _{thJA}	360		415	°C/W
		400		460	
Maximum Junction-to-Foot (Drain)	Steady State		R _{thJF}	300	350

Notes:

a. Surface mounted on 1" x 1" FR4 board.

SPECIFICATIONS $T_J = 25^\circ\text{C}$, unless otherwise noted

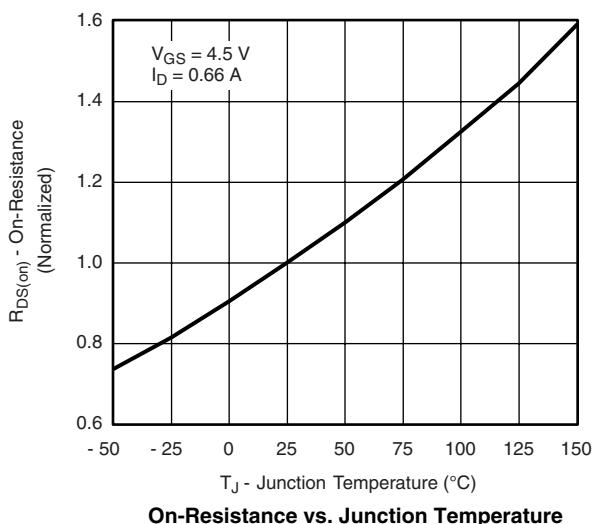
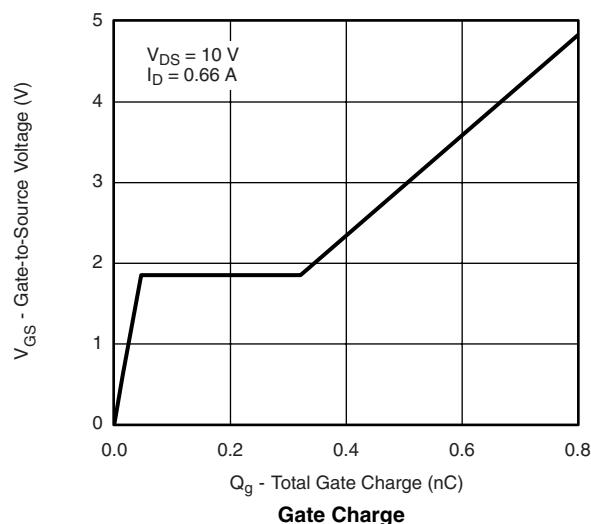
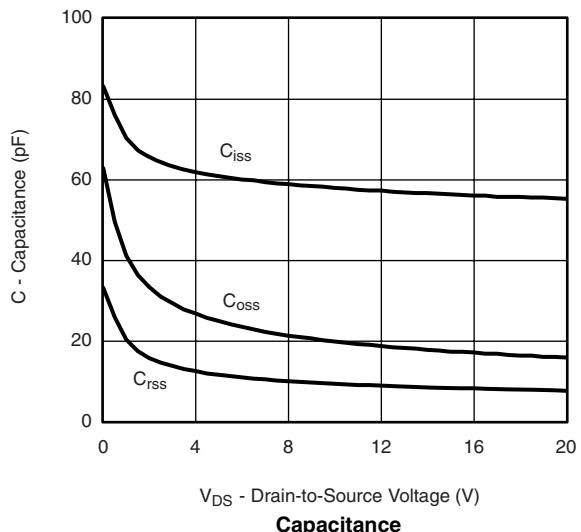
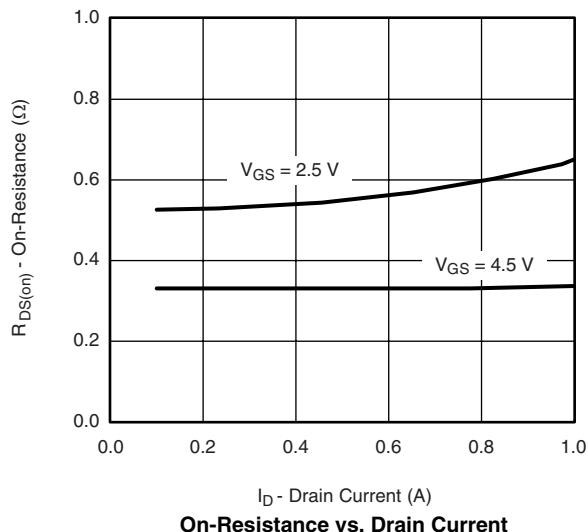
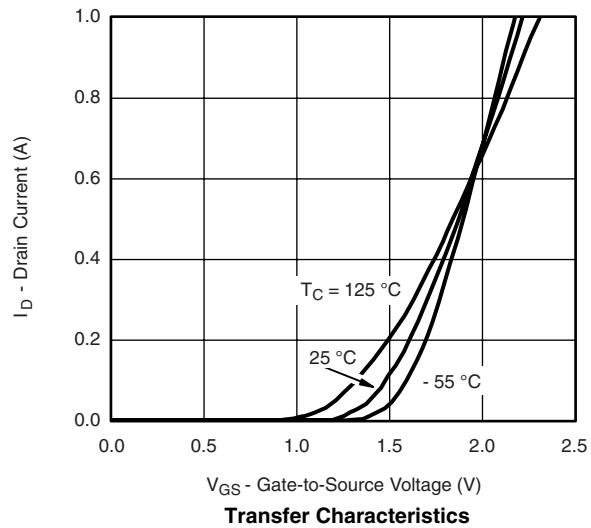
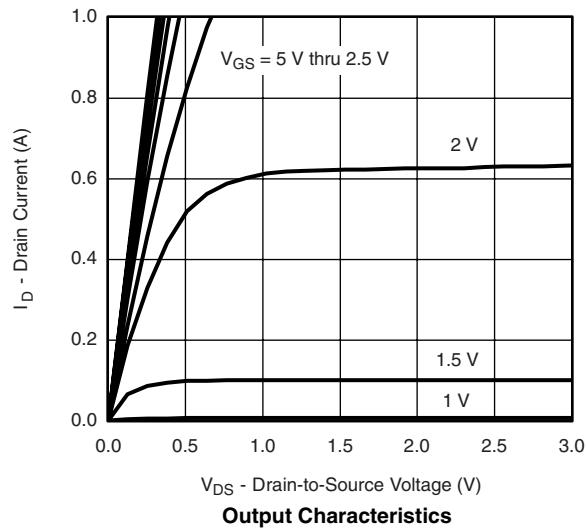
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
Static							
Gate Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$	N-Ch	0.6			
		$V_{DS} = V_{GS}, I_D = -250 \mu\text{A}$	P-Ch	- 0.6		V	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 12 \text{ V}$	N-Ch P-Ch		± 100 ± 100	nA	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 16 \text{ V}, V_{GS} = 0 \text{ V}$	N-Ch		1		
		$V_{DS} = -16 \text{ V}, V_{GS} = 0 \text{ V}$	P-Ch		- 1	μA	
		$V_{DS} = 16 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 85^\circ\text{C}$	N-Ch		5		
		$V_{DS} = -16 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 85^\circ\text{C}$	P-Ch		- 5		
On-State Drain Current ^a	$I_{D(\text{on})}$	$V_{DS} \geq 5 \text{ V}, V_{GS} = 4.5 \text{ V}$	N-Ch	1			
		$V_{DS} \leq -5 \text{ V}, V_{GS} = -4.5 \text{ V}$	P-Ch	- 1		A	
Drain-Source On-State Resistance ^a	$R_{DS(\text{on})}$	$V_{GS} = 4.5 \text{ V}, I_D = 0.66 \text{ A}$	N-Ch		0.320	0.385	
		$V_{GS} = -4.5 \text{ V}, I_D = -0.41 \text{ A}$	P-Ch		0.850	0.995	
		$V_{GS} = 2.5 \text{ V}, I_D = 0.40 \text{ A}$	N-Ch		0.560	0.630	
		$V_{GS} = -2.5 \text{ V}, I_D = -0.25 \text{ A}$	P-Ch		1.400	1.800	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 10 \text{ V}, I_D = 0.66 \text{ A}$	N-Ch		1.5		
		$V_{DS} = -10 \text{ V}, I_D = -0.41 \text{ A}$	P-Ch		0.8	S	
Diode Forward Voltage ^a	V_{SD}	$I_S = 0.23 \text{ A}, V_{GS} = 0 \text{ V}$	N-Ch		0.8	1.2	
		$I_S = -0.23 \text{ A}, V_{GS} = 0 \text{ V}$	P-Ch		- 0.8	- 1.2	
Dynamic^b							
Total Gate Charge	Q_g	N-Channel $V_{DS} = 10 \text{ V}, V_{GS} = 4.5 \text{ V}, I_D = 0.66 \text{ A}$ P-Channel $V_{DS} = -10 \text{ V}, V_{GS} = -4.5 \text{ V}, I_D = -0.41 \text{ A}$	N-Ch P-Ch		0.8 1.2	1.2 1.8	nC
Gate-Source Charge	Q_{gs}		N-Ch P-Ch		0.06 0.45		
Gate-Drain Charge	Q_{gd}		N-Ch P-Ch		0.30 0.25		
Turn-On Delay Time	$t_{d(\text{on})}$		N-Ch P-Ch		10 7.5	20 15	
Rise Time	t_r	N-Channel $V_{DD} = 10 \text{ V}, R_L = 20 \Omega$ $I_D \approx 0.5 \text{ A}, V_{GEN} = 4.5 \text{ V}, R_g = 6 \Omega$ P-Channel $V_{DD} = -10 \text{ V}, R_L = 20 \Omega$ $I_D \approx -0.5 \text{ A}, V_{GEN} = -4.5 \text{ V}, R_g = 6 \Omega$	N-Ch P-Ch		16 20	30 40	ns
Turn-Off Delay Time	$t_{d(\text{off})}$		N-Ch P-Ch		10 8.5	20 17	
Fall Time	t_f		N-Ch P-Ch		10 12	20 24	
Source-Drain Reverse Recovery Time	t_{rr}		N-Ch P-Ch		20 25	40 40	

Notes:

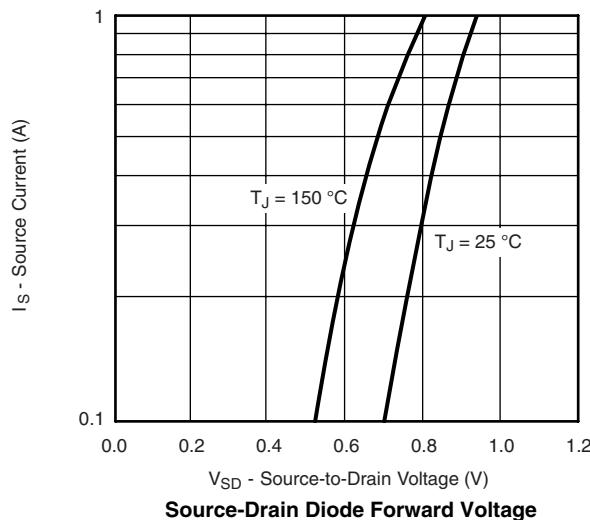
a. Pulse test; pulse width $\leq 300 \mu\text{s}$, duty cycle $\leq 2 \%$.

b. Guaranteed by design, not subject to production testing.

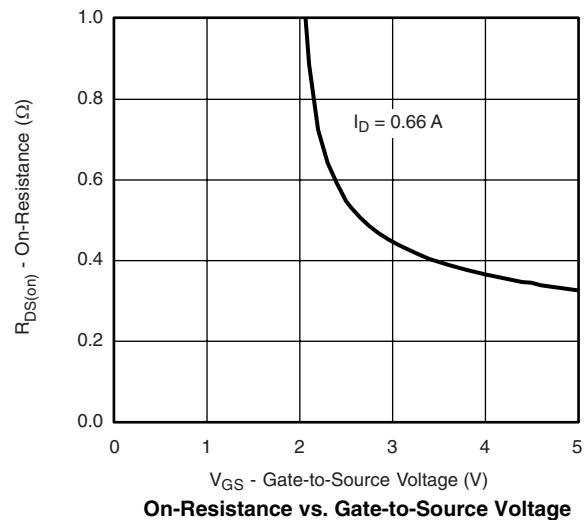
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

N-CHANNEL TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted


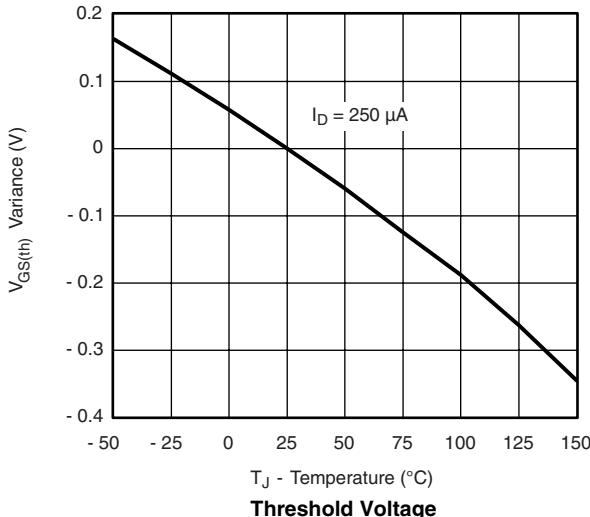
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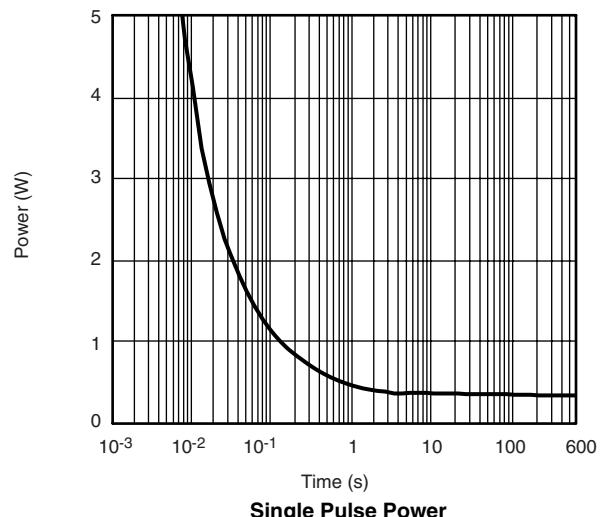
Source-Drain Diode Forward Voltage



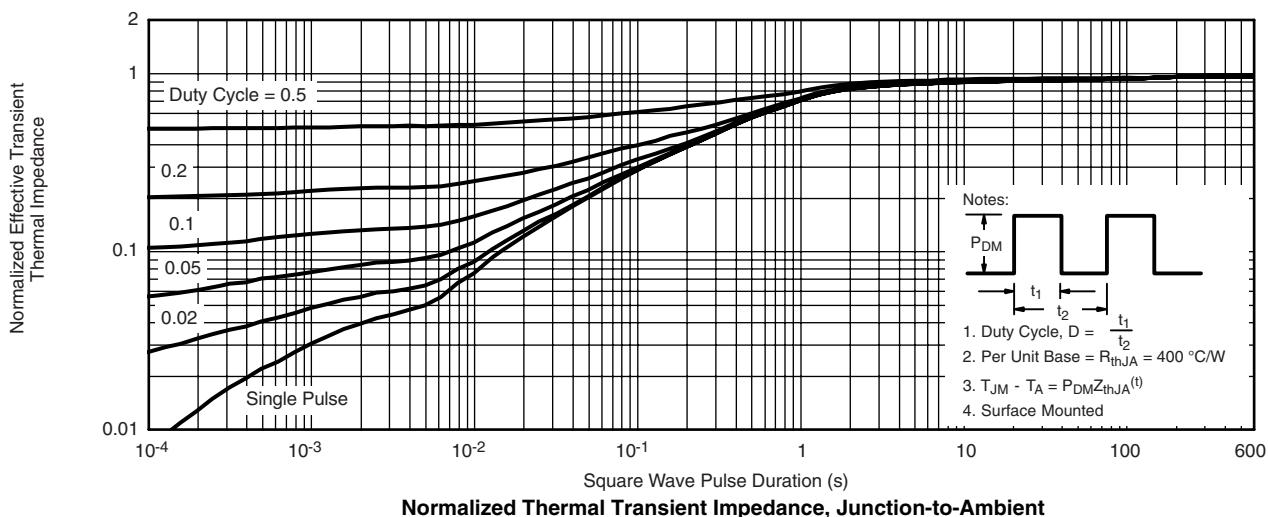
On-Resistance vs. Gate-to-Source Voltage



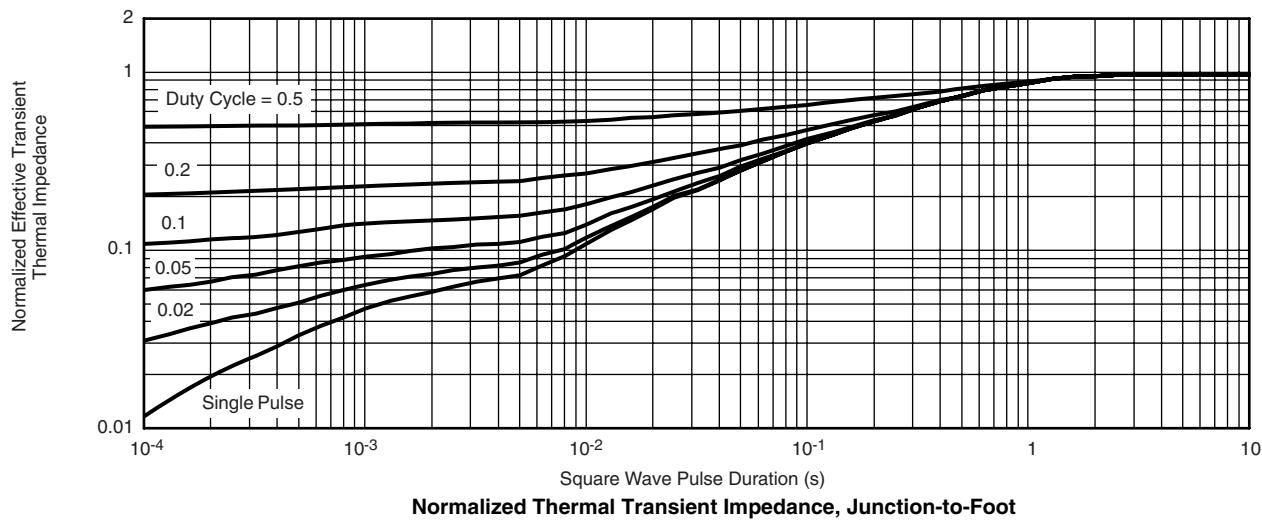
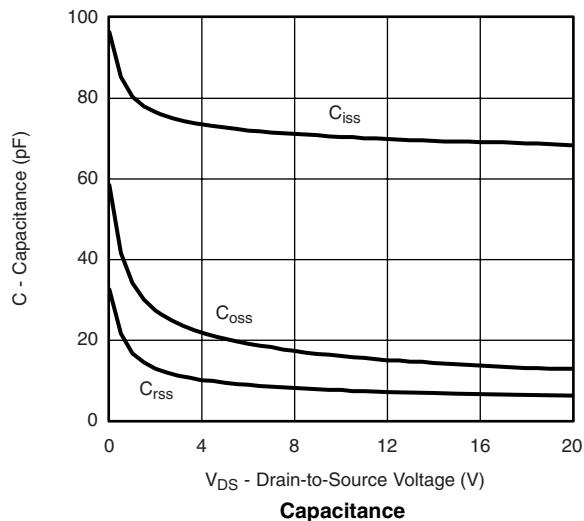
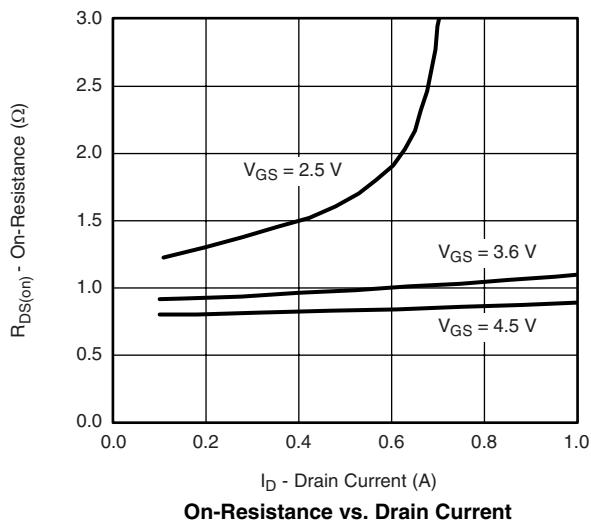
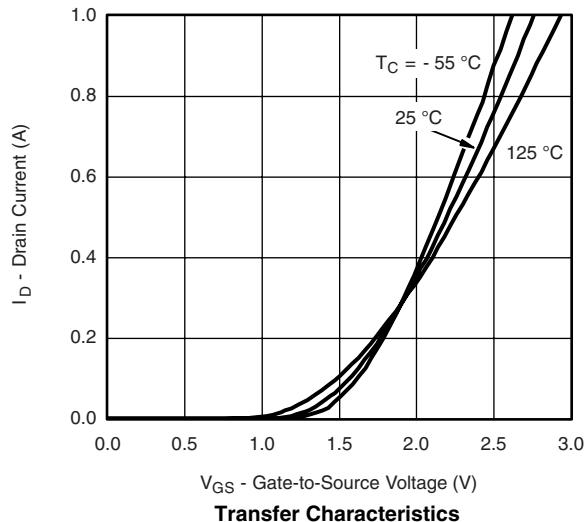
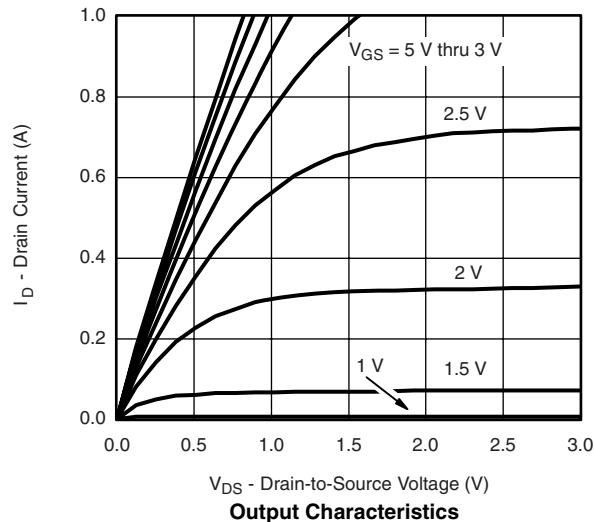
Threshold Voltage

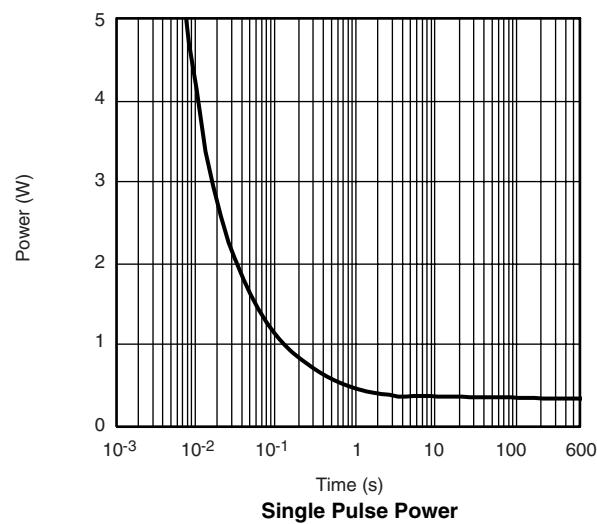
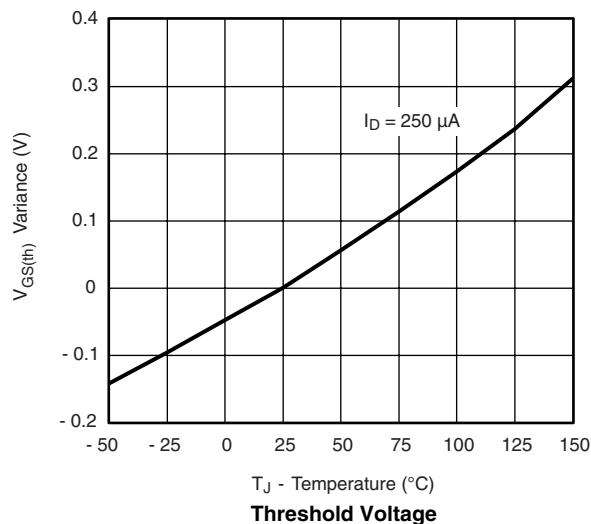
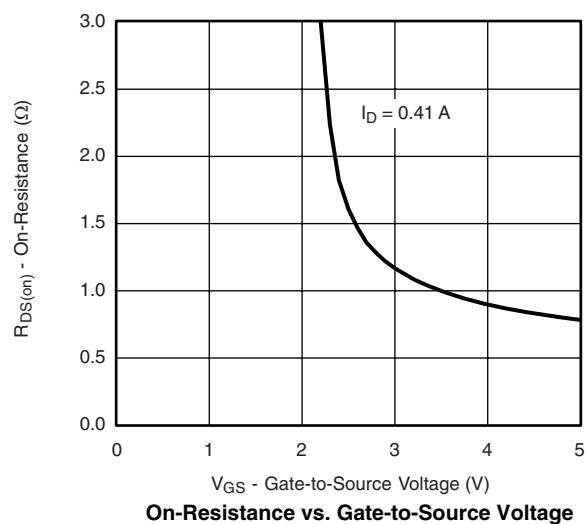
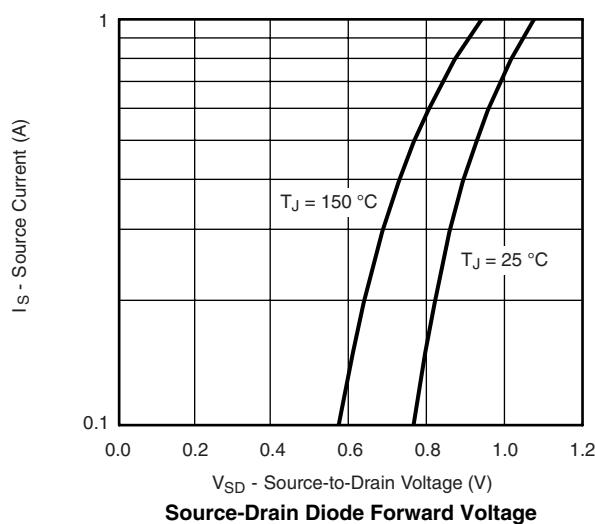
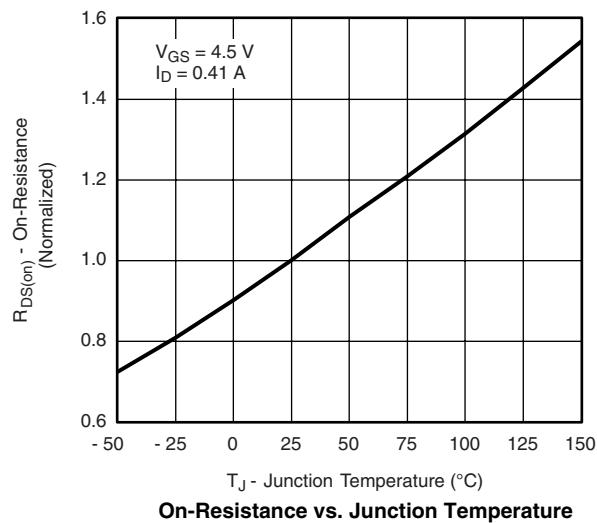
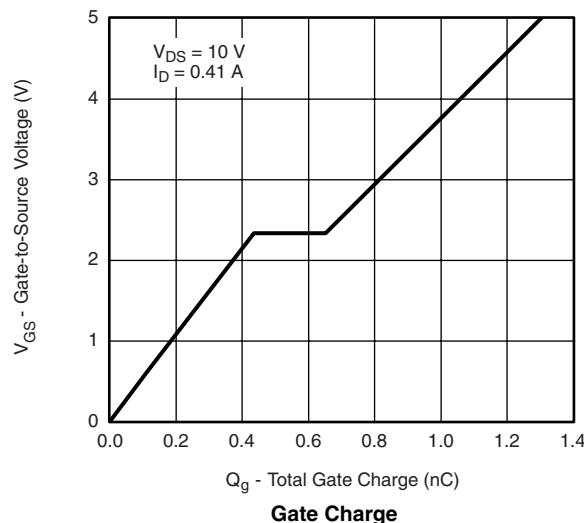


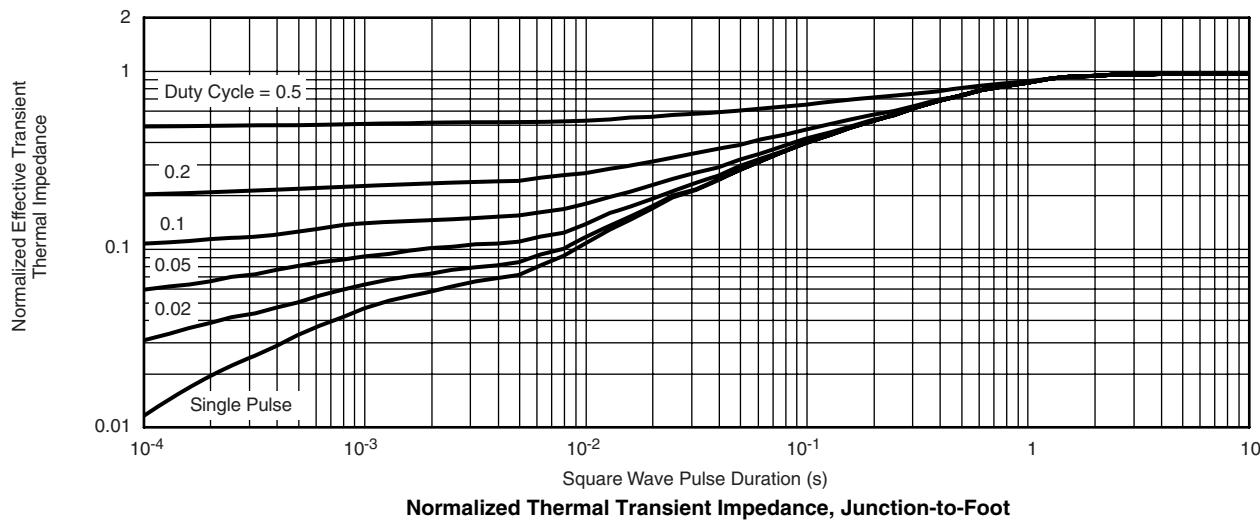
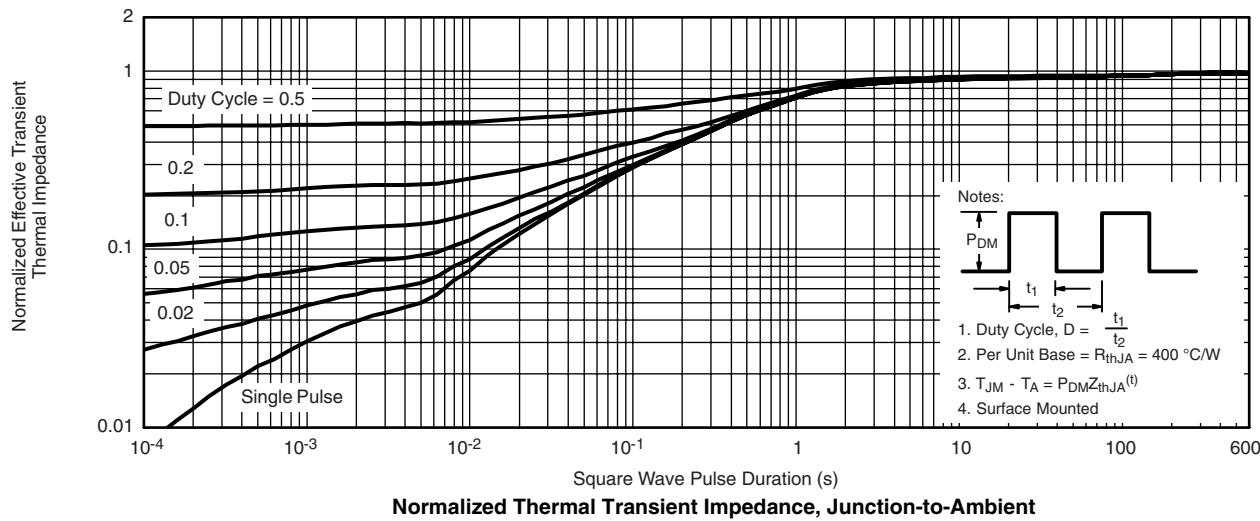
Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient

N-CHANNEL TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

P-CHANNEL TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted


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