

Complementary MOSFET (N- and P-Channel)

PRODUCT SUMMARY

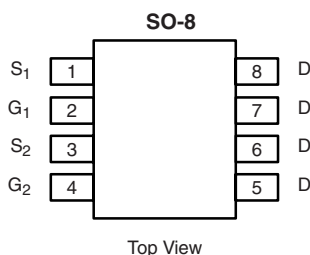
	V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
N-Channel	30	0.018 at $V_{GS} = 10$ V	± 9
		0.027 at $V_{GS} = 4.5$ V	± 7.4
P-Channel	- 8	0.042 at $V_{GS} = - 4.5$ V	± 6.2
		0.060 at $V_{GS} = - 2.5$ V	± 5.2

FEATURES

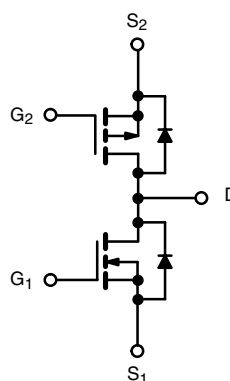
- Compliant to RoHS Directive 2002/95/EC



RoHS*
COMPLIANT



Ordering Information: Si4501DY-T1
Si4501DY-T1-E3 (Lead (Pb)-free)



ABSOLUTE MAXIMUM RATINGS $T_A = 25$ °C, unless otherwise noted

Parameter		Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage		V _{DS}	30	- 8	V
Gate-Source Voltage		V _{GS}	± 20	± 8	
Continuous Drain Current (T _J = 150 °C) ^{a, b}	T _A = 25 °C	I _D	± 9	± 6.2	A
	T _A = 70 °C		± 7.4	± 5.0	
Pulsed Drain Current		I _{DM}	± 30	± 20	
Continuous Source Current (Diode Conduction) ^{a, b}		I _S	1.7	- 1.7	
Maximum Power Dissipation ^{a, b}	T _A = 25 °C	P _D	2.5		W
	T _A = 70 °C		1.6		
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	$t \leq 10$ s	R_{thJA}	38	50	40	°C/W
	Steady State		73	95	73	
Maximum Junction-to-Foot	Steady State	R_{thJC}	17	22	20	

Notes:

a. Surface Mounted on FR4 board.

b. $t \leq 10$ s.

* Pb containing terminations are not RoHS compliant, exemptions may apply.

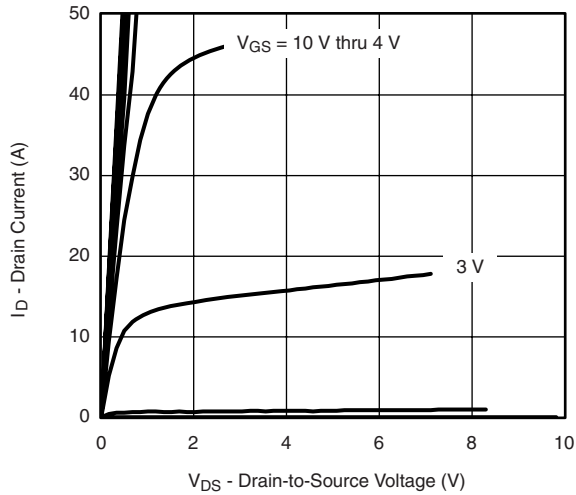
SPECIFICATIONS $T_J = 25\text{ }^{\circ}\text{C}$, unless otherwise noted							
Parameter	Symbol	Test Conditions		Min.	Typ. ^a	Max.	Unit
Static							
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	N-Ch	0.8			V
		$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	P-Ch	- 0.45			
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$	N-Ch			± 100	nA
		$V_{DS} = 0\text{ V}, V_{GS} = \pm 8\text{ V}$	P-Ch			± 100	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 24\text{ V}, V_{GS} = 0\text{ V}$	N-Ch			1	μA
		$V_{DS} = -6.4\text{ V}, V_{GS} = 0\text{ V}$	P-Ch			- 1	
		$V_{DS} = 24\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^{\circ}\text{C}$	N-Ch			5	
		$V_{DS} = -6.4\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^{\circ}\text{C}$	P-Ch			- 5	
On-State Drain Current ^b	$I_{D(on)}$	$V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$	N-Ch	30			A
		$V_{DS} = -5\text{ V}, V_{GS} = -4.5\text{ V}$	P-Ch	- 20			
Drain-Source On-State Resistance ^b	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 9\text{ A}$	N-Ch		0.015	0.018	Ω
		$V_{GS} = -4.5\text{ V}, I_D = -6.2\text{ A}$	P-Ch		0.034	0.042	
		$V_{GS} = 4.5\text{ V}, I_D = 7.4\text{ A}$	N-Ch		0.022	0.027	
		$V_{GS} = -2.5\text{ V}, I_D = -5.2\text{ A}$	P-Ch		0.048	0.060	
Forward Transconductance ^b	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 9\text{ A}$	N-Ch		20		S
		$V_{DS} = -15\text{ V}, I_D = -6.2\text{ A}$	P-Ch		14		
Diode Forward Voltage ^b	V_{SD}	$I_S = 1.7\text{ A}, V_{GS} = 0\text{ V}$	N-Ch		0.71	1.1	V
		$I_S = -1.7\text{ A}, V_{GS} = 0\text{ V}$	P-Ch		- 0.70	- 1.1	
Dynamic ^a							
Total Gate Charge	Q_g	N-Channel $V_{DS} = 15\text{ V}, V_{GS} = 5\text{ V}, I_D = 9\text{ A}$	N-Ch		14.2	20	nC
Gate-Source Charge	Q_{gs}		P-Ch		15	25	
		Gate-Drain Charge	Q_{gd}	P-Channel $V_{DS} = -4\text{ V}, V_{GS} = -5\text{ V}, I_D = -6.2\text{ A}$	N-Ch		
P-Ch					3.0		
Turn-On Delay Time	$t_{d(on)}$	N-Channel $V_{DD} = 15\text{ V}, R_L = 15\text{ }\Omega$ $I_D \cong 1\text{ A}, V_{GEN} = 10\text{ V}, R_g = 6\text{ }\Omega$	N-Ch		13	20	ns
			P-Ch		20	40	
Rise Time	t_r		N-Ch		9	18	
			P-Ch		50	100	
Turn-Off Delay Time	$t_{d(off)}$	P-Channel $V_{DD} = -4\text{ V}, R_L = 4\text{ }\Omega$ $I_D \cong -1\text{ A}, V_{GEN} = -4.5\text{ V}, R_g = 6\text{ }\Omega$	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}	$I_F = 1.7\text{ A}, dI/dt = 100\text{ A}/\mu\text{s}$	N-Ch		35	70	
			P-Ch		60	100	

Notes:

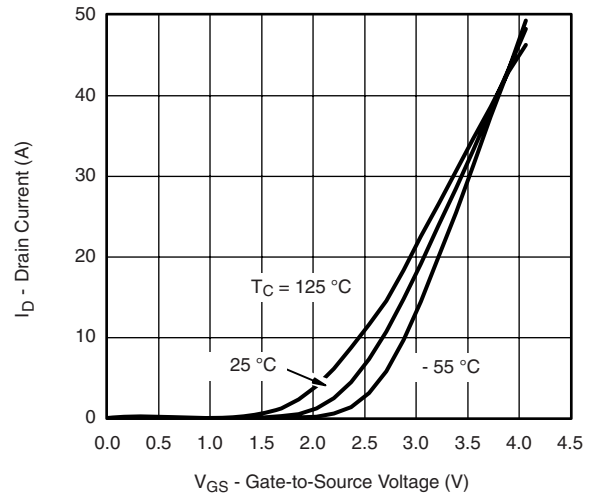
- a. Guaranteed by design, not subject to production testing.
b. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

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.

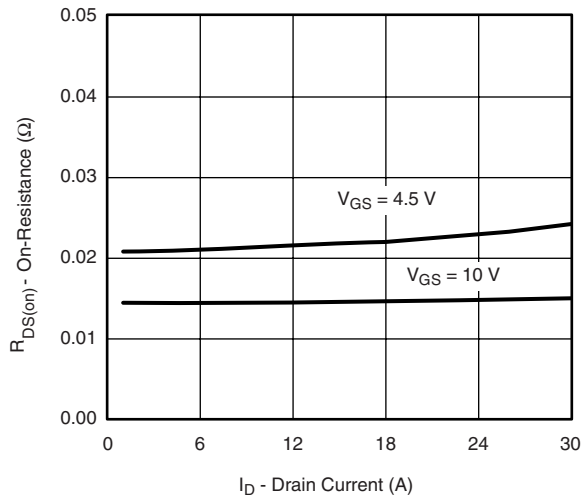
N-CHANNEL TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



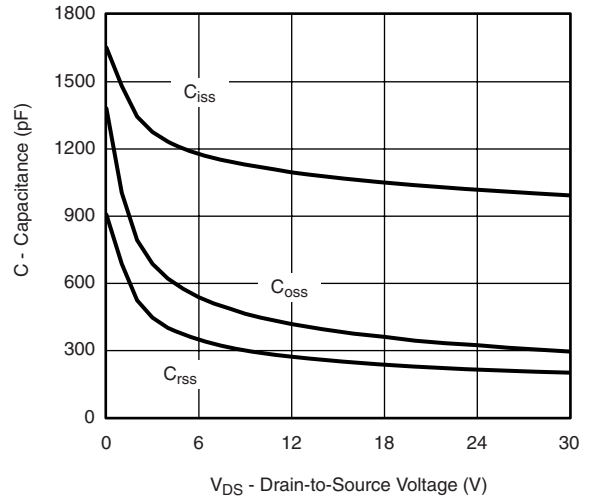
Output Characteristics



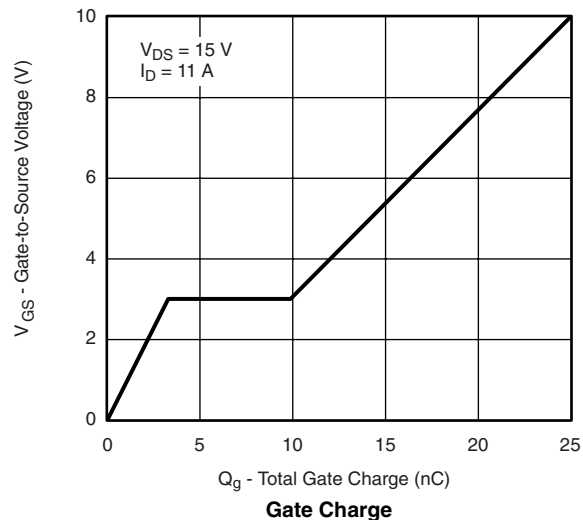
Transfer Characteristics



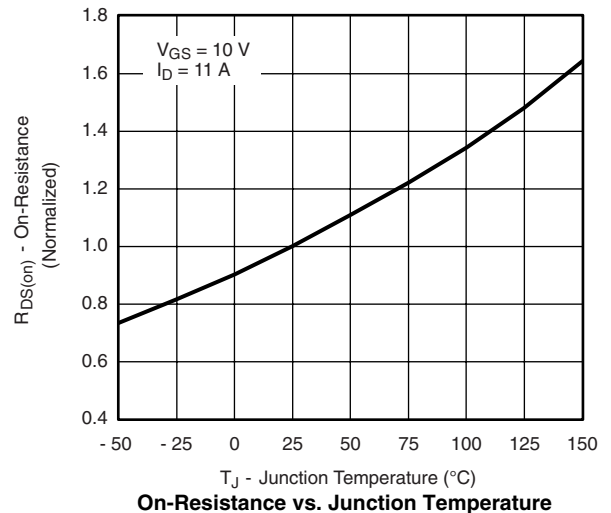
On-Resistance vs. Drain Current



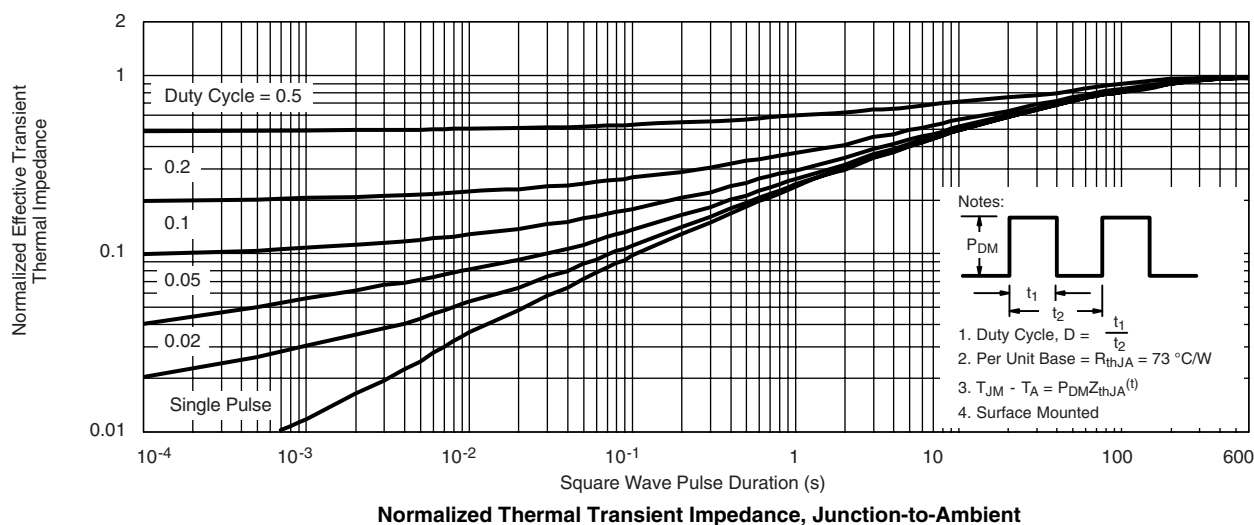
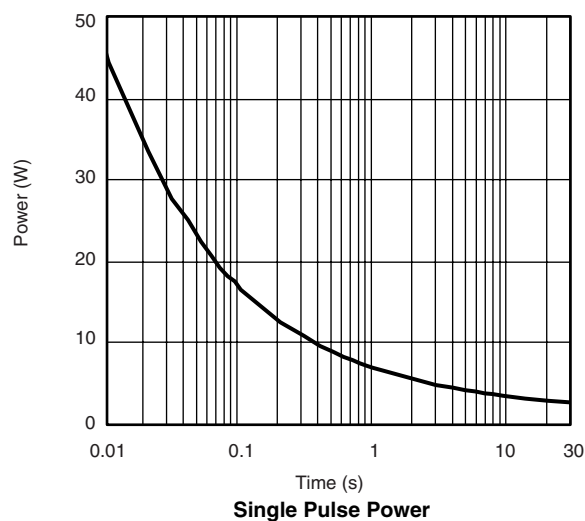
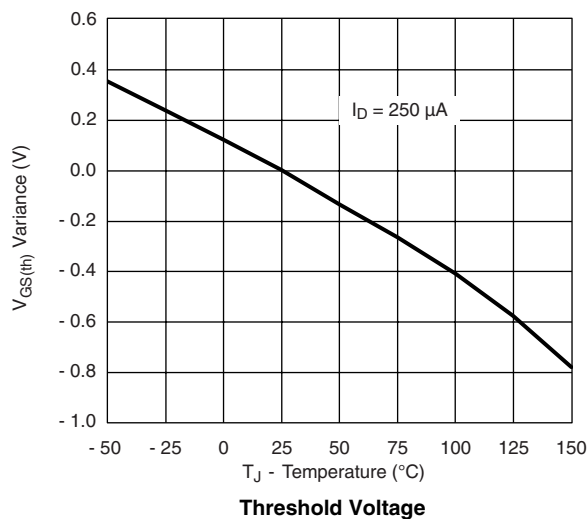
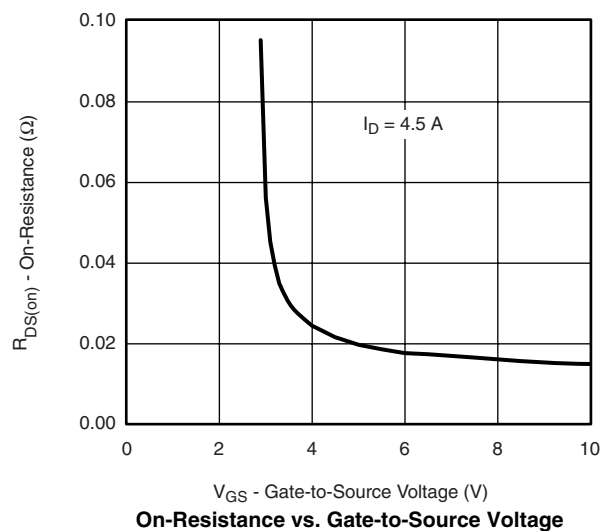
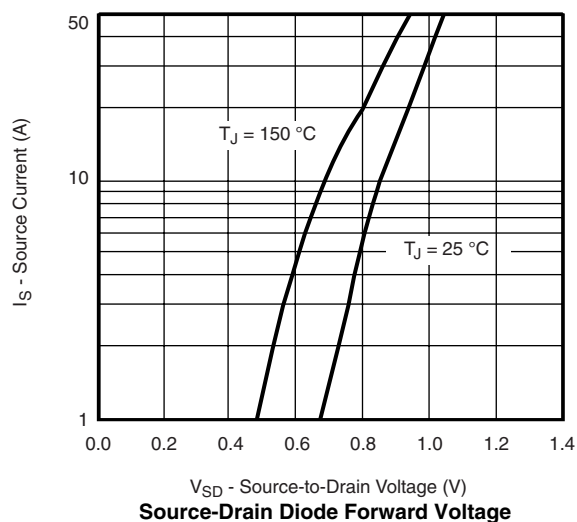
Capacitance



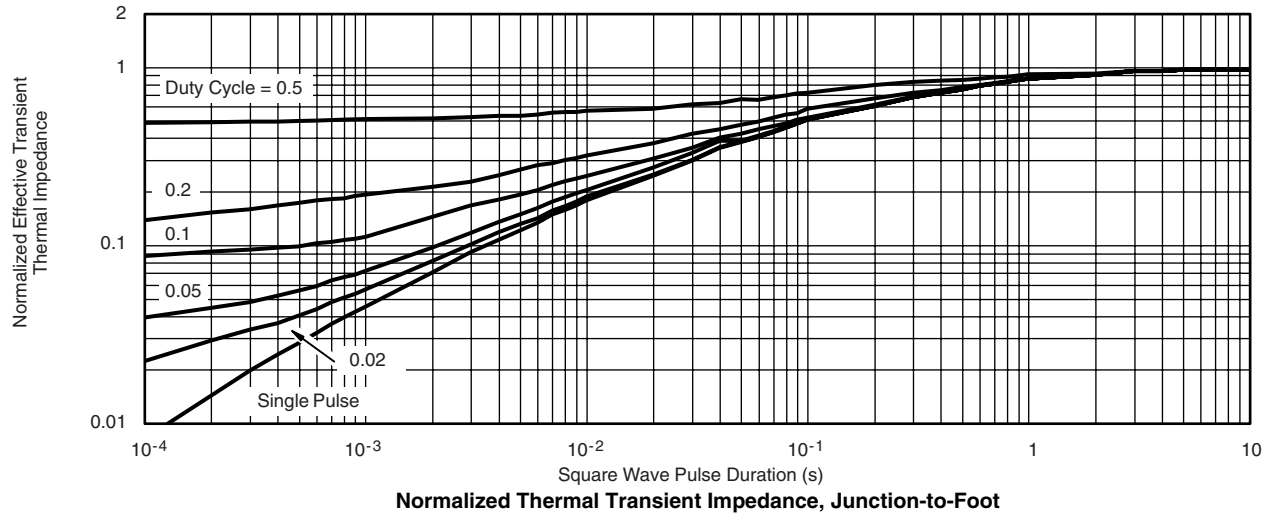
Gate Charge



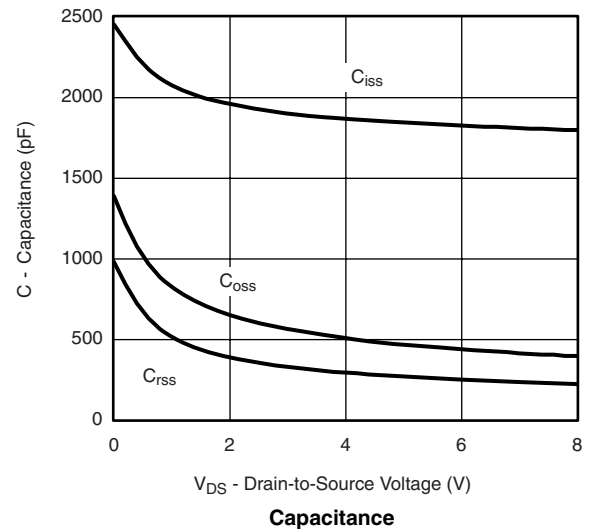
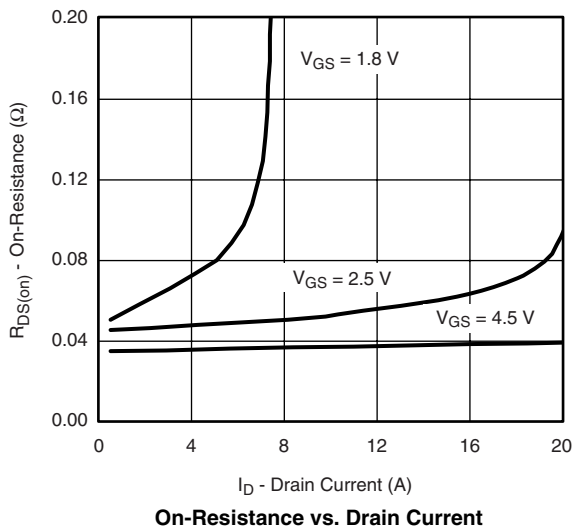
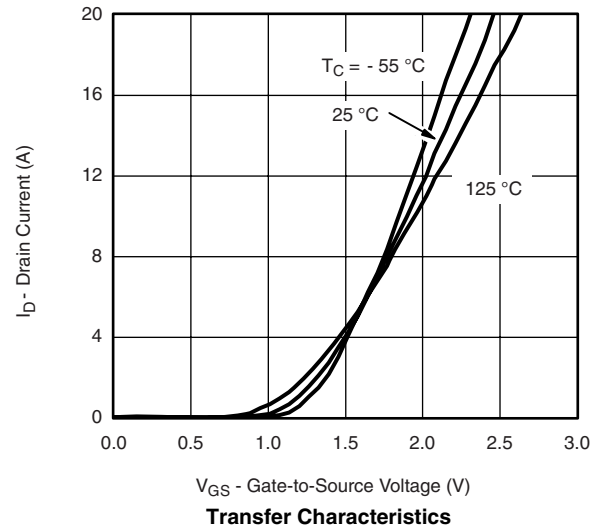
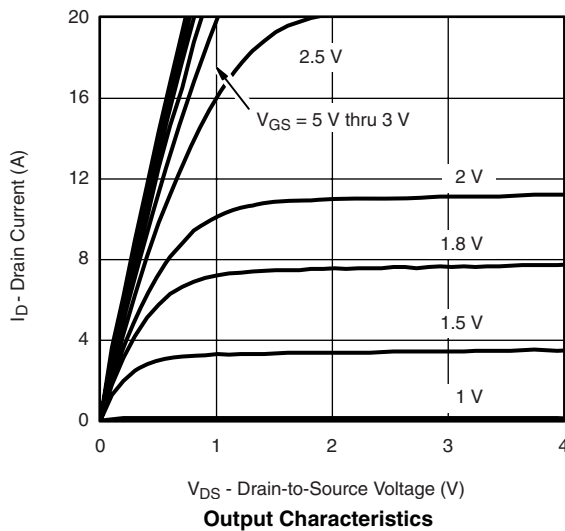
On-Resistance vs. Junction Temperature

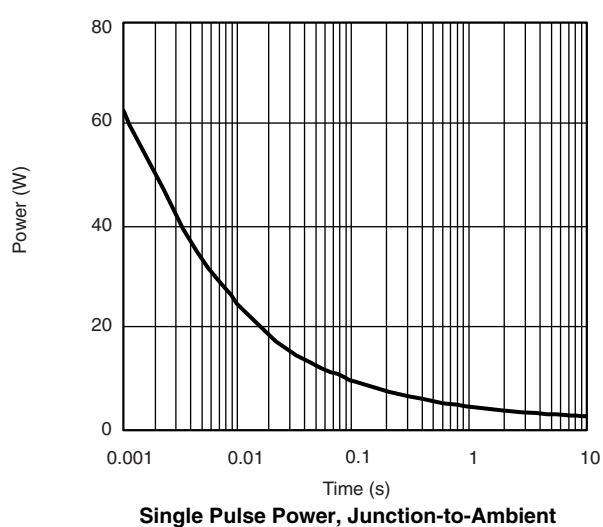
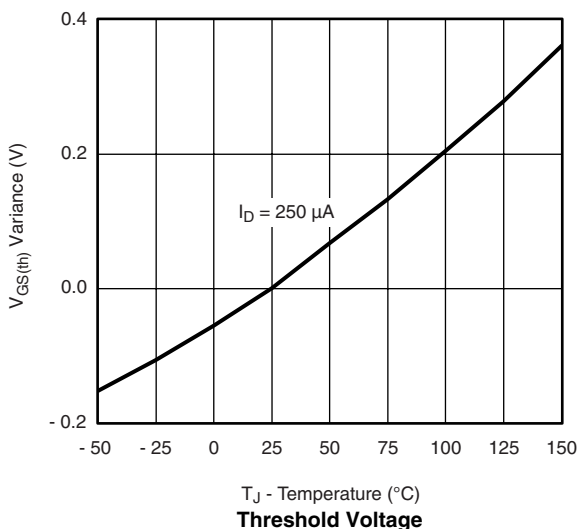
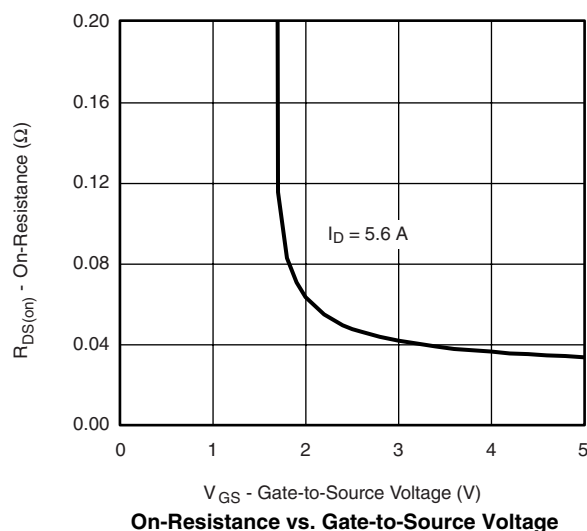
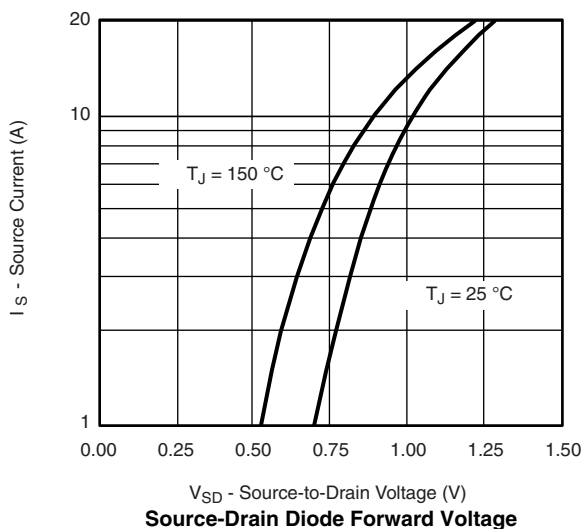
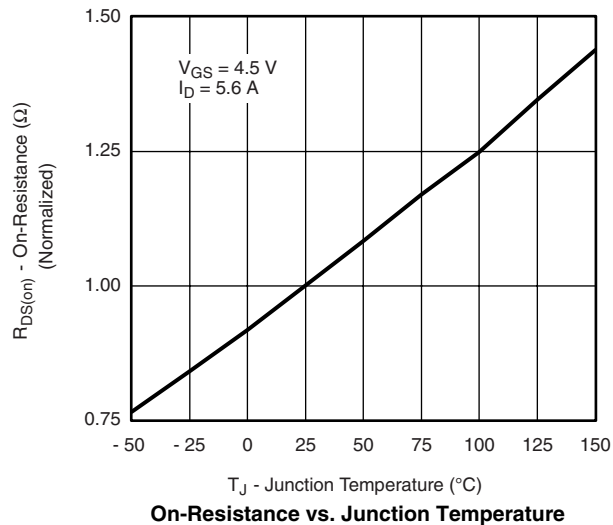
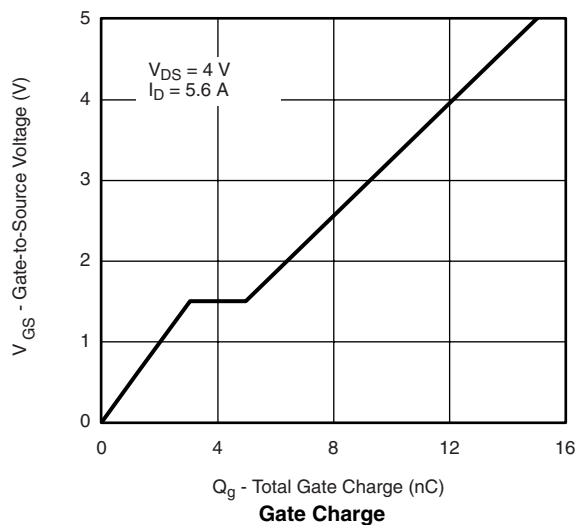
N-CHANNEL TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

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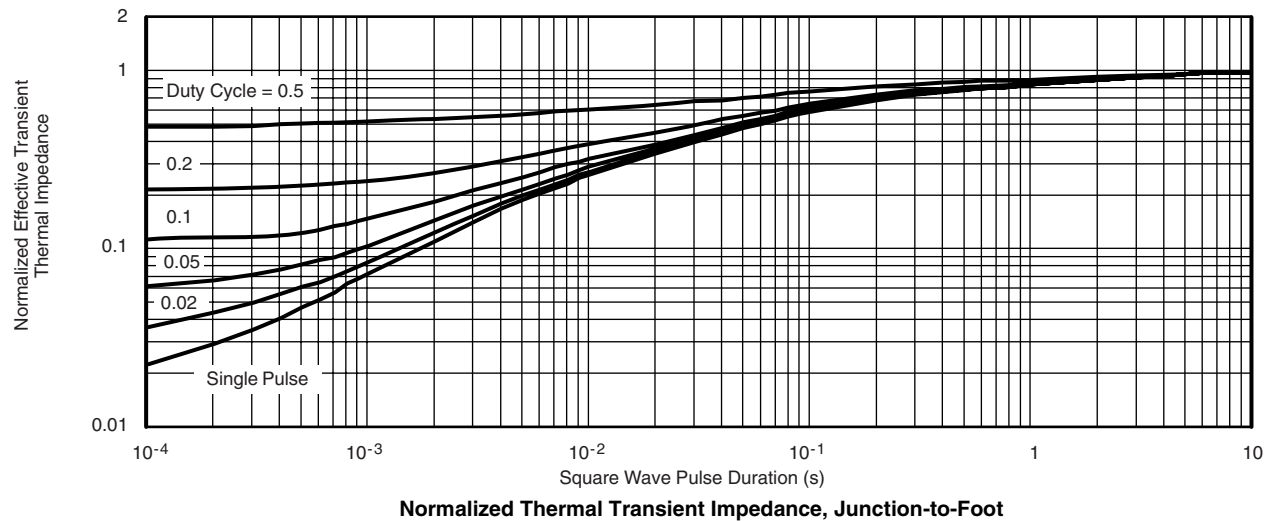
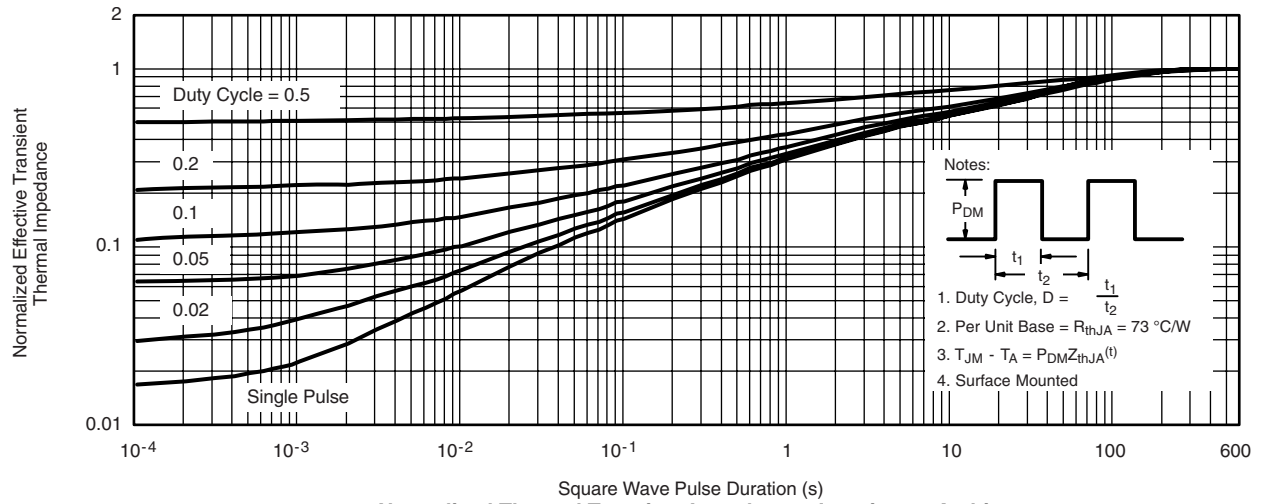


P-CHANNEL TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



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