

Asymmetrical Dual P-Channel 30-V/20-V (D-S) MOSFETs

PRODUCT SUMMARY			
	V _{DS} (V)	r _{DS(on)} (Ω)	I _D (A)
Channel-1	- 30	0.054 at V _{GS} = - 10 V	- 5.0
		0.100 at V _{GS} = - 4.5 V	- 3.7
Channel-2	- 20	0.027 at V _{GS} = - 4.5 V	- 7.0
		0.035 at V _{GS} = - 2.5 V	- 6.2
		0.048 at V _{GS} = - 1.8 V	- 5.2

FEATURES

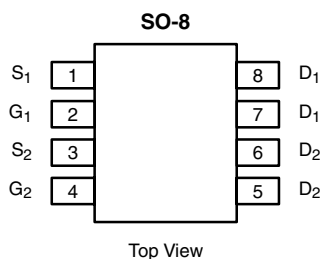
- TrenchFET® Power MOSFETs
- Low Gate Drive (2.5 V) Capability For Channel 2



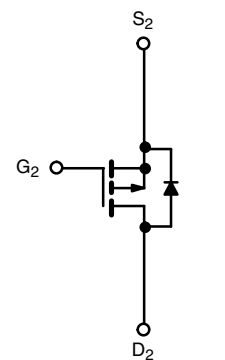
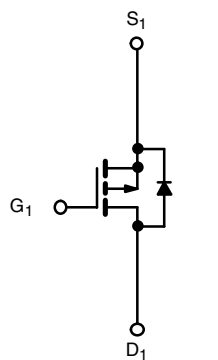
RoHS
COMPLIANT

APPLICATIONS

- Game Station
- Load Switch



Ordering Information: Si4955DY-T1-E3 (Lead (Pb)-free)



ABSOLUTE MAXIMUM RATINGS T _A = 25 °C, unless otherwise noted							
Parameter		Symbol	Channel-1		Channel-2		Unit
			10 sec	Steady State	10 sec	Steady State	
Drain-Source Voltage		V _{DS}	- 30		- 20		V
Gate-Source Voltage		V _{GS}	± 20		± 8		
Continuous Drain Current (T _J = 150 °C) ^a	T _A = 25 °C	I _D	- 5.0	- 3.8	- 7.0	- 5.3	A
	T _A = 70 °C		- 4.0	- 3.0	- 5.6	- 4.2	
Pulsed Drain Current		I _{DM}	- 20				
Continuous Source Current (Diode Conduction) ^a		I _S	- 1.7	- 0.9	- 1.7	- 0.9	
Maximum Power Dissipation ^a	T _A = 25 °C	P _D	2.0	1.1	2	1.1	W
	T _A = 70 °C		1.3	0.7	1.3	0.7	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	- 55 to 150				°C

THERMAL RESISTANCE RATINGS							
Parameter	Symbol	Channel-1		Channel-2		Unit	
		Typ	Max	Typ	Max		
Maximum Junction-to-Ambient ^a	R _{thJA}	55	62.5	58	62.5	°C/W	
		90	110	91	110		
Maximum Junction-to-Foot (Drain)	R _{thJF}	33	40	34	40		

Notes:

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

SPECIFICATIONS $T_J = 25\text{ }^{\circ}\text{C}$, unless otherwise noted							
Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Static							
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	Ch-1	-1.0		-3	V
		$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	Ch-2	-0.4		-1	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$	Ch-1			± 100	nA
		$V_{DS} = 0\text{ V}, V_{GS} = \pm 8\text{ V}$	Ch-2			± 100	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -30\text{ V}, V_{GS} = 0\text{ V}$	Ch-1			-1	μA
		$V_{DS} = -20\text{ V}, V_{GS} = 0\text{ V}$	Ch-2			-1	
		$V_{DS} = -30\text{ V}, V_{GS} = 0\text{ V}, T_J = 85\text{ }^{\circ}\text{C}$	Ch-1			-5	
		$V_{DS} = -20\text{ V}, V_{GS} = 0\text{ V}, T_J = 85\text{ }^{\circ}\text{C}$	Ch-2			-5	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq -5\text{ V}, V_{GS} = -10\text{ V}$	Ch-1	-20			A
		$V_{DS} \leq -5\text{ V}, V_{GS} = -10\text{ V}$	Ch-2	-20			
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -5.0\text{ A}$	Ch-1		0.044	0.054	Ω
		$V_{GS} = -4.5\text{ V}, I_D = -7.0\text{ A}$	Ch-2		0.022	0.027	
		$V_{GS} = -4.5\text{ V}, I_D = -3.7\text{ A}$	Ch-1		0.082	0.100	
		$V_{GS} = -2.5\text{ V}, I_D = -6.2\text{ A}$	Ch-2		0.029	0.035	
		$V_{GS} = -1.8\text{ V}, I_D = -3\text{ A}$	Ch-2		0.039	0.048	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15\text{ V}, I_D = -5.0\text{ A}$	Ch-1		10		S
		$V_{DS} = -15\text{ V}, I_D = -3\text{ A}$	Ch-2		25		
Diode Forward Voltage ^a	V_{SD}	$I_S = -1.7\text{ A}, V_{GS} = 0\text{ V}$	Ch-1		-0.80	-1.2	V
		$I_S = -1.7\text{ A}, V_{GS} = 0\text{ V}$	Ch-2		-0.80	-1.2	
Dynamic ^b							
Total Gate Charge	Q_g	Channel-1 $V_{DS} = -15\text{ V}, V_{GS} = -10\text{ V}, I_D = -5.0\text{ A}$	Ch-1		12.5	19	nC
			Ch-2		21	25	
Gate-Source Charge	Q_{gs}	Channel-2 $V_{DS} = -10\text{ V}, V_{GS} = -4.5\text{ V}, I_D = -7\text{ A}$	Ch-1		2.1		
			Ch-2		2.6		
Gate-Drain Charge	Q_{gd}		Ch-1		3.5		ns
			Ch-2		6.0		
Turn-On Delay Time	$t_{d(on)}$	Channel-1 $V_{DD} = -15\text{ V}, R_L = -15\text{ }\Omega$ $I_D \cong -1\text{ A}, V_{GEN} = -10\text{ V}, R_G = 6\text{ }\Omega$	Ch-1		7	15	
			Ch-2		20	30	
Rise Time	t_r	Channel-2 $V_{DD} = -10\text{ V}, R_L = 10\text{ }\Omega$ $I_D \cong -1\text{ A}, V_{GEN} = -4.5\text{ V}, R_G = 6\text{ }\Omega$	Ch-1		10	15	
			Ch-2		40	60	
Turn-Off Delay Time	$t_{d(off)}$		Ch-1		30	45	
			Ch-2		125	190	
Fall Time	t_f		Ch-1		22	35	
			Ch-2		85	130	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = -1.7\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$	Ch-1		25	60	
		$I_F = -1.7\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$	Ch-2		64	90	

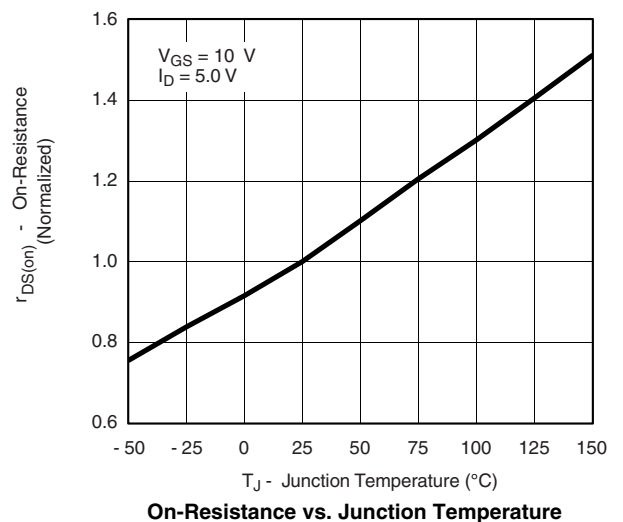
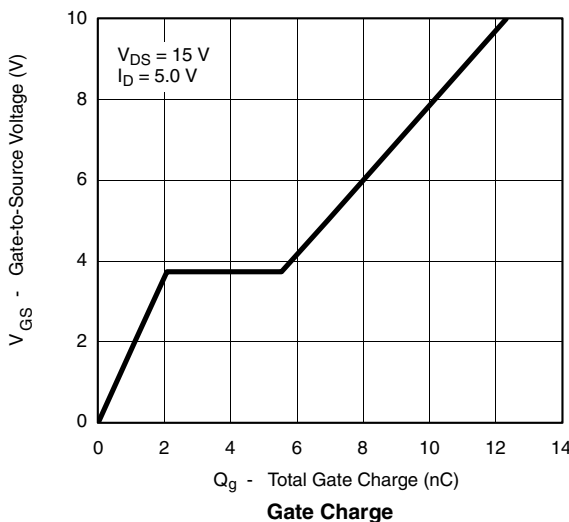
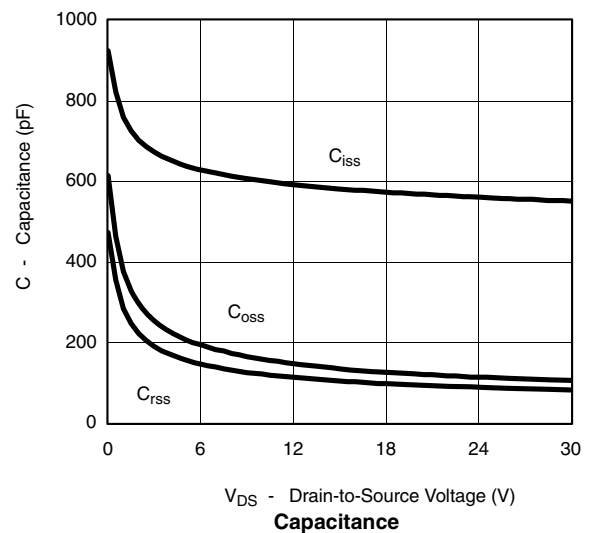
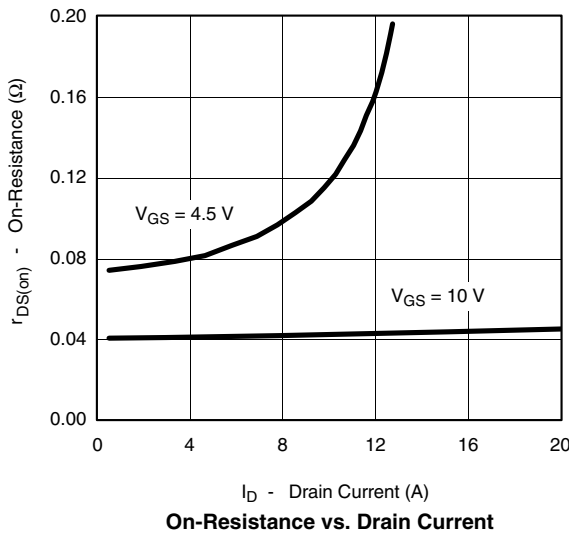
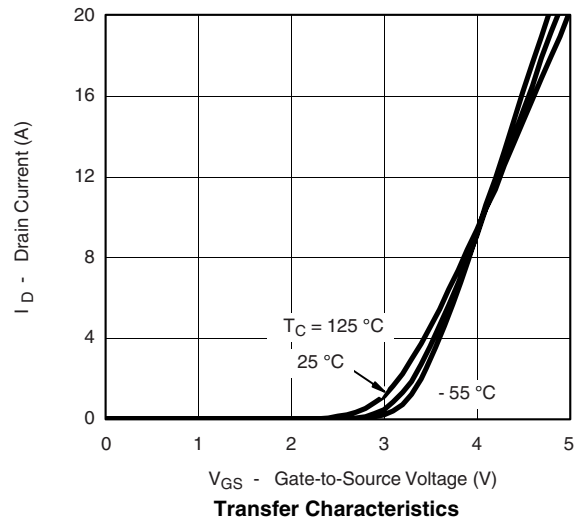
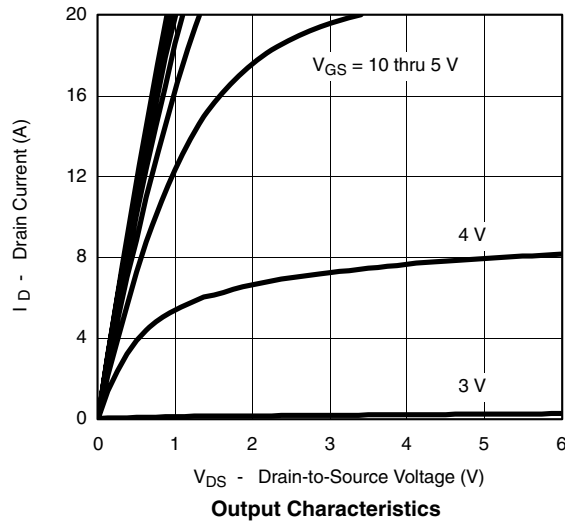
Notes:

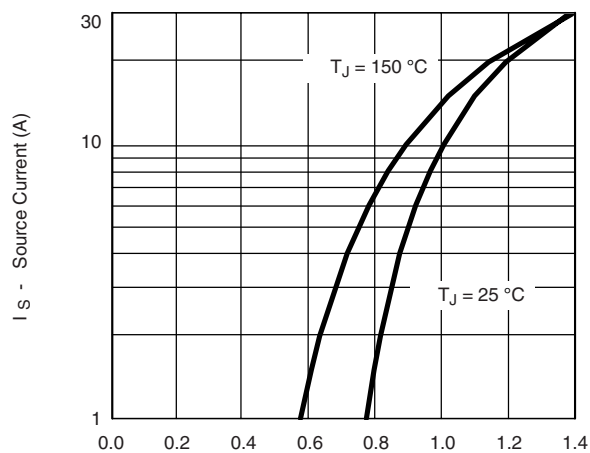
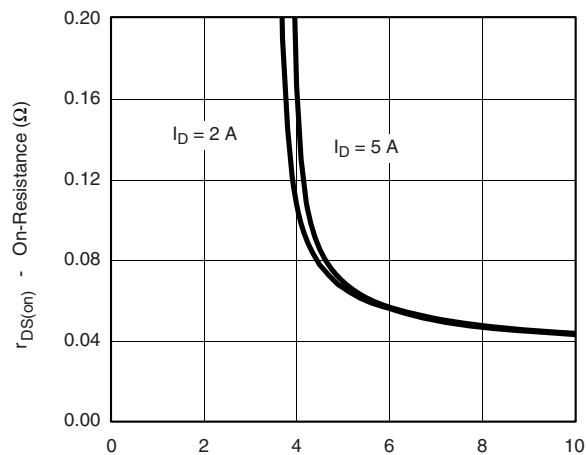
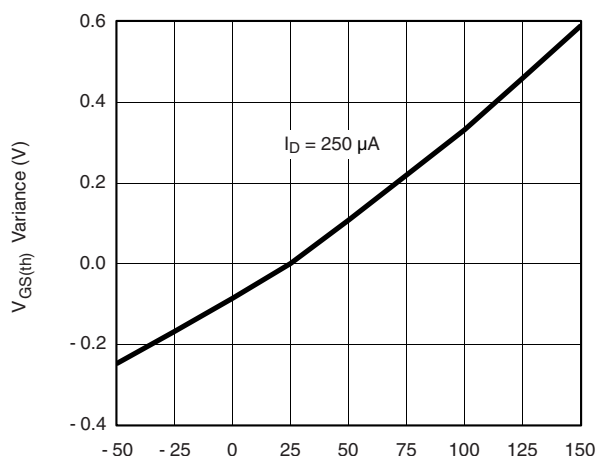
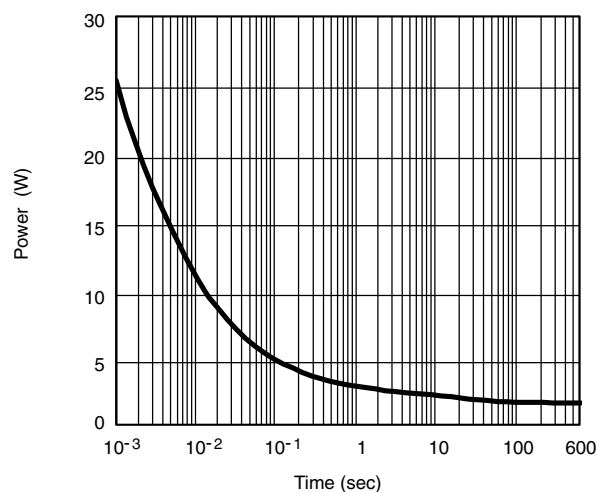
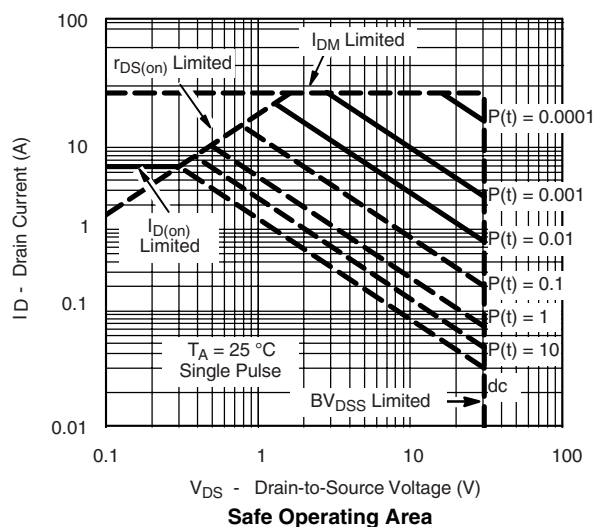
a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

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

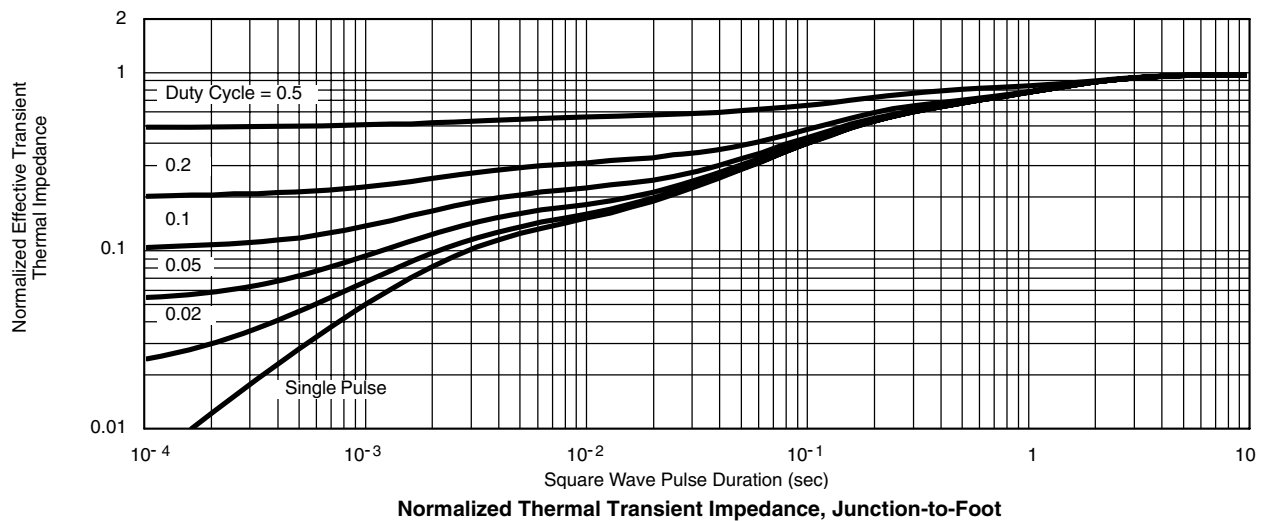
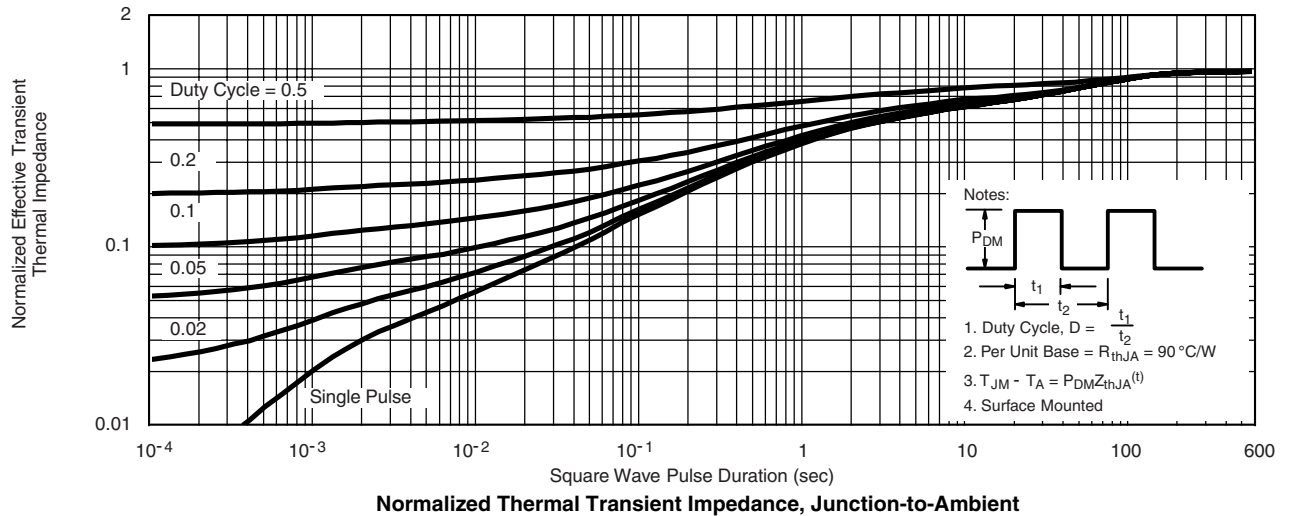
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

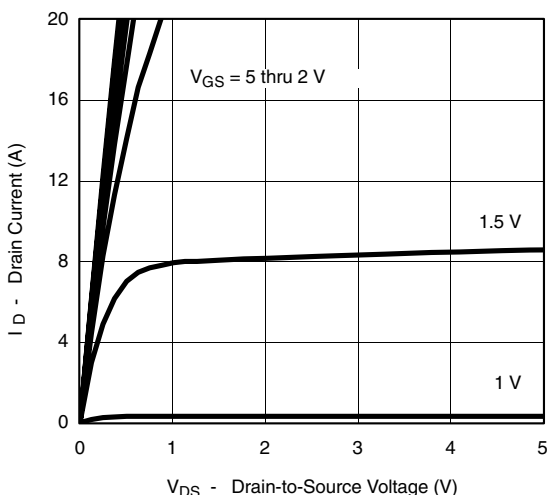
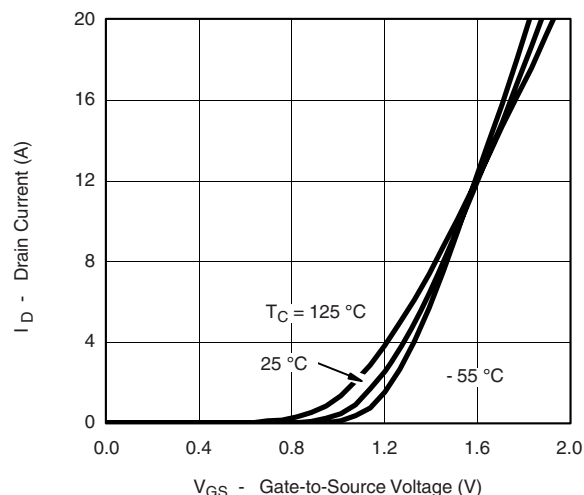
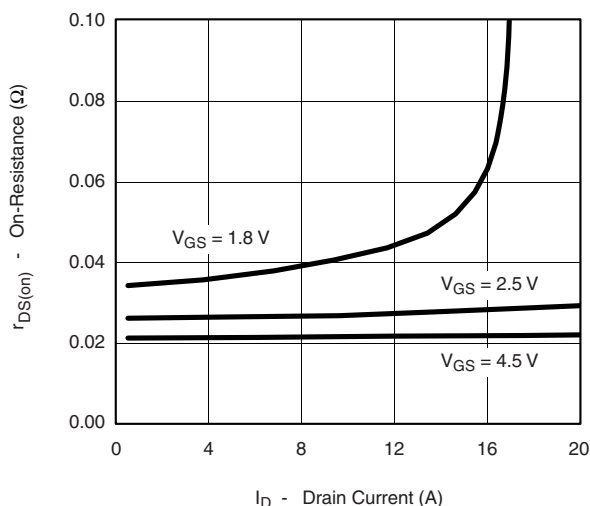
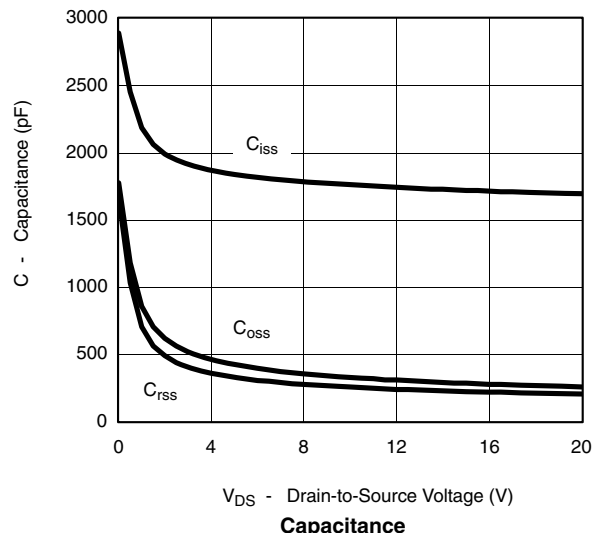
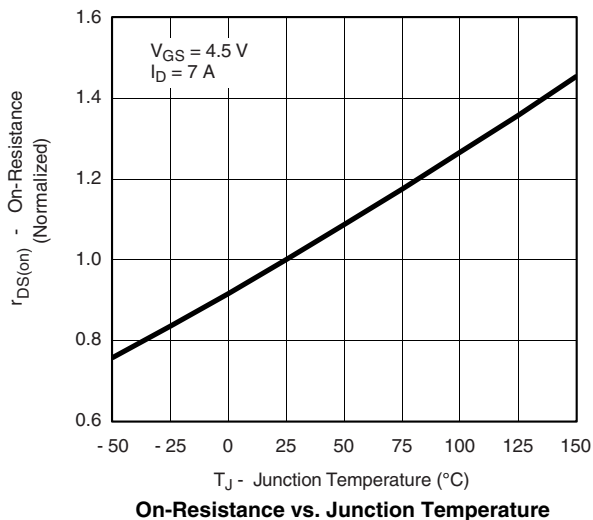
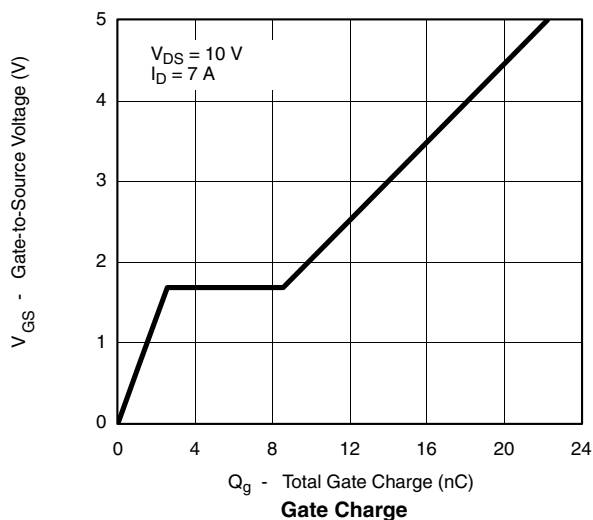
CHANNEL 1 TYPICAL CHARACTERISTICS 25 °C unless noted



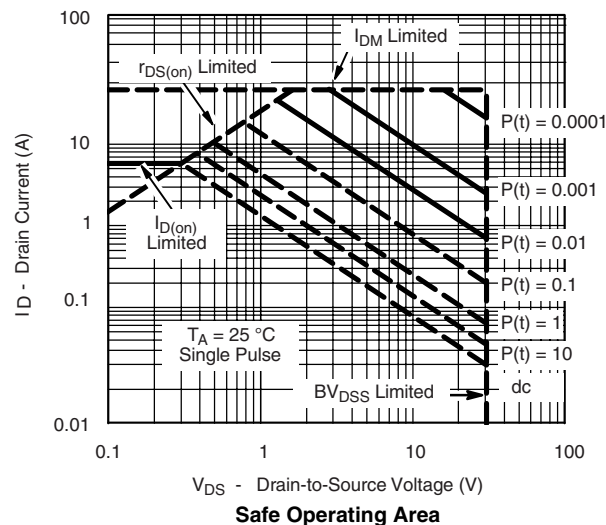
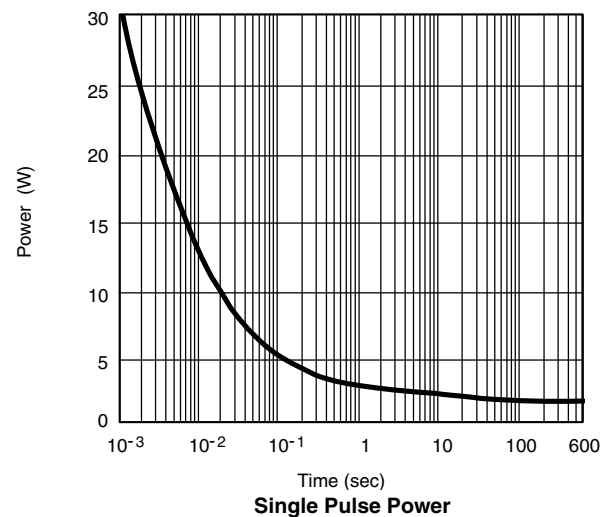
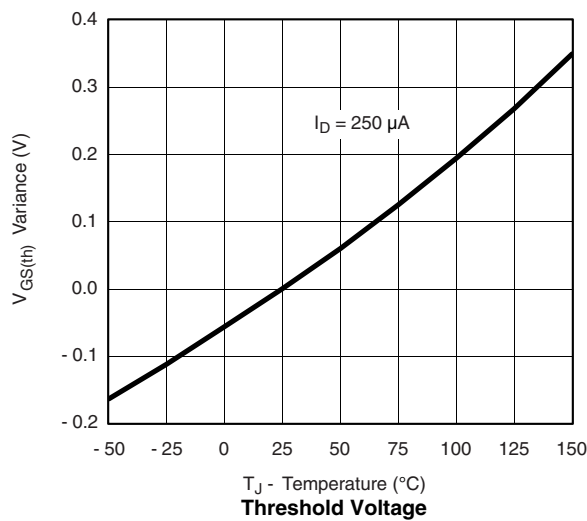
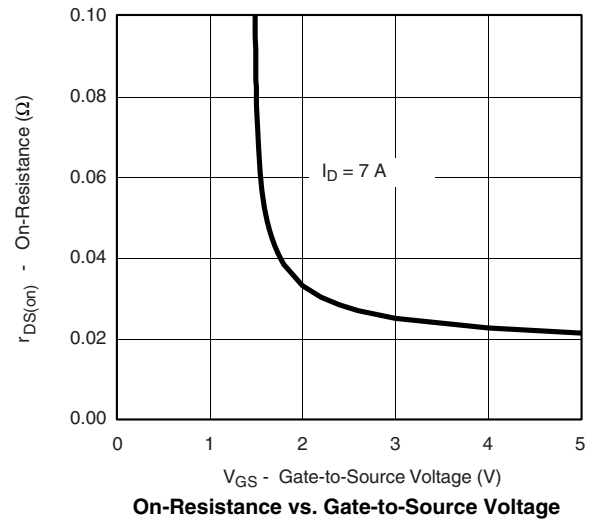
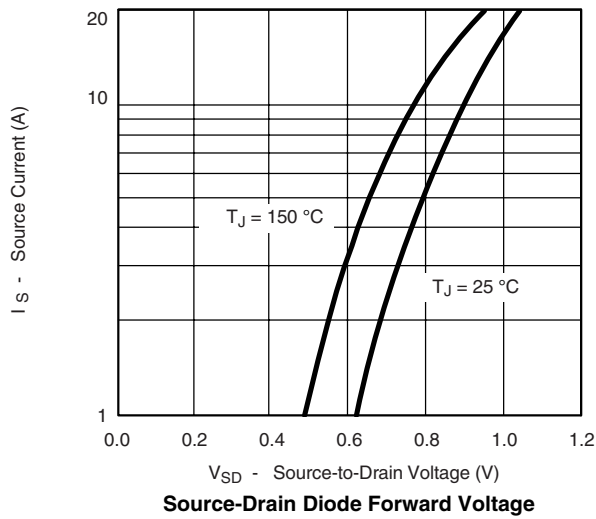
CHANNEL 1 TYPICAL CHARACTERISTICS 25 °C unless noted**Source-Drain Diode Forward Voltage****On-Resistance vs. Gate-to-Source Voltage****Threshold Voltage****Single Pulse Power**

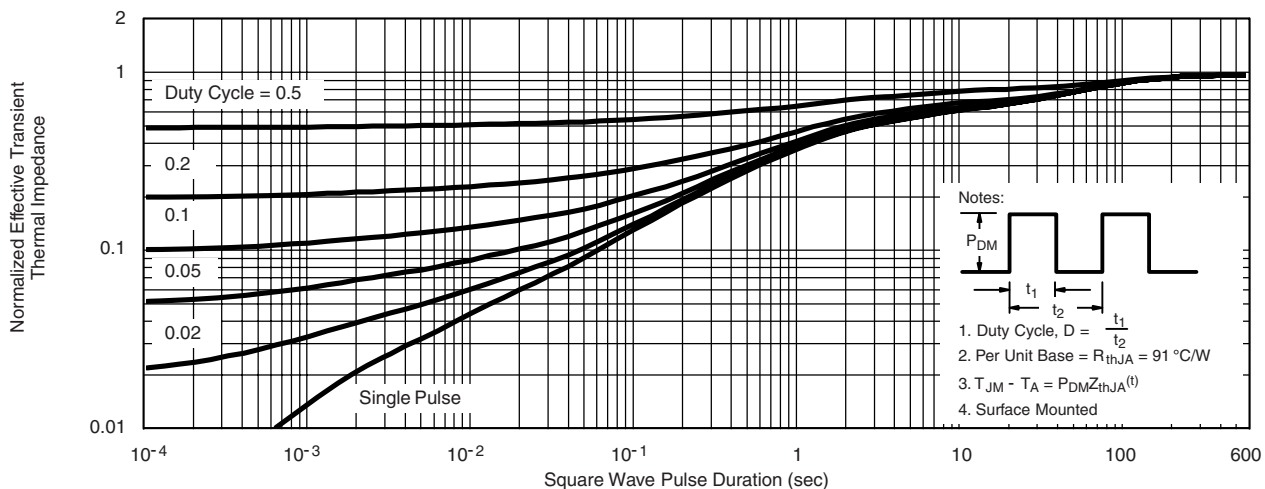
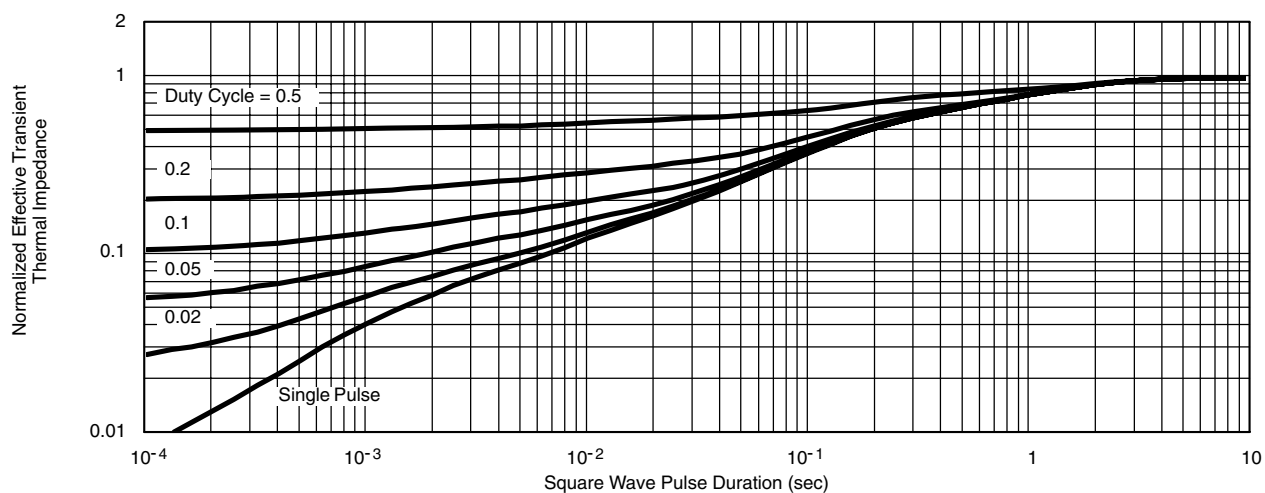
CHANNEL 1 TYPICAL CHARACTERISTICS 25 °C unless noted



CHANNEL 2 TYPICAL CHARACTERISTICS 25 °C unless noted**Output Characteristics****Transfer Characteristics****On-Resistance vs. Drain Current****Capacitance**

CHANNEL 2 TYPICAL CHARACTERISTICS 25 °C unless noted



CHANNEL 2 TYPICAL CHARACTERISTICS 25 °C unless noted**Normalized Thermal Transient Impedance, Junction-to-Ambient****Normalized Thermal Transient Impedance, Junction-to-Foot**

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