

Dual N-Channel 30-V (D-S) MOSFET

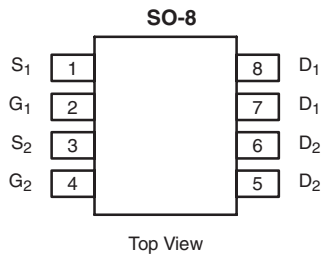
PRODUCT SUMMARY			
	V _{DS} (V)	r _{DS(on)} (Ω)	I _D (A)
Channel-1	30	0.019 at V _{GS} = 10 V	8.0
		0.026 at V _{GS} = 4.5 V	6.9
Channel-2		0.035 at V _{GS} = 10 V	6.0
		0.048 at V _{GS} = 4.5 V	5.0

FEATURES

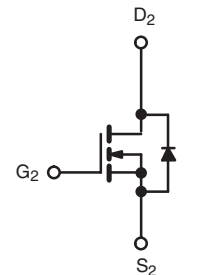
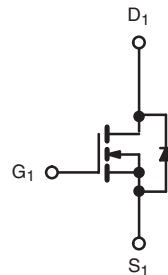
- TrenchFET® Power MOSFET
- 100 % R_g Tested

APPLICATIONS

- Logic DC/DC
- Notebook PC



Ordering Information: Si4974DY-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				V	
Gate-Source Voltage	V _{GS}	± 20					
Continuous Drain Current (T _J = 150 °C) ^a	I _D	T _A = 25 °C	8.0	6.0	6.0	4.4	A
		T _A = 70 °C	6.5	4.7	4.8	3.5	
Pulsed Drain Current	I _{DM}	40		30			
Continuous Source Current (Diode Conduction) ^a	I _S	1.8	1.0	1.8	1.0		
Single Pulse Avalanche Current	L = 0.1 mH	I _{AS}	15		7		
Avalanche Energy		E _{AS}	11		2.45		mJ
Maximum Power Dissipation ^a	P _D	T _A = 25 °C	2	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}	t ≤ 10 sec	50	62.5	52	62.5	°C/W
		Steady State	90	110	91	110	
Maximum Junction-to-Foot (Drain)	R _{thJF}	30	40	32	40		

Notes:

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

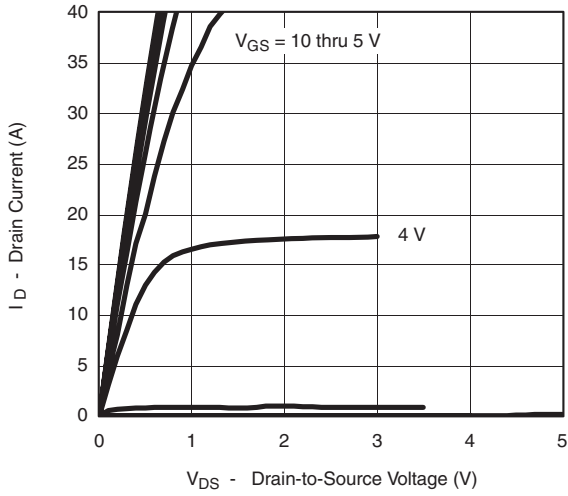
MOSFET SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted							
Parameter	Symbol	Test Conditions	Min	Typ ^a	Max	Unit	
Static							
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\text{ }\mu\text{A}$	Ch-1	1.0		3.0	V
			Ch-2	1.0		3.0	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}$, $V_{GS} = \pm 20\text{ V}$	Ch-1		± 100	nA	
			Ch-2		± 100		
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30\text{ V}$, $V_{GS} = 0\text{ V}$	Ch-1		1	μA	
			Ch-2		1		
		$V_{DS} = 30\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 85\text{ }^\circ\text{C}$	Ch-1		15		
			Ch-2		15		
On-State Drain Current ^b	$I_{D(on)}$	$V_{DS} = 5\text{ V}$, $V_{GS} = 10\text{ V}$	Ch-1	20		A	
			Ch-2	20			
Drain-Source On-State Resistance ^b	$r_{DS(on)}$	$V_{GS} = 10\text{ V}$, $I_D = 8.0\text{ A}$	Ch-1		0.016	0.019	Ω
			Ch-2		0.029	0.035	
		$V_{GS} = 4.5\text{ V}$, $I_D = 6.9\text{ A}$	Ch-1		0.0215	0.026	
			Ch-2		0.040	0.048	
Forward Transconductance ^b	g_{fs}	$V_{DS} = 15\text{ V}$, $I_D = 8.0\text{ A}$	Ch-1		19	S	
			Ch-2		13		
Diode Forward Voltage ^b	V_{SD}	$I_S = 1.8\text{ A}$, $V_{GS} = 0\text{ V}$	Ch-1		0.8	1.1	V
			Ch-2		0.8	1.1	
Dynamic^a							
Total Gate Charge	Q_g	Channel-1 $V_{DS} = 15\text{ V}$, $V_{GS} = 4.5\text{ V}$, $I_D = 8.0\text{ A}$	Ch-1		7.0	11	nC
			Ch-2		3.3	5	
Gate-Source Charge	Q_{gs}	Channel-2 $V_{DS} = 15\text{ V}$, $V_{GS} = 4.5\text{ V}$, $I_D = 6.0\text{ A}$	Ch-1		2.6		
			Ch-2		1.2		
Gate-Drain Charge	Q_{gd}		Ch-1		3.0		
			Ch-2		1.5		
Gate Resistance	R_g		Ch-1	0.8	1.5	2.3	Ω
			Ch-2	0.9	1.95	2.9	
Turn-On Delay Time	$t_{d(on)}$	Channel-1 $V_{DD} = 15\text{ V}$, $R_L = 15\text{ }\Omega$ $I_D \equiv 1\text{ A}$, $V_{GEN} = 10\text{ V}$, $R_G = 6\text{ }\Omega$	Ch-1		8	15	ns
			Ch-2		6	10	
Rise Time	t_r		Ch-1		12	20	
			Ch-2		11	18	
Turn-Off Delay Time	$t_{d(off)}$	Channel-2 $V_{DD} = 15\text{ V}$, $R_L = 15\text{ }\Omega$ $I_D \equiv 1\text{ A}$, $V_{GEN} = 10\text{ V}$, $R_G = 6\text{ }\Omega$	Ch-1		22	35	
			Ch-2		15	25	
Fall Time	t_f		Ch-1		6	10	
			Ch-2		6	10	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 1.8\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$	Ch-1		20	40	
			Ch-2		15	30	

Notes:

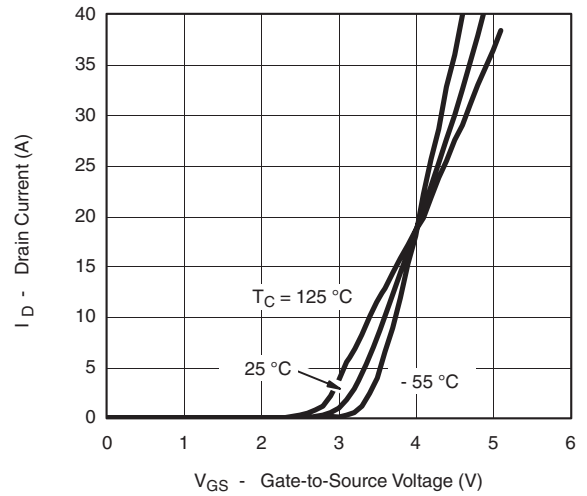
- a. Guaranteed by design, not subject to production testing.
b. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

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.

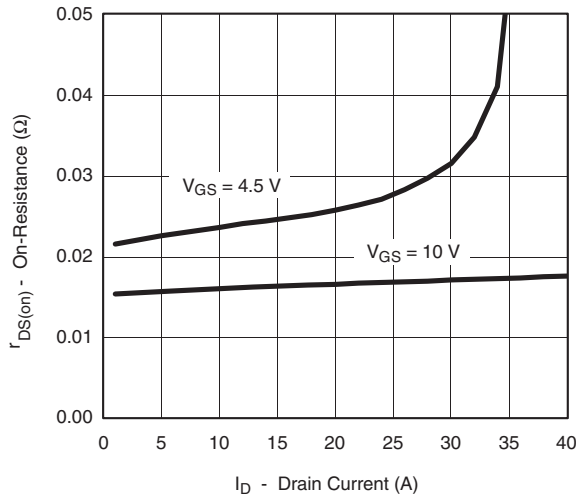
CHANNEL-1 TYPICAL CHARACTERISTICS 25 °C unless noted



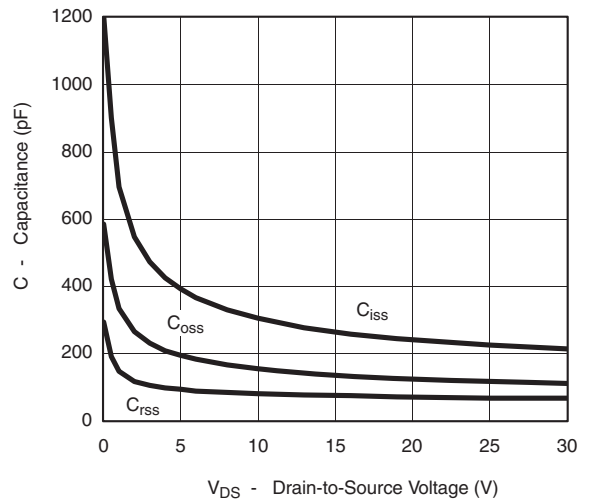
Output Characteristics



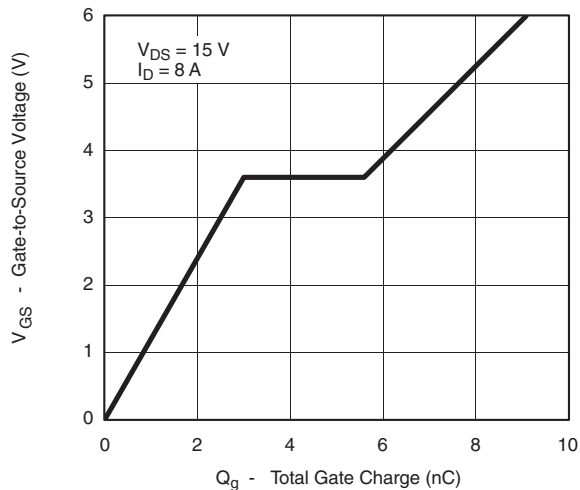
Transfer Characteristics



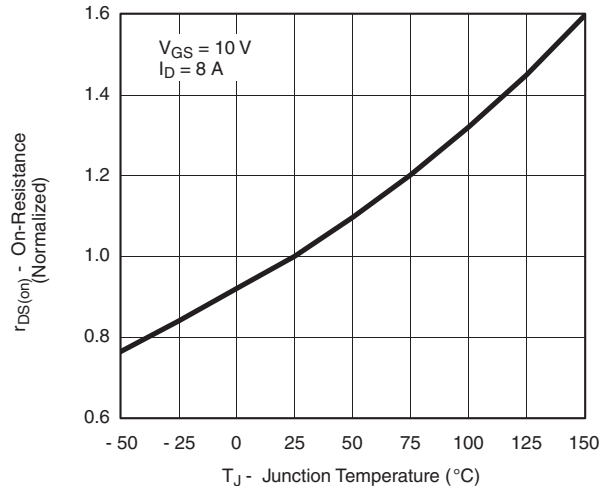
On-Resistance vs. Drain Current



Capacitance

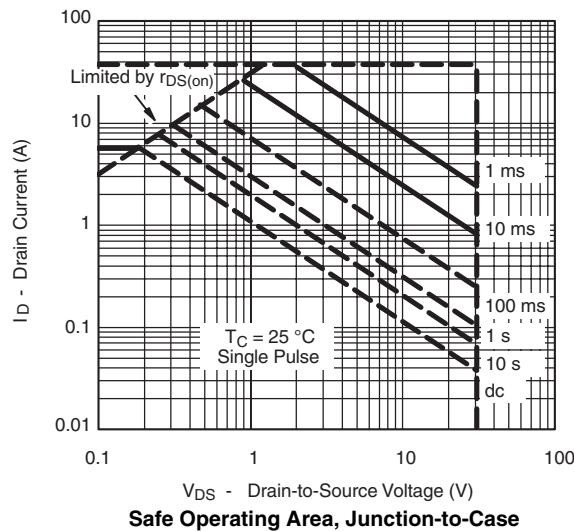
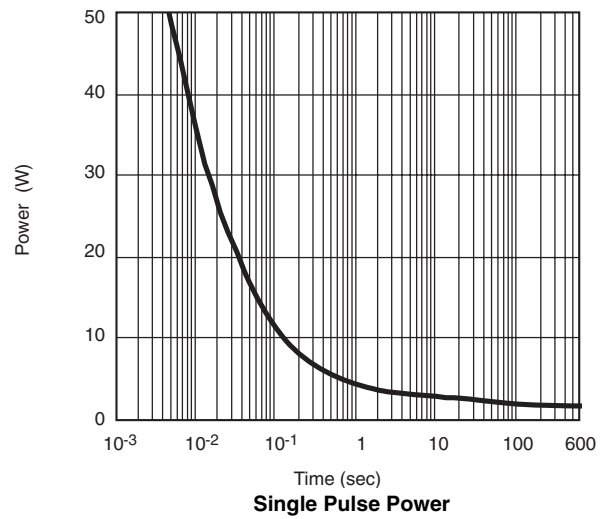
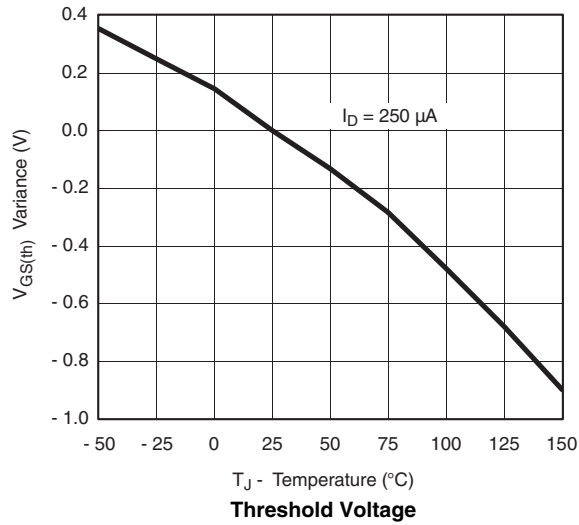
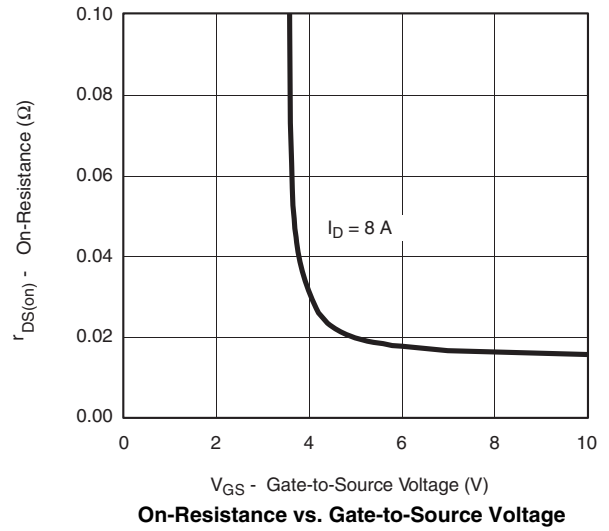
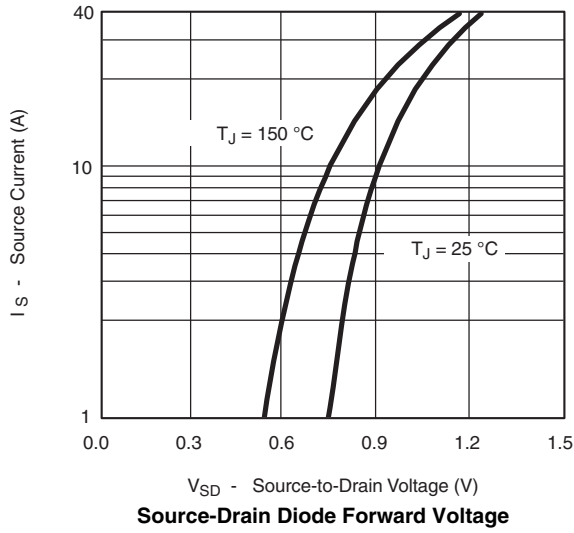


Gate Charge

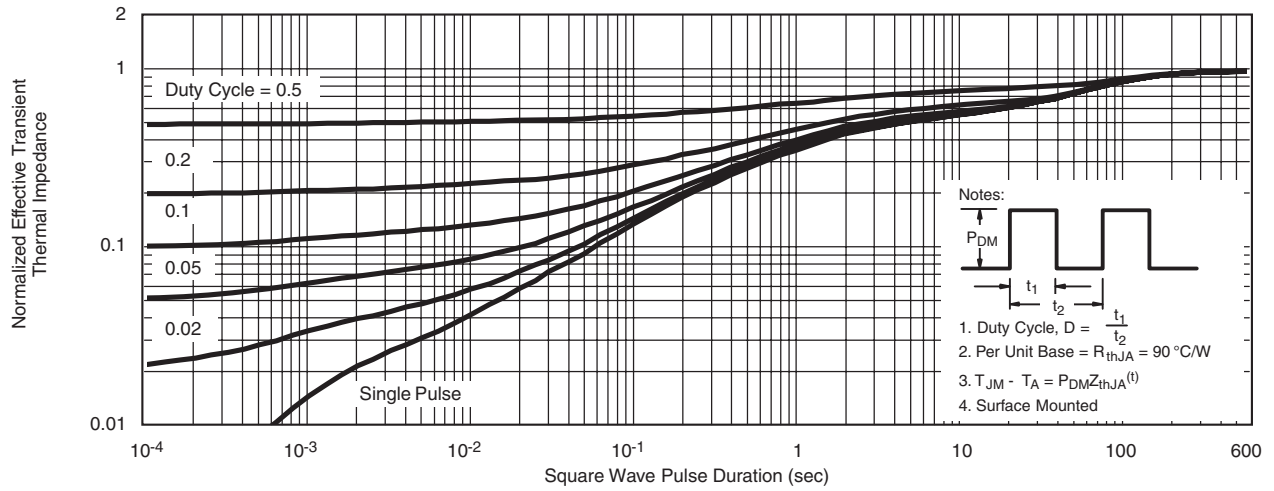


On-Resistance vs. Junction Temperature

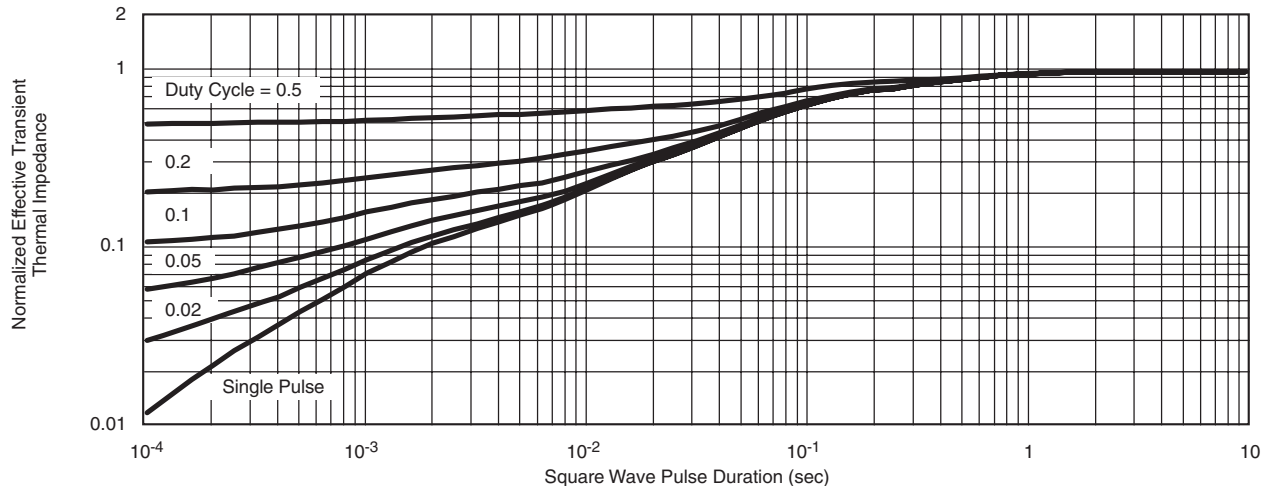
CHANNEL-1 TYPICAL CHARACTERISTICS 25 °C unless noted



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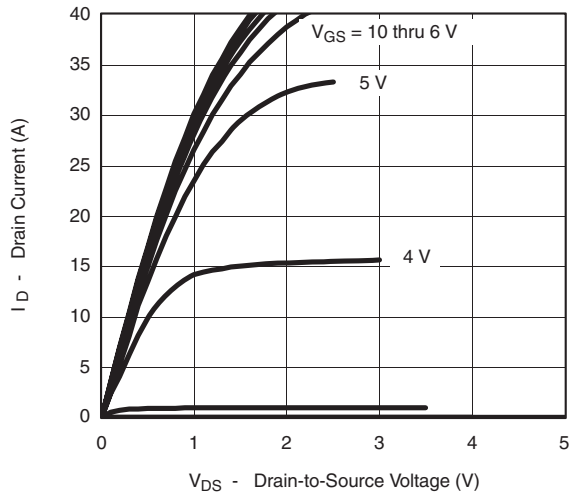


Normalized Thermal Transient Impedance, Junction-to-Ambient

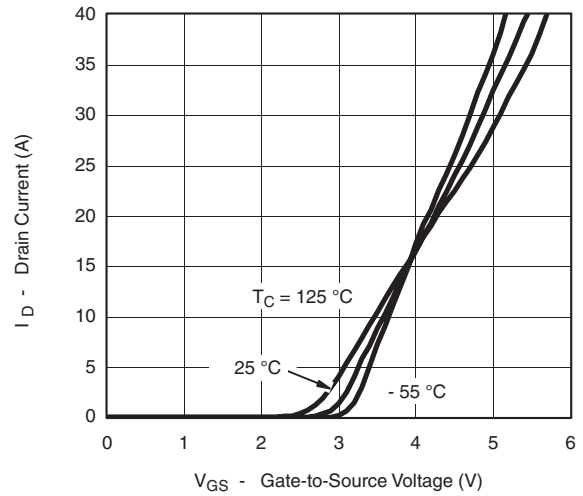


Normalized Thermal Transient Impedance, Junction-to-Foot

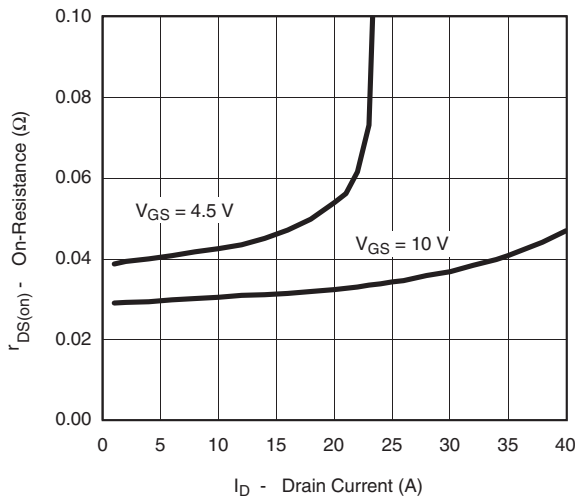
CHANNEL-2 TYPICAL CHARACTERISTICS 25 °C unless noted



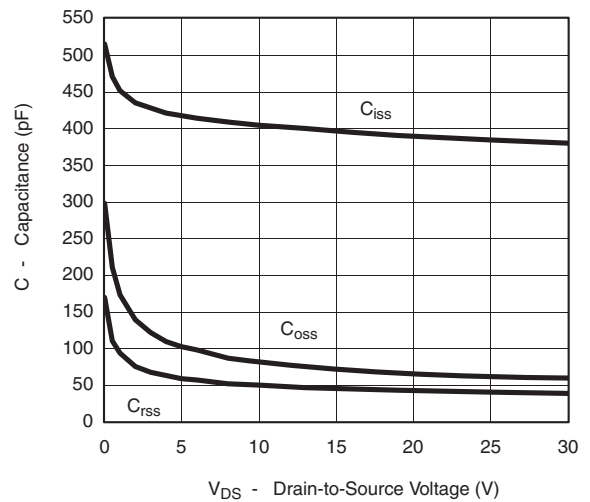
Output Characteristics



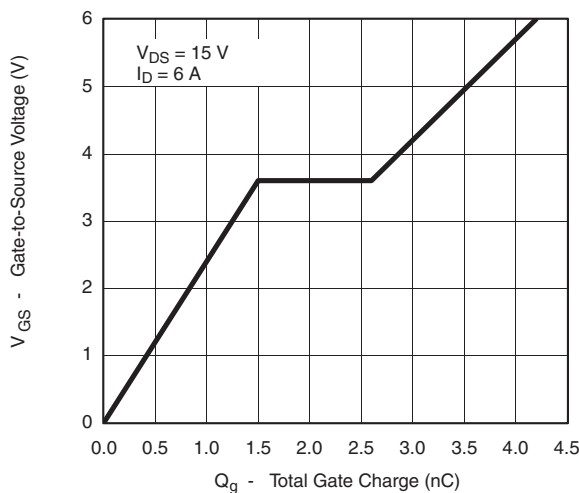
Transfer Characteristics



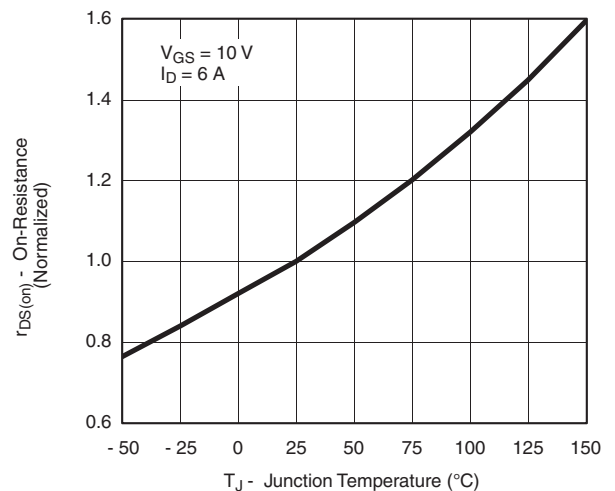
On-Resistance vs. Drain Current



Capacitance

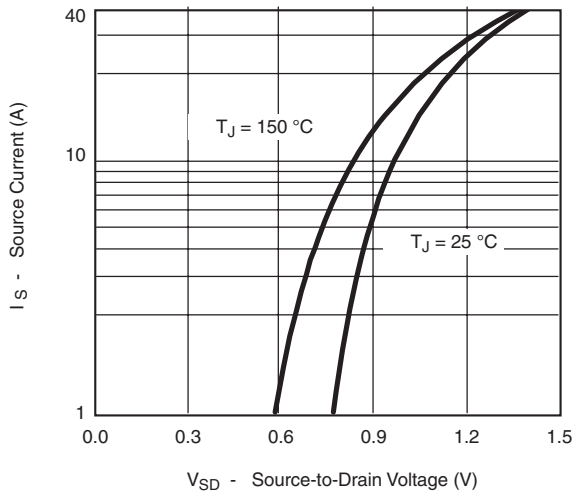


Gate Charge

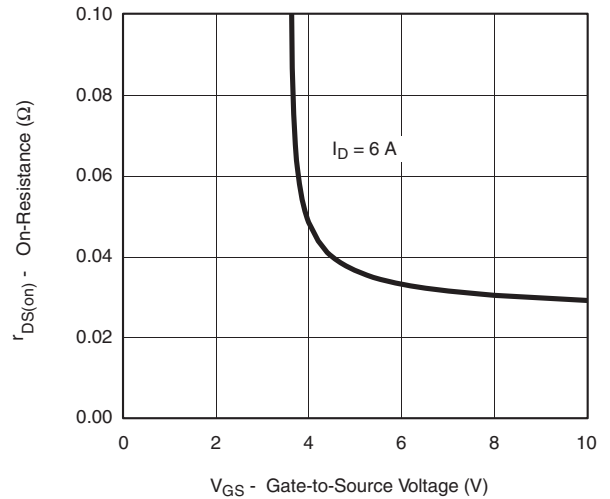


On-Resistance vs. Junction Temperature

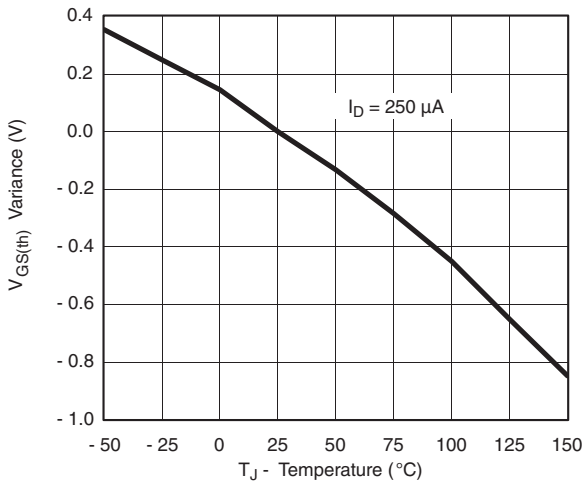
CHANNEL-2 TYPICAL CHARACTERISTICS 25 °C unless noted



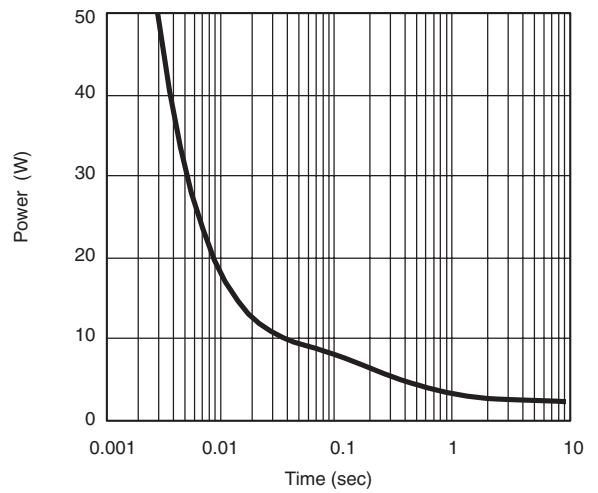
Source-Drain Diode Forward Voltage



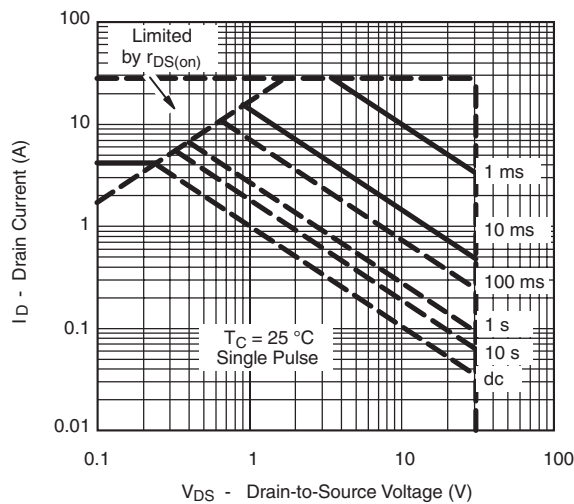
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

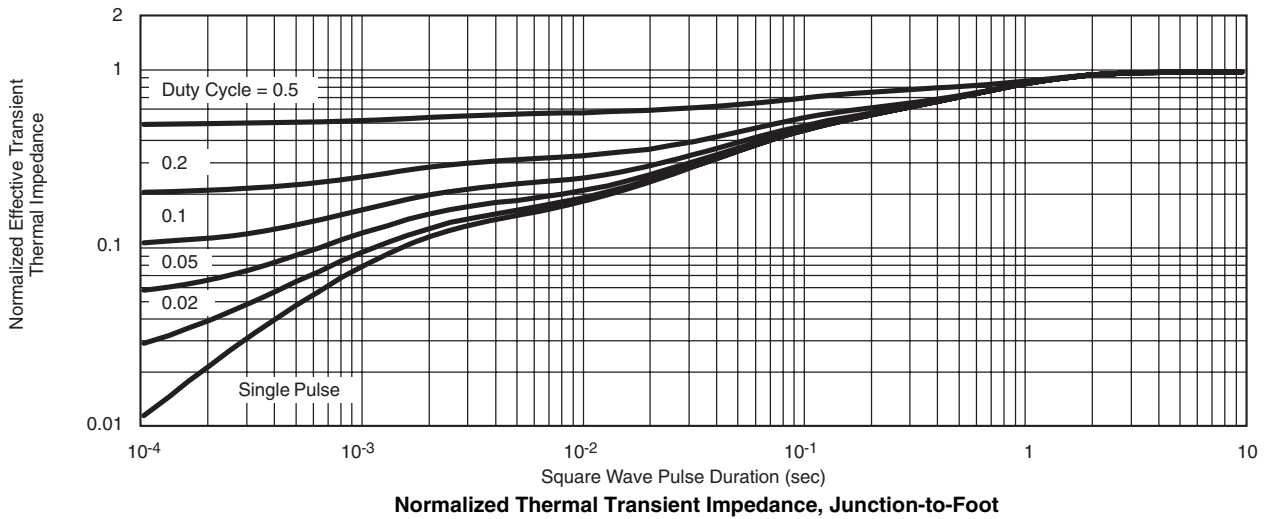
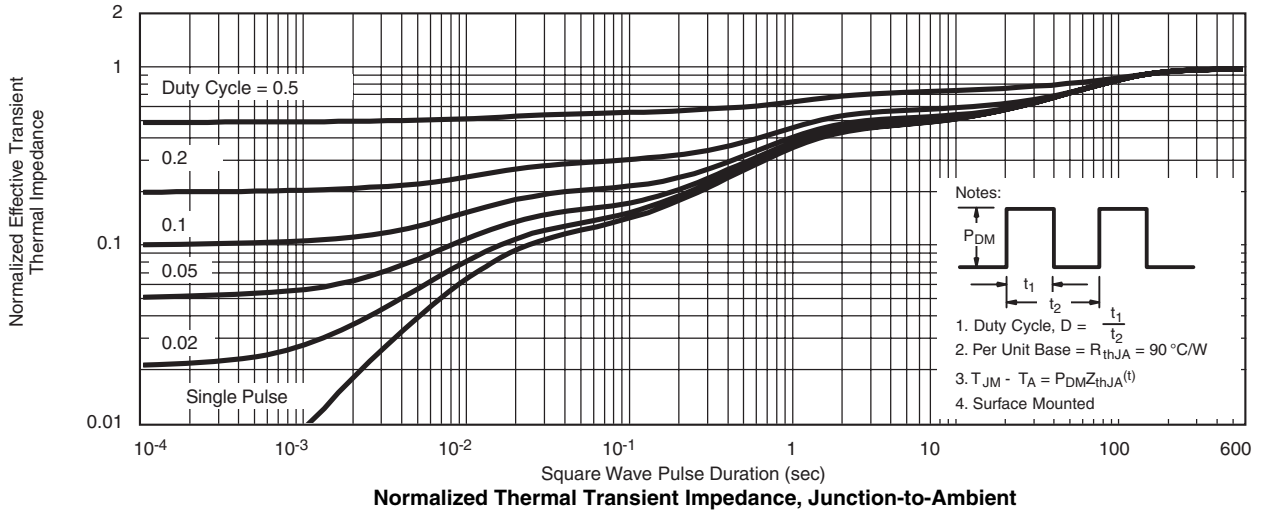


Single Pulse Power, Junction-to-Ambient



Safe Operating Area, Junction-to-Case

CHANNEL-2 TYPICAL CHARACTERISTICS 25 °C unless noted



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