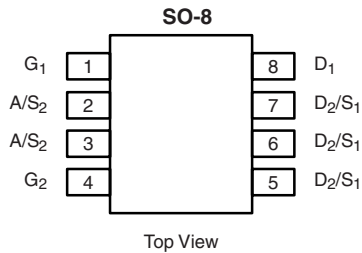


Dual N-Channel 30-V (D-S) MOSFET with Schottky Diode

PRODUCT SUMMARY				
	V _{DS} (V)	r _{DS(on)} (Ω)	I _D (A)	Q _g (Typ)
Channel-1	30	0.0185 at V _{GS} = 10 V	6.8	7.8
		0.0225 at V _{GS} = 4.5 V	6.0	
Channel-2		0.0115 at V _{GS} = 10 V	11.4	11.6
		0.016 at V _{GS} = 4.5 V	9.5	

SCHOTTKY PRODUCT SUMMARY		
V _{DS} (V)	V _{SD} (V) Diode Forward Voltage	I _F (A)
30	0.50 V at 1.0 A	2.0



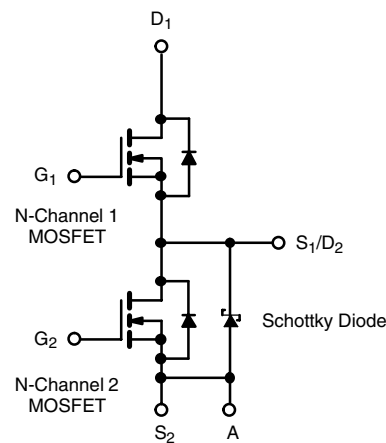
Ordering Information: Si4816BDY-T1-E3 (Lead (Pb)-free)

FEATURES

- LITTLE FOOT® Plus Power MOSFET
- 100 % R_g Tested



RoHS
COMPLIANT



ABSOLUTE MAXIMUM RATINGS $T_A = 25\text{ }^{\circ}\text{C}$, 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 ($T_J = 150\text{ }^{\circ}\text{C}$) ^a	$T_A = 25\text{ }^{\circ}\text{C}$	I_D	6.8	5.8	11.4	8.2	A
	$T_A = 70\text{ }^{\circ}\text{C}$		5.5	4.6	9.0	6.5	
Pulsed Drain Current		I_{DM}	30		40		
Continuous Source Current (Diode Conduction) ^a		I_S	1	0.9	2.2	1.15	
Single Pulse Avalanche Current	$L = 0.1\text{ mH}$	I_{AS}	10		20		
Avalanche Energy		E_{AS}	5		20		mJ
Maximum Power Dissipation ^a	$T_A = 25\text{ }^{\circ}\text{C}$	P_D	1.4	1.0	2.4	1.25	W
	$T_A = 70\text{ }^{\circ}\text{C}$		0.9	0.64	1.5	0.8	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150				$^{\circ}\text{C}$

THERMAL RESISTANCE RATINGS									
Parameter		Symbol	Channel-1		Channel-2		Schottky		Unit
			Typ	Max	Typ	Max	Typ	Max	
Maximum Junction-to-Ambient ^a	t ≤ 10 sec	R _{thJA}	72	90	43	53	48	60	°C/W
	Steady State		100	125	82	100	80	100	
Maximum Junction-to-Foot (Drain)	Steady State	R _{thJF}	51	63	25	30	28	35	

Notes:

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

MOSFET SPECIFICATIONS T _J = 25 °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 μA	Ch-1	1.0		3.0	V
			Ch-2	1.0		3.0	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = 20 V	Ch-1			100	nA
			Ch-2			100	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30 V, V _{GS} = 0 V	Ch-1			1	μA
			Ch-2			100	
		V _{DS} = 30 V, V _{GS} = 0 V, T _J = 85 °C	Ch-1			15	
			Ch-2			2000	
On-State Drain Current ^b	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 10 V	Ch-1	20			A
			Ch-2	30			
Drain-Source On-State Resistance ^b	r _{DS(on)}	V _{GS} = 10 V, I _D = 6.8 A	Ch-1		0.0155	0.0185	Ω
		V _{GS} = 10 V, I _D = 11.4 A	Ch-2		0.0093	0.0115	
		V _{GS} = 4.5 V, I _D = 6.0 A	Ch-1		0.0185	0.0225	
		V _{GS} = 4.5 V, I _D = 9.5 A	Ch-2		0.013	0.016	
Forward Transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 6.8 A	Ch-1		30		S
		V _{DS} = 15 V, I _D = 11.4 A	Ch-2		31		
Diode Forward Voltage ^b	V _{SD}	I _S = 1 A, V _{GS} = 0 V	Ch-1		0.73	1.1	V
		I _S = 1 A, V _{GS} = 0 V	Ch-2		0.47	0.5	
Dynamic ^a							
Total Gate Charge	Q _g	Channel-1 V _{DS} = 15 V, V _{GS} = 5 V, I _D = 6.8 A	Ch-1		7.8	10	nC
			Ch-2		11.6	18	
Gate-Source Charge	Q _{gs}	Channel-2 V _{DS} = 15 V, V _{GS} = 5 V, I _D = - 11.4 A	Ch-1		2.9		
			Ch-2		4.8		
Gate-Drain Charge	Q _{gd}		Ch-1		2.3		
			Ch-2		3.7		
Gate Resistance	R _g		Ch-1	1.5	3.0	4.5	Ω
			Ch-2	0.9	1.8	2.7	
Turn-On Delay Time	t _{d(on)}	Channel-1 V _{DD} = 15 V, R _L = 15 Ω I _D ≅ 1 A, V _{GEN} = 10 V, R _g = 6 Ω	Ch-1		11	17	ns
			Ch-2		13	20	
Rise Time	t _r		Ch-1		9	15	
			Ch-2		9	15	
Turn-Off Delay Time	t _{d(off)}	Channel-2 V _{DD} = 15 V, R _L = 15 Ω I _D ≅ 1 A, V _{GEN} = 10 V, R _g = 6 Ω	Ch-1		24	40	
			Ch-2		31	50	
Fall Time	t _f		Ch-1		9	15	
			Ch-2		11	17	
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 1.3 A, di/dt = 100 A/μs	Ch-1		20	35	
		I _F = 2.2 A, di/dt = 100 μA/μs	Ch-2		25	40	

Notes:

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

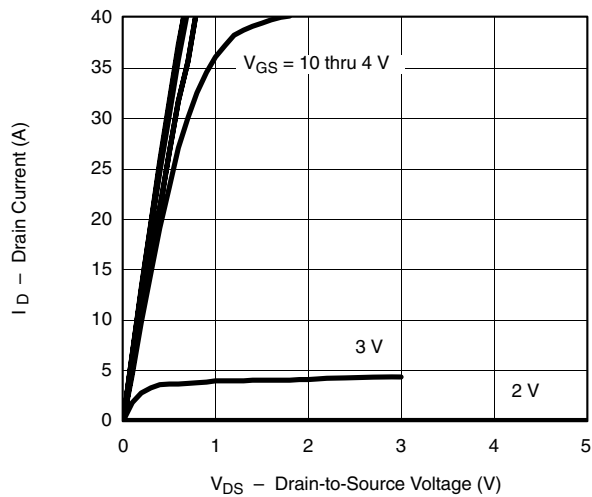
b. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.



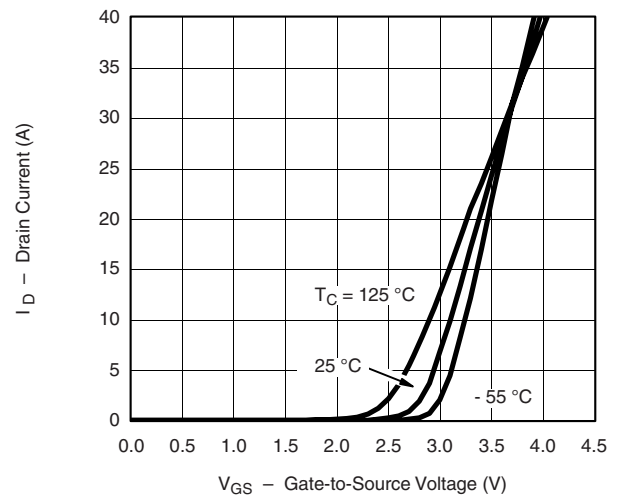
SCHOTTKY SPECIFICATIONS $T_J = 25\text{ }^{\circ}\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Forward Voltage Drop	V_F	$I_F = 1.0\text{ A}$		0.47	0.50	V
		$I_F = 1.0\text{ A}$, $T_J = 125\text{ }^{\circ}\text{C}$		0.36	0.42	
Maximum Reverse Leakage Current	I_{rm}	$V_r = 30\text{ V}$		0.004	0.100	mA
		$V_r = 30\text{ V}$, $T_J = 100\text{ }^{\circ}\text{C}$		0.7	10	
		$V_r = -30\text{ V}$, $T_J = 125\text{ }^{\circ}\text{C}$		3.0	20	
Junction Capacitance	C_T	$V_r = 10\text{ V}$		50		pF

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.

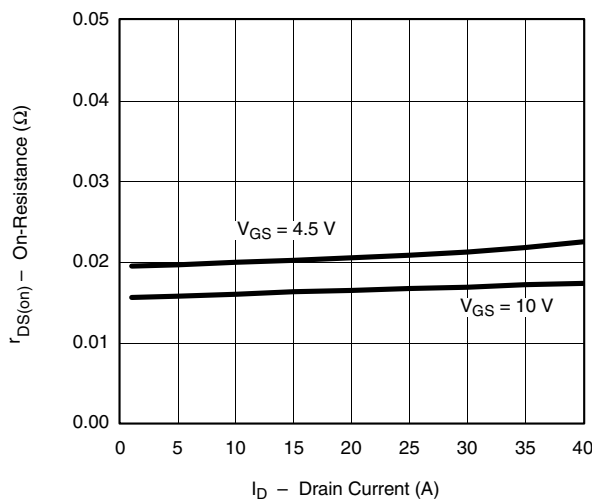
CHANNEL-1 TYPICAL CHARACTERISTICS $25\text{ }^{\circ}\text{C}$, unless noted



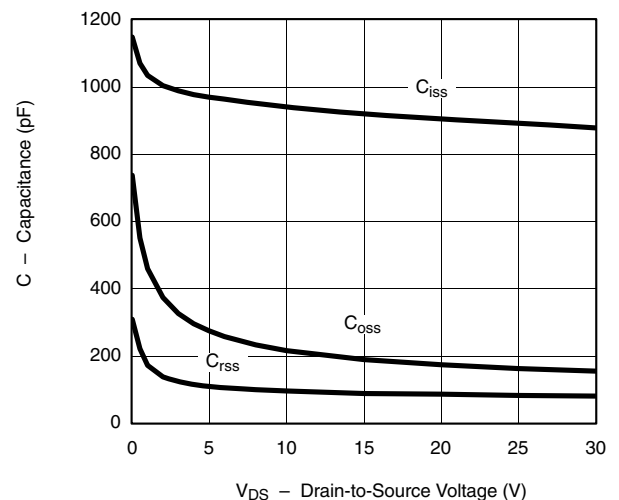
Output Characteristics



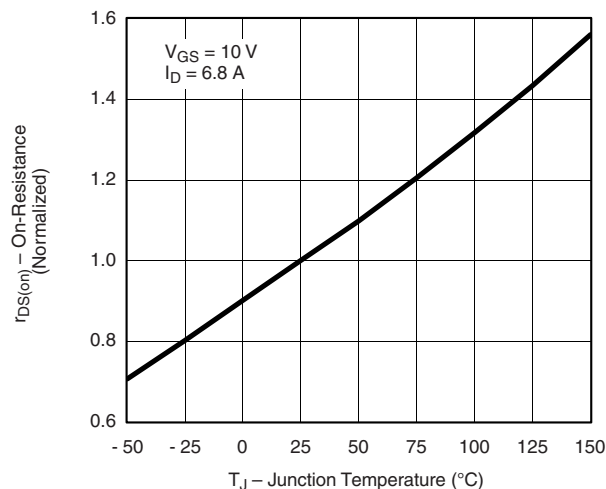
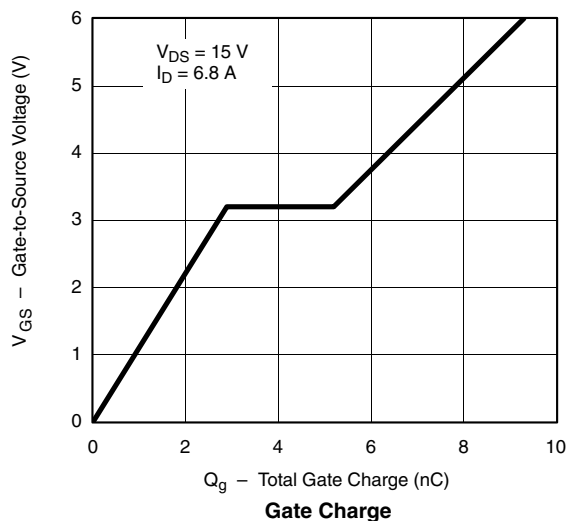
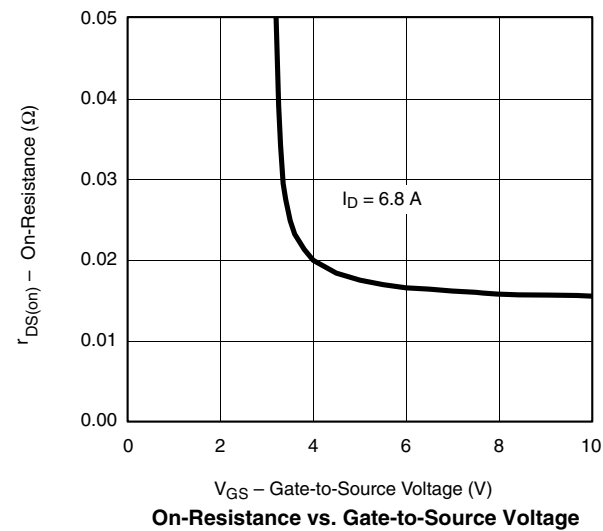
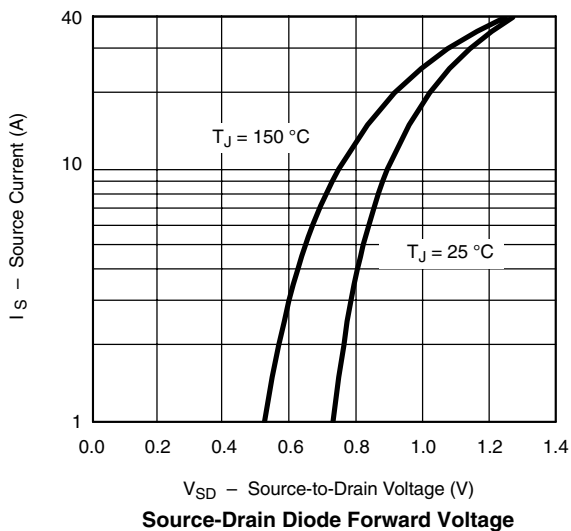
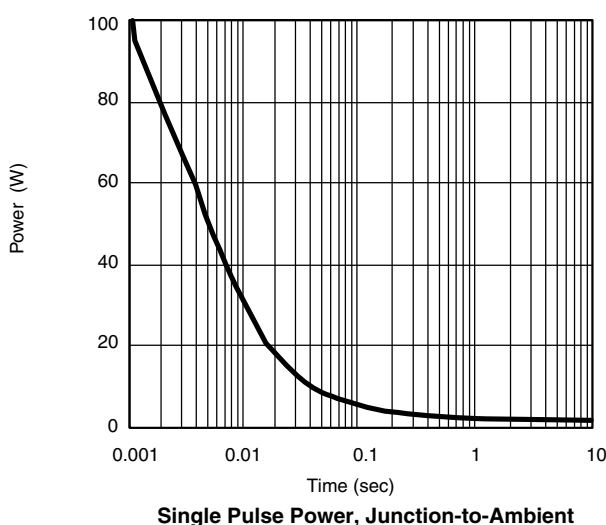
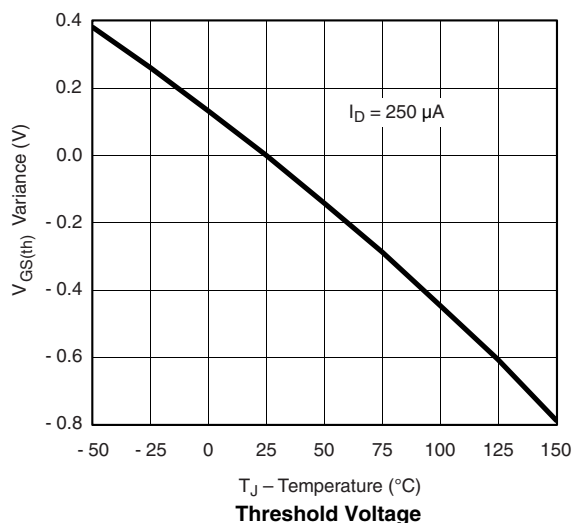
Transfer Characteristics



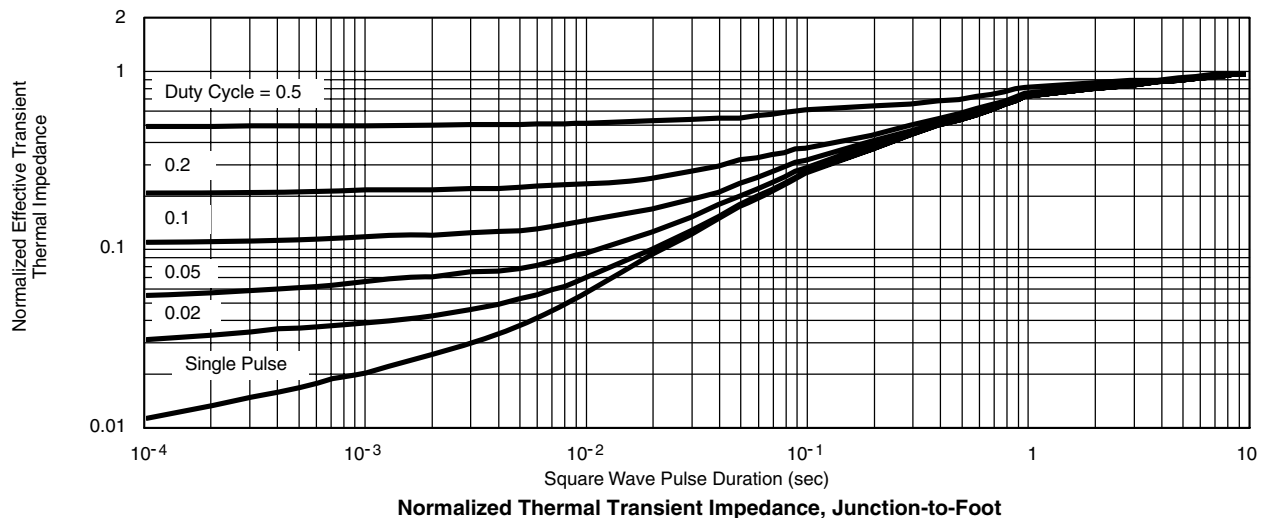
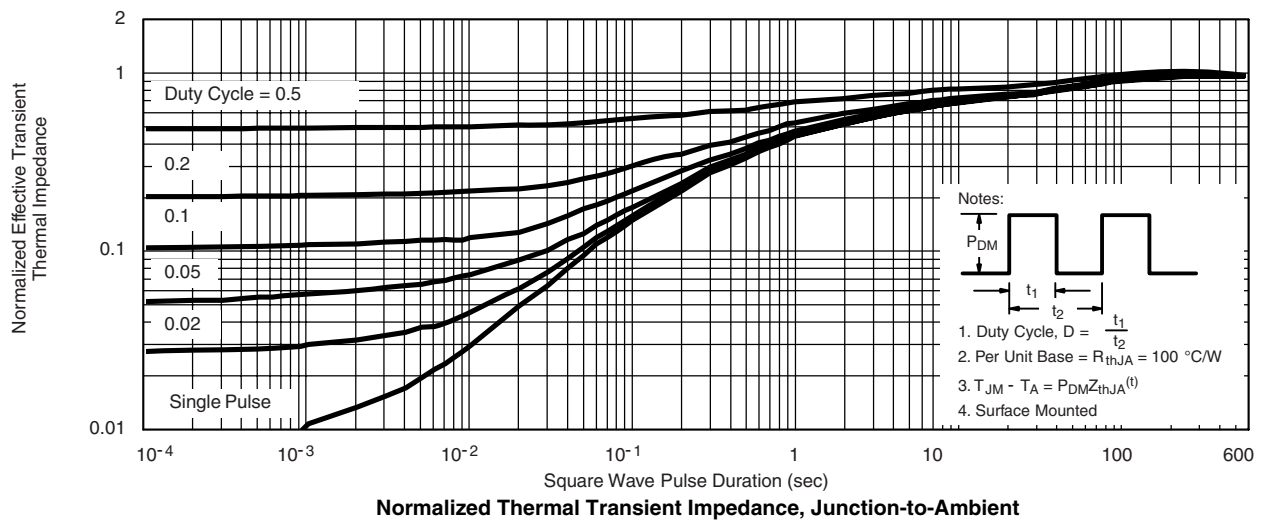
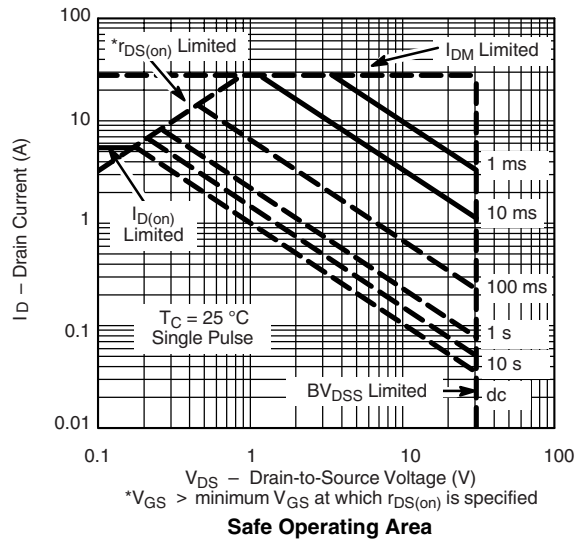
On-Resistance vs. Drain Current

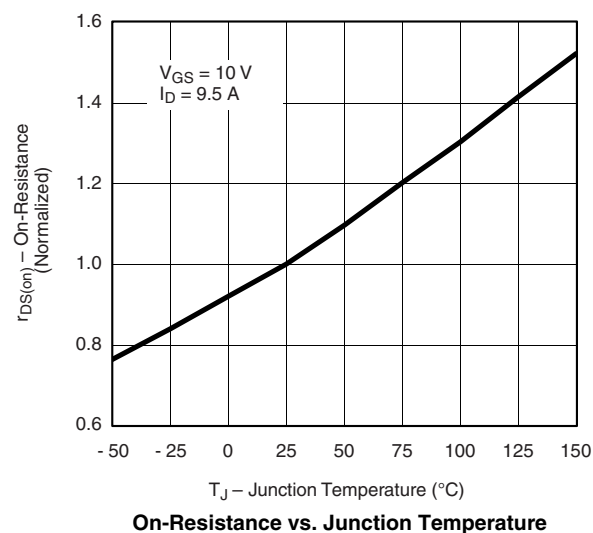
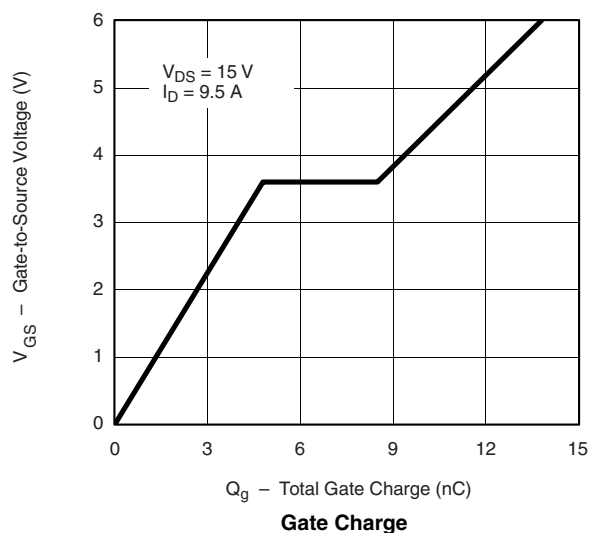
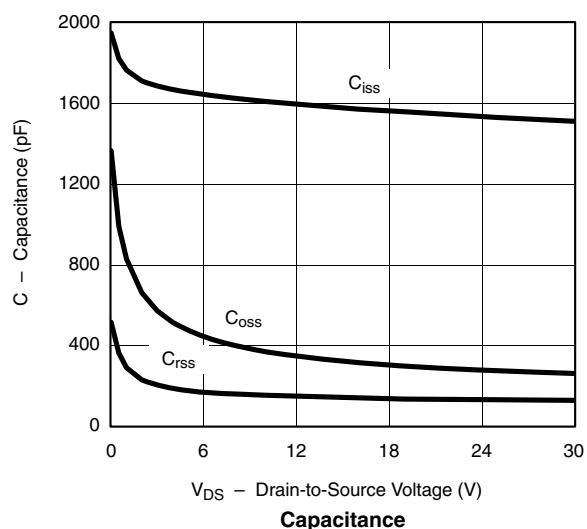
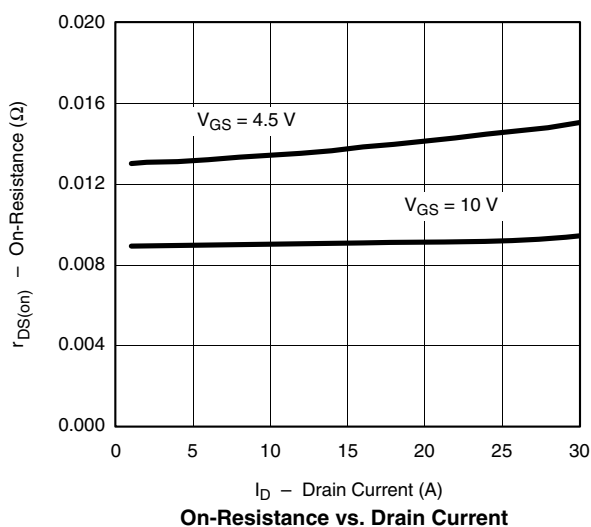
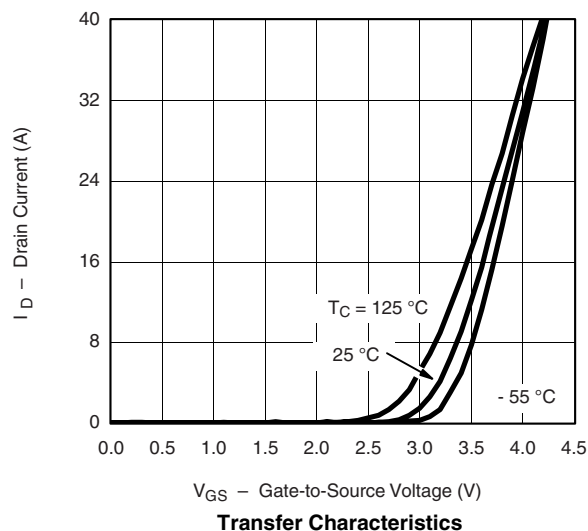
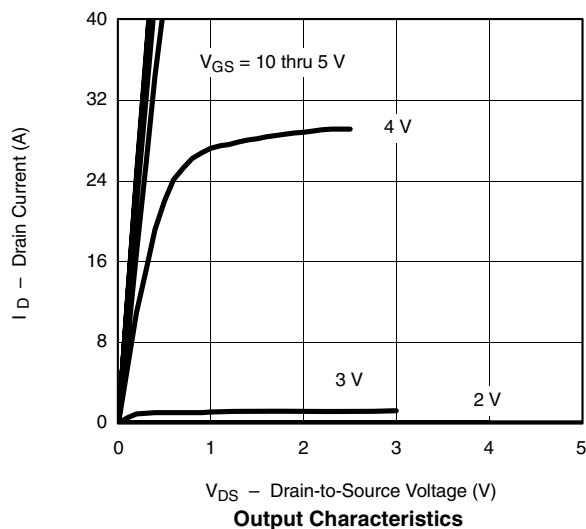


Capacitance

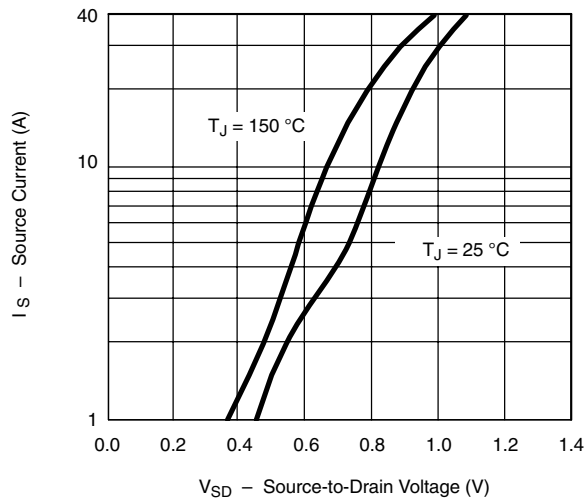
CHANNEL-1 TYPICAL CHARACTERISTICS 25 °C, unless noted**On-Resistance vs. Junction Temperature****On-Resistance vs. Gate-to-Source Voltage**

CHANNEL-1 TYPICAL CHARACTERISTICS 25 °C, unless noted

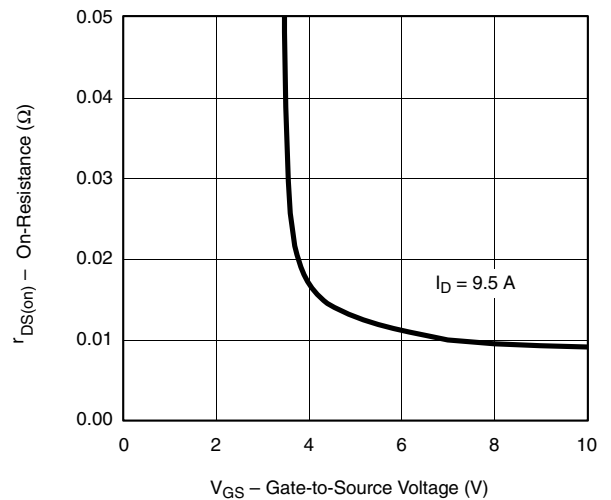


CHANNEL-2 TYPICAL CHARACTERISTICS 25 °C, unless noted

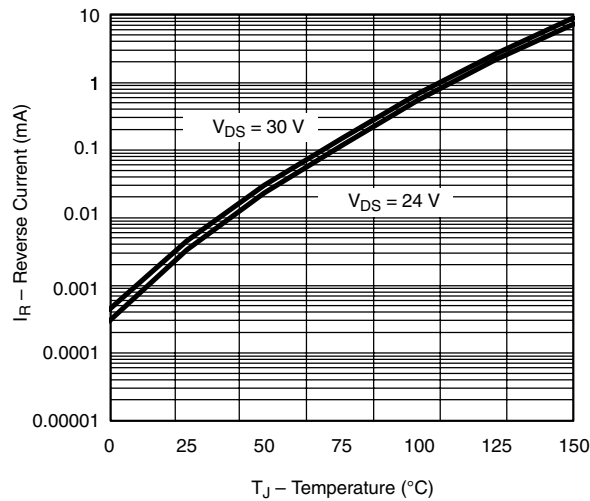
CHANNEL-2 TYPICAL CHARACTERISTICS 25 °C, unless noted



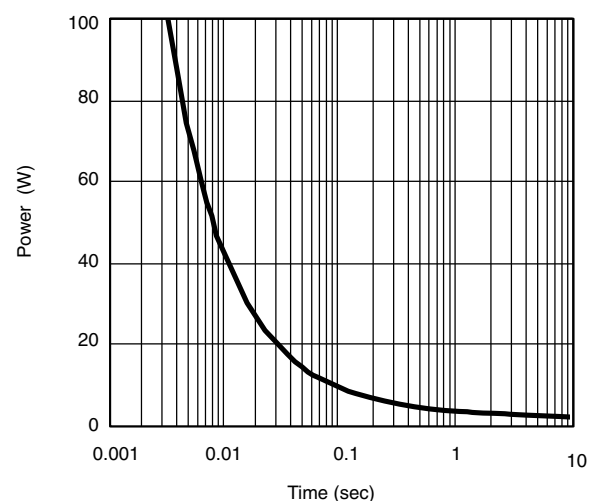
Source-Drain Diode Forward Voltage



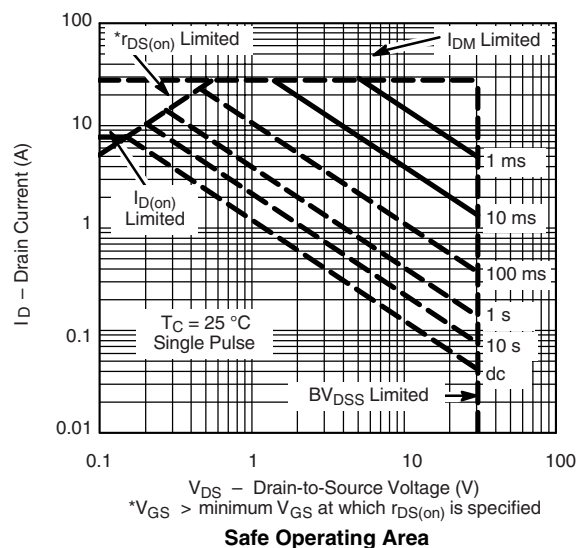
On-Resistance vs. Gate-to-Source Voltage

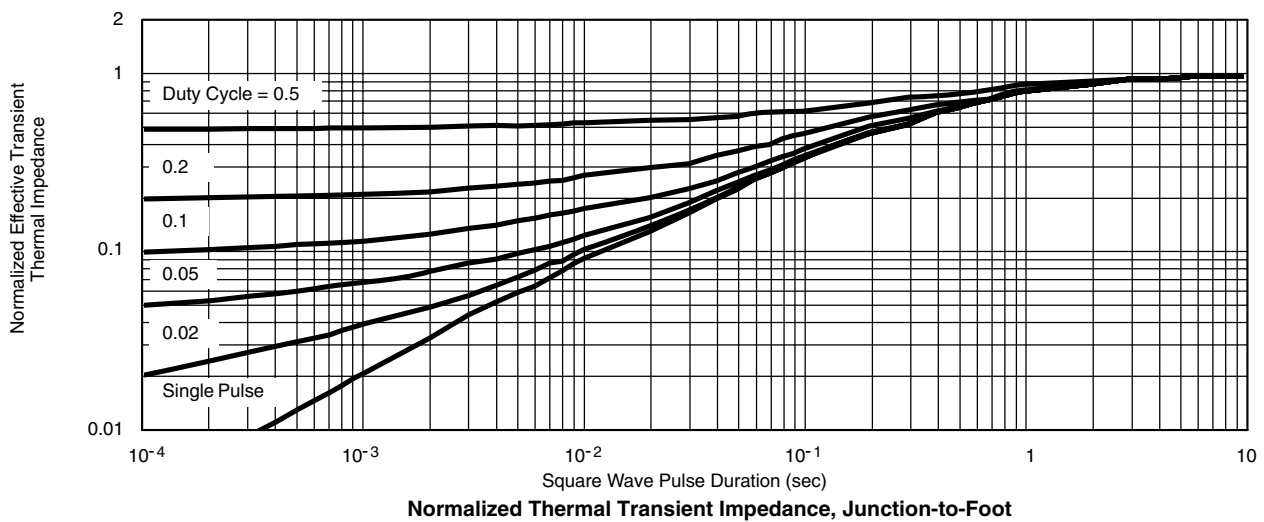
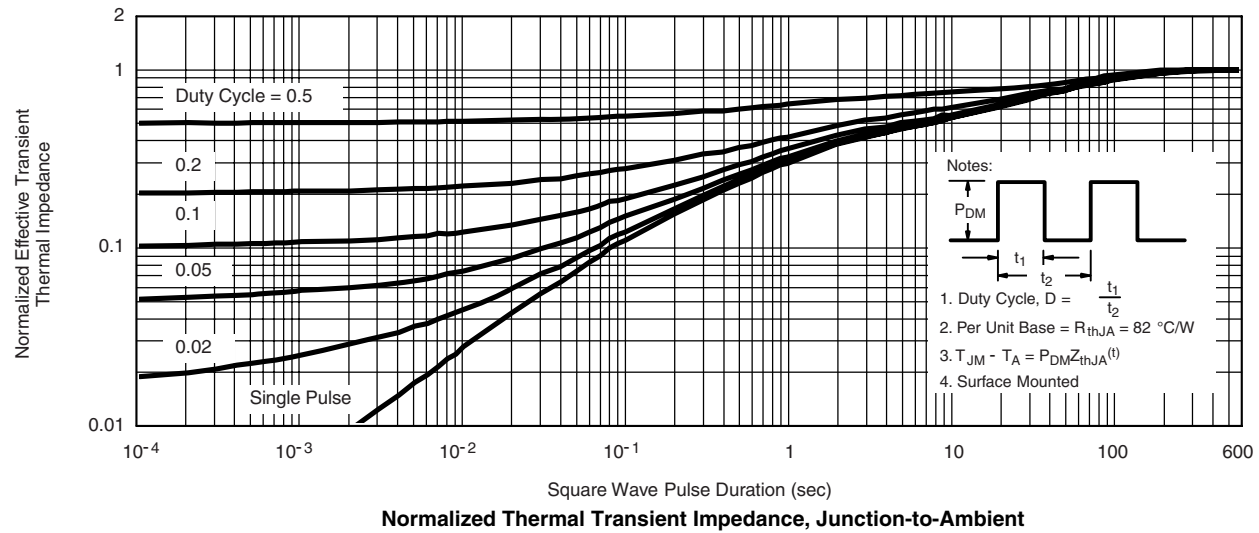


Reverse Current vs. Junction Temperature

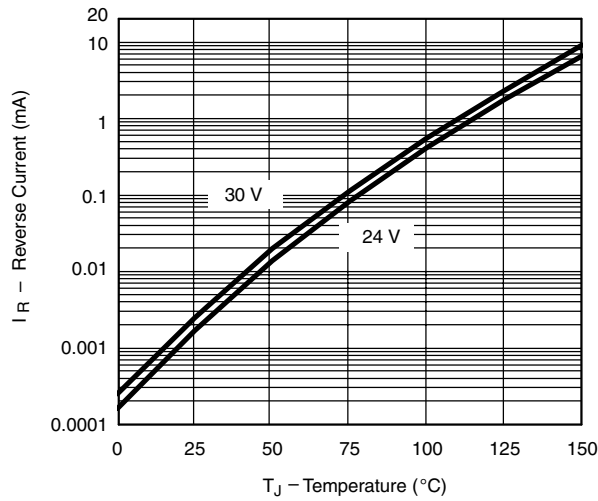


Single Pulse Power, Junction-to-Ambient

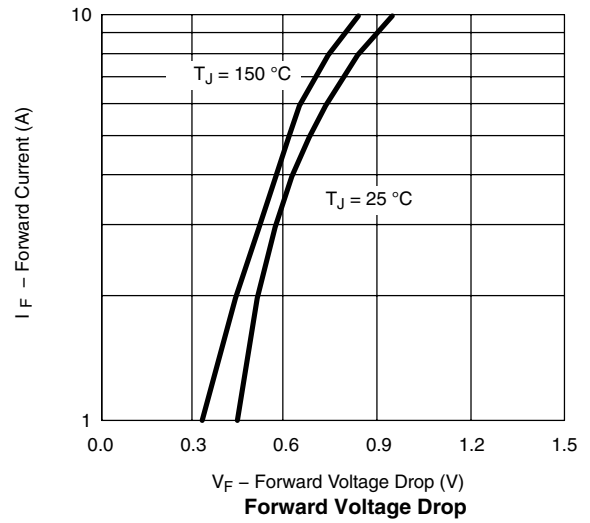


CHANNEL-2 TYPICAL CHARACTERISTICS 25 °C, unless noted

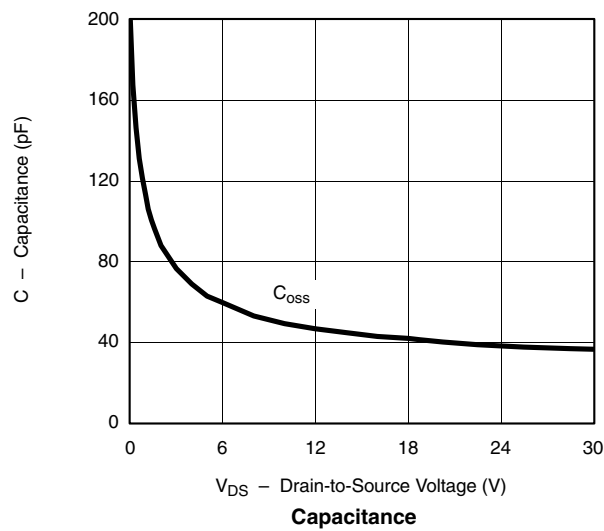
SCHOTTKY TYPICAL CHARACTERISTICS 25 °C, unless noted



Reverse Current vs. Junction Temperature



Forward Voltage Drop



Capacitance

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