



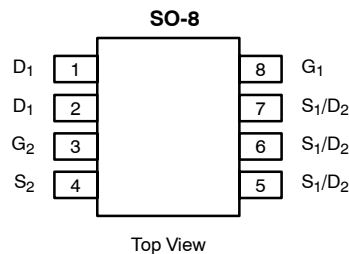
Dual N-Channel 30-V (D-S) MOSFET with Schottky Diode

PRODUCT SUMMARY

	V _{DS} (V)	r _{DS(on)} (Ω)	I _D (A)
Channel-1	30	0.021 @ V _{GS} = 10 V	7.0
		0.0325 @ V _{GS} = 4.5 V	5.6
Channel-2		0.020 @ V _{GS} = 10 V	7.4
		0.0265 @ V _{GS} = 4.5 V	6.4

SCHOTTKY PRODUCT SUMMARY

V_{DS} (V)	V_{SD} (V) Diode Forward Voltage	I_F (A)
30	0.50 V @ 1.0 A	2.0



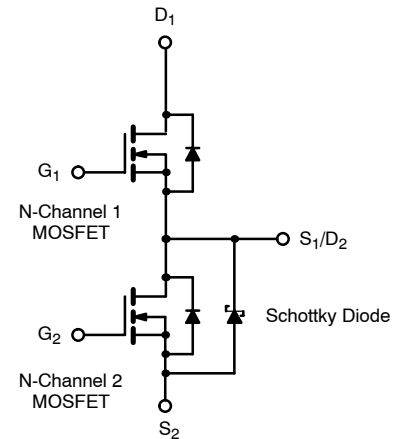
Ordering Information: Si4814DY
Si4814DY-T1 (with Tape and Reel)

FEATURES

- LITTLE FOOT® Plus Integrated Schottky
- Alternative Pinning for Additional Layout Options
- 100% R_g Tested

APPLICATIONS

- DC/DC Converters
– Notebook



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Channel-1		Channel-2		Unit
		10 secs	Steady State	10 secs	Steady State	
Drain-Source Voltage	V_{DS}	30				V
Gate-Source Voltage	V_{GS}	20				V
Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^a	I_D	7.0	5.5	7.4	5.7	A
	I_D	5.6	4.3	6	4.5	
Pulsed Drain Current	I_{DM}	40		40		A
Continuous Source Current (Diode Conduction) ^a	I_S	1.7	1.0	1.8	0.95	A
Maximum Power Dissipation ^a	P_D	1.9	1.1	2.0	1.16	W
	P_D	1.2	0.71	1.3	0.74	
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		Unit
			Typ	Max	Typ	Max	
Maximum Junction-to-Ambient ^a	$t \leq 10$ sec	R_{thJA}	52	65	47	60	$^\circ\text{C/W}$
	Steady-State		90	112	85	107	
Maximum Junction-to-Foot (Drain)	Steady-State	R_{thJF}	30	38	28	35	$^\circ\text{C/W}$

Notes

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

MOSFET SPECIFICATIONS (T _J = 25 °C UNLESS OTHERWISE NOTED)							
Parameter	Symbol	Test Condition		Min	Typ ^a	Max	Unit
Static							
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	Ch-1	0.8			V
			Ch-2	0.8			
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	20			
Drain-Source On-State Resistance ^b	r _{DS(on)}	V _{GS} = 10 V, I _D = 7.0 A	Ch-1		0.0175	0.021	Ω
		V _{GS} = 10 V, I _D = 7.4 A	Ch-2		0.0165	0.020	
		V _{GS} = 4.5 V, I _D = 5.6 A	Ch-1		0.027	0.0325	
		V _{GS} = 4.5 V, I _D = 6.4 A	Ch-2		0.022	0.0265	
Forward Transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 7.0 A	Ch-1		17		S
		V _{DS} = 15 V, I _D = 7.4 A	Ch-2		20		
Diode Forward Voltage ^b	V _{SD}	I _S = 1.7 A, V _{GS} = 0 V	Ch-1		0.7	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 = 7.0 A Channel-2 V _{DS} = 15 V, V _{GS} = 5 V, I _D = -7.4 A	Ch-1		6.5	10	nC
Gate-Source Charge	Q _{gs}		Ch-2		9.7	15	
			Ch-1		1.5		
Gate-Drain Charge	Q _{gd}		Ch-2		2.6		
Gate Resistance	R _g	Channel-1 V _{DD} = 15 V, R _L = 15 Ω I _D ≈ 1 A, V _{GEN} = 10 V, R _G = 6 Ω Channel-2 V _{DD} = 15 V, R _L = 15 Ω I _D ≈ 1 A, V _{GEN} = 10 V, R _G = 6 Ω	Ch-1		2.7		
			Ch-2		3.8		
Turn-On Delay Time	t _{d(on)}		Ch-1	0.5	1.6	2.6	Ω
			Ch-2	0.5	1.8	3.1	
Rise Time	t _r		Ch-1		12	20	ns
			Ch-2		13	20	
Turn-Off Delay Time	t _{d(off)}		Ch-1		13	20	
			Ch-2		13	20	
Fall Time	t _f		Ch-1		22	35	
			Ch-2		29	45	
Source-Drain Reverse Recovery Time	t _{rr}	Ch-1		8	15		
		Ch-2		12	20		
		I _F = 1.3 A, di/dt = 100 A/μs	Ch-1		50	80	
		I _F = 2.2 A, di/dt = 100 μA/μs	Ch-2		46	80	

Notes

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

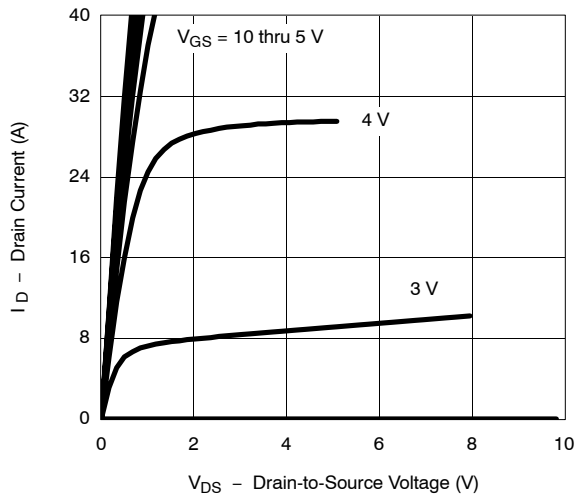
SCHOTTKY SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)							
Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
Forward Voltage Drop	V_F	$I_F = 1.0\ \text{A}$			0.47	0.50	V
		$I_F = 1.0\ \text{A}, T_J = 125^\circ\text{C}$			0.36	0.42	
Maximum Reverse Leakage Current	I_{rm}	$V_r = 30\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



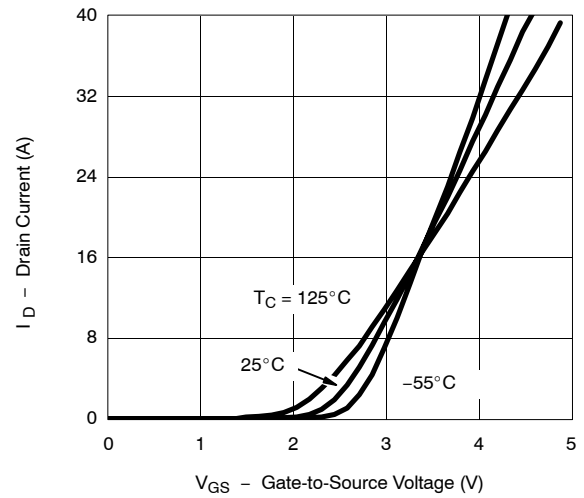
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

CHANNEL-1

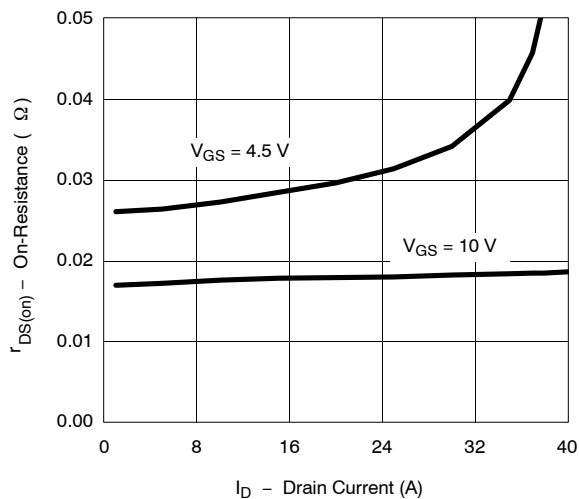
Output Characteristics



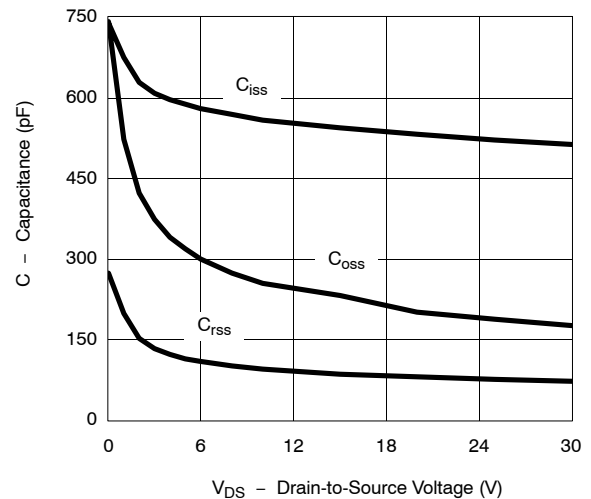
Transfer Characteristics



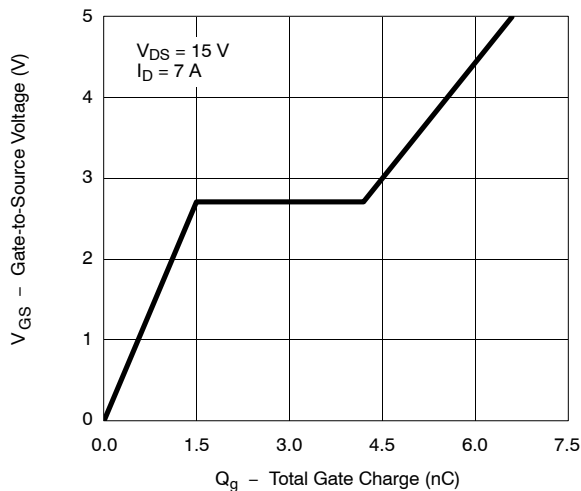
On-Resistance vs. Drain Current



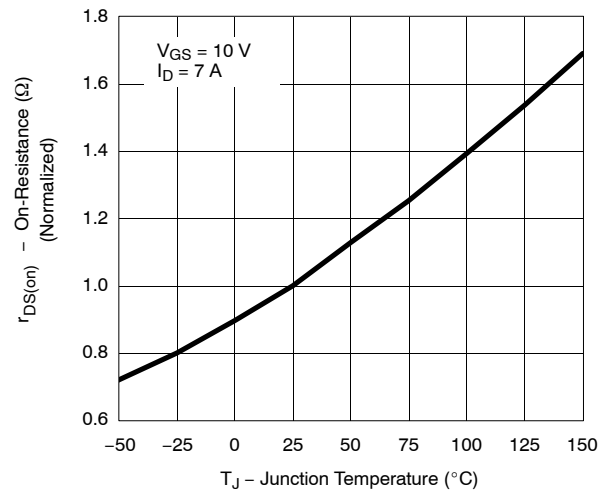
Capacitance



Gate Charge

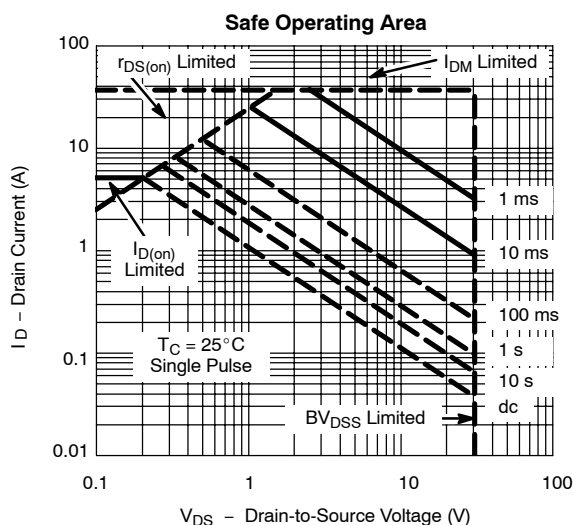
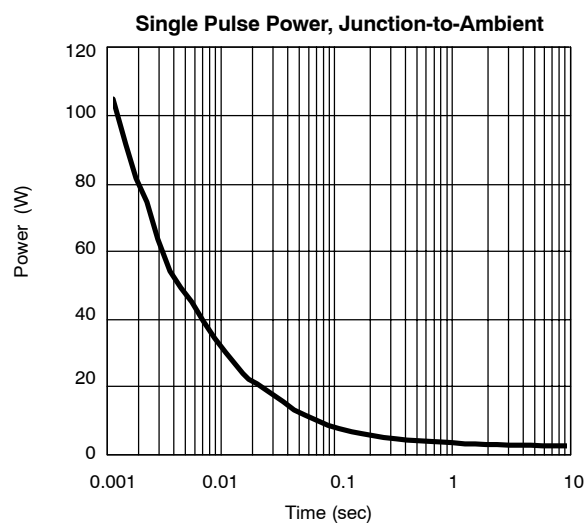
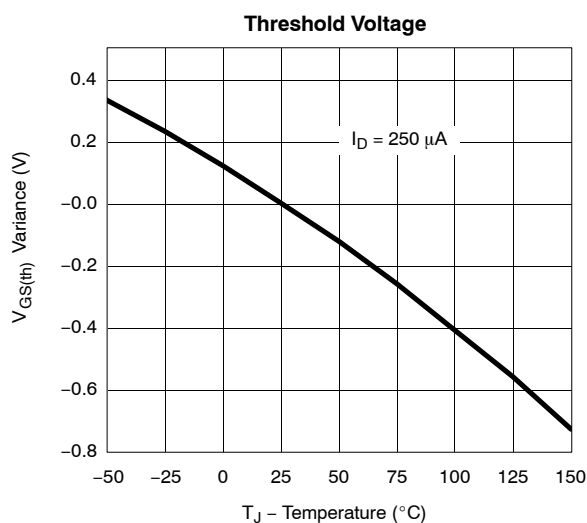
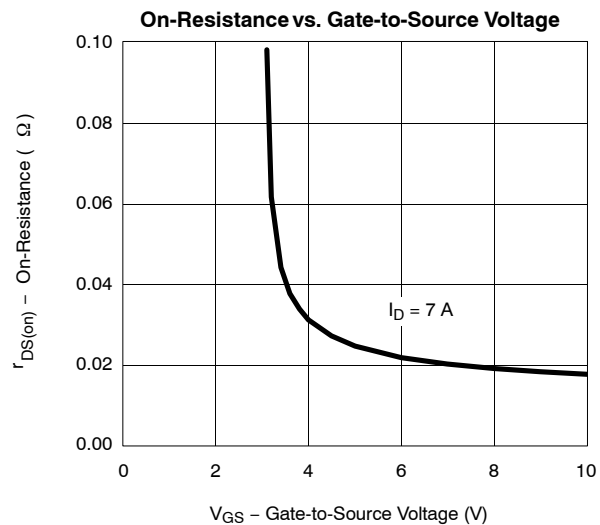
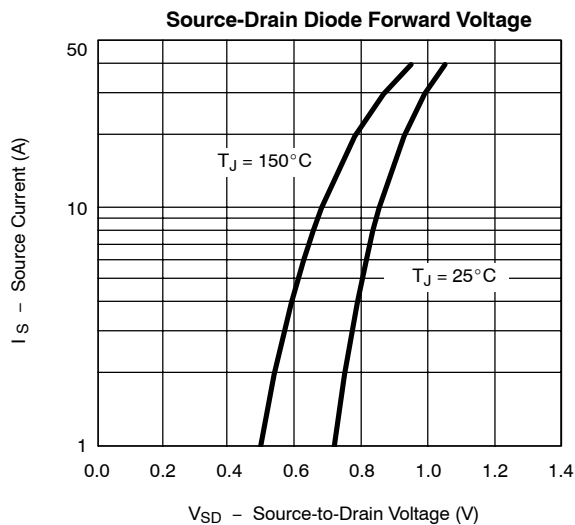


On-Resistance vs. Junction Temperature



TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

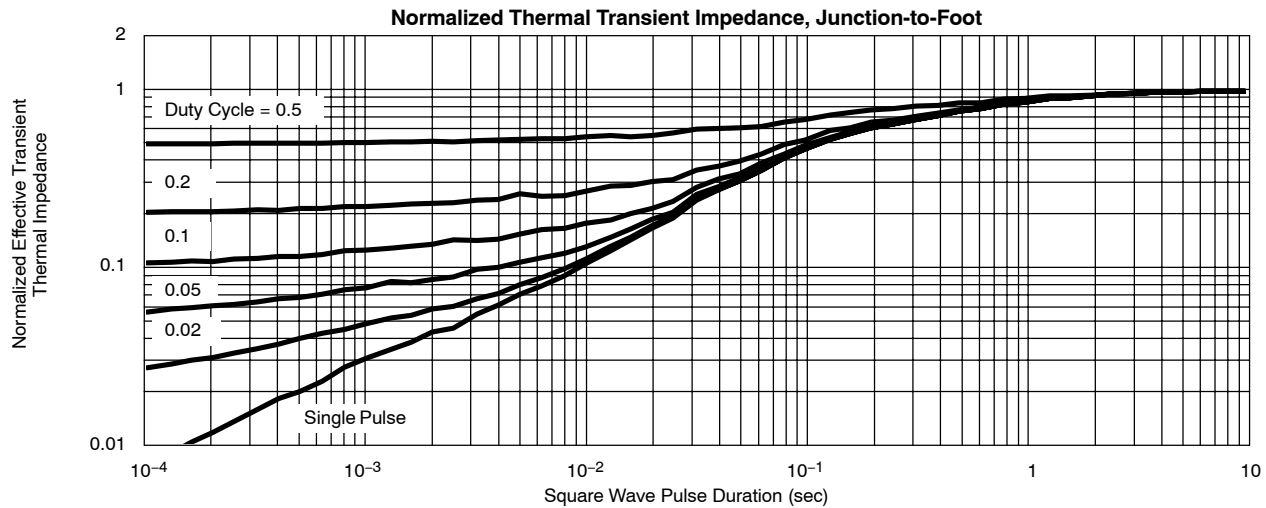
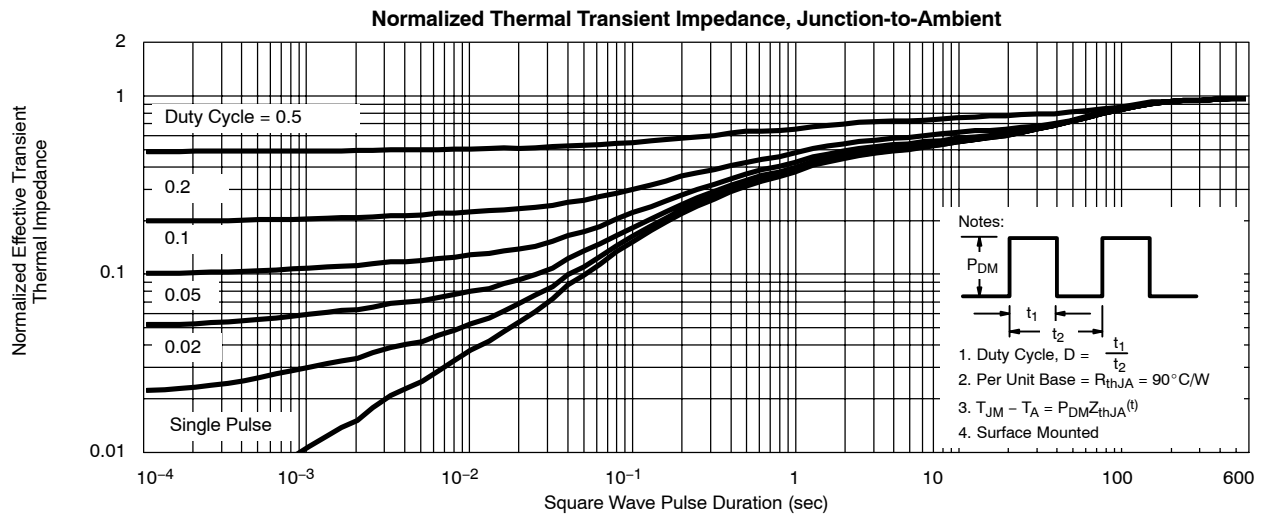
CHANNEL-1





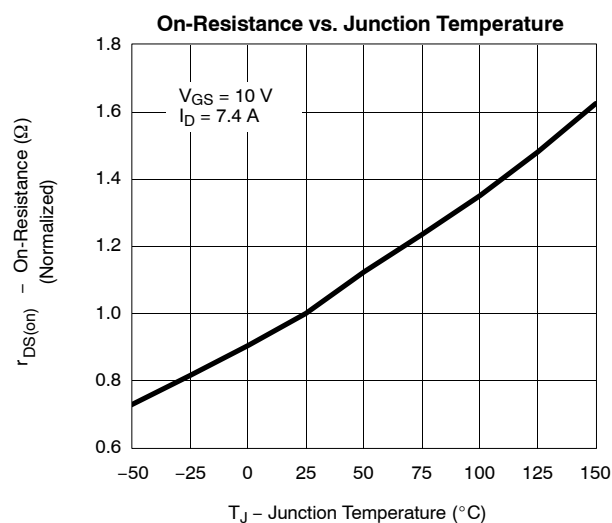
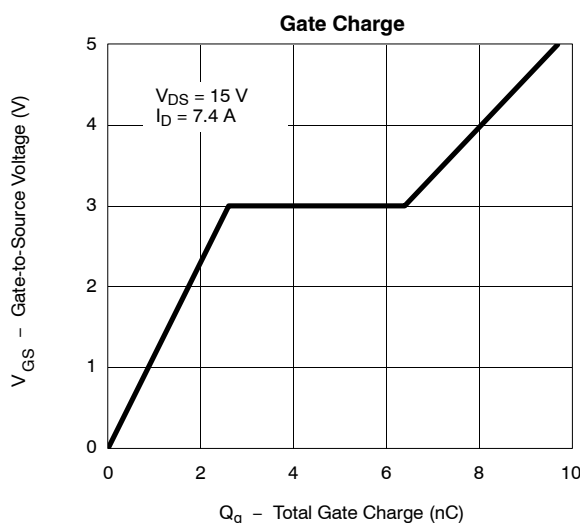
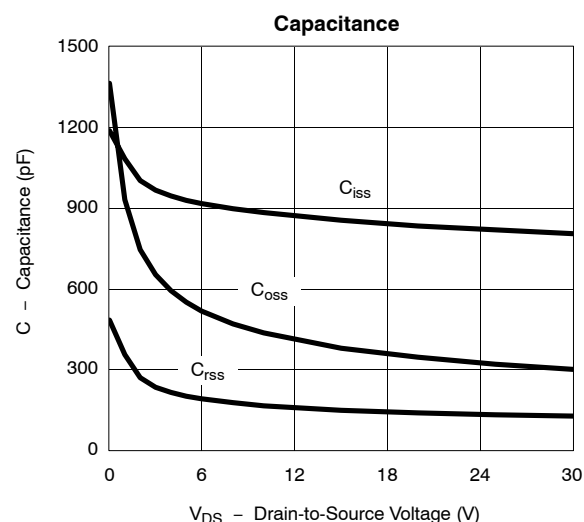
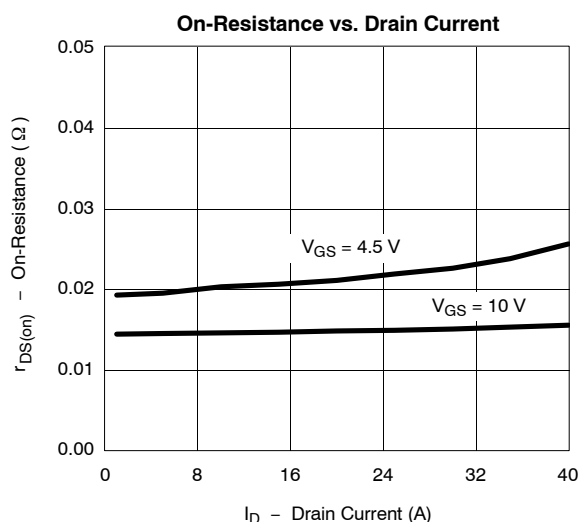
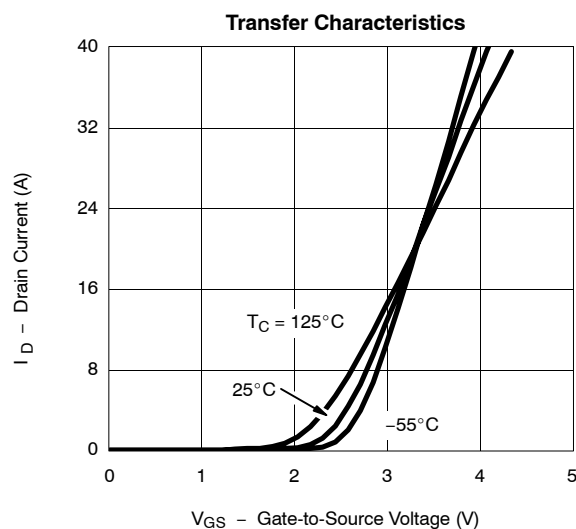
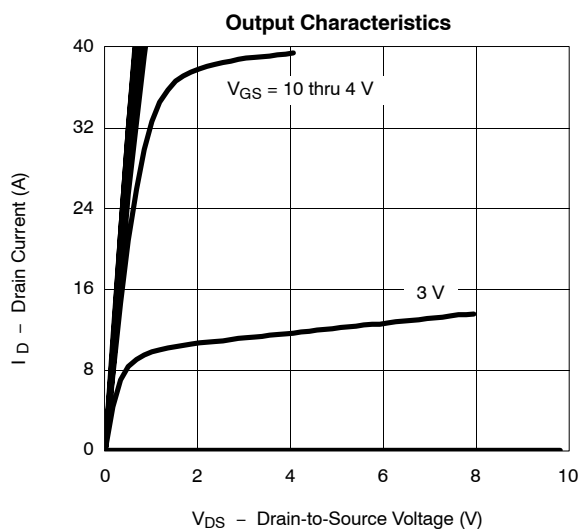
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

CHANNEL-1



TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

CHANNEL-2

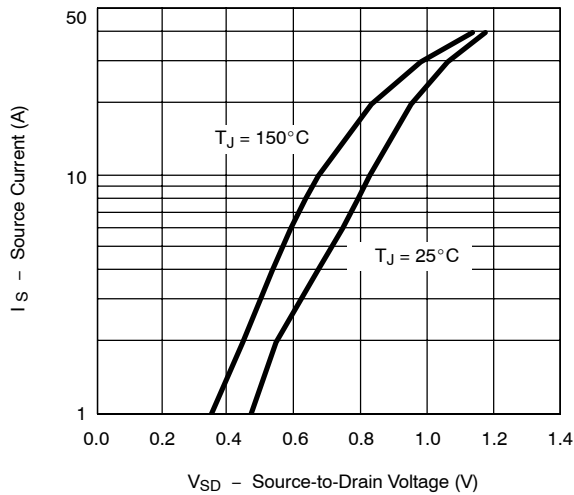




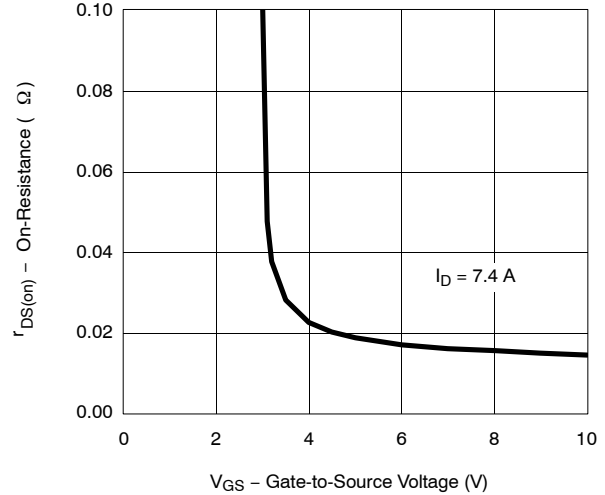
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

CHANNEL-2

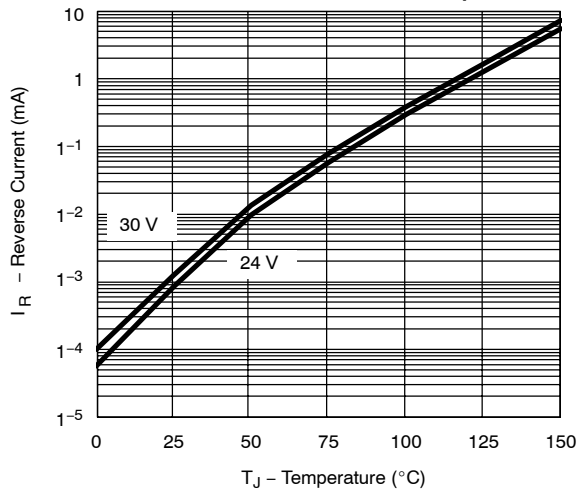
Source-Drain Diode Forward Voltage



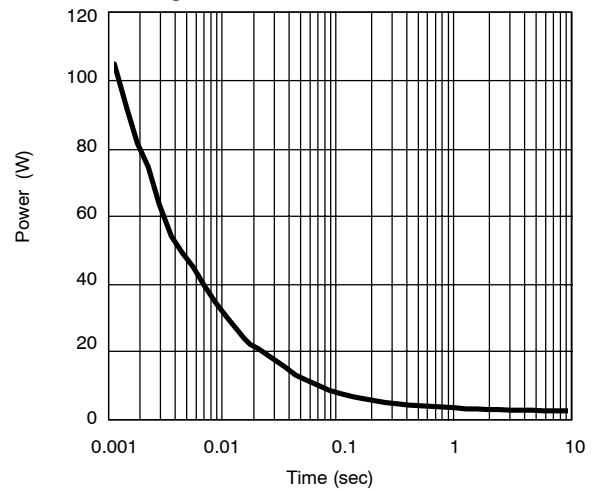
On-Resistance vs. Gate-to-Source Voltage



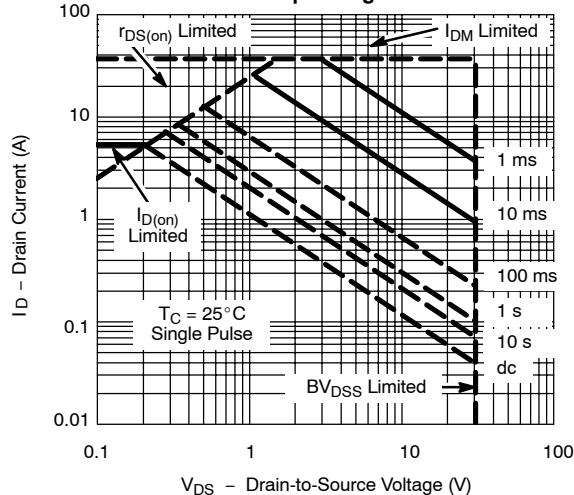
Reverse Current vs. Junction Temperature



Single Pulse Power, Junction-to-Ambient

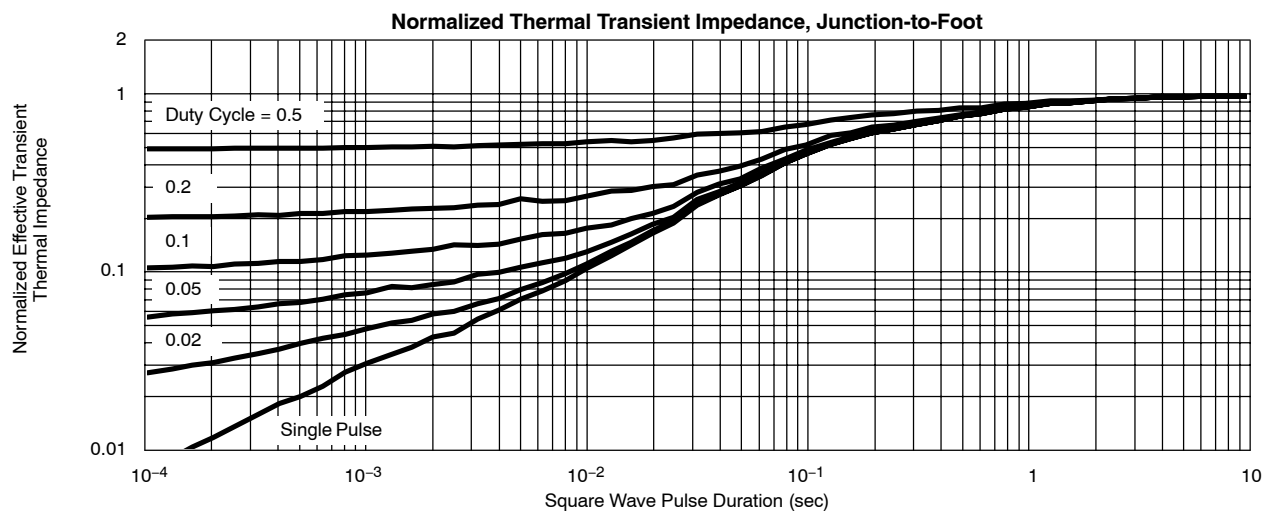
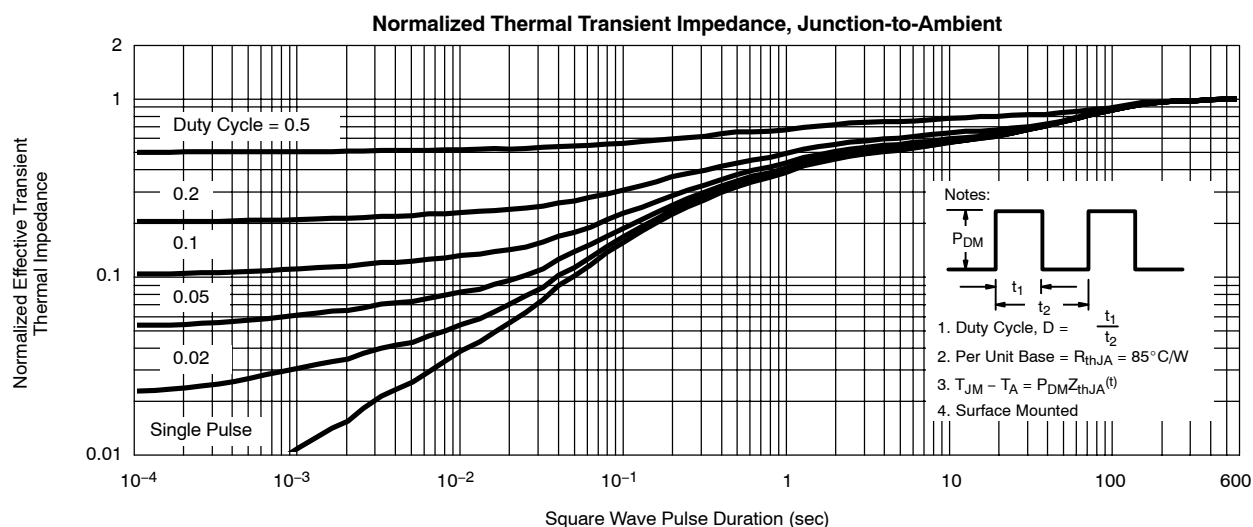


Safe Operating Area



TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

CHANNEL-2





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