



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

PRODUCT SUMMARY			
	V <sub>DS</sub> (V)	r <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A)
Channel-1	30	0.021 @ V <sub>GS</sub> = 10 V	7.0
		0.0325 @ V <sub>GS</sub> = 4.5 V	5.6
Channel-2		0.020 @ V <sub>GS</sub> = 10 V	7.4
		0.0265 @ V <sub>GS</sub> = 4.5 V	8.4

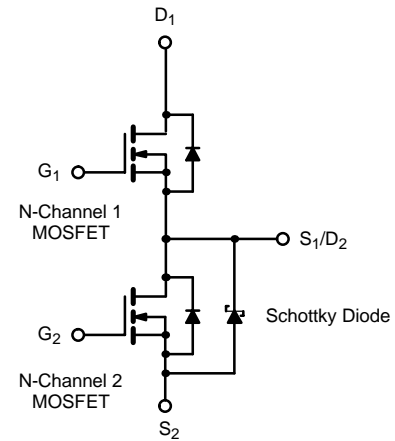
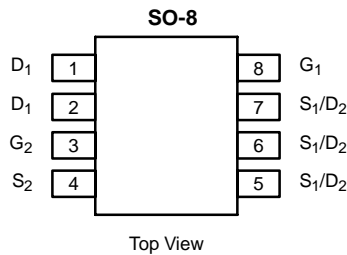
SCHOTTKY PRODUCT SUMMARY		
V <sub>DS</sub> (V)	V <sub>SD</sub> (V) Diode Forward Voltage	I <sub>F</sub> (A)
30	0.50 V @ 1.0 A	2.0

### FEATURES

- LITTLE FOOT *Plus*™ Integrated Schottky
- Alternative Pinning for Additional Layout Options

### APPLICATIONS

- DC/DC Converters  
- Notebook



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

ABSOLUTE MAXIMUM RATINGS (T <sub>A</sub> = 25°C UNLESS OTHERWISE NOTED)							
Parameter	Symbol	Channel-1		Channel-2		Unit	
		10 secs	Steady State	10 secs	Steady State		
Drain-Source Voltage	V <sub>DS</sub>	30				V	
Gate-Source Voltage	V <sub>GS</sub>	20					
Continuous Drain Current (T <sub>J</sub> = 150°C) <sup>a</sup>	I <sub>D</sub>	T <sub>A</sub> = 25°C	7.0	5.5	7.4	5.7	A
		T <sub>A</sub> = 70°C	5.6	4.3	6	4.5	
Pulsed Drain Current	I <sub>DM</sub>	40		40		A	
Continuous Source Current (Diode Conduction) <sup>a</sup>	I <sub>S</sub>	1.7	1.0	1.8	0.95		
Maximum Power Dissipation <sup>a</sup>	P <sub>D</sub>	T <sub>A</sub> = 25°C	1.9	1.1	2.0	1.16	W
		T <sub>A</sub> = 70°C	1.2	0.71	1.3	0.74	
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to 150				°C	

THERMAL RESISTANCE RATINGS							
Parameter	Symbol	Channel-1		Channel-2		Unit	
		Typ	Max	Typ	Max		
Maximum Junction-to-Ambient <sup>a</sup>	R <sub>thJA</sub>	t ≤ 10 sec	52	65	47	60	°C/W
		Steady-State	90	112	85	107	
Maximum Junction-to-Foot (Drain)	R <sub>thJF</sub>	30	38	28	35		

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

MOSFET SPECIFICATIONS (T <sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)							
Parameter	Symbol	Test Condition		Min	Typ <sup>a</sup>	Max	Unit
<b>Static</b>							
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	Ch-1	0.8			V
			Ch-2	0.8			
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = 20 V	Ch-1			100	nA
			Ch-2			100	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 24 V, V <sub>GS</sub> = 0 V	Ch-1			1	μA
			Ch-2			100	
		V <sub>DS</sub> = 24 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 85 °C	Ch-1			15	
			Ch-2			2000	
On-State Drain Current <sup>b</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> = 5 V, V <sub>GS</sub> = 10 V	Ch-1	20			A
			Ch-2	20			
Drain-Source On-State Resistance <sup>b</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 7.0 A	Ch-1		0.0175	0.021	Ω
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 7.4 A	Ch-2		0.0165	0.020	
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 5.6 A	Ch-1		0.027	0.0325	
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 8.4 A	Ch-2		0.022	0.0265	
Forward Transconductance <sup>b</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 7.0 A	Ch-1		17		S
		V <sub>DS</sub> = 15 V, I <sub>D</sub> = 7.4 A	Ch-2		20		
Diode Forward Voltage <sup>b</sup>	V <sub>SD</sub>	I <sub>S</sub> = 1.7 A, V <sub>GS</sub> = 0 V	Ch-1		0.7	1.1	V
		I <sub>S</sub> = 1 A, V <sub>GS</sub> = 0 V	Ch-2		0.47	0.5	
<b>Dynamic<sup>a</sup></b>							
Total Gate Charge	Q <sub>g</sub>	Channel-1 V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 5 V, I <sub>D</sub> = 7.0 A	Ch-1		6.5	10	nC
			Ch-2		9.7	15	
Gate-Source Charge	Q <sub>gs</sub>	Channel-2 V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 5 V, I <sub>D</sub> = -7.4 A	Ch-1		1.5		
			Ch-2		2.6		
Gate-Drain Charge	Q <sub>gd</sub>	Channel-2 V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 5 V, I <sub>D</sub> = -7.4 A	Ch-1		2.7		
			Ch-2		3.8		
Gate Resistance	R <sub>G</sub>		Ch-1	0.5	1.6	2.6	Ω
			Ch-2	0.5	1.8	3.1	
Turn-On Delay Time	t <sub>d(on)</sub>	Channel-1 V <sub>DD</sub> = 15 V, R <sub>L</sub> = 15 Ω I <sub>D</sub> ≅ 1 A, V <sub>GEN</sub> = 10 V, R <sub>G</sub> = 6 Ω	Ch-1		12	20	ns
Rise Time	t <sub>r</sub>		Ch-2		13	20	
		Turn-Off Delay Time	t <sub>d(off)</sub>	Ch-1		22	
Ch-2				29	45		
Fall Time	t <sub>f</sub>	Channel-2 V <sub>DD</sub> = 15 V, R <sub>L</sub> = 15 Ω I <sub>D</sub> ≅ 1 A, V <sub>GEN</sub> = 10 V, R <sub>G</sub> = 6 Ω	Ch-1		8	15	
			Ch-2		12	20	
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 1.3 A, di/dt = 100 A/μs	Ch-1		50	80	
		I <sub>F</sub> = 2.2 A, di/dt = 100 μA/μs	Ch-2		46	80	

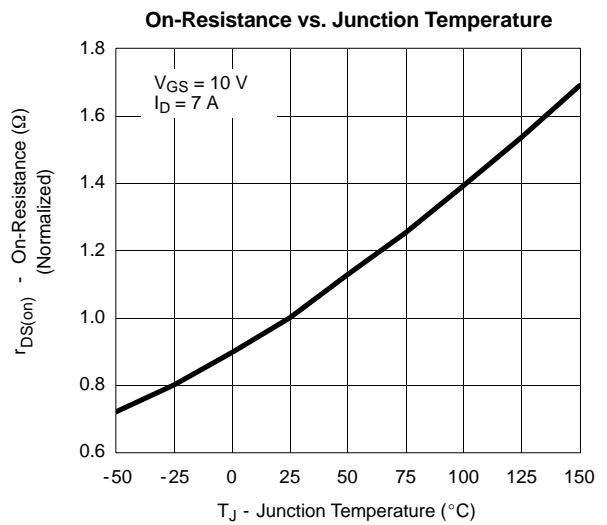
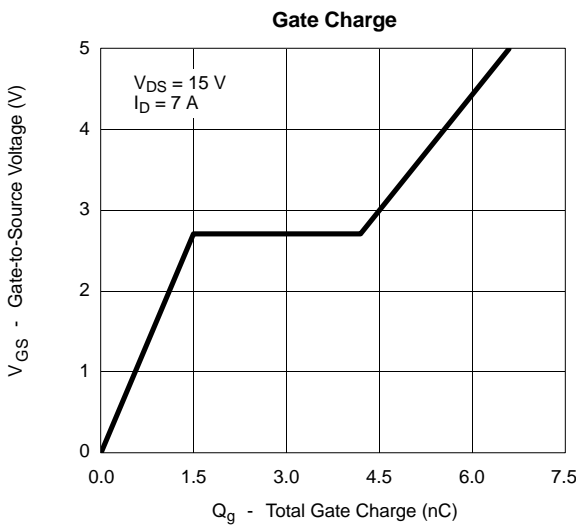
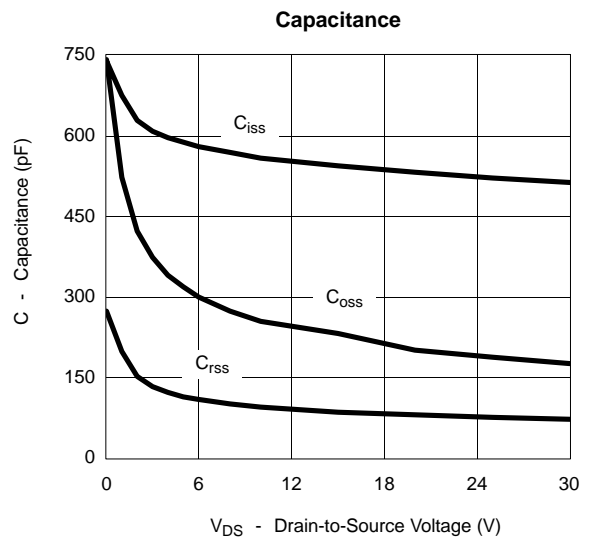
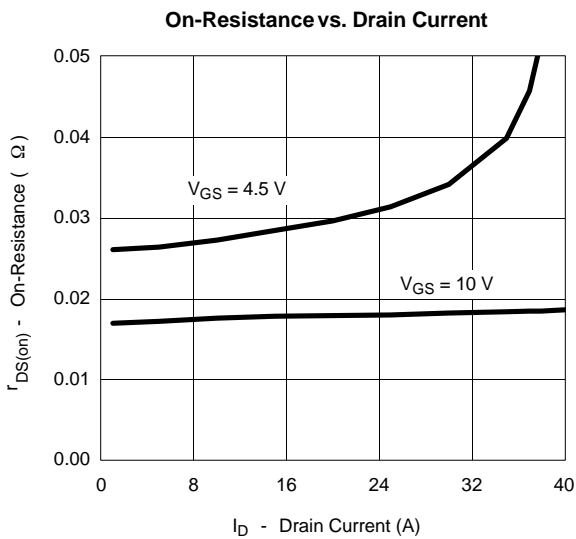
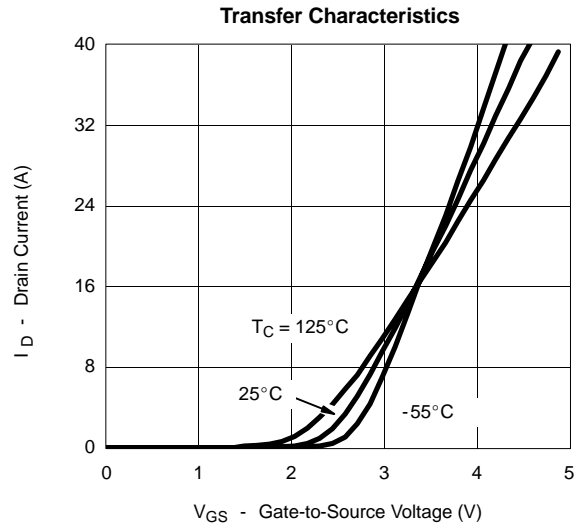
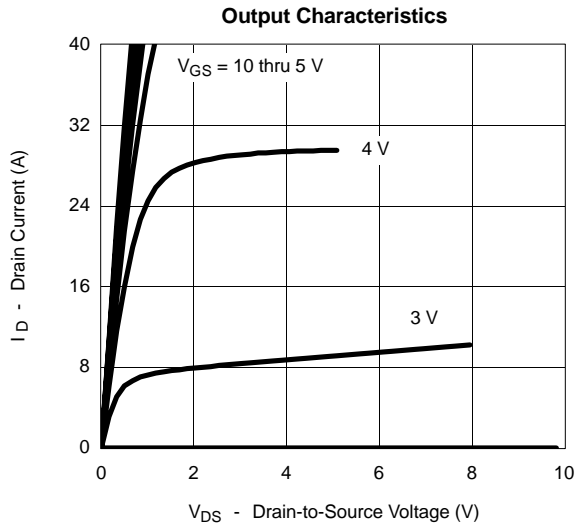
## Notes

- a. Guaranteed by design, not subject to production testing.  
b. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.

SCHOTTKY SPECIFICATIONS (T <sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)							
Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
Forward Voltage Drop	V <sub>F</sub>	I <sub>F</sub> = 1.0 A			0.47	0.50	V
		I <sub>F</sub> = 1.0 A, T <sub>J</sub> = 125 °C			0.36	0.42	
Maximum Reverse Leakage Current	I <sub>rm</sub>	V <sub>r</sub> = 30 V			0.004	0.100	mA
		V <sub>r</sub> = 30 V, T <sub>J</sub> = 100 °C			0.7	10	
		V <sub>r</sub> = -30 V, T <sub>J</sub> = 125 °C			3.0	20	
Junction Capacitance	C <sub>T</sub>	V <sub>r</sub> = 10 V			50		pF

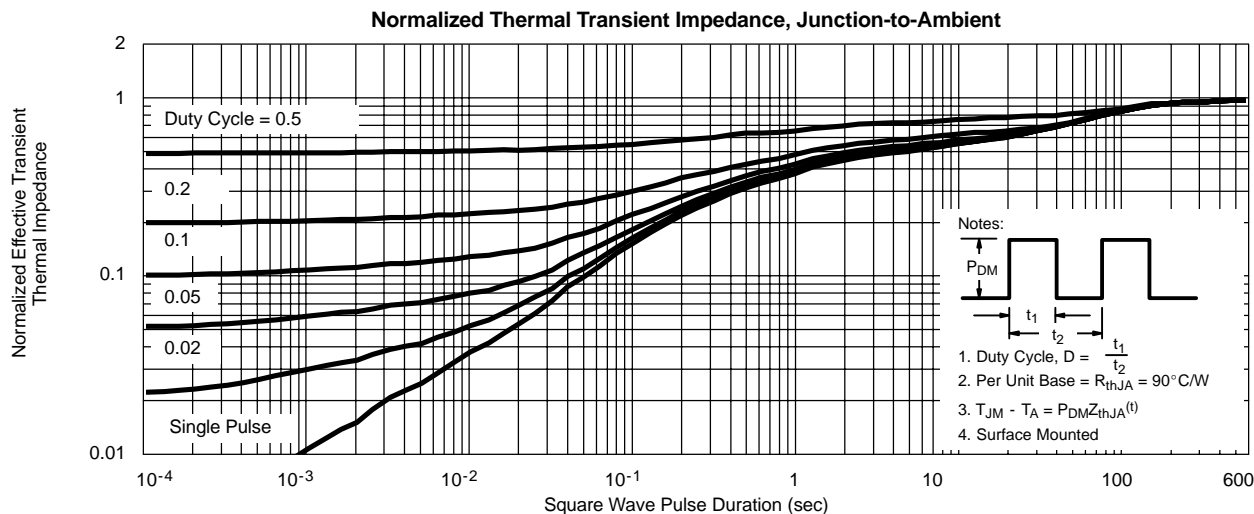
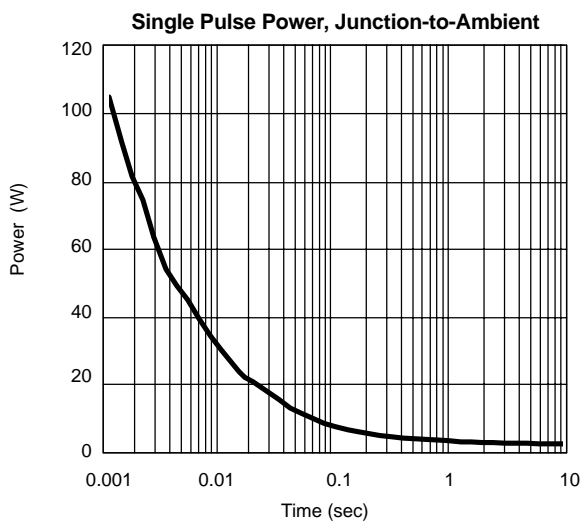
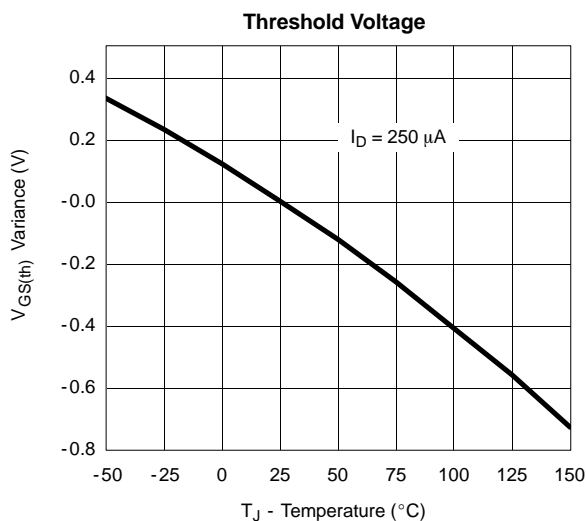
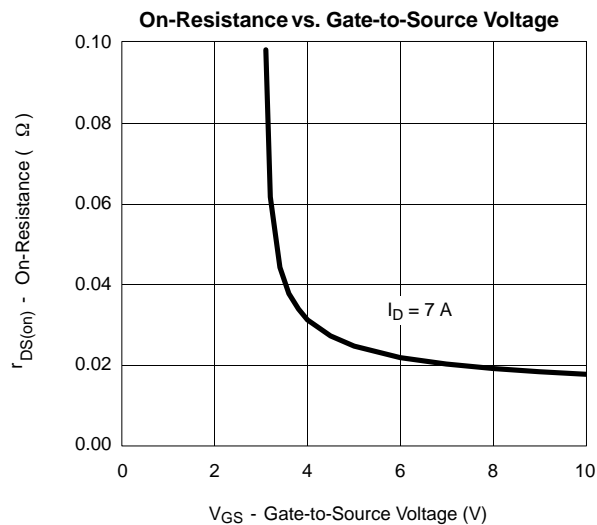
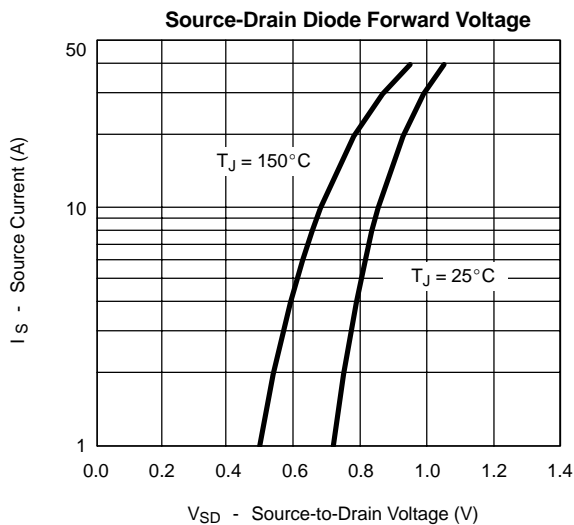


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) CHANNEL-1**



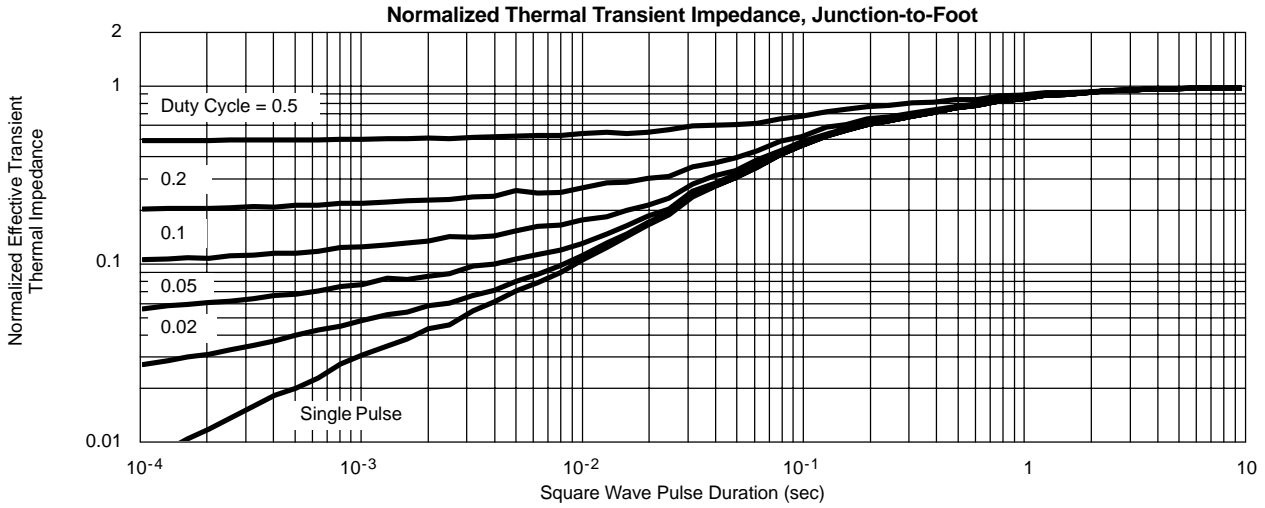
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**CHANNEL-1**

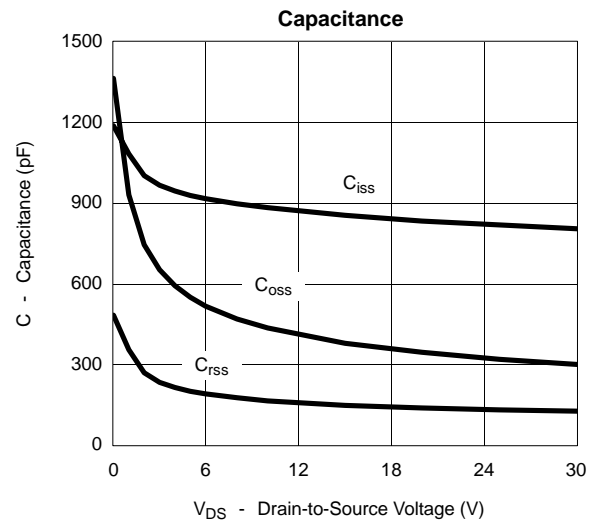
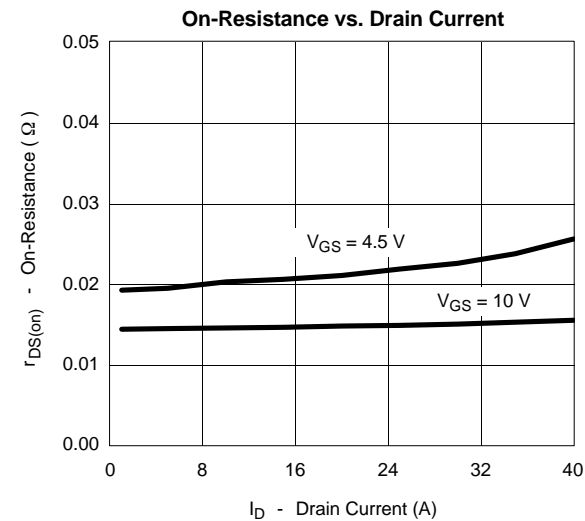
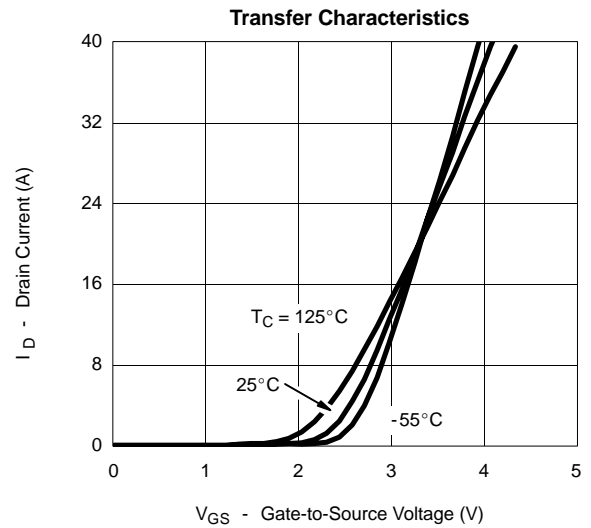
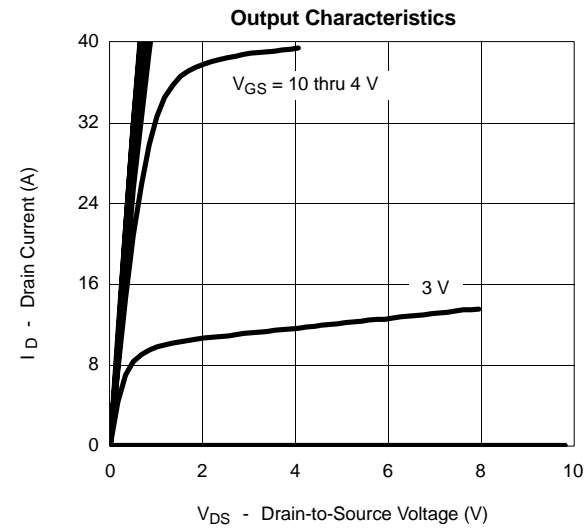




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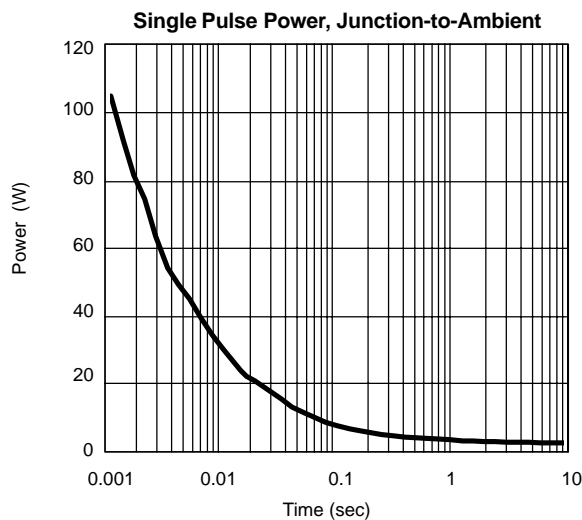
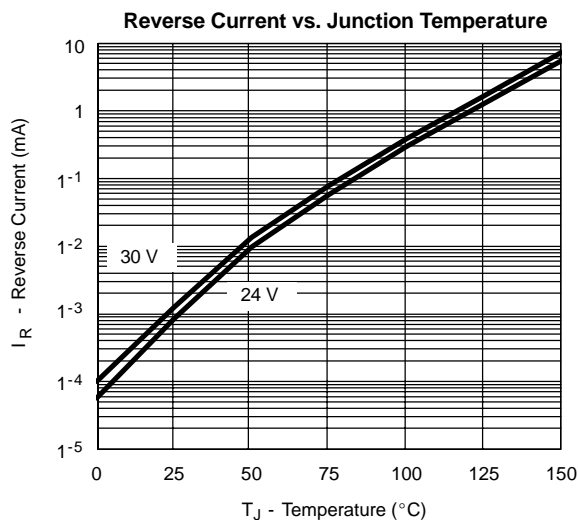
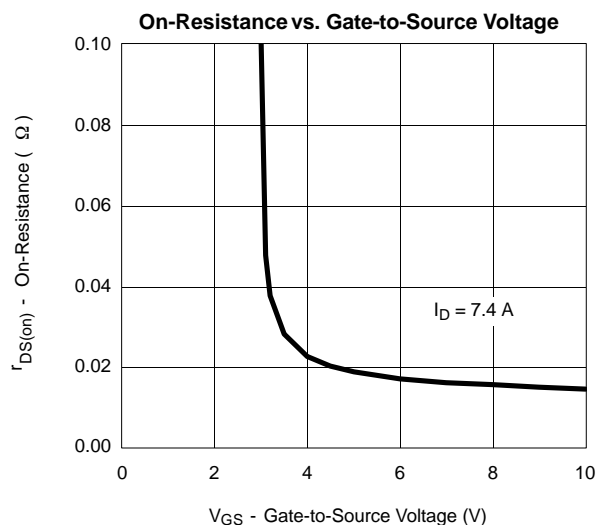
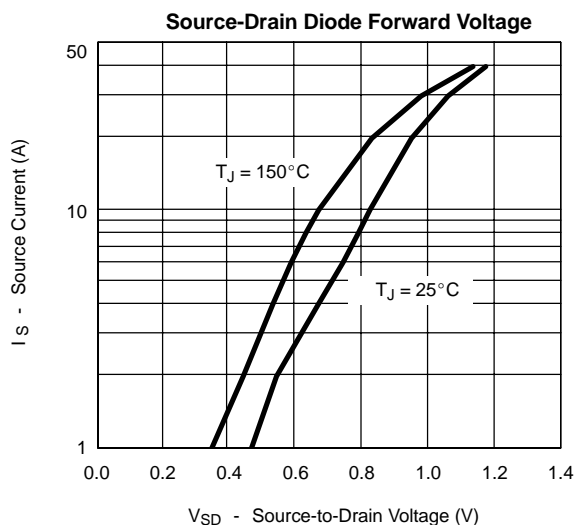
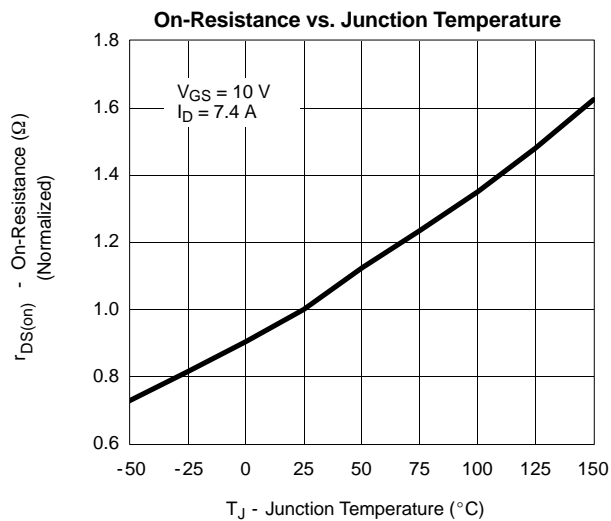
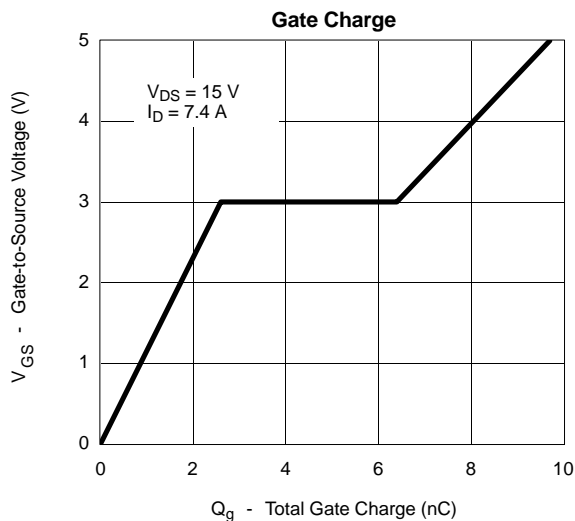


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) CHANNEL-2**



**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**

**CHANNEL-2**





**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) CHANNEL-2**

