



## 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	0.023 @ V <sub>GS</sub> = 10 V	7.0
		0.032 @ V <sub>GS</sub> = 4.5 V	5.6
Channel-2		0.020 @ V <sub>GS</sub> = 10 V	7.4
		0.027 @ V <sub>GS</sub> = 4.5 V	6.4

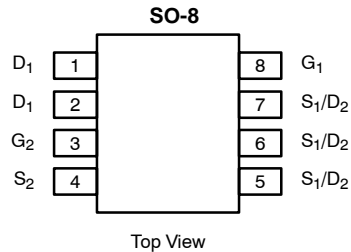
SCHOTTKY PRODUCT SUMMARY		
V <sub>DS</sub> (V)	V <sub>SD</sub> (V) Diode Forward Voltage	I <sub>F</sub> (A)
30	0.40 V @ 1.0 A	2.0

### FEATURES

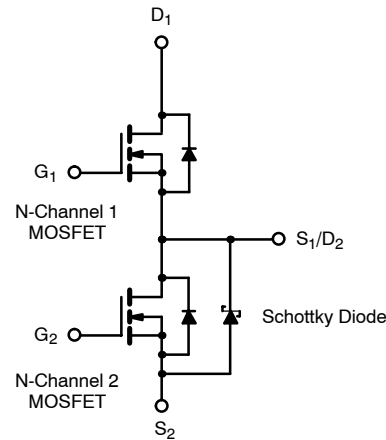
- LITTLE FOOT® Plus Integrated Schottky
- 100% R<sub>g</sub> Tested

### APPLICATIONS

- Logic DC/DC  
– Notebook PC



Ordering Information: Si4914DY—E3  
Si4914DY-T1—E3 (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 ( $T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)								
Parameter	Symbol	Test Condition		Min	Typ <sup>a</sup>	Max	Unit	
<b>Static</b>								
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$	Ch-1	1.0		2.5	V	
			Ch-2	1.0		2.5		
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 \text{ V}, V_{GS} = 20 \text{ V}$	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	$\mu\text{A}$	
			Ch-2			500		
		$V_{DS} = 30 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 85^\circ\text{C}$	Ch-1			0.015	mA	
			Ch-2			20		
On-State Drain Current <sup>b</sup>	$I_{D(on)}$	$V_{DS} = 5 \text{ V}, V_{GS} = 10 \text{ V}$	Ch-1	20			A	
			Ch-2	20				
Drain-Source On-State Resistance <sup>b</sup>	$r_{DS(on)}$	$V_{GS} = 10 \text{ V}, I_D = 7.0 \text{ A}$	Ch-1		0.019	0.023	$\Omega$	
			Ch-2		0.016	0.020		
			$V_{GS} = 4.5 \text{ V}, I_D = 5.6 \text{ A}$	Ch-1		0.026		0.032
				Ch-2		0.022		0.027
Forward Transconductance <sup>b</sup>	$g_{fs}$	$V_{DS} = 15 \text{ V}, I_D = 7.0 \text{ A}$	Ch-1		19		S	
			Ch-2		22			
Diode Forward Voltage <sup>b</sup>	$V_{SD}$	$I_S = 1.7 \text{ A}, V_{GS} = 0 \text{ V}$	Ch-1		0.75	1.1	V	
		$I_S = 1 \text{ A}, V_{GS} = 0 \text{ V}$	Ch-2		0.36	0.40		
<b>Dynamic<sup>a</sup></b>								
Total Gate Charge	$Q_g$	Channel-1 $V_{DS} = 15 \text{ V}, V_{GS} = 4.5 \text{ V}, I_D = 7.0 \text{ A}$	Ch-1		5.6	8.5	nC	
			Ch-2		7.3	11		
Gate-Source Charge	$Q_{gs}$	Channel-2 $V_{DS} = 15 \text{ V}, V_{GS} = 4.5 \text{ V}, I_D = 7.4 \text{ A}$	Ch-1		2.3		nC	
			Ch-2		2.8			
Gate-Drain Charge	$Q_{gd}$		Ch-1		1.7		nC	
			Ch-2		2.2			
Gate Resistance	$R_g$		Ch-1	0.5	2.3	2.6	$\Omega$	
			Ch-2	0.5	1.6	3.1		
Turn-On Delay Time	$t_{d(on)}$	Channel-1 $V_{DD} = 15 \text{ V}, R_L = 15 \Omega$ $I_D \cong 1 \text{ A}, V_{GEN} = 10 \text{ V}, R_g = 6 \Omega$	Ch-1		6	10	ns	
Rise Time	$t_r$		Ch-2		7	11		
		Turn-Off Delay Time	$t_{d(off)}$	Channel-2 $V_{DD} = 15 \text{ V}, R_L = 15 \Omega$ $I_D \cong 1 \text{ A}, V_{GEN} = 10 \text{ V}, R_g = 6 \Omega$	Ch-1		27	40
Ch-2					35	53		
Fall Time	$t_f$		Ch-1		9	15	ns	
			Ch-2		10	15		
Source-Drain Reverse Recovery Time	$t_{rr}$	$I_F = 1.3 \text{ A}, di/dt = 100 \text{ A}/\mu\text{s}$	Ch-1		30	50	ns	
		$I_F = 2.2 \text{ A}, di/dt = 100 \mu\text{A}/\mu\text{s}$	Ch-2		30	50		

## Notes

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

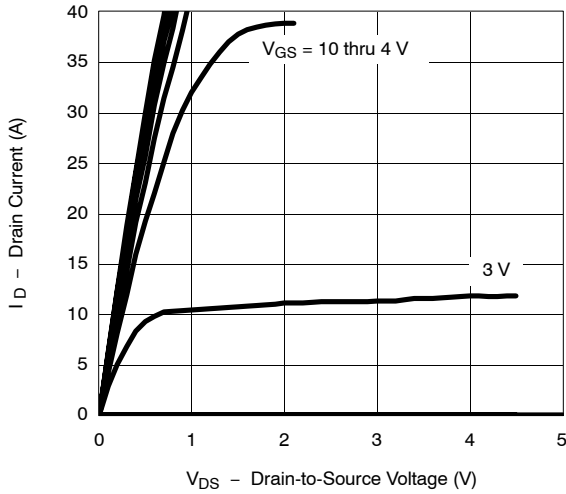
SCHOTTKY SPECIFICATIONS ( $T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)							
Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
Forward Voltage Drop	$V_F$	$I_F = 1.0 \text{ A}$			0.36	0.40	V
		$I_F = 1.0 \text{ A}, T_J = 150^\circ\text{C}$			0.27	0.31	
Maximum Reverse Leakage Current	$I_{rm}$	$V_r = 30 \text{ V}$			0.008	0.50	mA
		$V_r = 30 \text{ V}, T_J = 100^\circ\text{C}$			3.5	10	
		$V_r = -30 \text{ V}, T_J = 125^\circ\text{C}$			10	100	
Junction Capacitance	$C_T$	$V_r = 10 \text{ V}$			58		pF



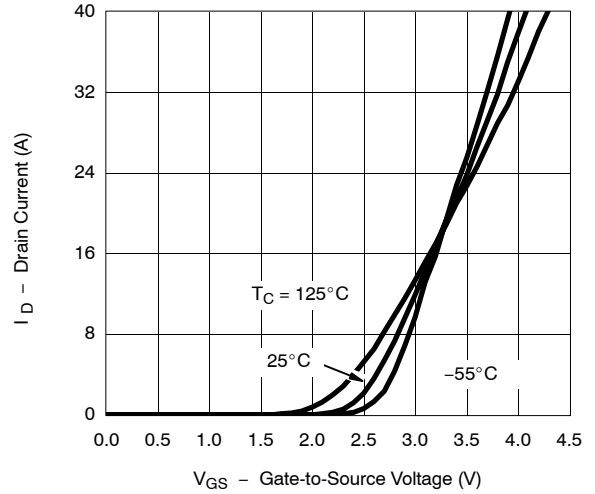
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

CHANNEL-1

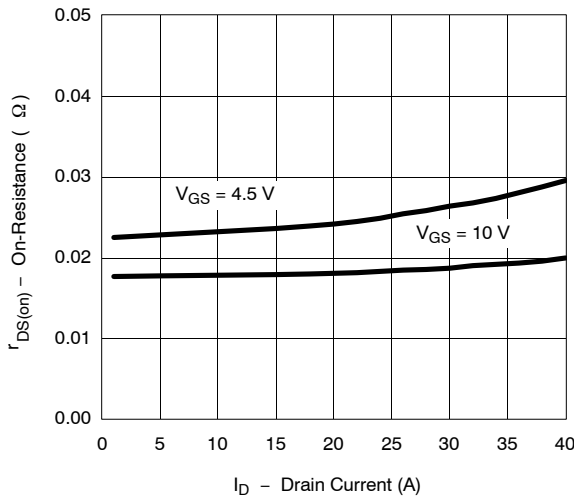
Output Characteristics



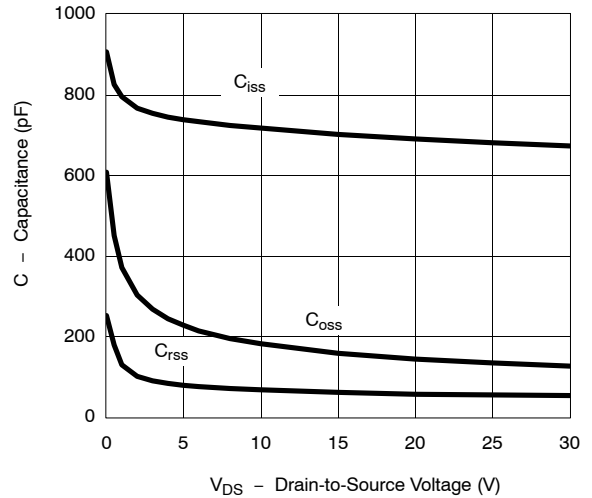
Transfer Characteristics



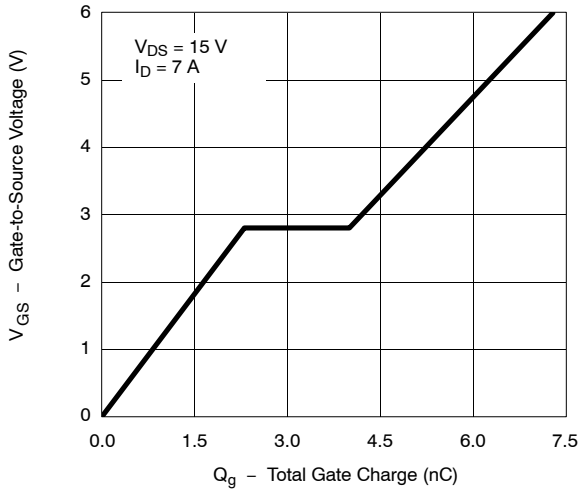
On-Resistance vs. Drain Current



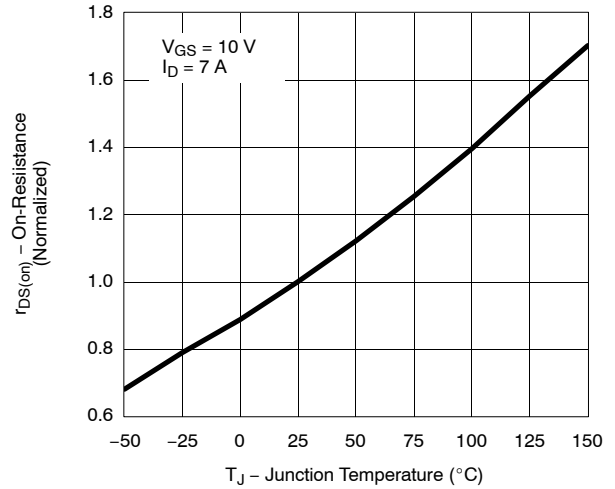
Capacitance



Gate Charge



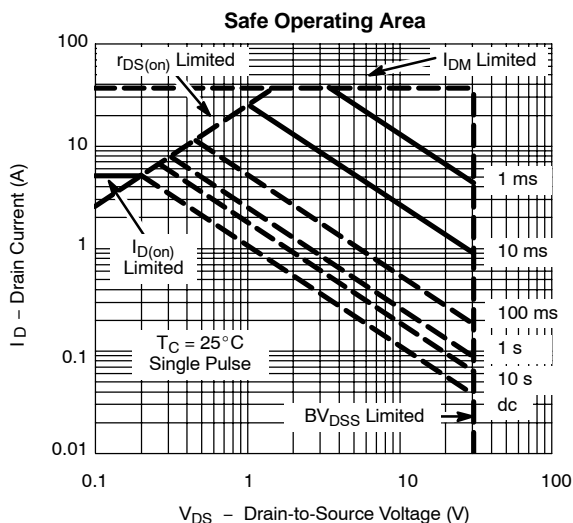
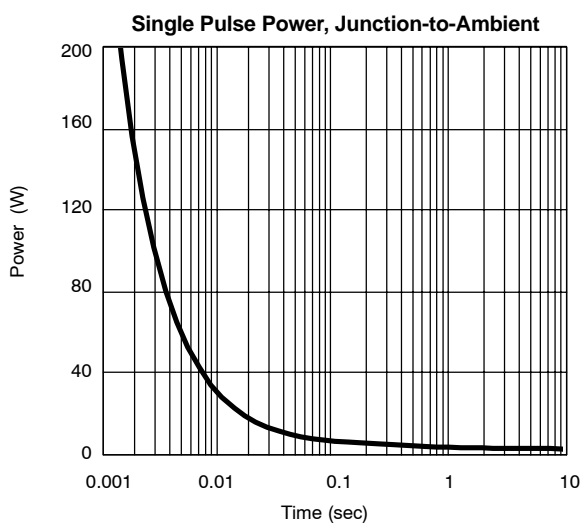
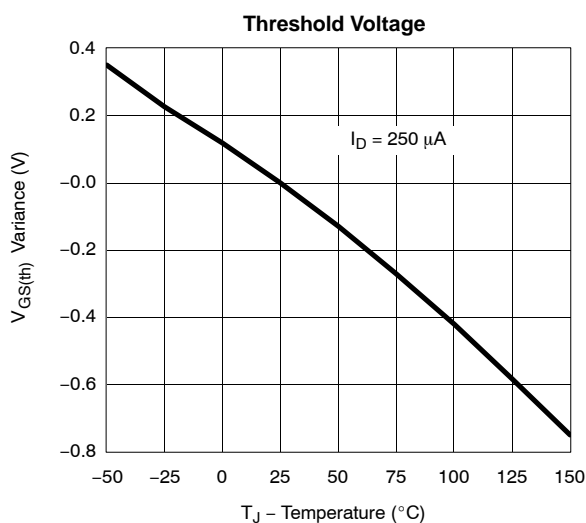
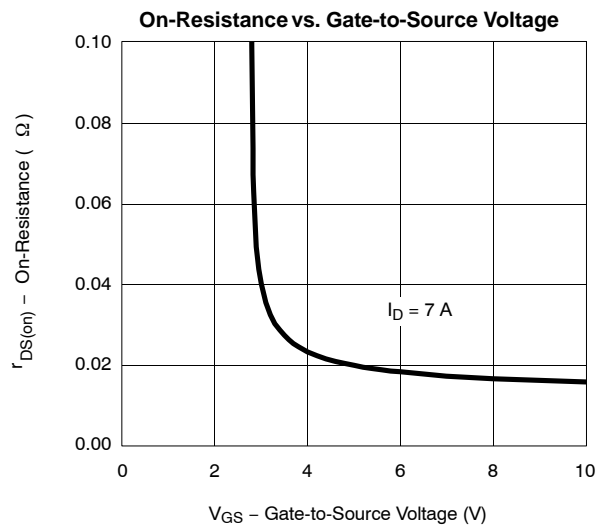
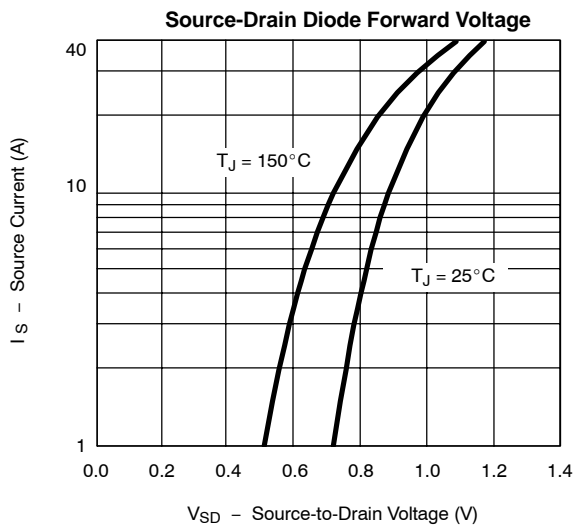
On-Resistance vs. Junction Temperature





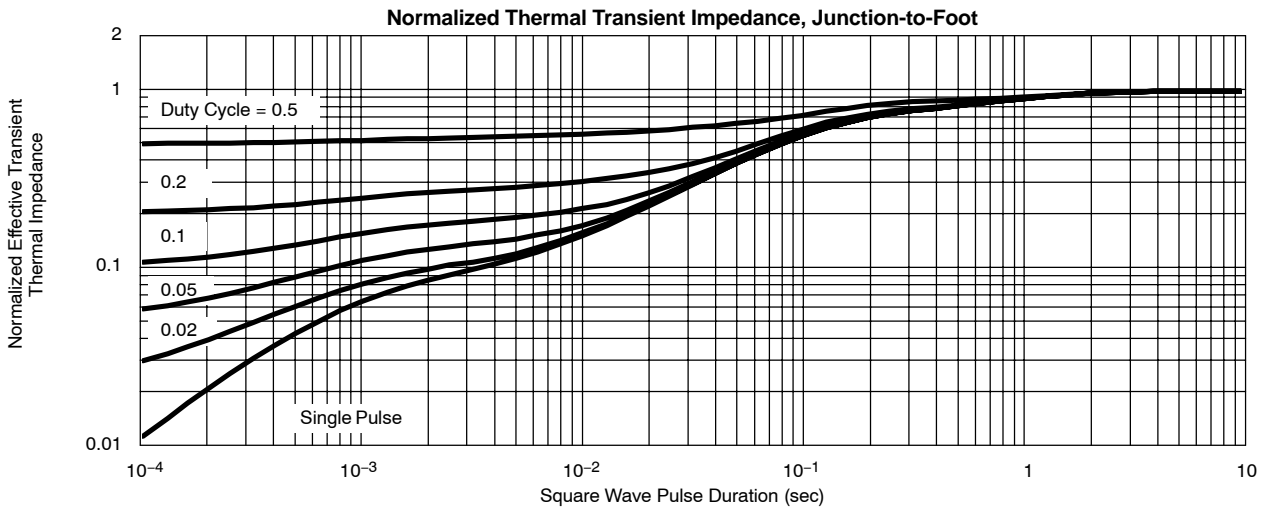
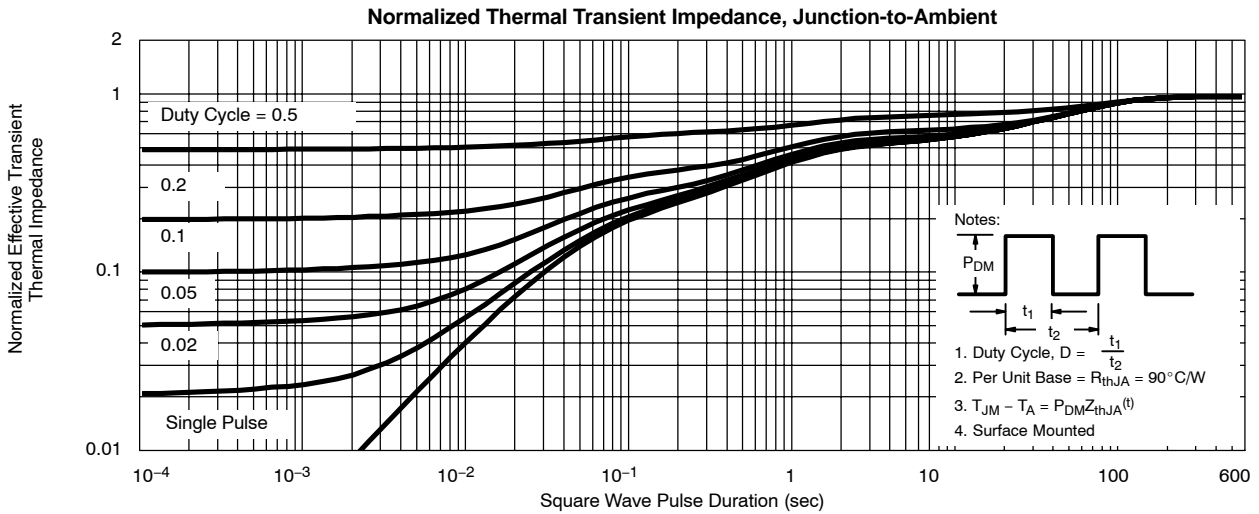
**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**

**CHANNEL-1**





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

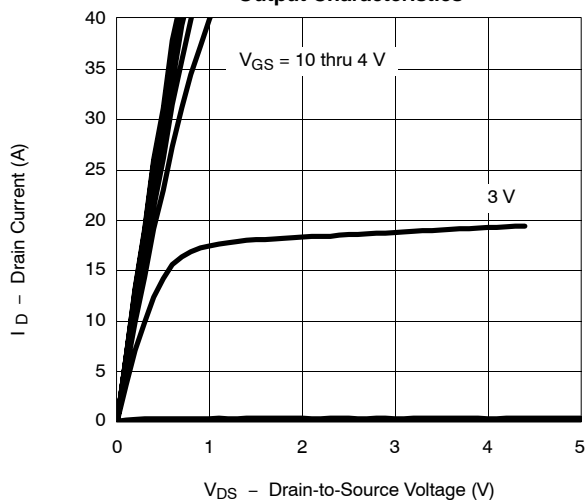




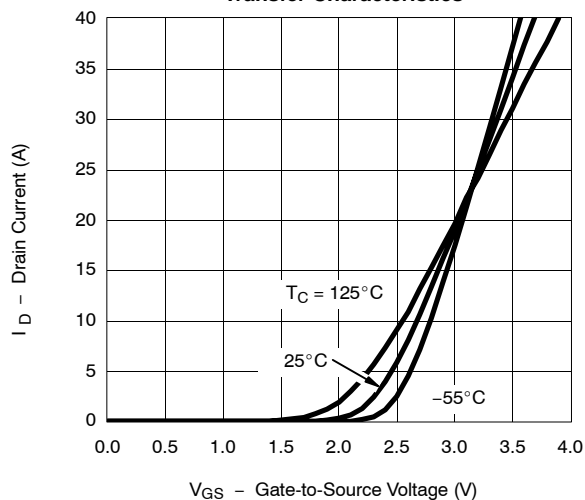
**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**

**CHANNEL-2**

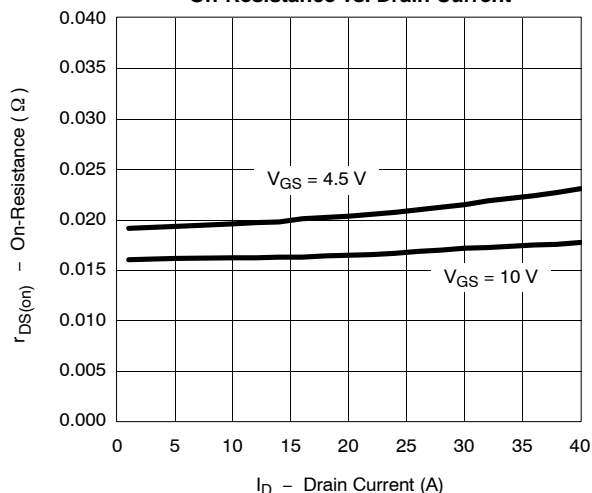
**Output Characteristics**



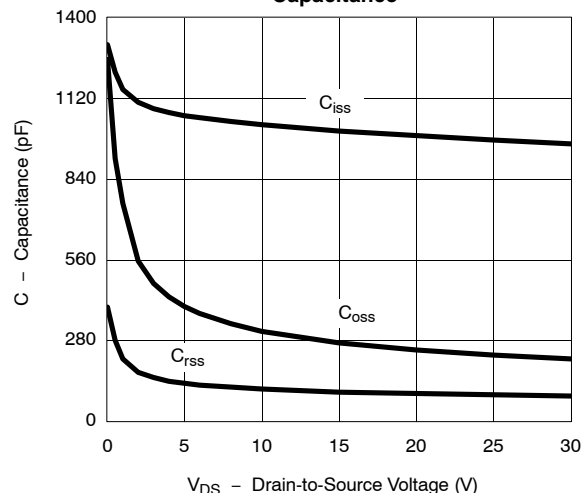
**Transfer Characteristics**



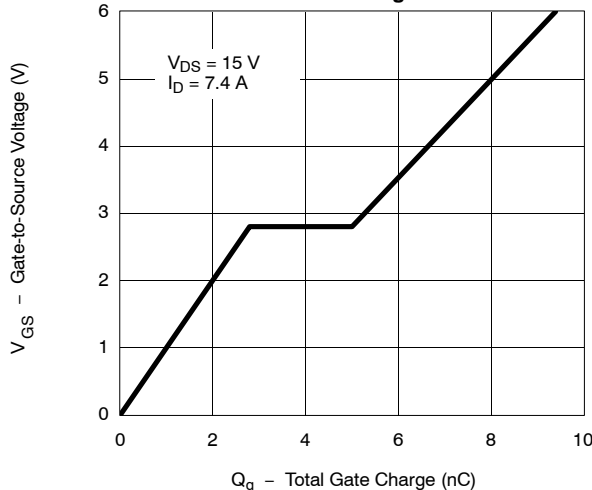
**On-Resistance vs. Drain Current**



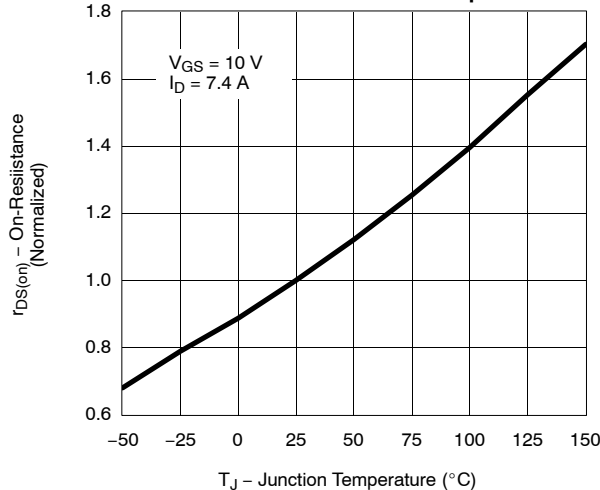
**Capacitance**



**Gate Charge**



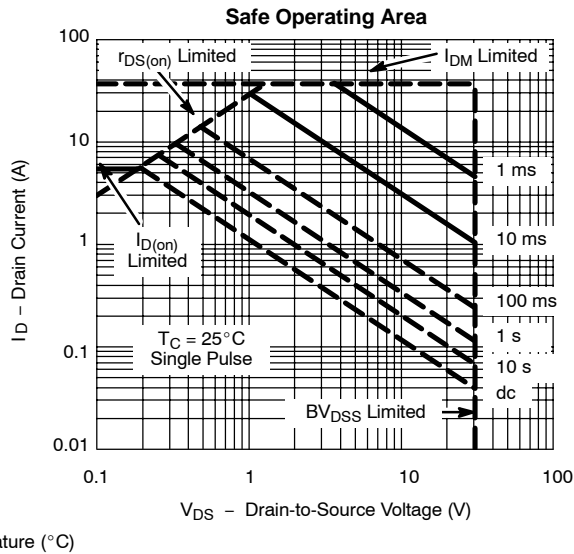
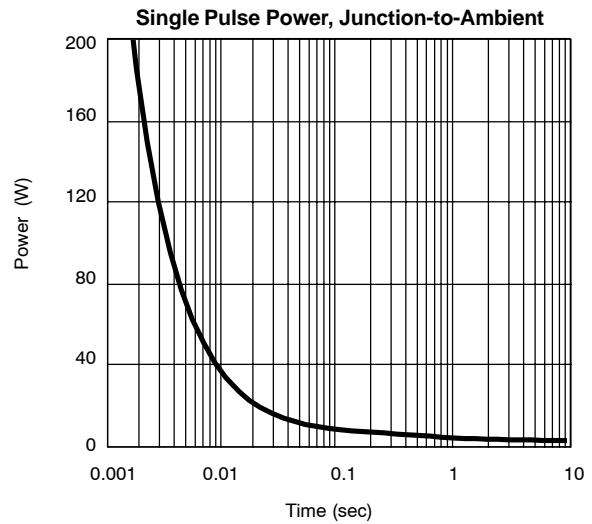
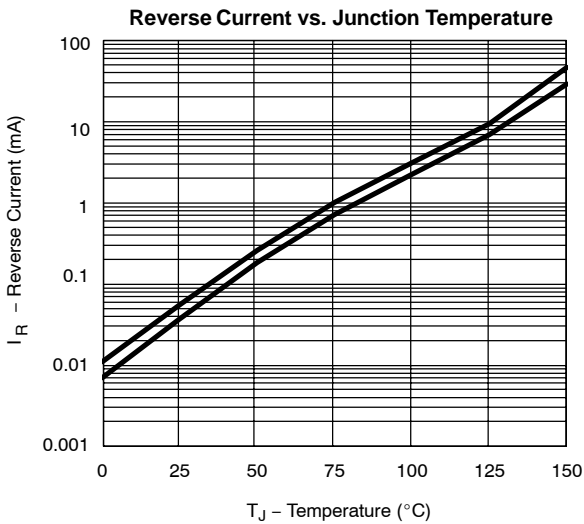
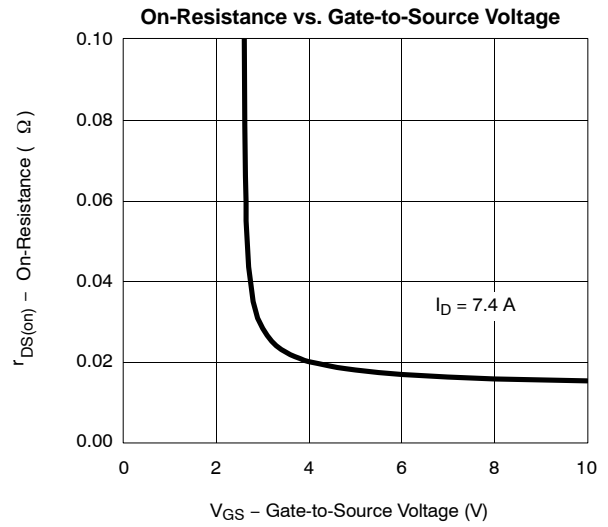
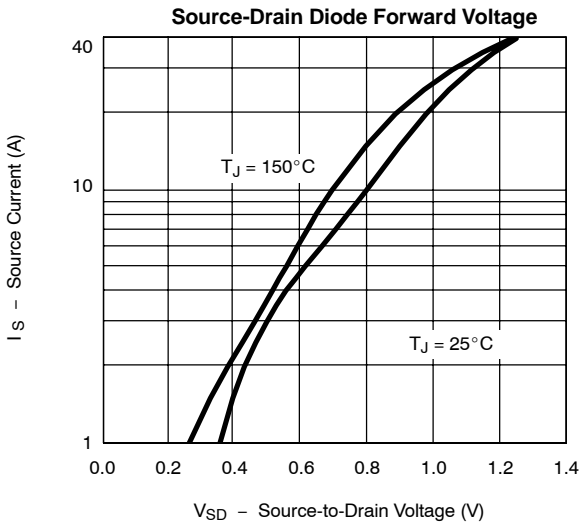
**On-Resistance vs. Junction Temperature**





TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

CHANNEL-2



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

**CHANNEL-2**

