



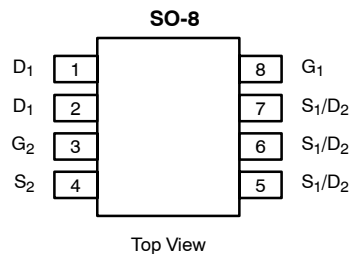
Dual N-Channel 30-V (D-S) MOSFET with Schottky Diode

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



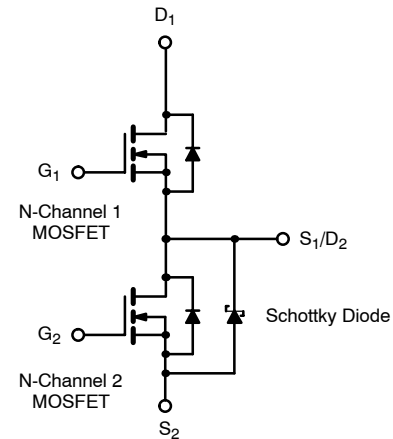
Ordering Information: Si4814DY
Si4814DY-T1 (with Tape and Reel)

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 Ch-2	0.8 0.8			V	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = 20 V	Ch-1 Ch-2			100 100	nA	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30 V, V _{GS} = 0 V V _{DS} = 30 V, V _{GS} = 0 V, T _J = 85 °C	Ch-1 Ch-2 Ch-1 Ch-2			1 100 15 2000	μA	
On-State Drain Current ^b	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 10 V	Ch-1 Ch-2	20 20			A	
Drain-Source On-State Resistance ^b	r _{DS(on)}	V _{GS} = 10 V, I _D = 7.0 A V _{GS} = 10 V, I _D = 7.4 A V _{GS} = 4.5 V, I _D = 5.6 A V _{GS} = 4.5 V, I _D = 6.4 A	Ch-1 Ch-2 Ch-1 Ch-2		0.0175 0.0165 0.027 0.022	0.021 0.020 0.0325 0.0265	Ω	
Forward Transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 7.0 A V _{DS} = 15 V, I _D = 7.4 A	Ch-1 Ch-2		17 20		S	
Diode Forward Voltage ^b	V _{SD}	I _S = 1.7 A, V _{GS} = 0 V I _S = 1 A, V _{GS} = 0 V	Ch-1 Ch-2		0.7 0.47	1.1 0.5	V	
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 Ch-2		6.5 9.7	10 15	nC	
Gate-Source Charge	Q _{gs}		Ch-1 Ch-2		1.5 2.6			
Gate-Drain Charge	Q _{gd}		Ch-1 Ch-2		2.7 3.8			
Gate Resistance	R _g		Ch-1 Ch-2	0.5 0.5	1.6 1.8	2.6 3.1		Ω
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 Channel-2 V _{DD} = 15 V, R _L = 15 Ω I _D ≅ 1 A, V _{GEN} = 10 V, R _G = 6 Ω	Ch-1 Ch-2		12 13	20 20	ns
Rise Time	t _r			Ch-1 Ch-2		13 13	20 20	
Turn-Off Delay Time	t _{d(off)}	Ch-1 Ch-2			22 29	35 45		
Fall Time	t _f	Ch-1 Ch-2			8 12	15 20		
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 1.3 A, di/dt = 100 A/μs I _F = 2.2 A, di/dt = 100 μA/μs		Ch-1 Ch-2		50 46	80 80	

Notes

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

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

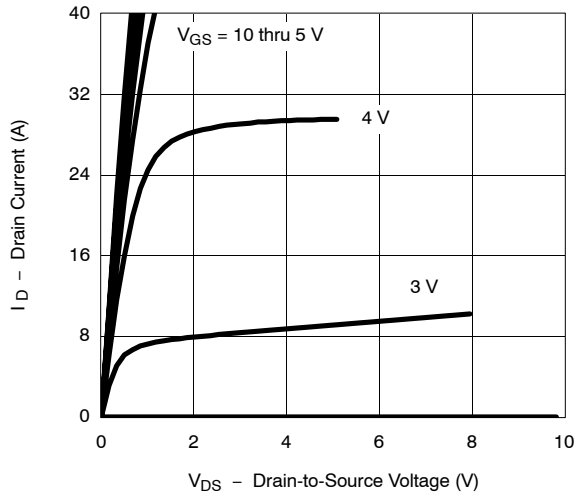
SCHOTTKY SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Forward Voltage Drop	V_F	$I_F = 1.0\ \text{A}$		0.47	0.50	V
		$I_F = 1.0\ \text{A}, T_J = 125^\circ\text{C}$		0.36	0.42	
Maximum Reverse Leakage Current	I_{rm}	$V_r = 30\ \text{V}$		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



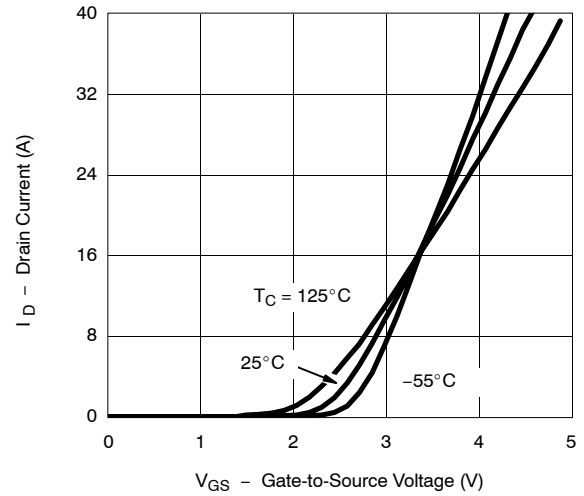
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

CHANNEL-1

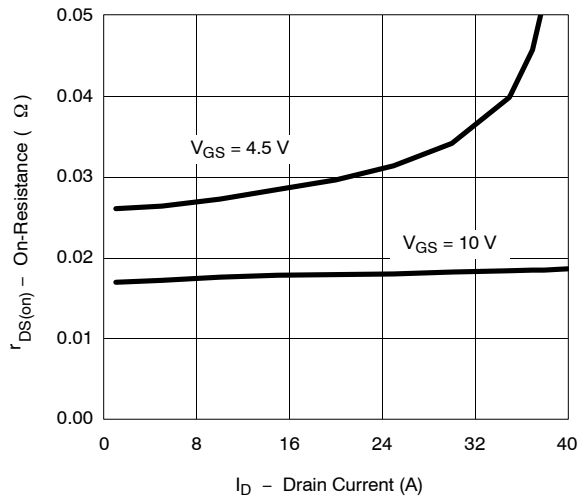
Output Characteristics



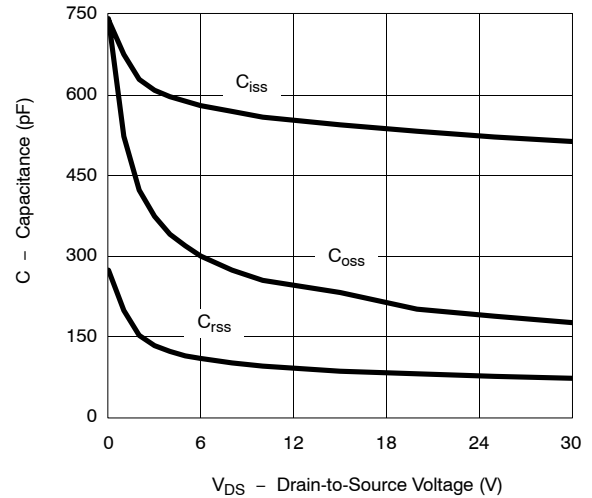
Transfer Characteristics



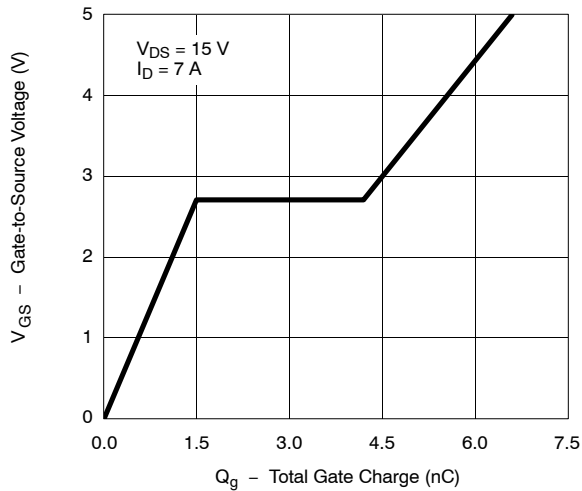
On-Resistance vs. Drain Current



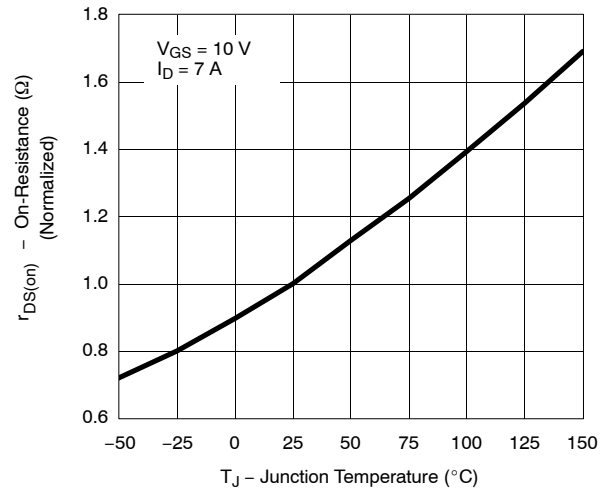
Capacitance



Gate Charge

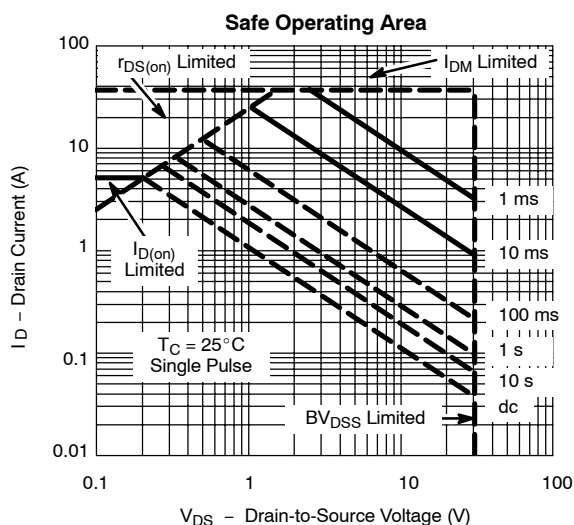
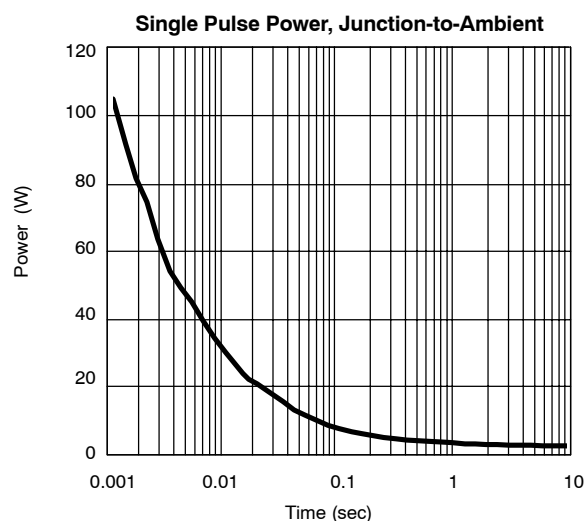
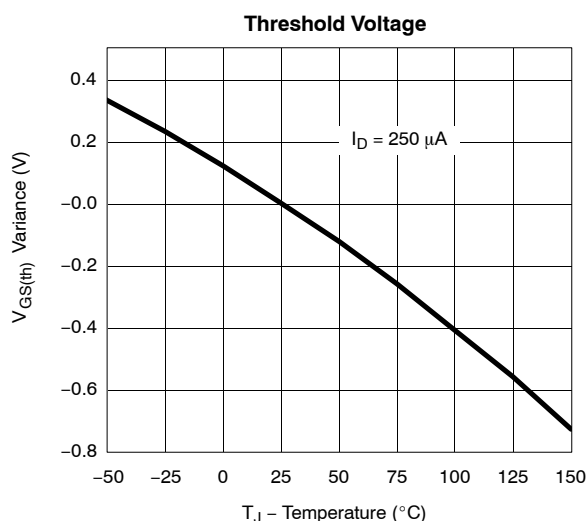
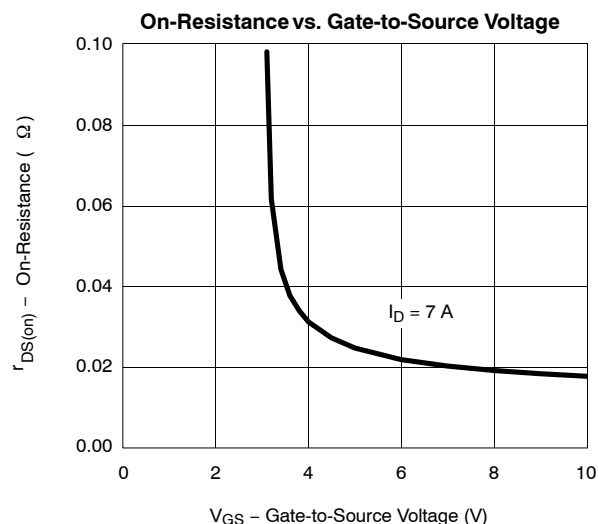
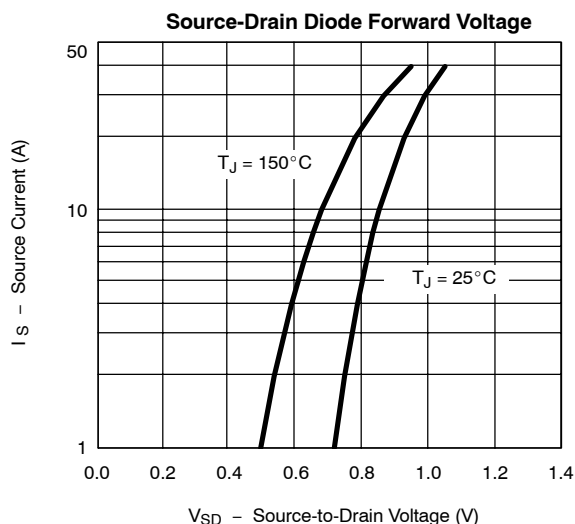


On-Resistance vs. Junction Temperature



TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

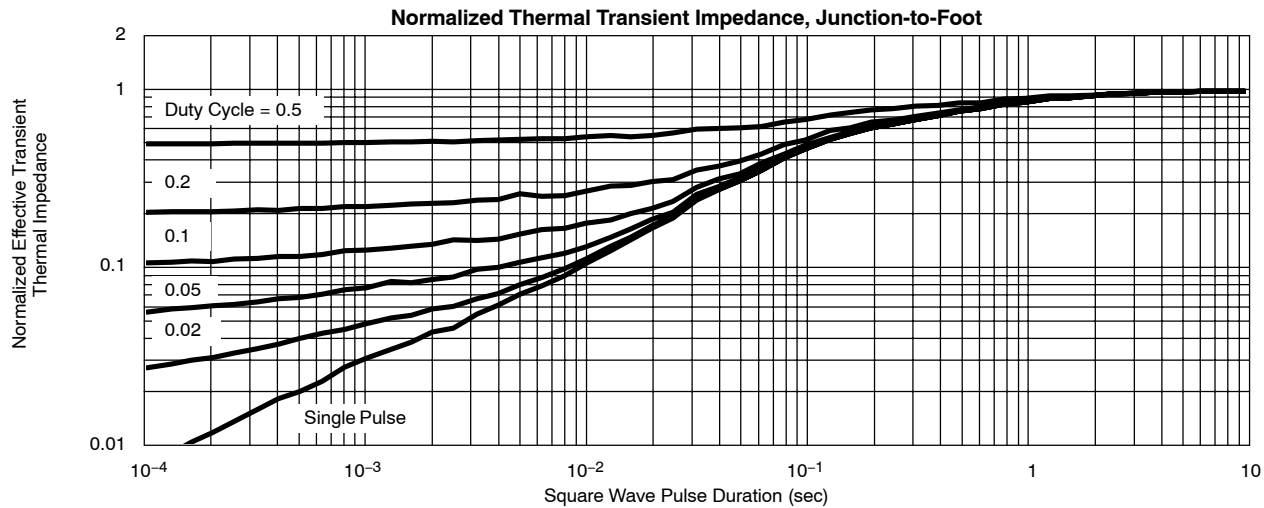
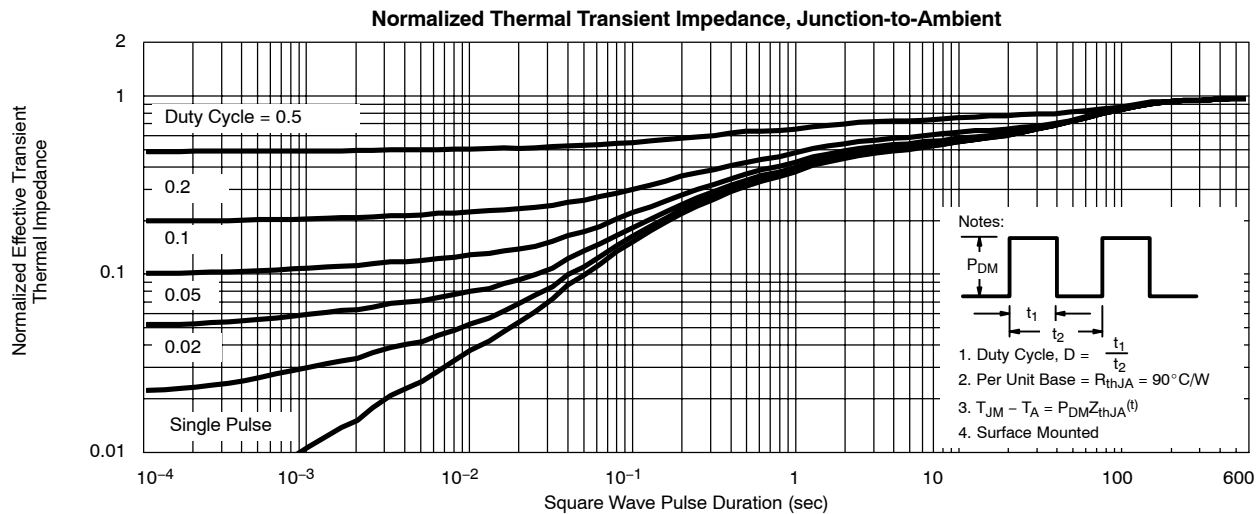
CHANNEL-1





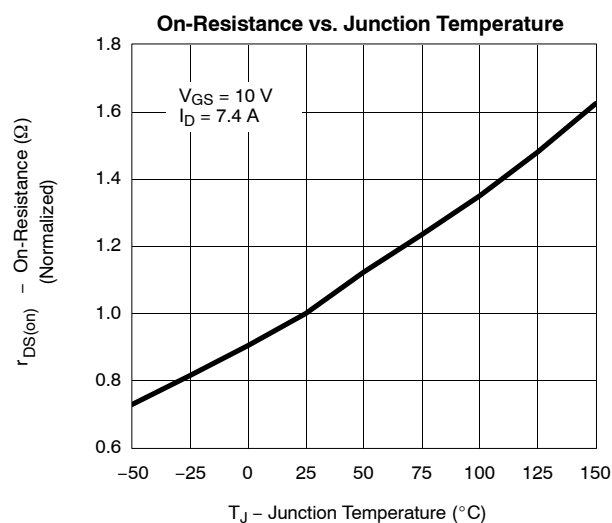
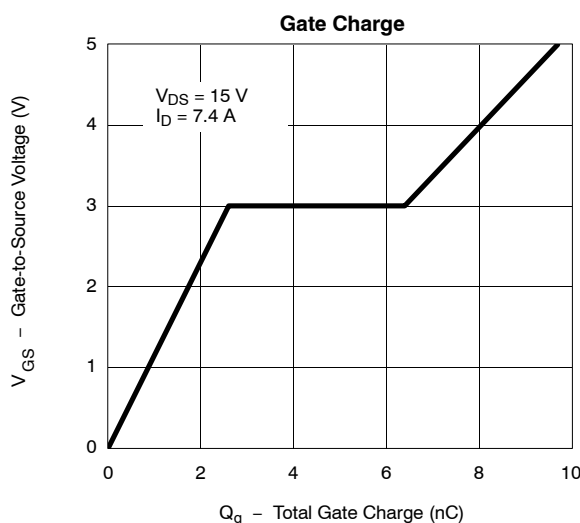
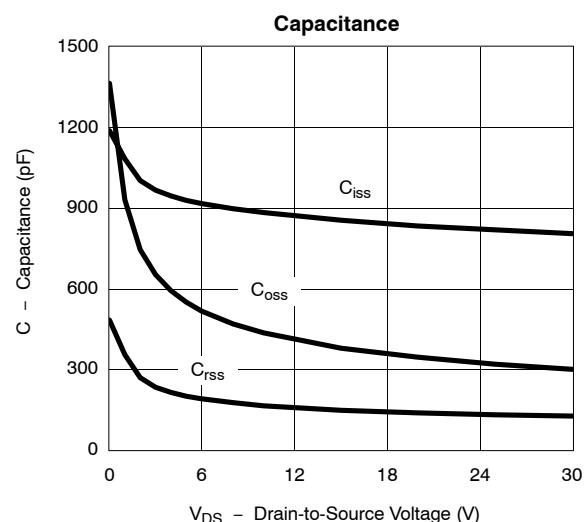
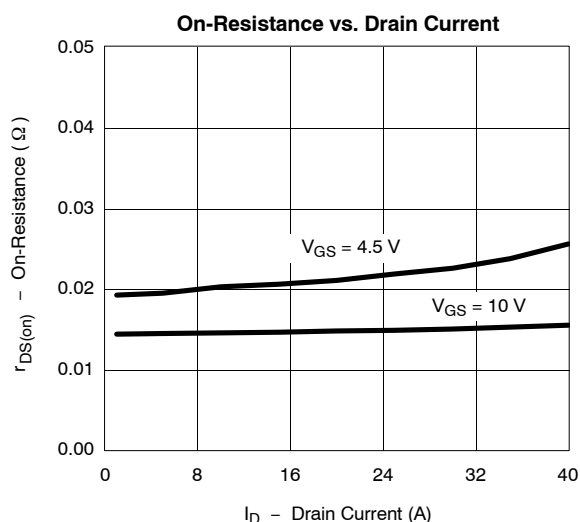
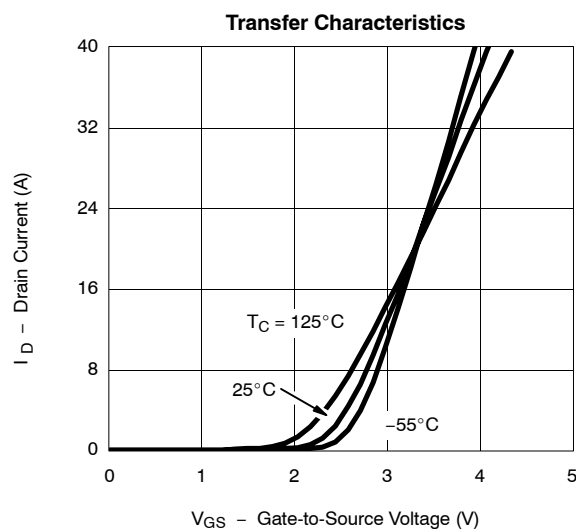
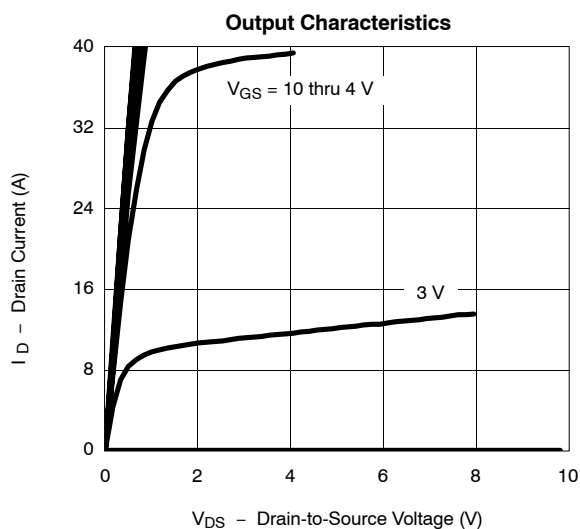
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

CHANNEL-1



TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

CHANNEL-2

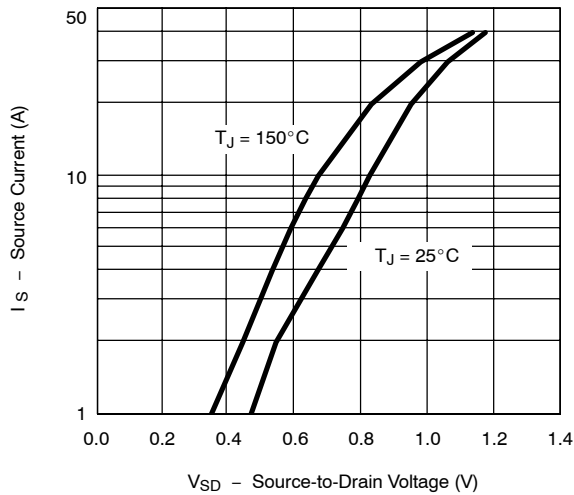




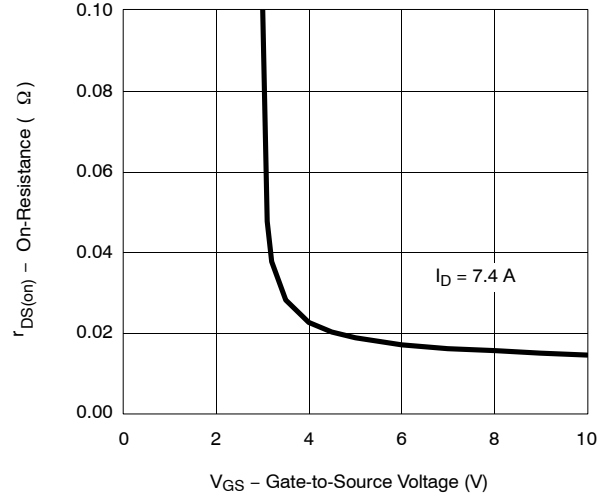
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

CHANNEL-2

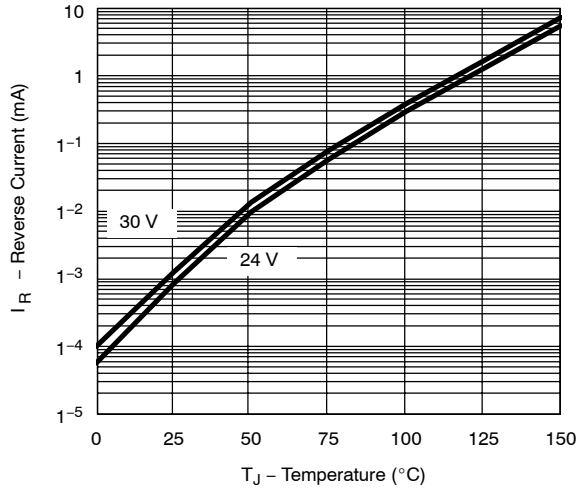
Source-Drain Diode Forward Voltage



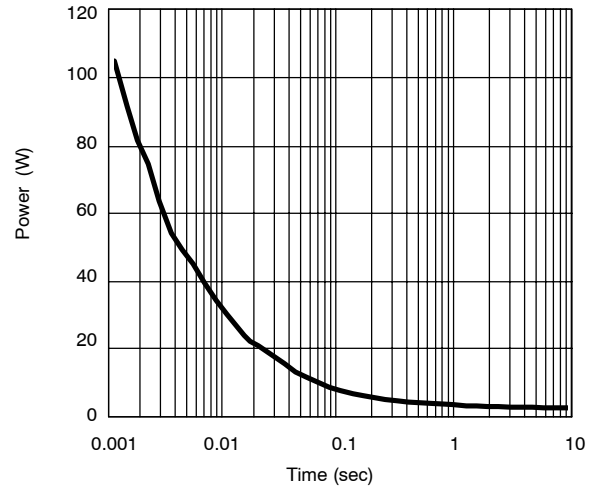
On-Resistance vs. Gate-to-Source Voltage



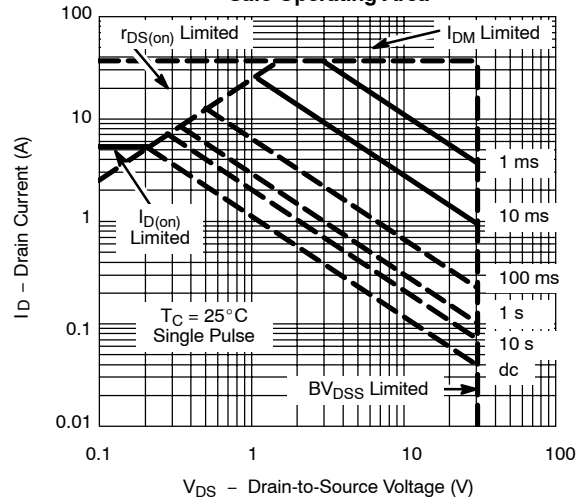
Reverse Current vs. Junction Temperature



Single Pulse Power, Junction-to-Ambient

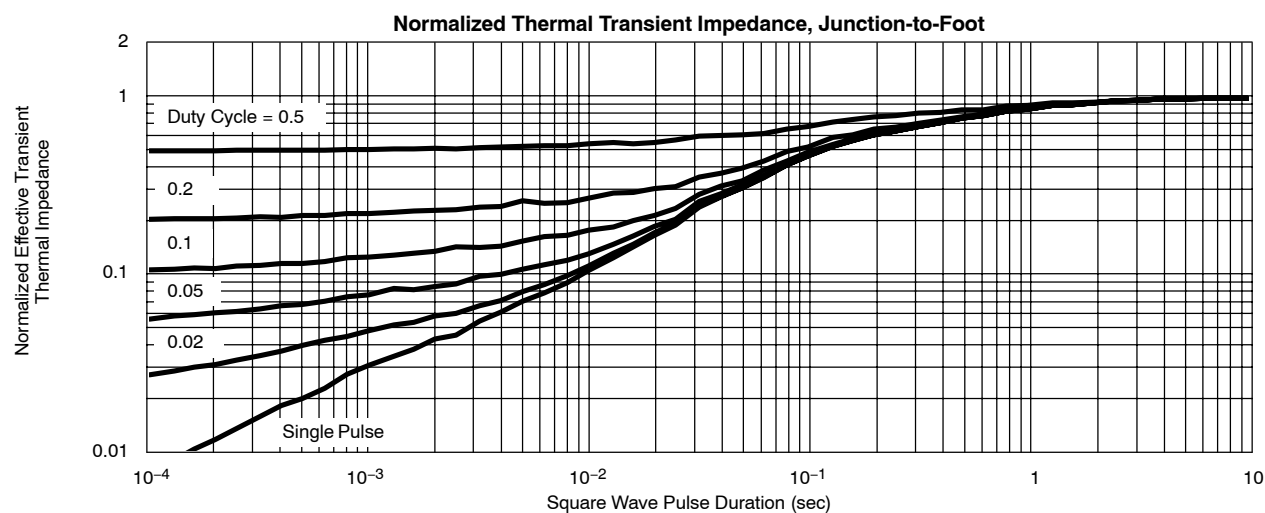
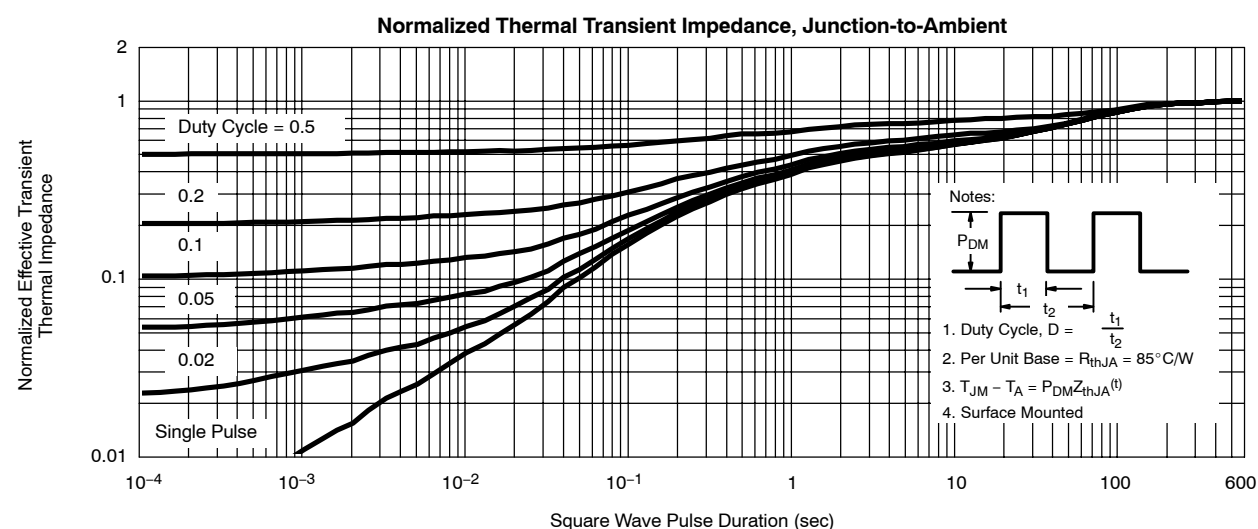


Safe Operating Area



TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

CHANNEL-2





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