



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

PRODUCT SUMMARY

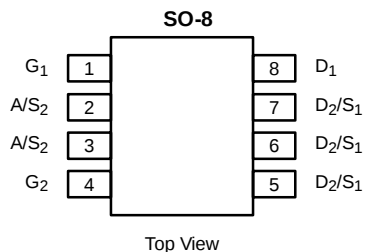
	V _{DS} (V)	r _{DS(on)} (Ω)	I _D (A)
Channel-1	30	0.022 @ V _{GS} = 10 V	6.3
		0.030 @ V _{GS} = 4.5 V	5.4
Channel-2		0.013 @ V _{GS} = 10 V	10
		0.0185 @ V _{GS} = 4.5 V	8.6

SCHOTTKY PRODUCT SUMMARY

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

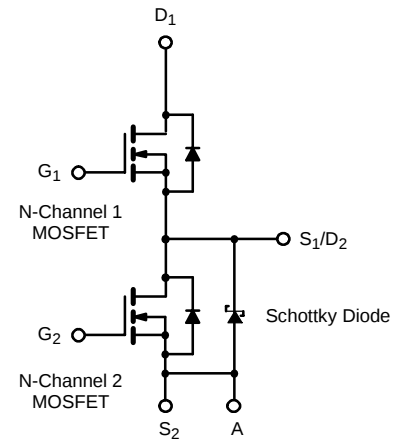
FEATURES

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



Top View

Ordering Information: Si4816DY
Si4816DY-T1 (with Tape and Reel)
Si4816DY—E3 (Lead (Pb)-Free)
Si4816DY-T1—E3 (Lead (Pb)-Free with Tape and Reel)



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				
Continuous Drain Current (T _J = 150°C) ^a	T _A = 25°C	I _D	6.3	5.3	10	7.7	A
	T _A = 70°C		5.4	4.2	8.2	6.2	
Pulsed Drain Current		I _{DM}	30		40		
Continuous Source Current (Diode Conduction) ^a		I _S	1.3	0.9	2.2	1.15	
Avalanche Current ^b		L = 0.1 mH	12		25		
Single Pulse Avalanche Energy ^b			E _{AS}	7.2		31.25	
Maximum Power Dissipation ^a	T _A = 25°C	P _D	1.4	1.0	2.4	1.25	W
	T _A = 70°C		0.9	0.64	1.5	0.8	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	-55 to 150				°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Channel-1		Channel-2		Schottky		Unit
		Typ	Max	Typ	Max	Typ	Max	
Maximum Junction-to-Ambient ^a	R_{thJA}	72	90	43	53	48	60	$^\circ\text{C/W}$
		100	125	82	100	80	100	
Maximum Junction-to-Foot (Drain)	R_{thJC}	51	63	25	30	28	35	

Notes

- a. Surface Mounted on 1" x 1" FR4 Board.
b. Starting date code W46BAA.

**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		2	V
			Ch-2	1.0		3	
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 = 6.3 A	Ch-1		0.018	0.022	Ω
		V _{GS} = 10 V, I _D = 10 A	Ch-2		0.0105	0.013	
		V _{GS} = 4.5 V, I _D = 5.4 A	Ch-1		0.024	0.030	
		V _{GS} = 4.5 V, I _D = 8.6 A	Ch-2		0.015	0.0185	
Forward Transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 6.3 A	Ch-1		17		S
		V _{DS} = 15 V, I _D = 10 A	Ch-2		28		
Diode Forward Voltage ^b	V _{SD}	I _S = 1.3 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 = 6.3 A Channel-2 V _{DS} = 15 V, V _{GS} = 5 V, I _D = -10 A	Ch-1		8.0	12	nC
Gate-Source Charge	Q _{gs}		Ch-2		15	23	
			Ch-1		1.75		
			Ch-2		5.3		
			Gate-Drain Charge	Q _{gd}	Ch-1		
Ch-2					4.6		
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	1.5		3.1	Ω
			Ch-2	0.5		2.6	
Turn-On Delay Time	t _{d(on)}		Ch-1		10	20	ns
			Ch-2		15	30	
Rise Time	t _r		Ch-1		5	10	
			Ch-2		5	10	
Turn-Off Delay Time	t _{d(off)}		Ch-1		26	50	
			Ch-2		44	80	
Fall Time	t _f		Ch-1		8	16	
			Ch-2		12	24	
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 1.3 A, di/dt = 100 A/μs	Ch-1		30	60	
		I _F = 2.2 A, di/dt = 100 μA/μs	Ch-2		32	70	

Notes

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

SCHOTTKY SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

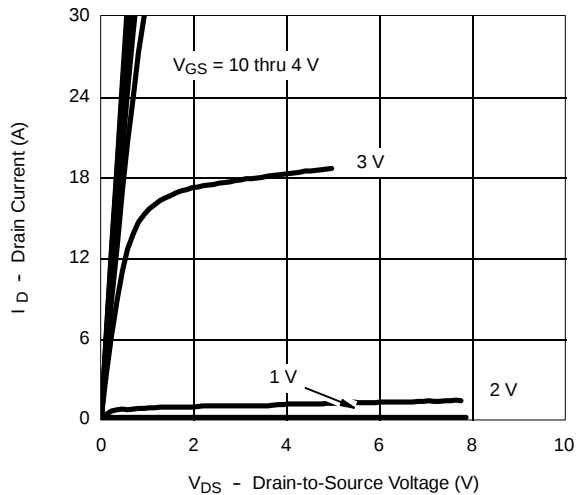
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Forward Voltage Drop	V _F	I _F = 1.0 A		0.47	0.50	V
		I _F = 1.0 A, T _J = 125°C		0.36	0.42	
Maximum Reverse Leakage Current	I _{rm}	V _r = 30 V		0.004	0.100	mA
		V _r = 30 V, T _J = 100°C		0.7	10	
		V _r = -30 V, T _J = 125°C		3.0	20	
Junction Capacitance	C _T	V _r = 10 V		50		pF



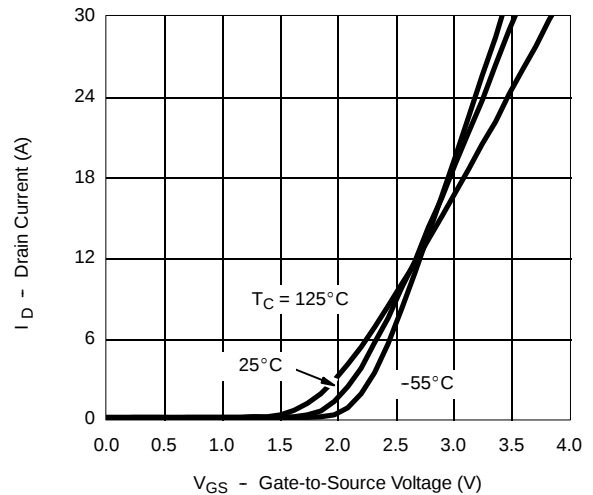
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

CHANNEL-1

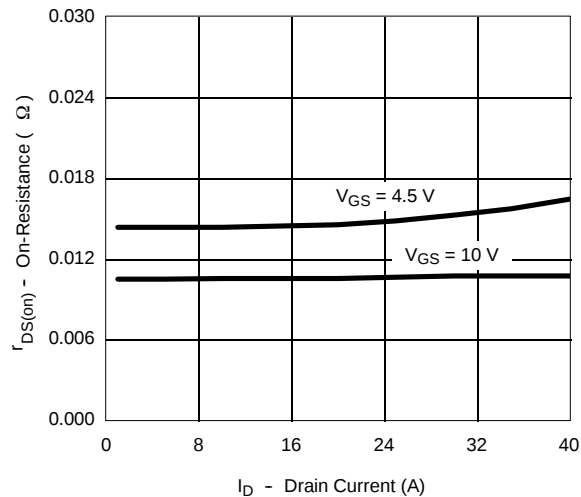
Output Characteristics



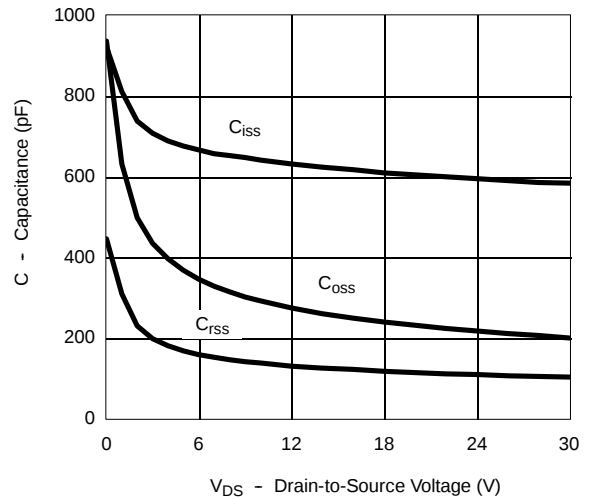
Transfer Characteristics



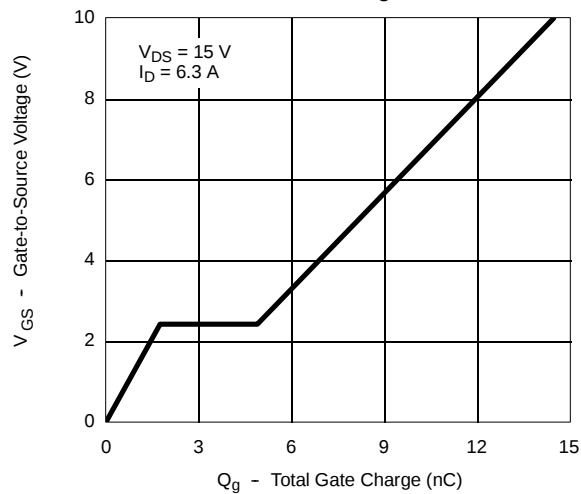
On-Resistance vs. Drain Current



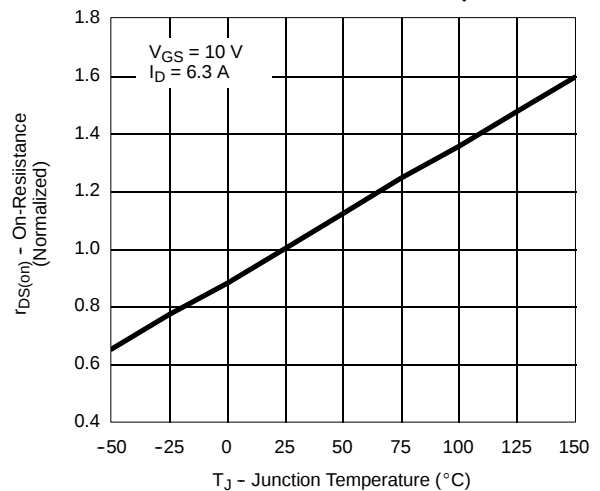
Capacitance



Gate Charge

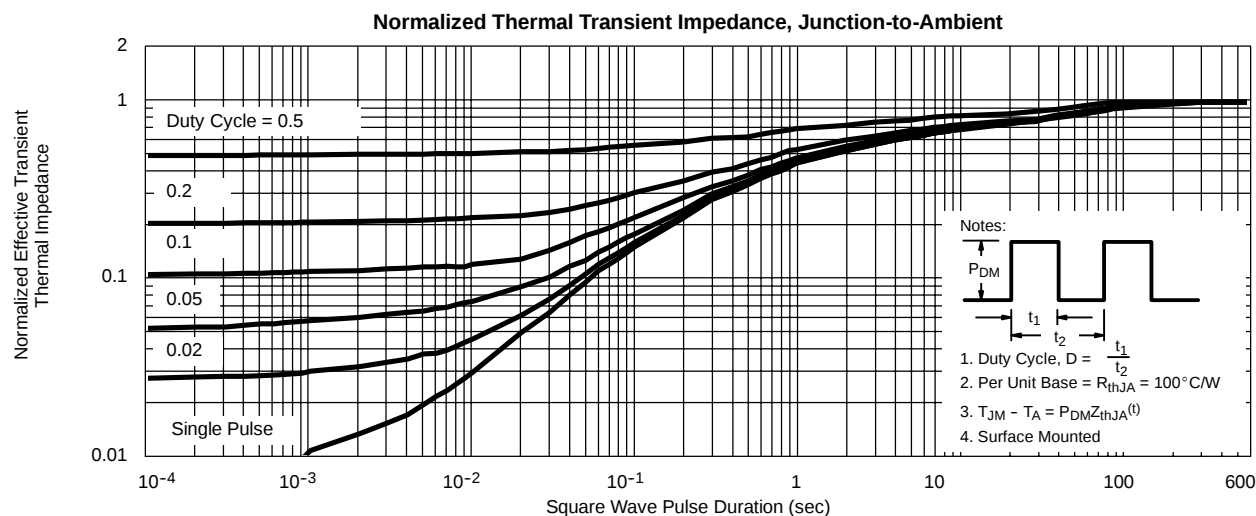
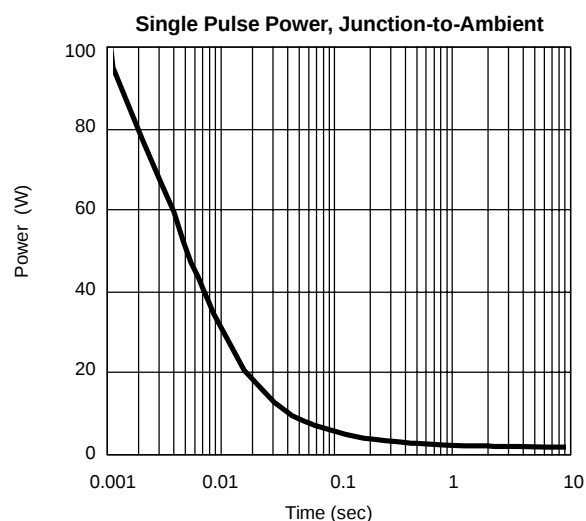
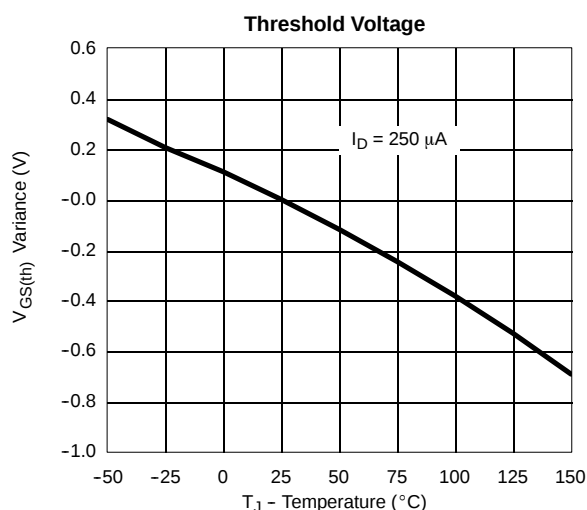
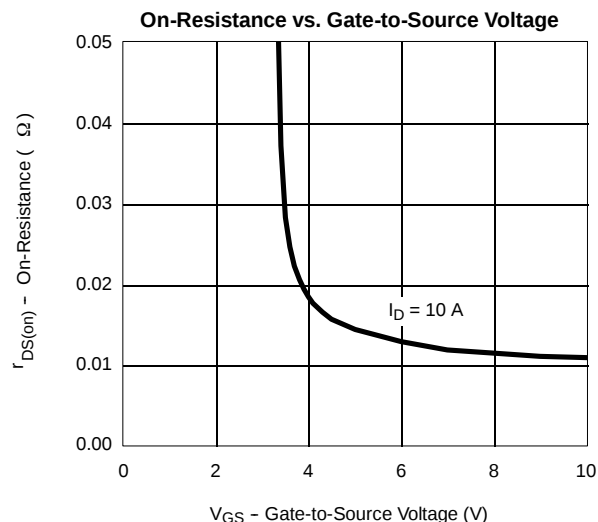
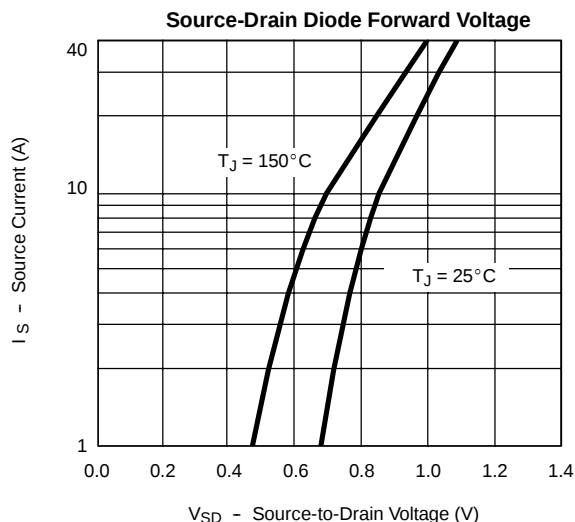


On-Resistance vs. Junction Temperature



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

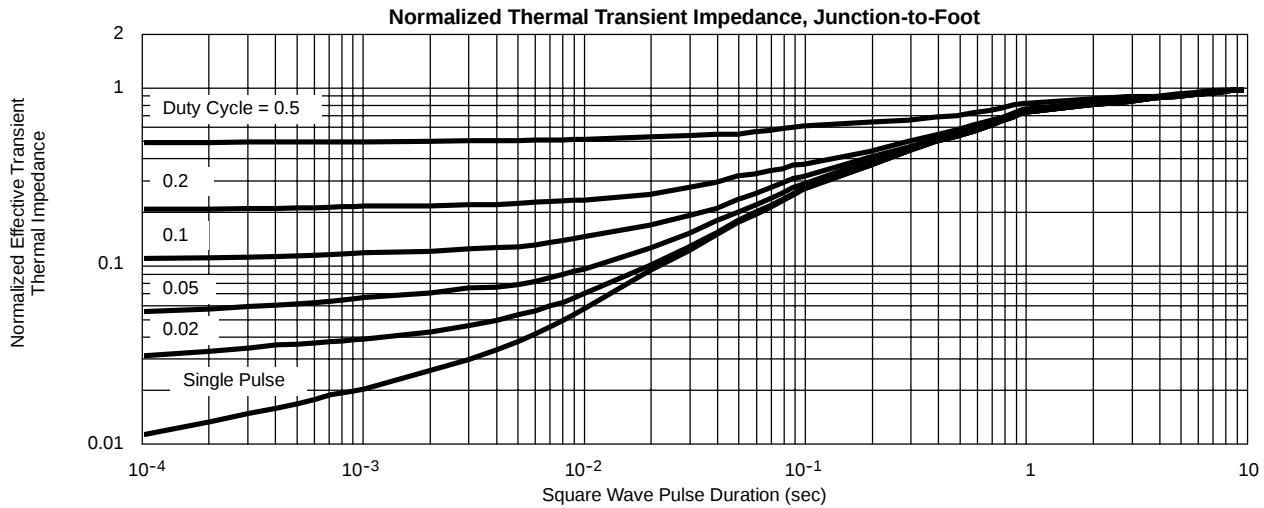
CHANNEL-1





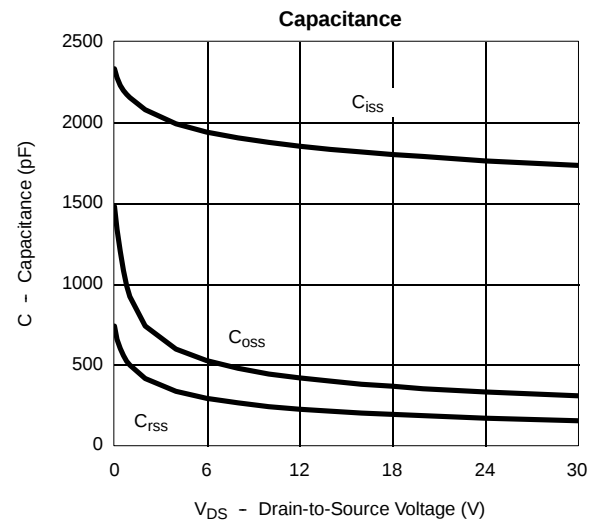
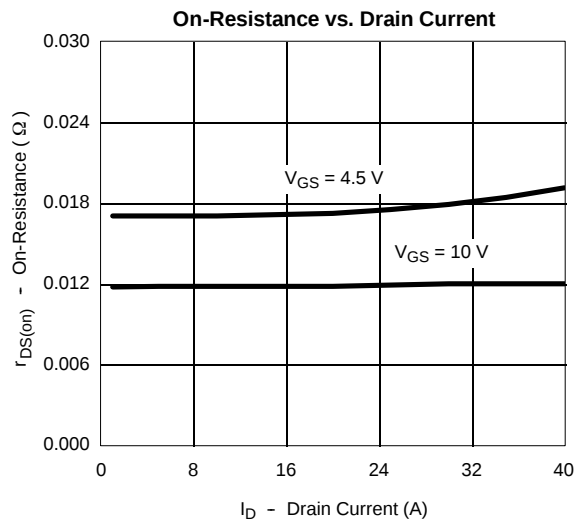
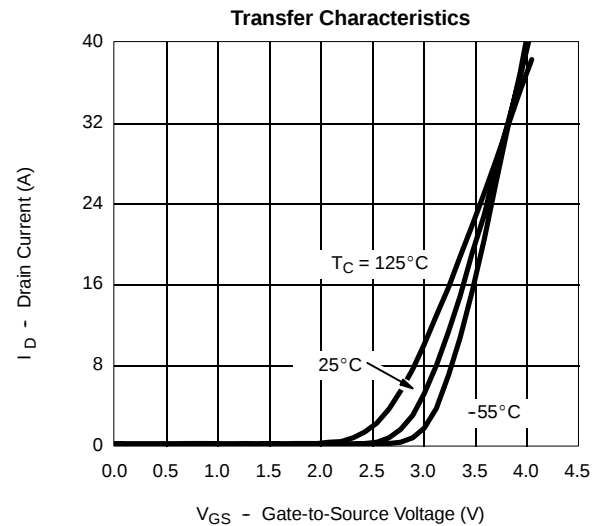
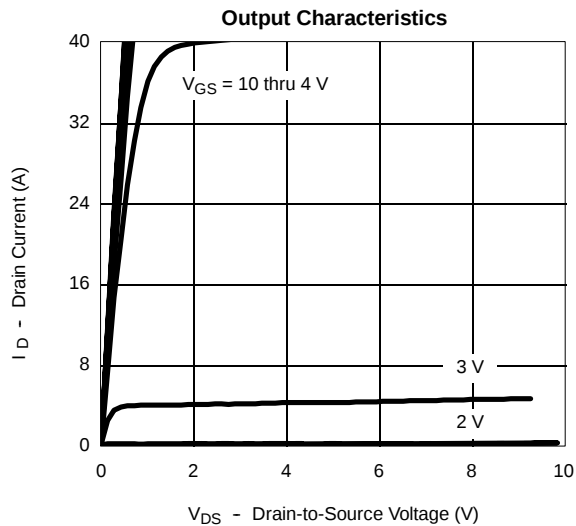
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

CHANNEL-1



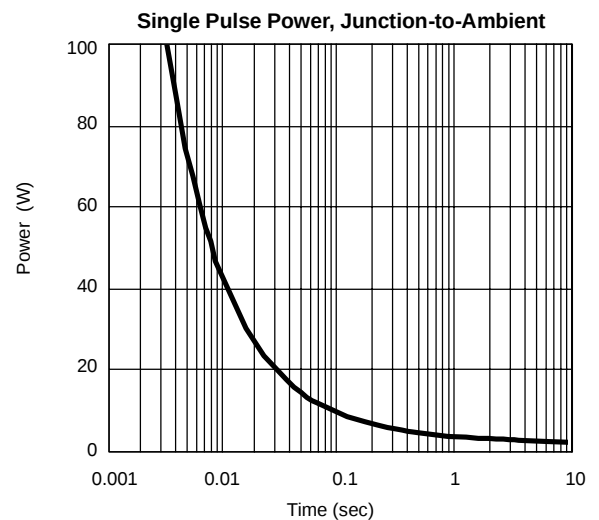
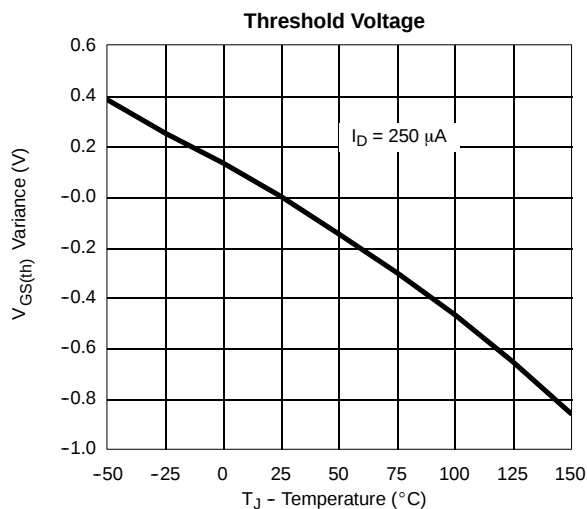
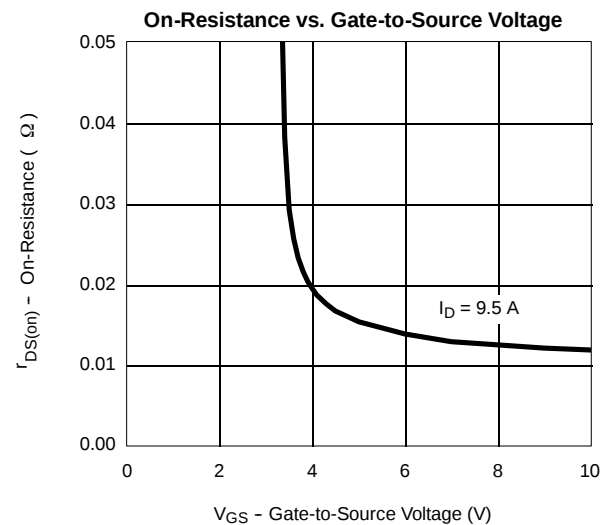
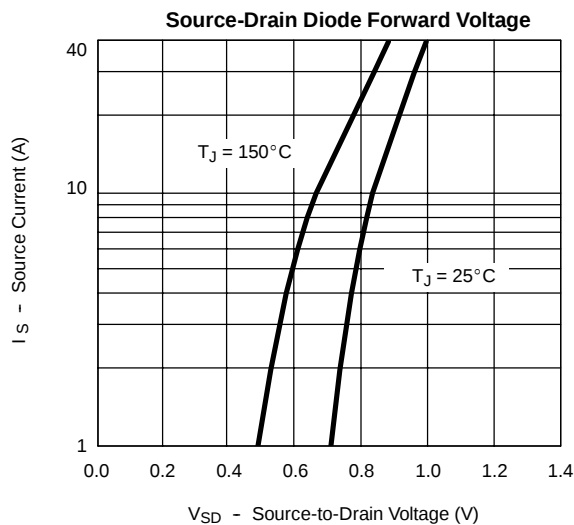
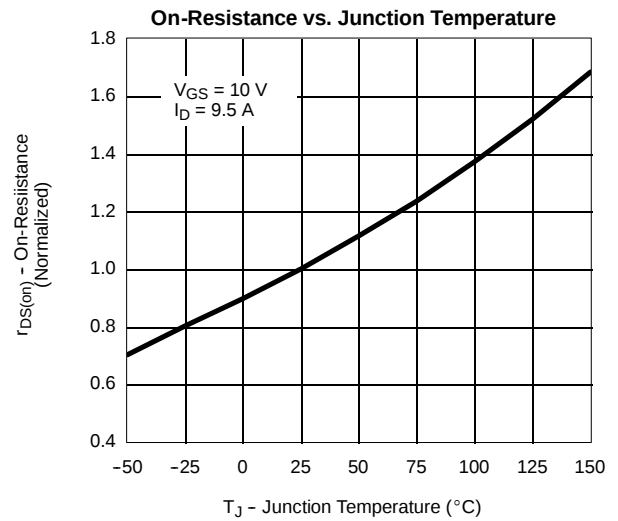
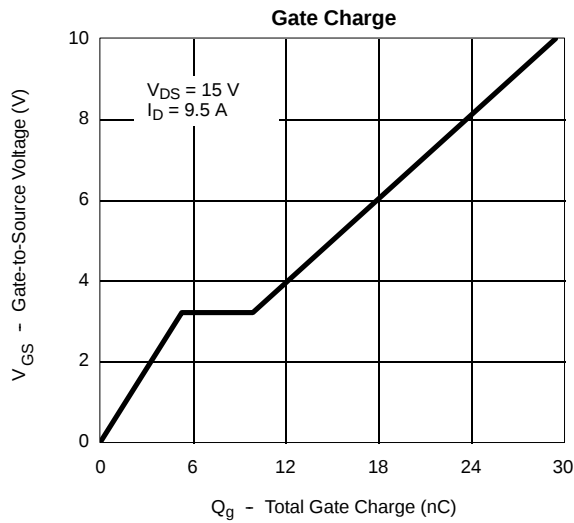
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

CHANNEL-2



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

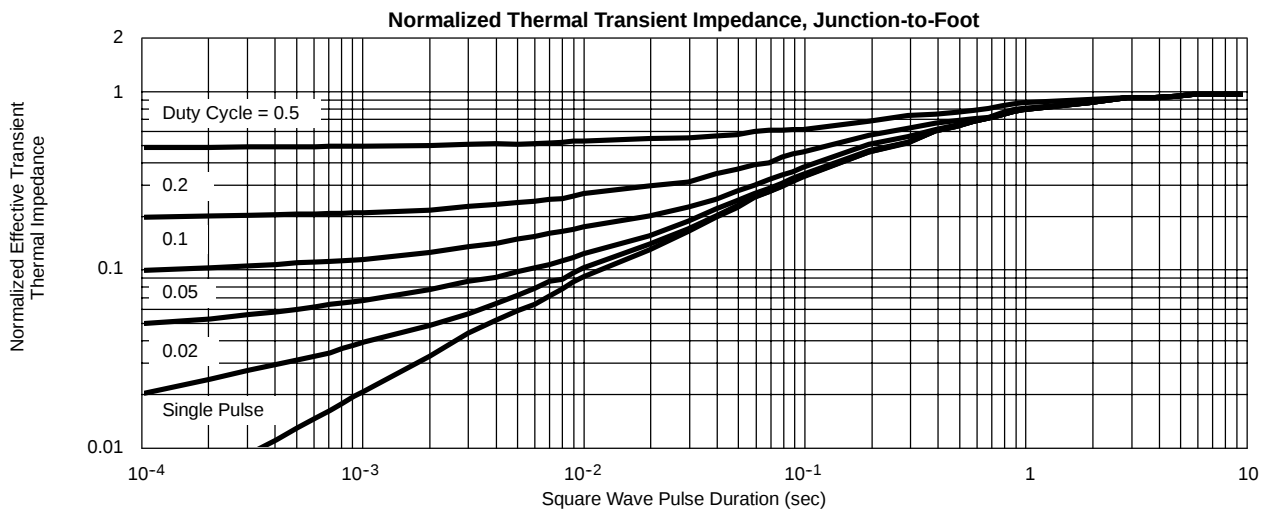
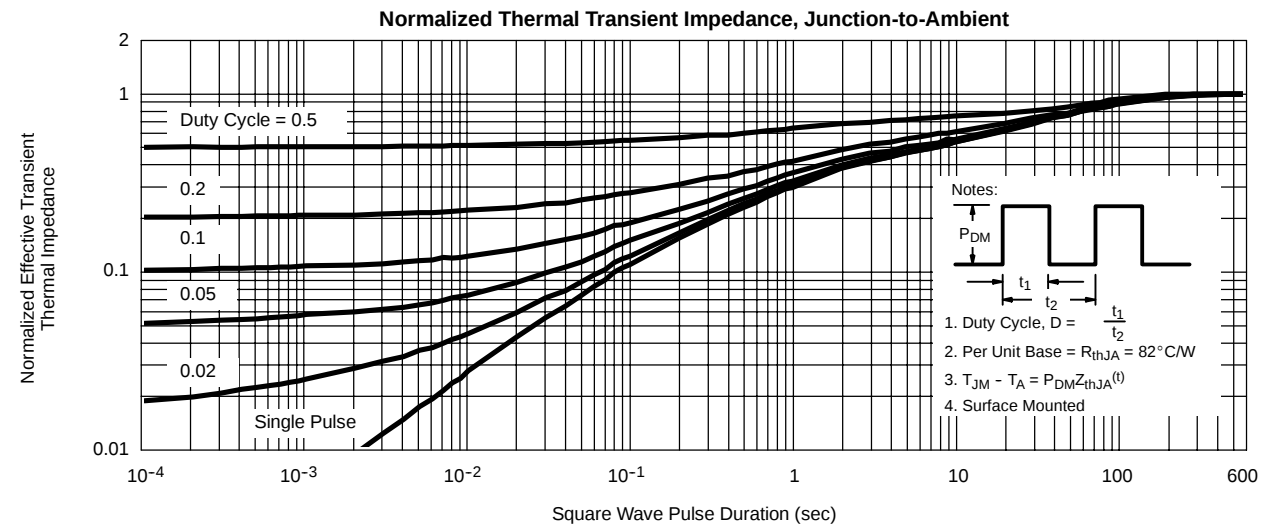
CHANNEL-2





TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

CHANNEL-2



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