



New Product

Si4814BDY
Vishay Siliconix

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

PRODUCT SUMMARY				
	V _{DS} (V)	r _{DS(on)} (Ω)	I _D (A) ^a	Q _g (Typ)
Channel-1	30	0.018 @ V _{GS} = 10 V	10	6.6
		0.023 @ V _{GS} = 4.5 V	8.5	
Channel-2		0.018 @ V _{GS} = 10 V	10.5	8.9
		0.022 @ V _{GS} = 4.5 V	9.3	

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

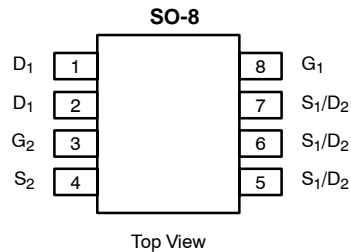
- LITTLE FOOT® Plus Integrated Schottky
- 100% R_g Tested

APPLICATIONS

- DC/DC Converters
 - Notebook

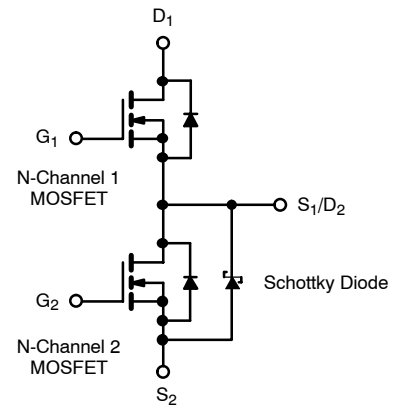


Product Is Completely Pb-free



Top View

Ordering Information: Si4814BDY—E3
Si4814BDY-T1—E3 (with Tape and Reel)



ABSOLUTE MAXIMUM RATINGS (T _A = 25°C UNLESS OTHERWISE NOTED)					
Parameter		Symbol	Channel-1	Channel-2	Unit
Drain-Source Voltage		V _{DS}	30		V
Gate-Source Voltage		V _{GS}	20		
Continuous Drain Current (T _J = 150°C) ^{a, b}	T _C = 25°C	I _D	10	10.5	A
	T _C = 70°C		8	8.3	
	T _A = 25°C		7.5 ^{a, b, c}	7.8 ^{a, b, c}	
	T _A = 70°C		6 ^{a, b, c}	6.3 ^{a, b, c}	
Pulsed Drain Current (10 μs Pulse Width)		I _{DM}	40	40	
Continuous Source-Drain Diode Current	T _C = 25°C	I _S	3	3.2	
	T _A = 25°C		1.7 ^{a, b, c}	1.8 ^{a, b, c}	
Pulsed Source-Drain Current		I _{SM}	40	40	
Single-Pulse Avalanche Current	L = 0.1 mH	I _{AS}	15		
Single-Pulse Avalanche Energy		E _{AS}	11.2		mJ
Maximum Power Dissipation ^{a, b}	T _C = 25°C	P _D	3.3	3.5	W
	T _C = 70°C		2.1	2.2	
	T _A = 25°C		1.9 ^{a, b, c}	2.0 ^{a, b, c}	
	T _A = 70°C		1.2 ^{a, b, c}	1.3 ^{a, b, c}	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	-55 to 150		°C

Notes

- Based on T_C = 25°C.
- Surface Mounted on 1" x 1" FR4 Board.
- t = 10 sec



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}	54	65	47	60	°C/W
Maximum Junction-to-Foot (Drain)	Steady-State	R_{thJF}	32	38	30	35	

Notes

- a. Surface Mounted on 1" x 1" FR4 Board.
 b. Maximum under steady state conditions is 112 °C/W for Channel 1 and 107 °C/W for Channel 2.

MOSFET SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)							
Parameter	Symbol	Test Condition	Min	Typ ^a	Max	Unit	
Static							
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	Ch-1 30 Ch-2 30			V	
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = 250\ \mu\text{A}$	Ch-1 Ch-2	24 25		mV/°C	
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$		Ch-1 Ch-2	-6 -6			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	Ch-1 Ch-2	1.5 1.5	3.0 2.7		
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = 20\text{ V}$	Ch-1 Ch-2		100 100	nA	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}$	Ch-1 Ch-2		1 100	μA	
		$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}, T_J = 85^\circ\text{C}$	Ch-1 Ch-2		15 2000		
On-State Drain Current ^b	$I_{D(on)}$	$V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$	Ch-1 Ch-2	20 20		A	
Drain-Source On-State Resistance ^b	$r_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 10\text{ A}$	Ch-1		0.0145	0.018	Ω
		$V_{GS} = 10\text{ V}, I_D = 10.5\text{ A}$	Ch-2		0.015	0.018	
		$V_{GS} = 4.5\text{ V}, I_D = 8.5\text{ A}$	Ch-1		0.019	0.023	
		$V_{GS} = 4.5\text{ V}, I_D = 9.3\text{ A}$	Ch-2		0.018	0.022	
Forward Transconductance ^b	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 10\text{ A}$	Ch-1		30	S	
		$V_{DS} = 15\text{ V}, I_D = 10.5\text{ A}$	Ch-2		35		
Diode Forward Voltage ^b	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		0.47	0.5	
Dynamic^a							
Total Gate Charge	Q_g	Channel-1 $V_{DS} = 15\text{ V}, V_{GS} = 4.5\text{ V}, I_D = 10\text{ A}$ Channel-2 $V_{DS} = 15\text{ V}, V_{GS} = 4.5\text{ V}, I_D = -10.5\text{ A}$	Ch-1 Ch-2		6.6 8.9	10 14	nC
Gate-Source Charge	Q_{gs}		Ch-1 Ch-2		2.9 3.4		
Gate-Drain Charge	Q_{gd}		Ch-1 Ch-2		2.3 2.4		
Gate Resistance	R_g		Ch-1 Ch-2	0.5 0.5	1.9 2.3	2.9 3.5	



MOSFET SPECIFICATIONS (T _J = 25 °C UNLESS OTHERWISE NOTED)								
Parameter	Symbol	Test Condition	Min	Typ ^a	Max	Unit		
Dynamic^a								
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	8	15	ns		
			Ch-2	9	15			
Rise Time	t _r		Ch-1	11	18			
			Ch-2	13	20			
Turn-Off Delay Time	t _{d(off)}		Ch-1	21	32			
			Ch-2	27	40			
Fall Time	t _f		Ch-1	6	10			
			Ch-2	9	15			
Source-Drain Reverse Recovery Time	t _{rr}		I _F = 1.3 A, di/dt = 100 A/μs	Ch-1	28		40	
			I _F = 2.2 A, di/dt = 100 μA/μs	Ch-2	24		35	
Body Diode Reverse Recovery Charge	Q _{rr}	I _F = 1.3 A, di/dt = 100 A/μs	Ch-1	17		nC		
		I _F = 2.2 A, di/dt = 100 μA/μs	Ch-2	12				
Reverse Recovery Fall Time	t _a	I _F = 1.3 A, di/dt = 100 A/μs	Ch-1	12		ns		
		I _F = 2.2 A, di/dt = 100 μA/μs	Ch-2	11				
Reverse Recovery Rise Time	t _b	I _F = 1.3 A, di/dt = 100 A/μs	Ch-1	16				
		I _F = 2.2 A, di/dt = 100 μA/μs	Ch-2	13				

Notes

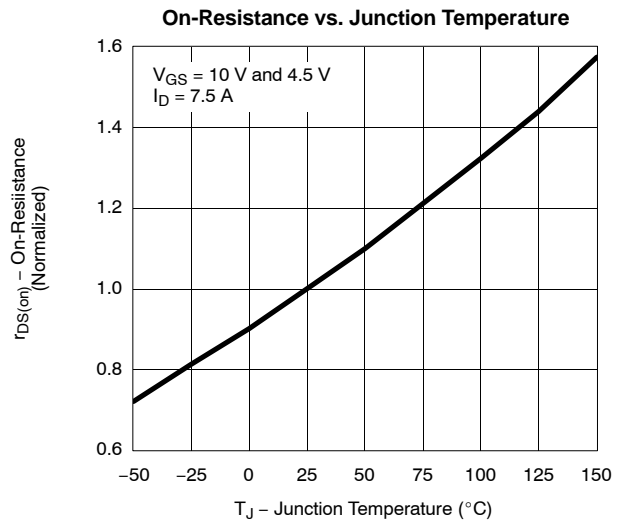
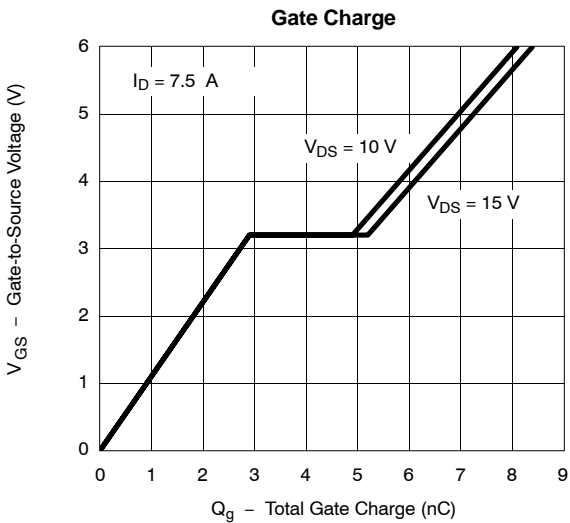
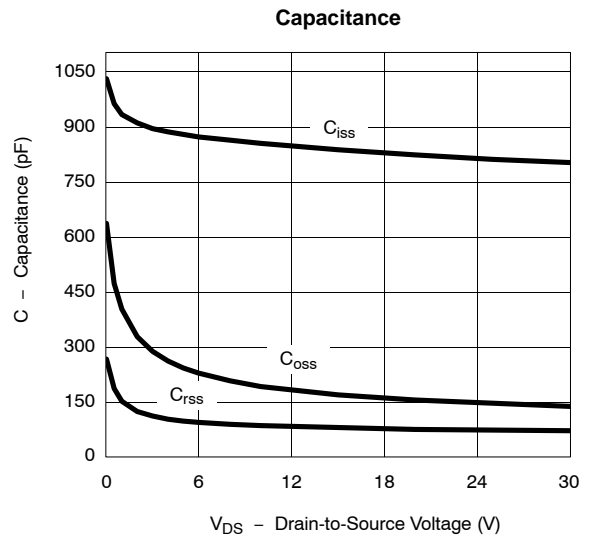
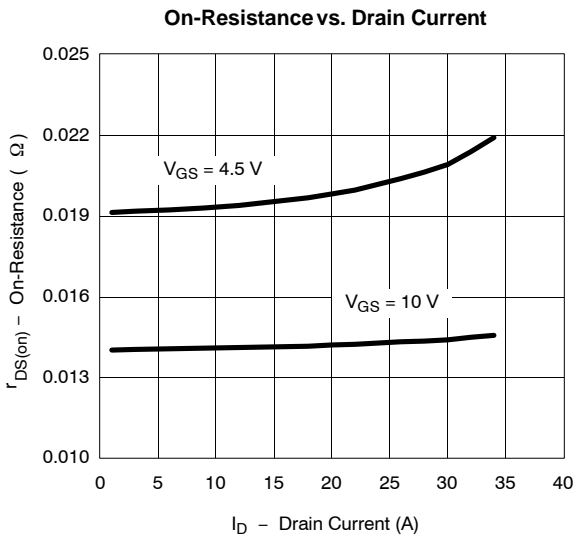
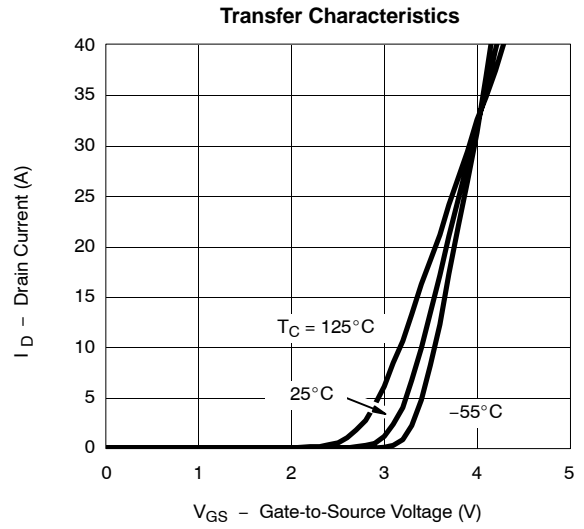
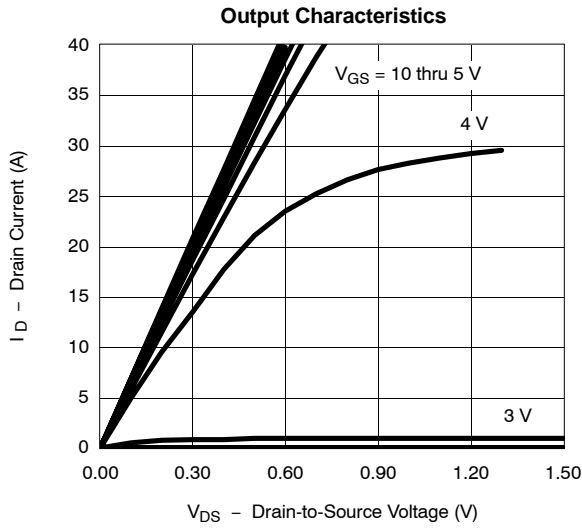
- a. Guaranteed by design, not subject to production testing.
- b. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.

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

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

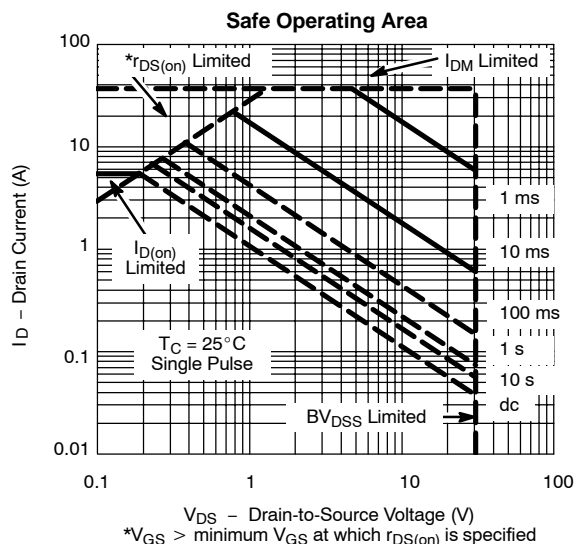
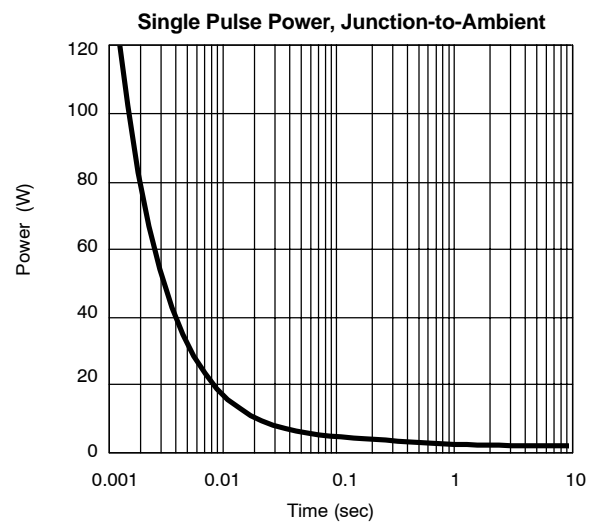
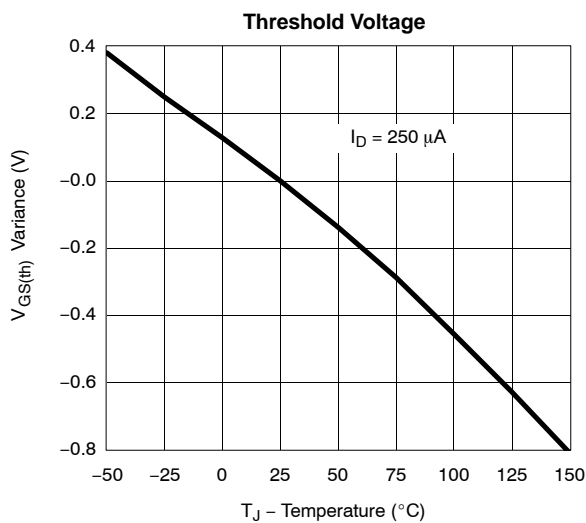
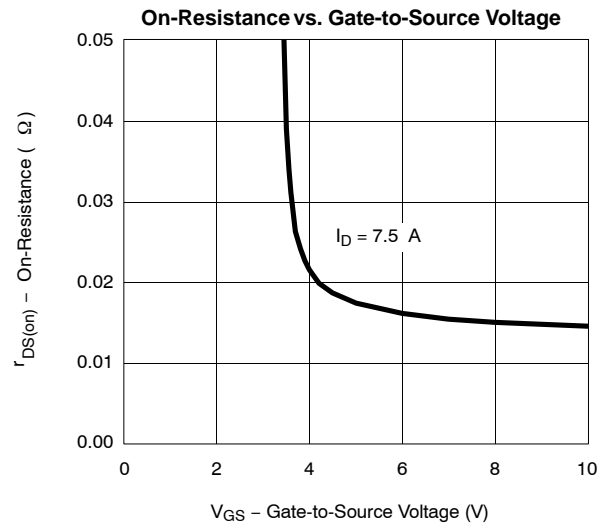
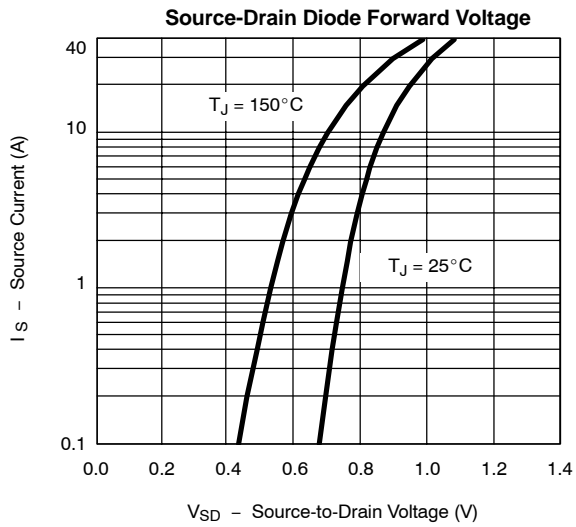
CHANNEL-1





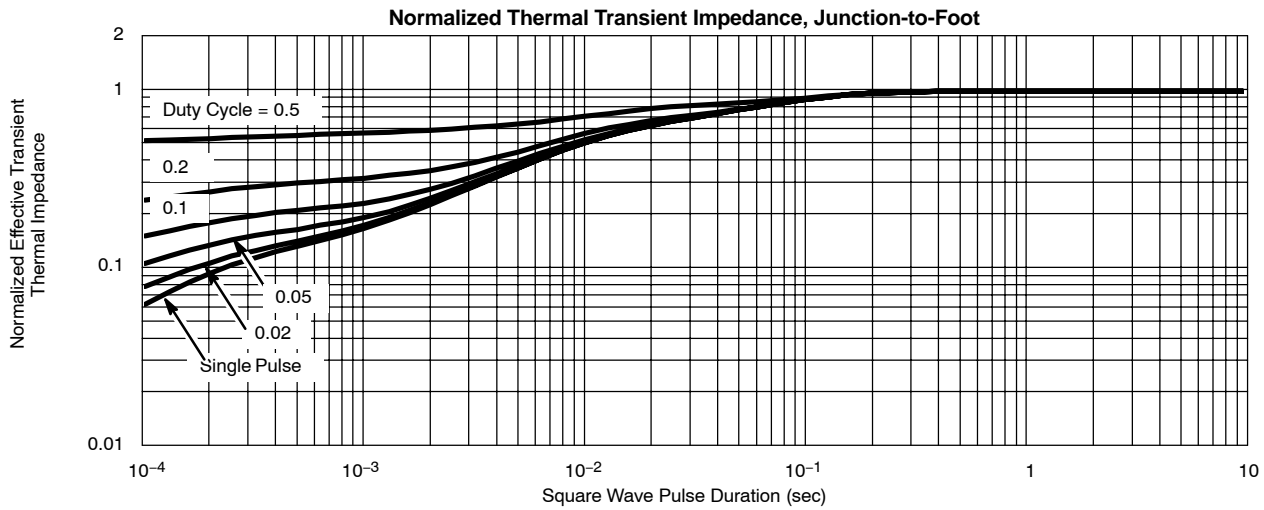
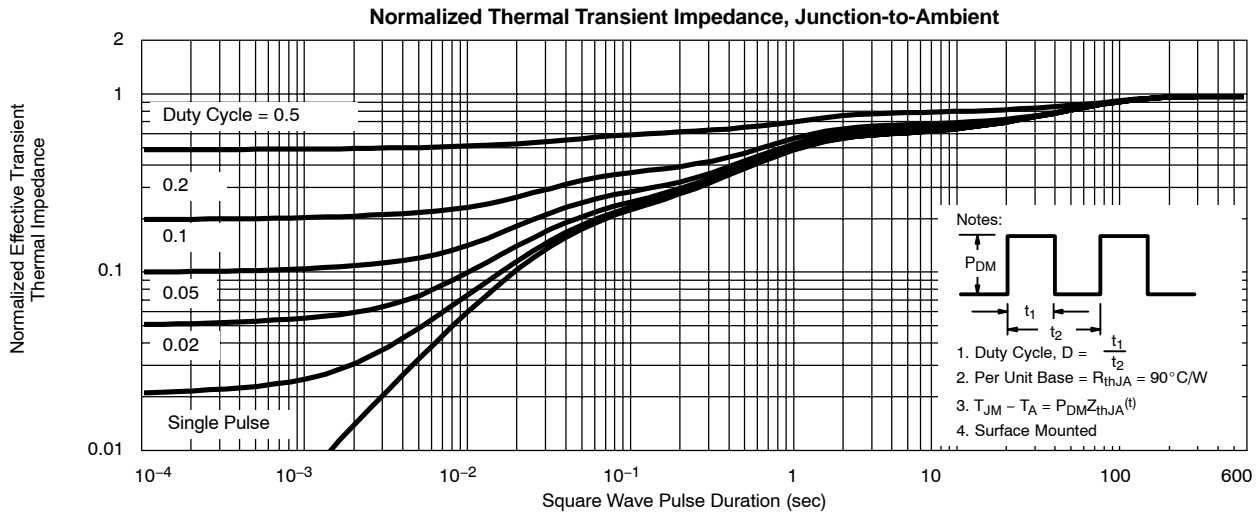
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

CHANNEL-1



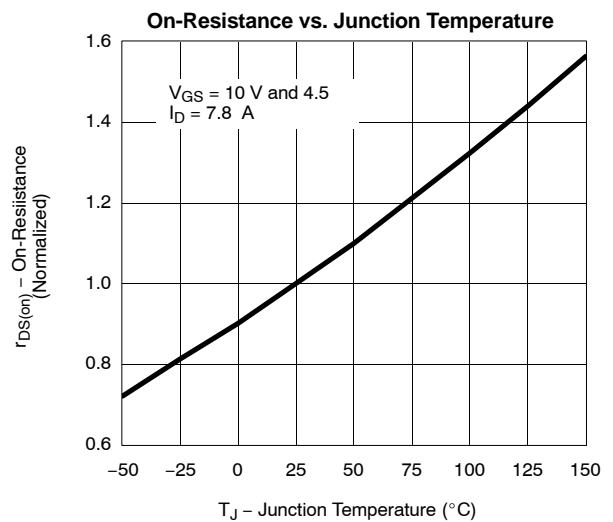
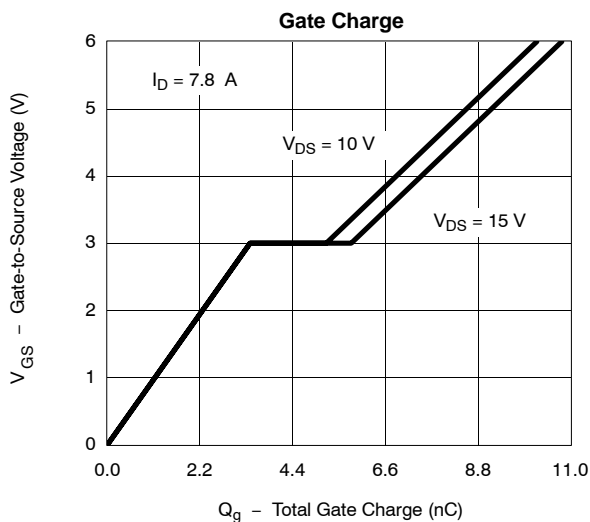
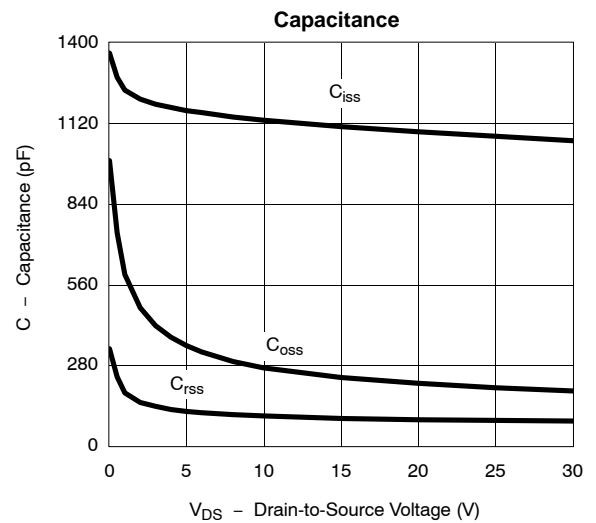
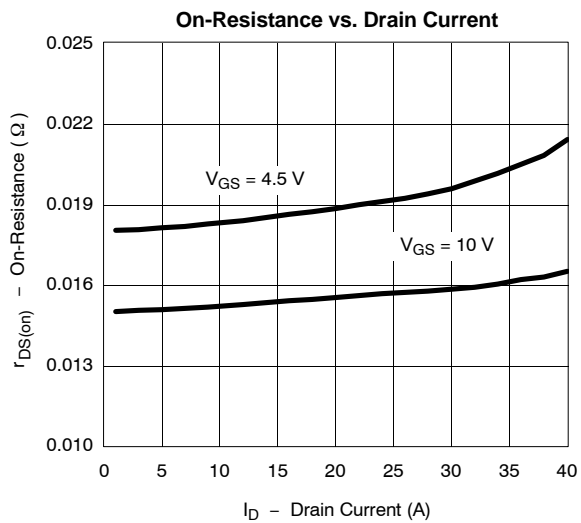
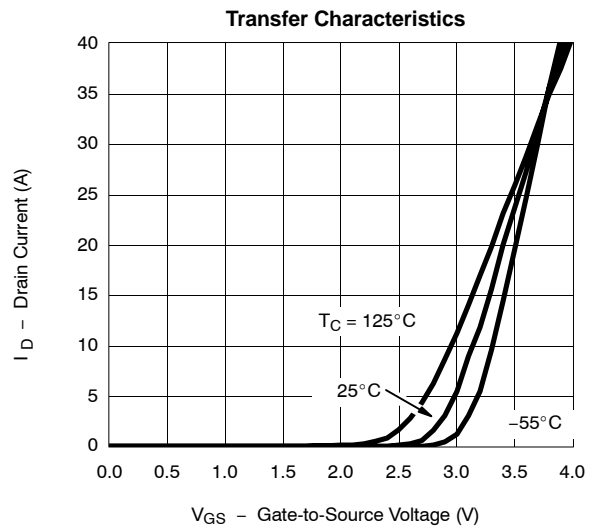
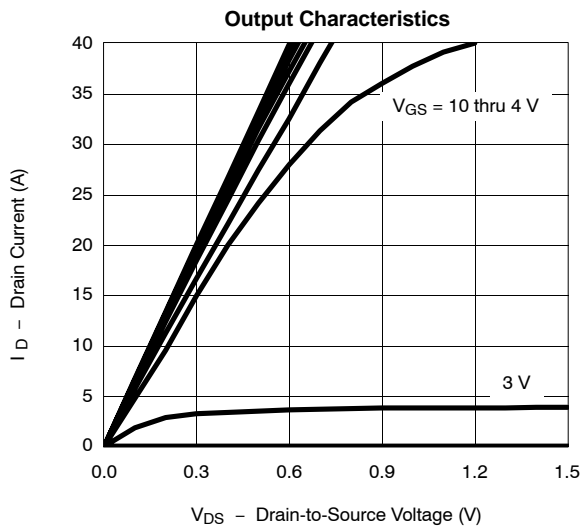
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

CHANNEL-1



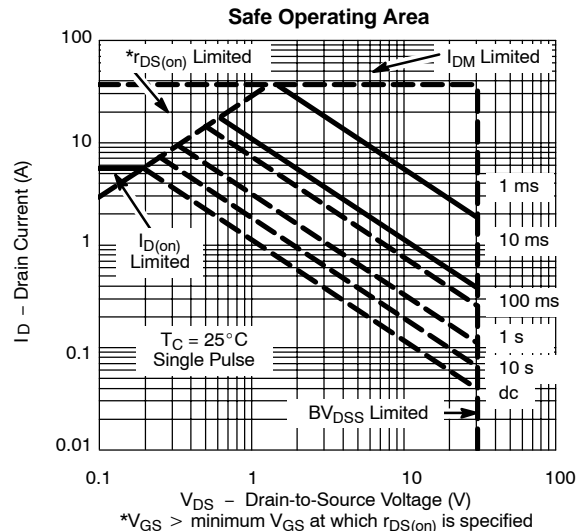
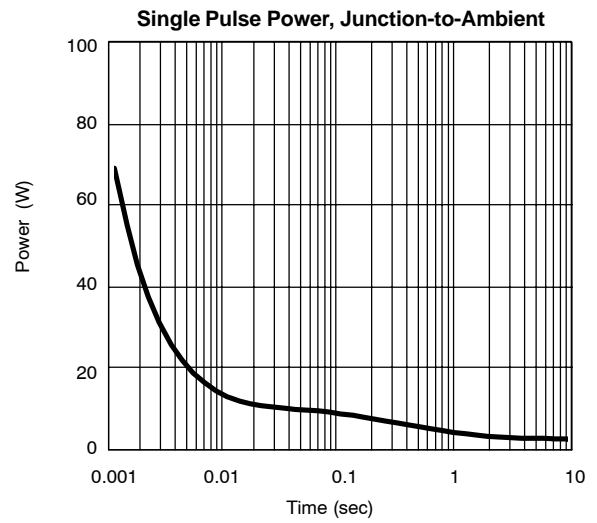
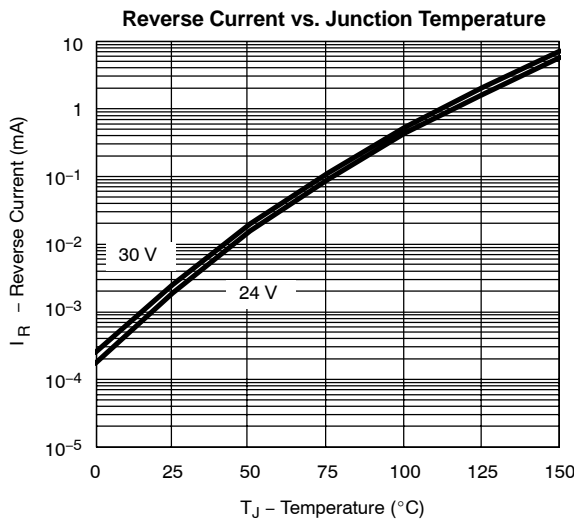
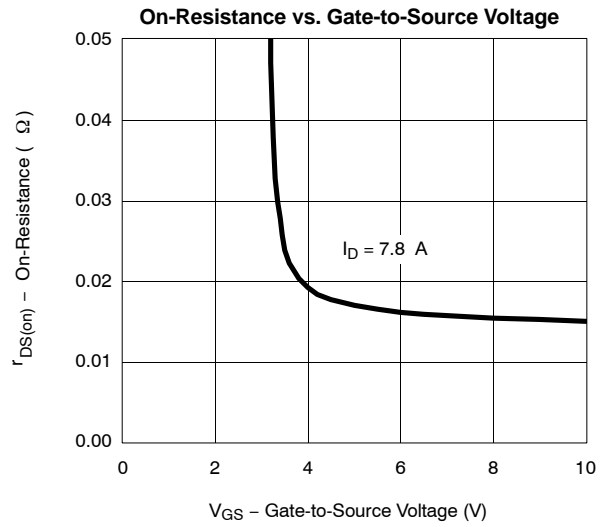
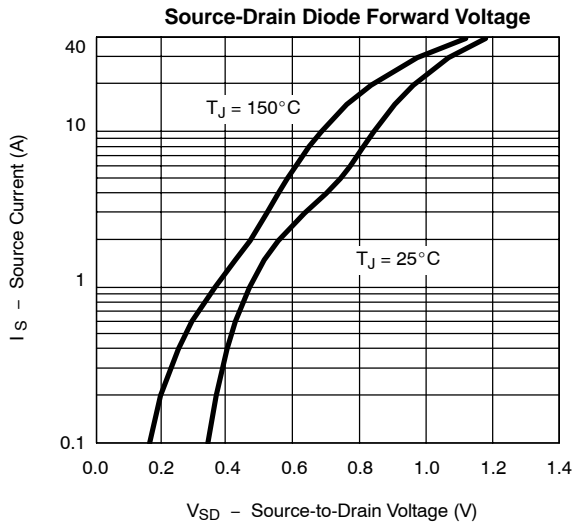


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) CHANNEL-2



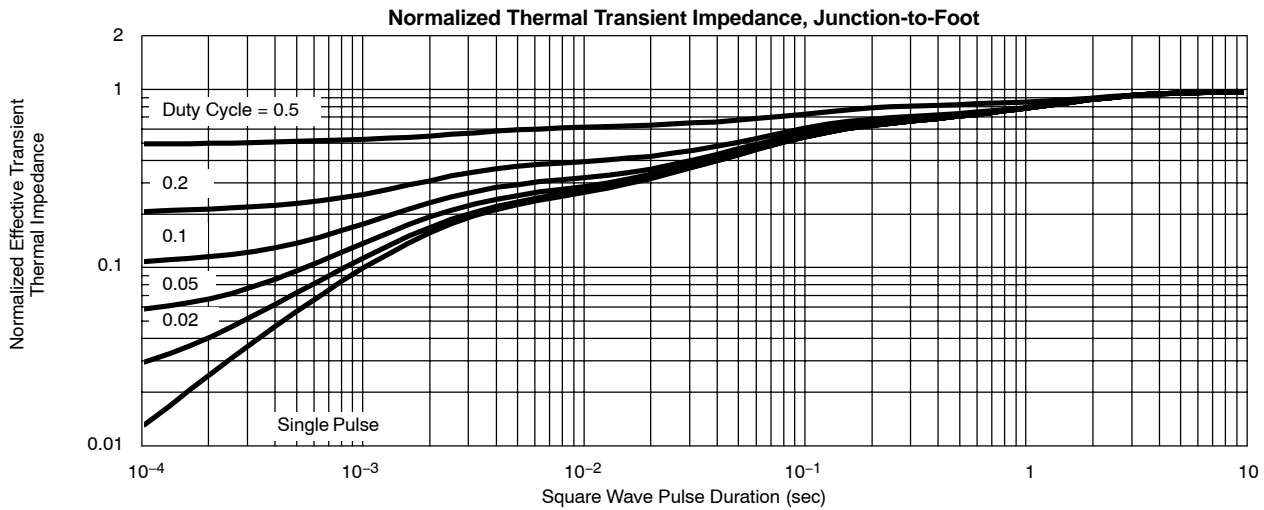
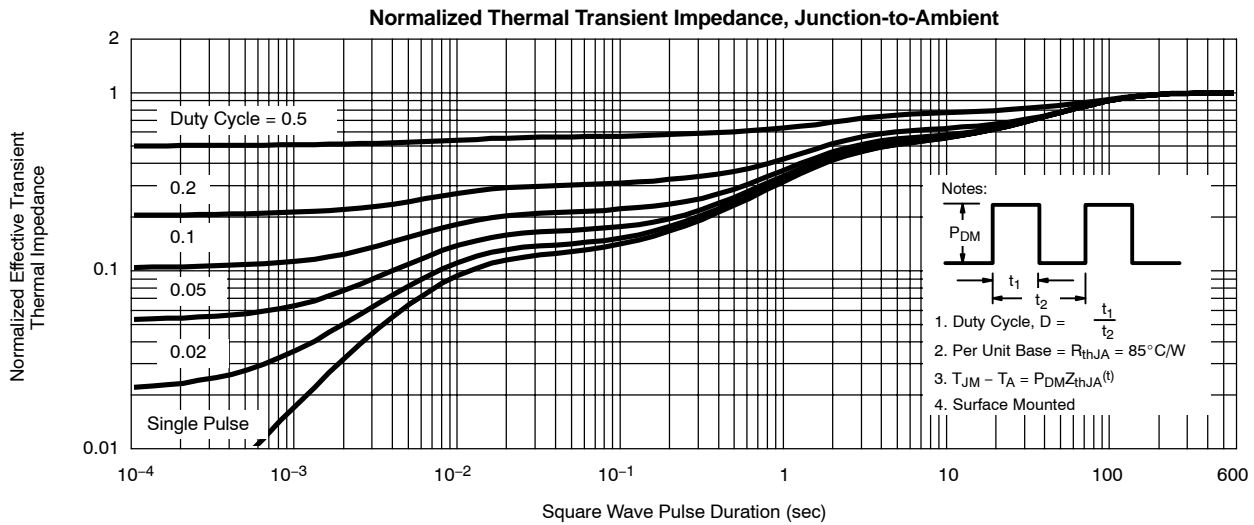
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

CHANNEL-2





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



Vishay Siliconix maintains worldwide manufacturing capability. Products may be manufactured at one of several qualified locations. Reliability data for Silicon Technology and Package Reliability represent a composite of all qualified locations. For related documents such as package/tape drawings, part marking, and reliability data, see <http://www.vishay.com/ppg?73278>.