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[Vishay/Siliconix](#)

[SI4814BDY-T1-E3](#)

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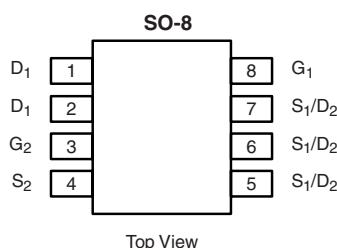
Si4814BDY

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 at V _{GS} = 10 V	10	6.6
		0.023 at V _{GS} = 4.5 V	8.5	
Channel-2		0.018 at V _{GS} = 10 V	10.5	8.9
		0.022 at 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 at 1.0 A	2.0



Ordering Information: Si4814BDY-T1-E3 (Lead (Pb)-free)
Si4814BDY-T1-GE3 (Lead (Pb)-free and Halogen-free)

FEATURES

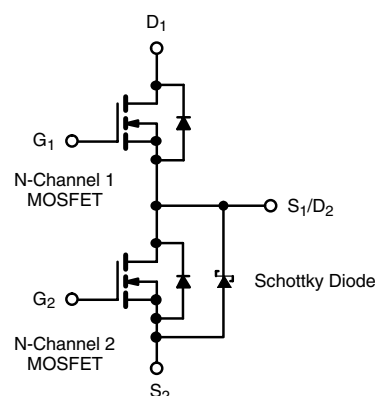
- Halogen-free According to IEC 61249-2-21 Available
- LITTLE FOOT® Plus Integrated Schottky
- 100 % R_g Tested

APPLICATIONS

- ADC/DC Converters
- Notebook



RoHS
COMPLIANT
HALOGEN
FREE
Available



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 _{sta}	- 55 to 150		°C	

Notes:

a. Based on T_C = 25 °C.

b. Surface Mounted on 1" x 1" FR4 board.

c. t = 10 s.

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THERMAL RESISTANCE RATINGS

Parameter		Symbol	Channel-1		Channel-2		Unit
			Typ.	Max.	Typ.	Max.	
Maximum Junction-to-Ambient ^a	$t \leq 10$ s	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 $T_J = 25$ °C, unless otherwise noted

Parameter	Symbol	Test Conditions		Min.	Typ. ^a	Max.	Unit
Static							
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA	Ch-1 Ch-2	30 30			V
V _{DS} Temperature Coefficient	ΔV _{DS} /T _J	I _D = 250 μA	Ch-1 Ch-2		24 25		mV/°C
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)} /T _J		Ch-1 Ch-2		- 6 - 6		V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	Ch-1 Ch-2	1.5 1.5		3.0 2.7	
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	Ch-1 Ch-2			1 100	μA
		V _{DS} = 30 V, V _{GS} = 0 V, T _J = 85 °C	Ch-1 Ch-2			15 2000	
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 = 10 A	Ch-1		0.0145	0.018	Ω
		V _{GS} = 10 V, I _D = 10.5 A	Ch-2		0.015	0.018	
		V _{GS} = 4.5 V, I _D = 8.5 A	Ch-1		0.019	0.023	
		V _{GS} = 4.5 V, I _D = 9.3 A	Ch-2		0.018	0.022	
Forward Transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 10 A	Ch-1		30		S
		V _{DS} = 15 V, I _D = 10.5 A	Ch-2		35		
Diode Forward Voltage ^b	V _{SD}	I _S = 1.7 A, V _{GS} = 0 V	Ch-1		0.75	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} = 4.5 V, I _D = 10 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}	Channel-2 V _{DS} = 15 V, V _{GS} = 4.5 V, I _D = - 10.5 A	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	



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MOSFET SPECIFICATIONS T _J = 25 °C, unless otherwise noted							
Parameter	Symbol	Test Conditions		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	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)}	Channel-2 V _{DD} = 15 V, R _L = 15 Ω I _D ≡ 1 A, V _{GEN} = 10 V, R _g = 6 Ω	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	nC
		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		
		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 $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

SCHOTTKY SPECIFICATIONS $T_J = 25\text{ }^{\circ}\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Forward Voltage Drop	V_F	$I_F = 1.0\text{ A}$		0.47	0.50	V
		$I_F = 1.0\text{ A}$, $T_J = 125\text{ }^{\circ}\text{C}$		0.36	0.42	
Maximum Reverse Leakage Current	I_{rm}	$V_R = 30\text{ V}$		0.004	0.100	mA
		$V_R = 30\text{ V}$, $T_J = 100\text{ }^{\circ}\text{C}$		0.7	10	
		$V_R = -30\text{ V}$, $T_J = 125\text{ }^{\circ}\text{C}$		3.0	20	
Junction Capacitance	C_T	$V_R = 10\text{ V}$		50		pF

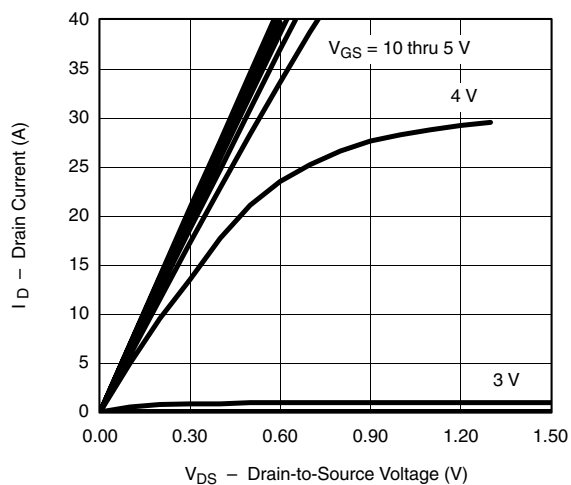
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

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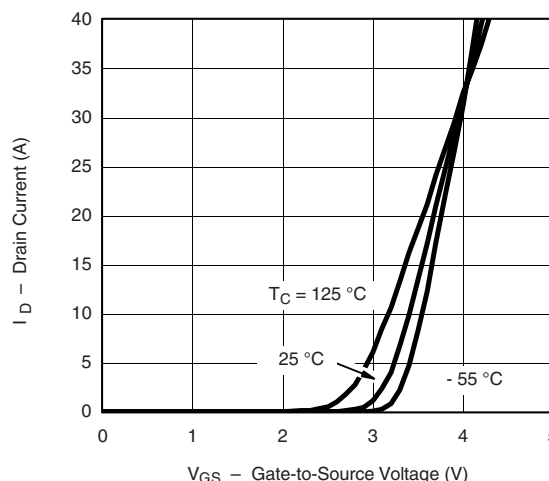
Vishay Siliconix



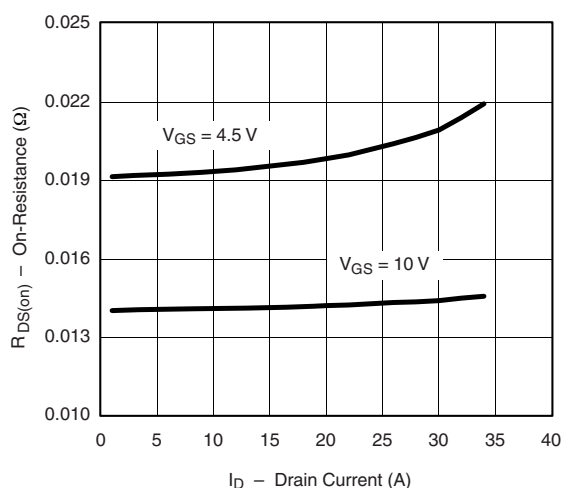
CHANNEL-1 TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



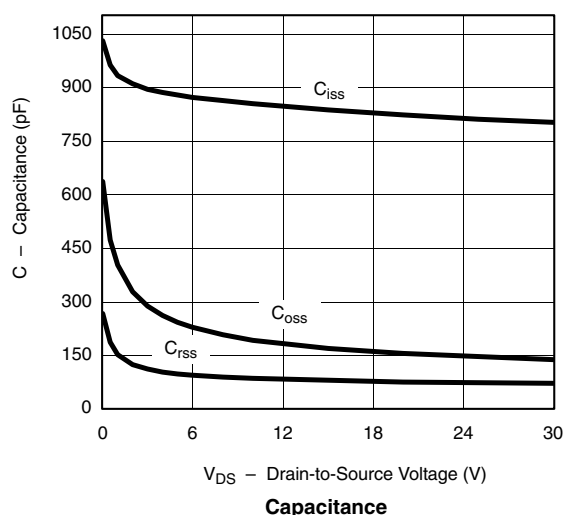
Output Characteristics



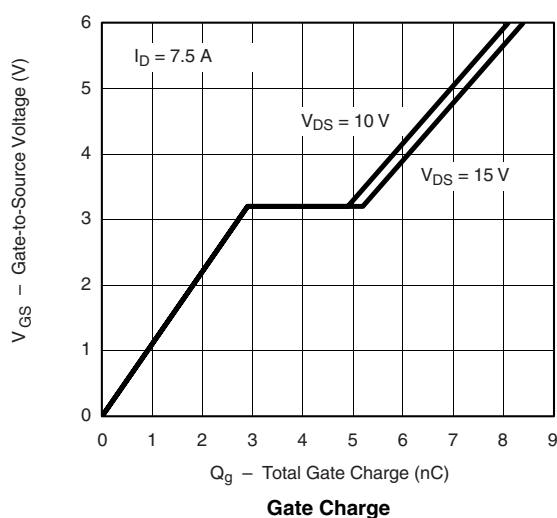
Transfer Characteristics



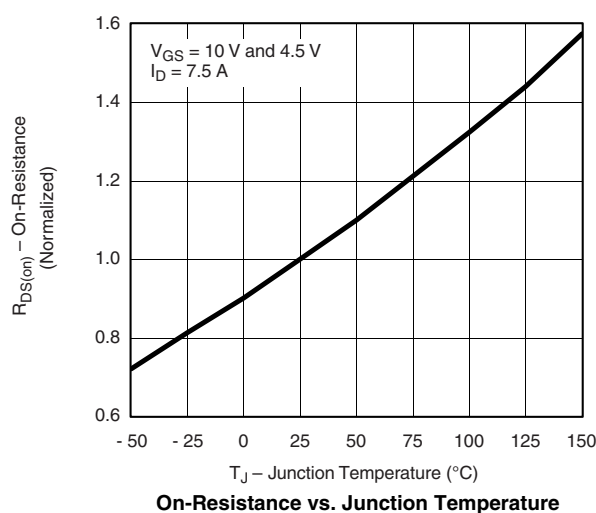
On-Resistance vs. Drain Current



Capacitance



Gate Charge



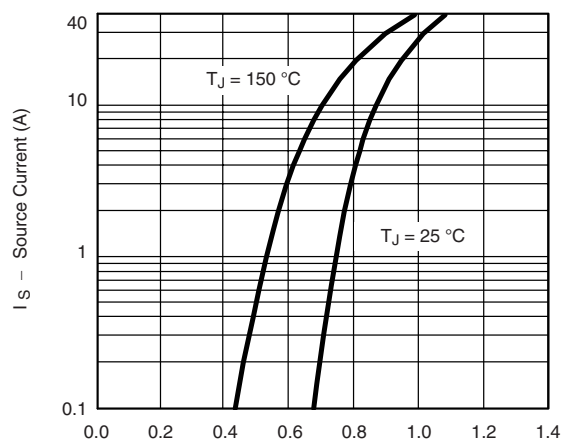
On-Resistance vs. Junction Temperature



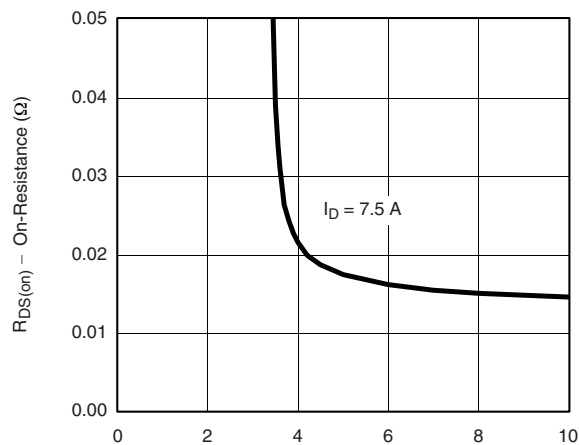
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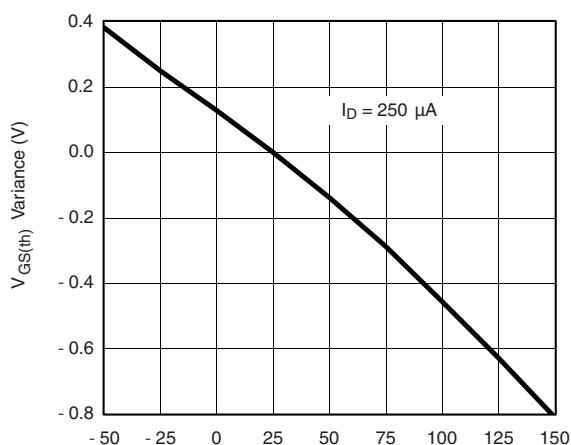
CHANNEL-1 TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



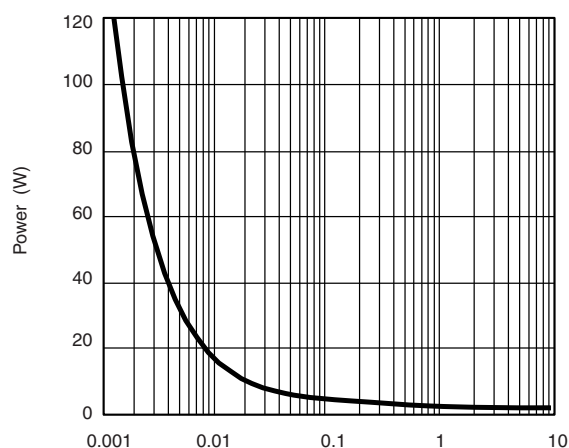
Source-Drain Diode Forward Voltage



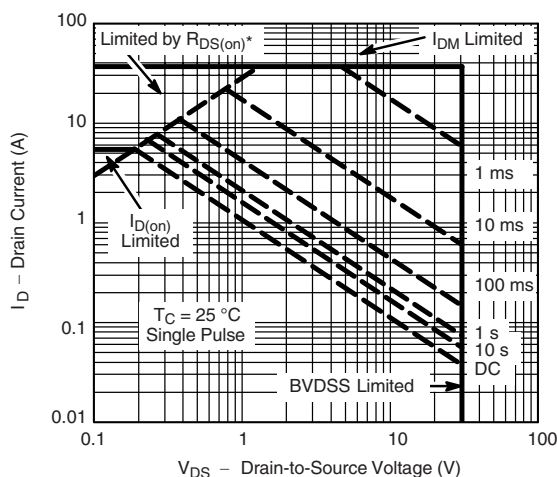
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power, Junction-to-Ambient



* $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified

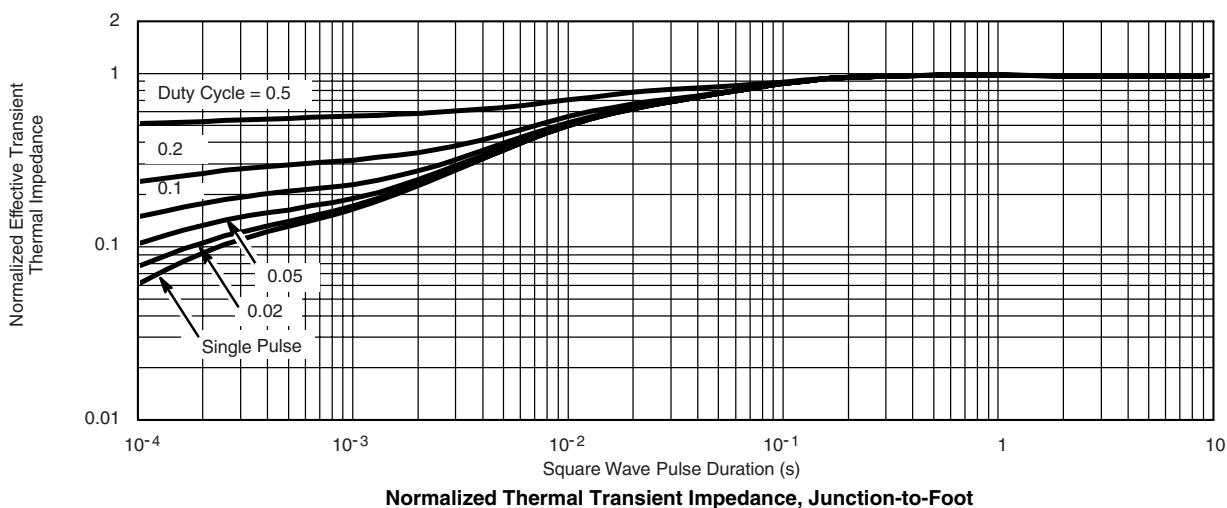
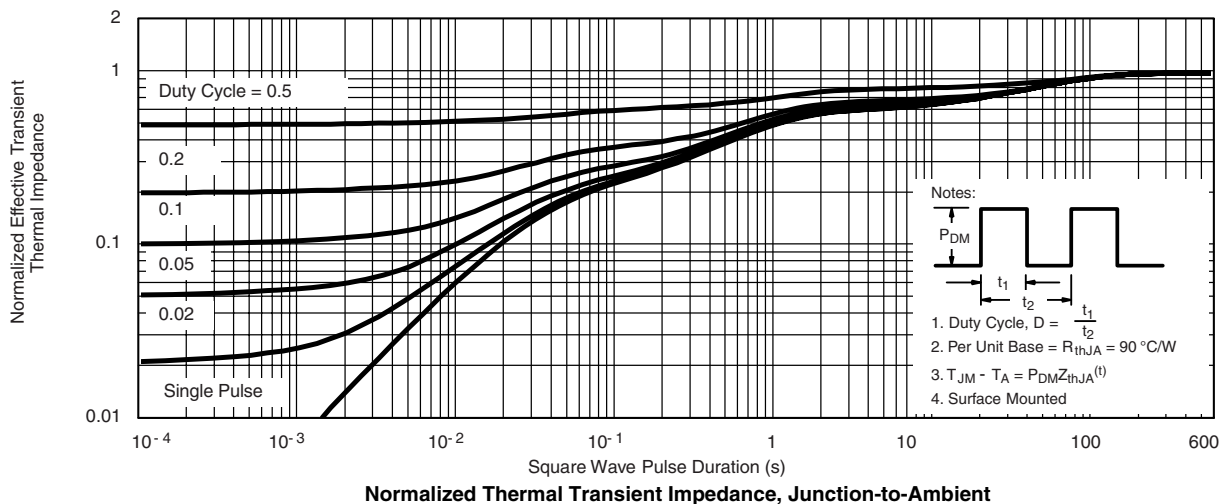
Safe Operating Area

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CHANNEL-1 TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

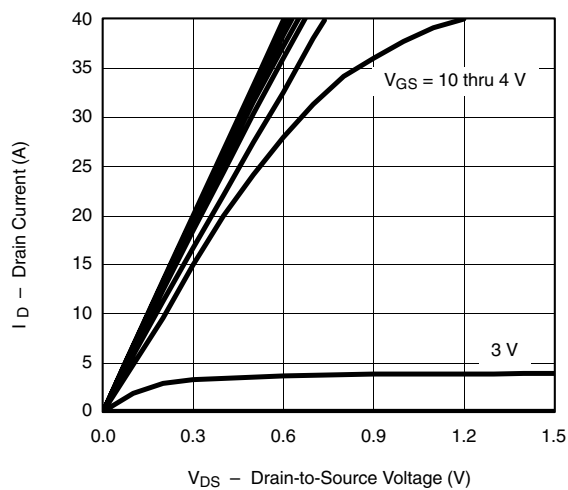




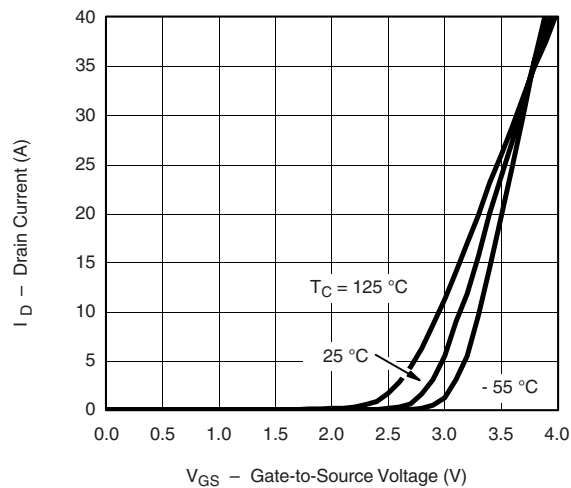
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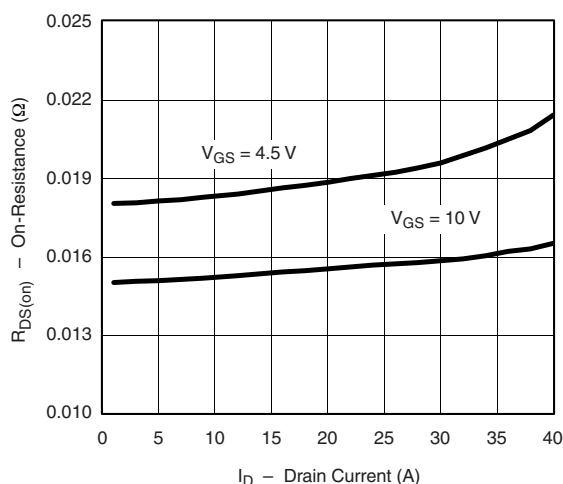
CHANNEL-2 TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



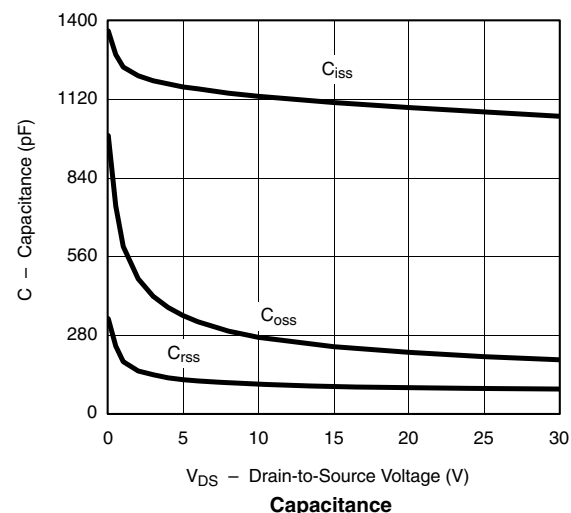
Output Characteristics



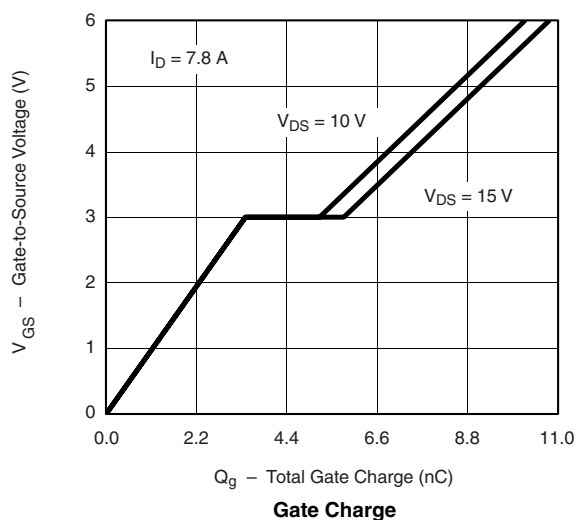
Transfer Characteristics



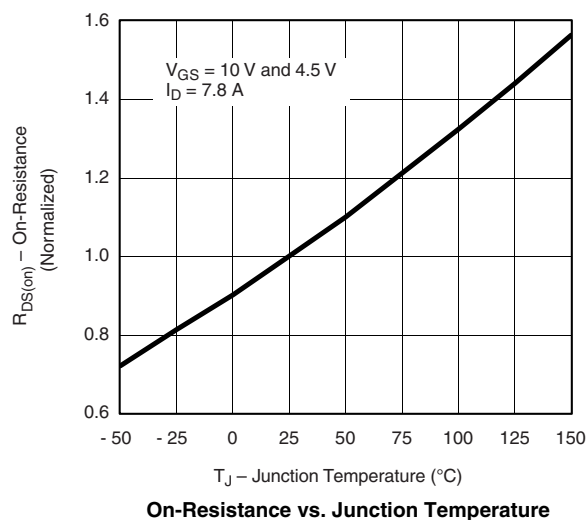
On-Resistance vs. Drain Current



Capacitance



Gate Charge



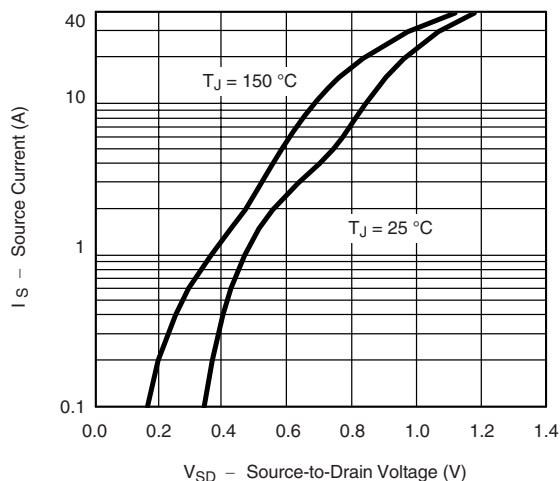
On-Resistance vs. Junction Temperature

Si4814BDY

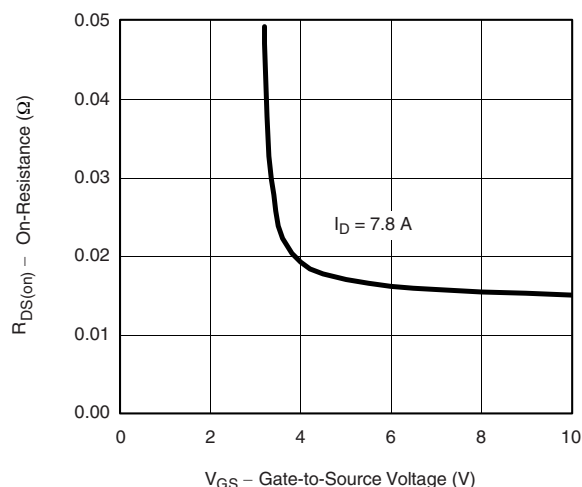
Vishay Siliconix



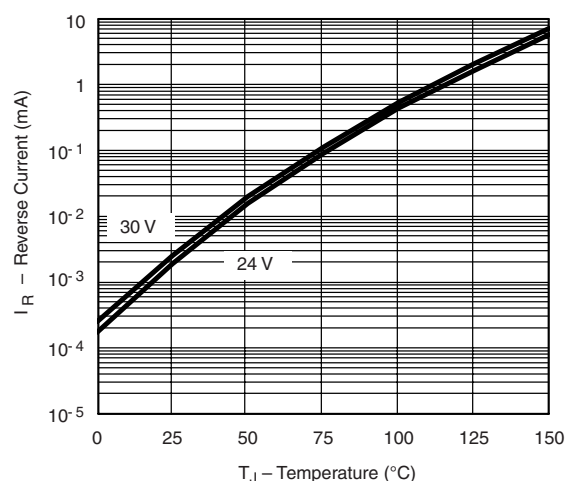
CHANNEL-2 TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



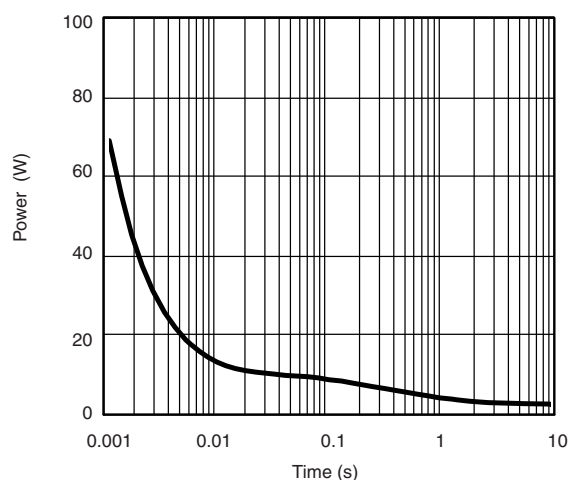
Source-Drain Diode Forward Voltage



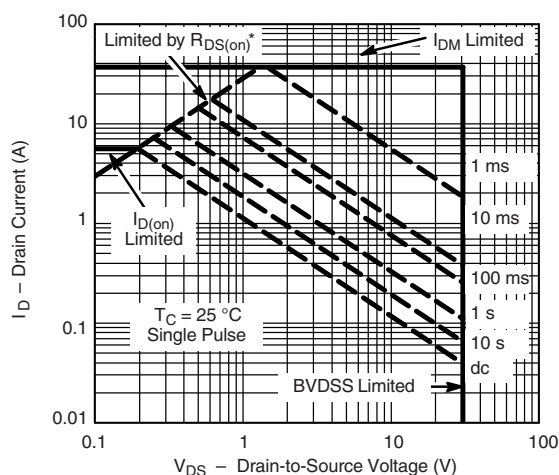
On-Resistance vs. Gate-to-Source Voltage



Reverse Current vs. Junction Temperature



Single Pulse Power, Junction-to-Ambient



* $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified

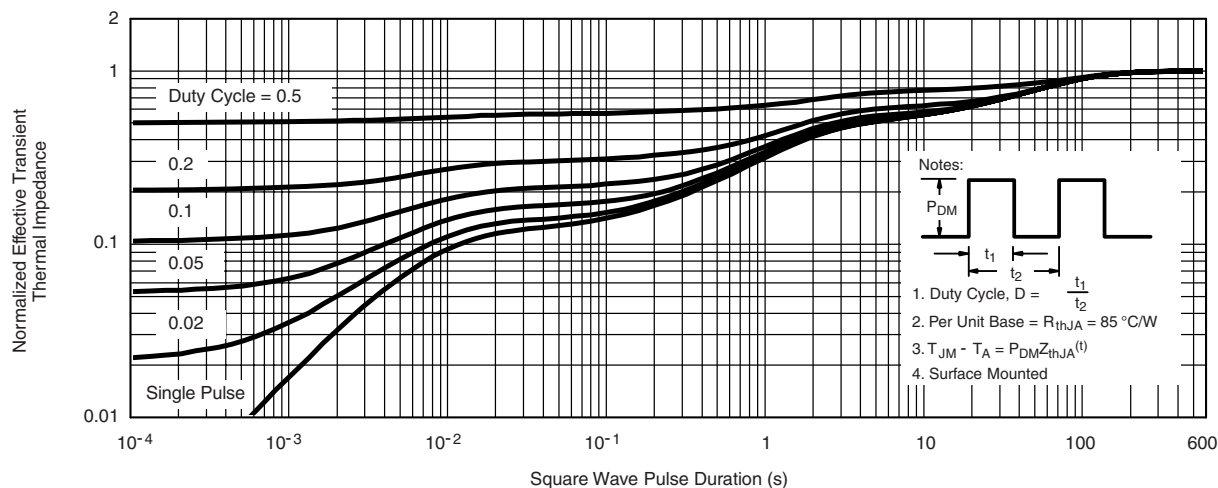
Safe Operating Area



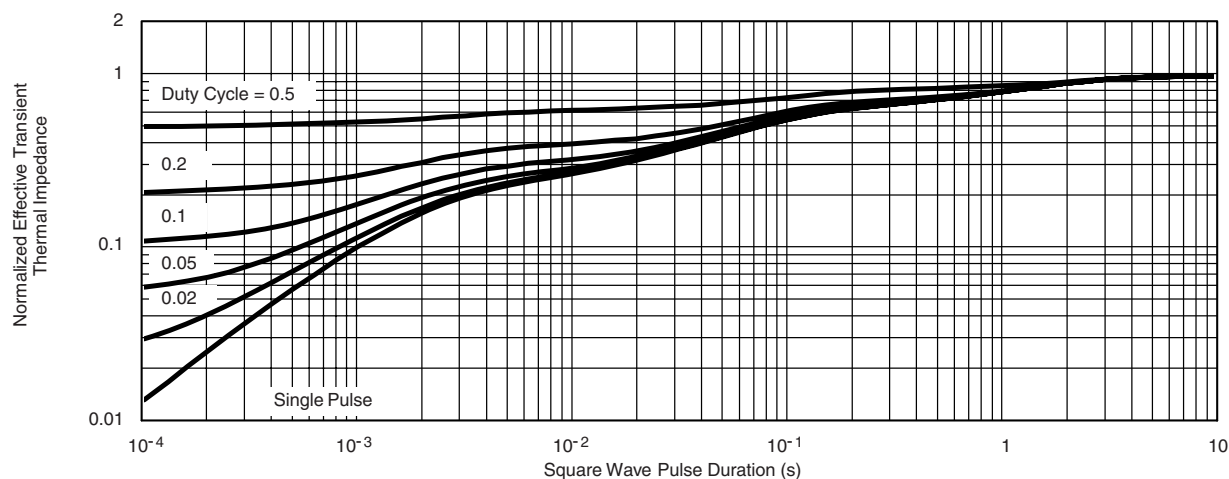
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CHANNEL-2 TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

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 www.vishay.com/ppg?73278.

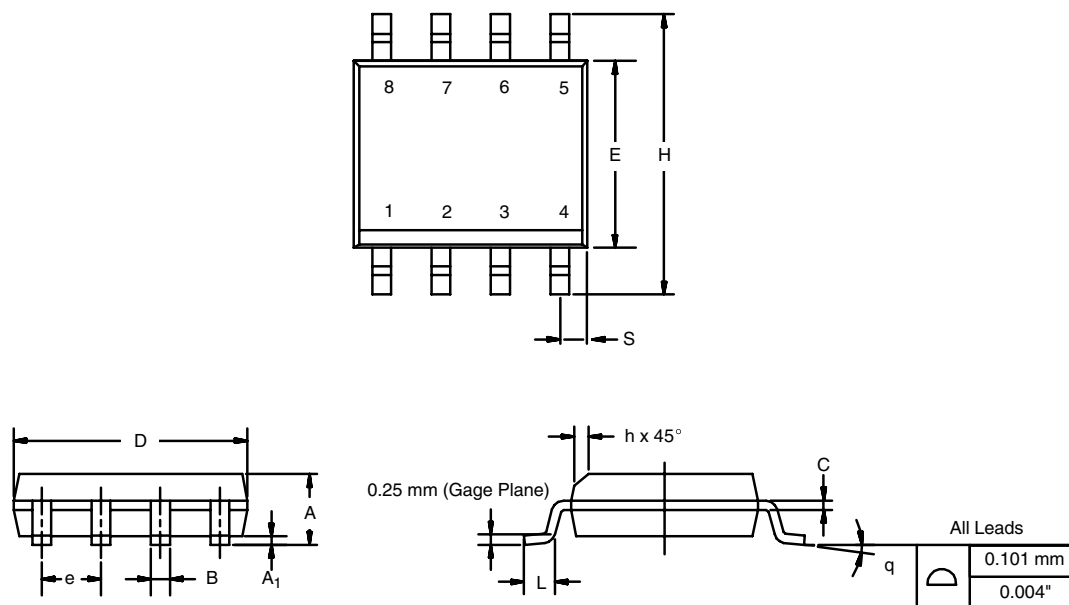


Package Information

Vishay Siliconix

SOIC (NARROW): 8-LEAD

JEDEC Part Number: MS-012



DIM	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	1.35	1.75	0.053	0.069
A ₁	0.10	0.20	0.004	0.008
B	0.35	0.51	0.014	0.020
C	0.19	0.25	0.0075	0.010
D	4.80	5.00	0.189	0.196
E	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
H	5.80	6.20	0.228	0.244
h	0.25	0.50	0.010	0.020
L	0.50	0.93	0.020	0.037
q	0°	8°	0°	8°
S	0.44	0.64	0.018	0.026

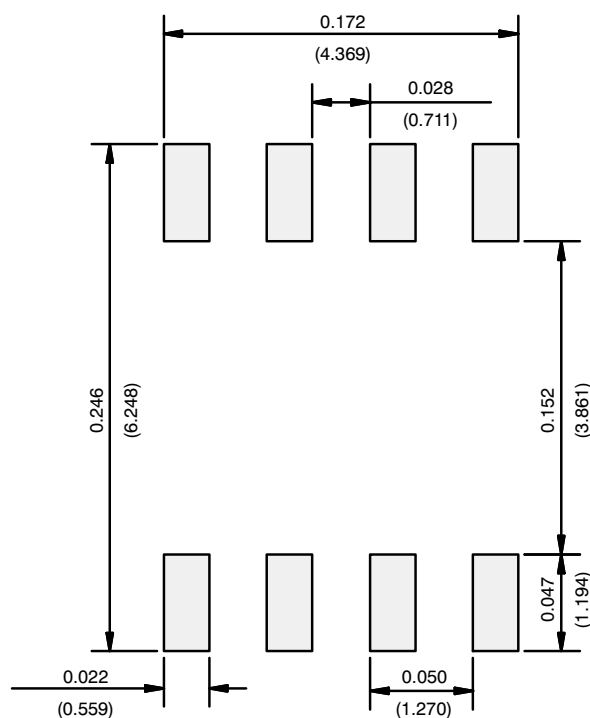
ECN: C-06527-Rev. I, 11-Sep-06
DWG: 5498

Application Note 826

Vishay Siliconix



RECOMMENDED MINIMUM PADS FOR SO-8



Recommended Minimum Pads
Dimensions in Inches/(mm)

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