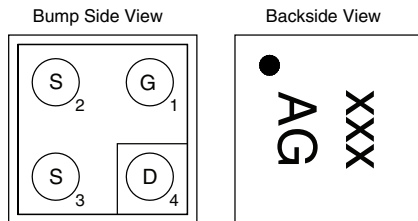




N-Channel 20 V (D-S) MOSFET

PRODUCT SUMMARY			
V _{DS} (V)	R _{DS(on)} (Ω) Max.	I _D (A) ^a	Q _g (Typ.)
20	0.059 at V _{GS} = 4.5 V	3.2	6.3 nC
	0.061 at V _{GS} = 3.7 V	3.1	
	0.065 at V _{GS} = 2.5 V	3.0	
	0.085 at V _{GS} = 1.8 V	2.7	

MICRO FOOT



Device Marking: xxx = Date/Lot Traceability Code
 AG = Device Marking Code

Ordering Information: Si8812DB-T2-E1 (Lead (Pb)-free and Halogen-free)

FEATURES

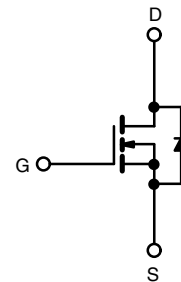
- TrenchFET[®] Power MOSFET
- Small 0.8 mm x 0.8 mm Outline Area
- Low 0.4 mm max. profile
- Low On-Resistance
- Material categorization:
 For definitions of compliance please see www.vishay.com/doc?99912



RoHS
 COMPLIANT
 HALOGEN
 FREE

APPLICATIONS

- Load Switch with Low Voltage Drop
- Power Management
- For Smart Phones, Tablet PCs, Mobile Computing



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T _A = 25 °C, unless otherwise noted)				
Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V _{DS}	20	V	
Gate-Source Voltage	V _{GS}	± 8		
Continuous Drain Current (T _J = 150 °C)	I _D	T _A = 25 °C	3.2 ^a	A
		T _A = 70 °C	2.6 ^a	
		T _A = 25 °C	2.3 ^b	
		T _A = 70 °C	1.8 ^b	
Pulsed Drain Current (t = 300 μs)	I _{DM}	20		
Continuous Source-Drain Diode Current	I _S	T _A = 25 °C	0.7 ^a	
		T _A = 25 °C	0.4 ^b	
Maximum Power Dissipation	P _D	T _A = 25 °C	0.9 ^a	W
		T _A = 70 °C	0.6 ^a	
		T _A = 25 °C	0.5 ^b	
		T _A = 70 °C	0.3 ^b	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to 150	°C	
Soldering Recommendations (Peak Temperature) ^c		260		

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient ^{a, d}	R _{thJA}	105	135	°C/W	
Maximum Junction-to-Ambient ^{b, e}		200	260		

Notes:

- Surface mounted on 1" x 1" FR4 board with full copper, t = 5 s.
- Surface mounted on 1" x 1" FR4 board with minimum copper, t = 5 s.
- Refer to IPC/JEDEC (J-STD-020), no manual or hand soldering.
- Maximum under steady state conditions is 185 °C/W.
- Maximum under steady state conditions is 330 °C/W.

SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA	20			V
V _{DS} Temperature Coefficient	ΔV _{DS} /T _J	I _D = 250 μA		29		mV/°C
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)} /T _J			- 2.6		
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	0.4		1	V
Gate-Source Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 8 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 20 V, V _{GS} = 0 V			1	μA
		V _{DS} = 20 V, V _{GS} = 0 V, T _J = 55 °C			10	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 5 V, V _{GS} = 4.5 V	10			A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = 4.5 V, I _D = 1 A		0.048	0.059	Ω
		V _{GS} = 3.7 V, I _D = 1 A		0.049	0.061	
		V _{GS} = 2.5 V, I _D = 1 A		0.052	0.065	
		V _{GS} = 1.8 V, I _D = 0.5 A		0.060	0.085	
Forward Transconductance ^a	g _{fs}	V _{DS} = 10 V, I _D = 1 A		12		S
Dynamic^b						
Total Gate Charge	Q _g	V _{DS} = 10 V, V _{GS} = 8 V, I _D = 1 A		11	17	nC
				6.3	10	
Gate-Source Charge	Q _{gs}	V _{DS} = 10 V, V _{GS} = 4.5 V, I _D = 1 A		0.8		nC
Gate-Drain Charge	Q _{gd}			1.4		
Gate Resistance	R _g	f = 1 MHz		6		Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = 10 V, R _L = 10 Ω I _D ≅ 1 A, V _{GEN} = 4.5 V, R _g = 1 Ω		10	20	ns
Rise Time	t _r			13	25	
Turn-Off Delay Time	t _{d(off)}			33	60	
Fall Time	t _f			10	20	
Turn-On Delay Time	t _{d(on)}	V _{DD} = 10 V, R _L = 10 Ω I _D ≅ 1 A, V _{GEN} = 8 V, R _g = 1 Ω		5	10	ns
Rise Time	t _r			11	20	
Turn-Off Delay Time	t _{d(off)}			25	50	
Fall Time	t _f			10	20	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I _S	T _A = 25 °C			0.7	A
Pulse Diode Forward Current	I _{SM}				20	
Body Diode Voltage	V _{SD}	I _S = 1 A, V _{GS} = 0 V		0.8	1.2	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = 1 A, dI/dt = 100 A/μs, T _J = 25 °C		10	20	ns
Body Diode Reverse Recovery Charge	Q _{rr}			3	10	nC
Reverse Recovery Fall Time	t _a			6		ns
Reverse Recovery Rise Time	t _b			4		

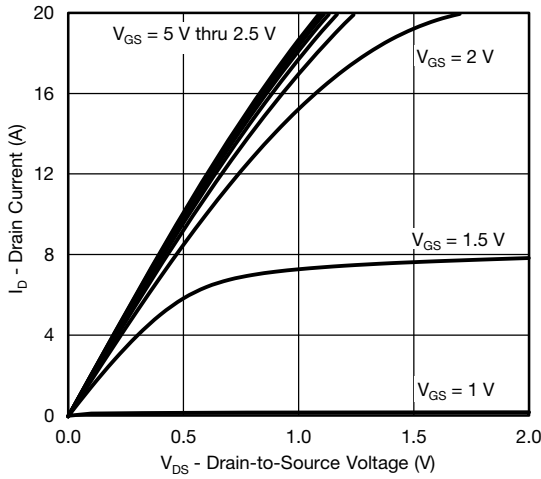
Notes:

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

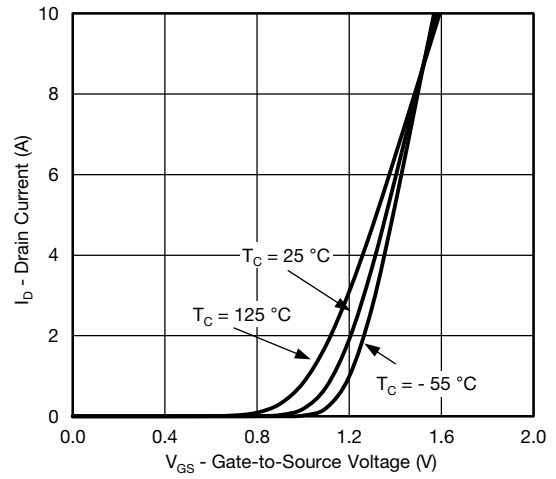
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



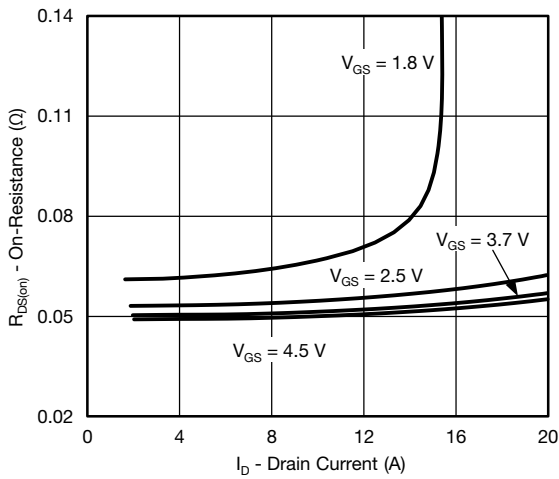
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



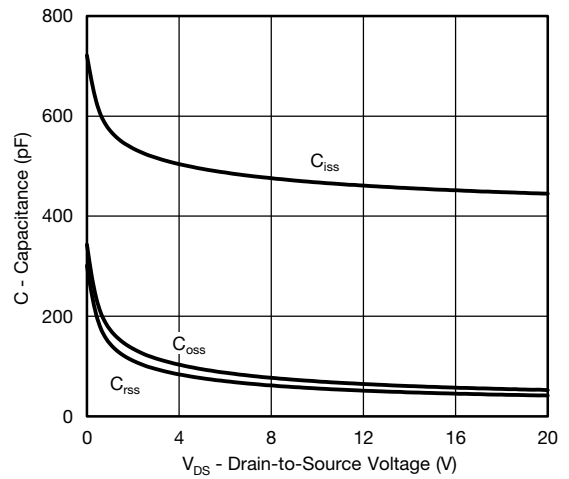
Output Characteristics



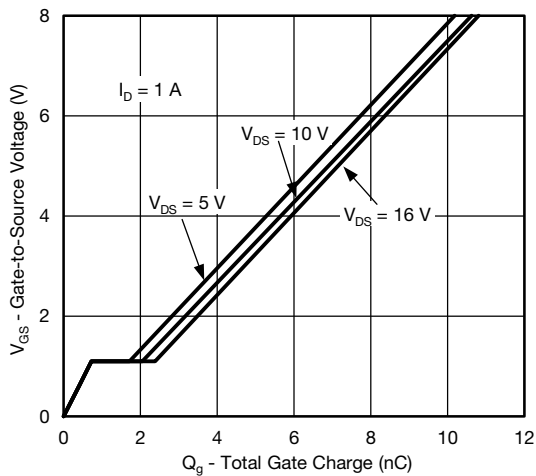
Transfer Characteristics



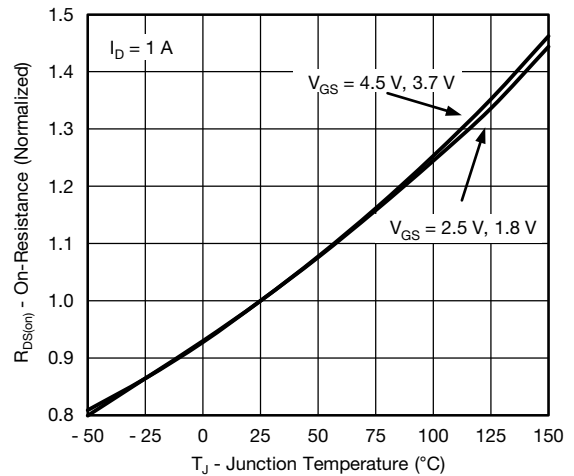
On-Resistance vs. Drain Current



Capacitance

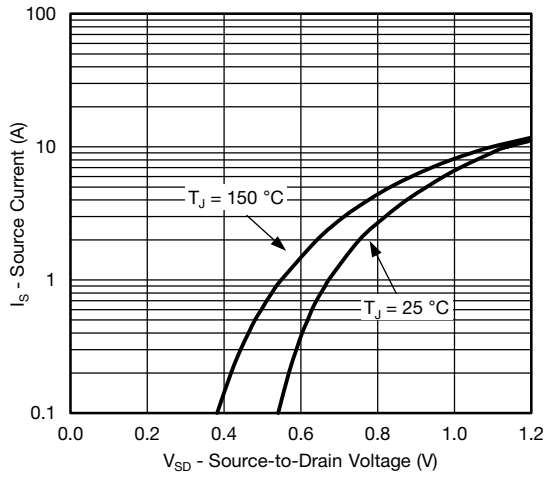


Gate Charge

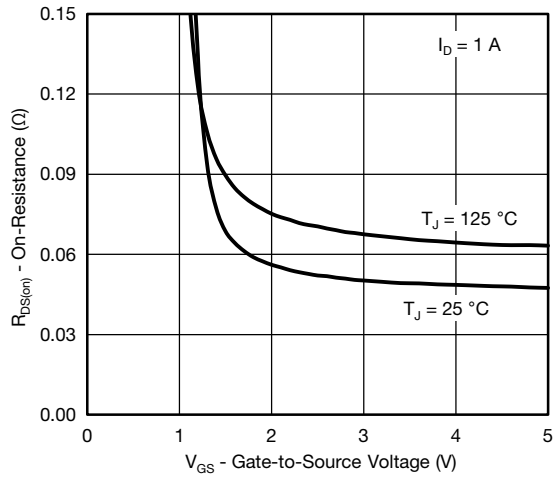


On-Resistance vs. Junction Temperature

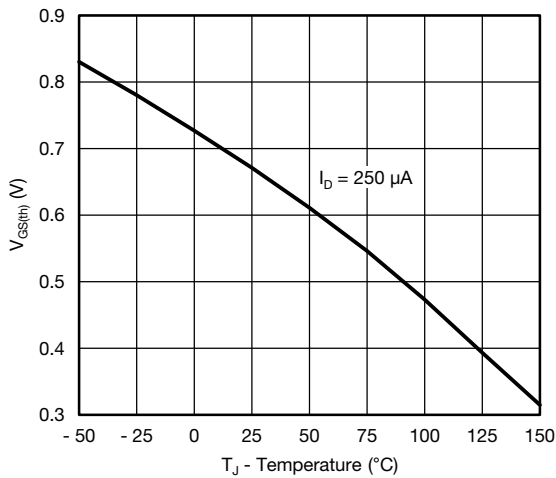
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



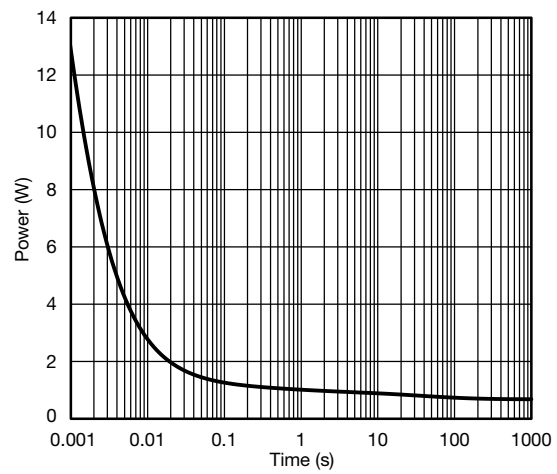
Source-Drain Diode Forward Voltage



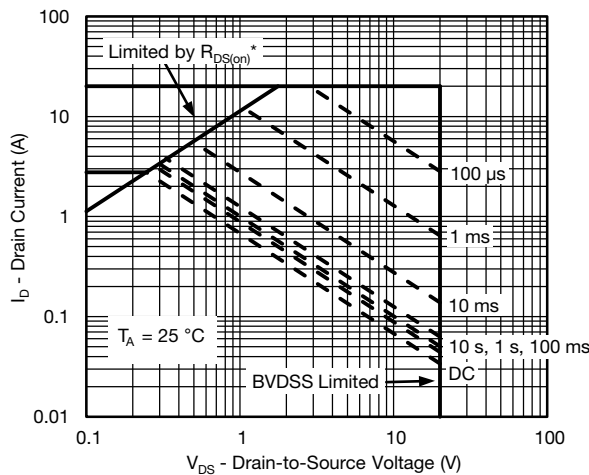
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



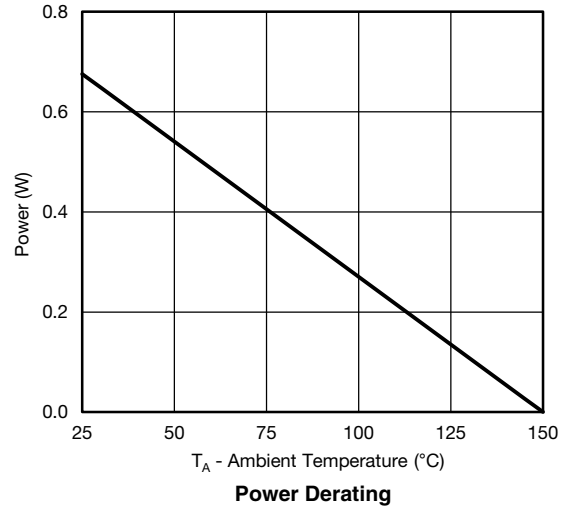
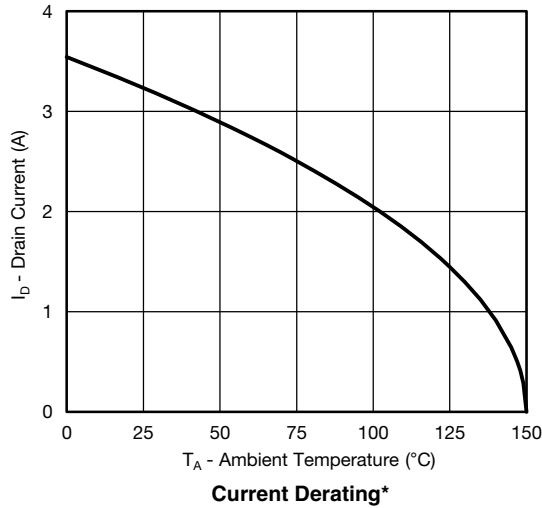
Single Pulse Power (Junction-to-Ambient)



Safe Operating Area, Junction-to-Ambient



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Note:
When mounted on 1" x 1" FR4 with full copper.

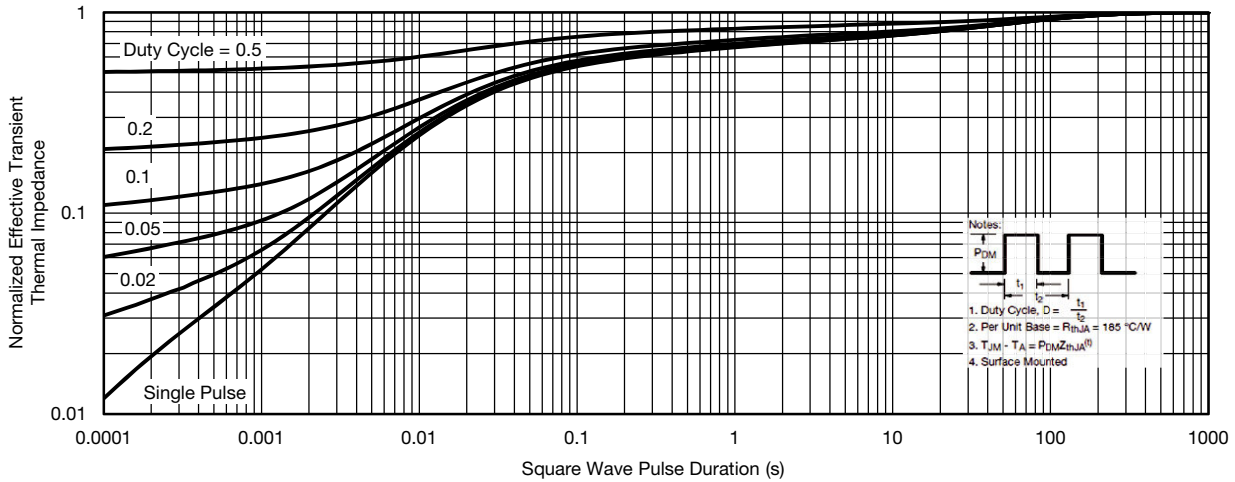
* The power dissipation P_D is based on $T_{J(max.)} = 150\text{ °C}$, using junction-to-ambient thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

Si8812DB

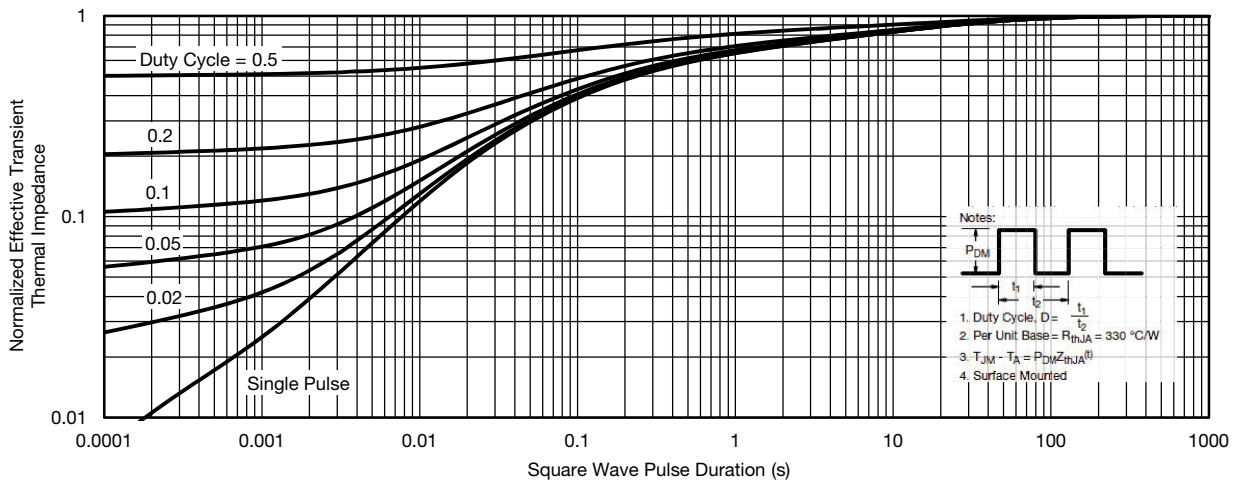
Vishay Siliconix



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient (On 1" x 1" FR4 board with maximum copper)

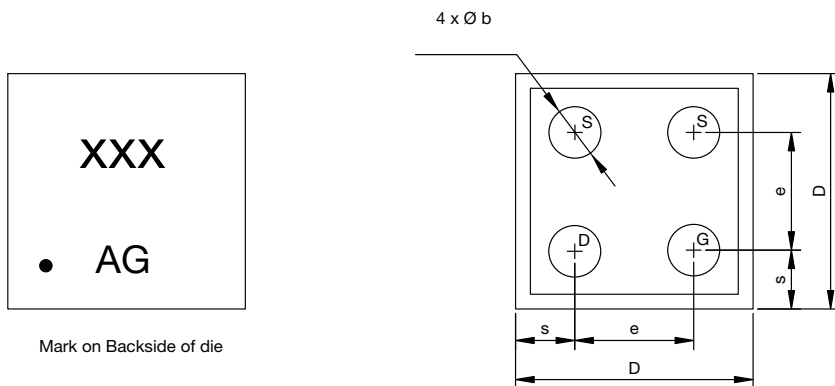


Normalized Thermal Transient Impedance, Junction-to-Ambient (On 1" x 1" FR4 board with minimum copper)



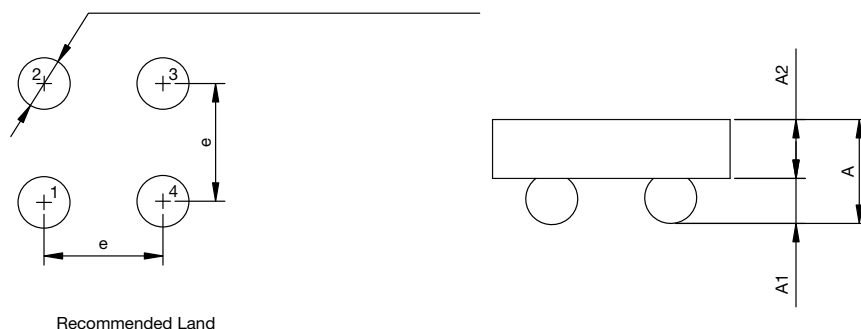
PACKAGE OUTLINE

MICRO FOOT 0.8 mm x 0.8 mm: 4-BUMP (2 x 2, 0.4 mm PITCH)



Mark on Backside of die

4 x Ø 0.205 to 0.225 Note 4
Solder Mask ~ Ø 0.215



Recommended Land

Notes (Unless otherwise specified):

1. All dimensions are in millimeters.
2. Four (4) solder bumps are lead (Pb)-free 95.5Sn/3.5Ag/0.7Cu with diameter Ø 0.165 mm to Ø 0.185 mm.
3. Backside surface is coated with a Ti/Ni/Ag layer.
4. Non-solder mask defined copper landing pad.
5. • is location of pin 1.

Dim.	Millimeters ^a			Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	0.314	0.357	0.400	0.0124	0.0141	0.0157
A ₁	0.127	0.157	0.187	0.0050	0.0062	0.0074
A ₂	0.187	0.200	0.213	0.0074	0.0079	0.0084
b	0.165	0.175	0.185	0.0064	0.0068	0.0072
e		0.400			0.0157	
s	0.180	0.200	0.220	0.0070	0.0078	0.0086
D	0.760	0.800	0.840	0.0299	0.0314	0.0330

Notes:

- a. Use millimeters as the primary measurement.

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?63682.



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- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
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- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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