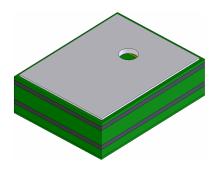
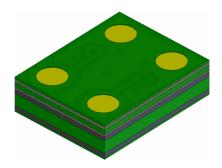


"Ultra-Mini" SiSonicTM Microphone Specification With RF Protection





Knowles Acoustics 1151 Maplewood Drive Itasca, IL 60143

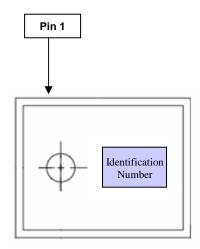




1. DESCRIPTION AND APPLICATION

- 1.1 Description"Mini" Surface Mount Silicon Microphone with RFFilter Protection
- 1.2 Application
 Hand held consumer electronics

2. PART MARKING



Identification Number Convention

S 1 2 3 4 5 6 7

S: Manufacturing Location
"S" – Knowles Electronics Suzhou
Suzhou, China

"No Alpha Character" – Knowles Electronics Itasca Itasca, IL USA

"E" – Engineering Samples

Digits 1 – 7: Job Identification Number

3. TEMPERATURE RANGE

3.1 Operating Temperature Range: -40°C to +100°C

3.2 Storage Temperature Range: -40°C to +100°C

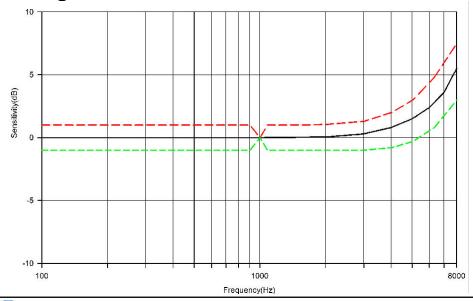




4. ACOUSTIC & ELECTRICAL SPECIFICATIONS

	Symbol	Condition	Limits			Unit
	Syllibol	Condition	Min.	Nom.	Max.	Oilit
Directivity		Omni-directional				
Sensitivity	S	@ 1kHz (0dB=1V/Pa)	-45	-42	-39	dB
Output impedance	Z _{OUT}	@ 1kHz (0dB=1V/Pa)	n/a	n/a	300	Ω
Current Consumption	I _{DSS}	across 1.5 to 3.6 volts	0.100	n/a	0.250	mA
Signal to Noise Ratio	S/N	@ 1kHz (0dB=1V/Pa)	55	59	n/a	dB
Supply Voltage	Vs		1.5	n/a	3.6	V
Typical Input Referred Noise	ENL	A-weighted	n/a	35	n/a	dBA SPL
Sensitivity Loss across Voltage		Change in sensitivity over 3.6v to 1.5v	No Change Across Voltage Range		dB	
Maximum Input Sound Level		At 100dB SPL, THD < 1% At 115dB SPL, THD = < 10%		dB		

5. FREQUENCY RESPONSE CURVE



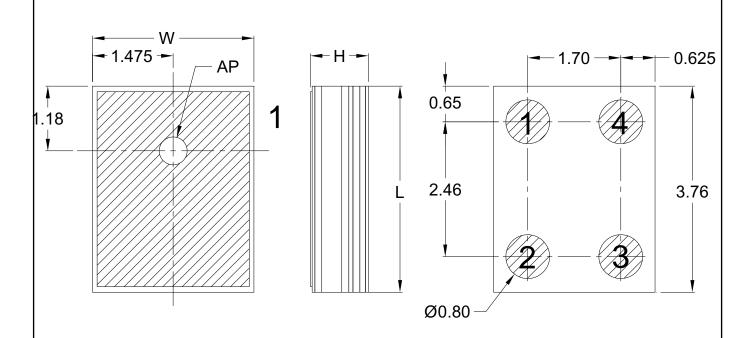


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Revision: C 3 of 10



6. MECHANICAL SPECIFICATIONS



PIN Designation		
Pin#	Function	
1	Power	
2	Ground	
3	Ground	
4	Output	

Item	Dimension	Tolerance (+/-)	Units
Length (L)	3.76	0.10	mm
Width (W)	2.95	0.10	mm
Height (H)	1.10	0.10	mm
Acoustic Port (<i>Diameter</i>) (AP)	0.50	0.10	mm

Note: (Tolerance +/-0.15mm unless otherwise specified)

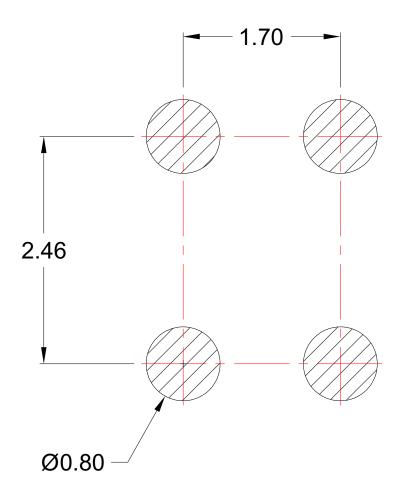


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Revision: C 4 of 10



7. RECOMMENDED CUSTOMER LAND PATTERN

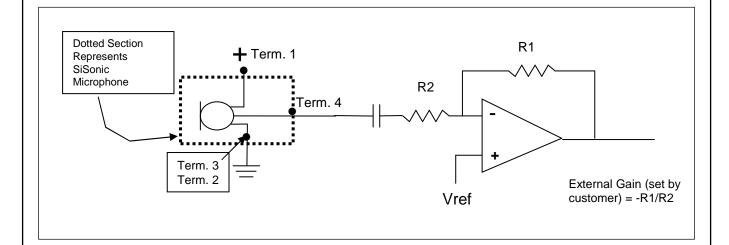


8. RECOMMENDED SOLDER STENCIL PATTERN N/A





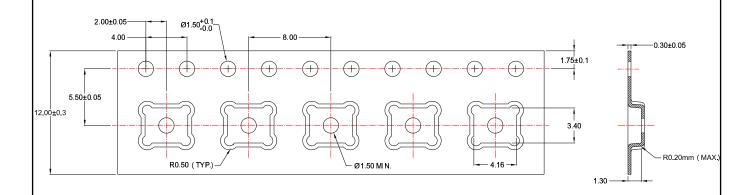
9. RECOMMENDED INTERFACE CIRCUIT

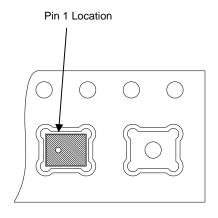






10. PACKAGING DETAIL





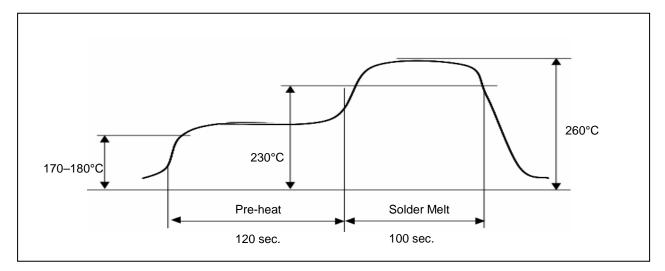
Model Number	Suffix	<u>Reel</u> <u>Diameter</u>	Quantity per Reel
SPUL409HE5H-PB	-2	7"	1,200
SPUL409HE5H-PB	-7	13"	5,700

Leader Length	800mm or minimum of 100 empty pockets
Label	Label applied to external package and direct to reel. Per JEDEC.
Empty Units	No consecutive empty pockets; No more than 3 empty pockets per reel. (Does not include empty pockets for leader/follower)





11. SOLDER REFLOW PROFILE



<u>Stage</u>	<u>Temperature Profile</u>	<u>Time (maximum)</u>
Pre-heat	170 ~ 180 C	120 sec.
Solder Melt	Above 230 C	100 sec.
Peak	260 C maximum	30 sec.

Notes:

- 1. <u>Do not pull a vacuum</u> over the port hole of the microphone. Pulling a vacuum over the port hole can damage the device.
- 2. <u>Do not board wash</u> after the reflow process. Board washing and cleaning agents can damage the device. Do not expose to ultrasonic processing or cleaning.
- 3. Number of Reflow = recommend no more than 3 cycles.

12. ADDITIONAL NOTES

- (A) Packaging (reference SiSonic_Packaging_Spec.pdf)
- (B) Shelf life: Twelve (12) months when devices are to be stored in factory supplied, unopened ESD moisture sensitive bag under maximum environmental conditions of 30°C, 70% R.H.
- (C) Exposure: Devices should not be exposed to high humidity, high temperature environment. MSL (moisture sensitivity level) Class 2.
- (D) Out of bag: Maximum of 90 days out of ESD moisture sensitive bag, assuming maximum conditions of 30°C/70% R.H.



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Revision: C 8 of 10



13. RELIABILITY SPECIFICATIONS

Note: After test conditions are performed, the sensitivity of the microphone shall not deviate more than 3dB from its initial value.

Test	Description
Thermal Shock	100 cycles of air-air thermal shock from -40C to +125C with 15min soaks. (ICE 68-2-4)
High Temperature Storage	+105C environment for 1,000 hours. (IEC 68-2-2 Test Ba)
Low Temperature Storage	-40C environment for 1,000 hours. (IEC 68-2-2 Test Aa)
High Temperature Bias	+105C environment while under bias for 1,000 hours. (IEC 68-2-2 Test Ba)
Low Temperature Bias	-40C environment while under bias for 1,000 hours. (IEC 68-2-2 Test Aa)
Temperature / Humidity Bias	+85C/85% RH environment while under bias for 500 hours. (JESD22-A101A-B)
Vibration	4 cycles lasting 12 minutes from 20 to 2,000Hz in X, Y, and Z direction with a peak acceleration of 20g. (MIL 883E, Method 2007.2, A)
Electrostatic Discharge	3 discharges at +/- 8kV direct contact to the lid when unit is grounded (IEC 1000-4-2) and 3 discharges at +/- 2kV direct contact to the I/O pins (MIL 883E, Method 3015.7)
Reflow	5 reflow cycles with peak temperature of 260C.
Mechanical Shock	3 pulses of 10,000g in the X, Y, and Z direction. (IEC 68-2-27, Test Ea)





14. SPECIFICATION REVISIONS

Revision	Detailed Specification Changes	Date
А	Preliminary Specification Release	02-14-2008
В	Specification Release. Update Product Marking	04-25-2008
С	Update Product Marking	06-26-2008

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