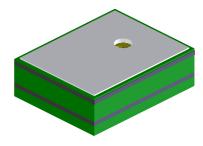
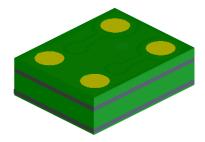


"UltraMini" SiSonic[™] Microphone Specification With Enhanced RF Protection - *Halogen Free*





Knowles Acoustics 1151 Maplewood Drive Itasca, IL 60143





1. DESCRIPTION AND APPLICATION

- 1.1 DESCRIPTION
 "UltraMini" Surface Mount Silicon Microphone with
 Enhanced RF Protection Halogen Free
- 1.2 APPLICATION

Consumer electronics devices

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, 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



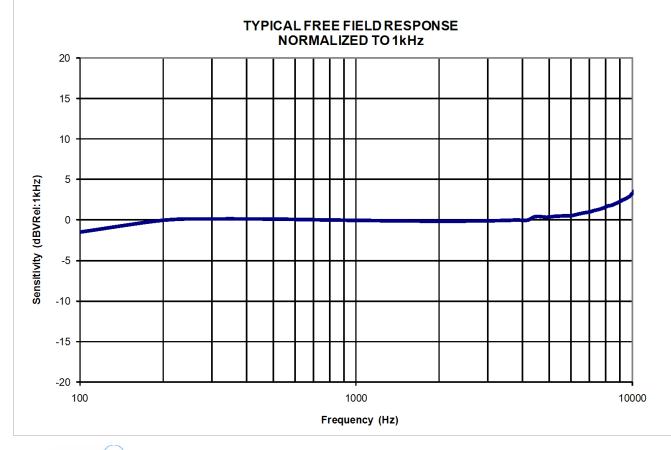


4. ACOUSTIC & ELECTRICAL SPECIFICATIONS

TEST CONDITIONS: +20°C, 60-70% R.H.

	Symbol	Condition	Limits			Unit
	Syllibol	Condition	Min.	Nom.	Max.	0111
Directivity		Omni-directional			-	
Sensitivity	S	@ 1kHz (0dB-1V/Pa)	-45	-42	-39	dB
Output Impedance	Zout	@ 1kHz (0dB-1V/Pa)			300	Ω
Current Consumption	I DDs	Across 1.5 to 3.6 volts			250	μΑ
Signal to Noise Ratio	S/N	@ 1kHz (0dB-1V/Pa)		59		dB
Supply Voltage	Vs		1.5		3.6	>
Sensitivity Loss Across		Change in sensitivity	No Change Across Voltage		dB	
Voltage		over 3.6V to 1.5V	Range		СВ	
Total Harmonic	THD At 100dB SPL, THD < 1%					
Distortion	At 115dB SPL, THD ≤ 10%		10%			

5. FREQUENCY RESPONSE CURVE



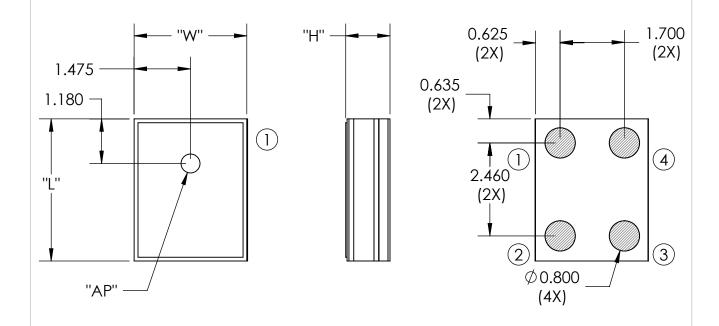


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Revision: E Release Level: Active Sheet 3 of 10



6. MECHANICAL SPECIFICATIONS



ITEM	DIMENSION	TOLERANCE	UNITS
LENGTH (L)	3.760	±0.100	mm
WIDTH (W)	2.950	±0.100	mm
HEIGHT (H)	1.100	±0.100	mm
ACOUSTIC	Ø0.500	±0.100	mm
PORT (AP)	Ø0.300	±0.100	mm

PIN OUTPUT		
PIN#	FUNCTION	
1	POWER (Vdd)	
2	GROUND	
3	GROUND	
4	OUTPUT	

Note:

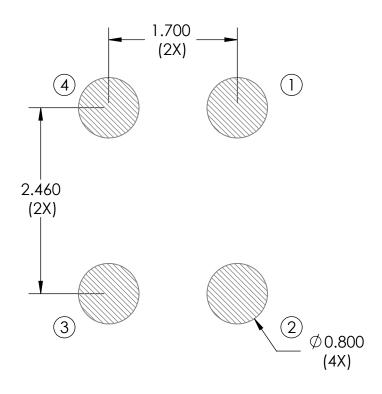
Dimensions are in milimeters unless otherwise specified.

Tolerance ± 0.15 mm unless otherwise specified.





7. RECOMMENDED CUSTOMER LAND PATTERN



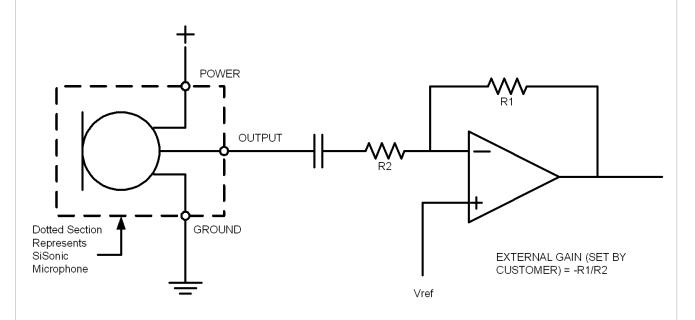
8. RECOMMENDED SOLDER STENCIL PATTERN

N/A



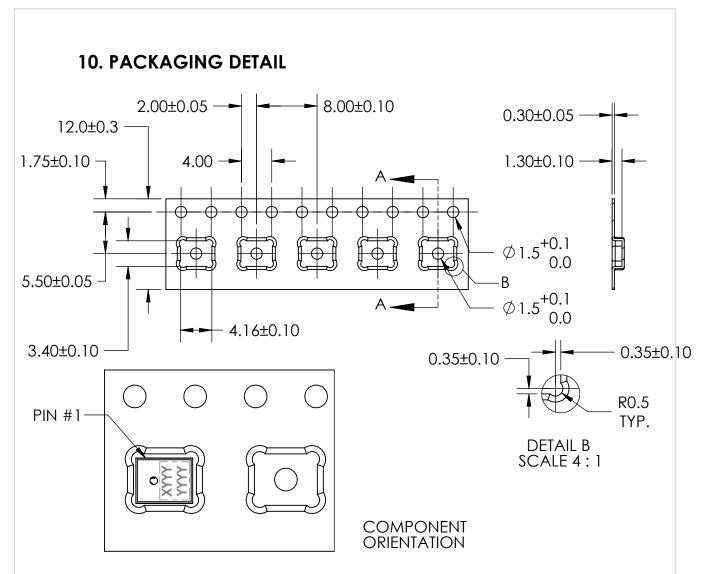


9. RECOMMENDED INTERFACE CIRCUIT









MODEL NUMBER	SUFFIX	REEL	QUANTITY
MODEL NOMBER		DIAMETER	PER REEL
SPUL409HE5H-PB	-7	13"	5,700

TAPE & REEL	PER EIA-481
LABFI	LABEL APPLIED TO EXTERNAL PACKAGE &
LADEL	DIRECT TO REEL.

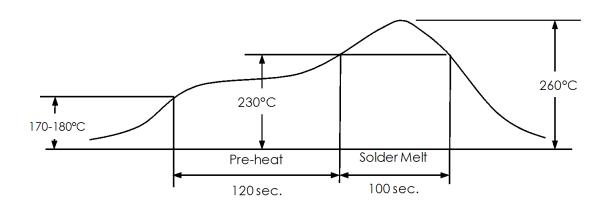
Note:

Dimensions are in milimeters unless otherwise specified.





11. SOLDER FLOW PROFILE



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

12. ADDITIONAL NOTES

- Shelf life: Twelve (12) months when devices are to be stored in factory supplied, (A) unopened ESD moisture sensitive bag under maximum environmental conditions of 30°C, 70% R.H.
- MSL (moisture sensitivity level) Class 2a. Do not pull a vacuum over port hole of the microphone. Pulling a vacuum over the port hole can damage the device.
- Do not board wash after the reflow process. Board washing and cleaning agents (D)
- can damage the device. Do not expose to ultrasonic processing or cleaning. Do not brush board after the reflow process. Brushing the board with/without (E) solvents can damage the device.
- Do not insert any object in port hole of device at any time as this can damage the (F)
- Number of reflow Recommend no more than 3 cycles.



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Revision: E Release Level: Active Sheet 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 -40°C to	
mema shock	+125°C with 15 minute soaks. (ICE 68-2-4)	
High Temperature	+105°C environment for 1,000 hours. (ICE 68-2-2 Test	
Storage	Ba)	
Low Temperature	-40°C environment for 1,000 hours. (ICE 68-2-2 Test Aa)	
Storage	-40 C GITVITOTITION 1,000 110013. (ICE 00-2-2 1631 Adj	
High Temperature Bias	+105°C environment while under bias for 1,000 hours.	
	(ICE 68-2-2 Test Ba)	
Low Tomporature Piac	-40°C environment while under bias for 1,000 hours.	
Low Temperature Bias	(ICE 68-2-2 Test Aa)	
Temperature / Humidity +85°C/85% R.H. environment while under bias for 1,0		
Bias	hours. (JESD22-A101A-B)	
	4 cycles lasting 12 minutes from 20 TO 2,000 Hz in X, Y	
Vibration	and Z direction with peak acceleration of 20g. (MIL	
	883E, Method 2007.2, A)	
	3 discharges at +/-8kV direct contact to lid when unit	
Electrostatic Discharge	is grounded (IEC 61000-4-2) and 3 discharges at +/-2kV	
	direct contact to I/O pins. (MIL 883E, Method 3015.7)	
Reflow	5 reflow cycles with peak temperature of +260°C.	
Machanical Shook	3 pulses of 10,000g in the X, Y and Z direction. (IEC 68-2-	
Mechanical Shock	27, Test Ea)	





14. SPECIFICATION REVISIONS

Revision	Detailed Specification Changes	Date
E	Updated to standard format. (E, C10110172)	9-24-2009

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