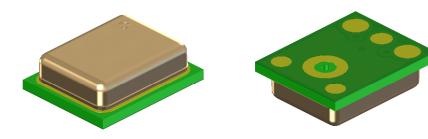


# Zero Height "Ultra-Mini" SiSonic<sup>™</sup> Microphone Specification With MaxRF Protection - *Halogen Free*



Knowles Acoustics 1151 Maplewood Drive Itasca, IL 60143





#### 1. DESCRIPTION AND APPLICATION

- 1.1 DESCRIPTION

  Zero Height "Ultra-mini" Surface Mount Silicon

  Microphone with Maximum RF Protection Halogen Free
- 1.2 APPLICATION

Hand held consumer electronic 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



Release Level: ACTIVE Sheet 2 of 10

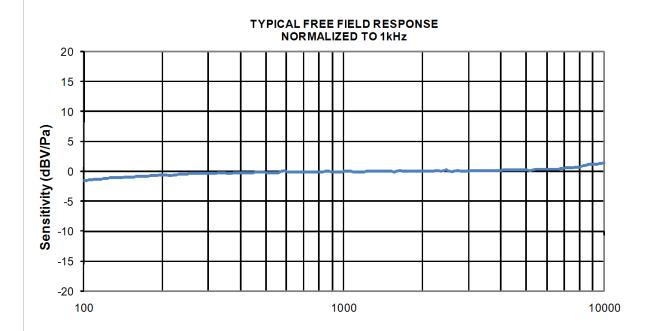


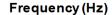
### 4. ACOUSTIC & ELECTRICAL SPECIFICATIONS

TEST CONDITIONS: +20°C, 60-70% R.H.

	Symbol	Condition	Limits		Unit	
	Зуппоот	Condition	Min.	Nom.	Max.	OHIII
Directivity		Omni-directional				
Sensitivity	S	@ 1kHz (0dB-1V/Pa)	-41	-38	-35	dB
Output Impedance	Zout	@ 1kHz (0dB-1V/Pa)			400	Ω
Current Consumption	Idds	Across 1.5 to 3.6 volts			250	μA
Signal to Noise Ratio	S/N	@ 1kHz (0dB-1V/Pa)		62		dB
Supply Voltage	Vs		1.5		3.6	V
Sensitivity Loss Across		Change in sensitivity	No Char	nge Across	: Voltage	dB
Voltage		over 3.6V to 1.5V		Range		αь
Total Harmonic	THD	At 100dB	SPL, THD <	< 1%		
Distortion	טווו	At 115dB \$	SPL, THD <	10%		

### 5. FREQUENCY RESPONSE CURVE



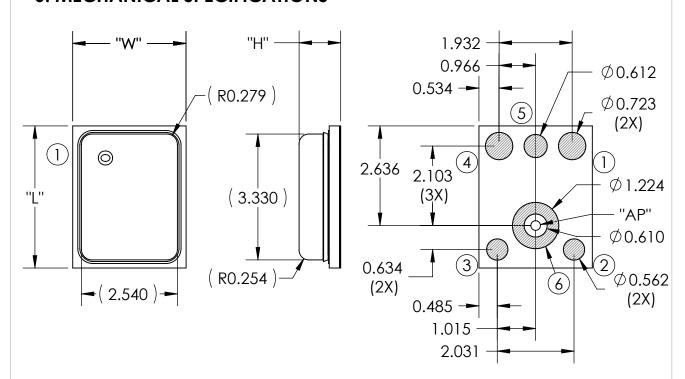




Revision: B Release Level: ACTIVE Sheet 3 of 10



### 6. MECHANICAL SPECIFICATIONS



ITEM	DIMENSION	TOLERANCE	UNITS
LENGTH (L)	3.760	±0.100	mm
WIDTH (W)	3.000	±0.100	mm
HEIGHT (H)	1.100	±0.100	mm
ACOUSTIC	Ø0.250	±0.076	po po
PORT (AP)	Ø0.230	±0.076	mm

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

#### Note:

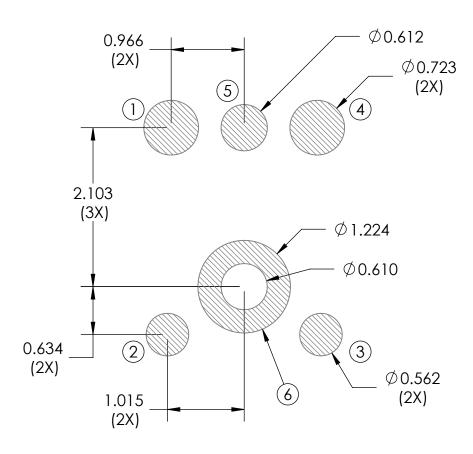


Dimensions are in milimeters unless otherwise specified. Tolerance  $\pm 0.15$ mm unless otherwise specified.

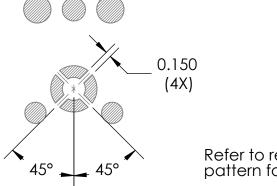




#### 7. RECOMMENDED CUSTOMER LAND PATTERN



### 8. RECOMMENDED SOLDER STENCIL PATTERN

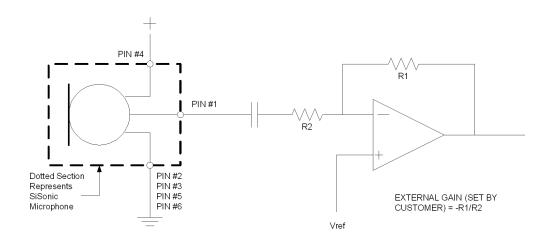


Refer to recommended land pattern for dimensions not shown.





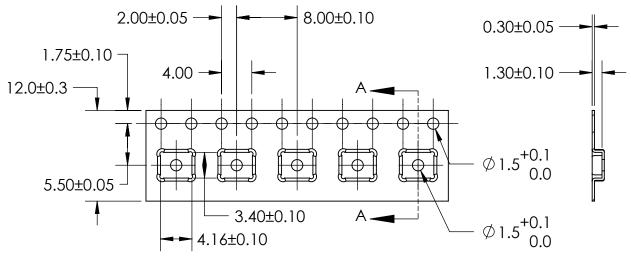
### 9. RECOMMENDED INTERFACE CIRCUIT

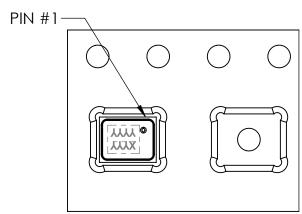






#### 10. PACKAGING DETAIL





**COMPONENT ORIENTATION** 

MODEL NUMBER	SUFFIX	REEL DIAMETER	QUANTITY PER REEL
SPU0410LR5H-QB	-2	7"	1,200
SI 004TOLKSIT-QD	-7	13"	5,700

TAPE & REEL	PER EIA-481
II ABFI	LABEL APPLIED TO EXTERNAL PACKAGE & DIRECT TO REEL.

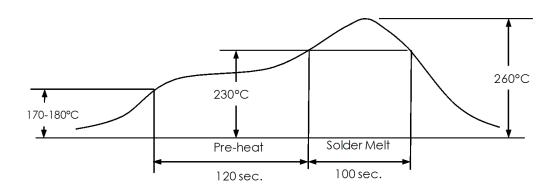
Note:

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

- (A) 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.
- (B) MSL (moisture sensitivity level) Class 2a.
- (C) Do not pull a vacuum over port hole of the microphone. Pulling a vacum over the port hole can damage the device.
- (D) Do not board wash after the reflow process. Board washing and cleaning agents can damage the device. Do not expose to ultrasonic processing or cleaning.
- (E) <u>Do not brush board</u> after the reflow process. Brushing the board with/without solvents can damage the device.
- (F) <u>Do not insert any object in port hole</u> of device at any time as this can damage the device.
- (G) Number of reflow Recommend no more than 3 cycles.



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## 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	
moman erre en	+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	1-40 C GITVITOTITION 1,000 MOUIS. (ICE 60-2-2 1651 Ad)	
High Topon orature Diese	+105°C environment while under bias for 1,000 hours.	
High Temperature Bias	(ICE 68-2-2 Test Ba)	
l T Di	-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 1,00		
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	
Licenostatic Discharge	direct contact to I/O pins. (MIL 883E, Method 3015.7)	
	alloci corrider to 1,0 piris. (Mile 000E, Metriod 3013.7)	
Reflow	5 reflow cycles with peak temperature of +260°C.	
Mechanical Shock	3 pulses of 10,000g in the X, Y and Z direction. (IEC 68-2-	
MECHANICALSHOCK	27, Test Ea)	





#### 14. SPECIFICATION REVISIONS

Revision	Detailed Specification Changes	Date
Α	Initial release. (DMS, ECO#C10109828)	7/8/2009
В	Update response curve (section 5). (DMS, C10110084)	7/20/2009

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