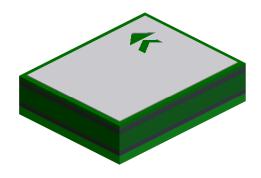
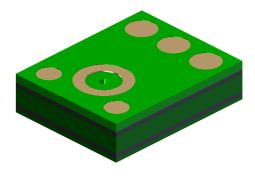


"Mini" SiSonic[™] Microphone Specification With Enhanced RF Protection - *Halogen Free*





Knowles Acoustics 1151 Maplewood Drive Itasca, IL 60143





1. DESCRIPTION AND APPLICATION

- 1.1 DESCRIPTION "Mini" 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



Release Level: ACTIVE Sheet 2 of 10

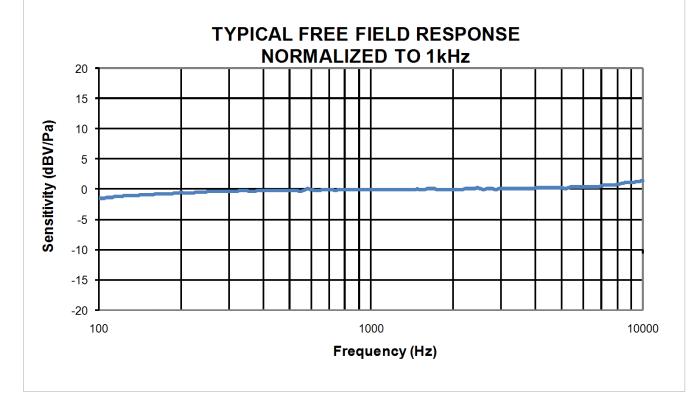


4. ACOUSTIC & ELECTRICAL SPECIFICATIONS

TEST CONDITIONS: +20°C, 60-70% R.H.

	Symbol	Condition	Limits			Unit
	39111001	Condition	Min.	Nom.	Max.	OF III
Directivity		Omni-directional				
Sensitivity	S	@ 1kHz (0dB-1V/Pa)	-41	-38	-35	dB
Output Impedance	Zout	@ 1kHz (0dB-1V/Pa)			300	Ω
Current Consumption	I DDs	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 Change 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 <u><</u>	10%		

5. FREQUENCY RESPONSE CURVE



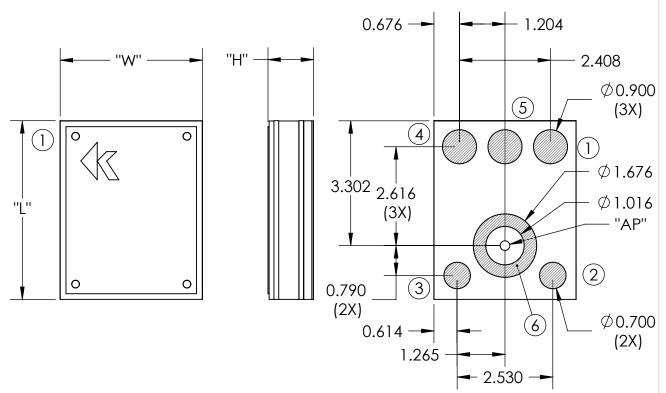


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6. MECHANICAL SPECIFICATIONS



ITEM	DIMENSION	TOLERANCE	UNITS
LENGTH (L)	4.724	±0.100	mm
WIDTH (W)	3.759	±0.100	mm
HEIGHT (H)	1.250	±0.100	mm
ACOUSTIC	Ø0.254	±0.100	mm
PORT (AP)	WU.234	10.100	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.

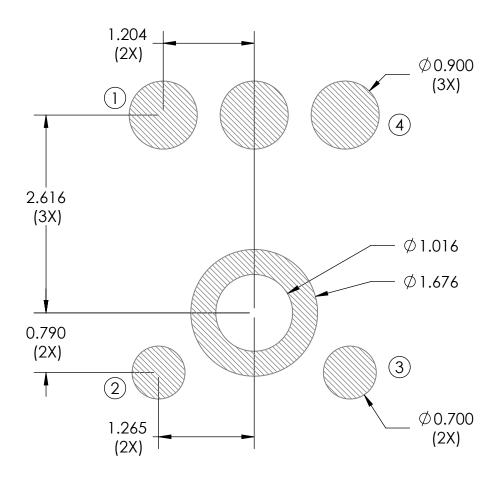
Tolerance ± 0.15 mm unless otherwise specified.



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7. RECOMMENDED CUSTOMER LAND PATTERN



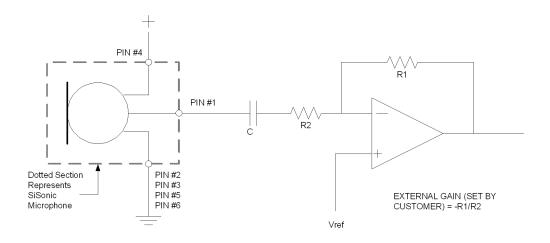
8. RECOMMENDED SOLDER STENCIL PATTERN

N/A





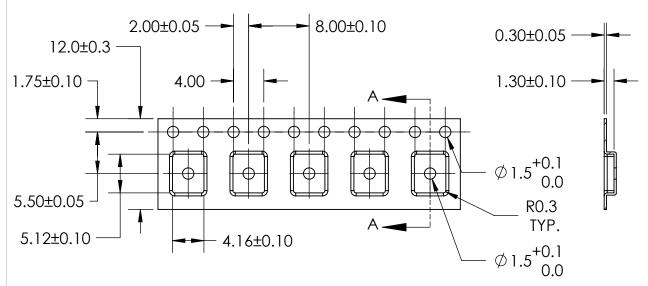
9. RECOMMENDED INTERFACE CIRCUIT

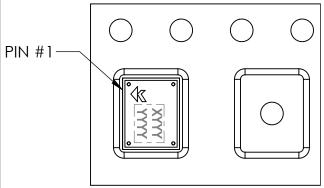






10. PACKAGING DETAIL





COMPONENT ORIENTATION

MODEL NUMBER	SUFFIX	reel Diameter	Quantity Per reel
SPM0404LE5H-QB	-2	7"	1,200
31 1V10404LL311-QD	-6	13"	4,800

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

Note:

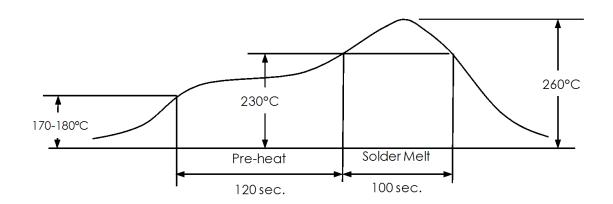
Dimensions are in milimeters unless otherwise specified.



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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) <u>Do not pull a vacuum</u> 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 after the reflow process.</u> 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	
	+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 environment for 1,000 floors. (ICE 86-2-2 lest Ad)	
High Tomporature Pigs	+105°C environment while under bias for 1,000 hours.	
High Temperature Bias	(ICE 68-2-2 Test Ba)	
Lavy Tapan aratura Diag	-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 1,000	
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.	
Ma ala quai a gul Cla a al :	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
D	Initial release. (DMS, C10109839)	7-20-2009
E	ROTATED LASER MARKING 90-DEGREES, CW TO MATCH PRODUCTION; ADDED DIMENSION FOR CORNER RADII OF CARRIER TAPE. (DMS, C10110197)	10-23-2009

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