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SoniCrest Brand Acoustic Components

www.jlsonicrest.com

Document Type : Specification
Product Type : Silicon Digital Microphone Component
Part Number : SDMO07C-26/1281

A1 - New issue created by Loki, Lo on 28 Mar., 2019		
A2 - Updated sections 2-4 and 7-11 by Hermes, Shum on 21 Oct., 2019		

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1. Purpose and Scope

This document contains both general requirements, qualification requirements, and those specific electrical, mechanical requirements for this part.

2. Description

3 x 4 x 1mm Silicon digital microphone with I²S output, reverse mount, Sensitivity tolerance ± 1 dB, RoHS compliant.

3. Application

Telecommunication Equipment, Computers and Peripherals, etc.

4. Component Requirement

4.1. General Requirement

Specification	Min.	Typ.	Max.	Unit
Operating Temperature	-40	-	100	°C
Storage Temperature	-40	-	70	°C
Operating Voltage	1.6	1.8	3.6	V

4.2. Electro Acoustical Specifications

Specification	Min.	Typ.	Max.	Unit
Directivity	Omni-directional			
Sensitivity Range (0dB = 1V/Pa)	-27	-26	-25	dBFS
Current Consumption in Normal mode	-	800	1000	μ A
Current consumption in Sleep mode	-	5	-	μ A
Total Harmonic Distortion at 110dB SPL, 1kHz	-	-	1	%
Signal to Noise Ratio (A-weighted) at 94dB SPL, 1kHz	-	65	-	dB
Power Supply Rejection (PSR) at 217Hz 100mVpp Square wave	-	-80	-	dBFS
Startup Time (Sensitivity reaching to 90%)	-	-	20	ms
Startup Time from Sleep mode	-	-	20	ms
Time for going to Sleep mode	-	-	20	ms
Clock Frequency in Normal mode	2.048	3.072	4.096	MHz
Clock Frequency in Sleep mode	-	320	-	KHz
Clock Jitter	-	-	500	ps
Load Capacitance	-	-	140	pF
Pass Band	-	18	-	KHz
Pass Band Attenuation	-	0.5	-	dB

4.3. Frequency Response

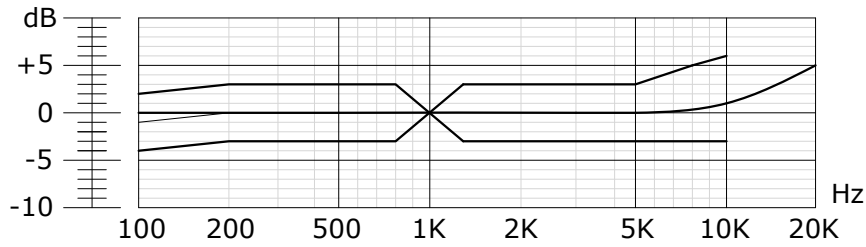


Figure 1. Frequency Response

5. Interface Circuit Design Considerations

5.1. Standard Mode (Two Microphones)

Standard Mode supports 2 microphones configuration.

5.1.1. Typical Application Schematics

L/R needs to be connected to GND for Left channel microphone.
 L/R needs to be connected to Supply for Right channel microphone.

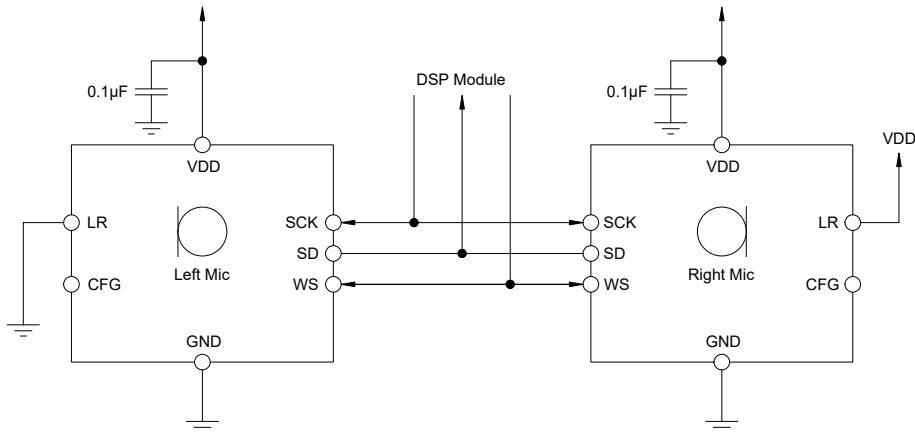


Figure 2. Typical Application Schematics for Two Microphones mode

5.1.2. Timing Diagram

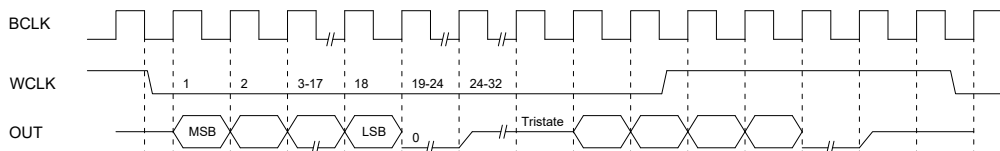


Figure 3. Timing Diagram in 2 Microphones configuration

5.2. Microphone Array Mode

Microphone Array Mode can support up to 8 microphones.

5.2.1. Typical Application Configurations

L/R pin determines if the current microphone is Left channel or Right channel. Status of CFG pin determines which slot the microphone needs to transmit.

Below are details of various configurations of L/R and CFG:

L/R =0 -> Left Channel
 L/R =1 -> Right Channel

CFG: Slot Select for 4 pairs of MICs
 Direct short to GND SLOT 1-2
 Direct Short to VDD SLOT 3-4
 47k pull-down to GND SLOT 5-6
 47k pull-up to VDD SLOT 7-8

5.2.2. Timing Diagram

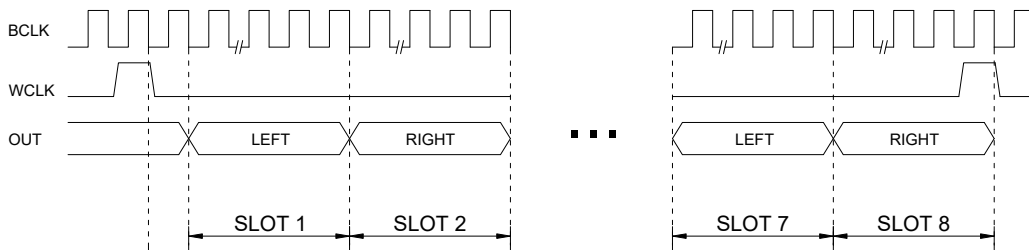
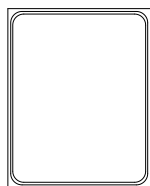


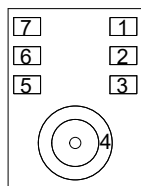
Figure 4. Timing Diagram in 8 Microphones configuration

6. Electrical Layout

Top View



Bottom View



Pin No.	Function	Type
1	L/R	Channel Select
2	CFG	Two mic or array mode
3	VDD	Power Supply
4	GND	Ground
5	WS	Serial data-word select for I ² S
6	SCK	Serial data clock for I ² S
7	SD	Serial data output

Figure 5. Electrical Layout of SDMO07C-26/1281

7. Reliability Test

- 7.1. **Reflow Simulation (without solder)** : Subject samples to reflow soldering condition with maximum temperature $260\pm 5^{\circ}\text{C}$ for 3 times. Components must be fully stabilized between each reflow test, which may require up to a 2 hours soak.
- 7.2. **Static Humidity** : Precondition at room temperature for 1 hour. Then expose to $+85^{\circ}\text{C}$ with 85% relative humidity for 1000 hours. Finally dry at room ambient for 2 hours before taking final measurement.
- 7.3. **Temperature Shock** : Each temperature cycle shall consist of 30 minutes at -40°C , 30 minutes at $+125^{\circ}\text{C}$ with 5 minutes transition time. Test duration is for 30 cycles. Components must be fully stabilized at temperature extremes before data is taken, which may require up to a 2 hours soak.
- 7.4. **ESD Test** : Perform ESD test according to IEC61000-4-2 level 3.
- 7.5. **Random Vibration** : Vibrate randomly along three perpendicular directions for 30 minutes in each direction, from 20 ~ 2000Hz with a peak acceleration 20g.
- 7.6. **Mechanical Shock** : Subject samples to half sine shock pulses ($3000\text{g}\pm 15\%$ for 0.3ms) in each direction, totally 18 shocks.
- 7.7. **Operation Life** : Subject samples to $+125^{\circ}\text{C}$ for 168 hours under maximum input voltage.
- 7.8. **Drop Test** : Drop samples naturally from the height of 1.5m onto a steel surface board for 3 times in 6 directions, totally 18 drops.

8. Recommended reflow oven temperature profile

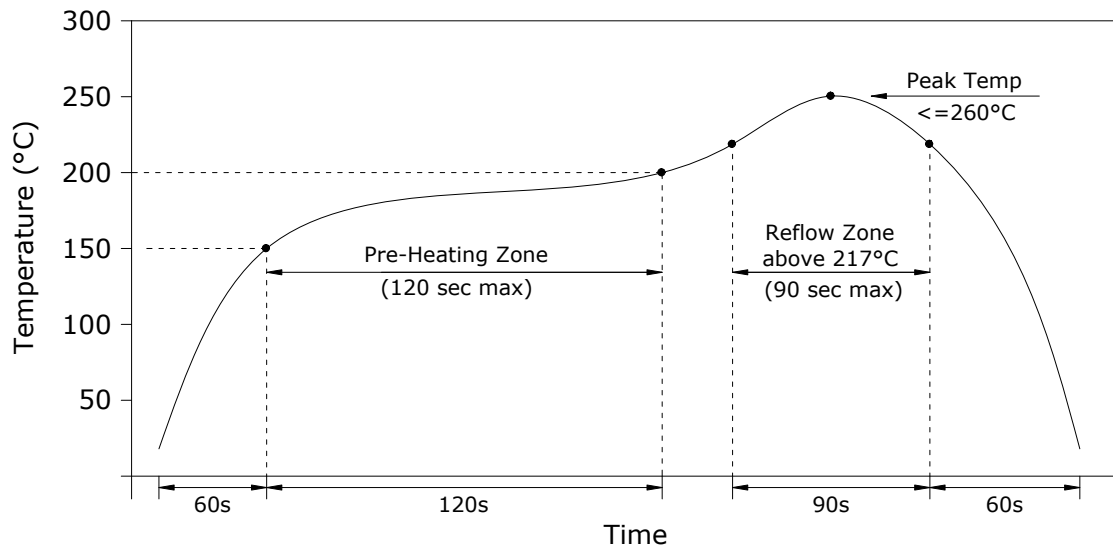


Figure 6. Recommended Reflow Oven Temperature Profile

Notes:

1. Do not boards wash or clean after the reflow process.
2. Do not apply over 0.3Mpa of air pressure into the port hole.
3. Do not expose to ultrasonic processing or cleaning.
4. Do not pull a vacuum over port hole of the microphone.

9. Mechanical Requirements

Unit : mm

Tolerance : Linear = ± 0.15
(unless otherwise specified)

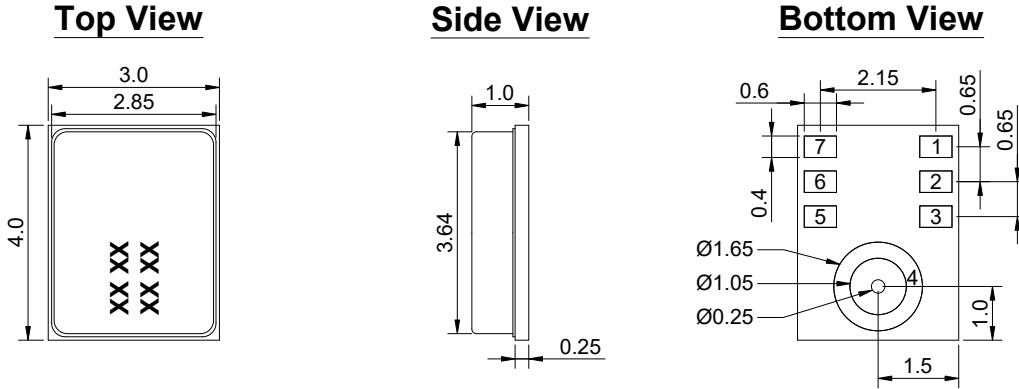


Figure 7. Mechanical Layout of SDMO07C-26/1281

10. PCB Solder Pad Layout

The below figure provide general guidance about the recommended PCB land pattern. The land pattern dimensions are exactly the same size and shape as the pads on the pressure sensor module. Recommended solder paste height is 3-5 mils (75 μ m to 125 μ m).

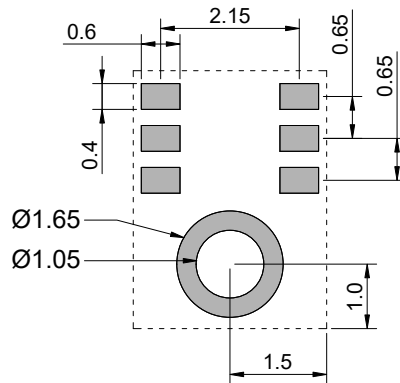


Figure 8. PCB solder pad layout for SDMO07C-26/1281

11. Standard Packing Layout

11.1. Tape Layout

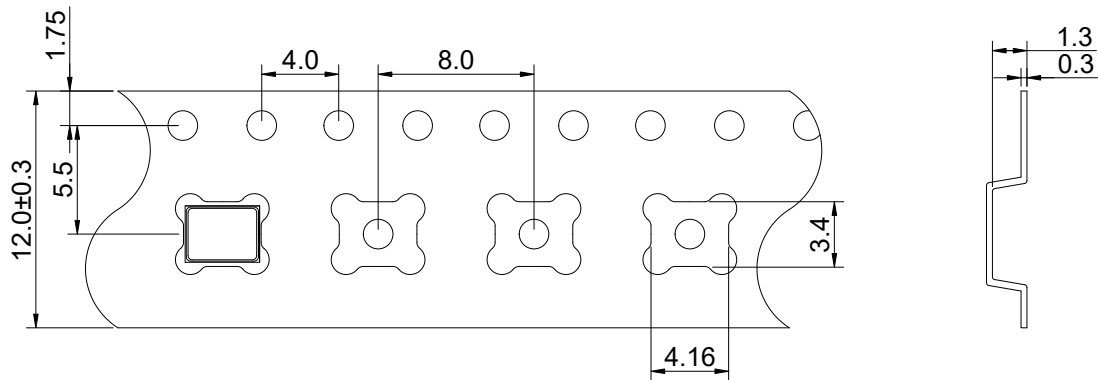


Figure 9. Tape Layout

11.2. Reel Layout

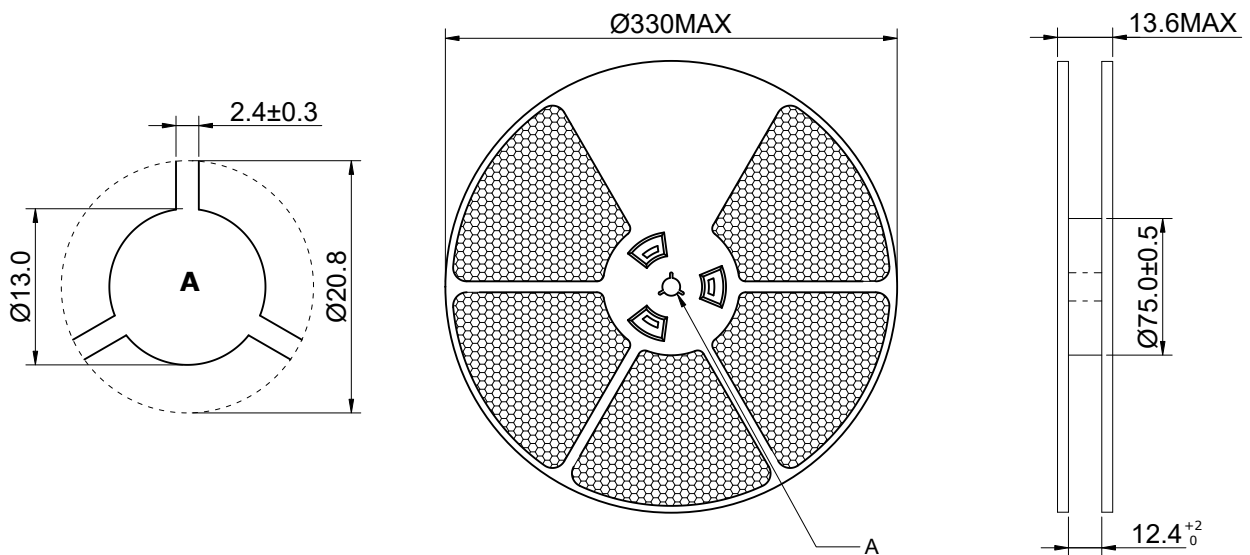


Figure 10. Reel Layout

11.3. Packing Quantity: 5000 pieces per reel, 5 reels per inner carton, 2 inner cartons per outer carton. (Total 50000 pieces)

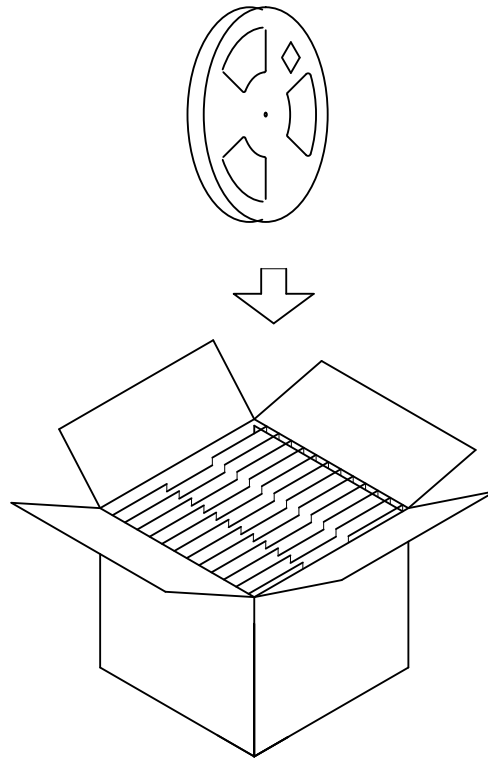
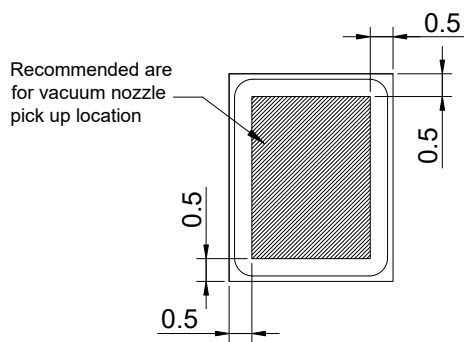


Figure 11. Reel Installation

11.4. Pickup Tool Pick Location



Pick Up Pressure Limits		
Condition	mmHg	PSI
Max. Air Purge	3000	58
Max. Vacuum	-500	9.6

Figure 12. Pickup Tool Pick Location