

	Date	29-Jun-2021	<b>SPECIFICATION</b>	OLE WOLFF
	Page	1 / 10		www.owolff.com
	DK	P/N: OWMMOA-332509A-S3811101-BP		Revision: 00



# SPECIFICATION FOR APPROVAL

## Analog MEMS Microphone

Part Number	OWMMOA-332509A-S3811101-BP
Note	This item is in compliance with the following requirements: 1. RoHS directive 2. REACH
Customer P/N	

		Prepared	Checked	Approved
Ole Wolff	Signature / Date			

		Confirmation
Customer	Signature / Date	

### REVISION NOTES:

Date	Rev.	Description of Revision
2021.06.29	00	Initial Release

OLE WOLFF ELEKTRONIK A/S Roedengvej 25 4180 Soroe Denmark  TEL: +45 57833830 FAX: +45 57820019	OLE WOLFF ELECTRONICS INC. 1525 McCarthy Blvd, Suite 1093 Milpitas, Ca 95035 USA  TEL: +1 408 888 8413	OLEWOLFF ELEKTRONIK GmbH Schulstrasse 15A. DE-25451 Quickborn, Germany  TEL: +49 (0) 4106 765900 FAX: +49 (0) 4106 627297	OLEWOLFF ELECTRONICS 3 Bedford Street, Woburn, Bedfordshire MK17 9QB, ENGLAND  TEL: +44 (0) 1525 290755 FAX: +44 (0) 1525 290855	OLE WOLFF ELEKTRONIK Ylipistonkatu 26 (P.O.BOX 257) FI-40101 Jyväskylä Finland  TEL: +358 14 338 3050 FAX: +358 14 338 3059	OLE WOLFF (ASIA) LTD. Unit B, 19/F., Bold Win Ind. Bldg., No. 16-18 Wah Sing St., Kwai Chung, N.T., H.K.  TEL: +852 2424 3274 FAX: +852 2424 2219	OLE WOLFF LTD. 5 Floor, Block G, WenTao Industrial Park, YingRenShi, Bao'an District, Shenzhen City, Guangdong Province, PRC.  TEL: +86 755 82612542 TEL: +86 755 26406156
---	---	--	---	---	--	---

	Date	29-Jun-2021	<b>SPECIFICATION</b>	OLE WOLFF
	Page	2 / 10		www.owolff.com
	DK	P/N: OWMMOA-332509A-S3811101-BP		Revision: 00

## 1. SCOPE

THIS SPECIFICATION IS APPLIED TO OLE WOLFF MINI SILICON MICROPHONE UNIT, MODEL NO.: OWMMOA-332509A-S3811101-BP

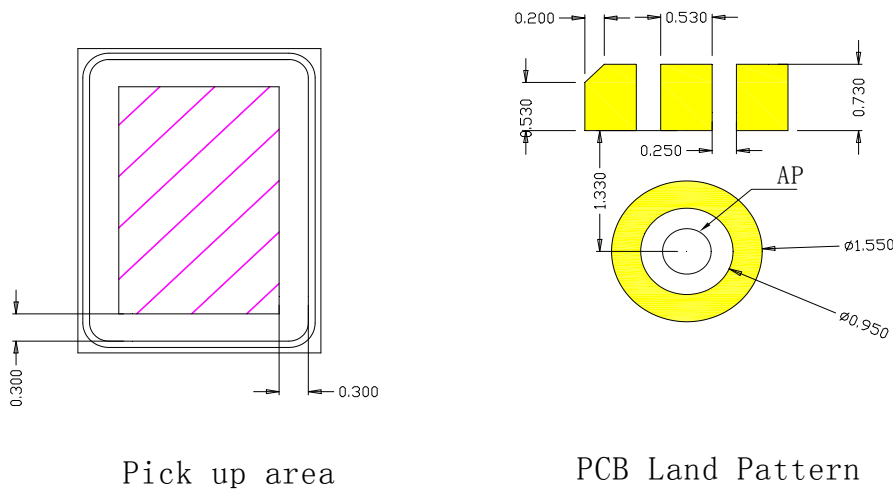
THE MEMS MICROPHONES ARE INTEGRATED WITH SPECIALIZED PRE-AMPLIFICATION ASIC TO PROVIDE HIGH SENSITIVITY, HIGH SNR OUTPUT FROM A CAPACITIVE AUDIO SENSOR. IT'S PACKAGED FOR SURFACE MOUNTING AND HIGH TEMPERATURE RE-FLOW ASSEMBLY.

## 2. DIMENSIONS AND MECHANICAL LAYOUT

DIMENSIONS: AS SHOWN IN FIGURE 6

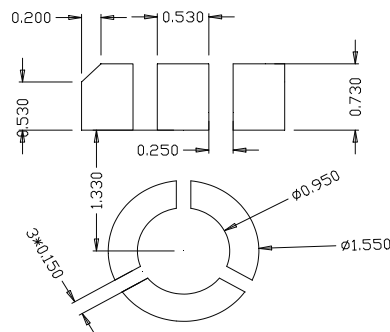
WEIGHT: About 0.017g

## 3. PICKUP TOOL PICK LOCATION & PCB SOLDER PAD LAYOUT (FIGURE 1)



Pick up area

PCB Land Pattern



Solder stencil pattern

FIGURE 1

OLE WOLFF ELEKTRONIK A/S Roedengvej 25 4180 Soroe Denmark TEL: +45 57833830 FAX: +45 57820019	OLE WOLFF ELECTRONICS INC. 1525 McCarthy Blvd, Suite 1093 Milpitas, Ca 95035 USA TEL: +1 408 888 8413	OLEWOLFF ELEKTRONIK GmbH Schulstrasse 15A. DE-25451 Quickborn, Germany TEL: +49 (0) 4106 765900 FAX: +49 (0) 4106 627297	OLEWOLFF ELECTRONICS 3 Bedford Street, Woburn, Bedfordshire MK17 9QB, ENGLAND TEL: +44 (0) 1525 290755 FAX: +44 (0) 1525 290855	OLE WOLFF ELEKTRONIK Ylipistonkatu 26 (P.O.BOX 257) FI-40101 Jyväskylä Finland TEL: +358 14 338 3050 FAX: +358 14 338 3059	OLE WOLFF (ASIA) LTD. Unit B, 19/F., Bold Win Ind. Bldg., No. 16-18 Wah Sing St., Kwai Chung, N.T., H.K. TEL: +852 2424 3274 FAX: +852 2424 2219	OLE WOLFF LTD. 5 Floor, Block G, WenTao Industrial Park, YingRenShi, Bao'an District, Shenzhen City, Guangdong Province, PRC. TEL: +86 755 82612542 TEL: +86 755 26406156
---	---	--	---	---	--	---

	Date	29-Jun-2021	<b>SPECIFICATION</b>	OLE WOLFF	
	Page	3 / 10		www.owolff.com	
	DK	P/N: OWMMOA-332509A-S3811101-BP		Revision: 00	

#### 4. ELECTRICAL SPECIFICATIONS

Standard Conditions		Basic Test Conditions	
Ordinary Temperature	15 to 35°C	Temperature	20 ± 2°C
Ordinary Humidity	45 to 85%	Humidity	63 to 67%
Ordinary air pressure	86 to 106kPa	Ordinary air pressure	86 to 106kPa

Test condition: Vdd=2.75V, no load, unless otherwise specified.

Specification	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Directivity			Omni-directional			
Sensitivity Range	S	94dB SPL @1kHz,	-39	-38	-37	dB
Output Impedance	Z <sub>out</sub>	@1kHz,			500	Ω
Current Consumption	I	Vdd =2.0V		170	230	uA
S/N Ratio	SNR	94dB SPL @1kHz, A-Weighted		66		dB(A)
Operating Voltage	V <sub>DD</sub>		1.52	2.75	3.6	V
Total Harmonic distortion	THD	132dB SPL @1kHz,		1		%
Acoustic Overload Point	AOP	10% THD @1KHz		136		dB SPL
Power Supply Rejection	PSR	100mVpp Square wave @217Hz, A-weighted		-105	-80	dB
Power Supply Rejection Ratio	PSRR	200mVpp Sine wave @1kHz, A-weighted	60	85		dB
Phase		100-10KHz	-5		5	Degree
Output load	C <sub>load</sub>				150	pF
	R <sub>load</sub>		10		100	K Ω

OLE WOLFF ELEKTRONIK A/S Roedengvej 25 4180 Soroe Denmark TEL: +45 57833830 FAX: +45 57820019	OLE WOLFF ELECTRONICS INC. 1525 McCarthy Blvd, Suite 1093 Milpitas, Ca 95035 USA TEL: +1 408 888 8413	OLEWOLFF ELEKTRONIK GmbH Schulstrasse 15A. DE-25451 Quickborn, Germany TEL: +49 (0) 4106 765900 FAX: +49 (0) 4106 627297	OLEWOLFF ELECTRONICS 3 Bedford Street, Woburn, Bedfordshire MK17 9QB, ENGLAND TEL: +44 (0) 1525 290755 FAX: +44 (0) 1525 290855	OLE WOLFF ELEKTRONIK Ylipistonkatu 26 (P.O.BOX 257) FI-40101 Jyväskylä Finland TEL: +358 14 338 3050 FAX: +358 14 338 3059	OLE WOLFF (ASIA) LTD. Unit B, 19/F., Bold Win Ind. Bldg., No. 16-18 Wah Sing St., Kwai Chung, N.T., H.K. TEL: +852 2424 3274 FAX: +852 2424 2219	OLE WOLFF LTD. 5 Floor, Block G, WenTao Industrial Park, YingRenShi, Bao'an District, Shenzhen City, Guangdong Province, PRC. TEL: +86 755 82612542 TEL: +86 755 26406156
---	---	--	---	---	--	---

	Date	29-Jun-2021	<b>SPECIFICATION</b>	OLE WOLFF
	Page	4 / 10		www.owolff.com
	DK	P/N: OWMMOA-332509A-S3811101-BP		Revision: 00

## 5. RELIABILITY TEST

High Temperature Test	After exposure at 105°C for 1000 hours, the sensitivity should be within ±3 dB from the initial value.
Low Temperature Test	After exposure at -40°C for 1000 hours, the sensitivity should be within ±3 dB from the initial value.
High Humidity & High Heat Test	After exposure at 85±3°C and 85% relative humidity for 1000 hours, the sensitivity should be within ±3 dB from the initial value.
Thermal Shocking Test	100 cycles air-to-air thermal shock from -40°C to +125°C with 15 minute soaks. the sensitivity should be within ±3 dB from the initial value.
Vibration Test	4 cycles of 20 to 2,000 Hz sinusoidal sweep with 20 G peak acceleration lasting 12 minutes in X, Y, and Z directions.
Drop Test	Height: 1.5m Fixture Weight: 150g (Sound Hole Diameter in the fixture is ≥0.8mm) Reference Surface: slippery marble floor Duration: 4 corners*4 times, 6 faces*4 times The sensitivity change should be less than 1dB after testing
ESD Test	3 discharges of ±2.5 kV direct contact to I/O pins. (HBM mode) 3 discharges of ±200 V direct contact to I/O pins. (MM mode)
Mechanical Shock	3 pulses of 10,000 G in the X, Y, and Z direction
Reflow	3 reflow cycles with peak temperature of +260°C

OLE WOLFF ELEKTRONIK A/S Roedengvej 25 4180 Soroe Denmark  TEL: +45 57833830 FAX: +45 57820019	OLE WOLFF ELECTRONICS INC. 1525 McCarthy Blvd, Suite 1093 Milpitas, Ca 95035 USA  TEL: +1 408 888 8413	OLEWOLFF ELEKTRONIK GmbH Schulstrasse 15A. DE-25451 Quickborn. Germany  TEL: +49 (0) 4106 765900 FAX: +49 (0) 4106 627297	OLEWOLFF ELECTRONICS 3 Bedford Street, Woburn, Bedfordshire MK17 9QB, ENGLAND  TEL: +44 (0) 1525 290755 FAX: +44 (0) 1525 290855	OLE WOLFF ELEKTRONIK Ylipistonkatu 26 (P.O. BOX 257) FI-40101 Jyväskylä Finland  TEL: +358 14 338 3050 FAX: +358 14 338 3059	OLE WOLFF (ASIA) LTD. Unit B, 19/F., Bold Win Ind. Bldg., No. 16-18 Wah Sing St., Kwai Chung, N.T., H.K.  TEL: +852 2424 3274 FAX: +852 2424 2219	OLE WOLFF LTD. 5 Floor, Block G, WenTao Industrial Park, YingRenShi, Bao'an District, Shenzhen City, Guangdong Province, PRC.  TEL: +86 755 82612542 TEL: +86 755 26406156
---	---	--	---	--	--	---

	Date	29-Jun-2021	<h1>SPECIFICATION</h1>	OLE WOLFF
	Page	5 / 10		www.owolff.com
	DK	P/N: OWMMOA-332509A-S3811101-BP		Revision: 00

## 6. TYPICAL FREQUENCY RESPONSE (FIGURE 2)

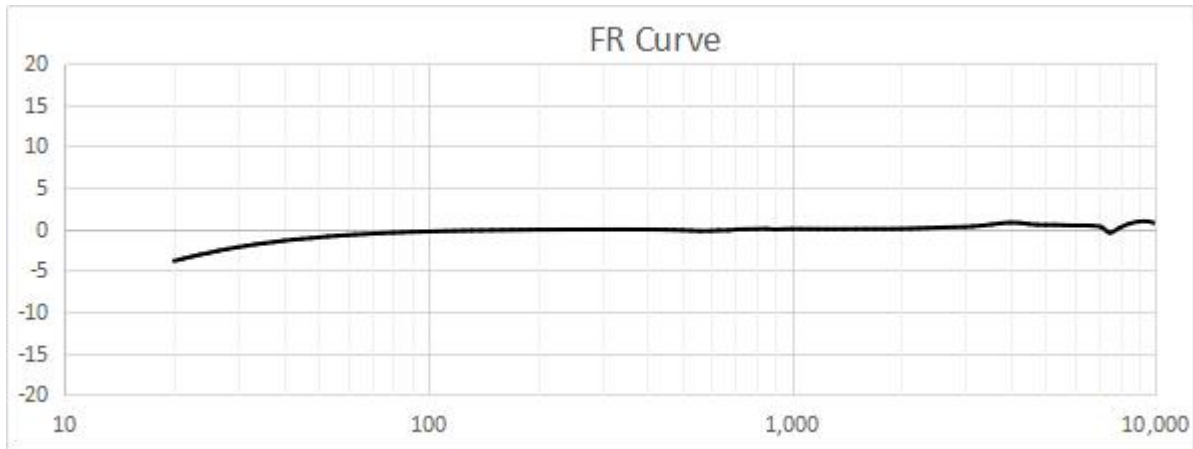


FIGURE 2

## 7. MEASUREMENT CIRCUIT (FIGURE 3)

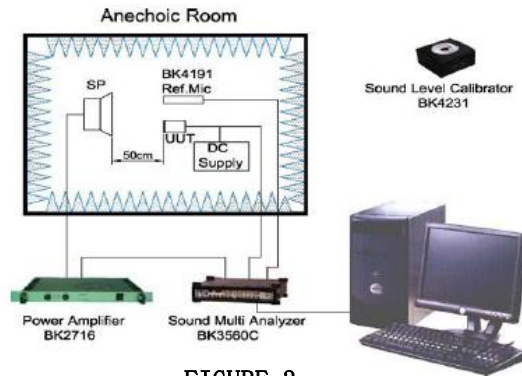


FIGURE 3

## 8. APPLICATION CIRCUIT (FIGURE 4)

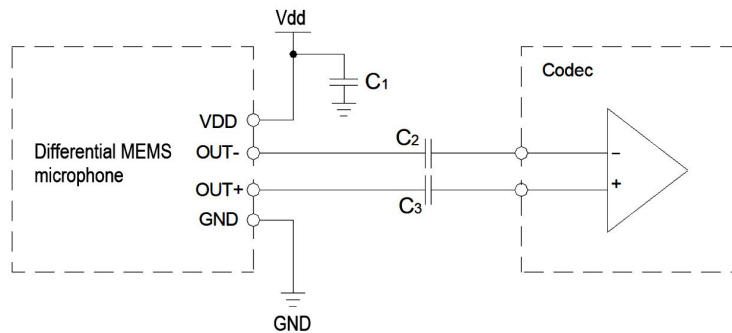


FIGURE 4

OLE WOLFF ELEKTRONIK A/S Roedengvej 25 4180 Soroe Denmark TEL: +45 57833830 FAX: +45 57820019	OLE WOLFF ELECTRONICS INC. 1525 McCarthy Blvd, Suite 1093 Milpitas, Ca 95035 USA TEL: +1 408 888 8413	OLEWOLFF ELEKTRONIK GmbH Schulstrasse 15A. DE-25451 Quickborn, Germany TEL: +49 (0) 4106 765900 FAX: +49 (0) 4106 627297	OLEWOLFF ELECTRONICS 3 Bedford Street, Woburn, Bedfordshire MK17 9QB, ENGLAND TEL: +44 (0) 1525 290755 FAX: +44 (0) 1525 290855	OLE WOLFF ELEKTRONIK Ylipistonkatu 26 (P.O.BOX 257) FI-40101 Jyväskylä Finland TEL: +358 14 338 3050 FAX: +358 14 338 3059	OLE WOLFF (ASIA) LTD. Unit B, 19/F., Bold Win Ind. Bldg., No. 16-18 Wah Sing St., Kwai Chung, N.T., H.K. TEL: +852 2424 3274 FAX: +852 2424 2219	OLE WOLFF LTD. 5 Floor, Block G, WenTao Industrial Park, YingRenShi, Bao'an District, Shenzhen City, Guangdong Province, PRC. TEL: +86 755 82612542 TEL: +86 755 26406156
---	---	--	---	---	--	---

	Date	29-Jun-2021	<b>SPECIFICATION</b>	OLE WOLFF
	Page	6 / 10		www.owolff.com
	DK	P/N: OWMMOA-332509A-S3811101-BP		Revision: 00

## 9. REFLOW PROFILE (FIGURE 5)

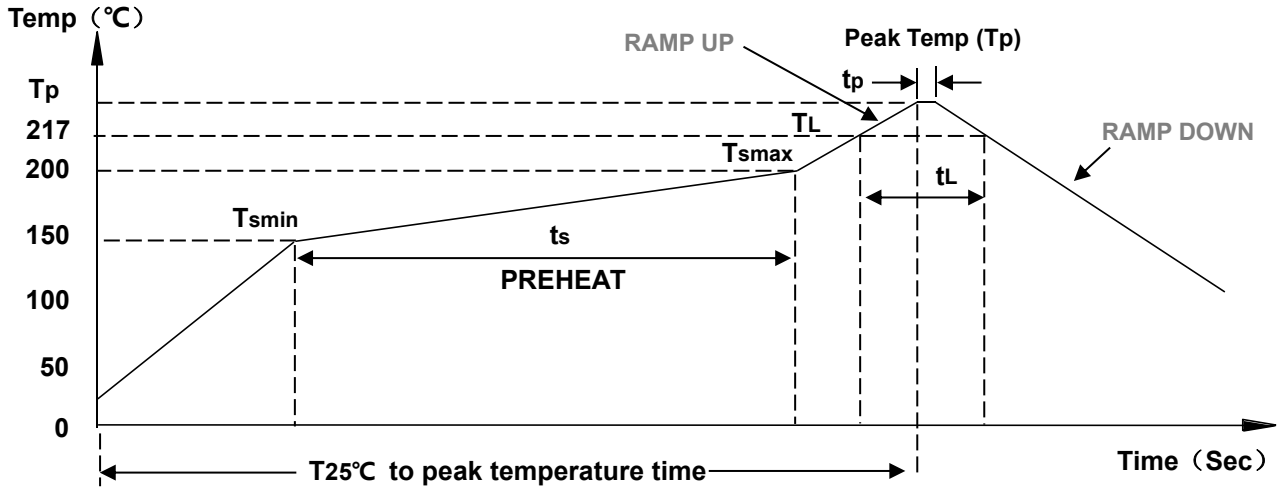


FIGURE 5

Parameter	Reference	Specification
Average Ramp Rate	$T_{smax}$ to $T_P$	3°C/sec max
Preheat	Minimum Temperature	$T_{SMIN}$
	Maximum Temperature	$T_{SMAX}$
	Time $T_{SMIN}$ to $T_{SMAX}$	$t_s$
Time Maintained Above Liquidous	$t_L$	60 sec to 150 sec
Liquidous Temperature	$T_L$	217°C
Peak Temperature	$T_P$	260°C +0°C/-5°C
Time Within +5°C of Actual Peak Temperature	$t_p$	20 sec to 40 sec
Ramp-Down Rate	$T_P$ to $T_{SMAX}$	3°C/sec max
Time +25°C ( $t_{25°C}$ ) to Peak Temperature		8 min max

OLE WOLFF ELEKTRONIK A/S Roedengvej 25 4180 Soroe Denmark TEL: +45 57833830 FAX: +45 57820019	OLE WOLFF ELECTRONICS INC. 1525 McCarthy Blvd, Suite 1093 Milpitas, Ca 95035 USA TEL: +1 408 888 8413	OLEWOLFF ELEKTRONIK GmbH Schulstrasse 15A. DE-25451 Quickborn, Germany TEL: +49 (0) 4106 765900 FAX: +49 (0) 4106 627297	OLEWOLFF ELECTRONICS 3 Bedford Street, Woburn, Bedfordshire MK17 9QB, ENGLAND TEL: +44 (0) 1525 290755 FAX: +44 (0) 1525 290855	OLE WOLFF ELEKTRONIK Ylipistonkatu 26 (P.O.BOX 257) FI-40101 Jyväskylä Finland TEL: +358 14 338 3050 FAX: +358 14 338 3059	OLE WOLFF (ASIA) LTD. Unit B, 19/F., Bold Win Ind. Bldg., No. 16-18 Wah Sing St., Kwai Chung, N.T., H.K. TEL: +852 2424 3274 FAX: +852 2424 2219	OLE WOLFF LTD. 5 Floor, Block G, WenTao Industrial Park, YingRenShi, Bao'an District, Shenzhen City, Guangdong Province, PRC. TEL: +86 755 82612542 TEL: +86 755 26406156
---	---	--	---	---	--	---

	Date	29-Jun-2021	<b>SPECIFICATION</b>	OLE WOLFF
	Page	7 / 10		www.owolff.com
	DK	P/N: OWMMOA-332509A-S3811101-BP		Revision: 00

## 10. APPEARANCE & DIMENSIONS (FIGURE 6)

The board surface cleaning pressure is 0.3Mpa limited

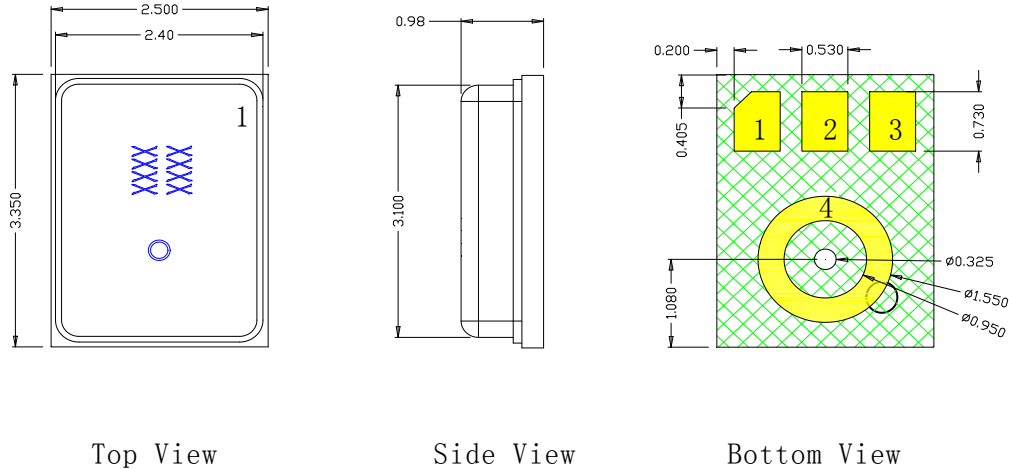


FIGURE 6

Item	Dimension	Tolerance(+/-)	Units
Length(L)	3.35	0.10	mm
Width(W)	2.50	0.10	mm
Height(H)	0.98	0.10	mm
Acoustic Port(AP)	Ø0.325	0.05	mm

Pin #	Pin Name	Type	Description
1	V <sub>DD</sub>	Power	Power Supply
2	Out -	Signal	Output Signal
3	Out +	Signal	Output Signal
4	GND	Ground	Ground

All dimensions are in millimeter (mm).

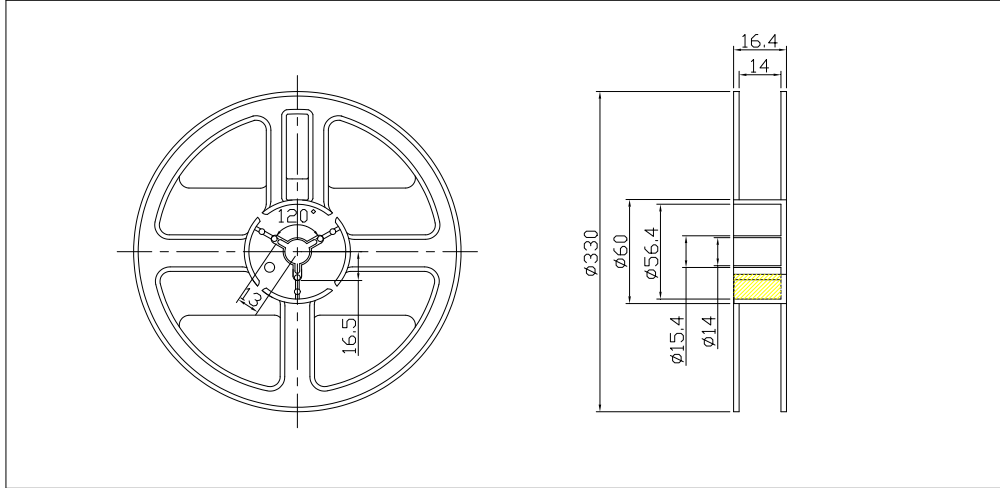
Tolerance±0.15mm unless otherwise specified.

OLE WOLFF ELEKTRONIK A/S Roedengvej 25 4180 Soroe Denmark TEL: +45 57833830 FAX: +45 57820019	OLE WOLFF ELECTRONICS INC. 1525 McCarthy Blvd, Suite 1093 Milpitas, Ca 95035 USA TEL: +1 408 888 8413	OLEWOLFF ELEKTRONIK GmbH Schulstrasse 15A. DE-25451 Quickborn, Germany TEL: +49 (0) 4106 765900 FAX: +49 (0) 4106 627297	OLEWOLFF ELECTRONICS 3 Bedford Street, Woburn, Bedfordshire MK17 9QB, ENGLAND TEL: +44 (0) 1525 290755 FAX: +44 (0) 1525 290855	OLE WOLFF ELEKTRONIK Ylipistonkatu 26 (P.O.BOX 257) FI-40101 Jyväskylä Finland TEL: +358 14 338 3050 FAX: +358 14 338 3059	OLE WOLFF (ASIA) LTD. Unit B, 19/F., Bold Win Ind. Bldg., No. 16-18 Wah Sing St., Kwai Chung, N.T., H.K. TEL: +852 2424 3274 FAX: +852 2424 2219	OLE WOLFF LTD. 5 Floor, Block G, WenTao Industrial Park, YingRenShi, Bao'an District, Shenzhen City, Guangdong Province, PRC. TEL: +86 755 82612542 TEL: +86 755 26406156
---	---	--	---	---	--	---

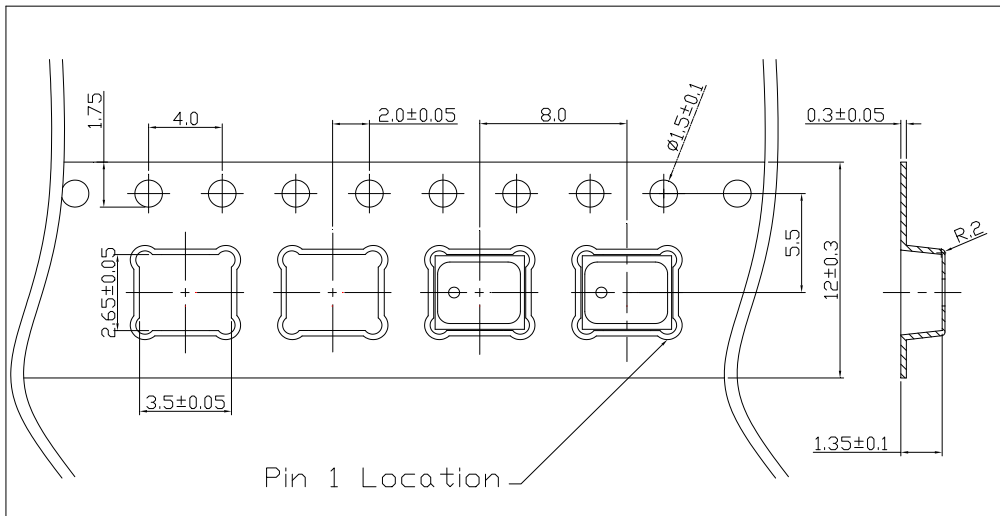
	Date	29-Jun-2021	<b>SPECIFICATION</b>	OLE WOLFF
	Page	8 / 10		www.owolff.com
	DK	P/N: OWMMOA-332509A-S3811101-BP		Revision: 00

**11. PACKING (UNIT: MM) (FIGURE 7)**

**13" Reel drawing:**



**Tape drawing:**



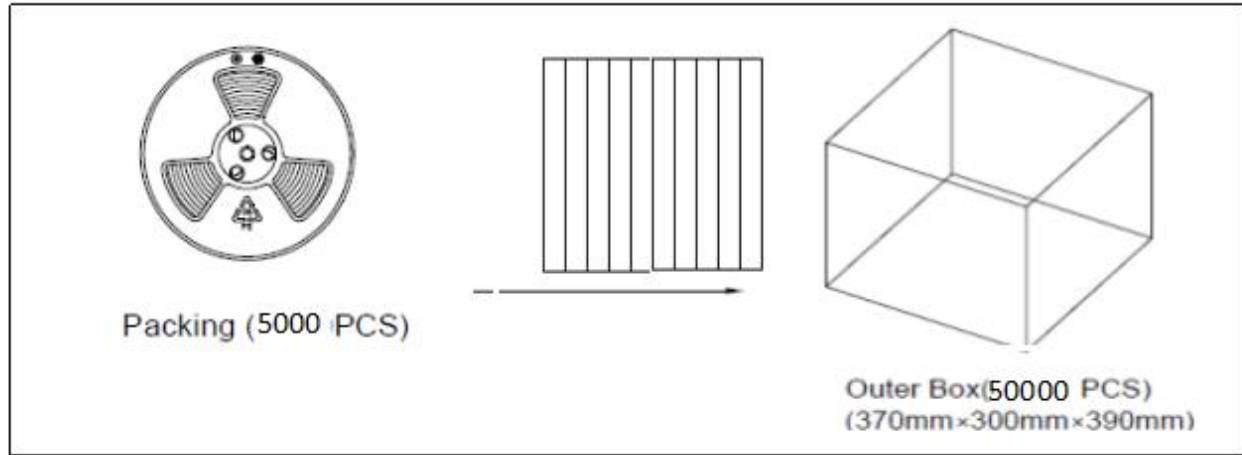
**FIGURE 7**

<p>OLE WOLFF ELEKTRONIK A/S Roedengvej 25 4180 Soroe Denmark</p> <p>TEL: +45 57833830 FAX: +45 57820019</p>	<p>OLE WOLFF ELECTRONICS INC. 1525 McCarthy Blvd, Suite 1093 Milpitas, Ca 95035 USA</p> <p>TEL: +1 408 888 8413</p>	<p>OLEWOLFF ELEKTRONIK GmbH Schulstrasse 15A. DE-25451 Quickborn, Germany</p> <p>TEL: +49 (0) 4106 765900 FAX: +49 (0) 4106 627297</p>	<p>OLEWOLFF ELECTRONICS 3 Bedford Street, Woburn, Bedfordshire MK17 9QB, ENGLAND</p> <p>TEL: +44 (0) 1525 290755 FAX: +44 (0) 1525 290855</p>	<p>OLE WOLFF ELEKTRONIK Yhöpistonkatu 26 (P.O.BOX 257) FI-40101 Jyväskylä Finland</p> <p>TEL: +358 14 338 3050 FAX: +358 14 338 3059</p>	<p>OLE WOLFF (ASIA) LTD. Unit B, 19/F., Bold Win Ind. Bldg., No. 16-18 Wah Sing St., Kwai Chung, N.T., H.K.</p> <p>TEL: +852 2424 3274 FAX: +852 2424 2219</p>	<p>OLE WOLFF LTD. 5 Floor, Block G, WenTao Industrial Park, YingRenShi, Bao'an District, Shenzhen City, Guangdong Province, PRC.</p> <p>TEL: +86 755 82612542 TEL: +86 755 26406156</p>
---	---	--	---	--	--	---



	Date	29-Jun-2021	<b>SPECIFICATION</b>	OLE WOLFF
	Page	9 / 10		www.owolff.com
	DK	P/N: OWMMOA-332509A-S3811101-BP		Revision: 00

The Content of Box:



Reel	5,000PCS×1=5,000PCS
Outer Box	5,000PCS×10=50,000PCS

OLE WOLFF ELEKTRONIK A/S Roedengvej 25 4180 Soroe Denmark  TEL: +45 57833830 FAX: +45 57820019	OLE WOLFF ELECTRONICS INC. 1525 McCarthy Blvd, Suite 1093 Milpitas, Ca 95035 USA  TEL: +1 408 888 8413	OLEWOLFF ELEKTRONIK GmbH Schulstrasse 15A. DE-25451 Quickborn, Germany  TEL: +49 (0) 4106 765900 FAX: +49 (0) 4106 627297	OLEWOLFF ELECTRONICS 3 Bedford Street, Woburn, Bedfordshire MK17 9QB, ENGLAND  TEL: +44 (0) 1525 290755 FAX: +44 (0) 1525 290855	OLE WOLFF ELEKTRONIK Ylipistonkatu 26 (P.O.BOX 257) FI-40101 Jyväskylä Finland  TEL: +358 14 338 3050 FAX: +358 14 338 3059	OLE WOLFF (ASIA) LTD. Unit B, 19/F., Bold Win Ind. Bldg., No. 16-18 Wah Sing St., Kwai Chung, N.T., H.K.  TEL: +852 2424 3274 FAX: +852 2424 2219	OLE WOLFF LTD. 5 Floor, Block G, WenTao Industrial Park, YingRenShi, Bao'an District, Shenzhen City, Guangdong Province, PRC.  TEL: +86 755 82612542 TEL: +86 755 26406156
---	---	--	---	---	--	---

	Date	29-Jun-2021	<b>SPECIFICATION</b>	OLE WOLFF
	Page	10 / 10		www.owolff.com
	DK	P/N: OWMMOA-332509A-S3811101-BP		Revision: 00

## 12. CAUTIONS WHEN USING MEMS MIC

### 12.1 Board Wash Forbidden

- Do not board wash by liquid or ultrasonic after the reflow process, otherwise this could damage the microphone.

### 12.2 Negative Pressure Forbidden

- Do not pull a vacuum such as nozzle over port hole of the microphone.
- Do not vacuum seal static bags used to store unused portions of reels.

### 12.3 Blowing Forbidden

- Not to blow the acoustic port of the microphone directly, otherwise, this could damage the microphone. If have to, air pressure should less than 0.3MPa, distance more than 5cm, and time less than 5 seconds.

### 12.4 Rework

- 250°C ~ 270°C, maximum 30 sec, Peak temperature 330°C.
- Wind speed: 15L/m.
- It is very important not to put a heatgun over the acoustic port of the microphone directly.

### 12.5 Other Application Notes

- Maximum of 3 reflow cycles is recommended.
- Suggest SMT the microphone at last time if double side PCBA used.
- Do not insert any object in port hole of device at any time.

### 12.6 Storage

- MSL (moisture sensitivity level) Class 1.
- Twelve 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. and floor life(out of bag) at factory no more than 4 weeks.
- Keep MEMS MIC in warehouse with less than 75% humidity and without sudden temperature change, acid air, any other harmful air or strong magnetic field.
- Please take proper measures against ESD in the process of assembly and transportation.
- Please use the shipping package for long-term storage.

### 12.7 Operating temperature

- Operating temperature range is from -40°C to 100°C.

OLE WOLFF ELEKTRONIK A/S Roedengvej 25 4180 Soroe Denmark  TEL: +45 57833830 FAX: +45 57820019	OLE WOLFF ELECTRONICS INC. 1525 McCarthy Blvd, Suite 1093 Milpitas, Ca 95035 USA  TEL: +1 408 888 8413	OLEWOLFF ELEKTRONIK GmbH Schulstrasse 15A. DE-25451 Quickborn, Germany  TEL: +49 (0) 4106 765900 FAX: +49 (0) 4106 627297	OLEWOLFF ELECTRONICS 3 Bedford Street, Woburn, Bedfordshire MK17 9QB, ENGLAND  TEL: +44 (0) 1525 290755 FAX: +44 (0) 1525 290855	OLE WOLFF ELEKTRONIK Yhöpistonkatu 26 (P.O. BOX 257) FI-40101 Jyväskylä Finland  TEL: +358 14 338 3050 FAX: +358 14 338 3059	OLE WOLFF (ASIA) LTD. Unit B, 19/F., Bold Win Ind. Bldg., No. 16-18 Wah Sing St., Kwai Chung, N.T., H.K.  TEL: +852 2424 3274 FAX: +852 2424 2219	OLE WOLFF LTD. 5 Floor, Block G, WenTao Industrial Park, YingRenShi, Bao'an District, Shenzhen City, Guangdong Province, PRC.  TEL: +86 755 82612542 TEL: +86 755 26406156
---	---	--	---	--	--	---