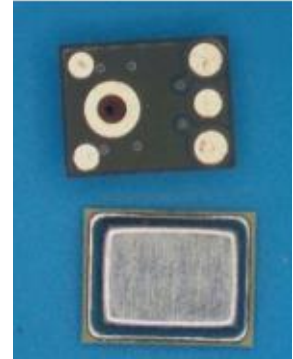


# Analog Bottom Mount MEMS Microphone

## IRS-3526-AB-3870

Integrating IR Sensors' advanced silicon microphones into your products significantly elevates the user experience. These microphones offer exceptional sound quality, characterized by a high signal-to-noise ratio (SNR), enhanced output sensitivity, and a low cut-off frequency. Additionally, users enjoy prolonged battery life thanks to the microphones' low power consumption, while their dustproof and waterproof design ensures increased reliability.

As a product manufacturer, you will value the microphones' compact form factor and seamless single-output integration, which allows for easy replacement of existing options. They are available in both tape & reel or tube packaging to suit your needs. With a network of global foundry partners, we minimize delivery risks and supply chain disruptions. Experience the next generation of MEMS microphones, engineered to enhance the quality and reliability of your products.



### Description

The IR-3526-AB-3870 series of MEMS capacitive silicon microphones feature a patented, next-generation design tailored to meet the diverse needs of customer applications and evolving market demands. Utilizing advanced capacitive sensing technology, this platform offers an extensive signal-to-noise ratio (SNR) range from -60dB to -80dB and beyond, positioning it to comply with future microphone standards.

Our unique, patented designs and processes produce world-class microphones specifically engineered for high-volume, high-performance applications. This innovation enables an exceptional signal-to-noise ratio (SNR) in a smaller die size, allowing for compact packaging that meets the growing demand for smaller footprints in future applications.

### Features

- High SNR > 67dB
- Low Noise
- Omni directional
- Small SMD package
- High sensitivity, -38dB typical
- JEDEC compatible
- Bottom & top mount
- RoHS compatible
- Low frequency roll off by design, 20 Hz, typical
- Intrinsically waterproof and dustproof
- Tape & Reel packaging or tube packaging
- Low current consumption, < 130 uA

### Typical Applications

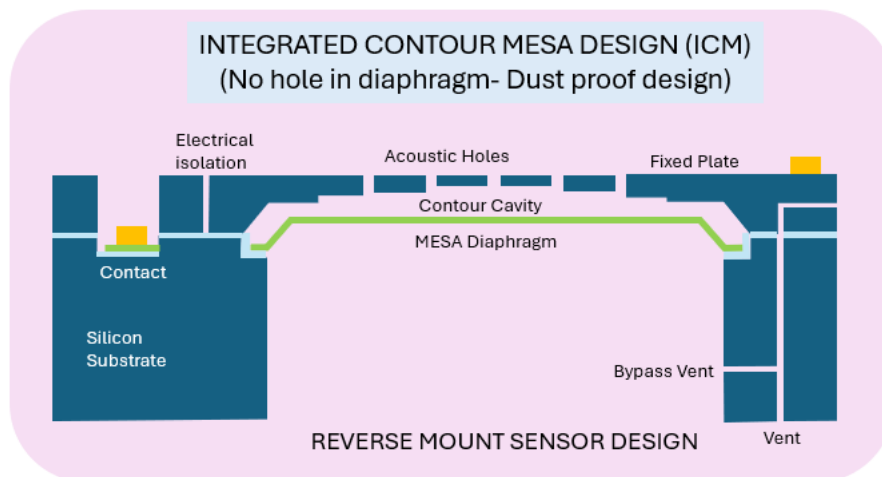
- Mobile Phones
- Audio devices
- Earphone and Earbud
- Laptop / PC / Tablet
- Automotive
- Remote Sensing
- Door Bell
- Home Automation
- Camera

# Analog Bottom Mount MEMS Microphone

## The Crown Jewel of MEMS microphones

The IR microphone sensor introduces groundbreaking technology that enables a reduction of up to 60% in package volume and power consumption compared to competitors, all while maintaining the same high signal-to-noise ratio (SNR). This innovation not only addresses the increasing demand for miniaturization but also enhances energy efficiency, making it the perfect solution for compact, power-sensitive applications.

IR's innovative two substrates design and fabrication



Our unique, patented technology integrates several innovative features, including a trapezoidal diaphragm design and contoured cavity, which work together to enhance sensitivity and minimize acoustic noise. This design allows the IR microphone sensor to achieve an SNR of -80dB with a single output and a compact footprint, making it perfect for high-performance applications where space is limited.

## Order Information

Product ID	Package	Marking/Order Code
IR3526AB3870	MP-B-3526-70	IR03

# Analog Bottom Mount MEMS Microphone

## PRODUCT KEY PERFORMANCE SPECIFICATIONS

Technical Specification: All data taken at 25±2°C, Relative Humidity 45±5% unless otherwise specified.  
 General Ratings Specifications

SPECIFICATION	MINIMUM	TYPICAL	MAXIMUM	UNITS
Operating Temperature	-40	-	+85	°C
Storage Temperature	-40	-	+100	°C
MSL (moisture sensitivity Level)	Class 1			

## Product Key Acoustic Performance Specification

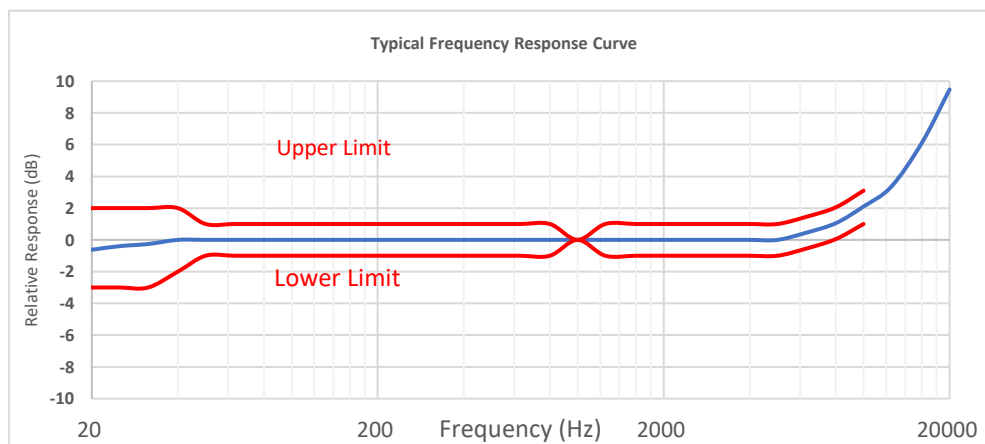
PARAMETER	SYMBOL	TEST CONDITION	VALUES			UNITS
			MIN	TYP	MAX	
Directivity			Omni-directional			
Sensitivity	S	94 dB SPL @ 1kHz	-40	-38	-36	dB V/Pa
Signal to Noise Ratio	SNR	94 dB SPL @ 1kHz, A-weighted		70		dB
Total Harmonic Distortion	THD	94 dB SPL @ 1kHz			0.1	%
Acoustic Over Pressure	AOP	10% THD @ 1kHz		>130		dB SPL
Low Frequency Cut-off	LFCO			20		Hz
High Frequency Flatness		+3dB relative to @ 1KHz		10		kHz

# Analog Bottom Mount MEMS Microphone

## Electrical Key Characteristics and Performance

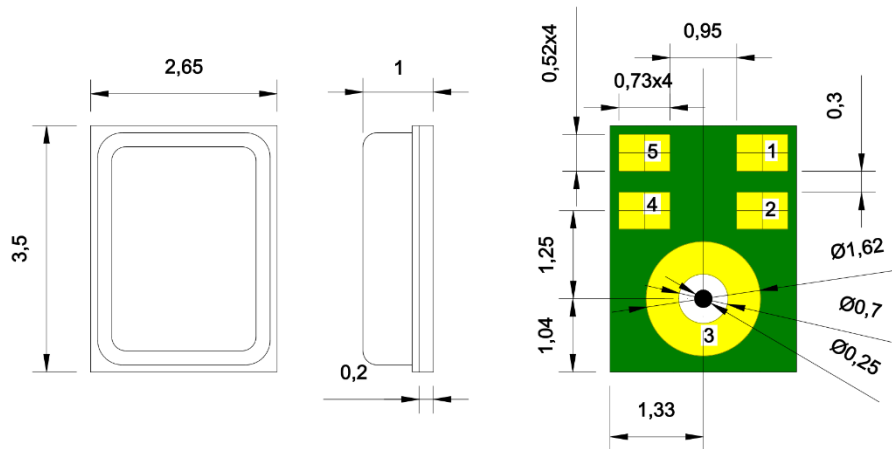
PARAMETER	SYMBOL	TEST CONDITION	VALUES			UNITS
			MIN	TYP	MAX	
Input / Supply Voltage	V <sub>DD</sub>		1.5	2.5	3.3	V
Input current	I <sub>DD</sub>	V <sub>DD</sub> =1.5V-3.3V	90	115	130	μA
Output impedance	Z <sub>OUT</sub>	94 dB SPL @ 1kHz, Single-ended output	-	-	200	Ohm
Power Supply Rejection	PSR	100mVpp Square wave @217Hz, A-weighted		-103		dBFS
Power Supply Rejection Ratio	PSRR	200mVpp sine wave at 1kHz, V <sub>DD</sub> =1.8V		70		dB
DC output voltage	V <sub>OUT_DC</sub>	V <sub>DD</sub> =1.5V-3.3V, Single ended output		0.85		V
Start-up time	t <sub>start</sub>	Single-ended output		15		mS
Equivalent input noise	EIN	Noise measured with A- weighted filter		3		μV

## TYPICAL FREQUENCY RESPONSE CURVE



# Analog Bottom Mount MEMS Microphone

## PACKAGE DIMENSION AND PIN LAYOUT



Item	Dimension	Tolerance(+/-)	Units
Length(L)	3.50	0.10	mm
Width(W)	2.65	0.10	mm
Height(H)	1.0	0.10	mm
Acoustic Port(AP)	Ø0.25	0.05	mm

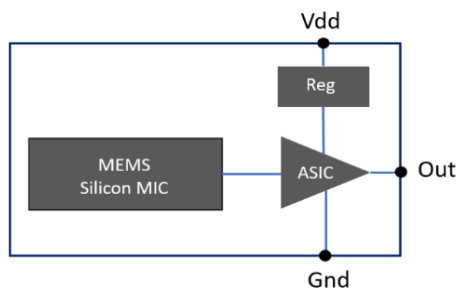
Pin #	Pin Name	Type	Description
1	Output	Signal	Output Signal
2	GND	Ground	Ground
3	GND	Ground	Ground
4	NA	NA	NA
5	VDD	Supply	Power supply

# Analog Bottom Mount MEMS Microphone

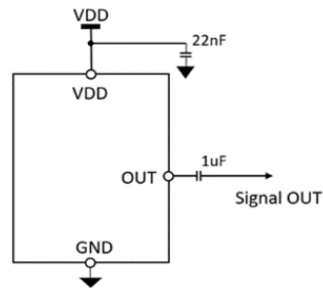
## Terminology

1. **POWER:** The Supply Voltage Positive Terminal (Pad name "VDD" in Electrical layout drawing) which is connected to the Microphone Sensing Element.
2. **OUTPUT:** The Output Terminal, where the electrical signal equivalent to the acoustic pressure is available, i.e. the Microphone output. (Pad name "OUTPUT" in Electrical layout drawing)
3. **COMMON:** The Terminal where the supply negative (Pad name "GND" in Electrical layout drawing) is connected to microphone package.
4. **SENSITIVITY:** Sensitivity is the open circuit output voltage amplitude for a given sound pressure at the microphone diaphragm. This is frequency dependent so typically quoted at 1KHz. Units are defined in dB logarithmic scale.
5. **FREQUENCY RESPONSE:** It is the plot of Sensitivity in dB vs frequency [Hz], it depends on transducer mechanism directional response, and reflection from room boundaries – usually quote free-field response.
6. **DIRECTIVITY:** It is the response pattern that expresses the geometric shape of the region of sensitivity surrounding the microphone, omni directional, uni directional, bi- directional.

## FUNCTIONAL BLOCK DIAGRAM



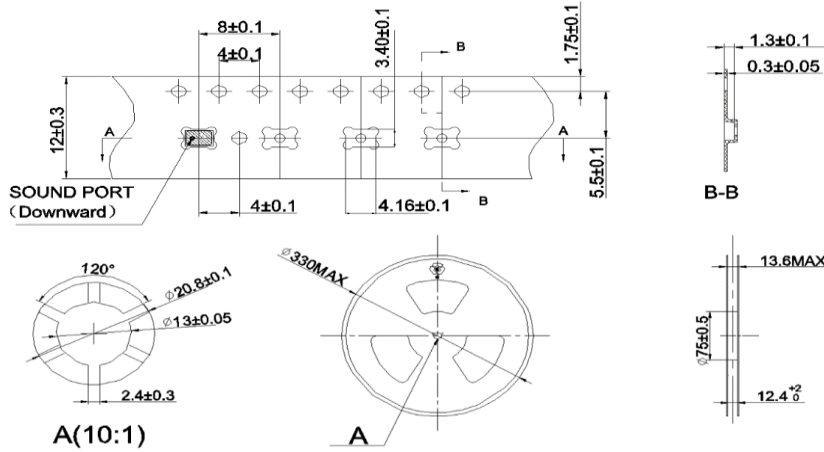
## ELECTRICAL BLOCK DIAGRAM



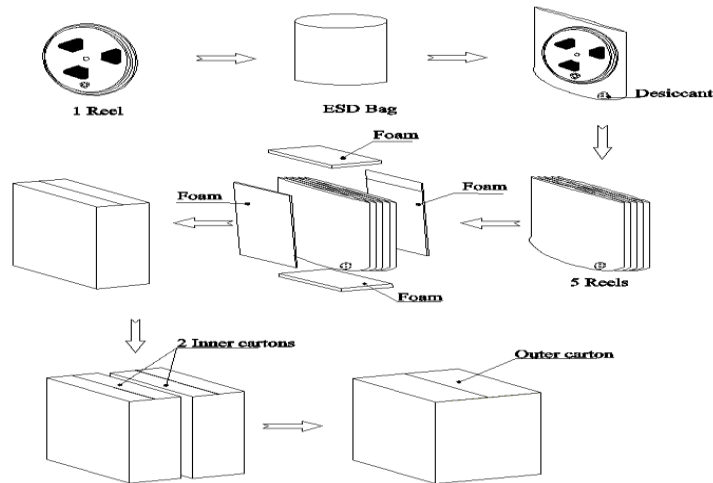
# Analog Bottom Mount MEMS Microphone

## Packaging Information

Tape & Reel Specification



## Packaging Information



Packaging quantity:

1 Reel=5000pcs

1 Inner Carton =5Reels=25000pcs

1 Outer Carton=2 Inner Cartons=50000pcs

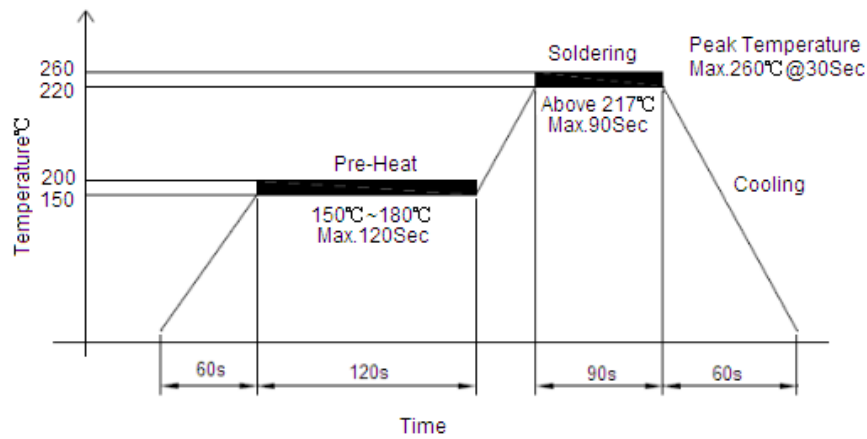


# Analog Bottom Mount MEMS Microphone

## PROCESSING INFORMATION

### Recommended Reflow Process Condition:

Recommend reflow profile, solder reflow  $\leq 260^{\circ}\text{C}$  (for 30s Max of peak temperature).

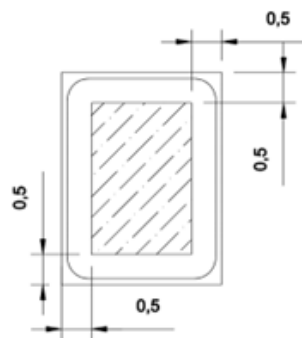


### Important Notes

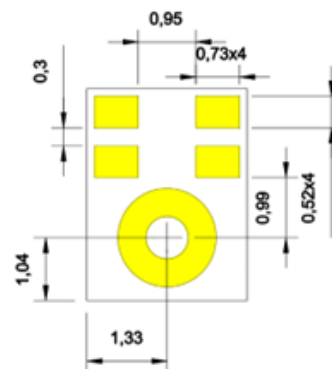
To minimize device damage:

- Do not wash or clean the boards after the reflow process.
- Do not apply airflow with pressure exceeding 0.3MPa to blow into the port hole within a distance of less than 5 cm.
- Do not expose the device to ultrasonic processing or cleaning.
- Do not apply a vacuum over the port hole of the microphone.

### Pickup Tool Pick Location & PCB Solder Pad Layout:



Recommended Pickup Location



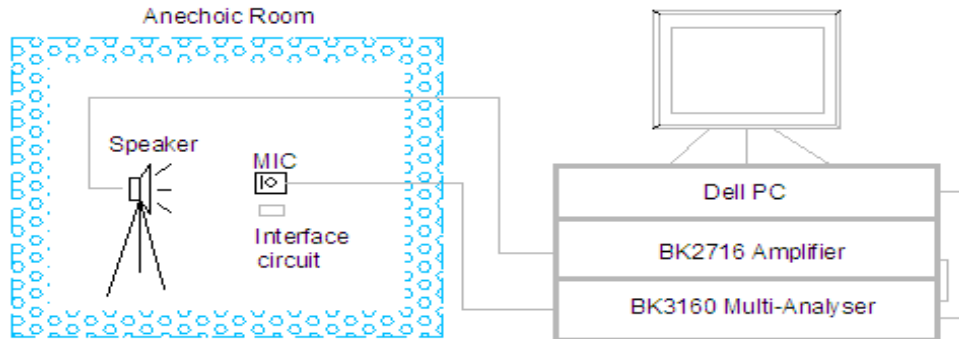
Recommended Solder Pad Layout



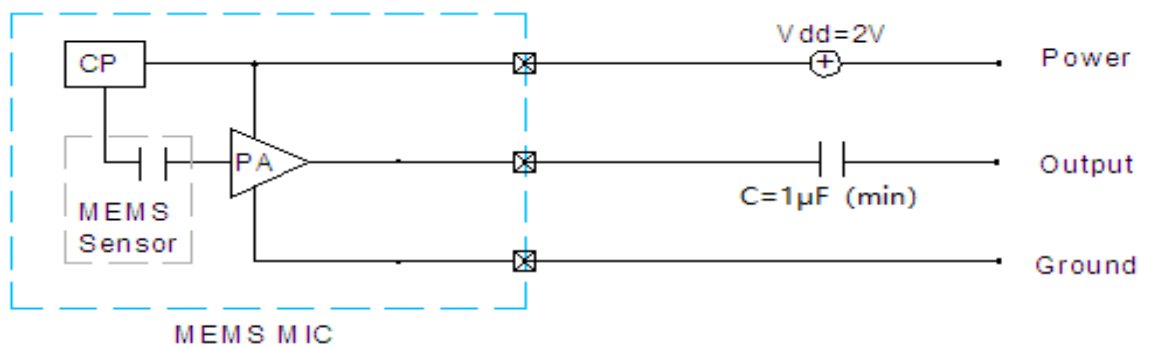
# Analog Bottom Mount MEMS Microphone

## TEST SETUP

### Sensitivity Test in Anechoic Room



## Measurement Circuit



# Analog Bottom Mount MEMS Microphone

## RELIABILITY TEST

The samples should be placed in the room with 23+/-2°C, 55+/-10%R.H. for 2 hours at least before final measurement, unless otherwise specified.

Item	Detail	Standard
Simulated Reflow (Without Solder)	Samples for qualification testing require 3 Times 260±5 °C reflow solder profiles. 2 hours of settling time is required between each reflow profile test.	±3 dB
Static Humidity	Precondition at +25°C for 1 hour. Then expose to +85°C with 85% relative humidity for 1000 hours.	±3 dB
Temperature Shock	Each cycle shall consist of 30 minutes at -40°C, 30 minutes at +125°C with 5 minutes transition time. Test duration is for 30 cycles, starting from cold to hot temperature.	±3 dB
ESD Sensitivity	Perform ESD sensitivity threshold measurements for each contact according to MIL-STD-883G, Method 3015.7 for Human Body Model. Identify the ESD threshold levels indicating passage of 8000V Human Body Model.	±3 dB
Random Vibrations	Vibrate randomly along three perpendicular directions for 30 minutes in each direction, 4cycles from 20Hz~2000Hz with a peak acceleration 20g.	±3 dB
Mechanical Shock	Subject samples to half sine shock pulses (3000g±15% for 0.3ms) in each direction, totally 18 shocks.	±3 dB
Operation Life	Subject samples to +125°C for 168 hours under full maximum rated voltage.	±3 dB
Drop Test	The test was repeated in six directions for three times, Dropped from 1.5m height on to a steel surface, total 18 times and inspected for mechanical damage. Note: Sensitivity should vary within +/-3dB from initial sensitivity after test conditions are performed.	±3 dB

## Delivery Standard:

- Product delivered with 100% testing.
- All parts are tested for sensitivity at 1KHz.
- Product samples tested for frequency curve and SNR.



# Analog Bottom Mount MEMS Microphone

## PRODUCT NAMING CONVENTION

Company name	Packaging size Length (mm) Width (mm)	Output A = Analog D = Digital	Mount T=Top Mount B= Bottom mount	Sensitivity -dB (V/Pa)	Noise dB	Status
IR Sensors & Systems						
IR	3526	A	B	38	70	Active

## DOCUMENT HISTORY

Document Version	Date of Release	Changes
1.0	Feb. 15 <sup>th</sup> , 2024	Initial Version

# Analog Bottom Mount MEMS Microphone

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