



PRODUCT INFORMATION

Part Numbers

CM03OS-0338-A1

Revision **2-2018**

Type

Analog MEMS Microphone
Active RF Filter

Compliance

- **RoHS, Lead Free**
- **ISO 9001:2000**
- **REACH: SUBSTANCE OF VERY HIGH CONCERN (SVHC)** This product does NOT contain any of the REACH Substances of Very High Concern (SVHC), and is in compliance with European Union REACH Regulation No.1907/2006 regarding chemical substances which must be registered or disclosed.

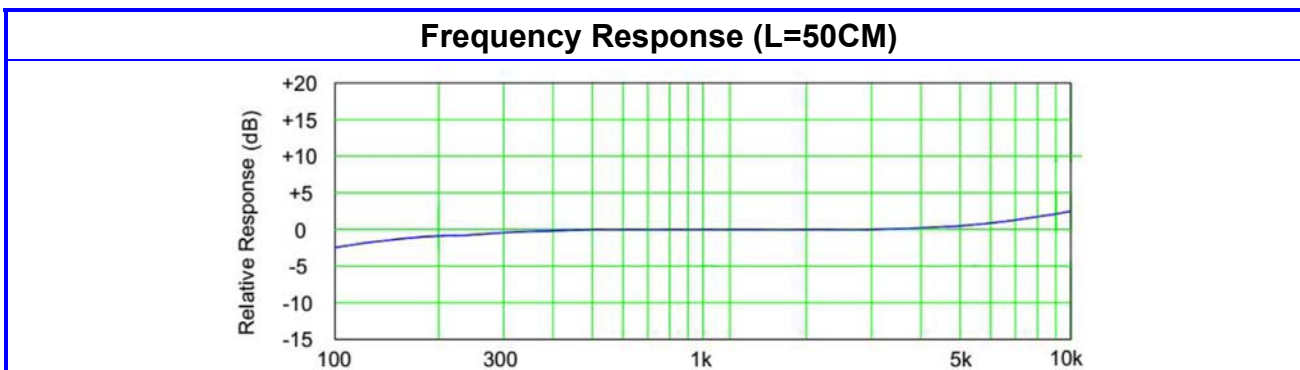


1. Electrical Characteristics

Test condition: $V_s = 2.0\text{ V}$ at $23 \pm 2^\circ\text{C}$, $L = 50\text{ cm}$, Relative Humidity $65 \pm 5\%$ unless otherwise specified

Parameter	Symbol	Condition	Limits			Unit
			Min.	Center	Max.	
Directivity		Omnidirectional				
Sensitivity ¹	S	$V_{dd} = 2\text{V}$, $F = 1\text{kHz}$, $\text{SPL} = 1\text{Pa}$, $0\text{dB} = 1\text{V/Pa}$	-39	-38	-37	dBV/Pa
Output impedance	Z out	$F = 1\text{ kHz}$			450	Ω
Operating Voltage Range	Vs		1.8	2.0	3.6	V
Current Consumption	I_{DSS}	$V_{dd} = 2.0\text{V}$			200	μA
Internal Capacitance	C_I				50+50	pF
Signal to Noise Ratio	S/N	$F = 1\text{ kHz}$ $\text{SPL} = 1\text{ Pa N (A-Weighted)}$		65		dB
Decreasing Voltage	ΔS	$F = 1\text{ kHz}$, $\text{Pin} = 1\text{ Pa}$ $V_s = 3.6 \rightarrow 1.8$	No Change			dBV/Pa
Total Harmonic Distortion	THD	1 kHz , 94 dB SPL			1	%
Acoustic Overload Point	AOP	10% THD @ 1 kHz , $S = \text{Typ}$, $V_{dd} = 3.6\text{ V}$, $R_{load} > 2\text{ kohm}$		123		dB SPL
Power Supply Rejection	PSR	100mVpp Square Wave @ 217Hz $V_{DD} = 2.0\text{V}$, A-weighted			-93	dBV

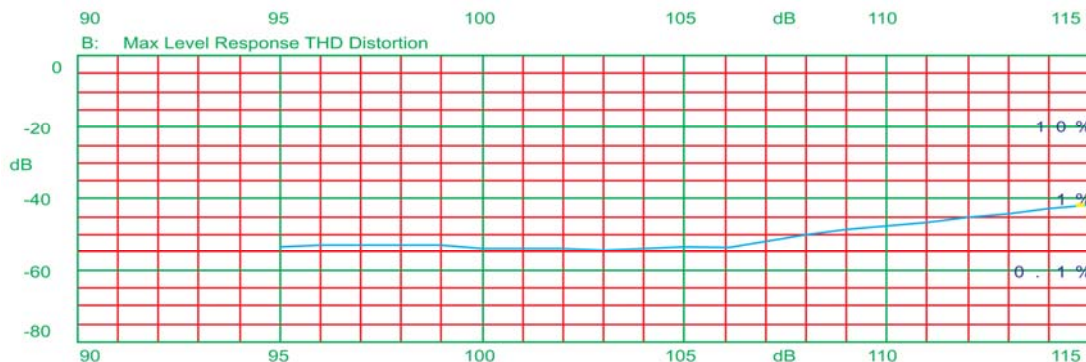
2. Frequency Response Curve



¹ 0dB = 1V/Pa, per I.E.C. (International Electrotechnical Commission) recommendation. To convert to a 0dB "ubar" reference, subtract 20 dB. Example: -40dB (1V/Pa) = -60dB (0dB = 1V/ubar)



3. THD Curve



4. Operating and Storage Application

4.1. Temperature Condition

4.1.a. Storage temperature range: $-40^{\circ}\text{C} \sim +70^{\circ}\text{C}$.

4.1.b. Operating temperature range: $-40^{\circ}\text{C} \sim +100^{\circ}\text{C}$.

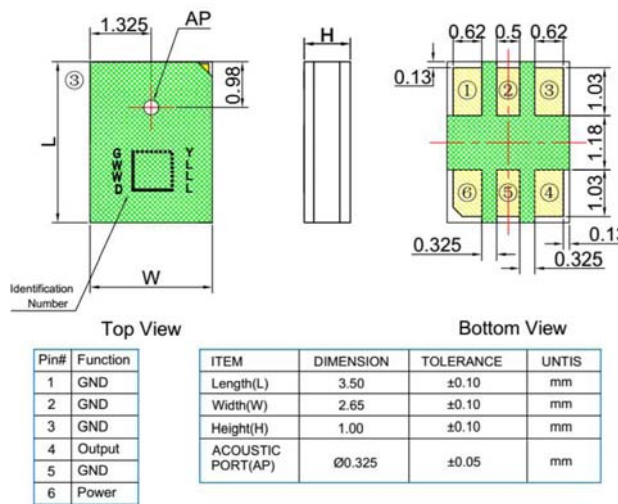
5. Mechanical Characteristics

5.1. Weight: Less than 0.03 grams

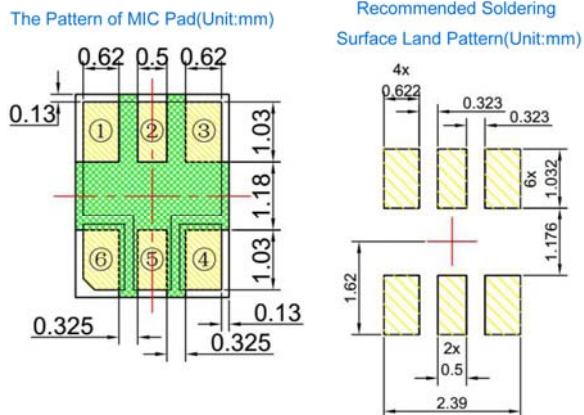
5.2. All dimensions are: in millimeter (mm).

5.3. Tolerance: ± 0.1 mm unless otherwise specified.

5.4. Microphone Dimensions: 3.5 mm x 2.65 mm x 1.00 mm

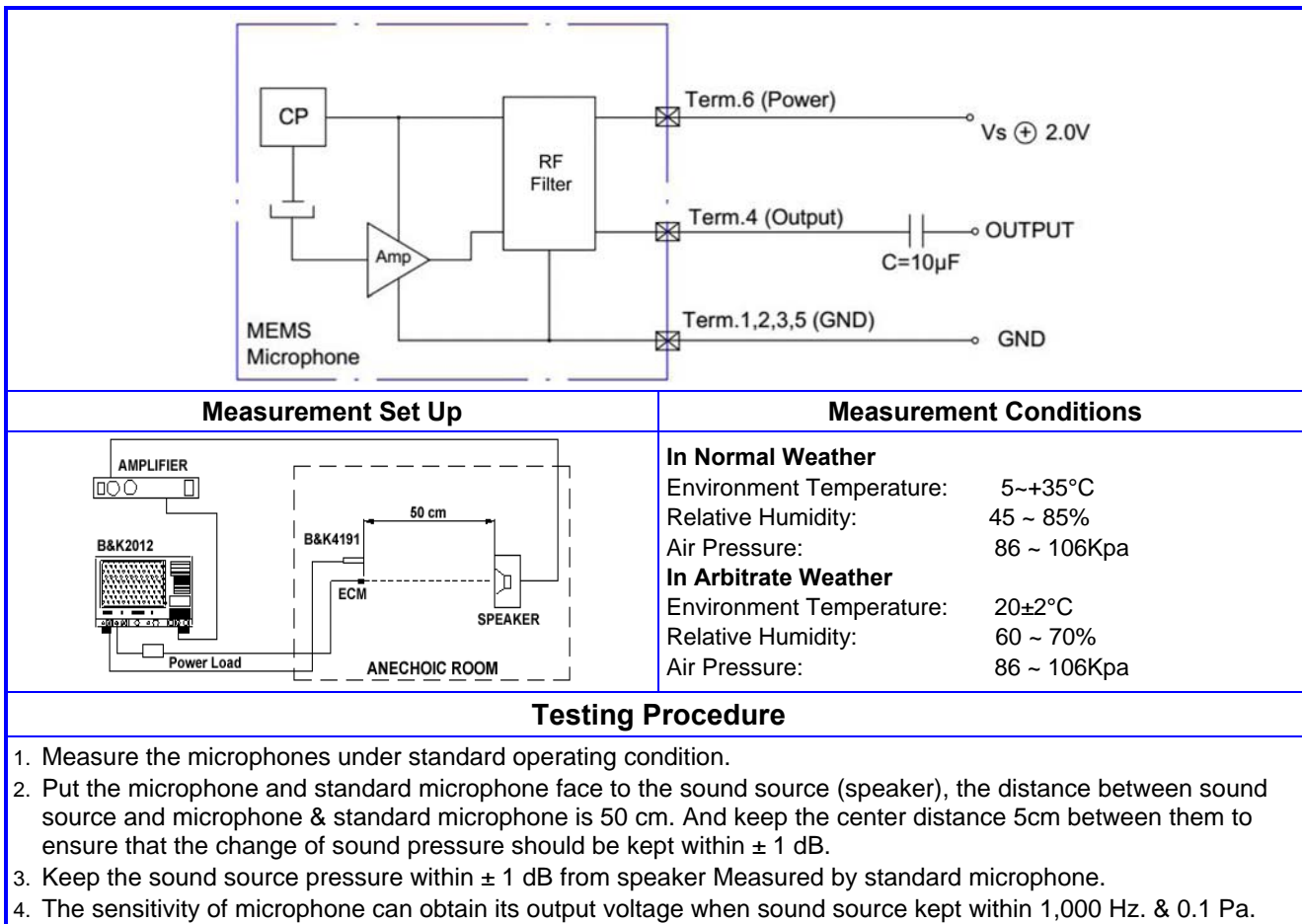


6. Recommended Land Pattern





7. Measurement Circuit



8. Soldering Condition

- 8.1. We suggest using anti-static welding machine which can control soldering temperature automatically.
- 8.2. Soldering temperature should be controlled under 320°C and soldering time for each terminal should be 1~2 seconds
- 8.3. Microphone should be fixed on the metal block (heat sink), which has high radiation effects, and heat sink shall contact with MIC tightly.
- 8.4. Microphone may easily be destroyed by the static electricity and the countermeasure for eliminating the static electricity shall be executed (worktable and human body shall be ground connection)

9. Concept of Unit

The difference between concept of “PASCAL” unit and the one unit “µbar” can be explained as follows:
In calibrating the sensitivity of ECMs, the sensitivity is manifested differently according as the units “PASCAL” or “µbar”. For example: **-60 dB (0 dB = 1 V / µbar) - -42 dB (0 dB = 1 V / Pa)**



10. Part Number Description

ID	Description
C	Challenge Electronics
M	Microphone
03	3 mm diameter
O	Omnidirectional
S	SMD Termination
-	Dash
03	3.6 V Maximum
38	-38 Typical Sensitivity
-	Dash
A	Analog
1	Version 1

11. Warranty

For a period of one (1) year from date of shipping under normal handling and operations conditions

This warranty does not apply to products damaged through misuse, abuse, improper installation, alteration, rework, or attempt to repair

Revision	Description	By	Date
0-2018	Initial Specification Sheet	JL	2018-06-04
1-2018	Added Recommended Land Pattern	JL	2018-07-23
2-2018	Removed Orientation Feature from Mechanical Drawing	JL	2018-08-30