

SPECIFICATION

Electret Condenser Microphone

RoHS Compliance

Product : Bi directional ECM $\Phi 6\text{mm} \times 2.7\text{mm}$

GETTOP P/N: BNM6027L-G433AC

Version : V4.0

Designed by	Checked by	Approved by	Released Date
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Revision History

Date	Version	Description	Controller
05-23-2022	V3.0	Initial Release	Qihua Guo
09-25-2023	V3.1	Update the operating voltage range	Qihua Guo
08-02-2025	V4.0	Added company contact information	Flora Guo

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1. Scope

This document is the technical specification of electret condenser (ECM) Bi-directional Microphone.

2. Product Type

BNM6027L-G433AC

3. Electro-Acoustic Specifications

Table 3-1 Electrical Specifications

(Test Condition: $+23^{\circ}\text{C} \pm 2$, 63%~67% RH, 86~106Kpa, $V_s=2\text{V}$, unless specified differently)

No.	Parameter	Symbol	Condition	Limits			Unit
				Min	Nom.	Max	
3.1	Sensitivity	S	$f=1\text{kHz}$, $P_{in}=1\text{Pa}$, $0\text{dB}=1\text{V/Pa}$	-46	-43	-40	dB
3.2	Directivity			Bi- directional			
3.3	Output Impedance	ZOUT	$f=1\text{kHz}$			2.2	k Ω
3.4	Current Consumption	IDSS	$R_L=2.2\text{k}\Omega$, $V_s=2.0\text{V}$			500	μA
3.5	S/N Ratio	S/N	$f=1\text{kHz}$, $P_{in}=1\text{Pa}$, (A-Weighted)		61		dB
3.6	Operating Voltage	Vmic		1.0		5.0	V
3.7	Sensitivity vs. Voltage	ΔS	$V_s=2.0\text{V}$ to 1.5V			3	dB
3.8	Distortion	THD	94dB SPL at 1kHz			1	%
3.9	Acoustic Overload Point	AOP	THD 10%@1KHz		130		dB SPL

Note: Considering tester and testing difference between each other, sensitivity 0.5 dB out of specification will be acceptable by customer for an acceptance.

4. Typical Frequency Response

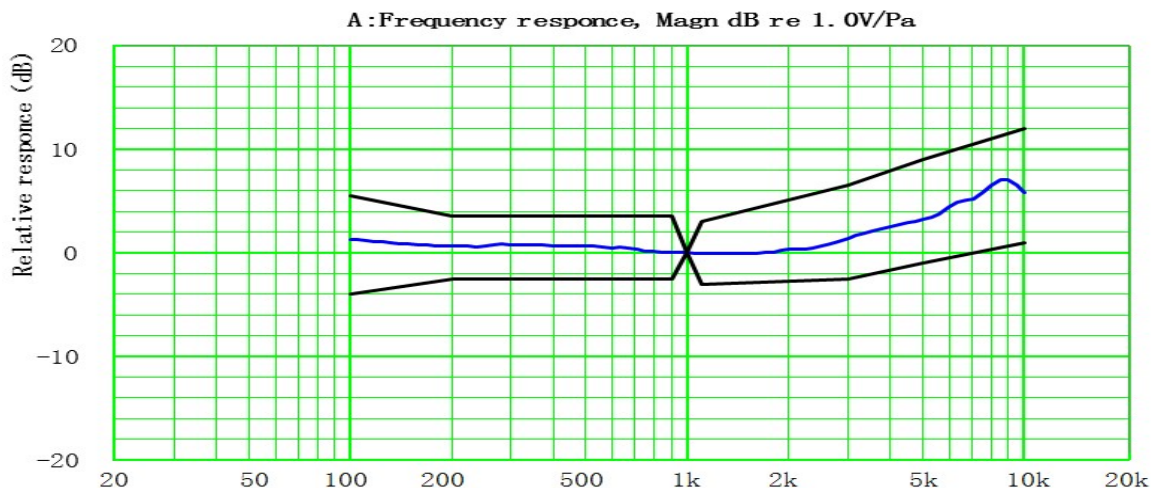


Fig. 4-1 Typical Frequency Response

Table 4-1 Frequency Response Limit Template

Frequency [Hz]	100	200	300	900	1K	1.1K	3K	5K	10K
Upper limit [dB]	5.5	3.5	3.5	3.5	0	3	7	9	12
Frequency [Hz]	100	200	300	900	1K	1.1K	3K	5K	10K
Lower limit [dB]	-4	-2.5	-2.5	-2.5	0	-3	-2.5	-1	1

5. Schematic Diagram

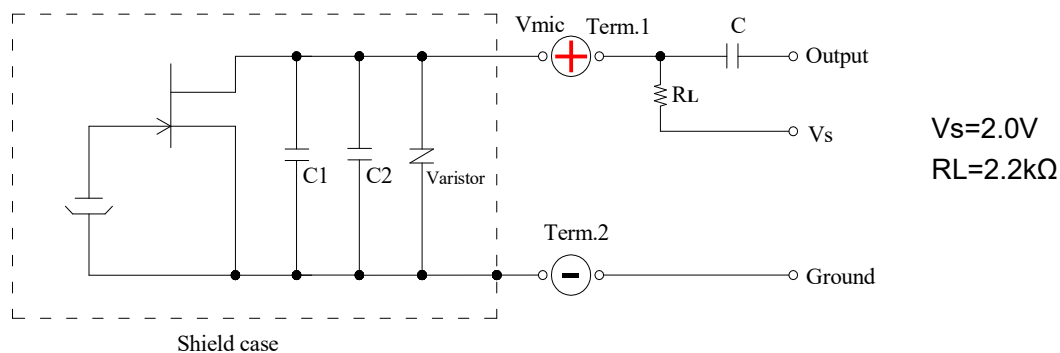


Fig. 5-1 Schematic Diagram

6. Measurement System Setup

Test signal: Sinusoid, Sweep,

Frequency Range: 100Hz-10KHz

Step: 1/12 octave

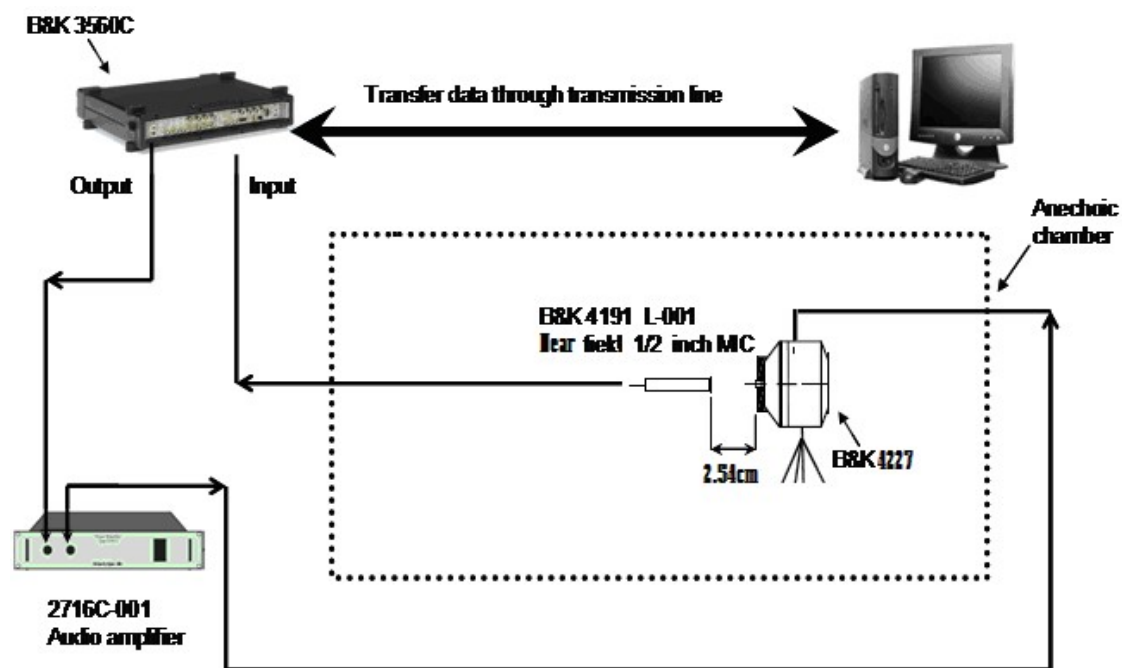
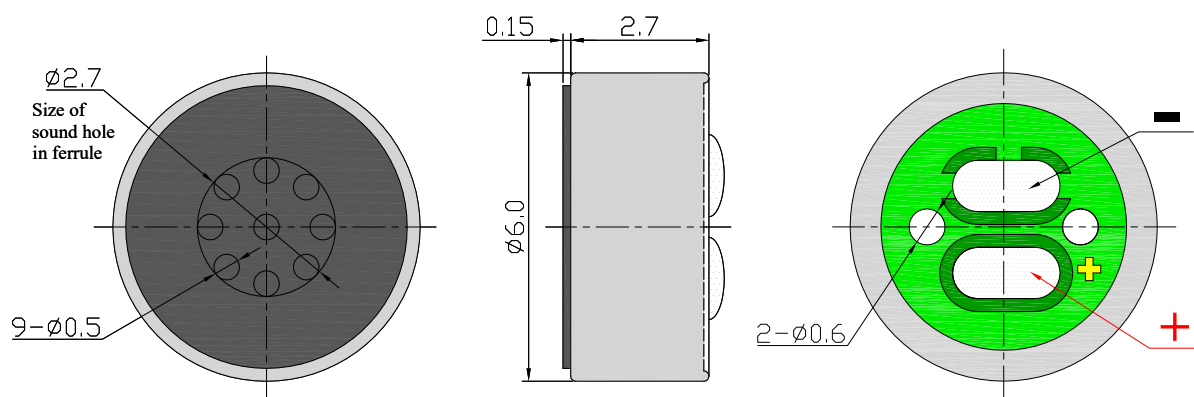


Fig. 6-1 Measurement System Setup

7. Mechanical Specification



Unmarked Tolerance: ± 0.1 (mm)

Fig. 7-1 Microphone Capsule

8. Reliability Tests

After conducting any of the following tests, the sensitivity change of DUT shall be less than $\pm 3\text{dB}$ from its initial value and shall keep its initial operation and appearance.

The measurement to be done after 2 hours of conditioning at $+15\text{ }^{\circ}\text{C} \sim +35\text{ }^{\circ}\text{C}$, R.H 45%~75%

8.1 Hi-Temperature Test

Temperature: $+85\text{ }^{\circ}\text{C}$
Duration: 240 hours

8.2 Low-Temperature Test

Temperature: $-40\text{ }^{\circ}\text{C}$
Duration: 240 hours

8.3 Humidity & Heat Test

Temperature: $+60\text{ }^{\circ}\text{C}$
Humidity: 93% RH
Duration: 240 hours

8.4 Thermal Shocking Test

Temperature & duration: $-40\text{ }^{\circ}\text{C}$, 30 minutes
Temperature & duration: $+80\text{ }^{\circ}\text{C}$, 30 minutes,
Cycles: 32 cycles

8.5 Vibration Test

Frequency: 10-55Hz
Amplitude: 1.52mm
Direction: 2 directions
Duration: 2 hours

8.6 Drop Test

Drop the microphones to the floor
Height: 1.5m
Reference surface: slippery marble floor
Duration: 3 times

8.7 Soldering Heat Test

Place microphones in the metallic fixture.
Soldering Heat: $350\text{ }^{\circ}\text{C}$
Duration: 5S

8.8 ESD

The tests are performed acc. to IEC61000-4-2 level 3

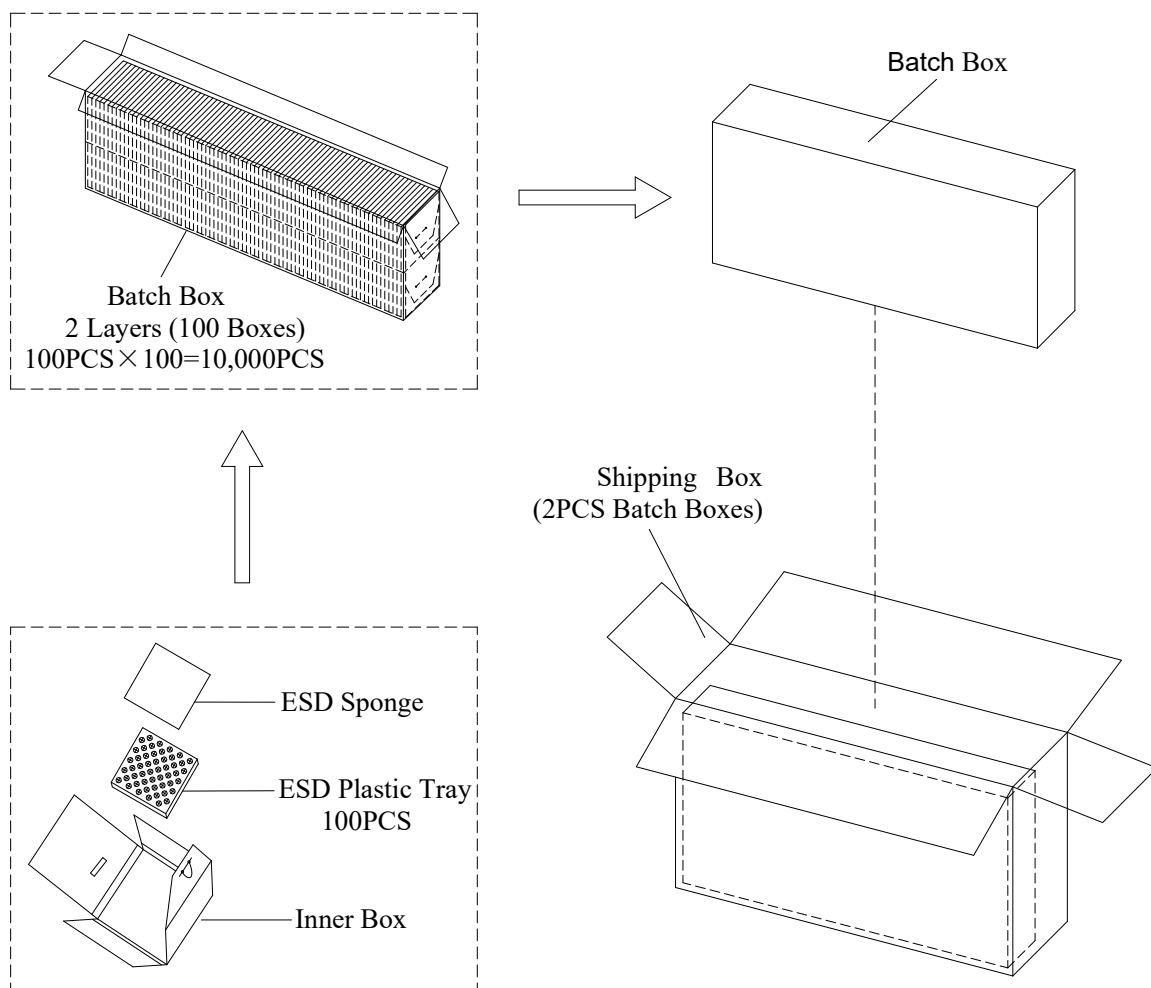
a. Contact discharge

Discharge position: Output of microphone
Charge voltage: $\pm 6000\text{VDC}$
Discharge network: $150\text{pF} \ \& \ 330\Omega$

b. Air discharge

Discharge position: Sound hole
Charge voltage: $\pm 8000\text{VDC}$
Discharge network: $150\text{pF} \ \& \ 330\Omega$

9. Packaging



Inner Box	82mm×82mm×8mm	100PCS×1=100PCS
Batch Box	435mm×100mm×185mm	100PCS×100=10,000PCS
Shipping Box	455mm×233mm×211mm	10,000PCS×2=20,000PCS

Fig. 9-1 Packaging

10. Usage Suggestions

10.1 Soldering Condition

All the soldering process should be completed in a metallic fixture. Based on a 90-watt soldering iron, the temperature of the soldering iron suggest be limited to $350^{\circ}\text{C} \pm 10^{\circ}\text{C}$. Soldering time on each pad should not exceed 1 second. If other welding method is used, to evaluate its influence on microphone is necessary.

Operators, the solder fixture and the soldering iron must be statically grounded under each soldering process.

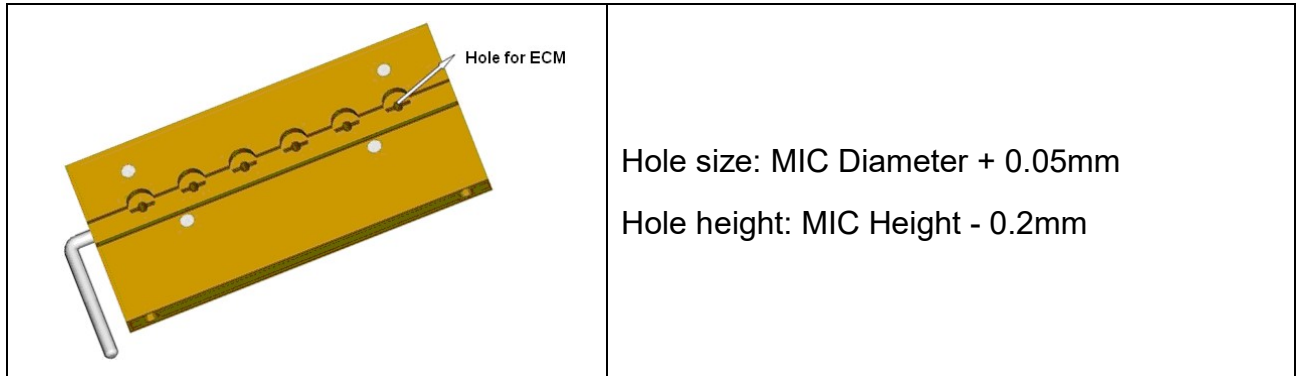


Fig. 10-1 Soldering Fixture

10.2 Others

Avoid volatilization of harmful substance that affects the performances of microphone, such as volatile glue and so on.

11. Special Cautions

11.1 Environmental Condition

Storage Condition: $-40^{\circ}\text{C} \sim +70^{\circ}\text{C}$.

Operation Condition: $-20^{\circ}\text{C} \sim +60^{\circ}\text{C}$.

Arbitration Condition: $23^{\circ}\text{C} \pm 1^{\circ}\text{C}$, R.H. 63%~67%, Air pressure: 86~106Kpa.

11.2 Storage

Keep ECM in warehouse with humidity less than 75%R.H. and without sudden temperature change, acid air, any other harmful air or strong magnetic field.

Please protect products against moist, shock, sunburn and pressure.

Please take proper measures against ESD in the process. Please use the shipment package for long-term storage.

12. Discard Suggestions

For microphones to be wasted, customer shall follow the regulation of Waste Electrical and Electronic Equipment (WEEE) Directive (2002/96/EC).