



| | |
|------------|-----------------|
| Data Sheet | AMM-3738-B-EB-R |
|------------|-----------------|

PUI Audio is proud to release a line of premium, high-fidelity MEMS wide-band microphones that cover the entire audio band from 20 Hz up to 18 kHz —and up to 20 kHz on some models—while featuring industry-best consistency of ± 1 dB across the entire frequency response.

Quickly test and prototype the bottom-firing **AMM-3738-B-R** with this evaluation board. Solder pads with pre-punched through-holes make wiring to the evaluation board quick-and-easy!

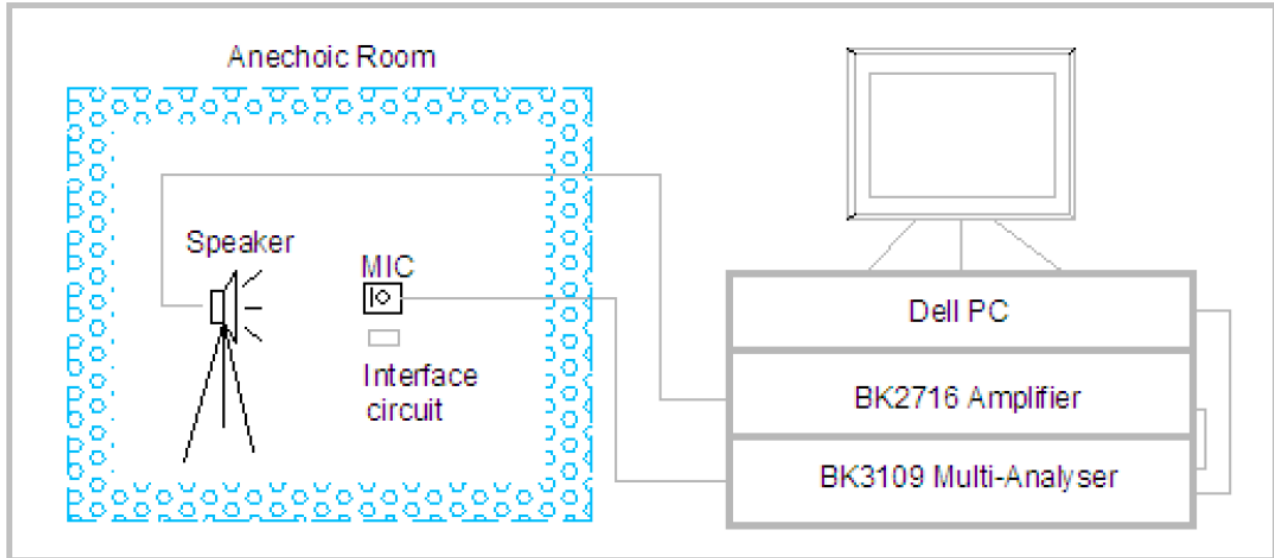
Specifications

| Parameters | Values | Units |
|---|-------------------|--------------|
| Sensitivity (1 kHz @ 50cm) 0 dB=1V/Pa | -38 \pm 1 | dB |
| Rated Voltage | 2 | VDC |
| Operating Voltage Range | 1.5 to 3.6 | VDC |
| Output Impedance (@ 1 kHz) | 300 | Ω |
| Current consumption (at 2 VDC/at 3.6 VDC) | 90/200 | μ A |
| Signal-to-Noise Ratio (1kHz, 94 dB input, A-weighted) | 62 | dB |
| Decreasing Voltage (0 dB=1V/Pa, 3.6 to 1.5 VDC) | 0.5 | dB |
| Frequency Range | 20 – 20,000 | Hz |
| Total Harmonic Distortion (94 dB @ 50cm, 1 kHz) | 0.5% | - |
| Acoustic Overload Point (AOP) (50cm, 1kHz, 10% THD) | 125 | dB |
| Directivity | Omnidirectional | |
| Environmental Compliances | RoHS/Halogen Free | |
| Power Supply Rejection (PSR, 100 mVpp Square Wave @ 217 Hz, A-weighted) | -90 | dB |
| Operating Temperature (VDD < 3 VDC) | -40 ~ +100 | $^{\circ}$ C |
| Operating Temperature (VDD > 3 VDC) | -40 ~ +70 | $^{\circ}$ C |
| Storage Temperature | -40 ~ +125 | $^{\circ}$ C |

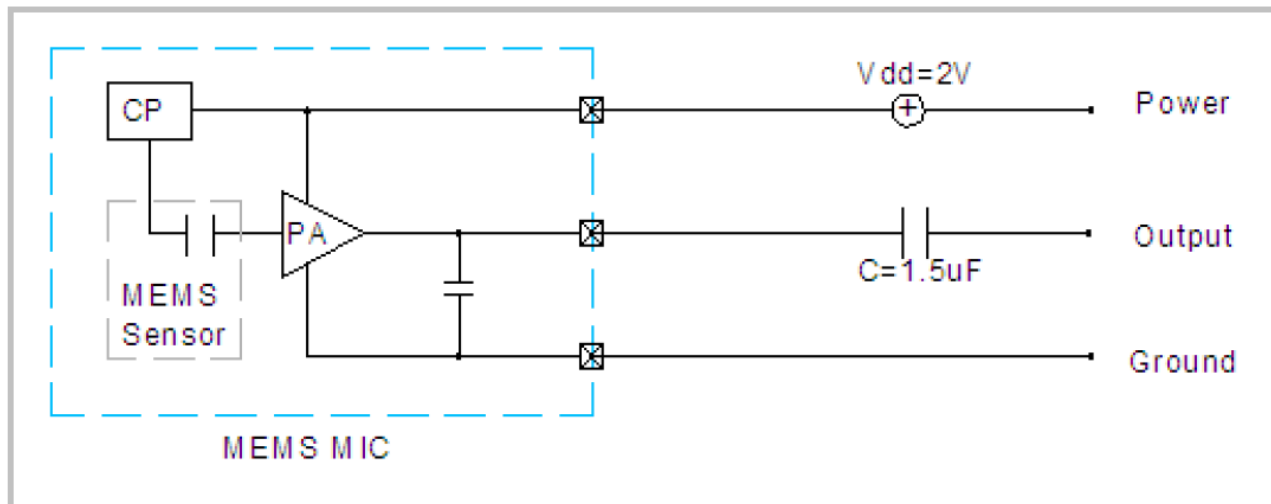
Absolute Maximum Ratings

| Parameters | Values | Units |
|--------------------------|---|-------|
| Max Voltage on Any Pin | 4 | VDC |
| Max Sound Pressure Level | 160 | dB |
| Max Mechanical Shock | 10,000 | Gs |
| Max Vibration | Pre-MIL-STD-883 Method 2007, Test Condition B | |

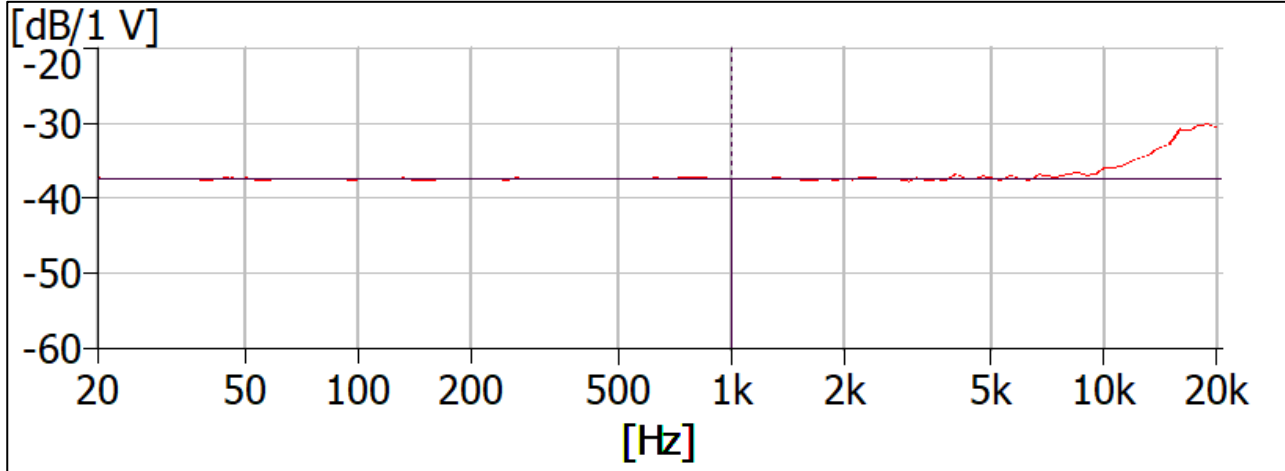
Measurement Method (with speaker spaced 50cm from microphone)



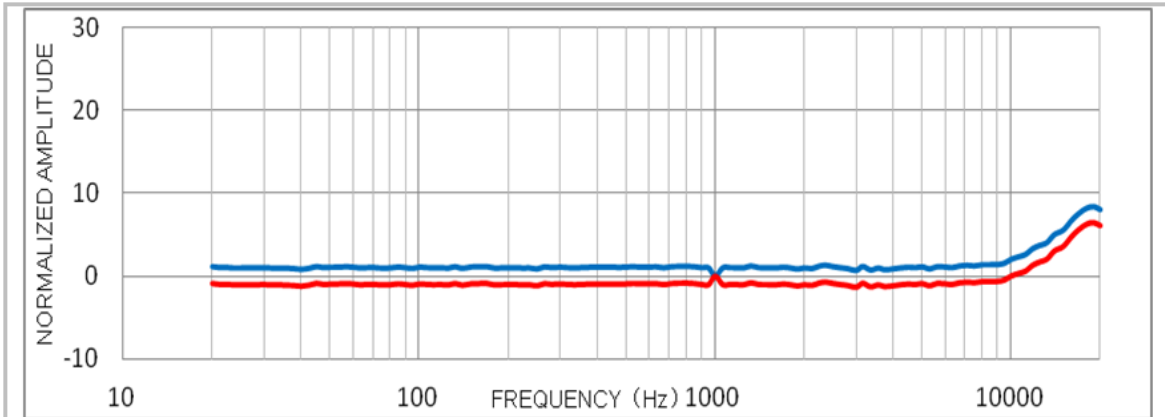
Recommended Drive Circuit (capacitor included on evaluation board)



Typical Frequency Response



Frequency Response Mask (100% Pass/Fail Test for Microphones)

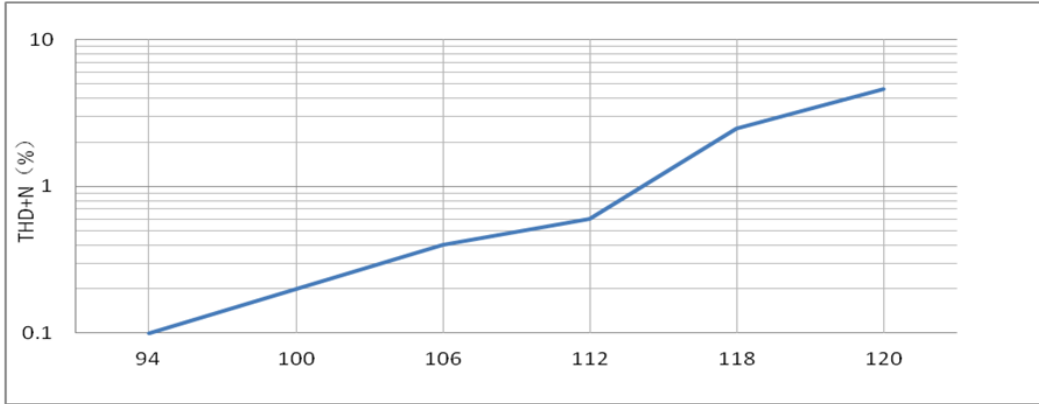


Frequency Response Mask

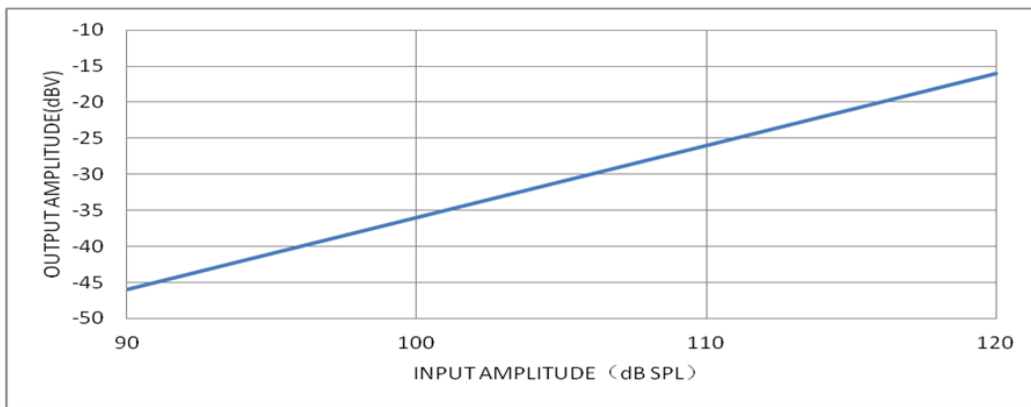
| Frequency (Hz) | Upper | Limit |
|----------------|-------|-------|
| 20 | 1 | -1 |
| 50 | 1 | -1 |
| 100 | 1 | -1 |
| 900 | 1 | -1 |
| 1000 | 0 | 0 |
| 1100 | 1 | -1 |
| 2000 | 1 | -1 |
| 5000 | 1 | -1 |
| 10000 | 2 | 0 |
| 15000 | 7 | 5 |
| 20000 | 8 | 6 |

Free-field frequency response normalized to 1kHz sensitivity value.

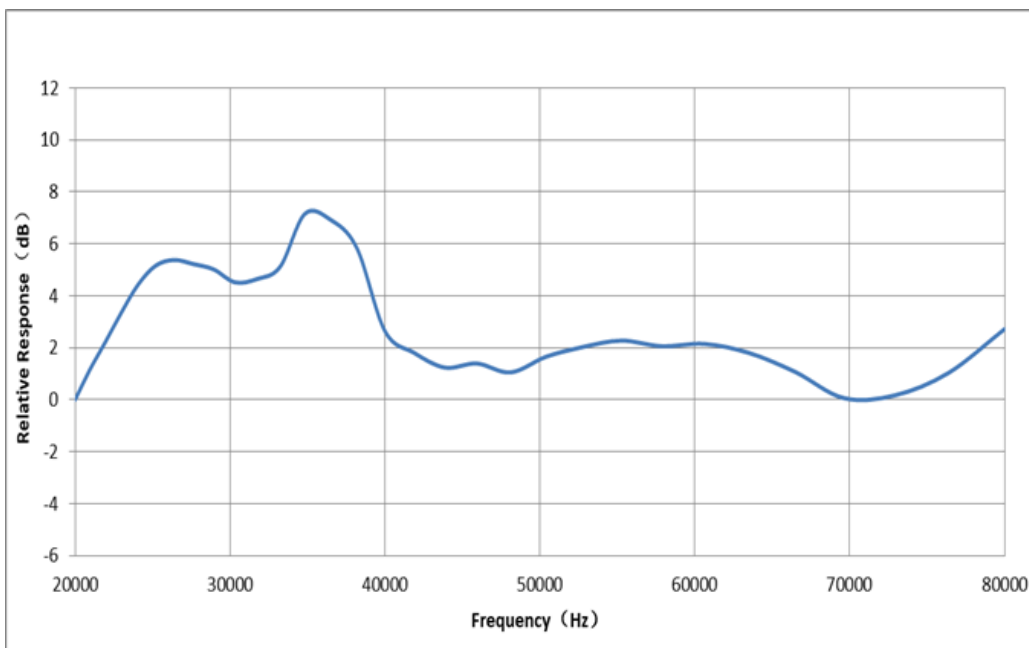
Total Harmonic Distortion + Noise versus SPL Input (with acoustic source at 50cm)



Microphone Output versus SPL Input (with acoustic source at 50cm)



Ultrasonic Frequency Response (Sensitivity normalized to 0 dB)

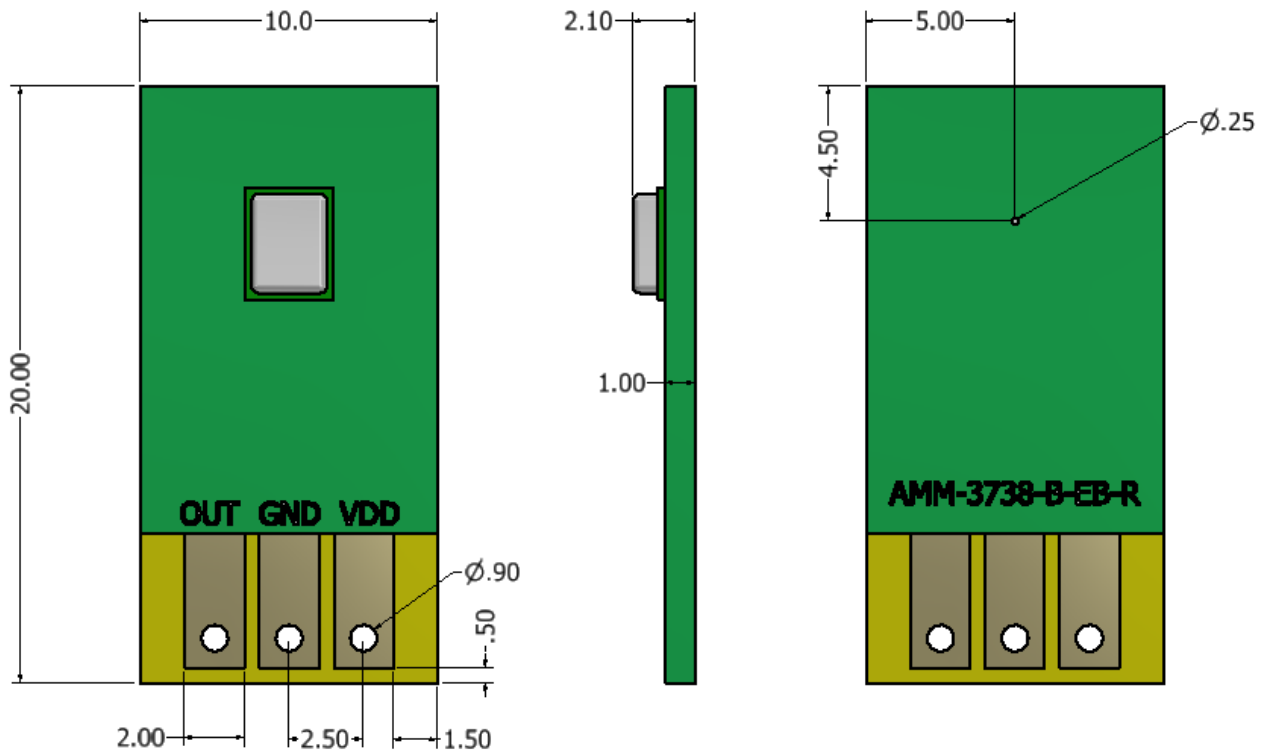


Reliability Testing

| Type of Test | Test Specifications |
|-----------------------------------|--|
| Simulated Reflow (Without Solder) | Samples for qualification testing require 3 passes 260±5 °C reflow solder profiles. 2 hours of setting time is required between each reflow profile test. |
| Static Humidity | Precondition at +25°C for 1 hour. Expose to +85°C with 85% relative humidity for 1000 hours. Finally, dry at room ambient for 3±1 hour before taking final measurement. |
| 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. |
| 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. |
| Vibration Test | Vibrate randomly along three perpendicular directions for 30 minutes in each direction, 4 cycles from 20~2000 Hz with a peak acceleration of 20 Gs. |
| Shock Test | Subject samples to half-sine shock pulses (3000±15% Gs for 0.3ms) in each direction, for a total of 18 shocks. |
| Drop Test | Drop samples from 1.5m height onto a steel surface, total 18 times and inspected for mechanical damage. |
| Operation Life | Subject samples to +125°C for 168 hours under full maximum rated voltage. |

Microphone frequency response and sensitivity shall not deviate more than ±3 dB.

Dimensions



Specifications Revisions

| Revision | Description | Date |
|-----------------|---------------------------|-------------|
| - | Released from Engineering | 1/31/2020 |
| A | Added Ultrasonic Response | 5/19/2020 |

Note:

1. Unless otherwise specified:
 - A. All dimensions are in millimeters.
 - B. Default tolerances are $\pm 0.5\text{mm}$ and angles are $\pm 3^\circ$.
2. Specifications subject to change or withdrawal without notice.