

## Specification of MEMS Microphone

**RoHS Compliance & Halogen Free**

**LinkMems P/N: LMD4020T261-OAC23-DM1**

| Designed by | Checked by | Approved by |
|-------------|------------|-------------|
| Kevin       | Thomas     | Hary        |

### Customer Approval

Approved by: \_\_\_\_\_



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## MEMS Microphone

### 1. Introduction

The LMD4020T 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 reflow assembly. Data format is a single bit PDM.

### 2. Electrical Characteristics

Test Condition:  $V_{DD}=1.8V$ ,  $23\pm 2^{\circ}C$ ,  $55\pm 10\%R.H.$ , unless otherwise specified.

#### Electrical Characteristics

| Parameter            | Symbol   | Note/Test Condition | Values |      |      | Unit |
|----------------------|----------|---------------------|--------|------|------|------|
|                      |          |                     | Min.   | Typ. | Max. |      |
| Power supply voltage | $V_{DD}$ |                     | 1.62   | 1.8  | 3.6  | V    |

#### Standard Mode

Test Condition: Measurement Clock Frequency 2.4 MHz,  $V_{DD} = 1.8 V$

| Specification             | Symbol | Test Conditions                          | Min.             | Typ. | Max. | Unit    |
|---------------------------|--------|------------------------------------------|------------------|------|------|---------|
| Directivity               |        |                                          | Omni-directional |      |      |         |
| Sensitivity Range         | S      | 94dB SPL @1kHz                           | -27              | -26  | -25  | dB      |
| Current Consumption       | I      |                                          |                  | 750  |      | $\mu A$ |
| S/N Ratio                 | SNR    | 94dB SPL @1kHz<br>A-Weighted             |                  | 61.5 |      | dB(A)   |
| Total Harmonic Distortion | THD    | 94dB SPL @1kHz                           |                  |      | 0.5  | %       |
| Acoustic Overload Point   | AOP    | 10% THD @1kHz                            |                  | 120  |      | dB SPL  |
| Power Supply Rejection    | PSR    | 100mVpp Square wave@217Hz,<br>A-weighted |                  | -80  |      | dB      |

### **Low Power Mode**

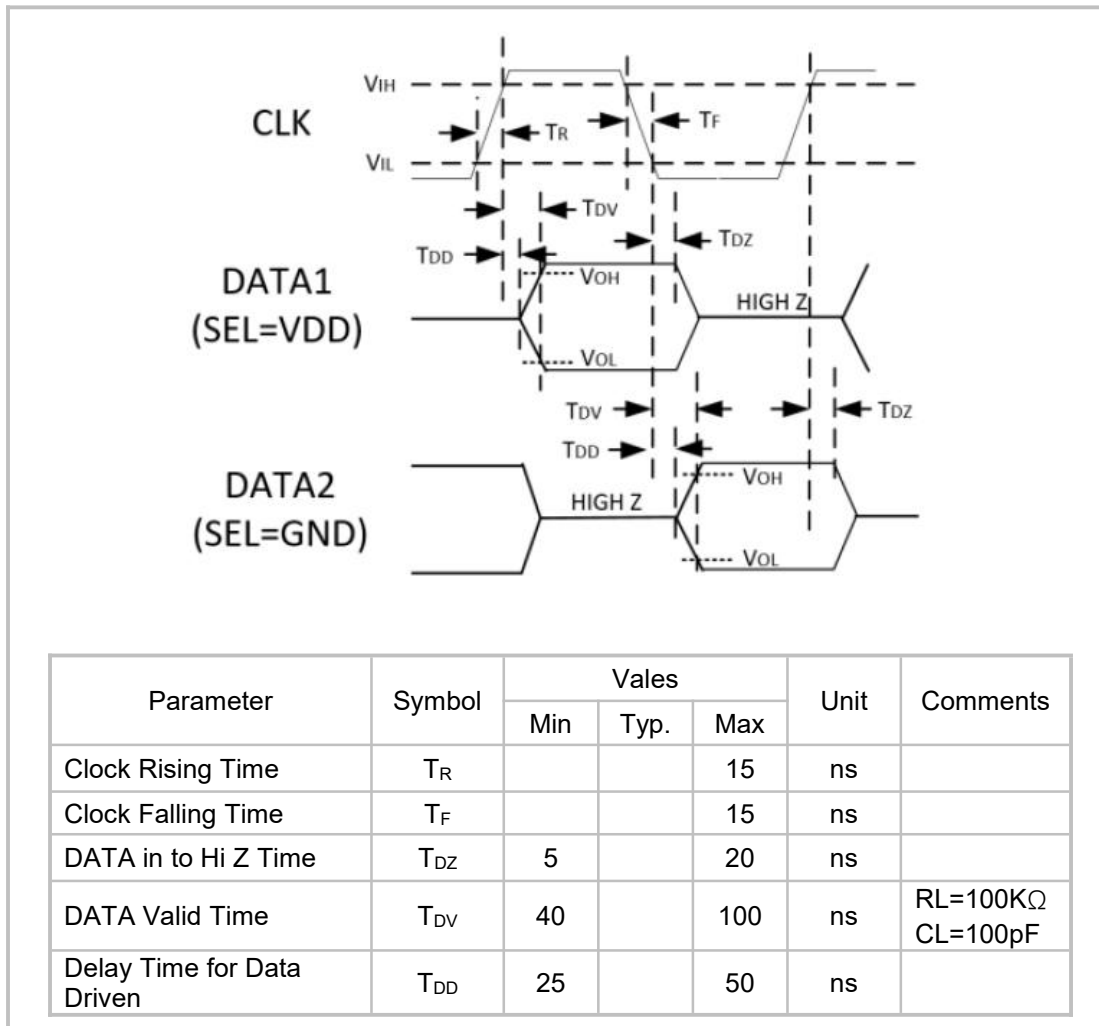
Test Condition: Measurement Clock Frequency 768 kHz, VDD = 1.8 V

| Specification             | Symbol | Test Conditions                          | Min.             | Typ. | Max. | Unit   |
|---------------------------|--------|------------------------------------------|------------------|------|------|--------|
| Directivity               |        |                                          | Omni-directional |      |      |        |
| Sensitivity Range         | S      | 94dB SPL @1kHz                           | -27              | -26  | -25  | dB     |
| Current Consumption       | I      |                                          |                  | 320  |      | μA     |
| S/N Ratio                 | SNR    | 94dB SPL @1kHz<br>A-Weighted             |                  | 61.5 |      | dB(A)  |
| Total Harmonic Distortion | THD    | 94dB SPL @1kHz                           |                  |      | 0.5  | %      |
| Acoustic Overload Point   | AOP    | 10% THD @1kHz                            |                  | 120  |      | dB SPL |
| Power Supply Rejection    | PSR    | 100mVpp Square wave@217Hz,<br>A-weighted |                  | -80  |      | dB     |

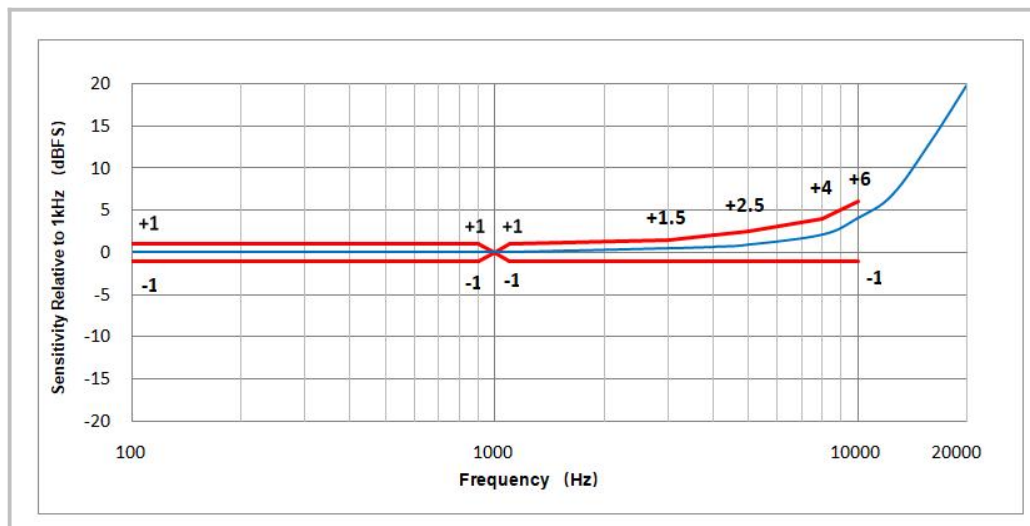
### **Operation Ratings**

| Parameter            |                | Symbol          | Note/Test Condition | Vales                 |      |                      | Unit |
|----------------------|----------------|-----------------|---------------------|-----------------------|------|----------------------|------|
|                      |                |                 |                     | Min                   | Typ. | Max                  |      |
| Power supply voltage |                | V <sub>DD</sub> |                     | 1.62                  |      | 3.6                  | V    |
| Frequency Range      | Sleep Mode     |                 |                     | 0                     |      | 10                   | kHz  |
|                      | Low Power Mode |                 |                     | 150                   | 768  | 900                  | kHz  |
|                      | Standard Mode  |                 |                     | 1300                  |      | 4800                 | kHz  |
| Clock Duty Cycle     |                |                 |                     | 40                    | 50   | 60                   | %    |
| Logic Input High     |                |                 |                     | 0.65*V <sub>DD</sub>  |      | V <sub>DD</sub> +0.3 | V    |
| Logic Input Low      |                |                 |                     | -0.3                  |      | 0.35*V <sub>DD</sub> | V    |
| Logic Output High    |                |                 |                     | V <sub>DD</sub> -0.45 |      |                      | V    |
| Logic Output Low     |                |                 |                     |                       |      | 0.45                 | V    |
| Load Capacitance     |                |                 |                     |                       |      | 100                  | pF   |

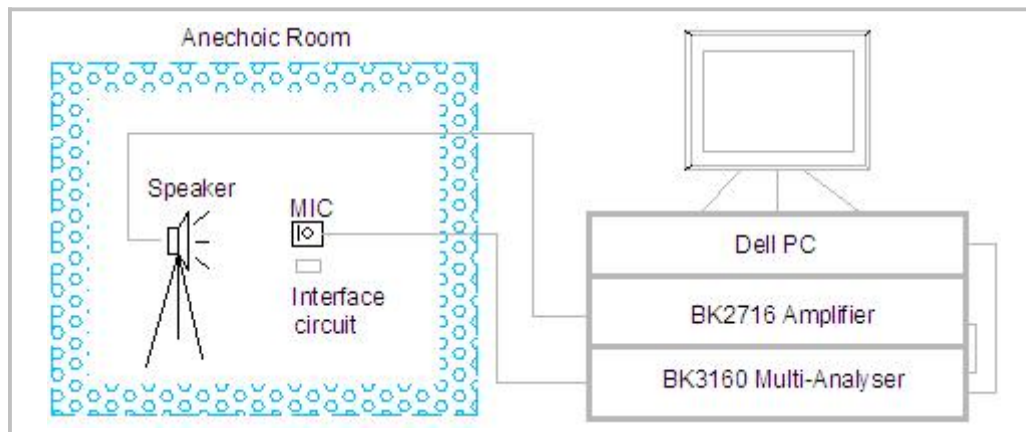
### 3. Timing Characteristics



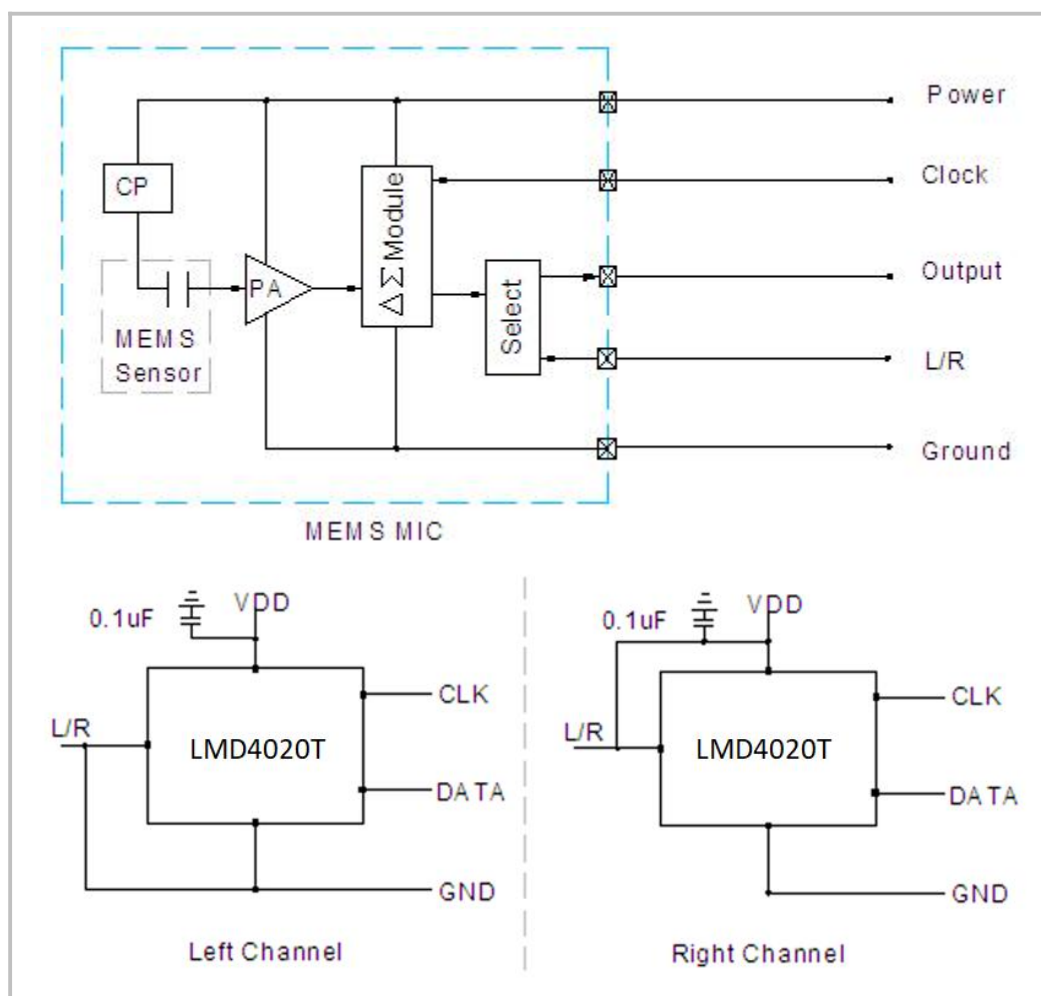
### 4. Frequency Response Curve



## 5. Test Setup (Sensitivity Test in Anechoic Room)

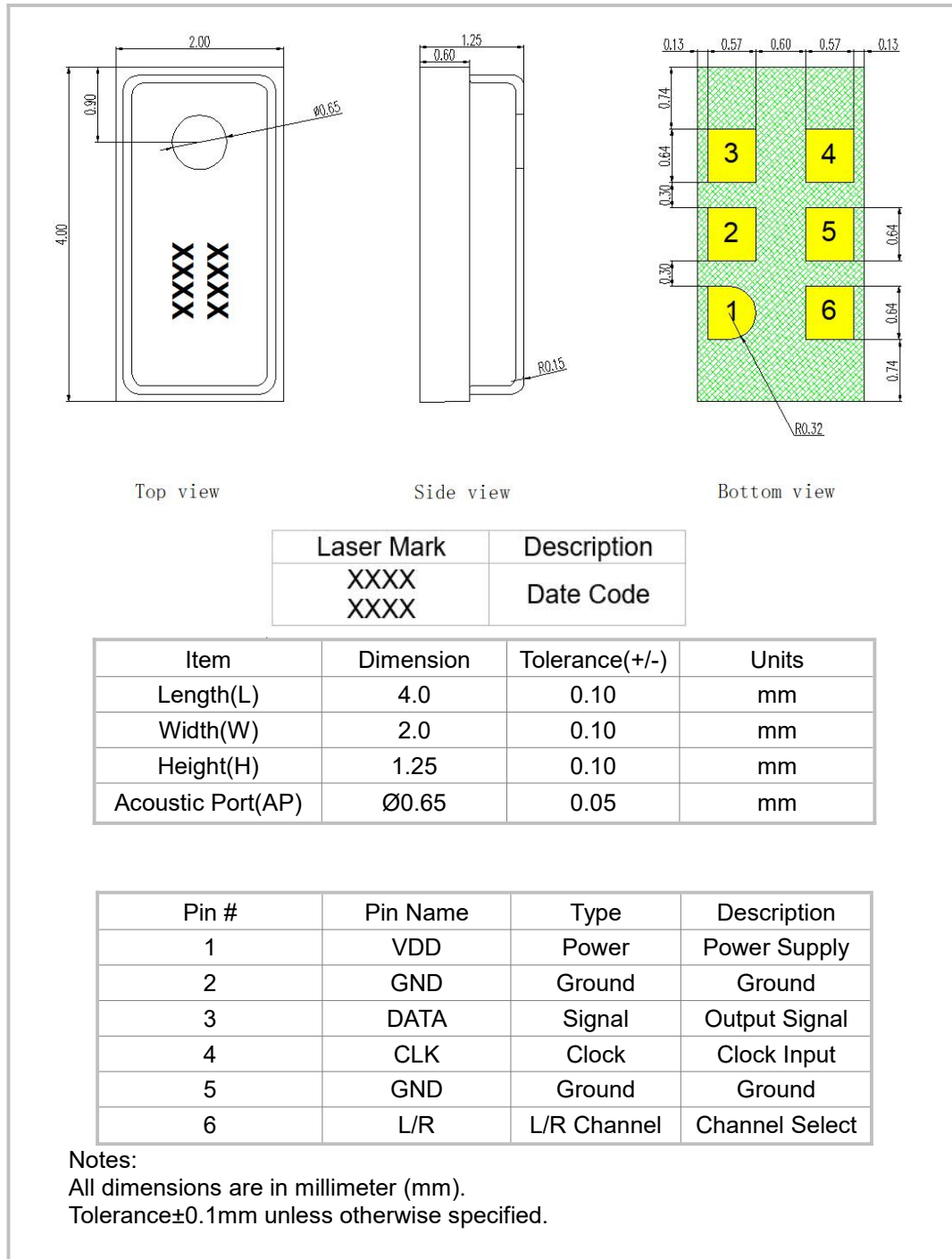


## 6. Measurement Circuit

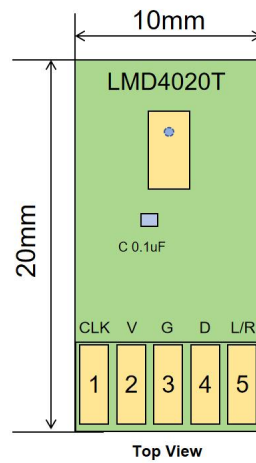


## 7. Mechanical Characteristics

### 7.1 Mic Unit



## 7.2 FPC



Top View

| Item              | Dimension | Tolerance(+/-) | Units |
|-------------------|-----------|----------------|-------|
| Length(L)         | 20.00     | 0.10           | mm    |
| Width(W)          | 10.00     | 0.10           | mm    |
| Height(H)         | 2.25      | 0.10           | mm    |
| Acoustic Port(AP) | Ø0.5      | 0.05           | mm    |

**Notes:**

All dimensions are in millimeter (mm).

Tolerance±0.1mm unless otherwise specified.

## Specification Revisions

| Revision | Description          | Approved | Date       |
|----------|----------------------|----------|------------|
| 1.2      | New Version Released | Hary     | 11/11/2024 |
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