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| Data Sheet | DMM-4026-B-EB-R |
|---|---|

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

Quickly test and prototype the bottom-firing **DMM-4026-B-EB-R** with this evaluation board.

## Specifications

| Parameters | Condition | Values | Units |
|---|---|---|---|
| Directivity | Omnidirectional | | |
| Sensitivity | 1 kHz @ 50cm with 94 dB source<br>0 dB=1V/Pa | -26±1 | dB |
| Data Format | 1/2 Cycle PDM | | |
| Rated Voltage | - | 1.8 | VDC |
| Operating Voltage Range | - | 1.5 to 3.6 | VDC |
| Current Draw | Full Power Mode | 820 ~ 1000 | µA |
| | Low Power Mode | 400 ~ 450 | µA |
| Signal-to-Noise Ratio (1kHz, 94 dB input, A-weighted) | Full Power Mode | 63 | dB |
| | Low Power Mode | 61 | dB |
| Frequency Range | 20~18,000 | | Hz |
| Total Harmonic Distortion (typical) | 94 dB @ 50cm, 1 kHz acoustic source | 0.5% | - |
| Acoustic Overload Point (AOP) | Full Power Mode<br>SPL @ 50cm with 10% THD @ 1 kHz | | 123 dB |
| | Low Power Mode<br>SPL @ 50cm with 10% THD @ 1 kHz | | 120 dB |
| Environmental Compliances | RoHS/Halogen Free | | |
| Power Supply Rejection | 100 mVpp Square Wave @ 217 Hz, A-weighted | -86 | dBFS |
| Load Capacitance | 140 | | pF |
| Max Voltage on any Pin | 4 | | VDC |
| Maximum SPL Before Damage (Source 50cm from microphone) | 160 | | dB |
| Max Mechanical Shock | 10,000 | | Gs |
| Max Vibration | Pre-MIL-STD-883 Method 2007, Test Condition B | | |
| Operating Temp (VDD <3.0V) | -40 ~ +100 | | °C |
| Operating Temp (VDD >3.0V) | -40 ~ +70 | | °C |
| Storage Temperature | -40 ~ +125 | | °C |

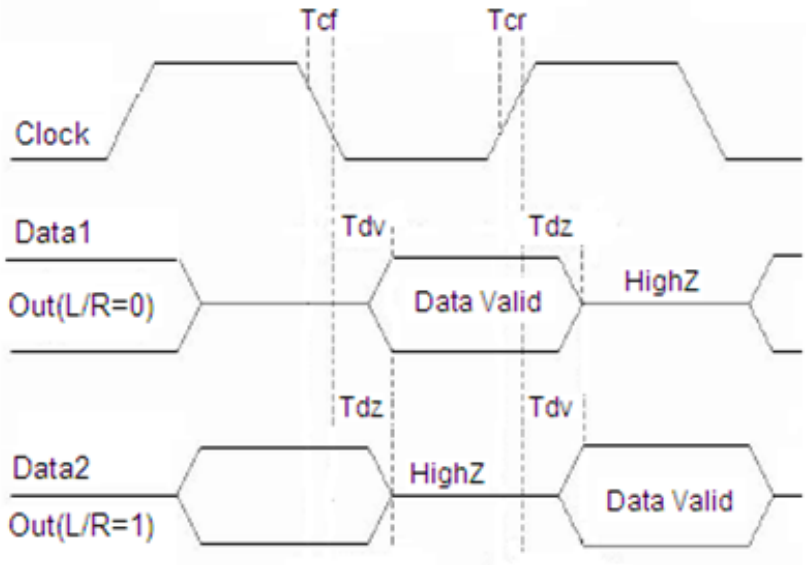
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## Operational Settings

| Parameters | Condition | Values | Units |
|---|---|---|---|
| Clock Frequency | Sleep Mode | 0 ~ 250 | kHz |
| | Low Power Mode | 351 ~ 800 | kHz |
| | Full Power Mode | 1.03 ~ 4.80 | MHz |
| Duty Cycle | For fCLK ≤ 2.4 MHz the duty cycle must be in the range of 40 ~ 60% and for fCLK > 2.4 MHz the duty cycle must be 50% | 40 ~ 60 | % |
| Logic Input High | - | 0.75*VDD ~ VDD + 0.3V | |
| Logic Input Low | - | -0.3 ~ 0.25*VDD | |
| Logic Output High | - | 0.75*VDD ~ VDD + 0.3V | |
| Logic Output Low | - | -0.3 ~ 0.25*VDD | |

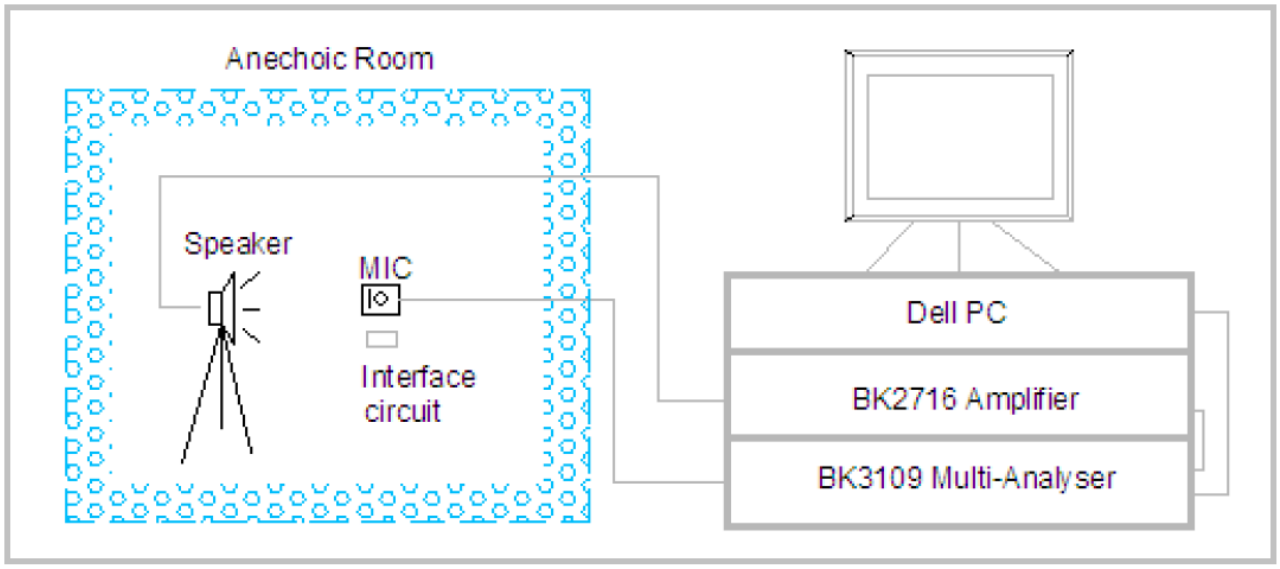
## Timing Characteristics



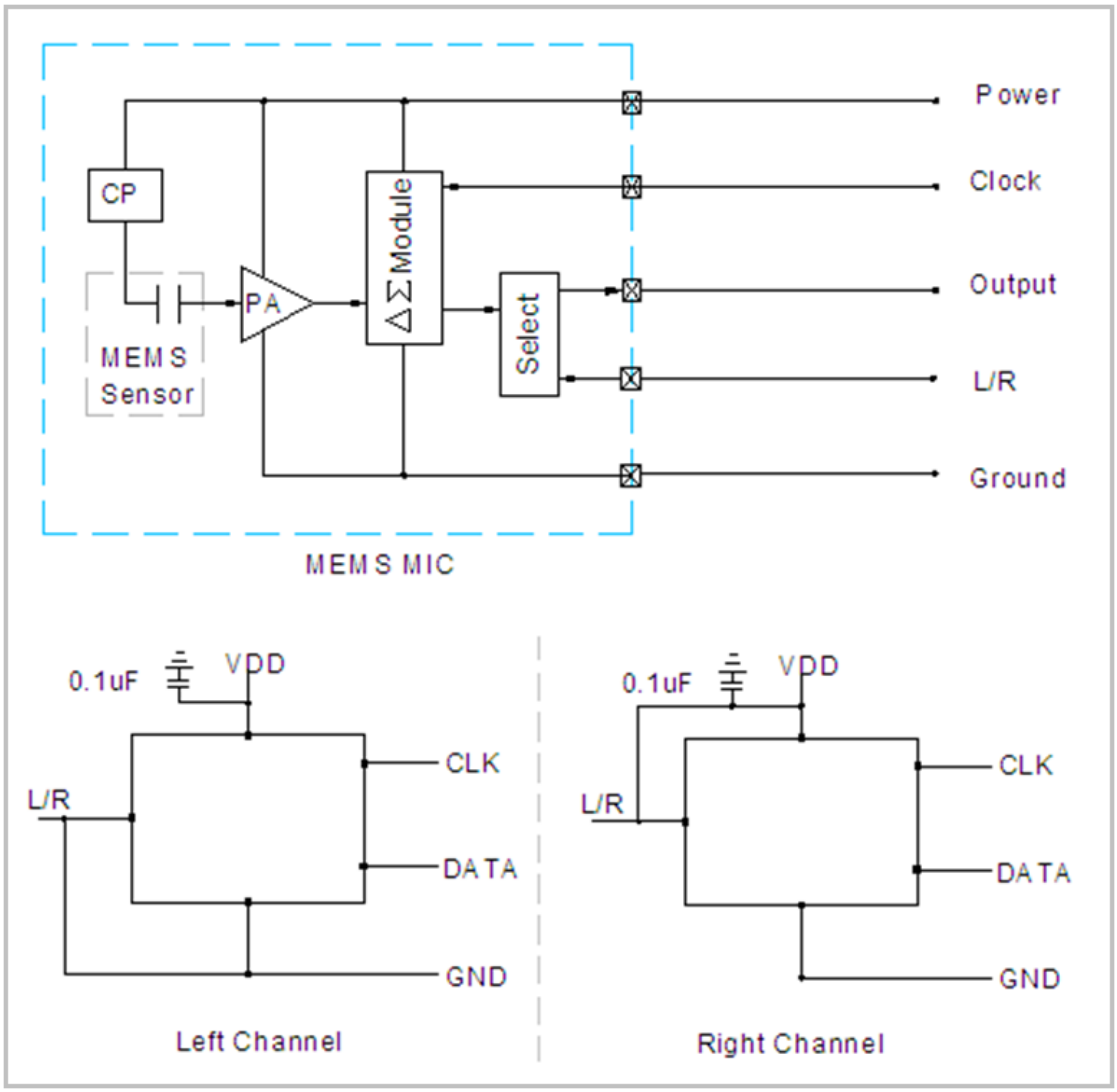

| Parameter | Symbol | Limit | | | Unit |
|---|---|---|---|---|---|
| | | Min. | Nom. | Max. | |
| Clock Fall Time | Tcf | | | 10 | ns |
| Clock Rise Time | Tcr | | | 10 | ns |
| Output Data Delay | Tdv | 20 | 31 | 40 | ns |
| Delay Time for High Z | Tdz | 0 | 8 | 15 | ns |

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## Measurement Method

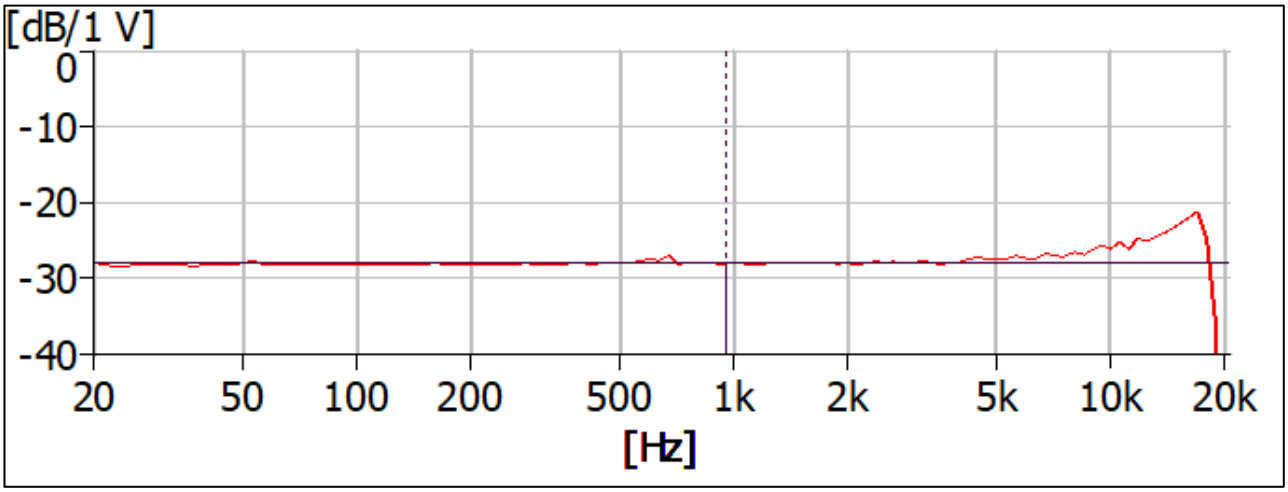



## Measurement Interface Circuit



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## Typical Frequency Response




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




Frequency Response Mask

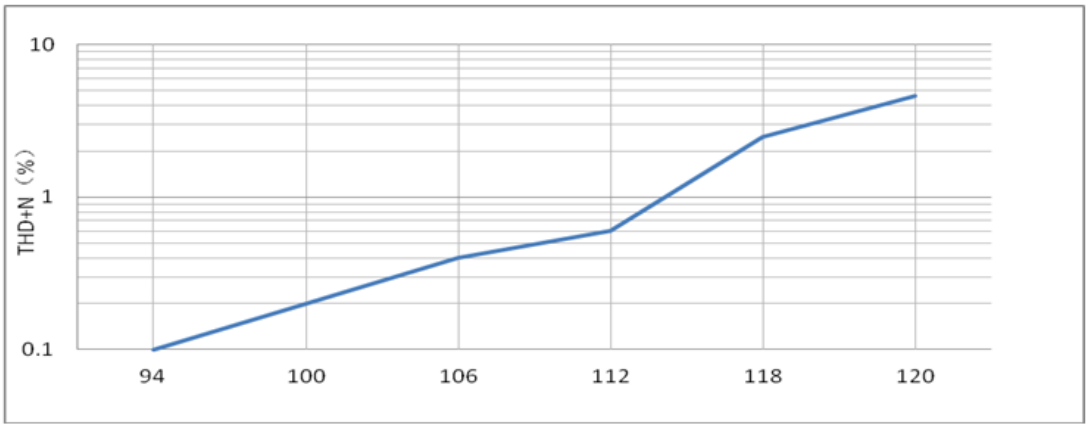
| Frequency (Hz) | Upper | Limit |
|---|---|---|
| 20 | 1 | -1 |
| 50 | 1 | -1 |
| 100 | 1 | -1 |
| 900 | 1 | -1 |
| 1000 | 0 | 0 |
| 1100 | 1 | -1 |
| 2000 | 1 | -1 |
| 5000 | 1 | -1 |
| 10000 | 3 | 1 |

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

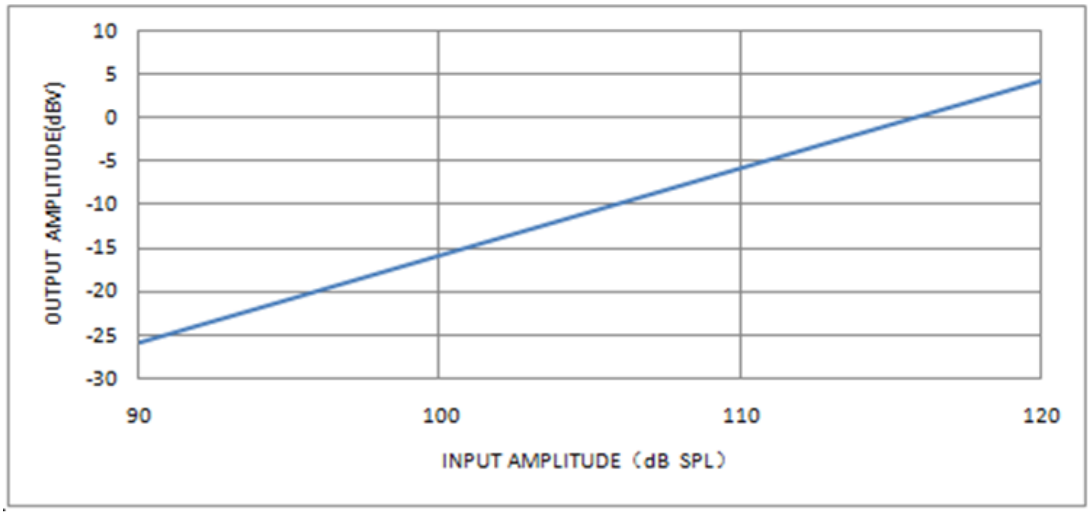
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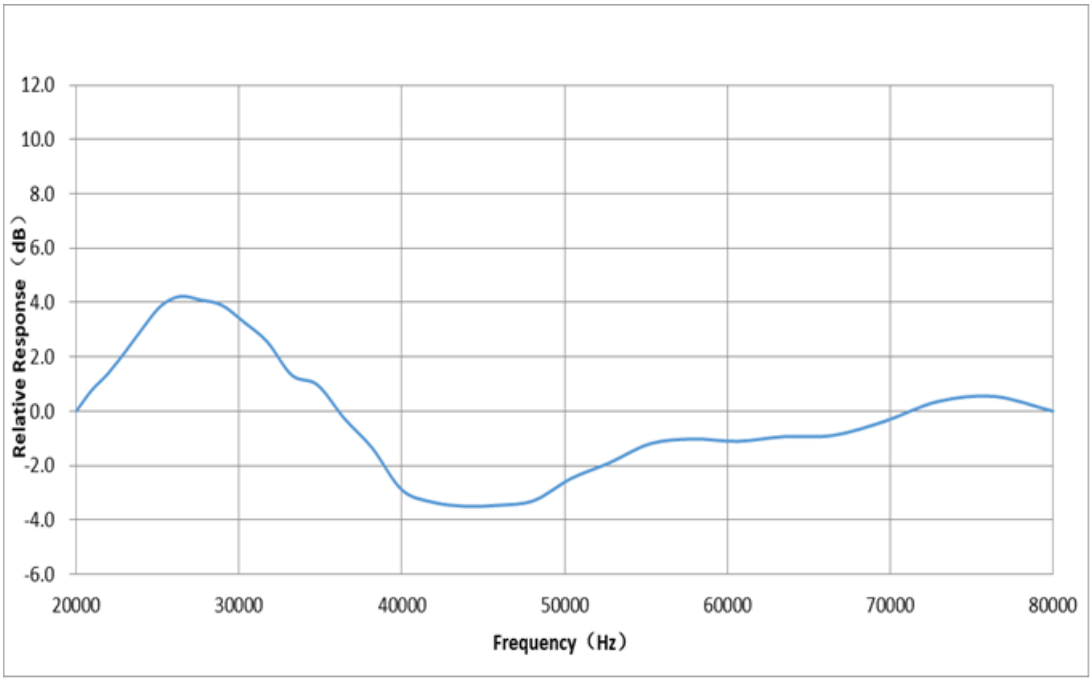
## Total Harmonic Distortion + Noise versus SPL Input (with acoustic source at 50cm)




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




## Ultrasonic Frequency Response (Sensitivity normalized to 0 dB)




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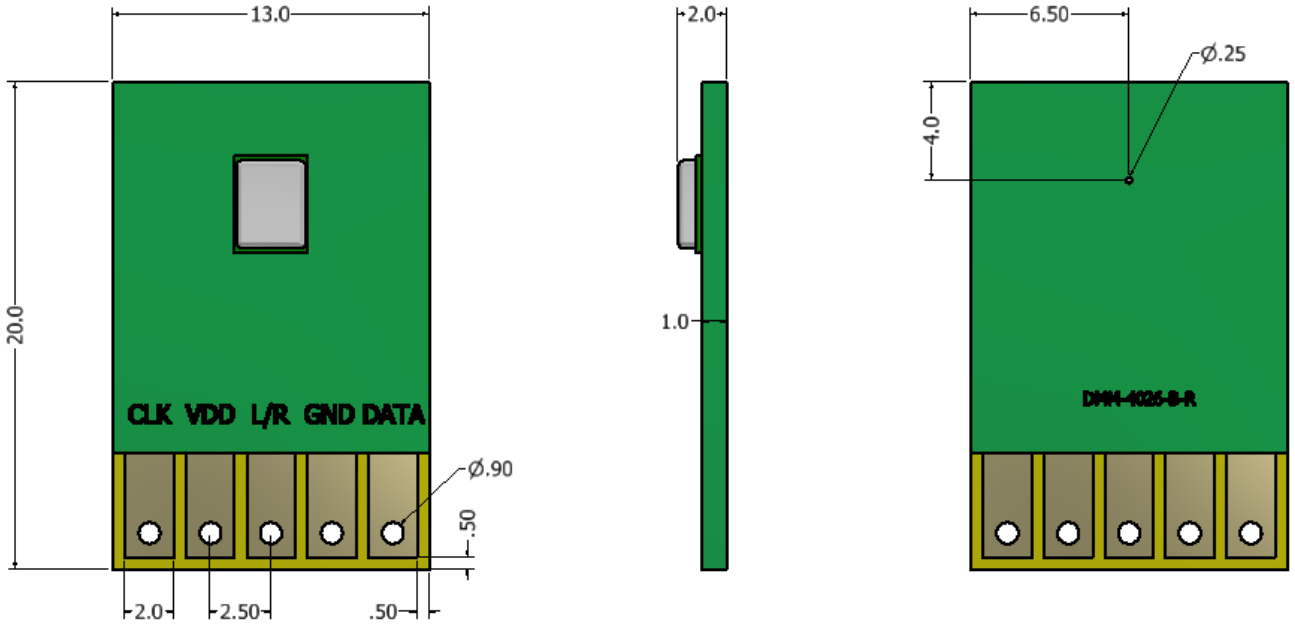
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## Reliability Testing

| 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. 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



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**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 ±0.5mm and angles are ±3°.
2. Specifications subject to change or withdrawal without notice.

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