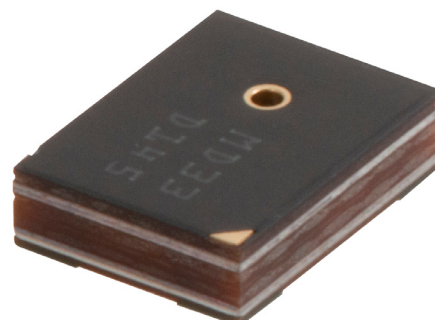


**MODEL:** CMM-4030DT-26164-TR | **DESCRIPTION:** MEMS MICROPHONE**FEATURES**

- digital (PDM)
- top port
- reflow solder compatible
- omnidirectional

**ELECTRICAL**

| parameter                           | conditions/description                       | min | typ | max    | units    |
|-------------------------------------|----------------------------------------------|-----|-----|--------|----------|
| directivity                         | omnidirectional                              |     |     |        |          |
| sensitivity (S)                     | at 94 dB SPL, 1 kHz                          | -26 | -25 | -24    | dB FS    |
|                                     | low-power mode                               | -27 | -26 | -25    | dB FS    |
|                                     | standard mode                                |     |     |        |          |
| supply voltage (VDD)                |                                              | 1.6 | 1.8 | 3.6    | V        |
| current consumption (IDD)           | low-power mode: F <sub>CLOCK</sub> = 768 kHz |     | 290 |        | μA       |
|                                     | standard mode: F <sub>CLOCK</sub> = 2.4 MHz  |     | 670 |        | μA       |
| frequency (f)                       |                                              | 100 |     | 10,000 | Hz       |
| signal to noise ratio (S/N)         | at 94 dB SPL, 1 kHz (A-weighted)             |     |     |        |          |
|                                     | low-power mode                               |     | 62  |        | dBA      |
|                                     | standard mode                                |     | 64  |        | dBA      |
| total harmonic distortion (THD)     | at 94 dB SPL, 1 kHz, S = typ                 |     | 0.1 |        | %        |
| acoustic overload point (AOP)       | at 10% THD, 1 kHz, S = typ                   |     |     |        |          |
|                                     | low-power mode                               |     | 120 |        | dB SPL   |
|                                     | standard mode                                |     | 120 |        | dB SPL   |
| power supply rejection ratio (PSSR) | 200 mVp-p sine wave @ 1 kHz                  |     |     |        |          |
|                                     | low-power mode                               |     | 50  |        | dB V/FS  |
|                                     | standard mode                                |     | 50  |        | dB V/FS  |
| power supply rejection (PSR)        | 100 mVp-p square wave @ 217 Hz (A-weighted)  |     |     |        |          |
|                                     | low-power mode                               |     | -80 |        | dB FS(A) |
|                                     | standard mode                                |     | -80 |        | dB FS(A) |

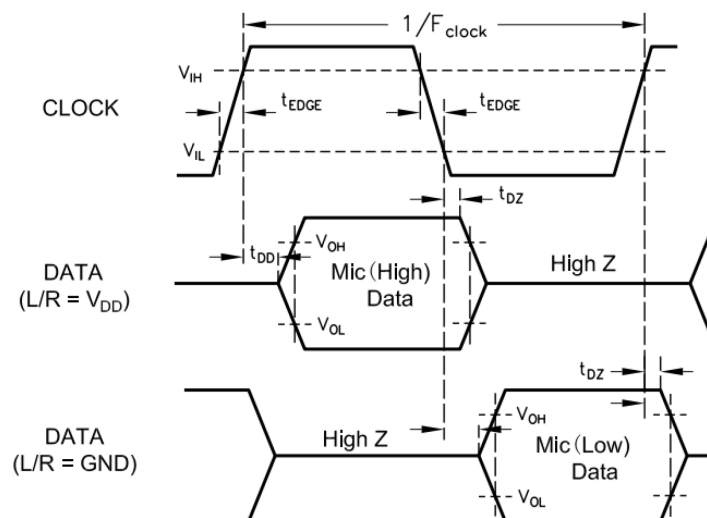
## DIGITAL INTERFACE

| parameter                                | conditions/description       | min                   | typ | max                 | units |
|------------------------------------------|------------------------------|-----------------------|-----|---------------------|-------|
| clock frequency range                    | sleep mode                   | 0                     |     | 50                  | kHz   |
|                                          | low-power mode               | 150                   |     | 900                 | kHz   |
|                                          | standard mode                | 1.1                   |     | 4.0                 | MHz   |
| sleep current (I <sub>SLEEP</sub> )      | F <sub>CLOCK</sub> ≤ 50 kHz  |                       | 1   |                     | μA    |
| dc output                                | fullscale = ±100             |                       | 4   |                     | %FS   |
| data format                              | 1/2 cycle PDM                |                       |     |                     |       |
| short circuit current (I <sub>sc</sub> ) | grounded data pin            | 1                     |     | 10                  | mA    |
| output load (C <sub>LOAD</sub> )         |                              |                       |     | 200                 | pF    |
| fall-asleep time                         | F <sub>CLOCK</sub> ≤ 50 kHz  |                       |     | 30                  | μs    |
| wake-up time                             | F <sub>CLOCK</sub> ≥ 151 kHz |                       |     | 200                 | μs    |
| power-up time                            | V <sub>DD</sub> ≥ V (min)    |                       | 6   | 20                  | ms    |
| mode-change time                         |                              |                       |     | 10                  | ms    |
| logic input high (V <sub>IH</sub> )      |                              | 0.7xV <sub>DD</sub>   |     | 3.6                 | V     |
| logic input low (V <sub>IL</sub> )       |                              | -0.3                  |     | 0.3xV <sub>DD</sub> | V     |
| logic output high (V <sub>OH</sub> )     | I <sub>OUT</sub> = 2 mA      | V <sub>DD</sub> -0.45 |     |                     | V     |
| logic output low (V <sub>OL</sub> )      | I <sub>OUT</sub> = 2 mA      |                       |     | 0.45                | V     |
| clock duty cycle                         |                              | 40                    |     | 60                  | %     |

Notes: 1. All specifications measured at 23±2°C, humidity at 55±20%, V<sub>DD</sub> = 1.8 V, F<sub>CLOCK</sub> = 2.4 MHz, L/R pin grounded, no load, unless otherwise noted.

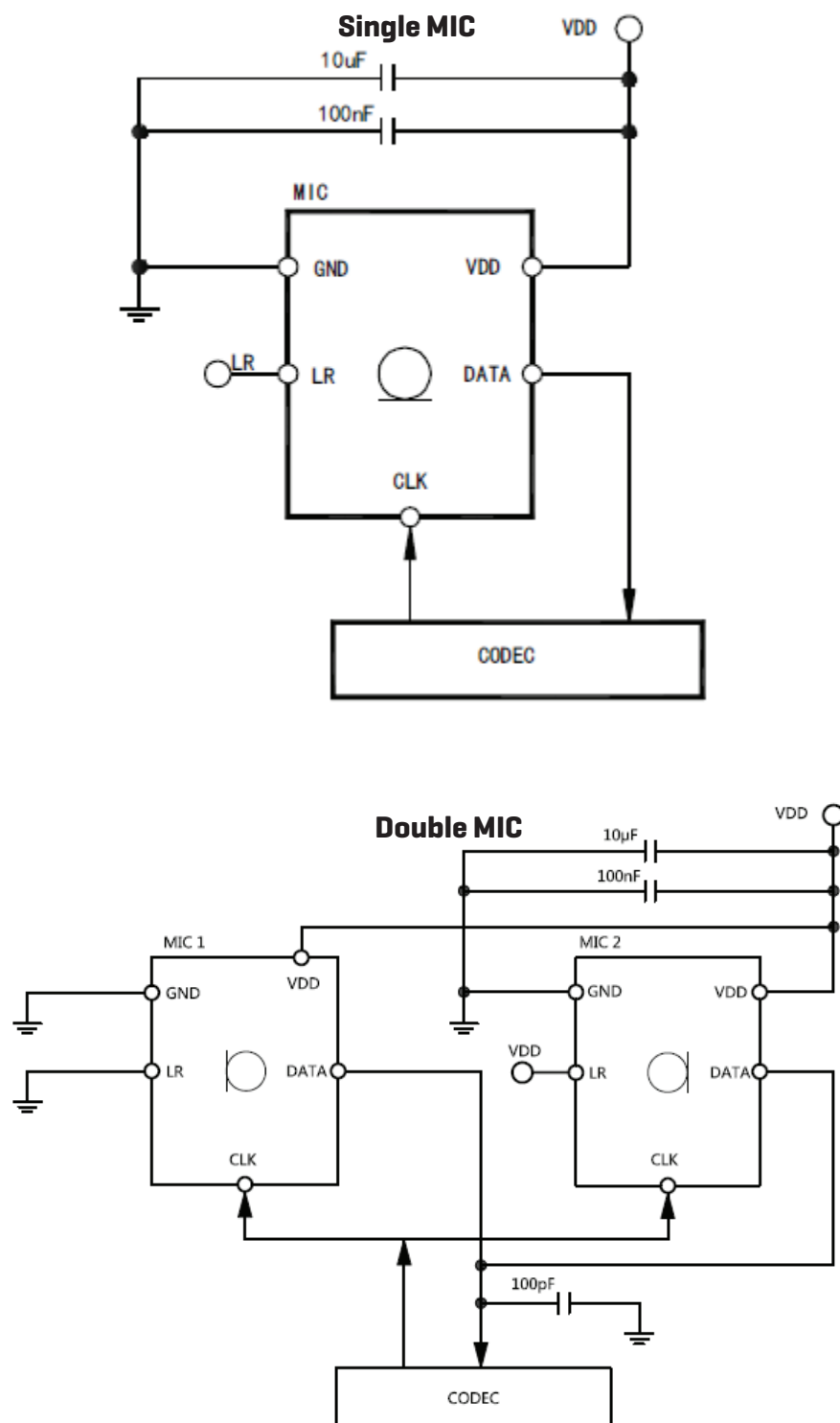
## TIMING CHARACTERISTICS

| parameter                      | conditions/description | min | typ | max | units |
|--------------------------------|------------------------|-----|-----|-----|-------|
| clock rise/fall time           | t <sub>EDGE</sub>      |     |     | 20  | ns    |
| delay time to high Z           | t <sub>DZ</sub>        |     |     | 40  | ns    |
| delay time to data line driven | t <sub>DD</sub>        |     |     | 50  | ns    |



| Microphone | Select (L/R)    | Asserts Data On    | Latch Data On      |
|------------|-----------------|--------------------|--------------------|
| Mic (High) | V <sub>DD</sub> | rising clock edge  | falling clock edge |
| Mic (Low)  | GND             | falling clock edge | rising clock edge  |

## RECOMMENDED INTERFACE CIRCUIT



Notes: 2. Power supply decoupling capacitors (100 nF, 10 µF ceramic) should be placed as near as possible to  $V_{DD}$  of the device.

## ENVIRONMENTAL

| parameter             | conditions/description | min | typ | max | units |
|-----------------------|------------------------|-----|-----|-----|-------|
| operating temperature |                        | -30 |     | 85  | °C    |
| storage temperature   | in packaging           | -40 |     | 100 | °C    |
| RoHS                  | yes                    |     |     |     |       |

## MECHANICAL

| parameter     | conditions/description | min | typ   | max | units |
|---------------|------------------------|-----|-------|-----|-------|
| dimensions    | 4.00 x 3.00 x 1.00     |     |       |     | mm    |
| acoustic port | top                    |     |       |     |       |
| terminals     | surface mount          |     |       |     |       |
| weight        |                        |     | 0.026 |     | g     |

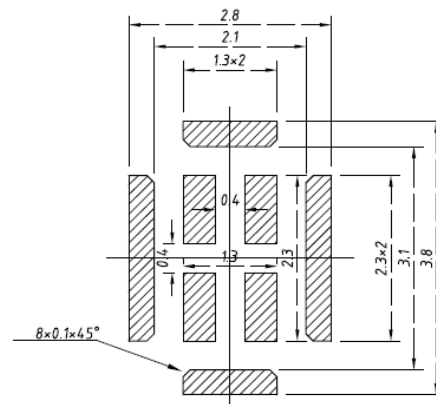
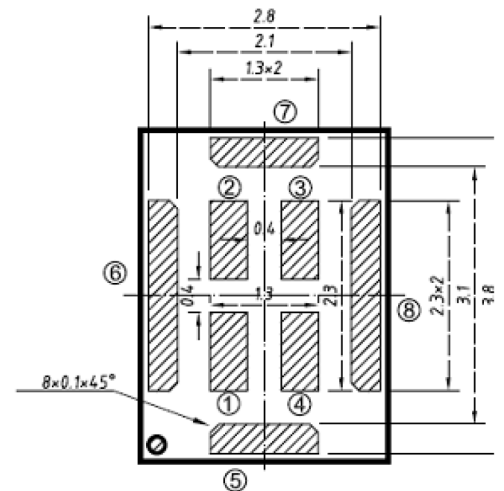
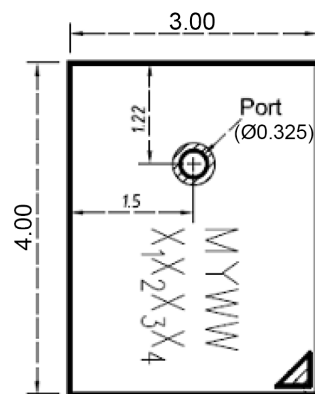
## MECHANICAL DRAWING

units: mm

tolerance:

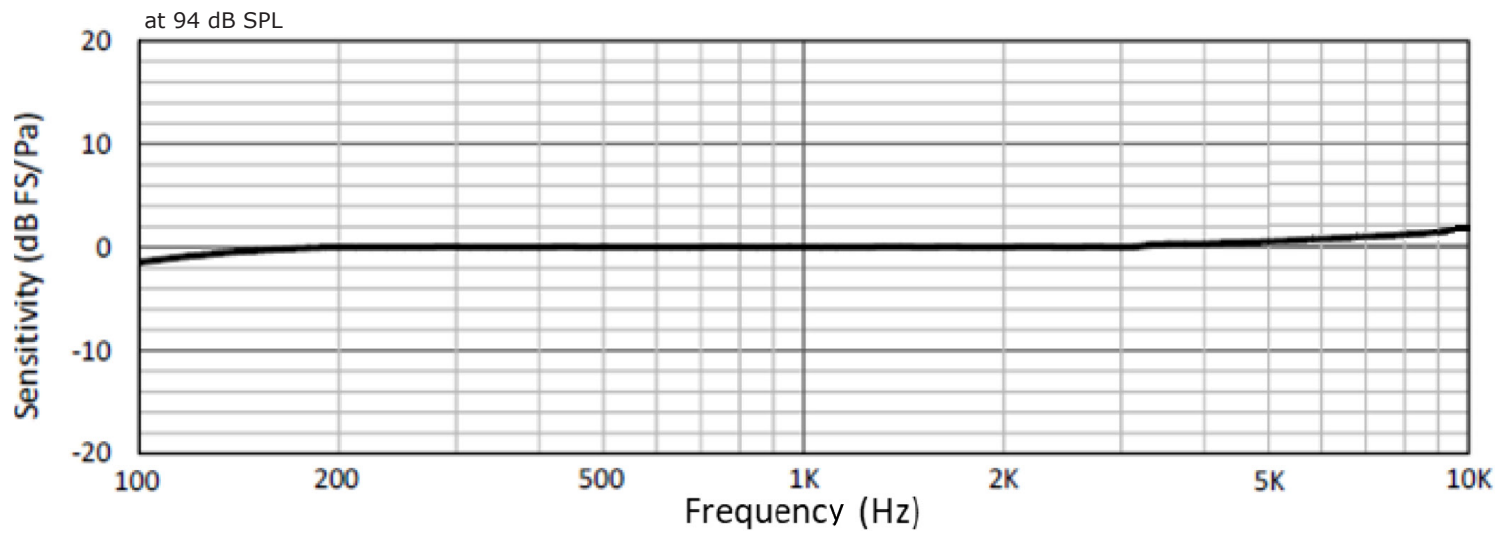
length, width, height:  $\pm 0.10$  mmacoustic port:  $\pm 0.05$  mmunless otherwise specified:  $\pm 0.15$  mm

| TERMINAL CONNECTIONS |          |
|----------------------|----------|
| TERM.                | FUNCTION |
| 1                    | VDD      |
| 2                    | L/R      |
| 3                    | CLOCK    |
| 4                    | DATA     |
| 5~8                  | GND      |



Recommended PCB Layout  
Top View

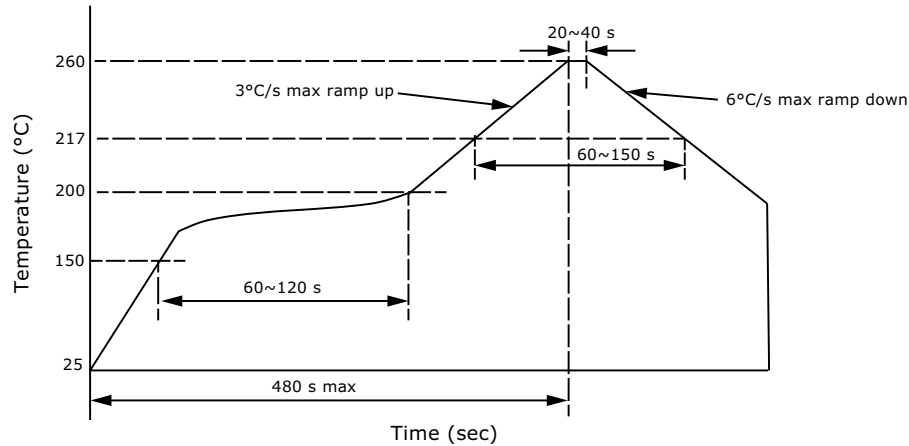
## FREQUENCY RESPONSE CURVE



## SOLDERABILITY

| parameter                     | conditions/description | min | typ | max | units |
|-------------------------------|------------------------|-----|-----|-----|-------|
| reflow soldering <sup>3</sup> | see reflow profile     |     |     | 260 | °C    |

Note: 3. Not recommended to exceed 3 reflow cycles.

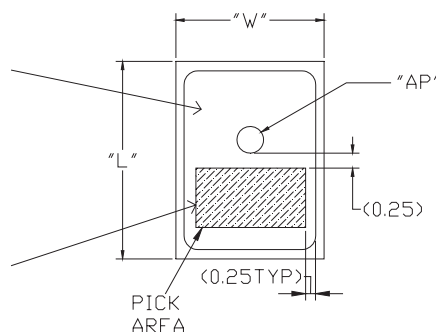


## HANDLING RECOMMENDATIONS

1. Not recommended to blow air heavily over acoustic port as debris could impact mic function.
2. Not suitable for wash process after reflow.
3. Not recommended to brush board with or without solvents after reflow process.
4. Not recommended to directly expose to ultrasonic processing or cleaning.
5. Not recommended to insert any object in port of device at any time.
6. Not recommended to apply over 30 psi of air pressure into the port hole.
7. Not recommended to pull a vacuum over port hole.
8. Not recommended to apply a vacuum when repackaging into sealed bag a rate faster than 0.5 atm/sec.
9. Not recommended to clean table or carrier plate with air guarding system that could induce particle floating inside mic.

Vacuum pick-up over the port hole is prohibited

pick up nozzle should stay within acceptable pick-up area

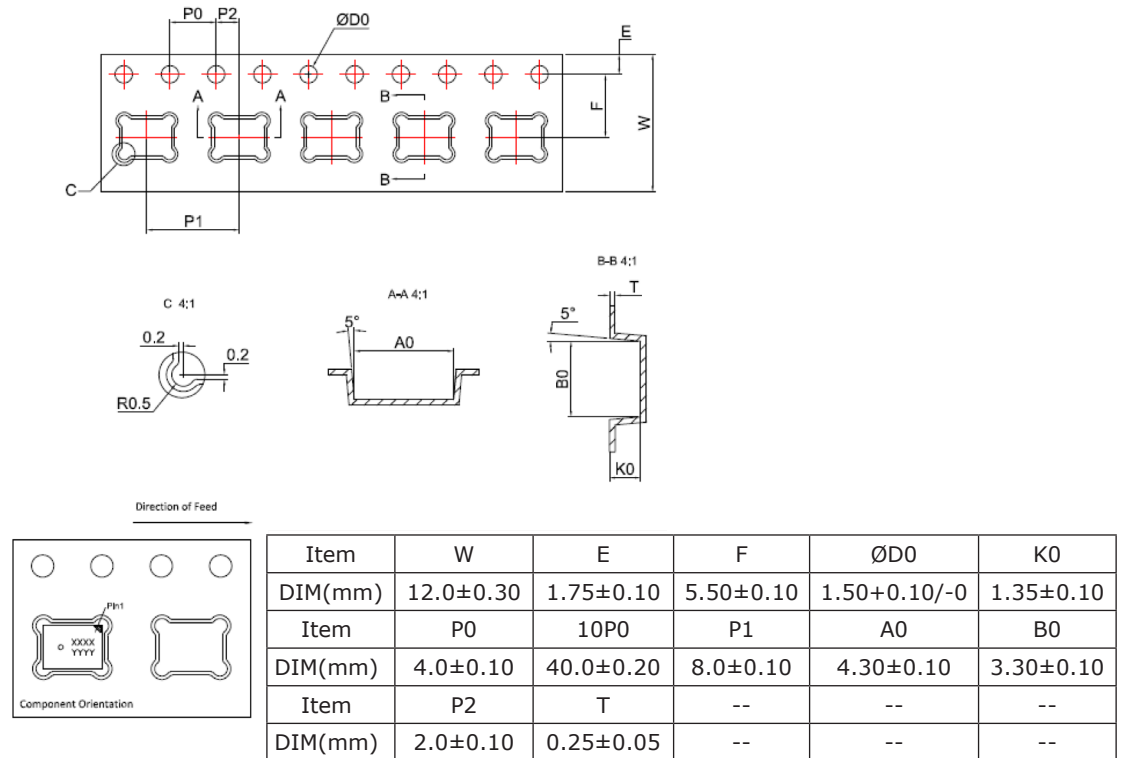


Recommended Vacuum Nozzle Pickup  
Top View

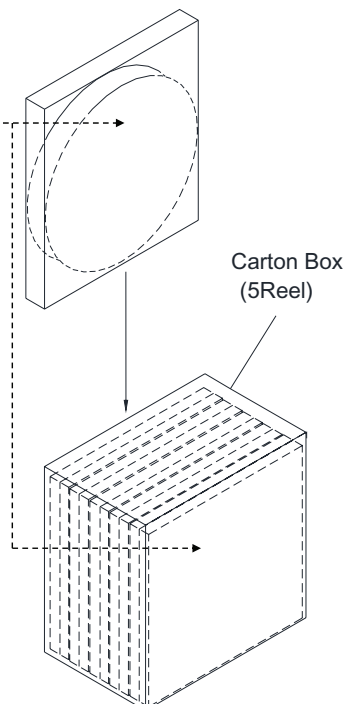
## PACKAGING

| parameter             | conditions/description | min | typ | max | units |
|-----------------------|------------------------|-----|-----|-----|-------|
| MSL                   | Class 1                |     |     |     |       |
| reel size             | Ø7 inches              |     |     |     |       |
| reel QTY <sup>4</sup> | 1,100 pcs per reel     |     |     |     |       |
| carton size           | 310 x 210 x 165 mm     |     |     |     |       |
| carton QTY            | 5,500 pcs              |     |     |     |       |

Note: 4. The leader tape of the reel, and the beginning tape fixed into the reel center, will leave 25 blank cavities each.



|               |                         |
|---------------|-------------------------|
| Lot No.       | XXXXXXXXXX              |
| Part No.      | CUI Inv#:<br>CUI Part#: |
| Quantity:     | XXXX Pcs                |
| Date:         | DD MM YY                |
| MADE IN CHINA |                         |
| CUI DEVICES   |                         |

**RoHS Compliant**

## REVISION HISTORY

| rev. | description     | date       |
|------|-----------------|------------|
| 1.0  | initial release | 03/09/2022 |

The revision history provided is for informational purposes only and is believed to be accurate.

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# CUI DEVICES

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