

**MODEL:** CMM-4030DT-261280-TR | **DESCRIPTION:** MEMS MICROPHONE

**FEATURES**

- high sensitivity
- top port
- PDM output


**ELECTRICAL**

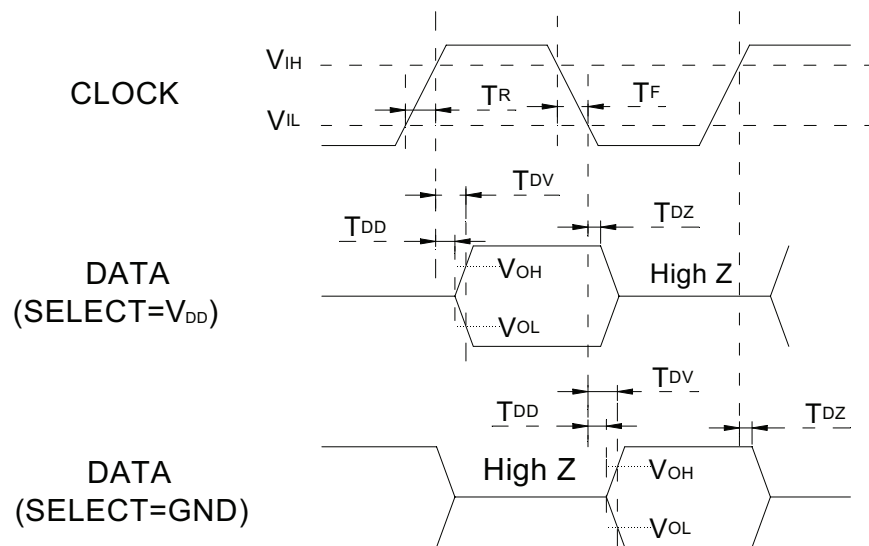
| parameter                              | conditions/description                        | min  | typ                       | max | units  |
|--|---|------|---------------------------|-----|--------|
| directivity                            | omnidirectional                               |      |                           |     |        |
| sensitivity [S]                        | at 94 dB SPL, 1 kHz                           | -27  | -26                       | -25 | dB FS  |
| supply voltage [V <sub>DD</sub> ]      |   | 1.65 |                           | 3.6 | V      |
| current consumption [I <sub>DD</sub> ] | standard mode [F <sub>CLOCK</sub> = 2.4 MHz]  |      | 680                       |     | μA     |
|  | low-power mode [F <sub>CLOCK</sub> = 768 kHz] |      | 280                       |     | μA     |
| signal to noise ratio [S/N]            | at 94 dB SPL, 1 kHz (A-weighted)              |      | 58                        |     | dB     |
| total harmonic distortion [THD]        | at 94 dB SPL, 1 kHz                           |      | 0.1                       |     | %      |
| acoustic overload point [AOP]          | at 10% THD, 1 kHz                             |      | 120                       |     | dB SPL |
| power supply rejection [PSR]           | 100 mVp-p square wave @ 217 Hz (A-weighted)   |      | -80                       |     | dB FS  |
| polarity                               | input higher voltage                          |      | increasing density of 1's |     |        |

## DIGITAL INTERFACE

| parameter                                       | conditions/description   | min                   | typ | max                  | units |
|---|--|-----------------------|-----|----------------------|-------|
| clock frequency                                 | sleep mode   | 0                     |     | 10                   | kHz   |
|   | low-power mode   | 150                   |     | 900                  | kHz   |
|   | standard mode  | 1.3                   |     | 4.8                  | MHz   |
| sleep current (I <sub>SLEEP</sub> )             | F <sub>CLOCK</sub> < 10 kHz  |                       | 3   |                      | μA    |
| dc output                                       | full scale = ±100  |                       | 4   |                      | %FS   |
| fall-asleep time                                | F <sub>CLOCK</sub> < 10 kHz  |                       |     | 20                   | μs    |
| wake-up time                                    | F <sub>CLOCK</sub> > 150 kHz   |                       |     | 20                   | ms    |
| startup time                                    | time to start up in any mode after V <sub>DD</sub> and CLOCK applied |                       |     | 20                   | ms    |
| mode switch time                                | time to switch between modes, V <sub>DD</sub> remains on             |                       |     | 20                   | ms    |
| data format                                     | 1/2 cycle PDM  |                       |     |                      |       |
| short circuit output current (I <sub>sc</sub> ) | connect DATA to ground   | 1                     |     | 20                   | mA    |
| output load (C <sub>LOAD</sub> )                |  |                       |     | 100                  | pF    |
| logic input high (V <sub>IH</sub> )             |  | 0.65XV <sub>DD</sub>  |     | V <sub>DD</sub> +0.3 | V     |
| logic input low (V <sub>IL</sub> )              |  | -0.30                 |     | 0.35XV <sub>DD</sub> | V     |
| logic output high (V <sub>OH</sub> )            |  | V <sub>DD</sub> -0.45 |     |                      | V     |
| logic output low (V <sub>OL</sub> )             |  |                       |     | 0.45                 | V     |
| clock duty cycle                                |  | 40                    |     | 60                   | %     |
| clock rise time (T <sub>R</sub> )               |  |                       |     | 15                   | ns    |
| clock fall time (T <sub>F</sub> )               |  |                       |     | 15                   | ns    |
| data into hi z time (t <sub>0Z</sub> )          |  | 5                     |     | 20                   | ns    |
| delay time for data driven (t <sub>0D</sub> )   |  | 25                    |     | 50                   | ns    |
| data valid time (t <sub>0V</sub> )              |  | 40                    |     | 100                  | ns    |

Notes: 1. All specifications measured at 23±2°C, humidity at 55±20%, V<sub>DD</sub> = 2.0 V, F<sub>CLOCK</sub> = 2.4 MHz, unless otherwise noted.

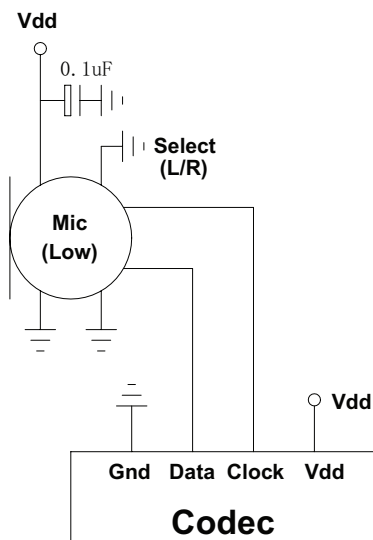
## TIMING CHARACTERISTICS



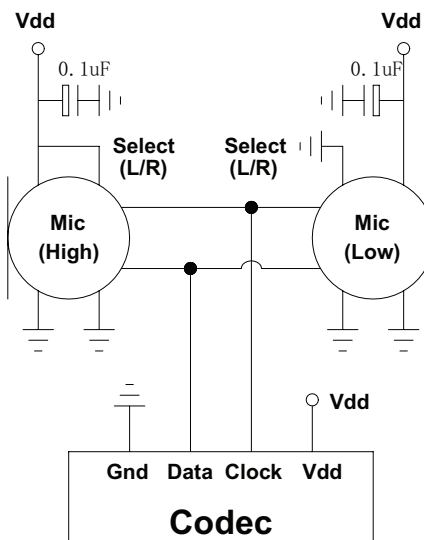
| Microphone | Select (L/R)    | Asserts DATA On    | Latch DATA On      |
|------------|-----------------|--------------------|--------------------|
| Mic(High)  | V <sub>DD</sub> | rising clock edge  | falling clock edge |
| Mic(Low)   | GND             | falling clock edge | rising clock edge  |

## RECOMMENDED INTERFACE CIRCUIT

Single Microphone



Dual Microphone



## ENVIRONMENTAL

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

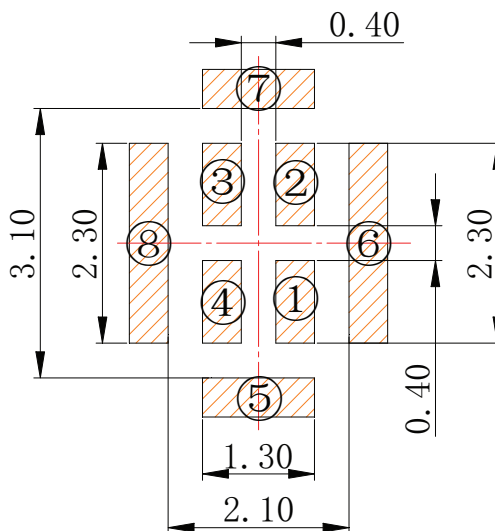
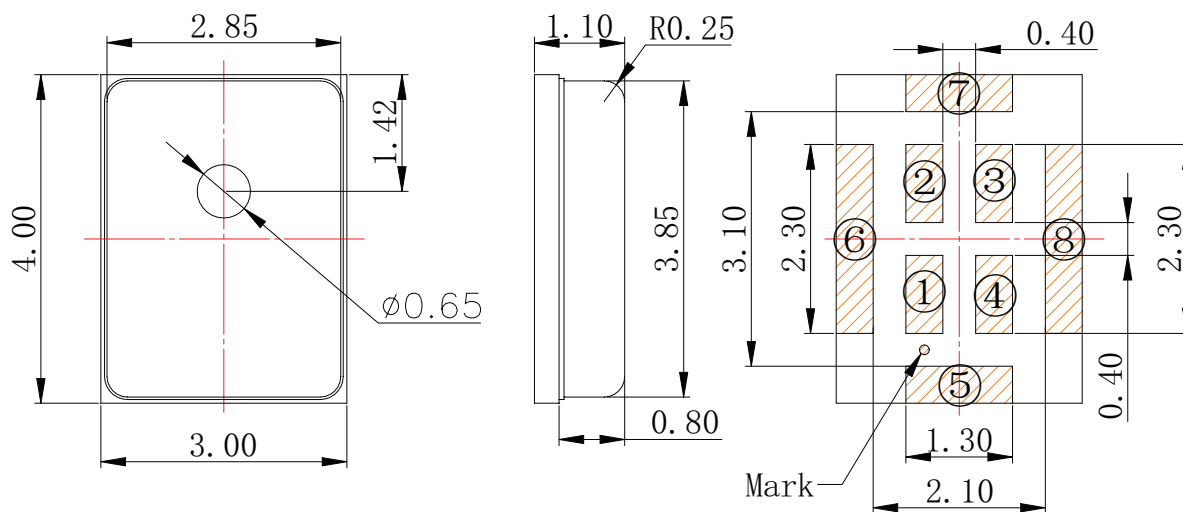
## MECHANICAL

| parameter     | conditions/description | min | typ   | max | units |
|---------------|------------------------|-----|-------|-----|-------|
| dimensions    | 4.00 X 3.00 X 1.10     |     |       |     | mm    |
| acoustic port | top                    |     |       |     | mm    |
| terminals     | surface mount          |     |       |     |       |
| weight        |                        |     | 0.034 |     | g     |

## MECHANICAL DRAWING

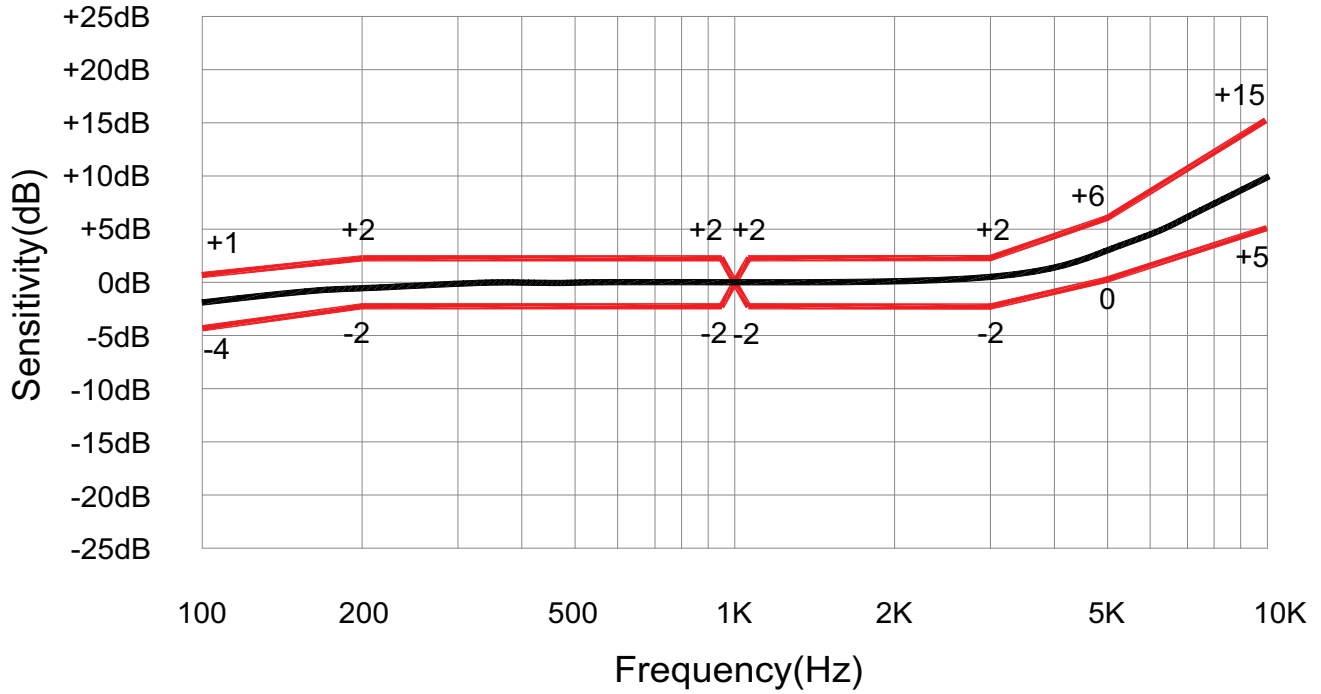
units: mm  
tolerance: ±0.10 mm

| TERMINAL CONNECTIONS |          |
|----------------------|----------|
| TERM.                | FUNCTION |
| 1                    | VDD      |
| 2                    | L/R      |
| 3                    | CLOCK    |
| 4                    | DATA     |
| 5                    | GND      |
| 6                    | GND      |
| 7                    | GND      |
| 8                    | GND      |

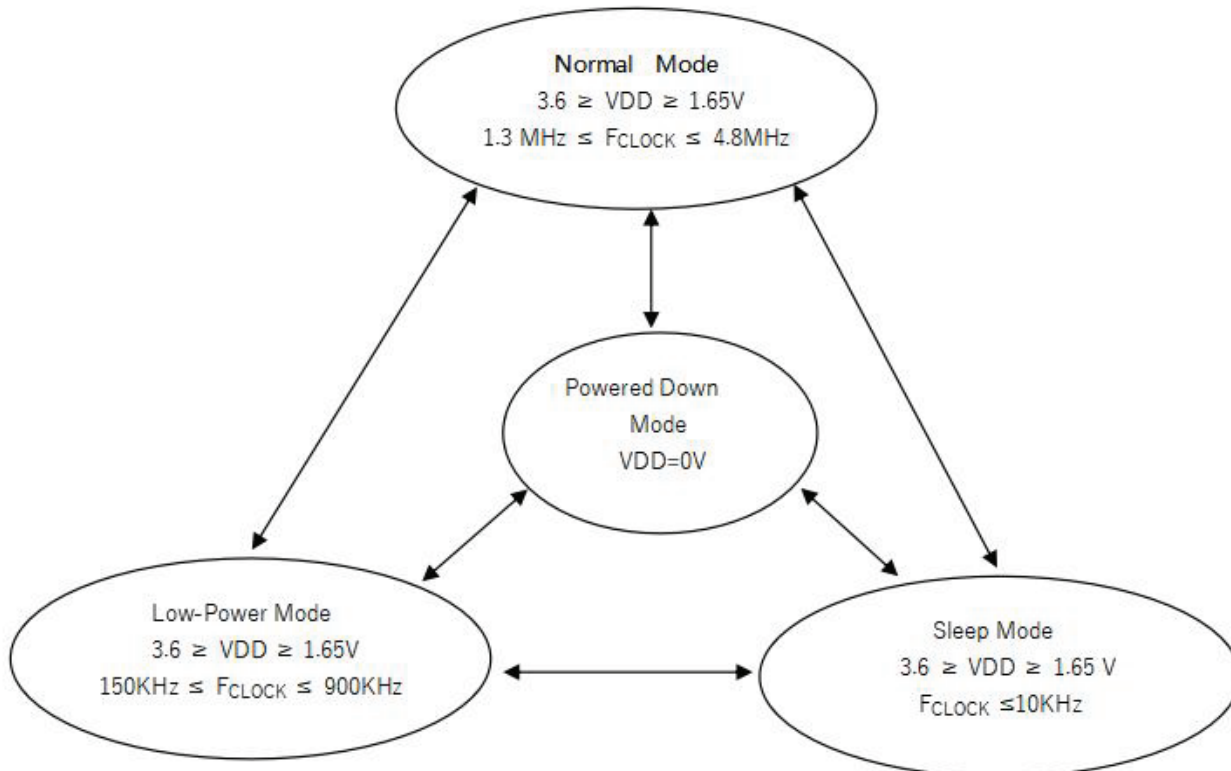


Recommended PCB Layout  
Top View

## FREQUENCY RESPONSE CURVE



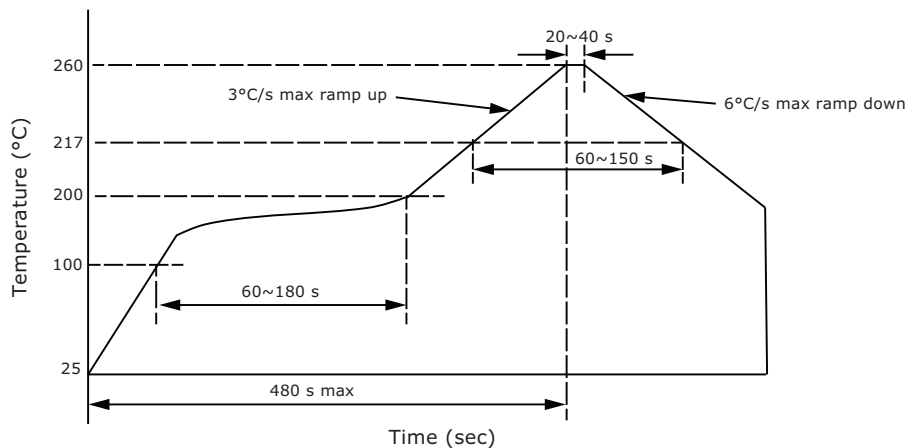
## MICROPHONE STATE DIAGRAM



## SOLDERABILITY

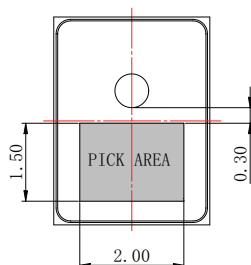
| parameter                     | conditions/description | min | typ | max | units |
|-------------------------------|------------------------|-----|-----|-----|-------|
| reflow soldering <sup>2</sup> | see reflow profile     |     |     | 260 | °C    |

Note: 2. Not recommended to exceed 3 reflow cycles.



## HANDLING RECOMMENDATIONS

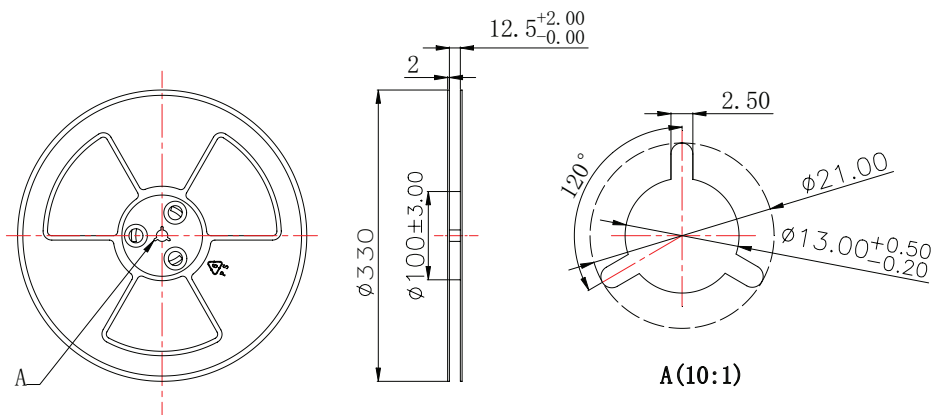
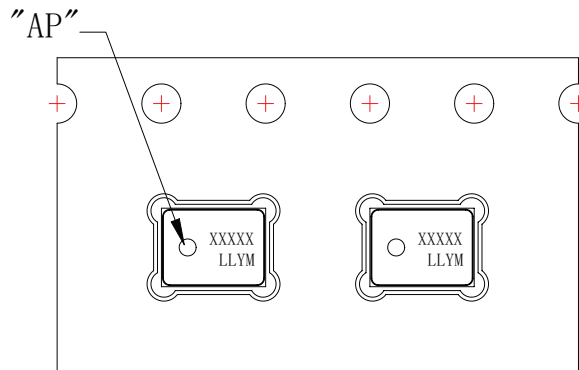
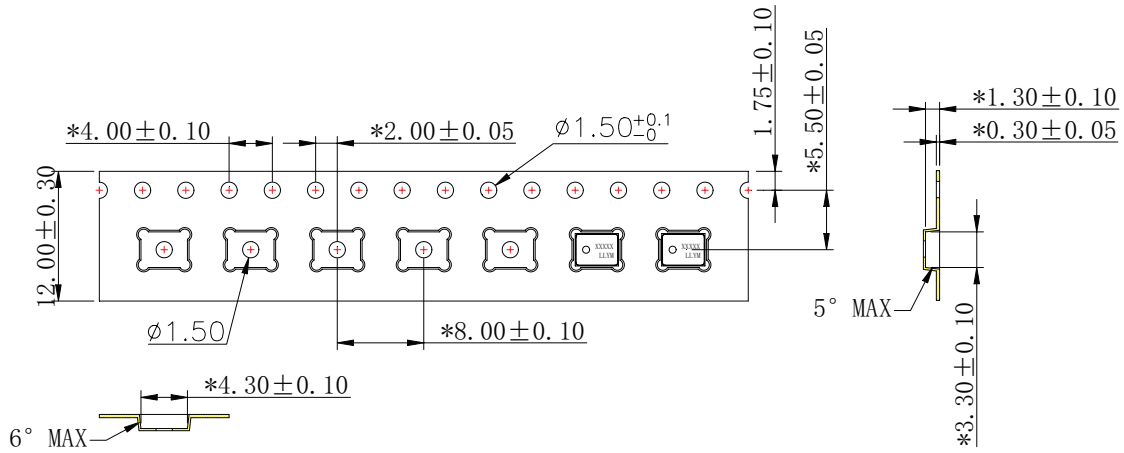
1. Not recommended to blow air heavily over acoustic port as debris could impact mic function.
2. Not suitable for wash process after reflow.
3. Not recommended to brush board with or without solvents after reflow process.
4. Not recommended to directly expose to ultrasonic processing or cleaning.
5. 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 carried plate with air guarding system that could induce particle floating inside mic.



Recommended Vacuum Nozzle Pickup  
Top View

## PACKAGING

| parameter   | conditions/description | min | typ | max | units |
|-------------|------------------------|-----|-----|-----|-------|
| MSL         | Class 1                |     |     |     |       |
| reel size   | Ø330 mm                |     |     |     |       |
| reel QTY    | 5,700 pcs per reel     |     |     |     |       |
| carton size | 330 x 380 x 270 mm     |     |     |     |       |
| carton QTY  | 136,800 pcs            |     |     |     |       |



## REVISION HISTORY

| rev. | description     | date       |
|------|-----------------|------------|
| 1.0  | initial release | 08/09/2023 |

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



CUI Devices offers a one (1) year limited warranty. Complete warranty information is listed on our website.

CUI Devices reserves the right to make changes to the product at any time without notice. Information provided by CUI Devices is believed to be accurate and reliable. However, no responsibility is assumed by CUI Devices for its use, nor for any infringements of patents or other rights of third parties which may result from its use.

CUI Devices products are not authorized or warranted for use as critical components in equipment that requires an extremely high level of reliability. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

[cuidevices.com](http://cuidevices.com)