



**MODEL:** CLS0231MP-1 | **DESCRIPTION:** SPEAKER

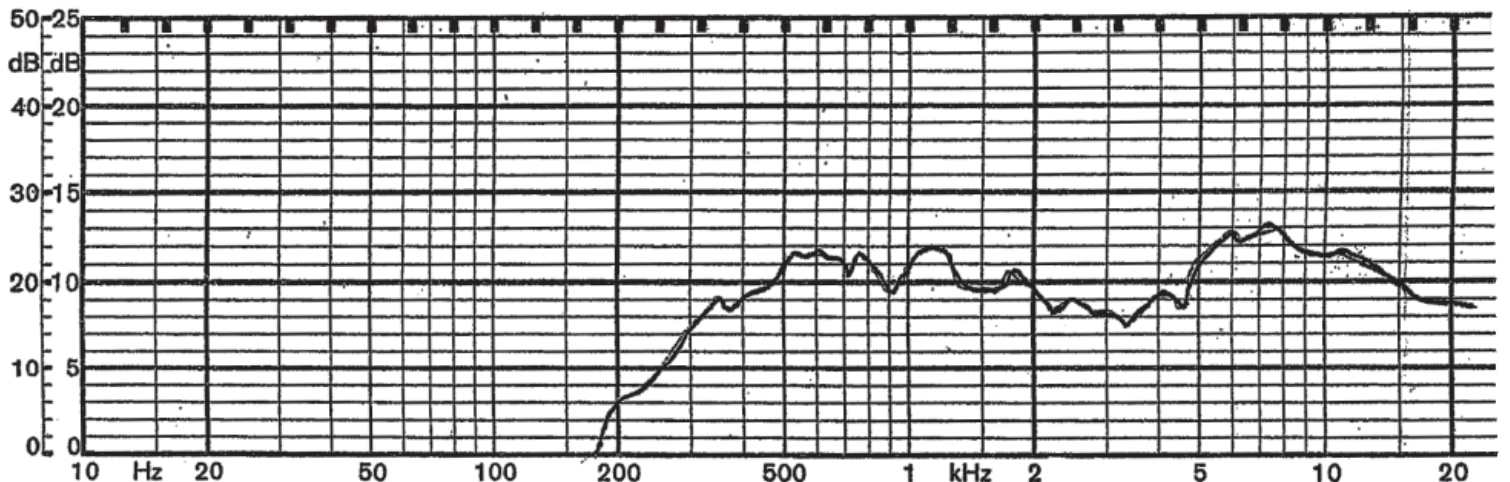


**SPECIFICATIONS**

| parameter            | conditions/description                     | min | typ | max    | units              |
|----------------------|--|-----|-----|--------|--------------------|
| nominal size         |  |     | 23  |        | mm                 |
| impedance            | at 1.5 kHz, 0.9 V                          | 6.8 | 8   | 9.2    | $\Omega$           |
| resonant frequency   | at 0.9 V                                   | 384 | 480 | 576    | Hz                 |
| sound pressure level | 0.1 W, 50 cm ave., at 0.6, 0.8, 1, 1.2 kHz | 69  | 72  | 75     | dB                 |
| response             | 10 dB max.                                 | Fo  |     | 20,000 | Hz                 |
| input power          |  |     | 0.1 | 0.2    | W                  |
| operation            | must be normal at program source           |     | 0.1 |        | W                  |
| buzz, rattle, etc.   | must be normal at sine wave                |     | 0.9 |        | Vdc                |
| magnet               | size: $\varnothing 9.5 \times 1.5$         |     |     |        | mm                 |
| load test            | 5 hours of white noise at                  |     | 0.1 |        | W                  |
| heat test            | 20 ~ 50% RH for 5 hours                    | 63  | 65  | 67     | $^{\circ}\text{C}$ |
| humidity test        | 90 ~ 95% RH for 5 hours                    | 38  | 40  | 42     | $^{\circ}\text{C}$ |
| RoHS                 | yes  |     |     |        |                    |

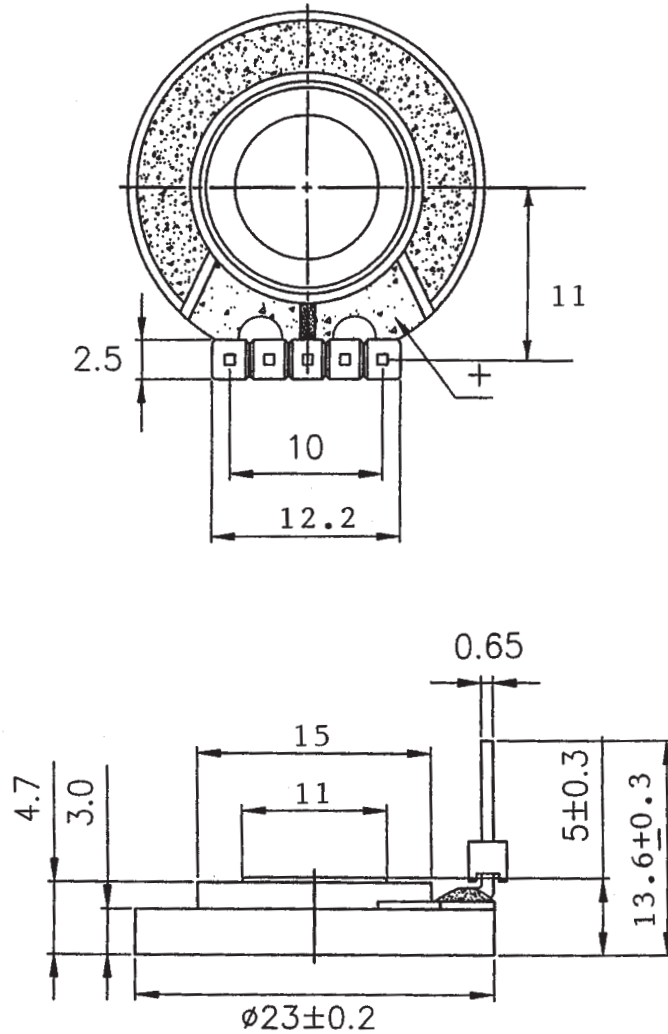
**FREQUENCY RESPONSE CURVE**

| parameter             | conditions/description |
|-----------------------|------------------------|
| potentiometer range   | 50 dB                  |
| rectifier             | RMS                    |
| lower limit frequency | 20 Hz                  |
| wr. speed             | 100 mm/sec             |
| zero level            | 50 dB                  |

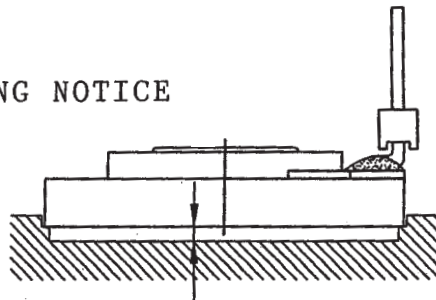


## MECHANICAL DRAWING

units: mm



### MOUNTING NOTICE



AT LEAST 0.8 M/M FOR  
DIAPHRAGM MOVING

## REVISION HISTORY

| rev. | description   | date       |
|------|---|------------|
| 1.0  | initial release   | 07/03/2007 |
| 1.01 | dimension updates   | 09/29/2009 |
| 1.02 | dimension updates   | 04/13/2010 |
| 1.03 | applied new spec template, corrected sound pressure level | 09/30/2013 |

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



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