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## The tentative specification of MLS25070

Type The multilayered type piezo products

Ordering name MLS25070-xxxx-xx

Made by TAIYO YUDEN Co., Ltd (JAPAN)  
TAIYO YUDEN(PHILIPPINES)INC

10,Jun.,2004

TAIYO YUDEN Co., Ltd

### 1.SCOPE OF APPLICATION

This specification shall apply to the multilayered type piezo products to be connected in the electric oscillation circuit using semiconductors like transistors, and others.

### 2.TEST CONDITIONS

Standard test conditions are at temperature of 5 to 35deg C with relative humidity of 45 to 85%, air pressure of 86kPa to 106kPa (860 to 1060mbar).

When there are questions concerning measurement results: In order to provide correlation data, the test shall be conducted under conditions of 25±2deg C of temperature, 60 to 70%relative humidity. Unless otherwise specified, all the tests are conducted under the standard condition.

### 3. ORDERING NAME

ML    S        25        070    - xxxx-xx  
(1)    (2)        (3)        (4)        (5)

(1):Multilayer type piezo products

(2):Applications

(3):Outer dimension

(4):Thickness

(5):Additional symbol to be applied when other identification not listed above is required.

### 4.CONSTRUCTION, DIMENSIONS

#### 4-1 Performance

##### 4-1-1 Electrical performance

Following the table 1 and figure 1.

##### 4-1-2 Environmental performance

Following the table 2.

#### 4-2 Appearance, dimensions and weight

##### 4-2-1 Appearance

There are significant flaws or stain.

##### 4-2-2 Dimensions

Following the figure 2.

##### 4-2-3 Weight

0.7g

### 5.OPERATION TEMPERATURE RANGE

-20deg C ~ +60deg C

### 6. STORAGE TEMPERATURE RANGE

-25deg C ~ +70deg C

### 7.PACKING

Packing shall be completed so as to cause no damage in the main body of the multilayered type piezo products during transportation and storing. The ordering name, quantity, Lot number and manufacture name shall be indicated clearly.

ELECTRICAL PERFORMANCE

Table-1

ITEMS	CONDITIONS	SPECIFIED VALUE
(1)Capacitance	Input voltage :1Vrms Sine wave Input frequency: 120Hz	1600nF ±30%
(2)Resonant frequency	Input voltage :1Vrms Sine wave	900Hz ±200Hz
(3)Sound pressure level	Input voltage :1Vrms Sine wave Distance from microphone:10cm *average of 4point's sound pressure level (800Hz,1000Hz,1500Hz,2000Hz)	More than 78dB
(4)Permissible input voltage *1	Sine wave	1Vrms (2.8Vp-p)
(5)Maximum input voltage	Apply the 1kHz Sine wave. Duration:Within 1hour	10Vp-p

\*1: Satisfy characteristic above:(1)(2)(3)

(6)The frequency characteristic of sound pressure

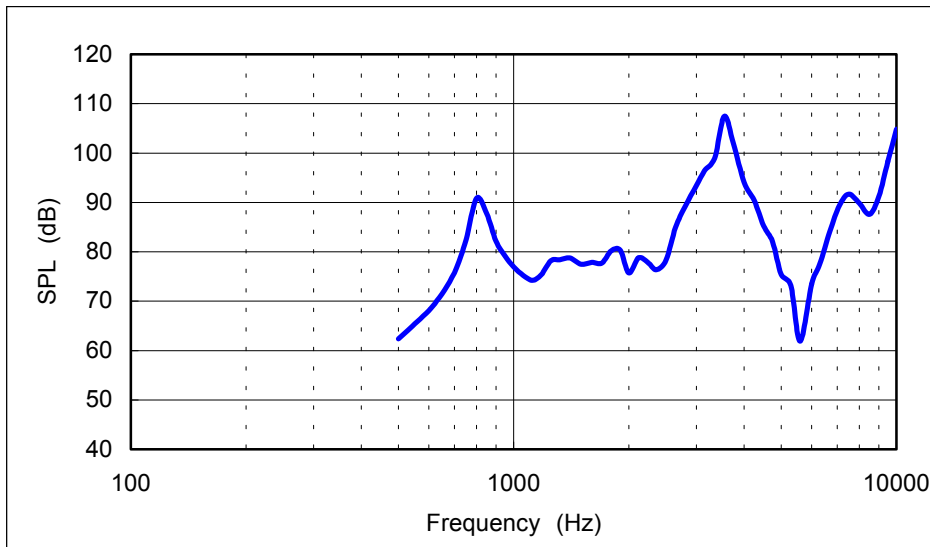
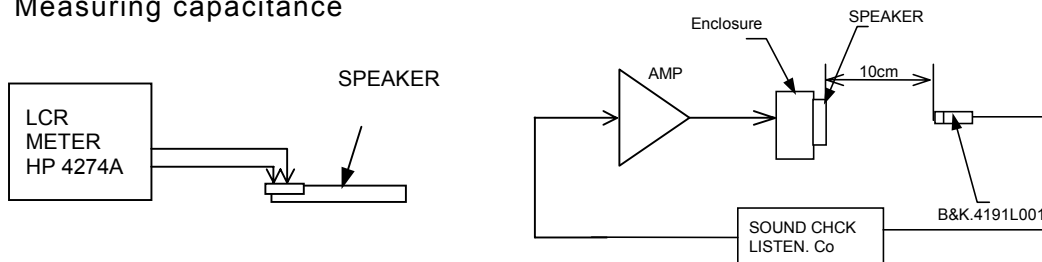


Figure 1

enclosure:φ120×t40 audio analyzer:Sound check LISTEN co.,Ltd  
Input voltage:1Vrms(100~10kHz)

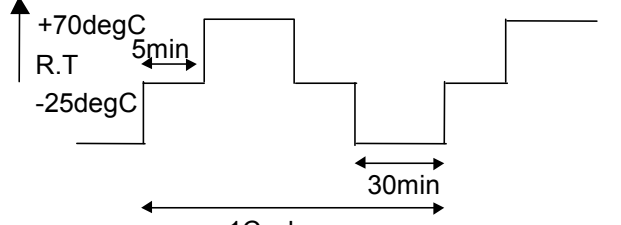
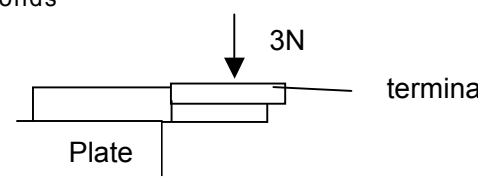
Measuring spl or frequency

Measuring capacitance



ENVIRONMENTAL PERFORMANCE

Table-2

Item	Test Methods	Specified Value
Humidity	Temperature: +40deg C Relative humidity:90~95% Exposure time: 96h Recovery: 3hrs of recovery under room temperature after the removal from test chamber.	(1)The percentage of change of capacitance is within ±30% of the initial value.
Heat resistance	Temperature: +70deg C Exposure time: 96h Recovery: 3hrs of recovery under room temperature after the removal from test chamber.	
Cold resistance	Temperature: -25deg C Exposure time: 96h Recovery: 3hrs of recovery under room temperature after the removal from test chamber.	
Temperature cycle	 <p>1Cycle:-25degC(30min) → R.T (5min) → +70degC(30min) → R.T (5min)</p> <p>Exposure time: 5cycle</p> <p>Recovery: 3hrs of recovery under room temperature after the removal from test chamber.</p>	(3) Sound pressure level change is within ±3dB of the initial value.
Continuous operation	Operating condition:SN-1 8Vpp at room temperature Measure the product after operation for 96h	
Shock test	Acceleration:1500G Direction: horizontal and vertical direction. The number of shock: three times each direction.	
Strength test of terminal	<p>Pressure the product at 3[N] horizontally for 3 seconds</p> 	

CONSTRUCTION AND DIMENSIONS

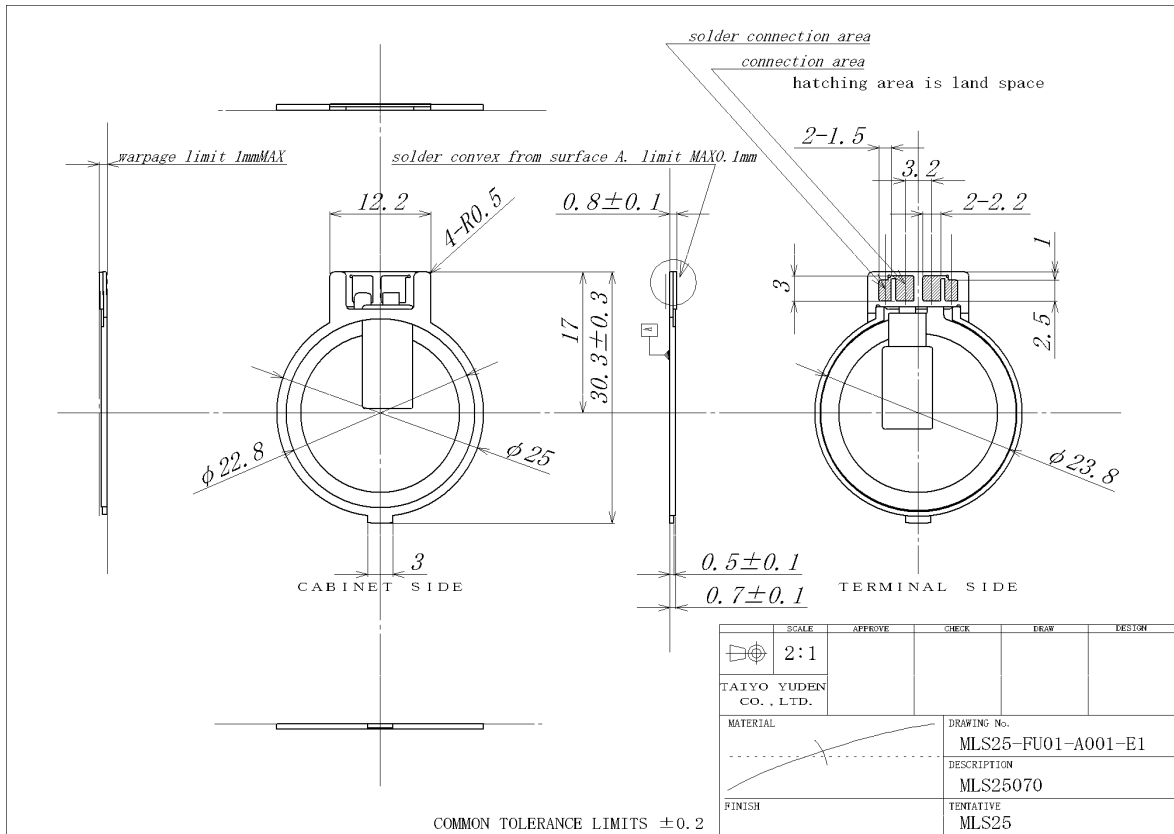
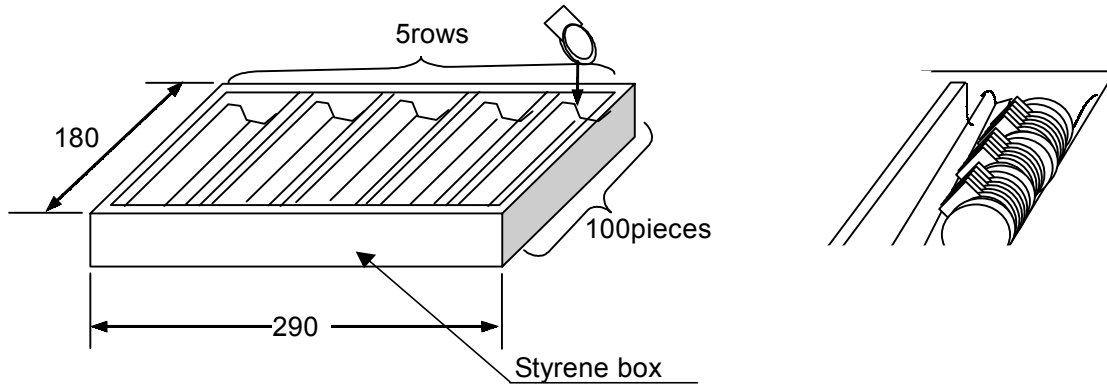


Figure 2

Tolerance: ±0.2  
Unit: mm

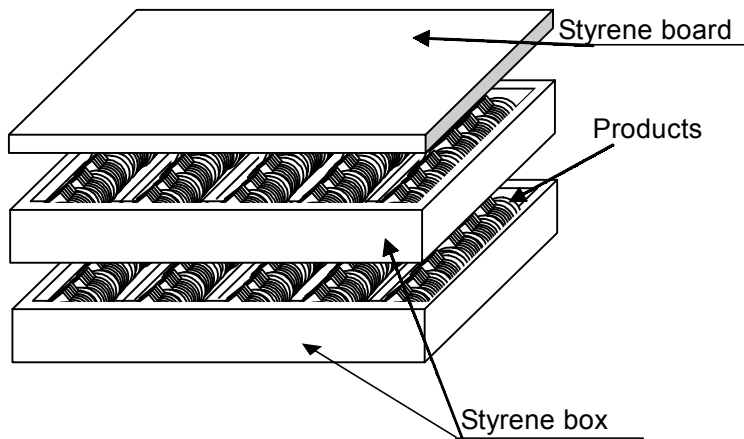
## PACKING

- (1) Use the styrene box.
- (2) The styrene box has 5 rows. Set 100 pieces in a row, then the box is 500 pieces
- (3) The minimum number of packing is 500 pieces.
- (4) Put the sponge spacer in each row to avoid moving products.



- (5) If the product is 500 pieces, pile up the styrene box packed products and empty box. Put styrene board on the top, and then pack them to the corrugated cardboard box (.185×103×295)

- (6) If the product is 1000 pieces, pile up 2 styrene box packed products. Put styrene board on the top, and then pack them to the corrugated cardboard box. (185×103×295)



## REMARKS

### (1) Operating environment

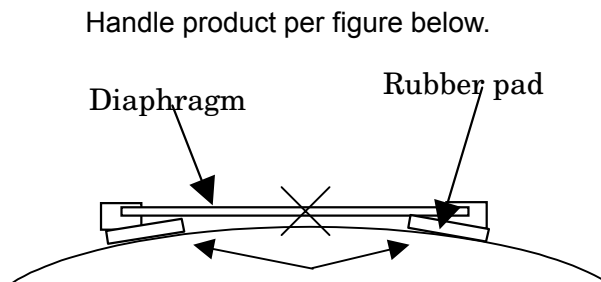
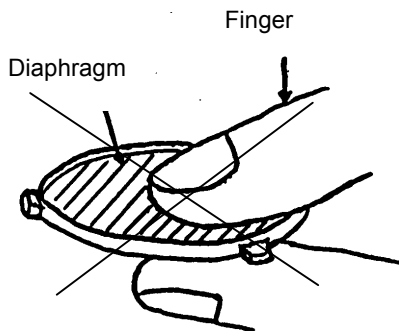
A malfunction in ambulance or vehicle equipment, medical equipment, spacecraft, nuclear reactors, etc. May cause serious harm to human life or have severe social ramifications. As such, any products to be used in such equipment may require higher safety and/or reliability considerations and should be clearly differentiated from components used in general purpose applications. In this case please consult Taiyo Yuden Technical Services.

### (2) Circuit Design

Applied voltage to products should be less than the maximum input voltage in design and direct current should not be applied. Please insert resistance more than 10 ohm in series with MLS.

### (3) Installation

- \*Please do not blow with the compressed air on the diaphragm directly.
- \*When attaching the product, do not push the terminal more than 2[N] in a vertical direction and terminal shall not be pushed to other directions.
- \*Please do not apply tension, pressure or twist to the case of product in the direction of the diameter.
- \*Be careful not to deform products or apply distortion stress during installation.



### (4) Handling

Please do not touch the diaphragm by finger or others. (when attaching or handling)

### (5) Soldering

Soldering of lead wire conditions.

- \*The lead wire should be soldered to the connection area on the terminal and do not put the solder iron to the terminal connection area.
- \*Please the soldering to terminal is under 50W, 250deg C and 5sec. (recommend)

### (6) Cleaning

Please avoid cleaning processes. (organic solvent and a water system solvent)

### (7) Storage conditions

- \*Please do not use or keep products in atmosphere of chlorine or sulfide.
- \*Please keep products under the standard condition.
- \*Even under ideal storage conditions, products terminal solderability decreases as time passes, so products should be used within 6 months from the time of delivery.

The operation conditions for the guarantee of this product are as shown in the drawing for approval.  
Please note that Taiyo Yuden ramifications shall not be responsible for a failure and/or abnormality, which are caused by use under the conditions other than the aforesaid operating conditions.