muRata

Specification of Piezoelectric Diaphragm

7NB-41-1

Date	March 25, 2009	Approved by	Checked by	Issued by

1.   Scope

This product specification is applied to the piezoelectric diaphragm used for sounder in alarm systems. Please contact us when using this product for any other applications than described in the above.

2.   Part Number

2-1   :7NB-41-1
        Murata Part Number
2-2   :
        Customer's Part Number
2-3   :
        Customer's Drawing Number

3.   Maximum Rating

	Item	Specification
3-1	Operating Temperature Range	-20 +70 -20 to +70°C
3-2	Storage Temperature Range	-30 +80 -30 to +80°C

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4.   Electrical Characteristics

	Item	Specification
4-1	Resonant Frequency	0.8± 0.3kHz
4-2	Resonant Impedance	600 /max.
4-3	(120Hz) Electrostatic Capacity (at 120Hz)	75nF± 30%
4-4	(10VD.C.) Insulation Resistance (at 10VD.C.)	100MΩ 100MΩmin.

Refer to next item for measuring method.

5.   Measuring Method

5-1   /   Resonant Frequency / Resonant Impedance

(
(   )
0   4kHz

Piezoelectric diaphragm shall be clamped at a node point as shown in following figure to be free from any mechanical stress, and measured its resonant frequency and resonant impedance by using vector impedance analyzer or equivalent.
When the input frequency is sweeped within 0 to 4 kHz, the resonant frequency is defined the frequency where the impedance shows minimum value, and this impedance shell be the resonant impedance.
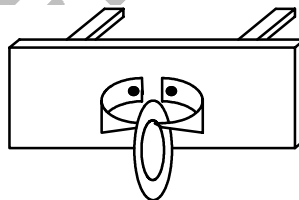
5-2   Static Capacitance

120Hz   L.C.R.   (HP:4192A   )
/
A electrostatic capacity capacitance shall be measured at 120Hz by using L.C.R. meter, ex. HP4192A(H.P.), or equivalent. The part shall be clamped in the same way as the measurement of resonant frequency / resonant impedance mentioned in the above.

5-3   Insulation resistance

An insulation resistance shall be measured by using an insulation resistance meter.

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5-4   Measuring Condition

+25± 3   60± 10 R.H.
+5 +35 ,   45 85 R.H.
Parts shall be measured under a condition (Temperature:+5 to +35°C, Humidity: 45 to 85%R.H.)unless the standard condition (Temperature:+25±3°C, Humidity: 60 ± 10%R.H.) is regulated to measure.

6.   Physical Characteristics

	Item	Test Condition	Specification
6-1	Shock	980m/s^2　　　　　　　　XYZ 3 3　　　Diaphragm shall be measured after being applied shock(980m/s^2) for each three mutually perpendicular directions to each of 3 times by half sine wave.	1
6-2	Vibration Resistant	10 55Hz 1.5mm XYZ 3 2　　　Diaphragm shall be measured after being applied vibration of amplitude of 1.5mm with 10 to 55Hz band of vibration frequency to each of 3 perpendicular directions for 2 hours.	The measured value shall meet Table 1.

7.   Environmental Characteristics

	Item	Test Condition	Specification
7-1	Dry Heat Test (Storage)	+85± 2 240 4　　After being placed in a chamber with +85±2°C for 240 hours and then being placed in natural condition for 4 hours, diaphragm shall be measured.	1　　The measured value shall meet Table 1.
7-2	Cold Test (Storage)	-40± 2 240 4　　After being placed in a chamber with -40±2°C for 240 hours and then being placed in natural condition for 4 hours, diaphragm shall be measured.	

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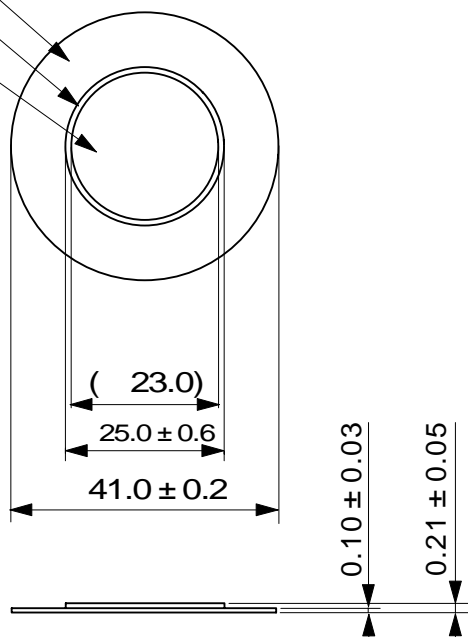| 7-3		+40± 2　　　90　95　R.H. 240　　　　　　　　　　　　　4	
	Humidity	After being placed in a chamber with 90 to 95%R.H. at +40±2°C for 240 hours and then being placed in natural condition for 4 hours, diaphragm shall be measured.	
7-4	Temperature Cycle	-40± 2　　　　　　　　30 (+20　)　15　　　　　　　　　+85± 2 　　　30　　　　　(+20　)　15 　　　　　　1　　　　　5 　　　　4 After being placed in a chamber at -40±2°C for 30 minutes, diaphragm shall be placed at room temperature(+20°C). After 15 minutes at this temperature, diaphragm shall be placed in a chamber at +85±2°C. After 30 minutes at this temperature, diaphragm shall be returned to room temperature(+20°C) for 15 minutes. After 5 above cycles, diaphragm shall be measured after being placed in natural condition for 4 hours.	1 The measured value shall meet Table 1.

1　　　Table 1.

Item	Specification after test
Resonant Frequency	± 10% Initial Value±10%
Resonant Impedance	1.2kΩ 1.2kΩmax.
Electrostatic Capacity	± 20% Initial Value±20%

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8.   Dimensions

(   ) Metal(Nickel Alloy)

Ceramic

Silver Electrode

(23.0)

25.0± 0.6

41.0± 0.2

0.10± 0.03

0.21± 0.05

:   mm
in mm

(   ) :
       Reference

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9   Packaging Standard

Each minimum package unit of components shall be in a carton box and it shall be clearly marked with Part Number, quantity and outgoing inspection number.

10 ⚠   Cautions

     10-1   Limitation of Applications

           (   )

Please contact us before using our products for the applications listed below which require   especially high reliability for the prevention of defects which might directly cause damage to the third party's life, body or property .
Aircraft equipment
Aerospace equipment
Undersea equipment
Power plant control equipment
Medical equipment
Transportation equipment(vehicles, trains, ships, etc.)
Traffic signal equipment
Disaster prevention / crime prevention equipment
Data-processing equipment
 Applications of similar complexity and /or with reliability requirements to the applications listed in the above.

     10-2   Fail-safe

Be sure to provide an appropriate fail-safe function on your product to prevent a second damage that may be caused by the abnormal function or the failure of our product.

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11.   Caution for Use

11-1

   Please do not touch the component with bare hand because electrode may be
   corroded.

11-2

   Applying load on the center area of the diaphragm may cause clack in the ceramic
   element. When the diaphragm is supported by edge, the load should be only applied
   around edge.

11-3

   The component may be damaged if mechanical stress over this specification is
   applied.

11-4

   Please pay attention to protect operating circuit from surge voltage provided by some-
   thing of force such as falling, shock and temperature changing.

11-5

   Please pay attention never to be applied DC voltage to piezo diaphragm.

11-6

   Please consult with Murata or Murata representative, in case of soldering on
   piezoelectric diaphragm.

11-7 IC   IC   IC   1 2k

   The resistor should be used as shown in Fig. A. A suitable resistance value should be
   chosen,   preferably 1kΩ to 2kΩ. Instead of this measure, a diode may also be
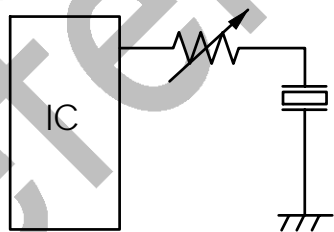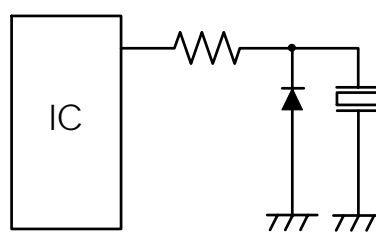   applied as shown in Fig. B.

           Fig.A   Fig.B

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12	Notice on Product Storage

12-1   -10   +40   15   85%

Please store the products in room where the temperature / humidity is stable. And avoid such places where there are large temperature changes. Please store the products under the following conditions :   Temperature   :   -10 to +40 (degree C)
                                                                                      Humidity   :   15 to 85% R.H.

12-2   6   6
            6
Expire date (Shelf life) of the products is 6 months after delivery under the conditions of a sealed and an unopened package. Please use the products within 6 months after delivery. If you store the products for a long time (more than 6months), use carefully because the products may be degraded in the solder-ability and/or rusty. Please confirm solder-ability and characteristics for the products regularly.

12-3

Please do not store the products in a chemical atmosphere (Acids, Alkali, Bases, Organic gas, Sulfides and so on), because the characteristics may be reduced in quality, and/or be degraded in the solder-ability due to the storage in a chemical atmosphere.

12-4

Please do not put the products directly on the floor without anything under them to avoid damp places and/or dusty places.

12-5

Please do not store the products in the places such as : in a damp heated place, in a place where direct sunlight comes in, in place applying vibrations.

12-6

Please use the products immediately after the package is opened, because the characteristics may be reduced in quality, and/or be degraded in the solder-ability due to storage under the poor condition.

12-7

Please do not drop the products to avoid cracking of ceramic element.

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13 ⚠   Note

13-1

Please make sure that your product has been evaluated in view of your specifications with our product being mounted to your product.

13-2

You are requested not to use our product deviating from this product specification.

13-3   1

Please return one duplicate of this product specification to us with your signature to acknowledge your receipt . In case of no return within three months from submission date, or if we receive order before the duplicate is returned, this product specification will be deemed to have been received by you.

13-4

We consider it not appropriate to include any terms and conditions with regard to the business transaction in the product specifications, drawings or other technical documents. Therefore, if your technical documents as above include such terms and conditions such as warranty clause, product liability clause, or intellectual property infringement liability clause, they will be deemed to be invalid.

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