



Product Specification

Ningbo East Electronics Limited

NO. 88 East Jinhui Road, Yinzhou Ningbo 315100, P.R.China

<http://www.east-mingtao.com>

Product Name:	SMD External-Driven Piezo Transducer
Part Number:	SFM-1240-03
Version:	1.05
Date:	2024-2-26
Note:	

East is an ISO 9001 , IATF16949 and ISO 14001 Certified Company

Revision History

Rev.	Description	Author/Date	Checked By	Approver
1.05	adding a quality guarantee period	司徒晓东 2024-2-26	胡汇峰	王建成
1.04	Quality management system revised	汤礼东 2019-9-25	吕文斌	王建成
1.03	change the paper reel to plastic reel	刘进 2015-5-30	汤礼东	王建成



ES France - Département Composants & Modules
127 rue de Buzenval BP 26 - 92380 Garches



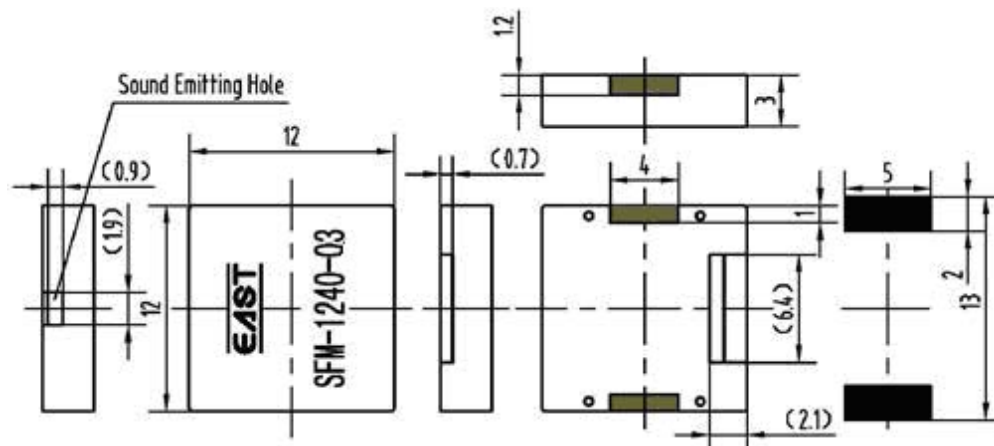
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Site Web : www.es-france.com

1. Part Number SFM-1240-03

2. Dimension Drawing (Unit: mm)



Recommended Version

SMD Foot Pattern

Solder paste thickness is not below 0.2mm

3.Specification

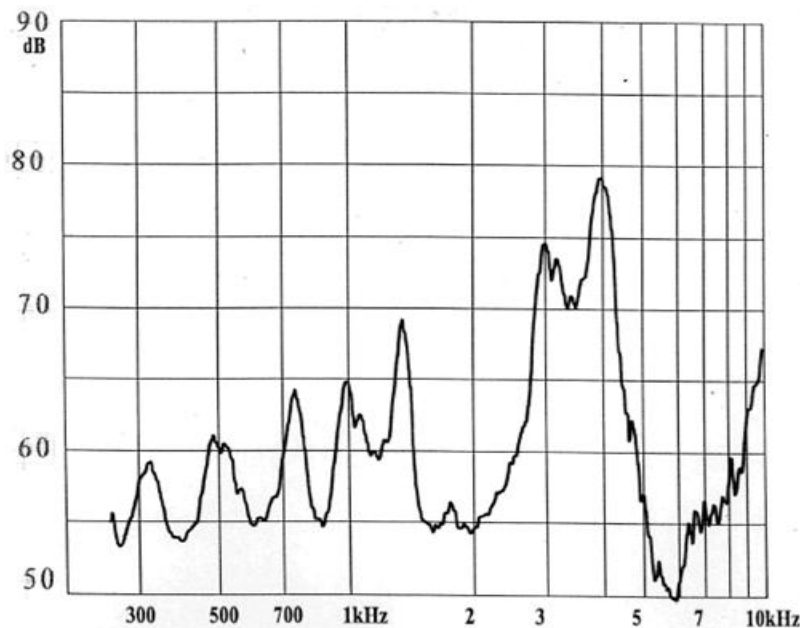
No.	Item	Specification
3-1	Min. Sound Pressure Level	76dB(A)/4.0KHz/3Vp-p Square Wave/10cm
3-2	Capacitance at 1000Hz	15nF±25%
3-3	Allowable Input Voltage	30Vp-p
3-4	Max. Consumption	3mA/4.0kHz/3Vp-p square wave
3-5	Resonant Frequency	4.0±0.5KHz
3-6	Operating Temperature	-40~+120°C
3-7	Storage Conditions	+5~+40°C,20~70%RH Please use with in 6 months
3-8	Case Material /Color	LCP/Black
3-9	Pin Material /Plated	Cu/Sn
3-10	Weight	0.5g

NOTES:

Test should be made under the conditions of room temperature ($20\pm 10^{\circ}\text{C}$), normal humidity ($60\pm 20\%$) and normal atmospheric pressure. In this case, however, that the judgment is questionable, the test conditions are to be changed to room temperature $20\pm 2^{\circ}\text{C}$, relative humidity 60~70% and normal atmospheric pressure



4. Typical Frequency Response Curve



Note: Input Voltage 3Vp-p Square Wave
Distance 10 cm

5. Reliability Test

No.	Item	Method of Test	Tolerance after Testing
5-1	Operating Temperature	-40~+120°C	Sound pressure level initial value ± 10 dB (A) Max. consumption value $\pm 20\%$ Capacitance value $\pm 20\%$
5-2	Storage in high temperature	Storage in +120°C test box 96 hours then exposed to the room temperature for 2 hours	
5-3	Storage in low temperature	Storage in -40°C test box 96 hours then exposed to the room temperature for 2 hours	
5-4	Life test in the room temperature	Operate the product continuously 5 seconds on 5 seconds off 300 hours at rated voltage	
5-5	Temperature / humidity cycle test	Storage in +40°C, 93 $\pm$ 3%RH test box 96 hours then exposed to the room temperature for 2 hours	
5-6	Temperature (high and low) cycle test	Conduct the test for 5 cycles without applying power then expose to the room temperature for 2 hours.(See Figure 5-6)	
5-7	Vibration test	Conduct the test for the directions of X Y and Z for 0.5 hour each (total 1.5 hours). To-and Fri sweep time(from 10 to 55Hz and then 55 to 10) under single amplitude of 0.75mm is 3 minute, then expose to the room temperature for 2 hours	



5-8	Drop test	Drop a product naturally from the height of 700mm onto the surface of 100mm thick wooden board. Two directions: upper and side of the product are to be applied for this drop test once respectively	
5-9	Reflow soldering heat resistance	a) Pre-heating conditions shall be +140°C to 160°C for 160 to 200 seconds. (See Figure5-9) b) Heating conditions shall be within 60 seconds at +200°C min., but peak temperature shall be lower than +260°C. (See Figure 5-9)	
5-10	Test of soldering	Dip the connecting pins in soldering at 230±5°C for 3±0.5 seconds	Solder shall be attached around over 95% of the dipped portion

NOTE: The pins are allowed to deform after drop test.

Figure 5-6

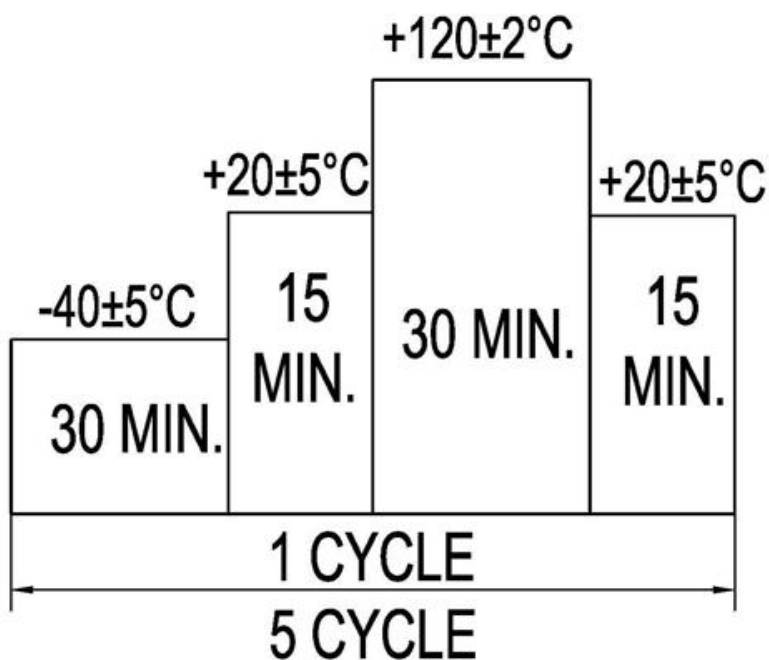
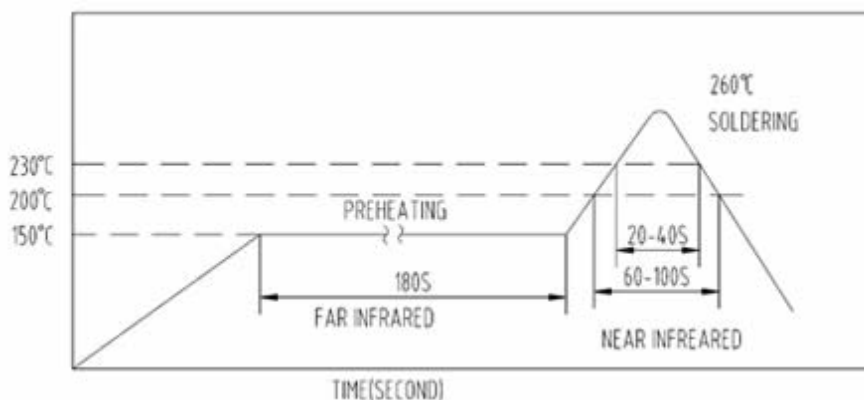
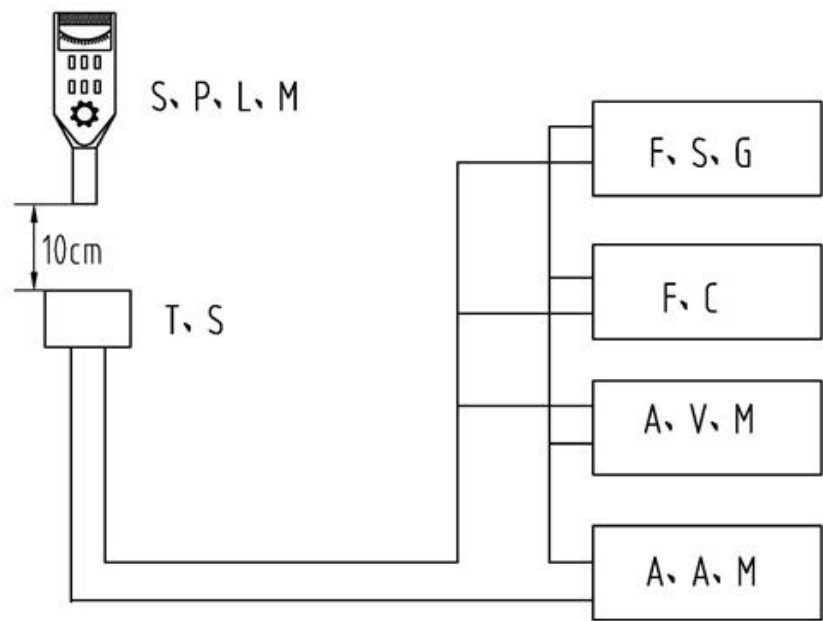


Figure 5-9

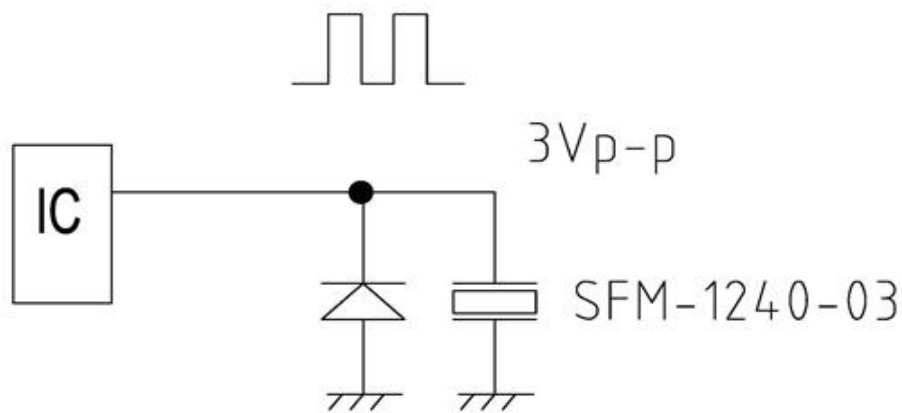


6. Electrical Testing Method



S.P.L.M	Sound Pressure Level Meter
T.S	Testing Sample
T.C	Test Circuit
F.C	Frequency Counter
F.S.G	Frequency Signal Generator
A.V.M	AC Voltage Meter
A.A.M	AC Ampere Meter

TC:



7. Packing Information

No.	Item	Description
7-1	Tape type information	a) The design for such tape packing was executed under standard IEC - 286-3 b) The material of the tape is polystyrene in black color. Detailed dimensions are as below: (See Figure7-1)
7-2	Dimensions of the rolling plate	a) The material of the rolling plate is plastic. b) The dimensions of the rolling plate are as below(See Figure7-2)
7-3	Packing dimensions and quantity	a) The rolling plate is put into a 340X335X35mm inner packing box and is packed with 1000pcs of transducer per plate. b) The dimension of the outer carton is 400X 350X 350mm containing 10 inner boxes with a total quantity of 10000 pcs of transducer. c) The total gross weight per carton is 11.6Kgs, while net weight is 5.0Kgs.

Figure 7-1

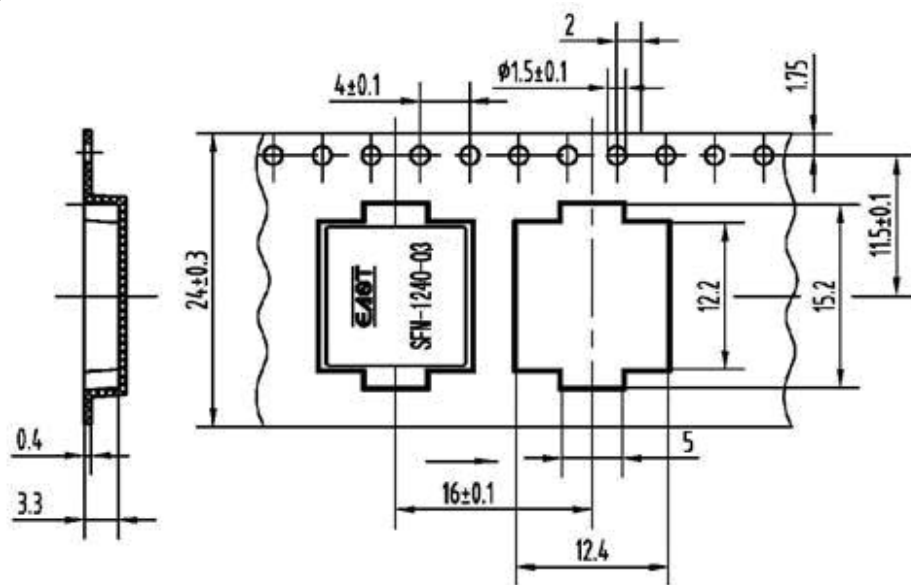
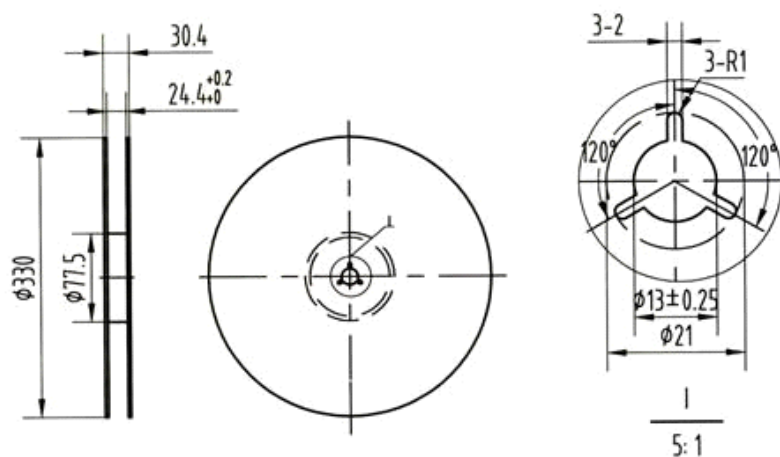


Figure 7-2





Product Specification

Ningbo East Electronics Limited

NO. 88 East Jinhui Road, Yinzhou Ningbo 315100, P.R.China

<http://www.east-mingtao.com>

Product Name:	SMD External-Driven Piezo Transducer
Part Number:	SFM-1220A
Version:	1.03
Date:	2019-10-8
Note:	

East is an ISO 9001 , IATF16949 and ISO 14001 Certified Company

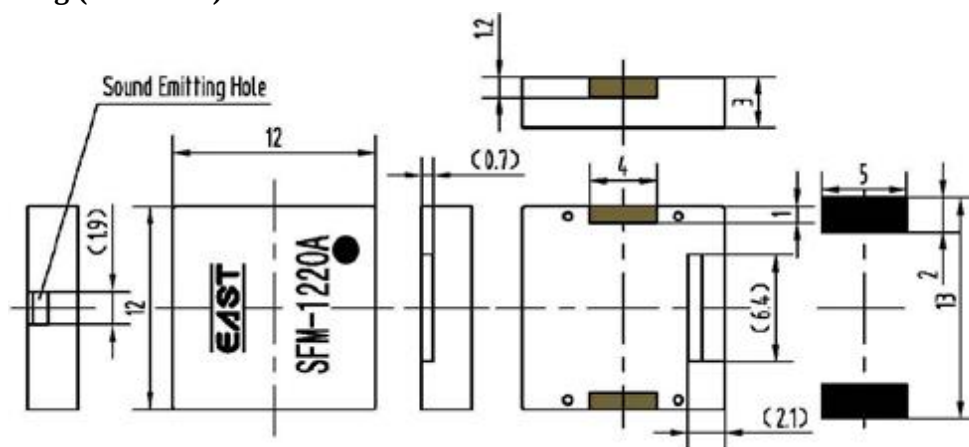
Revision History

Rev.	Description	Author/Date	Checked By	Approver
1.03	Quality management system revised	汤礼东 2019-10-8	吕文斌	王建成
1.02	change the paper reel to plastic reel	刘进 2015-5-30	汤礼东	王建成
1.01	Quality Certificate Symbol revised	刘宁 2015-2-4	汤礼东	王建成



1. Part Number SFM-1220A

2. Dimension Drawing (Unit: mm)



SFM-TERMINAL VERSION

RECOMMENDED SMD FOOT PATTERN

Solder paste thickness is not below 0.2mm

3.Specification

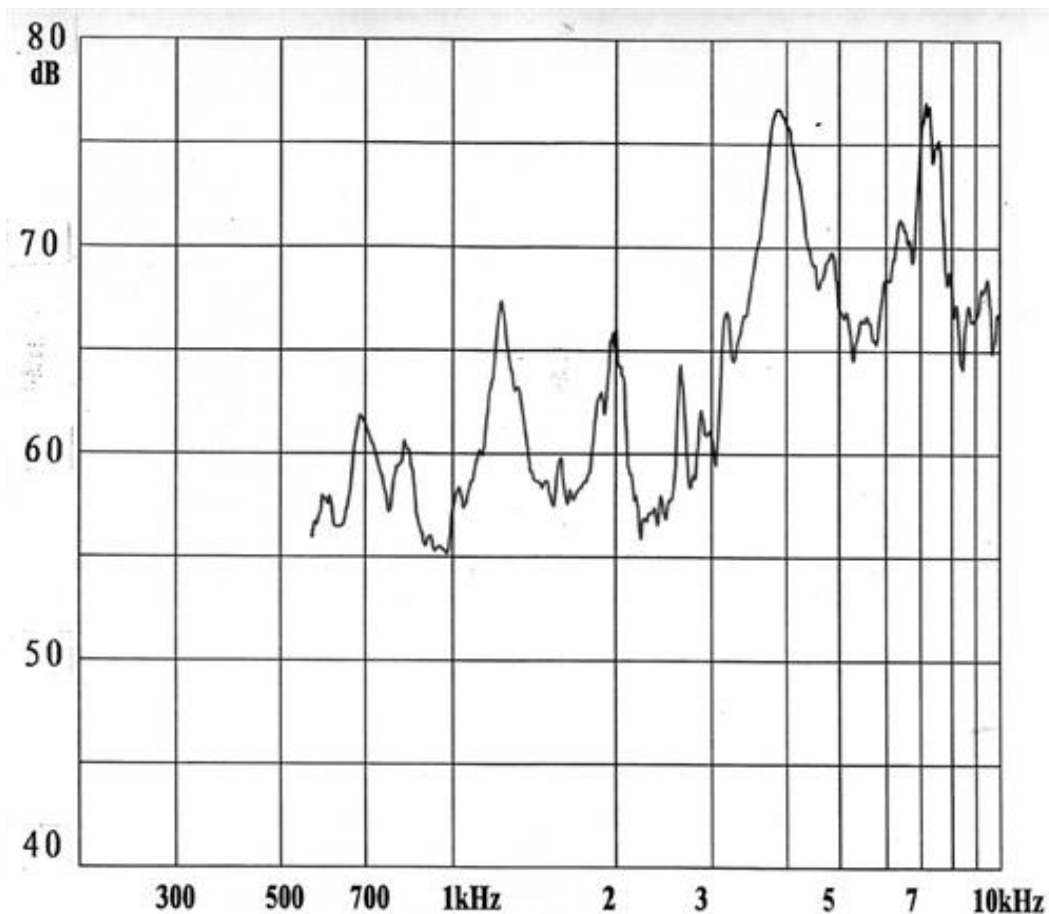
No.	Item	Specification
3-1	Min. Sound Pressure Level	58dB/2.0kHz/3.3Vp-p square wave /10cm
3-2	Allowed Input Voltage	30Vp-p
3-3	Capacitance	15±30% μ F(At 1000Hz)
3-4	Max. Consumption	2.5mA/2.0kHz/3.3Vp-p square wave
3-5	Resonant Frequency	2.0± 0.5kHz
3-6	Operating Temperature	-40~+85°C
3-7	Case Material /Color	LCP/Black
3-8	Weight	0.5g
3-9	Pin Strength	More than 10N

NOTES:

Test should be made under the conditions of room temperature (20±10°C), normal humidity (60±20%) and normal atmospheric pressure. In this case, however, that the judgment is questionable, the test conditions are to be changed to room temperature 20±2°C, relative humidity 60~70% and normal atmospheric pressure



4. Typical Frequency Response Curve



Note: Input Voltage 3.3Vp-p square wave
Distance 10 cm

5. Reliability Test

No.	Item	Method of Test	Tolerance after Testing
5-1	Operating Temperature	-40~+85°C	Sound pressure level initial value ± 10 dB Max. consumption value $\pm 20\%$ Capacitance value $\pm 20\%$
5-2	Storage in high temperature	Storage in +85°C test box 96 hours then exposed to the room temperature for 2 hours	
5-3	Storage in low temperature	Storage in -40°C test box 96 hours then exposed to the room temperature for 2 hours	
5-4	Life test in the room temperature	Operate the product continuously 5 seconds on 5 seconds off 300 hours at rated voltage	
5-5	Temperature / humidity cycle test	Storage in +40°C, 93 $\pm$ 3%RH test box 96 hours then exposed to the room temperature for 2 hours	
5-6	Temperature (high and low) cycle test	Conduct the test for 5 cycles without applying power then expose to the room temperature for 2 hours.(See Figure 5-6)	



5-7	Vibration test	Conduct the test for the directions of X Y and Z for 0.5 hour each (total 1.5 hours). To-and Fri sweep time(from 10 to 55Hz and then 55 to 10) under single amplitude of 0.75mm is 3 minute, then expose to the room temperature for 2 hours	
5-8	Drop test	Drop a product naturally from the height of 700mm onto the surface of 100mm thick wooden board. Two directions: upper and side of the product are to be applied for this drop test once respectively	
5-9	Reflow soldering heat resistance	a) Pre-heating conditions shall be $+140^{\circ}\text{C}$ to 160°C for 160 to 200 seconds. (See Figure5-9) b) Heating conditions shall be within 60 seconds at $+200^{\circ}\text{C}$ min., but peak temperature shall be lower than $+260^{\circ}\text{C}$. (See Figure 5-9)	
5-10	Test of soldering	Dip the connecting pins in soldering at $230\pm 5^{\circ}\text{C}$ for 3 ± 0.5 seconds	Solder shall be attached around over 95% of the dipped portion
NOTE: The pins are allowed to deform after drop test.			

Figure 5-6

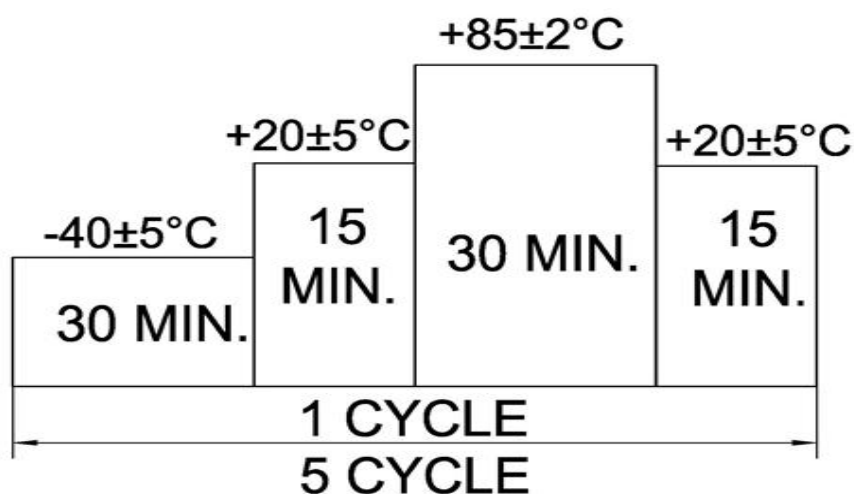
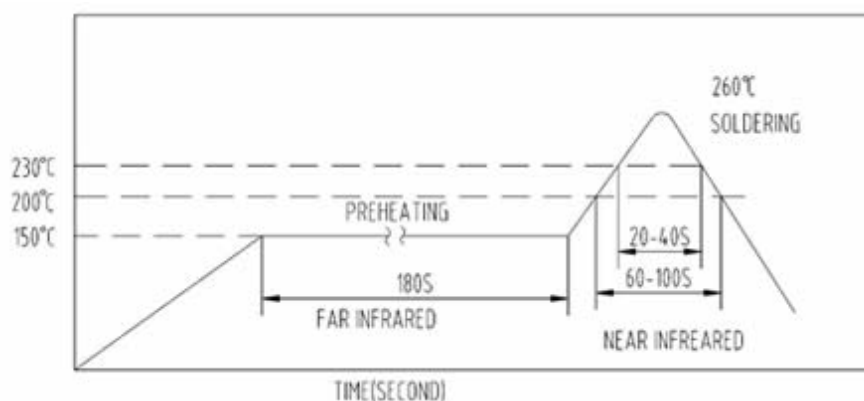
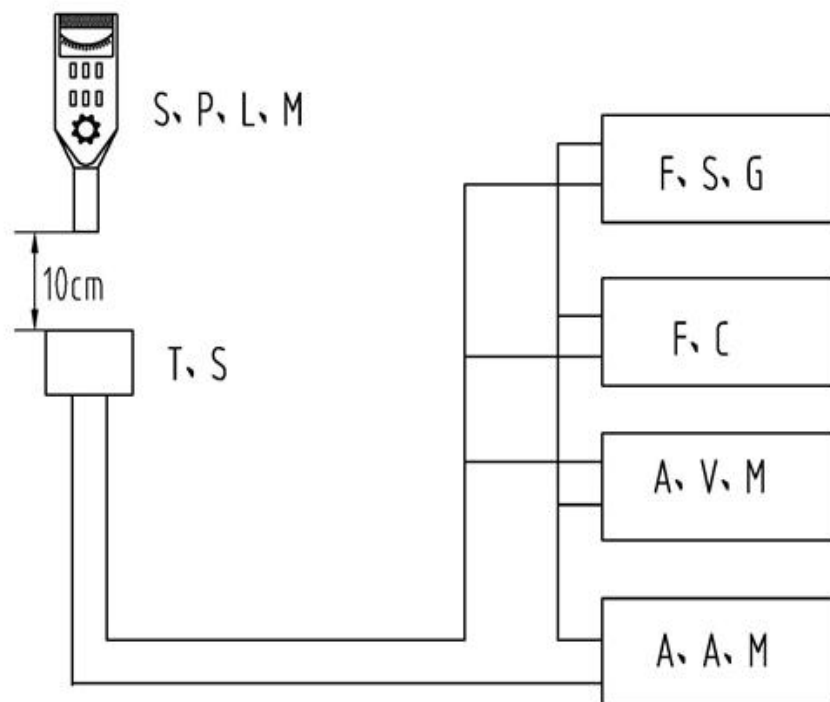


Figure 5-9



6. Electrical Testing Method



S.P.L.M	Sound Pressure Level Meter
T.S	Testing Sample
F.C	Frequency Counter
F.S.G	Frequency Signal Generator
A.V.M	AC Voltage Meter
A.A.M	AC Ampere Meter

7. Packing Information

No.	Item	Description
7-1	Tape type information	a) The design for such tape packing was executed under standard IEC - 286-3 b) The material of the tape is polystyrene in black color. Detailed dimensions are as below: (See Figure7-1)
7-2	Dimensions of the rolling plate	a) The material of the rolling plate is plastic. b) The dimensions of the rolling plate are as below(See Figure7-2)
7-3	Packing dimensions and quantity	a) The rolling plate is put into a 340X335X35mm inner packing box and is packed with 1000pcs of transducer per plate. b) The dimension of the outer carton is 400X 350X 350mm containing 10 inner boxes with a total quantity of 10000 pcs of transducer. c) The total gross weight per carton is 11.6Kgs, while net weight is 5.0Kgs.



Figure 7-1

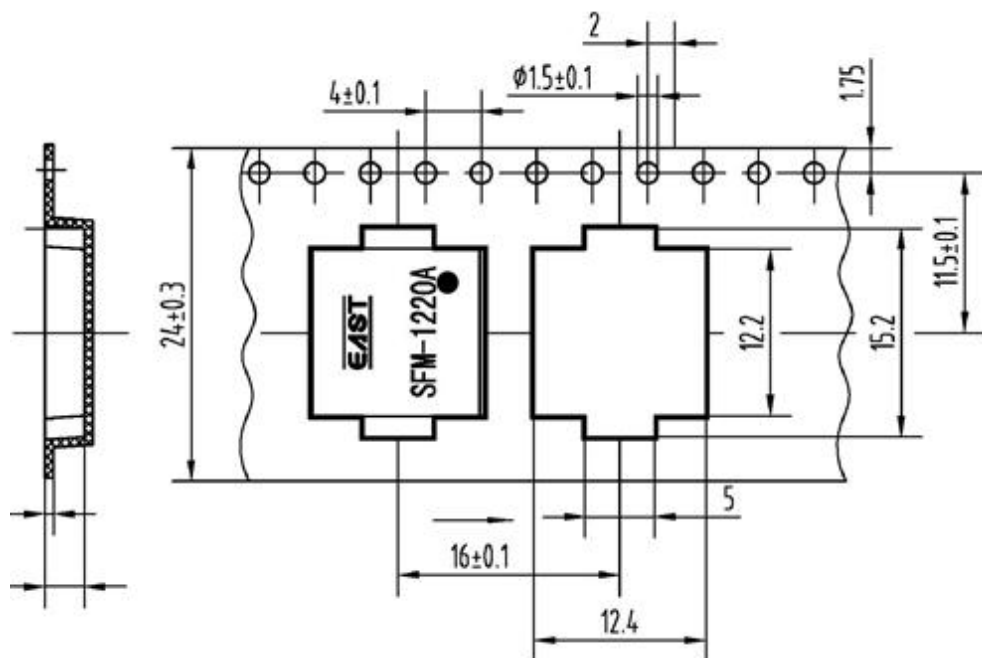
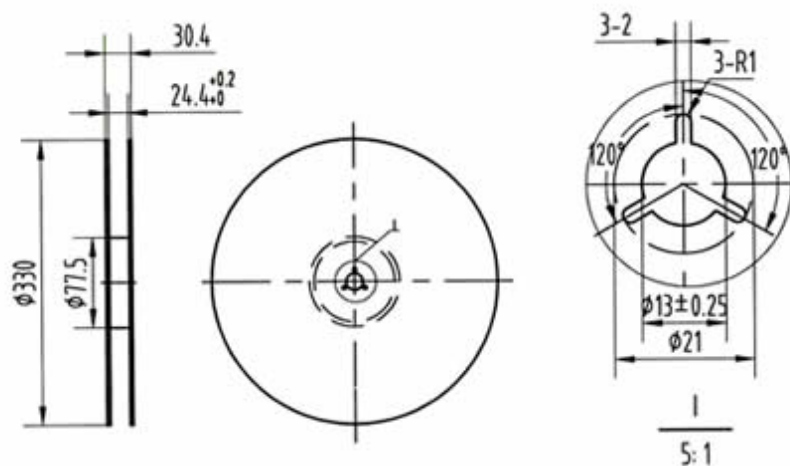


Figure 7-2





Product Specification

Ningbo East Electronics Limited

NO. 88 East Jinhui Road, Yinzhou Ningbo 315100, P.R.China

<http://www.east-mingtao.com>

Product Name:	SMD Piezo Transducer
Part Number:	SFM-9019-03A
Version:	1.04
Date:	2024-3-11
Note:	

East is an ISO 9001 , IATF16949 and ISO 14001 Certified Company

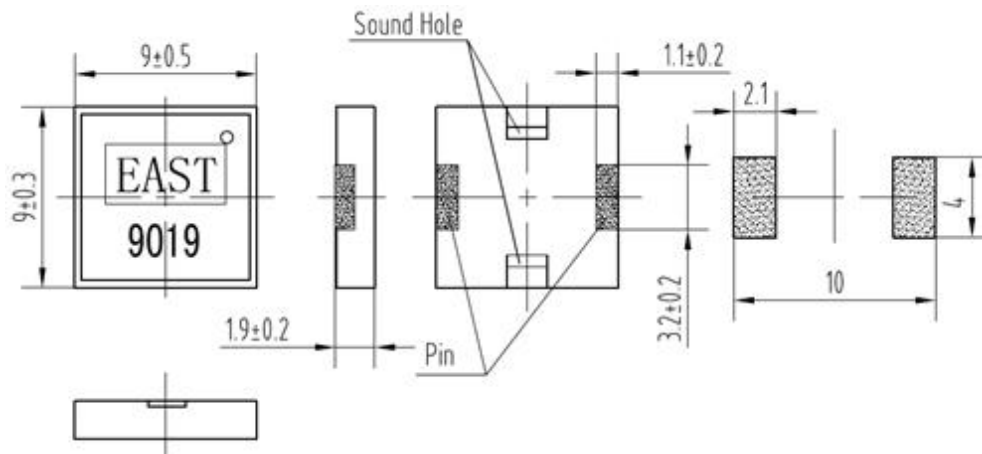
Revision History

Rev.	Description	Author/Date	Checked By	Approver
1.04	adding a quality guarantee period	司徒晓东 2024-3-11	胡汇峰	王建成
1.03	Update the capacitance specification.	胡汇峰 2022-2-8	汤礼东	王建成
1.02	Quality management system revised	汤礼东 2019-11-7	吕文斌	王建成



1. Part Number SFM-9019-03A

2. Dimension Drawing (Unit: mm)



SFM-TERMINAL VERSION

RECOMMENDED SMD FOOT PATTERN

Solder paste thickness is not below 0.2mm

3.Specification

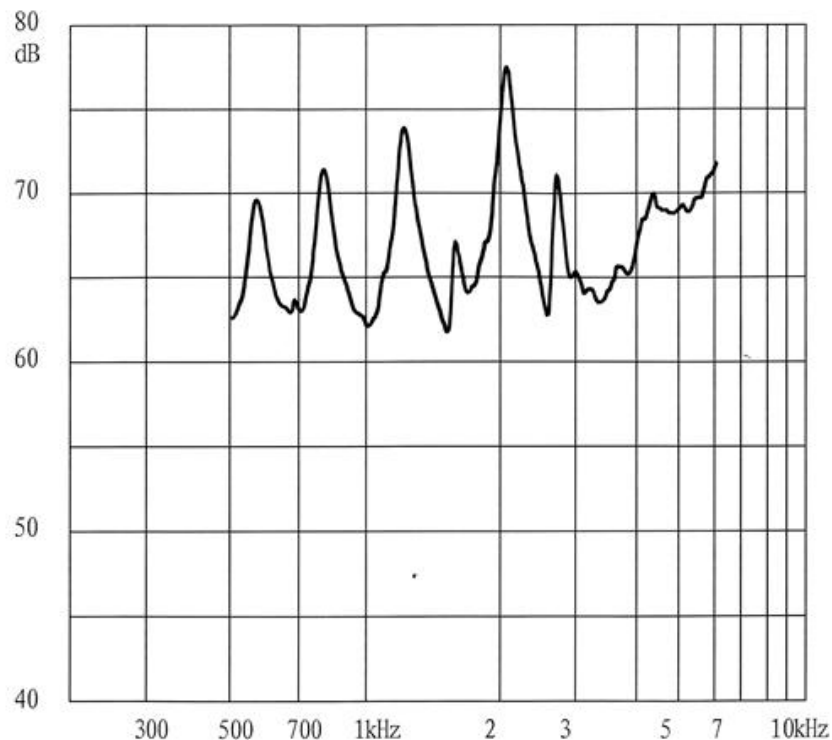
No.	Item	Specification
3-1	Min. Sound Pressure Level	65dB(A)/4.0kHz/3Vp-p square wave /10cm
3-2	Rated Voltage	3Vp-p
3-3	Allowed Input Voltage	1~20Vp-p
3-4	Capacitance	12±30%nF(At 100Hz/1V)
3-5	Max. Consumption	5mA/4.0kHz/3Vp-p square wave
3-6	Resonant Frequency	4.0±0.5KHz
3-7	Operating Temperature	-40~+85°C
3-8	Storage Conditions	+5~+40°C,20~70%RH Please use with in 6 months
3-9	Case Material /Color	LCP/Black
3-10	Pin Material Plating	Cu/Sn
3-11	Weight	0.2g

NOTES:

Test should be made under the conditions of room temperature (20±10°C), normal humidity (60±20%) and normal atmospheric pressure. In this case, however, that the judgment is questionable, the test conditions are to be changed to room temperature 20±2°C, relative humidity 60~70% and normal atmospheric pressure



4. Typical Frequency Response Curve



Note: Input Voltage 3Vp-p square wave
Distance 10 cm

5. Reliability Test

No.	Item	Method of Test	Tolerance after Testing
5-1	Operating Temperature	-40~+85°C	Sound pressure level initial value ± 10 dB (A)
5-2	Storage in high temperature	Storage in +85°C test box 96 hours then exposed to the room temperature for 2 hours	
5-3	Storage in low temperature	Storage in -40°C test box 96 hours then exposed to the room temperature for 2 hours	Max. consumption value $\pm 20\%$
5-4	Life test in the room temperature	Operate the product continuously 5 seconds on 5 seconds off 96 hours at rated voltage	Capacitance value $\pm 20\%$
5-5	Temperature / humidity cycle test	Storage in +40°C, 93 $\pm$ 3%RH test box 96 hours then exposed to the room temperature for 2 hours	
5-6	Temperature (high and low) cycle test	Conduct the test for 5 cycles without applying power then expose to the room temperature for 2 hours.(See Figure 5-6)	
5-7	Vibration test	Conduct the test for the directions of X Y and Z for 0.5 hour each (total 1.5 hours). To-and Fri sweep time(from 10 to 55Hz and then 55 to 10) under single amplitude of 0.75mm is 3	



5-8	Drop test	Drop a product naturally from the height of 700mm onto the surface of 100mm thick wooden board. Two directions: upper and side of the product are to be applied for this drop test once respectively	
5-9	Reflow soldering heat resistance	a) Pre-heating conditions shall be +140°C to 160°C for 160 to 200 seconds. (See Figure5-9) b) Heating conditions shall be within 60 seconds at +200°C min., but peak temperature shall be lower than +260°C. (See Figure 5-9)	
5-10	Test of soldering	Dip the connecting pins in soldering at 255±5°C for 3±0.5 seconds	Solder shall be attached around over 95% of the dipped portion

NOTE: The pins are allowed to deform after drop test.

Figure 5-6

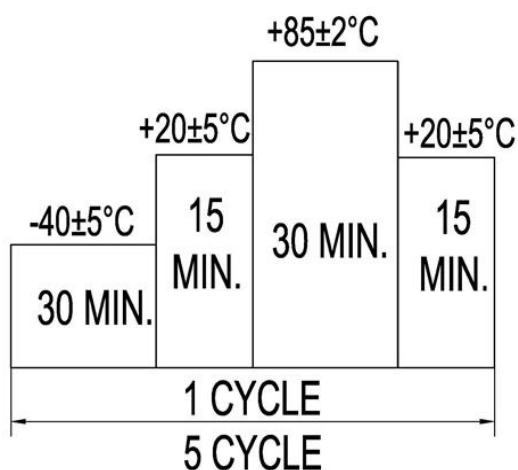
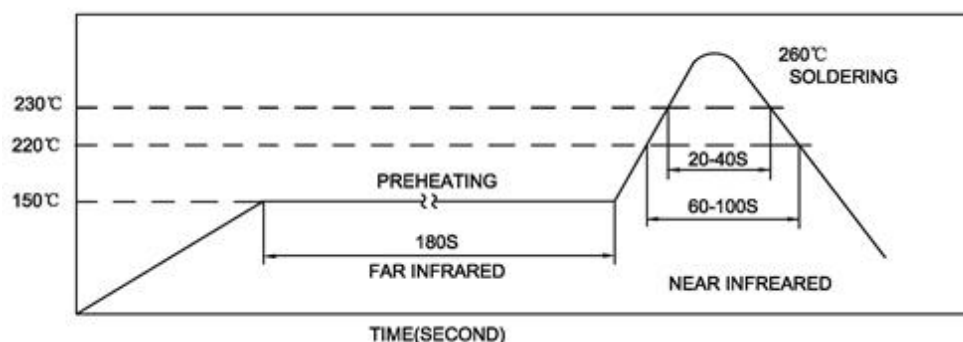
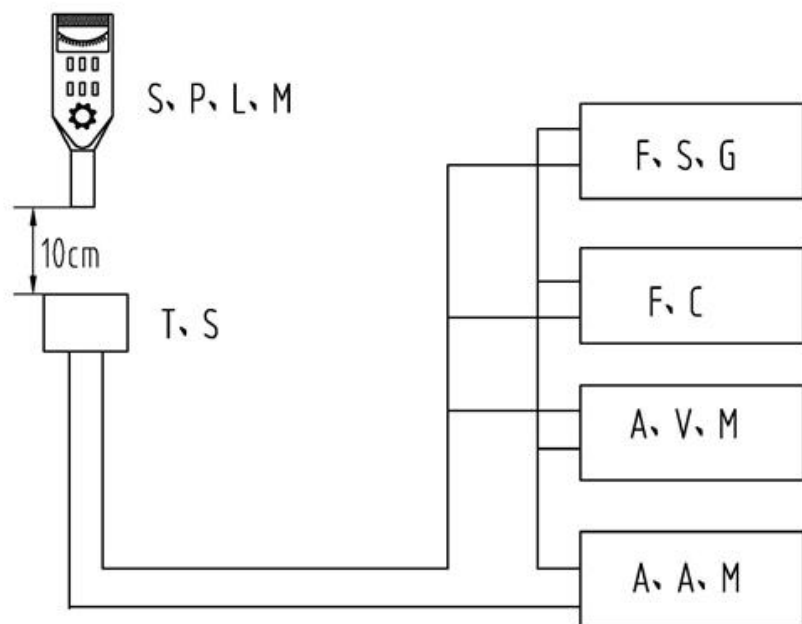


Figure 5-9



6. Electrical Testing Method



S.P.L.M	Sound Pressure Level Meter
T.S	Testing Sample
F.C	Frequency Counter
F.S.G	Frequency Signal Generator
A.V.M	AC Voltage Meter
A.A.M	AC Ampere Meter

7. Packing Information

No.	Item	Description
7-1	Tape type information	a) The design for such tape packing was executed under standard IEC - 286-3 b) The material of the tape is polystyrene in black color. Detailed dimensions are as below: (See Figure7-1)
7-2	Dimensions of the rolling plate	a) The material of the rolling plate is plastic. b) The dimensions of the rolling plate are as below(See Figure7-2)
7-3	Packing dimensions and quantity	a) The rolling plate is packed with 2,500 pcs of the transducer per plate. b) The dimension of the outer carton is 320X 350X 350mm containing 10 inner boxes (340X 335X 27mm)with a total quantity of 25000 pcs of transducer. c) The total gross weight per carton is 6.5Kgs, while net weight is 5 Kgs.



Figure 7-1

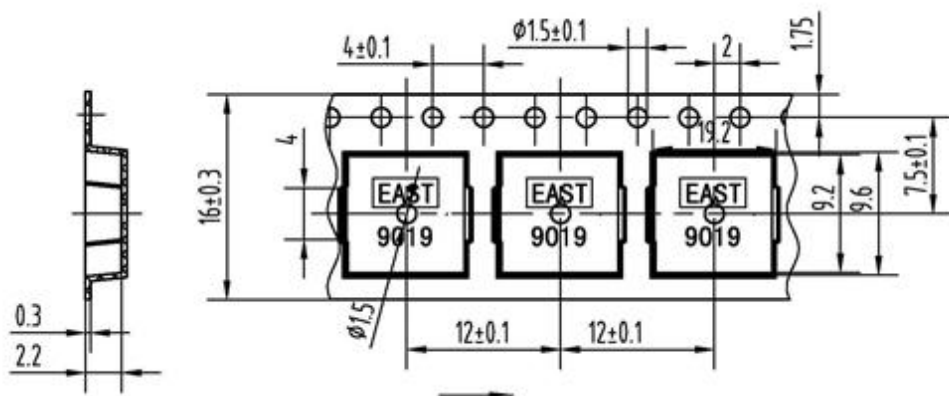
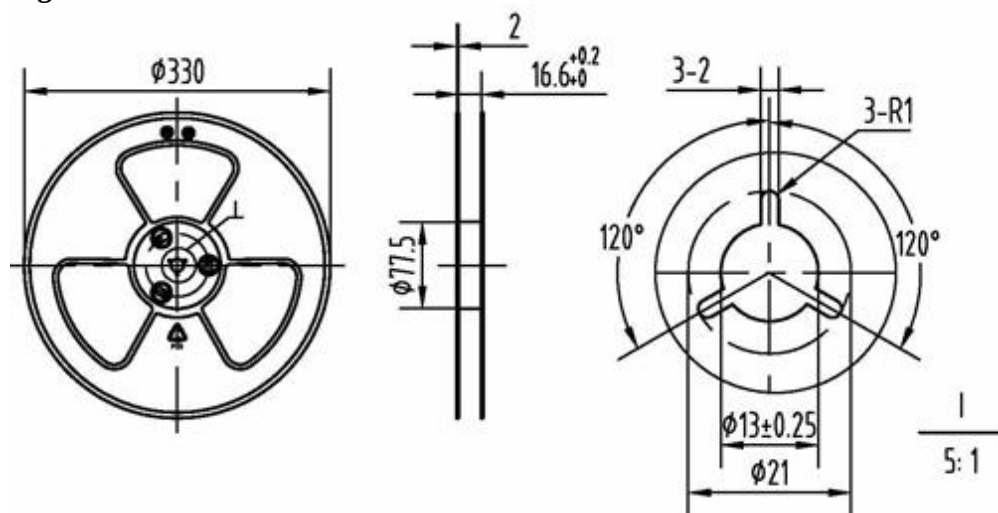


Figure 7-2





Product Specification

Ningbo East Electronics Limited

NO. 88 East Jinhui Road, Yinzhou Ningbo 315100, P.R.China

<http://www.east-mingtao.com>

Product Name:	SMD External-Driven Piezo Transducer
Part Number:	SFM-1820E
Version:	1.0
Date:	2022-4-25
Note:	

East is an ISO 9001 , IATF16949 and ISO 14001 Certified Company

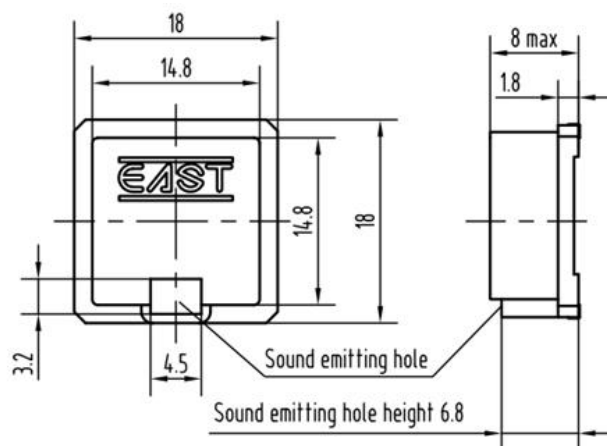
Revision History

Rev.	Description	Author/Date	Checked By	Approver
1.0	Released	胡汇峰 2022-4-25	汤礼东	王建成

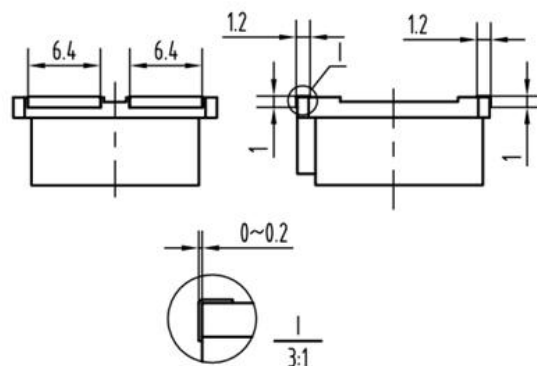


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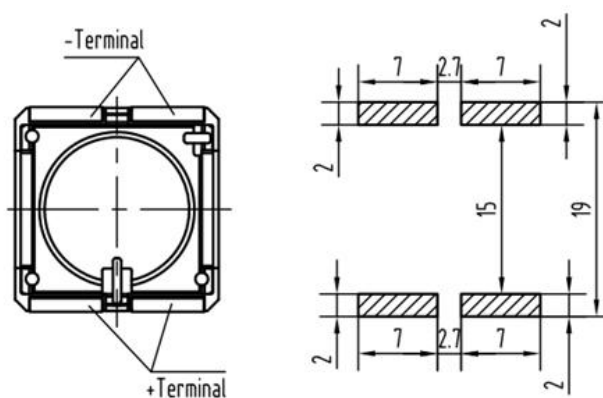
2. Dimension Drawing (Unit: mm)



PLASTIC PARTS SIZE



PIN SIZE



RECOMMENDED SMD FOOT PATTERN



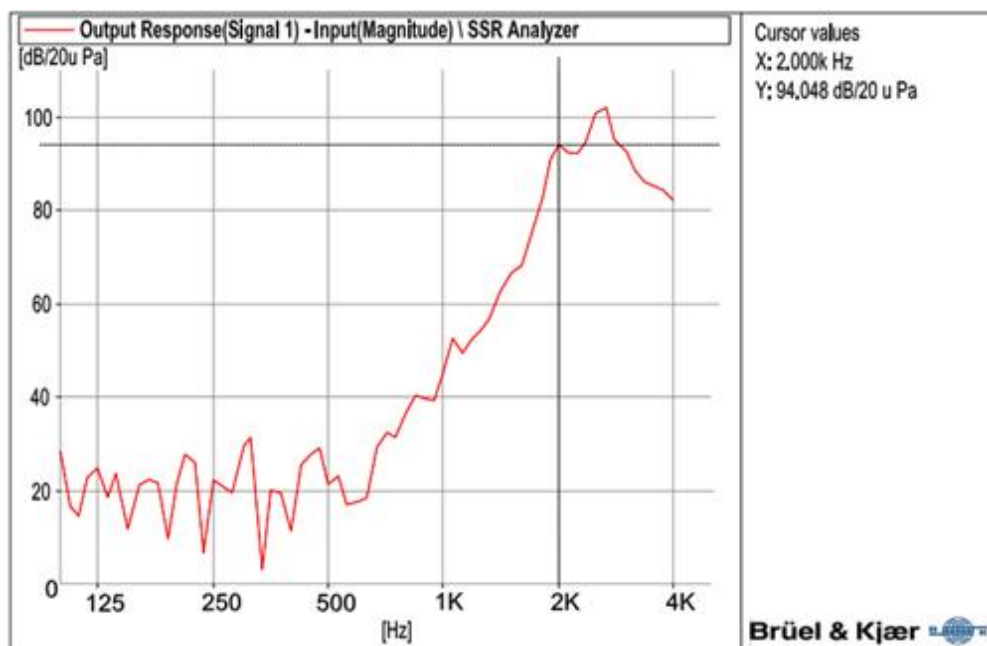
3.Specification

No.	Item	Specification
3-1	Typ. Sound Pressure Level	100dB(A)/2.0kHz/12Vp-p square wave /10cm
3-2	Min. Sound Pressure Level	90dB(A)/2.0kHz/12Vp-p square wave /10cm
3-3	Allowed Input Voltage	20Vp-p
3-4	Max. Consumption	3mA/2.0kHz/12Vp-p square wave
3-5	Resonant Frequency	2.0± 0.5kHz
3-6	Operating Temperature	-40~+105°C
3-7	Storage Temperature	-40~+105°C
3-8	Case Material /Color	LCP/Black
3-9	Pin Material /Plated	Cu/Sn
3-10	Weight	0.9g

NOTES:

Test should be made under the conditions of room temperature ($20\pm 10^{\circ}\text{C}$), normal humidity ($60\pm 20\%$) and normal atmospheric pressure. In this case, however, that the judgment is questionable, the test conditions are to be changed to room temperature $20\pm 2^{\circ}\text{C}$, relative humidity 60~70% and normal atmospheric pressure

4.Typical Frequency Response Curve



Note: Input Voltage 12Vp-p square wave



5. Reliability Test

No.	Item	Method of Test	Tolerance after Testing
5-1	Operating temperature	-40~+105°C	Sound pressure level initial value ± 10 dB Max. consumption value $\pm 20\%$
5-2	Storage in high temperature	Storage in +105°C test box 96 hours then exposed to the room temperature for 2 hours	
5-3	Storage in low temperature	Storage in -40°C test box 96 hours then exposed to the room temperature for 2 hours	
5-4	Life test in the room temperature	Operate the product continuously 5 seconds on 5 seconds off 300 hours at rated voltage	
5-5	Temperature / humidity cycle test	Storage in +40°C, 93 $\pm$ 3%RH test box 96 hours then exposed to the room temperature for 2 hours	
5-6	Temperature (high and low) cycle test	Conduct the test for 5 cycles without applying power then expose to the room temperature for 2 hours.(See Figure 5-6)	
5-7	Vibration test	Conduct the test for the directions of X Y and Z for 0.5 hour each (total 1.5 hours). To-and Fri sweep time(from 10 to 55Hz and then 55 to 10) under single amplitude of 0.75mm is 3 minute, then expose to the room temperature for 2 hours	
5-8	Drop test	Drop a product naturally from the height of 700mm onto the surface of 100mm thick wooden board. Two directions: upper and side of the product are to be applied for this drop test once respectively	
5-9	Reflow soldering heat resistance	a) Pre-heating conditions shall be +140°C to 160°C for 160 to 200 seconds. (See Figure5-9) b) Heating conditions shall be within 60 seconds at +200°C min., but peak temperature shall be lower than +260°C. (See Figure 5-9)	
5-10	Test of soldering	Dip the connecting pins in soldering at 230 $\pm$ 5°C for 3 $\pm$ 0.5 seconds	Solder shall be attached around over 95% of the dipped portion



Figure 5-6

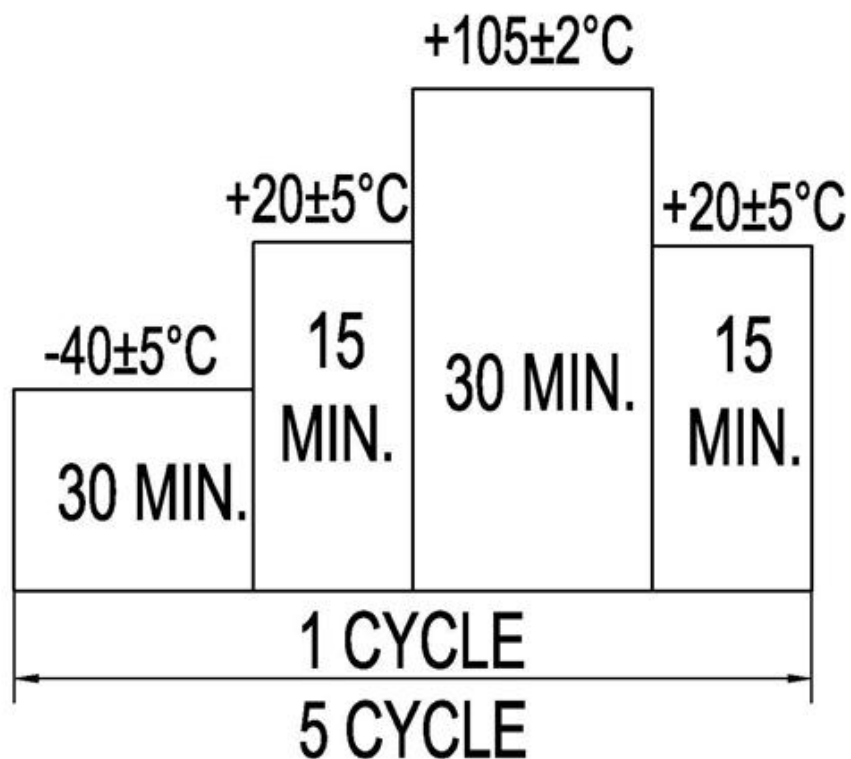
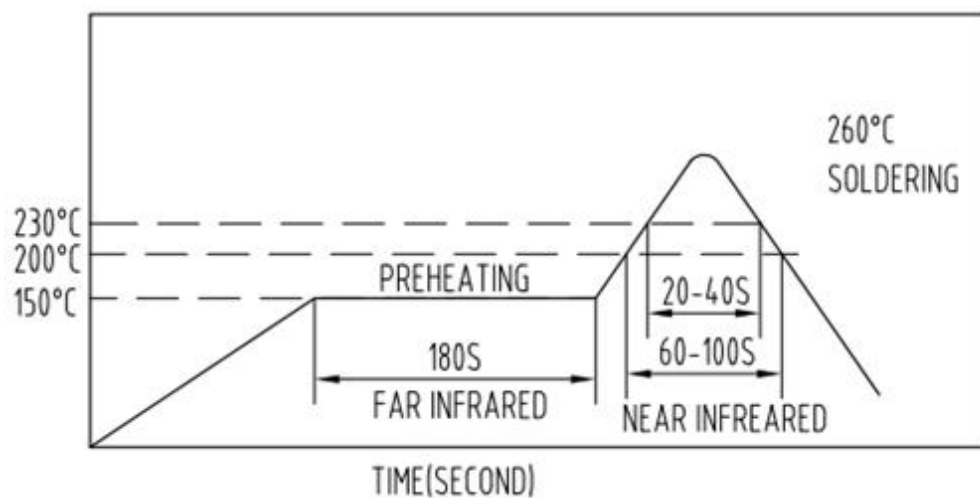
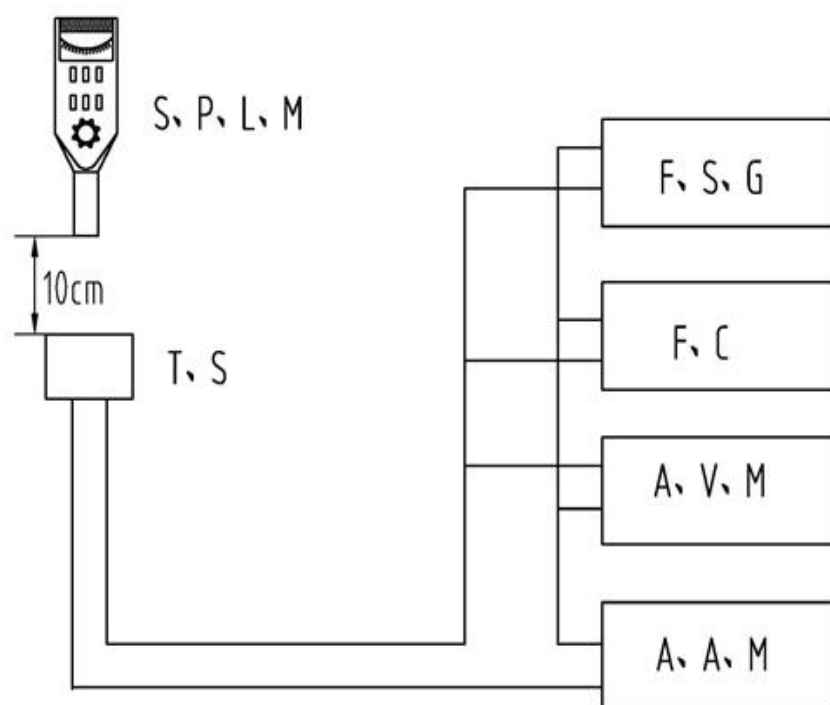


Figure 5-9



6. Electrical Testing Method



S.P.L.M	Sound Pressure Level Meter
T.S	Testing Sample
F.C	Frequency Counter
F.S.G	Frequency Signal Generator
A.V.M	AC Voltage Meter
A.A.M	AC Ampere Meter

7. Packing Information

No.	Item	Description
7-1	Tape type information	a) The design for such tape packing was executed under standard IEC - 286-3 b) *The material of the tape is polystyrene in black color. Detailed dimensions are as below: (See Figure7-1)
7-2	Dimensions of the rolling plate	a) The material of the rolling plate is plastic. b) The dimensions of the rolling plate are as below(See Figure7-2)
7-3	Packing dimensions and quantity	a) The rolling plate is put into a 340X340X45mm inner packing box and is packed with 300pcs of transducer per plate. b) The dimension of the outer carton is 460X 350X 350mm containing 10 inner boxes with a total quantity of 3000 pcs of transducer. c) The total gross weight per carton is 8.1Kgs, while net weight is 2.7Kgs.



Figure 7-1

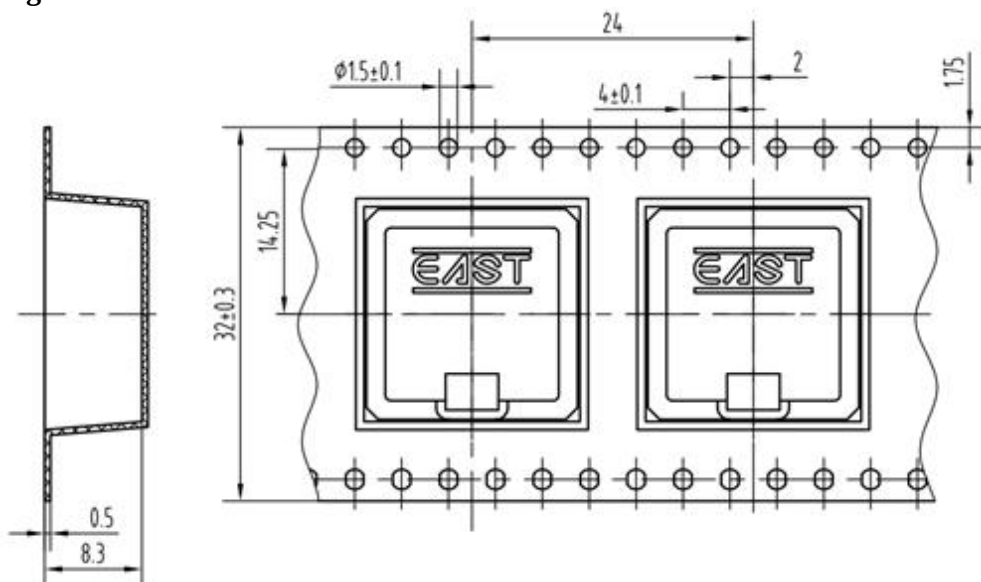
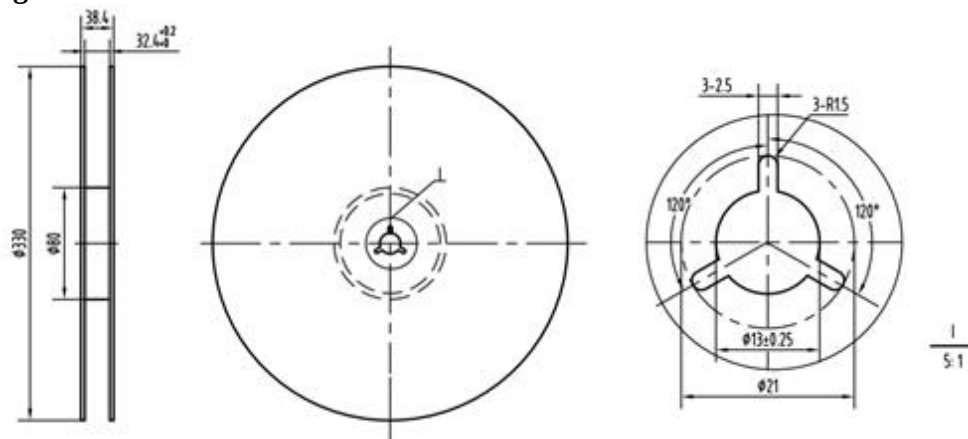


Figure 7-2





Product Specification

Ningbo East Electronics Limited

NO. 88 East Jinhui Road, Yinzhou Ningbo 315100, P.R.China

<http://www.east-mingtao.com>

Product Name:	External-Driven Piezo Transducer
Part Number:	TDM-59DA-7
Version:	1.0
Date:	2020-12-14
Note:	

East is an ISO 9001 , IATF16949 and ISO 14001 Certified Company

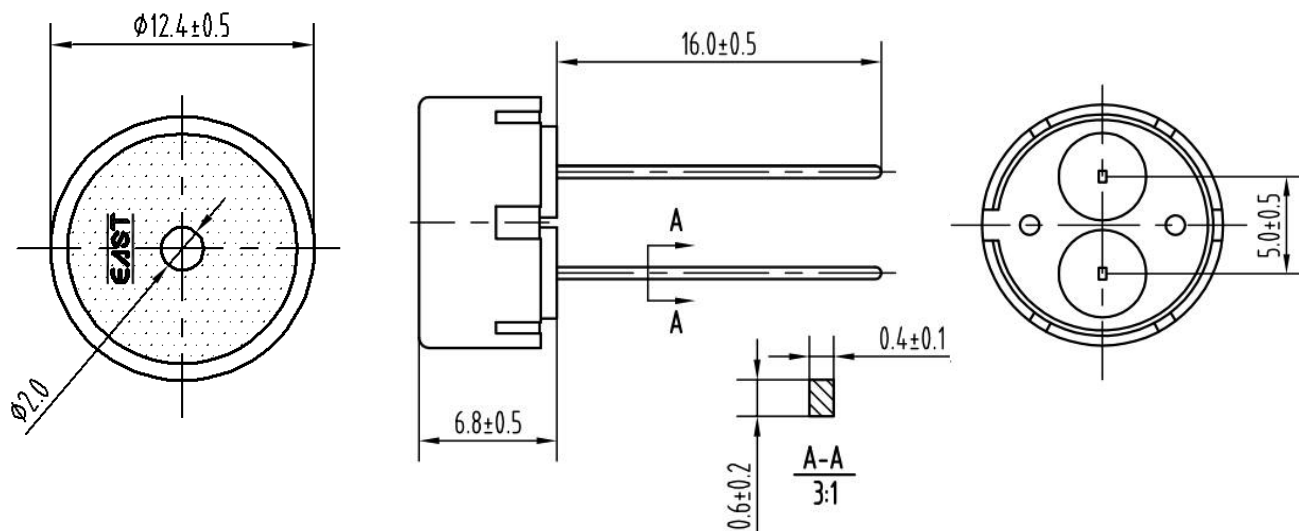
Revision History

Rev.	Description	Author/Date	Checked By	Approver
1.0	Released	李召毅 2020-12-14	汤礼东	王建成



1. Part Number TDM-59DA-7

2. Dimension Drawing (Unit: mm)



3. Specification

No.	Item	Specification
3-1	Min. Sound Pressure Level	80dB/4.0kHz/5Vp-p square wave /10cm
3-2	Allowed Input Voltage	25Vp-p
3-3	Capacitance	$12 \pm 30\%$ nF (At 100Hz)
3-4	Max. Consumption	8mA/4.0kHz/5Vp-p square wave
3-5	Resonant Frequency	4.0 ± 0.5 kHz
3-6	Operating Temperature	$-20 \sim +70^{\circ}\text{C}$
3-7	Storage Temperature	$-30 \sim +80^{\circ}\text{C}$
3-8	Case Material /Color	PBT/Black
3-9	Weight	0.75g
3-10	Pin Material/Plating	Cu/Sn
3-11	Pin Strength	More than 10N

NOTES:

Test should be made under the conditions of room temperature ($20 \pm 10^{\circ}\text{C}$), normal humidity ($60 \pm 20\%$) and normal atmospheric pressure. In this case, however, that the judgment is questionable, the test conditions are to be changed to room temperature $20 \pm 2^{\circ}\text{C}$, relative humidity $60 \sim 70\%$ and normal atmospheric pressure



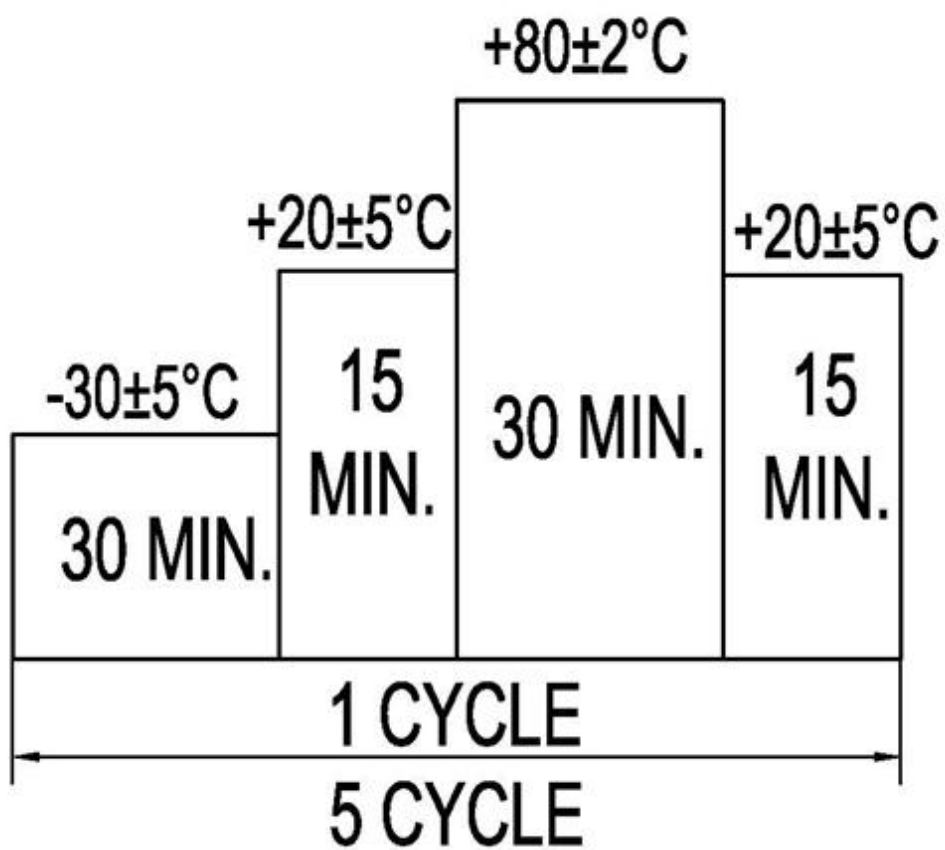
4. Reliability Test

No.	Item	Method of Test	Tolerance after Testing
4-1	Operating Temperature	-20~+70°C	Sound pressure level initial value $\pm 10\text{dB}$ Max. consumption value $\pm 20\%$ Capacitance value $\pm 20\%$
4-2	Storage in high temperature	Storage in +80°C test box 96 hours then exposed to the room temperature for 2 hours	
4-3	Storage in low temperature	Storage in -30°C test box 96 hours then exposed to the room temperature for 2 hours	
4-4	Life test in the room temperature	Operate the product continuously 5 seconds on 5 seconds off 300 hours at rated voltage	
4-5	Temperature / humidity cycle test	Storage in +40°C, 93 $\pm$ 3%RH test box 96 hours then exposed to the room temperature for 2 hours	
4-6	Temperature (high and low) cycle test	Conduct the test for 5 cycles without applying power then expose to the room temperature for 2 hours.(See Figure 4-6)	
4-7	Vibration test	Conduct the test for the directions of X Y and Z for 0.5 hour each (total 1.5 hours). To-and Fri sweep time(from 10 to 55Hz and then 55 to 10) under single amplitude of 0.75mm is 3 minute, then expose to the room temperature for 2 hours	
4-8	Drop test	Drop a product naturally from the height of 700mm onto the surface of 100mm thick wooden board. Two directions: upper and side of the product are to be applied for this drop test once respectively	
4-9	Soldering heat resistance test	Dip the connecting pins in soldering at 260 $\pm$ 5°C for 10 $\pm$ 1 seconds	
4-10	Test of soldering	Dip the connecting pins in soldering at 230 $\pm$ 5°C for 3 $\pm$ 0.5 seconds	Solder shall be attached around over 95% of the dipped portion

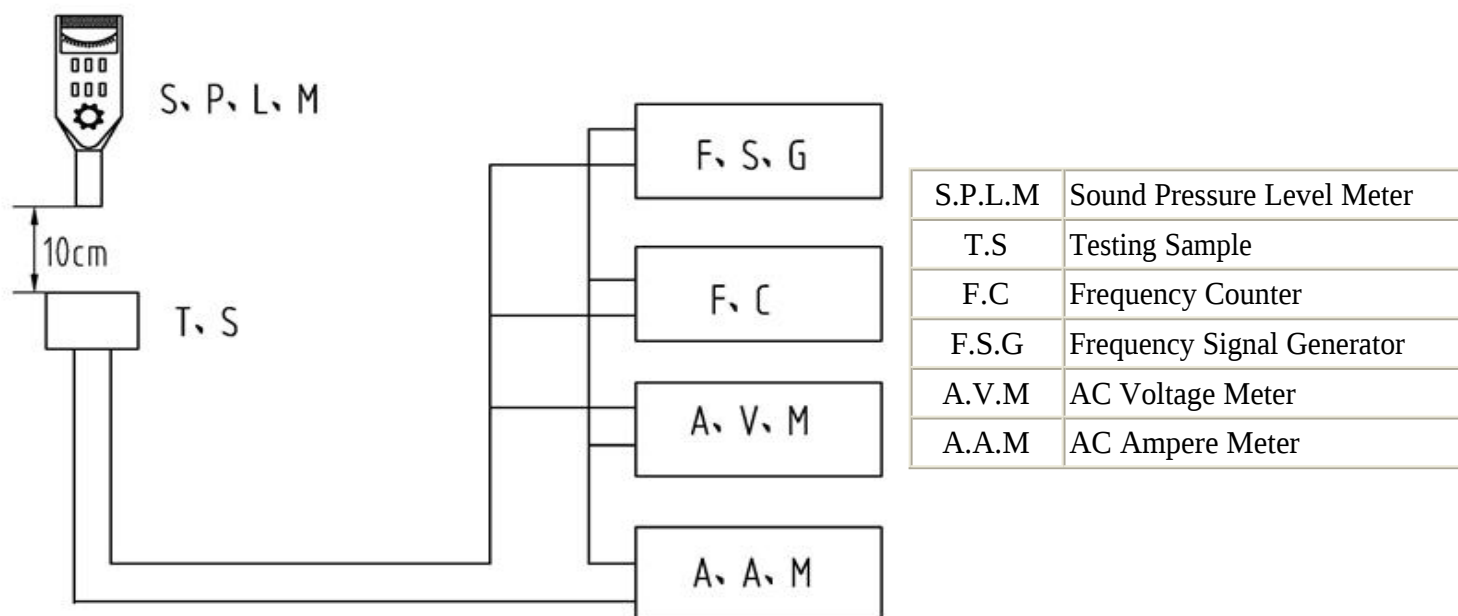
NOTE: The pins are allowed to deform after drop test.



Figure 4-6



5. Electrical Testing Method



6. Packing Information

No.	Item	Description
6-1	Tape type information	a) The design for such tape packing was executed under standard IEC - 286-3 b) The material of the tape is paper . Detailed dimensions are as below: (See Figure6-1)
6-2	Packing dimensions	a) The tape is put into a 300X330X50mm inner packing box and is packed with 500pcs of transducer per plate. b) The dimension of the outer carton is 610X 350X 280mm containing 10 inner boxes with a total quantity of 5000 pcs of transducer.(See Figure6-2)



Figure 6-1 (Unit: mm)

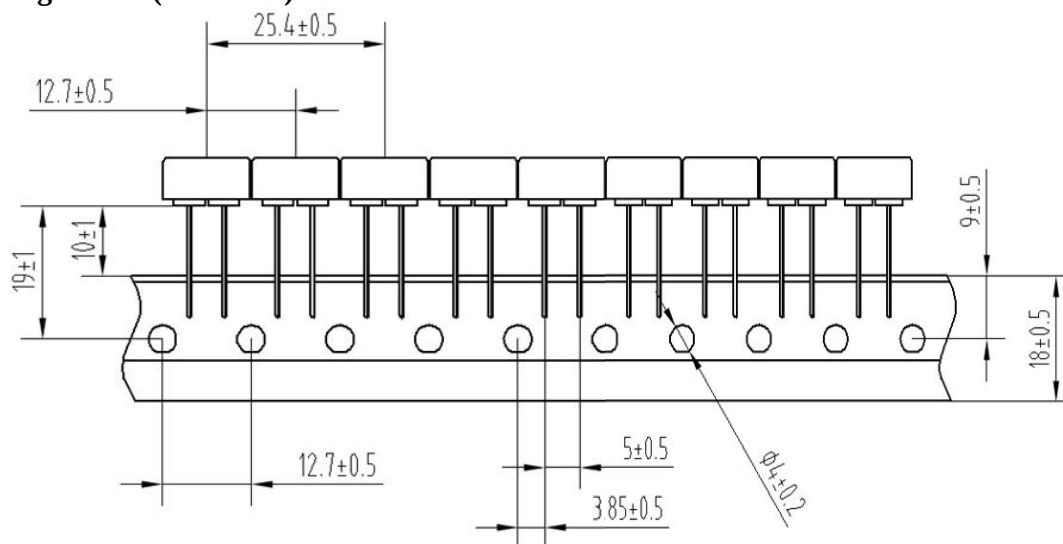
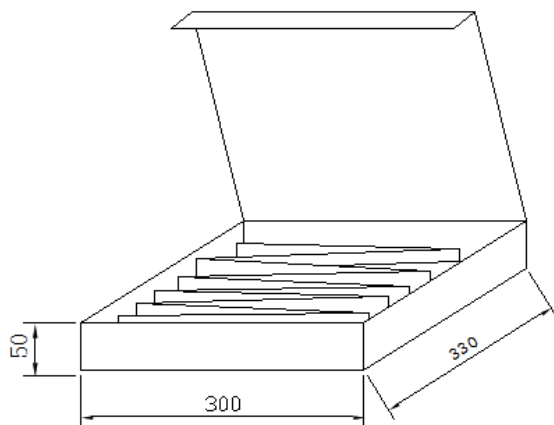
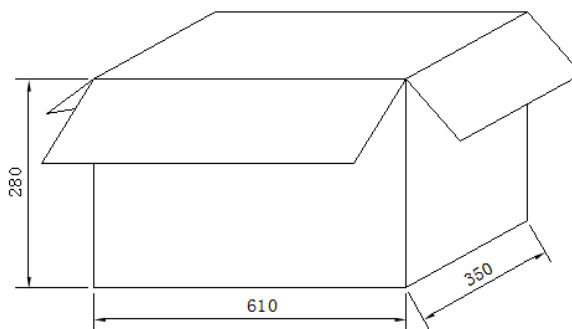


Figure 6-2 (Unit: mm)

Inner packing box



Outer carton





Product Specification

Ningbo East Electronics Limited

NO. 88 East Jinhui Road, Yinzhou Ningbo 315100, P.R.China

<http://www.east-mingtao.com>

Product Name:	External-Driven Piezo Transducer
Part Number:	TFM-59DA-5
Version:	1.04
Date:	2019-8-20
Note:	

East is an ISO 9001 , IATF16949 and ISO 14001 Certified Company

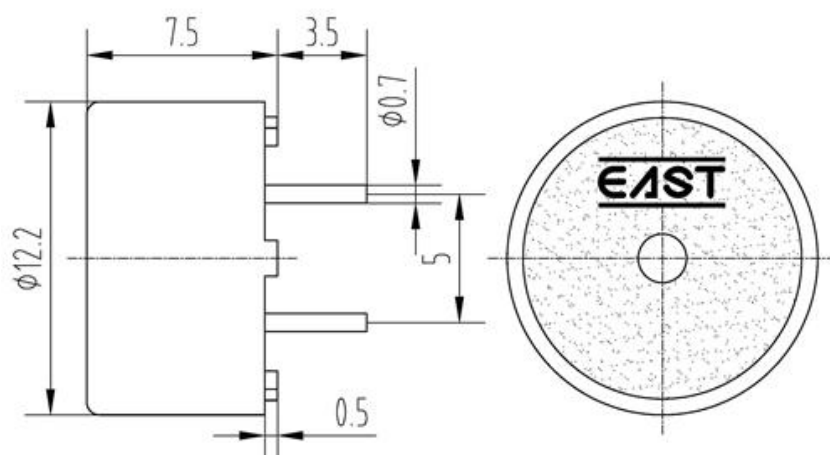
Revision History

Rev.	Description	Author/Date	Checked By	Approver
1.04	Quality management system revised	汤礼东 2019-8-20	吕文斌	王建成
1.03	Quality Certificate Symbol revised	刘宁 2015-2-12	汤礼东	王建成
1.02	Operating Temperature change from -20~+75°C to -40~+85°C	陈启旺 2013-7-17	汤礼东	王建成



1. Part Number TFM-59DA-5

2. Dimension Drawing (Unit: mm)



3. Specification

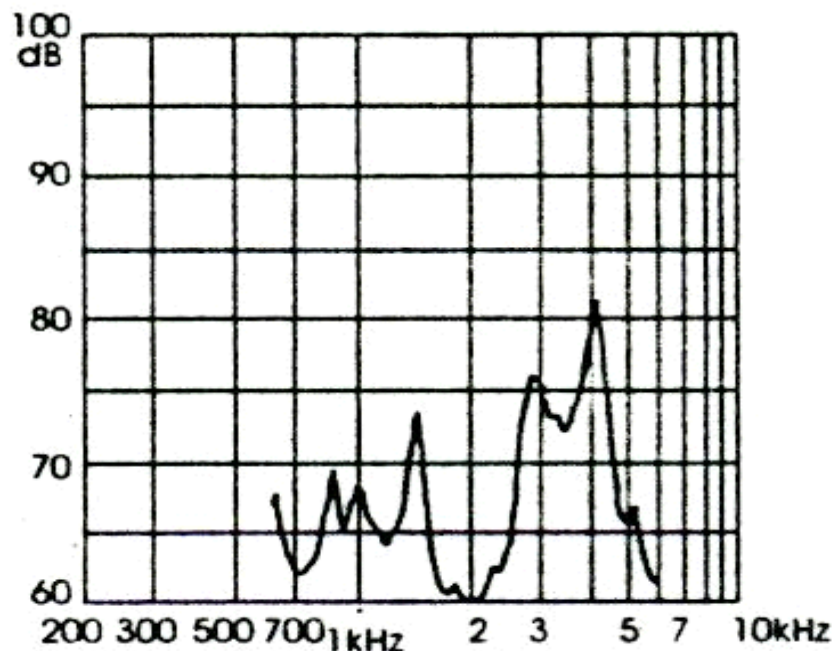
No.	Item	Specification
3-1	Min. Sound Pressure Level	70dB/4.0kHz/3Vp-p square wave /10cm
3-2	Allowed Input Voltage	25Vp-p
3-3	Capacitance	5500±30%pF(At 1000Hz)
3-4	Max. Consumption	3mA/4.0kHz/3Vp-p square wave
3-5	Resonant Frequency	4.0± 0.5kHz
3-6	Operating Temperature	-40~+85°C
3-7	Case Material /Color	PC/Black
3-8	Weight	0.6g
3-9	Pin Strength	More than 10N

NOTES:

Test should be made under the conditions of room temperature (20±10°C), normal humidity (60±20%) and normal atmospheric pressure. In this case, however, that the judgment is questionable, the test conditions are to be changed to room temperature 20±2°C, relative humidity 60~70% and normal atmospheric pressure



4. Typical Frequency Response Curve



Note: Input Voltage 3Vp-p square wave
Distance 10 cm

5. Reliability Test

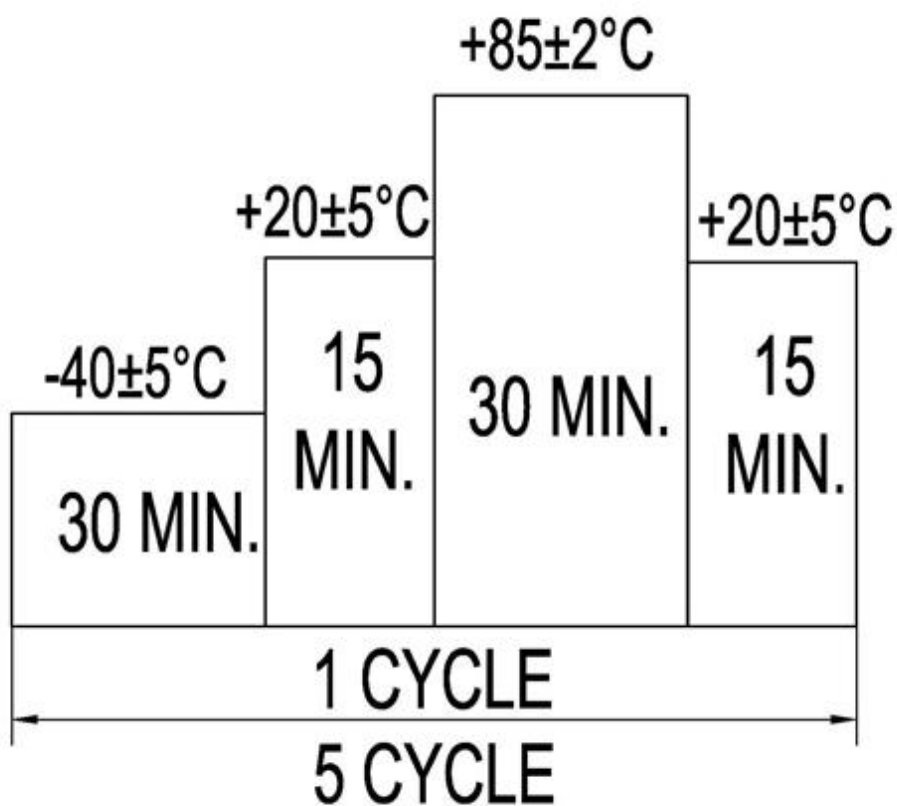
No.	Item	Method of Test	Tolerance after Testing
5-1	Operating Temperature	-40~+85°C	Sound pressure level initial value ± 10 dB Max. consumption value $\pm 20\%$ Capacitance value $\pm 20\%$
5-2	Storage in high temperature	Storage in +85°C test box 96 hours then exposed to the room temperature for 2 hours	
5-3	Storage in low temperature	Storage in -40°C test box 96 hours then exposed to the room temperature for 2 hours	
5-4	Life test in the room temperature	Operate the product continuously 5 seconds on 5 seconds off 300 hours at rated voltage	
5-5	Temperature / humidity cycle test	Storage in +40°C, 93 $\pm$ 3%RH test box 96 hours then exposed to the room temperature for 2 hours	
5-6	Temperature (high and low) cycle test	Conduct the test for 5 cycles without applying power then expose to the room temperature for 2 hours.(See Figure 5-6)	
5-7	Vibration test	Conduct the test for the directions of X Y and Z for 0.5 hour each (total 1.5 hours). To-and Fri sweep time(from 10 to 55Hz and then 55 to 10) under single amplitude of 0.75mm is 3	



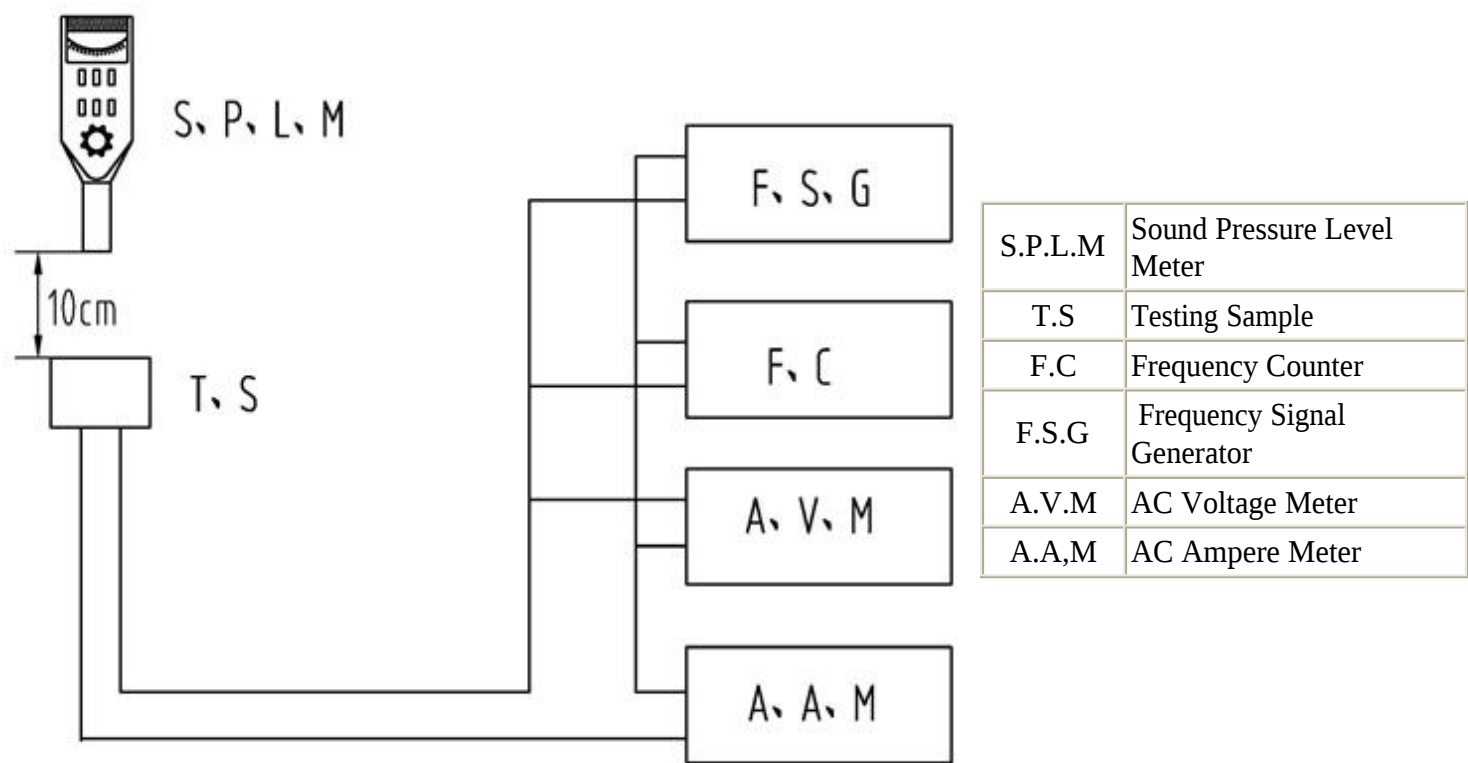
5-8	Drop test	Drop a product naturally from the height of 700mm onto the surface of 100mm thick wooden board. Two directions: upper and side of the product are to be applied for this drop test once respectively	
5-9	Soldering heat resistance test	Dip the connecting pins in soldering at $260\pm 5^{\circ}\text{C}$ for 10 ± 1 seconds	
5-10	Test of soldering	Dip the connecting pins in soldering at $230\pm 5^{\circ}\text{C}$ for 3 ± 0.5 seconds	Solder shall be attached around over 95% of the dipped portion

NOTE: The pins are allowed to deform after drop test.

Figure 5-6



6. Electrical Testing Method



7. Packing Information

Packing: 5000 pcs per export carton
Carton Size: 47× 30.5× 23 cm
G. Weight: 4.2 kgs N. Weight: 3.0 kgs





Product Specification

Ningbo East Electronics Limited

NO. 88 East Jinhui Road, Yinzhou Ningbo 315100, P.R.China

<http://www.east-mingtao.com>

Product Name:	External-Driven Piezo Transducer
Part Number:	TFM-51F
Version:	1.02
Date:	2019-9-5
Note:	

East is an ISO 9001 , IATF16949 and ISO 14001 Certified Company

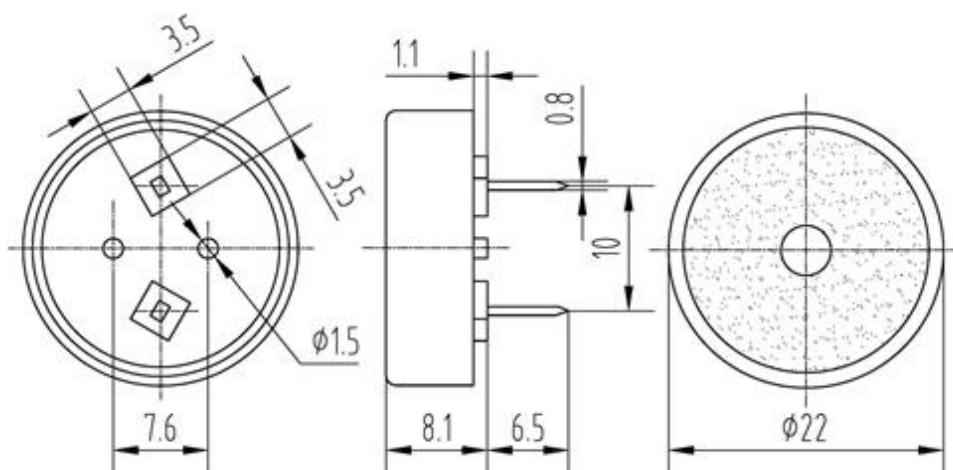
Revision History

Rev.	Description	Author/Date	Checked By	Approver
1.02	Quality management system revised	汤礼东 2019-9-5	吕文斌	王建成
1.01	Quality Certificate Symbol revised	刘宁 2015-2-12	汤礼东	王建成
1.0	Released	汤礼东 2011-8-3	张春雷	王建成



1. Part Number TFM-51F

2. Dimension Drawing (Unit: mm)



3. Specification

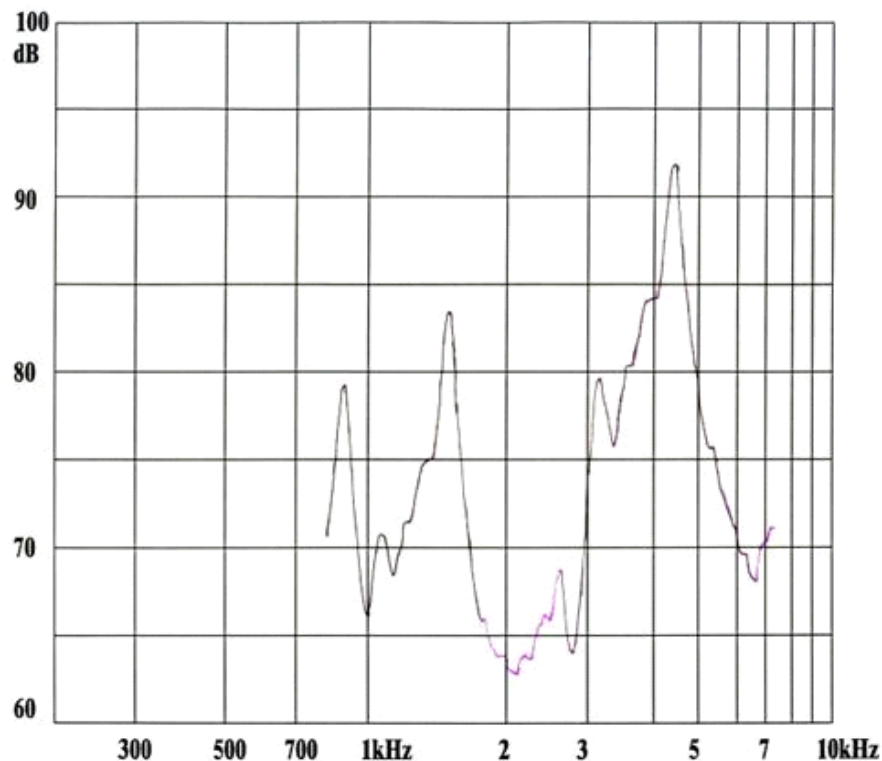
No.	Item	Specification
3-1	Min. Sound Pressure Level	75dB/4.0kHz/3Vp-p square wave /10cm
3-2	Allowed Input Voltage	30Vp-p
3-3	Capacitance	12±30%nF(At 1000Hz)
3-4	Max. Consumption	1mA/4.0kHz/3Vp-p square wave
3-5	Resonant Frequency	4.0± 0.5kHz
3-6	Operating Temperature	-40~+85°C
3-7	Case Material /Color	PA66(UL94-V0)/Black
3-8	Weight	2.5g
3-9	Pin Strength	More than 10N

NOTES:

Test should be made under the conditions of room temperature (20±10°C), normal humidity (60±20%) and normal atmospheric pressure. In this case, however, that the judgment is questionable, the test conditions are to be changed to room temperature 20±2°C, relative humidity 60~70% and normal atmospheric pressure



4. Typical Frequency Response Curve



Note: Input Voltage 3Vp-p square wave
Distance 10 cm

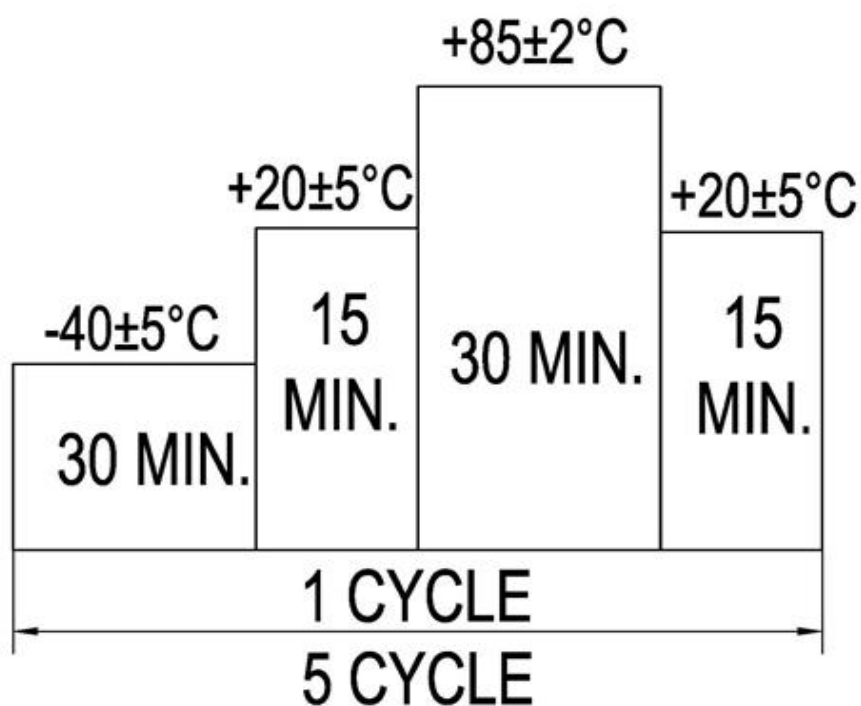
5. Reliability Test

No.	Item	Method of Test	Tolerance after Testing
5-1	Operating Temperature	-40~+85°C	Sound pressure level initial value ± 10 dB Max. consumption value $\pm 20\%$ Capacitance value $\pm 20\%$
5-2	Storage in high temperature	Storage in +85°C test box 96 hours then exposed to the room temperature for 2 hours	
5-3	Storage in low temperature	Storage in -40°C test box 96 hours then exposed to the room temperature for 2 hours	
5-4	Life test in the room temperature	Operate the product continuously 5 seconds on 5 seconds off 300 hours at rated voltage	
5-5	Temperature / humidity cycle test	Storage in +40°C, 93 $\pm$ 3%RH test box 96 hours then exposed to the room temperature for 2 hours	
5-6	Temperature (high and low) cycle test	Conduct the test for 5 cycles without applying power then expose to the room temperature for 2 hours.(See Figure 5-6)	
5-7	Vibration test	Conduct the test for the directions of X Y and Z for 0.5 hour each (total 1.5 hours). To-and Fri sweep time(from 10 to 55Hz and then 55 to 10) under single amplitude of 0.75mm is 3	

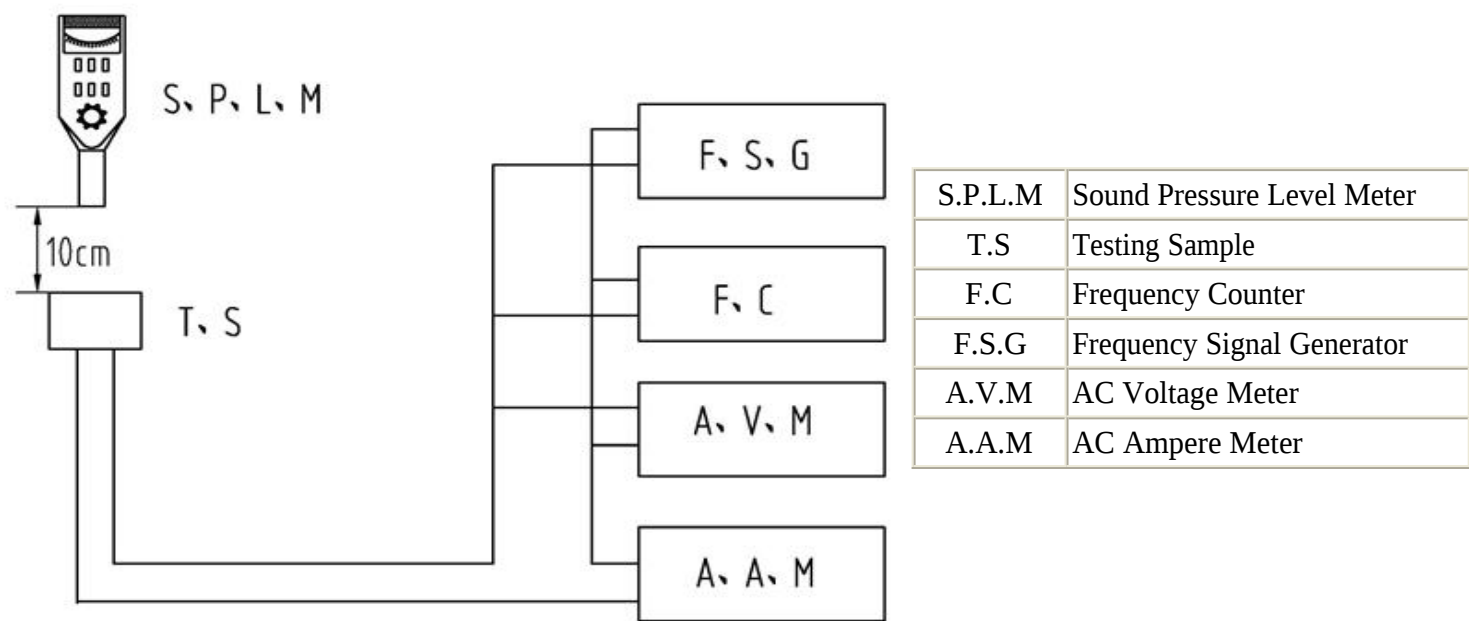


5-8	Drop test	Drop a product naturally from the height of 700mm onto the surface of 100mm thick wooden board. Two directions: upper and side of the product are to be applied for this drop test once respectively	
5-9	Soldering heat resistance test	Dip the connecting pins in soldering at 260±5°C for 10±1 seconds	
5-10	Test of soldering	Dip the connecting pins in soldering at 230±5°C for 3±0.5 seconds	Solder shall be attached around over 95% of the dipped portion
NOTE: The pins are allowed to deform after drop test.			

Figure 5-6



6. Electrical Testing Method



7. Packing Information

Packing: 2500 pcs per export carton
Carton Size: 47× 30.5× 36 cm
G. Weight: 9.2 kgs N. Weight: 7.0 kgs





Product Specification

Ningbo East Electronics Limited

NO. 88 East Jinhui Road, Yinzhou Ningbo 315100, P.R.China

<http://www.east-mingtao.com>

Product Name:	External-Driven Piezo Transducer
Part Number:	TFM-51FAA
Version:	1.04
Date:	2024-6-14
Note:	

East is an ISO 9001 , IATF16949 and ISO 14001 Certified Company

Revision History

Rev.	Description	Author/Date	Checked By	Approver
1.04	Revise the packing information	吕文斌 2024-6-14	汤礼东	王建成
1.03	Quality management system revised	汤礼东 2019-8-20	吕文斌	王建成
1.02	Packing quantity to 2800 pcs	汤礼东 2016-8-10	俞凯	王建成



ES France - Département Composants & Modules
127 rue de Buzenval BP 26 - 92380 Garches



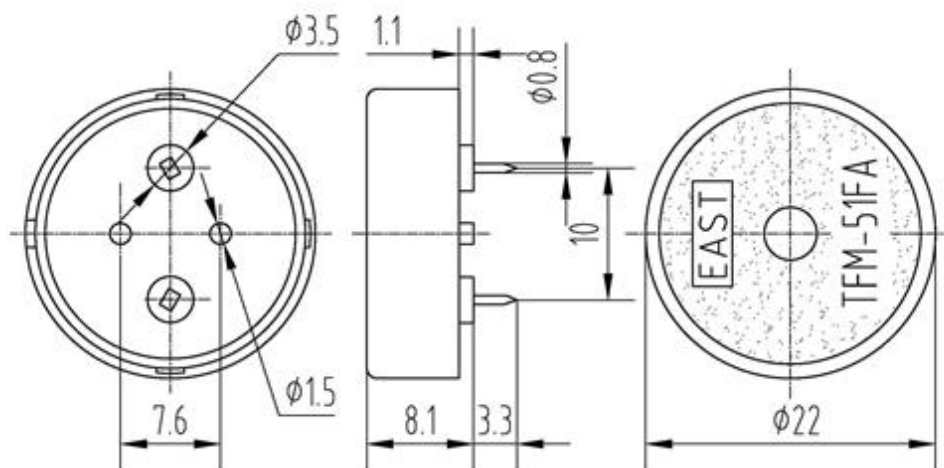
Tél. 01 47 95 99 89
Fax. 01 47 01 16 22



e-mail : comp@es-france.com
Site Web : www.es-france.com

1. Part Number TFM-51FAA

2. Dimension Drawing (Unit: mm)



3. Specification

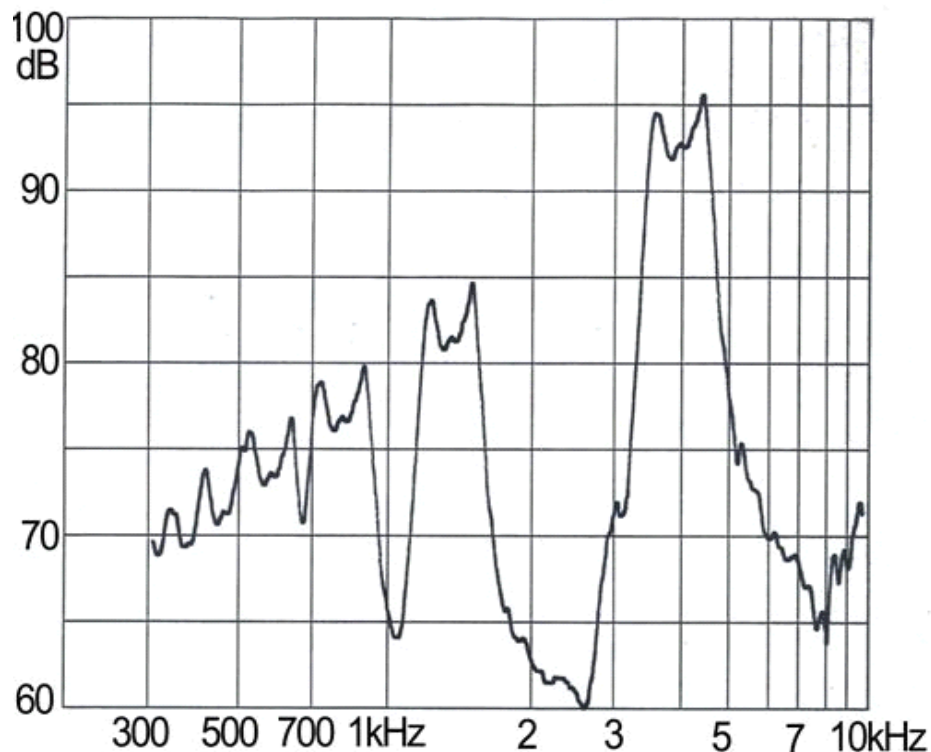
No.	Item	Specification
3-1	Min. Sound Pressure Level	75dB/4.0kHz/3Vp-p square wave /10cm
3-2	Allowed Input Voltage	30Vp-p
3-3	Capacitance	24 $\pm$ 30% nF (At 1000Hz)
3-4	Max. Consumption	2mA/4.0kHz/3Vp-p square wave
3-5	Resonant Frequency	4.0 $\pm$ 0.5kHz
3-6	Operating Temperature	-40 $\sim$ +85 $^{\circ}$ C
3-7	Case Material /Color	PA66/Black
3-8	Weight	2.5g
3-9	Pin Strength	More than 10N

NOTES:

Test should be made under the conditions of room temperature (20 $\pm$ 10 $^{\circ}$ C), normal humidity (60 $\pm$ 20%) and normal atmospheric pressure. In this case, however, that the judgment is questionable, the test conditions are to be changed to room temperature 20 $\pm$ 2 $^{\circ}$ C, relative humidity 60 $\sim$ 70% and normal atmospheric pressure



4. Typical Frequency Response Curve



Note: Input Voltage 3Vp-p square wave
Distance 10 cm

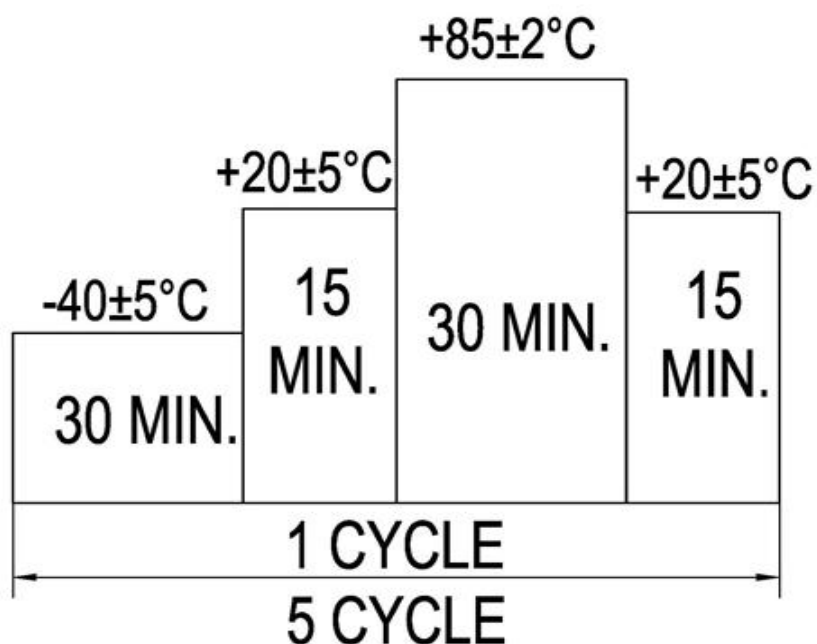
5. Reliability Test

No.	Item	Method of Test	Tolerance after Testing
5-1	Operating Temperature	-40~+85°C	Sound pressure level initial value ± 10 dB Max. consumption value $\pm 20\%$ Capacitance value $\pm 20\%$
5-2	Storage in high temperature	Storage in +85°C test box 96 hours then exposed to the room temperature for 2 hours	
5-3	Storage in low temperature	Storage in -40°C test box 96 hours then exposed to the room temperature for 2 hours	
5-4	Life test in the room temperature	Operate the product continuously 5 seconds on 5 seconds off 300 hours at rated voltage	
5-5	Temperature / humidity cycle test	Storage in +40°C, 93 $\pm$ 3%RH test box 96 hours then exposed to the room temperature for 2 hours	
5-6	Temperature (high and low) cycle test	Conduct the test for 5 cycles without applying power then expose to the room temperature for 2 hours.(See Figure 5-6)	
5-7	Vibration test	Conduct the test for the directions of X Y and Z for 0.5 hour each (total 1.5 hours). To-and Fri sweep time(from 10 to 55Hz and then 55 to 10) under single amplitude of 0.75mm is 3	

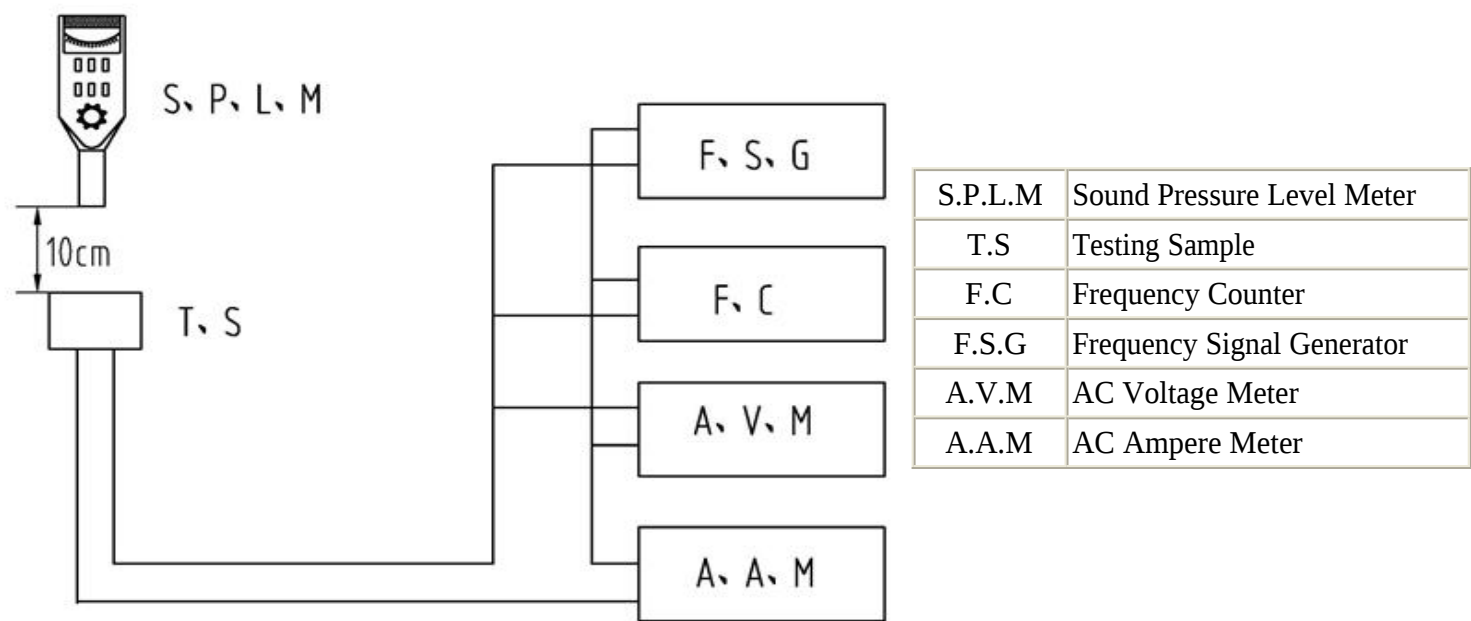


5-8	Drop test	Drop a product naturally from the height of 700mm onto the surface of 100mm thick wooden board. Two directions: upper and side of the product are to be applied for this drop test once respectively	
5-9	Soldering heat resistance test	Dip the connecting pins in soldering at 260±5°C for 10±1 seconds	
5-10	Test of soldering	Dip the connecting pins in soldering at 230±5°C for 3±0.5 seconds	Solder shall be attached around over 95% of the dipped portion
NOTE: The pins are allowed to deform after drop test.			

Figure 5-6



6. Electrical Testing Method



7. Packing Information

Packing: 2800 pcs per export carton
Carton Size: 47× 30.5× 29 cm
G. Weight: 9.9 kgs N. Weight: 7.0 kgs

