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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



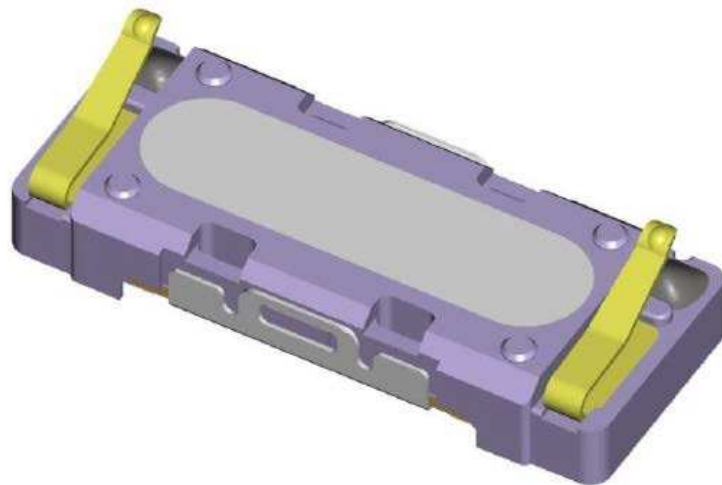
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## RECEIVER-615-2.5-SC-JULIA-HAC

2403 263 00052

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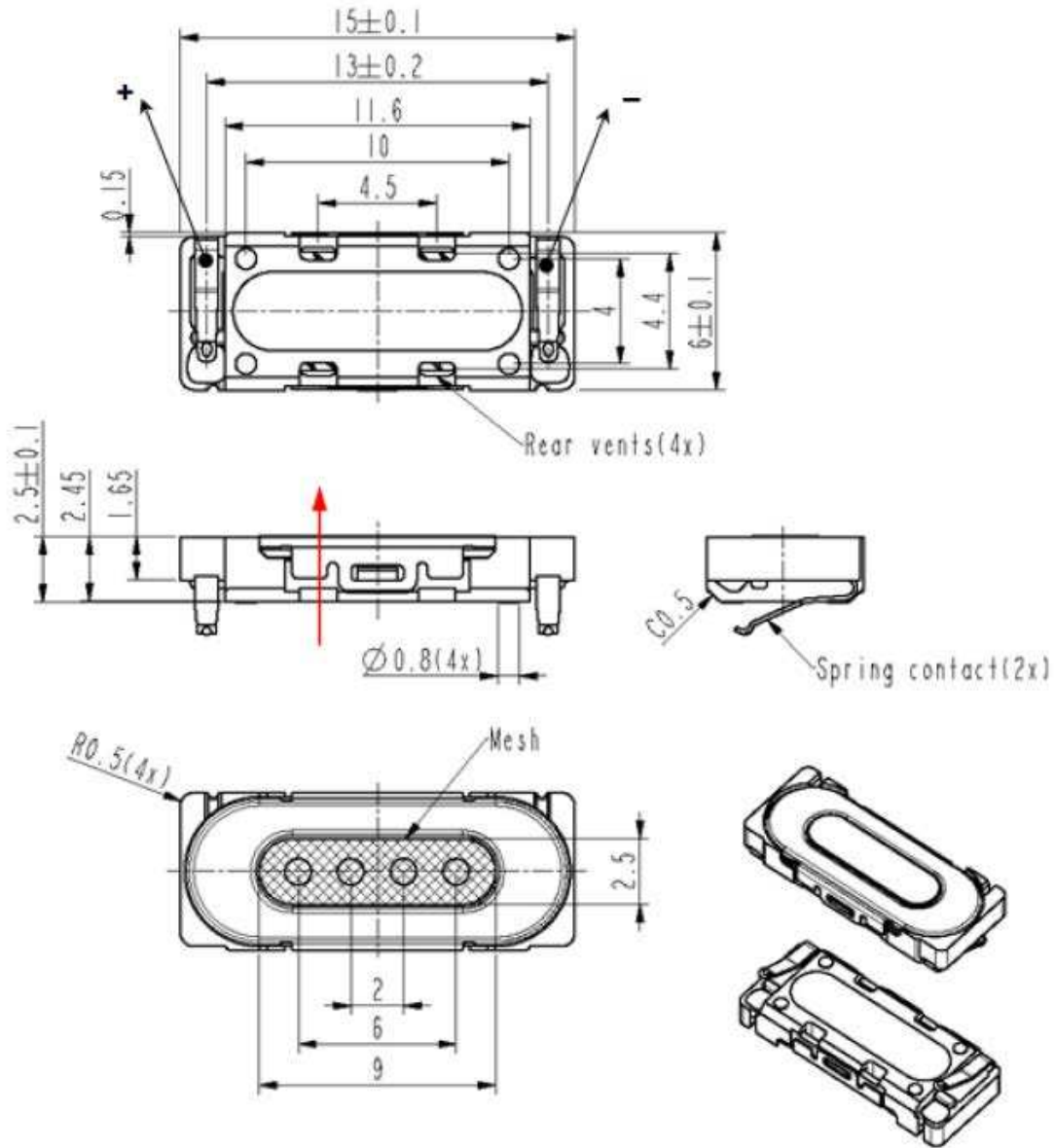
## 1. Theory of operation

Receiver-615-2.5-SC-Julia-HAC is an electro dynamic transducer, designed to translate electrical analog signals into sound. The input signal is fed into a coil in a magnetic field, which is attached to a membrane. Through the principle of the electromagnetic force, the membrane is moved according to the contents of the input signal.

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## 2. Mechanical Layout and Dimensions

### 2.1. Main Dimensions



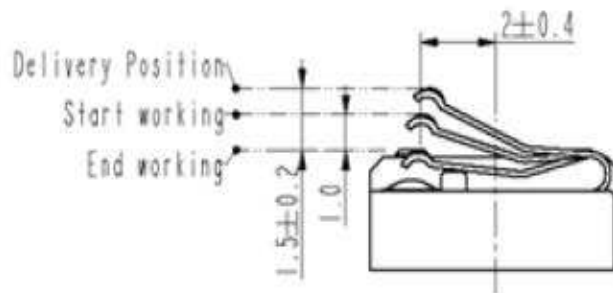
Drawing not to Scale!

Positive voltage on pad '+' moves membrane in direction of red arrow!

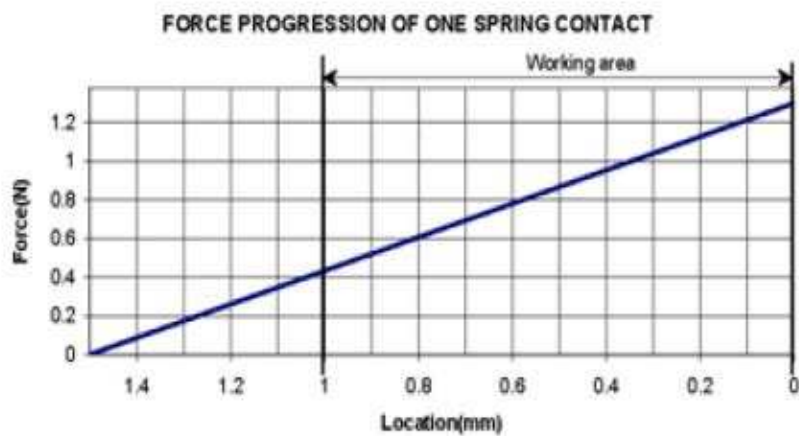
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## 2.2. Mechanical characteristics

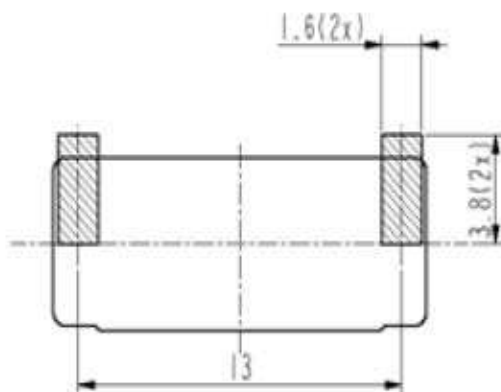
### Spring contact working position



### Spring contact displacement-force chart



### Position of contact-points view to PCB



Recommended pad material:  
 - Au layer 0.15-0.2µm

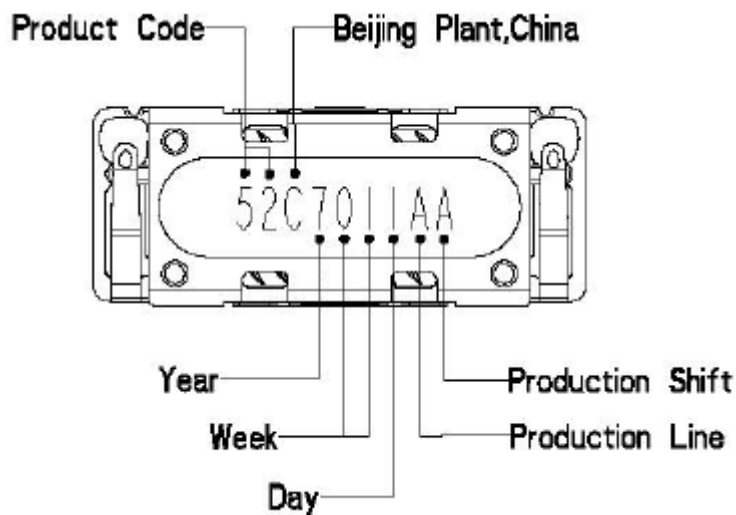
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**2.3. Material list**

- 1. MATERIAL of BASKET: PPA
- 2. MATERIAL of MEMBRANE: PEN
- 3. MATERIAL of POT/ TOPPLATE: SOFT MAGNETIC IRON
- 4. MATERIAL of MAGNET: Nd Fe B
- 5. MATERIAL of SPRING CONTACT: STAINLESS STEEL
- 6. PLATING of SPRING CONTACT: 1.27~3.0 μm Ni, 0.3-0.5 μm Au (CONTACT POINT)
- 7. MATERIAL of COVER: STAINLESS STEEL
- 8. DIMENSION: 6.0x15.0x2.5mm
- 9. MASS: 0.48g
- 10.CONNECTIONS: SPRING CONTACT
- 11.DIRECTION of CONNECTOR: VERTICAL TO PCB (ORIENTATED)

**2.4. Part marking labeling**

The products have a serial number on bottom side

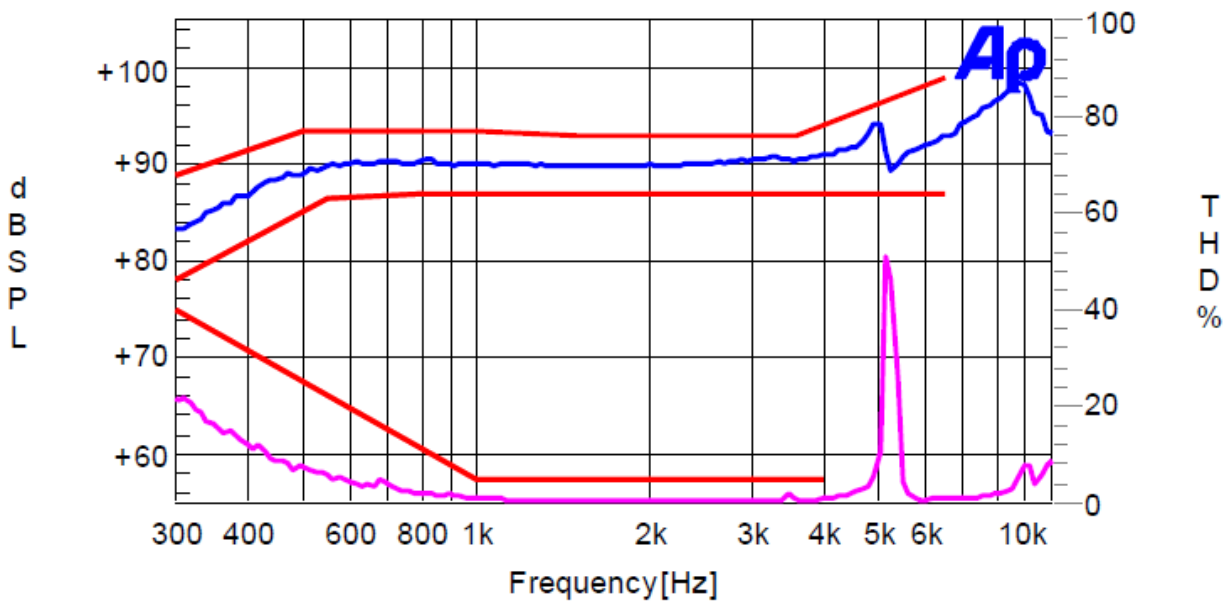


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## 3. Electrical and Acoustical Specifications

### 3.1. Frequency response

TYPICAL FREQUENCY RESPONSE ON BAFFLE - at 10mW, in 1cm distance



f[Hz]	THD[%] Upper Limit	f[Hz]	SPL[dB] Lower limit (floating)	f[Hz]	SPL[dB] Upper limit (floating)
300	40	300	78	300	89
1000	5	550	86.5	500	93.5
4000	5	800	87	800	93.5
		1200	87	1000	93.5
		4000	87	1500	93
		6500	87	3600	93
				6500	99



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### 3.2. Electro-Acoustic Parameters

RECEIVER MOUNTED IN MEASUREMENT SETUP ACC. TO SHEET 190-5

1. RATED IMPEDANCE	Z:	16 $\Omega$ $\pm$ 10 %	
2. VOICE COIL RESISTANCE	R:	28.8 $\Omega$ $\pm$ 10 %	
2.1 ADDITIONAL COIL RESISTANCE	R:	35.9 $\Omega$ $\pm$ 10 %	
3. RESONANCE FREQUENCY free air, non clamped	f <sub>0</sub> :	450 Hz $\pm$ 15 %	
4. MAGNETIC FLUX DENSITY	B:	~ 0.70 T	
5. CHARACT. SENSITIVITY (at 566mVrms in 1cm) in the frequency range: 2000 Hz – 3000 Hz	90 $\pm$ 3 dB		average
6. TOTAL HARMONIC DISTORTION	Limits acc. to 190-3		
7. MAX. Short Term Input Level (100h, 0.5sec. ON / 3sec. OFF)	1.265Vrms		
8. MAX. Continuous Input Level (500h) Receiver mounted in lifetime test device (open rear/open front) (test signal according to TDT)	0.8Vrms		



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## 3.3. Magnetic field for hearing aid characteristics

### 3.3.1. Receiver mounted in measurement setup acc. to sheet 190-5.1

#### 1. CHARACT. FIELD STRENGTH SENSITIVITY

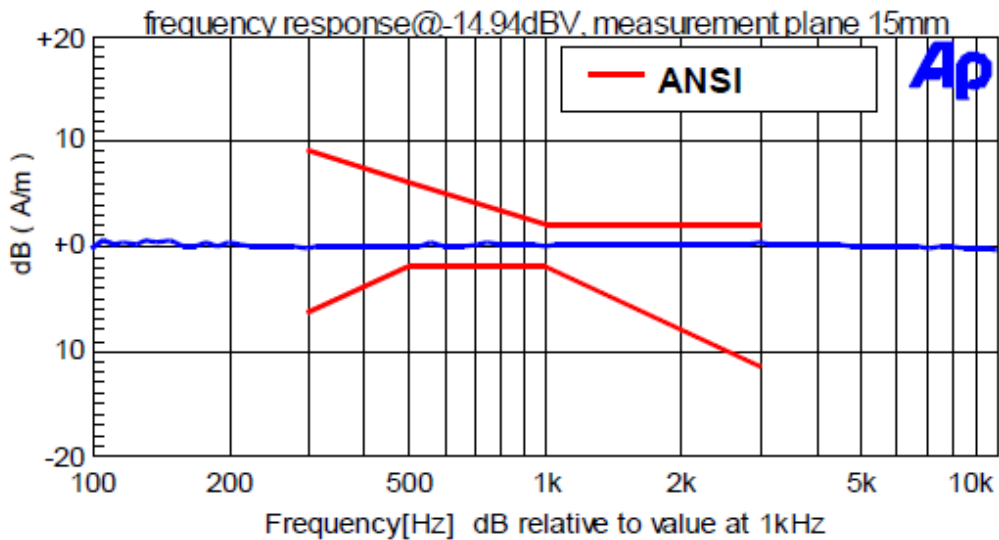
at 179mV (-14.94 dBV, 1 mW in 32 Ω), 1kHz, measurement plane 15mm

Axial (Position 1): 12 dB A/m per dBV

Radial X (Position 2): 5 dB A/m per dBV

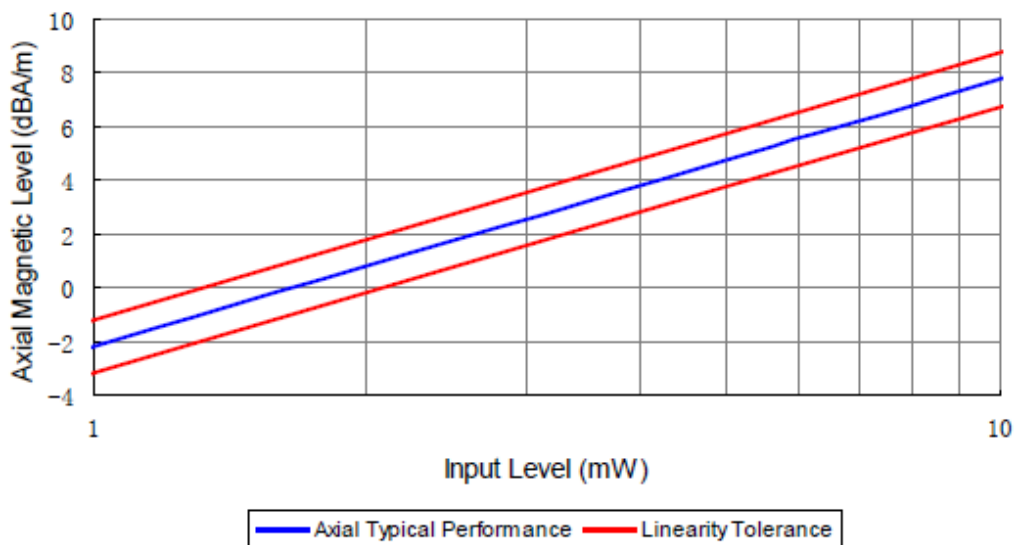
Radial Y (Position 3): 5 dB A/m per dBV

#### 2. FREQUENCY RESPONSE (AXIAL)



#### 3. FIELD STRENGTH LINEARITY (AXIAL)

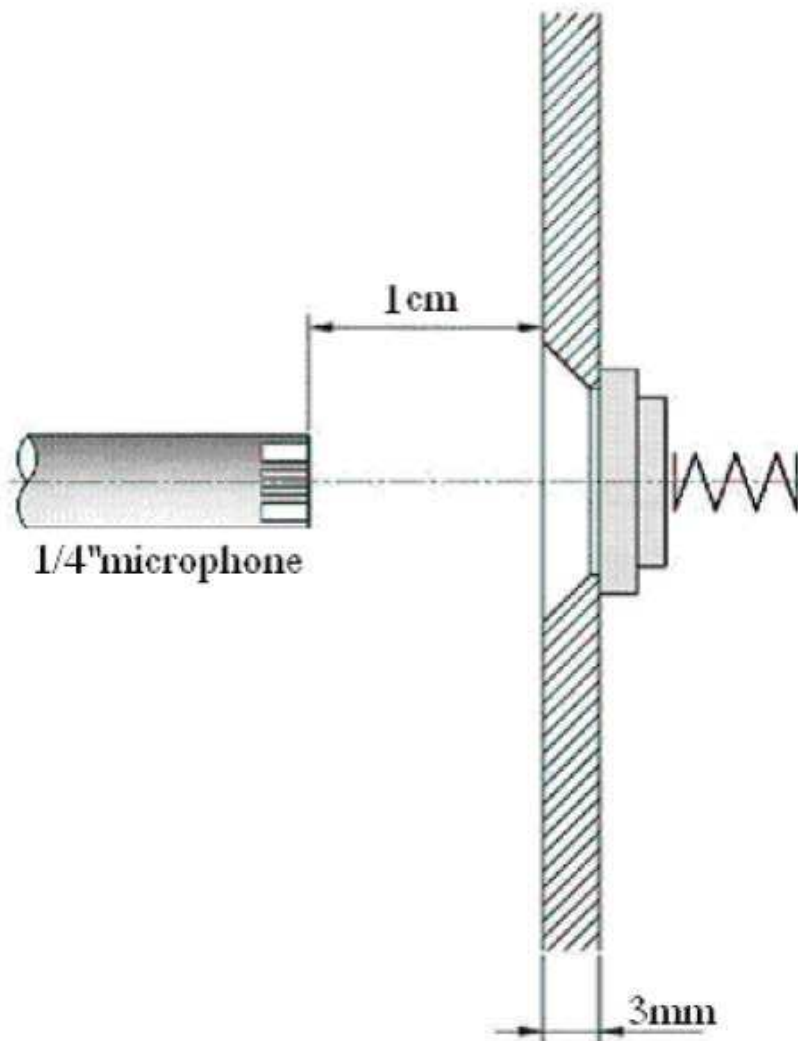
at 1 kHz, measurement plane 15mm



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3.4. Measurement setup

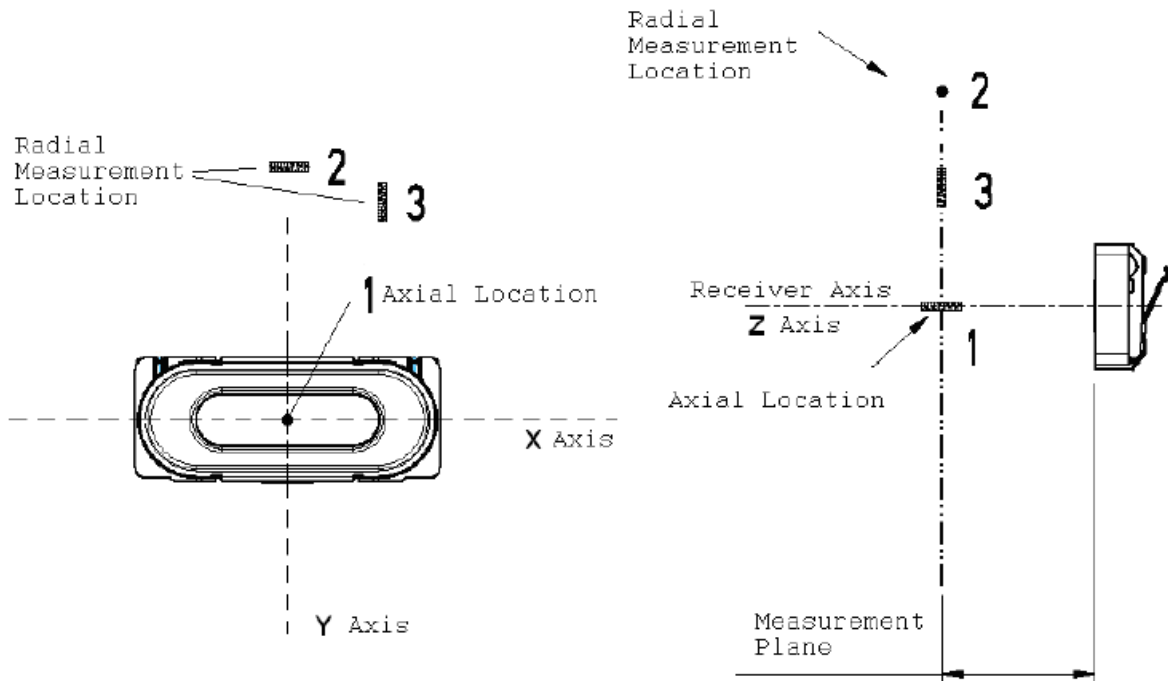
ON BAFFLE - at 566mVrms, in 1cm distance



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## 3.5. Measurement setup for hearing aid

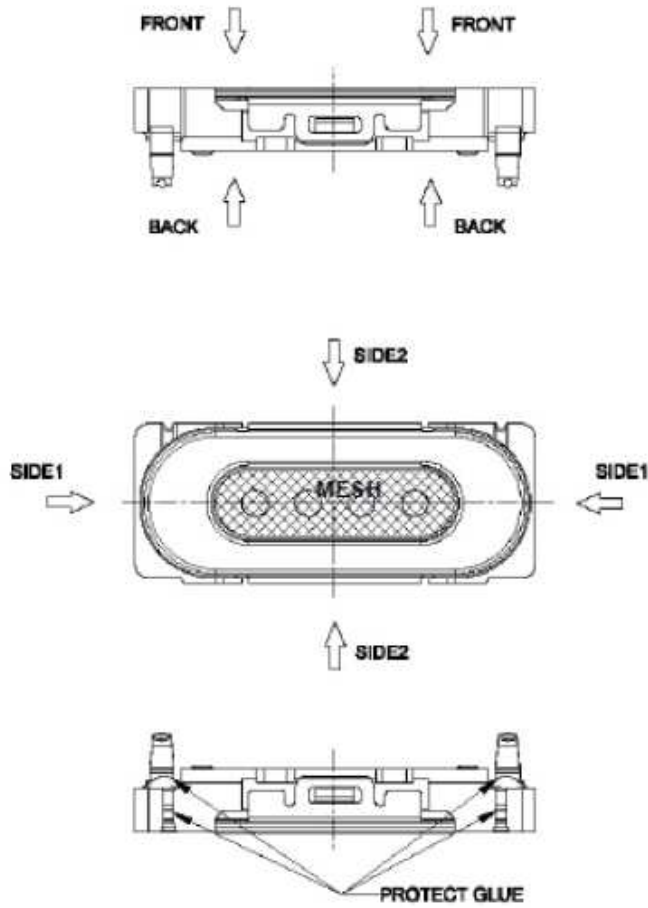
Tests are conducted at Z (Axial) direction, X and Y (Radial) directions  
 Measurement Positions acc. to ANSI C63.19-2007



- Axial (position 1): maximum value of Z direction
- Radial X (position 2): maximum value of X direction
- Radial Y (position 3): maximum value of Y direction, the difference between Radial X and Y is within 1dB

*\*Receiver must be mounted on a plastic surface, magnetic ambient levels be low as to not significantly affect the measurement, magnetic shielded chamber would be better.*

### 3.6. Forces on component



FORCES ON DIFFERENT STATE OF COMPONENT			
STATE	MIN. SURFACE OF PREASURE [mm <sup>2</sup> ]	MAX. PERMANENT FORCE [N]	MAX. HANDLING FORCE [N]
FROM FRONT TO BACK	20	5	5
FROM BACK TO FRONT	10	5	5
FROM SIDE1 TO SIDE1	3	5	10
FROM SIDE2 TO SIDE2	10	5	10
MESH	-	0	0
AREA OF PROTECT GLUE	-	0	0

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#### 4. Related Documents

1) Packaging Information

See general TPD document: [2403-263-00052-299-EN.pdf](#).

2) Technical Delivery Terms

See general TPD document: [9922-580-11741-EN.pdf](#).

3) Handling Instruction

See general TPD document: [9922-580-11831-EN.pdf](#).

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## 5. Change History

Status	Version	Date	ECR	Comment / Changes	Initials of owner
Obsolete	A	N/A	N/A	Draft	DS
Obsolete	B	11.09.07	2317	First release	DS
Obsolete	C	10.07.08	2276	Enhancement of TDT	DS
Obsolete	D	22.12.10	3000	Add information about max. permissible forces	DS
Obsolete	E	10.09.12	3859	Migration to latest edition Knowles template	CP
Release	F	22.01.13	4032	Correcting Ni plating thickness to 1.27-3.0 which is reasonable in plating process	Helen wei

## 6. Disclaimer

Stresses above the Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only. The device may not function when operated at these or any other conditions beyond those indicated under “Electrical and Acoustical Specifications”. Exposure beyond those indicated under “Electrical and Acoustical Specifications” for extended periods may affect device reliability.

This product is not qualified for use in automotive applications

Frequency range for Telekom use

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