



Elektrotechnik Karl-Heinz Mauz GmbH

LSF-S1318A-IPX7 (Artikel-Nr. 106123)

EKULIT

1. Product Outline	
1-1. Scope	This specification is a typical speaker unit for telephone handset
1-2. Dimensions	As shown in figure 1
1-3. Net Weight	Approx 1.7 grams
1-4. Operating Temperature Range	-30°C to +70°C without loss of function
1-5. Storage Temperature Range	-40 °C to +85 °C (Note: Return to ambient room temperature before using)
2. Electroacoustic Characteristics	
2-1. Test Setup	Measuring instrument as shown in Figure 4
2-2. Impedance	$8 \pm 15\%$ ohm (at 2.5 KHz, 1V input)
2-3.Sound Pressure Level	92 ± 3 dB SPL /0.7W/10cm at 3 kHz in 1.0cc box Speaker shall be mounted in a baffle with minimum dimensions of 80cm x 100cm. See Figure 6.
2-4.Frequency Response	See Figure 6, Table 2 Test at 2.36Vrms/10 cm with the speaker mounted in 1.0cc measure box in a baffle.
2-5.Bass Resonance Frequency	$850 \pm 15\%$ Hz in 1cc box
2-6. Input Power (Rated./Max.)	Rated Power: 0.7W (in 1.0cc box) Maximum Power: 1.0W (in 1cc box)
2-7.Rub and Buzz:	The input power shall be set at 0.7W. Using an audio oscillator, sweep from 500 to 6000 Hz with the speaker mounted in 1cc measure box and in a baffle. There shall be no buzzes, rattles, nor spurious noises.
2-8.THD	See Figure7 , Table 3 Test at 2.36Vrms/10cm with the speaker mounted in 1cc measure box in a baffle.
2-9.Polarity	When a DC source's "+" polarity is attached to speaker's "+" polarity, "-" polarity is attached speaker's "-" polarity ,the membrane will move forward .

Adresse: Felix-Wankel-Str. 35 • 73760 Ostfildern/Nellingen

Tel: +49-711/3414023

Fax: +49-711/3414024

E-mail: info@ekulit.de Web site: www.EKULIT.de



Elektrotechnik Karl-Heinz Mauz GmbH

LSF-S1318A-IPX7 (Artikel-Nr. 106123)

EKULIT

3. General Reliability	
3-1 General	After any following tests the response at 1 KHz shall not deviate more than ± 3 dB from the initial value
3-1 Temperature Shock Test	<p>Temperature: $-40^{\circ}\pm 3^{\circ}\text{C}$ \longleftrightarrow $+85^{\circ}\pm 3^{\circ}\text{C}$ Cycle: 10 cycles Duration: 1 hour 1 hour (recovery 2 hours)</p> <p>(30minutes) (5minutes) 1 cycle (5minutes)</p>
3-2 Static Humidity Test	Precondition at $+25^{\circ}\text{C}$ for 1 hour. Next expose samples to $+55^{\circ}\text{C}$ with 95% relative humidity for 96 hours with no bias. Finally allow test samples to dry at room ambient temperature for 3 ± 1 hour before taking final measurements.
3-3 Vibration Test	Secure device using a fixture appropriate for this test. Fixture shall be capable of mounting on vibration table. Vibrate from 10Hz to 2000Hz, 1 octave per minute, 2mm displacement $\pm x$, $\pm y$, $\pm z$ directions with 15 g's force for 2 hrs per each plane.
3-4 Drop Test	Drop samples 1.5 meters three times in each direction along each of the three mutually perpendicular axes for a total of 18 shocks. (Samples shall be mounted in a 100g fixture)
3-5 Operating Life Test	1cc box; 25°C ; Pink noise; 20Hz-20kHz; 0.7W; Crest factor 3-4; 96 H
3-6. Rated Sweep Power Test	1cc box; 25°C ; Rated Power (0.7W); 600-1000Hz; 0.7W; 1 sec; 12 H
3-7 Max Power Test	1cc box; 25°C ; Pink noise; 20Hz-20kHz; 1.0W; 1 sec on/60 sec off; 60 cycles
3-8. High Temperature Test	$85 \pm 2^{\circ}\text{C}$; 96H; 2H Recovery time
3-9. Low Temperature Test	$-40 \pm 2^{\circ}\text{C}$; 96H; 2H Recovery time
6.10 Waterproof Requirement	IPX-7 Test Condition: Depth of water: 1 Meters Time of duration: 30 Minutes
6.11 Air Leak Test Conditions	Air pressure 10KPa, Back side pressure 1Kg, Continuous time 7 Seconds, Less than 1 SCCM

Adresse: Felix-Wankel-Str. 35 • 73760 Ostfildern/Nellingen

Tel: +49-711/3414023

Fax: +49-711/3414024

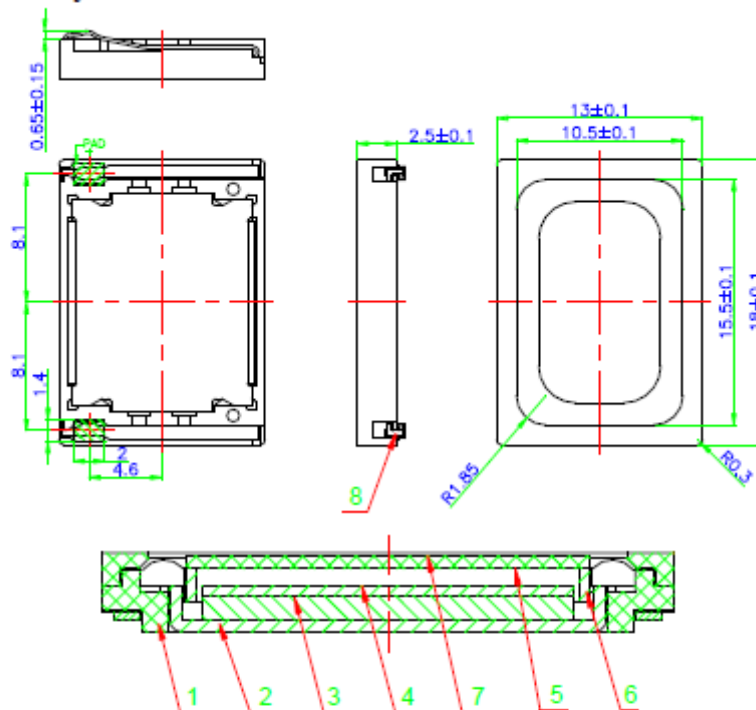
E-mail: info@ekulit.de Web site: www.EKULIT.de

LSF-S1318A-IPX7 (Artikel-Nr. 106123)

EKULIT

4. Mechanical Layout and Dimensions

4.1 Mechanical Layout



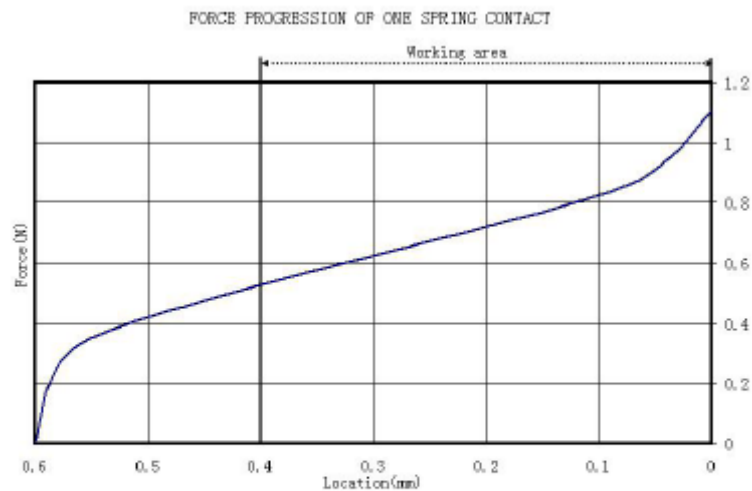
Notes:

1、 General unless otherwise noted $\pm 0.2\text{mm}$.

(Figure 1)

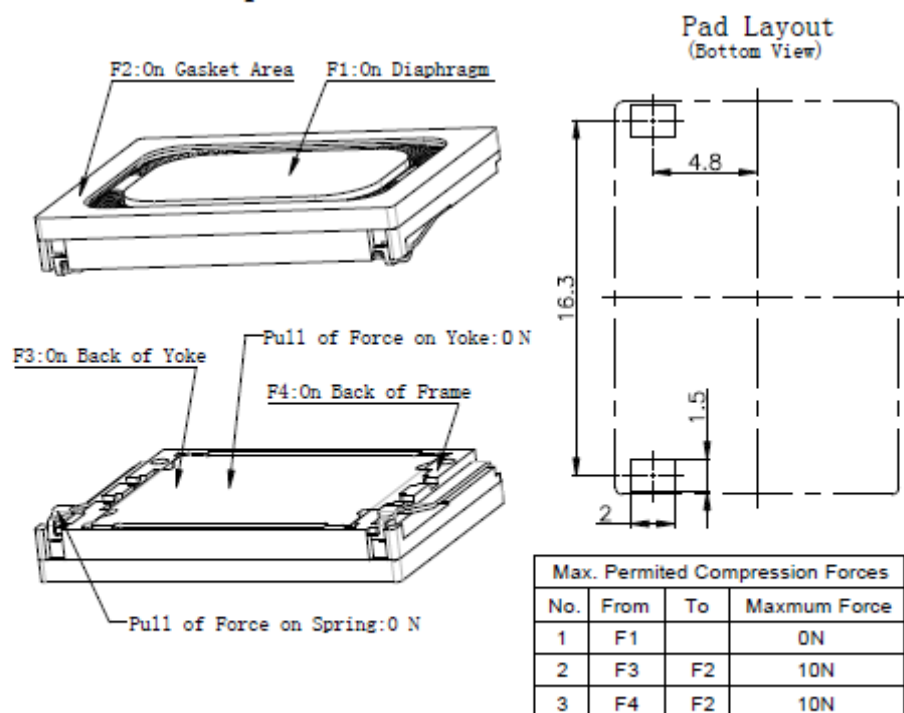
9	Spring	Stainless Steel	2	
8	Cover	Plastic	1	
7	Diaphragm	Polymer	1	
6	Pole Piece 2	Iron	2	
5	Magnet 2	NdFeB	2	
4	Pole Piece 1	Iron	1	
3	Magnet 1	NdFeB	1	
2	Yoke	Iron	1	
1	Frame	Plastic	1	
No.	Part Name	Material	Q'TY	Remark

4.2 Force Diagram



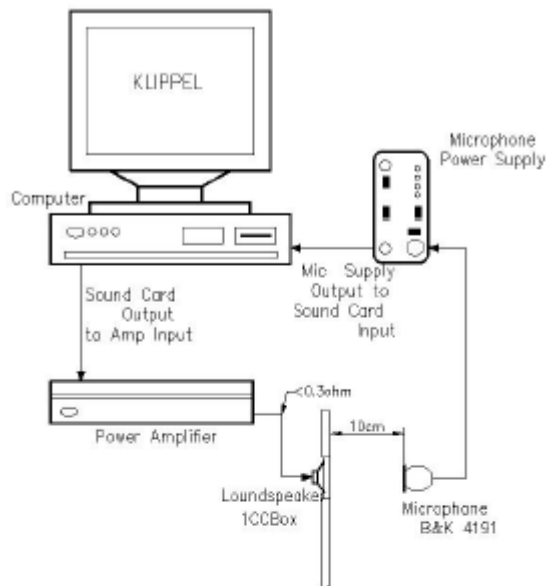
(Figure 2)

4.3 Permitted Force to Speaker



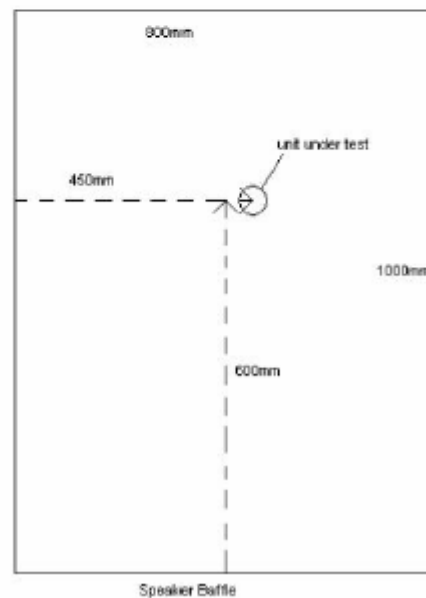
(Figure 3)

5. Measuring Setup



(Figure 4)

Baffle



(Figure 5)

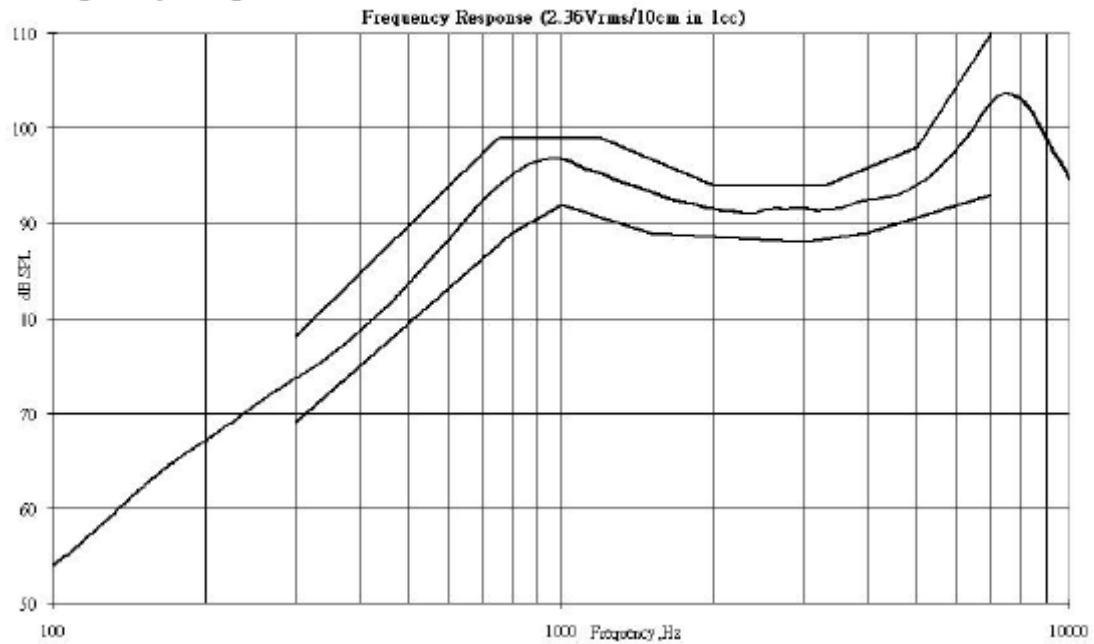


Elektrotechnik Karl-Heinz Mauz GmbH

LSF-S1318A-IPX7 (Artikel-Nr. 106123)

EKULIT

6. Frequency Response



(Figure 6)

Table 2: Tolerance Limits Date for FR

Frequency(Hz)	Upper Limits(dB)	Frequency(Hz)	Lower Limits(dB)
300	78	300	69
750	99	800	89
1200	99	1000	92
2000	94	1500	89
3300	94	3000	88
5000	98	4000	89
7000	110	7000	93

Adresse: Felix-Wankel-Str. 35 • 73760 Ostfildern/Nellingen

Tel: +49-711/3414023

Fax: +49-711/3414024

E-mail: info@ekulit.de Web site: www.EKULIT.de

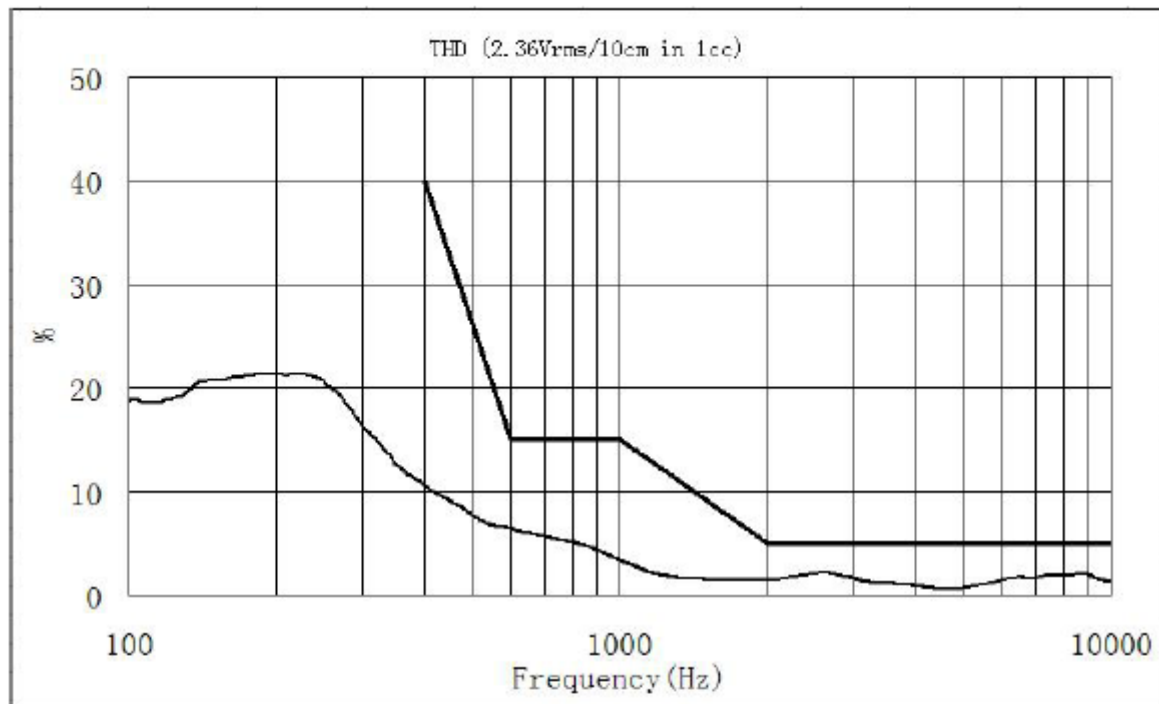


Elektrotechnik Karl-Heinz Mauz GmbH

LSF-S1318A-IPX7 (Artikel-Nr. 106123)

EKULIT

7. Total Harmonic Distortion



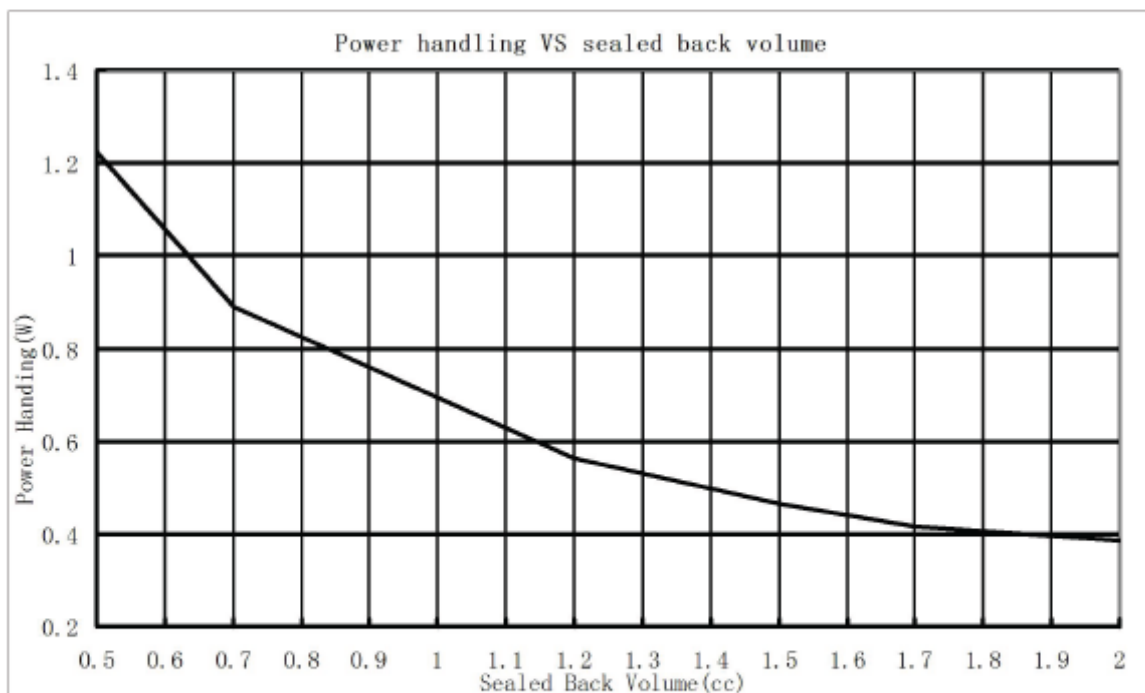
(Figure 7)

Table 3: Limits Date for THD

Frequency(Hz)	Limits
400	40
600	15
1000	15
2000	5
10000	5

8. Application Note

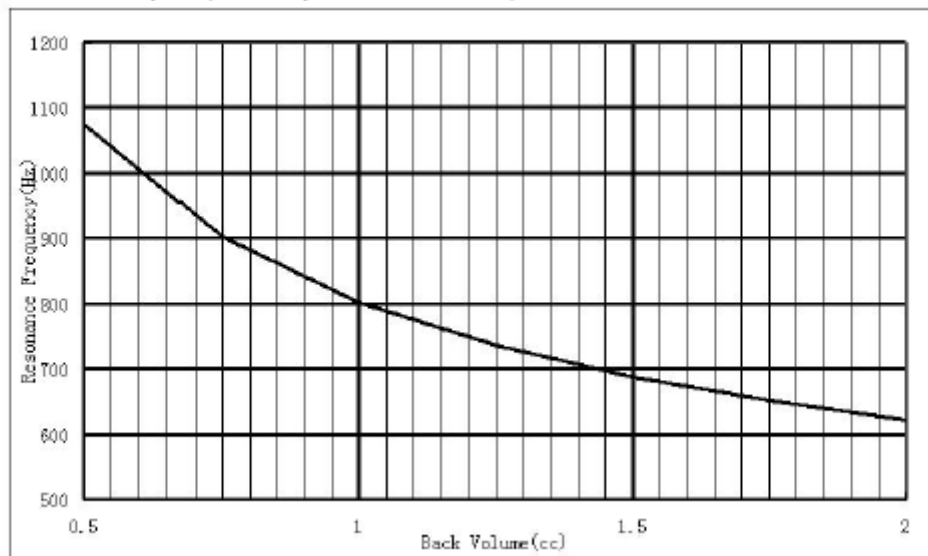
1. Air tight is needed between front cover of speaker and housing, otherwise cause audio performance's losing, such as higher THD, lower sensitivity;
2. Tiny air leakage in back of speaker is permitted to keep balance of air pressure;
3. For this speaker, the standard power is 0.7W in 1cc back cavity, when the back cavity is less or more than the standard volume of back cavity, the handling power also will be changed. See below figure about the relationship between power handling and back volume, here the power is excursion limited power, the thermal power should be evaluated, especially in small back cavity, such as 0.5cc. And the recommend minimum back volume is 0.5cc.
4. If the power higher than 0.7W input the speaker in standard back cavity, there is the risk of damaging speaker. in case of the back volume larger than 1cc, i.e. 1.5cc, the power handing of the speaker is pretty low. to maintain the rated power as 0.7W, we suggest adding thicker mesh with more acoustic resistance on the cover to reduce the vibration amplitude, or using electric filter to attenuate the maximum vibration amplitude.



(Figure 8)

5. Resonance frequency VS sealed back volume

The resonance frequency of the speaker box will vary with different sealed back volume.



(Figure 9)

6. T/S parameters

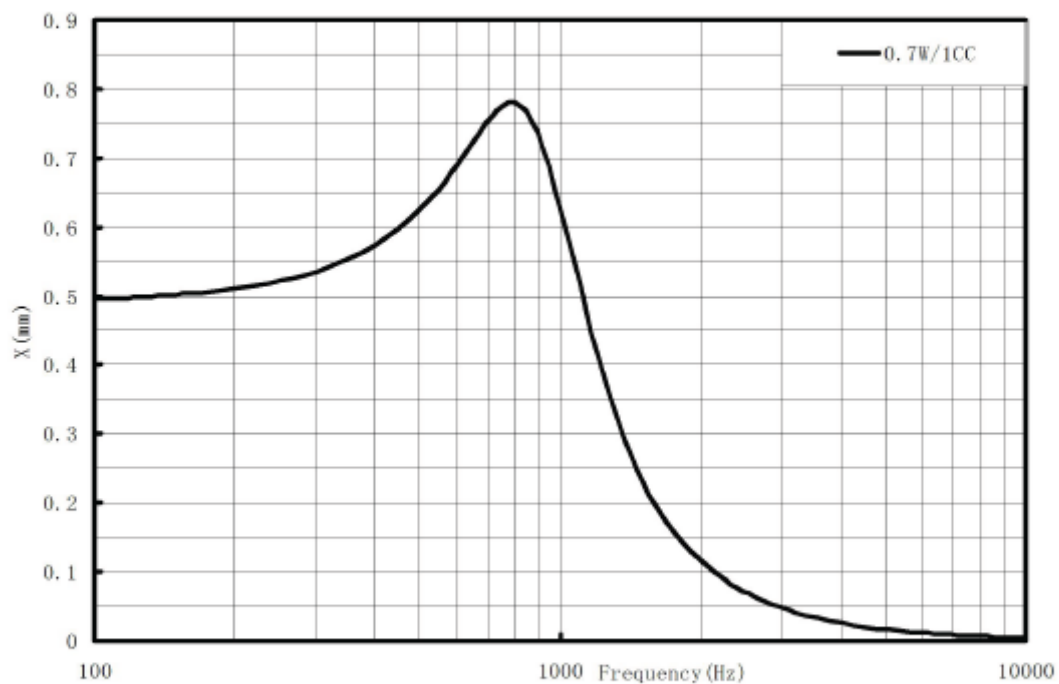
Thiele-Small Parameters: The following Thiele-Small Parameters are guidelines from a speaker exhibiting good audio performance.

Fs	320	Hz
Re	7.6	ohms
Sd	1.27	cm ²
Bl	0.88	T.m
Vas	5.77	cc
Cms	2.5	mm/N
Mms	97	mg
Qms	2.21	
Qes	1.93	
Qts	1.03	

LSF-S1318A-IPX7 (Artikel-Nr. 106123)

EKULIT

6. Peak to peak excursion
Xp-p in different power input



(Figure 10)

LSF-S1318A-IPX7 (Artikel-Nr. 106123)

EKULIT

9. Package

- 1, 100pcs of speaker in each tray
- 2, 20 trays in one carton
- 3, Total:2000 pcs / 1 carton
- 4, Gross Weight:5.4KGS
- 5, Net Weight: 3.4KGS

