LRA 12235C A

LINEAR RESONANT ACTUATOR

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CONTENT

1. SPECIFICATIONS

Parameter	Unit	Conditions / Description	MIN	TYP	MAX
Rated Voltage	Vrms			1.5	
Operating Voltage	Vrms		0.3		1.8
Resonance Frequency	Hz		188	235	282
Resistance	Ω	At 20°C	19.2	24	28.8
Acceleration	Grms	At 100g load, 1.5Vrms	0.9		
Rise Time	ms	0 → 90%, At 100g load, 1.5Vrms, 235Hz			60
Break Time	ms	100 → 10%, At 100g load, 1.5Vrms, 235Hz			90
Polarity		Positive voltage to (+), the magnet bowl moves forward			
Contact				CONNECTOR	
Packaging				TRAY	
Operating Temperature	°C		-40		+85
Storage Temperature	°C		-40		+95
Weight	g			2	

Remark:
Environmental Conditions
Standard conditions for inspection and measurement:
Temperature: +15~+35°C, Humidity: 45~85% RH (no condensation of moisture)
When a judgment under the standard condition raises doubts, the following conditions apply:
Temperature: +18~+22°C, Humidity: 50~60% RH (no condensation of moisture)

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RELEASED BY	Anouschka Esselun	DATE	2024.02.19	LRA 12235C A	A
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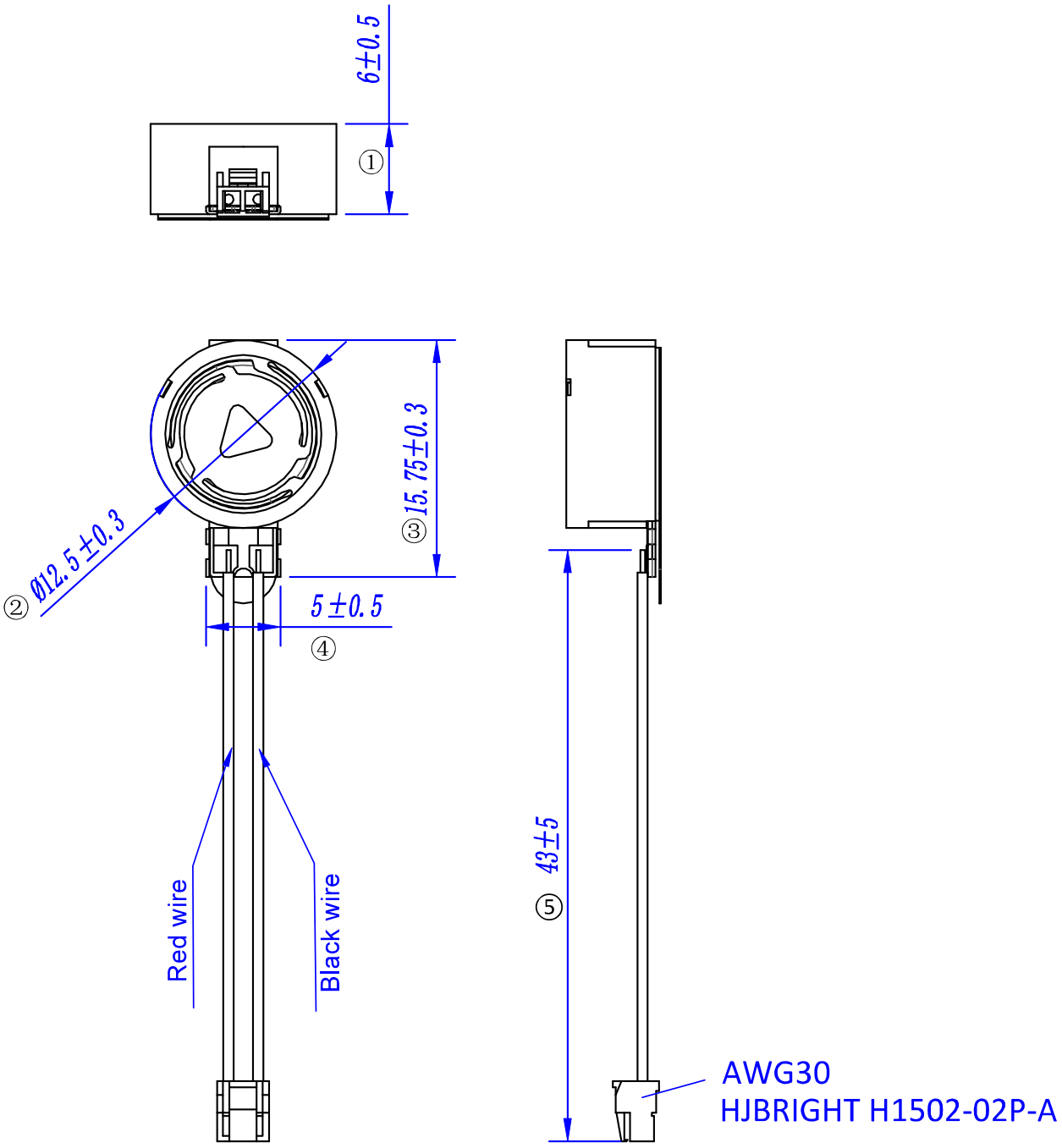
DRAWING NO.	453414798				

2. DRAWING



Unit: mm Tolerance: ± 0.2mm

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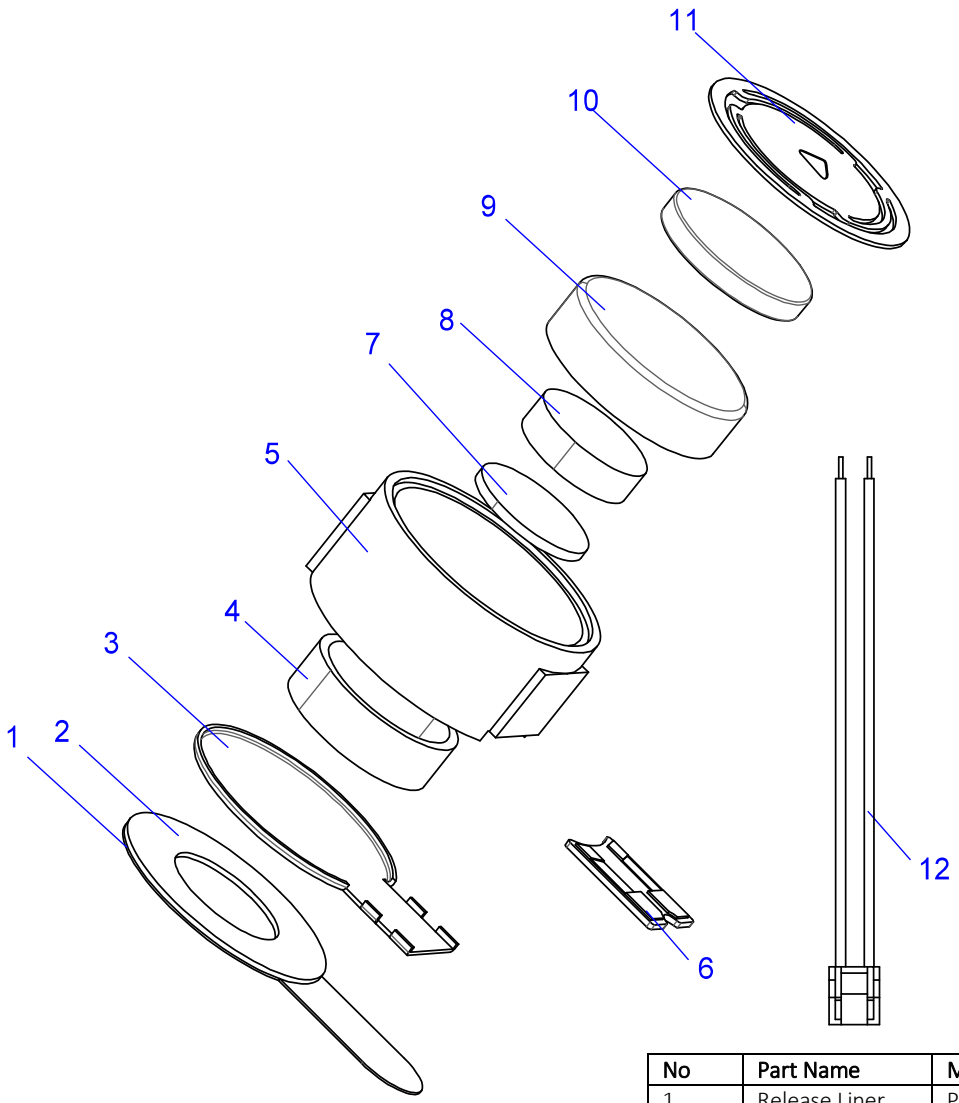
2.1 PART LIST



No	Part Name	Material
1	Release Liner	Paper
2	3M adhesive	3MVHB F9473PC
3	Cover Plate	SUS
4	Voice Coil	Φ0.065
5	Plastic Housing	PBT GF30
6	PCBA	FR4
7	Pole Piece	SPCC
8	Magnet	NdFeB
9	Magnet Bowl	SPCC
10	Mass	SUS
11	Spring	SUS
12	Plug Wire	AWG30/H1502-02P-A

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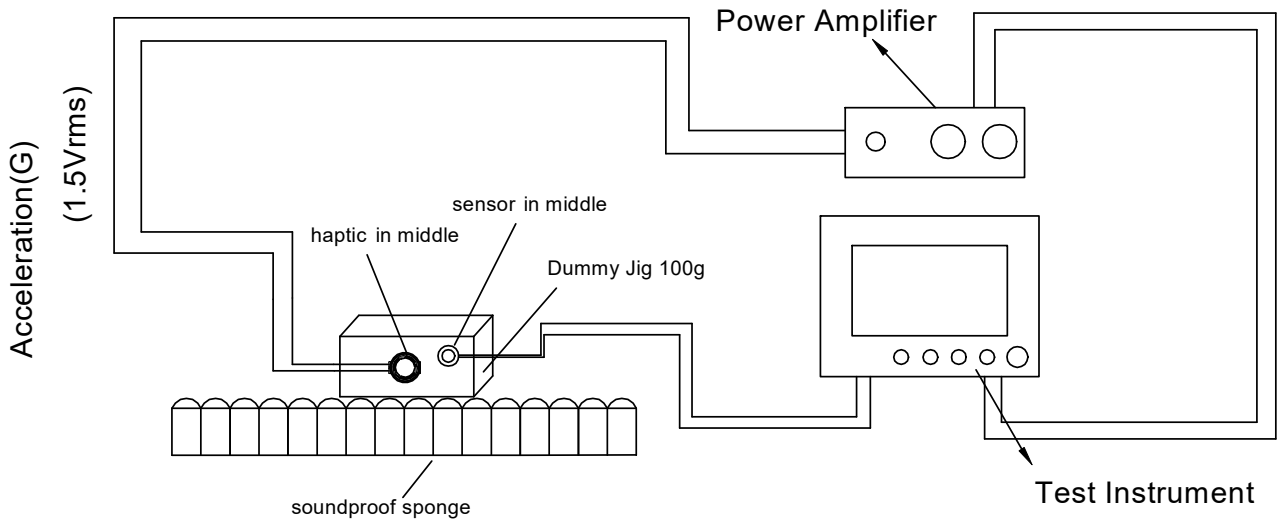
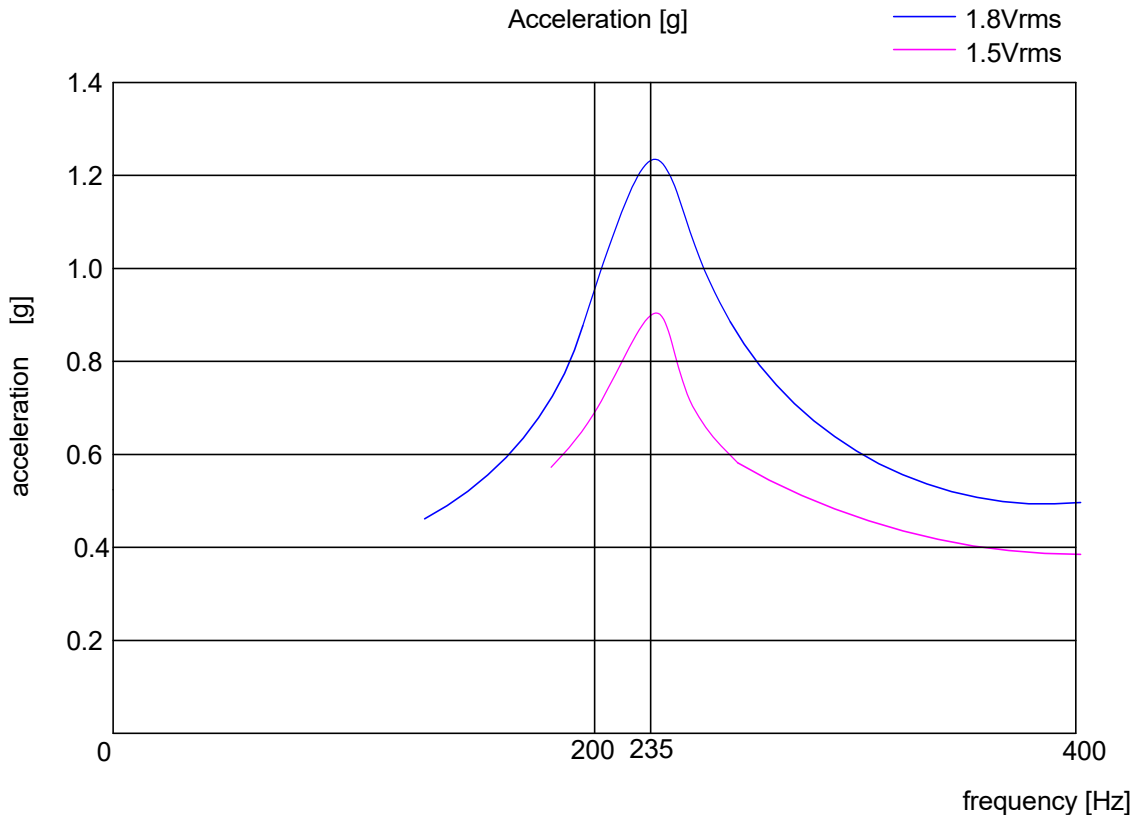
3. TEST SETUP



4. ACCELERATION CHARACTERISTICS



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5. RELIABILITY TEST

5.1 High Temperature Storage Test

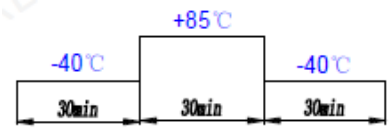
Temperature	+95 ±2°C
Duration	1000 hours

5.2 Low Temperature Storage Test

Temperature	-40 ±2°C
Duration	500 hours

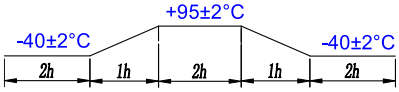
5.3 Thermal Shock Test

Temperature	-40~+85°C
Duration	1000 hours



5.4 Temperature Cycle Test

Cycles	80



5.5 Damp Heat Test

Temperature	+85 ±2°C
Relative Humidity	85 ±2% RH
Duration	1000 hours

5.6 Load Test

Power (Nom)	1.5 Vrms, 30ms ON, 470ms OFF
Input Signal	235Hz sine wave
Duration	1000 hours

5.7 Drop Test

Fix onto the 200g, 6000 series aluminum alloy carrier and drop on 10mm thick wooden board

Height	1m
Times	1 time for each direction
Direction	±X , ±Y, ±Z

PERFORMANCE REQUIREMENTS AFTER RELIABILITY TEST:

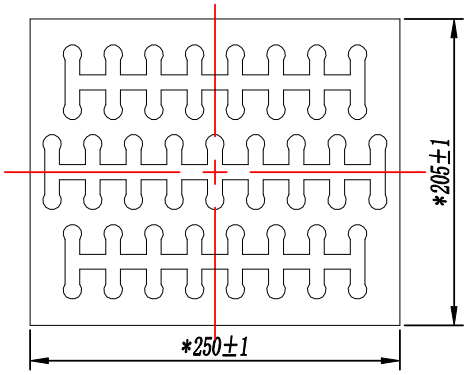
1) Acceleration: ≥0.8G at 100g load in middle, 1.5Vrms
2) RT (Rise Time): <70ms at 100g load in middle, 1.5Vrms, 235Hz
3) BT (Break Time): <110ms at 100g load in middle, 1.5Vrms, 235Hz

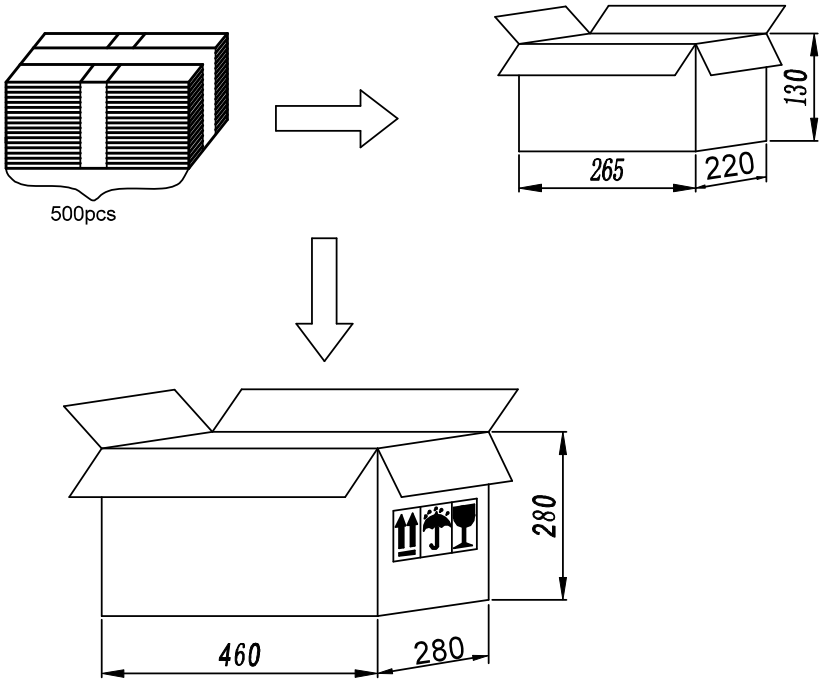
Notice: Before the tests, it should work normally for 1 hour; after the test, it should be placed at room temperature for at least 4 hours to test its performance.

6. PACKING

6.1 PACKING QUANTITY

50pcs per tray
10 trays per small carton
500pcs per small carton
4 small cartons per outer carton
2000pcs per outer carton in total
Outer Carton Size: 460x280x280mm





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7. NOTICE

7.1 **The products mustn't be washed**

7.2 **Structural and component changes**

The structure and components of the product can be modified to improve the quality of the product without changing the size and performance requirements.

7.3 **Storage Condition**

The products should be stored in a room, where the temperature/humidity is stable. And avoid such places where there are large temperature changes. Please store the products at the following conditions:
Temperature: -10 to + 40 C Humidity: 15 to 85% R.H.

7.4 **Expire Date on Storage**

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

7.5 **Notice on Product Storage**

(1) 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 solderability due to the storage in a chemical atmosphere.
(2) Please use the products immediately after the package is opened, because the characteristics may be reduced in quality, and/or be degraded in the solderability due to storage under the poor condition.

7.5 **Rated and Max Input Voltage**

Rated Voltage

Rated input voltage is the maximum (limit) value which can be put into the component intentionally. If the actual input voltage to the component keeps exceeding the Rated Input Voltage, it will damage the component's acoustic performances and reliability. In the worst case, the component will get broken and emit no sound.

Max Input Voltage

Max Input Voltage is the maximum (limit) value for unexpected input voltage which is caused in the customer's circuit like surge voltage.
If the actual input voltage to the component keeps exceeding the maximum input voltage, it will break the component and cause no sound in a short time. Please note that the component will have a risk of getting broken if the unexpected input voltage continues.
The value of input voltage is set based on the sinusoidal voltage in the normal speaker use. If the special signal is put into the component, the values of rated and max input voltage will be different. Please make a well-investigation at your laboratory in case of the special signal input.

8. HISTORY CHANGE RECORD

REV	CHANGE ITEMS		DATE
	BEFORE CHANGE	AFTER CHANGE	
A0		Initial version	2024.02.19