产品规格书

PRODUCT SPECIFICATION

客户名称Buyer Name	
客户料号Buyer Part No.	
客户承认签章 Buyers Approval & Signatures	

文件编号Spec No.		版本	A/5
品名描述 Product Description	LRA 扁平振动马达 LRA Coin vibration motor		
型号Part No.	VG1040003D		
送样日期Date			
设计Designed by	审核Checked by	批准Approved by	
陳满			
2024.08.09	2024.08.09	2024.08.09	

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Contents of Specification

1. Revision History

2. Application

3. Operating ,Storage Temperature and Humidity Conditions

4. Measurement Conditions

5. Specifications

6. Reliability Test Conditions

7. Cautions for Use

8. Drawing

9. Packing

1. Revision History

修改号 Rev. No.	日期 Rev. Date	页码 Page No.	修改项目 Revised Item	更改原因 Reason
A/0	2019.04.27	/	产品颁布/ Release for Production	
A/1	2020.07.01	/	changed company name from JINLONG MACHINERY to VYBRONICS, changed part # from G1040003D to VG1040003D	Rebranding
A/2	2022.08.23	/	Update temperature range	
A/3	2022.12.19	/	Change double sided tape size from 9mm to 8mm	
A/4	2024.02.29	/	Change foam thickness to 0.35mm	
A/5	2024.08.09	/	Update motor specifications	Production optimization

2. Application

This specification provides structure, function and usage condition of Linear Vibrator used in mobile communication devices for silent alert.

3. Operating , Storage Temperature /Humidity Conditions

No	Item	Condition
3-1	Operating Temperature Range	- 25℃ ~ + 70℃
3-2	Storage Temperature Range	- 40℃ ~ + 80℃

4. Measurement Conditions

No	Item	Condition
4-1	Temperature	20 ± 5℃
4-2	Humidity	65 ± 20%RH
4-3	Rated Input Voltage	2.5Vrms AC, Sinewave
4-4	Input Voltage Range	0.1 ~ 2.5 Vrms AC
4-5	Input Frequency	150 ~ 200Hz (f0 : 170±5 Hz)
4-6	Operating Attitude	Refer to Figure 1

※ Measurement Method

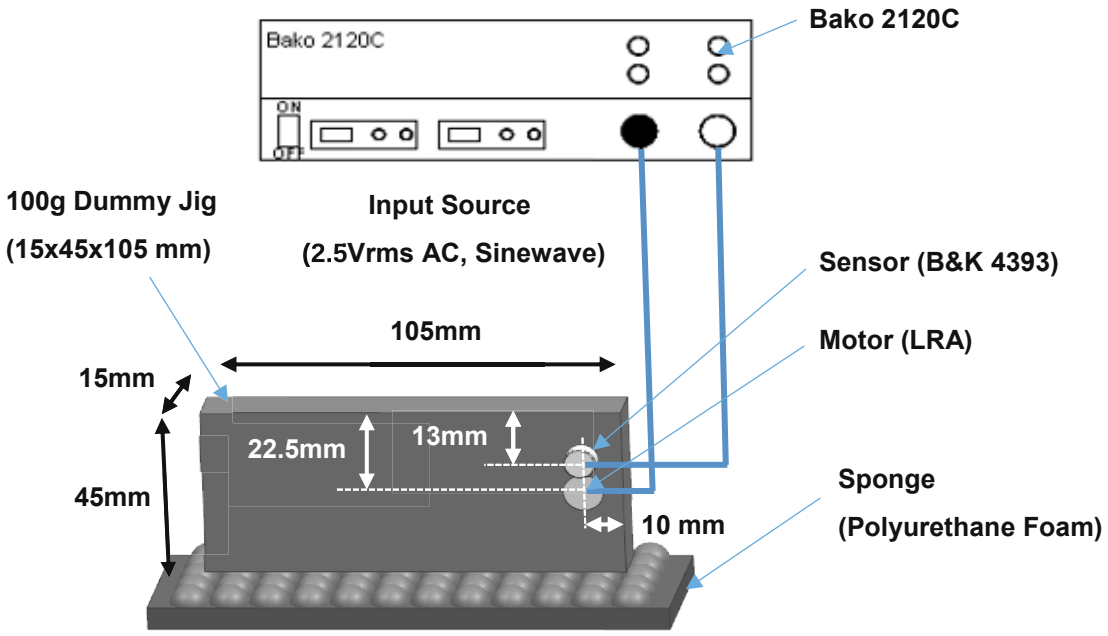


Figure 1. An Example of Measurement Method of Linear Vibrator

☐ **Position of Linear Vibrator and Accelerometer (Refer to Figure 1)**

- Linear Vibrator should be mounted to vibrate 15mm direction (y-direction) of Jig.
- Accelerometer also should be installed to measure y-direction vibration of Jig

☐ **Position of Dummy Jig**

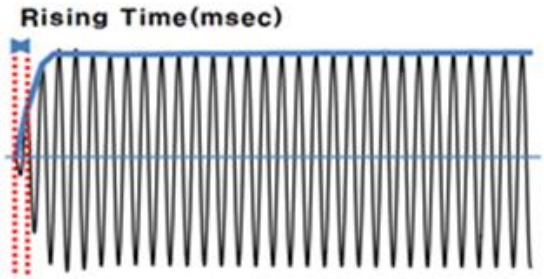
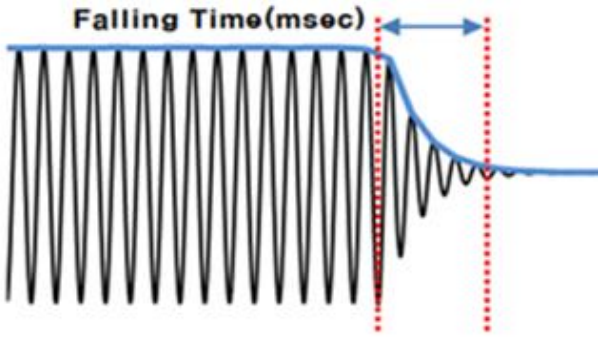
- 15mm*105mm plane of Dummy Jig should be located on Sponge
- At measurement of acceleration, Dummy Jig should be stabilized

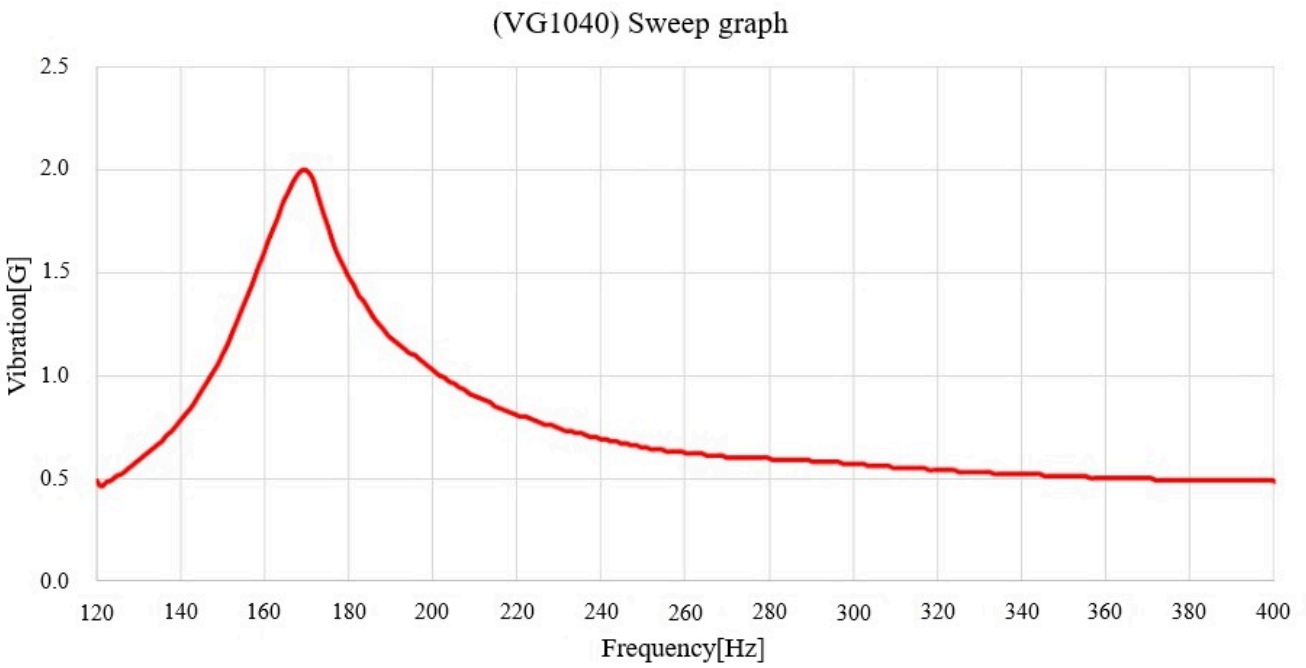
☐ **Measurement of Acceleration**

- Acceleration should be measured 2~3 second later after input source is applied
- For the precise measurement, Acceleration should be measured 3 times and adopted average value on each Linear Vibrator

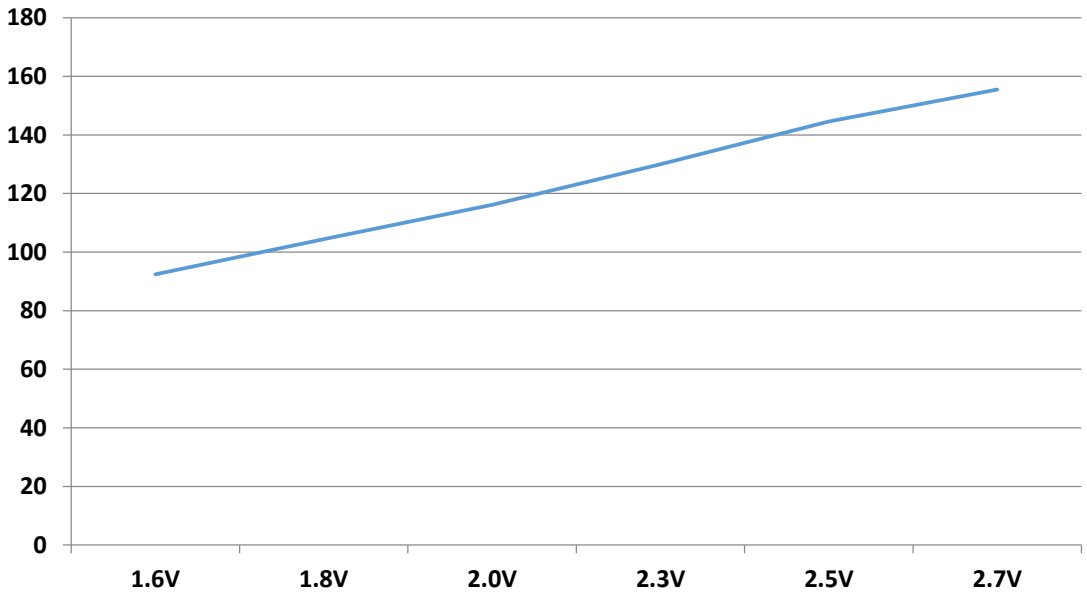
5. Specifications

No	Item	
5-1	Resistance	**12.0 ± 2 Ω**
5-2	Rated Current	**Max 200 mArms** (Input Source : 2.5Vrms AC, Sinewave)
5-3	Acceleration	**Min 0.8 G @ 150Hz** **Min 1.5 G @ 170Hz** **Min 0.9 G @ 200Hz** (Input Source : 2.5Vrms AC, Sinewave)
5-4	Frequency Characteristics	**Refer to Graph 1**
5-5	Motor Height	**4.05 ± 0.05mm** - Put the Case of the motor on Jig after zero setting and measure center point of bracket by Height Gauge.
5-6	Noise	**Max. 50 dB(A)** - 10cm distance from microphone, (Input Source : 2.5Vrms AC, Sinewave)
5-7	Noise by mechanical touch (Noise_T)	**Max 35dB** (Input Source : 2.5Vrms AC, Sinewave) - This is full inspection method in the mass production instead of measurement of 5-6 Noise - Measurement method ・Equipment : Bako 2120C ・It measures Noise touch(Mechanical touch) through vibration signal by acceleration sensor
5-8	Insulation Resistance	**Min 10 MΩ** (Input 100V DC, the insulation resistance between the vibrator case and terminal)

No	Item	Specification
5-9	Rising Time	**Max 10msec** - The time reaching to 50% of normal acceleration from power on 
5-10	Falling Time	**Max 50msec** - The time reaching to 10% of normal acceleration from power off 



Graph 1. Frequency Characteristics



Graph 2. Current vs Voltage

6. Reliability Test Condition

No	Item	Condition
6-1	Life test	Operating at rated input voltage and input frequency for 1,000,000 cycles. 1 cycle is 2 Sec On, 1 Sec Off.
6-2	Thermal shock test	- 40℃ ~ 85℃ in each of 2Hrs(1cycle), Total 15 cycles. Transition time is 5 minutes max. After the test, the Vibrator should be measured after room-temperature storage for 4Hrs.
6-3	High temperature storage test	+70℃, 168Hrs, After the test, the Vibrator should be measured after room-temperature storage for 4Hrs.
6-4	Low temperature storage test	-30℃, 168Hrs, After the test, the Vibrator should be measured after room-temperature storage for 4Hrs.
6-5	Static humidity test	+50℃, 95%RH, 120Hrs, After the test, the Vibrator should be measured after room-temperature storage for 4Hrs.
6-6	Vibration test	Vibrator that is attached to a 160g dummy jig is vibrated with 2.2G, 10~55Hz/min for 10min in each of X,Y,Z axis..
6-7	Mechanical shock test	The Vibrator that is attached to a 160g dummy jig is dropped to a steel floor 30 times(6 face, 5 times in each of X,Y,Z axis) from 1.5m in height.

Due to this LRA's wide bandwidth , the use of Haptic drivers that make use of "auto-resonance" detection can not be used. Please use the Dongwoon Anatech Part # DW7914A or equivalent.

☐ **Judgement**

① After test, The following specifications must be satisfied.

- Acceleration : Within initial Value ± 30%
- Rated Current : Max 170 mA rms
- Noise_T : Max. 35dB

② There should be no abnormalities in appearance and structure.

7. Cautions for Use

(1) Do not press the product with more than 0.5Kgf or drop it.
It can cause the transformation of performance or external appearance.

(2) Do not use under the following conditions. It may cause a decline in performance

- Do not drop into fluid (such as water, alcohol etc.)
- Do not keep at high temperature or high humidity for extended periods of times
- Do not use near gases which cause erosion
- Please refrain from operating the vibrator near magnetic devices.

(3) The vibrator has a strong magnet. So please be aware that it has a magnetic force on the surface of the bracket.

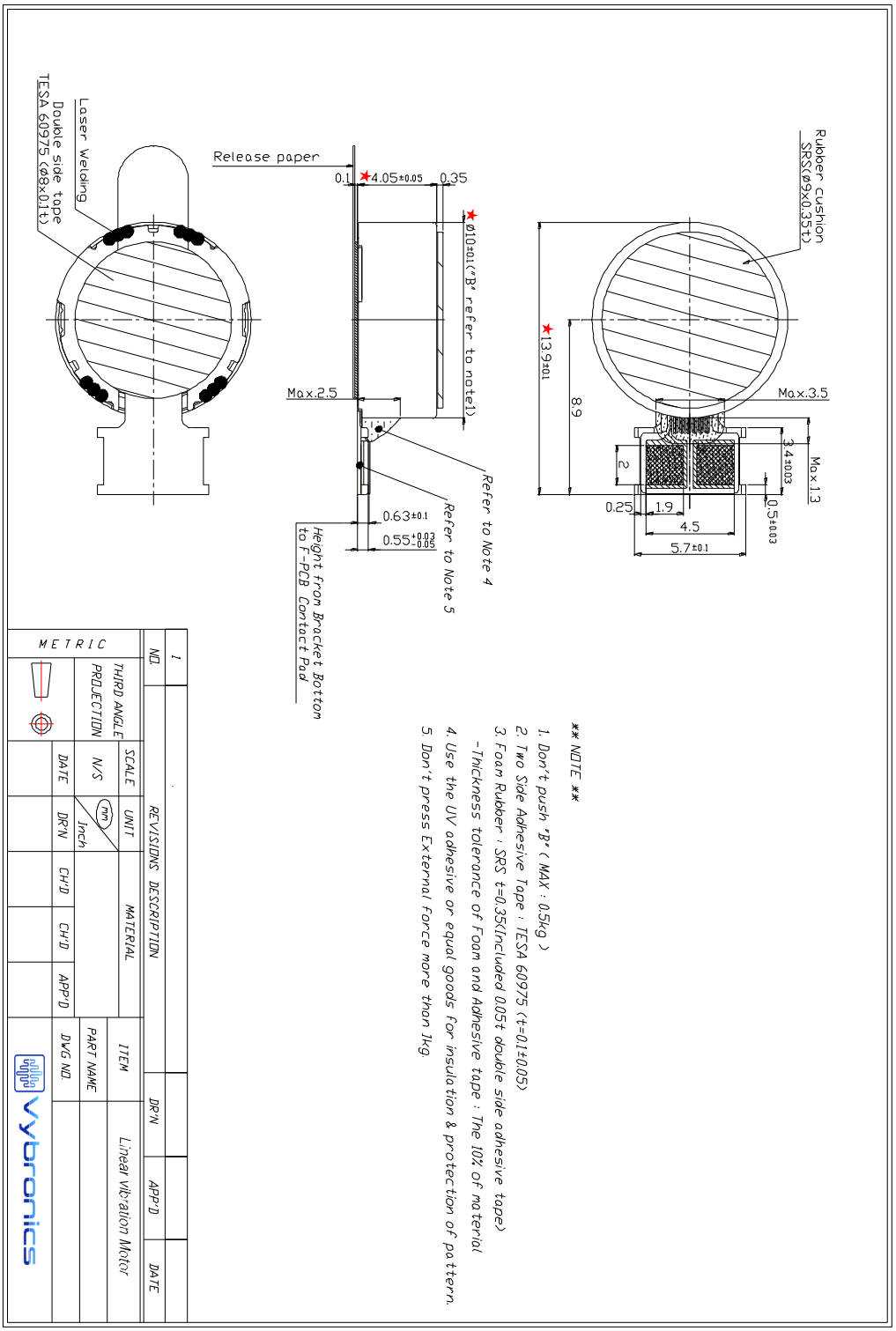
(4) To optimize the vibration force, Rated frequency and voltage could be changed as to assemble condition.

(5) Please refer to the packaging drawing. It can be modified by the request of the user.

(6) If any problems are occurred, Both the user and Vybronics shall try to solve the problem by mutual agreement and on reflection of the specification sheet.

(7) The storage condition is 5℃~35℃, 15%~65% RH, 1year about packing.

8. Drawing

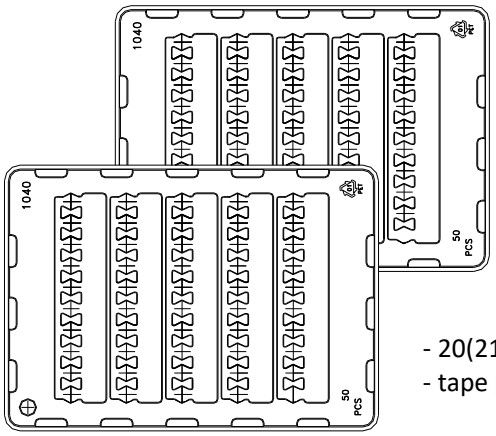

Laser welding
Double side tape
TESA 60975 (ø8x0.1t)
Release paper
0.1
4.05±0.05
0.35
ø10±0.1("B" refer to note1)
Max.2.5
Refer to Note 4
Refer to Note 5
0.63±0.1
0.55
Height from Bracket Botton
to F-PCB Contact Pad
Rubber cushion
SRS(ø9x0.35t)
13.9±0.1
8.9
Max.3.5
3.4±0.03
Max.1.3
2
0.25
1.9
4.5
5.7±0.1
0.5±0.03
** NOTE **
1. Don't push "B" (MAX : 0.5kg)
2. Two Side Adhesive Tape : TESA 60975 (t=0.1±0.005)
3. Foam Rubber : SRS t=0.35(Included 0.05t double side adhesive tape)
-Thickness tolerance of Foam and Adhesive tape : The 10% of material
4. Use the UV adhesive or equal goods for insulation & protection of pattern.
5. Don't press External force more than 1kg.
METRIC
THIRD ANGLE PROJECTION
SCALE N/S
UNIT mm / Inch
MATERIAL
DATE
DR'N
CH'D
CH'D
APP'D
ITEM Linear Vibration Motor
PART NAME
DWG NO.
NO. 1
REVISIONS DESCRIPTION
DR'N
APP'D
DATE
Vybronics

9. Packing

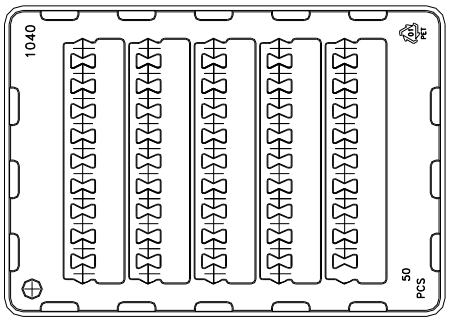
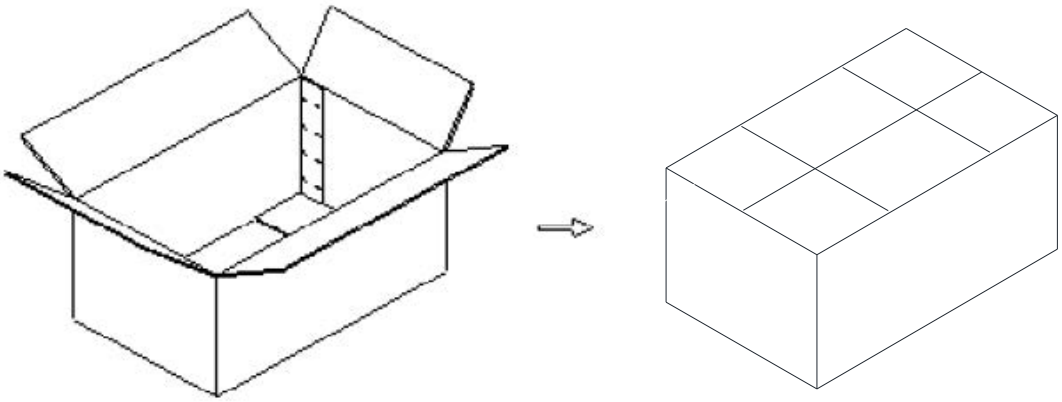
9-1. Paking q'ty : 4,000 PCS / Box

9-2. Out box size : 520 mm × 350 mm × 175 mm

9-3. Load max 6boxes



- 20(21) Tray x 2 = 4,000ea
- tape packing



1 Tray : 50ea