

TEST REPORT

Applicant: GN Hearing A/S
Address: Lautrupbjerg 7 ,2750 Ballerup Denmark
Equipment Type: Touch Controller
Model Name: VTD050
Brand Name: Jabra
FCC ID: BCE-VTD050
Test Standard: 47 CFR Part 2.1091
KDB 447498 D04 v01
Test Date: Nov. 01, 2024 - Nov. 11, 2024
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ISSUED BY:

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Revision History

<u>Version</u>	<u>Issue Date</u>	<u>Revisions Content</u>
<u>Rev. 01</u>	<u>Feb. 12, 2025</u>	<u>Initial Issue</u>

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1 GENERAL INFORMATION

1.1 Test Laboratory

Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

1.2 Test Location

Name	Shenzhen BALUN Technology Co., Ltd.
Location	☐ Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
	☒ 1/F, Building B, Ganghongji High-tech Intelligent Industrial Park, No. 1008, Songbai Road, Yangguang Community, Xili Sub-district, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	GN Hearing A/S
Address	Lautrupbjerg 7 ,2750 Ballerup Denmark

2.2 Manufacturer Information

Manufacturer	GN Hearing A/S
Address	Lautrupbjerg 7 ,2750 Ballerup Denmark

2.3 Factory Information

Factory	N/A
Address	N/A

2.4 General Description for Equipment under Test (EUT)

EUT Name	Touch Controller
Model Name Under Test	VTD050
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	LTAM781
Software Version	panacastcontroller-user-6.51.0-35
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.5 Technical Information

Network and Wireless connectivity	Bluetooth (BR+EDR+BLE) 2.4G WIFI 802.11b, 802.11g and 802.11n(HT20/40) 5G WIFI 802.11a, 802.11n(HT20/HT40), 802.11ac(VHT20/HT40) 5.8G SRD
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The requirement for the following technical information of the EUT was tested in this report:

Operating Mode	Bluetooth, WIFI	
Frequency Range	Bluetooth	2402 ~ 2480 MHz
	2.4G WIFI	2412 ~ 2462 MHz
	5G WIFI	U-NII-1: 5150 ~ 5250MHz U-NII-2A: 5250 ~ 5350MHz U-NII-2C: 5470-5725MHz U-NII-3: 5725 ~ 5850MHz
Antenna Type	Bluetooth	Dipole Antenna
	WIFI	Dipole Antenna
Exposure Category	General Population/Uncontrolled Exposure	
Product Type	Mobile Device	

3 SUMMARY OF TEST RESULT

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 2.1091	Radiofrequency radiation exposure evaluation: mobile devices
2	KDB 447498 D04 v01	447498 D04 Interim General RF Exposure Guidance v01

4 DEVICE CATEGORY AND LEVELS LIMITS

Mobile Devices:

CFR Title 47 §2.1091(b)

For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons.

FCC KDB 447498 D04 General RF Exposure Guidance v01 Limit

Evaluation of compliance with the exposure limits in § 1.1310 is necessary if the ERP of the device is greater than ERP_{20cm} in Formula (B.1) [repeated from § 2.1091(c)(1) and § 1.1307(b)(1)(i)(B)].

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \quad (\text{B.1})$$

If the ERP is not easily obtained, then the available maximum time-averaged power may be used (i. e., without consideration of ERP only if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole.

SAR-based exemptions are constant at separation distances between 20 cm and 40 cm to avoid discontinuities in the threshold when transitioning between SAR-based and MPE-based exemption criteria at 40 cm, considering the importance of reflections.

The SAR-based exemption formula of § 1.1307(b)(3)(i)(B), repeated here as Formula (B.2), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold P_{th} (mW).

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by Formula (B.2).

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases} \quad (\text{B. 2})$$

where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right)$$

and f is in GHz, d is the separation distance (cm), and $ERP_{20 \text{ cm}}$ is per Formula (B.1). The example values shown in Table B.2 are for illustration only.

Table B.2—Example Power Thresholds (mW)

Frequency (MHz)	Distance (mm)										
		5	10	15	20	25	30	35	40	45	50
300		39	65	88	110	129	148	166	184	201	217
450		22	44	67	89	112	135	158	180	203	226
835		9	25	44	66	90	116	145	175	207	240
1900		3	12	26	44	66	92	122	157	195	236
2450		3	10	22	38	59	83	111	143	179	219
3600		2	8	18	32	49	71	96	125	158	195
5800		1	6	14	25	40	58	80	106	136	169

According with FCC KDB 447498 D04, Appendix A, Per § 1.1307(b)(3)(i)(A), a single RF source is exempt RF device (from the requirement to show data demonstrating compliance to RF exposure limits, as previously mentioned) if the available maximum time-averaged power is no more than 1 mW, regardless of separation distance.

This exemption applies to all operating configurations and exposure conditions, for the frequency range 100 kHz to 100 GHz, regardless of fixed, mobile, or portable device exposure conditions. This is a standalone exemption, and it cannot be applied in conjunction with any other test exemption.

When maximum available power each individual transmitting antenna within the same time averaging period is ≤ 1 mW, and the nearest parts of the antenna structures of the simultaneously operating transmitters are separated by at least 2 cm.

When the aggregate maximum available power of all transmitting antennas is ≤ 1 mW in the same time-averaging period.

5 ASSESSMENT RESULT

5.1 Output Power

Bluetooth				
Mode	GFSK	$\pi/4$ -DQPSK	8-DPSK	BLE
Conducted Power (dBm)	4.35	6.10	6.39	4.12
Antenna Gain (dBi)	2.50	2.50	2.50	2.50
EIRP (dBm)	6.85	8.60	8.89	6.62
Note: This report listed the worst case conducted power value, please refer to RF test report No. BL-SH24A0783-601 and BL-SH24A0783-602 for more details.				

WLAN					
Mode	WLAN 2.4G	WLAN 5G U-NII-1: 5150-5250MHz	WLAN 5G U-NII-2A: 5250-5350MHz	WLAN 5G U-NII-2C: 5470-5725MHz	WLAN 5G U-NII-3: 5725-5850MHz
Conducted Power (dBm)	23.57	13.53	13.53	14.20	14.50
Antenna Gain (dBi)	2.50	3.50	3.50	2.00	2.50
EIRP (dBm)	26.07	17.03	17.03	16.20	17.00
Note: This report listed the worst case conducted power value, please refer to RF test report No. BL-SH24A0783-603 and BL-SH24A0783-604 for more details.					

5.2 Tune-up power

Mode		Conducted Power Range (dBm)	EIRP Range (dBm)	ERP Range (dBm)
Bluetooth	Bluetooth	【5.50,7.50】	【8.00,10.00】	【5.85,7.85】
2.4GWIFI	2.4GWIFI	【22.50,24.50】	【25.00,27.00】	【22.85,24.85】
5GWIFI	U-NII-1: 5150-5250MHz	【12.50,14.50】	【16.00,18.00】	【13.85,15.85】
5GWIFI	U-NII-2A: 5250-5350MHz	【12.50,14.50】	【16.00,18.00】	【13.85,15.85】
5GWIFI	U-NII-2C: 5470-5725MHz	【13.00,15.00】	【15.00,17.00】	【12.85,14.85】
5GWIFI	U-NII-3: 5725-5850MHz	【13.50,15.50】	【16.00,18.00】	【13.85,15.85】
Note1: ERP= EIRP -2.15dB.				
Note2: According KDB 447498 D04, used the greater of maximum conducted power and ERP to compare with the threshold value Pth.				

5.3 RF Exposure Evaluation Result

Evolution mode		f(MHz)	Distance (cm)	Maximum power (dBm)	Maximum power (mw)	Threshold Power (mW)	P/Plimit	Verdict
Bluetooth	Bluetooth	2402	20	7.85	6.10	3060.00	0.0020	Pass
WALN	2.4GWIFI	2412	20	24.85	305.49	3060.00	0.0998	Pass
	5GWIFI(U-NII-1: 5150-5250MHz)	5150	20	15.85	38.46	3060.00	0.0126	Pass
	5GWIFI(U-NII-2A: 5250-5350MHz)	5250	20	15.85	38.46	3060.00	0.0126	Pass
	5GWIFI(U-NII-2C: 5470-5725MHz)	5470	20	15.00	31.62	3060.00	0.0103	Pass
	5GWIFI(U-NII-3: 5725-5850MHz)	5725	20	15.85	38.46	3060.00	0.0126	Pass

5.4 Collocated Power Calculation

Evolution mode	Frequency (MHz)	Power /Limit	$\Sigma(\text{Power} / \text{Limit})$ of WLAN + Bluetooth	Verdict
Bluetooth	2402MHz ~ 2480MHz	0.002	0.1018	Pass
2.4G WIFI	2412MHz ~ 2462MHz	0.0998		

Note:

- $\Sigma(\text{Power} / \text{Limit})$: This is a summation of [(power for each transmitter/ antenna included in the simultaneous transmission)/ (corresponding Power limit)], for Bluetooth+ WLAN.
- Both of the 2.4GHz/5GHz can transmit simultaneously, the formula of calculated the Power is $CP1 / LP1 + CP2 / LP2 + \dots \text{etc.} < 1$
 CP = Calculation power
 LP = Limit of power
- The worst-case situation is 0.1018, which is less than “1”. This confirmed that the device comply with FCC KDB 447498 D04 Power limit.
- The DUT work frequency range used is 2402MHz ~ 2480 MHz, 5150MHz ~ 5250 MHz, 5250MHz ~ 5350 MHz, 5470MHz ~ 5725 MHz, 5725MHz ~ 5850 MHz the result close to the limit by the above formula, so we select worst case power to calculate the exclusion power threshold.
- More power list please refer to test report No. BL-SH24A0783-601/602/603/604.

5.5 Conclusion

This EUT is deemed to comply with the reference level limits, therefore the basic restrictions are compliant with human exposure limits.

Statement

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--END OF REPORT--