1. RF Exposure Requirements

1.1 General Information

Client Information

Applicant:	ZHEJIANG HUACHUANG VISION TECHNOLOGY CO., LTD.
Address of applicant:	Floor 16, Building 1, No. 1168 BinAn Road, Binjiang District, Hangzhou, Zhejiang, China
Manufacturer:	ZHEJIANG HUACHUANG VISION TECHNOLOGY CO., LTD.
Address of manufacturer:	Floor 16, Building 1, No. 1168 BinAn Road, Binjiang District, Hangzhou, Zhejiang, China

General Description of EUT:

Product Name:	Speakerphone
Trade Name	Hitrolink
Model No.:	HT-OM450
Adding Model(s):	HT-OM450H, HT-OM450E, HT-OM450 Serise, HT-OM450H Serise, HT-OM450E Serise, HTI-OM450, HTI-OM450H, HTI-OM450E, HTI-OM450 Serise, HTI-OM450H Serise, HTI-OM450E Serise, OM450, OM450H, OM450E, OM450 Serise, OM450H Serise, OM450E Serise
Rated Voltage:	Battery DC 3.7V
Battery Capacity:	1000*2mAh
FCC ID:	2A2QD-HT-OM450
Equipment Type:	Portable device

Technical Characteristics of EUT:

Bluetooth (BLE mode)

Bluetooth Version:	V5.1 (BLE mode)
Frequency Range:	2402-2480MHz
RF Output Power:	-11.73dBm (Conducted)
Data Rate:	1Mbps
Modulation:	GFSK
Quantity of Channels:	40
Channel Separation:	2MHz
Type of Antenna:	Chip Antenna
Antenna Gain:	-1.43dBi

Bluetooth (BR/EDR mode)

Bluetooth Version:	V5.1 (BR/EDR mode)
Frequency Range:	2402-2480MHz
RF Output Power:	-10.67dBm (Conducted)
Data Rate:	1Mbps, 2Mbps, 3Mbps
Modulation:	GFSK, π/4 DQPSK, 8DPSK
Quantity of Channels:	79
Channel Separation:	1MHz

Type of Antenna:	Chip Antenna
Antenna Gain:	-1.43dBi

1.2 RF Exposure Exemption

According to §1.1307(b)(3) and 447498 D04 Interim General RF Exposure Guidance v01, system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

Option A: FCC Rule Part 1.1307 (b)(3)(i)(A):The available maximum time-averaged power is no more than 1mW, regardless of separation distance.

Option B: FCC Rule Part 1.1307 (b)(3)(i)(B): The available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P_{th} (mW) described in the following formula. P_{th} is given by:

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

Where

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

and

$$ERP_{20\ cm}\ (\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases}$$

d = the separation distance (cm);

Option C: FCC Rule Part 1.1307 (b)(3)(i)(C): The minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters.

Single RF Sources Subject to Routine Environmental Evaluation	
RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R^2
1.34-30	3,450 R^2/f^2
30-300	3.83 R^2
300-1,500	0.0128 R^2f
1,500-100,000	19.2R^2

For Multiple RF sources: FCC Rule Part 1.1307(b)(3)(ii):

(A) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required).

(B) In the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^{a}\frac{P_i}{P_{th,i}}+\sum_{j=1}^{b}\frac{ERP_j}{ERP_{th,j}}+\sum_{k=1}^{c}\frac{Evaluated_k}{Exposure\ Limit_k}\leq 1$$

1.3 Calculated Result

Radio Access Technology	Min. Frequency	Max. Output Power	Max. Tune-Up Output Power	Antenna Gain	Duty Cycle	Tune-Up EIRP
	(MHz)	(dBm)	(dBm)	(dBi)	(%)	(dBm)
Bluetooth	2402	-10.67	-10.50	-1.43	100	-11.93

Frequency	Option	Min. Distance	Tune-Up ERP		Exposure Limit	Ratio	Result
(MHz)		(cm)	(dBm)	(mW)	(mW)		Pass/Fail
2402	B	0.5	-14.08	0.04	2.79	0.01	Pass

Note: 1. ERP=EIRP-2.15dB; EIRP= Output Power + Antenna gain

2. Option A, B and C refers as clause 1.2.

3. For option B, Pth(mW) convert to Exposure Limit(mW); For option C, ERP(W) convert to Exposure Limit(mW).

4. Ratio= Tune-Up ERP(mW)/ Exposure Limit (mW)

Mode for Simultaneous Multi-band Transmission:

Radio Access Technology	Ratio 1	Ratio 2	Simultaneous Ratio	Limit	Result
					Pass/Fail
--	--	--	--	--	--

Result: Pass