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Report No.: 1705RSU00807 Report Version: Issue Date: 06-19-2017

# **RF Exposure Evaluation Declaration**

FCC ID: T2C-CP960

YEALINK(XIAMEN) NETWORK TECHNOLOGY APPLICANT:

CO.,LTD

**Application Type:** Certification

**Product: HD IP Conference Phone** 

Model No.: CP960

**Brand Name:** YEALINK

FCC Classification: Digital Transmission System (DTS)

FCC Part 15 Spread Spectrum Transmitter(DSS)

**Test Procedure(s):** KDB 447498 D01v06

May 05 ~ June 05, 2017 **Test Date:** 

: Survy Sur (Sunny Sun) Reviewed By

Approved By

( Marlin Chen )





The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

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# **Revision History**

Report No.	Version	Description	Issue Date	Note
1705RSU00807	Rev. 01	Initial report	06-19-2017	Valid

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## 1. PRODUCT INFORMATION

## 1.1. Equipment Description

Product Name:   HD   P Conference Phone				
### Brand Name: YEALINK   Wi-Fi Specification: 802.11a/b/g/n/ac	Product Name:	HD IP Conference Phone		
Wi-Fi Specification:         802.11a/b/g/n/ac           Bluetooth Version:         v3.0 + HS, v4.0           DECT Specification:         DECT 6.0           Wi-Fi Specification         802.11b/g/n-HT20: 2412 ~ 2462 MHz           Frequency Range:         802.11n-HT40: 2422 ~ 2452 MHz           For 802.11a/n-HT20: 5180~5320MHz, 5500~5700MHz, 5745~5825MHz         For 802.11ac-VHT20: 5180~5320MHz, 5500~5720MHz, 5745~5825MHz           For 802.11n-HT40: 5190~5310MHz, 5510~5670MHz, 5755~5795MHz         For 802.11ac-VHT40: 5190~5310MHz, 5510~5710MHz, 5755~5795MHz           For 802.11ac-VHT80: 5190~5310MHz, 5510~5710MHz, 5755~5795MHz         For 802.11ac-VHT80: 5210MHz, 5690MHz, 5775MHz           Type of Modulation:         802.11b: DSSS 802.11a/g/n/ac: OFDM           Antenna Gain         2.4GHz: 1.49dBi 5GHz: 2.19dBi           Bluetooth Specification         5GHz: 2.19dBi           Bluetooth Specification         Frequency Range: 2402~2480MHz           Data Rate         1Mbps(GFSK), 2Mbps(Pi/4 DQPSK), 3Mbps (8DPSK)           Antenna Gain         1.49dBi           DECT Specification         Frequency Range           Type of Modulation         Digital (Gaussian Frequency Shift Keying)	Model No.:	CP960		
Bluetooth Version:	Brand Name:	YEALINK		
DECT Specification:  Wi-Fi Specification  Frequency Range:  802.11b/g/n-HT20: 2412 ~ 2462 MHz 802.11n-HT40: 2422 ~ 2452 MHz For 802.11a/n-HT20: 5180~5320MHz, 5500~5700MHz, 5745~5825MHz For 802.11ac-VHT20: 5180~5320MHz, 5500~5720MHz, 5745~5825MHz For 802.11n-HT40: 5190~5310MHz, 5510~5670MHz, 5755~5795MHz For 802.11ac-VHT40: 5190~5310MHz, 5510~5710MHz, 5755~5795MHz For 802.11ac-VHT80: 5210MHz, 5290MHz, 5530MHz, 5610MHz, 5690MHz, 5775MHz  Type of Modulation:  802.11b: DSSS 802.11a/g/n/ac: OFDM  Antenna Gain 2.4GHz: 1.49dBi 5GHz: 2.19dBi  Bluetooth Specification  Frequency Range: 2402~2480MHz Data Rate 1Mbps(GFSK), 2Mbps(Pi/4 DQPSK), 3Mbps (8DPSK) Antenna Gain 1.49dBi DECT Specification  Frequency Range 1921.536 ~ 1928.448MHz Type of Modulation Digital (Gaussian Frequency Shift Keying)	Wi-Fi Specification:	802.11a/b/g/n/ac		
Wi-Fi Specification  Frequency Range:  802.11b/g/n-HT20: 2412 ~ 2462 MHz 802.11n-HT40: 2422 ~ 2452 MHz For 802.11a/n-HT20: 5180~5320MHz, 5500~5700MHz, 5745~5825MHz For 802.11ac-VHT20: 5180~5320MHz, 5500~5720MHz, 5745~5825MHz For 802.11n-HT40: 5190~5310MHz, 5510~5670MHz, 5755~5795MHz For 802.11ac-VHT40: 5190~5310MHz, 5510~5710MHz, 5755~5795MHz For 802.11ac-VHT40: 5190~5310MHz, 5510~5710MHz, 5755~5795MHz For 802.11ac-VHT80: 5210MHz, 5290MHz, 5530MHz, 5610MHz, 5690MHz, 5775MHz  Type of Modulation:  802.11a/g/n/ac: OFDM  Antenna Gain 2.4GHz: 1.49dBi 5GHz: 2.19dBi  Bluetooth Specification  Frequency Range: 2402~2480MHz Data Rate 1Mbps(GFSK), 2Mbps(Pi/4 DQPSK), 3Mbps (8DPSK) Antenna Gain 1.49dBi DECT Specification  Frequency Range 1921.536 ~ 1928.448MHz Type of Modulation Digital (Gaussian Frequency Shift Keying)	Bluetooth Version:	v3.0 + HS, v4.0		
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For 802.11ac-VHT80: 5210MHz, 5290MHz, 5530MHz, 5610MHz, 5690MHz, 5775MHz  Type of Modulation: 802.11b: DSSS 802.11a/g/n/ac: OFDM  Antenna Gain 2.4GHz: 1.49dBi 5GHz: 2.19dBi  Bluetooth Specification  Frequency Range: 2402~2480MHz  Data Rate 1Mbps(GFSK), 2Mbps(Pi/4 DQPSK), 3Mbps (8DPSK)  Antenna Gain 1.49dBi  DECT Specification  Frequency Range 1921.536 ~ 1928.448MHz  Type of Modulation Digital (Gaussian Frequency Shift Keying)		or 802.11ac-VHT40:		
5210MHz, 5290MHz, 5530MHz, 5610MHz, 5690MHz, 5775MHz  Type of Modulation: 802.11b: DSSS 802.11a/g/n/ac: OFDM  Antenna Gain 2.4GHz: 1.49dBi 5GHz: 2.19dBi  Bluetooth Specification Frequency Range: 2402~2480MHz  Data Rate 1Mbps(GFSK), 2Mbps(Pi/4 DQPSK), 3Mbps (8DPSK)  Antenna Gain 1.49dBi  DECT Specification Frequency Range 1921.536 ~ 1928.448MHz  Type of Modulation Digital (Gaussian Frequency Shift Keying)		190~5310MHz, 5510~5710MHz, 5755~5795MHz		
Type of Modulation:  802.11b: DSSS 802.11a/g/n/ac: OFDM  Antenna Gain  2.4GHz: 1.49dBi 5GHz: 2.19dBi  Bluetooth Specification  Frequency Range:  2402~2480MHz  Data Rate  1Mbps(GFSK), 2Mbps(Pi/4 DQPSK), 3Mbps (8DPSK)  Antenna Gain  1.49dBi  DECT Specification  Frequency Range  1921.536 ~ 1928.448MHz  Type of Modulation  Digital (Gaussian Frequency Shift Keying)		For 802.11ac-VHT80:		
802.11a/g/n/ac: OFDM  Antenna Gain 2.4GHz: 1.49dBi 5GHz: 2.19dBi  Bluetooth Specification  Frequency Range: 2402~2480MHz  Data Rate 1Mbps(GFSK), 2Mbps(Pi/4 DQPSK), 3Mbps (8DPSK)  Antenna Gain 1.49dBi  DECT Specification  Frequency Range 1921.536 ~ 1928.448MHz  Type of Modulation Digital (Gaussian Frequency Shift Keying)		5210MHz, 5290MHz, 5530MHz, 5610MHz, 5690MHz, 5775MHz		
Antenna Gain  2.4GHz: 1.49dBi 5GHz: 2.19dBi  Bluetooth Specification  Frequency Range:  2402~2480MHz  Data Rate  1Mbps(GFSK), 2Mbps(Pi/4 DQPSK), 3Mbps (8DPSK)  Antenna Gain  1.49dBi  DECT Specification  Frequency Range  1921.536 ~ 1928.448MHz  Type of Modulation  Digital (Gaussian Frequency Shift Keying)	Type of Modulation:	802.11b: DSSS		
Bluetooth Specification Frequency Range: 2402~2480MHz  Data Rate 1Mbps(GFSK), 2Mbps(Pi/4 DQPSK), 3Mbps (8DPSK)  Antenna Gain 1.49dBi  DECT Specification Frequency Range 1921.536 ~ 1928.448MHz  Type of Modulation Digital (Gaussian Frequency Shift Keying)		802.11a/g/n/ac: OFDM		
Bluetooth Specification  Frequency Range: 2402~2480MHz  Data Rate 1Mbps(GFSK), 2Mbps(Pi/4 DQPSK), 3Mbps (8DPSK)  Antenna Gain 1.49dBi  DECT Specification  Frequency Range 1921.536 ~ 1928.448MHz  Type of Modulation Digital (Gaussian Frequency Shift Keying)	Antenna Gain	2.4GHz: 1.49dBi		
Frequency Range: 2402~2480MHz  Data Rate 1Mbps(GFSK), 2Mbps(Pi/4 DQPSK), 3Mbps (8DPSK)  Antenna Gain 1.49dBi  DECT Specification  Frequency Range 1921.536 ~ 1928.448MHz  Type of Modulation Digital (Gaussian Frequency Shift Keying)		5GHz: 2.19dBi		
Data Rate 1Mbps(GFSK), 2Mbps(Pi/4 DQPSK), 3Mbps (8DPSK)  Antenna Gain 1.49dBi  DECT Specification  Frequency Range 1921.536 ~ 1928.448MHz  Type of Modulation Digital (Gaussian Frequency Shift Keying)	Bluetooth Specification			
Antenna Gain  1.49dBi  DECT Specification  Frequency Range  1921.536 ~ 1928.448MHz  Type of Modulation  Digital (Gaussian Frequency Shift Keying)	Frequency Range:	2402~2480MHz		
DECT Specification  Frequency Range 1921.536 ~ 1928.448MHz  Type of Modulation Digital (Gaussian Frequency Shift Keying)	Data Rate	1Mbps(GFSK), 2Mbps(Pi/4 DQPSK), 3Mbps (8DPSK)		
Frequency Range 1921.536 ~ 1928.448MHz  Type of Modulation Digital (Gaussian Frequency Shift Keying)	Antenna Gain	1.49dBi		
Type of Modulation Digital (Gaussian Frequency Shift Keying)	DECT Specification			
	Frequency Range	1921.536 ~ 1928.448MHz		
Antenna Gain 1.49dBi	Type of Modulation	Digital (Gaussian Frequency Shift Keying)		
	Antenna Gain	1.49dBi		

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## 2. RF Exposure Evaluation

## 2.1. Limits

### **FCC Rules:**

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

## LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range	Electric Field	Magnetic Field	Power Density	Average Time	
(MHz)	Strength (V/m)	Strength (A/m)	(mW/cm <sup>2</sup> )	(Minutes)	
	(A) Limits for Occupational/ Control Exposures				
300-1500			f/300	6	
1500-100,000			5	6	
(B) Limits for General Population/ Uncontrolled Exposures					
300-1500			f/1500	6	
1500-100,000			1	30	

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### Formula as follows:

f= Frequency in MHz

Calculation Formula:  $Pd = (Pout*G)/(4*pi*r^2)$ 

Where

Pd = power density in mW/cm<sup>2</sup>

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

r = distance between observation point and center of the radiator in cm

Pd is the limit of MPE, 1mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

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## 2.2. Test Result of RF Exposure Evaluation

Product	HD IP Conference Phone
Test Item	RF Exposure Evaluation

Antenna Gain: Refer to Section 1.1

### For Wi-Fi Band:

Test Mode	Frequency Band	Maximum Average	Power Density at	FCC
	(MHz)	Output Power	r = 20 cm	Limit
		(dBm)	(mW/cm <sup>2</sup> )	(mW/cm <sup>2</sup> )
802.11b/g/n	2412 ~ 2462	14.45	0.0078	1
	5180 ~ 5240	6.20	0.0014	1
802.11a/n/ac	5260 ~ 5320	7.21	0.0017	1
	5500 ~ 5720	9.23	0.0028	1
	5745 ~ 5825	7.02	0.0017	1

### For Bluetooth Band:

Test Mode	Frequency Band	Maximum Output	Power Density at	FCC
	(MHz)	Power	r = 20 cm	Limit
		(dBm)	(mW/cm <sup>2</sup> )	(mW/cm <sup>2</sup> )
BLE	2402 ~ 2480	2.81	0.0005	1
DH5/2DH5/3DH5	2402 ~ 2480	5.24	0.0009	1

### For DECT Band:

Test Mode	Frequency Band	Maximum Output	Power Density at	FCC
	(MHz)	Power	r = 20 cm	Limit
		(dBm)	(mW/cm <sup>2</sup> )	(mW/cm <sup>2</sup> )
DECT 6.0	1921.536 ~ 1928.448	14.82	0.0085	1

## **CONCULISON:**

Both of the WLAN, Bluetooth & DECT can transmit simultaneously. Therefore, the Max Power Density at r (20 cm) =  $0.0078 \text{mW/cm}^2 + 0.0009 \text{mW/cm}^2 + 0.0085 \text{mW/cm}^2 = 0.0172 \text{mW/cm}^2 < 1 \text{mW/cm}^2$ .

So the EUT complies with the FCC requirement.

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