

EMC-TRF-03 Rev 1.0

Report No.: GZCR220900115405 Page: 1 of 14 FCC ID: T2C-YL430132

RF EXPOSURE EVALUATION REPORT

Application No.:	GZCR2209001154AT
Applicant:	YEALINK (XIAMEN) NETWORK TECHNOLOGY CO., LTD.
Address of Applicant:	No.666 Hu'an Rd,Huli District Xiamen City, Fujian, P.R. China
Manufacturer:	YEALINK (XIAMEN) NETWORK TECHNOLOGY CO., LTD.
Address of Manufacturer:	No.666 Hu'an Rd,Huli District Xiamen City, Fujian, P.R. China
Equipment Under Test (EUT	·):
EUT Name:	HD Wireless Conference Phone
Model No.:	CP935W
Trade Mark:	YEALINK
Standard(s) :	FCC Rules 47 CFR §2.1091
	KDB 447498 D04 interim General RF Exposure Guidance v01
Date of Receipt:	2022-09-07
Date of Test:	2022-09-24 to 2022-11-17
Date of Issue:	2023-01-09
Test Result:	Pass*

* In the configuration tested, the EUT complied with the standards specified above.

Uday Liu

Ricky Liu Manager



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	Revision Record								
Version	Chapter	Date	Modifier	Remark					
01		2023-01-09		Original					

Authorized for issue by		
	CJ Vu	
	Curry Wu /Project Engineer	
	Ridey Liv	
	Ricky Liu/Reviewer	





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3 General Information

3.1 General Description of E.U.T.

	Portable device
Product Type:	⊠ Mobile device
	Fixed device

3.2 Details of E.U.T.

Power supply:	Rechargeable battery DC3.7V, 7800mAh ,charged by adapter
	Powered by adapter
	Adapter No.: YLPS121250C1-3C
	Input: AC100-240V; 50/60Hz; 0.5A
	Output: DC12.0V 1.25A
Cable(s):	DC cable: 250cm unshielded
	DC cable: 85cm unshielded
	USB Type C cable: 85cm unshielded
For BT:	F
Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	V5.0 Dual mode
Modulation Type:	GFSK, pi/4DQPSK, 8DPSK
Number of Channels:	79
Channel Spacing:	1MHz
Spectrum Spread Technology:	Frequency Hopping Spread Spectrum(FHSS)
Antenna Type:	FPC Antenna
Antenna Gain:	5.08dBi declared by applicant
For BLE:	
Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	V5.0 Dual mode
Modulation Type:	GFSK
Data Rate:	Only Support 1Mb/s
Number of Channels:	40
Channel Spacing:	2MHz
Antenna Type:	FPC Antenna
Antenna Gain:	5.08dBi declared by applicant



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For 2.4G WIFI:					
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz				
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK);				
	802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)				
Number of Channels:	802.11b/g/n(HT20):11				
Channel Spacing:	5MHz				
Antenna Type:	FPC Antenna				
Antenna Gain:	5.08dBi declared by applicant				
For 5G WIFI:					
Operation Frequency (20MHz):	U-NII-1: 5180-5240MHz; U-NII-2A: 5260-5320MHz; U-NII-2C: 5500- 5700MHz; U-NII-3: 5745-5825MHz				
Modulation Type:	802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK);				
	802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM);				
Channel Spacing:	802.11a/n(HT20): 20MHz				
DFS Function:	Slave without Radar detection				
TPC Function:	Without TPC function				
Antenna Type:	FPC Antenna				
Antenna Gain:	3.57dBi declared by applicant				
For DECT:					
Frequency Range:	1921.536 to 1928.448 MHz				
Number of Channels:	5 RF Channels, $5 \times 12 = 60$ TDMA Duplex Channels				
Type of Modulation:	Digital (Gaussian Frequency Shift Keying)				
Antenna Connector:	None				
Antenna Type:	FPC Antenna				
Antenna Gain:	5.81dBi declared by applicant				
Number of Antennas:	1				
Antenna Diversity Supported:	No				

3.3 Separation Distance

Minimum test separation distance:	20cm				
Remark: This minimum test separation distance is determined by the smallest distance from the antenna and					
radiating structures or outer surface of the device, according to the host form factor, exposure conditions and					
platform requirements, to any part of the	body or extremity of a user or bystander.				



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3.4 Test Location

All tests were performed at: SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory, 198 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District, Guangzhou, China 510663 Tel: +86 20 82155555 Fax: +86 20 82075059 No tests were sub-contracted.

3.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• NVLAP (Lab Code: 200611-0)

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

• ACMA

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian/New Zealand Regulatory Compliance Mark (RCM).

• SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

• FCC Recognized Accredited Test Firm(Registration No.: 486818)

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818.

• ISED (Registration No.: 4620B, CAB identifier: CN0052)

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

• VCCI (Registration No.: R-12460, C-12584, G-20107 and T-11179)

The 10m Semi-anechoic chamber, 966 Anechoic Chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584, G-20107 and T-11179 respectively.

• CBTL (Lab Code: TL129)

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2017, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

3.6 Deviation from Standards

None

3.7 Abnormalities from Standard Conditions

None



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FCC Radiofrequency radiation exposure limits 4

Test exemptions apply for devices used in general population/uncontrolled exposure environments, according to the SAR-based, or MPE-based exemption thresholds.

4.1 Blanket 1 mW Blanket Exemption

The 1 mW Blanket Exemption of §1.1307(b)(3)(i)(A) applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power of no more than 1 mW, regardless of separation distance.

The 1-mW blanket exemption applies at separation distances less than 0.5 cm, including where there is no separation. This exemption shall not be used in conjunction with other exemption criteria other than those for multiple RF sources in paragraph §1.1307(b)(3)(ii)(A).

The 1-mW exemption is independent of service type and covers the full range of 100 kHz to 100 GHz, but it shall not be used in conjunction with other exemption criteria or in devices with higher-power transmitters operating in the same time-averaging period. Exposure from such higher-power transmitters would invalidate the underlying assumption that exposure from the lower-power transmitter is the only contributor to SAR in the relevant volume of tissue.

4.2 MPE-based Exemption

General frequency and separation-distance dependent MPE-based effective radiated power (ERP) thresholds are in Table B.1 [Table 1 of §1.1307(b)(1)(i)(C)] to support an exemption from further evaluation from 300 kHz through 100 GHz.

RF Source Frequency			Minimum Distance			Threshold ERP		
<i>f</i> ∟ MHz		<i>f</i> ⊦ MHz	λ∟ / 2π	λ_ / 2π λ_ / 2π		W		
0.3	-	1.34	159 m	_	35.6 m	1,920 R ²		
1.34	-	30	35.6 m – 1.6 m		3,450 R²/f ²			
30	-	300	1.6 m	_	159 mm	3.83 R ²		
300	300 –		159 mm	_	31.8 mm	0.0128 R ² f		
1,500 – 100,000 31.8 mm – 0.5 mm 19.2R ²								
Subscripts L ar	Subscripts L and H are low and high; λ is wavelength.							

Table B.1—Thresholds For Single RF Sources Subject to Routine Environmental Evaluation

From §1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns.

The table applies to any RF source (i.e. single fixed, mobile, and portable transmitters) and specifies power and distance criteria for each of the five frequency ranges used for the MPE limits. These criteria apply at separation distances from any part of the radiating structure of at least $\lambda/2\pi$. The thresholds are



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based on the general population MPE limits with a single perfect reflection, outside of the reactive near-field, and in the main beam of the radiator.

For mobile devices that are not exempt per Table B.1 [Table 1 of \$1.1307(b)(1)(i)(C)] at distances from 20 cm to 40 cm and in 0.3 GHz to 6 GHz, 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); also in \$1.1307(b)(1)(i)(B)].

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

Limit calculation								
Frequency range	Frequency(MHz)	R(λ/2π)(m)	Threshold ERP(W)					
300~1500MHz	915	0.0522	0.032					
1500~100000MHz	2480	0.0193	0.007					

4.3 SAR-based Exemption

SAR-based thresholds are derived based on frequency, power, and separation distance of the RF source. The formula defines the thresholds in general for either available maximum time-averaged power or maximum time-averaged ERP, whichever is greater.

If the ERP of a device is not easily determined, such as for a portable device with a small form factor, the applicant may use the available maximum time-averaged power exclusively if the device antenna or radiating structure does not exceed an electrical length of $\lambda/4$.

As for devices with antennas of length greater than $\lambda/4$ where the gain is not well defined, but always less than that of a half-wave dipole (length $\lambda/2$), the available maximum time-averaged power generated by the device may be used in place of the maximum time-averaged ERP, where that value is not known.

The separation distance is the smallest distance from any part of the antenna or radiating structure for all persons, during operation at the applicable ERP. In the case of mobile or portable devices, the separation distance is from the outer housing of the device where it is closest to the antenna.



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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 $P_{\rm th}$ (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). Pth is given by Formula (B.2).

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

where

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

and f is in GHz, d is the separation distance (cm), and ERP_{20cm} is per Formula (B.1).



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Example values shown in Table B.2 are for illustration only.

Table B.2—Example Power Thresholds (mW)										
Frequency					Distand	ce(mm)				
(MHz)	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

Limit calculation								
Frequency range(GHz) Frequency(GHz) X Distance(cm) Pth (mW)								
0.3~1.5	0.915	1.474	0.5	8.133				
1.5~6	2.48	1.905	0.5	2.717				



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5 Measurement and Calculation

5.1 Maximum transmit power

For BT

Antenna Gain: 5.08dBi declared by applicant

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	E.I.R.P (dBm)	E.I.R.P (mW)
Highest	2480	11.68	16.76	47.42

Note: Refer to report No. GZCR211002125801 for EUT test Max Conducted Peak Output Power value.

For BLE

Antenna Gain: 5.08dBi declared by applicant

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	E.I.R.P (dBm)	E.I.R.P (mW)
Highest	2480	11.76	16.84	48.31

Note: Refer to report No. GZCR211002125802 for EUT test Max Conducted Peak Output Power value.

For 2.4G WIFI

Antenna Gain: 5.08dBi declared by applicant

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	E.I.R.P (dBm)	E.I.R.P (mW)
Lowest	2412	18.26	23.34	215.77

Note: Refer to report No. GZCR211002125803 for EUT test Max Conducted Peak Output Power value.

For 5G WIFI

Antenna Gain: 3.57dBi declared by applicant

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	E.I.R.P (dBm)	E.I.R.P (mW)
Highest	5825	15.27	18.84	76.56

Note: Refer to report No. GZCR211002125804 for EUT test Max Conducted Peak Output Power value.





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For DECT

Antenna Gain: 5.81dBi declared by applicant

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	E.I.R.P (dBm)	E.I.R.P (mW)
Middle	1924.992	19.02	24.83	304.09

Note: Refer to report No. CHTEW22110032 for EUT test Max Conducted Peak Output Power value.



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5.2 RF Exposure Calculation

Remark: we used the maximum power between the conducted power and ERP/EIRP to perform RF exposure exemption evaluation.

For BT:

The Max E.I.R.P is 47.42mW.

	Evaluation method	Exempt Limit(mW)	Verdict
	Blanket 1 mW Blanket Exemption	1mW	N/A
	MPE-based Exemption(ERP)	7mW(ERP)	N/A
\boxtimes	SAR-based Exemption(<i>P</i> th)	3060	Yes

For BLE:

The Max E.I.R.P is 48.31mW.

	Evaluation method	Exempt Limit(mW)	Verdict
	Blanket 1 mW Blanket Exemption	1mW	N/A
	MPE-based Exemption(ERP)	7mW(ERP)	N/A
\boxtimes	SAR-based Exemption(<i>P</i> th)	3060	Yes

For 2.4 WIFI transmitter:

The Max E.I.R.P is 215.77mW.

	Evaluation method	Exempt Limit(mW)	Verdict
	Blanket 1 mW Blanket Exemption	1mW	N/A
	MPE-based Exemption(ERP)	7mW(ERP)	N/A
\boxtimes	SAR-based Exemption(<i>P</i> th)	3060	Yes

For 5G WIFI transmitter:

The Max E.I.R.P is 76.56mW.

	Evaluation method	Exempt Limit(mW)	Verdict
	Blanket 1 mW Blanket Exemption	1mW	N/A
	MPE-based Exemption(ERP)	7mW(ERP)	N/A
\square	SAR-based Exemption(P_{th})	3060	Yes



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For DECT transmitter:

The Max E.I.R.P is 304.09mW.

	Evaluation method	Exempt Limit(mW)	Verdict
	Blanket 1 mW Blanket Exemption	1mW	N/A
	MPE-based Exemption(ERP)	7mW(ERP)	N/A
\boxtimes	SAR-based Exemption(<i>P</i> th)	3060	Yes

So, the device is to qualify for SAR test exemption, the exemption report is in lieu of the SAR report.

5.3 Simultaneous transmitting

 Σ rations of simultaneous transmitting: BT + WIFI + DECT as the following table:

Ratio of EIRP power of BT	Ratio of EIRP power of WIFI	Ratio of EIRP power of DECT	Total ratios of simultaneous transmitting	Limit	Result
0.016	0.071	0.099	0.186	1.0	PASS

So, the device is to qualify for SAR test exemption, the exemption report is in lieu of the SAR report.

--End of the Report--



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