FCC C2PC Test Report

FCC ID	:	**MXF-W1700K**
Equipment	:	**Wi-Fi 7 Router**
Model No.	:	**W1700K**
Brand Name	:	**Q Fiber**
Applicant	:	**Gemtek Technology Co., Ltd.**
Address	:	**No. 15-1 Zhonghua Road, Hsinchu Industrial Park, Hukou, Hsinchu, Taiwan, 30352.**
Standard	:	**47 CFR FCC Part 15.407**
Equipment Class / Type	:	**☒ 6ID: Indoor access point** **☐ 6PP: Subordinate device** **☐ 6XD: Client device**
Received Date	:	**Jun. 27, 2023**
Tested Date	:	**Aug. 01 ~ Oct. 30, 2023**

We, International Certification Corporation, would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by:	**Approved by:**
Along Chen	Gary Chang
Along Chen / Assistant Manager	**Gary Chang / Manager**

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Release Record

Report No.	Version	Description	Issued Date
FR362704-01AO	Rev. 01	Initial issue	Mar. 18, 2024

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.407(b)(5) 15.209	Unwanted Emission	[dBuV/m at 3m]: 5150.00MHz 53.85 (Margin -0.15dB) - AV	Pass
15.407(a)(5)	RF Output Power (e.i.r.p)	Max Power [dBm]: ***Non-beamforming mode*** 5925-6425MHz: 23.71 6425-6525MHz: 23.46 6525-6875MHz: 23.37 6875-7125MHz: 21.57 ***Beamforming mode*** 5925-6425MHz: 23.62 6425-6525MHz: 23.14 6525-6875MHz: 23.05 6875-7125MHz: 21.52	Pass
15.407(a)(5)	Power Spectral Density (e.i.r.p)	Meet the requirement of limit	Pass
15.407(d)(6)	Contention Based Protocol	Meet the requirement of limit	Pass

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

1 General Description

1.1 Information

This report is issued as a Class II Permissive Change. The modification is only concerned with

1. adding absorber.
2. Adding type of material (Stainless Steel) of antenna

Therefore, related test items had been performed and presented in the following sections.

1.1.1 Specification of the Equipment under Test (EUT)

RF General Information					
Frequency Range (MHz)	**IEEE Std. 802.11**	**Ch. Freq. (MHz)**	**Channel Number**	**Transmit Chains (N_{TX})**	**Data Rate / MCS**
5925 ~ 7125	11a	5955 ~ 7115	1 ~ 233 [59]	4	6-54Mbps
5925 ~ 7125	ax (HE20)	5955 ~ 7115	1 ~ 233 [59]	4	MCS 0-11
5925 ~ 7125	ax (HE40)	5965 ~ 7085	3 ~ 227 [29]	4	MCS 0-11
5925 ~ 7125	ax (HE80)	5985 ~ 7025	7 ~ 215 [14]	4	MCS 0-11
5925 ~ 7125	ax (HE160)	6025 ~ 6985	15 ~ 207 [7]	4	MCS 0-11
5925 ~ 7125	be (EHT20)	5955 ~ 7115	1 ~ 233 [59]	4	MCS 0-13
5925 ~ 7125	be (EHT 40)	5965 ~ 7085	3 ~ 227 [29]	4	MCS 0-13
5925 ~ 7125	be (EHT 80)	5985 ~ 7025	7 ~ 215 [14]	4	MCS 0-13
5925 ~ 7125	be (EHT 160)	6025 ~ 6985	15 ~ 207 [7]	4	MCS 0-13
5925 ~ 7125	be (EHT 320)	6105 ~ 6905	31 ~ 191 [6]	4	MCS 0-13
Note 1: OFDM/OFDMA-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM and 4096QAM modulation. Note 2: 802.11be supports beamforming function. Note 3: FW version for CBP: WXK001-05.01.00.00_CBP2					

1.1.2 Antenna Details

Antenna 1 ~ 4 has 2 types of material. One type is Tin Plate(Original), the other is Stainless Steel(New).
Antenna gain for type of Tin Plate

Ant. No.	Brand	Model	Type	Connector	Operating Frequencies (MHz) / Gain (dBi)			
					5925~6425	6425~6525	6525~6875	6875~7125
1	Gemtek	WAPE-269BE_6E_Ant1	PIFA	UFL	1.06	1.01	1.22	1.09
2	Gemtek	WAPE-269BE_6E_Ant2	PIFA	UFL	1.85	2.46	2.59	1.97
3	Gemtek	WAPE-269BE_6E_Ant3	PIFA	UFL	2.9	2.01	2.76	2.71
4	Gemtek	WAPE-269BE_6E_Ant4	PIFA	UFL	2.39	2.69	3.3	1.46

Antenna gain for type of Stainless Steel

Ant. No.	Brand	Model	Type	Connector	Operating Frequencies (MHz) / Gain (dBi)			
					5925~6425	6425~6525	6525~6875	6875~7125
1	Gemtek	WAPE-269BE_6E_Ant1	PIFA	UFL	1.93	1.63	2.07	1.37
2	Gemtek	WAPE-269BE_6E_Ant2	PIFA	UFL	3.15	2.11	3.23	1.68
3	Gemtek	WAPE-269BE_6E_Ant3	PIFA	UFL	3.26	2.19	3.36	2.12
4	Gemtek	WAPE-269BE_6E_Ant4	PIFA	UFL	1.93	1.52	1.12	1.21

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	12Vdc from AC adapter

1.1.4 Accessories

Accessories		
No.	**Equipment**	**Description**
1	AC adapter	Brand: LUCENT TRANS ELECTRONICS CO., LTD. Model: 1A98-LJHL I/P: 100-120V~1.6A, 50-60Hz O/P: 12V⎓5.0A, 60.0W Power Line: 1.8m non-shielded without core
2	AC adapter	Brand: LEI Model: ML60-4120500-A1 I/P: 120V~60Hz, 1.5A O/P: 12V⎓5.0A Power Line: 1.8m non-shielded without core
3	RJ45	Brand: Tung Li Line: 1.8m non-shielded without core
4	RJ45	Brand: RAPID CONN Line: 1.8m non-shielded without core
5	Fan	Brand: SUNONWEALTH ELECTRIC MACHINE INDUSTRY CO LTD Model: MF70151V1-1C010-S99
6	Fan	Brand: Yingfan Model: DB701512HMS4B01F25

1.1.5 Channel List

802.11a / ax HE20 / be EHT20							
Channel	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**
1	5955	61	6255	121	6555	181	6855
5	5975	65	6275	125	6575	185	6875
9	5995	69	6295	129	6595	189	6895
13	6015	73	6315	133	6615	193	6915
17	6035	77	6335	137	6635	197	6935
21	6055	81	6355	141	6655	201	6955
25	6075	85	6375	145	6675	205	6975
29	6095	89	6395	149	6695	209	6995
33	6115	93	6415	153	6715	213	7015
37	6135	97	6435	157	6735	217	7035
41	6155	101	6455	161	6755	221	7055
45	6175	105	6475	165	6775	225	7075
49	6195	109	6495	169	6795	229	7095
53	6215	113	6515	173	6815	233	7115
57	6235	117	6535	177	6835	---	---

802.11ax HE40 / be EHT40							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
3	5965	67	6285	131	6605	195	6925
11	6005	75	6325	139	6645	203	6965
19	6045	83	6365	147	6685	211	7005
27	6085	91	6405	155	6725	219	7045
35	6125	99	6445	163	6765	227	7085
43	6165	107	6485	171	6805	---	---
51	6205	115	6525	179	6845	---	---
59	6245	123	6565	187	6885	---	---

802.11ax HE80 / be EH80							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
7	5985	71	6305	135	6625	199	6945
23	6065	87	6385	151	6705	215	7025
39	6145	103	6465	167	6785	---	---
55	6225	119	6545	183	6865	---	---

802.11ax HE160 / be EHT160							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
15	6025	79	6345	143	6665	207	6985
47	6185	111	6505	175	6825	---	---

802.11ax HE320 / be EHT320							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
31	6105	95	6425	159	6745	---	---
63	6265	127	6585	191	6905	---	---

1.1.6 Test Tool and Duty Cycle

Test Tool	QATool, Version: 0.0.2.99		
Duty Cycle and Duty Factor	**Mode**	**Duty Cycle (%)**	**Duty Factor (dB)**
	11a	98.95%	0.05
	be EHT20-OFDMA	99.64%	0.02
	be EHT40-OFDMA	98.53%	0.06
	be EHT80-OFDMA	96.71%	0.15
	be EHT160-OFDMA	92.14%	0.36
	be EHT320-OFDMA	87.85%	0.56

1.1.7 Power Index of Test Tool

Modulation Mode	Test Frequency (MHz)	Power Index	
		Non-beamforming mode	Beamforming mode
11a	5955	3.5	---
11a	6175	3.5	---
11a	6415	4	---
11a	6435	3.5	---
11a	6475	3.5	---
11a	6515	3.5	---
11a	6535	3.5	---
11a	6715	3	---
11a	6855	3	---
11a	6875	3	---
11a	6895	3.5	---
11a	7015	4	---
11a	7095	4	---
11a	7115	4.5	---
be EHT20-OFDMA	5955	4.5	
be EHT20-OFDMA	6175	4.5	8
be EHT20-OFDMA	6415	5	9
be EHT20-OFDMA	6435	4.5	8
be EHT20-OFDMA	6475	4.5	6
be EHT20-OFDMA	6515	4.5	6
be EHT20-OFDMA	6535	4.5	6
be EHT20-OFDMA	6715	4.5	6
be EHT20-OFDMA	6855	4.5	7
be EHT20-OFDMA	6875	4	7
be EHT20-OFDMA	6895	4.5	6
be EHT20-OFDMA	7015	5	7
be EHT20-OFDMA	7095	5	7
be EHT20-OFDMA	7115	5.5	7
be EHT40-OFDMA	5965	8.5	16
be EHT40-OFDMA	6165	8.5	17
be EHT40-OFDMA	6405	9	18
be EHT40-OFDMA	6445	8	14
be EHT40-OFDMA	6485	8.5	14

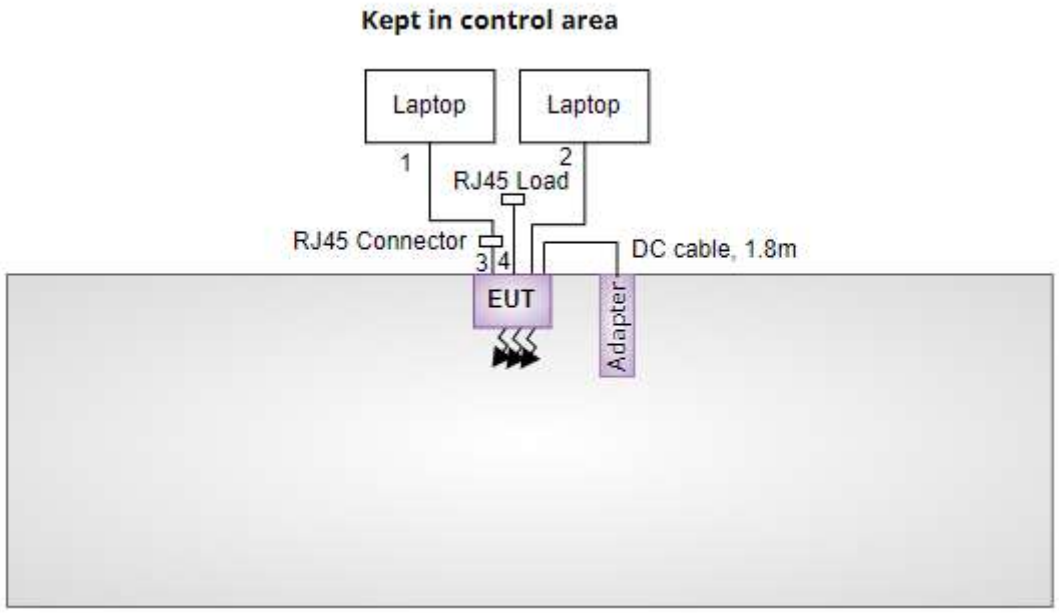
be EHT40-OFDMA	6525	8	13
be EHT40-OFDMA	6565	8.5	15
be EHT40-OFDMA	6725	8	15
be EHT40-OFDMA	6845	8.5	15
be EHT40-OFDMA	6885	8.5	15
be EHT40-OFDMA	6925	8.5	14
be EHT40-OFDMA	7005	8	14
be EHT40-OFDMA	7085	8.5	14
be EHT80-OFDMA	5985	11.5	22
be EHT80-OFDMA	6145	12	23
be EHT80-OFDMA	6385	12	23
be EHT80-OFDMA	6465	11.5	21
be EHT80-OFDMA	6545	11.5	21
be EHT80-OFDMA	6625	11.5	22
be EHT80-OFDMA	6705	11.5	22
be EHT80-OFDMA	6785	11.5	20
be EHT80-OFDMA	6865	11.5	21
be EHT80-OFDMA	6945	11.5	20
be EHT80-OFDMA	7025	11.5	21
be EHT160-OFDMA	6025	15	30
be EHT160-OFDMA	6185	15	30
be EHT160-OFDMA	6345	15	30
be EHT160-OFDMA	6505	14.5	27
be EHT160-OFDMA	6665	14.5	28
be EHT160-OFDMA	6825	14.5	26
be EHT160-OFDMA	6985	15	28
be EHT320-OFDMA	6105	18	36
be EHT320-OFDMA	6265	18	36
be EHT320-OFDMA	6425	18	34
be EHT320-OFDMA	6585	18	34
be EHT320-OFDMA	6745	18	34
be EHT320-OFDMA	6905	18	34

1.2 Local Support Equipment List

Support Equipment List					
No.	**Equipment**	**Brand**	**Model**	**FCC ID**	**Remarks**
1	RJ45 Load	ICC	--	--	---
2	RJ45 Connector	ICC	RJ45 Connector	--	---
3	Laptop	DELL	Latitude 5400	DoC	---
4	Laptop	DELL	Latitude E5470	DoC	---

1.3 Test Setup Chart

Test Setup Diagram



No.	Signal cable / Length (m)
1-2	RJ45, 10m non-shielded.
3	RJ45, 1.8m non-shielded.
4	RJ45, 1.3m(x2) non-shielded with load.

1.4 The Equipment List

Test Item	Radiated Emission below 1GHz				
Test Site	966 chamber1 / (03CH01-WS)				
Tested Date	Oct. 28 ~ Oct. 30, 2023				
Instrument	**Brand**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Receiver	R&S	ESR3	101657	Mar. 03, 2023	Mar. 02, 2024
Spectrum Analyzer	R&S	FSV40	101498	Nov. 21, 2022	Nov. 20, 2023
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 01, 2022	Oct. 31, 2023
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jul. 31, 2023	Jul. 30, 2024
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Nov. 25, 2022	Nov. 24, 2023
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170508	Dec. 30, 2022	Dec. 29, 2023
Preamplifier	EMC	EMC02325	980225	Jun. 28, 2023	Jun. 27, 2024
Preamplifier	EMC	EMC118A45SE	980898	Jul. 14, 2023	Jul. 13, 2024
Preamplifier	EMC	EMC184045SE	980903	Jul. 17, 2023	Jul. 16, 2024
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 03, 2023	Oct. 02, 2024
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Oct. 03, 2023	Oct. 02, 2024
LF cable 11M	EMC	EMCCFD400-NW-NW-11000	200801	Oct. 03, 2023	Oct. 02, 2024
LF cable 1M	EMC	EMCCFD400-NM-NM-1000	160502	Oct. 03, 2023	Oct. 02, 2024
RF Cable	EMC	EMC104-35M-35M-8000	210920	Oct. 03, 2023	Oct. 02, 2024
RF Cable	EMC	EMC104-35M-35M-3000	210922	Oct. 03, 2023	Oct. 02, 2024
Attenuator	Pasternack	PE7005-10	10-1	Oct. 05, 2023	Oct. 04, 2024
HIGHPASS FILTER 7.5-18G	STI	STI15-9722	STI-HP7.5G-A	Oct. 05, 2023	Oct. 04, 2024
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Tested Date	Aug. 01 ~ Aug. 14, 2023				
Instrument	**Brand**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101910	Apr. 14, 2023	Apr. 13, 2024
Power Meter	Anritsu	ML2495A	1241002	Nov. 23, 2022	Nov. 22, 2023
Power Sensor	Anritsu	MA2411B	1207366	Nov. 23, 2022	Nov. 22, 2023
TEMP&HUMIDITY CHAMBER	GIANT FORCE	GCT-225-40-SP-SD	MAF1212-002	Jun. 21, 2023	Jun. 20, 2024
AC POWER SOURCE	APC	AFC-500W	F312060012	Dec. 09, 2022	Dec. 08, 2023
Attenuator	Pasternack	PE7005-10	10-2	Oct. 06, 2022	Oct. 05, 2023
Measurement Software	Sporton	SENSE-15407_NII	V5.10	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	CBP (Contention Based Protocol)				
Test Site	(TH01-WS)				
Tested Date	Sep. 04 ~ Sep. 05, 2023				
Instrument	**Brand**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101910	Apr. 14, 2023	Apr. 13, 2024
AWGN Signal Gemerator	R&S	SMW200A	109619	Jul. 28, 2023	Jul. 27, 2024
Splitter	woken	0120A02201801O	DOM2AEW1A23	Oct. 13, 2022	Oct. 12, 2023
Directional Coupler	KRYTAR	180120	146890	Oct. 14, 2022	Oct. 13, 2023
RF Cable	WOKEN	woken-S05	S05-141231-110	Aug. 30, 2023	Aug. 29, 2024
RF Cable	EMC	EMC105SFF-SM-SM-2000	210816	Aug. 30, 2023	Aug. 29, 2024
RF Cable	EMC	EMC104-SM-SM-8000	181106	Aug. 30, 2023	Aug. 29, 2024
Attenuator	woken	PE7013-10	10-1	Oct. 14, 2022	Oct. 13, 2023
Attenuator	woken	PE7013-20	20-1	Oct. 14, 2022	Oct. 13, 2023
Measurement Software	NA	NA	NA	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

1.5 Test Standards

47 CFR FCC Part 15.407
ANSI C63.10-2013

1.6 Reference Guidance

FCC KDB 987594 D02 U-NII 6GHz EMC Measurement v02r01
FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01
FCC KDB 412172 D01 Determining ERP and EIRP v01r01
FCC KDB 662911 D01 Multiple Transmitter Output v02r01

1.7 Deviation from Test Standard and Measurement Procedure

None

1.8 Measurement Uncertainty

The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)).

Measurement Uncertainty	
Parameters	**Uncertainty**
Bandwidth	±34.130 Hz
Conducted power	±0.808 dB
Frequency error	$\pm 1 \times 10^{-9}$
Power density	±0.583 dB
Conducted emission	±2.715 dB
AC conducted emission	±2.92 dB
Radiated emission ≤ 1GHz	±3.41 dB
Radiated emission > 1GHz	±4.59 dB
Time	±0.1%
Temperature	±0.4 °C

2 Test Configuration

2.1 Testing Facility

Test Laboratory	International Certification Corp.
Test Site	03CH01-WS, TH01-WS
Address of Test Site	No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan District, Tao Yuan City 33381, Taiwan, R.O.C.

- FCC Designation No.: TW2732
- FCC site registration No.: 181692
- ISED#: 10807A
- CAB identifier: TW2732

2.2 Test Worst Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate	Test Configuration
Non-beamforming mode				
Unwanted Emissions ≤1GHz	be EHT320-OFDMA	6105	MCS 0	---
Unwanted Emissions >1GHz RF Output Power Power Spectral Density	11a	5955 / 6175 / 6415 / 6435 / 6475 / 6515 / 6535 / 6715 / 6855 / 6875 / 6895 / 7015 / 7095 / 7115	MCS 0	---
	be EHT20-OFDMA	5955 / 6175 / 6415 / 6435 / 6475 / 6515 / 6535 / 6715 / 6855 / 6875 / 6895 / 7015 / 7095 / 7115	MCS 0	
	be EHT40-OFDMA	5965 / 6165 / 6405 / 6445 / 6485 / 6525 / 6565 / 6725 / 6845 / 6885 / 6925 / 7005 / 7085	MCS 0	
	be EHT80-OFDMA	5985 / 6145 / 6385 / 6465 / 6545 / 6625 / 6705 / 6785 / 6865 / 6945 / 7025	MCS 0	
	be EHT160-OFDMA	6025 / 6185 / 6345 / 6505 / 6665 / 6825 / 6985	MCS 0	
	be EHT320-OFDMA	6105 / 6265 / 6425 / 6585 / 6745 / 6905	MCS 0	
Contention Based Protocol	be EHT20-OFDMA	6195 / 6475 / 6695 / 6995 /	MCS 0	---
	be EHT320-OFDMA	6105 / 6585 / 6905	MCS 0	

NOTE:

1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **Z-plane** results were found as the worst case and were shown in this report.
2. Two adapters (LUCENT TRANS ELECTRONICS CO., LTD and LEI) had been covered during the pretest, and found that **LUCENT TRANS ELECTRONICS CO., LTD** was the worst case and was selected for final test.
3. Two RJ45 cable (Tung Li and RAPID CONN) had been covered during the pretest, and found that **Tung Li adapter** was the worst case and was selected for final test.
4. Two Fan (SUNONWEALTH ELECTRIC MACHINE INDUSTRY CO LTD and Yingfan) had been covered during the pretest, and found that **Yingfan** was the worst case and was selected for final test.
5. Non-beamforming and beamforming mode had been covered during the pretest. The worst mode is Non-beamforming thus Non-beamforming is tested for all test items.

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate	Test Configuration
Beamforming mode				
RF Output Power	be EHT20-OFDMA	5955 / 6175 / 6415 / 6435 / 6475 / 6515 / 6535 / 6715 / 6855 / 6875 / 6895 / 7015 / 7095 / 7115	MCS 0	---
	be EHT40-OFDMA	5965 / 6165 / 6405 / 6445 / 6485 / 6525 / 6565 / 6725 / 6845 / 6885 /6925 / 7005 / 7085	MCS 0	
	be EHT80-OFDMA	5985 / 6145 / 6385 / 6465 / 6545 / 6625 / 6705 / 6785 / 6865 /6945 7025	MCS 0	
	be EHT160-OFDMA	6025 / 6185 / 6345 / 6505 / 6665 / 6825 / 6985	MCS 0	
	be EHT320-OFDMA	6105 / 6265 / 6425 / 6585 / 6745 / 6905	MCS 0	

NOTE:

1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **Z-plane** results were found as the worst case and were shown in this report.
2. Two adapters (LUCENT TRANS ELECTRONICS CO., LTD and LEI) had been covered during the pretest, and found that **LUCENT TRANS ELECTRONICS CO., LTD** was the worst case and was selected for final test.
3. Two RJ45 cable (Tung Li and RAPID CONN) had been covered during the pretest, and found that **Tung Li adapter** was the worst case and was selected for final test.

3 Transmitter Test Results

3.1 RF Output Power

3.1.1 Limit

Frequency Band	Operating Mode	Maximum EIRP Limit
5925 ~ 7125 MHz	☒ Indoor access point	30 dBm
	☐ Subordinate device	30 dBm
	☐ Client devices	24 dBm

3.1.2 Test Procedures

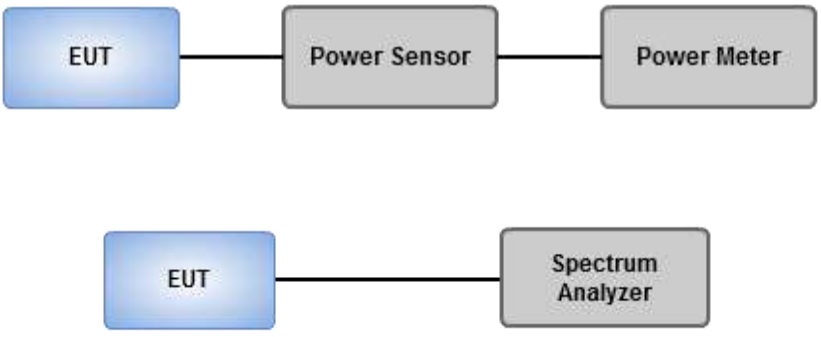
Method PM-G (Measurement using a gated RF average power meter)

1. Measurements is performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.
2. EIRP = Measured conducted power + Antenna gain

Spectrum analyzer (For channel that extends across the 6.525 / 6.875 GHz boundary)

1. Set RBW = 1MHz, VBW = 3MHz, Sweep time = Auto, Detector = RMS.
2. Trace average at least 100 traces in power averaging mode.
3. Compute power by integrating the spectrum across the 26 dB EBW.
4. Add 10 log(1/X, X:duty cycle) if duty cycle is <98%).
5. EIRP = Measured conducted power + Antenna gain

3.1.3 Test Setup



3.1.4 Test Result

Ambient Condition	23-26°C / 66-68%	Tested By	Roger Lu

Refer to Appendix A.

3.2 Power Spectral Density

3.2.1 Limit

Frequency Band	Operating Mode	Limit
5925 ~ 7125 MHz	☒ Indoor access point	EIRP: 5 dBm / 1 MHz
	☐ Subordinate device	EIRP: 5 dBm / 1 MHz
	☐ Client devices	EIRP: -1 dBm / 1 MHz

3.2.2 Test Procedures

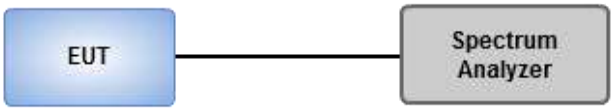
Duty cycle ≥ 98 %

1. Set RBW = 1 MHz, VBW = 3 MHz, Sweep time = auto, Detector = RMS.
2. Trace average 100 traces.
3. Use the peak marker function to determine the maximum amplitude level.
4. EIRP PSD = Measured conducted power density + Antenna gain

Duty cycle < 98 %

1. Set RBW = 1 MHz, VBW = 3 MHz, Detector = RMS.
2. Set sweep time ≥ 10 * (number of points in sweep) * (total on/off period of the transmitted signal).
3. Perform a single sweep.
4. Use the peak marker function to determine the maximum amplitude level.
5. Add 10 log(1/x), where x is the duty cycle.
6. EIRP PSD = Measured conducted power density + Antenna gain

3.2.3 Test Setup



3.2.4 Test Result

Ambient Condition	23-26°C / 66-68%	Tested By	Roger Lu

Refer to Appendix B.

3.3 Unwanted Emissions

3.3.1 Limit of Unwanted Emissions

Restricted Band Emissions Limit			
Frequency Range (MHz)	**Field Strength (uV/m)**	**Field Strength (dBuV/m)**	**Measure Distance (m)**
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1:
Qusai-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit
Note 2:
Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

Un-restricted band emissions above 1GHz Limit		
Operating Band	**PK Limit**	**AV Limit**
5.925 – 7.125 GHz	e.i.r.p. -7 dBm [88.2 dBuV/m@3m]	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]

Note 1: Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

3.3.2 Test Procedures

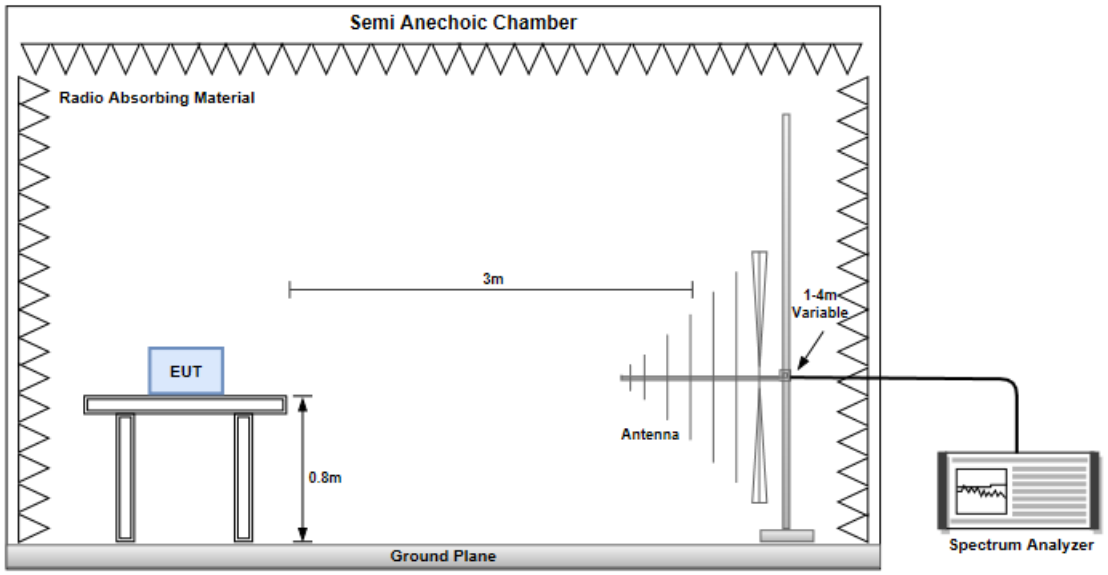
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at test table. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

Note:

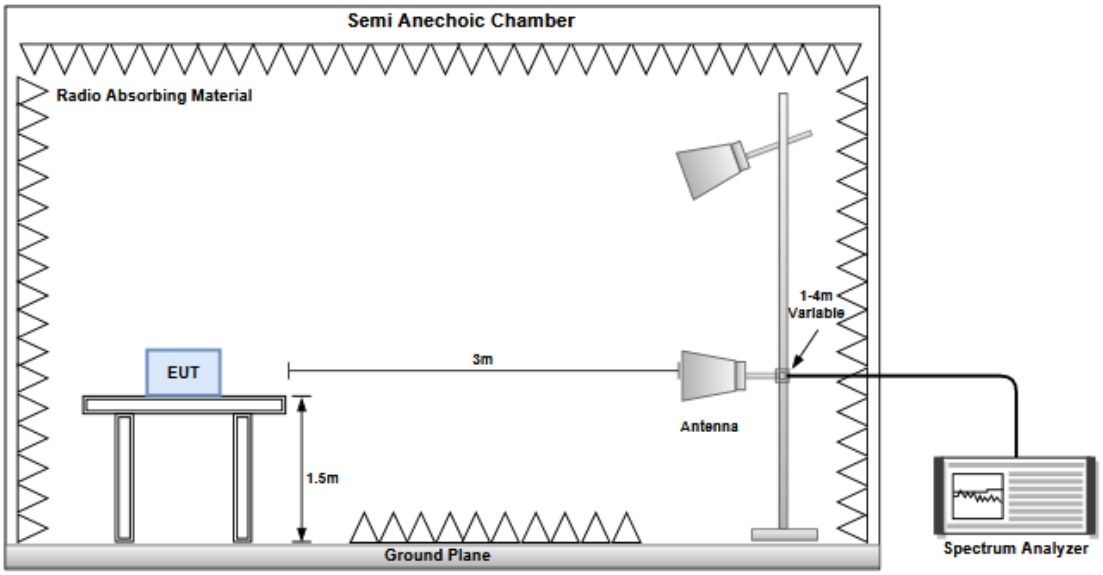
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above 1GHz.

3.3.3 Test Setup

Radiated Emissions below 1 GHz



Radiated Emissions above 1 GHz



3.3.4 Test Results

Refer to Appendix C.

3.4 Contention Based Protocol

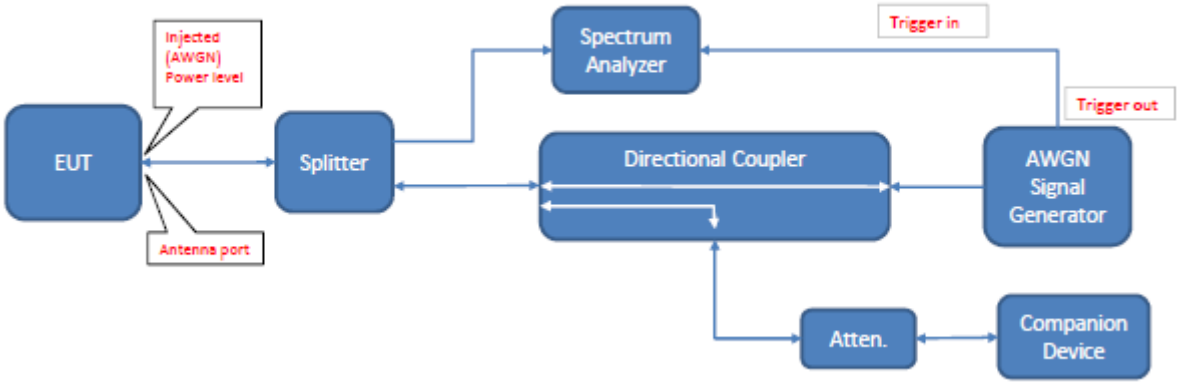
3.4.1 Limit

Unlicensed low-power indoor devices must detect co-channel radio frequency power that is at least -62 dBm or lower. The -62 dBm (or lower) threshold is referenced to a 0 dBi antenna gain. Additionally, low-power indoor devices must detect co-channel energy with 90% or greater certainty

3.4.2 Test Procedure

1. Configure the EUT to transmit with a constant duty cycle
2. Set the operating parameters of the EUT including power level, operating frequency, modulation and bandwidth
3. Set the signal analyzer center frequency to the nominal EEUT channel center frequency. The span range of the signal analyzer shall be between two times and five times the OBW of the EUT. Connect the output port of the EUT to the signal analyzer 2, as shown in Figure 2. Ensure that the attenuator 2 provides enough attenuation to not overload the signal analyzer 2 receiver.
4. Monitoring the signal analyzer 2, verify the EUT is operating and transmitting with the parameters set at step two.
5. Using an AWGN signal source, generate (but do not transmit, i.e., RF OFF) a 10 MHz-wide AWGN signal. Use Table 1 to determine the center frequency of the 10 MHz AWGN signal relative to the EUT's channel bandwidth and center frequency.
6. Set the AWGN signal power to an extremely low level (more than 20 dB below the -62 dBm threshold). Connect the AWGN signal source, via a 3-dB splitter, to the signal analyzer 1 and the EUT as shown in Figure 2
7. Transmit the AWGN signal (RF ON) and verify its characteristics on the signal analyzer 1.
8. Monitor the signal analyzer 2 to verify if the AWGN signal has been detected and the EUT has ceased transmission. If the EUT continues to transmit, then incrementally increase the AWGN signal power level until the EUT stops transmitting.
9. (Including all losses in the RF paths) Determine and record the AWGN signal power level (at the EUT's antenna port) at which the EUT ceased transmission. Repeat the procedure at least 10 times to verify the EUT can detect an AWGN signal with 90% (or better) level of certainty.
10. Refer to Table 1 to determine number of times the detection threshold testing needs to be repeated. If testing is required more than once, then go back to step 5, choose a different center frequency for the AWGN signal and repeat the process.

3.4.3 Test Setup



3.4.4 Test Result

Ambient Condition	24~25°C / 65~67%	Tested By	Aska Huang

Refer to Appendix D.

4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corporation (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website http://www.icertifi.com.tw.

Linkou

Tel: 886-2-2601-1640

No.30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei City, Taiwan (R.O.C.)

Kwei Shan

Tel: 886-3-271-8666

No.3-1, Lane 6, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)

No.2-1, Lane 6, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)

Kwei Shan Site II

Tel: 886-3-271-8640

No.14-1, Lane 19, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)

If you have any suggestion, please feel free to contact us as below information.

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