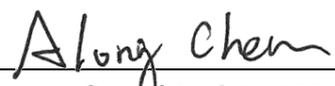


FCC C2PC Test Report

FCC ID : MXF-WLTGG12248H
Equipment : WLTGG-122 LTE Cat 12 B48 HE Outdoor CPE
Model No. : WLTGG-122-HGA_48
Brand Name : Gemtek
Multiple Listing : Refer to item 1.1.1 for more details.
Applicant : Gemtek Technology Co., Ltd.
Address : No. 15-1 Zhonghua Road, Hsinchu Industrial
Park, Hukou, Hsinchu, Taiwan, 30352.
Standard : 47 CFR FCC Part 96
Type : End User Device
 Category A CBSD
 Category B CBSD
 CPE-CBSD
Received Date : Aug. 06, 2020
Tested Date : Aug. 11, 2020

We, International Certification Corp., 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 may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by:


Along Chen / Assistant Manager

Approved by:

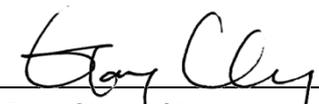

Gary Chang / Manager



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Release Record

Report No.	Version	Description	Issued Date
FG990205-01	Rev. 01	Initial issue	Sep. 04, 2020

Summary of Test Results

FCC Rules	Test Items	Measured	Result
2.1053 / 96.41(e)	Radiated Spurious Emission	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 is a Class II Permissive Change report (C2PC).

This report is issued as a supplementary report to original ICC report no. FG990205. The modification is only concerned with following item:

- ✧ Removed components of GPS function

1.1.1 Product Details

The following models are provided to this EUT.

Brand Name	Model Name	Product Name	Description
Gemtek	WLTGG-122-HGA_48	WLTGG-122 LTE Cat 12 B48 HE Outdoor CPE	with 16dBi antenna
	WLTGG-122_48		with 13dBi antenna
BLiNQ	FWC-122HG-35	WLTGG-122-HGA	with 16dBi antenna
	FWC-122-35	WLTGG-122	with 13dBi antenna
<ul style="list-style-type: none"> ✦ All models are electrically identical except antenna, different model names are for applied antenna and marketing purpose. ✦ The above models, model WLTGG-122-HGA_48 with highest gain was selected as a representative one for the final test and only its data was recorded in this report. 			

1.1.2 Specification of the Equipment under Test (EUT)

Operating Band	Band 48 Channel Bandwidth: 10MHz: 3555.0 MHz ~ 3695.0 MHz Channel Bandwidth: 20MHz: 3560.0 MHz ~ 3690.0 MHz
Modulation Type	QPSK, 16QAM, 64QAM (Uplink) QPSK, 16QAM, 64QAM, 256QAM (Downlink)
Duplex Mode	TDD
UE Category	Cat. 12
Release	12
TX/RX function	2TX / 4RX
CA Type	Intra-Band Non-Contiguous CA

1.1.3 Antenna Details

Two sets of antenna are provided for this device.

Ant.	Type	Connector	Gain (dBi)	Remark	Antenna Polarization
1	Patch	UFL	15.49	Black (TX)	- 45 degree
2	Patch	UFL	15.31	Blue (TX)	+ 45 degree
3	Patch	UFL	15.89	Gray	- 45 degree
4	Patch	UFL	15.39	Red	+ 45 degree
1	Patch	UFL	12.77	A1 (Black) (TX)	+ 45 degree
2	Patch	UFL	12.34	A2 (Blue) (TX)	- 45 degree
3	Patch	UFL	12.51	A3 (Blue)	- 45 degree
4	Patch	UFL	12.77	A4 (Black)	+ 45 degree

1.1.4 EUT Operational Condition

Supply Voltage	56Vdc from POE
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1.1.5 Accessories

Accessories		
No.	Equipment	Description
1	POE	Brand: SHENZHEN FRECOM Model: PGOC24D01-560027 I/P: 100-240Vac, 50/60Hz, 0.7A Max O/P: 56Vdc, 0.27A Power Line: 0.72m non-shielded without core
2	RJ45 Cable	1.45m non-shielded without core

1.1.6 Operating Channel List

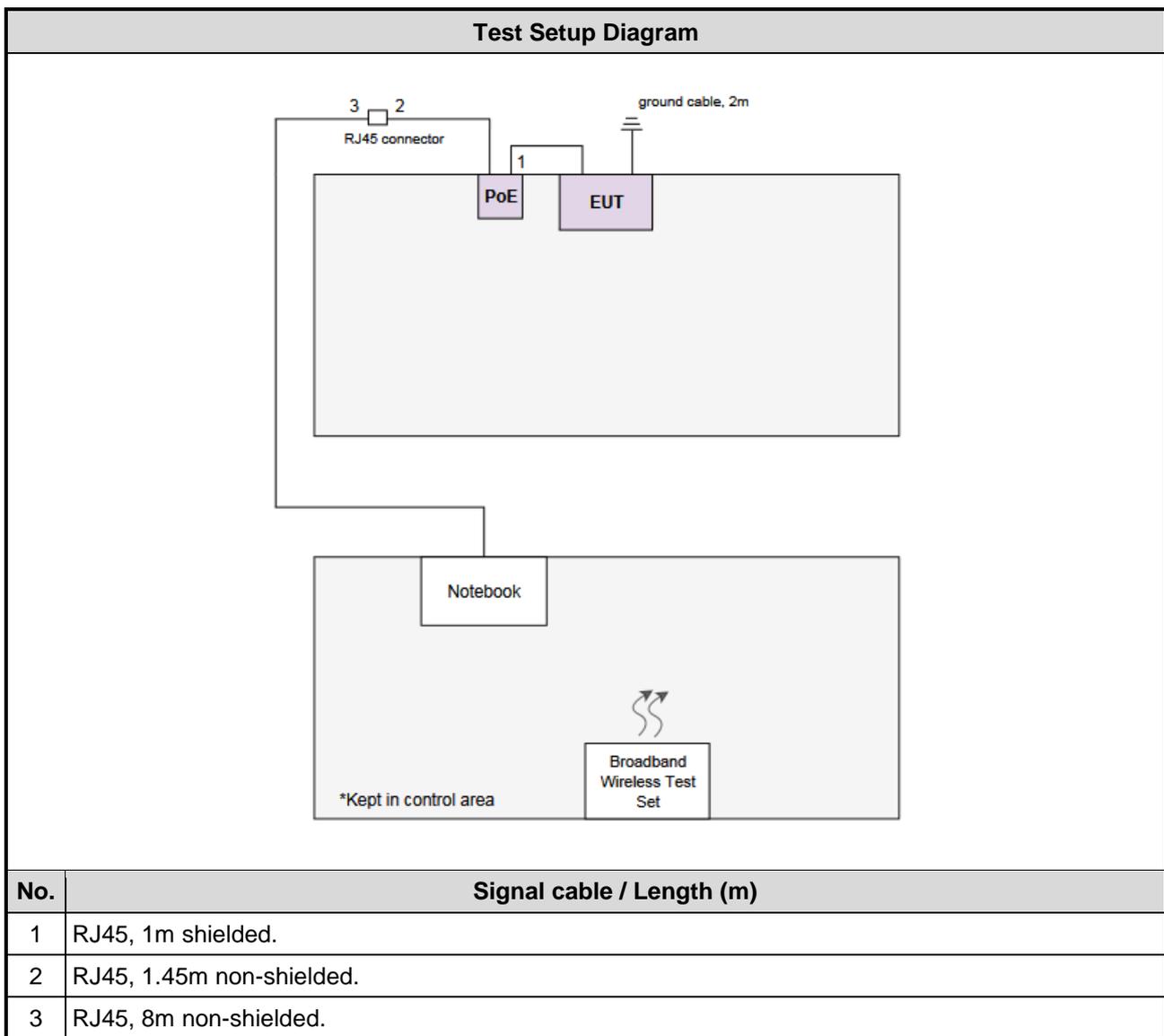
CDD Mode		
Channel Bandwidth (MHz)	Channel	Frequency (MHz)
10	55290	3555.0
10	55990	3625.0
10	56690	3695.0
20	55340	3560.0
20	55990	3625.0
20	56640	3690.0

CA Mode		
Channel Bandwidth (MHz)	Test Channel	Frequency (MHz)
10+10	55290+56690	3555.0+3695.0
10+20	55290+56640	3555.0+3690.0
20+10	55340+56690	3560.0+3695.0
20+20	55340+56640	3560.0+3690.0

1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Remarks
1	Notebook	DELL	Latitude E5470	DoC	---

1.3 Test Setup Chart



1.4 The Equipment List

Test Item	Radiated Emission				
Test Site	966 chamber1 / (03CH01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101498	Dec. 17, 2019	Dec. 16, 2020
Receiver	R&S	ESR3	101657	Feb. 14, 2020	Feb. 13, 2021
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jul. 10, 2020	Jul. 09, 2021
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Dec. 12, 2019	Dec. 11, 2020
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 15, 2019	Nov. 14, 2020
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 13, 2019	Nov. 12, 2020
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 07, 2019	Oct. 06, 2020
Preamplifier	EMC	EMC02325	980225	Jul. 03, 2020	Jul. 02, 2021
Preamplifier	Agilent	83017A	MY39501308	Oct. 08, 2019	Oct. 07, 2020
Preamplifier	EMC	EMC184045B	980192	Jul. 21, 2020	Jul. 20, 2021
RF Cable	EMC	EMC104-SM-SM-80 00	181106	Oct. 07, 2019	Oct. 06, 2020
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Oct. 07, 2019	Oct. 06, 2020
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Oct. 07, 2019	Oct. 06, 2020
LF cable 1M	EMC	EMCCFD400-NM-N M-1000	160502	Oct. 07, 2019	Oct. 06, 2020
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Oct. 07, 2019	Oct. 06, 2020
LF cable 10M	Woken	CFD400NL-LW	CFD400NL-002	Oct. 07, 2019	Oct. 06, 2020
Measurement Software	AUDIX	e3	6.120210g	NA	NA

Note: Calibration Interval of instruments listed above is one year.

1.5 Test Standards

According to the specification of EUT, the EUT must comply with following standards.

47 CFR FCC Part 96

ANSI C63.26-2015

FCC KDB 971168 D01 Power Meas License Digital Systems v03r01

1.6 Reference Guidance

FCC KDB 412172 D01 Determining ERP and EIRP v01r01

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
Radiated emission \leq 1GHz	± 3.41 dB
Radiated emission $>$ 1GHz	± 4.59 dB

2 Test Configuration

2.1 Testing Condition and Location Information

Test Item	Test Site	Ambient Condition	Tested By
Radiated Emissions	03CH01-WS	24°C / 66%	Akun Chung

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

2.2 Testing Facility

Test Laboratory	International Certification Corp.
Test Site	03CH01-WS
Address of Test Site	No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C.

2.3 The Worst Test Modes and Channel Details

CDD Mode			
Test item	Channel Bandwidth	Modulation	Test channel (MHz)
Radiated Emissions ≤ 1GHz	10MHz	QPSK	3625.0
	20MHz	QPSK	3625.0
Radiated Emissions > 1GHz	10MHz	QPSK	3695.0

CA Mode			
Test item	Channel Bandwidth	Modulation	Test channel (MHz)
Radiated Emission ≤ 1GHz	10MHz+10MHz	64QAM	3555.0+3695.0
	10MHz+20MHz	64QAM	3555.0+3690.0
	20MHz+10MHz	64QAM	3560.0+3695.0
	20MHz+20MHz	64QAM	3560.0+3690.0
Radiated Emission > 1GHz	20MHz+20MHz	64QAM	3560.0+3690.0

3 Test Results

3.1 Radiated Emissions

3.1.1 Limit of Radiated Emissions

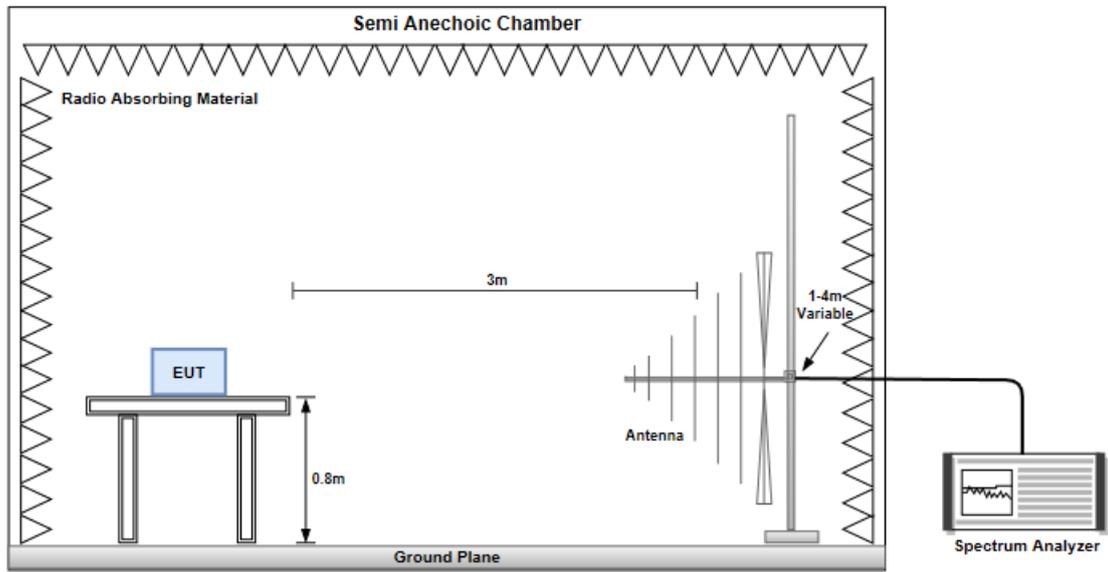
Frequency range	Limit (dBm/MHz)
Within 0-10 MHz above the Assigned Channel Within 0-10 MHz below the assigned Channel	-13
Greater than 10 MHz above the Assigned Channel Greater than 10 MHz below the Assigned Channel	-25
Power of any Emission below 3530 MHz Power of any Emission above 3720 MHz	-40

3.1.2 Test Procedures

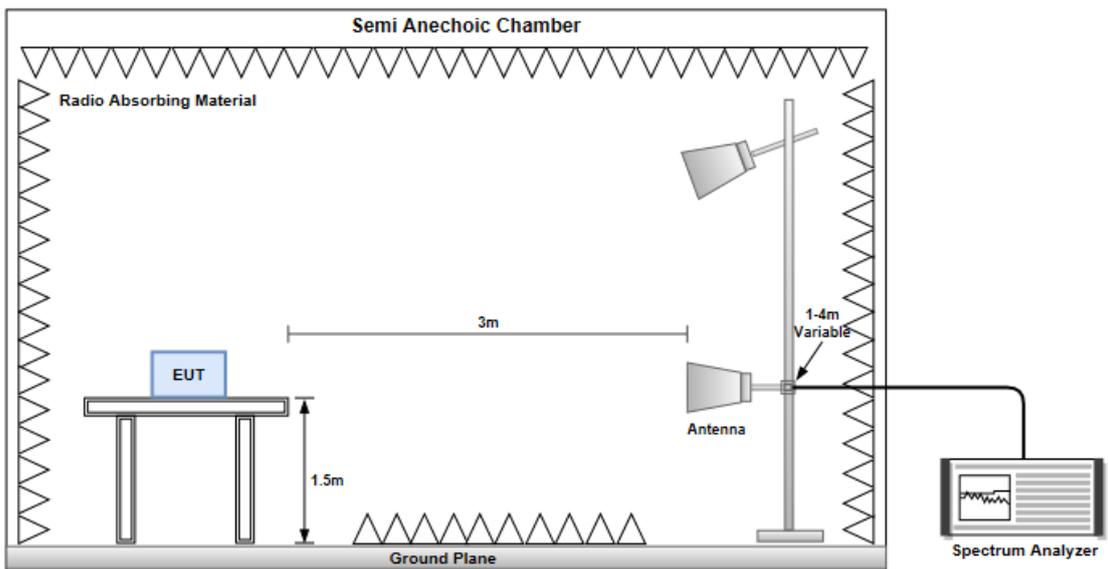
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. 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.
4. After finding the max radiated emission, substitution method will be used for getting effective radiated power. EUT will be removed and substitution antenna will be placed at same position. Signal generator will output CW signal to substitution antenna through a RF cable. Rotate turntable and move antenna to find maximum radiated emission. Adjust output power of signal generator to let the maximum radiated emission is same as step 3. Record the output power level.
5. E.I.R.P = output power of step 4 + gain of substitution antenna – cable loss of RF cable. ERP can be calculated by below formula:

3.1.3 Test Setup

Radiated Emissions below 1 GHz



Radiated Emissions above 1 GHz



3.1.4 Test Result of Radiated Emissions below 1GHz (CDD Mode)

Mode							
LTE Band 48, QPSK, CB:10 MHz, 50 RB Offset 0, Channel: 55990							
Frequency (MHz)	Antenna Polarity	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
30.00	H	-56.28	-40.00	-16.28	-64.51	-36.83	-19.45
36.79	H	-65.71	-40.00	-25.71	-72.75	-47.71	-18.00
67.83	H	-69.22	-40.00	-29.22	-67.85	-57.94	-11.28
94.99	H	-66.67	-40.00	-26.67	-64.83	-61.71	-4.96
102.75	H	-68.96	-40.00	-28.96	-67.04	-63.80	-5.16
149.31	H	-72.38	-40.00	-32.38	-71.64	-65.85	-6.53
30.00	V	-54.34	-40.00	-14.34	-49.40	-34.89	-19.45
36.79	V	-59.67	-40.00	-19.67	-55.39	-41.67	-18.00
50.37	V	-58.37	-40.00	-18.37	-56.08	-42.34	-16.03
93.05	V	-61.09	-40.00	-21.09	-58.66	-56.15	-4.94
156.10	V	-59.77	-40.00	-19.77	-61.96	-53.40	-6.37
207.51	V	-68.58	-40.00	-28.58	-68.39	-65.91	-2.67

NOTE: EIRP = S.G power value + correction factor

Mode							
LTE Band 48, QPSK, CB:20 MHz, 100 RB Offset 0, Channel: 55990							
Frequency (MHz)	Antenna Polarity	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
30.00	H	-56.55	-40.00	-16.55	-64.78	-37.10	-19.45
36.79	H	-66.40	-40.00	-26.40	-73.44	-48.40	-18.00
66.86	H	-69.25	-40.00	-29.25	-68.15	-57.65	-11.60
94.99	H	-65.85	-40.00	-25.85	-64.01	-60.89	-4.96
149.31	H	-74.90	-40.00	-34.90	-74.16	-68.37	-6.53
315.18	H	-71.88	-40.00	-31.88	-71.50	-70.66	-1.22
30.00	V	-55.17	-40.00	-15.17	-50.23	-35.72	-19.45
36.79	V	-62.57	-40.00	-22.57	-58.29	-44.57	-18.00
54.25	V	-63.79	-40.00	-23.79	-61.36	-48.64	-15.15
90.14	V	-63.17	-40.00	-23.17	-60.83	-58.26	-4.91
454.86	V	-70.25	-40.00	-30.25	-73.90	-68.94	-1.31
746.83	V	-64.55	-40.00	-24.55	-74.43	-62.47	-2.08

NOTE: EIRP = S.G power value + correction factor

3.1.5 Test Result of Radiated Emissions above 1GHz (CDD Mode)

Mode	LTE Band 48, QPSK, CB:10 MHz, 50 RB Offset 0, Channel: 56690						
Frequency (MHz)	Antenna Polarity	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
7250.00	H	-42.51	-40.00	-2.51	-62.29	-46.06	3.55
10875.00	H	-48.78	-40.00	-8.78	-71.25	-49.77	0.99
7250.00	V	-42.20	-40.00	-2.20	-63.08	-45.75	3.55
10875.00	V	-49.40	-40.00	-9.40	-71.55	-50.39	0.99

NOTE: EIRP = S.G power value + correction factor

3.1.6 Test Result of Radiated Emissions below 1GHz (CA Mode)

Mode							
LTE Band 48, 64QAM, CB:10+10 MHz, 50+50 RB Offset 0, Channel: 55290+56690							
Frequency (MHz)	Antenna Polarity	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
30.00	H	-56.97	-40.00	-16.97	-65.20	-37.52	-19.45
74.62	H	-65.61	-40.00	-25.61	-63.07	-56.59	-9.02
154.16	H	-65.00	-40.00	-25.00	-64.24	-58.59	-6.41
210.42	H	-69.58	-40.00	-29.58	-64.25	-67.01	-2.57
249.22	H	-72.16	-40.00	-32.16	-69.01	-70.87	-1.29
288.99	H	-68.85	-40.00	-28.85	-67.11	-67.58	-1.27
30.00	V	-54.35	-40.00	-14.35	-49.41	-34.90	-19.45
45.52	V	-56.67	-40.00	-16.67	-53.87	-39.84	-16.83
94.99	V	-62.14	-40.00	-22.14	-59.65	-57.18	-4.96
149.31	V	-65.45	-40.00	-25.45	-67.34	-58.92	-6.53
174.53	V	-66.17	-40.00	-26.17	-68.10	-60.99	-5.18
205.57	V	-64.40	-40.00	-24.40	-64.11	-61.66	-2.74

NOTE: EIRP = S.G power value + correction factor

Mode							
LTE Band 48, QPSK, CB:10+20 MHz, 50+100 RB Offset 0, Channel: 55290+56640							
Frequency (MHz)	Antenna Polarity	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
30.06	H	-56.52	-40.00	-16.52	-64.74	-37.08	-19.44
38.66	H	-66.59	-40.00	-26.59	-73.41	-48.82	-17.77
45.48	H	-68.80	-40.00	-28.80	-75.01	-51.97	-16.83
95.77	H	-66.25	-40.00	-26.25	-64.42	-61.28	-4.97
160.48	H	-72.84	-40.00	-32.84	-72.00	-66.61	-6.23
315.33	H	-72.25	-40.00	-32.25	-71.87	-71.04	-1.21
30.22	V	-54.45	-40.00	-14.45	-49.53	-35.05	-19.40
54.33	V	-65.88	-40.00	-25.88	-63.45	-50.75	-15.13
81.23	V	-68.77	-40.00	-28.77	-67.86	-61.80	-6.97
91.85	V	-63.30	-40.00	-23.30	-60.91	-58.37	-4.93
135.88	V	-68.85	-40.00	-28.85	-70.06	-62.23	-6.62
159.22	V	-70.52	-40.00	-30.52	-72.85	-64.23	-6.29

NOTE: EIRP = S.G power value + correction factor

Mode	LTE Band 48, 64QAM, CB:20+10 MHz, 100+50 RB Offset 0, Channel: 55340+56690						
Frequency (MHz)	Antenna Polarity	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
30.00	H	-56.46	-40.00	-16.46	-64.69	-37.01	-19.45
38.73	H	-66.50	-40.00	-26.50	-73.32	-48.74	-17.76
45.52	H	-69.47	-40.00	-29.47	-75.67	-52.64	-16.83
95.96	H	-67.81	-40.00	-27.81	-65.98	-62.84	-4.97
160.95	H	-73.83	-40.00	-33.83	-72.95	-67.63	-6.20
315.18	H	-72.59	-40.00	-32.59	-72.21	-71.37	-1.22
30.00	V	-54.36	-40.00	-14.36	-49.42	-34.91	-19.45
54.25	V	-66.39	-40.00	-26.39	-63.96	-51.24	-15.15
80.44	V	-69.81	-40.00	-29.81	-69.17	-62.66	-7.15
92.08	V	-64.19	-40.00	-24.19	-61.78	-59.26	-4.93
136.70	V	-69.44	-40.00	-29.44	-70.70	-62.80	-6.64
159.01	V	-71.45	-40.00	-31.45	-73.77	-65.16	-6.29

NOTE: EIRP = S.G power value + correction factor

Mode	LTE Band 48, 64QAM, CB:20+20 MHz, 100+100 RB Offset 0, Channel: 55340+56640						
Frequency (MHz)	Antenna Polarity	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
30.00	H	-58.00	-40.00	-18.00	-66.23	-77.45	19.45
36.79	H	-64.97	-40.00	-24.97	-72.01	-46.97	-18.00
54.25	H	-70.31	-40.00	-30.31	-72.98	-55.16	-15.15
66.86	H	-70.06	-40.00	-30.06	-68.96	-58.46	-11.60
92.08	H	-68.61	-40.00	-28.61	-66.16	-63.68	-4.93
159.01	H	-74.81	-40.00	-34.81	-74.81	-68.52	-6.29
30.00	V	-54.44	-40.00	-14.44	-49.50	-34.99	-19.45
36.79	V	-61.94	-40.00	-21.94	-57.66	-43.94	-18.00
54.25	V	-63.63	-40.00	-23.63	-61.20	-48.48	-15.15
90.14	V	-63.63	-40.00	-23.63	-61.29	-58.72	-4.91
139.61	V	-73.10	-40.00	-33.10	-74.54	-66.35	-6.75
279.29	V	-70.24	-40.00	-30.24	-72.01	-68.97	-1.27

NOTE: EIRP = S.G power value + correction factor

3.1.7 Test Result of Radiated Emissions above 1GHz (CA Mode)

Mode							
LTE Band 48, 64QAM, CB:20+20 MHz, 100+100 RB Offset 0, Channel: 55340+56640							
Frequency (MHz)	Antenna Polarity	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
7120.00	H	-47.52	-40.00	-7.52	-66.29	-51.38	3.86
7380.00	H	-46.65	-40.00	-6.65	-65.85	-49.74	3.09
10680.00	H	-45.31	-40.00	-5.31	-67.85	-45.96	0.65
11070.00	H	-44.48	-40.00	-4.48	-67.22	-45.08	0.60
7120.00	V	-44.07	-40.00	-4.07	-63.94	-47.93	3.86
7380.00	V	-44.16	-40.00	-4.16	-63.96	-47.25	3.09
10680.00	V	-46.00	-40.00	-6.00	-67.88	-46.65	0.65
11070.00	V	-44.89	-40.00	-4.89	-67.99	-45.49	0.60

NOTE: EIRP = S.G power value + correction factor

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 Corp (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

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

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