Partial FCC Test Report
(Part 22 – CA mode (LTE Band 5B))

Report No.:	RFCDVB-WTW-P22100073-7
FCC ID:	QYLLN920V
Test Model:	LN920A12-WW
Received Date:	Oct. 11, 2022
Test Date:	Dec. 30, 2022
Issued Date:	Jan. 11, 2023
Applicant:	Getac Technology Corporation.
Address:	5F., Building A, No. 209, Sec.1, Nangang Rd., Nangang Dist., Taipei City 11568, Taiwan, R.O.C.
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location (1):	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan
FCC Registration / Designation Number:	788550 / TW0003
Test Location (2):	No. 70, Wenming Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)
FCC Registration / Designation Number:	281270 / TW0032

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Release Control Record

Issue No.	Description	Date Issued
RFCDVB-WTW-P22100073-7	Original release	Jan. 11, 2023

1 Certificate of Conformity

Product:	Radio Module
Brand:	Getac
Test Model:	LN920A12-WW
Sample Status:	Engineering sample
Applicant:	Getac Technology Corporation.
Test Date:	Dec. 30, 2022
Standards:	FCC Part 22, Subpart H

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : Celine Chou , **Date:** Jan. 11, 2023

Celine Chou / Senior Specialist

Approved by : Jeremy Lin , **Date:** Jan. 11, 2023

Jeremy Lin / Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 22 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 22.913 (a)	Effective radiated power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	N/A	Refer to Note
22.913 (d)	Peak To Average Ratio	N/A	Refer to Note
2.1055 22.355	Frequency Stability	N/A	Refer to Note
2.1049	Occupied Bandwidth	N/A	Refer to Note
22.917	Band Edge Measurements	N/A	Refer to Note
2.1051 22.917	Conducted Spurious Emissions	N/A	Refer to Note
2.1053 22.917	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -25.82dB at 30.00MHz.

Note:

1. This report is a Class II change partial report. Therefore, only test item of Radiated Spurious Emissions tests and Effective Radiated Power were performed for this report. Other testing data please refer to SGS Taiwan Ltd. report no.: TERF2206000797ER for module (Brand: Telit, Model: LN920A12-WW).
2. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.00 dB
	30MHz ~ 200MHz	2.91 dB
	200MHz ~1000MHz	2.93 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	1.76 dB
	18GHz ~ 40GHz	1.77 dB

2.2 Modification Record

There were no modifications required for compliance.

2.3 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver R&S	ESR3+	102782	Dec. 12, 2022	Dec. 11, 2023
Spectrum Analyzer R&S	FSW43	101866	Jan. 14, 2022	Jan. 13, 2023
Loop Antenna TESEQ	HLA 6121	45745	Jul. 27, 2022	Jul. 26, 2023
Pre-amplifier EMCI	EMC001340	980201	Sep. 23, 2022	Sep. 22, 2023
RF Coaxial Cable EMCI	5D-NM-BM	140903+140902	Jan. 15, 2022	Jan. 14, 2023
Preamplifier EMCI	EMC330N	980782	Jan. 17, 2022	Jan. 16, 2023
BILOG Antenna SCHWARZBECK	VULB9168	9168-1213	Oct. 20, 2022	Oct. 19, 2023
RF Coaxial Cable EMCI	EMCCFD400-NM-NM-500	201233	Jan. 17, 2022	Jan. 16, 2023
RF Coaxial Cable EMCI	EMCCFD400-NM-NM-3000	201235	Jan. 17, 2022	Jan. 16, 2023
RF Coaxial Cable EMCI	EMCCFD400-NM-NM-9000	201236	Jan. 17, 2022	Jan. 16, 2023
HORN Antenna RF SPIN	DRH18-E	210103A18E	Nov. 13, 2022	Nov. 12, 2023
Preamplifier EMCI	EMC118A45SE	980808	Dec. 29, 2022	Dec. 28, 2023
RF Coaxial Cable EMCI	EMC104-SM-SM-1000	210102	Jan. 17, 2022	Jan. 16, 2023
RF Coaxial Cable EMCI	EMC104-SM-SM-3000	201231	Jan. 17, 2022	Jan. 16, 2023
RF Coaxial Cable EMCI	EMC104-SM-SM-9000	201243	Jan. 17, 2022	Jan. 16, 2023
Preamplifier EMCI	EMC184045SE	980788	Jan. 17, 2022	Jan. 16, 2023
HORN Antenna SCHWARZBECK	BBHA 9170	9170-1049	Nov. 13, 2022	Nov. 12, 2023
RF signal cable EMCI	EMC101G-KM-KM-5000	201260	Jan. 17, 2022	Jan. 16, 2023
RF signal cable EMCI	EMC101G-KM-KM-3000	201257	Jan. 17, 2022	Jan. 16, 2023
RF signal cable EMCI	EMC101G-KM-KM-2000	201254	Jan. 17, 2022	Jan. 16, 2023
Software BV ADT	ADT_Radiated_V7.6.15.9.5	NA	NA	NA
Antenna Tower &Turn Max-Full	MFT-151SS-0.5T	NA	NA	NA
Turn Table Max-Full	MF-7802BS	NA	NA	NA
Turn Table Controller Max-Full	MF-7802BS	MF780208674	NA	NA
Turn Table Controller Max-Full	MF-7802BS	MF780208674	NA	NA

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Radio Communication Analyzer Anritsu	MT8820C	6201300640	Aug. 26, 2021	Aug. 22, 2023

Note: 1. The calibration interval of the above test instruments is 12/24 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in WM - 966 chamber 8.

3 General Information

3.1 General Description of EUT

Product	Radio Module			
Brand	Getac			
Test Model	LN920A12-WW			
Sample Status	Engineering sample			
Power Supply Rating	3.3Vdc			
Modulation Type	QPSK, 16QAM, 64QAM			
Operating Frequency	LTE Band 5B	829.0 MHz ~ 844.0MHz		
Max. ERP Power		QPSK	16QAM	64QAM
	LTE Band 5B (10MHz + 10MHz)	92.045mW (19.64dBm)	70.146mW (18.46dBm)	60.256mW (17.80dBm)
Antenna Type	Refer to Note as below			
Antenna Connector	Refer to Note as below			
Accessory Device	NA			
Cable Supplied	NA			

Note:

1. The EUT is authorized for use in specific End-product.

Product	Brand	Model	Difference
Notebook	Getac	V110	For marketing purpose
		V110G7	
		V110Y (Y= 10 characters, Y can be 0 to 9, A to Z, a to z, "/", "\", "-", "_" or blank)	

* The model of the V110G7 was chosen for final test.

2. The End-product contains following accessory devices.

Part	Brand	Model	Specification
Adapter 1	FSP	FSP065-RBBN3	I/P: 100-240Vac, 50-60Hz, 1.5A O/P: 19.0Vdc, 3.42A 1.5m DC power cable with one core attached on adapter
Adapter 2	Getac	MTA190474W4	I/P: 100-240Vac, 50-60Hz, 1.6A O/P: 19.0Vdc, 4.74A 1.55m DC power cable with two cores attached on adapter
Battery	Getac	BP3S1P2100-S	Rating: 11.1Vdc, 2040mAh, 23Wh Typical name: 2100mAh, 24Wh
Digitizer Pen	EMpen Technology Corp	DIGITIZER PEN	-

3. The End-product has three SKUs for sale, after pre-test. SKU 2 was chosen for final test and presented in the test report.

Part	Brand	Model	Specification	Configuration		
				SKU 1	SKU 2	SKU 3
CPU	Intel	Alder Lake	i5-1235U (Non Vpro)	V		V
			i7-1265U (Vpro)		V	
DDR	Kingston	---	16GB (8GB+8GB)	V		
		---	32GB (16GB+16GB)		V	
		---	64GB (32GB+32GB)			V
SSD	SSSTC	---	256GB	V		
		---	512GB		V	
		---	1TB			V
LCD Panel	AUO	G116HAN01	11.6"	V	V	V
Touchscreen	Getac	---	---	V	V	V
Finger Print	Egistec	---	---	V	V	V
WLAN Module	Intel	AX211NGW	---	V	V	V
WWAN Module	Telit	LN920A12-WW	---	V	V	V
GPS	GlobalSat	MC1010G	---	V	V	V
RFID Module	NXP	PN-7462	---		V	V
Digitizer Module	Getac	EMR116-UA00	---		V	V
Bottom Camera	FOXLINK	FN80AF-443H	---	V	V	V
	Chicony	CKAM816	---	V	V	V
Camera	FOXLINK	FN20FF-679H	---	V	V	V
IR Camera	FOXLINK	FN23FF-678H	---		V	V
Option Bay	Honeywell	N6703	Barcode	V		V
	Getac	---	SD Card reader		V	
	Getac	---	Smart Card		V	

4. The following antennas were provided to the End-product.

Ant.	Type	Connector	Gain (dBi)								
			WCDMA B2	WCDMA B4	WCDMA B5	LTE B2	LTE B4	LTE B5	LTE B7	LTE B12	LTE B13
Main (TX / RX)	PIFA	I-PEX	2.48	2.28	-0.69	2.48	2.28	-0.69	1.92	3.16	0.87
			LTE B14	LTE B25	LTE B26	LTE B38	LTE B41	LTE B48	LTE B66	LTE B71	
			0.78	2.48	-0.69	2.15	2.82	-1.30	2.28	2.65	
Ant.	Type	Connector	Gain (dBi)								
			WCDMA B2	WCDMA B4	WCDMA B5	LTE B2	LTE B4	LTE B5	LTE B7	LTE B12	LTE B13
Aux (RX only)	PIFA	I-PEX	4.17	2.69	-1.49	4.17	2.69	-1.49	-0.11	-3.06	0.60
			LTE B14	LTE B25	LTE B26	LTE B38	LTE B41	LTE B48	LTE B66	LTE B71	
			0.82	4.17	-1.49	0.48	1.31	-0.99	2.89	-4.84	

* Detail antenna specification please refer to antenna datasheet an antenna gain measurement report.

5. For CA mode configuration, please consult the manufacturer to declare the test mode.

6. The EUT support the following CA Configuration.

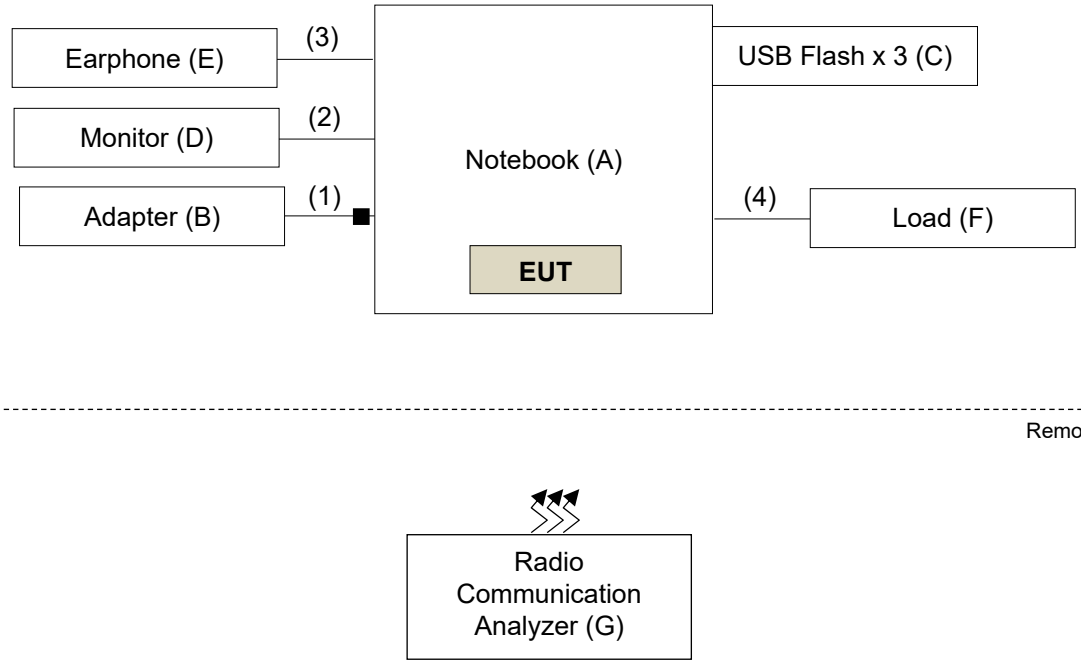
Band Configuration
5B
7C
38C
41C

7. E-UTRA CA configuration / Bandwidth combination set.

E-UTRA CA configuration / Bandwidth combination set		
E-UTRA CA Configuration	Component carriers in order of increasing carrier frequency Channel bandwidth for PCC and SCC [MHz]	Maximum aggregated bandwidth [MHz]
CA_5B	5+10 / 10+5	15
	10+10	20
CA_7C	10+20 / 20+10 / 15+15	30
	15+20 / 20+15	35
	20 + 20	40
CA_38C	15+15	30
	20+20	40
CA_41C	5+20 / 20+5	25
	10+20 / 20+10 / 15+15	30
	15+20 / 20+15	35
	20+20	40

*5B is continuous CA and maximum combination is 10M+10M.
*7C is continuous CA and maximum combination is 20M+20M.
*38C is continuous CA and maximum combination is 20M+20M.
*41C is continuous CA and maximum combination is 20M+20M.

3.2 Configuration of System under Test



3.2.1 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	Getac	V110G7	NA	NA	Provided by manufacturer
B.	Adapter	FSP	FSP065-RBBN3	NA	NA	Provided by manufacturer
C.	USB Flash x 3	SanDisk	SDDDC3-032G	NA	NA	-
D.	Monitor	ASUS	VA24EHE	LCLMTF243824	NA	-
E.	Earphone	Apple	MB77PFEB	NA	NA	-
F.	Load	NA	NA	NA	NA	-
G.	Radio Communication Analyzer	Anritsu	MT8820C	6201300640	NA	-

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item G acted as a communication partner to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Power Cable	1	1.5	N	1	Provided by manufacturer Attached on adapter
2.	HDMI Cable	1	1.0	Y	0	-
3.	Earphone Cable	1	1.5	N	0	-
4.	RJ45 Cable	1	1.5	N	0	-

Note: The core(s) is(are) originally attached to the cable(s).

3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis, NB mode and tablet mode. The worst case was found when positioned on Z-Plane. Following channel(s) was (were) selected for the final test as listed below:

LTE Band 5B

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	Mode
-	ERP	20450 to 20501 20549 to 20600	20450 (829.0MHz) + 20549 (838.9MHz), 20476 (831.6MHz) + 20575 (841.5MHz), 20501 (834.1MHz) + 20600 (844.0MHz)	10MHz + 10MHz	QPSK / 16QAM / 64QAM	1 RB / 0 RB Offset + 1 RB / 49 RB Offset 1 RB / 49 RB Offset + 1 RB / 0 RB Offset
-	Radiated Emission Below 1GHz	20450 to 20501 20549 to 20600	20450 (829.0MHz) + 20549 (838.9MHz)	10MHz + 10MHz	QPSK	1 RB / 0 RB Offset 1 RB / 49 RB Offset
-	Radiated Emission Above 1GHz	20450 to 20501 20549 to 20600	20450 (829.0MHz) + 20549 (838.9MHz), 20476 (831.6MHz) + 20575 (841.5MHz), 20501 (834.1MHz) + 20600 (844.0MHz)	10MHz + 10MHz	QPSK	1 RB / 0 RB Offset + 1 RB / 49 RB Offset 1 RB / 49 RB Offset + 1 RB / 0 RB Offset

Note:
1. This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.
2. For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP	25deg. C, 60%RH	120Vac, 60Hz (System)	Willy Cheng
Radiated Emission	19deg. C, 67%RH	120Vac, 60Hz (System)	Edison Lee

3.4 EUT Operating Conditions

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency

3.5 General Description of Applied Standards and References

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards and References:

Test Standard:

FCC 47 CFR Part 2

FCC 47 CFR Part 22

ANSI/TIA/EIA-603-E 2016

ANSI 63.26-2015

References Test Guidance:

KDB 971168 D01 Power Meas License Digital Systems v03r01

All test items have been performed and recorded as per the above standards.

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

Mobile / Portable station are limited to 7 watts e.r.p.

4.1.2 Test Procedures

Conducted Power Measurement:

The EUT was set up for the maximum power with LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

Maximum EIRP / ERP

The relevant equation for determining the maximum ERP or EIRP from the measured RF output power is given in Equation as follows:

$EIRP = P_{Meas} + G_T$

$ERP = P_{Meas} + G_T - 2.15$

where

ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as P_{Meas}, e.g., dBm or dBW)

P_{Meas} measured transmitter output power or PSD, in dBm or dBW

G_T gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

4.1.3 Test Setup

Conducted Power Measurement:

4.1.4 Test Results

Conducted Output Power (dBm)

LTE Band 5B

Con fugure	Com-bination	PCC							SCC							Measurement Power
		Band	BW (MHz)	Modu lation	RB Size	RB Offset	UL Chan.	UL Freq. (MHz)	Band	BW (MHz)	Modu lation	RB Size	RB Offset	UL Chan.	UL Freq. (MHz)	Tx Power with UL-CA Active (dBm)
																Total
Intra Band Conti-guous	CA_5B	5	10	QPSK	1	0	20450	829	5	10	QPSK	1	49	20549	838.9	13.08
					1	49						1	0			22.48
		5	10	QPSK	1	0	20476	831.6	5	10	QPSK	1	49	20575	841.5	13.05
					1	49						1	0			22.44
		5	10	QPSK	1	0	20501	834.1	5	10	QPSK	1	49	20600	844.0	13.09
					1	49						1	0			22.41

Con fugure	Com-bination	PCC							SCC							Measurement Power
		Band	BW (MHz)	Modu lation	RB Size	RB Offset	UL Chan.	UL Freq. (MHz)	Band	BW (MHz)	Modu lation	RB Size	RB Offset	UL Chan.	UL Freq. (MHz)	Tx Power with UL-CA Active (dBm)
																Total
Intra Band Conti-guous	CA_5B	5	10	16QAM	1	0	20450	829	5	10	16QAM	1	49	20549	838.9	11.93
					1	49						1	0			21.27
		5	10	16QAM	1	0	20476	831.6	5	10	16QAM	1	49	20575	841.5	11.88
					1	49						1	0			21.17
		5	10	16QAM	1	0	20501	834.1	5	10	16QAM	1	49	20600	844.0	11.96
					1	49						1	0			21.30

Con fugure	Com-bination	PCC							SCC							Measurement Power
		Band	BW (MHz)	Modu lation	RB Size	RB Offset	UL Chan.	UL Freq. (MHz)	Band	BW (MHz)	Modu lation	RB Size	RB Offset	UL Chan.	UL Freq. (MHz)	Tx Power with UL-CA Active (dBm)
																Total
Intra Band Conti-guous	CA_5B	5	10	64QAM	1	0	20450	829	5	10	64QAM	1	49	20549	838.9	11.42
					1	49						1	0			20.54
		5	10	64QAM	1	0	20476	831.6	5	10	64QAM	1	49	20575	841.5	11.36
					1	49						1	0			20.52
		5	10	64QAM	1	0	20501	834.1	5	10	64QAM	1	49	20600	844.0	11.48
					1	49						1	0			20.64

ERP Power (dBm)

Configure	Combination	PCC							SCC							Measurement Power
		Band	BW (MHz)	Modulation	RB Size	RB Offset	UL Chan.	UL Freq. (MHz)	Band	BW (MHz)	Modulation	RB Size	RB Offset	UL Chan.	UL Freq. (MHz)	Tx Power with UL-CA Active (dBm)
																Total
Intra Band Contiguous	CA_5B	5	10	QPSK	1	0	20450	829	5	10	QPSK	1	49	20549	838.9	10.24
					1	49						1	0			19.64
		5	10	QPSK	1	0	20476	831.6	5	10	QPSK	1	49	20575	841.5	10.21
					1	49						1	0			19.60
		5	10	QPSK	1	0	20501	834.1	5	10	QPSK	1	49	20600	844.0	10.25
					1	49						1	0			19.57

Configure	Combination	PCC							SCC							Measurement Power
		Band	BW (MHz)	Modulation	RB Size	RB Offset	UL Chan.	UL Freq. (MHz)	Band	BW (MHz)	Modulation	RB Size	RB Offset	UL Chan.	UL Freq. (MHz)	Tx Power with UL-CA Active (dBm)
																Total
Intra Band Contiguous	CA_5B	5	10	16QAM	1	0	20450	829	5	10	16QAM	1	49	20549	838.9	9.09
					1	49						1	0			18.43
		5	10	16QAM	1	0	20476	831.6	5	10	16QAM	1	49	20575	841.5	9.04
					1	49						1	0			18.33
		5	10	16QAM	1	0	20501	834.1	5	10	16QAM	1	49	20600	844.0	9.12
					1	49						1	0			18.46

Configure	Combination	PCC							SCC							Measurement Power
		Band	BW (MHz)	Modulation	RB Size	RB Offset	UL Chan.	UL Freq. (MHz)	Band	BW (MHz)	Modulation	RB Size	RB Offset	UL Chan.	UL Freq. (MHz)	Tx Power with UL-CA Active (dBm)
																Total
Intra Band Contiguous	CA_5B	5	10	64QAM	1	0	20450	829	5	10	64QAM	1	49	20549	838.9	8.58
					1	49						1	0			17.70
		5	10	64QAM	1	0	20476	831.6	5	10	64QAM	1	49	20575	841.5	8.52
					1	49						1	0			17.68
		5	10	64QAM	1	0	20501	834.1	5	10	64QAM	1	49	20600	844.0	8.64
					1	49						1	0			17.80

*ERP (dBm) = Conducted Output Power (dBm) + Antenna Gain (dBi) - 2.15

4.2 Radiated Emission Measurement

4.2.1 Limits of Radiated Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to –13dBm.

4.2.2 Test Procedure

a. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.

b. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

c. Perform a field strength measurement and record the worse read value, is the field strength value via a spectrum reading obtained corrected for antenna factor, cable loss and pre-amplifier factor and then mathematically convert the measured field strength level to EIRP/ERP level.

d. Following C63.26 section 5.5 and 5.2.7.
EIRP (dBm) = E (dBμV/m) + 20log (D) - 104.8; where D is the measurement distance (in the far field region) in m.
ERP (dBm) = E (dBμV/m) + 20log (D) - 104.8 - 2.15; where D is the measurement distance (in the far field region) in m.

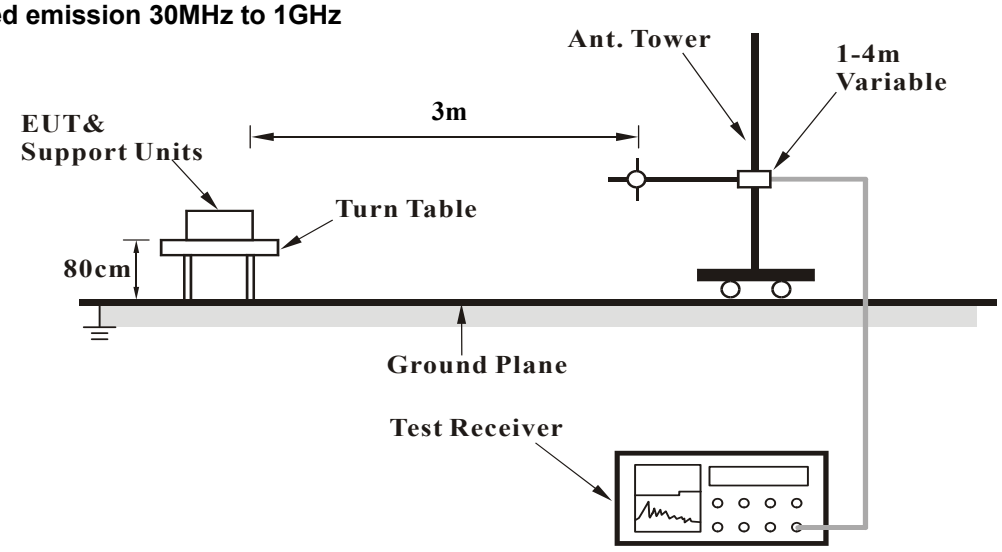
Note:
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.
2. The emission levels were against the limit of frequency range 9 kHz ~ 30 MHz:
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

4.2.3 Deviation from Test Standard

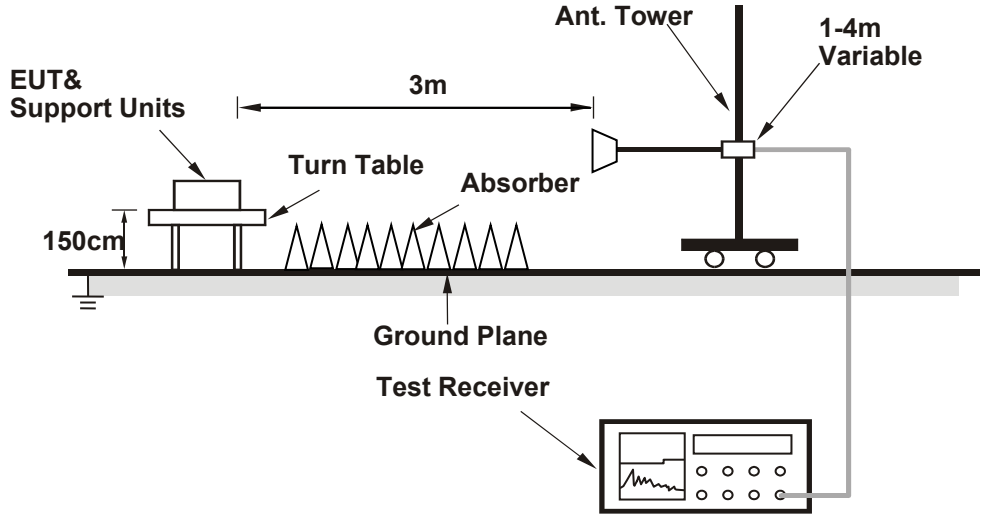
No deviation.

4.2.4 Test Setup

For radiated emission 30MHz to 1GHz



For radiated emission above 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.5 Test Results

Below 1GHz

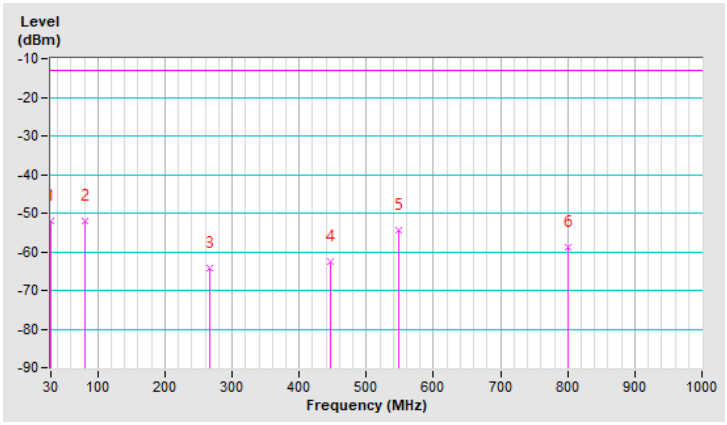
LTE Band 5B, Channel Bandwidth 10MHz + 10MHz (1 RB / 0 RB Offset + 1 RB / 49 RB Offset)

Mode	TX channel 20450 (829.0MHz) + 20549 (838.9MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Edison Lee		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	30.00	-51.95	-13.00	-38.95	1.25 H	58	59.95	-111.90
2	80.44	-52.19	-13.00	-39.19	1.50 H	227	63.51	-115.70
3	266.68	-64.32	-13.00	-51.32	1.50 H	124	46.83	-111.15
4	446.13	-62.57	-13.00	-49.57	1.25 H	289	43.53	-106.10
5	547.98	-54.43	-13.00	-41.43	1.50 H	274	49.94	-104.37
6	801.15	-58.84	-13.00	-45.84	1.00 H	98	40.95	-99.79

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

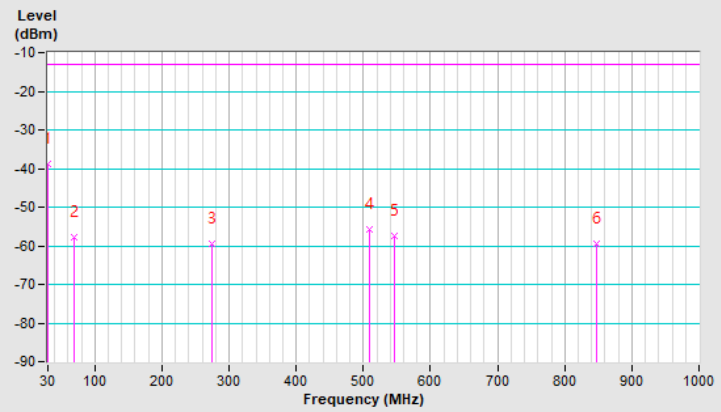


Mode	TX channel 20450 (829.0MHz) + 20549 (838.9MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Edison Lee		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	**30.00**	**-38.82**	**-13.00**	**-25.82**	**1.00 V**	**18**	**73.08**	**-111.90**
2	68.80	-57.83	-13.00	-44.83	1.50 V	316	55.21	-113.04
3	275.41	-59.45	-13.00	-46.45	1.25 V	18	51.19	-110.64
4	508.21	-55.87	-13.00	-42.87	1.00 V	172	49.18	-105.05
5	547.01	-57.30	-13.00	-44.30	1.50 V	98	47.09	-104.39
6	846.74	-59.55	-13.00	-46.55	1.25 V	18	39.51	-99.06

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.



Above 1GHz

LTE Band 5B, Channel Bandwidth 10MHz + 10MHz (1 RB / 0 RB Offset + 1 RB / 49 RB Offset)

Mode	TX channel 20450 (829.0MHz) + 20549 (838.9MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Edison Lee		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1658.00	-57.03	-13.00	-44.03	1.17 H	60	46.80	-103.83
2	1677.80	-58.01	-13.00	-45.01	3.86 H	328	45.80	-103.81
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1658.00	-57.43	-13.00	-44.43	1.55 V	162	46.40	-103.83
2	1677.80	-58.41	-13.00	-45.41	3.90 V	240	45.40	-103.81

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

Mode	TX channel 20476 (831.6MHz) + 20575 (841.5MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Edison Lee		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1663.20	-57.40	-13.00	-44.40	1.12 H	59	46.50	-103.90
2	1683.00	-58.50	-13.00	-45.50	3.81 H	329	45.40	-103.90
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1663.20	-58.00	-13.00	-45.00	1.56 V	166	45.90	-103.90
2	1683.00	-58.60	-13.00	-45.60	2.93 V	237	45.30	-103.90

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

Mode	TX channel 20501 (834.1MHz) + 20600 (844.0MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Edison Lee		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1668.20	-57.51	-13.00	-44.51	1.17 H	61	46.32	-103.83
2	1688.00	-58.26	-13.00	-45.26	3.86 H	330	45.56	-103.82
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1668.20	-57.93	-13.00	-44.93	1.53 V	162	45.90	-103.83
2	1688.00	-58.88	-13.00	-45.88	2.91 V	240	44.94	-103.82

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

LTE Band 5B, Channel Bandwidth 10MHz + 10MHz (1 RB / 49 RB Offset + 1 RB / 0 RB Offset)

Mode	TX channel 20450 (829.0MHz) + 20549 (838.9MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Edison Lee		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1658.00	-57.32	-13.00	-44.32	1.15 H	58	46.51	-103.83
2	1677.80	-58.45	-13.00	-45.45	3.83 H	325	45.36	-103.81
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1658.00	-57.62	-13.00	-44.62	1.52 V	159	46.21	-103.83
2	1677.80	-58.62	-13.00	-45.62	2.91 V	244	45.19	-103.81

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

Mode	TX channel 20476 (831.6MHz) + 20575 (841.5MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Edison Lee		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1663.20	-57.30	-13.00	-44.30	1.12 H	59	46.60	-103.90
2	1683.00	-58.30	-13.00	-45.30	3.88 H	326	45.60	-103.90
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1663.20	-58.00	-13.00	-45.00	1.57 V	162	45.90	-103.90
2	1683.00	-58.80	-13.00	-45.80	2.94 V	240	45.10	-103.90

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

Mode	TX channel 20501 (834.1MHz) + 20600 (844.0MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	19deg. C, 67%RH	Input Power	120Vac, 60Hz (System)
Tested By	Edison Lee		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1668.20	-57.48	-13.00	-44.48	1.18 H	60	46.35	-103.83
2	1688.00	-58.44	-13.00	-45.44	3.91 H	332	45.38	-103.82
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1668.20	-57.72	-13.00	-44.72	1.59 V	164	46.11	-103.83
2	1688.00	-58.71	-13.00	-45.71	2.87 V	237	45.11	-103.82

Remarks:

1. ERP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8 - 2.15
3. Margin value = ERP – Limit value
4. The other ERP levels were very low against the limit.

5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

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