Test Report No:
2450097R-RFNAOTHV02-A

VARIANT TEST REPORT
FCC Rules&Regulations

Product Name	goRAN LTE Base Station
Brand Name	UBIIK
Model No.	BS1AL-D54US
FCC ID	2AXTDBS1ALD54US
Applicant´s Name / Address	Ubiik Inc. 19F., No. 17, Sec. 1, Chengde Rd., Datong Dist., Taipei City 103, Taiwan (R.O.C.)
Manufacturer's Name / Address	Ubiik Inc. 19F., No. 17, Sec. 1, Chengde Rd., Datong Dist., Taipei City 103, Taiwan (R.O.C.)
Test Method Requested, Standard	FCC CFR Title 47 Part 27 Subpart J ANSI/TIA-603-E-2016 ANSI C63.26-2015
Verdict Summary	IN COMPLIANCE
Documented By	Amelia Wu
Approved By	Rueyyan Lin
Date of Receipt	May 07, 2024
Date of Issue	Jun. 24, 2024
Report Version	V1.0

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Competences and Guarantees

DEKRA is a testing laboratory competent to carry out the tests described in this report.
In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

General Conditions

1. The test results relate only to the samples tested.
2. The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.
3. This report must not be used to claim product endorsement by TAF or any agency of the government.
4. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification Co., Ltd.
5. Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Revision History

Version	Description	Issued Date
V1.0	Initial issue of report	Jun. 24, 2024

Permissive Change

Report No.	Version	Description	Issued Date
2410704R-RFUSV24S-A	V1.0	Original application.	Apr. 15, 2024
2450097R-RFNAOTHV02-A	V1.0	Class II Permissive Change (C2PC) Add a new WWAN antenna (Model: 750 10074) of the same type as the original application with higher gain. After evaluating, it was verified for radiated spurious emission above 1 GHz test, and other test results are based on original test report.	Jun. 24, 2024

Summary of Test Result

Report Clause	Test Items	Band	Ref Std. Clause	Limit	Result (PASS/FAIL)	Remark
3	RF Output Power	54	§2.1033 §2.1046 §27.50	Fixed and base stations < 2000 Watts. Mobile stations 4 Watts.	PASS	-
4	Occupied Bandwidth	54	§2.1049	N/A	PASS	-
5	Peak to Average Power Ratio	54	§27.50	≦ 13 dB	PASS	-
6	Spurious Emission	54	§27.53	< -13 dBm	PASS	-
7	Conducted Band Edge	54	§2.1053 §27.53	< -13 dBm	PASS	-
8	Frequency Stability	54	§2.1055 §27.54	± 2.5 ppm	PASS	-
Note: The EUT supports two radio functions, a chip on board and the other is a certified WWAN module (brand name: UBIIK, model: RC7611-1, FCC ID: 2AXTDRC76B).						

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.

Comments and Remarks

The product specification and testing instructions for the EUT declared in the report are provided by the manufacturer who will take all responsibilities for the accuracy.

1. General Information

1.1. EUT Description

Uplink Frequency Range	LTE Band 54: 1670~1675 MHz
Downlink Frequency Range	LTE Band 54: 1670~1675 MHz
Bandwidth	5 MHz
Type of Modulation	QPSK / 16QAM

Accessories Information					
No.	Equipment Name	Brand Name	Model No.	Rating	
1	PoE 1	PHIHONG	POE60U-BTA	INPUT: 100~240V, 1.5A, 50~60Hz OUTPUT 1: 56V, 0.535A, 30W PIN 3,6 + PIN 1,2 Return OUTPUT 2: 56V, 0.535A, 30W PIN 4,5 + PIN 7,8 Return	
2	PoE 2	PHIHONG	POEO75U-1BT	INPUT: 100~240V, 2.0A, 50~60Hz OUTPUT 1: 56V, 0.8A, 45W PIN 3,6 - +56V PIN 1,2 - RETURN OUTPUT 2: 56V, 0.8A, 45W PIN 4,5 - +56V PIN 7,8 - RETURN	
No.	Equipment Name	Brand Name	Model No.	Description	Remark
3	Power Cable 1	SHEE LINE	SL-2 to SL-3	Non-Shielded, 1.8m	For PoE 1 use
4	Power Cable 2	SHEE LINE	SL-2 to POE Injector	Non-Shielded, 1.8m	For PoE 2 use
5	MicroSD Card	ADATA	DU3A-016GT	--	Internal of EUT

For WWAN Function:

Antenna Information						
Ant.	Brand Name	Model No.	Type	Antenna Gain (dBi)	Cable Loss (dB)	Actual Gain (dBi)
1	Dawn Communication Co., Ltd.	DB-698-4000-7-65A-OD-NV3	Panel	8.00	0.80	7.20
2	Invax	DS1619-1048WNM	OMNI	4.28	--	4.28
3	KATHREIN	750 10074	OMNI	13.00	0.30	12.70

For GNSS Function:

Antenna Information				
Ant.	Brand Name	Model No.	Type	Antenna Gain (dBi)
1	Jinchang	JCA225-N	RHCP	5

For WWAN Module:

Antenna Information											
Ant.	Brand Name	Model No.	Type	Antenna Gain (dBi)							
				Band 2	Band 5	Band 12	Band 13	Band 14	Band 25	Band 26	Band 71
1	Grand-Tek	OA-LTEWB-035-C0-UB	OMNI	1.80	0.00	-0.80	1.40	1.40	1.80	-0.50	-1.50

1.2. EUT Information

EUT Power Type	From PoE
EUT Type	Fixed and base stations
Hardware Version	DV21RV13
Software Version	eNB 2024-3-26

1.3. Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC CFR Title 47 Part 27 Subpart J
- ANSI/TIA-603-E (2016)
- ANSI C63.26-2015
- FCC KDB 971168 D01 v03r01

The following reference test guidance is not within the scope of accreditation of TAF.

- FCC KDB 412172 D01 v01r01
- FCC KDB 414788 D01 v01r01

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

1.4. Testing Location Information

Testing Location Information		
Test Laboratory：DEKRA Testing and Certification Co., Ltd.		
	1 (TAF: 3024)	ADD: No.372-2, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C. TEL: +886-3-582-8001 FAX: +886-3-582-8958 Test site Designation No. TW3024 with FCC. Conformity Assessment Body Identifier (CABID) TW3024 with ISED.
	2 (TAF: 3024)	ADD: No.372, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C. TEL: +886-3-582-8001 FAX: +886-3-582-8958 Test site Designation No. TW3024 with FCC. Conformity Assessment Body Identifier (CABID) TW3024 with ISED.
Test site number for address 1 includes HC-SR02. Test site number for address 2 includes HC-CB02, HC-CB03, HC-CB04, HC-SR10 and HC-SR12.		

Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date
RF Conducted Emission	HC-SR12	Max Chang	21~23 / 61~62	2024/03/01~2024/04/03
Radiated Emission	HC-CB04	Luffy Lin Cyril Chen	20.6~21 / 48~64	2024/03/13~2024/06/04

1.5. Measurement Uncertainty

Uncertainties have been calculated according to the DEKRA internal document with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2).

Test Item	Uncertainty
RF Output Power	± 1.16 dB
Occupied Bandwidth	± 217.9 Hz
Peak to Average Power Ratio	± 2.47 dB
Spurious Emissions	± 3.52 dB below 1 GHz ± 3.56 dB above 1 GHz
Conducted Band Edge	± 2.47 dB
Frequency Stability	± 217.9 Hz

1.6. List of Test Equipment

HC-SR12

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Cal. Date	Next Cal. Date
High Speed Peak Power Meter Dual Input	Anritsu	ML2496A	1602004	0.3-40 GHz	2023/10/25	2024/10/24
Pulse Power Sensor	Anritsu	MA2411B	1531043	0.3-40 GHz	2023/10/25	2024/10/24
EXA Signal Analyzer	Keysight	N9010A	MY51440132	10 Hz-44 GHz	2023/12/11	2024/12/10
Pulse Power Sensor	Anritsu	MA2411B	1531044	0.3-40 GHz	2023/10/25	2024/10/24
Spectrum Analyzer	Keysight	N9030B	MY57140404	3 Hz-26.5 GHz	2023/04/24	2024/04/23
Temperature & Humidity Test Chamber	KSON	THS-B4T-150	A0401	-40°C~+150° C/10%-98%R.H；114x93x162cm	2023/12/06	2024/12/05

HC-CB04

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Cal. Date	Next Cal. Date
Signal Analyzer	R&S	FSVA40	101455	10 Hz-40 GHz	2023/10/03	2024/10/02
EXA Signal Analyzer	Keysight	N9010A	MY51440132	10 Hz-44 GHz	2023/12/11	2024/12/10
Trilog Broadband Antenna	Schwarzbeck	VULB 9168	1209	30 MHz-2 GHz	2023/06/13	2024/06/12
Double Ridged Horn Antenna	RF SPIN	DRH18-E	211212A18EN	1G-18GHz	2023/11/17	2024/11/16
Horn Antenna	Schwarzbeck	BBHA 9170	203	18G-40GHz	2024/02/02	2025/02/01
Pre-Amplifier	EMCI	EMC01820I	980364	30M-8 GHz,20 dB	2023/06/06	2024/06/05
Pre-Amplifier	EMEC	EM01G18GA	060835	1-18 GHz,50 dB	2023/07/24	2024/07/23
Pre-Amplifier	DEKRA	AP-400C	201801231	18G-40 GHz,48 dB	2023/10/03	2024/10/02
Coaxial Cable(11m)	Suhner	SF102_SF104	HC-CB04	30M-18 GHz	2023/08/08	2024/08/07
Coaxial Cable(3m)	Suhner,Rosnol	SF102_UP0264	HC-CB04-1	18G-40 GHz	2023/08/14	2024/08/13
Radiated Software	Audix	e3 V9	HC-CB04_1	N/A	N/A	N/A

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

2. Test Configuration of EUT

2.1. Test Condition

EUT Operational Condition			
Testing Voltage	Vnom (AC 120V/60Hz)	Vmax (AC 138V/60Hz)	Vmin (AC 102V/60Hz)
Operational Climatic	Tnom (25℃)	Tmax (55℃)	Tmin (-40℃)

2.2. The Worst Case Measurement Configuration

For Radiated Emission above 1GHz test:	
Test Mode	Mode 1: LTE Band 54 / Ant. 1
	Mode 2: LTE Band 54 / Cabinet emissions
For other tests:	
Test Mode	Mode 1: LTE Band 54 / Ant. 1

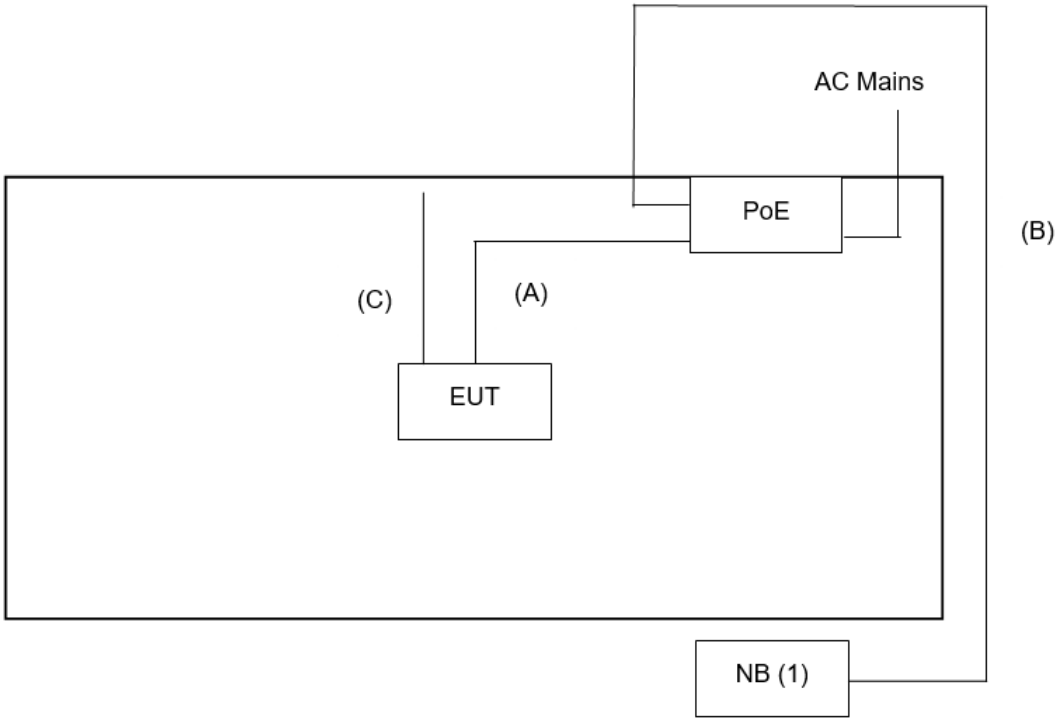
Note:
1. Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. The device was tested under all bandwidths, RB configurations and modulations.
   The worst case was found in “QPSK” and show in “Conducted Band Edge”.
   The worst case was found in “QPSK / 5 MHz” and show in “Spurious Emission”.
3. The EUT could be applied with WWAN LTE of EUT + WWAN LTE of WWAN module function; therefore Co-location Maximum Permissible Exposure (please refer to Report No.: 2450097R-RFNAV02S-A) and Radiated Emission Co-location (please refer to Appendix G) tests are added for simultaneously transmit with WWAN LTE of EUT + WWAN LTE of WWAN module function.

2.3. Tested System Details

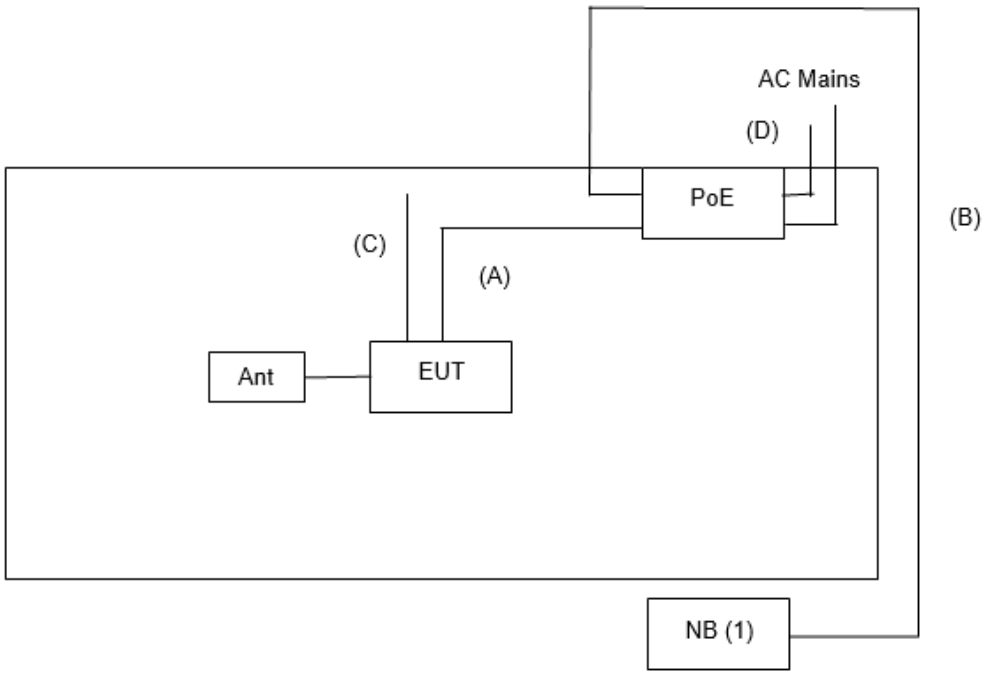
No.	Equipment	Brand Name	Model No.	Serial No.
1	NB	ASUS	E402S	GBN0CV14W224476

2.4. Configuration of Tested System

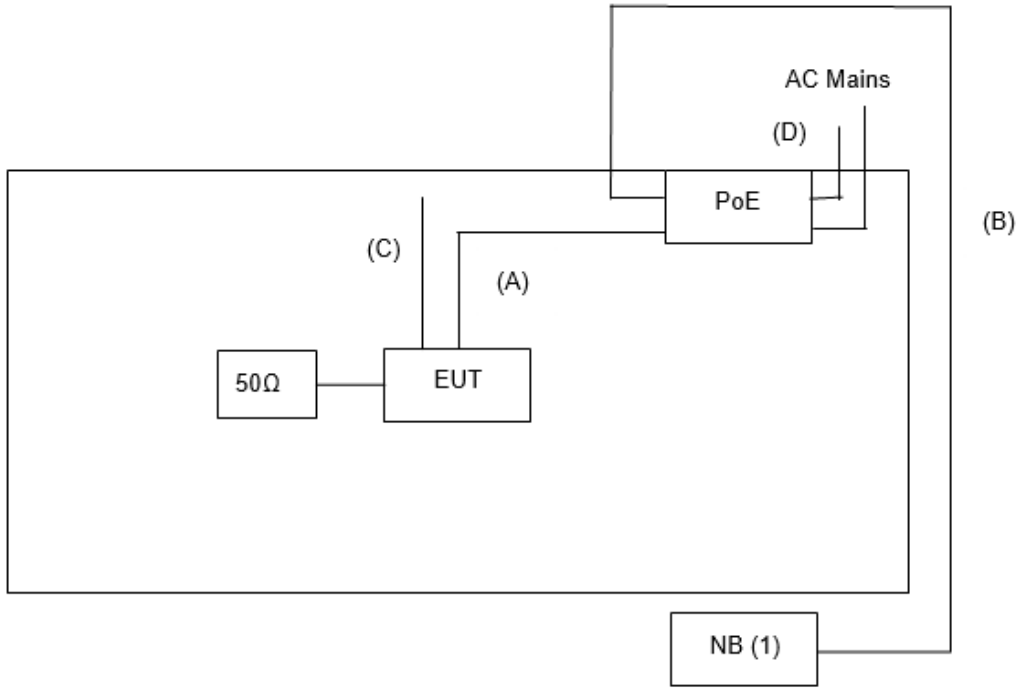
Connection Diagram – EUT + Ant. 1 with PoE 1



Signal Cable Type		Signal cable Description
A	Ethernet Cable	Shielded, 1.9m
B	Ethernet Cable	Non-Shielded, 10m
C	GND Cable	Non-Shielded, 2.5m

Connection Diagram – EUT + Ant. 1 with PoE 2


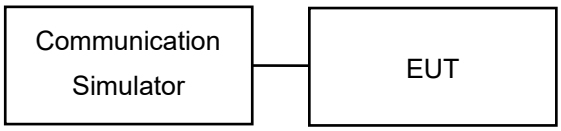
Signal Cable Type		Signal cable Description
A	Ethernet Cable	Shielded, 1.9m
B	Ethernet Cable	Non-Shielded, 10m
C	GND Cable	Non-Shielded, 2.5m
D	GND Cable	Non-Shielded, 2.5m

Connection Diagram – EUT + 50Ω termination matching with PoE 2


Signal Cable Type		Signal cable Description
A	Ethernet Cable	Shielded, 1.9m
B	Ethernet Cable	Non-Shielded, 10m
C	GND Cable	Non-Shielded, 2.5m
D	GND Cable	Non-Shielded, 2.5m

3. RF Output Power

3.1. Test Setup



3.2. Test Procedure

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum conducted RF output power under transmission mode and specific channel frequency. The relevant equation for determining the ERP or EIRP from the conducted RF output power measured using the guidance provided above is:

$$ERP \text{ or } EIRP = P_{Meas} + G_T - L_C$$

where:

ERP or EIRP = effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as PMeas, typically dBW or dBm);

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);

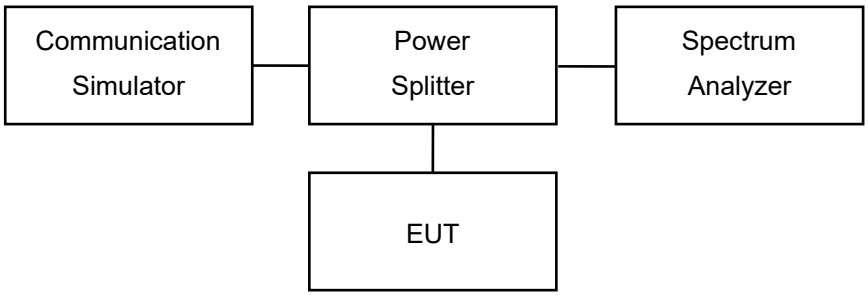
L_C = signal attenuation in the connecting cable between the transmitter and antenna, in dB

3.3. Test Result of RF Output Power

Refer as Appendix A

4. Occupied Bandwidth

4.1. Test Setup



4.2. Test Procedures

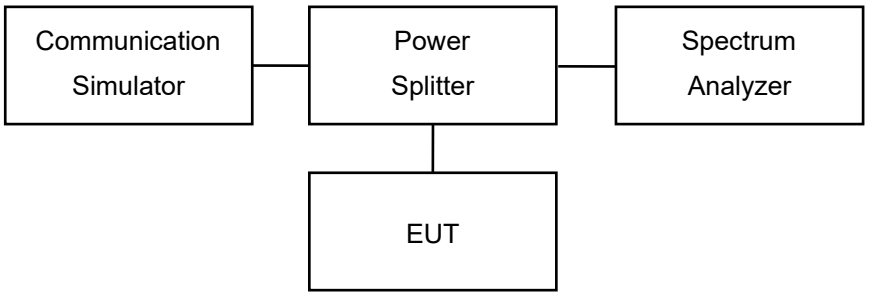
The EUT makes a call to the communication simulator. The 26dB bandwidth and 99% occupied bandwidth measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. The path loss was compensated to the results for each measurement.

4.3. Test Result of Occupied Bandwidth

Refer as Appendix B

5. Peak to Average Power Ratio

5.1. Test Setup



5.2. Test Procedure

1. 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. The path loss was compensated to the results for each measurement.
2. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth.
3. Set the number of counts to a value that stabilizes the measured CCDF curve.
4. Record the maximum PAPR level associated with a probability of 0.1 %.

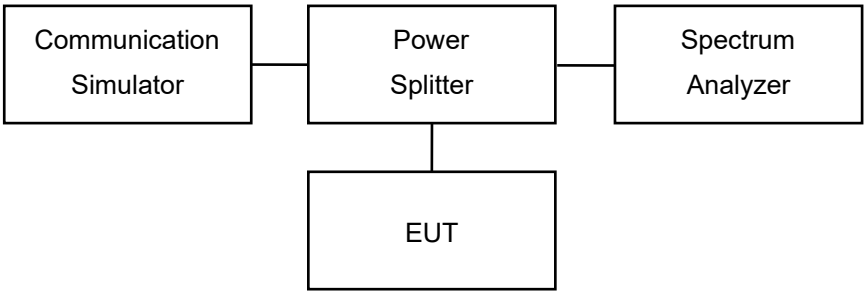
5.3. Test Result of Peak to Average Power Ratio

Refer as Appendix C

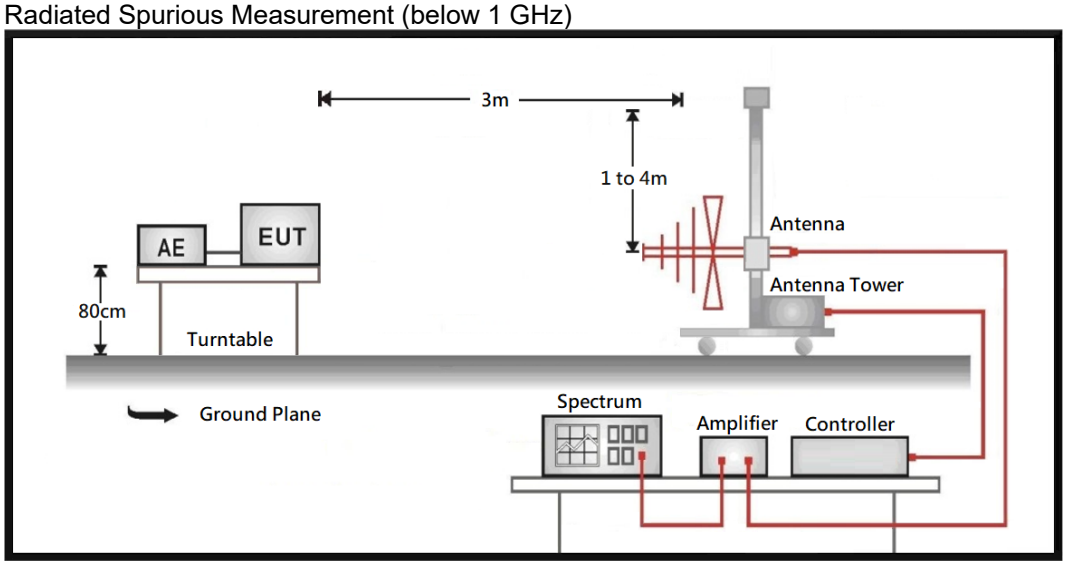
6. Spurious Emission

6.1. Test Setup

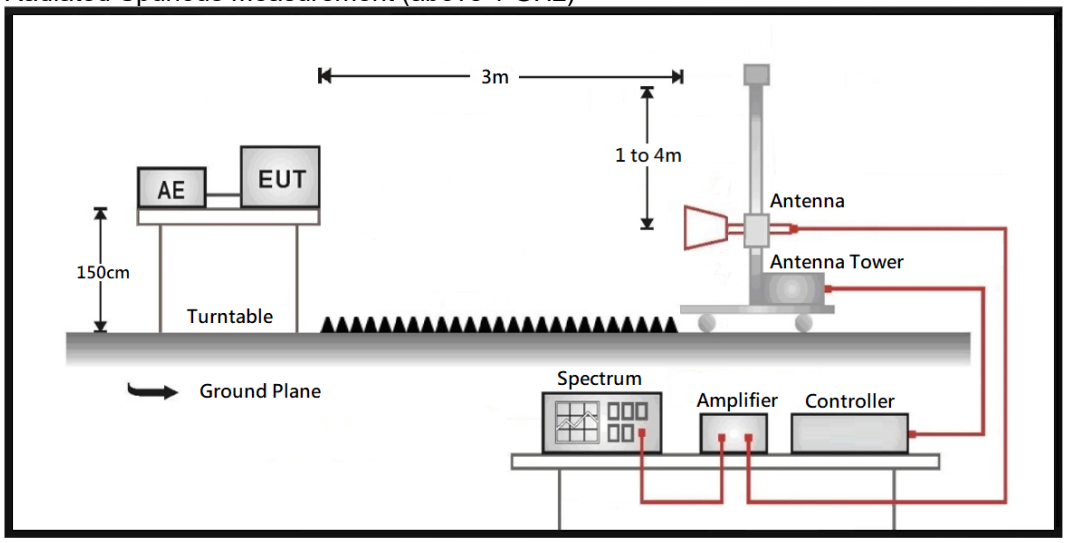
Conducted Spurious Measurement



Radiated Spurious Measurement (below 1 GHz)



Radiated Spurious Measurement (above 1 GHz)



6.2. Test Procedure

Conducted Spurious Measurement:

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. The path loss was compensated to the results for each measurement. The resolution bandwidth of the spectrum analyzer was set at 1 MHz, sufficient scans were taken to show the out of band Emission if any up to 10^{th} harmonic.

Radiated Spurious Measurement:

The EUT and its simulators are placed on a turn table which is 0.8 or 1.5 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations. The resolution bandwidth of the spectrum analyzer was set at 1 MHz, sufficient scans were taken to show the out of band Emission if any up to 10th harmonic. Taking the record of maximum spurious emission.

Cabinet emissions measurements

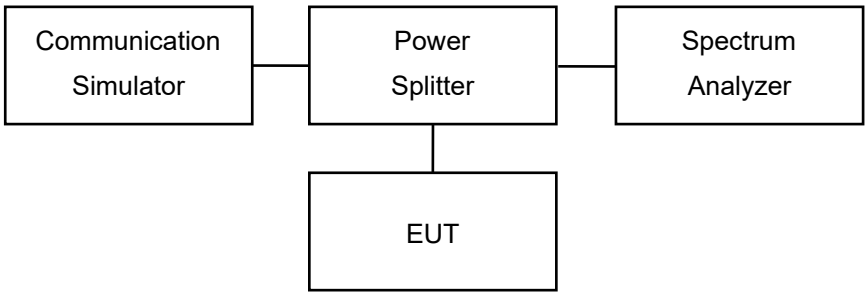
Due to antenna length or other restrictions, alternative solutions are permitted; antenna-port conducted measurements in conjunction with cabinet emissions tests are permitted to determine compliance provided

6.3. Test Result of Spurious Emission

Refer as Appendix D

7. Conducted Band Edge

7.1. Test Setup



7.2. Test Procedure

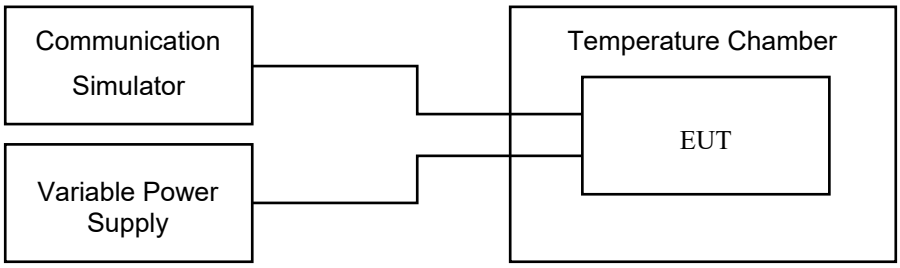
1. The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. The path loss was compensated to the results for each measurement.
2. In the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.

7.3. Test Result of Conducted Band Edge

Refer as Appendix E

8. Frequency Stability

8.1. Test Setup



8.2. Test Procedures

Frequency Stability under Temperature Variations:

The EUT under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a communication simulator. The EUT was placed inside the temperature chamber. Set the EUT 20℃ operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -40℃. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10℃ increased per stage until the highest temperature of +55℃ reached.

Frequency Stability under Voltage Variations:

Set chamber temperature to 20℃. Use a variable AC or DC power supply to power the EUT and set the voltage to rated voltage. Reduce the input voltage to specify extreme voltage variation (±15%) and endpoint, record the maximum frequency change.

8.3. Test Result of Frequency Stability

Refer as Appendix F

Appendix A. Test Result of RF Output Power

Mode			Conducted Power		EIRP Power		Limit
BW (MHz)	Frequency (MHz)	Channel	QPSK (dBm)	16-QAM (dBm)	QPSK EIRP(W)	16-QAM EIRP(W)	Limit EIRP(W)
5	1672.5	60280	26.96	26.79	2.606	2.506	2000

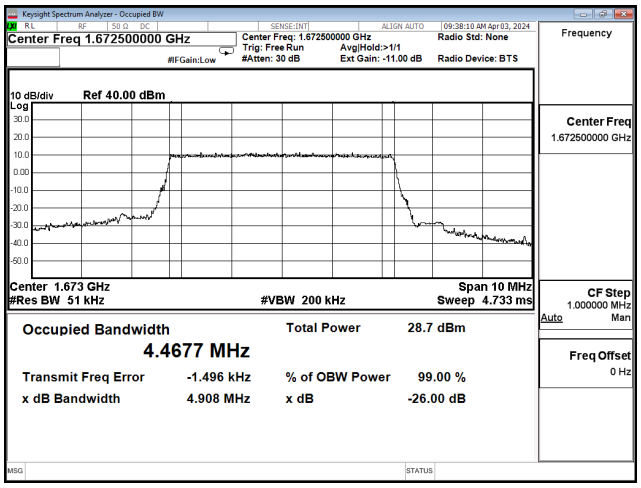
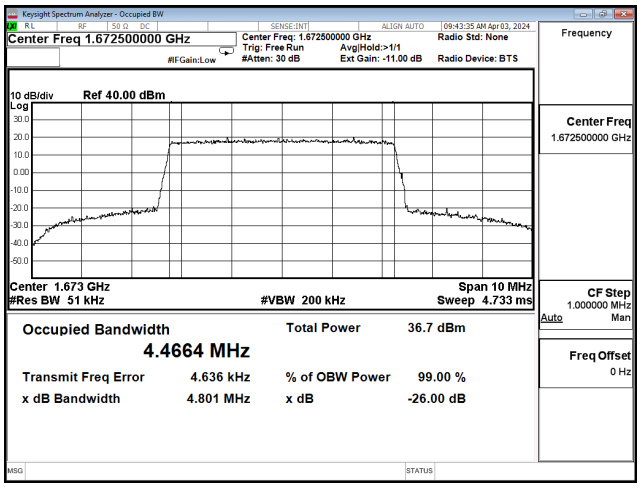
Note:

1. EIRP (W) = Conducted Output Power (dBm) + Antenna Gain (dBi)

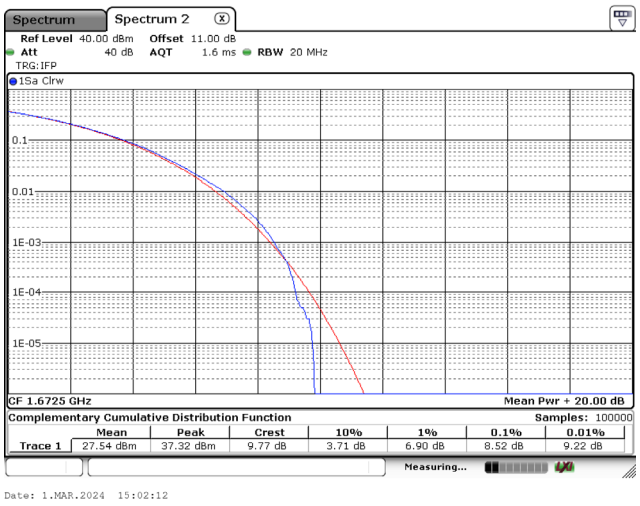
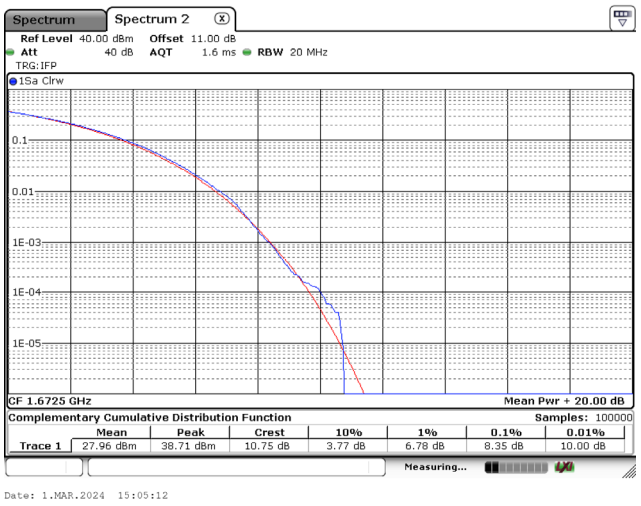
2. EIRP (W) = $(10^{(Power(dBm)/10)})*10^{-3}$

Appendix B. Test Result of Occupied Bandwidth

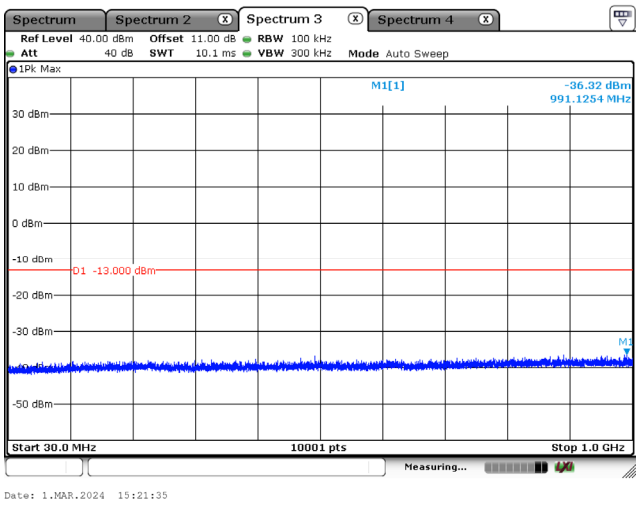
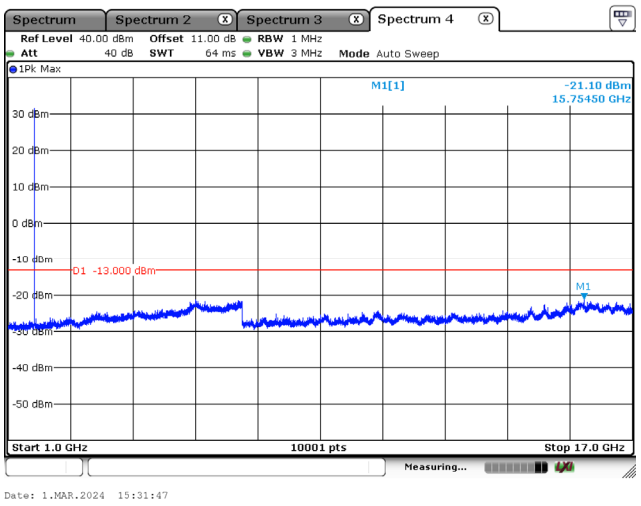
Bandwidth (MHz)	Channel	Modulation	Frequency (MHz)	Measure Level (MHz)		Limit (MHz)
				26dB BW	99% BW	
5	60280	QPSK	1672.5	4.908	4.467	N/A
		16-QAM		4.801	4.466	N/A

LTE Band 54 / QPSK / 5 MHz / 1672.5 MHz	LTE Band 54 / 16QAM / 5 MHz / 1672.5 MHz
	

Appendix C. Test Result of Peak to Average Power Ratio

LTE Band 54 / QPSK / 5 MHz / 1672.5 MHz	LTE Band 54 / 16QAM / 5 MHz / 1672.5 MHz
	

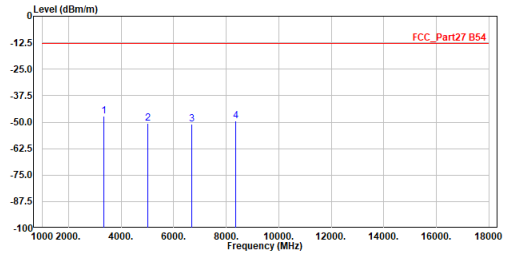
Appendix D.1 Test Result of Conducted Spurious Emission

LTE Band 54 / QPSK / 5 MHz / 1672.5 MHz (Below 1GHz)	LTE Band 54 / QPSK / 5 MHz / 1672.5 MHz (Above 1GHz)
	

Appendix D.2 Test Result of Radiated Spurious Emission

Mode 1:

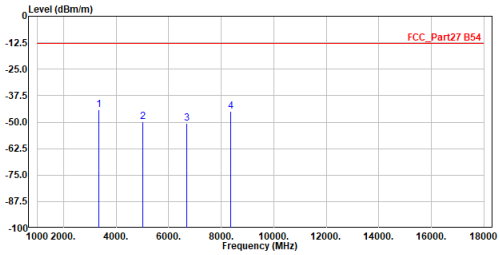
Site : HC-CB04
Condition : 3m ,Horizontal
Mode : B54_5M_1672.5MHz
Test By : Luffy Lin



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	3345.000	-47.01	-13.00	-34.01	-36.99	-10.02	Peak
2	5017.500	-50.56	-13.00	-37.56	-45.07	-5.49	Peak
3	6690.000	-50.78	-13.00	-37.78	-49.00	-1.78	Peak
4	8362.500	-49.43	-13.00	-36.43	-50.12	0.69	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
5. The other emission levels were very low against the limit.

Site : HC-CB04
Condition : 3m ,Vertical
Mode : B54_5M_1672.5MHz
Test By : Luffy Lin

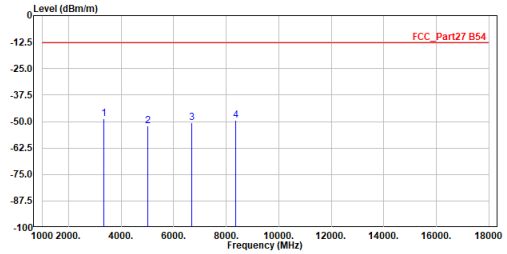


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	3345.000	-44.29	-13.00	-31.29	-34.27	-10.02	Peak
2	5017.500	-49.93	-13.00	-36.93	-44.44	-5.49	Peak
3	6690.000	-50.59	-13.00	-37.59	-48.81	-1.78	Peak
4	8362.500	-45.07	-13.00	-32.07	-45.76	0.69	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
5. The other emission levels were very low against the limit.

Mode 2:

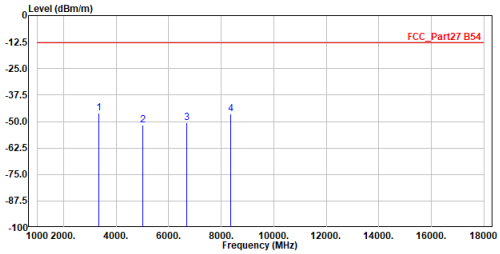
Site :HC-CB04
Condition :3m Horizontal
Mode :LTE_Band54_1672.5MHz
Test By :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3345.000	-48.63	-13.00	-35.63	-38.61	-10.02	Peak
2	5017.500	-52.02	-13.00	-39.02	-46.53	-5.49	Peak
3	6690.000	-50.69	-13.00	-37.69	-48.91	-1.78	Peak
4	8362.500	-49.58	-13.00	-36.58	-50.27	0.69	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Site :HC-CB04
Condition :3m Vertical
Mode :LTE_Band54_1672.5MHz
Test By :Cyril

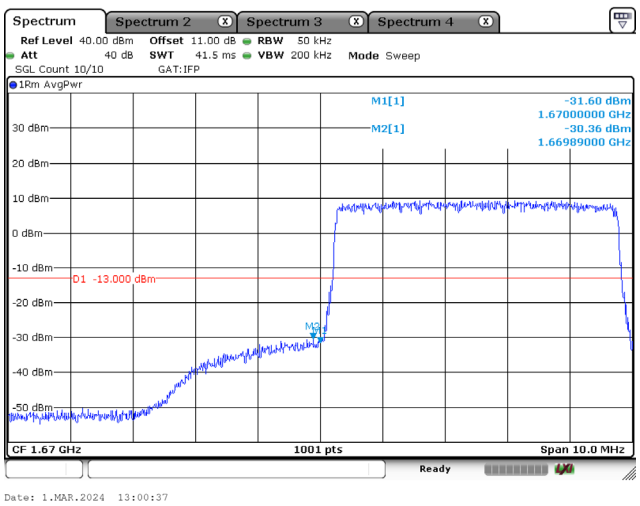


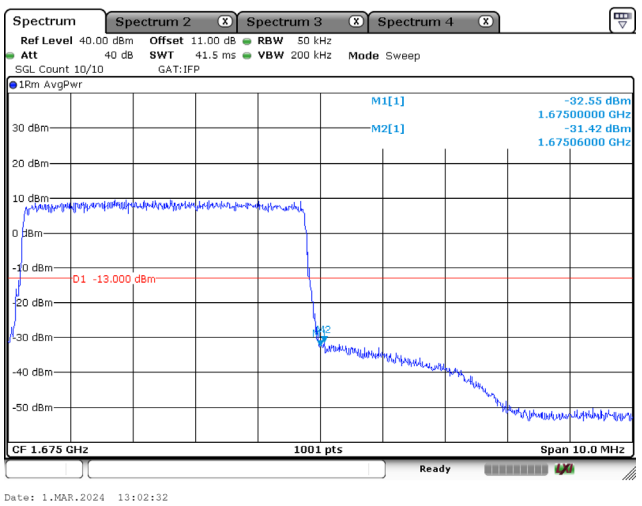
No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3345.000	-46.21	-13.00	-33.21	-36.19	-10.02	Peak
2	5017.500	-51.63	-13.00	-38.63	-46.14	-5.49	Peak
3	6690.000	-50.61	-13.00	-37.61	-48.83	-1.78	Peak
4	8362.500	-46.32	-13.00	-33.32	-47.01	0.69	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Appendix E. Test Result of Conducted Band Edge

LTE Band 54 / QPSK / 5 MHz / 1672.5 MHz





Appendix F. Test Result of Frequency Stability

LTE Band 54 / 5 MHz / 1672.5 MHz

Voltage (Vac)	F_L (MHz)	F_C (MHz)	F_H (MHz)	Limit (MHz)	Result
138.00	1670.2722	1672.51	1674.7378	1670~1675	Pass
120.00	1670.2722	1672.51	1674.7378	1670~1675	Pass
102.00	1670.2622	1672.50	1674.7378	1670~1675	Pass

Temperature (°C)	F_L (MHz)	F_C (MHz)	F_H (MHz)	Limit (MHz)	Result
-40	1670.2722	1672.505	1674.7378	1670~1675	Pass
-30	1670.2722	1672.51	1674.7478	1670~1675	Pass
-20	1670.2622	1672.5	1674.7378	1670~1675	Pass
-10	1670.2622	1672.5	1674.7378	1670~1675	Pass
0	1670.2622	1672.5	1674.7378	1670~1675	Pass
10	1670.2722	1672.51	1674.7478	1670~1675	Pass
20	1670.2722	1672.505	1674.7378	1670~1675	Pass
30	1670.2622	1672.505	1674.7478	1670~1675	Pass
40	1670.2622	1672.505	1674.7478	1670~1675	Pass
50	1670.2622	1672.505	1674.7478	1670~1675	Pass
55	1670.2722	1672.505	1674.7378	1670~1675	Pass

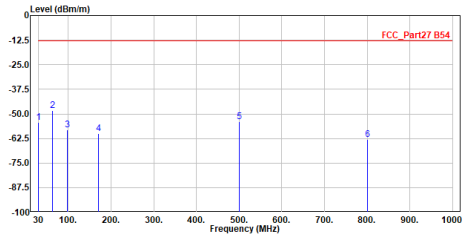
Appendix G. Test Result of Radiated Emissions Co-location

WWAN LTE of EUT + WWAN LTE of WWAN module

<30 MHz ~ 1 GHz>

EUT + PoE 1

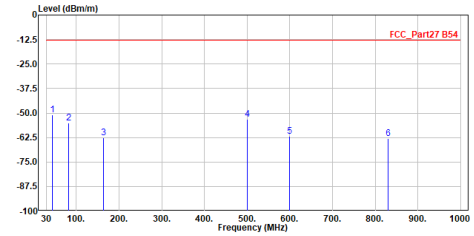
Site :HC-CB04
Condition :3m ,Horizontal
Mode :LF_Co-location_B54+B2
Test By :Luffy Lin



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	30.000	-54.15	-13.00	-41.15	-62.71	8.56	QP
2	62.980	-48.34	-13.00	-35.34	-56.48	8.14	QP
3	98.191	-58.25	-13.00	-45.25	-61.68	3.43	QP
4	169.583	-59.92	-13.00	-46.92	-68.04	8.12	QP
5	499.965	-54.07	-13.00	-41.07	-67.80	13.73	QP
6	800.083	-62.92	-13.00	-49.92	-81.80	18.88	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
5. The other emission levels were very low against the limit.

Site :HC-CB04
Condition :3m ,Vertical
Mode :LF_Co-location_B54+B2
Test By :Luffy Lin

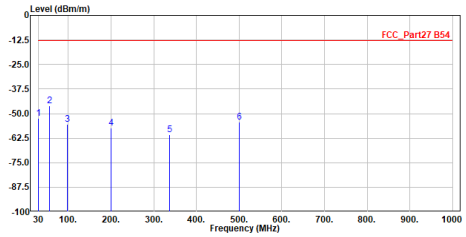


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	43.289	-51.10	-13.00	-38.10	-60.61	9.51	QP
2	82.574	-55.22	-13.00	-42.22	-59.17	3.95	QP
3	164.151	-62.66	-13.00	-49.66	-70.97	8.31	QP
4	499.965	-53.24	-13.00	-40.24	-66.97	13.73	QP
5	600.069	-61.98	-13.00	-48.98	-78.18	16.20	QP
6	829.474	-63.06	-13.00	-50.06	-82.39	19.33	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
5. The other emission levels were very low against the limit.

EUT + PoE 2

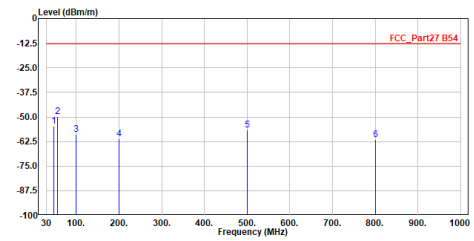
Site :HC-CB04
Condition :3m ,Horizontal
Mode :LF_Co-location_B54+B2
Test By :Luffy Lin



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	30.000	-52.29	-13.00	-39.29	-60.85	8.56	QP
2	56.287	-46.07	-13.00	-33.07	-54.76	8.69	QP
3	97.997	-55.44	-13.00	-42.44	-58.85	3.41	QP
4	199.944	-57.25	-13.00	-44.25	-62.21	4.96	QP
5	337.878	-60.59	-13.00	-47.59	-70.44	9.85	QP
6	499.965	-54.43	-13.00	-41.43	-68.16	13.73	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
5. The other emission levels were very low against the limit.

Site :HC-CB04
Condition :3m ,Vertical
Mode :LF_Co-location_B54+B2
Test By :Luffy Lin

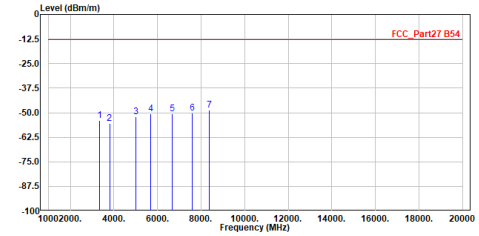


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	46.781	-54.80	-13.00	-41.80	-64.29	9.49	QP
2	56.481	-49.73	-13.00	-36.73	-58.43	8.70	QP
3	99.646	-58.73	-13.00	-45.73	-62.43	3.70	QP
4	199.944	-61.28	-13.00	-48.28	-66.24	4.96	QP
5	499.965	-56.69	-13.00	-43.69	-70.42	13.73	QP
6	800.083	-61.34	-13.00	-48.34	-80.22	18.88	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
5. The other emission levels were very low against the limit.

<Above 1 GHz>

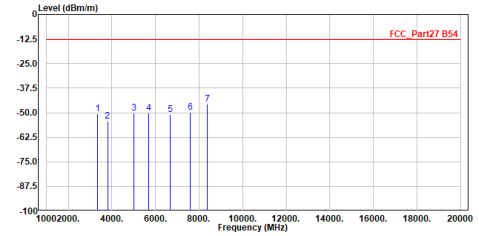
Site :HC-CB04
Condition :3m ,Horizontal
Mode :Co-location_B54+B2
Test By :Luffy Lin



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	3345.000	-53.95	-13.00	-40.95	-43.93	-10.02	Peak
2	3800.000	-55.60	-13.00	-42.60	-46.96	-8.64	Peak
3	5017.500	-52.13	-13.00	-39.13	-46.64	-5.49	Peak
4	5700.000	-50.39	-13.00	-37.39	-45.43	-4.96	Peak
5	6690.000	-50.40	-13.00	-37.40	-48.62	-1.78	Peak
6	7600.000	-50.36	-13.00	-37.36	-49.87	-0.49	Peak
7	8362.500	-48.52	-13.00	-35.52	-49.21	0.69	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
5. The other emission levels were very low against the limit.

Site :HC-CB04
Condition :3m ,Vertical
Mode :Co-location_B54+B2
Test By :Luffy Lin



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	3345.000	-50.65	-13.00	-37.65	-40.63	-10.02	Peak
2	3800.000	-54.23	-13.00	-41.23	-45.59	-8.64	Peak
3	5017.500	-50.19	-13.00	-37.19	-44.70	-5.49	Peak
4	5700.000	-50.29	-13.00	-37.29	-45.33	-4.96	Peak
5	6690.000	-50.82	-13.00	-37.82	-49.04	-1.78	Peak
6	7600.000	-49.78	-13.00	-36.78	-49.29	-0.49	Peak
7	8362.500	-45.66	-13.00	-32.66	-46.35	0.69	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
5. The other emission levels were very low against the limit.