TEST REPORT

CERTIFICATE OF CONFORMITY

Standard:	**47 CFR FCC Part 24** **47 CFR FCC Part 27** **47 CFR FCC Part 2**
Report No.:	RFBCMN-WTW-P23100614-8
FCC ID:	Q3N-RS38
Product:	Mobile Computer
Brand:	CIPHERLAB
Model No.:	RS38
Received Date:	2023/11/12
Test Date:	2024/2/6 ~ 2024/7/19
Issued Date:	2024/8/14
Applicant:	Cipherlab Co., Ltd.
Address:	12F, 333 Dunhua S. Rd., Sec. 2, Taipei, Taiwan 10669
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., Kewi Shan Dist., Taoyuan City 33383, Taiwan
Test Location(2):	No. 70, Wenming Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)
FCC Registration / Designation Number:	788550 / TW0003 for Test Location(1) 281270 / TW0032 for Test Location(2)

Approved by: Jeremy Lin , **Date:** 2024/8/14

Jeremy Lin / Project Engineer

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Prepared by : Polly Chien / Specialist

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Release Control Record

Issue No.	Description	Date Issued
RFBCMN-WTW-P23100614-8	Original release.	2024/8/14

1 Certificate

Product:	Mobile Computer
Brand:	CIPHERLAB
Test Model:	RS38
Sample Status:	Engineering sample
Applicant:	Cipherlab Co., Ltd.
Test Date:	2024/2/6 ~ 2024/7/19
Standard:	47 CFR FCC Part 24 47 CFR FCC Part 27 47 CFR FCC Part 2
Measurement procedure:	ANSI/TIA/EIA-603-E 2016 ANSI C63.26-2015 KDB 971168 D01 Power Meas License Digital Systems v03r01 KDB 971168 D02 Misc Rev Approv License Devices v02r01

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.

2 Summary of Test Results

47 CFR FCC Part 24 47 CFR FCC Part 27 47 CFR FCC Part 2			
Standard / Clause	Test Item	Result	Remark
FCC 47 CFR Part 2.1046 FCC 47 CFR Part 24.232 (c) FCC 47 CFR Part 27.50(d) FCC 47 CFR Part 27.50(h)	Effective Radiated Power and Equivalent Isotropically Radiated Power	Pass	Meet the requirement of limit.
FCC 47 CFR Part 2.1047	Modulation Characteristics	Pass	Refer to Note 2
FCC 47 CFR Part 24.232 (d) FCC 47 CFR Part 27.50(d)	Peak to Average Ratio	Pass	Meet the requirement of limit.
FCC 47 CFR Part 2.1049	Bandwidth	Pass	Meet the requirement of limit.
FCC 47 CFR Part 2.1051 FCC 47 CFR Part 24.238 FCC 47 CFR Part 27.53(h) FCC 47 CFR Part 27.53(m)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
FCC 47 CFR Part 2.1053 FCC 47 CFR Part 24.238 FCC 47 CFR Part 27.53(h) FCC 47 CFR Part 27.53(m)	Radiated Spurious Emissions below 1GHz	Pass	Minimum passing margin is -18.16 dB at 34.85 MHz
FCC 47 CFR Part 2.1053 FCC 47 CFR Part 24.238 FCC 47 CFR Part 27.53(h) FCC 47 CFR Part 27.53(m)	Radiated Spurious Emissions above 1GHz	Pass	Minimum passing margin is -17.98 dB at 5089.80 MHz & 5120.00 MHz
FCC 47 CFR Part 2.1055 FCC 47 CFR Part 24.235 FCC 47 CFR Part 27.54	Frequency Stability	Pass	Meet the requirement of limit.

Note:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. LTE CA mode is similar to digital modulation in LTE single frequency band, so please refer to BV CPS report no.: RFBCMN-WTW-P23100614-11 for the modulation characteristics data of CA mode

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	Specification	Expanded Uncertainty (k=2) (±)
Maximum Output Power / Peak to Average Ratio	-	1.371 dB
26dB Bandwidth / Occupied Bandwidth	-	453.93 Hz / 72 Hz
Conducted emission / Spectrum Emission Mask	-	2.120 dB / 1.899 dB
Frequency Stability	-	0.176 ppm
Radiated Spurious Emissions below 1GHz	9 kHz ~ 30 MHz	3.00 dB
	30 MHz ~ 1 GHz	2.93 dB
Radiated Spurious Emissions above 1GHz	1 GHz ~ 18 GHz	1.76 dB
	18 GHz ~ 40 GHz	1.77 dB

The other instruments specified are routine verified to remain within the calibrated levels, no measurement uncertainty is required to be calculated.

2.2 Supplementary Information

There is not any deviation from the test standards for the test method, and no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Mobile Computer
Brand	CIPHERLAB
Test Model	RS38
Status of EUT	Engineering sample
Power Supply Rating	3.87 Vdc (from battery) 5 Vdc (from adapter or host equipment)

Note:

1. EUT Overview

Band / Bandwidth	TX Frequency Range (MHz)	Max. EIRP Power			
		QPSK	16QAM	64QAM	256QAM
LTE Band 2 (CA 2C) (20MHz + 20MHz)	1860.0-1900.0	127.938mW (21.07dBm)	104.713mW (20.20dBm)	86.298mW (19.36dBm)	43.652mW (16.40dBm)
LTE Band 7 (CA 7C) (20MHz + 20MHz)	2510.0-2560.0	112.980mW (20.53dBm)	92.257mW (19.65dBm)	75.683mW (18.79dBm)	38.282mW (15.83dBm)
LTE Band 41 (CA 41C) (20MHz + 20MHz)	2506.0-2680.0	105.925mW (20.25dBm)	87.700mW (19.43dBm)	71.945mW (18.57dBm)	36.559mW (15.63dBm)
LTE Band 66 (CA 66C) (20MHz + 20MHz)	1720.0-1770.0	105.925mW (20.25dBm)	87.096mW (19.40dBm)	71.614mW (18.55dBm)	36.475mW (15.62dBm)

Band / Bandwidth	TX Frequency Range (MHz)	Emission Designator			
		QPSK	16QAM	64QAM	256QAM
LTE Band 2 (CA 2C) (20MHz + 20MHz)	1860.0-1900.0	37M5G7D	37M5D7W	37M5D7W	37M5D7W
LTE Band 7 (CA 7C) (20MHz + 20MHz)	2510.0-2560.0	37M6G7D	37M6D7W	37M6D7W	37M6D7W
LTE Band 41 (CA 41C) (20MHz + 20MHz)	2506.0-2680.0	37M6G7D	37M5D7W	37M6D7W	37M5D7W
LTE Band 66 (CA 66C) (20MHz + 20MHz)	1720.0-1770.0	37M5G7D	37M5D7W	37M5D7W	37M5D7W

2. The EUT uses following accessories.

Item	Brand	Model	Specification
Adapter	Channel WELL Technology	2AEA010BC3D	AC Input: 100-240 Vac, 50/60 Hz, 0.35 A DC Output: 5.0 Vdc, 2.0 A, 10.0 W
Reader 1	Zebra	SE4770	-
Reader 2	Zebra	SE4100	-
Reader 3	Zebra	SE5500	-
1st Battery	CIPHERLAB	BA-0174A5	3.87 Vdc, 4500 mAh, 17.42 Wh
2nd Battery	Chongqing VDL Electronics Co., Ltd	341322PM4	3.85 Vdc, 90 mAh
USB To Type C Cable	SUNCA CO., LTD	1Q11512211-XJ	0.9 m

* After pretesting, Reader 1 and 1st Battery were the worst case and chosen for final test.

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

4. The EUT support the following CA Configuration.

Band Configuration
2C
7C
41C
48C
66C

5. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

3.2 Antenna Description of EUT

1. The antenna information is listed as below.

Antenna Type	LDS					
Antenna Connector	spring					
Item	Band	Freq. Range (MHz)	Gain (dBi)			
			Ant. 0	Ant. 5	Ant. 6	Ant. 7
LTE	LTE Band 2	1850 ~ 1910	-1			-2
	LTE Band 4	1710 ~ 1755	-1			-2
	LTE Band 5	824 ~ 849	-1.5			
	LTE Band 7	2500 ~ 2570		-1	0.5	
	LTE Band 12	698 ~ 716	-2			
	LTE Band 13	777 ~ 787	-2			
	LTE Band 14	788 ~ 798	-2			
	LTE Band 17	704 ~ 716	-2			
	LTE Band 25	1850 ~ 1915	-1			
	LTE Band 26	814 ~ 849	-1.5			
	LTE Band 30	2305 ~ 2315		-1	0.5	
	LTE Band 38	2570 ~ 2620		-1	0.5	
	LTE Band 41	2496 ~ 2690		-1	0.5	
	LTE Band 66	1710 ~ 1780	-1			-2
	LTE Band 71	663 ~ 698	-1.5			

* The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan:	EUT can be used in the following ways: X-axis/ Y-axis/ Z-axis. Pre-scan these ways and find the worst case as a representative test condition.
Worst Case:	X-axis/ Y-axis/ Z-axis Worst Condition: Z-axis

For LTE Band 2 (CA 2C)

Test Item	Tested Channel	Channel Bandwidth	Modulation	Mode
EIRP	18700 (1860.0MHz) + 18898 (1879.8MHz) 18801 (1870.1MHz) + 18999 (1889.9MHz) 18902 (1880.2MHz) + 19100 (1900.0MHz)	20MHz + 20MHz	QPSK / 16QAM / 64QAM / 256QAM	1 RB Half RB Full RB
Frequency Stability	18700 (1860.0MHz) + 18898 (1879.8MHz) 18902 (1880.2MHz) + 19100 (1900.0MHz)	20MHz + 20MHz	QPSK	Full RB
Occupied Bandwidth	18700 (1860.0MHz) + 18898 (1879.8MHz) 18801 (1870.1MHz) + 18999 (1889.9MHz) 18902 (1880.2MHz) + 19100 (1900.0MHz)	20MHz + 20MHz	QPSK / 16QAM / 64QAM / 256QAM	Full RB
Peak to Average Ratio	18700 (1860.0MHz) + 18898 (1879.8MHz) 18801 (1870.1MHz) + 18999 (1889.9MHz) 18902 (1880.2MHz) + 19100 (1900.0MHz)	20MHz + 20MHz	QPSK / 16QAM / 64QAM / 256QAM	1 RB
Conducted Emission	18700 (1860.0MHz) + 18898 (1879.8MHz) 18801 (1870.1MHz) + 18999 (1889.9MHz) 18902 (1880.2MHz) + 19100 (1900.0MHz)	20MHz + 20MHz	QPSK	1 RB Full RB
RE Below 1GHz	18902 (1880.2MHz) + 19100 (1900.0MHz)	20MHz + 20MHz	QPSK	1 RB
RE Above 1GHz	18700 (1860.0MHz) + 18898 (1879.8MHz) 18801 (1870.1MHz) + 18999 (1889.9MHz) 18902 (1880.2MHz) + 19100 (1900.0MHz)	20MHz + 20MHz	QPSK	1 RB

For LTE Band 7 (CA 7C)

Test Item	Tested Channel	Channel Bandwidth	Modulation	Mode
EIRP	20850 (2510.0MHz) + 21048 (2529.8MHz) 21001 (2525.1MHz) + 21199 (2544.9MHz) 21152 (2540.2MHz) + 21350 (2560.0MHz)	20MHz + 20MHz	QPSK / 16QAM / 64QAM / 256QAM	1 RB Half RB Full RB
Frequency Stability	20850 (2510.0MHz) + 21048 (2529.8MHz) 21152 (2540.2MHz) + 21350 (2560.0MHz)	20MHz + 20MHz	QPSK	Full RB
Occupied Bandwidth	20850 (2510.0MHz) + 21048 (2529.8MHz) 21001 (2525.1MHz) + 21199 (2544.9MHz) 21152 (2540.2MHz) + 21350 (2560.0MHz)	20MHz + 20MHz	QPSK / 16QAM / 64QAM / 256QAM	Full RB
Peak to Average Ratio	20850 (2510.0MHz) + 21048 (2529.8MHz) 21001 (2525.1MHz) + 21199 (2544.9MHz) 21152 (2540.2MHz) + 21350 (2560.0MHz)	20MHz + 20MHz	QPSK / 16QAM / 64QAM / 256QAM	1 RB
Conducted Emission	20850 (2510.0MHz) + 21048 (2529.8MHz) 21001 (2525.1MHz) + 21199 (2544.9MHz) 21152 (2540.2MHz) + 21350 (2560.0MHz)	20MHz + 20MHz	QPSK	1 RB Full RB
RE Below 1GHz	21152 (2540.2MHz) + 21350 (2560.0MHz)	20MHz + 20MHz	QPSK	1 RB
RE Above 1GHz	20850 (2510.0MHz) + 21048 (2529.8MHz) 21001 (2525.1MHz) + 21199 (2544.9MHz) 21152 (2540.2MHz) + 21350 (2560.0MHz)	20MHz + 20MHz	QPSK	1 RB

For LTE Band 41 (CA 41C)

Test Item	Tested Channel	Channel Bandwidth	Modulation	Mode
EIRP	39750 (2506.0MHz) + 39948 (2525.8MHz) 40521 (2583.1MHz) + 40719 (2602.9MHz) 41292 (2660.2MHz) + 41490 (2680.0MHz)	20MHz + 20MHz	QPSK / 16QAM / 64QAM / 256QAM	1 RB Half RB Full RB
Frequency Stability	39750 (2506.0MHz) + 39948 (2525.8MHz) 41292 (2660.2MHz) + 41490 (2680.0MHz)	20MHz + 20MHz	QPSK	Full RB
Occupied Bandwidth	39750 (2506.0MHz) + 39948 (2525.8MHz) 40521 (2583.1MHz) + 40719 (2602.9MHz) 41292 (2660.2MHz) + 41490 (2680.0MHz)	20MHz + 20MHz	QPSK / 16QAM / 64QAM / 256QAM	Full RB
Peak to Average Ratio	39750 (2506.0MHz) + 39948 (2525.8MHz) 40521 (2583.1MHz) + 40719 (2602.9MHz) 41292 (2660.2MHz) + 41490 (2680.0MHz)	20MHz + 20MHz	QPSK / 16QAM / 64QAM / 256QAM	1 RB
Conducted Emission	39750 (2506.0MHz) + 39948 (2525.8MHz) 40521 (2583.1MHz) + 40719 (2602.9MHz) 41292 (2660.2MHz) + 41490 (2680.0MHz)	20MHz + 20MHz	QPSK	1 RB Full RB
RE Below 1GHz	41292 (2660.2MHz) + 41490 (2680.0MHz)	20MHz + 20MHz	QPSK	1 RB
RE Above 1GHz	39750 (2506.0MHz) + 39948 (2525.8MHz) 40521 (2583.1MHz) + 40719 (2602.9MHz) 41292 (2660.2MHz) + 41490 (2680.0MHz)	20MHz + 20MHz	QPSK	1 RB

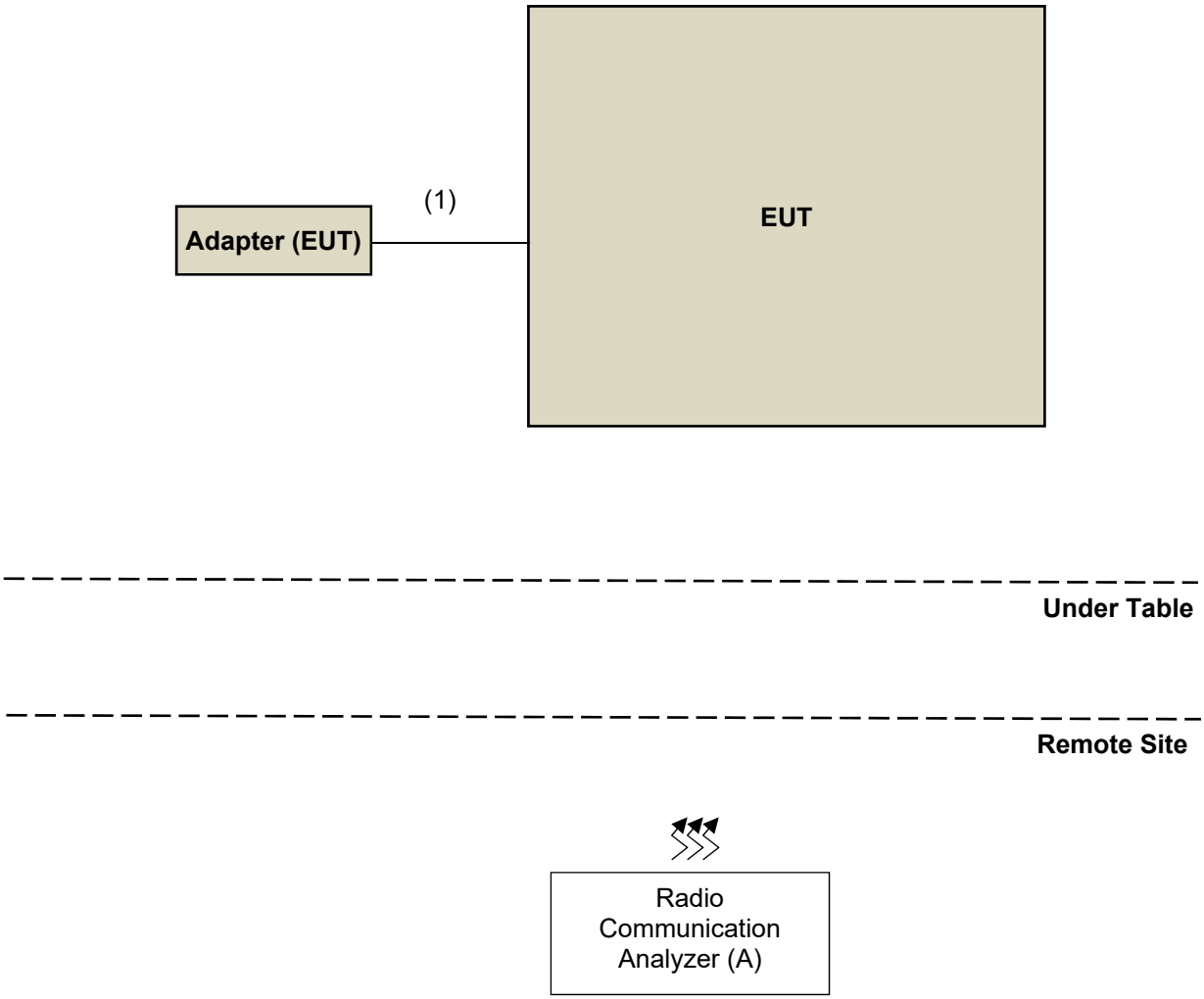
For LTE Band 66 (CA 66C)

Test Item	Tested Channel	Channel Bandwidth	Modulation	Mode
EIRP	132072 (1720.0MHz) + 132270 (1739.8MHz) 132323 (1745.1MHz) + 132521 (1764.9MHz) 132374 (1750.2MHz) + 132572 (1770.0MHz)	20MHz + 20MHz	QPSK / 16QAM / 64QAM / 256QAM	1 RB Half RB Full RB
Frequency Stability	132072 (1720.0MHz) + 132270 (1739.8MHz) 132374 (1750.2MHz) + 132572 (1770.0MHz)	20MHz + 20MHz	QPSK	Full RB
Occupied Bandwidth	132072 (1720.0MHz) + 132270 (1739.8MHz) 132323 (1745.1MHz) + 132521 (1764.9MHz) 132374 (1750.2MHz) + 132572 (1770.0MHz)	20MHz + 20MHz	QPSK / 16QAM / 64QAM / 256QAM	Full RB
Peak to Average Ratio	132072 (1720.0MHz) + 132270 (1739.8MHz) 132323 (1745.1MHz) + 132521 (1764.9MHz) 132374 (1750.2MHz) + 132572 (1770.0MHz)	20MHz + 20MHz	QPSK / 16QAM / 64QAM / 256QAM	1 RB
Conducted Emission	132072 (1720.0MHz) + 132270 (1739.8MHz) 132323 (1745.1MHz) + 132521 (1764.9MHz) 132374 (1750.2MHz) + 132572 (1770.0MHz)	20MHz + 20MHz	QPSK	1 RB Full RB
RE Below 1GHz	132323 (1745.1MHz) + 132521 (1764.9MHz)	20MHz + 20MHz	QPSK	1 RB
RE Above 1GHz	132072 (1720.0MHz) + 132270 (1739.8MHz) 132323 (1745.1MHz) + 132521 (1764.9MHz) 132374 (1750.2MHz) + 132572 (1770.0MHz)	20MHz + 20MHz	QPSK	1 RB

3.4 Test Program Used and Operation Descriptions

There is no need to controlling software during the test, and the EUT can be paired with the Radio Communication Analyzer to test the connection when it is powered on.

3.5 Connection Diagram of EUT and Peripheral Devices



3.6 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	Radio Communication Analyzer	Anritsu	MT8821C	6201462755	N/A	Provided by Lab

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	USB To Type C Cable	1	0.9	Y	0	Accessory of EUT

4 Test Instruments

The calibration interval of the all test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.1 Effective Radiated Power and Equivalent Isotropically Radiated Power

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
N9030B - PXA Signal Analyzer KEYSIGHT	N9030B	MY57140488	2024/3/6	2025/3/5
Radio Communication Analyzer Anritsu	MT8821C	6201462755	2024/3/13	2025/3/12
Software BV	ADT_RF Test Software V6.6.5.4	N/A	N/A	N/A

Notes:

1. The test was performed in Oven room.
2. Tested Date: 2024/7/19

4.2 Peak to Average Ratio

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
N9030B - PXA Signal Analyzer KEYSIGHT	N9030B	MY57140938	2023/3/16	2024/3/15
Radio Communication Analyzer Anritsu	MT8821C	6201462755	2023/3/3	2024/3/2
Software BV	ADT_RF Test Software V6.6.5.4	N/A	N/A	N/A

Notes:

1. The test was performed in Oven room.
2. Tested Date: 2024/2/6 ~ 2024/2/7

4.3 Bandwidth

Refer to section 4.1 to get information of the instruments.

4.4 Conducted Spurious Emissions

Refer to section 4.1 to get information of the instruments.

4.5 Radiated Spurious Emissions below 1GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Antenna Tower Max-Full	MFT-151SS-0.5T	N/A	N/A	N/A
Bi_Log Antenna Schwarzbeck	VULB 9168	9168-1213	2023/10/13	2024/10/12
EMI Test Receiver R&S	ESR3	102782	2023/12/7	2024/12/6
Loop Antenna Electro-Metrics	EM-6879	269	2023/9/23	2024/9/22
Loop Antenna TESEQ	HLA 6121	45745	2023/8/8	2024/8/7
MXA Signal Analyzer Keysight	N9020B	MY60110513	2023/12/22	2024/12/21
Preamplifier EMCI	EMC330N	980782	2024/1/15	2025/1/14
	EMC001340	980201	2023/9/27	2024/9/26
RF Coaxial Cable EMCI	EMCCFD400-NM-NM-500	201233	2024/1/15	2025/1/14
	EMCCFD400-NM-NM-3000	201235	2024/1/15	2025/1/14
	EMCCFD400-NM-NM-9000	201236(with PAD)	2024/1/15	2025/1/14
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	N/A	N/A	N/A
Turn Table Max-Full	MF-7802BS	N/A	N/A	N/A
Turn Table Controller Max-Full	MF-7802BS	MF780208674	N/A	N/A
Radio Communication Analyzer Anritsu	MT8821C	6201462755	2023/3/3	2024/3/2

Notes:

1. The test was performed in WM - 966 chamber 8.
2. Tested Date: 2024/2/26 ~ 2024/2/27

4.6 Radiated Spurious Emissions above 1GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Antenna Tower Max-Full	MFT-151SS-0.5T	N/A	N/A	N/A
EMI Test Receiver R&S	ESR3	102782	2023/12/7	2024/12/6
Horn Antenna RFSPIN	DRH18-E	210103A18E	2023/11/12	2024/11/11
Horn Antenna Schwarzbeck	BBHA 9170	9170-1049	2023/11/12	2024/11/11
MXA Signal Analyzer Keysight	N9020B	MY60110513	2023/12/22	2024/12/21
Preamplifier EMCI	EMC118A45SE	980808	2023/12/28	2024/12/27
	EMC184045SE	980788	2024/1/15	2025/1/14
RF Coaxial Cable EMCI	EMC101G-KM-KM-2000	201254	2024/1/15	2025/1/14
	EMC101G-KM-KM-3000	201258	2024/1/15	2025/1/14
	EMC101G-KM-KM-5000	201261	2024/1/15	2025/1/14
	EMC104-SM-SM-1000	210102	2024/1/15	2025/1/14
	EMC104-SM-SM-3000	201231	2024/1/15	2025/1/14
	EMC104-SM-SM-9000	201243	2024/1/15	2025/1/14
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	N/A	N/A	N/A
Turn Table Max-Full	MF-7802BS	N/A	N/A	N/A
Turn Table Controller Max-Full	MF-7802BS	MF780208674	N/A	N/A

Notes:

1. The test was performed in WM - 966 chamber 8.
2. Tested Date: 2024/2/21 ~ 2024/2/23

4.7 Frequency Stability

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
3-channel DC power supply JIN YIH Technology	ODP3033	ODP30332128138	N/A	N/A
Digital Multimeter Fluke	87-III	70360742	2023/7/6	2024/7/5
Signal and spectrum analyzer R&S	FSV3044	101105	2024/2/27	2025/2/26
Software BV	ADT_RF Test Software V6.6.5.4	N/A	N/A	N/A
Temperature & Humidity Chamber TERCHY	HRM-120RF	931022	2023/12/19	2024/12/18
Radio Communication Analyzer Anritsu	MT8821C	6201462755	2024/3/13	2025/3/12

Notes:

1. The test was performed in Oven room.
2. Tested Date: 2024/4/8

5 Limits of Test Items

5.1 Effective Radiated Power and Equivalent Isotropically Radiated Power

For LTE Band 2 (CA 2C):

Mobile and portable stations are limited to 2 watts EIRP.

For LTE Band 7 (CA 7C) and LTE Band 41 (CA 41C):

Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

For LTE Band 66 (CA 66C):

Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

5.2 Peak to Average Ratio

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

5.3 Bandwidth

According to FCC 47 CFR part 2.1049, the occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5% of the total mean power radiated by a given emission.

5.4 Conducted Spurious Emissions

For LTE Band 2 (CA 2C):

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 –13 dBm.

For LTE Band 7 (CA 7C) and LTE Band 41 (CA 41C):

According to FCC 47 CFR part 27.53(m)(4) regulations, any transmit power outside of the channel edge must be attenuated below the transmitting power (P) by a factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed.

LTE Band 66 (CA 66C):

According to FCC 47 CFR part 27.53(h), for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log (P) dB. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

5.5 Radiated Spurious Emissions below 1GHz

For LTE Band 2 (CA 2C):

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 –13 dBm.

For LTE Band 7 (CA 7C) and LTE Band 41 (CA 41C):

According to FCC 47 CFR part 27.53(m)(4), on any frequency outside a licensee’s frequency block, The power of any emission shall be attenuated below the transmitter power (P) by at least 55 + 10 log (P) dB. The emission limit equal to –25 dBm.

LTE Band 66 (CA 66C):

According to FCC 47 CFR part 27.53(h), for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log (P) dB. The limit of emission is equal to -13 dBm.

5.6 Radiated Spurious Emissions above 1GHz

For LTE Band 2 (CA 2C):

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 –13 dBm.

For LTE Band 7 (CA 7C) and LTE Band 41 (CA 41C):

According to FCC 47 CFR part 27.53(m)(4), on any frequency outside a licensee’s frequency block, The power of any emission shall be attenuated below the transmitter power (P) by at least 55 + 10 log (P) dB. The emission limit equal to –25 dBm.

For LTE Band 66 (CA 66C):

According to FCC 47 CFR part 27.53(h), for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log (P) dB. The limit of emission is equal to -13 dBm.

5.7 Frequency Stability

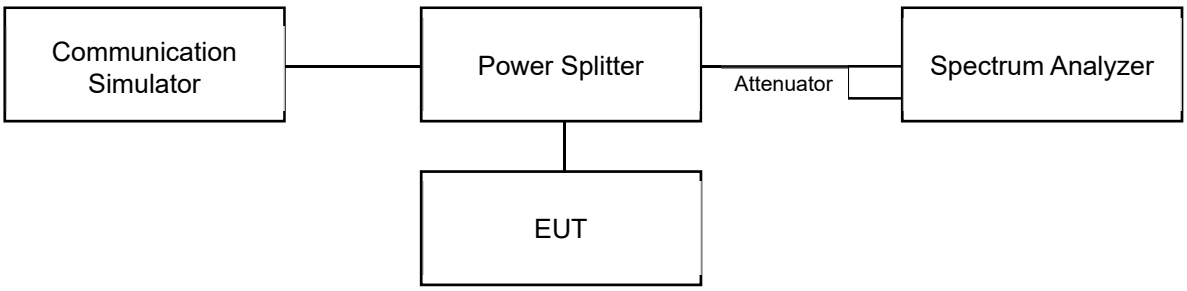
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation (authorized frequency block).

6 Test Arrangements

6.1 Effective Radiated Power and Equivalent Isotropically Radiated Power

6.1.1 Test Setup

Conducted Power Measurement:



6.1.2 Test Procedure

Conducted Power Measurement:

The EUT is configured by emulator to set data modulation and maximum power using WWAN technology. The power measurement was performed on emulator and power value was measured from power function on emulator. 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

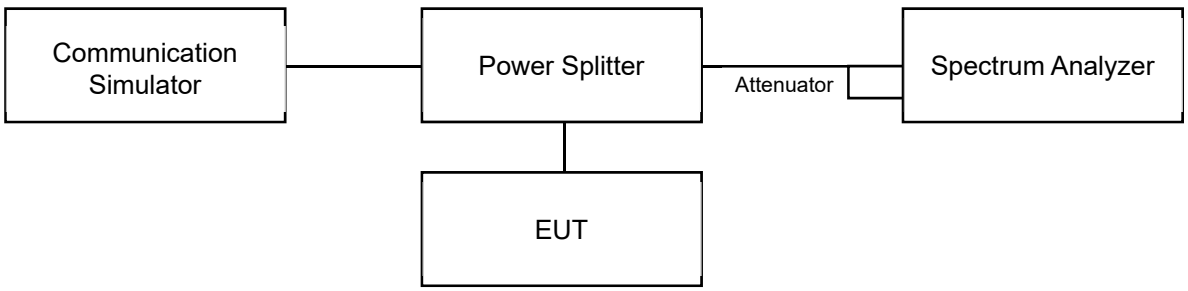
ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as P_{Meas}, e.g., dBm or dBW)

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)

6.2 Peak to Average Ratio

6.2.1 Test Setup

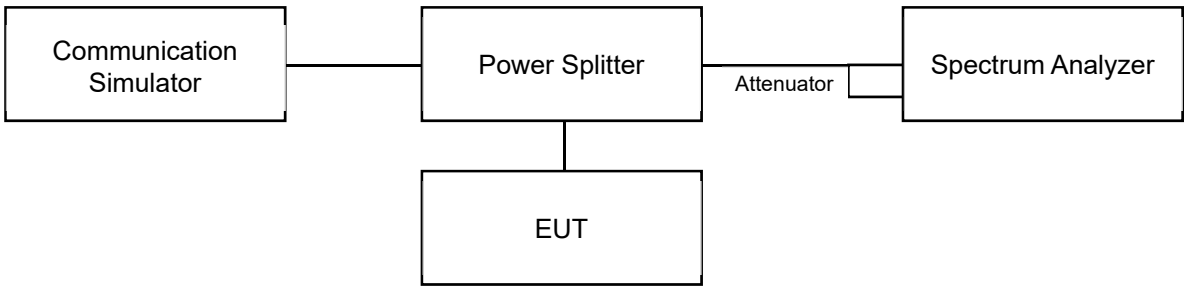


6.2.2 Test Procedure

a. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
b. Set the number of counts to a value that stabilizes the measured CCDF curve;
c. Record the maximum PAPR level associated with a probability of 0.1%.

6.3 Bandwidth

6.3.1 Test Setup



6.3.2 Test Procedure

For the 26 dBc bandwidth measurement method, please refer to section 5.4.3 of ANSI C63.26.

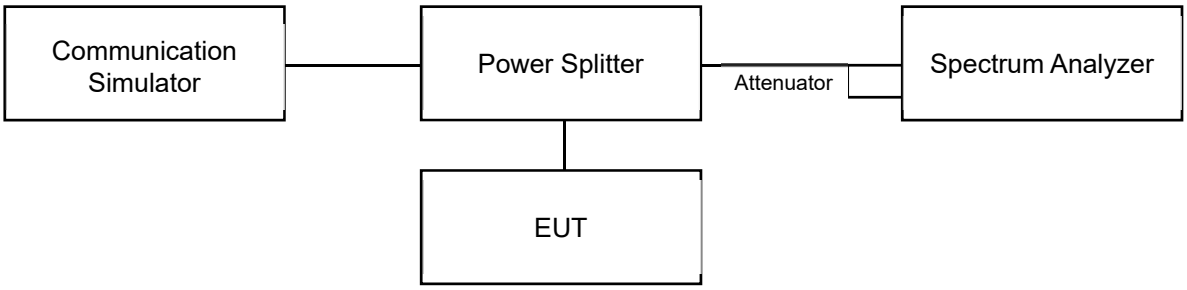
a. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be wide enough to see sufficient roll off of the signal to make the measurement.
b. The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set ≥ 3 × RBW.
c. Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation. See guidance provided in 4.2.3.
d. The dynamic range of the spectrum analyzer at the selected RBW shall be more than 10 dB below the target "−X dB" requirement, i.e., if the requirement calls for measuring the −26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be at least 36 dB below the reference level.
e. Set spectrum analyzer detection mode to peak, and the trace mode to max hold.
f. Determine the following reference values: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).
g. Determine the "−X dB amplitude" as equal to (Reference Value − X). Alternatively, this calculation can be performed on the spectrum analyzer using the delta-marker measurement function.
h. Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the "−X dB amplitude" determined in step f). If a marker is below this "−X dB amplitude" value it should be as close as possible to this value. The OBW is the positive frequency difference between the two markers.
i. The OBW shall be reported by providing plot(s) of the measuring instrument display, to include markers depicting the relevant frequency and amplitude information (e.g., marker table). The frequency and amplitude axis and scale shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

For the occupied bandwidth measurement method, please refer to section 5.4.4 of ANSI C63.26.

a. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be wide enough to see sufficient roll off of the signal to make the measurement.
b. The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set ≥ 3 × RBW.
c. Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation. See guidance provided in 4.2.3.
d. The dynamic range of the spectrum analyzer at the selected RBW shall be more than 10 dB below the target "−X dB" requirement, i.e., if the requirement calls for measuring the −26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be at least 36 dB below the reference level.
e. Set spectrum analyzer detection mode to peak, and the trace mode to max hold.
f. Determine the reference value by either of the following:
g. 1) Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).
h. 2) Set the EUT to transmit an unmodulated carrier. Set the spectrum analyzer marker to the level of the carrier.
i. Determine the "−X dB amplitude" as equal to (Reference Value − X). Alternatively, this calculation can be performed on the spectrum analyzer using the delta-marker measurement function.
j. If the reference value was determined using an unmodulated carrier, turn the EUT modulation on, then either clear the existing trace or start a new trace on the spectrum analyzer and allow the new trace to stabilize. Otherwise the trace from step f) shall be used for step i).
k. Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the "−X dB amplitude" determined in step f). If a marker is below this "−X dB amplitude" value it should be as close as possible to this value. The OBW is the positive frequency difference between the two markers. The spectral envelope can cross the "−X dB amplitude" at multiple points. The lowest or highest frequency shall be selected as the frequencies that are the farthest away from the center frequency at which the spectral envelope crosses the "−X dB amplitude."
l. The OBW shall be reported by providing plot(s) of the measuring instrument display, to include markers depicting the relevant frequency and amplitude information (e.g., marker table). The frequency and amplitude axis and scale shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

6.4 Conducted Spurious Emissions

6.4.1 Test Setup



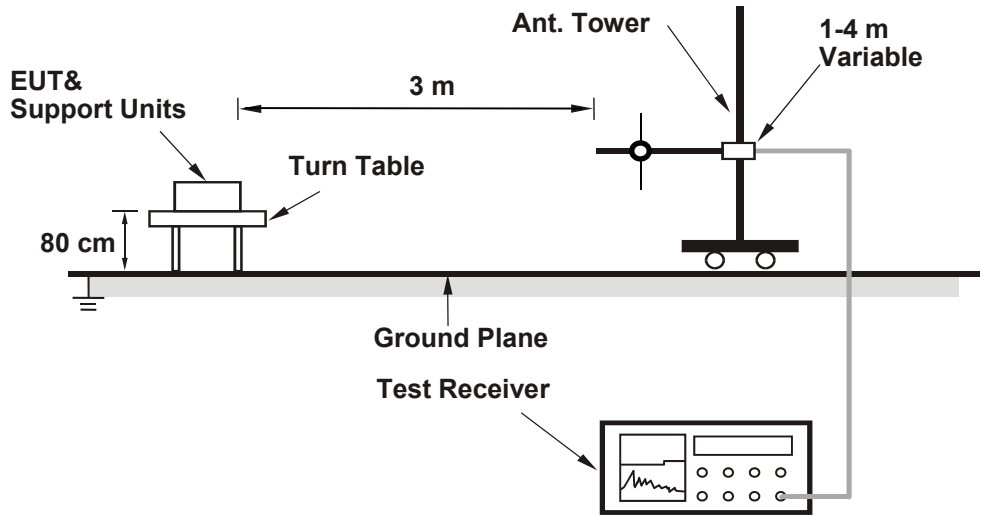
6.4.2 Test Procedure

a. Measurement refer to ANSI C63.26 section 5.7.
b. All measurements were done at 3 channels: low, middle and high operational frequency range.
c. Measuring frequency range is from 9 kHz up to the tenth harmonic of the hightest fundamental frequency or to 40 GHz, whichever is lower. 20 dB attenuation pad is connected with spectrum.
d. The fundamental frequency above 1 GHz, the spectrum set RBW = 1 MHz, VBW = 3 MHz, Detector = Average.
e. The fundamental frequency below 1 GHz, the spectrum set RBW ≥ 100 kHz, VBW ≥ 3 x RBW, Detector = Average.
f. Measuring frequency band edge, narrow RBW (no less than 1% of the OBW) is used for conducted emission measurement.

6.5 Radiated Spurious Emissions below 1GHz

6.5.1 Test Setup

For radiated emission 30 MHz to 1 GHz



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

6.5.2 Test Procedure

The EUT is configured by emulator to set data modulation and maximum power using WWAN technology.

a. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 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

e. EIRP (dBm) = E (dBμV/m) + 20log(D) - 104.8; where D is the measurement distance (in the far field region) in m.

f. ERP (dBm) = E (dBμV/m) + 20log(D) - 104.8 - 2.15; where D is the measurement distance (in the far field region) in m.

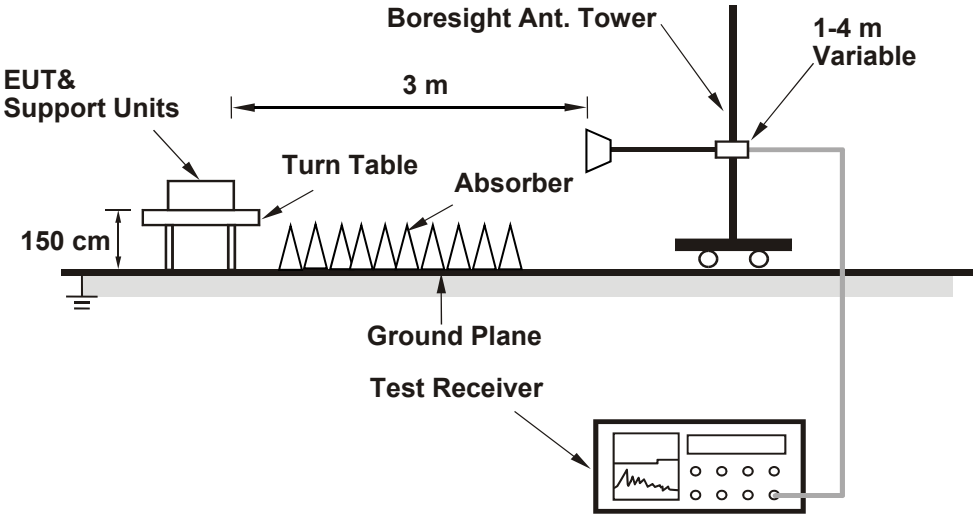
Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz/3 MHz. Set detector=average.
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.

6.6 Radiated Spurious Emissions above 1GHz

6.6.1 Test Setup

For radiated emission above 1 GHz



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

6.6.2 Test Procedure

The EUT is configured by emulator to set data modulation and maximum power using WWAN technology.

a. In the semi-anechoic chamber, EUT placed on the 1.5 m 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

e. EIRP (dBm) = E (dBμV/m) + 20log(D) - 104.8; where D is the measurement distance (in the far field region) in m.

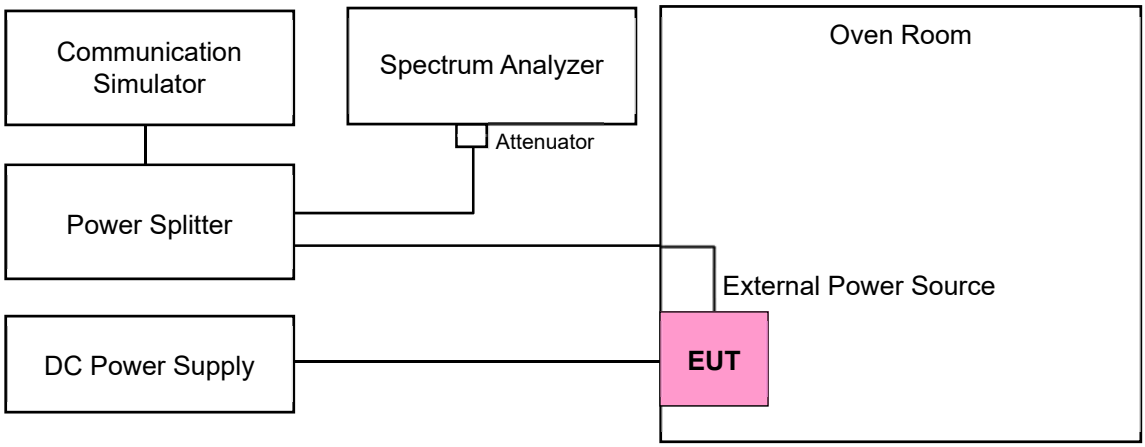
f. ERP (dBm) = E (dBμV/m) + 20log(D) - 104.8 - 2.15; where D is the measurement distance (in the far field region) in m.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz/3 MHz. Set detector=average.

6.7 Frequency Stability

6.7.1 Test Setup



6.7.2 Test Procedure

The EUT is configured by emulator to set data modulation and maximum power using WWAN technology.

a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.

c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5℃ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

Note: The frequency error was recorded frequency error from the communication simulator.

7 Test Results of Test Item

7.1 Effective Radiated Power and Equivalent Isotropically Radiated Power

Input Power:	3.87 Vdc	Environmental Conditions:	21°C, 69% RH	Tested By:	Willy Cheng

7.1.1 LTE Band 2 (CA 2C)

Conducted Output Power (dBm)

Ant. 0

Confugure	Combination	PCC							SCC							Measurement Power
		Band	BW (MHz)	Modulation	RB Size	RB Offset	UL Channel	UL Frequency (MHz)	Band	BW (MHz)	Modulation	RB Size	RB Offset	UL Channel	UL Frequency (MHz)	Tx Power with UL-CA Active (dBm)
																Total
Intra Band Contiguous	CA_2C	2	20	QPSK	1	0	18700	1860	2	20	QPSK	1	99	18898	1879.8	15.64
					1	99						1	0			21.93
		2	20	QPSK	1	0	18801	1870.1	2	20	QPSK	1	99	18999	1889.9	16.21
					1	99						1	0			21.47
		2	20	QPSK	1	0	18902	1880.2	2	20	QPSK	1	99	19100	1900	16.15
					1	99						1	0			22.07
Intra Band Contiguous	CA_2C	2	20	16QAM	1	0	18700	1860	2	20	16QAM	1	99	18898	1879.8	14.80
					1	99						1	0			21.09
		2	20	16QAM	1	0	18801	1870.1	2	20	16QAM	1	99	18999	1889.9	15.36
					1	99						1	0			20.67
		2	20	16QAM	1	0	18902	1880.2	2	20	16QAM	1	99	19100	1900	15.29
					1	99						1	0			21.20
Intra Band Contiguous	CA_2C	2	20	64QAM	1	0	18700	1860	2	20	64QAM	1	99	18898	1879.8	13.97
					1	99						1	0			20.20
		2	20	64QAM	1	0	18801	1870.1	2	20	64QAM	1	99	18999	1889.9	14.48
					1	99						1	0			19.82
		2	20	64QAM	1	0	18902	1880.2	2	20	64QAM	1	99	19100	1900	14.41
					1	99						1	0			20.36
Intra Band Contiguous	CA_2C	2	20	256QAM	1	0	18700	1860	2	20	256QAM	1	99	18898	1879.8	11.03
					1	99						1	0			17.25
		2	20	256QAM	1	0	18801	1870.1	2	20	256QAM	1	99	18999	1889.9	11.53
					1	99						1	0			16.88
		2	20	256QAM	1	0	18902	1880.2	2	20	256QAM	1	99	19100	1900	11.43
					1	99						1	0			17.40

EIRP Power (dBm)

Maximum Output Power		
Modulation	Cond. Power (dBm)	Max. EIRP (dBm)
QPSK	22.07	21.07
16QAM	21.20	20.20
64QAM	20.36	19.36
256QAM	17.40	16.40

Note: EIRP (dBm) = Cond. Power (dBm) + Antenna Gain (dBi) + Array Gain (if applicable)

7.1.2 LTE Band 7 (CA 7C)

Conducted Output Power (dBm)

Ant. 5

Confugure	Combination	PCC							SCC							Measurement Power
		Band	BW (MHz)	Modulation	RB Size	RB Offset	UL Channel	UL Frequency (MHz)	Band	BW (MHz)	Modulation	RB Size	RB Offset	UL Channel	UL Frequency (MHz)	Tx Power with UL-CA Active (dBm)
																Total
Intra Band Contiguous	CA_7C	7	20	QPSK	1	0	20850	2510	7	20	QPSK	1	99	21048	2529.8	15.21
					1	99						1	0			21.47
		7	20	QPSK	1	0	21001	2525.1	7	20	QPSK	1	99	21199	2544.9	14.18
					1	99						1	0			21.53
		7	20	QPSK	1	0	21152	2540.2	7	20	QPSK	1	99	21350	2560	14.66
					1	99						1	0			21.14
Intra Band Contiguous	CA_7C	7	20	16QAM	1	0	20850	2510	7	20	16QAM	1	99	21048	2529.8	14.39
					1	99						1	0			20.63
		7	20	16QAM	1	0	21001	2525.1	7	20	16QAM	1	99	21199	2544.9	13.33
					1	99						1	0			20.65
		7	20	16QAM	1	0	21152	2540.2	7	20	16QAM	1	99	21350	2560	13.77
					1	99						1	0			20.27
Intra Band Contiguous	CA_7C	7	20	64QAM	1	0	20850	2510	7	20	64QAM	1	99	21048	2529.8	13.58
					1	99						1	0			19.78
		7	20	64QAM	1	0	21001	2525.1	7	20	64QAM	1	99	21199	2544.9	12.47
					1	99						1	0			19.79
		7	20	64QAM	1	0	21152	2540.2	7	20	64QAM	1	99	21350	2560	12.90
					1	99						1	0			19.44
Intra Band Contiguous	CA_7C	7	20	256QAM	1	0	20850	2510	7	20	256QAM	1	99	21048	2529.8	10.64
					1	99						1	0			16.81
		7	20	256QAM	1	0	21001	2525.1	7	20	256QAM	1	99	21199	2544.9	9.49
					1	99						1	0			16.83
		7	20	256QAM	1	0	21152	2540.2	7	20	256QAM	1	99	21350	2560	9.95
					1	99						1	0			16.46

EIRP Power (dBm)

Maximum Output Power		
Modulation	Cond. Power (dBm)	Max. EIRP (dBm)
QPSK	21.53	20.53
16QAM	20.65	19.65
64QAM	19.79	18.79
256QAM	16.83	15.83

Note: EIRP (dBm) = Cond. Power (dBm) + Antenna Gain (dBi) + Array Gain (if applicable)

7.1.3 LTE Band 41 (CA 41C)

Conducted Output Power (dBm)

Ant. 5

Confugure	Combination	PCC							SCC							Measurement Power
		Band	BW (MHz)	Modulation	RB Size	RB Offset	UL Channel	UL Frequency (MHz)	Band	BW (MHz)	Modulation	RB Size	RB Offset	UL Channel	UL Frequency (MHz)	Tx Power with UL-CA Active (dBm)
																Total
Intra Band Contiguous	CA_41C	41	20	QPSK	1	0	39750	2506	41	20	QPSK	1	99	39948	2525.8	14.48
					1	99						1	0			21.18
		41	20	QPSK	1	0	40521	2583.1	41	20	QPSK	1	99	40719	2602.9	14.41
					1	99						1	0			21.25
		41	20	QPSK	1	0	41292	2660.2	41	20	QPSK	1	99	41490	2680	13.77
					1	99						1	0			21.14
Intra Band Contiguous	CA_41C	41	20	16QAM	1	0	39750	2506	41	20	16QAM	1	99	39948	2525.8	13.65
					1	99						1	0			20.34
		41	20	16QAM	1	0	40521	2583.1	41	20	16QAM	1	99	40719	2602.9	13.53
					1	99						1	0			20.43
		41	20	16QAM	1	0	41292	2660.2	41	20	16QAM	1	99	41490	2680	12.92
					1	99						1	0			20.30
Intra Band Contiguous	CA_41C	41	20	64QAM	1	0	39750	2506	41	20	64QAM	1	99	39948	2525.8	12.79
					1	99						1	0			19.49
		41	20	64QAM	1	0	40521	2583.1	41	20	64QAM	1	99	40719	2602.9	12.67
					1	99						1	0			19.57
		41	20	64QAM	1	0	41292	2660.2	41	20	64QAM	1	99	41490	2680	12.08
					1	99						1	0			19.48
Intra Band Contiguous	CA_41C	41	20	256QAM	1	0	39750	2506	41	20	256QAM	1	99	39948	2525.8	9.84
					1	99						1	0			16.57
		41	20	256QAM	1	0	40521	2583.1	41	20	256QAM	1	99	40719	2602.9	9.72
					1	99						1	0			16.63
		41	20	256QAM	1	0	41292	2660.2	41	20	256QAM	1	99	41490	2680	9.11
					1	99						1	0			16.55

EIRP Power (dBm)

Maximum Output Power		
Modulation	Cond. Power (dBm)	Max. EIRP (dBm)
QPSK	21.25	20.25
16QAM	20.43	19.43
64QAM	19.57	18.57
256QAM	16.63	15.63

Note: EIRP (dBm) = Cond. Power (dBm) + Antenna Gain (dBi) + Array Gain (if applicable)

7.1.4 LTE Band 66 (CA 66C)

Conducted Output Power (dBm)

Ant. 0

Confugure	Combination	PCC							SCC							Measurement Power
		Band	BW (MHz)	Modulation	RB Size	RB Offset	UL Channel	UL Frequency (MHz)	Band	BW (MHz)	Modulation	RB Size	RB Offset	UL Channel	UL Frequency (MHz)	Tx Power with UL-CA Active (dBm)
																Total
Intra Band Contiguous	CA_66C	66	20	QPSK	1	0	132072	1720	66	20	QPSK	1	99	132270	1739.8	15.73
					1	99						1	0			21.23
		66	20	QPSK	1	0	132323	1745.1	66	20	QPSK	1	99	132521	1764.9	15.90
					1	99						1	0			21.25
		66	20	QPSK	1	0	132374	1750.2	66	20	QPSK	1	99	132572	1770	15.78
					1	99						1	0			21.18
Intra Band Contiguous	CA_66C	66	20	16QAM	1	0	132072	1720	66	20	16QAM	1	99	132270	1739.8	14.88
					1	99						1	0			20.40
		66	20	16QAM	1	0	132323	1745.1	66	20	16QAM	1	99	132521	1764.9	15.06
					1	99						1	0			20.37
		66	20	16QAM	1	0	132374	1750.2	66	20	16QAM	1	99	132572	1770	14.94
					1	99						1	0			20.37
Intra Band Contiguous	CA_66C	66	20	64QAM	1	0	132072	1720	66	20	64QAM	1	99	132270	1739.8	14.02
					1	99						1	0			19.55
		66	20	64QAM	1	0	132323	1745.1	66	20	64QAM	1	99	132521	1764.9	14.17
					1	99						1	0			19.51
		66	20	64QAM	1	0	132374	1750.2	66	20	64QAM	1	99	132572	1770	14.08
					1	99						1	0			19.52
Intra Band Contiguous	CA_66C	66	20	256QAM	1	0	132072	1720	66	20	256QAM	1	99	132270	1739.8	11.09
					1	99						1	0			16.62
		66	20	256QAM	1	0	132323	1745.1	66	20	256QAM	1	99	132521	1764.9	11.19
					1	99						1	0			16.56
		66	20	256QAM	1	0	132374	1750.2	66	20	256QAM	1	99	132572	1770	11.13
					1	99						1	0			16.56

EIRP Power (dBm)

Maximum Output Power		
Modulation	Cond. Power (dBm)	Max. EIRP (dBm)
QPSK	21.25	20.25
16QAM	20.40	19.40
64QAM	19.55	18.55
256QAM	16.62	15.62

Note: EIRP (dBm) = Cond. Power (dBm) + Antenna Gain (dBi) + Array Gain (if applicable)

7.2 Peak to Average Ratio

Input Power:	3.87 Vdc	Environmental Conditions:	21°C, 69% RH	Tested By:	Willy Cheng

7.2.1 LTE Band 2 (CA 2C)

Channel	Frequency (MHz)		Peak to Average Ratio (dB)				Limit
			QPSK	16QAM	64QAM	256QAM	
18700 + 18898	1860	1879.8	6.38	6.79	6.90	7.18	13.00
18801 + 18999	1870.1	1889.9	6.39	6.78	6.91	7.17	
18902 + 19100	1880.2	1900	6.29	6.71	6.79	7.07	

Spectrum Plot of Worst Value	
	
256QAM CH 18801 (1870.1MHz) + 18999 (1889.9MHz)	

7.2.2 LTE Band 7 (CA 7C)

Channel	Frequency (MHz)		Peak to Average Ratio (dB)				Limit
			QPSK	16QAM	64QAM	256QAM	
20850 + 21048	2510	2529.8	6.35	6.78	6.82	7.28	13.00
21001 + 21199	2525.1	2544.9	6.33	6.78	6.86	7.30	
21152 + 21350	2540.2	2560	6.43	6.86	6.93	7.33	

Spectrum Plot of Worst Value	
	
256QAM CH 21152 (2540.2MHz) + 21350 (2560MHz)	

7.2.3 LTE Band 41 (CA 41C)

Channel	Frequency (MHz)		Peak to Average Ratio (dB)				Limit
			QPSK	16QAM	64QAM	256QAM	
39750 + 39948	2506	2525.8	7.38	7.66	7.84	8.10	13.00
40521 + 40719	2583.1	2602.9	7.36	7.72	7.89	7.94	
41292 + 41490	2660.2	2680	7.60	7.71	7.79	7.91	

Spectrum Plot of Worst Value	
	
256QAM CH 39750 (2506.0MHz) + 39948 (2525.8MHz)	

7.2.4 LTE Band 66 (CA 66C)

Channel	Frequency (MHz)		Peak to Average Ratio (dB)				Limit
			QPSK	16QAM	64QAM	256QAM	
132072 + 132270	1720	1739.8	6.26	6.78	6.79	7.35	13.00
132323 + 132521	1745.1	1764.9	6.27	6.78	6.81	7.28	
132374 + 132572	1750.2	1770	6.18	6.70	6.73	7.21	

Spectrum Plot of Worst Value	
	
256QAM CH 132072 (1720.0MHz) + 132270 (1739.8MHz)	

7.3 Bandwidth

Input Power:	3.87 Vdc	Environmental Conditions:	21°C, 69% RH	Tested By:	Willy Cheng

7.3.1 LTE Band 2 (CA 2C)

Channel	Frequency (MHz)		Occupied Bandwidth (MHz)				26 dB Bandwidth (MHz)			
			QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
18700 + 18898	1860	1879.8	37.50	37.49	37.48	37.49	38.84	38.84	38.84	38.85
18801 + 18999	1870.1	1889.9	37.52	37.51	37.50	37.50	38.86	38.85	38.85	38.84
18902 + 19100	1880.2	1900	37.51	37.51	37.51	37.52	38.86	38.85	38.85	38.85

Spectrum Plot of Worst Value	
Occupied bandwidth	26 dB Bandwidth
	
256QAM CH 18902 (1880.2MHz) + 19100 (1900MHz)	QPSK CH 18801 (1870.1MHz) + 18999 (1889.9MHz)

7.3.2 LTE Band 7 (CA 7C)

Channel	Frequency (MHz)		Occupied Bandwidth (MHz)				26 dB Bandwidth (MHz)			
			QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20850 + 21048	2510	2529.8	37.58	37.57	37.55	37.58	38.88	38.85	38.85	38.87
21001 + 21199	2525.1	2544.9	37.50	37.51	37.48	37.49	38.86	38.85	38.86	38.85
21152 + 21350	2540.2	2560	37.51	37.52	37.51	37.53	38.86	38.85	38.85	38.87

Spectrum Plot of Worst Value	
Occupied bandwidth	26 dB Bandwidth
	
QPSK CH 20850 (2510MHz) + 21048 (2529.8MHz)	QPSK CH 20850 (2510MHz) + 21048 (2529.8MHz)

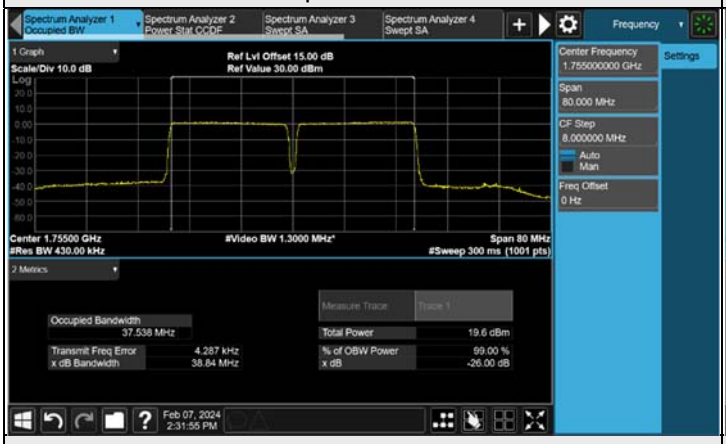
7.3.3 LTE Band 41 (CA 41C)

Channel	Frequency (MHz)		Occupied Bandwidth (MHz)				26 dB Bandwidth (MHz)			
			QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
39750 + 39948	2506	2525.8	37.53	37.52	37.50	37.54	38.86	38.86	38.84	38.88
40521 + 40719	2583.1	2602.9	37.52	37.53	37.53	37.53	38.86	38.88	38.87	38.87
41292 + 41490	2660.2	2680	37.56	37.54	37.55	37.54	38.89	38.88	38.85	38.87

Spectrum Plot of Worst Value	
Occupied bandwidth	26 dB Bandwidth
	
QPSK CH 41292 (2660.2MHz) + 41490 2680MHz)	QPSK CH 41292 (2660.2MHz) + 41490 2680MHz)

7.3.4 LTE Band 66 (CA 66C)

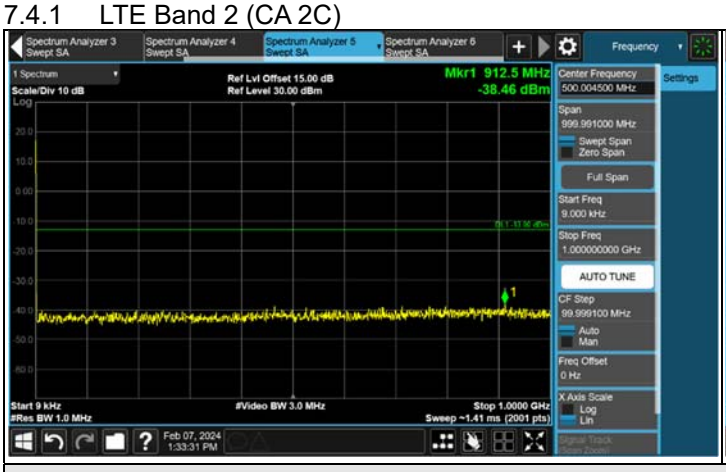
Channel	Frequency (MHz)		Occupied Bandwidth (MHz)				26 dB Bandwidth (MHz)			
			QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
132072 + 132270	1720	1739.8	37.53	37.52	37.51	37.53	38.86	38.85	38.86	38.86
132323 + 132521	1745.1	1764.9	37.53	37.53	37.53	37.54	38.86	38.86	38.85	38.84
132374 + 132572	1750.2	1770	37.51	37.52	37.51	37.52	38.87	38.89	38.86	38.85

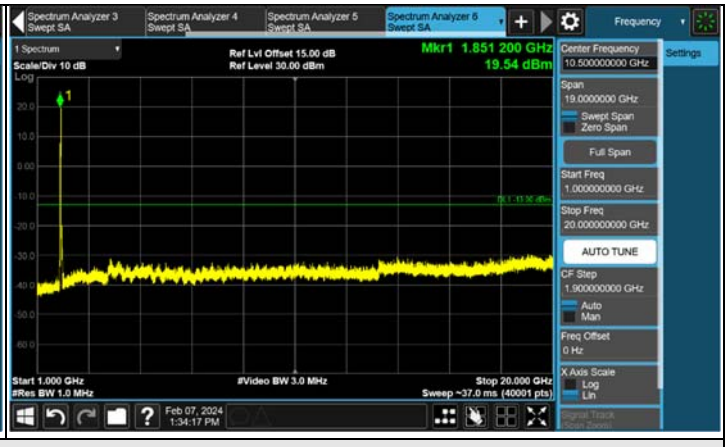
Spectrum Plot of Worst Value	
Occupied bandwidth	26 dB Bandwidth
	
256QAM CH 132323 (1745.1MHz) + 132521 (1764.9MHz)	16QAM CH 132374 (1750.2MHz) + 132572 (1770.0MHz)

7.4 Conducted Spurious Emissions

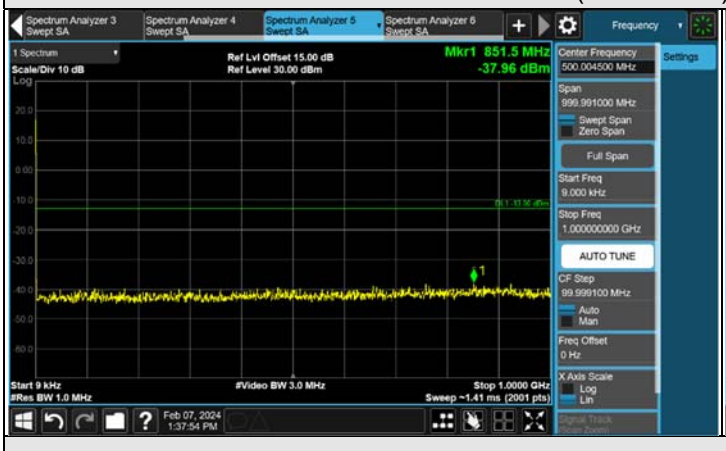
Input Power:	3.87 Vdc	Environmental Conditions:	21°C, 69% RH	Tested By:	Willy Cheng

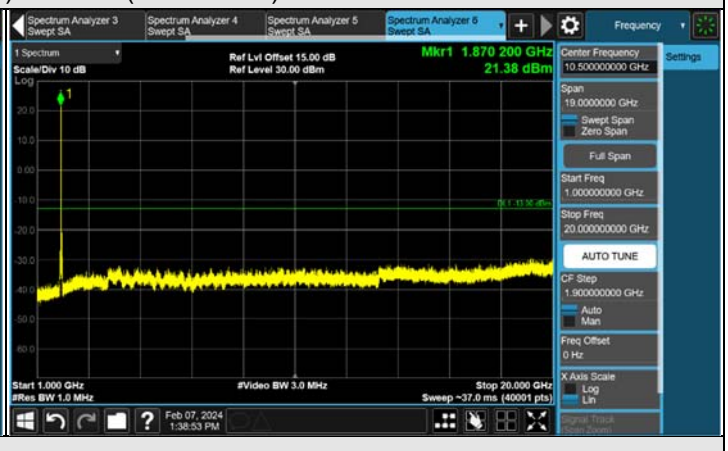
7.4.1 LTE Band 2 (CA 2C)





CH 18700 (1860.0MHz) + 18898 (1879.8MHz)

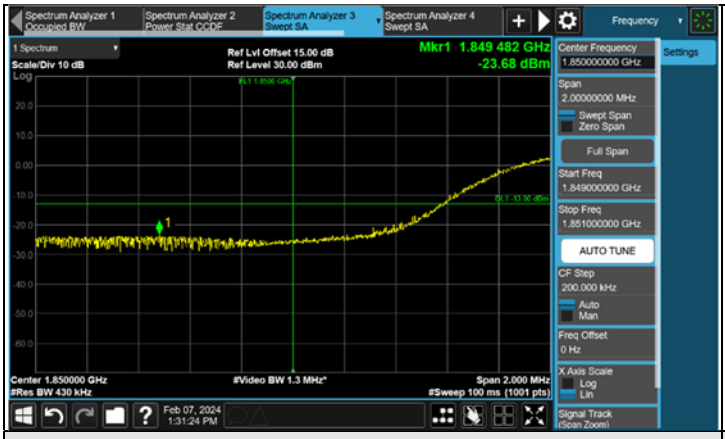




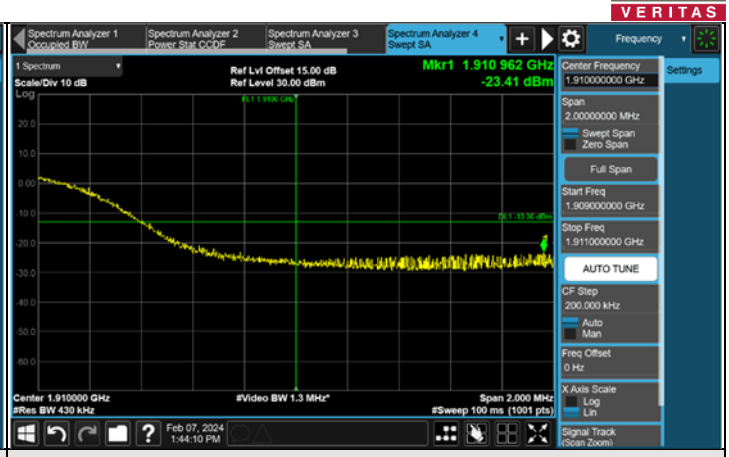
CH 18801 (1870.1MHz) + 18999 (1889.9MHz)

CH 18902 (1880.2MHz) + 19100 (1900.0MHz)

Note: The signal at 9 kHz is IF signal from spectrum analyzer.

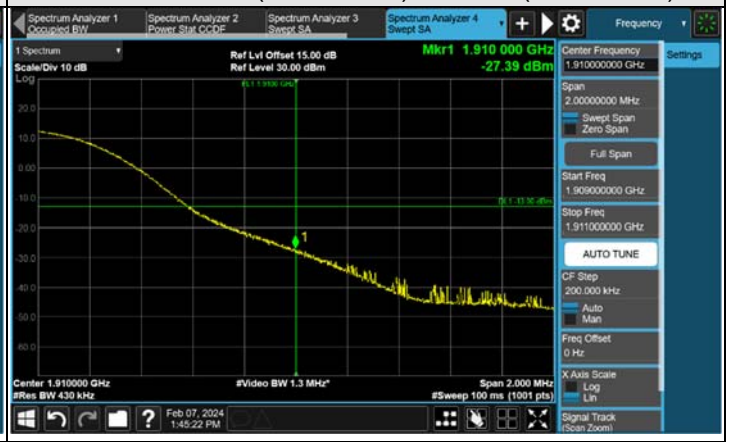


FULL CH 18700 (1860.0MHz) + 18898 (1879.8MHz)



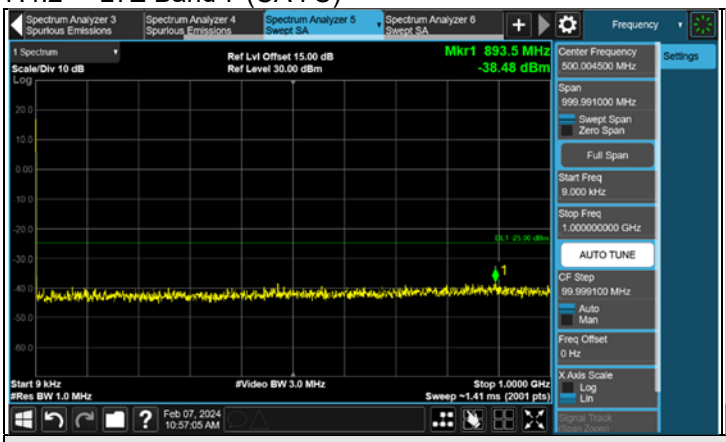
FULL CH 18902 (1880.2MHz) + 19100 (1900.0MHz)

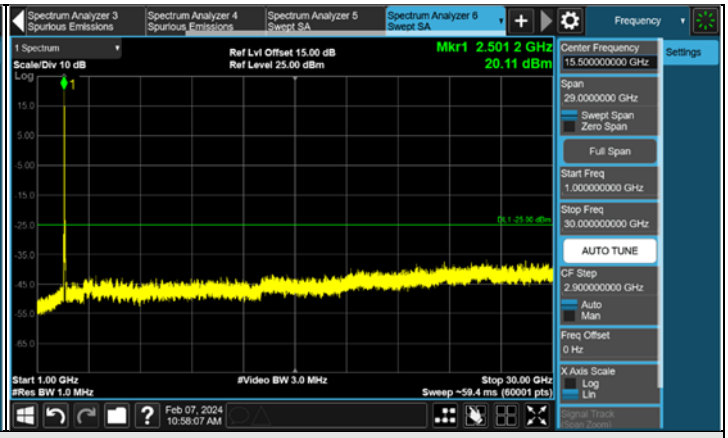
1RB CH 18700 (1860.0MHz) + 18898 (1879.8MHz)



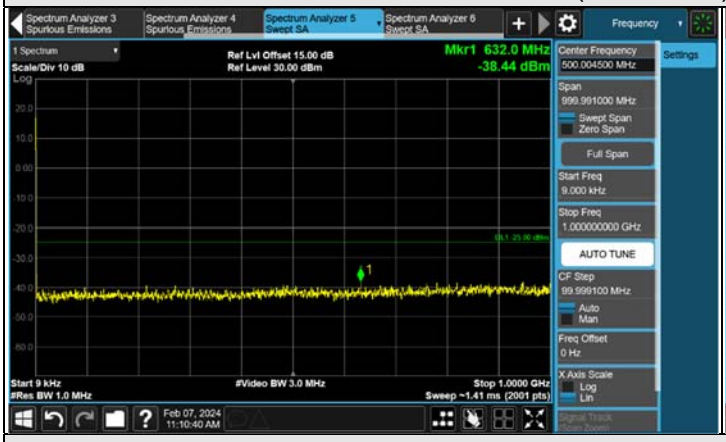
1RB CH 18902 (1880.2MHz) + 19100 (1900.0MHz)

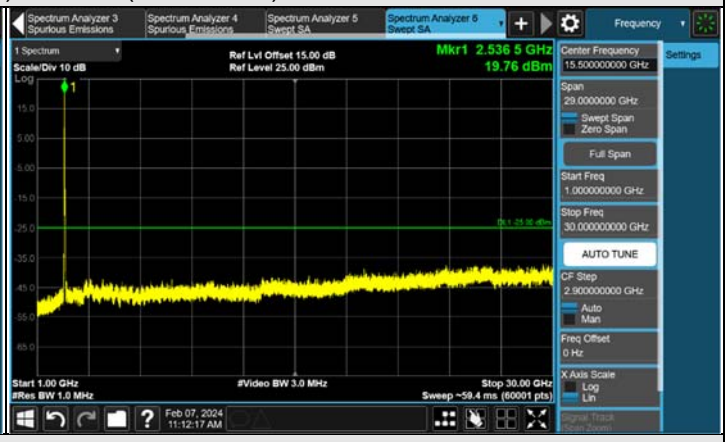
7.4.2 LTE Band 7 (CA 7C)



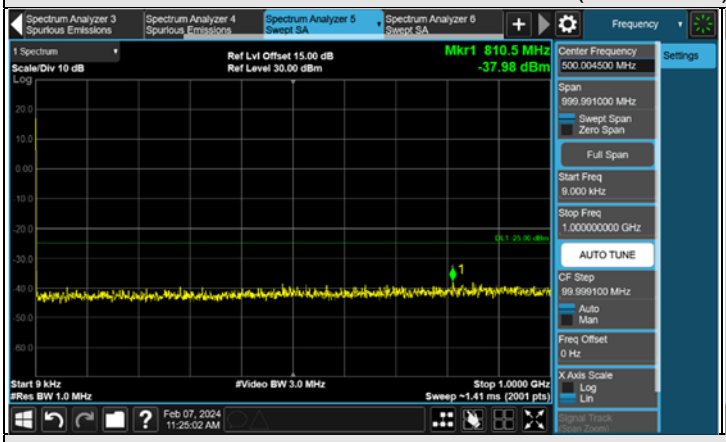


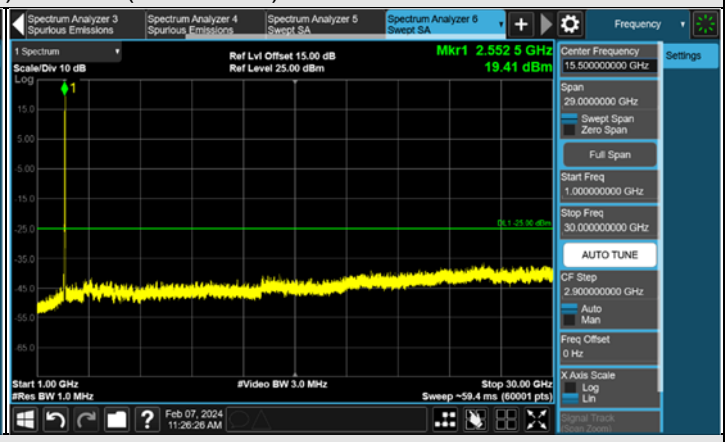
CH 20850 (2510.0MHz) + 21048 (2529.8MHz)





CH 21001 (2525.1MHz) + 21199 (2544.9MHz)

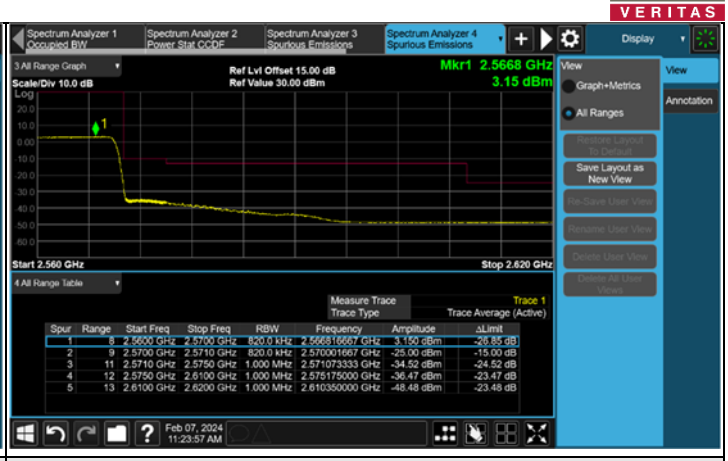




CH 21152 (2540.2MHz) + 21350 (2560.0MHz)

Note: The signal at 9 kHz is IF signal from spectrum analyzer.

FULL CH 20850 (2510.0MHz) + 21048 (2529.8MHz)

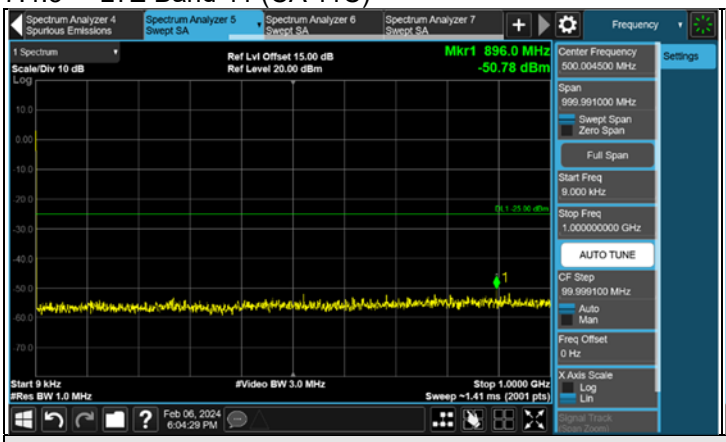


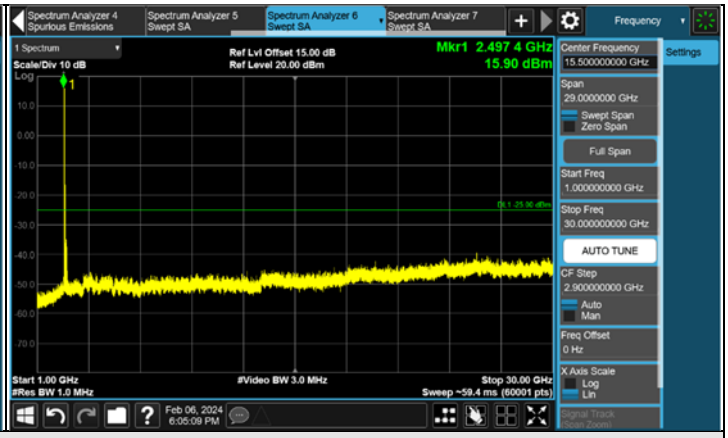
FULL CH 21152 (2540.2MHz) + 21350 (2560.0MHz)

1RB CH 20850 (2510.0MHz) + 21048 (2529.8MHz)

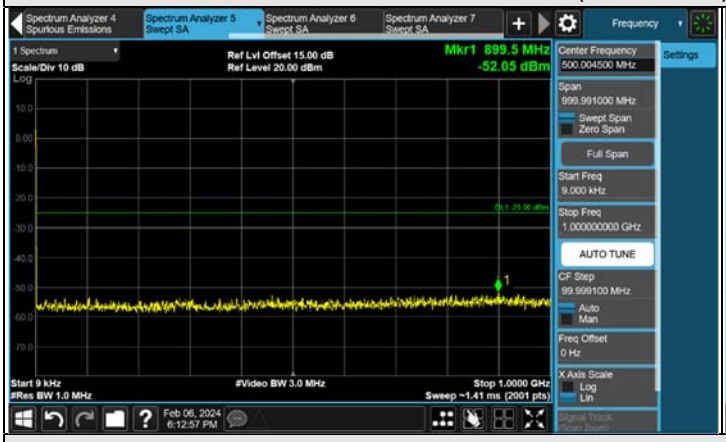
1RB CH 21152 (2540.2MHz) + 21350 (2560.0MHz)

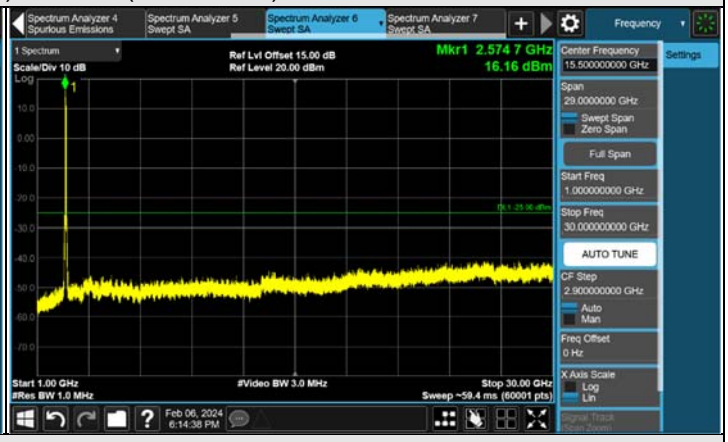
7.4.3 LTE Band 41 (CA 41C)



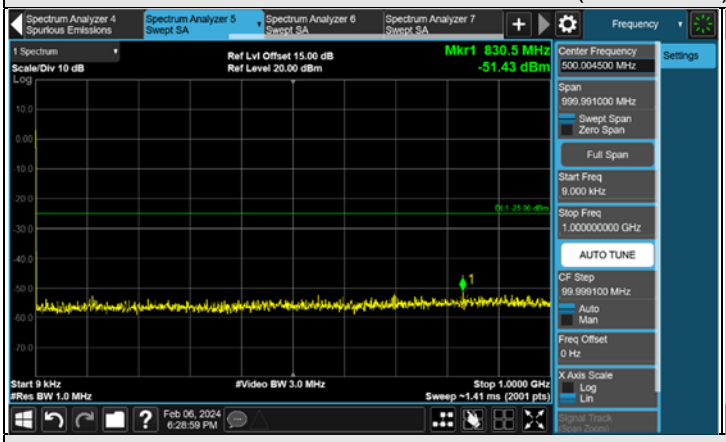


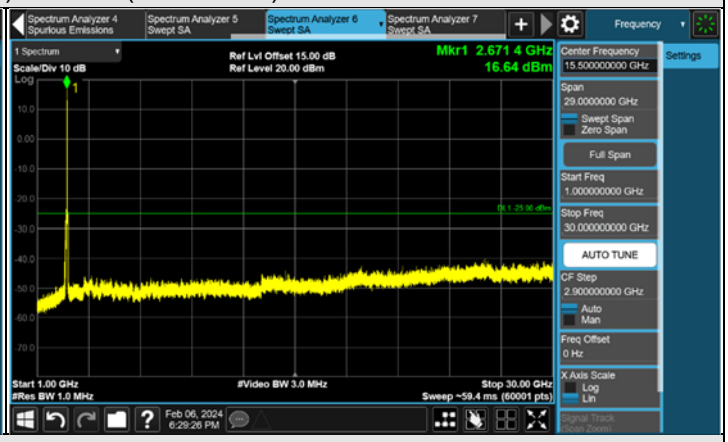
CH 39750 (2506.0MHz) + 39948 (2525.8MHz)





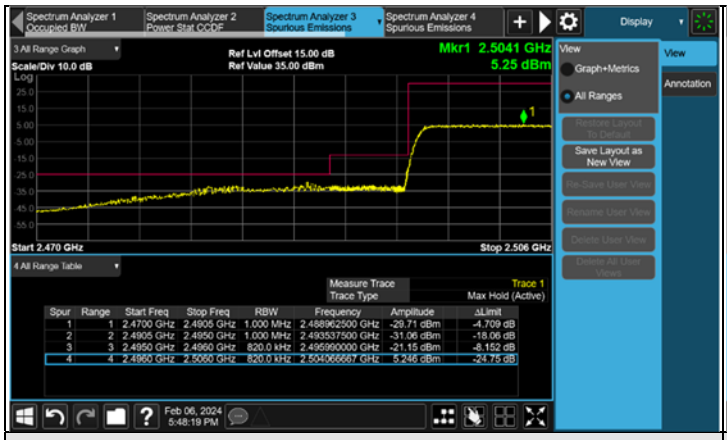
CH 40521 (2583.1MHz) + 40719 (2602.9MHz)



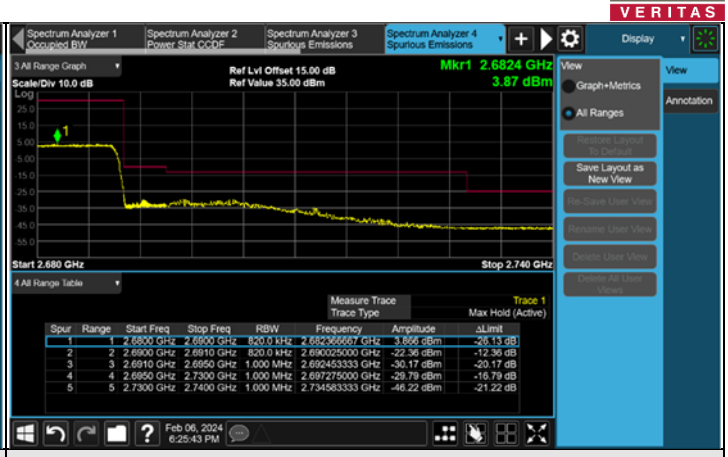


CH 41292 (2660.2MHz) + 41490 (2680.0MHz)

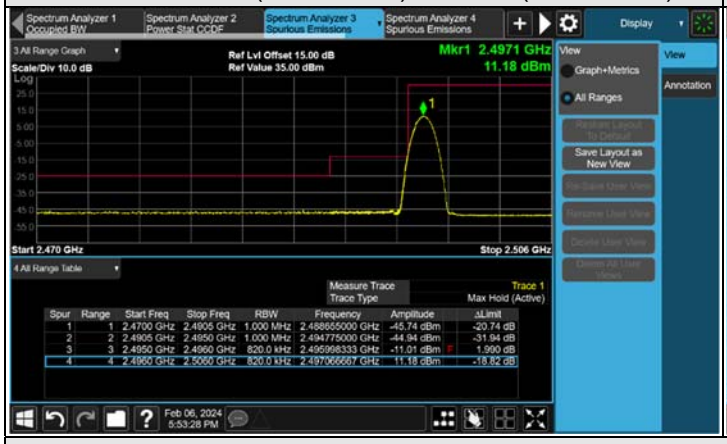
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

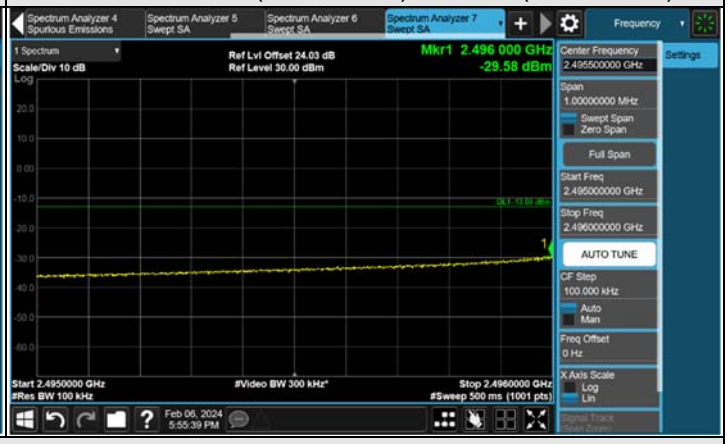


FULL CH 39750 (2506.0MHz) + 39948 (2525.8MHz)

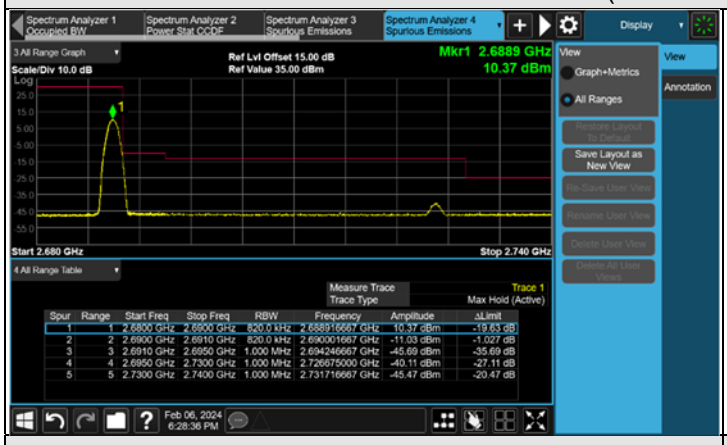


FULL CH 41292 (2660.2MHz) + 41490 (2680.0MHz)



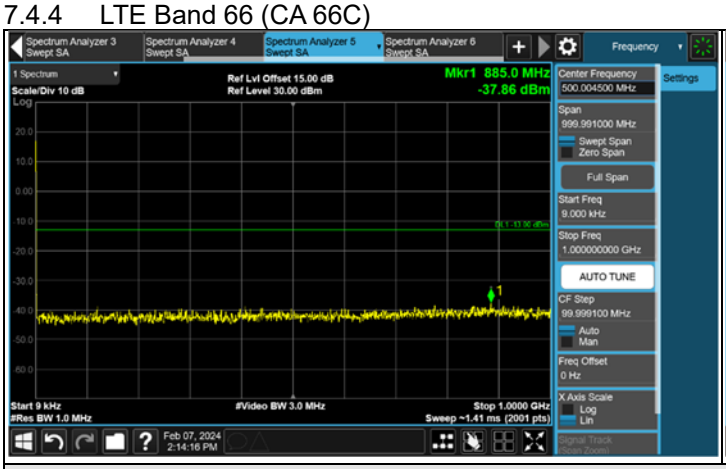


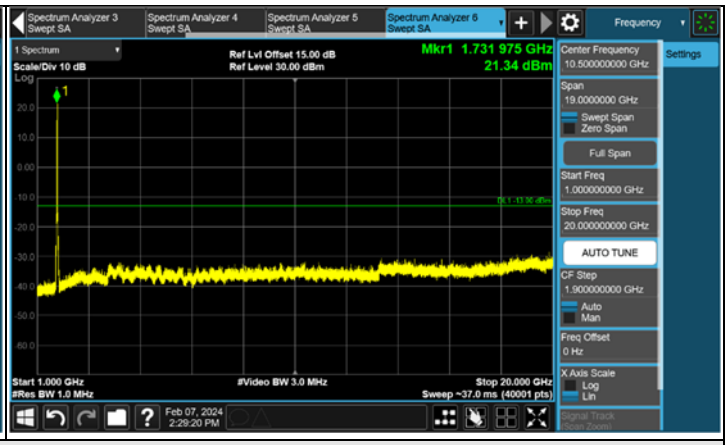
1RB CH 39750 (2506.0MHz) + 39948 (2525.8MHz)



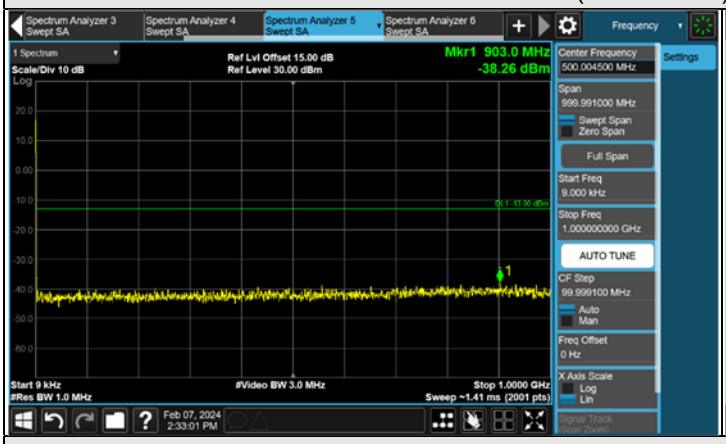
1RB CH 41292 (2660.2MHz) + 41490 (2680.0MHz)

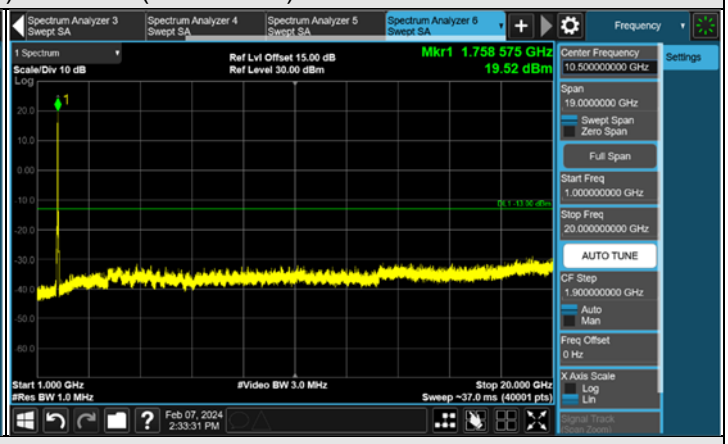
7.4.4 LTE Band 66 (CA 66C)



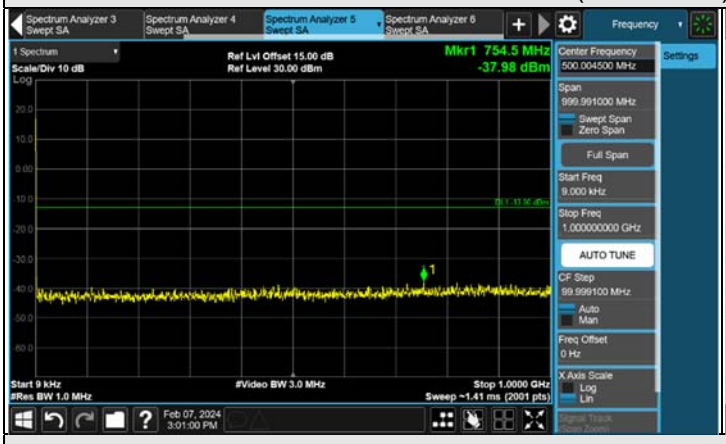


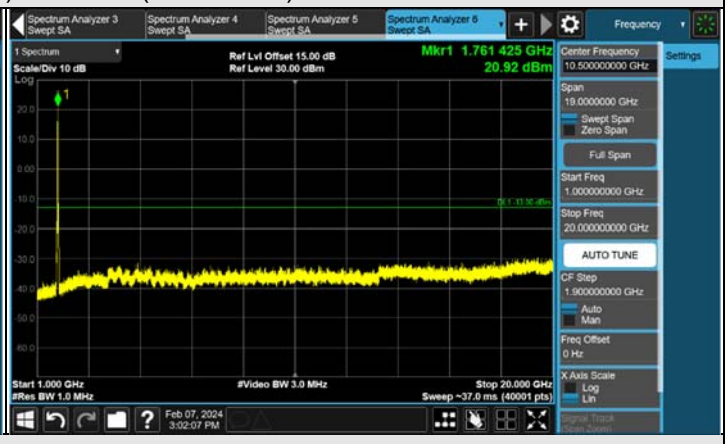
CH 132072 (1720.0MHz) + 132270 (1739.8MHz)





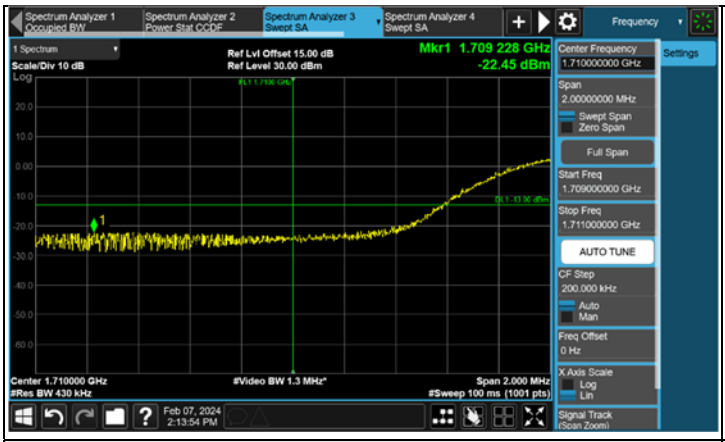
CH 132323 (1745.1MHz) + 132521 (1764.9MHz)



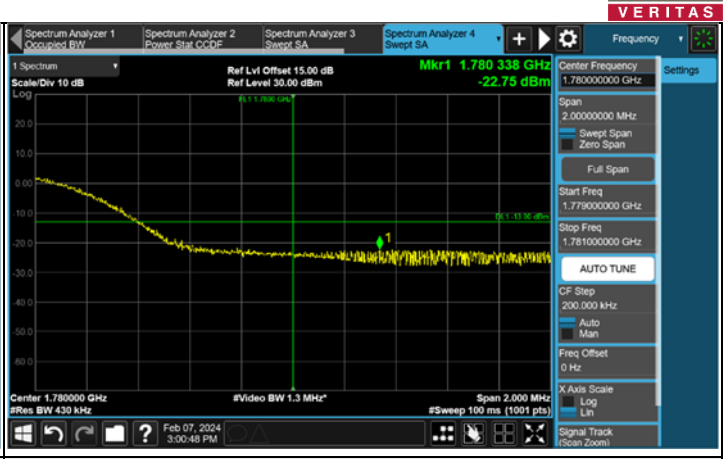


CH 132374 (1750.2MHz) + 132572 (1770.0MHz)

Note: The signal at 9 kHz is IF signal from spectrum analyzer.

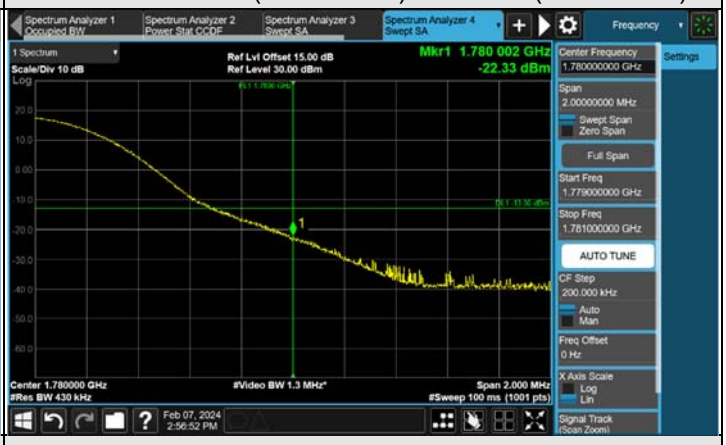


FULL CH 132072 (1720.0MHz) + 132270 (1739.8MHz)



FULL CH 132374 (1750.2MHz) + 132572 (1770.0MHz)

1RB CH 132072 (1720.0MHz) + 132270 (1739.8MHz)



1RB CH 132374 (1750.2MHz) + 132572 (1770.0MHz)

7.5 Radiated Spurious Emissions below 1GHz

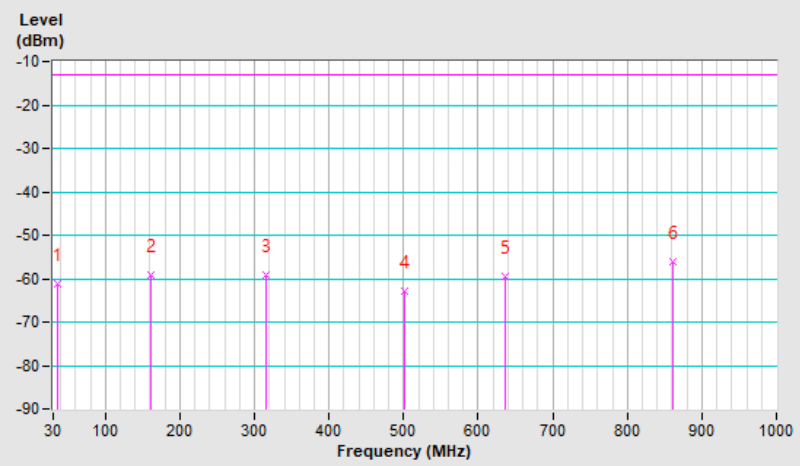
7.5.1 LTE Band 2 (CA 2C)

RF Mode	LTE Band 2 (CA 2C) Channel Bandwidth: 20MHz + 20MHz	**Channel**	CH 18902 (1880.2MHz) + 19100 (1900.0MHz)
Frequency Range	30 MHz ~ 1 GHz	**Detector Function & Bandwidth**	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	21°C, 69% RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	36.79	-61.02	-13.00	-48.02	1.00 H	184	48.00	-109.02
2	161.92	-59.01	-13.00	-46.01	1.50 H	328	48.96	-107.97
3	316.15	-59.02	-13.00	-46.02	1.25 H	258	48.08	-107.10
4	501.42	-62.90	-13.00	-49.90	1.50 H	18	39.81	-102.71
5	636.25	-59.40	-13.00	-46.40	2.00 H	14	40.23	-99.63
6	860.32	-56.12	-13.00	-43.12	1.00 H	13	40.43	-96.55

Remarks:

1. EIRP(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
3. Margin value = EIRP – Limit value
4. The other EIRP levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.

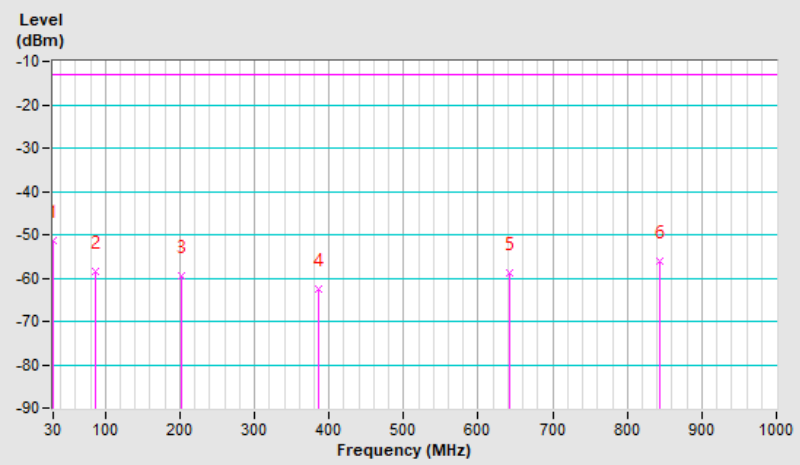


RF Mode	LTE Band 2 (CA 2C) Channel Bandwidth: 20MHz + 20MHz	**Channel**	CH 18902 (1880.2MHz) + 19100 (1900.0MHz)
Frequency Range	30 MHz ~ 1 GHz	**Detector Function & Bandwidth**	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	21°C, 69% RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	30.00	-51.19	-13.00	-38.19	1.25 V	269	58.43	-109.62
2	87.23	-58.31	-13.00	-45.31	1.50 V	8	55.76	-114.07
3	201.69	-59.66	-13.00	-46.66	1.00 V	182	52.17	-111.83
4	385.02	-62.41	-13.00	-49.41	1.25 V	194	42.94	-105.35
5	643.04	-58.84	-13.00	-45.84	1.50 V	146	40.67	-99.51
6	843.83	-56.11	-13.00	-43.11	1.00 V	77	40.78	-96.89

Remarks:

1. EIRP(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
3. Margin value = EIRP – Limit value
4. The other EIRP levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.



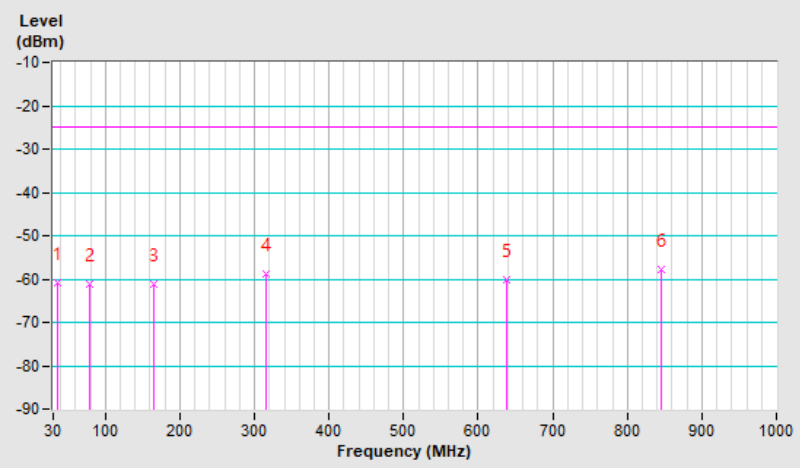
7.5.2 LTE Band 7 (CA 7C)

RF Mode	LTE Band 7 (CA 7C) Channel Bandwidth: 20MHz + 20MHz	**Channel**	CH 21152 (2540.2MHz) + 21350 (2560.0MHz)
Frequency Range	30 MHz ~ 1 GHz	**Detector Function & Bandwidth**	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	21°C, 69% RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	35.82	-60.71	-25.00	-35.71	1.50 H	173	48.48	-109.19
2	79.47	-61.21	-25.00	-36.21	1.00 H	272	51.79	-113.00
3	165.80	-61.24	-25.00	-36.24	1.25 H	162	46.93	-108.17
4	315.18	-58.96	-25.00	-33.96	1.00 H	256	48.17	-107.13
5	638.19	-60.29	-25.00	-35.29	1.50 H	10	39.30	-99.59
6	845.77	-57.80	-25.00	-32.80	1.25 H	318	39.05	-96.85

Remarks:

1. EIRP(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
3. Margin value = EIRP – Limit value
4. The other EIRP levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.

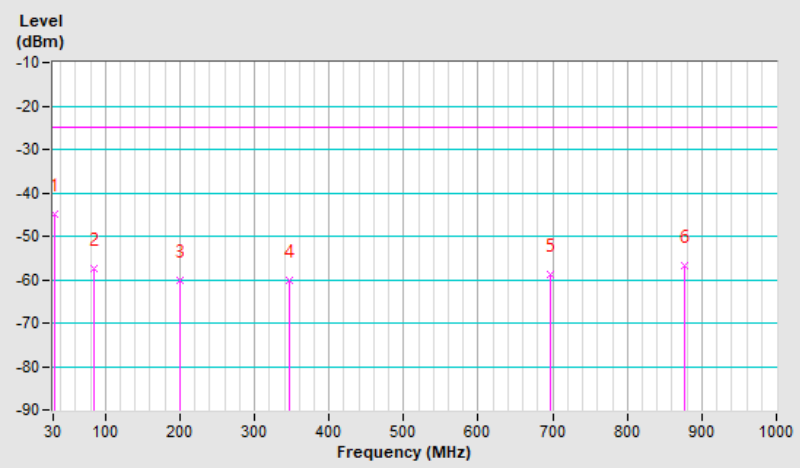


RF Mode	LTE Band 7 (CA 7C) Channel Bandwidth: 20MHz + 20MHz	**Channel**	CH 21152 (2540.2MHz) + 21350 (2560.0MHz)
Frequency Range	30 MHz ~ 1 GHz	**Detector Function & Bandwidth**	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	21°C, 69% RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	31.94	-44.78	-25.00	-19.78	1.00 V	3	64.78	-109.56
2	84.32	-57.51	-25.00	-32.51	1.50 V	39	56.35	-113.86
3	200.72	-60.08	-25.00	-35.08	1.25 V	163	51.74	-111.82
4	347.19	-60.12	-25.00	-35.12	1.00 V	165	46.48	-106.60
5	696.39	-58.72	-25.00	-33.72	1.50 V	272	40.15	-98.87
6	875.84	-56.80	-25.00	-31.80	1.25 V	9	39.48	-96.28

Remarks:

1. EIRP(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
3. Margin value = EIRP – Limit value
4. The other EIRP levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.



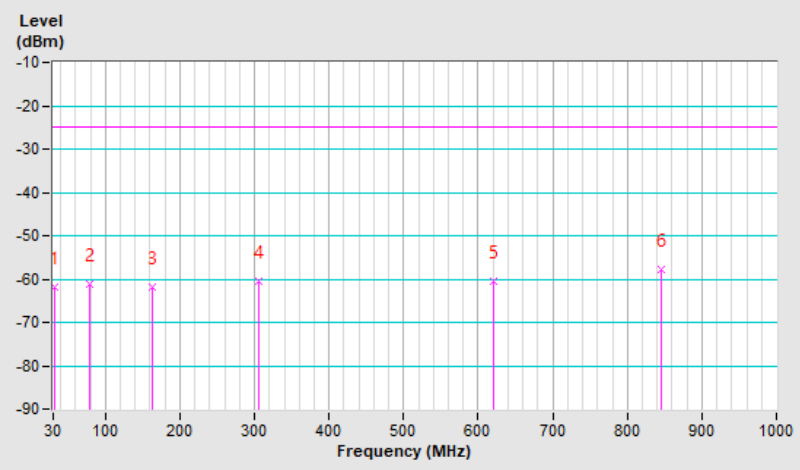
7.5.3 LTE Band 41 (CA 41C)

RF Mode	LTE Band 41 (CA 41CB) Channel Bandwidth: 20MHz + 20MHz	**Channel**	CH 41292 (2660.2MHz) + 41490 (2680.0MHz)
Frequency Range	30 MHz ~ 1 GHz	**Detector Function & Bandwidth**	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	21°C, 69% RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	32.91	-61.76	-25.00	-36.76	1.00 H	201	47.83	-109.59
2	79.47	-61.11	-25.00	-36.11	1.25 H	305	51.89	-113.00
3	163.86	-61.79	-25.00	-36.79	1.25 H	2	46.24	-108.03
4	306.45	-60.63	-25.00	-35.63	1.00 H	259	46.83	-107.46
5	620.73	-60.44	-25.00	-35.44	1.00 H	47	39.47	-99.91
6	845.77	-57.83	-25.00	-32.83	1.50 H	84	39.02	-96.85

Remarks:

1. EIRP(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
3. Margin value = EIRP – Limit value
4. The other EIRP levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.

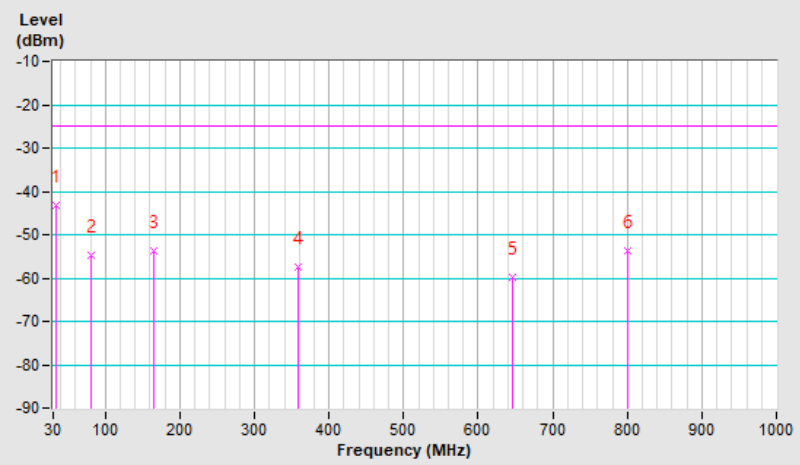


RF Mode	LTE Band 41 (CA 41CB) Channel Bandwidth: 20MHz + 20MHz	**Channel**	CH 41292 (2660.2MHz) + 41490 (2680.0MHz)
Frequency Range	30 MHz ~ 1 GHz	**Detector Function & Bandwidth**	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	21°C, 69% RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	**34.85**	**-43.16**	**-25.00**	**-18.16**	**1.00 V**	**357**	**66.22**	**-109.38**
2	81.41	-54.89	-25.00	-29.89	1.50 V	296	58.59	-113.48
3	165.80	-53.75	-25.00	-28.75	1.25 V	328	54.42	-108.17
4	357.86	-57.34	-25.00	-32.34	1.50 V	6	49.01	-106.35
5	645.95	-59.96	-25.00	-34.96	1.00 V	155	39.53	-99.49
6	801.15	-53.75	-25.00	-28.75	1.00 V	106	43.63	-97.38

Remarks:

1. EIRP(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
3. Margin value = EIRP – Limit value
4. The other EIRP levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.



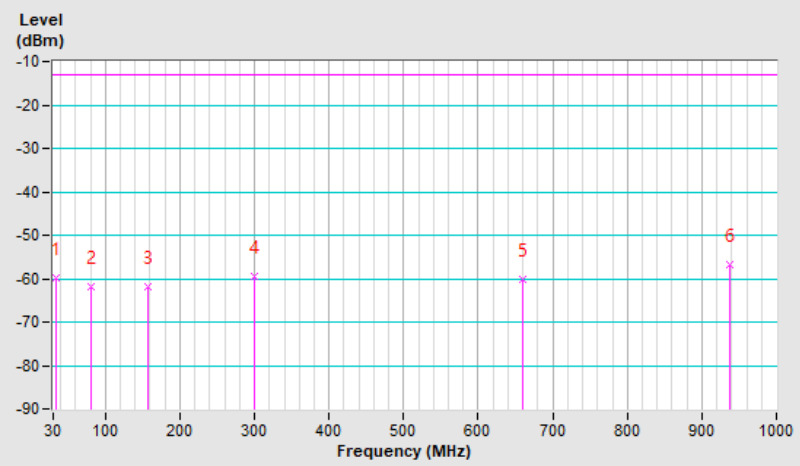
7.5.4 LTE Band 66 (CA 66C)

RF Mode	LTE Band 66 (CA 66C) Channel Bandwidth: 20MHz + 20MHz	**Channel**	CH 132323 (1745.1MHz) + 132521 (1764.9MHz)
Frequency Range	30 MHz ~ 1 GHz	**Detector Function & Bandwidth**	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	21°C, 69% RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	34.85	-59.81	-13.00	-46.81	1.50 H	153	49.57	-109.38
2	80.44	-61.77	-13.00	-48.77	1.00 H	270	51.51	-113.28
3	158.04	-62.03	-13.00	-49.03	1.00 H	349	45.89	-107.92
4	300.63	-59.48	-13.00	-46.48	1.25 H	247	48.14	-107.62
5	659.53	-60.31	-13.00	-47.31	1.00 H	130	39.21	-99.52
6	936.95	-56.76	-13.00	-43.76	1.50 H	292	38.52	-95.28

Remarks:

1. EIRP(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
3. Margin value = EIRP – Limit value
4. The other EIRP levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.

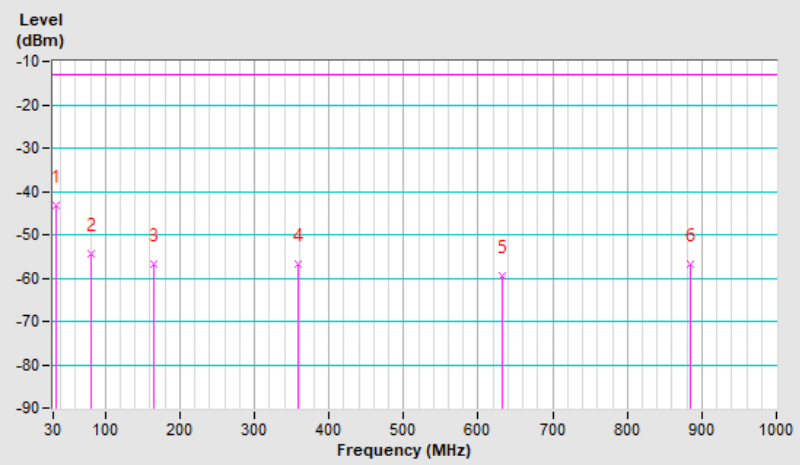


RF Mode	LTE Band 66 (CA 66C) Channel Bandwidth: 20MHz + 20MHz	**Channel**	CH 132323 (1745.1MHz) + 132521 (1764.9MHz)
Frequency Range	30 MHz ~ 1 GHz	**Detector Function & Bandwidth**	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	21°C, 69% RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	34.85	-43.28	-13.00	-30.28	1.00 V	19	66.10	-109.38
2	80.44	-54.50	-13.00	-41.50	1.25 V	345	58.78	-113.28
3	164.83	-56.93	-13.00	-43.93	1.50 V	9	51.17	-108.10
4	357.86	-56.88	-13.00	-43.88	1.00 V	18	49.47	-106.35
5	631.40	-59.61	-13.00	-46.61	1.00 V	174	40.09	-99.70
6	884.57	-56.84	-13.00	-43.84	1.25 V	277	39.40	-96.24

Remarks:

1. EIRP(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
3. Margin value = EIRP – Limit value
4. The other EIRP levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.



7.6 Radiated Spurious Emissions above 1GHz

7.6.1 LTE Band 2 (CA 2C)

RF Mode	LTE Band 2 (CA 2C) Channel Bandwidth: 20MHz + 20MHz	**Channel**	CH 18700 (1860.0MHz) + 18898 (1879.8MHz)
Frequency Range	1 GHz ~ 20 GHz	**Detector Function & Bandwidth**	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	21°C, 69% RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	3720.00	-48.84	-13.00	-35.84	1.59 H	316	46.52	-95.36
2	3759.60	-48.61	-13.00	-35.61	1.59 H	316	46.50	-95.11
Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	3720.00	-49.75	-13.00	-36.75	2.57 V	222	45.61	-95.36
2	3759.60	-49.52	-13.00	-36.52	2.57 V	222	45.59	-95.11

Remarks:

1. EIRP(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
3. Margin value = EIRP – Limit value
4. The other EIRP levels were very low against the limit.

RF Mode	LTE Band 2 (CA 2C) Channel Bandwidth: 20MHz + 20MHz	**Channel**	CH 18801 (1870.1MHz) + 18999 (1889.9MHz)
Frequency Range	1 GHz ~ 20 GHz	**Detector Function & Bandwidth**	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	21°C, 69% RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	3740.20	-48.62	-13.00	-35.62	1.58 H	314	46.58	-95.20
2	3779.80	-48.52	-13.00	-35.52	1.58 H	314	46.53	-95.05
Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	3740.20	-49.89	-13.00	-36.89	2.67 V	221	45.31	-95.20
2	3779.80	-49.79	-13.00	-36.79	2.67 V	221	45.26	-95.05

Remarks:

1. EIRP(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
3. Margin value = EIRP – Limit value
4. The other EIRP levels were very low against the limit.

RF Mode	LTE Band 2 (CA 2C) Channel Bandwidth: 20MHz + 20MHz	**Channel**	CH 18902 (1880.2MHz) + 19100 (1900.0MHz)
Frequency Range	1 GHz ~ 20 GHz	**Detector Function & Bandwidth**	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	21°C, 69% RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	3760.40	-48.42	-13.00	-35.42	1.63 H	319	46.68	-95.10
2	3800.00	-48.46	-13.00	-35.46	1.63 H	319	46.54	-95.00
Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	3760.40	-49.77	-13.00	-36.77	2.67 V	224	45.33	-95.10
2	3800.00	-49.97	-13.00	-36.97	2.67 V	224	45.03	-95.00

Remarks:

1. EIRP(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
3. Margin value = EIRP – Limit value
4. The other EIRP levels were very low against the limit.

7.6.2 LTE Band 7 (CA 7C)

RF Mode	LTE Band 7 (CA 7C) Channel Bandwidth: 20MHz + 20MHz	**Channel**	CH 20850 (2510.0MHz) + 21048 (2529.8MHz)
Frequency Range	1 GHz ~ 27 GHz	**Detector Function & Bandwidth**	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	21°C, 69% RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	5020.00	-43.31	-25.00	-18.31	2.34 H	143	49.44	-92.75
2	5059.60	-43.18	-25.00	-18.18	2.34 H	143	49.47	-92.65
Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	5020.00	-44.73	-25.00	-19.73	1.13 V	272	48.02	-92.75
2	5059.60	-44.56	-25.00	-19.56	1.13 V	272	48.09	-92.65

Remarks:

1. EIRP(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
3. Margin value = EIRP – Limit value
4. The other EIRP levels were very low against the limit.

RF Mode	LTE Band 7 (CA 7C) Channel Bandwidth: 20MHz + 20MHz	**Channel**	CH 21001 (2525.1MHz) + 21199 (2544.9MHz)
Frequency Range	1 GHz ~ 27 GHz	**Detector Function & Bandwidth**	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	21°C, 69% RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	5050.20	-43.10	-25.00	-18.10	2.38 H	142	49.58	-92.68
2	**5089.80**	**-42.98**	**-25.00**	**-17.98**	**2.38 H**	**142**	**49.56**	**-92.54**
Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	5050.20	-44.54	-25.00	-19.54	1.21 V	278	48.14	-92.68
2	5089.80	-44.40	-25.00	-19.40	1.21 V	278	48.14	-92.54

Remarks:

1. EIRP(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
3. Margin value = EIRP – Limit value
4. The other EIRP levels were very low against the limit.

RF Mode	LTE Band 7 (CA 7C) Channel Bandwidth: 20MHz + 20MHz	**Channel**	CH 21152 (2540.2MHz) + 21350 (2560.0MHz)
Frequency Range	1 GHz ~ 27 GHz	**Detector Function & Bandwidth**	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	21°C, 69% RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	5080.40	-43.00	-25.00	-18.00	2.34 H	143	49.56	-92.56
2	**5120.00**	**-42.98**	**-25.00**	**-17.98**	**2.34 H**	**143**	**49.52**	**-92.50**
Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	5080.40	-44.44	-25.00	-19.44	1.20 V	275	48.12	-92.56
2	5120.00	-44.42	-25.00	-19.42	1.20 V	275	48.08	-92.50

Remarks:

1. EIRP(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
3. Margin value = EIRP – Limit value
4. The other EIRP levels were very low against the limit.

7.6.3 LTE Band 41 (CA 41C)

RF Mode	LTE Band 41 (CA 41C) Channel Bandwidth: 20MHz + 20MHz	**Channel**	CH 39750 (2506.0MHz) + 39948 (2525.8MHz)
Frequency Range	1 GHz ~ 27 GHz	**Detector Function & Bandwidth**	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	21°C, 69% RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	5012.00	-43.24	-25.00	-18.24	1.74 H	85	49.52	-92.76
2	5051.60	-43.22	-25.00	-18.22	1.74 H	85	49.46	-92.68
Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	5012.00	-46.60	-25.00	-21.60	2.02 V	150	46.16	-92.76
2	5051.60	-44.42	-25.00	-19.42	2.02 V	150	48.26	-92.68

Remarks:

1. EIRP(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
3. Margin value = EIRP – Limit value
4. The other EIRP levels were very low against the limit.

RF Mode	LTE Band 41 (CA 41C) Channel Bandwidth: 20MHz + 20MHz	**Channel**	CH 40521 (2583.1MHz) + 40719 (2602.9MHz)
Frequency Range	1 GHz ~ 27 GHz	**Detector Function & Bandwidth**	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	21°C, 69% RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	5166.20	-43.03	-25.00	-18.03	1.69 H	87	49.54	-92.57
2	5205.80	-43.19	-25.00	-18.19	1.69 H	87	49.52	-92.71
Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	5166.20	-44.36	-25.00	-19.36	2.11 V	147	48.21	-92.57
2	5205.80	-44.42	-25.00	-19.42	2.11 V	147	48.29	-92.71

Remarks:

1. EIRP(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
3. Margin value = EIRP – Limit value
4. The other EIRP levels were very low against the limit.

RF Mode	LTE Band 41 (CA 41C) Channel Bandwidth: 20MHz + 20MHz	**Channel**	CH 41292 (2660.2MHz) + 41490 (2680.0MHz)
Frequency Range	1 GHz ~ 27 GHz	**Detector Function & Bandwidth**	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	21°C, 69% RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	5320.40	-43.24	-25.00	-18.24	1.73 H	86	49.43	-92.67
2	5360.00	-43.14	-25.00	-18.14	1.73 H	86	49.53	-92.67
Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	5320.40	-44.61	-25.00	-19.61	2.09 V	148	48.06	-92.67
2	5360.00	-44.66	-25.00	-19.66	2.09 V	148	48.01	-92.67

Remarks:

1. EIRP(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
3. Margin value = EIRP – Limit value
4. The other EIRP levels were very low against the limit.

7.6.4 LTE Band 66 (CA 66C)

RF Mode	LTE Band 66 (CA 66C) Channel Bandwidth: 20MHz + 20MHz	**Channel**	CH 132072 (1720.0MHz) + 132270 (1739.8MHz)
Frequency Range	1 GHz ~ 18 GHz	**Detector Function & Bandwidth**	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	21°C, 69% RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	3440.00	-47.86	-13.00	-34.86	2.17 H	137	48.52	-96.38
2	3479.60	-47.65	-13.00	-34.65	2.17 H	137	48.59	-96.24
Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	3440.00	-49.05	-13.00	-36.05	1.78 V	232	47.33	-96.38
2	3479.60	-48.73	-13.00	-35.73	1.78 V	232	47.51	-96.24

Remarks:

1. EIRP(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
3. Margin value = EIRP – Limit value
4. The other EIRP levels were very low against the limit.

RF Mode	LTE Band 66 (CA 66C) Channel Bandwidth: 20MHz + 20MHz	**Channel**	CH 132323 (1745.1MHz) + 132521 (1764.9MHz)
Frequency Range	1 GHz ~ 18 GHz	**Detector Function & Bandwidth**	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	21°C, 69% RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	3490.20	-47.61	-13.00	-34.61	2.20 H	135	48.58	-96.19
2	3529.80	-47.42	-13.00	-34.42	2.20 H	135	48.64	-96.06
Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	3490.20	-48.83	-13.00	-35.83	1.76 V	235	47.36	-96.19
2	3529.80	-48.72	-13.00	-35.72	1.76 V	235	47.34	-96.06

Remarks:

1. EIRP(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
3. Margin value = EIRP – Limit value
4. The other EIRP levels were very low against the limit.

RF Mode	LTE Band 66 (CA 66C) Channel Bandwidth: 20MHz + 20MHz	**Channel**	CH 132374 (1750.2MHz) + 132572 (1770.0MHz)
Frequency Range	1 GHz ~ 18 GHz	**Detector Function & Bandwidth**	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	21°C, 69% RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	3500.40	-47.57	-13.00	-34.57	2.15 H	134	48.57	-96.14
2	3540.00	-47.47	-13.00	-34.47	2.15 H	134	48.55	-96.02
Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	3500.40	-48.68	-13.00	-35.68	1.71 V	229	47.46	-96.14
2	3540.00	-48.61	-13.00	-35.61	1.71 V	229	47.41	-96.02

Remarks:

1. EIRP(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
3. Margin value = EIRP – Limit value
4. The other EIRP levels were very low against the limit.

7.7 Frequency Stability

Input Power:	3.87 Vdc	Environmental Conditions:	21°C, 69% RH	Tested By:	Willy Cheng

7.7.1 LTE Band 2 (CA 2C)

Frequency Stability Versus Voltage				
Voltage (Vdc)	CH 18700 (1860.0MHz) + 18898 (1879.8MHz)		CH 18902 (1880.2MHz) + 19100 (1900.0MHz)	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.40	1860.000002	0.0011	1900.000004	0.0021
3.87	1860.000003	0.0016	1900.000003	0.0016
3.60	1860.000003	0.0016	1900.000003	0.0016

Note: The applicant defined the normal working voltage is from 3.60 to 4.40 Vdc.

Frequency Stability Versus Temperature				
Temperature (℃)	CH 18700 (1860.0MHz) + 18898 (1879.8MHz)		CH 18902 (1880.2MHz) + 19100 (1900.0MHz)	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1860.000003	0.0016	1900.000004	0.0021
-20	1860.000001	0.0005	1900.000002	0.0011
-10	1860.000002	0.0011	1900.000001	0.0005
0	1860.000003	0.0016	1900.000003	0.0016
10	1859.999998	-0.0011	1899.999998	-0.0011
20	1859.999999	-0.0005	1899.999998	-0.0011
30	1859.999997	-0.0016	1899.999998	-0.0011
40	1859.999996	-0.0022	1899.999998	-0.0011
50	1859.999997	-0.0016	1899.999997	-0.0016

7.7.2 LTE Band 7 (CA 7C)

Frequency Stability Versus Voltage				
Voltage (Vdc)	CH 20850 (2510.0MHz) + 21048 (2529.8MHz)		CH 21152 (2540.2MHz) + 21350 (2560.0MHz)	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.40	2510.000002	0.0008	2560.000003	0.0012
3.87	2510.000004	0.0016	2560.000003	0.0012
3.60	2510.000002	0.0008	2560.000002	0.0008

Note: The applicant defined the normal working voltage is from 3.60 to 4.40 Vdc.

Frequency Stability Versus Temperature				
Temperature (℃)	CH 20850 (2510.0MHz) + 21048 (2529.8MHz)		CH 21152 (2540.2MHz) + 21350 (2560.0MHz)	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2510.000001	0.0004	2560.000002	0.0008
-20	2510.000004	0.0016	2560.000002	0.0008
-10	2510.000001	0.0004	2560.000004	0.0016
0	2510.000002	0.0008	2560.000002	0.0008
10	2509.999999	-0.0004	2559.999997	-0.0012
20	2509.999996	-0.0016	2559.999997	-0.0012
30	2509.999998	-0.0008	2559.999998	-0.0008
40	2509.999996	-0.0016	2559.999998	-0.0008
50	2509.999996	-0.0016	2559.999996	-0.0016

7.7.3 LTE Band 41 (CA 41C)

Frequency Stability Versus Voltage				
Voltage (Vdc)	CH 39750 (2506.0MHz) + 39948 (2525.8MHz)		CH 41292 (2660.2MHz) + 41490 (2680.0MHz)	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.40	2506.000004	0.0016	2680.000002	0.0007
3.87	2506.000003	0.0012	2680.000002	0.0007
3.60	2506.000001	0.0004	2680.000001	0.0004

Note: The applicant defined the normal working voltage is from 3.60 to 4.40 Vdc.

Frequency Stability Versus Temperature				
Temperature (℃)	CH 39750 (2506.0MHz) + 39948 (2525.8MHz)		CH 41292 (2660.2MHz) + 41490 (2680.0MHz)	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	2506.000002	0.0008	2680.000003	0.0011
-20	2506.000002	0.0008	2680.000003	0.0011
-10	2506.000003	0.0012	2680.000001	0.0004
0	2506.000001	0.0004	2680.000001	0.0004
10	2505.999998	-0.0008	2679.999997	-0.0011
20	2505.999996	-0.0016	2679.999997	-0.0011
30	2505.999996	-0.0016	2679.999996	-0.0015
40	2505.999996	-0.0016	2679.999997	-0.0011
50	2505.999998	-0.0008	2679.999999	-0.0004

7.7.4 LTE Band 66 (CA 66C)

Frequency Stability Versus Voltage				
Voltage (Vdc)	CH 132072 (1720.0MHz) + 132270 (1739.8MHz)		CH 132374 (1750.2MHz) + 132572 (1770.0MHz)	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.40	1720.000002	0.0012	1770.000002	0.0011
3.87	1720.000002	0.0012	1770.000003	0.0017
3.60	1720.000001	0.0006	1770.000002	0.0011

Note: The applicant defined the normal working voltage is from 3.60 to 4.40 Vdc.

Frequency Stability Versus Temperature				
Temperature (℃)	CH 132072 (1720.0MHz) + 132270 (1739.8MHz)		CH 132374 (1750.2MHz) + 132572 (1770.0MHz)	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1720.000004	0.0023	1770.000002	0.0011
-20	1720.000002	0.0012	1770.000004	0.0023
-10	1720.000003	0.0017	1770.000003	0.0017
0	1720.000003	0.0017	1770.000002	0.0011
10	1719.999998	-0.0012	1769.999997	-0.0017
20	1719.999997	-0.0017	1769.999998	-0.0011
30	1719.999998	-0.0012	1769.999999	-0.0006
40	1719.999996	-0.0023	1769.999998	-0.0011
50	1719.999999	-0.0006	1769.999996	-0.0023

8 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo)

9 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 according to ISO/IEC 17025.

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

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

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