FCC Test Report

(PART 22)

Report No.:	RFBFJZ-WTW-P22040598-5
FCC ID:	V65E4811
Test Model:	E4811
Series Model:	E4811NC (refer to item 3.1 for more details)
Received Date:	2022/4/22
Test Date:	2022/4/26 ~ 2022/6/20
Issued Date:	2022/7/22
Applicant:	Kyocera Corporation ℅ Kyocera International, Inc.
Address:	8611 Balboa Avenue, San Diego, CA 92123
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location (1):	No.19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan
Test Location (2):	B2F., No.215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan
FCC Registration / Designation Number:	788550 / TW0003 427177 / TW0011

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RFBFJZ-WTW-P22040598-5	Original Release	2022/7/22

1 Certificate of Conformity

Product:	Feature Phone
Brand:	Kyocera
Test Model:	E4811
Series Model:	E4811NC (refer to item 3.1 for more details)
Sample Status:	Identical Prototype
Applicant:	Kyocera Corporation ％ Kyocera International, Inc.
Test Date:	2022/4/26 ~ 2022/6/20
Standards:	FCC Part 22, Subpart H

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

Prepared by : Vera Huang , **Date:** 2022/7/22

Vera Huang / Specialist

Approved by : Jeremy Lin , **Date:** 2022/7/22

Jeremy Lin / Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 22 & Part 2			
FCC Clause	**Test Item**	**Result**	**Remarks**
2.1046 22.913 (a)	Effective Radiated Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Meet the requirement.
22.913 (d)	Peak to Average Ratio	Pass	Meet the requirement of limit.
2.1055 22.355	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
22.917	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 22.917	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 22.917	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -34.47 dB at 1658.00 MHz.

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

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

Measurement	**Frequency**	**Expanded Uncertainty (k=2) (±)**
Radiated Emissions up to 1 GHz	9 kHz ~ 30 MHz	3.0400 dB
	30 MHz ~ 200 MHz	2.0153 dB
	200 MHz ~ 1000 MHz	2.0224 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	1.0121 dB
	18 GHz ~ 40 GHz	1.1508 dB

2.2 Test Site and Instruments

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Antenna Tower Max-Full	UNAT_5+	PAD-CH6-01	N/A	N/A
Antenna Tower Controller Max-Full	MF-7802	N/A	N/A	N/A
Bi_Log Antenna Schwarzbeck	VULB9168	9168-616	2021/10/27	2022/10/26
Preamplifier Agilent	310N	187226	2021/6/17	2022/6/16
			2022/6/14	2023/6/13
Pre-amplifier EMCI	EMC001340	980201	2021/9/15	2022/9/14
RF Coaxial Cable EMCI	5D-NM-BM	140903+140902	2022/1/15	2023/1/14
RF Coaxial Cable ETS-Lindgren	EMC104-SM-SM-10000	Cable-CH1-01(RFC-SMS-100-SMS-120+RFC-SMS-100-SMS-4	2021/6/17	2022/6/16
			2022/6/14	2023/6/13
	RFC-SMS-100-SMS-24-IN	Cable-CH1-02(RFC-SMS-100-SMS-24)	2021/6/17	2022/6/16
			2022/6/14	2023/6/13
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	N/A	N/A	N/A
Test Receiver Agilent	N9038A	MY52260177	2021/9/1	2022/8/31
Turn Table Max-Full	TT-1510	N/A	N/A	N/A
Turn Table Controller Max-Full	MF-7802	N/A	N/A	N/A
Boresight antenna tower fixture BV	BAF-02	8	N/A	N/A
Horn Antenna ETS-Lindgren	3117	00143293	2021/11/14	2022/11/13
Horn Antenna Schwarzbeck	BBHA 9170	BBHA9170241	2021/10/26	2022/10/25
Radio Communication Analyzer Anritsu	MT8821C	6261806803	2022/2/16	2023/2/15
Loop Antenna EMCI	EM-6879	269	2021/9/16	2022/9/15

Notes:
1. The test was performed in XD - 966 chamber 6.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

3 General Information

3.1 General Description of EUT

Product	Feature Phone	
Brand	Kyocera	
Test Model	E4811	
Series Model	E4811NC	
Status of EUT	Identical Prototype	
Power Supply Rating	5 Vdc (from adapter) 3.8 Vdc (from Li-ion battery)	
Modulation Type	WCDMA: BPSK, QPSK HSDPA: BPSK HSUPA: QPSK LTE: QPSK, 16QAM	
Frequency Range	WCDMA Band 5	826.4 ~ 846.6 MHz
	LTE Band 5 (Channel Bandwidth: 1.4 MHz)	824.7 ~ 848.3 MHz
	LTE Band 5 (Channel Bandwidth: 3 MHz)	825.5 ~ 847.5 MHz
	LTE Band 5 (Channel Bandwidth: 5 MHz)	826.5 ~ 846.5 MHz
	LTE Band 5 (Channel Bandwidth: 10 MHz)	829 ~ 844 MHz
Max. ERP Power	WCDMA Band 5	90.365 mW (19.56dBm)
	LTE Band 5 (Channel Bandwidth: 1.4 MHz)	88.716 mW (19.48dBm)
	LTE Band 5 (Channel Bandwidth: 3 MHz)	87.498 mW (19.42dBm)
	LTE Band 5 (Channel Bandwidth: 5 MHz)	87.498 mW (19.42dBm)
	LTE Band 5 (Channel Bandwidth: 10 MHz)	90.365 mW (19.56dBm)
Emission Designator	WCDMA Band 5	4M19F9W
	LTE Band 5 (Channel Bandwidth: 1.4 MHz)	1M09G7D
	LTE Band 5 (Channel Bandwidth: 3 MHz)	2M69G7D
	LTE Band 5 (Channel Bandwidth: 5 MHz)	4M50G7D
	LTE Band 5 (Channel Bandwidth: 10 MHz)	8M98G7D
Antenna Type	Refer to Note as below	
Accessory Device	Refer to Note as below	
Data Cable Supplied	Refer to Note as below	

Note:

1. All models are listed as below. The model of E4811 was chosen for final test.

Brand	Model	Difference
Kyocera	E4811	with Camera function
	E4811NC	without Camera function

2. The EUT contains following accessory devices.

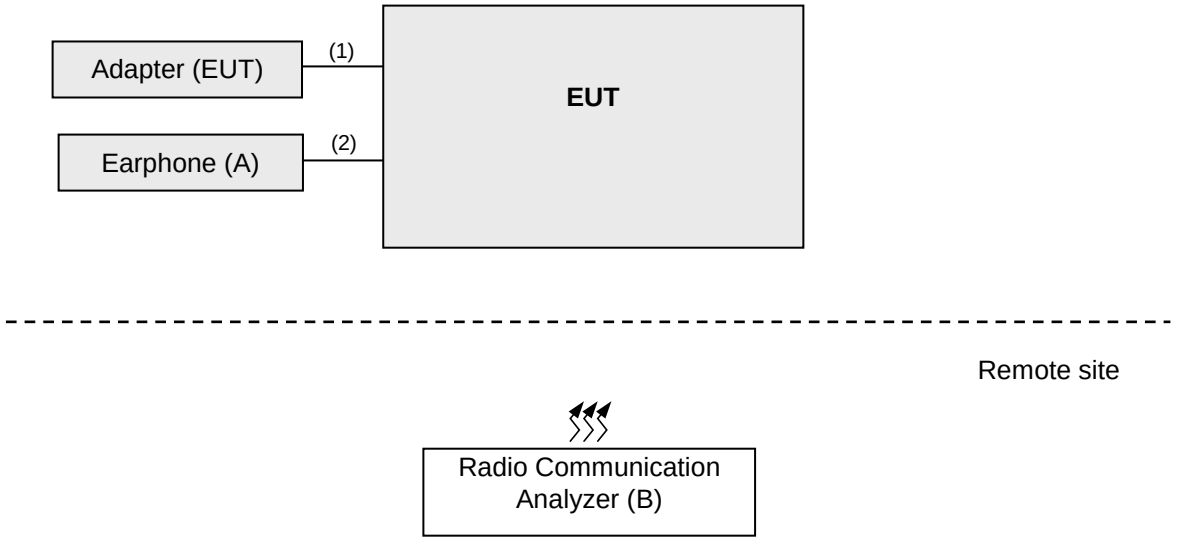
Product	Brand	Model	Description
Adapter	Kyocera	SCP-47ADT	I/P: 100-240 Vac, 50/60 Hz, 200 mA O/P: 5 Vdc, 1000 mA
Battery	Kyocera	SCP-73LBPS	3.8 Vdc, 1770 mAh, 6.8Wh
USB Cable	Kyocera	SCP-24SDC	1 m shielded Type A to Type C USB cable w/o core

3. The antenna information is listed as below.

Band	Gain (dBi)	Antenna Type	Connector Type
WCDMA 5 / LTE 5	-2.42	Internal fixed monopole	N/A

4. Detail antenna specification please refer to antenna datasheet and/or antenna measurement report.
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 Configuration of System under Test



3.2.1 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	Earphone	Funkey	FK-130102	NA	N/A	Supplied by applicant
B	Radio Communication Analyzer	Anritsu	MT8821C	6261806803	NA	Supplied by lab

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	USB Cable	1	1	No	0	Accessory of the EUT
2.	Earphone Cable	1	1	No	0	Supplied by applicant

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

3.3 Test Mode Applicability and Tested Channel Detail

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

Band	Radiated Emission
WCDMA Band 5	Y-axis
LTE Band 5	Y-axis

WCDMA Band 5

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	ERP	4132 to 4233	4132, 4182, 4233	WCDMA, HSDPA, HSUPA
-	Modulation Characteristics	4132 to 4233	4182	WCDMA, HSDPA, HSUPA
-	Frequency Stability	4132 to 4233	4132, 4233	WCDMA
-	Occupied Bandwidth	4132 to 4233	4132, 4182, 4233	WCDMA, HSDPA, HSUPA
-	Band Edge	4132 to 4233	4132, 4233	WCDMA, HSDPA, HSUPA
-	Peak to Average Ratio	4132 to 4233	4132, 4182, 4233	WCDMA, HSDPA, HSUPA
-	Conducted Emission	4132 to 4233	4132, 4182, 4233	WCDMA, HSDPA, HSUPA
-	Radiated Emission	4132 to 4233	4132, 4182, 4233	WCDMA

Note: For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.

LTE Band 5

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	RB #
-	ERP	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK / 16QAM	1 Half Full
		20415 to 20635	20415, 20525, 20635	3 MHz	QPSK / 16QAM	1 Half Full
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK / 16QAM	1 Half Full
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK / 16QAM	1 Half Full
-	Modulation Characteristics	20450 to 20600	20450	10 MHz	QPSK / 16QAM	Full
-	Frequency Stability	20407 to 20643	20407, 20643	1.4 MHz	QPSK	Full
		20415 to 20635	20415, 20635	3 MHz	QPSK	Full
		20425 to 20625	20425, 20625	5 MHz	QPSK	Full
		20450 to 20600	20450, 20600	10 MHz	QPSK	Full
-	Occupied Bandwidth	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK / 16QAM	Full
		20415 to 20635	20415, 20525, 20635	3 MHz	QPSK / 16QAM	Full
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK / 16QAM	Full
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK / 16QAM	Full
-	Band Edge	20407 to 20643	20407, 20643	1.4MHz	QPSK	1 Half Full
		20415 to 20635	20415, 20635	3 MHz	QPSK	1 Half Full
		20425 to 20625	20425, 20625	5 MHz	QPSK	1 Half Full
		20450 to 20600	20450, 20600	10 MHz	QPSK	1 Half Full
-	Peak to Average Ratio	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK / 16QAM	1
		20415 to 20635	20415, 20525, 20635	3 MHz	QPSK / 16QAM	1
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK / 16QAM	1
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK / 16QAM	1
-	Conducted Emission	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK	1
		20415 to 20635	20415, 20525, 20635	3 MHz	QPSK	1
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK	1
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK	1
-	Radiated Emission	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK	1
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK	1
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK	1

Note:

1. This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation. Therefore, only modulation characteristics, occupied bandwidth and peak to average ratio items had been tested under QPSK, 16QAM mode, the other items were performed under QPSK mode only.
2. For radiated emission above 1 GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the lowest, 5 MHz & highest channel bandwidth for final test.
3. For radiated emissions below 1 GHz, select the worst radiated emission channel for final testing.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP	25 deg. C, 66 % RH	3.8 Vdc	James Yang
Modulation Characteristics	25 deg. C, 66 % RH	3.8 Vdc	James Yang
Frequency Stability	25 deg. C, 66 % RH	3.8 Vdc	James Yang
Occupied Bandwidth	25 deg. C, 66 % RH	3.8 Vdc	James Yang
Band Edge	25 deg. C, 66 % RH	3.8 Vdc	James Yang
Peak to Average Ratio	25 deg. C, 66 % RH	3.8 Vdc	James Yang
Conducted Emission	25 deg. C, 66 % RH	3.8 Vdc	James Yang
Radiated Emission	25 deg. C, 60 % RH	120 Vac, 60 Hz	Karl Lee / Charles Hsiao

3.4 EUT Operating Conditions

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

3.5 General Description of Applied Standards and references

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

Test Standard:
FCC 47 CFR Part 2
FCC 47 CFR Part 22
ANSI/TIA/EIA-603-E 2016
ANSI 63.26-2015

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

References Test Guidance:
KDB 971168 D01 Power Meas License Digital Systems v03r01

Note: All test items have been performed as a reference to the above KDB test guidance.

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

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

4.1.2 Test Procedures

Conducted Power Measurement:

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

Maximum EIRP / ERP

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

$EIRP = P_{Meas} + G_T$

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

where

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

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

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

4.1.3 Test Setup

Conducted Power Measurement:

4.1.4 Test Results

Conducted Output Power (dBm)

Band	WCDMA V		
Channel	4132	4182	4233
Frequency (MHz)	826.4	836.4	846.6
RMC 12.2K	24.12	24.13	23.90
HSDPA Subtest-1	23.15	23.11	22.94
HSDPA Subtest-2	23.08	23.06	22.89
HSDPA Subtest-3	22.56	22.54	22.32
HSDPA Subtest-4	22.59	22.57	22.39
HSUPA Subtest-1	23.13	23.12	22.95
HSUPA Subtest-2	22.15	22.11	21.99
HSUPA Subtest-3	23.15	23.13	22.98
HSUPA Subtest-4	21.66	21.55	21.44
HSUPA Subtest-5	23.10	23.10	22.90

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20407	20525	20643
		Frequency (MHz)		824.7	836.5	848.3
1.4M	QPSK	1	0	23.96	24.05	23.80
		1	2	23.70	23.90	23.61
		1	5	23.71	23.81	23.69
		3	0	23.90	24.01	23.80
		3	1	23.89	24.00	23.80
		3	3	23.83	23.98	23.69
		6	0	22.84	23.03	22.74
	16QAM	1	0	23.10	23.18	23.02
		1	2	23.15	23.09	23.09
		1	5	23.07	23.13	22.90
		3	0	22.90	23.01	22.76
		3	1	22.78	23.04	22.72
		3	3	22.77	22.89	22.68
		6	0	21.83	21.99	21.77

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20415	20525	20635
		Frequency (MHz)		825.5	836.5	847.5
3M	QPSK	1	0	23.91	23.99	23.87
		1	7	23.66	23.90	23.72
		1	14	23.67	23.73	23.51
		8	0	22.98	23.05	22.83
		8	3	22.83	22.94	22.78
		8	7	22.87	22.92	22.62
		15	0	22.87	22.97	22.71
	16QAM	1	0	23.19	23.33	23.06
		1	7	23.13	23.11	23.04
		1	14	23.01	23.09	22.81
		8	0	21.96	22.11	21.77
		8	3	21.79	21.90	21.76
		8	7	21.75	21.93	21.61
		15	0	21.89	22.07	21.70

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20425	20525	20625
		Frequency (MHz)		826.5	836.5	846.5
5M	QPSK	1	0	23.96	23.99	23.80
		1	12	23.72	23.83	23.67
		1	24	23.70	23.91	23.56
		12	0	22.95	22.99	22.77
		12	6	22.83	22.95	22.62
		12	13	22.83	22.84	22.58
		25	0	22.89	22.97	22.73
	16QAM	1	0	23.19	23.27	23.09
		1	12	23.05	23.07	22.98
		1	24	23.08	23.09	22.92
		12	0	21.83	21.94	21.77
		12	6	21.82	21.94	21.74
		12	13	21.84	21.93	21.73
		25	0	21.88	22.06	21.72

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20450	20525	20600
		Frequency (MHz)		829	836.5	844
10M	QPSK	1	0	24.03	24.13	23.95
		1	24	23.88	23.98	23.80
		1	49	23.83	23.93	23.75
		25	0	23.02	23.12	22.94
		25	12	22.97	23.07	22.89
		25	25	22.92	23.02	22.84
		50	0	22.98	23.08	22.90
	16QAM	1	0	23.27	23.37	23.19
		1	24	23.21	23.31	23.13
		1	49	23.13	23.23	23.05
		25	0	22.04	22.14	21.96
		25	12	21.95	22.05	21.87
		25	25	21.92	22.02	21.84
		50	0	21.98	22.08	21.90

ERP Power (dBm)

Band	WCDMA V		
TX Channel	4132	4182	4233
Rx Channel	4357	4407	4458
Frequency (MHz)	826.4	836.4	846.6
RMC 12.2K	19.55	**19.56**	19.33
HSDPA Subtest-1	18.58	18.54	18.37
HSDPA Subtest-2	18.51	18.49	18.32
HSDPA Subtest-3	17.99	17.97	17.75
HSDPA Subtest-4	18.02	18.00	17.82
HSUPA Subtest-1	18.56	18.55	18.38
HSUPA Subtest-2	17.58	17.54	17.42
HSUPA Subtest-3	18.58	18.56	18.41
HSUPA Subtest-4	17.09	16.98	16.87

*ERP = Conducted + antenna gain (-2.42dBi)-2.15

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20407	20525	20643
		Frequency (MHz)		824.7	836.5	848.3
1.4M	QPSK	1	0	19.39	**19.48**	19.23
		1	2	19.13	19.33	19.04
		1	5	19.14	19.24	19.12
		3	0	19.33	19.44	19.23
		3	1	19.32	19.43	19.23
		3	3	19.26	19.41	19.12
		6	0	18.27	18.46	18.17
	16QAM	1	0	18.53	18.61	18.45
		1	2	18.58	18.52	18.52
		1	5	18.50	18.56	18.33
		3	0	18.33	18.44	18.19
		3	1	18.21	18.47	18.15
		3	3	18.20	18.32	18.11
		6	0	17.26	17.42	17.20

*ERP = Conducted + antenna gain (-2.42dBi)-2.15

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20415	20525	20635
		Frequency (MHz)		825.5	836.5	847.5
3M	QPSK	1	0	19.34	**19.42**	19.30
		1	7	19.09	19.33	19.15
		1	14	19.10	19.16	18.94
		8	0	18.41	18.48	18.26
		8	3	18.26	18.37	18.21
		8	7	18.30	18.35	18.05
		15	0	18.30	18.40	18.14
	16QAM	1	0	18.62	18.76	18.49
		1	7	18.56	18.54	18.47
		1	14	18.44	18.52	18.24
		8	0	17.39	17.54	17.20
		8	3	17.22	17.33	17.19
		8	7	17.18	17.36	17.04
		15	0	17.32	17.50	17.13

*ERP = Conducted + antenna gain (-2.42dBi)-2.15

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20425	20525	20625
		Frequency (MHz)		826.5	836.5	846.5
5M	QPSK	1	0	19.39	**19.42**	19.23
		1	12	19.15	19.26	19.10
		1	24	19.13	19.34	18.99
		12	0	18.38	18.42	18.20
		12	6	18.26	18.38	18.05
		12	13	18.26	18.27	18.01
		25	0	18.32	18.40	18.16
	16QAM	1	0	18.62	18.70	18.52
		1	12	18.48	18.50	18.41
		1	24	18.51	18.52	18.35
		12	0	17.26	17.37	17.20
		12	6	17.25	17.37	17.17
		12	13	17.27	17.36	17.16
		25	0	17.31	17.49	17.15

*ERP = Conducted + antenna gain (-2.42dBi)-2.15

LTE Band 5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		20450	20525	20600
		Frequency (MHz)		829	836.5	844
10M	QPSK	1	0	19.46	**19.56**	19.38
		1	24	19.31	19.41	19.23
		1	49	19.26	19.36	19.18
		25	0	18.45	18.55	18.37
		25	12	18.40	18.50	18.32
		25	25	18.35	18.45	18.27
		50	0	18.41	18.51	18.33
	16QAM	1	0	18.70	18.80	18.62
		1	24	18.64	18.74	18.56
		1	49	18.56	18.66	18.48
		25	0	17.47	17.57	17.39
		25	12	17.38	17.48	17.30
		25	25	17.35	17.45	17.27
		50	0	17.41	17.51	17.33

*ERP = Conducted + antenna gain (-2.42dBi)-2.15

4.2 Modulation Characteristics Measurement

4.2.1 Limits of Modulation Characteristics

N/A

4.2.2 Test Setup

4.2.3 Test Procedure

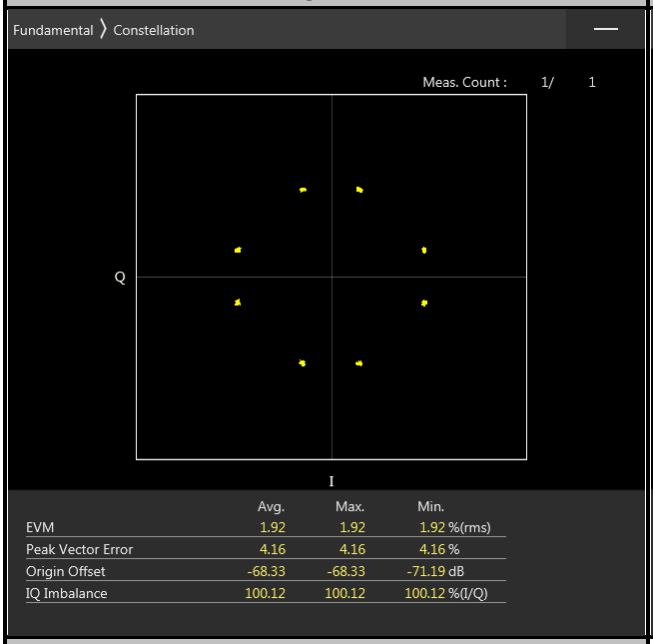
Connect the EUT to Communication Simulator via the antenna connector. The frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

4.2.4 Test Results

Spectrum Plot of Measurement

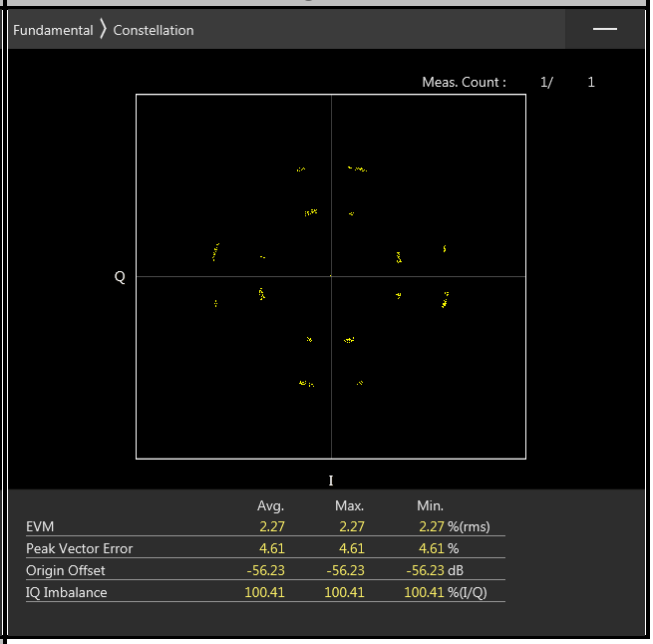
Channel 4182

WCDMA



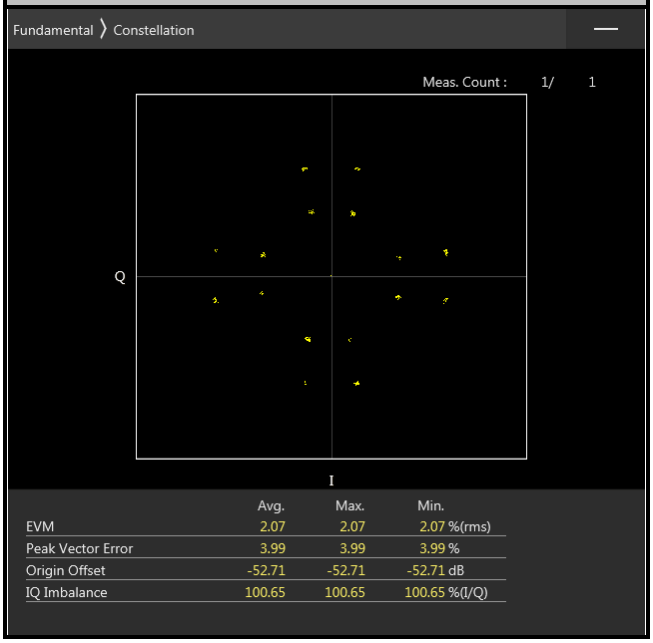
	Avg.	Max.	Min.
EVM	1.92	1.92	1.92 %(rms)
Peak Vector Error	4.16	4.16	4.16 %
Origin Offset	-68.33	-68.33	-71.19 dB
IQ Imbalance	100.12	100.12	100.12 %(I/Q)

HSDPA



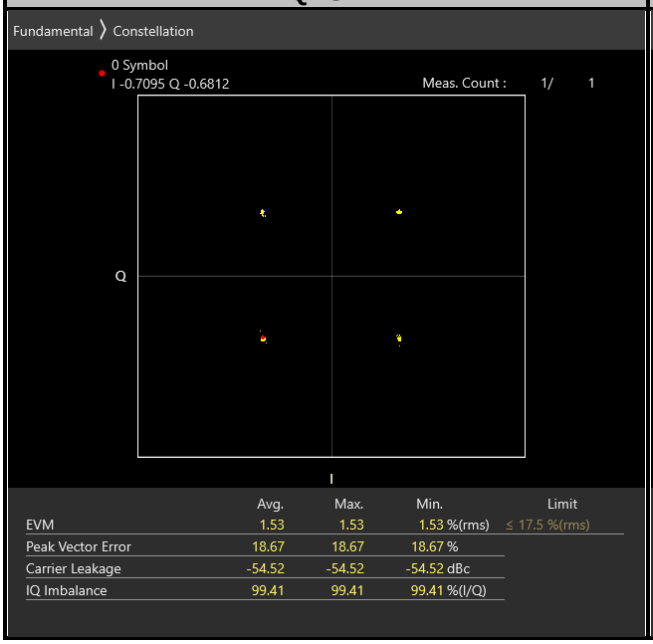
	Avg.	Max.	Min.
EVM	2.27	2.27	2.27 %(rms)
Peak Vector Error	4.61	4.61	4.61 %
Origin Offset	-56.23	-56.23	-56.23 dB
IQ Imbalance	100.41	100.41	100.41 %(I/Q)

HSUPA

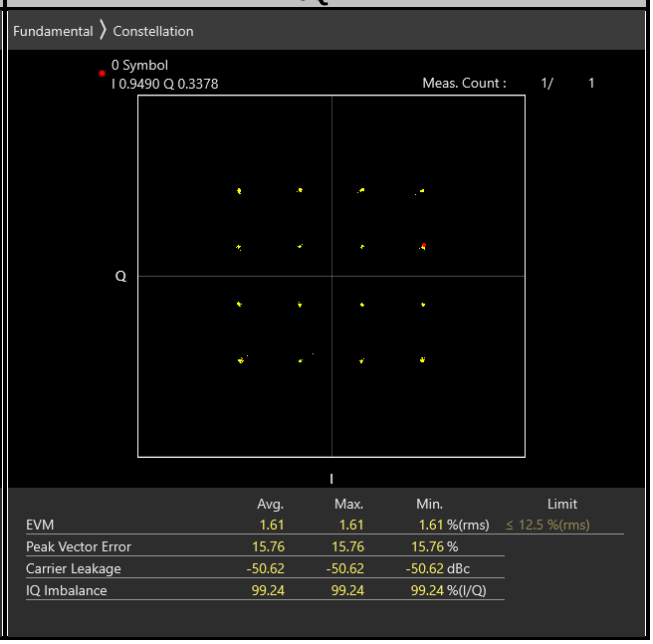


	Avg.	Max.	Min.
EVM	2.07	2.07	2.07 %(rms)
Peak Vector Error	3.99	3.99	3.99 %
Origin Offset	-52.71	-52.71	-52.71 dB
IQ Imbalance	100.65	100.65	100.65 %(I/Q)

Spectrum Plot of Measurement	
LTE Band 5	
Channel 20450	
QPSK	16QAM



	Avg.	Max.	Min.	Limit
EVM	1.53	1.53	1.53 %(rms)	≤ 17.5 %(rms)
Peak Vector Error	18.67	18.67	18.67 %	
Carrier Leakage	-54.52	-54.52	-54.52 dBc	
IQ Imbalance	99.41	99.41	99.41 %(I/Q)	



	Avg.	Max.	Min.	Limit
EVM	1.61	1.61	1.61 %(rms)	≤ 12.5 %(rms)
Peak Vector Error	15.76	15.76	15.76 %	
Carrier Leakage	-50.62	-50.62	-50.62 dBc	
IQ Imbalance	99.24	99.24	99.24 %(I/Q)	

4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

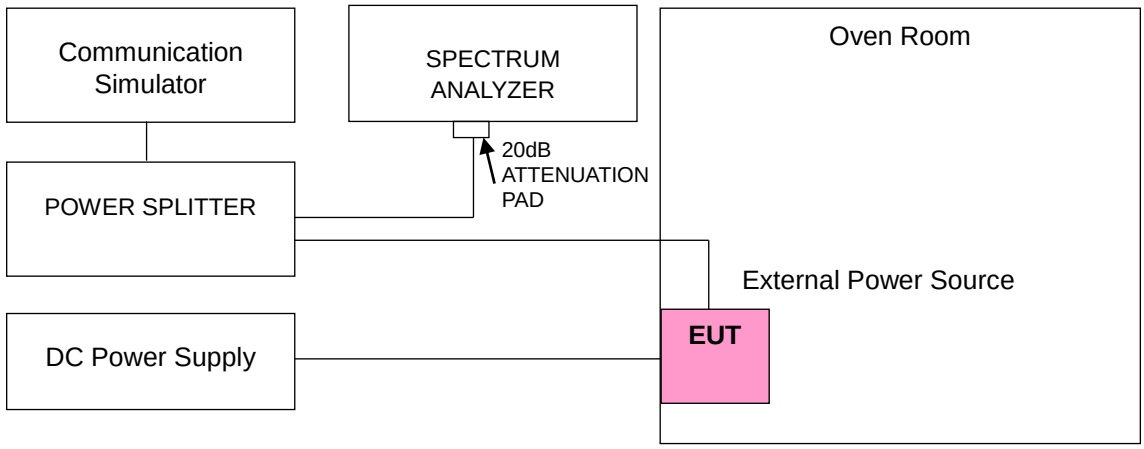
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

4.3.2 Test Procedure

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.

4.3.3 Test Setup



4.3.4 Test Results

Frequency Error vs. Voltage

Voltage (Volts)	WCDMA				Limit (ppm)
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.8	826.400001	0.001	846.600002	0.002	2.5
3.23	826.400001	0.001	846.600004	0.005	2.5
4.37	826.400003	0.004	846.600004	0.005	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.23 Vdc to 4.37 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	WCDMA				Limit (ppm)
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	826.400001	0.001	846.600003	0.004	2.5
-20	826.400004	0.005	846.600002	0.002	2.5
-10	826.400003	0.004	846.600002	0.002	2.5
0	826.400003	0.004	846.600003	0.004	2.5
10	826.400001	0.001	846.600002	0.002	2.5
20	826.399999	-0.001	846.599996	-0.005	2.5
30	826.399999	-0.001	846.599997	-0.004	2.5
40	826.399997	-0.004	846.599999	-0.001	2.5
50	826.399996	-0.005	846.599997	-0.004	2.5
60	826.399996	-0.005	846.599997	-0.004	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.8	824.700003	0.004	848.299996	-0.005	2.5
3.23	824.700003	0.004	848.300005	0.006	2.5
4.37	824.700004	0.005	848.300002	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.23 Vdc to 4.37 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	824.700004	0.005	848.299998	-0.002	2.5
-20	824.700002	0.002	848.300005	0.006	2.5
-10	824.700002	0.002	848.299999	-0.001	2.5
0	824.700003	0.004	848.299996	-0.005	2.5
10	824.700002	0.002	848.300002	0.002	2.5
20	824.699997	-0.004	848.300005	0.006	2.5
30	824.699998	-0.002	848.300005	0.006	2.5
40	824.699998	-0.002	848.299997	-0.004	2.5
50	824.699999	-0.001	848.300004	0.005	2.5
60	824.699999	-0.001	848.300004	0.005	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.8	825.500004	0.005	847.500002	0.002	2.5
3.23	825.500002	0.002	847.500005	0.006	2.5
4.37	825.500001	0.001	847.499996	-0.005	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.23 Vdc to 4.37 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	825.500002	0.002	847.500002	0.002	2.5
-20	825.500001	0.001	847.500002	0.002	2.5
-10	825.500001	0.001	847.500002	0.002	2.5
0	825.500004	0.005	847.500003	0.004	2.5
10	825.500002	0.002	847.500003	0.004	2.5
20	825.499997	-0.004	847.499996	-0.005	2.5
30	825.499998	-0.002	847.500001	0.001	2.5
40	825.499996	-0.005	847.500002	0.002	2.5
50	825.499997	-0.004	847.500004	0.005	2.5
60	825.499999	-0.001	847.500002	0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.8	826.500004	0.005	846.500003	0.004	2.5
3.23	826.500002	0.002	846.499996	-0.005	2.5
4.37	826.500003	0.004	846.500005	0.006	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.23 Vdc to 4.37 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	826.500001	0.001	846.500005	0.006	2.5
-20	826.500001	0.001	846.500001	0.001	2.5
-10	826.500001	0.001	846.500002	0.002	2.5
0	826.500001	0.001	846.499999	-0.001	2.5
10	826.500002	0.002	846.500001	0.001	2.5
20	826.499997	-0.004	846.499997	-0.004	2.5
30	826.499996	-0.005	846.499995	-0.006	2.5
40	826.499998	-0.002	846.499998	-0.002	2.5
50	826.499999	-0.001	846.499995	-0.006	2.5
60	826.499998	-0.002	846.500002	0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.8	829.000003	0.004	843.999999	-0.001	2.5
3.23	829.000002	0.002	843.999997	-0.004	2.5
4.37	829.000003	0.004	844.000004	0.005	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.23 Vdc to 4.37 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	829.000001	0.001	843.999997	-0.004	2.5
-20	829.000002	0.002	843.999996	-0.005	2.5
-10	829.000001	0.001	843.999996	-0.005	2.5
0	829.000003	0.004	844.000004	0.005	2.5
10	829.000004	0.005	844.000004	0.005	2.5
20	828.999999	-0.001	843.999999	-0.001	2.5
30	828.999996	-0.005	844.000003	0.004	2.5
40	828.999998	-0.002	844.000001	0.001	2.5
50	828.999996	-0.005	844.000002	0.002	2.5
60	828.999999	-0.001	844.000004	0.005	2.5

4.4 Occupied Bandwidth Measurement

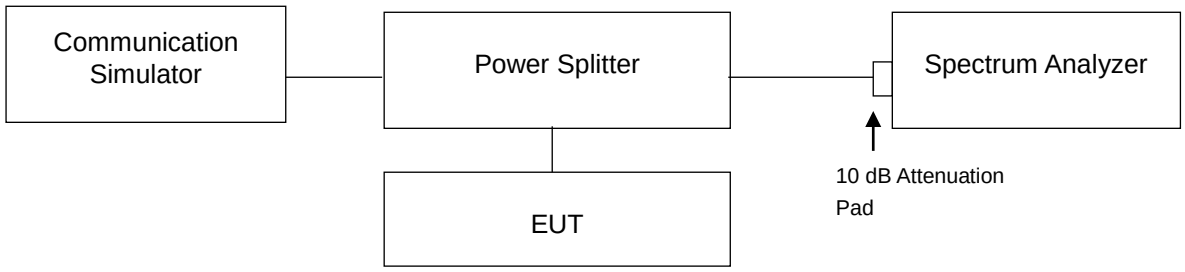
4.4.1 Test Procedure

For the 26dBc 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.

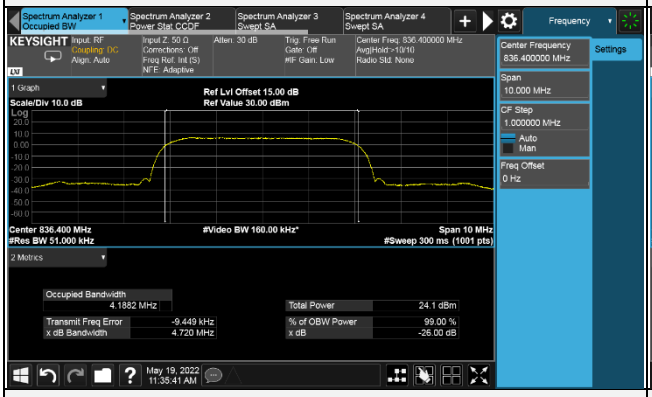
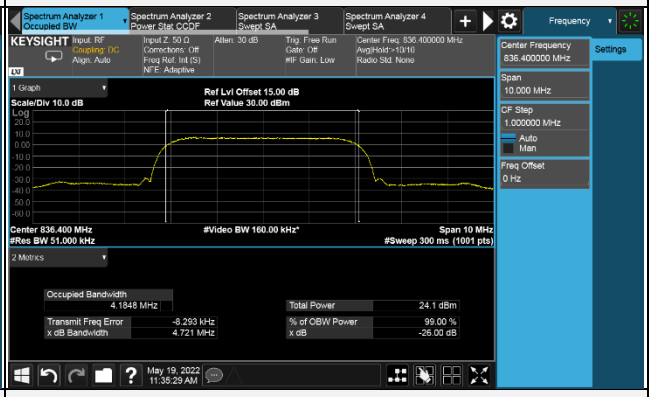
4.4.2 Test Setup



4.4.3 Test Result

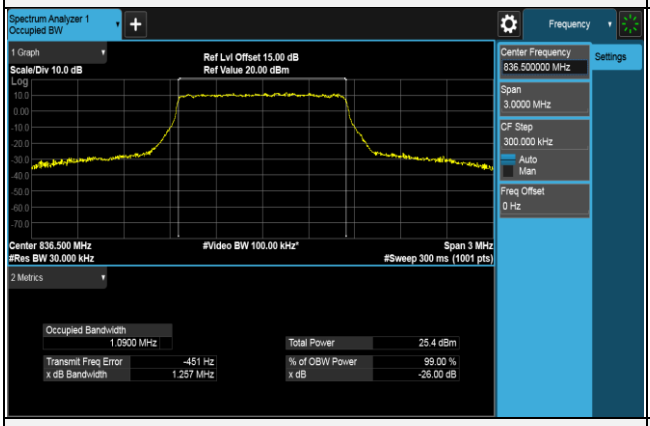
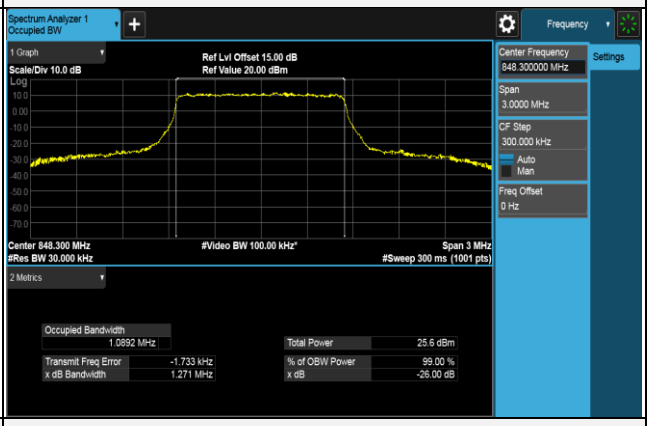
WCDMA

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
WCDMA	4132	826.4	4.18	4.72
WCDMA	4182	836.4	4.18	4.72
WCDMA	4233	846.6	4.18	4.72
HSDPA	4132	826.4	4.18	4.71
HSDPA	4182	836.4	4.19	4.72
HSDPA	4233	846.6	4.18	4.71
HSUPA	4132	826.4	4.18	4.72
HSUPA	4182	836.4	4.18	4.72
HSUPA	4233	846.6	4.18	4.72

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
HSDPA CH 4182 (836.4MHz)	HSUPA CH 4182 (836.4MHz)

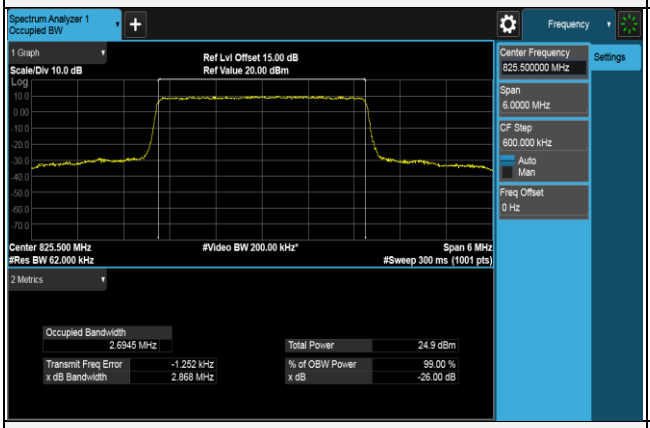
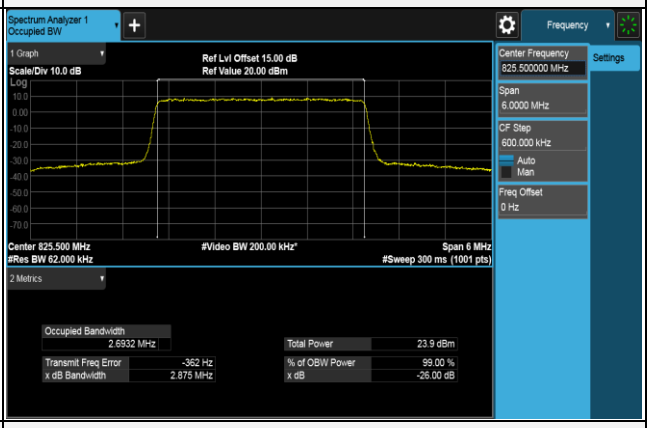
LTE Band 5 (Channel Bandwidth 1.4MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	20407	824.7	1.0852	1.247
QPSK	20525	836.5	1.0900	1.257
QPSK	20643	848.3	1.0892	1.271
16QAM	20407	824.7	1.0861	1.248
16QAM	20525	836.5	1.0857	1.246
16QAM	20643	848.3	1.0877	1.251

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 20525 (836.5MHz)	QPSK CH 20643 (848.3MHz)

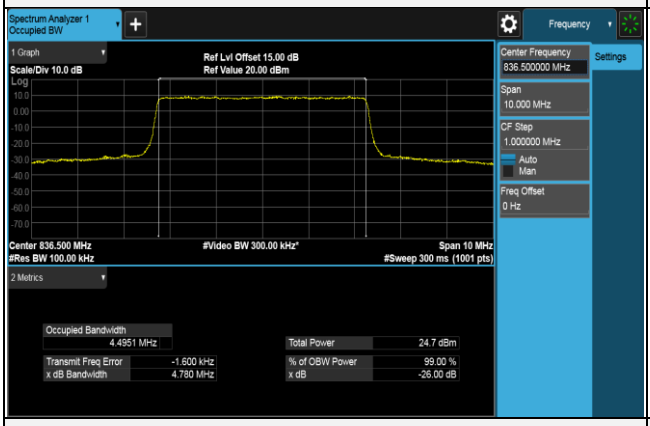
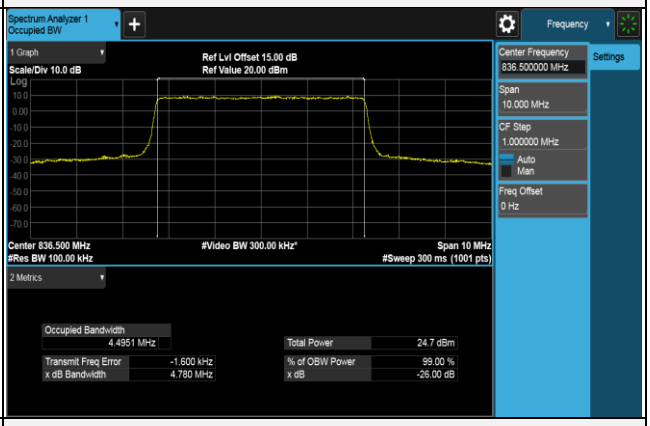
LTE Band 5 (Channel Bandwidth 3MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	20415	825.5	2.6945	2.868
QPSK	20525	836.5	2.6928	2.863
QPSK	20635	847.5	2.6939	2.871
16QAM	20415	825.5	2.6932	2.875
16QAM	20525	836.5	2.6925	2.869
16QAM	20635	847.5	2.6924	2.867

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 20415 (825.5MHz)	16QAM CH 20415 (825.5MHz)

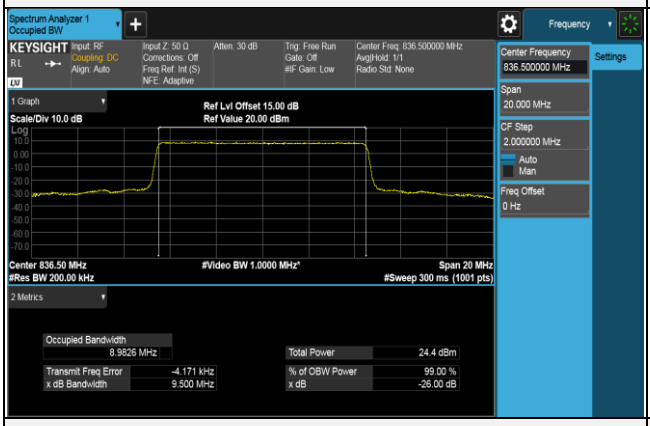
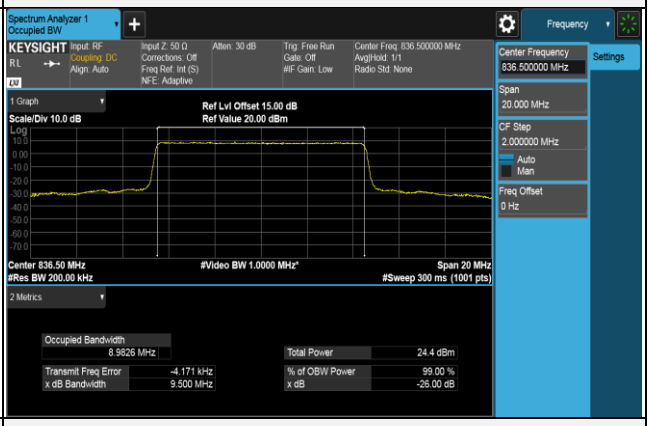
LTE Band 5 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	20425	826.5	4.4924	4.775
QPSK	20525	836.5	4.4951	4.780
QPSK	20625	846.5	4.4921	4.776
16QAM	20425	826.5	4.4904	4.770
16QAM	20525	836.5	4.4923	4.767
16QAM	20625	846.5	4.4895	4.767

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 20525 (836.5MHz)	QPSK CH 20525 (836.5MHz)

LTE Band 5 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	20450	829	8.9712	9.498
QPSK	20525	836.5	8.9826	9.500
QPSK	20600	844	8.9727	9.492
16QAM	20450	829	8.9712	9.489
16QAM	20525	836.5	8.9792	9.489
16QAM	20600	844	8.9714	9.500

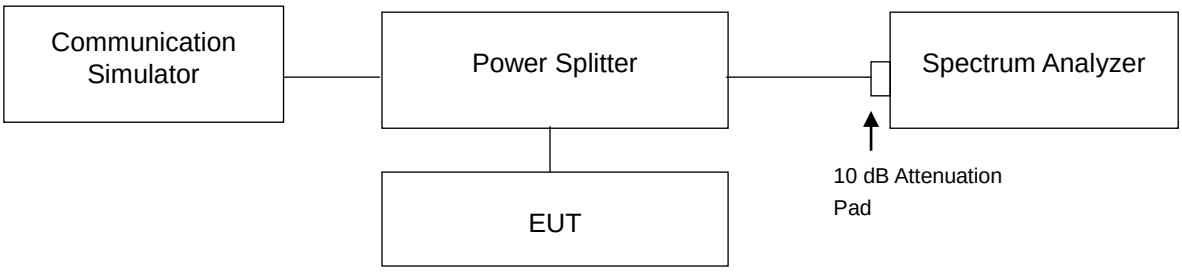
Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
QPSK CH 20525 (836.5MHz)	QPSK CH 20525 (836.5MHz)

4.5 Band Edge Measurement

4.5.1 Limits of Band Edge Measurement

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. In the 1 MHz 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.

4.5.2 Test Setup

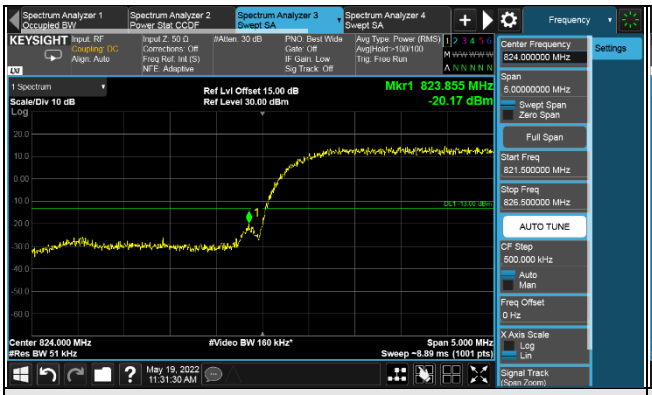


4.5.3 Test Procedures

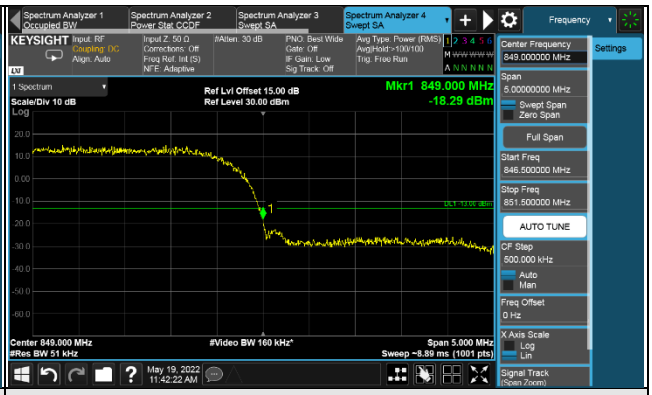
a. All measurements were done at low and high operational frequency range.
b. The center frequency of spectrum is the band edge frequency and span is 5 MHz. RB of the spectrum is 51 kHz and VB of the spectrum is 160 kHz (WCDMA / HSDPA / HSUPA).
c. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 15 kHz and VB of the spectrum is 51 kHz (LTE Bandwidth 1.4 MHz).
d. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 30 kHz and VB of the spectrum is 100 kHz (LTE Bandwidth 3 MHz).
e. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 51 kHz and VB of the spectrum is 160 kHz (LTE Bandwidth 5 MHz).
f. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 100 kHz and VB of the spectrum is 300 kHz (LTE Bandwidth 10 MHz).
g. Record the max trace plot into the test report.

4.5.4 Test Results

WCDMA

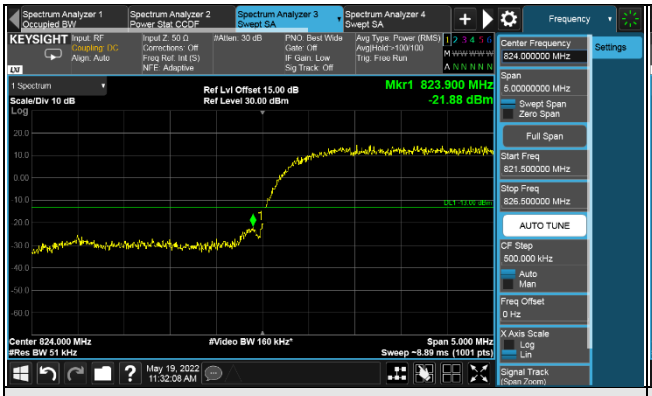


826.4MHz

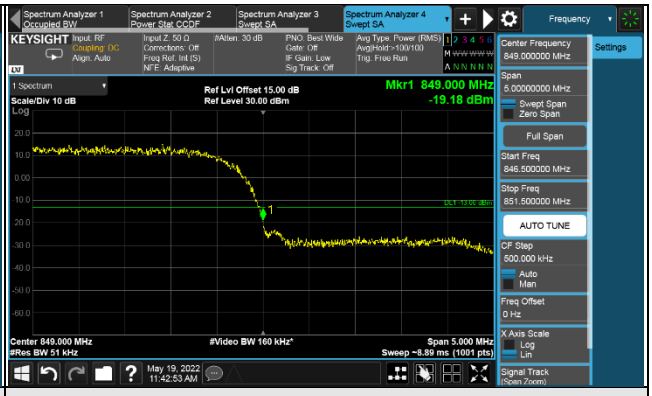


846.6MHz

HSDPA

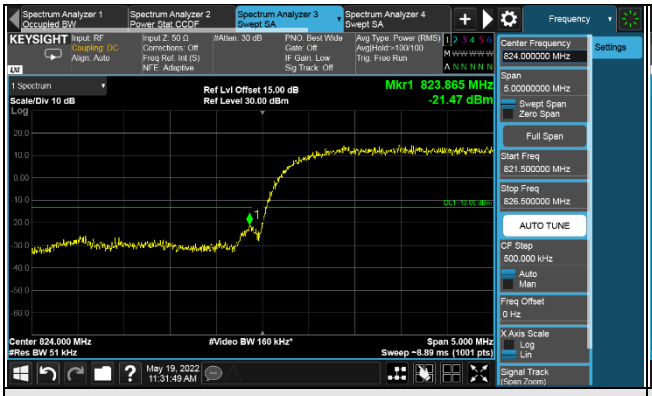


826.4MHz

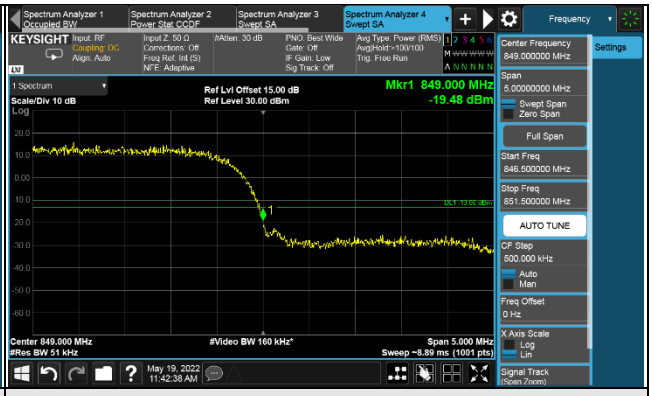


846.6MHz

HSUPA

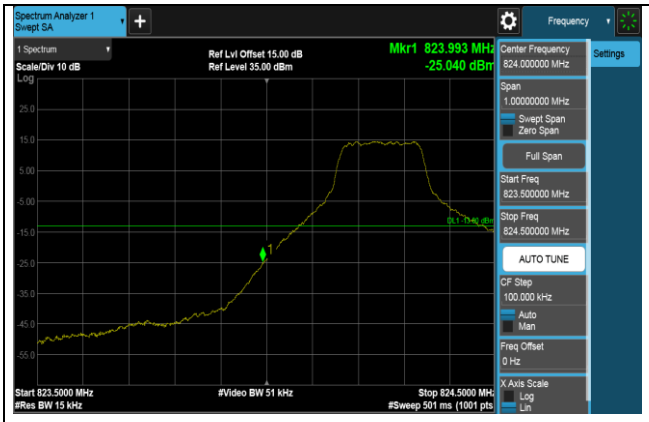
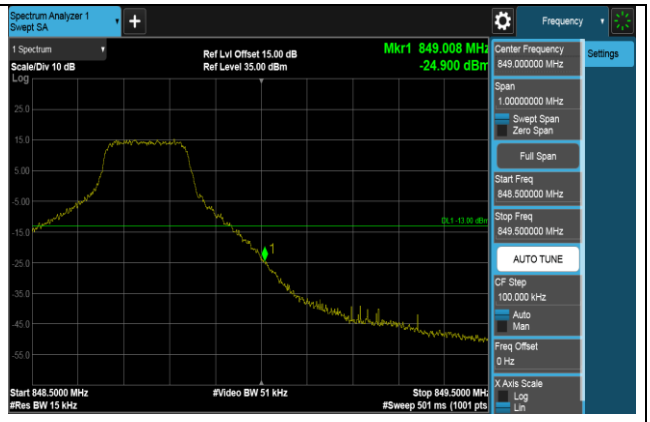
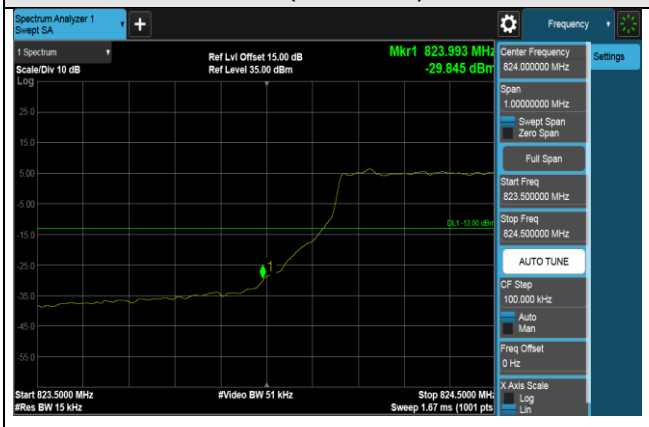
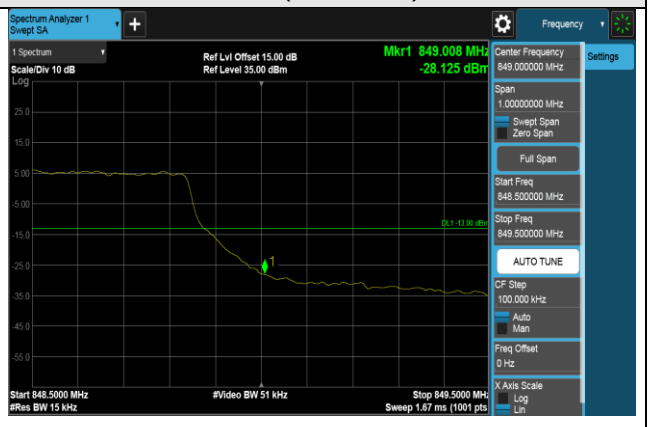


826.4MHz

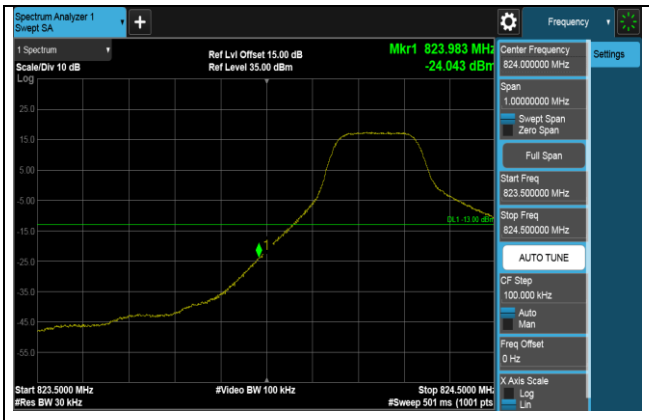
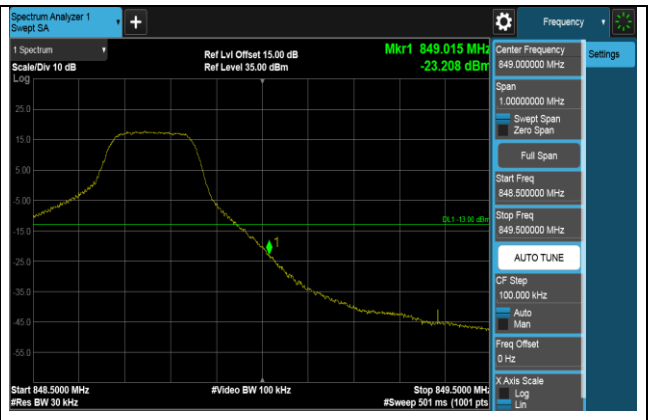
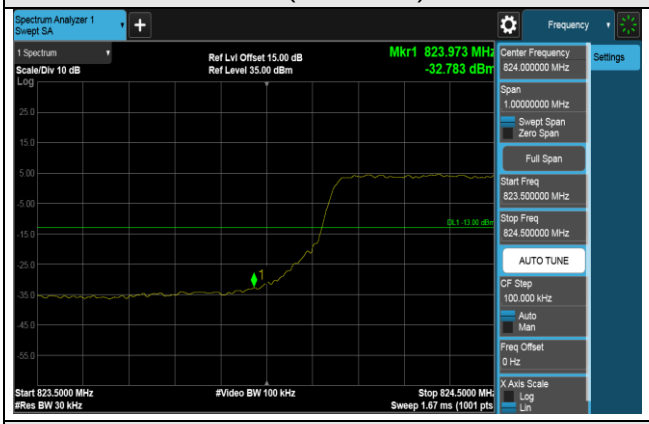
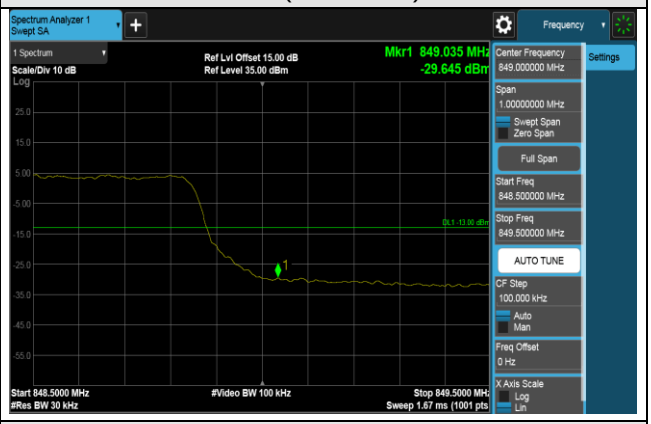


846.6MHz

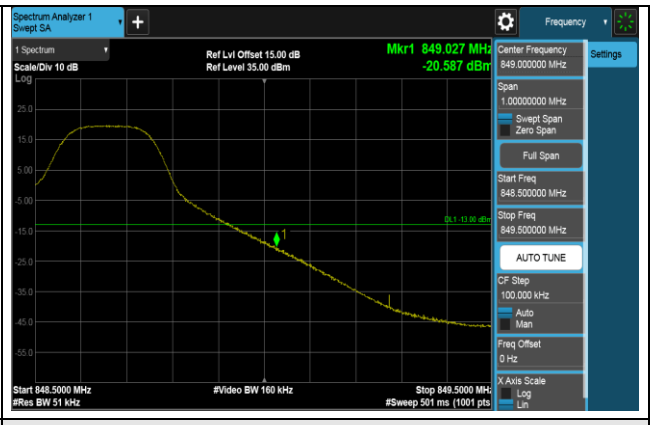
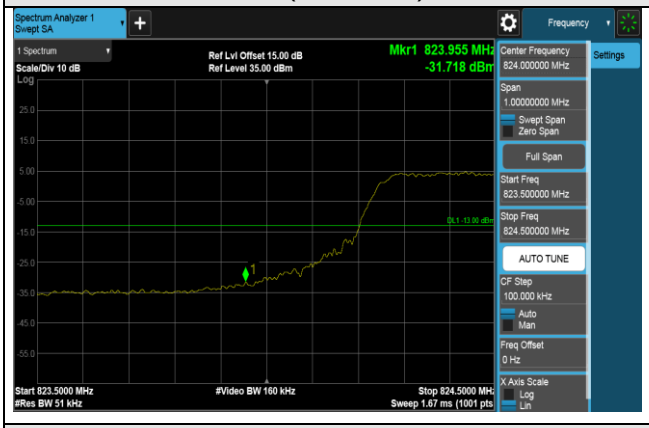
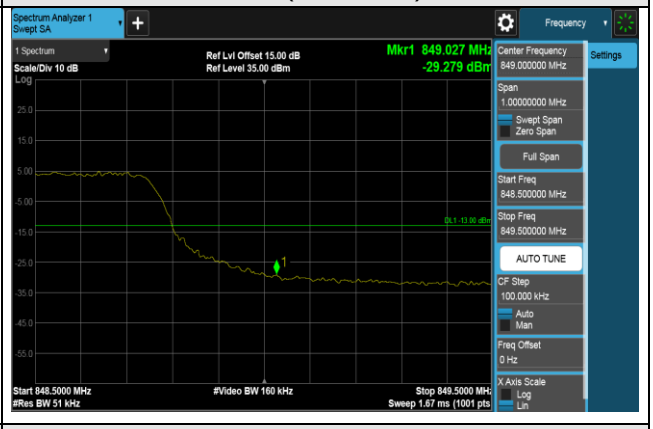
LTE Band 5 (Channel Bandwidth 1.4MHz)

	
1RB (824.7MHz)	1RB (848.3MHz)
	
FULL (824.7MHz)	FULL (848.3MHz)

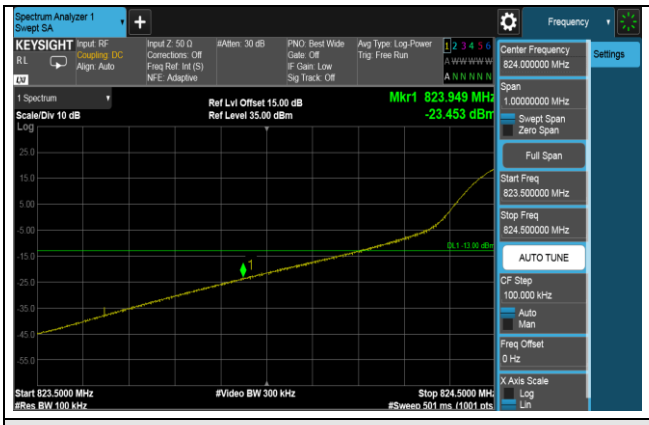
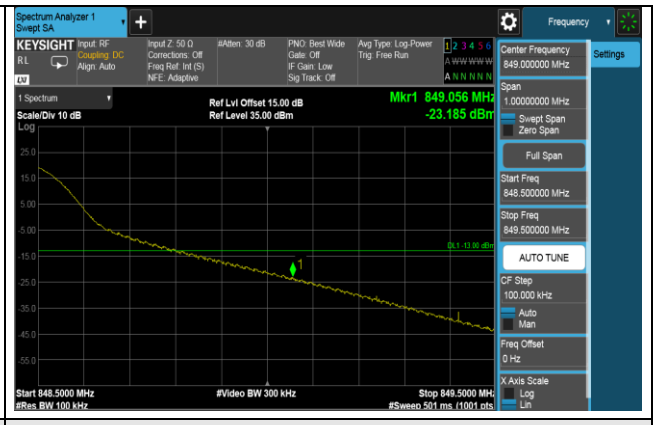
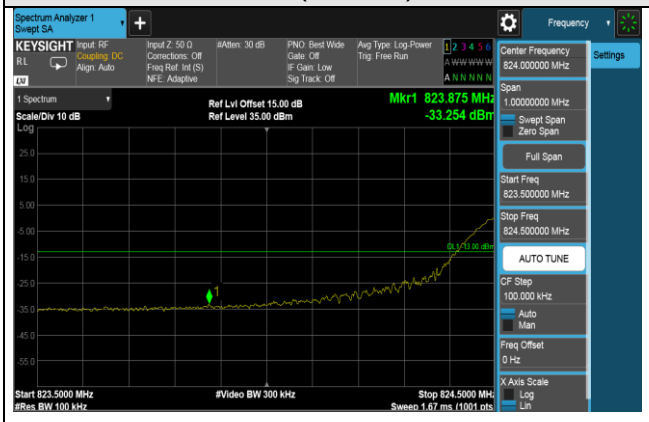
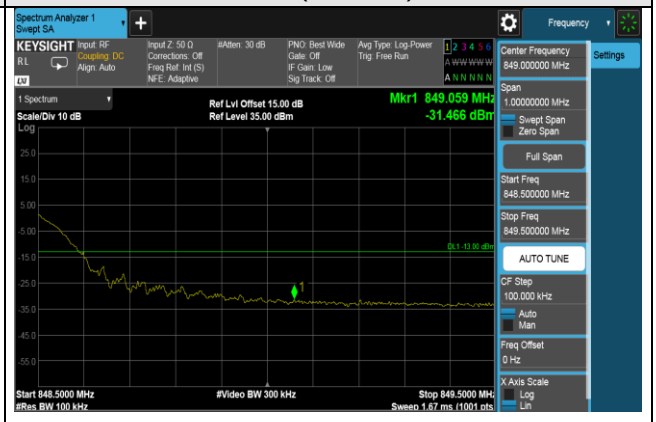
LTE Band 5 (Channel Bandwidth 3MHz)

	
1RB (825.5MHz)	1RB (847.5MHz)
	
FULL (825.5MHz)	FULL (847.5MHz)

LTE Band 5 (Channel Bandwidth 5MHz)

	
1RB (826.5MHz)	1RB (846.5MHz)
	
FULL (826.5MHz)	FULL (846.5MHz)

LTE Band 5 (Channel Bandwidth 10MHz)

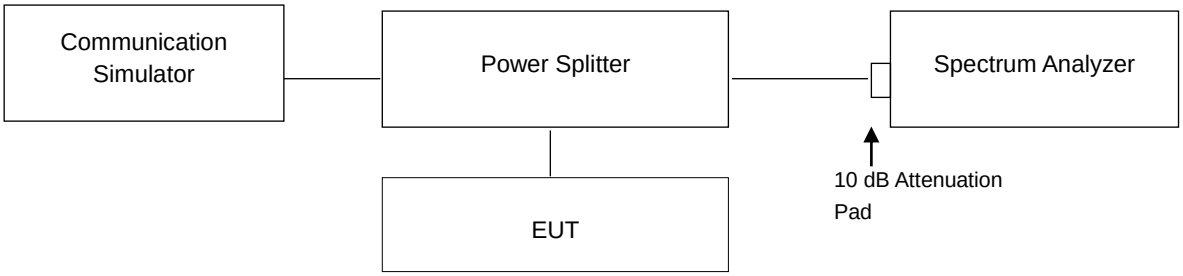
	
1RB (829MHz)	1RB (844MHz)
	
FULL (829MHz)	FULL (844MHz)

4.6 Peak to Average Ratio

4.6.1 Limits of Peak to Average Ratio Measurement

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.

4.6.2 Test Setup



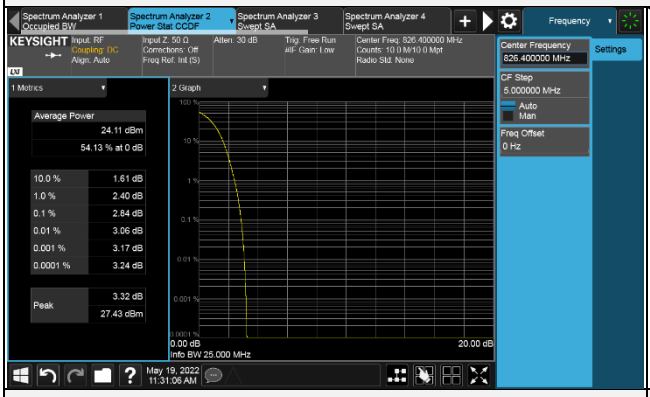
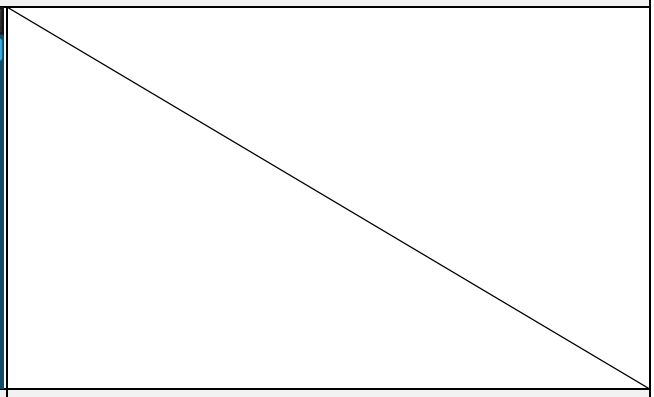
4.6.3 Test Procedures

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

4.6.4 Test Results

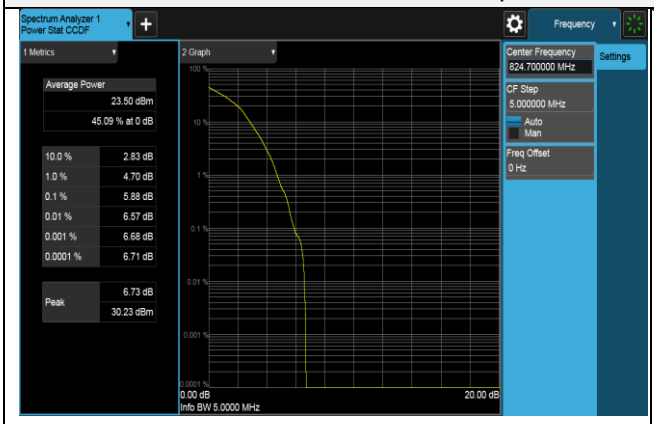
WCDMA

Test Condition	Channel	Frequency (MHz)	Measure. Value (dB)	Limit (dB)	Result
WCDMA	4132	826.4	2.84	13	Pass
WCDMA	4182	836.4	2.78	13	Pass
WCDMA	4233	846.6	2.82	13	Pass
HSDPA	4132	826.4	2.84	13	Pass
HSDPA	4182	836.4	2.78	13	Pass
HSDPA	4233	846.6	2.82	13	Pass
HSUPA	4132	826.4	2.84	13	Pass
HSUPA	4182	836.4	2.78	13	Pass
HSUPA	4233	846.6	2.81	13	Pass

Spectrum Plot of Worst Value	
	
WCDMA CH 4132 (826.4MHz)	

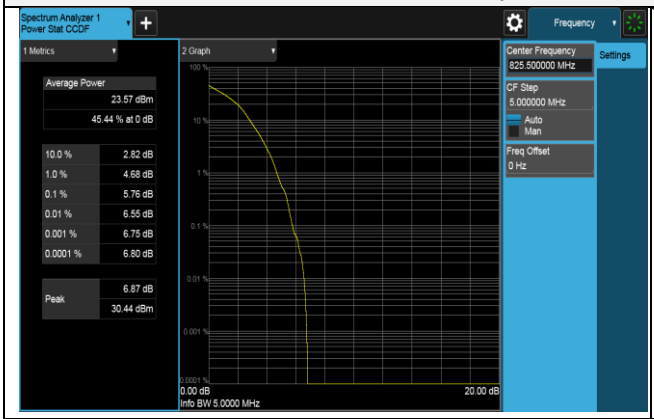
LTE Band 5 (Channel Bandwidth 1.4MHz)

Test Condition	Channel	Frequency (MHz)	Measure. Value(dB)	Limit dB	Result
QPSK	20407	824.7	4.85	13	PASS
QPSK	20525	836.5	4.53	13	PASS
QPSK	20643	848.3	4.26	13	PASS
16QAM	20407	824.7	5.88	13	PASS
16QAM	20525	836.5	5.58	13	PASS
16QAM	20643	848.3	5.36	13	PASS

Spectrum Plot of Worst Value	
	
16QAM CH 20407 (824.7MHz)	

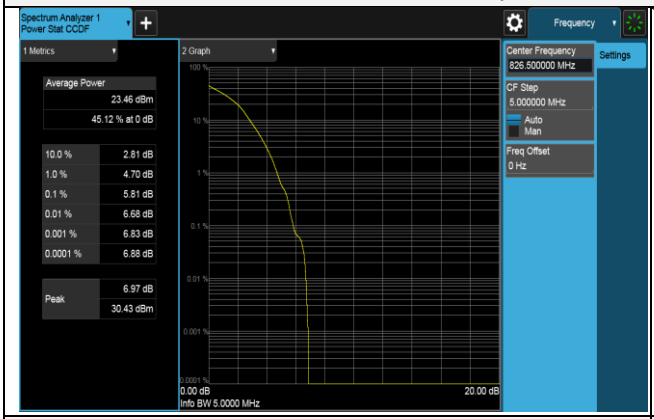
LTE Band 5 (Channel Bandwidth 3MHz)

Test Condition	Channel	Frequency (MHz)	Measure. Value(dB)	Limit dB	Result
QPSK	20415	825.5	4.62	13	PASS
QPSK	20525	836.5	4.47	13	PASS
QPSK	20635	847.5	4.41	13	PASS
16QAM	20415	825.5	5.76	13	PASS
16QAM	20525	836.5	5.48	13	PASS
16QAM	20635	847.5	5.46	13	PASS

Spectrum Plot of Worst Value	
	
16QAM CH 20415 (825.5MHz)	

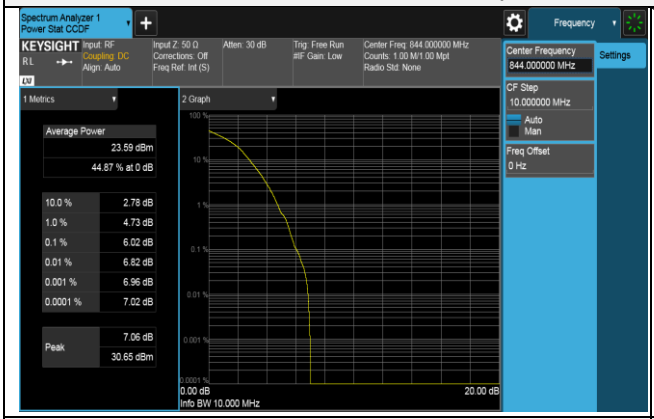
LTE Band 5 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Measure. Value(dB)	Limit dB	Result
QPSK	20425	826.5	4.72	13	PASS
QPSK	20525	836.5	4.46	13	PASS
QPSK	20625	846.5	4.58	13	PASS
16QAM	20425	826.5	5.81	13	PASS
16QAM	20525	836.5	5.50	13	PASS
16QAM	20625	846.5	5.70	13	PASS

Spectrum Plot of Worst Value	
	
16QAM CH 20425 (826.5MHz)	

LTE Band 5 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Measure. Value(dB)	Limit dB	Result
QPSK	20450	829	4.65	13	PASS
QPSK	20525	836.5	4.38	13	PASS
QPSK	20600	844	4.66	13	PASS
16QAM	20450	829	5.78	13	PASS
16QAM	20525	836.5	5.47	13	PASS
16QAM	20600	844	6.02	13	PASS

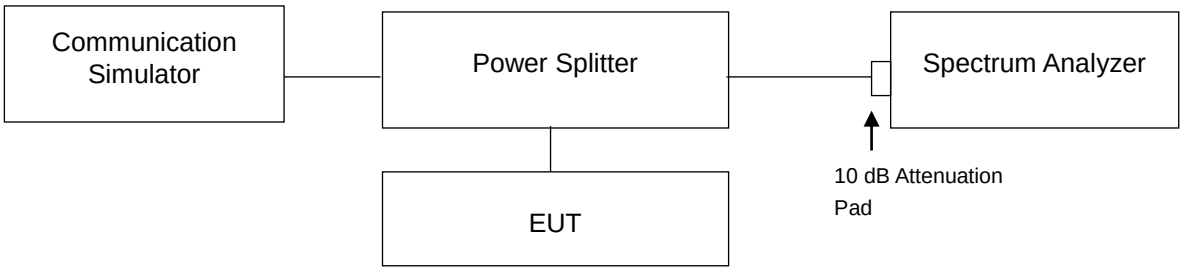
Spectrum Plot of Worst Value	
	
16QAM CH 20600 (844MHz)	

4.7 Conducted Spurious Emissions

4.7.1 Limits of Conducted Spurious Emissions Measurement

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

4.7.2 Test Setup

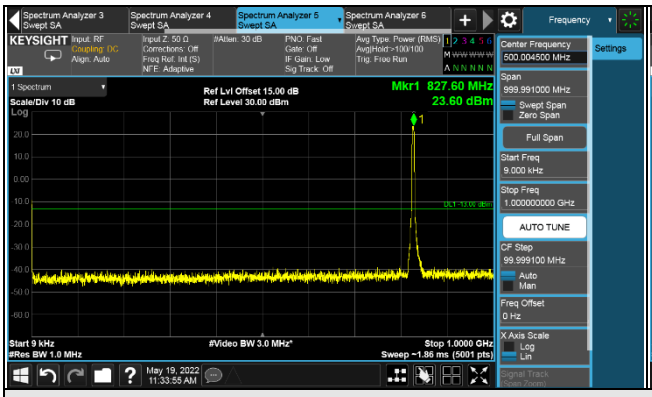


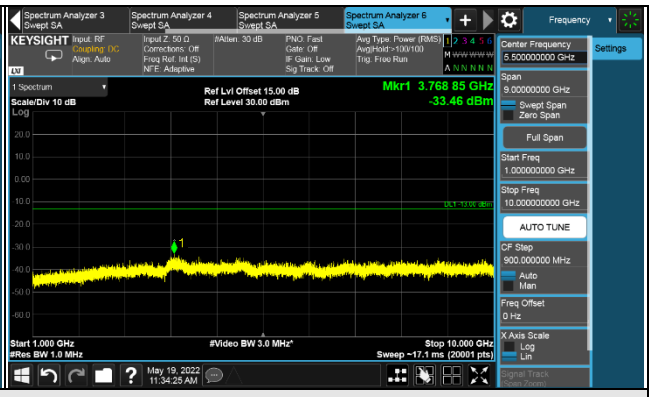
4.7.3 Test Procedure

a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
b. Measuring frequency range is from 9 kHz to 1 GHz. 10 dB attenuation pad is connected with spectrum. RBW = 1 MHz and VBW = 3 MHz is used for conducted emission measurement.
c. Measuring frequency range is from 1 GHz to 10 GHz for WCDMA / HSDPA / HSUPA and 1 GHz to 9 GHz for LTE. 10 dB attenuation pad is connected with spectrum. RBW = 1 MHz and VBW = 3 MHz is used for conducted emission measurement.

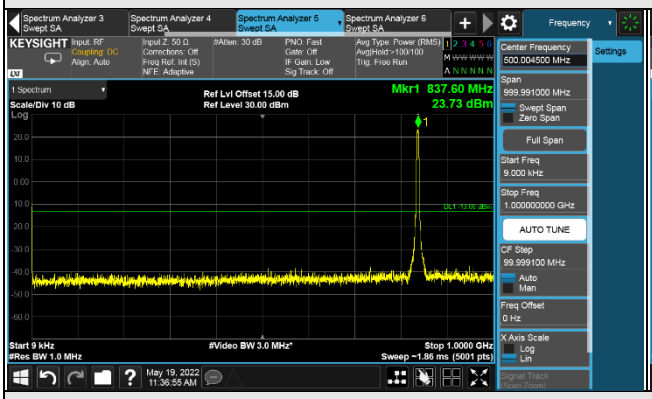
4.7.4 Test Results

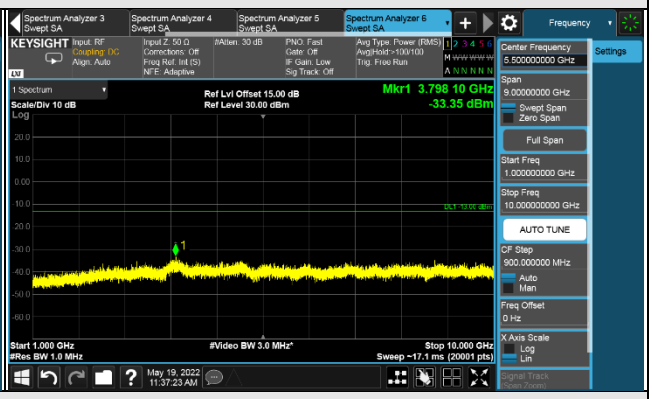
WCDMA



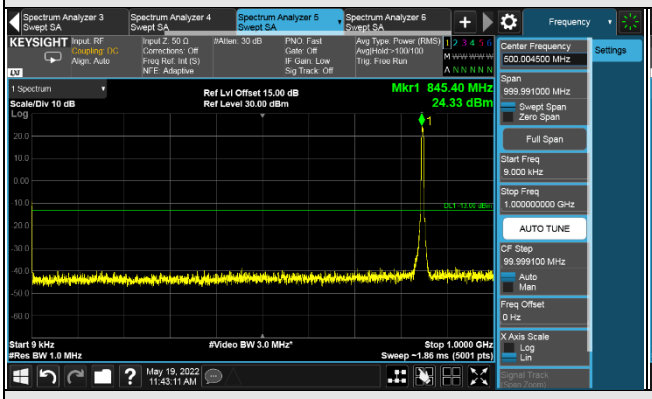


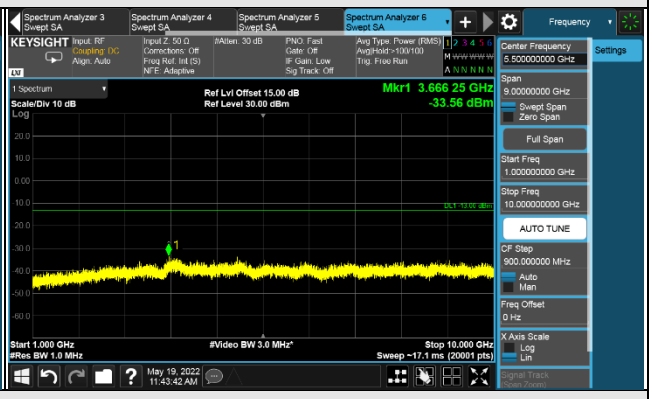
CH 4132 (826.4MHz)





CH 4182 (836.4MHz)





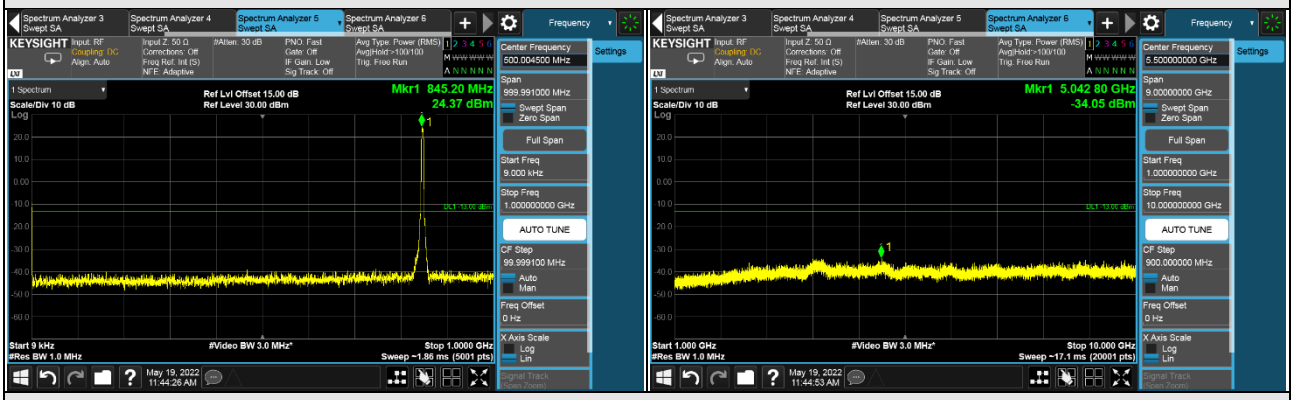
CH 4233 (846.6MHz)

*The 9kHz signal over the limit is from Spectrum.

HSDPA

CH 4132 (826.4MHz)

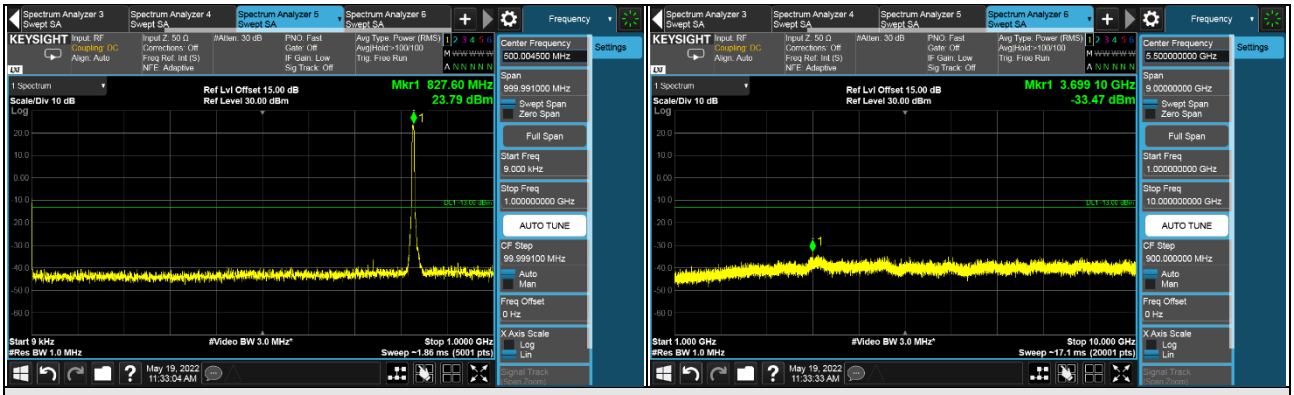
CH 4182 (836.4MHz)



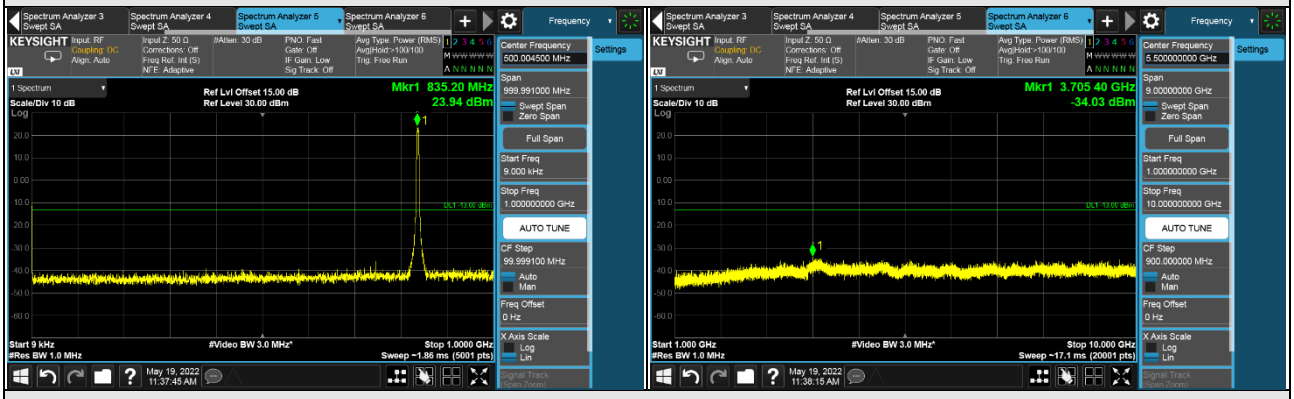
CH 4233 (846.6MHz)

*The 9kHz signal over the limit is from Spectrum.

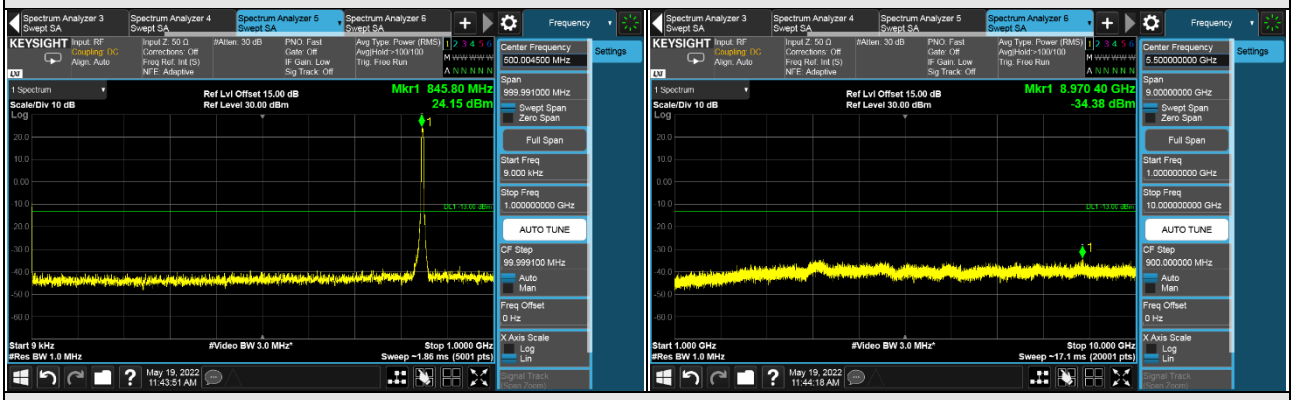
HSUPA



CH 4132 (826.4MHz)



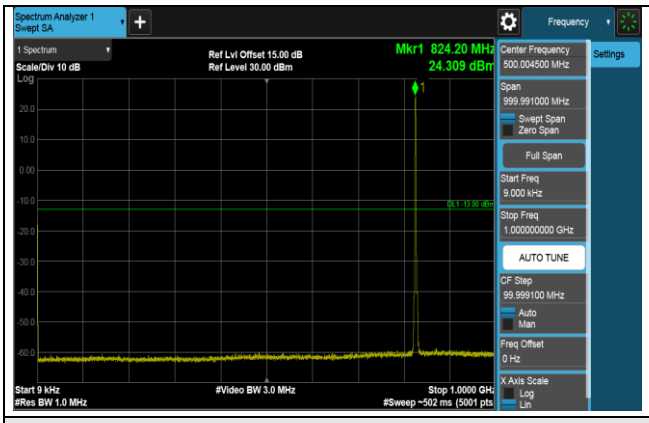
CH 4182 (836.4MHz)

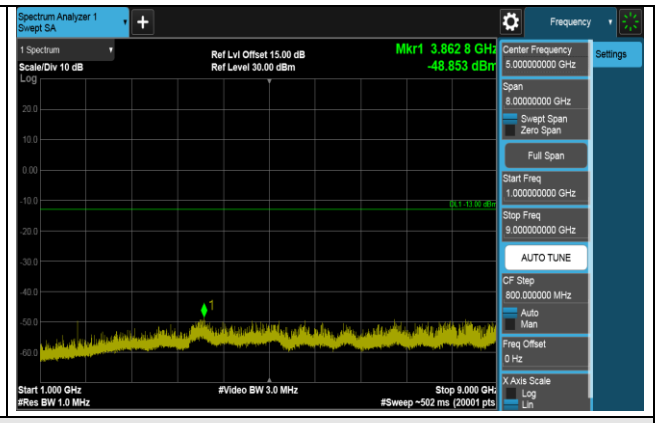


CH 4233 (846.6MHz)

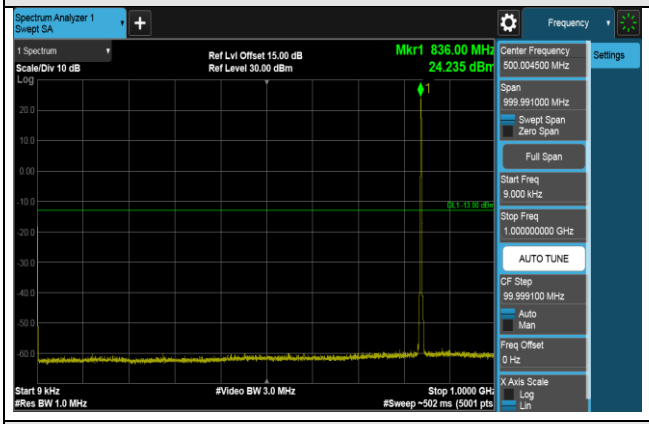
*The 9kHz signal over the limit is from Spectrum.

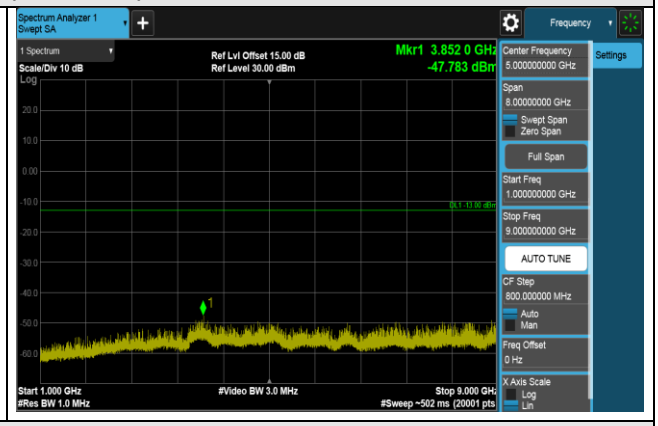
LTE Band 5 (Channel Bandwidth 1.4MHz)



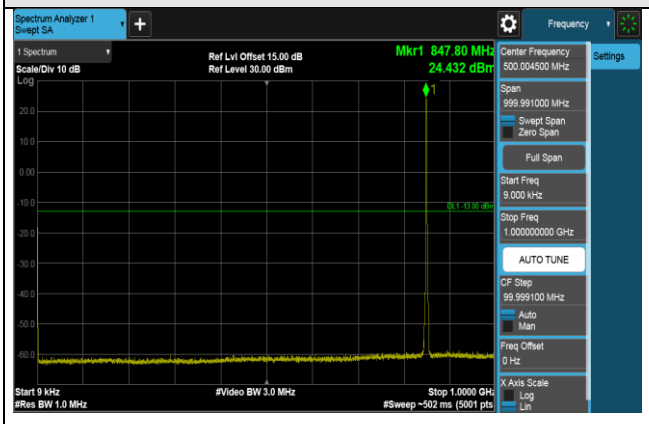


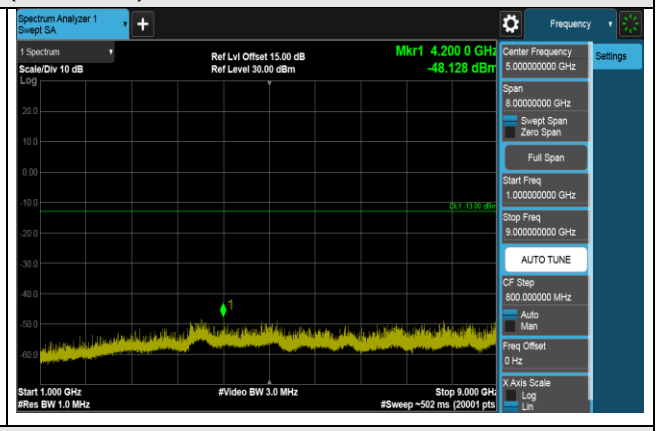
CH 20407 (824.7MHz)





CH 20525 (836.5MHz)

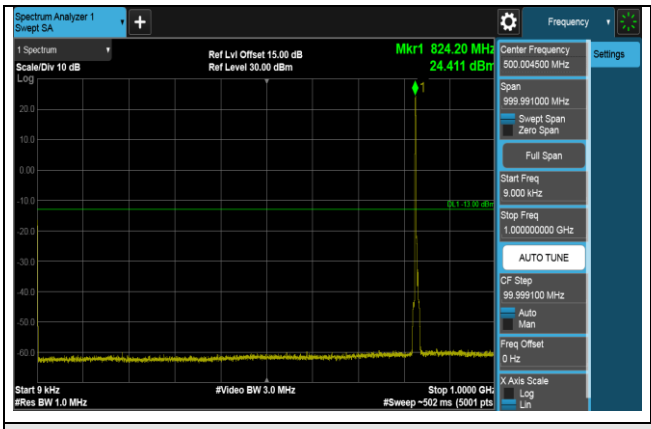


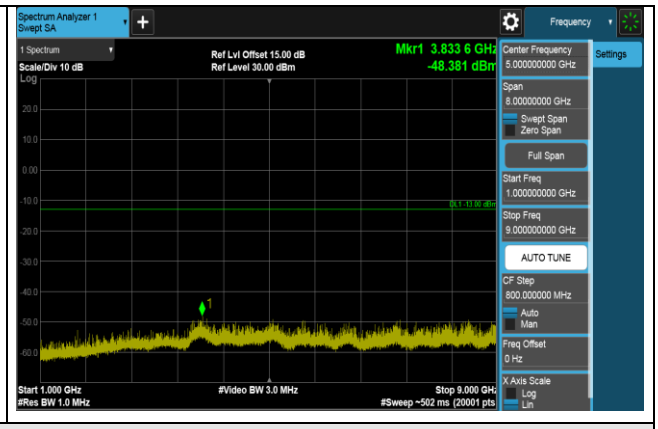


CH 20643 (848.3MHz)

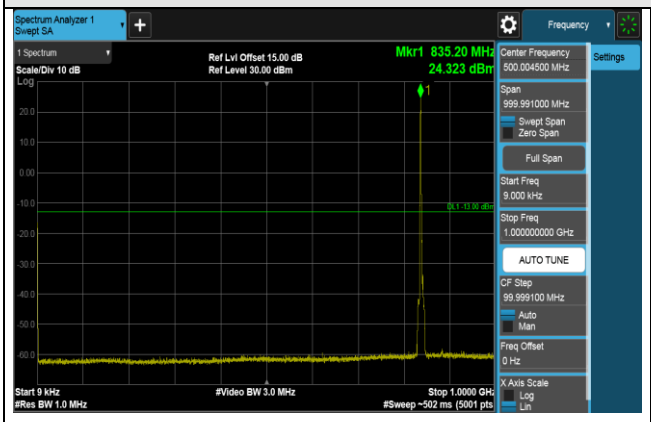
*The 9kHz signal over the limit is from Spectrum.

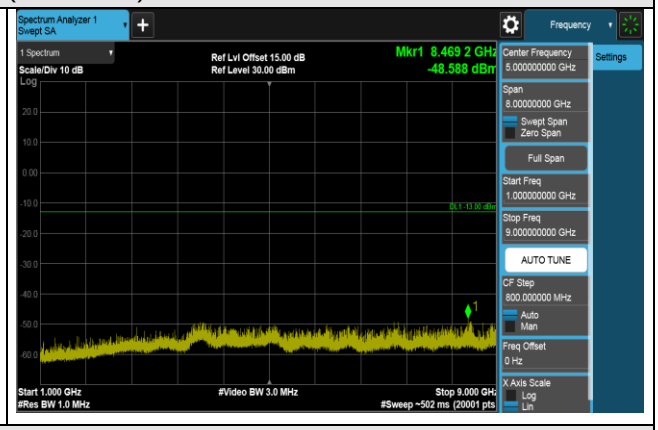
LTE Band 5 (Channel Bandwidth 3MHz)



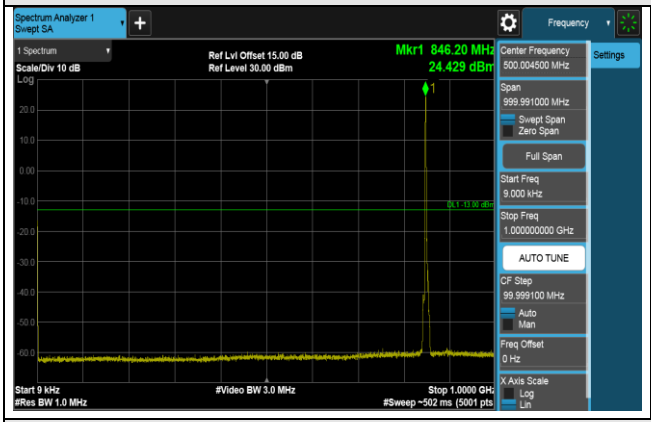


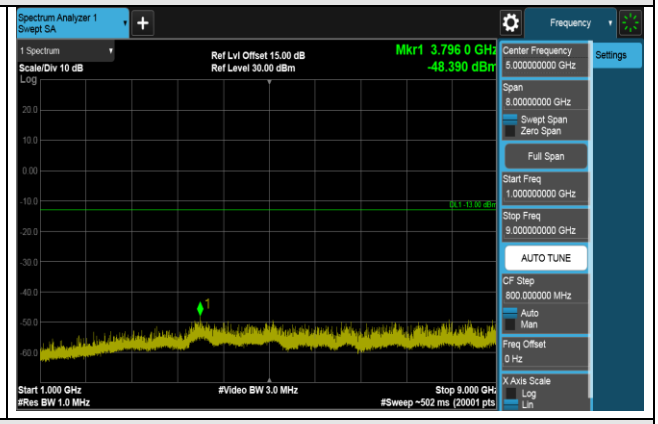
CH 20415 (825.5MHz)





CH 20525 (836.5MHz)

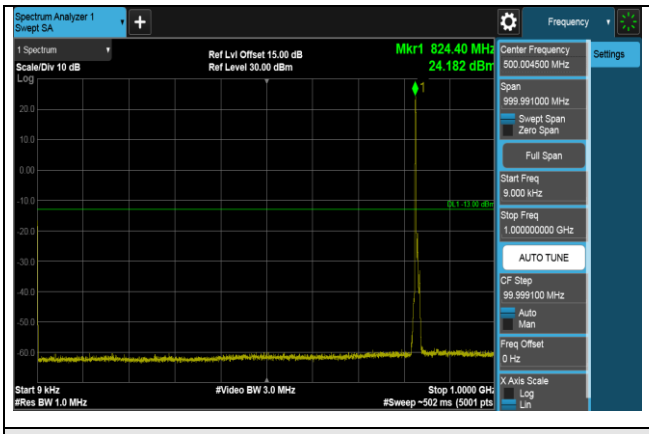


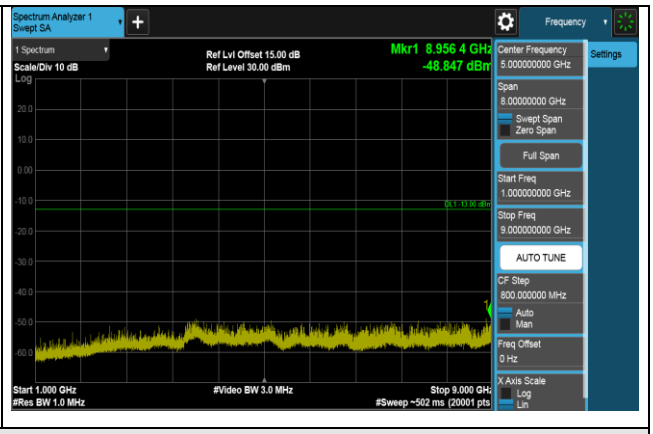


CH 20635 (847.5MHz)

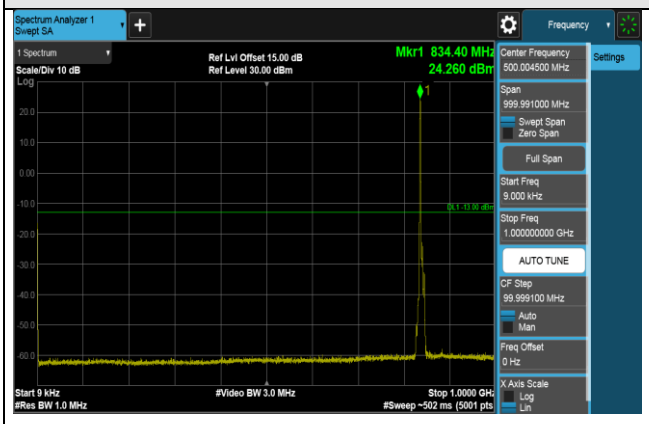
*The 9kHz signal over the limit is from Spectrum.

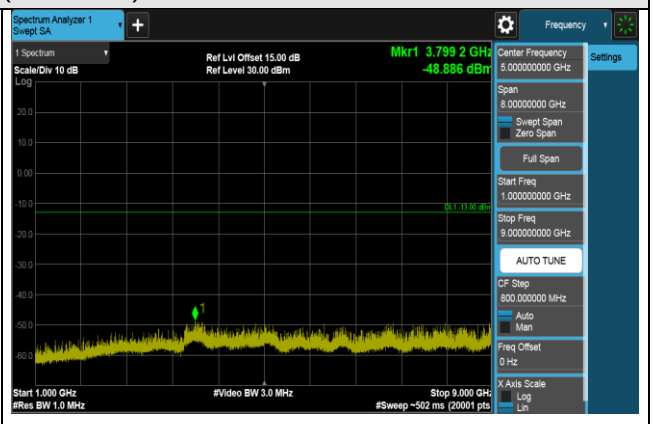
LTE Band 5 (Channel Bandwidth 5MHz)



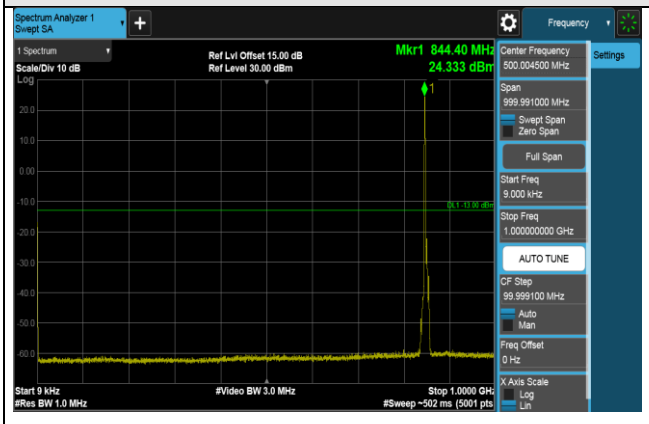


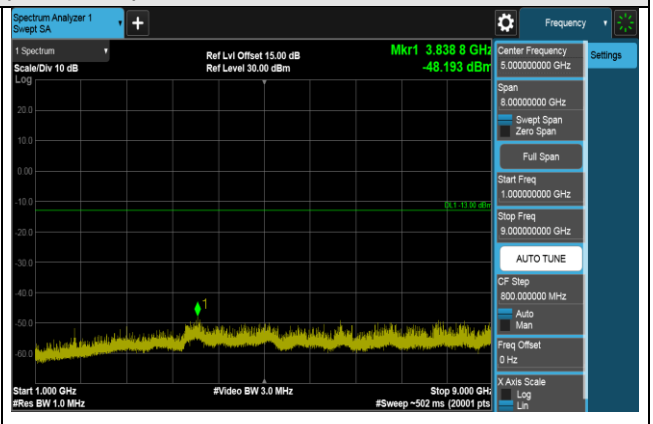
CH 20425 (826.5MHz)





CH 20525 (836.5MHz)

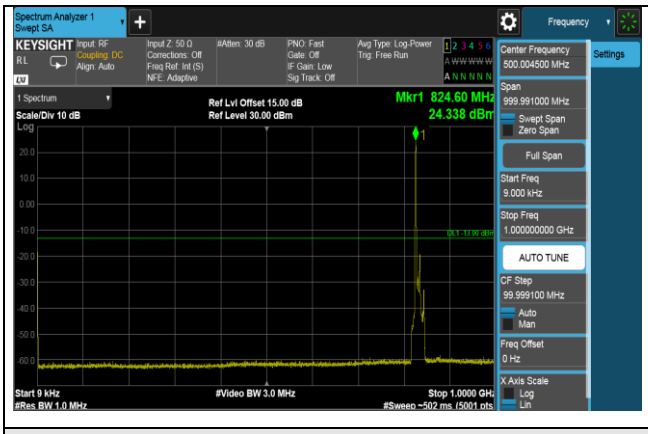


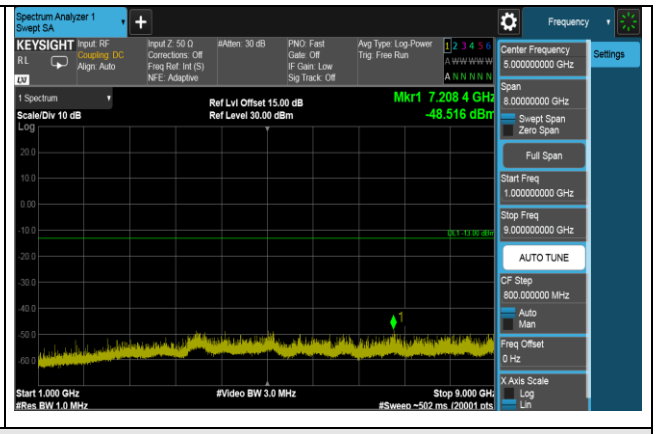


CH 20625 (846.5MHz)

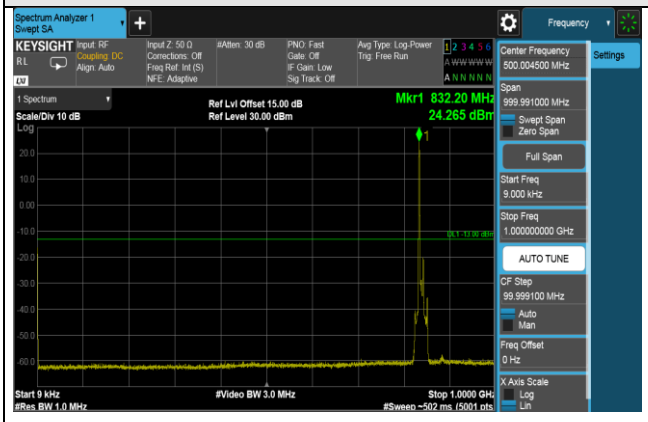
*The 9kHz signal over the limit is from Spectrum.

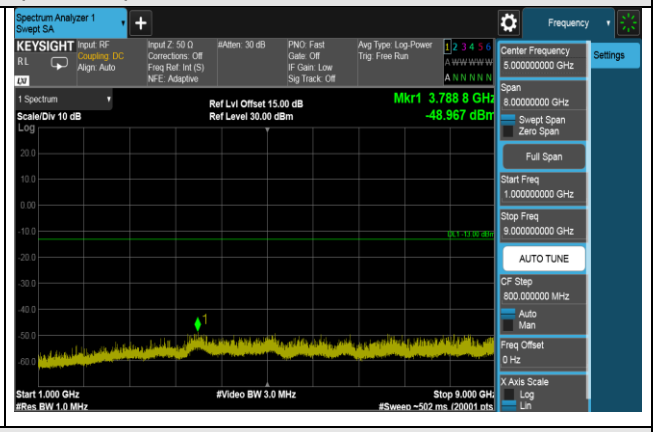
LTE Band 5 (Channel Bandwidth 10MHz)



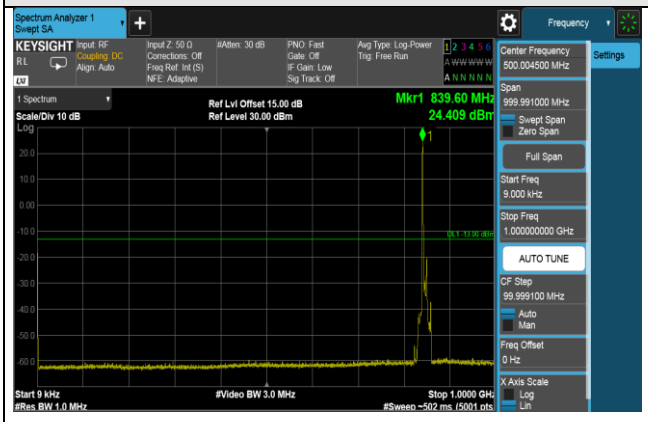


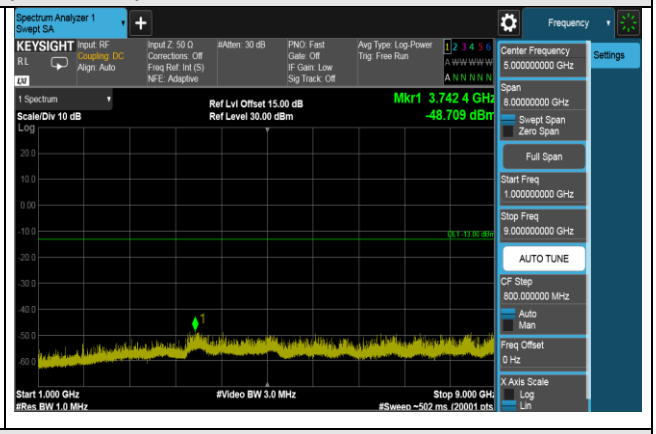
CH 20450 (829MHz)





CH 20525 (836.5MHz)





CH 20600 (844MHz)

*The 9kHz signal over the limit is from Spectrum.

4.8 Radiated Emission Measurement

4.8.1 Limits of Radiated Emission Measurement

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

4.8.2 Test Procedure

a. In the semi-anechoic chamber, EUT placed on the 0.8m(below or equal 1GHz) and/or 1.5m(above 1GHz) 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 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
b. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
c. Perform a field strength measurement and record the worse read value, is the field strength value via a spectrum reading obtained corrected for antenna factor, cable loss and pre-amplifier factor and then mathematically convert the measured field strength level to EIRP/ERP level.
d. Following C63.26 section 5.5 and 5.2.7
   EIRP (dBm) = E (dBμV/m) + 20log(D) - 104.8; where D is the measurement distance (in the far field region) in m.
   ERP (dBm) = E (dBμV/m) + 20log(D) - 104.8 - 2.15; where D is the measurement distance (in the far field region) in m.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz/3 MHz.
2. The emission levels were against the limit of frequency range 9 kHz ~ 30 MHz:

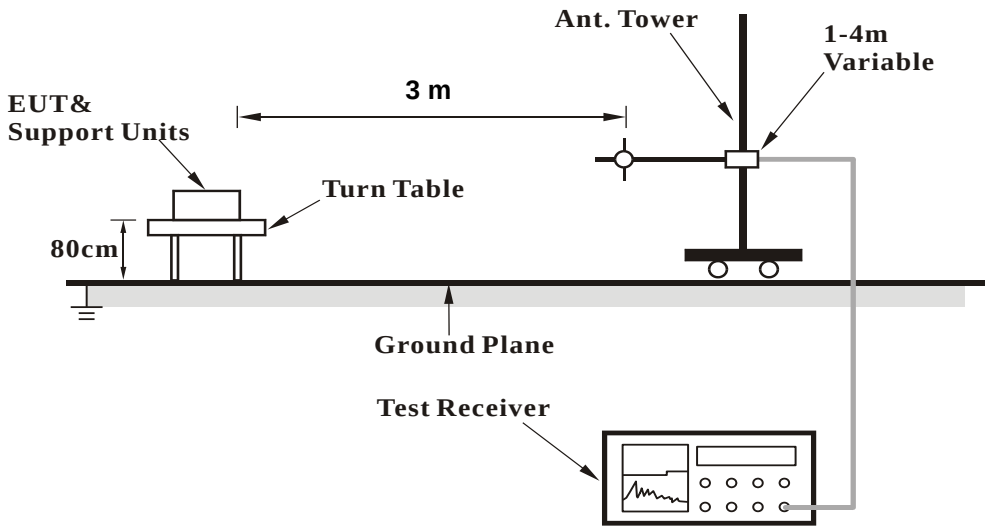
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

4.8.3 Deviation from Test Standard

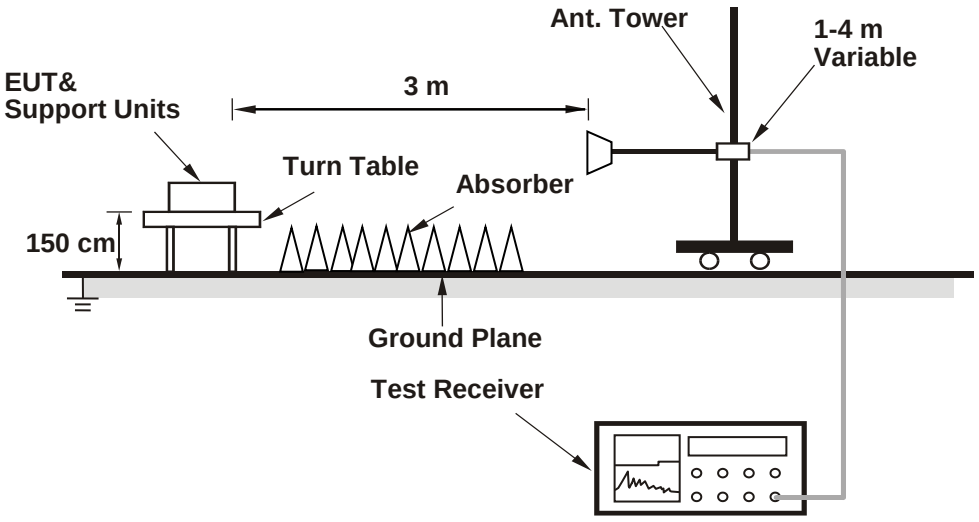
No deviation.

4.8.4 Test Setup

<Radiated Emission below or equal 1 GHz>



<Radiated Emission above 1 GHz>



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

4.8.5 Test Results

Below 1GHz

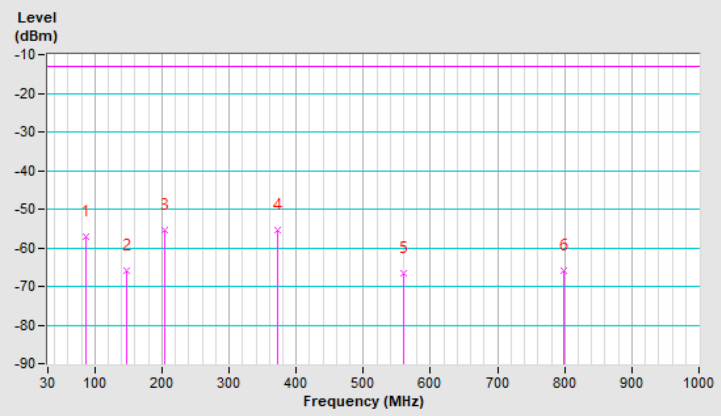
WCDMA Band 5

Mode	TX channel 4132 (826.4MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 60%RH	Input Power	120Vac, 60Hz
Tested By	Karl Lee		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	87.52	-57.16	-13.00	-44.16	1.83 H	324	-32.09	-25.07
2	147.27	-65.94	-13.00	-52.94	1.03 H	182	-47.36	-18.58
3	203.47	-55.37	-13.00	-42.37	1.12 H	64	-33.27	-22.10
4	372.61	-55.47	-13.00	-42.47	1.28 H	259	-39.38	-16.09
5	560.35	-66.57	-13.00	-53.57	1.81 H	72	-54.38	-12.19
6	798.60	-66.05	-13.00	-53.05	1.57 H	153	-58.07	-7.98

Remarks:

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

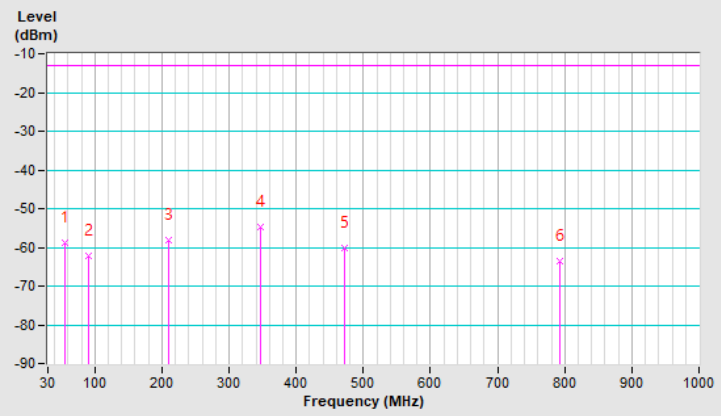


Mode	TX channel 4132 (826.4MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 60%RH	Input Power	120Vac, 60Hz
Tested By	Karl Lee		

Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	55.81	-58.73	-13.00	-45.73	1.63 V	47	-39.24	-19.49
2	90.41	-62.12	-13.00	-49.12	2.51 V	158	-37.09	-25.03
3	210.35	-58.06	-13.00	-45.06	1.48 V	7	-35.93	-22.13
4	345.86	-54.80	-13.00	-41.80	2.64 V	193	-37.85	-16.95
5	472.41	-60.04	-13.00	-47.04	1.08 V	23	-46.54	-13.50
6	792.56	-63.72	-13.00	-50.72	2.71 V	105	-55.65	-8.07

Remarks:

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



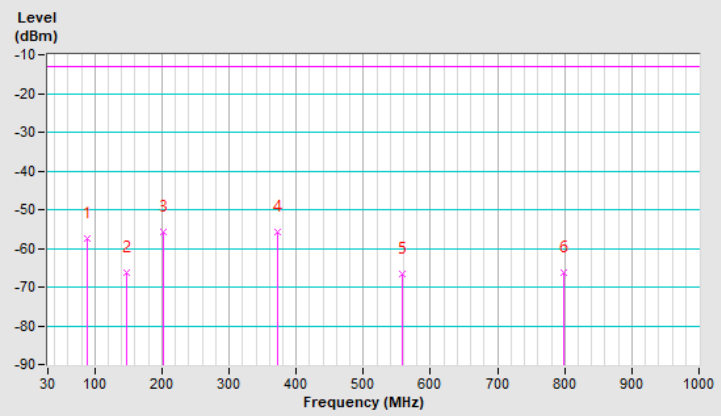
LTE Band 5 (Channel Bandwidth 10MHz)

Mode	TX channel 20450 (829.0MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 60%RH	Input Power	120Vac, 60Hz
Tested By	Karl Lee		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	88.32	-57.53	-13.00	-44.53	1.56 H	172	-32.50	-25.03
2	146.37	-66.18	-13.00	-53.18	1.63 H	180	-47.54	-18.64
3	201.99	-55.67	-13.00	-42.67	1.13 H	157	-33.61	-22.06
4	371.40	-55.85	-13.00	-42.85	1.38 H	84	-39.75	-16.10
5	557.60	-66.65	-13.00	-53.65	1.06 H	281	-54.34	-12.31
6	799.10	-66.27	-13.00	-53.27	3.10 H	164	-58.29	-7.98

Remarks:

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

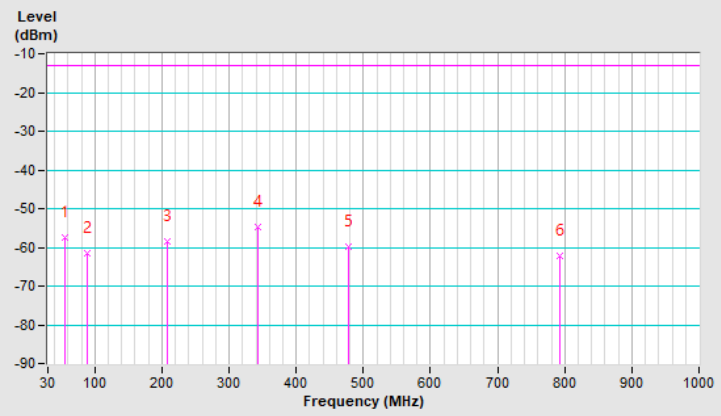


Mode	TX channel 20450 (829.0MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 60%RH	Input Power	120Vac, 60Hz
Tested By	Karl Lee		

Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	54.57	-57.55	-13.00	-44.55	1.62 V	193	-37.99	-19.56
2	89.13	-61.69	-13.00	-48.69	1.51 V	72	-36.64	-25.05
3	208.20	-58.41	-13.00	-45.41	2.75 V	106	-36.26	-22.15
4	342.70	-54.67	-13.00	-41.67	1.53 V	182	-37.78	-16.89
5	478.50	-59.71	-13.00	-46.71	2.71 V	172	-46.22	-13.49
6	792.80	-62.33	-13.00	-49.33	1.16 V	75	-54.26	-8.07

Remarks:

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



Above 1GHz

WCDMA Band 5

Mode	TX channel 4132 (826.4MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	25deg. C, 60%RH	Input Power	120Vac, 60Hz
Tested By	Charles Hsiao		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1652.80	-53.89	-13.00	-40.89	1.05 H	113	-51.62	-2.27
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1652.80	-55.34	-13.00	-42.34	1.54 V	117	-53.07	-2.27

Remarks:

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

Mode	TX channel 4182 (836.4MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	25deg. C, 60%RH	Input Power	120Vac, 60Hz
Tested By	Charles Hsiao		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1672.80	-54.20	-13.00	-41.20	1.99 H	241	-52.30	-1.90
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1672.80	-56.17	-13.00	-43.17	1.24 V	85	-54.27	-1.90

Remarks:

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

Mode	TX channel 4233 (846.6MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	25deg. C, 60%RH	Input Power	120Vac, 60Hz
Tested By	Charles Hsiao		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1693.20	-54.35	-13.00	-41.35	1.45 H	227	-52.84	-1.51
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1693.20	-55.96	-13.00	-42.96	1.51 V	119	-54.45	-1.51

Remarks:

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

LTE Band 5 (Channel Bandwidth 1.4MHz)

Mode	TX channel 20407 (824.7MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	25deg. C, 60%RH	Input Power	120Vac, 60Hz
Tested By	Charles Hsiao		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1649.40	-48.56	-13.00	-35.56	1.33 H	328	-46.21	-2.35
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1649.40	-49.61	-13.00	-36.61	1.15 V	146	-47.26	-2.35

Remarks:

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

Mode	TX channel 20525 (836.5MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	25deg. C, 60%RH	Input Power	120Vac, 60Hz
Tested By	Charles Hsiao		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-49.52	-13.00	-36.52	1.90 H	325	-47.62	-1.90
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-50.68	-13.00	-37.68	1.90 V	318	-48.78	-1.90

Remarks:

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

Mode	TX channel 20643 (848.3MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	25deg. C, 60%RH	Input Power	120Vac, 60Hz
Tested By	Charles Hsiao		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1696.60	-52.76	-13.00	-39.76	1.45 H	118	-51.31	-1.45
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1696.60	-52.46	-13.00	-39.46	1.45 V	113	-51.01	-1.45

Remarks:

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

LTE Band 5 (Channel Bandwidth 5MHz)

Mode	TX channel 20425 (826.5MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	25deg. C, 60%RH	Input Power	120Vac, 60Hz
Tested By	Charles Hsiao		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1653.00	-49.53	-13.00	-36.53	1.77 H	227	-47.26	-2.27
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1653.00	-51.27	-13.00	-38.27	1.30 V	308	-49.00	-2.27

Remarks:

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

Mode	TX channel 20525 (836.5MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	25deg. C, 60%RH	Input Power	120Vac, 60Hz
Tested By	Charles Hsiao		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-48.00	-13.00	-35.00	1.64 H	335	-46.10	-1.90
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-51.38	-13.00	-38.38	1.24 V	158	-49.48	-1.90

Remarks:

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

Mode	TX channel 20625 (846.5MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	25deg. C, 60%RH	Input Power	120Vac, 60Hz
Tested By	Charles Hsiao		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1693.00	-50.01	-13.00	-37.01	1.51 H	118	-48.50	-1.51
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1693.00	-49.55	-13.00	-36.55	1.46 V	328	-48.04	-1.51

Remarks:

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

LTE Band 5 (Channel Bandwidth 10MHz)

Mode	TX channel 20450 (829.0MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	25deg. C, 60%RH	Input Power	120Vac, 60Hz
Tested By	Charles Hsiao		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	**1658.00**	**-47.47**	**-13.00**	**-34.47**	**1.05 H**	**225**	**-45.30**	**-2.17**
2	2487.00	-50.39	-13.00	-37.39	1.36 H	99	-53.37	2.98
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1658.00	-51.46	-13.00	-38.46	1.35 V	114	-49.29	-2.17
2	2487.00	-47.97	-13.00	-34.97	1.00 V	298	-50.95	2.98

Remarks:

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

Mode	TX channel 20525 (836.5MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	25deg. C, 60%RH	Input Power	120Vac, 60Hz
Tested By	Charles Hsiao		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-47.55	-13.00	-34.55	1.90 H	310	-45.65	-1.90
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1673.00	-49.30	-13.00	-36.30	1.15 V	315	-47.40	-1.90

Remarks:

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

Mode	TX channel 20600 (844.0MHz)	Frequency Range	1GHz ~ 10GHz
Environmental Conditions	25deg. C, 60%RH	Input Power	120Vac, 60Hz
Tested By	Charles Hsiao		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1688.00	-50.98	-13.00	-37.98	1.60 H	325	-49.38	-1.60
2	2532.00	-51.68	-13.00	-38.68	1.17 H	130	-54.65	2.97
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1688.00	-51.83	-13.00	-38.83	1.61 V	316	-50.23	-1.60
2	2532.00	-51.10	-13.00	-38.10	1.05 V	297	-54.07	2.97

Remarks:

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

5 Pictures of Test Arrangements

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

Appendix – Information of the Testing Laboratories

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

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

Lin Kou EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
Tel: 886-3-6668565
Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab
Tel: 886-3-3183232
Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

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