FCC Test Report

(PART 24)

Report No.:	RFBFJZ-WTW-P22040598-6
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-P22040598-6	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 24, Subpart E

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 24 & Part 2			
FCC Clause	**Test Item**	**Result**	**Remarks**
2.1046 24.232	Equivalent Isotropic Radiated Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Meet the requirement.
24.232(d)	Peak to Average Ratio	Pass	Meet the requirement of limit.
2.1055 24.235	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
24.238	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 24.238	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 24.238	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -31.00 dB at 5557.20 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 2	1852.4 ~ 1907.6 MHz
	LTE Band 2 (Channel Bandwidth: 1.4 MHz)	1850.7 ~ 1909.3 MHz
	LTE Band 2 (Channel Bandwidth: 3 MHz)	1851.5 ~ 1908.5 MHz
	LTE Band 2 (Channel Bandwidth: 5 MHz)	1852.5 ~ 1907.5 MHz
	LTE Band 2 (Channel Bandwidth: 10 MHz)	1855.0 ~ 1905.0 MHz
	LTE Band 2 (Channel Bandwidth: 15 MHz)	1857.5 ~ 1902.5 MHz
	LTE Band 2 (Channel Bandwidth: 20 MHz)	1860.0 ~ 1900.0 MHz
Max. EIRP Power	WCDMA Band 2	265.461 mW (24.24 dBm)
	LTE Band 2 (Channel Bandwidth: 1.4 MHz)	283.139 mW (24.52 dBm)
	LTE Band 2 (Channel Bandwidth: 3 MHz)	280.543 mW (24.48 dBm)
	LTE Band 2 (Channel Bandwidth: 5 MHz)	277.971 mW (24.44 dBm)
	LTE Band 2 (Channel Bandwidth: 10 MHz)	283.792 mW (24.53 dBm)
	LTE Band 2 (Channel Bandwidth: 15 MHz)	281.838 mW (24.50 dBm)
	LTE Band 2 (Channel Bandwidth: 20 MHz)	285.759 mW (24.56 dBm)
Emission Designator	WCDMA Band 2	4M18F9W
	LTE Band 2 (Channel Bandwidth: 1.4 MHz)	1M09G7D
	LTE Band 2 (Channel Bandwidth: 3 MHz)	2M69G7D
	LTE Band 2 (Channel Bandwidth: 5 MHz)	4M49G7D
	LTE Band 2 (Channel Bandwidth: 10 MHz)	8M97G7D
	LTE Band 2 (Channel Bandwidth: 15 MHz)	13M5G7D
	LTE Band 2 (Channel Bandwidth: 20 MHz)	18M0D7W
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.

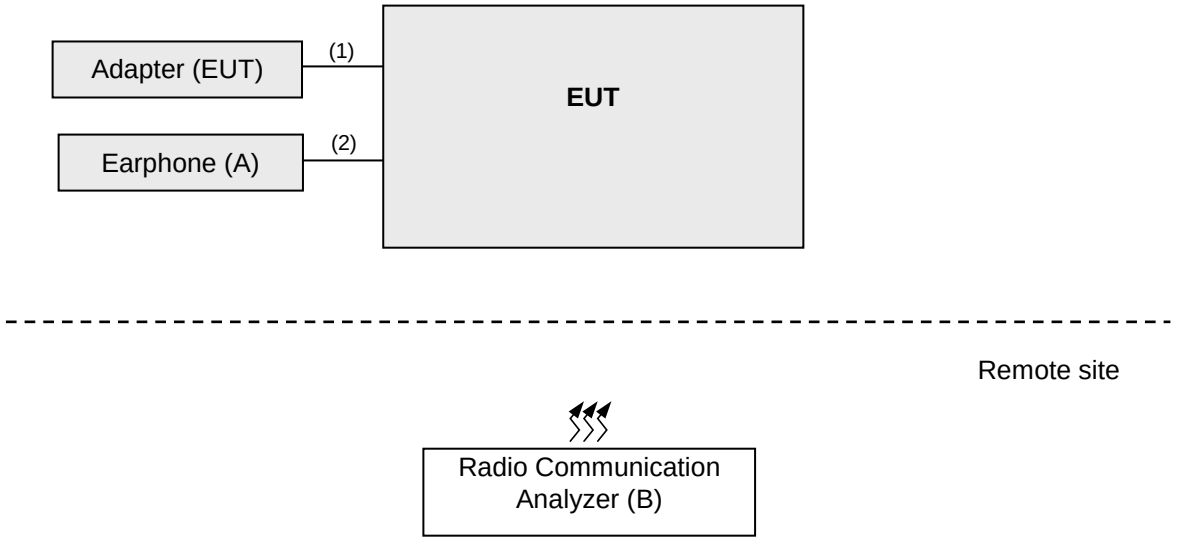
Product	Brand	Model	Description
Adapter	Kyocera	SCP-47ADT	I/P: 100-240 Vac, 50/60 Hz, 200 mA O/P: 5 Vdc, 1000 mA
Battery	Kyocera	SCP-73LBPS	3.8 Vdc, 1770 mAh, 6.8Wh
USB Cable	Kyocera	SCP-24SDC	1 m shielded Type A to Type C USB cable w/o core

3. The antenna information is listed as below.

Band	Gain (dBi)	Antenna Type	Connector Type
WCDMA 2 / LTE 2	0.51	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 2	X-plane
LTE Band 2	X-plane

WCDMA Band 2

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	EIRP	9262 to 9538	9262, 9400, 9538	WCDMA, HSDPA, HSUPA
-	Modulation Characteristics	9262 to 9538	9400	WCDMA, HSDPA, HSUPA
-	Frequency Stability	9262 to 9538	9262, 9538	WCDMA
-	Occupied Bandwidth	9262 to 9538	9262, 9400, 9538	WCDMA, HSDPA, HSUPA
-	Band Edge	9262 to 9538	9262, 9538	WCDMA, HSDPA, HSUPA
-	Peak to Average Ratio	9262 to 9538	9262, 9400, 9538	WCDMA, HSDPA, HSUPA
-	Conducted Emission	9262 to 9538	9262, 9400, 9538	WCDMA, HSDPA, HSUPA
-	Radiated Emission	9262 to 9538	9262, 9400, 9538	WCDMA

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

LTE Band 2

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	RB #
-	EIRP	18607 to 19193	18607, 18900, 19193	1.4 MHz	QPSK / 16QAM	1 Half Full
		18615 to 19185	18615, 18900, 19185	3 MHz	QPSK / 16QAM	1 Half Full
		18625 to 19175	18625, 18900, 19175	5 MHz	QPSK / 16QAM	1 Half Full
		18650 to 19150	18650, 18900, 19150	10 MHz	QPSK / 16QAM	1 Half Full
		18675 to 19125	18675, 18900, 19125	15 MHz	QPSK / 16QAM	1 Half Full
		18700 to 19100	18700, 18900, 19100	20 MHz	QPSK / 16QAM	1 Half Full
-	Modulation Characteristics	18700 to 19100	18900	20 MHz	QPSK / 16QAM	Full
-	Frequency Stability	18607 to 19193	18607, 19193	1.4 MHz	QPSK	Full
		18615 to 19185	18615, 19185	3 MHz	QPSK	Full
		18625 to 19175	18625, 19175	5 MHz	QPSK	Full
		18650 to 19150	18650, 19150	10 MHz	QPSK	Full
		18675 to 19125	18675, 19125	15 MHz	QPSK	Full
		18700 to 19100	18700, 19100	20 MHz	QPSK	Full
-	Occupied Bandwidth	18607 to 19193	18607, 18900, 19193	1.4 MHz	QPSK / 16QAM	Full
		18615 to 19185	18615, 18900, 19185	3 MHz	QPSK / 16QAM	Full
		18625 to 19175	18625, 18900, 19175	5 MHz	QPSK / 16QAM	Full
		18650 to 19150	18650, 18900, 19150	10 MHz	QPSK / 16QAM	Full
		18675 to 19125	18675, 18900, 19125	15 MHz	QPSK / 16QAM	Full
		18700 to 19100	18700, 18900, 19100	20 MHz	QPSK / 16QAM	Full
-	Peak to Average Ratio	18607 to 19193	18607, 18900, 19193	1.4 MHz	QPSK / 16QAM	1
		18615 to 19185	18615, 18900, 19185	3 MHz	QPSK / 16QAM	1
		18625 to 19175	18625, 18900, 19175	5 MHz	QPSK / 16QAM	1
		18650 to 19150	18650, 18900, 19150	10 MHz	QPSK / 16QAM	1
		18675 to 19125	18675, 18900, 19125	15 MHz	QPSK / 16QAM	1
		18700 to 19100	18700, 18900, 19100	20 MHz	QPSK / 16QAM	1

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	RB #
-	Band Edge	18607 to 19193	18607, 19193	1.4 MHz	QPSK	1 Half Full
		18615 to 19185	18615, 19185	3 MHz	QPSK	1 Half Full
		18625 to 19175	18625, 19175	5 MHz	QPSK	1 Half Full
		18650 to 19150	18650, 19150	10 MHz	QPSK	1 Half Full
		18675 to 19125	18675, 19125	15 MHz	QPSK	1 Half Full
		18700 to 19100	18700, 19100	20 MHz	QPSK	1 Half Full
-	Conducted Emission	18607 to 19193	18607, 18900, 19193	1.4 MHz	QPSK	1
		18615 to 19185	18615, 18900, 19185	3 MHz	QPSK	1
		18625 to 19175	18625, 18900, 19175	5 MHz	QPSK	1
		18650 to 19150	18650, 18900, 19150	10 MHz	QPSK	1
		18675 to 19125	18675, 18900, 19125	15 MHz	QPSK	1
		18700 to 19100	18700, 18900, 19100	20 MHz	QPSK	1
-	Radiated Emission	18607 to 19193	18607, 18900, 19193	1.4 MHz	QPSK	1
		18625 to 19175	18625, 18900, 19175	5 MHz	QPSK	1
		18700 to 19100	18700, 18900, 19100	20 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
EIRP	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 24
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 2 watts e.i.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 II		
Channel	9262	9400	9538
Frequency (MHz)	1852.4	1880.0	1907.6
RMC 12.2K	23.66	23.73	23.68
HSDPA Subtest-1	22.64	22.71	22.75
HSDPA Subtest-2	22.56	22.74	22.61
HSDPA Subtest-3	22.08	22.23	22.14
HSDPA Subtest-4	22.16	22.28	22.20
HSUPA Subtest-1	22.63	22.78	22.71
HSUPA Subtest-2	21.72	21.78	21.69
HSUPA Subtest-3	22.67	22.74	22.69
HSUPA Subtest-4	21.11	21.28	21.20
HSUPA Subtest-5	22.60	22.70	22.70

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18607	18900	19193
		Frequency (MHz)		1850.7	1880	1909.3
1.4M	QPSK	1	0	23.87	23.86	23.87
		1	2	23.78	23.85	23.74
		1	5	23.87	23.90	23.72
		3	0	23.83	24.01	23.84
		3	1	23.72	23.88	23.79
		3	3	23.90	23.77	23.70
		6	0	22.77	22.81	22.69
	16QAM	1	0	22.84	22.89	22.83
		1	2	22.87	22.85	22.77
		1	5	22.79	22.77	22.73
		3	0	22.77	22.93	22.78
		3	1	22.72	22.86	22.78
		3	3	22.79	22.70	22.72
		6	0	21.71	21.74	21.76

LTE Band 2						
BW	MCS Index	Channel		18615	18900	19185
		Frequency (MHz)		1851.5	1880	1908.5
3M	QPSK	1	0	23.91	23.97	23.84
		1	7	23.85	23.93	23.78
		1	14	23.82	23.79	23.66
		8	0	22.87	22.93	22.74
		8	3	22.90	22.81	22.72
		8	7	22.80	22.88	22.83
		15	0	22.73	22.88	22.65
	16QAM	1	0	22.93	22.91	22.73
		1	7	22.80	22.80	22.71
		1	14	22.85	22.83	22.64
		8	0	21.80	21.80	21.71
		8	3	21.81	21.75	21.75
		8	7	21.62	21.83	21.78
		15	0	21.71	21.78	21.77

LTE Band 2						
BW	MCS Index	Channel		18625	18900	19175
		Frequency (MHz)		1852.5	1880	1907.5
5M	QPSK	1	0	23.84	23.93	23.71
		1	12	23.76	23.89	23.88
		1	24	23.83	23.91	23.72
		12	0	22.84	22.94	22.79
		12	6	22.88	22.79	22.72
		12	13	22.70	22.83	22.78
		25	0	22.78	22.74	22.65
	16QAM	1	0	22.86	22.92	22.87
		1	12	22.85	22.76	22.77
		1	24	22.85	22.84	22.75
		12	0	21.70	21.78	21.73
		12	6	21.72	21.88	21.79
		12	13	21.65	21.70	21.68
		25	0	21.80	21.82	21.80

LTE Band 2						
BW	MCS Index	Channel		18650	18900	19150
		Frequency (MHz)		1855	1880	1905
10M	QPSK	1	0	23.82	24.02	23.81
		1	24	23.94	24.02	23.90
		1	49	23.78	23.79	23.73
		25	0	22.82	22.88	22.81
		25	12	22.91	22.77	22.89
		25	25	22.66	22.86	22.85
		50	0	22.77	22.92	22.74
	16QAM	1	0	22.85	22.90	22.80
		1	24	22.74	22.81	22.74
		1	49	22.73	22.94	22.69
		25	0	21.79	21.90	21.69
		25	12	21.82	21.80	21.77
		25	25	21.67	21.79	21.75
		50	0	21.71	21.90	21.66

LTE Band 2						
BW	MCS Index	Channel		18675	18900	19125
		Frequency (MHz)		1857.5	1880	1902.5
15M	QPSK	1	0	23.99	23.97	23.87
		1	37	23.98	23.96	23.88
		1	74	23.89	23.90	23.83
		36	0	22.91	23.00	22.84
		36	19	22.89	22.96	22.85
		36	39	22.85	22.87	22.86
		75	0	22.87	22.90	22.86
	16QAM	1	0	22.95	22.97	22.83
		1	37	22.91	22.95	22.82
		1	74	22.84	22.85	22.80
		36	0	21.85	21.89	21.84
		36	19	21.81	21.82	21.81
		36	39	21.77	21.81	21.70
		75	0	21.79	21.82	21.81

LTE Band 2						
BW	MCS Index	Channel		18700	18900	19100
		Frequency (MHz)		1860	1880	1900
20M	QPSK	1	0	24.01	24.05	23.96
		1	50	23.98	24.02	23.93
		1	99	23.91	23.95	23.86
		50	0	22.99	23.03	22.94
		50	25	22.97	23.01	22.92
		50	50	22.91	22.95	22.86
		100	0	22.93	22.97	22.88
	16QAM	1	0	22.95	22.99	22.90
		1	50	22.91	22.95	22.86
		1	99	22.90	22.94	22.85
		50	0	21.91	21.95	21.86
		50	25	21.88	21.92	21.83
		50	50	21.84	21.88	21.79
		100	0	21.87	21.91	21.82

EIRP Power (dBm)

Band	WCDMA II		
Channel	9262	9400	9538
Frequency	1852.4	1880	1907.6
RMC 12.2K	24.17	**24.24**	24.19
HSDPA Subtest-1	23.15	23.22	23.26
HSDPA Subtest-2	23.07	23.25	23.12
HSDPA Subtest-3	22.59	22.74	22.65
HSDPA Subtest-4	22.67	22.79	22.71
HSUPA Subtest-1	23.14	23.29	23.22
HSUPA Subtest-2	22.23	22.29	22.20
HSUPA Subtest-3	23.18	23.25	23.20
HSUPA Subtest-4	21.62	21.79	21.71
HSUPA Subtest-5	23.11	23.21	23.21

*EIRP = Conducted + antenna gain (0.51dBi)

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18607	18900	19193
		Frequency (MHz)		1850.7	1880	1909.3
1.4M	QPSK	1	0	24.38	24.37	24.38
		1	2	24.29	24.36	24.25
		1	5	24.38	24.41	24.23
		3	0	24.34	**24.52**	24.35
		3	1	24.23	24.39	24.30
		3	3	24.41	24.28	24.21
		6	0	23.28	23.32	23.20
	16QAM	1	0	23.35	23.40	23.34
		1	2	23.38	23.36	23.28
		1	5	23.30	23.28	23.24
		3	0	23.28	23.44	23.29
		3	1	23.23	23.37	23.29
		3	3	23.30	23.21	23.23
		6	0	22.22	22.25	22.27

*EIRP = Conducted + antenna gain (0.51dBi)

LTE Band 2						
BW	MCS Index	Channel		18615	18900	19185
		Frequency (MHz)		1851.5	1880	1908.5
3M	QPSK	1	0	24.42	**24.48**	24.35
		1	7	24.36	24.44	24.29
		1	14	24.33	24.30	24.17
		8	0	23.38	23.44	23.25
		8	3	23.41	23.32	23.23
		8	7	23.31	23.39	23.34
		15	0	23.24	23.39	23.16
	16QAM	1	0	23.44	23.42	23.24
		1	7	23.31	23.31	23.22
		1	14	23.36	23.34	23.15
		8	0	22.31	22.31	22.22
		8	3	22.32	22.26	22.26
		8	7	22.13	22.34	22.29
		15	0	22.22	22.29	22.28

*EIRP = Conducted + antenna gain (0.51dBi)

LTE Band 2						
BW	MCS Index	Channel		18625	18900	19175
		Frequency (MHz)		1852.5	1880	1907.5
5M	QPSK	1	0	24.35	**24.44**	24.22
		1	12	24.27	24.40	24.39
		1	24	24.34	24.42	24.23
		12	0	23.35	23.45	23.30
		12	6	23.39	23.30	23.23
		12	13	23.21	23.34	23.29
		25	0	23.29	23.25	23.16
	16QAM	1	0	23.37	23.43	23.38
		1	12	23.36	23.27	23.28
		1	24	23.36	23.35	23.26
		12	0	22.21	22.29	22.24
		12	6	22.23	22.39	22.30
		12	13	22.16	22.21	22.19
		25	0	22.31	22.33	22.31

*EIRP = Conducted + antenna gain (0.51dBi)

LTE Band 2						
BW	MCS Index	Channel		18650	18900	19150
		Frequency (MHz)		1855	1880	1905
10M	QPSK	1	0	24.33	**24.53**	24.32
		1	24	24.45	**24.53**	24.41
		1	49	24.29	24.30	24.24
		25	0	23.33	23.39	23.32
		25	12	23.42	23.28	23.40
		25	25	23.17	23.37	23.36
		50	0	23.28	23.43	23.25
	16QAM	1	0	23.36	23.41	23.31
		1	24	23.25	23.32	23.25
		1	49	23.24	23.45	23.20
		25	0	22.30	22.41	22.20
		25	12	22.33	22.31	22.28
		25	25	22.18	22.30	22.26
		50	0	22.22	22.41	22.17

*EIRP = Conducted + antenna gain (0.51dBi)

LTE Band 2						
BW	MCS Index	Channel		18675	18900	19125
		Frequency (MHz)		1857.5	1880	1902.5
15M	QPSK	1	0	**24.50**	24.48	24.38
		1	37	24.49	24.47	24.39
		1	74	24.40	24.41	24.34
		36	0	23.42	23.51	23.35
		36	19	23.40	23.47	23.36
		36	39	23.36	23.38	23.37
		75	0	23.38	23.41	23.37
	16QAM	1	0	23.46	23.48	23.34
		1	37	23.42	23.46	23.33
		1	74	23.35	23.36	23.31
		36	0	22.36	22.40	22.35
		36	19	22.32	22.33	22.32
		36	39	22.28	22.32	22.21
		75	0	22.30	22.33	22.32

*EIRP = Conducted + antenna gain (0.51dBi)

LTE Band 2						
BW	MCS Index	Channel		18700	18900	19100
		Frequency (MHz)		1860	1880	1900
20M	QPSK	1	0	24.52	**24.56**	24.47
		1	50	24.49	24.53	24.44
		1	99	24.42	24.46	24.37
		50	0	23.50	23.54	23.45
		50	25	23.48	23.52	23.43
		50	50	23.42	23.46	23.37
		100	0	23.44	23.48	23.39
	16QAM	1	0	23.46	23.50	23.41
		1	50	23.42	23.46	23.37
		1	99	23.41	23.45	23.36
		50	0	22.42	22.46	22.37
		50	25	22.39	22.43	22.34
		50	50	22.35	22.39	22.30
		100	0	22.38	22.42	22.33

*EIRP = Conducted + antenna gain (0.51dBi)

4.2 Modulation Characteristics Measurement

4.2.1 Limits of Modulation Characteristics

N/A

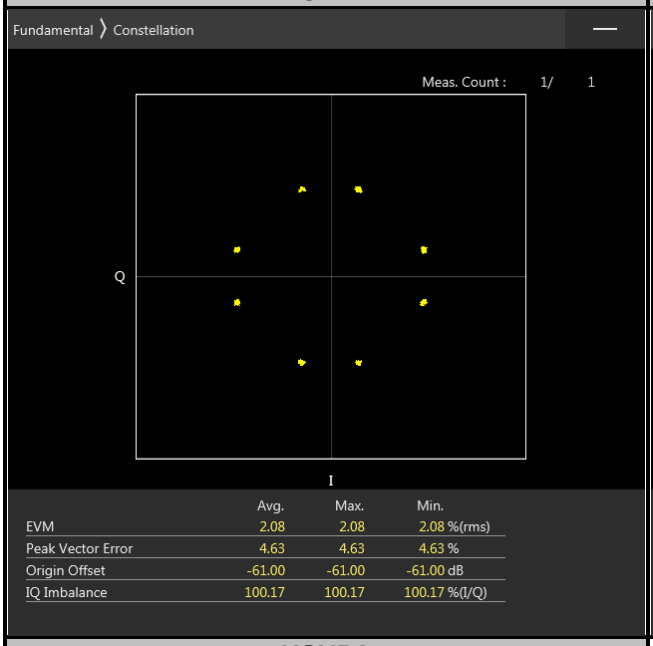
4.2.2 Test Setup

4.2.3 Test Procedure

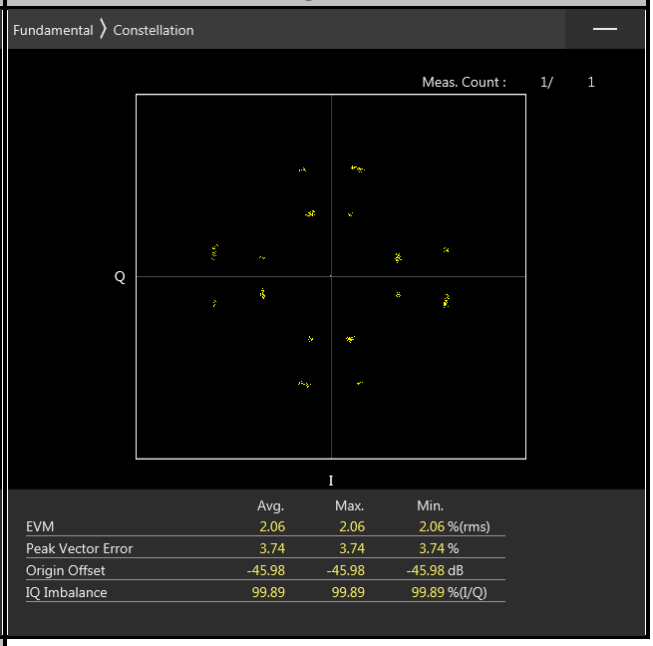
Connect the EUT to Communication Simulator via the antenna connector. The frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

4.2.4 Test Results

Spectrum Plot of Measurement	
Channel 9400	
WCDMA	HSDPA

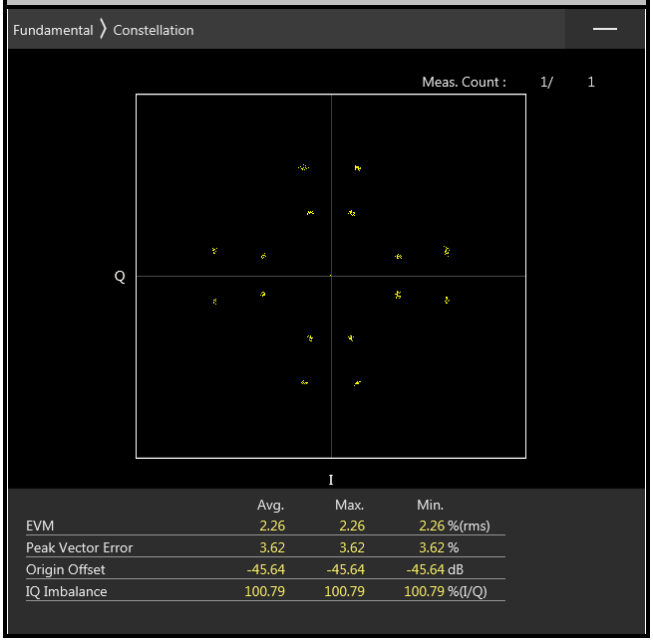


	Avg.	Max.	Min.	
EVM	2.08	2.08	2.08	%(rms)
Peak Vector Error	4.63	4.63	4.63	%
Origin Offset	-61.00	-61.00	-61.00	dB
IQ Imbalance	100.17	100.17	100.17	%(I/Q)



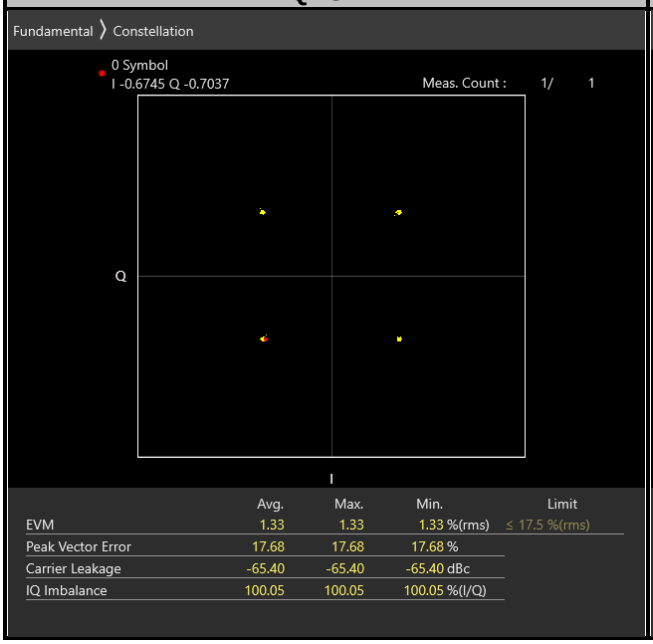
	Avg.	Max.	Min.	
EVM	2.06	2.06	2.06	%(rms)
Peak Vector Error	3.74	3.74	3.74	%
Origin Offset	-45.98	-45.98	-45.98	dB
IQ Imbalance	99.89	99.89	99.89	%(I/Q)

HSUPA

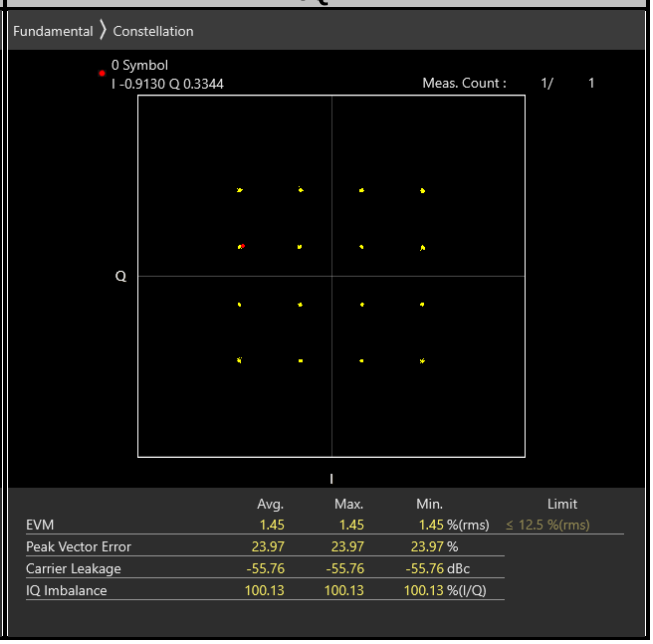


	Avg.	Max.	Min.	
EVM	2.26	2.26	2.26	%(rms)
Peak Vector Error	3.62	3.62	3.62	%
Origin Offset	-45.64	-45.64	-45.64	dB
IQ Imbalance	100.79	100.79	100.79	%(I/Q)

Spectrum Plot of Measurement	
LTE Band 2	
Channel 18900	
QPSK	16QAM



	Avg.	Max.	Min.	Limit
EVM	1.33	1.33	1.33 %(rms)	≤ 17.5 %(rms)
Peak Vector Error	17.68	17.68	17.68 %	
Carrier Leakage	-65.40	-65.40	-65.40 dBc	
IQ Imbalance	100.05	100.05	100.05 %(I/Q)	



	Avg.	Max.	Min.	Limit
EVM	1.45	1.45	1.45 %(rms)	≤ 12.5 %(rms)
Peak Vector Error	23.97	23.97	23.97 %	
Carrier Leakage	-55.76	-55.76	-55.76 dBc	
IQ Imbalance	100.13	100.13	100.13 %(I/Q)	

4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

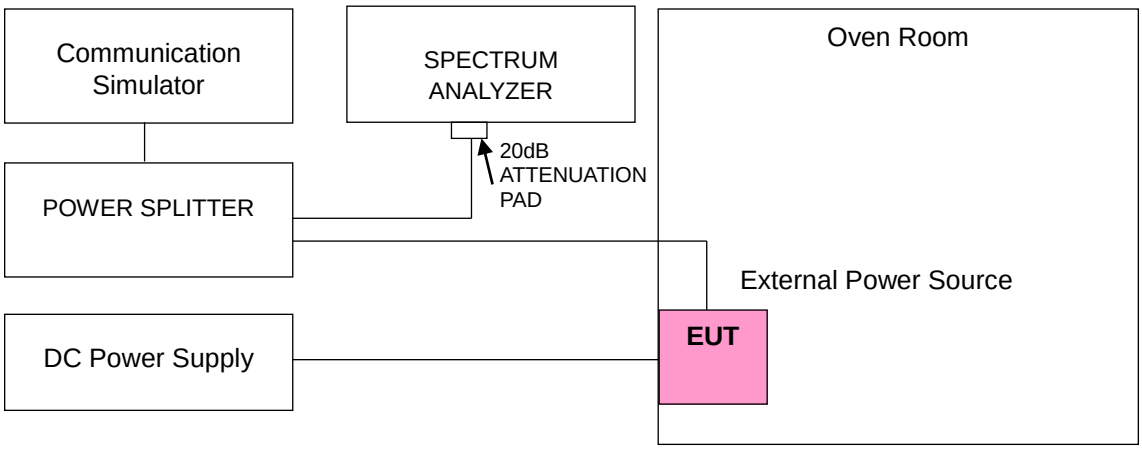
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

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			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.8	1852.400004	0.002	1907.600003	0.002
3.23	1852.400003	0.002	1907.600004	0.002
4.37	1852.400004	0.002	1907.600002	0.001

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			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1852.400003	0.002	1907.600001	0.001
-20	1852.400004	0.002	1907.600003	0.002
-10	1852.400002	0.001	1907.600002	0.001
0	1852.400002	0.001	1907.600002	0.001
10	1852.400001	0.001	1907.600002	0.001
20	1852.399996	-0.002	1907.599998	-0.001
30	1852.399997	-0.002	1907.599998	-0.001
40	1852.399999	-0.001	1907.599996	-0.002
50	1852.399996	-0.002	1907.599998	-0.001
60	1852.399998	-0.001	1907.599998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.8	1850.700001	0.001	1909.300000	0.002
3.23	1850.700003	0.002	1909.300003	0.002
4.37	1850.700002	0.001	1909.300004	0.002

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 2			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1850.700003	0.002	1909.300003	0.002
-20	1850.700002	0.001	1909.300002	0.001
-10	1850.700001	0.001	1909.300002	0.001
0	1850.700001	0.001	1909.300004	0.002
10	1850.700004	0.002	1909.300003	0.002
20	1850.699998	-0.001	1909.299996	-0.002
30	1850.699998	-0.001	1909.299997	-0.002
40	1850.699999	-0.001	1909.299997	-0.002
50	1850.699998	-0.001	1909.299999	-0.001
60	1850.699997	-0.002	1909.299996	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.8	1851.500001	0.001	1908.500003	0.002
3.23	1851.500002	0.001	1908.500003	0.002
4.37	1851.500001	0.001	1908.500004	0.002

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 2			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1851.500002	0.001	1908.500003	0.002
-20	1851.500003	0.002	1908.500002	0.001
-10	1851.500002	0.001	1908.500001	0.001
0	1851.500002	0.001	1908.500004	0.002
10	1851.500001	0.001	1908.500001	0.001
20	1851.499997	-0.002	1908.499998	-0.001
30	1851.499997	-0.002	1908.499999	-0.001
40	1851.499998	-0.001	1908.499997	-0.002
50	1851.499997	-0.002	1908.499999	-0.001
60	1851.499999	-0.001	1908.499998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.8	1852.500003	0.002	1907.500003	0.002
3.23	1852.500003	0.002	1907.500001	0.001
4.37	1852.500001	0.001	1907.500001	0.001

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 2			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1852.500002	0.001	1907.500001	0.001
-20	1852.500003	0.002	1907.500002	0.001
-10	1852.500001	0.001	1907.500001	0.001
0	1852.500001	0.001	1907.500001	0.001
10	1852.500003	0.002	1907.500003	0.002
20	1852.499999	-0.001	1907.499996	-0.002
30	1852.499996	-0.002	1907.499999	-0.001
40	1852.499999	-0.001	1907.499998	-0.001
50	1852.499997	-0.002	1907.499999	-0.001
60	1852.499999	-0.001	1907.499998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.8	1855.000003	0.002	1905.000003	0.002
3.23	1855.000001	0.001	1905.000004	0.002
4.37	1855.000002	0.001	1905.000001	0.001

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 2			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1855.000003	0.002	1905.000004	0.002
-20	1855.000002	0.001	1905.000004	0.002
-10	1855.000004	0.002	1905.000004	0.002
0	1855.000001	0.001	1905.000003	0.002
10	1855.000002	0.001	1905.000003	0.002
20	1854.999996	-0.002	1904.999998	-0.001
30	1854.999998	-0.001	1904.999996	-0.002
40	1854.999999	-0.001	1904.999999	-0.001
50	1854.999997	-0.002	1904.999996	-0.002
60	1854.999999	-0.001	1904.999998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.8	1857.500002	0.001	1902.500003	0.002
3.23	1857.500002	0.001	1902.500003	0.002
4.37	1857.500004	0.002	1902.500003	0.002

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 2			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1857.500003	0.002	1902.500003	0.002
-20	1857.500004	0.002	1902.500003	0.002
-10	1857.500003	0.002	1902.500003	0.002
0	1857.500003	0.002	1902.500003	0.002
10	1857.500002	0.001	1902.500002	0.001
20	1857.499998	-0.001	1902.499999	-0.001
30	1857.499996	-0.002	1902.499997	-0.002
40	1857.499999	-0.001	1902.499997	-0.002
50	1857.499998	-0.001	1902.499999	-0.001
60	1857.499998	-0.001	1902.499998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.8	1860.000003	0.002	1900.000002	0.001
3.23	1860.000004	0.002	1900.000002	0.001
4.37	1860.000004	0.002	1900.000002	0.001

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 2			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1860.000004	0.002	1900.000003	0.002
-20	1860.000003	0.002	1900.000002	0.001
-10	1860.000004	0.002	1900.000004	0.002
0	1860.000001	0.001	1900.000002	0.001
10	1860.000004	0.002	1900.000002	0.001
20	1859.999999	-0.001	1899.999996	-0.002
30	1859.999998	-0.001	1899.999997	-0.002
40	1859.999998	-0.001	1899.999999	-0.001
50	1859.999999	-0.001	1899.999997	-0.002
60	1859.999998	-0.001	1899.999999	-0.001

4.4 Occupied Bandwidth Measurement

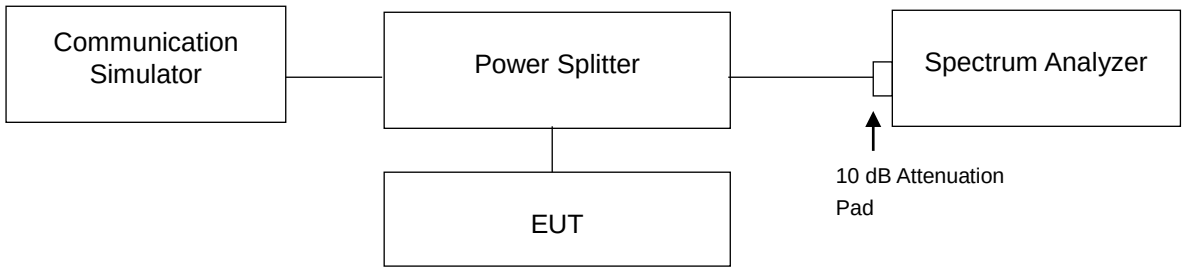
4.4.1 Test Procedure

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.

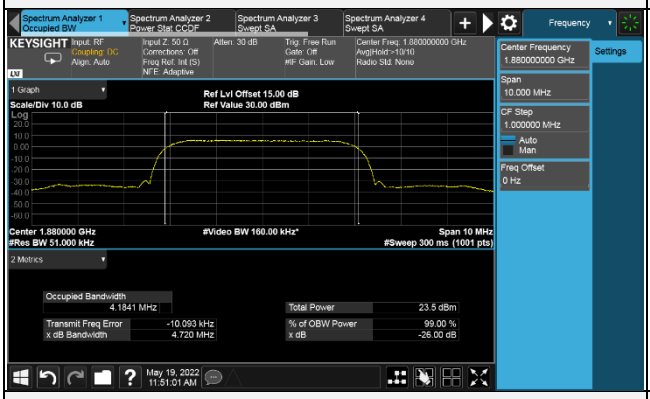
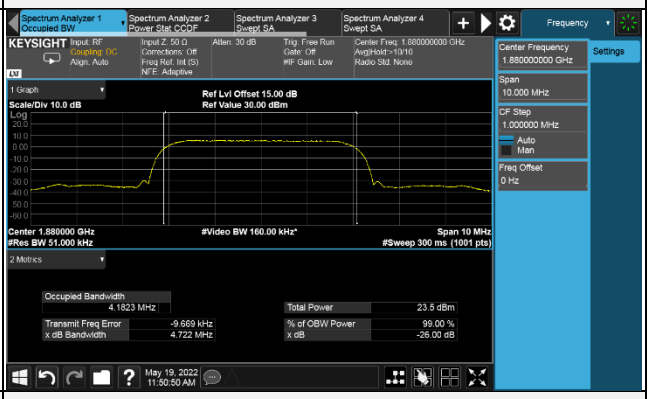
4.4.2 Test Setup



4.4.3 Test Result

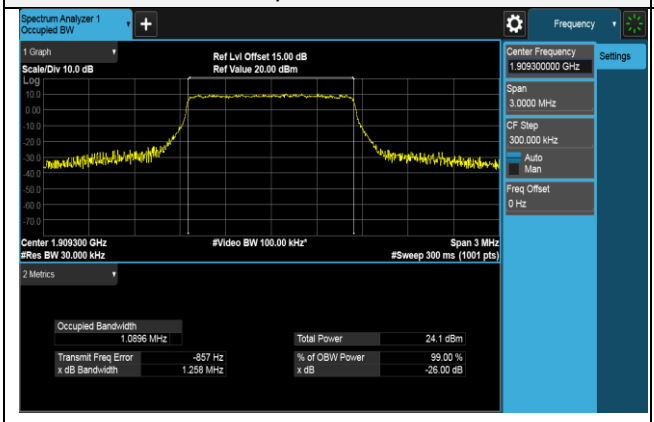
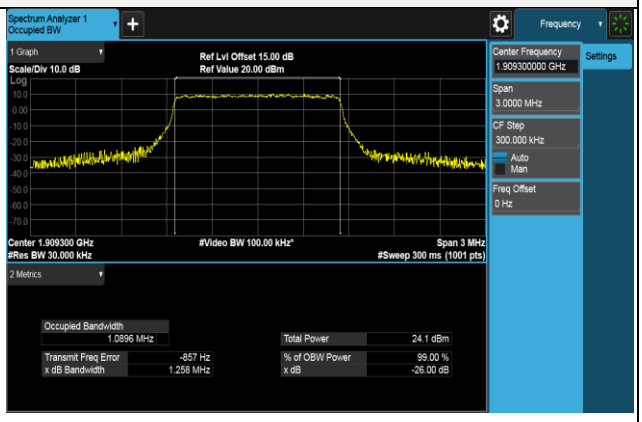
WCDMA

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
WCDMA	9262	1852.4	4.18	4.71
WCDMA	9400	1880.0	4.18	4.72
WCDMA	9538	1907.6	4.18	4.72
HSDPA	9262	1852.4	4.18	4.72
HSDPA	9400	1880.0	4.18	4.72
HSDPA	9538	1907.6	4.18	4.71
HSUPA	9262	1852.4	4.18	4.71
HSUPA	9400	1880.0	4.18	4.72
HSUPA	9538	1907.6	4.18	4.72

Spectrum Plot of Worst Value	
Occupied bandwidth	26dB Bandwidth
	
HSDPA CH 9400 (1880.0MHz)	HSUPA CH 9400 (1880.0MHz)

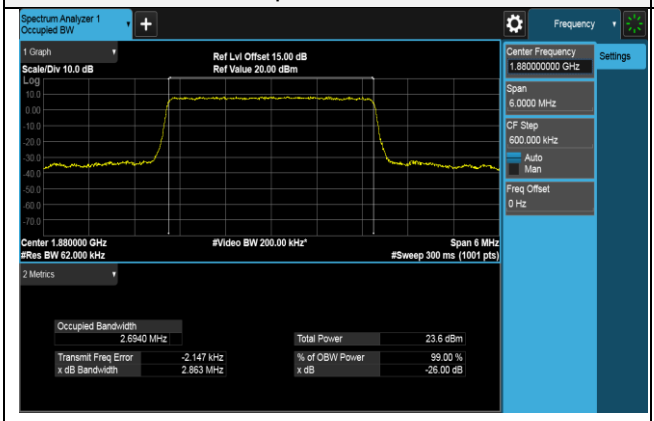
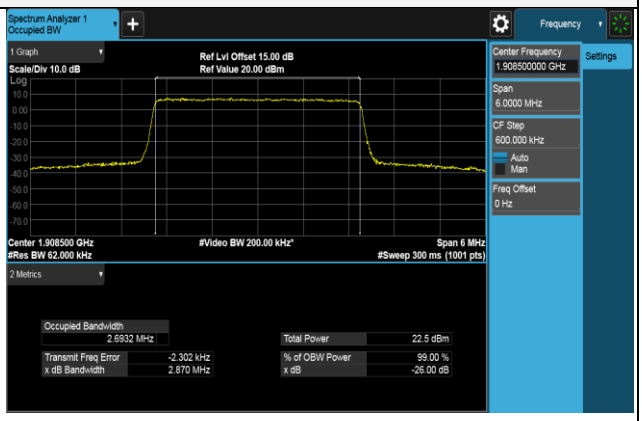
LTE Band 2 (Channel Bandwidth 1.4MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	18607	1850.7	1.0869	1.249
QPSK	18900	1880	1.0895	1.254
QPSK	19193	1909.3	1.0896	1.258
16QAM	18607	1850.7	1.0873	1.246
16QAM	18900	1880	1.0870	1.250
16QAM	19193	1909.3	1.0875	1.246

Spectrum Plot of Worst Value	
Occupied bandwidth	26 dB Bandwidth
	
QPSK CH 19193 (1909.3MHz)	QPSK CH 19193 (1909.3MHz)

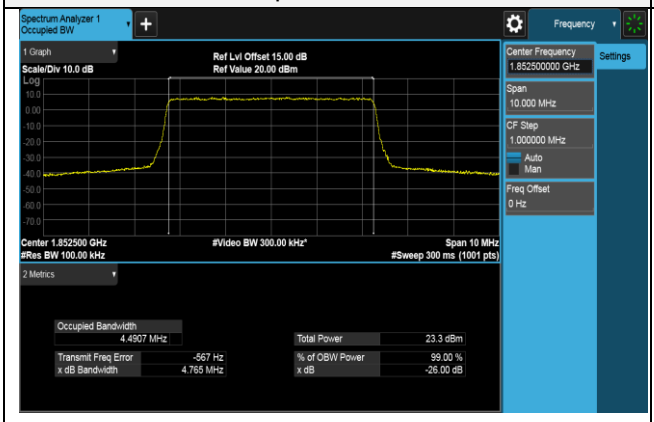
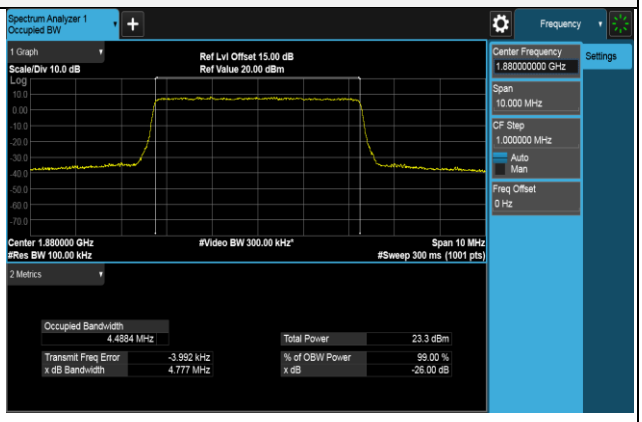
LTE Band 2 (Channel Bandwidth 3MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	18615	1851.5	2.6932	2.863
QPSK	18900	1880	2.6940	2.863
QPSK	19185	1908.5	2.6909	2.866
16QAM	18615	1851.5	2.6930	2.867
16QAM	18900	1880	2.6926	2.867
16QAM	19185	1908.5	2.6932	2.870

Spectrum Plot of Worst Value	
Occupied bandwidth	26 dB Bandwidth
	
QPSK CH 18900 (1880MHz)	16QAM CH 19185 (1908.5MHz)

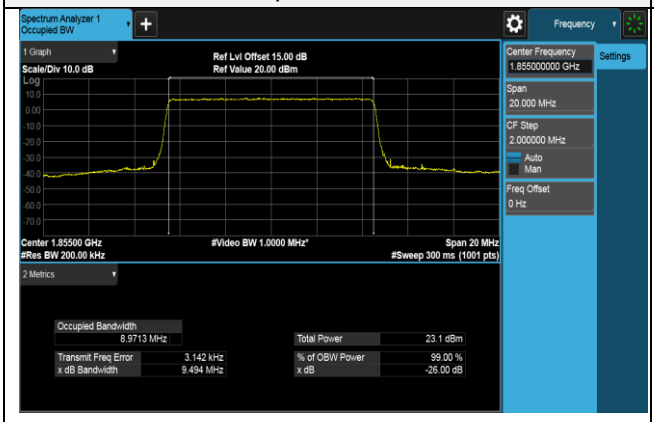
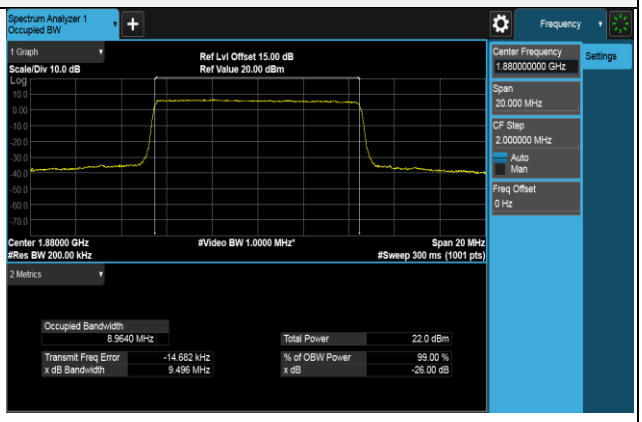
LTE Band 2 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	18625	1852.5	4.4907	4.765
QPSK	18900	1880	4.4884	4.777
QPSK	19175	1907.5	4.4904	4.774
16QAM	18625	1852.5	4.4868	4.767
16QAM	18900	1880	4.4861	4.764
16QAM	19175	1907.5	4.4863	4.758

Spectrum Plot of Worst Value	
Occupied bandwidth	26 dB Bandwidth
	
QPSK CH 18625 (1852.5MHz)	QPSK CH 18900 (1880MHz)

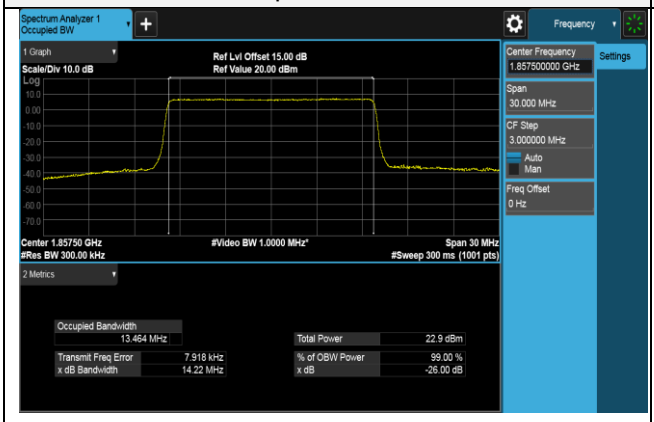
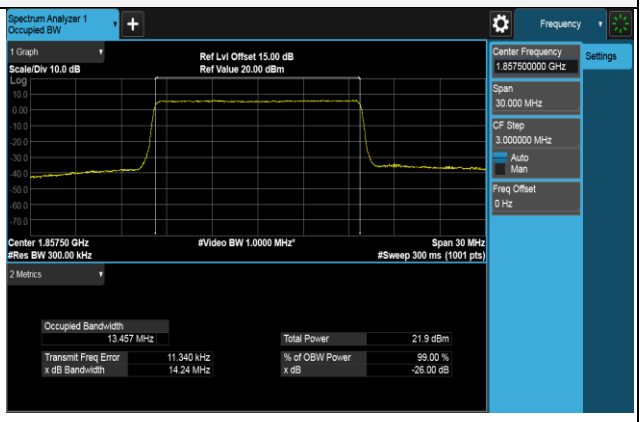
LTE Band 2 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	18650	1855	8.9713	9.494
QPSK	18900	1880	8.9648	9.481
QPSK	19150	1905	8.9648	9.486
16QAM	18650	1855	8.9701	9.488
16QAM	18900	1880	8.9640	9.496
16QAM	19150	1905	8.9636	9.487

Spectrum Plot of Worst Value	
Occupied bandwidth	26 dB Bandwidth
	
QPSK CH 18650 (1855MHz)	16QAM CH 18900 (1880MHz)

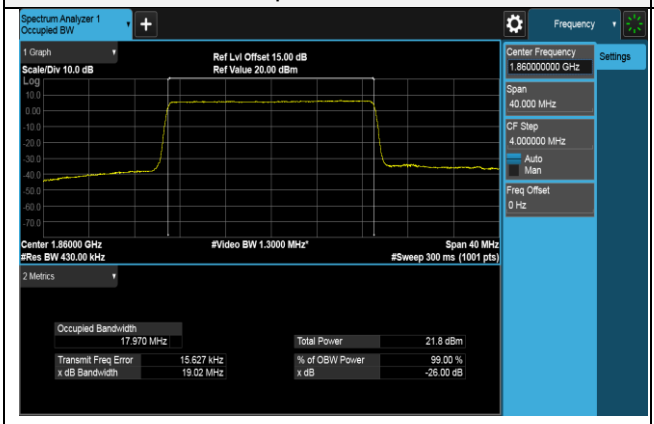
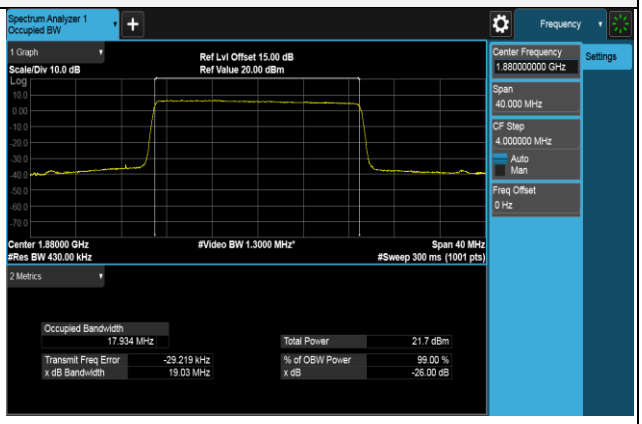
LTE Band 2 (Channel Bandwidth 15MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	18675	1857.5	13.4636	14.217
QPSK	18900	1880	13.4533	14.206
QPSK	19125	1902.5	13.4440	14.211
16QAM	18675	1857.5	13.4568	14.236
16QAM	18900	1880	13.4352	14.204
16QAM	19125	1902.5	13.4317	14.218

Spectrum Plot of Worst Value	
Occupied bandwidth	26 dB Bandwidth
	
QPSK CH 18675 (1857.5MHz)	16QAM CH 18675 (1857.5MHz)

LTE Band 2 (Channel Bandwidth 20MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	18700	1860	17.9631	19.025
QPSK	18900	1880	17.9350	18.991
QPSK	19100	1900	17.9303	19.014
16QAM	18700	1860	17.9698	19.022
16QAM	18900	1880	17.9342	19.027
16QAM	19100	1900	17.9402	19.023

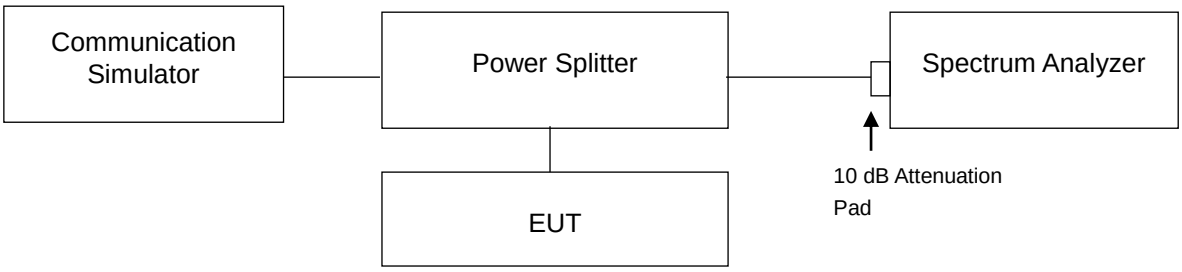
Spectrum Plot of Worst Value	
Occupied bandwidth	26 dB Bandwidth
	
16QAM CH 18700 (1860MHz)	16QAM CH 18900 (1880MHz)

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

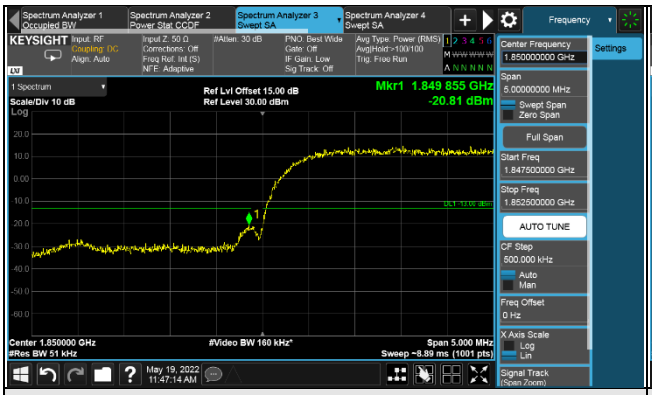


4.5.3 Test Procedures

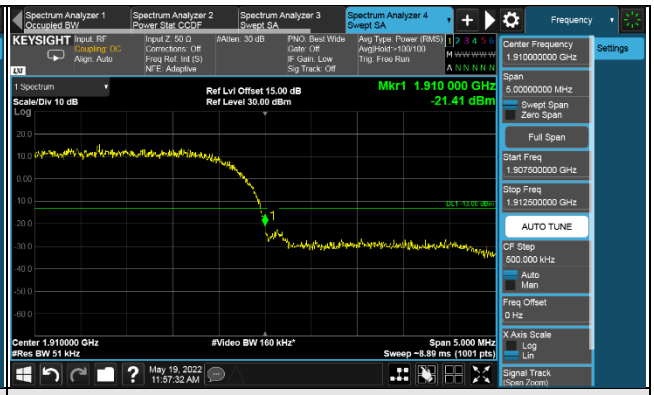
a. All measurements were done at low and high operational frequency range.
b. The center frequency of spectrum is the band edge frequency and span is 5 MHz. RB of the spectrum is 51 kHz and VB of the spectrum is 160 kHz (WCDMA / HSDPA / HSUPA).
c. The center frequency of spectrum is the band edge frequency 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. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 150 kHz and VB of the spectrum is 470 kHz (LTE Bandwidth 15 MHz).
h. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 200 kHz and VB of the spectrum is 1 MHz (LTE Bandwidth 20 MHz).
i. Record the max trace plot into the test report.

4.5.4 Test Results

WCDMA

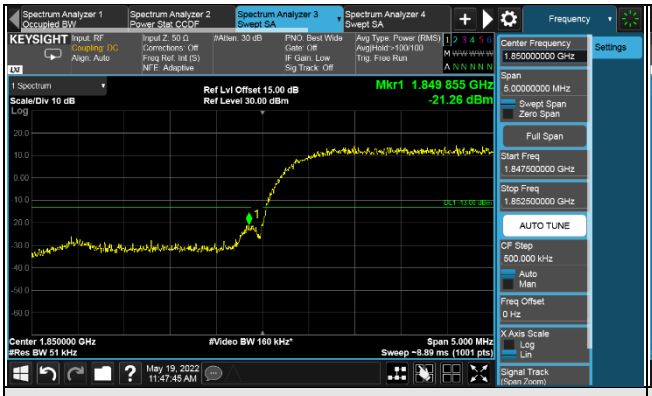


1852.4MHz

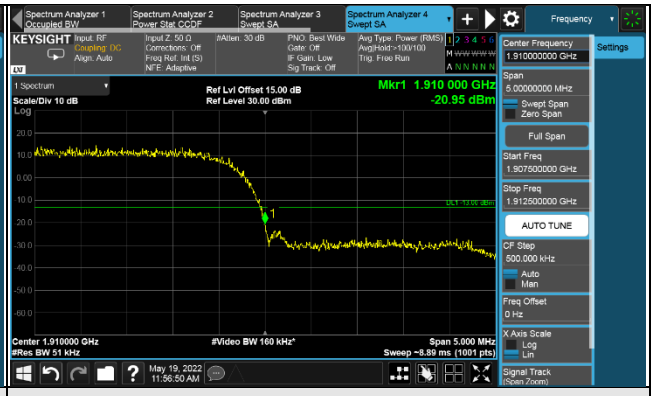


1907.6MHz

HSDPA

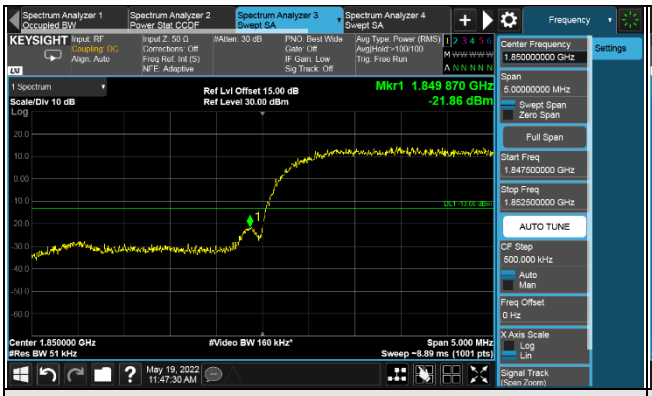


1852.4MHz

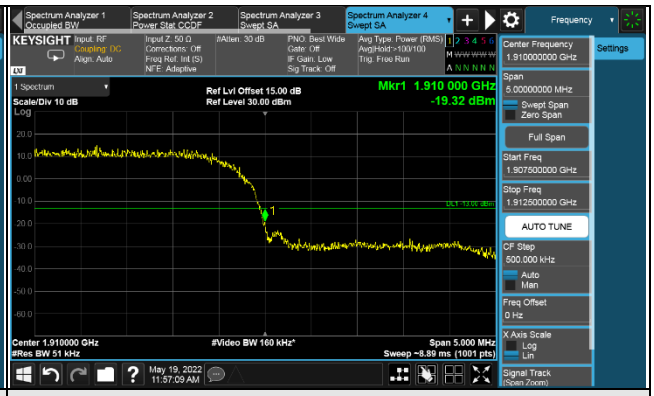


1907.6MHz

HSUPA

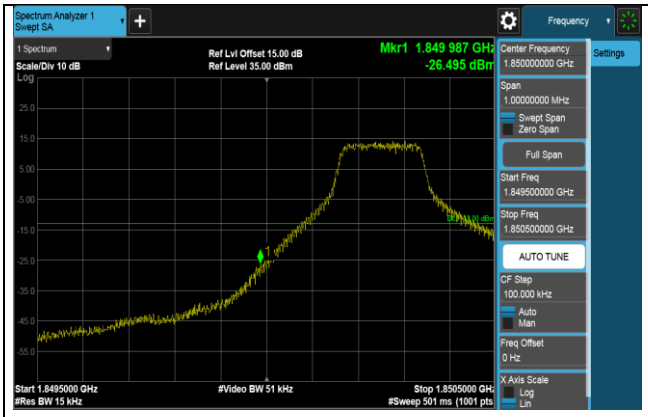


1852.4MHz

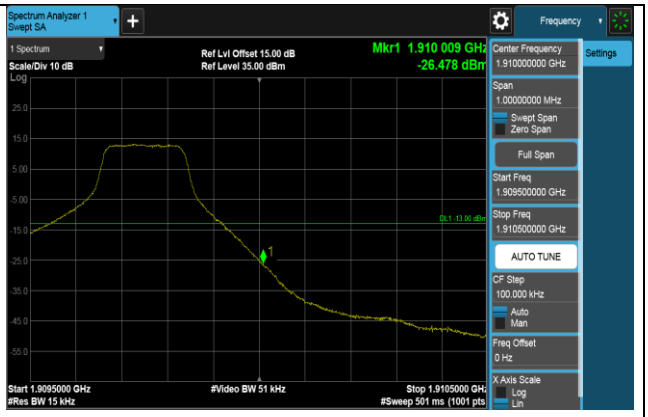


1907.6MHz

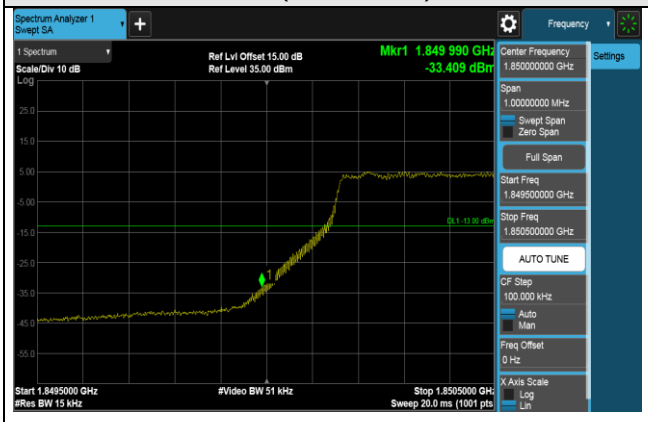
LTE Band 2 (Channel Bandwidth 1.4MHz)



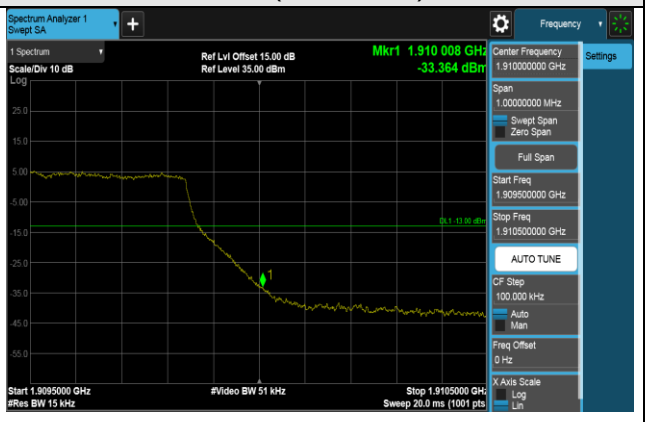
1RB (1850.7MHz)



1RB (1909.3MHz)

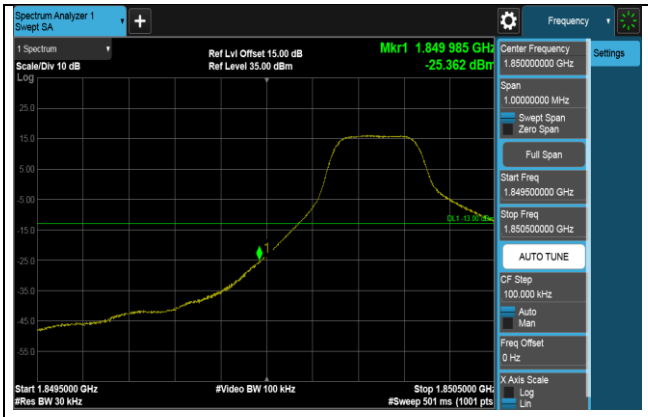


FULL (1850.7MHz)

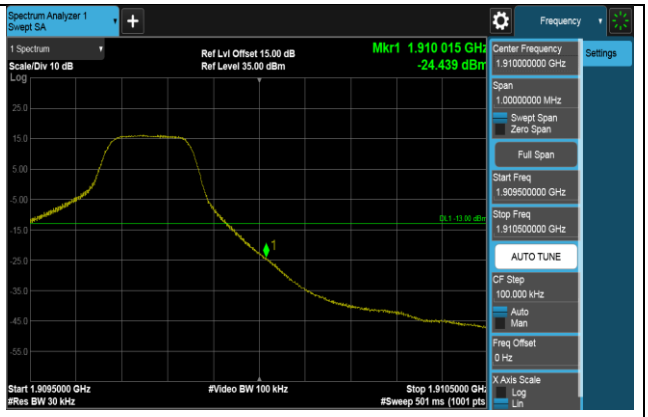


FULL (1909.3MHz)

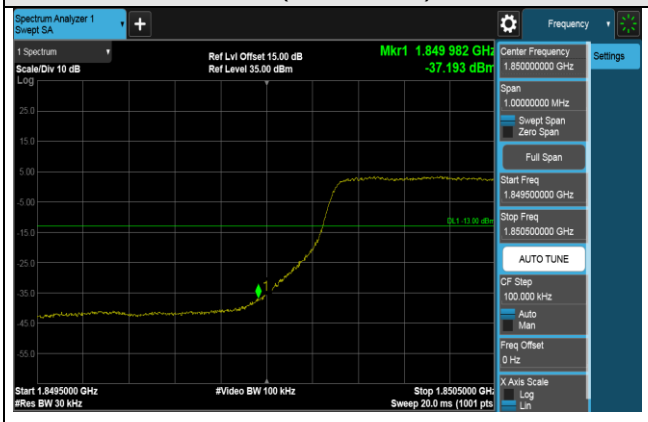
LTE Band 2 (Channel Bandwidth 3MHz)



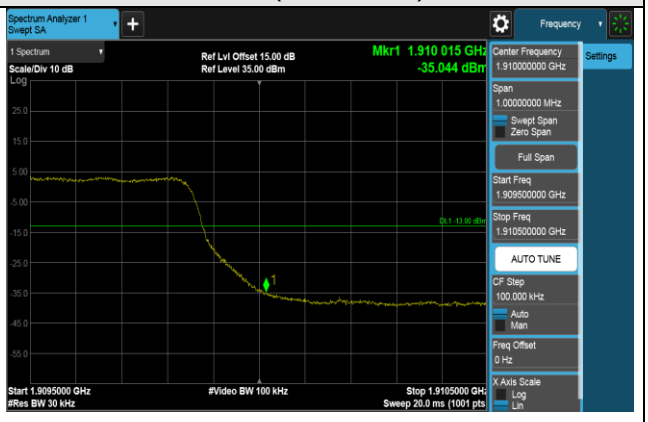
1RB (1851.5MHz)



1RB (1908.5MHz)

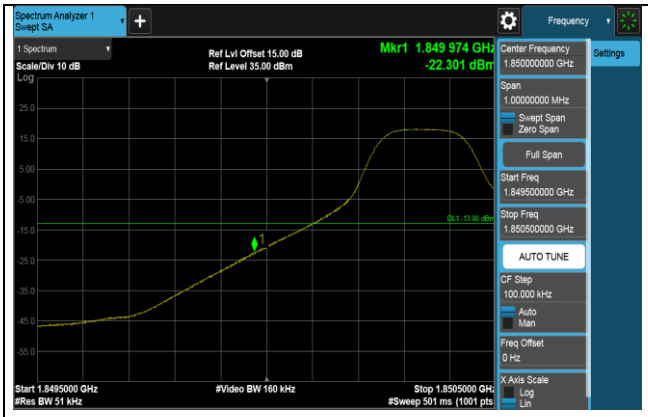
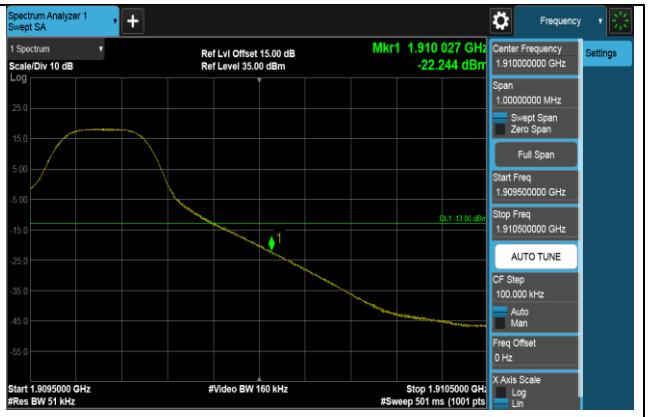
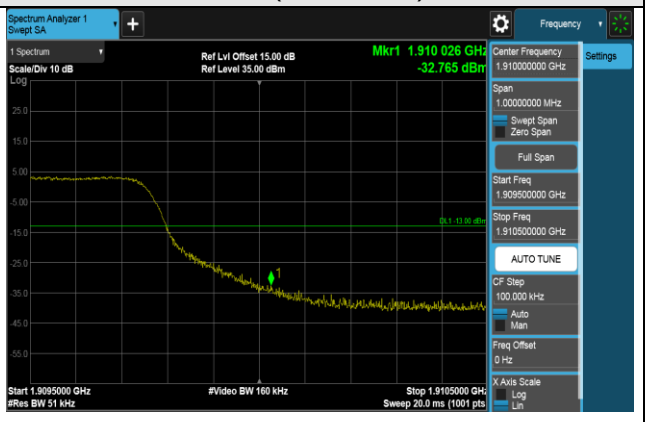


FULL (1851.5MHz)

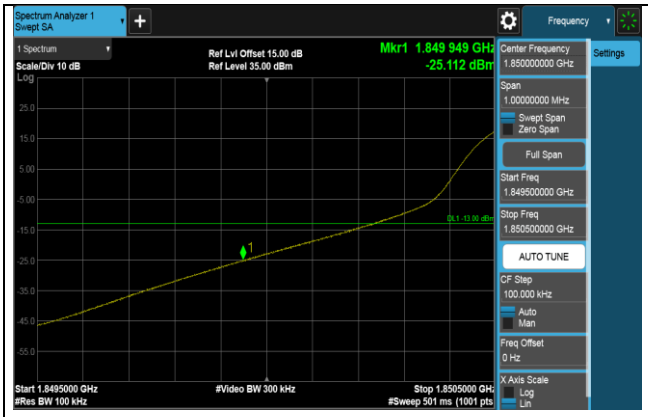
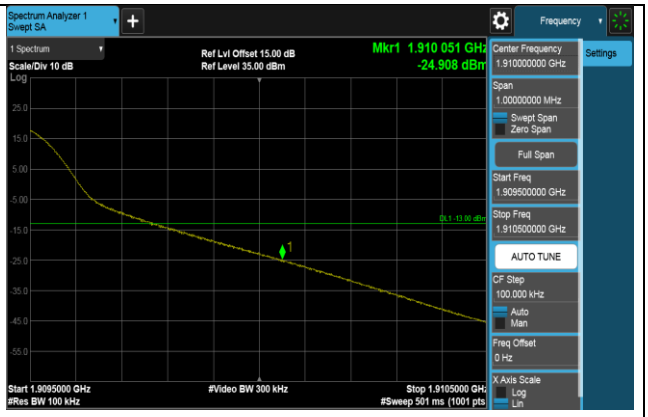
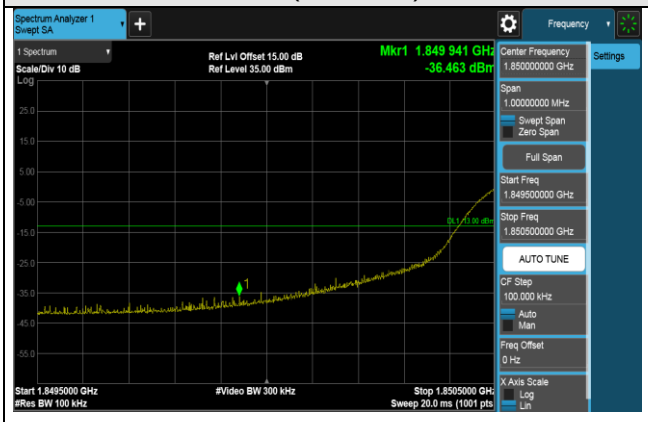
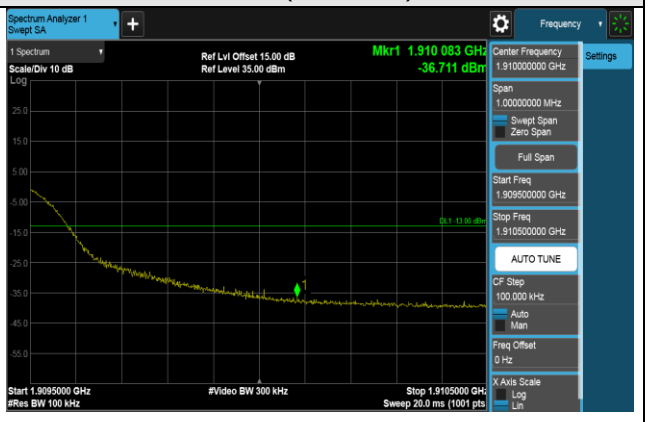


FULL (1908.5MHz)

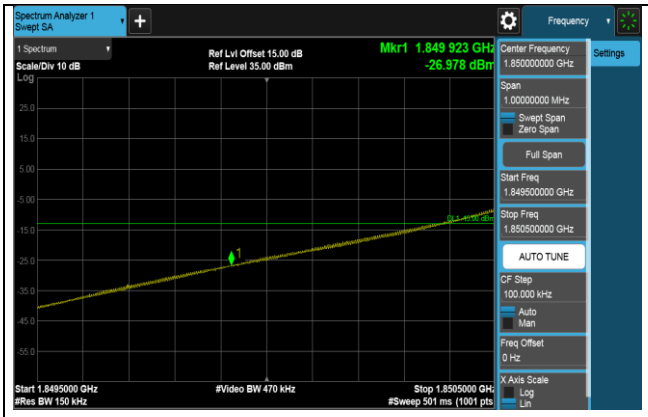
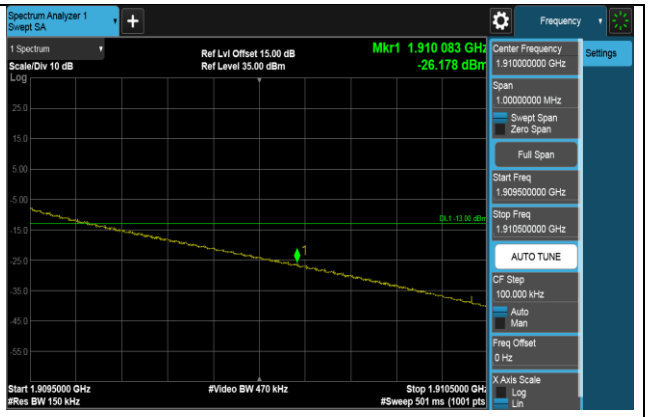
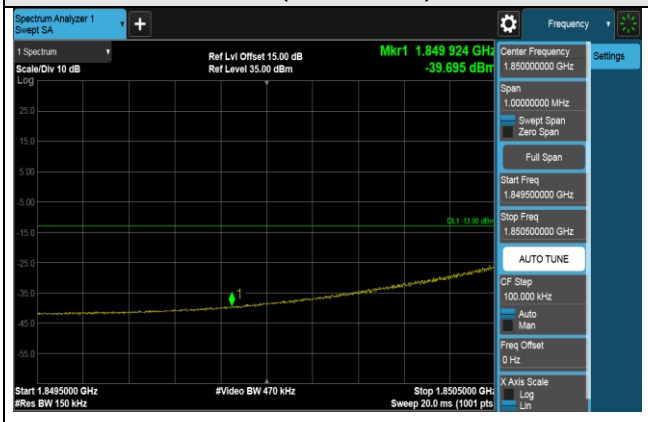
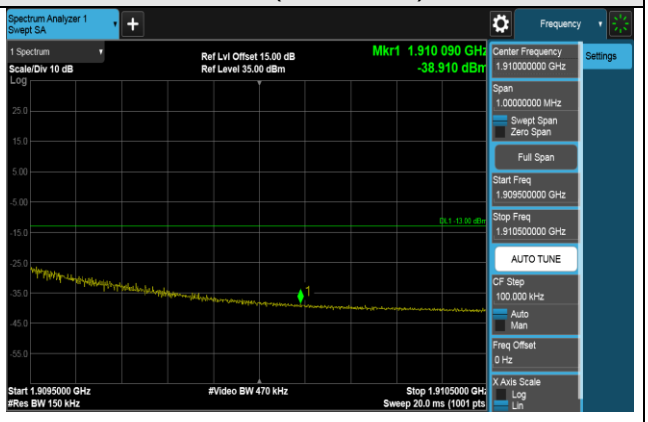
LTE Band 2 (Channel Bandwidth 5MHz)

	
1RB (1852.5MHz)	1RB (1907.5MHz)
	
FULL (1852.5MHz)	FULL (1907.5MHz)

LTE Band 2 (Channel Bandwidth 10MHz)

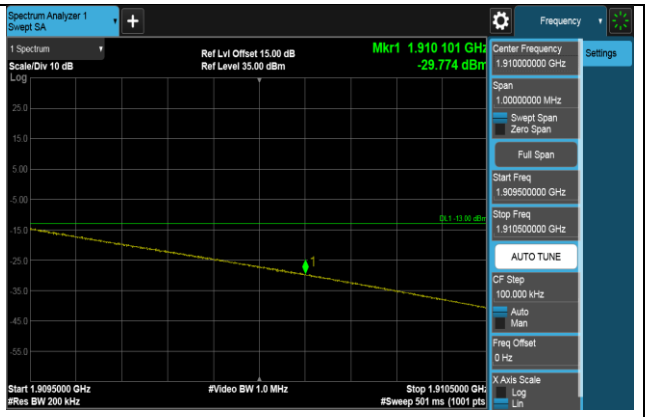
	
1RB (1855MHz)	1RB (1905MHz)
	
FULL (1855MHz)	FULL (1905MHz)

LTE Band 2 (Channel Bandwidth 15MHz)

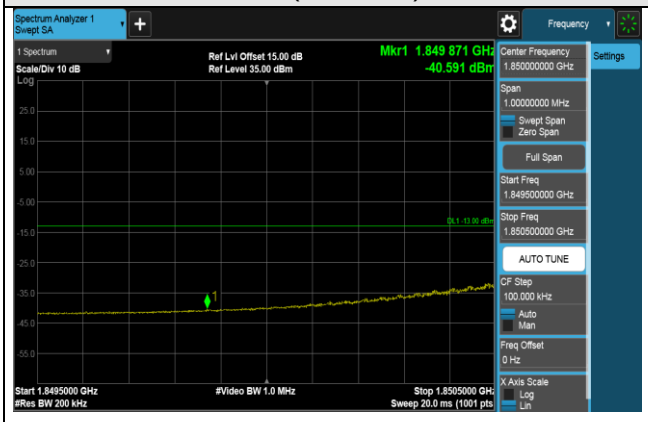
	
1RB (1857.5MHz)	1RB (1902.5MHz)
	
FULL (1857.5MHz)	FULL (1902.5MHz)

LTE Band 2 (Channel Bandwidth 20MHz)

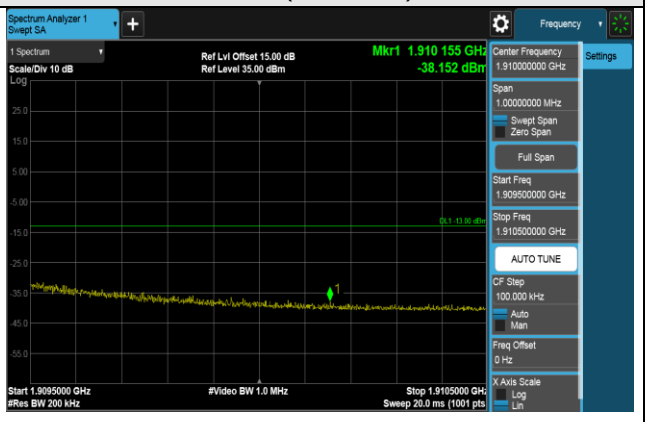
1RB (1860MHz)



1RB (1900MHz)



FULL (1860MHz)



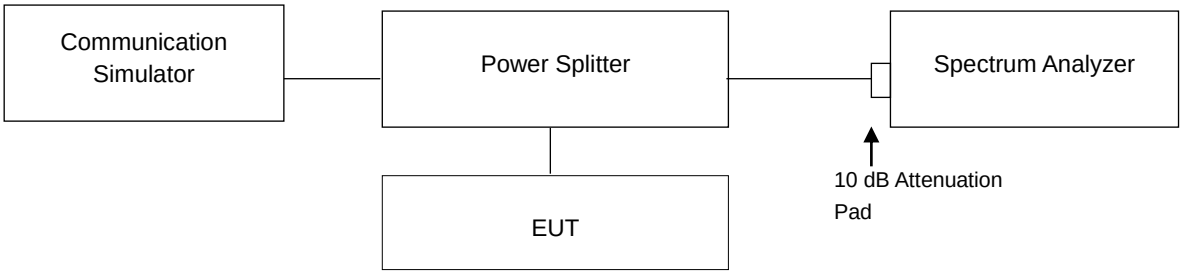
FULL (1900MHz)

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



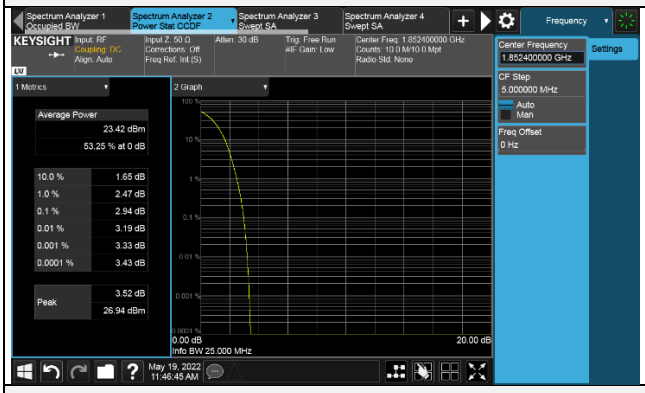
4.6.3 Test Procedures

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

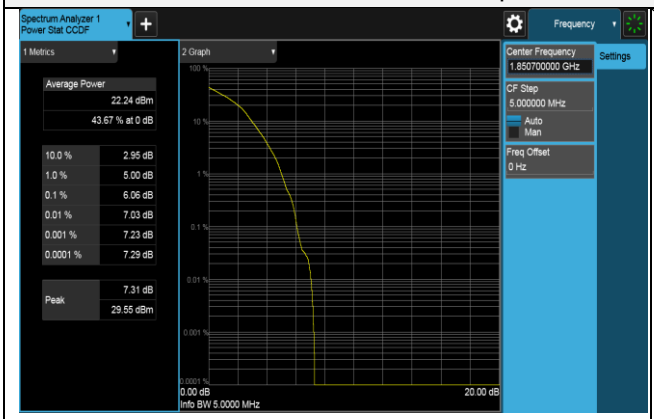
WCDMA

Test Condition	Channel	Frequency (MHz)	Measure. Value (dB)	Limit (dB)	Result
WCDMA	9262	1852.4	2.94	13	Pass
WCDMA	9400	1880.0	2.82	13	Pass
WCDMA	9538	1907.6	2.80	13	Pass
HSDPA	9262	1852.4	2.94	13	Pass
HSDPA	9400	1880.0	2.82	13	Pass
HSDPA	9538	1907.6	2.80	13	Pass
HSUPA	9262	1852.4	2.94	13	Pass
HSUPA	9400	1880.0	2.82	13	Pass
HSUPA	9538	1907.6	2.80	13	Pass

Spectrum Plot of Worst Value	
	
WCDMA CH 9262 (1852.4MHz)	

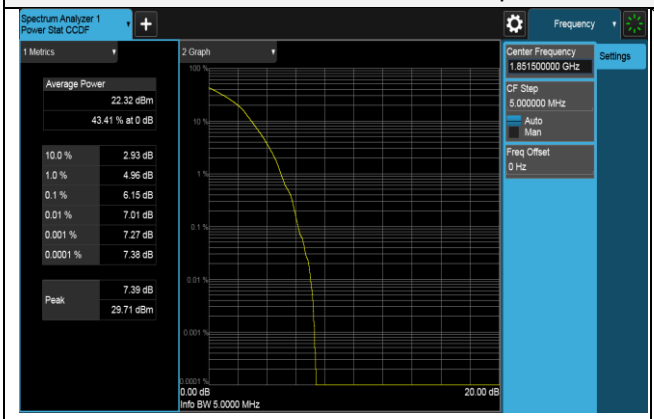
LTE Band 2 (Channel Bandwidth 1.4MHz)

Test Condition	Channel	Frequency (MHz)	Measure. Value(dB)	Limit dB	Result
QPSK	18607	1850.7	5.01	13	PASS
QPSK	18900	1880	4.44	13	PASS
QPSK	19193	1909.3	4.51	13	PASS
16QAM	18607	1850.7	6.06	13	PASS
16QAM	18900	1880	5.54	13	PASS
16QAM	19193	1909.3	5.60	13	PASS

Spectrum Plot of Worst Value	
	
16QAM CH 18607 (1850.7MHz)	

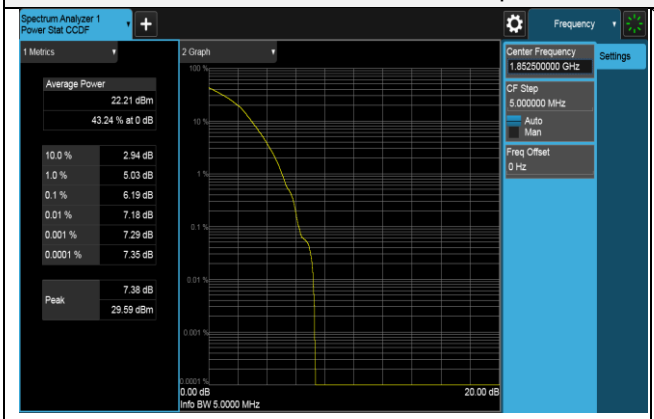
LTE Band 2 (Channel Bandwidth 3MHz)

Test Condition	Channel	Frequency (MHz)	Measure. Value(dB)	Limit dB	Result
QPSK	18615	1851.5	5.03	13	PASS
QPSK	18900	1880	4.46	13	PASS
QPSK	19185	1908.5	4.40	13	PASS
16QAM	18615	1851.5	6.15	13	PASS
16QAM	18900	1880	5.54	13	PASS
16QAM	19185	1908.5	5.41	13	PASS

Spectrum Plot of Worst Value	
	
16QAM CH 18615 (1851.5MHz)	

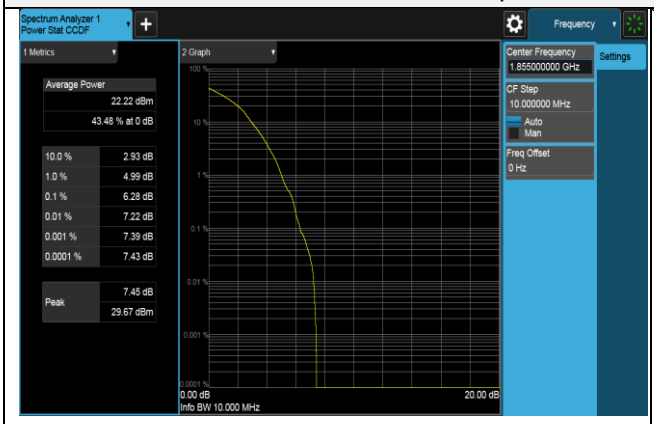
LTE Band 2 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Measure. Value(dB)	Limit dB	Result
QPSK	18625	1852.5	5.04	13	PASS
QPSK	18900	1880	4.50	13	PASS
QPSK	19175	1907.5	4.49	13	PASS
16QAM	18625	1852.5	6.19	13	PASS
16QAM	18900	1880	5.58	13	PASS
16QAM	19175	1907.5	5.67	13	PASS

Spectrum Plot of Worst Value	
	
16QAM CH 18625 (1852.5MHz)	

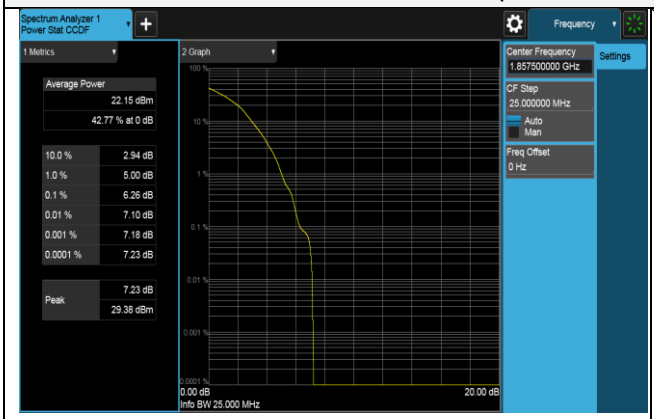
LTE Band 2 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Measure. Value(dB)	Limit dB	Result
QPSK	18650	1855	5.06	13	PASS
QPSK	18900	1880	4.52	13	PASS
QPSK	19150	1905	4.52	13	PASS
16QAM	18650	1855	6.28	13	PASS
16QAM	18900	1880	5.65	13	PASS
16QAM	19150	1905	5.54	13	PASS

Spectrum Plot of Worst Value	
	
16QAM CH 18650 (1855MHz)	

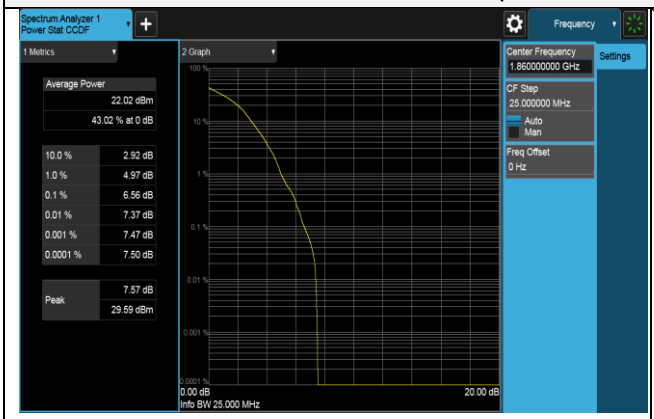
LTE Band 2 (Channel Bandwidth 15MHz)

Test Condition	Channel	Frequency (MHz)	Measure. Value(dB)	Limit dB	Result
QPSK	18675	1857.5	5.12	13	PASS
QPSK	18900	1880	4.48	13	PASS
QPSK	19125	1902.5	4.79	13	PASS
16QAM	18675	1857.5	6.26	13	PASS
16QAM	18900	1880	5.61	13	PASS
16QAM	19125	1902.5	5.75	13	PASS

Spectrum Plot of Worst Value	
	
16QAM CH 18675 (1857.5MHz)	

LTE Band 2 (Channel Bandwidth 20MHz)

Test Condition	Channel	Frequency (MHz)	Measure. Value(dB)	Limit dB	Result
QPSK	18700	1860	5.12	13	PASS
QPSK	18900	1880	4.72	13	PASS
QPSK	19100	1900	5.05	13	PASS
16QAM	18700	1860	6.56	13	PASS
16QAM	18900	1880	5.87	13	PASS
16QAM	19100	1900	6.02	13	PASS

Spectrum Plot of Worst Value	
	
16QAM CH 18700 (1860MHz)	