

FCC Test Report

(Part 22 – GPRS, EDGE, WCDMA, LTE Band 5 / 26)

Report No.: RFBFMG-WTW-P22010752

FCC ID: B32E2351

Test Model: e235-4G-1

Received Date: Jan. 24, 2022

Test Date: Mar. 20 ~ Mar. 25, 2022

Issued Date: Jul. 22, 2022

Applicant: Verifone, Inc.

Address: 1400 West Stanford Ranch Road Suite 150 Rocklin CA 95765 USA

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lin Kou Laboratories

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

Test Location(1): No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City
33383, Taiwan

**FCC Registration /
Designation Number(1):** 788550 / TW0003

Test Location(2): B2F., No.215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan

**FCC Registration /
Designation Number(2):** 427177 / TW0011



This report is governed by, and incorporates by reference, the Conditions of Testing as posted at the date of issuance of this report at <http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions/> and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. Statements of conformity are based on simple acceptance criteria without taking measurement uncertainty into account, unless otherwise requested in writing. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.

Table of Contents

Release Control Record	4
1 Certificate of Conformity	5
2 Summary of Test Results	6
2.1 Measurement Uncertainty.....	6
2.2 Test Site and Instruments.....	7
3 General Information	8
3.1 General Description of EUT.....	8
3.2 Configuration of System under Test.....	10
3.2.1 Description of Support Units.....	10
3.3 Test Mode Applicability and Tested Channel Detail.....	11
3.4 EUT Operating Conditions.....	18
3.5 General Description of Applied Standards and References.....	18
4 Test Types and Results	19
4.1 Output Power Measurement.....	19
4.1.1 Limits of Output Power Measurement.....	19
4.1.2 Test Procedures.....	19
4.1.3 Test Setup.....	19
4.1.4 Test Results.....	20
4.2 Modulation Characteristics Measurement.....	32
4.2.1 Limits of Modulation Characteristics.....	32
4.2.2 Test Procedure.....	32
4.2.3 Test Setup.....	32
4.2.4 Test Results.....	33
4.3 Frequency Stability Measurement.....	35
4.3.1 Limits of Frequency Stability Measurement.....	35
4.3.2 Test Procedure.....	35
4.3.3 Test Setup.....	35
4.3.4 Test Results.....	36
4.4 Occupied Bandwidth Measurement.....	48
4.4.1 Limits of Occupied Bandwidth Measurement.....	48
4.4.2 Test Procedure.....	48
4.4.3 Test Setup.....	48
4.4.4 Test Result.....	49
4.5 Band Edge Measurement.....	60
4.5.1 Limits of Band Edge Measurement.....	60
4.5.2 Test Setup.....	60
4.5.3 Test Procedures.....	60
4.5.4 Test Results.....	61
4.6 Peak to Average Ratio.....	72
4.6.1 Limits of Peak to Average Ratio Measurement.....	72
4.6.2 Test Setup.....	72
4.6.3 Test Procedures.....	72
4.6.4 Test Results.....	73
4.7 Conducted Spurious Emissions.....	84
4.7.1 Limits of Conducted Spurious Emissions Measurement.....	84
4.7.2 Test Setup.....	84
4.7.3 Test Procedure.....	84
4.7.4 Test Results.....	85
4.8 Radiated Emission Measurement.....	99
4.8.1 Limits of Radiated Emission Measurement.....	99
4.8.2 Test Procedure.....	99
4.8.3 Deviation from Test Standard.....	99
4.8.4 Test Setup.....	100

4.8.5 Test Results	101
5 Pictures of Test Arrangements.....	133
Appendix – Information of the Testing Laboratories	134

Release Control Record

Issue No.	Description	Date Issued
RFBFMG-WTW-P22010752	Original release	Jul. 22, 2022

1 Certificate of Conformity

Product: Point of Sale Terminal

Brand: Verifone

Test Model: e235-4G-1

Sample Status: Engineering sample

Applicant: Verifone, Inc.

Test Date: Mar. 20 ~ Mar. 25, 2022

Standards: FCC Part 22, Subpart H

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

Prepared by : Pettie Chen, **Date:** Jul. 22, 2022
Pettie Chen / Senior Specialist

Approved by : Jeremy Lin, **Date:** Jul. 22, 2022
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 -30.74dB at 2472.6MHz.

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) (\pm)
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.04 dB
	30MHz ~ 200MHz	2.0153 dB
	200MHz ~ 1000MHz	2.0224 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	1.0121 dB
	18GHz ~ 40GHz	1.1508 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver Agilent Technologies	N9038A	MY52260177	Sep. 01, 2021	Aug. 31, 2022
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Apr. 12, 2021	Apr. 11, 2022
Loop Antenna TESEQ	HLA 6121	45745	Jul. 21, 2021	Jul. 20, 2022
HORN Antenna ETS-Lindgren	3117	00143293	Nov. 14, 2021	Nov. 13, 2022
BILOG Antenna SCHWARZBECK	VULB 9168	9168-616	Oct. 27, 2021	Oct. 26, 2022
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Nov. 14, 2021	Nov. 13, 2022
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 13, 2021	Apr. 12, 2022
MXG Vector signal generator Agilent	N5182B	MY53050430	Nov. 25, 2021	Nov. 24, 2022
Preamplifier Agilent	310N	187226	Jun. 17, 2021	Jun. 16, 2022
Preamplifier Agilent	83017A	MY39501357	Jun. 17, 2021	Jun. 16, 2022
Preamplifier EMCI	EMC 184045	980116	Oct. 05, 2021	Oct. 04, 2022
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(RFC-SMS-100-SMS-120+RFC-SMS-100-SMS-400)	Jun. 17, 2021	Jun. 16, 2022
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(RFC-SMS-100-SMS-24)	Jun. 17, 2021	Jun. 16, 2022
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Software BV ADT	ADT_Radiated_V7.6.1 5.9.5	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA
DC power supply KEYSIGHT	U8002A	MY56330015	NA	NA
Digital Multimeter Fluke	87-III	70360755	Jul. 08, 2021	Jul. 07, 2022
Radio Communication Analyzer Anritsu	MT8820C	6201300640	Aug. 26, 2021	Aug. 25, 2022
Radio Communication Analyzer Anritsu	MT8821C	6201462755	Mar. 03, 2022	Mar. 02, 2023
Temperature & Humidity Chamber TERCHY	HRM-120RF	931022	Jan. 03, 2022	Jan. 02, 2023
Spectrum Analyzer KEYSIGHT	N9030B	MY57140953	Jul. 06, 2021	Jul. 05, 2022

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

3 General Information

3.1 General Description of EUT

Product	Point of Sale Terminal		
Brand	Verifone		
Test Model	e235-4G-1		
Sample Status	Engineering sample		
Power Supply Rating	5Vdc (From adapter)		
Modulation Type	GPRS: GMSK EDGE: 8PSK WCDMA: BPSK, QPSK HSDPA: BPSK HSUPA: QPSK LTE: QPSK, 16QAM		
Operating Frequency	GPRS, EDGE	824.2MHz ~ 848.8MHz	
	WCDMA Band 5	826.4MHz ~ 846.6MHz	
	LTE Band 5 (Channel Bandwidth 1.4MHz)	824.7MHz ~ 848.3MHz	
	LTE Band 5 (Channel Bandwidth 3MHz)	825.5MHz ~ 847.5MHz	
	LTE Band 5 (Channel Bandwidth 5MHz)	826.5MHz ~ 846.5MHz	
	LTE Band 5 (Channel Bandwidth 10MHz)	829.0MHz ~ 844.0MHz	
	LTE Band 26 (Channel Bandwidth 1.4MHz)	824.7MHz ~ 848.3MHz	
	LTE Band 26 (Channel Bandwidth 3MHz)	825.5MHz ~ 847.5MHz	
	LTE Band 26 (Channel Bandwidth 5MHz)	826.5MHz ~ 846.5MHz	
	LTE Band 26 (Channel Bandwidth 10MHz)	829.0MHz ~ 844.0MHz	
	LTE Band 26 (Channel Bandwidth 15MHz)	831.5MHz ~ 841.5MHz	
Max. ERP Power	GPRS	1733.804mW (32.39dBm)	
	EDGE	383.707mW (25.84dBm)	
	WCDMA Band 5	164.059mW (22.15dBm)	
		QPSK	16QAM
	LTE Band 5 (Channel Bandwidth 1.4MHz)	177.419mW (22.49dBm)	142.561mW (21.54dBm)
	LTE Band 5 (Channel Bandwidth 3MHz)	177.419mW (22.49dBm)	142.233mW (21.53dBm)
	LTE Band 5 (Channel Bandwidth 5MHz)	175.792mW (22.45dBm)	143.219mW (21.56dBm)
	LTE Band 5 (Channel Bandwidth 10MHz)	178.238mW (22.51dBm)	144.212mW (21.59dBm)
	LTE Band 26 (Channel Bandwidth 1.4MHz)	167.880mW (22.25dBm)	136.773mW (21.36dBm)
	LTE Band 26 (Channel Bandwidth 3MHz)	165.196mW (22.18dBm)	137.404mW (21.38dBm)
	LTE Band 26 (Channel Bandwidth 5MHz)	166.341mW (22.21dBm)	137.721mW (21.39dBm)
	LTE Band 26 (Channel Bandwidth 10MHz)	166.725mW (22.22dBm)	136.773mW (21.36dBm)
	LTE Band 26 (Channel Bandwidth 15MHz)	167.109mW (22.23dBm)	138.038mW (21.40dBm)

Emission Designator	GPRS	246KGXW	
	EDGE	246KG7W	
	WCDMA Band 5	4M14F9W	
		QPSK	16QAM
	LTE Band 5 (Channel Bandwidth 1.4MHz)	1M09G7D	1M09D7W
	LTE Band 5 (Channel Bandwidth 3MHz)	2M70G7D	2M70D7W
	LTE Band 5 (Channel Bandwidth 5MHz)	4M50G7D	4M49D7W
	LTE Band 5 (Channel Bandwidth 10MHz)	8M96G7D	4M57D7W
	LTE Band 26 (Channel Bandwidth 1.4MHz)	1M09G7D	1M09D7W
	LTE Band 26 (Channel Bandwidth 3MHz)	2M70G7D	2M70D7W
	LTE Band 26 (Channel Bandwidth 5MHz)	4M49G7D	4M49D7W
	LTE Band 26 (Channel Bandwidth 10MHz)	8M96G7D	4M57D7W
	LTE Band 26 (Channel Bandwidth 15MHz)	13M5G7D	4M67D7W
	Antenna Type	Refer to note	
Accessory Device	NA		
Cable Supplied	0.93m non-shielded USB cable		

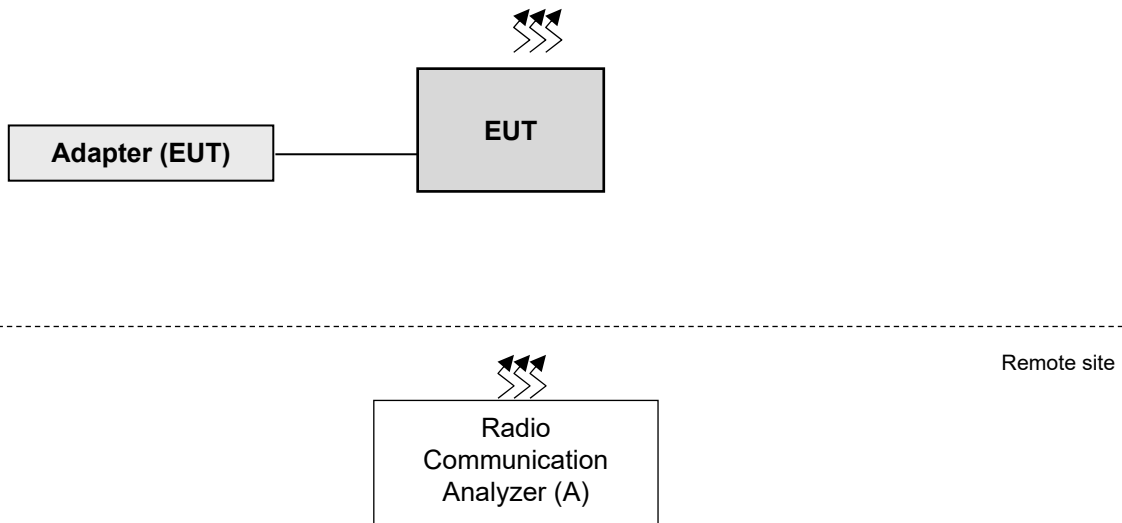
Note:

1. The antenna information is listed as below.

Type	Gain (dBi)														
	GSM 850	GSM 1900	WCDMA B2	WCDMA B4	WCDMA B5	LTE B2	LTE B4	LTE B5	LTE B7	LTE B12	LTE B13	LTE B25	LTE B26	LTE B38	LTE B41
monopole	1.1	2.2	2.2	2.0	1.1	2.2	2.0	1.1	2.5	-0.5	0.6	2.2	1.1	2.7	3.3

- * The above Antenna information refers to the manufacturer's antenna specifications, the laboratory shall not be held responsible.
2. EUT WWAN equipment specification, 16QAM modulation with bandwidth exceeding 10MHz only supports 25RB.

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.	Radio Communication Analyzer	Anritsu	MT8820C	6201240432	NA	For LTE
		R&S	CMU200	101095	NA	For GPRS, EDGE, WCDMA

Note:

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

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
GPRS, EDGE	Z-plane
WCDMA Band 5	Z-plane
LTE Band 5	Y-plane
LTE Band 26	Y-plane

GPRS, EDGE Mode

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Modulation
-	ERP	128 to 251	128 (824.2MHz), 189 (836.4MHz), 251 (848.8MHz)	GPRS, EDGE
-	Modulation Characteristics	128 to 251	128 (824.2MHz)	GPRS, EDGE
-	Frequency Stability	128 to 251	128 (824.2MHz), 251 (848.8MHz)	GPRS, EDGE
-	Occupied Bandwidth	128 to 251	128 (824.2MHz), 189 (836.4MHz), 251 (848.8MHz)	GPRS, EDGE
-	Band Edge	128 to 251	128(824.2MHz), 251(848.8MHz)	GPRS, EDGE
-	Peak To Average Ratio	128 to 251	128 (824.2MHz), 189 (836.4MHz), 251 (848.8MHz)	GPRS, EDGE
-	Conducted Emission	128 to 251	128 (824.2MHz), 189 (836.4MHz), 251 (848.8MHz)	GPRS, EDGE
-	Radiated Emission Below 1GHz	128 to 251	128 (824.2MHz)	GPRS
-			251 (848.8MHz)	EDGE
-	Radiated Emission Above 1GHz	128 to 251	128 (824.2MHz), 189 (836.4MHz), 251 (848.8MHz)	GPRS, EDGE

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

WCDMA Band 5

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	ERP	4132 to 4233	4132 (826.4MHz), 4182 (836.4MHz), 4233 (846.6MHz)	WCDMA, HSDPA, HSUPA
-	Modulation Characteristics	4132 to 4233	4182 (836.4MHz)	WCDMA, HSDPA, HSUPA
-	Frequency Stability	4132 to 4233	4132 (826.4MHz), 4233 (846.6MHz)	WCDMA
-	Occupied Bandwidth	4132 to 4233	4132 (826.4MHz), 4182 (836.4MHz), 4233 (846.6MHz)	WCDMA, HSDPA, HSUPA
-	Band Edge	4132 to 4233	4132 (826.4MHz), 4233 (846.6MHz)	WCDMA, HSDPA, HSUPA
-	Peak To Average Ratio	4132 to 4233	4132 (826.4MHz), 4182 (836.4MHz), 4233 (846.6MHz)	WCDMA, HSDPA, HSUPA
-	Conducted Emission	4132 to 4233	4132 (826.4MHz), 4182 (836.4MHz), 4233 (846.6MHz)	WCDMA, HSDPA, HSUPA
-	Radiated Emission Below 1GHz	4132 to 4233	4233 (846.6MHz)	WCDMA
-	Radiated Emission Above 1GHz	4132 to 4233	4132 (826.4MHz), 4182 (836.4MHz), 4233 (846.6MHz)	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 (824.7MHz), 20525 (836.5MHz), 20643 (848.3MHz)	1.4MHz	QPSK / 16QAM	1 Half Full
		20415 to 20635	20415 (825.5MHz), 20525 (836.5MHz), 20635 (847.5MHz)	3MHz	QPSK / 16QAM	1 Half Full
		20425 to 20625	20425 (826.5MHz), 20525 (836.5MHz), 20625 (846.5MHz)	5MHz	QPSK / 16QAM	1 Half Full
		20450 to 20600	20450 (829.0MHz), 20525 (836.5MHz), 20600 (844.0MHz)	10MHz	QPSK / 16QAM	1 Half Full
-	Modulation Characteristics	20450 to 20600	20525 (836.5MHz)	10MHz	QPSK / 16QAM	Full
-	Frequency Stability	20407 to 20643	20407 (824.7MHz), 20643 (848.3MHz)	1.4MHz	QPSK	Full
		20415 to 20635	20415 (825.5MHz), 20635 (847.5MHz)	3MHz	QPSK	Full
		20425 to 20625	20425 (826.5MHz), 20625 (846.5MHz)	5MHz	QPSK	Full
		20450 to 20600	20450 (829.0MHz), 20600 (844.0MHz)	10MHz	QPSK	Full
-	Occupied Bandwidth	20407 to 20643	20407 (824.7MHz), 20525 (836.5MHz), 20643 (848.3MHz)	1.4MHz	QPSK / 16QAM	Full
		20415 to 20635	20415 (825.5MHz), 20525 (836.5MHz), 20635 (847.5MHz)	3MHz	QPSK / 16QAM	Full
		20425 to 20625	20425 (826.5MHz), 20525 (836.5MHz), 20625 (846.5MHz)	5MHz	QPSK / 16QAM	Full
		20450 to 20600	20450 (829.0MHz), 20525 (836.5MHz), 20600 (844.0MHz)	10MHz	QPSK / 16QAM	Full
-	Band Edge	20407 to 20643	20407 (824.7MHz), 20643 (848.3MHz)	1.4MHz	QPSK	1 Half Full
		20415 to 20635	20415 (825.5MHz), 20635 (847.5MHz)	3MHz	QPSK	1 Half Full
		20425 to 20625	20425 (826.5MHz), 20625 (846.5MHz)	5MHz	QPSK	1 Half Full
		20450 to 20600	20450 (829.0MHz), 20600 (844.0MHz)	10MHz	QPSK	1 Half Full

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	RB #
-	Peak to Average Ratio	20407 to 20643	20407 (824.7MHz), 20525 (836.5MHz), 20643 (848.3MHz)	1.4MHz	QPSK / 16QAM	1
		20415 to 20635	20415 (825.5MHz), 20525 (836.5MHz), 20635 (847.5MHz)	3MHz	QPSK / 16QAM	1
		20425 to 20625	20425 (826.5MHz), 20525 (836.5MHz), 20625 (846.5MHz)	5MHz	QPSK / 16QAM	1
		20450 to 20600	20450 (829.0MHz), 20525 (836.5MHz), 20600 (844.0MHz)	10MHz	QPSK / 16QAM	1
-	Conducted Emission	20407 to 20643	20407 (824.7MHz), 20525 (836.5MHz), 20643 (848.3MHz)	1.4MHz	QPSK	1
		20415 to 20635	20415 (825.5MHz), 20525 (836.5MHz), 20635 (847.5MHz)	3MHz	QPSK	1
		20425 to 20625	20425 (826.5MHz), 20525 (836.5MHz), 20625 (846.5MHz)	5MHz	QPSK	1
		20450 to 20600	20450 (829.0MHz), 20525 (836.5MHz), 20600 (844.0MHz)	10MHz	QPSK	1
-	Radiated Emission Below 1GHz	20450 to 20600	20525 (836.5MHz)	10MHz	QPSK	1
-	Radiated Emission Above 1GHz	20407 to 20643	20407 (824.7MHz), 20525 (836.5MHz), 20643 (848.3MHz)	1.4MHz	QPSK	1
		20425 to 20625	20425 (826.5MHz), 20525 (836.5MHz), 20625 (846.5MHz)	5MHz	QPSK	1
		20450 to 20600	20450 (829.0MHz), 20525 (836.5MHz), 20600 (844.0MHz)	10MHz	QPSK	1

Note:

1. For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.
2. For radiated emission above 1GHz, according to 3GPP 36.521-1 Section 6.6.3.1.4.1, choose the lowest, 5MHz & highest channel bandwidth for final test.
3. The output power for QPSK and 16QAM, measured value of QPSK is higher than 16QAM mode. Therefore, only Modulation characteristics, occupied bandwidth and Peak to average ratio items had been tested under QPSK and 16QAM modes, the other test items were performed under worse mode according to the maximum output power.

LTE Band 26

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	RB #
-	ERP	26797 to 27033	26797 (824.7MHz), 26915 (836.5MHz), 27033 (848.3MHz)	1.4MHz	QPSK / 16QAM	1 Half Full
		26805 to 27025	26805 (825.5MHz), 26915 (836.5MHz), 27025 (847.5MHz)	3MHz	QPSK / 16QAM	1 Half Full
		26815 to 27015	26815 (826.5MHz), 26915 (836.5MHz), 27015 (846.5MHz)	5MHz	QPSK / 16QAM	1 Half Full
		26840 to 26990	26840 (829.0MHz), 26915 (836.5MHz), 26990 (844.0MHz)	10MHz	QPSK / 16QAM	1 Half Full
		26865 to 26965	26865 (831.5MHz), 26915 (836.5MHz), 26965 (841.5MHz)	15MHz	QPSK / 16QAM	1 Half Full
-	Modulation Characteristics	26865 to 26965	26915 (836.5MHz)	15MHz	QPSK / 16QAM	Full
-	Frequency Stability	26797 to 27033	26797 (824.7MHz), 27033 (848.3MHz)	1.4MHz	QPSK	Full
		26805 to 27025	26805 (825.5MHz), 27025 (847.5MHz)	3MHz	QPSK	Full
		26815 to 27015	26815 (826.5MHz), 27015 (846.5MHz)	5MHz	QPSK	Full
		26840 to 26990	26840 (829.0MHz), 26990 (844.0MHz)	10MHz	QPSK	Full
		26865 to 26965	26865 (831.5MHz), 26965 (841.5MHz)	15MHz	QPSK	Full
-	Occupied Bandwidth	26797 to 27033	26797 (824.7MHz), 26915 (836.5MHz), 27033 (848.3MHz)	1.4MHz	QPSK / 16QAM	Full
		26805 to 27025	26805 (825.5MHz), 26915 (836.5MHz), 27025 (847.5MHz)	3MHz	QPSK / 16QAM	Full
		26815 to 27015	26815 (826.5MHz), 26915 (836.5MHz), 27015 (846.5MHz)	5MHz	QPSK / 16QAM	Full
		26840 to 26990	26840 (829.0MHz), 26915 (836.5MHz), 26990 (844.0MHz)	10MHz	QPSK / 16QAM	Full
		26865 to 26965	26865 (831.5MHz), 26915 (836.5MHz), 26965 (841.5MHz)	15MHz	QPSK / 16QAM	Full

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	RB #
-	Band Edge	26797 to 27033	26797 (824.7MHz), 27033 (848.3MHz)	1.4MHz	QPSK	1 Half Full
		26805 to 27025	26805 (825.5MHz), 27025 (847.5MHz)	3MHz	QPSK	1 Half Full
		26815 to 27015	26815 (826.5MHz), 27015 (846.5MHz)	5MHz	QPSK	1 Half Full
		26840 to 26990	26840 (829.0MHz), 26990 (844.0MHz)	10MHz	QPSK	1 Half Full
		26865 to 26965	26865 (831.5MHz), 26965 (841.5MHz)	15MHz	QPSK	1 Half Full
-	Peak to Average Ratio	26797 to 27033	26797 (824.7MHz), 26915 (836.5MHz), 27033 (848.3MHz)	1.4MHz	QPSK / 16QAM	1
		26805 to 27025	26805 (825.5MHz), 26915 (836.5MHz), 27025 (847.5MHz)	3MHz	QPSK / 16QAM	1
		26815 to 27015	26815 (826.5MHz), 26915 (836.5MHz), 27015 (846.5MHz)	5MHz	QPSK / 16QAM	1
		26840 to 26990	26840 (829.0MHz), 26915 (836.5MHz), 26990 (844.0MHz)	10MHz	QPSK / 16QAM	1
		26865 to 26965	26865 (831.5MHz), 26915 (836.5MHz), 26965 (841.5MHz)	15MHz	QPSK / 16QAM	1
-	Conducted Emission	26797 to 27033	26797 (824.7MHz), 26915 (836.5MHz), 27033 (848.3MHz)	1.4MHz	QPSK	1
		26805 to 27025	26805 (825.5MHz), 26915 (836.5MHz), 27025 (847.5MHz)	3MHz	QPSK	1
		26815 to 27015	26815 (826.5MHz), 26915 (836.5MHz), 27015 (846.5MHz)	5MHz	QPSK	1
		26840 to 26990	26840 (829.0MHz), 26915 (836.5MHz), 26990 (844.0MHz)	10MHz	QPSK	1
		26865 to 26965	26865 (831.5MHz), 26915 (836.5MHz), 26965 (841.5MHz)	15MHz	QPSK	1

EUT Configure Mode	Test item	Available channel	Tested channel	Channel Bandwidth	Modulation	RB #
-	Radiated Emission Below 1GHz	26865 to 26965	26965 (841.5MHz)	15MHz	QPSK	1
-	Radiated Emission Above 1GHz	26797 to 27033	26797 (824.7MHz), 26915 (836.5MHz), 27033 (848.3MHz)	1.4MHz	QPSK	1
		26815 to 27015	26815 (826.5MHz), 26915 (836.5MHz), 27015 (846.5MHz)	5MHz	QPSK	1
		26865 to 26965	26865 (831.5MHz), 26915 (836.5MHz), 26965 (841.5MHz)	15MHz	QPSK	1

Note:

1. For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.
2. For radiated emission above 1GHz, according to 3GPP 36.521-1 Section 6.6.3.1.4.1, choose the lowest, 5MHz & highest channel bandwidth for final test.
3. The output power for QPSK and 16QAM, measured value of QPSK is higher than 16QAM mode. Therefore, only Modulation characteristics, occupied bandwidth and Peak to average ratio items had been tested under QPSK and 16QAM modes, the other test items were performed under worse mode according to the maximum output power.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP	25deg. C, 60%RH	120Vac, 60Hz	Willy Cheng
Modulation Characteristics	25deg. C, 60%RH	120Vac, 60Hz	Willy Cheng
Frequency Stability	25deg. C, 60%RH	3.7Vdc	Willy Cheng
Occupied Bandwidth	25deg. C, 60%RH	120Vac, 60Hz	Willy Cheng
Band Edge	25deg. C, 60%RH	120Vac, 60Hz	Willy Cheng
Peak To Average Ratio	25deg. C, 60%RH	120Vac, 60Hz	Willy Cheng
Conducted Emission	25deg. C, 60%RH	120Vac, 60Hz	Willy Cheng
Radiated Emission	25deg. C, 60%RH	120Vac, 60Hz	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:

Test Standard:

FCC 47 CFR Part 2

FCC 47 CFR Part 22

ANSI/TIA/EIA-603-E 2016

ANSI 63.26-2015

References Test Guidance:

KDB 971168 D01 Power Meas License Digital Systems v03r01

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

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

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

4.1.2 Test Procedures

Conducted Power Measurement:

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

Maximum EIRP / ERP

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

$$\text{EIRP} = P_{\text{Meas}} + G_{\text{T}}$$

$$\text{ERP} = P_{\text{Meas}} + G_{\text{T}} - 2.15$$

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	GPRS, EDGE 850		
Channel	128	189	251
Frequency (MHz)	824.2	836.4	848.8
GPRS 1Tx Slot	33.20	33.33	33.44
GPRS 2Tx Slot	30.93	31.06	31.17
GPRS 3Tx Slot	29.25	29.38	29.49
GPRS 4Tx Slot	27.74	27.87	27.98
EDGE 1Tx Slot (MCS9)	26.65	26.78	26.89
EDGE 2Tx Slot (MCS9)	25.25	25.38	25.49
EDGE 3Tx Slot (MCS9)	23.74	23.87	23.98
EDGE 4Tx Slot (MCS9)	22.70	22.83	22.94

Band	WCDMA V		
TX Channel	4132	4182	4233
Frequency (MHz)	826.4	836.4	846.6
RMC 12.2K	23.17	23.20	23.16
HSDPA Subtest-1	22.47	22.49	22.46
HSDPA Subtest-2	22.43	22.47	22.44
HSDPA Subtest-3	21.94	21.97	21.93
HSDPA Subtest-4	21.96	21.96	21.91
DC-HSDPA Subtest-1	22.39	22.42	22.38
DC-HSDPA Subtest-2	22.35	22.40	22.36
DC-HSDPA Subtest-3	21.86	21.90	21.85
DC-HSDPA Subtest-4	21.88	21.89	21.83
HSUPA Subtest-1	22.34	22.36	22.33
HSUPA Subtest-2	20.43	20.48	20.44
HSUPA Subtest-3	21.42	21.49	21.43
HSUPA Subtest-4	20.47	20.49	20.44
HSUPA Subtest-5	22.44	22.48	22.41

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	23.56	23.36	23.51
		1	24	23.53	23.35	23.43
		1	49	23.37	23.31	23.34
		25	0	22.66	22.51	22.59
		25	12	22.61	22.46	22.52
		25	25	22.47	22.33	22.38
		50	0	22.58	22.49	22.52
10M	16QAM	1	0	22.64	22.55	22.59
		1	24	22.61	22.52	22.55
		1	49	22.52	22.43	22.52
		25	0	21.58	21.57	21.58
		25	12	21.56	21.42	21.52
		25	25	21.49	21.44	21.49
		50	0	-	-	-

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	23.50	23.28	23.42
		1	12	23.47	23.26	23.38
		1	24	23.27	23.31	23.25
		12	0	22.58	22.41	22.54
		12	6	22.57	22.46	22.43
		12	13	22.42	22.28	22.36
		25	0	22.58	22.41	22.49
5M	16QAM	1	0	22.61	22.52	22.58
		1	12	22.60	22.50	22.55
		1	24	22.42	22.35	22.42
		12	0	21.58	21.49	21.50
		12	6	21.47	21.39	21.43
		12	13	21.42	21.36	21.40
		25	0	21.48	21.42	21.44

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	23.54	23.26	23.48
		1	7	23.43	23.32	23.40
		1	14	23.33	23.22	23.24
		8	0	22.64	22.42	22.54
		8	3	22.51	22.41	22.43
		8	7	22.47	22.26	22.34
		15	0	22.51	22.42	22.42
3M	16QAM	1	0	22.58	22.50	22.51
		1	7	22.51	22.49	22.46
		1	14	22.50	22.35	22.47
		8	0	21.48	21.48	21.55
		8	3	21.50	21.33	21.46
		8	7	21.47	21.36	21.46
		15	0	21.43	21.32	21.44

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	23.49	23.27	23.36
		1	2	23.48	23.16	23.22
		1	5	23.19	23.14	23.23
		3	0	23.47	23.38	23.54
		3	1	23.46	23.35	23.31
		3	3	23.34	23.19	23.29
		6	0	22.47	22.31	22.41
1.4M	16QAM	1	0	22.57	22.41	22.52
		1	2	22.59	22.34	22.39
		1	5	22.38	22.36	22.38
		3	0	22.54	22.44	22.47
		3	1	22.46	22.34	22.49
		3	3	22.36	22.31	22.42
		6	0	21.40	21.30	21.27

LTE Band 26						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26865	26915	26965
		Frequency (MHz)		831.5	836.5	841.5
15M	QPSK	1	0	23.23	23.13	23.28
		1	37	23.21	23.16	23.25
		1	74	23.15	23.05	23.18
		36	0	22.44	22.36	22.47
		36	19	22.34	22.25	22.42
		36	39	22.21	22.17	22.31
		75	0	22.31	22.22	22.36
15M	16QAM	1	0	22.40	22.33	22.45
		1	37	22.35	22.29	22.41
		1	74	22.32	22.30	22.37
		36	0	-	-	-
		36	19	-	-	-
		36	39	-	-	-
		75	0	-	-	-

LTE Band 26						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26840	26915	26990
		Frequency (MHz)		829	836.5	844
10M	QPSK	1	0	23.08	23.10	23.27
		1	24	23.10	23.09	23.16
		1	49	23.13	22.96	23.18
		25	0	22.30	22.30	22.45
		25	12	22.34	22.22	22.37
		25	25	22.09	22.15	22.27
		50	0	22.23	22.19	22.30
10M	16QAM	1	0	22.33	22.19	22.41
		1	24	22.27	22.23	22.32
		1	49	22.25	22.20	22.35
		25	0	21.17	21.15	21.44
		25	12	21.13	21.11	21.36
		25	25	21.08	21.03	21.22
		50	0	-	-	-

LTE Band 26						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26815	26915	27015
		Frequency (MHz)		826.5	836.5	846.5
5M	QPSK	1	0	23.03	22.96	23.26
		1	12	23.09	22.97	23.25
		1	24	23.13	22.94	23.17
		12	0	22.21	22.23	22.37
		12	6	22.19	22.19	22.40
		12	13	21.95	22.02	22.23
		25	0	22.13	22.08	22.30
5M	16QAM	1	0	22.33	22.13	22.44
		1	12	22.16	22.14	22.31
		1	24	22.22	22.14	22.36
		12	0	21.41	21.32	21.37
		12	6	21.34	21.32	21.26
		12	13	21.31	21.29	21.16
		25	0	21.29	21.27	21.19

LTE Band 26						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26805	26915	27025
		Frequency (MHz)		825.5	836.5	847.5
3M	QPSK	1	0	23.01	23.15	23.23
		1	7	23.05	23.10	23.16
		1	14	22.91	23.18	23.14
		8	0	22.23	22.42	22.38
		8	3	22.09	22.23	22.32
		8	7	22.06	22.15	22.28
		15	0	22.10	22.26	22.36
3M	16QAM	1	0	22.07	22.39	22.43
		1	7	22.11	22.31	22.37
		1	14	22.13	22.21	22.27
		8	0	21.33	21.42	21.38
		8	3	21.29	21.32	21.26
		8	7	21.20	21.12	21.14
		15	0	21.18	21.17	21.19

LTE Band 26						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26797	26915	27033
		Frequency (MHz)		824.7	836.5	848.3
1.4M	QPSK	1	0	23.10	23.15	23.19
		1	2	23.03	23.12	23.11
		1	5	22.95	23.06	23.11
		3	0	23.23	23.30	23.14
		3	1	23.08	23.23	23.22
		3	3	23.09	23.15	23.11
		6	0	22.15	22.17	22.25
1.4M	16QAM	1	0	22.14	22.41	22.39
		1	2	22.21	22.23	22.31
		1	5	22.17	22.21	22.16
		3	0	22.27	22.32	22.39
		3	1	22.21	22.26	22.27
		3	3	22.18	22.19	22.11
		6	0	21.08	21.16	21.14

ERP Power (dBm)

Band	GPRS, EDGE 850		
Channel	128	189	251
Frequency (MHz)	824.2	836.4	848.8
GPRS 1Tx Slot	32.15	32.28	32.39
GPRS 2Tx Slot	29.88	30.01	30.12
GPRS 3Tx Slot	28.20	28.33	28.44
GPRS 4Tx Slot	26.69	26.82	26.93
EDGE 1Tx Slot (MCS9)	25.60	25.73	25.84
EDGE 2Tx Slot (MCS9)	24.20	24.33	24.44
EDGE 3Tx Slot (MCS9)	22.69	22.82	22.93
EDGE 4Tx Slot (MCS9)	21.65	21.78	21.89

*ERP = Conducted + antenna gain (1.1dBi) - 2.15

Band	WCDMA V		
TX Channel	4132	4182	4233
Frequency (MHz)	826.4	836.4	846.6
RMC 12.2K	22.12	22.15	22.11
HSDPA Subtest-1	21.42	21.44	21.41
HSDPA Subtest-2	21.38	21.42	21.39
HSDPA Subtest-3	20.89	20.92	20.88
HSDPA Subtest-4	20.91	20.91	20.86
DC-HSDPA Subtest-1	21.34	21.37	21.33
DC-HSDPA Subtest-2	21.30	21.35	21.31
DC-HSDPA Subtest-3	20.81	20.85	20.80
DC-HSDPA Subtest-4	20.83	20.84	20.78
HSUPA Subtest-1	21.29	21.31	21.28
HSUPA Subtest-2	19.38	19.43	19.39
HSUPA Subtest-3	20.37	20.44	20.38
HSUPA Subtest-4	19.42	19.44	19.39
HSUPA Subtest-5	21.39	21.43	21.36

*ERP = Conducted + antenna gain (1.1dBi) - 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	22.51	22.31	22.46
		1	24	22.48	22.30	22.38
		1	49	22.32	22.26	22.29
		25	0	21.61	21.46	21.54
		25	12	21.56	21.41	21.47
		25	25	21.42	21.28	21.33
		50	0	21.53	21.44	21.47
10M	16QAM	1	0	21.59	21.50	21.54
		1	24	21.56	21.47	21.50
		1	49	21.47	21.38	21.47
		25	0	20.53	20.52	20.53
		25	12	20.51	20.37	20.47
		25	25	20.44	20.39	20.44
		50	0	-	-	-

*ERP = Conducted + antenna gain (1.1dBi) - 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	22.45	22.23	22.37
		1	12	22.42	22.21	22.33
		1	24	22.22	22.26	22.20
		12	0	21.53	21.36	21.49
		12	6	21.52	21.41	21.38
		12	13	21.37	21.23	21.31
		25	0	21.53	21.36	21.44
5M	16QAM	1	0	21.56	21.47	21.53
		1	12	21.55	21.45	21.50
		1	24	21.37	21.30	21.37
		12	0	20.53	20.44	20.45
		12	6	20.42	20.34	20.38
		12	13	20.37	20.31	20.35
		25	0	20.43	20.37	20.39

*ERP = Conducted + antenna gain (1.1dBi) - 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	22.49	22.21	22.43
		1	7	22.38	22.27	22.35
		1	14	22.28	22.17	22.19
		8	0	21.59	21.37	21.49
		8	3	21.46	21.36	21.38
		8	7	21.42	21.21	21.29
		15	0	21.46	21.37	21.37
3M	16QAM	1	0	21.53	21.45	21.46
		1	7	21.46	21.44	21.41
		1	14	21.45	21.30	21.42
		8	0	20.43	20.43	20.50
		8	3	20.45	20.28	20.41
		8	7	20.42	20.31	20.41
		15	0	20.38	20.27	20.39

*ERP = Conducted + antenna gain (1.1dBi) - 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	22.44	22.22	22.31
		1	2	22.43	22.11	22.17
		1	5	22.14	22.09	22.18
		3	0	22.42	22.33	22.49
		3	1	22.41	22.30	22.26
		3	3	22.29	22.14	22.24
		6	0	21.42	21.26	21.36
1.4M	16QAM	1	0	21.52	21.36	21.47
		1	2	21.54	21.29	21.34
		1	5	21.33	21.31	21.33
		3	0	21.49	21.39	21.42
		3	1	21.41	21.29	21.44
		3	3	21.31	21.26	21.37
		6	0	20.35	20.25	20.22

*ERP = Conducted + antenna gain (1.1dBi) - 2.15

LTE Band 26						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26865	26915	26965
		Frequency (MHz)		831.5	836.5	841.5
15M	QPSK	1	0	22.18	22.08	22.23
		1	37	22.16	22.11	22.20
		1	74	22.10	22.00	22.13
		36	0	21.39	21.31	21.42
		36	19	21.29	21.20	21.37
		36	39	21.16	21.12	21.26
		75	0	21.26	21.17	21.31
15M	16QAM	1	0	21.35	21.28	21.40
		1	37	21.30	21.24	21.36
		1	74	21.27	21.25	21.32
		36	0	-	-	-
		36	19	-	-	-
		36	39	-	-	-
		75	0	-	-	-

*ERP = Conducted + antenna gain (1.1dBi) - 2.15

LTE Band 26						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26840	26915	26990
		Frequency (MHz)		829	836.5	844
10M	QPSK	1	0	22.03	22.05	22.22
		1	24	22.05	22.04	22.11
		1	49	22.08	21.91	22.13
		25	0	21.25	21.25	21.40
		25	12	21.29	21.17	21.32
		25	25	21.04	21.10	21.22
		50	0	21.18	21.14	21.25
10M	16QAM	1	0	21.28	21.14	21.36
		1	24	21.22	21.18	21.27
		1	49	21.20	21.15	21.30
		25	0	20.12	20.10	20.39
		25	12	20.08	20.06	20.31
		25	25	20.03	19.98	20.17
		50	0	-	-	-

*ERP = Conducted + antenna gain (1.1dBi) - 2.15

LTE Band 26						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26815	26915	27015
		Frequency (MHz)		826.5	836.5	846.5
5M	QPSK	1	0	21.98	21.91	22.21
		1	12	22.04	21.92	22.20
		1	24	22.08	21.89	22.12
		12	0	21.16	21.18	21.32
		12	6	21.14	21.14	21.35
		12	13	20.90	20.97	21.18
		25	0	21.08	21.03	21.25
5M	16QAM	1	0	21.28	21.08	21.39
		1	12	21.11	21.09	21.26
		1	24	21.17	21.09	21.31
		12	0	20.36	20.27	20.32
		12	6	20.29	20.27	20.21
		12	13	20.26	20.24	20.11
		25	0	20.24	20.22	20.14

*ERP = Conducted + antenna gain (1.1dBi) - 2.15

LTE Band 26						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26805	26915	27025
		Frequency (MHz)		825.5	836.5	847.5
3M	QPSK	1	0	21.96	22.10	22.18
		1	7	22.00	22.05	22.11
		1	14	21.86	22.13	22.09
		8	0	21.18	21.37	21.33
		8	3	21.04	21.18	21.27
		8	7	21.01	21.10	21.23
		15	0	21.05	21.21	21.31
3M	16QAM	1	0	21.02	21.34	21.38
		1	7	21.06	21.26	21.32
		1	14	21.08	21.16	21.22
		8	0	20.28	20.37	20.33
		8	3	20.24	20.27	20.21
		8	7	20.15	20.07	20.09
		15	0	20.13	20.12	20.14

*ERP = Conducted + antenna gain (1.1dBi) - 2.15

LTE Band 26						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26797	26915	27033
		Frequency (MHz)		824.7	836.5	848.3
1.4M	QPSK	1	0	22.05	22.10	22.14
		1	2	21.98	22.07	22.06
		1	5	21.90	22.01	22.06
		3	0	22.18	22.25	22.09
		3	1	22.03	22.18	22.17
		3	3	22.04	22.10	22.06
		6	0	21.10	21.12	21.20
1.4M	16QAM	1	0	21.09	21.36	21.34
		1	2	21.16	21.18	21.26
		1	5	21.12	21.16	21.11
		3	0	21.22	21.27	21.34
		3	1	21.16	21.21	21.22
		3	3	21.13	21.14	21.06
		6	0	20.03	20.11	20.09

*ERP = Conducted + antenna gain (1.1dBi) - 2.15

4.2 Modulation Characteristics Measurement

4.2.1 Limits of Modulation Characteristics

N/A

4.2.2 Test Procedure

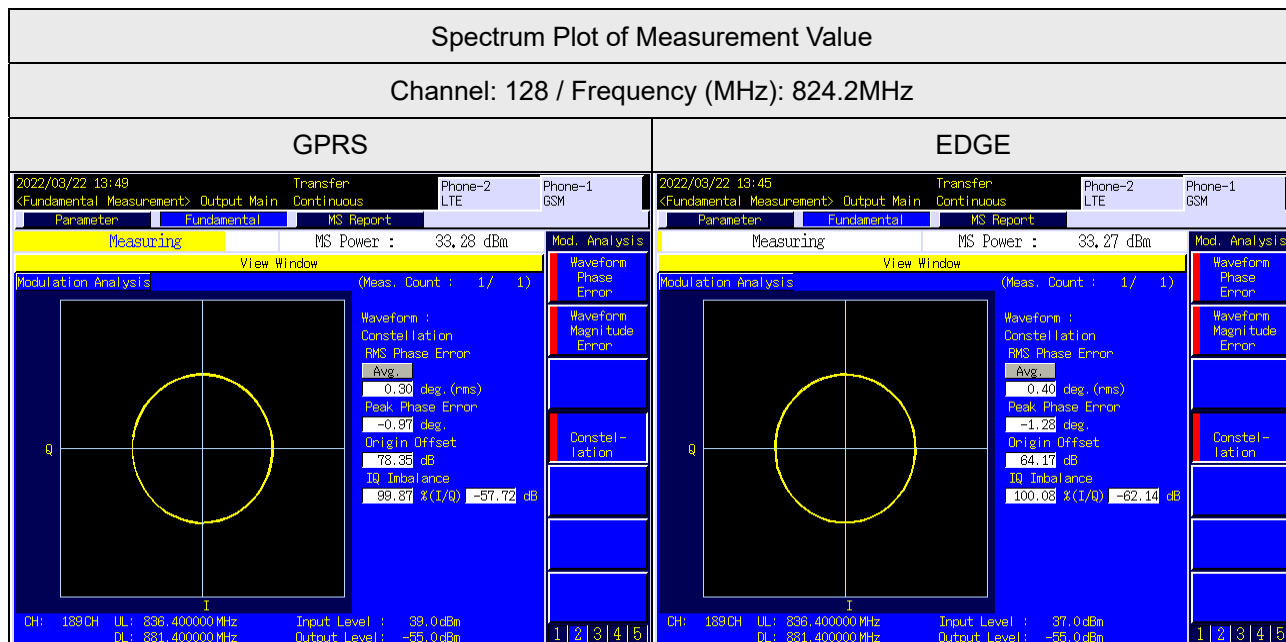
Connect the EUT to Communication Simulator via the antenna connector, The frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

4.2.3 Test Setup

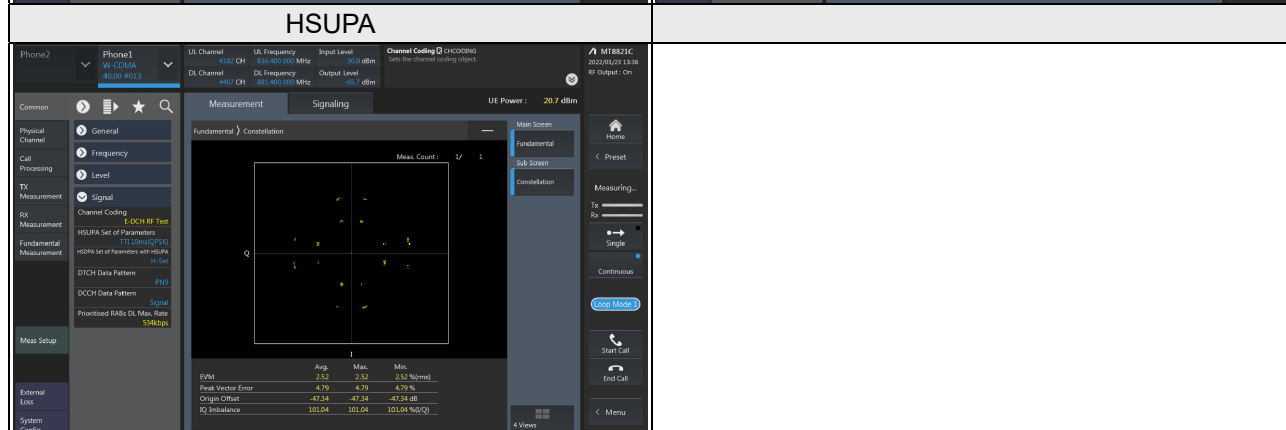
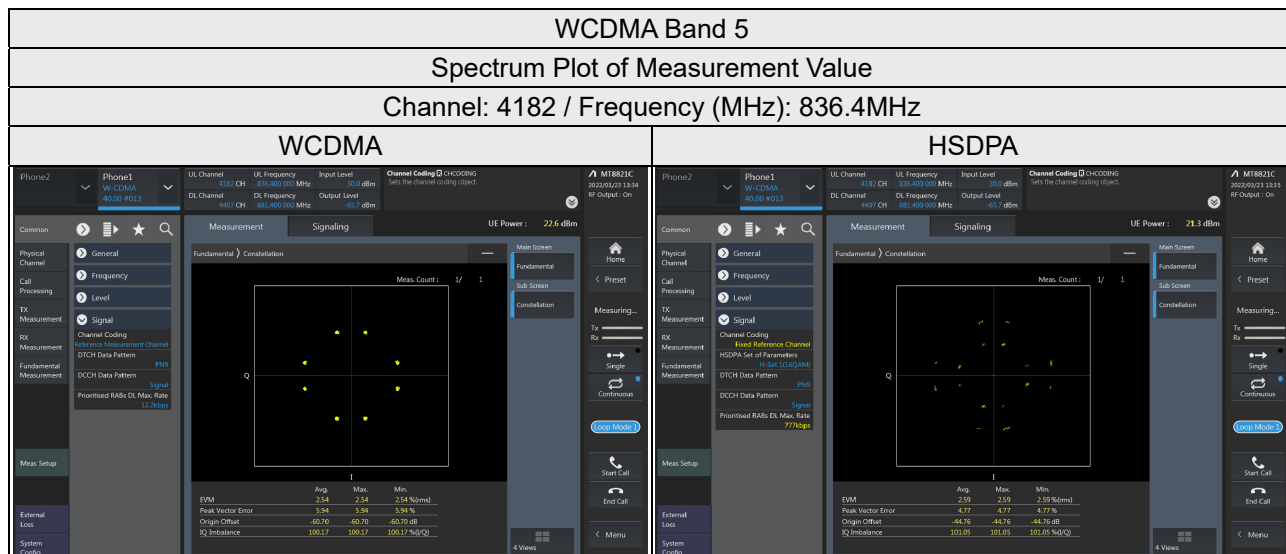


4.2.4 Test Results

GPRS, EDGE



WCDMA

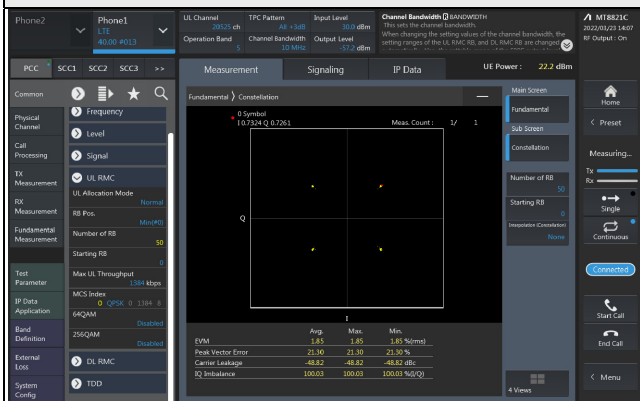


LTE Band 5

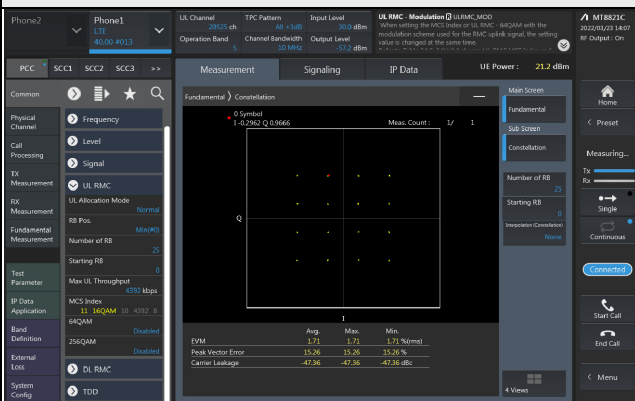
Spectrum Plot of Measurement Value

Channel: 20525 / Frequency (MHz): 836.5MHz

QPSK



16QAM

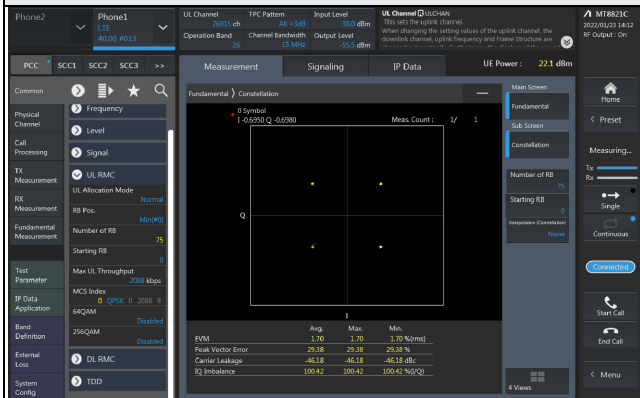


LTE Band 26

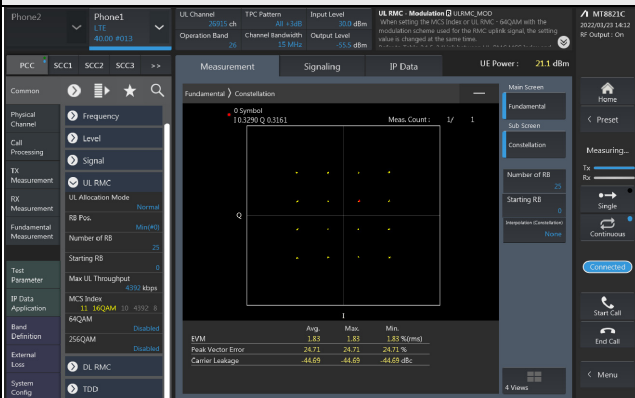
Spectrum Plot of Measurement Value

Channel: 26915 / Frequency (MHz): 836.5MHz

QPSK



16QAM



4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

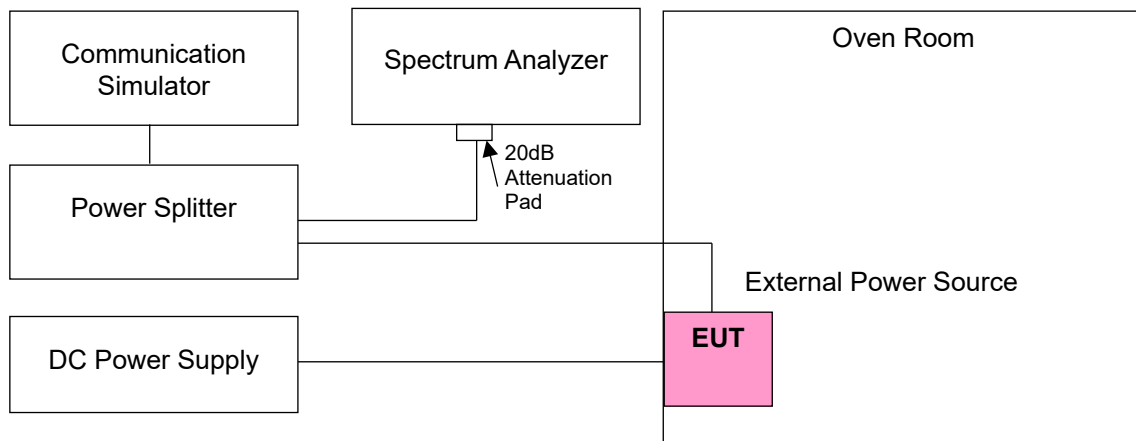
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

4.3.2 Test Procedure

- 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.
- 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.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ± 0.5 °C 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 (Vdc)	GPRS			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	824.200003	0.004	848.800002	0.002
3.7	824.200001	0.001	848.800003	0.004
4.255	824.200002	0.002	848.800004	0.005

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (°C)	GPRS			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	824.200003	0.004	848.800002	0.002
-20	824.200003	0.004	848.800003	0.004
-10	824.200002	0.002	848.800002	0.002
0	824.200003	0.004	848.800004	0.005
10	824.199999	-0.001	848.799999	-0.001
20	824.199998	-0.002	848.799996	-0.005
30	824.199999	-0.001	848.799997	-0.004
40	824.199999	-0.001	848.799996	-0.005
50	824.199996	-0.005	848.799997	-0.004

Frequency Error vs. Voltage

Voltage (Vdc)	EDGE			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	824.200004	0.005	848.800003	0.004
3.7	824.200004	0.005	848.800004	0.005
4.255	824.200003	0.004	848.800004	0.005

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (°C)	EDGE			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	824.200001	0.001	848.800003	0.004
-20	824.200002	0.002	848.800003	0.004
-10	824.200002	0.002	848.800004	0.005
0	824.200001	0.001	848.800001	0.001
10	824.199998	-0.002	848.799998	-0.002
20	824.199997	-0.004	848.799999	-0.001
30	824.199996	-0.005	848.799999	-0.001
40	824.199999	-0.001	848.799996	-0.005
50	824.199998	-0.002	848.799996	-0.005

Frequency Error vs. Voltage

Voltage (Vdc)	WCDMA Band 5			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	826.400003	0.004	846.600002	0.002
3.7	826.400003	0.004	846.600001	0.001
4.255	826.400002	0.002	846.600003	0.004

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (°C)	WCDMA Band 5			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	826.400004	0.005	846.600001	0.001
-20	826.400002	0.002	846.600003	0.004
-10	826.400004	0.005	846.600002	0.002
0	826.400003	0.004	846.600001	0.001
10	826.399996	-0.005	846.599997	-0.004
20	826.399998	-0.002	846.599999	-0.001
30	826.399996	-0.005	846.599999	-0.001
40	826.399999	-0.001	846.599998	-0.002
50	826.399998	-0.002	846.599996	-0.005

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 5			
	Channel Bandwidth 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	824.700002	0.002	848.300001	0.001
3.7	824.700003	0.004	848.300003	0.004
4.255	824.700004	0.005	848.300004	0.005

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 5			
	Channel Bandwidth 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	824.700001	0.001	848.300002	0.002
-20	824.700004	0.005	848.300004	0.005
-10	824.700004	0.005	848.300003	0.004
0	824.700004	0.005	848.300004	0.005
10	824.699999	-0.001	848.299999	-0.001
20	824.699999	-0.001	848.299996	-0.005
30	824.699998	-0.002	848.299997	-0.004
40	824.699999	-0.001	848.299998	-0.002
50	824.699998	-0.002	848.299997	-0.004

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 5			
	Channel Bandwidth 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	825.500002	0.002	847.500001	0.001
3.7	825.500004	0.005	847.500001	0.001
4.255	825.500004	0.005	847.500002	0.002

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 5			
	Channel Bandwidth 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	825.500001	0.001	847.500004	0.005
-20	825.500002	0.002	847.500003	0.004
-10	825.500002	0.002	847.500003	0.004
0	825.500004	0.005	847.500003	0.004
10	825.499997	-0.004	847.499999	-0.001
20	825.499998	-0.002	847.499999	-0.001
30	825.499997	-0.004	847.499998	-0.002
40	825.499997	-0.004	847.499996	-0.005
50	825.499998	-0.002	847.499996	-0.005

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 5			
	Channel Bandwidth 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	826.500003	0.004	846.500001	0.001
3.7	826.500003	0.004	846.500002	0.002
4.255	826.500002	0.002	846.500004	0.005

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 5			
	Channel Bandwidth 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	826.500003	0.004	846.500001	0.001
-20	826.500001	0.001	846.500003	0.004
-10	826.500002	0.002	846.500002	0.002
0	826.500002	0.002	846.500004	0.005
10	826.499997	-0.004	846.499998	-0.002
20	826.499999	-0.001	846.499997	-0.004
30	826.499996	-0.005	846.499996	-0.005
40	826.499997	-0.004	846.499996	-0.005
50	826.499997	-0.004	846.499998	-0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 5			
	Channel Bandwidth 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	829.000003	0.004	844.000003	0.004
3.7	829.000002	0.002	844.000002	0.002
4.255	829.000002	0.002	844.000002	0.002

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 5			
	Channel Bandwidth 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	829.000004	0.005	844.000001	0.001
-20	829.000001	0.001	844.000003	0.004
-10	829.000002	0.002	844.000004	0.005
0	829.000003	0.004	844.000002	0.002
10	828.999997	-0.004	843.999999	-0.001
20	828.999999	-0.001	843.999999	-0.001
30	828.999996	-0.005	843.999996	-0.005
40	828.999997	-0.004	843.999997	-0.004
50	828.999996	-0.005	843.999996	-0.005

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 26			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	824.700003	0.004	848.300002	0.002
3.7	824.700004	0.005	848.300003	0.004
4.255	824.700001	0.001	848.300002	0.002

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 26			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	824.700001	0.001	848.300002	0.002
-20	824.700002	0.002	848.300004	0.005
-10	824.700001	0.001	848.300004	0.005
0	824.700002	0.002	848.300003	0.004
10	824.699996	-0.005	848.299999	-0.001
20	824.699999	-0.001	848.299999	-0.001
30	824.699999	-0.001	848.299996	-0.005
40	824.699996	-0.005	848.299998	-0.002
50	824.699999	-0.001	848.299996	-0.005

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 26			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	825.500004	0.005	847.500004	0.005
3.7	825.500003	0.004	847.500003	0.004
4.255	825.500004	0.005	847.500001	0.001

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 26			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	825.500001	0.001	847.500002	0.002
-20	825.500002	0.002	847.500001	0.001
-10	825.500002	0.002	847.500003	0.004
0	825.500004	0.005	847.500004	0.005
10	825.499999	-0.001	847.499997	-0.004
20	825.499996	-0.005	847.499998	-0.002
30	825.499996	-0.005	847.499996	-0.005
40	825.499999	-0.001	847.499999	-0.001
50	825.499996	-0.005	847.499997	-0.004

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 26			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	826.500003	0.004	846.500002	0.002
3.7	826.500002	0.002	846.500001	0.001
4.255	826.500003	0.004	846.500003	0.004

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 26			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	826.500003	0.004	846.500001	0.001
-20	826.500003	0.004	846.500004	0.005
-10	826.500002	0.002	846.500002	0.002
0	826.500002	0.002	846.500003	0.004
10	826.499996	-0.005	846.499997	-0.004
20	826.499997	-0.004	846.499999	-0.001
30	826.499998	-0.002	846.499997	-0.004
40	826.499999	-0.001	846.499996	-0.005
50	826.499999	-0.001	846.499998	-0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 26			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	829.000001	0.001	844.000004	0.005
3.7	829.000004	0.005	844.000004	0.005
4.255	829.000002	0.002	844.000004	0.005

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 26			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	829.000001	0.001	844.000003	0.004
-20	829.000004	0.005	844.000001	0.001
-10	829.000003	0.004	844.000004	0.005
0	829.000001	0.001	844.000003	0.004
10	828.999997	-0.004	843.999996	-0.005
20	828.999997	-0.004	843.999999	-0.001
30	828.999996	-0.005	843.999996	-0.005
40	828.999998	-0.002	843.999998	-0.002
50	828.999997	-0.004	843.999996	-0.005

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 26			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.145	831.500003	0.004	841.500002	0.002
3.7	831.500004	0.005	841.500002	0.002
4.255	831.500003	0.004	841.500003	0.004

Note: The applicant defined the normal working voltage is from 3.145Vdc to 4.255Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 26			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	831.500004	0.005	841.500001	0.001
-20	831.500002	0.002	841.500002	0.002
-10	831.500004	0.005	841.500003	0.004
0	831.500002	0.002	841.500004	0.005
10	831.499996	-0.005	841.499996	-0.005
20	831.499997	-0.004	841.499997	-0.004
30	831.499996	-0.005	841.499997	-0.004
40	831.499996	-0.005	841.499999	-0.001
50	831.499998	-0.002	841.499999	-0.001

4.4 Occupied Bandwidth Measurement

4.4.1 Limits of Occupied Bandwidth Measurement

The occupied bandwidth (OBW), that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 % of the total mean power radiated by a given emission.

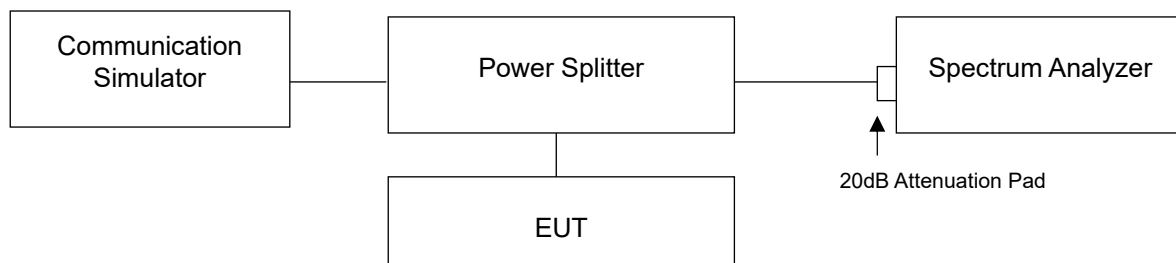
4.4.2 Test Procedure

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

- 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.
- The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set $\geq 3 \times$ RBW.
- 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.
- 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.
- Set spectrum analyzer detection mode to peak, and the trace mode to max hold.
- 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).
- 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.
- Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the “-X dB amplitude” determined in step f). If a marker is below this “-X dB amplitude” value it should be as close as possible to this value. The OBW is the positive frequency difference between the two markers.
- The 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.

4.4.3 Test Setup

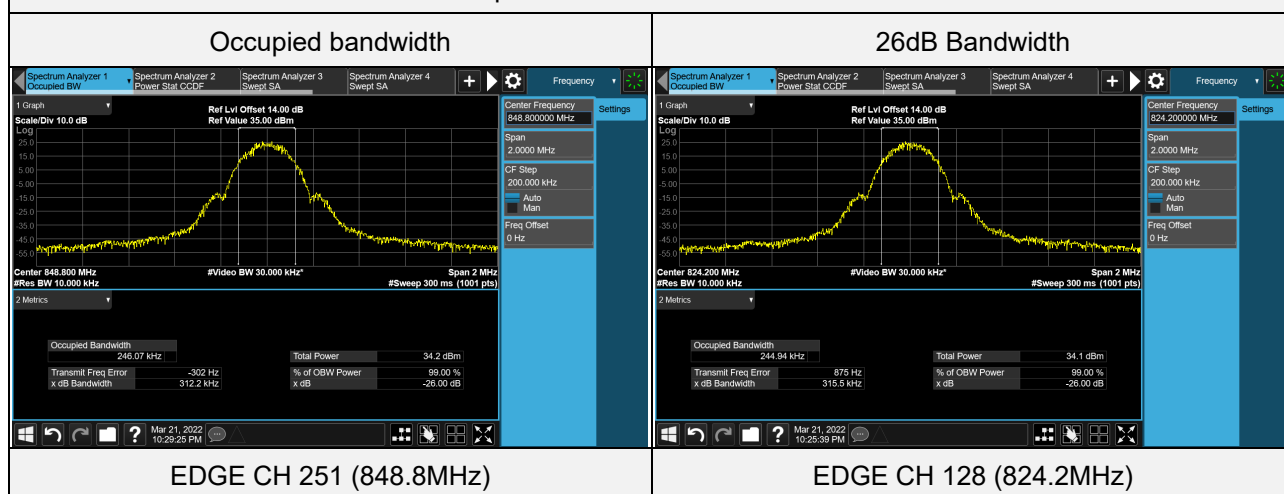


4.4.4 Test Result

GPRS, EDGE

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (kHz)	26dB Bandwidth (kHz)
GPRS	128	824.2	245.17	309.30
GPRS	189	836.4	244.61	313.20
GPRS	251	848.8	245.79	310.80
EDGE	128	824.2	244.94	315.50
EDGE	189	836.4	245.87	314.50
EDGE	251	848.8	246.07	312.20

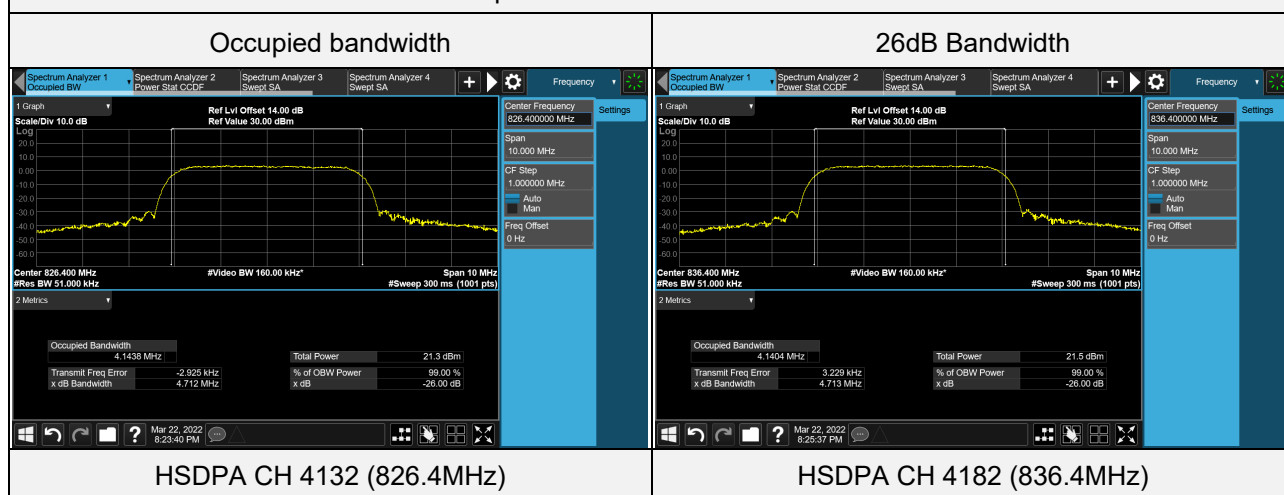
Spectrum Plot of Worst Value



WCDMA Band 5

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
WCDMA	4132	826.4	4.1349	4.697
WCDMA	4182	836.4	4.1325	4.703
WCDMA	4233	846.6	4.1332	4.703
HSDPA	4132	826.4	4.1438	4.712
HSDPA	4182	836.4	4.1404	4.713
HSDPA	4233	846.6	4.1360	4.698
HSUPA	4132	826.4	4.1357	4.709
HSUPA	4182	836.4	4.1321	4.708
HSUPA	4233	846.6	4.1357	4.710

Spectrum Plot of Worst Value

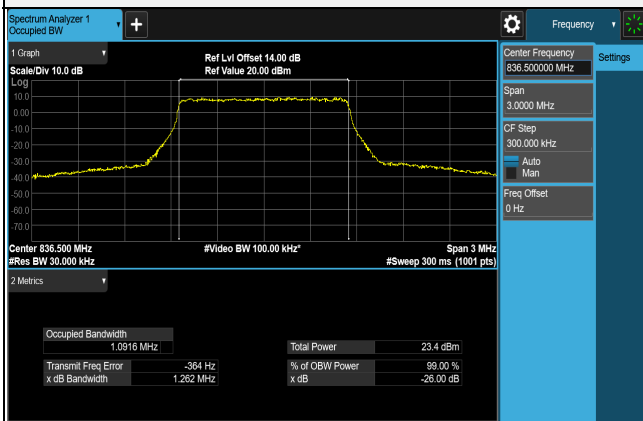


LTE Band 5 (Channel Bandwidth 1.4MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	20407	824.7	1.0910	1.258
QPSK	20525	836.5	1.0916	1.262
QPSK	20643	848.3	1.0900	1.257
16QAM	20407	824.7	1.0875	1.246
16QAM	20525	836.5	1.0876	1.249
16QAM	20643	848.3	1.0879	1.244

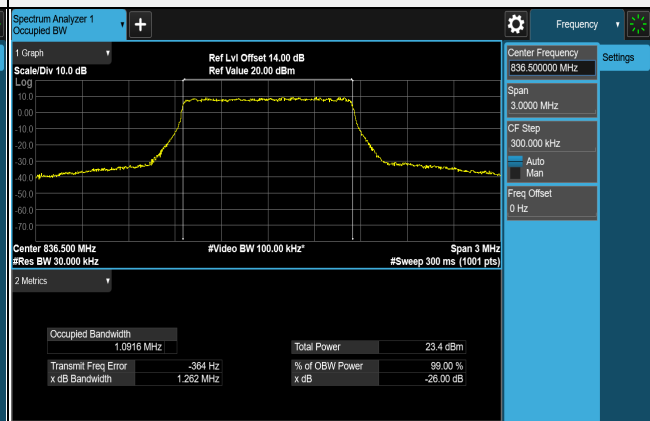
Spectrum Plot of Worst Value

Occupied bandwidth



QPSK CH 20525 (836.5MHz)

26dB Bandwidth



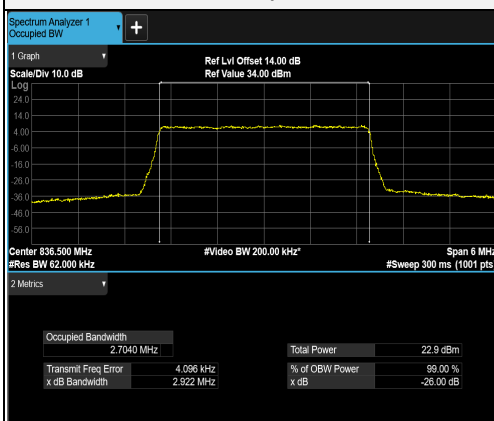
QPSK CH 20525 (836.5MHz)

LTE Band 5 (Channel Bandwidth 3MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	20415	825.5	2.6948	2.899
QPSK	20525	836.5	2.7040	2.922
QPSK	20635	847.5	2.6967	2.909
16QAM	20415	825.5	2.6949	2.921
16QAM	20525	836.5	2.6992	2.922
16QAM	20635	847.5	2.6981	2.925

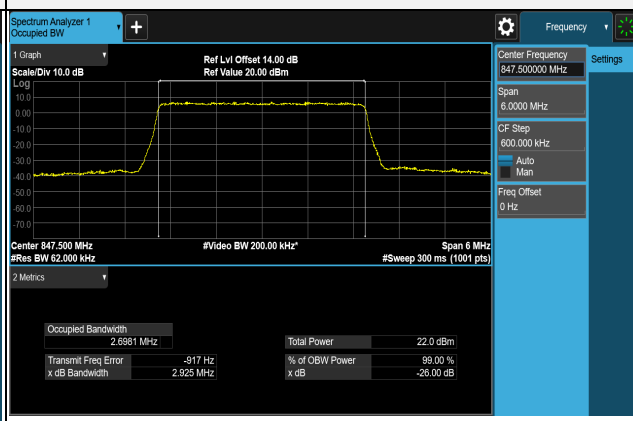
Spectrum Plot of Worst Value

Occupied bandwidth



QPSK CH 20525 (836.5MHz)

26dB Bandwidth

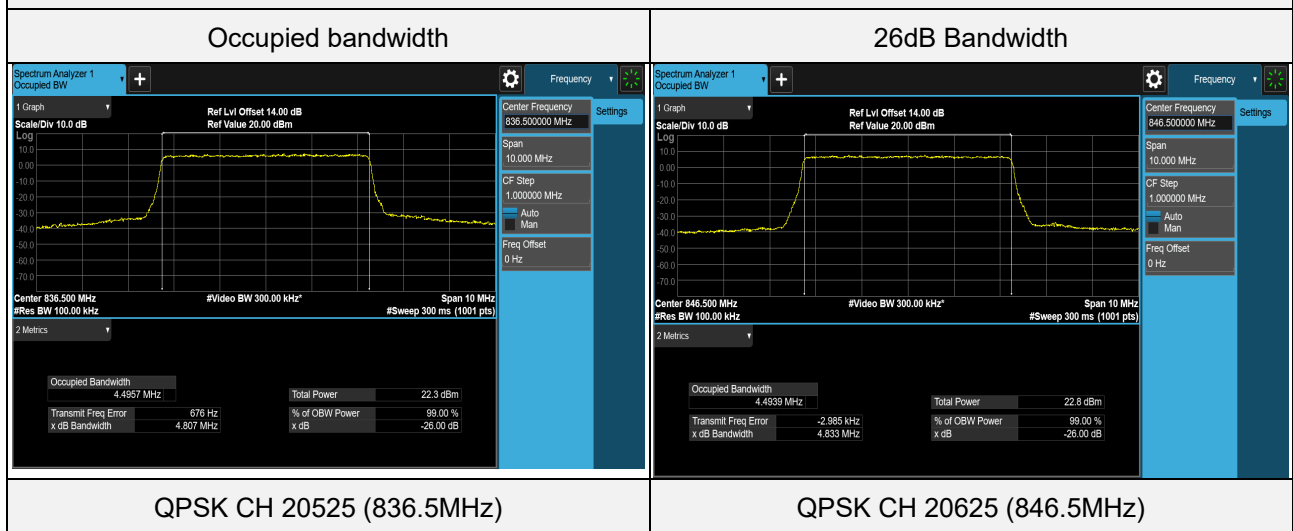


16QAM CH 20635 (847.5MHz)

LTE Band 5 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	20425	826.5	4.4934	4.811
QPSK	20525	836.5	4.4957	4.807
QPSK	20625	846.5	4.4939	4.833
16QAM	20425	826.5	4.4900	4.818
16QAM	20525	836.5	4.4873	4.814
16QAM	20625	846.5	4.4884	4.816

Spectrum Plot of Worst Value

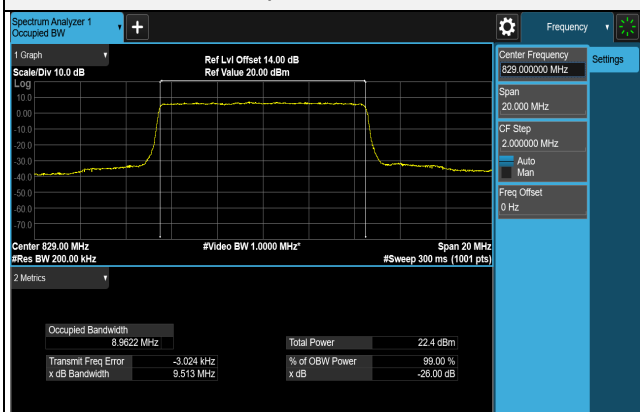


LTE Band 5 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	20450	829	8.9622	9.513
QPSK	20525	836.5	8.9590	9.527
QPSK	20600	844	8.9568	9.506
16QAM	20450	829	4.5681	5.053
16QAM	20525	836.5	4.5663	5.078
16QAM	20600	844	4.5660	5.101

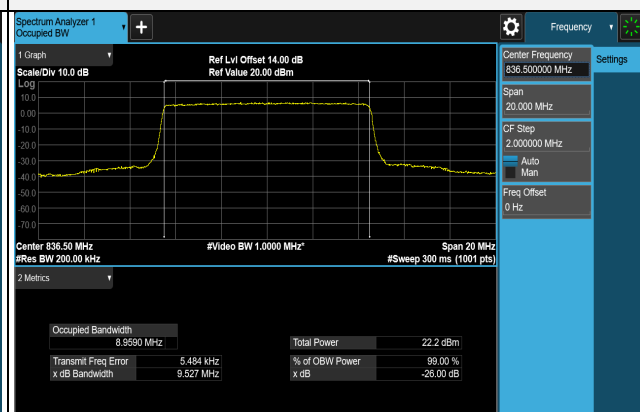
Spectrum Plot of Worst Value

Occupied bandwidth



QPSK CH 20450 (829MHz)

26dB Bandwidth

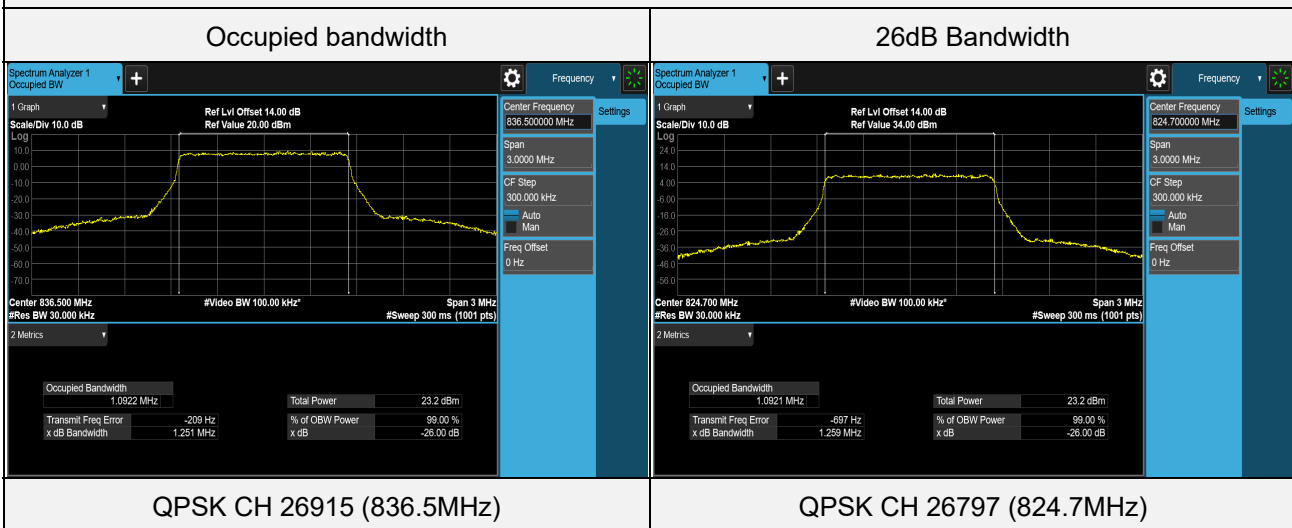


QPSK CH 20525 (836.5MHz)

LTE Band 26 (Channel Bandwidth 1.4MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	26797	824.7	1.0921	1.259
QPSK	26915	836.5	1.0922	1.251
QPSK	27033	848.3	1.0906	1.259
16QAM	26797	824.7	1.0883	1.250
16QAM	26915	836.5	1.0891	1.248
16QAM	27033	848.3	1.0888	1.250

Spectrum Plot of Worst Value

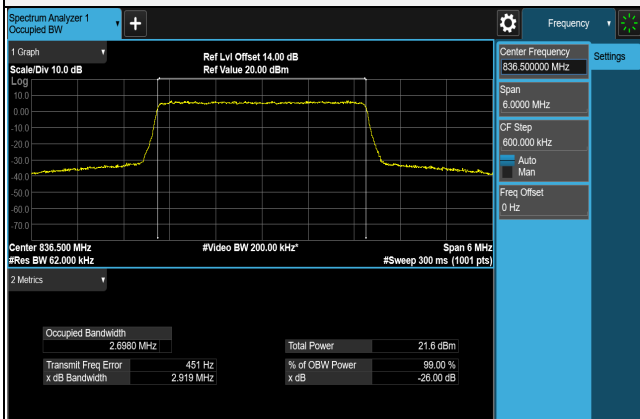


LTE Band 26 (Channel Bandwidth 3MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	26805	825.5	2.6964	2.915
QPSK	26915	836.5	2.6969	2.907
QPSK	27025	847.5	2.6967	2.906
16QAM	26805	825.5	2.6956	2.916
16QAM	26915	836.5	2.6980	2.919
16QAM	27025	847.5	2.6976	2.922

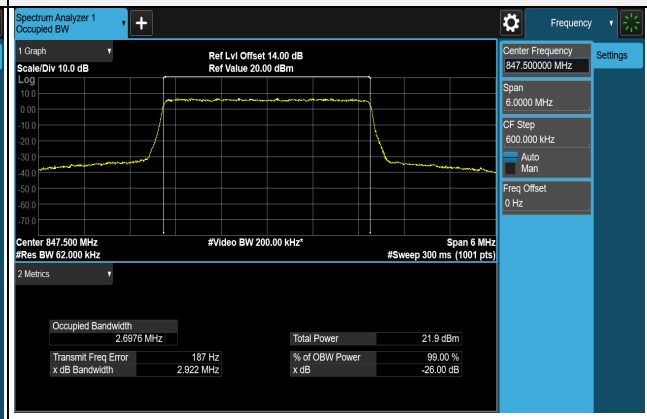
Spectrum Plot of Worst Value

Occupied bandwidth



16QAM CH 26915 (836.5MHz)

26dB Bandwidth



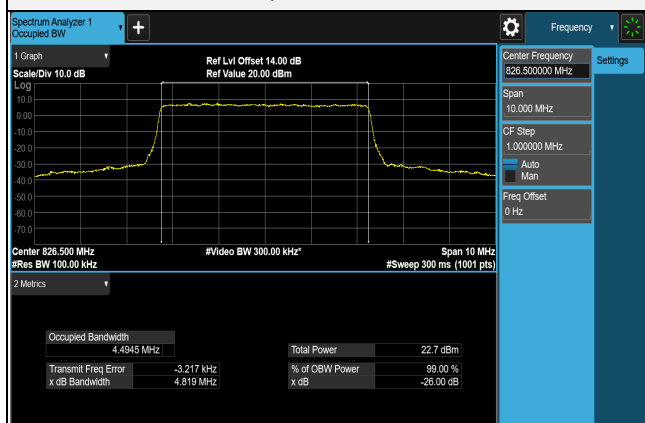
16QAM CH 27025 (847.5MHz)

LTE Band 26 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	26815	826.5	4.4945	4.819
QPSK	26915	836.5	4.4939	4.832
QPSK	27015	846.5	4.4936	4.830
16QAM	26815	826.5	4.4902	4.819
16QAM	26915	836.5	4.4859	4.812
16QAM	27015	846.5	4.4886	4.819

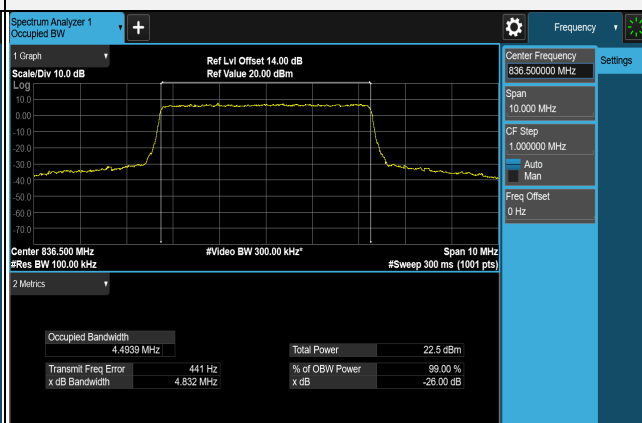
Spectrum Plot of Worst Value

Occupied bandwidth



QPSK CH 26815 (826.5MHz)

26dB Bandwidth



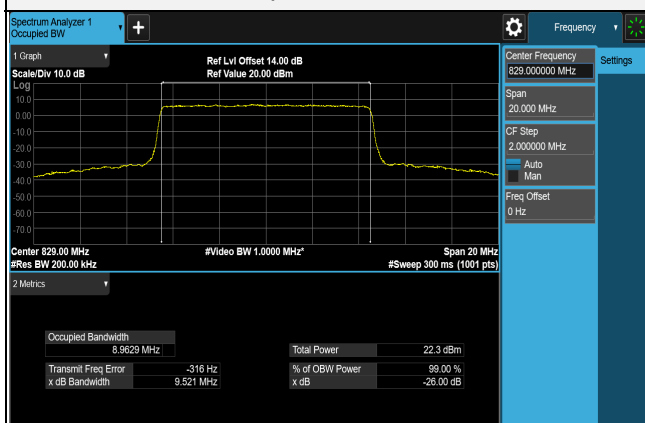
QPSK CH 26915 (836.5MHz)

LTE Band 26 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	26840	829	8.9629	9.521
QPSK	26915	836.5	8.9558	9.524
QPSK	26990	844	8.9580	9.500
16QAM	26840	829	4.5695	5.079
16QAM	26915	836.5	4.5719	5.093
16QAM	26990	844	4.5660	5.112

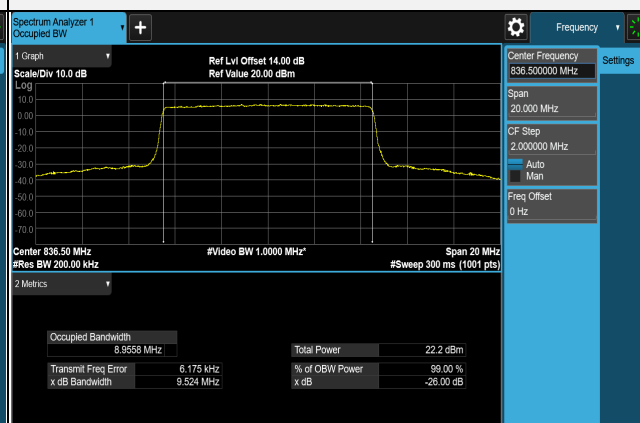
Spectrum Plot of Worst Value

Occupied bandwidth



QPSK CH 26840 (829MHz)

26dB Bandwidth



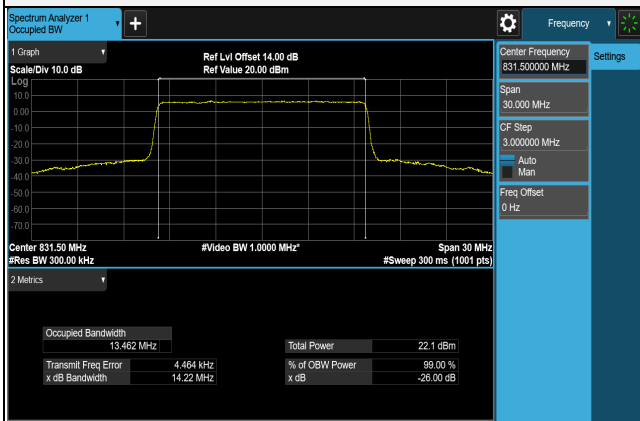
QPSK CH 26915 (836.5MHz)

LTE Band 26 (Channel Bandwidth 15MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	26865	831.5	13.4618	14.222
QPSK	26915	836.5	13.4248	14.236
QPSK	26965	841.5	13.4152	14.221
16QAM	26865	831.5	4.6726	5.357
16QAM	26915	836.5	4.6586	5.291
16QAM	26965	841.5	4.6739	5.319

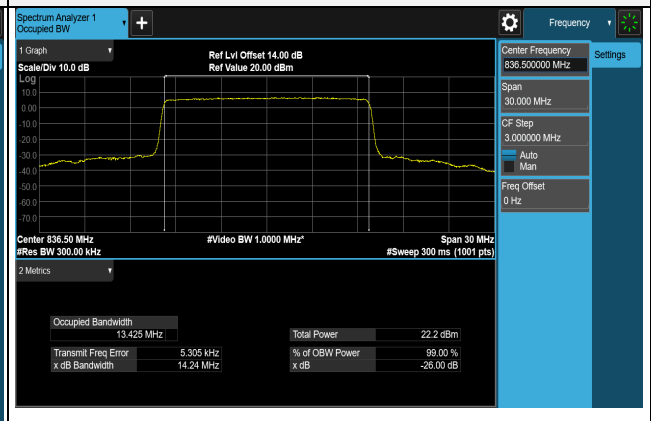
Spectrum Plot of Worst Value

Occupied bandwidth



QPSK CH 26865 (831.5MHz)

26dB Bandwidth



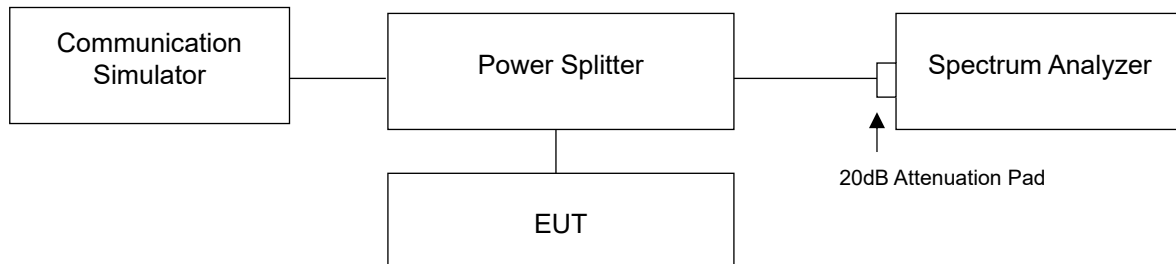
QPSK CH 26915 (836.5MHz)

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

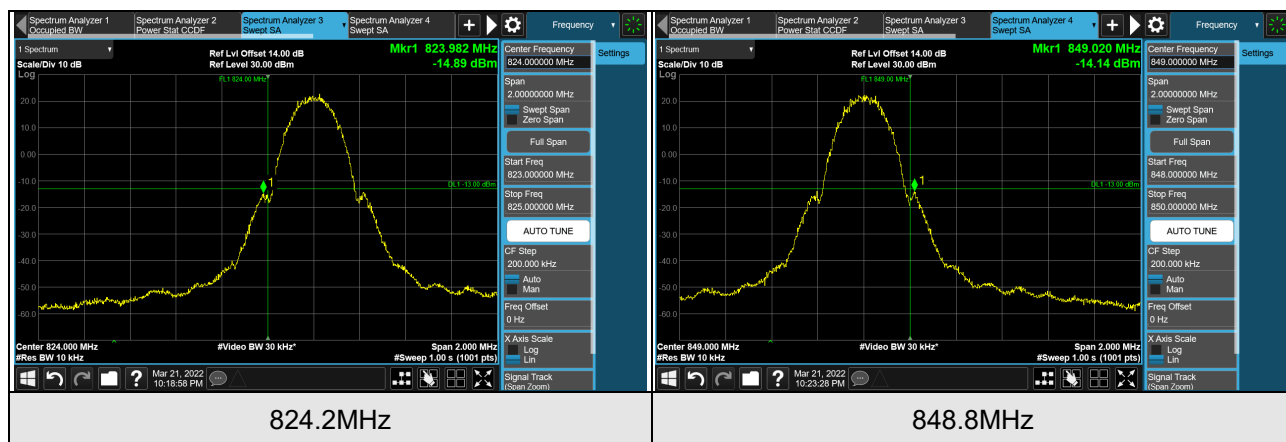


4.5.3 Test Procedures

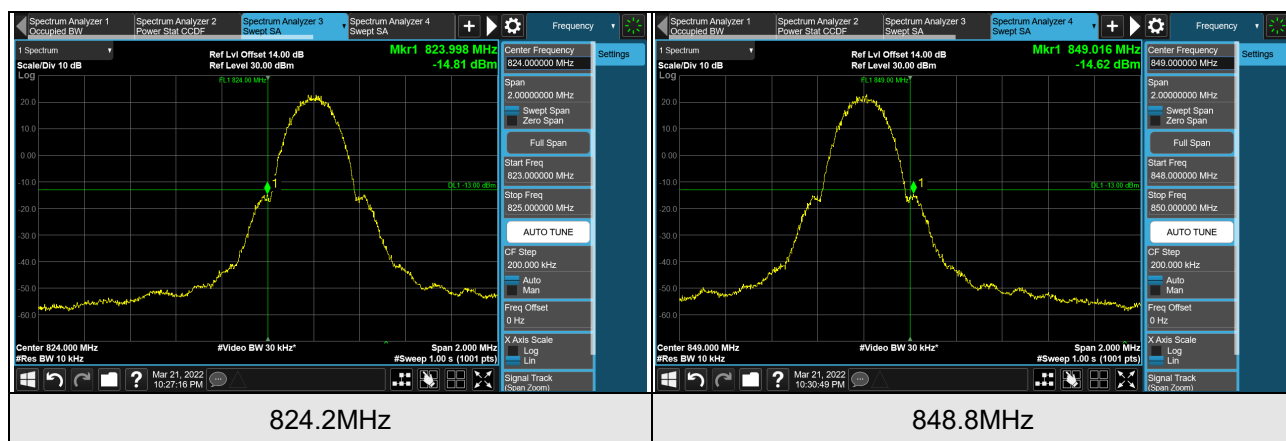
- All measurements were done at low and high operational frequency range.
- The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 10kHz and VB of the spectrum is 30kHz (GPRS / EDGE).
- The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 51kHz and VB of the spectrum is 160kHz (WCDMA / HSDPA / HSUPA).
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 15kHz and VB of the spectrum is 51kHz (LTE Channel Bandwidth 1.4MHz).
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 30kHz and VB of the spectrum is 100kHz (LTE Channel Bandwidth 3MHz).
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 51kHz and VB of the spectrum is 160kHz (LTE Channel Bandwidth 5MHz).
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (LTE Channel Bandwidth 10MHz).
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 150kHz and VB of the spectrum is 470kHz (LTE Channel Bandwidth 15MHz).
- Record the max trace plot into the test report.

4.5.4 Test Results

GPRS



EDGE



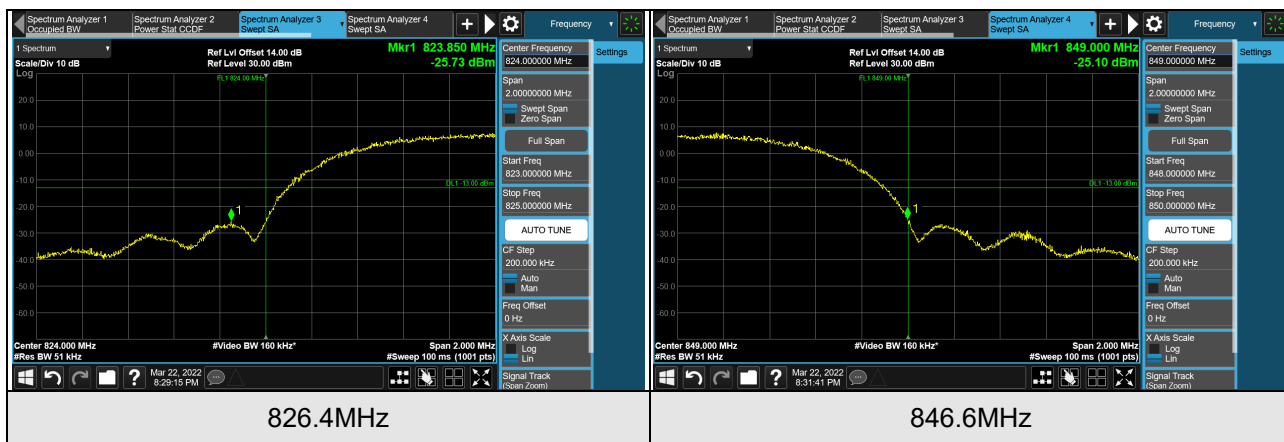
WCDMA



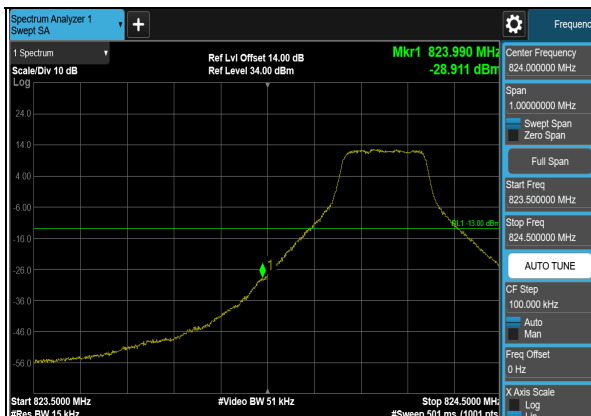
HSDPA



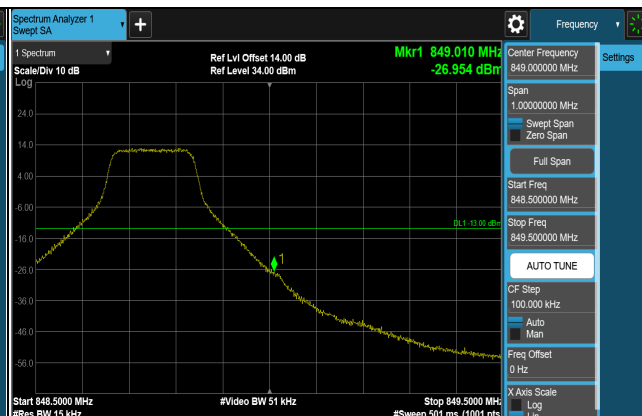
HSUPA



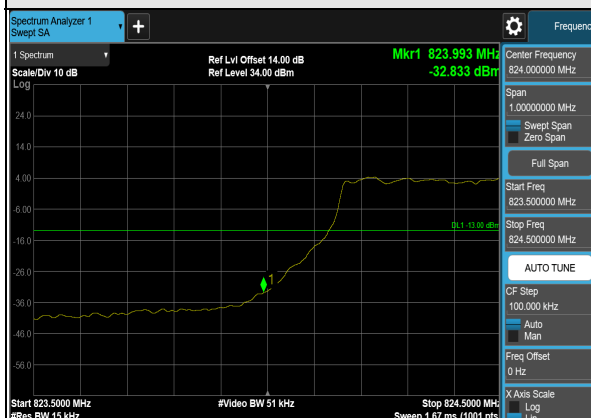
LTE Band 5 (Channel Bandwidth 1.4MHz)



1RB (824.7MHz)



1RB (848.3MHz)

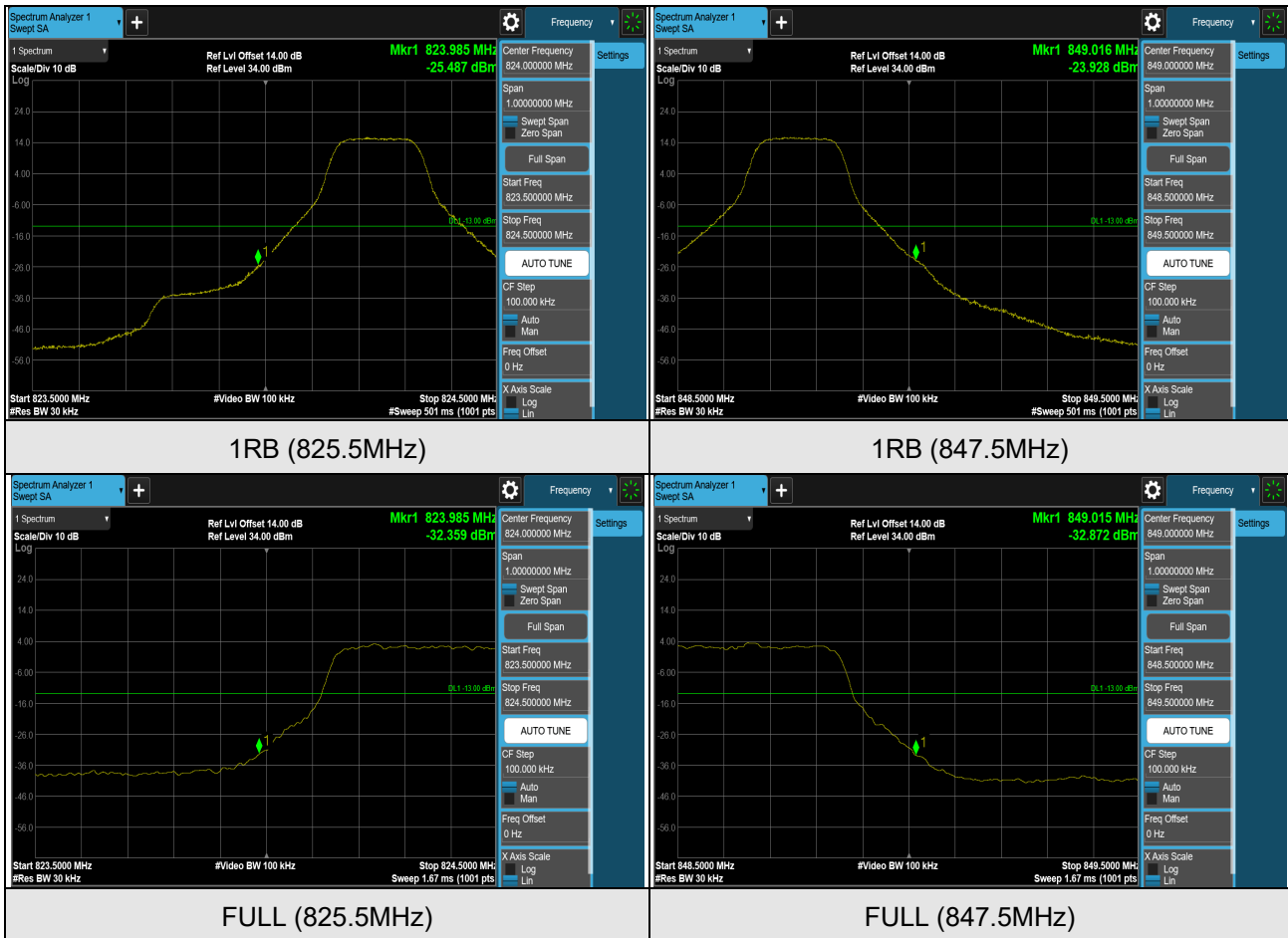


FULL (824.7MHz)

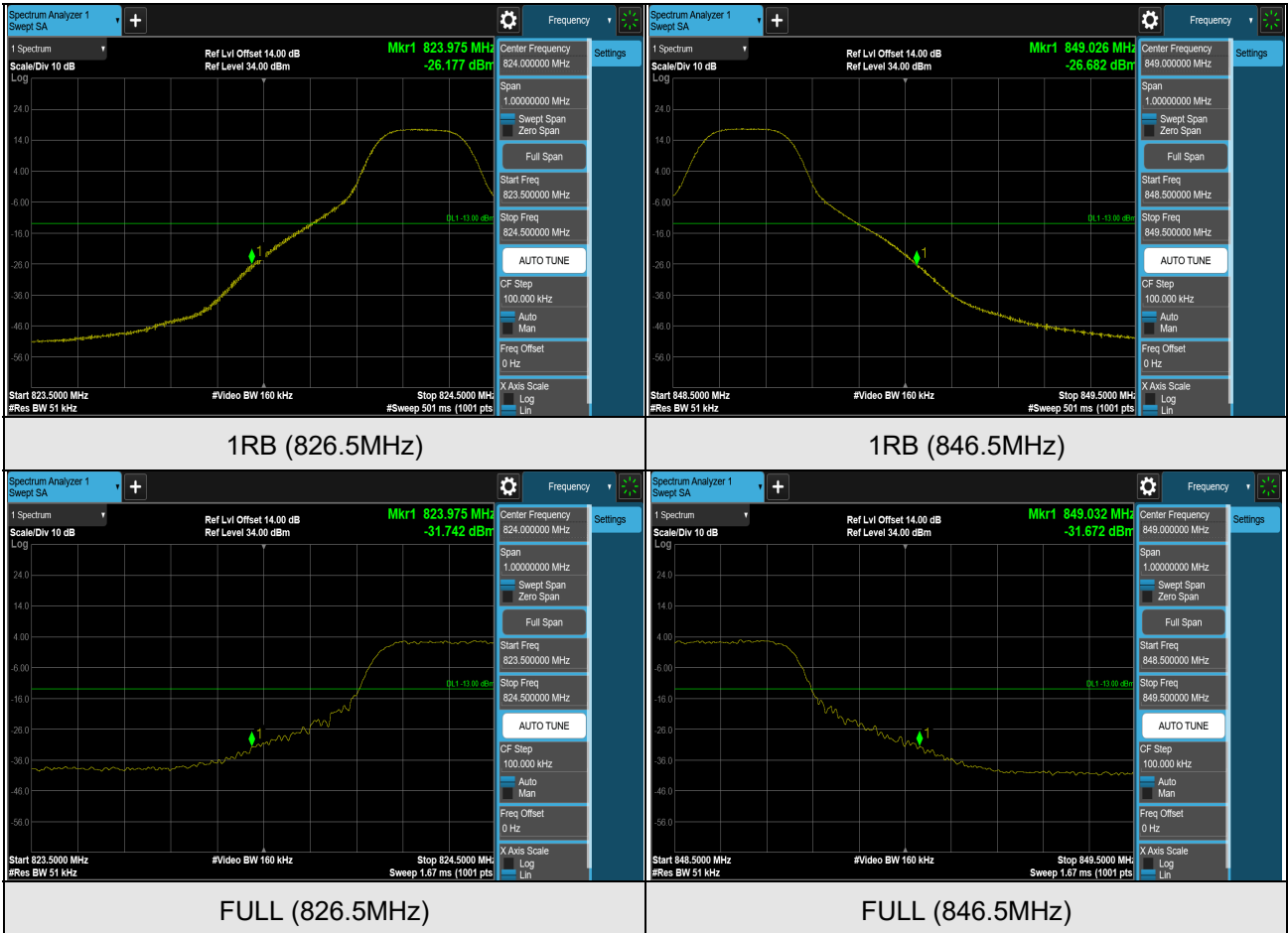


FULL (848.3MHz)

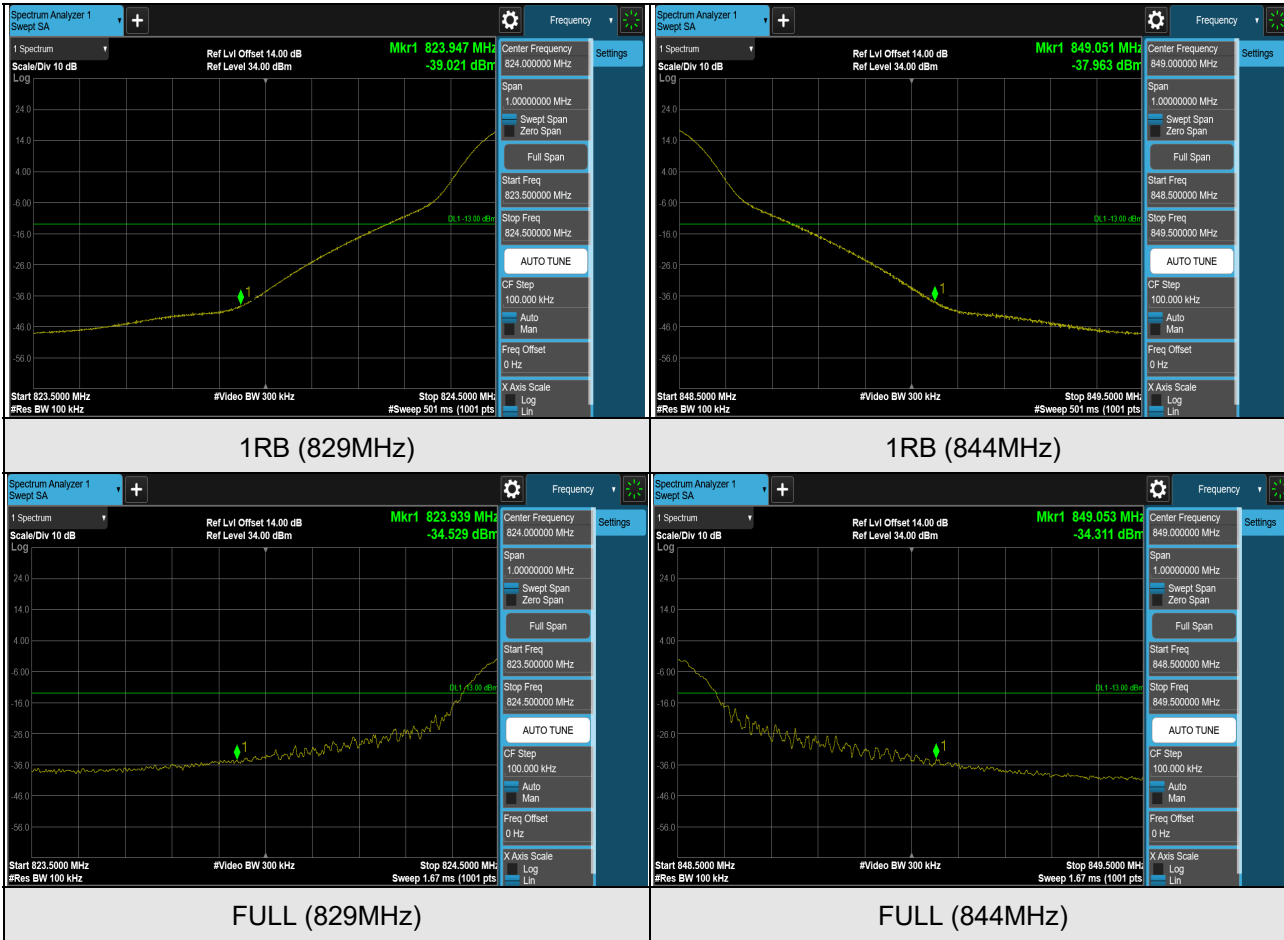
LTE Band 5 (Channel Bandwidth 3MHz)



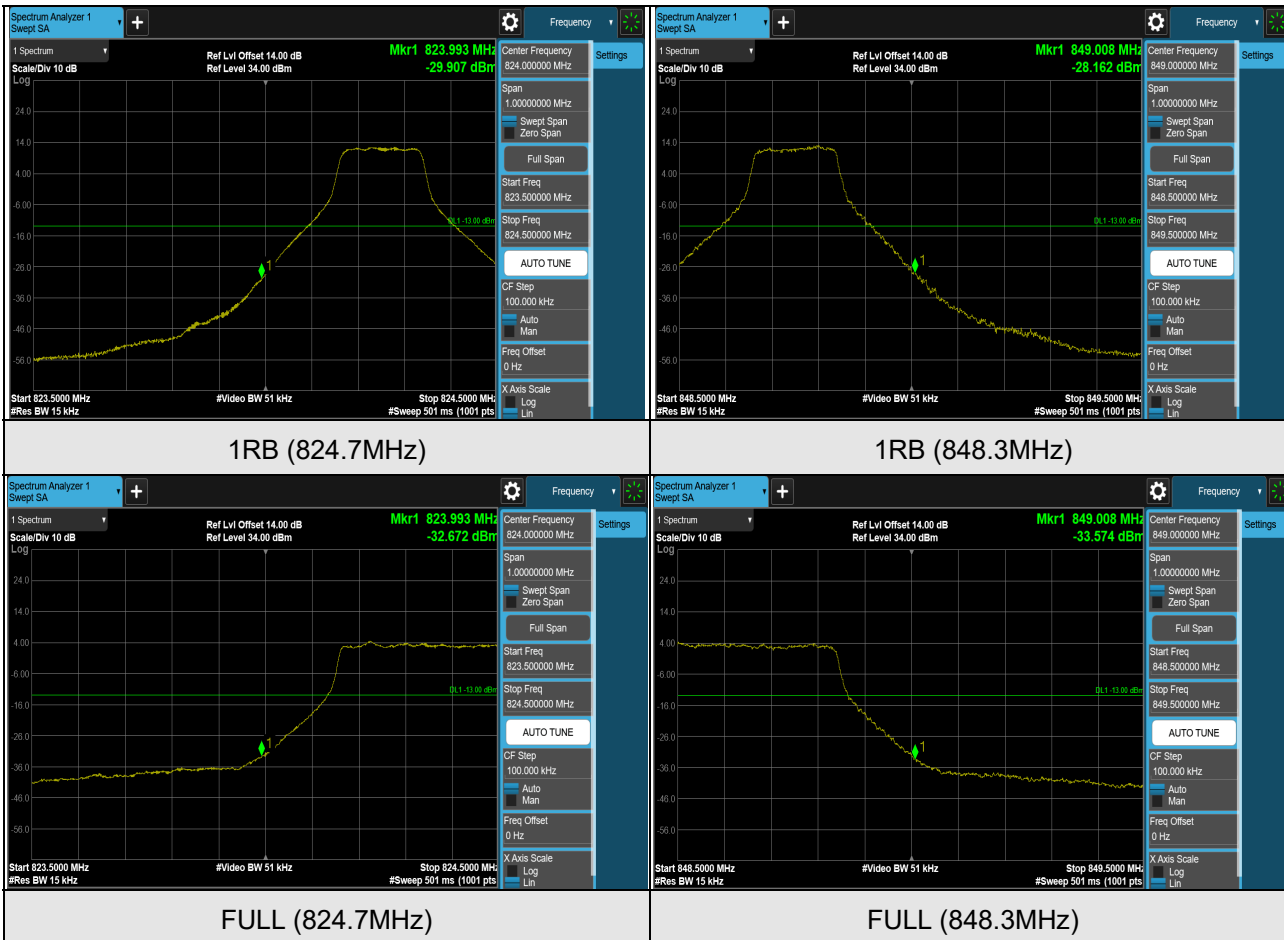
LTE Band 5 (Channel Bandwidth 5MHz)



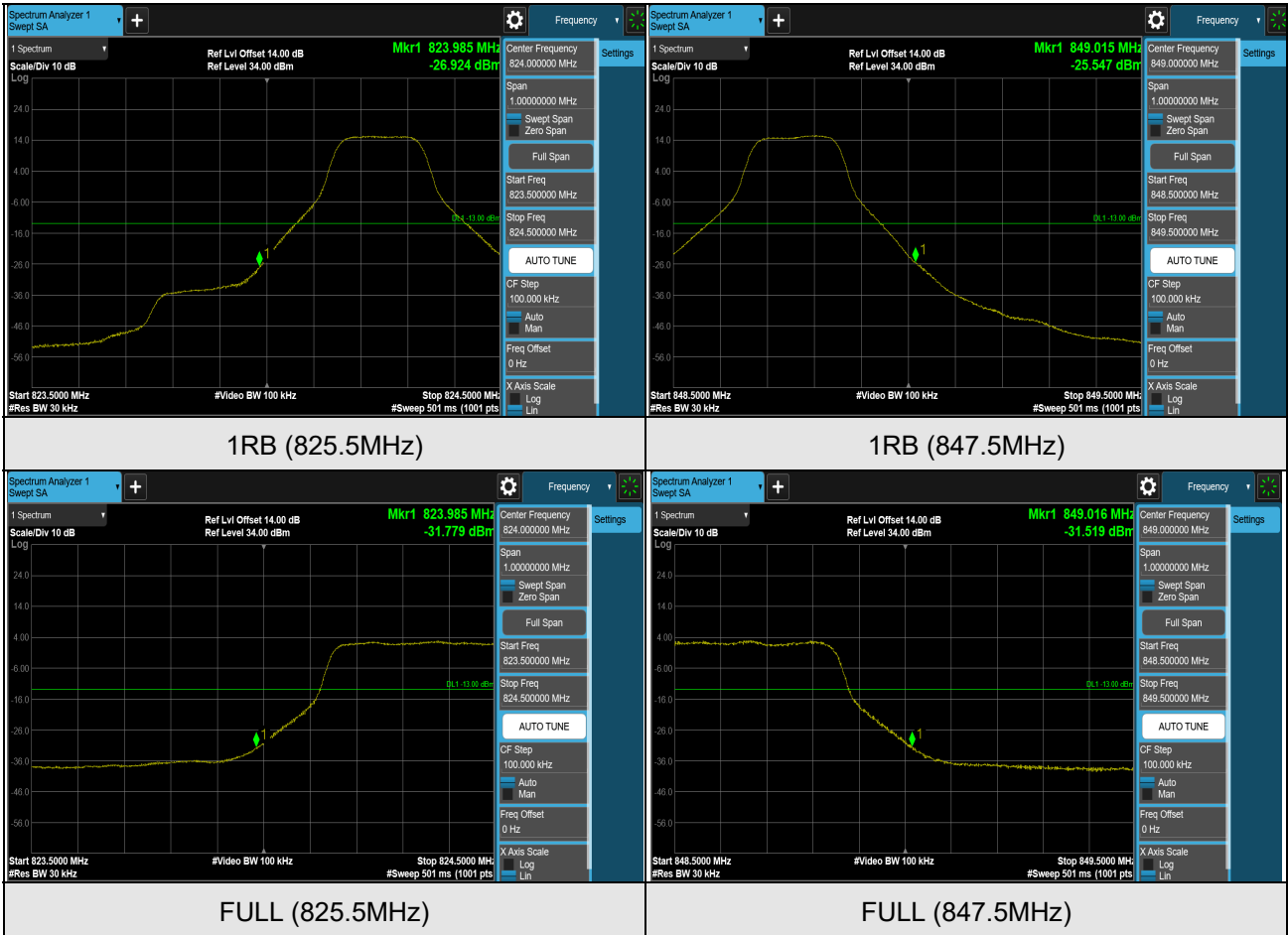
LTE Band 5 (Channel Bandwidth 10MHz)



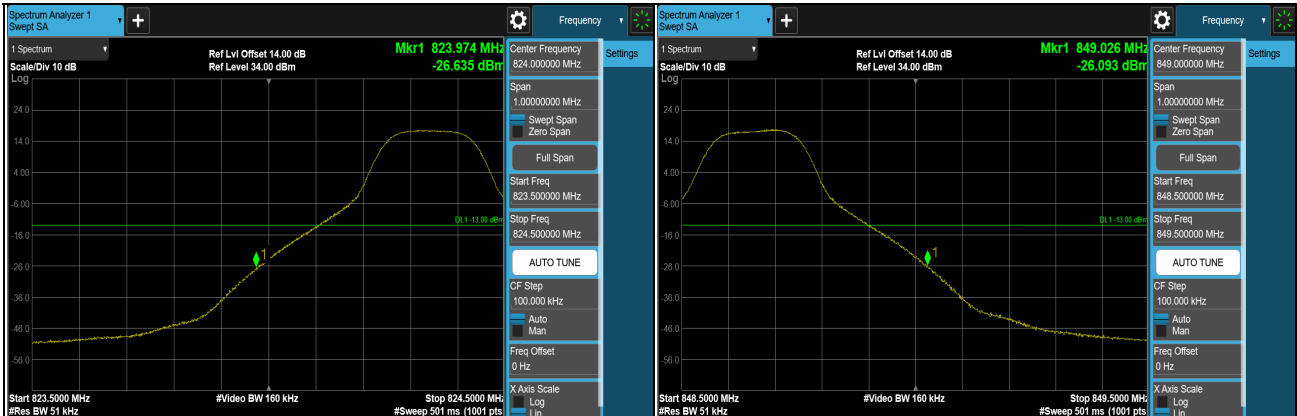
LTE Band 26 (Channel Bandwidth 1.4MHz)



LTE Band 26 (Channel Bandwidth 3MHz)

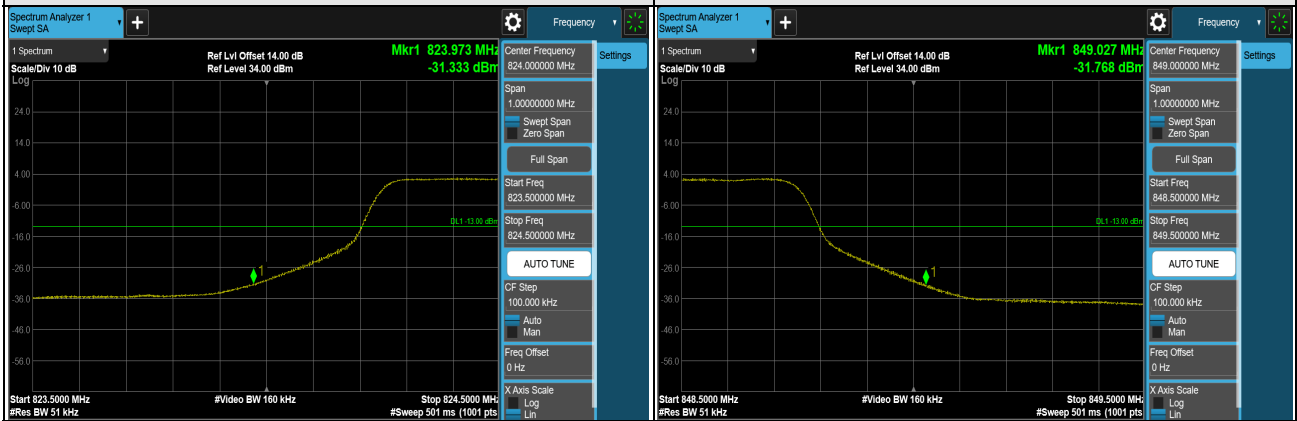


LTE Band 26 (Channel Bandwidth 5MHz)



1RB (826.5MHz)

1RB (846.5MHz)



FULL (826.5MHz)

FULL (846.5MHz)

LTE Band 26 (Channel Bandwidth 10MHz)

