

FCC Test Report

(PART 22)

Report No.: RF181205C03

FCC ID: B32V400M4GWW

Test Model: V400m Plus 4G WW

Received Date: Dec. 05, 2018

Test Date: Dec. 22, 2018 ~ Jan. 04, 2019

Issued Date: Jan. 14, 2019

Applicant: Verifone, Inc.

Address: 1400 West Stanford Ranch Road Suite 200 Rocklin CA 95765 USA

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

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

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

FCC Registration /
Designation Number: 788550 / TW0003



This report is 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. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, 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. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification. The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies

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	9
3.1 General Description of EUT	9
3.2 Configuration of System under Test.....	11
3.2.1 Description of Support Units.....	11
3.3 Test Mode Applicability and Tested Channel Detail	12
3.4 EUT Operating Conditions	14
3.5 General Description of Applied Standards.....	14
4 Test Types and Results.....	15
4.1 Output Power Measurement.....	15
4.1.1 Limits of Output Power Measurement	15
4.1.2 Test Procedures.....	15
4.1.3 Test Setup.....	16
4.1.4 Test Results	17
4.2 Modulation Characteristics Measurement	21
4.2.1 Limits of Modulation Characteristics	21
4.2.2 Test Setup.....	21
4.2.3 Test Procedure	21
4.2.4 Test Results	22
4.3 Frequency Stability Measurement	23
4.3.1 Limits of Frequency Stability Measurement	23
4.3.2 Test Procedure	23
4.3.3 Test Setup.....	23
4.3.4 Test Results	24
4.4 Occupied Bandwidth Measurement.....	31
4.4.1 Test Procedure	31
4.4.2 Test Setup.....	31
4.4.3 Test Result.....	32
4.5 Band Edge Measurement	35
4.5.1 Limits of Band Edge Measurement	35
4.5.2 Test Setup.....	35
4.5.3 Test Procedures.....	35
4.5.4 Test Results	36
4.6 Peak to Average Ratio	42
4.6.1 Limits of Peak to Average Ratio Measurement	42
4.6.2 Test Setup.....	42
4.6.3 Test Procedures.....	42
4.6.4 Test Results	43
4.7 Conducted Spurious Emissions.....	46
4.7.1 Limits of Conducted Spurious Emissions Measurement.....	46
4.7.2 Test Setup.....	46
4.7.3 Test Procedure	46
4.7.4 Test Results	47
4.8 Radiated Emission Measurement.....	54
4.8.1 Limits of Radiated Emission Measurement	54
4.8.2 Test Procedure	54
4.8.3 Deviation from Test Standard	54
4.8.4 Test Setup.....	55
4.8.5 Test Results	56

5 Pictures of Test Arrangements	92
Appendix – Information of the Testing Laboratories	93

Release Control Record

Issue No.	Description	Date Issued
RF181205C03	Original Release	Jan. 14, 2019

1 Certificate of Conformity

Product: Point of Sale Terminal

Brand: Verifone

Test Model: V400m Plus 4G WW

Sample Status: Identical Prototype

Applicant: Verifone, Inc.

Test Date: Dec. 22, 2018 ~ Jan. 04, 2019

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 : Flora Huang, **Date:** Jan. 14, 2019
Flora Huang / Specialist

Approved by : Dylan Chiou, **Date:** Jan. 14, 2019
Dylan Chiou / 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.
---	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 -20.34 dB at 2472.60 MHz.

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	30 MHz ~ 200 MHz	2.93 dB
	200 MHz ~ 1000 MHz	2.95 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	2.26 dB
	18 GHz ~ 40 GHz	1.94 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent	N9038A	MY51210203	Mar. 16, 2018	Mar. 15, 2019
Spectrum Analyzer Agilent	N9010A	MY52220314	Dec. 13, 2018	Dec. 12, 2019
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Jan. 11, 2018	Jan. 10, 2019
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-969	Nov. 25, 2018	Nov. 24, 2019
BILOG Antenna SCHWARZBECK	VULB 9168	9168-472	Nov. 23, 2018	Nov. 22, 2019
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 16, 2018	Apr. 15, 2019
MXG Vector signal generator Agilent	N5182B	MY53050430	Nov. 19, 2018	Nov. 18, 2019
Preamplifier EMCI	EMC 330H	980112	Oct. 12, 2018	Oct. 11, 2019
Preamplifier EMCI	EMC 012645	980115	Oct. 12, 2018	Oct. 11, 2019
Power Meter Anritsu	ML2495A	1012010	Sep. 05, 2018	Sep. 04, 2019
Power Sensor Anritsu	MA2411B	1315050	Sep. 04, 2018	Sep. 03, 2019
RF Coaxial Cable HUBER+SUHNNER	EMC104-SM-SM- 8000&3000	140811+170717	Oct. 12, 2018	Oct. 11, 2019
RF Coaxial Cable HUBER+SUHNNER	SUCOFLEX 104	EMC104-SM-SM- 1000(140807)	Oct. 12, 2018	Oct. 11, 2019
RF Coaxial Cable WOKEN	8D-FB	Cable-Ch10-01	Oct. 12, 2018	Oct. 11, 2019
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA
Communications Tester- Wireless Agilent	8960 Series 10	MY53201073	Jun. 28, 2017	Jun. 27, 2019
Radio Communication Analyzer Anritsu	MT8820C	6201300640	Aug. 16, 2017	Aug. 15, 2019

Temperature & Humidity Chamber	GTH-120-40-CP-AR	MAA1306-019	Sep. 05, 2018	Sep. 04, 2019
--------------------------------	------------------	-------------	---------------	---------------

- 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 calibration interval of the loop antenna is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
 3. The test was performed in HwaYa Chamber 10.
 4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 5. The FCC Site Registration No. is 690701.
 6. The IC Site Registration No. is 7450F-10.

3 General Information

3.1 General Description of EUT

Product	Point of Sale Terminal	
Brand	Verifone	
Test Model	V400m Plus 4G WW	
Status of EUT	Identical Prototype	
Power Supply Rating	5.0 Vdc (Adapter) 3.85 Vdc (Li-ion battery)	
Modulation Type	GSM/GPRS	GMSK
	EDGE	GMSK, 8PSK
	WCDMA	QPSK
	LTE	QPSK, 16QAM
Frequency Range	GSM/GPRS/EDGE	824.2 ~ 848.8 MHz
	WCDMA	826.4 ~ 846.6 MHz
	LTE 5 (Channel Bandwidth: 1.4 MHz)	824.7 ~ 848.3 MHz
	LTE 5 (Channel Bandwidth: 3 MHz)	825.5 ~ 847.5 MHz
	LTE 5 (Channel Bandwidth: 5 MHz)	826.5 ~ 846.5 MHz
	LTE 5 (Channel Bandwidth: 10 MHz)	829 ~ 844 MHz
Max. ERP Power	GSM/GPRS	1931.97mW
	EDGE	508.16 mW
	WCDMA	211.84 mW
	LTE 5 (Channel Bandwidth: 1.4 MHz)	135.52 mW
	LTE 5 (Channel Bandwidth: 3 MHz)	143.88 mW
	LTE 5 (Channel Bandwidth: 5 MHz)	152.05 mW
	LTE 5 (Channel Bandwidth: 10 MHz)	160.32 mW
Emission Designator	GSM/GPRS	248KGXW
	EDGE	252KG7W
	WCDMA	4M09F9W
	LTE 5 (Channel Bandwidth: 1.4 MHz)	1M09W7D
	LTE 5 (Channel Bandwidth: 3 MHz)	2M70G7D
	LTE 5 (Channel Bandwidth: 5 MHz)	4M49G7D
	LTE 5 (Channel Bandwidth: 10 MHz)	8M96W7D
Antenna Type	Fixed Internal Antenna	
Antenna Gain	0.1 dBi	
Accessory Device	Refer to Note as below	
Data Cable Supplied	Refer to Note as below	

Note:

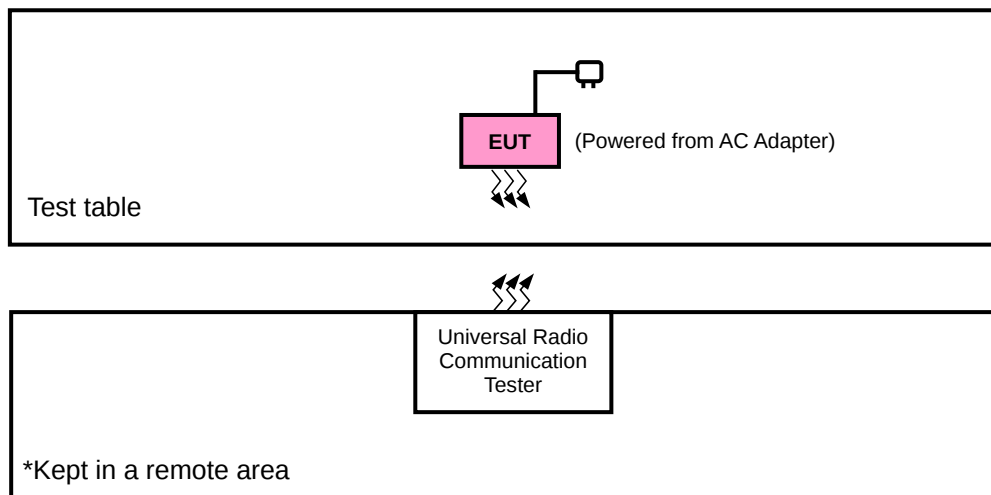
1. The EUT contains following accessory devices.

Product	Brand	Model	Description
Adapter 1	Verifone	AM11A-050A	I/P: 100-240 Vac, 50/60 Hz, 500 mA O/P: 5 Vdc, 2.2 A 1.75m non-shielded cable w/o core Manufacturer: Phihong
Adapter 2	Verifone	VF0402	I/P: 100-240 Vac, 50/60 Hz, 500 mA O/P: 5 Vdc, 2.2 A 1.75m non-shielded cable w/o core Manufacturer: Salcomp
Battery 1	Verifone	BPK475-001	3.85 Vdc, 2890 mAh
Battery 2	Verifone	BPK475-001	3.85 Vdc, 2900 mAh

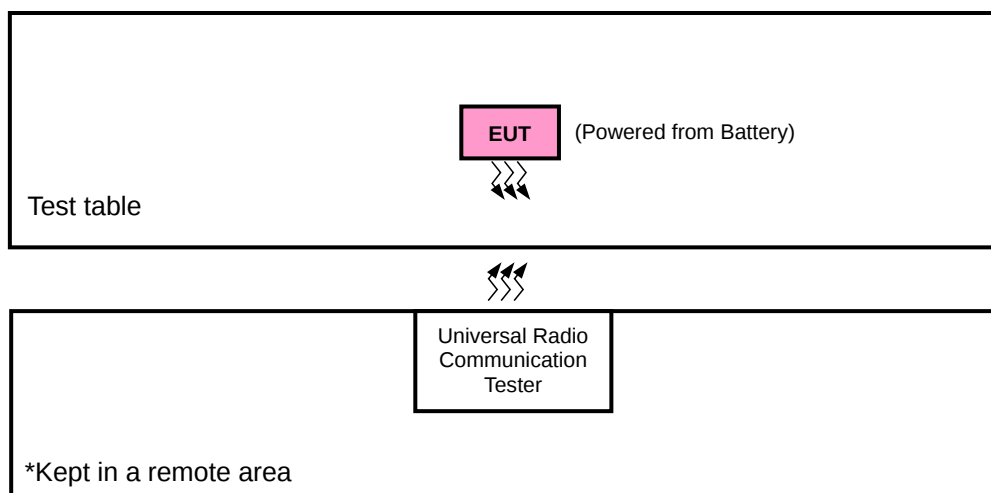
2. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

3.2 Configuration of System under Test

<Radiated Emission Test>



<E.R.P. 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.

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	ERP	Radiated Emission
GSM	X-plane	Z-axis
EDGE	X-plane	Z-axis
WCDMA	X-plane	Z-axis
LTE Band 5	X-plane	Y-axis

GSM

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	ERP	128 to 251	128, 189, 251	GSM, EDGE
-	Modulation Characteristics	128 to 251	189	GSM, EDGE
-	Frequency Stability	128 to 251	128, 251	GSM, EDGE
-	Occupied Bandwidth	128 to 251	128, 189, 251	GSM, EDGE
-	Band Edge	128 to 251	128, 251	GSM, EDGE
-	Peak to Average Ratio	128 to 251	128, 189, 251	GSM, EDGE
-	Conducted Emission	128 to 251	128, 189, 251	GSM, EDGE
-	Radiated Emission	128 to 251	128, 189, 251	GSM, EDGE

WCDMA

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

LTE Band 5

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK, 16QAM	3 RB / 0 RB Offset
		20415 to 20635	20415, 20525, 20635	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Modulation Characteristics	20450 to 20600	20525	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
-	Frequency Stability	20407 to 20643	20407, 20643	1.4 MHz	QPSK	1 RB / 0 RB Offset
		20415 to 20635	20415, 20635	3 MHz	QPSK	1 RB / 0 RB Offset
		20425 to 20625	20425, 20625	5 MHz	QPSK	1 RB / 0 RB Offset
		20450 to 20600	20450, 20600	10 MHz	QPSK	1 RB / 0 RB Offset
-	Occupied Bandwidth	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		20415 to 20635	20415, 20525, 20635	3 MHz	QPSK, 16QAM	15 RB / 0 RB Offset
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
-	Band Edge	20407 to 20643	20407	1.4MHz	QPSK	1 RB / 0 RB Offset
			20643	1.4MHz	QPSK	6 RB / 0 RB Offset
		20415 to 20635	20415	3 MHz	QPSK	1 RB / 5 RB Offset
			20635	3 MHz	QPSK	6 RB / 0 RB Offset
		20425 to 20625	20425	5 MHz	QPSK	1 RB / 0 RB Offset
			20625	5 MHz	QPSK	15 RB / 0 RB Offset
		20450 to 20600	20450	10 MHz	QPSK	1 RB / 14 RB Offset
			20600	10 MHz	QPSK	15 RB / 0 RB Offset
		20407 to 20643	20407	1.4MHz	QPSK	1 RB / 0 RB Offset
			20643	1.4MHz	QPSK	6 RB / 0 RB Offset
		20415 to 20635	20415	3 MHz	QPSK	1 RB / 5 RB Offset
			20635	3 MHz	QPSK	6 RB / 0 RB Offset
-	Peak to Average Ratio	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20415 to 20635	20415, 20525, 20635	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Conducted Emission	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK	3 RB / 0 RB Offset
		20415 to 20635	20415, 20525, 20635	3 MHz	QPSK	1 RB / 0 RB Offset
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK	1 RB / 0 RB Offset
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK	3 RB / 0 RB Offset
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK	1 RB / 0 RB Offset
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK	1 RB / 0 RB Offset

Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP	25 deg. C, 65 % RH	120 Vac, 60 Hz	Jisyong Wang
Modulation Characteristics	25 deg. C, 65 % RH	3.85 Vdc	Getaz Yang
Frequency Stability	25 deg. C, 65 % RH	3.85 Vdc	Getaz Yang
Occupied Bandwidth	25 deg. C, 65 % RH	3.85 Vdc	Getaz Yang
Band Edge	25 deg. C, 65 % RH	3.85 Vdc	Getaz Yang
Peak to Average Ratio	25 deg. C, 65 % RH	3.85 Vdc	Getaz Yang
Conducted Emission	25 deg. C, 65 % RH	3.85 Vdc	Getaz Yang
Radiated Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Jisyong Wang

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

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

FCC 47 CFR Part 2

FCC 47 CFR Part 22

KDB 971168 D01 Power Meas License Digital Systems v03r01

ANSI/TIA/EIA-603-E 2016

ANSI 63.26-2015

Note: 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

EIRP / ERP Measurement:

- a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 1 MHz for GSM, GPRS & EDGE, and 5 MHz for WCDMA and 10 MHz for LTE mode.
- b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- c. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step b. Record the power level of S.G.
- d. $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, $E.R.P \text{ power} = E.I.R.P \text{ power} - 2.15 \text{ dB}$.

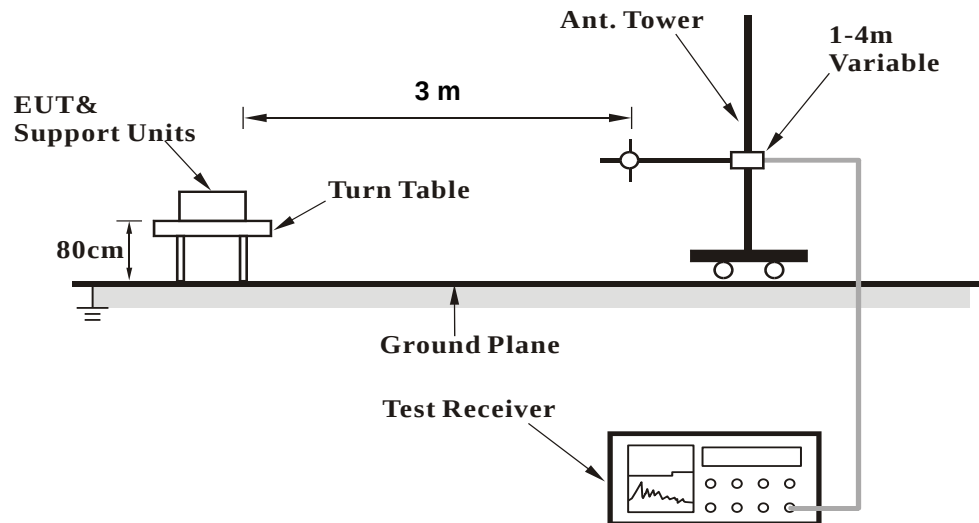
Conducted Power Measurement:

The EUT was set up for the maximum power with GSM, GPRS, EDGE, WCDMA and 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.

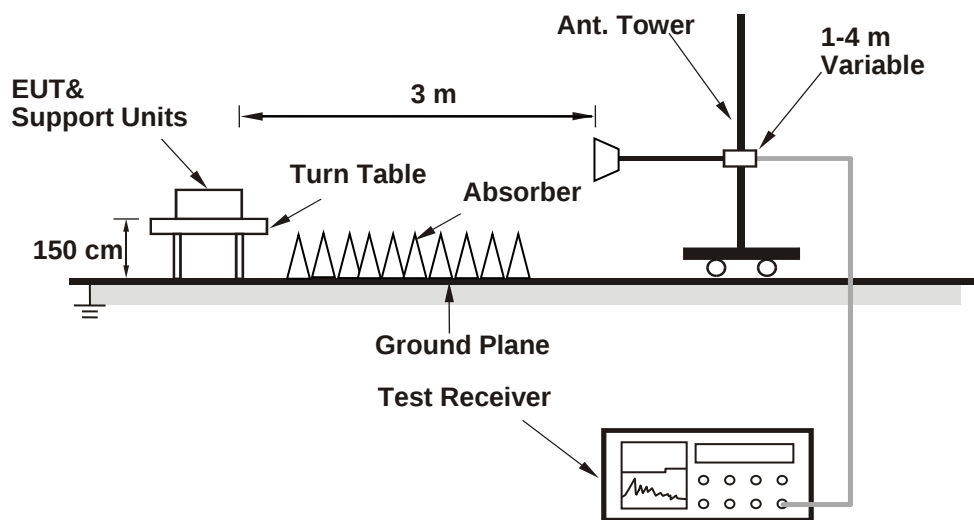
4.1.3 Test Setup

EIRP / ERP Measurement:

<Radiated Emission below or equal 1 GHz>

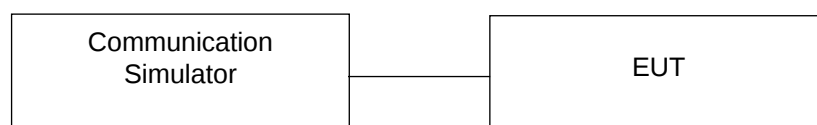


<Radiated Emission above 1 GHz>



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

Conducted Power Measurement:



4.1.4 Test Results

Conducted Output Power (dBm)

Band	GSM850		
Channel	128	189	251
Frequency (MHz)	824.2	836.4	848.8
GSM (GMSK, 1Tx-slot)	32.47	32.71	33.48
GPRS (GMSK, 1Tx-slot)	30.20	30.43	31.20
GPRS (GMSK, 2Tx-slot)	28.38	28.61	29.38
GPRS (GMSK, 3Tx-slot)	27.18	27.41	28.18
GPRS (GMSK, 4Tx-slot)	26.34	26.57	27.34
EDGE (8PSK, 1Tx-slot)	24.03	24.23	25.02
EDGE (8PSK, 2Tx-slot)	22.15	22.38	23.15
EDGE (8PSK, 3Tx-slot)	20.95	21.18	21.95
EDGE (8PSK, 4Tx-slot)	32.47	32.71	33.48

Band	WCDMA V		
Channel	4132	4182	4233
Frequency (MHz)	826.4	836.4	846.6
RMC 12.2K	23.61	23.63	23.46
HSDPA Subtest-1	23.49	23.51	23.34
HSDPA Subtest-2	22.61	22.63	22.46
HSDPA Subtest-3	22.11	22.13	21.96
HSDPA Subtest-4	21.93	21.95	21.78
HSUPA Subtest-1	22.13	22.15	22.08
HSUPA Subtest-2	20.24	20.26	20.09
HSUPA Subtest-3	21.43	21.45	21.28
HSUPA Subtest-4	20.66	20.68	20.51
HSUPA Subtest-5	22.51	22.53	22.36

LTE Band 5															
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		20450	20525	20600				Channel		20425	20525	20625	
		Frequency (MHz)		829.0	836.5	844.0				Frequency (MHz)		826.5	836.5	846.5	
10M	QPSK	1	0	22.37	22.17	22.26	0	5M	QPSK	1	0	22.33	22.17	22.25	0
		1	24	22.23	22.03	22.12	0			1	12	22.21	21.96	22.07	0
		1	49	22.21	22.01	22.10	0			1	24	22.21	21.98	22.10	0
		25	0	21.67	21.47	21.56	1			12	0	21.64	21.38	21.48	1
		25	12	21.63	21.43	21.52	1			12	6	21.53	21.39	21.43	1
		25	25	21.58	21.38	21.47	1			12	13	21.48	21.30	21.45	1
	16QAM	50	0	21.66	21.46	21.55	1		25	0	21.59	21.43	21.49	1	
		1	0	21.32	21.12	21.21	1		16QAM	1	0	21.28	21.08	21.19	1
		1	24	21.18	20.98	21.07	1			1	12	21.10	20.98	20.99	1
		1	49	21.16	20.96	21.05	1			1	24	21.10	20.96	20.99	1
		25	0	20.62	20.42	20.51	2			12	0	20.54	20.32	20.44	2
		25	12	20.58	20.38	20.47	2			12	6	20.48	20.33	20.37	2
25	25	20.53	20.33	20.42	2	12	13	20.46		20.27	20.41	2			
50	0	20.61	20.41	20.50	2	25	0	20.55	20.36	20.47	2				
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		20415	20525	20635				Channel		20407	20525	20643	
		Frequency (MHz)		825.5	836.5	847.5				Frequency (MHz)		824.7	836.5	848.3	
3M	QPSK	1	0	22.21	21.98	22.12	0	1.4M	QPSK	1	0	22.16	22.06	22.12	0
		1	7	22.10	21.99	22.04	0			1	2	22.20	21.98	21.93	0
		1	14	22.03	21.87	21.93	0			1	5	22.15	21.89	21.96	0
		8	0	21.66	21.34	21.41	1			3	0	22.56	22.27	22.51	0
		8	3	21.40	21.29	21.46	1			3	1	22.46	22.25	22.39	0
		8	7	21.36	21.21	21.38	1			3	3	22.39	22.30	22.40	0
	16QAM	15	0	21.49	21.21	21.44	1		6	0	21.52	21.34	21.47	1	
		1	0	21.31	21.03	21.08	1		16QAM	1	0	21.12	21.02	21.08	1
		1	7	21.16	20.83	20.92	1			1	2	21.05	20.87	20.87	1
		1	14	20.99	20.81	20.90	1			1	5	21.04	20.92	20.91	1
		8	0	20.47	20.40	20.45	2			3	0	21.51	21.26	21.43	1
		8	3	20.38	20.21	20.34	2			3	1	21.42	21.24	21.26	1
8	7	20.37	20.20	20.24	2	3	3	21.37		21.18	21.22	1			
15	0	20.51	20.20	20.33	2	6	0	20.44	20.36	20.34	2				

ERP Power (dBm)

GSM							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	128	824.2	1.38	32.62	31.85	1531.09	H
	189	836.4	1.72	32.52	32.09	1618.08	
	251	848.8	2.36	32.65	32.86	1931.97	
	128	824.2	-3.70	32.76	26.91	490.91	V
	189	836.4	-2.85	32.39	27.39	548.28	
	251	848.8	-2.54	32.54	27.85	609.54	

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB) – 2.15

EDGE							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	128	824.2	-4.41	32.62	26.06	403.65	H
	189	836.4	-4.08	32.52	26.29	425.60	
	251	848.8	-3.44	32.65	27.06	508.16	
	128	824.2	-9.60	32.76	21.01	126.18	V
	189	836.4	-8.76	32.39	21.48	140.60	
	251	848.8	-8.20	32.54	22.19	165.58	

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB) – 2.15

WCDMA							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	4132	826.4	-7.23	32.62	23.24	210.86	H
	4182	836.4	-7.11	32.52	23.26	211.84	
	4233	846.6	-7.41	32.65	23.09	203.70	
	4132	826.4	-11.83	32.76	18.78	75.51	V
	4182	836.4	-11.28	32.39	18.96	78.70	
	4233	846.6	-11.97	32.54	18.42	69.50	

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB) – 2.15

LTE Band 5							
Channel Bandwidth: 1.4 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	20407	824.7	-9.15	32.62	21.32	135.52	H
	20525	836.5	-9.25	32.52	21.12	129.42	
	20643	848.3	-9.29	32.65	21.21	132.13	
	20407	824.7	-12.82	32.76	17.79	60.12	V
	20525	836.5	-12.99	32.39	17.25	53.09	
	20643	848.3	-13.07	32.54	17.32	53.95	
Channel Bandwidth: 1.4 MHz / 16QAM							
X	20407	824.7	-10.14	32.62	20.33	107.89	H
	20525	836.5	-10.24	32.52	20.13	103.04	
	20643	848.3	-10.28	32.65	20.22	105.20	
	20407	824.7	-13.81	32.76	16.80	47.86	V
	20525	836.5	-13.98	32.39	16.26	42.27	
	20643	848.3	-14.06	32.54	16.33	42.95	

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB) – 2.15

LTE Band 5							
Channel Bandwidth: 3 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	20415	825.5	-8.89	32.62	21.58	143.88	H
	20525	836.5	-8.99	32.52	21.38	137.40	
	20635	847.5	-9.03	32.65	21.47	140.28	
	20415	825.5	-12.56	32.76	18.05	63.83	V
	20525	836.5	-12.73	32.39	17.51	56.36	
	20635	847.5	-12.81	32.54	17.58	57.28	
Channel Bandwidth: 3 MHz / 16QAM							
X	20415	825.5	-9.90	32.62	20.57	114.02	H
	20525	836.5	-10.00	32.52	20.37	108.89	
	20635	847.5	-10.04	32.65	20.46	111.17	
	20415	825.5	-13.57	32.76	17.04	50.58	V
	20525	836.5	-13.74	32.39	16.50	44.67	
	20635	847.5	-13.82	32.54	16.57	45.39	

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB) – 2.15

LTE Band 5							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	20425	826.5	-8.65	32.62	21.82	152.05	H
	20525	836.5	-8.75	32.52	21.62	145.21	
	20625	846.5	-8.79	32.65	21.71	148.25	
	20425	826.5	-12.32	32.76	18.29	67.45	V
	20525	836.5	-12.49	32.39	17.75	59.57	
	20625	846.5	-12.57	32.54	17.82	60.53	
Channel Bandwidth: 5 MHz / 16QAM							
X	20425	826.5	-9.67	32.62	20.80	120.23	H
	20525	836.5	-9.77	32.52	20.60	114.82	
	20625	846.5	-9.81	32.65	20.69	117.22	
	20425	826.5	-13.34	32.76	17.27	53.33	V
	20525	836.5	-13.51	32.39	16.73	47.10	
	20625	846.5	-13.59	32.54	16.80	47.86	

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB) – 2.15

LTE Band 5							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	20450	829.0	-8.42	32.62	22.05	160.32	H
	20525	836.5	-8.52	32.52	21.85	153.11	
	20600	844.0	-8.56	32.65	21.94	156.31	
	20450	829.0	-12.09	32.76	18.52	71.12	V
	20525	836.5	-12.26	32.39	17.98	62.81	
	20600	844.0	-12.34	32.54	18.05	63.83	
Channel Bandwidth: 10 MHz / 16QAM							
X	20425	826.5	-9.43	32.62	21.04	127.06	H
	20525	836.5	-9.53	32.52	20.84	121.34	
	20625	846.5	-9.57	32.65	20.93	123.88	
	20425	826.5	-13.10	32.76	17.51	56.36	V
	20525	836.5	-13.27	32.39	16.97	49.77	
	20625	846.5	-13.35	32.54	17.04	50.58	

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB) – 2.15

4.2 Modulation Characteristics Measurement

4.2.1 Limits of Modulation Characteristics

N/A

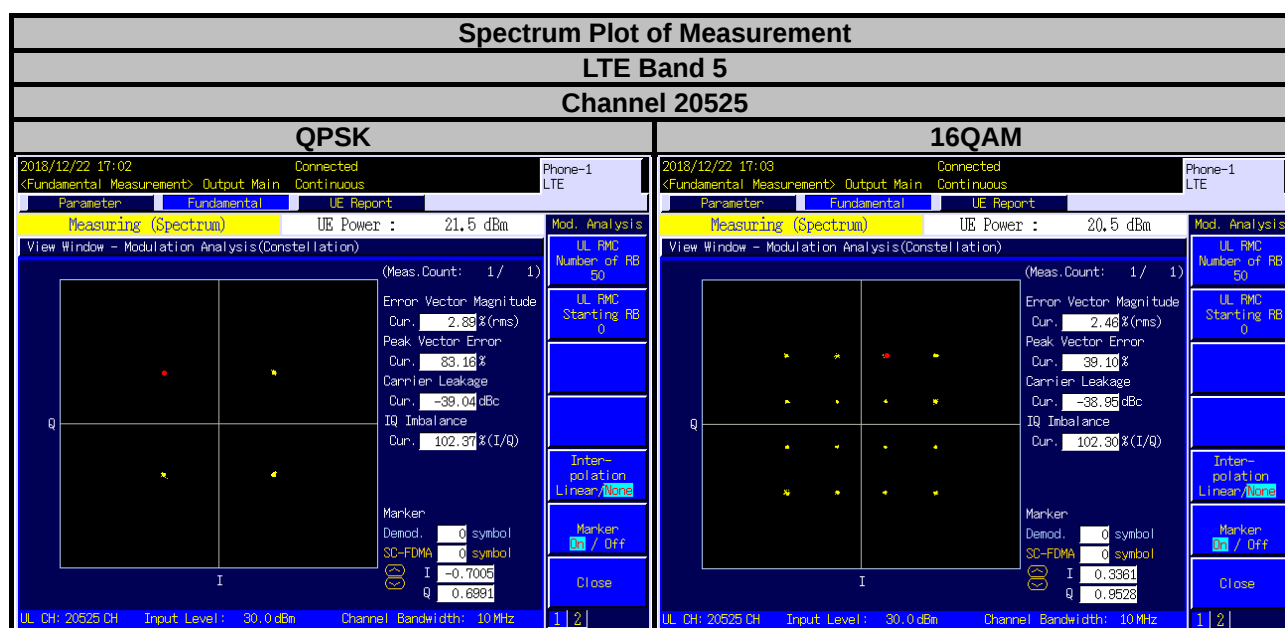
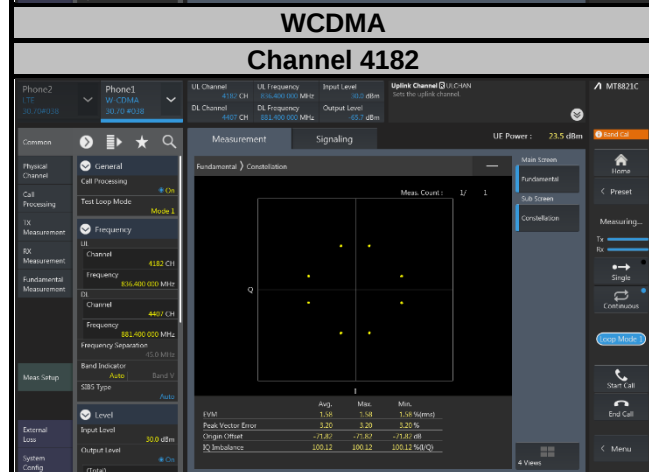
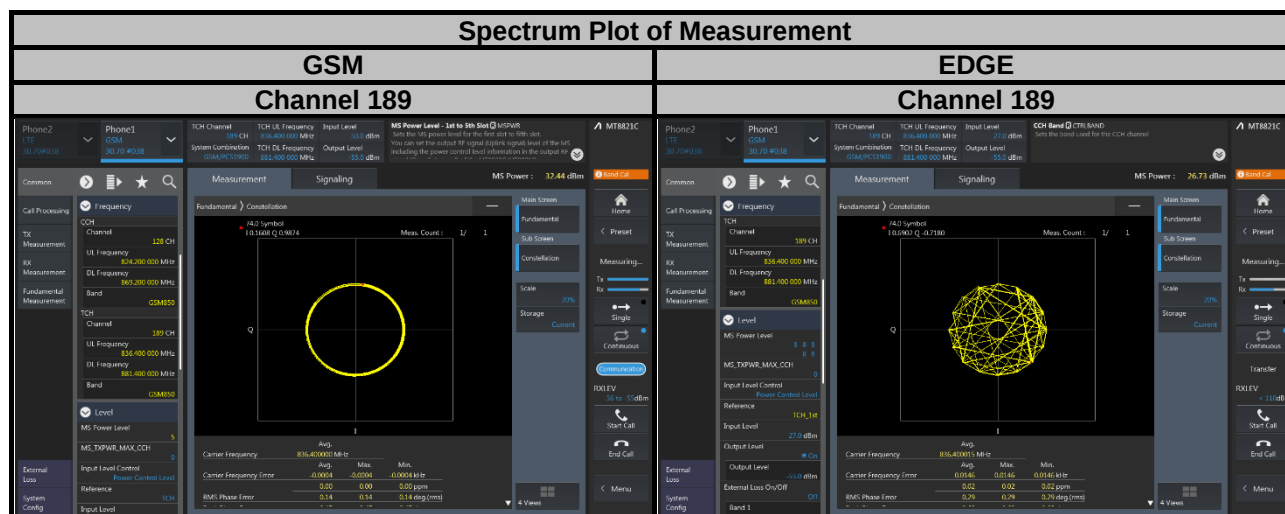
4.2.2 Test Setup



4.2.3 Test Procedure

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

4.2.4 Test Results



4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

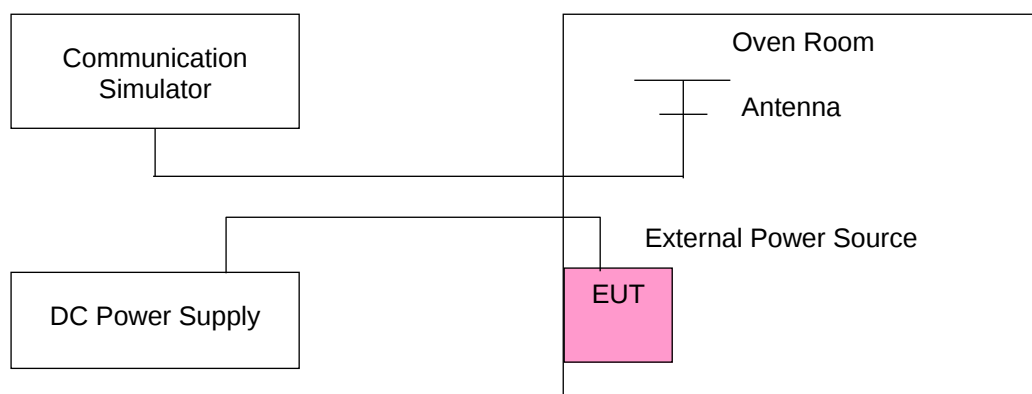
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

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 (Volts)	GSM				Limit (ppm)
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	824.200002	0.003	848.800002	0.002	2.5
3.27	824.200001	0.002	848.800004	0.004	2.5
4.23	824.200002	0.003	848.800002	0.003	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.27 Vdc to 4.23 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	GSM				Limit (ppm)
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	824.200002	0.002	848.800002	0.002	2.5
-20	824.200004	0.005	848.800003	0.004	2.5
-10	824.200002	0.002	848.800003	0.003	2.5
0	824.200001	0.001	848.800002	0.003	2.5
10	824.200002	0.002	848.800001	0.002	2.5
20	824.199997	-0.004	848.799996	-0.005	2.5
30	824.199999	-0.001	848.799998	-0.002	2.5
40	824.199998	-0.002	848.799999	-0.002	2.5
50	824.199998	-0.003	848.799998	-0.003	2.5

Frequency Error vs. Voltage

Voltage (Volts)	EDGE				Limit (ppm)
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	824.200004	0.005	848.800002	0.002	2.5
3.27	824.200003	0.003	848.800003	0.003	2.5
4.23	824.200004	0.005	848.800001	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.27 Vdc to 4.23 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	EDGE				Limit (ppm)
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	824.200004	0.005	848.800003	0.003	2.5
-20	824.200001	0.001	848.800003	0.003	2.5
-10	824.200002	0.002	848.800004	0.005	2.5
0	824.200004	0.005	848.800004	0.005	2.5
10	824.200001	0.002	848.800002	0.003	2.5
20	824.199997	-0.003	848.799996	-0.005	2.5
30	824.199998	-0.002	848.799997	-0.004	2.5
40	824.199997	-0.003	848.799997	-0.004	2.5
50	824.199997	-0.004	848.799997	-0.003	2.5

Frequency Error vs. Voltage

Voltage (Volts)	WCDMA				Limit (ppm)
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	826.400002	0.002	846.600004	0.004	2.5
3.27	826.400002	0.003	846.600002	0.002	2.5
4.23	826.400001	0.001	846.600002	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.27 Vdc to 4.23 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	WCDMA				Limit (ppm)
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	826.400001	0.002	846.600002	0.003	2.5
-20	826.400001	0.002	846.600004	0.005	2.5
-10	826.400004	0.005	846.600002	0.003	2.5
0	826.400002	0.003	846.600002	0.002	2.5
10	826.400003	0.003	846.600003	0.003	2.5
20	826.399998	-0.003	846.599996	-0.005	2.5
30	826.399997	-0.003	846.599996	-0.004	2.5
40	826.399998	-0.002	846.599997	-0.003	2.5
50	826.399997	-0.004	846.599997	-0.004	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	824.700002	0.003	848.300002	0.002	2.5
3.27	824.700002	0.003	848.300001	0.002	2.5
4.23	824.700003	0.003	848.300003	0.003	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.27 Vdc to 4.23 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	824.700003	0.003	848.300004	0.004	2.5
-20	824.700003	0.003	848.300002	0.002	2.5
-10	824.700001	0.001	848.300003	0.003	2.5
0	824.700004	0.005	848.300004	0.004	2.5
10	824.700001	0.001	848.300004	0.004	2.5
20	824.699996	-0.005	848.299999	-0.001	2.5
30	824.699998	-0.002	848.299999	-0.002	2.5
40	824.699998	-0.002	848.299999	-0.001	2.5
50	824.699997	-0.004	848.299996	-0.005	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	825.500003	0.003	847.500003	0.004	2.5
3.27	825.500002	0.002	847.500004	0.004	2.5
4.23	825.500002	0.002	847.500003	0.004	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.27 Vdc to 4.23 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	825.500001	0.002	847.500001	0.001	2.5
-20	825.500003	0.003	847.500002	0.003	2.5
-10	825.500001	0.002	847.500002	0.002	2.5
0	825.500002	0.002	847.500004	0.005	2.5
10	825.500001	0.002	847.500003	0.004	2.5
20	825.499996	-0.005	847.499999	-0.001	2.5
30	825.499997	-0.004	847.499996	-0.004	2.5
40	825.499999	-0.002	847.499998	-0.002	2.5
50	825.499997	-0.004	847.499996	-0.004	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	826.500004	0.005	846.500003	0.004	2.5
3.27	826.500003	0.003	846.500002	0.002	2.5
4.23	826.500001	0.001	846.500003	0.004	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.27 Vdc to 4.23 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	826.500001	0.001	846.500002	0.003	2.5
-20	826.500001	0.001	846.500004	0.004	2.5
-10	826.500003	0.004	846.500003	0.003	2.5
0	826.500002	0.002	846.500003	0.004	2.5
10	826.500002	0.002	846.500002	0.003	2.5
20	826.499997	-0.003	846.499999	-0.001	2.5
30	826.499996	-0.005	846.499999	-0.001	2.5
40	826.499997	-0.004	846.499999	-0.002	2.5
50	826.499998	-0.002	846.499997	-0.004	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	829.000004	0.005	844.000002	0.003	2.5
3.27	829.000002	0.002	844.000001	0.001	2.5
4.23	829.000003	0.004	844.000004	0.005	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.27 Vdc to 4.23 Vdc.

Frequency Error vs. Temperature

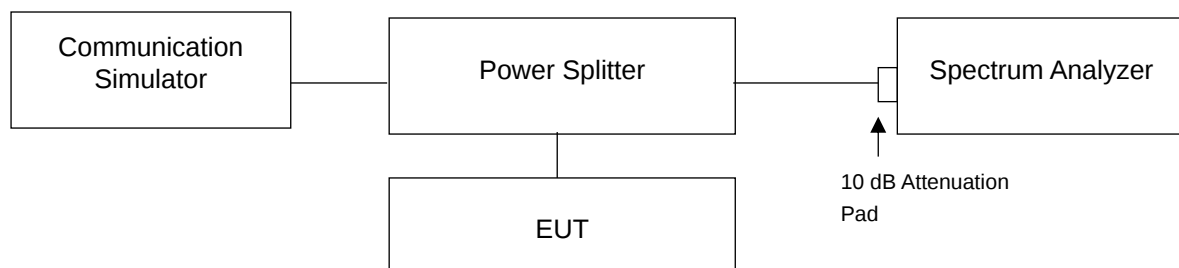
Temp. (°C)	LTE Band 5				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	829.000002	0.003	844.000004	0.004	2.5
-20	829.000002	0.003	844.000004	0.004	2.5
-10	829.000004	0.004	844.000003	0.004	2.5
0	829.000002	0.003	844.000003	0.004	2.5
10	829.000004	0.005	844.000003	0.003	2.5
20	828.999996	-0.005	843.999997	-0.003	2.5
30	828.999996	-0.005	843.999997	-0.004	2.5
40	828.999998	-0.003	843.999997	-0.004	2.5
50	828.999998	-0.003	843.999996	-0.005	2.5

4.4 Occupied Bandwidth Measurement

4.4.1 Test Procedure

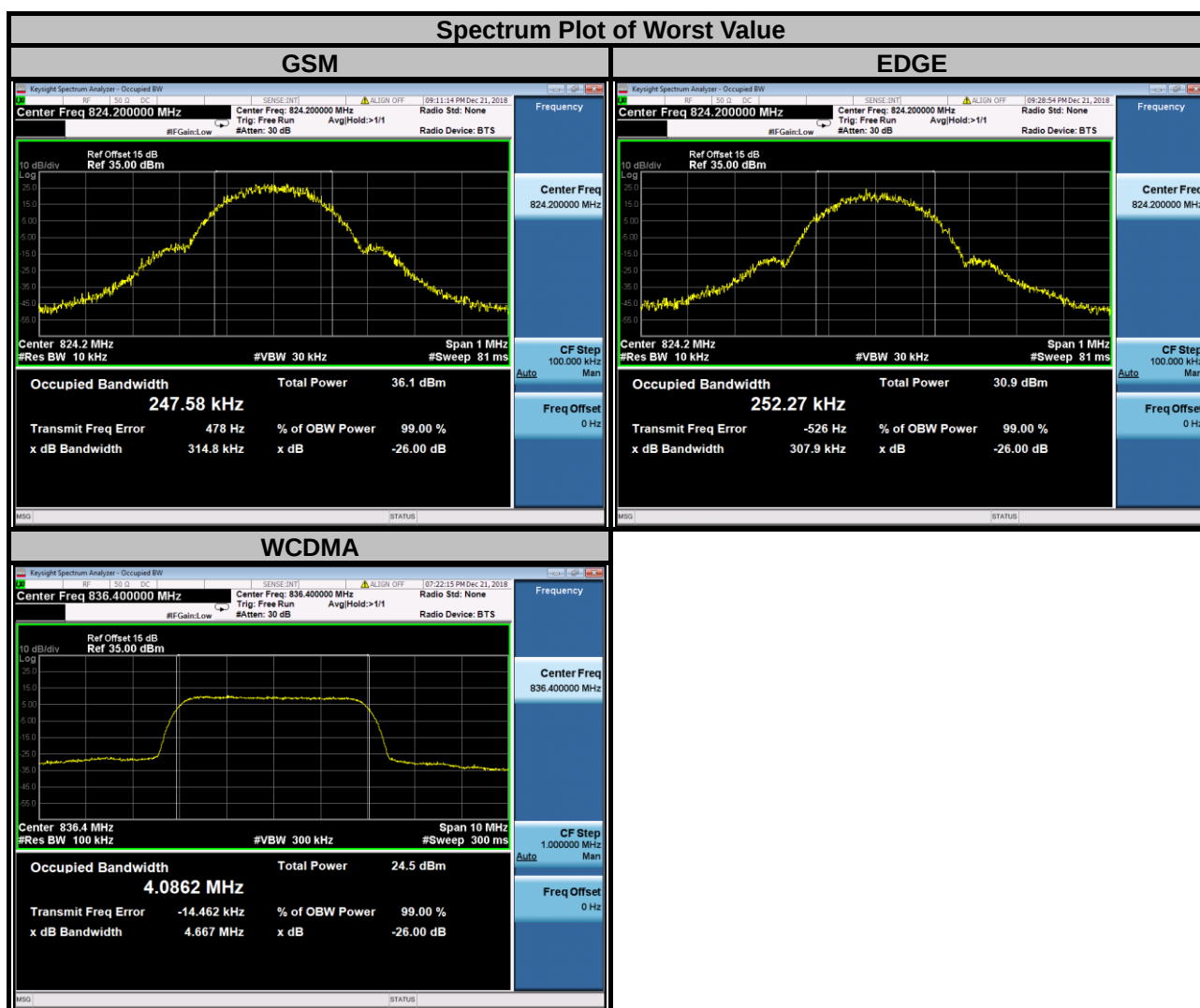
The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

4.4.2 Test Setup

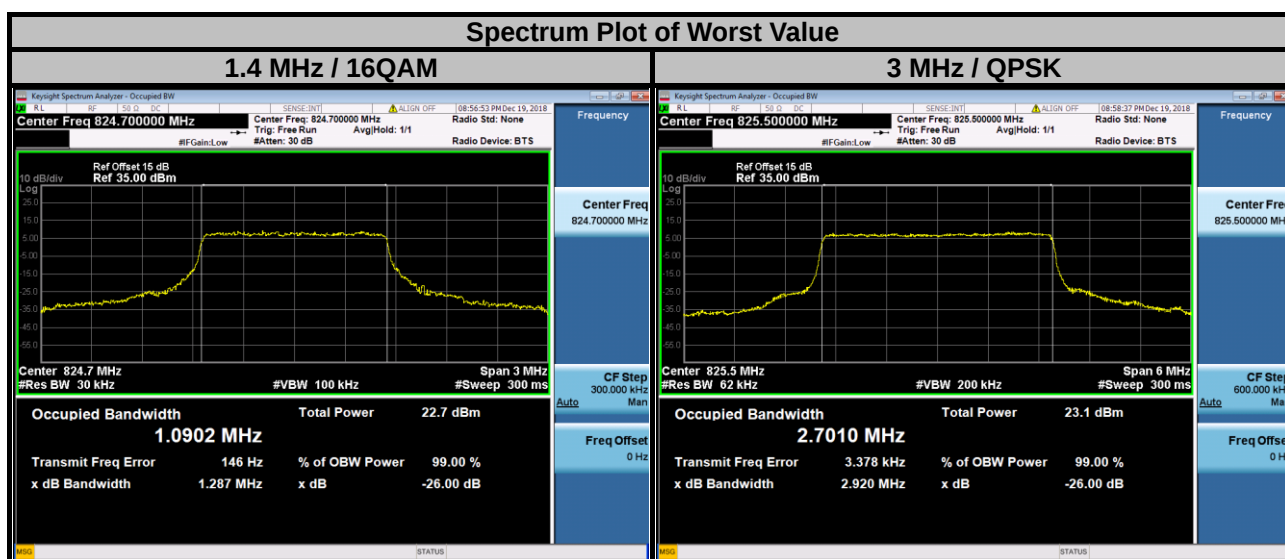


4.4.3 Test Result

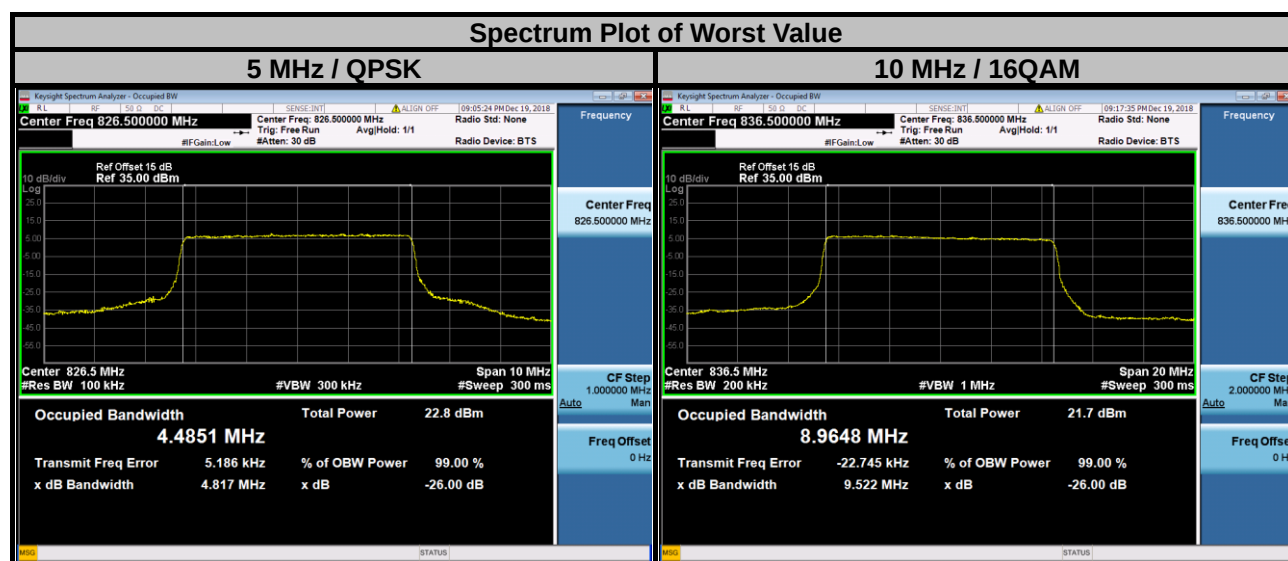
Channel	Frequency (MHz)	99 % Occupied Bandwidth (kHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)
		GSM	EDGE			
128	824.2	247.58	252.27	4132	826.4	4.0841
189	836.4	246.51	250.19	4182	836.4	4.0862
251	848.8	245.10	250.44	4233	846.6	4.0770



LTE Band 5							
Channel Bandwidth: 1.4 MHz				Channel Bandwidth: 3 MHz			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
20407	824.7	1.0898	1.0902	20415	825.5	2.701	2.699
20525	836.5	1.0892	1.0892	20525	836.5	2.700	2.696
20643	848.3	1.0887	1.0884	20635	847.5	2.699	2.696



LTE Band 5							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
20425	826.5	4.4851	4.4839	20450	829.0	8.9614	8.9610
20525	836.5	4.4814	4.4841	20525	836.5	8.9607	8.9648
20625	846.5	4.4736	4.4780	20600	844.0	8.9588	8.9585

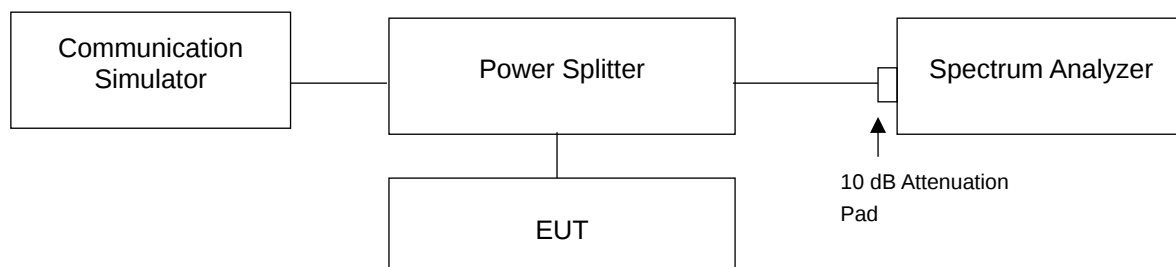


4.5 Band Edge Measurement

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.

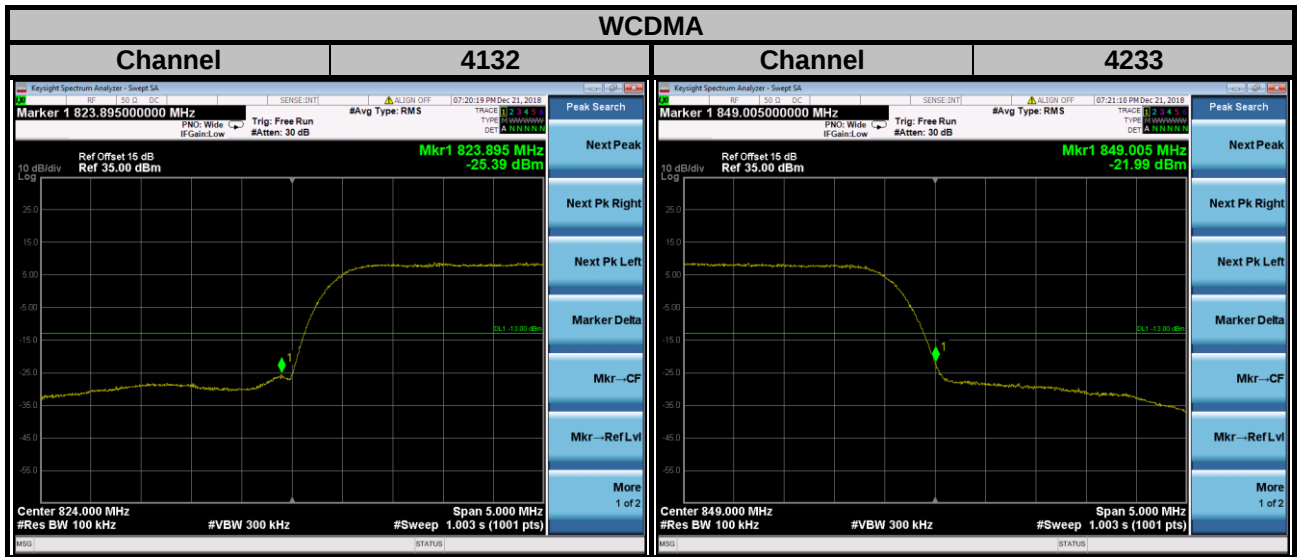
4.5.2 Test Setup

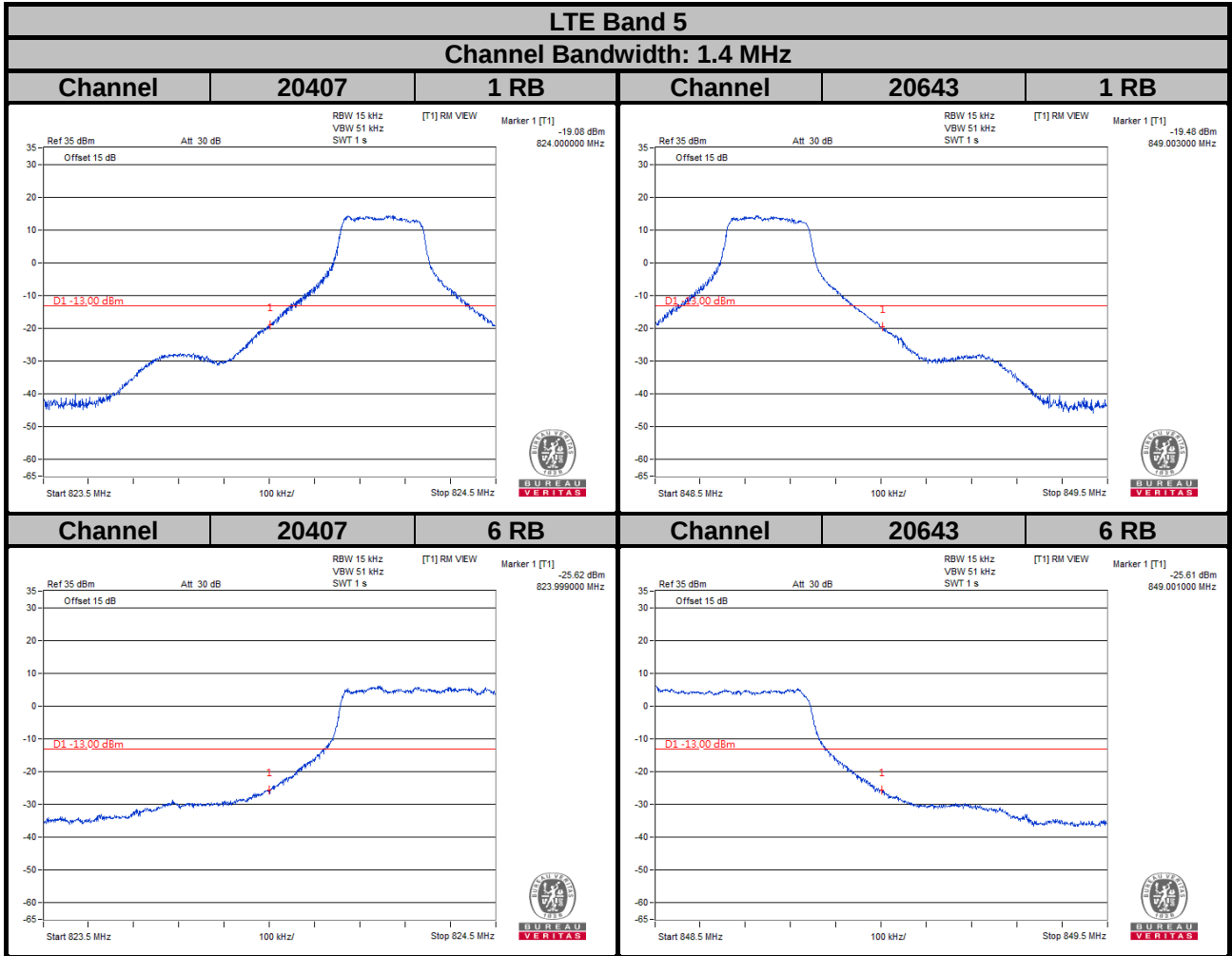


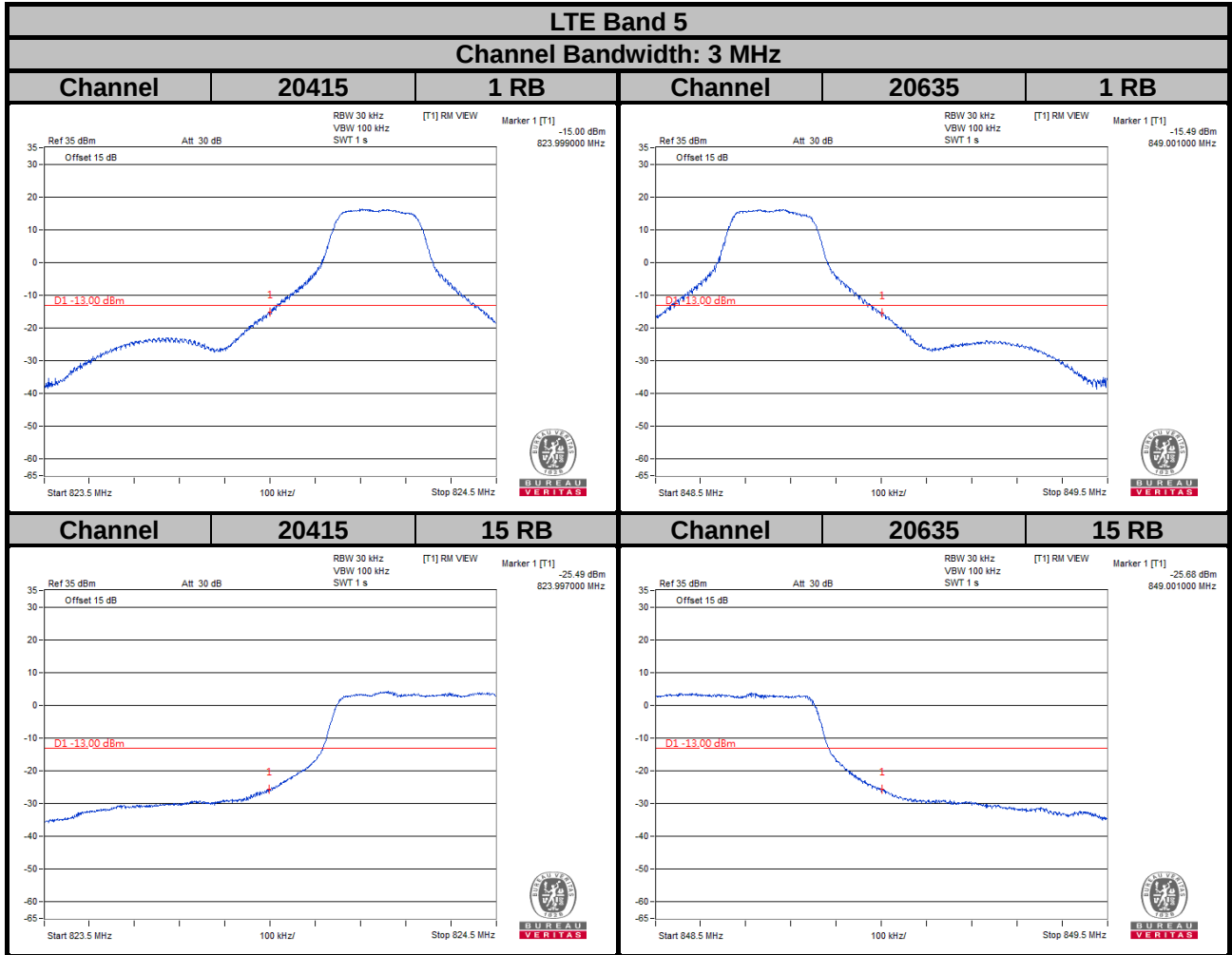
4.5.3 Test Procedures

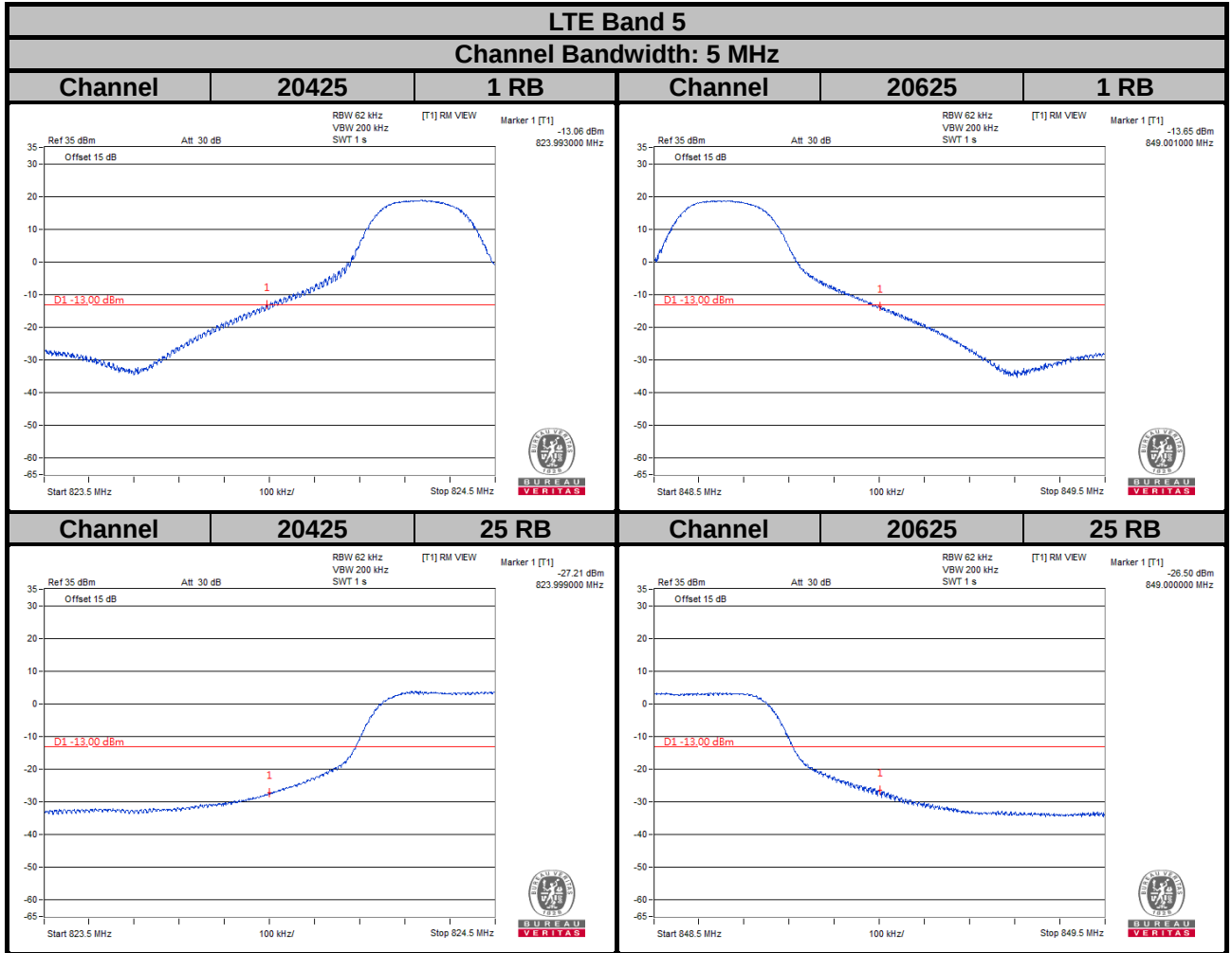
- All measurements were done at low and high operational frequency range.
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 10 kHz and VB of the spectrum is 30 kHz (GSM/GPRS/EDGE).
- The center frequency of spectrum is the band edge frequency and span is 5 MHz. RB of the spectrum is 100 kHz and VB of the spectrum is 300 kHz (WCDMA).
- 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).
- 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).
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 62 kHz and VB of the spectrum is 200 kHz (LTE Bandwidth 5 MHz).
- 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).
- Record the max trace plot into the test report.

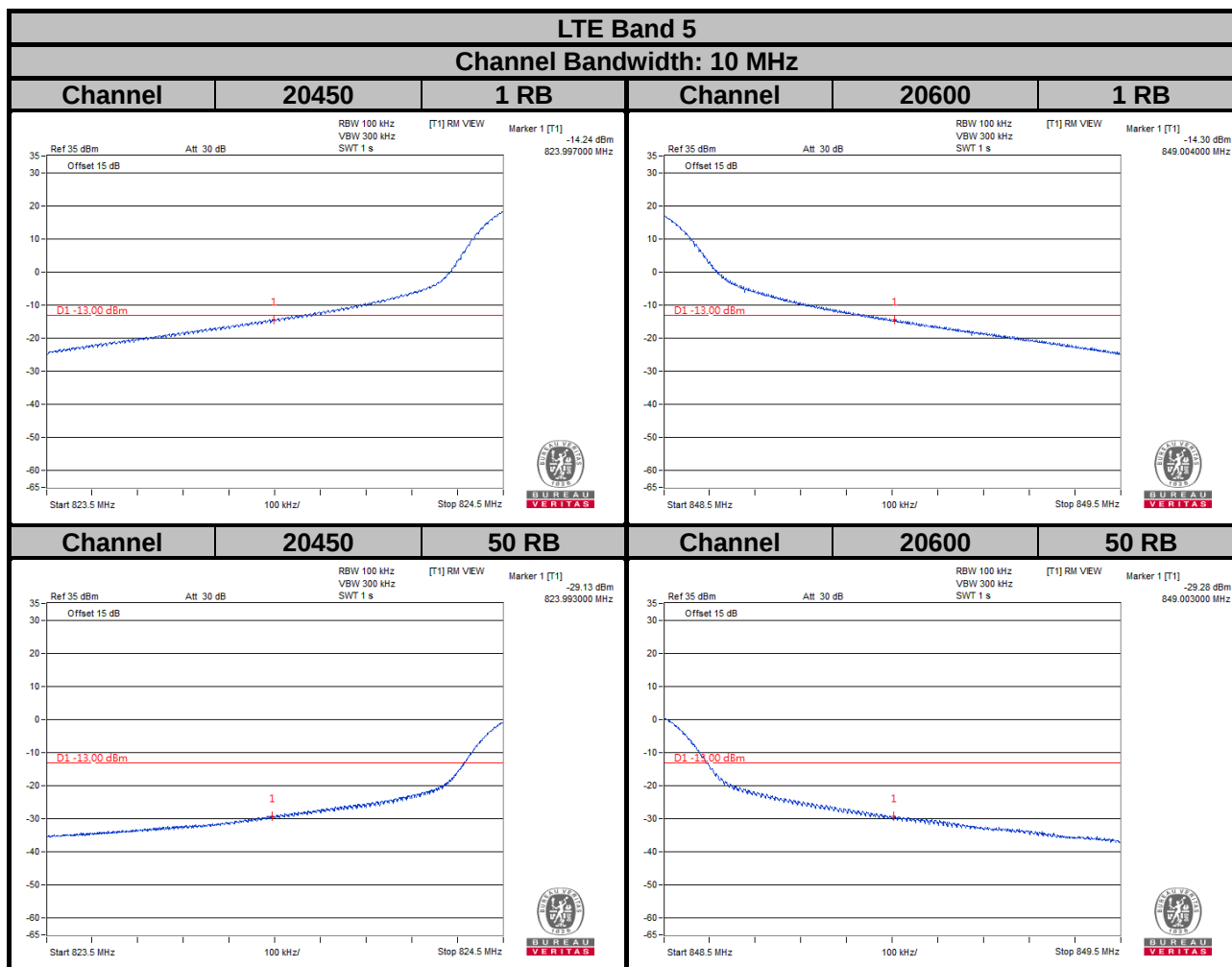
GSM	
Channel	128
Keylight Spectrum Analyzer - Swept SA Marker 1 824.00000000 MHz Ref Offset 15 dB Ref 35.00 dBm Mkr1 824.000 MHz -14.93 dBm Center 824.0000 MHz #Res BW 10 kHz #VBW 30 kHz #Sweep 1.003 s (1001 pts)	
Keylight Spectrum Analyzer - Swept SA Marker 1 849.01800000 MHz Ref Offset 15 dB Ref 35.00 dBm Mkr1 849.018 MHz -14.11 dBm Center 849.0000 MHz #Res BW 10 kHz #VBW 30 kHz #Sweep 1.003 s (1001 pts)	
EDGE	
Channel	128
Keylight Spectrum Analyzer - Swept SA Marker 1 823.97900000 MHz Ref Offset 15 dB Ref 35.00 dBm Mkr1 823.979 MHz -21.40 dBm Center 824.0000 MHz #Res BW 10 kHz #VBW 30 kHz #Sweep 1.003 s (1001 pts)	
Keylight Spectrum Analyzer - Swept SA Marker 1 849.01100000 MHz Ref Offset 15 dB Ref 35.00 dBm Mkr1 849.011 MHz -21.62 dBm Center 849.0000 MHz #Res BW 10 kHz #VBW 30 kHz #Sweep 1.003 s (1001 pts)	









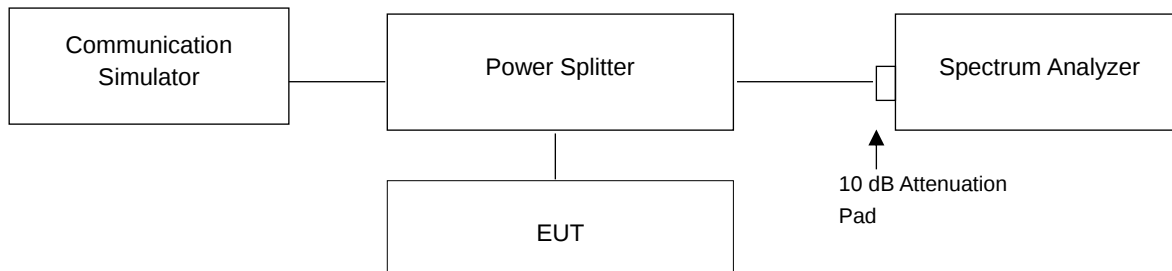


4.6 Peak to Average Ratio

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

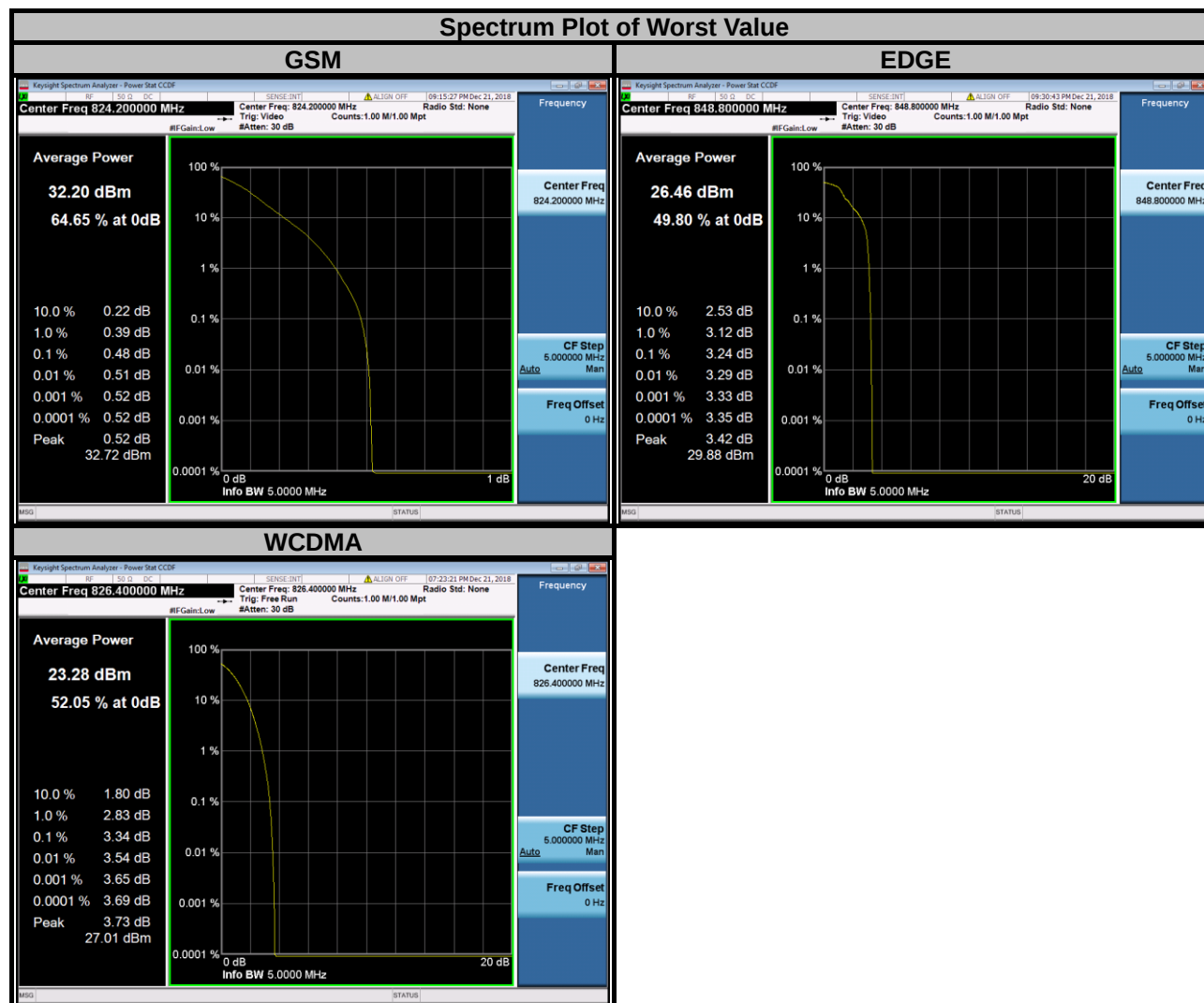


4.6.3 Test Procedures

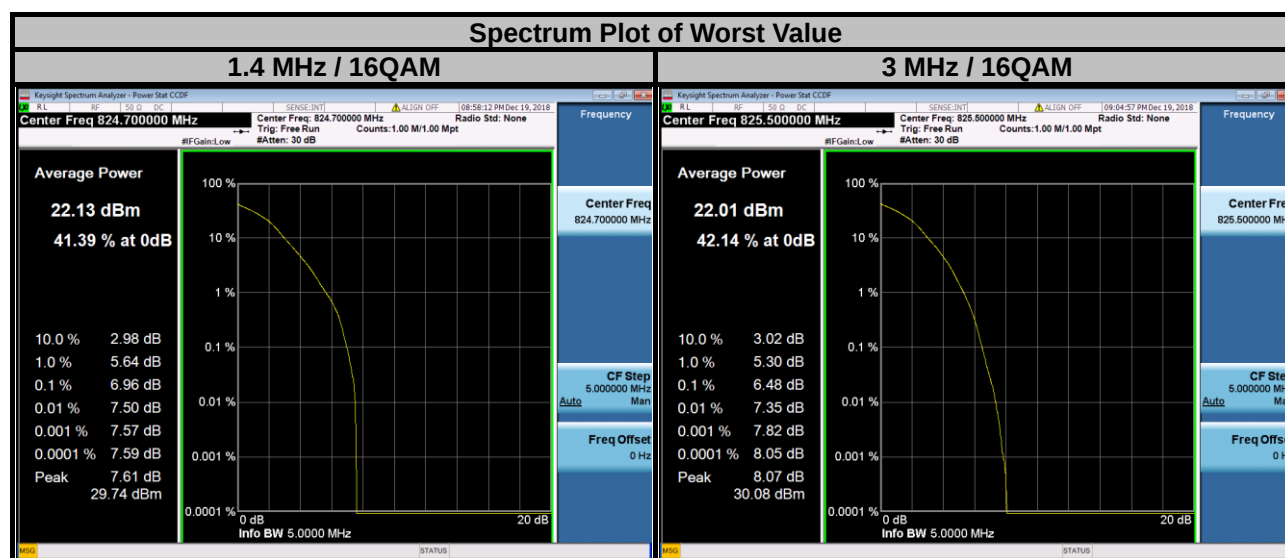
1. Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1 %.

4.6.4 Test Results

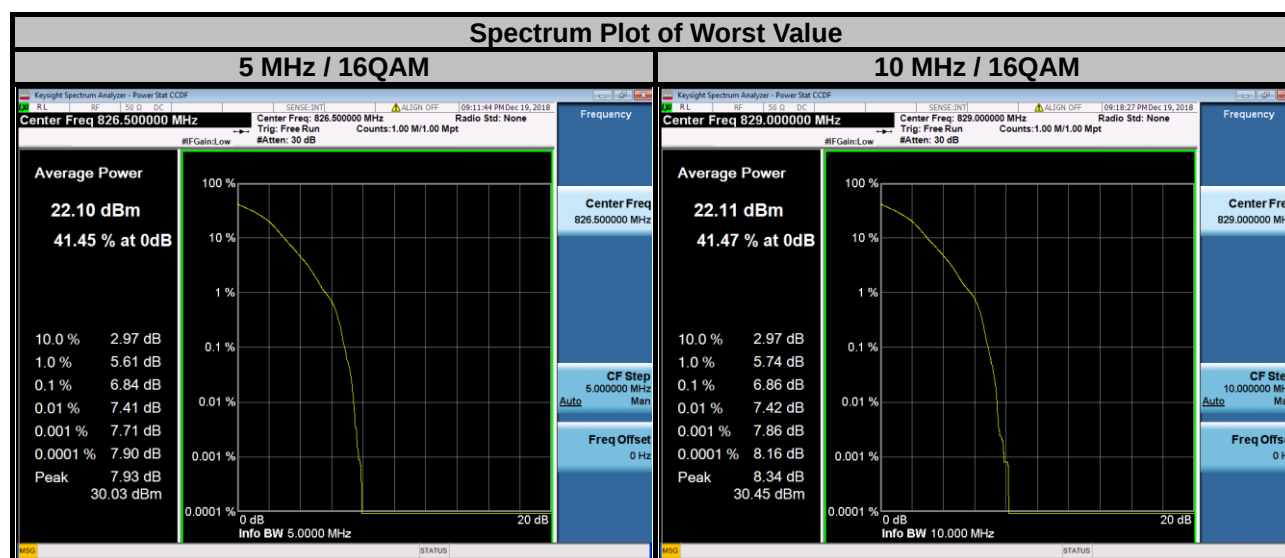
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)
		GSM	EDGE			
128	824.2	0.48	3.20	4132	826.4	3.34
189	836.4	0.40	3.21	4182	836.4	2.95
251	848.8	0.47	3.24	4233	846.6	2.85



LTE Band 5							
Channel Bandwidth: 1.4 MHz				Channel Bandwidth: 3 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
20407	824.7	5.90	6.96	20415	825.5	5.65	6.48
20525	836.5	5.43	6.29	20525	836.5	5.29	6.10
20643	848.3	4.75	5.59	20635	847.5	5.00	5.79



LTE Band 5							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
20425	826.5	5.82	6.84	20450	829.0	5.68	6.86
20525	836.5	5.05	6.20	20525	836.5	5.06	6.32
20625	846.5	5.41	6.52	20600	844.0	5.51	6.63

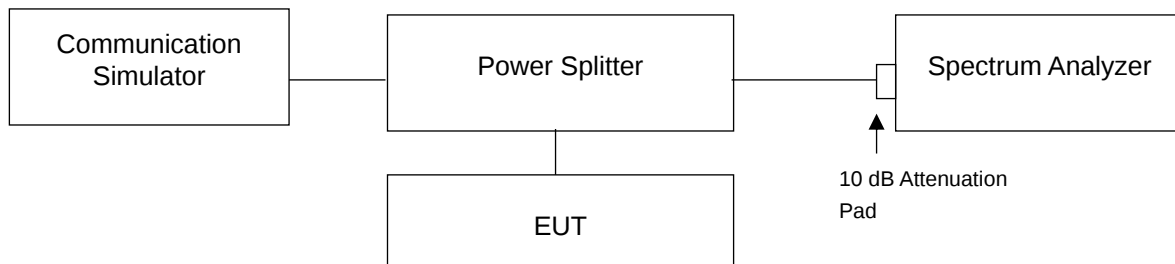


4.7 Conducted Spurious Emissions

4.7.1 Limits of Conducted Spurious Emissions Measurement

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

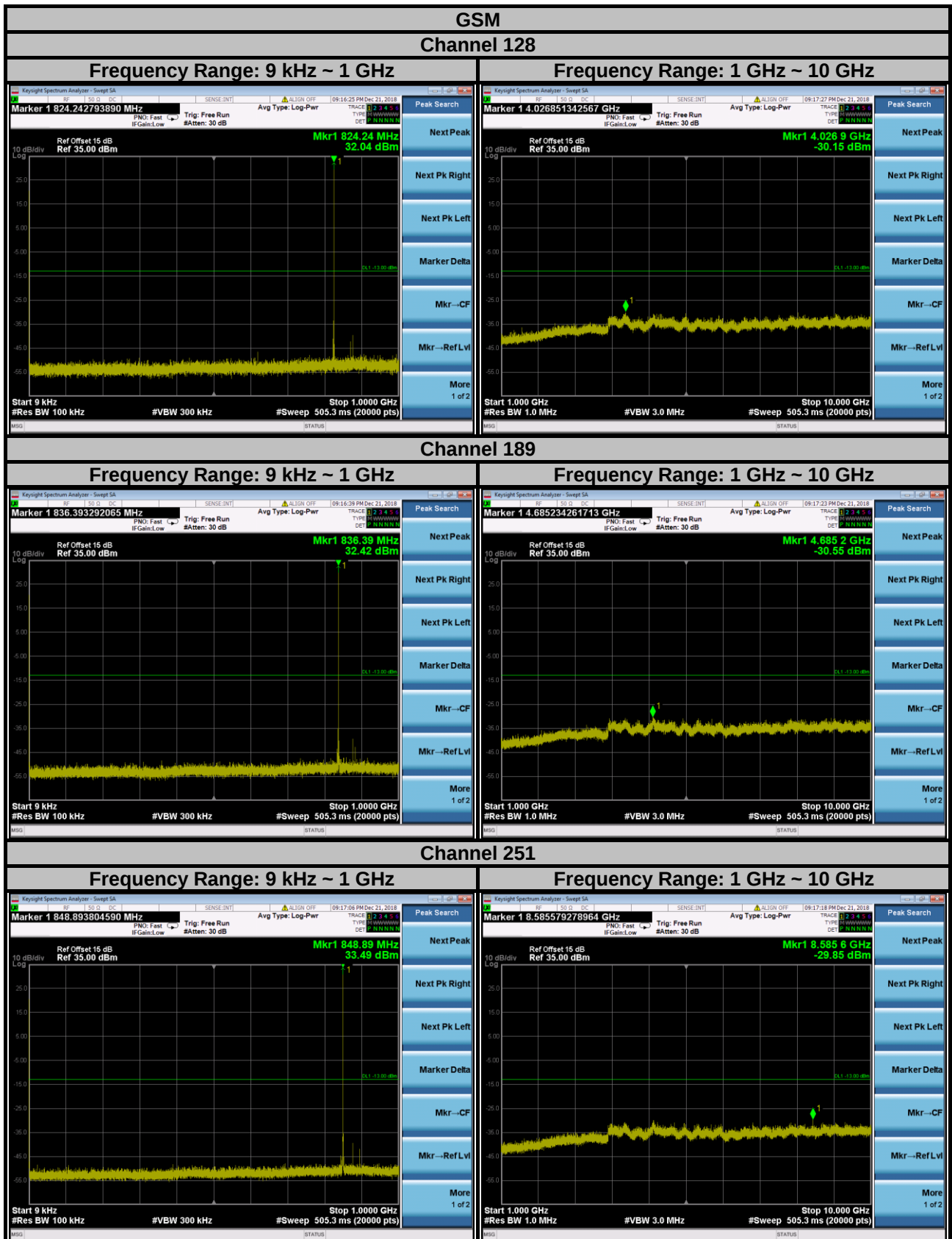
4.7.2 Test Setup



4.7.3 Test Procedure

- The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- Measuring frequency range is from 9 kHz to 1 GHz. 10 dB attenuation pad is connected with spectrum. RBW = 100 kHz and VBW = 300 kHz is used for conducted emission measurement.
- Measuring frequency range is from 1 GHz to 10 GHz. 10 dB attenuation pad is connected with spectrum. RBW = 1 MHz and VBW = 3 MHz is used for conducted emission measurement.

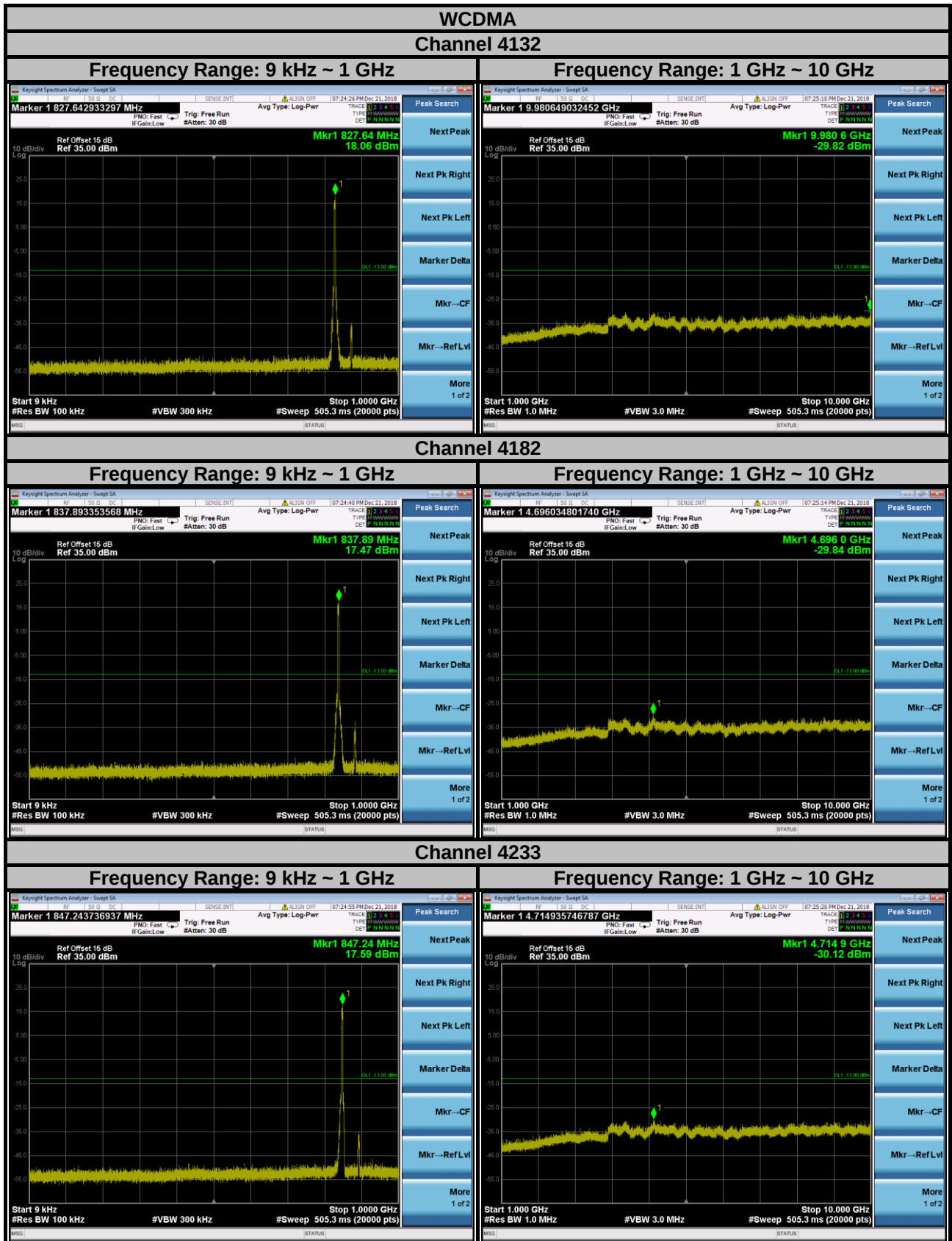
4.7.4 Test Results



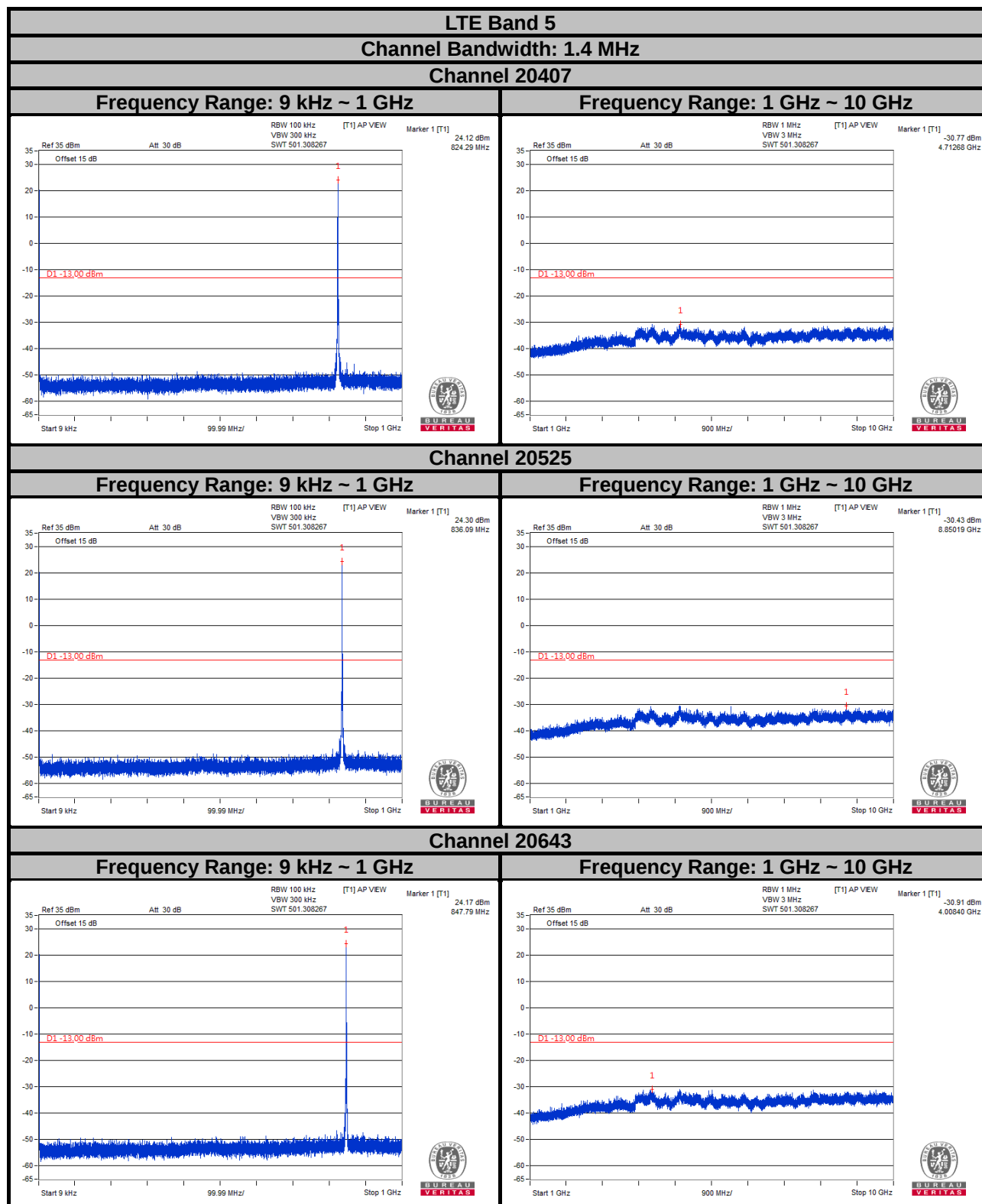
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



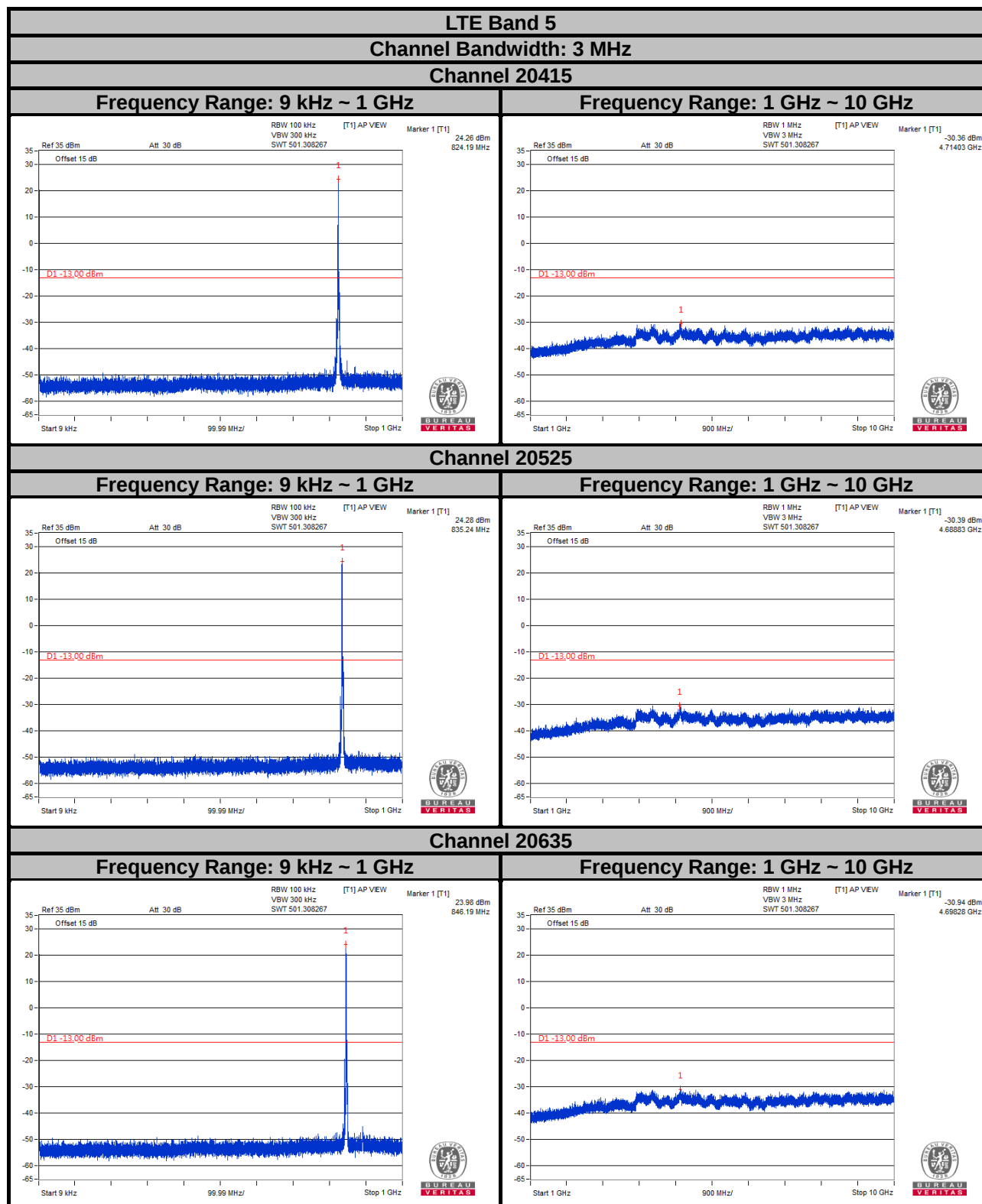
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



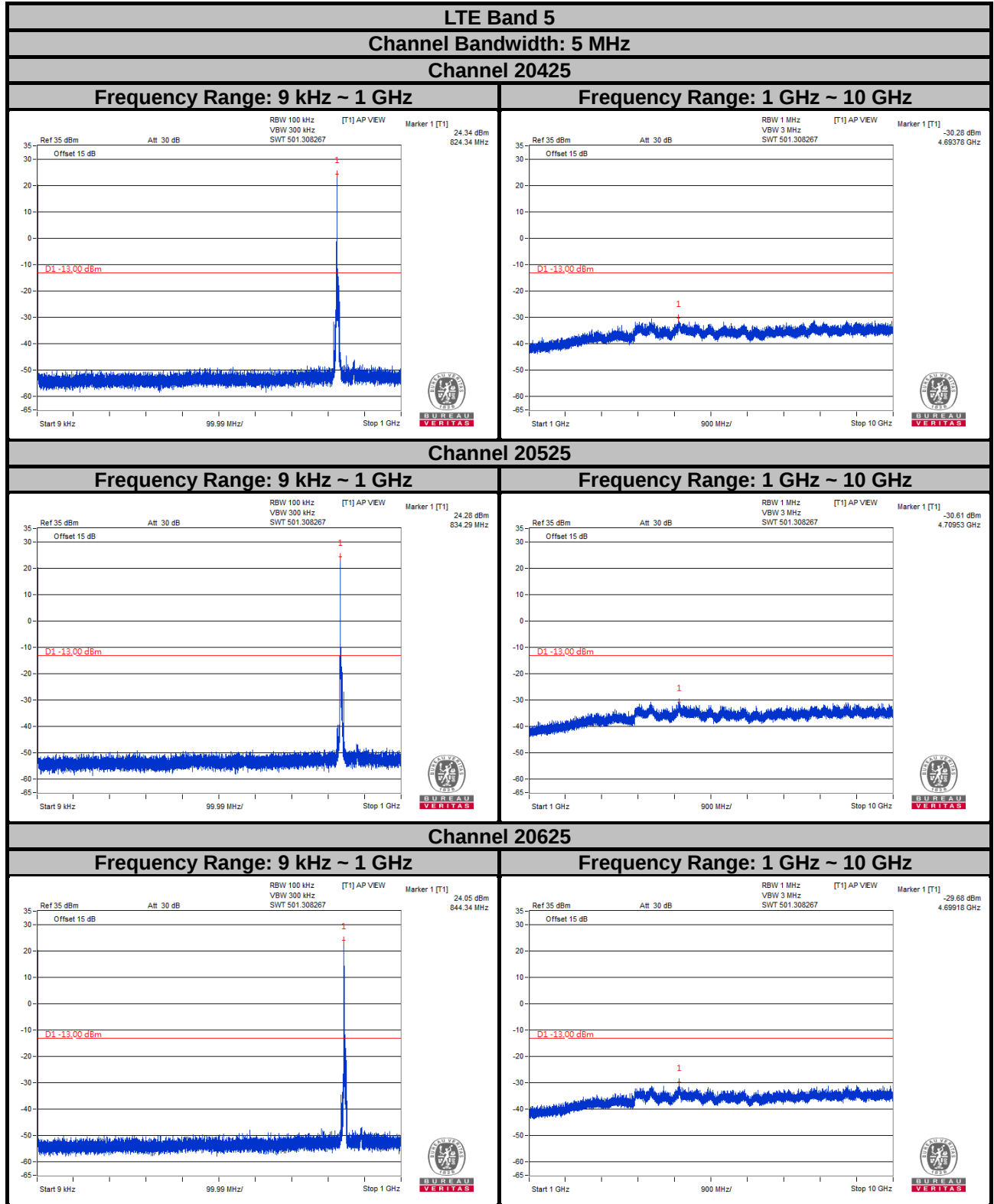
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



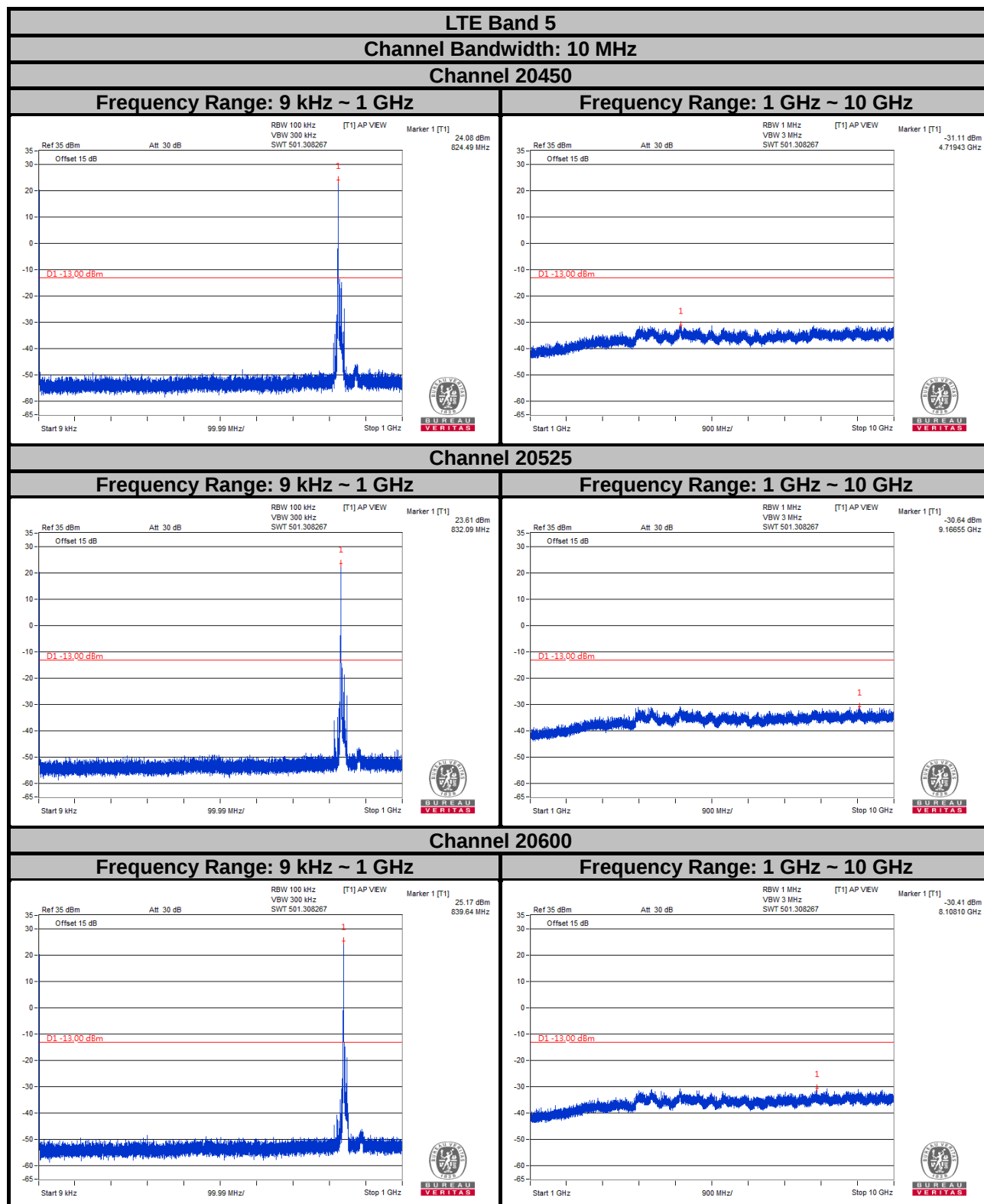
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



Note: The signal over the limit in 9 kHz is from spectrum analyzer.



Note: The signal over the limit in 9 kHz is from spectrum analyzer.



Note: The signal over the limit in 9 kHz is from spectrum analyzer.

4.8 Radiated Emission Measurement

4.8.1 Limits of Radiated Emission Measurement

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

4.8.2 Test Procedure

- Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step a. Record the power level of S.G
- $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}.$
- E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, $E.R.P \text{ power} = E.I.R.P \text{ power} - 2.15 \text{ dB}.$

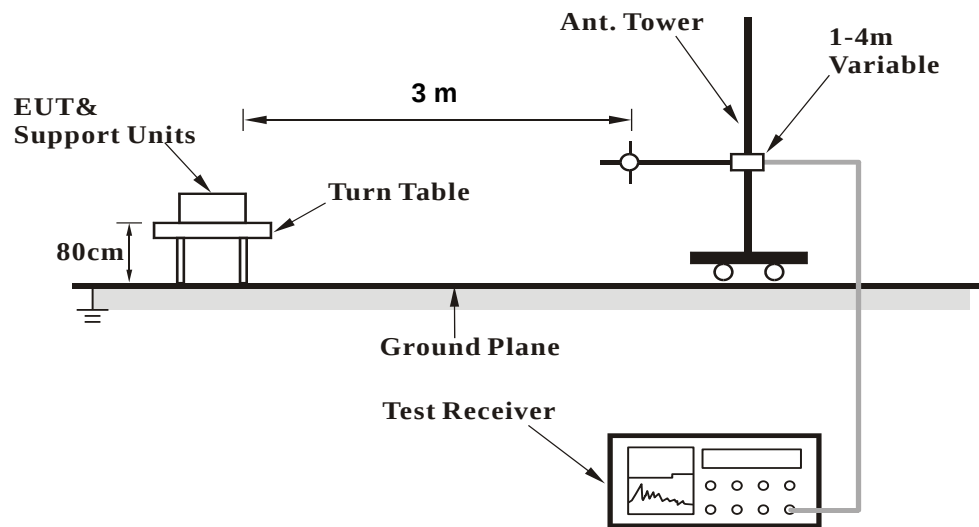
NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz/3 MHz.

4.8.3 Deviation from Test Standard

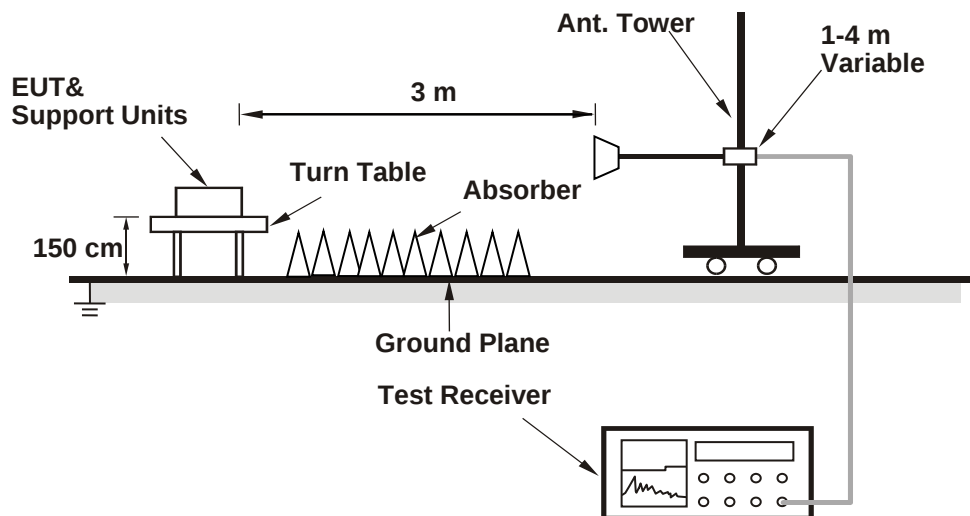
No deviation.

4.8.4 Test Setup

<Radiated Emission below or equal 1 GHz>



<Radiated Emission above 1 GHz>



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

4.8.5 Test Results

GSM:

Low Channel

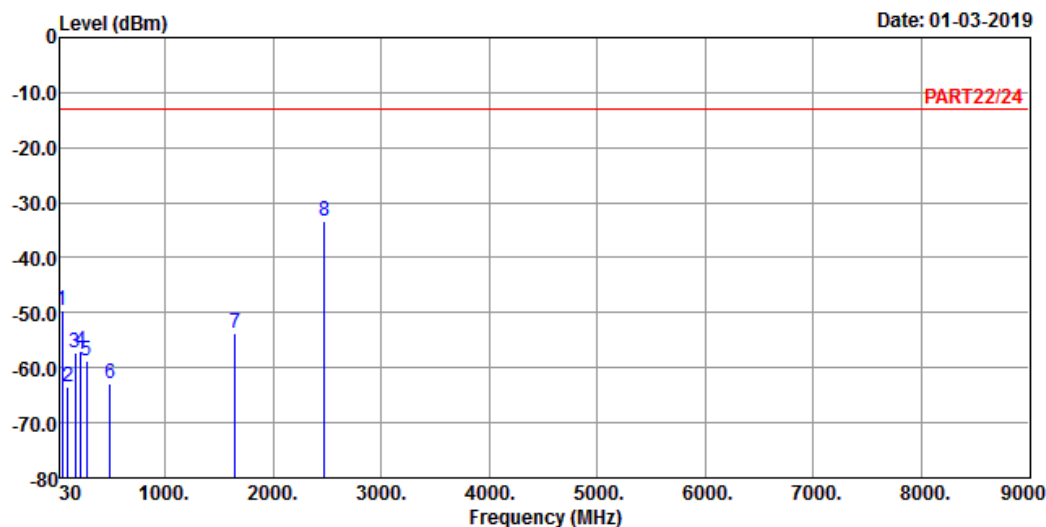
Bureau Veritas Consumer Products Services Ltd., Taoyuan



A D T

Data: 5

Date: 01-03-2019



Site : 966 Chamber 5

Condition: PART22/24 HORIZONTAL

Remak : GPRS 850 Link_L-CH

Tested by: Jisyong Wang

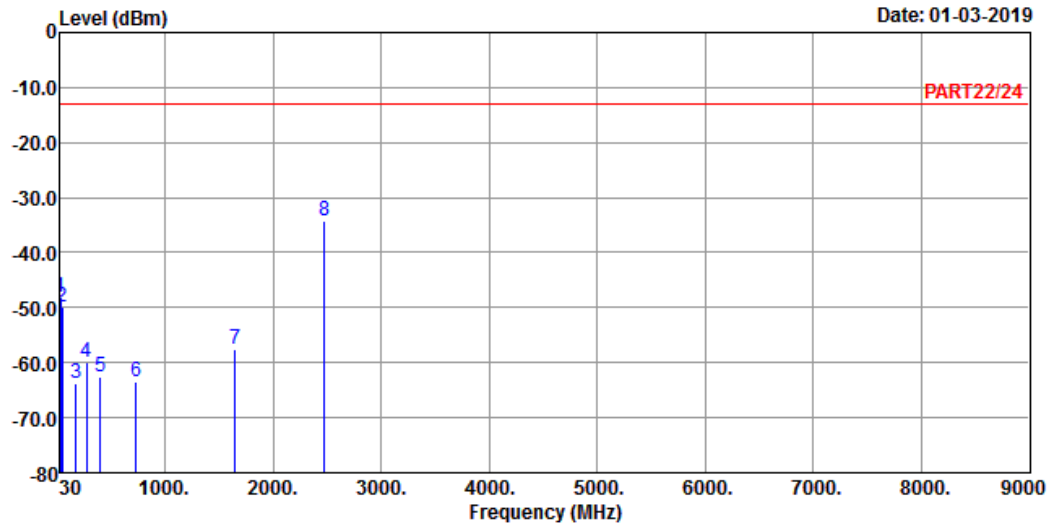
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	43.58	-49.67	-48.20	-13.00	-36.67	-1.47	Peak
2	102.75	-63.43	-52.94	-13.00	-50.43	-10.49	Peak
3	170.65	-57.34	-51.64	-13.00	-44.34	-5.70	Peak
4	217.21	-56.93	-49.61	-13.00	-43.93	-7.32	Peak
5	272.50	-58.82	-52.37	-13.00	-45.82	-6.45	Peak
6	488.81	-62.91	-58.08	-13.00	-49.91	-4.83	Peak
7	1648.40	-53.64	-39.90	-13.00	-40.64	-13.74	Peak
8 pp	2472.60	-33.34	-23.32	-13.00	-20.34	-10.02	Peak

Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch



A D T

Data: 6



Site : 966 Chamber 5

Condition: PART22/24 VERTICAL

Remak : GPRS 850 Link_L-CH

Tested by: Jisyong Wang

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	31.94	-48.01	-47.41	-13.00	-35.01	-0.60	Peak
2	43.58	-49.95	-48.48	-13.00	-36.95	-1.47	Peak
3	172.59	-63.66	-57.62	-13.00	-50.66	-6.04	Peak
4	275.41	-59.80	-53.29	-13.00	-46.80	-6.51	Peak
5	399.57	-62.63	-56.68	-13.00	-49.63	-5.95	Peak
6	730.34	-63.56	-64.06	-13.00	-50.56	0.50	Peak
7	1648.40	-57.48	-43.74	-13.00	-44.48	-13.74	Peak
8 pp	2472.60	-34.31	-24.29	-13.00	-21.31	-10.02	Peak

Middle Channel

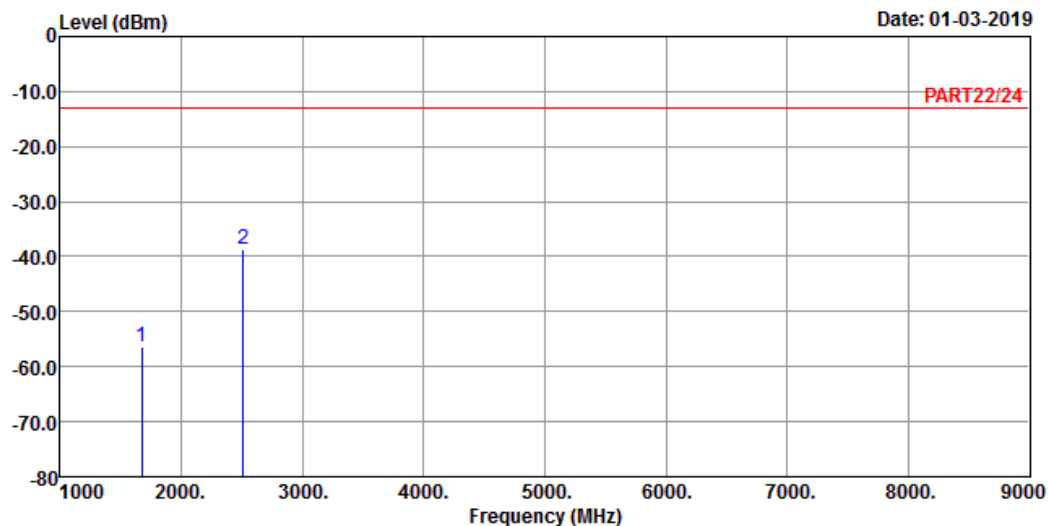
Bureau Veritas Consumer Products Services Ltd., Taoyuan



A D T

Data: 1

Date: 01-03-2019



Site : 966 Chamber 5

Condition: PART22/24 HORIZONTAL

Remak : GPRS 850 Link_M-CH

Tested by: Jisyong Wang

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1672.80	-56.31	-42.41	-13.00	-43.31	-13.90	Peak
2 pp	2509.20	-38.72	-28.64	-13.00	-25.72	-10.08	Peak

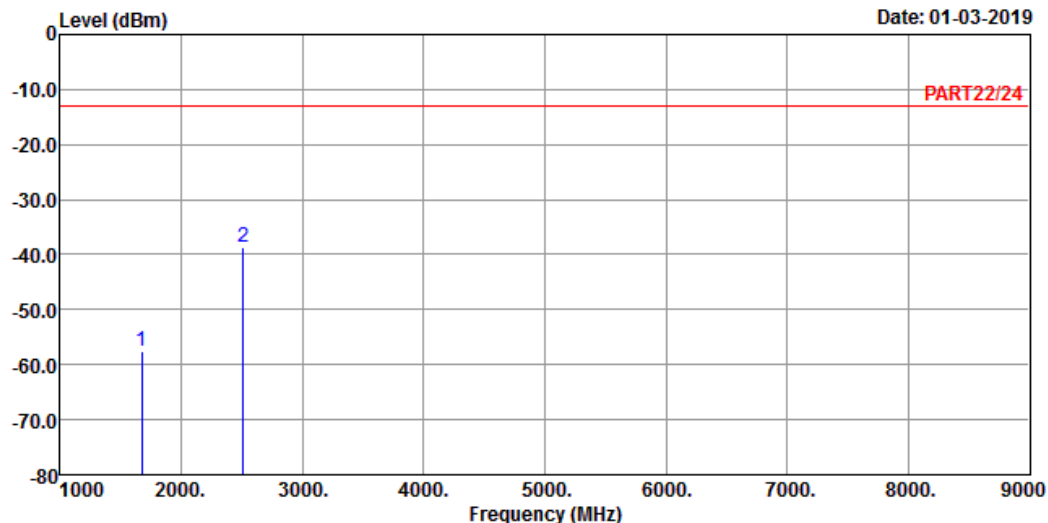
Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch



A D T

Data: 2

Date: 01-03-2019



Site : 966 Chamber 5

Condition: PART22/24 VERTICAL

Remak : GPRS 850 Link_M-CH

Tested by: Jisyong Wang

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1672.80	-57.71	-43.81	-13.00	-44.71	-13.90	Peak
2 pp	2509.20	-38.71	-28.63	-13.00	-25.71	-10.08	Peak

High Channel

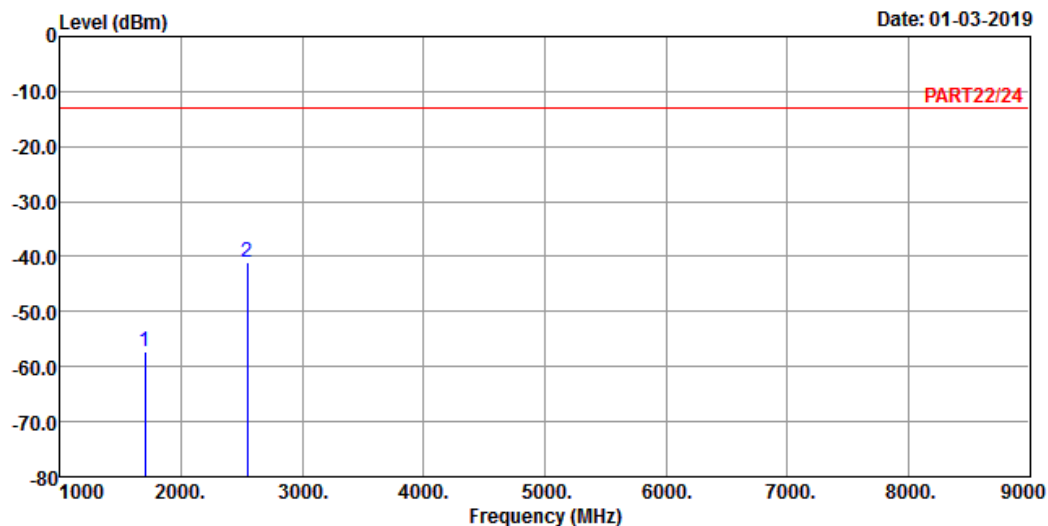
Bureau Veritas Consumer Products Services Ltd., Taoyuan



A D T

Data: 1

Date: 01-03-2019



Site : 966 Chamber 5

Condition: PART22/24 HORIZONTAL

Remak : GPRS 850 Link_H-CH

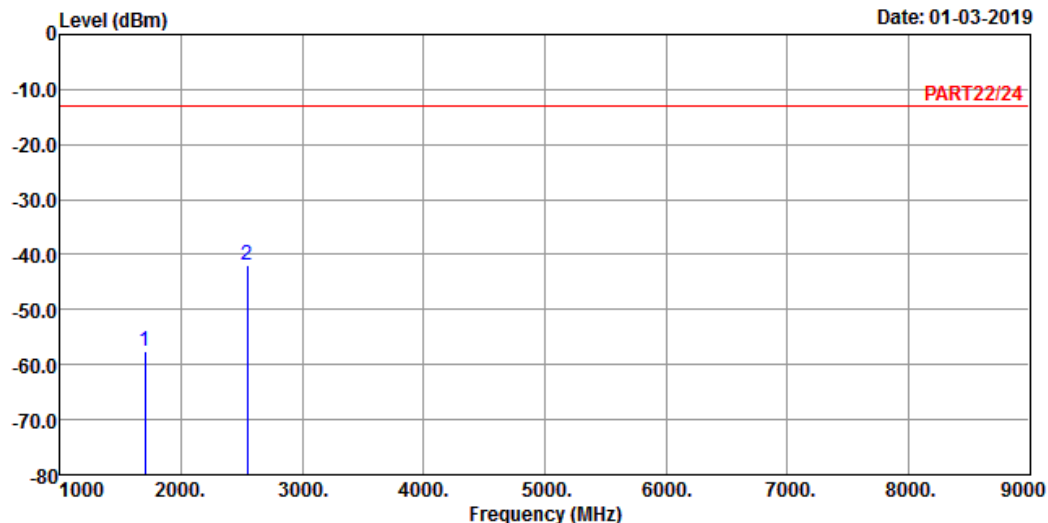
Tested by: Jisyong Wang

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1697.60	-57.28	-43.23	-13.00	-44.28	-14.05	Peak
2 pp	2546.40	-41.12	-31.06	-13.00	-28.12	-10.06	Peak



Data: 2

Date: 01-03-2019



Site : 966 Chamber 5

Condition: PART22/24 VERTICAL

Remak : GPRS 850 Link_H-CH

Tested by: Jisyong Wang

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1697.60	-57.62	-43.57	-13.00	-44.62	-14.05	Peak
2 pp	2546.40	-41.96	-31.90	-13.00	-28.96	-10.06	Peak

EDGE:
Low Channel

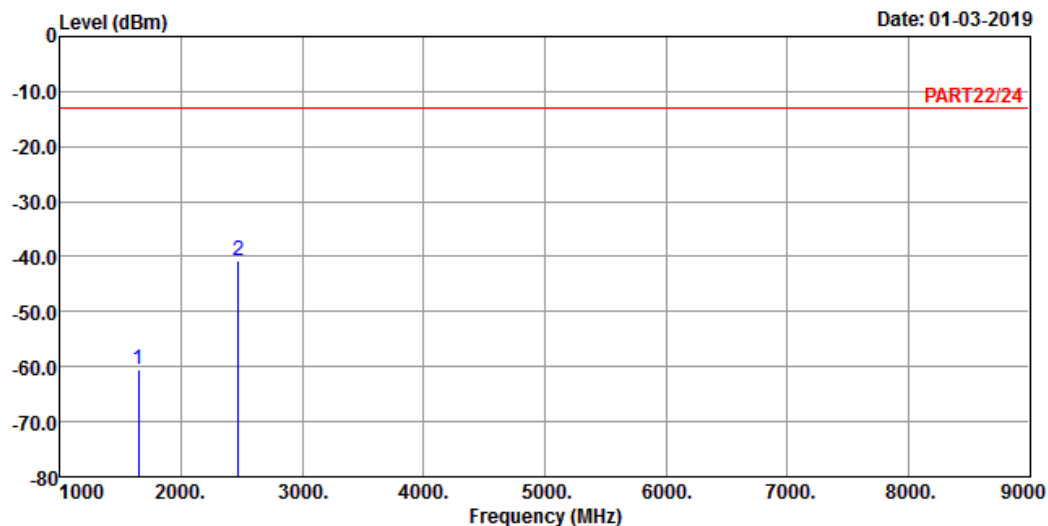
Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch



A D T

Data: 1

Date: 01-03-2019



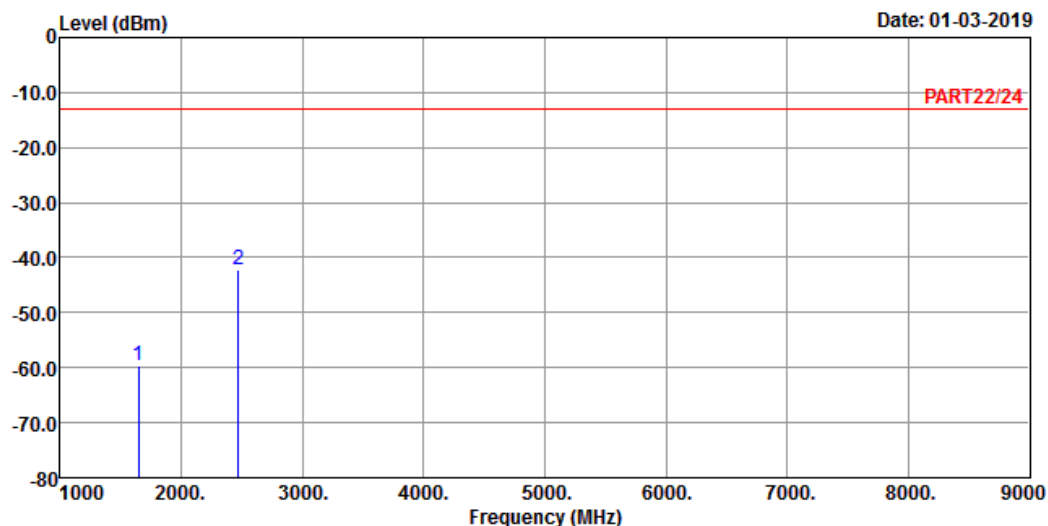
Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remark : EDGE 850 Link_L-CH
Tested by: Jisyong Wang

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1648.40	-60.40	-46.66	-13.00	-47.40	-13.74	Peak
2 pp	2472.60	-40.66	-30.64	-13.00	-27.66	-10.02	Peak



Data: 2

Date: 01-03-2019



Site : 966 Chamber 5

Condition: PART22/24 VERTICAL

Remark : EDGE 850 Link_L-CH

Tested by: Jisyong Wang

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1648.40	-59.63	-45.89	-13.00	-46.63	-13.74	Peak
2 pp	2472.60	-42.11	-32.09	-13.00	-29.11	-10.02	Peak

Middle Channel

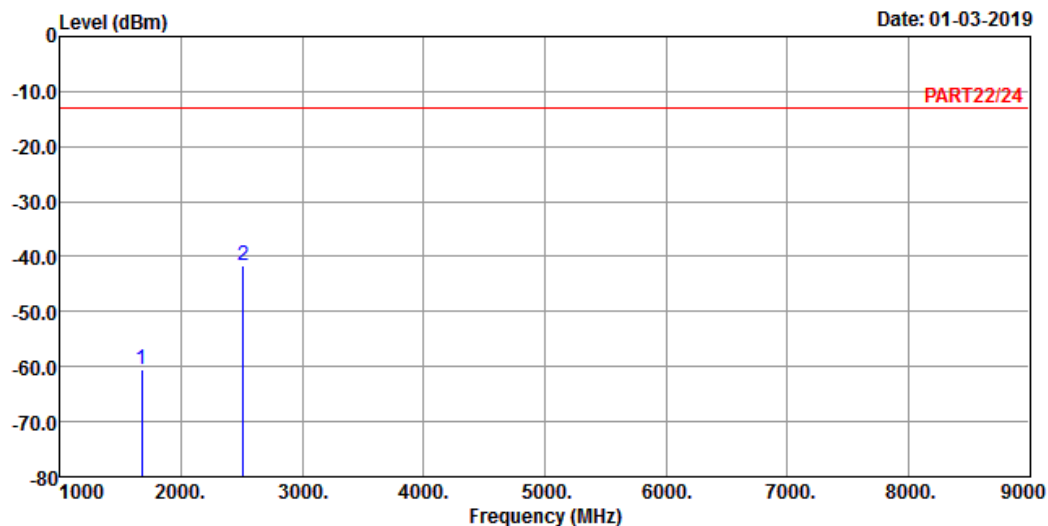
Bureau Veritas Consumer Products Services Ltd., Taoyuan



A D T

Data: 1

Date: 01-03-2019



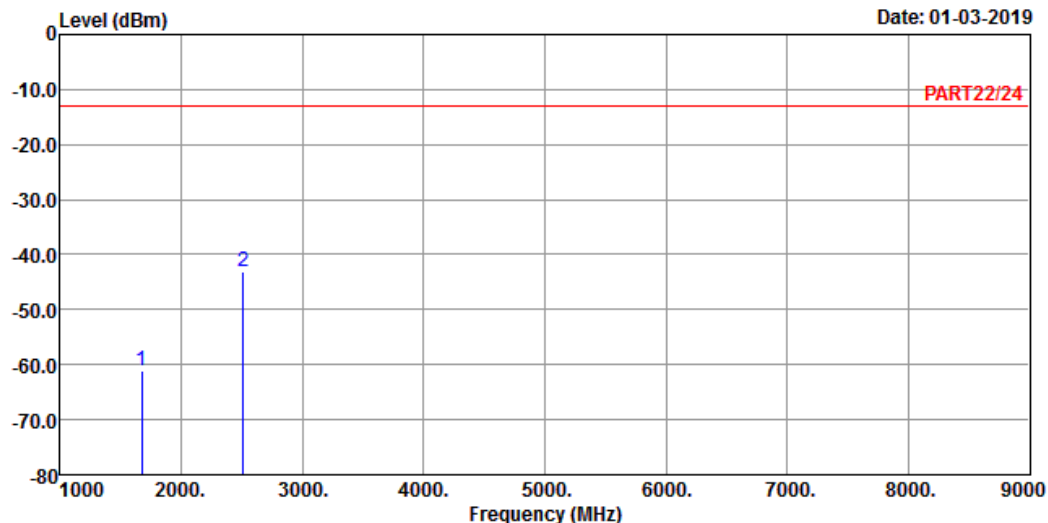
Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remark : EDGE 850 Link_M-CH
Tested by: Jisyong Wang

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1672.80	-60.58	-46.68	-13.00	-47.58	-13.90	Peak
2 pp	2509.20	-41.57	-31.49	-13.00	-28.57	-10.08	Peak



Data: 2

Date: 01-03-2019



Site : 966 Chamber 5

Condition: PART22/24 VERTICAL

Remark : EDGE 850 Link_M-CH

Tested by: Jisyong Wang

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1672.80	-61.21	-47.31	-13.00	-48.21	-13.90	Peak
2 pp	2509.20	-43.18	-33.10	-13.00	-30.18	-10.08	Peak

High Channel

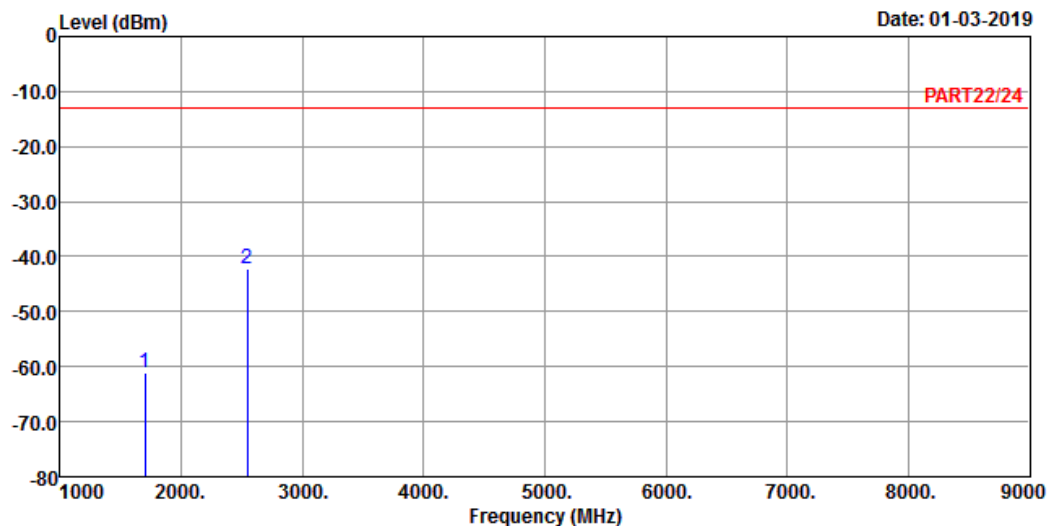
Bureau Veritas Consumer Products Services Ltd., Taoyuan



A D T

Data: 1

Date: 01-03-2019



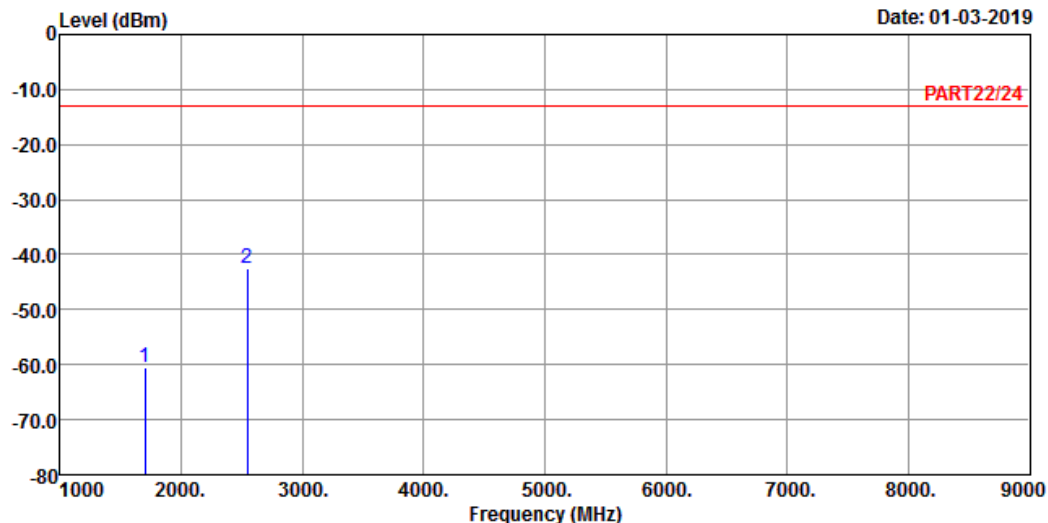
Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remark : EDGE 850 Link_H-CH
Tested by: Jisyong Wang

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1697.60	-61.21	-47.16	-13.00	-48.21	-14.05	Peak
2 pp	2546.40	-42.30	-32.24	-13.00	-29.30	-10.06	Peak



Data: 2

Date: 01-03-2019



Site : 966 Chamber 5

Condition: PART22/24 VERTICAL

Remark : EDGE 850 Link_H-CH

Tested by: Jisyong Wang

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1697.60	-60.39	-46.34	-13.00	-47.39	-14.05	Peak
2 pp	2546.40	-42.37	-32.31	-13.00	-29.37	-10.06	Peak

WCDMA:
Low Channel

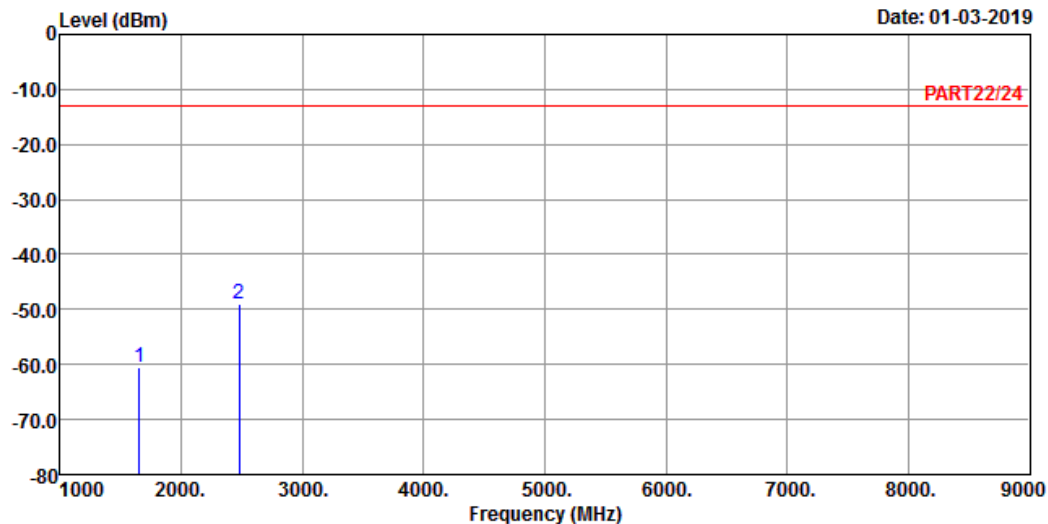
Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch



A D T

Data: 1

Date: 01-03-2019



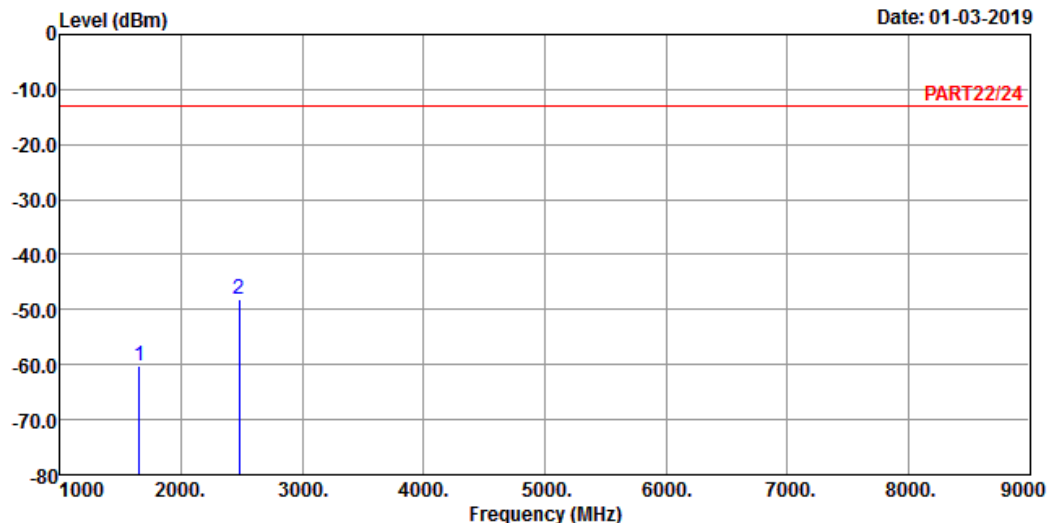
Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remark : WCDMA Band V Link_L-CH
Tested by: Jisyong Wang

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1652.80	-60.64	-46.87	-13.00	-47.64	-13.77	Peak
2 pp	2479.20	-48.87	-38.84	-13.00	-35.87	-10.03	Peak



Data: 2

Date: 01-03-2019



Site : 966 Chamber 5

Condition: PART22/24 VERTICAL

Remark : WCDMA Band V Link_L-CH

Tested by: Jisyong Wang

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1652.80	-60.33	-46.56	-13.00	-47.33	-13.77	Peak
2 pp	2479.20	-48.20	-38.17	-13.00	-35.20	-10.03	Peak

Middle Channel

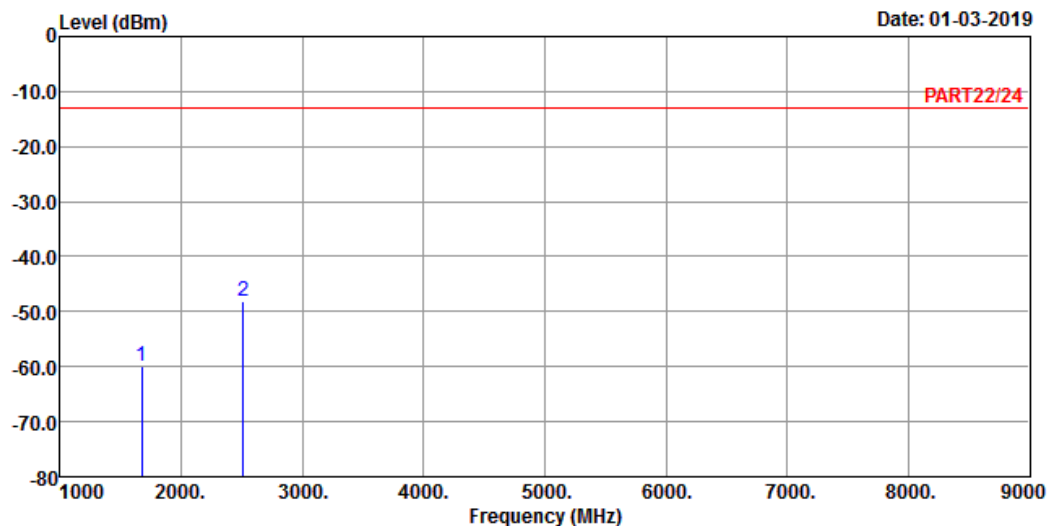
Bureau Veritas Consumer Products Services Ltd., Taoyuan



A D T

Data: 1

Date: 01-03-2019



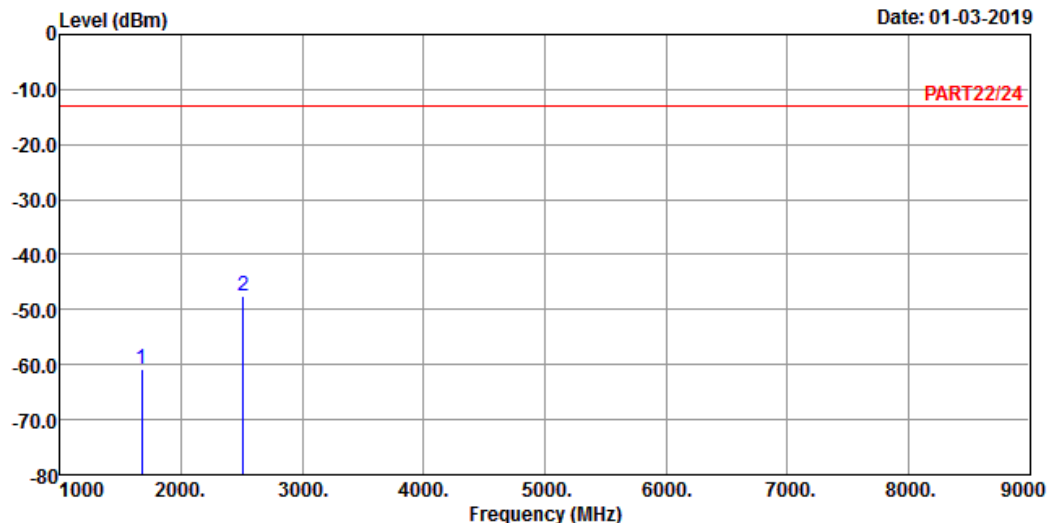
Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remark : WCDMA Band V Link_M-CH
Tested by: Jisyong Wang

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1672.80	-59.86	-45.96	-13.00	-46.86	-13.90	Peak
2 pp	2509.20	-48.13	-38.05	-13.00	-35.13	-10.08	Peak



Data: 2

Date: 01-03-2019



Site : 966 Chamber 5

Condition: PART22/24 VERTICAL

Remark : WCDMA Band V Link_M-CH

Tested by: Jisyong Wang

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1672.80	-60.83	-46.93	-13.00	-47.83	-13.90	Peak
2 pp	2509.20	-47.61	-37.53	-13.00	-34.61	-10.08	Peak

High Channel

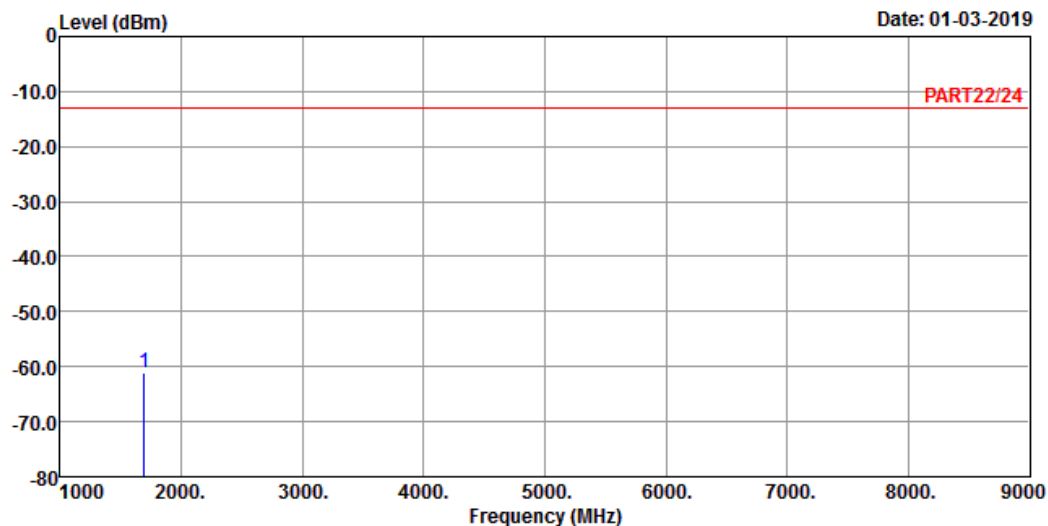
Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch



A D T

Data: 1

Date: 01-03-2019



Site : 966 Chamber 5

Condition: PART22/24 HORIZONTAL

Remark : WCDMA Band V Link_H-CH

Tested by: Jisyong Wang

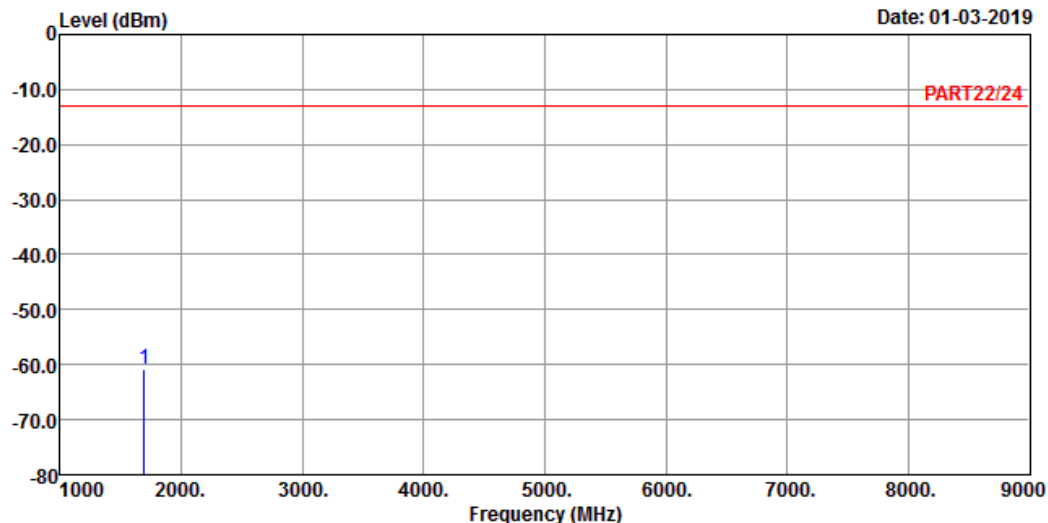
Freq	Level	Read	Limit	Over		Remark
		Level	Line	Limit	Factor	
MHz	dBm	dBm	dBm	dB	dB	

1 pp 1693.20 -61.24 -47.22 -13.00 -48.24 -14.02 Peak



Data: 2

Date: 01-03-2019



Site : 966 Chamber 5

Condition: PART22/24 VERTICAL

Remark : WCDMA Band V Link_H-CH

Tested by: Jisyong Wang

Freq	Level	Read	Limit	Over			Remark
		Level	Line	Limit	Factor		
MHz	dBm	dBm	dBm	dB	dB		

1 pp 1693.20 -60.82 -46.80 -13.00 -47.82 -14.02 Peak

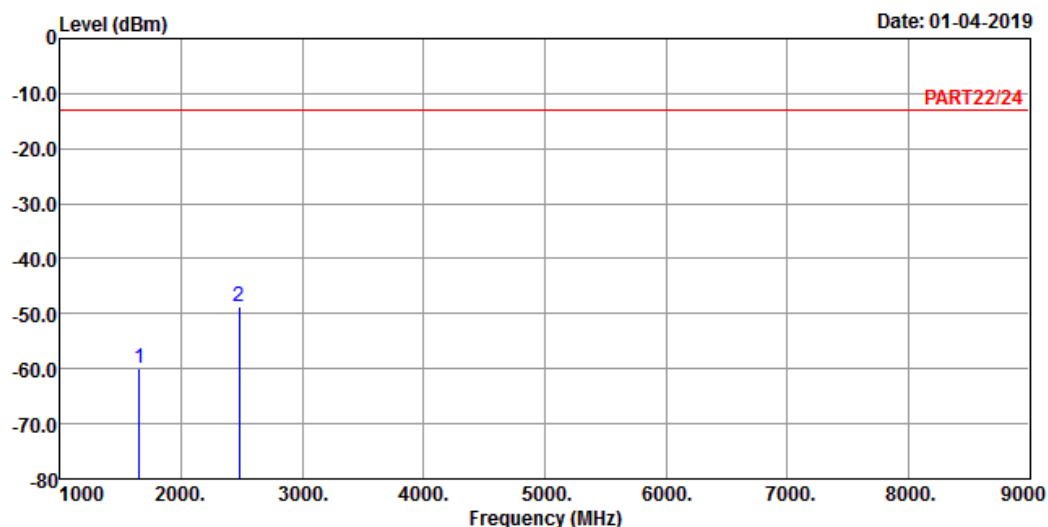
LTE Band 5
Channel Bandwidth: 1.4 MHz / QPSK
Low Channel

Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch



A D T

Data: 3



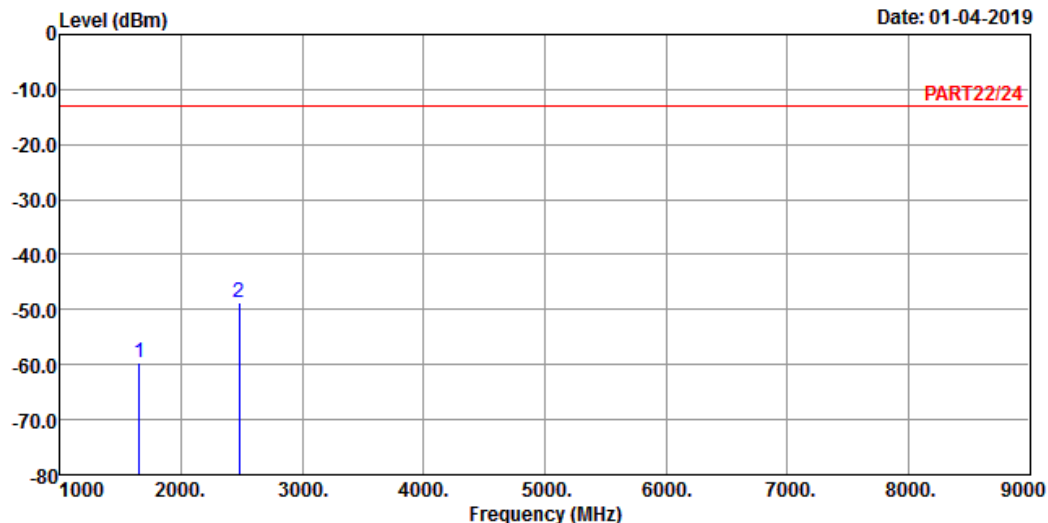
Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : LTE Band 5 QPSK_1.4M Link_L-CH
Tested by: Jisyong Wang

		Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark	
MHz	dBm	dBm	dBm	dB	dB		
1	1649.40	-59.80	-46.06	-13.00	-46.80	-13.74	Peak
2 pp	2474.10	-48.85	-38.83	-13.00	-35.85	-10.02	Peak



Data: 4

Date: 01-04-2019



Site : 966 Chamber 5

Condition: PART22/24 VERTICAL

Remak : LTE Band 5 QPSK_1.4M Link_L-CH

Tested by: Jisyong Wang

			Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark	
MHz	dBm	dBm	dBm	dB	dB		
1	1649.40	-59.55	-45.81	-13.00	-46.55	-13.74	Peak
2	2474.10	-48.78	-38.76	-13.00	-35.78	-10.02	Peak

Middle Channel

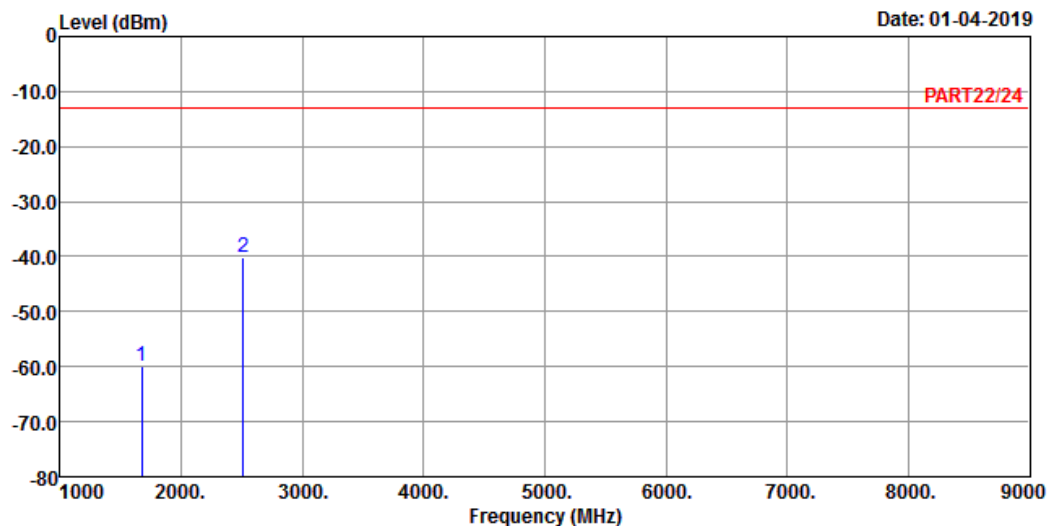
Bureau Veritas Consumer Products Services Ltd., Taoyuan



A D T

Data: 3

Date: 01-04-2019



Site : 966 Chamber 5

Condition: PART22/24 HORIZONTAL

Remak : LTE Band 5 QPSK_1.4M Link_M-CH

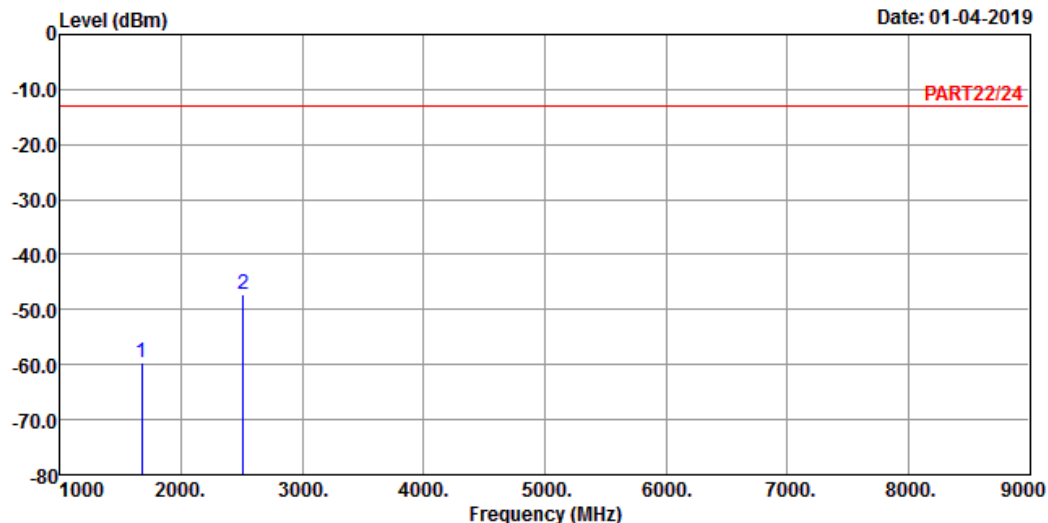
Tested by: Jisyong Wang

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1673.00	-60.07	-46.17	-13.00	-47.07	-13.90	Peak
2 pp	2509.50	-40.05	-29.97	-13.00	-27.05	-10.08	Peak



Data: 4

Date: 01-04-2019



Site : 966 Chamber 5

Condition: PART22/24 VERTICAL

Remak : LTE Band 5 QPSK_1.4M Link_M-CH

Tested by: Jisyong Wang

			Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark	
MHz	dBm	dBm	dBm	dB	dB		
1	1673.00	-59.62	-45.72	-13.00	-46.62	-13.90	Peak
2	2509.50	-47.13	-37.05	-13.00	-34.13	-10.08	Peak

High Channel

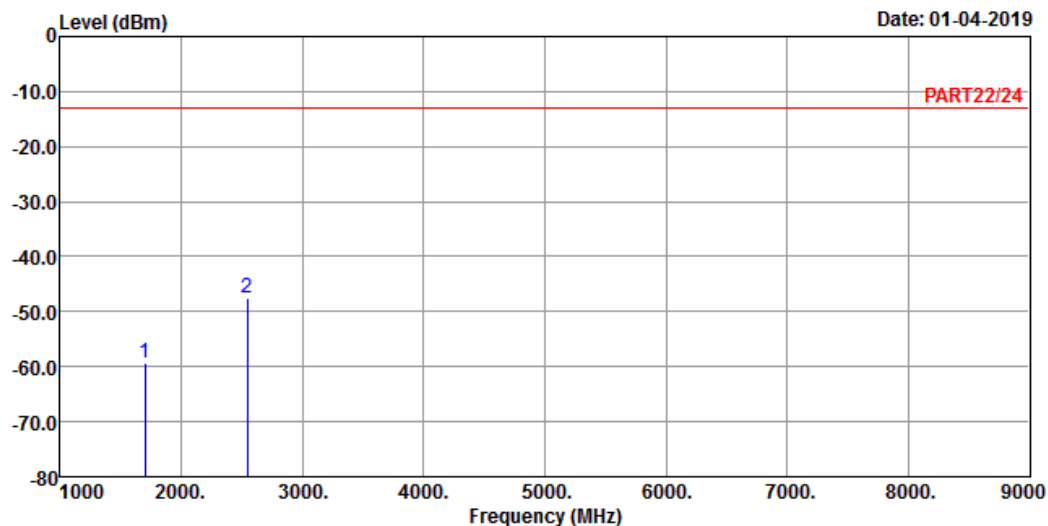
Bureau Veritas Consumer Products Services Ltd., Taoyuan



A D T

Data: 3

Date: 01-04-2019



Site : 966 Chamber 5

Condition: PART22/24 HORIZONTAL

Remak : LTE Band 5 QPSK_1.4M Link_H-CH

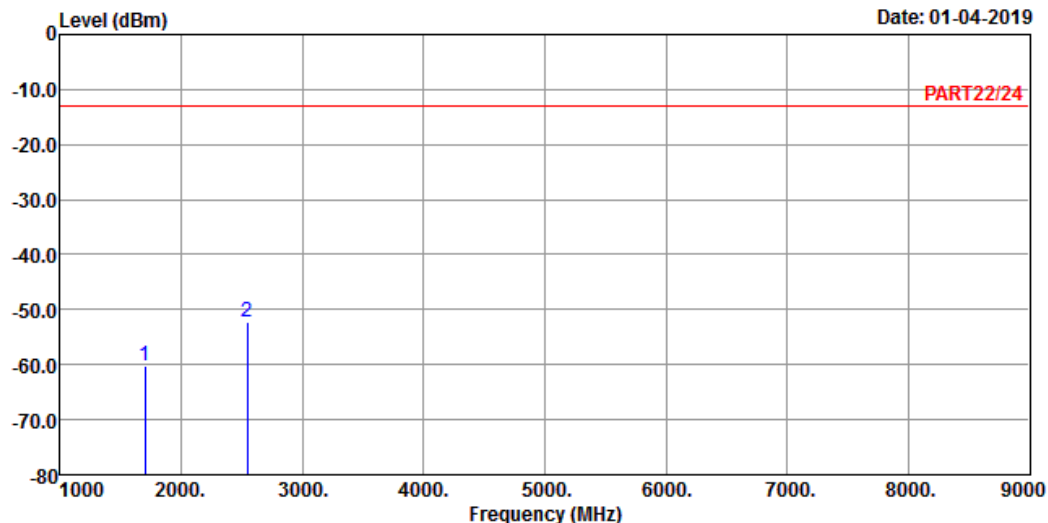
Tested by: Jisyong Wang

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1696.60	-59.41	-45.39	-13.00	-46.41	-14.02	Peak
2 pp	2544.90	-47.58	-37.52	-13.00	-34.58	-10.06	Peak



Data: 4

Date: 01-04-2019



Site : 966 Chamber 5

Condition: PART22/24 VERTICAL

Remak : LTE Band 5 QPSK_1.4M Link_H-CH

Tested by: Jisyong Wang

			Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark	
MHz	dBm	dBm	dBm	dB	dB		
1	1696.60	-60.32	-46.30	-13.00	-47.32	-14.02	Peak
2	2544.90	-52.34	-42.28	-13.00	-39.34	-10.06	Peak

Channel Bandwidth: 5 MHz / QPSK
Low Channel

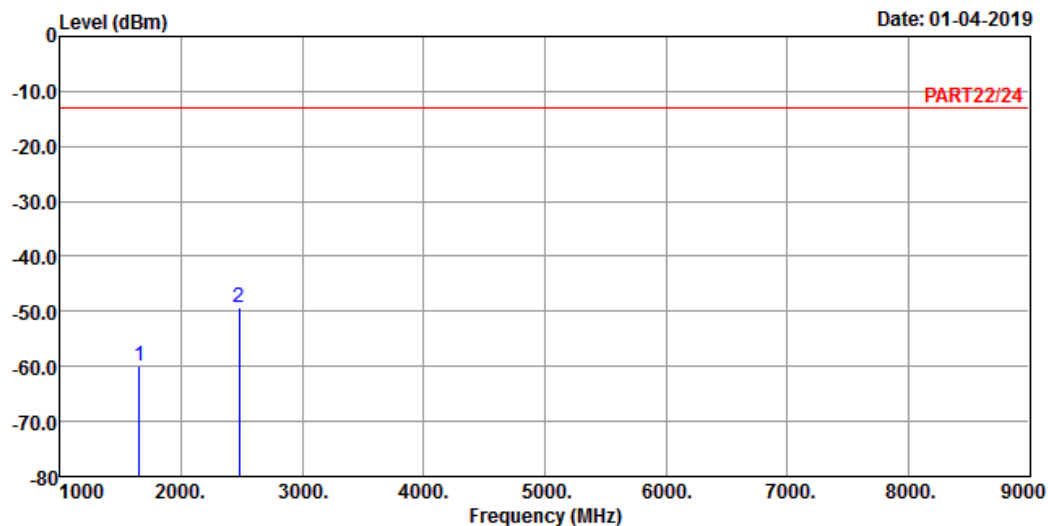
Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch



A D T

Data: 3

Date: 01-04-2019



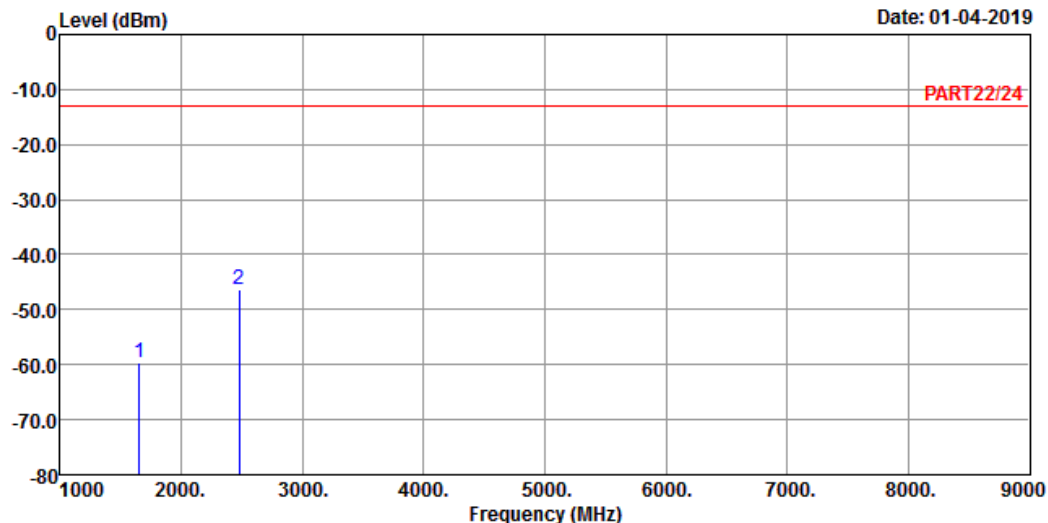
Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : LTE Band 5 QPSK_5M Link_L-CH
Tested by: Jisyong Wang

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1653.00	-60.03	-46.26	-13.00	-47.03	-13.77	Peak
2 pp	2479.50	-49.36	-39.33	-13.00	-36.36	-10.03	Peak



Data: 4

Date: 01-04-2019



Site : 966 Chamber 5

Condition: PART22/24 VERTICAL

Remak : LTE Band 5 QPSK_5M Link_L-CH

Tested by: Jisyong Wang

			Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark	
MHz	dBm	dBm	dBm	dB	dB		
1	1653.00	-59.62	-45.85	-13.00	-46.62	-13.77	Peak
2	2479.50	-46.43	-36.40	-13.00	-33.43	-10.03	Peak

Middle Channel

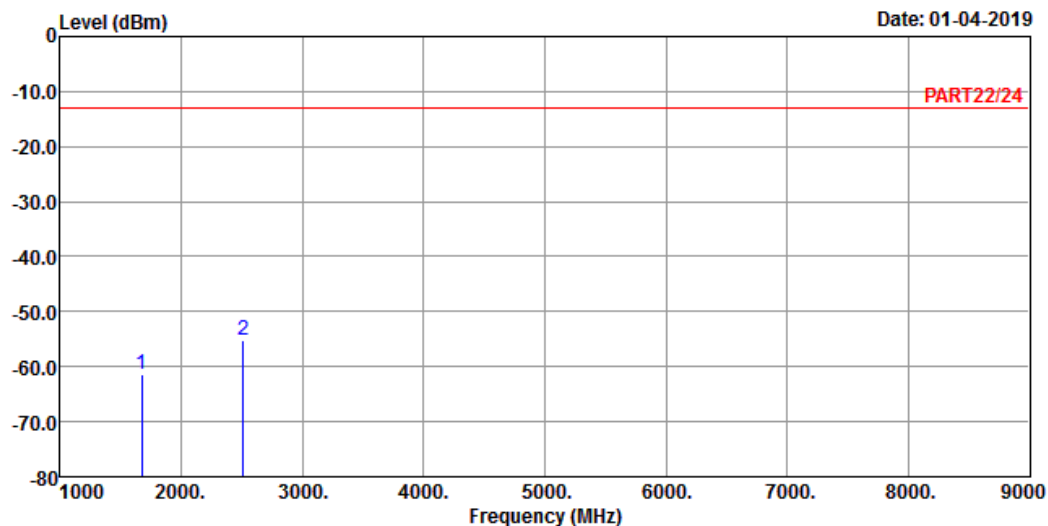
Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch



A D T

Data: 3

Date: 01-04-2019



Site : 966 Chamber 5

Condition: PART22/24 HORIZONTAL

Remak : LTE Band 5 QPSK_5M Link_M-CH

Tested by: Jisyong Wang

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1673.00	-61.26	-47.36	-13.00	-48.26	-13.90	Peak
2 pp	2509.50	-55.35	-45.27	-13.00	-42.35	-10.08	Peak

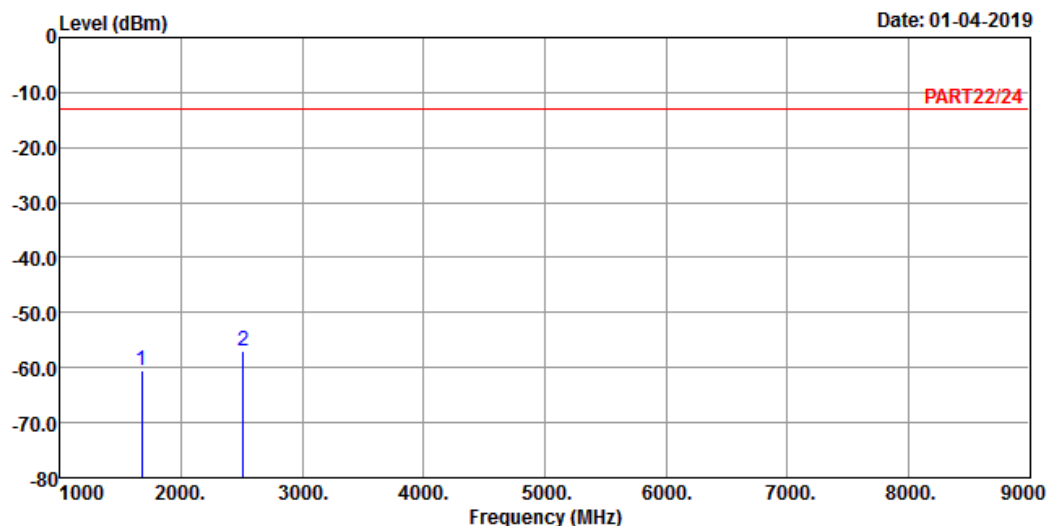
Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch



A D T

Data: 4

Date: 01-04-2019



Site : 966 Chamber 5

Condition: PART22/24 VERTICAL

Remak : LTE Band 5 QPSK_5M Link_M-CH

Tested by: Jisyong Wang

			Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark	
MHz	dBm	dBm	dBm	dB	dB		
1	1673.00	-60.46	-46.56	-13.00	-47.46	-13.90	Peak
2	2509.50	-56.96	-46.88	-13.00	-43.96	-10.08	Peak

High Channel

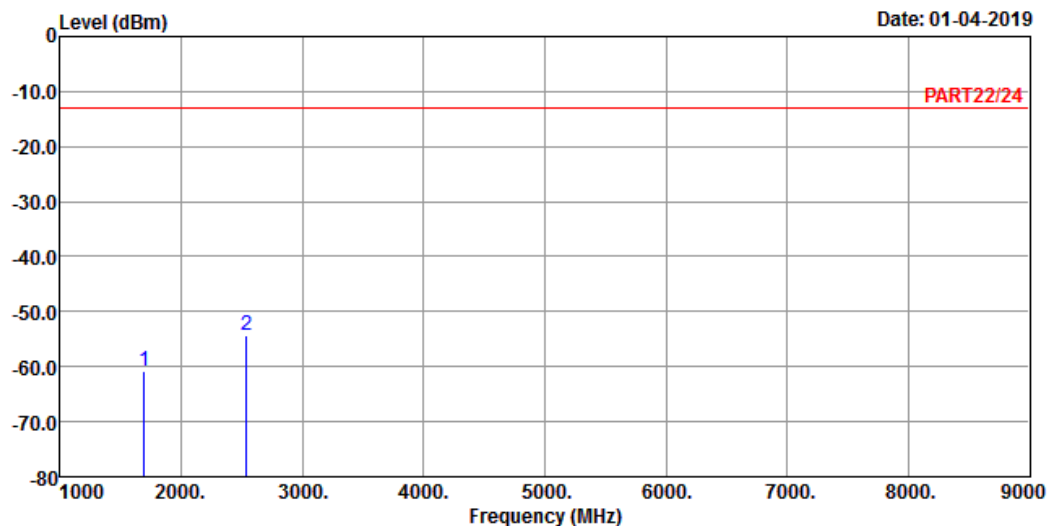
Bureau Veritas Consumer Products Services Ltd., Taoyuan



A D T

Data: 3

Date: 01-04-2019



Site : 966 Chamber 5

Condition: PART22/24 HORIZONTAL

Remak : LTE Band 5 QPSK_5M Link_H-CH

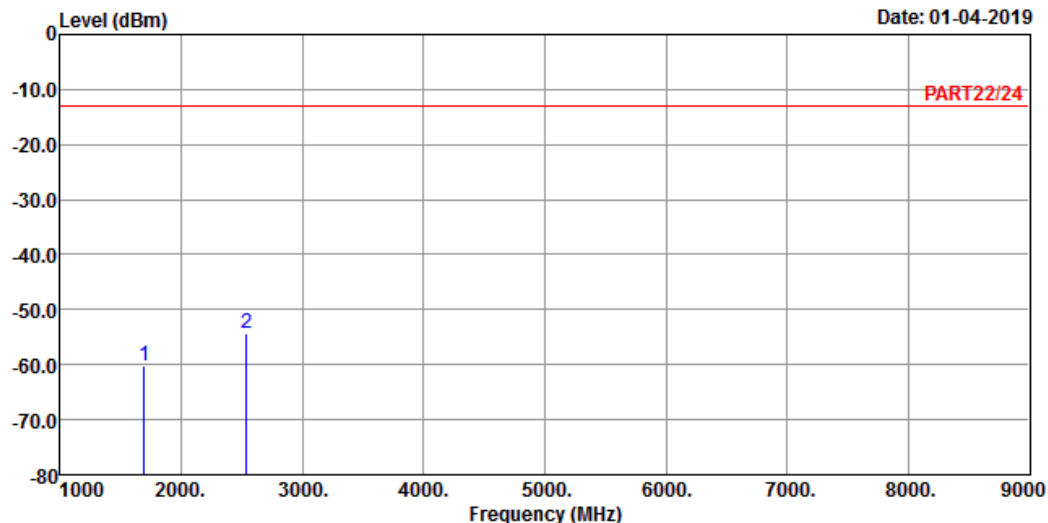
Tested by: Jisyong Wang

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1693.00	-60.70	-46.68	-13.00	-47.70	-14.02	Peak
2 pp	2539.50	-54.28	-44.22	-13.00	-41.28	-10.06	Peak



Data: 4

Date: 01-04-2019



Site : 966 Chamber 5

Condition: PART22/24 VERTICAL

Remak : LTE Band 5 QPSK_5M Link_H-CH

Tested by: Jisyong Wang

			Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark	
MHz	dBm	dBm	dBm	dB	dB		
1	1693.00	-60.25	-46.23	-13.00	-47.25	-14.02	Peak
2	2539.50	-54.44	-44.38	-13.00	-41.44	-10.06	Peak

Channel Bandwidth: 10 MHz / QPSK
Low Channel

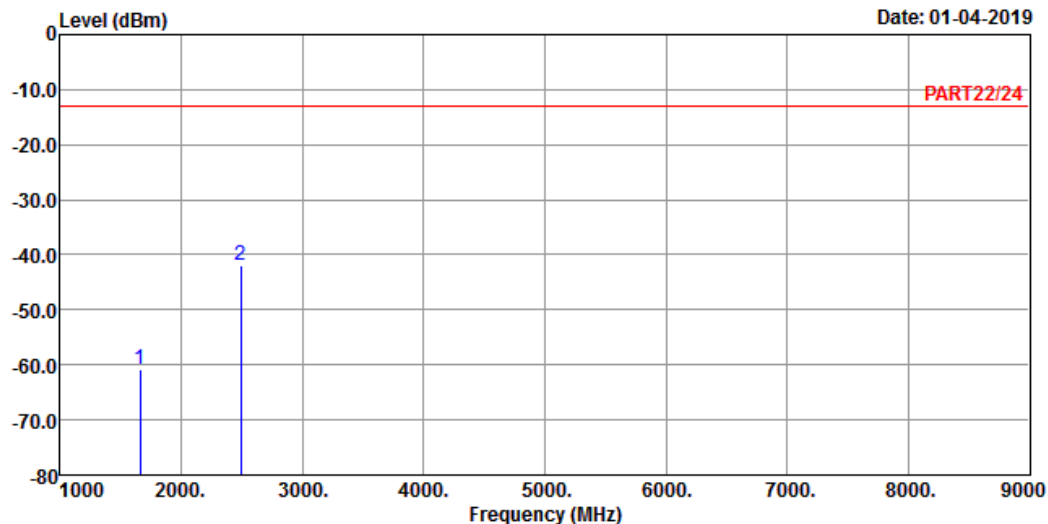
Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch



A D T

Data: 3

Date: 01-04-2019



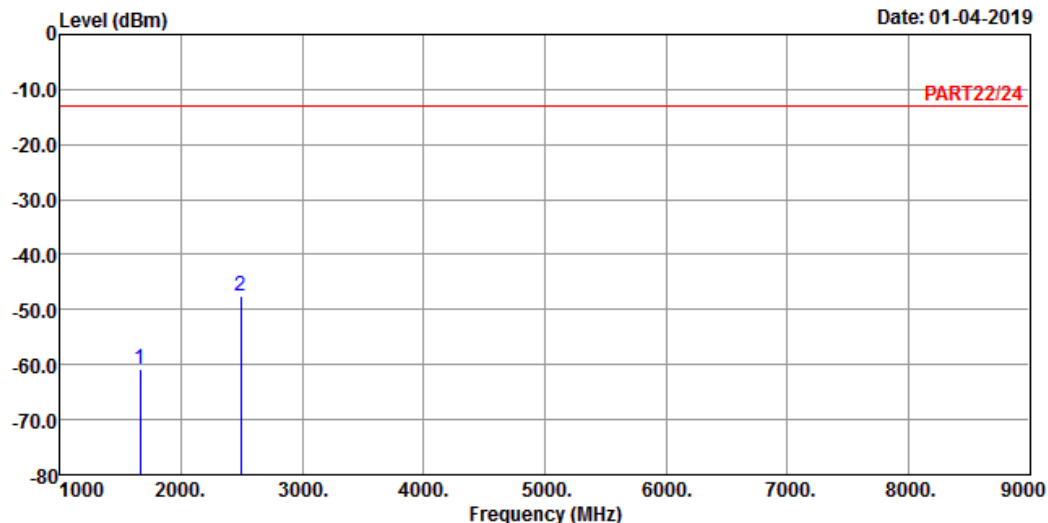
Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : LTE Band 5 QPSK_10M Link_L-CH
Tested by: Jisyong Wang

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1658.00	-60.76	-46.96	-13.00	-47.76	-13.80	Peak
2 pp	2487.00	-41.84	-31.79	-13.00	-28.84	-10.05	Peak



Data: 4

Date: 01-04-2019



Site : 966 Chamber 5

Condition: PART22/24 VERTICAL

Remak : LTE Band 5 QPSK_10M Link_L-CH

Tested by: Jisyong Wang

			Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark	
MHz	dBm	dBm	dBm	dB	dB		
1	1658.00	-60.82	-47.02	-13.00	-47.82	-13.80	Peak
2	2487.00	-47.47	-37.42	-13.00	-34.47	-10.05	Peak

Middle Channel

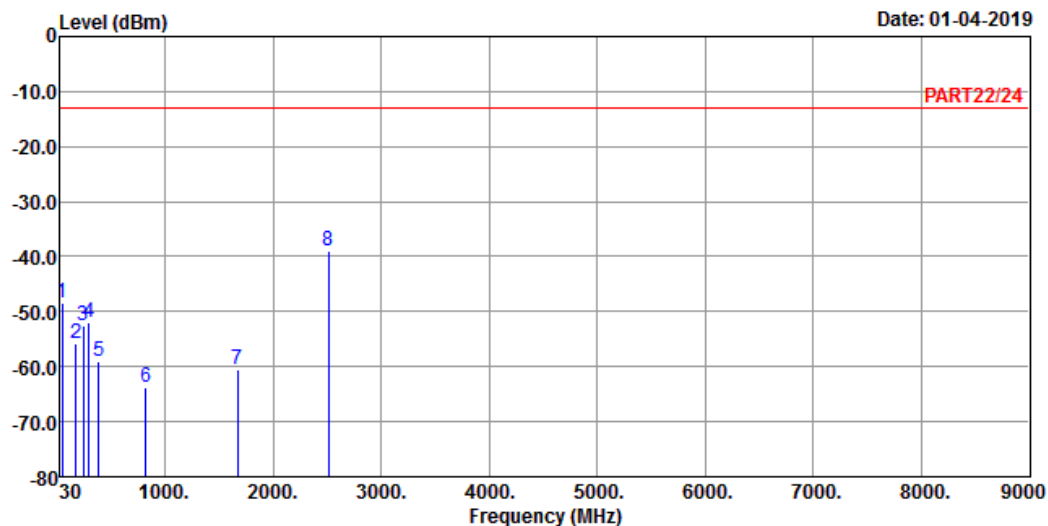
Bureau Veritas Consumer Products Services Ltd., Taoyuan



A D T

Data: 5

Date: 01-04-2019



Site : 966 Chamber 5

Condition: PART22/24 HORIZONTAL

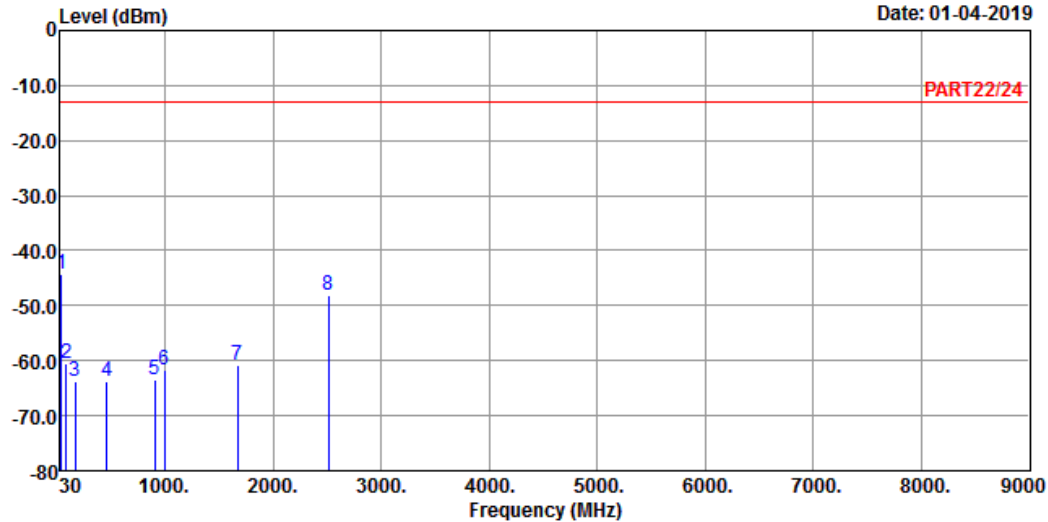
Remak : LTE Band 5 QPSK_10M Link_M-CH

Tested by: Jisyong Wang

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	44.55	-48.54	-46.55	-13.00	-35.54	-1.99	Peak
2	174.53	-55.74	-49.36	-13.00	-42.74	-6.38	Peak
3	245.34	-52.55	-46.36	-13.00	-39.55	-6.19	Peak
4	292.87	-52.00	-45.13	-13.00	-39.00	-6.87	Peak
5	383.08	-59.03	-52.99	-13.00	-46.03	-6.04	Peak
6	817.64	-63.66	-64.24	-13.00	-50.66	0.58	Peak
7	1673.00	-60.60	-46.70	-13.00	-47.60	-13.90	Peak
8 pp	2509.50	-39.04	-28.96	-13.00	-26.04	-10.08	Peak

Data: 6

Date: 01-04-2019



Site : 966 Chamber 5

Condition: PART22/24 VERTICAL

Remak : LTE Band 5 QPSK_10M Link_M-CH

Tested by: Jisyong Wang

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	39.70	-44.19	-44.83	-13.00	-31.19	0.64	Peak
2	81.41	-60.45	-49.54	-13.00	-47.45	-10.91	Peak
3	168.71	-63.67	-58.21	-13.00	-50.67	-5.46	Peak
4	458.74	-63.70	-58.31	-13.00	-50.70	-5.39	Peak
5	905.91	-63.40	-64.12	-13.00	-50.40	0.72	Peak
6	995.15	-61.66	-65.07	-13.00	-48.66	3.41	Peak
7	1673.00	-60.72	-46.82	-13.00	-47.72	-13.90	Peak
8	2509.50	-48.07	-37.99	-13.00	-35.07	-10.08	Peak

High Channel

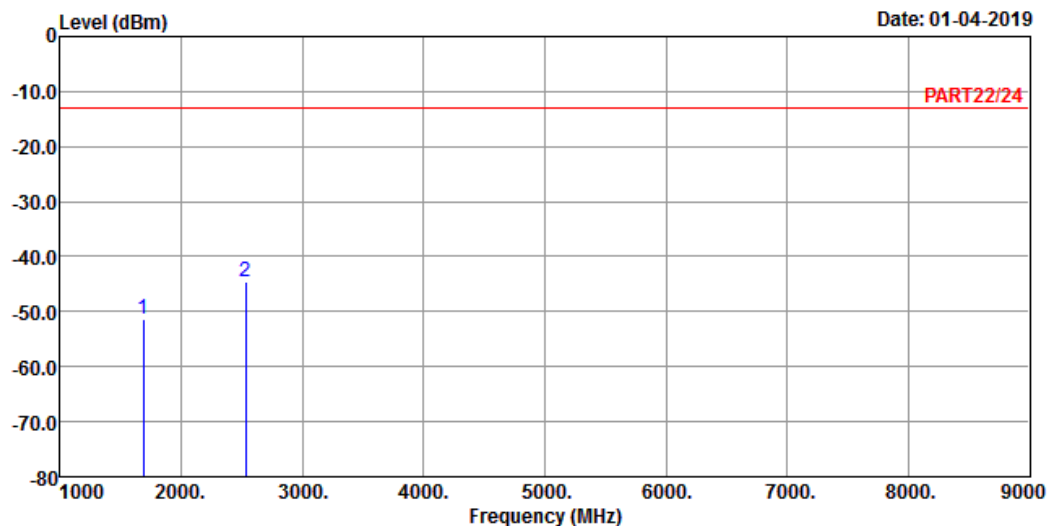
Bureau Veritas Consumer Products Services Ltd., Taoyuan



A D T

Data: 3

Date: 01-04-2019



Site : 966 Chamber 5

Condition: PART22/24 HORIZONTAL

Remak : LTE Band 5 QPSK_10M Link_H-CH

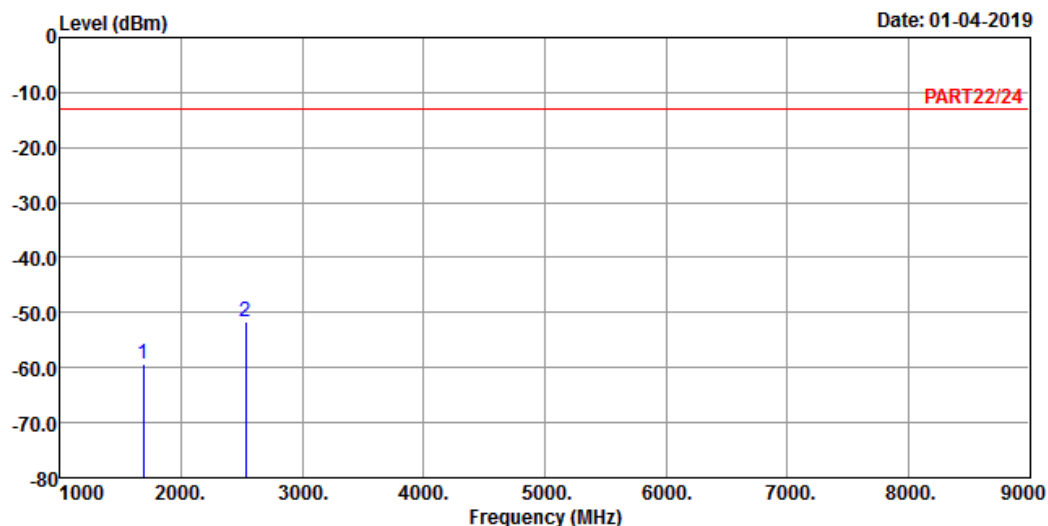
Tested by: Jisyong Wang

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1688.00	-51.38	-37.39	-13.00	-38.38	-13.99	Peak
2 pp	2532.00	-44.56	-34.49	-13.00	-31.56	-10.07	Peak



Data: 4

Date: 01-04-2019



Site : 966 Chamber 5

Condition: PART22/24 VERTICAL

Remak : LTE Band 5 QPSK_10M Link_H-CH

Tested by: Jisyong Wang

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1688.00	-59.20	-45.21	-13.00	-46.20	-13.99	Peak
2 pp	2532.00	-51.52	-41.45	-13.00	-38.52	-10.07	Peak

5 Pictures of Test Arrangements

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

Appendix – Information of the Testing Laboratories

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

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

Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

--- END ---