Variant FCC Test Report

(PART 24)

Report No.: RF181123D01D-1

FCC ID: P27-TPM540

Test Model: TPM540; TPM540M; TPM540S; TPM540MS

Received Date: Jan. 17, 2020

Test Date: Feb. 10 ~ Mar. 04, 2020

Issued Date: Mar. 06, 2020

Applicant: Sercomm Corp.

Address: 8F, No. 3-1, YuanQu St., NanKang, Taipei 115, Taiwan, R.O.C. (NanKang Software Park)

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

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FCC Registration / Designation Number: 788550 / TW0003

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RF181123D01D-1	Original Release	Mar. 06, 2020

1 Certificate of Conformity

Product: Cat-M1 Module

Brand: Sercomm

Test Model: TPM540; TPM540M; TPM540S; TPM540MS

Sample Status: Engineering Sample

Applicant: Sercomm Corp.

Test Date: Feb. 10 ~ Mar. 04, 2020

Standards: FCC Part 24, Subpart E

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

Prepared by : _____ , **Date:** Mar. 06, 2020

Gina Liu / Specialist

Approved by : _____ , **Date:** Mar. 06, 2020

Dylan Chiou / Senior Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 24 & Part 2			
FCC Clause	**Test Item**	**Result**	**Remarks**
2.1046 24.232	Effective Isotropic Radiated Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Meet the requirement.
24.232(d)	Peak to Average Ratio	Pass	Meet the requirement of limit.
2.1055 24.235	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
24.238	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 24.238	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 24.238	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -16.02 dB at 7620.00 MHz.

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

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	9 kHz ~ 30 MHz	3.04 dB
	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. 18, 2019	Mar. 17, 2020
Spectrum Analyzer Agilent	N9010A	MY52220314	Dec. 12, 2019	Dec. 11, 2020
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Apr. 15, 2019	Apr. 14, 2020
HORN Antenna SCHWARZBECK	9120D	9120D-1169	Nov. 24, 2019	Nov. 23, 2020
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-969	Nov. 24, 2019	Nov. 23, 2020
HORN Antenna SCHWARZBECK	BBHA 9170	148	Nov. 24, 2019	Nov. 23, 2020
BILOG Antenna SCHWARZBECK	VULB 9168	9168-472	Nov. 08, 2019	Nov. 07, 2020
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 15, 2019	Apr. 14, 2020
MXG Vector signal generator Agilent	N5182B	MY53050430	Oct. 25, 2019	Oct. 24, 2020
Preamplifier EMCI	EMC 184045	980116	Oct. 08, 2019	Oct. 07, 2020
Preamplifier EMCI	EMC 012645	980115	Oct. 08, 2019	Oct. 07, 2020
Preamplifier EMCI	EMC 330H	980112	Oct. 08, 2019	Oct. 07, 2020
RF Coaxial Cable HUBER+SUHNNER	EMC104-SM-SM-800 0&3000	140811+170717	Oct. 08, 2019	Oct. 07, 2020
RF Coaxial Cable HUBER+SUHNNER	SUCOFLEX 104	EMC104-SM-SM-1 000(140807)	Oct. 08, 2019	Oct. 07, 2020
RF Coaxial Cable WOKEN	8D-FB	Cable-Ch10-01	Oct. 08, 2019	Oct. 07, 2020
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
Radio Communication Analyzer Anritsu	MT8821C	6261806803	Jan. 18, 2020	Jan. 17, 2021
Temperature & Humidity Chamber	GTH-120-40-CP-AR	MAA1306-019	Sep. 06, 2019	Sep. 05, 2020
DC Power Supply Topward	33010D	807748	N/A	N/A

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 HwaYa Chamber 10.
3. The horn antenna and preamplifier (model: EMC 184045) are used only for the measurement of emission frequency above 1 GHz if tested.

3 General Information

3.1 General Description of EUT

Product	Cat-M1 Module	
Brand	Sercomm	
Test Model	TPM540; TPM540M; TPM540S; TPM540MS	
Status of EUT	Engineering Sample	
Power Supply Rating	5.0 Vdc (adapter)	
Modulation Type	LTE	QPSK, 16QAM
Frequency Range	LTE Band 25 (Channel Bandwidth: 1.4 MHz)	1850.7 ~ 1914.3 MHz
	LTE Band 25 (Channel Bandwidth: 3 MHz)	1851.5 ~ 1913.5 MHz
	LTE Band 25 (Channel Bandwidth: 5 MHz)	1852.5 ~ 1912.5 MHz
	LTE Band 25 (Channel Bandwidth: 10 MHz)	1855.0 ~ 1910.0 MHz
	LTE Band 25 (Channel Bandwidth: 15 MHz)	1857.5 ~ 1907.5 MHz
	LTE Band 25 (Channel Bandwidth: 20 MHz)	1860.0 ~ 1905.0 MHz
Max. EIRP Power	LTE Band 25 (Channel Bandwidth: 1.4 MHz)	615.18 mW
	LTE Band 25 (Channel Bandwidth: 3 MHz)	629.51 mW
	LTE Band 25 (Channel Bandwidth: 5 MHz)	639.73 mW
	LTE Band 25 (Channel Bandwidth: 10 MHz)	636.80 mW
	LTE Band 25 (Channel Bandwidth: 15 MHz)	650.13 mW
	LTE Band 25 (Channel Bandwidth: 20 MHz)	659.17 mW
Emission Designator	LTE Band 25 (Channel Bandwidth: 1.4 MHz)	1M09D7W
	LTE Band 25 (Channel Bandwidth: 3 MHz)	1M09G7D
	LTE Band 25 (Channel Bandwidth: 5 MHz)	1M09D7W
	LTE Band 25 (Channel Bandwidth: 10 MHz)	1M09D7W
	LTE Band 25 (Channel Bandwidth: 15 MHz)	1M10D7W
	LTE Band 25 (Channel Bandwidth: 20 MHz)	1M10D7W
Antenna Type	Monopole (PCB) Antenna with 4.18 dBi gain	
Accessory Device	N/A	
Data Cable Supplied	N/A	

Note:

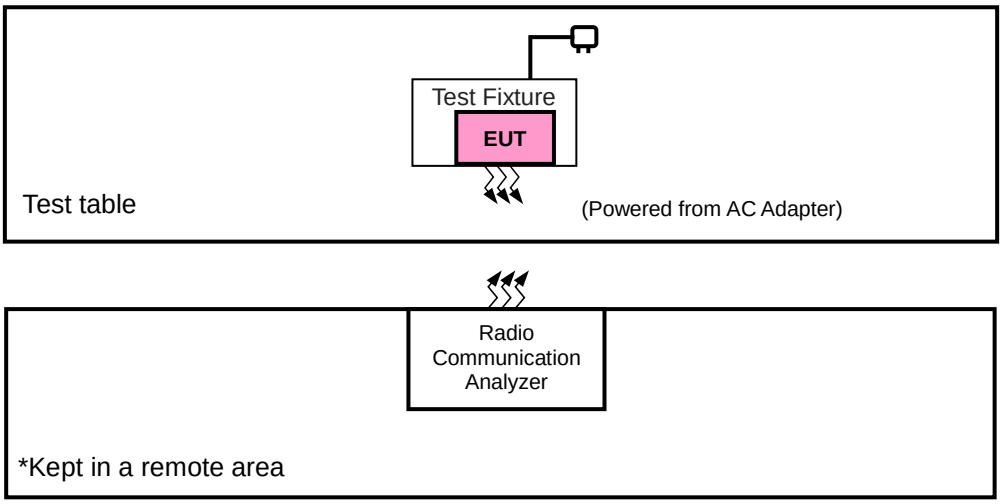
1. This report is prepared for FCC class II permissive change. The difference compared with the original report (BV CPS report no.: RF181123D01B) is adding LTE Band 25 and LTE Band 26 by software, therefore the EUT is re-tested in this report.
2. All models are listed as below.

Brand	Model	Difference
Sercomm	TPM540	GNSS embedded
	TPM540M	MCU/GNSS embedded
	TPM540S	Pure Modem
	TPM540MS	MCU embedded

* Above models had been pre-tested, and the worst case was found on model TPM540. Therefore, only this model was chosen for the final test and presented in the test report.

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

3.2 Configuration of System under Test



3.2.1 Description of Support Units

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

No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	Adapter	Kted	KSA0050500100VUD	N/A	N/A
2.	Test Fixture	N/A	N/A	N/A	N/A
3.	Radio Communication Analyzer	Anritsu	MT8821C	626180680	N/A

No.	Signal Cable Description Of The Above Support Units
1.	N/A
2.	N/A
3.	N/A

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item 1-2 were provided by client.

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	EIRP	Radiated Emission
LTE Band 25	Z-plane	Z-plane

LTE Band 25

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	26047 to 26683	26047, 26365, 26683	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26055 to 26675	26055, 26365, 26675	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26065 to 26665	26065, 26365, 26665	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26090 to 26640	26090, 26365, 26640	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26115 to 26615	26115, 26365, 26615	15 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26140 to 26590	26140, 26365, 26590	20 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Modulation Characteristics	26140 to 26590	26365	20 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
-	Frequency Stability	26047 to 26683	26047, 26683	1.4 MHz	QPSK	6 RB / 0 RB Offset
		26055 to 26675	26055, 26675	3 MHz	QPSK	6 RB / 0 RB Offset
		26065 to 26665	26065, 26665	5 MHz	QPSK	6 RB / 0 RB Offset
		26090 to 26640	26090, 26640	10 MHz	QPSK	6 RB / 0 RB Offset
		26115 to 26615	26115, 26615	15 MHz	QPSK	6 RB / 0 RB Offset
		26140 to 26590	26140, 26590	20 MHz	QPSK	6 RB / 0 RB Offset
-	Occupied Bandwidth	26047 to 26683	26047, 26365, 26683	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		26055 to 26675	26055, 26365, 26675	3 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		26065 to 26665	26065, 26365, 26665	5 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		26090 to 26640	26090, 26365, 26640	10 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		26115 to 26615	26115, 26365, 26615	15 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		26140 to 26590	26140, 26365, 26590	20 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
-	Peak to Average Ratio	26047 to 26683	26047, 26365, 26683	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26055 to 26675	26055, 26365, 26675	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26065 to 26665	26065, 26365, 26665	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26090 to 26640	26090, 26365, 26640	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26115 to 26615	26115, 26365, 26615	15 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26140 to 26590	26140, 26365, 26590	20 MHz	QPSK, 16QAM	1 RB / 0 RB Offset

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Band Edge	26047 to 26683	26047	1.4 MHz	QPSK	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			26683	1.4 MHz	QPSK	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		26055 to 26675	26055	3 MHz	QPSK	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			26675	3 MHz	QPSK	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		26065 to 26665	26065	5 MHz	QPSK	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			26665	5 MHz	QPSK	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		26090 to 26640	26090	10 MHz	QPSK	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			26640	10 MHz	QPSK	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		26115 to 26615	26115	15 MHz	QPSK	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			26615	15 MHz	QPSK	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		26140 to 26590	26140	20 MHz	QPSK	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			26590	20 MHz	QPSK	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
-	Conducted Emission	26047 to 26683	26047, 26365, 26683	1.4 MHz	QPSK	1 RB / 0 RB Offset
		26055 to 26675	26055, 26365, 26675	3 MHz	QPSK	1 RB / 0 RB Offset
		26065 to 26665	26065, 26365, 26665	5 MHz	QPSK	1 RB / 0 RB Offset
		26090 to 26640	26090, 26365, 26640	10 MHz	QPSK	1 RB / 0 RB Offset
		26115 to 26615	26115, 26365, 26615	15 MHz	QPSK	1 RB / 0 RB Offset
		26140 to 26590	26140, 26365, 26590	20 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission	26047 to 26683	26047, 26365, 26683	1.4 MHz	QPSK	1 RB / 0 RB Offset
		26065 to 26665	26065, 26365, 26665	5 MHz	QPSK	1 RB / 0 RB Offset
		26140 to 26590	26140, 26365, 26590	20 MHz	QPSK	1 RB / 0 RB Offset

Note:

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

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
EIRP	26 deg. C, 58 % RH	120 Vac, 60 Hz	Getaz Yang
Modulation Characteristics	26 deg. C, 58 % RH	120 Vac, 60 Hz	Willy Cheng
Frequency Stability	26 deg. C, 58 % RH	120 Vac, 60 Hz	Willy Cheng
Occupied Bandwidth	26 deg. C, 58 % RH	120 Vac, 60 Hz	Willy Cheng
Band Edge	26 deg. C, 58 % RH	120 Vac, 60 Hz	Willy Cheng
Peak to Average Ratio	26 deg. C, 58 % RH	120 Vac, 60 Hz	Willy Cheng
Conducted Emission	26 deg. C, 58 % RH	120 Vac, 60 Hz	Willy Cheng
Radiated Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Getaz Yang

3.4 EUT Operating Conditions

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

3.5 General Description of Applied Standards and references

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

Test Standard:
FCC 47 CFR Part 2
FCC 47 CFR Part 24
ANSI 63.26-2015

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

References Test Guidance:
KDB 971168 D01 Power Meas License Digital Systems v03r01
ANSI/TIA/EIA-603-E 2016

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

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

Mobile / Portable station are limited to 2 watts e.i.r.p.

4.1.2 Test Procedures

EIRP / ERP Measurement:

a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 20 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.

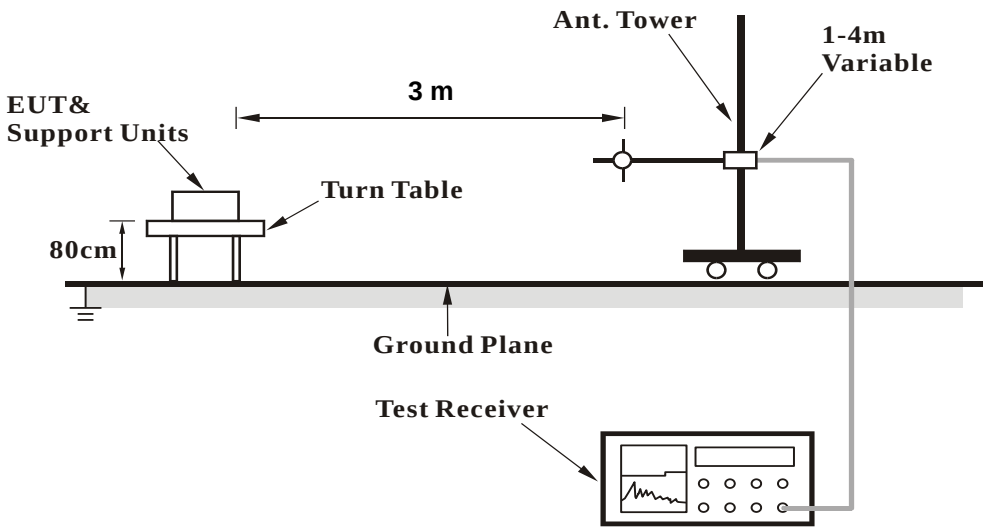
d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15 dB.

Conducted Power Measurement:

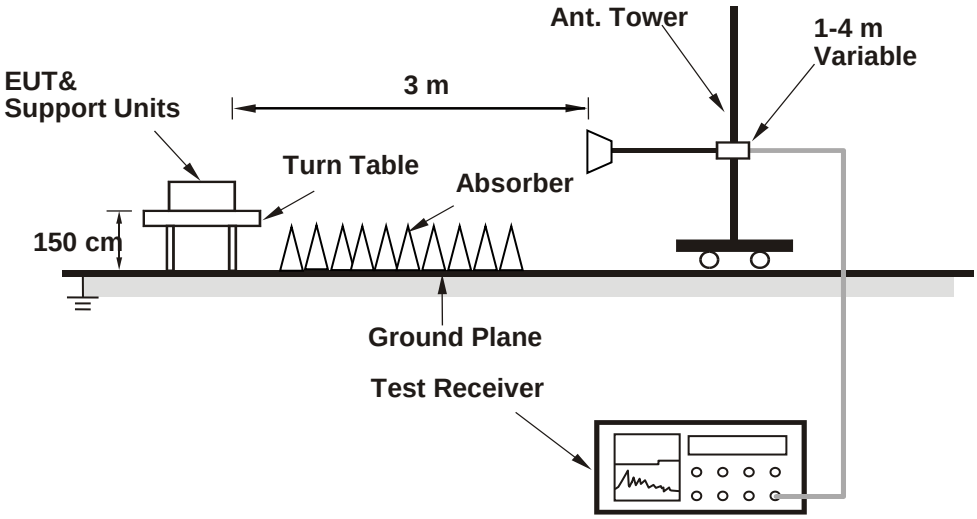
The EUT was set up for the maximum power with LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

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)

BW(MHz):	1.4

Test Frequency ID	N_{UL}	Frequency of Uplink [MHz]	Test Configuration Initial of Power				EUT	
			Modulation	RB Size	RB Offset	Narrowband Index	Cell power (dBm/15kHz)	power (dBm)
Low Range	26047	1850.7	QPSK	1	0	0	-85	23.68
			QPSK	1	5	0	-85	23.61
			QPSK	3	3	0	-85	22.83
			QPSK	6	0	0	-85	21.48
			16QAM	1	0	0	-85	22.31
			16QAM	1	5	0	-85	22.28
			16QAM	3	0	0	-85	21.23
			16QAM	5	0	0	-85	21.77
Mid Range	26365	1882.5	QPSK	1	0	0	-85	23.72
			QPSK	1	5	0	-85	23.66
			QPSK	3	3	0	-85	22.72
			QPSK	6	0	0	-85	21.43
			16QAM	1	0	0	-85	22.21
			16QAM	1	5	0	-85	22.17
			16QAM	3	0	0	-85	21.09
			16QAM	5	0	0	-85	21.65
High Range	26683	1914.3	QPSK	1	0	0	-85	23.53
			QPSK	1	5	0	-85	23.49
			QPSK	3	3	0	-85	22.47
			QPSK	6	0	0	-85	21.26
			16QAM	1	0	0	-85	22.15
			16QAM	1	5	0	-85	22.05
			16QAM	3	0	0	-85	21.17
			16QAM	5	0	0	-85	21.43

BW(MHz):	3

Test Frequency ID	N_{UL}	Frequency of Uplink [MHz]	Test Configuration Initial of Power				EUT	
			Modulation	RB Size	RB Offset	Narrowband Index	Cell power (dBm/15kHz)	power (dBm)
Low Range	26055	1851.5	QPSK	1	0	0	-85	23.69
			QPSK	1	5	0	-85	23.46
			QPSK	1	0	1	-85	23.63
			QPSK	1	5	1	-85	23.65
			QPSK	3	3	0	-85	22.35
			QPSK	3	3	1	-85	22.32
			QPSK	6	0	0	-85	21.39
			QPSK	6	0	1	-85	21.43
			16QAM	1	0	0	-85	22.24
			16QAM	1	5	0	-85	22.17
			16QAM	1	0	1	-85	22.17
			16QAM	1	5	1	-85	22.19
			16QAM	3	0	0	-85	21.35
			16QAM	3	3	1	-85	21.25
			16QAM	5	0	0	-85	21.48
			16QAM	5	0	1	-85	21.47
Mid Range	26365	1882.5	QPSK	1	0	0	-85	23.67
			QPSK	1	5	0	-85	23.64
			QPSK	1	0	1	-85	23.63
			QPSK	1	5	1	-85	23.59
			QPSK	3	3	0	-85	22.36
			QPSK	3	3	1	-85	22.31
			QPSK	6	0	0	-85	21.43
			QPSK	6	0	1	-85	21.21
			16QAM	1	0	0	-85	22.18
			16QAM	1	5	0	-85	22.12
			16QAM	1	0	1	-85	22.15
			16QAM	1	5	1	-85	22.07
			16QAM	3	0	0	-85	21.13
			16QAM	3	3	1	-85	21.05
			16QAM	5	0	0	-85	21.43
			16QAM	5	0	1	-85	21.38

Test Frequency ID	N_{UL}	Frequency of Uplink [MHz]	Test Configuration Initial of Power				EUT	
			Modulation	RB Size	RB Offset	Narrowband Index	Cell power (dBm/15kHz)	power (dBm)
High Range	26675	1913.5	QPSK	1	0	0	-85	23.24
			QPSK	1	5	0	-85	23.21
			QPSK	1	0	1	-85	23.45
			QPSK	1	5	1	-85	23.34
			QPSK	3	3	0	-85	22.22
			QPSK	3	3	1	-85	22.13
			QPSK	6	0	0	-85	21.23
			QPSK	6	0	1	-85	21.21
			16QAM	1	0	0	-85	22.06
			16QAM	1	5	0	-85	22.08
			16QAM	1	0	1	-85	22.07
			16QAM	1	5	1	-85	21.76
			16QAM	3	0	0	-85	21.15
			16QAM	3	3	1	-85	21.13
			16QAM	5	0	0	-85	21.24
			16QAM	5	0	1	-85	21.21

BW(MHz):	5

Test Frequency ID	N_{UL}	Frequency of Uplink [MHz]	Test Configuration Initial of Power				EUT	
			Modulation	RB Size	RB Offset	Narrowband Index	Cell power (dBm/15kHz)	power (dBm)
Low Range	26065	1852.5	QPSK	1	0	0	-85	23.78
			QPSK	1	5	0	-85	23.75
			QPSK	1	0	1	-85	23.76
			QPSK	1	5	1	-85	23.74
			QPSK	1	0	3	-85	23.73
			QPSK	1	5	3	-85	23.71
			QPSK	3	0	0	-85	22.46
			QPSK	3	3	3	-85	22.32
			QPSK	6	0	0	-85	22.34
			QPSK	6	0	1	-85	22.35
			QPSK	6	0	3	-85	22.29
			16QAM	1	0	0	-85	23.94
			16QAM	1	5	0	-85	23.92
			16QAM	1	0	1	-85	23.92
			16QAM	1	5	1	-85	23.89
			16QAM	1	0	3	-85	23.92
			16QAM	1	5	3	-85	23.89
			16QAM	3	0	0	-85	22.51
			16QAM	3	3	3	-85	22.46
			16QAM	5	0	0	-85	21.35
			16QAM	5	0	1	-85	21.32
			16QAM	5	0	3	-85	21.28

Test Frequency ID	N_{UL}	Frequency of Uplink [MHz]	Test Configuration Initial of Power				EUT	
			Modulation	RB Size	RB Offset	Narrowband Index	Cell power (dBm/15kHz)	power (dBm)
Mid Range	26365	1882.5	QPSK	1	0	0	-85	23.54
			QPSK	1	5	0	-85	23.52
			QPSK	1	0	1	-85	23.49
			QPSK	1	5	1	-85	23.46
			QPSK	1	0	3	-85	23.46
			QPSK	1	5	3	-85	23.44
			QPSK	3	0	0	-85	22.35
			QPSK	3	3	3	-85	22.15
			QPSK	6	0	0	-85	22.27
			QPSK	6	0	1	-85	22.25
			QPSK	6	0	3	-85	22.17
			16QAM	1	0	0	-85	23.71
			16QAM	1	5	0	-85	23.72
			16QAM	1	0	1	-85	23.69
			16QAM	1	5	1	-85	23.64
			16QAM	1	0	3	-85	23.63
			16QAM	1	5	3	-85	23.61
			16QAM	3	0	0	-85	22.41
			16QAM	3	3	3	-85	22.32
			16QAM	5	0	0	-85	21.21
			16QAM	5	0	1	-85	21.19
			16QAM	5	0	3	-85	21.17
High Range	26665	1912.5	QPSK	1	0	0	-85	23.45
			QPSK	1	5	0	-85	23.43
			QPSK	1	0	1	-85	23.75
			QPSK	1	5	1	-85	23.75
			QPSK	1	0	3	-85	23.37
			QPSK	1	5	3	-85	23.36
			QPSK	3	0	0	-85	22.19
			QPSK	3	3	3	-85	22.06
			QPSK	6	0	0	-85	22.15
			QPSK	6	0	1	-85	22.16
			QPSK	6	0	3	-85	22.12
			16QAM	1	0	0	-85	23.58
			16QAM	1	5	0	-85	23.56
			16QAM	1	0	1	-85	23.58
			16QAM	1	5	1	-85	23.54
			16QAM	1	0	3	-85	23.49
			16QAM	1	5	3	-85	23.47
			16QAM	3	0	0	-85	22.29
			16QAM	3	3	3	-85	22.25
			16QAM	5	0	0	-85	21.07
			16QAM	5	0	1	-85	21.07
			16QAM	5	0	3	-85	21.24

BW(MHz):	10

Test Frequency ID	N_{UL}	Frequency of Uplink [MHz]	Test Configuration Initial of Power				EUT	
			Modulation	RB Size	RB Offset	Narrowband Index	Cell power (dBm/15kHz)	power (dBm)
Low Range	26090	1855	QPSK	1	0	0	-85	23.86
			QPSK	1	5	0	-85	23.56
			QPSK	1	0	3	-85	23.83
			QPSK	1	5	3	-85	23.67
			QPSK	1	0	7	-85	23.6
			QPSK	1	5	7	-85	23.56
			QPSK	4	0	0	-85	23.38
			QPSK	4	2	7	-85	23.57
			QPSK	6	0	0	-85	22.31
			QPSK	6	0	7	-85	22.29
			16QAM	1	0	0	-85	23.92
			16QAM	1	5	0	-85	23.88
			16QAM	1	0	3	-85	23.88
			16QAM	1	5	3	-85	23.85
			16QAM	1	0	7	-85	23.84
			16QAM	1	5	7	-85	23.84
			16QAM	4	2	0	-85	22.52
			16QAM	4	2	7	-85	22.49
			16QAM	5	0	0	-85	22.28
			16QAM	5	0	7	-85	22.24
Mid Range	26365	1882.5	QPSK	1	0	0	-85	23.42
			QPSK	1	5	0	-85	23.41
			QPSK	1	0	3	-85	23.39
			QPSK	1	5	3	-85	23.36
			QPSK	1	0	7	-85	23.32
			QPSK	1	5	7	-85	23.32
			QPSK	4	0	0	-85	23.27
			QPSK	4	2	7	-85	23.35
			QPSK	6	0	0	-85	22.26
			QPSK	6	0	7	-85	22.17
			16QAM	1	0	0	-85	23.72
			16QAM	1	5	0	-85	23.72
			16QAM	1	0	3	-85	23.68
			16QAM	1	5	3	-85	23.64
			16QAM	1	0	7	-85	23.61
			16QAM	1	5	7	-85	23.57
			16QAM	4	2	0	-85	22.36
			16QAM	4	2	7	-85	22.37
			16QAM	5	0	0	-85	22.14
			16QAM	5	0	7	-85	22.14

Test Frequency ID	N_{UL}	Frequency of Uplink [MHz]	Test Configuration Initial of Power				EUT	
			Modulation	RB Size	RB Offset	Narrowband Index	Cell power (dBm/15kHz)	power (dBm)
High Range	26640	1910	QPSK	1	0	0	-85	23.28
			QPSK	1	5	0	-85	23.26
			QPSK	1	5	7	-85	23.2
			QPSK	1	0	3	-85	23.25
			QPSK	1	5	3	-85	23.23
			QPSK	1	0	7	-85	23.22
			QPSK	4	0	0	-85	23.19
			QPSK	4	2	7	-85	23.27
			QPSK	6	0	0	-85	22.25
			QPSK	6	0	7	-85	22.13
			16QAM	1	0	0	-85	23.58
			16QAM	1	5	0	-85	23.56
			16QAM	1	0	3	-85	23.59
			16QAM	1	5	3	-85	23.61
			16QAM	1	0	7	-85	23.51
			16QAM	1	5	7	-85	23.49
			16QAM	4	2	0	-85	22.33
			16QAM	4	2	7	-85	22.29
			16QAM	5	0	0	-85	22.03
			16QAM	5	0	7	-85	22.07

BW(MHz):	15

Test Frequency ID	N_{UL}	Frequency of Uplink [MHz]	Test Configuration Initial of Power				EUT	
			Modulation	RB Size	RB Offset	Narrowband Index	Cell power (dBm/15kHz)	power (dBm)
Low Range	26115	1857.5	QPSK	1	0	0	-85	23.75
			QPSK	1	5	0	-85	23.73
			QPSK	1	0	5	-85	23.7
			QPSK	1	5	5	-85	23.68
			QPSK	1	0	11	-85	23.63
			QPSK	1	5	11	-85	23.59
			QPSK	3	0	0	-85	23.46
			QPSK	3	3	11	-85	23.42
			QPSK	6	0	0	-85	23.28
			QPSK	6	0	11	-85	23.23
			16QAM	1	0	0	-85	23.88
			16QAM	1	5	0	-85	23.84
			16QAM	1	0	5	-85	23.89
			16QAM	1	5	5	-85	23.88
			16QAM	1	0	11	-85	23.83
			16QAM	1	5	11	-85	23.81
			16QAM	3	0	0	-85	23.44
			16QAM	3	3	11	-85	23.49
			16QAM	5	0	0	-85	23.26
			16QAM	5	0	11	-85	23.17

Test Frequency ID	N_{UL}	Frequency of Uplink [MHz]	Test Configuration Initial of Power				EUT	
			Modulation	RB Size	RB Offset	Narrowband Index	Cell power (dBm/15kHz)	power (dBm)
Mid Range	26365	1882.5	QPSK	1	0	0	-85	23.45
			QPSK	1	5	0	-85	23.42
			QPSK	1	0	5	-85	23.38
			QPSK	1	5	5	-85	23.37
			QPSK	1	0	11	-85	23.27
			QPSK	1	5	11	-85	23.27
			QPSK	3	0	0	-85	23.34
			QPSK	3	3	11	-85	23.14
			QPSK	6	0	0	-85	23.22
			QPSK	6	0	11	-85	23.08
			16QAM	1	0	0	-85	23.75
			16QAM	1	5	0	-85	23.71
			16QAM	1	0	5	-85	23.68
			16QAM	1	5	5	-85	23.64
			16QAM	1	0	11	-85	23.78
			16QAM	1	5	11	-85	23.74
			16QAM	3	0	0	-85	23.28
			16QAM	3	3	11	-85	23.22
			16QAM	5	0	0	-85	23.16
			16QAM	5	0	11	-85	23.02
High Range	26615	1907.5	QPSK	1	0	0	-85	23.35
			QPSK	1	5	0	-85	23.34
			QPSK	1	0	5	-85	23.29
			QPSK	1	5	5	-85	23.27
			QPSK	1	0	11	-85	23.22
			QPSK	1	5	11	-85	23.21
			QPSK	3	0	0	-85	23.42
			QPSK	3	3	11	-85	23.04
			QPSK	6	0	0	-85	22.87
			QPSK	6	0	11	-85	23.02
			16QAM	1	0	0	-85	23.61
			16QAM	1	5	0	-85	23.59
			16QAM	1	0	5	-85	23.61
			16QAM	1	5	5	-85	23.61
			16QAM	1	0	11	-85	23.48
			16QAM	1	5	11	-85	23.51
			16QAM	3	0	0	-85	23.28
			16QAM	3	3	11	-85	23.18
			16QAM	5	0	0	-85	22.89
			16QAM	5	0	11	-85	22.95

BW(MHz):	20

Test Frequency ID	N_{UL}	Frequency of Uplink [MHz]	Test Configuration Initial of Power				EUT	
			Modulation	RB Size	RB Offset	Narrowband Index	Cell power (dBm/15kHz)	power (dBm)
Low Range	26140	1860	QPSK	1	0	0	-85	23.99
			QPSK	1	5	0	-85	23.89
			QPSK	1	0	7	-85	23.81
			QPSK	1	5	7	-85	23.72
			QPSK	1	0	15	-85	23.66
			QPSK	1	5	15	-85	23.61
			QPSK	3	0	0	-85	23.55
			QPSK	3	3	15	-85	23.34
			QPSK	6	0	0	-85	23.27
			QPSK	6	0	15	-85	23.12
			16QAM	1	0	0	-85	23.88
			16QAM	1	5	0	-85	23.84
			16QAM	1	0	7	-85	23.82
			16QAM	1	5	7	-85	23.85
			16QAM	1	0	15	-85	23.76
			16QAM	1	5	15	-85	23.81
			16QAM	3	0	0	-85	23.43
			16QAM	3	3	15	-85	23.36
			16QAM	5	0	0	-85	23.24
			16QAM	5	0	15	-85	23.25
Mid Range	26365	1882.5	QPSK	1	0	0	-85	23.44
			QPSK	1	5	0	-85	23.41
			QPSK	1	0	7	-85	23.37
			QPSK	1	5	7	-85	23.34
			QPSK	1	0	15	-85	23.26
			QPSK	1	5	15	-85	23.28
			QPSK	3	0	0	-85	23.38
			QPSK	3	3	15	-85	23.16
			QPSK	6	0	0	-85	23.26
			QPSK	6	0	15	-85	23.08
			16QAM	1	0	0	-85	22.46
			16QAM	1	5	0	-85	22.39
			16QAM	1	0	7	-85	22.32
			16QAM	1	5	7	-85	22.31
			16QAM	1	0	15	-85	22.31
			16QAM	1	5	15	-85	22.34
			16QAM	3	0	0	-85	22.3
			16QAM	3	3	15	-85	21.75
			16QAM	5	0	0	-85	23.19
			16QAM	5	0	15	-85	23.03

Test Frequency ID	N_{UL}	Frequency of Uplink [MHz]	Test Configuration Initial of Power				EUT	
			Modulation	RB Size	RB Offset	Narrowband Index	Cell power (dBm/15kHz)	power (dBm)
High Range	26590	1905	QPSK	1	0	0	-85	23.39
			QPSK	1	5	0	-85	23.36
			QPSK	1	0	7	-85	23.33
			QPSK	1	5	7	-85	23.31
			QPSK	1	0	15	-85	23.23
			QPSK	1	5	15	-85	23.22
			QPSK	3	0	0	-85	23.38
			QPSK	3	3	15	-85	23.1
			QPSK	6	0	0	-85	23.03
			QPSK	6	0	15	-85	23.04
			16QAM	1	0	0	-85	23.63
			16QAM	1	5	0	-85	23.57
			16QAM	1	0	7	-85	23.59
			16QAM	1	5	7	-85	23.58
			16QAM	1	0	15	-85	23.47
			16QAM	1	5	15	-85	23.46
			16QAM	3	0	0	-85	23.4
			16QAM	3	3	15	-85	23.11
			16QAM	5	0	0	-85	22.99
			16QAM	5	0	15	-85	22.97

EIRP Power (dBm)

LTE Band 25							
Channel Bandwidth: 1.4 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**Reading (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (mW)**	**Polarization (H/V)**
Z	26047	1850.7	-8.68	36.57	27.89	615.18	H
	26365	1882.5	-9.71	37.22	27.51	563.64	
	26683	1914.3	-11.78	39.09	27.31	538.27	
	26047	1850.7	-17.55	37.65	20.10	102.33	V
	26365	1882.5	-17.70	37.58	19.88	97.27	
	26683	1914.3	-18.17	37.92	19.75	94.41	
Channel Bandwidth: 1.4 MHz / 16QAM							
Z	26047	1850.7	-11.05	36.57	25.52	356.45	H
	26365	1882.5	-12.10	37.22	25.12	325.09	
	26683	1914.3	-14.15	39.09	24.94	311.89	
	26047	1850.7	-19.87	37.65	17.78	59.98	V
	26365	1882.5	-20.07	37.58	17.51	56.36	
	26683	1914.3	-20.56	37.92	17.36	54.45	

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

LTE Band 25							
Channel Bandwidth: 3 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**Reading (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (mW)**	**Polarization (H/V)**
Z	26055	1851.5	-8.58	36.57	27.99	629.51	H
	26365	1882.5	-9.58	37.22	27.64	580.76	
	26675	1913.5	-11.79	39.11	27.32	539.51	
	26055	1851.5	-17.58	37.65	20.07	101.62	V
	26365	1882.5	-17.61	37.58	19.97	99.31	
	26675	1913.5	-18.10	37.93	19.83	96.16	
Channel Bandwidth: 3 MHz / 16QAM							
Z	26055	1851.5	-10.01	36.57	26.56	452.90	H
	26365	1882.5	-10.90	37.22	26.32	428.55	
	26675	1913.5	-13.01	39.11	26.10	407.38	
	26055	1851.5	-18.83	37.65	18.82	76.21	V
	26365	1882.5	-18.99	37.58	18.59	72.28	
	26675	1913.5	-19.42	37.93	18.51	70.96	

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

LTE Band 25							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Z	26065	1852.5	-8.51	36.57	28.06	639.73	H
	26365	1882.5	-9.55	37.22	27.67	584.79	
	26665	1912.5	-10.68	38.11	27.43	553.35	
	26065	1852.5	-17.47	37.65	20.18	104.23	V
	26365	1882.5	-17.59	37.58	19.99	99.77	
	26665	1912.5	-18.08	37.96	19.88	97.27	
Channel Bandwidth: 5 MHz / 16QAM							
Z	26065	1852.5	-9.84	36.57	26.73	470.98	H
	26365	1882.5	-10.77	37.22	26.45	441.57	
	26665	1912.5	-12.01	38.11	26.10	407.38	
	26065	1852.5	-18.73	37.65	18.92	77.98	V
	26365	1882.5	-18.85	37.58	18.73	74.64	
	26665	1912.5	-19.35	37.96	18.61	72.61	

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

LTE Band 25							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Z	26090	1855.0	-8.53	36.57	28.04	636.80	H
	26365	1882.5	-9.47	37.22	27.75	595.66	
	26640	1910.0	-10.74	38.19	27.45	555.90	
	26090	1855.0	-17.38	37.65	20.27	106.41	V
	26365	1882.5	-17.56	37.58	20.02	100.46	
	26640	1910.0	-18.23	38.15	19.92	98.17	
Channel Bandwidth: 10 MHz / 16QAM							
Z	26090	1855.0	-9.72	36.57	26.85	484.17	H
	26365	1882.5	-10.70	37.22	26.52	448.75	
	26640	1910.0	-11.91	38.19	26.28	424.62	
	26090	1855.0	-18.59	37.65	19.06	80.54	V
	26365	1882.5	-18.65	37.58	18.93	78.16	
	26640	1910.0	-19.38	38.15	18.77	75.34	

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

LTE Band 25							
Channel Bandwidth: 15 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Z	26115	1857.5	-8.44	36.57	28.13	650.13	H
	26365	1882.5	-9.44	37.22	27.78	599.79	
	26615	1907.5	-10.71	38.23	27.52	564.94	
	26115	1857.5	-17.37	37.65	20.28	106.66	V
	26365	1882.5	-17.47	37.58	20.11	102.57	
	26615	1907.5	-18.24	38.22	19.98	99.54	
Channel Bandwidth: 15 MHz / 16QAM							
Z	26115	1857.5	-9.57	36.57	27.00	501.19	H
	26365	1882.5	-10.57	37.22	26.65	462.38	
	26615	1907.5	-11.87	38.23	26.36	432.51	
	26115	1857.5	-37.65	37.65	19.02	79.80	V
	26365	1882.5	-37.58	37.58	18.94	78.34	
	26615	1907.5	-38.22	38.22	18.75	74.99	

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

LTE Band 25							
Channel Bandwidth: 20 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Z	26140	1860.0	-8.38	36.57	28.19	659.17	H
	26365	1882.5	-9.38	37.22	27.84	608.14	
	26590	1905.0	-11.16	38.72	27.56	570.16	
	26140	1860.0	-17.32	37.65	20.33	107.89	V
	26365	1882.5	-17.40	37.58	20.18	104.23	
	26590	1905.0	-17.51	37.56	20.05	101.16	
Channel Bandwidth: 20 MHz / 16QAM							
Z	26140	1860.0	-9.45	36.57	27.12	515.23	H
	26365	1882.5	-10.42	37.22	26.80	478.63	
	26590	1905.0	-12.21	38.72	26.51	447.71	
	26140	1860.0	-18.53	37.65	19.12	81.66	V
	26365	1882.5	-18.58	37.58	19.00	79.43	
	26590	1905.0	-18.64	37.56	18.92	77.98	

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

4.2 Modulation Characteristics Measurement

4.2.1 Limits of Modulation Characteristics

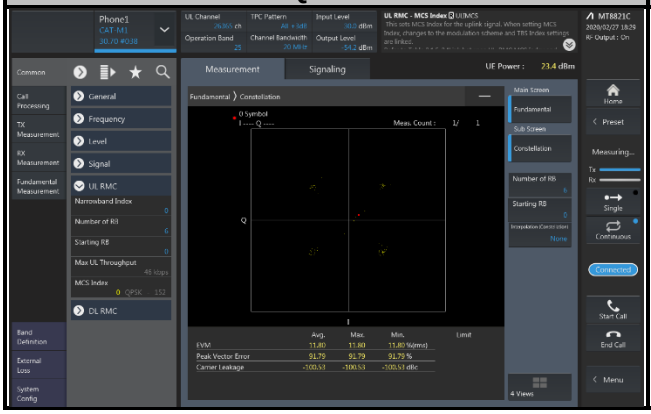
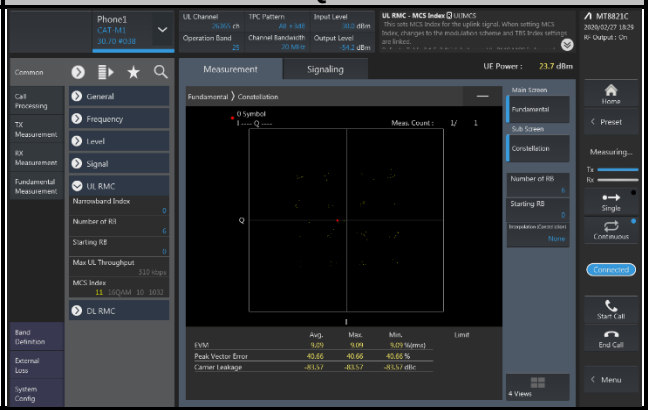
N/A

4.2.2 Test Setup

4.2.3 Test Procedure

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

4.2.4 Test Results

Spectrum Plot of Measurement	
LTE Band 25	
Channel 26365	
QPSK	16QAM
	

4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

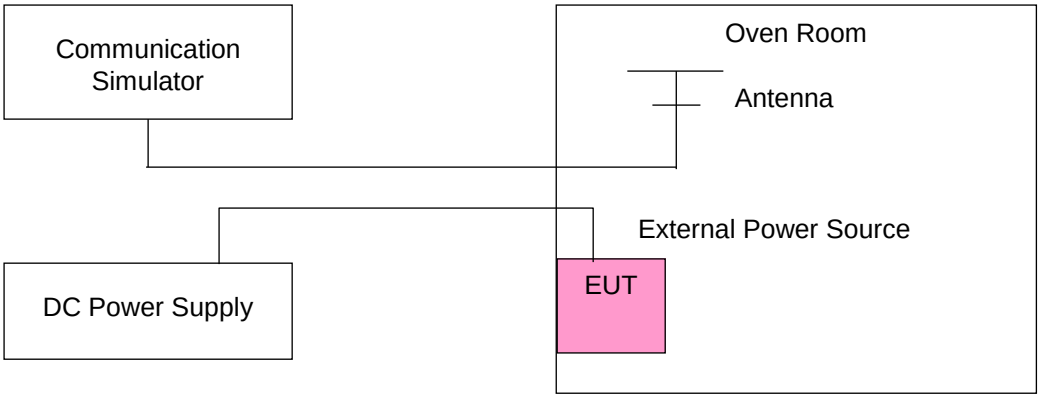
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

4.3.2 Test Procedure

a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5℃ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

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

4.3.3 Test Setup



4.3.4 Test Results

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 25			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1850.700003	0.001	1914.300001	0.001
5.00	1850.700001	0.001	1914.300004	0.002
5.75	1850.700003	0.001	1914.300003	0.002

Note: The applicant defined the normal working voltage of the adapter is from 4.25 Vdc to 5.75 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 25			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1850.700001	0.001	1914.300003	0.001
-20	1850.700002	0.001	1914.300003	0.001
-10	1850.700004	0.002	1914.300002	0.001
0	1850.700003	0.002	1914.300004	0.002
10	1850.700003	0.002	1914.300002	0.001
20	1850.699999	-0.001	1914.299997	-0.002
30	1850.699999	-0.001	1914.299996	-0.002
40	1850.699997	-0.002	1914.299998	-0.001
50	1850.699999	-0.001	1914.299996	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 25			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1851.500001	0.001	1913.500002	0.001
5.00	1851.500004	0.002	1913.500001	0.001
5.75	1851.500003	0.001	1913.500002	0.001

Note: The applicant defined the normal working voltage of the adapter is from 4.25 Vdc to 5.75 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 25			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1851.500003	0.002	1913.500002	0.001
-20	1851.500003	0.002	1913.500003	0.002
-10	1851.500003	0.002	1913.500002	0.001
0	1851.500004	0.002	1913.500001	0.001
10	1851.500003	0.002	1913.500002	0.001
20	1851.499999	-0.001	1913.499999	-0.001
30	1851.499997	-0.002	1913.499998	-0.001
40	1851.499996	-0.002	1913.499997	-0.002
50	1851.499999	-0.001	1913.499997	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 25			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1852.500003	0.001	1912.500001	0.001
5.00	1852.500003	0.002	1912.500002	0.001
5.75	1852.500002	0.001	1912.500004	0.002

Note: The applicant defined the normal working voltage of the adapter is from 4.25 Vdc to 5.75 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 25			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1852.500001	0.001	1912.500003	0.002
-20	1852.500004	0.002	1912.500001	0.001
-10	1852.500003	0.001	1912.500004	0.002
0	1852.500003	0.001	1912.500003	0.002
10	1852.500002	0.001	1912.500004	0.002
20	1852.499998	-0.001	1912.499998	-0.001
30	1852.499998	-0.001	1912.499999	-0.001
40	1852.499996	-0.002	1912.499996	-0.002
50	1852.499997	-0.002	1912.499997	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 25			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1855.000003	0.002	1910.000003	0.001
5.00	1855.000002	0.001	1910.000003	0.001
5.75	1855.000001	0.001	1910.000002	0.001

Note: The applicant defined the normal working voltage of the adapter is from 4.25 Vdc to 5.75 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 25			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1855.000002	0.001	1910.000001	0.001
-20	1855.000002	0.001	1910.000002	0.001
-10	1855.000003	0.002	1910.000001	0.001
0	1855.000003	0.001	1910.000002	0.001
10	1855.000003	0.002	1910.000003	0.001
20	1854.999997	-0.002	1909.999997	-0.001
30	1854.999997	-0.002	1909.999996	-0.002
40	1854.999997	-0.002	1909.999997	-0.002
50	1854.999997	-0.002	1909.999997	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 25			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1857.500003	0.001	1907.500002	0.001
5.00	1857.500004	0.002	1907.500004	0.002
5.75	1857.500001	0.001	1907.500002	0.001

Note: The applicant defined the normal working voltage of the adapter is from 4.25 Vdc to 5.75 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 25			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1857.500003	0.002	1907.500003	0.001
-20	1857.500003	0.001	1907.500004	0.002
-10	1857.500002	0.001	1907.500001	0.001
0	1857.500003	0.001	1907.500001	0.001
10	1857.500001	0.001	1907.500001	0.001
20	1857.499997	-0.002	1907.499997	-0.001
30	1857.499998	-0.001	1907.499996	-0.002
40	1857.499997	-0.002	1907.499998	-0.001
50	1857.499998	-0.001	1907.499998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 25			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1860.000003	0.002	1905.000001	0.001
5.00	1860.000004	0.002	1905.000002	0.001
5.75	1860.000003	0.002	1905.000002	0.001

Note: The applicant defined the normal working voltage of the adapter is from 4.25 Vdc to 5.75 Vdc.

Frequency Error vs. Temperature

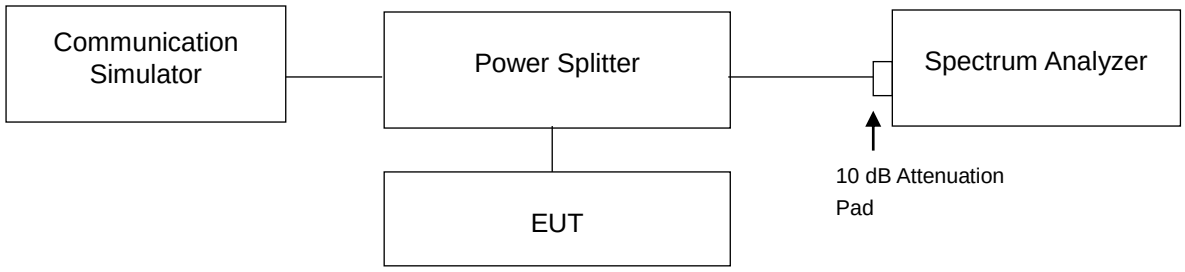
Temp. (℃)	LTE Band 25			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1860.000002	0.001	1905.000002	0.001
-20	1860.000003	0.002	1905.000003	0.002
-10	1860.000002	0.001	1905.000003	0.002
0	1860.000002	0.001	1905.000003	0.001
10	1860.000002	0.001	1905.000002	0.001
20	1859.999999	-0.001	1904.999997	-0.002
30	1859.999997	-0.002	1904.999997	-0.001
40	1859.999996	-0.002	1904.999996	-0.002
50	1859.999999	-0.001	1904.999997	-0.002

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.

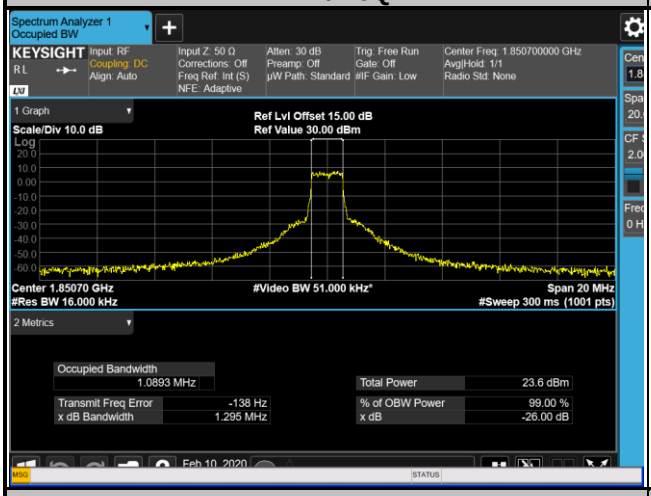
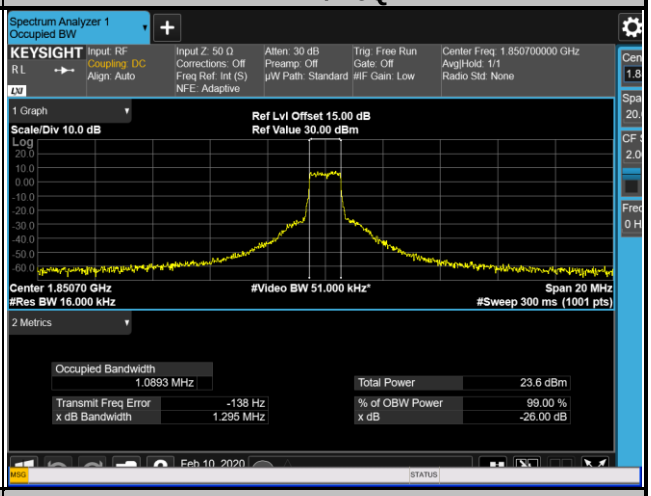
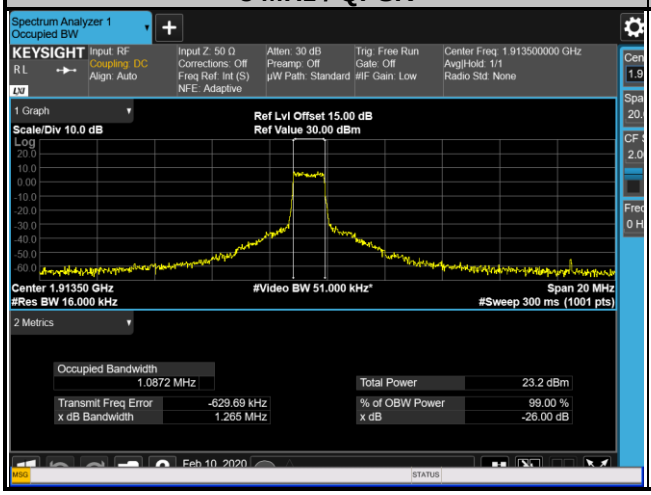
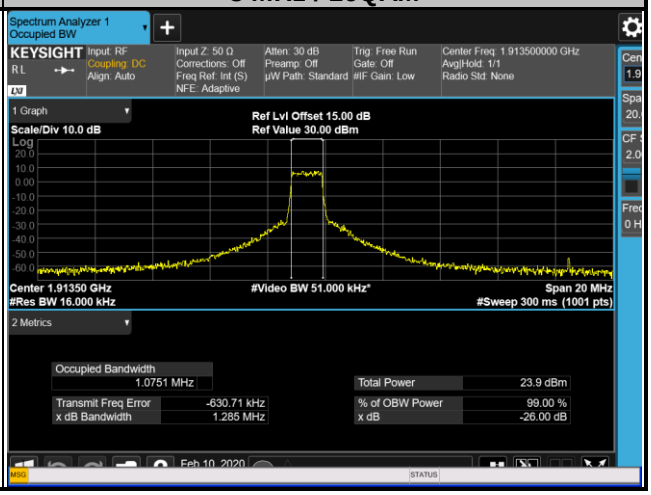
4.4.2 Test Setup



4.4.3 Test Result

LTE Band 25					
Channel Bandwidth: 1.4 MHz					
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**		**26 dB Bandwidth (MHz)**	
		QPSK	**16QAM**	**QPSK**	**16QAM**
26047	1850.7	1.0844	1.0893	1.250	1.295
26365	1882.5	1.0852	1.0847	1.250	1.279
26683	1914.3	1.0823	1.0868	1.279	1.265
Channel Bandwidth: 3 MHz					
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**		**26 dB Bandwidth (MHz)**	
		QPSK	**16QAM**	**QPSK**	**16QAM**
26055	1851.5	1.0816	1.0853	1.255	1.267
26365	1882.5	1.0783	1.0796	1.265	1.273
26675	1913.5	1.0872	1.0751	1.265	1.285

Spectrum Plot of Worst Value

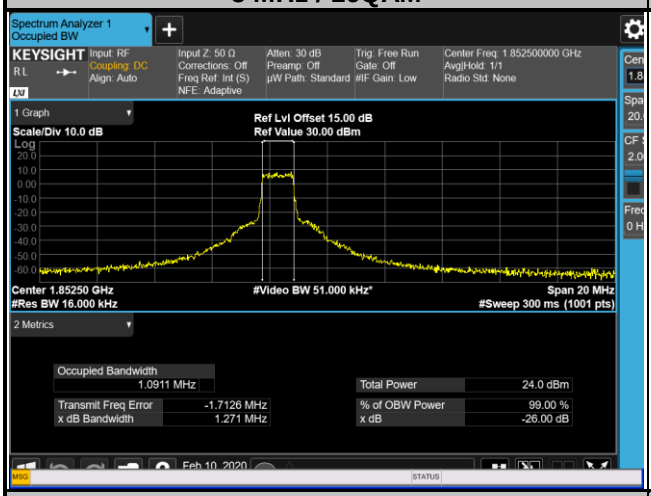
99 % Occupied Bandwidth	26 dB Bandwidth
1.4 MHz / 16QAM	**1.4 MHz / 16QAM**
	
3 MHz / QPSK	**3 MHz / 16QAM**
	

LTE Band 25					
Channel Bandwidth: 5 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
26065	1852.5	1.0869	1.0911	1.278	1.271
26365	1882.5	1.0894	1.0863	1.292	1.278
26665	1912.5	1.0733	1.0853	1.275	1.267
Channel Bandwidth: 10 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
26090	1855.0	1.0840	1.0867	1.280	1.290
26365	1882.5	1.0873	1.0882	1.268	1.302
26640	1910.0	1.0851	1.0880	1.270	1.292

Spectrum Plot of Worst Value

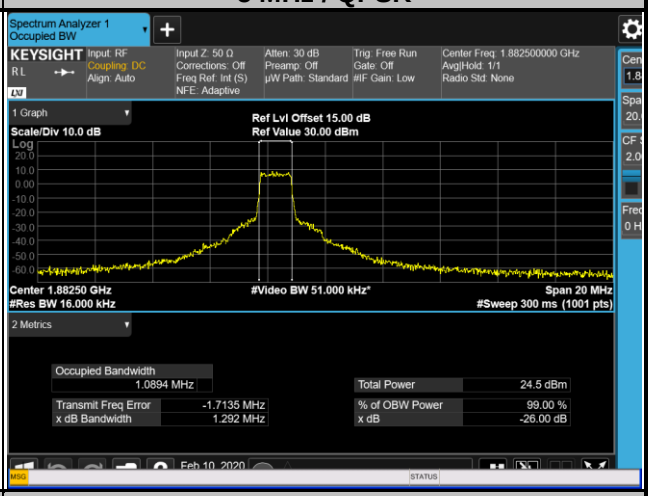
99 % Occupied Bandwidth

5 MHz / 16QAM

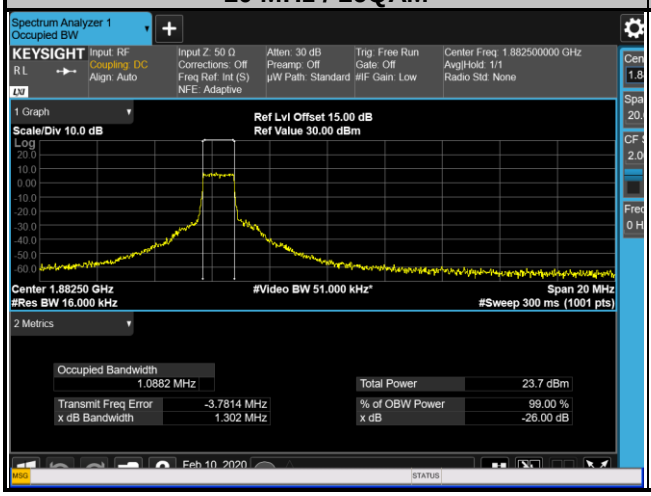


26 dB Bandwidth

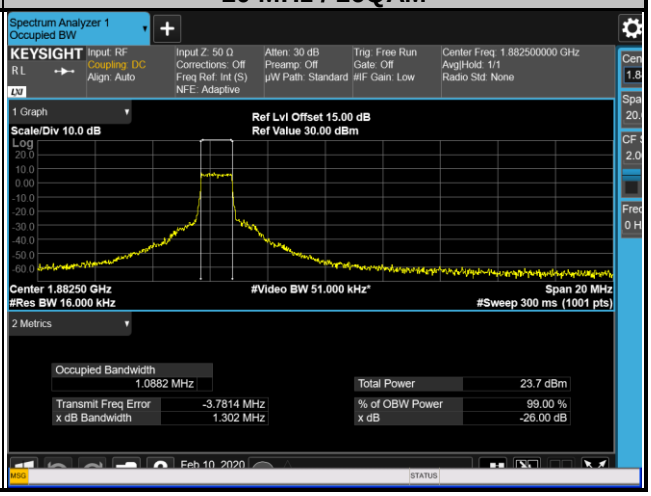
5 MHz / QPSK



10 MHz / 16QAM



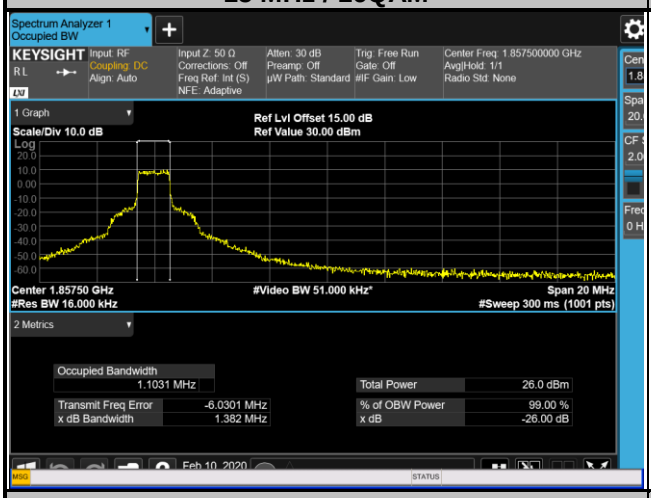
10 MHz / 16QAM

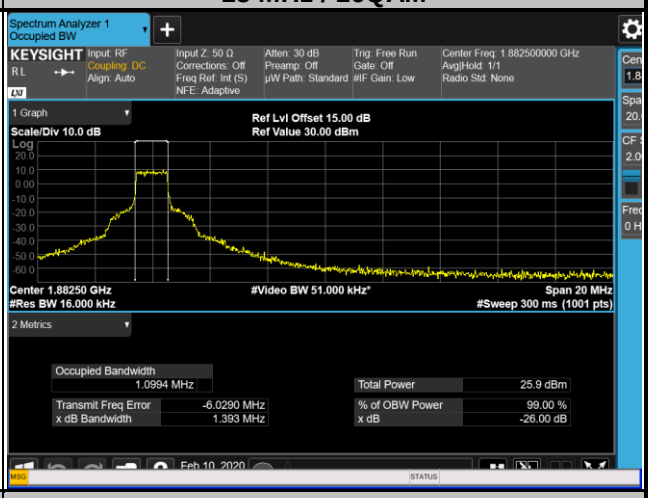


LTE Band 25					
Channel Bandwidth: 15 MHz					
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**		**26 dB Bandwidth (MHz)**	
		QPSK	**16QAM**	**QPSK**	**16QAM**
26115	1857.5	1.0981	1.1031	1.311	1.382
26365	1882.5	1.0947	1.0994	1.299	1.393
26615	1907.5	1.0862	1.0958	1.289	1.327
Channel Bandwidth: 20 MHz					
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**		**26 dB Bandwidth (MHz)**	
		QPSK	**16QAM**	**QPSK**	**16QAM**
26140	1860.0	1.0894	1.0958	1.330	1.440
26365	1882.5	1.0890	1.0957	1.312	1.353
26590	1905.0	1.0884	1.0941	1.311	1.500

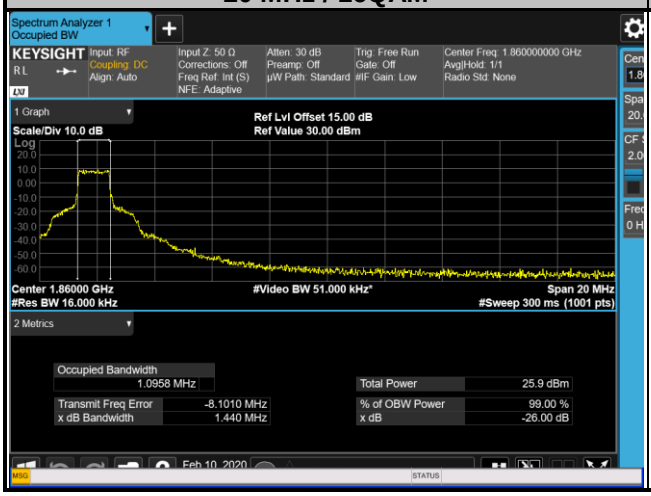
Spectrum Plot of Worst Value

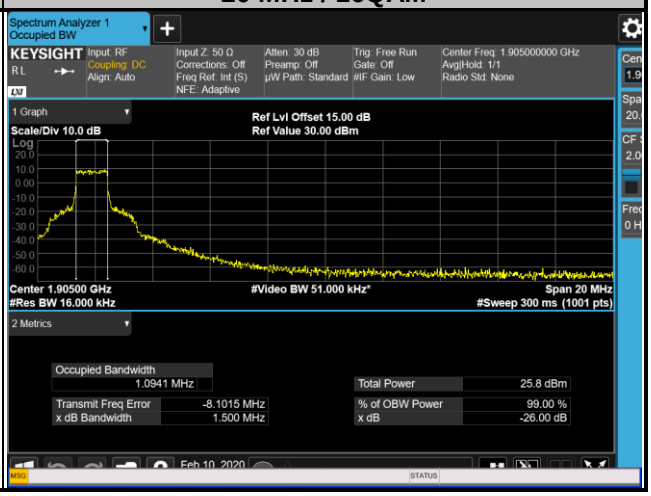
99 % Occupied Bandwidth	26 dB Bandwidth
15 MHz / 16QAM	**15 MHz / 16QAM**





20 MHz / 16QAM | **20 MHz / 16QAM**



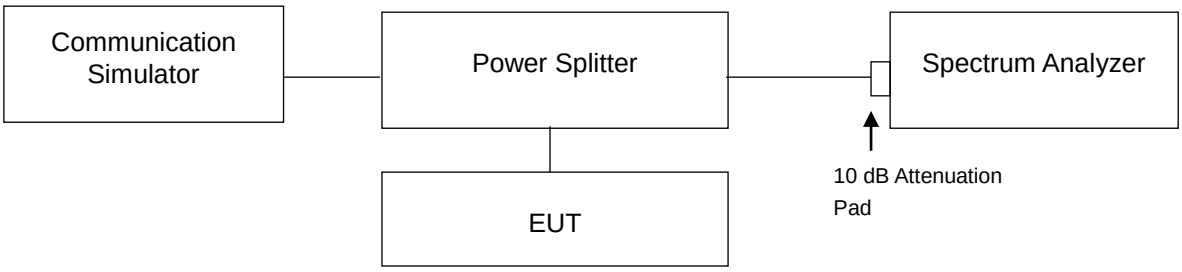


4.5 Band Edge Measurement

4.5.1 Limits of Band Edge Measurement

Power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

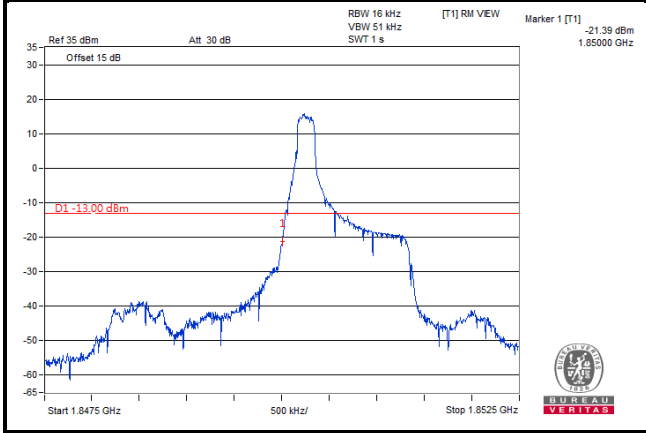
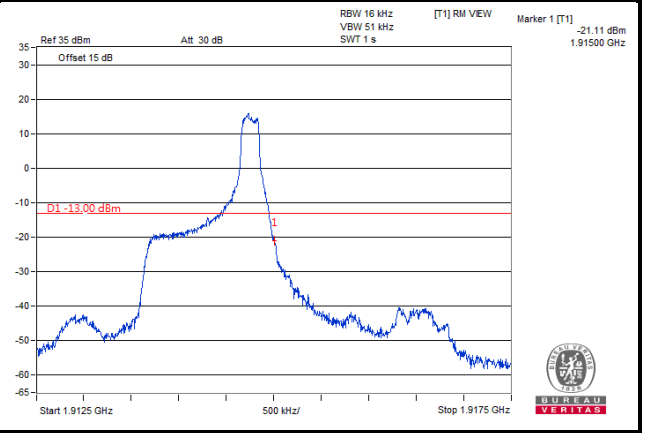
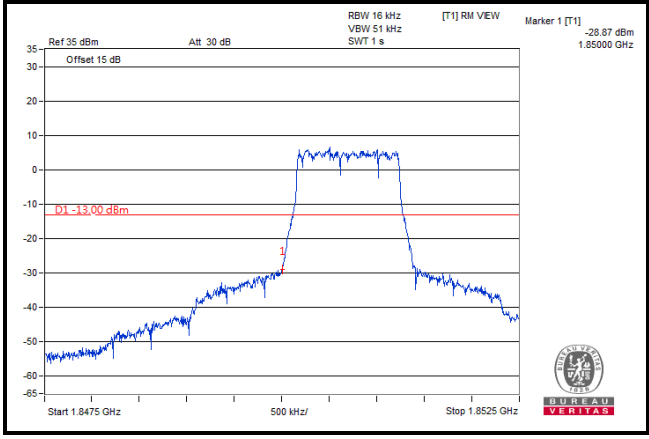
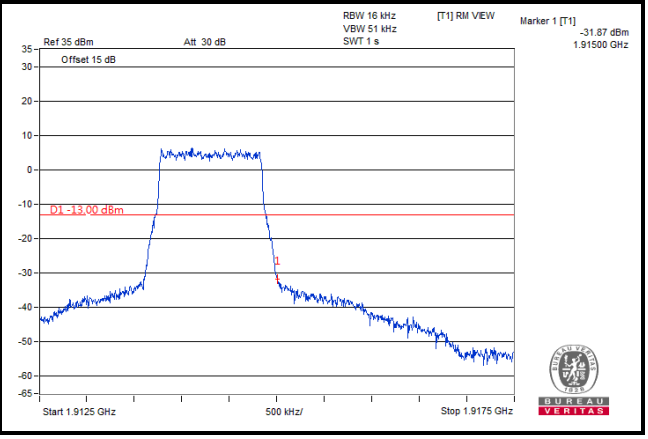
4.5.2 Test Setup

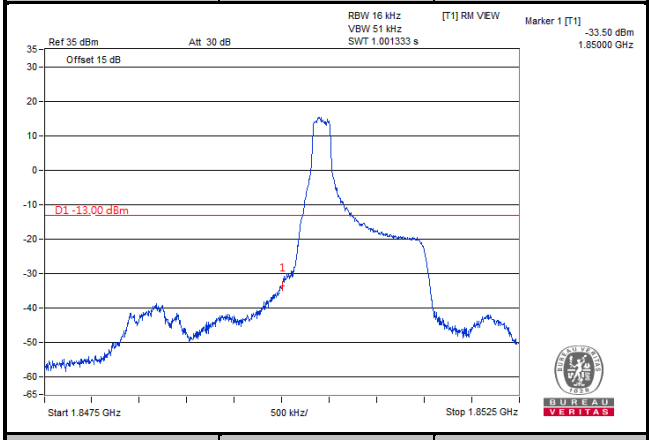
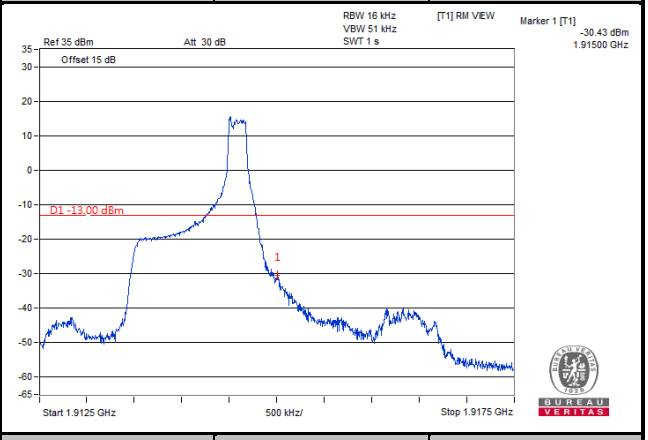
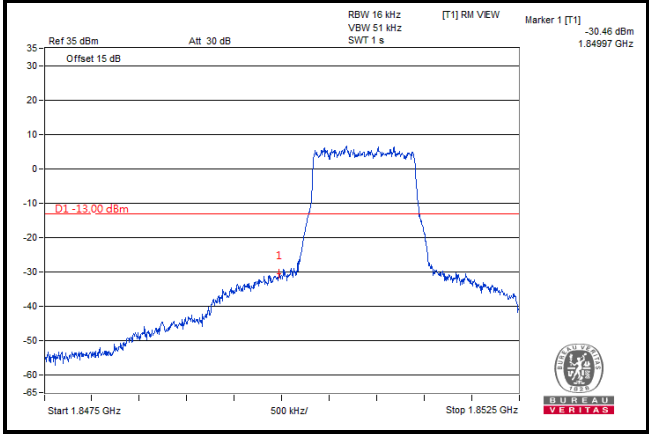
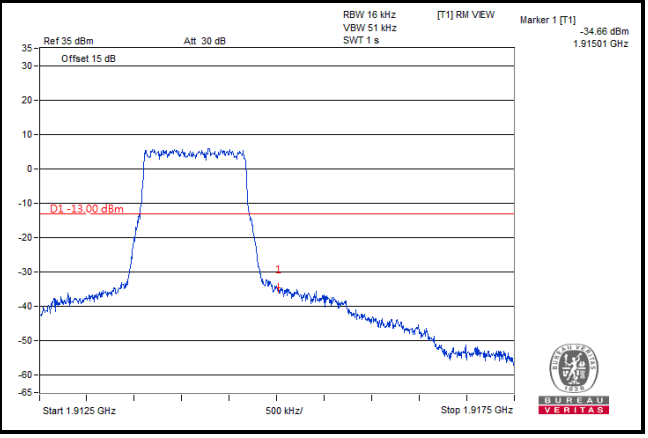


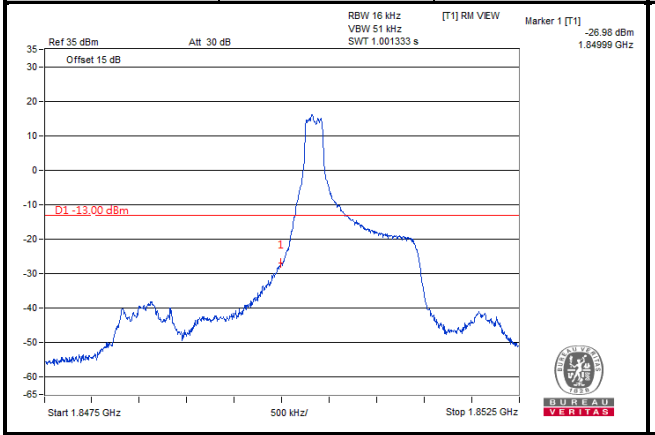
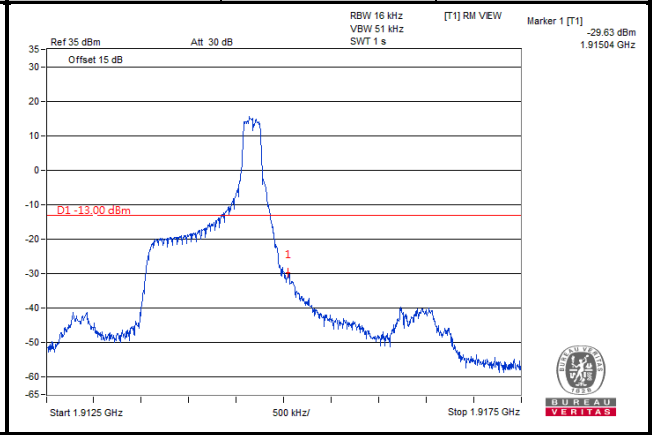
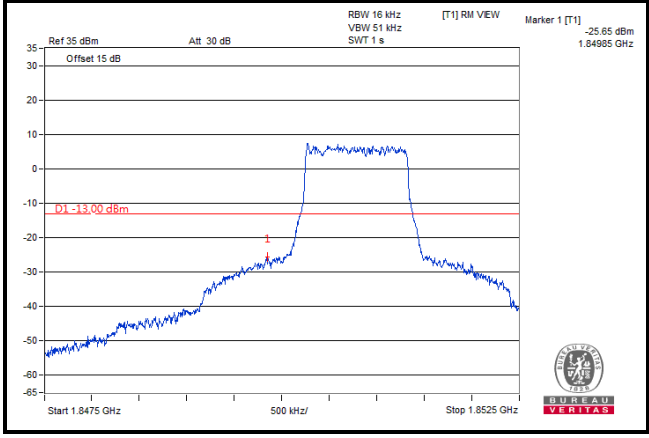
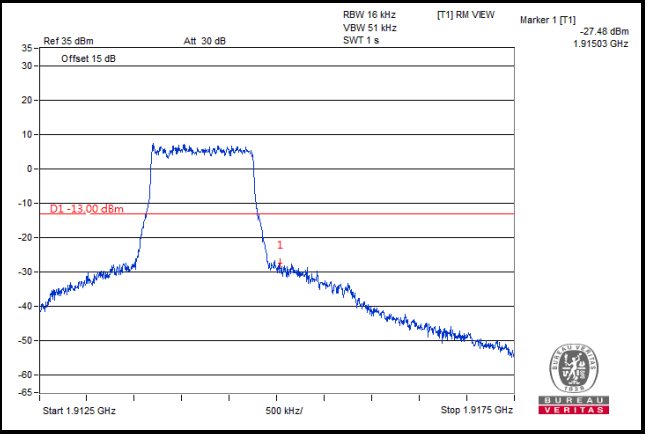
4.5.3 Test Procedures

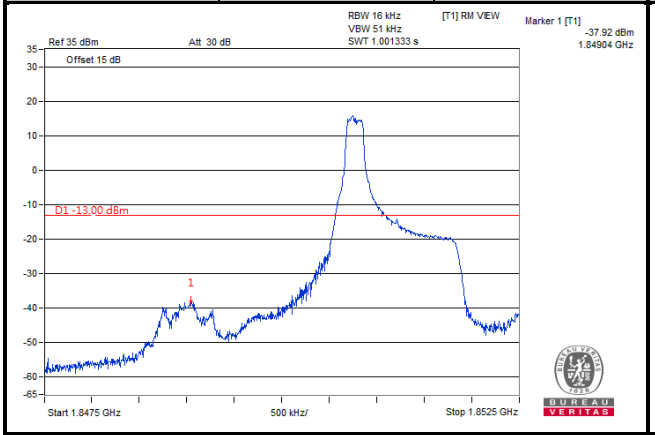
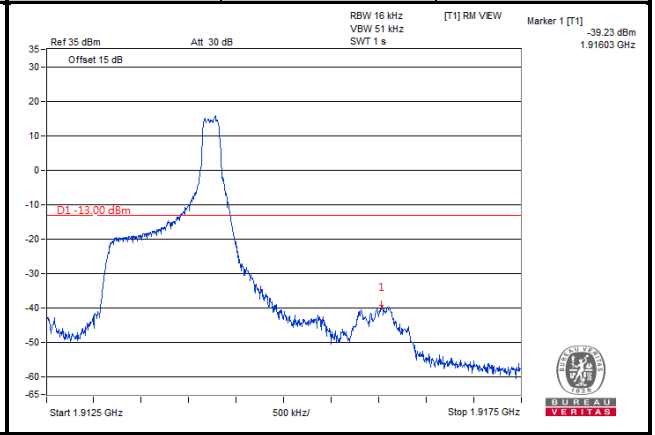
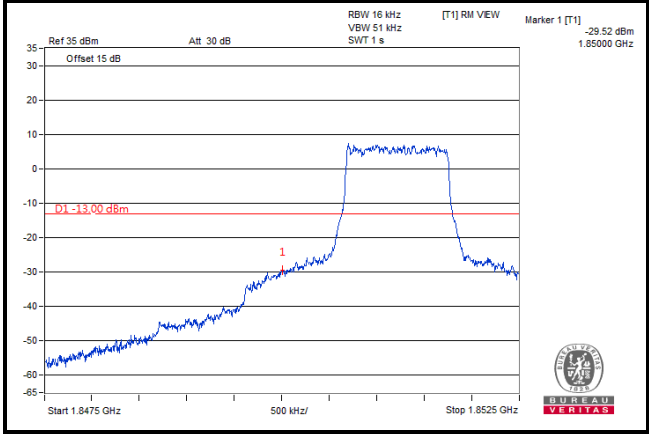
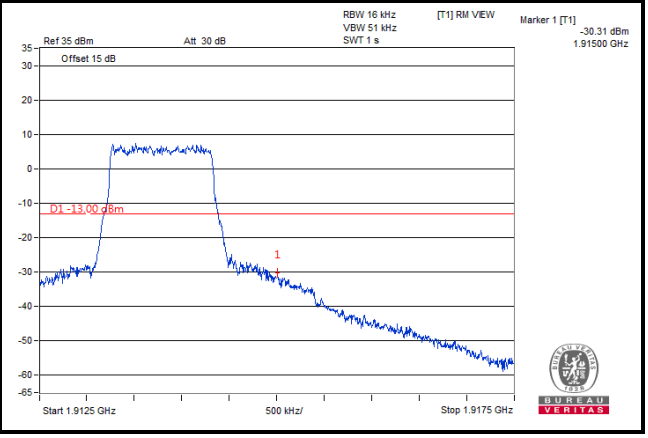
a. All measurements were done at low and high operational frequency range.
b. The center frequency of spectrum is the band edge frequency and span is 5 MHz. RB of the spectrum is 16 kHz and VB of the spectrum is 51 kHz
c. Record the max trace plot into the test report.

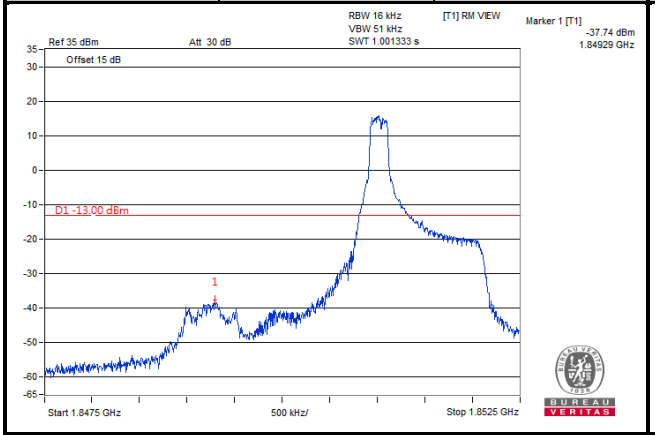
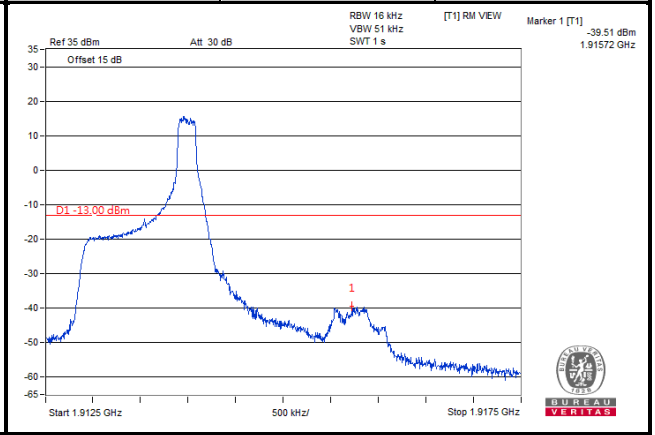
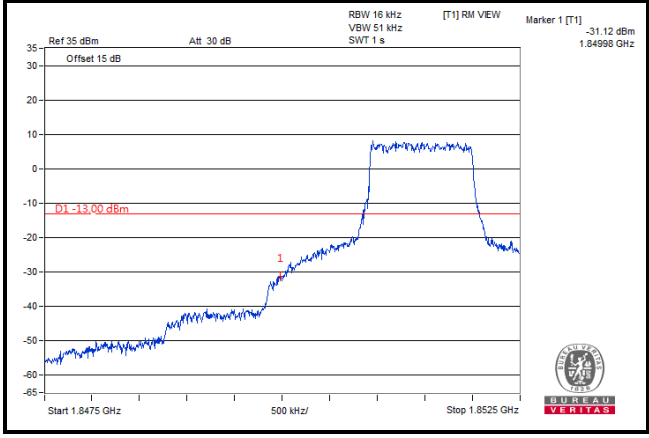
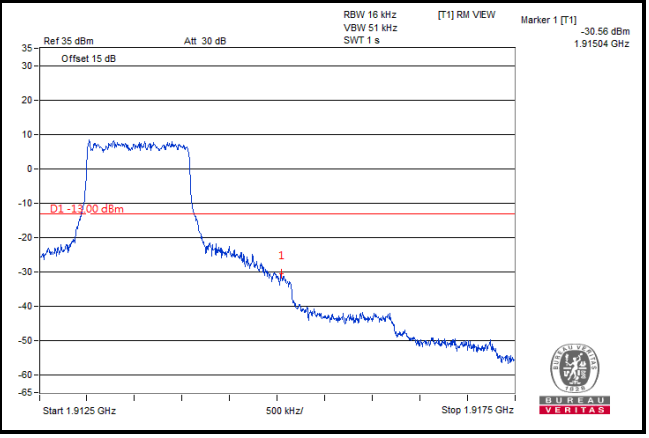
4.5.4 Test Results

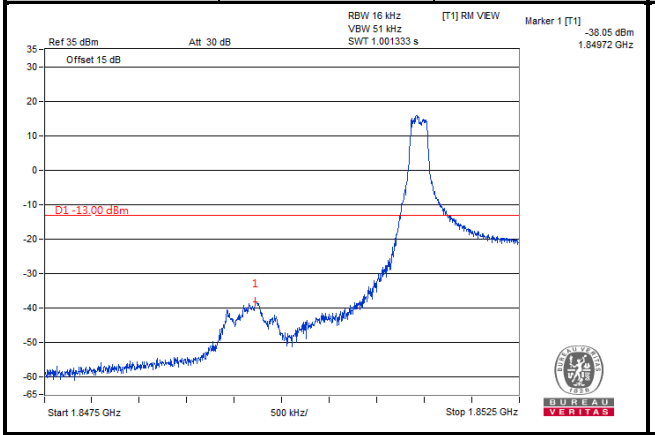
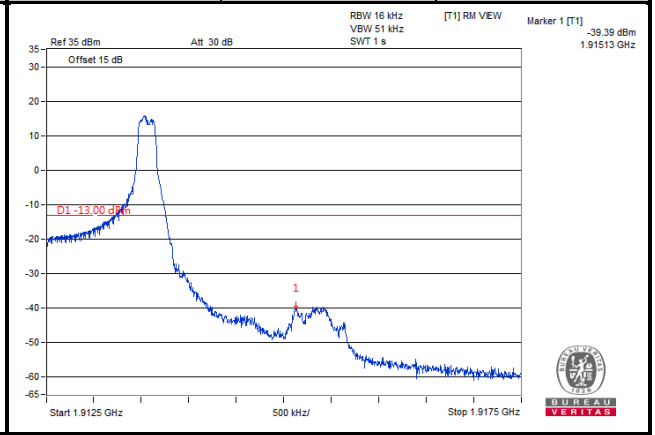
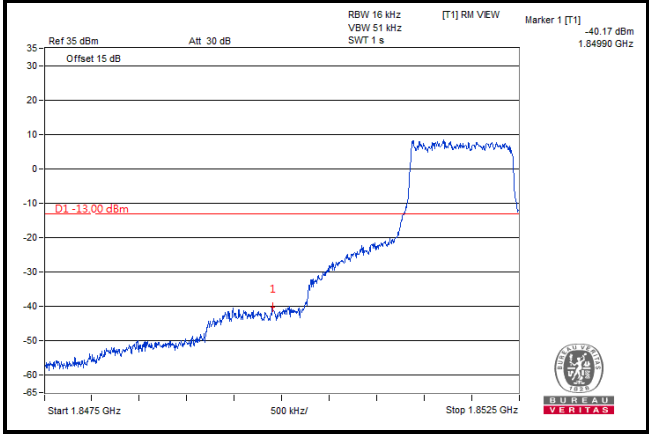
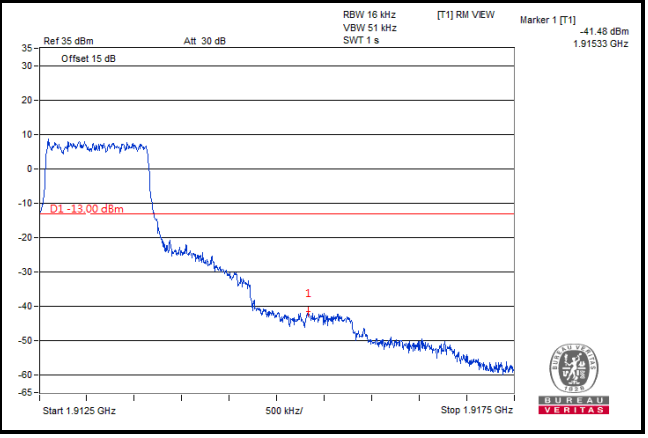
LTE Band 25					
Channel Bandwidth: 1.4 MHz					
Channel	26047	1 RB	Channel	26683	1 RB
					
Channel	26047	6 RB	Channel	26683	6 RB
					

LTE Band 25					
Channel Bandwidth: 3 MHz					
Channel	26055	1 RB	Channel	26675	1 RB
					
Channel	26055	6 RB	Channel	26675	6 RB
					

LTE Band 25					
Channel Bandwidth: 5 MHz					
Channel	26065	1 RB	Channel	26665	1 RB
					
Channel	26065	6 RB	Channel	26665	6 RB
					

LTE Band 25					
Channel Bandwidth: 10 MHz					
Channel	26090	1 RB	Channel	26640	1 RB
					
Channel	26090	6 RB	Channel	26640	6 RB
					

LTE Band 25					
Channel Bandwidth: 15 MHz					
Channel	26115	1 RB	Channel	26615	1 RB
					
Channel	26115	6 RB	Channel	26615	6 RB
					

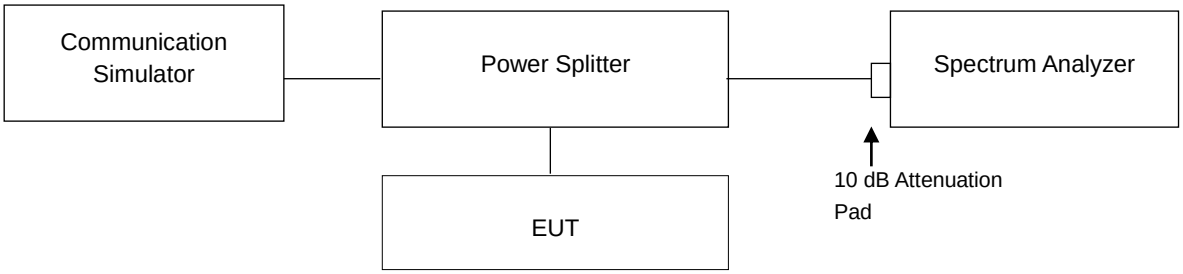
LTE Band 25					
Channel Bandwidth: 20 MHz					
Channel	26140	1 RB	Channel	26590	1 RB
					
Channel	26140	6 RB	Channel	26590	6 RB
					

4.6 Peak to Average Ratio

4.6.1 Limits of Peak to Average Ratio Measurement

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

4.6.2 Test Setup

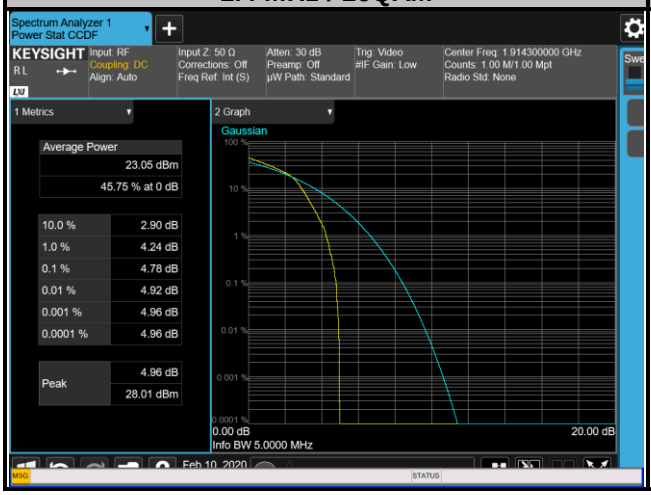
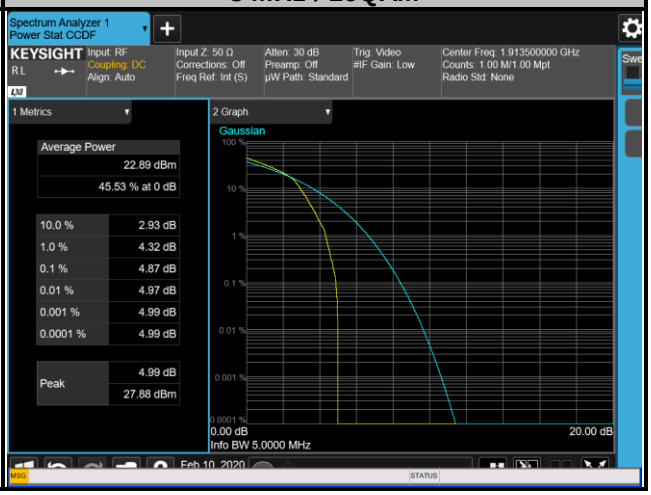


4.6.3 Test Procedures

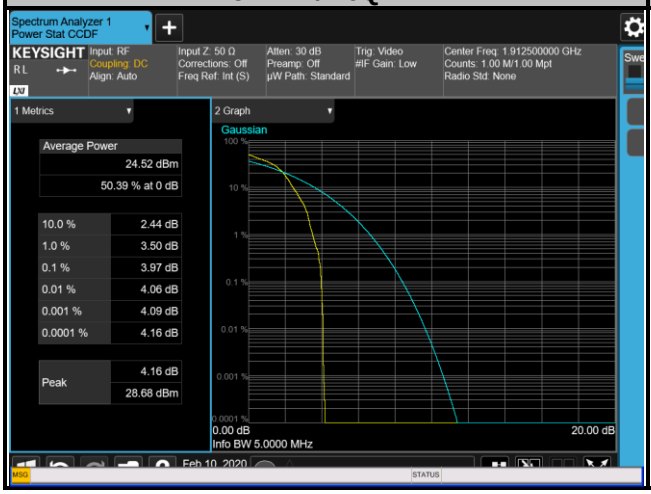
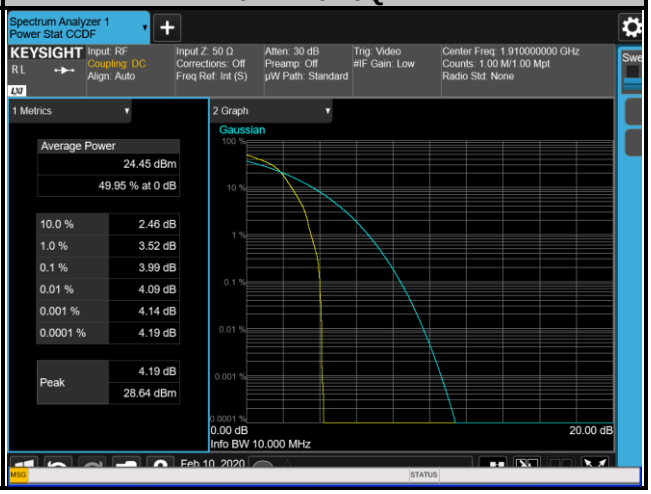
1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1 %.

4.6.4 Test Results

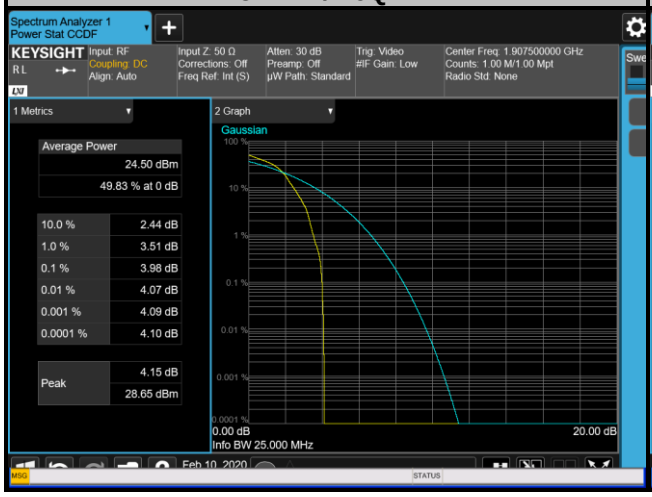
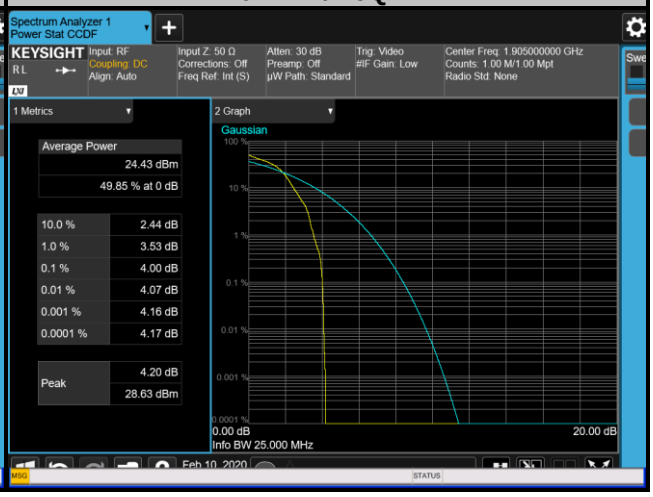
LTE Band 25							
Channel Bandwidth: 1.4 MHz				Channel Bandwidth: 3 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
26047	1850.7	3.24	4.55	26055	1851.5	3.34	4.63
26365	1882.5	3.37	4.68	26365	1882.5	3.44	4.74
26683	1914.3	3.54	4.78	26675	1913.5	3.54	4.87

Spectrum Plot of Worst Value	
1.4 MHz / 16QAM	3 MHz / 16QAM
	

LTE Band 25							
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
26065	1852.5	3.58	3.72	26090	1855.0	3.41	3.72
26365	1882.5	3.55	3.84	26365	1882.5	3.56	3.80
26665	1912.5	3.73	3.97	26640	1910.0	3.57	3.99

Spectrum Plot of Worst Value	
5 MHz / 16QAM	10 MHz / 16QAM
	

LTE Band 25							
Channel Bandwidth: 15 MHz				Channel Bandwidth: 20 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
26115	1857.5	3.39	3.70	26140	1860.0	3.35	3.66
26365	1882.5	3.61	3.82	26365	1882.5	3.59	3.78
26615	1907.5	3.87	3.98	26590	1905.0	3.51	4.00

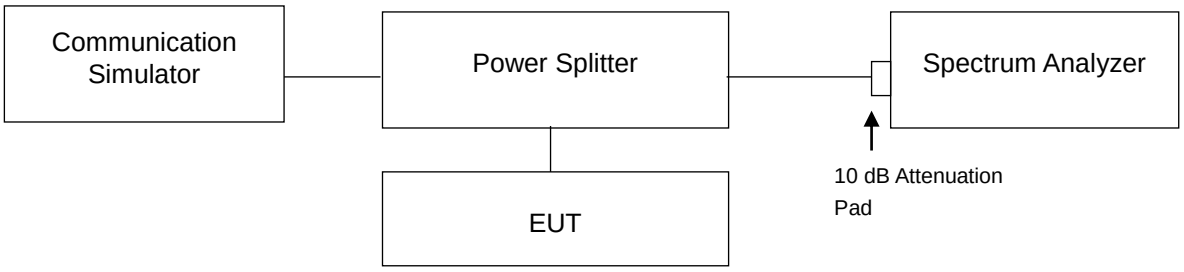
Spectrum Plot of Worst Value	
15 MHz / 16QAM	20 MHz / 16QAM
	

4.7 Conducted Spurious Emissions

4.7.1 Limits of Conducted Spurious Emissions Measurement

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

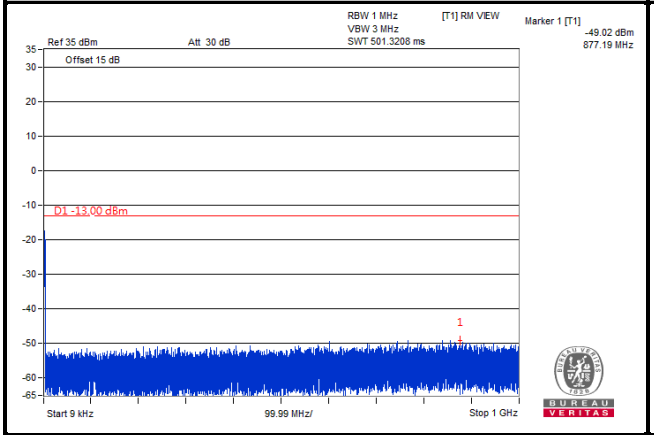
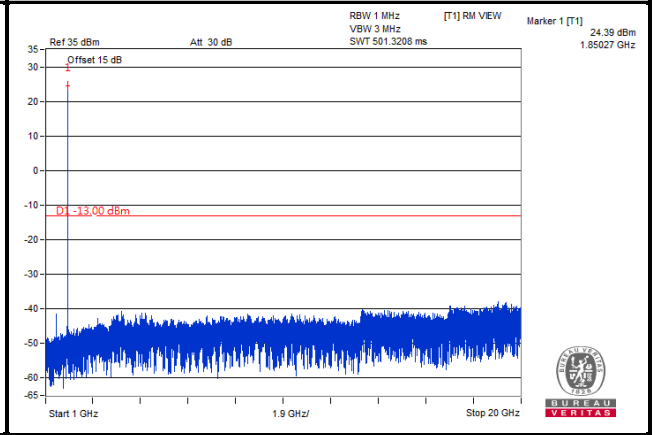
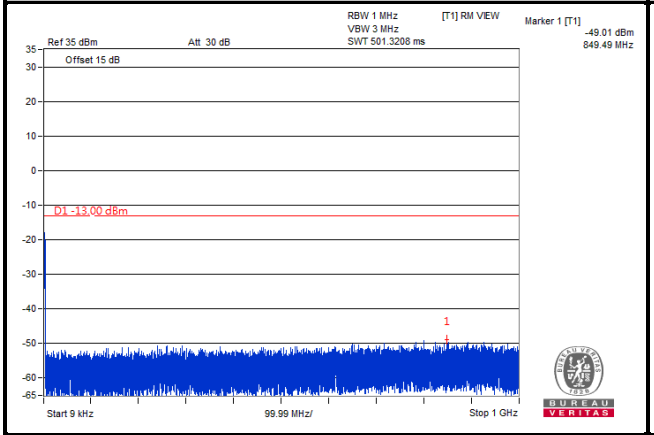
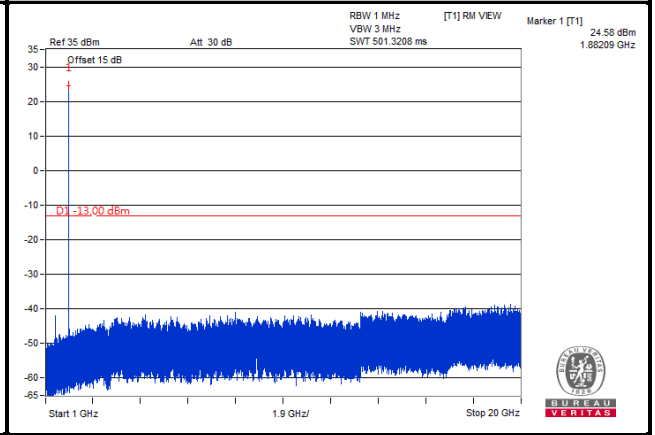
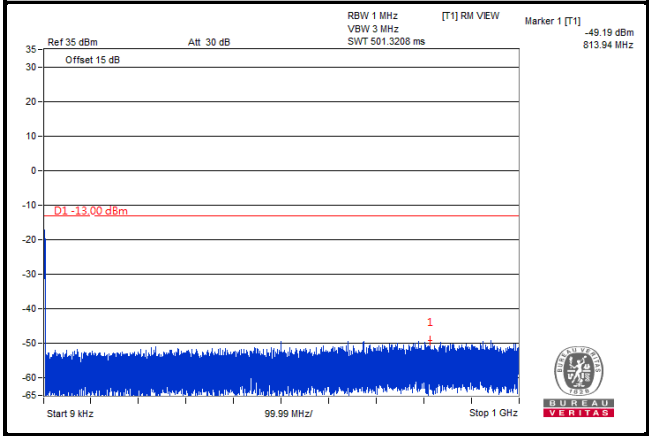
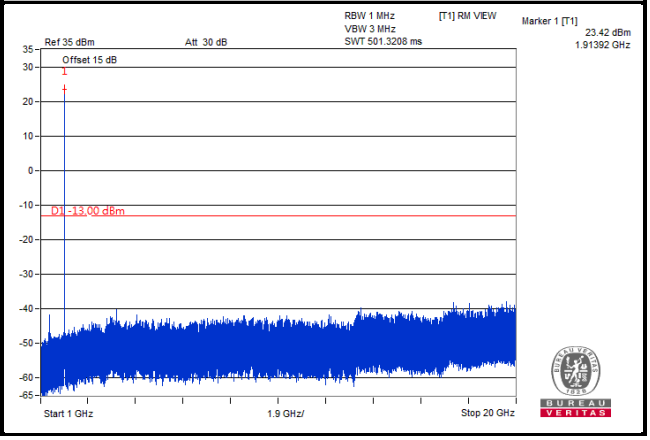
4.7.2 Test Setup



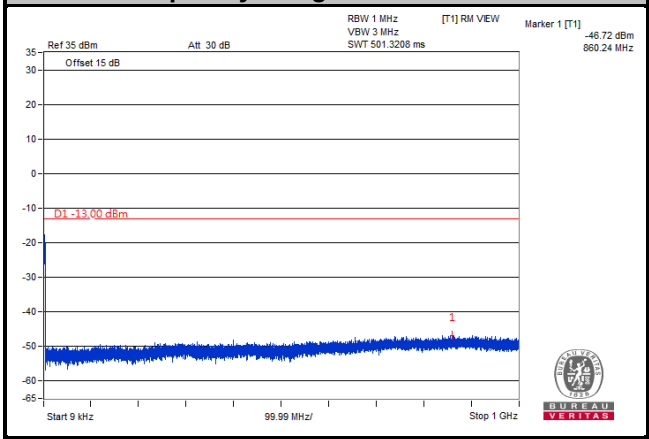
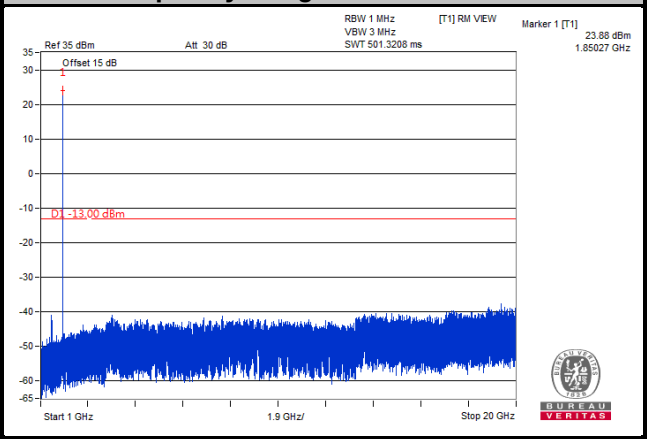
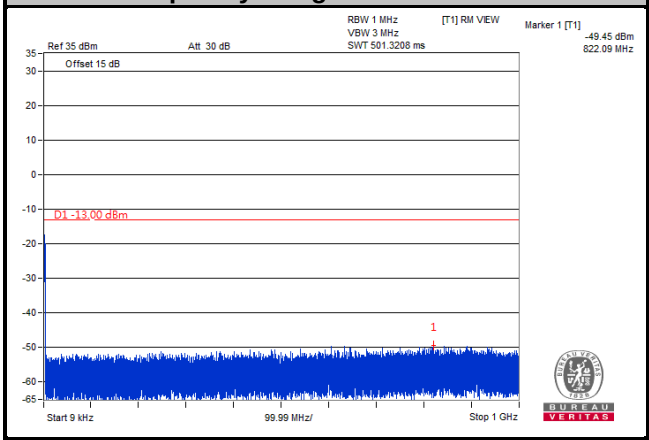
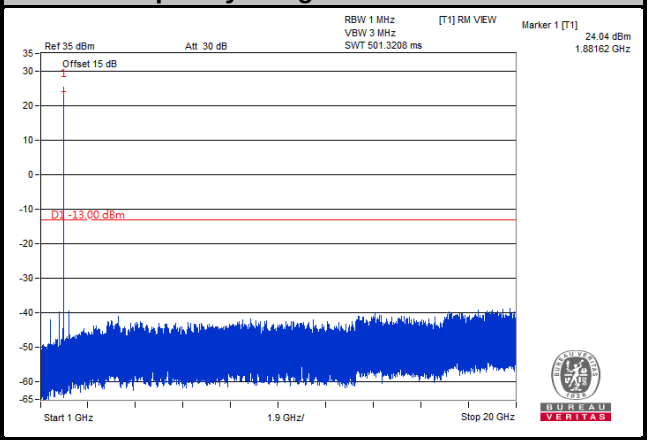
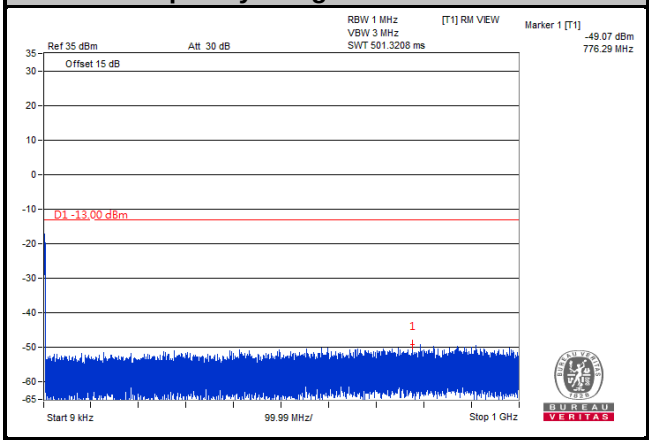
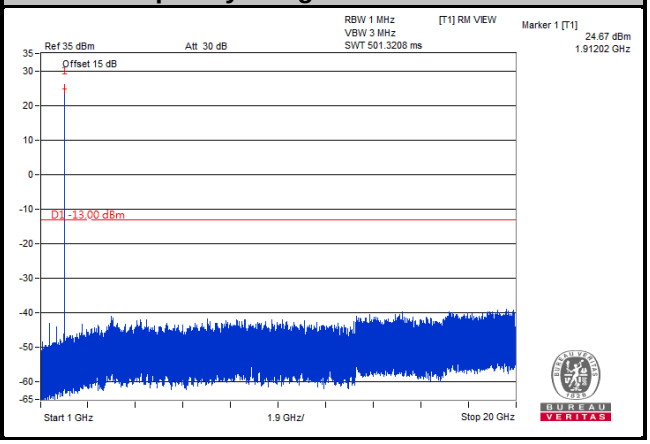
4.7.3 Test Procedure

a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
b. Measuring frequency range is from 9 kHz to 1 GHz. 10 dB attenuation pad is connected with spectrum. RBW = 1 MHz and VBW = 3 MHz is used for conducted emission measurement.
c. Measuring frequency range is from 1 GHz to 20 GHz. 10 dB attenuation pad is connected with spectrum. RBW = 1 MHz and VBW = 3 MHz is used for conducted emission measurement.

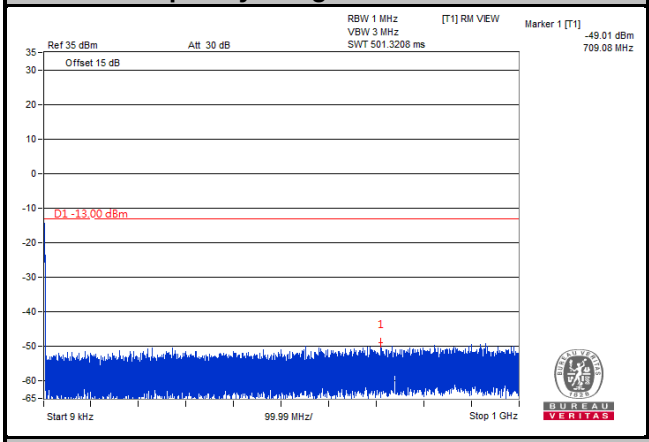
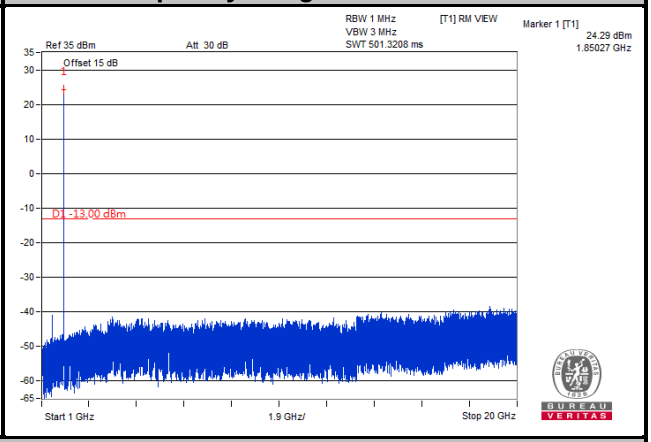
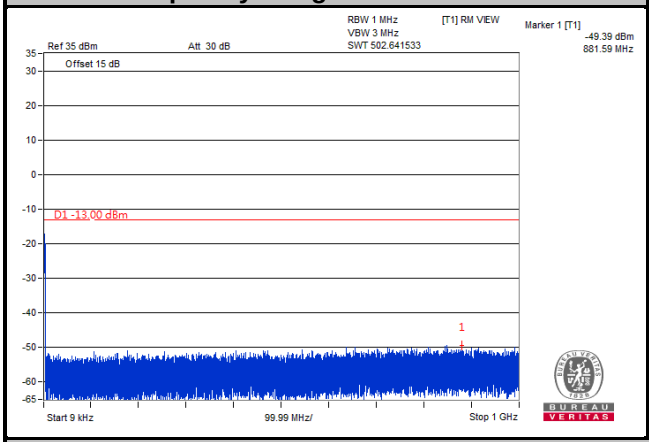
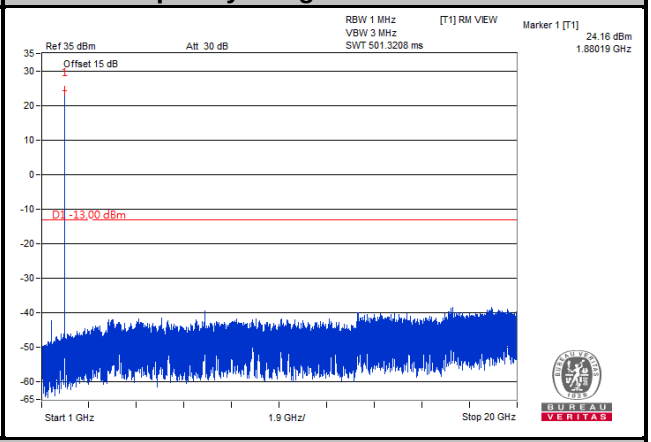
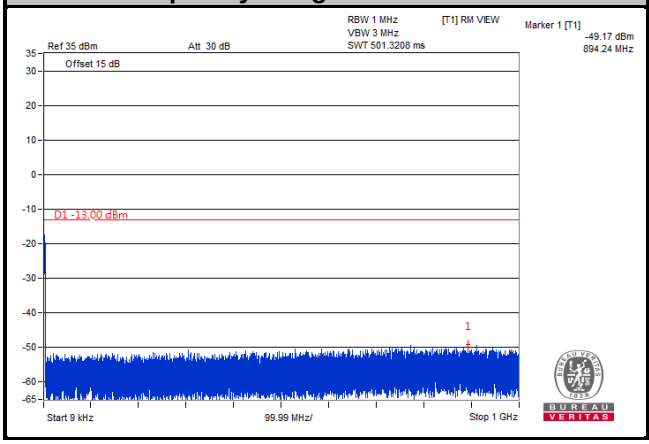
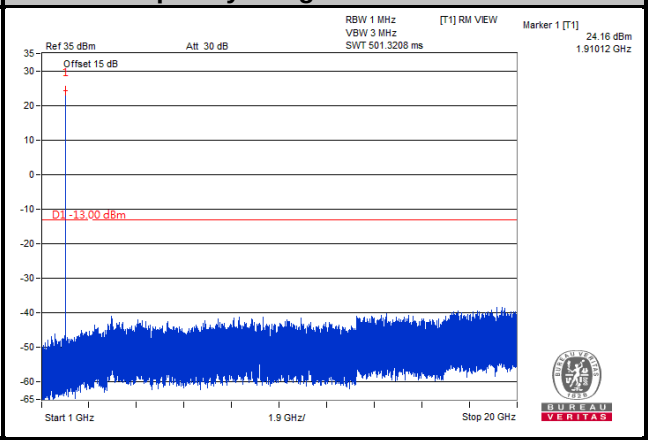
4.7.4 Test Results

LTE Band 25	
Channel Bandwidth: 1.4 MHz	
Channel 26047	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel 26365	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel 26683	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	

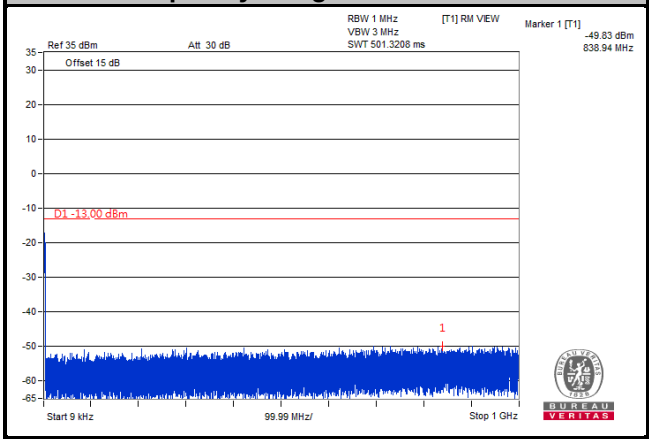
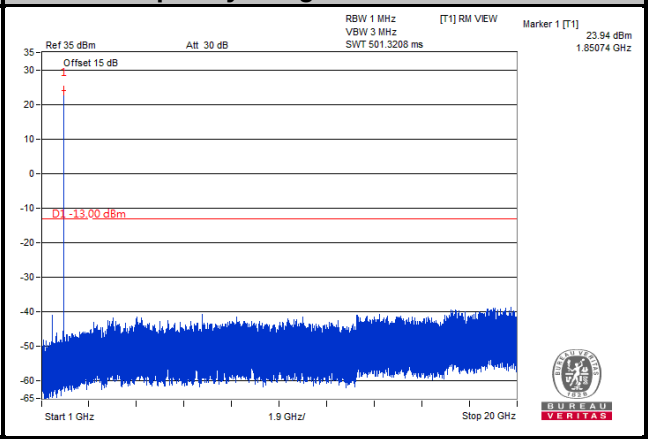
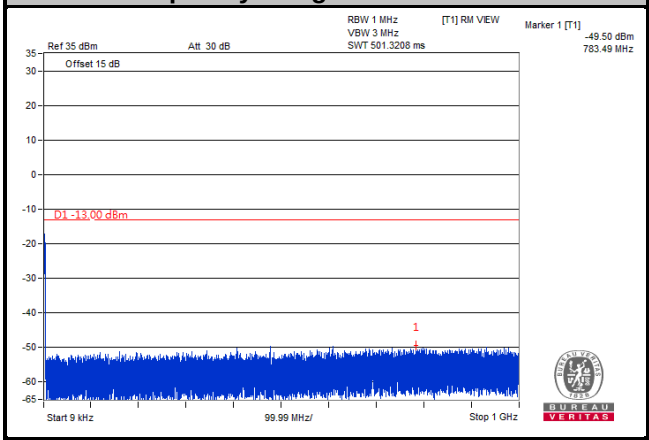
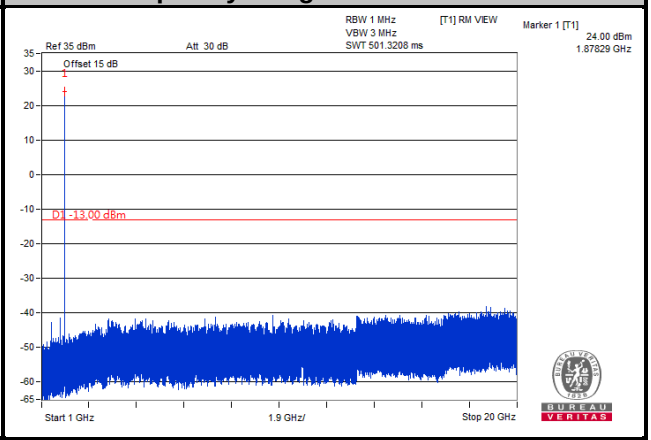
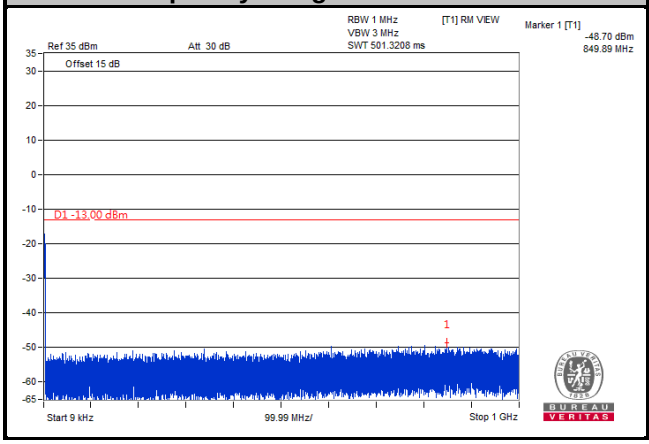
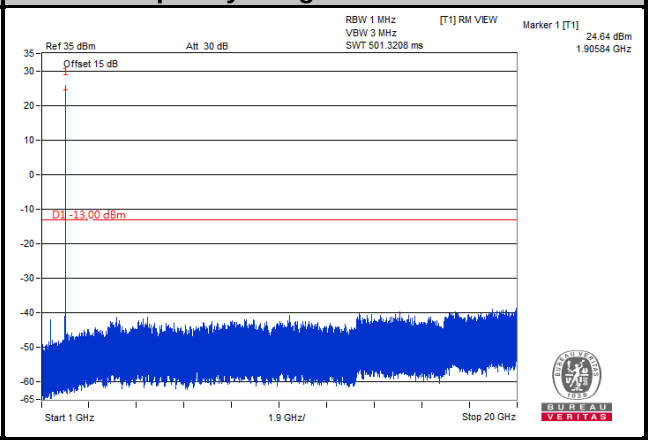
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 25	
Channel Bandwidth: 3 MHz	
Channel 26055	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel 26365	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel 26675	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	

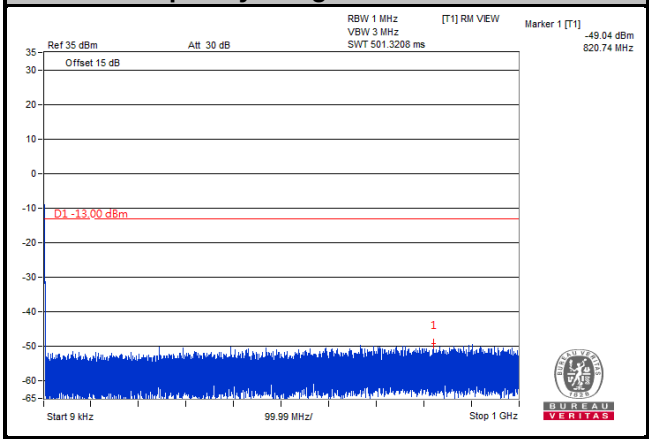
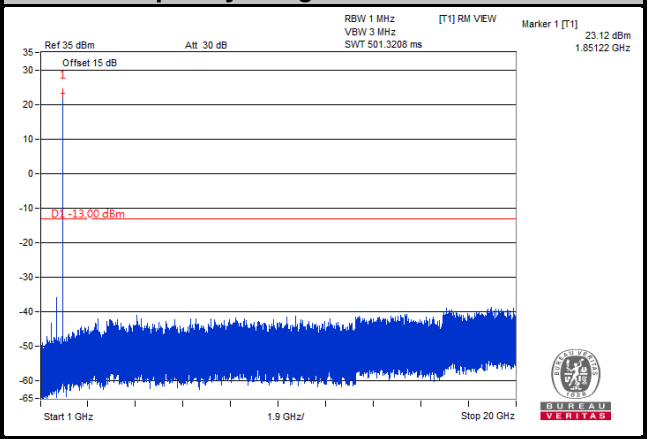
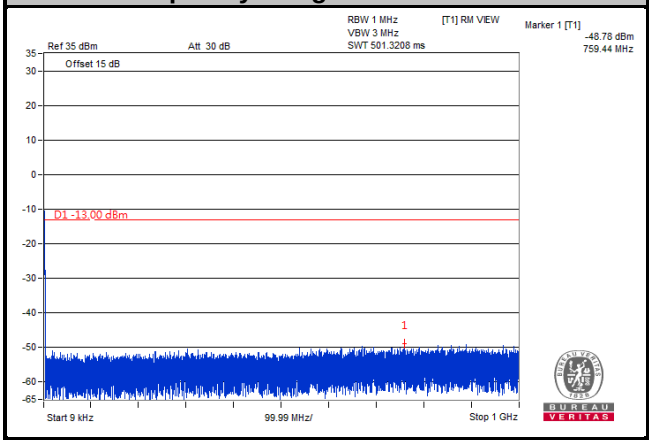
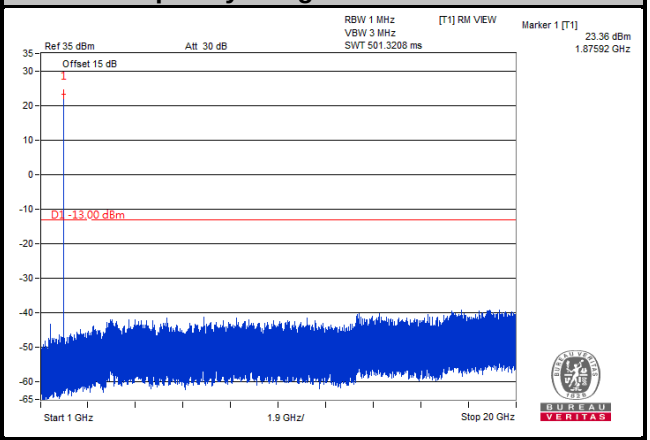
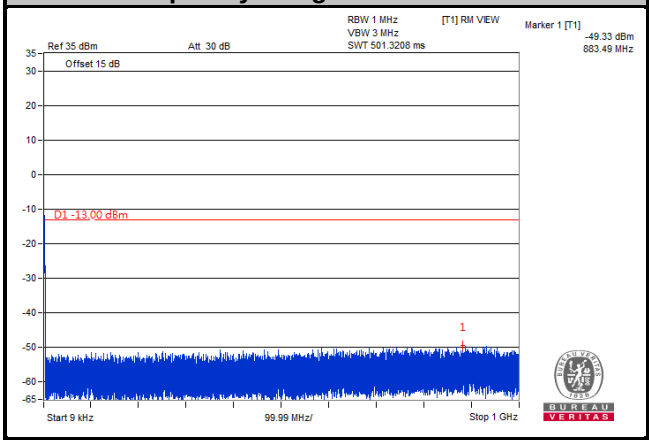
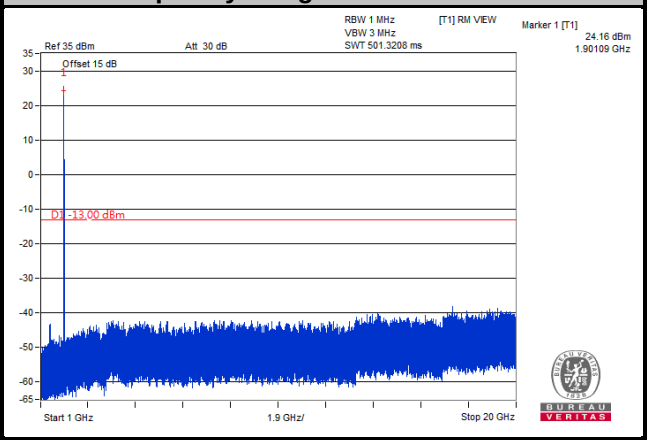
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 25	
Channel Bandwidth: 5 MHz	
Channel 26065	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel 26365	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel 26665	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	

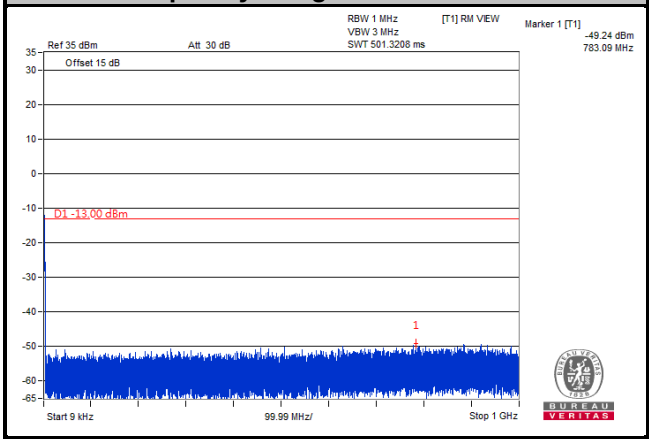
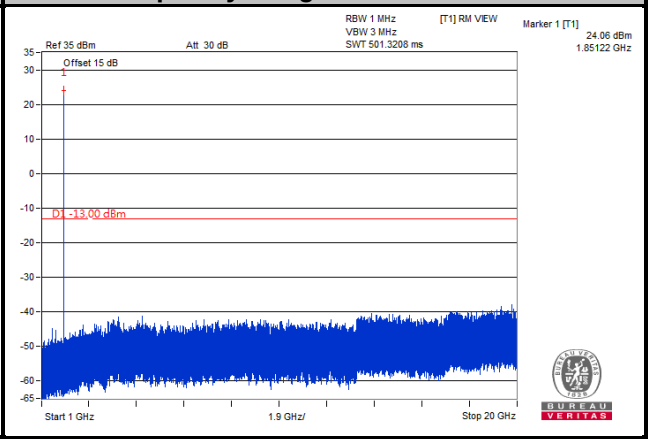
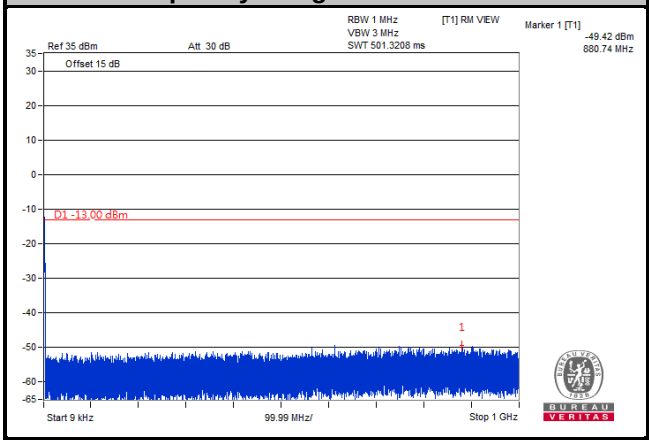
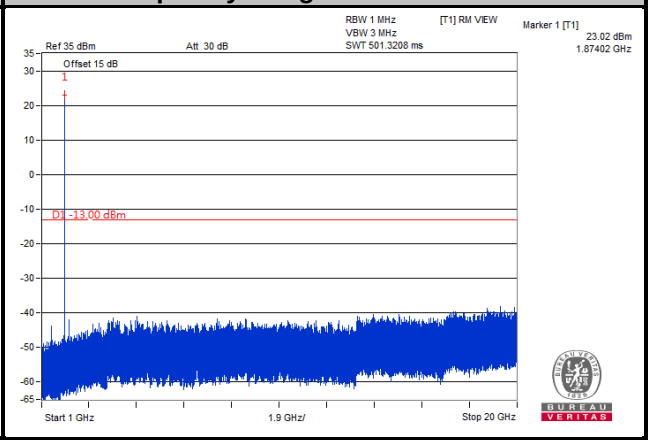
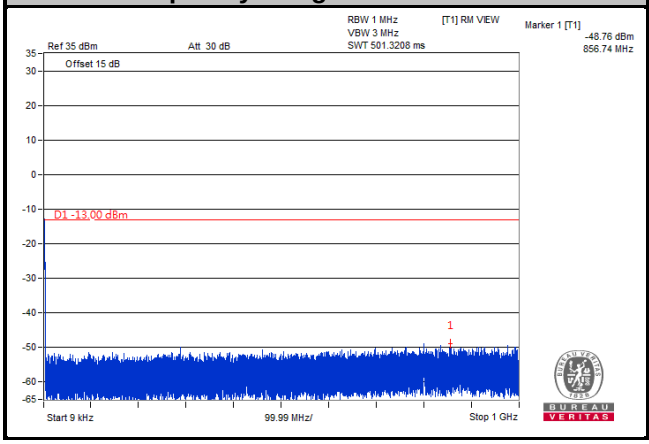
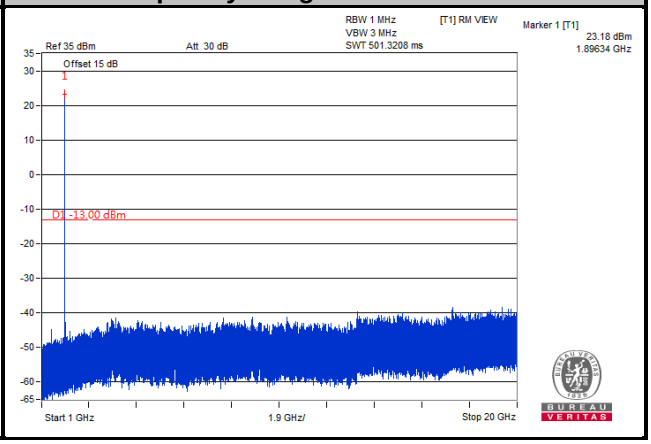
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 25	
Channel Bandwidth: 10 MHz	
Channel 26090	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel 26365	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel 26640	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	

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

LTE Band 25	
Channel Bandwidth: 15 MHz	
Channel 26115	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel 26365	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel 26615	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	

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

LTE Band 25	
Channel Bandwidth: 20 MHz	
Channel 26140	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel 26365	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	
Channel 26590	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 20 GHz
	

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

a. 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.
b. 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.
c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15 dB.

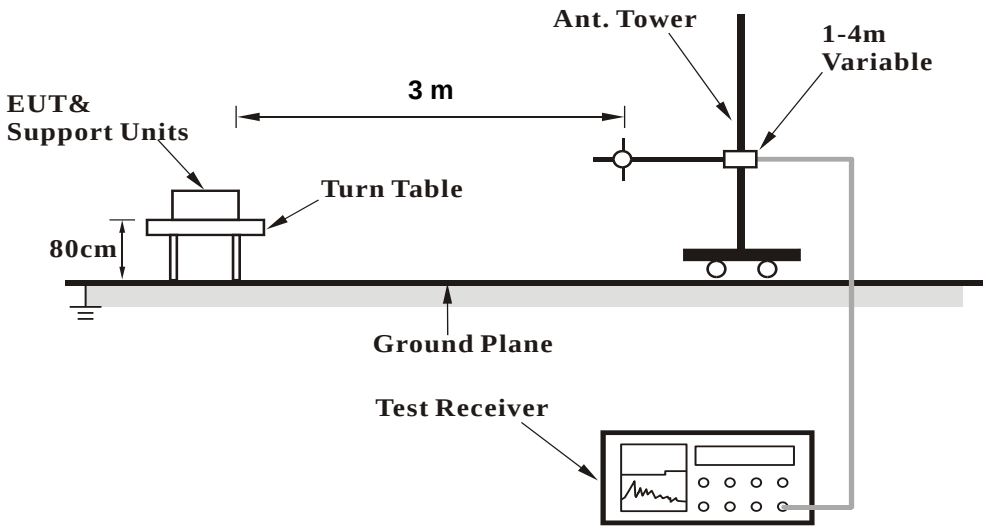
NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz/3 MHz.

4.8.3 Deviation from Test Standard

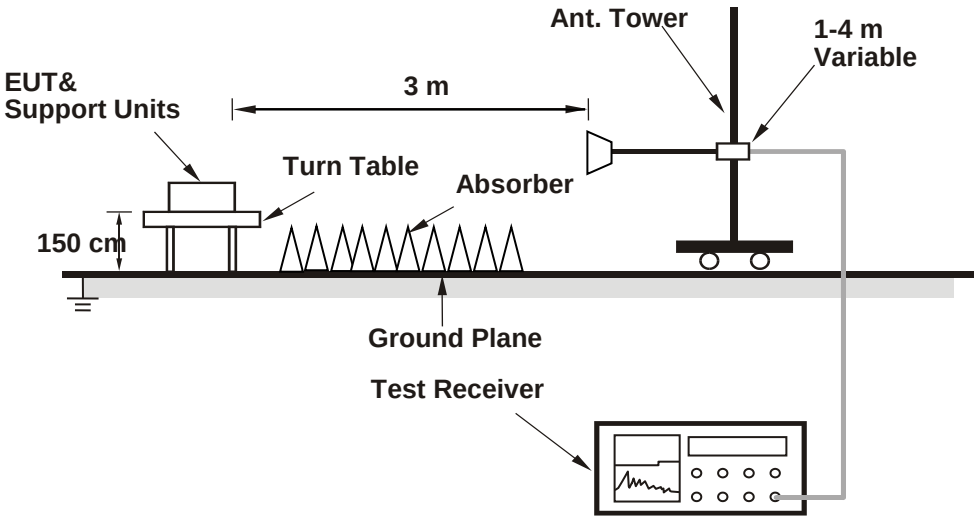
No deviation.

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

LTE Band 25

Channel Bandwidth: 1.4 MHz / QPSK

Low Channel

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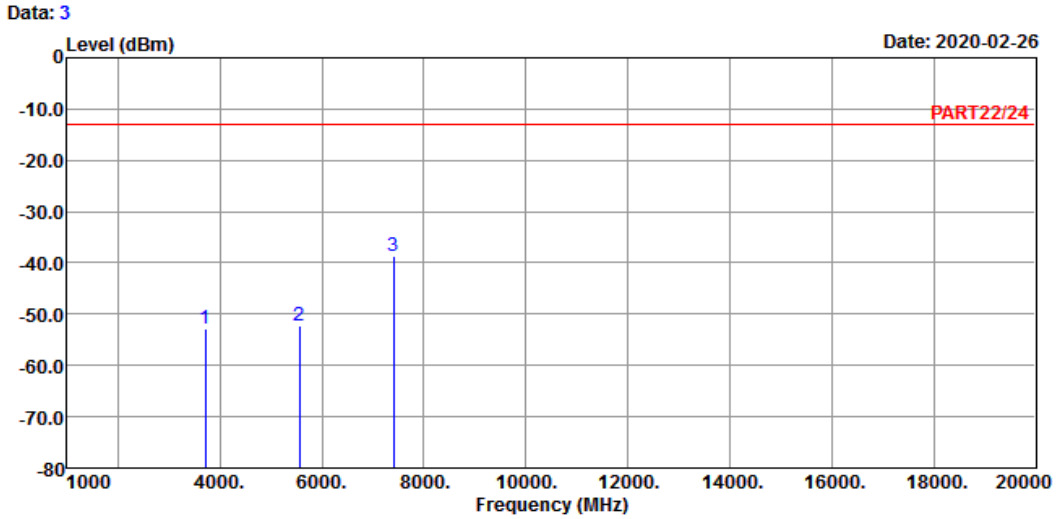
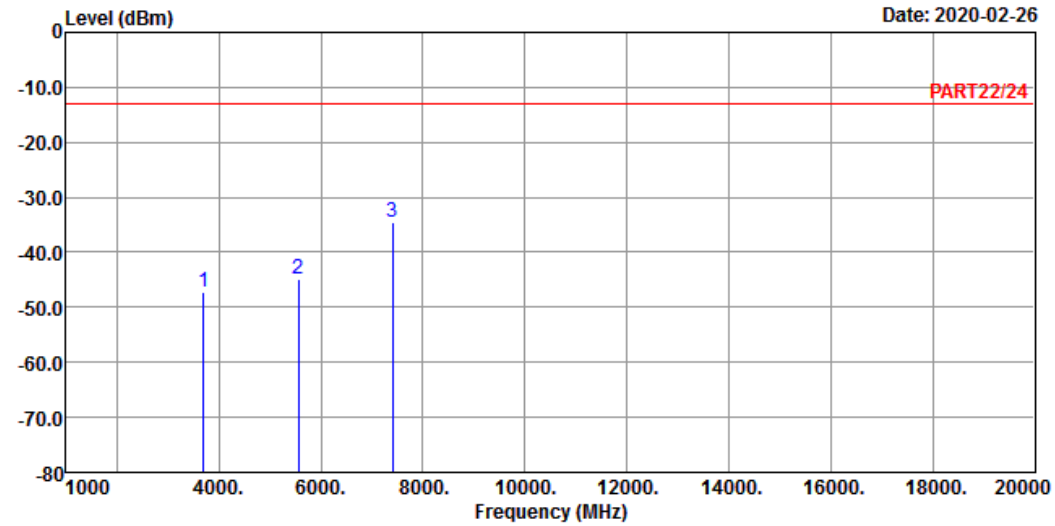


Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 25 QPSK_1.4M Link_L-CH
Tested by: Getaz Yang

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3710.40	-52.84	-45.97	-13.00	-6.87	-39.84	Peak
2	5552.10	-52.33	-50.43	-13.00	-1.90	-39.33	Peak
3 pp	7402.80	-38.56	-42.67	-13.00	4.11	-25.56	Peak

Data: 4

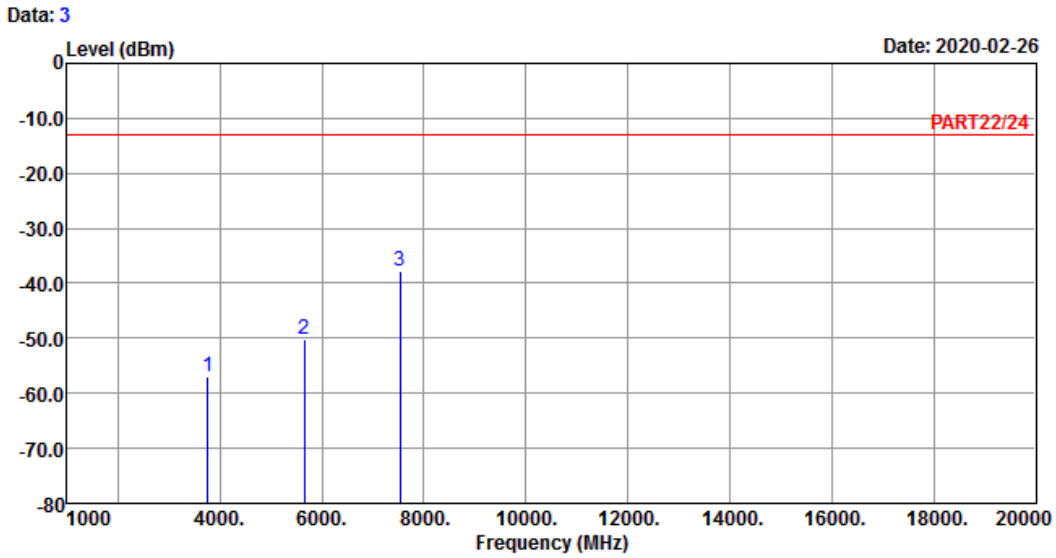


Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : Cat-M1 Band 25 QPSK_1.4M Link_L-CH
Tested by: Getaz Yang

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3701.40	-47.33	-40.40	-13.00	-6.93	-34.33	Peak
2	5552.10	-44.96	-43.06	-13.00	-1.90	-31.96	Peak
3 pp	7402.80	-34.65	-38.76	-13.00	4.11	-21.65	Peak

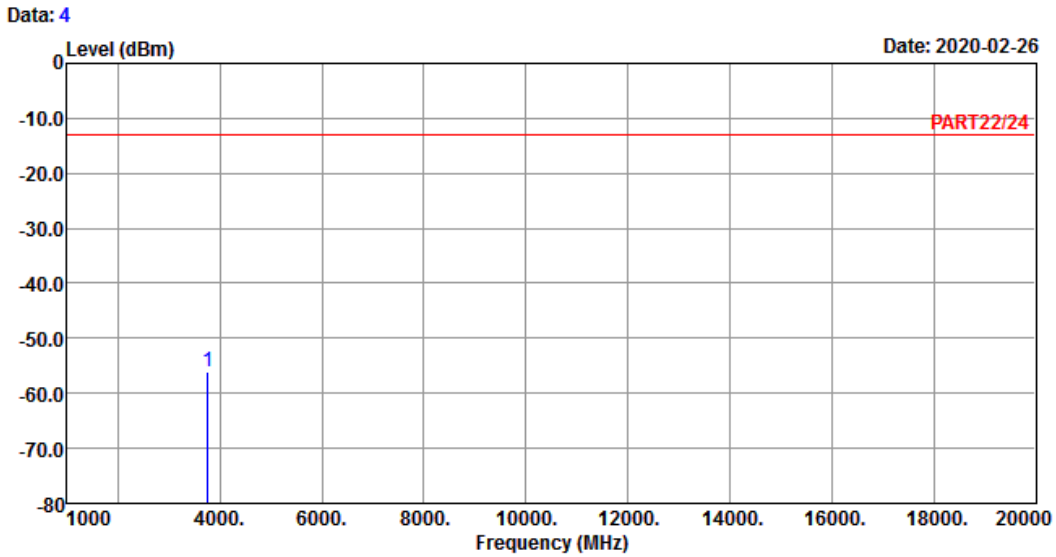
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 25 QPSK_1.4M Link_M-CH
Tested by: Getaz Yang

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3765.00	-56.86	-50.26	-13.00	-6.60	-43.86	Peak
2	5647.50	-50.15	-48.32	-13.00	-1.83	-37.15	Peak
3 pp	7530.00	-37.89	-42.17	-13.00	4.28	-24.89	Peak

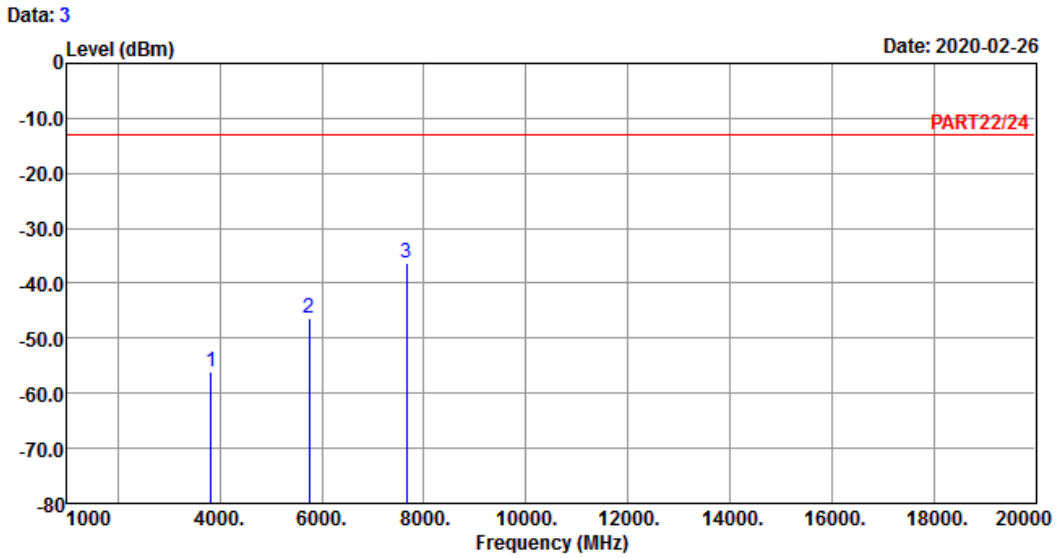


Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : Cat-M1 Band 25 QPSK_1.4M Link_M-CH
Tested by: Getaz Yang

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3765.00	-56.18	-49.58	-13.00	-6.60	-43.18	Peak

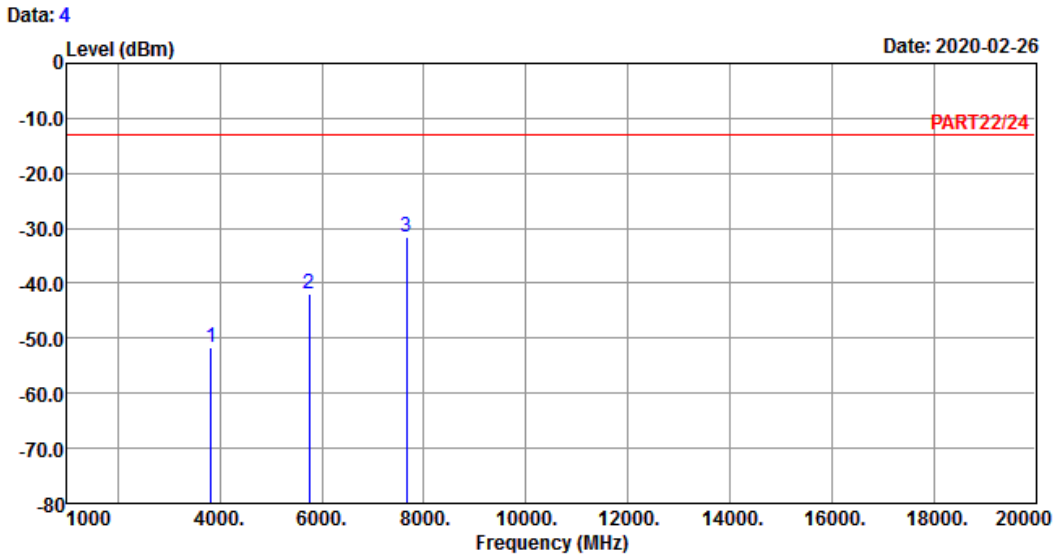
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 25 QPSK_1.4M Link_H-CH
Tested by: Getaz Yang

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3828.60	-56.11	-49.74	-13.00	-6.37	-43.11	Peak
2	5742.90	-46.28	-44.63	-13.00	-1.65	-33.28	Peak
3 pp	7657.20	-36.19	-40.77	-13.00	4.58	-23.19	Peak

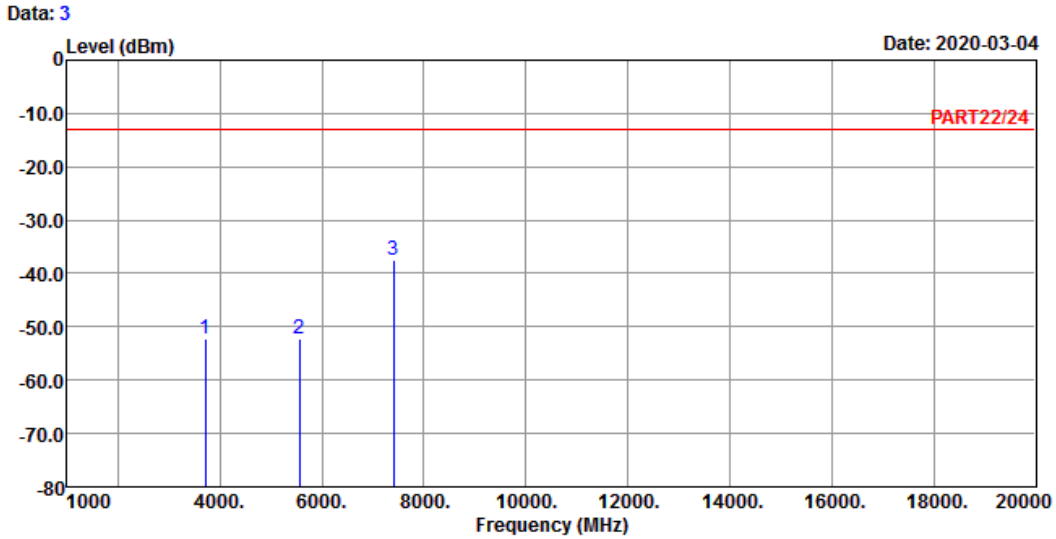


Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : Cat-M1 Band 25 QPSK_1.4M Link_H-CH
Tested by: Getaz Yang

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3828.60	-51.66	-45.29	-13.00	-6.37	-38.66	Peak
2	5742.90	-41.81	-40.16	-13.00	-1.65	-28.81	Peak
3 pp	7657.20	-31.48	-36.06	-13.00	4.58	-18.48	Peak

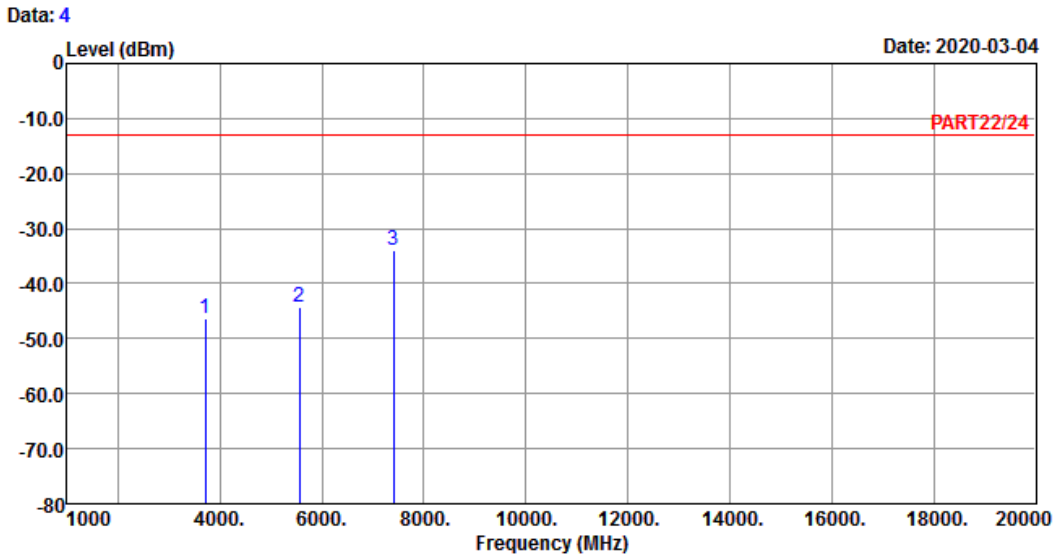
Channel Bandwidth: 5 MHz / QPSK
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 25 QPSK_5M Link_L-CH
Tested by: Getaz Yang

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3705.00	-52.21	-45.28	-13.00	-6.93	-39.21	Peak
2	5557.50	-52.14	-50.23	-13.00	-1.91	-39.14	Peak
3 pp	7410.00	-37.57	-41.70	-13.00	4.13	-24.57	Peak

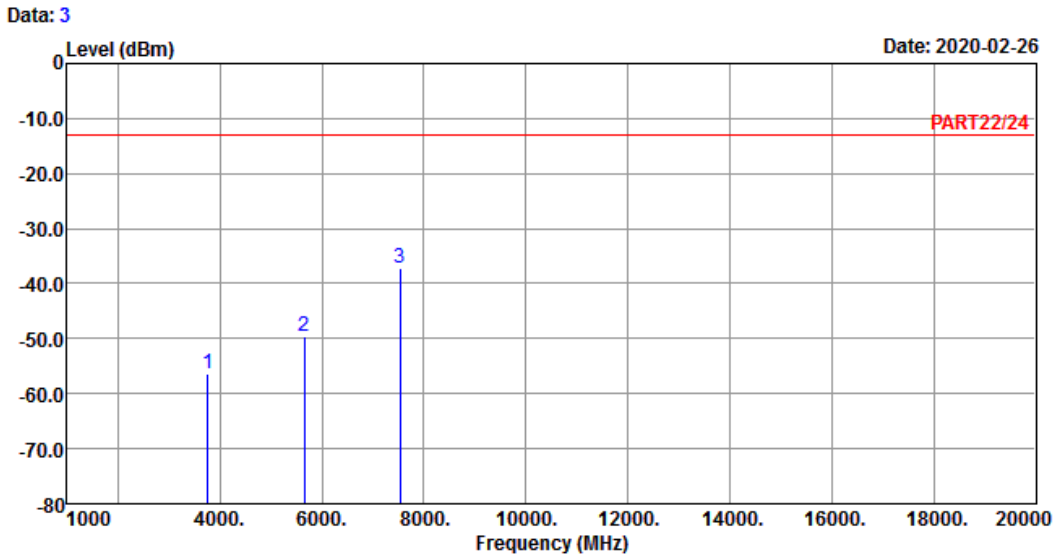


Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : Cat-M1 Band 25 QPSK_5M Link_L-CH
Tested by: Getaz Yang

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3705.00	-46.24	-39.31	-13.00	-6.93	-33.24	Peak
2	5557.50	-44.33	-42.42	-13.00	-1.91	-31.33	Peak
3 pp	7410.00	-33.94	-38.07	-13.00	4.13	-20.94	Peak

Middle Channel

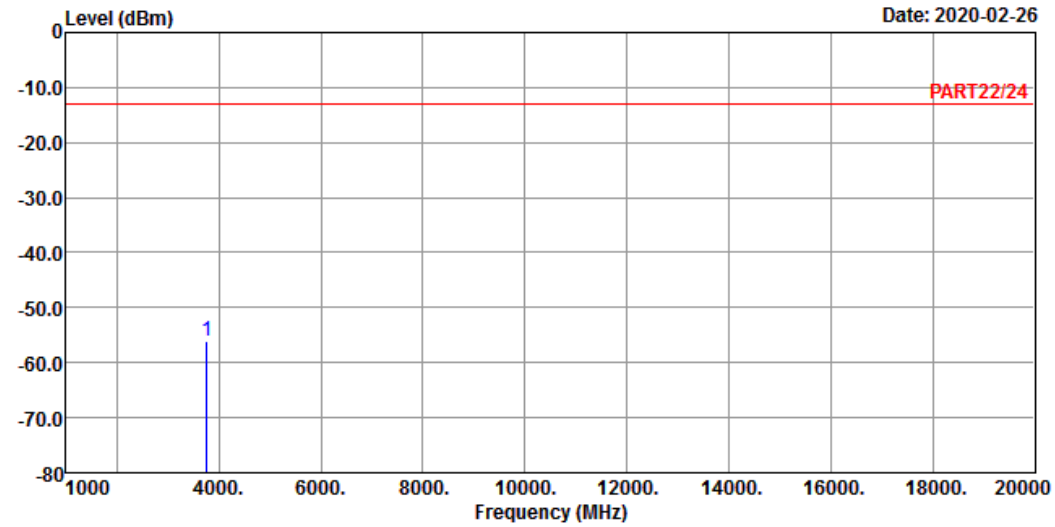
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 25 QPSK_5M Link_M-CH
Tested by: Getaz Yang

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3765.00	-56.30	-49.70	-13.00	-6.60	-43.30	Peak
2	5647.50	-49.59	-47.76	-13.00	-1.83	-36.59	Peak
3 pp	7530.00	-37.11	-41.39	-13.00	4.28	-24.11	Peak

Data: 4

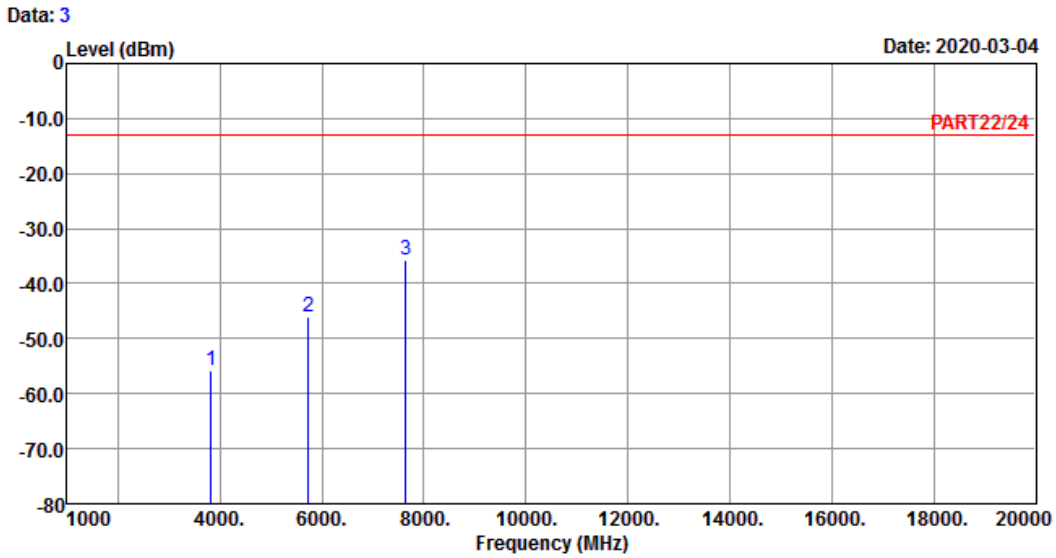


Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : Cat-M1 Band 25 QPSK_5M Link_M-CH
Tested by: Getaz Yang

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3765.00	-55.95	-49.35	-13.00	-6.60	-42.95	Peak

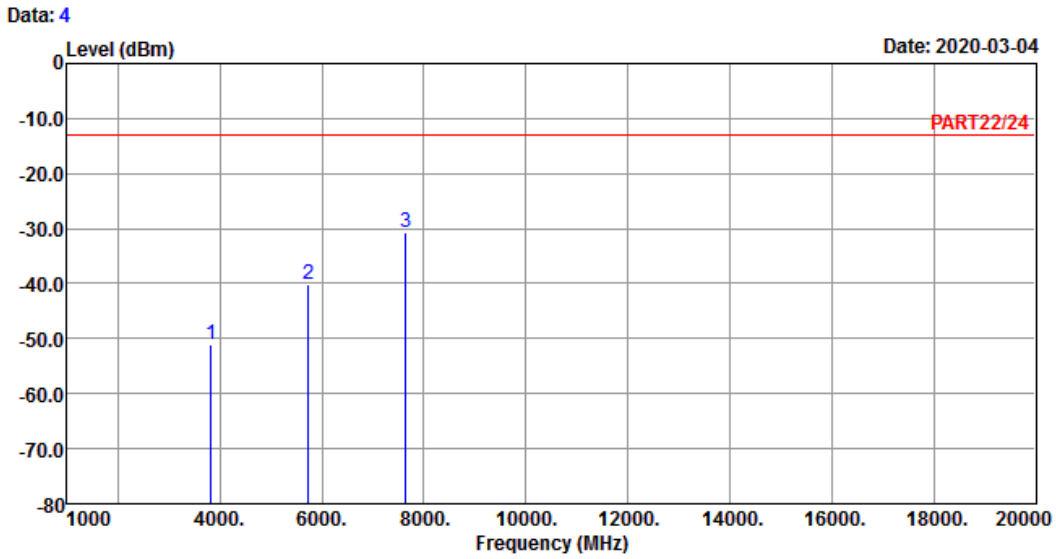
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 25 QPSK_5M Link_H-CH
Tested by: Getaz Yang

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3825.00	-55.86	-49.49	-13.00	-6.37	-42.86	Peak
2	5737.50	-45.92	-44.27	-13.00	-1.65	-32.92	Peak
3 pp	7650.00	-35.71	-40.26	-13.00	4.55	-22.71	Peak

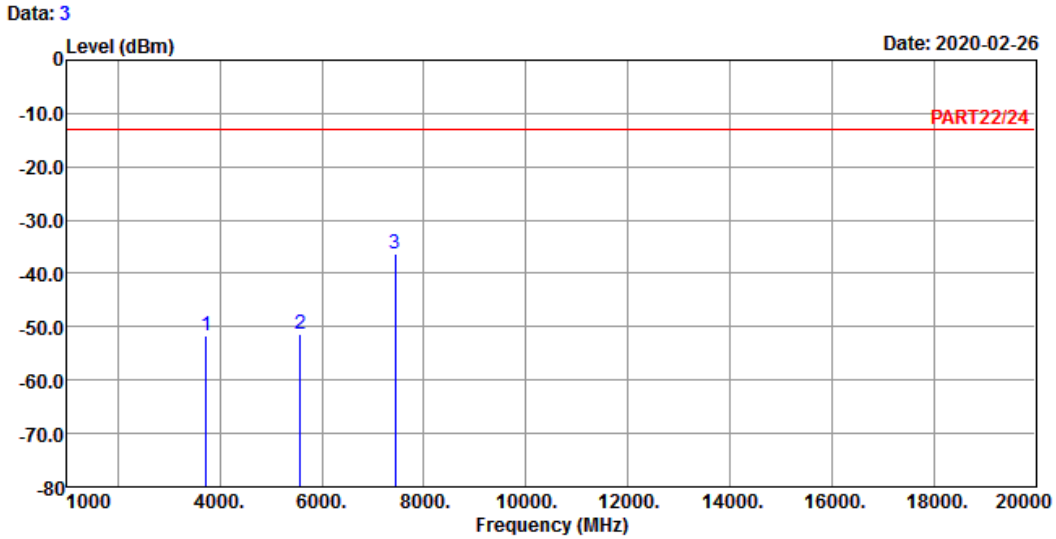


Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : Cat-M1 Band 25 QPSK_5M Link_H-CH
Tested by: Getaz Yang

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3825.00	-50.96	-44.59	-13.00	-6.37	-37.96	Peak
2	5737.50	-40.18	-38.53	-13.00	-1.65	-27.18	Peak
3 pp	7650.00	-30.84	-35.39	-13.00	4.55	-17.84	Peak

Channel Bandwidth: 20 MHz / QPSK
Low Channel

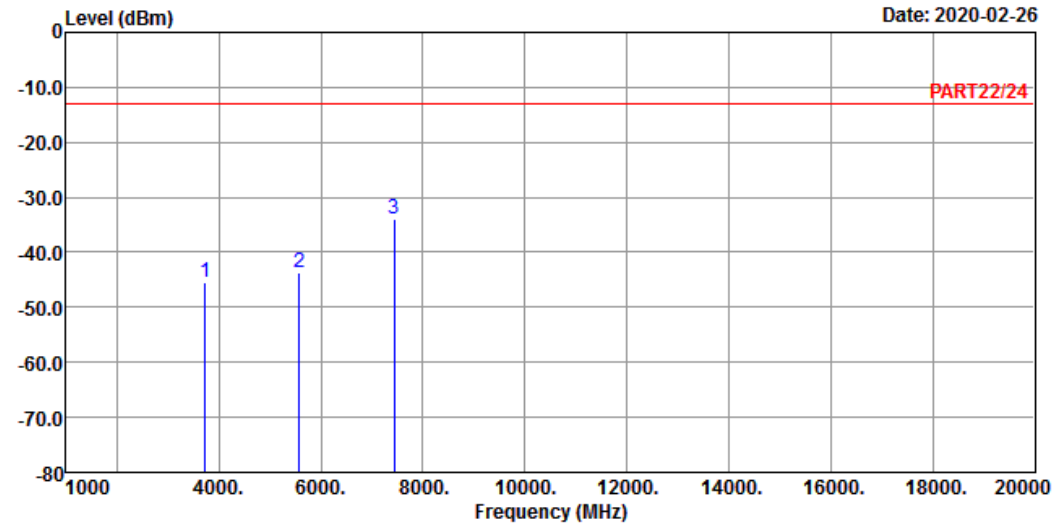
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 25 QPSK_20M Link_L-CH
Tested by: Getaz Yang

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3720.00	-51.61	-44.79	-13.00	-6.82	-38.61	Peak
2	5580.00	-51.38	-49.46	-13.00	-1.92	-38.38	Peak
3 pp	7440.00	-36.27	-40.42	-13.00	4.15	-23.27	Peak

Data: 4



Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : Cat-M1 Band 25 QPSK_20M Link_L-CH
Tested by: Getaz Yang

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3720.00	-45.33	-38.51	-13.00	-6.82	-32.33	Peak
2	5580.00	-43.55	-41.63	-13.00	-1.92	-30.55	Peak
3 pp	7440.00	-33.88	-38.03	-13.00	4.15	-20.88	Peak

Middle Channel

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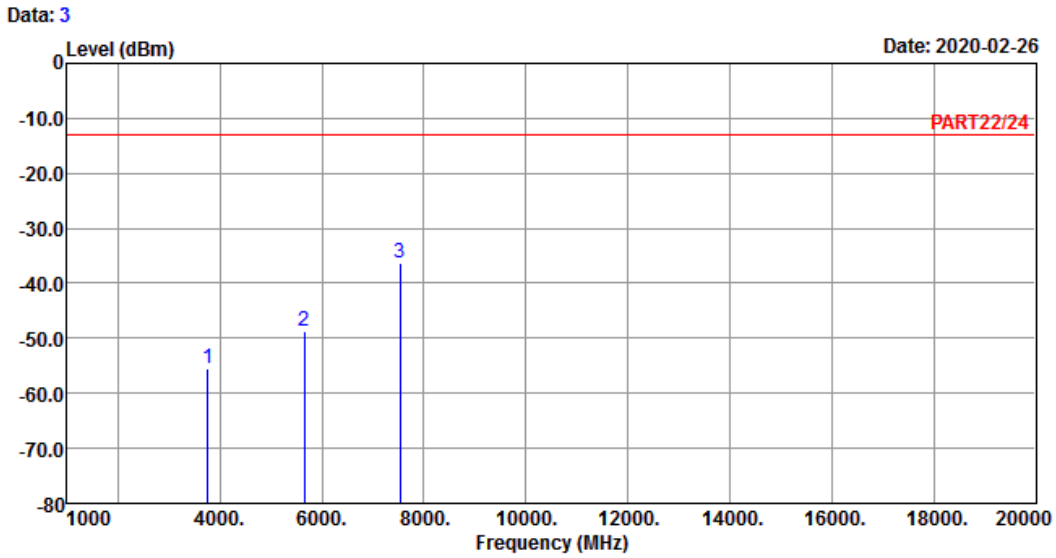
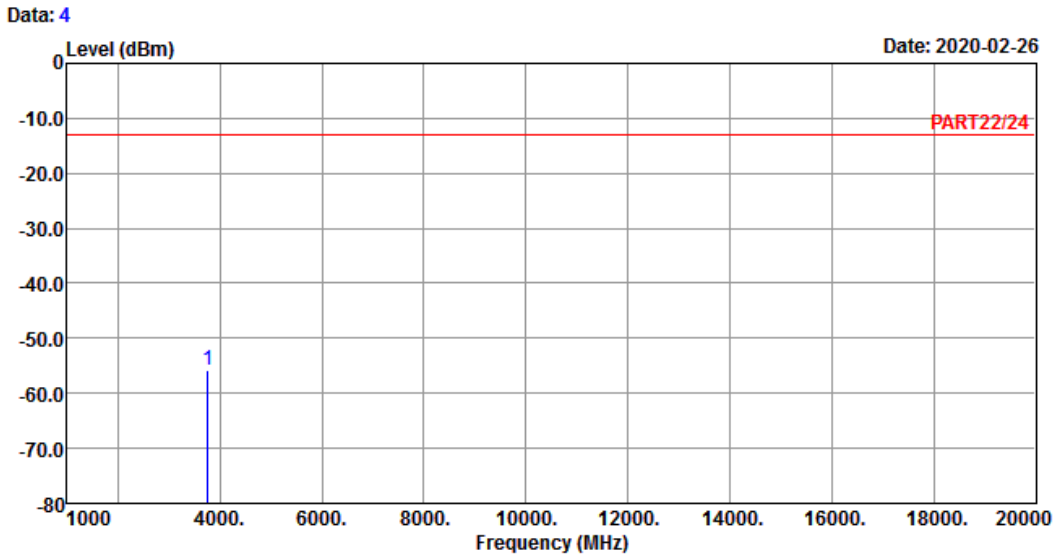


Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 25 QPSK_20M Link_M-CH
Tested by: Getaz Yang

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3765.00	-55.64	-49.04	-13.00	-6.60	-42.64	Peak
2	5647.50	-48.58	-46.75	-13.00	-1.83	-35.58	Peak
3 pp	7530.00	-36.31	-40.59	-13.00	4.28	-23.31	Peak

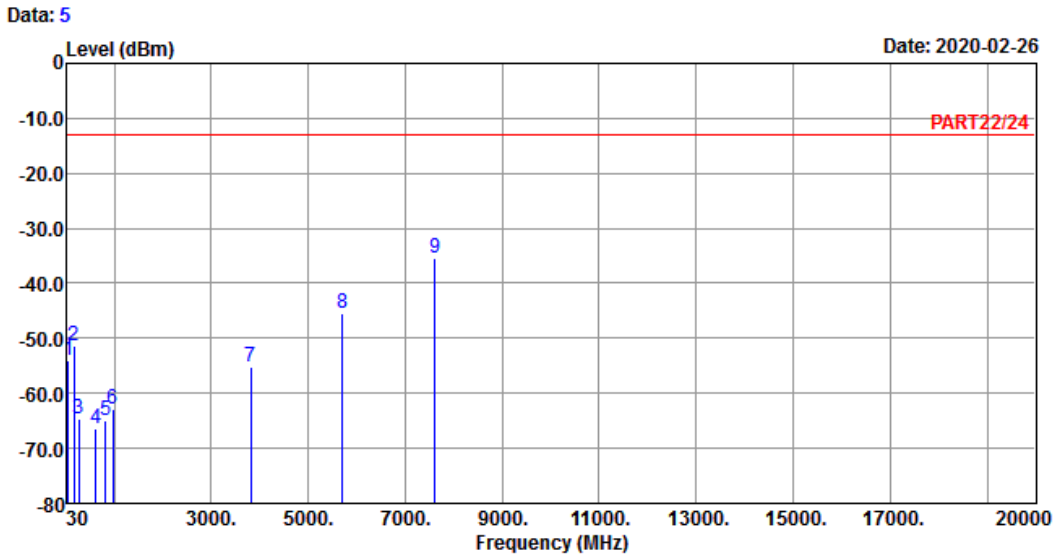


Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : Cat-M1 Band 25 QPSK_20M Link_M-CH
Tested by: Getaz Yang

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3765.00	-55.76	-49.16	-13.00	-6.60	-42.76	Peak

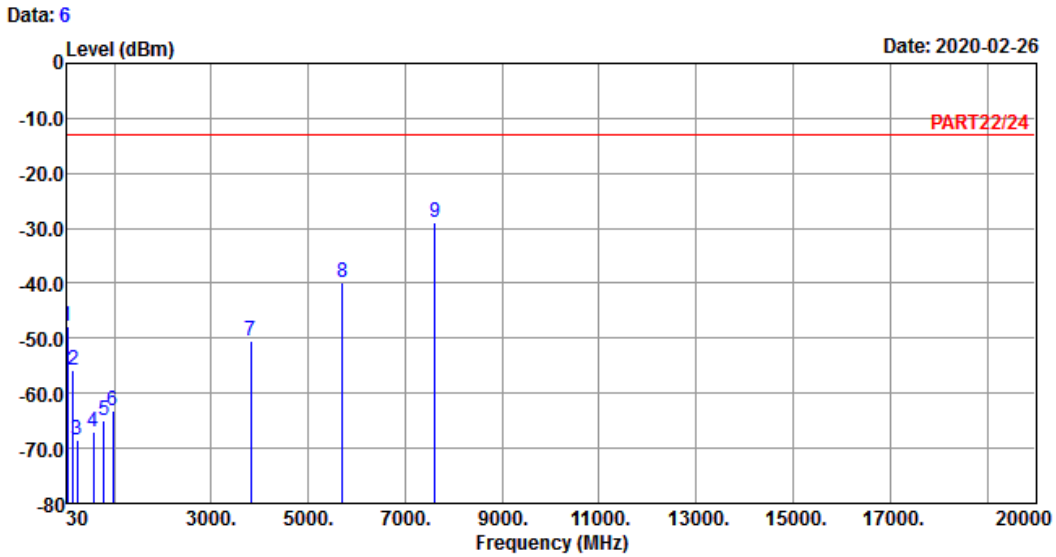
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 25 QPSK_20M Link_H-CH
Tested by: Getaz Yang

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	43.58	-53.97	-52.50	-13.00	-1.47	-40.97	Peak
2	168.71	-51.41	-45.95	-13.00	-5.46	-38.41	Peak
3	272.50	-64.53	-58.08	-13.00	-6.45	-51.53	Peak
4	617.82	-66.28	-65.48	-13.00	-0.80	-53.28	Peak
5	829.28	-65.05	-65.52	-13.00	0.47	-52.05	Peak
6	970.90	-62.88	-65.43	-13.00	2.55	-49.88	Peak
7	3810.00	-55.16	-48.76	-13.00	-6.40	-42.16	Peak
8	5715.00	-45.53	-43.84	-13.00	-1.69	-32.53	Peak
9 pp	7620.00	-35.55	-40.06	-13.00	4.51	-22.55	Peak



Site : 966 Chamber 5
Condition: PART22/24 VERTICAL
Remak : Cat-M1 Band 25 QPSK_20M Link_H-CH
Tested by: Getaz Yang

	Freq	Level	Read Level	Limit Line	Factor	Over Limit	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	37.76	-47.89	-47.45	-13.00	-0.44	-34.89	Peak
2	154.16	-55.90	-49.42	-13.00	-6.48	-42.90	Peak
3	236.61	-68.63	-62.09	-13.00	-6.54	-55.63	Peak
4	578.05	-67.13	-65.45	-13.00	-1.68	-54.13	Peak
5	785.63	-64.80	-65.58	-13.00	0.78	-51.80	Peak
6	966.05	-63.25	-65.63	-13.00	2.38	-50.25	Peak
7	3810.00	-50.61	-44.21	-13.00	-6.40	-37.61	Peak
8	5715.00	-39.71	-38.02	-13.00	-1.69	-26.71	Peak
9 pp	7620.00	-29.02	-33.53	-13.00	4.51	-16.02	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:

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Web Site: www.bureauveritas-adt.com

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

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