

# FCC Test Report

## (PART 90S)

**Report No.:** RF181005C08-4

**FCC ID:** NKRIMQ3

**Test Model:** IMQ3-2

**Series Model:** IMQ3-0, IMQ3-1, IMQ3-3 (See section 3.1 for more detail)

**Received Date:** Oct. 05, 2018

**Test Date:** Jan. 04, 2019 ~ Jan. 15, 2019

**Issued Date:** Jan. 25, 2019

**Applicant:** Wistron NeWeb Corporation

**Address:** 20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan, R.O.C

**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



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### Release Control Record

Issue No.	Description	Date Issued
RF181005C08-4	Original Release	Jan. 25, 2019

## 1 Certificate of Conformity

**Product:** M2M DATA MODULE

**Brand:** WNC

**Test Model:** IMQ3-2

**Series Model:** IMQ3-0, IMQ3-1, IMQ3-3 (See section 3.1 for more detail)

**Sample Status:** Engineering Sample


**Applicant:** Wistron NeWeb Corporation

**Test Date:** Jan. 04, 2019 ~ Jan. 15, 2019

**Standards:** FCC Part 90, Subpart I,S  
FCC Part 2

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:** Jan. 25, 2019  
Lena Wang / Specialist

**Approved by :** , **Date:** Jan. 25, 2019  
Dylan Chiou / Project Engineer

## 2 Summary of Test Results

Applied Standard: FCC Part 90 & Part 2 (LTE 26)			
FCC Clause	Test Item	Result	Remarks
2.1046 90.635 (b)	Effective Radiated Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Meet the requirement.
2.1055 90.213	Frequency Stability	Pass	Meet the requirement of limit.
2.1049 90.209	Occupied Bandwidth	Pass	Meet the requirement of limit.
2.1051 90.210	Emission Masks	Pass	Meet the requirement of limit.
2.1051 90.691	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 90.691	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -31.11 dB at 2457.00 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	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 012645	980115	Oct. 12, 2018	Oct. 11, 2019
Preamplifier EMCI	EMC 330H	980112	Oct. 12, 2018	Oct. 11, 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
LTE Wireless Communication Test Set Keysight	E7515A	MY56030229	Mar. 14, 2018	Mar. 13, 2019
Radio Communication Analyzer Anritsu	MT8821C	6201502978	Jul. 20, 2018	Jul. 19, 2019
Temperature & Humidity Chamber	GTH-120-40-CP-AR	MAA1306-019	Sep. 05, 2018	Sep. 04, 2019
DC Power Supply Agilent	66319D	MY43005576	Oct. 19, 2018	Oct. 18, 2019

- Note:
1. The calibration interval of the above test instruments is 12 / 24 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.
  4. The IC Site Registration No. is 7450F-10.

### 3 General Information

#### 3.1 General Description of EUT

<b>Product</b>	M2M DATA MODULE	
<b>Brand</b>	WNC	
<b>Test Model</b>	IMQ3-2	
<b>Series Model</b>	IMQ3-0, IMQ3-1, IMQ3-3	
<b>Status of EUT</b>	Engineering Sample	
<b>Power Supply Rating</b>	3.8 Vdc	
<b>Modulation Type</b>	LTE	QPSK, 16QAM
<b>Frequency Range</b>	LTE Band 26 (Channel Bandwidth: 1.4 MHz)	814.7 ~ 823.3 MHz
	LTE Band 26 (Channel Bandwidth: 3 MHz)	815.5 ~ 822.5 MHz
	LTE Band 26 (Channel Bandwidth: 5 MHz)	816.5 ~ 821.5 MHz
	LTE Band 26 (Channel Bandwidth: 10 MHz)	819 MHz
<b>Emission Designator</b>	LTE Band 26 (Channel Bandwidth: 1.4 MHz)	1M09G7D
	LTE Band 26 (Channel Bandwidth: 3 MHz)	1M09G7D
	LTE Band 26 (Channel Bandwidth: 5 MHz)	1M09G7D
	LTE Band 26 (Channel Bandwidth: 10 MHz)	1M09G7D
<b>Max. ERP Power</b>	LTE Band 26 (Channel Bandwidth: 1.4 MHz)	72.44 mW
	LTE Band 26 (Channel Bandwidth: 3 MHz)	77.27 mW
	LTE Band 26 (Channel Bandwidth: 5 MHz)	82.04 mW
	LTE Band 26 (Channel Bandwidth: 10 MHz)	85.70 mW
<b>Antenna Type</b>	Dipole Antenna with -3.5 dBi gain	
<b>Accessory Device</b>	N/A	
<b>Data Cable Supplied</b>	N/A	

Note:

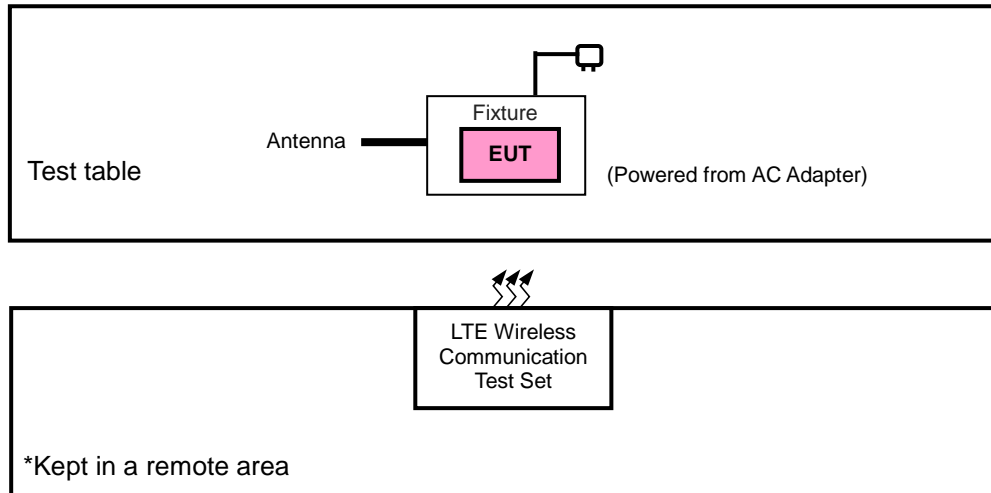
1. All models are listed as below. Model IMQ3-2 was chosen for final test and present in the report.

Brand	Model	Difference
WNC	IMQ3-2	LTE M1+2G+GPS
	IMQ3-0	LTE M1+GPS
	IMQ3-1	LTE M1+2G
	IMQ3-3	LTE M1

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. In addition to Frequency Stability Measurement, the other tests are tested with Adapter (12 Vdc).



### 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.	LTE Wireless Communication Test Set	Keysight	E7515A	MY56030229	N/A
2.	Adapter	Asian Power Devices Inc.	WA-24Q12FU	N/A	N/A
3.	Antenna	Cortec	AN0727-6706BSM	N/A	N/A
4.	DC Power Supply	Agilent	66319D	MY43005576	N/A

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

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Items 1 acted as communication partners to transfer data.
3. Item 2, 3 was 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	ERP	Radiated Emission
LTE Band 26	X-plane	Z-axis

## LTE Band 26

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	26697 to 26783	26697, 26740, 26783	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26705 to 26775	26705, 26740, 26775	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		26715 to 26765	26715, 26740, 26765	5 MHz	QPSK, 16QAM	1 RB / 5 RB Offset
		26740	26740	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Modulation Characteristics	26740	26740	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Frequency Stability	26697 to 26783	26697, 26783	1.4 MHz	QPSK	1 RB / 0 RB Offset
		26705 to 26775	26705, 26775	3 MHz	QPSK	1 RB / 0 RB Offset
		26715 to 26765	26715, 26765	5 MHz	QPSK	1 RB / 0 RB Offset
		26740	26740	10 MHz	QPSK	1 RB / 0 RB Offset
-	Occupied Bandwidth	26697 to 26783	26697, 26740, 26783	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		26705 to 26775	26705, 26740, 26775	3 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		26715 to 26765	26715, 26740, 26765	5 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		26740	26740	10 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
-	Emission Mask	26697 to 26783	26697, 26740, 26783	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset 5 RB / 0 RB Offset
		26705 to 26775	26705, 26740, 26775	3 MHz	QPSK, 16QAM	6 RB / 0 RB Offset 5 RB / 0 RB Offset
		26715 to 26765	26715, 26740, 26765	5 MHz	QPSK, 16QAM	6 RB / 0 RB Offset 5 RB / 0 RB Offset
		26740	26740	10 MHz	QPSK, 16QAM	6 RB / 0 RB Offset 5 RB / 0 RB Offset t
-	Conducted Emission	26697 to 26783	26697, 26740, 26783	1.4 MHz	QPSK	1 RB / 0 RB Offset
		26705 to 26775	26705, 26740, 26775	3 MHz	QPSK	1 RB / 0 RB Offset
		26715 to 26765	26715, 26740, 26765	5 MHz	QPSK	1 RB / 5 RB Offset
		26740	26740	10 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission	26697 to 26783	26697, 26740, 26783	1.4 MHz	QPSK	1 RB / 0 RB Offset
		26715 to 26765	26715, 26740, 26765	5 MHz	QPSK	1 RB / 5 RB Offset
		26740	26740	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	12 Vdc	Thomas Wei
Frequency Stability	25 deg. C, 65 % RH	12 Vdc	Getaz Yang
Occupied Bandwidth	25 deg. C, 65 % RH	12 Vdc	Getaz Yang
Peak to Average Ratio	25 deg. C, 65 % RH	12 Vdc	Getaz Yang
Emission Mask	25 deg. C, 65 % RH	12 Vdc	Getaz Yang
Band Edge	25 deg. C, 65 % RH	12 Vdc	Getaz Yang
Conducted Emission	25 deg. C, 65 % RH	12 Vdc	Getaz Yang
Radiated Emission	25 deg. C, 65 % RH	12 Vdc	Thomas Wei

### **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 90**

**KDB 971168 D01 Power Meas License Digital Systems v03r01**

**KDB 971168 D02 Misc Rev Approv License Devices v02r01**

**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

LTE Band 26

The maximum output power of the transmitter for mobile stations is 100 watts (20 dBw).

#### 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 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,  $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15 \text{ dB}$ .

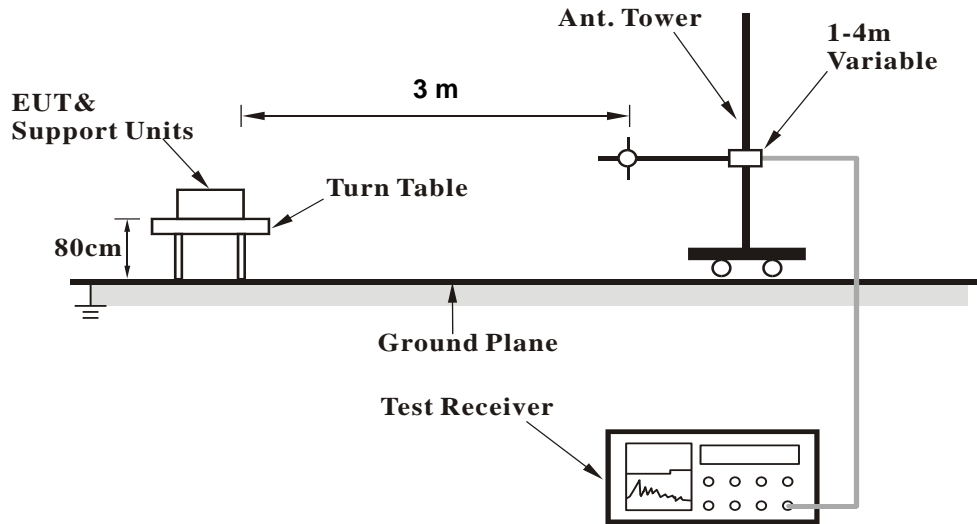
##### **Conducted Power Measurement:**

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

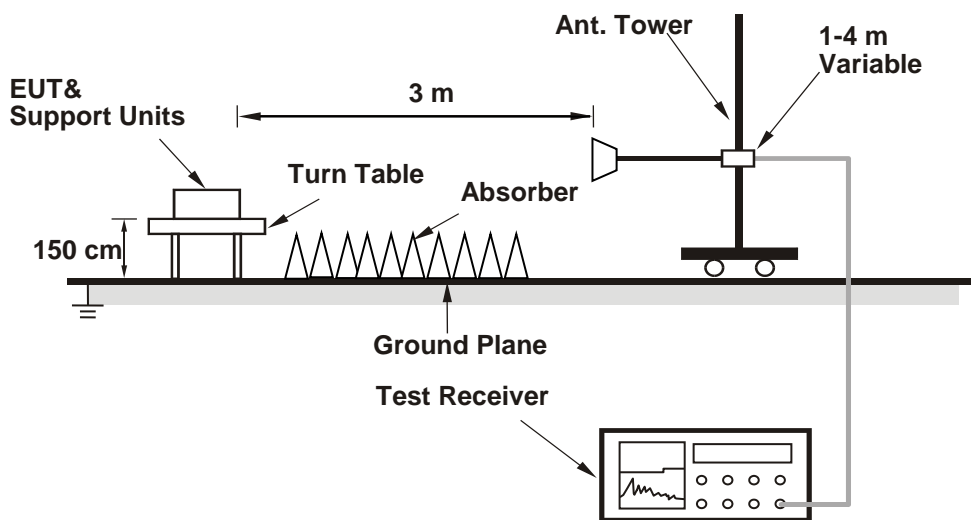
4.1.3 Test Setup

**EIRP / ERP Measurement:**

**<Radiated Emission below or equal 1 GHz>**

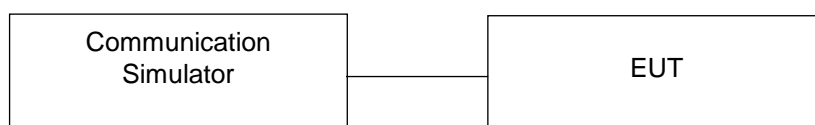


**<Radiated Emission above 1 GHz>**



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)

eMTC	Band 26	Region(s):	FCC	Power:	Class 3	23	Tolerance:	2.7
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maximum:	23.23
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BW(MHz):	1.4
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Test Frequency ID	N <sub>UL</sub>	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	26697	814.7	QPSK	1	0	0	-85	22.87
			QPSK	1	5	0	-85	22.79
			QPSK	3	3	0	-85	21.64
			QPSK	6	0	0	-85	20.75
			16QAM	1	0	0	-85	21.63
			16QAM	1	5	0	-85	21.67
			16QAM	3	0	0	-85	21.13
Mid Range	26740	819	QPSK	1	0	0	-85	22.79
			QPSK	1	5	0	-85	22.83
			QPSK	3	3	0	-85	21.73
			QPSK	6	0	0	-85	20.68
			16QAM	1	0	0	-85	22.18
			16QAM	1	5	0	-85	21.71
			16QAM	3	0	0	-85	21.25
High Range	26783	823.3	QPSK	1	0	0	-85	22.85
			QPSK	1	5	0	-85	22.77
			QPSK	3	3	0	-85	21.6
			QPSK	6	0	0	-85	20.7
			16QAM	1	0	0	-85	21.59
			16QAM	1	5	0	-85	21.73
			16QAM	3	0	0	-85	21.28
16QAM	5	0	0	-85	21.44			

BW(MHz):	3
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Test Frequency ID	N <sub>UL</sub>	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	26705	815.5	QPSK	1	0	0	-85	22.77
			QPSK	1	5	0	-85	22.69
			QPSK	1	0	1	-85	22.74
			QPSK	1	5	1	-85	22.66

			QPSK	3	3	0	-85	21.65
			QPSK	3	3	1	-85	21.69
			QPSK	6	0	0	-85	20.73
			QPSK	6	0	1	-85	20.7
			16QAM	1	0	0	-85	22.05
			16QAM	1	5	0	-85	22.13
			16QAM	1	0	1	-85	21.96
			16QAM	1	5	1	-85	21.97
			16QAM	3	0	0	-85	21.24
			16QAM	3	3	1	-85	21.11
			16QAM	5	0	0	-85	21.1
			16QAM	5	0	1	-85	21.29
Mid Range	26740	819	QPSK	1	0	0	-85	22.69
			QPSK	1	5	0	-85	22.6
			QPSK	1	0	1	-85	22.56
			QPSK	1	5	1	-85	22.57
			QPSK	3	3	0	-85	21.57
			QPSK	3	3	1	-85	21.64
			QPSK	6	0	0	-85	20.66
			QPSK	6	0	1	-85	20.61
			16QAM	1	0	0	-85	21.94
			16QAM	1	5	0	-85	21.95
			16QAM	1	0	1	-85	21.71
			16QAM	1	5	1	-85	21.82
			16QAM	3	0	0	-85	21.09
			16QAM	3	3	1	-85	21.12
High Range	26775	822.5	QPSK	1	0	0	-85	22.7
			QPSK	1	5	0	-85	22.74
			QPSK	1	0	1	-85	22.76
			QPSK	1	5	1	-85	22.68
			QPSK	3	3	0	-85	21.7
			QPSK	3	3	1	-85	21.63
			QPSK	6	0	0	-85	20.78
			QPSK	6	0	1	-85	20.7
			16QAM	1	0	0	-85	22.08
			16QAM	1	5	0	-85	22.11
			16QAM	1	0	1	-85	22.02
			16QAM	1	5	1	-85	22.05
			16QAM	3	0	0	-85	21.35

			16QAM	3	3	1	-85	21.15
			16QAM	5	0	0	-85	21.21
			16QAM	5	0	1	-85	21.13

BW(MHz): 5

Test Frequency ID	N <sub>UL</sub>	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	26715	816.5	QPSK	1	0	0	-85	22.72
			QPSK	1	5	0	-85	22.73
			QPSK	1	0	1	-85	22.69
			QPSK	1	5	1	-85	22.76
			QPSK	1	0	3	-85	22.61
			QPSK	1	5	3	-85	22.52
			QPSK	3	0	0	-85	21.77
			QPSK	3	3	3	-85	21.76
			QPSK	6	0	0	-85	21.64
			QPSK	6	0	1	-85	21.69
			QPSK	6	0	3	-85	21.66
			16QAM	1	0	0	-85	23.02
			16QAM	1	5	0	-85	23.1
			16QAM	1	0	1	-85	23.01
			16QAM	1	5	1	-85	23.02
			16QAM	1	0	3	-85	23.02
			16QAM	1	5	3	-85	23.1
			16QAM	3	0	0	-85	22.01
			16QAM	3	3	3	-85	22.09
			16QAM	5	0	0	-85	21.08
16QAM	5	0	1	-85	21.18			
16QAM	5	0	3	-85	21.23			
Mid Range	26740	819	QPSK	1	0	0	-85	22.71
			QPSK	1	5	0	-85	22.69
			QPSK	1	0	1	-85	22.77
			QPSK	1	5	1	-85	22.59
			QPSK	1	0	3	-85	22.74
			QPSK	1	5	3	-85	22.61
			QPSK	3	0	0	-85	21.82
			QPSK	3	3	3	-85	21.67
			QPSK	6	0	0	-85	21.65
			QPSK	6	0	1	-85	21.66
			QPSK	6	0	3	-85	21.75



			16QAM	1	0	0	-85	23.01
			16QAM	1	5	0	-85	23.05
			16QAM	1	0	1	-85	23.01
			16QAM	1	5	1	-85	23.12
			16QAM	1	0	3	-85	23.08
			16QAM	1	5	3	-85	23.14
			16QAM	3	0	0	-85	21.98
			16QAM	3	3	3	-85	22.03
			16QAM	5	0	0	-85	21.04
			16QAM	5	0	1	-85	21.06
			16QAM	5	0	3	-85	21.17
High Range	26765	821.5	QPSK	1	0	0	-85	22.71
			QPSK	1	5	0	-85	22.73
			QPSK	1	0	1	-85	22.71
			QPSK	1	5	1	-85	22.78
			QPSK	1	0	3	-85	22.68
			QPSK	1	5	3	-85	22.78
			QPSK	3	0	0	-85	21.77
			QPSK	3	3	3	-85	21.59
			QPSK	6	0	0	-85	21.77
			QPSK	6	0	1	-85	21.64
			QPSK	6	0	3	-85	21.71
			16QAM	1	0	0	-85	23.03
			16QAM	1	5	0	-85	23.08
			16QAM	1	0	1	-85	23.02
			16QAM	1	5	1	-85	23.03
			16QAM	1	0	3	-85	23.01
			16QAM	1	5	3	-85	23.05
			16QAM	3	0	0	-85	22.07
			16QAM	3	3	3	-85	22.05
			16QAM	5	0	0	-85	21.11
16QAM	5	0	1	-85	21.29			
16QAM	5	0	3	-85	21.08			

BW(MHz): 10

Test Frequency ID	N <sub>UL</sub>	Frequency of Uplink [MHz]	Test Configuration Initial of Power				EUT	
			Modulation	RB Size	RB Offset	Narrowband Index	Cell power (dBm/15kHz)	power (dBm)
	26740	819	QPSK	1	0	0	-85	22.61

		QPSK	1	5	0	-85	22.7
		QPSK	1	0	3	-85	22.66
		QPSK	1	5	3	-85	22.76
		QPSK	1	0	7	-85	22.66
		QPSK	1	5	7	-85	22.69
		QPSK	4	0	0	-85	22.72
		QPSK	4	2	7	-85	22.57
		QPSK	6	0	0	-85	21.63
		QPSK	6	0	7	-85	21.57
		16QAM	1	0	0	-85	23.01
		16QAM	1	5	0	-85	23.04
		16QAM	1	0	3	-85	23.03
		16QAM	1	5	3	-85	23.02
		16QAM	1	0	7	-85	23.23
		16QAM	1	5	7	-85	23.01
		16QAM	4	2	0	-85	21.87
		16QAM	4	2	7	-85	22.01
		16QAM	5	0	0	-85	22.04
		16QAM	5	0	7	-85	21.99

**ERP Power (dBm)**

LTE Band 26							
Channel Bandwidth: 1.4 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	26697	814.7	-11.49	32.01	18.37	68.71	H
	26740	819.0	-11.36	32.11	18.60	72.44	
	26783	823.3	-11.82	32.32	18.35	68.39	
	26697	814.7	-16.87	32.54	13.52	22.49	V
	26740	819.0	-17.24	32.51	13.12	20.51	
	26783	823.3	-17.17	32.51	13.19	20.84	
Channel Bandwidth: 1.4 MHz / 16QAM							
X	26697	814.7	-12.51	32.01	17.35	54.33	H
	26740	819.0	-12.41	32.11	17.55	56.89	
	26783	823.3	-12.84	32.32	17.33	54.08	
	26697	814.7	-17.89	32.54	12.50	17.78	V
	26740	819.0	-18.32	32.51	12.04	16.00	
	26783	823.3	-18.19	32.51	12.17	16.48	

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

LTE Band 26							
Channel Bandwidth: 3 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	26705	815.5	-10.99	32.02	18.88	77.27	H
	26740	819.0	-11.12	32.11	18.84	76.56	
	26775	822.5	-11.17	32.18	18.86	76.91	
	26705	815.5	-16.32	32.5	14.03	25.29	V
	26740	819.0	-17.00	32.51	13.36	21.68	
	26775	822.5	-16.62	32.47	13.70	23.44	
Channel Bandwidth: 3 MHz / 16QAM							
X	26705	815.5	-12.03	32.02	17.84	60.81	H
	26740	819.0	-12.16	32.11	17.80	60.26	
	26775	822.5	-12.21	32.18	17.82	60.53	
	26705	815.5	-17.36	32.5	12.99	19.91	V
	26740	819.0	-18.04	32.51	12.32	17.06	
	26775	822.5	-17.66	32.47	12.66	18.45	

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

LTE Band 26							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	26715	816.5	-10.75	32.04	19.14	82.04	H
	26740	819.0	-10.86	32.11	19.10	81.28	
	26765	821.5	-10.52	31.79	19.12	81.66	
	26715	816.5	-16.08	32.52	14.29	26.85	V
	26740	819.0	-16.74	32.51	13.62	23.01	
	26765	821.5	-16.06	32.17	13.96	24.89	
Channel Bandwidth: 5 MHz / 16QAM							
X	26715	816.5	-11.79	32.04	18.10	64.57	H
	26740	819.0	-11.90	32.11	18.06	63.97	
	26765	821.5	-11.56	31.79	18.08	64.27	
	26715	816.5	-17.12	32.52	13.25	21.13	V
	26740	819.0	-17.78	32.51	12.58	18.11	
	26765	821.5	-17.10	32.17	12.92	19.59	

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

LTE Band 26							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	26740	819.0	-10.63	32.11	19.33	85.70	H
	26740	819.0	-16.51	32.51	13.85	24.27	V
Channel Bandwidth: 10 MHz / 16QAM							
X	26740	819.0	-11.65	32.11	18.31	67.76	H
	26740	819.0	-17.53	32.51	12.83	19.19	V

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

## 4.2 Modulation Characteristics Measurement

### 4.2.1 Limits of Modulation Characteristics

N/A

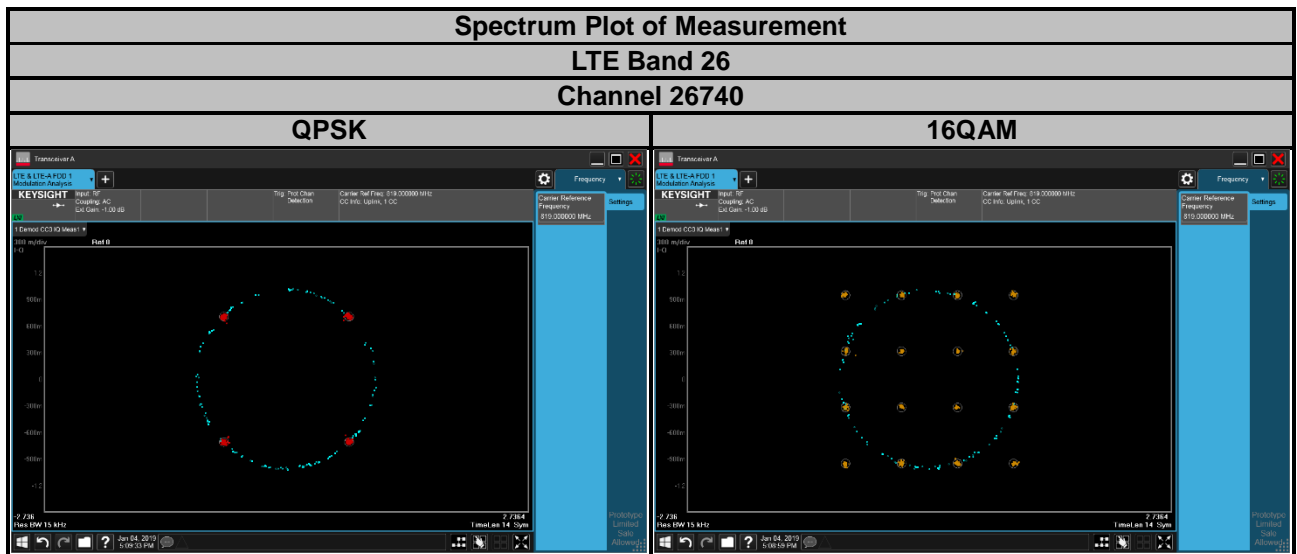
### 4.2.2 Test Setup



### 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

LTE Band 26

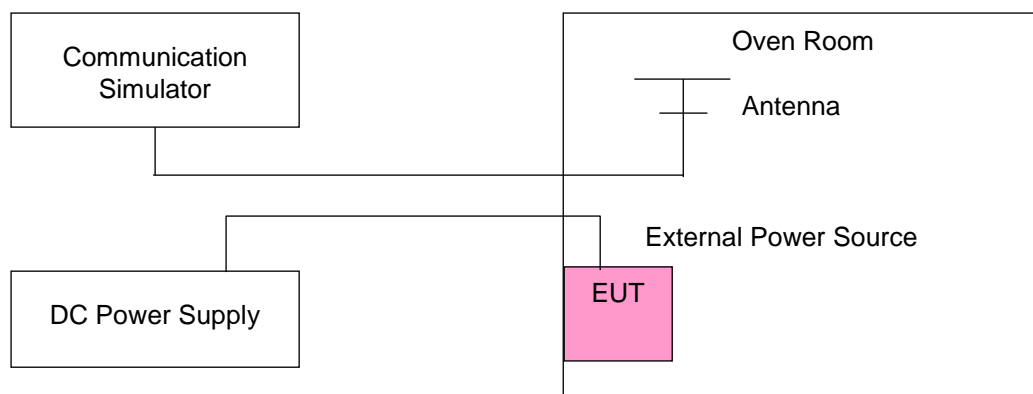
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

#### 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  $\pm 0.5$  °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)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
12	814.700004	0.005	823.300000	0.002	2.5
10.2	814.700002	0.002	823.300000	0.004	2.5
13.8	814.700004	0.005	823.300000	0.003	2.5

**Note:** The fixture defined the normal working voltage of the DC Power Supply is from 10.2 Vdc to 13.8 Vdc.

##### Frequency Error vs. Temperature

Temp. (°C)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	814.700003	0.004	823.300000	0.003	2.5
-20	814.700004	0.004	823.300000	0.003	2.5
-10	814.700001	0.001	823.300000	0.002	2.5
0	814.700004	0.005	823.300000	0.002	2.5
10	814.700003	0.004	823.300000	0.002	2.5
20	814.700002	0.002	823.300000	0.004	2.5
30	814.699996	-0.004	823.300000	-0.001	2.5
40	814.699998	-0.003	823.300000	-0.002	2.5
50	814.699999	-0.002	823.300000	-0.004	2.5
50	814.699996	-0.005	823.300000	-0.004	2.5
65	814.699997	-0.003	823.300000	-0.002	2.5



## Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
12	814.700003	0.004	823.300000	0.003	2.5
10.2	814.700003	0.004	823.300000	0.003	2.5
13.8	814.700002	0.003	823.300000	0.003	2.5

**Note:** The fixture defined the normal working voltage of the DC Power Supply is from 10.2 Vdc to 13.8 Vdc.

## Frequency Error vs. Temperature

Temp. (°C)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	814.700001	0.002	823.300000	0.003	2.5
-20	814.700001	0.001	823.300000	0.004	2.5
-10	814.700003	0.004	823.300000	0.003	2.5
0	814.700002	0.002	823.300000	0.002	2.5
10	814.700003	0.004	823.300000	0.003	2.5
20	814.700002	0.003	823.300000	0.002	2.5
30	814.699999	-0.001	823.300000	-0.002	2.5
40	814.699997	-0.004	823.300000	-0.001	2.5
50	814.699997	-0.004	823.300000	-0.003	2.5
50	814.699999	-0.001	823.300000	-0.003	2.5
65	814.699996	-0.005	823.300000	-0.003	2.5

**Frequency Error vs. Voltage**

Voltage (Volts)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
12	814.700002	0.002	823.300000	0.003	2.5
10.2	814.700001	0.001	823.300000	0.002	2.5
13.8	814.700003	0.003	823.300000	0.003	2.5

**Note:** The fixture defined the normal working voltage of the DC Power Supply is from 10.2 Vdc to 13.8 Vdc.

**Frequency Error vs. Temperature**

Temp. (°C)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	814.700002	0.002	823.300000	0.003	2.5
-20	814.700001	0.002	823.300000	0.003	2.5
-10	814.700002	0.002	823.300000	0.002	2.5
0	814.700001	0.001	823.300000	0.002	2.5
10	814.700002	0.002	823.300000	0.003	2.5
20	814.700003	0.004	823.300000	0.004	2.5
30	814.699998	-0.003	823.300000	-0.005	2.5
40	814.699998	-0.003	823.300000	-0.002	2.5
50	814.699997	-0.003	823.300000	-0.002	2.5
50	814.699996	-0.004	823.300000	-0.003	2.5
65	814.699996	-0.005	823.300000	-0.002	2.5

## Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 26		Limit (ppm)
	Channel Bandwidth: 10 MHz		
	Frequency (MHz)	Frequency Error (ppm)	
12	814.700001	0.001	2.5
10.2	814.700003	0.003	2.5
13.8	814.700001	0.002	2.5

**Note:** The fixture defined the normal working voltage of the DC Power Supply is from 10.2 Vdc to 13.8 Vdc.

## Frequency Error vs. Temperature

Temp. (°C)	LTE Band 26		Limit (ppm)
	Channel Bandwidth: 10 MHz		
	Frequency (MHz)	Frequency Error (ppm)	
-30	814.700003	0.004	2.5
-20	814.700004	0.004	2.5
-10	814.700004	0.004	2.5
0	814.700003	0.003	2.5
10	814.700001	0.002	2.5
20	814.700001	0.001	2.5
30	814.699998	-0.003	2.5
40	814.699999	-0.002	2.5
50	814.699999	-0.001	2.5
50	814.699999	-0.002	2.5
65	814.699996	-0.005	2.5

## 4.4 Occupied Bandwidth Measurement

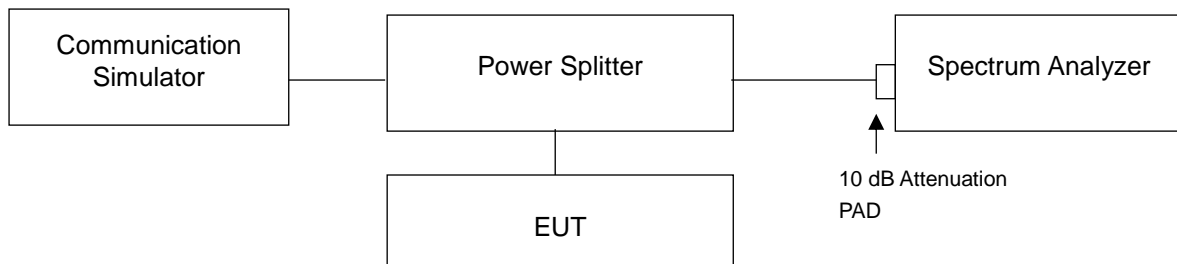
### 4.4.1 Limits of Occupied Bandwidth Measurement

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

### 4.4.2 Test Procedure

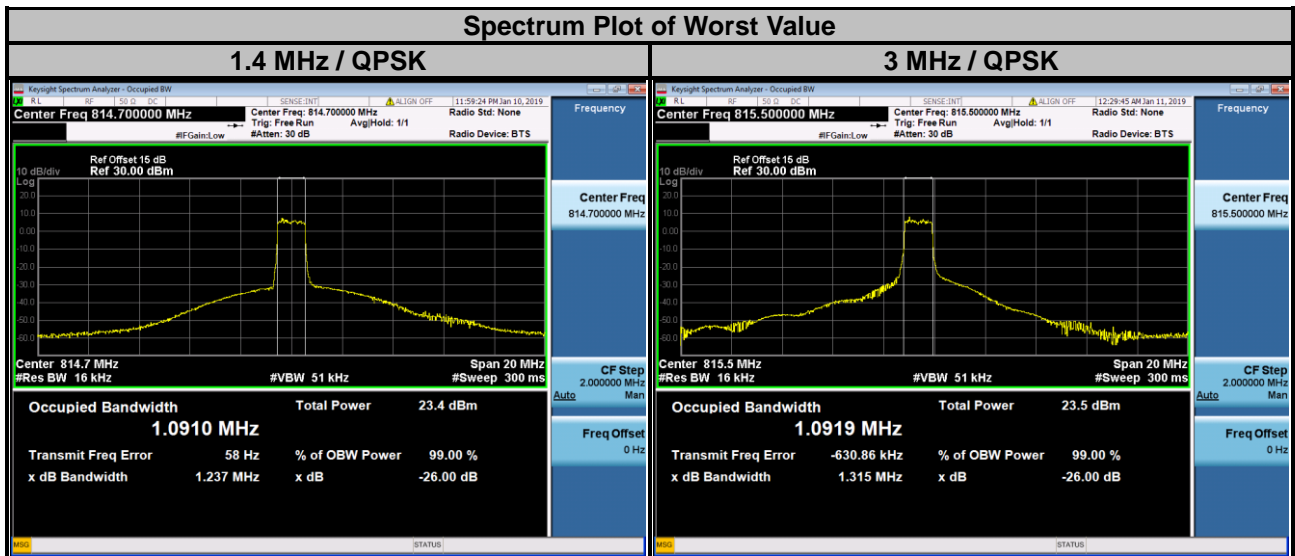
The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function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

### 4.4.3 Test Setup

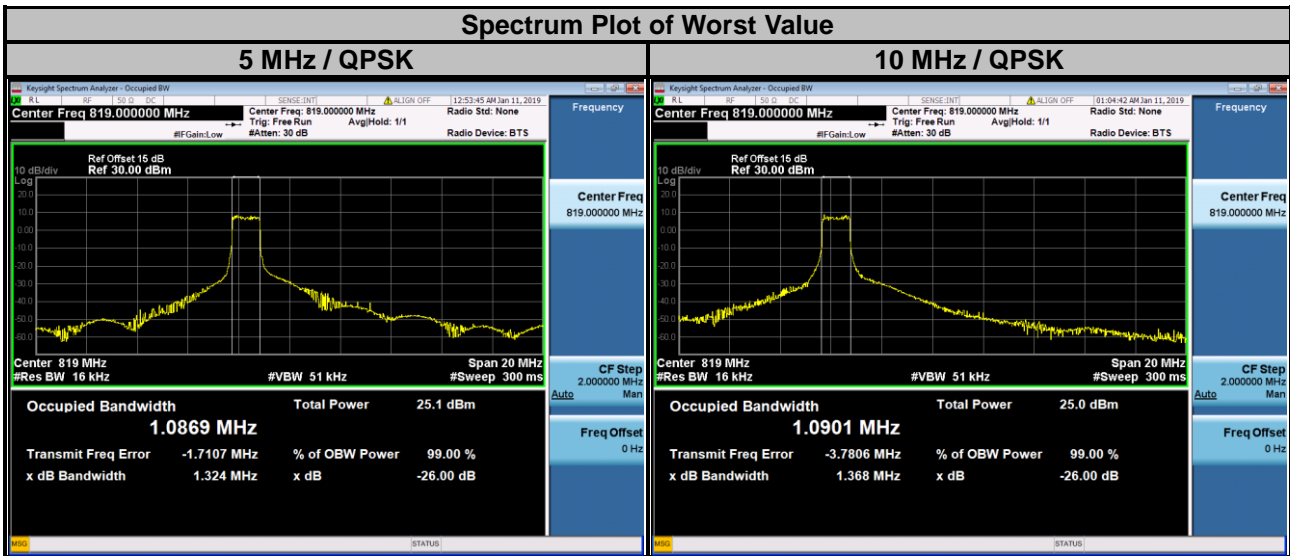


#### 4.4.4 Test Results

LTE Band 26							
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
26697	814.7	1.0910	0.9092	26705	815.5	1.0919	0.9084
26740	819.0	1.0865	0.9083	26740	819.0	1.0876	0.9119
26783	823.3	1.0868	0.9088	26775	822.5	1.0841	0.9103



LTE Band 26							
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
26715	816.5	1.0846	0.9162	26740	819.0	1.0901	0.9142
26740	819.0	1.0869	0.9198				
26765	821.5	1.0839	0.9199				



## 4.5 Emission Mask Measurement

### 4.5.1 Limits of Emission Mask Measurement

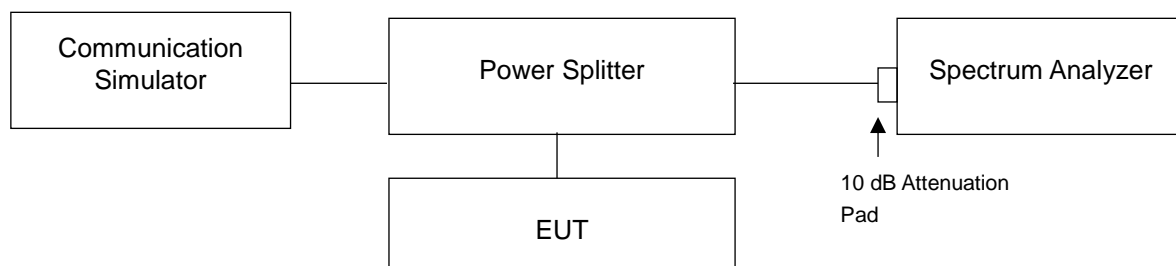
#### LTE Band 26

According to FCC part 90.691 shall be tested the emission mask. For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least  $116 \text{ Log}_{10}(f/6.1)$  decibels or  $50 + 10\text{Log}_{10}(P)$  decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10\text{Log}_{10}(P)$  decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

For §90.691(a), RBW=300 Hz for offset less than 37.5 kHz from channel edge and RBW=100 kHz for offsets greater than 37.5 kHz is allowed.

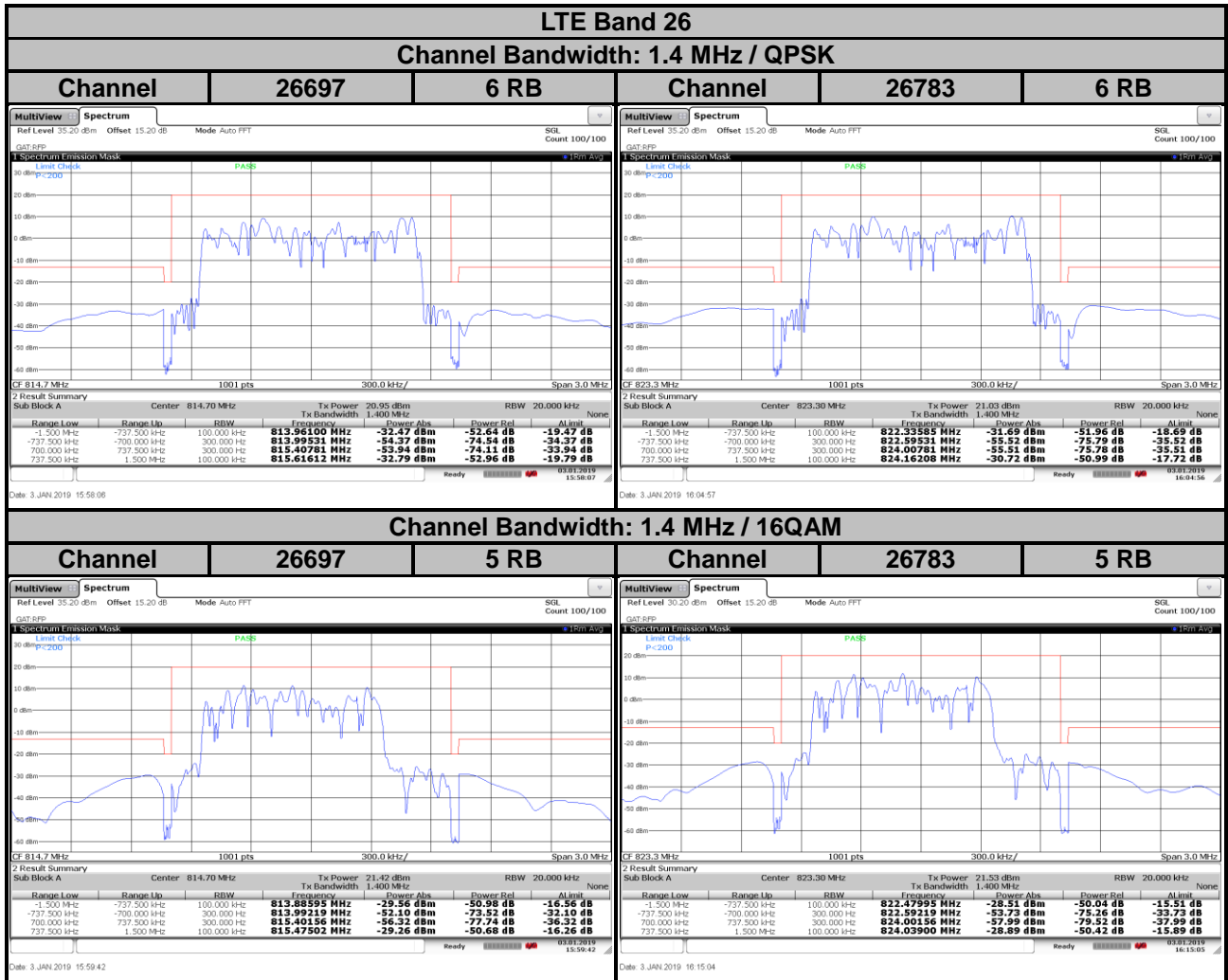
### 4.5.2 Test Setup



### 4.5.3 Test Procedures

- The measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- Record the test plot.

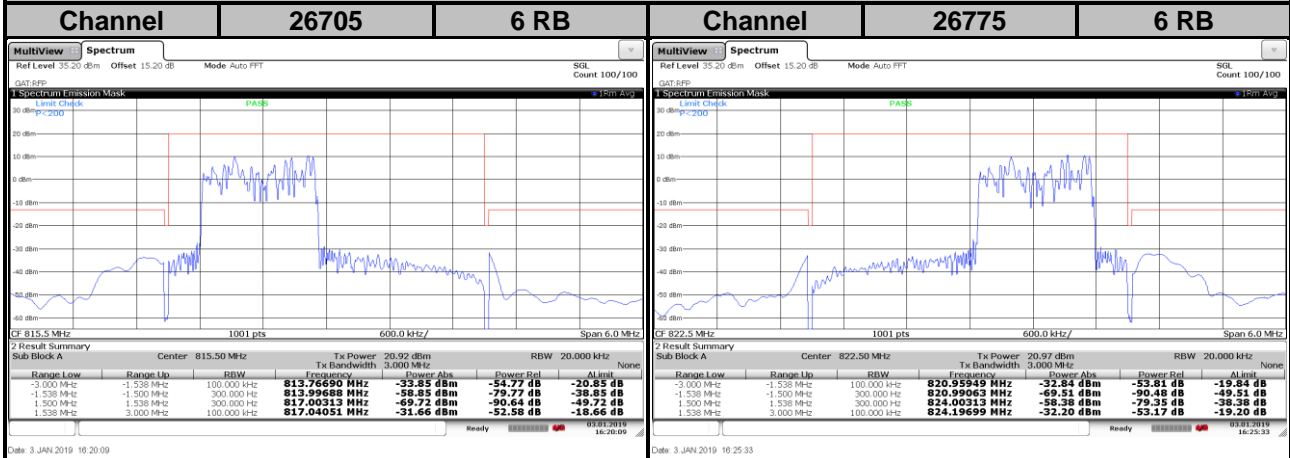
### 4.5.4 Test Results



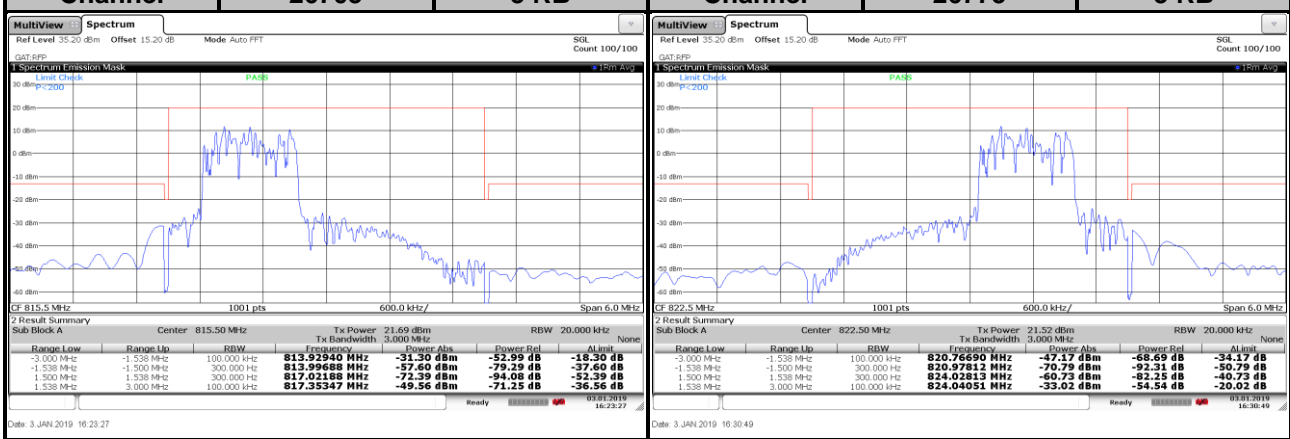


## LTE Band 26

### Channel Bandwidth: 3 MHz / QPSK

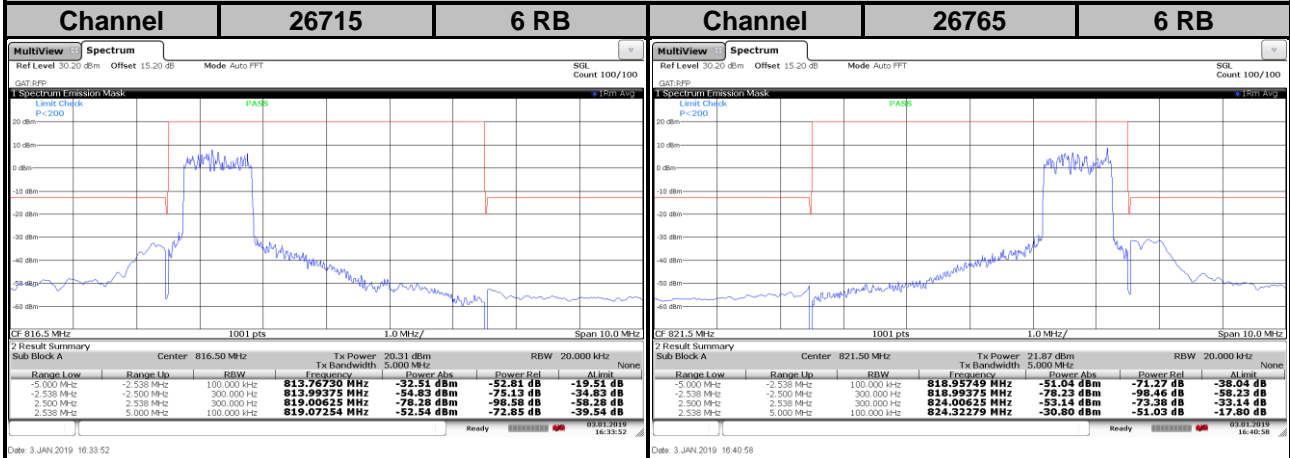


## Channel Bandwidth: 3 MHz / 16QAM

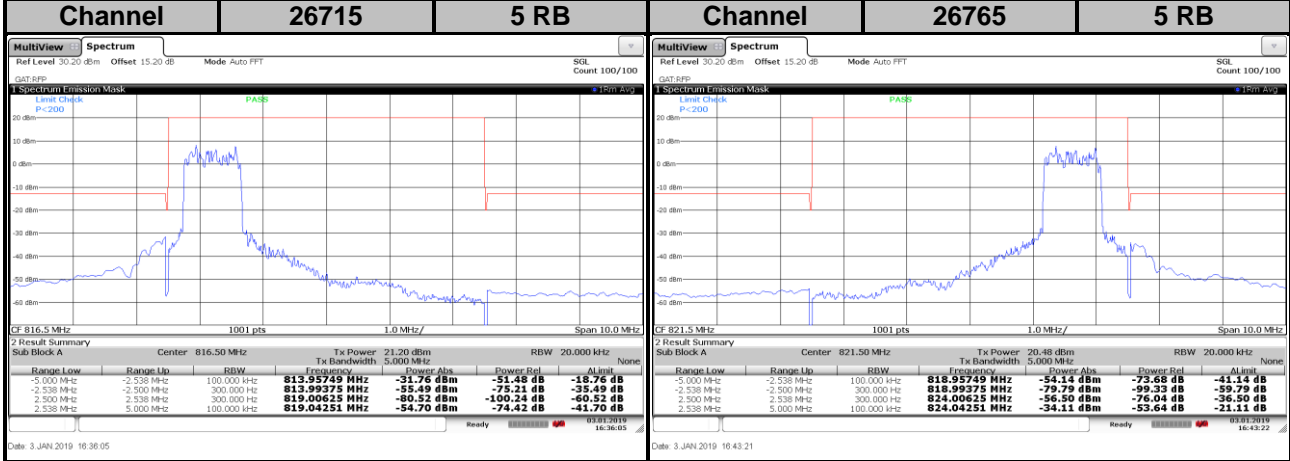


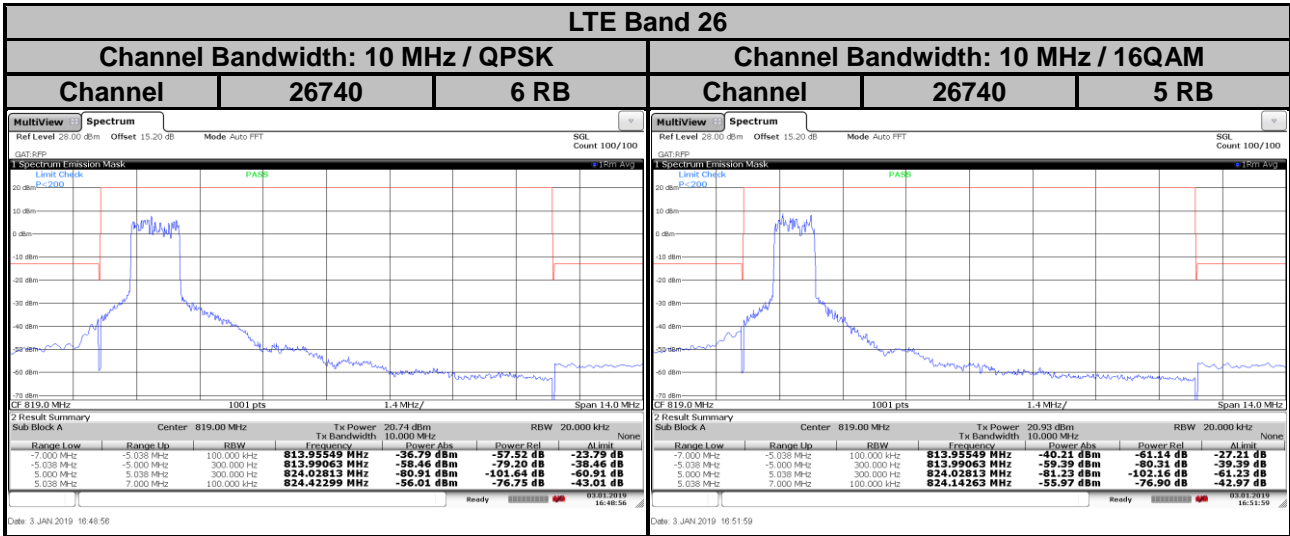
## LTE Band 26

### Channel Bandwidth: 5 MHz / QPSK



### Channel Bandwidth: 5 MHz / 16QAM



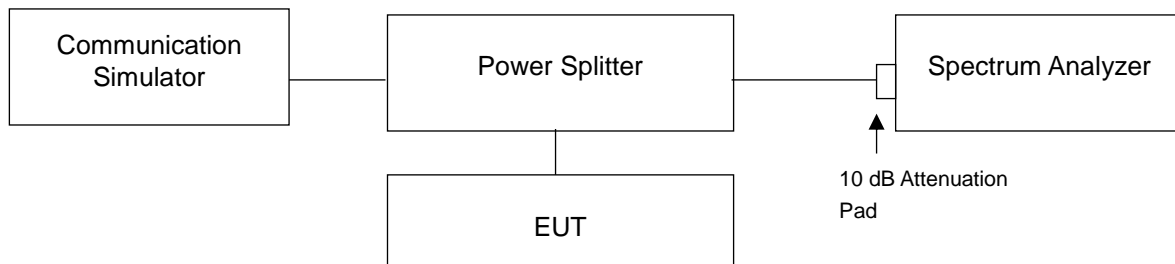


## 4.6 Conducted Spurious Emissions

### 4.6.1 Limits of Conducted Spurious Emissions Measurement

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log_{10}(P)$  dB. The limit of emission is equal to -13 dBm.

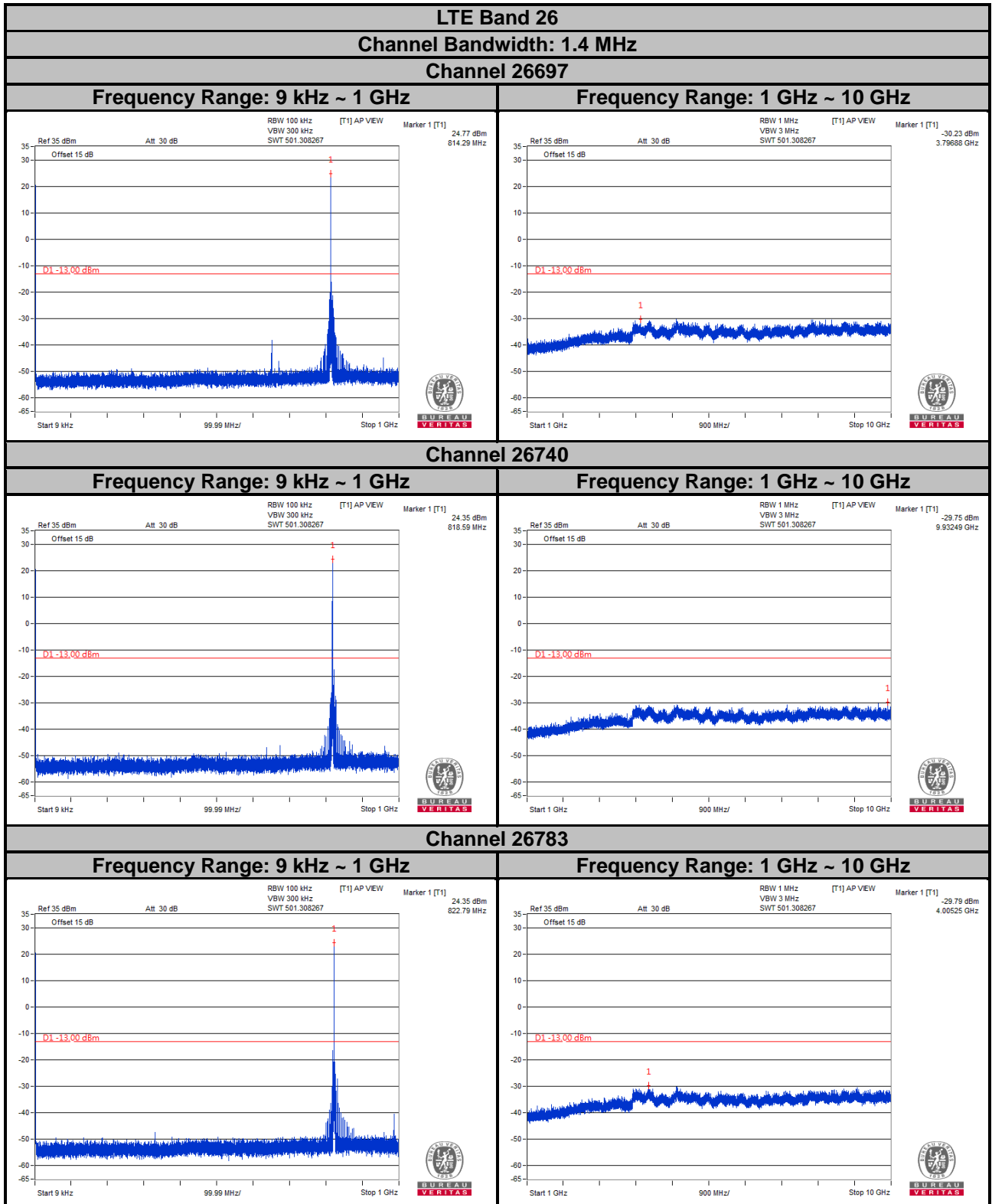
### 4.6.2 Test Setup



### 4.6.3 Test Procedure

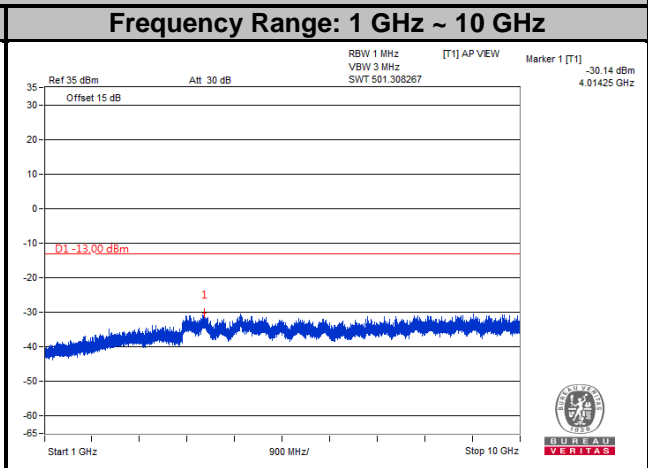
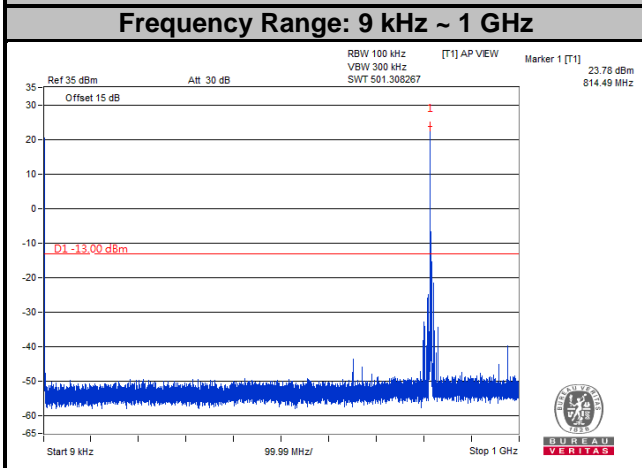
- The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- Measuring frequency range is from 9 kHz to 1 GHz. 10 dB attenuation pad is connected with spectrum. RBW = 100 kHz and VBW = 300 kHz are used for conducted emission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

#### 4.6.4 Test Results

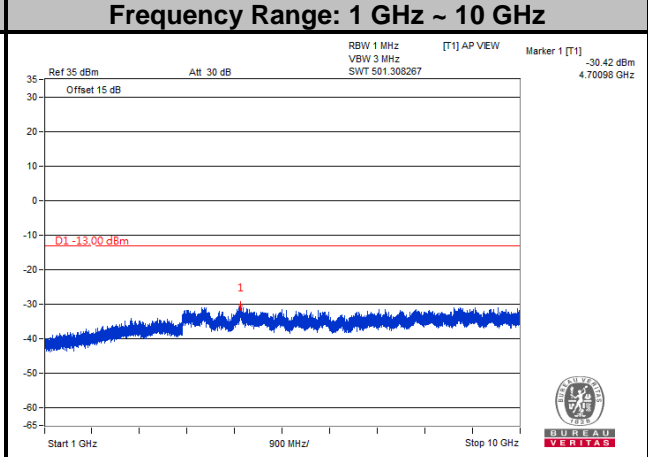
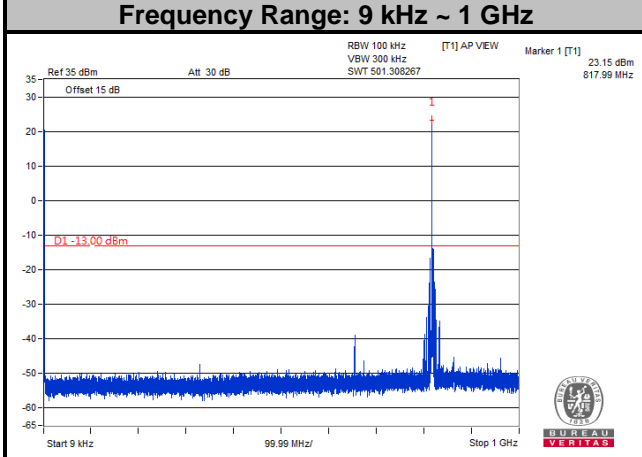


Note: The signal over the limit in 9 kHz is from spectrum analyzer.

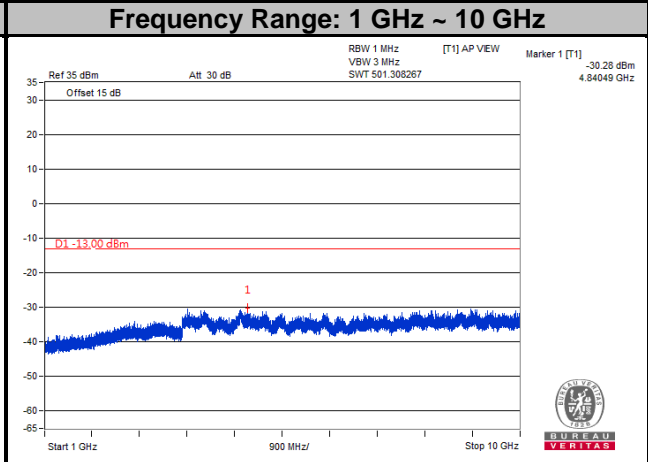
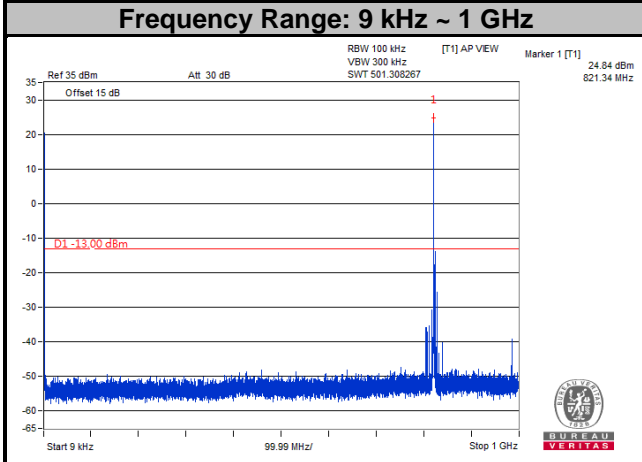
**LTE Band 26**  
**Channel Bandwidth: 3 MHz**  
**Channel 26705**



**Channel 26740**



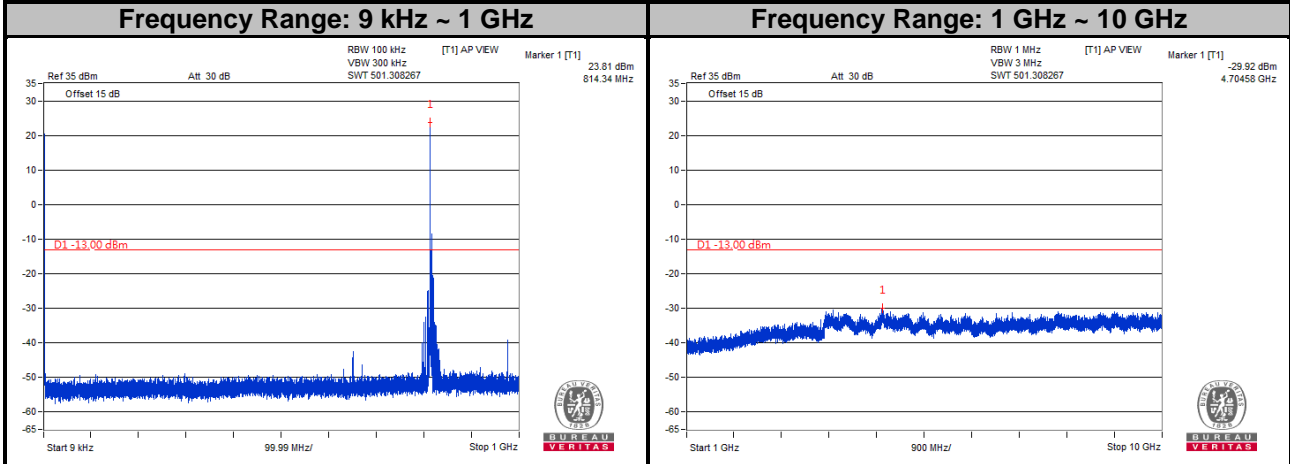
**Channel 26775**



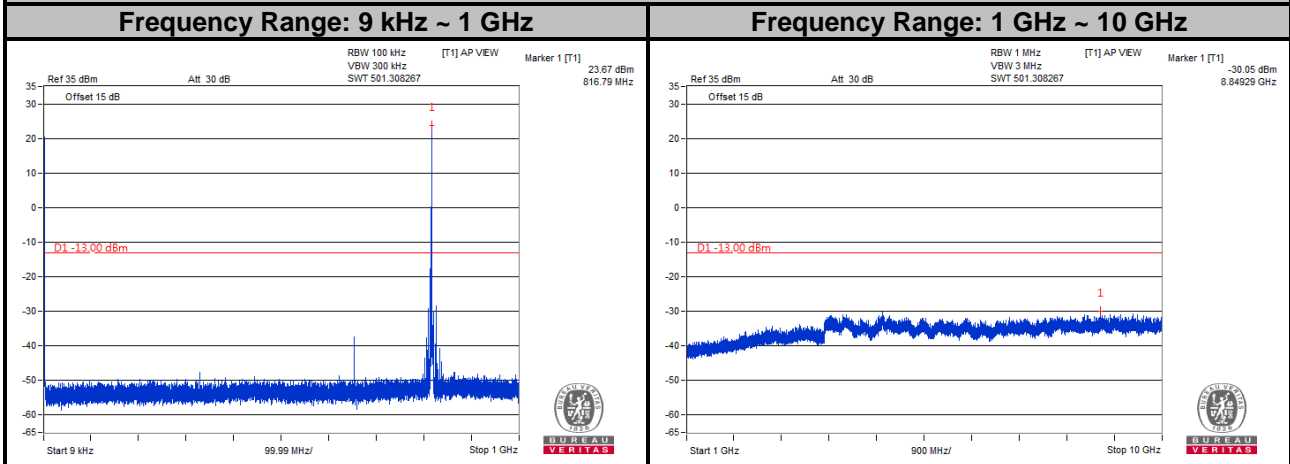
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

**LTE Band 26**  
**Channel Bandwidth: 5 MHz**

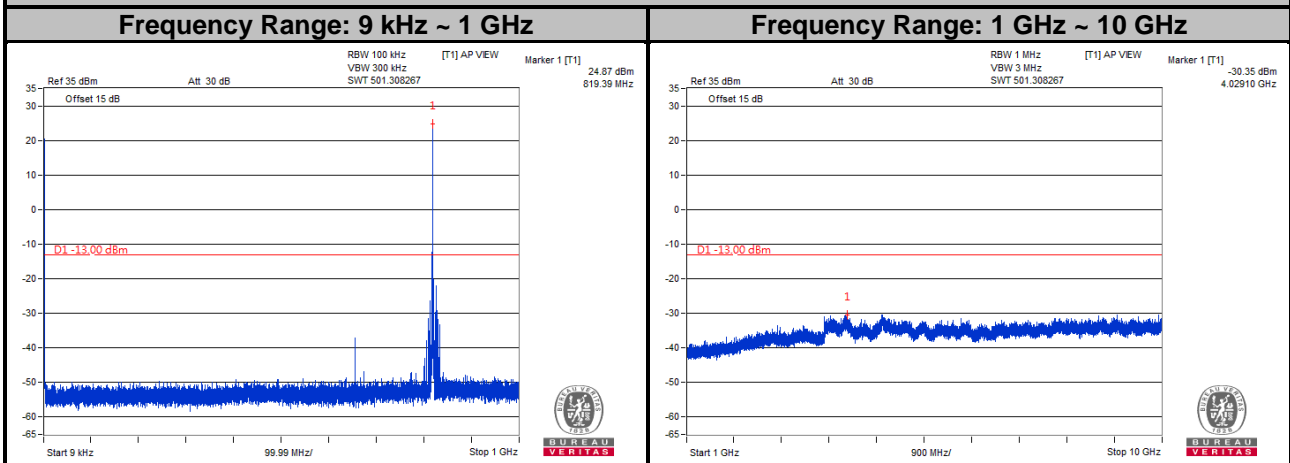
**Channel 26715**



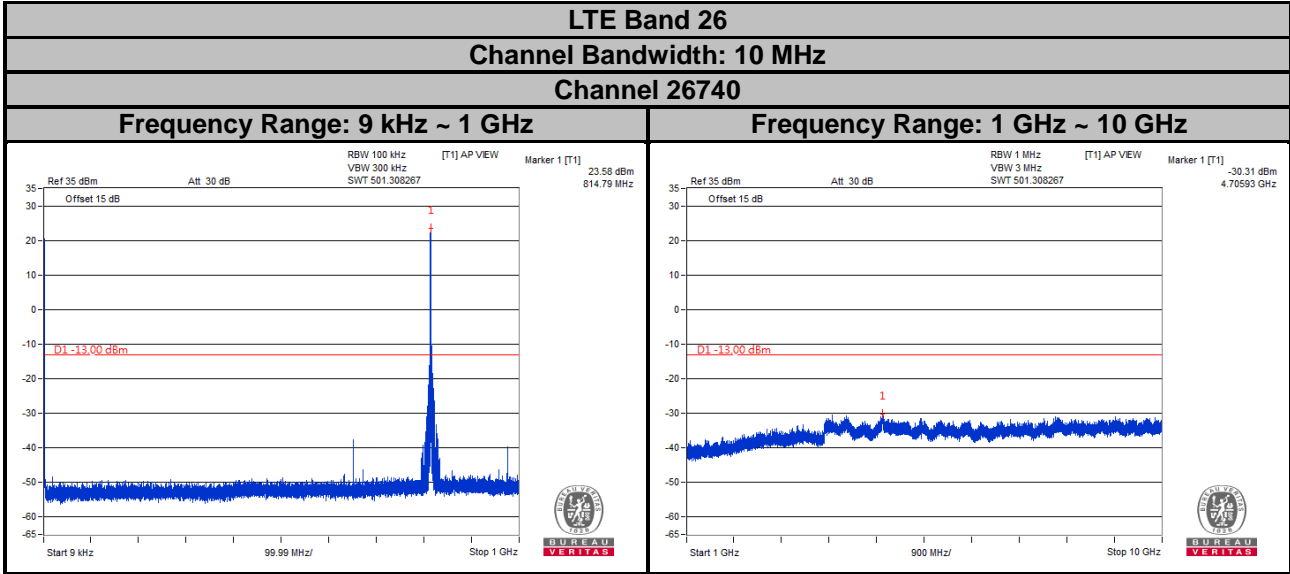
**Channel 26740**



**Channel 26765**



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.



## 4.7 Radiated Emission Measurement

### 4.7.1 Limits of Radiated Emission Measurement

(1) The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB. The limit of emission is equal to -13 dBm.

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

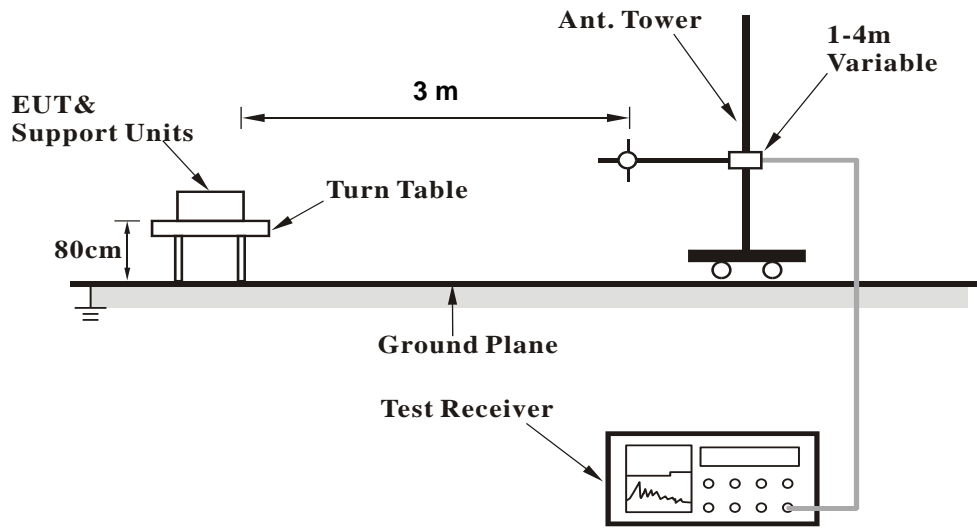
**Note:** The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

### 4.7.3 Deviation from Test Standard

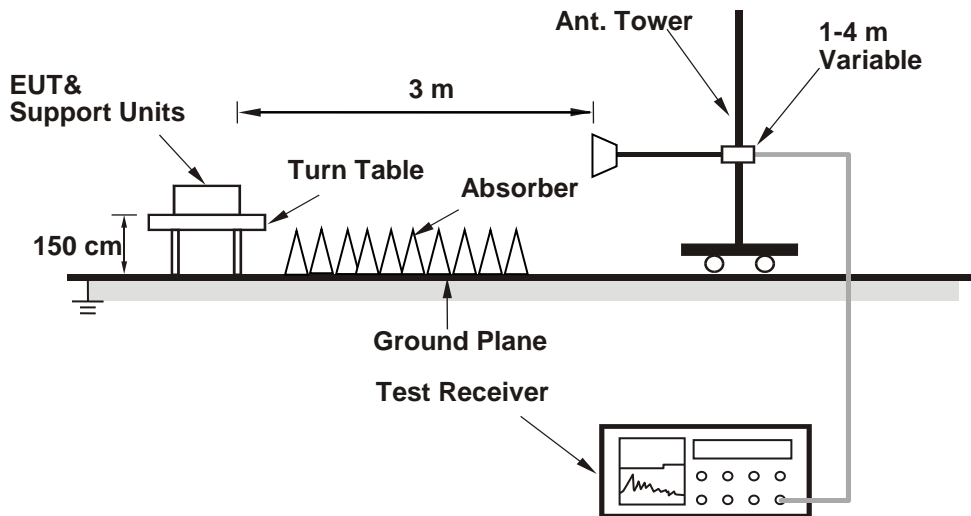
No deviation.

#### 4.7.4 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).

4.7.5 Test Results

LTE Band 26

Channel Bandwidth: 1.4 MHz / QPSK

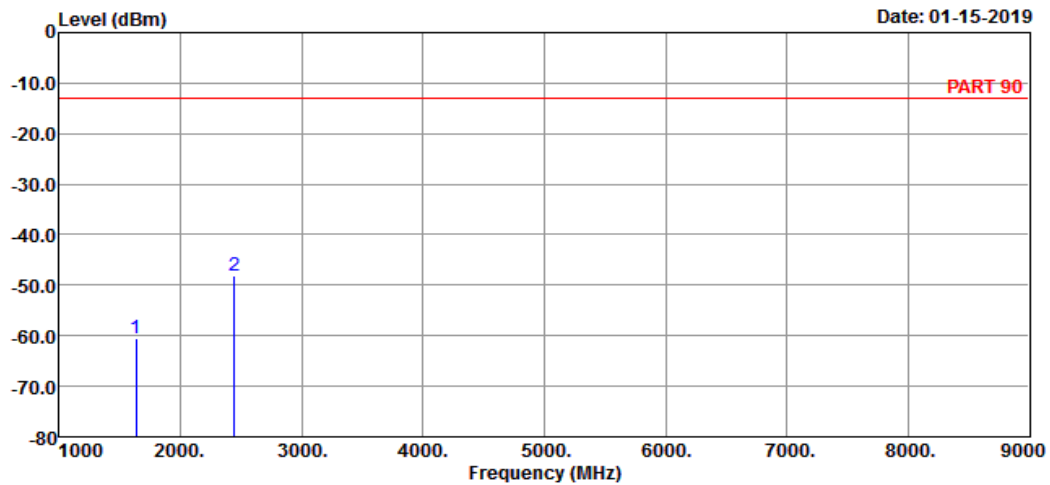
Low Channel

Bureau Veritas Consumer Products Services Ltd., Taoyuan



A D T

Data: 1



Site : 966 Chamber 5  
 Condition: PART 90 HORIZONTAL  
 Remak : Cat-M1 Band 26 QPSK\_1.4M Link\_L-CH  
 Tested by: Thomas Wei

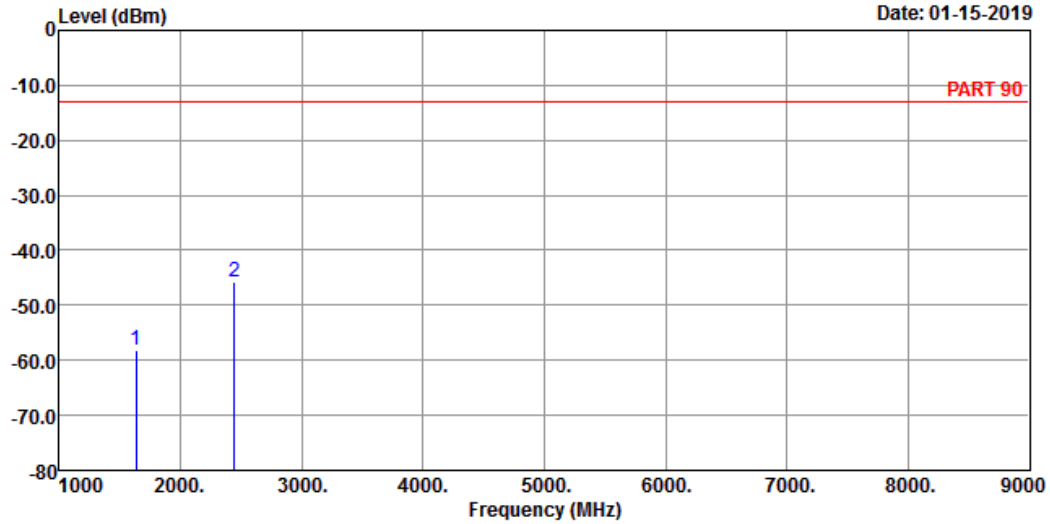
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1629.40	-60.52	-45.73	-13.00	-47.52	-14.79	Peak
2 pp	2444.10	-48.13	-37.69	-13.00	-35.13	-10.44	Peak

Bureau Veritas Consumer Products Services Ltd., Taoyuan



A D T

Data: 2



Site : 966 Chamber 5  
 Condition: PART 90 VERTICAL  
 Remak : Cat-M1 Band 26 QPSK\_1.4M Link\_L-CH  
 Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1629.40	-58.02	-43.23	-13.00	-45.02	-14.79	Peak
2	2444.10	-45.78	-35.34	-13.00	-32.78	-10.44	Peak

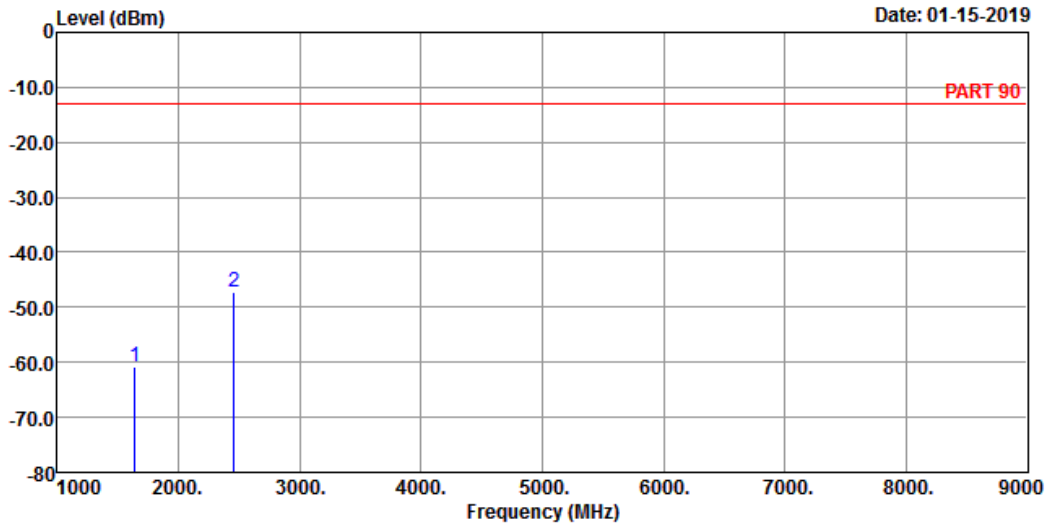
Middle Channel

Bureau Veritas Consumer Products Services Ltd., Taoyuan



A D T

Data: 1



Site : 966 Chamber 5  
 Condition: PART 90 HORIZONTAL  
 Remak : Cat-M1 Band 26 QPSK\_1.4M Link\_M-CH  
 Tested by: Thomas Wei

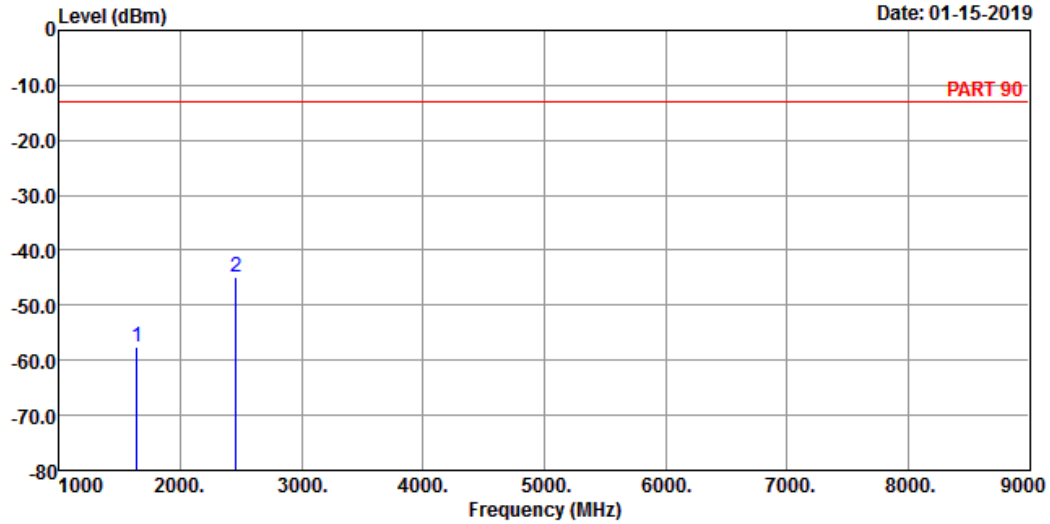
	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1	1638.00	-60.68	-45.89	-13.00	-47.68	-14.79 Peak
2 pp	2457.00	-47.17	-36.73	-13.00	-34.17	-10.44 Peak

Bureau Veritas Consumer Products Services Ltd., Taoyuan



A D T

Data: 2



Site : 966 Chamber 5  
 Condition: PART 90 VERTICAL  
 Remak : Cat-M1 Band 26 QPSK\_1.4M Link\_M-CH  
 Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1638.00	-57.62	-42.83	-13.00	-44.62	-14.79	Peak
2	2457.00	-44.81	-34.37	-13.00	-31.81	-10.44	Peak

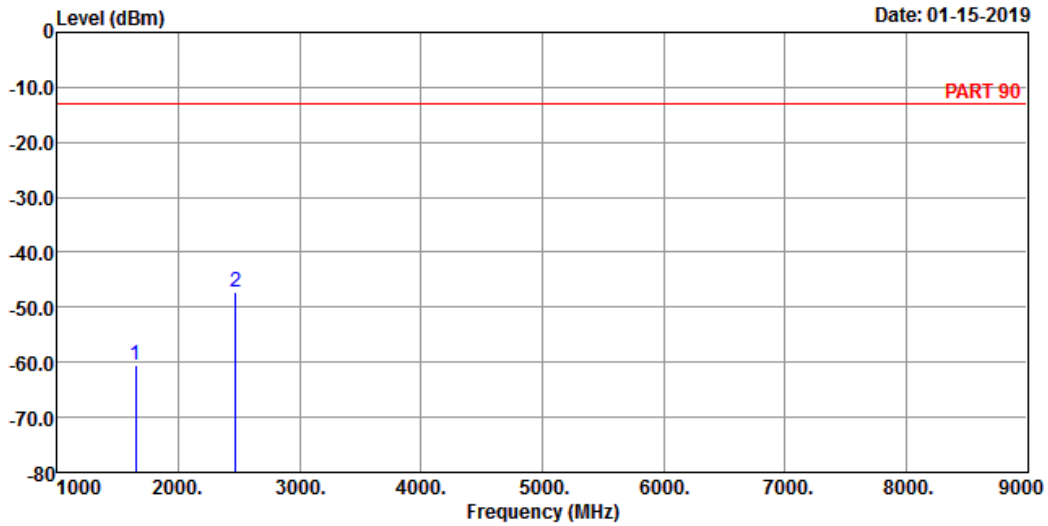
High Channel

Bureau Veritas Consumer Products Services Ltd., Taoyuan



A D T

Data: 1

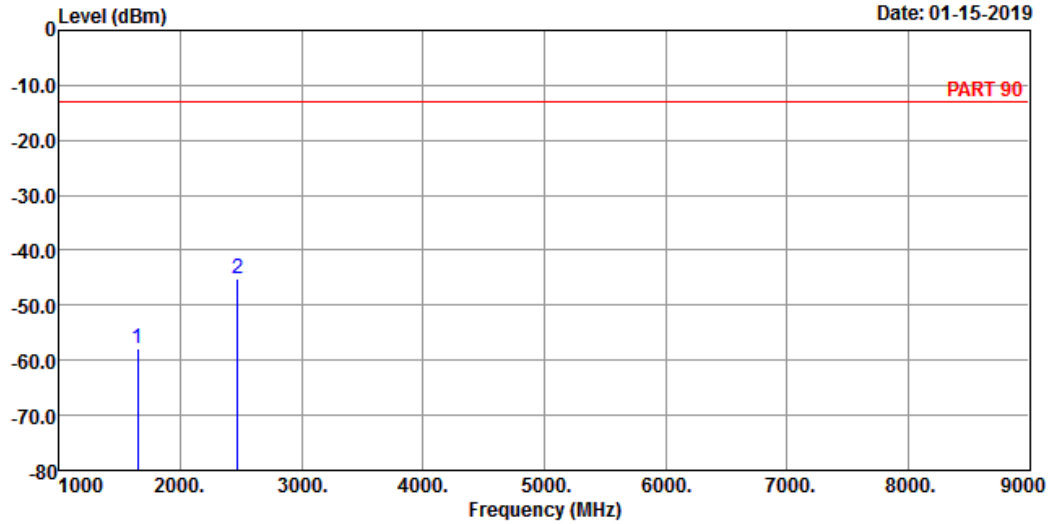


Site : 966 Chamber 5  
 Condition: PART 90 HORIZONTAL  
 Remak : Cat-M1 Band 26 QPSK\_1.4M Link\_H-CH  
 Tested by: Thomas Wei

	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1	1646.60	-60.60	-45.87	-13.00	-47.60	-14.73 Peak
2 pp	2469.90	-47.27	-36.83	-13.00	-34.27	-10.44 Peak



Data: 2



Site : 966 Chamber 5  
 Condition: PART 90 VERTICAL  
 Remak : Cat-M1 Band 26 QPSK\_1.4M Link\_H-CH  
 Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1646.60	-57.91	-43.18	-13.00	-44.91	-14.73	Peak
2	pp 2469.90	-45.03	-34.59	-13.00	-32.03	-10.44	Peak



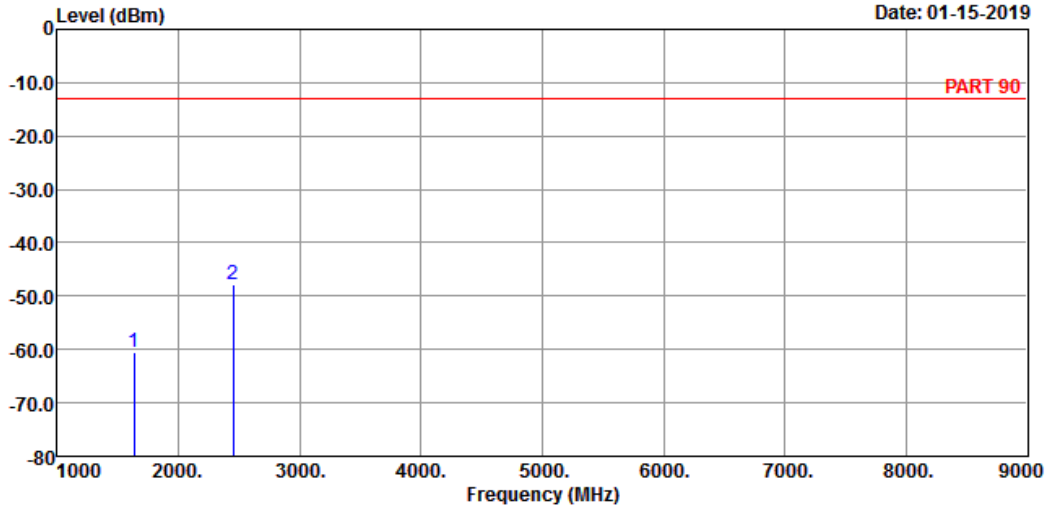
Channel Bandwidth: 5 MHz / QPSK  
Low Channel

Bureau Veritas Consumer Products Services Ltd., Taoyuan



A D T

Data: 1



Site : 966 Chamber 5  
Condition: PART 90 HORIZONTAL  
Remak : Cat-M1 Band 26 QPSK\_5M Link\_L-CH  
Tested by: Thomas Wei

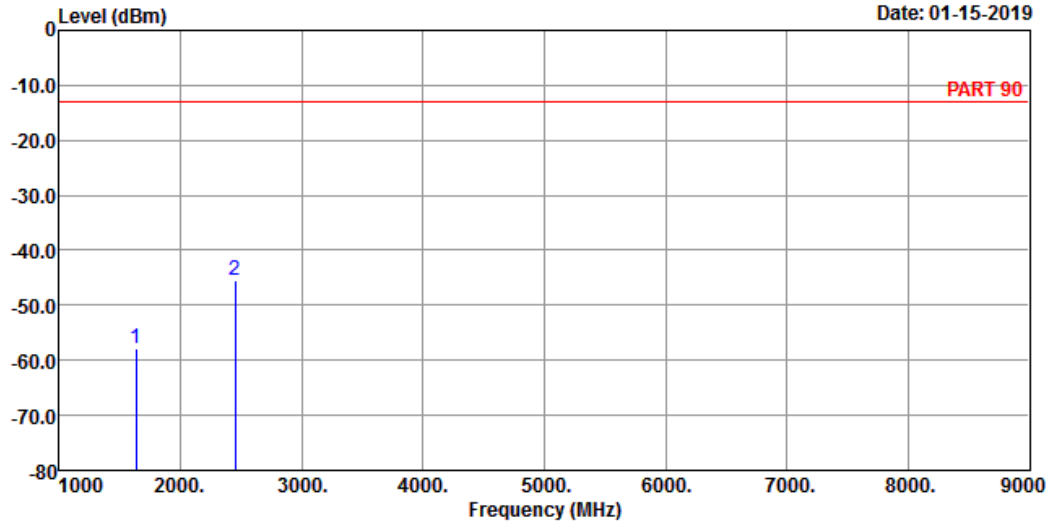
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1633.00	-60.47	-45.68	-13.00	-47.47	-14.79	Peak
2 pp	2449.50	-47.84	-37.40	-13.00	-34.84	-10.44	Peak

Bureau Veritas Consumer Products Services Ltd., Taoyuan



A D T

Data: 2



Site : 966 Chamber 5  
 Condition: PART 90 VERTICAL  
 Remak : Cat-M1 Band 26 QPSK\_5M Link\_L-CH  
 Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1633.00	-57.72	-42.93	-13.00	-44.72	-14.79	Peak
2	2449.50	-45.47	-35.03	-13.00	-32.47	-10.44	Peak

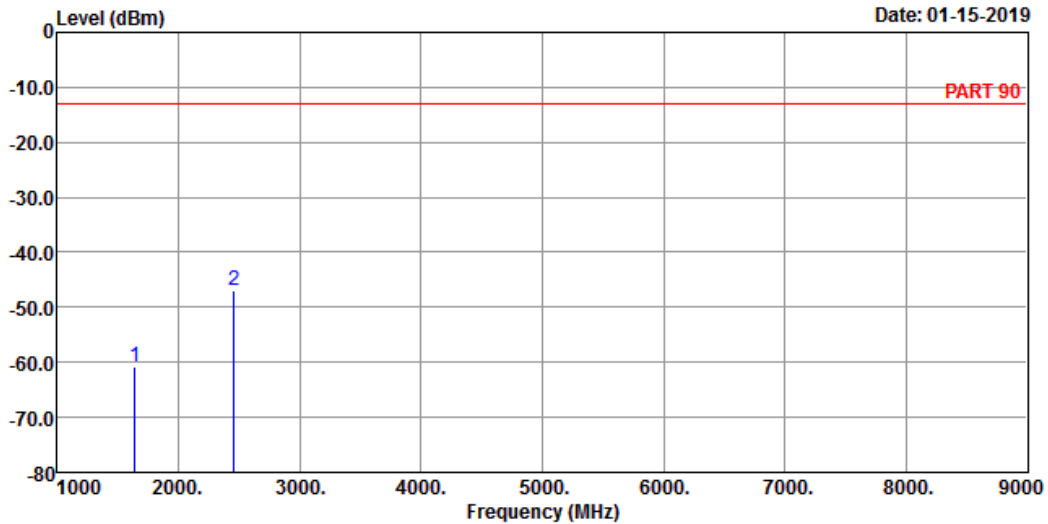
Middle Channel

Bureau Veritas Consumer Products Services Ltd., Taoyuan



A D T

Data: 1



Site : 966 Chamber 5  
 Condition: PART 90 HORIZONTAL  
 Remak : Cat-M1 Band 26 QPSK\_5M Link\_M-CH  
 Tested by: Thomas Wei

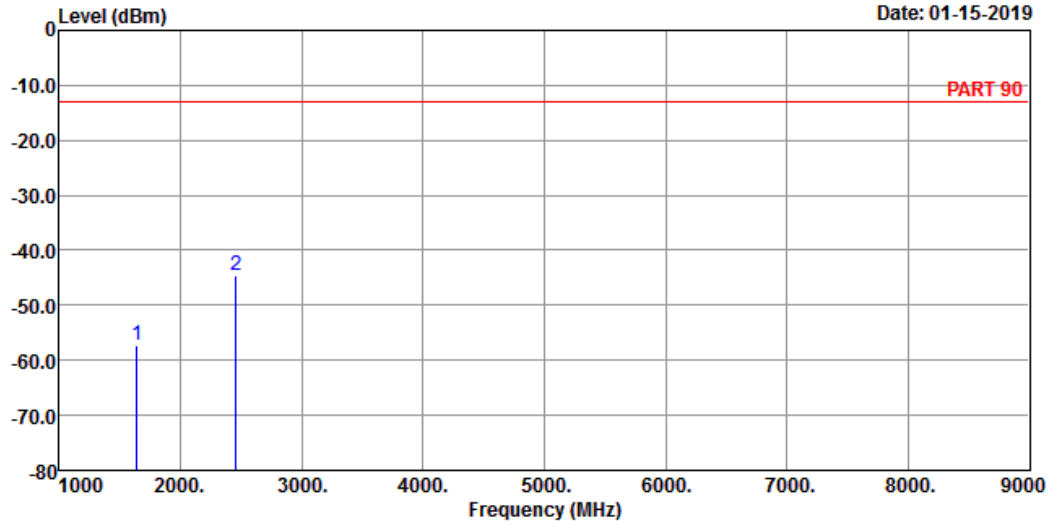
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1638.00	-60.74	-45.95	-13.00	-47.74	-14.79	Peak
2 pp	2457.00	-46.81	-36.37	-13.00	-33.81	-10.44	Peak

Bureau Veritas Consumer Products Services Ltd., Taoyuan



A D T

Data: 2



Site : 966 Chamber 5  
 Condition: PART 90 VERTICAL  
 Remak : Cat-M1 Band 26 QPSK\_5M Link\_M-CH  
 Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1638.00	-57.38	-42.59	-13.00	-44.38	-14.79	Peak
2	2457.00	-44.46	-34.02	-13.00	-31.46	-10.44	Peak

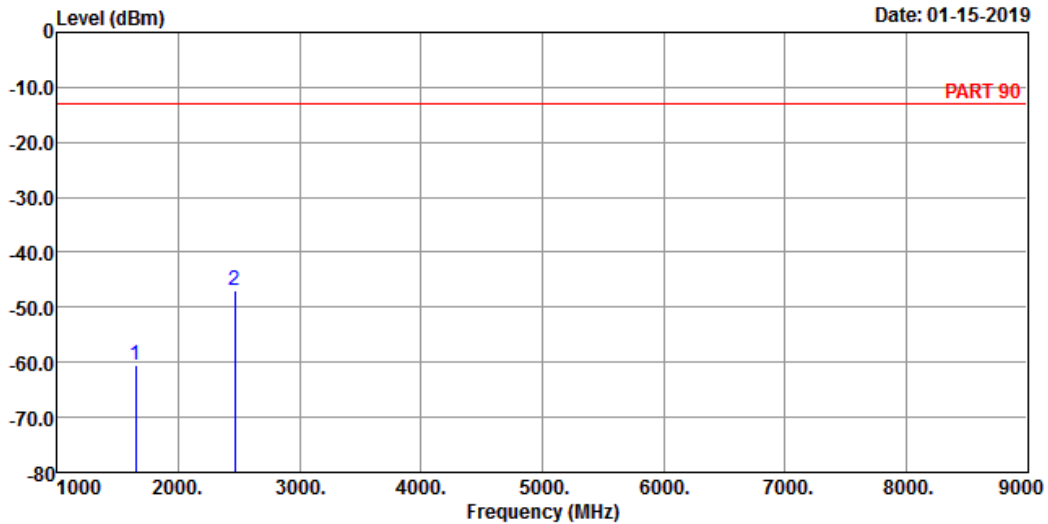
High Channel

Bureau Veritas Consumer Products Services Ltd., Taoyuan



A D T

Data: 1



Site : 966 Chamber 5  
 Condition: PART 90 HORIZONTAL  
 Remak : Cat-M1 Band 26 QPSK\_5M Link\_H-CH  
 Tested by: Thomas Wei

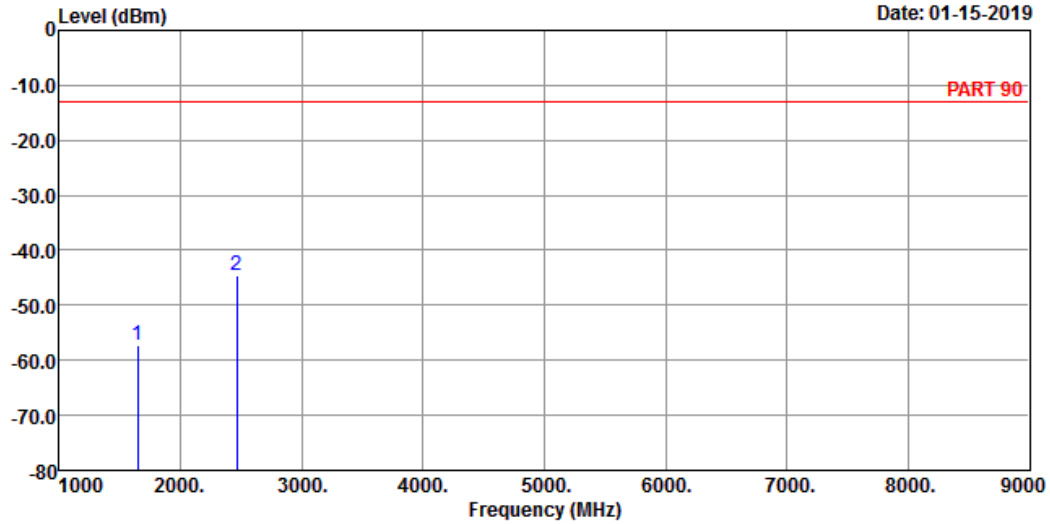
	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1	1643.00	-60.63	-45.90	-13.00	-47.63	-14.73 Peak
2 pp	2464.50	-46.96	-36.52	-13.00	-33.96	-10.44 Peak

Bureau Veritas Consumer Products Services Ltd., Taoyuan



A D T

Data: 2



Site : 966 Chamber 5  
 Condition: PART 90 VERTICAL  
 Remak : Cat-M1 Band 26 QPSK\_5M Link\_H-CH  
 Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1643.00	-57.36	-42.63	-13.00	-44.36	-14.73	Peak
2	2464.50	-44.66	-34.22	-13.00	-31.66	-10.44	Peak

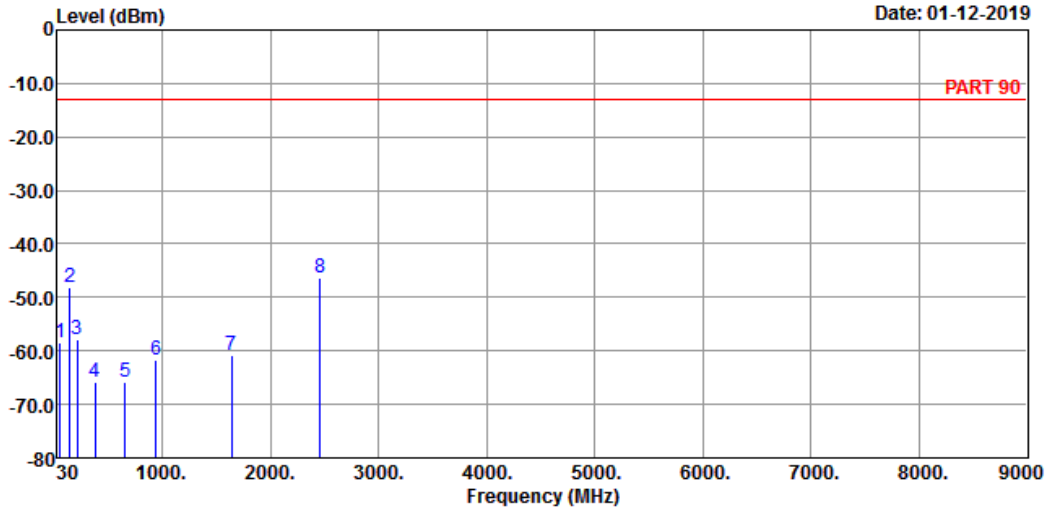
Channel Bandwidth: 10 MHz / QPSK  
Middle Channel

Bureau Veritas Consumer Products Services Ltd., Taoyuan



A D T

Data: 5



Site : 966 Chamber 5  
Condition: PART 90 HORIZONTAL  
Remak : Cat-M1 Band 26 QPSK\_10M Link\_M-CH  
Tested by: Thomas Wei

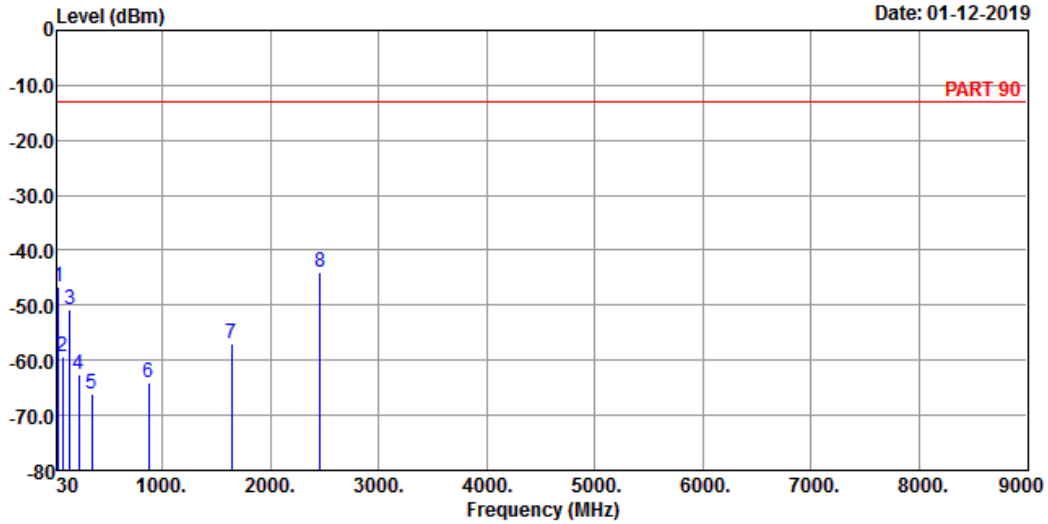
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	52.31	-58.44	-52.90	-13.00	-45.44	-5.54	Peak
2	146.40	-48.10	-40.13	-13.00	-35.10	-7.97	Peak
3	214.30	-57.88	-50.44	-13.00	-44.88	-7.44	Peak
4	377.26	-65.69	-59.61	-13.00	-52.69	-6.08	Peak
5	658.56	-65.69	-64.94	-13.00	-52.69	-0.75	Peak
6	940.83	-61.84	-63.42	-13.00	-48.84	1.58	Peak
7	1638.00	-60.71	-45.92	-13.00	-47.71	-14.79	Peak
8 pp	2457.00	-46.44	-36.00	-13.00	-33.44	-10.44	Peak

Bureau Veritas Consumer Products Services Ltd., Taoyuan



A D T

Data: 6



Site : 966 Chamber 5  
 Condition: PART 90 VERTICAL  
 Remak : Cat-M1 Band 26 QPSK\_10M Link\_M-CH  
 Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	41.64	-46.71	-46.30	-13.00	-33.71	-0.41	Peak
2	76.56	-59.38	-49.40	-13.00	-46.38	-9.98	Peak
3	145.43	-50.72	-42.65	-13.00	-37.72	-8.07	Peak
4	227.88	-62.52	-55.63	-13.00	-49.52	-6.89	Peak
5	345.25	-66.26	-59.95	-13.00	-53.26	-6.31	Peak
6	870.99	-64.11	-64.52	-13.00	-51.11	0.41	Peak
7	1638.00	-56.94	-42.15	-13.00	-43.94	-14.79	Peak
8 pp	2457.00	-44.11	-33.67	-13.00	-31.11	-10.44	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](mailto:service.adt@tw.bureauveritas.com)

**Web Site:** [www.bureauveritas-adt.com](http://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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