

FCC Test Report

(PART 90)

Report No.: RF180425C07A-3

FCC ID: N7NHL78M

Test Model: HL7800-M

Received Date: Jun. 14, 2018

Test Date: Jul. 03, 2018 ~ Jul. 06, 2018

Issued Date: Jul. 18, 2018

Applicant: Sierra Wireless Inc.

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

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(R.O.C)

Test Location: No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan
Hsien 333, Taiwan, R.O.C.

**FCC Registration /
Designation Number:** 788550 / TW0003



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Report Issue History Record

Issue No.	Description	Date Issued
RF180425C07A-3	Original Release	Jul. 18, 2018

1 Certificate of Conformity

Product: Embedded Module

Brand: AirPrime

Test Model: HL7800-M

Sample Status: ENGINEERING SAMPLE

Applicant: Sierra Wireless Inc.

Test Date: Jul. 03, 2018 ~ Jul. 06, 2018

Standards: FCC Part 90, Subpart R, S

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 : Gina Liu, **Date:** Jul. 18, 2018
Gina Liu / Specialist

Approved by : Dylan Chiou, **Date:** Jul. 18, 2018
Dylan Chiou / Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 90 & Part 2 (LTE 14)			
FCC Clause	Test Item	Result	Remarks
2.1046 90.542 (a)(7)	Effective Radiated Power	Pass	Meet the requirement of limit.
2.1047	Modulation characteristics	Pass	Meet the requirement
2.1055 90.539	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth (*)	Pass	Meet the requirement of limit.
90.210 (n)	Emission Masks	Pass	Meet the requirement of limit.
2.1051 90.543 (e)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 90.543 (e)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -8.32 dB at 1586.00 MHz.

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 90.209	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 -35.72 dB at 2457.00 MHz.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.44 dB
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	Nov. 24, 2017	Nov. 23, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Jan. 11, 2018	Jan. 10, 2019
Double Ridge Guide Horn Antenna EMCO	3115	5619	Nov. 30, 2017	Nov. 29, 2018
BILOG Antenna SCHWARZBECK	VULB 9168	9168-153	Dec. 06, 2017	Dec. 05, 2018
Radio Communication Analyzer Anritsu	MT8820C	6201300640	Aug. 16, 2017	Aug. 15, 2019
Preamplifier EMCI	EMC 012645	980115	Oct. 20, 2017	Oct. 19, 2018
Preamplifier EMCI	EMC 184045	980116	Oct. 20, 2017	Oct. 19, 2018
Preamplifier EMCI	EMC 330H	980112	Oct. 13, 2017	Oct. 12, 2018
Power Meter Anritsu	ML2495A	1012010	Aug. 15, 2017	Aug. 14, 2018
Power Sensor Anritsu	MA2411B	1315050	Aug. 15, 2017	Aug. 14, 2018
RF Coaxial Cable HUBER+SUHNNER	EMC104-SM-SM-8000 &3000	140811+170717	Oct. 20, 2017	Oct. 19, 2018
RF Coaxial Cable HUBER+SUHNNER	SUCOFLEX 104	EMC104-SM-SM-10 00(140807)	Oct. 20, 2017	Oct. 19, 2018
RF Coaxial Cable Worken	8D-FB	Cable-Ch10-01	Oct. 20, 2017	Oct. 19, 2018
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
DC Power Supply Topward	33010D	807748	Oct. 25, 2016	Oct. 24, 2018
STANDARD TEMPERATURE & HUMIDITY CHAMBER TERCHY	MHU-225AU	920842	Jun. 01, 2018	May 30, 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 IC7450F-10.

3 General Information

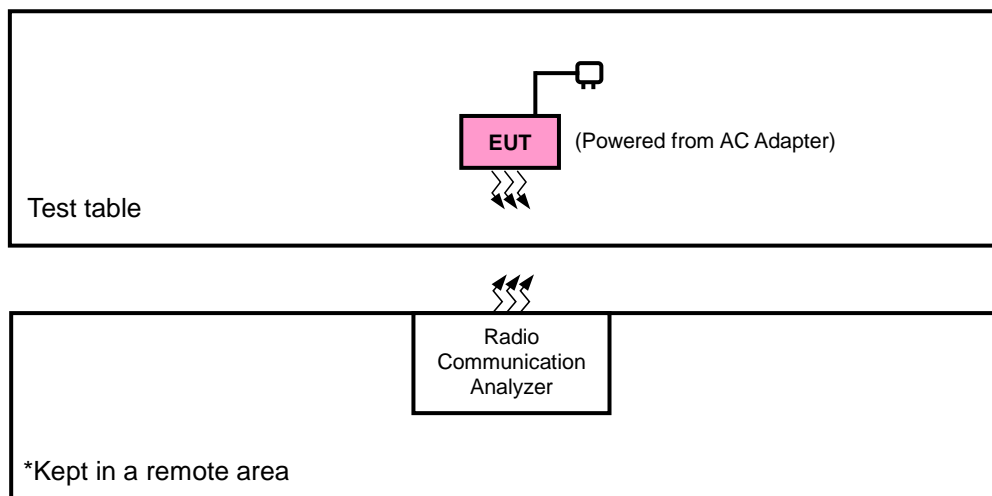
3.1 General Description of EUT

Product	Embedded Module	
Brand	AirPrime	
Test Model	HL7800-M	
Status of EUT	ENGINEERING SAMPLE	
Power Supply Rating	5.0 Vdc (host equipment) 12.0 Vdc (adapter)	
Modulation Type	LTE	QPSK, 16QAM
Frequency Range	LTE Band 14 (Channel Bandwidth: 5 MHz)	790.5 ~ 795.5 MHz
	LTE Band 14 (Channel Bandwidth: 10 MHz)	793 MHz
	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
Emission Designator	LTE Band 14 (Channel Bandwidth: 5 MHz)	1M08G7D
	LTE Band 14 (Channel Bandwidth: 10 MHz)	1M09G7D
	LTE Band 26 (Channel Bandwidth: 1.4 MHz)	1M09G7D
	LTE Band 26 (Channel Bandwidth: 3 MHz)	1M08G7D
	LTE Band 26 (Channel Bandwidth: 5 MHz)	1M08G7D
	LTE Band 26 (Channel Bandwidth: 10 MHz)	1M09G7D
Max. ERP Power	LTE Band 14 (Channel Bandwidth: 5 MHz)	262.42 mW
	LTE Band 14 (Channel Bandwidth: 10 MHz)	229.09 mW
	LTE Band 26 (Channel Bandwidth: 1.4 MHz)	254.68 mW
	LTE Band 26 (Channel Bandwidth: 3 MHz)	240.44 mW
	LTE Band 26 (Channel Bandwidth: 5 MHz)	228.03 mW
	LTE Band 26 (Channel Bandwidth: 10 MHz)	199.53 mW
Antenna Type	Dipole Antenna with 2 dBi gain	
Accessory Device	N/A	
Data Cable Supplied	N/A	

Note:

1. The above EUT information is declared by manufacturer and for more detailed features description, please refer 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	N/A	N/A	N/A	N/A
2.	Radio Communication Analyzer	Anritsu	MT8820C	6201300640	NA

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

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item 1 was provided by client.
3. Item 2 acted as communication partners to transfer data.

3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis, and antenna ports

The worst case was found when positioned as the table below. Following channel(s) was (were) selected for the final test as listed below:

Band	ERP	Radiated Emission
LTE Band 14	X-plane	Z-axis
LTE Band 26	X-plane	Z-axis

LTE Band 14

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode	
-	ERP	23305 to 23355	23305, 23330, 23355	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset	
		23330	23330	10 MHz	QPSK, 16QAM	1 RB / 24 RB Offset	
-	Modulation characteristics	23305 to 23355	23330	5 MHz	QPSK, 16QAM	5 RB / 0 RB Offset	
-	Frequency Stability	23305 to 23355	23305, 23330, 23355	5 MHz	QPSK	1 RB / 0 RB Offset	
		23330	23330	10 MHz	QPSK	1 RB / 24 RB Offset	
-	Occupied Bandwidth	23305 to 23355	23305, 23330, 23355	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset	
		23330	23330	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset	
-	Peak to Average Ratio	23305 to 23355	23305, 23330, 23355	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset	
		23330	23330	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset	
-	Band Edge	23305 to 23355	23305	5 MHz	QPSK	1 RB / 0 RB Offset	
							25 RB / 0 RB Offset
			23355	5 MHz	QPSK	1 RB / 24 RB Offset	
		23330					25 RB / 0 RB Offset
			23330	10 MHz	QPSK	1 RB / 0 RB Offset	
			23330	10 MHz	QPSK	1 RB / 49 RB Offset	
-	Conducted Emission	23305 to 23355	23305, 23330, 23355	5 MHz	QPSK	1 RB / 0 RB Offset	
		23330	23330	10 MHz	QPSK	1 RB / 0 RB Offset	
-	Radiated Emission	23330	23330	10 MHz	QPSK	1 RB / 24 RB Offset	
						1 RB / 50 RB Offset	

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

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 / 2 RB Offset
		26705 to 26775	26705, 26740, 26775	3 MHz	QPSK, 16QAM	1 RB / 7 RB Offset
		26715 to 26765	26715, 26740, 26765	5 MHz	QPSK, 16QAM	1 RB / 12 RB Offset
		26740	26740	10 MHz	QPSK, 16QAM	1 RB / 49 RB Offset
-	Modulation characteristics	26715 to 26765	26740	5 MHz	QPSK, 16QAM	5 RB / 0 RB Offset
-	Frequency Stability	26697 to 26783	26697, 26783	1.4 MHz	QPSK	1 RB / 2 RB Offset
		26705 to 26775	26705, 26775	3 MHz	QPSK	1 RB / 7 RB Offset
		26715 to 26765	26715, 26765	5 MHz	QPSK	1 RB / 12 RB Offset
		26740	26740	10 MHz	QPSK	1 RB / 49 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	15 RB / 0 RB Offset
		26715 to 26765	26715, 26740, 26765	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		26740	26740	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
-	Emission Mask	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	15 RB / 0 RB Offset
		26715 to 26765	26715, 26740, 26765	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		26740	26740	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
-	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 / 0 RB Offset
		26740	26740	10 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission	26740	26740	10 MHz	QPSK	1 RB / 49 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
Modulation characteristics	25 deg. C, 65 % RH	12 Vdc	Getaz Yang
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
Condcudeted Emission	25 deg. C, 65 % RH	12 Vdc	Getaz Yang
Radiated Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	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

ANSI/TIA/EIA-603-E 2016

ANSI 63.26-2015

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

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

Mobile / Portable station are limited to 100 watts e.r.p.

Portable stations (hand-held devices) are limited to 3 watts ERP

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

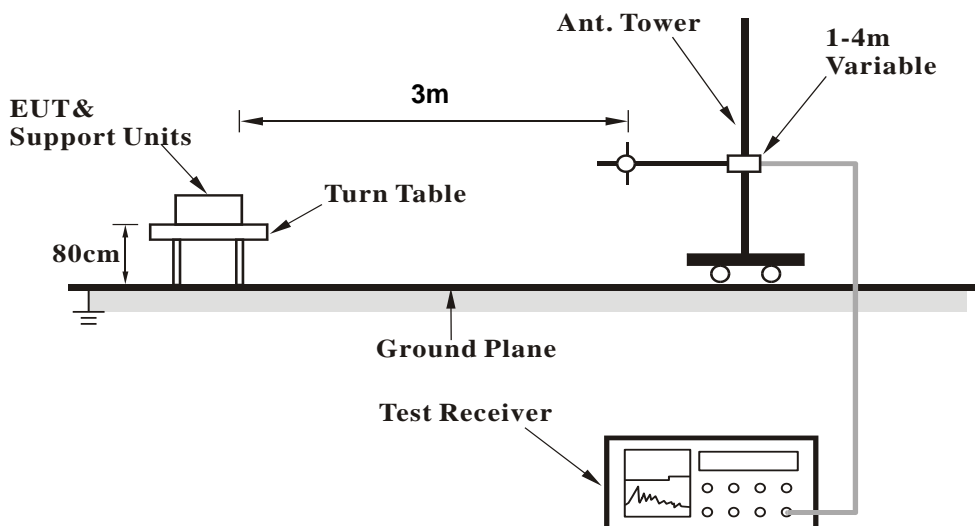
Conducted Power Measurement:

- 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.

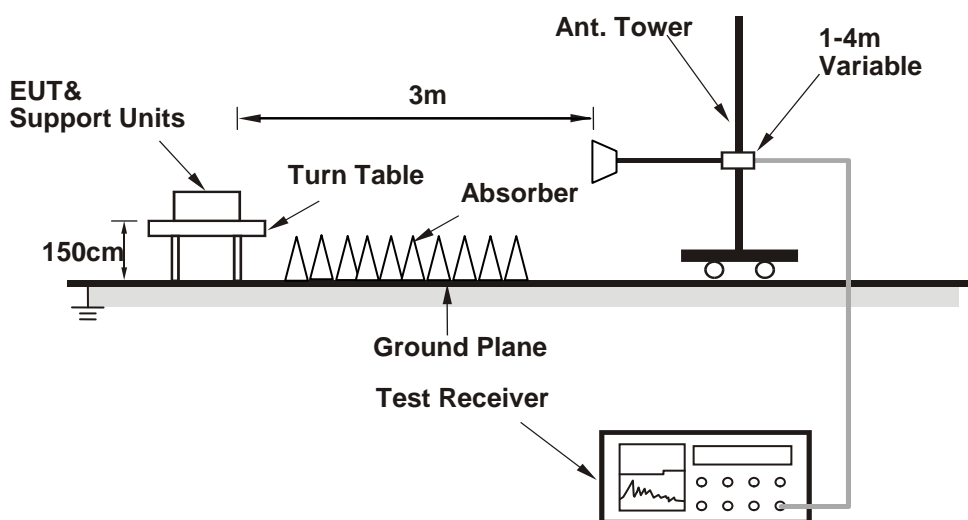
4.1.3 Test Setup

EIRP / ERP Measurement:

<Radiated Emission below or equal 1 GHz>

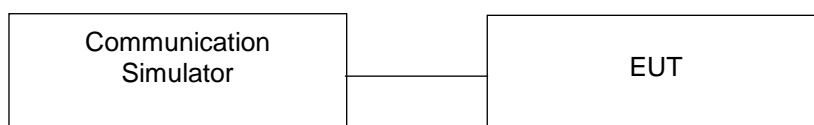


<Radiated Emission above 1 GHz>



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)

LTE Band 14

BW(MHz): 5

Test Frequency ID	N _{UL}	Frequency of Uplink [MHz]	N _{DL}	Frequency of Downlink [MHz]	Test Configuration Initial of Power				EUT	
					Modulation	RB Size	RB Offset	Narrowband Index	Cell power (dBm/15kHz)	power (dBm)
Low Range	23305	790.5	5305	760.5	QPSK	1	0	0	-85	23.55
					QPSK	1	5	0	-85	23.54
					QPSK	1	0	1	-85	23.51
					QPSK	1	5	1	-85	23.48
					QPSK	1	0	3	-85	23.47
					QPSK	1	5	3	-85	23.46
					QPSK	3	0	0	-85	22.83
					QPSK	3	3	3	-85	22.59
					QPSK	6	0	0	-85	22.82
					QPSK	6	0	1	-85	22.84
					QPSK	6	0	3	-85	22.79
					16QAM	1	0	0	-85	22.83
					16QAM	1	5	0	-85	22.85
					16QAM	1	0	1	-85	22.91
					16QAM	1	5	1	-85	22.87
					16QAM	1	0	3	-85	22.84
					16QAM	1	5	3	-85	22.81
					16QAM	3	0	0	-85	22.45
					16QAM	3	3	3	-85	22.45
					16QAM	5	0	0	-85	21.36
16QAM	5	0	1	-85	21.29					
16QAM	5	0	3	-85	21.17					
Mid Range	23330	793	5330	763	QPSK	1	0	0	-85	23.48
					QPSK	1	5	0	-85	23.44
					QPSK	1	0	1	-85	23.45
					QPSK	1	5	1	-85	23.41
					QPSK	1	0	3	-85	23.43
					QPSK	1	5	3	-85	23.39
					QPSK	3	0	0	-85	22.76
					QPSK	3	3	3	-85	22.73
					QPSK	6	0	0	-85	22.79
					QPSK	6	0	1	-85	22.77
					QPSK	6	0	3	-85	22.69
					16QAM	1	0	0	-85	22.81
					16QAM	1	5	0	-85	22.78
					16QAM	1	0	1	-85	22.66
					16QAM	1	5	1	-85	22.68
					16QAM	1	0	3	-85	22.81
					16QAM	1	5	3	-85	22.77
					16QAM	3	0	0	-85	22.48
					16QAM	3	3	3	-85	22.33
					16QAM	5	0	0	-85	21.22
16QAM	5	0	1	-85	21.24					
16QAM	5	0	3	-85	21.19					

High Range	23355	795.5	5355	765.5	QPSK	1	0	0	-85	23.46
					QPSK	1	5	0	-85	23.48
					QPSK	1	0	1	-85	23.41
					QPSK	1	5	1	-85	23.44
					QPSK	1	0	3	-85	23.41
					QPSK	1	5	3	-85	23.39
					QPSK	3	0	0	-85	22.79
					QPSK	3	3	3	-85	22.75
					QPSK	6	0	0	-85	22.77
					QPSK	6	0	1	-85	22.79
					QPSK	6	0	3	-85	22.76
					16QAM	1	0	0	-85	22.82
					16QAM	1	5	0	-85	22.78
					16QAM	1	0	1	-85	22.87
					16QAM	1	5	1	-85	22.83
					16QAM	1	0	3	-85	22.69
					16QAM	1	5	3	-85	22.41
					16QAM	3	0	0	-85	22.39
					16QAM	3	3	3	-85	22.34
					16QAM	5	0	0	-85	21.36
16QAM	5	0	1	-85	21.21					
16QAM	5	0	3	-85	21.22					

BW(MHz): 10

N _{UL}	Frequency of Uplink [MHz]	N _{DL}	Frequency of Downlink [MHz]	Test Configuration Initial of Power				EUT	
				Modulation	RB Size	RB Offset	Narrowband Index	Cell power (dBm/15kHz)	power (dBm)
23330	793	5330	763	QPSK	1	0	0	-85	23.51
				QPSK	1	5	0	-85	23.38
				QPSK	1	0	3	-85	23.12
				QPSK	1	5	3	-85	23.39
				QPSK	1	0	7	-85	23.34
				QPSK	1	5	7	-85	23.45
				QPSK	4	0	0	-85	23.47
				QPSK	4	2	7	-85	23.33
				QPSK	6	0	0	-85	22.89
				QPSK	6	0	7	-85	22.61
				16QAM	1	0	0	-85	23.14
				16QAM	1	5	0	-85	23.25
				16QAM	1	0	3	-85	23.06
				16QAM	1	5	3	-85	23.22
				16QAM	1	0	7	-85	23.14
				16QAM	1	5	7	-85	23.33
				16QAM	4	2	0	-85	23.03
				16QAM	4	2	7	-85	23.27
				16QAM	6	0	0	-85	22.77
				16QAM	6	0	7	-85	22.56

LTE Band 26

BW(MHz): 1.4

Test Frequency ID	N _{UL}	Frequency of Uplink [MHz]	N _{DL}	Frequency of Downlink [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	8697	859.7	QPSK	1	0	0	-85	23.67
					QPSK	1	5	0	-85	23.62
					QPSK	3	3	0	-85	22.06
					QPSK	6	0	0	-85	21.45
					16QAM	1	0	0	-85	23.28
					16QAM	1	5	0	-85	23.18
					16QAM	3	0	0	-85	22.27
Mid Range	26740	819	8740	864	QPSK	1	0	0	-85	23.55
					QPSK	1	5	0	-85	23.54
					QPSK	3	3	0	-85	21.97
					QPSK	6	0	0	-85	21.37
					16QAM	1	0	0	-85	23.13
					16QAM	1	5	0	-85	23.18
					16QAM	3	0	0	-85	22.27
High Range	26783	823.3	8783	868.3	QPSK	1	0	0	-85	23.61
					QPSK	1	5	0	-85	23.51
					QPSK	3	3	0	-85	22.18
					QPSK	6	0	0	-85	21.39
					16QAM	1	0	0	-85	23.14
					16QAM	1	5	0	-85	23.12
					16QAM	3	0	0	-85	22.27
					16QAM	5	0	0	-85	22.11

BW(MHz): 3

Test Frequency ID	N _{UL}	Frequency of Uplink [MHz]	N _{DL}	Frequency of Downlink [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	8705	860.5	QPSK	1	0	0	-85	23.16
					QPSK	1	5	0	-85	23.18
					QPSK	1	0	1	-85	23.39
					QPSK	1	5	1	-85	23.28
					QPSK	3	3	0	-85	22.9
					QPSK	3	3	1	-85	22.15
					QPSK	6	0	0	-85	21.47
					QPSK	6	0	1	-85	20.97
					16QAM	1	0	0	-85	23.34
					16QAM	1	5	0	-85	23.01
					16QAM	1	0	1	-85	23.13
					16QAM	1	5	1	-85	23.13
					16QAM	3	0	0	-85	22.37
					16QAM	3	3	1	-85	22.21
16QAM	5	0	0	-85	22.01					
16QAM	5	0	1	-85	22.14					

Test Frequency ID	N _{UL}	Frequency of Uplink [MHz]	N _{DL}	Frequency of Downlink [MHz]	Test Configuration Initial of Power				EUT	
					Modulation	RB Size	RB Offset	Narrowband Index	Cell power (dBm/15kHz)	power (dBm)
Mid Range	26740	819	8740	864	QPSK	1	0	0	-85	23.42
					QPSK	1	5	0	-85	23.46
					QPSK	1	0	1	-85	23.52
					QPSK	1	5	1	-85	23.33
					QPSK	3	3	0	-85	22.14
					QPSK	3	3	1	-85	22.17
					QPSK	6	0	0	-85	21.15
					QPSK	6	0	1	-85	20.87
					16QAM	1	0	0	-85	23.19
					16QAM	1	5	0	-85	23.16
					16QAM	1	0	1	-85	23.21
					16QAM	1	5	1	-85	23.05
					16QAM	3	0	0	-85	22.52
					16QAM	3	3	1	-85	22.16
					16QAM	5	0	0	-85	22.29
High Range	26775	822.5	8775	867.5	QPSK	1	0	0	-85	23.36
					QPSK	1	5	0	-85	23.45
					QPSK	1	0	1	-85	23.49
					QPSK	1	5	1	-85	23.36
					QPSK	3	3	0	-85	22.09
					QPSK	3	3	1	-85	22.11
					QPSK	6	0	0	-85	21.17
					QPSK	6	0	1	-85	20.91
					16QAM	1	0	0	-85	23.12
					16QAM	1	5	0	-85	23.09
					16QAM	1	0	1	-85	23.19
					16QAM	1	5	1	-85	23.07
					16QAM	3	0	0	-85	22.29
					16QAM	3	3	1	-85	22.13
					16QAM	5	0	0	-85	22.26
16QAM	5	0	1	-85	21.93					

BW(MHz):		5									
Test Frequency ID	NUL	Frequency of Uplink [MHz]	N _{DL}	Frequency of Downlink [MHz]	Test Configuration			Initial of Power		EUT	
					Modulation	RB Size	RB Offset	Narrowband Index	Cell power (dBm/15kHz)	power (dBm)	
Low Range	26715	819	8715	861.5	QPSK	1	0	0	-85	23.27	
					QPSK	1	5	0	-85	23.37	
					QPSK	1	0	1	-85	23.29	
					QPSK	1	5	1	-85	23.24	
					QPSK	1	0	3	-85	23.12	
					QPSK	1	5	3	-85	23.16	
					QPSK	3	0	0	-85	22.44	
					QPSK	3	3	3	-85	22.21	
					QPSK	6	0	0	-85	22.13	
					QPSK	6	0	1	-85	22.34	
					QPSK	6	0	3	-85	22.17	
					16QAM	1	0	0	-85	23.28	
					16QAM	1	5	0	-85	23.41	
					16QAM	1	0	1	-85	23.31	
					16QAM	1	5	1	-85	23.35	
					16QAM	1	0	3	-85	23.26	
					16QAM	1	5	3	-85	23.21	
					16QAM	3	0	0	-85	22.37	
					16QAM	3	3	3	-85	22.18	
					16QAM	5	0	0	-85	22.29	
16QAM	5	0	1	-85	22.34						
16QAM	5	0	3	-85	22.24						
Mid Range	26740	819	8740	864	QPSK	1	0	0	-85	23.57	
					QPSK	1	5	0	-85	23.48	
					QPSK	1	0	1	-85	23.33	
					QPSK	1	5	1	-85	23.31	
					QPSK	1	0	3	-85	23.25	
					QPSK	1	5	3	-85	23.27	
					QPSK	3	0	0	-85	22.87	
					QPSK	3	3	3	-85	22.99	
					QPSK	6	0	0	-85	22.58	
					QPSK	6	0	1	-85	22.65	
					QPSK	6	0	3	-85	22.33	
					16QAM	1	0	0	-85	23.43	
					16QAM	1	5	0	-85	23.42	
					16QAM	1	0	1	-85	23.33	
					16QAM	1	5	1	-85	23.42	
					16QAM	1	0	3	-85	23.22	
					16QAM	1	5	3	-85	23.19	
					16QAM	3	0	0	-85	22.57	
					16QAM	3	3	3	-85	22.46	
					16QAM	5	0	0	-85	22.64	
16QAM	5	0	1	-85	22.67						
16QAM	5	0	3	-85	22.31						

Test Frequency ID	N _{UL}	Frequency of Uplink [MHz]	N _{DL}	Frequency of Downlink [MHz]	Test Configuration			Initial of Power		EUT	
					Modulation	RB Size	RB Offset	Narrowband Index	Cell power (dBm/15kHz)	power (dBm)	
High Range	26765	821.5	8765	866.5	QPSK	1	0	0	-85	23.13	
					QPSK	1	5	0	-85	23.01	
					QPSK	1	0	1	-85	23.04	
					QPSK	1	5	1	-85	23.11	
					QPSK	1	0	3	-85	23.21	
					QPSK	1	5	3	-85	23.18	
					QPSK	3	0	0	-85	22.44	
					QPSK	3	3	3	-85	22.39	
					QPSK	6	0	0	-85	22.47	
					QPSK	6	0	1	-85	22.45	
					QPSK	6	0	3	-85	22.37	
					16QAM	1	0	0	-85	23.53	
					16QAM	1	5	0	-85	23.33	
					16QAM	1	0	1	-85	23.34	
					16QAM	1	5	1	-85	23.24	
					16QAM	1	0	3	-85	23.16	
					16QAM	1	5	3	-85	23.18	
					16QAM	3	0	0	-85	22.25	
16QAM	3	3	3	-85	22.19						
16QAM	5	0	0	-85	22.31						
16QAM	5	0	1	-85	23.32						
16QAM	5	0	3	-85	23.25						

BW(MHz): 10

N _{UL}	Frequency of Uplink [MHz]	N _{DL}	Frequency of Downlink [MHz]	Test Configuration			Initial of Power		EUT	
				Modulation	RB Size	RB Offset	Narrowband Index	Cell power (dBm/15kHz)	power (dBm)	
26740	819	8740	864	QPSK	1	0	0	-85	23.07	
				QPSK	1	5	0	-85	23.13	
				QPSK	1	0	3	-85	23.02	
				QPSK	1	5	3	-85	23.27	
				QPSK	1	0	7	-85	23.22	
				QPSK	1	5	7	-85	23.24	
				QPSK	4	0	0	-85	23.19	
				QPSK	4	2	7	-85	23.64	
				QPSK	6	0	0	-85	22.37	
				QPSK	6	0	7	-85	22.72	
				16QAM	1	0	0	-85	23.24	
				16QAM	1	5	0	-85	23.12	
				16QAM	1	0	3	-85	23.31	
				16QAM	1	5	3	-85	23.14	
				16QAM	1	0	7	-85	23.41	
				16QAM	1	5	7	-85	23.55	
				16QAM	4	2	0	-85	23.24	
				16QAM	4	2	7	-85	23.41	
16QAM	5	0	0	-85	22.17					
16QAM	5	0	7	-85	22.61					

ERP Power (dBm)

LTE Band 14							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	23305	790.5	-5.90	32.24	24.19	262.42	H
	23330	793.0	-6.17	32.17	23.85	242.66	
	23355	795.5	-5.93	32.11	24.03	252.93	
	23305	790.5	-10.43	32.43	19.85	96.61	V
	23330	793.0	-10.85	32.42	19.42	87.50	
	23355	795.5	-10.64	32.46	19.67	92.68	
Channel Bandwidth: 5 MHz / 16QAM							
X	23305	790.5	-6.92	32.24	23.17	207.49	H
	23330	793.0	-7.19	32.17	22.83	191.87	
	23355	795.5	-6.95	32.11	23.01	199.99	
	23305	790.5	-11.45	32.43	18.83	76.38	V
	23330	793.0	-11.87	32.42	18.40	69.18	
	23355	795.5	-11.66	32.46	18.65	73.28	

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

LTE Band 14							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	23330	793.0	-6.42	32.17	23.60	229.09	H
	23330	793.0	-10.85	32.42	19.42	87.50	V
Channel Bandwidth: 10 MHz / 16QAM							
X	23330	793.0	-7.44	32.17	22.58	181.13	H
	23330	793.0	-11.87	32.42	18.40	69.18	V

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

LTE Band 26							
Channel Bandwidth: 1.4 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	26697	814.7	-5.80	32.01	24.06	254.68	H
	26740	819.0	-6.17	32.11	23.79	239.33	
	26783	823.3	-6.25	32.32	23.92	246.60	
	26697	814.7	-12.14	32.54	18.25	66.83	V
	26740	819.0	-12.50	32.51	17.86	61.09	
	26783	823.3	-12.35	32.51	18.01	63.24	
Channel Bandwidth: 1.4 MHz / 16QAM							
X	26697	814.7	-6.82	32.01	23.04	201.37	H
	26740	819.0	-7.19	32.11	22.77	189.23	
	26783	823.3	-7.27	32.32	22.90	194.98	
	26697	814.7	-13.16	32.54	17.23	52.84	V
	26740	819.0	-13.52	32.51	16.84	48.31	
	26783	823.3	-13.37	32.51	16.99	50.00	

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

LTE Band 26							
Channel Bandwidth: 3 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	26705	815.5	-6.06	32.02	23.81	240.44	H
	26740	819.0	-6.42	32.11	23.54	225.94	
	26775	822.5	-6.36	32.18	23.67	232.81	
	26705	815.5	-12.35	32.5	18.00	63.10	V
	26740	819.0	-12.75	32.51	17.61	57.68	
	26775	822.5	-12.56	32.47	17.76	59.70	
Channel Bandwidth: 3 MHz / 16QAM							
X	26705	815.5	-7.05	32.02	22.82	191.43	H
	26740	819.0	-7.41	32.11	22.55	179.89	
	26775	822.5	-7.35	32.18	22.68	185.35	
	26705	815.5	-13.34	32.5	17.01	50.23	V
	26740	819.0	-13.74	32.51	16.62	45.92	
	26775	822.5	-13.55	32.47	16.77	47.53	

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

LTE Band 26							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	26715	816.5	-6.31	32.04	23.58	228.03	H
	26740	819.0	-6.65	32.11	23.31	214.29	
	26765	821.5	-6.20	31.79	23.44	220.80	
	26715	816.5	-12.60	32.52	17.77	59.84	V
	26740	819.0	-12.98	32.51	17.38	54.70	
	26765	821.5	-12.49	32.17	17.53	56.62	
Channel Bandwidth: 5 MHz / 16QAM							
X	26715	816.5	-7.32	32.04	22.57	180.72	H
	26740	819.0	-7.66	32.11	22.30	169.82	
	26765	821.5	-7.21	31.79	22.43	174.98	
	26715	816.5	-13.61	32.52	16.76	47.42	V
	26740	819.0	-13.99	32.51	16.37	43.35	
	26765	821.5	-13.50	32.17	16.52	44.87	

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

LTE Band 26							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	26740	819.0	-6.96	32.11	23.00	199.53	H
	26740	819.0	-13.29	32.51	17.07	50.93	V
Channel Bandwidth: 10 MHz / 16QAM							
X	26740	819.0	-7.97	32.11	21.99	158.12	H
	26740	819.0	-14.30	32.51	16.06	40.36	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 Procedure

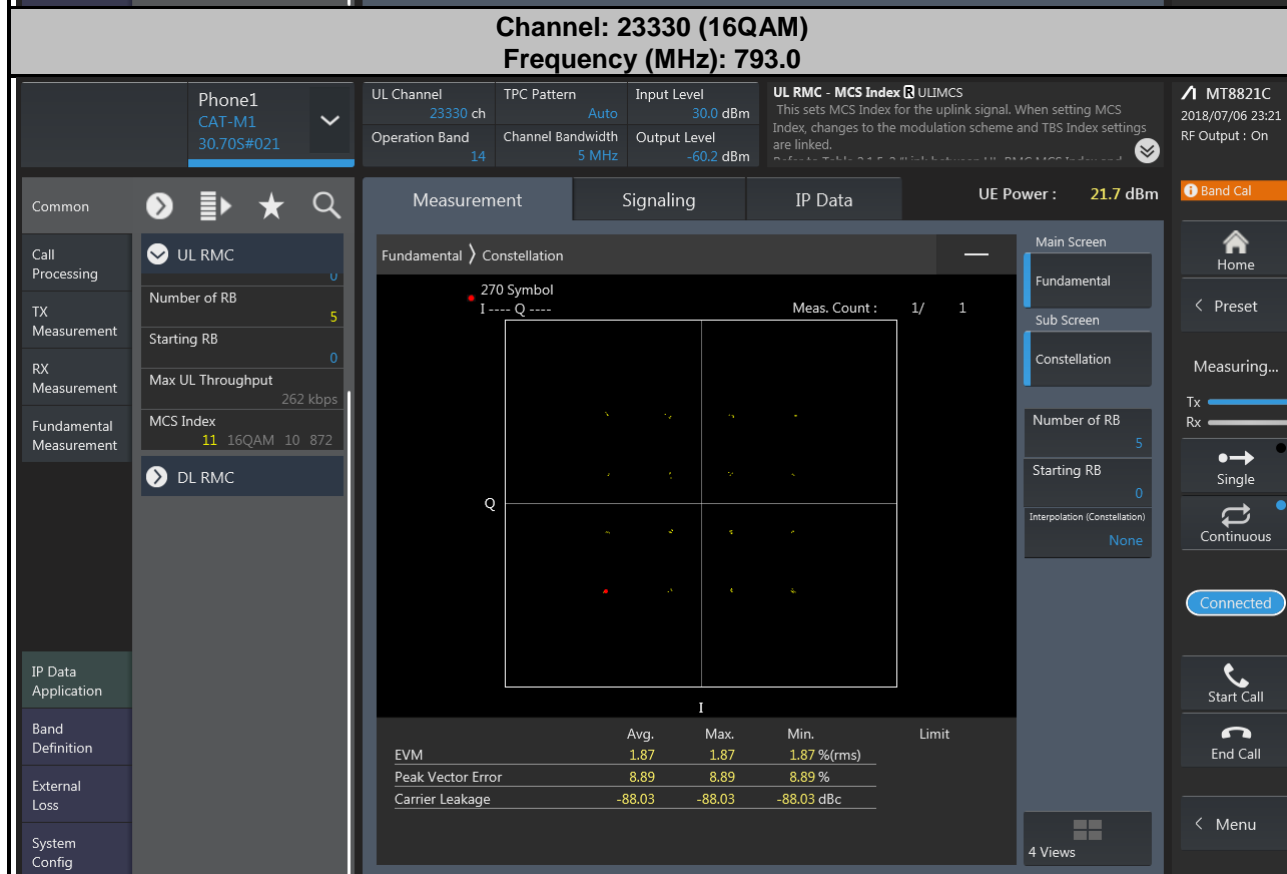
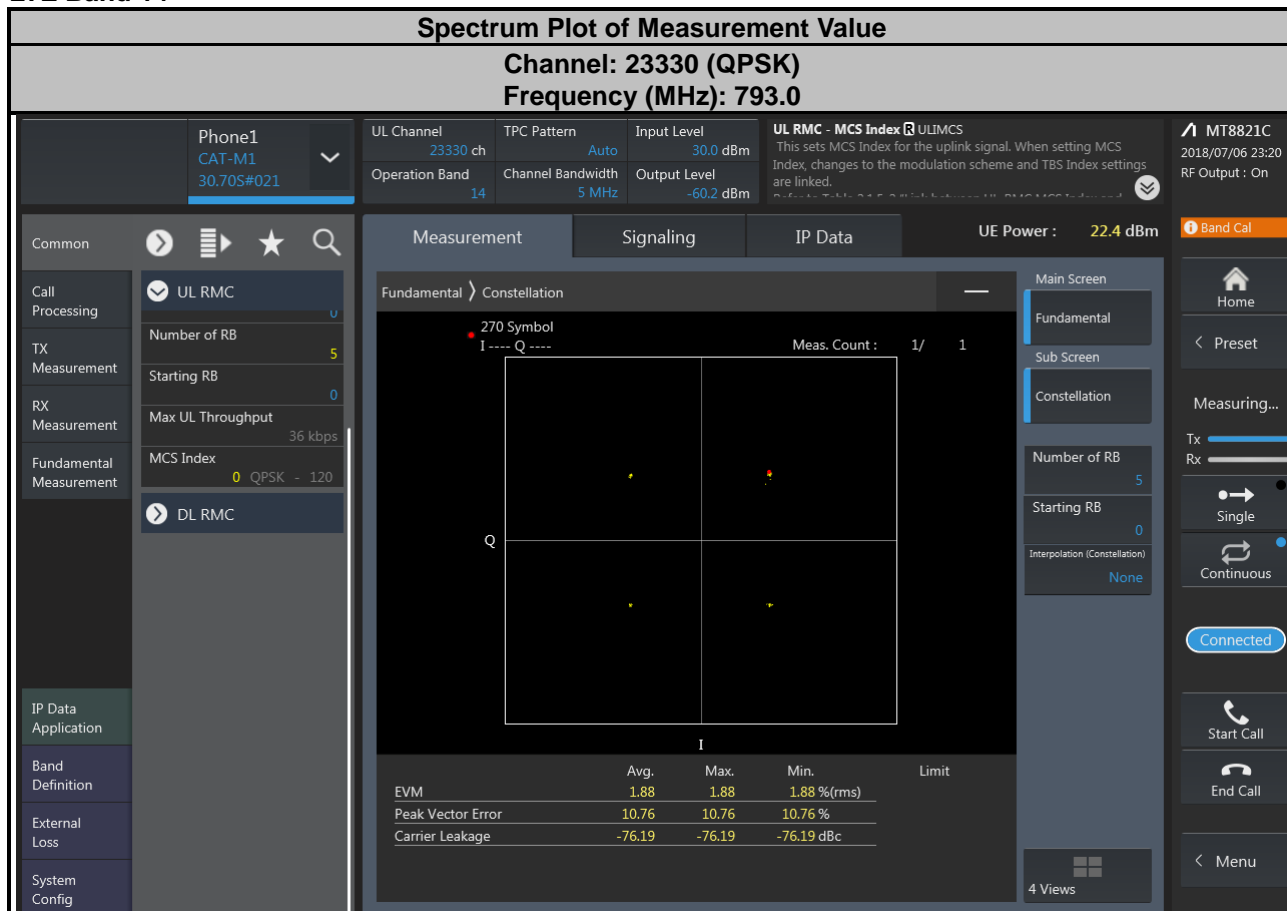
Connect the EUT to Communication Simulator via the antenna connector, The frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

4.2.3 Test Setup



4.2.4 Test Results

LTE Band 14



LTE Band 26

Spectrum Plot of Measurement Value

Channel: 26740 (QPSK) Frequency (MHz): 819.0

Phone1
CAT-M1
30.70S#021

UL Channel: 26740 ch
Operation Band: 26

TPC Pattern: Auto
Channel Bandwidth: 5 MHz

Input Level: 30.0 dBm
Output Level: -60.2 dBm

UL Channel: ULCHAN
This sets the uplink channel. When changing the set value of the uplink channel, the downlink channel and uplink frequency are changed automatically.

MT8821C
2018/07/06 23:27
RF Output: On

Common

Call Processing: UL RMC

TX Measurement: Number of RB: 5, Starting RB: 0

RX Measurement: Max UL Throughput: 36 kbps

Fundamental Measurement: MCS Index: 0 QPSK - 120

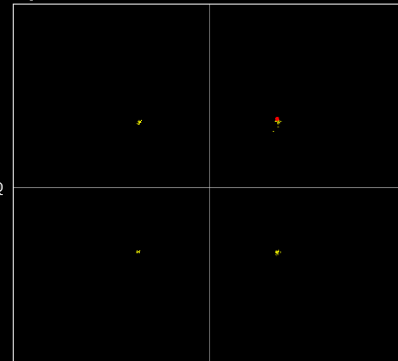
DL RMC

Measurement | Signaling | IP Data

UE Power: 22.1 dBm

Fundamental > Constellation

270 Symbol



Meas. Count: 1/ 1

	Avg.	Max.	Min.	Limit
EVM	2.05	2.05	2.05 %(rms)	
Peak Vector Error	11.09	11.09	11.09 %	
Carrier Leakage	-72.39	-72.39	-72.39 dBc	

Main Screen

Fundamental

Sub Screen

Constellation

Number of RB: 5

Starting RB: 0

Interpolation (Constellation): None

4 Views

Channel: 26740 (16QAM) Frequency (MHz): 819.0

Phone1
CAT-M1
30.70S#021

UL Channel: 26740 ch
Operation Band: 26

TPC Pattern: Auto
Channel Bandwidth: 5 MHz

Input Level: 30.0 dBm
Output Level: -60.2 dBm

UL RMC - MCS Index: ULIMCS
This sets MCS Index for the uplink signal. When setting MCS Index, changes to the modulation scheme and TBS Index settings are linked.

MT8821C
2018/07/06 23:27
RF Output: On

Common

Call Processing: UL RMC

TX Measurement: Number of RB: 5, Starting RB: 0

RX Measurement: Max UL Throughput: 262 kbps

Fundamental Measurement: MCS Index: 11 16QAM 10 872

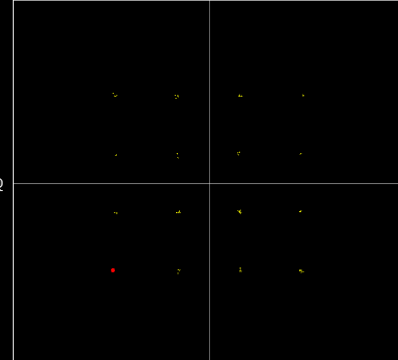
DL RMC

Measurement | Signaling | IP Data

UE Power: 21.5 dBm

Fundamental > Constellation

270 Symbol



Meas. Count: 1/ 1

	Avg.	Max.	Min.	Limit
EVM	1.98	1.98	1.98 %(rms)	
Peak Vector Error	8.19	8.19	8.19 %	
Carrier Leakage	-76.86	-76.86	-76.86 dBc	

Main Screen

Fundamental

Sub Screen

Constellation

Number of RB: 5

Starting RB: 0

Interpolation (Constellation): None

4 Views

4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

LTE Band 14

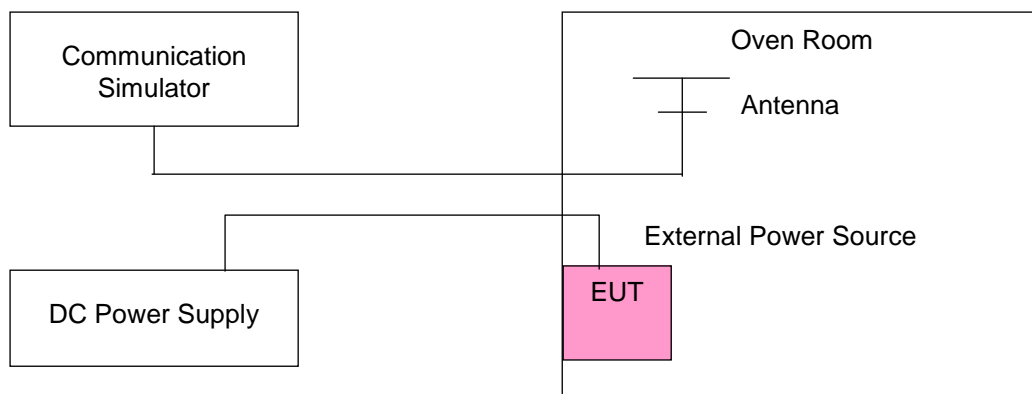
The frequency stability of mobile, portable and control transmitters operating in the wideband segment must be 1.25 parts per million or better when AFC is locked to a base station, and 5 parts per million or better when AFC is not locked.

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 °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 14				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
108	790.500002	0.002	795.500003	0.004	2.5
120	790.500002	0.003	795.500003	0.004	2.5
132	790.500003	0.004	795.500004	0.005	2.5

Note: The applicant defined the normal working voltage of the adapter is from 108 Vdc to 132 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 14				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	790.500003	0.003	795.500002	0.003	2.5
-20	790.500004	0.004	795.500004	0.005	2.5
-10	790.500002	0.002	795.500003	0.004	2.5
0	790.500003	0.004	795.500002	0.002	2.5
10	790.500003	0.004	795.500003	0.004	2.5
20	790.500002	0.002	795.500003	0.004	2.5
30	790.499998	-0.003	795.499996	-0.005	2.5
40	790.499998	-0.002	795.499998	-0.002	2.5
50	790.499997	-0.004	795.499999	-0.002	2.5
60	790.499996	-0.005	795.499998	-0.002	2.5
70	790.499997	-0.004	795.499999	-0.002	2.5
80	790.499997	-0.004	795.499999	-0.002	2.5
85	790.499998	-0.003	795.499997	-0.004	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 14		Limit (ppm)
	Channel Bandwidth: 10 MHz		
	Frequency (MHz)	Frequency Error (ppm)	
120	793.000002	0.002	2.5
108	793.000002	0.003	2.5
132	793.000004	0.005	2.5

Note: The applicant defined the normal working voltage of the adapter is from 108 Vac to 132 Vac.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 14		Limit (ppm)
	Channel Bandwidth: 10 MHz		
	Frequency (MHz)	Frequency Error (ppm)	
-30	793.000002	0.003	2.5
-20	793.000003	0.004	2.5
-10	793.000004	0.005	2.5
0	793.000003	0.004	2.5
10	793.000001	0.002	2.5
20	793.000002	0.003	2.5
30	792.999999	-0.002	2.5
40	792.999997	-0.003	2.5
50	792.999997	-0.004	2.5
60	792.999996	-0.005	2.5
70	792.999999	-0.001	2.5
50	792.999998	-0.002	2.5
85	792.999997	-0.004	2.5

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)	
120	814.700001	0.002	823.300004	0.005	2.5
108	814.700004	0.005	823.300002	0.003	2.5
132	814.700001	0.002	823.300003	0.004	2.5

Note: The applicant defined the normal working voltage of the adapter is from 108 Vac to 132 Vac.

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	814.700002	0.003	823.300004	0.005	2.5
-20	814.700001	0.001	823.300004	0.004	2.5
-10	814.700003	0.004	823.300003	0.003	2.5
0	814.700002	0.003	823.300002	0.003	2.5
10	814.700004	0.004	823.300003	0.004	2.5
20	814.700004	0.004	823.300003	0.004	2.5
30	814.699999	-0.002	823.299996	-0.004	2.5
40	814.699998	-0.002	823.299997	-0.004	2.5
50	814.699997	-0.004	823.299999	-0.002	2.5
60	814.699997	-0.004	823.299996	-0.004	2.5
70	814.699998	-0.002	823.299997	-0.003	2.5
80	814.699997	-0.003	823.299999	-0.001	2.5
85	814.699996	-0.005	823.299998	-0.003	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)	
120	815.500004	0.005	822.500002	0.002	2.5
108	815.500002	0.002	822.500001	0.002	2.5
132	815.500003	0.004	822.500002	0.002	2.5

Note: The applicant defined the normal working voltage of the adapter is from 108 Vac to 132 Vac.

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	815.500002	0.003	822.500003	0.004	2.5
-20	815.500002	0.002	822.500003	0.004	2.5
-10	815.500001	0.001	822.500002	0.003	2.5
0	815.500003	0.003	822.500001	0.001	2.5
10	815.500004	0.005	822.500001	0.001	2.5
20	815.500003	0.004	822.500003	0.004	2.5
30	815.499999	-0.001	822.499999	-0.002	2.5
40	815.499996	-0.005	822.499998	-0.002	2.5
50	815.499998	-0.003	822.499996	-0.005	2.5
60	815.499997	-0.003	822.499998	-0.002	2.5
70	815.499996	-0.005	822.499996	-0.005	2.5
80	815.499997	-0.003	822.499999	-0.002	2.5
85	815.499997	-0.004	822.499997	-0.004	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)	
120	816.500001	0.001	821.500002	0.003	2.5
108	816.500001	0.001	821.500002	0.003	2.5
132	816.500002	0.002	821.500001	0.002	2.5

Note: The applicant defined the normal working voltage of the adapter is from 108 Vac to 132 Vac.

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	816.500003	0.004	821.500002	0.003	2.5
-20	816.500003	0.004	821.500002	0.003	2.5
-10	816.500003	0.004	821.500001	0.002	2.5
0	816.500004	0.005	821.500001	0.002	2.5
10	816.500002	0.003	821.500001	0.001	2.5
20	816.500001	0.001	821.500003	0.003	2.5
30	816.499998	-0.002	821.499998	-0.003	2.5
40	816.499998	-0.003	821.499997	-0.003	2.5
50	816.499998	-0.002	821.499996	-0.004	2.5
60	816.499998	-0.002	821.499998	-0.002	2.5
70	816.499997	-0.004	821.499998	-0.003	2.5
80	816.499997	-0.004	821.499999	-0.001	2.5
85	816.499998	-0.003	821.499999	-0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 26		Limit (ppm)
	Channel Bandwidth: 10 MHz		
	Frequency (MHz)	Frequency Error (ppm)	
120	819.000003	0.003	2.5
108	819.000002	0.003	2.5
132	819.000002	0.002	2.5

Note: The applicant defined the normal working voltage of the adapter is from 108 Vac to 132 Vac.

Frequency Error vs. Temperature

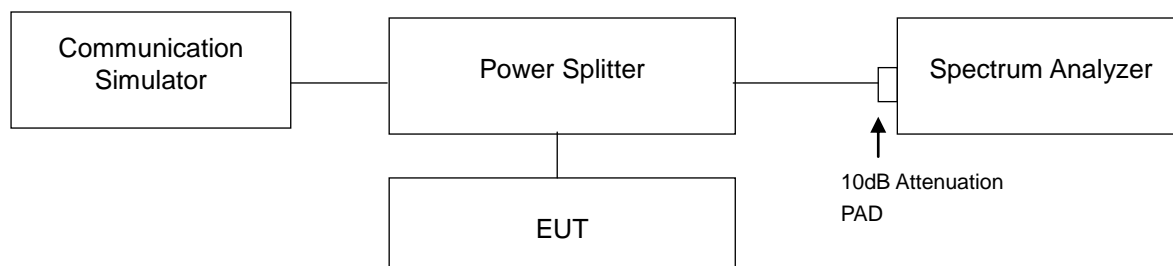
Temp. (°C)	LTE Band 26		Limit (ppm)
	Channel Bandwidth: 10 MHz		
	Frequency (MHz)	Frequency Error (ppm)	
-30	819.000001	0.001	2.5
-20	819.000003	0.004	2.5
-10	819.000003	0.003	2.5
0	819.000003	0.003	2.5
10	819.000004	0.005	2.5
20	819.000004	0.004	2.5
30	818.999997	-0.004	2.5
40	818.999999	-0.001	2.5
50	818.999997	-0.004	2.5
60	818.999997	-0.004	2.5
70	818.999997	-0.004	2.5
80	818.999997	-0.003	2.5
85	818.999999	-0.001	2.5

4.4 Occupied Bandwidth Measurement

4.4.1 Test Procedure

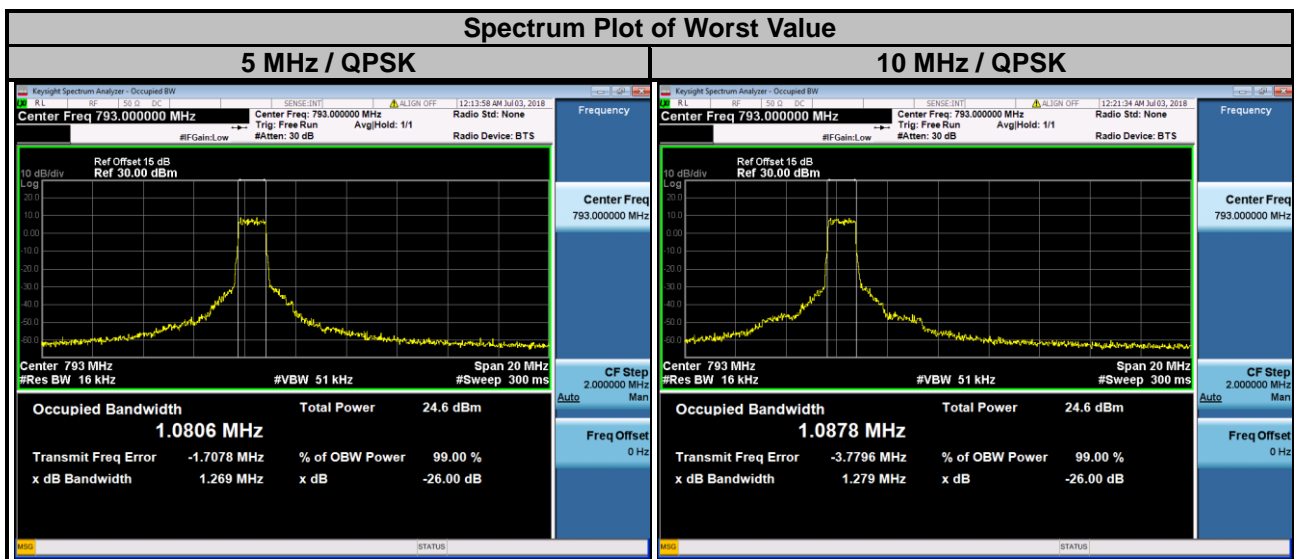
The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function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

4.4.2 Test Setup

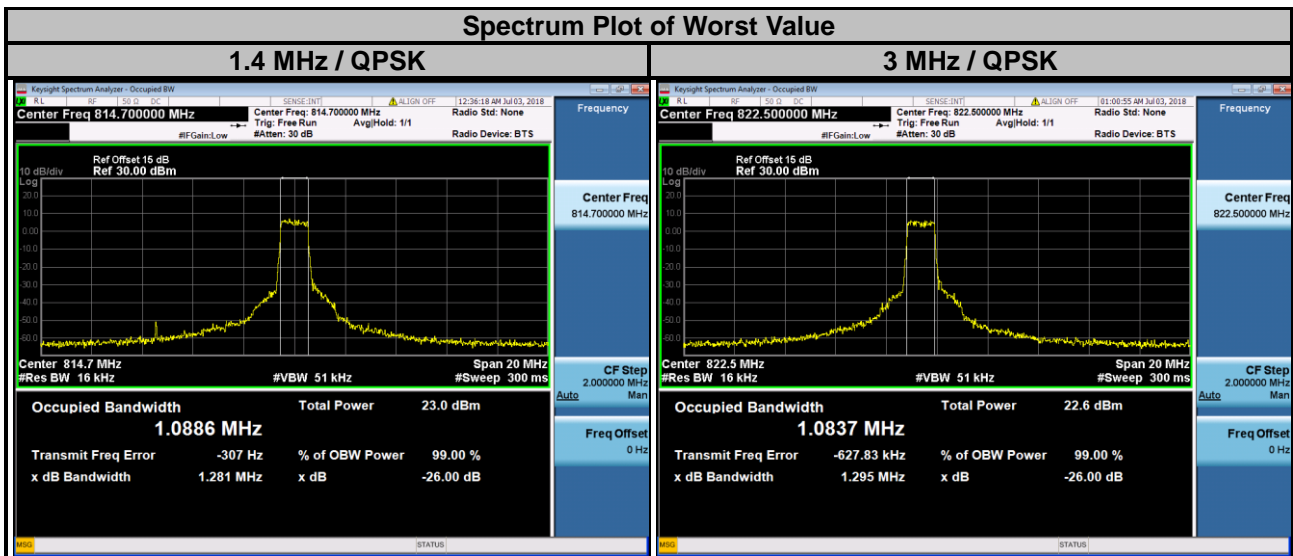


4.4.3 Test Result

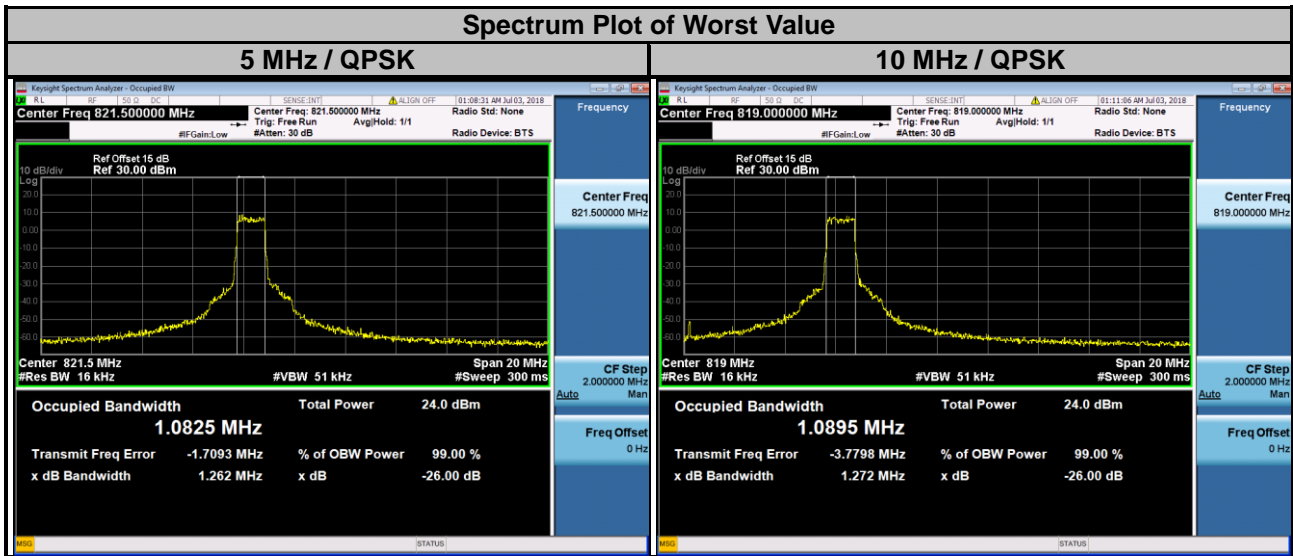
LTE Band 14							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
23305	790.5	1.078	0.890	23330	793	1.088	0.912
23330	793	1.081	0.912				
23355	795.5	1.079	0.913				



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	1.089	0.911	26705	815.5	1.084	0.905
26740	819.0	1.087	0.912	26740	819.0	1.079	0.916
26783	823.3	1.088	0.914	26775	822.5	1.084	0.915



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	1.082	0.918	26740	819.0	1.090	0.910
26740	819.0	1.077	0.917				
26765	821.5	1.083	0.904				



4.5 Emission Mask Measurement

4.5.1 Limits of Band Edge Measurement

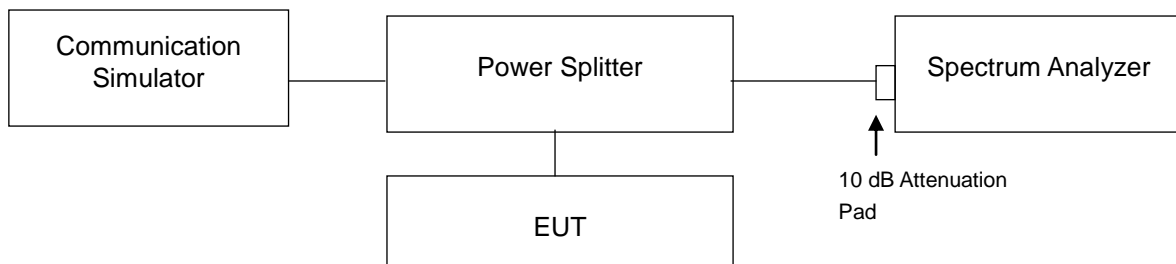
LTE Band 14

- (1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.
- (2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.
- (3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least $43 + 10 \log (P)$ dB

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.

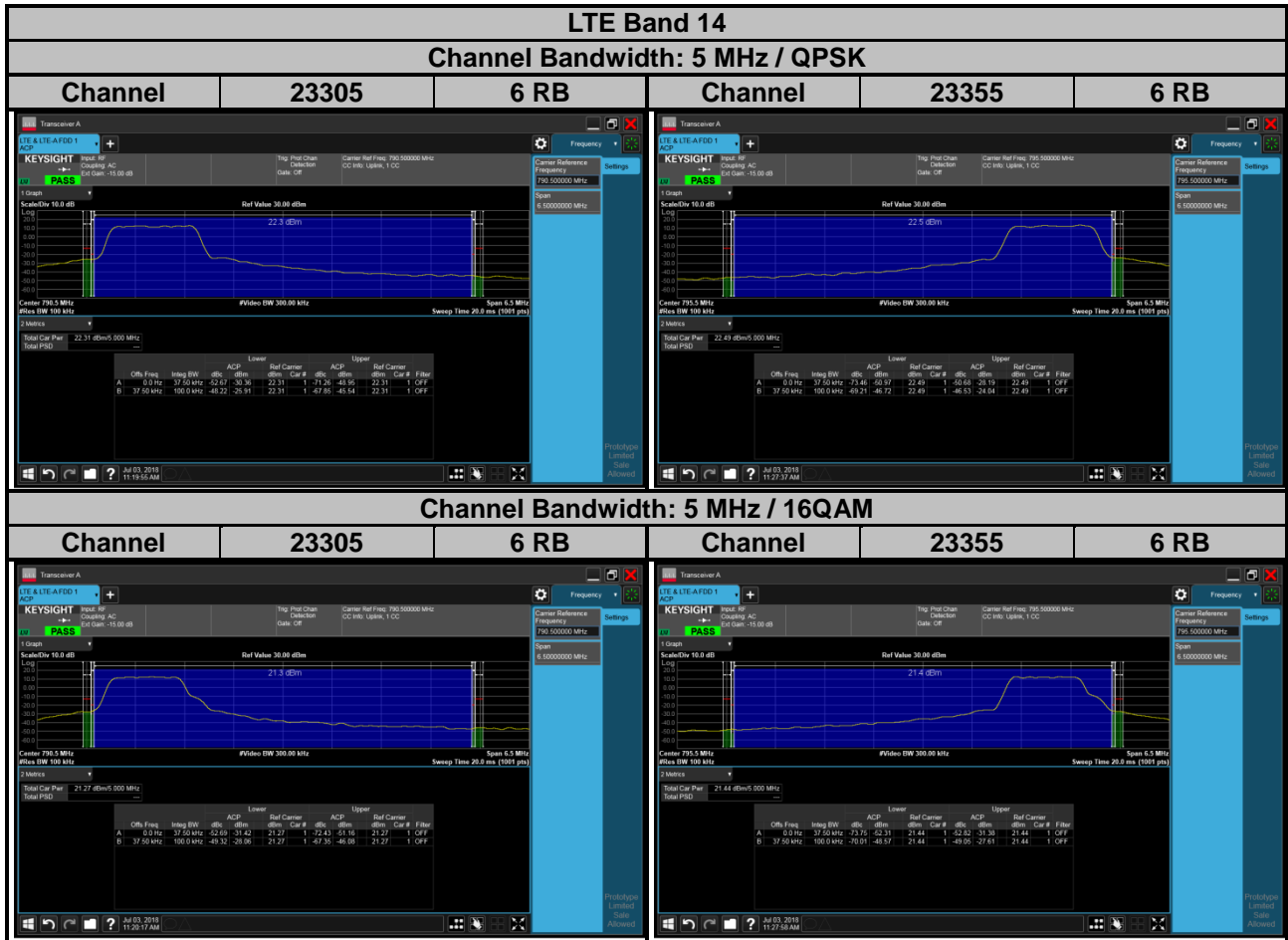
4.5.2 Test Setup



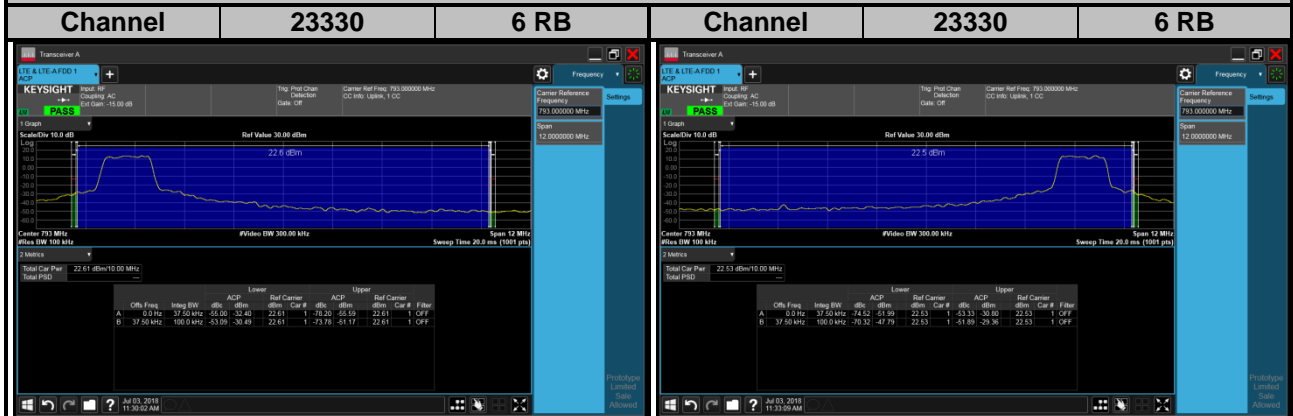
4.5.3 Test Procedures

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

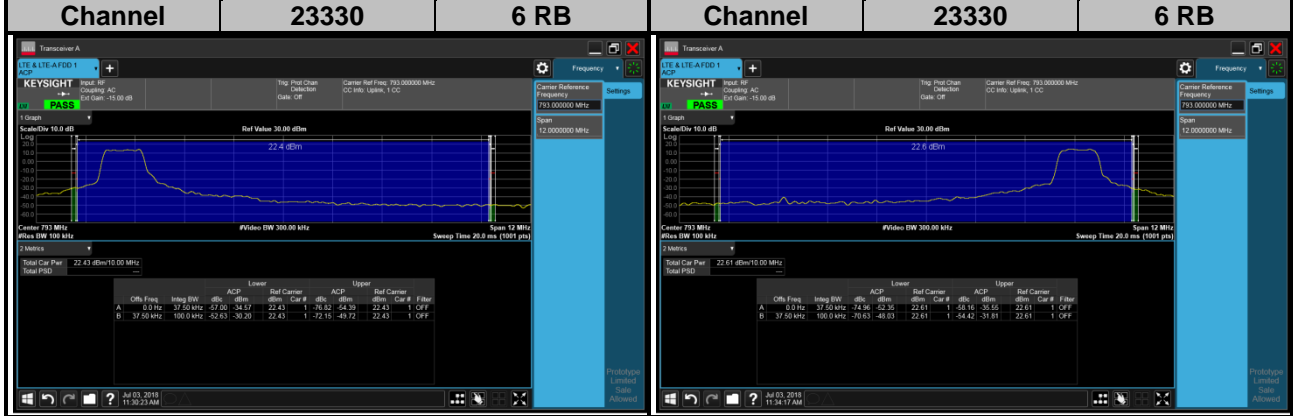
4.5.4 Test Results

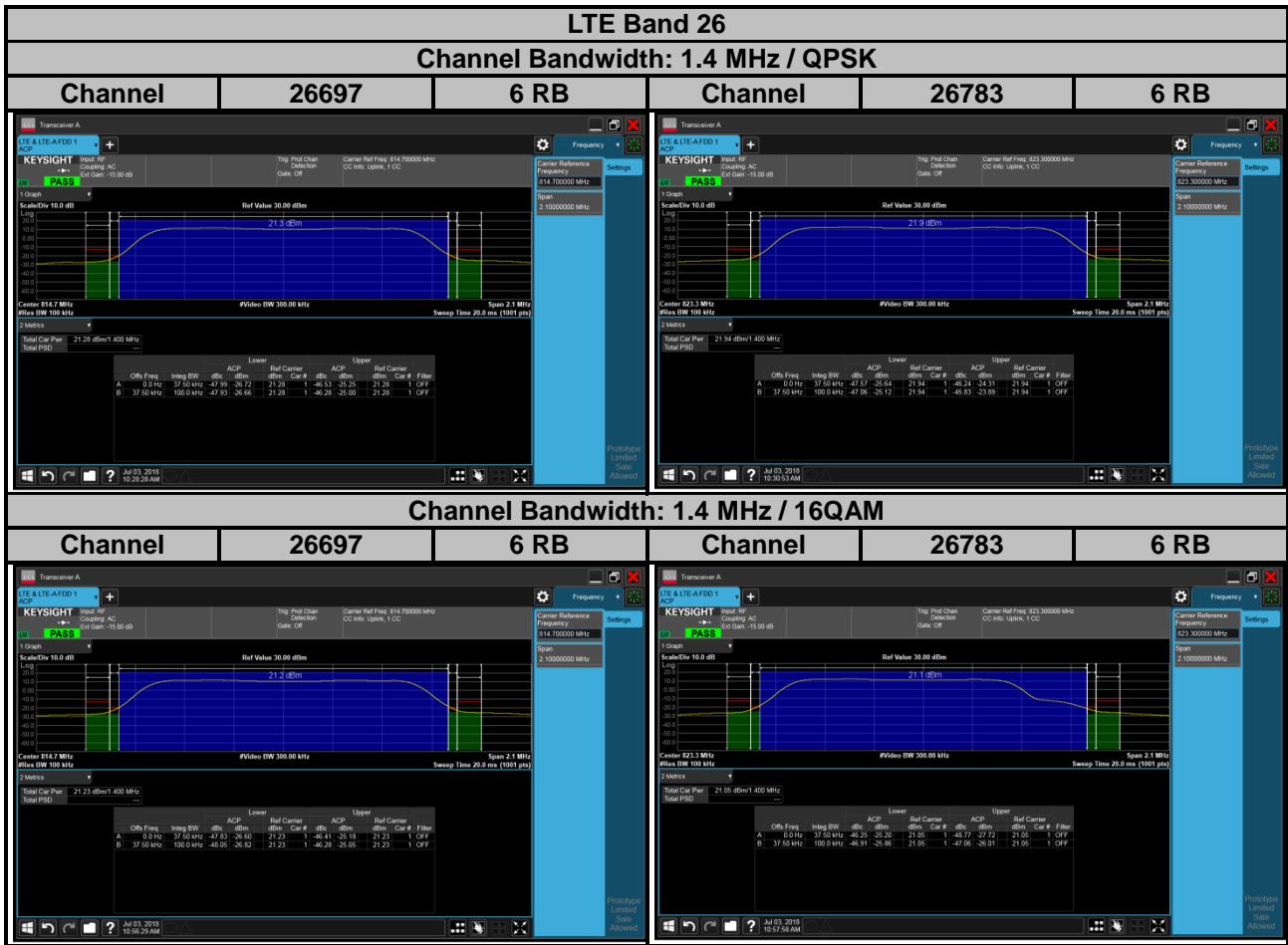


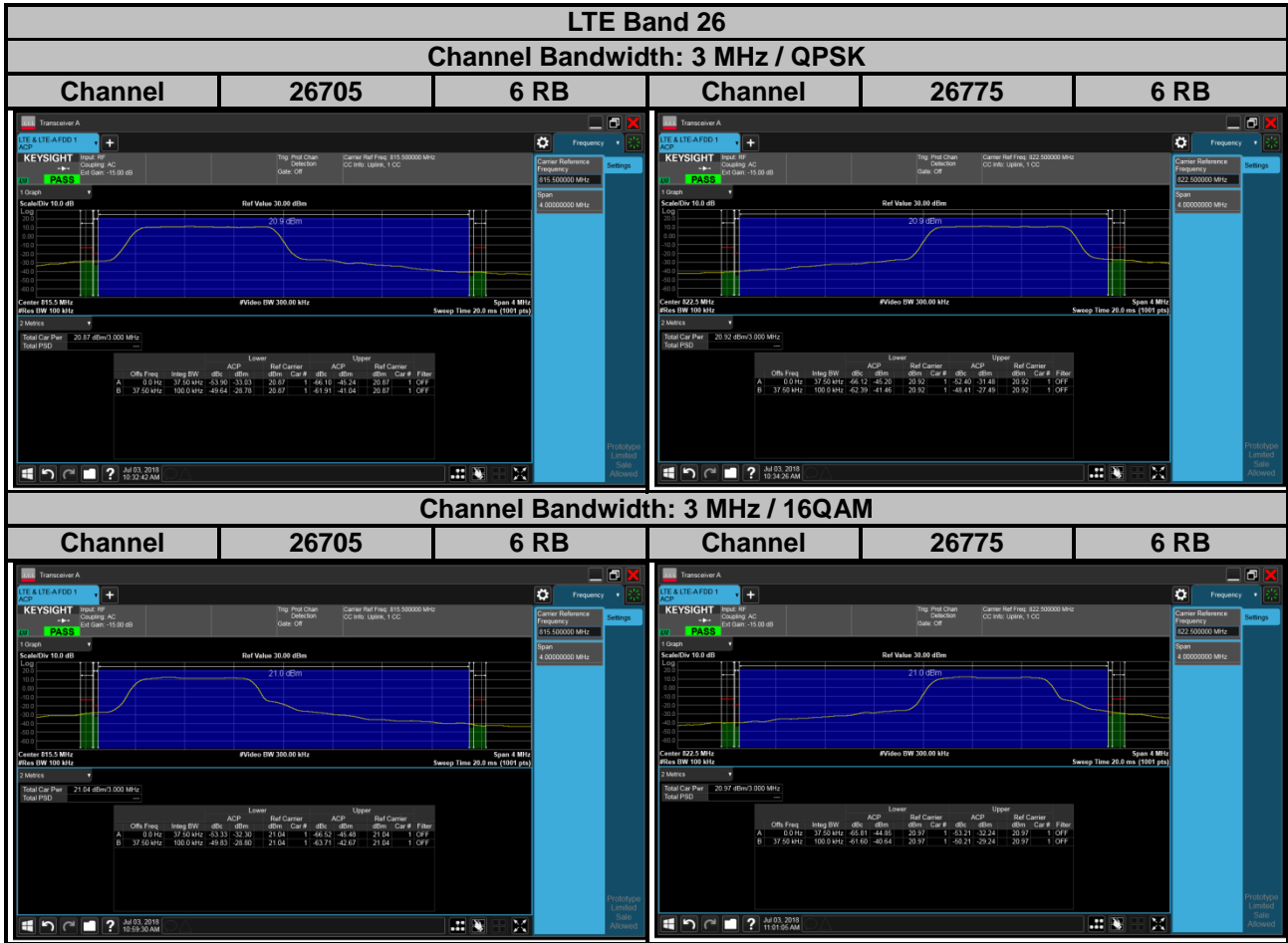
LTE Band 14
Channel Bandwidth: 10 MHz / QPSK

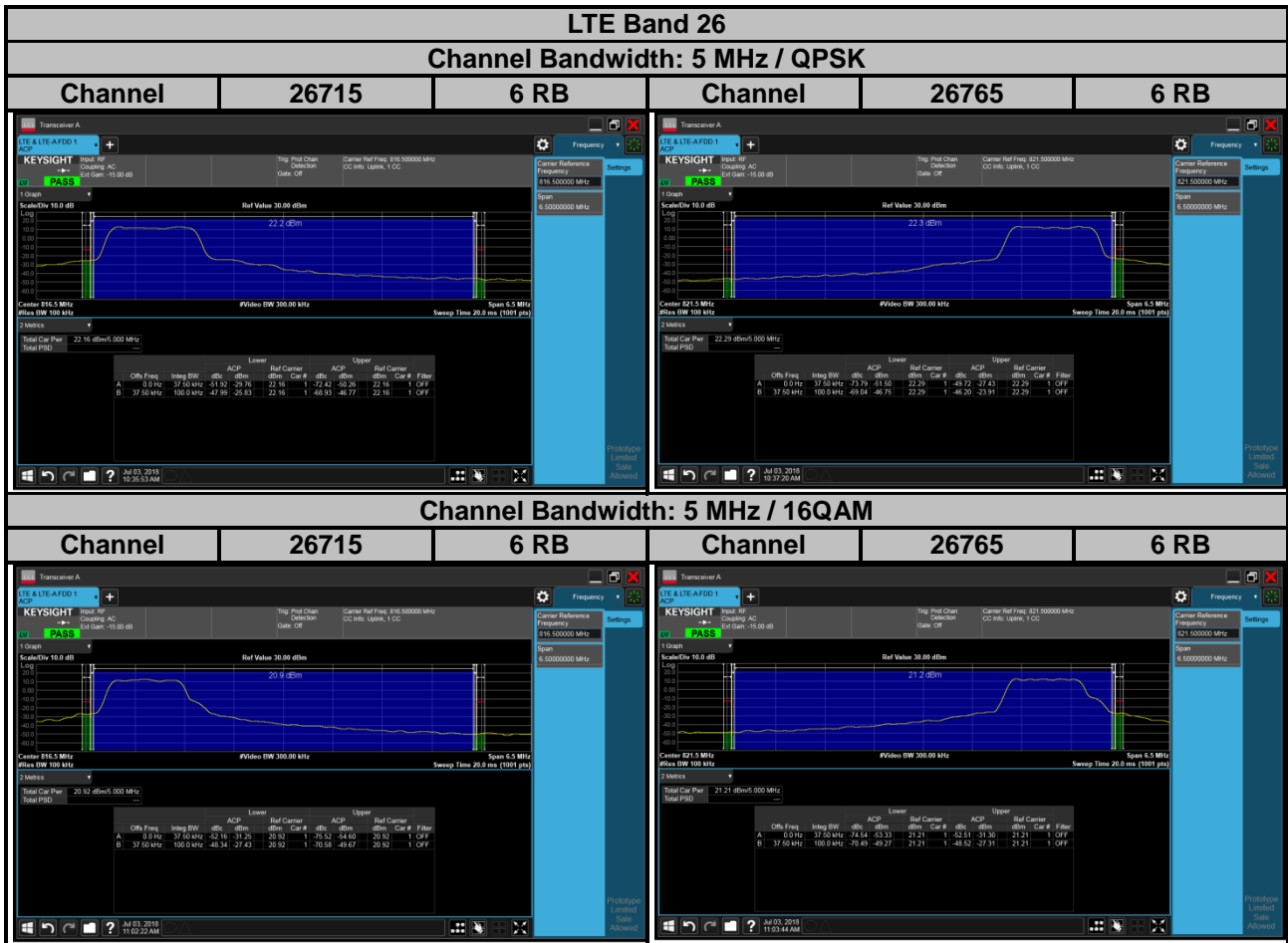


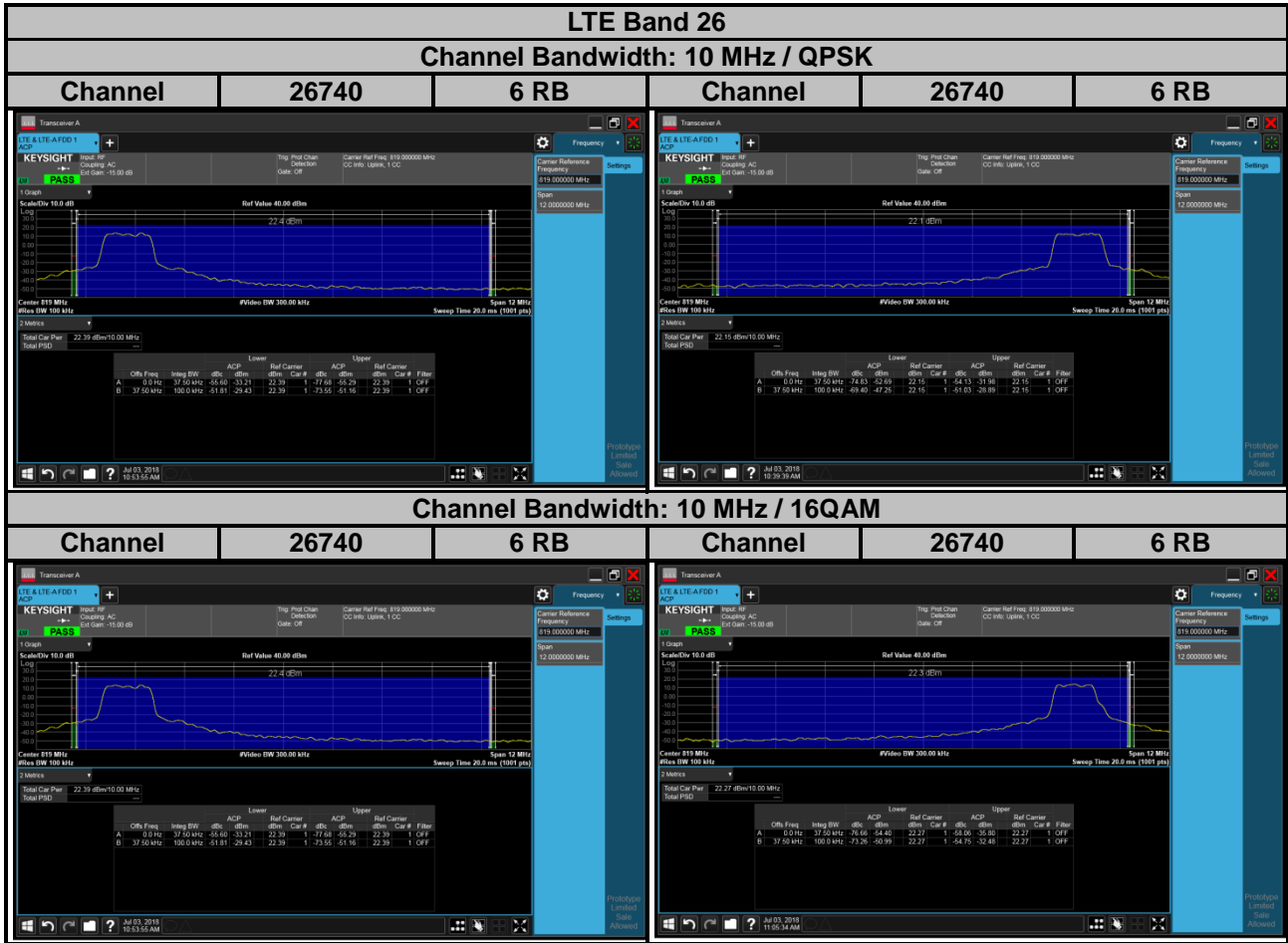
Channel Bandwidth: 10 MHz / 16QAM











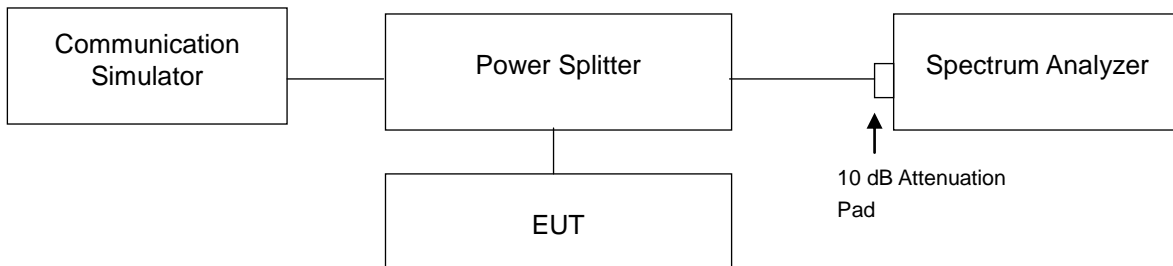
4.6 Conducted Spurious Emissions

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.

On all frequencies between 769 – 775 MHz and 799 – 805 MHz, by a factor not less than $65 + 10 \log(P)$ dB in a 6.25 kHz band segment, for mobile and portable stations.

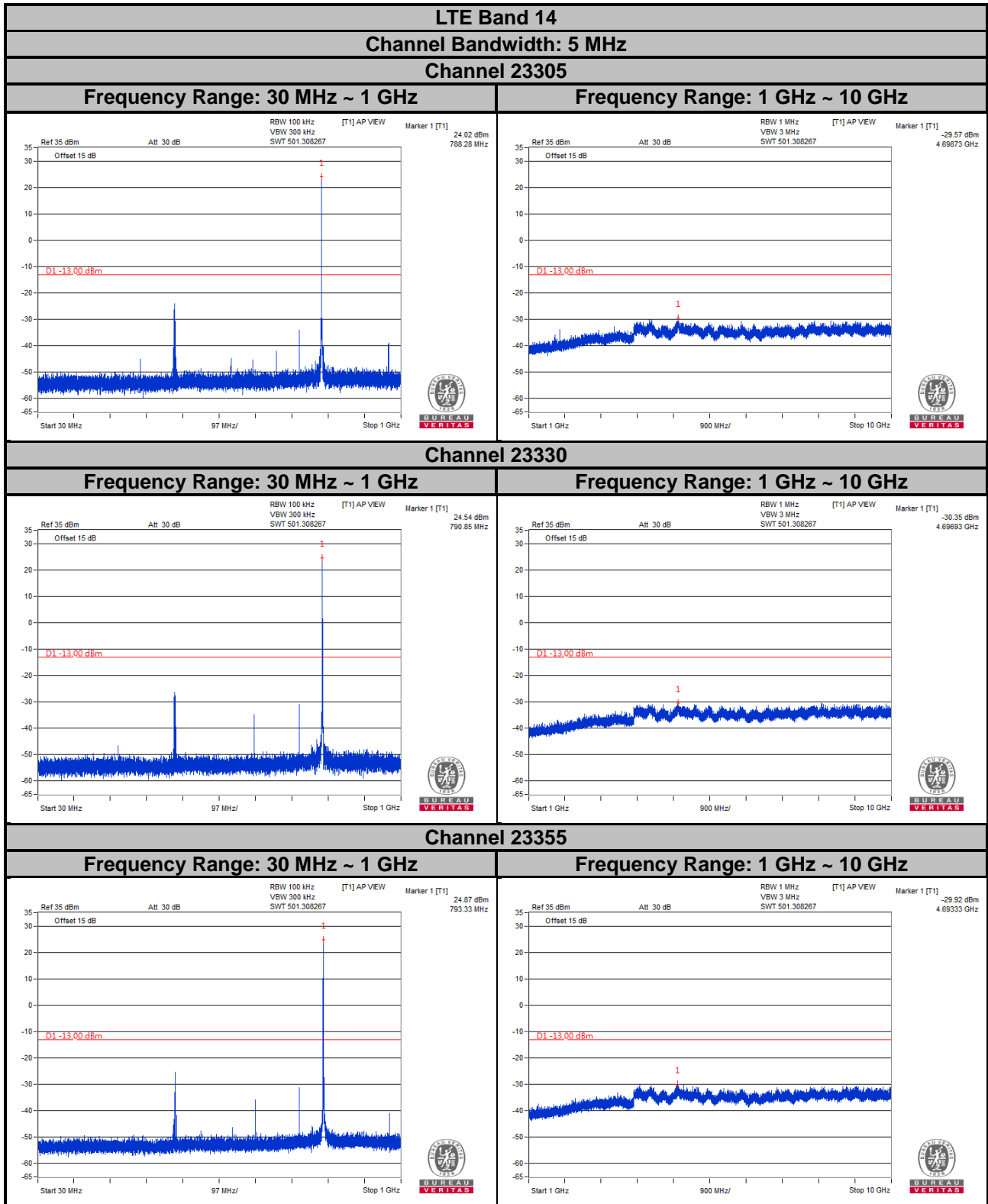
4.6.2 Test Setup



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 30 MHz to 10 GHz. 10 dB attenuation pad is connected with spectrum. RBW = 100 kHz and VBW = 300 kHz are used for conducted emission measurement.

4.6.4 Test Results



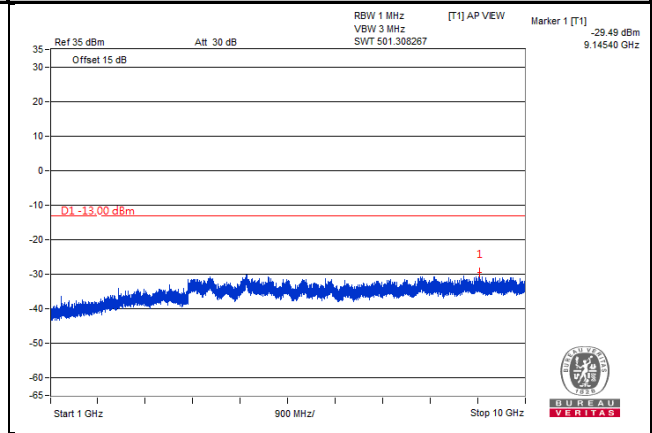
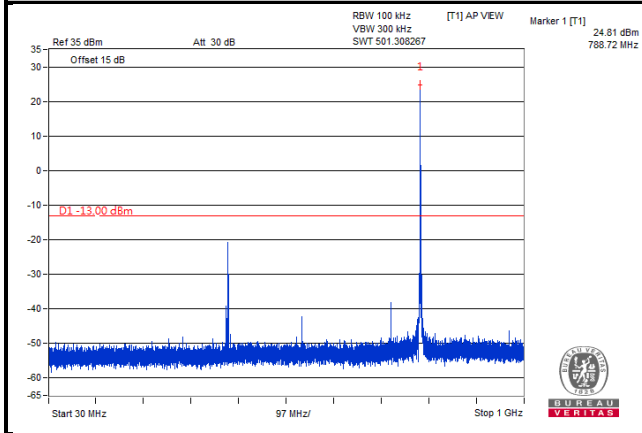
LTE Band 14

Channel Bandwidth: 10 MHz

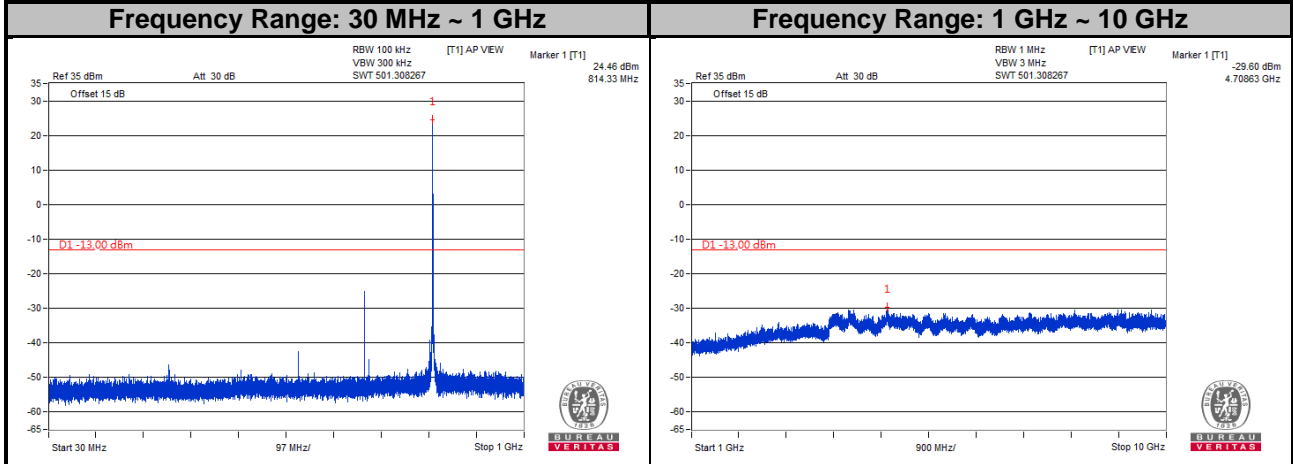
Channel 23330

Frequency Range: 30 MHz ~ 1 GHz

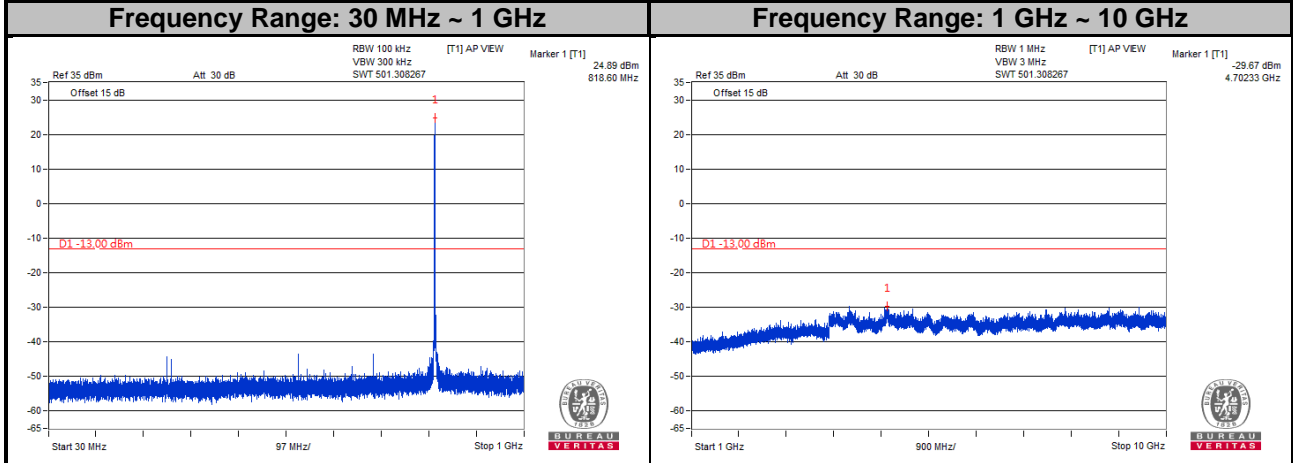
Frequency Range: 1 GHz ~ 10 GHz



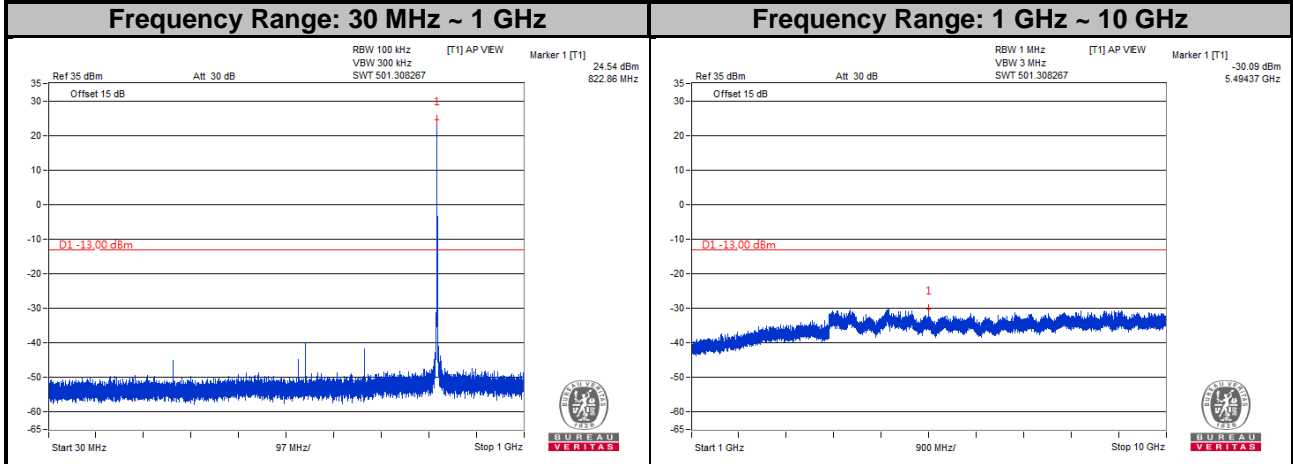
LTE Band 26
Channel Bandwidth: 1.4 MHz
Channel 26697



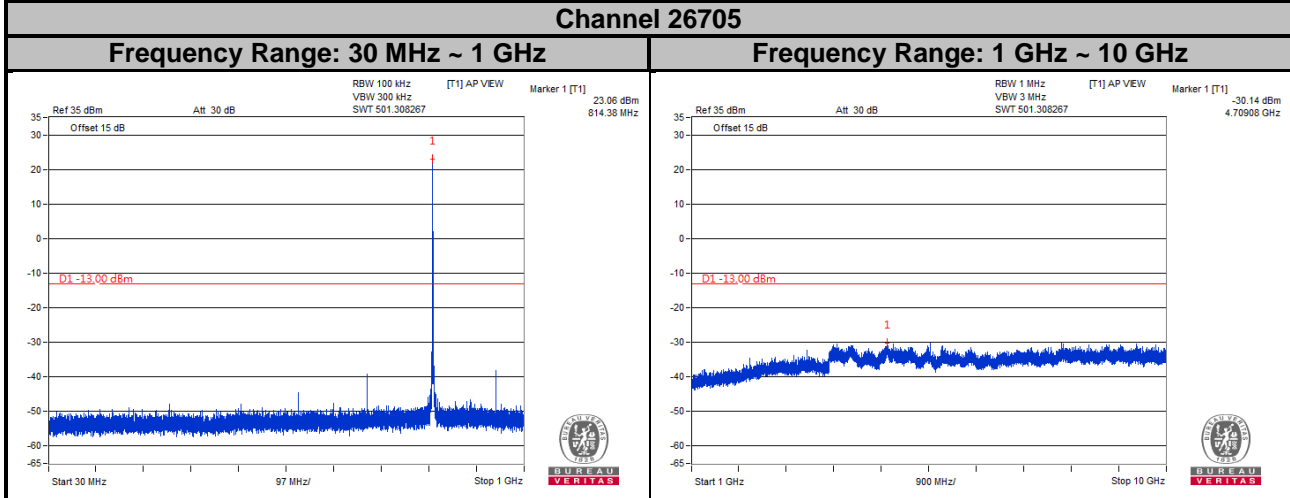
Channel 26740



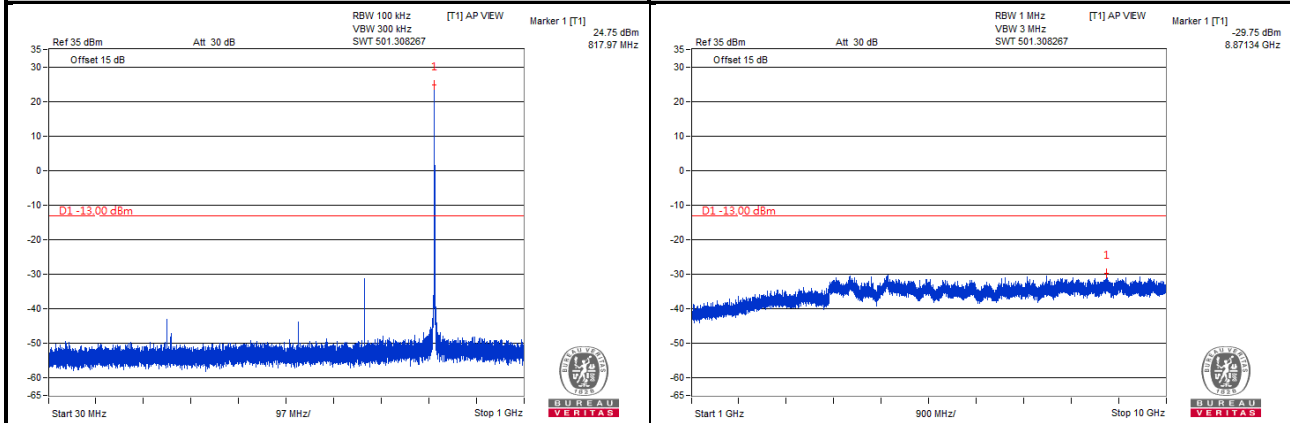
Channel 26783



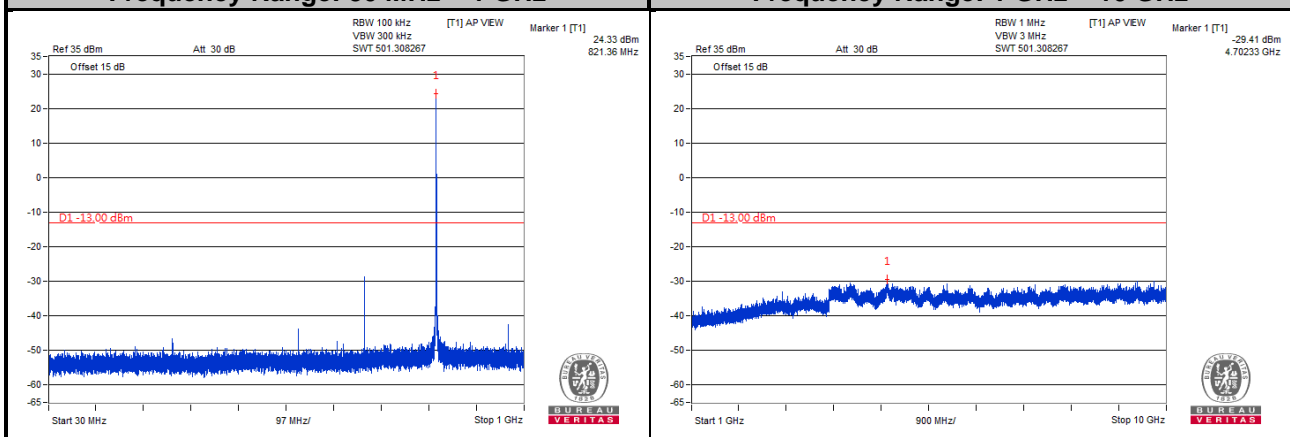
LTE Band 26
Channel Bandwidth: 3 MHz
Channel 26705



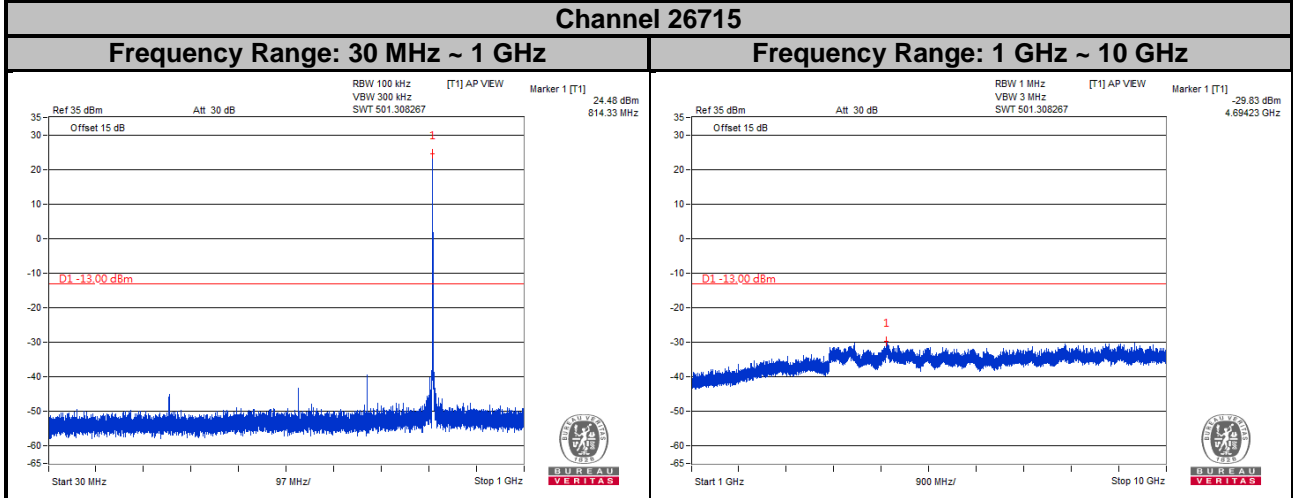
Channel 26740



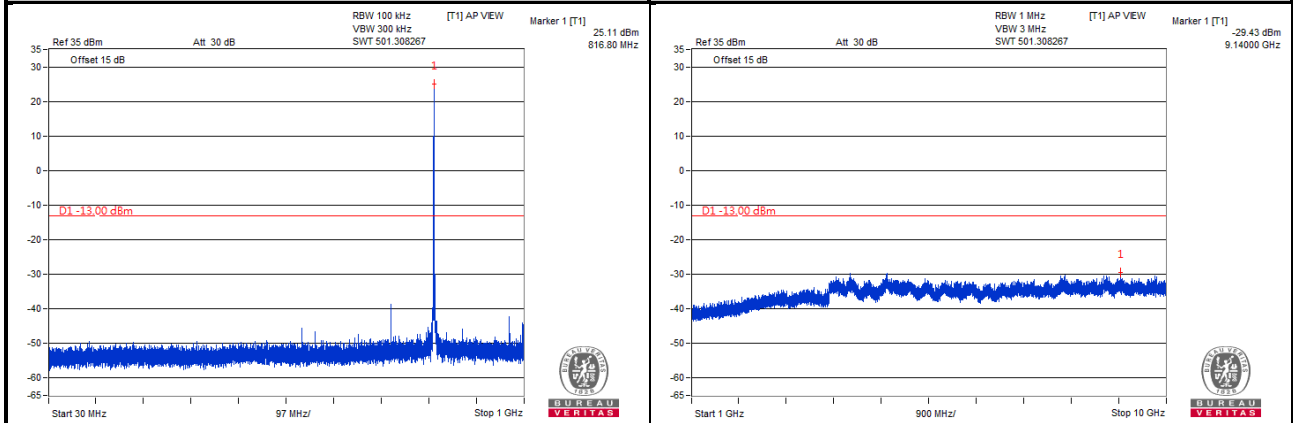
Channel 26775



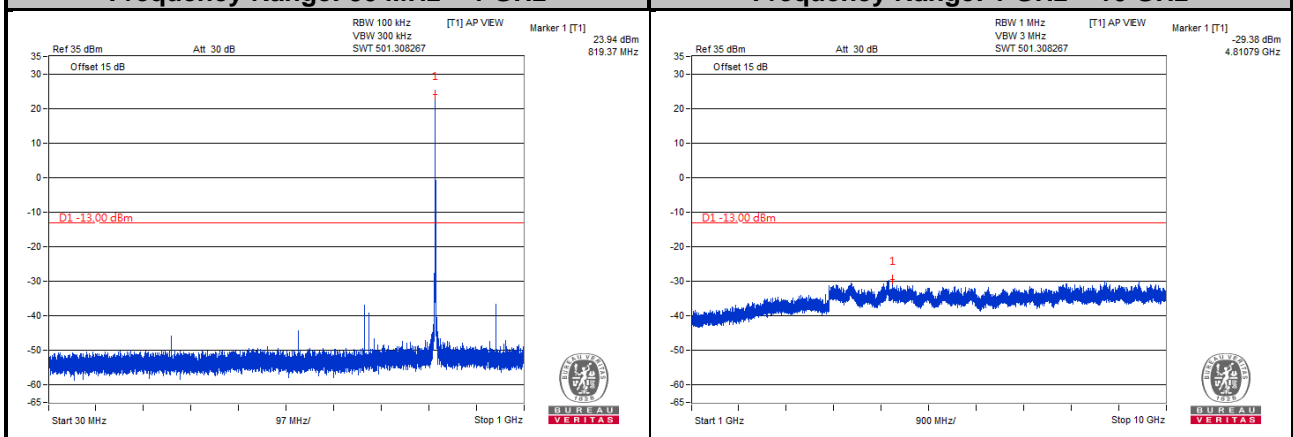
LTE Band 26
Channel Bandwidth: 5 MHz
Channel 26715

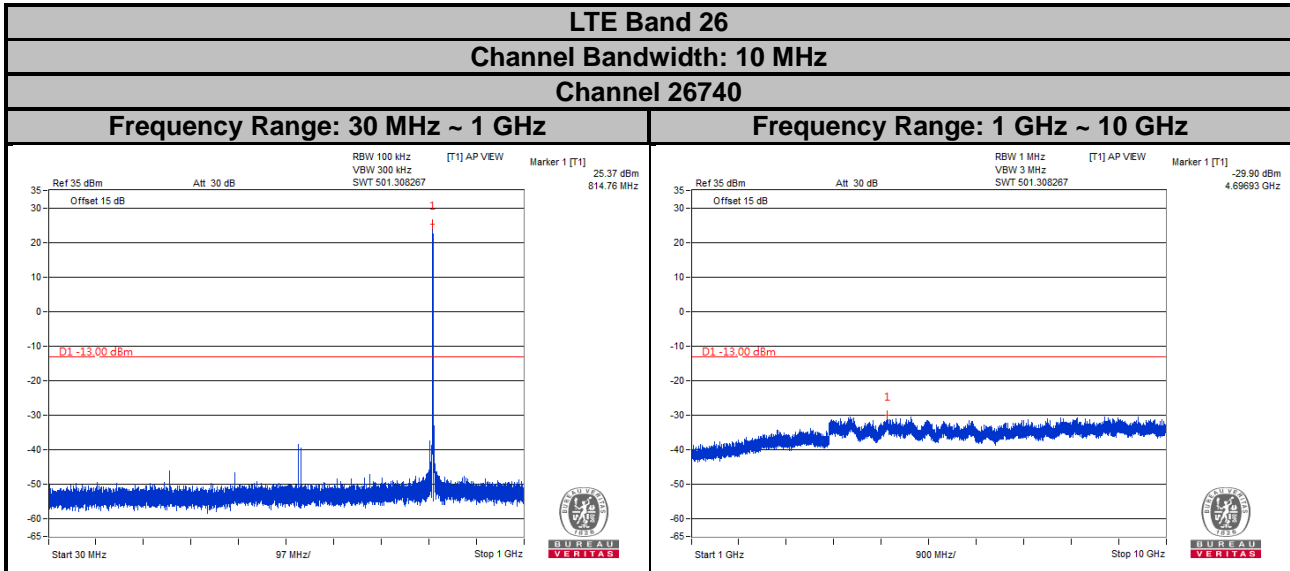


Channel 26740



Channel 26765





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 $43 + 10 \log_{10}(P)$ dB. The limit of emission is equal to -13 dBm.
- (2) For operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

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

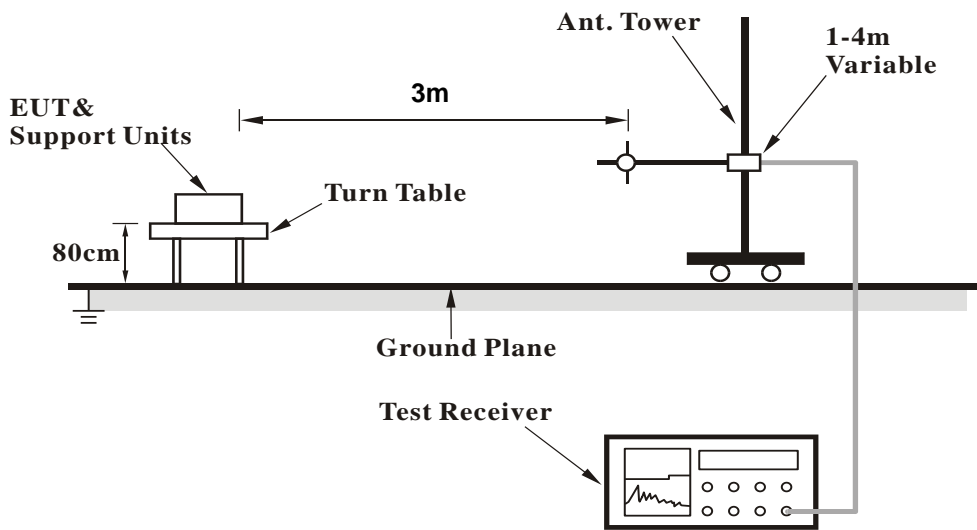
Note: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.7.3 Deviation from Test Standard

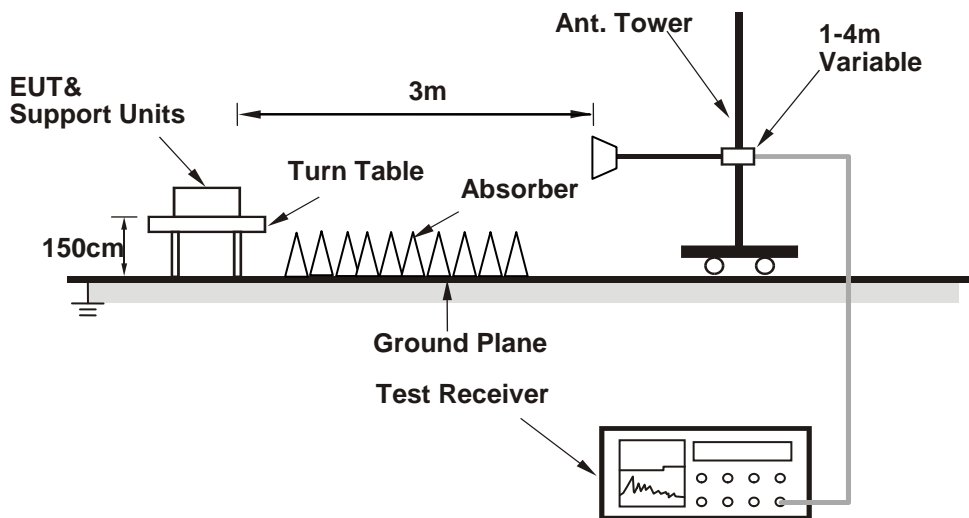
No deviation.

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 14_1 RB

Channel Bandwidth: 5 MHz / QPSK

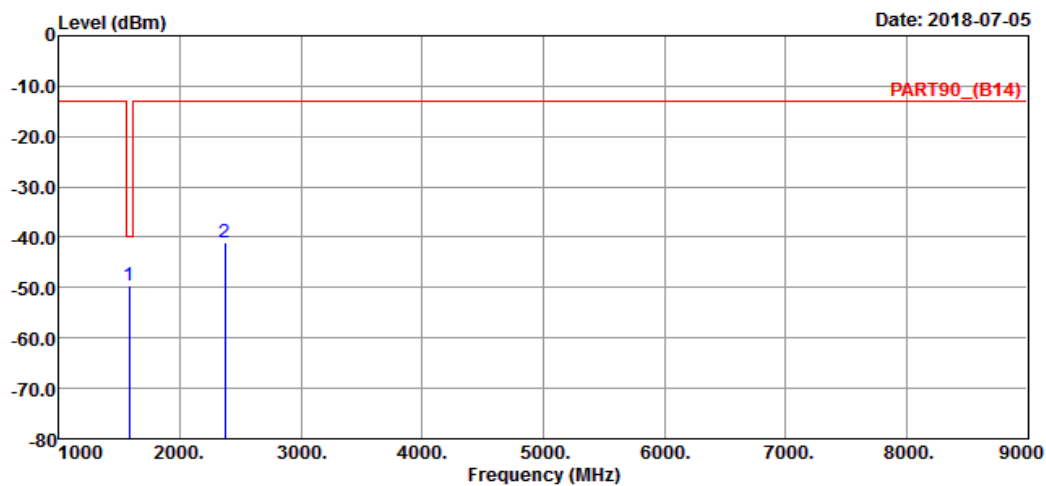
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 1



Site : 966 Chamber 5
 Condition: PART90_(B14) HORIZONTAL
 Remak : Cat-M1 Band 14 QPSK_5M Link_L-CH
 Tested by: Thomas Wei

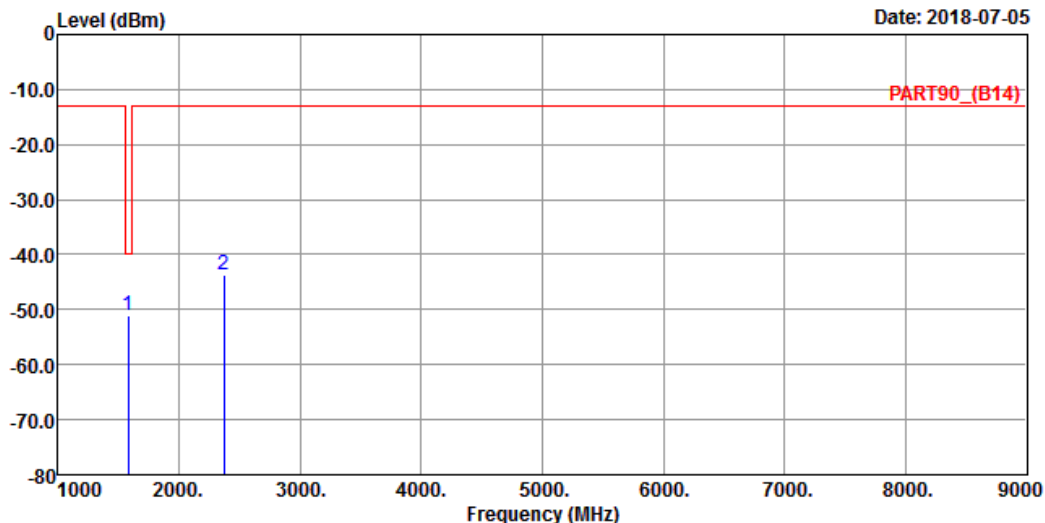
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1581.00	-49.55	-36.17	-40.00	-9.55	-13.38	Peak
2	2371.50	-40.89	-31.26	-13.00	-27.89	-9.63	Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 2



Site : 966 Chamber 5
 Condition: PART90_(B14) VERTICAL
 Remak : Cat-M1 Band 14 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 pp	1581.00	-51.18	-37.80	-40.00	-11.18	-13.38	Peak
2	2371.50	-43.60	-33.97	-13.00	-30.60	-9.63	Peak

Middle Channel

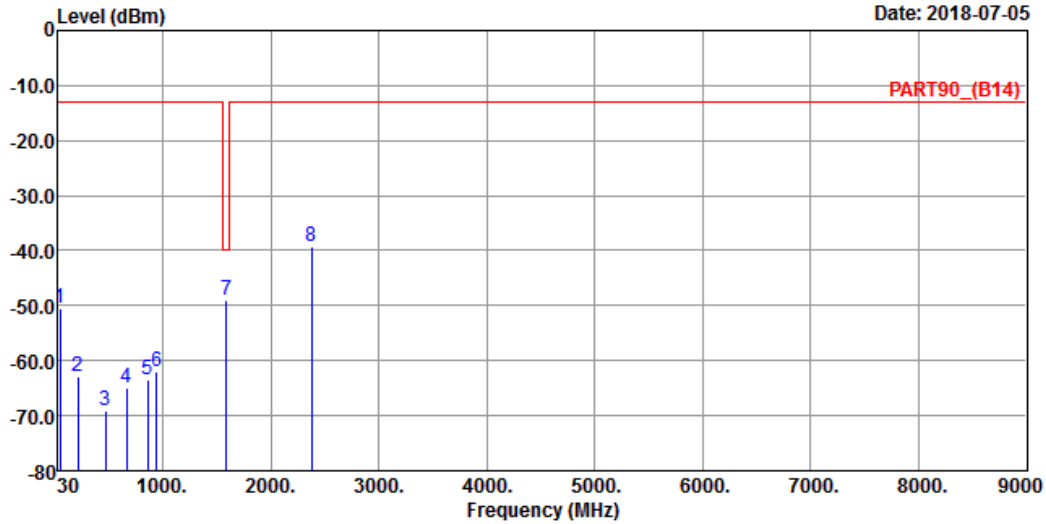


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5

Date: 2018-07-05



Site : 966 Chamber 5
 Condition: PART90_(B14) HORIZONTAL
 Remak : Cat-M1 Band 14 QPSK_5M Link_M-CH
 Tested by: Thomas Wei

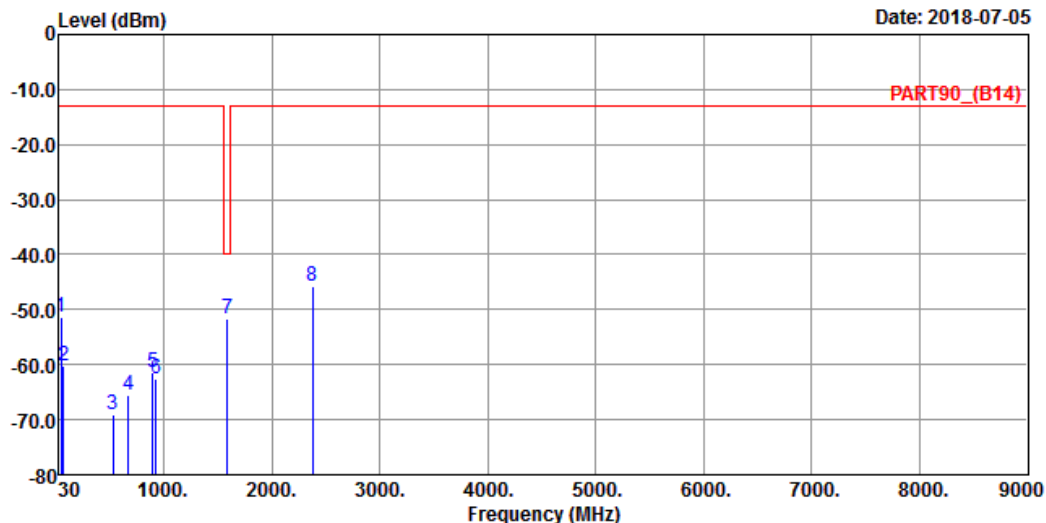
	Read	Limit	Over				
Freq	Level	Level	Line	Limit	Factor	Remark	
MHz	dBm	dBm	dBm	dB	dB		
1	45.52	-50.47	-47.97	-13.00	-37.47	-2.50	Peak
2	210.42	-62.74	-55.15	-13.00	-49.74	-7.59	Peak
3	471.35	-68.94	-63.79	-13.00	-55.94	-5.15	Peak
4	664.38	-65.08	-64.42	-13.00	-52.08	-0.66	Peak
5	862.26	-63.56	-63.92	-13.00	-50.56	0.36	Peak
6	942.77	-61.91	-63.54	-13.00	-48.91	1.63	Peak
7 pp	1586.00	-49.14	-35.75	-40.00	-9.14	-13.39	Peak
8	2379.00	-39.13	-29.44	-13.00	-26.13	-9.69	Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 6



Site : 966 Chamber 5
 Condition: PART90_(B14) VERTICAL
 Remak : Cat-M1 Band 14 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	43.58	-51.40	-49.93	-13.00	-38.40	-1.47	Peak
2	68.80	-60.34	-52.02	-13.00	-47.34	-8.32	Peak
3	530.52	-69.00	-65.46	-13.00	-56.00	-3.54	Peak
4	674.08	-65.44	-64.93	-13.00	-52.44	-0.51	Peak
5	895.24	-61.46	-62.00	-13.00	-48.46	0.54	Peak
6	923.37	-62.47	-63.62	-13.00	-49.47	1.15	Peak
7 pp	1586.00	-51.75	-38.36	-40.00	-11.75	-13.39	Peak
8	2379.00	-45.90	-36.21	-13.00	-32.90	-9.69	Peak

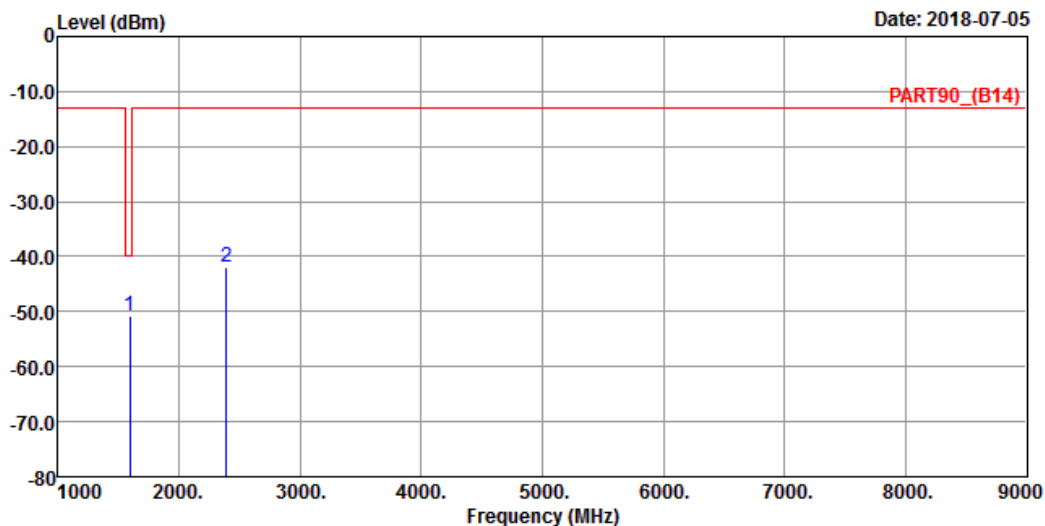
High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 1



Site : 966 Chamber 5
 Condition: PART90_(B14) HORIZONTAL
 Remak : Cat-M1 Band 14 QPSK_5M Link_H-CH
 Tested by: Thomas Wei

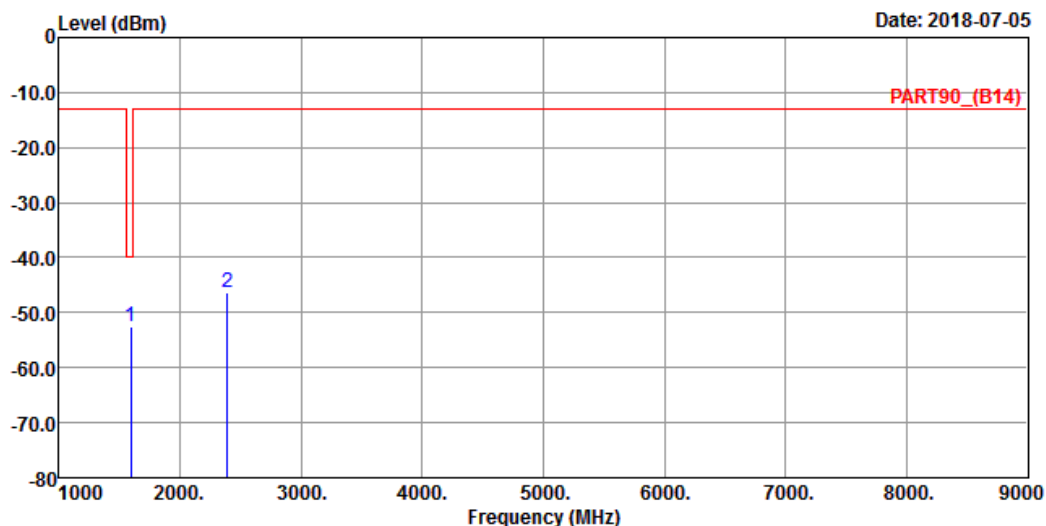
	Read	Limit	Over				
Freq	Level	Level	Line	Limit	Factor	Remark	
MHz	dBm	dBm	dBm	dB	dB		
1 pp 1591.00	-50.78	-37.37	-40.00	-10.78	-13.41	Peak	
2 2386.50	-42.01	-32.26	-13.00	-29.01	-9.75	Peak	



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 2



Site : 966 Chamber 5
 Condition: PART90_(B14) VERTICAL
 Remak : Cat-M1 Band 14 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 pp	1591.00	-52.44	-39.03	-40.00	-12.44	-13.41	Peak
2	2386.50	-46.26	-36.51	-13.00	-33.26	-9.75	Peak

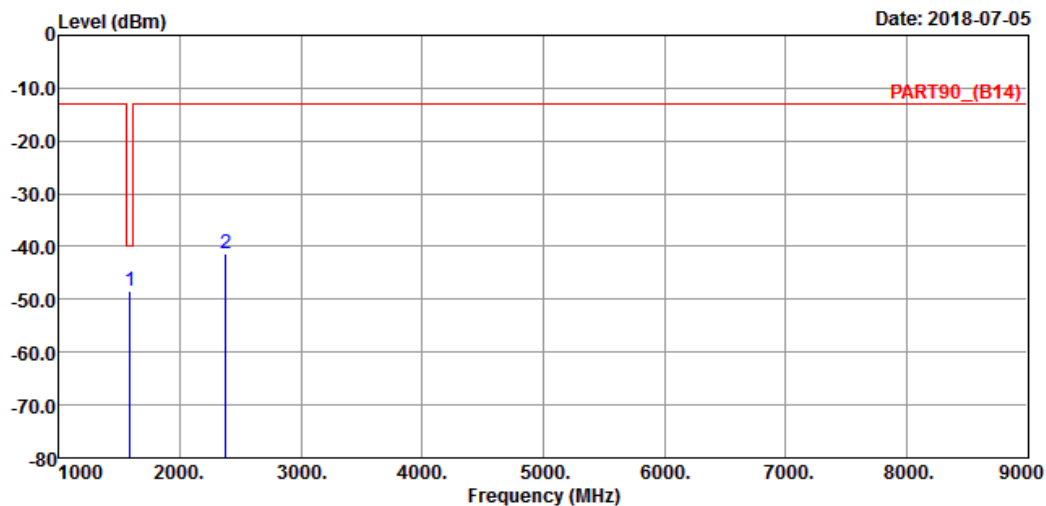
Channel Bandwidth: 10 MHz / QPSK
Middle Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 1



Site : 966 Chamber 5
Condition: PART90_(B14) HORIZONTAL
Remak : Cat-M1 Band 14 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	pp 1586.00	-48.32	-34.93	-40.00	-8.32	-13.39	Peak
2	2379.00	-41.27	-31.58	-13.00	-28.27	-9.69	Peak

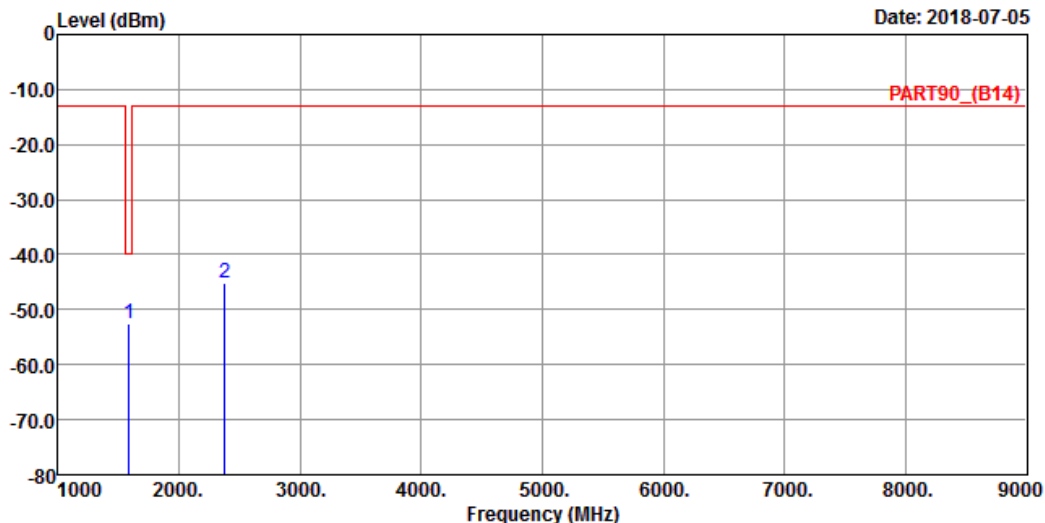


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 2

Date: 2018-07-05



Site : 966 Chamber 5
 Condition: PART90_(B14) VERTICAL
 Remak : Cat-M1 Band 14 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 pp	1586.00	-52.64	-39.25	-40.00	-12.64	-13.39	Peak
2	2379.00	-45.29	-35.60	-13.00	-32.29	-9.69	Peak

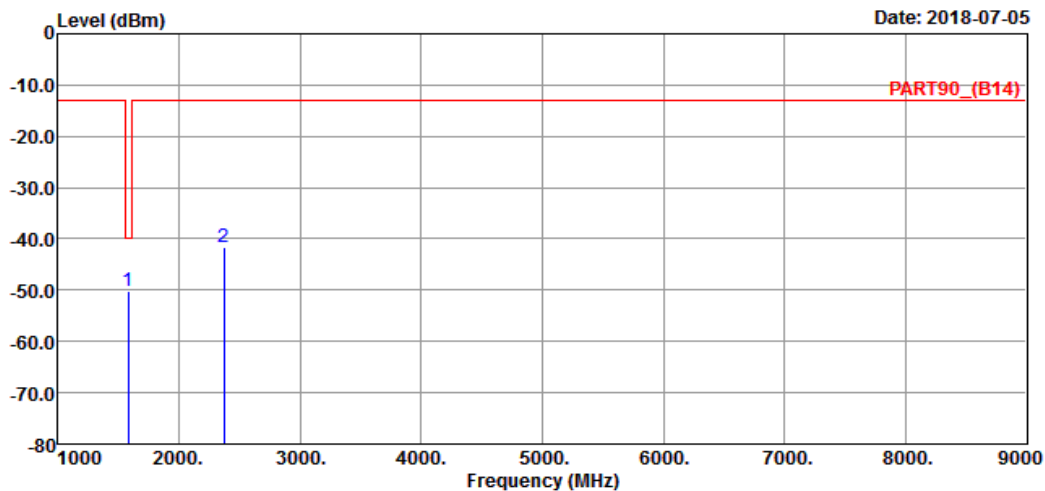
LTE Band 14_Full RB
 Channel Bandwidth: 5 MHz / QPSK
 Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 1



Site : 966 Chamber 5
 Condition: PART90_(B14) HORIZONTAL
 Remak : Cat-M1 Band 14 QPSK_5M Link_L-CH
 Tested by: Thomas Wei

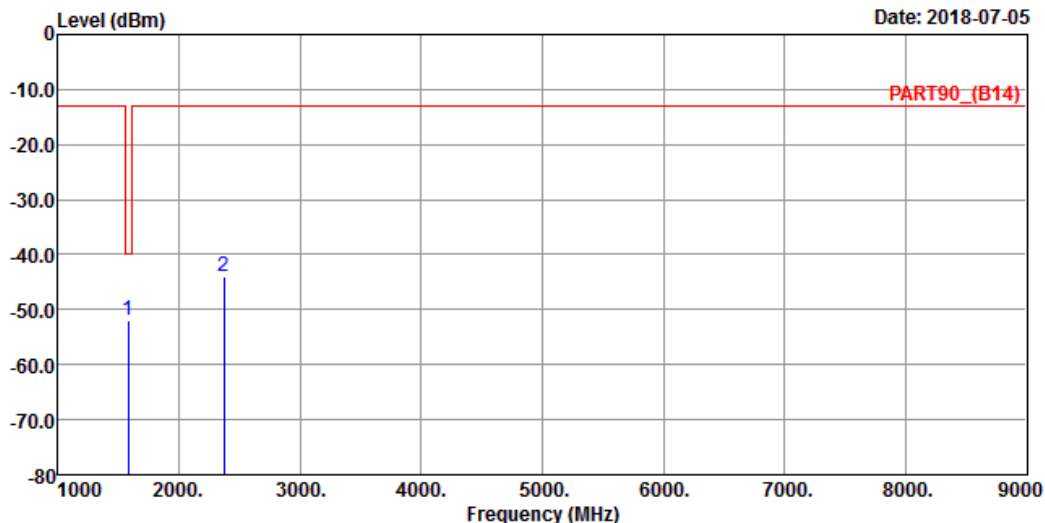
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	pp 1581.00	-50.11	-36.73	-40.00	-10.11	-13.38	Peak
2	2371.50	-41.58	-31.95	-13.00	-28.58	-9.63	Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 2



Site : 966 Chamber 5
 Condition: PART90_(B14) VERTICAL
 Remak : Cat-M1 Band 14 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 pp	1581.00	-51.87	-38.49	-40.00	-11.87	-13.38	Peak
2	2371.50	-44.06	-34.43	-13.00	-31.06	-9.63	Peak

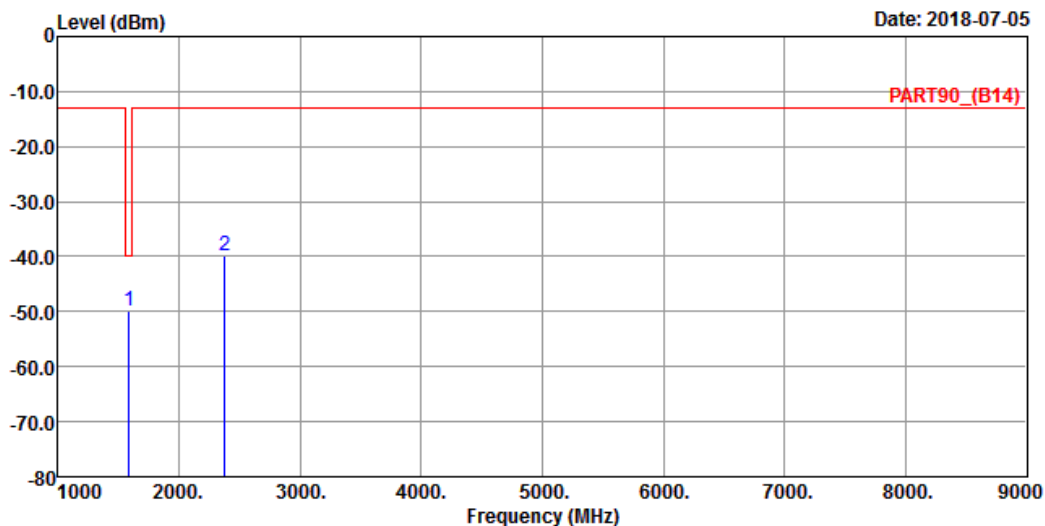
Middle Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 1



Site : 966 Chamber 5
 Condition: PART90_(B14) HORIZONTAL
 Remak : Cat-M1 Band 14 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	pp 1586.00	-49.83	-36.44	-40.00	-9.83	-13.39	Peak
2	2379.00	-39.91	-30.22	-13.00	-26.91	-9.69	Peak

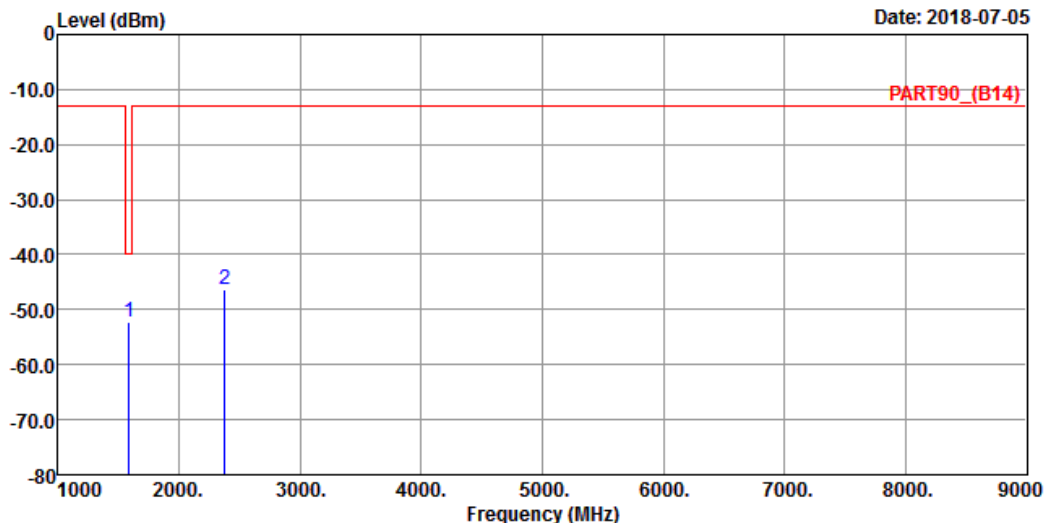


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 2

Date: 2018-07-05



Site : 966 Chamber 5
 Condition: PART90_(B14) VERTICAL
 Remak : Cat-M1 Band 14 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 pp	1586.00	-52.29	-38.90	-40.00	-12.29	-13.39	Peak
2	2379.00	-46.48	-36.79	-13.00	-33.48	-9.69	Peak

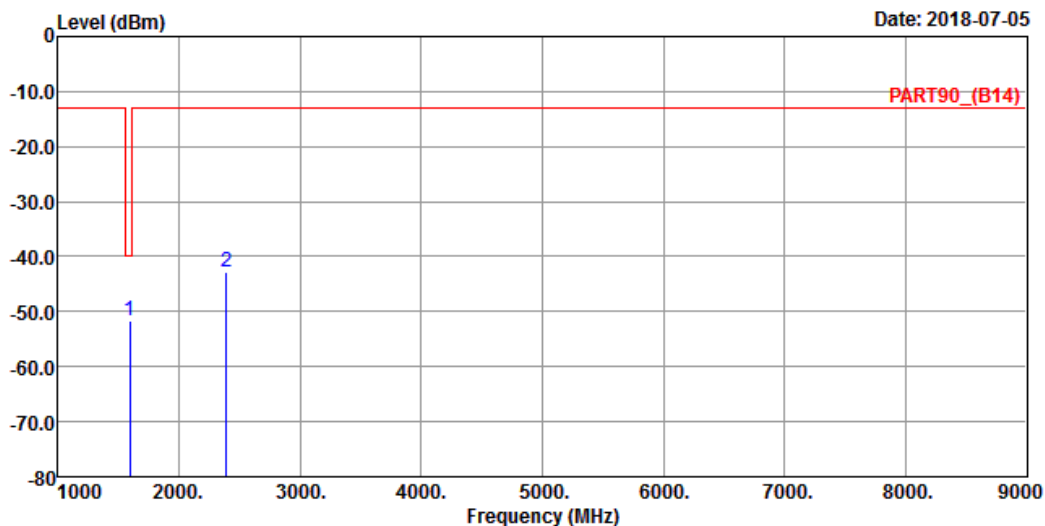
High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 1



Site : 966 Chamber 5
 Condition: PART90_(B14) HORIZONTAL
 Remak : Cat-M1 Band 14 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 pp 1591.00	-51.55	-38.14	-40.00	-11.55	-13.41	Peak
2 2386.50	-42.79	-33.04	-13.00	-29.79	-9.75	Peak

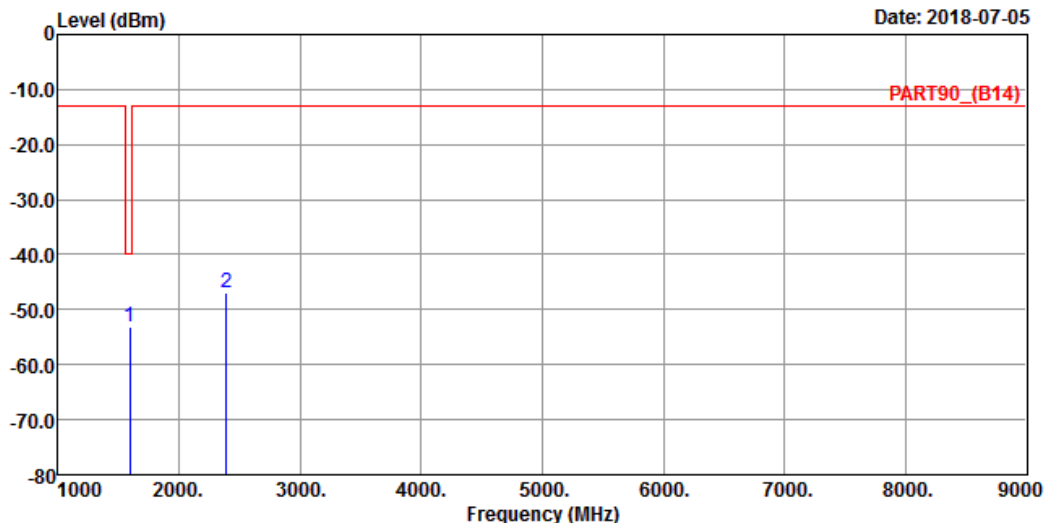


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 2

Date: 2018-07-05



Site : 966 Chamber 5
 Condition: PART90_(B14) VERTICAL
 Remak : Cat-M1 Band 14 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 pp	1591.00	-53.06	-39.65	-40.00	-13.06	-13.41	Peak
2	2386.50	-46.92	-37.17	-13.00	-33.92	-9.75	Peak

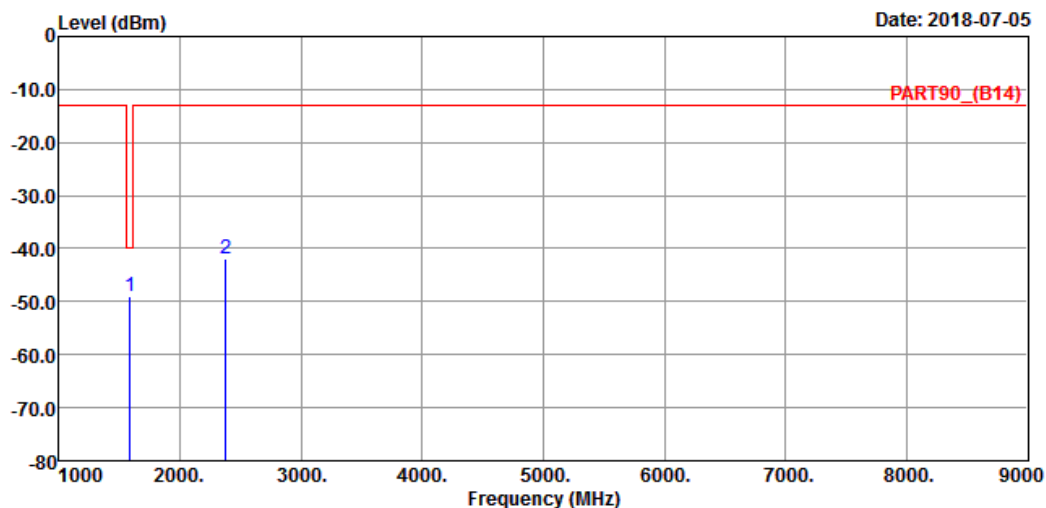
Channel Bandwidth: 10 MHz / QPSK
Middle Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 1



Site : 966 Chamber 5
Condition: PART90_(B14) HORIZONTAL
Remak : Cat-M1 Band 14 QPSK_10M Link_M-CH
Tested by: Thomas Wei

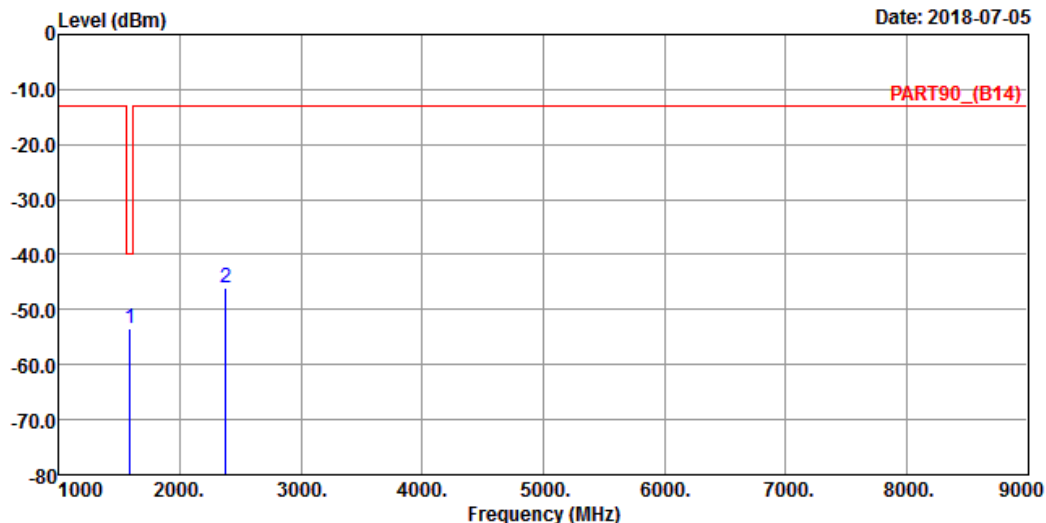
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	pp 1586.00	-48.97	-35.58	-40.00	-8.97	-13.39	Peak
2	2379.00	-41.88	-32.19	-13.00	-28.88	-9.69	Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 2



Site : 966 Chamber 5
 Condition: PART90_(B14) VERTICAL
 Remak : Cat-M1 Band 14 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 pp	1586.00	-53.29	-39.90	-40.00	-13.29	-13.39	Peak
2	2379.00	-46.00	-36.31	-13.00	-33.00	-9.69	Peak

LTE Band 26
 Channel Bandwidth: 1.4 MHz / QPSK
 Low Channel

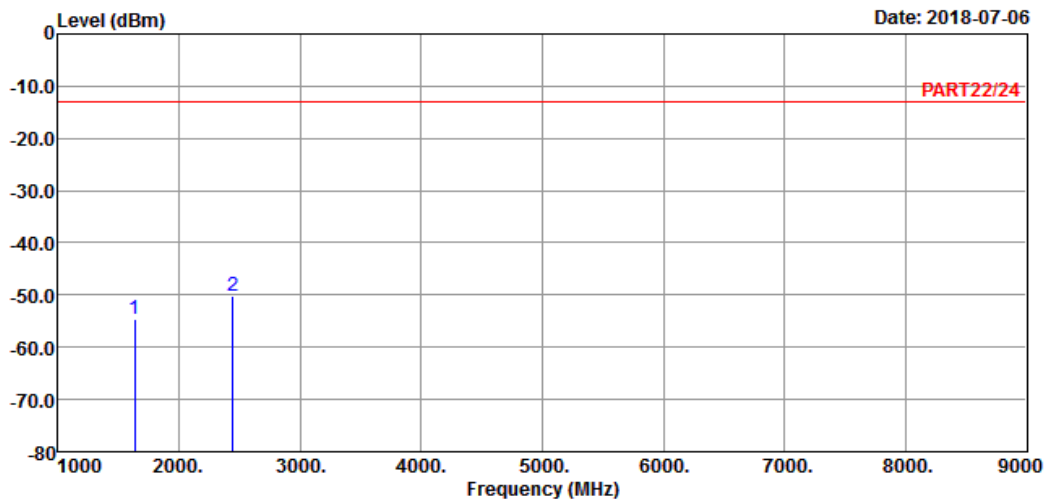


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 1

Date: 2018-07-06



Site : 966 Chamber 5
 Condition: PART22/24 HORIZONTAL
 Remak : Cat-M1 Band 26 QPSK_1.4M Link_L-CH
 Tested by: Thomas Wei

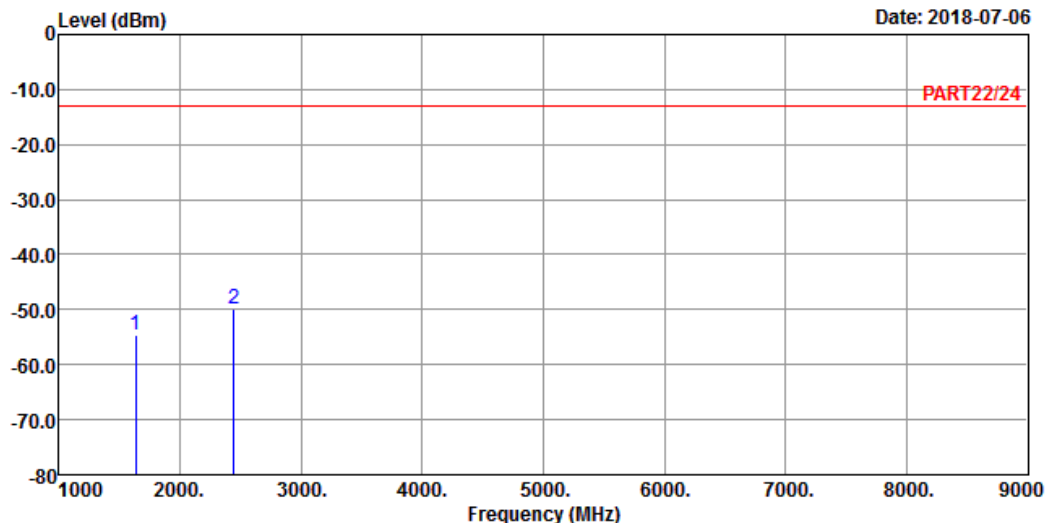
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1629.40	-54.67	-41.05	-13.00	-41.67	-13.62	Peak
2	pp 2444.10	-50.22	-40.26	-13.00	-37.22	-9.96	Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 2



Site : 966 Chamber 5
 Condition: PART22/24 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	-54.60	-40.98	-13.00	-41.60	-13.62	Peak
2 pp	2444.10	-49.75	-39.79	-13.00	-36.75	-9.96	Peak

Middle Channel

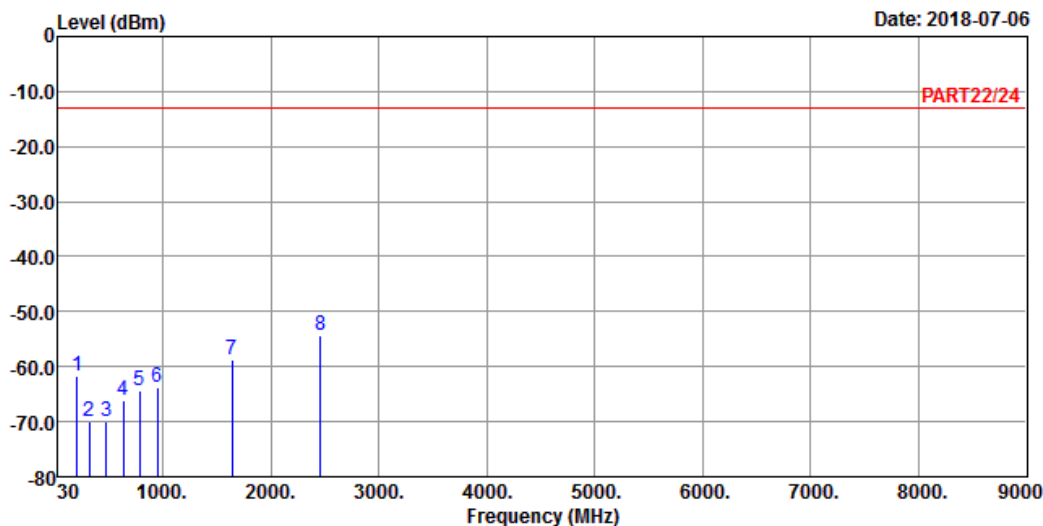


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5

Date: 2018-07-06



Site : 966 Chamber 5
 Condition: PART22/24 HORIZONTAL
 Remak : Cat-M1 Band 26 QPSK_1.4M Link_M-CH
 Tested by: Thomas Wei

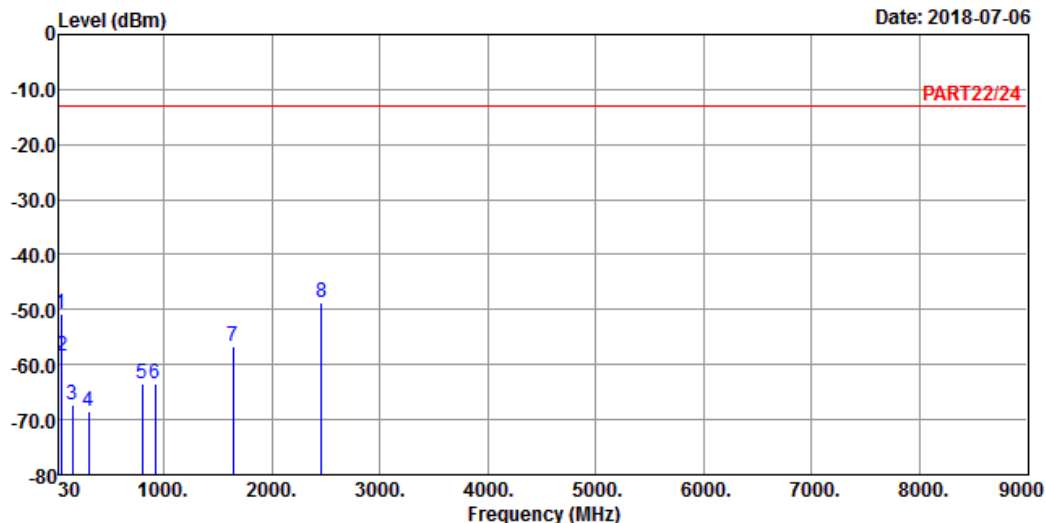
	Read	Limit	Over				
Freq	Level	Level	Line	Limit	Factor	Remark	
MHz	dBm	dBm	dBm	dB	dB		
1	202.66	-61.81	-53.91	-13.00	-48.81	-7.90	Peak
2	316.15	-69.83	-63.07	-13.00	-56.83	-6.76	Peak
3	479.11	-70.00	-64.99	-13.00	-57.00	-5.01	Peak
4	630.43	-66.06	-65.23	-13.00	-53.06	-0.83	Peak
5	780.78	-64.28	-65.07	-13.00	-51.28	0.79	Peak
6	952.47	-63.67	-65.57	-13.00	-50.67	1.90	Peak
7	1638.00	-58.78	-45.10	-13.00	-45.78	-13.68	Peak
8 pp	2457.00	-54.21	-44.22	-13.00	-41.21	-9.99	Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 6



Site : 966 Chamber 5
 Condition: PART22/24 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	44.55	-50.64	-48.65	-13.00	-37.64	-1.99	Peak
2	54.25	-58.57	-52.50	-13.00	-45.57	-6.07	Peak
3	155.13	-67.24	-61.03	-13.00	-54.24	-6.21	Peak
4	299.66	-68.58	-61.57	-13.00	-55.58	-7.01	Peak
5	795.33	-63.41	-64.16	-13.00	-50.41	0.75	Peak
6	915.61	-63.34	-64.30	-13.00	-50.34	0.96	Peak
7	1638.00	-56.72	-43.04	-13.00	-43.72	-13.68	Peak
8 pp	2457.00	-48.72	-38.73	-13.00	-35.72	-9.99	Peak

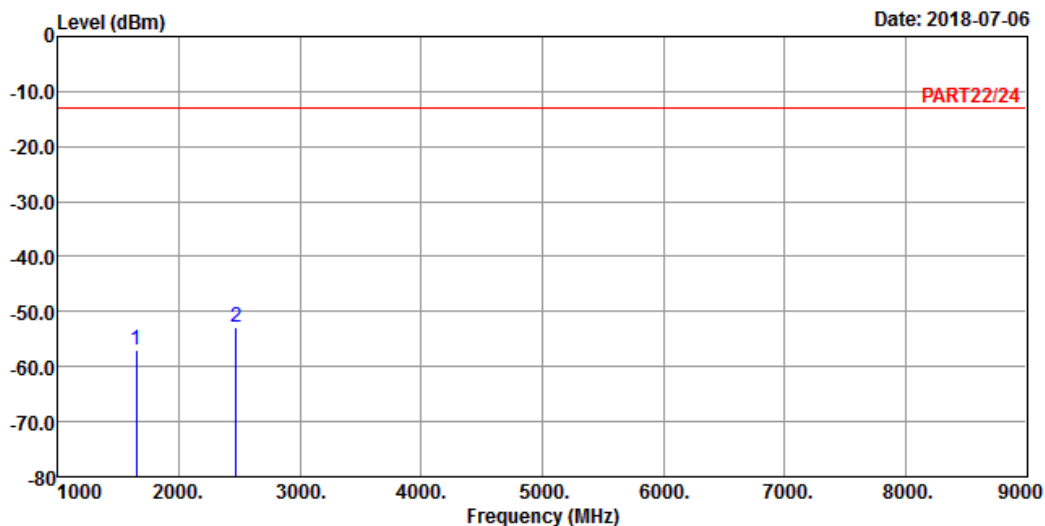
High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 1



Site : 966 Chamber 5
 Condition: PART22/24 HORIZONTAL
 Remak : Cat-M1 Band 26 QPSK_1.4M Link_H-CH
 Tested by: Thomas Wei

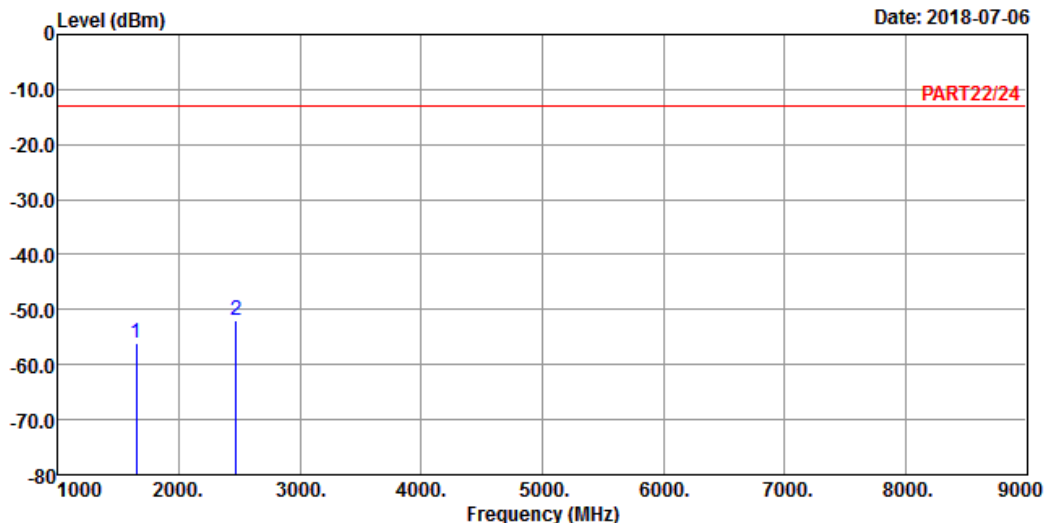
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1646.60	-57.06	-43.35	-13.00	-44.06	-13.71	Peak
2 pp	2469.90	-52.73	-42.71	-13.00	-39.73	-10.02	Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 2



Site : 966 Chamber 5
 Condition: PART22/24 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	-56.20	-42.49	-13.00	-43.20	-13.71	Peak
2 pp	2469.90	-52.05	-42.03	-13.00	-39.05	-10.02	Peak

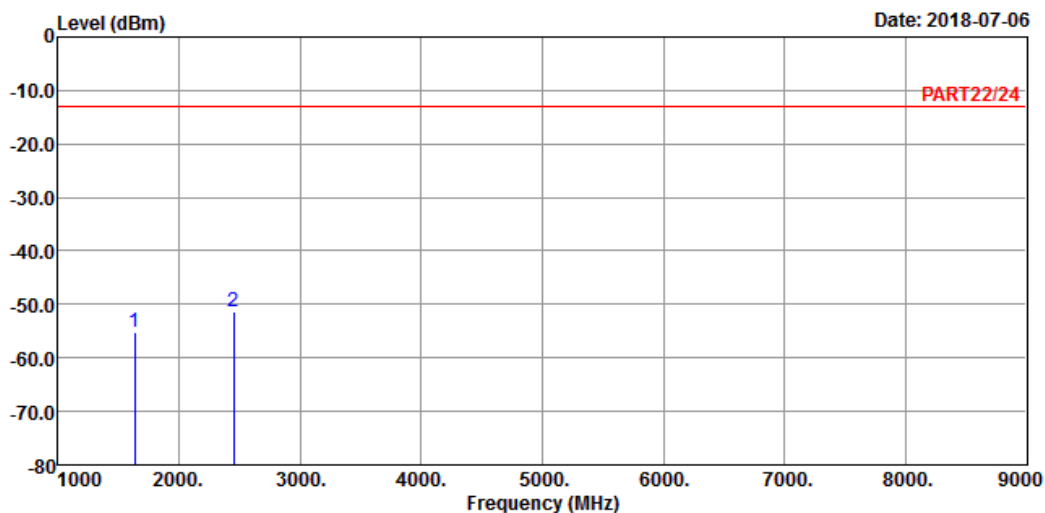
Channel Bandwidth: 5 MHz / QPSK
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 1



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 26 QPSK_5M Link_L-CH
Tested by: Thomas Wei

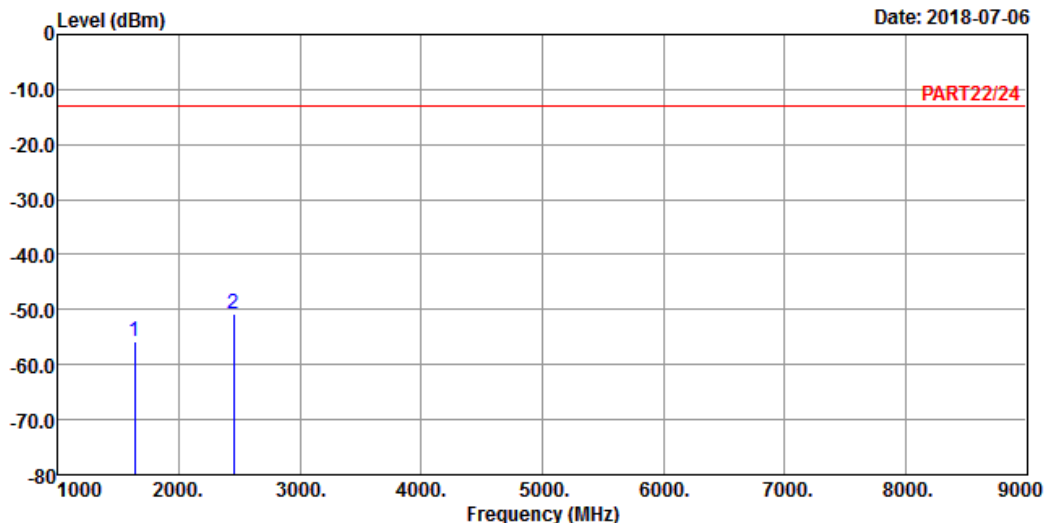
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1633.00	-55.23	-41.61	-13.00	-42.23	-13.62	Peak
2 pp	2449.50	-51.33	-41.37	-13.00	-38.33	-9.96	Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 2



Site : 966 Chamber 5
 Condition: PART22/24 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	-55.89	-42.27	-13.00	-42.89	-13.62	Peak
2 pp	2449.50	-50.66	-40.70	-13.00	-37.66	-9.96	Peak

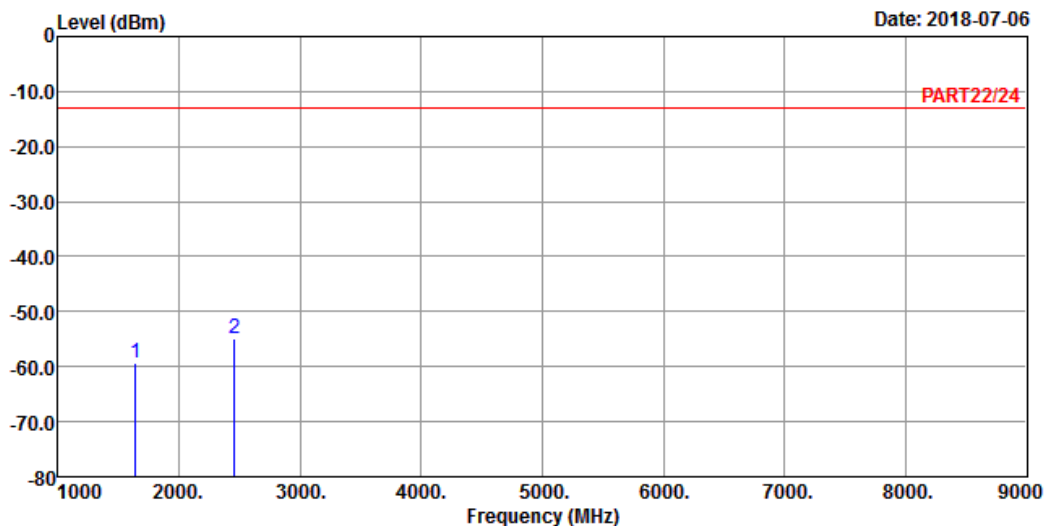
Middle Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 1



Site : 966 Chamber 5
 Condition: PART22/24 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	-59.33	-45.65	-13.00	-46.33	-13.68	Peak
2 pp	2457.00	-54.79	-44.80	-13.00	-41.79	-9.99	Peak

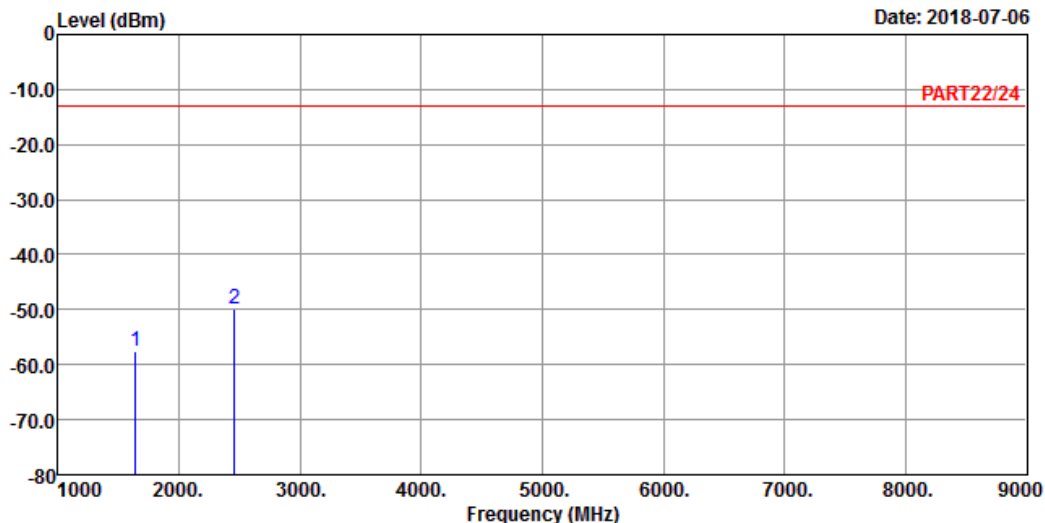


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 2

Date: 2018-07-06



Site : 966 Chamber 5
 Condition: PART22/24 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	-57.49	-43.81	-13.00	-44.49	-13.68	Peak
2 pp	2457.00	-49.88	-39.89	-13.00	-36.88	-9.99	Peak

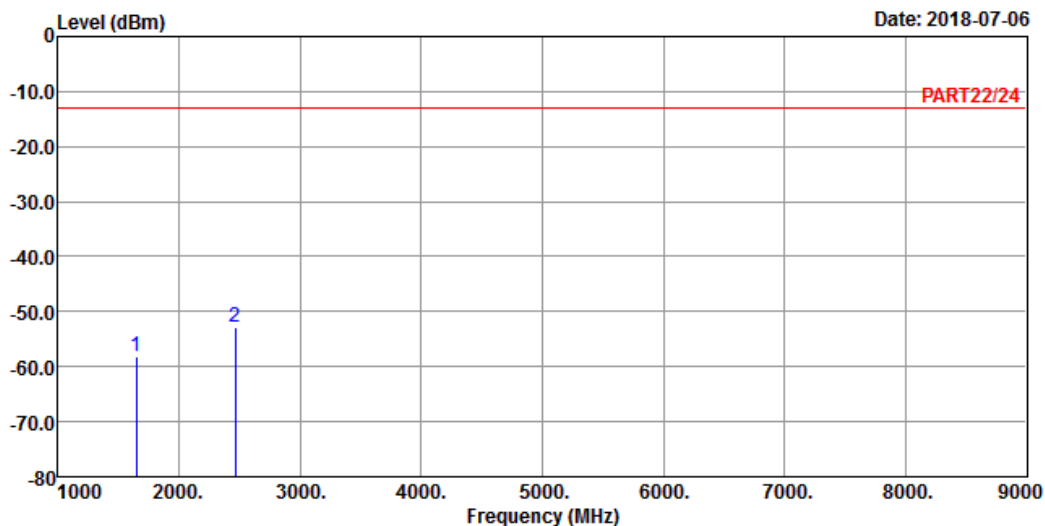
High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 1



Site : 966 Chamber 5
 Condition: PART22/24 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	-58.07	-44.36	-13.00	-45.07	-13.71	Peak
2 pp	2464.50	-52.93	-42.91	-13.00	-39.93	-10.02	Peak

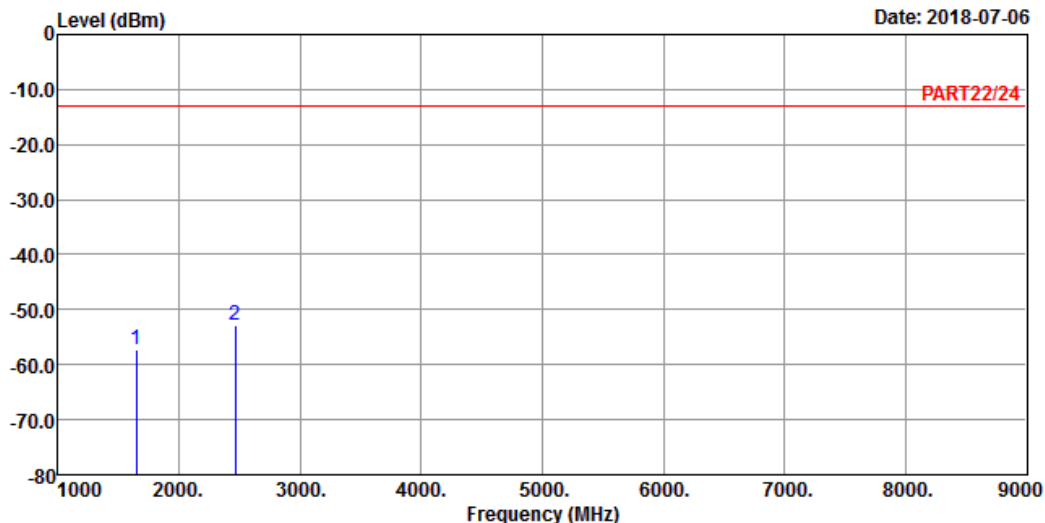


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 2

Date: 2018-07-06



Site : 966 Chamber 5
 Condition: PART22/24 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	-57.14	-43.43	-13.00	-44.14	-13.71	Peak
2 pp	2464.50	-52.98	-42.96	-13.00	-39.98	-10.02	Peak

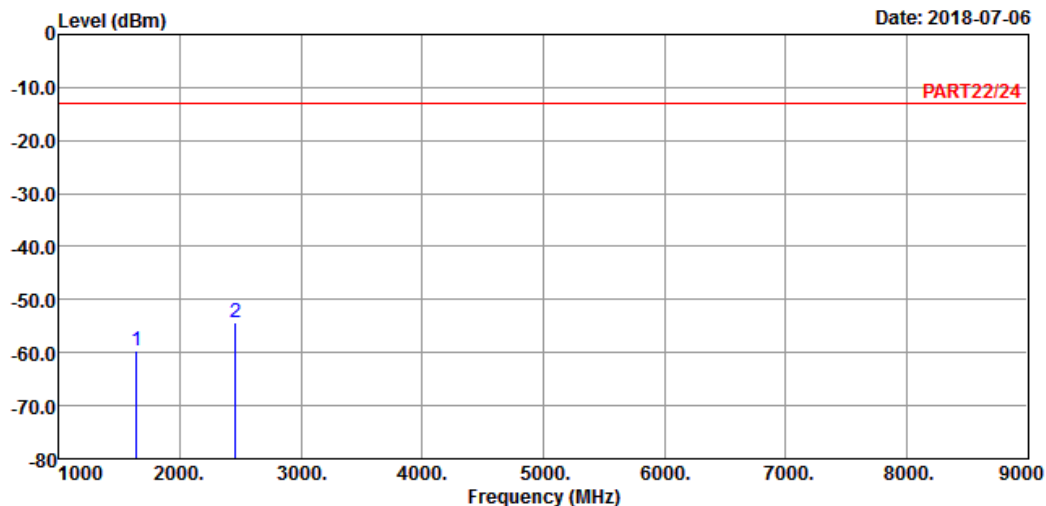
Channel Bandwidth: 10 MHz / QPSK
Middle Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 1



Site : 966 Chamber 5
Condition: PART22/24 HORIZONTAL
Remak : Cat-M1 Band 26 QPSK_10M Link_M-CH
Tested by: Thomas Wei

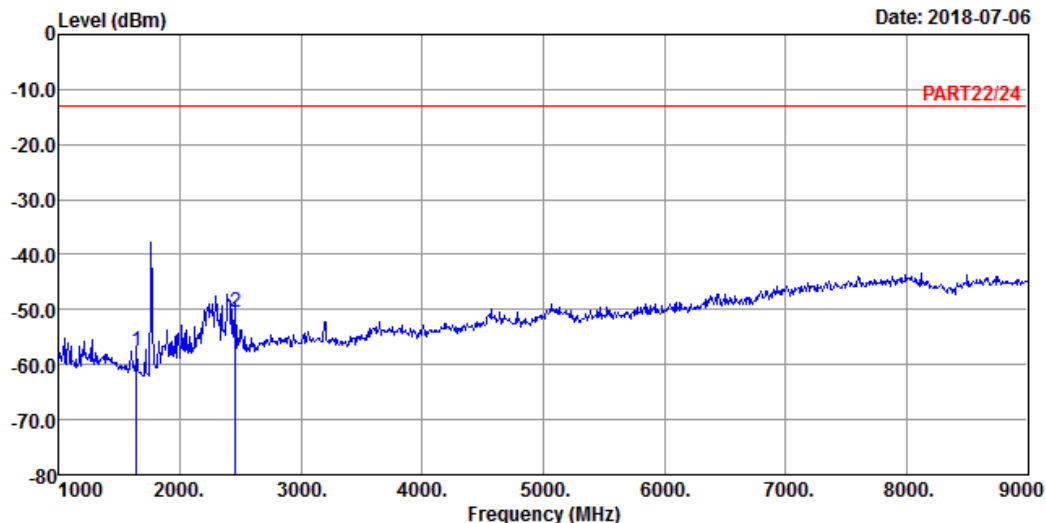
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1638.00	-59.68	-46.00	-13.00	-46.68	-13.68	Peak
2	2457.00	-54.19	-44.20	-13.00	-41.19	-9.99	Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 2



Site : 966 Chamber 5
 Condition: PART22/24 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	1638.00	-57.66	-43.98	-13.00	-44.66	-13.68	Peak
2 pp	2457.00	-50.41	-40.42	-13.00	-37.41	-9.99	Peak

5 Pictures of Test Arrangements

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

Appendix – Information on 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

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Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

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