FCC Test Report

(PART 90)

Report No.:	RF181001C06-11
FCC ID:	A4RG020A
Model Name:	G020A
Received Date:	Oct. 01, 2018
Test Date:	Oct. 17, 2018 ~ Oct. 19, 2018
Issued Date:	Dec. 27, 2018
Applicant:	Google LLC
Address:	1600 Amphitheatre Parkway, Mountain View, CA 94043, USA
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C)
Test Location (1):	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
RF181001C06-11	Original Release	Dec. 27, 2018

1 Certificate of Conformity

Product:	Smartphone
Model Name:	G020A
Sample Status:	Identical Prototype
Applicant:	Google LLC
Test Date:	Oct. 17, 2018 ~ Oct. 19, 2018
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:** Dec. 27, 2018

Ivonne Wu / Supervisor

Approved by : _____ , **Date:** Dec. 27, 2018

Dylan Chiou / Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 90 & Part 2 (CDMA)			
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 -29.55 dB at 30.00 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 90.210	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 -28.43 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	Expended 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 Keysight	N9010A	MY56070348	Sep. 06, 2018	Sep. 05, 2019
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Jan. 11, 2018	Jan. 10, 2019
Spectrum Analyzer ROHDE & SCHWARZ	FSW26	102023	Oct. 11, 2018	Oct. 10, 2019
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-969	Dec. 12, 2017	Dec. 11, 2018
BILOG Antenna SCHWARZBECK	VULB 9168	9168-472	Dec. 06, 2017	Dec. 05, 2018
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 16, 2018	Apr. 15, 2019
MXG Vector signal generator Agilent	N5182B	MY53052658	May 24, 2018	May 23, 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
Universal Radio Communication Tester R&S	CMU200	123112	Dec. 28, 2017	Dec. 27, 2018
Radio Communication Analyzer Anritsu	MT8820C	6201300640	Aug. 16, 2017	Aug. 15, 2019
Temperature & Humidity Chamber	GTH-120-40-CP-AR	MAA1306-019	Sep. 05, 2018	Sep. 04, 2019
DC Power Supply Topward	33010D	807748	NA	NA

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

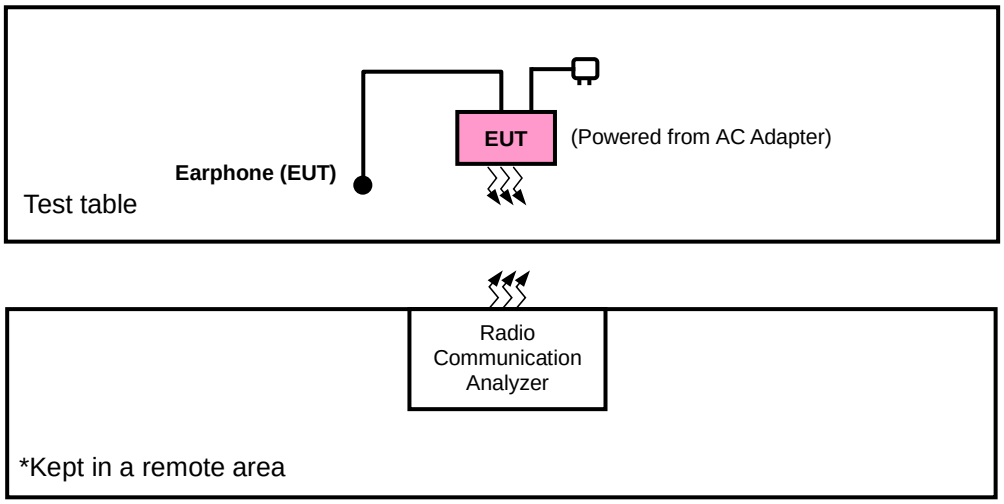
Product	Smartphone	
Model Name	G020A	
Status of EUT	Identical Prototype	
Power Supply Rating	3.85 Vdc (Li-ion battery) 5.0 Vdc or 9 Vdc (adapter) 5.0 Vdc (host equipment)	
Modulation Type	CDMA	QPSK, OQPSK, HPSK
	LTE	QPSK, 16QAM, 64QAM
Frequency Range	CDMA BC10	817.9 ~ 823.1 MHz
	LTE Band 26 (Channel 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	CDMA BC10	1M27F9W
	LTE Band 26 (Channel Bandwidth: 1.4 MHz)	1M09W7D
	LTE Band 26 (Channel Bandwidth: 3 MHz)	2M70W7D
	LTE Band 26 (Channel Bandwidth: 5 MHz)	4M50W7D
	LTE Band 26 (Channel Bandwidth: 10 MHz)	8M78W7D
Max. ERP Power	CDMA BC10	69.02 mW
	LTE Band 26 (Channel Bandwidth: 1.4 MHz)	68.08 mW
	LTE Band 26 (Channel Bandwidth: 3 MHz)	71.94 mW
	LTE Band 26 (Channel Bandwidth: 5 MHz)	75.86 mW
	LTE Band 26 (Channel Bandwidth: 10 MHz)	93.11 mW
Antenna Type	PIFA Antenna	
Antenna Gain	CDMA BC10	-5 dBi gain
	LTE Band 26	-4.7 dBi gain
Accessory Device	Refer to Note as below	
Data Cable Supplied	Refer to Note as below	

Note:

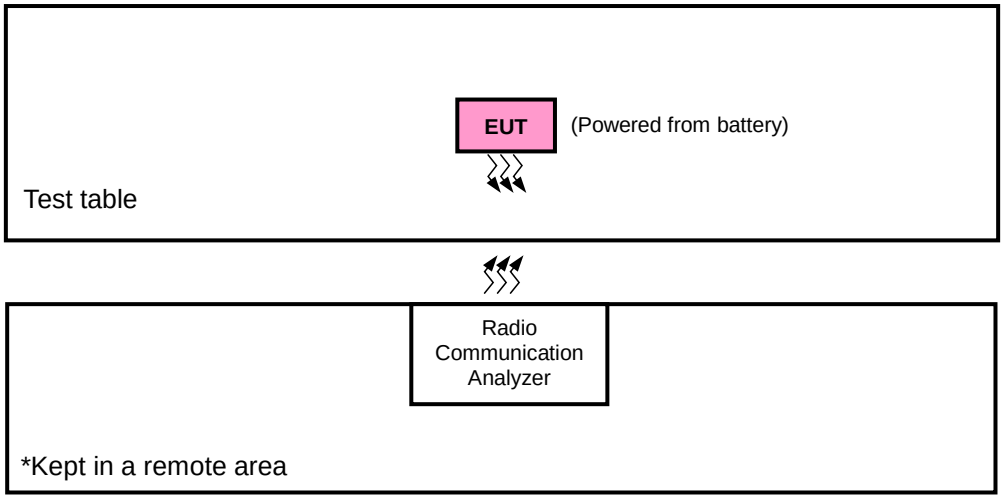
1. There're 2 configurations for the EUT listed as below.
   Main Sample: EUT + Battery 1
   2nd Sample: EUT + Battery 2
   - ✧ After pre-tested with the EUT, only the worst configuration (main sample) was chosen for the final test.
2. The EUT's accessories list refers to Ext. Pho.
3. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

3.2 Configuration of System under Test

<Radiated Emission Test>



<E.R.P. Test>



3.2.1 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units.

3.3 Test Mode Applicability and Tested Channel Detail

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

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

Band	ERP	Radiated Emission
CDMA	Y-plane	Y-axis
LTE Band 26	Y-plane	Z-axis

CDMA

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	ERP	476 to 684	476, 580, 684	1xRTT
-	Modulation Characteristics	476 to 684	580	1xRTT
-	Frequency Stability	476 to 684	476, 684	1xRTT
-	Occupied Bandwidth	476 to 684	476, 580, 684	1xRTT
-	Emission Mask	476 to 684	476, 580, 684	1xRTT
-	Conducted Emission	476 to 684	476, 580, 684	1xRTT
-	Radiated Emission	476 to 684	476, 580, 684	1xRTT

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, 64QAM	1 RB / 0 RB Offset
		26705 to 26775	26705, 26740, 26775	3 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		26715 to 26765	26715, 26740, 26765	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		26740	26740	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Modulation Characteristics	26715 to 26765	26740	5 MHz	QPSK, 16QAM, 64QAM	25 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, 64QAM	6 RB / 0 RB Offset
		26705 to 26775	26705, 26740, 26775	3 MHz	QPSK, 16QAM, 64QAM	15 RB / 0 RB Offset
		26715 to 26765	26715, 26740, 26765	5 MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		26740	26740	10 MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
-	Emission Mask	26697 to 26783	26697	1.4 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			26783	1.4 MHz	QPSK, 16QAM, 64QAM	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		26705 to 26775	26705	3 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
						15 RB / 0 RB Offset
			26775	3 MHz	QPSK, 16QAM, 64QAM	1 RB / 14 RB Offset
						15 RB / 0 RB Offset
		26715 to 26765	26715	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			26765	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		26740	26740	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
						1 RB / 49 RB Offset
						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	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 / 0 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	3.85 Vdc	Thomas Wei
Frequency Stability	25 deg. C, 65 % RH	3.85 Vdc	Wayne Lin
Occupied Bandwidth	25 deg. C, 65 % RH	3.85 Vdc	Wayne Lin
Peak to Average Ratio	25 deg. C, 65 % RH	3.85 Vdc	Wayne Lin
Emission Mask	25 deg. C, 65 % RH	3.85 Vdc	Wayne Lin
Band Edge	25 deg. C, 65 % RH	3.85 Vdc	Wayne Lin
Conducted Emission	25 deg. C, 65 % RH	3.85 Vdc	Wayne Lin
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
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

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

4.1.2 Test Procedures

EIRP / ERP Measurement:

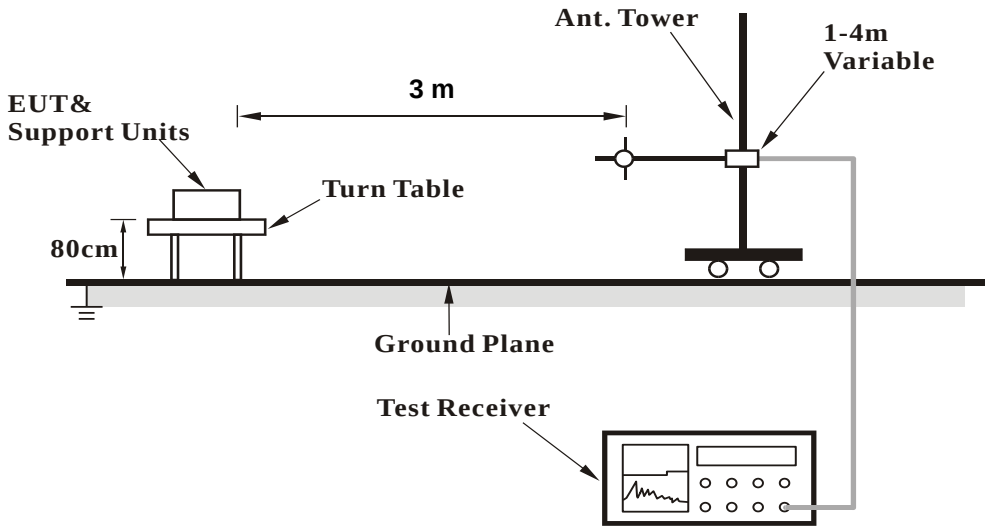
a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 5 MHz for CDMA and 10 MHz for LTE mode.
b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) height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

Conducted Power Measurement:

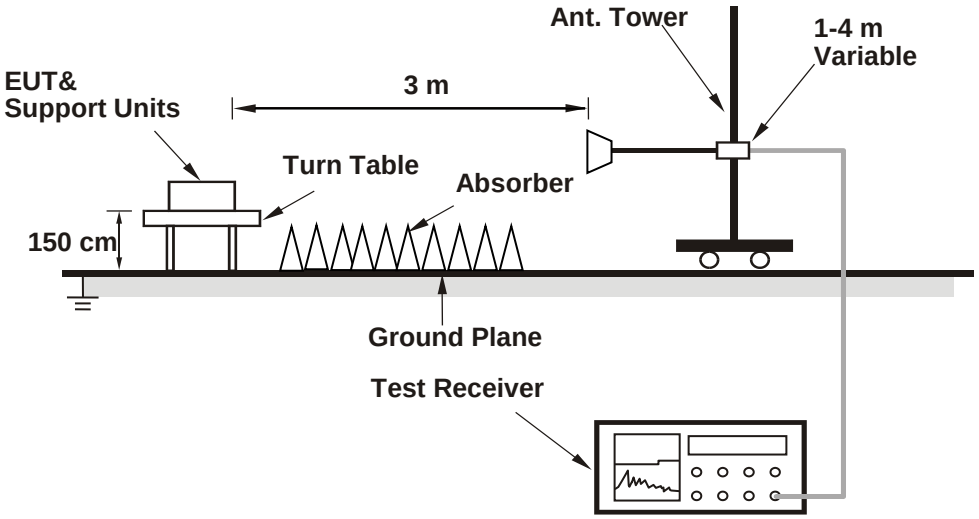
a. The EUT was set up for the maximum power with CDMA and LTE link data modulation and link up with simulator.
b. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

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

The worst configuration mode is presented in the report as below. Please refer to SAR test report for more detail test mode.

Band		TX Antenna	WLAN Function	Body-Worn/Hotspot
CDMA	BC10	Ant 0	WLAN-Off	Body-Worn/Hotspot
LTE	B26	Ant 0	WLAN-Off	Body-Worn/Hotspot

Conducted Output Power (dBm)

Band	**CDMA BC10**		
Mode	**Body-Worn / Hotspot**		
Tx Antenna	**Ant-0**		
Channel	**476**	**580**	**684**
Frequency (MHz)	**817.9**	**820.5**	**823.1**
RC1+SO55	24.33	24.57	24.44
RC3+SO55	24.32	24.57	24.42
RC3+SO32(+ F-SCH)	24.33	24.57	24.43
RC3+SO32(+SCH)	24.33	24.56	24.44
RTAP 153.6	24.34	24.58	24.45
RETAP 4096	24.33	24.57	24.43

LTE Band 26
Body-Worn / Hotspot
Ant-0

BW	MCS Index	RB Size	RB Offset		Mid		3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel			26740					Channel		26715	26740	26765	
		Frequency (MHz)			819.0					Frequency (MHz)		816.5	819.0	821.5	
10M	QPSK	1	0		24.40		0	5M	QPSK	1	0	24.34	24.39	24.50	0
		1	24		24.45		0			1	12	24.30	24.43	24.45	0
		1	49		24.24		0			1	24	24.09	24.21	24.31	0
		25	0		23.54		1			12	0	23.53	23.53	23.56	1
		25	12		23.42		1			12	6	23.28	23.40	23.47	1
		25	25		23.39		1			12	13	23.32	23.36	23.45	1
		50	0		23.46		1			25	0	23.52	23.45	23.55	1
	16QAM	1	0		23.38		1		16QAM	1	0	23.40	23.37	23.44	1
		1	24		23.30		1			1	12	23.20	23.28	23.45	1
		1	49		23.27		1			1	24	23.15	23.24	23.24	1
		25	0		22.47		2			12	0	22.42	22.46	22.50	2
		25	12		22.39		2			12	6	22.27	22.37	22.40	2
		25	25		22.39		2			12	13	22.23	22.36	22.45	2
		50	0		22.42		2			25	0	22.50	22.41	22.48	2
	64QAM	1	0		22.40		2		64QAM	1	0	22.34	22.39	22.41	2
		1	24		22.36		2			1	12	22.33	22.34	22.37	2
		1	49		22.22		2			1	24	22.21	22.19	22.31	2
		25	0		21.48		3			12	0	21.37	21.47	21.50	3
		25	12		21.41		3			12	6	21.39	21.39	21.43	3
		25	25		21.36		3			12	13	21.27	21.33	21.41	3
		50	0		21.44		3			25	0	21.34	21.43	21.51	3

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		26705	26740	26775				Channel		26697	26740	26783	
		Frequency (MHz)		815.5	819.0	822.5				Frequency (MHz)		814.7	819.0	823.3	
3M	QPSK	1	0	24.35	24.37	24.44	0	1.4M	QPSK	1	0	24.35	24.33	24.47	0
		1	7	24.35	24.42	24.39	0			1	2	24.27	24.44	24.35	0
		1	14	24.27	24.12	24.21	0			1	5	24.08	24.22	24.25	0
		8	0	23.34	23.52	23.53	1			3	0	24.37	24.42	24.51	0
		8	3	23.36	23.34	23.33	1			3	1	24.32	24.30	24.47	0
		8	7	23.30	23.28	23.34	1			3	3	24.26	24.36	24.42	0
		15	0	23.44	23.36	23.44	1			6	0	23.45	23.42	23.54	1
	16QAM	1	0	23.42	23.24	23.32	1		16QAM	1	0	23.33	23.32	23.36	1
		1	7	23.23	23.26	23.30	1			1	2	23.24	23.20	23.35	1
		1	14	23.26	23.19	23.21	1			1	5	23.12	23.23	23.17	1
		8	0	22.31	22.34	22.38	2			3	0	23.33	23.43	23.43	1
		8	3	22.40	22.38	22.37	2			3	1	23.36	23.24	23.25	1
		8	7	22.24	22.31	22.45	2			3	3	23.40	23.34	23.31	1
		15	0	22.44	22.32	22.34	2			6	0	22.23	22.30	22.44	2
	64QAM	1	0	22.32	22.33	22.38	2		64QAM	1	0	22.41	22.29	22.29	2
		1	7	22.36	22.35	22.37	2			1	2	22.28	22.34	22.30	2
		1	14	22.13	22.09	22.26	2			1	5	22.28	22.22	22.28	2
		8	0	21.41	21.37	21.42	3			3	0	22.28	22.34	22.48	2
		8	3	21.32	21.41	21.40	3			3	1	22.33	22.41	22.40	2
		8	7	21.34	21.21	21.26	3			3	3	22.22	22.30	22.27	2
		15	0	21.32	21.34	21.42	3			6	0	21.30	21.34	21.42	3

ERP Power (dBm)

CDMA							
Plane	**Channel**	**Frequency (MHz)**	**Reading (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (mW)**	**Polarization (H/V)**
Y	476	817.9	-10.89	31.208	18.17	65.61	H
	580	820.5	-10.63	31.3	18.52	71.12	
	684	823.1	-10.68	31.222	18.39	69.02	
	476	817.9	-18.96	31.504	10.39	10.94	V
	580	820.5	-18.28	31.117	10.69	11.72	
	684	823.1	-19.32	31.922	10.45	11.09	

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

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)**
Y	26697	814.7	-11.90	32.01	17.96	62.52	H
	26740	819.0	-11.63	32.11	18.33	68.08	
	26783	823.3	-12.02	32.32	18.15	65.31	
	26697	814.7	-19.88	32.54	10.51	11.25	V
	26740	819.0	-19.43	32.51	10.93	12.39	
	26783	823.3	-19.65	32.51	10.71	11.78	
Channel Bandwidth: 1.4 MHz / 16QAM							
Y	26697	814.7	-12.95	32.01	16.91	49.09	H
	26740	819.0	-12.68	32.11	17.28	53.46	
	26783	823.3	-13.07	32.32	17.10	51.29	
	26697	814.7	-20.93	32.54	9.46	8.83	V
	26740	819.0	-20.48	32.51	9.88	9.73	
	26783	823.3	-20.70	32.51	9.66	9.25	
Channel Bandwidth: 1.4 MHz / 64QAM							
Y	26697	814.7	-13.93	32.01	15.93	39.17	H
	26740	819.0	-13.66	32.11	16.30	42.66	
	26783	823.3	-14.05	32.32	16.12	40.93	
	26697	814.7	-21.91	32.54	8.48	7.05	V
	26740	819.0	-21.46	32.51	8.90	7.76	
	26783	823.3	-21.68	32.51	8.68	7.38	

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)**
Y	26705	815.5	-11.67	32.02	18.20	66.07	H
	26740	819.0	-11.39	32.11	18.57	71.94	
	26775	822.5	-11.64	32.18	18.39	69.02	
	26705	815.5	-19.60	32.5	10.75	11.89	V
	26740	819.0	-19.19	32.51	11.17	13.09	
	26775	822.5	-19.37	32.47	10.95	12.45	
Channel Bandwidth: 3 MHz / 16QAM							
Y	26705	815.5	-12.70	32.02	17.17	52.12	H
	26740	819.0	-12.42	32.11	17.54	56.75	
	26775	822.5	-12.67	32.18	17.36	54.45	
	26705	815.5	-20.63	32.5	9.72	9.38	V
	26740	819.0	-20.22	32.51	10.14	10.33	
	26775	822.5	-20.40	32.47	9.92	9.82	
Channel Bandwidth: 3 MHz / 64QAM							
Y	26705	815.5	-13.72	32.02	16.15	41.21	H
	26740	819.0	-13.44	32.11	16.52	44.87	
	26775	822.5	-13.69	32.18	16.34	43.05	
	26705	815.5	-21.65	32.5	8.70	7.41	V
	26740	819.0	-21.24	32.51	9.12	8.17	
	26775	822.5	-21.42	32.47	8.90	7.76	

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)**
Y	26715	816.5	-11.46	32.04	18.43	69.66	H
	26740	819.0	-11.16	32.11	18.80	75.86	
	26765	821.5	-11.02	31.79	18.62	72.78	
	26715	816.5	-19.39	32.52	10.98	12.53	V
	26740	819.0	-18.96	32.51	11.40	13.80	
	26765	821.5	-18.84	32.17	11.18	13.12	
Channel Bandwidth: 5 MHz / 16QAM							
Y	26715	816.5	-12.49	32.04	17.40	54.95	H
	26740	819.0	-12.19	32.11	17.77	59.84	
	26765	821.5	-12.05	31.79	17.59	57.41	
	26715	816.5	-20.42	32.52	9.95	9.89	V
	26740	819.0	-19.99	32.51	10.37	10.89	
	26765	821.5	-19.87	32.17	10.15	10.35	
Channel Bandwidth: 5 MHz / 64QAM							
Y	26715	816.5	-13.51	32.04	16.38	43.45	H
	26740	819.0	-13.21	32.11	16.75	47.32	
	26765	821.5	-13.07	31.79	16.57	45.39	
	26715	816.5	-21.44	32.52	8.93	7.82	V
	26740	819.0	-21.01	32.51	9.35	8.61	
	26765	821.5	-20.89	32.17	9.13	8.18	

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)**
Y	26740	819.0	-10.27	32.11	19.69	93.11	H
	26740	819.0	-18.04	32.51	12.32	17.06	V
Channel Bandwidth: 10 MHz / 16QAM							
Y	26740	819.0	-11.28	32.11	18.68	73.79	H
	26740	819.0	-19.05	32.51	11.31	13.52	V
Channel Bandwidth: 10 MHz / 64QAM							
Y	26740	819.0	-12.31	32.11	17.65	58.21	H
	26740	819.0	-20.08	32.51	10.28	10.67	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

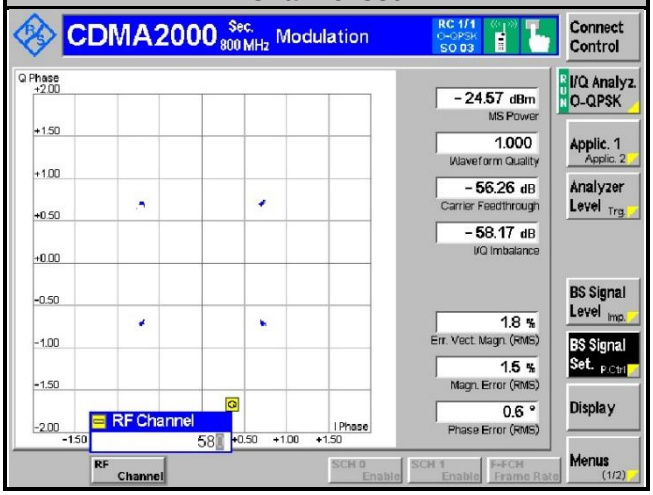
4.2.2 Test Setup

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.

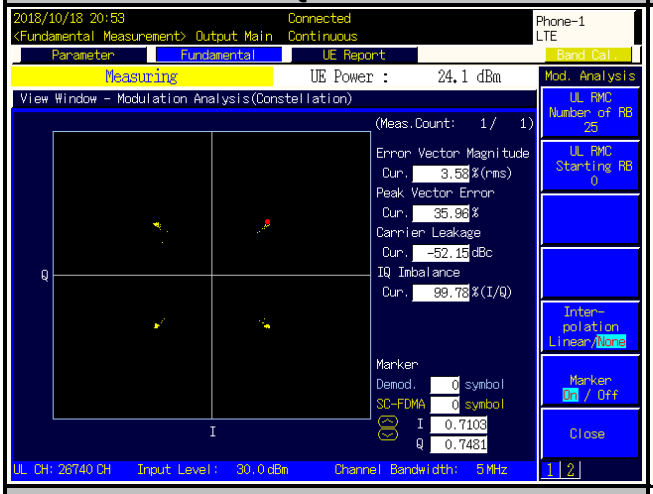
4.2.4 Test Results

Spectrum Plot of Measurement
CDMA
Channel 580

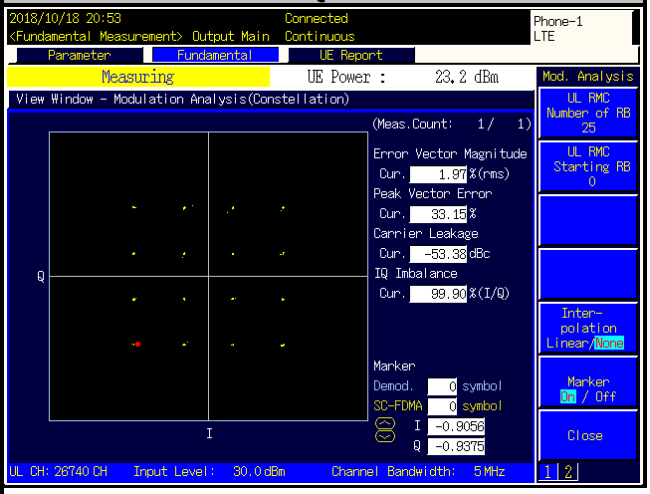


Spectrum Plot of Measurement
LTE Band 26
Channel 26740

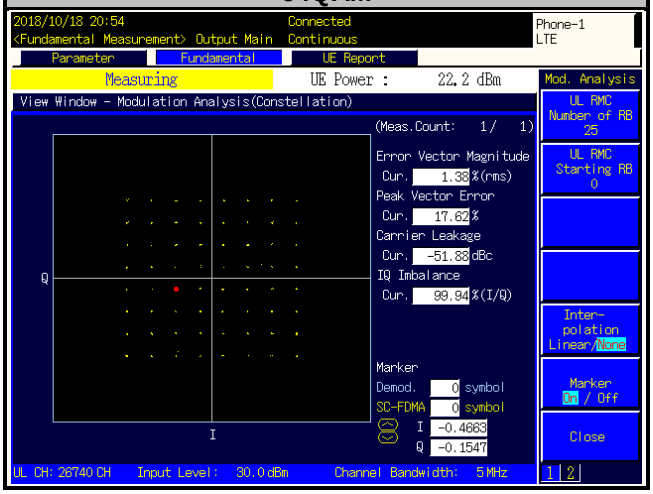
QPSK



16QAM



64QAM



4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

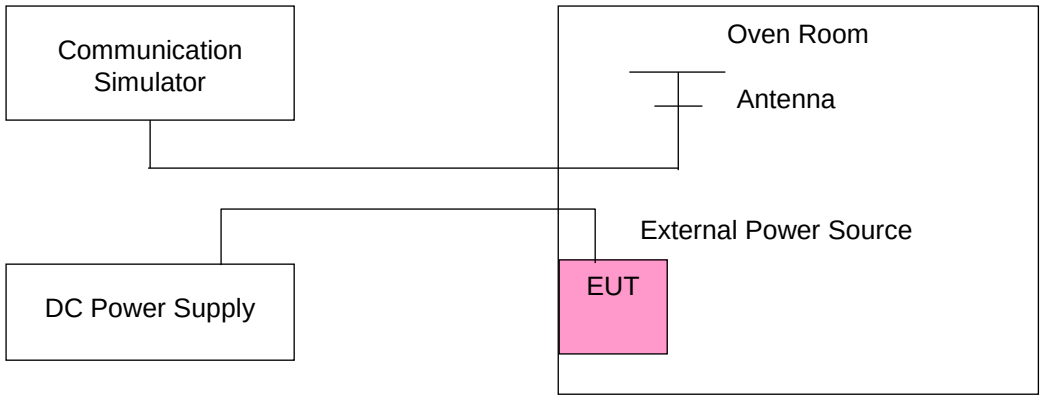
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

4.3.2 Test Procedure

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

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

4.3.3 Test Setup



4.3.4 Test Results

Frequency Error vs. Voltage

Voltage (Volts)	CDMA				Limit (ppm)
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	817.900001	0.002	823.100003	0.003	2.5
3.6	817.900004	0.005	823.100004	0.005	2.5
4.4	817.900003	0.003	823.100002	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	CDMA				Limit (ppm)
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	817.900004	0.005	823.100002	0.002	2.5
-20	817.900003	0.003	823.100004	0.005	2.5
-10	817.900004	0.004	823.100002	0.003	2.5
0	817.900003	0.004	823.100003	0.003	2.5
10	817.900001	0.001	823.100004	0.004	2.5
20	817.899997	-0.003	823.099997	-0.004	2.5
30	817.899998	-0.002	823.099997	-0.003	2.5
40	817.899999	-0.002	823.099999	-0.001	2.5
50	817.899998	-0.003	823.099998	-0.002	2.5
55	817.899997	-0.003	823.099997	-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)	
3.85	814.700003	0.004	823.300000	0.004	2.5
3.6	814.700004	0.005	823.300000	0.003	2.5
4.4	814.700003	0.004	823.300000	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	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	814.700004	0.005	823.300000	0.004	2.5
-20	814.700002	0.002	823.300000	0.004	2.5
-10	814.700002	0.002	823.300000	0.002	2.5
0	814.700004	0.005	823.300000	0.002	2.5
10	814.700003	0.003	823.300000	0.004	2.5
20	814.699997	-0.004	823.300000	-0.004	2.5
30	814.699997	-0.003	823.300000	-0.004	2.5
40	814.699997	-0.004	823.300000	-0.002	2.5
50	814.699999	-0.001	823.300000	-0.002	2.5
55	814.699997	-0.004	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)	
3.85	815.500002	0.002	822.500000	0.003	2.5
3.6	815.500004	0.005	822.500000	0.002	2.5
4.4	815.500001	0.001	822.500000	0.003	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	815.500003	0.003	822.500000	0.005	2.5
-20	815.500001	0.001	822.500000	0.004	2.5
-10	815.500002	0.003	822.500000	0.003	2.5
0	815.500004	0.005	822.500000	0.002	2.5
10	815.500003	0.003	822.500000	0.005	2.5
20	815.499996	-0.004	822.500000	-0.005	2.5
30	815.499998	-0.002	822.500000	-0.003	2.5
40	815.499996	-0.005	822.500000	-0.002	2.5
50	815.499997	-0.004	822.500000	-0.003	2.5
55	815.499996	-0.005	822.500000	-0.002	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)	
3.85	816.500003	0.003	821.500000	0.002	2.5
3.6	816.500002	0.003	821.500000	0.003	2.5
4.4	816.500004	0.004	821.500000	0.004	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 26				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	816.500002	0.003	821.500000	0.002	2.5
-20	816.500003	0.004	821.500000	0.004	2.5
-10	816.500003	0.004	821.500000	0.003	2.5
0	816.500003	0.004	821.500000	0.003	2.5
10	816.500003	0.003	821.500000	0.002	2.5
20	816.499998	-0.003	821.500000	-0.005	2.5
30	816.499998	-0.002	821.500000	-0.003	2.5
40	816.499997	-0.003	821.500000	-0.004	2.5
50	816.499999	-0.002	821.500000	-0.003	2.5
55	816.499999	-0.002	821.500000	-0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 26		Limit (ppm)
	Channel Bandwidth: 10 MHz		
	Frequency (MHz)	Frequency Error (ppm)	
3.85	819.000003	0.003	2.5
3.6	819.000004	0.005	2.5
4.4	819.000002	0.003	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.6 Vdc to 4.4 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 26		Limit (ppm)
	Channel Bandwidth: 10 MHz		
	Frequency (MHz)	Frequency Error (ppm)	
-30	819.000004	0.004	2.5
-20	819.000002	0.003	2.5
-10	819.000003	0.004	2.5
0	819.000003	0.004	2.5
10	819.000003	0.004	2.5
20	818.999997	-0.004	2.5
30	818.999996	-0.005	2.5
40	818.999997	-0.004	2.5
50	818.999996	-0.005	2.5
55	818.999998	-0.002	2.5

4.4 Occupied Bandwidth Measurement

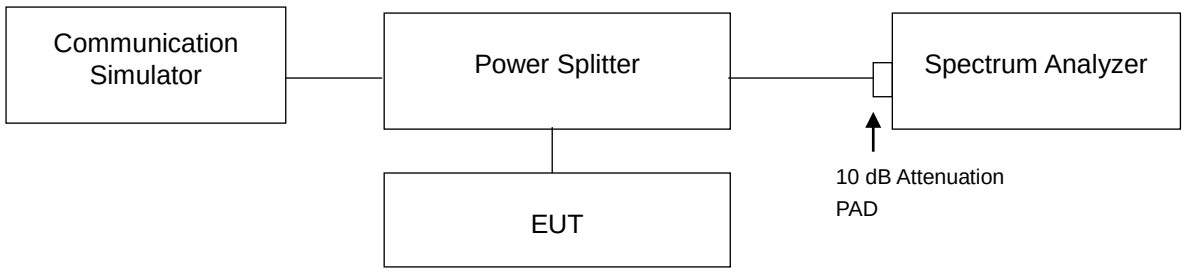
4.4.1 Limits of Occupied Bandwidth Measurement

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

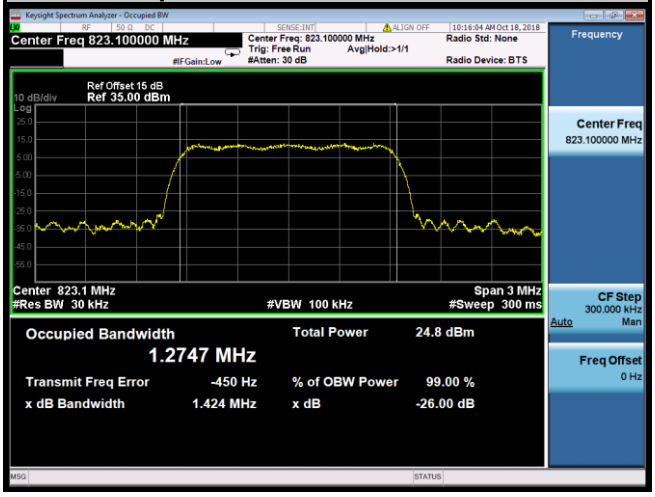


4.4.4 Test Results

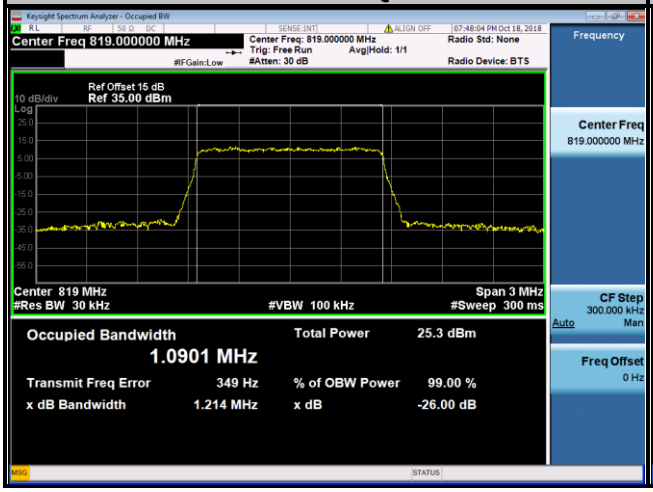
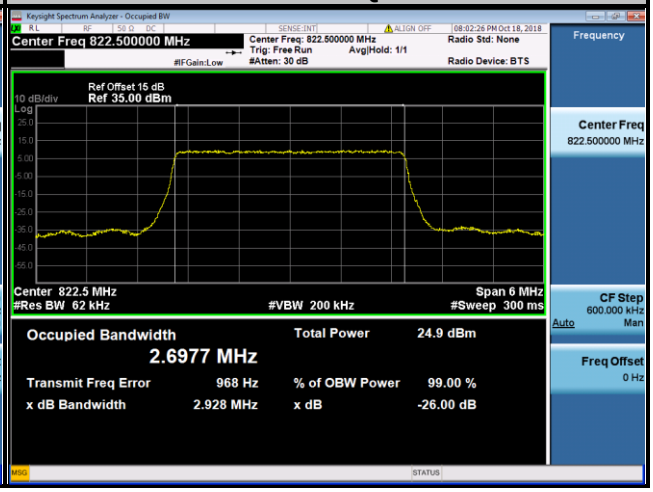
<99 % Occupied Bandwidth>

CDMA		
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**
476	817.9	1.2729
580	820.5	1.2746
684	823.1	1.2747

Spectrum Plot of Worst Value



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	64QAM			QPSK	16QAM	64QAM
26697	814.7	1.0857	1.0896	1.0901	26705	815.5	2.6996	2.6970	2.6953
26740	819.0	1.0869	1.0901	1.0894	26740	819.0	2.6995	2.6975	2.6958
26783	823.3	1.0885	1.0890	1.0890	26775	822.5	2.6987	2.6974	2.6977

Spectrum Plot of Worst Value	
1.4 MHz / 16QAM	3 MHz / 64QAM
	

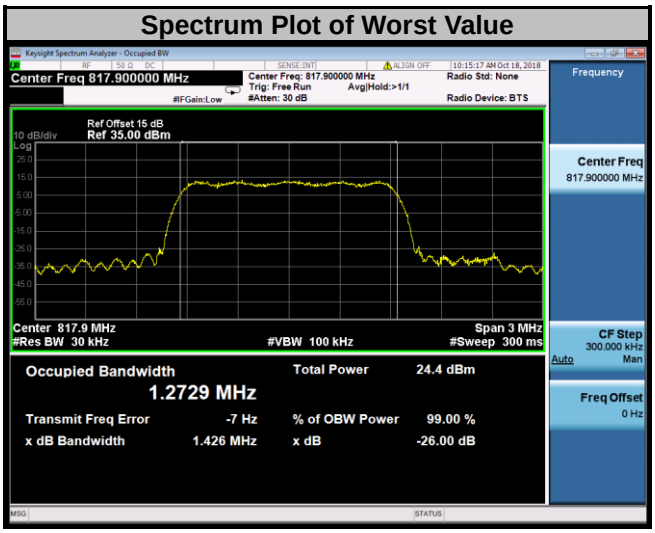
LTE Band 26									
Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
26715	816.5	4.4885	4.4907	4.4940	26740	819.0	8.9713	8.9775	8.9746
26740	819.0	4.4929	4.4964	4.4942					
26765	821.5	4.4890	4.4938	4.4928					

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

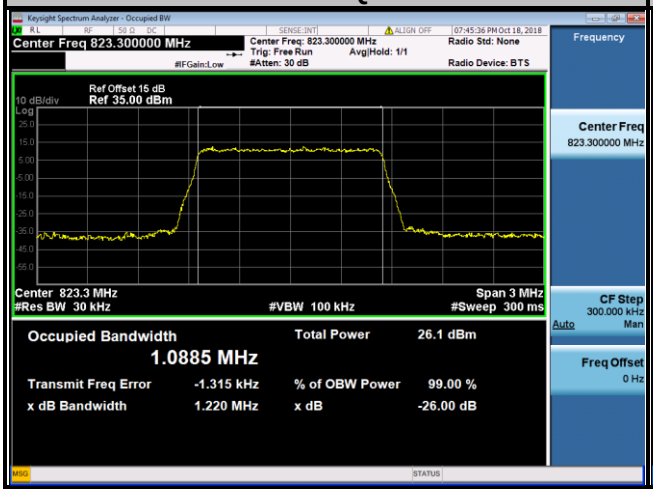
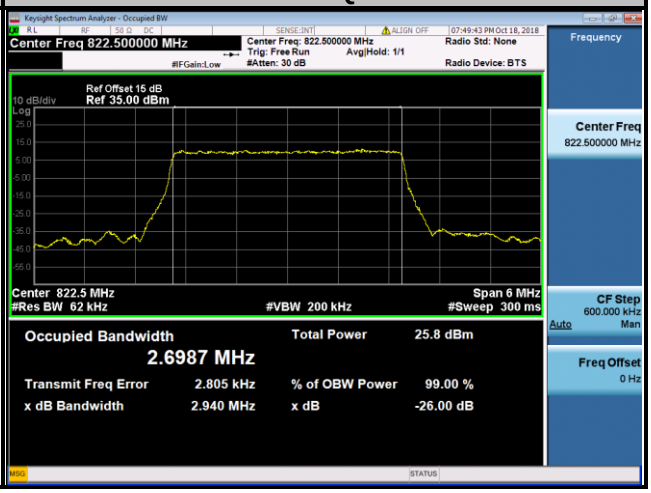
<26 dB Bandwidth>

CDMA		
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
476	817.9	1.426
580	820.5	1.425
684	823.1	1.424

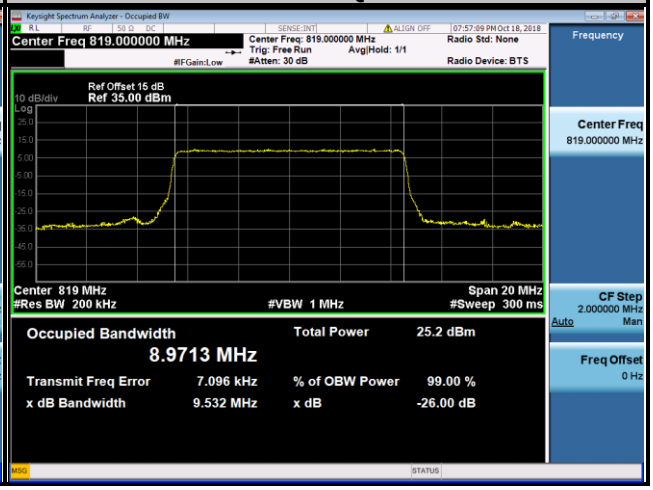
Spectrum Plot of Worst Value



LTE Band 26									
Channel Bandwidth: 1.4 MHz					Channel Bandwidth: 3 MHz				
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)			Channel	Frequency (MHz)	26 dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
26697	814.7	1.219	1.215	1.211	26705	815.5	2.929	2.933	2.928
26740	819.0	1.220	1.214	1.211	26740	819.0	2.939	2.931	2.922
26783	823.3	1.220	1.214	1.213	26775	822.5	2.940	2.918	2.928

Spectrum Plot of Worst Value	
1.4 MHz / QPSK	3 MHz / QPSK
	

LTE Band 26									
Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)			Channel	Frequency (MHz)	26 dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
26715	816.5	4.823	4.809	4.804	26740	819.0	9.532	9.520	9.526
26740	819.0	4.822	4.819	4.806					
26765	821.5	4.819	4.794	4.810					

Spectrum Plot of Worst Value	
5 MHz / QPSK	10 MHz / QPSK
	

4.5 Emission Mask Measurement

4.5.1 Limits of Emission Mask Measurement

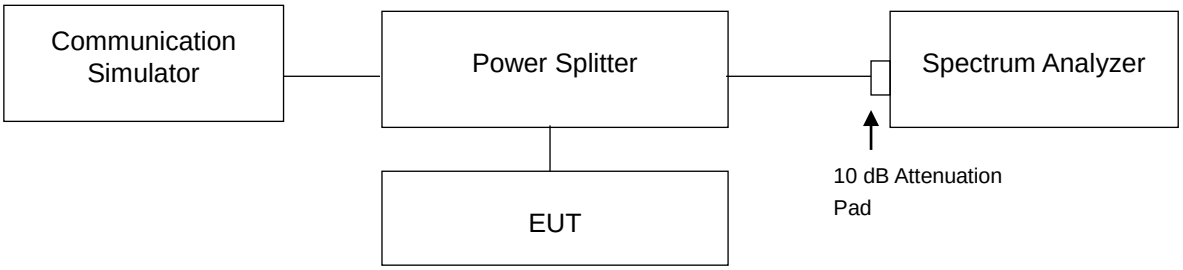
CDMA / LTE Band 26

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 $Log_{10}(f/6.1)$ decibels or 50 + $10Log_{10}(P)$ 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 + $10Log_{10}(P)$ 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.

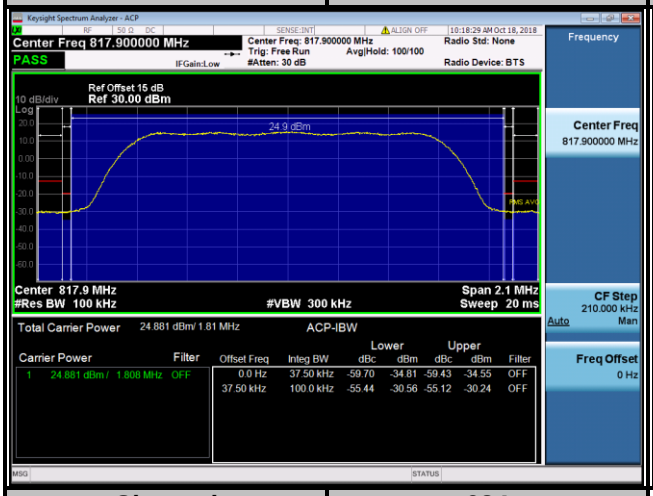
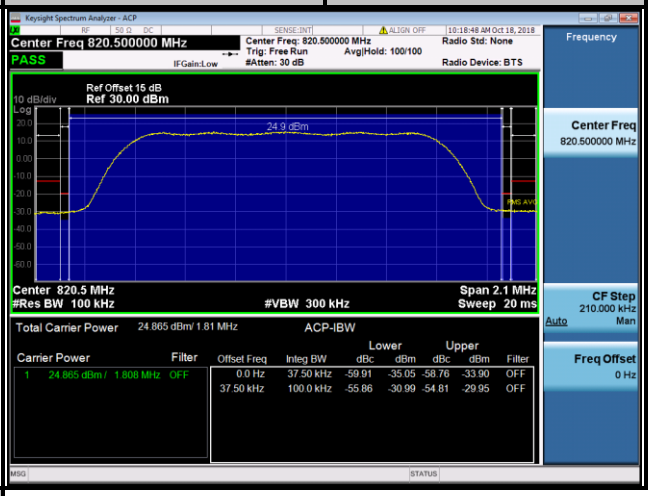
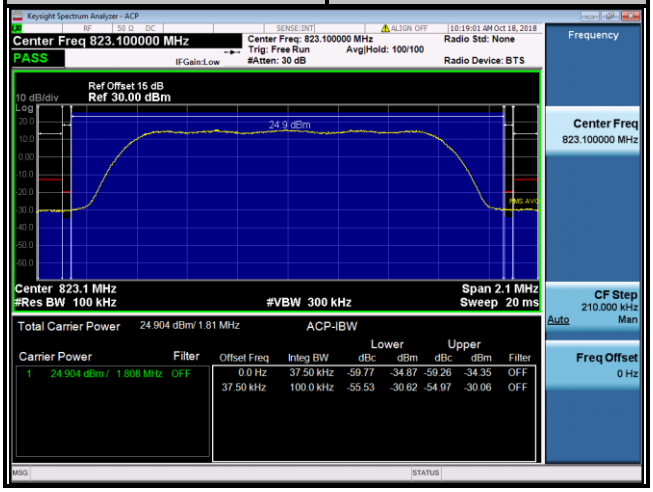
4.5.2 Test Setup



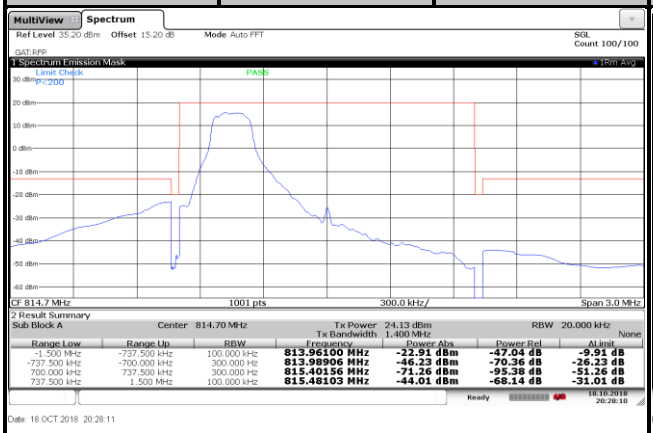
4.5.3 Test Procedures

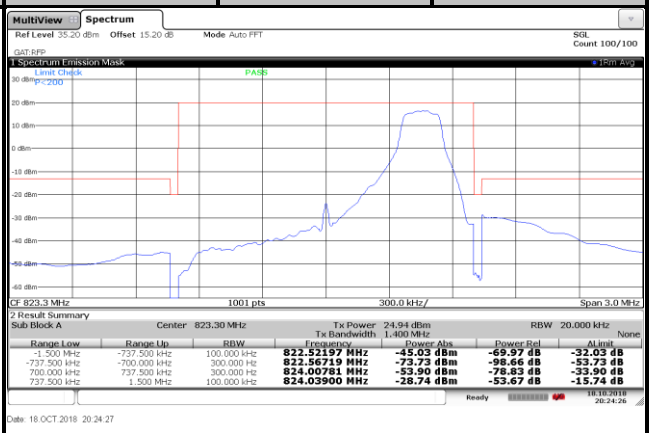
a. The measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
b. Record the test plot.

4.5.4 Test Results

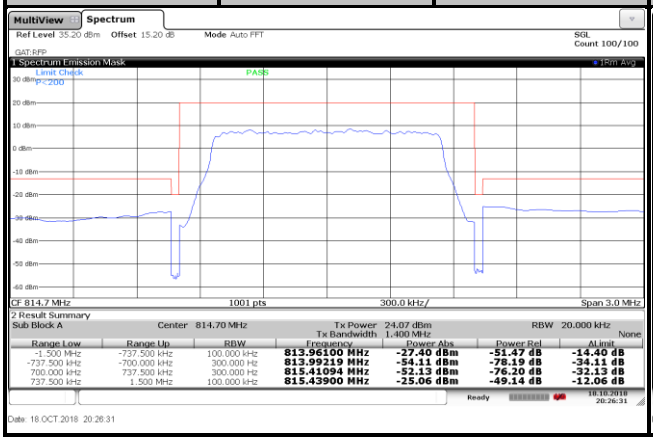
CDMA			
Channel	476	Channel	580
			
Channel	684		
			

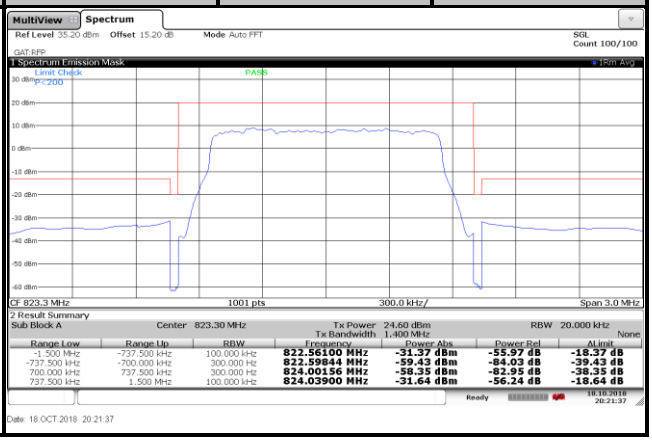
LTE Band 26					
Channel Bandwidth: 1.4 MHz / QPSK					
Channel	26697	1 RB	Channel	26783	1 RB

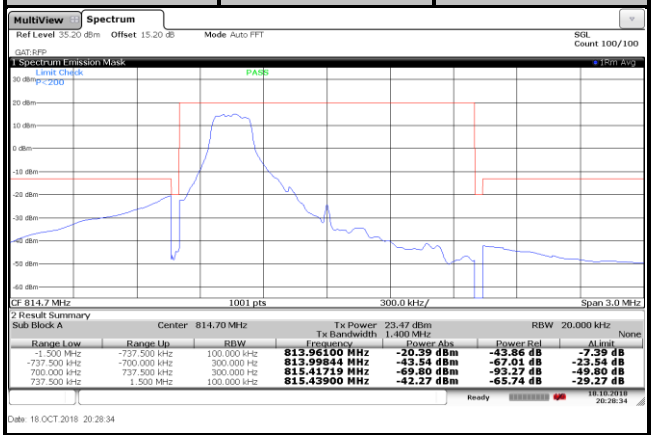
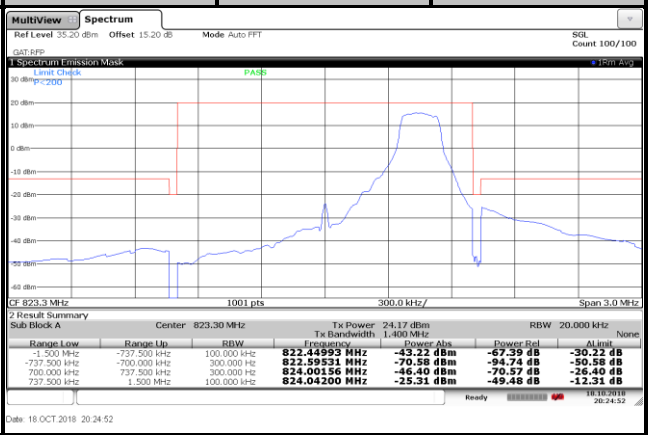
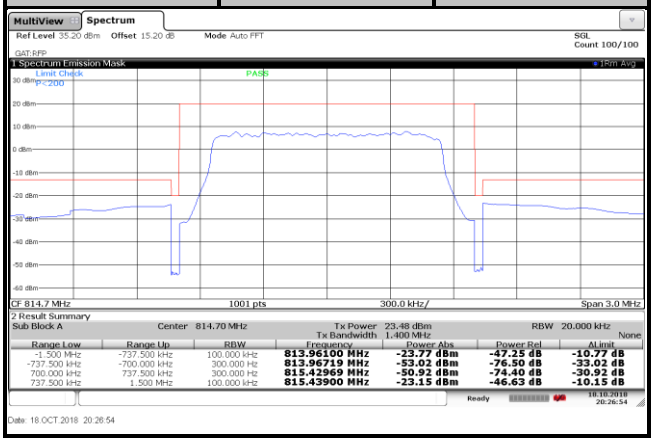
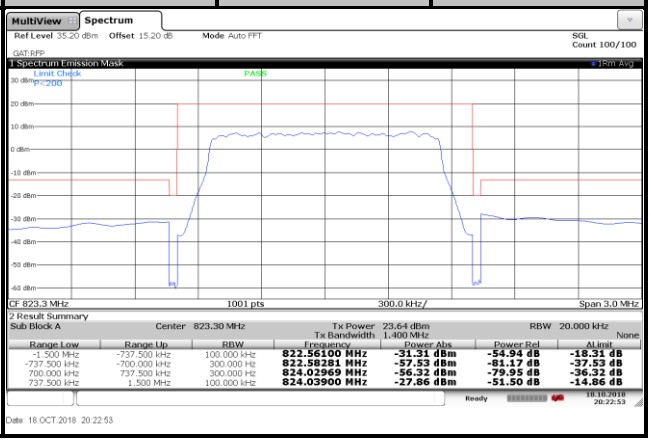




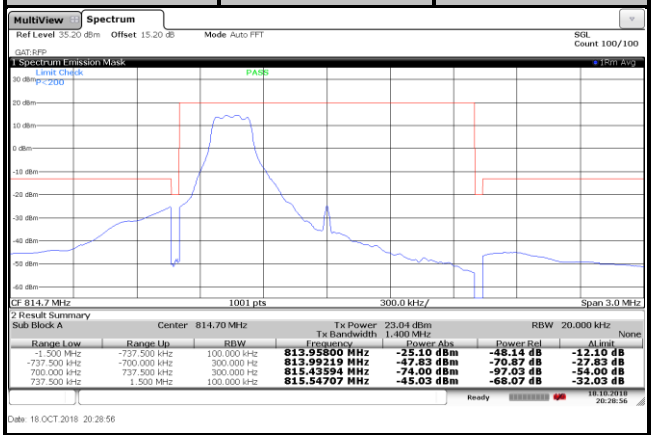
Channel	26697	6 RB	Channel	26783	6 RB



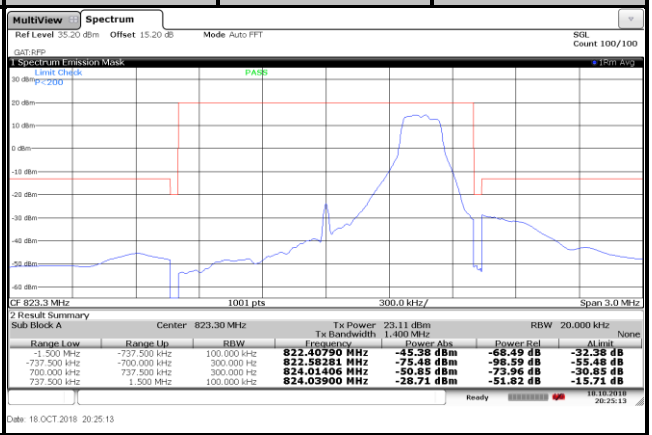


LTE Band 26					
Channel Bandwidth: 1.4 MHz / 16QAM					
Channel	26697	1 RB	Channel	26783	1 RB
					
Channel	26697	6 RB	Channel	26783	6 RB
					

LTE Band 26					
Channel Bandwidth: 1.4 MHz / 64QAM					
Channel	26697	1 RB	Channel	26783	1 RB

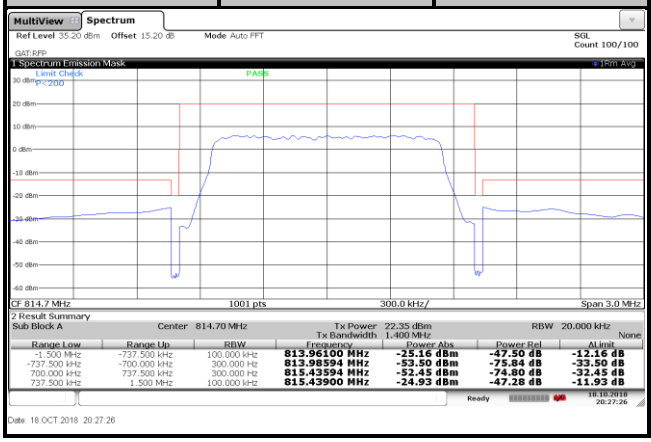


Date: 18.OCT.2018 20:28:56

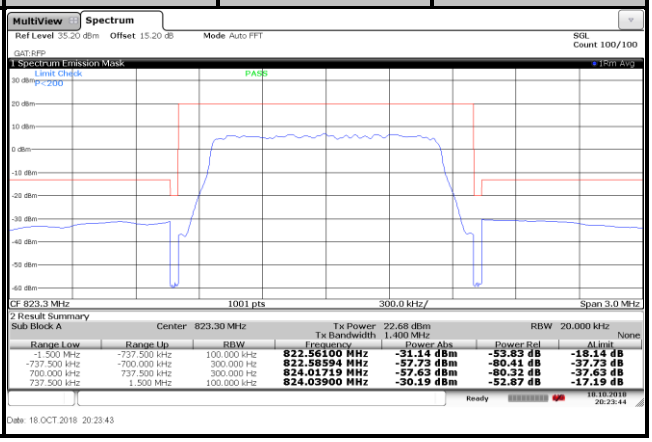


Date: 18.OCT.2018 20:25:13

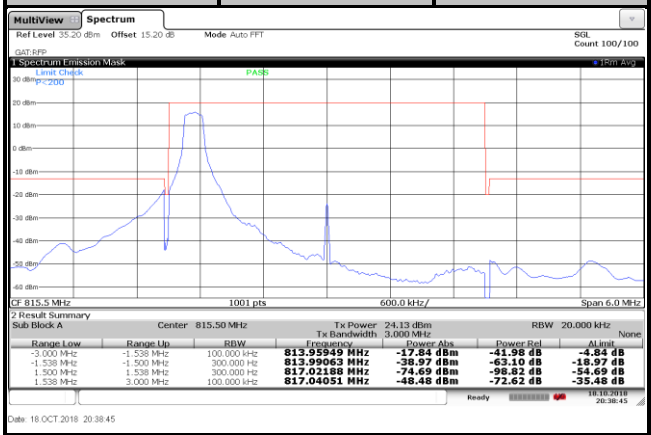
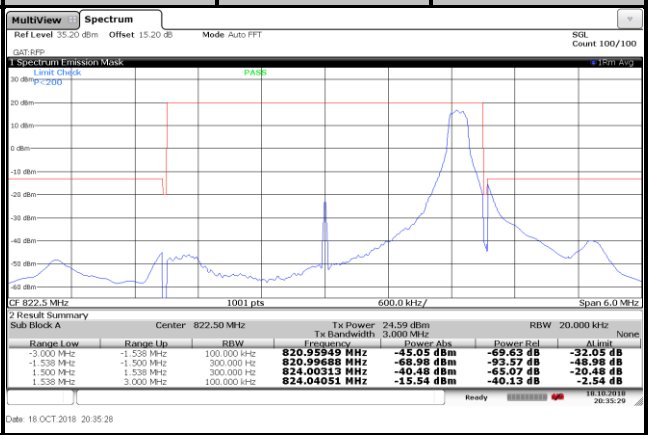
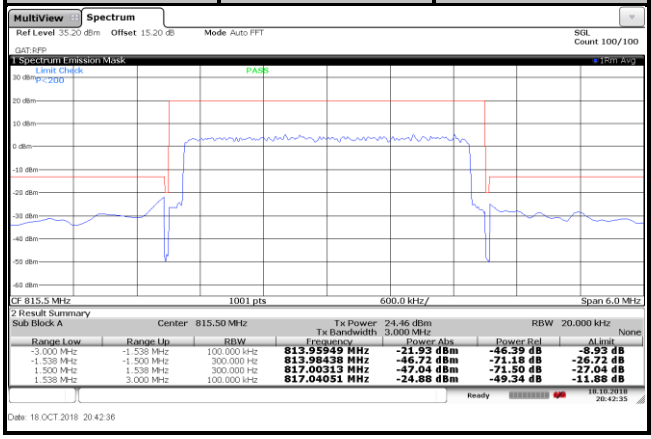
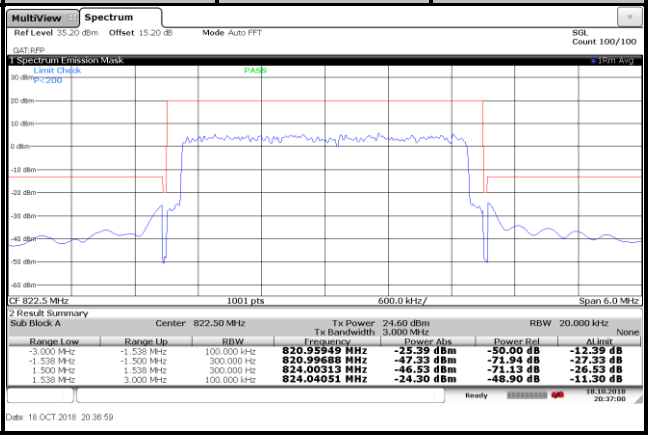
Channel	26697	6 RB	Channel	26783	6 RB

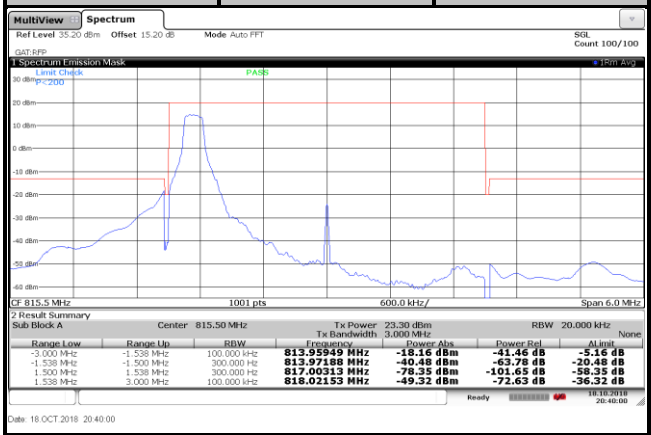
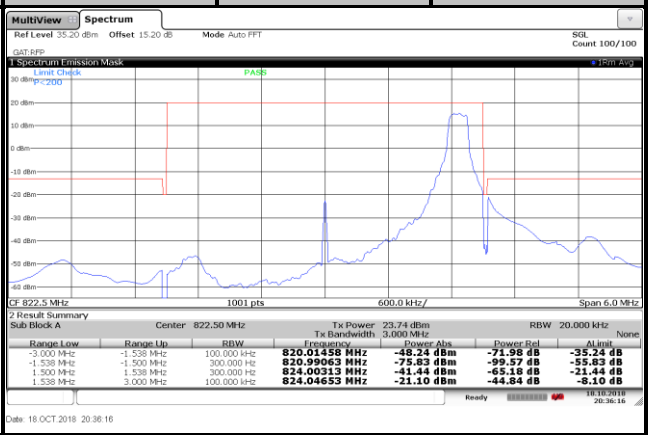
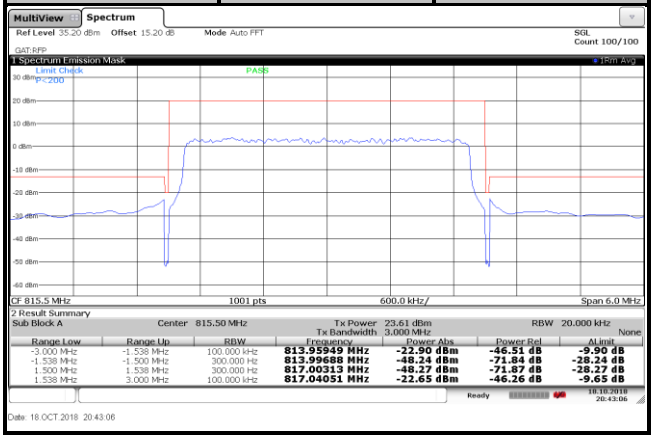
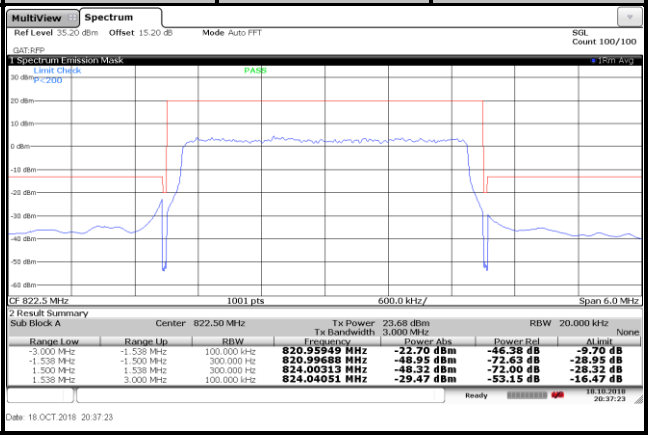


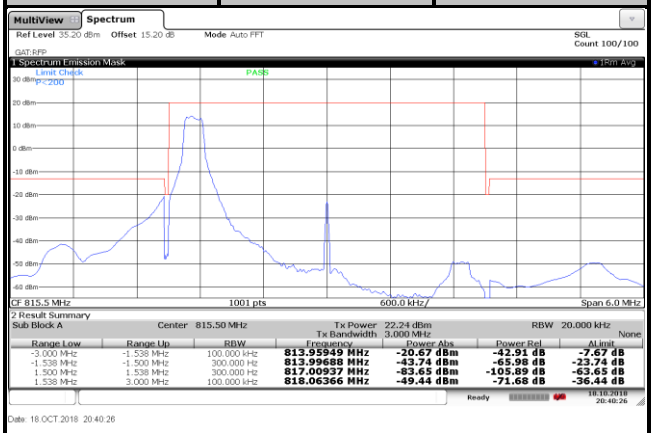
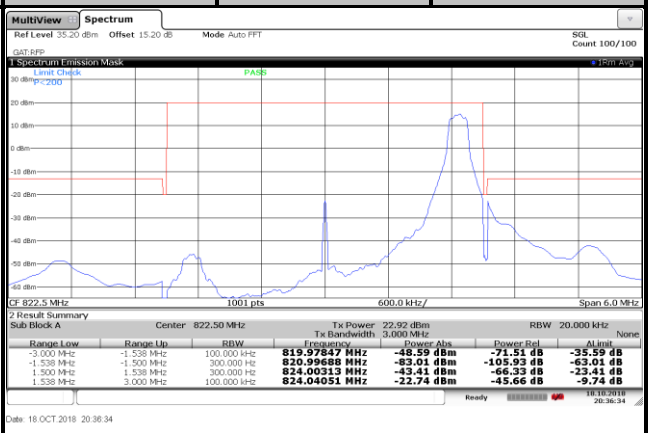
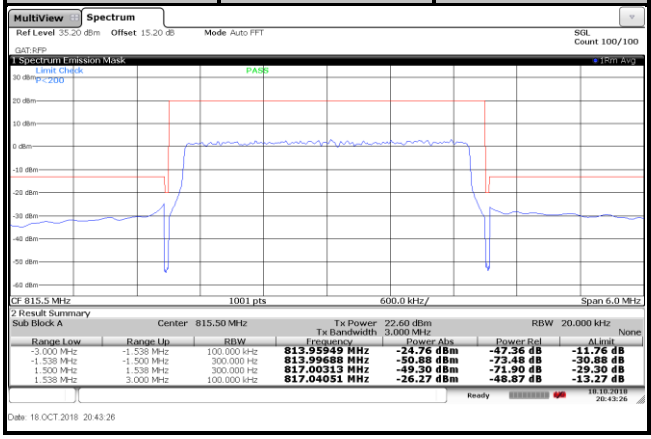
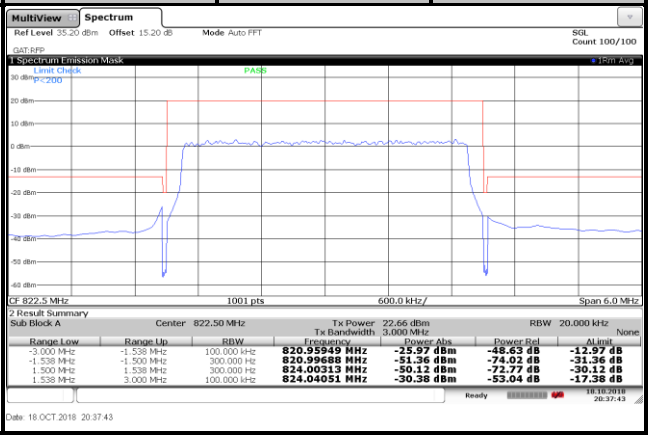
Date: 18.OCT.2018 20:27:26



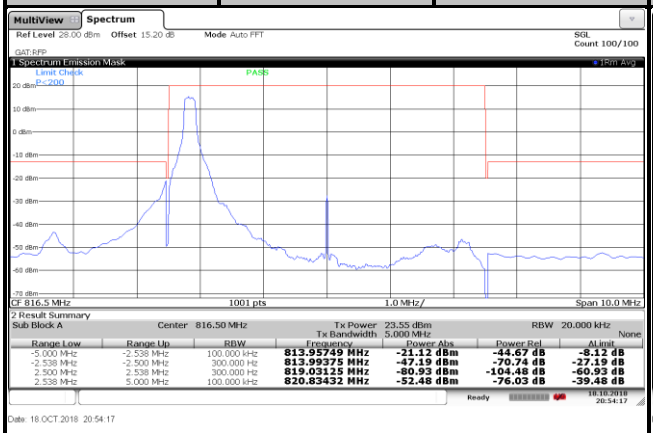
Date: 18.OCT.2018 20:23:43

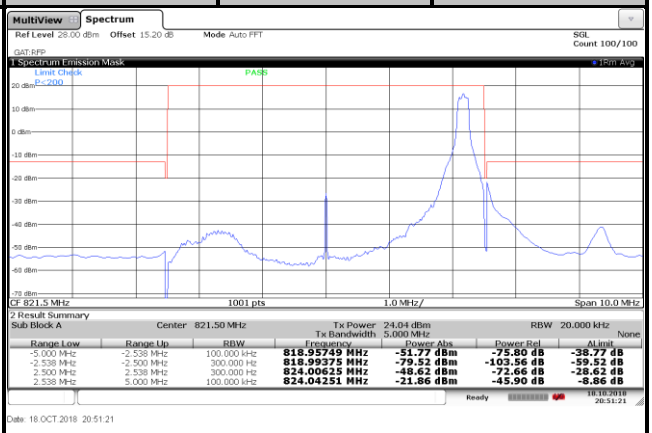
LTE Band 26					
Channel Bandwidth: 3 MHz / QPSK					
Channel	26705	1 RB	Channel	26775	1 RB
					
Channel	26705	15 RB	Channel	26775	15 RB
					

LTE Band 26					
Channel Bandwidth: 3 MHz / 16QAM					
Channel	26705	1 RB	Channel	26775	1 RB
					
Channel	26705	15 RB	Channel	26775	15 RB
					

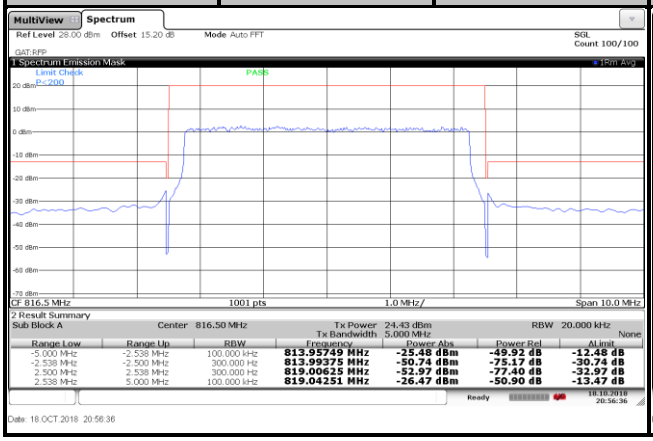
LTE Band 26					
Channel Bandwidth: 3 MHz / 64QAM					
Channel	26705	1 RB	Channel	26775	1 RB
					
Channel	26705	15 RB	Channel	26775	15 RB
					

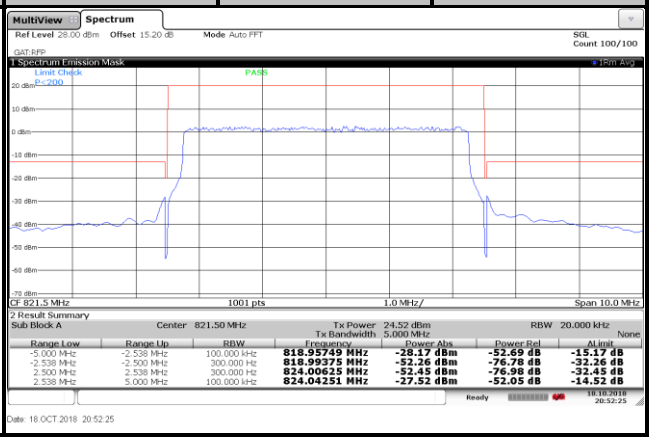
LTE Band 26					
Channel Bandwidth: 5 MHz / QPSK					
Channel	26715	1 RB	Channel	26765	1 RB

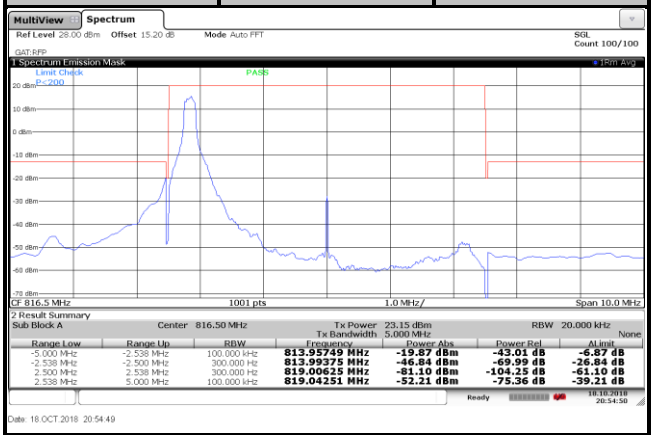
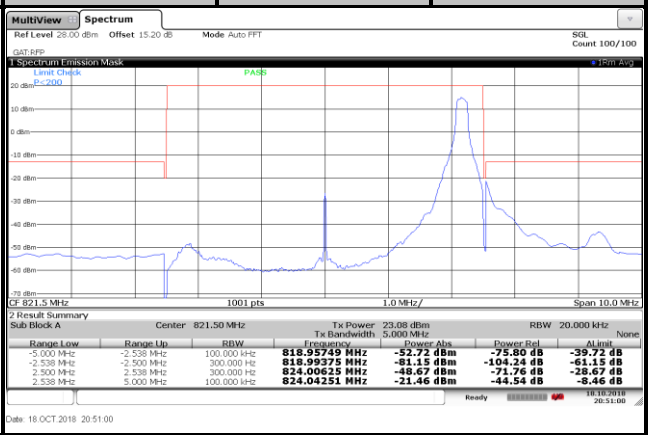
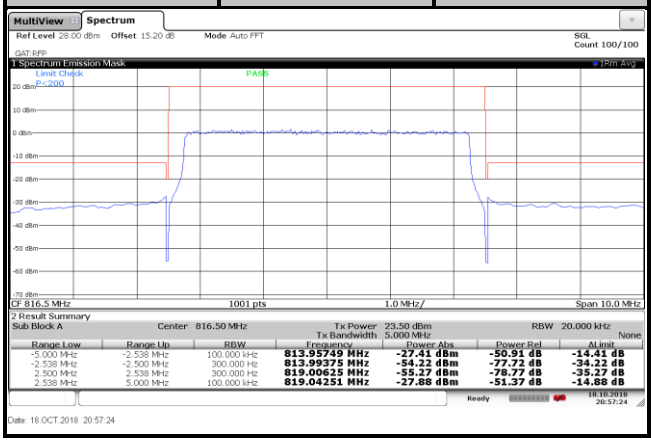
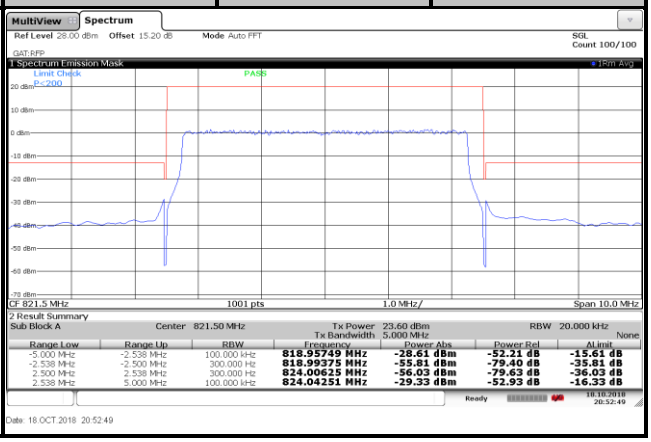


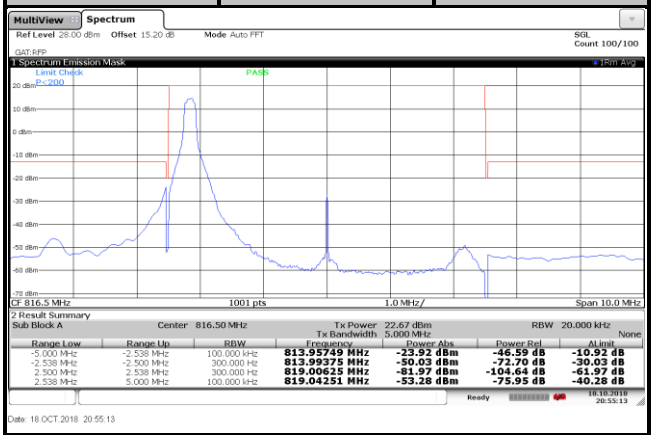
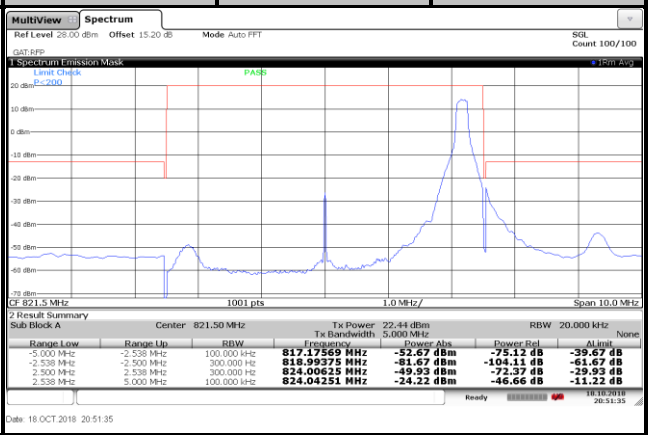
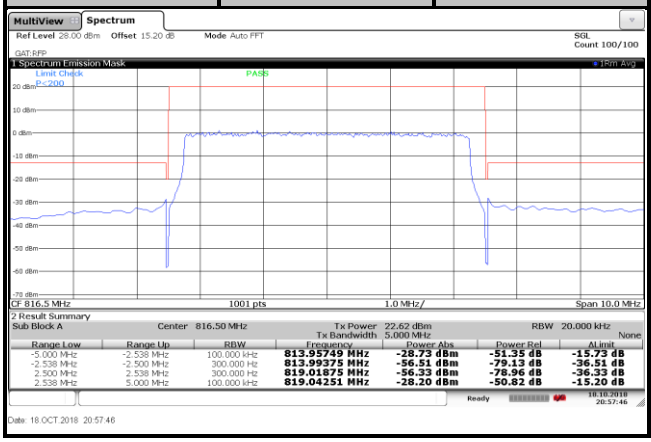
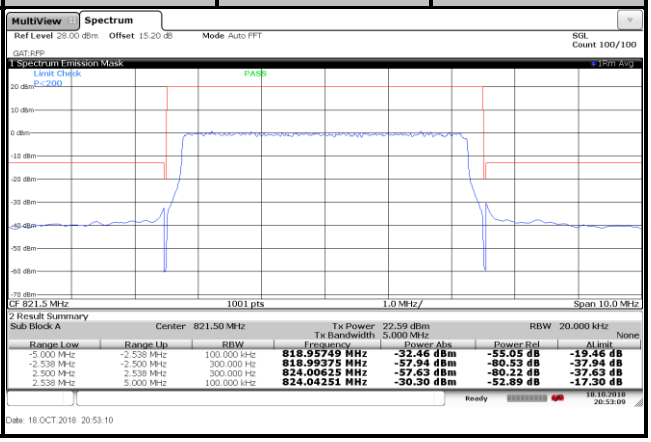


Channel	26715	25 RB	Channel	26765	25 RB

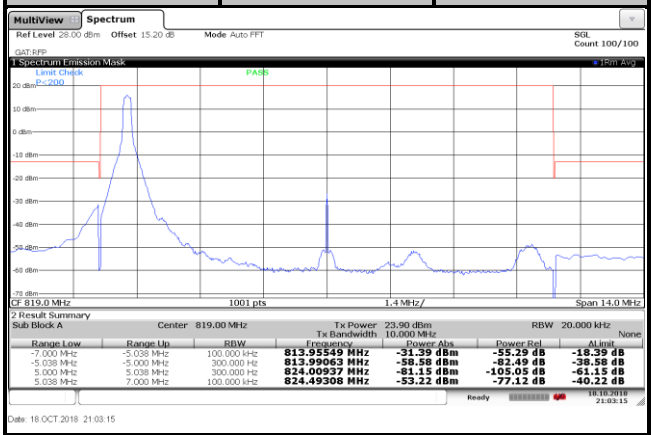


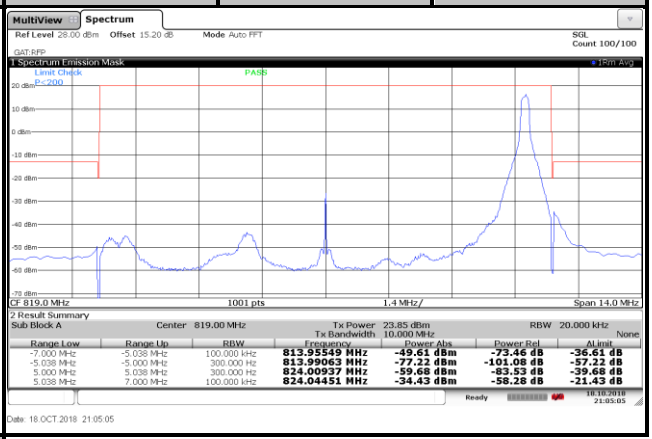


LTE Band 26					
Channel Bandwidth: 5 MHz / 16QAM					
Channel	26715	1 RB	Channel	26765	1 RB
					
Channel	26715	25 RB	Channel	26765	25 RB
					

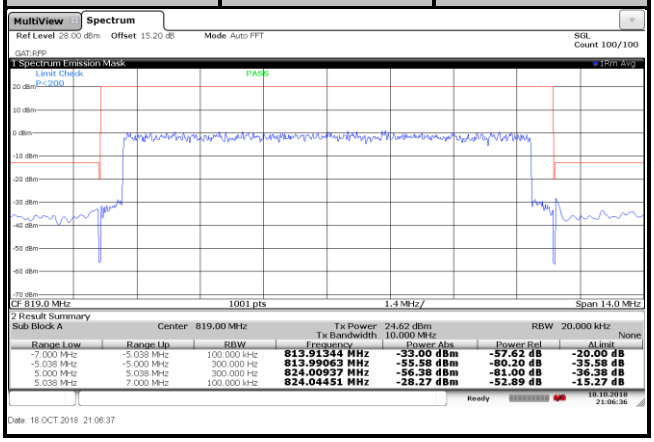
LTE Band 26					
Channel Bandwidth: 5 MHz / 64QAM					
Channel	26715	1 RB	Channel	26765	1 RB
					
Channel	26715	25 RB	Channel	26765	25 RB
					

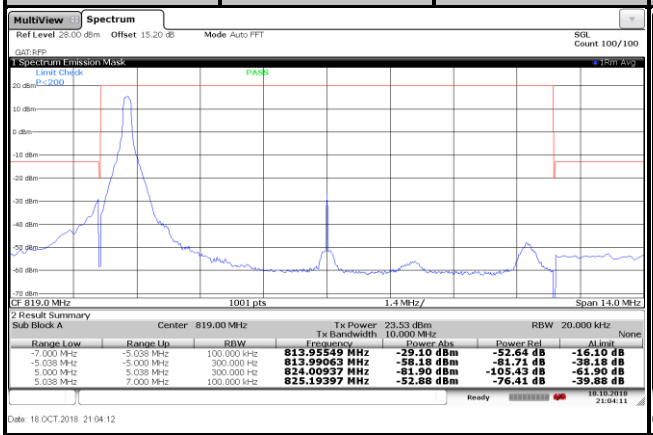
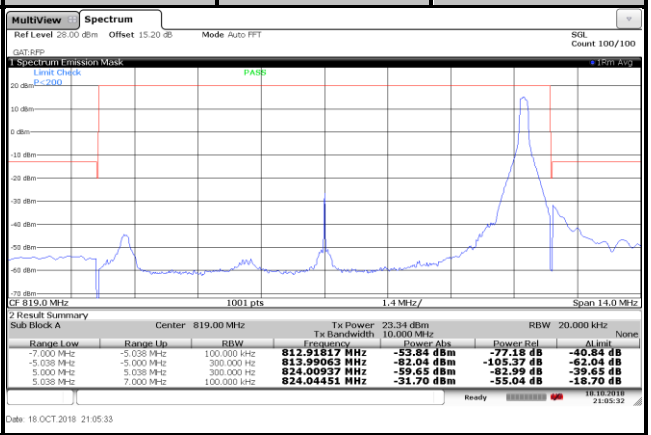
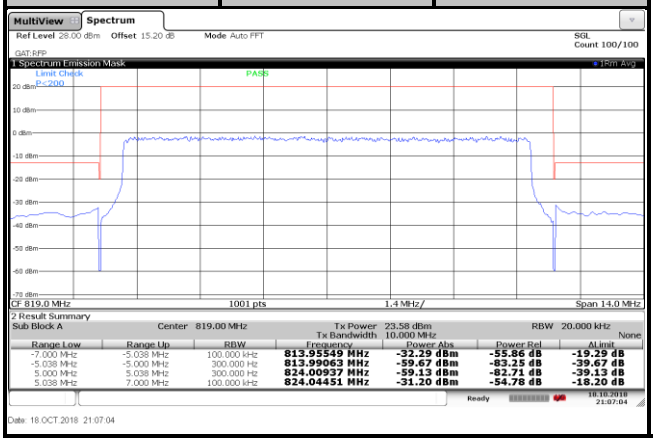
LTE Band 26					
Channel Bandwidth: 10 MHz / QPSK					
Channel	26740	1 RB	Channel	26740	1 RB



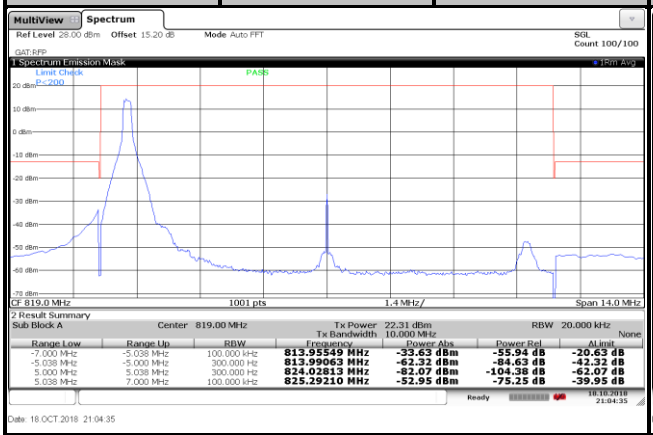


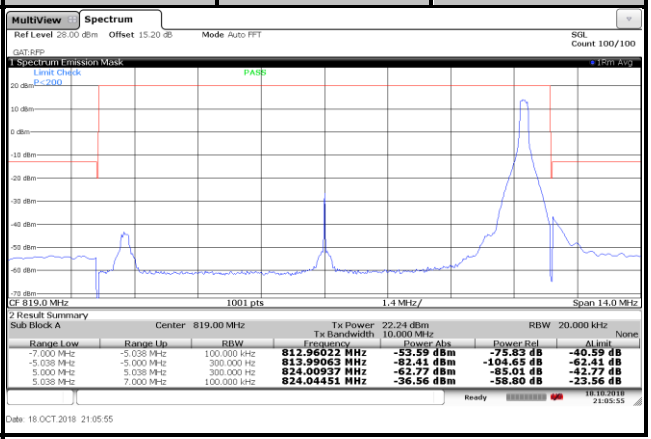
Channel	26740	50 RB



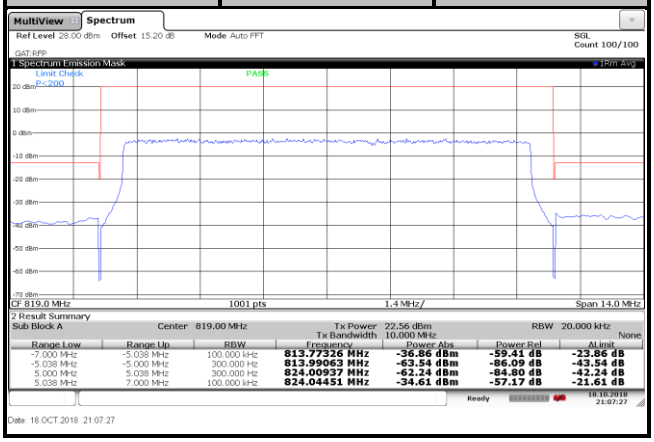
LTE Band 26					
Channel Bandwidth: 10 MHz / 16QAM					
Channel	26740	1 RB	Channel	26740	1 RB
					
Channel	26740	50 RB			
					

LTE Band 26					
Channel Bandwidth: 10 MHz / 64QAM					
Channel	26740	1 RB	Channel	26740	1 RB





Channel	26740	1 RB

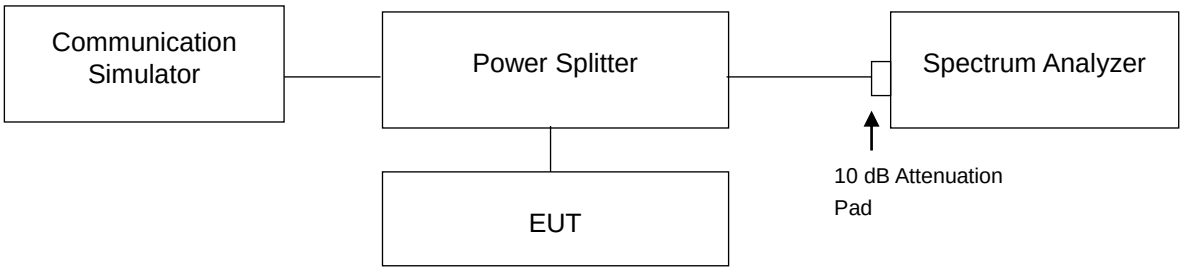


4.6 Conducted Spurious Emissions

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.

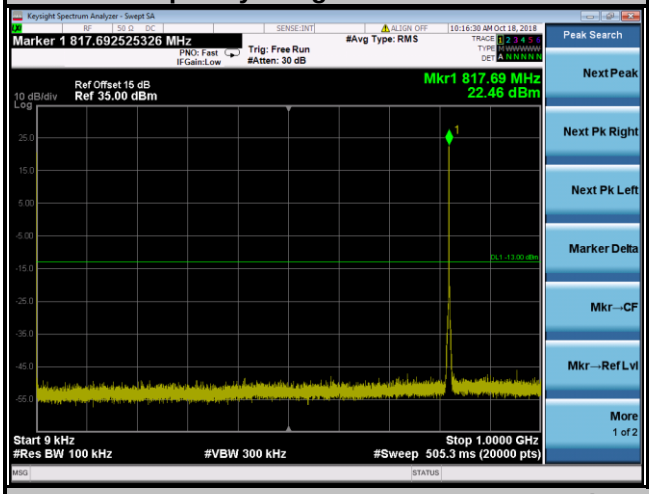
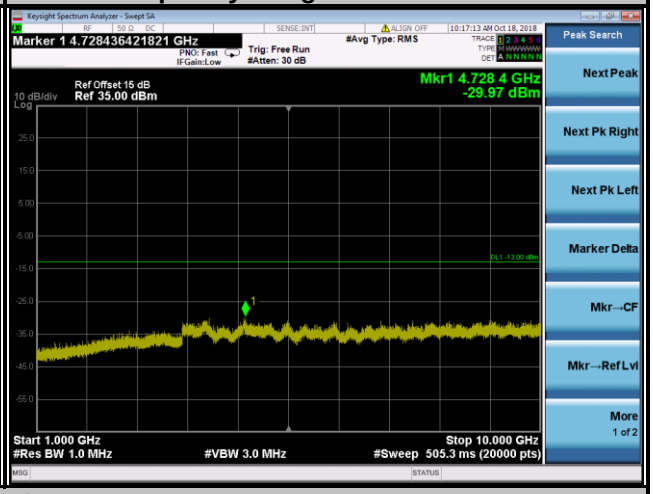
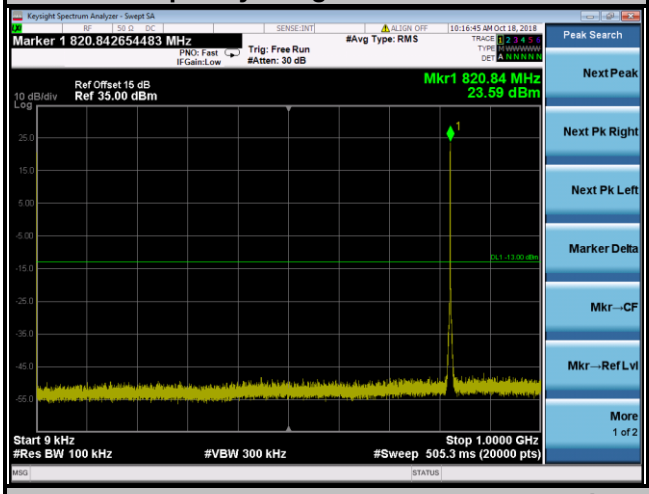
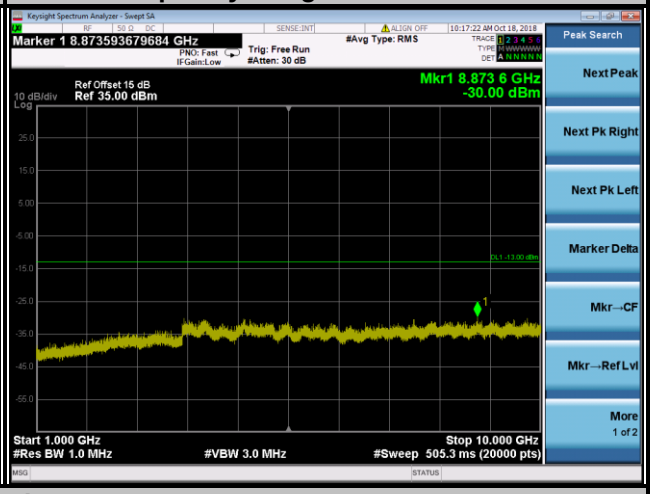
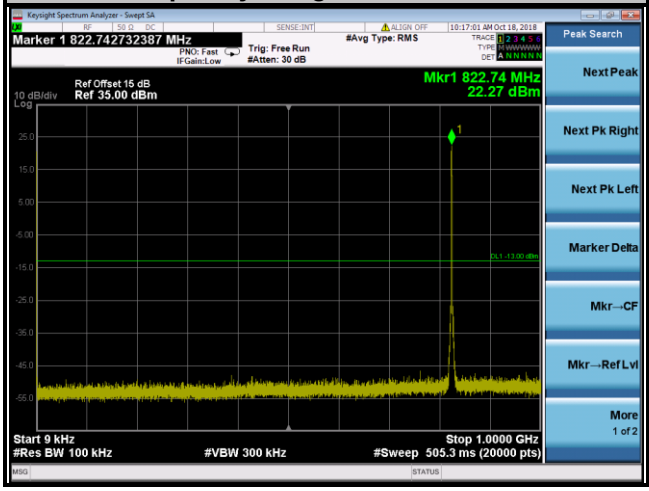
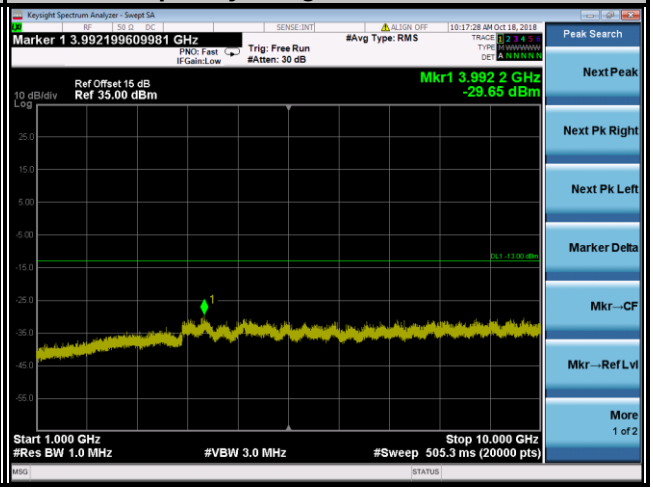
4.6.2 Test Setup



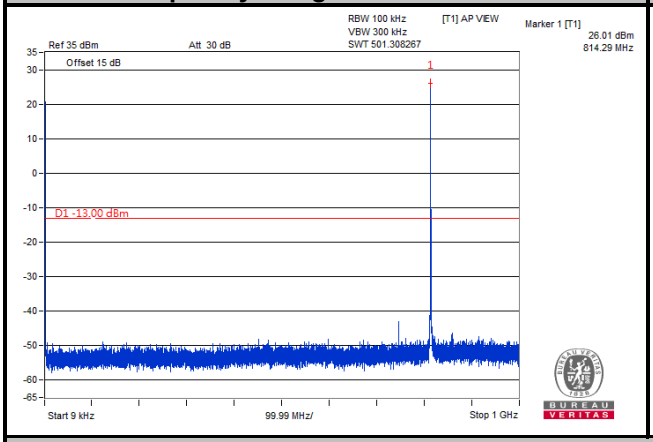
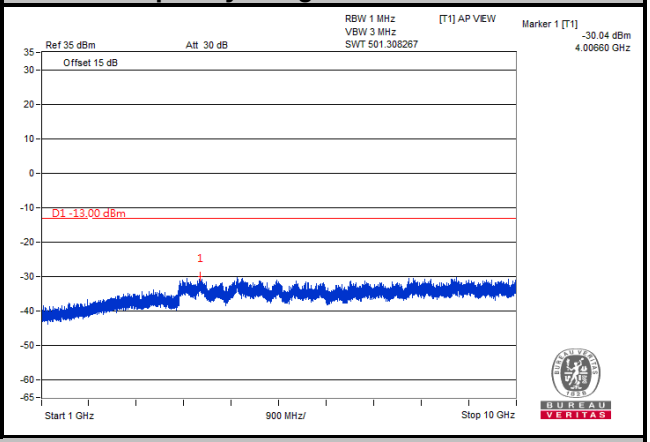
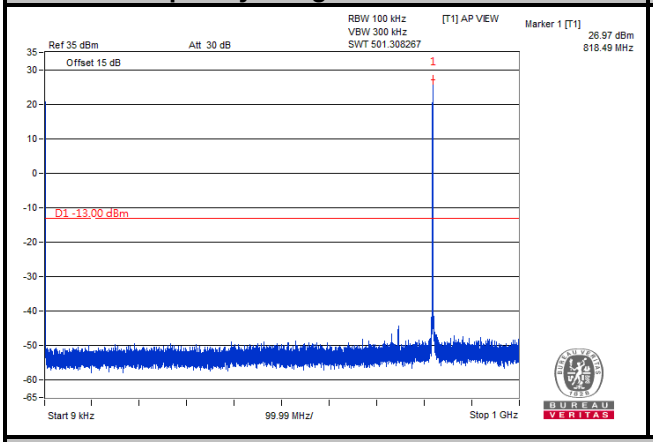
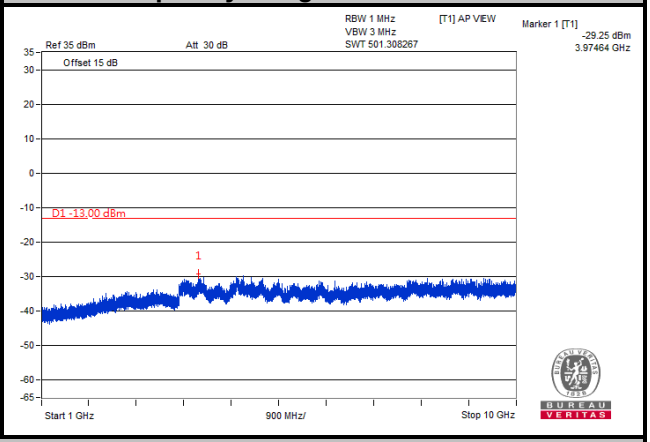
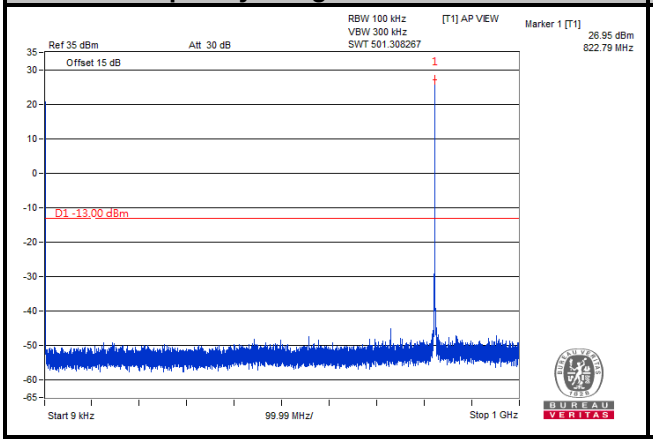
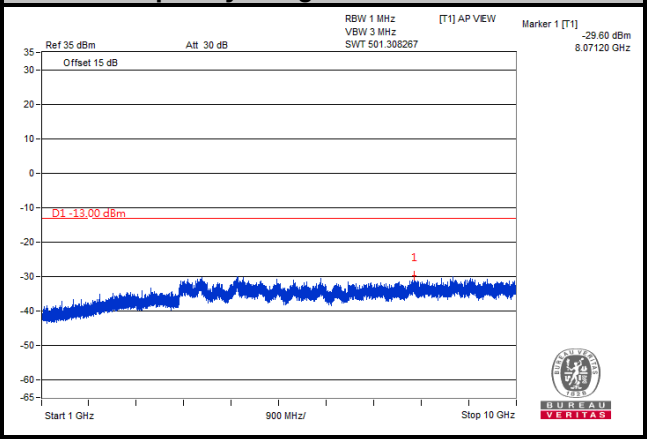
4.6.3 Test Procedure

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

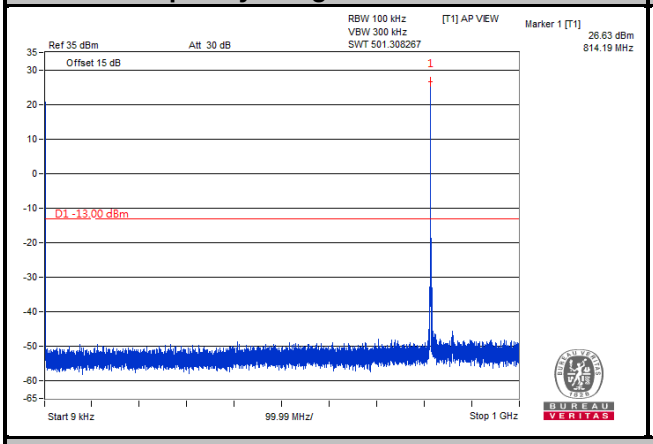
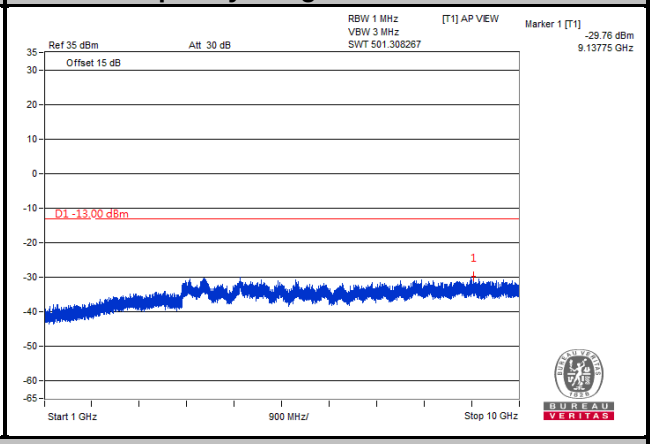
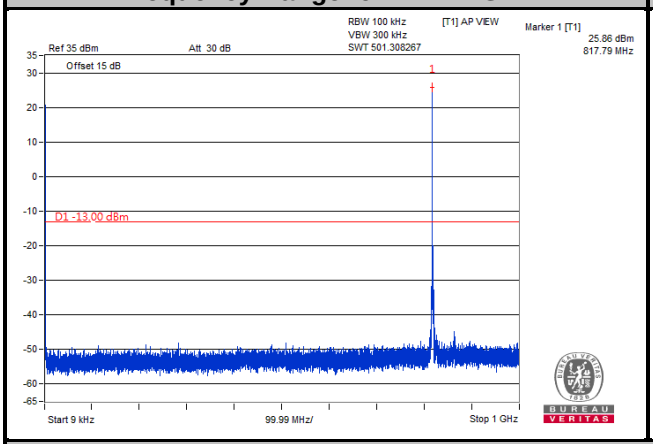
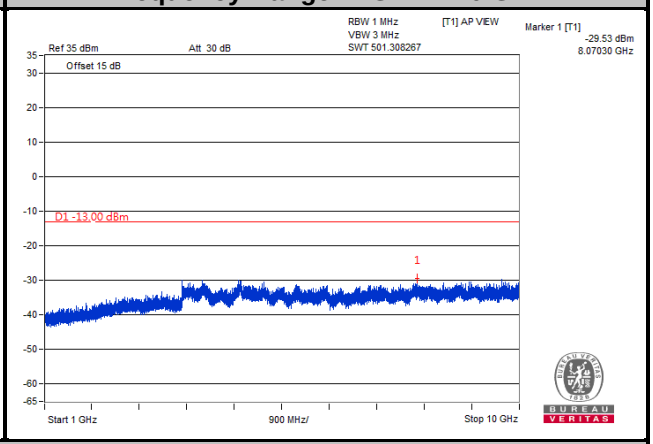
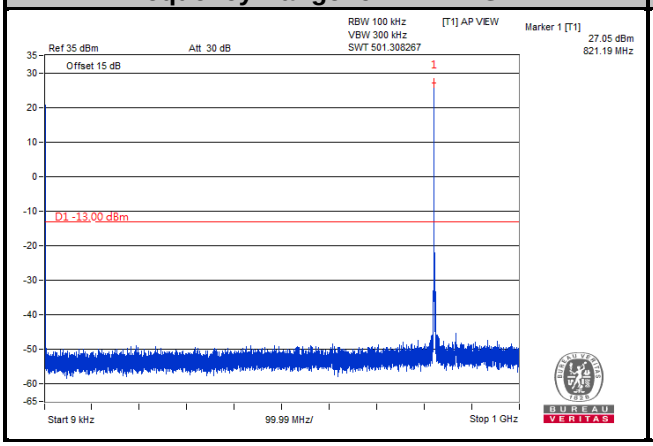
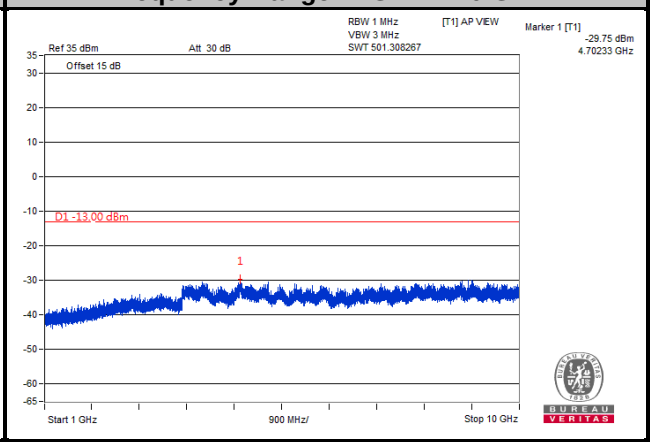
4.6.4 Test Results

CDMA	
Channel 476	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Channel 580	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Channel 684	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	

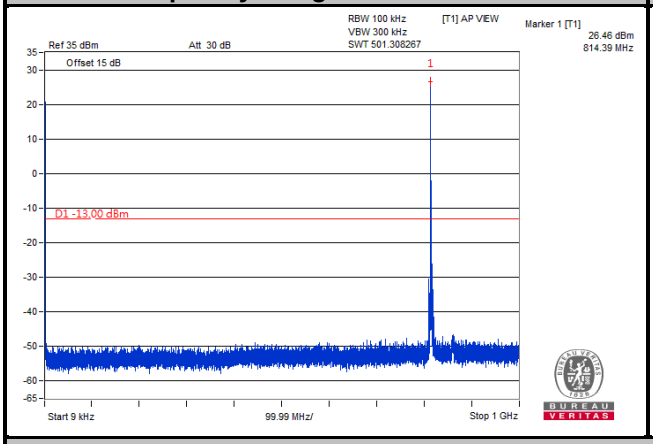
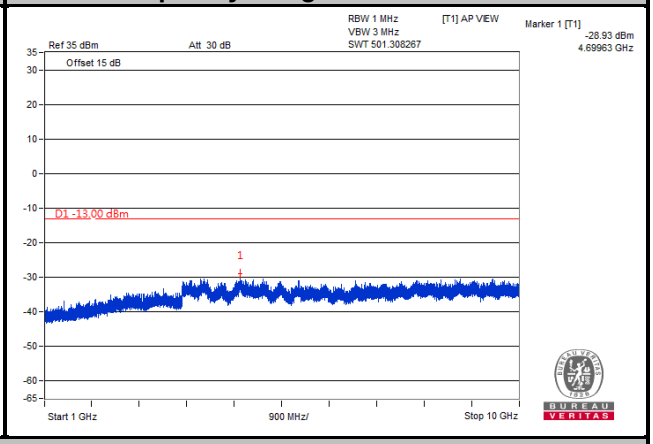
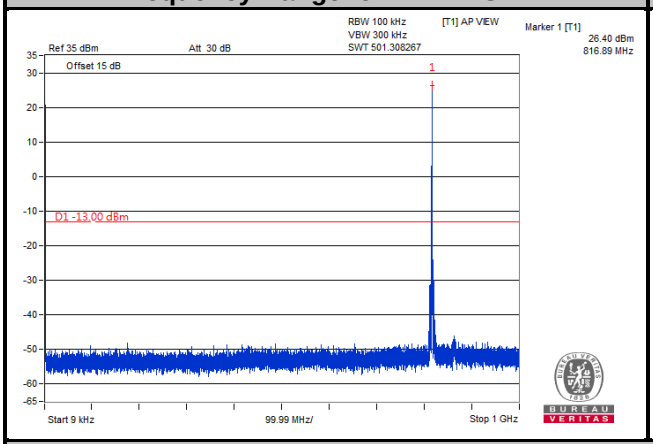
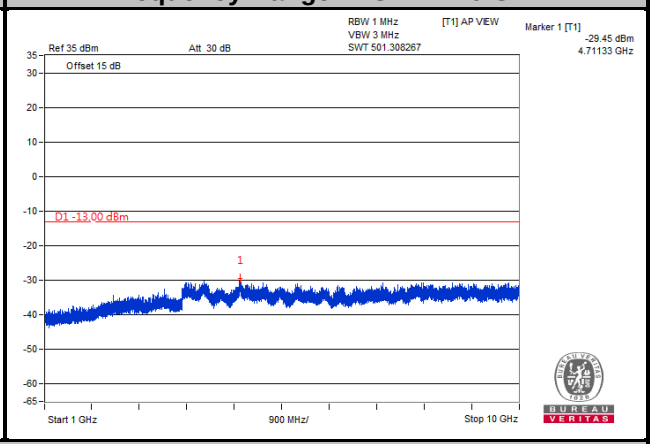
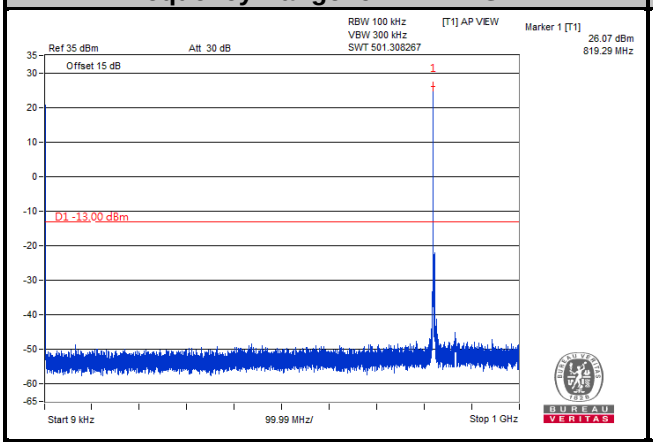
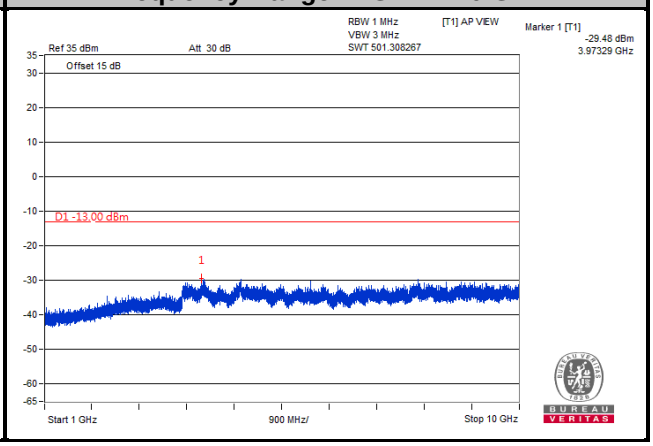
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 26	
Channel Bandwidth: 1.4 MHz	
Channel 26697	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Channel 26740	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Channel 26783	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	

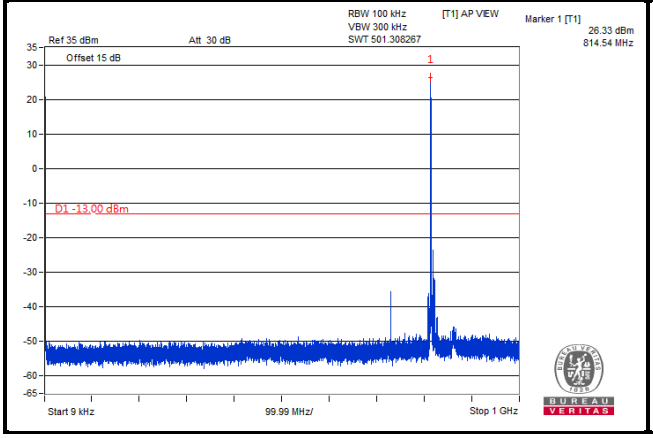
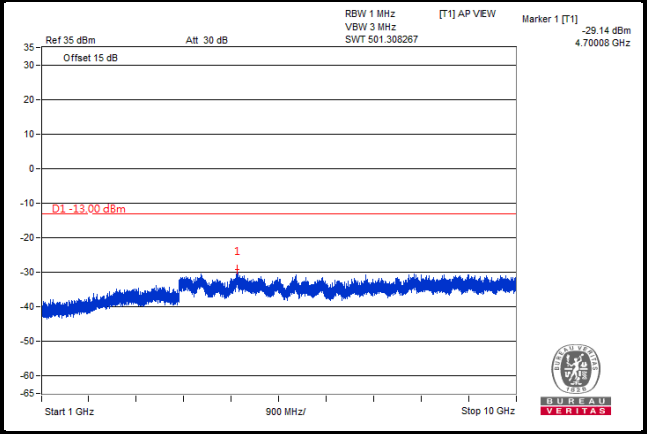
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 26	
Channel Bandwidth: 3 MHz	
Channel 26705	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Channel 26740	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Channel 26775	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	

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

LTE Band 26	
Channel Bandwidth: 5 MHz	
Channel 26715	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Channel 26740	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Channel 26765	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	

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

LTE Band 26	
Channel Bandwidth: 10 MHz	
Channel 26740	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	

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

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

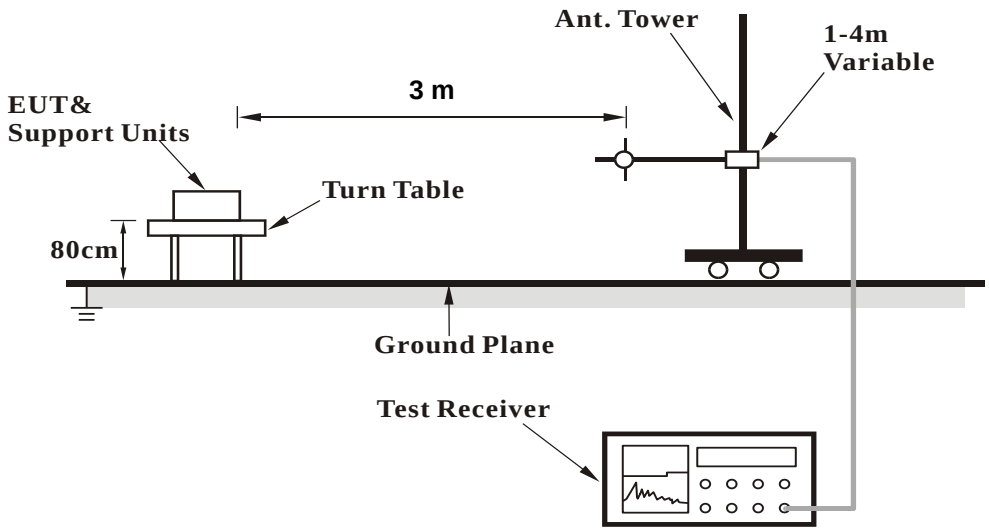
Note: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.7.3 Deviation from Test Standard

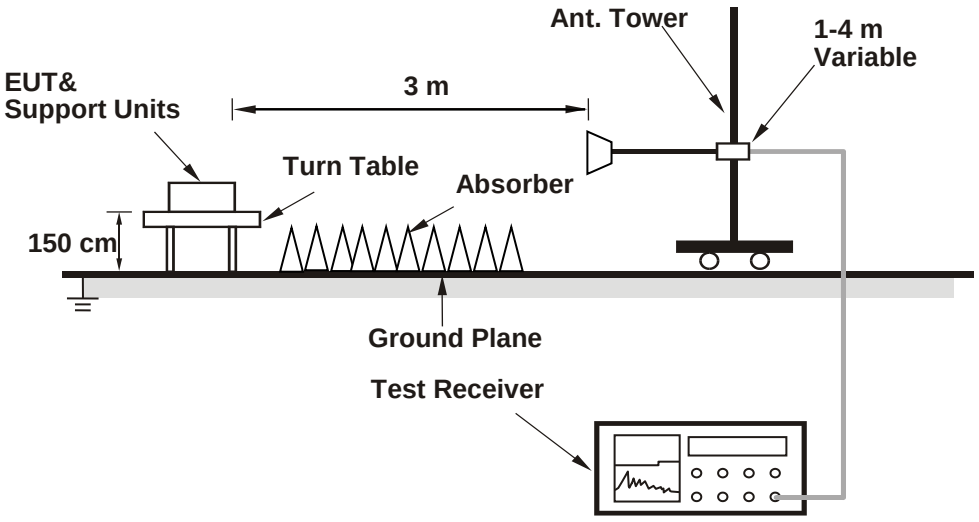
No deviation.

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

CDMA:

Low Channel

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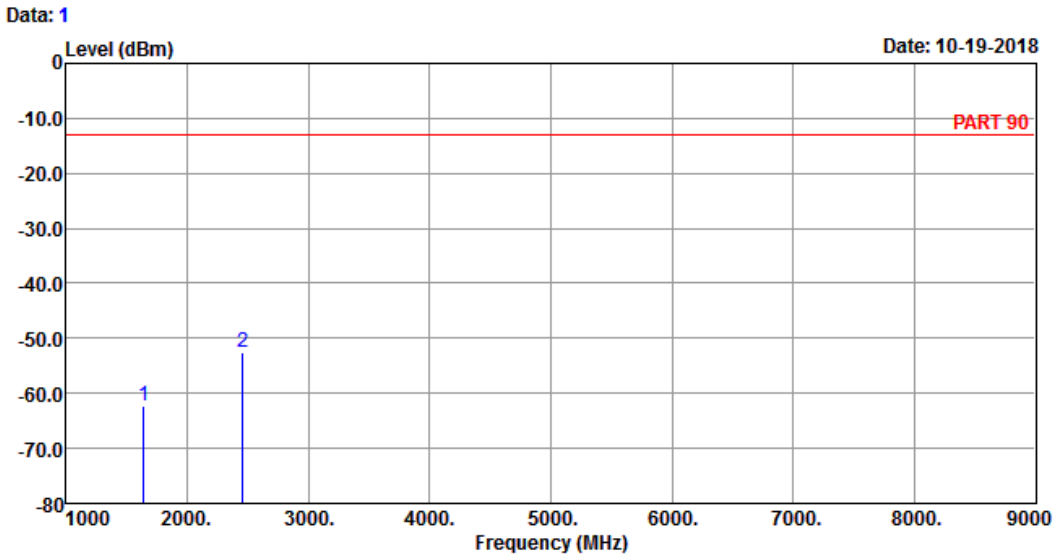
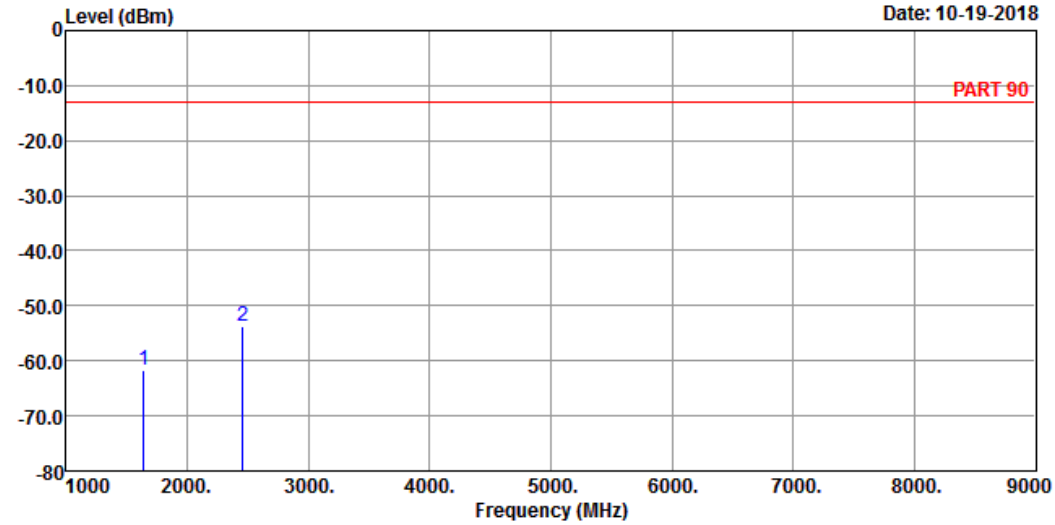


Site : 966 Chamber 5
Condition: PART 90 HORIZONTAL
Remark : CDMA BC10 Link_L-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1635.80	-62.16	-47.37	-13.00	-49.16	-14.79	Peak
2 pp	2453.70	-52.58	-42.14	-13.00	-39.58	-10.44	Peak

Data: 2

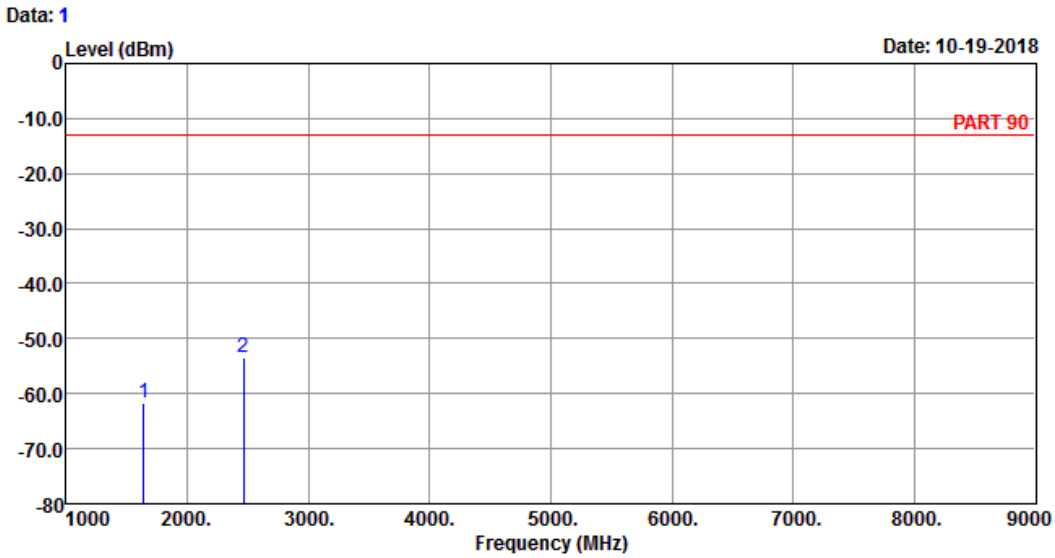


Site : 966 Chamber 5
Condition: PART 90 VERTICAL
Remark : CDMA BC10 Link_L-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1635.80	-61.79	-47.00	-13.00	-48.79	-14.79	Peak
2 pp	2453.70	-53.67	-43.23	-13.00	-40.67	-10.44	Peak

Middle Channel

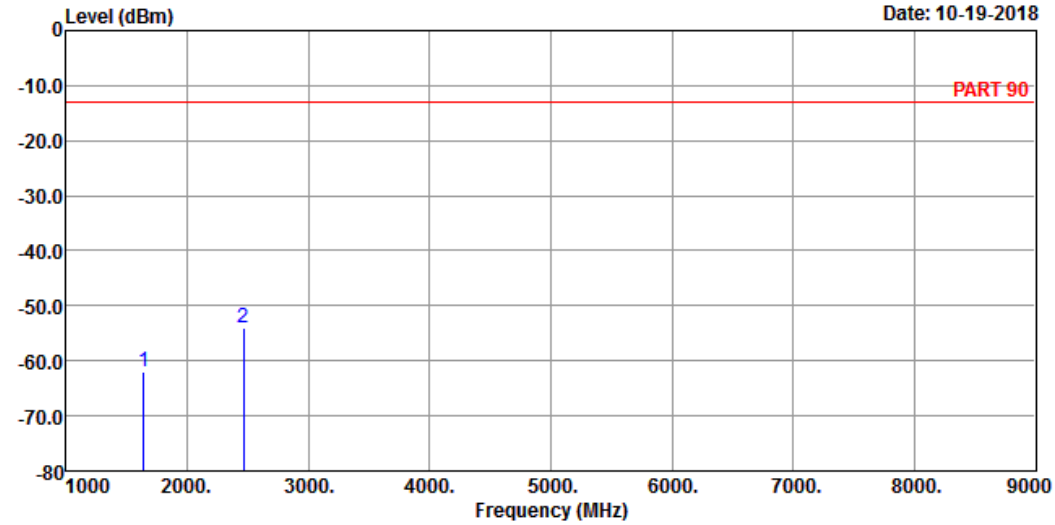
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART 90 HORIZONTAL
Remark : CDMA BC10 Link_M-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1641.00	-61.79	-47.06	-13.00	-48.79	-14.73	Peak
2 pp	2461.50	-53.39	-42.95	-13.00	-40.39	-10.44	Peak

Data: 2

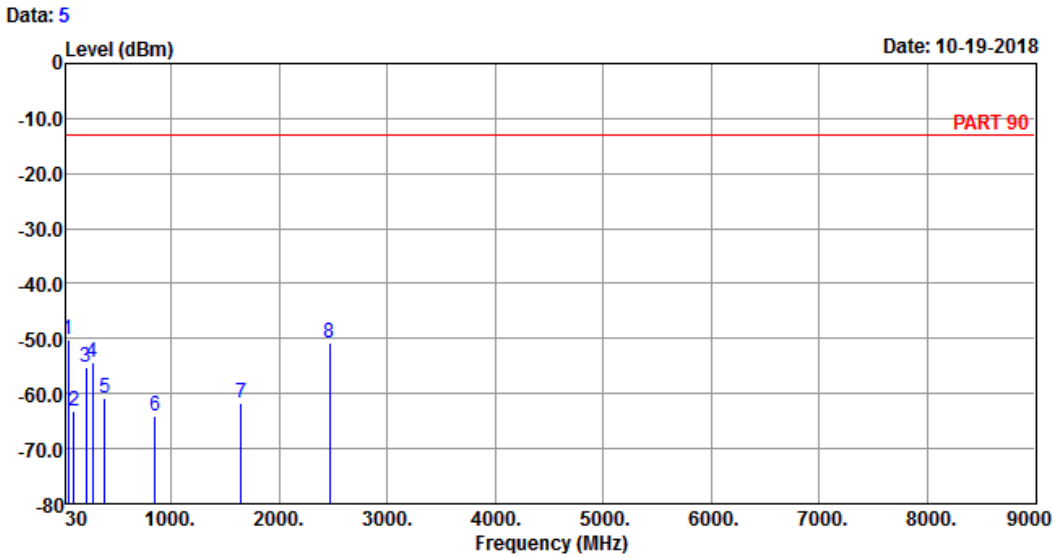


Site : 966 Chamber 5
Condition: PART 90 VERTICAL
Remark : CDMA BC10 Link_M-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1641.00	-62.04	-47.31	-13.00	-49.04	-14.73	Peak
2 pp	2461.50	-54.06	-43.62	-13.00	-41.06	-10.44	Peak

High Channel

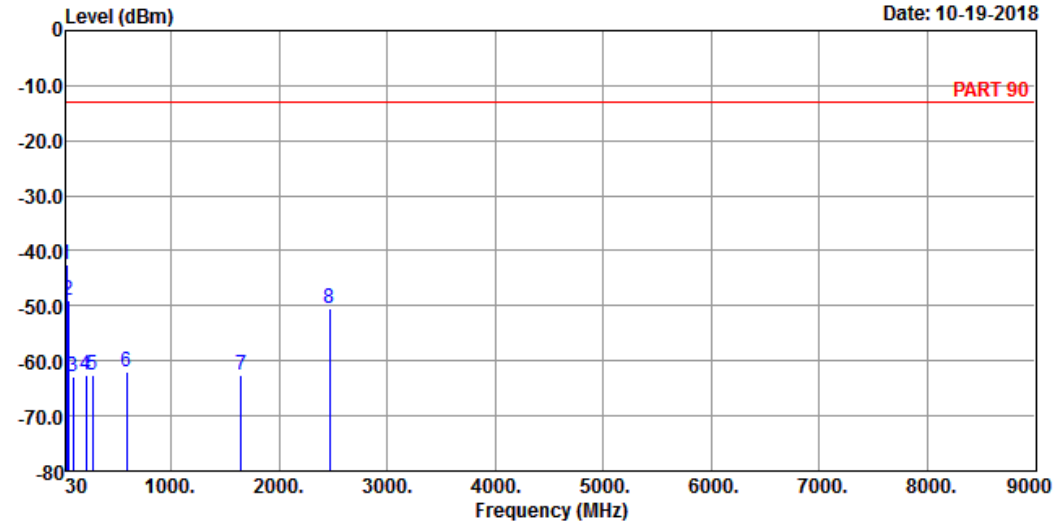
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART 90 HORIZONTAL
Remark : CDMA BC10 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	44.55	-50.15	-48.16	-13.00	-37.15	-1.99	Peak
2	96.93	-63.08	-52.35	-13.00	-50.08	-10.73	Peak
3	215.27	-55.21	-47.81	-13.00	-42.21	-7.40	Peak
4	276.38	-54.29	-47.76	-13.00	-41.29	-6.53	Peak
5	382.11	-60.90	-54.85	-13.00	-47.90	-6.05	Peak
6	848.68	-63.95	-64.25	-13.00	-50.95	0.30	Peak
7	1646.20	-61.56	-46.83	-13.00	-48.56	-14.73	Peak
8	2469.30	-50.80	-40.36	-13.00	-37.80	-10.44	Peak

Data: 6



Site : 966 Chamber 5
Condition: PART 90 VERTICAL
Remark : CDMA BC10 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	30.00	-42.55	-42.93	-13.00	-29.55	0.38	Peak
2	43.58	-48.87	-47.40	-13.00	-35.87	-1.47	Peak
3	94.99	-62.94	-52.10	-13.00	-49.94	-10.84	Peak
4	215.27	-62.54	-55.14	-13.00	-49.54	-7.40	Peak
5	274.44	-62.60	-56.11	-13.00	-49.60	-6.49	Peak
6	584.84	-62.00	-60.60	-13.00	-49.00	-1.40	Peak
7	1646.20	-62.47	-47.74	-13.00	-49.47	-14.73	Peak
8	2469.30	-50.54	-40.10	-13.00	-37.54	-10.44	Peak

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

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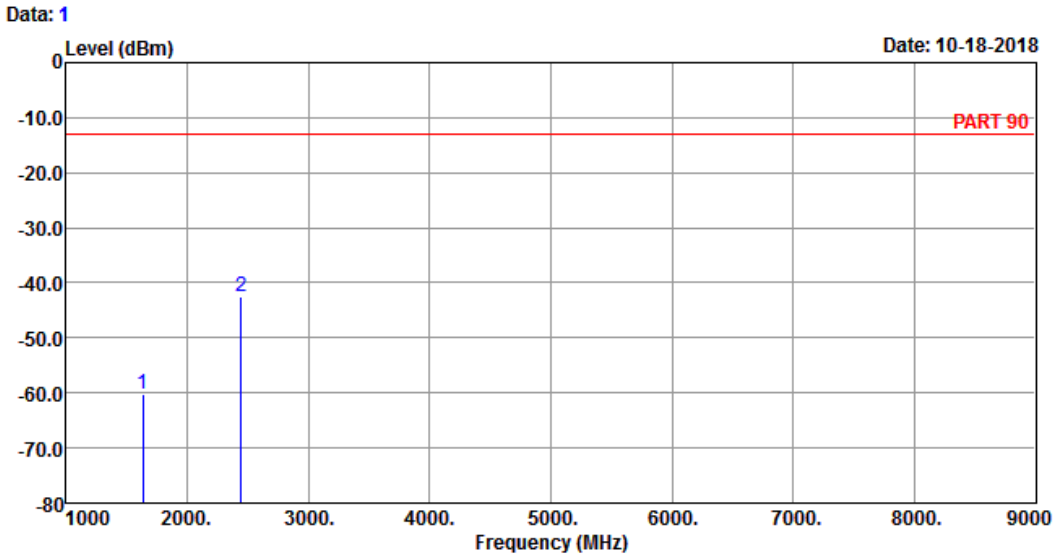
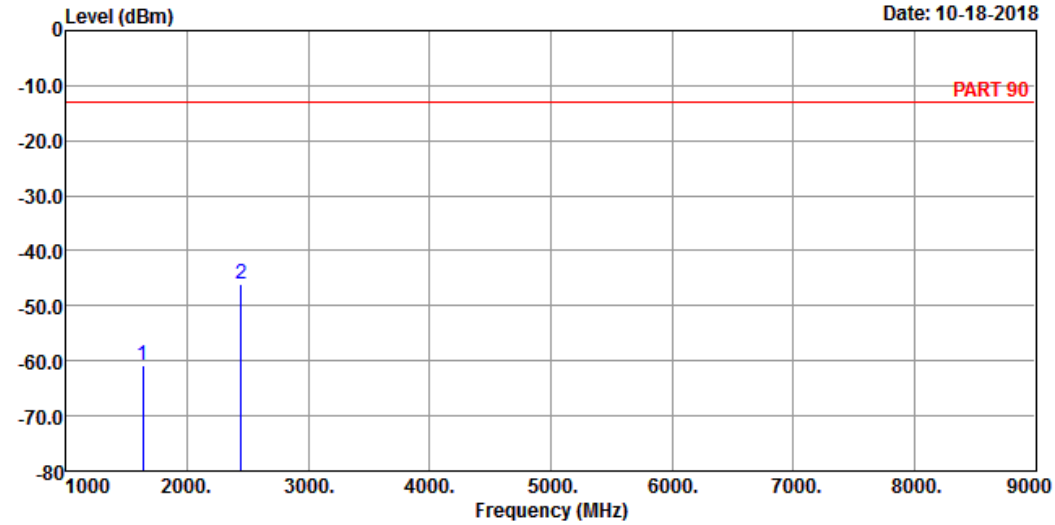


Site : 966 Chamber 5
Condition: PART 90 HORIZONTAL
Remak : LTE Band 26 QPSK_1.4M Link_L-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1629.40	-60.21	-45.42	-13.00	-47.21	-14.79	Peak
2 pp	2444.10	-42.53	-32.09	-13.00	-29.53	-10.44	Peak

Data: 2

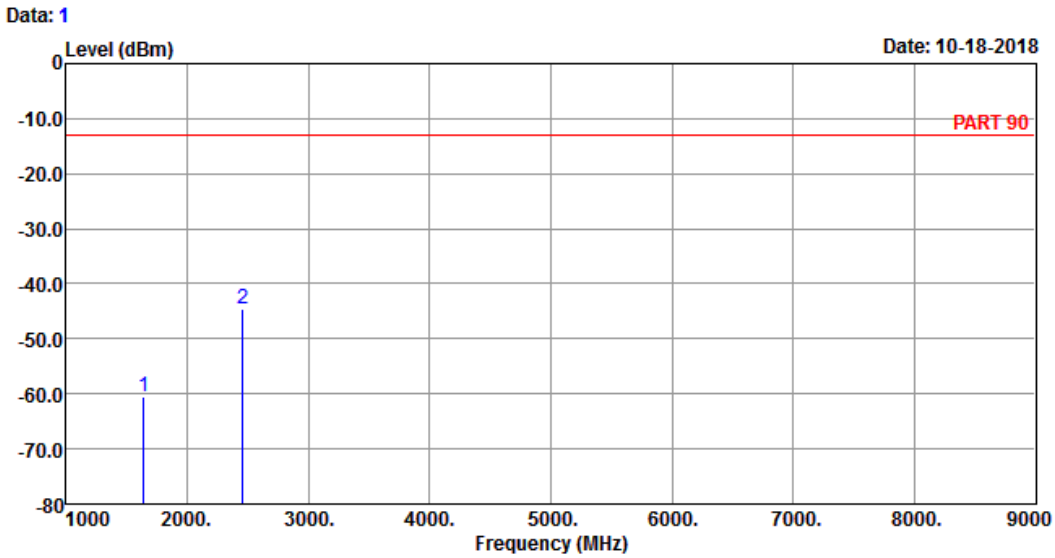


Site : 966 Chamber 5
Condition: PART 90 VERTICAL
Remak : LTE Band 26 QPSK_1.4M Link_L-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1629.40	-60.78	-45.99	-13.00	-47.78	-14.79	Peak
2 pp	2444.10	-46.09	-35.65	-13.00	-33.09	-10.44	Peak

Middle Channel

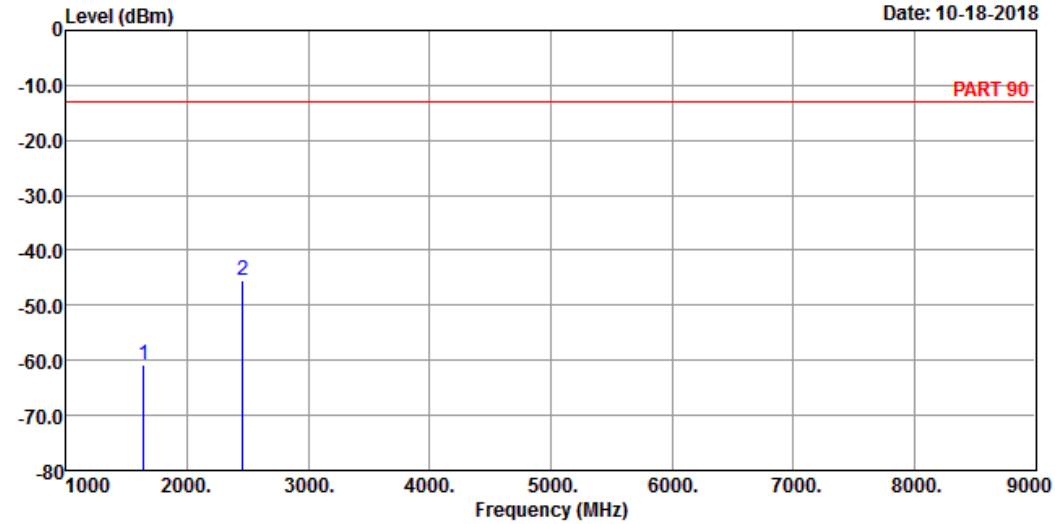
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART 90 HORIZONTAL
Remak : LTE 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	-60.61	-45.82	-13.00	-47.61	-14.79	Peak
2 pp	2457.00	-44.67	-34.23	-13.00	-31.67	-10.44	Peak

Data: 2

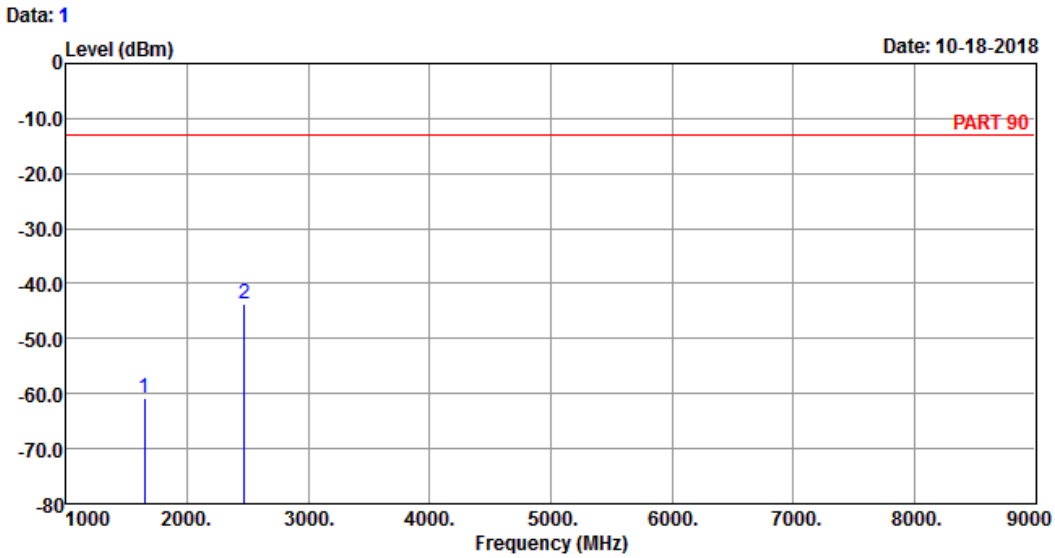


Site : 966 Chamber 5
Condition: PART 90 VERTICAL
Remak : LTE Band 26 QPSK_1.4M Link_M-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1638.00	-60.73	-45.94	-13.00	-47.73	-14.79	Peak
2 pp	2457.00	-45.36	-34.92	-13.00	-32.36	-10.44	Peak

High Channel

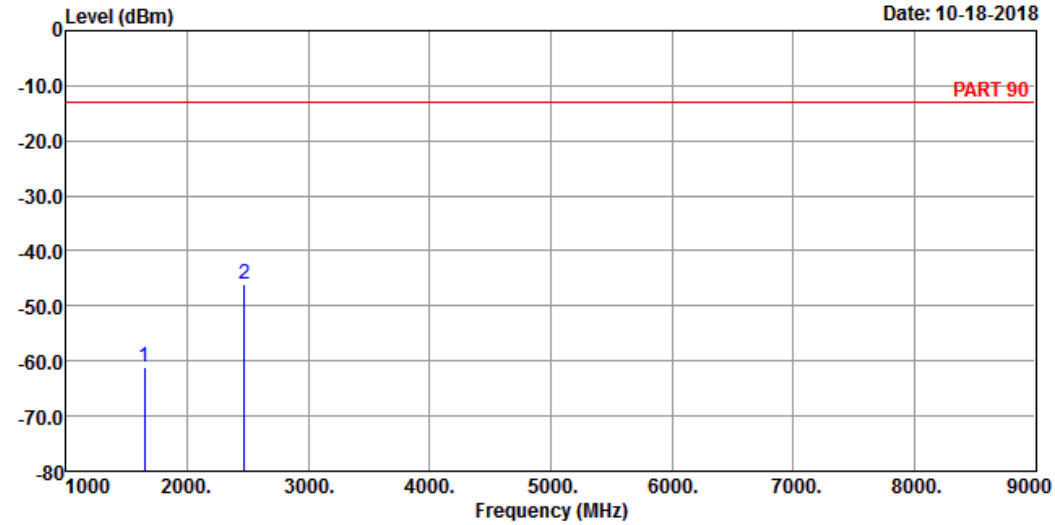
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART 90 HORIZONTAL
Remak : LTE 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	-60.69	-45.96	-13.00	-47.69	-14.73	Peak
2 pp	2469.90	-43.77	-33.33	-13.00	-30.77	-10.44	Peak

Data: 2

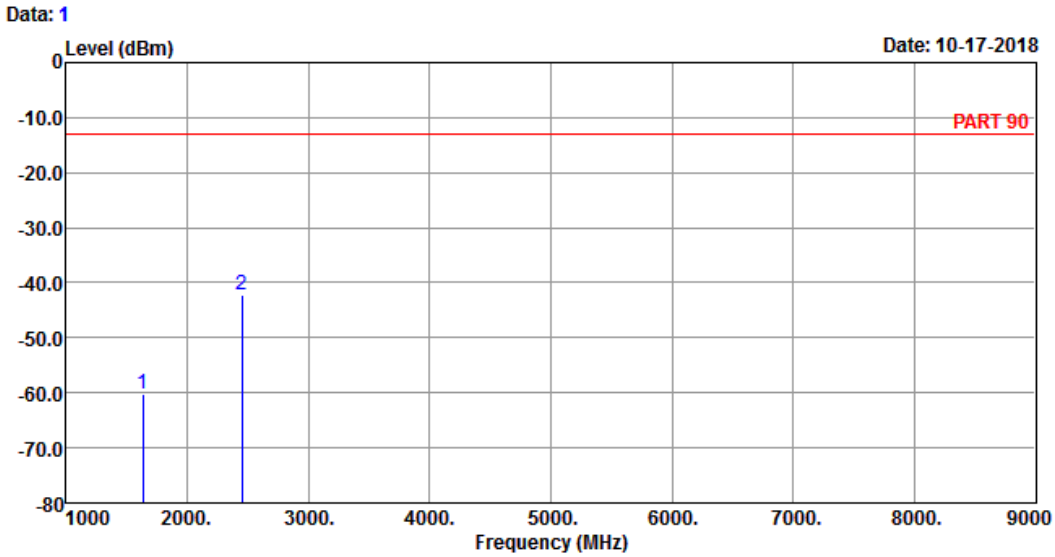


Site : 966 Chamber 5
Condition: PART 90 VERTICAL
Remak : LTE Band 26 QPSK_1.4M Link_H-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1646.60	-61.18	-46.45	-13.00	-48.18	-14.73	Peak
2 pp	2469.90	-45.99	-35.55	-13.00	-32.99	-10.44	Peak

Channel Bandwidth: 5 MHz / QPSK
Low Channel

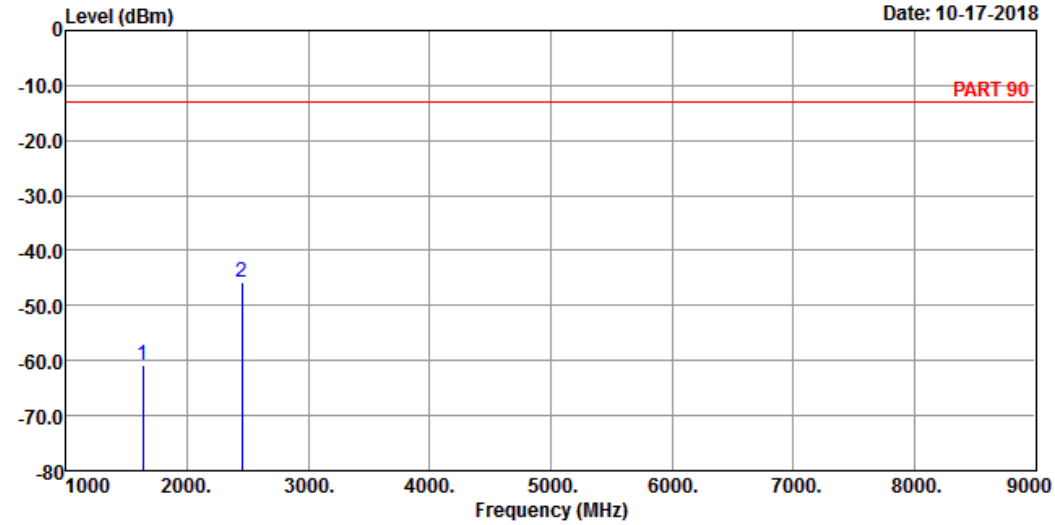
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART 90 HORIZONTAL
Remak : LTE 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	-60.14	-45.35	-13.00	-47.14	-14.79	Peak
2 pp	2449.50	-42.18	-31.74	-13.00	-29.18	-10.44	Peak

Data: 2

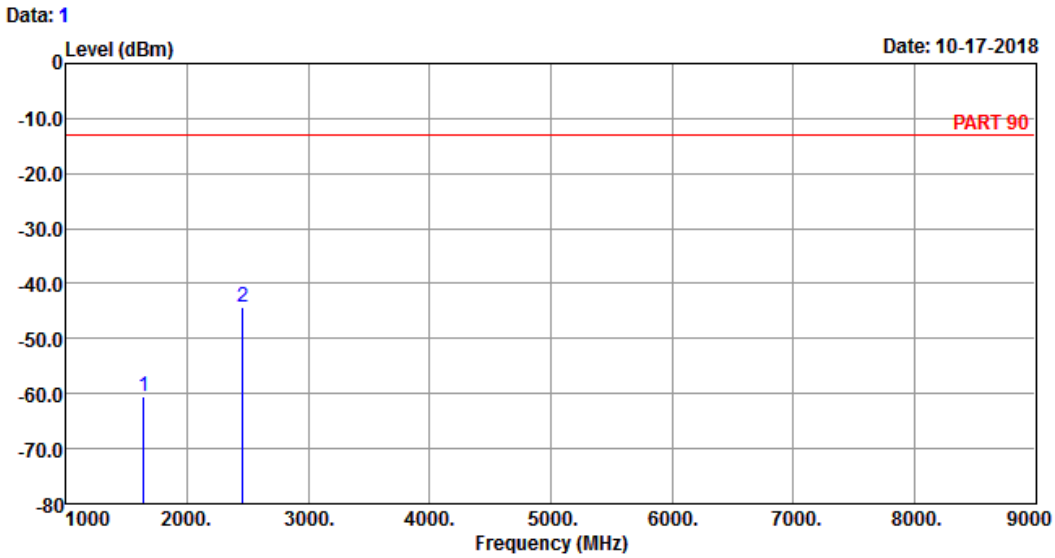


Site : 966 Chamber 5
Condition: PART 90 VERTICAL
Remak : LTE Band 26 QPSK_5M Link_L-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1633.00	-60.78	-45.99	-13.00	-47.78	-14.79	Peak
2 pp	2449.50	-45.75	-35.31	-13.00	-32.75	-10.44	Peak

Middle Channel

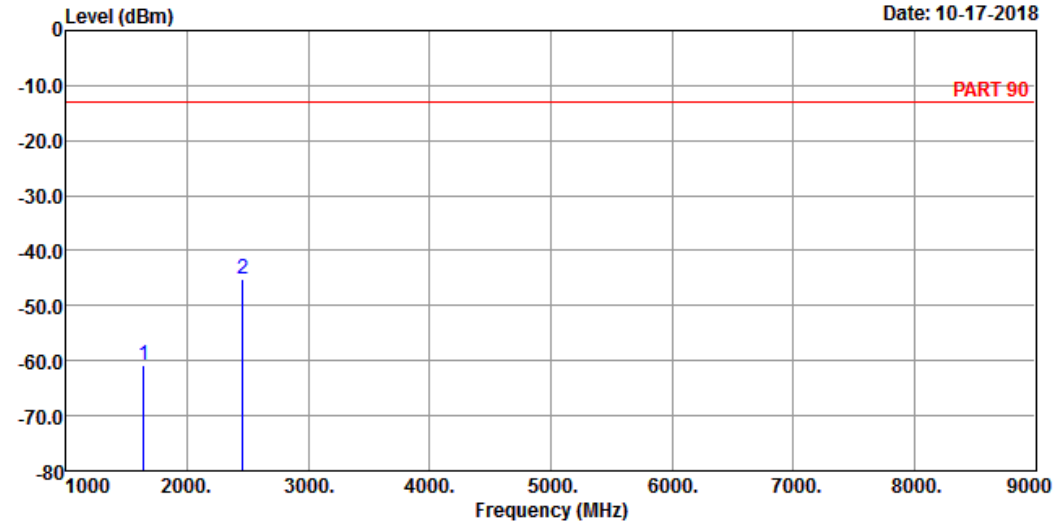
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART 90 HORIZONTAL
Remak : LTE 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	-60.65	-45.86	-13.00	-47.65	-14.79	Peak
2 pp	2457.00	-44.21	-33.77	-13.00	-31.21	-10.44	Peak

Data: 2

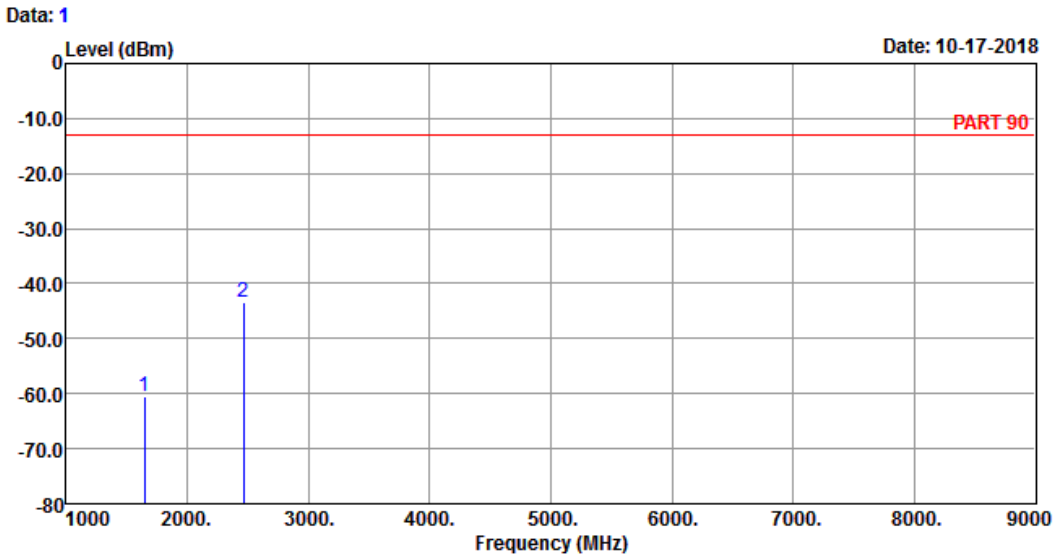


Site : 966 Chamber 5
Condition: PART 90 VERTICAL
Remak : LTE Band 26 QPSK_5M Link_M-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1638.00	-60.88	-46.09	-13.00	-47.88	-14.79	Peak
2 pp	2457.00	-45.20	-34.76	-13.00	-32.20	-10.44	Peak

High Channel

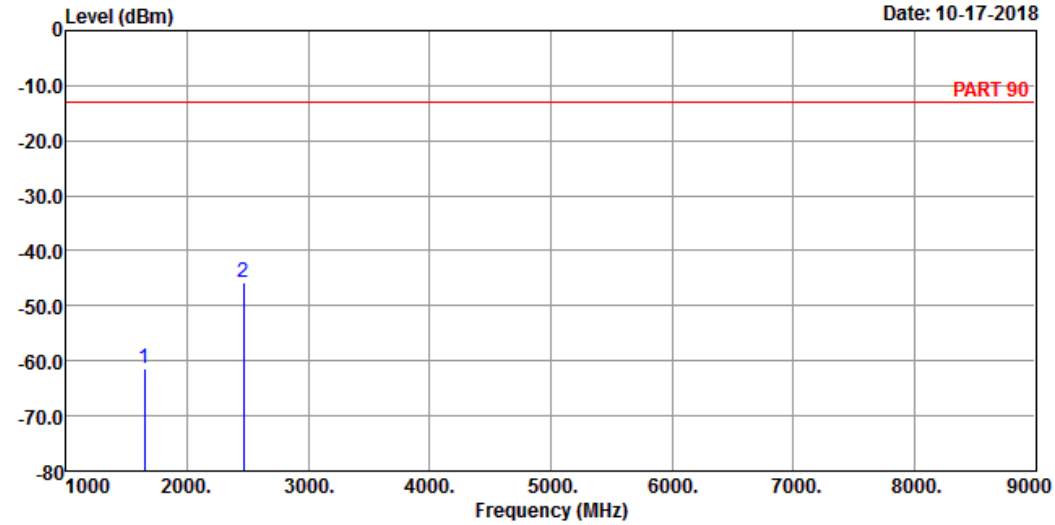
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART 90 HORIZONTAL
Remak : LTE 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	-60.63	-45.90	-13.00	-47.63	-14.73	Peak
2 pp	2464.50	-43.38	-32.94	-13.00	-30.38	-10.44	Peak

Data: 2

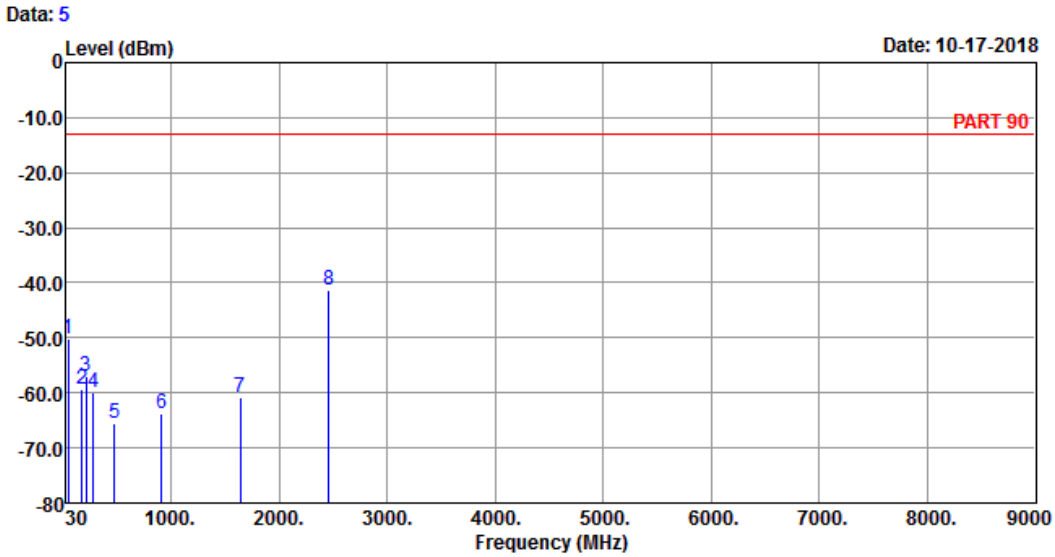


Site : 966 Chamber 5
Condition: PART 90 VERTICAL
Remak : LTE Band 26 QPSK_5M Link_H-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1643.00	-61.27	-46.54	-13.00	-48.27	-14.73	Peak
2 pp	2464.50	-45.77	-35.33	-13.00	-32.77	-10.44	Peak

Channel Bandwidth: 10 MHz / QPSK
Middle Channel

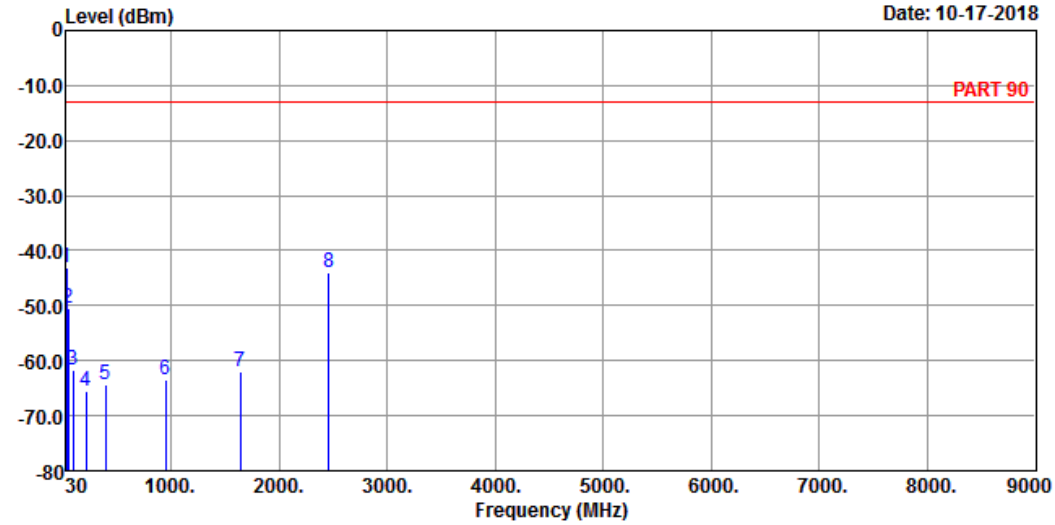
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART 90 HORIZONTAL
Remak : LTE 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	44.55	-50.24	-48.25	-13.00	-37.24	-1.99	Peak
2	172.59	-59.38	-53.34	-13.00	-46.38	-6.04	Peak
3	212.36	-56.96	-49.45	-13.00	-43.96	-7.51	Peak
4	277.35	-60.06	-53.51	-13.00	-47.06	-6.55	Peak
5	474.26	-65.63	-60.53	-13.00	-52.63	-5.10	Peak
6	913.67	-63.71	-64.62	-13.00	-50.71	0.91	Peak
7	1638.00	-60.76	-45.97	-13.00	-47.76	-14.79	Peak
8 pp	2457.00	-41.43	-30.99	-13.00	-28.43	-10.44	Peak

Data: 6



Site : 966 Chamber 5
Condition: PART 90 VERTICAL
Remak : LTE 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 pp	30.00	-43.24	-43.62	-13.00	-30.24	0.38	Peak
2	44.55	-50.59	-48.60	-13.00	-37.59	-1.99	Peak
3	95.96	-61.66	-50.88	-13.00	-48.66	-10.78	Peak
4	215.27	-65.49	-58.09	-13.00	-52.49	-7.40	Peak
5	395.69	-64.32	-58.35	-13.00	-51.32	-5.97	Peak
6	945.68	-63.33	-65.03	-13.00	-50.33	1.70	Peak
7	1638.00	-61.85	-47.06	-13.00	-48.85	-14.79	Peak
8	2457.00	-43.84	-33.40	-13.00	-30.84	-10.44	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:

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Web Site: www.bureauveritas-adt.com

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

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