FCC Test Report

(PART 27)

Report No.:	RF190524D09-2
FCC ID:	P27BC950NA4
Test Model:	BC950NA4
Series Model:	BC950NA4yxxxxxxx, BC950NA4Cyxxxxxxx (y should be "blank" or "-"; x could be 0 to 9, A to Z, a to z, "blank" or "-" , for marketing purpose) (See section 3.2.1 for more details)
Received Date:	May 24, 2019
Test Date:	May 31, 2019 ~ Jun. 11, 2019 (for RSE for mode A, Conducted tests, and ERP) Sep. 04, 2019 (for RSE for mode B)
Issued Date:	Sep. 05, 2019
Applicant:	Sercomm Corp.
Address:	8F, No. 3-1, YuanQu St., NanKang, Taipei 115, Taiwan, R.O.C. (NanKang Software Park)
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
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)
Test Location (2):	B2F., No.215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan, R.O.C
FCC Registration / Designation Number:	427177 / TW0011

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RF190524D09-2	Original Release	Sep. 05, 2019

1 Certificate of Conformity

Product:	LTE Battery Camera
Brand:	Sercomm
Test Model:	BC950NA4
Series Model:	BC950NA4yxxxxxxx, BC950NA4Cyxxxxxxx (y should be "blank" or "-"; x could be 0 to 9, A to Z, a to z, "blank" or "-" , for marketing purpose) (See section 3.2.1 for more details)
Sample Status:	Engineering Sample
Applicant:	Sercomm Corp.
Test Date:	May 31, 2019 ~ Jun. 11, 2019 (for RSE for mode A, Conducted tests, and ERP) Sep. 04, 2019 (for RSE for mode B)
Standards:	FCC Part 27, Subpart C, H, F, L

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 : Rona Chen , **Date:** Sep. 05, 2019

Rona Chen / Specialist

Approved by : , **Date:** Sep. 05, 2019

Dylan Chiou / Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 27 & Part 2 (LTE 4)			
FCC Clause	**Test Item**	**Result**	**Remarks**
2.1046 27.50(d)(4)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Meet the requirement.
2.1055 27.54	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
27.50(d)(5)	Peak to Average Ratio	Pass	Meet the requirement of limit.
27.53(h)	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 27.53(h)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53(h)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -19.48 dB at 6930.00 MHz.

Applied Standard: FCC Part 27 & Part 2 (LTE 12)			
FCC Clause	**Test Item**	**Result**	**Remarks**
2.1046 27.50(c)(10)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Meet the requirement.
2.1055 27.54	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
---	Peak to Average Ratio	Pass	Meet the requirement of limit.
27.53(g)	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 27.53(g)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53(g)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -28.26 dB at 1422.00 MHz.

Applied Standard: FCC Part 27 & Part 2 (LTE 13)			
FCC Clause	**Test Item**	**Result**	**Remarks**
2.1046 27.50(b)(10)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Meet the requirement.
2.1055 27.54	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
---	Peak to Average Ratio	Pass	Meet the requirement of limit.
27.53(c)(2)(4)	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 27.53(c)(2)&(f)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53(c)(2)&(f)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -2.17 dB at 1564.00 MHz.

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

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	9 kHz ~ 30 MHz	3.0400 dB
	30 MHz ~ 200 MHz	2.0153 dB
	200 MHz ~ 1000 MHz	2.0224 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	1.0121 dB
	18 GHz ~ 40 GHz	1.1508 dB

2.2 Test Site and Instruments

Test Duration:

May 31, 2019 ~ Jun. 11, 2019 (for RSE for mode A, Conducted tests, and ERP)
Sep. 04, 2019 (for RSE for mode B)

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent Technologies	N9038A	MY52260177	Aug. 20, 2018	Aug. 19, 2019
			Aug. 26, 2019	Aug. 25, 2020
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Apr. 15, 2019	Apr. 14, 2020
Spectrum Analyzer ROHDE & SCHWARZ	FSW26	102023	Oct. 11, 2018	Oct. 10, 2019
BILOG Antenna SCHWARZBECK	VULB9168	9168-616	Nov. 27, 2018	Nov. 26, 2019
HORN Antenna ETS-Lindgren	3117	00143293	Nov. 25, 2018	Nov. 24, 2019
HORN Antenna SCHWARZBECK	BBHA9170	9170-480	Nov. 25, 2018	Nov. 24, 2019
BILOG Antenna SCHWARZBECK	VULB9168	9168-631	Nov. 26, 2018	Nov. 25, 2019
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-969	Nov. 25, 2018	Nov. 24, 2019
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 15, 2019	Apr. 14, 2020
MXG Vector signal generator Agilent	N5182B	MY53050430	Nov. 19, 2018	Nov. 18, 2019
Preamplifier Agilent	310N	187226	Jun. 19, 2018	Jun. 18, 2019
			Jun. 18, 2019	Jun. 17, 2020
Preamplifier Agilent	83017A	MY39501357	Jun. 19, 2018	Jun. 18, 2019
			Jun. 18, 2019	Jun. 17, 2020
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(RFC-SMS-100-SMS-120+RFC-SMS-100-SMS-400)	Jun. 19, 2018	Jun. 18, 2019
			Jun. 18, 2019	Jun. 17, 2020
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(RFC-SMS-100-SMS-24)	Jun. 19, 2018	Jun. 18, 2019
			Jun. 18, 2019	Jun. 17, 2020
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Software BV ADT	E3 8.130425b	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower &Turn Table Controller MF	MF-7802	NA	NA	NA
Radio Communication Analyzer Anritsu	MT8820C	6201300640	Aug. 16, 2017	Aug. 15, 2019
			Jun. 19, 2019	Jun. 18, 2020
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 HsinTien Chamber 1.

3 General Information

3.1 General Description of EUT

Product	LTE Battery Camera	
Brand	Sercomm	
Test Model	BC950NA4	
Series Model	BC950NA4yxxxxxxx, BC950NA4Cyxxxxxxx (y should be "blank" or "-"; x could be 0 to 9, A to Z, a to z, "blank" or "-" , for marketing purpose)	
Status of EUT	Engineering Sample	
Power Supply Rating	5.0 Vdc (Adapter) 3.6 Vdc (Li-ion battery)	
Modulation Type	LTE	QPSK, 16QAM
Frequency Range	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	1710.7 ~ 1754.3 MHz
	LTE Band 4 (Channel Bandwidth: 3 MHz)	1711.5 ~ 1753.5 MHz
	LTE Band 4 (Channel Bandwidth: 5 MHz)	1712.5 ~ 1752.5 MHz
	LTE Band 4 (Channel Bandwidth: 10 MHz)	1715.0 ~ 1750.0 MHz
	LTE Band 4 (Channel Bandwidth: 15 MHz)	1717.5 ~ 1747.5 MHz
	LTE Band 4 (Channel Bandwidth: 20 MHz)	1720.0 ~ 1745.0 MHz
	LTE Band 12 (Channel Bandwidth: 1.4 MHz)	699.7 ~ 715.3 MHz
	LTE Band 12 (Channel Bandwidth: 3 MHz)	700.5 ~ 714.5 MHz
	LTE Band 12 (Channel Bandwidth: 5 MHz)	701.5 ~ 713.5 MHz
	LTE Band 12 (Channel Bandwidth: 10 MHz)	704.0 ~ 711.0 MHz
	LTE Band 13 (Channel Bandwidth: 5 MHz)	779.5 ~ 784.5 MHz
	LTE Band 13 (Channel Bandwidth: 10 MHz)	782.0 MHz
Emission Designator	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	1M09D7W
	LTE Band 4 (Channel Bandwidth: 3 MHz)	2M70G7D
	LTE Band 4 (Channel Bandwidth: 5 MHz)	4M49D7W
	LTE Band 4 (Channel Bandwidth: 10 MHz)	8M98D7W
	LTE Band 4 (Channel Bandwidth: 15 MHz)	13M5G7D
	LTE Band 4 (Channel Bandwidth: 20 MHz)	18M0D7W
	LTE Band 12 (Channel Bandwidth: 1.4 MHz)	1M09D7W
	LTE Band 12 (Channel Bandwidth: 3 MHz)	2M70G7D
	LTE Band 12 (Channel Bandwidth: 5 MHz)	4M49D7W
	LTE Band 12 (Channel Bandwidth: 10 MHz)	8M99D7W
	LTE Band 13 (Channel Bandwidth: 5 MHz)	4M49D7W
	LTE Band 13 (Channel Bandwidth: 10 MHz)	8M99D7W
Max. ERP Power	LTE Band 12 (Channel Bandwidth: 1.4 MHz)	76.67 mW
	LTE Band 12 (Channel Bandwidth: 3 MHz)	77.37 mW
	LTE Band 12 (Channel Bandwidth: 5 MHz)	78.09 mW
	LTE Band 12 (Channel Bandwidth: 10 MHz)	78.87 mW
	LTE Band 13 (Channel Bandwidth: 5 MHz)	76.23 mW
	LTE Band 13 (Channel Bandwidth: 10 MHz)	71.90 mW

Max. EIRP Power	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	294.92 mW
	LTE Band 4 (Channel Bandwidth: 3 MHz)	293.76 mW
	LTE Band 4 (Channel Bandwidth: 5 MHz)	294.24 mW
	LTE Band 4 (Channel Bandwidth: 10 MHz)	300.40 mW
	LTE Band 4 (Channel Bandwidth: 15 MHz)	301.30 mW
	LTE Band 4 (Channel Bandwidth: 20 MHz)	300.40 mW
Antenna Type	PIFA Antenna	
Antenna Gain	LTE Band 4	2.88 dBi
	LTE Band 12	-2.90 dBi
	LTE Band 13	-0.14 dBi
Accessory Device	Refer to Note as below	
Data Cable Supplied	Refer to Note as below	

Note:

1. All models are listed as below. Model : BC950NA4 is the representative for final test.

Product	Brand	Model	Difference
LTE Battery Camera	Sercomm	BC950NA4yxxxxxxx	With GPS function
		BC950NA4Cyxxxxxxx	Without GPS function
(y should be "blank" or "-"; x could be 0 to 9, A to Z, a to z, "blank" or "-" , for marketing purpose)			

2. The EUT contains following accessory devices.

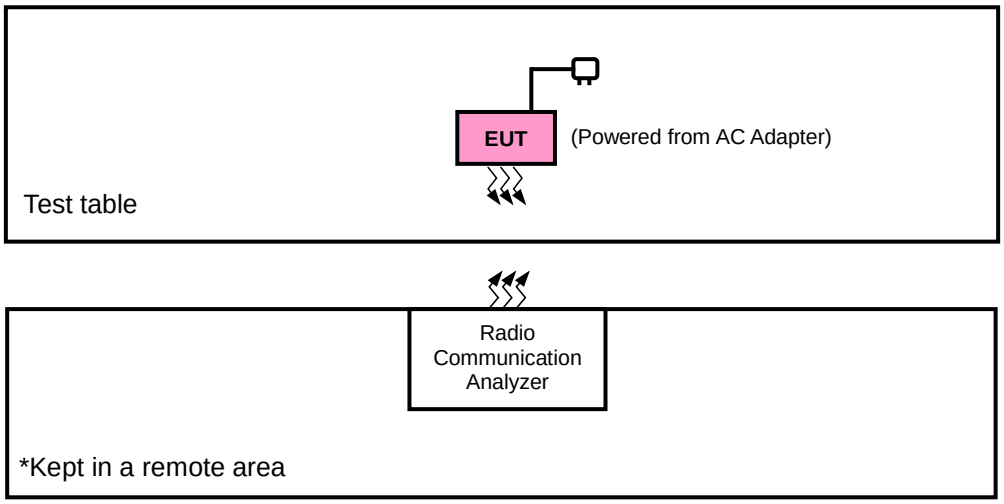
Product	Brand	Model	Description
Adapter 1	Lucent Trans	1A52-UB52A	I/P: 100-240 Vac, 50-60 Hz, 0.3 A O/P: 5 Vdc, 2 A
Adapter 2	PHIHONG	PSAF10A-050Q	I/P: 100-240 Vac, 50/60 Hz, 0.28 A O/P: 5 Vdc, 2 A
Battery	Sercomm	P2-01	Rating: 3.6 Vdc, 31.68 Wh Capacity: 8800 mAh Charging voltage: 4.2 A
BC950 Battery Charging Station	Sercomm	BCSP2-01	I/P: 5Vdc, 2 A
USB Cable 1	N/A	N/A	5 m shielded cable w/o core
USB Cable 2	N/A	N/A	1 m shielded cable w/o core

*** We had pre-test on Adapter 1 and Adapter 2. The worst case was found on Adapter 1. Therefore, only Adapter 1 was as representative for final test.**

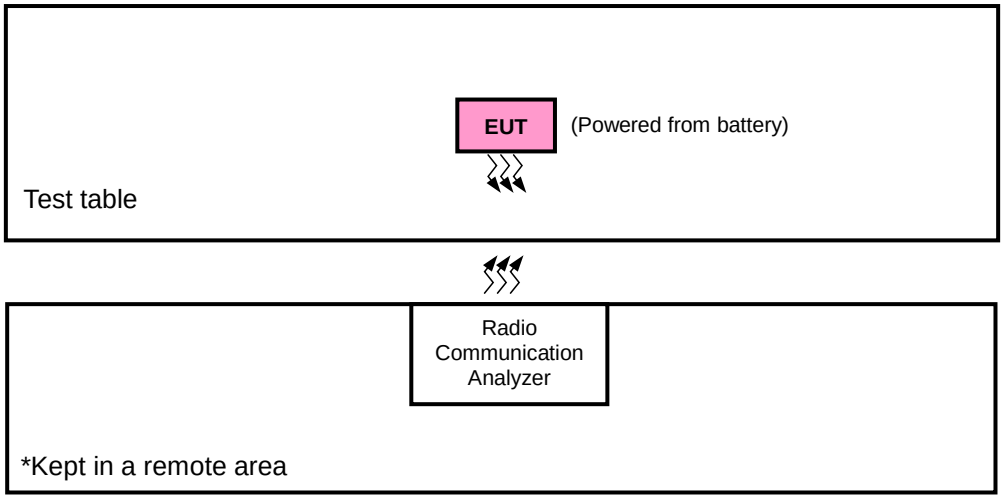
3. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

3.2 Configuration of System under Test

<Radiated Emission Test>



<E.R.P. / E.I.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, 0 & 90 degree, 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:

EUT Configure Mode	Description
A	EUT + USB Cable 1
B	EUT + USB Cable 2

Band	ERP / EIRP	Radiated Emission
LTE Band 4	90 degree	0 degree
LTE Band 12	90 degree	0 degree
LTE Band 13	90 degree	90 degree

LTE Band 4

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Modulation Characteristics	20050 to 20300	20175	20 MHz	QPSK, 16QAM	100 RB / 0 RB Offset
-	Frequency Stability	19957 to 20393	19957, 20393	1.4 MHz	QPSK	1 RB / 0 RB Offset
		19965 to 20385	19965, 20385	3 MHz	QPSK	1 RB / 0 RB Offset
		19975 to 20375	19975, 20375	5 MHz	QPSK	1 RB / 0 RB Offset
		20000 to 20350	20000, 20350	10 MHz	QPSK	1 RB / 0 RB Offset
		20025 to 20325	20025, 20325	15 MHz	QPSK	1 RB / 0 RB Offset
		20050 to 20300	20050, 20300	20 MHz	QPSK	1 RB / 0 RB Offset
-	Occupied Bandwidth	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK, 16QAM	15 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK, 16QAM	75 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK, 16QAM	100 RB / 0 RB Offset
-	Peak to Average Ratio	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK, 16QAM	1 RB / 0 RB Offset

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Band Edge	19957 to 20393	19957	1.4 MHz	QPSK	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			20393	1.4 MHz	QPSK	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		19965 to 20385	19965	3 MHz	QPSK	1 RB / 0 RB Offset
						15 RB / 0 RB Offset
			20385	3 MHz	QPSK	1 RB / 14 RB Offset
						15 RB / 0 RB Offset
		19975 to 20375	19975	5 MHz	QPSK	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			20375	5 MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		20000 to 20350	20000	10 MHz	QPSK	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			20350	10 MHz	QPSK	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
		20025 to 20325	20025	15 MHz	QPSK	1 RB / 0 RB Offset
						75 RB / 0 RB Offset
			20325	15 MHz	QPSK	1 RB / 74 RB Offset
						75 RB / 0 RB Offset
		20050 to 20300	20050	20 MHz	QPSK	1 RB / 0 RB Offset
						100 RB / 0 RB Offset
			20300	20 MHz	QPSK	1 RB / 99 RB Offset
						100 RB / 0 RB Offset
-	Conducted Emission	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK	1 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK	1 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK	1 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK	1 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK	1 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK	1 RB / 0 RB Offset
A	Radiated Emission	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK	1 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK	1 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK	1 RB / 0 RB Offset
B		20050 to 20300	20175	20 MHz	QPSK	1 RB / 0 RB Offset

Note:

1. This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.
2. For radiated emission above 1 GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the lowest, 5 MHz & highest channel bandwidth for final test.

LTE Band 12

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	23017 to 23173	23017, 23095, 23173	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23025 to 23165	23025, 23095, 23165	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23035 to 23155	23035, 23095, 23155	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23060 to 23130	23060, 23095, 23130	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Modulation Characteristics	23060 to 23130	23095	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
-	Frequency Stability	23017 to 23173	23017, 23173	1.4 MHz	QPSK	1 RB / 0 RB Offset
		23025 to 23165	23025, 23165	3 MHz	QPSK	1 RB / 0 RB Offset
		23035 to 23155	23035, 23155	5 MHz	QPSK	1 RB / 0 RB Offset
		23060 to 23130	23060, 23130	10 MHz	QPSK	1 RB / 0 RB Offset
-	Occupied Bandwidth	23017 to 23173	23017, 23095, 23173	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		23025 to 23165	23025, 23095, 23165	3 MHz	QPSK, 16QAM	15 RB / 0 RB Offset
		23035 to 23155	23035, 23095, 23155	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		23060 to 23130	23060, 23095, 23130	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
-	Peak to Average Ratio	23017 to 23173	23017, 23095, 23173	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23025 to 23165	23025, 23095, 23165	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23035 to 23155	23035, 23095, 23155	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23060 to 23130	23060, 23095, 23130	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Band Edge	23017 to 23173	23017	1.4 MHz	QPSK	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			23173	1.4 MHz	QPSK	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		23025 to 23165	23025	3 MHz	QPSK	1 RB / 0 RB Offset
						15 RB / 0 RB Offset
			23165	3 MHz	QPSK	1 RB / 14 RB Offset
						15 RB / 0 RB Offset
		23035 to 23155	23035	5 MHz	QPSK	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			23155	5 MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		23060 to 23130	23060	10 MHz	QPSK	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			23130	10 MHz	QPSK	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
-	Conducted Emission	23017 to 23173	23017, 23095, 23173	1.4 MHz	QPSK	1 RB / 0 RB Offset
		23025 to 23165	23025, 23095, 23165	3 MHz	QPSK	1 RB / 0 RB Offset
		23035 to 23155	23035, 23095, 23155	5 MHz	QPSK	1 RB / 0 RB Offset
		23060 to 23130	23060, 23095, 23130	10 MHz	QPSK	1 RB / 0 RB Offset
A	Radiated Emission	23017 to 23173	23017, 23095, 23173	1.4 MHz	QPSK	1 RB / 0 RB Offset
		23035 to 23155	23035, 23095, 23155	5 MHz	QPSK	1 RB / 0 RB Offset
		23060 to 23130	23060, 23095, 23130	10 MHz	QPSK	1 RB / 0 RB Offset
B		23060 to 23130	23130	10 MHz	QPSK	1 RB / 0 RB Offset

Note:

1. This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.
2. For radiated emission above 1 GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the lowest, 5 MHz & highest channel bandwidth for final test.

LTE Band 13

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23230	23230	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Modulation Characteristics	23230	23230	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
-	Frequency Stability	23205 to 23255	23205, 23255	5 MHz	QPSK	1 RB / 0 RB Offset
		23230	23230	10 MHz	QPSK	1 RB / 0 RB Offset
-	Occupied Bandwidth	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		23230	23230	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
-	Peak to Average Ratio	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23230	23230	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Band Edge	23205 to 23255	23205	5 MHz	QPSK	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			23255	5 MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		23230	23230	10 MHz	QPSK	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			23230	10 MHz	QPSK	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
-	Conducted Emission	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK	1 RB / 0 RB Offset
		23230	23230	10 MHz	QPSK	1 RB / 0 RB Offset
A	Radiated Emission	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK	1 RB / 0 RB Offset
		23230	23230	10 MHz	QPSK	1 RB / 0 RB Offset
B		23230	23230	10 MHz	QPSK	1 RB / 0 RB Offset

Note:

1. This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.
2. For radiated emission above 1 GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the lowest, 5 MHz & highest channel bandwidth for final test.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP / EIRP	25 deg. C, 65 % RH	3.6 Vdc	Karl Lee
Modulation Characteristics	25 deg. C, 65 % RH	3.6 Vdc	Gavin Wu
Frequency Stability	25 deg. C, 65 % RH	3.6 Vdc	Gavin Wu
Occupied Bandwidth	25 deg. C, 65 % RH	3.6 Vdc	Gavin Wu
Band Edge	25 deg. C, 65 % RH	3.6 Vdc	Gavin Wu
Peak to Average Ratio	25 deg. C, 65 % RH	3.6 Vdc	Gavin Wu
Conducted Emission	25 deg. C, 65 % RH	3.6 Vdc	Gavin Wu
Radiated Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Karl Lee

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 27
KDB 971168 D01 Power Meas License Digital Systems v03r01
ANSI/TIA/EIA-603-E 2016
ANSI 63.26-2015

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

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

Portable stations (hand-held devices) operating in the 746-757 MHz, 776-788 MHz and 805-806 MHz band are limited to 3 watts ERP

Portable stations (hand-held device) operating in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

4.1.2 Test Procedures

EIRP / ERP Measurement:

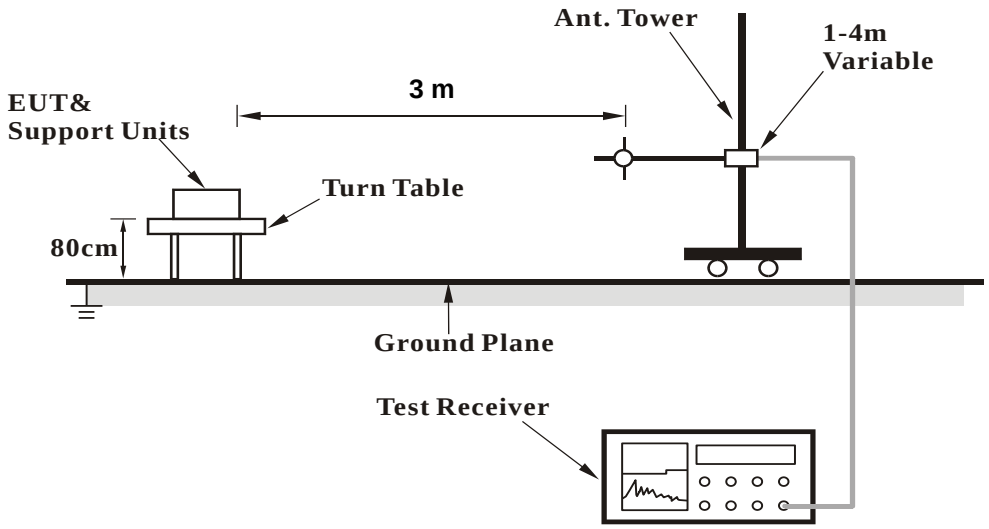
a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 10 MHz for LTE mode.
b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) height of Turn Table, 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 = Output power level of S.G – TX cable loss + Antenna gain of substitution horn. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15 dB.

Conducted Power Measurement:

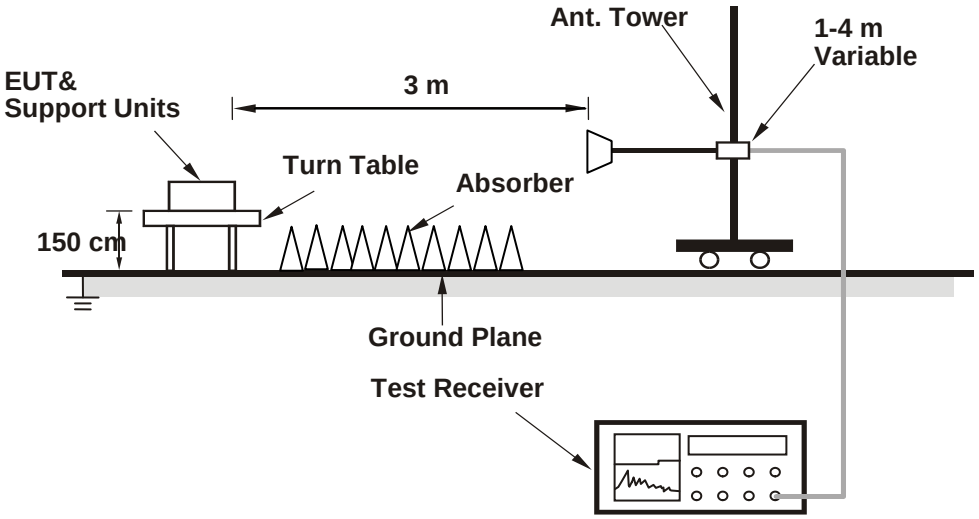
a. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
b. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

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)

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 19957	Mid Ch 20175	High Ch 20393		Low Ch 19957	Mid Ch 20175	High Ch 20393	
			1710.7 MHz	1732.5 MHz	1754.3 MHz		1710.7 MHz	1732.5 MHz	1754.3 MHz	
4 / 1.4M	1	0	22.33	22.49	22.47	0	21.25	21.37	21.34	1
	1	2	22.26	22.33	22.38	0	21.14	21.34	21.28	1
	1	5	22.11	22.13	22.17	0	20.90	21.06	21.18	1
	3	0	21.27	21.40	21.37	0	20.15	20.34	20.26	1
	3	1	21.04	21.12	21.18	0	20.03	20.19	20.09	1
	3	3	20.94	21.09	21.10	0	19.89	19.97	19.93	1
	6	0	21.15	21.33	21.26	1	20.16	20.34	20.23	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 19965	Mid Ch 20175	High Ch 20385		Low Ch 19965	Mid Ch 20175	High Ch 20385	
			1711.5 MHz	1732.5 MHz	1753.5 MHz		1711.5 MHz	1732.5 MHz	1753.5 MHz	
4 / 3M	1	0	22.39	22.56	22.50	0	21.03	21.20	21.20	1
	1	7	22.28	22.45	22.42	0	21.18	21.40	21.33	1
	1	14	22.01	22.22	22.27	0	20.97	21.19	21.20	1
	8	0	21.27	21.43	21.49	1	20.17	20.29	20.35	2
	8	3	21.03	21.28	21.32	1	20.04	20.06	20.06	2
	8	7	21.01	21.21	21.17	1	19.88	19.99	20.00	2
	15	0	21.23	21.37	21.40	1	20.16	20.28	20.23	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 19975	Mid Ch 20175	High Ch 20375		Low CH 19975	Mid CH 20175	High CH 20375	
			1712.5 MHz	1732.5 MHz	1752.5 MHz		1712.5 MHz	1732.5 MHz	1752.5 MHz	
4 / 5M	1	0	22.46	22.55	22.55	0	21.24	21.30	21.29	1
	1	12	22.34	22.50	22.43	0	21.25	21.37	21.30	1
	1	24	22.07	22.34	22.28	0	21.09	21.18	21.26	1
	12	0	21.31	21.43	21.44	1	20.27	20.20	20.40	2
	12	6	21.07	21.29	21.28	1	20.08	20.15	20.22	2
	12	13	20.96	21.23	21.26	1	20.04	20.13	20.19	2
	25	0	21.28	21.38	21.42	1	20.24	20.31	20.40	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20000	Mid Ch 20175	High Ch 20350		Low Ch 20000	Mid Ch 20175	High Ch 20350	
			1715.0 MHz	1732.5 MHz	1750.0 MHz		1715.0 MHz	1732.5 MHz	1750.0 MHz	
4 / 10M	1	0	22.51	22.64	22.59	0	21.33	21.50	21.39	1
	1	24	22.38	22.49	22.47	0	21.33	21.46	21.45	1
	1	49	22.23	22.41	22.37	0	21.08	21.22	21.27	1
	25	0	21.39	21.52	21.49	1	20.24	20.26	20.50	2
	25	12	21.12	21.37	21.32	1	20.15	20.25	20.37	2
	25	25	21.01	21.25	21.19	1	20.12	20.19	20.28	2
	50	0	21.41	21.48	21.35	1	20.28	20.44	20.40	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20025	Mid Ch 20175	High Ch 20325		Low Ch 20025	Mid Ch 20175	High Ch 20325	
			1717.5 MHz	1732.5 MHz	1747.5 MHz		1717.5 MHz	1732.5 MHz	1747.5 MHz	
4 / 15M	1	0	22.55	22.72	22.69	0	21.41	21.58	21.54	1
	1	37	22.39	22.60	22.55	0	21.41	21.53	21.51	1
	1	74	22.17	22.40	22.38	0	21.19	21.32	21.26	1
	36	0	21.43	21.60	21.59	1	20.30	20.40	20.39	2
	36	19	21.25	21.42	21.39	1	20.11	20.33	20.29	2
	36	39	21.17	21.36	21.30	1	20.00	20.27	20.17	2
	75	0	21.43	21.59	21.47	1	20.35	20.43	20.44	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20050	Mid Ch 20175	High Ch 20300		Low Ch 20050	Mid Ch 20175	High Ch 20300	
			1720.0 MHz	1732.5 MHz	1745.0 MHz		1720.0 MHz	1732.5 MHz	1745.0 MHz	
4 / 20M	1	0	22.61	22.75	22.73	0	21.59	21.68	21.65	1
	1	50	22.45	22.61	22.63	0	21.50	21.59	21.51	1
	1	99	22.32	22.52	22.39	0	21.35	21.45	21.29	1
	50	0	21.45	21.61	21.57	1	20.39	20.37	20.52	2
	50	25	21.24	21.39	21.38	1	20.25	20.40	20.38	2
	50	50	21.20	21.38	21.31	1	20.09	20.32	20.27	2
	100	0	21.40	21.53	21.64	1	20.41	20.57	20.58	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 23017	Mid Ch 23095	High Ch 23173		Low Ch 23017	Mid Ch 23095	High Ch 23173	
			699.7 MHz	707.5 MHz	715.3 MHz		699.7 MHz	707.5 MHz	715.3 MHz	
12 / 1.4M	1	0	22.82	22.94	22.75	0	21.85	21.85	21.61	1
	1	2	22.66	22.83	22.65	0	21.63	21.74	21.59	1
	1	5	22.45	22.58	22.38	0	21.60	21.61	21.41	1
	3	0	21.75	21.77	21.63	0	20.71	20.71	20.54	1
	3	1	21.56	21.53	21.46	0	20.46	20.54	20.48	1
	3	3	21.41	21.49	21.28	0	20.32	20.50	20.33	1
	6	0	21.74	21.69	21.54	1	20.68	20.79	20.67	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 23025	Mid Ch 23095	High Ch 23165		Low Ch 23025	Mid Ch 23095	High Ch 23165	
			700.5 MHz	707.5 MHz	714.5 MHz		700.5 MHz	707.5 MHz	714.5 MHz	
12 / 3M	1	0	22.97	22.96	22.81	0	21.53	21.69	21.40	1
	1	7	22.80	22.86	22.68	0	21.70	21.83	21.72	1
	1	14	22.53	22.79	22.43	0	21.48	21.67	21.43	1
	8	0	21.82	21.90	21.67	1	20.56	20.73	20.67	2
	8	3	21.57	21.64	21.50	1	20.48	20.58	20.46	2
	8	7	21.53	21.60	21.38	1	20.35	20.46	20.39	2
	15	0	21.78	21.89	21.58	1	20.64	20.89	20.60	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 23035	Mid Ch 23095	High Ch 23155		Low Ch 23035	Mid Ch 23095	High Ch 23155	
			701.5 MHz	707.5 MHz	713.5 MHz		701.5 MHz	707.5 MHz	713.5 MHz	
12 / 5M	1	0	22.99	23.05	22.87	0	21.64	21.82	21.65	1
	1	12	22.76	22.94	22.79	0	21.80	21.80	21.77	1
	1	24	22.68	22.68	22.67	0	21.57	21.83	21.43	1
	12	0	21.90	21.89	21.74	1	20.67	20.77	20.69	2
	12	6	21.61	21.72	21.58	1	20.60	20.62	20.52	2
	12	13	21.58	21.53	21.37	1	20.55	20.54	20.47	2
	25	0	21.87	21.88	21.82	1	20.77	20.82	20.65	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 23060	Mid Ch 23095	High Ch 23130		Low Ch 23060	Mid Ch 23095	High Ch 23130	
			704.0 MHz	707.5 MHz	711.0 MHz		704.0 MHz	707.5 MHz	711.0 MHz	
12 / 10M	1	0	22.98	23.09	22.91	0	21.75	21.98	21.79	1
	1	24	22.85	22.94	22.81	0	21.86	21.88	21.75	1
	1	49	22.67	22.75	22.68	0	21.62	21.68	21.51	1
	25	0	21.90	22.02	21.83	1	20.74	20.79	20.83	2
	25	12	21.65	21.82	21.57	1	20.65	20.72	20.59	2
	25	25	21.59	21.69	21.50	1	20.55	20.63	20.47	2
	50	0	21.85	22.00	21.71	1	20.84	20.99	20.76	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 23205	Mid Ch 23230	High Ch 23255		Low Ch 23205	Mid Ch 23230	High Ch 23255	
			779.5 MHz	782.0 MHz	784.5 MHz		779.5 MHz	782.0 MHz	784.5 MHz	
13 / 5M	1	0	22.94	22.61	22.85	0	21.68	21.33	21.52	1
	1	12	22.76	22.52	22.72	0	21.80	21.43	21.65	1
	1	24	22.64	22.31	22.63	0	21.68	21.25	21.47	1
	12	0	21.85	21.54	21.69	1	20.61	20.38	20.69	2
	12	6	21.57	21.29	21.52	1	20.56	20.21	20.60	2
	12	13	21.43	21.17	21.43	1	20.56	20.02	20.32	2
	25	0	21.84	21.52	21.75	1	20.63	20.44	20.57	2

Band / BW	RB Size	RB Offset	QPSK	3GPP MPR (dB)	16QAM	3GPP MPR (dB)
			Mid Ch 23230		Mid Ch 23230	
			782.0 MHz		782.0 MHz	
13 / 10M	1	0	22.66	0	21.44	1
	1	24	22.53	0	21.46	1
	1	49	22.38	0	21.32	1
	25	0	21.53	1	20.47	2
	25	12	21.31	1	20.31	2
	25	25	21.20	1	20.21	2
	50	0	21.57	1	20.36	2

ERP Power (dBm)

LTE Band 12							
Channel Bandwidth: 1.4 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**Reading (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (mW)**	**Polarization (H/V)**
90°	23017	699.7	-11.81	32.719	18.76	75.14	H
	23095	707.5	-11.74	32.736	18.85	**76.67**	
	23173	715.3	-11.85	32.591	18.59	72.29	
	23017	699.7	-17.81	32.69	12.73	18.75	V
	23095	707.5	-17.85	32.81	12.81	19.10	
	23173	715.3	-18.04	32.74	12.55	17.99	
Channel Bandwidth: 1.4 MHz / 16QAM							
90°	23017	699.7	-12.82	32.719	17.75	59.55	H
	23095	707.5	-12.74	32.736	17.85	60.90	
	23173	715.3	-12.85	32.591	17.59	57.42	
	23017	699.7	-18.82	32.69	11.72	14.86	V
	23095	707.5	-18.85	32.81	11.81	15.17	
	23173	715.3	-19.05	32.74	11.54	14.26	

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

LTE Band 12							
Channel Bandwidth: 3 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**Reading (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (mW)**	**Polarization (H/V)**
90°	23025	700.5	-11.78	32.719	18.79	75.67	H
	23095	707.5	-11.70	32.736	18.89	**77.37**	
	23165	714.5	-11.80	32.591	18.64	73.13	
	23025	700.5	-17.77	32.69	12.77	18.92	V
	23095	707.5	-17.81	32.81	12.85	19.28	
	23165	714.5	-18.00	32.74	12.59	18.16	
Channel Bandwidth: 3 MHz / 16QAM							
90°	23025	700.5	-12.78	32.719	17.79	60.10	H
	23095	707.5	-12.71	32.736	17.88	61.32	
	23165	714.5	-12.80	32.591	17.64	58.09	
	23025	700.5	-18.77	32.69	11.77	15.03	V
	23095	707.5	-18.82	32.81	11.84	15.28	
	23165	714.5	-19.01	32.74	11.58	14.39	

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

LTE Band 12							
Channel Bandwidth: 5 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**Reading (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (mW)**	**Polarization (H/V)**
90°	23035	701.5	-11.74	32.719	18.83	76.37	H
	23095	707.5	-11.66	32.736	18.93	**78.09**	
	23155	713.5	-11.76	32.591	18.68	73.76	
	23035	701.5	-17.73	32.69	12.81	19.10	V
	23095	707.5	-17.76	32.81	12.90	19.50	
	23155	713.5	-17.95	32.74	12.64	18.37	
Channel Bandwidth: 5 MHz / 16QAM							
90°	23035	701.5	-12.75	32.719	17.82	60.52	H
	23095	707.5	-12.67	32.736	17.92	61.89	
	23155	713.5	-12.76	32.591	17.68	58.63	
	23035	701.5	-18.73	32.69	11.81	15.17	V
	23095	707.5	-18.77	32.81	11.89	15.45	
	23155	713.5	-18.96	32.74	11.63	14.55	

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

LTE Band 12							
Channel Bandwidth: 10 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**Reading (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (mW)**	**Polarization (H/V)**
90°	23060	704.0	-11.70	32.727	18.88	77.21	H
	23095	707.5	-11.62	32.739	18.97	**78.87**	
	23130	711.0	-11.82	32.728	18.76	75.13	
	23060	704.0	-17.75	32.75	12.85	19.28	V
	23095	707.5	-17.72	32.81	12.94	19.68	
	23130	711.0	-18.00	32.84	12.69	18.58	
Channel Bandwidth: 10 MHz / 16QAM							
90°	23060	704.0	-12.71	32.727	17.87	61.19	H
	23095	707.5	-12.62	32.739	17.97	62.65	
	23130	711.0	-12.82	32.728	17.76	59.68	
	23060	704.0	-18.75	32.75	11.85	15.31	V
	23095	707.5	-18.73	32.81	11.93	15.60	
	23130	711.0	-19.00	32.84	11.69	14.76	

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

LTE Band 13							
Channel Bandwidth: 5 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**Reading (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (mW)**	**Polarization (H/V)**
90°	23205	779.5	-11.80	32.771	18.82	**76.23**	H
	23230	782.0	-12.06	32.741	18.53	71.30	
	23255	784.5	-12.10	32.854	18.60	72.51	
	23205	779.5	-16.64	32.5	13.71	23.50	V
	23230	782.0	-16.89	32.52	13.48	22.28	
	23255	784.5	-16.88	32.62	13.59	22.86	
Channel Bandwidth: 5 MHz / 16QAM							
90°	23205	779.5	-12.80	32.771	17.82	60.55	H
	23230	782.0	-13.07	32.741	17.52	56.51	
	23255	784.5	-13.10	32.854	17.60	57.60	
	23205	779.5	-17.65	32.5	12.70	18.62	V
	23230	782.0	-17.89	32.52	12.48	17.70	
	23255	784.5	-17.88	32.62	12.59	18.16	

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

LTE Band 13							
Channel Bandwidth: 10 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**Reading (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (mW)**	**Polarization (H/V)**
90°	23230	782.0	-12.02	32.737	18.57	**71.90**	H
	23230	782.0	-16.84	32.52	13.53	22.54	V
Channel Bandwidth: 10 MHz / 16QAM							
90°	23230	782.0	-13.02	32.737	17.57	57.11	H
	23230	782.0	-17.84	32.52	12.53	17.91	V

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

EIRP Power (dBm)

LTE Band 4							
Channel Bandwidth: 1.4 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**Reading (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (mW)**	**Polarization (H/V)**
90°	19957	1710.7	-18.05	42.49	24.44	277.65	H
	20175	1732.5	-17.63	42.33	24.70	**294.92**	
	20393	1754.3	-17.52	42.10	24.58	287.08	
	19957	1710.7	-21.63	42.99	21.36	136.77	V
	20175	1732.5	-21.19	42.74	21.55	142.89	
	20393	1754.3	-20.73	42.21	21.48	140.60	
Channel Bandwidth: 1.4 MHz / 16QAM							
90°	19957	1710.7	-19.06	42.49	23.43	220.04	H
	20175	1732.5	-18.65	42.33	23.68	233.18	
	20393	1754.3	-18.51	42.10	23.59	228.56	
	19957	1710.7	-22.64	42.99	20.35	108.39	V
	20175	1732.5	-22.15	42.74	20.59	114.55	
	20393	1754.3	-21.77	42.21	20.44	110.66	

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

LTE Band 4							
Channel Bandwidth: 3 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**Reading (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (mW)**	**Polarization (H/V)**
90°	19965	1711.5	-17.93	42.49	24.56	285.43	H
	20175	1732.5	-17.65	42.33	24.68	293.56	
	20385	1753.5	-17.42	42.10	24.68	**293.76**	
	19965	1711.5	-21.54	42.99	21.45	139.64	V
	20175	1732.5	-21.14	42.74	21.60	144.54	
	20385	1753.5	-20.65	42.21	21.56	143.22	
Channel Bandwidth: 3 MHz / 16QAM							
90°	19965	1711.5	-19.03	42.49	23.46	221.56	H
	20175	1732.5	-18.64	42.33	23.69	233.72	
	20385	1753.5	-18.52	42.10	23.58	228.03	
	19965	1711.5	-22.52	42.99	20.47	111.43	V
	20175	1732.5	-22.16	42.74	20.58	114.29	
	20385	1753.5	-21.61	42.21	20.60	114.82	

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

LTE Band 4							
Channel Bandwidth: 5 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**Reading (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (mW)**	**Polarization (H/V)**
90°	19975	1712.5	-17.93	42.49	24.56	285.43	H
	20175	1732.5	-17.64	42.33	24.69	**294.24**	
	20375	1752.5	-17.42	42.10	24.68	293.76	
	19975	1712.5	-21.51	42.99	21.48	140.60	V
	20175	1732.5	-21.06	42.74	21.68	147.23	
	20375	1752.5	-20.63	42.21	21.58	143.88	
Channel Bandwidth: 5 MHz / 16QAM							
90°	19975	1712.5	-18.97	42.49	23.52	224.65	H
	20175	1732.5	-18.66	42.33	23.67	232.65	
	20375	1752.5	-18.48	42.10	23.62	230.14	
	19975	1712.5	-22.57	42.99	20.42	110.15	V
	20175	1732.5	-22.15	42.74	20.59	114.55	
	20375	1752.5	-21.66	42.21	20.55	113.50	

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

LTE Band 4							
Channel Bandwidth: 10 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**Reading (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (mW)**	**Polarization (H/V)**
90°	20000	1715.0	-17.93	42.49	24.56	285.43	H
	20175	1732.5	-17.55	42.33	24.78	**300.40**	
	20350	1750.0	-17.42	42.10	24.68	293.76	
	20000	1715.0	-21.47	42.99	21.52	141.91	V
	20175	1732.5	-21.04	42.74	21.70	147.91	
	20350	1750.0	-20.54	42.21	21.67	146.89	
Channel Bandwidth: 10 MHz / 16QAM							
90°	20000	1715.0	-18.94	42.49	23.55	226.20	H
	20175	1732.5	-18.52	42.33	23.81	240.27	
	20350	1750.0	-18.45	42.10	23.65	231.74	
	20000	1715.0	-22.53	42.99	20.46	111.17	V
	20175	1732.5	-22.07	42.74	20.67	116.68	
	20350	1750.0	-21.54	42.21	20.67	116.68	

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

LTE Band 4							
Channel Bandwidth: 15 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**Reading (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (mW)**	**Polarization (H/V)**
90°	20025	1717.5	-17.85	42.49	24.64	290.74	H
	20175	1732.5	-17.56	42.33	24.77	299.71	
	20325	1747.5	-17.31	42.10	24.79	**301.30**	
	20025	1717.5	-21.42	42.99	21.57	143.55	V
	20175	1732.5	-21.04	42.74	21.70	147.91	
	20325	1747.5	-20.57	42.21	21.64	145.88	
Channel Bandwidth: 15 MHz / 16QAM							
90°	20025	1717.5	-18.87	42.49	23.62	229.88	H
	20175	1732.5	-18.56	42.33	23.77	238.07	
	20325	1747.5	-18.37	42.10	23.73	236.05	
	20025	1717.5	-22.48	42.99	20.51	112.46	V
	20175	1732.5	-22.04	42.74	20.70	117.49	
	20325	1747.5	-21.56	42.21	20.65	116.14	

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

LTE Band 4							
Channel Bandwidth: 20 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**Reading (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (mW)**	**Polarization (H/V)**
90°	20050	1720.0	-17.79	42.49	24.70	294.78	H
	20175	1732.5	-17.55	42.33	24.78	**300.40**	
	20300	1745.0	-17.34	42.10	24.76	299.23	
	20050	1720.0	-21.47	42.99	21.52	141.91	V
	20175	1732.5	-20.94	42.74	21.80	151.36	
	20300	1745.0	-20.54	42.21	21.67	146.89	
Channel Bandwidth: 20 MHz / 16QAM							
90°	20050	1720.0	-18.87	42.49	23.62	229.88	H
	20175	1732.5	-18.53	42.33	23.80	239.72	
	20300	1745.0	-18.33	42.10	23.77	238.23	
	20050	1720.0	-22.44	42.99	20.55	113.50	V
	20175	1732.5	-21.98	42.74	20.76	119.12	
	20300	1745.0	-21.52	42.21	20.69	117.22	

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

4.2 Modulation Characteristics Measurement

4.2.1 Limits of Modulation Characteristics

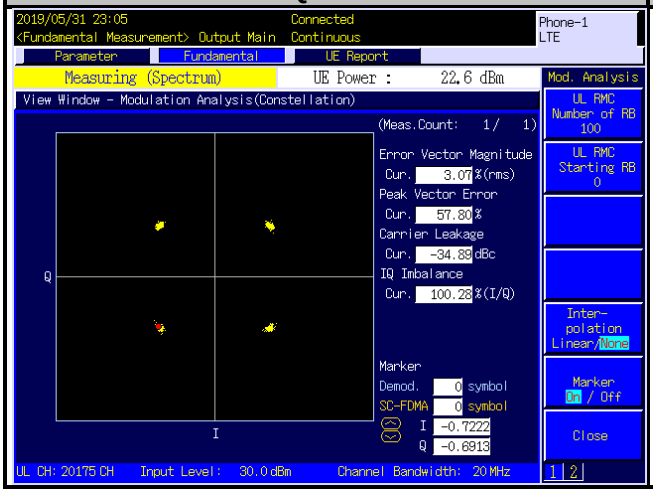
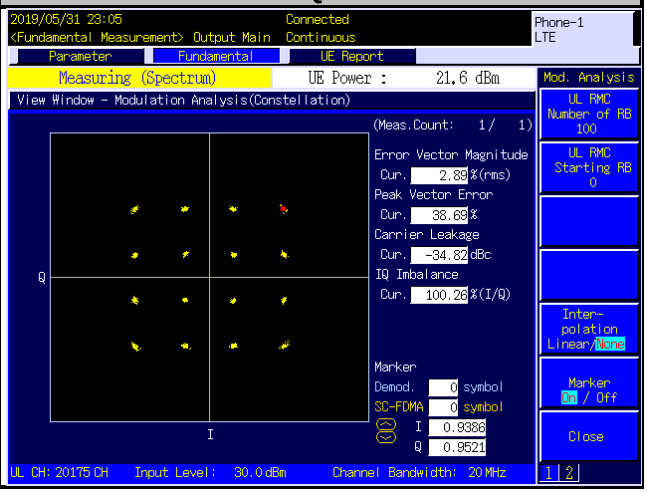
N/A

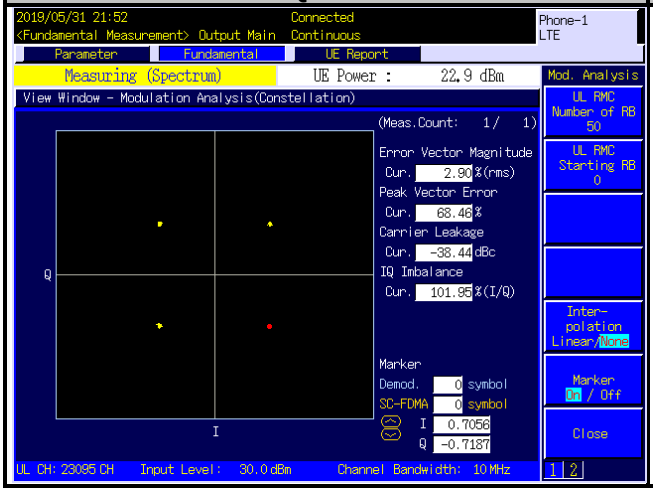
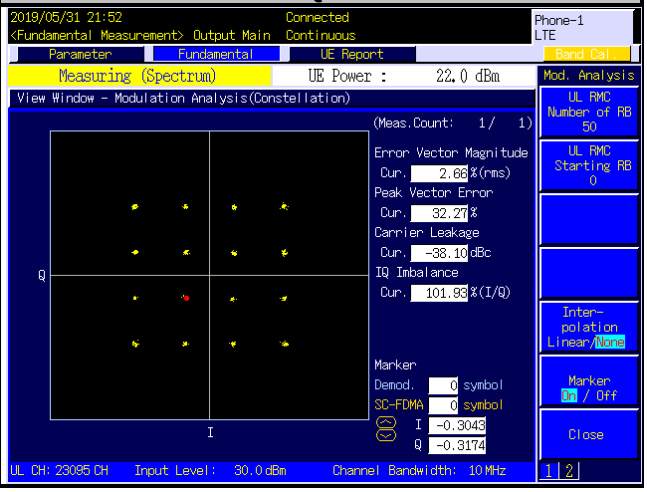
4.2.2 Test Setup

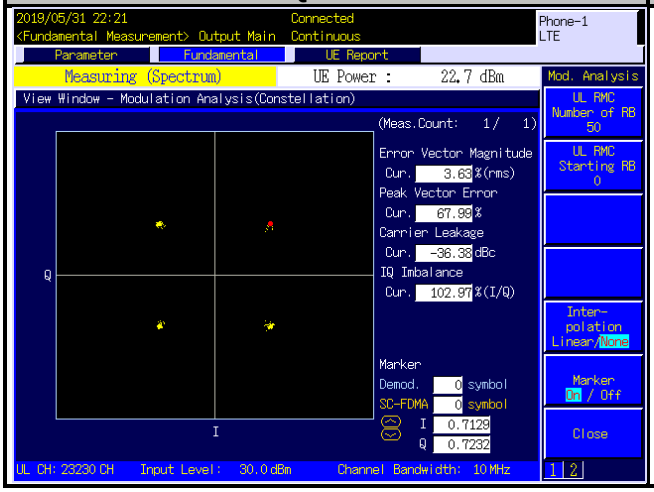
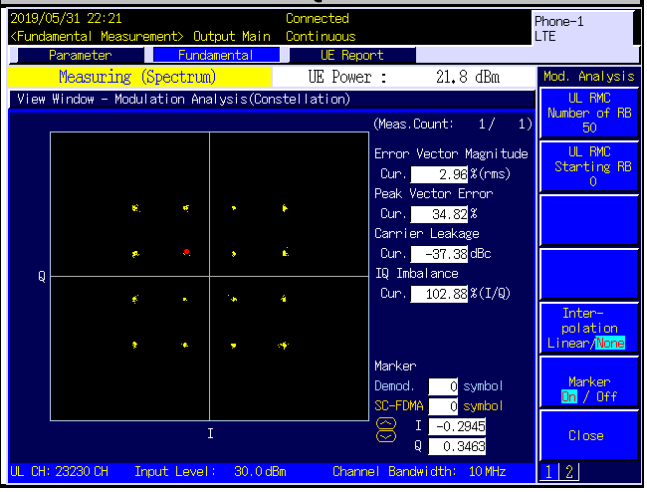
4.2.3 Test Procedure

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

4.2.4 Test Results

Spectrum Plot of Measurement	
LTE Band 4	
Channel 20175	
QPSK	16QAM
	

Spectrum Plot of Measurement	
LTE Band 12	
Channel 23095	
QPSK	16QAM
	

Spectrum Plot of Measurement	
LTE Band 13	
Channel 23230	
QPSK	16QAM
	

4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

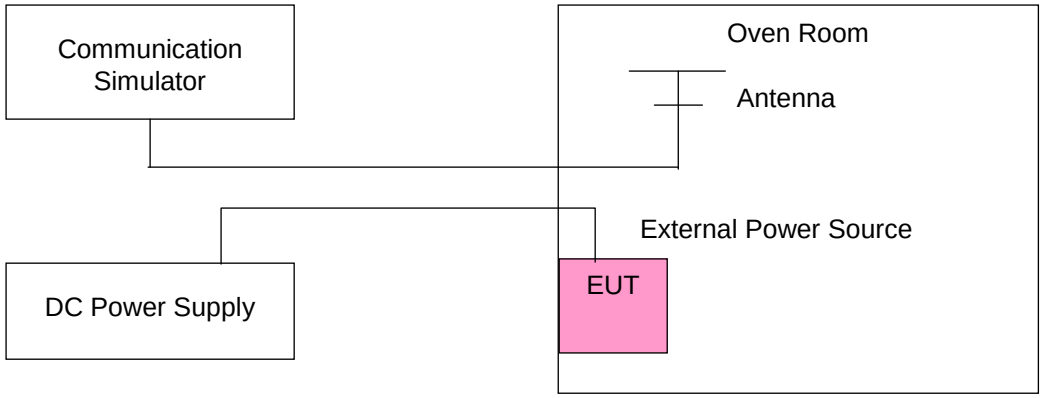
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

4.3.2 Test Procedure

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

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

4.3.3 Test Setup



4.3.4 Test Results

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.6	1710.700002	0.001	1754.300003	0.002
3.06	1710.700002	0.001	1754.300002	0.001
4.14	1710.700003	0.002	1754.300004	0.002

Note: The applicant defined the normal working voltage of the battery is from 3.06 Vdc to 4.14 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-10	1710.700004	0.002	1754.300002	0.001
0	1710.700001	0.001	1754.300002	0.001
10	1710.700002	0.001	1754.300004	0.002
20	1710.699998	-0.001	1754.300003	0.001
30	1710.699997	-0.002	1754.299998	-0.001
40	1710.699996	-0.002	1754.299996	-0.002
50	1710.699997	-0.002	1754.299996	-0.002

Note:

1. The applicant declared that the normal operating temperature of the EUT is from -10˚C to 50˚C.
2. The EUT would shut down automatically as below -10˚C.

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.6	1710.700002	0.001	1754.300003	0.002
3.06	1710.700004	0.002	1754.300002	0.001
4.14	1710.700002	0.001	1754.300001	0.001

Note: The applicant defined the normal working voltage of the battery is from 3.06 Vdc to 4.14 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-10	1710.700001	0.001	1754.300002	0.001
0	1710.700003	0.002	1754.300002	0.001
10	1710.700003	0.002	1754.300001	0.001
20	1710.699996	-0.002	1754.300002	0.001
30	1710.699997	-0.002	1754.299998	-0.001
40	1710.699998	-0.001	1754.299998	-0.001
50	1710.699997	-0.002	1754.299997	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.6	1710.700004	0.002	1754.300001	0.001
3.06	1710.700003	0.002	1754.300003	0.002
4.14	1710.700001	0.001	1754.300003	0.002

Note: The applicant defined the normal working voltage of the battery is from 3.06 Vdc to 4.14 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-10	1710.700002	0.001	1754.300003	0.002
0	1710.700002	0.001	1754.300004	0.002
10	1710.700004	0.002	1754.300002	0.001
20	1710.699998	-0.001	1754.300002	0.001
30	1710.699997	-0.002	1754.299999	-0.001
40	1710.699998	-0.001	1754.299997	-0.002
50	1710.699996	-0.002	1754.299997	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.6	1710.700002	0.001	1754.300002	0.001
3.06	1710.700002	0.001	1754.300003	0.002
4.14	1710.700002	0.001	1754.300002	0.001

Note: The applicant defined the normal working voltage of the battery is from 3.06 Vdc to 4.14 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-10	1710.700002	0.001	1754.300003	0.002
0	1710.700003	0.002	1754.300002	0.001
10	1710.700001	0.001	1754.300002	0.001
20	1710.699998	-0.001	1754.300003	0.001
30	1710.699998	-0.001	1754.299999	-0.001
40	1710.699997	-0.002	1754.299997	-0.002
50	1710.699996	-0.002	1754.299998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.6	1710.700003	0.002	1754.300004	0.002
3.06	1710.700003	0.002	1754.300002	0.001
4.14	1710.700003	0.002	1754.300004	0.002

Note: The applicant defined the normal working voltage of the battery is from 3.06 Vdc to 4.14 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-10	1710.700001	0.001	1754.300002	0.001
0	1710.700003	0.002	1754.300002	0.001
10	1710.700004	0.002	1754.300002	0.001
20	1710.699999	-0.001	1754.300002	0.001
30	1710.699997	-0.002	1754.299998	-0.001
40	1710.699999	-0.001	1754.299998	-0.001
50	1710.699997	-0.002	1754.299997	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.6	1710.700003	0.002	1754.300003	0.002
3.06	1710.700004	0.002	1754.300002	0.001
4.14	1710.700002	0.001	1754.300004	0.002

Note: The applicant defined the normal working voltage of the battery is from 3.06 Vdc to 4.14 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-10	1710.700001	0.001	1754.300002	0.001
0	1710.700002	0.001	1754.300003	0.002
10	1710.700002	0.001	1754.300001	0.001
20	1710.699998	-0.001	1754.300003	0.002
30	1710.699997	-0.002	1754.299998	-0.001
40	1710.699998	-0.001	1754.299997	-0.002
50	1710.699997	-0.002	1754.299998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.6	699.700003	0.004	715.300001	0.001
3.06	699.700004	0.005	715.300001	0.002
4.14	699.700003	0.004	715.300003	0.005

Note: The applicant defined the normal working voltage of the battery is from 3.06 Vdc to 4.14 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 12			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-10	699.700003	0.005	715.300003	0.005
0	699.700003	0.005	715.300003	0.004
10	699.700003	0.004	715.300003	0.004
20	699.699996	-0.005	715.300002	0.002
30	699.699997	-0.004	715.299998	-0.003
40	699.699997	-0.004	715.299997	-0.004
50	699.699996	-0.005	715.299998	-0.003

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.6	699.700003	0.004	715.300002	0.003
3.06	699.700003	0.004	715.300003	0.004
4.14	699.700004	0.005	715.300002	0.003

Note: The applicant defined the normal working voltage of the battery is from 3.06 Vdc to 4.14 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 12			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-10	699.700002	0.002	715.300003	0.004
0	699.700002	0.002	715.300001	0.002
10	699.700004	0.005	715.300001	0.001
20	699.699997	-0.005	715.300001	0.002
30	699.699998	-0.003	715.299997	-0.005
40	699.699998	-0.004	715.299997	-0.004
50	699.699999	-0.001	715.299996	-0.006

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.6	699.700002	0.002	715.300004	0.005
3.06	699.700003	0.004	715.300002	0.002
4.14	699.700004	0.006	715.300004	0.005

Note: The applicant defined the normal working voltage of the battery is from 3.06 Vdc to 4.14 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 12			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-10	699.700003	0.004	715.300003	0.005
0	699.700003	0.004	715.300002	0.003
10	699.700002	0.003	715.300004	0.005
20	699.699998	-0.004	715.300004	0.005
30	699.699996	-0.006	715.299999	-0.002
40	699.699997	-0.005	715.299997	-0.004
50	699.699997	-0.004	715.299997	-0.004

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.6	699.700002	0.003	715.300002	0.003
3.06	699.700003	0.005	715.300001	0.002
4.14	699.700004	0.005	715.300002	0.002

Note: The applicant defined the normal working voltage of the battery is from 3.06 Vdc to 4.14 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 12			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-10	699.700003	0.004	715.300004	0.005
0	699.700002	0.003	715.300002	0.003
10	699.700003	0.004	715.300004	0.005
20	699.699997	-0.004	715.300002	0.003
30	699.699998	-0.003	715.299999	-0.002
40	699.699999	-0.002	715.299998	-0.002
50	699.699998	-0.003	715.299997	-0.005

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 13			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.6	779.500002	0.002	784.500002	0.003
3.06	779.500003	0.004	784.500002	0.003
4.14	779.500001	0.002	784.500004	0.005

Note: The applicant defined the normal working voltage of the battery is from 3.06 Vdc to 4.14 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 13			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-10	779.500001	0.002	784.500004	0.005
0	779.500004	0.005	784.500003	0.004
10	779.500002	0.003	784.500002	0.003
20	779.499998	-0.003	784.500002	0.002
30	779.499998	-0.003	784.499996	-0.005
40	779.499998	-0.003	784.499996	-0.005
50	779.499996	-0.005	784.499997	-0.004

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 13	
	Channel Bandwidth: 10 MHz	
	Frequency (MHz)	Frequency Error (ppm)
3.6	779.500003	0.004
3.06	779.500003	0.004
4.14	779.500002	0.002

Note: The applicant defined the normal working voltage of the battery is from 3.06 Vdc to 4.14 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 13	
	Channel Bandwidth: 10 MHz	
	Frequency (MHz)	Frequency Error (ppm)
-10	779.500002	0.003
0	779.500002	0.002
10	779.500002	0.003
20	779.499997	-0.003
30	779.499999	-0.002
40	779.499997	-0.004
50	779.499996	-0.005

4.4 Occupied Bandwidth Measurement

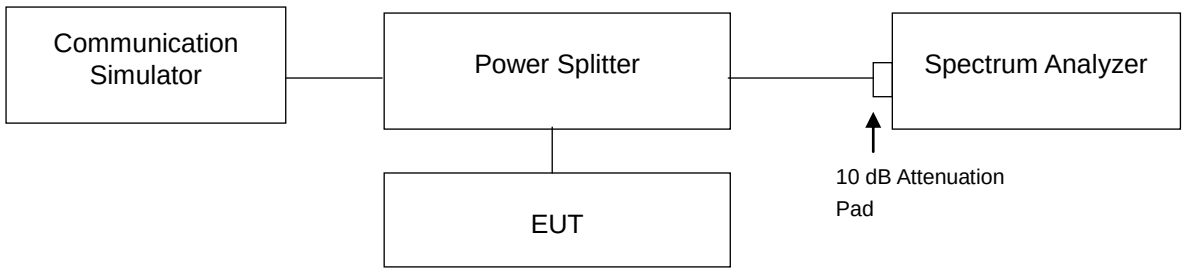
4.4.1 Limits of Occupied Bandwidth Measurement

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

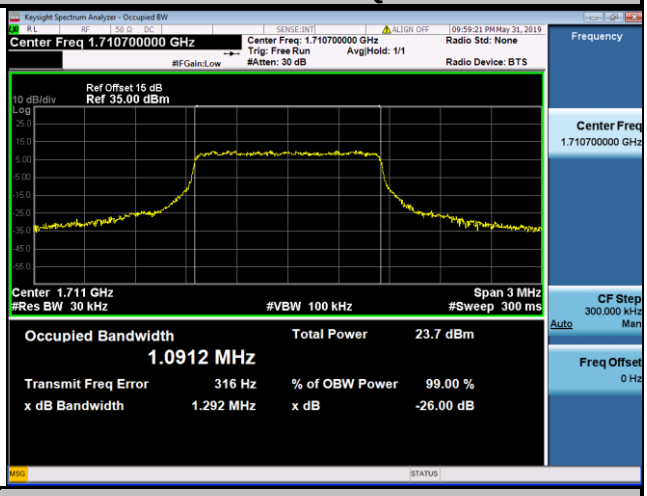
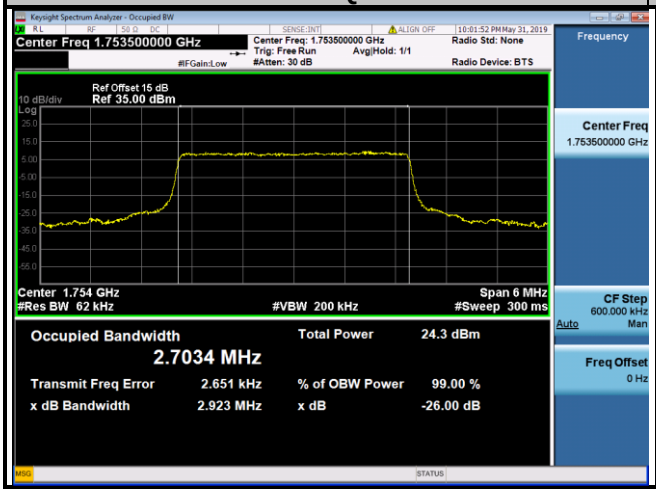
a. The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
b. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

4.4.3 Test Setup



4.4.4 Test Result

LTE Band 4					
Channel Bandwidth: 1.4 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
19957	1710.7	1.0883	1.0912	1.283	1.292
20175	1732.5	1.0888	1.0916	1.288	1.291
20393	1754.3	1.0887	1.0907	1.283	1.282
Channel Bandwidth: 3 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
19965	1711.5	2.7009	2.6950	2.928	2.936
20175	1732.5	2.7007	2.6974	2.931	2.941
20385	1753.5	2.7034	2.6967	2.923	2.934

Spectrum Plot of Worst Value	
99 % Occupied Bandwidth	26 dB Bandwidth
1.4 MHz / 16QAM	1.4 MHz / 16QAM
	
3 MHz / QPSK	3 MHz / 16QAM
	

LTE Band 4					
Channel Bandwidth: 5 MHz					
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**		**26 dB Bandwidth (MHz)**	
		QPSK	**16QAM**	**QPSK**	**16QAM**
19975	1712.5	4.4843	4.4854	4.829	4.803
20175	1732.5	4.4845	4.4852	4.810	4.827
20375	1752.5	4.4842	4.4859	4.812	4.828
Channel Bandwidth: 10 MHz					
Channel	**Frequency (MHz)**	**99 % Occupied Bandwidth (MHz)**		**26 dB Bandwidth (MHz)**	
		QPSK	**16QAM**	**QPSK**	**16QAM**
20000	1715.0	8.9707	8.9766	9.540	9.586
20175	1732.5	8.9611	8.9653	9.541	9.538
20350	1750.0	8.9754	8.9754	9.557	9.564

Spectrum Plot of Worst Value	
99 % Occupied Bandwidth	**26 dB Bandwidth**
5 MHz / 16QAM	**5 MHz / QPSK**
	
10 MHz / 16QAM	**10 MHz / 16QAM**
	

LTE Band 4					
Channel Bandwidth: 15 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
20025	1717.5	13.471	13.464	14.29	14.36
20175	1732.5	13.447	13.433	14.29	14.32
20325	1747.5	13.484	13.471	14.36	14.40
Channel Bandwidth: 20 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
20050	1720.0	17.953	17.975	19.06	19.06
20175	1732.5	17.900	17.916	19.10	19.06
20300	1745.0	17.964	17.979	19.11	19.08

Spectrum Plot of Worst Value	
99 % Occupied Bandwidth	26 dB Bandwidth
15 MHz / QPSK	15 MHz / 16QAM
	
20 MHz / 16QAM	20 MHz / QPSK
	

LTE Band 12					
Channel Bandwidth: 1.4 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
23017	699.7	1.0899	1.0889	1.297	1.279
23095	707.5	1.0889	1.0907	1.302	1.283
23173	715.3	1.0891	1.0898	1.275	1.277
Channel Bandwidth: 3 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
23025	700.5	2.7030	2.6986	2.927	2.937
23095	707.5	2.7015	2.6967	2.909	2.930
23165	714.5	2.7017	2.6974	2.921	2.921

Spectrum Plot of Worst Value	
99 % Occupied Bandwidth	26 dB Bandwidth
1.4 MHz / 16QAM	1.4 MHz / QPSK
	
3 MHz / QPSK	3 MHz / 16QAM
	

LTE Band 12					
Channel Bandwidth: 5 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
23035	701.5	4.4905	4.4909	4.839	4.836
23095	707.5	4.4759	4.4779	4.778	4.821
23155	713.5	4.4888	4.4907	4.824	4.829
Channel Bandwidth: 10 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
23060	704.0	8.9638	8.9670	9.531	9.572
23095	707.5	8.9378	8.9449	9.508	9.522
23130	711.0	8.9867	8.9892	9.549	9.580

Spectrum Plot of Worst Value	
99 % Occupied Bandwidth	26 dB Bandwidth
5 MHz / 16QAM	5 MHz / QPSK
	
10 MHz / 16QAM	10 MHz / 16QAM
	

LTE Band 13					
Channel Bandwidth: 5 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
23205	779.5	4.4905	4.4927	4.824	4.828
23230	782.0	4.4844	4.4895	4.836	4.821
23255	784.5	4.4742	4.4752	4.810	4.796
Channel Bandwidth: 10 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
23230	782.0	8.9865	8.9898	9.535	9.558

Spectrum Plot of Worst Value

99 % Occupied Bandwidth

5 MHz / 16QAM

26 dB Bandwidth

5 MHz / QPSK

10 MHz / 16QAM

10 MHz / 16QAM

4.5 Band Edge Measurement

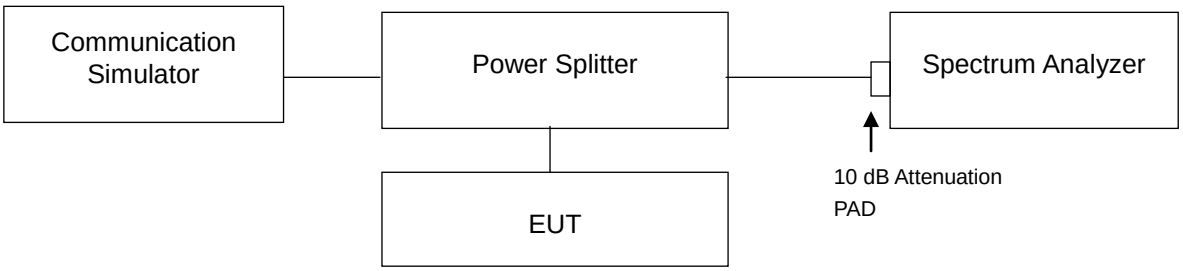
4.5.1 Limits of Band Edge Measurement

For operations in the 698-787 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater.
However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB.
On all frequencies between 763-775 MHz and 793-805 MHz, by a factor no less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

For operations in the 1710–1755 MHz bands, 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.

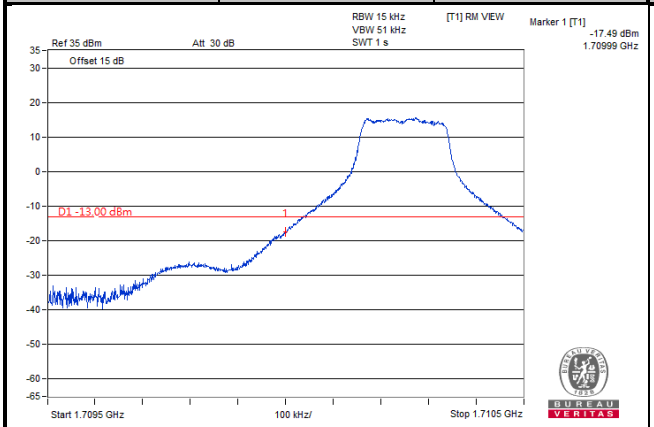
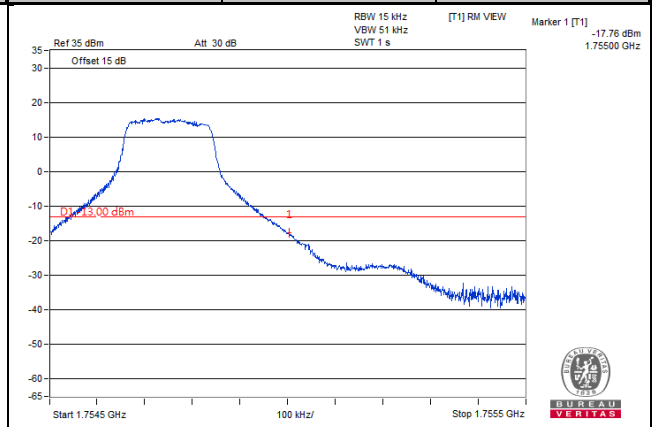
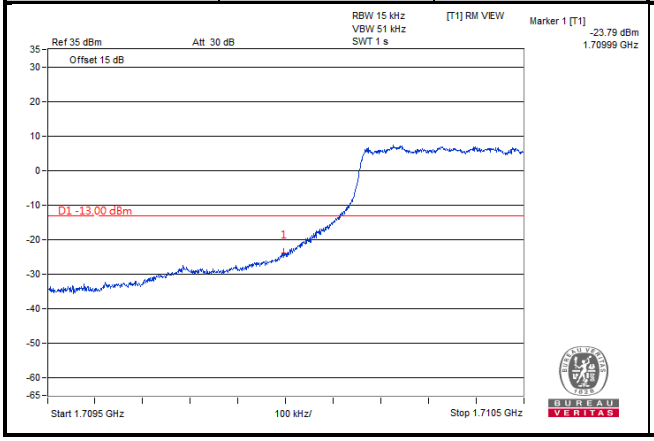
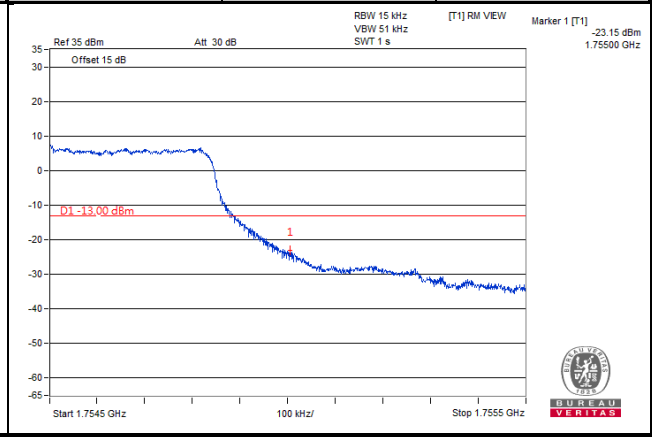
4.5.2 Test Setup

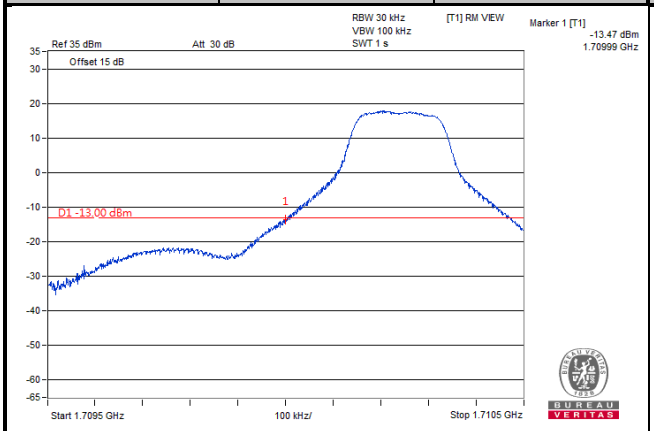
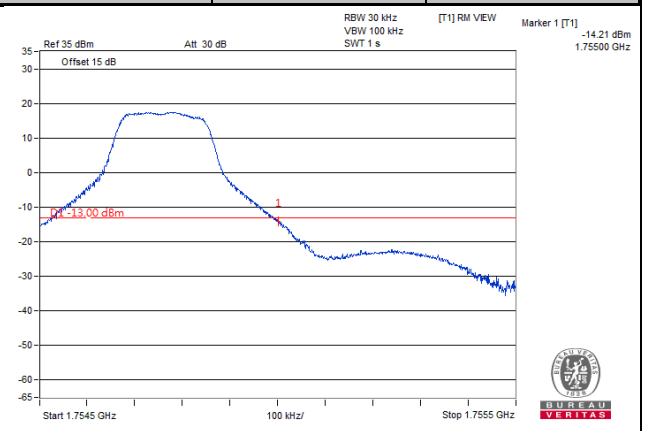
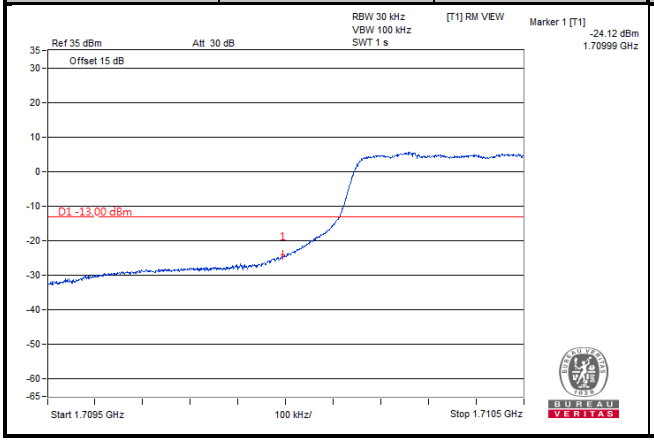
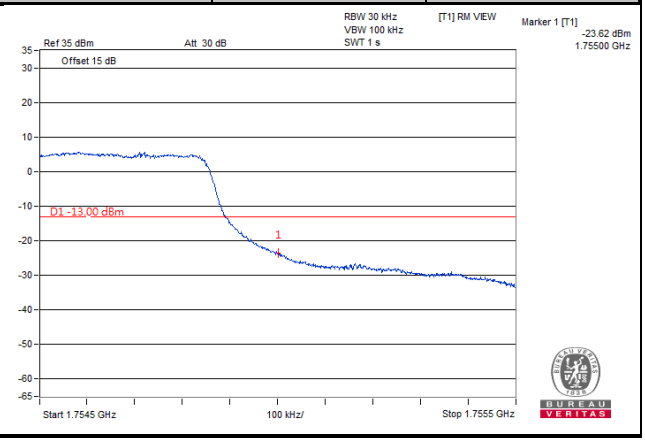


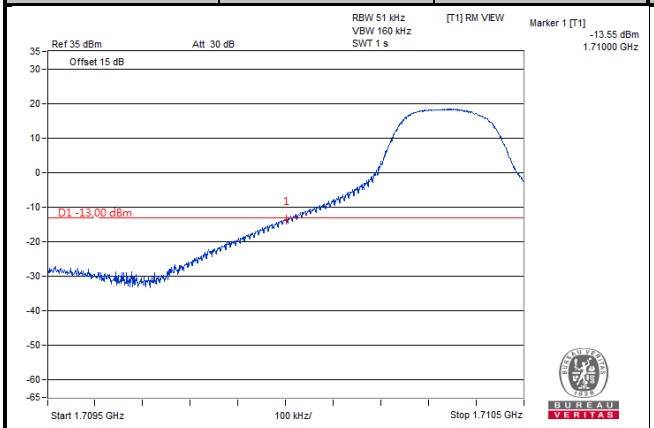
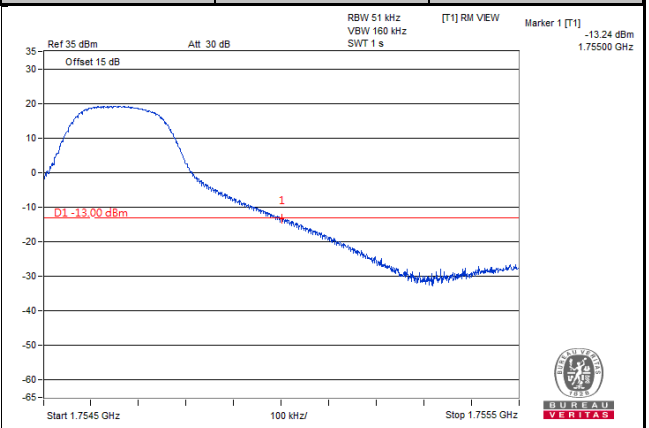
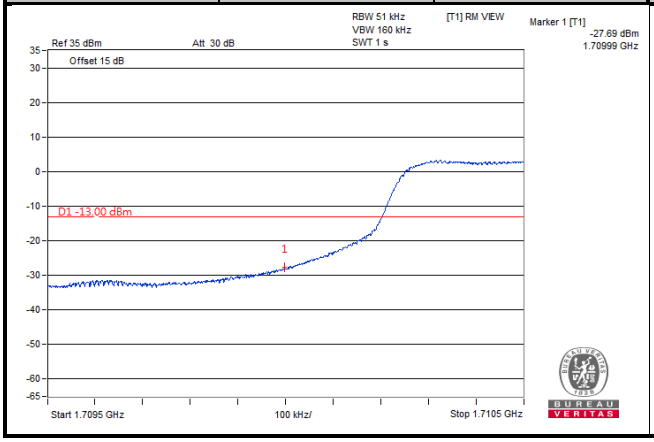
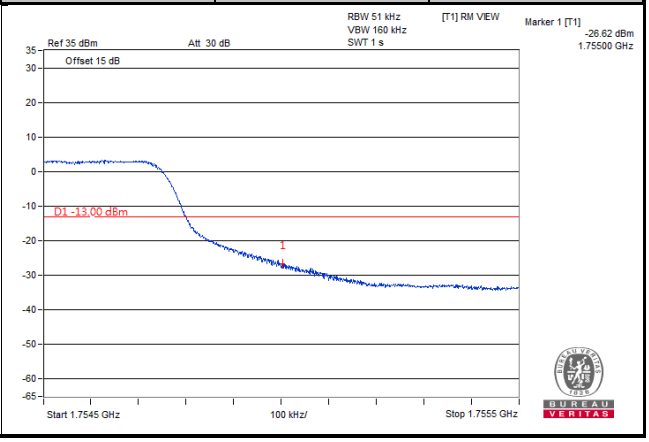
4.5.3 Test Procedures

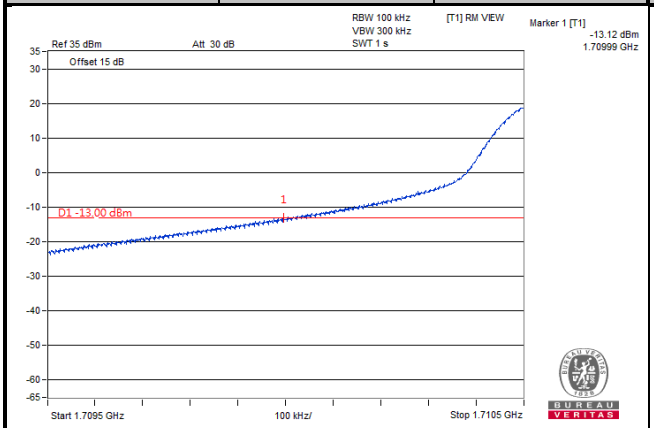
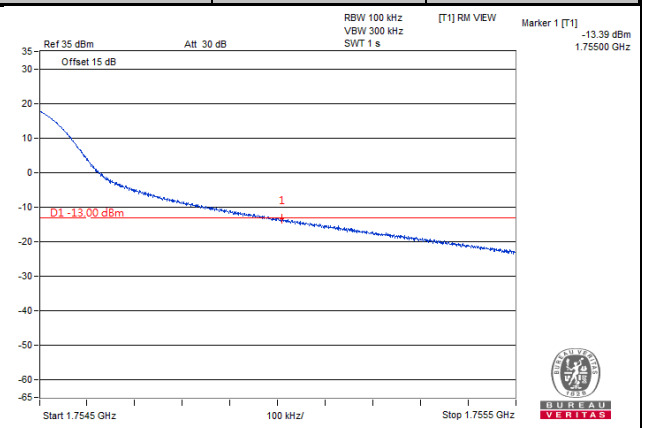
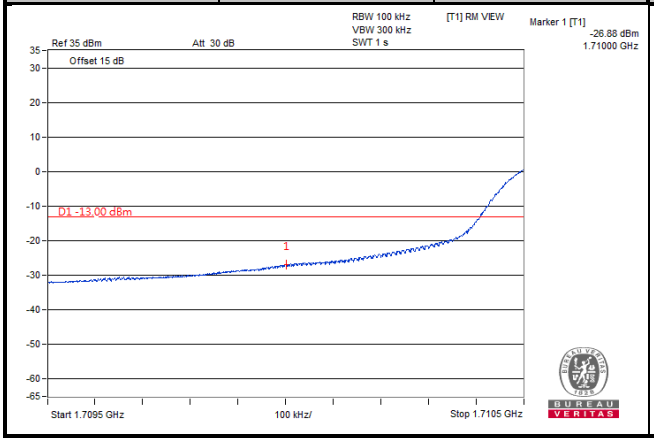
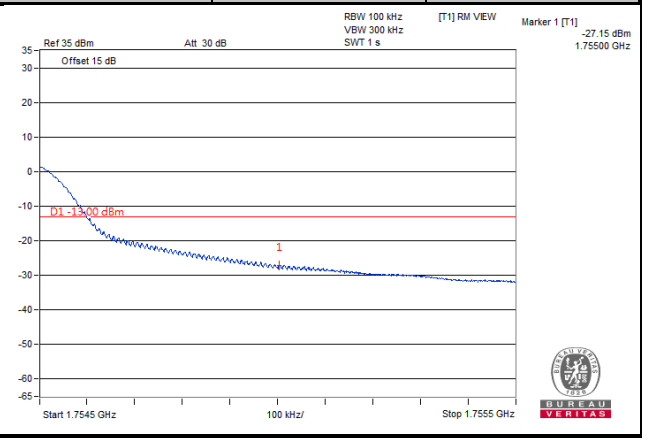
a. All measurements were done at low and high operational frequency range.
b. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 15 kHz and VB of the spectrum is 51 kHz (LTE Bandwidth 1.4 MHz).
c. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 30 kHz and VB of the spectrum is 100 kHz (LTE Bandwidth 3 MHz).
d. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 51 kHz and VB of the spectrum is 160 kHz (LTE Bandwidth 5 MHz).
e. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 100 kHz and VB of the spectrum is 300 kHz (LTE Bandwidth 10 MHz).
f. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 150 kHz and VB of the spectrum is 470 kHz (LTE Bandwidth 15 MHz).
g. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 200 kHz and VB of the spectrum is 1 MHz (LTE Bandwidth 20 MHz).
h. Record the max. trace plot into the test report.

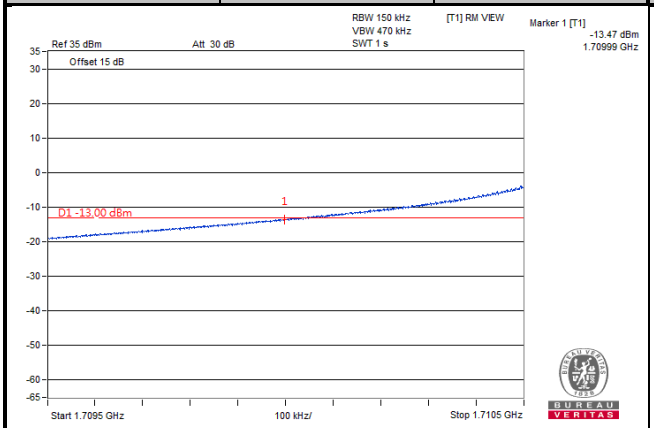
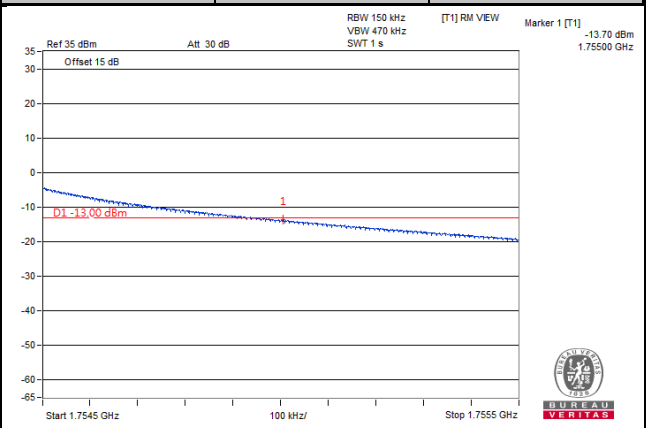
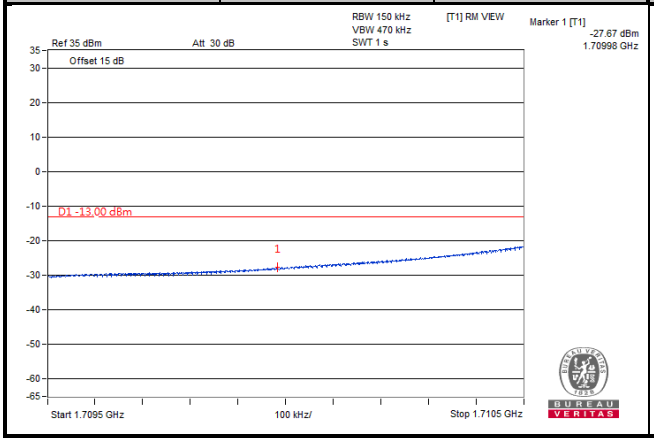
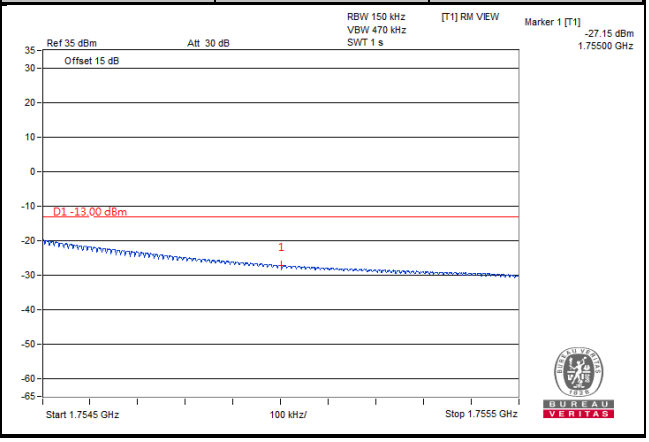
4.5.4 Test Results

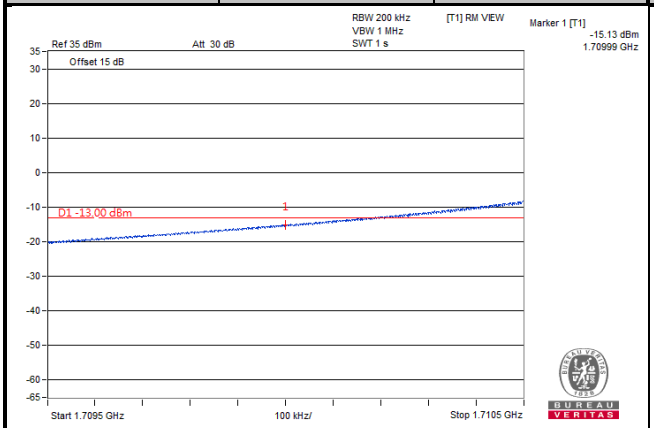
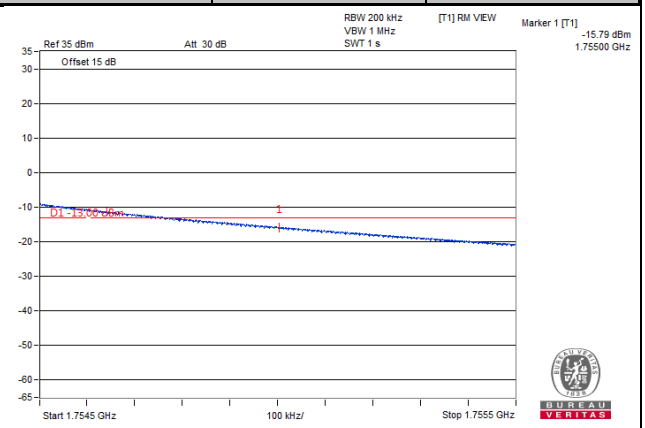
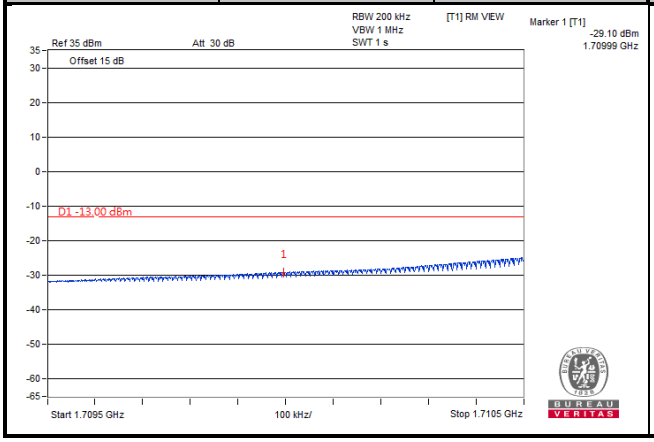
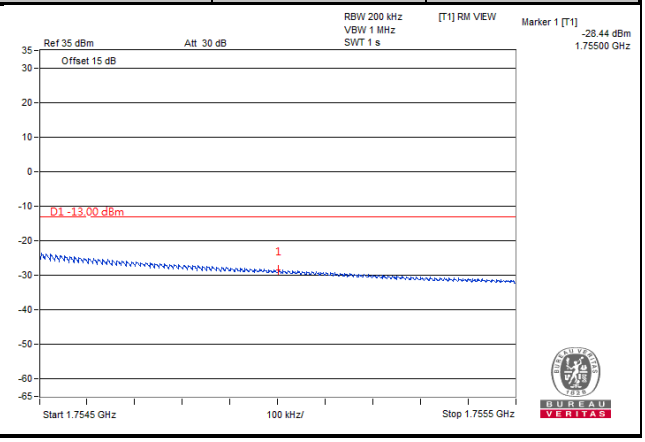
LTE Band 4					
Channel Bandwidth: 1.4 MHz					
Channel	19957	1 RB	Channel	20393	1 RB
					
Channel	19957	6 RB	Channel	20393	6 RB
					

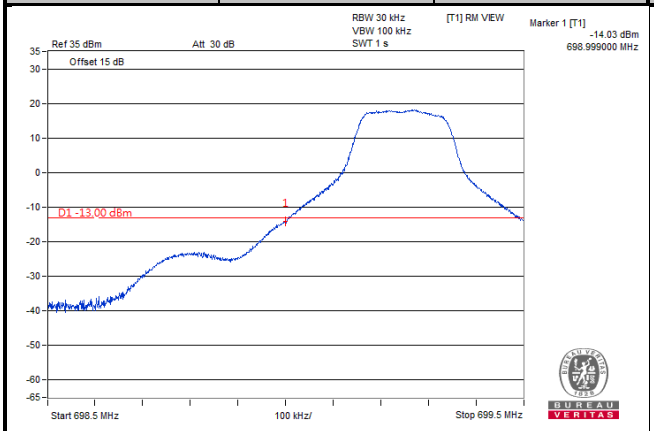
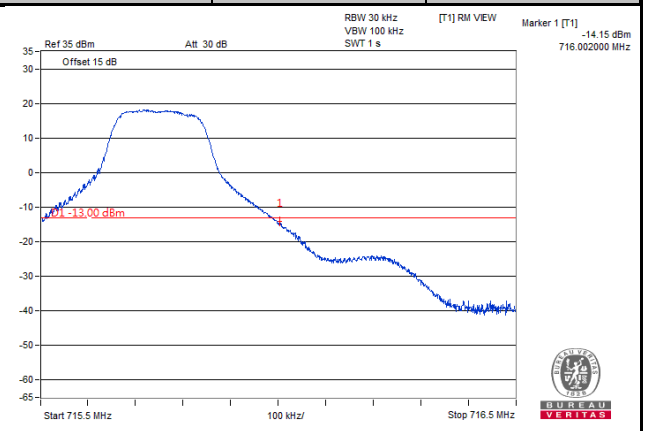
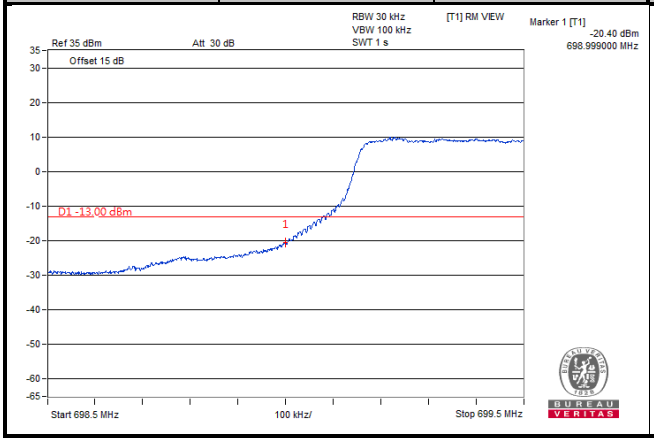
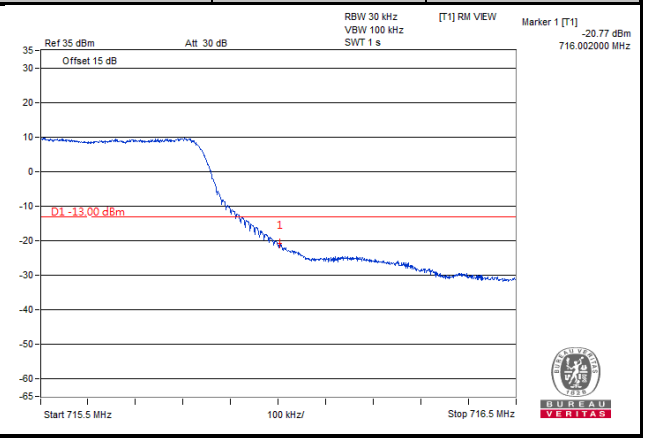
LTE Band 4					
Channel Bandwidth: 3 MHz					
Channel	19965	1 RB	Channel	20385	1 RB
					
Channel	19965	15 RB	Channel	20385	15 RB
					

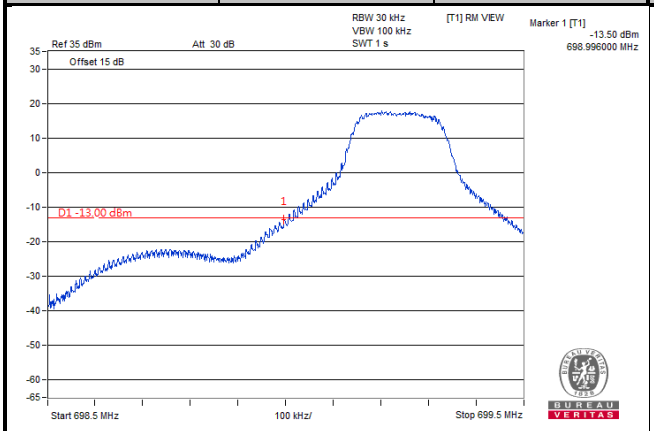
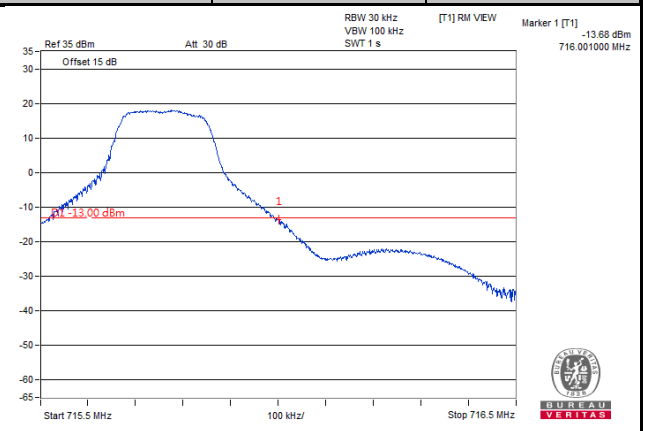
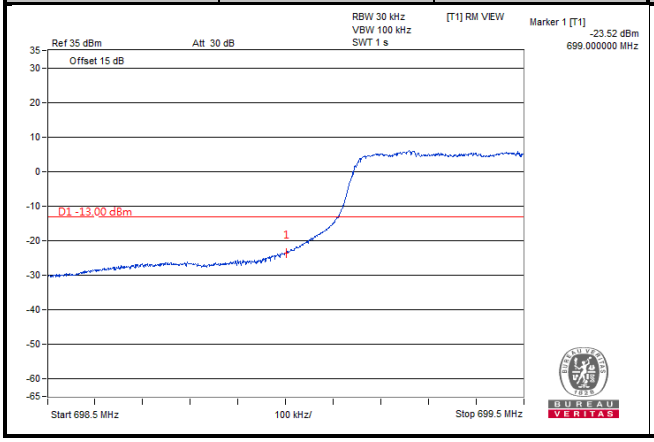
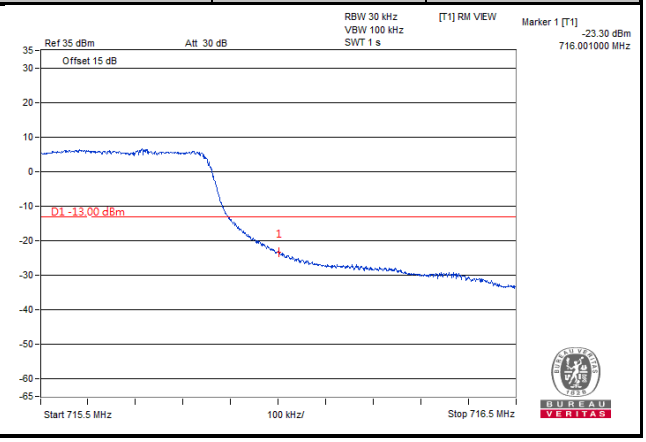
LTE Band 4					
Channel Bandwidth: 5 MHz					
Channel	19975	1 RB	Channel	20375	1 RB
					
Channel	19975	25 RB	Channel	20375	25 RB
					

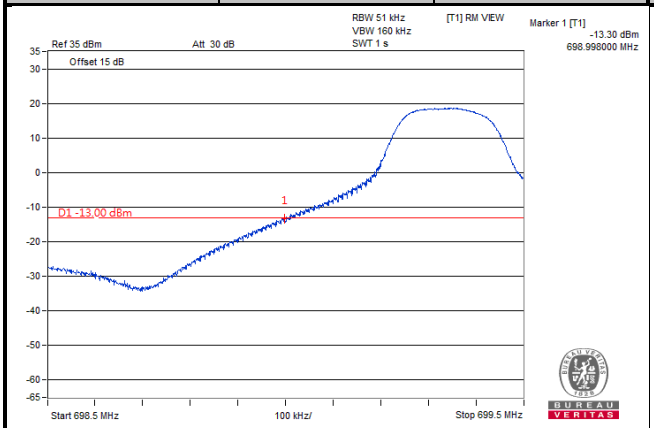
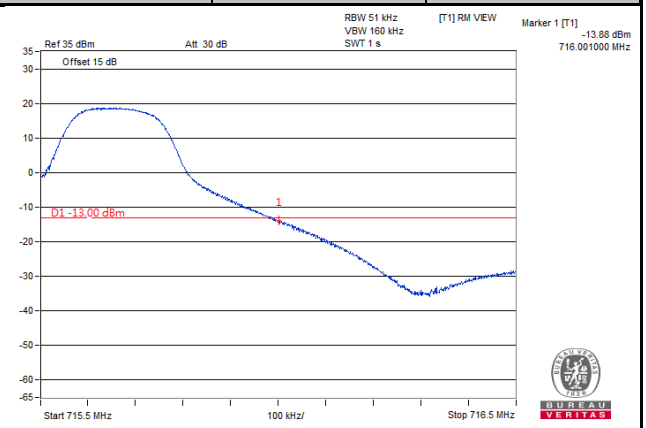
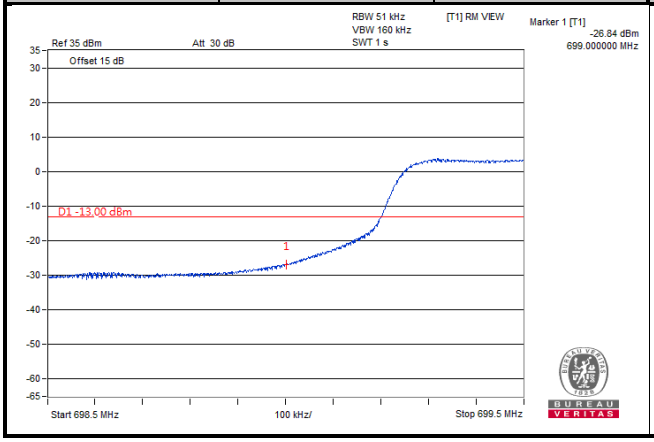
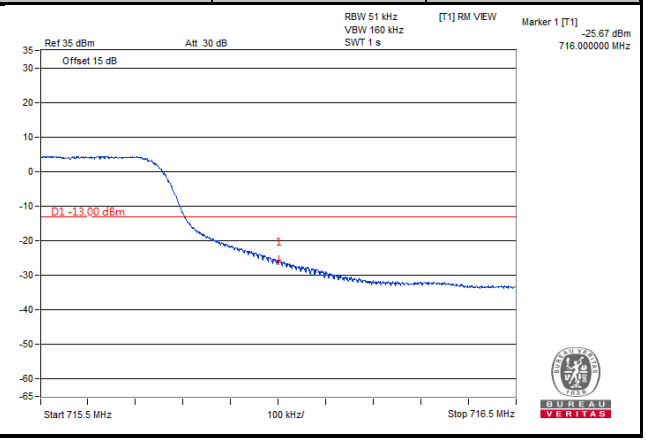
LTE Band 4					
Channel Bandwidth: 10 MHz					
Channel	20000	1 RB	Channel	20350	1 RB
					
Channel	20000	50 RB	Channel	20350	50 RB
					

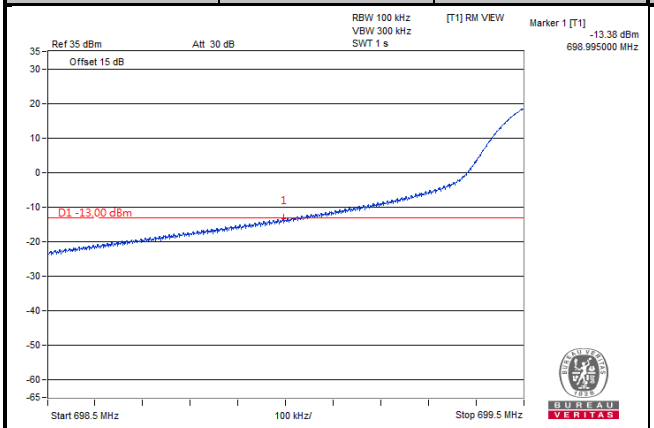
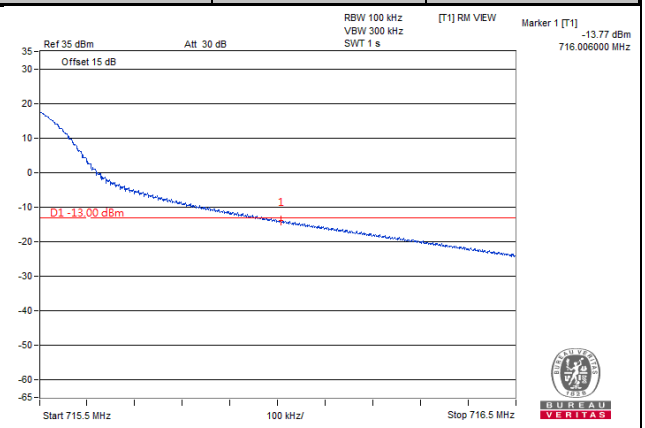
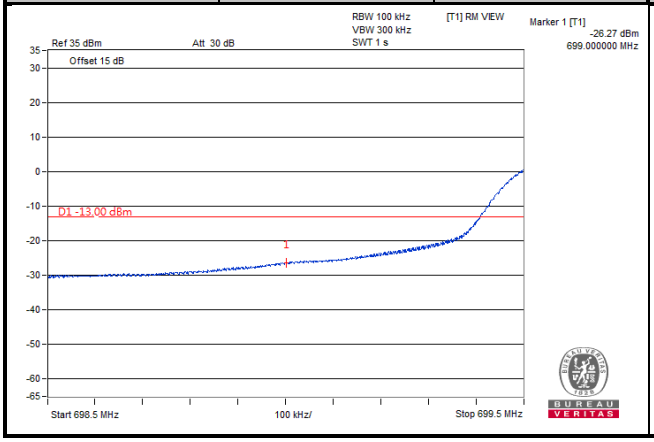
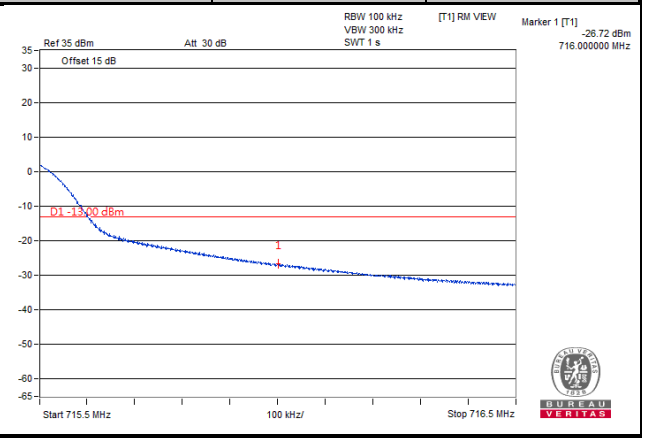
LTE Band 4					
Channel Bandwidth: 15 MHz					
Channel	20025	1 RB	Channel	20325	1 RB
					
Channel	20025	75 RB	Channel	20325	75 RB
					

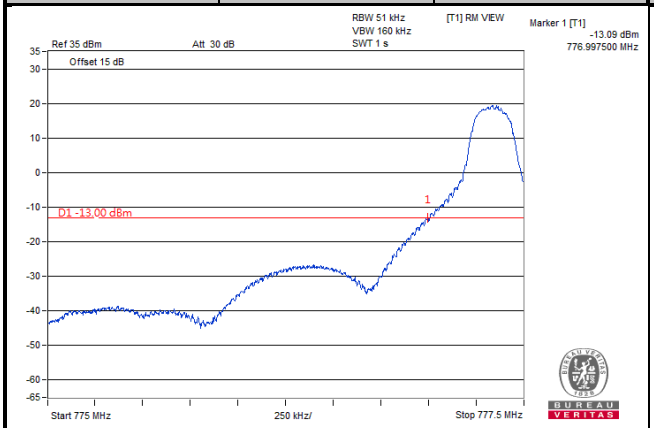
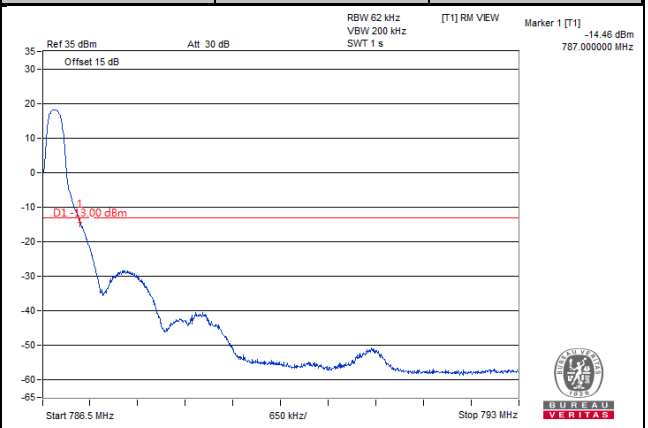
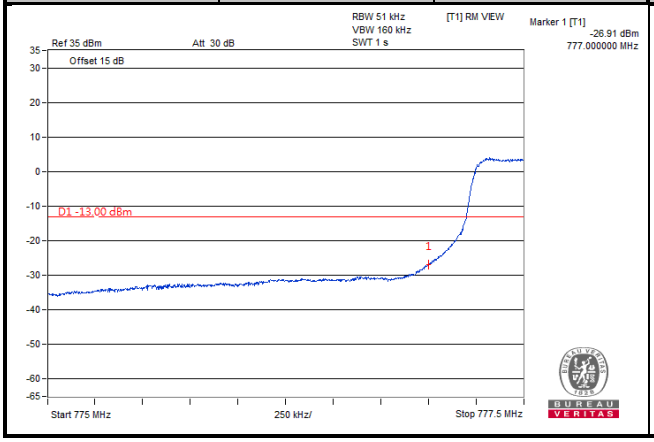
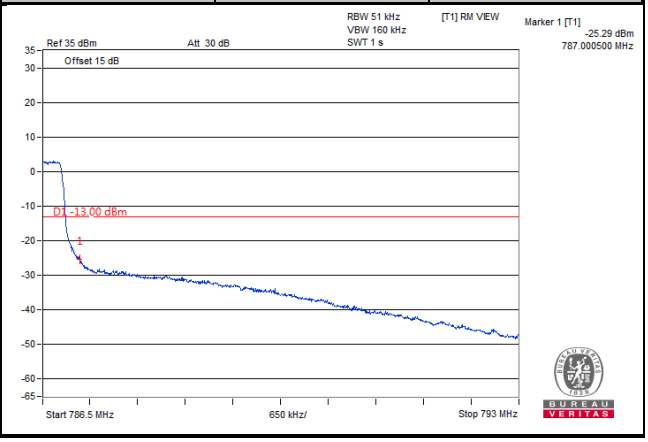
LTE Band 4					
Channel Bandwidth: 20 MHz					
Channel	20050	1 RB	Channel	20300	1 RB
					
Channel	20050	100 RB	Channel	20300	100 RB
					

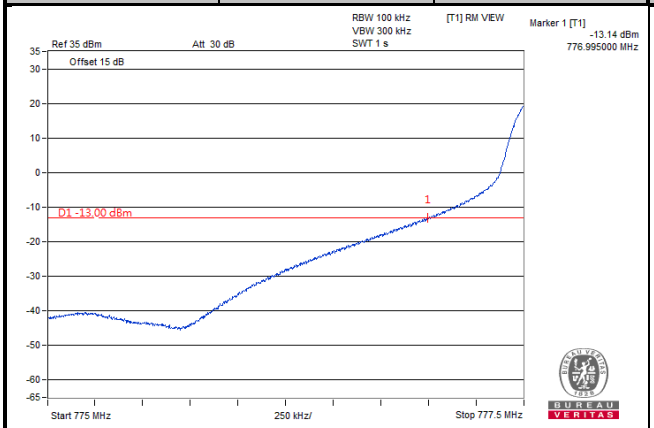
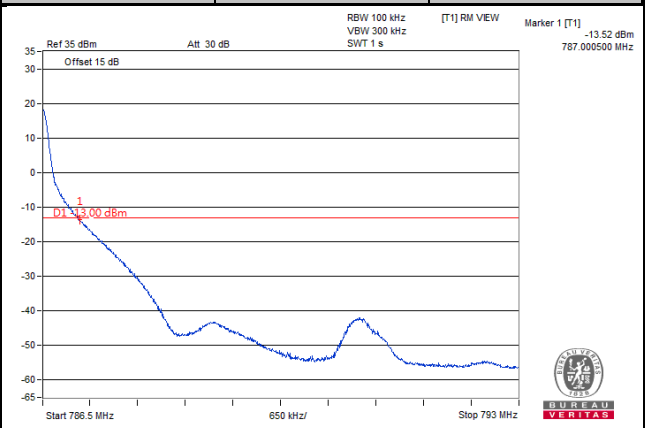
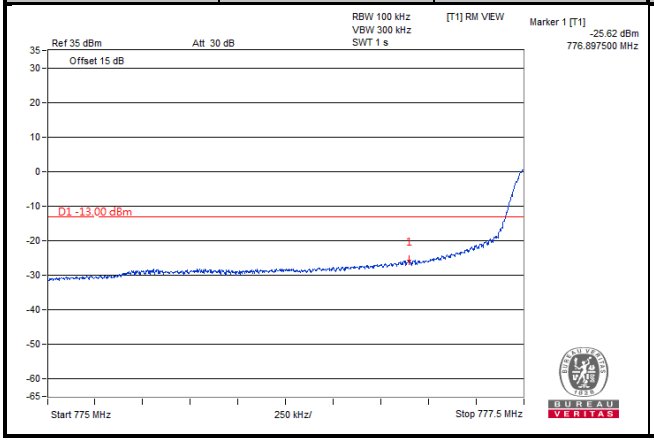
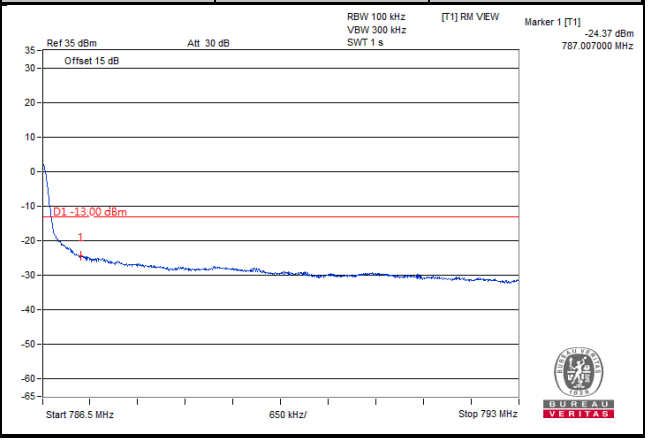
LTE Band 12					
Channel Bandwidth: 1.4 MHz					
Channel	23017	1 RB	Channel	23173	1 RB
					
Channel	23017	6 RB	Channel	23173	6 RB
					

LTE Band 12					
Channel Bandwidth: 3 MHz					
Channel	23025	1 RB	Channel	23165	1 RB
					
Channel	23025	15 RB	Channel	23165	15 RB
					

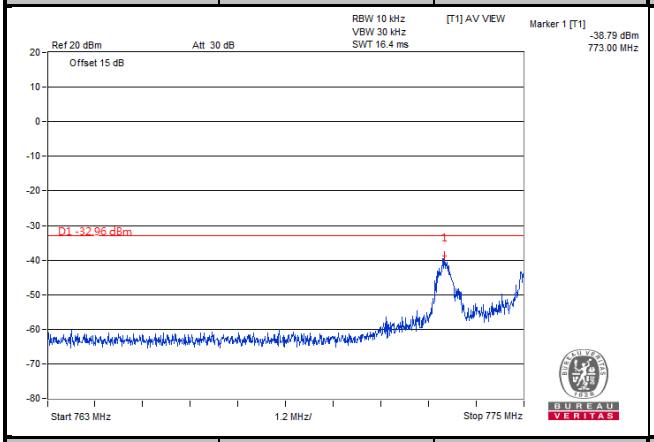
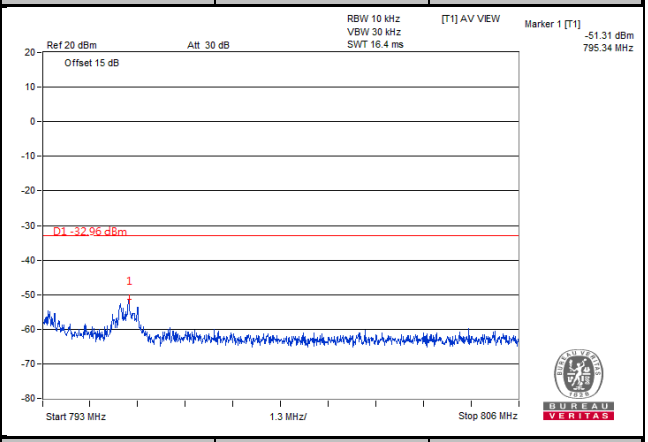
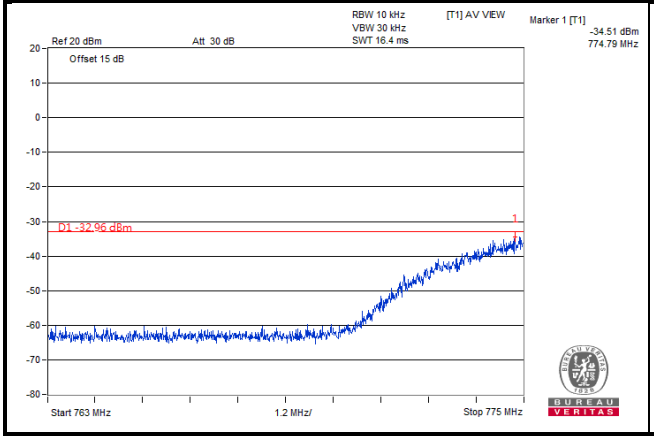
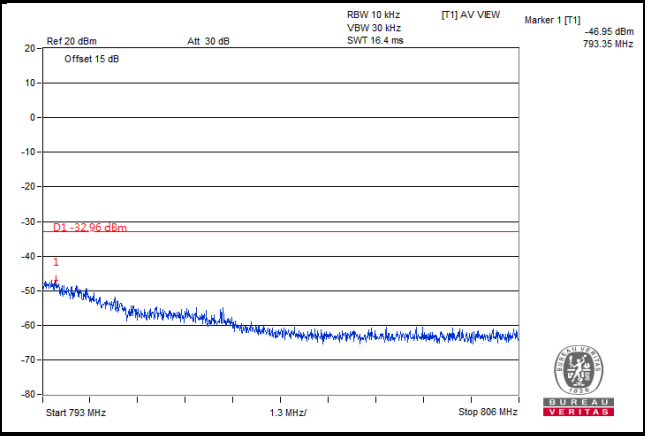
LTE Band 12					
Channel Bandwidth: 5 MHz					
Channel	23035	1 RB	Channel	23155	1 RB
					
Channel	23035	25 RB	Channel	23155	25 RB
					

LTE Band 12					
Channel Bandwidth: 10 MHz					
Channel	23060	1 RB	Channel	23130	1 RB
					
Channel	23060	50 RB	Channel	23130	50 RB
					

LTE Band 13					
Channel Bandwidth: 5 MHz					
Channel	23205	1 RB	Channel	23255	1 RB
					
Channel	23205	25 RB	Channel	23255	25 RB
					

LTE Band 13					
Channel Bandwidth: 10 MHz					
Channel	23230	1 RB	Channel	23230	1 RB
					
Channel	23230	50 RB	Channel	23230	50 RB
					

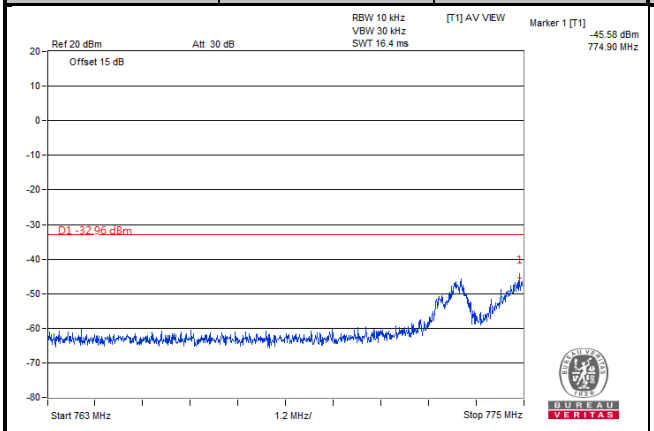
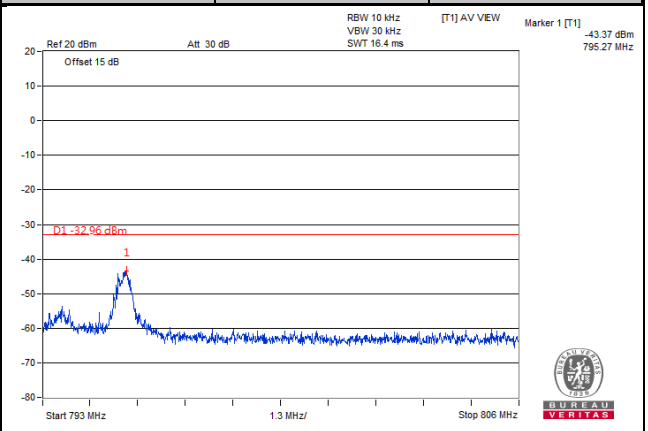
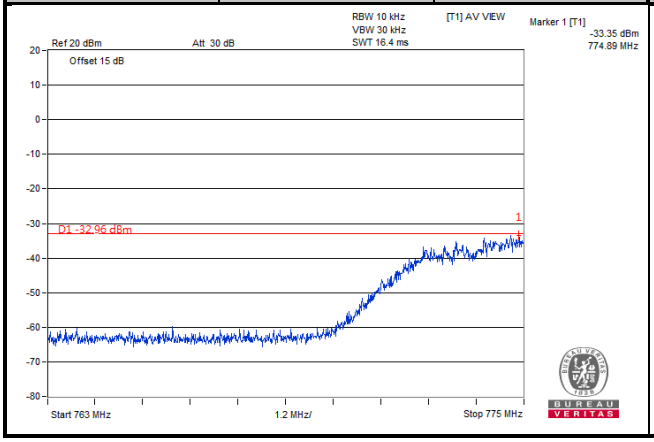
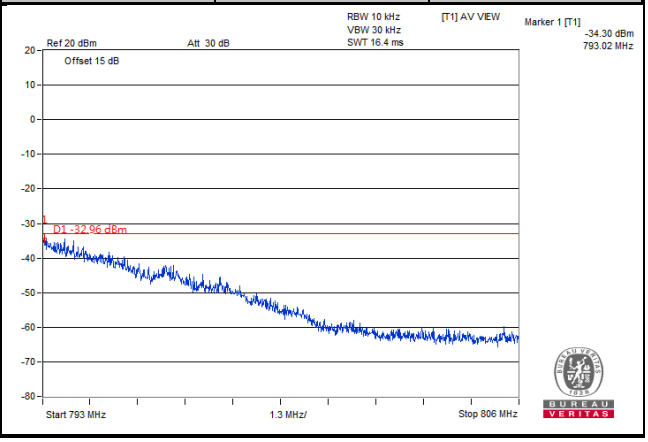
Emission Mask

LTE Band 13					
Channel Bandwidth: 5 MHz					
Channel	23205	1 RB	Channel	23255	1 RB
					
Channel	23205	25 RB	Channel	23255	25 RB
					

For the 763 - 775 MHz and 793 - 805 MHz band, the FCC limit is 65+10log(P[watt]) in a 6.25 kHz bandwidth. Since it was not possible to set the resolution bandwidth to 6.25 kHz with the available equipment, a bandwidth of 10 kHz was used instead to show compliance. By using a 10 kHz bandwidth on the spectrum analyzer.

10log(10kHz/6.25kHz) = 2.04 dB

Limit line = -35 dBm + 2.04 dB = -32.96 dBm

LTE Band 13					
Channel Bandwidth: 10 MHz					
Channel	23230	1 RB	Channel	23230	1 RB
					
Channel	23230	50 RB	Channel	23230	50 RB
					

For the 763 - 775 MHz and 793 - 805 MHz band, the FCC limit is 65+10log(P[watt]) in a 6.25 kHz bandwidth. Since it was not possible to set the resolution bandwidth to 6.25 kHz with the available equipment, a bandwidth of 10 kHz was used instead to show compliance. By using a 10 kHz bandwidth on the spectrum analyzer.

10log(10kHz/6.25kHz) = 2.04 dB

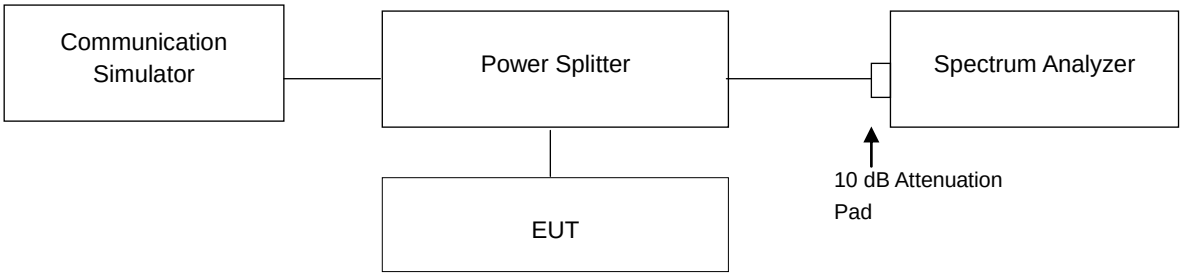
Limit line = -35 dBm + 2.04 dB =-32.96 dBm

4.6 Peak to Average Ratio

4.6.1 Limits of Peak to Average Ratio Measurement

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

4.6.2 Test Setup



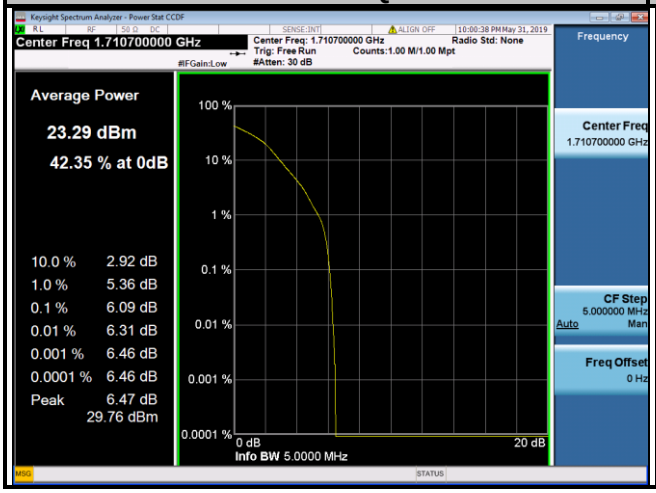
4.6.3 Test Procedures

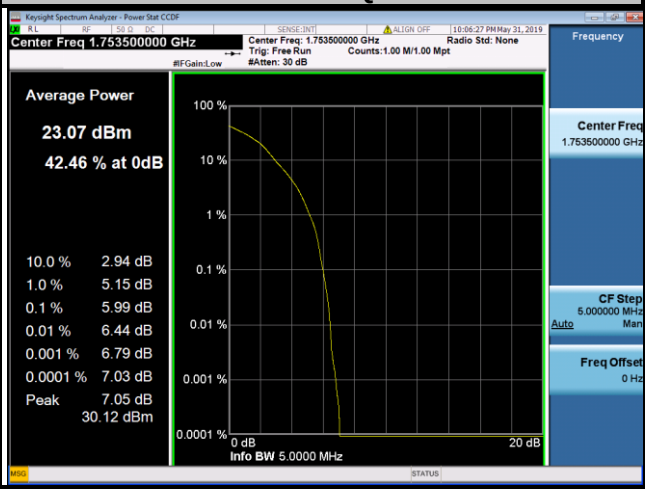
1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1 %.

4.6.4 Test Results

LTE Band 4							
Channel Bandwidth: 1.4 MHz				Channel Bandwidth: 3 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
19957	1710.7	5.22	6.09	19965	1711.5	5.14	5.97
20175	1732.5	4.97	5.80	20175	1732.5	4.90	5.75
20393	1754.3	5.11	5.92	20385	1753.5	5.19	5.99

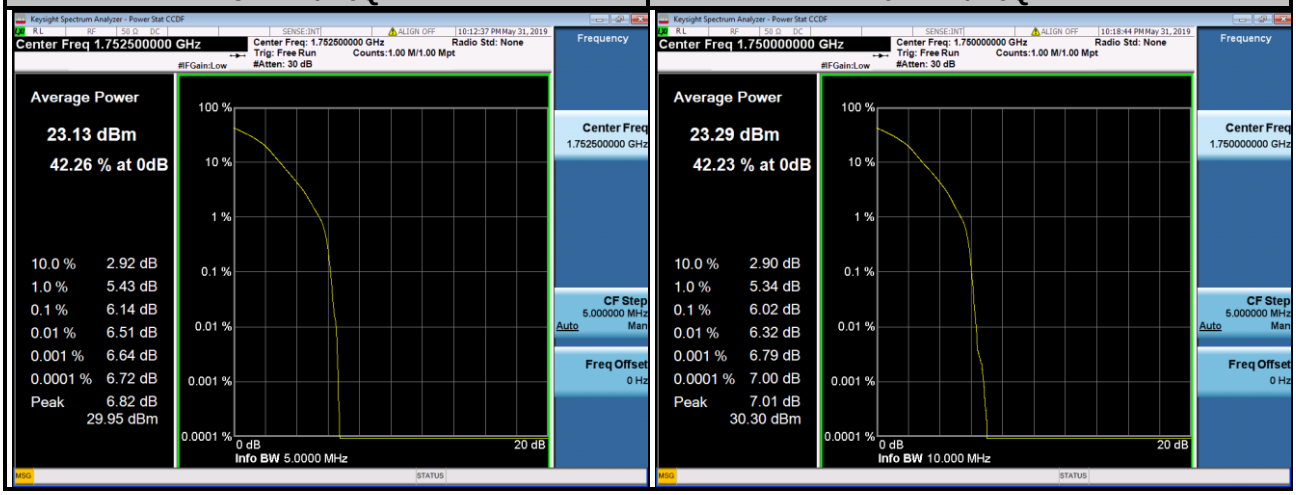
Spectrum Plot of Worst Value	
1.4 MHz / 16QAM	3 MHz / 16QAM



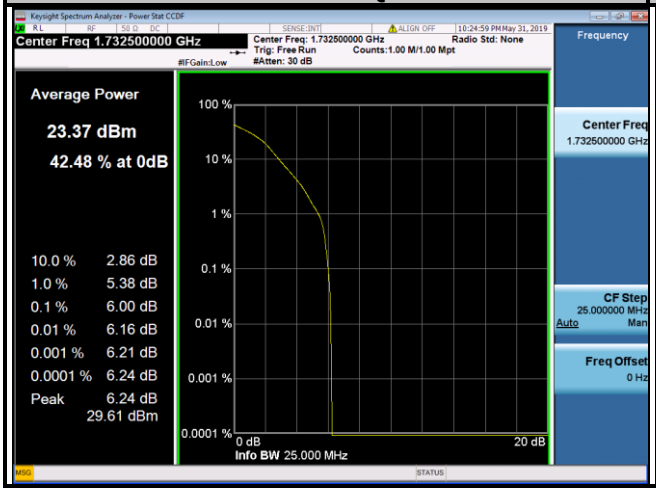
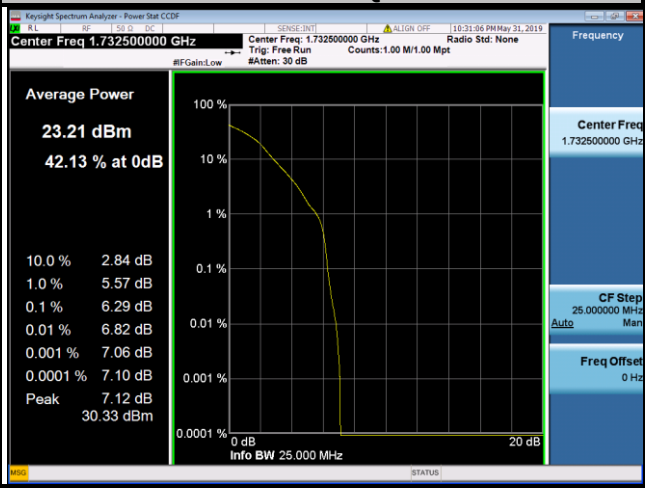


LTE Band 4							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
19975	1712.5	5.32	6.08	20000	1715.0	5.27	5.90
20175	1732.5	5.03	5.84	20175	1732.5	5.04	5.82
20375	1752.5	5.31	6.14	20350	1750.0	5.28	6.02

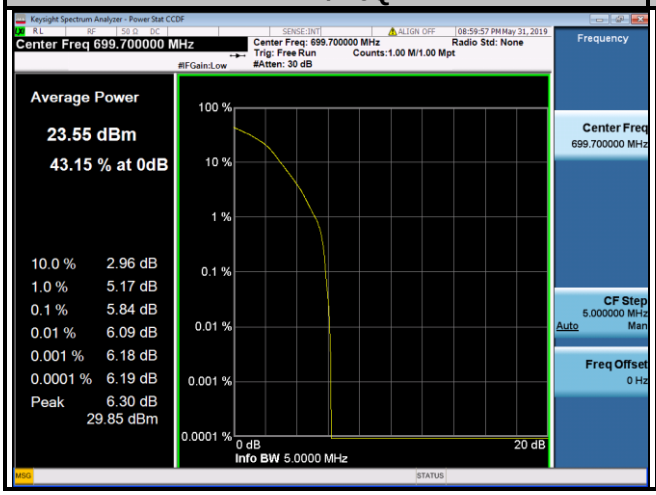
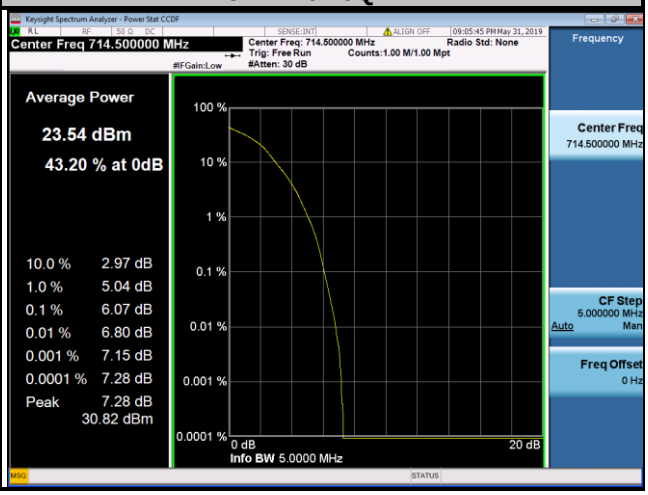
Spectrum Plot of Worst Value	
5 MHz / 16QAM	10 MHz / 16QAM



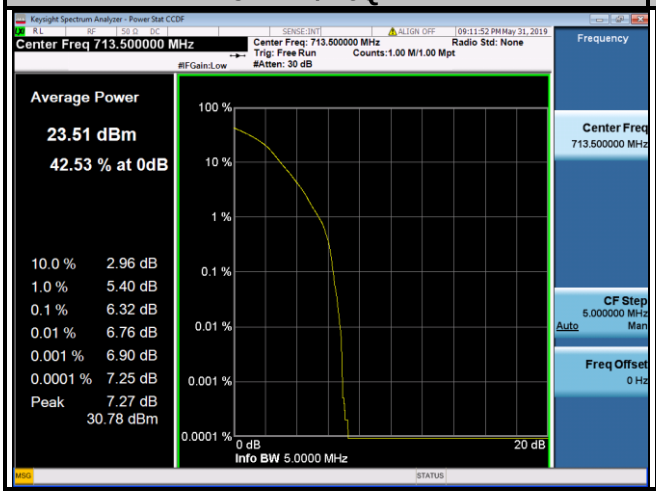
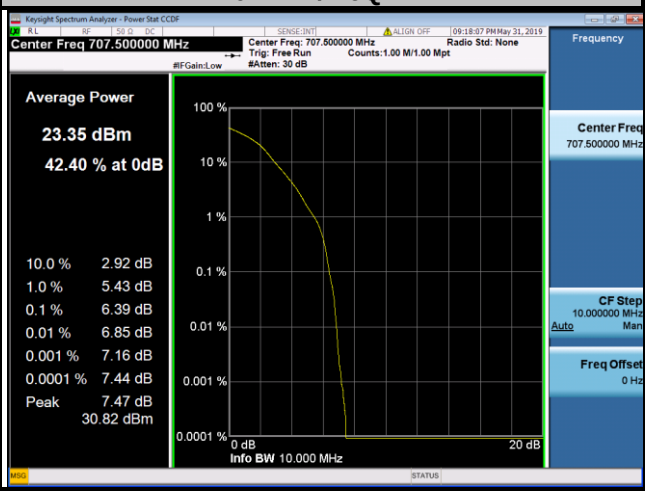
LTE Band 4							
Channel Bandwidth: 15 MHz				Channel Bandwidth: 20 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
20025	1717.5	5.09	5.97	20050	1720.0	5.20	6.00
20175	1732.5	5.04	6.00	20175	1732.5	5.45	6.29
20325	1747.5	5.14	5.91	20300	1745.0	4.84	5.67

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

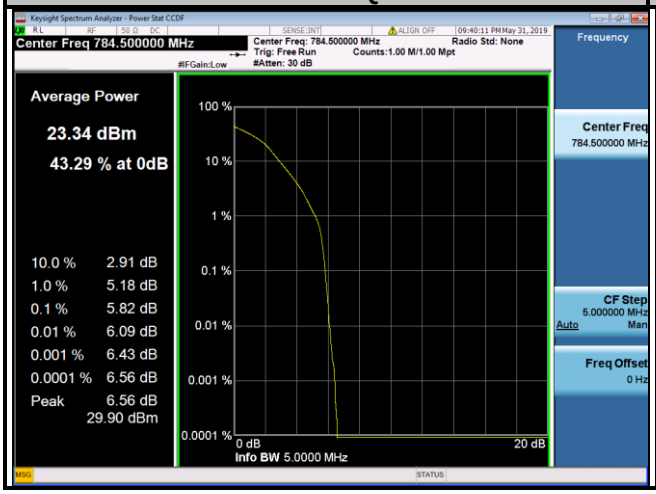
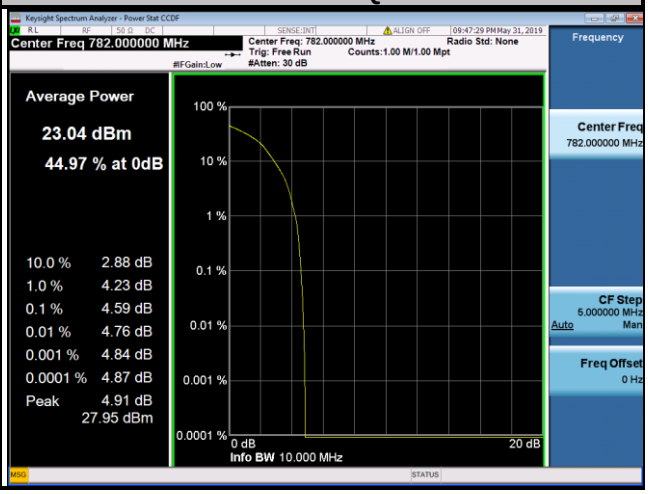
LTE Band 12							
Channel Bandwidth: 1.4 MHz				Channel Bandwidth: 3 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
23017	699.7	5.01	5.84	23025	700.5	4.90	5.76
23095	707.5	4.77	5.61	23095	707.5	4.85	5.71
23173	715.3	4.82	5.70	23165	714.5	5.24	6.07

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

LTE Band 12							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
23035	701.5	5.03	5.95	23060	704.0	5.17	5.92
23095	707.5	5.13	5.90	23095	707.5	5.47	6.39
23155	713.5	5.51	6.32	23130	711.0	4.90	5.73

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

LTE Band 13							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
23205	779.5	3.57	4.30	23230	782.0	3.83	4.59
23230	782.0	4.87	5.56				
23255	784.5	5.02	5.82				

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

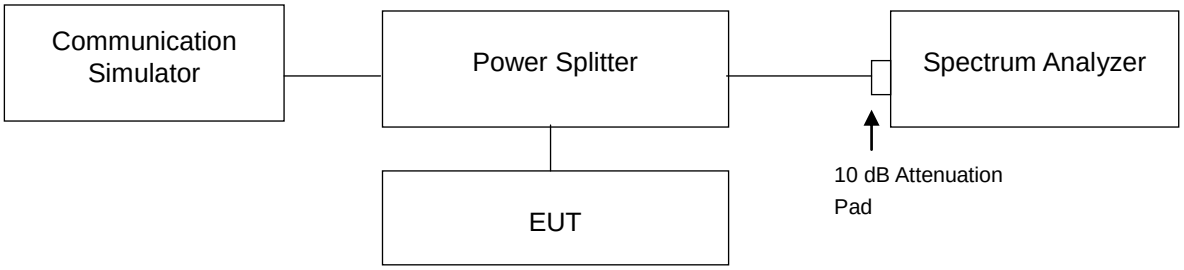
4.7 Conducted Spurious Emissions

4.7.1 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 (P) dB. The limit of emission is equal to -13 dBm.

For operations in the 775-788 MHz, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz. The limit of emissions is equal to -40 dBm.

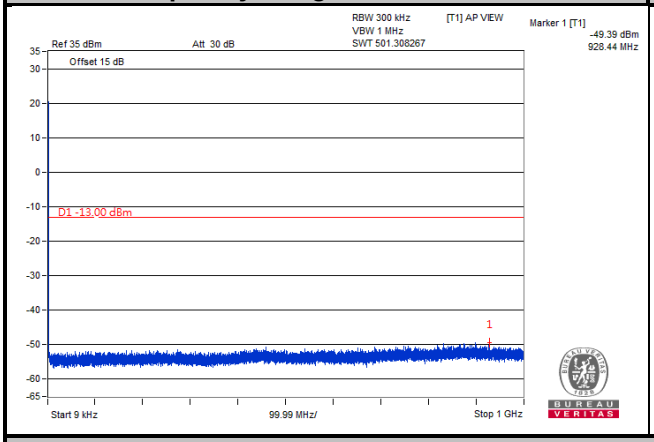
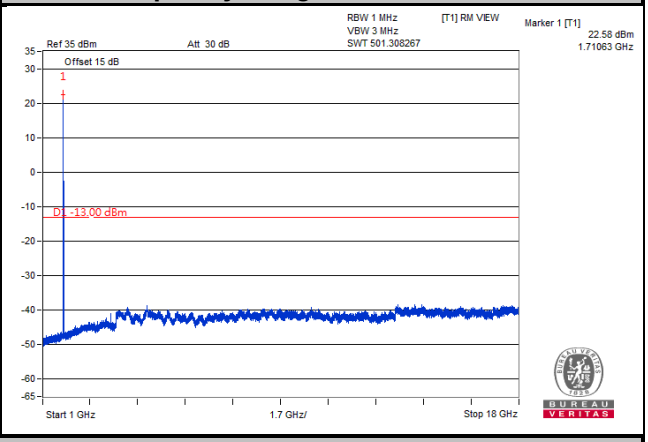
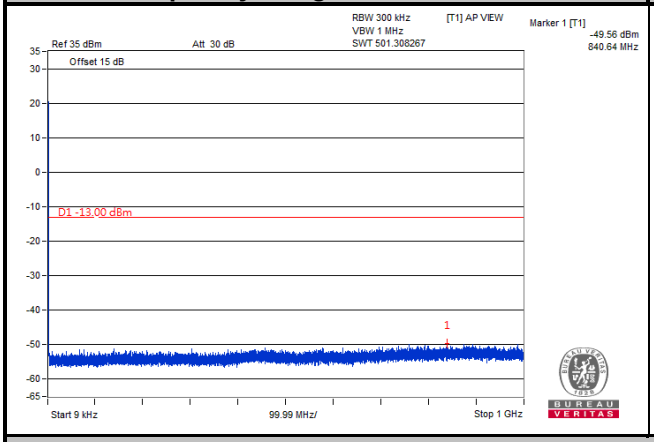
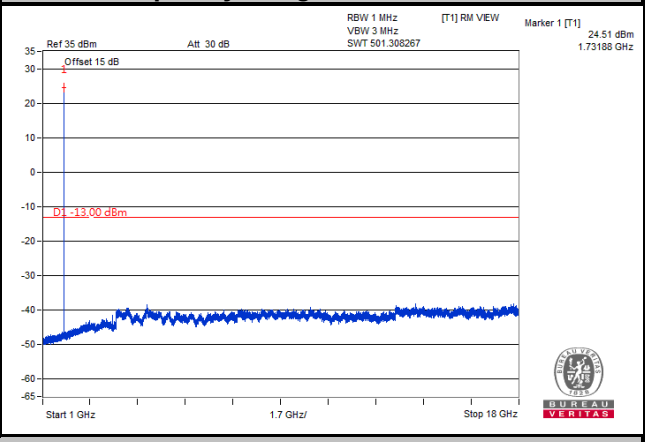
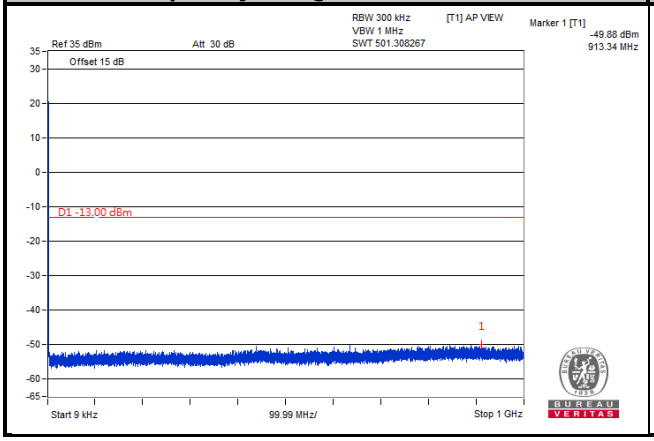
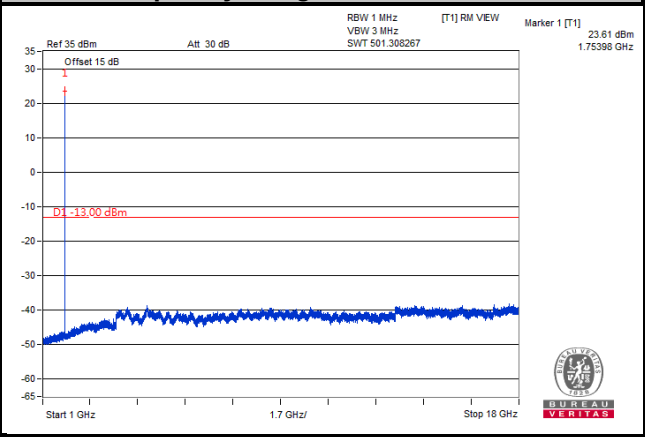
4.7.2 Test Setup



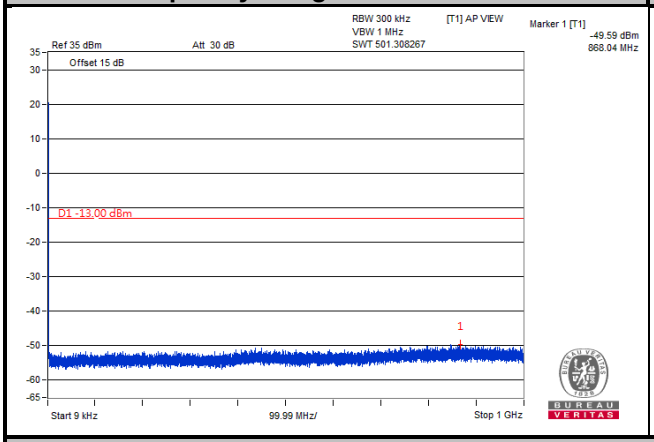
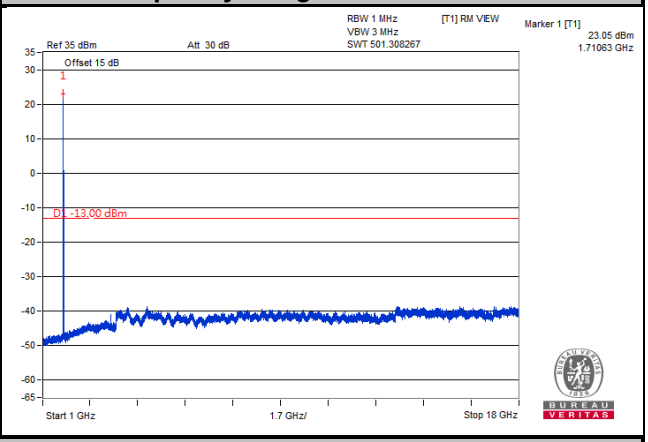
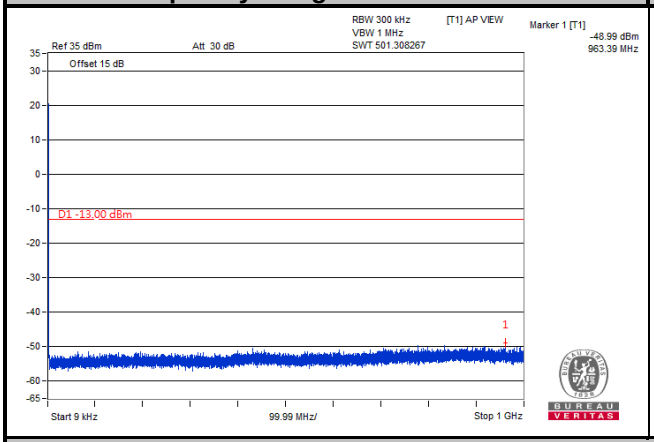
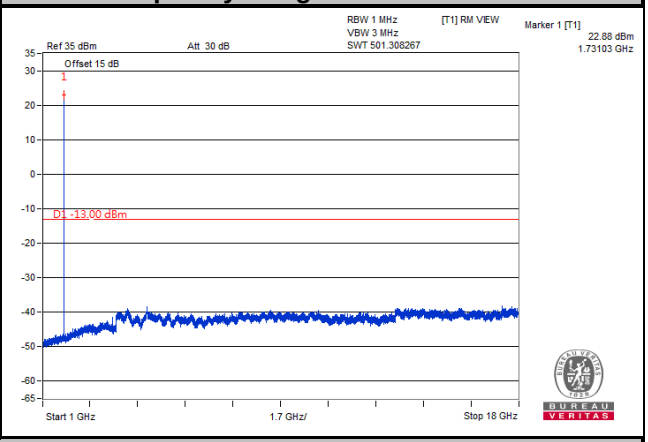
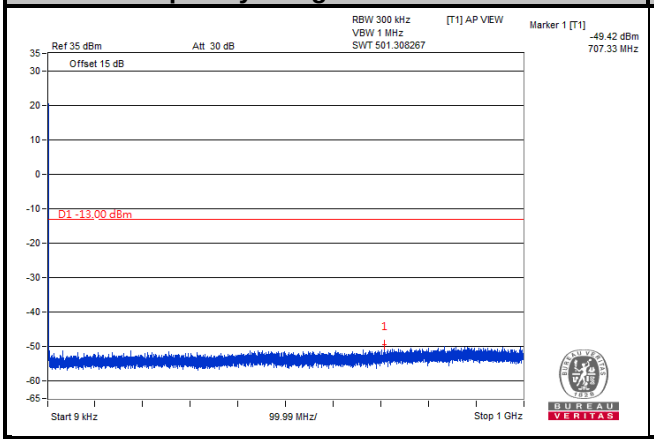
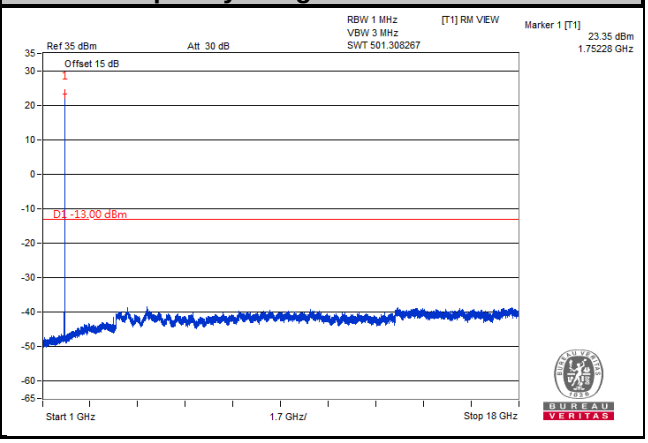
4.7.3 Test Procedure

a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
b. Measuring frequency range is from 9 kHz to 1 GHz. 10 dB attenuation pad is connected with spectrum. RBW = 300 kHz and VBW = 1 MHz is used for conducted emission measurement for LTE Band 4. RBW = 100 kHz and VBW = 300 kHz is used for conducted emission measurement for LTE Band 12, 13.
c. Measuring frequency range is from 1 GHz to 8 GHz / 18 GHz. 10 dB attenuation pad is connected with spectrum. RBW = 1 MHz and VBW = 3 MHz is used for conducted emission measurement.

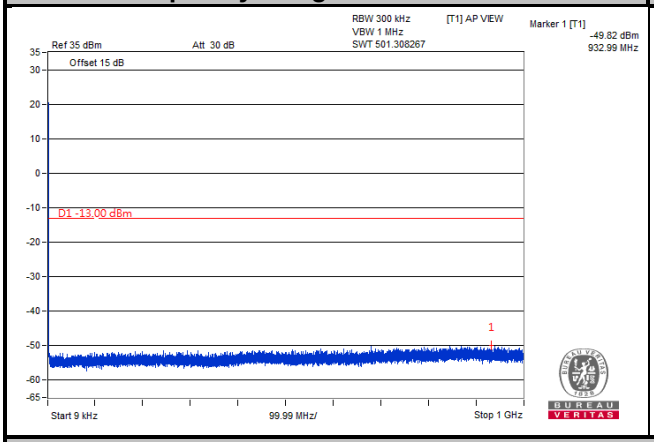
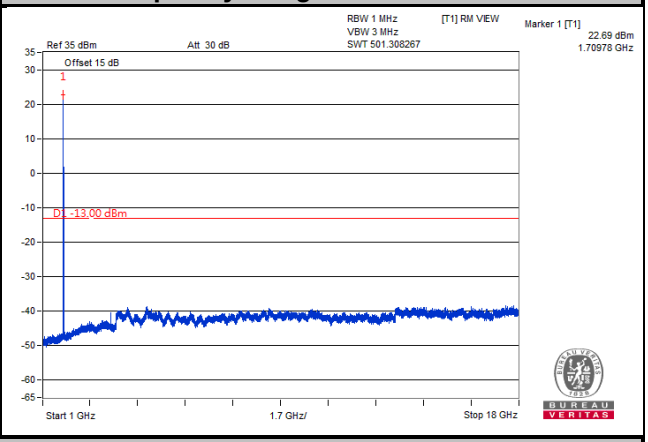
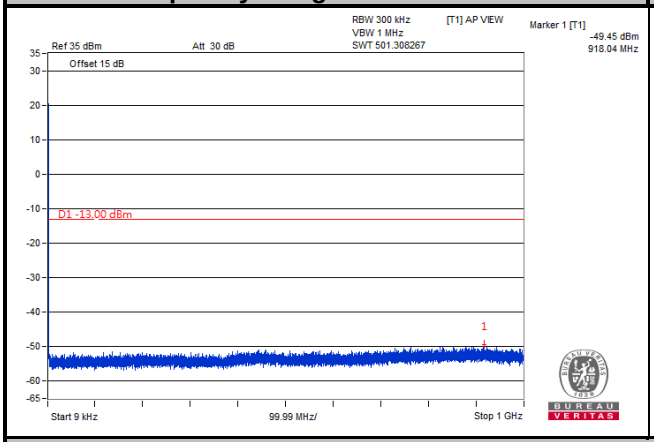
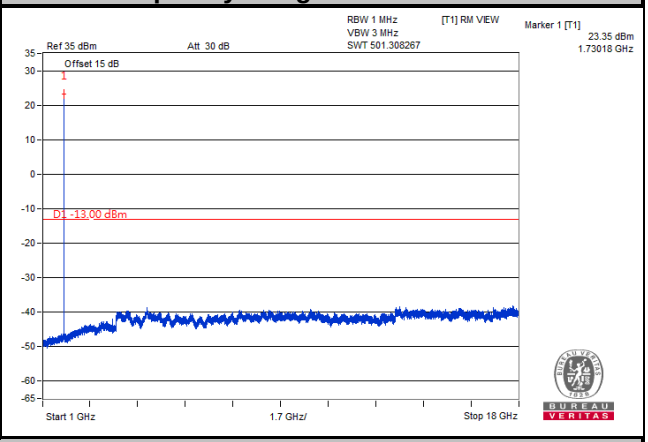
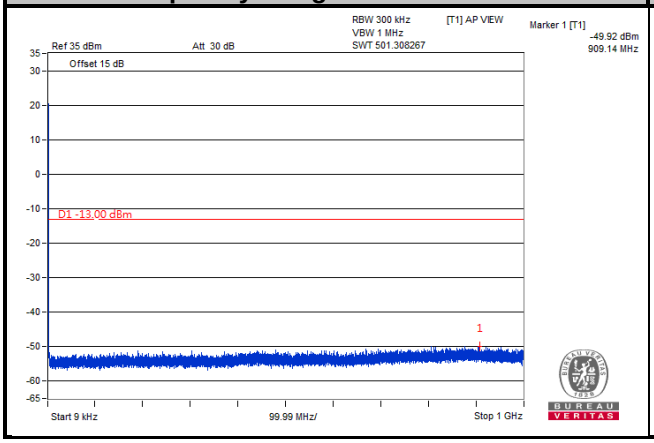
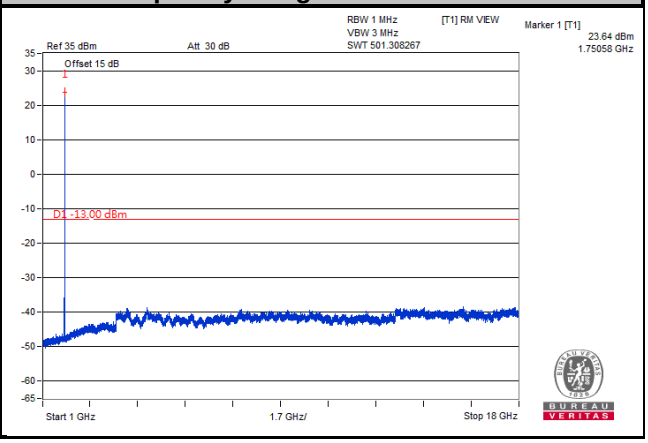
4.7.4 Test Results

LTE Band 4	
Channel Bandwidth: 1.4 MHz	
Channel 19957	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	
Channel 20175	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	
Channel 20393	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	

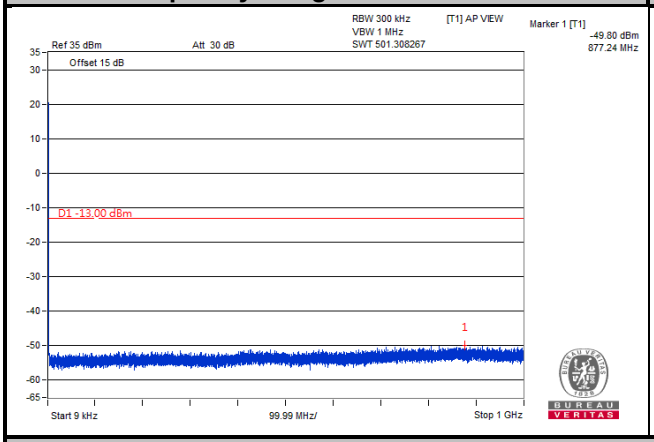
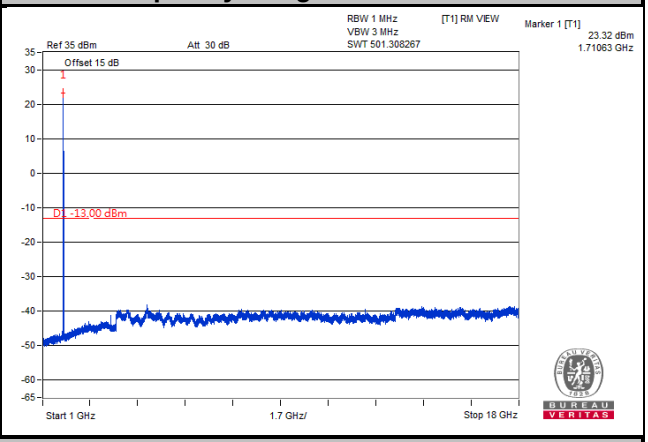
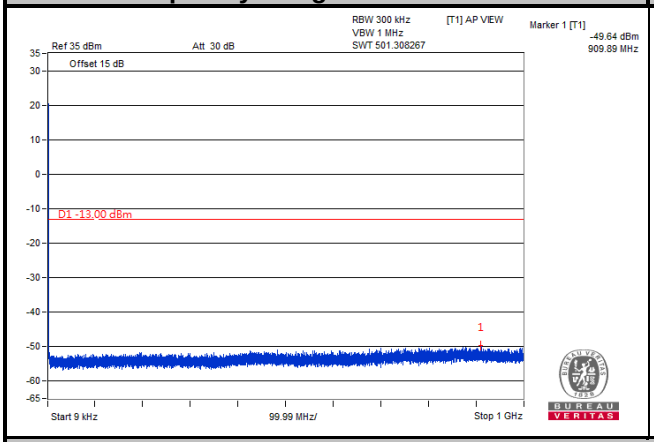
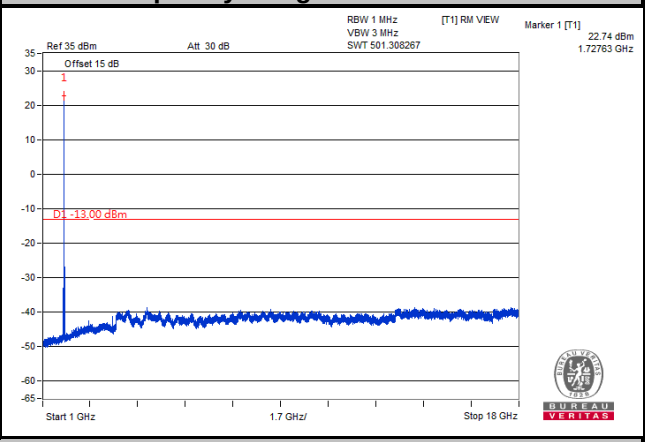
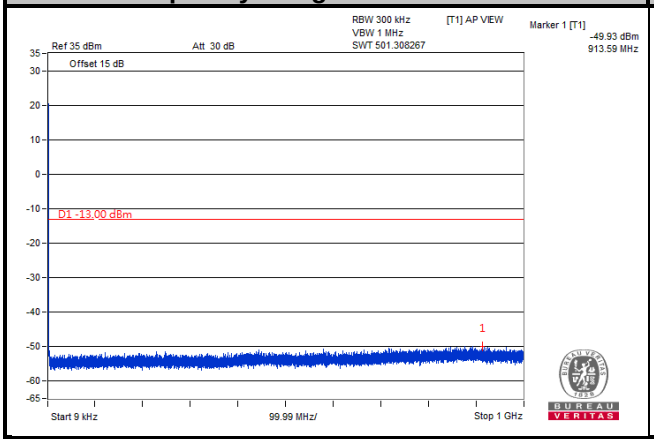
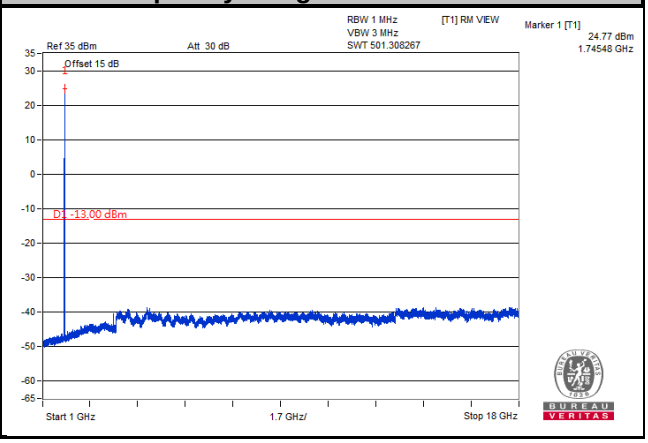
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4	
Channel Bandwidth: 3 MHz	
Channel 19965	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	
Channel 20175	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	
Channel 20385	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	

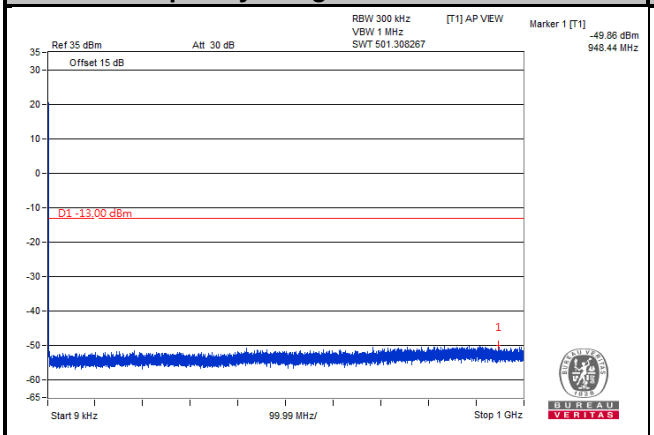
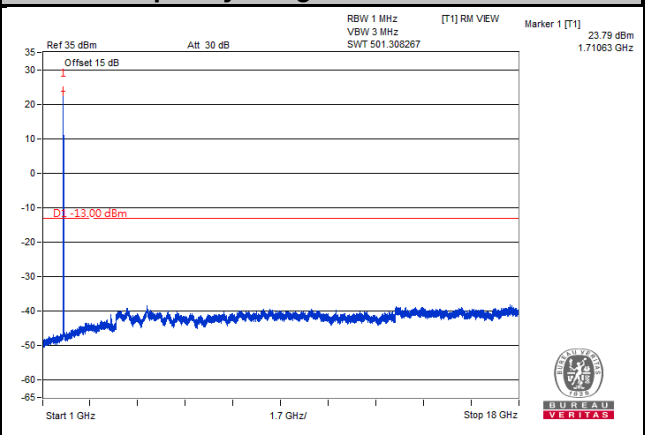
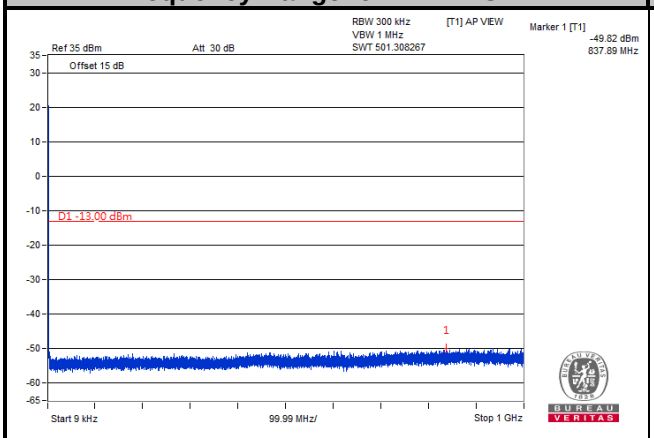
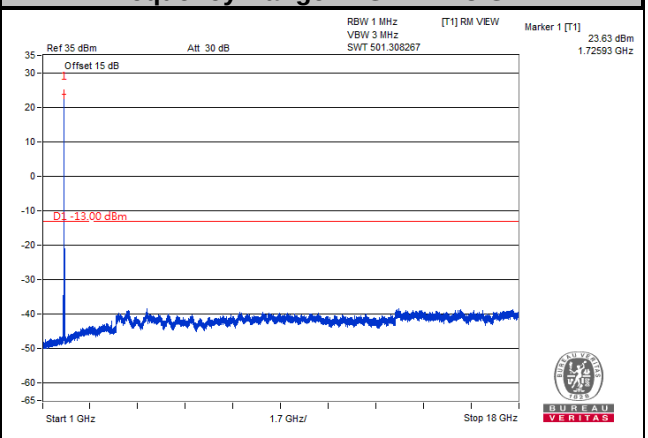
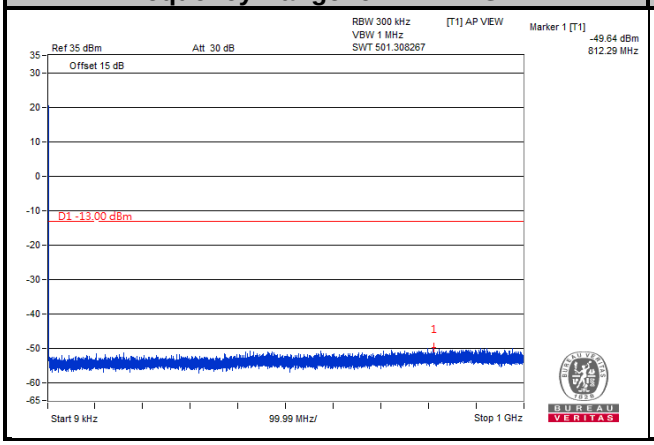
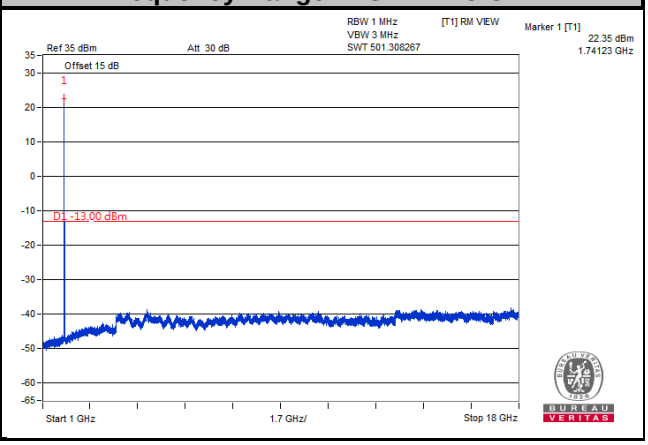
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4	
Channel Bandwidth: 5 MHz	
Channel 19975	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	
Channel 20175	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	
Channel 20375	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	

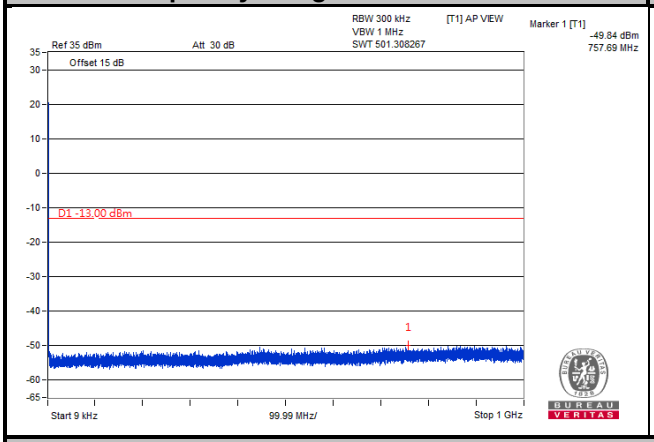
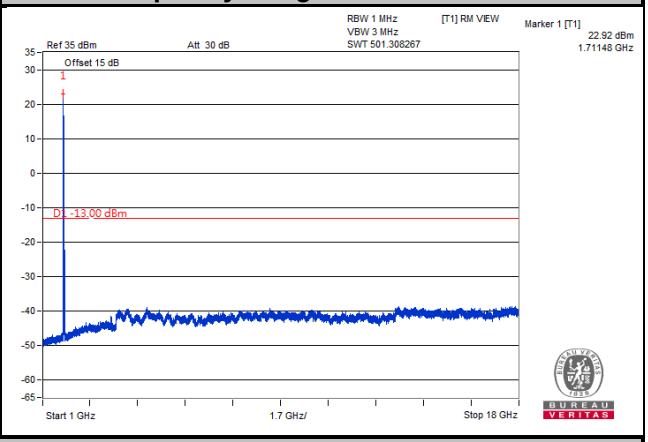
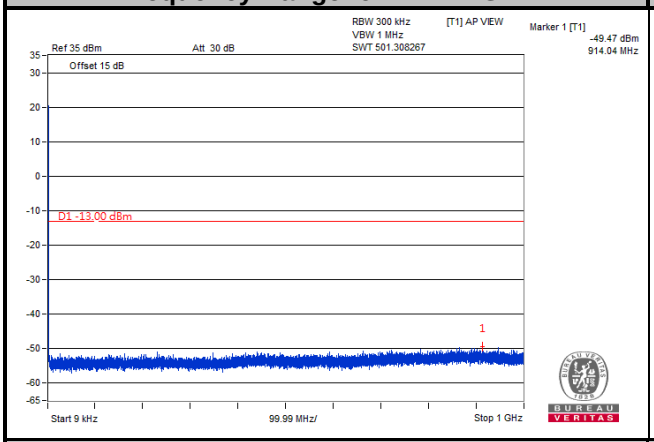
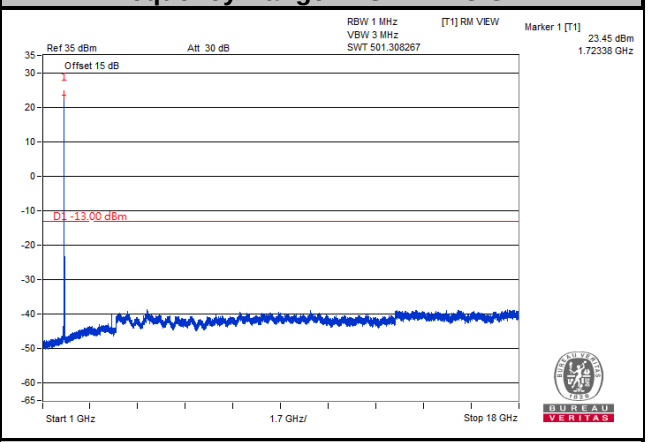
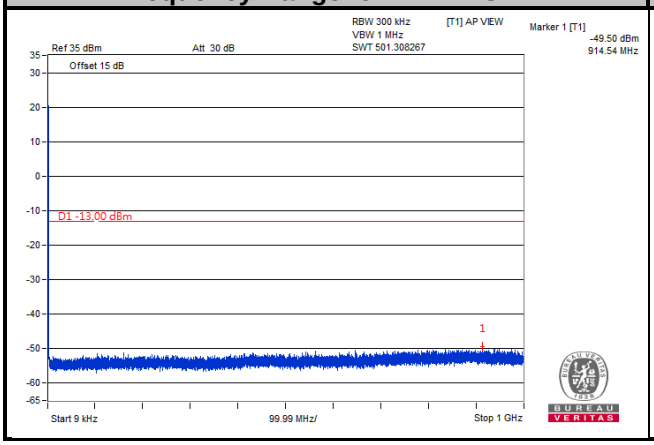
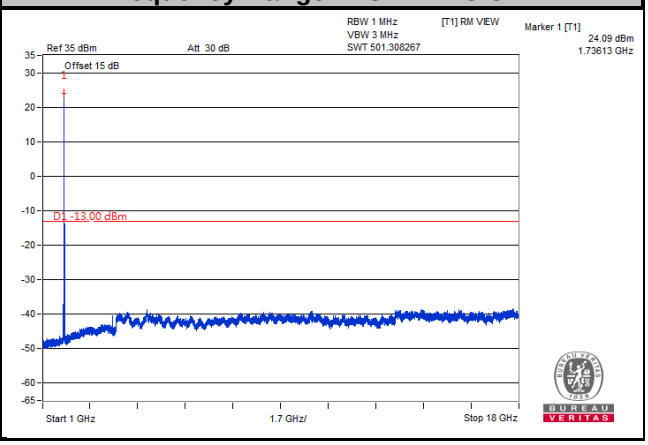
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4	
Channel Bandwidth: 10 MHz	
Channel 20000	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	
Channel 20175	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	
Channel 20350	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	

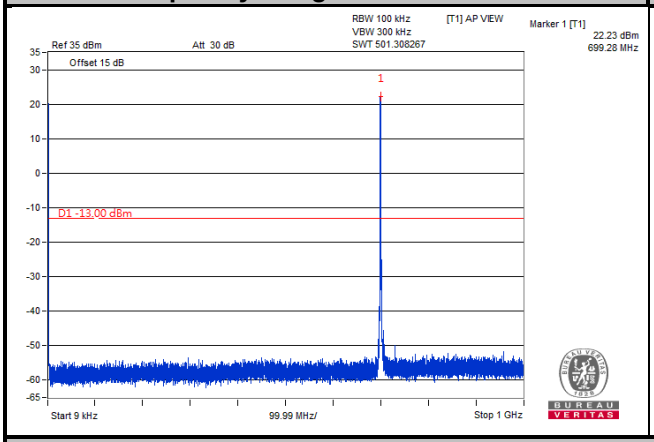
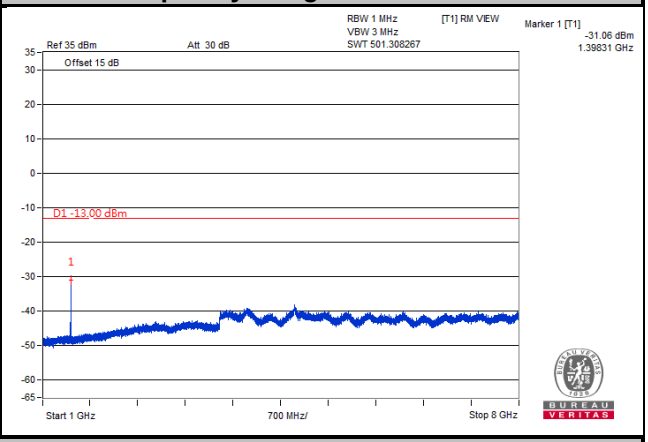
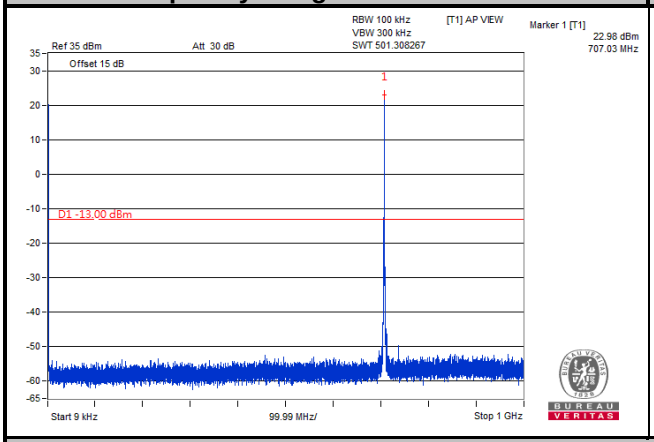
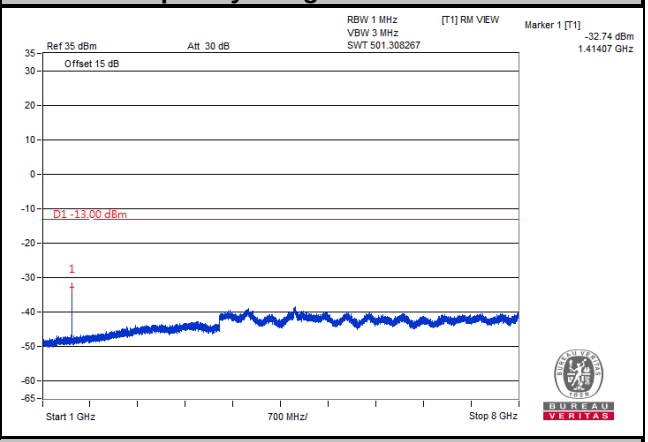
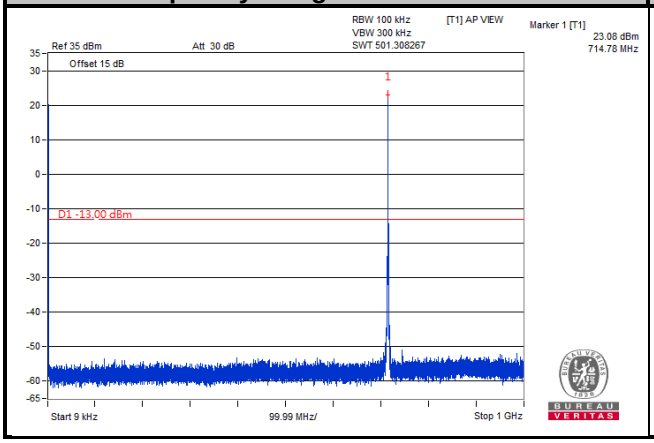
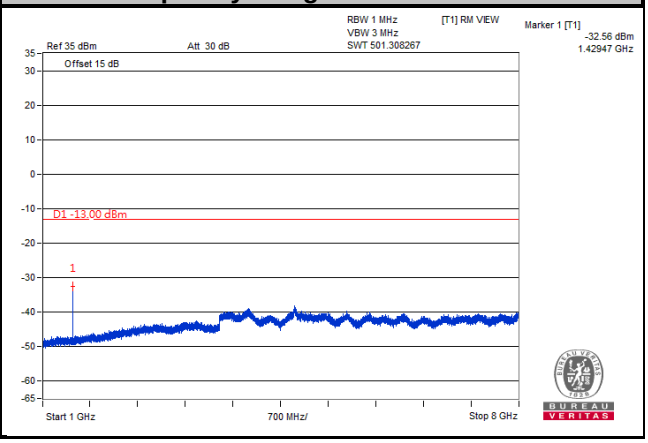
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4	
Channel Bandwidth: 15 MHz	
Channel 20025	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	
Channel 20175	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	
Channel 20325	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	

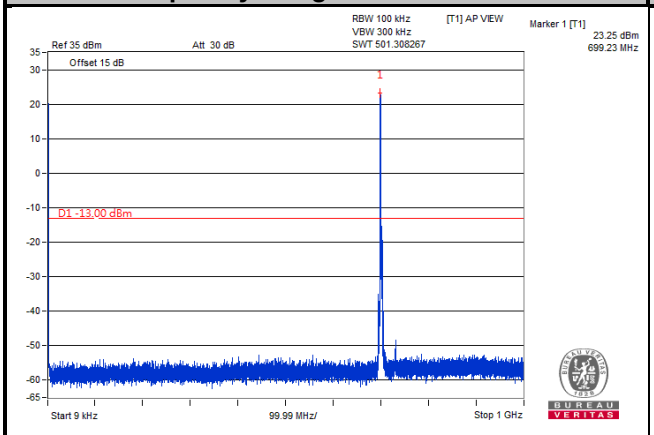
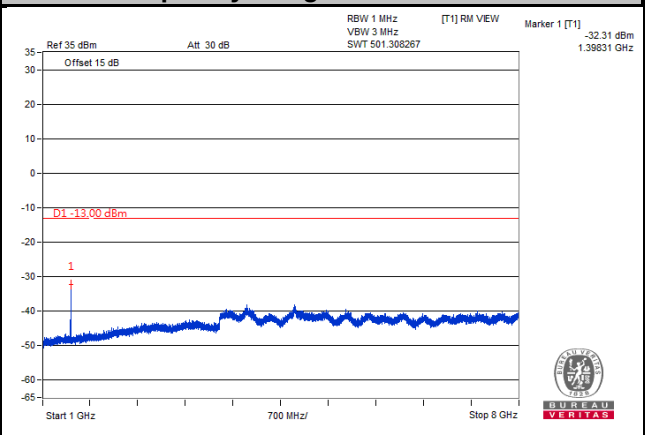
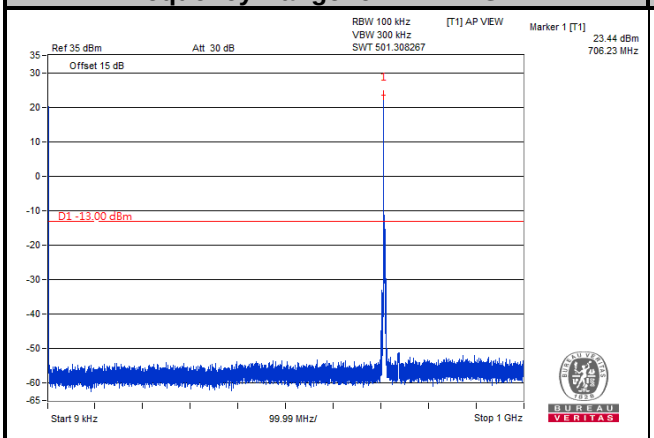
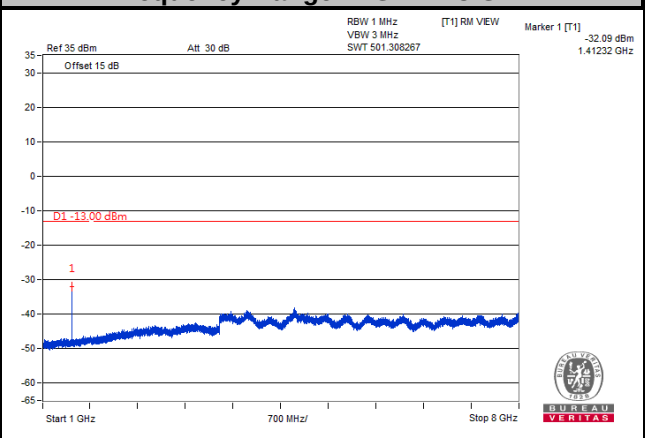
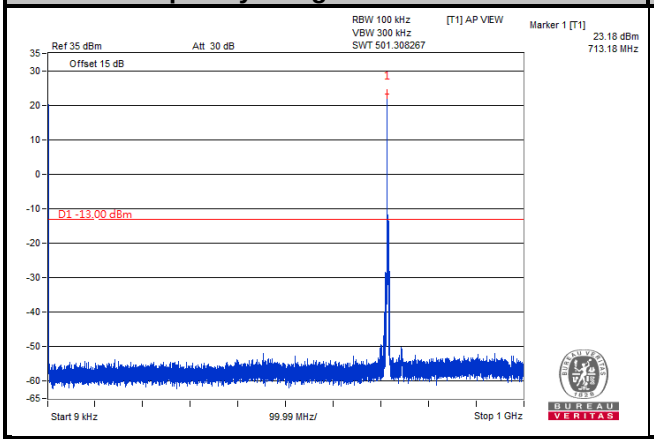
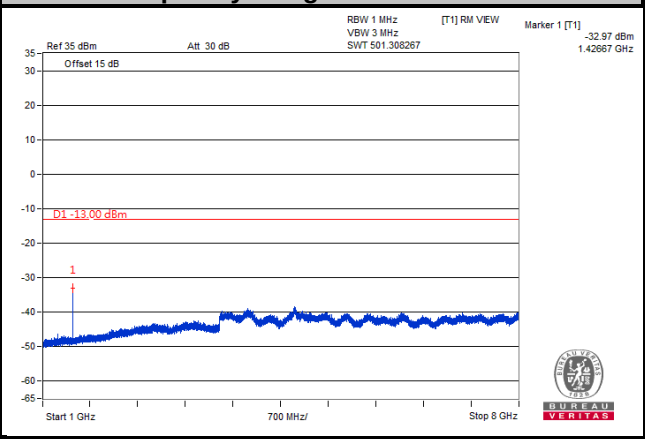
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4	
Channel Bandwidth: 20 MHz	
Channel 20050	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	
Channel 20175	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	
Channel 20300	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 18 GHz
	

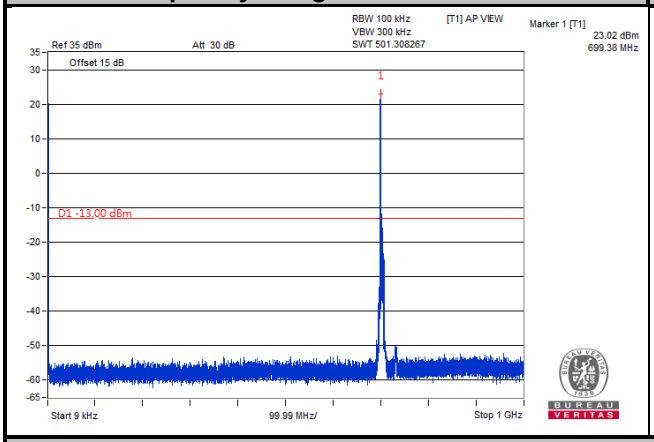
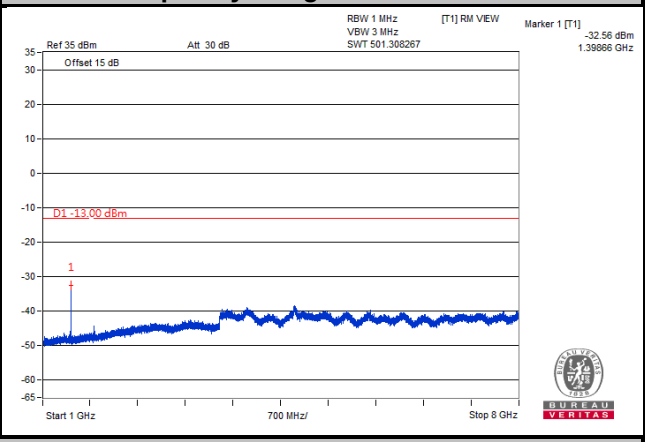
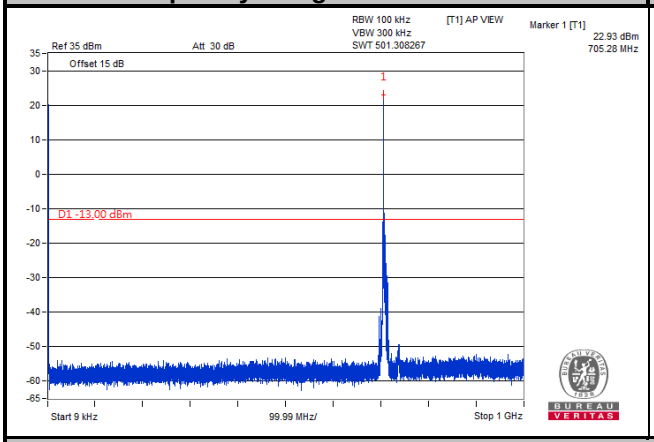
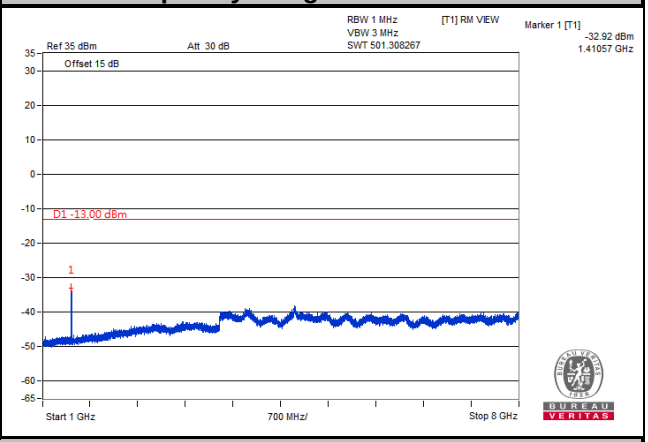
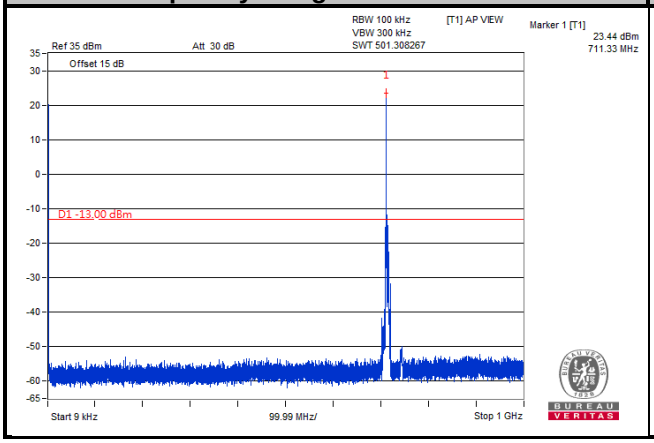
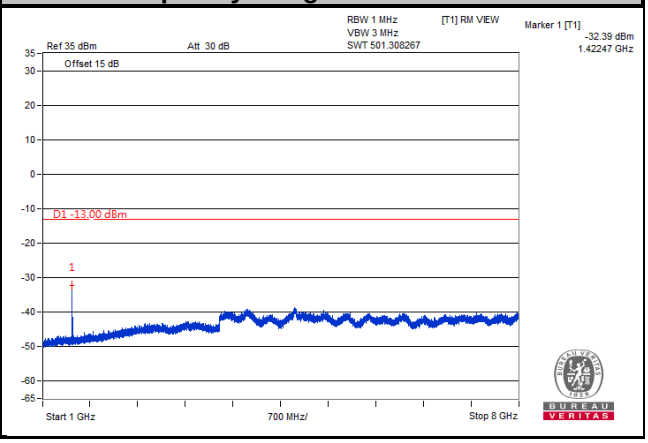
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 12	
Channel Bandwidth: 1.4 MHz	
Channel 23017	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 8 GHz
	
Channel 23095	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 8 GHz
	
Channel 23173	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 8 GHz
	

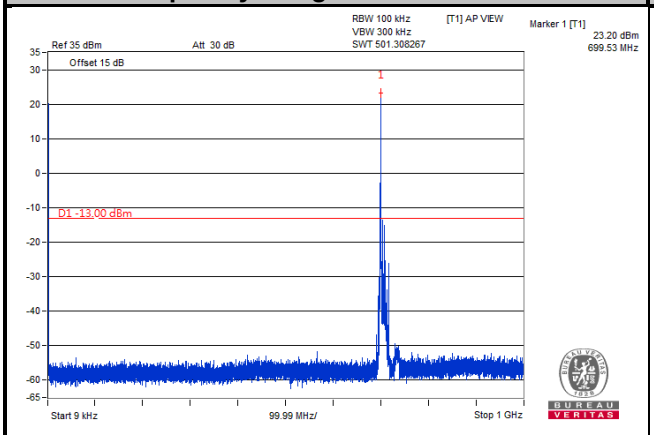
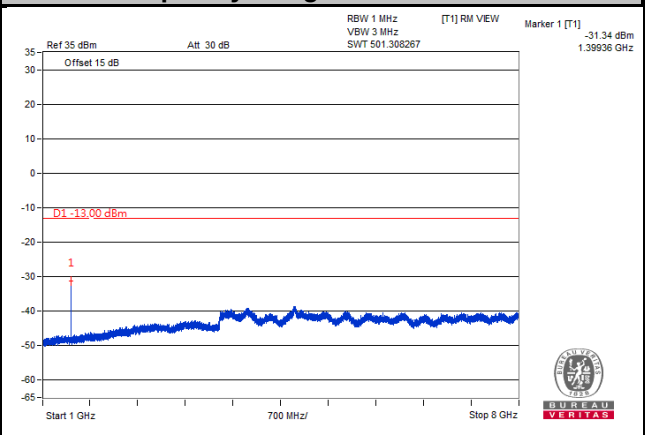
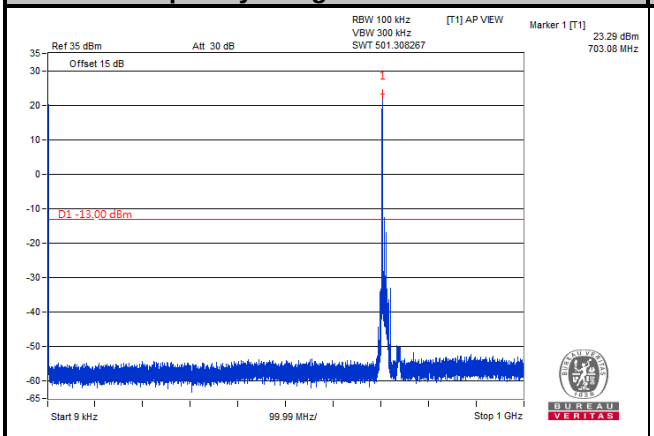
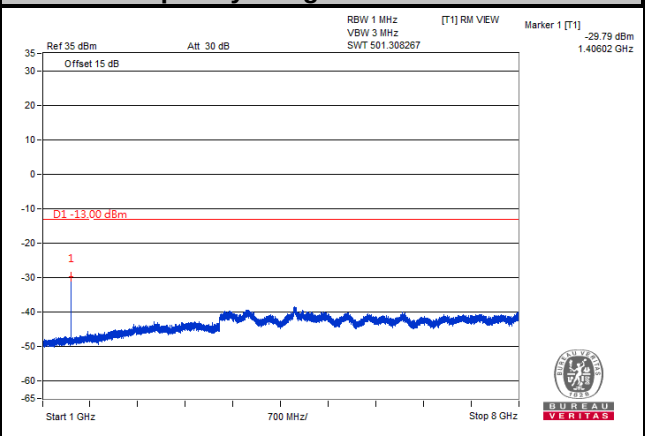
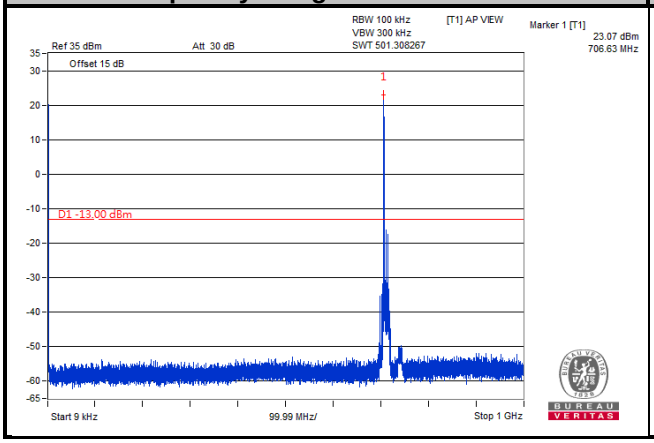
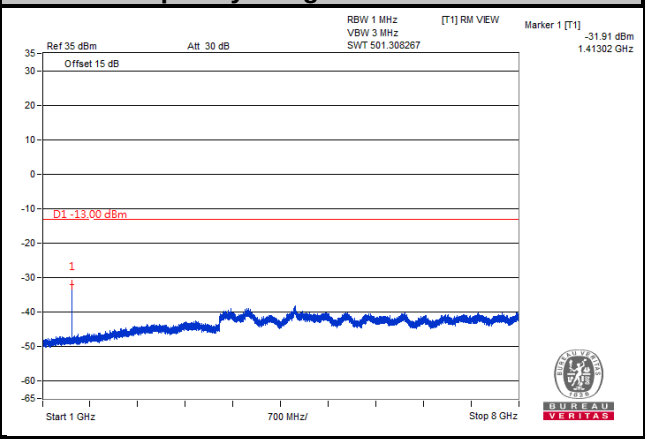
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 12	
Channel Bandwidth: 3 MHz	
Channel 23025	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 8 GHz
	
Channel 23095	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 8 GHz
	
Channel 23165	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 8 GHz
	

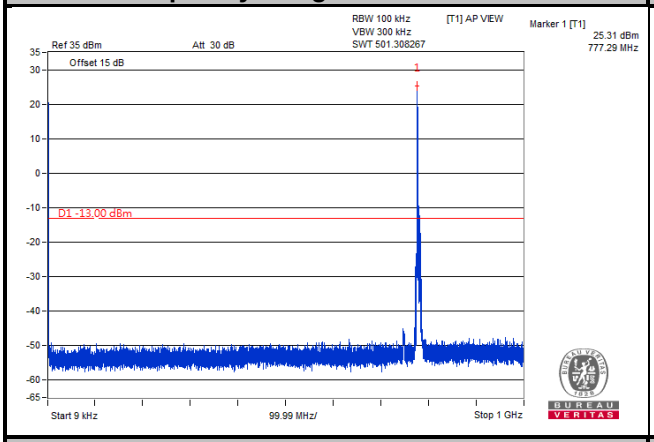
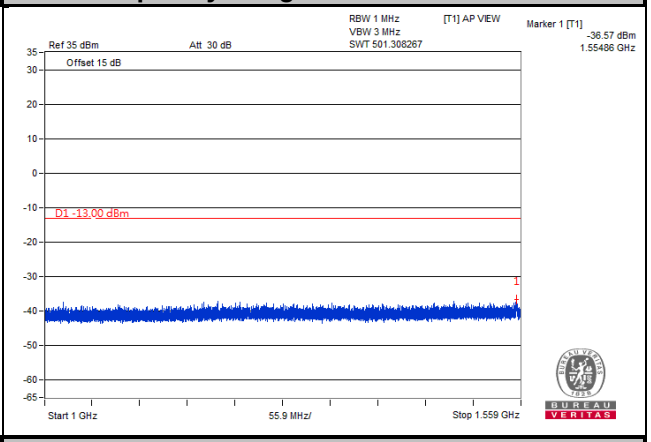
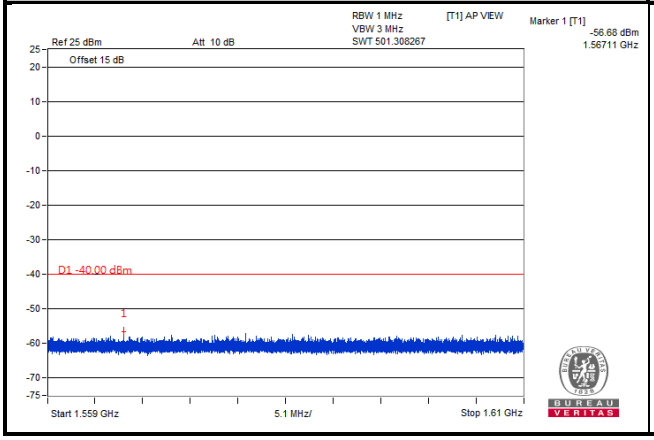
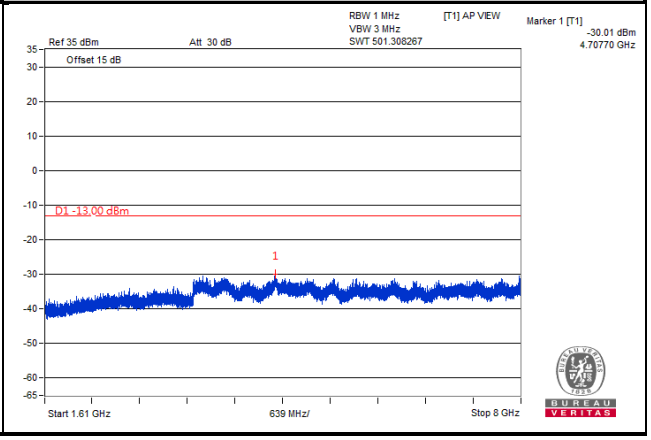
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 12	
Channel Bandwidth: 5 MHz	
Channel 23035	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 8 GHz
	
Channel 23095	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 8 GHz
	
Channel 23155	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 8 GHz
	

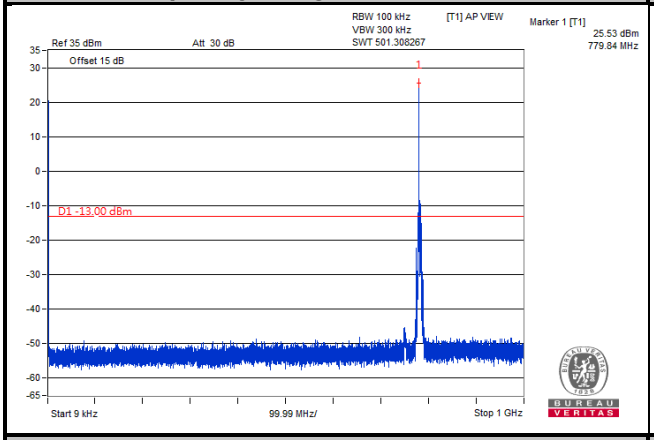
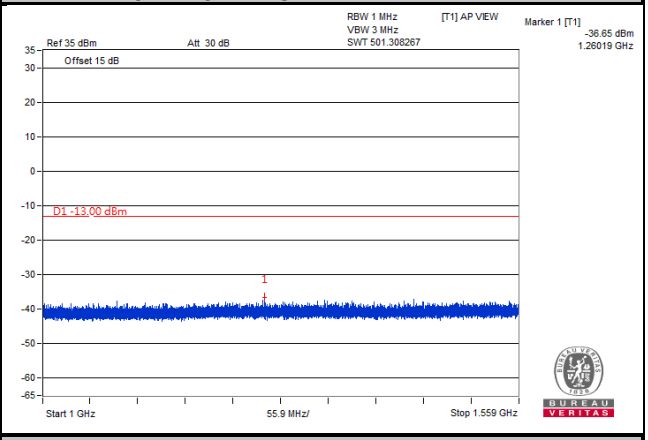
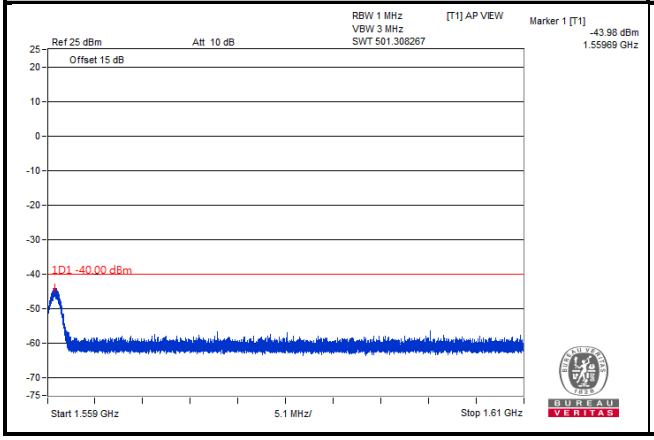
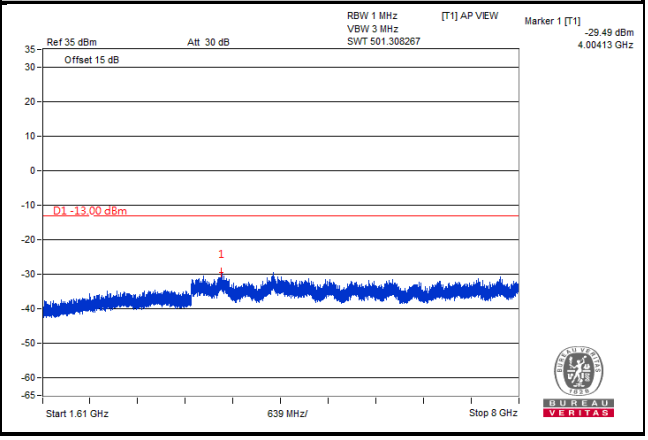
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 12	
Channel Bandwidth: 10 MHz	
Channel 23060	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 8 GHz
	
Channel 23095	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 8 GHz
	
Channel 23130	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 8 GHz
	

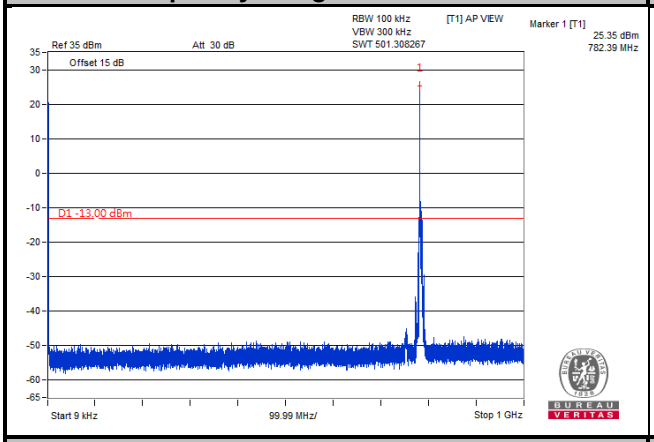
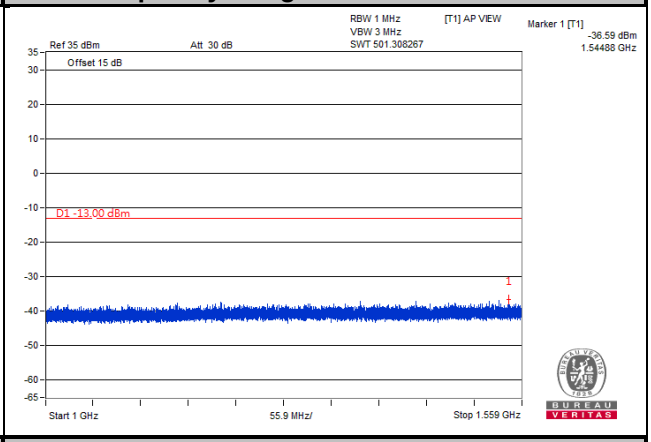
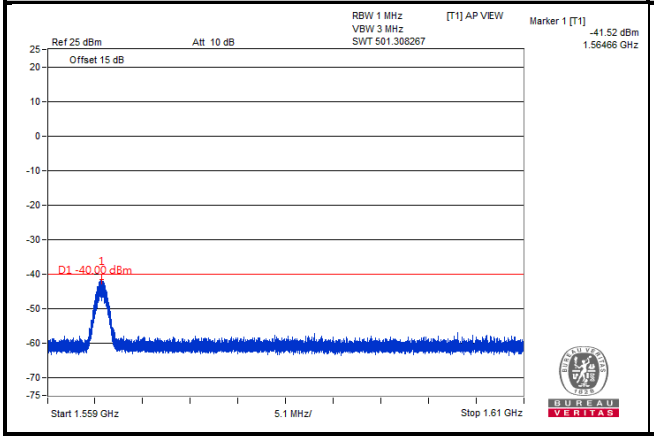
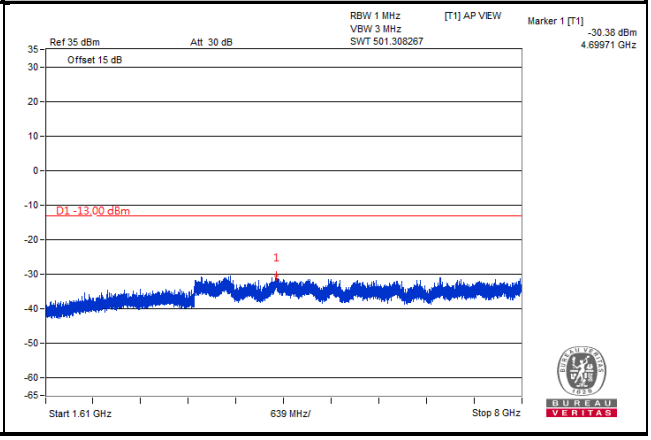
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 13	
Channel Bandwidth: 5 MHz	
Channel 23205	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 1.559 GHz
	
Frequency Range: 1.559 GHz ~ 1.61 GHz	Frequency Range: 1.61 GHz ~ 8 GHz
	

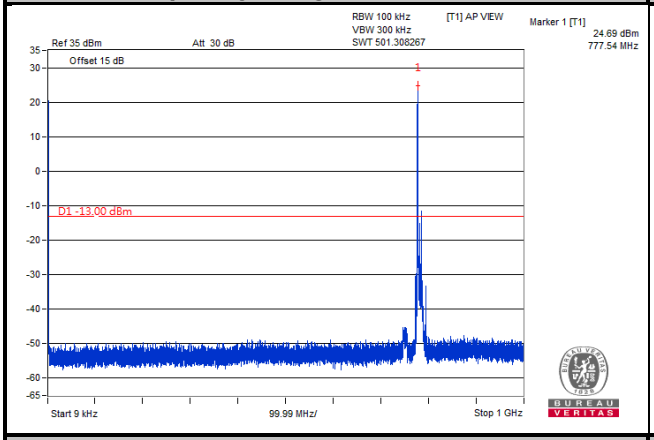
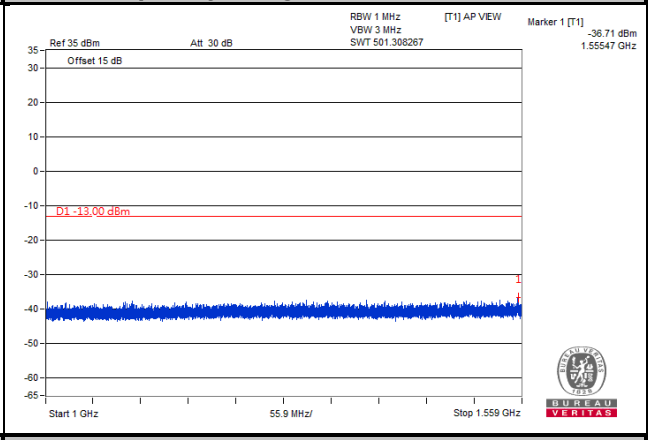
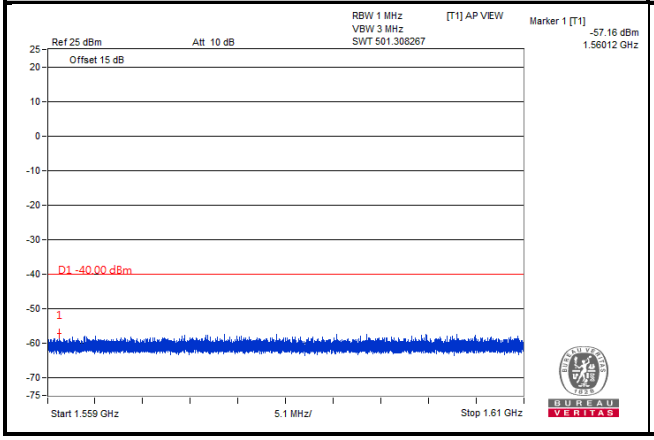
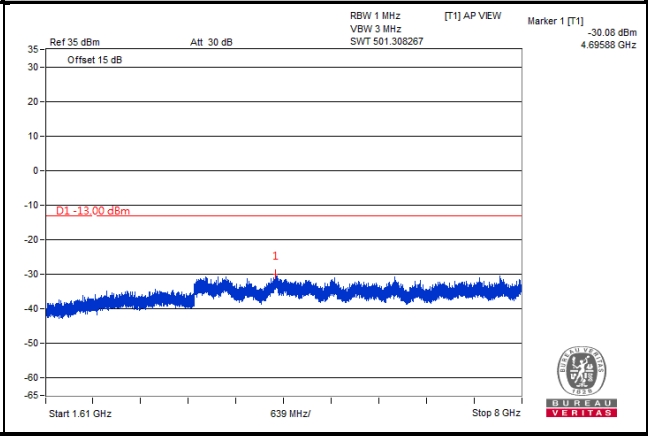
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 13	
Channel Bandwidth: 5 MHz	
Channel 23230	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 1.559 GHz
	
Frequency Range: 1.559 GHz ~ 1.61 GHz	Frequency Range: 1.61 GHz ~ 8 GHz
	

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

LTE Band 13	
Channel Bandwidth: 5 MHz	
Channel 23255	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 1.559 GHz
	
Frequency Range: 1.559 GHz ~ 1.61 GHz	Frequency Range: 1.61 GHz ~ 8 GHz
	

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

LTE Band 13	
Channel Bandwidth: 10 MHz	
Channel 23230	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 1.559 GHz
	
Frequency Range: 1.559 GHz ~ 1.61 GHz	Frequency Range: 1.61 GHz ~ 8 GHz
	

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

4.8 Radiated Emission Measurement

4.8.1 Limits of Radiated Emission Measurement

a. 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.
b. For operations in the 775-788 MHz, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz. The limit of emissions is equal to -40 dBm.

4.8.2 Test Procedure

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

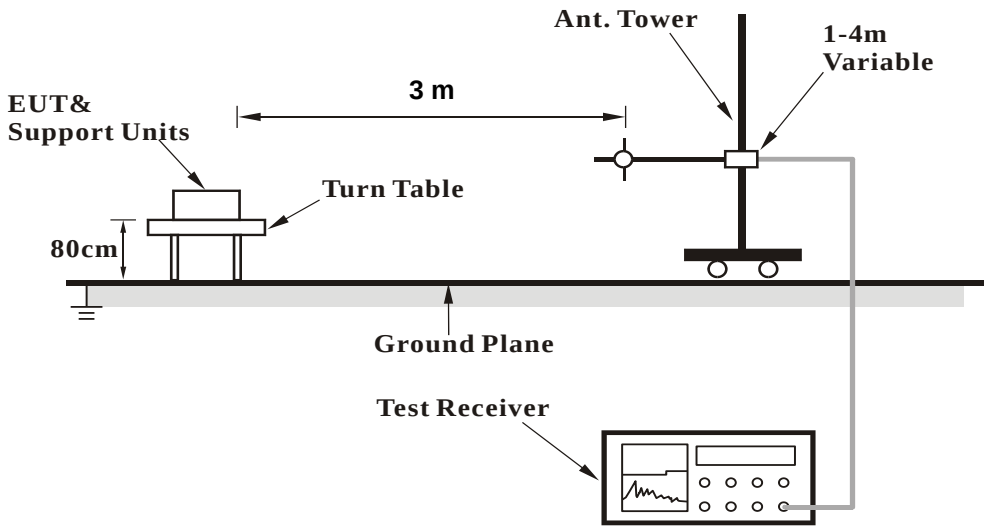
Note: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.8.3 Deviation from Test Standard

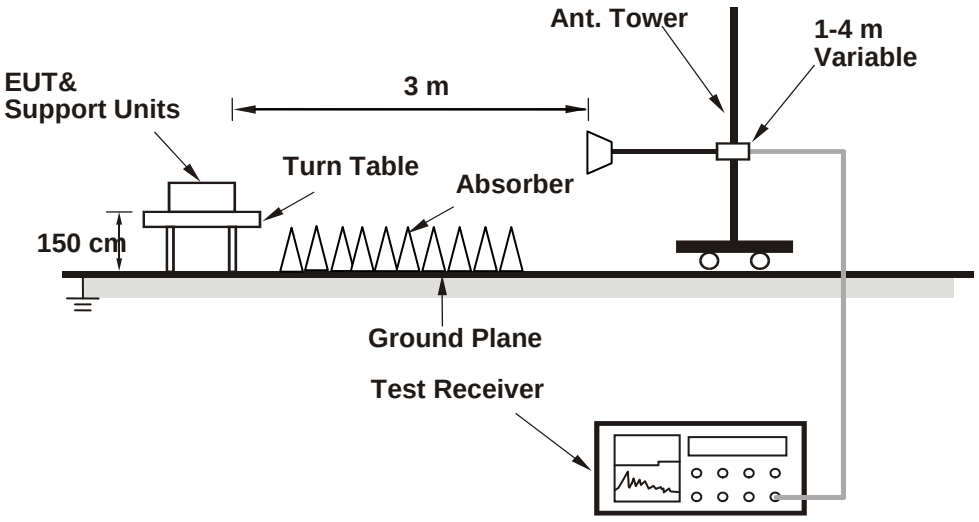
No deviation.

4.8.4 Test Setup

<Radiated Emission below or equal 1 GHz>



<Radiated Emission above 1 GHz>



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

4.8.5 Test Results

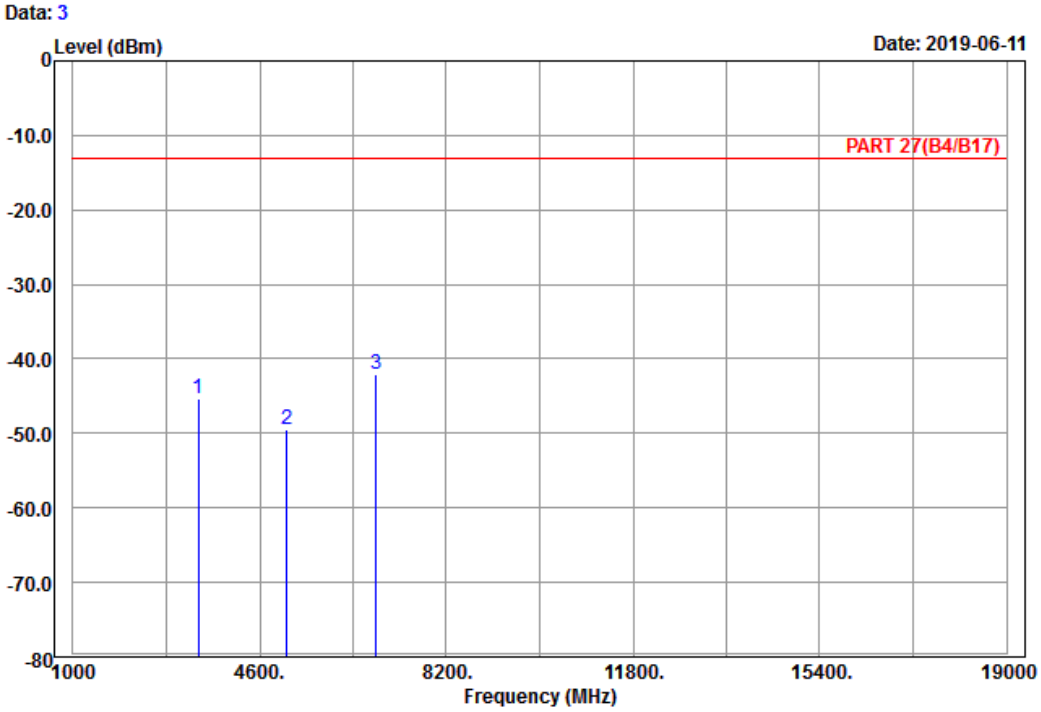
Mode A

LTE Band 4

Channel Bandwidth: 1.4 MHz / QPSK

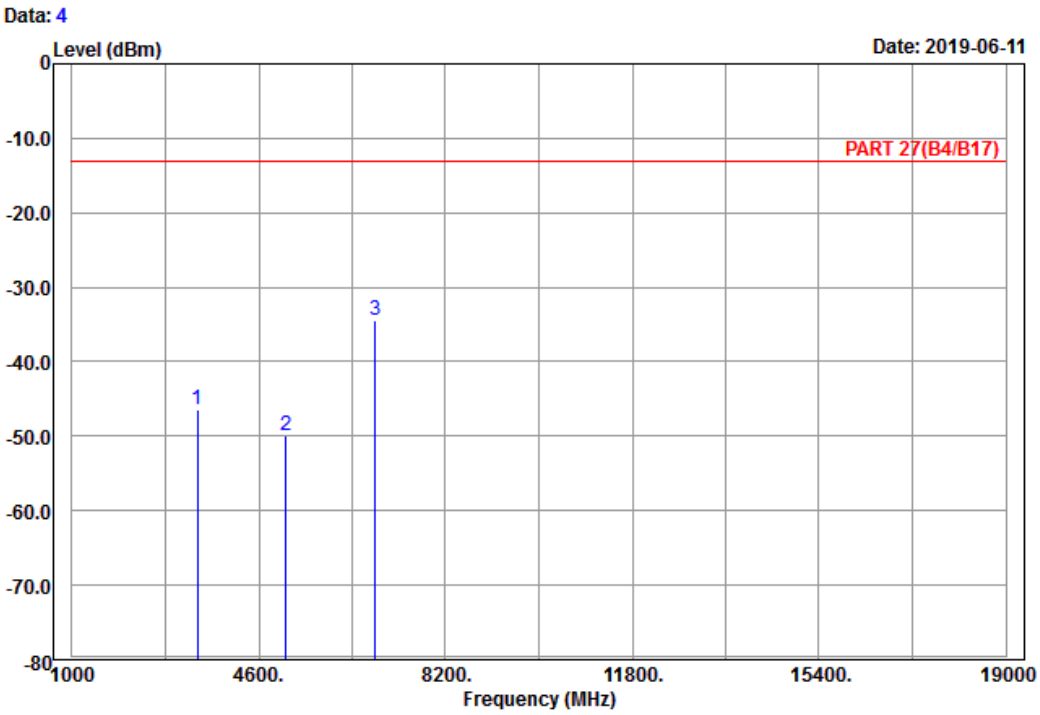
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




```
Site     : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark   : LTE_Band 4_Link_CH19957
Tested by: Karl Lee
```

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3421.40	-45.45	-59.82	14.37	-13.00	-32.45	Peak
2	5132.10	-49.54	-69.35	19.81	-13.00	-36.54	Peak
3 pp	6842.80	-42.10	-64.82	22.72	-13.00	-29.10	Peak

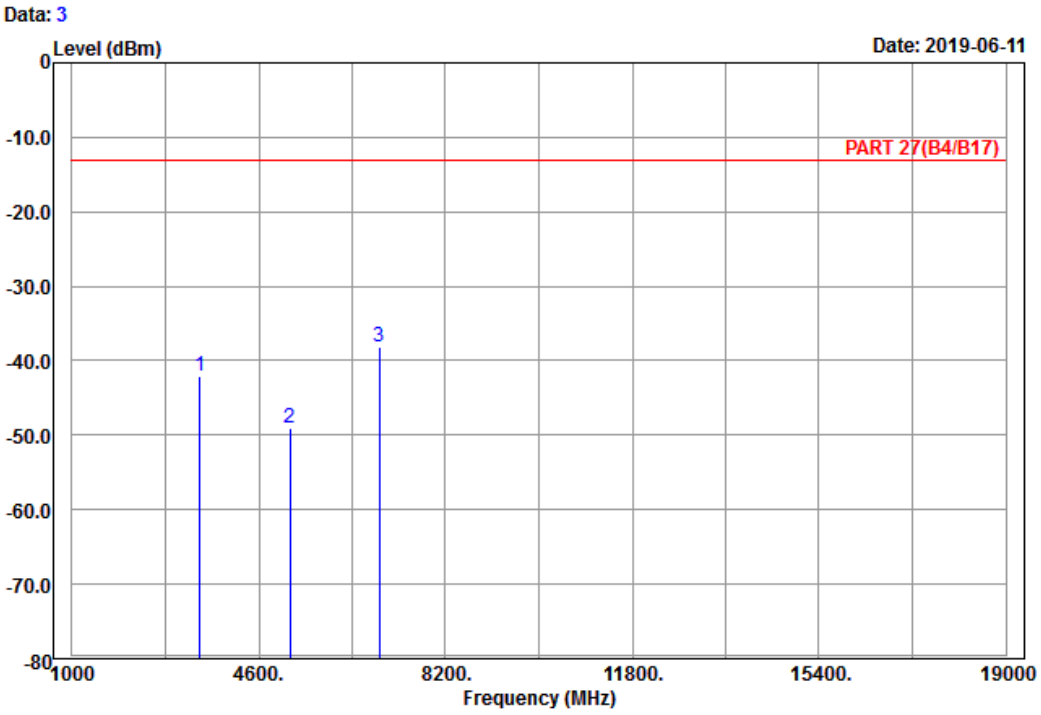


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH19957
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3421.40	-46.51	-60.88	14.37	-13.00	-33.51	Peak
2	5132.10	-49.86	-69.67	19.81	-13.00	-36.86	Peak
3 pp	6842.80	-34.42	-57.14	22.72	-13.00	-21.42	Peak

Middle Channel

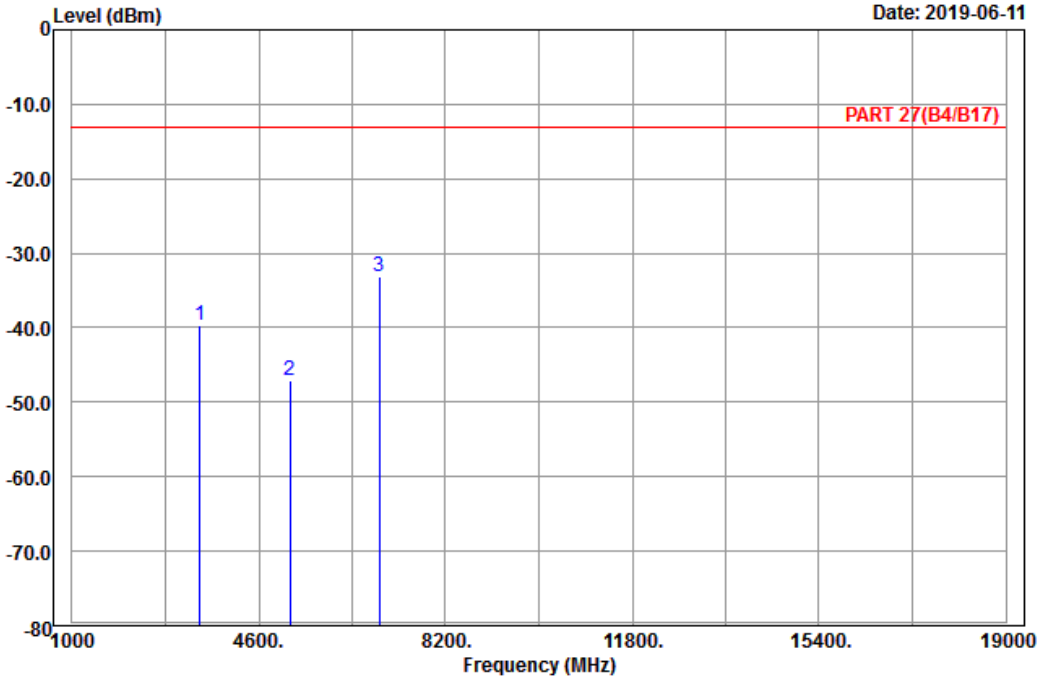
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : LTE_Band 4_Link_CH20175
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3465.00	-42.06	-56.40	14.34	-13.00	-29.06	Peak
2	5197.50	-49.06	-69.18	20.12	-13.00	-36.06	Peak
3 pp	6930.00	-38.13	-61.00	22.87	-13.00	-25.13	Peak

Data: 4

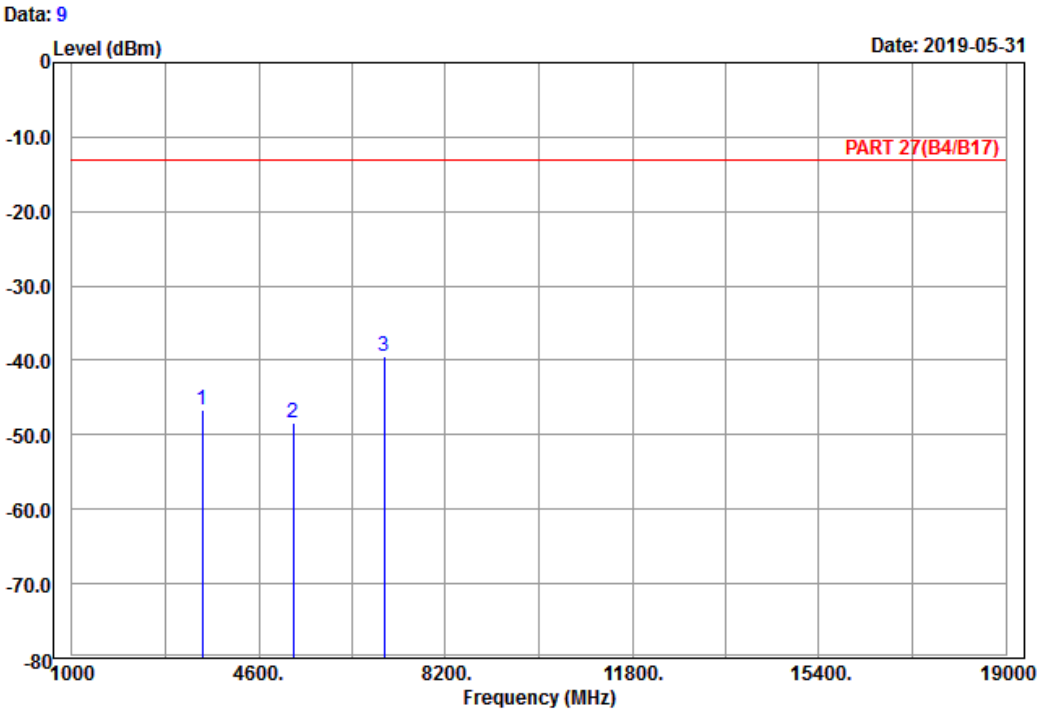


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH20175
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3465.00	-39.58	-53.92	14.34	-13.00	-26.58	Peak
2	5197.50	-47.09	-67.21	20.12	-13.00	-34.09	Peak
3 pp	6930.00	-33.24	-56.11	22.87	-13.00	-20.24	Peak

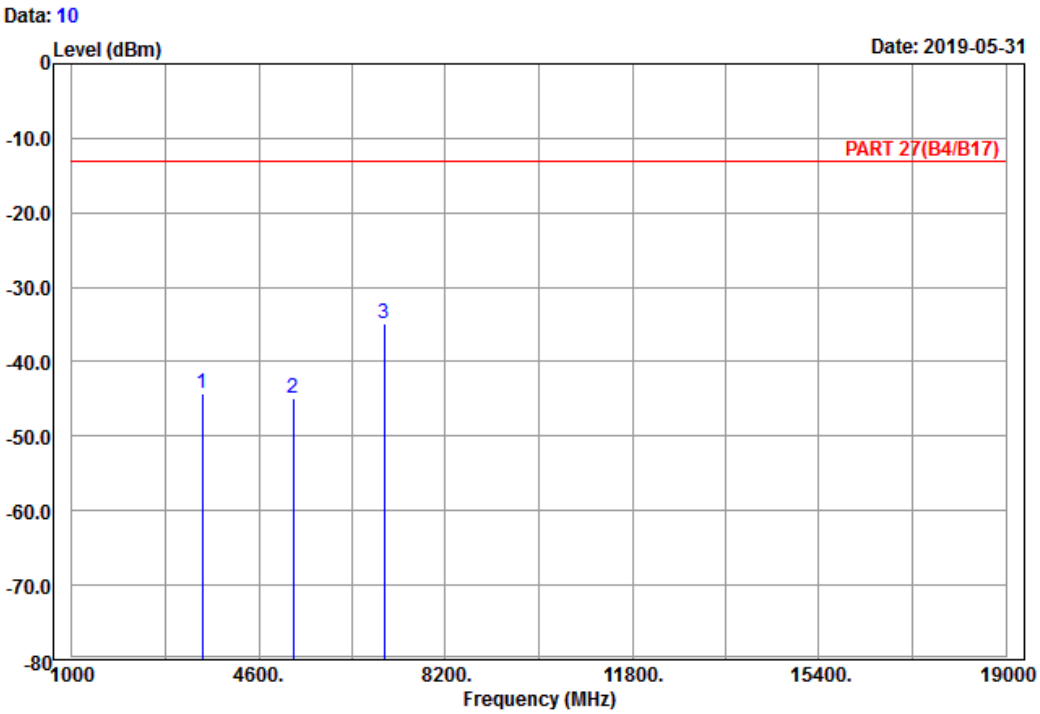
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : LTE_Band 4_Link_CH20393
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3508.60	-46.66	-60.94	14.28	-13.00	-33.66	Peak
2	5262.90	-48.37	-68.57	20.20	-13.00	-35.37	Peak
3 pp	7017.20	-39.54	-62.15	22.61	-13.00	-26.54	Peak

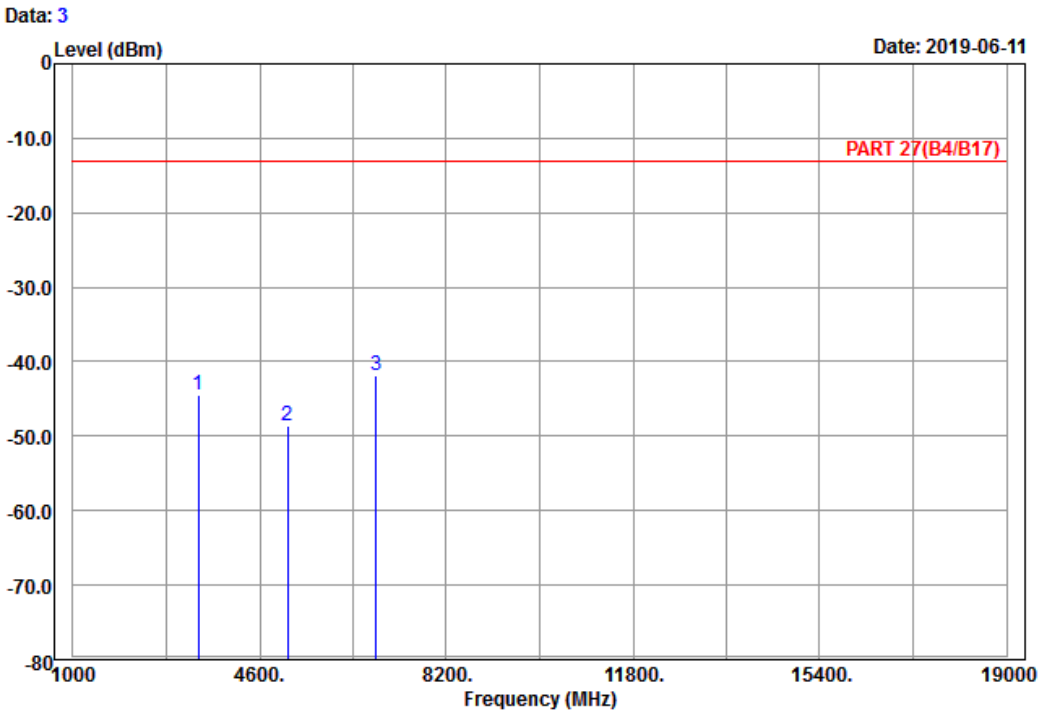


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH20393
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3508.60	-44.32	-58.60	14.28	-13.00	-31.32	Peak
2	5262.90	-44.99	-65.19	20.20	-13.00	-31.99	Peak
3 pp	7017.20	-34.88	-57.49	22.61	-13.00	-21.88	Peak

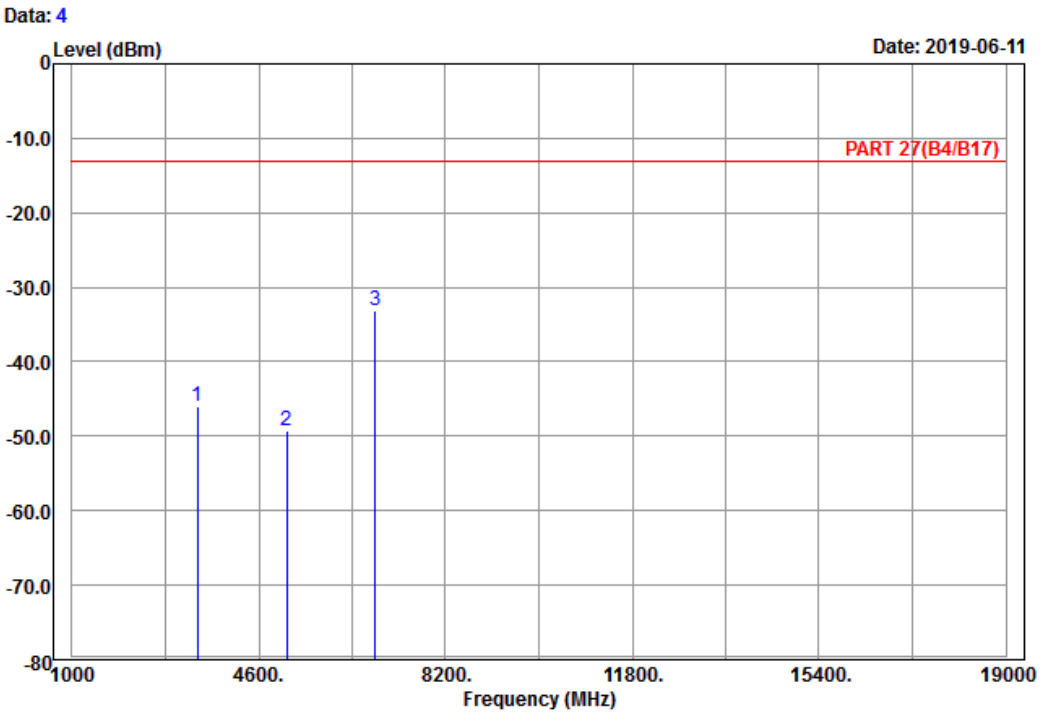
Channel Bandwidth: 5 MHz / QPSK
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : LTE_Band 4_Link_CH19975
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3425.00	-44.52	-58.89	14.37	-13.00	-31.52	Peak
2	5137.50	-48.52	-68.33	19.81	-13.00	-35.52	Peak
3 pp	6850.00	-41.81	-64.53	22.72	-13.00	-28.81	Peak

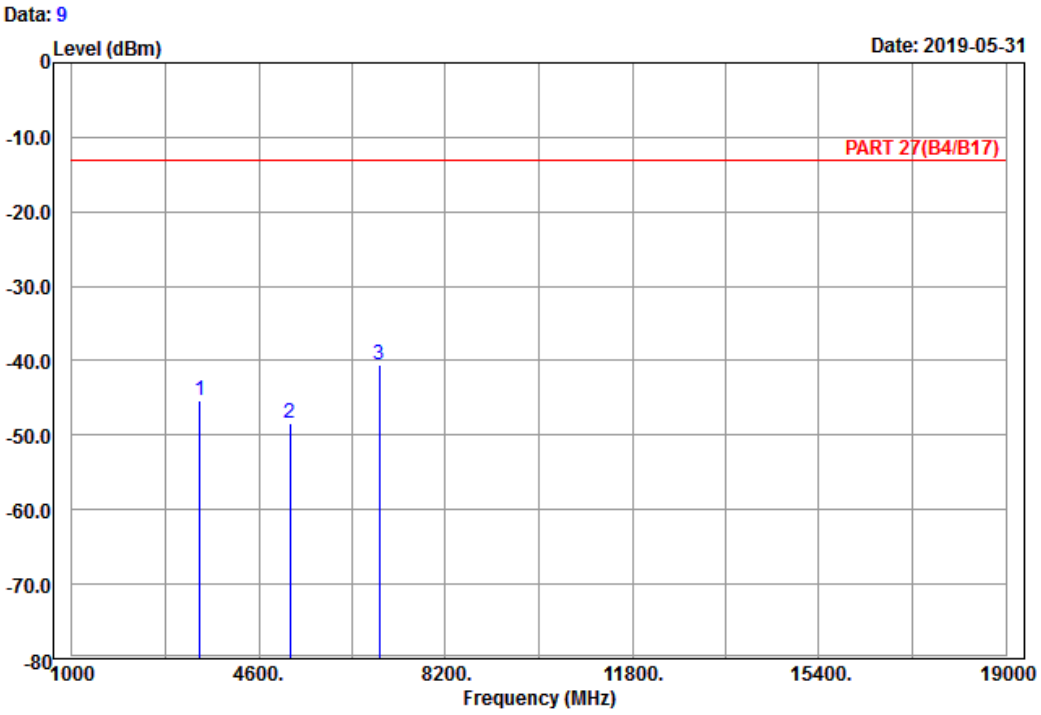


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH19975
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3425.00	-46.07	-60.44	14.37	-13.00	-33.07	Peak
2	5137.50	-49.34	-69.15	19.81	-13.00	-36.34	Peak
3 pp	6850.00	-33.12	-55.84	22.72	-13.00	-20.12	Peak

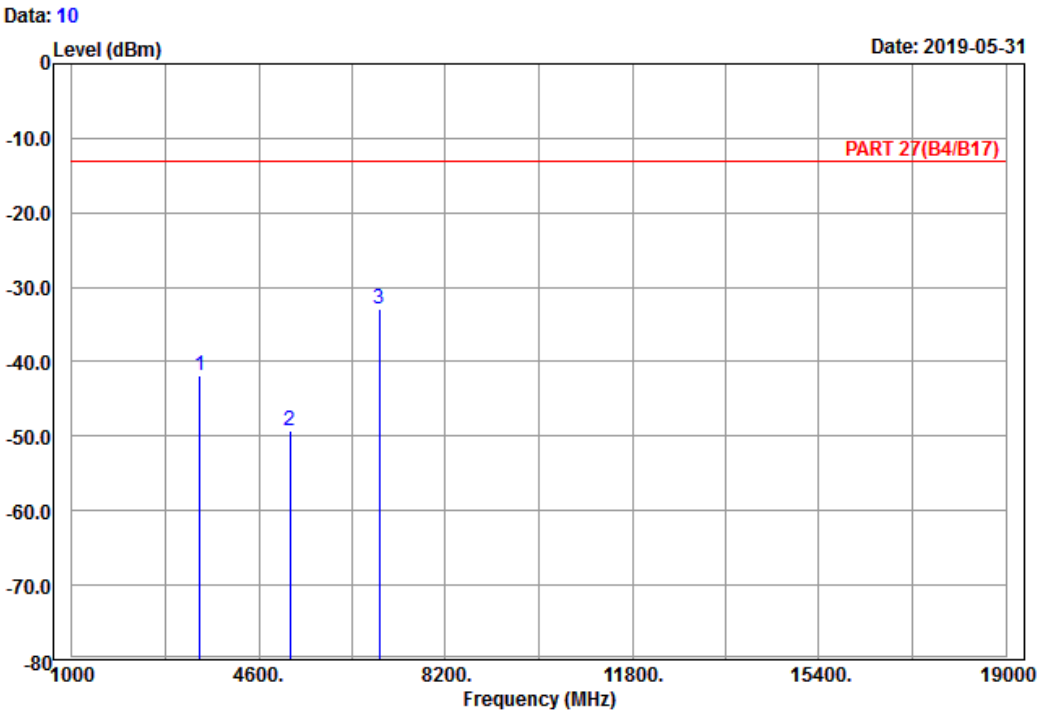
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : LTE_Band 4_Link_CH20175
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3465.00	-45.37	-59.71	14.34	-13.00	-32.37	Peak
2	5197.50	-48.48	-68.60	20.12	-13.00	-35.48	Peak
3 pp	6930.00	-40.46	-63.33	22.87	-13.00	-27.46	Peak

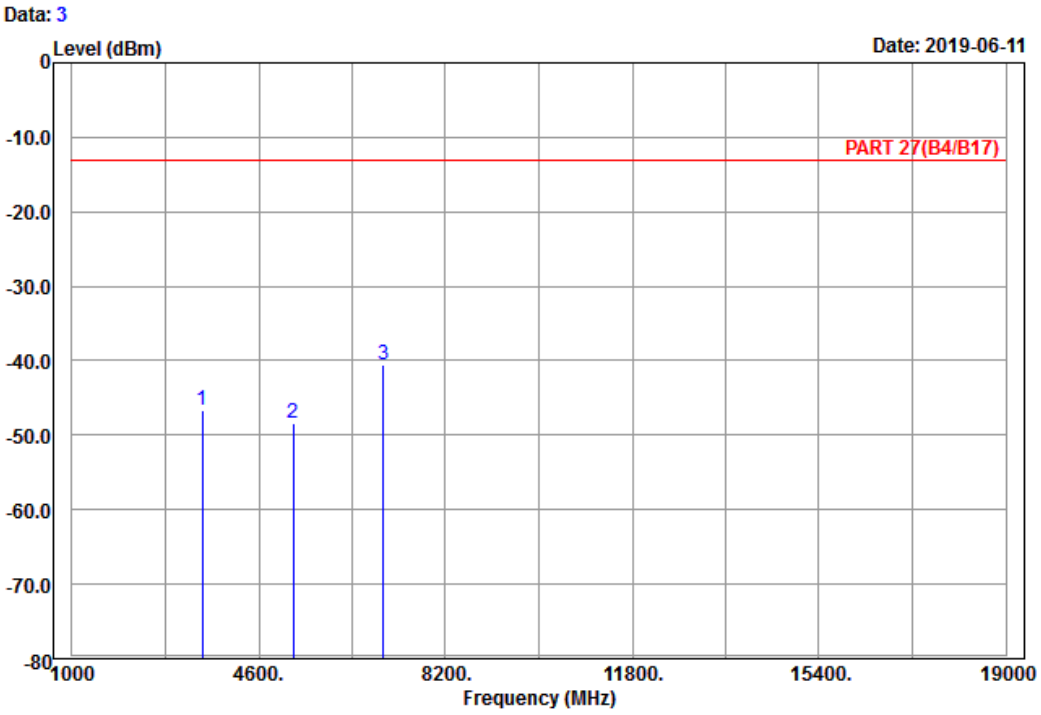


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH20175
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3465.00	-41.83	-56.17	14.34	-13.00	-28.83	Peak
2	5197.50	-49.28	-69.40	20.12	-13.00	-36.28	Peak
3 pp	6930.00	-32.99	-55.86	22.87	-13.00	-19.99	Peak

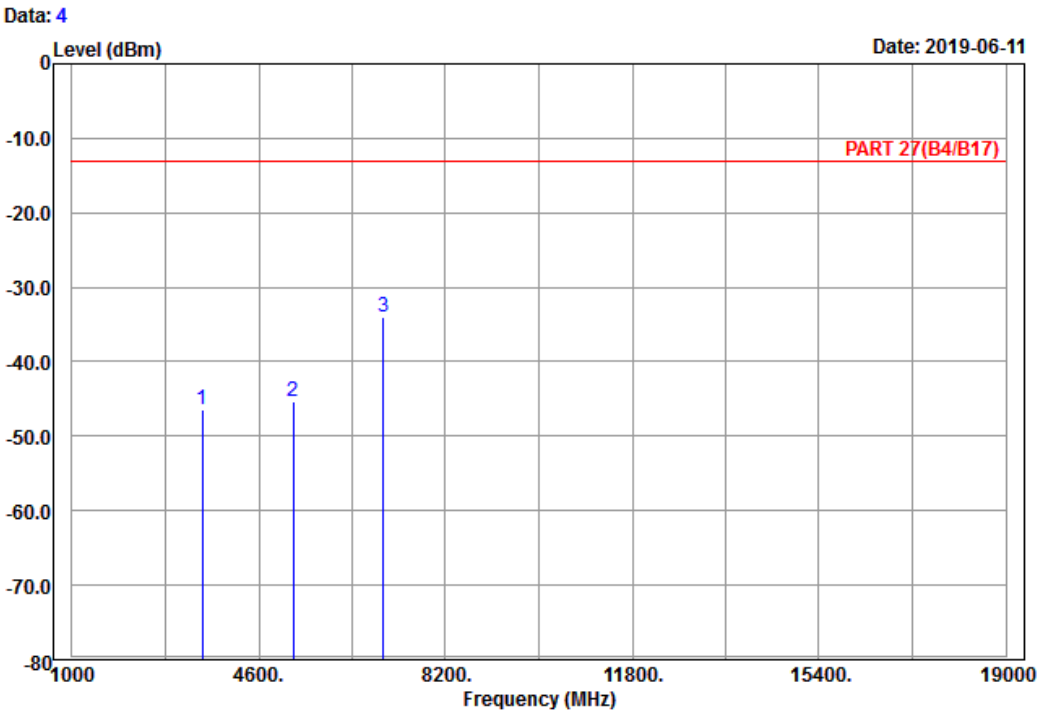
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : LTE_Band 4_Link_CH20375
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3505.00	-46.60	-60.88	14.28	-13.00	-33.60	Peak
2	5257.50	-48.35	-68.55	20.20	-13.00	-35.35	Peak
3 pp	7010.00	-40.56	-63.17	22.61	-13.00	-27.56	Peak

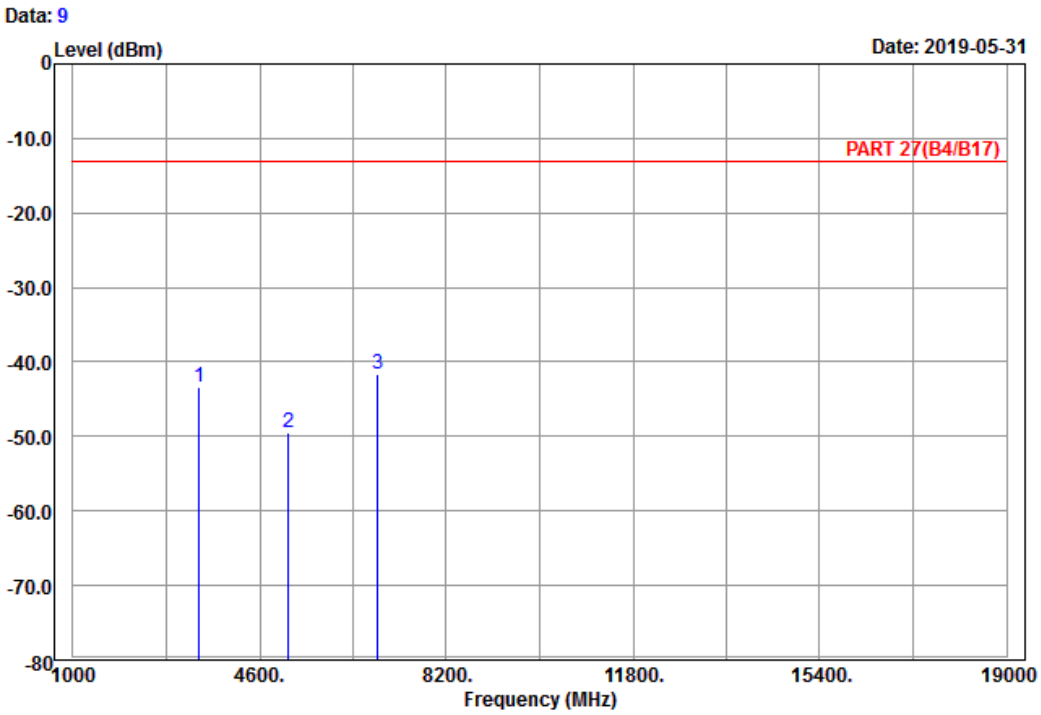


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH20375
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3505.00	-46.40	-60.68	14.28	-13.00	-33.40	Peak
2	5257.50	-45.42	-65.62	20.20	-13.00	-32.42	Peak
3 pp	7010.00	-34.10	-56.71	22.61	-13.00	-21.10	Peak

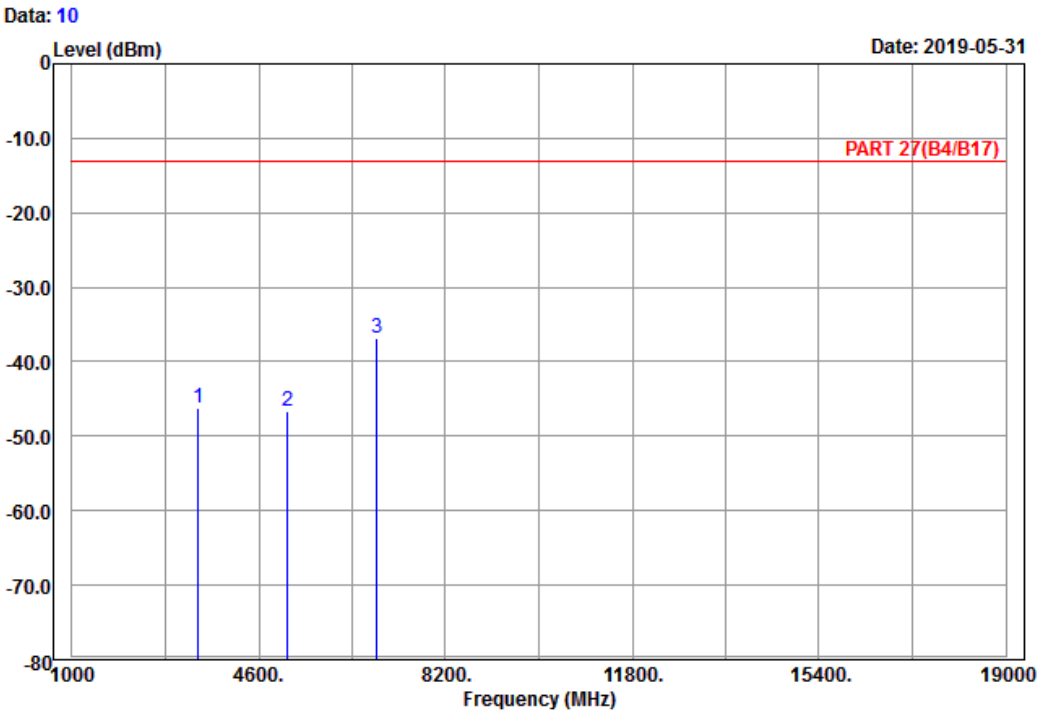
Channel Bandwidth: 20 MHz / QPSK
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




```
Site      : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark    : LTE_Band 4_Link_CH20050
Tested by: Karl Lee
```

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3440.00	-43.44	-57.79	14.35	-13.00	-30.44	Peak
2	5160.00	-49.58	-69.50	19.92	-13.00	-36.58	Peak
3 pp	6880.00	-41.71	-64.51	22.80	-13.00	-28.71	Peak

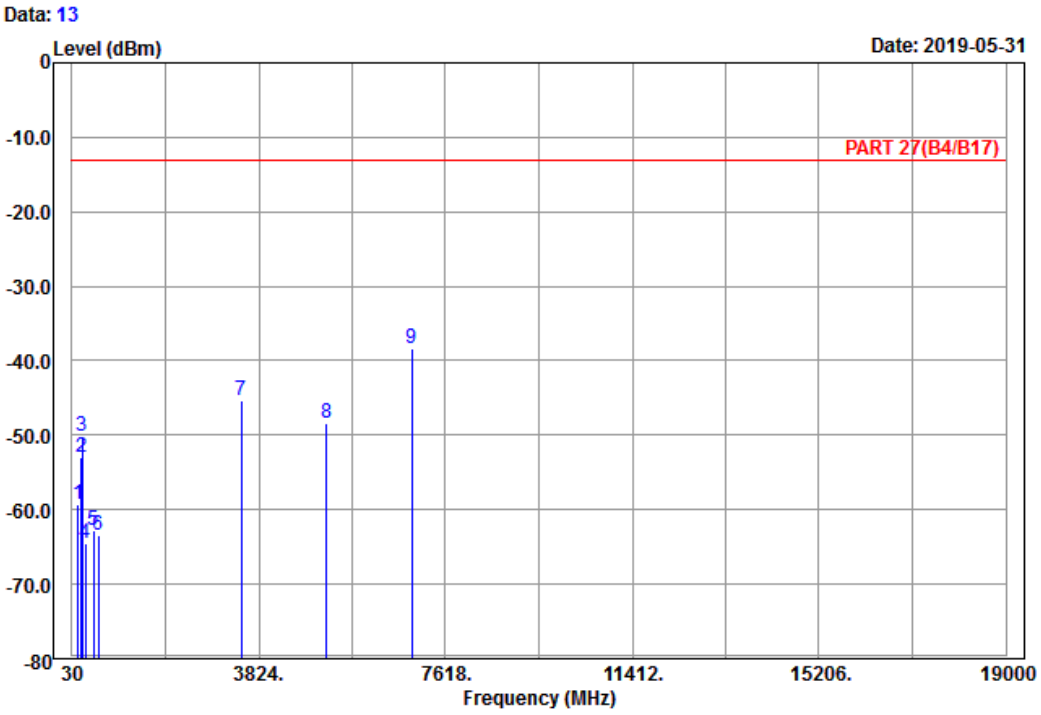


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH20050
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3440.00	-46.26	-60.61	14.35	-13.00	-33.26	Peak
2	5160.00	-46.64	-66.56	19.92	-13.00	-33.64	Peak
3 pp	6880.00	-36.78	-59.58	22.80	-13.00	-23.78	Peak

Middle Channel

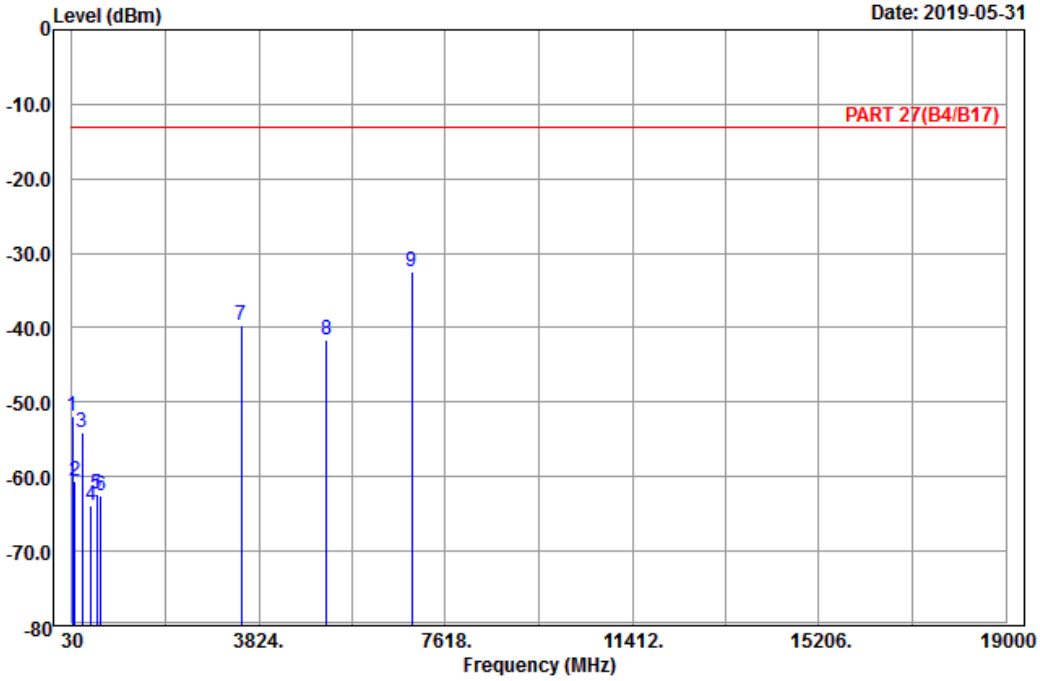
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : LTE_Band 4_Link_CH20175
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	155.28	-59.20	-51.39	-7.81	-13.00	-46.20	Peak
2	222.51	-52.90	-47.02	-5.88	-13.00	-39.90	Peak
3	241.14	-50.12	-44.50	-5.62	-13.00	-37.12	Peak
4	307.70	-64.59	-58.72	-5.87	-13.00	-51.59	Peak
5	470.10	-62.80	-58.37	-4.43	-13.00	-49.80	Peak
6	571.60	-63.51	-62.73	-0.78	-13.00	-50.51	Peak
7	3465.00	-45.31	-59.65	14.34	-13.00	-32.31	Peak
8	5197.50	-48.46	-68.58	20.12	-13.00	-35.46	Peak
9 pp	6930.00	-38.46	-61.33	22.87	-13.00	-25.46	Peak

Data: 14

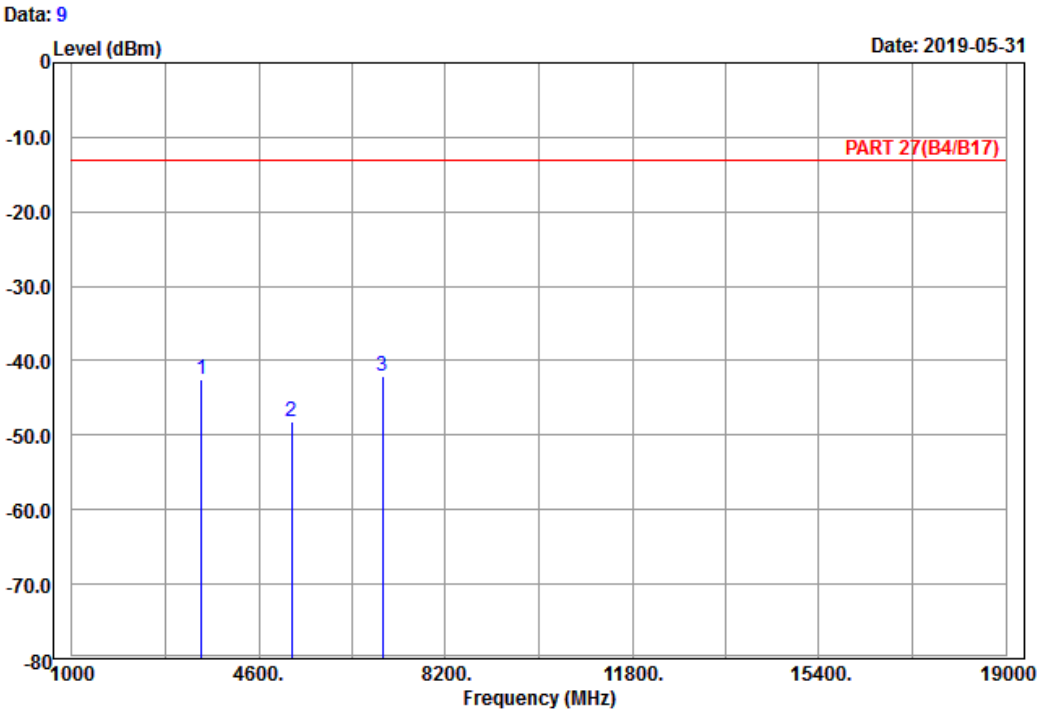


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH20175
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	33.24	-51.94	-41.07	-10.87	-13.00	-38.94	Peak
2	91.83	-60.65	-50.09	-10.56	-13.00	-47.65	Peak
3	239.52	-54.06	-48.41	-5.65	-13.00	-41.06	Peak
4	421.80	-63.79	-60.56	-3.23	-13.00	-50.79	Peak
5	531.70	-62.29	-59.28	-3.01	-13.00	-49.29	Peak
6	620.60	-62.58	-62.78	0.20	-13.00	-49.58	Peak
7	3465.00	-39.58	-53.92	14.34	-13.00	-26.58	Peak
8	5197.50	-41.62	-61.74	20.12	-13.00	-28.62	Peak
9 pp	6930.00	-32.48	-55.35	22.87	-13.00	-19.48	Peak

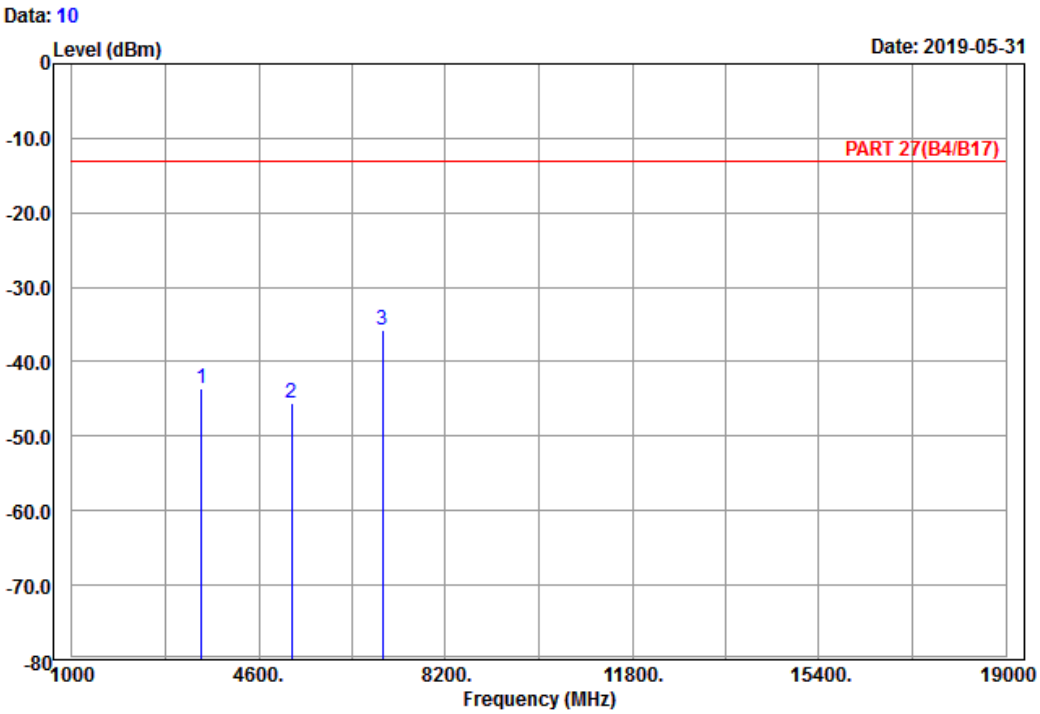
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : LTE_Band 4_Link_CH20300
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3490.00	-42.52	-56.83	14.31	-13.00	-29.52	Peak
2	5235.00	-48.15	-68.31	20.16	-13.00	-35.15	Peak
3 pp	6980.00	-42.18	-64.87	22.69	-13.00	-29.18	Peak

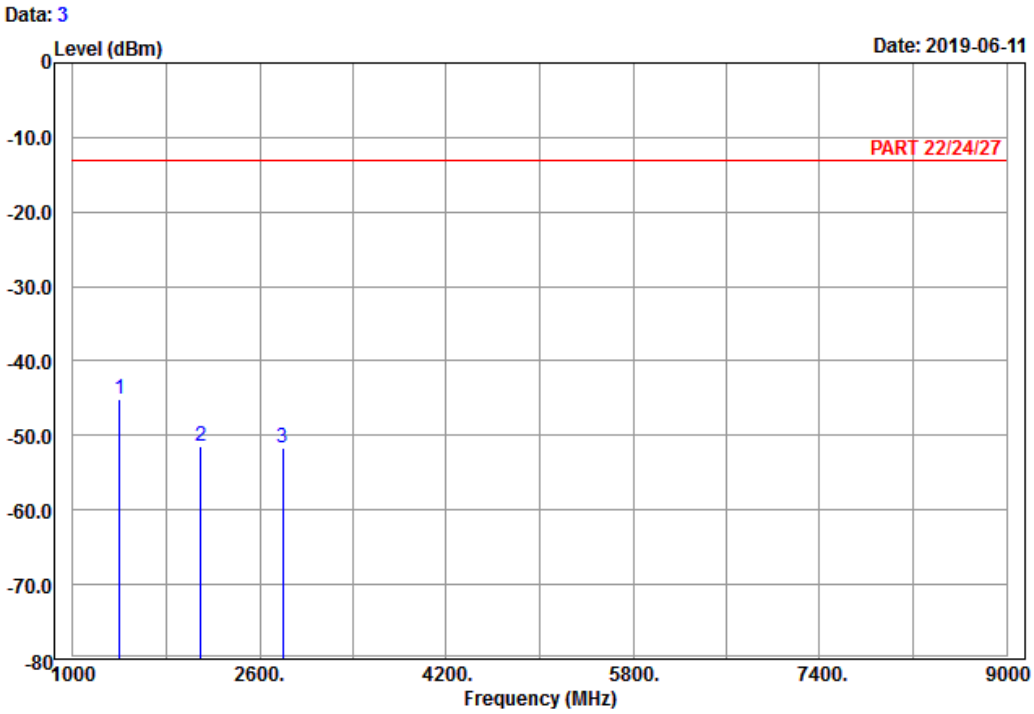


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH20300
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3490.00	-43.57	-57.88	14.31	-13.00	-30.57	Peak
2	5235.00	-45.51	-65.67	20.16	-13.00	-32.51	Peak
3 pp	6980.00	-35.82	-58.51	22.69	-13.00	-22.82	Peak

LTE Band 12
Channel Bandwidth: 1.4 MHz / QPSK
Low Channel

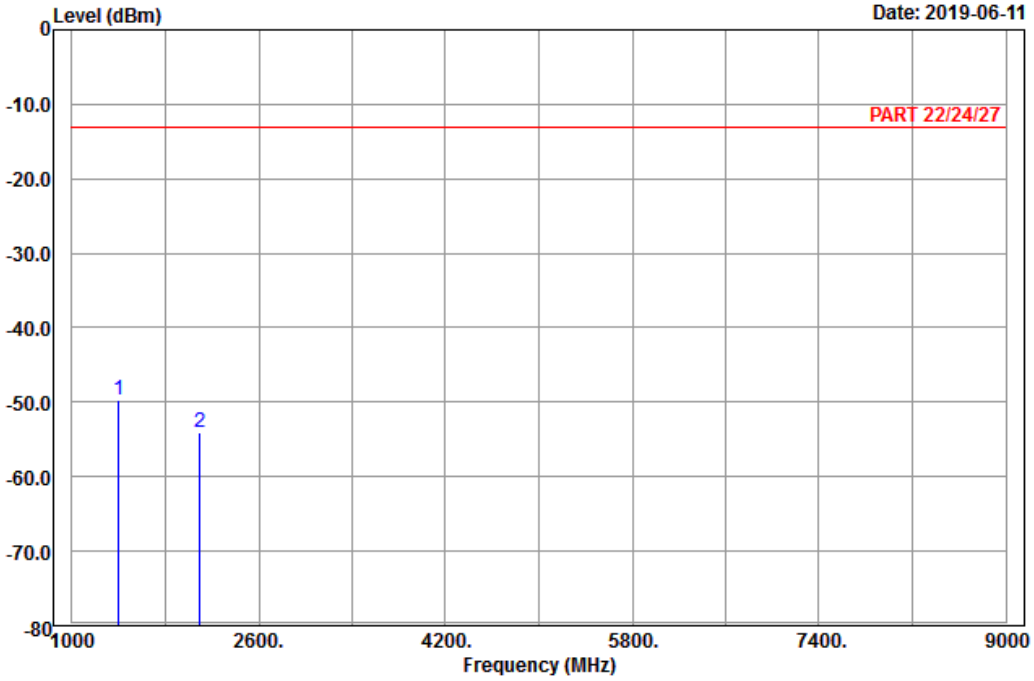
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 22/24/27 Horizontal
Remark : LTE_Band 12_Link_CH23095
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	1399.40	-45.18	-51.28	6.10	-13.00	-32.18	Peak
2	2099.10	-51.48	-62.41	10.93	-13.00	-38.48	Peak
3	2798.80	-51.74	-64.52	12.78	-13.00	-38.74	Peak

Data: 4

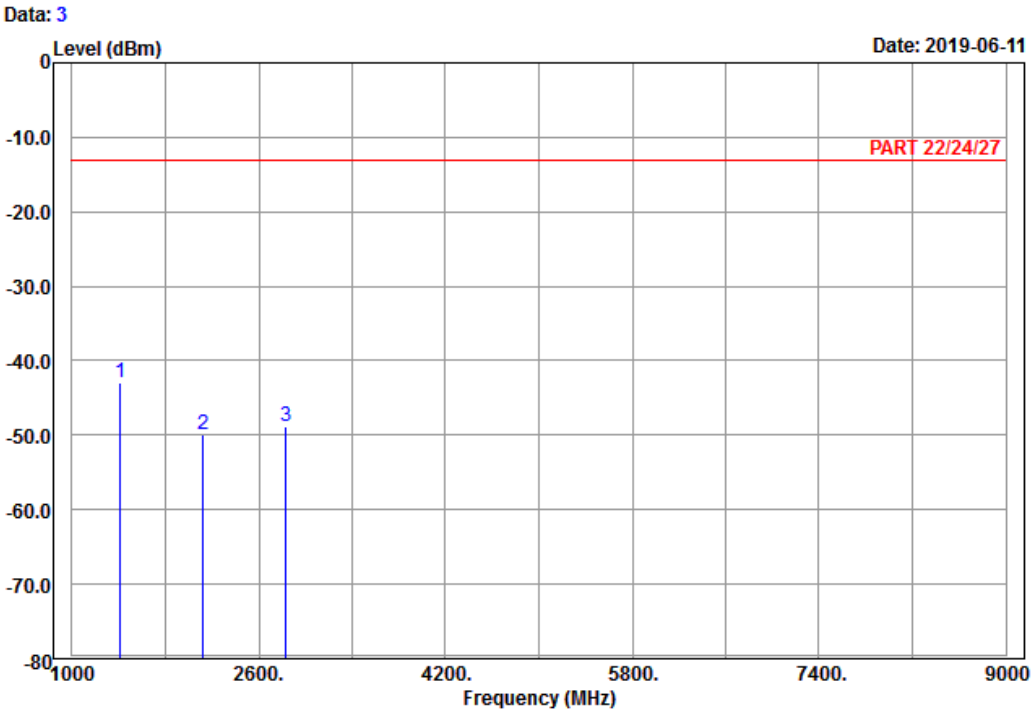


Site : 966 chamber 1
Condition: PART 22/24/27 Vertical
Remark : LTE_Band 12_Link_CH23095
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	1399.40	-49.74	-55.84	6.10	-13.00	-36.74	Peak
2	2099.10	-54.07	-65.00	10.93	-13.00	-41.07	Peak

Middle Channel

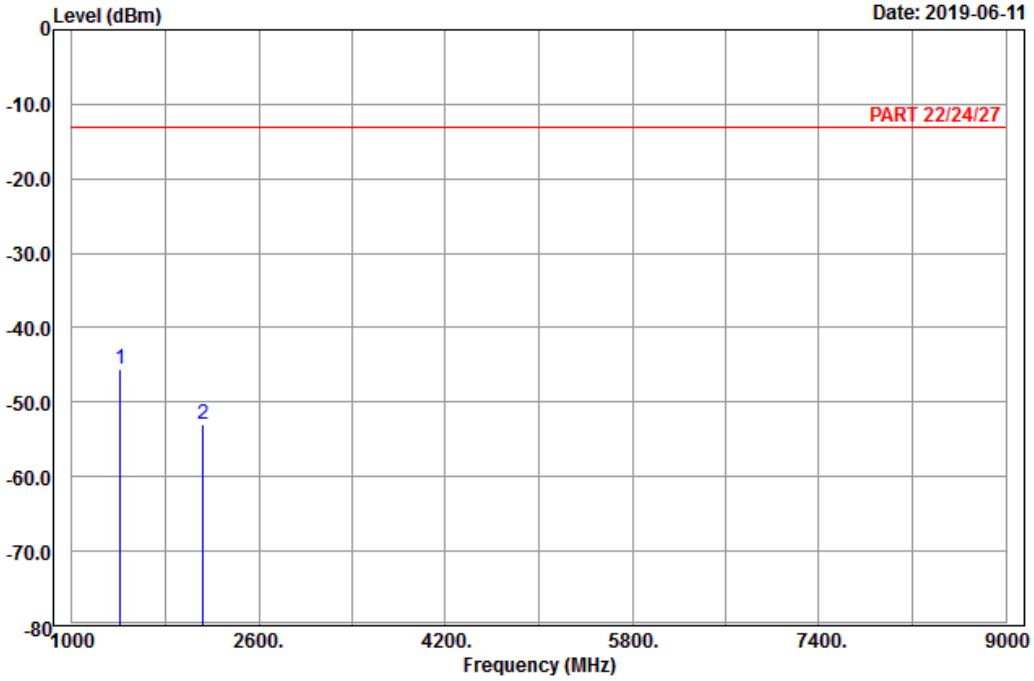
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 22/24/27 Horizontal
Remark : LTE_Band 12_Link_CH23095
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	1415.00	-42.88	-49.24	6.36	-13.00	-29.88	Peak
2	2122.50	-49.88	-60.99	11.11	-13.00	-36.88	Peak
3	2830.00	-48.89	-61.86	12.97	-13.00	-35.89	Peak

Data: 4

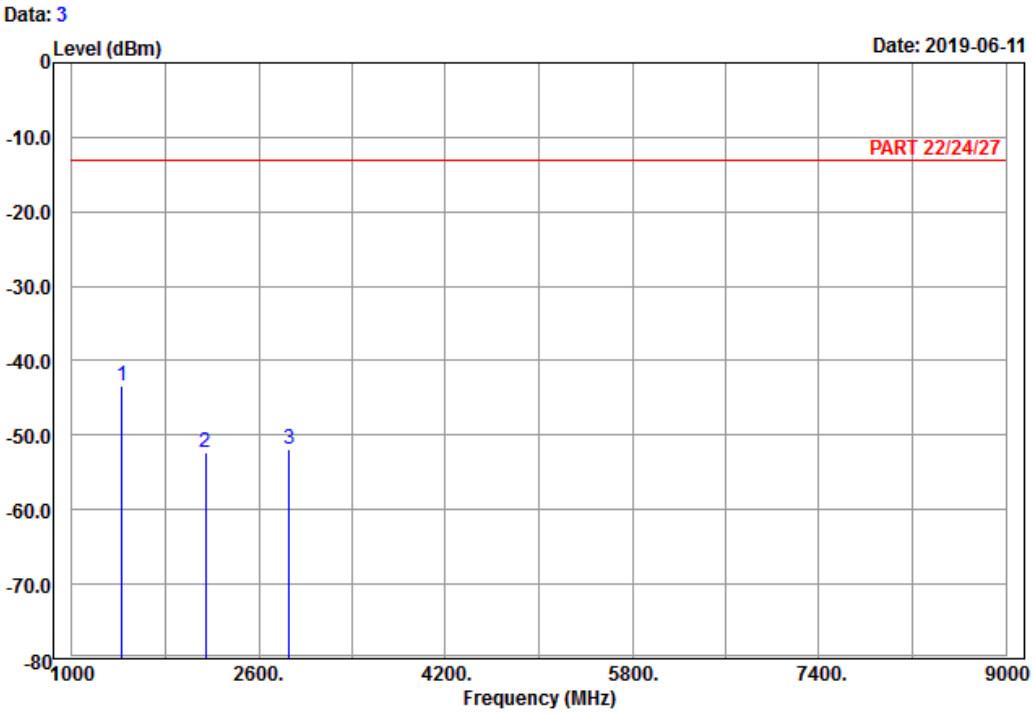


Site : 966 chamber 1
Condition: PART 22/24/27 Vertical
Remark : LTE_Band 12_Link_CH23095
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	1415.00	-45.57	-51.93	6.36	-13.00	-32.57	Peak
2	2122.50	-53.07	-64.18	11.11	-13.00	-40.07	Peak

High Channel

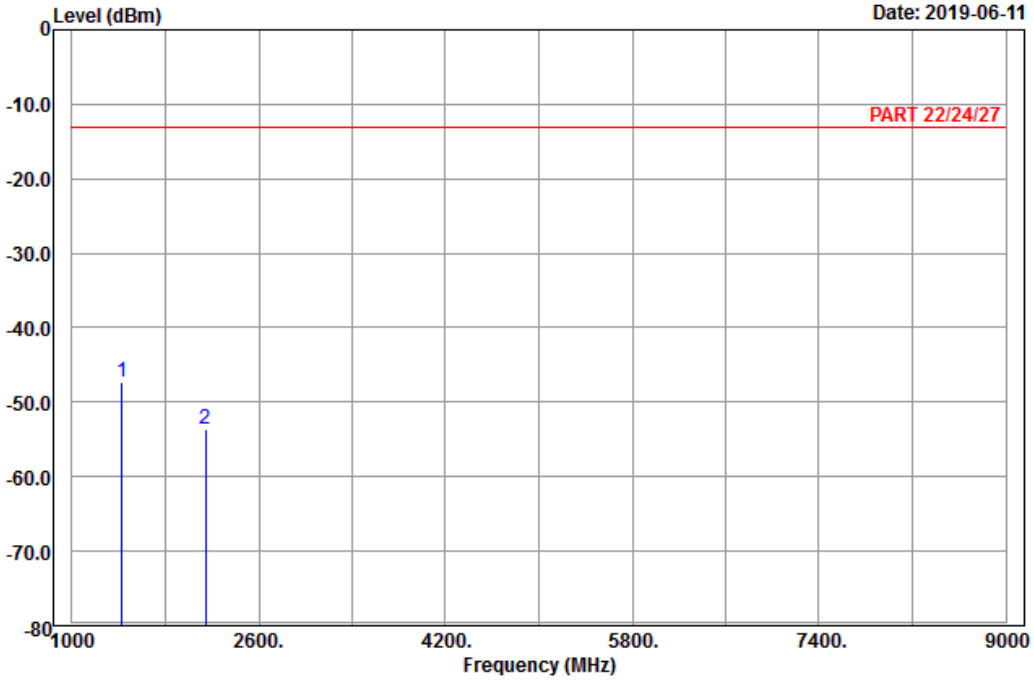
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 22/24/27 Horizontal
Remark : LTE_Band 12_Link_CH23095
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	1430.60	-43.46	-49.70	6.24	-13.00	-30.46	Peak
2	2145.90	-52.37	-63.62	11.25	-13.00	-39.37	Peak
3	2861.20	-51.89	-64.91	13.02	-13.00	-38.89	Peak

Data: 4

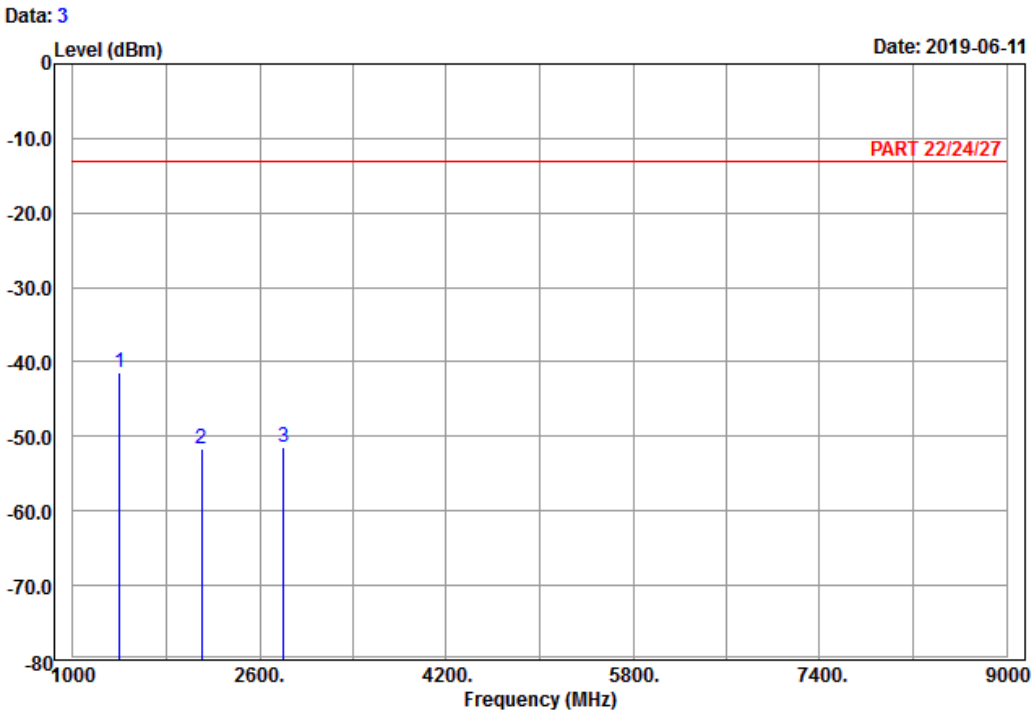


Site : 966 chamber 1
Condition: PART 22/24/27 Vertical
Remark : LTE_Band 12_Link_CH23095
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	1430.60	-47.39	-53.63	6.24	-13.00	-34.39	Peak
2	2145.90	-53.66	-64.91	11.25	-13.00	-40.66	Peak

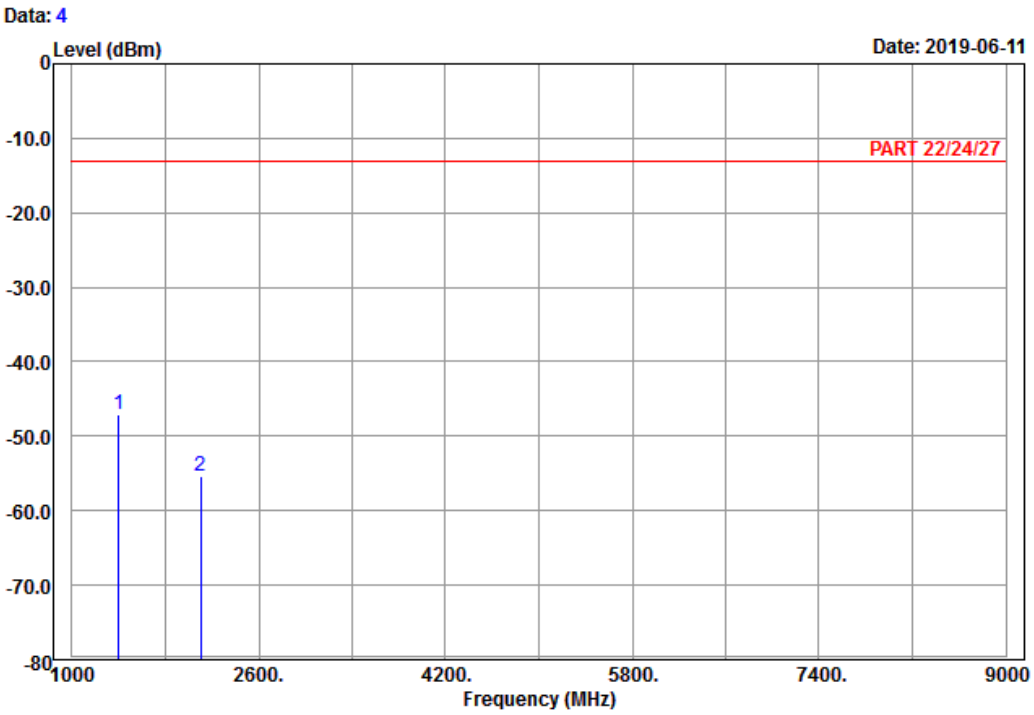
Channel Bandwidth: 5 MHz / QPSK
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 22/24/27 Horizontal
Remark : LTE_Band 12_Link_CH23035
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	1403.00	-41.51	-47.61	6.10	-13.00	-28.51	Peak
2	2104.50	-51.71	-62.64	10.93	-13.00	-38.71	Peak
3	2806.00	-51.46	-64.24	12.78	-13.00	-38.46	Peak

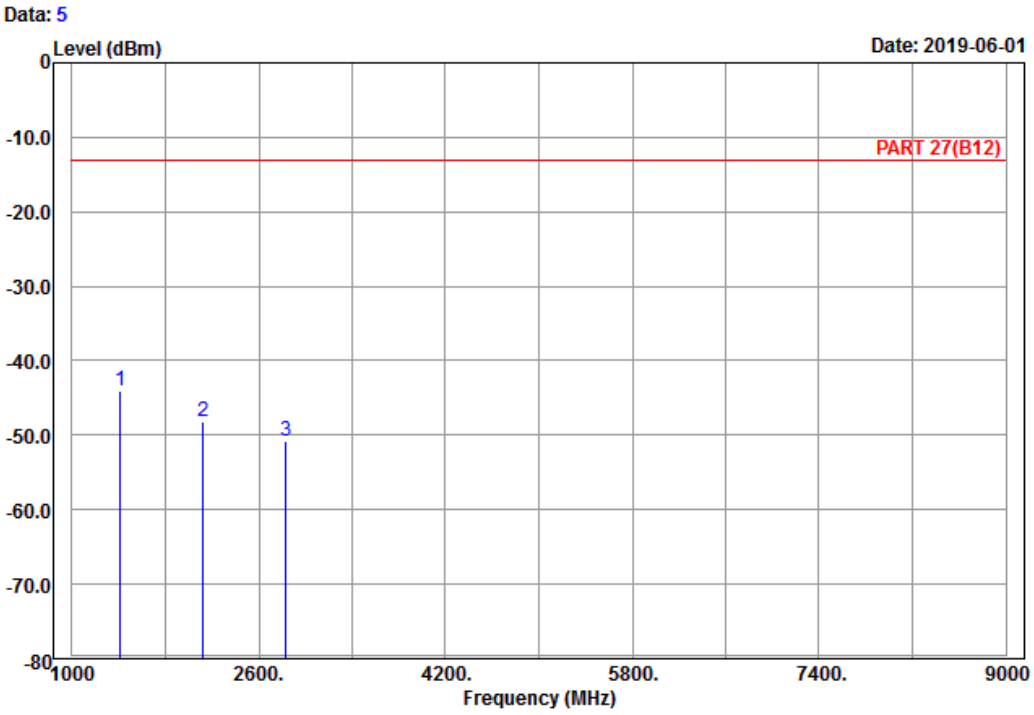


Site : 966 chamber 1
Condition: PART 22/24/27 Vertical
Remark : LTE_Band 12_Link_CH23035
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	1403.00	-46.98	-53.08	6.10	-13.00	-33.98	Peak
2	2104.50	-55.36	-66.29	10.93	-13.00	-42.36	Peak

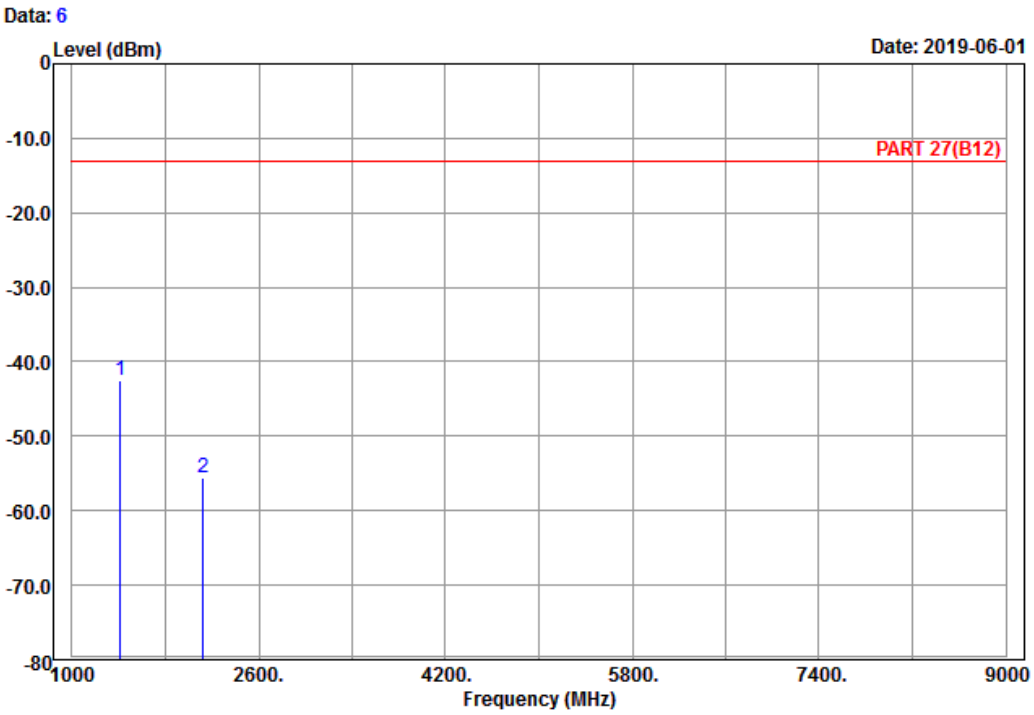
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B12) Horizontal
Remark : LTE_Band 12_Link_CH23095
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	1415.00	-44.11	-50.47	6.36	-13.00	-31.11	Peak
2	2122.50	-48.11	-59.22	11.11	-13.00	-35.11	Peak
3	2830.00	-50.89	-63.86	12.97	-13.00	-37.89	Peak

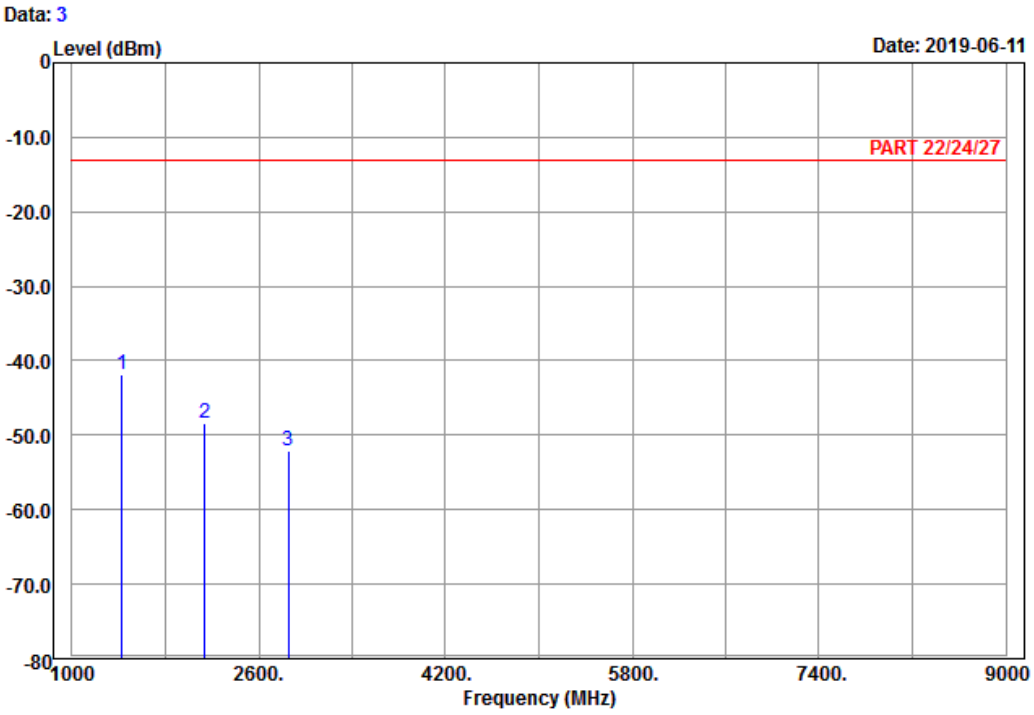


Site : 966 chamber 1
Condition: PART 27(B12) Vertical
Remark : LTE_Band 12_Link_CH23095
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	1415.00	-42.56	-48.92	6.36	-13.00	-29.56	Peak
2	2122.50	-55.66	-66.77	11.11	-13.00	-42.66	Peak

High Channel

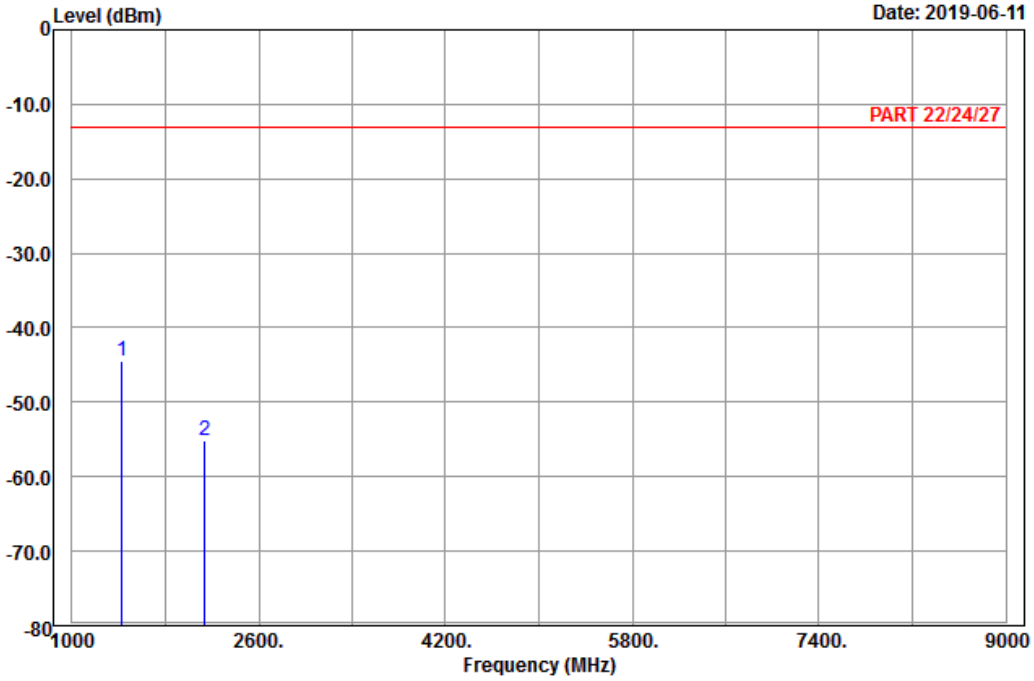
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 22/24/27 Horizontal
Remark : LTE_Band 12_Link_CH23135
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	1427.00	-41.93	-48.17	6.24	-13.00	-28.93	Peak
2	2140.50	-48.46	-59.74	11.28	-13.00	-35.46	Peak
3	2854.00	-52.14	-65.16	13.02	-13.00	-39.14	Peak

Data: 4

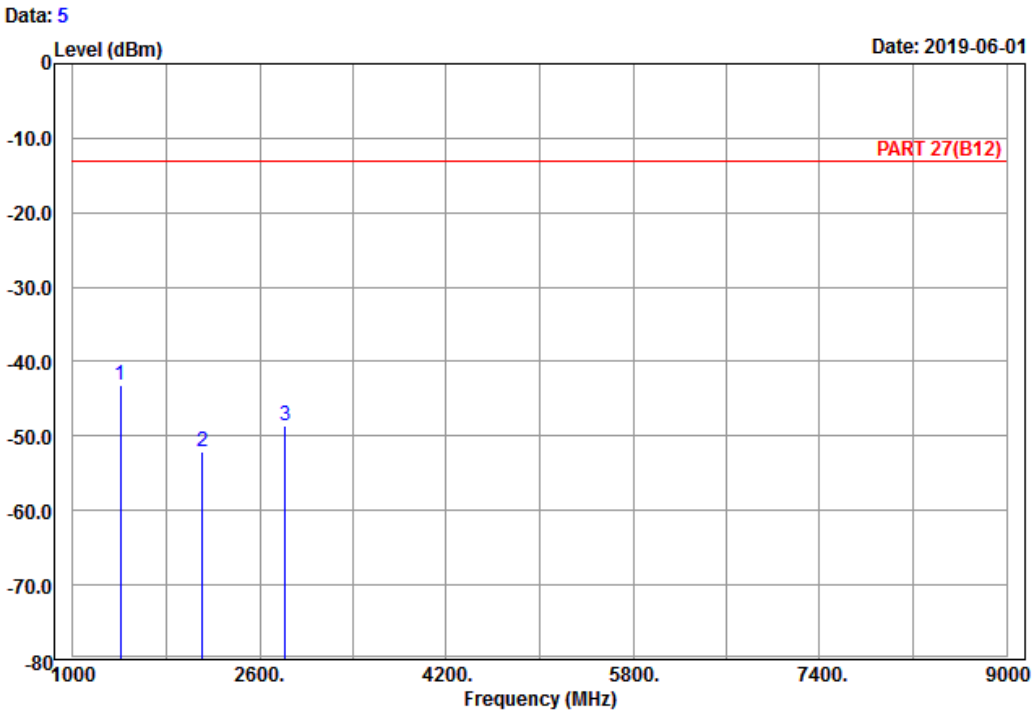


Site : 966 chamber 1
Condition: PART 22/24/27 Vertical
Remark : LTE_Band 12_Link_CH23135
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	1427.00	-44.38	-50.62	6.24	-13.00	-31.38	Peak
2	2140.50	-55.10	-66.38	11.28	-13.00	-42.10	Peak

Channel Bandwidth: 10 MHz / QPSK
Low Channel

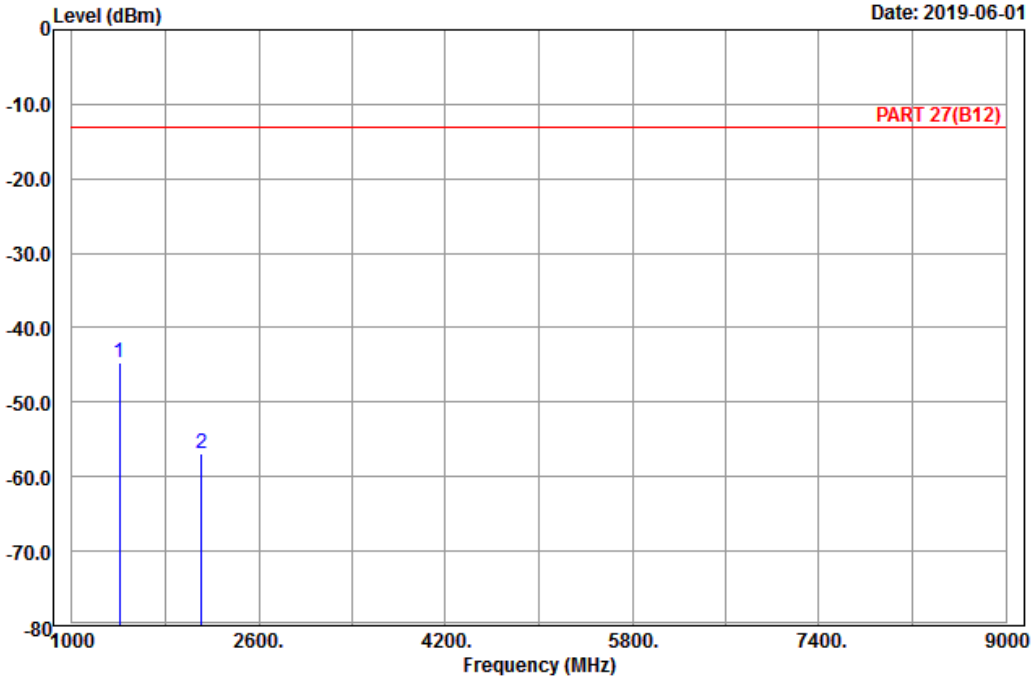
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B12) Horizontal
Remark : LTE_Band 12_Link_CH23060
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	1408.00	-43.21	-49.57	6.36	-13.00	-30.21	Peak
2	2112.00	-52.17	-63.28	11.11	-13.00	-39.17	Peak
3	2816.00	-48.51	-61.38	12.87	-13.00	-35.51	Peak

Data: 6

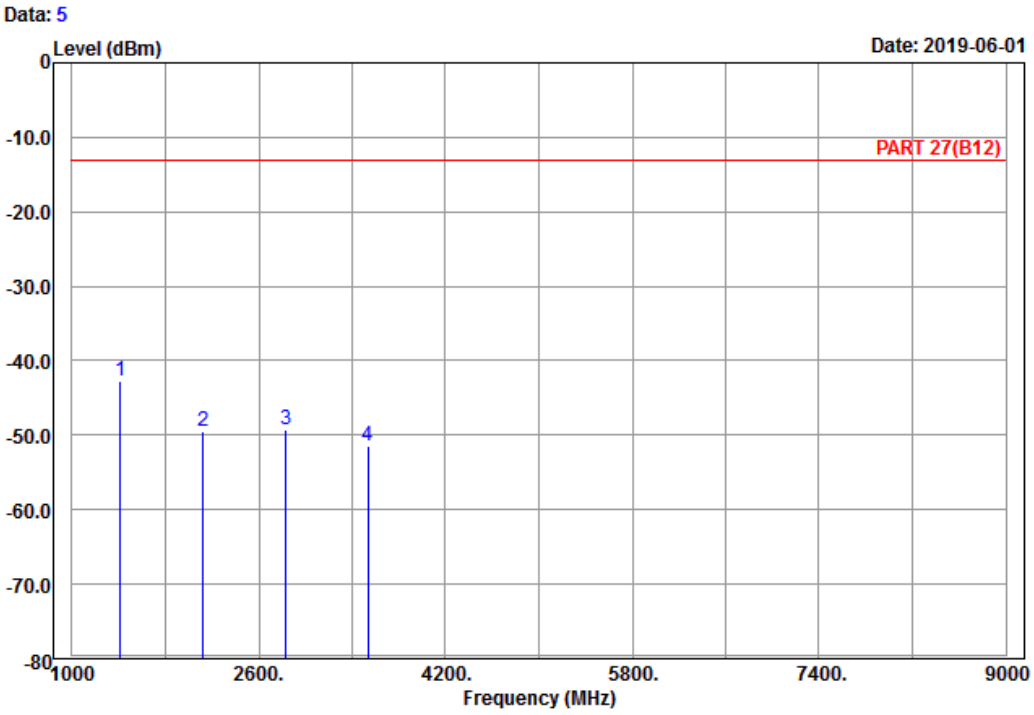


Site : 966 chamber 1
Condition: PART 27(B12) Vertical
Remark : LTE_Band 12_Link_CH23060
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	1408.00	-44.74	-51.10	6.36	-13.00	-31.74	Peak
2	2112.00	-56.89	-68.00	11.11	-13.00	-43.89	Peak

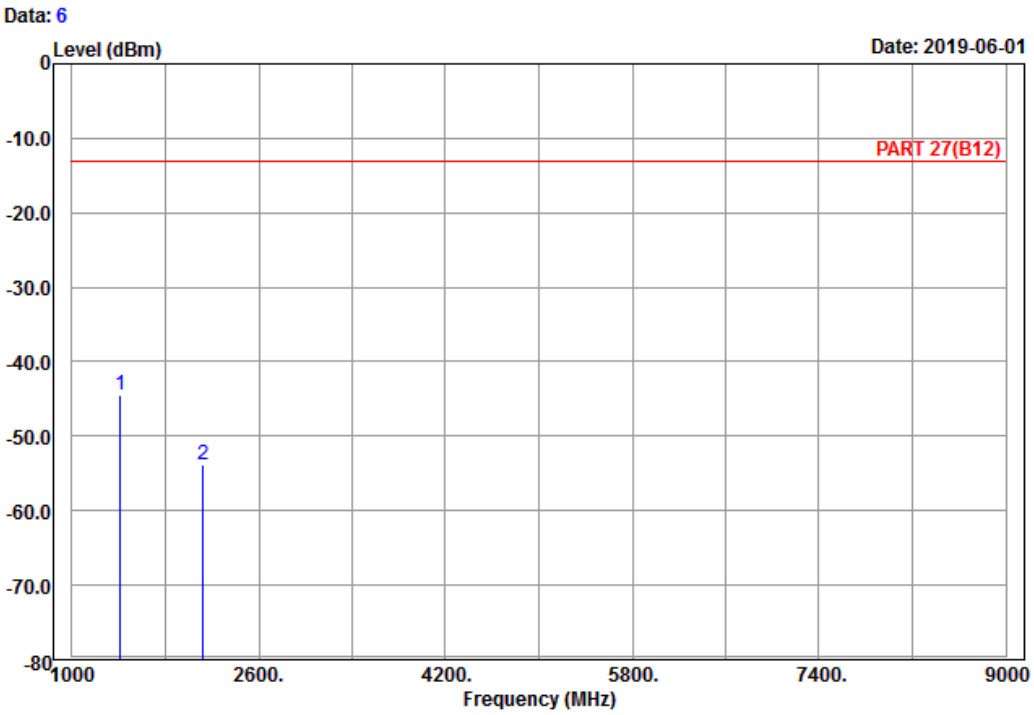
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B12) Horizontal
Remark : LTE_Band 12_Link_CH23095
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	1415.00	-42.66	-49.02	6.36	-13.00	-29.66	Peak
2	2122.50	-49.58	-60.69	11.11	-13.00	-36.58	Peak
3	2830.00	-49.22	-62.19	12.97	-13.00	-36.22	Peak
4	3537.50	-51.42	-66.31	14.89	-13.00	-38.42	Peak

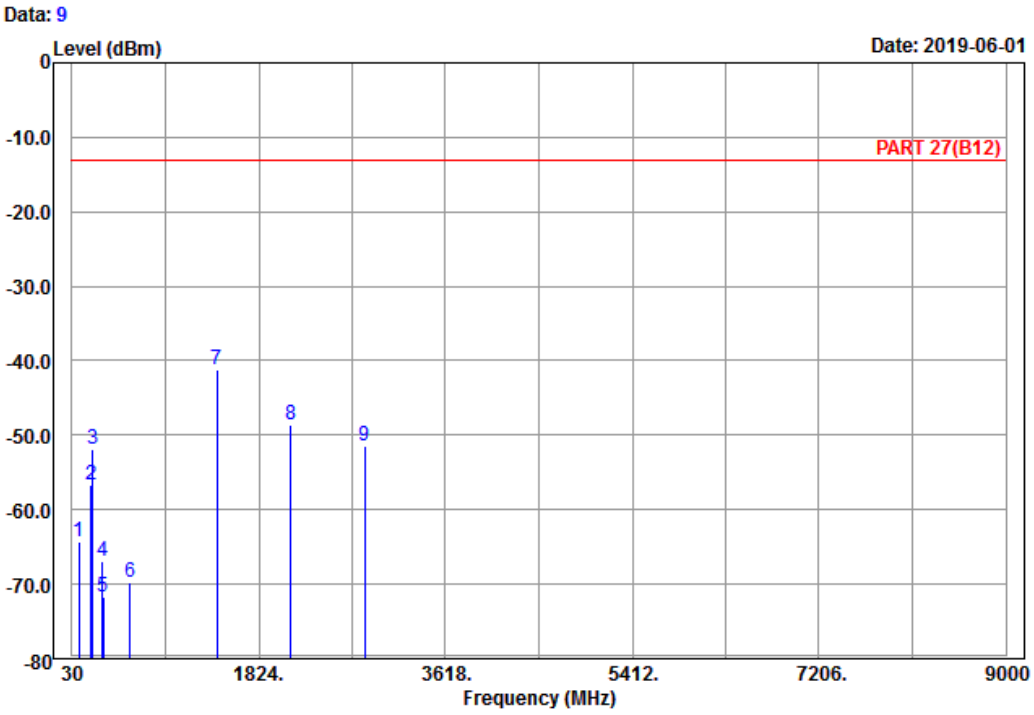


Site : 966 chamber 1
Condition: PART 27(B12) Vertical
Remark : LTE_Band 12_Link_CH23095
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	1415.00	-44.56	-50.92	6.36	-13.00	-31.56	Peak
2	2122.50	-53.78	-64.89	11.11	-13.00	-40.78	Peak

High Channel

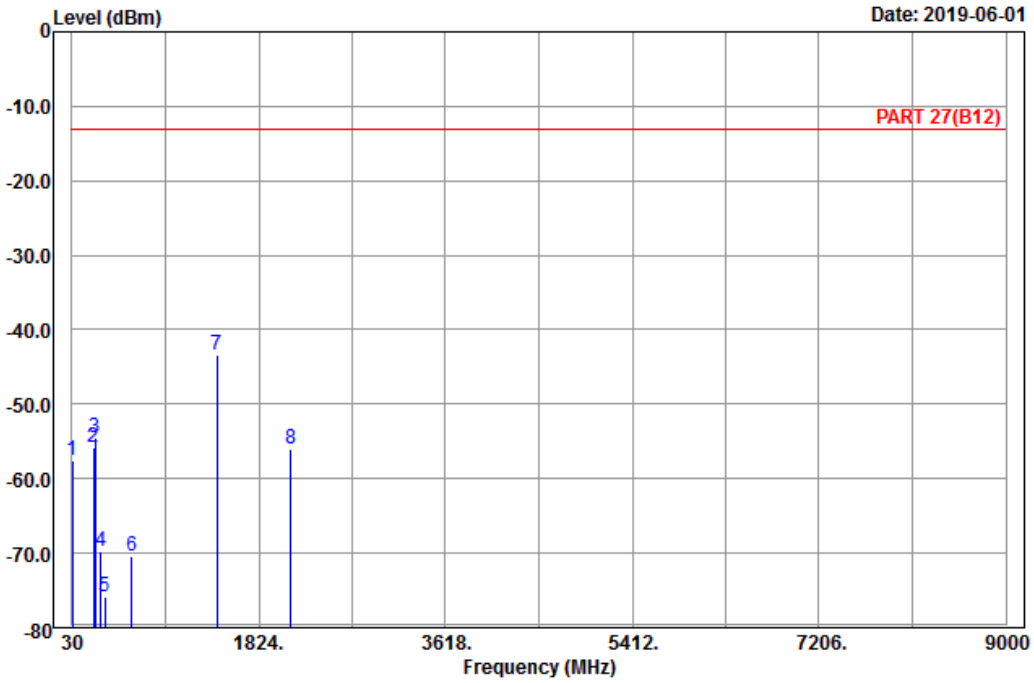
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B12) Horizontal
Remark : LTE_Band 12_Link_CH23130
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	98.85	-64.32	-54.14	-10.18	-13.00	-51.32	Peak
2	211.98	-56.65	-50.64	-6.01	-13.00	-43.65	Peak
3	230.61	-51.86	-46.09	-5.77	-13.00	-38.86	Peak
4	320.30	-66.97	-61.25	-5.72	-13.00	-53.97	Peak
5	327.30	-71.66	-66.01	-5.65	-13.00	-58.66	Peak
6	589.80	-69.65	-69.64	-0.01	-13.00	-56.65	Peak
7 pp	1422.00	-41.26	-47.62	6.36	-13.00	-28.26	Peak
8	2133.00	-48.64	-59.92	11.28	-13.00	-35.64	Peak
9	2844.00	-51.43	-64.40	12.97	-13.00	-38.43	Peak

Data: 10

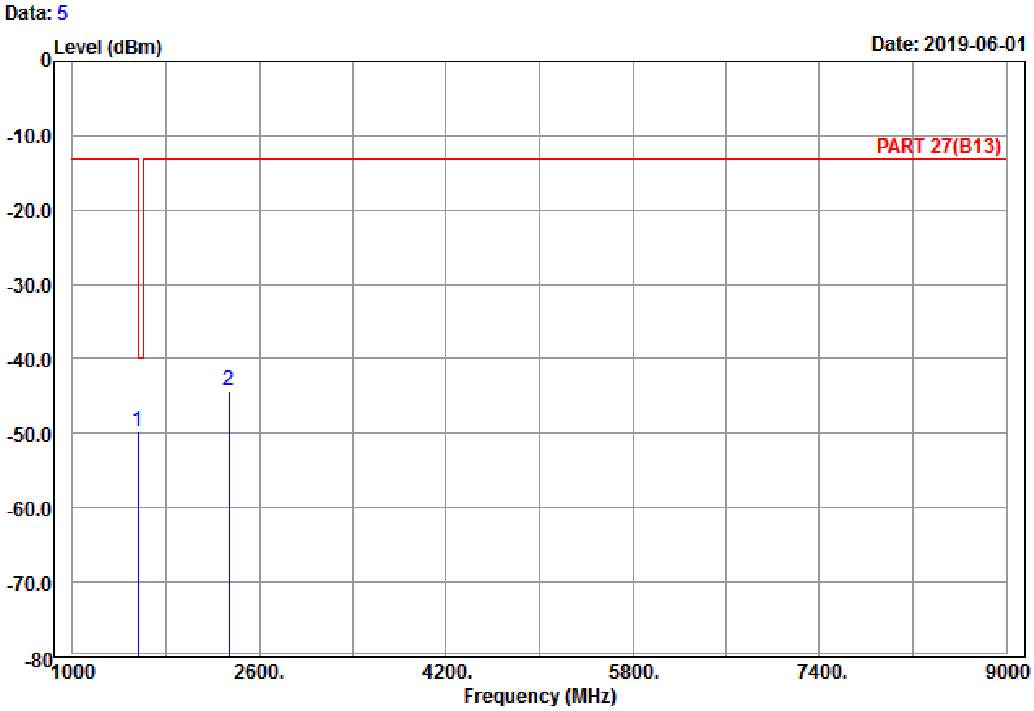


Site : 966 chamber 1
Condition: PART 27(B12) Vertical
Remark : LTE_Band 12_Link_CH23130
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	35.13	-57.53	-46.43	-11.10	-13.00	-44.53	Peak
2	235.74	-55.78	-50.08	-5.70	-13.00	-42.78	Peak
3	248.70	-54.54	-49.01	-5.53	-13.00	-41.54	Peak
4	310.50	-69.82	-63.98	-5.84	-13.00	-56.82	Peak
5	345.50	-75.78	-70.35	-5.43	-13.00	-62.78	Peak
6	605.20	-70.43	-70.80	0.37	-13.00	-57.43	Peak
7 pp	1422.00	-43.43	-49.79	6.36	-13.00	-30.43	Peak
8	2133.00	-55.96	-67.24	11.28	-13.00	-42.96	Peak

LTE Band 13
Channel Bandwidth: 5 MHz / QPSK
Low Channel

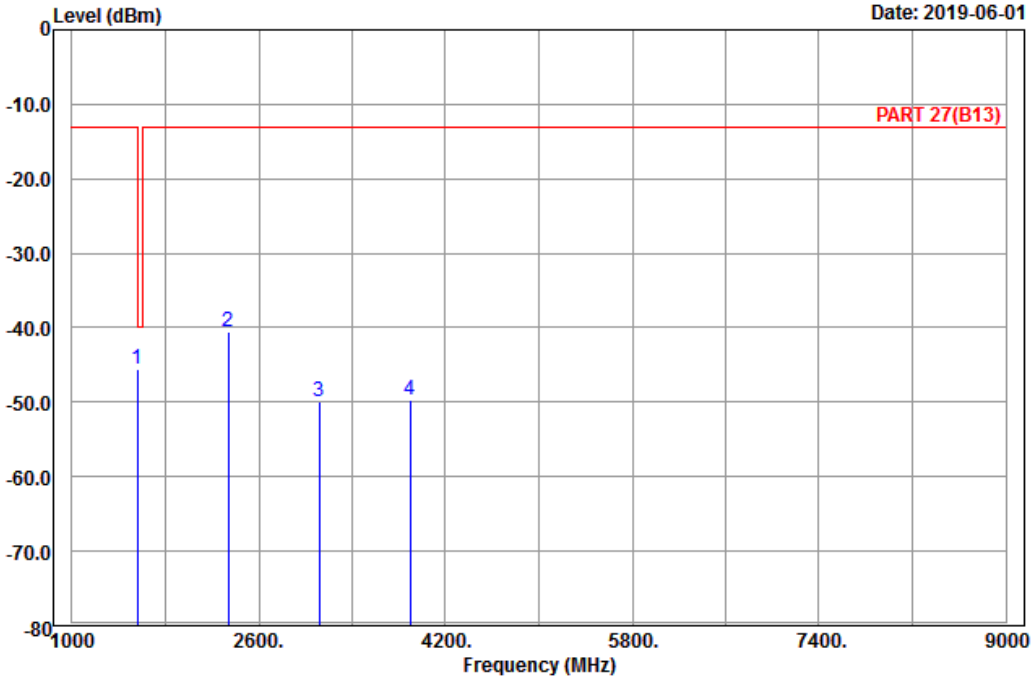
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B13) Horizontal
Remark : LTE_Band 13_Link_CH23205
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	1559.00	-49.71	-56.57	6.86	-40.00	-9.71	Peak
2	2338.50	-44.20	-55.16	10.96	-13.00	-31.20	Peak

Data: 6

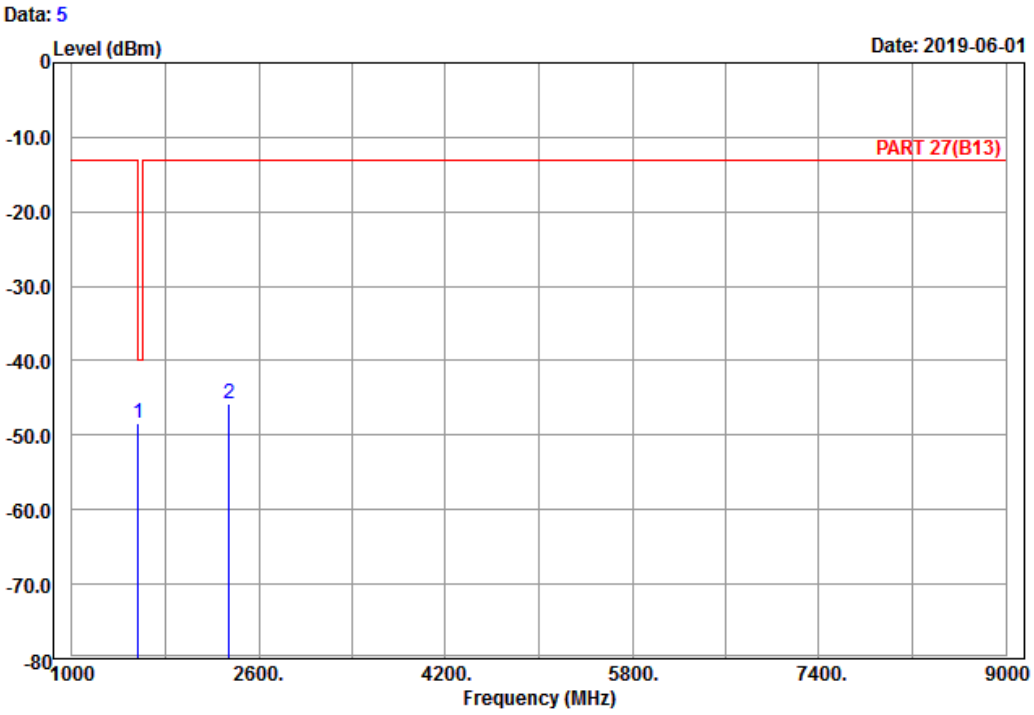


Site : 966 chamber 1
Condition: PART 27(B13) Vertical
Remark : LTE_Band 13_Link_CH23205
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	1559.00	-45.56	-52.42	6.86	-40.00	-5.56	Peak
2	2338.50	-40.63	-51.59	10.96	-13.00	-27.63	Peak
3	3118.00	-49.95	-63.47	13.52	-13.00	-36.95	Peak
4	3897.50	-49.72	-66.57	16.85	-13.00	-36.72	Peak

Middle Channel

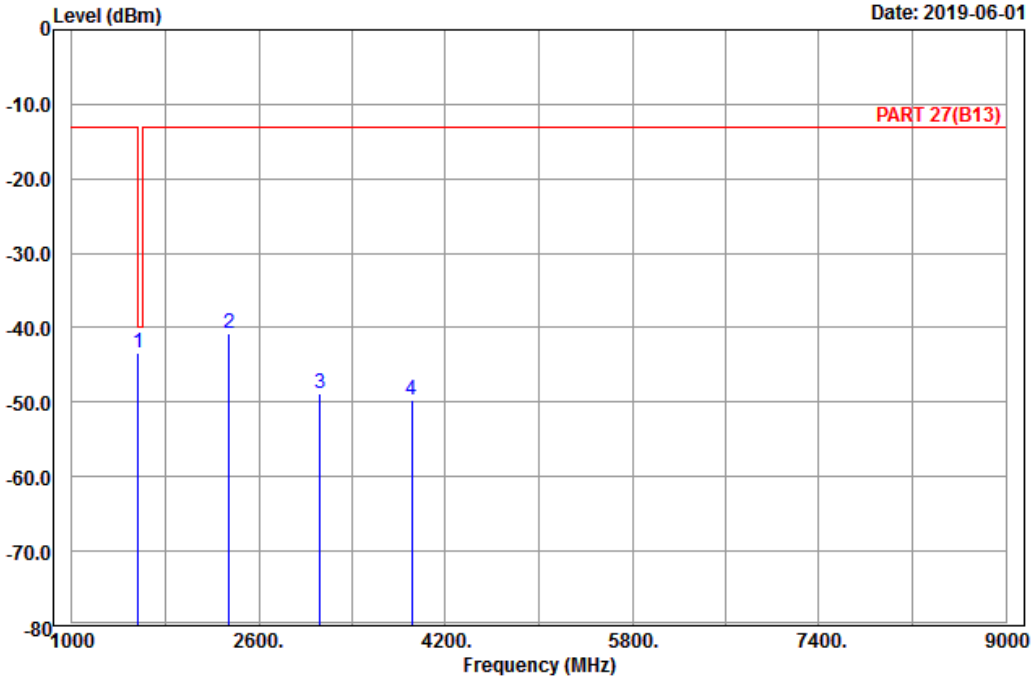
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B13) Horizontal
Remark : LTE_Band 13_Link_CH23230
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	1564.00	-48.47	-55.33	6.86	-40.00	-8.47	Peak
2	2346.00	-45.78	-56.72	10.94	-13.00	-32.78	Peak

Data: 6

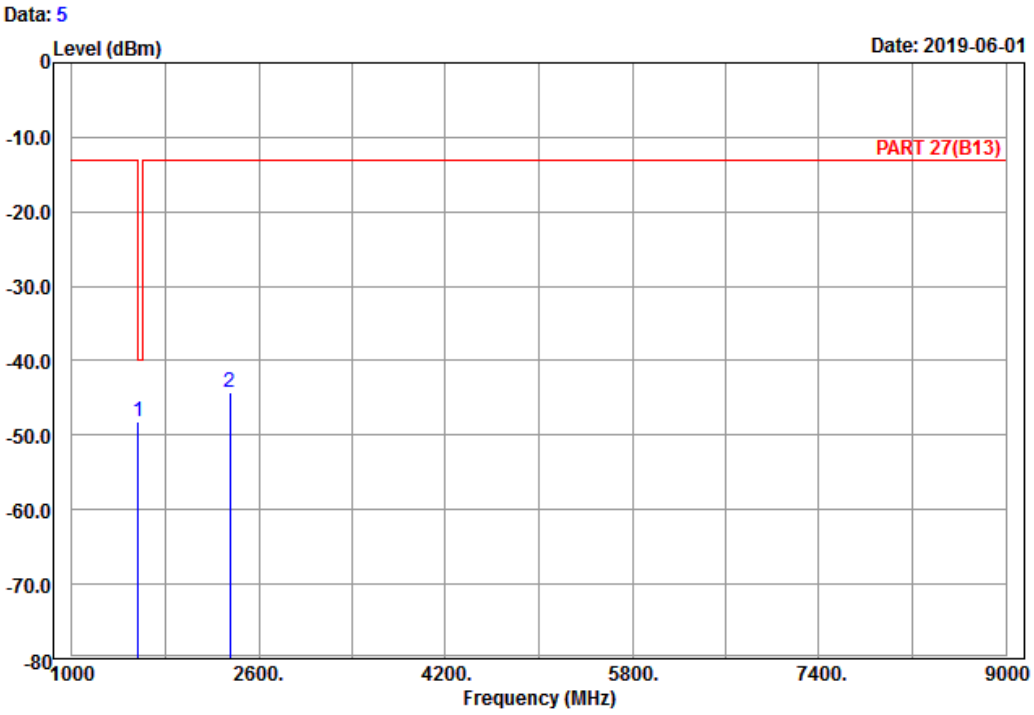


Site : 966 chamber 1
Condition: PART 27(B13) Vertical
Remark : LTE_Band 13_Link_CH23230
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	1564.00	-43.31	-50.17	6.86	-40.00	-3.31	Peak
2	2346.00	-40.67	-51.61	10.94	-13.00	-27.67	Peak
3	3128.00	-48.83	-62.35	13.52	-13.00	-35.83	Peak
4	3910.00	-49.61	-66.55	16.94	-13.00	-36.61	Peak

High Channel

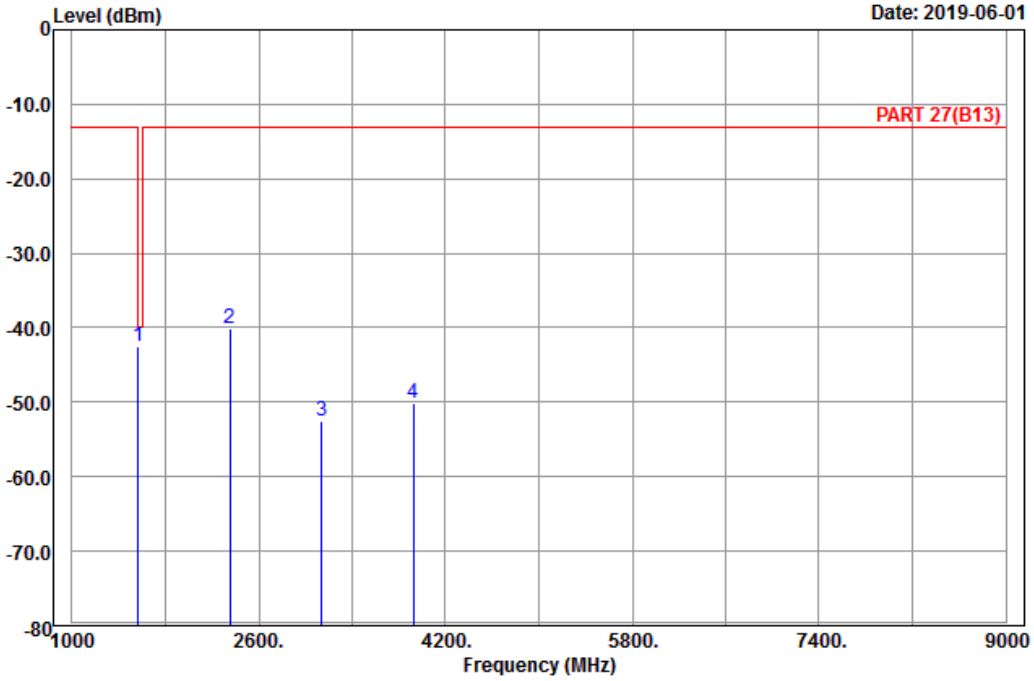
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B13) Horizontal
Remark : LTE_Band 13_Link_CH23255
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	1569.00	-48.11	-55.15	7.04	-40.00	-8.11	Peak
2	2353.50	-44.31	-55.25	10.94	-13.00	-31.31	Peak

Data: 6

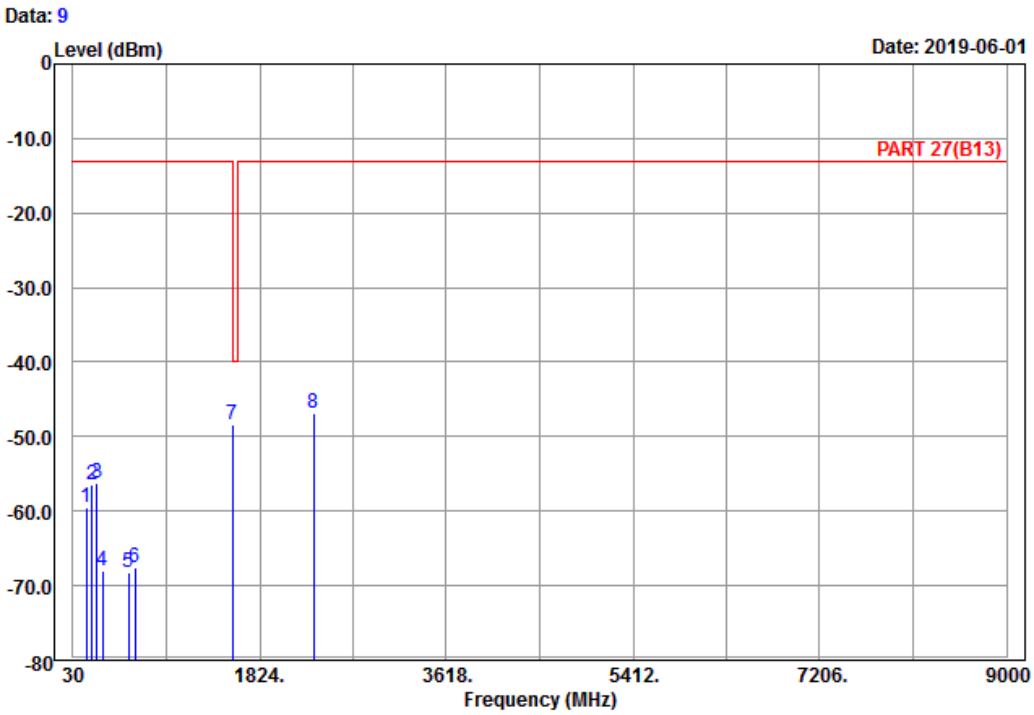


Site : 966 chamber 1
Condition: PART 27(B13) Vertical
Remark : LTE_Band 13_Link_CH23255
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	1569.00	-42.56	-49.60	7.04	-40.00	-2.56	Peak
2	2353.50	-40.18	-51.12	10.94	-13.00	-27.18	Peak
3	3138.00	-52.46	-66.06	13.60	-13.00	-39.46	Peak
4	3922.50	-50.03	-66.97	16.94	-13.00	-37.03	Peak

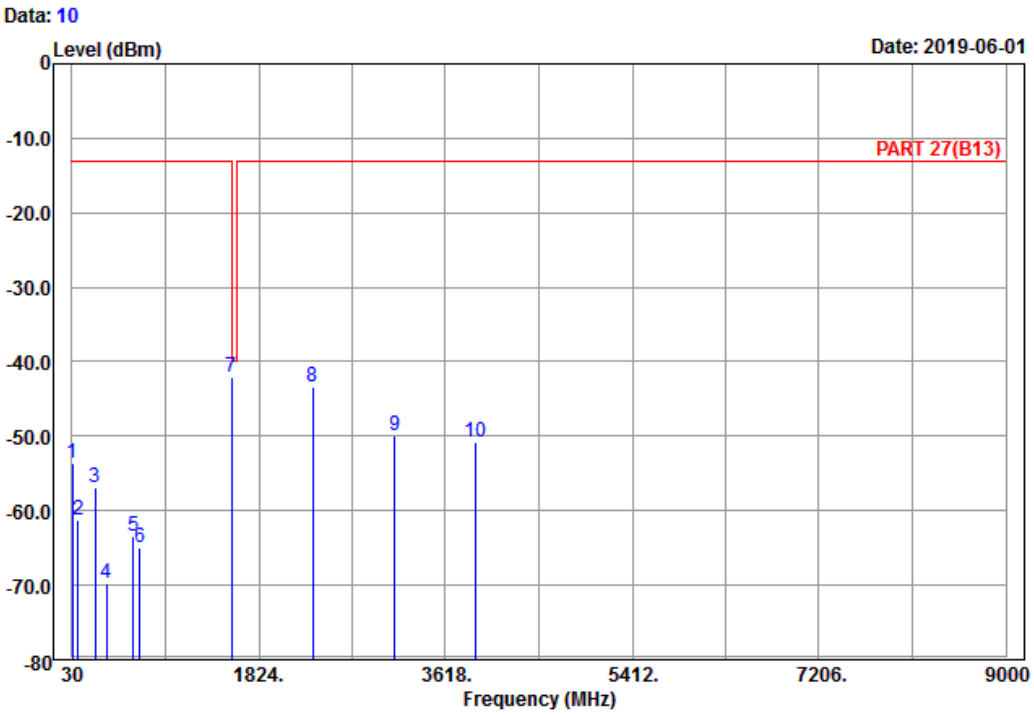
Channel Bandwidth: 10 MHz / QPSK
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B13) Horizontal
Remark : LTE_Band 13_Link_CH23230
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	155.82	-59.54	-51.76	-7.78	-13.00	-46.54	Peak
2	211.44	-56.37	-50.34	-6.03	-13.00	-43.37	Peak
3	259.77	-56.35	-50.75	-5.60	-13.00	-43.35	Peak
4	317.50	-68.08	-62.32	-5.76	-13.00	-55.08	Peak
5	563.20	-68.30	-67.20	-1.10	-13.00	-55.30	Peak
6	630.40	-67.67	-67.76	0.09	-13.00	-54.67	Peak
7 pp	1564.00	-48.30	-55.16	6.86	-40.00	-8.30	Peak
8	2346.00	-46.95	-57.89	10.94	-13.00	-33.95	Peak



Site : 966 chamber 1
Condition: PART 27(B13) Vertical
Remark : LTE_Band 13_Link_CH23230
Tested by: Karl Lee

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
		MHz	dBm	dBm	dB	dBm	dB	
1		31.62	-53.67	-42.91	-10.76	-13.00	-40.67	Peak
2		92.10	-61.17	-50.61	-10.56	-13.00	-48.17	Peak
3		252.21	-56.93	-51.41	-5.52	-13.00	-43.93	Peak
4		360.90	-69.67	-64.86	-4.81	-13.00	-56.67	Peak
5		622.00	-63.39	-63.57	0.18	-13.00	-50.39	Peak
6		678.00	-64.98	-64.71	-0.27	-13.00	-51.98	Peak
7	pp	1564.00	-42.17	-49.03	6.86	-40.00	-2.17	Peak
8		2346.00	-43.28	-54.22	10.94	-13.00	-30.28	Peak
9		3128.00	-49.89	-63.41	13.52	-13.00	-36.89	Peak
10		3910.00	-50.83	-67.77	16.94	-13.00	-37.83	Peak

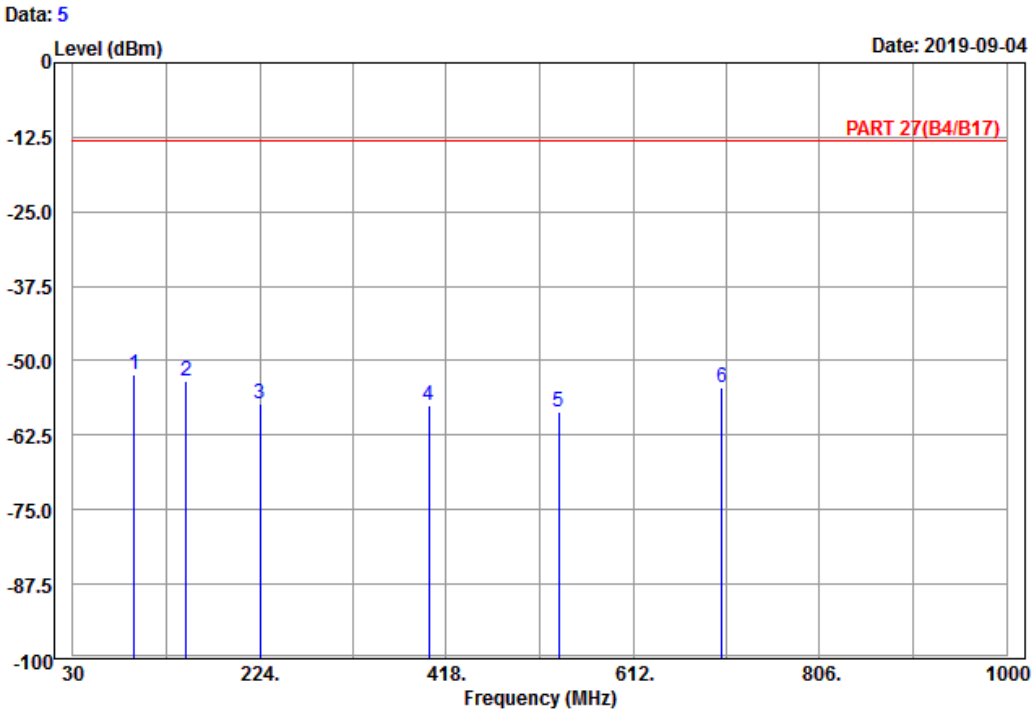
Mode B

LTE Band 4

Channel Bandwidth: 20 MHz / QPSK

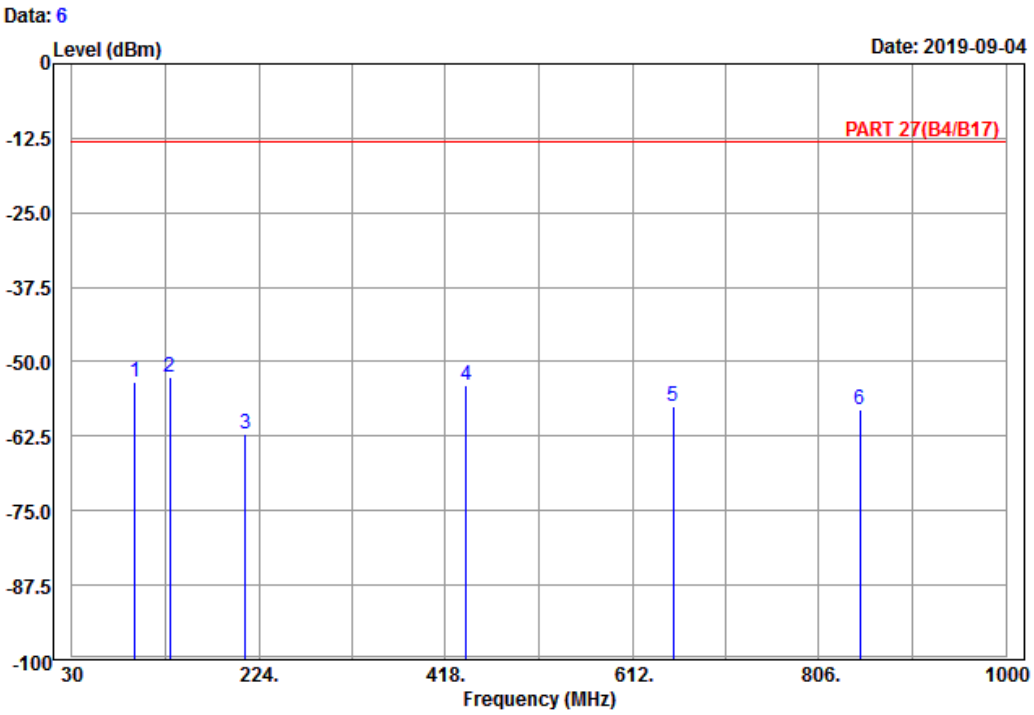
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : LTE_Band 4_Link_CH20175
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	93.99	-52.28	-41.83	-13.00	-39.28	-10.45	Peak
2	147.99	-53.33	-45.43	-13.00	-40.33	-7.90	Peak
3	224.40	-57.25	-51.39	-13.00	-44.25	-5.86	Peak
4	400.10	-57.60	-54.84	-13.00	-44.60	-2.76	Peak
5	535.20	-58.53	-55.80	-13.00	-45.53	-2.73	Peak
6	704.60	-54.61	-54.16	-13.00	-41.61	-0.45	Peak

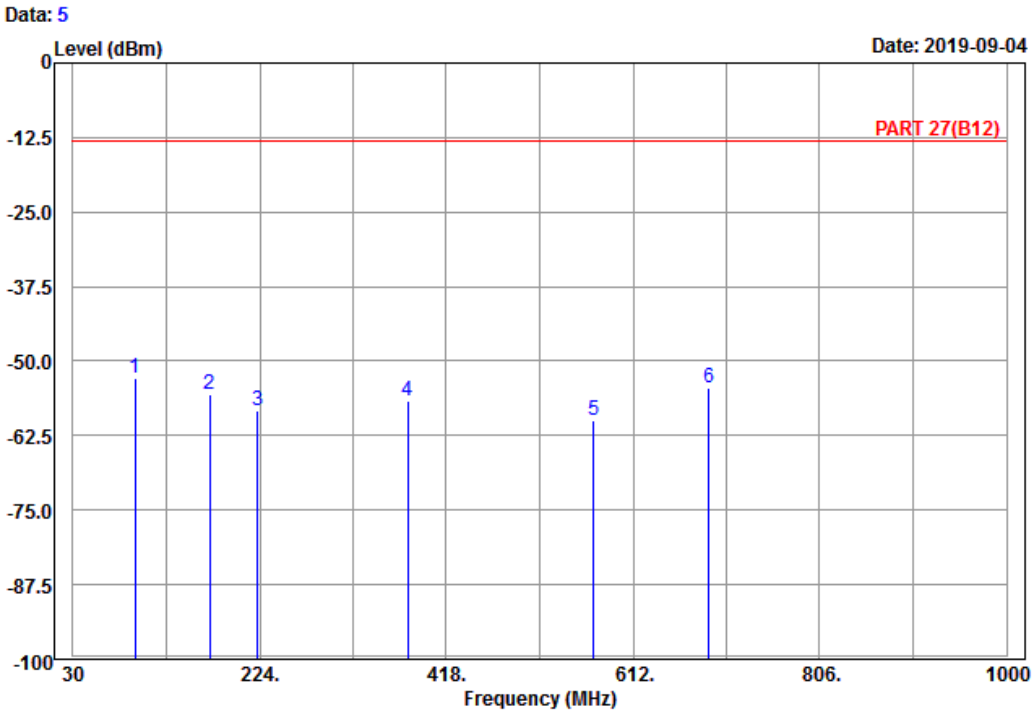


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH20175
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	95.61	-53.38	-43.04	-13.00	-40.38	-10.34	Peak
2 pp	131.79	-52.49	-44.83	-13.00	-39.49	-7.66	Peak
3	210.09	-62.13	-56.09	-13.00	-49.13	-6.04	Peak
4	439.30	-54.02	-50.41	-13.00	-41.02	-3.61	Peak
5	654.90	-57.55	-57.39	-13.00	-44.55	-0.16	Peak
6	848.80	-58.06	-59.52	-13.00	-45.06	1.46	Peak

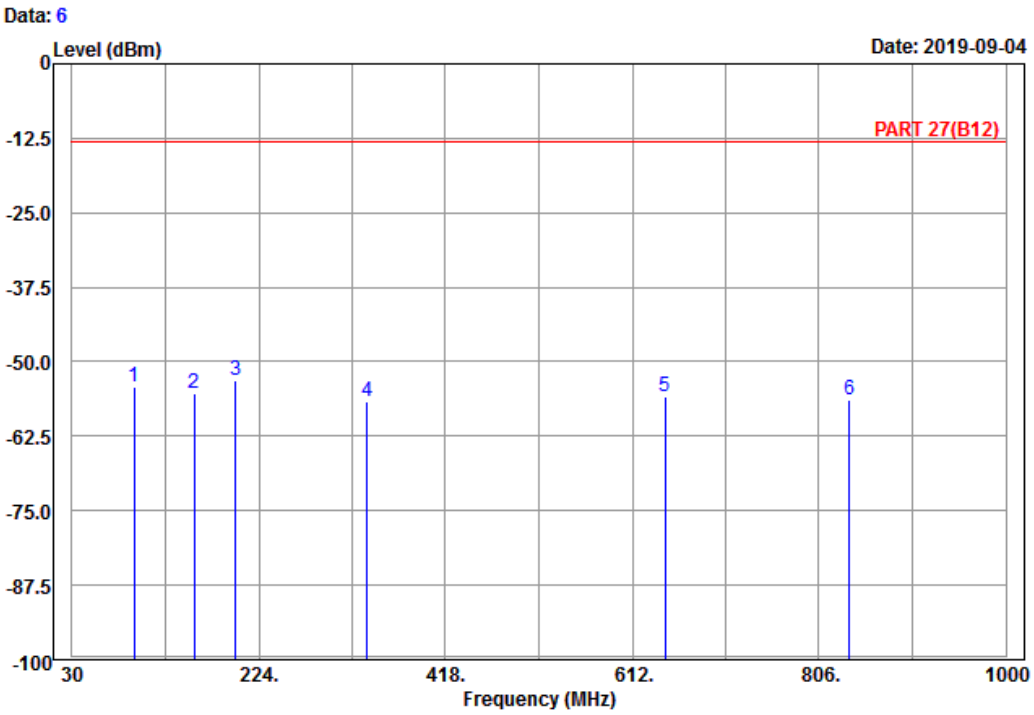
LTE Band 12
Channel Bandwidth: 10 MHz / QPSK
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B12) Horizontal
Remark : LTE_Band 12_Link_CH23130
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	94.80	-52.99	-42.59	-13.00	-39.99	-10.40	Peak
2	172.29	-55.63	-49.23	-13.00	-42.63	-6.40	Peak
3	221.97	-58.35	-52.47	-13.00	-45.35	-5.88	Peak
4	377.70	-56.75	-52.82	-13.00	-43.75	-3.93	Peak
5	570.90	-59.96	-59.18	-13.00	-46.96	-0.78	Peak
6	690.60	-54.44	-54.11	-13.00	-41.44	-0.33	Peak

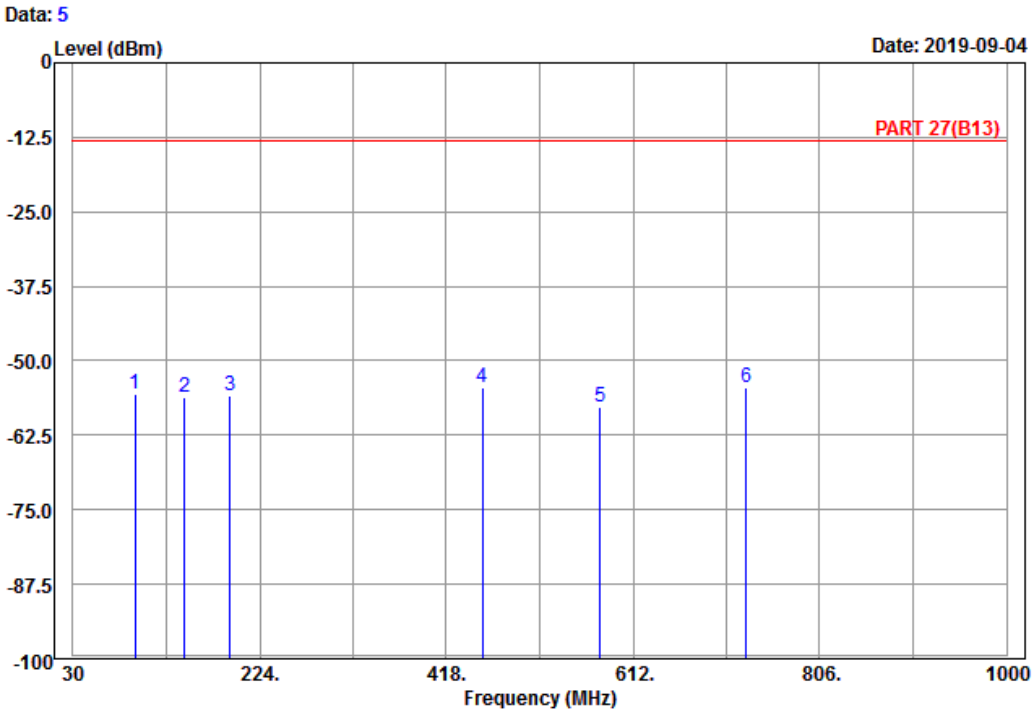


Site : 966 chamber 1
Condition: PART 27(B12) Vertical
Remark : LTE_Band 12_Link_CH23130
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	94.53	-54.22	-43.82	-13.00	-41.22	-10.40	Peak
2	156.90	-55.40	-47.65	-13.00	-42.40	-7.75	Peak
3 pp	199.83	-53.26	-47.08	-13.00	-40.26	-6.18	Peak
4	336.40	-56.64	-51.11	-13.00	-43.64	-5.53	Peak
5	645.80	-55.83	-55.74	-13.00	-42.83	-0.09	Peak
6	837.60	-56.50	-58.08	-13.00	-43.50	1.58	Peak

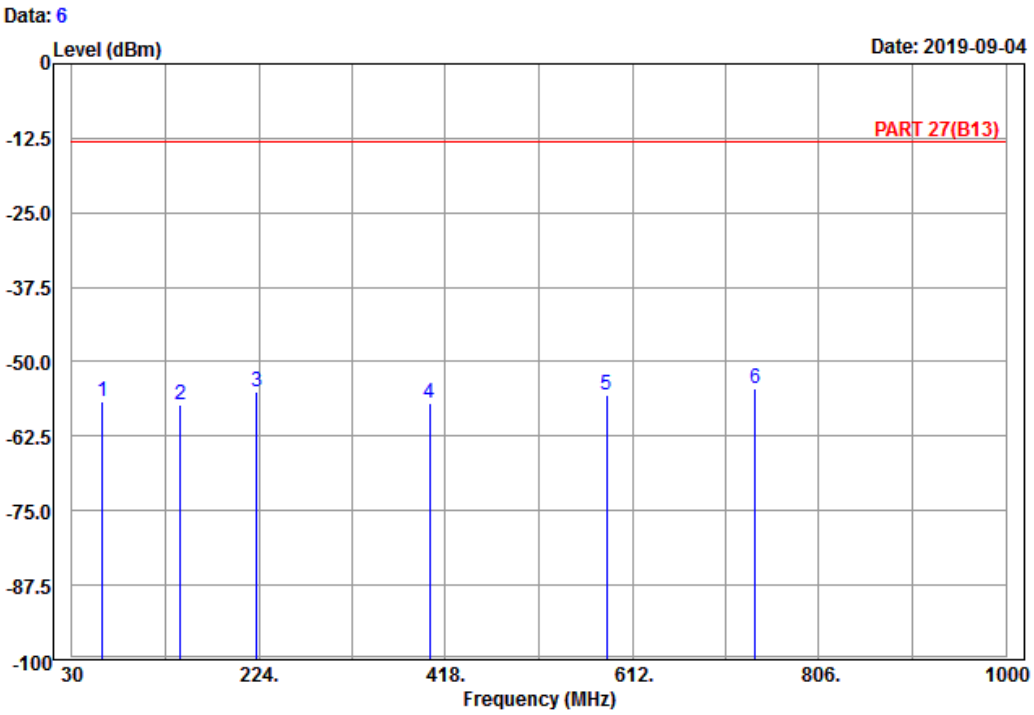
LTE Band 13
Channel Bandwidth: 10 MHz / QPSK
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B13) Horizontal
Remark : LTE_Band 13_Link_CH23230
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	94.80	-55.54	-45.14	-13.00	-42.54	-10.40	Peak
2	145.56	-56.05	-48.22	-13.00	-43.05	-7.83	Peak
3	193.08	-55.73	-49.86	-13.00	-42.73	-5.87	Peak
4	455.40	-54.54	-50.53	-13.00	-41.54	-4.01	Peak
5	577.90	-57.89	-57.39	-13.00	-44.89	-0.50	Peak
6 pp	729.80	-54.39	-53.46	-13.00	-41.39	-0.93	Peak



Site : 966 chamber 1
Condition: PART 27(B13) Vertical
Remark : LTE_Band 13_Link_CH23230
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	61.32	-56.79	-42.86	-13.00	-43.79	-13.93	Peak
2	142.59	-57.30	-49.54	-13.00	-44.30	-7.76	Peak
3	221.70	-54.95	-49.07	-13.00	-41.95	-5.88	Peak
4	401.50	-57.08	-54.30	-13.00	-44.08	-2.78	Peak
5	585.60	-55.65	-55.47	-13.00	-42.65	-0.18	Peak
6 pp	739.60	-54.40	-53.27	-13.00	-41.40	-1.13	Peak

5 Pictures of Test Arrangements

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

Appendix – Information of the Testing Laboratories

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

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

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Fax: 886-2-26051924

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Fax: 886-3-6668323

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Tel: 886-3-3183232
Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

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