FCC Test Report

(PART 27)

Report No.:	RF181008C16-2
FCC ID:	NKRUMC-9628FHN
Test Model:	UMC-9628FHN
Received Date:	Oct. 08, 2018
Test Date:	Oct. 24, 2018 ~ Oct. 27, 2018
Issued Date:	Nov. 14, 2018
Applicant:	Wistron NeWeb Corporation
Address:	20 Park Ave. II, Hsinchu Science Park,Hsinchu 308, Taiwan
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C)
Test Location:	No. 19, Hwa Ya 2nd Rd, Wen Hwa Vil, Kwei Shan Dist., Taoyuan City 33383, Taiwan (R.O.C)
FCC Registration / Designation Number:	788550 / TW0003

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RF181008C16-2	Original Release	Nov. 14, 2018

1 Certificate of Conformity

Product:	LTE Module
Brand:	Wistron NeWeb Corp.
Test Model:	UMC-9628FHN
Sample Status:	Identical Prototype
Applicant:	Wistron NeWeb Corporation
Test Date:	Oct. 24, 2018 ~ Oct. 27, 2018
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 : Gina Liu , **Date:** Nov. 14, 2018

Gina Liu / Specialist

Approved by : , **Date:** Nov. 14, 2018

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 27.53(h)	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 -31.04 dB at 590.66 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.
27.50(d)(5)	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 -29.84 dB at 1408.00 MHz.

Applied Standard: FCC Part 27 & Part 2 (LTE 17)			
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 27.53(g)	Occupied Bandwidth	Pass	Meet the requirement of limit.
27.50(d)(5)	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 -30.60 dB at 572.23 MHz.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	30 MHz ~ 200 MHz	2.93 dB
	200 MHz ~ 1000 MHz	2.95 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	2.26 dB
	18 GHz ~ 40 GHz	1.94 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent	N9038A	MY51210203	Mar. 16, 2018	Mar. 15, 2019
Spectrum Analyzer Agilent	N9010A	MY52220314	Nov. 24, 2017	Nov. 23, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Jan. 11, 2018	Jan. 10, 2019
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Dec. 12, 2017	Dec. 11, 2018
HORN Antenna SCHWARZBECK	BBHA 9170	148	Dec. 13, 2017	Dec. 12, 2018
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Dec. 06, 2017	Dec. 05, 2018
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 16, 2018	Apr. 15, 2019
MXG Vector signal generator Agilent	N5182B	MY53050162	Jan. 10, 2018	Jan. 09, 2019
Preamplifier EMCI	EMC 184045	980116	Oct. 12, 2018	Oct. 11, 2019
Preamplifier EMCI	EMC 012645	980115	Oct. 12, 2018	Oct. 11, 2019
Preamplifier EMCI	EMC 330H	980112	Oct. 12, 2018	Oct. 11, 2019
RF Coaxial Cable HUBER+SUHNNER	EMC104-SM-SM-8000&3000	140811+170717	Oct. 12, 2018	Oct. 11, 2019
RF Coaxial Cable HUBER+SUHNNER	SUCOFLEX 104	EMC104-SM-SM-1000(140807)	Oct. 12, 2018	Oct. 11, 2019
RF Coaxial Cable Worken	8D-FB	Cable-Ch10-01	Oct. 12, 2018	Oct. 11, 2019
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower &Turn Table Controller MF	MF-7802	NA	NA	NA
Radio Communication Analyzer Anritsu	MT8820C	6201300640	Aug. 16, 2017	Aug. 15, 2019
Temperature & Humidity Chamber	GTH-120-40-CP-AR	MAA1306-019	Sep. 05, 2018	Sep. 04, 2019
DC Power Supply Topward	33010D	807748	N/A	N/A

Note:
1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 10.
3. The horn antenna and preamplifier (model: EMC 184045) are used only for the measurement of emission frequency above 1 GHz if tested.
4. The IC Site Registration No. is 7450F-10.

3 General Information

3.1 General Description of EUT

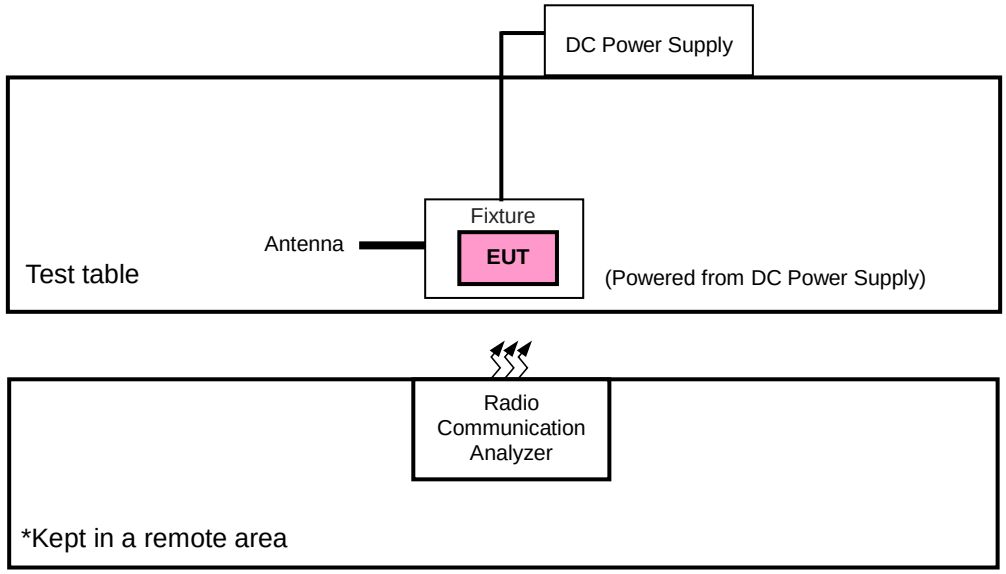
Product	LTE Module	
Brand	Wistron NeWeb Corp.	
Test Model	UMC-9628FHN	
Status of EUT	Identical Prototype	
Power Supply Rating	3.8 Vdc (DC Power Supply)	
Modulation Type	LTE	QPSK, 16QAM, 64QAM
Frequency Range	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	1710.7 ~ 1754.3 MHz
	LTE Band 4 (Channel Bandwidth: 3 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 17 (Channel Bandwidth: 5 MHz)	706.5 ~ 713.5 MHz
	LTE Band 17 (Channel Bandwidth: 10 MHz)	709.0 ~ 711.0 MHz
Emission Designator	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	1M08W7D
	LTE Band 4 (Channel Bandwidth: 3 MHz)	2M70W7D
	LTE Band 4 (Channel Bandwidth: 5 MHz)	4M49W7D
	LTE Band 4 (Channel Bandwidth: 10 MHz)	8M95W7D
	LTE Band 4 (Channel Bandwidth: 15 MHz)	13M4G7D
	LTE Band 4 (Channel Bandwidth: 20 MHz)	17M8W7D
	LTE Band 12 (Channel Bandwidth: 1.4 MHz)	1M09W7D
	LTE Band 12 (Channel Bandwidth: 3 MHz)	2M70W7D
	LTE Band 12 (Channel Bandwidth: 5 MHz)	4M50W7D
	LTE Band 12 (Channel Bandwidth: 10 MHz)	8M97W7D
	LTE Band 17 (Channel Bandwidth: 5 MHz)	4M49W7D
	LTE Band 17 (Channel Bandwidth: 10 MHz)	8M93W7D
Max. ERP Power	LTE Band 12 (Channel Bandwidth: 1.4 MHz)	208.45 mW
	LTE Band 12 (Channel Bandwidth: 3 MHz)	220.29 mW
	LTE Band 12 (Channel Bandwidth: 5 MHz)	233.88 mW
	LTE Band 12 (Channel Bandwidth: 10 MHz)	246.60 mW
	LTE Band 17 (Channel Bandwidth: 5 MHz)	267.92 mW
	LTE Band 17 (Channel Bandwidth: 10 MHz)	288.40 mW
Max. EIRP Power	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	283.79 mW
	LTE Band 4 (Channel Bandwidth: 3 MHz)	299.92 mW
	LTE Band 4 (Channel Bandwidth: 5 MHz)	317.69 mW
	LTE Band 4 (Channel Bandwidth: 10 MHz)	334.97 mW
	LTE Band 4 (Channel Bandwidth: 15 MHz)	355.63 mW
	LTE Band 4 (Channel Bandwidth: 20 MHz)	375.84 mW

Antenna Type	Fixed External Antenna	
Antenna Gain	LTE Band 4	3.6 dBi
	LTE Band 12	1.5 dBi
	LTE Band 17	1.5 dBi
Accessory Device	N/A	
Data Cable Supplied	N/A	

Note:

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

3.2 Configuration of System under Test



3.2.1 Description of Support Units

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

No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	Radio Communication Analyzer	Anritsu	MT8820C	6201300640	N/A
2.	Antenna	N/A	N/A	N/A	N/A
3.	DC Power Supply	Topward	33010D	807748	

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

Note:

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

3.3 Test Mode Applicability and Tested Channel Detail

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

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

Band	ERP / EIRP	Radiated Emission
LTE Band 4	Z-plane	Z-axis
LTE Band 12	X-plane	X-axis
LTE Band 17	X-plane	X-axis

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, 64QAM	1 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Modulation Characteristics	20050 to 20300	20175	5 MHz	QPSK, 16QAM, 64QAM	1 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, 64QAM	6 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK, 16QAM, 64QAM	15 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK, 16QAM, 64QAM	75 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK, 16QAM, 64QAM	100 RB / 0 RB Offset

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

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Peak to Average Ratio	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	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
-	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

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

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, 64QAM	1 RB / 0 RB Offset
		23025 to 23165	23025, 23095, 23165	3 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23035 to 23155	23035, 23095, 23155	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23060 to 23130	23060, 23095, 23130	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Modulation Characteristics	23060 to 23130	23095	5 MHz	QPSK, 16QAM, 64QAM	1 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, 64QAM	6 RB / 0 RB Offset
		23025 to 23165	23025, 23095, 23165	3 MHz	QPSK, 16QAM, 64QAM	15 RB / 0 RB Offset
		23035 to 23155	23035, 23095, 23155	5 MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		23060 to 23130	23060, 23095, 23130	10 MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
-	Peak to Average Ratio	23017 to 23173	23017, 23095, 23173	1.4 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23025 to 23165	23025, 23095, 23165	3 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23035 to 23155	23035, 23095, 23155	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23060 to 23130	23060, 23095, 23130	10 MHz	QPSK, 16QAM, 64QAM	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

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

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	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
-	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

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

LTE Band 17

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	23755 to 23825	23755, 23790, 23825	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23780 to 23800	23780, 23790, 23800	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Modulation Characteristics	23780 to 23800	23790	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Frequency Stability	23755 to 23825	23755, 23825	5 MHz	QPSK	1 RB / 0 RB Offset
		23780 to 23800	23780, 23800	10 MHz	QPSK	1 RB / 0 RB Offset
-	Occupied Bandwidth	23755 to 23825	23755, 23790, 23825	5 MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		23780 to 23800	23780, 23790, 23800	10 MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
-	Peak to Average Ratio	23755 to 23825	23755, 23790, 23825	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 12 RB Offset
		23780 to 23800	23780, 23790, 23800	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 24 RB Offset
-	Band Edge	23755 to 23825	23755	5 MHz	QPSK	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			23825	5 MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		23780 to 23800	23780	10 MHz	QPSK	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			23800	10 MHz	QPSK	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
-	Conducted Emission	23755 to 23825	23755, 23790, 23825	5 MHz	QPSK	1 RB / 0 RB Offset
		23780 to 23800	23780, 23790, 23800	10 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission	23755 to 23825	23755, 23790, 23825	5 MHz	QPSK	1 RB / 0 RB Offset
		23780 to 23800	23780, 23790, 23800	10 MHz	QPSK	1 RB / 0 RB Offset

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

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP / EIRP	25 deg. C, 65 % RH	3.8 Vdc	Thomas Wei
Modulation Characteristics	25 deg. C, 65 % RH	3.8 Vdc	Gavin Wu
Frequency Stability	25 deg. C, 65 % RH	3.8 Vdc	Gavin Wu
Occupied Bandwidth	25 deg. C, 65 % RH	3.8 Vdc	Gavin Wu
Band Edge	25 deg. C, 65 % RH	3.8 Vdc	Gavin Wu
Peak to Average Ratio	25 deg. C, 65 % RH	3.8 Vdc	Gavin Wu
Conducted Emission	25 deg. C, 65 % RH	3.8 Vdc	Gavin Wu
Radiated Emission	25 deg. C, 65 % RH	3.8 Vdc	Thomas Wei

3.4 EUT Operating Conditions

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

3.5 General Description of Applied Standards

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

FCC 47 CFR Part 2
FCC 47 CFR Part 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:

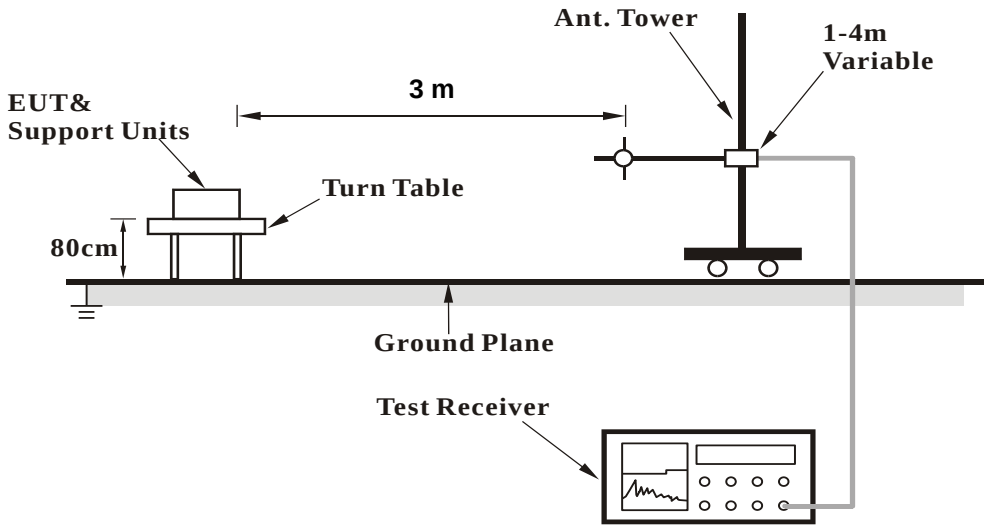
a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 10 MHz for LTE mode.
b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) height of Turn Table, 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:

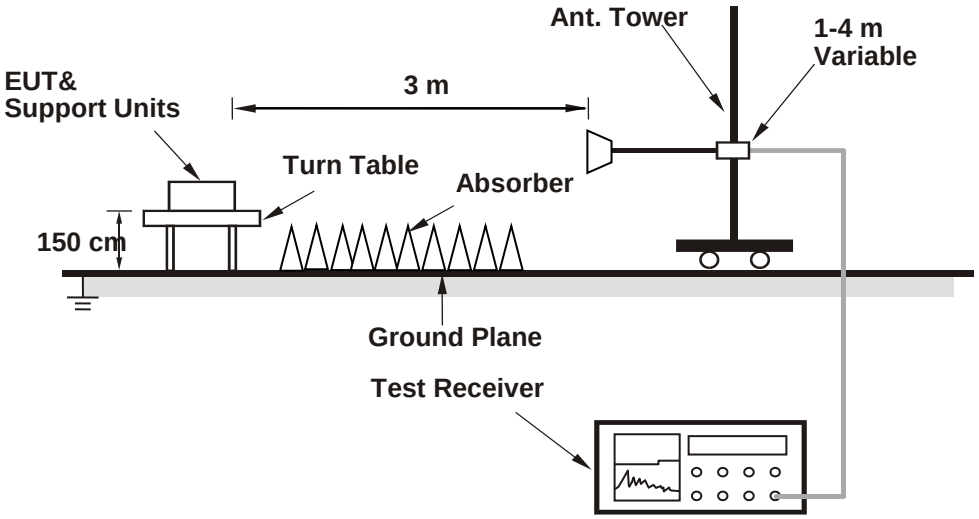
a. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
b. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

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)

LTE Band 4															
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		20050	20175	20300				Channel		20025	20175	20325	
		Frequency (MHz)		1720.0	1732.5	1745.0				Frequency (MHz)		1717.5	1732.5	1747.5	
20M	QPSK	1	0	23.31	23.79	24.01	0	15M	QPSK	1	0	23.28	23.71	23.98	0
		1	50	23.17	23.70	23.85	0			1	37	23.11	23.60	23.86	0
		1	99	22.95	23.48	23.78	0			1	74	23.07	23.39	23.58	0
		50	0	22.18	22.65	22.87	1			36	0	22.11	22.62	22.78	1
		50	25	21.96	22.43	22.65	1			36	19	21.95	22.40	22.60	1
		50	50	21.95	22.38	22.55	1			36	39	21.88	22.29	22.51	1
		100	0	22.18	22.59	22.87	1			75	0	22.16	22.50	22.73	1
	16QAM	1	0	22.23	22.70	22.97	1		16QAM	1	0	22.09	22.62	22.79	1
		1	50	22.10	22.62	22.83	1			1	37	22.09	22.53	22.82	1
		1	99	21.98	22.34	22.63	1			1	74	21.86	22.42	22.63	1
		50	0	21.15	21.53	21.71	2			36	0	20.99	21.56	21.58	2
		50	25	20.96	21.40	21.57	2			36	19	20.87	21.34	21.54	2
		50	50	20.91	21.26	21.47	2			36	39	20.73	21.18	21.43	2
		100	0	21.06	21.50	21.76	2			75	0	21.07	21.65	21.77	2
	64QAM	1	0	21.26	21.71	21.91	2		64QAM	1	0	21.15	21.57	21.80	2
		1	50	21.08	21.54	21.86	2			1	37	21.03	21.40	21.71	2
		1	99	20.93	21.36	21.51	2			1	74	20.96	21.39	21.65	2
		50	0	19.97	20.26	20.61	3			36	0	20.02	20.35	20.69	3
		50	25	19.92	20.35	20.47	3			36	19	19.84	20.35	20.54	3
		50	50	19.76	20.24	20.43	3			36	39	19.77	20.18	20.48	3
		100	0	20.07	20.60	20.78	3			75	0	20.13	20.53	20.67	3
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		20000	20175	20350				Channel		19975	20175	20375	
		Frequency (MHz)		1715.0	1732.5	1750.0				Frequency (MHz)		1712.5	1732.5	1752.5	
10M	QPSK	1	0	23.21	23.71	23.89	0	5M	QPSK	1	0	23.13	23.62	23.85	0
		1	24	23.01	23.54	23.74	0			1	12	23.06	23.46	23.67	0
		1	49	22.92	23.37	23.62	0			1	24	22.77	23.34	23.51	0
		25	0	22.12	22.48	22.76	1			12	0	22.03	22.51	22.80	1
		25	12	21.93	22.38	22.62	1			12	6	21.86	22.33	22.54	1
		25	25	21.89	22.26	22.49	1			12	13	21.78	22.29	22.48	1
		50	0	22.10	22.52	22.64	1			25	0	21.98	22.50	22.71	1
	16QAM	1	0	22.06	22.50	22.76	1		16QAM	1	0	21.85	22.41	22.63	1
		1	24	22.03	22.45	22.72	1			1	12	22.05	22.49	22.67	1
		1	49	21.97	22.22	22.58	1			1	24	21.81	22.36	22.43	1
		25	0	20.88	21.38	21.61	2			12	0	21.08	21.24	21.50	2
		25	12	20.81	21.27	21.51	2			12	6	20.78	21.19	21.45	2
		25	25	20.73	21.25	21.39	2			12	13	20.68	21.17	21.40	2
		50	0	21.03	21.47	21.61	2			25	0	20.90	21.46	21.54	2
	64QAM	1	0	21.10	21.60	21.79	2		64QAM	1	0	21.01	21.64	21.80	2
		1	24	20.96	21.46	21.62	2			1	12	20.97	21.36	21.62	2
		1	49	20.87	21.35	21.51	2			1	24	20.77	21.30	21.50	2
		25	0	19.85	20.48	20.50	3			12	0	19.76	20.40	20.61	3
		25	12	19.68	20.30	20.37	3			12	6	19.66	20.20	20.51	3
		25	25	19.70	20.12	20.35	3			12	13	19.69	20.17	20.34	3
		50	0	19.92	20.50	20.63	3			25	0	19.68	20.20	20.36	3
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		19965	20175	20385				Channel		19957	20175	20393	
		Frequency (MHz)		1711.5	1732.5	1753.5				Frequency (MHz)		1710.7	1732.5	1754.3	
3M	QPSK	1	0	23.10	23.56	23.76	0	1.4M	QPSK	1	0	23.00	23.62	23.72	0
		1	7	22.91	23.38	23.69	0			1	2	22.98	23.33	23.66	0
		1	14	22.76	23.23	23.41	0			1	5	22.63	23.10	23.48	0
		8	0	21.97	22.45	22.59	1			3	0	21.95	22.40	22.63	0
		8	3	21.81	22.27	22.42	1			3	1	21.68	22.27	22.50	0
		8	7	21.82	22.13	22.34	1			3	3	21.64	22.12	22.34	0
		15	0	21.98	22.42	22.65	1			6	0	21.80	22.35	22.63	1
	16QAM	1	0	21.70	22.26	22.46	1		16QAM	1	0	21.97	22.51	22.71	1
		1	7	21.90	22.30	22.61	1			1	2	21.82	22.34	22.46	1
		1	14	21.72	22.23	22.44	1			1	5	21.73	22.27	22.33	1
		8	0	20.87	21.27	21.51	2			3	0	20.76	21.26	21.57	1
		8	3	20.75	21.09	21.46	2			3	1	20.61	21.05	21.42	1
		8	7	20.65	21.15	21.32	2			3	3	20.52	21.02	21.43	1
		15	0	20.77	21.35	21.66	2			6	0	20.89	21.31	21.51	2
	64QAM	1	0	21.02	21.39	21.66	2		64QAM	1	0	20.88	21.46	21.61	2
		1	7	20.81	21.41	21.59	2			1	2	20.84	21.37	21.57	2
		1	14	20.82	21.21	21.47	2			1	5	20.78	21.31	21.57	2
		8	0	19.72	20.29	20.54	3			3	0	20.70	21.23	21.45	2
		8	3	19.60	20.07	20.38	3			3	1	20.67	21.19	21.49	2
		8	7	19.49	20.10	20.39	3			3	3	20.54	21.22	21.39	2
		15	0	19.70	20.14	20.39	3			6	0	19.79	20.19	20.47	3

LTE Band 12

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		23060	23095	23130				Channel		23035	23095	23155	
		Frequency (MHz)		704.0	707.5	711.0				Frequency (MHz)		701.5	707.5	713.5	
10M	QPSK	1	0	23.88	23.51	23.54	0	5M	QPSK	1	0	23.68	23.35	23.38	0
		1	24	23.65	23.31	23.27	0			1	12	23.58	23.27	23.24	0
		1	49	23.45	23.16	23.01	0			1	24	23.40	23.13	23.13	0
		25	0	22.64	22.31	22.38	1			12	0	22.53	22.17	22.23	1
		25	12	22.39	22.11	22.14	1			12	6	22.37	22.01	22.11	1
		25	25	22.34	22.02	22.06	1			12	13	22.27	21.81	21.98	1
		50	0	22.53	22.22	22.25	1			25	0	22.62	22.07	22.27	1
	16QAM	1	0	22.63	22.26	22.18	1		16QAM	1	0	22.50	22.07	22.06	1
		1	24	22.59	22.18	22.28	1			1	12	22.53	22.20	22.20	1
		1	49	22.43	22.05	22.18	1			1	24	22.40	21.95	21.99	1
		25	0	21.37	21.12	21.18	2			12	0	21.30	21.14	20.94	2
		25	12	21.34	21.03	21.02	2			12	6	21.37	20.99	20.93	2
		25	25	21.20	20.86	20.83	2			12	13	21.16	21.00	20.90	2
		50	0	21.65	21.16	21.18	2			25	0	21.57	21.13	21.16	2
	64QAM	1	0	21.72	21.28	21.36	2		64QAM	1	0	21.58	21.21	21.32	2
		1	24	21.57	21.12	21.23	2			1	12	21.52	21.19	21.27	2
		1	49	21.37	20.93	21.07	2			1	24	21.32	20.99	20.84	2
		25	0	20.38	20.14	20.10	3			12	0	20.49	19.84	19.99	3
		25	12	20.40	19.86	20.01	3			12	6	20.30	19.90	19.90	3
		25	25	20.22	19.89	19.94	3			12	13	20.25	19.70	19.89	3
		50	0	20.47	20.11	20.08	3			25	0	20.38	19.93	19.92	3

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		23025	23095	23165				Channel		23017	23095	23173	
		Frequency (MHz)		700.5	707.5	714.5				Frequency (MHz)		699.7	707.5	715.3	
3M	QPSK	1	0	23.69	23.29	23.31	0	1.4M	QPSK	1	0	23.57	23.23	23.31	0
		1	7	23.50	23.19	23.10	0			1	2	23.53	23.12	23.11	0
		1	14	23.35	22.97	22.93	0			1	5	23.34	22.99	22.98	0
		8	0	22.50	22.12	22.20	1			3	0	22.54	22.03	22.10	0
		8	3	22.33	21.99	22.07	1			3	1	22.30	21.85	21.95	0
		8	7	22.23	21.85	21.86	1			3	3	22.19	21.82	21.87	0
		15	0	22.44	22.14	22.25	1			6	0	22.46	22.03	22.18	1
	16QAM	1	0	22.35	21.93	22.07	1		16QAM	1	0	22.47	22.24	22.23	1
		1	7	22.56	22.13	22.17	1			1	2	22.47	22.06	22.03	1
		1	14	22.42	21.98	22.01	1			1	5	22.26	21.93	21.94	1
		8	0	21.36	21.07	20.88	2			3	0	21.43	21.05	21.18	1
		8	3	21.34	21.00	20.90	2			3	1	21.21	20.80	20.81	1
		8	7	21.29	20.96	20.79	2			3	3	21.21	20.78	20.76	1
		15	0	21.46	21.15	21.23	2			6	0	21.36	20.97	21.01	2
	64QAM	1	0	21.58	21.28	21.15	2		64QAM	1	0	21.53	21.12	21.16	2
		1	7	21.52	21.07	21.07	2			1	2	21.54	21.11	21.16	2
		1	14	21.21	20.91	20.89	2			1	5	21.45	20.96	20.98	2
		8	0	20.27	19.87	19.96	3			3	0	21.41	20.89	20.99	2
		8	3	20.27	19.84	19.87	3			3	1	21.34	20.91	20.85	2
		8	7	20.23	19.76	19.77	3			3	3	21.26	20.82	20.77	2
		15	0	20.29	20.06	19.74	3			6	0	20.35	20.11	19.99	3

LTE Band 17

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		23780	23790	23800				Channel		23755	23790	23825	
		Frequency (MHz)		709.0	710.0	711.0				Frequency (MHz)		706.5	710.0	713.5	
10M	QPSK	1	0	24.05	23.85	23.92	0	5M	QPSK	1	0	23.89	23.72	23.74	0
		1	24	24.01	23.71	23.82	0			1	12	23.80	23.54	23.68	0
		1	49	23.69	23.57	23.79	0			1	24	23.70	23.40	23.45	0
		25	0	22.98	22.75	22.88	1			12	0	22.79	22.62	22.61	1
		25	12	22.79	22.50	22.71	1			12	6	22.59	22.37	22.43	1
		25	25	22.71	22.44	22.57	1			12	13	22.48	22.29	22.36	1
		50	0	22.94	22.75	22.77	1			25	0	22.60	22.64	22.72	1
	16QAM	1	0	22.97	22.75	22.85	1		16QAM	1	0	22.87	22.62	22.85	1
		1	24	22.91	22.67	22.83	1			1	12	22.80	22.53	22.69	1
		1	49	22.70	22.54	22.60	1			1	24	22.47	22.32	22.49	1
		25	0	21.77	21.56	21.76	2			12	0	21.71	21.52	21.60	2
		25	12	21.64	21.49	21.60	2			12	6	21.52	21.35	21.52	2
		25	25	21.50	21.44	21.51	2			12	13	21.52	21.28	21.32	2
		50	0	21.82	21.66	21.83	2			25	0	21.72	21.55	21.66	2
	64QAM	1	0	21.91	21.77	21.89	2		64QAM	1	0	21.83	21.68	21.77	2
		1	24	21.95	21.68	21.75	2			1	12	21.75	21.55	21.66	2
		1	49	21.73	21.41	21.54	2			1	24	21.42	21.38	21.51	2
		25	0	20.83	20.73	20.83	3			12	0	20.63	20.37	20.48	3
		25	12	20.61	20.39	20.59	3			12	6	20.44	20.28	20.46	3
		25	25	20.65	20.28	20.45	3			12	13	20.50	20.10	20.31	3
		50	0	20.74	20.65	20.74	3			25	0	20.64	20.61	20.54	3

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)**
X	23017	699.7	-5.02	30.36	23.19	208.45	H
	23095	707.5	-4.92	30.17	23.10	204.17	
	23173	715.3	-5.03	30.17	22.99	199.07	
	23017	699.7	-12.09	32.03	17.79	60.12	V
	23095	707.5	-12.40	31.98	17.43	55.34	
	23173	715.3	-12.66	32.06	17.25	53.09	
Channel Bandwidth: 1.4 MHz / 16QAM							
X	23017	699.7	-6.01	30.36	22.20	165.96	H
	23095	707.5	-5.91	30.17	22.11	162.55	
	23173	715.3	-6.02	30.17	22.00	158.49	
	23017	699.7	-13.08	32.03	16.80	47.86	V
	23095	707.5	-13.39	31.98	16.44	44.06	
	23173	715.3	-13.65	32.06	16.26	42.27	
Channel Bandwidth: 1.4 MHz / 64QAM							
X	23017	699.7	-7.01	30.36	21.20	131.83	H
	23095	707.5	-6.91	30.17	21.11	129.12	
	23173	715.3	-7.02	30.17	21.00	125.89	
	23017	699.7	-14.08	32.03	15.80	38.02	V
	23095	707.5	-14.39	31.98	15.44	34.99	
	23173	715.3	-14.65	32.06	15.26	33.57	

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)**
X	23025	700.5	-4.59	30.17	23.43	220.29	H
	23095	707.5	-4.68	30.17	23.34	215.77	
	23165	714.5	-4.80	30.18	23.23	210.38	
	23025	700.5	-11.78	31.96	18.03	63.53	V
	23095	707.5	-12.16	31.98	17.67	58.48	
	23165	714.5	-12.39	32.03	17.49	56.10	
Channel Bandwidth: 3 MHz / 16QAM							
X	23025	700.5	-5.58	30.17	22.44	175.39	H
	23095	707.5	-5.67	30.17	22.35	171.79	
	23165	714.5	-5.79	30.18	22.24	167.49	
	23025	700.5	-12.77	31.96	17.04	50.58	V
	23095	707.5	-13.15	31.98	16.68	46.56	
	23165	714.5	-13.38	32.03	16.50	44.67	
Channel Bandwidth: 3 MHz / 64QAM							
X	23025	700.5	-6.60	30.17	21.42	138.68	H
	23095	707.5	-6.69	30.17	21.33	135.83	
	23165	714.5	-6.81	30.18	21.22	132.43	
	23025	700.5	-13.79	31.96	16.02	39.99	V
	23095	707.5	-14.17	31.98	15.66	36.81	
	23165	714.5	-14.40	32.03	15.48	35.32	

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)**
X	23035	701.5	-4.33	30.17	23.69	233.88	H
	23095	707.5	-4.42	30.17	23.60	229.09	
	23155	713.5	-4.54	30.18	23.49	223.36	
	23035	701.5	-11.52	31.96	18.29	67.45	V
	23095	707.5	-11.90	31.98	17.93	62.09	
	23155	713.5	-12.13	32.03	17.75	59.57	
Channel Bandwidth: 5 MHz / 16QAM							
X	23035	701.5	-5.35	30.17	22.67	184.93	H
	23095	707.5	-5.44	30.17	22.58	181.13	
	23155	713.5	-5.56	30.18	22.47	176.60	
	23035	701.5	-12.54	31.96	17.27	53.33	V
	23095	707.5	-12.92	31.98	16.91	49.09	
	23155	713.5	-13.15	32.03	16.73	47.10	
Channel Bandwidth: 5 MHz / 64QAM							
X	23035	701.5	-6.37	30.17	21.65	146.22	H
	23095	707.5	-6.46	30.17	21.56	143.22	
	23155	713.5	-6.58	30.18	21.45	139.64	
	23035	701.5	-13.56	31.96	16.25	42.17	V
	23095	707.5	-13.94	31.98	15.89	38.82	
	23155	713.5	-14.17	32.03	15.71	37.24	

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)**
X	23060	704.0	-4.10	30.17	23.92	246.60	H
	23095	707.5	-4.19	30.17	23.83	241.55	
	23130	711.0	-4.31	30.18	23.72	235.50	
	23060	704.0	-11.29	31.96	18.52	71.12	V
	23095	707.5	-11.67	31.98	18.16	65.46	
	23130	711.0	-11.90	32.03	17.98	62.81	
Channel Bandwidth: 10 MHz / 16QAM							
X	23060	704.0	-5.11	30.17	22.91	195.43	H
	23095	707.5	-5.20	30.17	22.82	191.43	
	23130	711.0	-5.32	30.18	22.71	186.64	
	23060	704.0	-12.30	31.96	17.51	56.36	V
	23095	707.5	-12.68	31.98	17.15	51.88	
	23130	711.0	-12.91	32.03	16.97	49.77	
Channel Bandwidth: 10 MHz / 64QAM							
X	23060	704.0	-6.13	30.17	21.89	154.53	H
	23095	707.5	-6.22	30.17	21.80	151.36	
	23130	711.0	-6.34	30.18	21.69	147.57	
	23060	704.0	-13.32	31.96	16.49	44.57	V
	23095	707.5	-13.70	31.98	16.13	41.02	
	23130	711.0	-13.93	32.03	15.95	39.36	

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

LTE Band 17							
Channel Bandwidth: 5 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**Reading (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (mW)**	**Polarization (H/V)**
X	23755	706.5	-4.16	30.36	24.05	254.10	H
	23790	710.0	-3.89	30.17	24.13	258.82	
	23825	713.5	-3.74	30.17	24.28	267.92	
	23755	706.5	-10.96	32.03	18.92	77.98	V
	23790	710.0	-10.71	31.98	19.12	81.66	
	23825	713.5	-10.46	32.06	19.45	88.10	
Channel Bandwidth: 5 MHz / 16QAM							
X	23755	706.5	-5.14	30.36	23.07	202.77	H
	23790	710.0	-4.84	30.17	23.18	207.97	
	23825	713.5	-4.69	30.17	23.33	215.28	
	23755	706.5	-12.03	32.03	17.85	60.95	V
	23790	710.0	-11.76	31.98	18.07	64.12	
	23825	713.5	-11.43	32.06	18.48	70.47	
Channel Bandwidth: 5 MHz / 64QAM							
X	23755	706.5	-6.12	30.36	22.09	161.81	H
	23790	710.0	-5.93	30.17	22.09	161.81	
	23825	713.5	-5.74	30.17	22.28	169.04	
	23755	706.5	-13.03	32.03	16.85	48.42	V
	23790	710.0	-12.73	31.98	17.10	51.29	
	23825	713.5	-12.45	32.06	17.46	55.72	

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

LTE Band 17							
Channel Bandwidth: 10 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**Reading (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (mW)**	**Polarization (H/V)**
X	23780	709.0	-3.67	30.17	24.35	272.27	H
	23790	710.0	-3.65	30.17	24.37	273.53	
	23800	711.0	-3.43	30.18	24.60	288.40	
	23780	709.0	-10.71	31.96	19.10	81.28	V
	23790	710.0	-10.51	31.98	19.32	85.51	
	23800	711.0	-10.23	32.03	19.65	92.26	
Channel Bandwidth: 10 MHz / 16QAM							
X	23780	709.0	-4.67	30.17	23.35	216.27	H
	23790	710.0	-4.68	30.17	23.34	215.77	
	23800	711.0	-4.51	30.18	23.52	224.91	
	23780	709.0	-11.75	31.96	18.06	63.97	V
	23790	710.0	-11.58	31.98	18.25	66.83	
	23800	711.0	-11.19	32.03	18.69	73.96	
Channel Bandwidth: 10 MHz / 64QAM							
X	23780	709.0	-5.76	30.17	22.26	168.27	H
	23790	710.0	-5.70	30.17	22.32	170.61	
	23800	711.0	-5.47	30.18	22.56	180.30	
	23780	709.0	-12.76	31.96	17.05	50.70	V
	23790	710.0	-12.55	31.98	17.28	53.46	
	23800	711.0	-12.19	32.03	17.69	58.75	

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)**
Z	19957	1710.7	-17.11	36.45	19.34	85.90	H
	20175	1732.5	-17.86	36.80	18.94	78.34	
	20393	1754.3	-18.31	36.94	18.63	72.95	
	19957	1710.7	-12.75	37.28	24.53	283.79	V
	20175	1732.5	-13.22	37.63	24.41	276.06	
	20393	1754.3	-13.35	37.64	24.29	268.53	
Channel Bandwidth: 1.4 MHz / 16QAM							
Z	19957	1710.7	-18.12	36.45	18.33	68.08	H
	20175	1732.5	-18.87	36.80	17.93	62.09	
	20393	1754.3	-19.32	36.94	17.62	57.81	
	19957	1710.7	-13.76	37.28	23.52	224.91	V
	20175	1732.5	-14.23	37.63	23.40	218.78	
	20393	1754.3	-14.36	37.64	23.28	212.81	
Channel Bandwidth: 1.4 MHz / 64QAM							
Z	19957	1710.7	-19.15	36.45	17.30	53.70	H
	20175	1732.5	-19.90	36.80	16.90	48.98	
	20393	1754.3	-20.35	36.94	16.59	45.60	
	19957	1710.7	-14.79	37.28	22.49	177.42	V
	20175	1732.5	-15.26	37.63	22.37	172.58	
	20393	1754.3	-15.39	37.64	22.25	167.88	

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)**
Z	19965	1711.5	-16.87	36.45	19.58	90.78	H
	20175	1732.5	-17.62	36.80	19.18	82.79	
	20385	1753.5	-18.07	36.94	18.87	77.09	
	19965	1711.5	-12.51	37.28	24.77	299.92	V
	20175	1732.5	-12.98	37.63	24.65	291.74	
	20385	1753.5	-13.11	37.64	24.53	283.79	
Channel Bandwidth: 3 MHz / 16QAM							
Z	19965	1711.5	-17.88	36.45	18.57	71.94	H
	20175	1732.5	-18.63	36.80	18.17	65.61	
	20385	1753.5	-19.08	36.94	17.86	61.09	
	19965	1711.5	-13.52	37.28	23.76	237.68	V
	20175	1732.5	-13.99	37.63	23.64	231.21	
	20385	1753.5	-14.12	37.64	23.52	224.91	
Channel Bandwidth: 3 MHz / 64QAM							
Z	19965	1711.5	-18.89	36.45	17.56	57.02	H
	20175	1732.5	-19.64	36.80	17.16	52.00	
	20385	1753.5	-20.09	36.94	16.85	48.42	
	19965	1711.5	-14.53	37.28	22.75	188.36	V
	20175	1732.5	-15.00	37.63	22.63	183.23	
	20385	1753.5	-15.13	37.64	22.51	178.24	

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)**
Z	19975	1712.5	-16.62	36.45	19.83	96.16	H
	20175	1732.5	-17.37	36.80	19.43	87.70	
	20375	1752.5	-17.82	36.94	19.12	81.66	
	19975	1712.5	-12.26	37.28	25.02	317.69	V
	20175	1732.5	-12.73	37.63	24.90	309.03	
	20375	1752.5	-12.86	37.64	24.78	300.61	
Channel Bandwidth: 5 MHz / 16QAM							
Z	19975	1712.5	-17.62	36.45	18.83	76.38	H
	20175	1732.5	-18.37	36.80	18.43	69.66	
	20375	1752.5	-18.82	36.94	18.12	64.86	
	19975	1712.5	-13.26	37.28	24.02	252.35	V
	20175	1732.5	-13.73	37.63	23.90	245.47	
	20375	1752.5	-13.86	37.64	23.78	238.78	
Channel Bandwidth: 5 MHz / 64QAM							
Z	19975	1712.5	-18.64	36.45	17.81	60.39	H
	20175	1732.5	-19.39	36.80	17.41	55.08	
	20375	1752.5	-19.84	36.94	17.10	51.29	
	19975	1712.5	-14.28	37.28	23.00	199.53	V
	20175	1732.5	-14.75	37.63	22.88	194.09	
	20375	1752.5	-14.88	37.64	22.76	188.80	

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)**
Z	20000	1715.0	-16.58	36.64	20.06	101.39	H
	20175	1732.5	-17.14	36.80	19.66	92.47	
	20350	1750.0	-17.45	36.80	19.35	86.10	
	20000	1715.0	-12.19	37.44	25.25	334.97	V
	20175	1732.5	-12.50	37.63	25.13	325.84	
	20350	1750.0	-12.63	37.64	25.01	316.96	
Channel Bandwidth: 10 MHz / 16QAM							
Z	20000	1715.0	-17.56	36.64	19.08	80.91	H
	20175	1732.5	-18.12	36.80	18.68	73.79	
	20350	1750.0	-18.43	36.80	18.37	68.71	
	20000	1715.0	-13.17	37.44	24.27	267.30	V
	20175	1732.5	-13.48	37.63	24.15	260.02	
	20350	1750.0	-13.61	37.64	24.03	252.93	
Channel Bandwidth: 10 MHz / 64QAM							
Z	20000	1715.0	-18.59	36.64	18.05	63.83	H
	20175	1732.5	-19.15	36.80	17.65	58.21	
	20350	1750.0	-19.46	36.80	17.34	54.20	
	20000	1715.0	-14.20	37.44	23.24	210.86	V
	20175	1732.5	-14.51	37.63	23.12	205.12	
	20350	1750.0	-14.64	37.64	23.00	199.53	

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)**
Z	20025	1717.5	-16.13	36.45	20.32	107.65	H
	20175	1732.5	-16.88	36.80	19.92	98.17	
	20325	1747.5	-17.33	36.94	19.61	91.41	
	20025	1717.5	-11.77	37.28	25.51	355.63	V
	20175	1732.5	-12.24	37.63	25.39	345.94	
	20325	1747.5	-12.37	37.64	25.27	336.51	
Channel Bandwidth: 15 MHz / 16QAM							
Z	20025	1717.5	-17.16	36.45	19.29	84.92	H
	20175	1732.5	-17.91	36.80	18.89	77.45	
	20325	1747.5	-18.36	36.94	18.58	72.11	
	20025	1717.5	-12.80	37.28	24.48	280.54	V
	20175	1732.5	-13.27	37.63	24.36	272.90	
	20325	1747.5	-13.40	37.64	24.24	265.46	
Channel Bandwidth: 15 MHz / 64QAM							
Z	20025	1717.5	-18.15	36.45	18.30	67.61	H
	20175	1732.5	-18.90	36.80	17.90	61.66	
	20325	1747.5	-19.35	36.94	17.59	57.41	
	20025	1717.5	-13.79	37.28	23.49	223.36	V
	20175	1732.5	-14.26	37.63	23.37	217.27	
	20325	1747.5	-14.39	37.64	23.25	211.35	

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)**
Z	20050	1720.0	-15.89	36.45	20.56	113.76	H
	20175	1732.5	-16.64	36.80	20.16	103.75	
	20300	1745.0	-17.09	36.94	19.85	96.61	
	20050	1720.0	-11.53	37.28	25.75	375.84	V
	20175	1732.5	-12.00	37.63	25.63	365.59	
	20300	1745.0	-12.13	37.64	25.51	355.63	
Channel Bandwidth: 20 MHz / 16QAM							
Z	20050	1720.0	-16.90	36.45	19.55	90.16	H
	20175	1732.5	-17.65	36.80	19.15	82.22	
	20300	1745.0	-18.10	36.94	18.84	76.56	
	20050	1720.0	-12.54	37.28	24.74	297.85	V
	20175	1732.5	-13.01	37.63	24.62	289.73	
	20300	1745.0	-13.14	37.64	24.50	281.84	
Channel Bandwidth: 20 MHz / 64QAM							
Z	20050	1720.0	-17.89	36.45	18.56	71.78	H
	20175	1732.5	-18.64	36.80	18.16	65.46	
	20300	1745.0	-19.09	36.94	17.85	60.95	
	20050	1720.0	-13.53	37.28	23.75	237.14	V
	20175	1732.5	-14.00	37.63	23.63	230.67	
	20300	1745.0	-14.13	37.64	23.51	224.39	

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

4.2 Modulation Characteristics Measurement

4.2.1 Limits of Modulation Characteristics

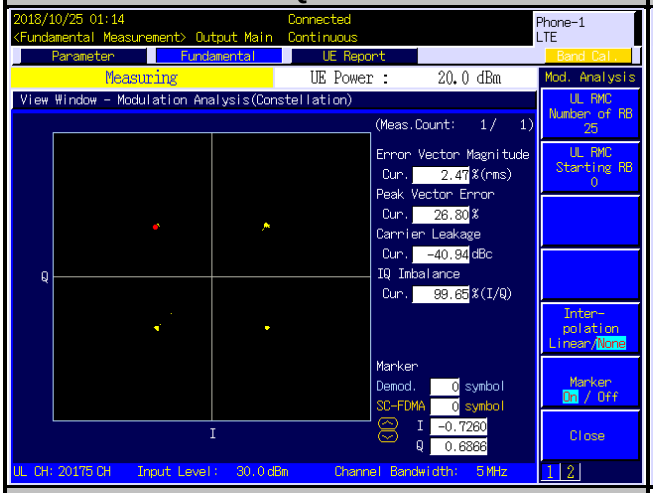
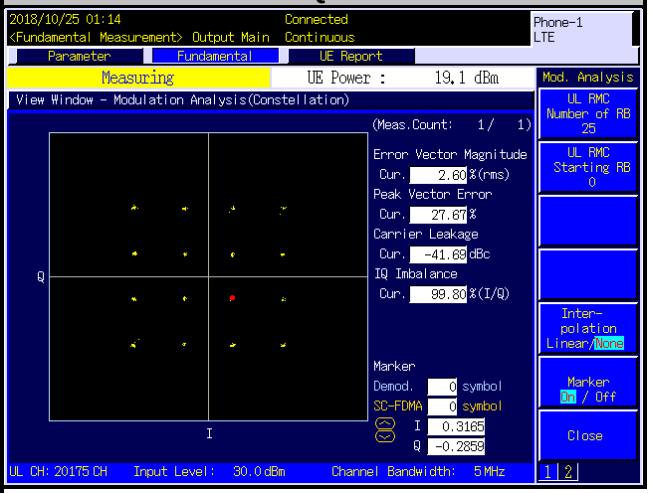
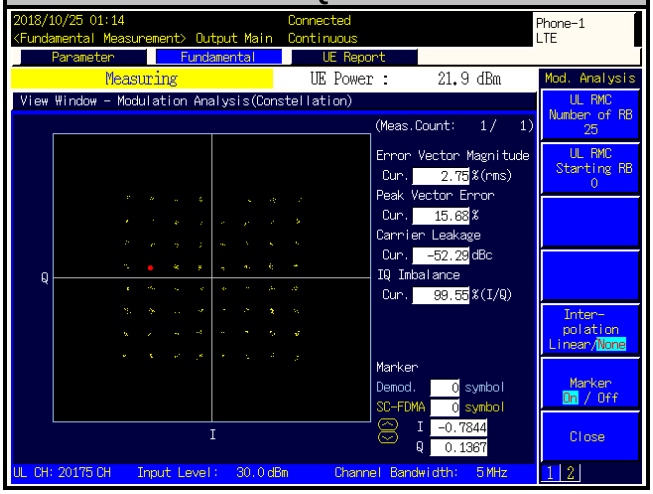
N/A

4.2.2 Test Setup

4.2.3 Test Procedure

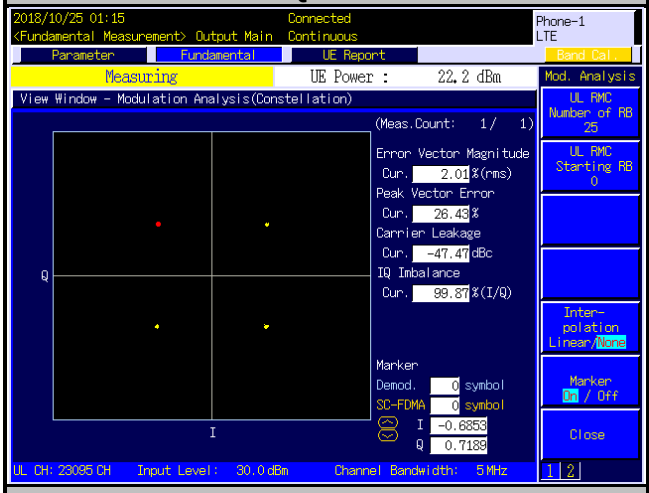
Connect the EUT to Communication Simulator via the antenna connector. The frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

4.2.4 Test Results

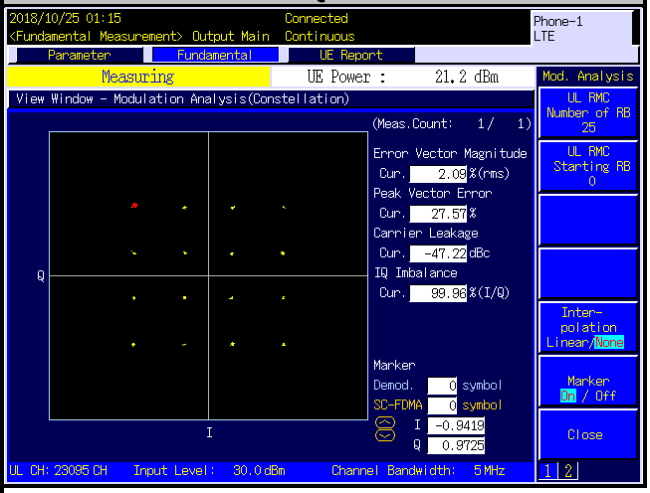
Spectrum Plot of Measurement	
LTE Band 4	
Channel 20175	
QPSK	16QAM
	
64QAM	
	

Spectrum Plot of Measurement
LTE Band 12
Channel 23095

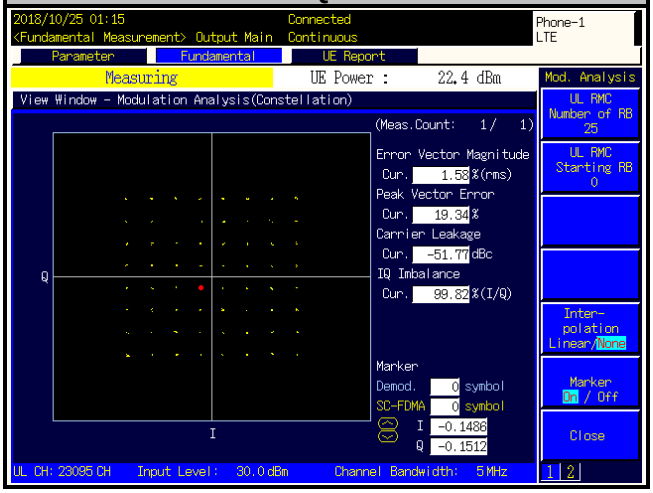
QPSK

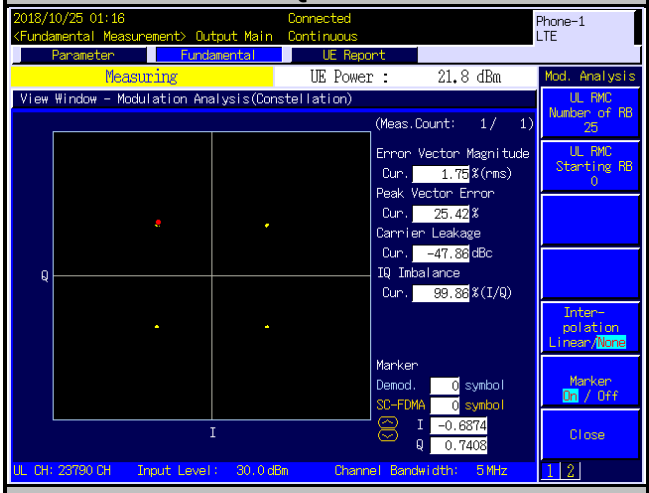
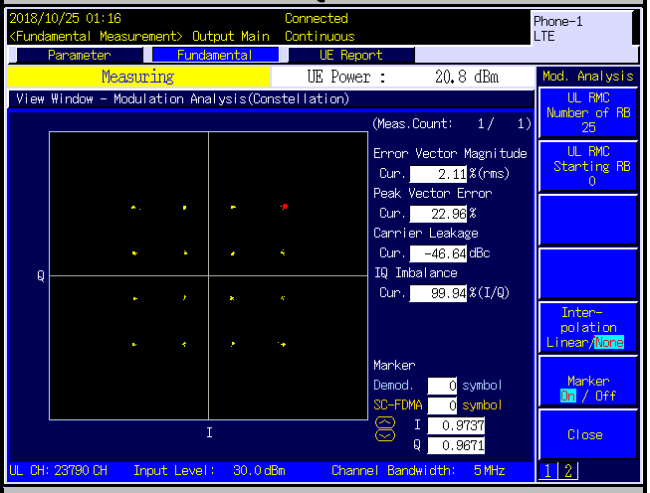
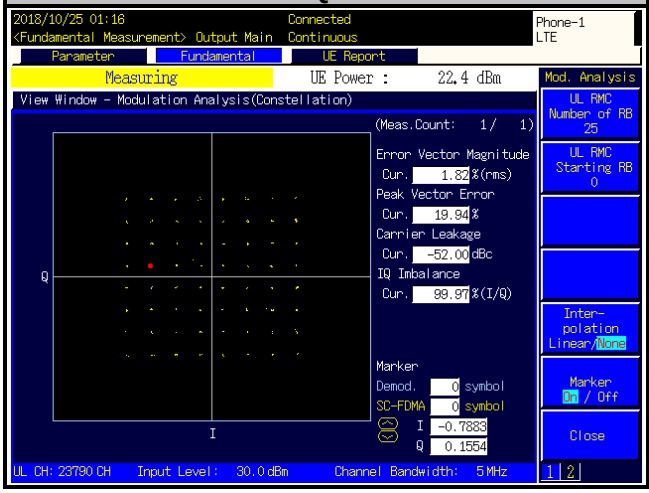


16QAM



64QAM



Spectrum Plot of Measurement	
LTE Band 17	
Channel 23790	
QPSK	16QAM
	
64QAM	
	

4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

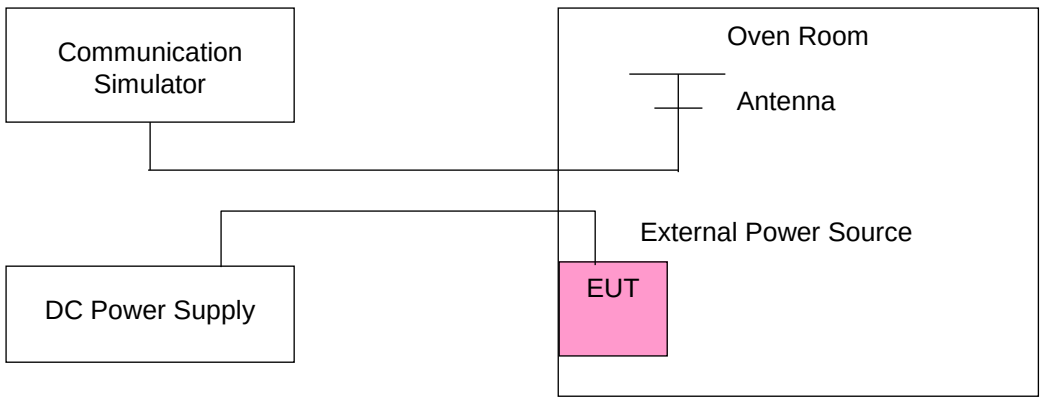
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

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				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.8	1710.700002	0.001	1754.300002	0.001	2.5
3.23	1710.700004	0.002	1754.300004	0.002	2.5
4.37	1710.700002	0.001	1754.300001	0.001	2.5

Note: The applicant defined the normal working voltage of the DC Power Supply is from 3.23 Vdc to 4.37 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1710.700003	0.002	1754.300002	0.001	2.5
-20	1710.700004	0.002	1754.300004	0.002	2.5
-10	1710.700004	0.002	1754.300003	0.001	2.5
0	1710.700002	0.001	1754.300001	0.001	2.5
10	1710.700004	0.002	1754.300001	0.001	2.5
20	1710.699998	-0.001	1754.299999	-0.001	2.5
30	1710.699999	-0.001	1754.299999	-0.001	2.5
40	1710.699997	-0.002	1754.299996	-0.002	2.5
50	1710.699998	-0.001	1754.299998	-0.001	2.5
60	1710.699999	-0.001	1754.299997	-0.002	2.5
70	1710.699998	-0.001	1754.299998	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.8	1711.500004	0.002	1753.500001	0.001	2.5
3.23	1711.500003	0.002	1753.500004	0.002	2.5
4.37	1711.500004	0.002	1753.500002	0.001	2.5

Note: The applicant defined the normal working voltage of the DC Power Supply is from 3.23 Vdc to 4.37 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1711.500002	0.001	1753.500003	0.002	2.5
-20	1711.500002	0.001	1753.500003	0.002	2.5
-10	1711.500001	0.001	1753.500003	0.001	2.5
0	1711.500001	0.001	1753.500002	0.001	2.5
10	1711.500003	0.002	1753.500001	0.001	2.5
20	1711.499997	-0.002	1753.499997	-0.002	2.5
30	1711.499997	-0.002	1753.499996	-0.002	2.5
40	1711.499997	-0.002	1753.499997	-0.002	2.5
50	1711.499997	-0.002	1753.499997	-0.002	2.5
60	1711.499998	-0.001	1753.499998	-0.001	2.5
70	1711.499996	-0.002	1753.499998	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.8	1712.500002	0.001	1752.500002	0.001	2.5
3.23	1712.500004	0.002	1752.500003	0.002	2.5
4.37	1712.500003	0.002	1752.500001	0.001	2.5

Note: The applicant defined the normal working voltage of the DC Power Supply is from 3.23 Vdc to 4.37 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1712.500004	0.002	1752.500002	0.001	2.5
-20	1712.500001	0.001	1752.500001	0.001	2.5
-10	1712.500002	0.001	1752.500002	0.001	2.5
0	1712.500003	0.002	1752.500001	0.001	2.5
10	1712.500003	0.001	1752.500002	0.001	2.5
20	1712.499999	-0.001	1752.499998	-0.001	2.5
30	1712.499997	-0.002	1752.499997	-0.001	2.5
40	1712.499999	-0.001	1752.499998	-0.001	2.5
50	1712.499997	-0.002	1752.499999	-0.001	2.5
60	1712.499997	-0.002	1752.499997	-0.002	2.5
70	1712.499998	-0.001	1752.499997	-0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.8	1715.000001	0.001	1750.000003	0.002	2.5
3.23	1715.000002	0.001	1750.000001	0.001	2.5
4.37	1715.000002	0.001	1750.000002	0.001	2.5

Note: The applicant defined the normal working voltage of the DC Power Supply is from 3.23 Vdc to 4.37 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1715.000003	0.002	1750.000003	0.002	2.5
-20	1715.000004	0.002	1750.000003	0.001	2.5
-10	1715.000004	0.002	1750.000003	0.002	2.5
0	1715.000003	0.002	1750.000002	0.001	2.5
10	1715.000003	0.002	1750.000001	0.001	2.5
20	1714.999998	-0.001	1749.999998	-0.001	2.5
30	1714.999998	-0.001	1749.999999	-0.001	2.5
40	1714.999998	-0.001	1749.999999	-0.001	2.5
50	1714.999999	-0.001	1749.999996	-0.002	2.5
60	1714.999997	-0.002	1749.999997	-0.002	2.5
70	1714.999999	-0.001	1749.999996	-0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.8	1717.500002	0.001	1747.500002	0.001	2.5
3.23	1717.500004	0.002	1747.500002	0.001	2.5
4.37	1717.500003	0.002	1747.500001	0.001	2.5

Note: The applicant defined the normal working voltage of the DC Power Supply is from 3.23 Vdc to 4.37 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1717.500003	0.002	1747.500004	0.002	2.5
-20	1717.500003	0.002	1747.500002	0.001	2.5
-10	1717.500003	0.002	1747.500002	0.001	2.5
0	1717.500002	0.001	1747.500002	0.001	2.5
10	1717.500002	0.001	1747.500003	0.002	2.5
20	1717.499997	-0.002	1747.499997	-0.002	2.5
30	1717.499996	-0.002	1747.499997	-0.002	2.5
40	1717.499997	-0.002	1747.499998	-0.001	2.5
50	1717.499997	-0.002	1747.499999	-0.001	2.5
60	1717.499998	-0.001	1747.499996	-0.002	2.5
70	1717.499997	-0.002	1747.499996	-0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 20 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.8	1720.000004	0.002	1745.000004	0.002	2.5
3.23	1720.000002	0.001	1745.000002	0.001	2.5
4.37	1720.000004	0.002	1745.000001	0.001	2.5

Note: The applicant defined the normal working voltage of the DC Power Supply is from 3.23 Vdc to 4.37 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 20 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1720.000004	0.002	1745.000004	0.002	2.5
-20	1720.000002	0.001	1745.000003	0.002	2.5
-10	1720.000002	0.001	1745.000002	0.001	2.5
0	1720.000004	0.002	1745.000003	0.002	2.5
10	1720.000002	0.001	1745.000001	0.001	2.5
20	1719.999996	-0.002	1744.999997	-0.002	2.5
30	1719.999997	-0.002	1744.999997	-0.002	2.5
40	1719.999999	-0.001	1744.999997	-0.002	2.5
50	1719.999998	-0.001	1744.999996	-0.002	2.5
60	1719.999997	-0.002	1744.999998	-0.001	2.5
70	1719.999999	-0.001	1744.999999	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.8	699.700003	0.005	715.300002	0.003	2.5
3.23	699.700002	0.003	715.300001	0.002	2.5
4.37	699.700003	0.004	715.300003	0.004	2.5

Note: The applicant defined the normal working voltage of the DC Power Supply is from 3.23 Vdc to 4.37 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	699.700004	0.006	715.300003	0.004	2.5
-20	699.700003	0.005	715.300001	0.002	2.5
-10	699.700002	0.003	715.300002	0.003	2.5
0	699.700003	0.004	715.300002	0.002	2.5
10	699.700001	0.002	715.300004	0.006	2.5
20	699.699999	-0.002	715.299996	-0.005	2.5
30	699.699997	-0.004	715.299999	-0.002	2.5
40	699.699997	-0.004	715.299998	-0.003	2.5
50	699.699997	-0.004	715.299997	-0.004	2.5
60	699.699997	-0.004	715.299996	-0.005	2.5
70	699.699999	-0.002	715.299998	-0.003	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.8	700.500001	0.002	714.500001	0.002	2.5
3.23	700.500003	0.004	714.500003	0.003	2.5
4.37	700.500002	0.002	714.500001	0.002	2.5

Note: The applicant defined the normal working voltage of the DC Power Supply is from 3.23 Vdc to 4.37 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	700.500003	0.005	714.500001	0.002	2.5
-20	700.500002	0.003	714.500003	0.004	2.5
-10	700.500003	0.004	714.500002	0.003	2.5
0	700.500002	0.003	714.500002	0.003	2.5
10	700.500002	0.002	714.500003	0.004	2.5
20	700.499998	-0.004	714.499998	-0.002	2.5
30	700.499996	-0.005	714.499998	-0.003	2.5
40	700.499998	-0.003	714.499997	-0.005	2.5
50	700.499998	-0.003	714.499998	-0.002	2.5
60	700.499999	-0.002	714.499999	-0.002	2.5
70	700.499997	-0.005	714.499997	-0.004	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.8	701.500003	0.005	713.500003	0.005	2.5
3.23	701.500003	0.004	713.500002	0.003	2.5
4.37	701.500002	0.003	713.500002	0.003	2.5

Note: The applicant defined the normal working voltage of the DC Power Supply is from 3.23 Vdc to 4.37 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	701.500003	0.004	713.500002	0.003	2.5
-20	701.500003	0.005	713.500003	0.004	2.5
-10	701.500002	0.003	713.500003	0.004	2.5
0	701.500002	0.002	713.500003	0.005	2.5
10	701.500004	0.005	713.500004	0.005	2.5
20	701.499998	-0.003	713.499998	-0.002	2.5
30	701.499997	-0.004	713.499996	-0.005	2.5
40	701.499998	-0.003	713.499997	-0.004	2.5
50	701.499996	-0.006	713.499996	-0.006	2.5
60	701.499996	-0.005	713.499998	-0.003	2.5
70	701.499998	-0.003	713.499998	-0.003	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.8	704.000003	0.005	711.000004	0.005	2.5
3.23	704.000002	0.003	711.000002	0.002	2.5
4.37	704.000003	0.005	711.000003	0.005	2.5

Note: The applicant defined the normal working voltage of the DC Power Supply is from 3.23 Vdc to 4.37 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	704.000002	0.002	711.000002	0.003	2.5
-20	704.000002	0.003	711.000002	0.003	2.5
-10	704.000002	0.002	711.000001	0.002	2.5
0	704.000003	0.005	711.000002	0.002	2.5
10	704.000002	0.003	711.000001	0.001	2.5
20	703.999997	-0.004	710.999998	-0.003	2.5
30	703.999998	-0.003	710.999998	-0.003	2.5
40	703.999998	-0.003	710.999997	-0.004	2.5
50	703.999998	-0.003	710.999996	-0.006	2.5
60	703.999998	-0.003	710.999999	-0.002	2.5
70	703.999997	-0.004	710.999999	-0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 17				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.8	706.500003	0.004	713.500003	0.004	2.5
3.23	706.500002	0.002	713.500002	0.002	2.5
4.37	706.500002	0.002	713.500001	0.002	2.5

Note: The applicant defined the normal working voltage of the DC Power Supply is from 3.23 Vdc to 4.37 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 17				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	706.500003	0.005	713.500002	0.003	2.5
-20	706.500002	0.002	713.500003	0.004	2.5
-10	706.500002	0.003	713.500002	0.003	2.5
0	706.500004	0.005	713.500002	0.003	2.5
10	706.500002	0.003	713.500004	0.005	2.5
20	706.499999	-0.002	713.499996	-0.006	2.5
30	706.499999	-0.002	713.499996	-0.005	2.5
40	706.499996	-0.005	713.499999	-0.002	2.5
50	706.499997	-0.004	713.499998	-0.002	2.5
60	706.499996	-0.006	713.499998	-0.003	2.5
70	706.499996	-0.005	713.499997	-0.005	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 17				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.8	709.000002	0.002	711.000002	0.003	2.5
3.23	709.000002	0.003	711.000002	0.003	2.5
4.37	709.000003	0.004	711.000002	0.002	2.5

Note: The applicant defined the normal working voltage of the DC Power Supply is from 3.23 Vdc to 4.37 Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 17				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	709.000002	0.003	711.000002	0.003	2.5
-20	709.000002	0.003	711.000004	0.005	2.5
-10	709.000002	0.003	711.000004	0.005	2.5
0	709.000003	0.004	711.000004	0.005	2.5
10	709.000002	0.003	711.000004	0.005	2.5
20	708.999998	-0.003	710.999996	-0.005	2.5
30	708.999997	-0.005	710.999997	-0.004	2.5
40	708.999998	-0.003	710.999999	-0.002	2.5
50	708.999997	-0.005	710.999998	-0.003	2.5
60	708.999998	-0.003	710.999997	-0.004	2.5
70	708.999997	-0.004	710.999999	-0.002	2.5

4.4 Occupied Bandwidth Measurement

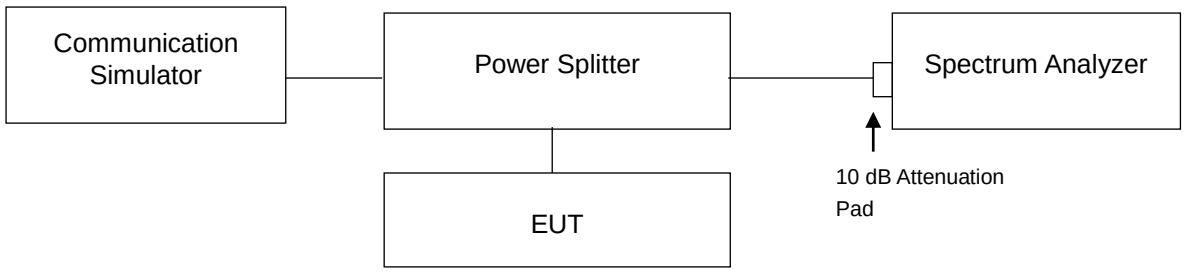
4.4.1 Limits of Occupied Bandwidth Measurement

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

4.4.2 Test Procedure

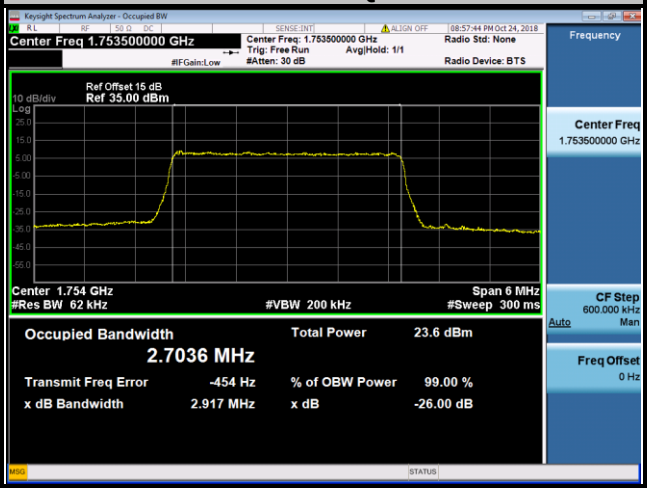
a. The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
b. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

4.4.3 Test Setup

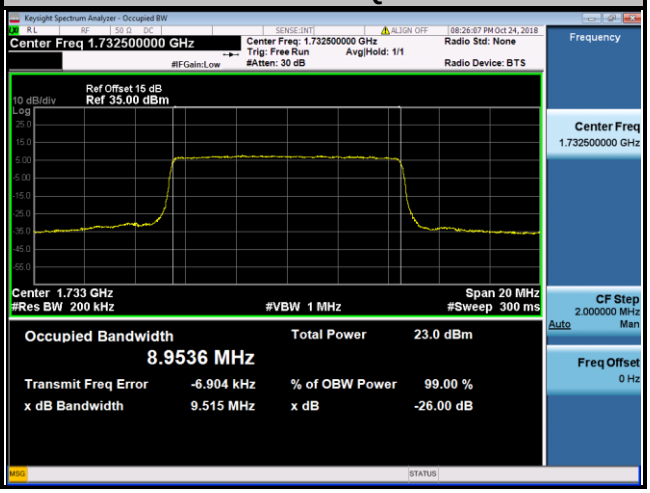


4.4.4 Test Result

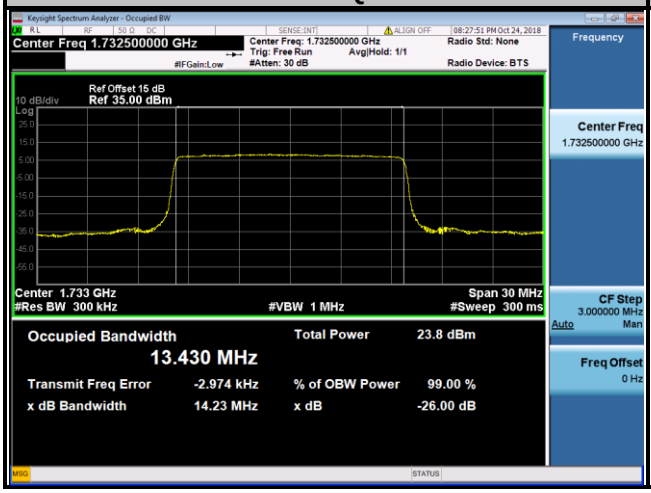
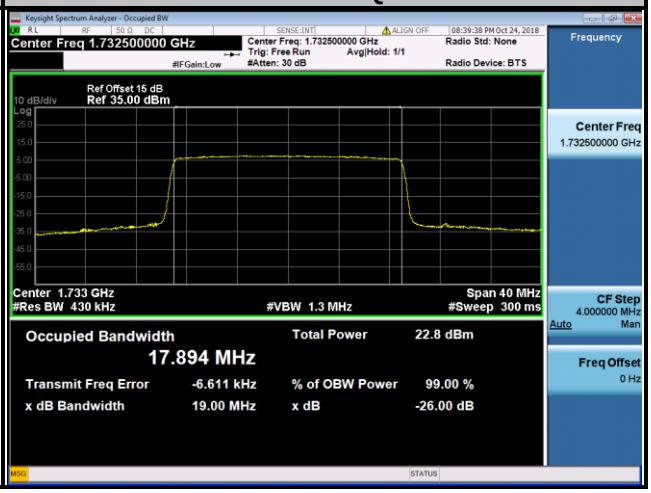
LTE Band 4									
Channel Bandwidth: 1.4 MHz					Channel Bandwidth: 3 MHz				
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
19957	1710.7	1.0882	1.0886	1.0871	19965	1711.5	2.7012	2.6972	2.7030
20175	1732.5	1.0881	1.0895	1.0879	20175	1732.5	2.6980	2.6955	2.7032
20393	1754.3	1.0875	1.0863	1.0883	20385	1753.5	2.7010	2.6942	2.7036

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

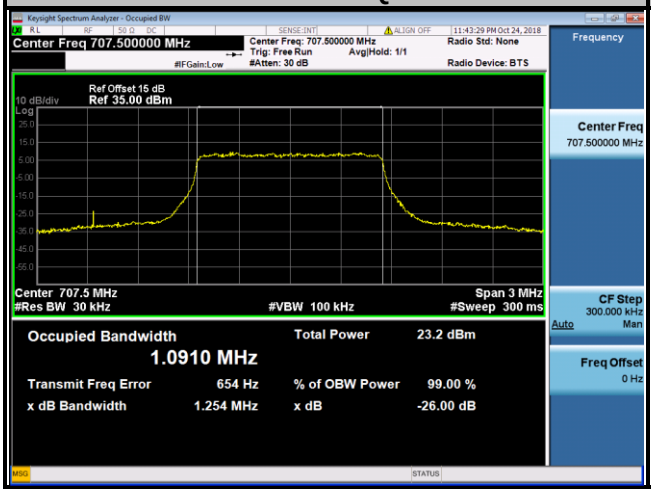
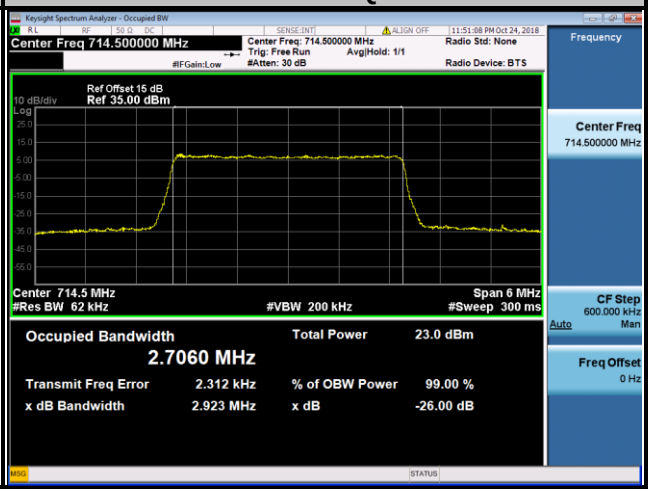
LTE Band 4									
Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
19975	1712.5	4.4874	4.4895	4.4930	20000	1715.0	8.9457	8.9492	8.9454
20175	1732.5	4.4882	4.4925	4.4911	20175	1732.5	8.9483	8.9536	8.9475
20375	1752.5	4.4898	4.4911	4.4900	20350	1750.0	8.9437	8.9476	8.9412

Spectrum Plot of Worst Value	
5 MHz / 64QAM	10 MHz / 16QAM
	

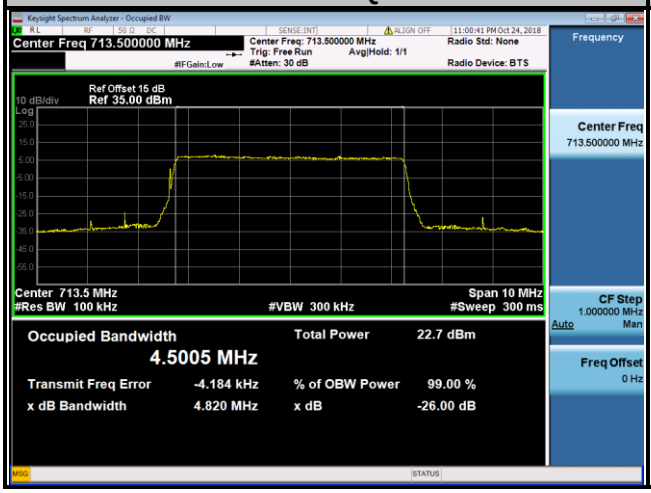
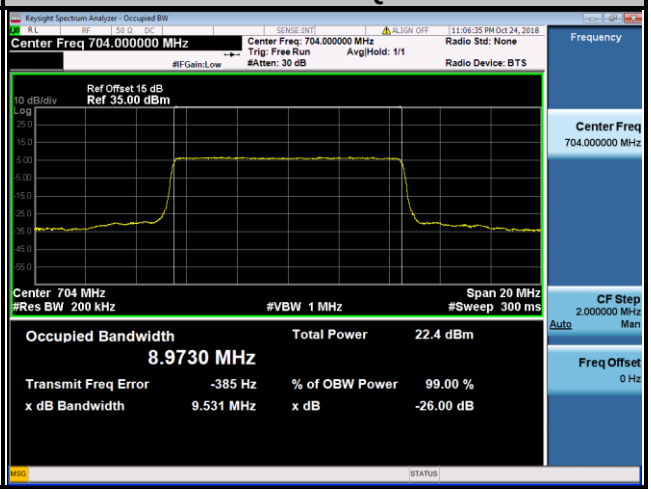
LTE Band 4									
Channel Bandwidth: 15 MHz					Channel Bandwidth: 20 MHz				
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
20025	1717.5	13.418	13.408	13.406	20050	1720.0	17.859	17.890	17.878
20175	1732.5	13.430	13.413	13.410	20175	1732.5	17.874	17.894	17.888
20325	1747.5	13.415	13.397	13.396	20300	1745.0	17.857	17.887	17.887

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

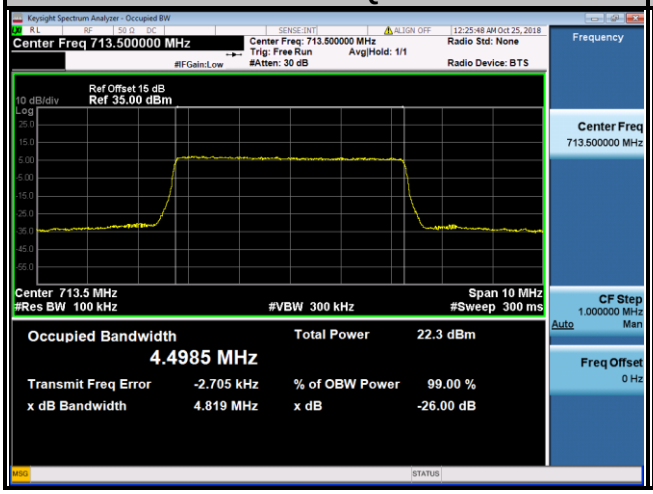
LTE Band 12									
Channel Bandwidth: 1.4 MHz					Channel Bandwidth: 3 MHz				
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
23017	699.7	1.0866	1.0863	1.0885	23025	700.5	2.6984	2.6975	2.7018
23095	707.5	1.0883	1.0910	1.0873	23095	707.5	2.7023	2.7002	2.7056
23173	715.3	1.0879	1.0904	1.0874	23165	714.5	2.7025	2.6985	2.7060

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

LTE Band 12									
Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
23035	701.5	4.4882	4.4903	4.4913	23060	704.0	8.9711	8.9730	8.9725
23095	707.5	4.4903	4.4921	4.4910	23095	707.5	8.9358	8.9232	8.9377
23155	713.5	4.4956	4.5005	4.5004	23130	711.0	8.9364	8.9318	8.9334

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

LTE Band 17									
Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
23755	706.5	4.4918	4.4797	4.4958	23780	709.0	8.9228	8.9266	8.9232
23790	710.0	4.4767	4.4816	4.4846	23790	710.0	8.9253	8.9243	8.9237
23825	713.5	4.4889	4.4969	4.4985	23800	711.0	8.9359	8.9372	8.9348

Spectrum Plot of Worst Value	
5 MHz / 64QAM	10 MHz / 16QAM
	

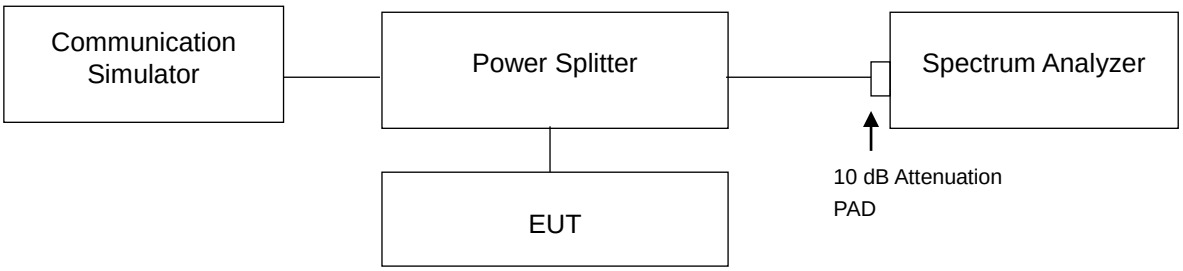
4.5 Band Edge Measurement

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 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.

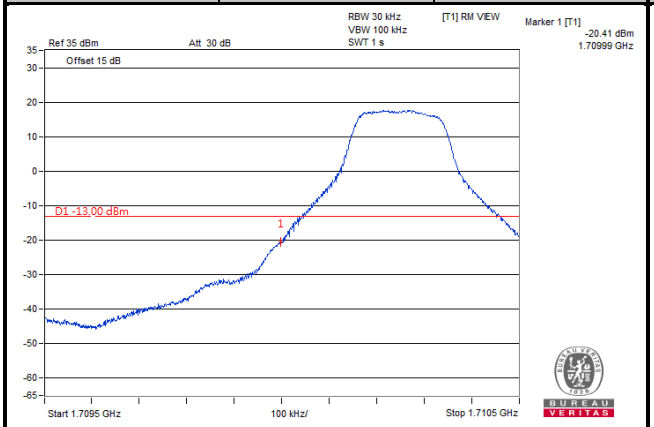
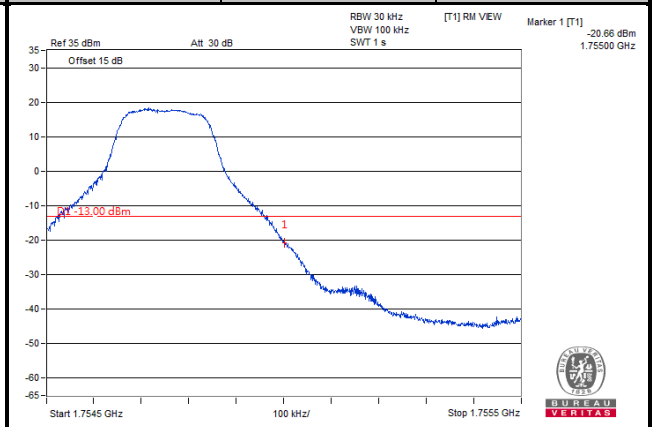
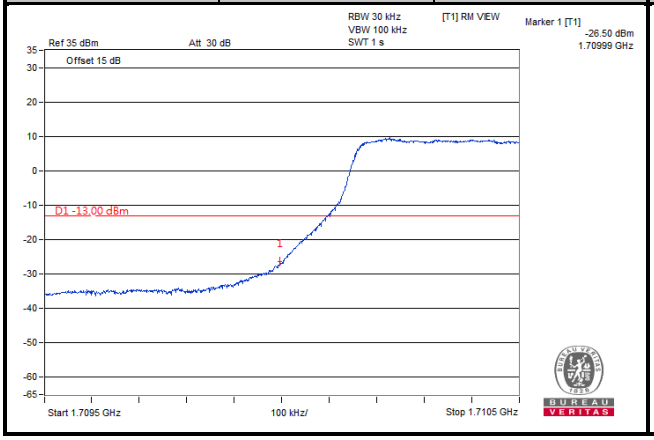
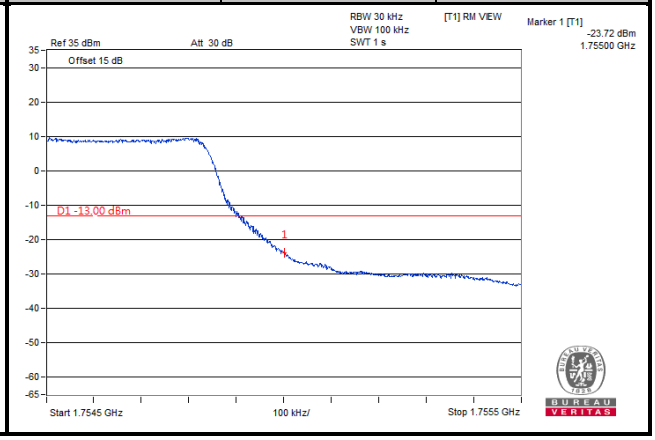
4.5.2 Test Setup

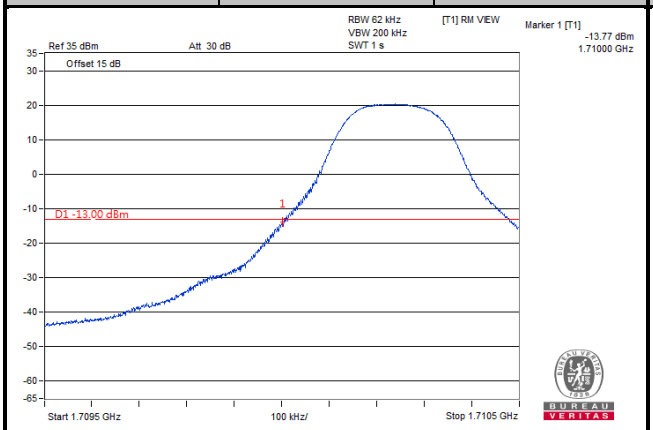
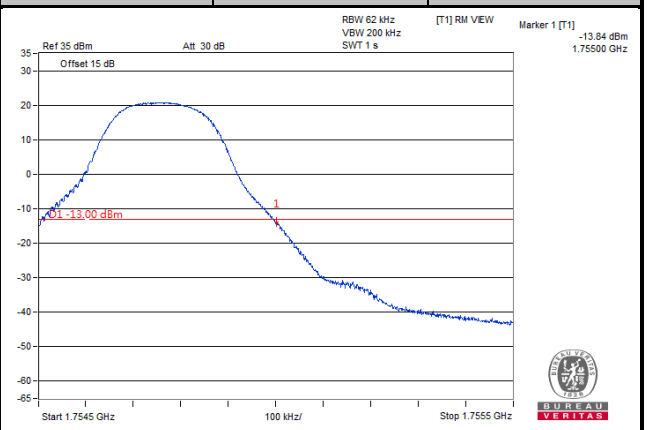
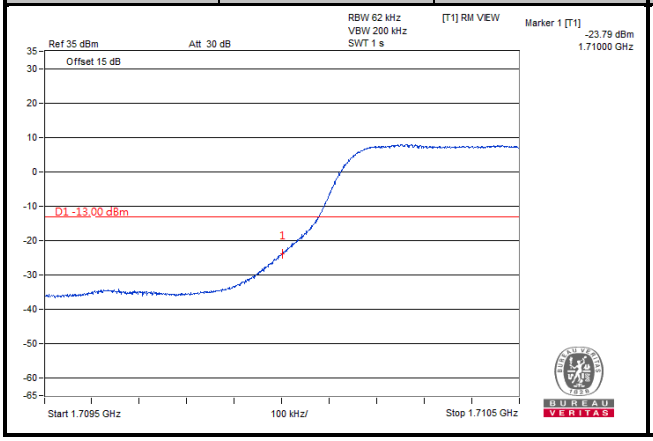
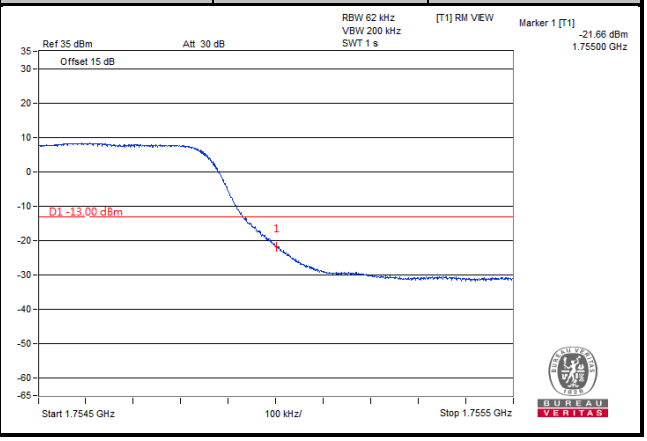


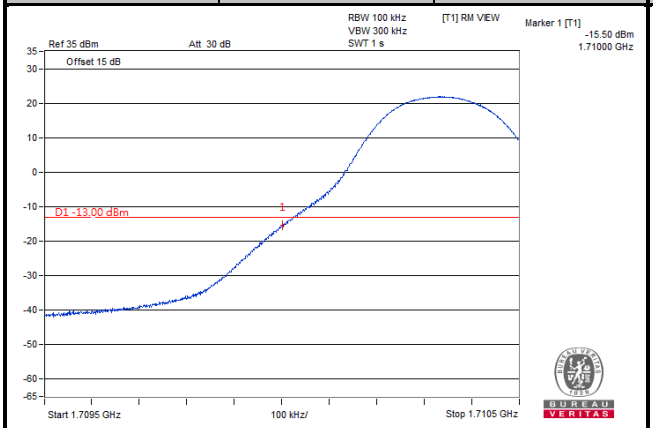
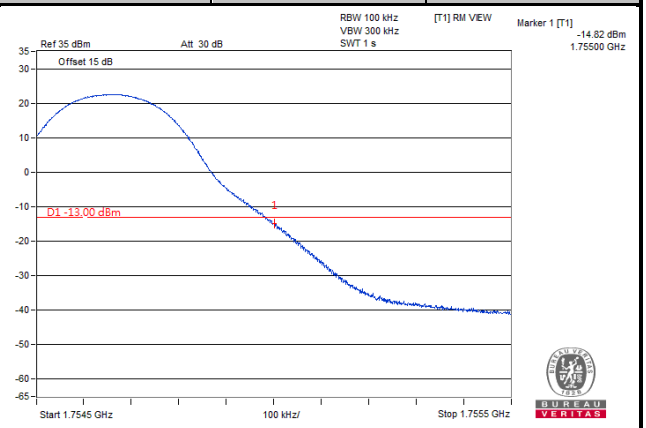
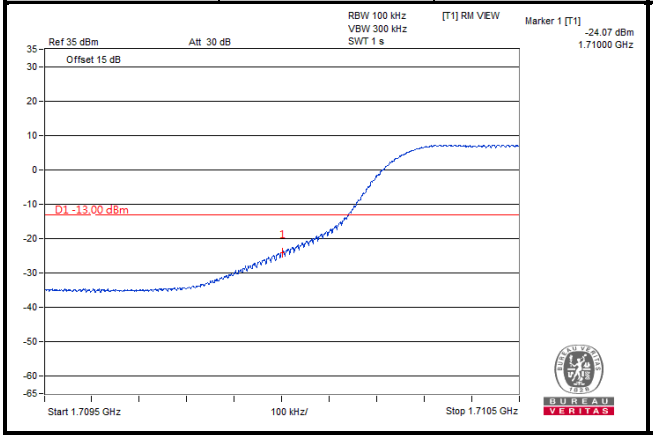
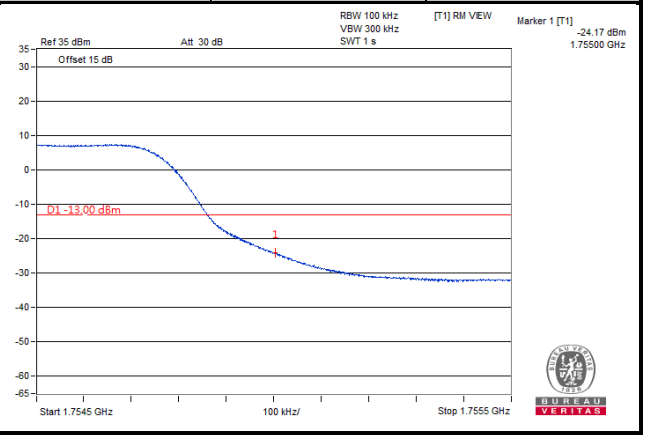
4.5.3 Test Procedures

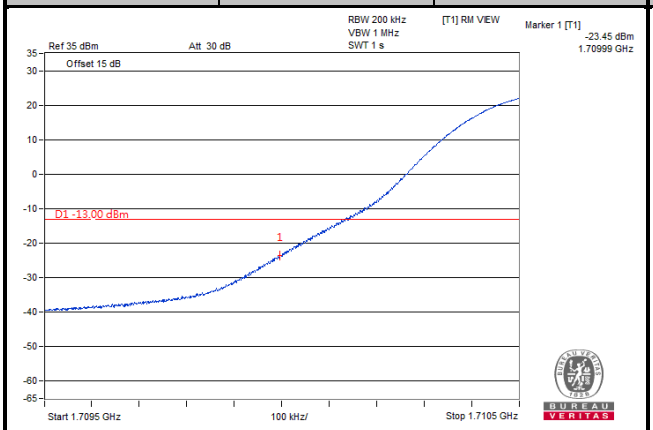
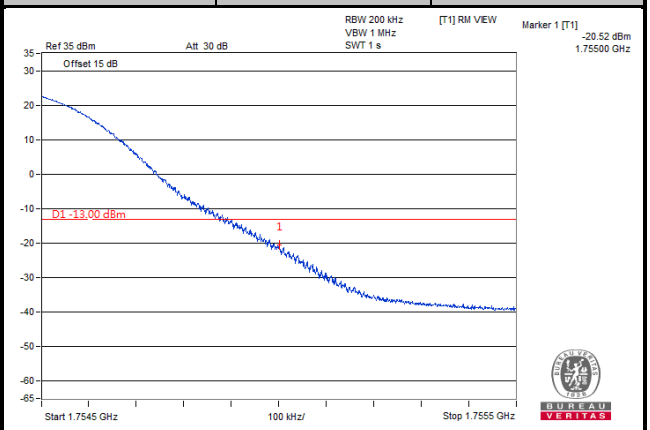
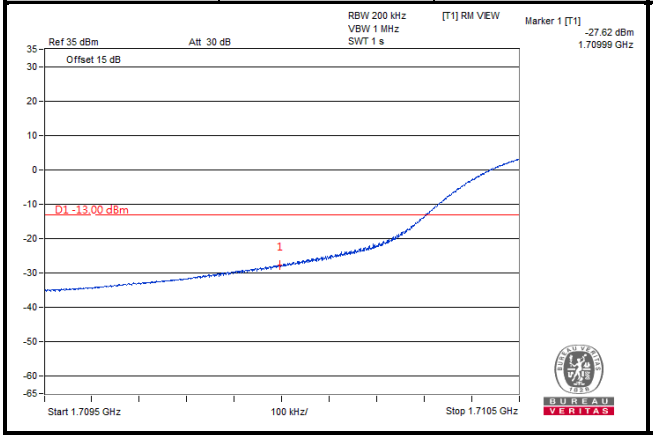
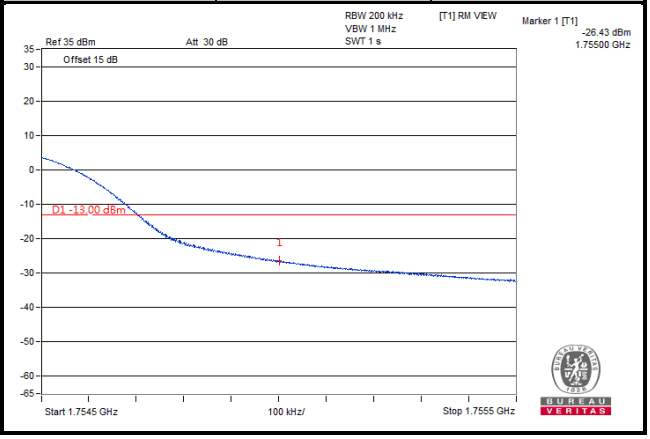
a. All measurements were done at low and high operational frequency range.
b. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 30 kHz and VB of the spectrum is 100 kHz (LTE Bandwidth 1.4 MHz).
c. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 62 kHz and VB of the spectrum is 200 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 100 kHz and VB of the spectrum is 300 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 200 kHz and VB of the spectrum is 1 MHz (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 300 kHz and VB of the spectrum is 1 MHz (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 430 kHz and VB of the spectrum is 1.3 MHz (LTE Bandwidth 20 MHz).
h. Record the max. trace plot into the test report.

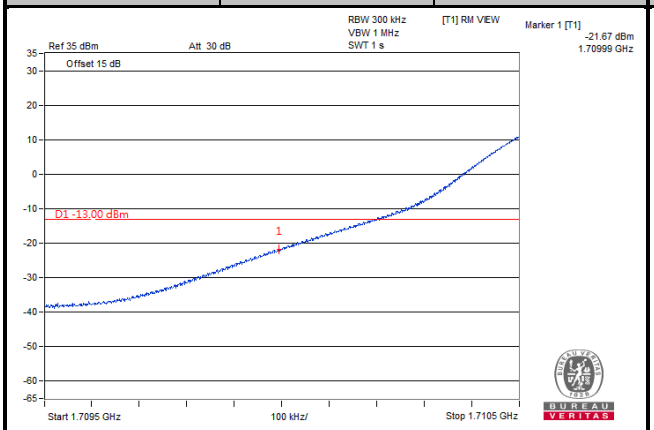
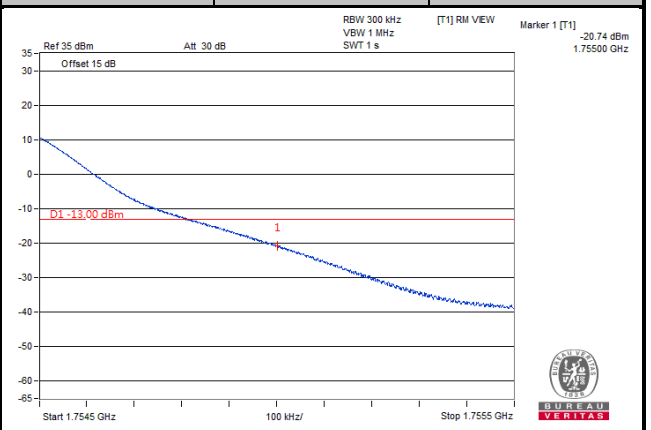
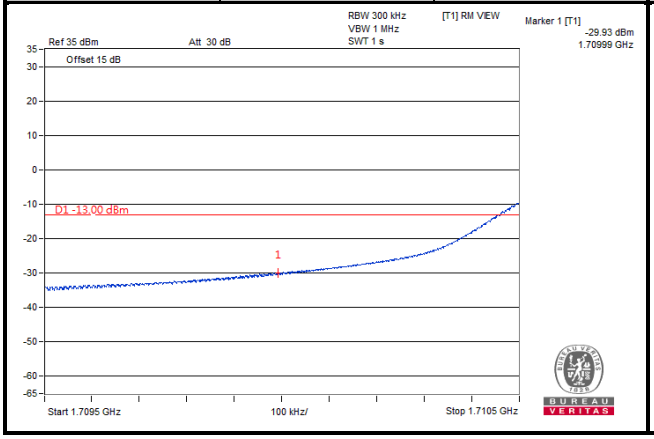
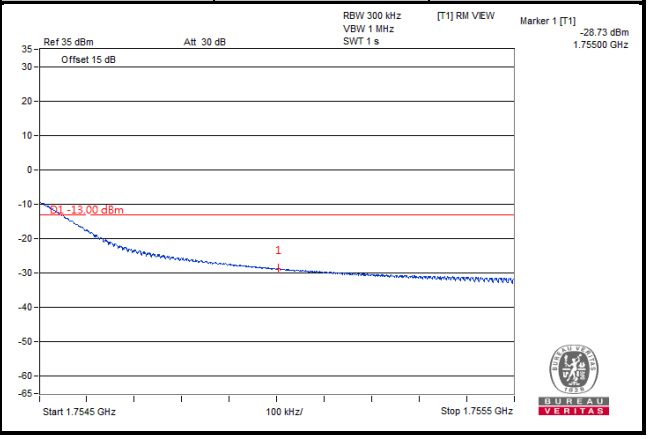
4.5.4 Test Results

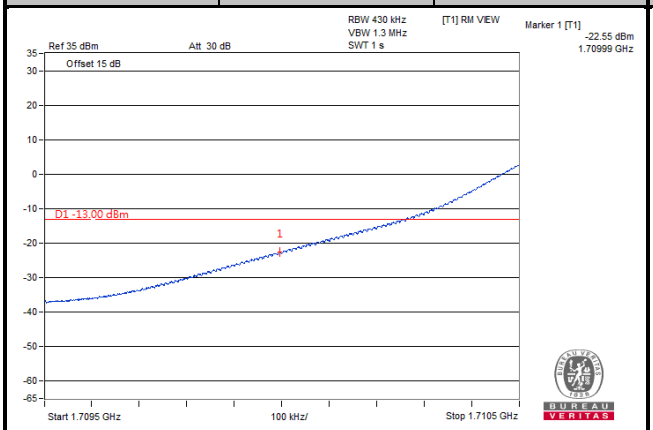
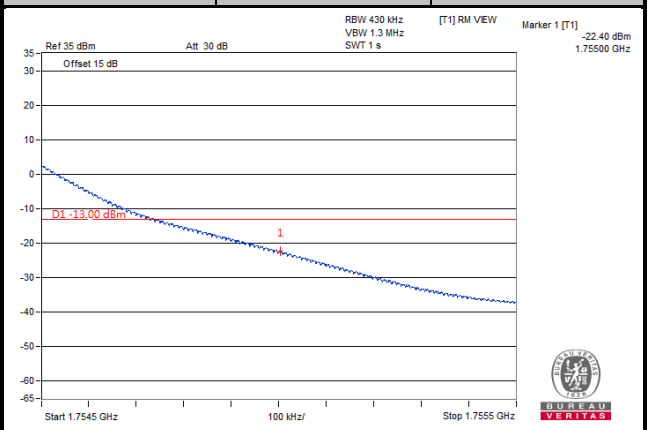
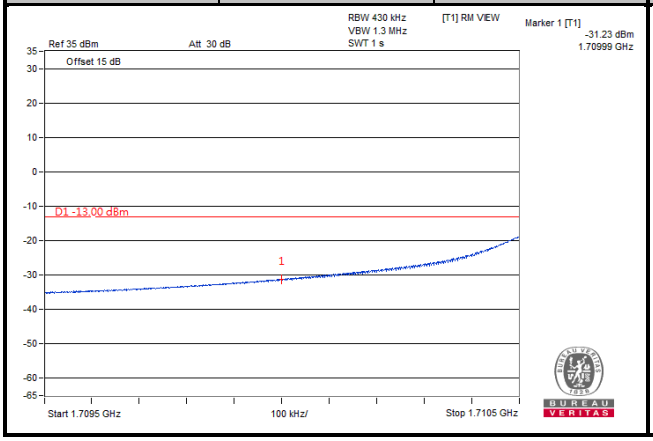
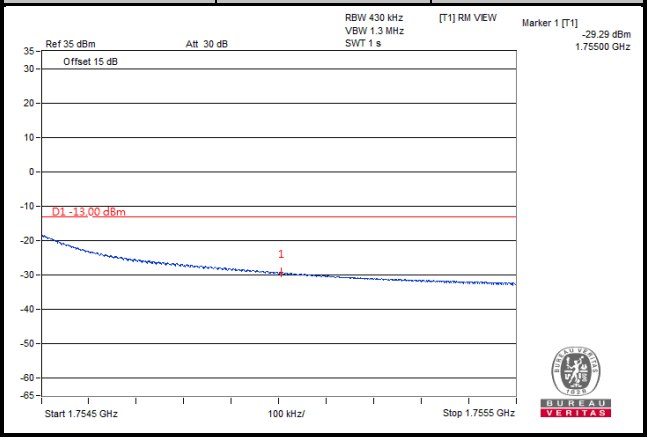
LTE Band 4					
Channel Bandwidth: 1.4 MHz					
Channel	19957	1 RB	Channel	20393	1 RB
					
Channel	19957	6 RB	Channel	20393	6 RB
					

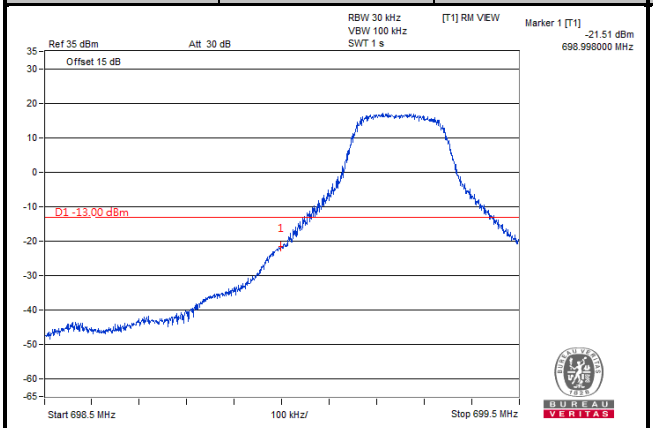
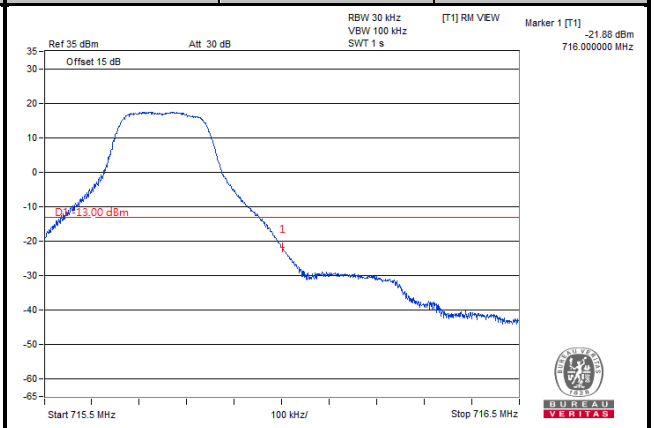
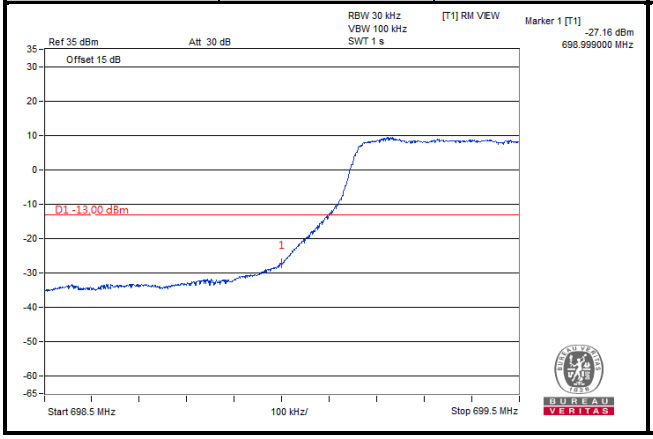
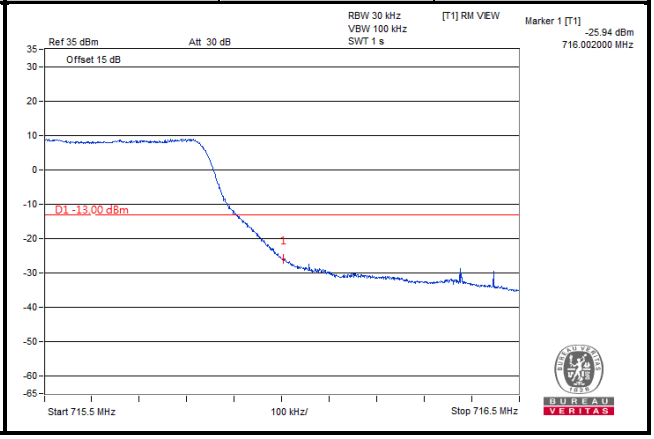
LTE Band 4					
Channel Bandwidth: 3 MHz					
Channel	19965	1 RB	Channel	20385	1 RB
					
Channel	19965	15 RB	Channel	20385	15 RB
					

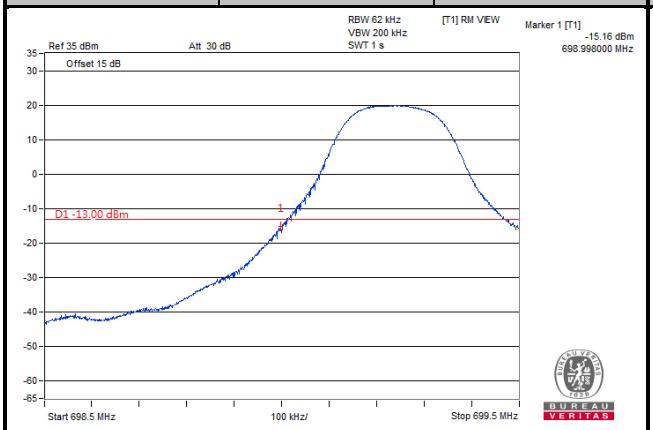
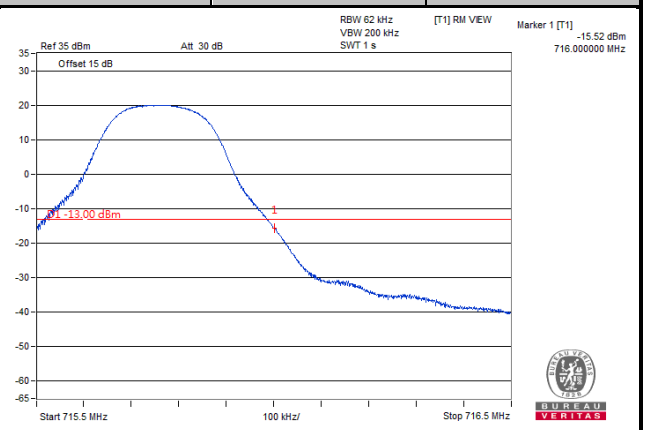
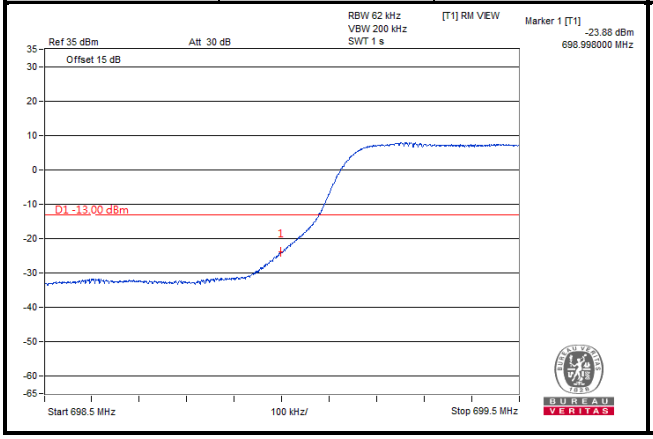
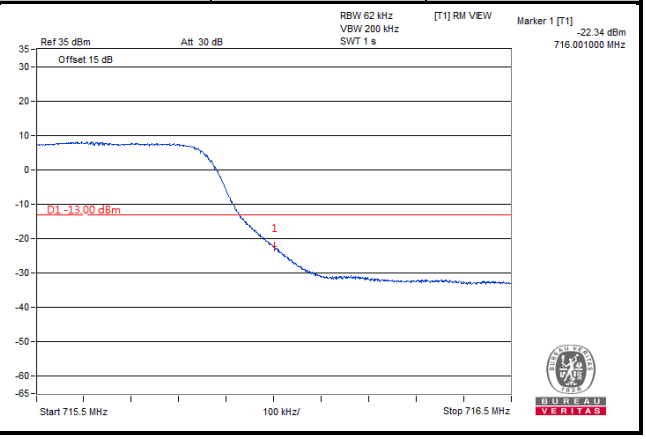
LTE Band 4					
Channel Bandwidth: 5 MHz					
Channel	19975	1 RB	Channel	20375	1 RB
					
Channel	19975	25 RB	Channel	20375	25 RB
					

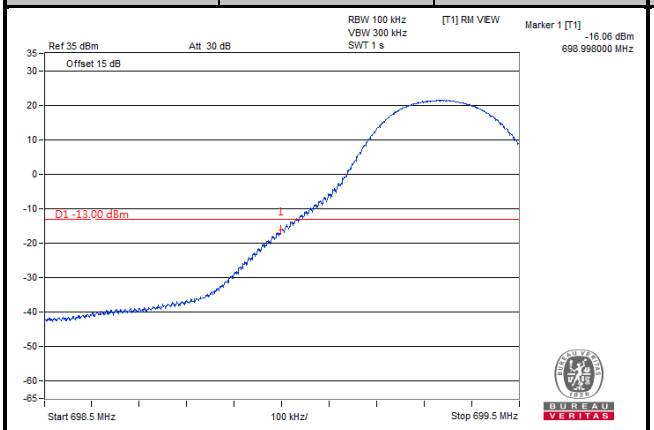
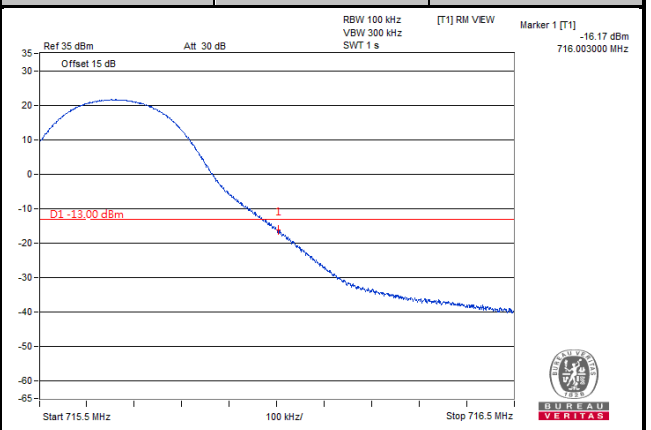
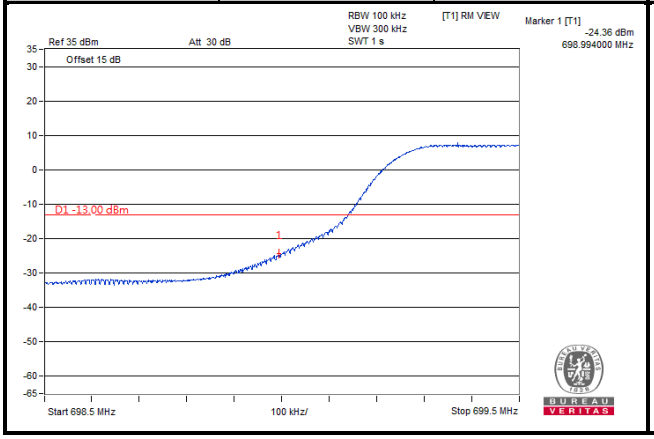
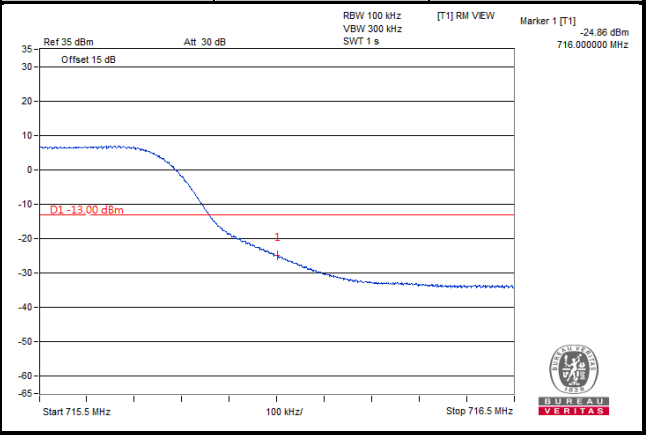
LTE Band 4					
Channel Bandwidth: 10 MHz					
Channel	20000	1 RB	Channel	20350	1 RB
					
Channel	20000	50 RB	Channel	20350	50 RB
					

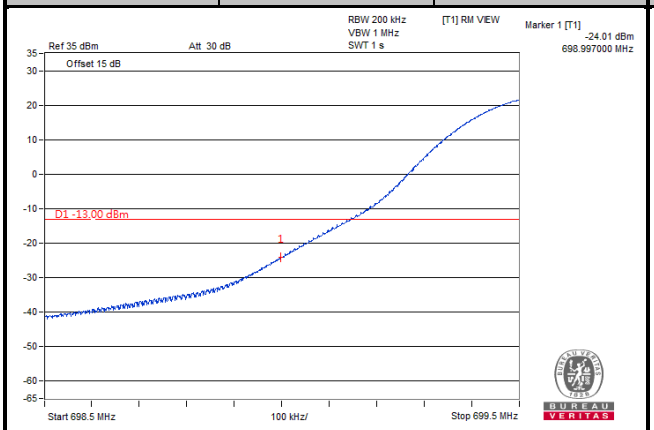
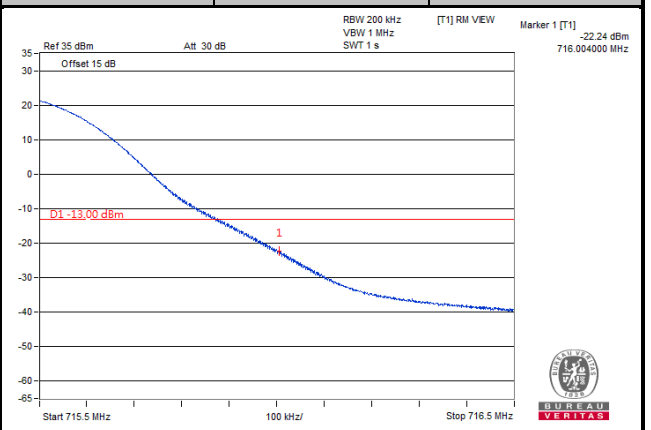
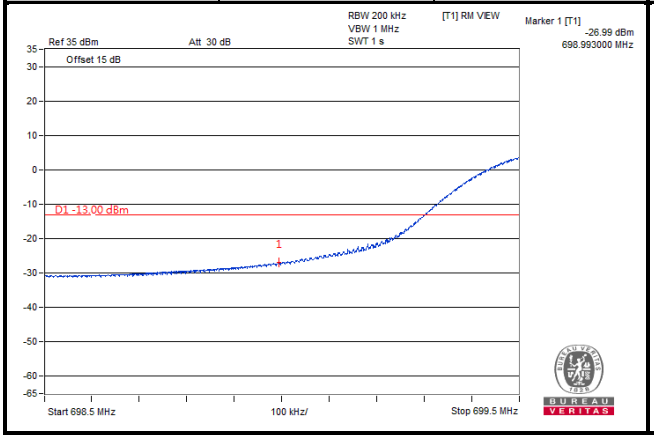
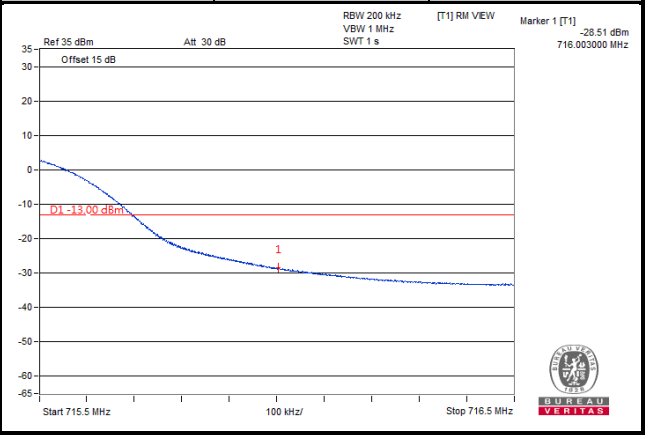
LTE Band 4					
Channel Bandwidth: 15 MHz					
Channel	20025	1 RB	Channel	20325	1 RB
					
Channel	20025	75 RB	Channel	20325	75 RB
					

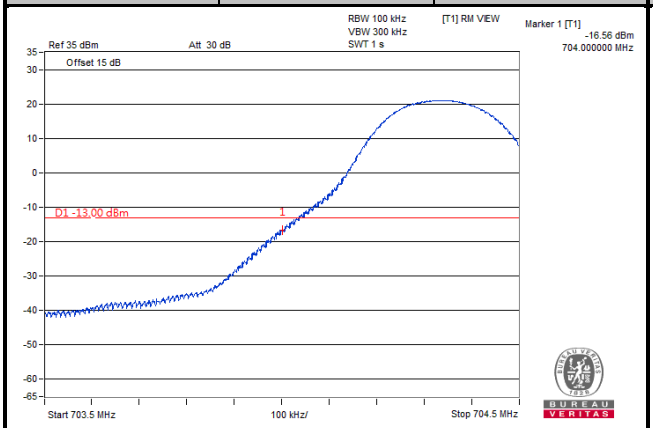
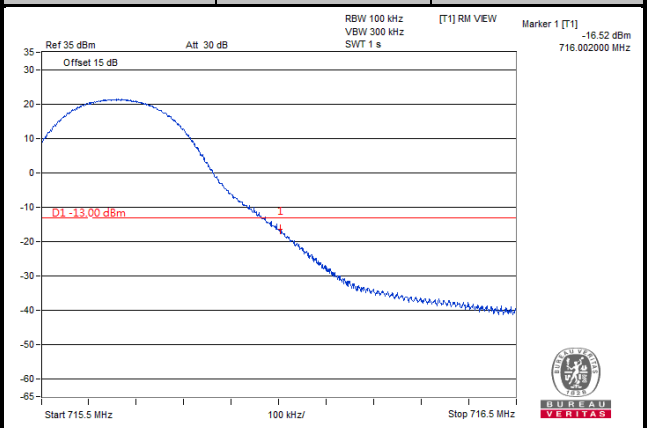
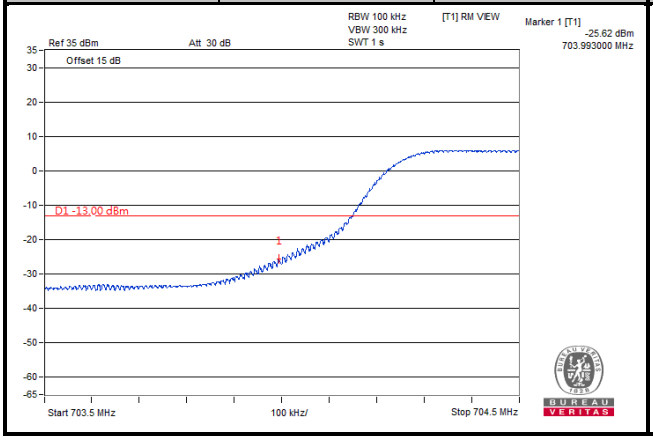
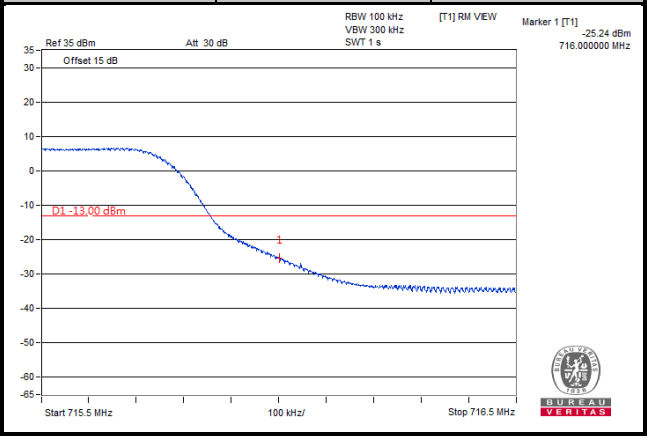
LTE Band 4					
Channel Bandwidth: 20 MHz					
Channel	20050	1 RB	Channel	20300	1 RB
					
Channel	20050	100 RB	Channel	20300	100 RB
					

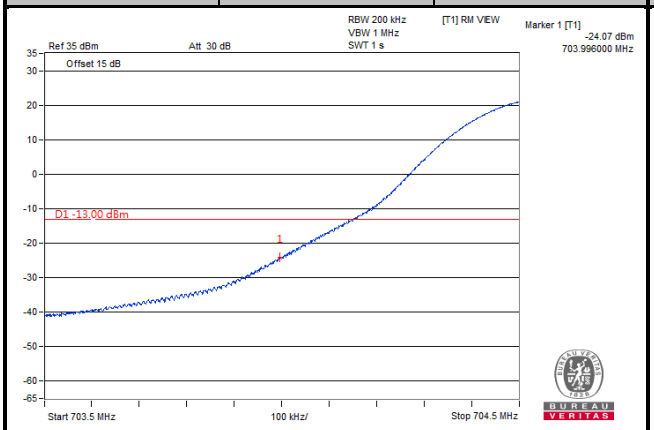
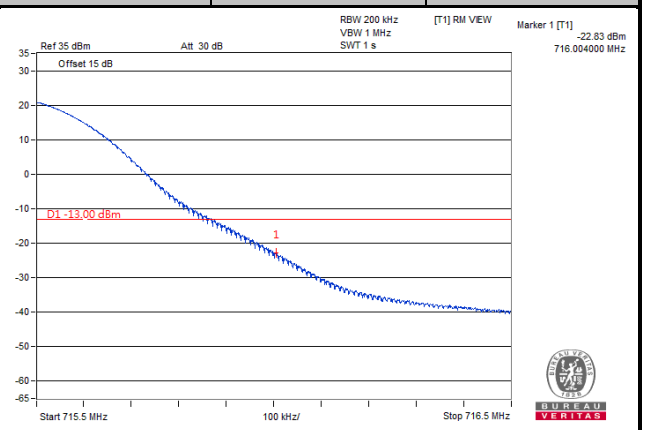
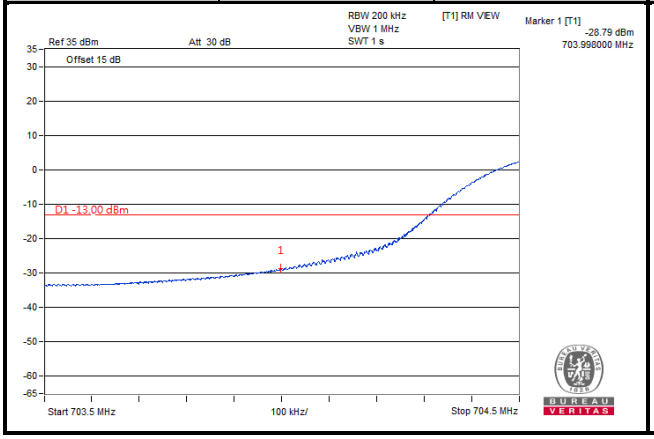
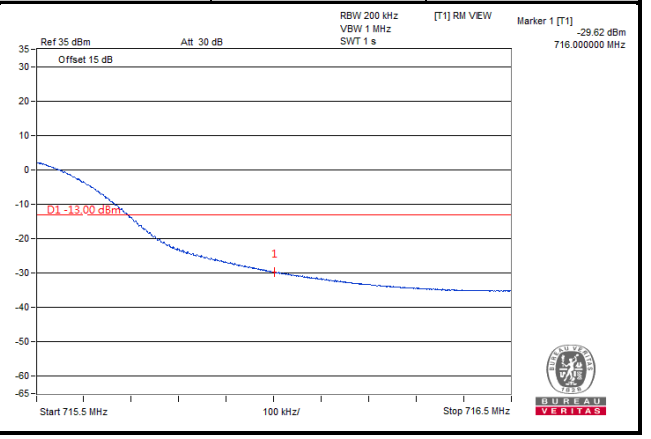
LTE Band 12					
Channel Bandwidth: 1.4 MHz					
Channel	23017	1 RB	Channel	23173	1 RB
					
Channel	23017	6 RB	Channel	23173	6 RB
					

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 17					
Channel Bandwidth: 5 MHz					
Channel	23755	1 RB	Channel	23825	1 RB
					
Channel	23755	25 RB	Channel	23825	25 RB
					

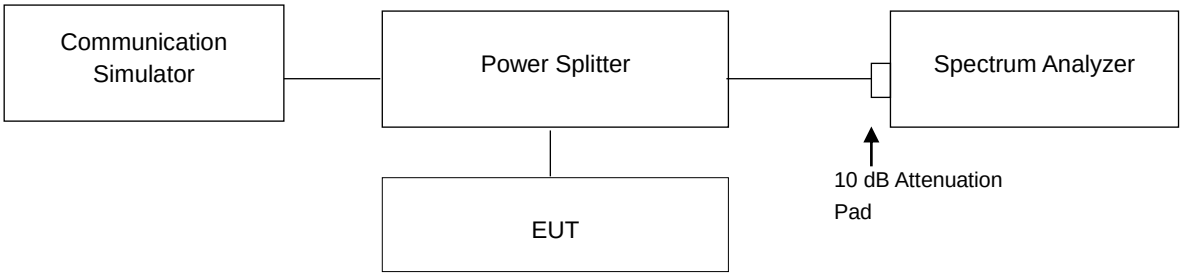
LTE Band 17					
Channel Bandwidth: 10 MHz					
Channel	23780	1 RB	Channel	23800	1 RB
					
Channel	23780	50 RB	Channel	23800	50 RB
					

4.6 Peak to Average Ratio

4.6.1 Limits of Peak to Average Ratio Measurement

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

4.6.2 Test Setup

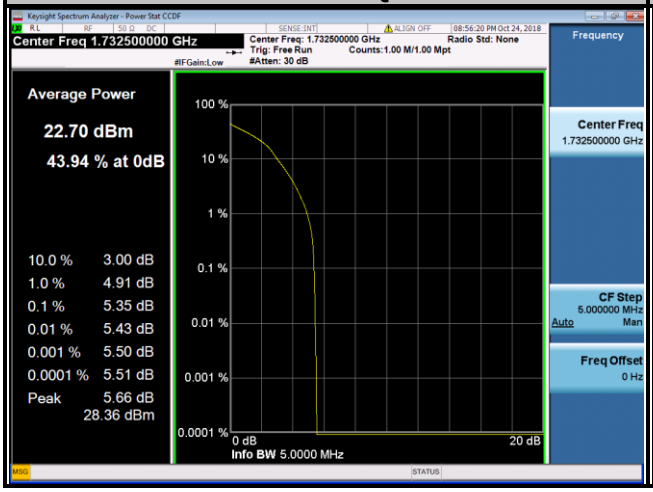
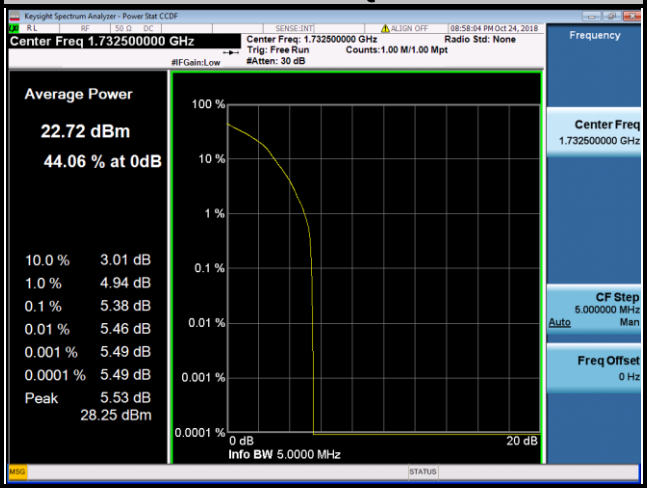


4.6.3 Test Procedures

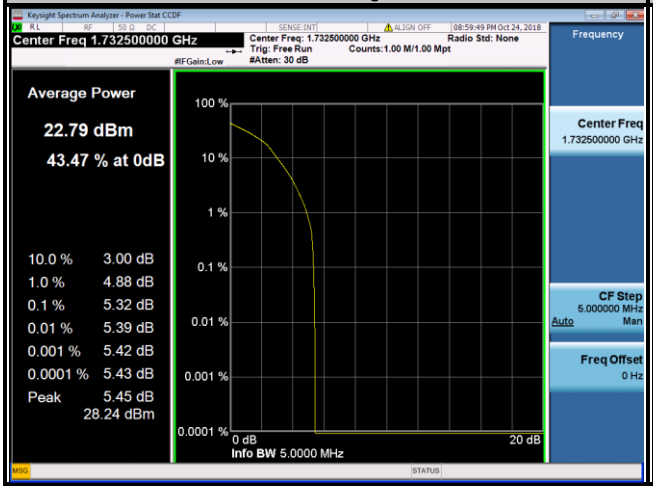
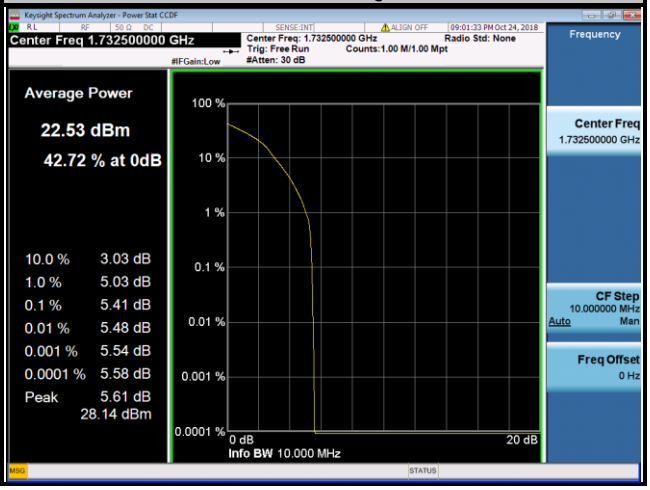
1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1 %.

4.6.4 Test Results

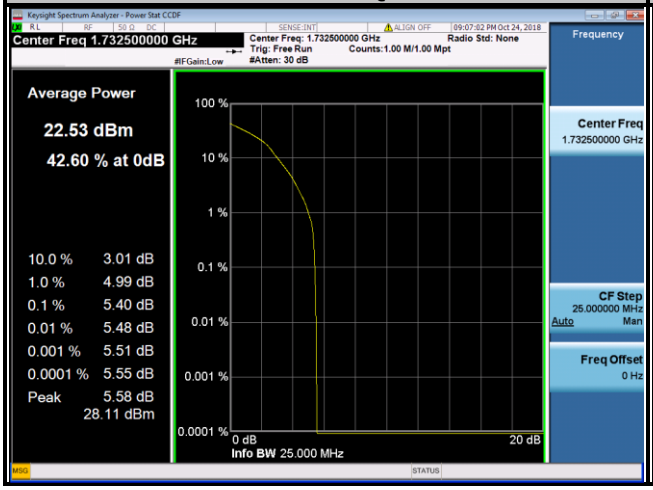
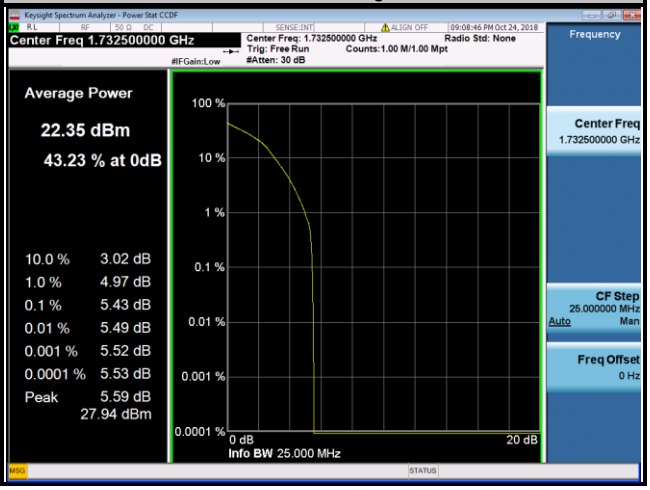
LTE Band 4									
Channel Bandwidth: 1.4 MHz					Channel Bandwidth: 3 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
19957	1710.7	4.19	5.11	5.17	19965	1711.5	4.19	5.16	5.28
20175	1732.5	4.25	5.14	5.35	20175	1732.5	4.28	5.17	5.38
20393	1754.3	3.90	4.85	4.94	20385	1753.5	4.03	5.02	5.20

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

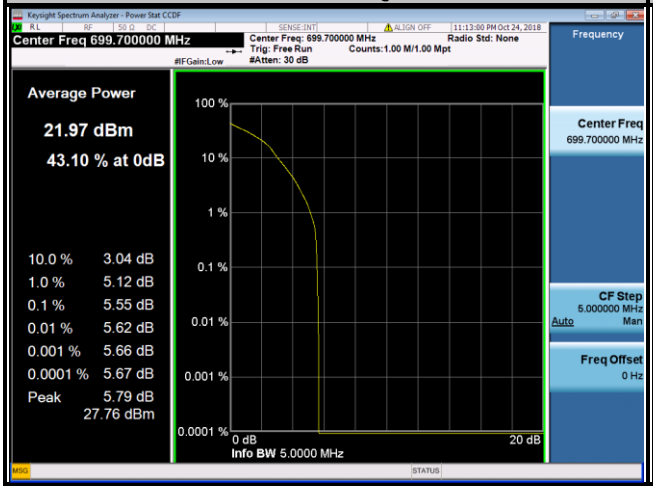
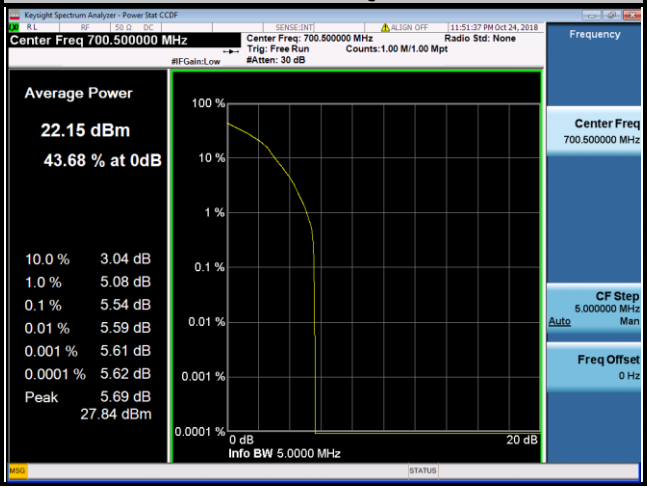
LTE Band 4									
Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
19975	1712.5	4.19	5.13	5.23	20000	1715.0	4.10	5.09	5.30
20175	1732.5	4.29	5.19	5.32	20175	1732.5	4.29	5.19	5.41
20375	1752.5	4.05	5.05	5.14	20350	1750.0	4.18	5.06	5.15

Spectrum Plot of Worst Value	
5 MHz / 64QAM	10 MHz / 64QAM
	

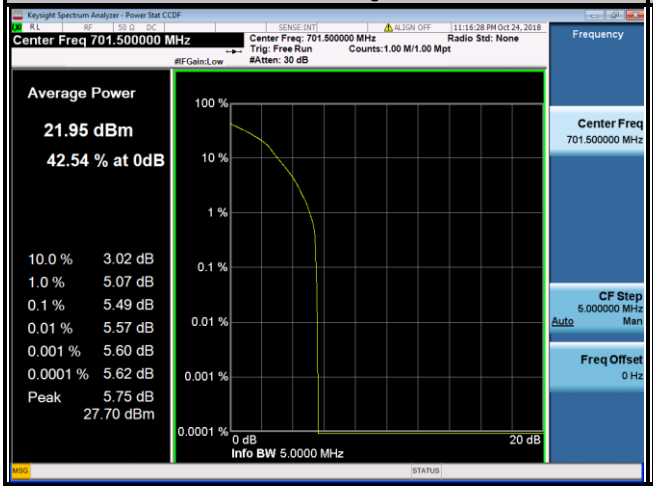
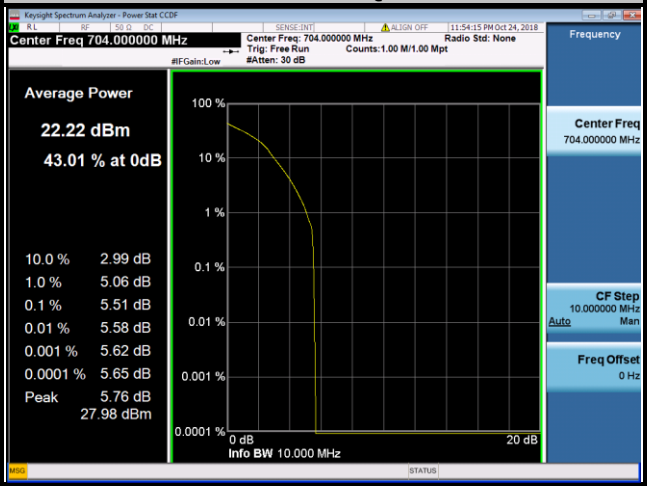
LTE Band 4									
Channel Bandwidth: 15 MHz					Channel Bandwidth: 20 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
20025	1717.5	4.22	5.09	5.30	20050	1720.0	4.13	5.00	5.30
20175	1732.5	4.34	5.20	5.40	20175	1732.5	4.28	5.12	5.43
20325	1747.5	4.05	4.96	5.06	20300	1745.0	4.11	5.04	5.29

Spectrum Plot of Worst Value	
15 MHz / 64QAM	20 MHz / 64QAM
	

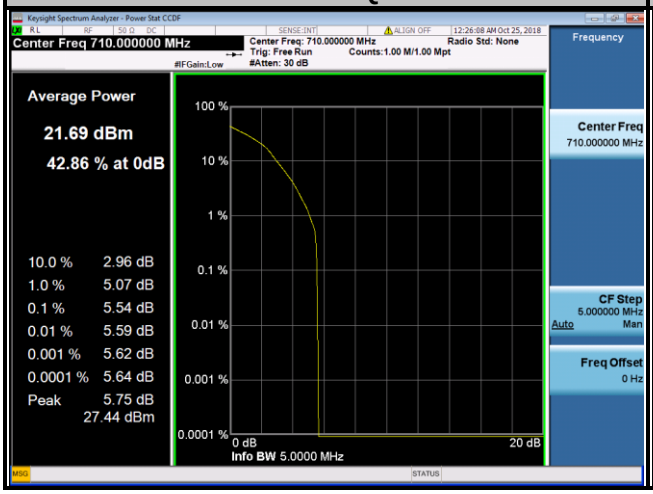
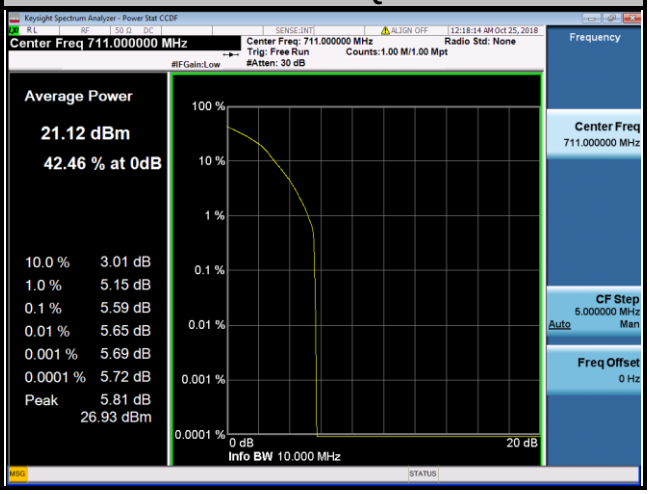
LTE Band 12									
Channel Bandwidth: 1.4 MHz					Channel Bandwidth: 3 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
23017	699.7	4.43	5.39	5.55	23025	700.5	4.51	5.45	5.54
23095	707.5	4.69	5.45	5.49	23095	707.5	4.58	5.45	5.49
23173	715.3	4.39	5.21	5.47	23165	714.5	4.38	5.20	5.38

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

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	64QAM			QPSK	16QAM	64QAM
23035	701.5	4.56	5.43	5.49	23060	704.0	4.46	5.36	5.51
23095	707.5	4.54	5.32	5.45	23095	707.5	4.47	5.25	5.39
23155	713.5	4.38	5.30	5.35	23130	711.0	4.47	5.37	5.50

Spectrum Plot of Worst Value	
5 MHz / 64QAM	10 MHz / 64QAM
	

LTE Band 17									
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	64QAM			QPSK	16QAM	64QAM
23755	706.5	4.54	5.36	5.43	23780	709.0	4.53	5.35	5.47
23790	710.0	4.71	5.42	5.54	23790	710.0	4.52	5.34	5.53
23825	713.5	4.55	5.36	5.46	23800	711.0	4.55	5.39	5.59

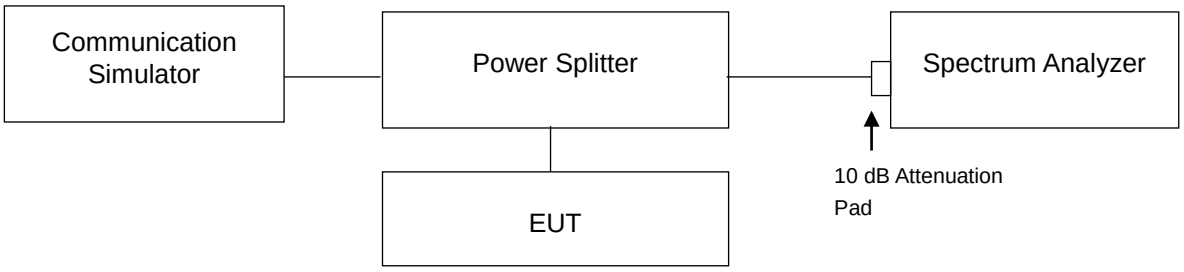
Spectrum Plot of Worst Value	
5 MHz / 64QAM	10 MHz / 64QAM
	

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.

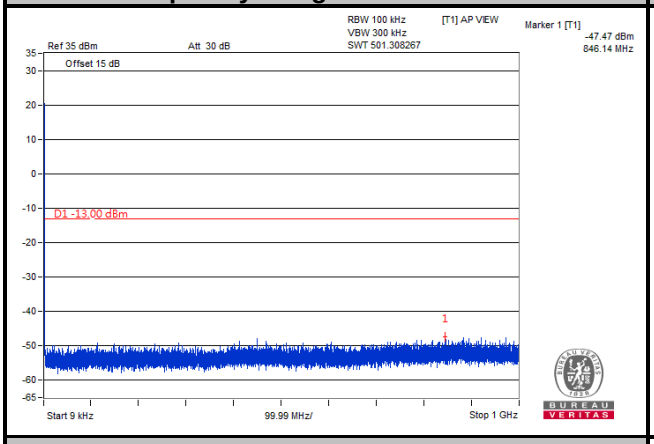
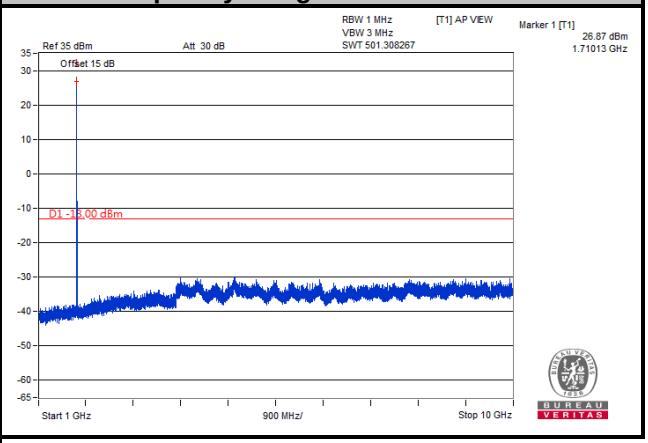
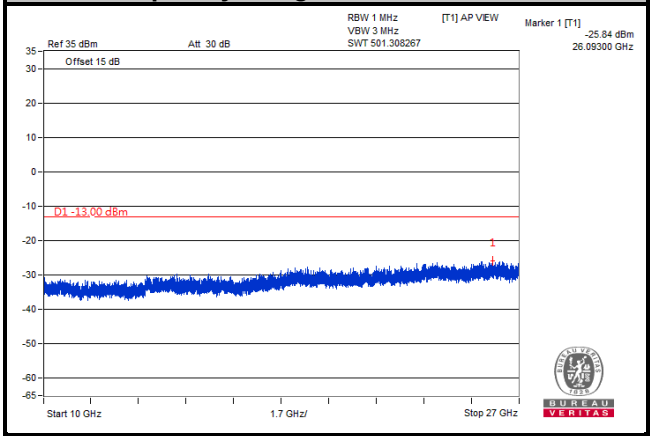
4.7.2 Test Setup



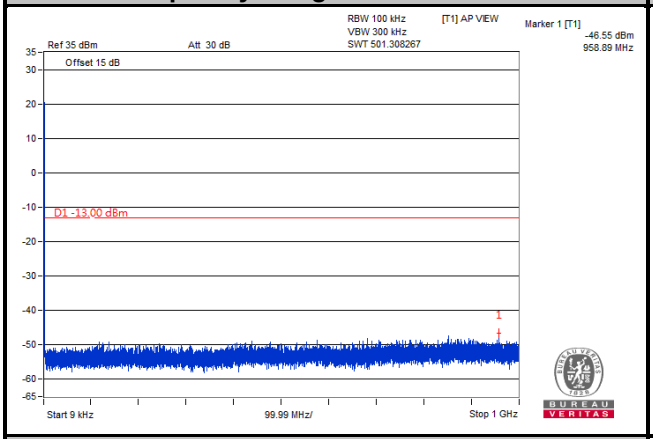
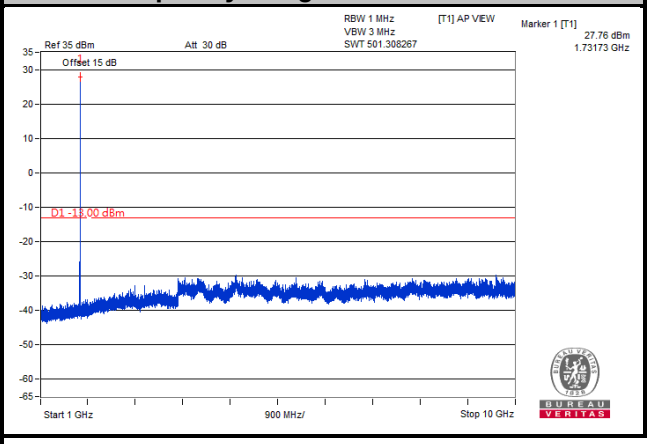
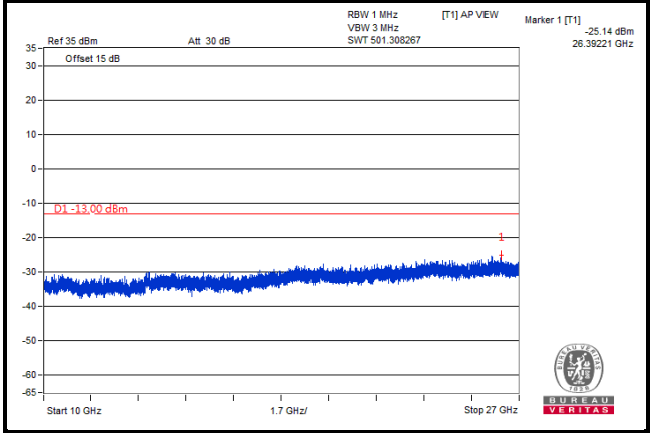
4.7.3 Test Procedure

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 = 100 kHz and VBW = 300 kHz is used for conducted emission measurement.
c. Measuring frequency range is from 1 GHz to 27 GHz. 10 dB attenuation pad is connected with spectrum. RBW = 1 MHz and VBW = 3 MHz is used for conducted emission measurement.

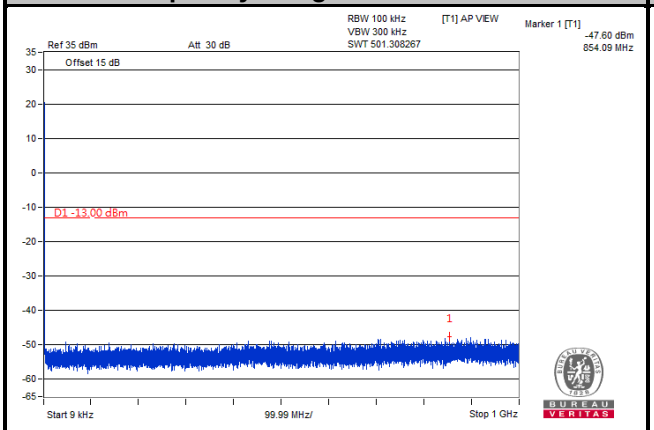
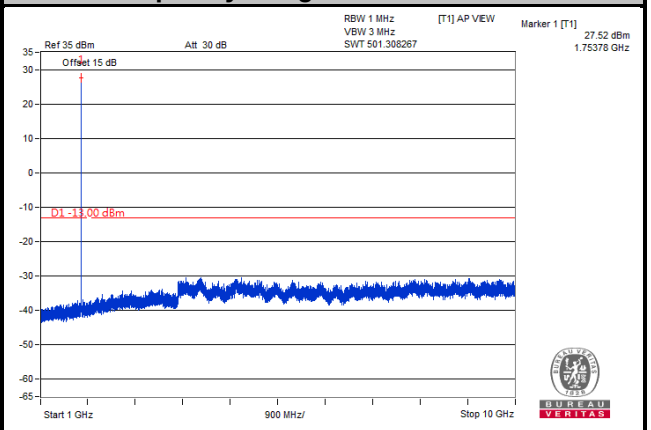
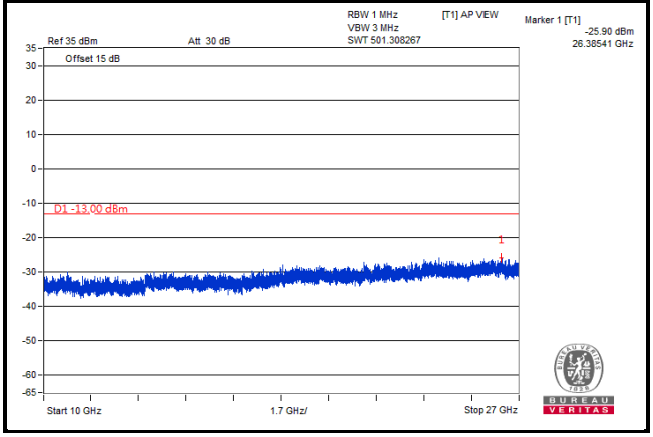
4.7.4 Test Results

LTE Band 4	
Channel Bandwidth: 1.4 MHz	
Channel 19957	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Frequency Range: 10 GHz ~ 27 GHz	
	

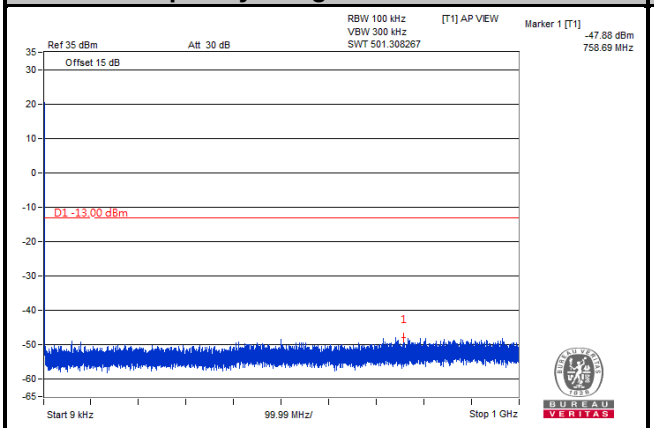
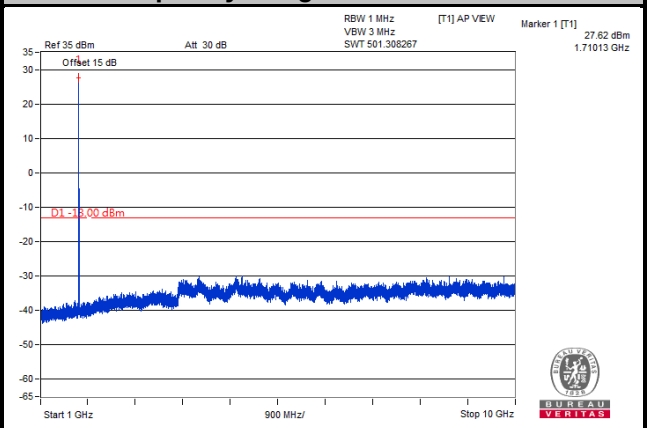
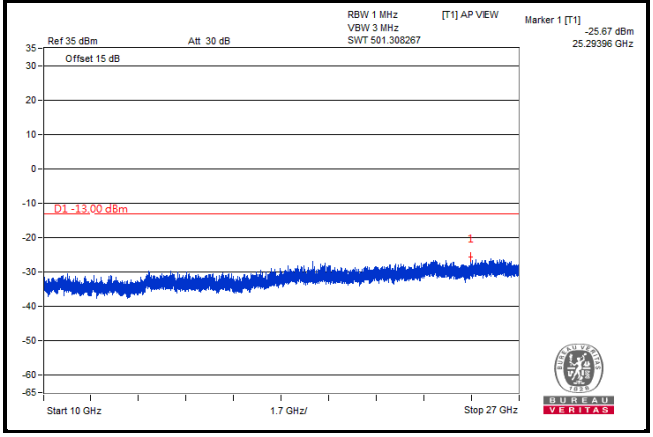
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4	
Channel Bandwidth: 1.4 MHz	
Channel 20175	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Frequency Range: 10 GHz ~ 27 GHz	
	

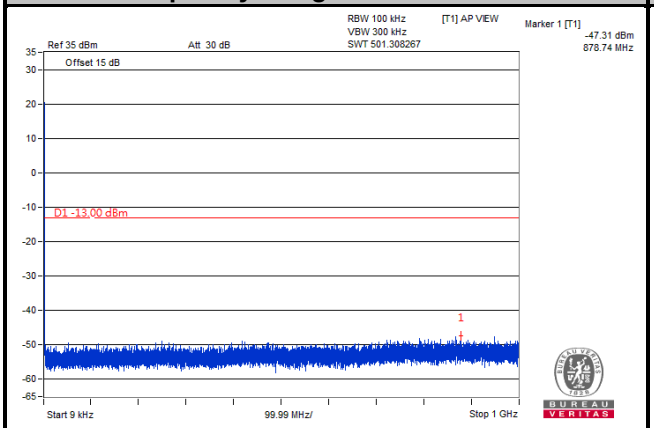
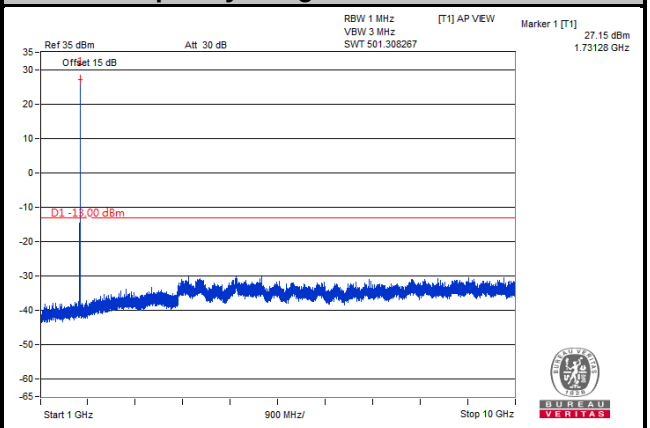
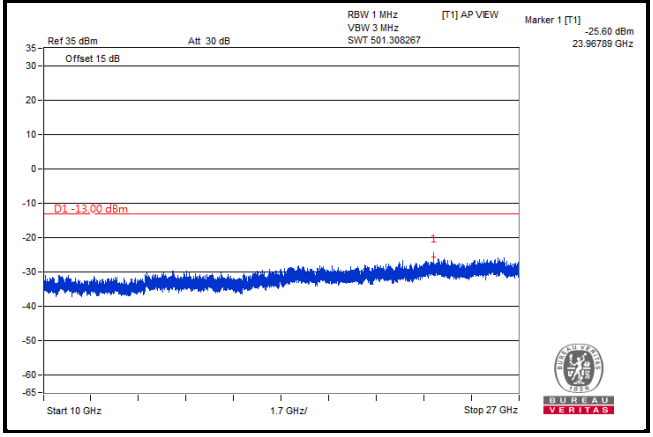
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4	
Channel Bandwidth: 1.4 MHz	
Channel 20393	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Frequency Range: 10 GHz ~ 27 GHz	
	

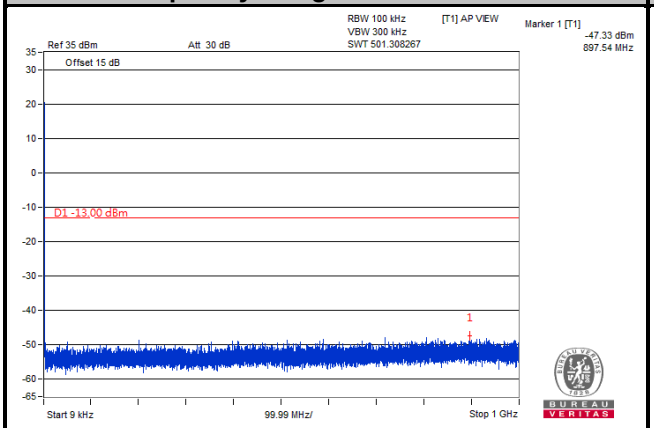
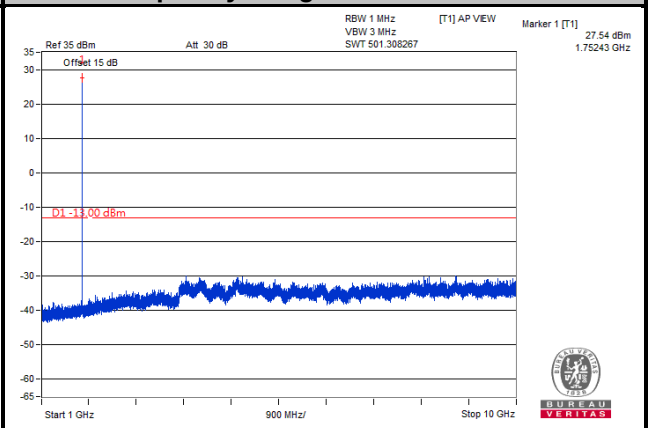
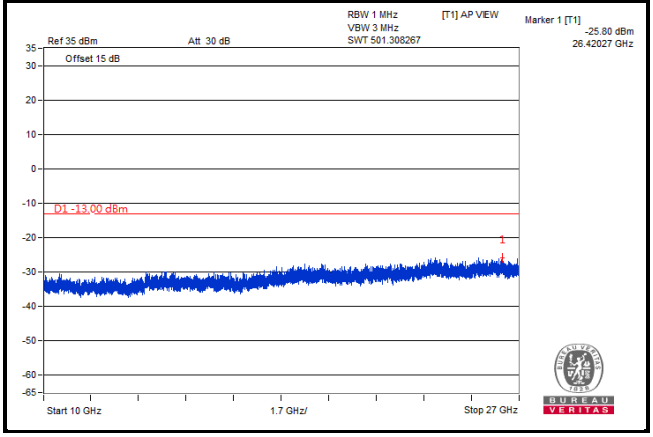
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4	
Channel Bandwidth: 3 MHz	
Channel 19965	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Frequency Range: 10 GHz ~ 27 GHz	
	

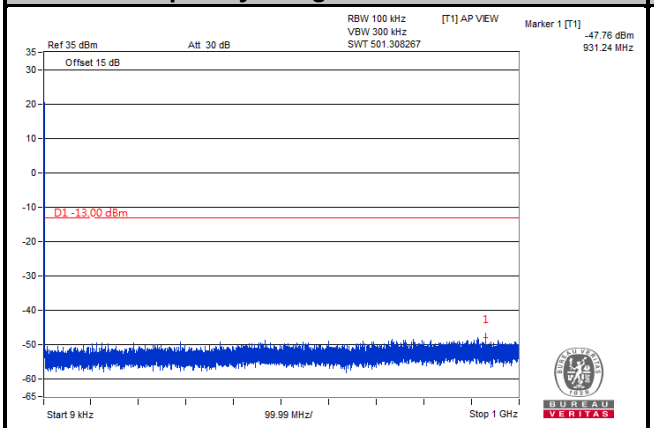
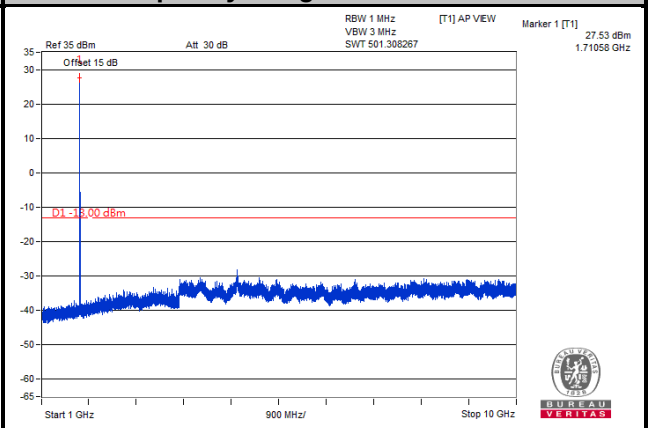
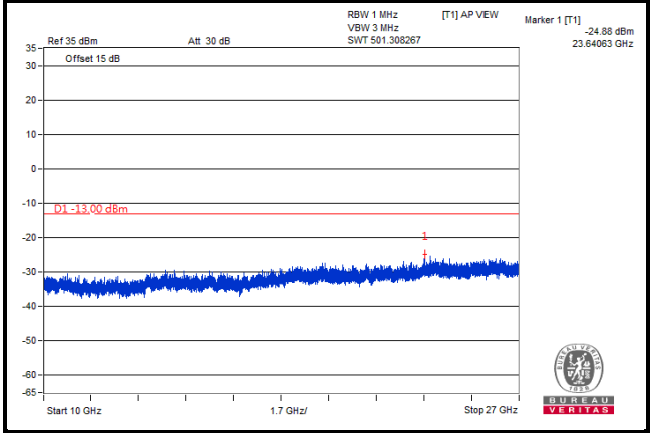
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4	
Channel Bandwidth: 3 MHz	
Channel 20175	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Frequency Range: 10 GHz ~ 27 GHz	
	

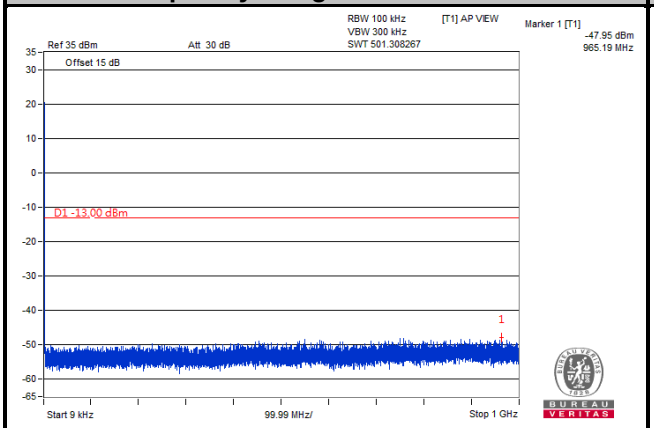
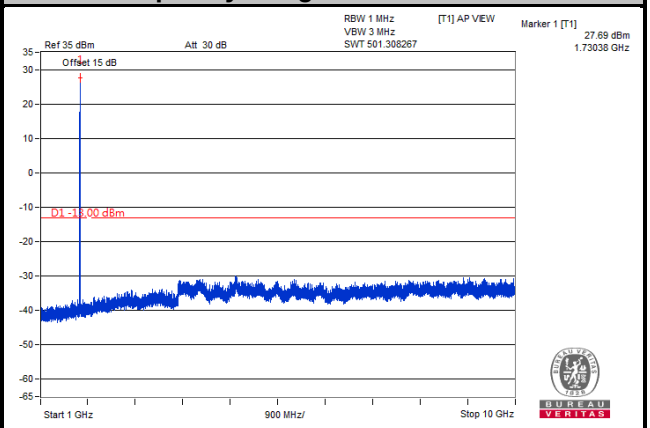
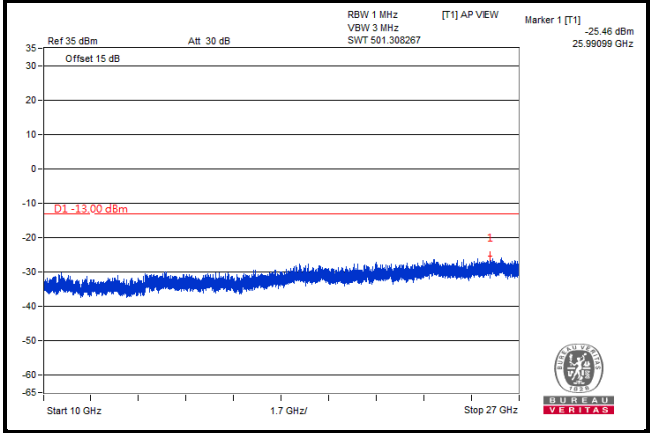
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4	
Channel Bandwidth: 3 MHz	
Channel 20385	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Frequency Range: 10 GHz ~ 27 GHz	
	

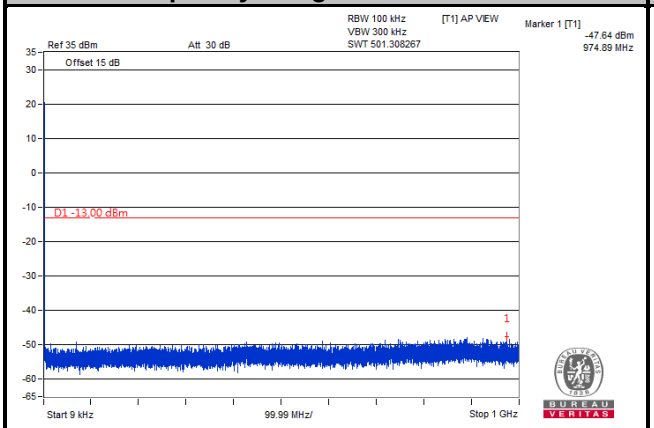
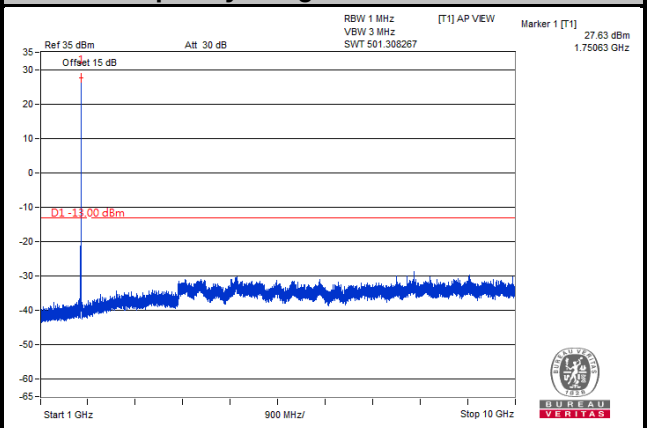
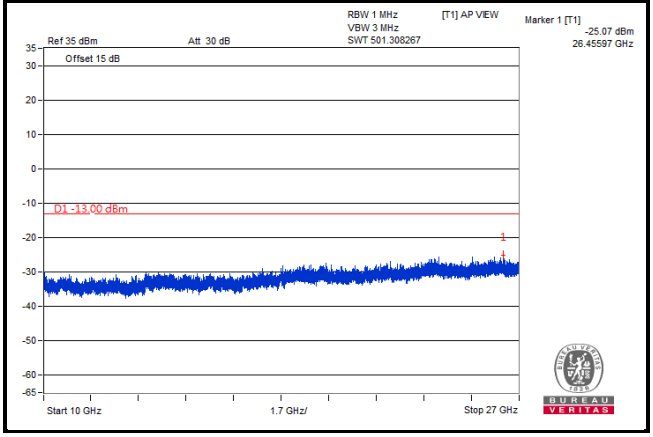
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4	
Channel Bandwidth: 5 MHz	
Channel 19975	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Frequency Range: 10 GHz ~ 27 GHz	
	

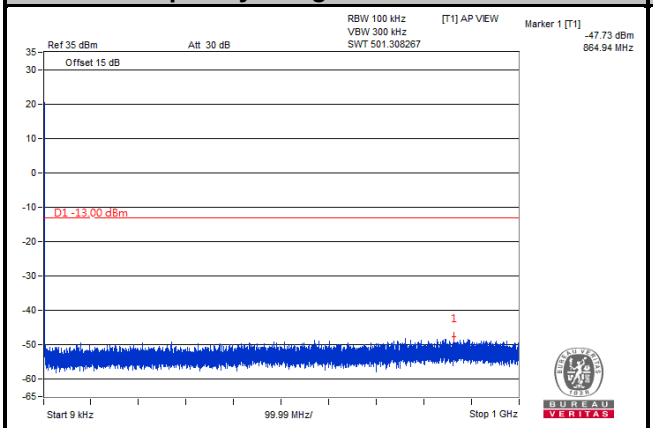
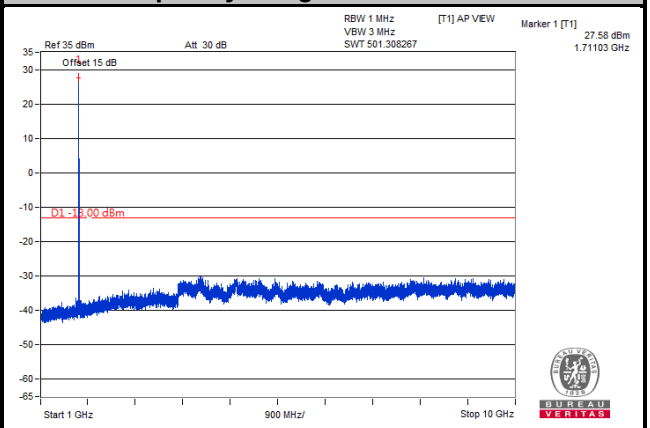
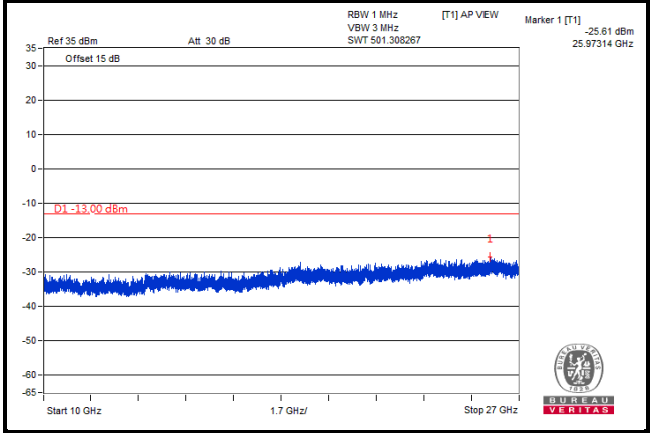
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4	
Channel Bandwidth: 5 MHz	
Channel 20175	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Frequency Range: 10 GHz ~ 27 GHz	
	

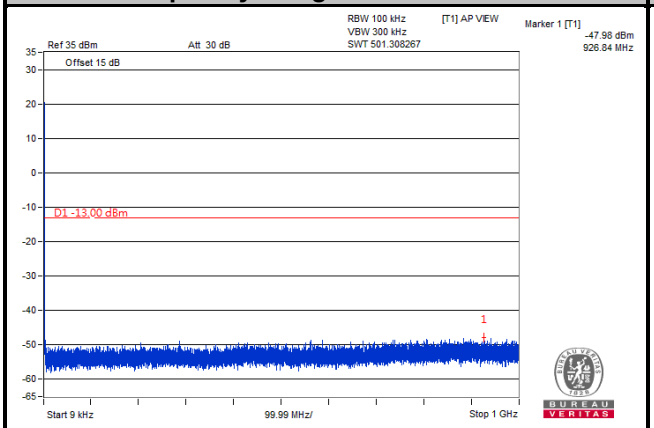
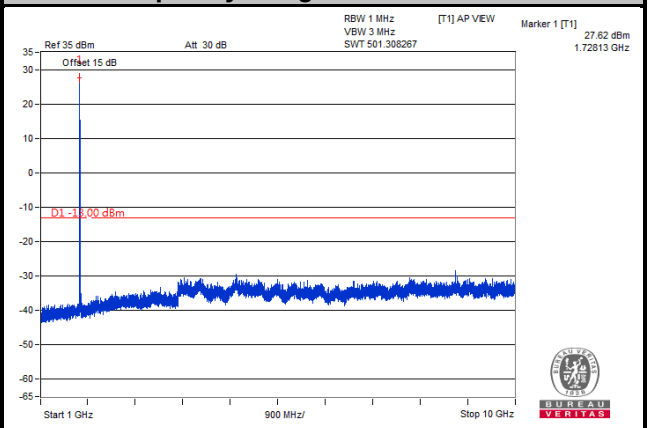
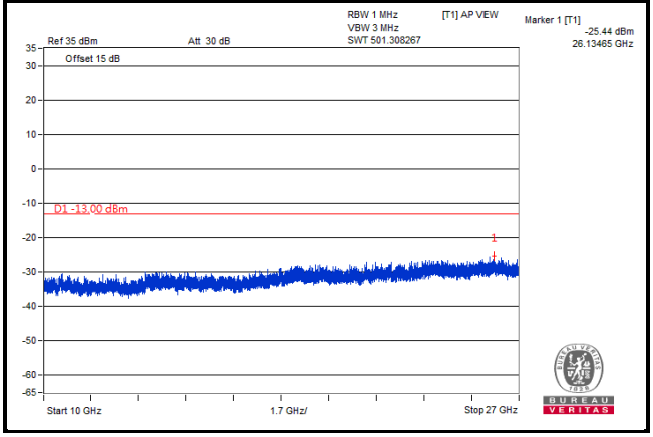
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4	
Channel Bandwidth: 5 MHz	
Channel 20375	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Frequency Range: 10 GHz ~ 27 GHz	
	

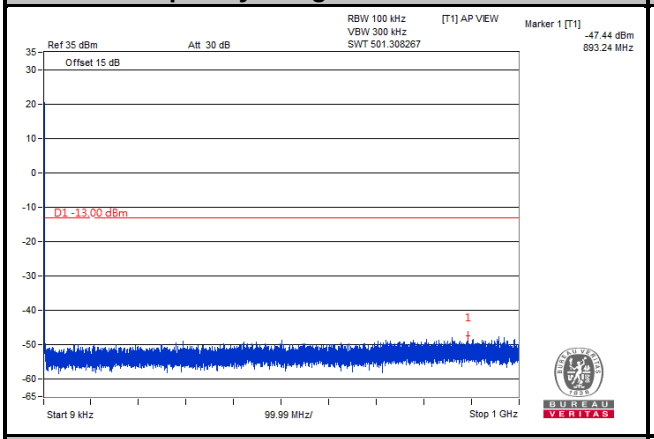
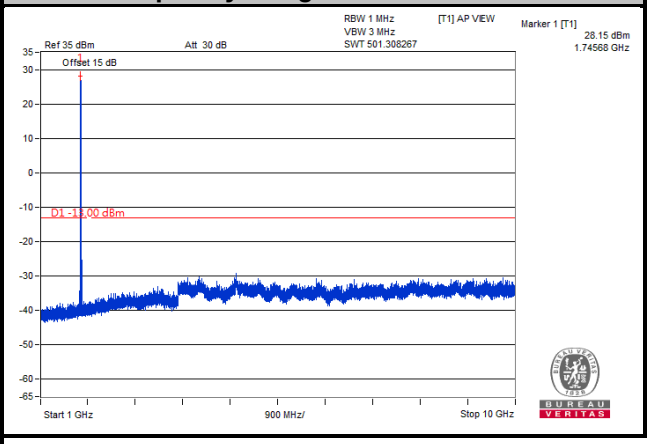
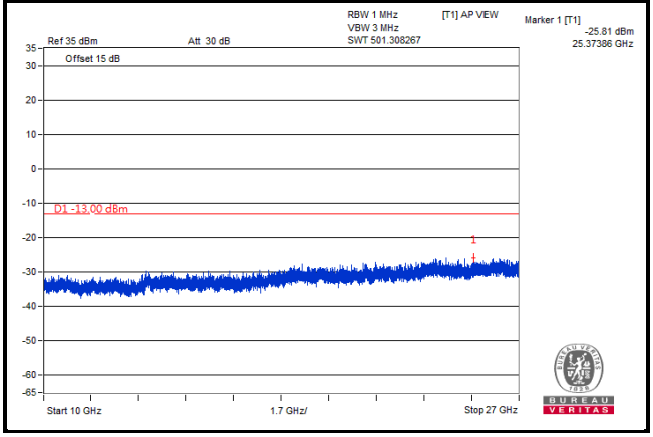
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4	
Channel Bandwidth: 10 MHz	
Channel 20000	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Frequency Range: 10 GHz ~ 27 GHz	
	

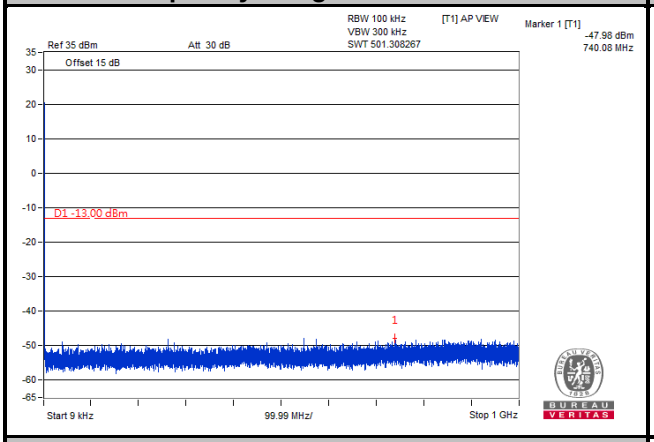
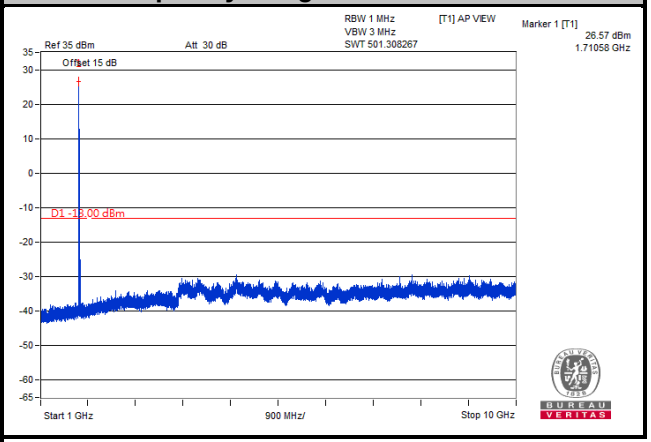
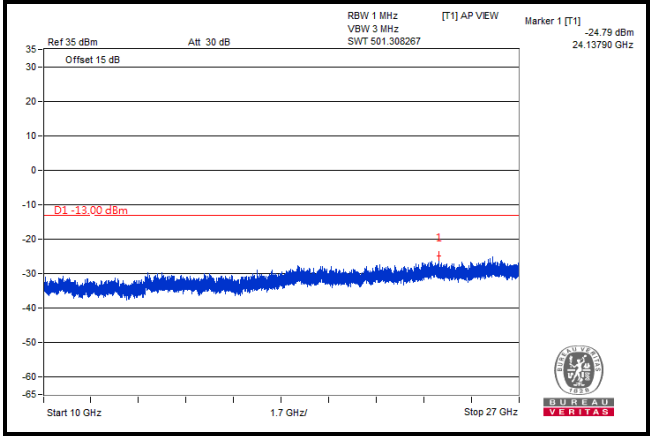
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4	
Channel Bandwidth: 10 MHz	
Channel 20175	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Frequency Range: 10 GHz ~ 27 GHz	
	

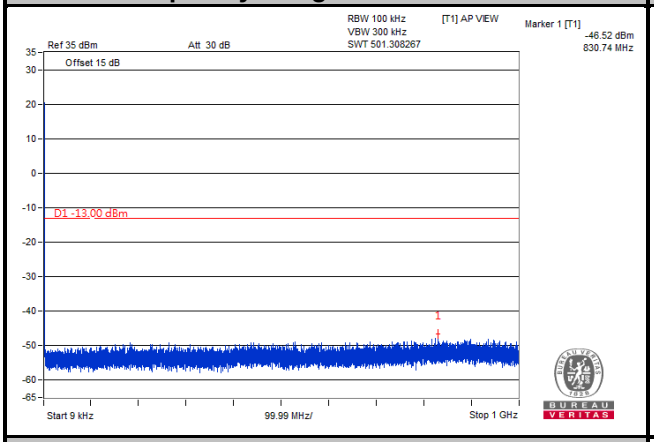
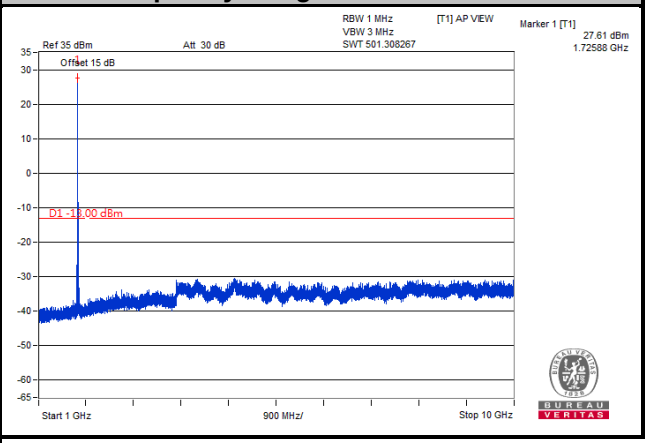
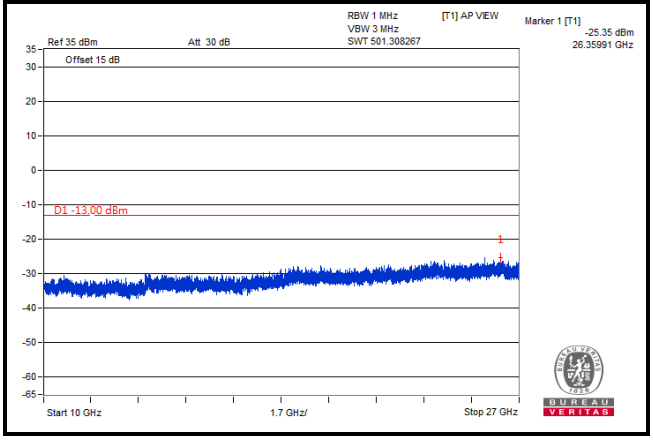
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4	
Channel Bandwidth: 10 MHz	
Channel 20350	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Frequency Range: 10 GHz ~ 27 GHz	
	

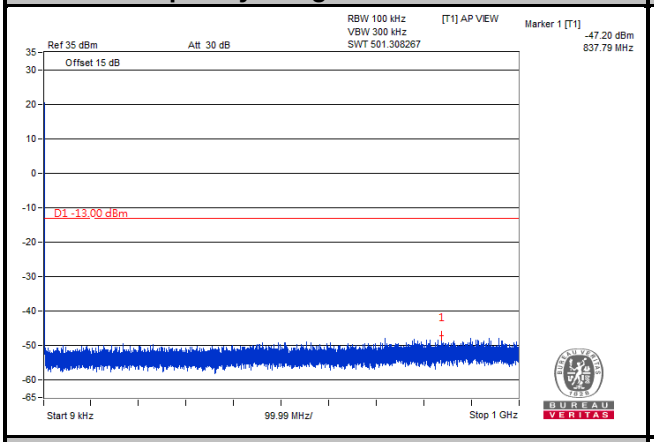
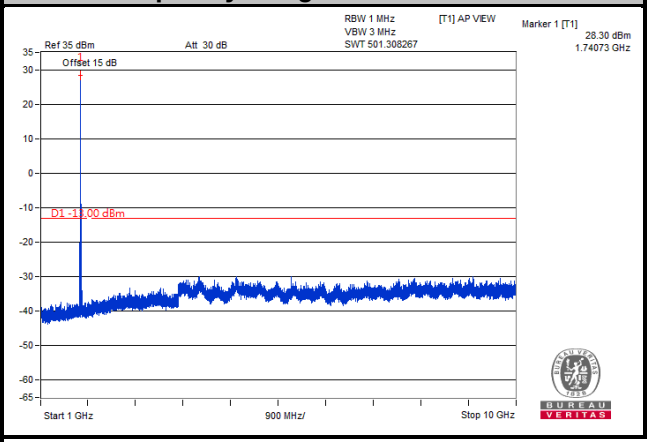
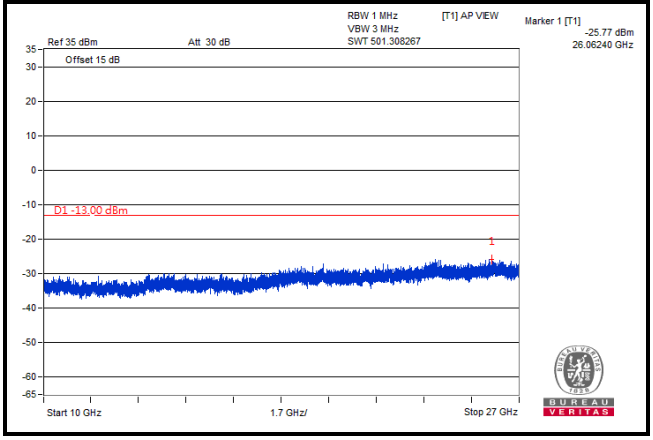
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4	
Channel Bandwidth: 15 MHz	
Channel 20025	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Frequency Range: 10 GHz ~ 27 GHz	
	

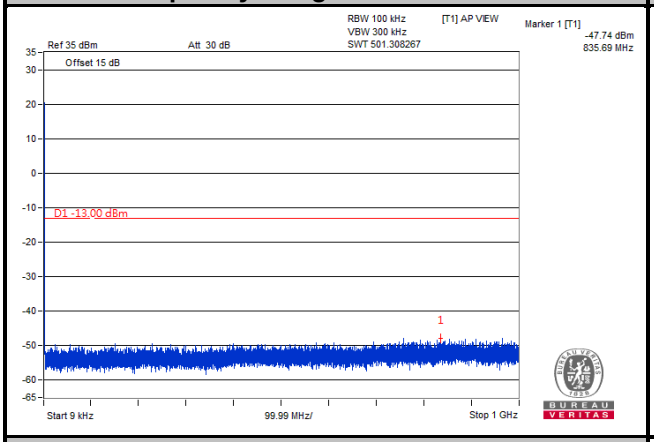
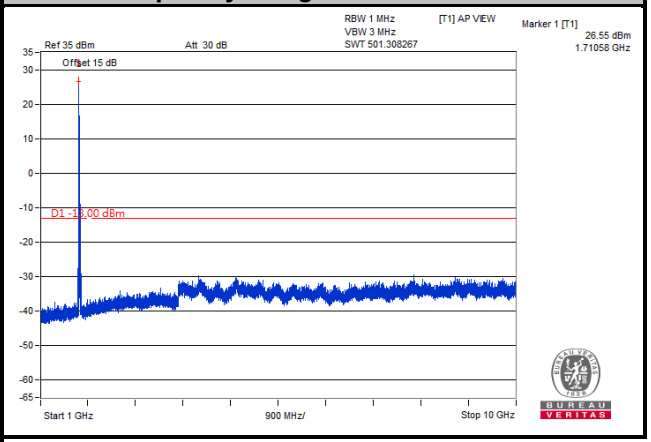
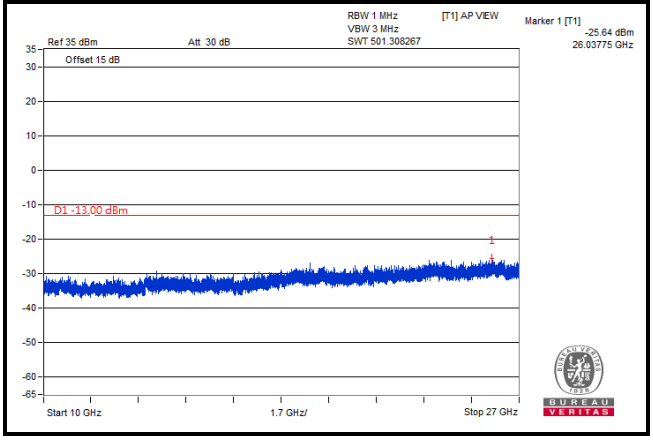
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4	
Channel Bandwidth: 15 MHz	
Channel 20175	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Frequency Range: 10 GHz ~ 27 GHz	
	

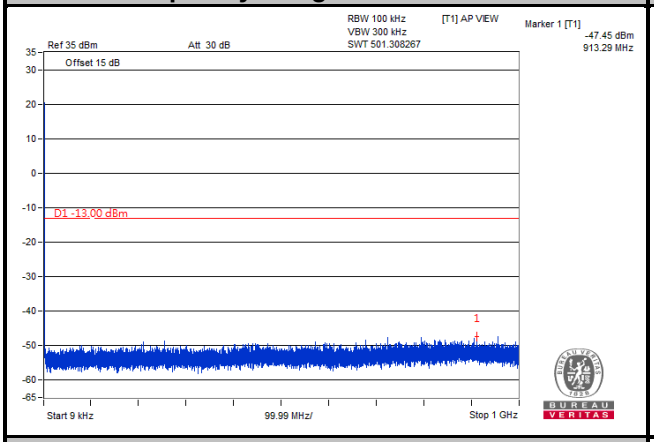
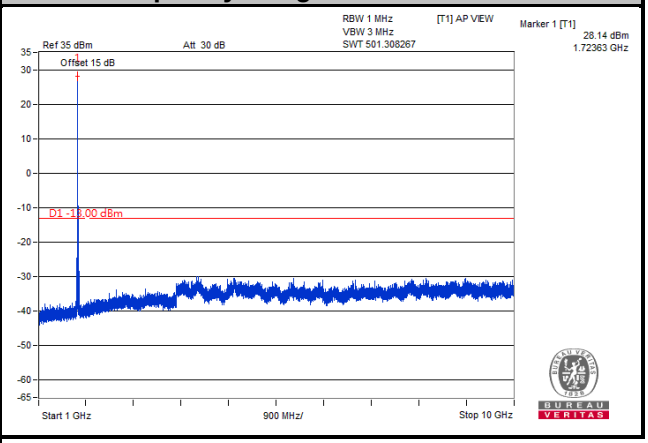
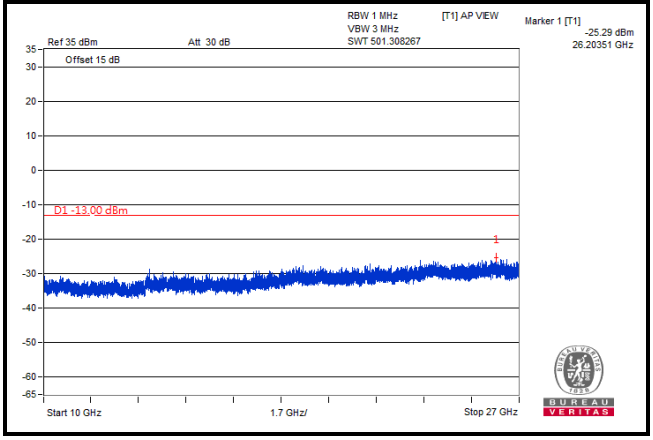
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4	
Channel Bandwidth: 15 MHz	
Channel 20325	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Frequency Range: 10 GHz ~ 27 GHz	
	

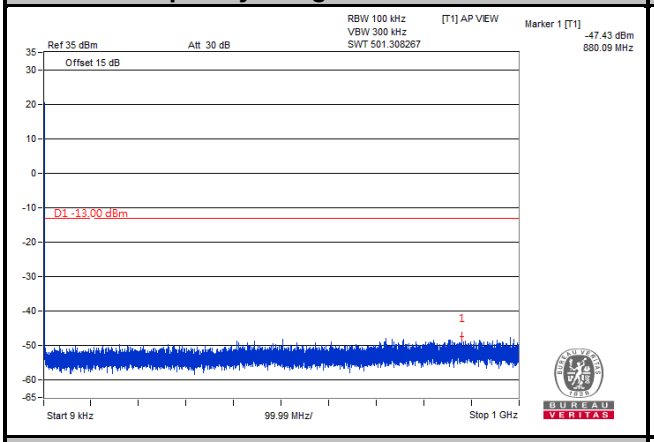
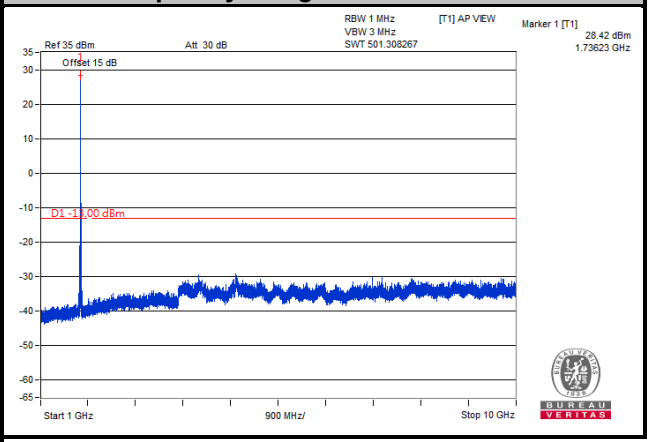
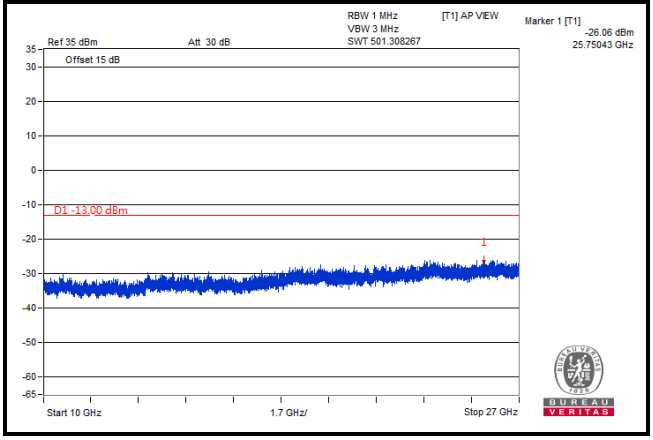
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4	
Channel Bandwidth: 20 MHz	
Channel 20050	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Frequency Range: 10 GHz ~ 27 GHz	
	

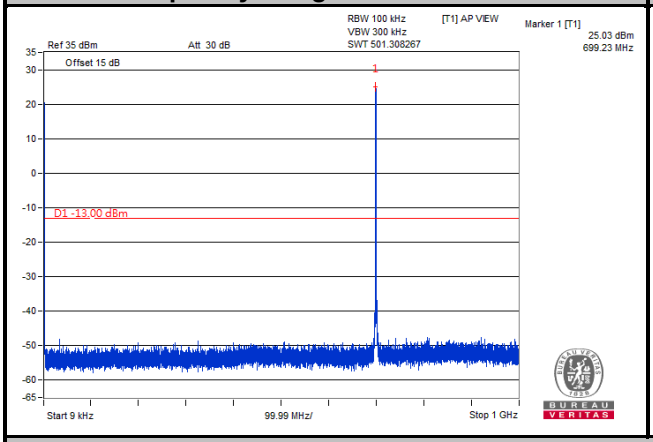
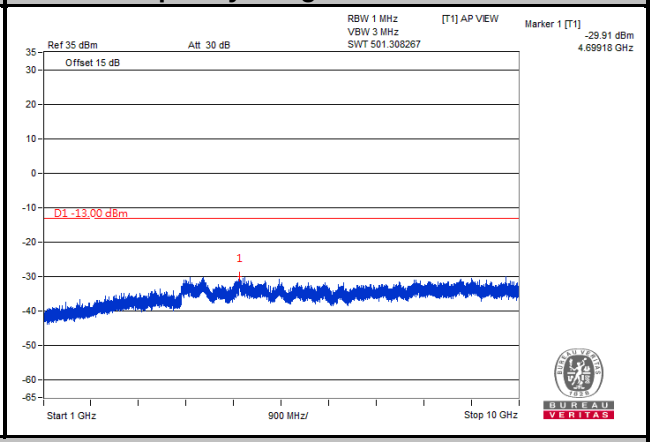
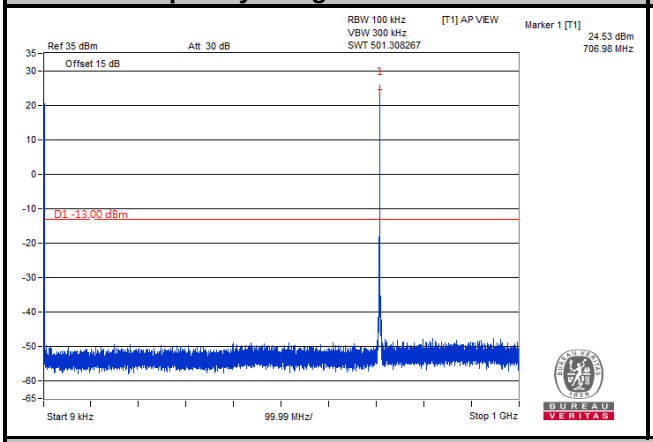
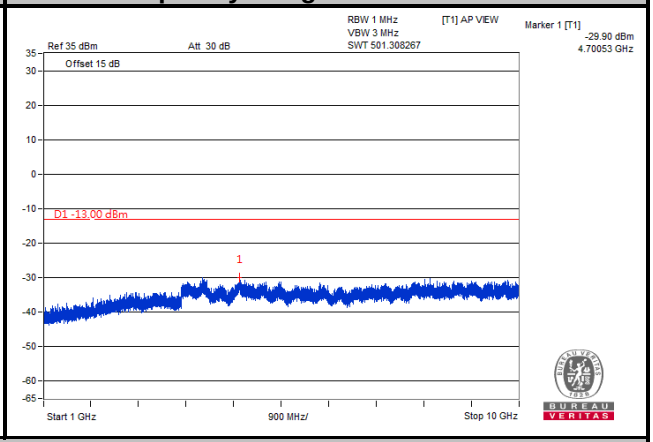
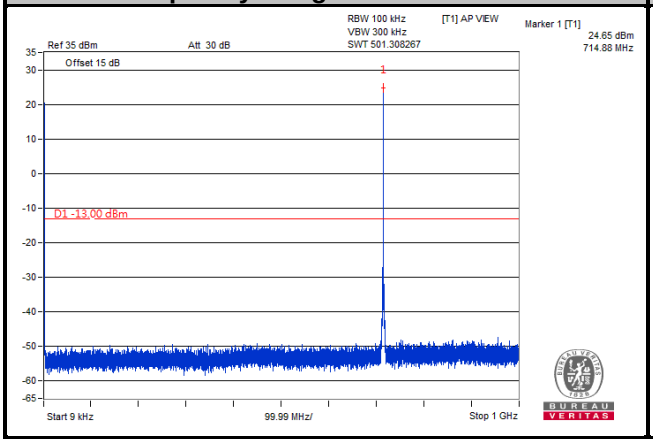
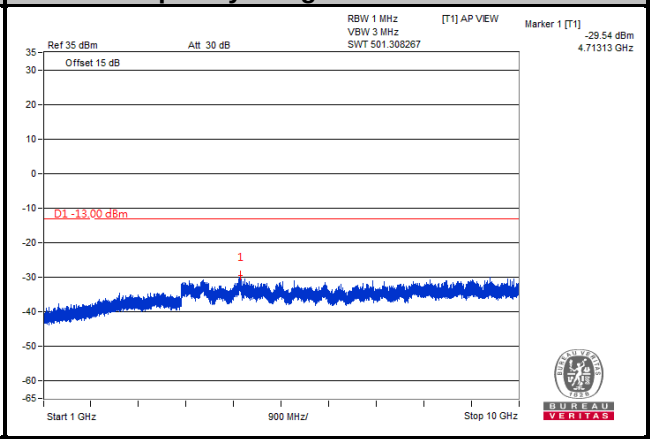
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4	
Channel Bandwidth: 20 MHz	
Channel 20175	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Frequency Range: 10 GHz ~ 27 GHz	
	

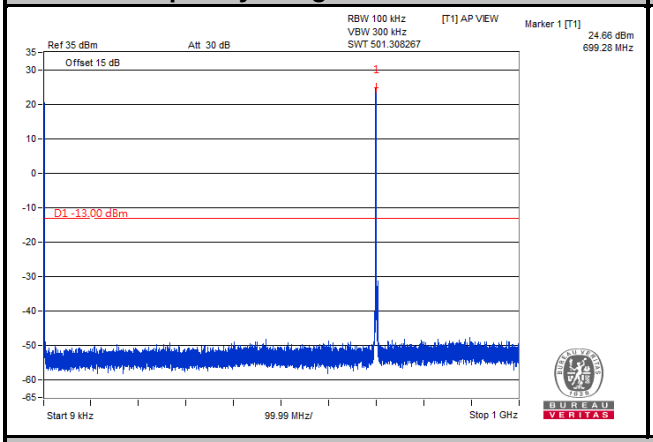
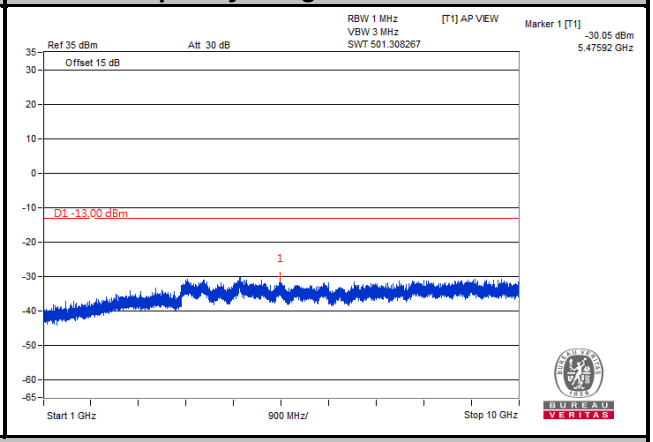
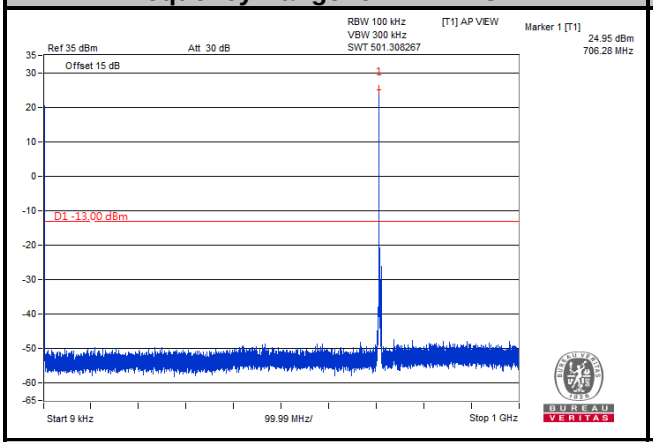
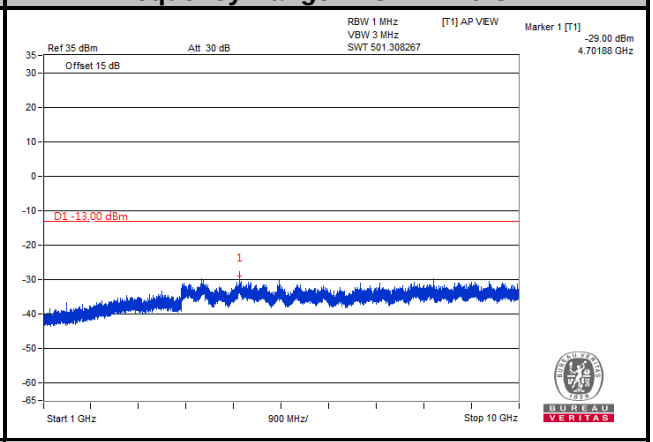
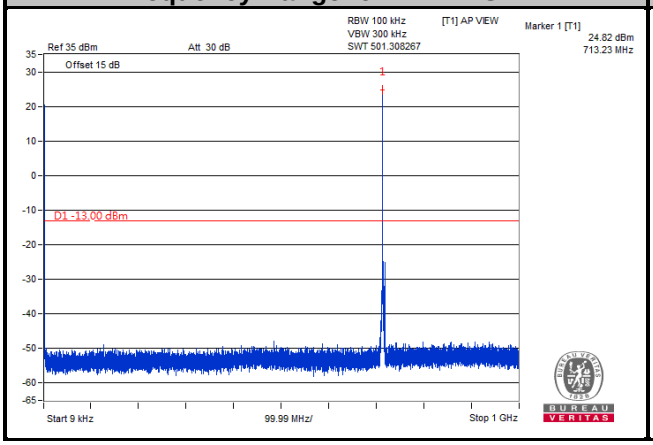
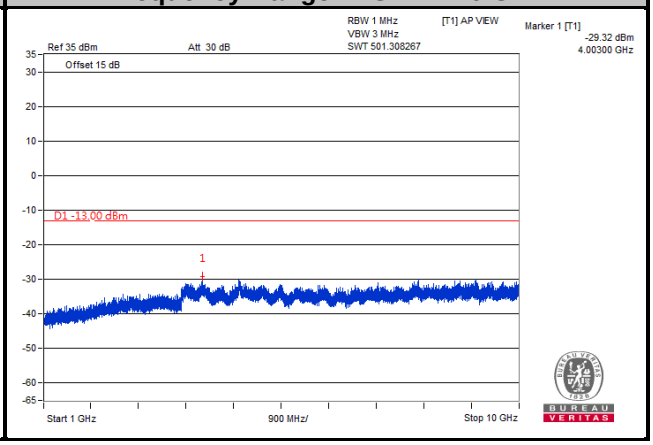
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4	
Channel Bandwidth: 20 MHz	
Channel 20300	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Frequency Range: 10 GHz ~ 27 GHz	
	

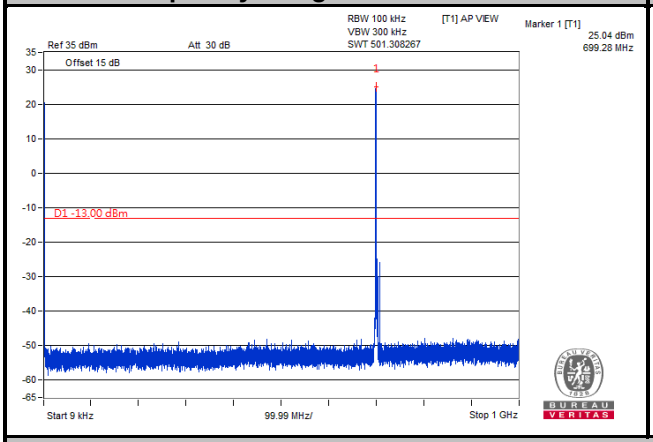
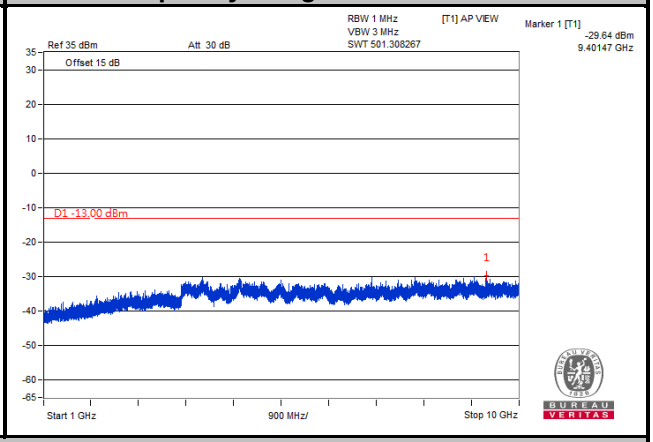
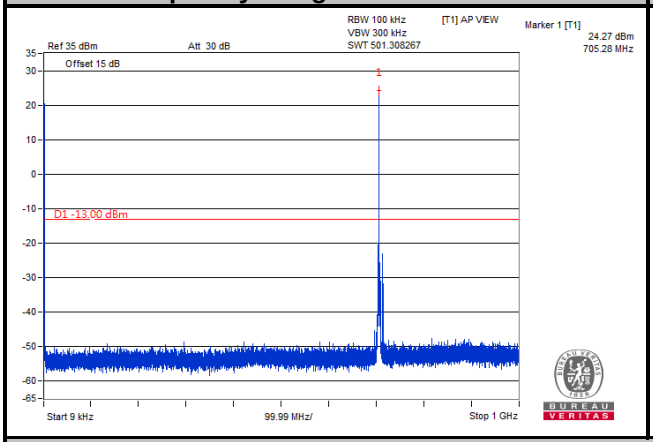
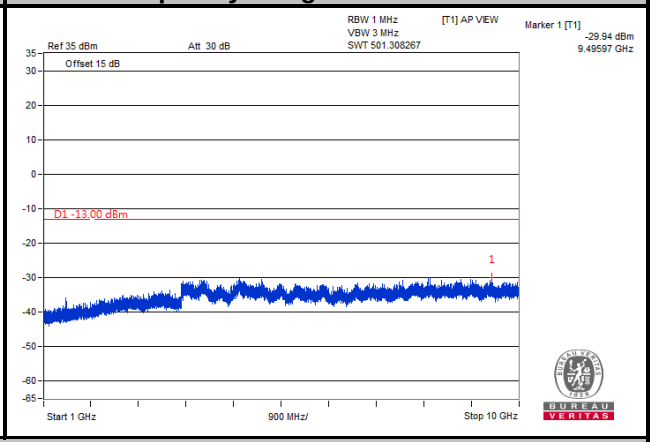
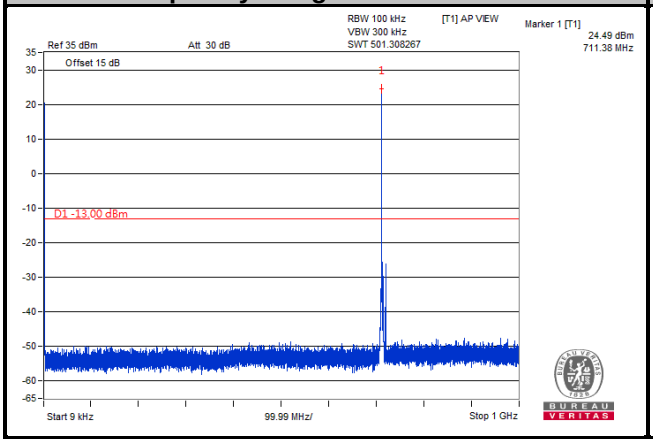
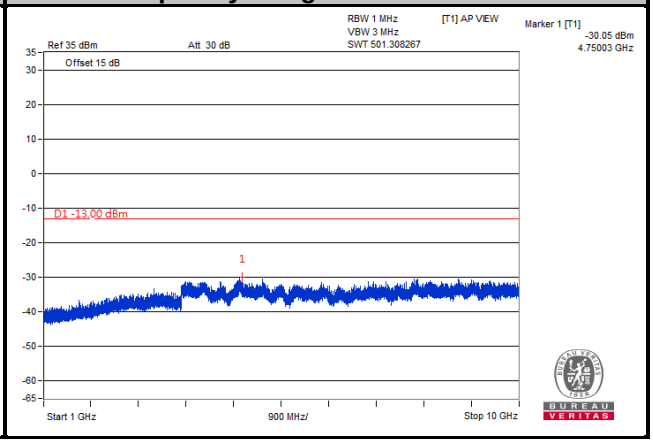
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 12	
Channel Bandwidth: 1.4 MHz	
Channel 23017	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Channel 23095	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Channel 23173	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	

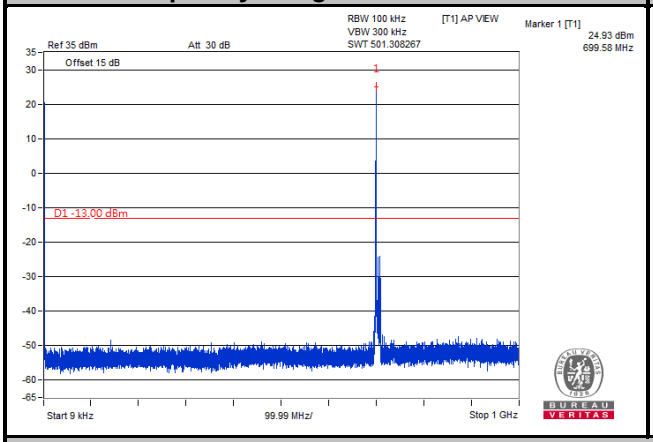
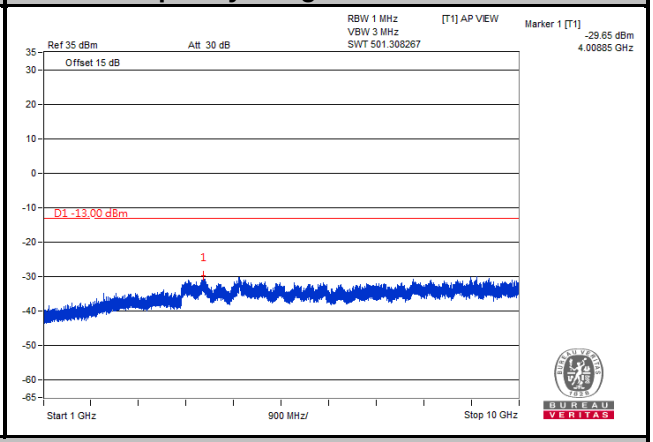
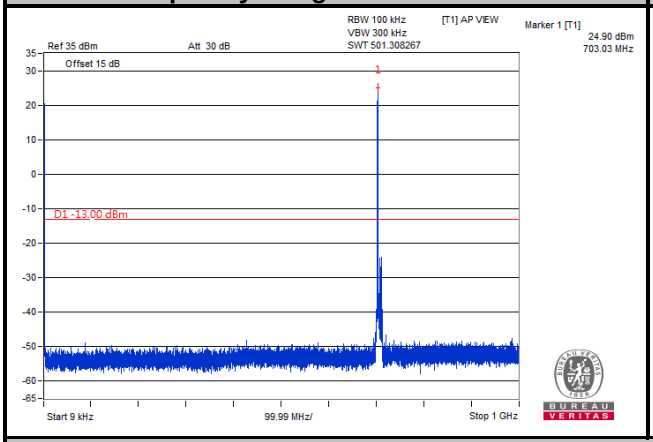
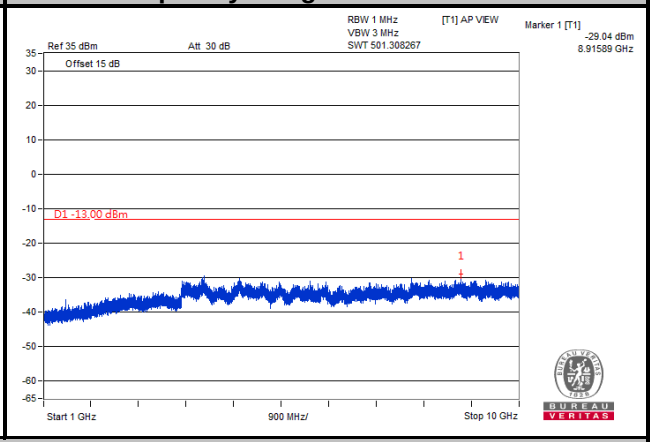
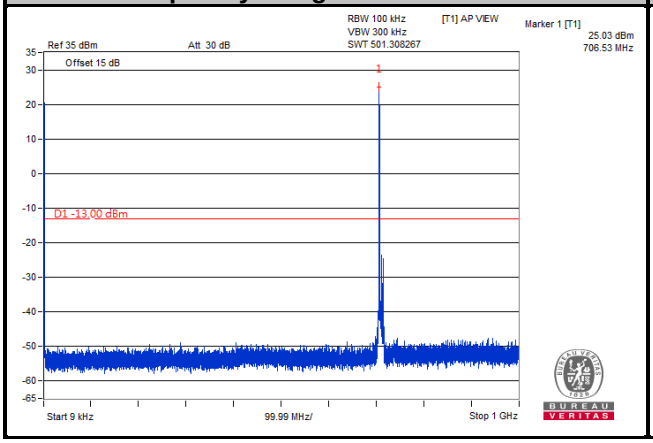
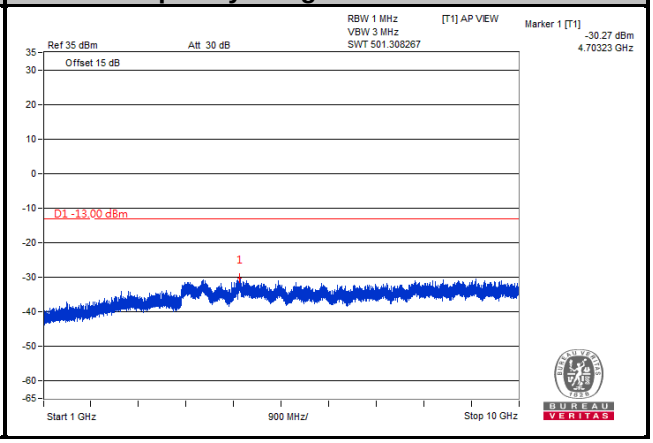
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 12	
Channel Bandwidth: 3 MHz	
Channel 23025	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Channel 23095	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Channel 23165	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	

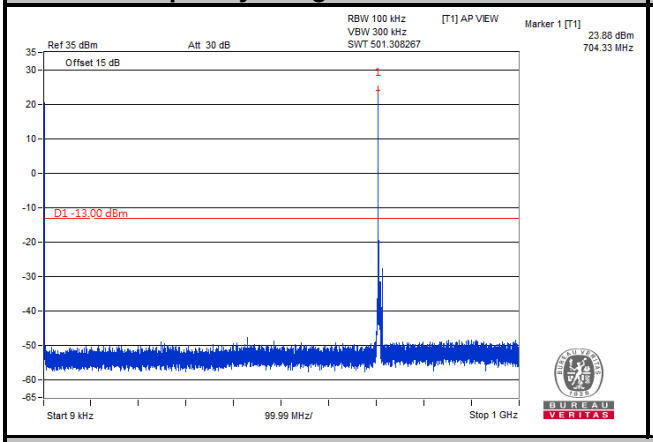
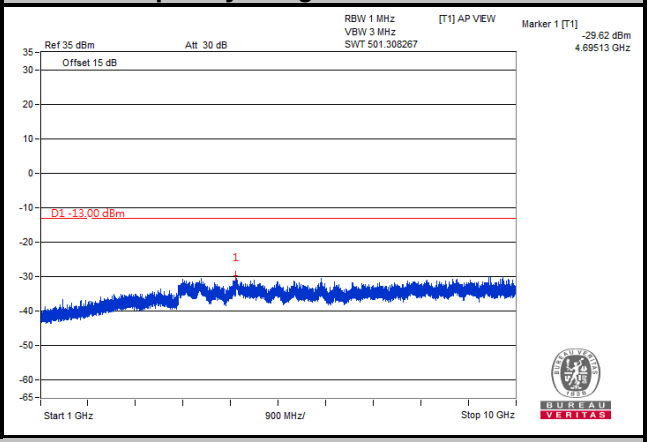
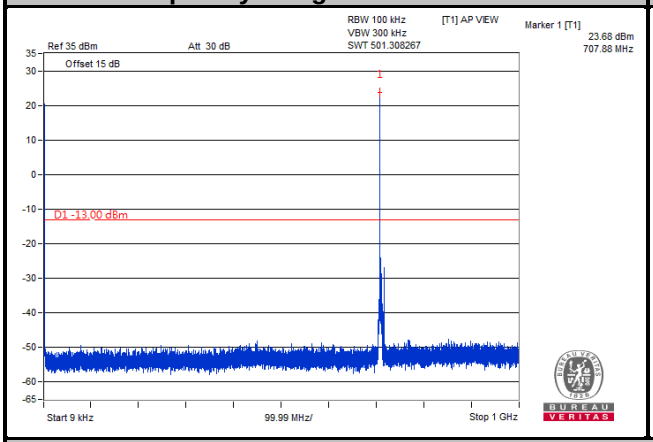
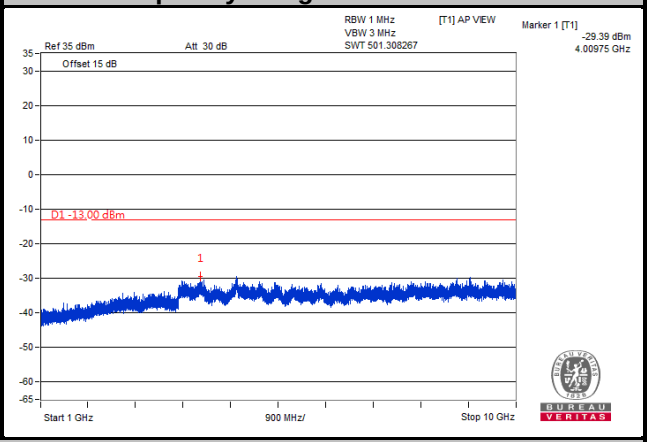
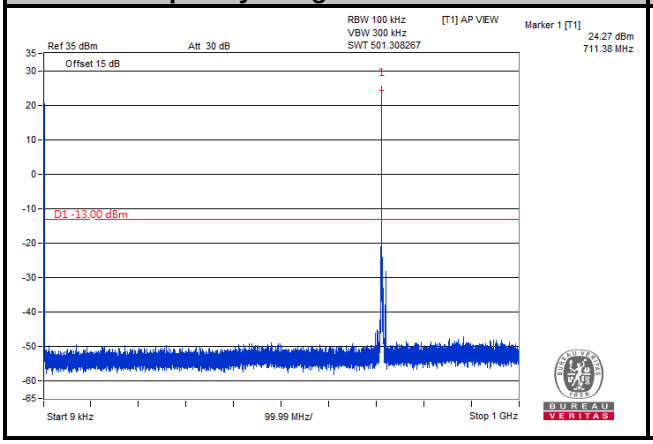
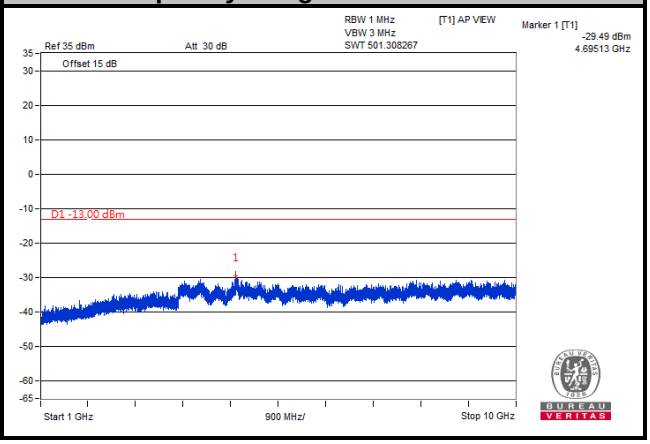
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 12	
Channel Bandwidth: 5 MHz	
Channel 23035	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Channel 23095	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Channel 23155	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	

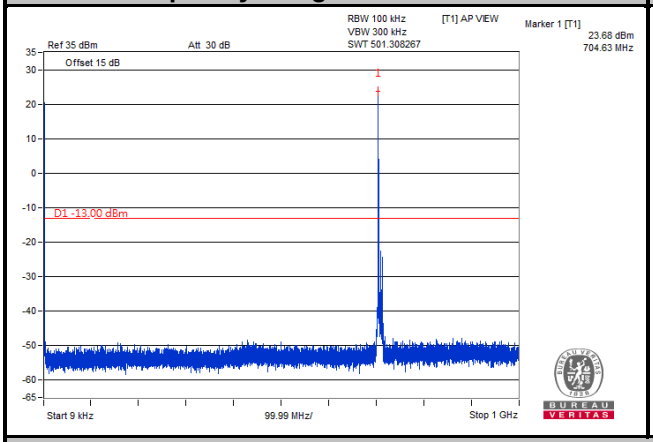
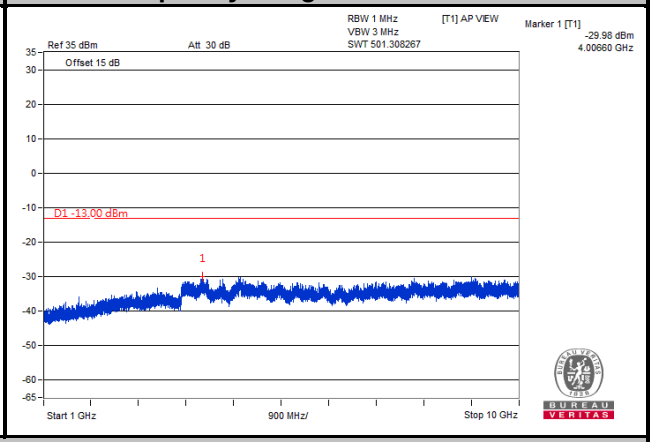
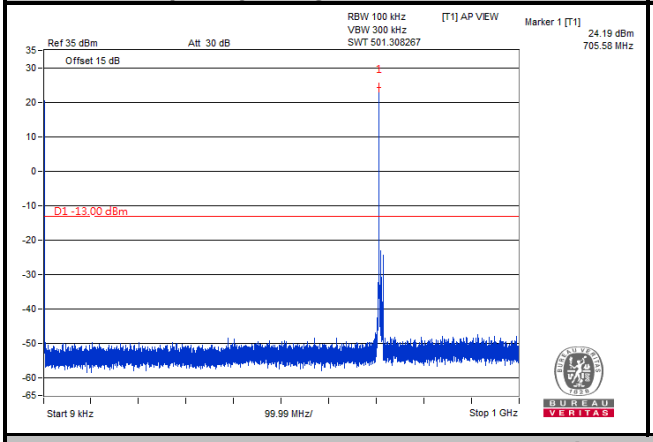
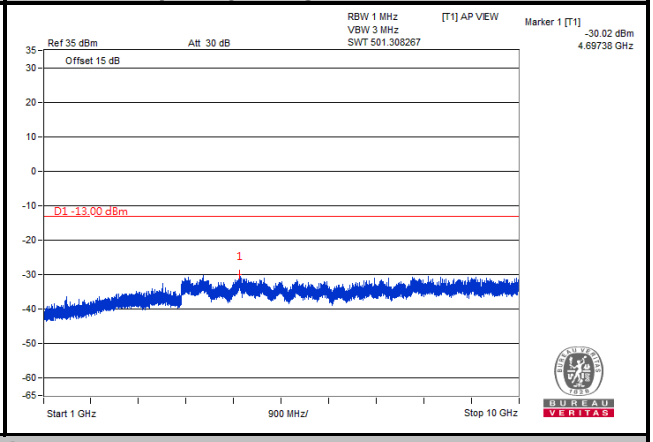
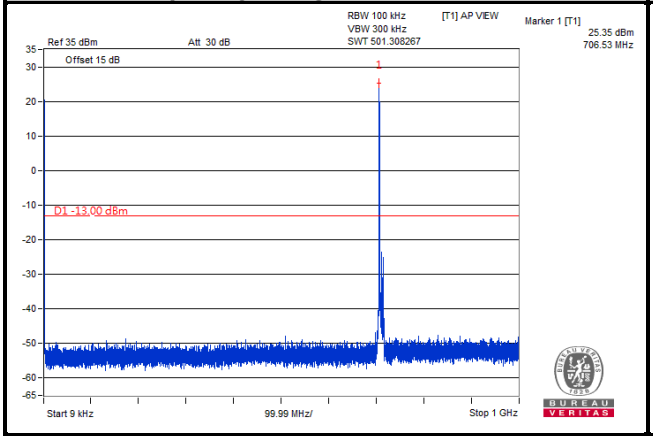
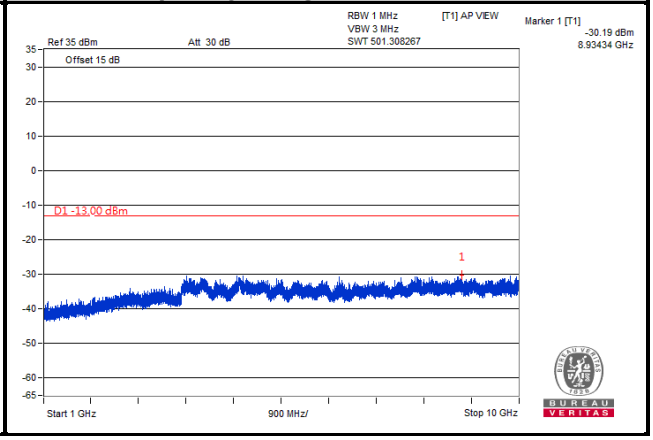
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

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

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

LTE Band 17	
Channel Bandwidth: 5 MHz	
Channel 23755	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Channel 23790	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Channel 23825	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	

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

LTE Band 17	
Channel Bandwidth: 10 MHz	
Channel 23780	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Channel 23790	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	
Channel 23800	
Frequency Range: 9 kHz ~ 1 GHz	Frequency Range: 1 GHz ~ 10 GHz
	

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

4.8 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.

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.

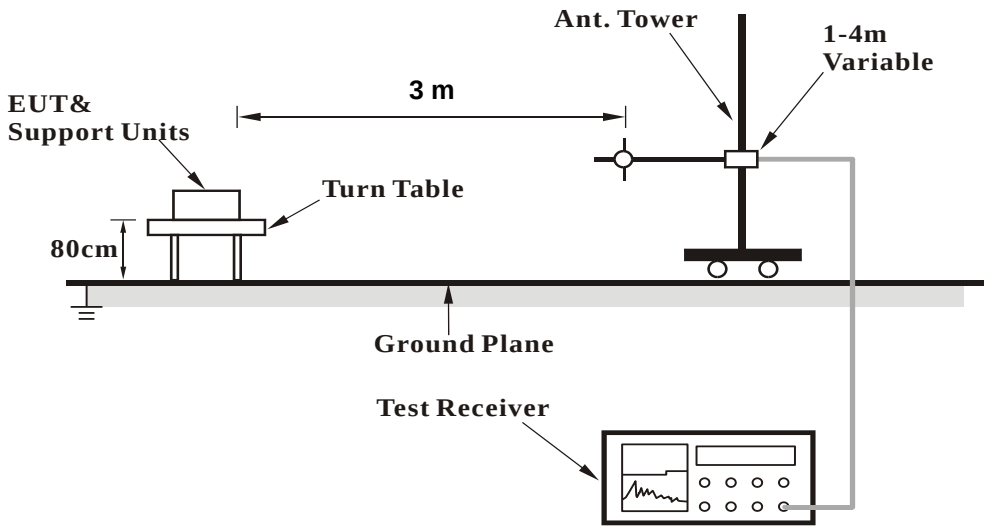
Note: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.8.3 Deviation from Test Standard

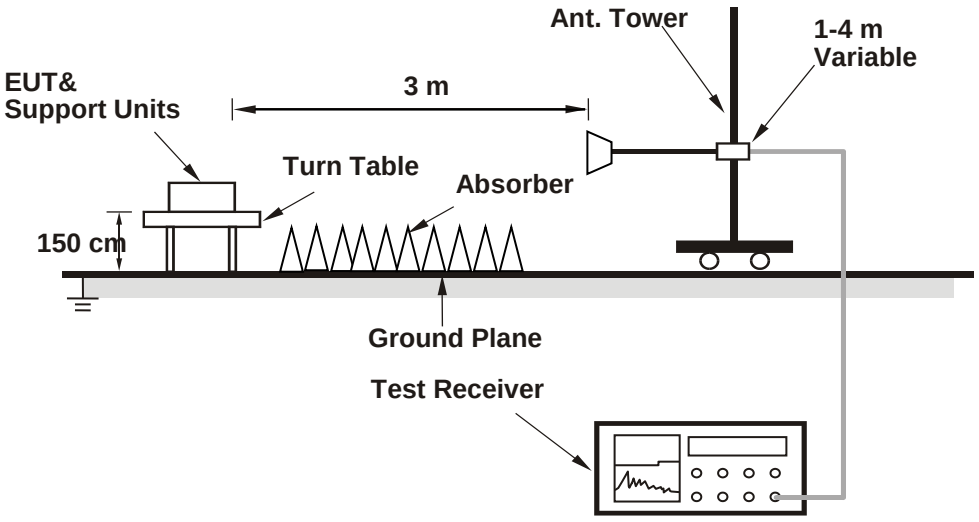
No deviation.

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).

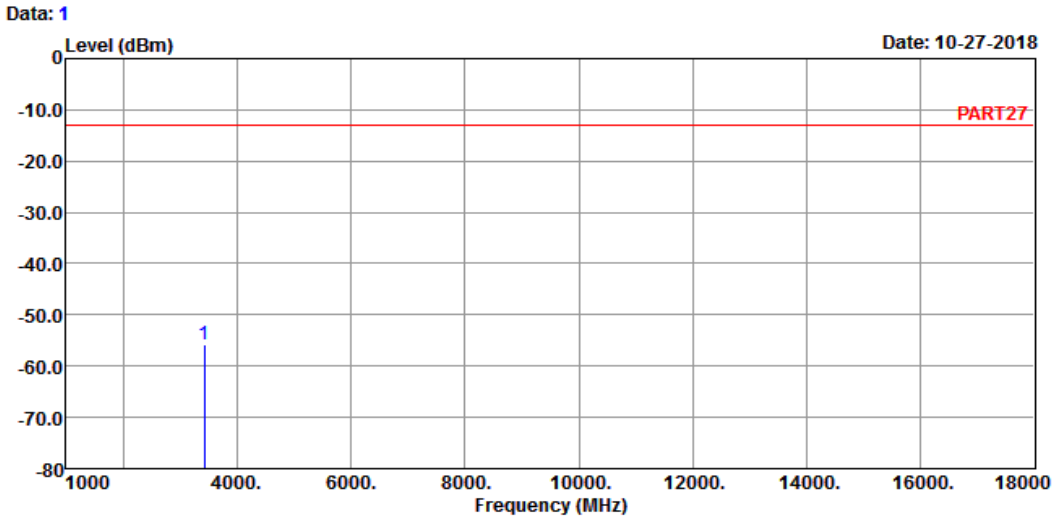
4.8.5 Test Results

LTE Band 4

Channel Bandwidth: 1.4 MHz / QPSK

Low Channel

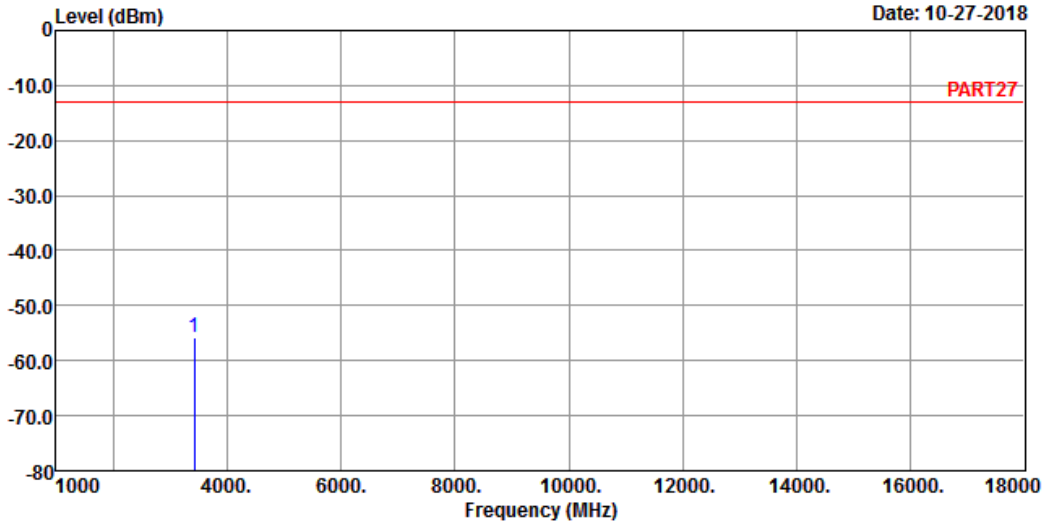
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 4 QPSK_1.4M Link_L-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3421.40	-55.69	-47.35	-13.00	-42.69	-8.34	Peak

Data: 2

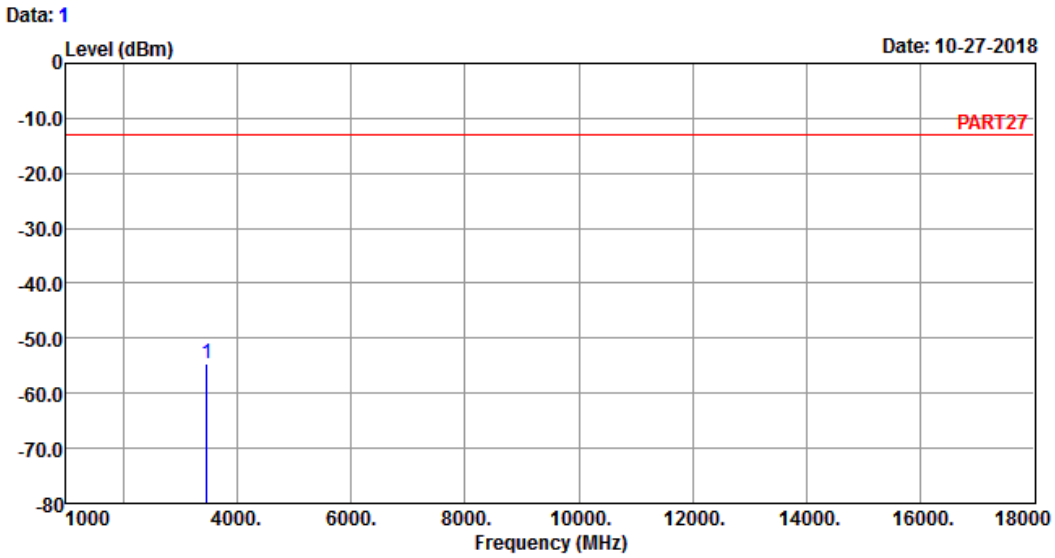


Site : 966 Chamber 5
Condition: PART27 VERTICAL
Remak : LTE Band 4 QPSK_1.4M Link_L-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3421.40	-55.92	-47.58	-13.00	-42.92	-8.34	Peak

Middle Channel

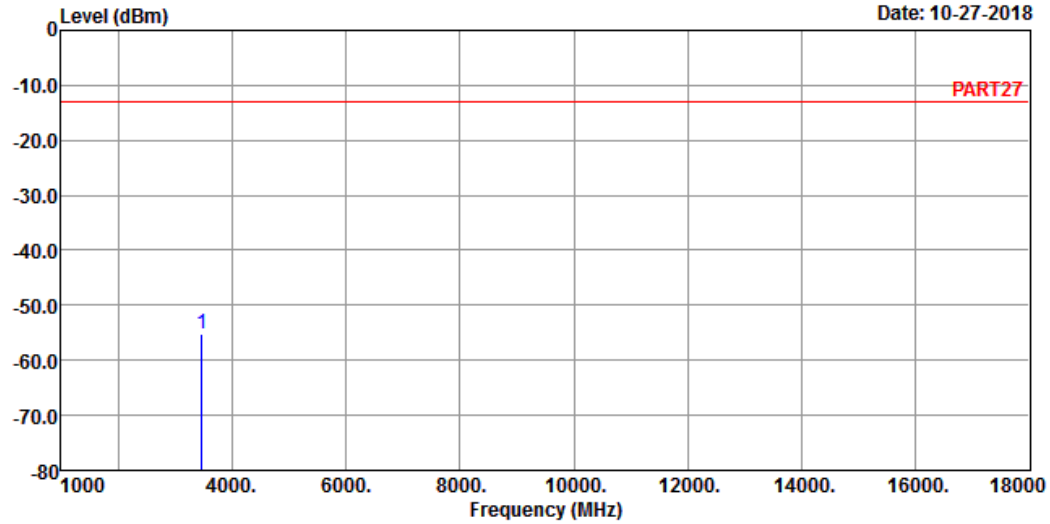
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 4 QPSK_1.4M Link_M-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3465.00	-54.74	-46.86	-13.00	-41.74	-7.88	Peak

Data: 2

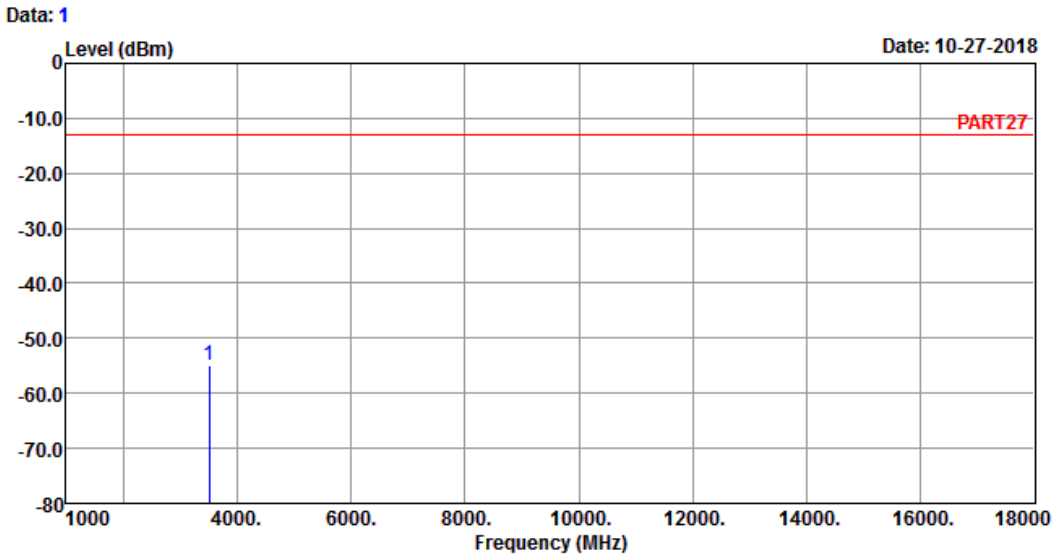


Site : 966 Chamber 5
Condition: PART27 VERTICAL
Remak : LTE Band 4 QPSK_1.4M Link_M-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3465.00	-55.06	-47.18	-13.00	-42.06	-7.88	Peak

High Channel

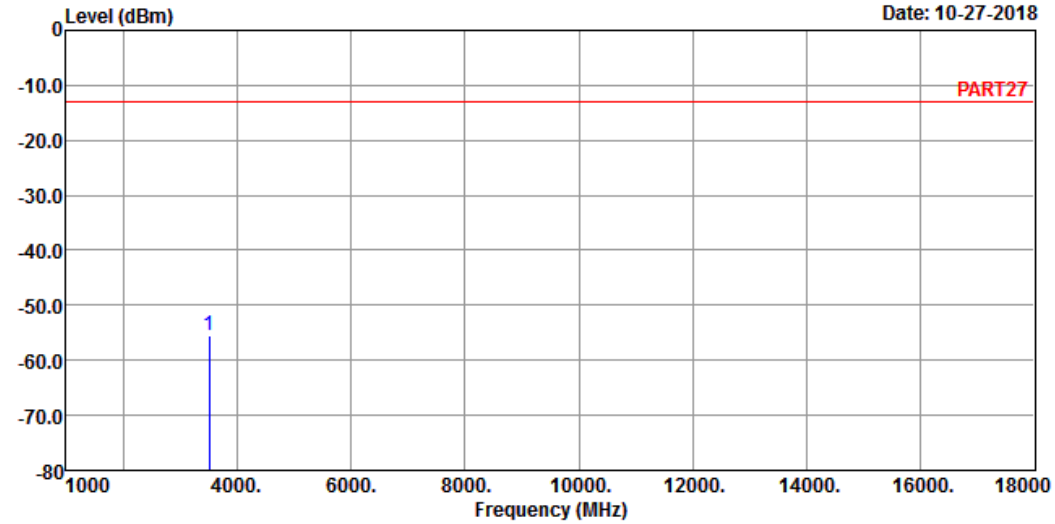
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 4 QPSK_1.4M Link_H-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3508.60	-54.77	-47.32	-13.00	-41.77	-7.45	Peak

Data: 2

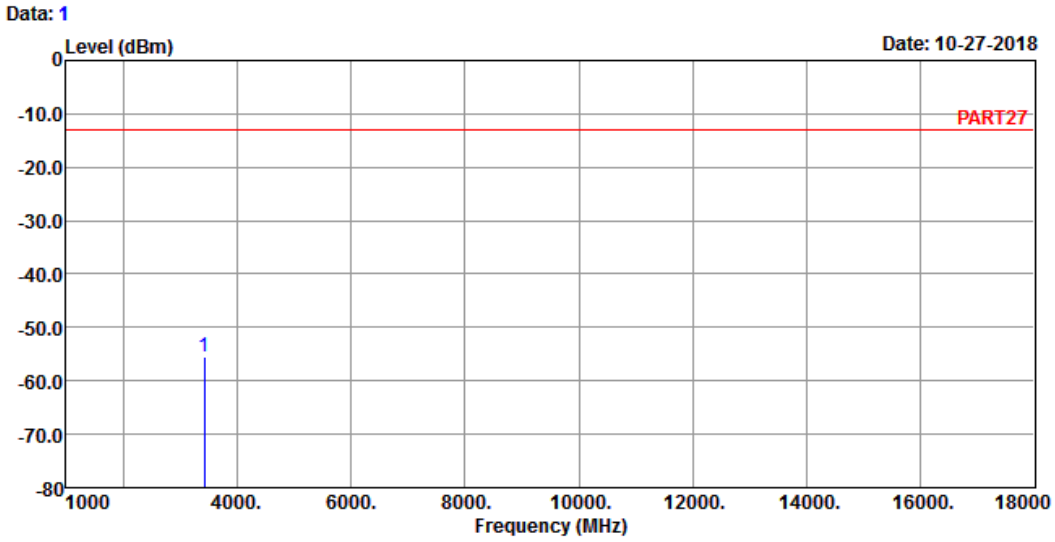


Site : 966 Chamber 5
Condition: PART27 VERTICAL
Remak : LTE Band 4 QPSK_1.4M Link_H-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3508.60	-55.35	-47.90	-13.00	-42.35	-7.45	Peak

Channel Bandwidth: 5 MHz / QPSK
Low Channel

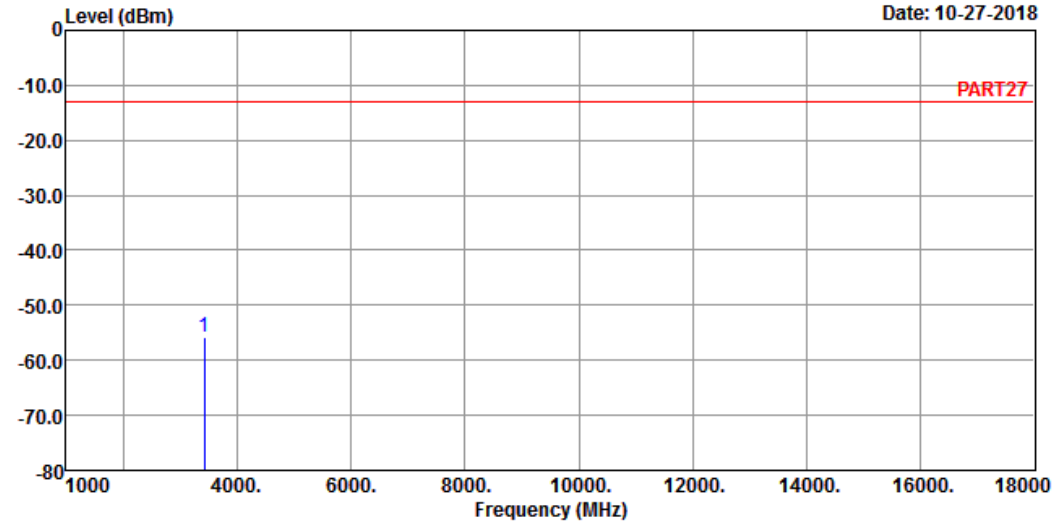
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 4 QPSK_5M Link_L-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3425.00	-55.63	-47.29	-13.00	-42.63	-8.34	Peak

Data: 2

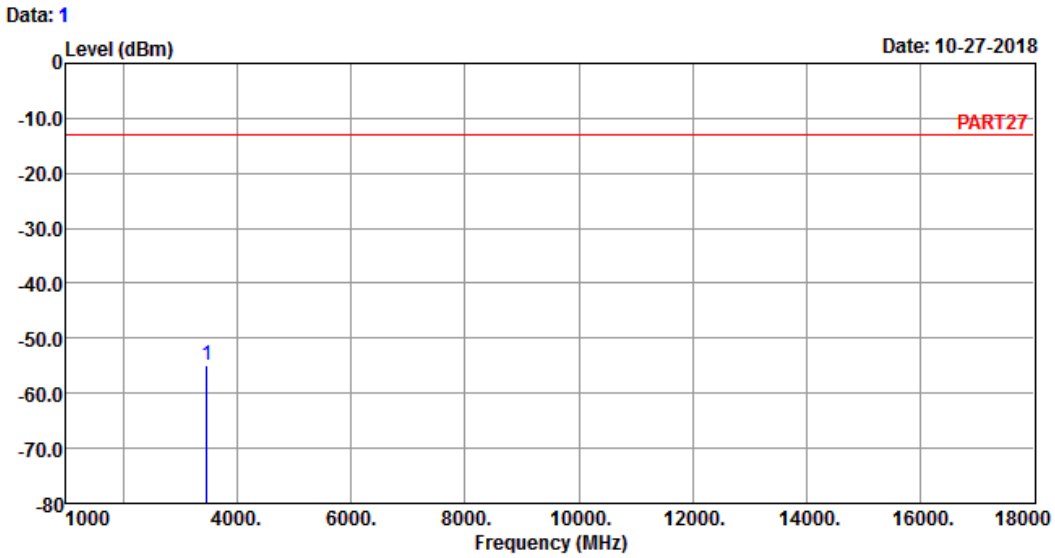


Site : 966 Chamber 5
Condition: PART27 VERTICAL
Remak : LTE Band 4 QPSK_5M Link_L-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3425.00	-55.82	-47.48	-13.00	-42.82	-8.34	Peak

Middle Channel

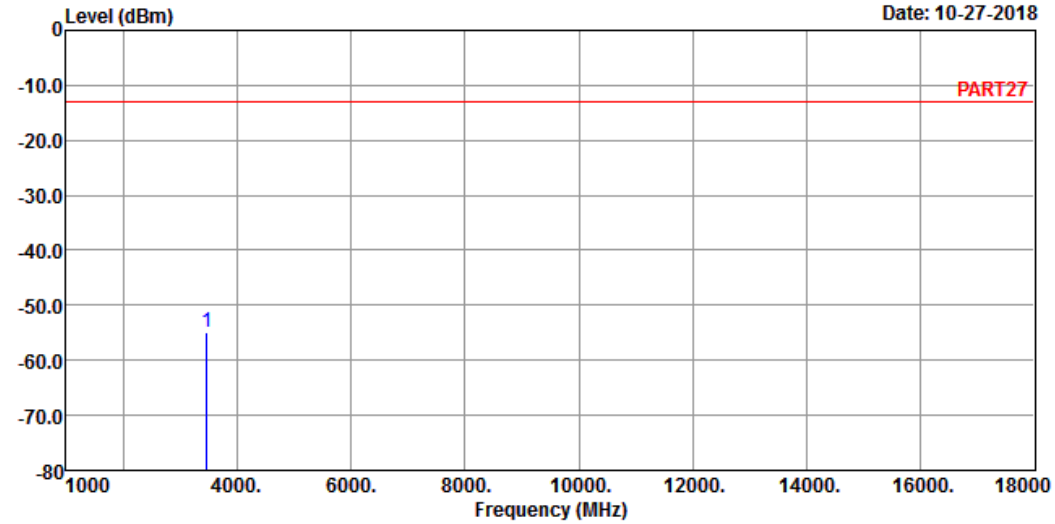
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 4 QPSK_5M Link_M-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3465.00	-54.78	-46.90	-13.00	-41.78	-7.88	Peak

Data: 2

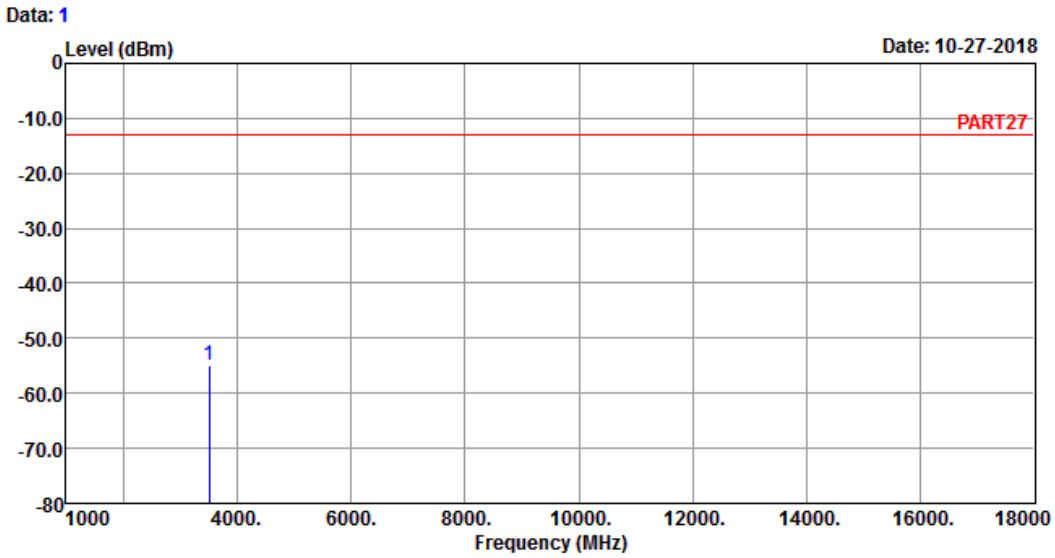


Site : 966 Chamber 5
Condition: PART27 VERTICAL
Remak : LTE Band 4 QPSK_5M Link_M-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3465.00	-54.87	-46.99	-13.00	-41.87	-7.88	Peak

High Channel

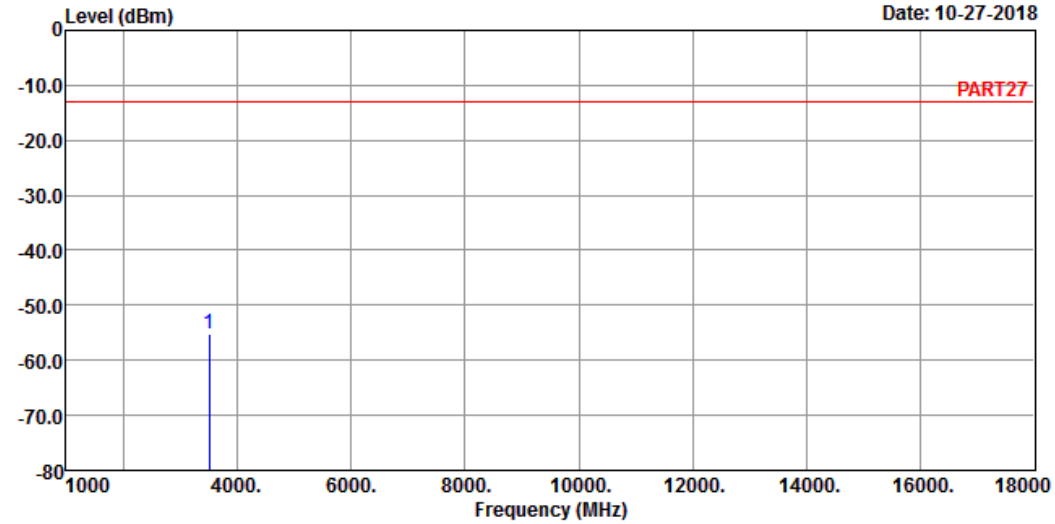
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 4 QPSK_5M Link_H-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3505.00	-54.92	-47.47	-13.00	-41.92	-7.45	Peak

Data: 2

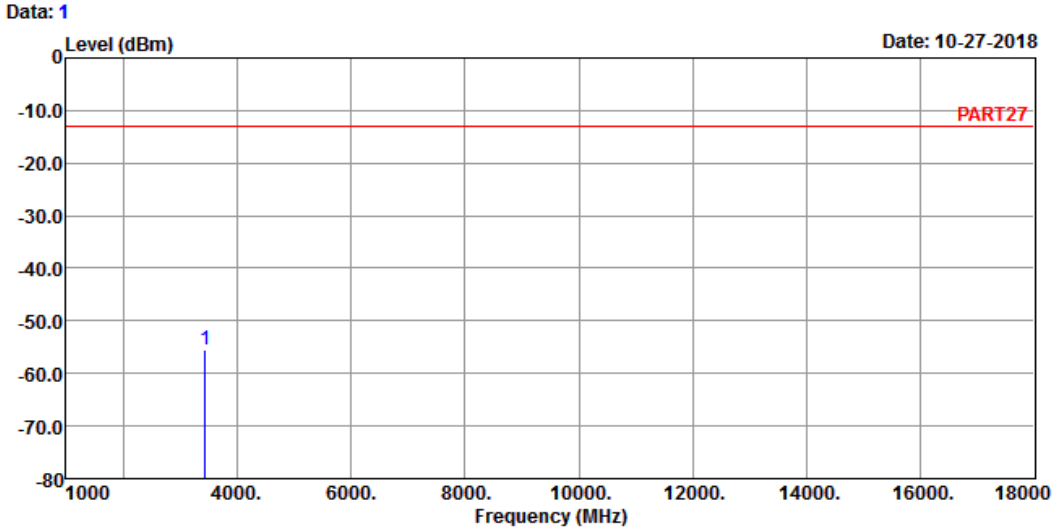


Site : 966 Chamber 5
Condition: PART27 VERTICAL
Remak : LTE Band 4 QPSK_5M Link_H-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3505.00	-55.13	-47.68	-13.00	-42.13	-7.45	Peak

Channel Bandwidth: 20 MHz / QPSK
Low Channel

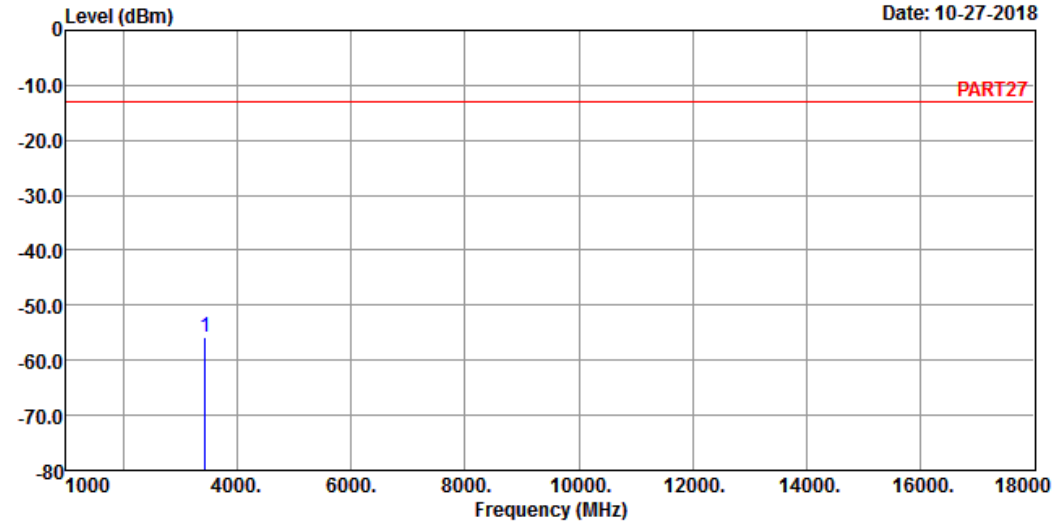
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 4 QPSK_20M Link_L-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3440.00	-55.61	-47.39	-13.00	-42.61	-8.22	Peak

Data: 2

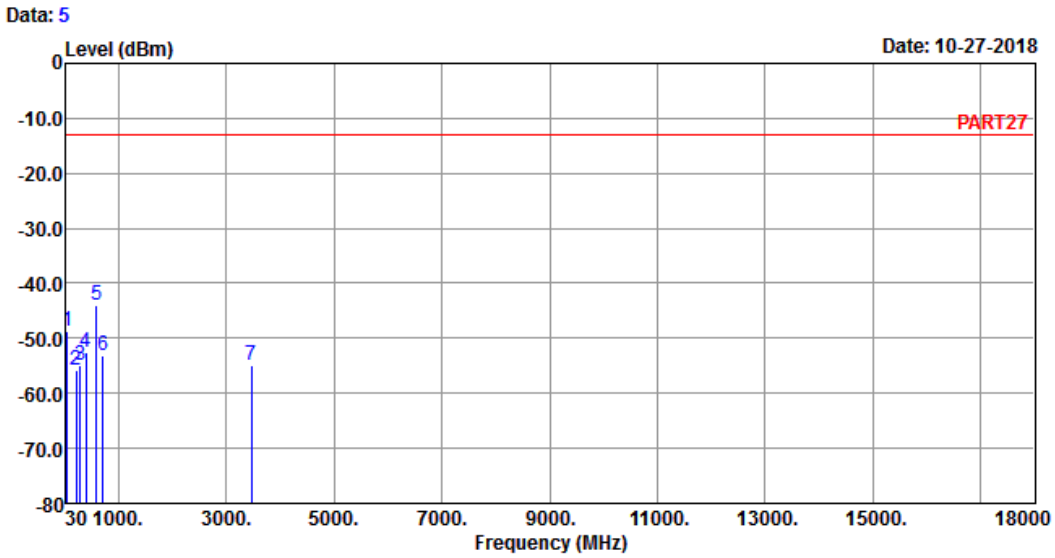


Site : 966 Chamber 5
Condition: PART27 VERTICAL
Remak : LTE Band 4 QPSK_20M Link_L-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3440.00	-55.88	-47.66	-13.00	-42.88	-8.22	Peak

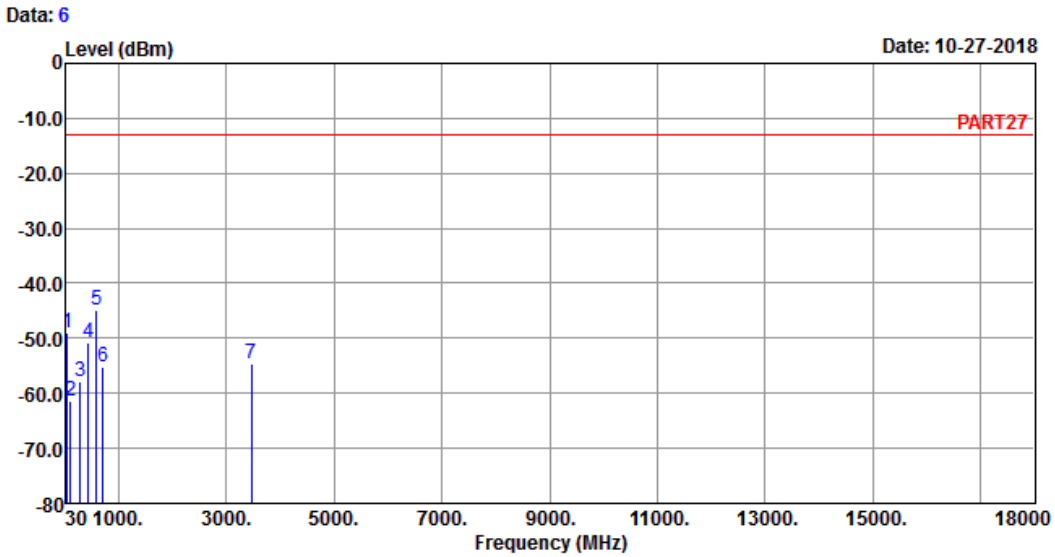
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 4 QPSK_20M Link_M-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	44.55	-48.57	-46.58	-13.00	-35.57	-1.99	Peak
2	208.48	-55.84	-48.17	-13.00	-42.84	-7.67	Peak
3	291.90	-54.95	-48.10	-13.00	-41.95	-6.85	Peak
4	400.54	-52.51	-46.57	-13.00	-39.51	-5.94	Peak
5 pp	590.66	-44.04	-42.88	-13.00	-31.04	-1.16	Peak
6	709.00	-53.10	-53.17	-13.00	-40.10	0.07	Peak
7	3465.00	-54.77	-46.89	-13.00	-41.77	-7.88	Peak

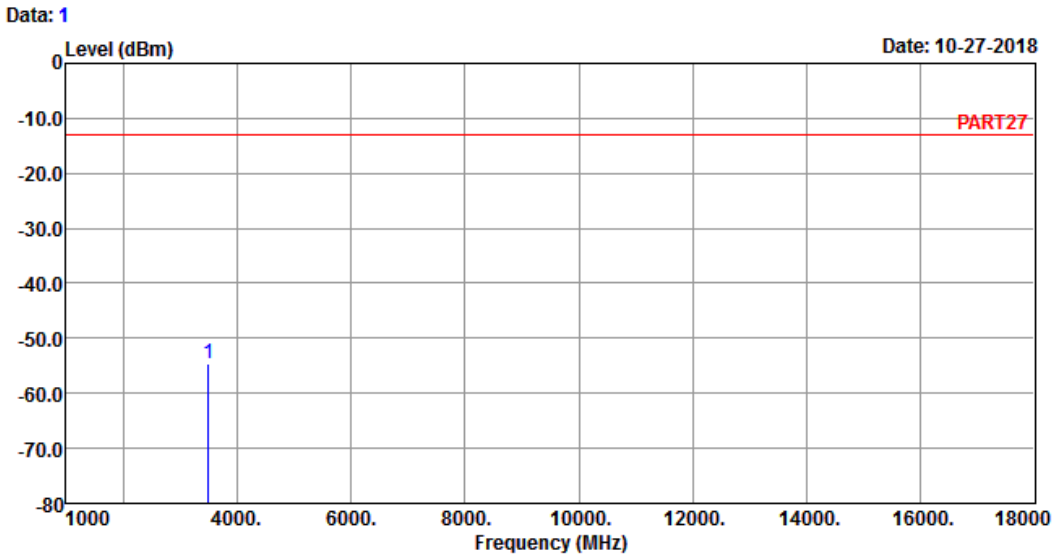


Site : 966 Chamber 5
Condition: PART27 VERTICAL
Remak : LTE Band 4 QPSK_20M Link_M-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	43.58	-48.90	-47.43	-13.00	-35.90	-1.47	Peak
2	112.45	-61.26	-51.06	-13.00	-48.26	-10.20	Peak
3	291.90	-58.01	-51.16	-13.00	-45.01	-6.85	Peak
4	445.16	-50.92	-45.33	-13.00	-37.92	-5.59	Peak
5 pp	592.60	-44.73	-43.65	-13.00	-31.73	-1.08	Peak
6	711.91	-55.31	-55.44	-13.00	-42.31	0.13	Peak
7	3465.00	-54.48	-46.60	-13.00	-41.48	-7.88	Peak

High Channel

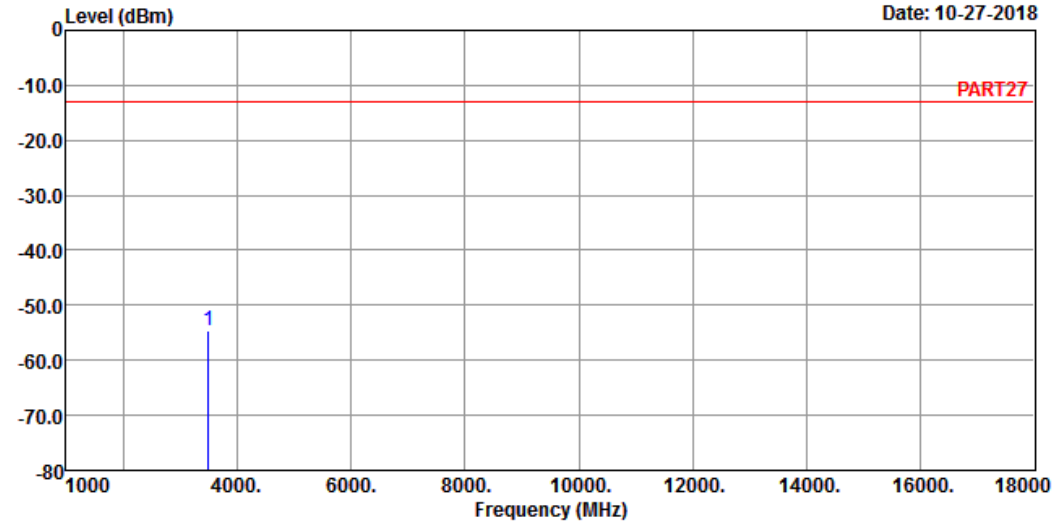
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 4 QPSK_20M Link_H-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3490.00	-54.73	-47.08	-13.00	-41.73	-7.65	Peak

Data: 2

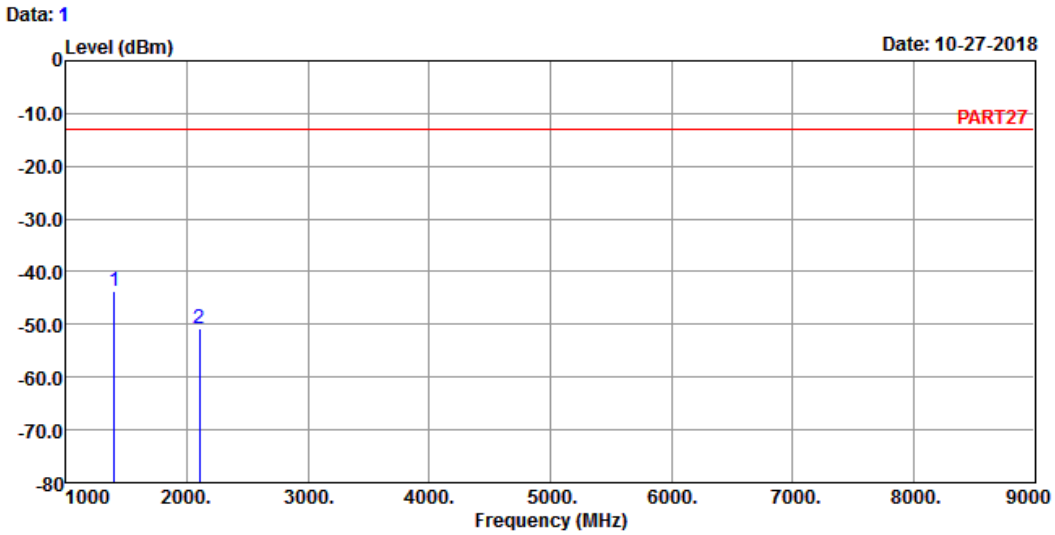


Site : 966 Chamber 5
Condition: PART27 VERTICAL
Remak : LTE Band 4 QPSK_20M Link_H-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3490.00	-54.57	-46.92	-13.00	-41.57	-7.65	Peak

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

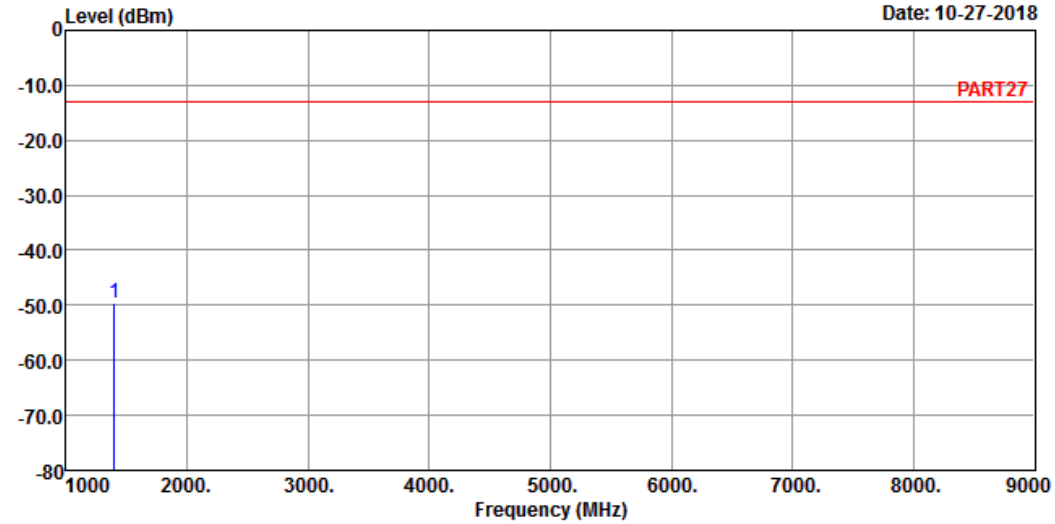
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 12 QPSK_1.4M Link_L-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1399.40	-43.55	-31.70	-13.00	-30.55	-11.85	Peak
2	2099.10	-50.71	-40.55	-13.00	-37.71	-10.16	Peak

Data: 2

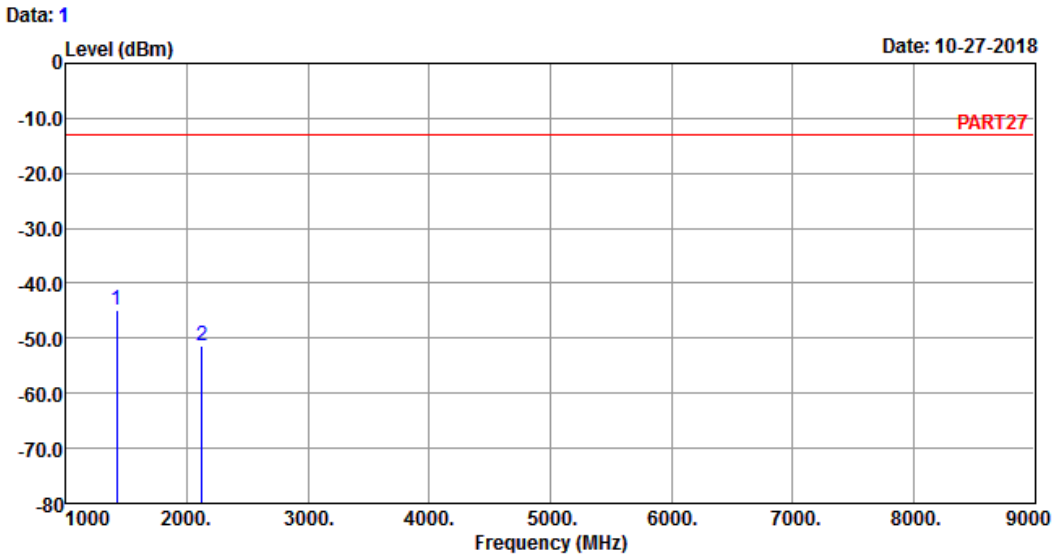


Site : 966 Chamber 5
Condition: PART27 VERTICAL
Remak : LTE Band 12 QPSK_1.4M Link_L-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1399.40	-49.47	-37.62	-13.00	-36.47	-11.85	Peak

Middle Channel

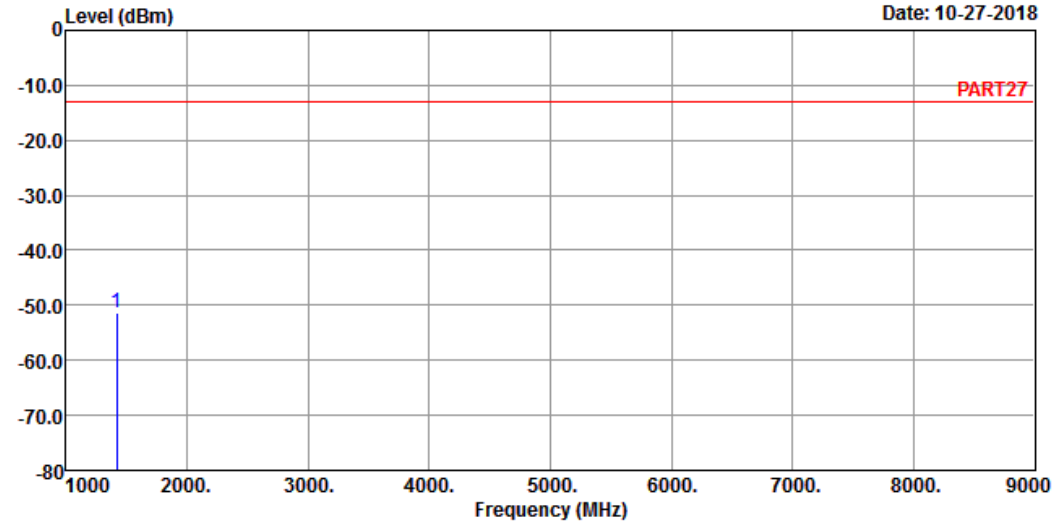
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 12 QPSK_1.4M Link_M-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1415.00	-44.79	-32.71	-13.00	-31.79	-12.08	Peak
2	2122.50	-51.22	-41.35	-13.00	-38.22	-9.87	Peak

Data: 2

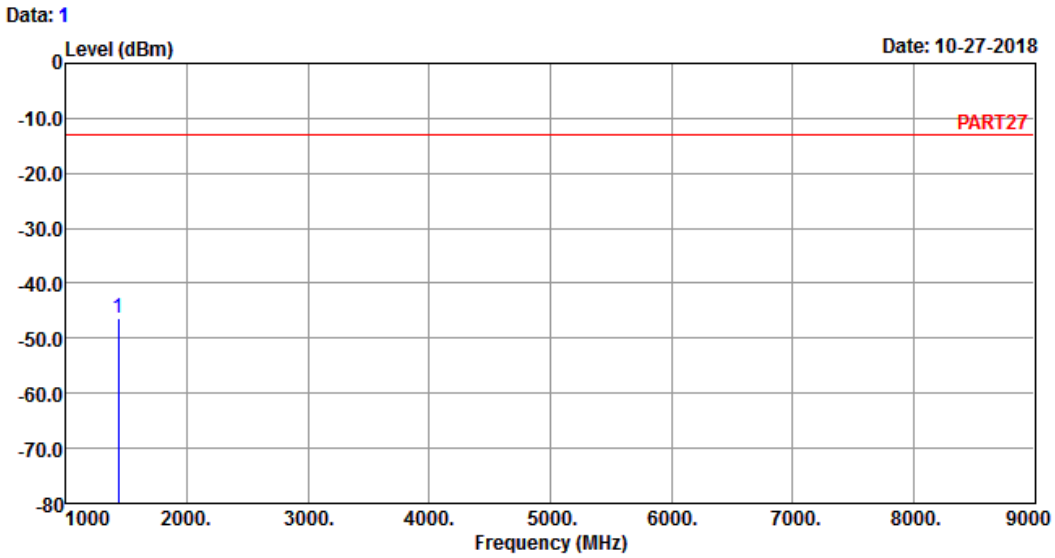


Site : 966 Chamber 5
Condition: PART27 VERTICAL
Remak : LTE Band 12 QPSK_1.4M Link_M-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1415.00	-51.30	-39.22	-13.00	-38.30	-12.08	Peak

High Channel

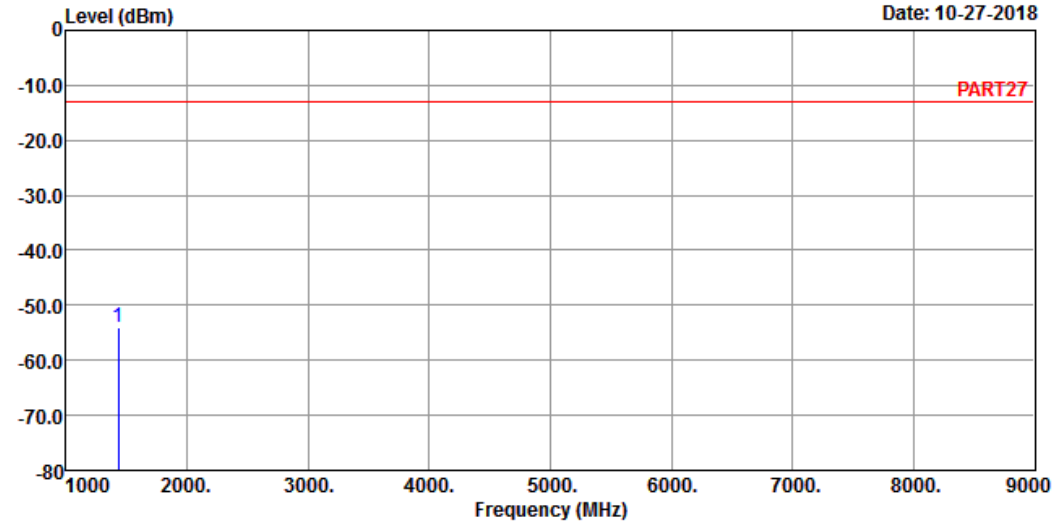
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 12 QPSK_1.4M Link_H-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1430.60	-46.33	-34.02	-13.00	-33.33	-12.31	Peak

Data: 2

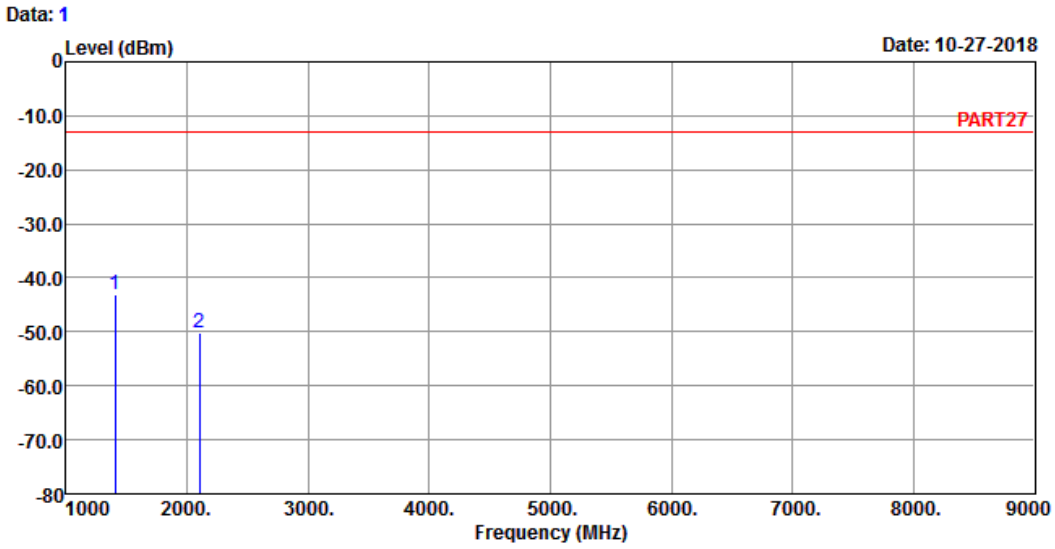


Site : 966 Chamber 5
Condition: PART27 VERTICAL
Remak : LTE Band 12 QPSK_1.4M Link_H-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1430.60	-54.16	-41.85	-13.00	-41.16	-12.31	Peak

Channel Bandwidth: 5 MHz / QPSK
Low Channel

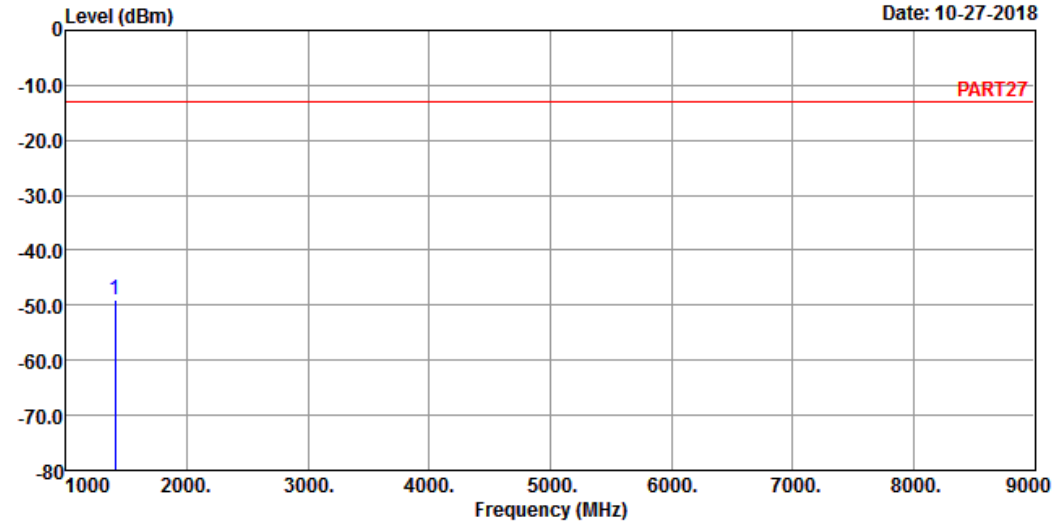
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 12 QPSK_5M Link_L-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1403.00	-43.15	-31.24	-13.00	-30.15	-11.91	Peak
2	2104.50	-50.27	-40.11	-13.00	-37.27	-10.16	Peak

Data: 2

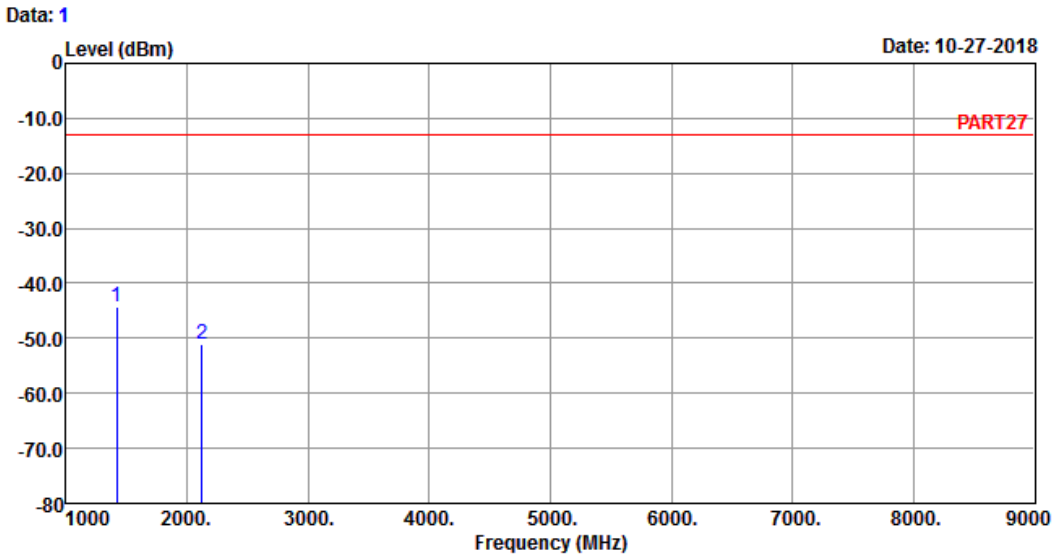


Site : 966 Chamber 5
Condition: PART27 VERTICAL
Remak : LTE Band 12 QPSK_5M Link_L-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1403.00	-48.95	-37.04	-13.00	-35.95	-11.91	Peak

Middle Channel

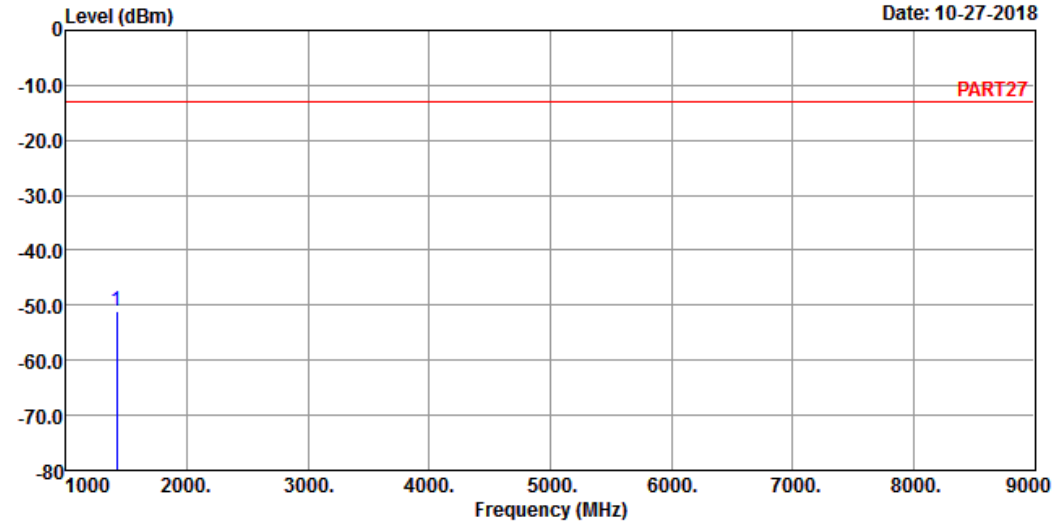
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 12 QPSK_5M Link_M-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1415.00	-44.41	-32.33	-13.00	-31.41	-12.08	Peak
2	2122.50	-51.02	-41.15	-13.00	-38.02	-9.87	Peak

Data: 2

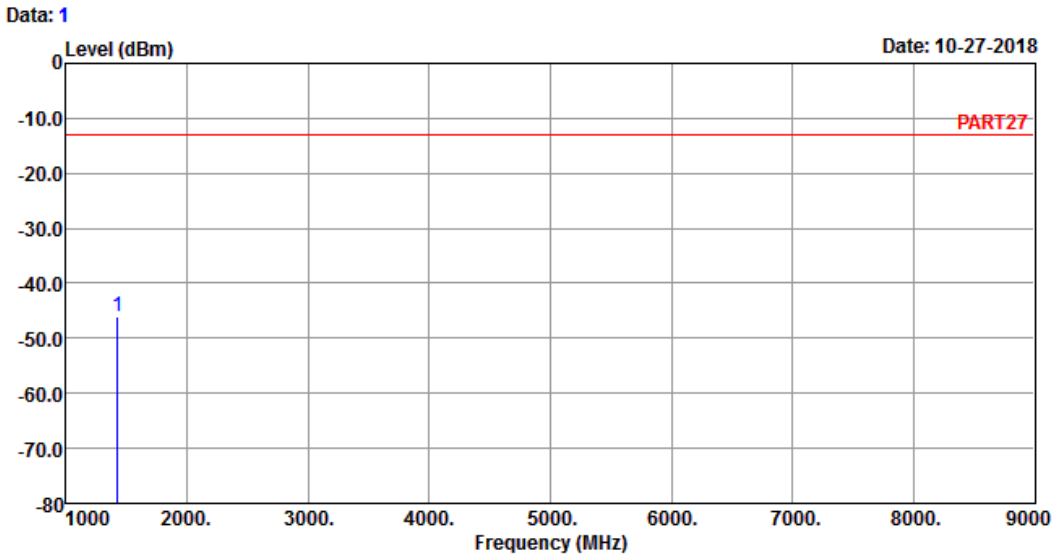


Site : 966 Chamber 5
Condition: PART27 VERTICAL
Remak : LTE Band 12 QPSK_5M Link_M-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1415.00	-51.03	-38.95	-13.00	-38.03	-12.08	Peak

High Channel

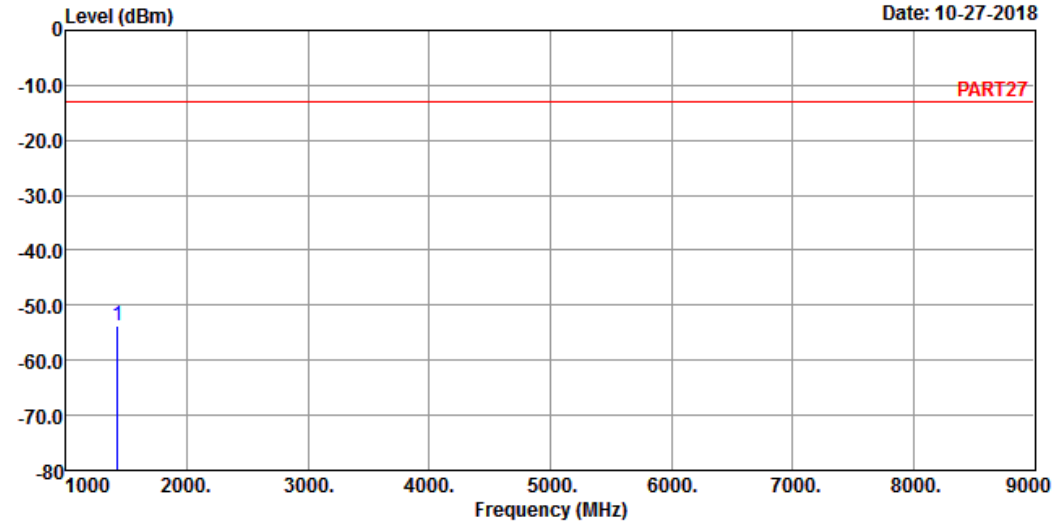
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 12 QPSK_5M Link_H-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1427.00	-45.99	-33.74	-13.00	-32.99	-12.25	Peak

Data: 2

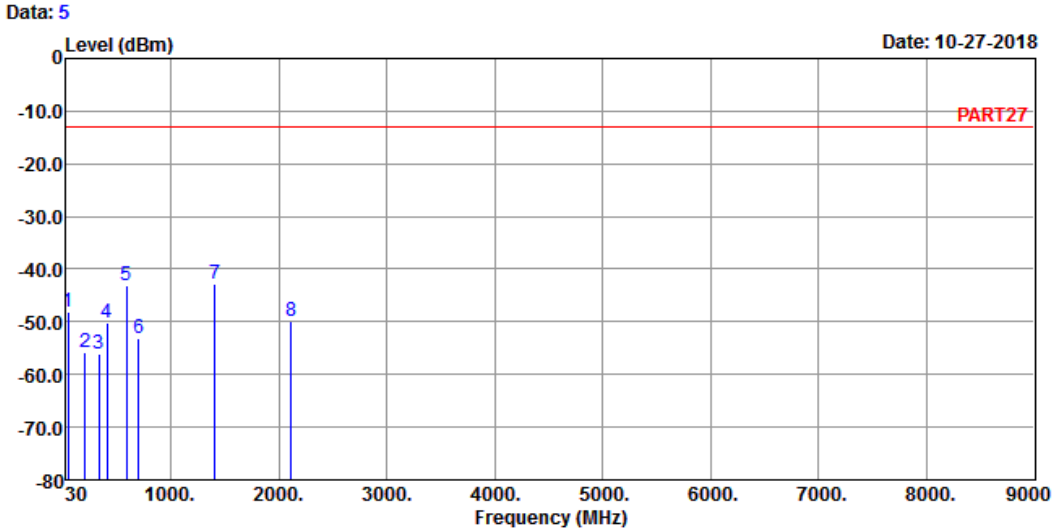


Site : 966 Chamber 5
Condition: PART27 VERTICAL
Remak : LTE Band 12 QPSK_5M Link_H-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1427.00	-53.74	-41.49	-13.00	-40.74	-12.25	Peak

Channel Bandwidth: 10 MHz / QPSK
Low Channel

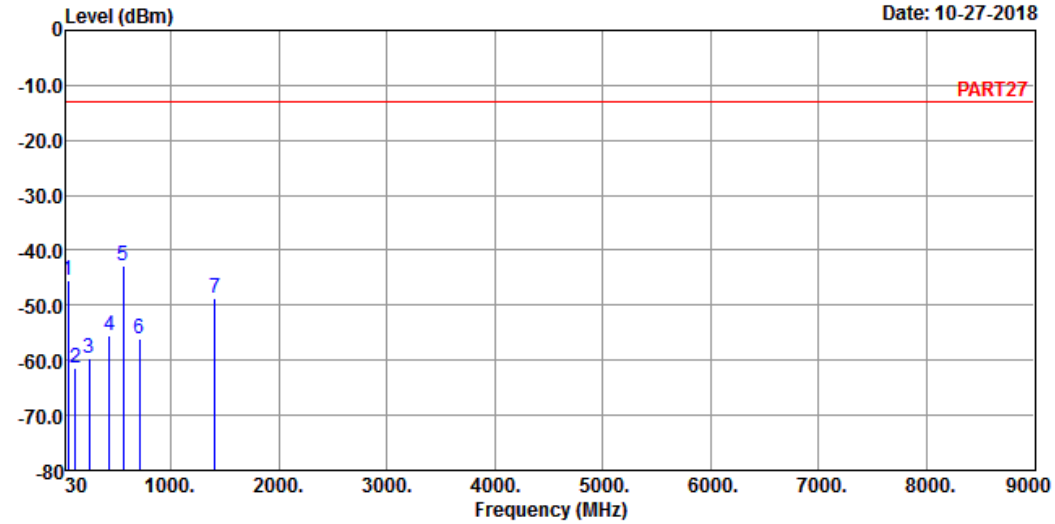
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 12 QPSK_10M Link_L-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	44.55	-48.18	-46.19	-13.00	-35.18	-1.99	Peak
2	207.51	-55.93	-48.22	-13.00	-42.93	-7.71	Peak
3	331.67	-56.14	-49.62	-13.00	-43.14	-6.52	Peak
4	409.27	-50.11	-44.24	-13.00	-37.11	-5.87	Peak
5	589.69	-43.17	-41.97	-13.00	-30.17	-1.20	Peak
6	700.27	-53.22	-53.12	-13.00	-40.22	-0.10	Peak
7 pp	1408.00	-42.84	-30.88	-13.00	-29.84	-11.96	Peak
8	2112.00	-49.95	-39.99	-13.00	-36.95	-9.96	Peak

Data: 6

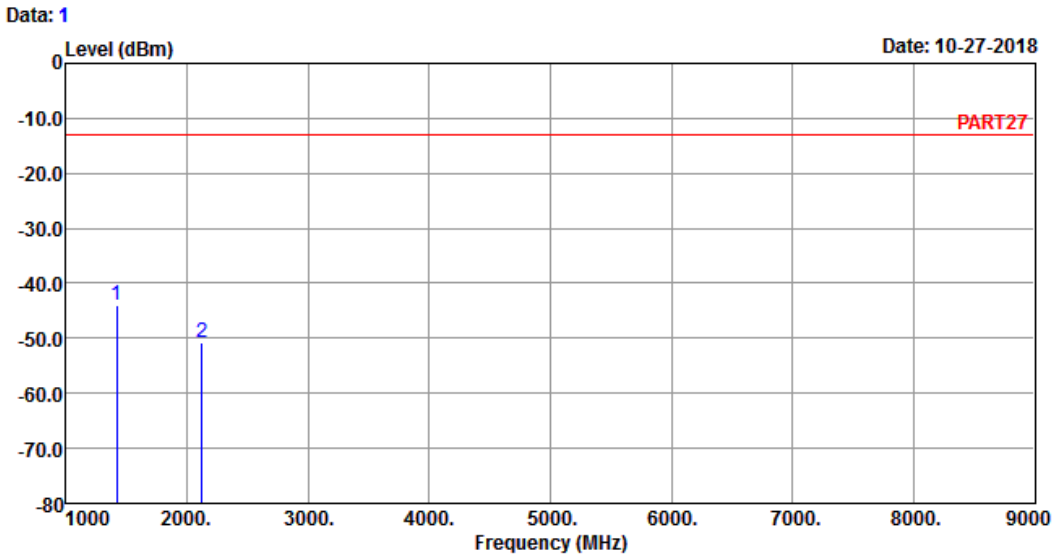


Site : 966 Chamber 5
Condition: PART27 VERTICAL
Remak : LTE Band 12 QPSK_10M Link_L-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	44.55	-45.46	-43.47	-13.00	-32.46	-1.99	Peak
2	112.45	-61.27	-51.07	-13.00	-48.27	-10.20	Peak
3	245.34	-59.76	-53.57	-13.00	-46.76	-6.19	Peak
4	431.58	-55.51	-49.81	-13.00	-42.51	-5.70	Peak
5 pp	556.71	-42.88	-40.31	-13.00	-29.88	-2.57	Peak
6	708.03	-56.08	-56.13	-13.00	-43.08	0.05	Peak
7	1408.00	-48.74	-36.78	-13.00	-35.74	-11.96	Peak

Middle Channel

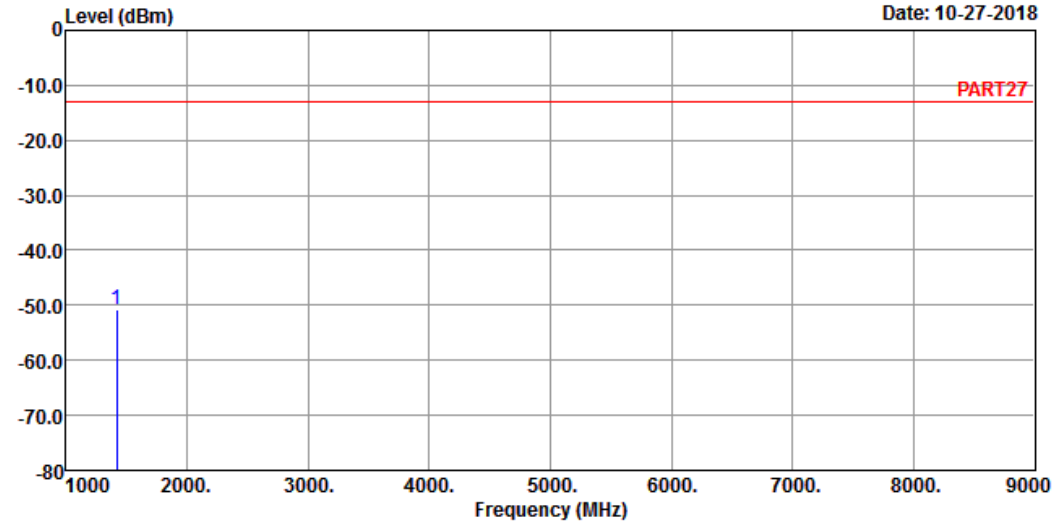
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 12 QPSK_10M Link_M-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1415.00	-44.04	-31.96	-13.00	-31.04	-12.08	Peak
2	2122.50	-50.72	-40.85	-13.00	-37.72	-9.87	Peak

Data: 2

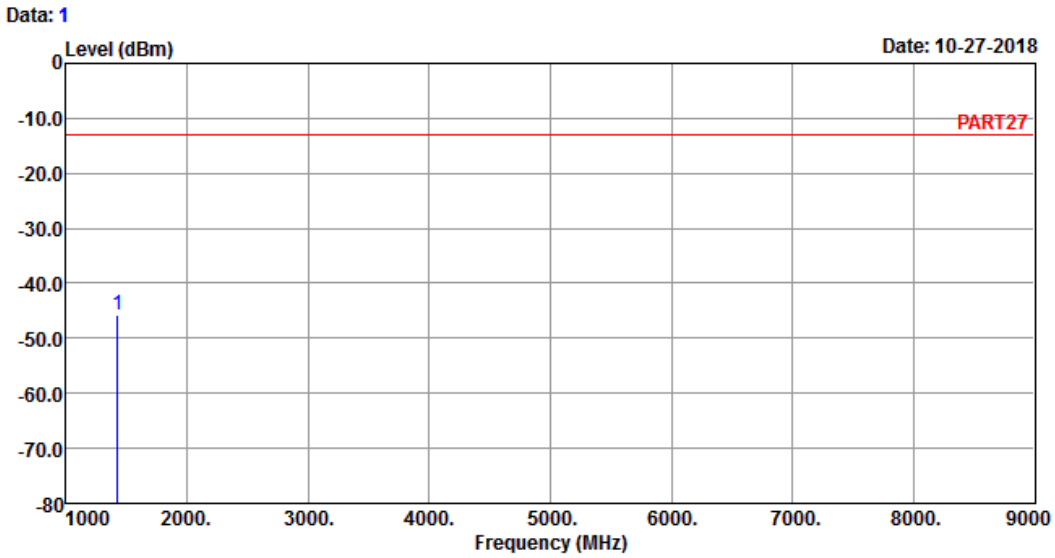


Site : 966 Chamber 5
Condition: PART27 VERTICAL
Remak : LTE Band 12 QPSK_10M Link_M-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1415.00	-50.66	-38.58	-13.00	-37.66	-12.08	Peak

High Channel

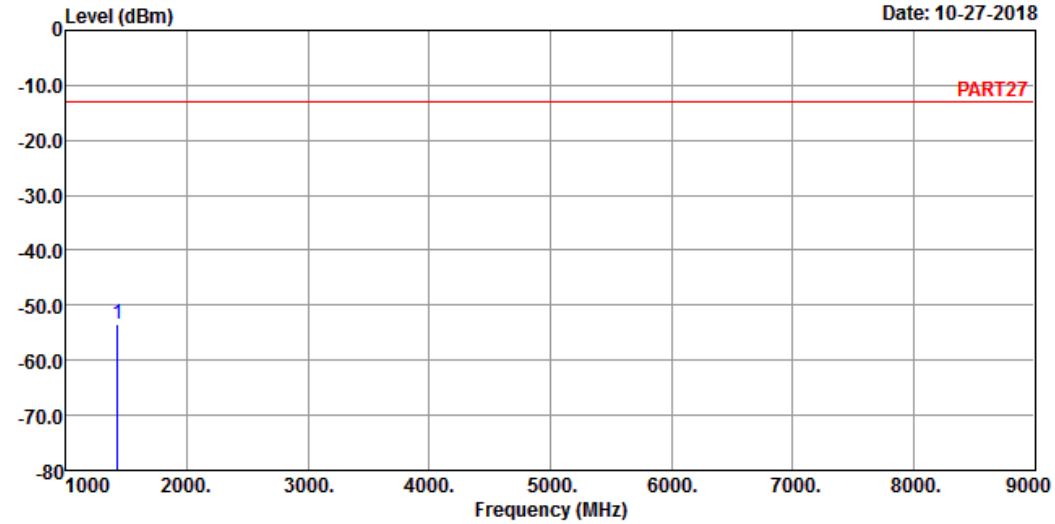
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 12 QPSK_10M Link_H-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1422.00	-45.72	-33.53	-13.00	-32.72	-12.19	Peak

Data: 2

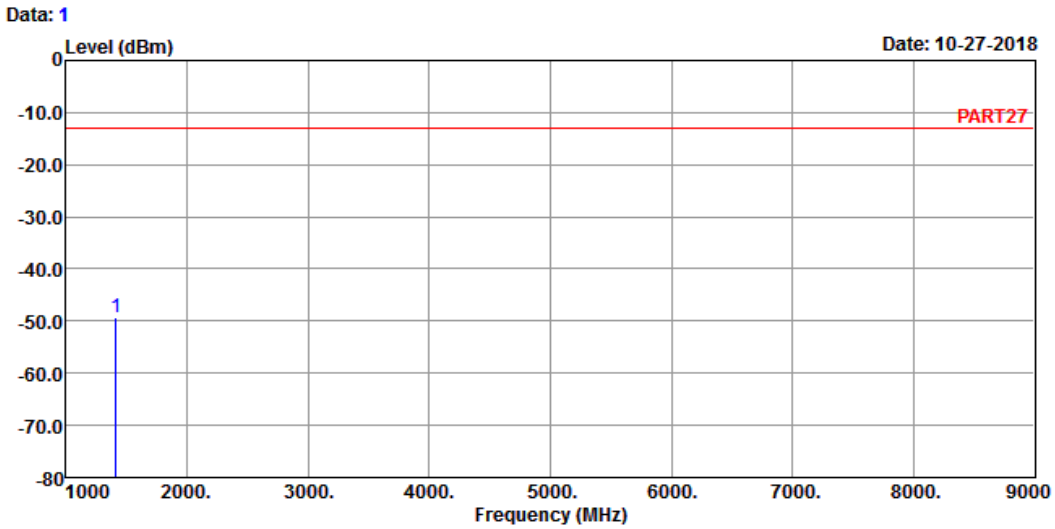


Site : 966 Chamber 5
Condition: PART27 VERTICAL
Remak : LTE Band 12 QPSK_10M Link_H-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1422.00	-53.31	-41.12	-13.00	-40.31	-12.19	Peak

LTE Band 17
Channel Bandwidth: 5 MHz / QPSK
Low Channel

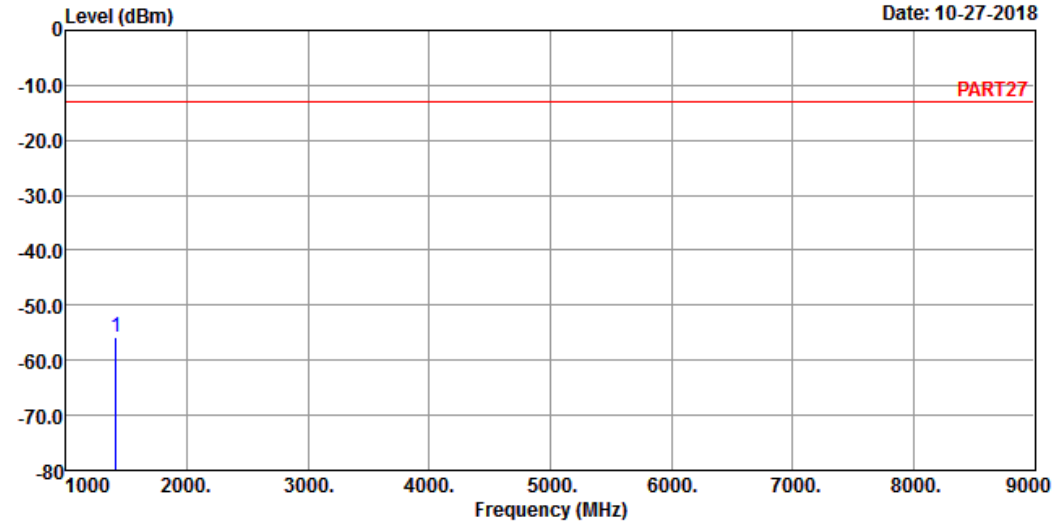
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 17 QPSK_5M Link_L-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1413.00	-49.44	-37.42	-13.00	-36.44	-12.02	Peak

Data: 2

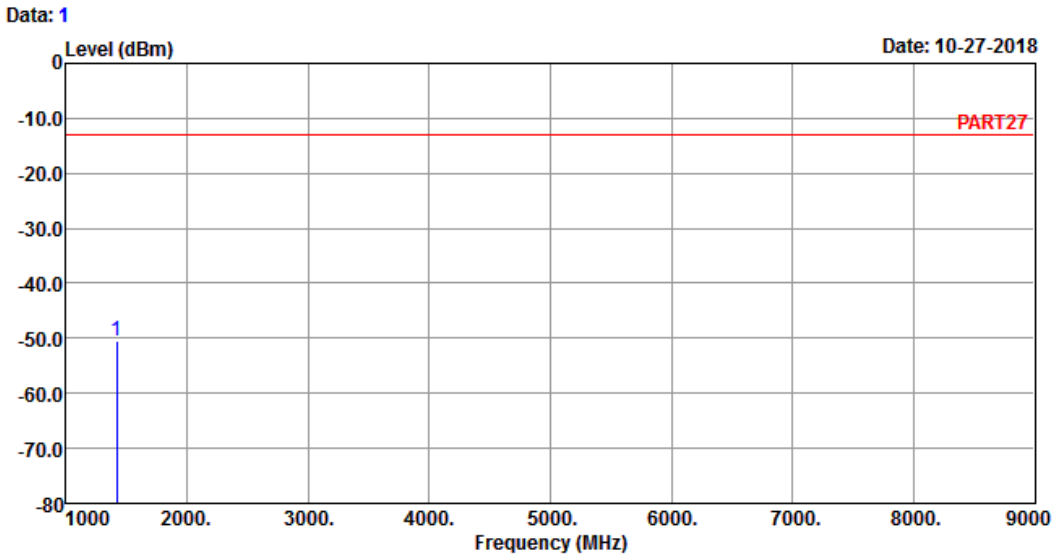


Site : 966 Chamber 5
Condition: PART27 VERTICAL
Remak : LTE Band 17 QPSK_5M Link_L-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1413.00	-55.91	-43.89	-13.00	-42.91	-12.02	Peak

Middle Channel

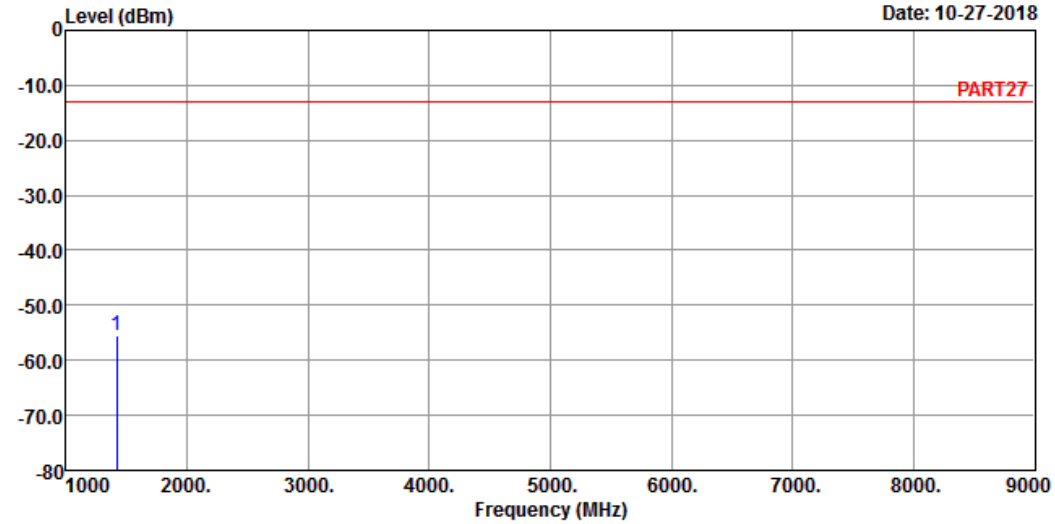
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 17 QPSK_5M Link_M-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1420.00	-50.56	-38.42	-13.00	-37.56	-12.14	Peak

Data: 2

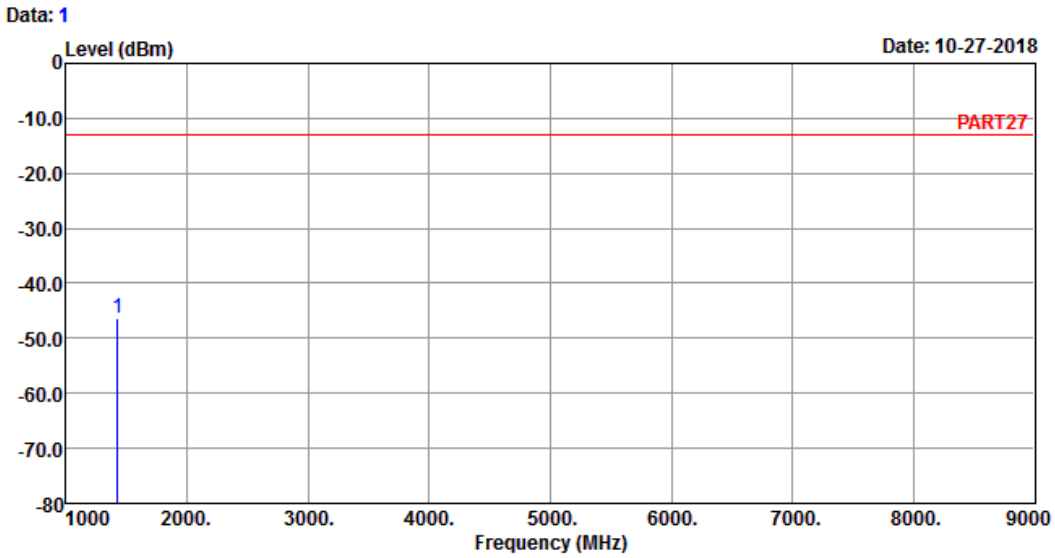


Site : 966 Chamber 5
Condition: PART27 VERTICAL
Remak : LTE Band 17 QPSK_5M Link_M-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1420.00	-55.57	-43.43	-13.00	-42.57	-12.14	Peak

High Channel

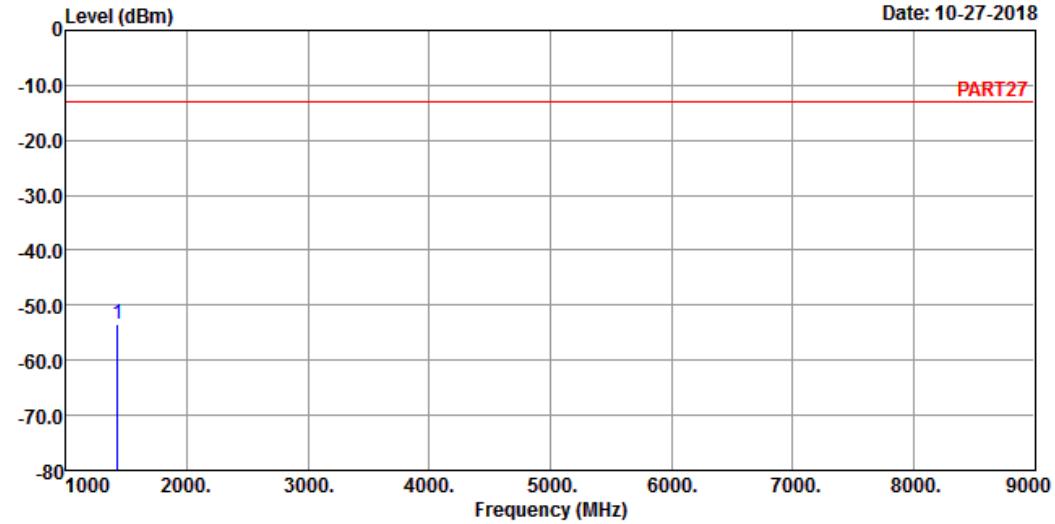
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 17 QPSK_5M Link_H-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1427.00	-46.28	-34.03	-13.00	-33.28	-12.25	Peak

Data: 2

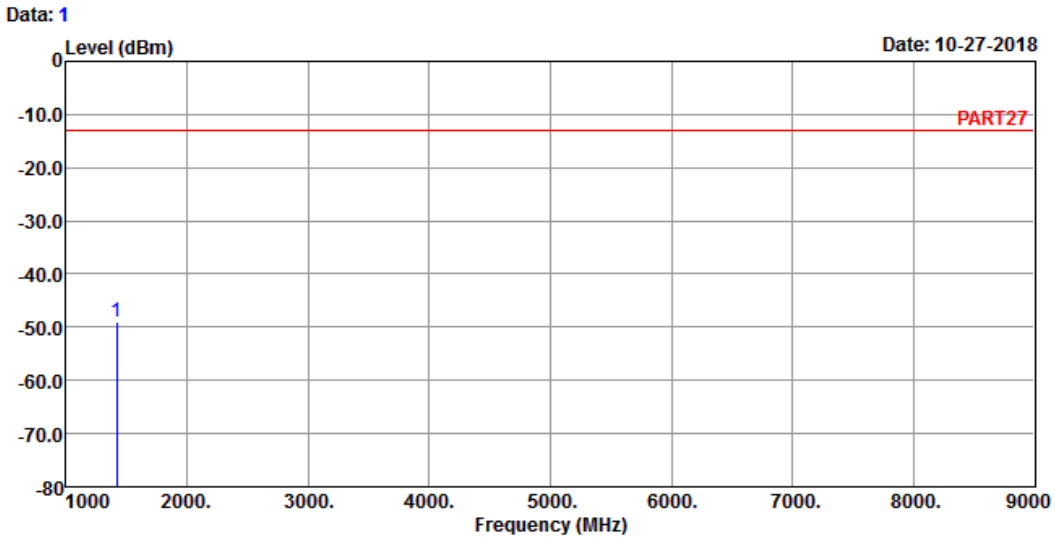


Site : 966 Chamber 5
Condition: PART27 VERTICAL
Remak : LTE Band 17 QPSK_5M Link_H-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1427.00	-53.42	-41.17	-13.00	-40.42	-12.25	Peak

Channel Bandwidth: 10 MHz / QPSK
Low Channel

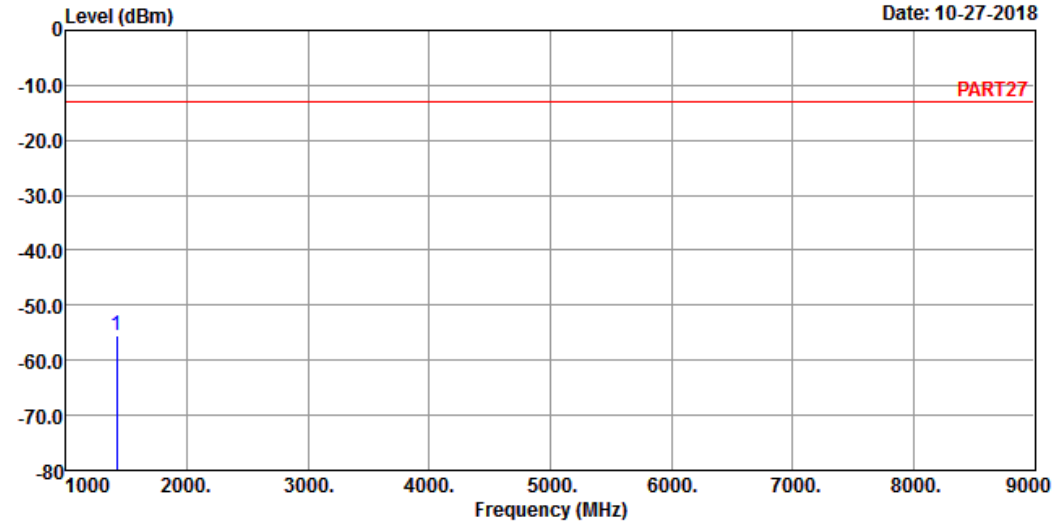
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 17 QPSK_10M Link_L-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1418.00	-48.97	-36.83	-13.00	-35.97	-12.14	Peak

Data: 2

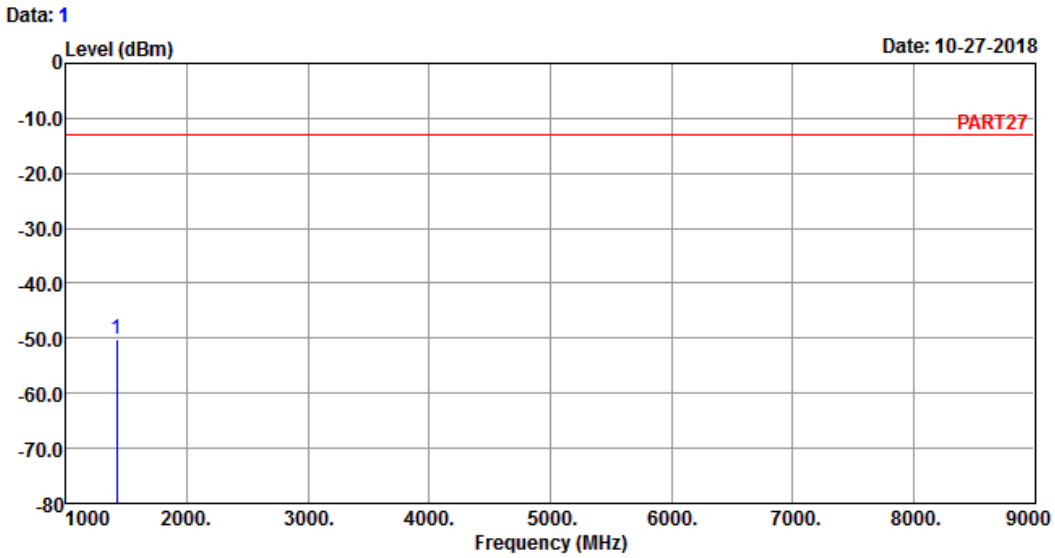


Site : 966 Chamber 5
Condition: PART27 VERTICAL
Remak : LTE Band 17 QPSK_10M Link_L-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1418.00	-55.59	-43.45	-13.00	-42.59	-12.14	Peak

Middle Channel

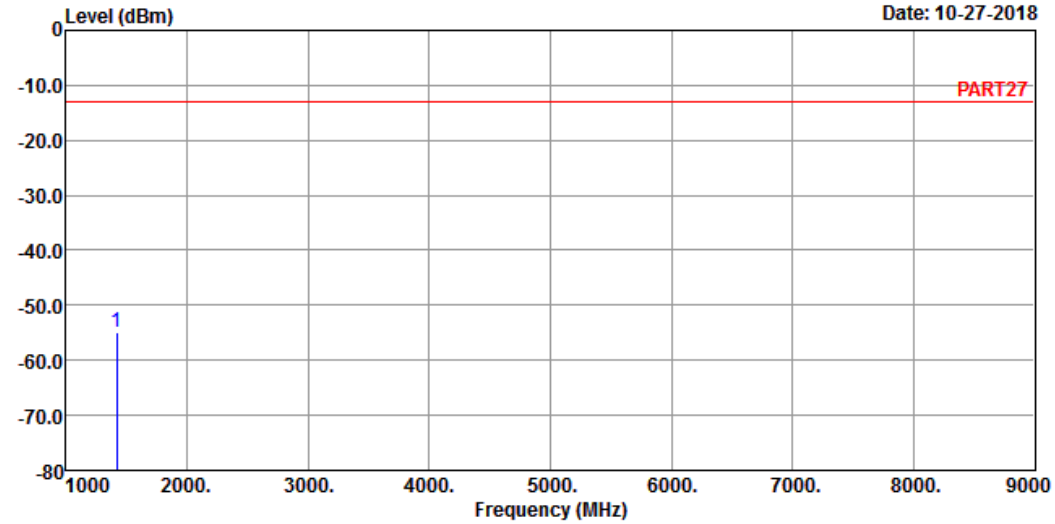
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 17 QPSK_10M Link_M-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1420.00	-50.30	-38.16	-13.00	-37.30	-12.14	Peak

Data: 2

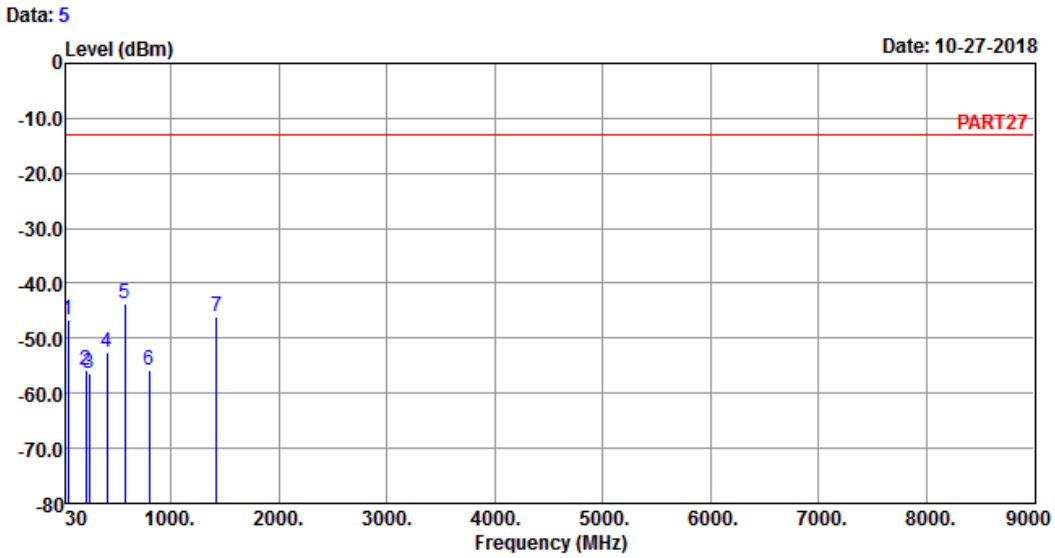


Site : 966 Chamber 5
Condition: PART27 VERTICAL
Remak : LTE Band 17 QPSK_10M Link_M-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1420.00	-55.03	-42.89	-13.00	-42.03	-12.14	Peak

High Channel

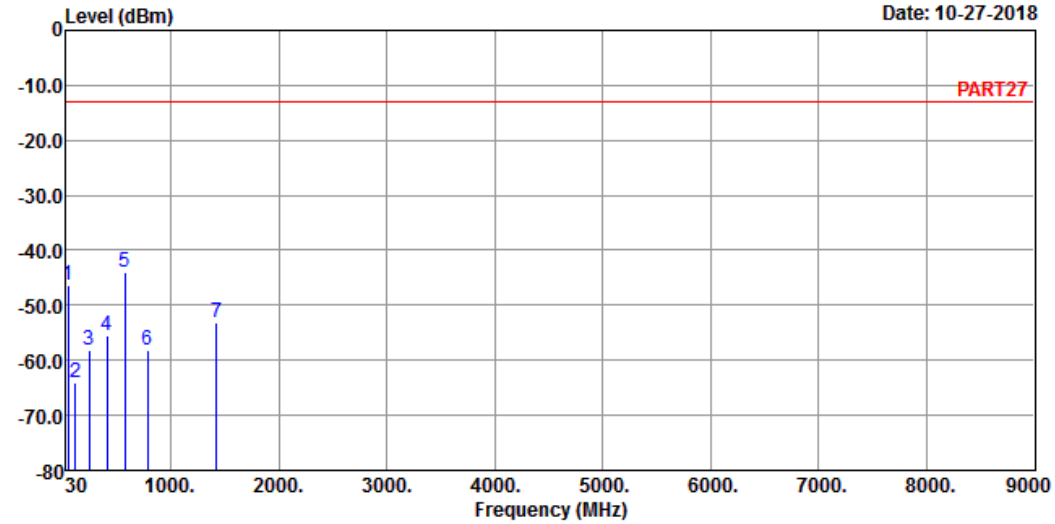
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 17 QPSK_10M Link_H-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	43.58	-46.72	-45.25	-13.00	-33.72	-1.47	Peak
2	209.45	-55.77	-48.14	-13.00	-42.77	-7.63	Peak
3	245.34	-56.46	-50.27	-13.00	-43.46	-6.19	Peak
4	405.39	-52.52	-46.62	-13.00	-39.52	-5.90	Peak
5 pp	572.23	-43.60	-41.68	-13.00	-30.60	-1.92	Peak
6	798.24	-55.87	-56.61	-13.00	-42.87	0.74	Peak
7	1422.00	-46.02	-33.83	-13.00	-33.02	-12.19	Peak

Data: 6



Site : 966 Chamber 5
Condition: PART27 VERTICAL
Remak : LTE Band 17 QPSK_10M Link_H-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	43.58	-46.33	-44.86	-13.00	-33.33	-1.47	Peak
2	113.42	-64.20	-54.05	-13.00	-51.20	-10.15	Peak
3	246.31	-58.22	-52.07	-13.00	-45.22	-6.15	Peak
4	410.24	-55.49	-49.63	-13.00	-42.49	-5.86	Peak
5 pp	576.11	-43.90	-42.14	-13.00	-30.90	-1.76	Peak
6	786.60	-58.25	-59.02	-13.00	-45.25	0.77	Peak
7	1422.00	-53.14	-40.95	-13.00	-40.14	-12.19	Peak

5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

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Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
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Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

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