Partial FCC Test Report

(PART 27)

Report No.:	RF180802C04-2
FCC ID:	WIYT910
Test Model:	LE910-NA1
Received Date:	Aug. 02, 2018
Test Date:	Aug. 21, 2018
Issued Date:	Sep. 14, 2018
Applicant:	CASTLES TECHNOLOGY CO., LTD.
Address:	6F, NO. 207-5, SEC. 3, BEIXIN RD., XINDIAN DISTRICT, NEW TAIPEI CITY 23143, TAIWAN (R. O. C.)
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C)
Test Location (1):	No. 19, Hwa Ya 2nd Rd, Wen Hwa Vil, Kwei Shan Dist., Taoyuan City 33383, Taiwan (R.O.C)
Test Location (2):	No.215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan, R.O.C
FCC Registration / Designation Number:	427177 / TW0011

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Release Control Record

Issue No.	Description	Date Issued
RF180802C04-2	Original Release	Sep. 14, 2018

1 Certificate of Conformity

Product:	LTE module
Brand:	Telit
Test Model:	LE910-NA1
Sample Status:	Identical Prototype
Applicant:	CASTLES TECHNOLOGY CO., LTD.
Test Date:	Aug. 21, 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:** Sep. 14, 2018

Gina Liu / Specialist

Approved by : , **Date:** Sep. 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	N/A	Refer to Note
2.1055 27.54	Frequency Stability	N/A	Refer to Note
2.1049 27.53(h)	Occupied Bandwidth	N/A	Refer to Note
27.50(d)(5)	Peak to Average Ratio	N/A	Refer to Note
27.53(h)	Band Edge Measurements	N/A	Refer to Note
2.1051 27.53(h)	Conducted Spurious Emissions	N/A	Refer to Note
2.1053 27.53(h)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -23.42 dB at 8724.00 MHz.

Applied Standard: FCC Part 27 & Part 2 (LTE 12)			
FCC Clause	**Test Item**	**Result**	**Remarks**
2.1046 27.50(c)(10)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	N/A	Refer to Note
2.1055 27.54	Frequency Stability	N/A	Refer to Note
2.1049 27.53(g)	Occupied Bandwidth	N/A	Refer to Note
27.50(d)(5)	Peak to Average Ratio	N/A	Refer to Note
27.53(g)	Band Edge Measurements	N/A	Refer to Note
2.1051 27.53(g)	Conducted Spurious Emissions	N/A	Refer to Note
2.1053 27.53(g)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -19.48 dB at 1415.00 MHz.

Applied Standard: FCC Part 27 & Part 2 (LTE 13)			
FCC Clause	**Test Item**	**Result**	**Remarks**
2.1046 27.50(b)(10)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	N/A	Refer to Note
2.1055 27.54	Frequency Stability	N/A	Refer to Note
2.1049 27.53(g)	Occupied Bandwidth	N/A	Refer to Note
27.50(d)(5)	Peak to Average Ratio	N/A	Refer to Note
27.53(g)	Band Edge Measurements	N/A	Refer to Note
2.1051 27.53(g)	Conducted Spurious Emissions	N/A	Refer to Note
2.1053 27.53(g)(f)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -12.30 dB at 1564.00 MHz.

Note:

This report is a partial report. Therefore, only test item of Maximum Peak Output Power and Radiated Spurious Emissions tests were performed for this report. Other testing data please refer to ATL report no.: 1506FR21-01 for module (Brand: Telit, Model: LE910-NA V2)

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	2.0153 dB
	200 MHz ~ 1000 MHz	2.0224 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	1.0121 dB
	18 GHz ~ 40 GHz	1.1508 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent Technologies	N9038A	MY51210203	Mar. 16, 2018	Mar. 15, 2019
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Jan. 11, 2018	Jan. 10, 2019
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Dec. 06, 2017	Dec. 05, 2018
HORN Antenna ETS-Lindgren	3117	00143293	Dec. 13, 2017	Dec. 12, 2018
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 01, 2017	Nov. 30, 2018
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 16, 2018	Apr. 15, 2019
MXG Vector signal generator	N5182B	MY53050430	Oct. 24, 2017	Oct. 23, 2018
Preamplifier Agilent	310N	187226	Jun. 19, 2018	Jun. 18, 2019
Preamplifier Agilent	83017A	MY39501357	Jun. 19, 2018	Jun. 18, 2019
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(RFC-SMS-100-SMS-120+RFC-SMS-100-SMS-400)	Jun. 19, 2018	Jun. 18, 2019
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(RFC-SMS-100-SMS-24)	Jun. 19, 2018	Jun. 18, 2019
Software BV ADT	E3 8.130425b	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower &Turn Table Controller MF	MF-7802	NA	NA	NA
Radio Communication Analyzer Anritsu	MT8820C	6201010284	Dec. 28, 2017	Dec. 27, 2018
Temperature & Humidity Chamber	GTH-120-40-CP-AR	MAA1306-019	Sep. 08, 2017	Sep. 07, 2018
DC Power Supply Topward	33010D	807748	Oct. 25, 2016	Oct. 24, 2018
Digital Multimeter Fluke	87-III	70360742	Jun. 29, 2018	Jun. 28, 2019

Note: 1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HsinTien Chamber 1.
3. The horn antenna and preamplifier (model: 83017A) are used only for the measurement of emission frequency above 1 GHz if tested.
4. The IC Site Registration No. is IC7450I-1.

3 General Information

3.1 General Description of EUT

Product	LTE module	
Brand	Telit	
Test Model	LE910-NA1	
Status of EUT	Identical Prototype	
Power Supply Rating	5.0 Vdc (adapter or host equipment) 3.7 Vdc (battery)	
Modulation Type	LTE	QPSK, 16QAM
Frequency Range	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	1710.7 ~ 1754.3 MHz
	LTE Band 4 (Channel Bandwidth: 3 MHz)	1711.5 ~ 1753.5 MHz
	LTE Band 4 (Channel Bandwidth: 5 MHz)	1712.5 ~ 1752.5 MHz
	LTE Band 4 (Channel Bandwidth: 10 MHz)	1715.0 ~ 1750.0 MHz
	LTE Band 4 (Channel Bandwidth: 15 MHz)	1717.5 ~ 1747.5 MHz
	LTE Band 4 (Channel Bandwidth: 20 MHz)	1720.0 ~ 1745.0 MHz
	LTE Band 12 (Channel Bandwidth: 1.4 MHz)	699.7 ~ 715.3 MHz
	LTE Band 12 (Channel Bandwidth: 3 MHz)	700.5 ~ 714.5 MHz
	LTE Band 12 (Channel Bandwidth: 5 MHz)	701.5 ~ 713.5 MHz
	LTE Band 12 (Channel Bandwidth: 10 MHz)	704.0 ~ 711.0 MHz
	LTE Band 13 (Channel Bandwidth: 5 MHz)	779.5 ~ 784.5 MHz
	LTE Band 13 (Channel Bandwidth: 10 MHz)	782.0 MHz
Max. ERP Power	LTE Band 12 (Channel Bandwidth: 1.4 MHz)	141.78 mW
	LTE Band 12 (Channel Bandwidth: 3 MHz)	143.09 mW
	LTE Band 12 (Channel Bandwidth: 5 MHz)	144.08 mW
	LTE Band 12 (Channel Bandwidth: 10 MHz)	145.51 mW
	LTE Band 13 (Channel Bandwidth: 5 MHz)	127.17 mW
	LTE Band 13 (Channel Bandwidth: 10 MHz)	127.85 mW
Max. EIRP Power	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	447.40 mW
	LTE Band 4 (Channel Bandwidth: 3 MHz)	451.54 mW
	LTE Band 4 (Channel Bandwidth: 5 MHz)	454.67 mW
	LTE Band 4 (Channel Bandwidth: 10 MHz)	360.33 mW
	LTE Band 4 (Channel Bandwidth: 15 MHz)	457.83 mW
	LTE Band 4 (Channel Bandwidth: 20 MHz)	461.00 mW
Antenna Type	Dipole Antenna	
Antenna Gain	LTE Band 4	1.19 dBi
	LTE Band 12	1.19 dBi
	LTE Band 13	1.19 dBi
Accessory Device	Refer to Note as below	
Data Cable Supplied	Refer to Note as below	

Note:

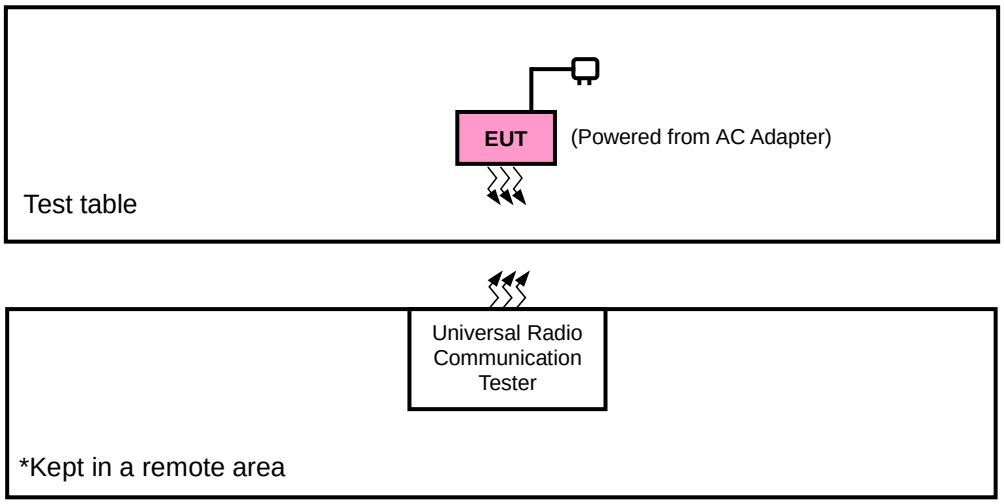
1. The EUT was installed in POS Terminal (Brand: CASTLES TECHNOLOGY, Model: VEGA3000).
2. The EUT contains following accessory devices.

Product	Brand	Model	Description
USB Cable	CHANG YANG ELECTRON CO., LTD.	CY-AS-HK0059	1 m

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

3.2 Configuration of System under Test

<Radiated Emission Test>



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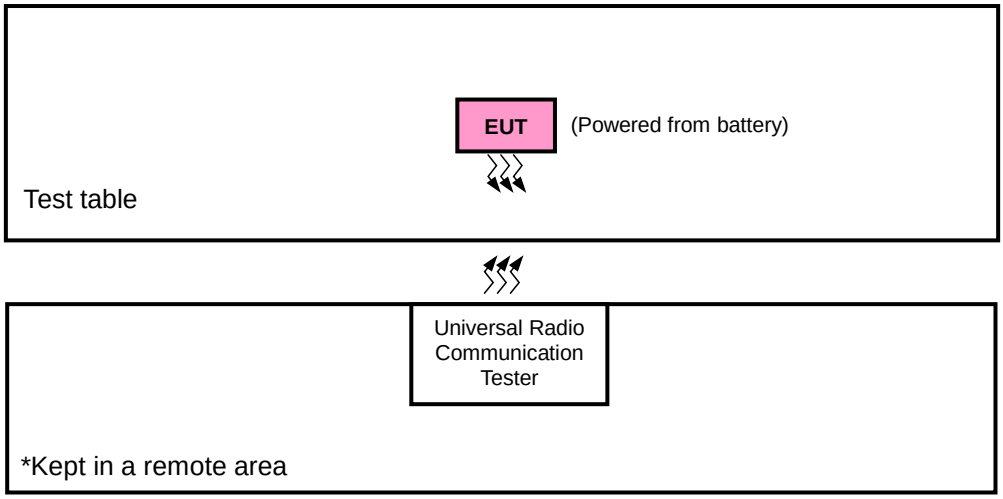


3.2.1 Description of Support Units

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

No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	Adapter	LUCENT	1A52-UB52A	N/A	N/A

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

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item 1 was provided by client.

3.3 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	X-plane	X-axis
LTE Band 12	Z-plane	Z-axis
LTE Band 13	X-plane	Z-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	1 RB / 5 RB Offset
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK, 16QAM	1 RB / 14 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK, 16QAM	1 RB / 24 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK, 16QAM	1 RB / 49 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK, 16QAM	1 RB / 74 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK, 16QAM	1 RB / 99 RB Offset
-	Radiated Emission below 1GHz	20050 to 20300	20300	20 MHz	QPSK	50 RB / 0 RB Offset
-	Radiated Emission above 1GHz	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK	1 RB / 2 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK	12 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK	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.

LTE Band 12

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	23017 to 23173	23017, 23095, 23173	1.4 MHz	QPSK, 16QAM	1 RB / 2 RB Offset
		23025 to 23165	23025, 23095, 23165	3 MHz	QPSK, 16QAM	1 RB / 7 RB Offset
		23035 to 23155	23035, 23095, 23155	5 MHz	QPSK, 16QAM	1 RB / 12 RB Offset
		23060 to 23130	23060, 23095, 23130	10 MHz	QPSK, 16QAM	1 RB / 24 RB Offset
-	Radiated Emission below 1GHz	23060 to 23130	23095	10 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission above 1GHz	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 13

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23230	23230	10 MHz	QPSK, 16QAM	1 RB / 24 RB Offset
-	Radiated Emission below 1GHz	23230	23230	10 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission above 1GHz	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK	1 RB / 0 RB Offset
		23230	23230	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	3.7 Vdc	Karl Lee, Charles Hsiao
Radiated Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Karl Lee, Charles Hsiao

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 are limited to 1 watt EIRP.

Portable stations (hand-held devices) operating in the 698-787 MHz band are limited to 3 watts ERP

4.1.2 Test Procedures

EIRP / ERP Measurement:

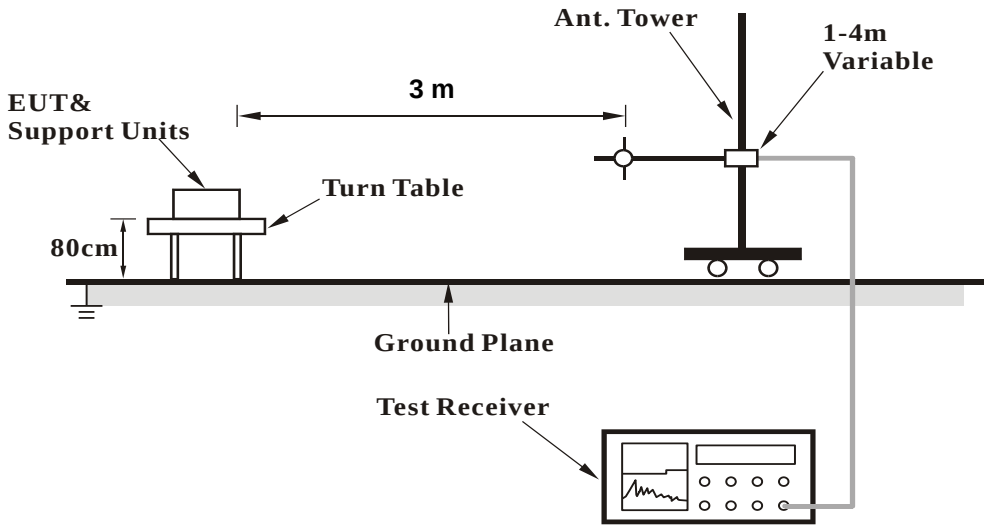
a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 5 MHz for WCDMA and 10 MHz for LTE mode.
b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) height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

Conducted Power Measurement:

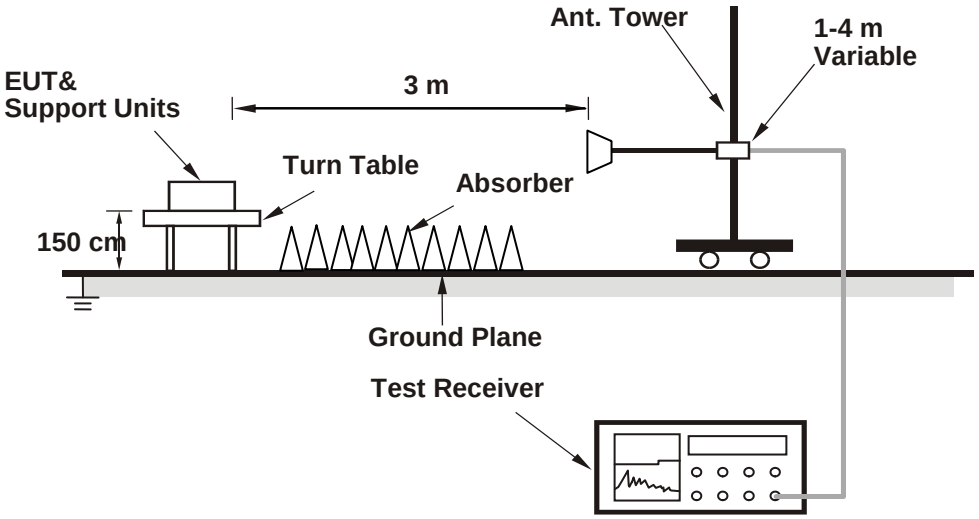
a. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
b. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

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	22.97	23.09	22.86	0	15M	QPSK	1	0	22.94	23.06	22.83	0
		1	50	22.38	22.50	22.27	0			1	37	22.35	22.47	22.24	0
		1	99	22.27	22.39	22.16	0			1	74	22.24	22.36	22.13	0
		50	0	21.71	21.83	21.60	1			36	0	21.68	21.80	21.57	1
		50	25	21.59	21.71	21.48	1			36	19	21.56	21.68	21.45	1
		50	50	21.52	21.64	21.41	1			36	39	21.49	21.61	21.38	1
		100	0	21.47	21.59	21.36	1			75	0	21.44	21.56	21.33	1
	16QAM	1	0	21.95	22.07	21.84	1		16QAM	1	0	21.92	22.04	21.81	1
		1	50	21.36	21.48	21.25	1			1	37	21.33	21.45	21.22	1
		1	99	21.25	21.37	21.14	1			1	74	21.22	21.34	21.11	1
		50	0	20.69	20.81	20.58	2			36	0	20.66	20.78	20.55	2
		50	25	20.57	20.69	20.46	2			36	19	20.54	20.66	20.43	2
		50	50	20.50	20.62	20.39	2			36	39	20.47	20.59	20.36	2
		100	0	20.45	20.57	20.34	2			75	0	20.42	20.54	20.31	2
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	22.90	23.02	22.79	0	5M	QPSK	1	0	22.86	22.98	22.75	0
		1	24	22.31	22.43	22.20	0			1	12	22.27	22.39	22.16	0
		1	49	22.20	22.32	22.09	0			1	24	22.16	22.28	22.05	0
		25	0	21.64	21.76	21.53	1			12	0	21.60	21.72	21.49	1
		25	12	21.52	21.64	21.41	1			12	6	21.48	21.60	21.37	1
		25	25	21.45	21.57	21.34	1			12	13	21.41	21.53	21.30	1
		50	0	21.40	21.52	21.29	1			25	0	21.36	21.48	21.25	1
	16QAM	1	0	21.88	22.00	21.77	1		16QAM	1	0	21.84	21.96	21.73	1
		1	24	21.29	21.41	21.18	1			1	12	21.25	21.37	21.14	1
		1	49	21.18	21.30	21.07	1			1	24	21.14	21.26	21.03	1
		25	0	20.62	20.74	20.51	2			12	0	20.58	20.70	20.47	2
		25	12	20.50	20.62	20.39	2			12	6	20.46	20.58	20.35	2
		25	25	20.43	20.55	20.32	2			12	13	20.39	20.51	20.28	2
		50	0	20.38	20.50	20.27	2			25	0	20.34	20.46	20.23	2
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	22.82	22.94	22.71	0	1.4M	QPSK	1	0	22.77	22.89	22.66	0
		1	7	22.23	22.35	22.12	0			1	2	22.18	22.30	22.07	0
		1	14	22.12	22.24	22.01	0			1	5	22.07	22.19	21.96	0
		8	0	21.56	21.68	21.45	1			3	0	22.53	22.65	22.42	0
		8	3	21.44	21.56	21.33	1			3	1	22.41	22.53	22.30	0
		8	7	21.37	21.49	21.26	1			3	3	22.34	22.46	22.23	0
		15	0	21.32	21.44	21.21	1			6	0	21.27	21.39	21.16	1
	16QAM	1	0	21.80	21.92	21.69	1		16QAM	1	0	21.75	21.87	21.64	1
		1	7	21.21	21.33	21.10	1			1	2	21.16	21.28	21.05	1
		1	14	21.10	21.22	20.99	1			1	5	21.05	21.17	20.94	1
		8	0	20.54	20.66	20.43	2			3	0	21.52	21.64	21.41	1
		8	3	20.42	20.54	20.31	2			3	1	21.40	21.52	21.29	1
		8	7	20.35	20.47	20.24	2			3	3	21.33	21.45	21.22	1
		15	0	20.30	20.42	20.19	2			6	0	20.25	20.37	20.14	2

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	22.67	22.75	22.71	0	5M	QPSK	1	0	22.63	22.71	22.67	0
		1	24	22.60	22.68	22.64	0			1	12	22.56	22.64	22.60	0
		1	49	22.47	22.55	22.51	0			1	24	22.43	22.51	22.47	0
		25	0	21.56	21.64	21.60	1			12	0	21.52	21.60	21.56	1
		25	12	21.54	21.62	21.58	1			12	6	21.50	21.58	21.54	1
		25	25	21.39	21.47	21.43	1			12	13	21.35	21.43	21.39	1
		50	0	21.31	21.39	21.35	1			25	0	21.27	21.35	21.31	1
	16QAM	1	0	21.63	21.71	21.67	1		16QAM	1	0	21.59	21.67	21.63	1
		1	24	21.56	21.64	21.60	1			1	12	21.52	21.60	21.56	1
		1	49	21.43	21.51	21.47	1			1	24	21.39	21.47	21.43	1
		25	0	20.52	20.60	20.56	2			12	0	20.48	20.56	20.52	2
		25	12	20.50	20.58	20.54	2			12	6	20.46	20.54	20.50	2
		25	25	20.35	20.43	20.39	2			12	13	20.31	20.39	20.35	2
		50	0	20.27	20.35	20.31	2			25	0	20.23	20.31	20.27	2
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	22.61	22.69	22.65	0	1.4M	QPSK	1	0	22.58	22.66	22.62	0
		1	7	22.54	22.62	22.58	0			1	2	22.51	22.59	22.55	0
		1	14	22.41	22.49	22.45	0			1	5	22.38	22.46	22.42	0
		8	0	21.50	21.58	21.54	1			3	0	21.47	21.55	21.51	0
		8	3	21.48	21.56	21.52	1			3	1	21.45	21.53	21.49	0
		8	7	21.33	21.41	21.37	1			3	3	21.30	21.38	21.34	0
		15	0	21.25	21.33	21.29	1			6	0	21.22	21.30	21.26	1
	16QAM	1	0	21.57	21.65	21.61	1		16QAM	1	0	21.54	21.62	21.58	1
		1	7	21.50	21.58	21.54	1			1	2	21.47	21.55	21.51	1
		1	14	21.37	21.45	21.41	1			1	5	21.34	21.42	21.38	1
		8	0	20.46	20.54	20.50	2			3	0	20.43	20.51	20.47	1
		8	3	20.44	20.52	20.48	2			3	1	20.41	20.49	20.45	1
		8	7	20.29	20.37	20.33	2			3	3	20.26	20.34	20.30	1
		15	0	20.21	20.29	20.25	2			6	0	20.18	20.26	20.22	2

LTE Band 13

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			23230					Channel		23205	23230	23225	
		Frequency (MHz)			782.0					Frequency (MHz)		779.5	782.0	784.5	
10M	QPSK	1	0		22.25		0	5M	QPSK	1	0	22.19	22.23	22.23	0
		1	24		22.18		0			1	12	22.12	22.16	22.16	0
		1	49		22.14		0			1	24	22.08	22.12	22.12	0
		25	0		21.75		1			12	0	21.69	21.73	21.73	1
		25	12		21.69		1			12	6	21.63	21.67	21.67	1
		25	25		21.61		1			12	13	21.55	21.59	21.59	1
		50	0		21.64		1			25	0	21.58	21.62	21.62	1
	16QAM	1	0		21.82		1		16QAM	1	0	21.76	21.80	21.80	1
		1	24		21.66		1			1	12	21.60	21.64	21.64	1
		1	49		21.37		1			1	24	21.31	21.35	21.35	1
		25	0		20.83		2			12	0	20.77	20.81	20.81	2
		25	12		20.70		2			12	6	20.64	20.68	20.68	2
		25	25		20.74		2			12	13	20.68	20.72	20.72	2
		50	0		20.72		2			25	0	20.66	20.70	20.70	2

ERP Power (dBm)

LTE Band 12							
Channel Bandwidth: 1.4 MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**Reading (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (mW)**	**Polarization (H/V)**
Z	23017	699.7	-9.14	32.719	21.43	138.96	H
	23095	707.5	-9.07	32.736	21.52	141.78	
	23173	715.3	-8.95	32.591	21.49	140.96	
	23017	699.7	-13.13	32.69	17.41	55.08	V
	23095	707.5	-13.10	32.81	17.56	57.02	
	23173	715.3	-13.10	32.74	17.49	56.10	
Channel Bandwidth: 1.4 MHz / 16QAM							
Z	23017	699.7	-10.14	32.719	20.43	110.38	H
	23095	707.5	-10.08	32.736	20.51	112.36	
	23173	715.3	-9.96	32.591	20.48	111.71	
	23017	699.7	-14.14	32.69	16.40	43.65	V
	23095	707.5	-14.11	32.81	16.55	45.19	
	23173	715.3	-14.10	32.74	16.49	44.57	

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)**
Z	23025	700.5	-9.11	32.719	21.46	139.93	H
	23095	707.5	-9.03	32.736	21.56	143.09	
	23165	714.5	-8.92	32.591	21.52	141.94	
	23025	700.5	-13.10	32.69	17.44	55.46	V
	23095	707.5	-13.07	32.81	17.59	57.41	
	23165	714.5	-13.06	32.74	17.53	56.62	
Channel Bandwidth: 3 MHz / 16QAM							
Z	23025	700.5	-10.12	32.719	20.45	110.89	H
	23095	707.5	-10.03	32.736	20.56	113.66	
	23165	714.5	-9.93	32.591	20.51	112.49	
	23025	700.5	-14.11	32.69	16.43	43.95	V
	23095	707.5	-14.08	32.81	16.58	45.50	
	23165	714.5	-14.07	32.74	16.52	44.87	

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)
Z	23035	701.5	-9.07	32.719	21.50	141.22	H
	23095	707.5	-9.00	32.736	21.59	144.08	
	23155	713.5	-8.89	32.591	21.55	142.92	
	23035	701.5	-13.06	32.69	17.48	55.98	V
	23095	707.5	-13.04	32.81	17.62	57.81	
	23155	713.5	-13.02	32.74	17.57	57.15	
Channel Bandwidth: 5 MHz / 16QAM							
Z	23035	701.5	-10.09	32.719	20.48	111.66	H
	23095	707.5	-10.01	32.736	20.58	114.18	
	23155	713.5	-9.90	32.591	20.54	113.27	
	23035	701.5	-14.07	32.69	16.47	44.36	V
	23095	707.5	-14.05	32.81	16.61	45.81	
	23155	713.5	-14.03	32.74	16.56	45.29	

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)
Z	23060	704.0	-9.04	32.727	21.54	142.46	H
	23095	707.5	-8.96	32.739	21.63	145.51	
	23130	711.0	-9.00	32.728	21.58	143.81	
	23060	704.0	-13.08	32.75	17.52	56.49	V
	23095	707.5	-13.00	32.81	17.66	58.34	
	23130	711.0	-13.08	32.84	17.61	57.68	
Channel Bandwidth: 10 MHz / 16QAM							
Z	23060	704.0	-10.05	32.727	20.53	112.90	H
	23095	707.5	-9.97	32.739	20.62	115.32	
	23130	711.0	-10.01	32.728	20.57	113.97	
	23060	704.0	-14.09	32.75	16.51	44.77	V
	23095	707.5	-14.01	32.81	16.65	46.24	
	23130	711.0	-14.08	32.84	16.61	45.81	

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

LTE Band 13							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	23205	779.5	-9.64	32.771	20.98	125.34	H
	23230	782.0	-9.56	32.741	21.03	126.79	
	23255	784.5	-9.66	32.854	21.04	127.17	
	23205	779.5	-13.40	32.5	16.95	49.55	V
	23230	782.0	-13.36	32.52	17.01	50.23	
	23255	784.5	-13.45	32.62	17.02	50.35	
Channel Bandwidth: 5 MHz / 16QAM							
X	23205	779.5	-10.65	32.771	19.97	99.33	H
	23230	782.0	-10.57	32.741	20.02	100.48	
	23255	784.5	-10.67	32.854	20.03	100.79	
	23205	779.5	-14.41	32.5	15.94	39.26	V
	23230	782.0	-14.37	32.52	16.00	39.81	
	23255	784.5	-14.46	32.62	16.01	39.90	

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

LTE Band 13							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	23230	782.0	-9.52	32.737	21.07	127.85	H
	23230	782.0	-13.32	32.52	17.05	50.70	V
Channel Bandwidth: 10 MHz / 16QAM							
X	23230	782.0	-10.53	32.737	20.06	101.32	H
	23230	782.0	-14.33	32.52	16.04	40.18	V

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

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)
X	19957	1710.7	-16.06	42.49	26.43	439.04	H
	20175	1732.5	-15.82	42.33	26.51	447.40	
	20393	1754.3	-15.74	42.10	26.36	432.51	
	19957	1710.7	-22.52	42.99	20.47	111.43	V
	20175	1732.5	-22.21	42.74	20.53	112.98	
	20393	1754.3	-21.86	42.21	20.35	108.39	
Channel Bandwidth: 1.4 MHz / 16QAM							
X	19957	1710.7	-17.07	42.49	25.42	347.94	H
	20175	1732.5	-16.83	42.33	25.50	354.57	
	20393	1754.3	-16.75	42.10	25.35	342.77	
	19957	1710.7	-23.53	42.99	19.46	88.31	V
	20175	1732.5	-23.22	42.74	19.52	89.54	
	20393	1754.3	-22.87	42.21	19.34	85.90	

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)
X	19965	1711.5	-16.03	42.49	26.46	442.08	H
	20175	1732.5	-15.78	42.33	26.55	451.54	
	20385	1753.5	-15.71	42.10	26.39	435.51	
	19965	1711.5	-22.49	42.99	20.50	112.20	V
	20175	1732.5	-22.18	42.74	20.56	113.76	
	20385	1753.5	-21.82	42.21	20.39	109.40	
Channel Bandwidth: 3 MHz / 16QAM							
X	19965	1711.5	-17.04	42.49	25.45	350.35	H
	20175	1732.5	-16.78	42.33	25.55	358.67	
	20385	1753.5	-16.72	42.10	25.38	345.14	
	19965	1711.5	-23.50	42.99	19.49	88.92	V
	20175	1732.5	-23.19	42.74	19.55	90.16	
	20385	1753.5	-22.83	42.21	19.38	86.70	

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)
X	19975	1712.5	-15.99	42.49	26.50	446.17	H
	20175	1732.5	-15.75	42.33	26.58	454.67	
	20375	1752.5	-15.68	42.10	26.42	438.53	
	19975	1712.5	-22.46	42.99	20.53	112.98	V
	20175	1732.5	-22.14	42.74	20.60	114.82	
	20375	1752.5	-21.79	42.21	20.42	110.15	
Channel Bandwidth: 5 MHz / 16QAM							
X	19975	1712.5	-17.00	42.49	25.49	353.59	H
	20175	1732.5	-16.76	42.33	25.57	360.33	
	20375	1752.5	-16.68	42.10	25.42	348.34	
	19975	1712.5	-23.47	42.99	19.52	89.54	V
	20175	1732.5	-23.16	42.74	19.58	90.78	
	20375	1752.5	-22.80	42.21	19.41	87.30	

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)
X	20000	1715.0	-15.96	42.49	26.53	449.26	H
	20175	1732.5	-15.72	42.33	26.61	457.83	
	20350	1750.0	-15.64	42.10	26.46	442.59	
	20000	1715.0	-22.43	42.99	20.56	113.76	V
	20175	1732.5	-22.10	42.74	20.64	115.88	
	20350	1750.0	-21.76	42.21	20.45	110.92	
Channel Bandwidth: 10 MHz / 16QAM							
X	20000	1715.0	-16.97	42.49	25.52	356.04	H
	20175	1732.5	-16.72	42.33	25.61	363.66	
	20350	1750.0	-16.65	42.10	25.45	350.75	
	20000	1715.0	-23.44	42.99	19.55	90.16	V
	20175	1732.5	-23.11	42.74	19.63	91.83	
	20350	1750.0	-22.76	42.21	19.45	88.10	

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)
X	20025	1717.5	-15.92	42.49	26.57	453.42	H
	20175	1732.5	-15.69	42.33	26.64	461.00	
	20325	1747.5	-15.60	42.10	26.50	446.68	
	20025	1717.5	-22.40	42.99	20.59	114.55	V
	20175	1732.5	-22.06	42.74	20.68	116.95	
	20325	1747.5	-21.72	42.21	20.49	111.94	
Channel Bandwidth: 15 MHz / 16QAM							
X	20025	1717.5	-16.93	42.49	25.56	359.34	H
	20175	1732.5	-16.70	42.33	25.63	365.34	
	20325	1747.5	-16.61	42.10	25.49	354.00	
	20025	1717.5	-23.40	42.99	19.59	90.99	V
	20175	1732.5	-23.06	42.74	19.68	92.90	
	20325	1747.5	-22.73	42.21	19.48	88.72	

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)
X	20050	1720.0	-15.89	42.49	26.60	456.56	H
	20175	1732.5	-15.65	42.33	26.68	465.26	
	20300	1745.0	-15.56	42.10	26.54	450.82	
	20050	1720.0	-22.36	42.99	20.63	115.61	V
	20175	1732.5	-22.03	42.74	20.71	117.76	
	20300	1745.0	-21.68	42.21	20.53	112.98	
Channel Bandwidth: 20 MHz / 16QAM							
X	20050	1720.0	-16.90	42.49	25.59	361.83	H
	20175	1732.5	-16.66	42.33	25.67	368.72	
	20300	1745.0	-16.58	42.10	25.52	356.45	
	20050	1720.0	-23.37	42.99	19.62	91.62	V
	20175	1732.5	-23.04	42.74	19.70	93.33	
	20300	1745.0	-22.68	42.21	19.53	89.74	

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

4.2 Radiated Emission Measurement

4.2.1 Limits of Radiated Emission Measurement

a. The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 +10 log (P) dB. The limit of emission is equal to -13 dBm.
b. For operations in the 775-788 MHz, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz. The limit of emissions is equal to -40 dBm.

4.2.2 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.

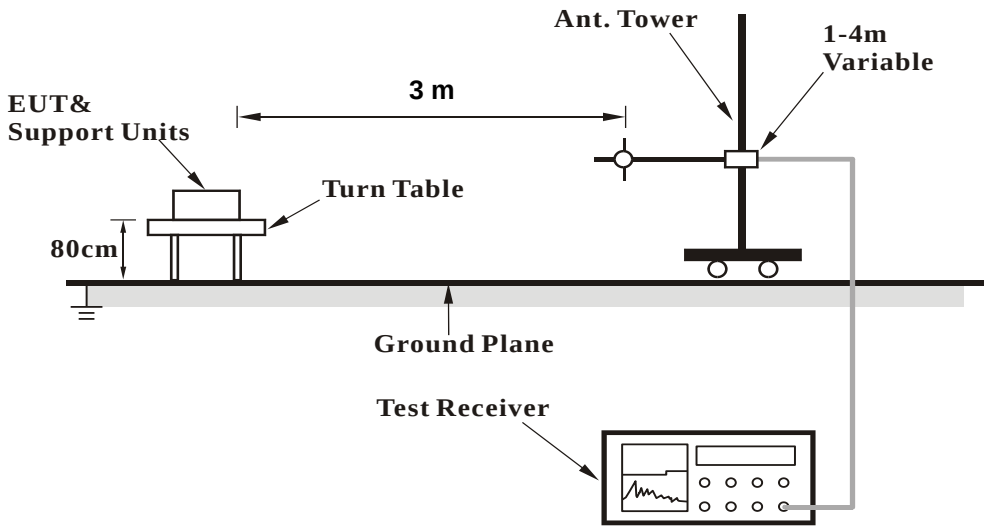
Note: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.2.3 Deviation from Test Standard

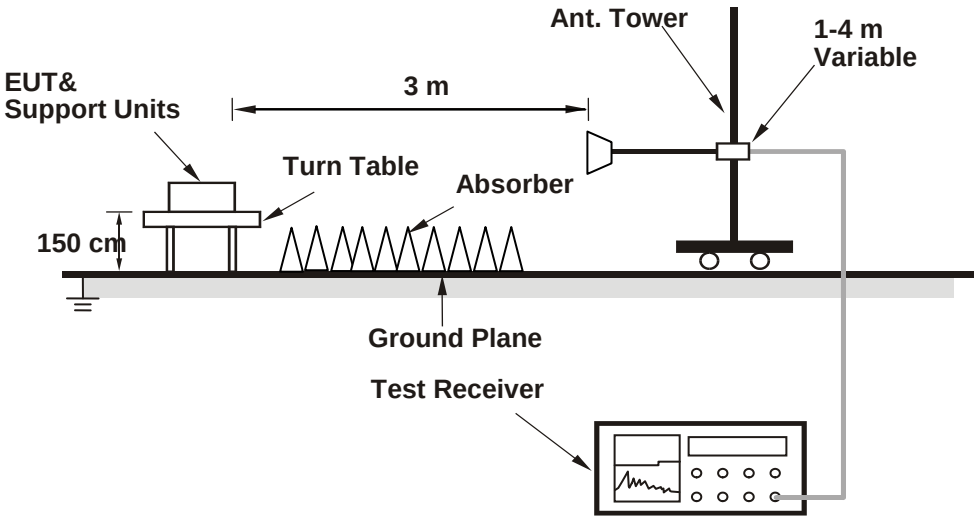
No deviation.

4.2.4 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).

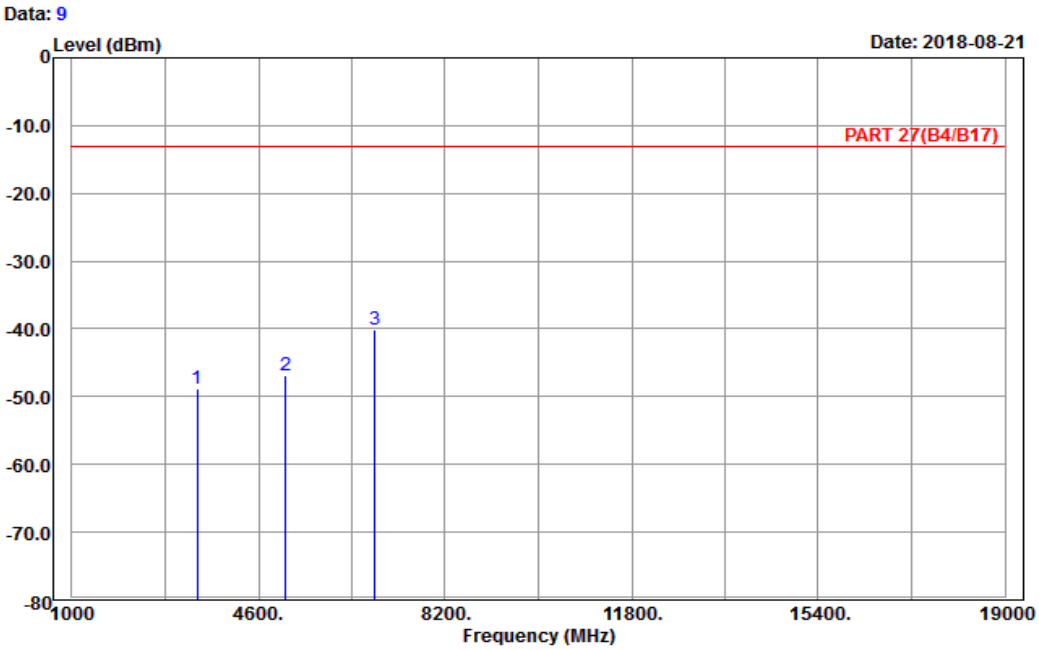
4.2.5 Test Results

LTE Band 4

Channel Bandwidth: 1.4 MHz / QPSK

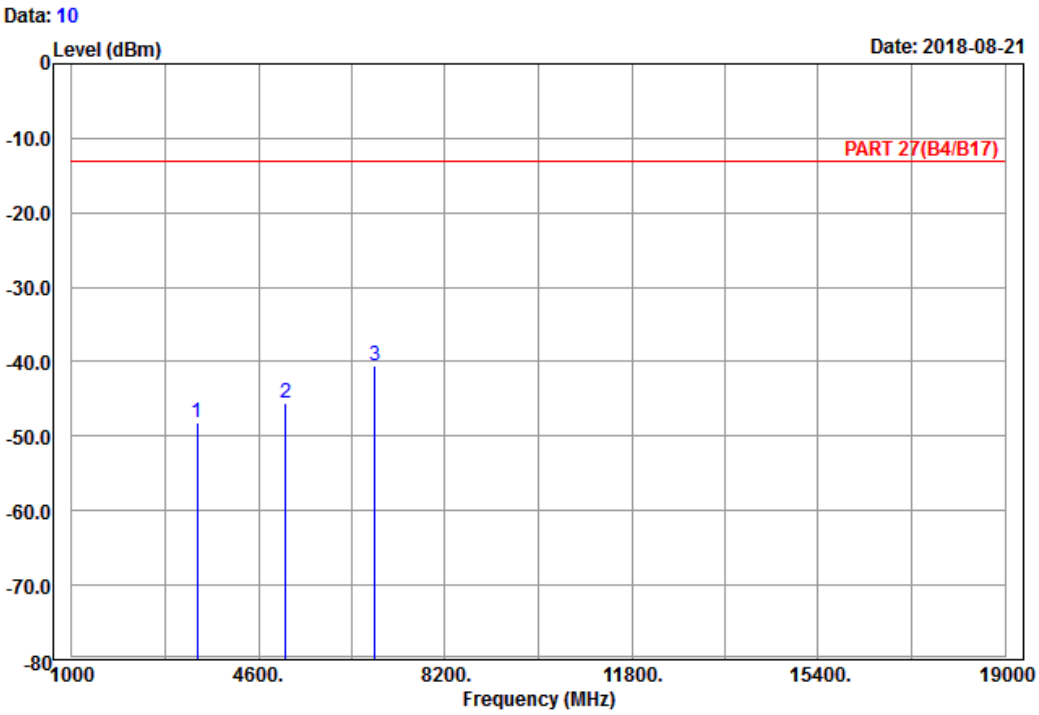
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3421.40	-48.83	-63.20	-13.00	-35.83	14.37	Peak
2	5132.10	-46.83	-66.64	-13.00	-33.83	19.81	Peak
3 pp	6842.80	-40.15	-62.87	-13.00	-27.15	22.72	Peak

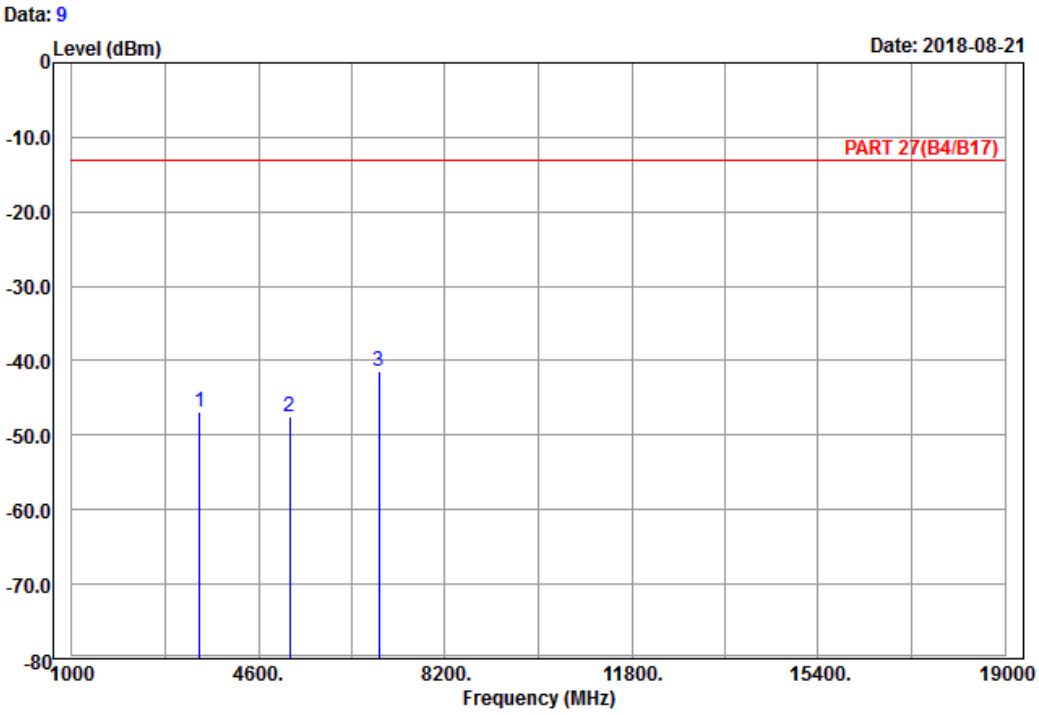


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH19957
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3421.40	-48.10	-62.47	-13.00	-35.10	14.37	Peak
2	5132.10	-45.66	-65.47	-13.00	-32.66	19.81	Peak
3 pp	6842.80	-40.49	-63.21	-13.00	-27.49	22.72	Peak

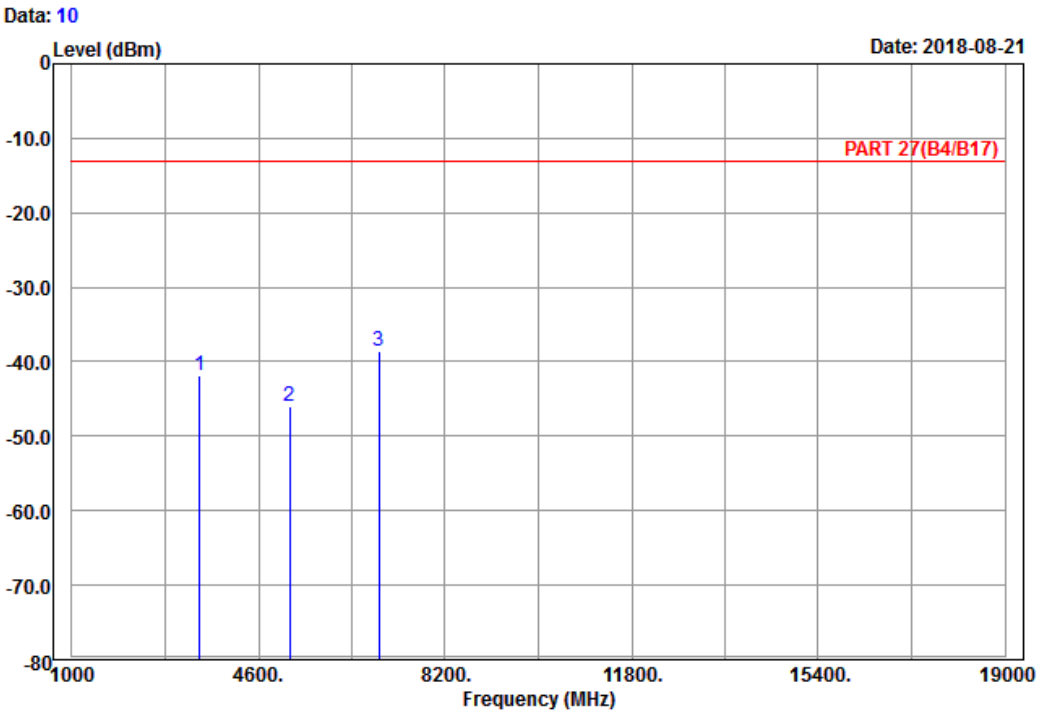
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3465.00	-46.81	-61.15	-13.00	-33.81	14.34	Peak
2	5197.50	-47.46	-67.58	-13.00	-34.46	20.12	Peak
3 pp	6930.00	-41.38	-64.25	-13.00	-28.38	22.87	Peak

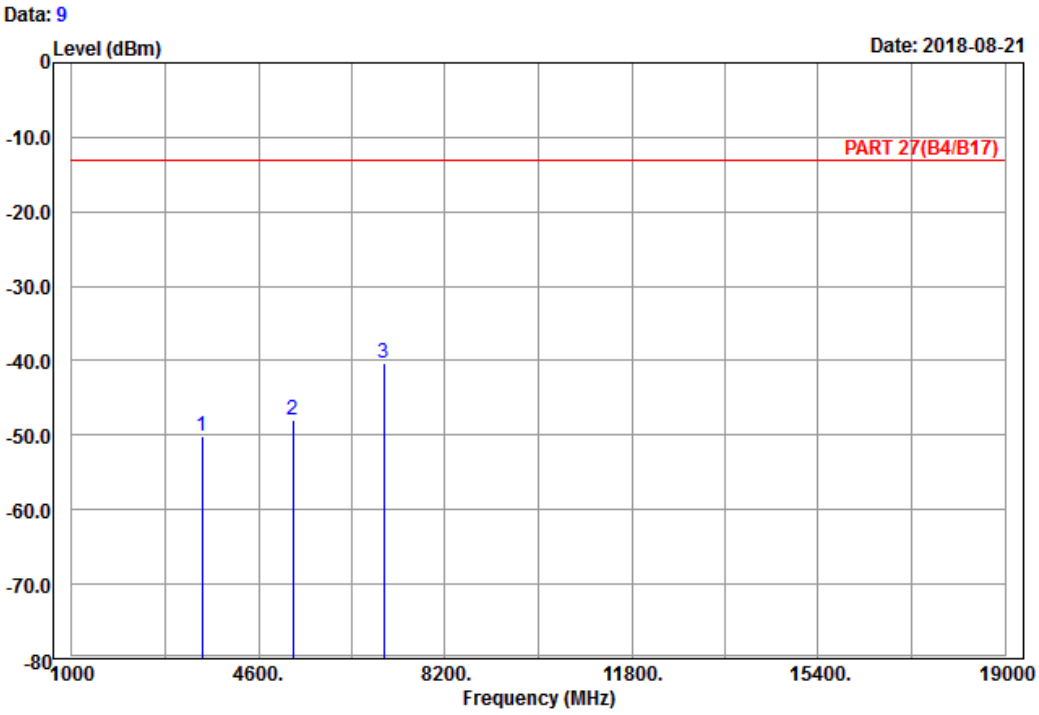


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH20175
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3465.00	-41.74	-56.08	-13.00	-28.74	14.34	Peak
2	5197.50	-45.95	-66.07	-13.00	-32.95	20.12	Peak
3 pp	6930.00	-38.55	-61.42	-13.00	-25.55	22.87	Peak

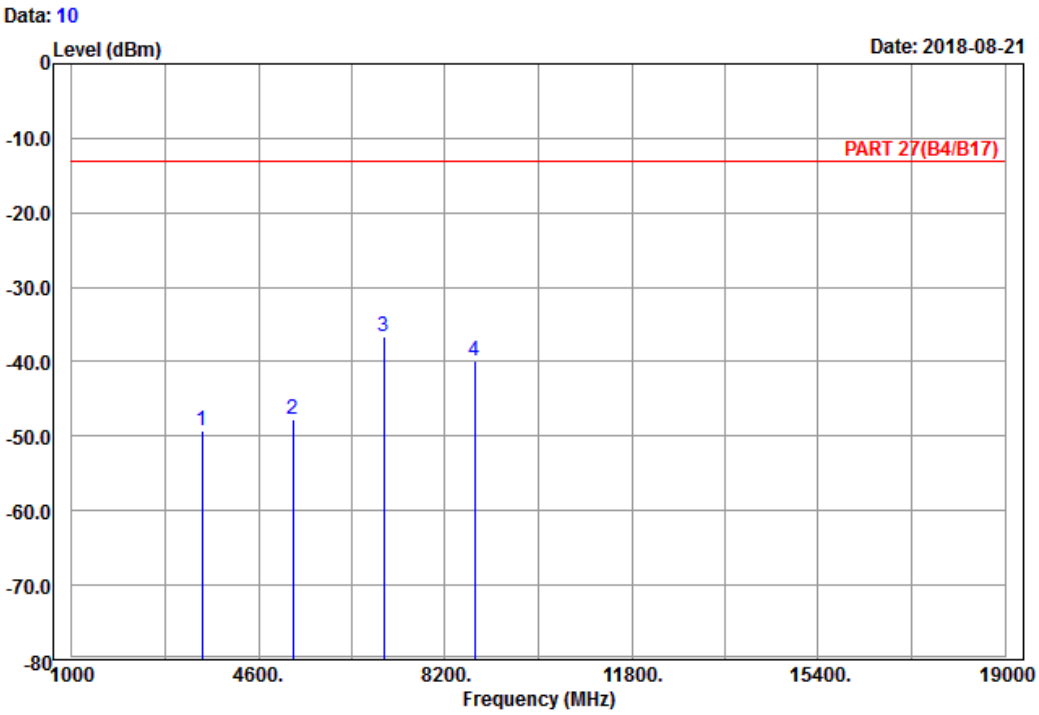
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3508.60	-50.10	-64.38	-13.00	-37.10	14.28	Peak
2	5262.90	-48.03	-68.23	-13.00	-35.03	20.20	Peak
3 pp	7017.20	-40.41	-63.02	-13.00	-27.41	22.61	Peak

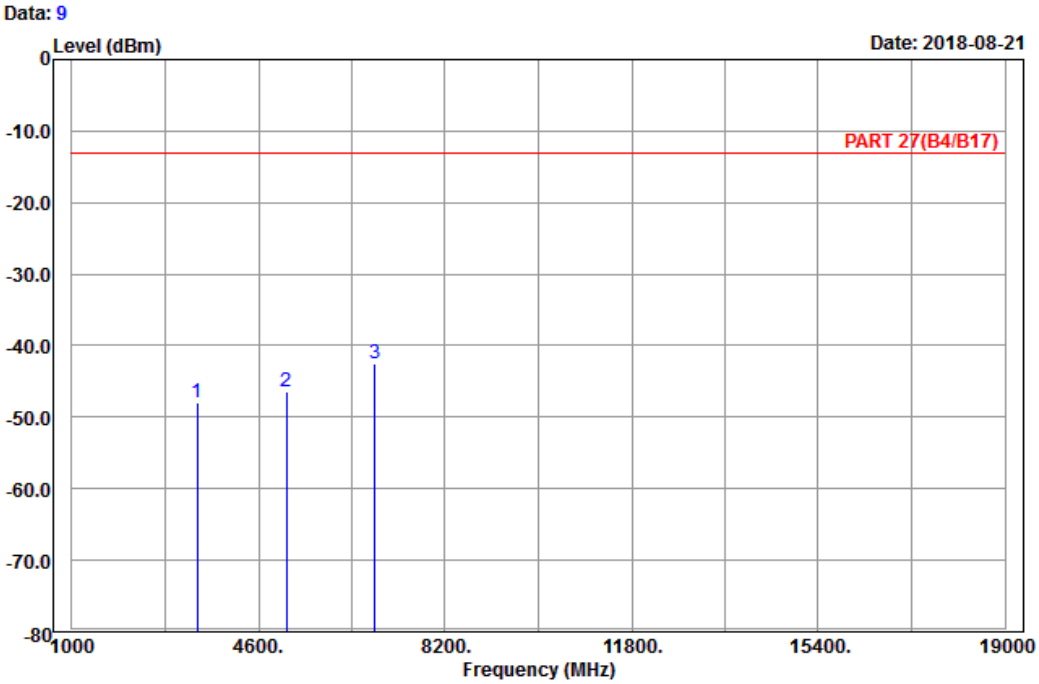


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH20393
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3508.60	-49.24	-63.52	-13.00	-36.24	14.28	Peak
2	5262.90	-47.80	-68.00	-13.00	-34.80	20.20	Peak
3 pp	7017.20	-36.57	-59.18	-13.00	-23.57	22.61	Peak
4	8771.50	-39.93	-64.49	-13.00	-26.93	24.56	Peak

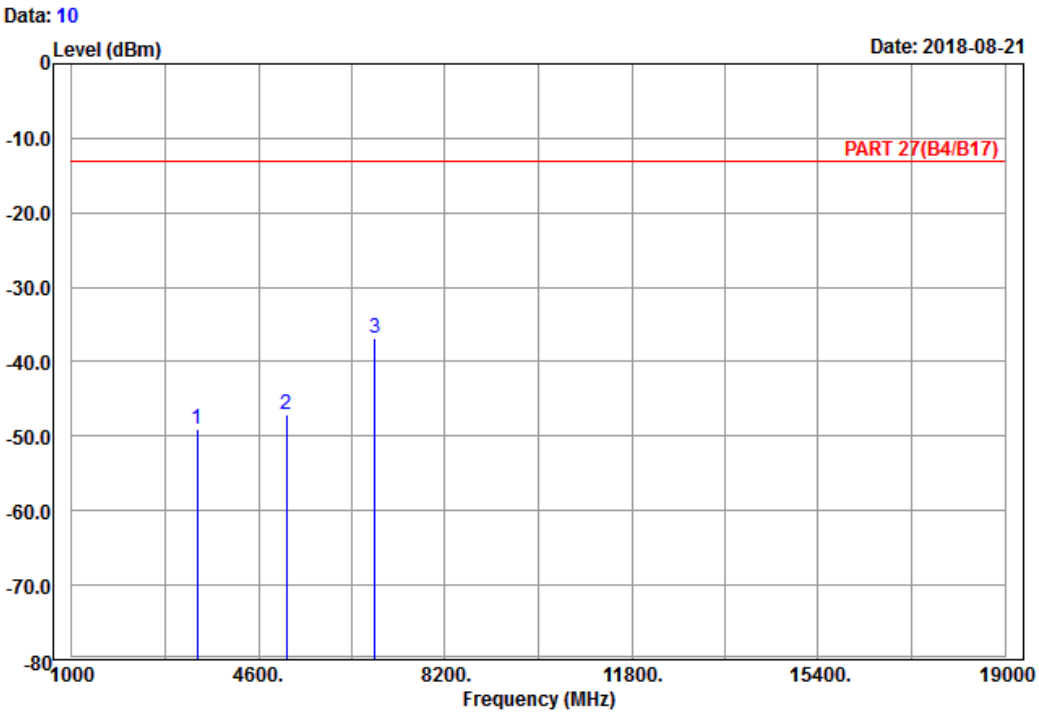
Channel Bandwidth: 5 MHz / QPSK
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3425.00	-48.01	-62.38	-13.00	-35.01	14.37	Peak
2	5137.50	-46.40	-66.21	-13.00	-33.40	19.81	Peak
3 pp	6850.00	-42.45	-65.17	-13.00	-29.45	22.72	Peak

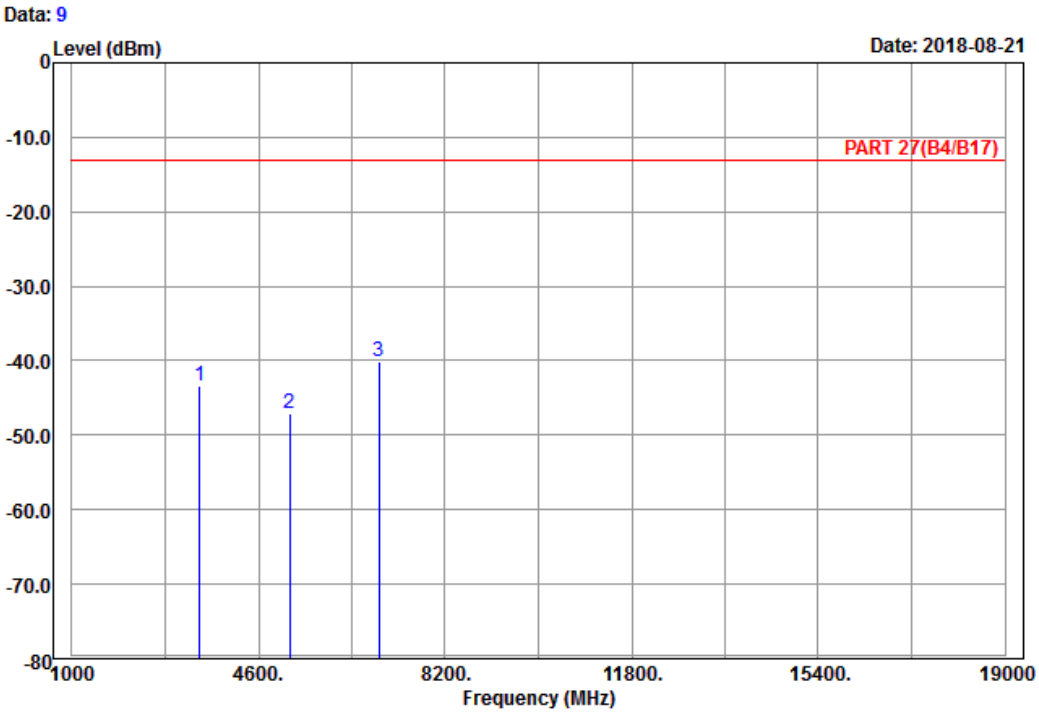


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH19975
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3425.00	-49.06	-63.43	-13.00	-36.06	14.37	Peak
2	5137.50	-47.16	-66.97	-13.00	-34.16	19.81	Peak
3 pp	6850.00	-36.79	-59.51	-13.00	-23.79	22.72	Peak

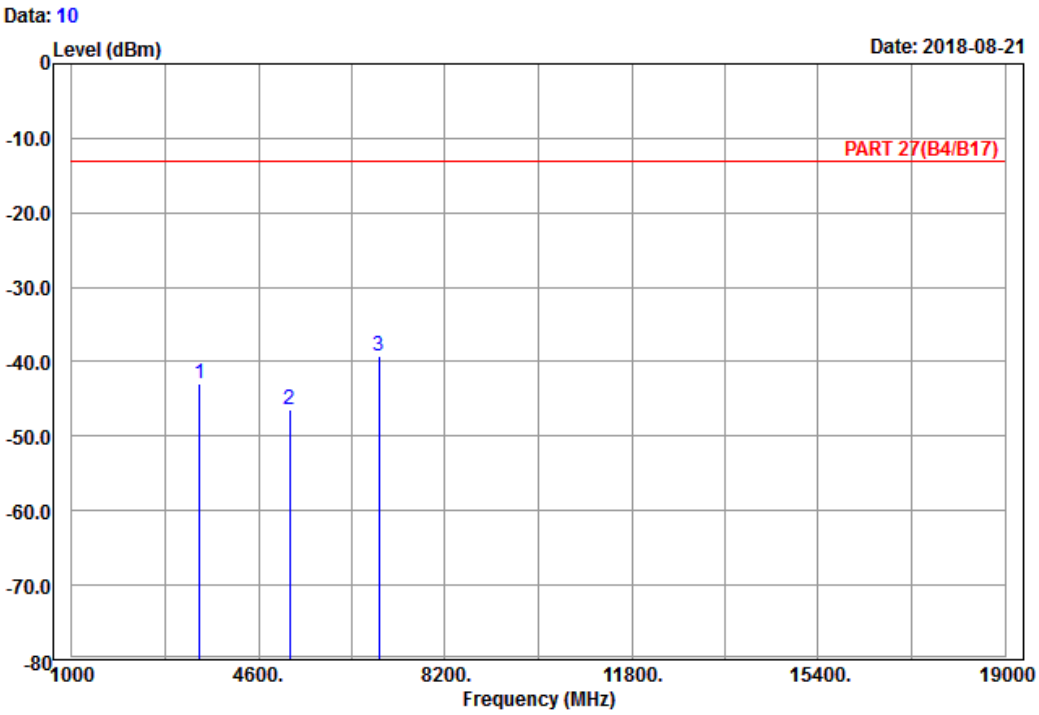
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3465.00	-43.33	-57.67	-13.00	-30.33	14.34	Peak
2	5197.50	-47.16	-67.28	-13.00	-34.16	20.12	Peak
3 pp	6930.00	-40.14	-63.01	-13.00	-27.14	22.87	Peak

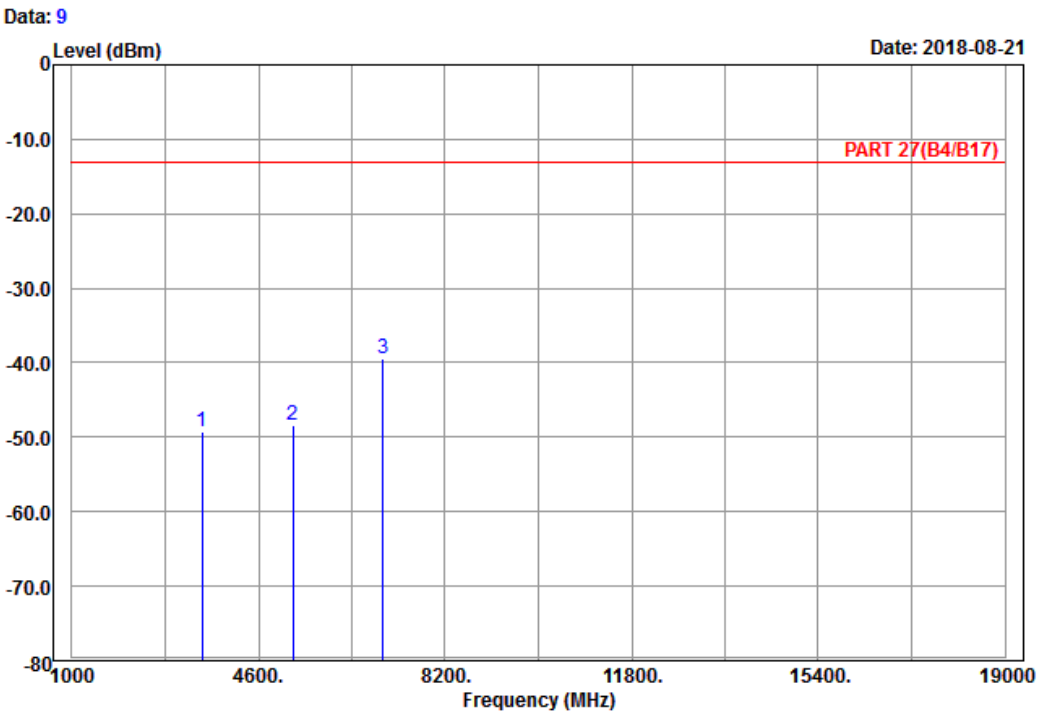


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH20175
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3465.00	-42.94	-57.28	-13.00	-29.94	14.34	Peak
2	5197.50	-46.51	-66.63	-13.00	-33.51	20.12	Peak
3 pp	6930.00	-39.33	-62.20	-13.00	-26.33	22.87	Peak

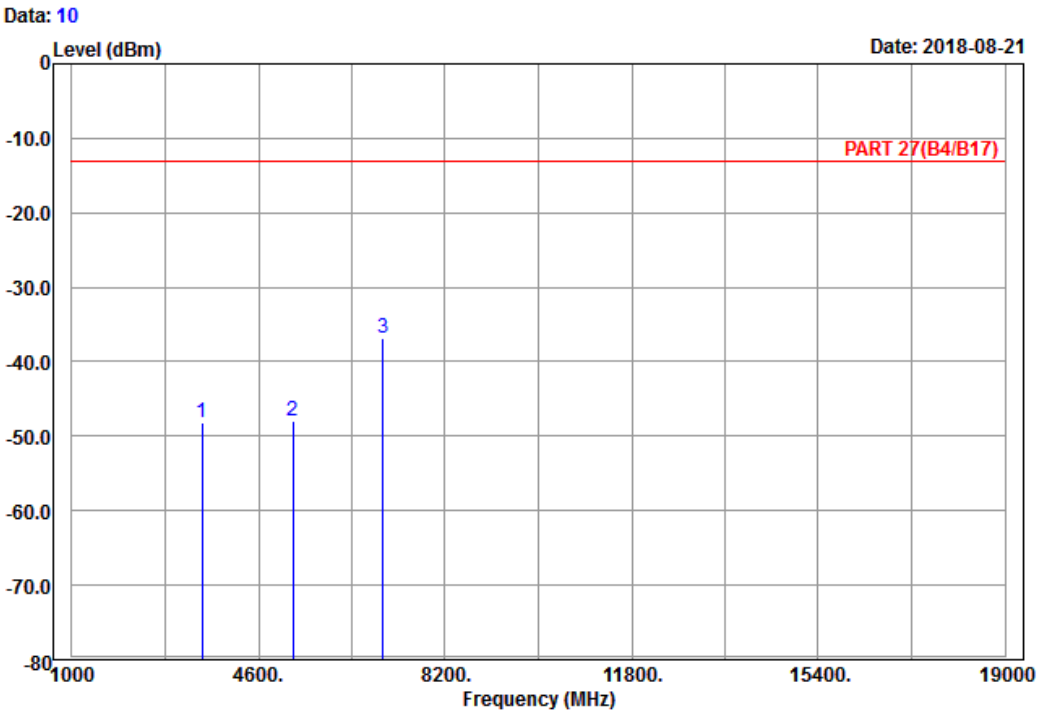
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3505.00	-49.30	-63.58	-13.00	-36.30	14.28	Peak
2	5257.50	-48.35	-68.55	-13.00	-35.35	20.20	Peak
3 pp	7010.00	-39.47	-62.08	-13.00	-26.47	22.61	Peak

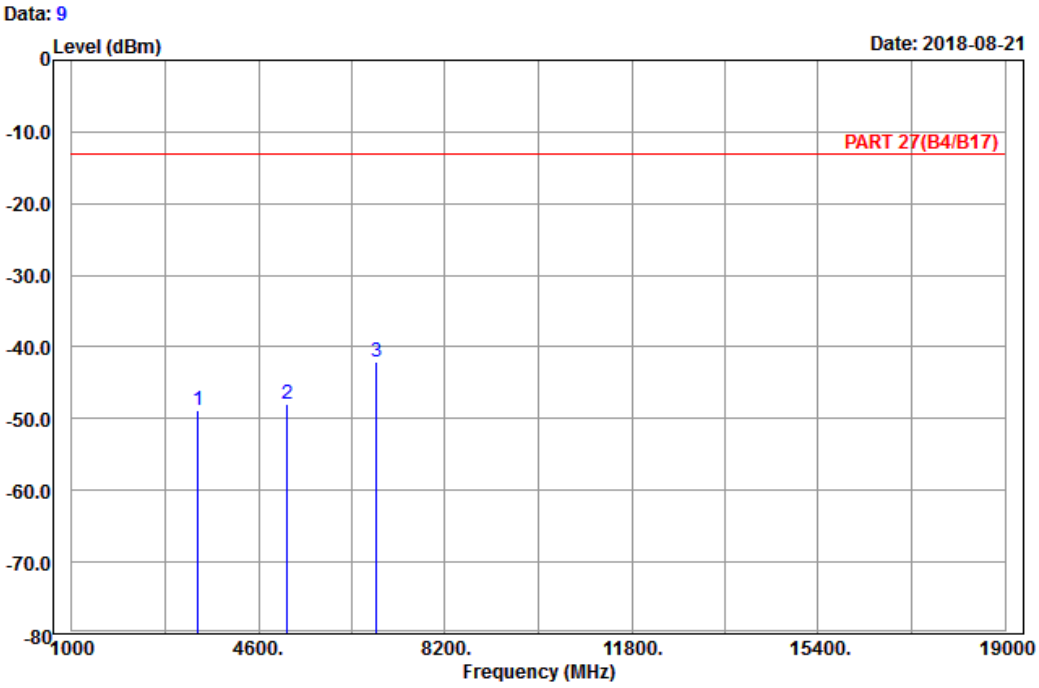


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH20375
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3505.00	-48.09	-62.37	-13.00	-35.09	14.28	Peak
2	5257.50	-47.96	-68.16	-13.00	-34.96	20.20	Peak
3 pp	7010.00	-36.93	-59.54	-13.00	-23.93	22.61	Peak

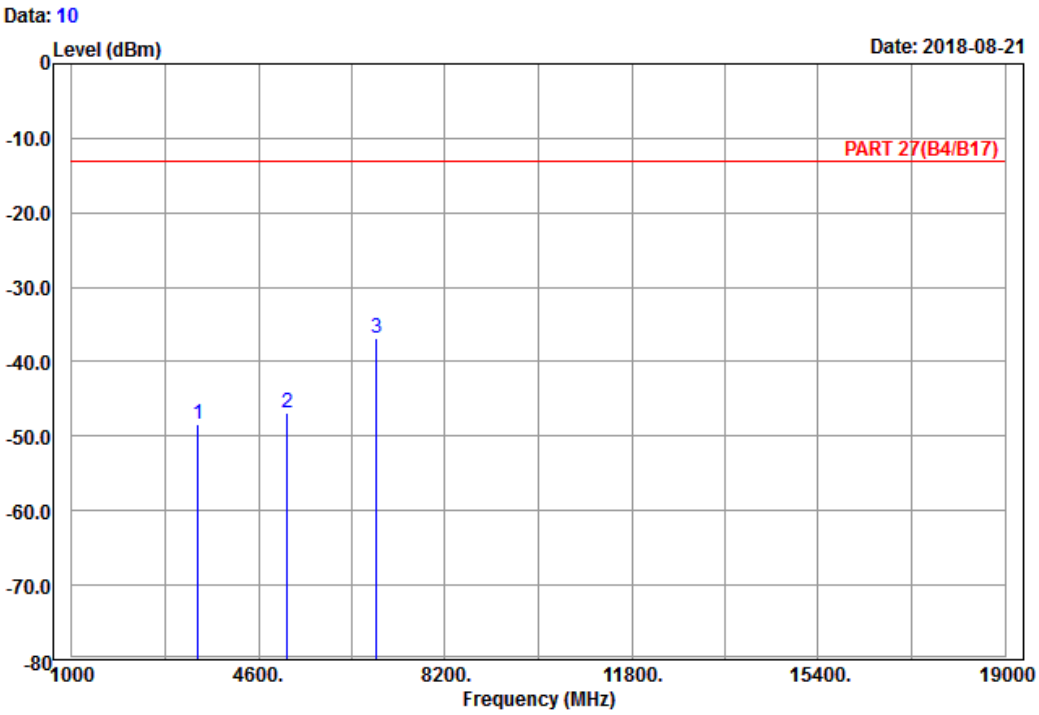
Channel Bandwidth: 20 MHz / QPSK
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3440.00	-48.93	-63.28	-13.00	-35.93	14.35	Peak
2	5160.00	-47.87	-67.79	-13.00	-34.87	19.92	Peak
3 pp	6880.00	-42.10	-64.90	-13.00	-29.10	22.80	Peak

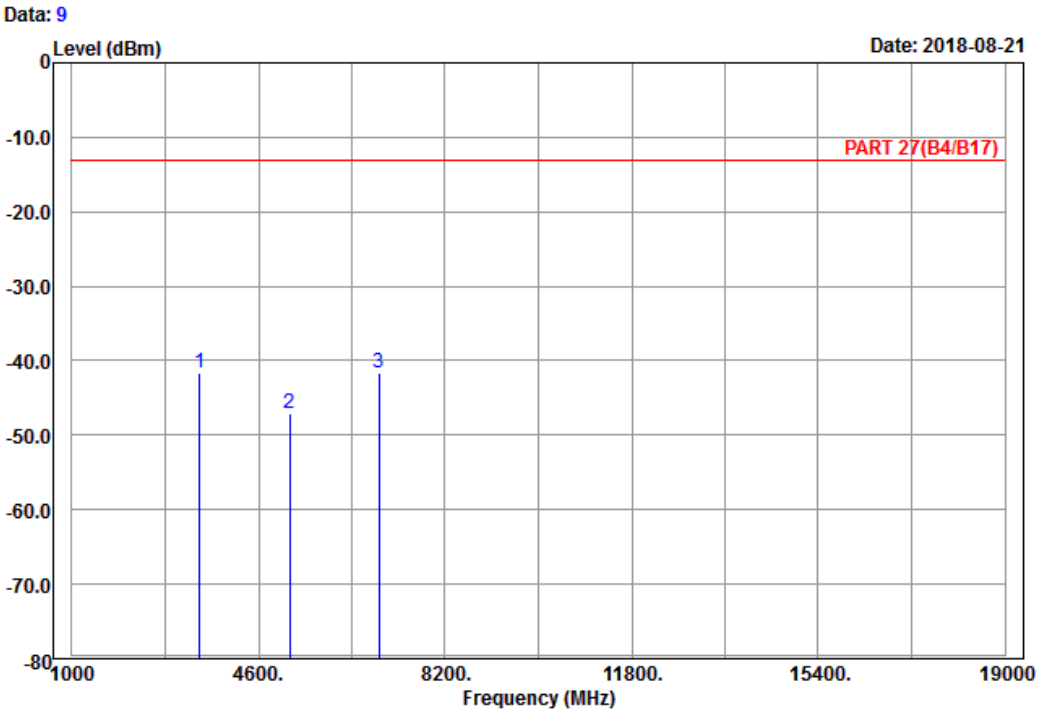


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH20050
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3440.00	-48.31	-62.66	-13.00	-35.31	14.35	Peak
2	5160.00	-46.91	-66.83	-13.00	-33.91	19.92	Peak
3 pp	6880.00	-36.84	-59.64	-13.00	-23.84	22.80	Peak

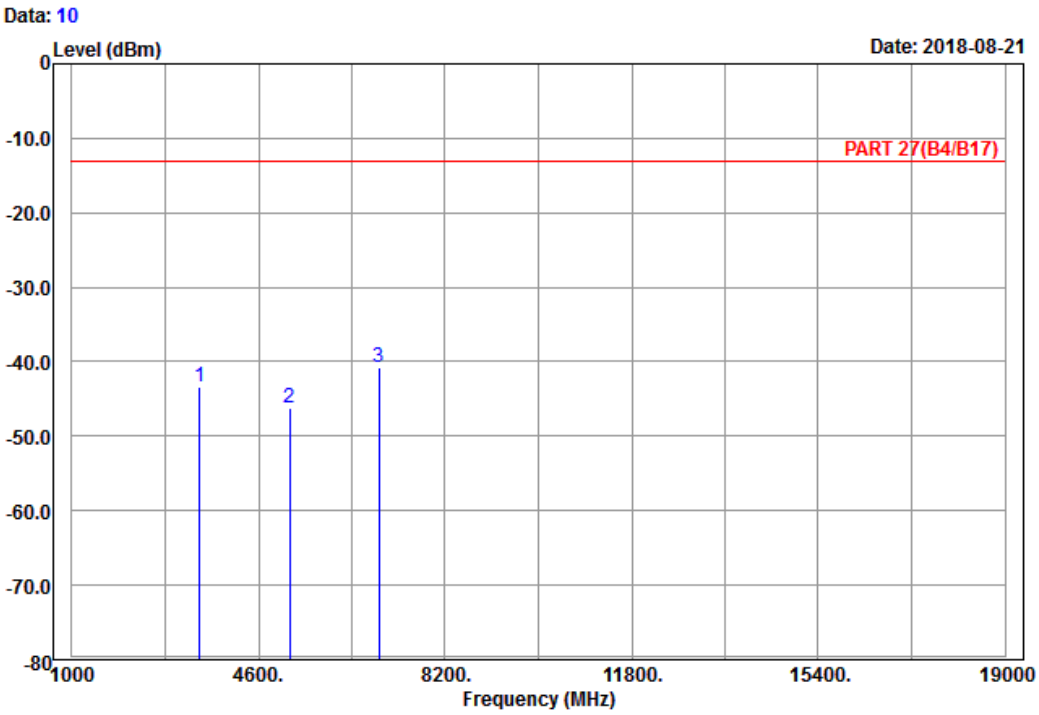
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3465.00	-41.61	-55.95	-13.00	-28.61	14.34	Peak
2	5197.50	-47.04	-67.16	-13.00	-34.04	20.12	Peak
3	6930.00	-41.73	-64.60	-13.00	-28.73	22.87	Peak

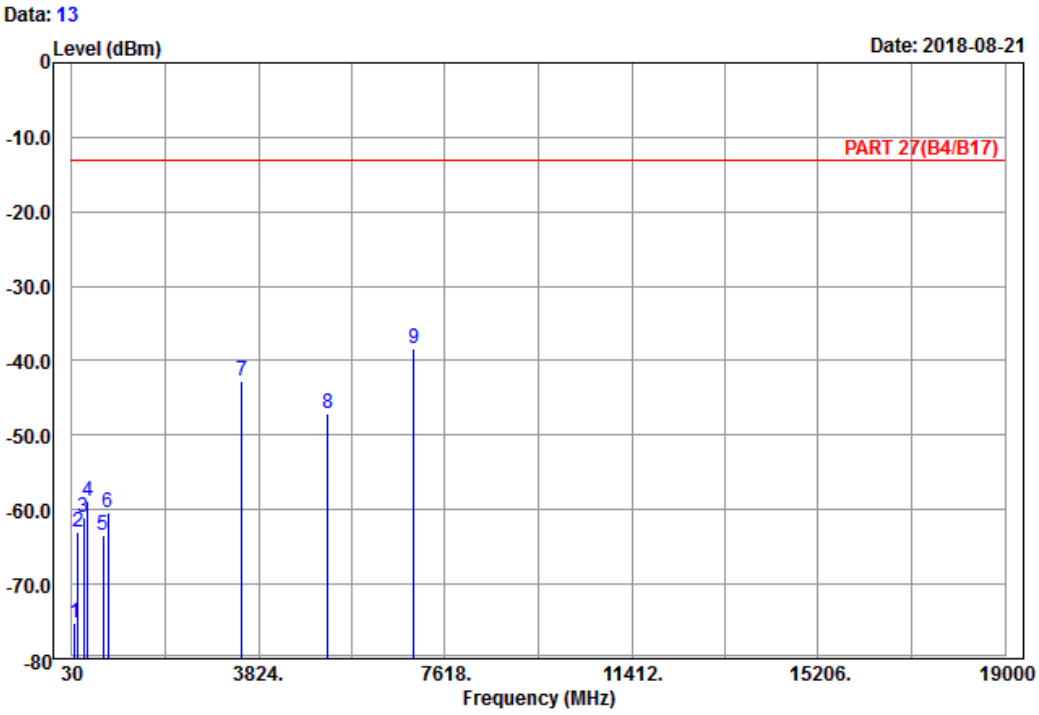


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH20175
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3465.00	-43.42	-57.76	-13.00	-30.42	14.34	Peak
2	5197.50	-46.20	-66.32	-13.00	-33.20	20.12	Peak
3 pp	6930.00	-40.77	-63.64	-13.00	-27.77	22.87	Peak

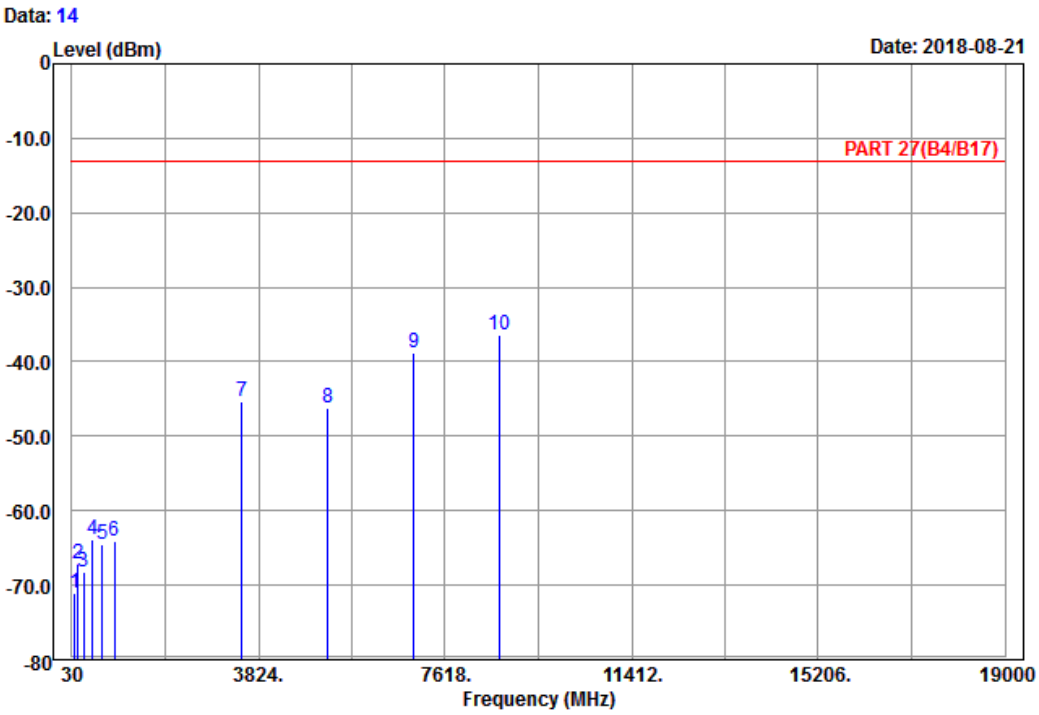
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	92.37	-75.24	-64.68	-13.00	-62.24	-10.56	Peak
2	159.60	-62.95	-55.28	-13.00	-49.95	-7.67	Peak
3	262.74	-60.98	-55.36	-13.00	-47.98	-5.62	Peak
4	351.10	-58.87	-53.54	-13.00	-45.87	-5.33	Peak
5	657.70	-63.44	-63.27	-13.00	-50.44	-0.17	Peak
6	766.20	-60.28	-60.06	-13.00	-47.28	-0.22	Peak
7	3490.00	-42.80	-57.11	-13.00	-29.80	14.31	Peak
8	5235.00	-47.15	-67.31	-13.00	-34.15	20.16	Peak
9 pp	6980.00	-38.29	-60.98	-13.00	-25.29	22.69	Peak

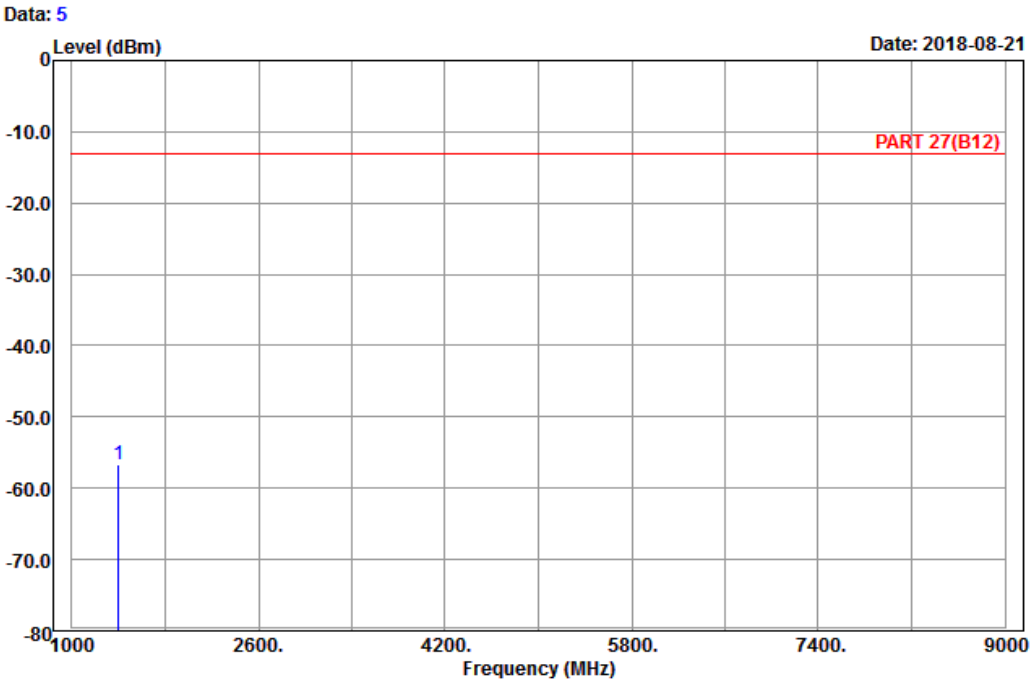


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH20300
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	85.08	-71.12	-59.90	-13.00	-58.12	-11.22	Peak
2	153.93	-67.21	-59.37	-13.00	-54.21	-7.84	Peak
3	263.01	-68.18	-62.56	-13.00	-55.18	-5.62	Peak
4	447.00	-63.88	-60.10	-13.00	-50.88	-3.78	Peak
5	651.40	-64.58	-64.44	-13.00	-51.58	-0.14	Peak
6	897.80	-64.19	-67.02	-13.00	-51.19	2.83	Peak
7	3490.00	-45.42	-59.73	-13.00	-32.42	14.31	Peak
8	5235.00	-46.22	-66.38	-13.00	-33.22	20.16	Peak
9	6980.00	-38.75	-61.44	-13.00	-25.75	22.69	Peak
10 pp	8724.00	-36.42	-60.81	-13.00	-23.42	24.39	Peak

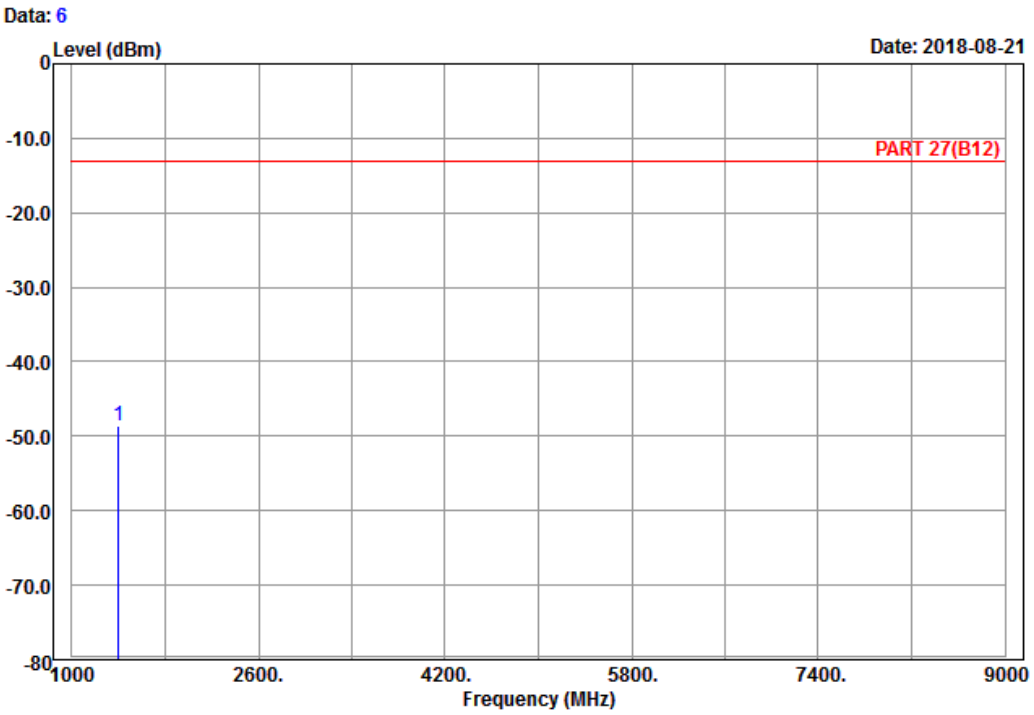
LTE Band 12
Channel Bandwidth: 1.4 MHz / QPSK
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B12) Horizontal
Remark : LTE_Band 12_Link_CH23017
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1399.40	-56.57	-62.67	-13.00	-43.57	6.10	Peak

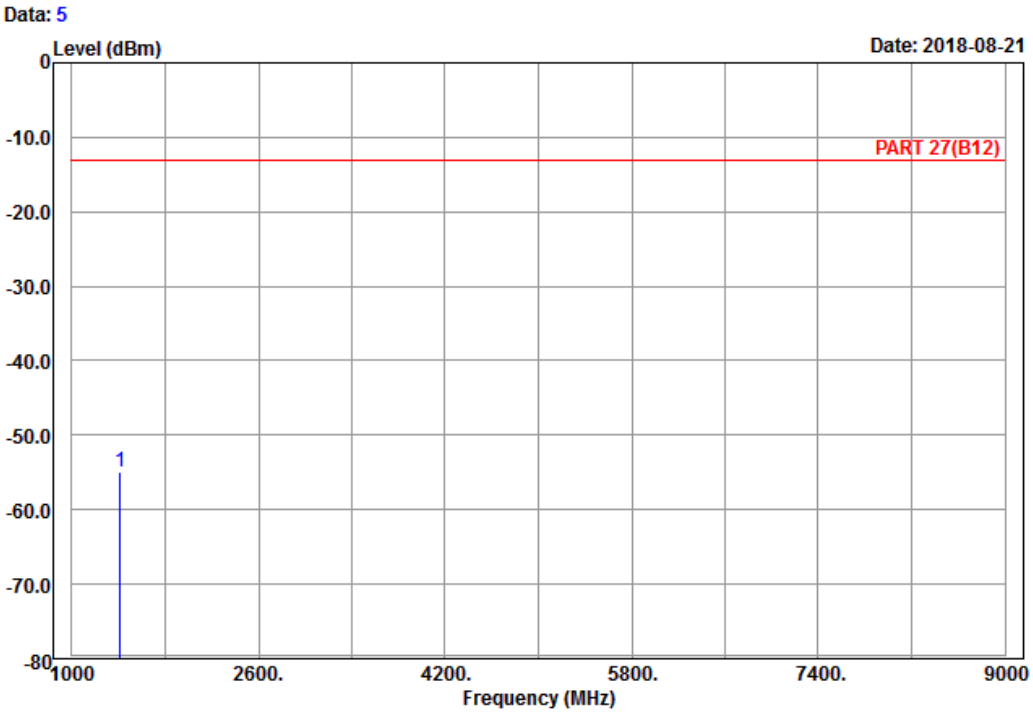


Site : 966 chamber 1
Condition: PART 27(B12) Vertical
Remark : LTE_Band 12_Link_CH23017
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1399.40	-48.70	-54.80	-13.00	-35.70	6.10	Peak

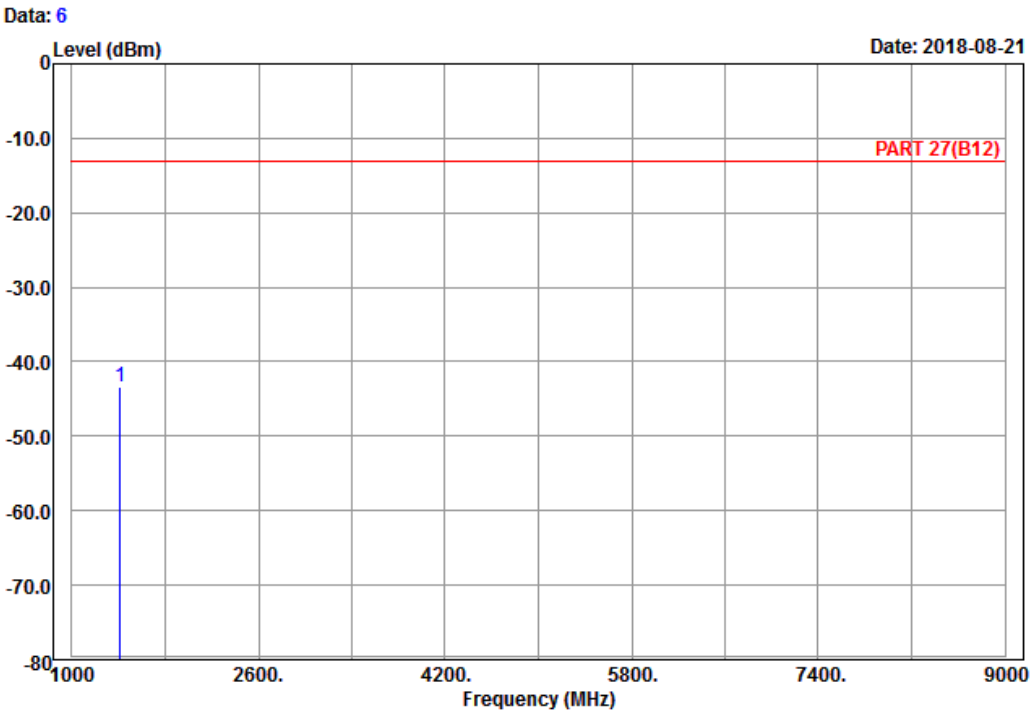
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1415.00	-54.97	-61.33	-13.00	-41.97	6.36	Peak

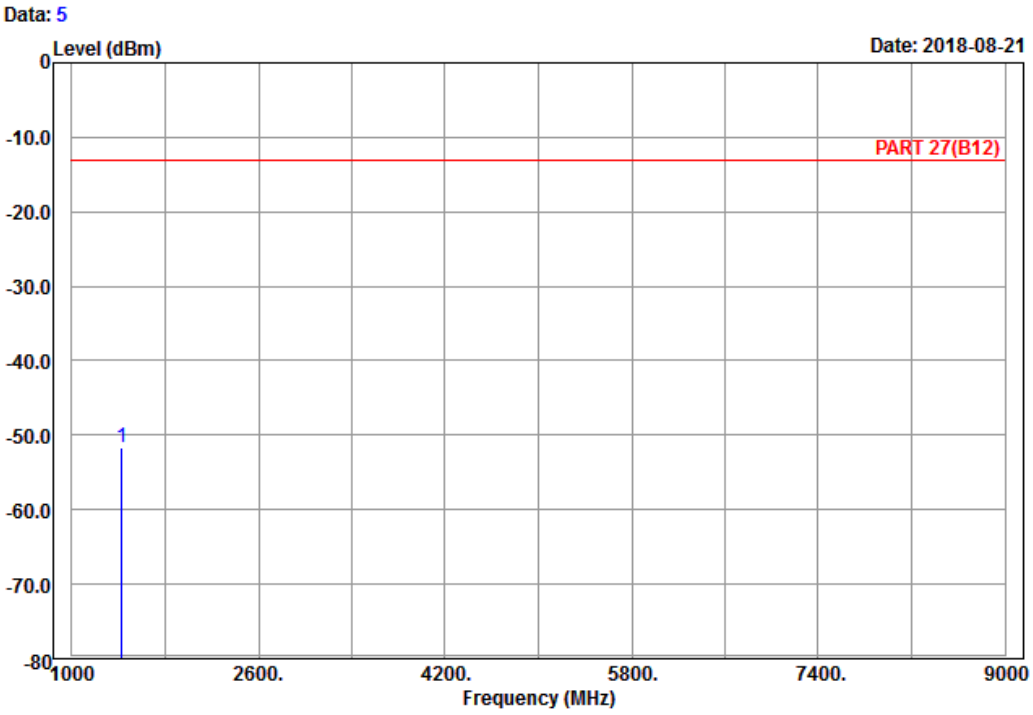


Site : 966 chamber 1
Condition: PART 27(B12) Vertical
Remark : LTE_Band 12_Link_CH23095
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1415.00	-43.31	-49.67	-13.00	-30.31	6.36	Peak

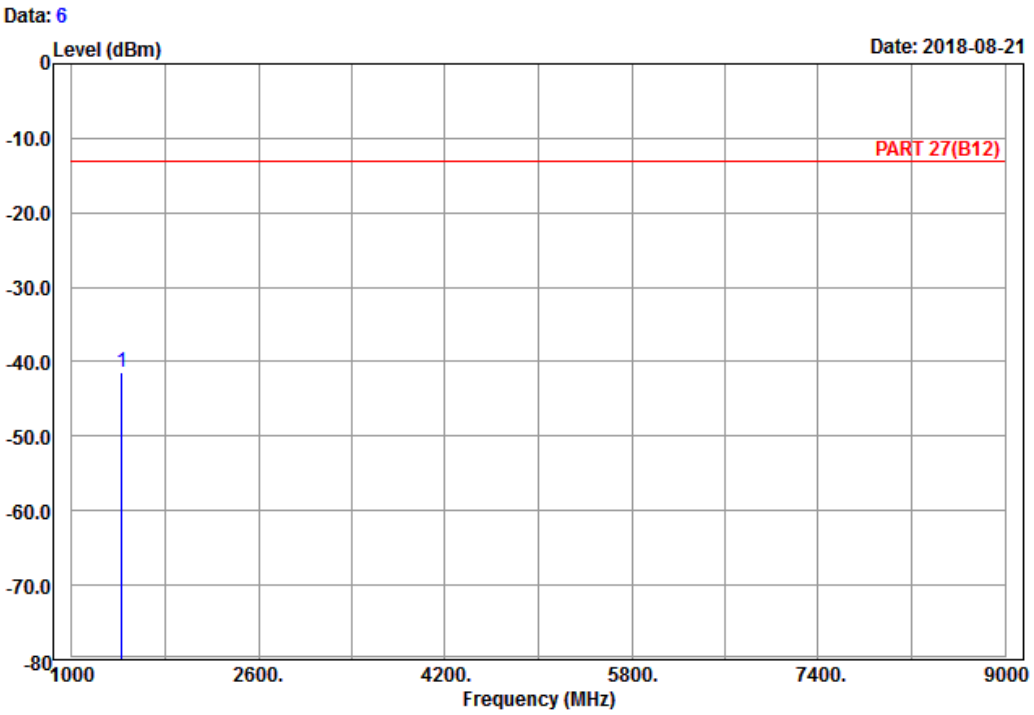
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B12) Horizontal
Remark : LTE_Band 12_Link_CH23173
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1430.60	-51.74	-57.98	-13.00	-38.74	6.24	Peak

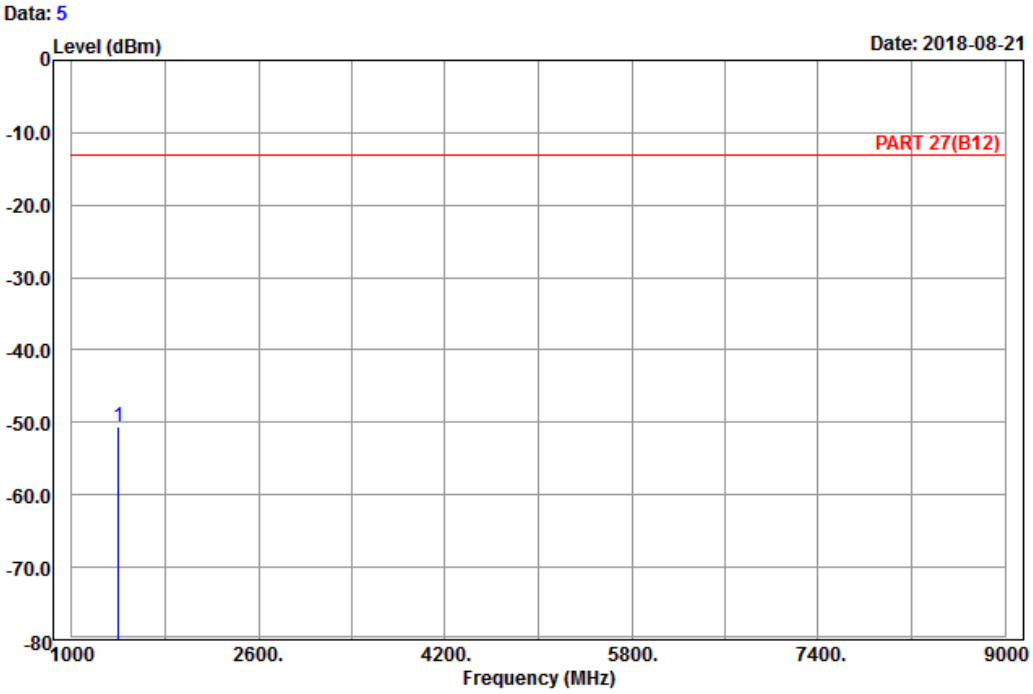


Site : 966 chamber 1
Condition: PART 27(B12) Vertical
Remark : LTE_Band 12_Link_CH23173
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1430.60	-41.38	-47.62	-13.00	-28.38	6.24	Peak

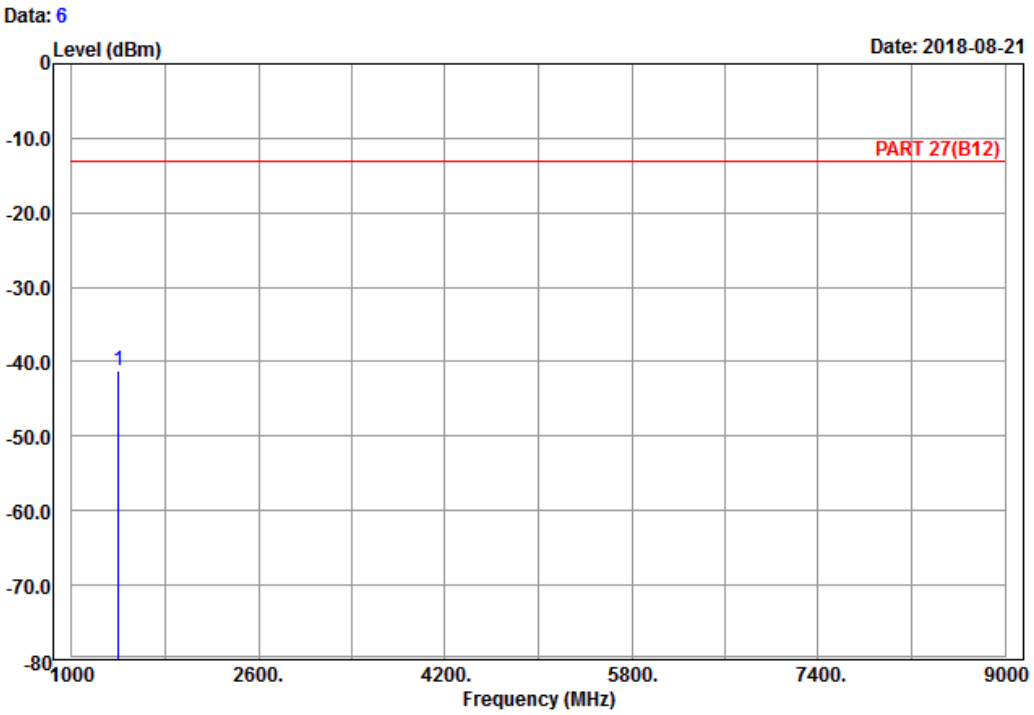
Channel Bandwidth: 5 MHz / QPSK
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B12) Horizontal
Remark : LTE_Band 12_Link_CH23035
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1403.00	-50.57	-56.67	-13.00	-37.57	6.10	Peak

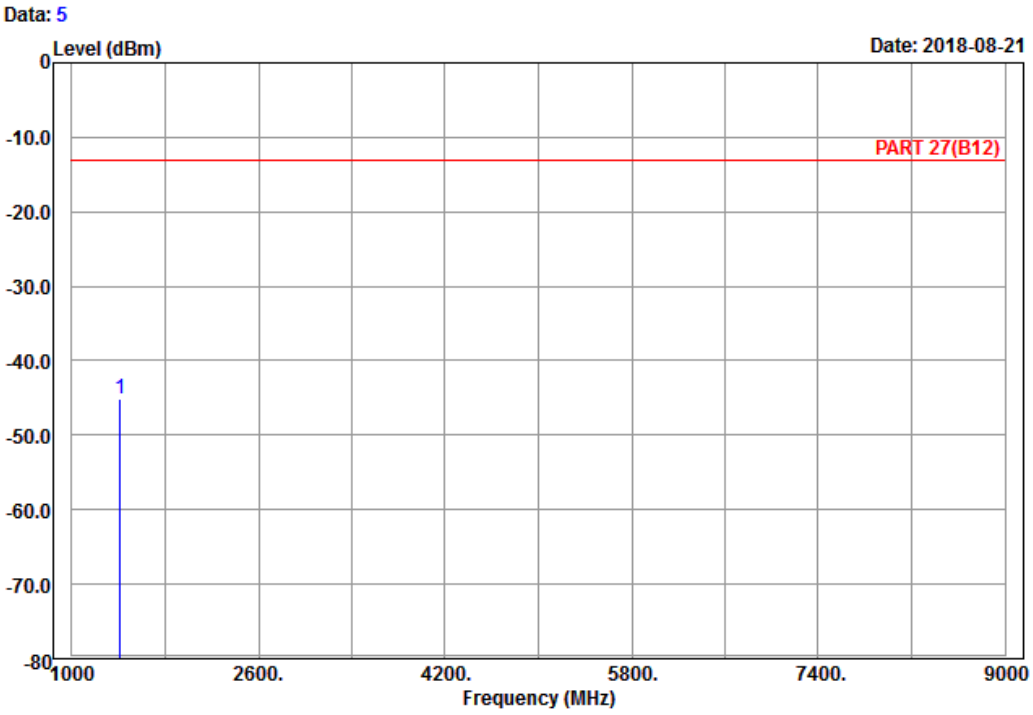


Site : 966 chamber 1
Condition: PART 27(B12) Vertical
Remark : LTE_Band 12_Link_CH23035
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1403.00	-41.09	-47.19	-13.00	-28.09	6.10	Peak

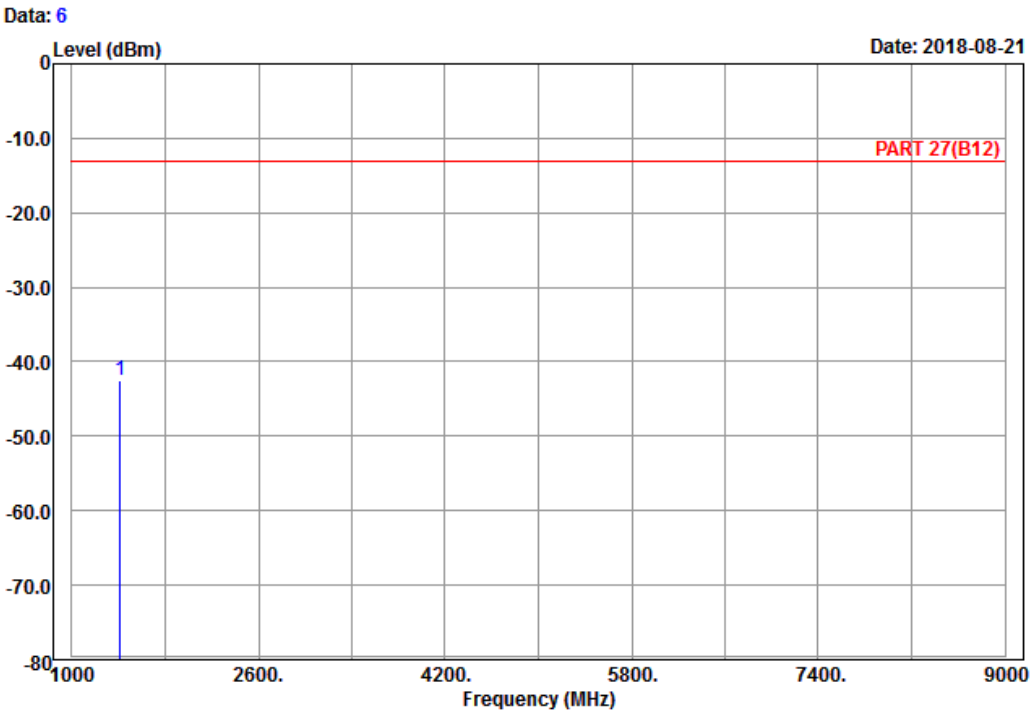
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1415.00	-45.18	-51.54	-13.00	-32.18	6.36	Peak

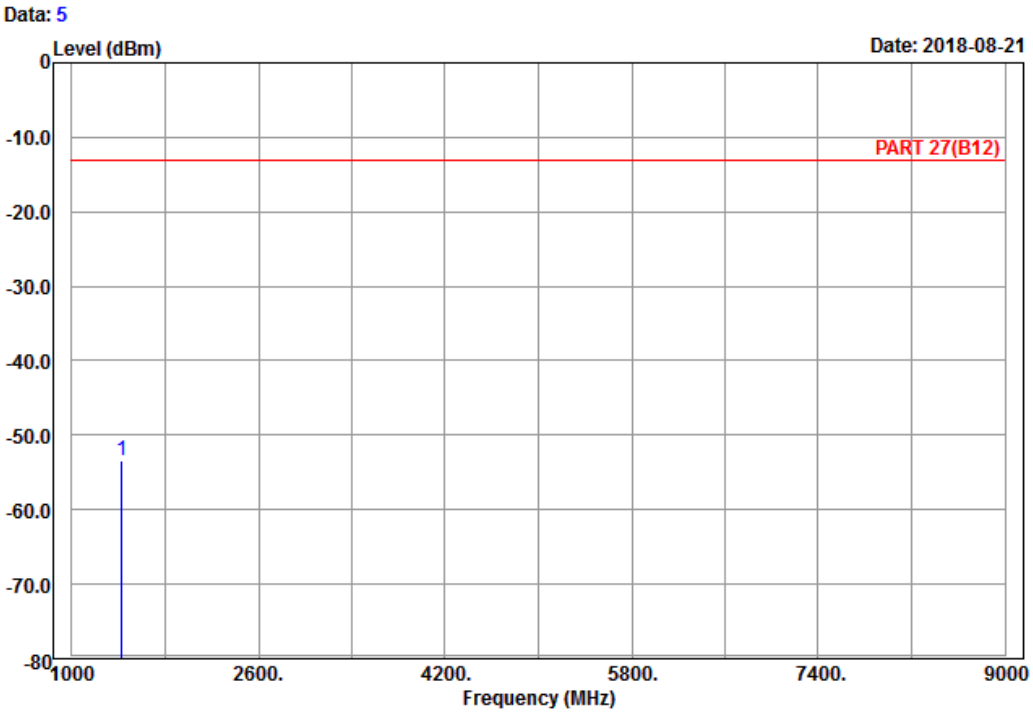


Site : 966 chamber 1
Condition: PART 27(B12) Vertical
Remark : LTE_Band 12_Link_CH23095
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1415.00	-42.54	-48.90	-13.00	-29.54	6.36	Peak

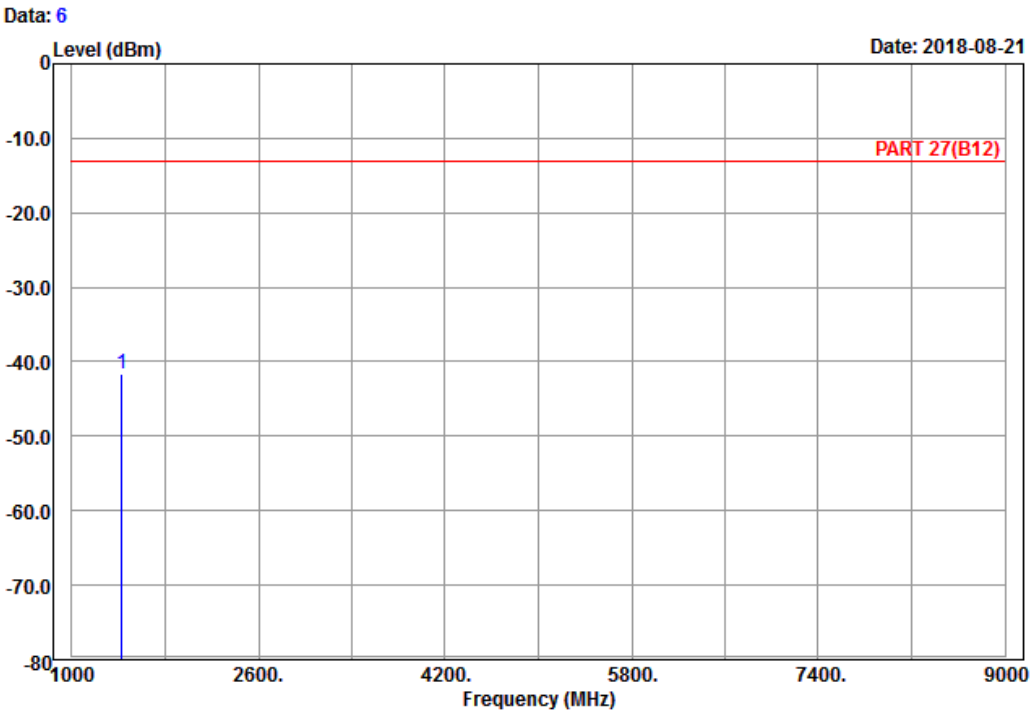
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B12) Horizontal
Remark : LTE_Band 12_Link_CH23155
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1427.00	-53.34	-59.58	-13.00	-40.34	6.24	Peak

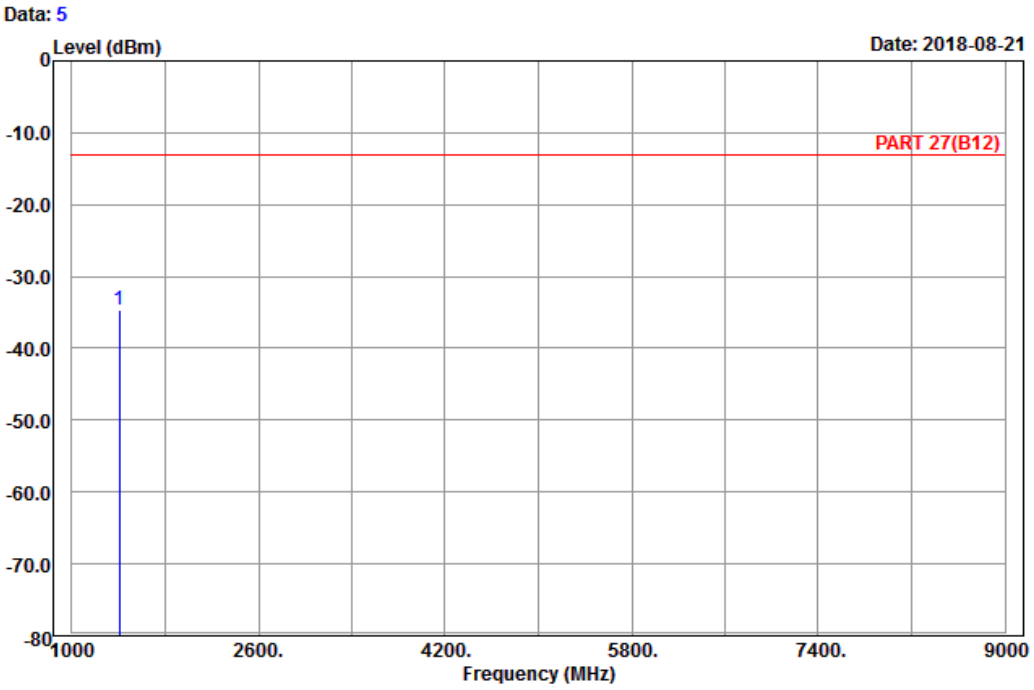


Site : 966 chamber 1
Condition: PART 27(B12) Vertical
Remark : LTE_Band 12_Link_CH23155
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1427.00	-41.60	-47.84	-13.00	-28.60	6.24	Peak

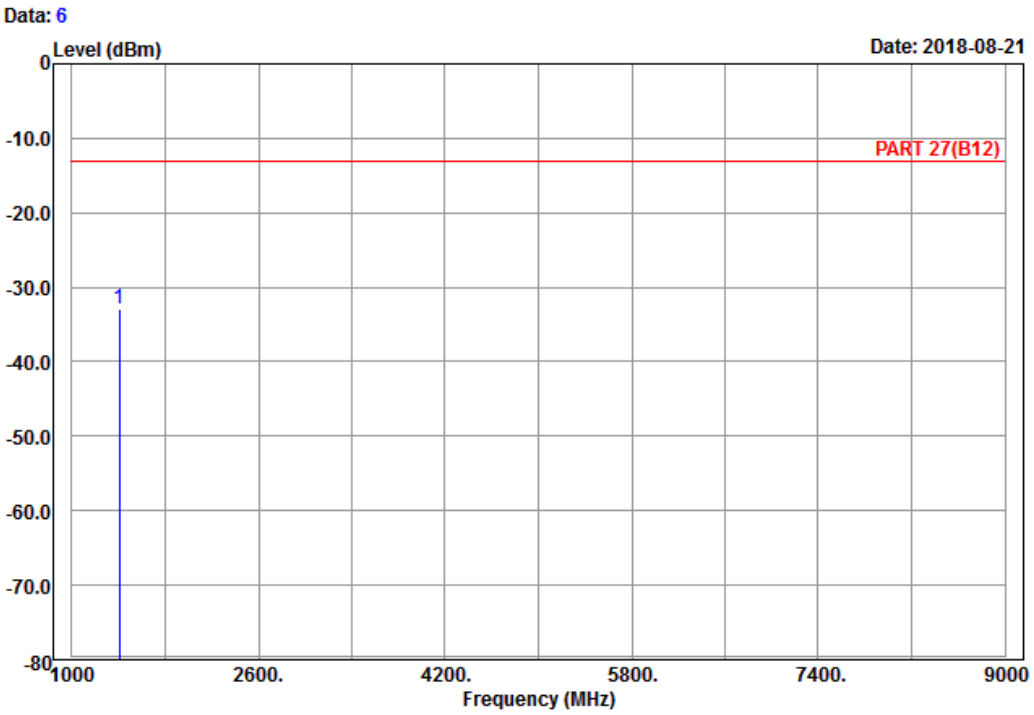
Channel Bandwidth: 10 MHz / QPSK
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1408.00	-34.76	-41.12	-13.00	-21.76	6.36	Peak

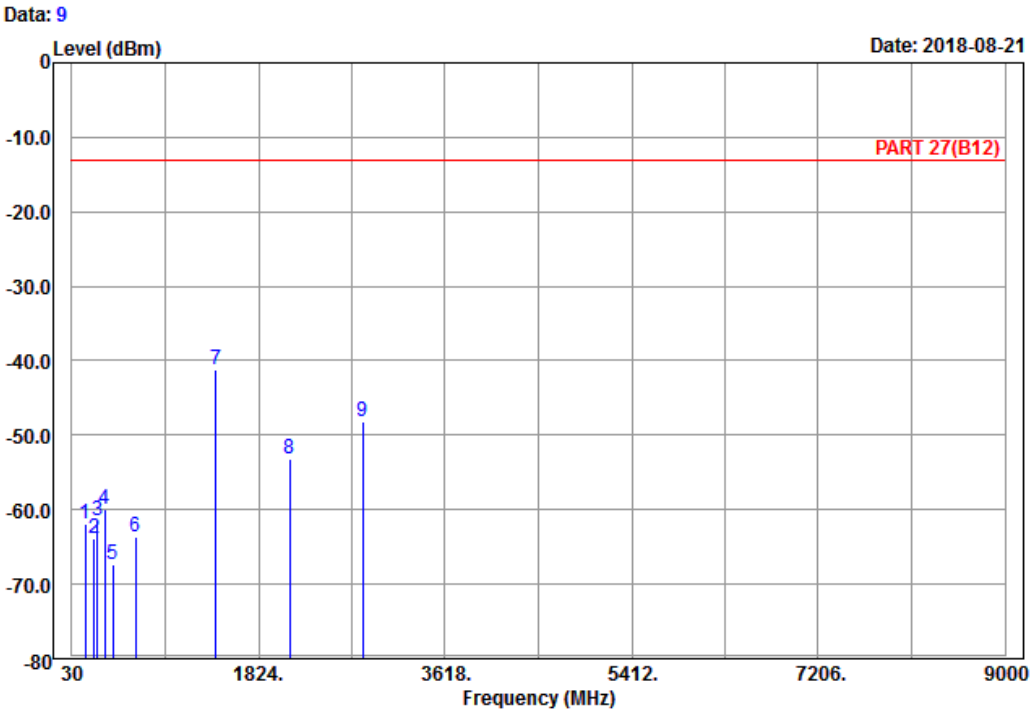


Site : 966 chamber 1
Condition: PART 27(B12) Vertical
Remark : LTE_Band 12_Link_CH23060
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1408.00	-32.96	-39.32	-13.00	-19.96	6.36	Peak

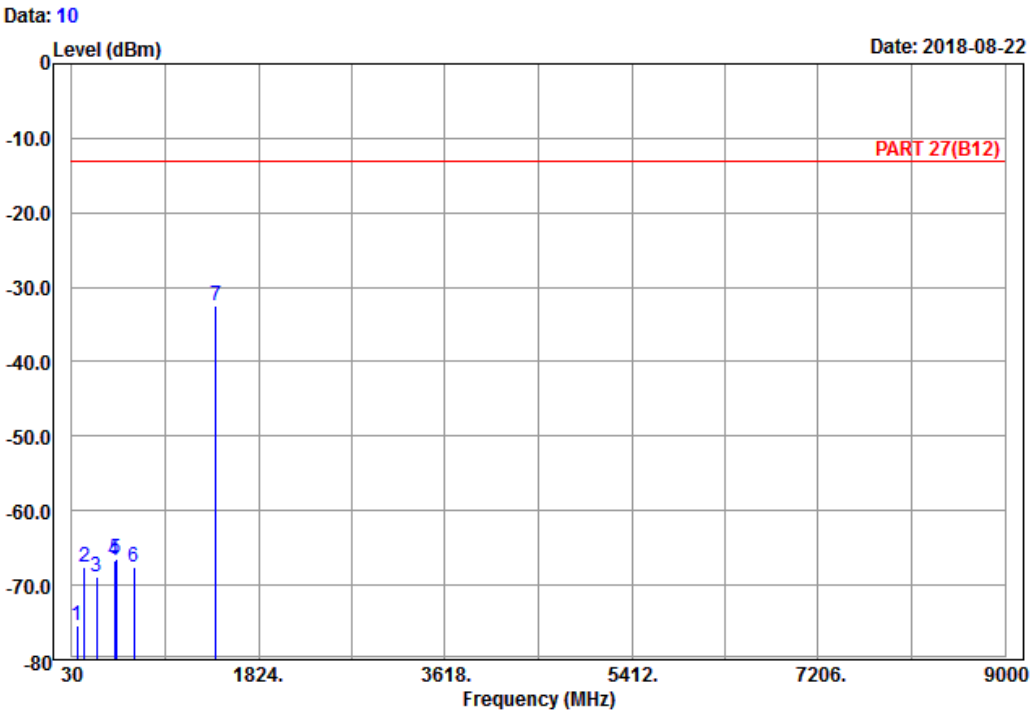
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	158.79	-62.01	-54.31	-13.00	-49.01	-7.70	Peak
2	244.92	-63.83	-58.26	-13.00	-50.83	-5.57	Peak
3	279.48	-61.52	-55.75	-13.00	-48.52	-5.77	Peak
4	345.50	-60.00	-54.57	-13.00	-47.00	-5.43	Peak
5	426.70	-67.35	-64.01	-13.00	-54.35	-3.34	Peak
6	641.60	-63.64	-63.59	-13.00	-50.64	-0.05	Peak
7 pp	1415.00	-41.11	-47.47	-13.00	-28.11	6.36	Peak
8	2122.50	-53.16	-64.27	-13.00	-40.16	11.11	Peak
9	2830.00	-48.14	-61.11	-13.00	-35.14	12.97	Peak

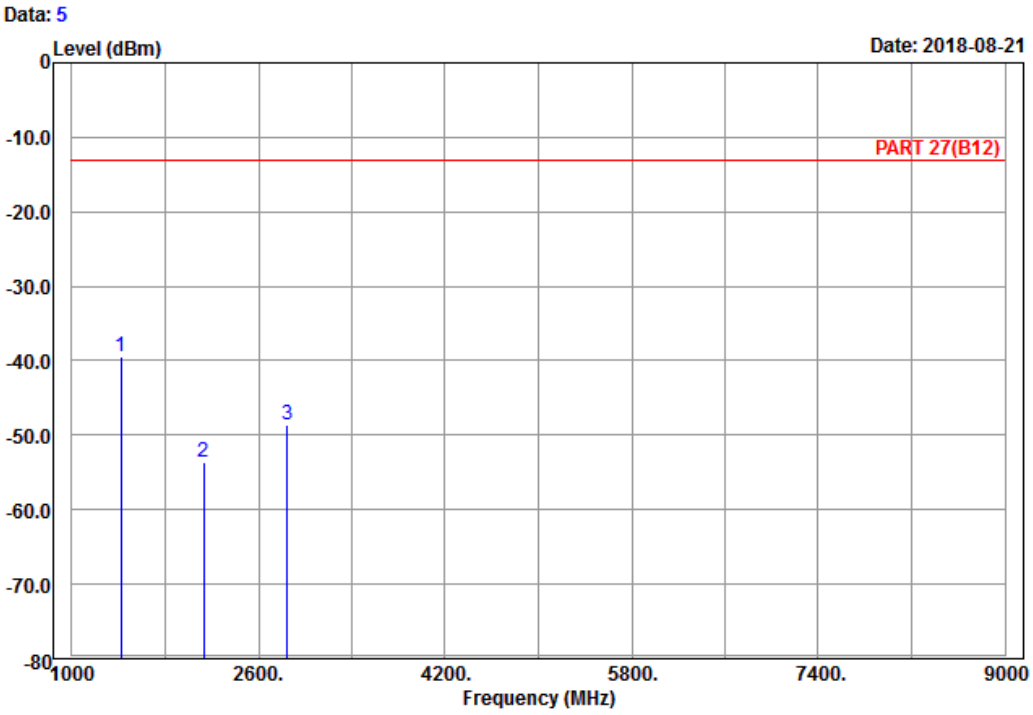


Site : 966 chamber 1
Condition: PART 27(B12) Vertical
Remark : LTE_Band 12_Link_CH23095
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	84.54	-75.44	-64.11	-13.00	-62.44	-11.33	Peak
2	152.31	-67.47	-59.58	-13.00	-54.47	-7.89	Peak
3	268.68	-68.88	-63.20	-13.00	-55.88	-5.68	Peak
4	437.90	-66.76	-63.17	-13.00	-53.76	-3.59	Peak
5	456.10	-66.48	-62.47	-13.00	-53.48	-4.01	Peak
6	626.90	-67.57	-67.70	-13.00	-54.57	0.13	Peak
7 pp	1415.00	-32.48	-38.84	-13.00	-19.48	6.36	Peak

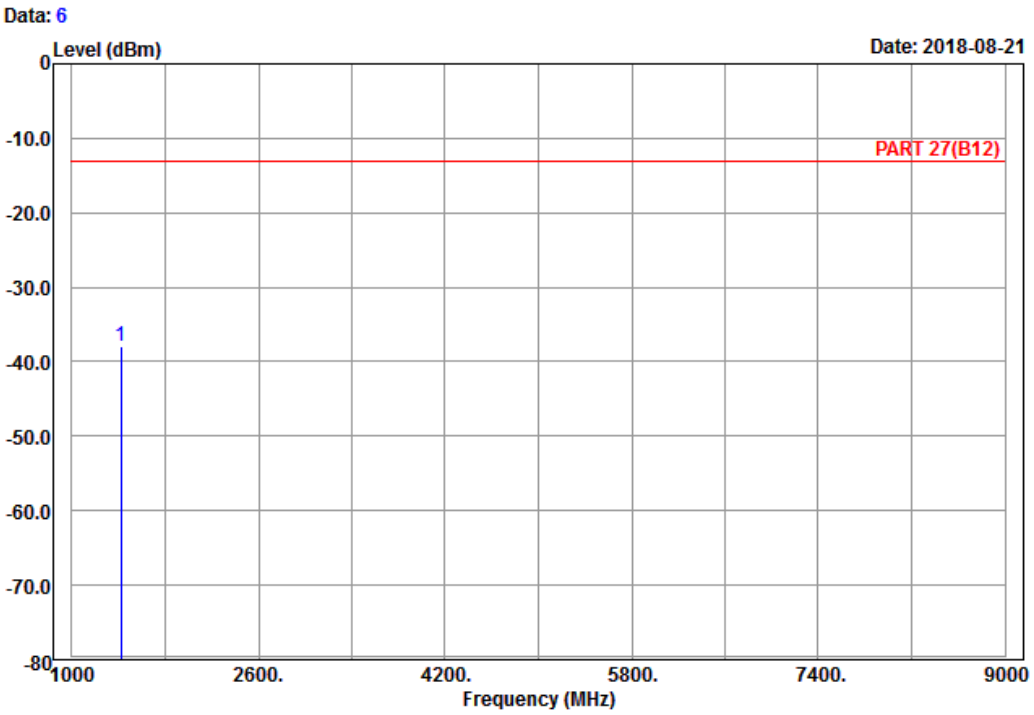
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1422.00	-39.54	-45.90	-13.00	-26.54	6.36	Peak
2	2133.00	-53.73	-65.01	-13.00	-40.73	11.28	Peak
3	2844.00	-48.54	-61.51	-13.00	-35.54	12.97	Peak

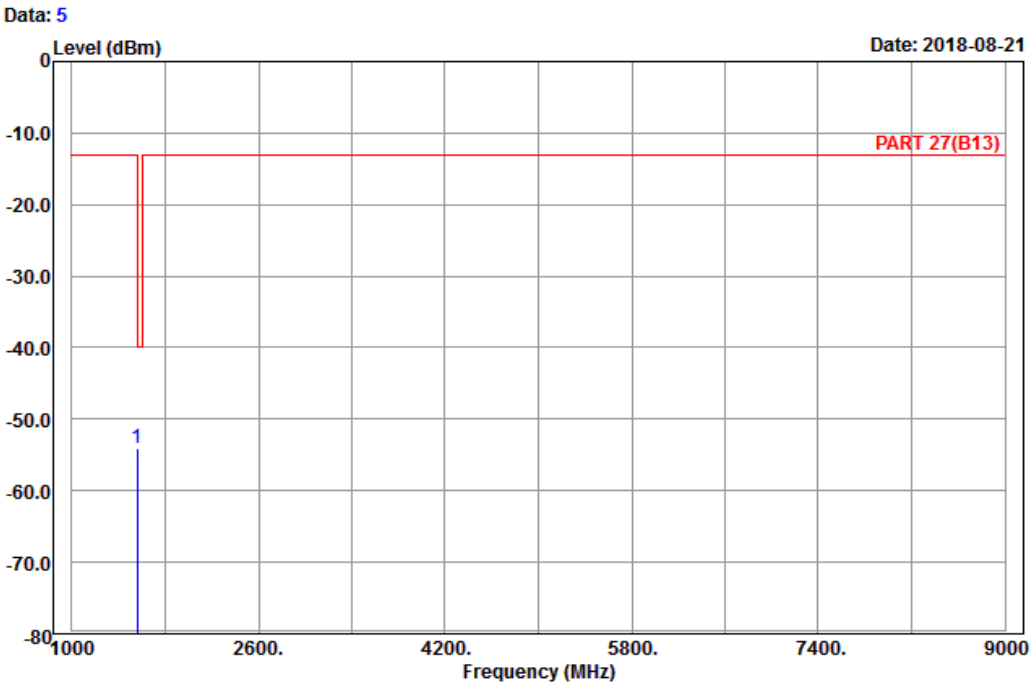


Site : 966 chamber 1
Condition: PART 27(B12) Vertical
Remark : LTE_Band 12_Link_CH23130
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1422.00	-37.94	-44.30	-13.00	-24.94	6.36	Peak

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

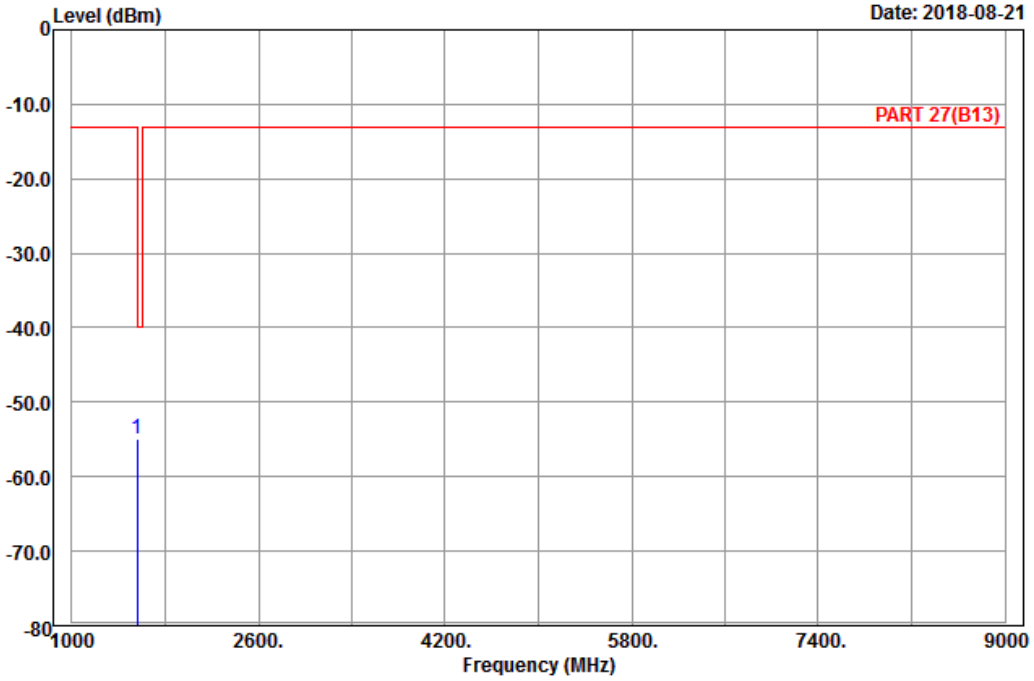
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1559.00	-54.08	-60.94	-40.00	-14.08	6.86	Peak

Data: 6

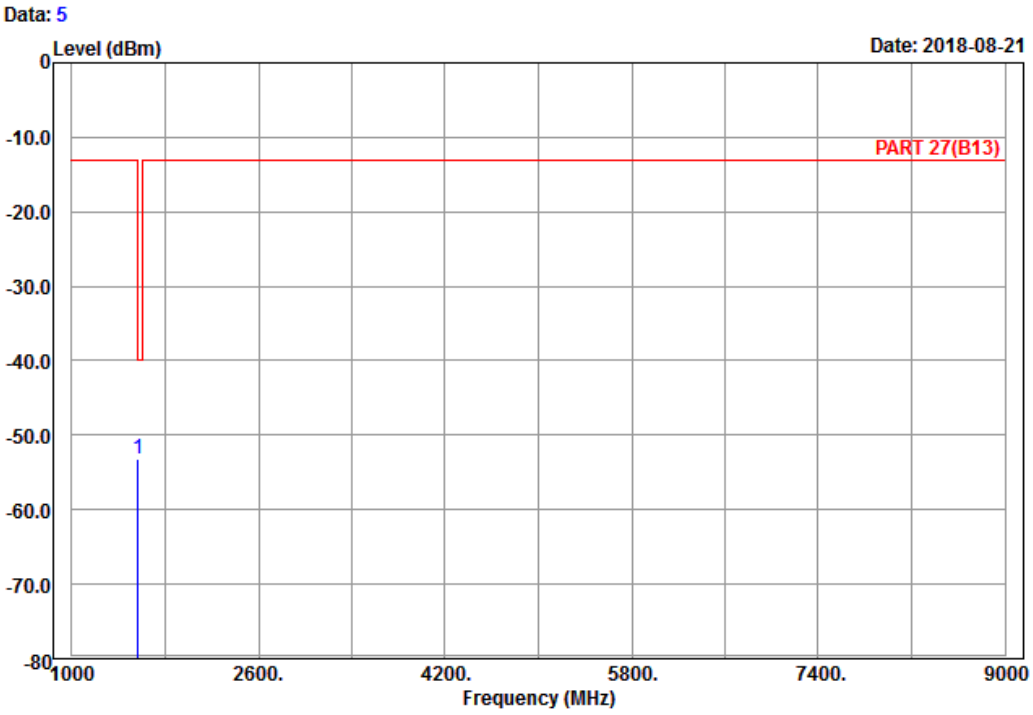


Site : 966 chamber 1
Condition: PART 27(B13) Vertical
Remark : LTE_Band 13_Link_CH23205
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1559.00	-54.90	-61.76	-40.00	-14.90	6.86	Peak

Middle Channel

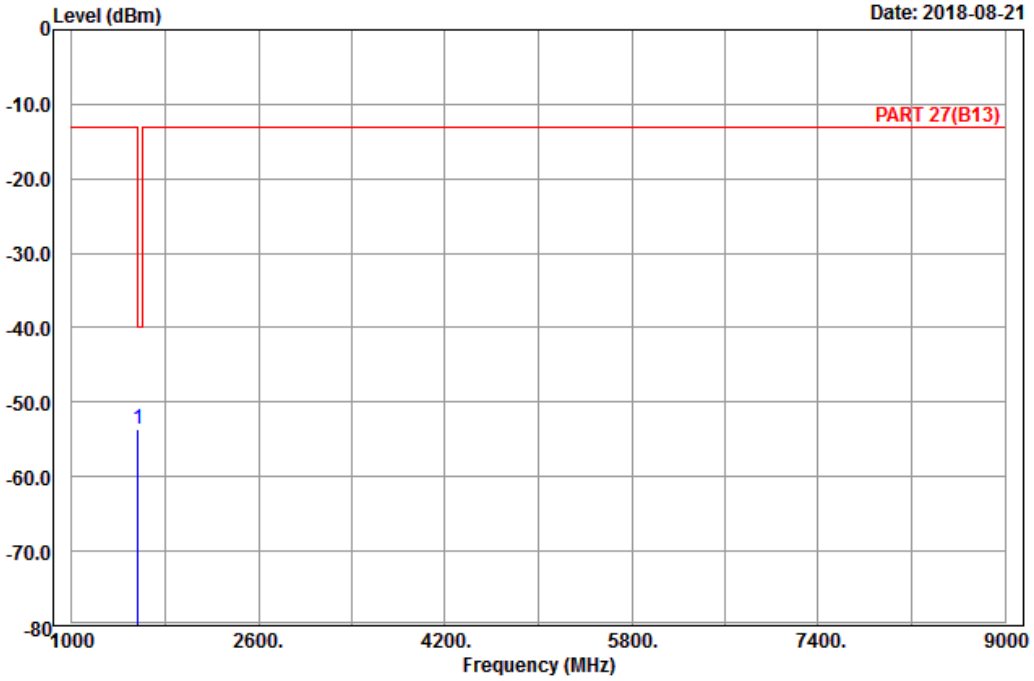
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1564.00	-53.24	-60.10	-40.00	-13.24	6.86	Peak

Data: 6

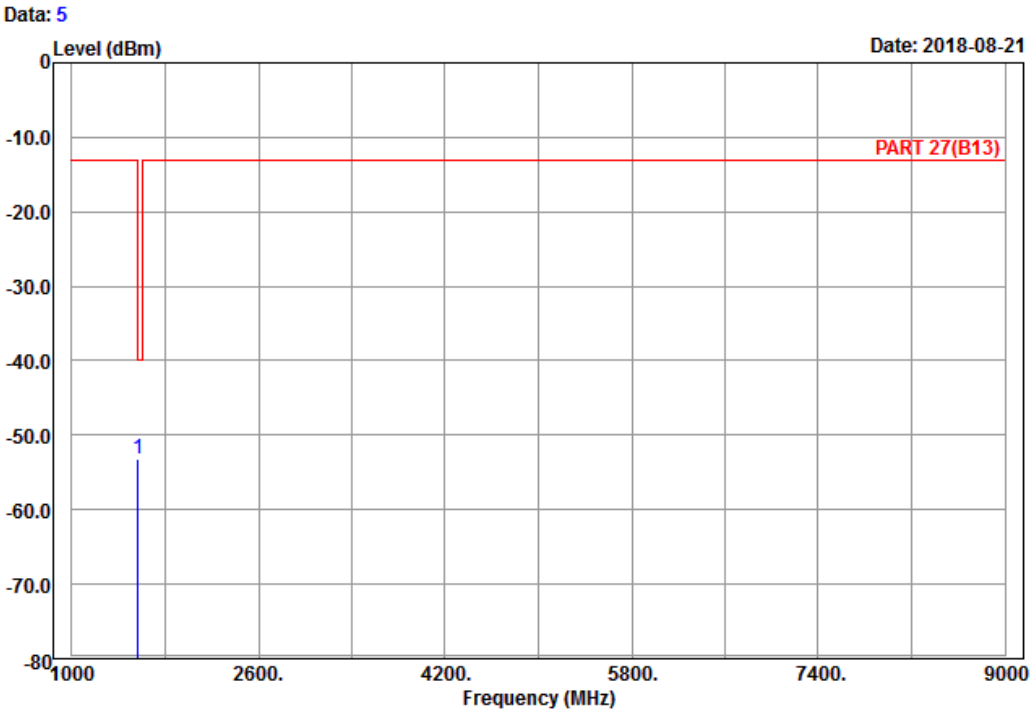


Site : 966 chamber 1
Condition: PART 27(B13) Vertical
Remark : LTE_Band 13_Link_CH23230
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1564.00	-53.57	-60.43	-40.00	-13.57	6.86	Peak

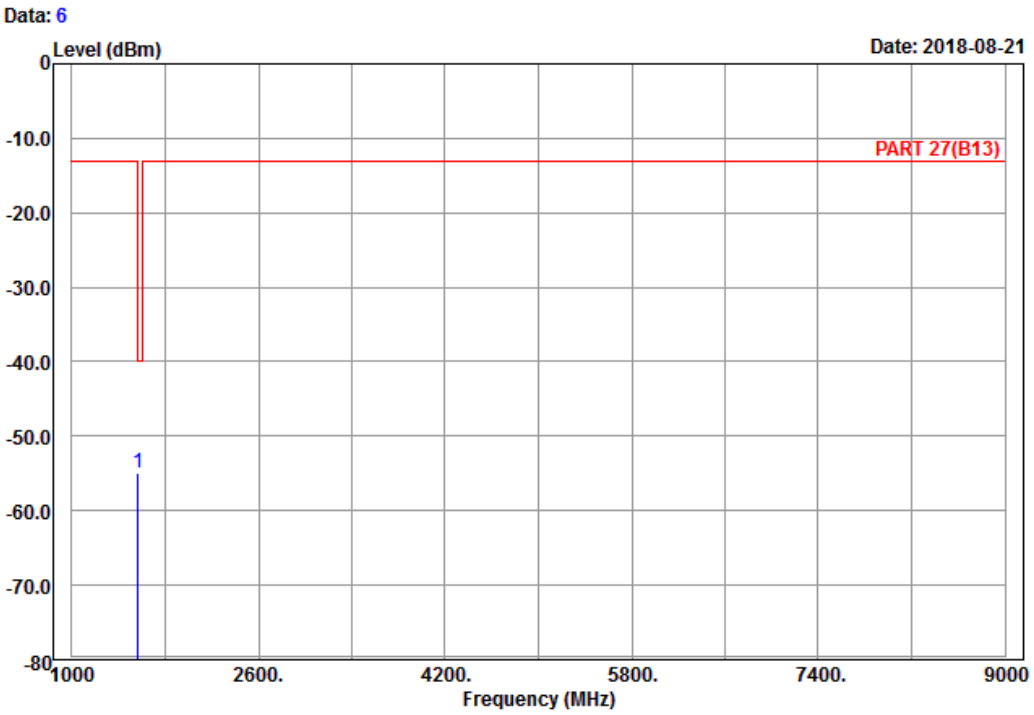
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1569.00	-53.20	-60.24	-40.00	-13.20	7.04	Peak

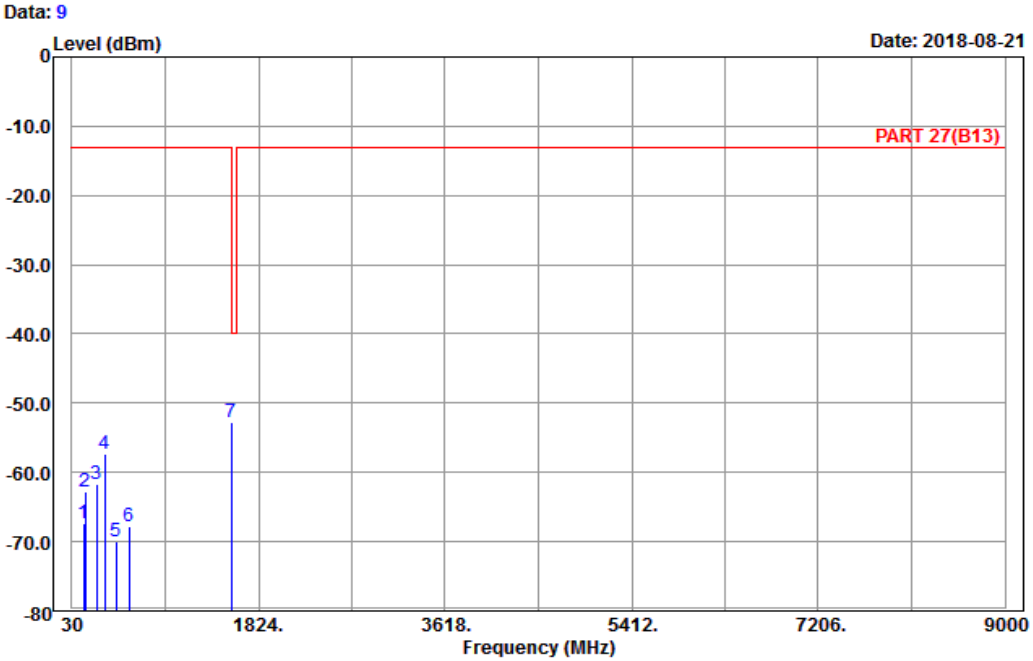


Site : 966 chamber 1
Condition: PART 27(B13) Vertical
Remark : LTE_Band 13_Link_CH23255
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1569.00	-55.02	-62.06	-40.00	-15.02	7.04	Peak

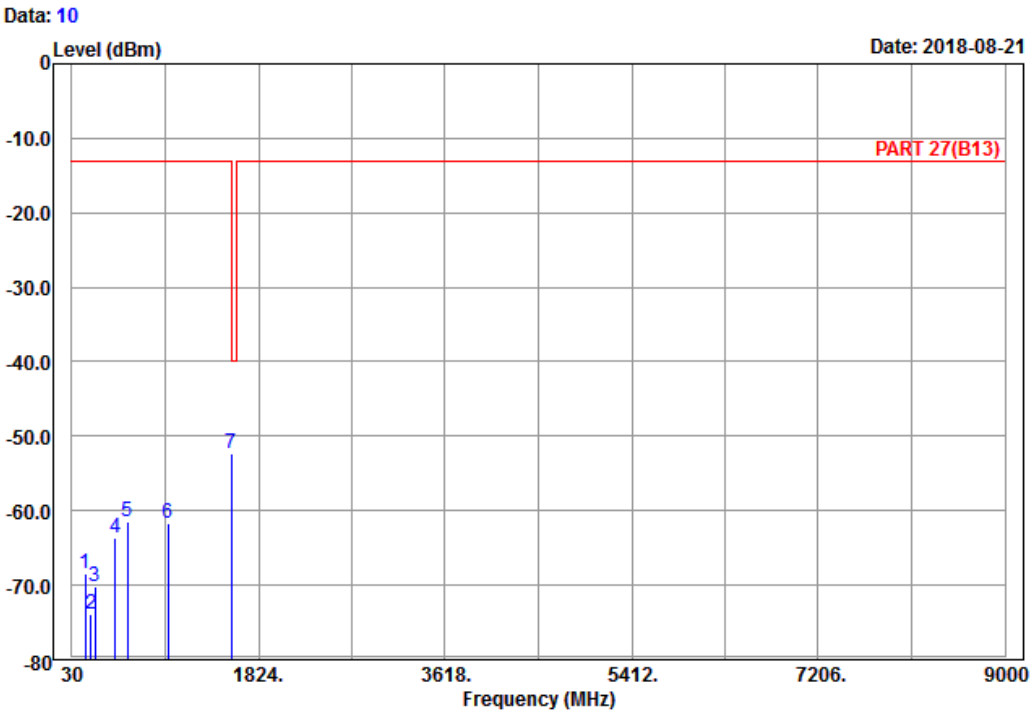
Channel Bandwidth: 10 MHz / QPSK

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	144.48	-67.37	-59.56	-13.00	-54.37	-7.81	Peak
2	158.79	-62.76	-55.06	-13.00	-49.76	-7.70	Peak
3	269.49	-61.65	-55.97	-13.00	-48.65	-5.68	Peak
4	344.10	-57.25	-51.80	-13.00	-44.25	-5.45	Peak
5	453.30	-70.01	-66.08	-13.00	-57.01	-3.93	Peak
6	577.90	-67.78	-67.28	-13.00	-54.78	-0.50	Peak
7 pp	1564.00	-52.76	-59.62	-40.00	-12.76	6.86	Peak



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	157.98	-68.42	-60.70	-13.00	-55.42	-7.72	Peak
2	210.36	-73.85	-67.81	-13.00	-60.85	-6.04	Peak
3	254.91	-70.29	-64.74	-13.00	-57.29	-5.55	Peak
4	446.30	-63.56	-59.80	-13.00	-50.56	-3.76	Peak
5	563.90	-61.50	-60.40	-13.00	-48.50	-1.10	Peak
6	956.60	-61.72	-66.85	-13.00	-48.72	5.13	Peak
7 pp	1564.00	-52.30	-59.16	-40.00	-12.30	6.86	Peak

5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

Linko EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
Tel: 886-3-6668565
Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety
Tel: 886-3-3183232
Fax: 886-3-3270892

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

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

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