Partial FCC Test Report

(PART 27)

Report No.: RF190828C21-2

FCC ID: QYLEM7455Z

Test Model: EM7455

Received Date: Aug. 28, 2019

Test Date: Sep. 06 ~ Sep. 10, 2019

Issued Date: Oct. 31, 2019

Applicant: Getac Technology Corporation.

Address: 5F., Building A, No. 209, Sec.1, Nangang Rd.,Nangang Dist., Taipei City 11568, Taiwan, R.O.C.

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

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

Test Location: B2F., No.215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan

FCC Registration / Designation Number: 427177 / TW0011

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Release Control Record

Issue No.	Description	Date Issued
RF190828C21-2	Original Release	Oct. 31, 2019

1 Certificate of Conformity

Product: Radio module

Brand: Sierra wireless Inc.

Test Model: EM7455

Sample Status: Identical Prototype

Applicant: Getac Technology Corporation.

Test Date: Sep. 06 ~ Sep. 10, 2019

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 : _____ , **Date:** Oct. 31, 2019

Gina Liu / Specialist

Approved by : _____ , **Date:** Oct. 31, 2019

Dylan Chiou / Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 27 & Part 2 (WCDMA)			
FCC Clause	**Test Item**	**Result**	**Remarks**
2.1046 27.50(d)(4)	Equivalent Isotropic Radiated 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	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 -35.96 dB at 31.89 MHz.

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	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 -35.68 dB at 3490.00 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	Occupied Bandwidth	N/A	Refer to Note
---	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 -35.79 dB at 151.50 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	Occupied Bandwidth	N/A	Refer to Note
---	Peak to Average Ratio	N/A	Refer to Note
27.53(c)(2)(4)	Band Edge Measurements	N/A	Refer to Note
2.1051 27.53(c)(2)&(f)	Conducted Spurious Emissions	N/A	Refer to Note
2.1053 27.53(c)(2)&(f)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -18.93 dB at 1564.00 MHz.

Note:

1. This report is a Class II change Partial report. Therefore, only test item of Radiated Spurious Emissions tests and Maximum Peak Output Power were performed for this report. Other testing data please refer to TTL report no.: B15W50341-FCC-RF and B15W50341-FCC-RF_Rev1 for module (Brand: Sierra wireless Inc., Model: EM7455)
2. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

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

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

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent Technologies	N9038A	MY52260177	Aug. 26, 2019	Aug. 25, 2020
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Apr. 15, 2019	Apr. 14, 2020
Spectrum Analyzer ROHDE & SCHWARZ	FSW26	102023	Oct. 11, 2018	Oct. 10, 2019
BILOG Antenna SCHWARZBECK	VULB9168	9168-616	Nov. 27, 2018	Nov. 26, 2019
HORN Antenna ETS-Lindgren	3117	00143293	Nov. 25, 2018	Nov. 24, 2019
BILOG Antenna SCHWARZBECK	VULB9168	9168-631	Nov. 26, 2018	Nov. 25, 2019
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-969	Nov. 25, 2018	Nov. 24, 2019
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 15, 2019	Apr. 14, 2020
MXG Vector signal generator Agilent	N5182B	MY53050430	Nov. 19, 2018	Nov. 18, 2019
Preamplifier Agilent	310N	187226	Jun. 18, 2019	Jun. 17, 2020
Preamplifier Agilent	83017A	MY39501357	Jun. 18, 2019	Jun. 17, 2020
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(RFC-SMS-100-SMS-120+RFC-SMS-100-SMS-400)	Jun. 18, 2019	Jun. 17, 2020
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(RFC-SMS-100-SMS-24)	Jun. 18, 2019	Jun. 17, 2020
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Software BV ADT	E3 8.130425b	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower &Turn Table Controller MF	MF-7802	NA	NA	NA
Communications Tester-Wireless Agilent	8960 Series 10	MY53201073	Jul. 01, 2019	Jun. 30, 2021
Radio Communication Analyzer Anritsu	MT8820C	6201300640	Aug. 19, 2019	Aug. 18, 2021

Note: 1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HsinTien Chamber 1.

3 General Information

3.1 General Description of EUT

Product	Radio module	
Brand	Sierra wireless Inc.	
Test Model	EM7455	
Status of EUT	Identical Prototype	
Power Supply Rating	3.3 Vdc (Host equipment)	
Modulation Type	WCDMA	QPSK
	LTE	QPSK, 16QAM
Frequency Range	WCDMA	1712.4 ~ 1752.6 MHz
	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)	63.96 mW
	LTE Band 12 (Channel Bandwidth: 3 MHz)	64.55 mW
	LTE Band 12 (Channel Bandwidth: 5 MHz)	65.15 mW
	LTE Band 12 (Channel Bandwidth: 10 MHz)	65.72 mW
	LTE Band 13 (Channel Bandwidth: 5 MHz)	106.44 mW
	LTE Band 13 (Channel Bandwidth: 10 MHz)	106.83 mW
Max. EIRP Power	WCDMA	399.48 mW
	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	361.99 mW
	LTE Band 4 (Channel Bandwidth: 3 MHz)	365.34 mW
	LTE Band 4 (Channel Bandwidth: 5 MHz)	368.72 mW
	LTE Band 4 (Channel Bandwidth: 10 MHz)	371.28 mW
	LTE Band 4 (Channel Bandwidth: 15 MHz)	374.71 mW
	LTE Band 4 (Channel Bandwidth: 20 MHz)	378.18 mW
Antenna Type	Refer to Note as below	
Accessory Device	Refer to Note as below	
Data Cable Supplied	Refer to Note as below	

Note:

1. The EUT is authorized for use in specific End-product.

Product	Brand	Model
Tablet	Getac	ZX70

2. The antenna information is listed as below.

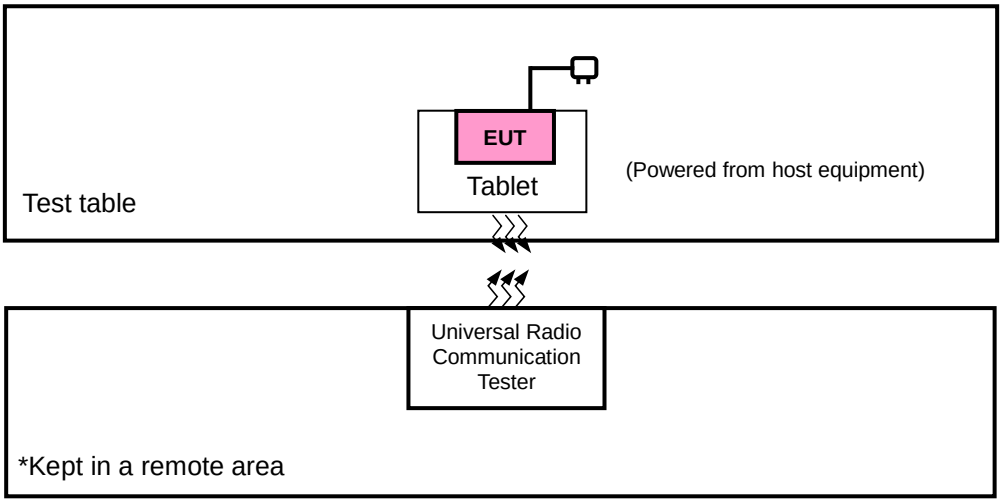
Antenna Type	Brand	Model	Antenna Gain			
			WCDMA IV	LTE B4	LTE B12	LTE B13
PIFA	SINBON	A9703134	1.73	1.73	-0.46	-0.66

3. The End-product contains following accessory devices.

Product	Brand	Model	Description
Adapter 1	APD	WA24Q12R	I/P: 100-240 Vac, 50-60 Hz, 0.7A O/P: 12 Vdc, 2 A DC Lind: 1.75 m cable w/ 1 core
Adapter 2	APD	WB-24J12R	I/P: 100-240 Vac, 50-60 Hz, 0.7A O/P: 12 Vdc, 2 A DC Lind: 1.75 m cable w/ 1 core
Battery	Geatc	BP1S2P4240L	3.8 Vdc, 8480 mAh
LCD Panel	Truly	TDO-HD0698K61701	7"
Photo Camera	Chicony	CWFFF2520005340LH	2MPs HD Fix focus camera
Video Camera	Chicony	CYAF82520005340LH	8MPs auto focus camera
CPU	intel	Atom Z8350	592 PIN
Memory	Samsung	K4E6E304EE-EGCE	DDR3 4G (2G*2)
Storage	Samsung	KLMAG4GEND-B031	32G
GPS Module	U-blox	MAX-M8N	--
BT/WLAN Module	AMPAK	AP6234	--
RFID Module	Jogtek	TRF7970A	--
WWAN Module	Sierra	EM7455	--
Bar Code Reader	Honeywell	N6603	--
Fingerprint	IMD	SF1115	--

4. 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.	Tablet	Getac	ZX70	N/A	N/A
2.	Universal Radio Communication Tester	Anritsu	MT8820C	6201300640	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
WCDMA	Z-plane	Z-plane
LTE Band 4	Z-plane	Z-plane
LTE Band 12	Z-plane	Z-plane
LTE Band 13	Z-plane	Z-plane

WCDMA

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	EIRP	1312 to 1513	1312, 1413, 1513	WCDMA
-	Radiated Emission	1312 to 1513	1312, 1413, 1513	WCDMA

LTE Band 4

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

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

LTE Band 12

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	23017 to 23173	23017, 23095, 23173	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23025 to 23165	23025, 23095, 23165	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23035 to 23155	23035, 23095, 23155	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23060 to 23130	23060, 23095, 23130	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	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:

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

LTE Band 13

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23230	23230	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Radiated Emission	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK	1 RB / 0 RB Offset
		23230	23230	10 MHz	QPSK	1 RB / 0 RB Offset

Note:

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

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP / EIRP	25 deg. C, 65 % RH	3.3 Vdc	Charles Hsiao, Karl Lee
Radiated Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Charles Hsiao, Karl Lee

3.4 EUT Operating Conditions

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

3.5 General Description of Applied Standards

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

FCC 47 CFR Part 2
FCC 47 CFR Part 27
KDB 971168 D01 Power Meas License Digital Systems v03r01
ANSI/TIA/EIA-603-E 2016
ANSI 63.26-2015

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

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

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

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

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

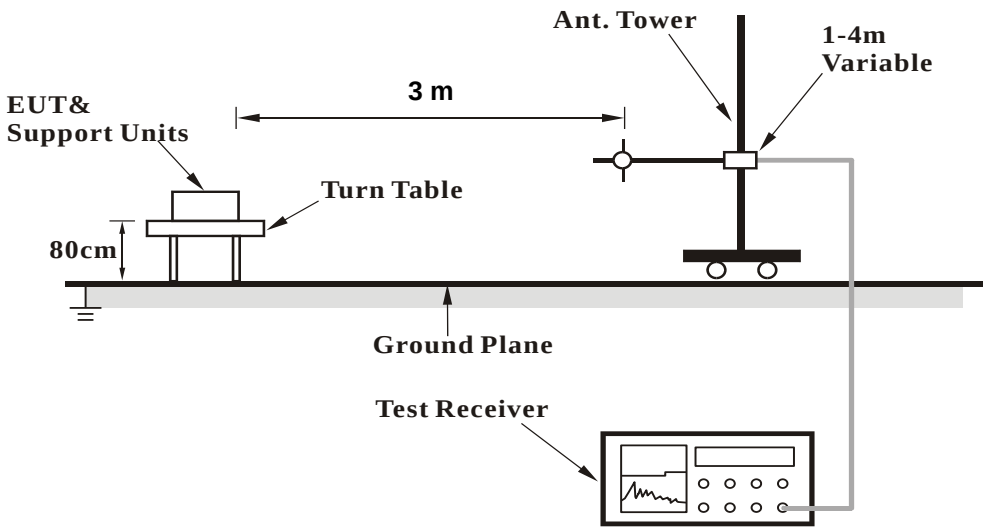
4.1.2 Test Procedures

EIRP / ERP Measurement:

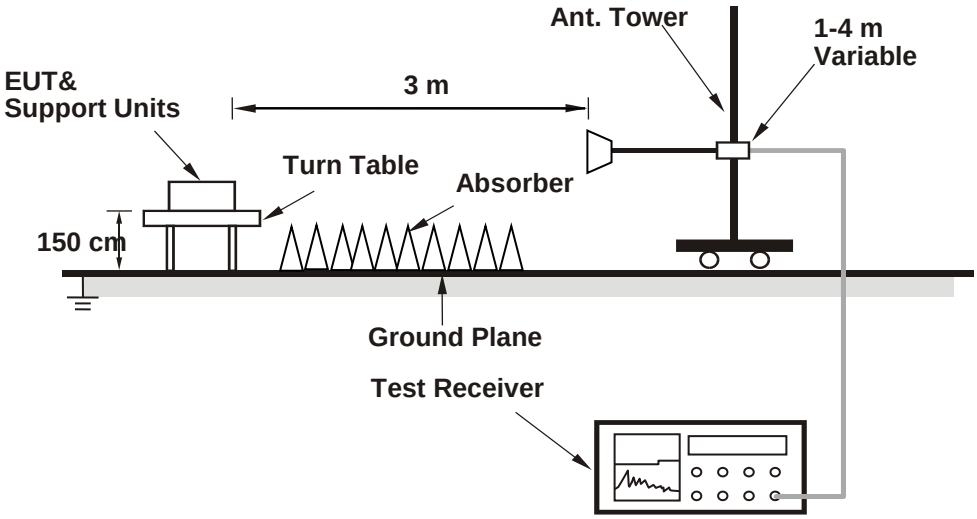
a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 5 MHz for WCDMA and 10 MHz for LTE mode.
b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) height 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.

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).

4.1.4 Test Results

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	-12.51	32.719	18.06	63.96	H
	23095	707.5	-12.58	32.736	18.01	63.18	
	23173	715.3	-12.47	32.591	17.97	62.68	
	23017	699.7	-16.46	32.69	14.08	25.59	V
	23095	707.5	-16.60	32.81	14.06	25.47	
	23173	715.3	-16.58	32.74	14.01	25.18	
Channel Bandwidth: 1.4 MHz / 16QAM							
Z	23017	699.7	-13.51	32.719	17.06	50.80	H
	23095	707.5	-13.59	32.736	17.00	50.07	
	23173	715.3	-13.47	32.591	16.97	49.79	
	23017	699.7	-17.46	32.69	13.08	20.32	V
	23095	707.5	-17.61	32.81	13.05	20.18	
	23173	715.3	-17.58	32.74	13.01	20.00	

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	-12.47	32.719	18.10	64.55	H
	23095	707.5	-12.54	32.736	18.05	63.77	
	23165	714.5	-12.43	32.591	18.01	63.26	
	23025	700.5	-16.42	32.69	14.12	25.82	V
	23095	707.5	-16.56	32.81	14.10	25.70	
	23165	714.5	-16.54	32.74	14.05	25.41	
Channel Bandwidth: 3 MHz / 16QAM							
Z	23025	700.5	-13.48	32.719	17.09	51.16	H
	23095	707.5	-13.54	32.736	17.05	50.65	
	23165	714.5	-13.44	32.591	17.00	50.13	
	23025	700.5	-17.42	32.69	13.12	20.51	V
	23095	707.5	-17.56	32.81	13.10	20.42	
	23165	714.5	-17.54	32.74	13.05	20.18	

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	-12.43	32.719	18.14	65.15	H
	23095	707.5	-12.50	32.736	18.09	64.36	
	23155	713.5	-12.39	32.591	18.05	63.84	
	23035	701.5	-16.38	32.69	14.16	26.06	V
	23095	707.5	-16.54	32.81	14.12	25.82	
	23155	713.5	-16.50	32.74	14.09	25.64	
Channel Bandwidth: 5 MHz / 16QAM							
Z	23035	701.5	-13.43	32.719	17.14	51.75	H
	23095	707.5	-13.50	32.736	17.09	51.12	
	23155	713.5	-13.40	32.591	17.04	50.59	
	23035	701.5	-17.38	32.69	13.16	20.70	V
	23095	707.5	-17.54	32.81	13.12	20.51	
	23155	713.5	-17.51	32.74	13.08	20.32	

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	-12.40	32.727	18.18	65.72	H
	23095	707.5	-12.46	32.739	18.13	65.00	
	23130	711.0	-12.49	32.728	18.09	64.39	
	23060	704.0	-16.40	32.75	14.20	26.30	V
	23095	707.5	-16.50	32.81	14.16	26.06	
	23130	711.0	-16.56	32.84	14.13	25.88	
Channel Bandwidth: 10 MHz / 16QAM							
Z	23060	704.0	-13.41	32.727	17.17	52.08	H
	23095	707.5	-13.46	32.739	17.13	51.63	
	23130	711.0	-13.50	32.728	17.08	51.03	
	23060	704.0	-17.41	32.75	13.19	20.84	V
	23095	707.5	-17.50	32.81	13.16	20.70	
	23130	711.0	-17.57	32.84	13.12	20.51	

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)
Z	23205	779.5	-10.35	32.771	20.27	106.44	H
	23230	782.0	-10.34	32.741	20.25	105.95	
	23255	784.5	-10.50	32.854	20.20	104.81	
	23205	779.5	-15.13	32.5	15.22	33.27	V
	23230	782.0	-15.18	32.52	15.19	33.04	
	23255	784.5	-15.30	32.62	15.17	32.89	
Channel Bandwidth: 5 MHz / 16QAM							
Z	23205	779.5	-11.36	32.771	19.26	84.35	H
	23230	782.0	-11.34	32.741	19.25	84.16	
	23255	784.5	-11.51	32.854	19.19	83.06	
	23205	779.5	-16.13	32.5	14.22	26.42	V
	23230	782.0	-16.19	32.52	14.18	26.18	
	23255	784.5	-16.31	32.62	14.16	26.06	

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)
Z	23230	782.0	-10.30	32.737	20.29	106.83	H
	23230	782.0	-15.15	32.52	15.22	33.27	V
Channel Bandwidth: 10 MHz / 16QAM							
Z	23230	782.0	-11.31	32.737	19.28	84.66	H
	23230	782.0	-16.15	32.52	14.22	26.42	V

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

EIRP Power (dBm)

WCDMA							
Plane	**Channel**	**Frequency (MHz)**	**Reading (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (mW)**	**Polarization (H/V)**
Z	1312	1712.4	-16.47	42.49	26.02	399.48	H
	1413	1732.6	-16.37	42.33	25.96	394.18	
	1513	1752.6	-16.20	42.10	25.90	389.05	
	1312	1712.4	-21.00	42.99	21.99	158.12	V
	1413	1732.6	-20.80	42.74	21.94	156.31	
	1513	1752.6	-20.30	42.21	21.91	155.24	

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

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	-16.94	42.49	25.55	358.51	H
	20175	1732.5	-16.74	42.33	25.59	361.99	
	20393	1754.3	-16.61	42.10	25.49	354.00	
	19957	1710.7	-21.47	42.99	21.52	141.91	V
	20175	1732.5	-21.17	42.74	21.57	143.55	
	20393	1754.3	-20.74	42.21	21.47	140.28	
Channel Bandwidth: 1.4 MHz / 16QAM							
Z	19957	1710.7	-17.95	42.49	24.54	284.12	H
	20175	1732.5	-17.74	42.33	24.59	287.54	
	20393	1754.3	-17.62	42.10	24.48	280.54	
	19957	1710.7	-22.48	42.99	20.51	112.46	V
	20175	1732.5	-22.17	42.74	20.57	114.02	
	20393	1754.3	-21.74	42.21	20.47	111.43	

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	-16.92	42.49	25.57	360.16	H
	20175	1732.5	-16.70	42.33	25.63	365.34	
	20385	1753.5	-16.57	42.10	25.53	357.27	
	19965	1711.5	-21.44	42.99	21.55	142.89	V
	20175	1732.5	-21.13	42.74	21.61	144.88	
	20385	1753.5	-20.70	42.21	21.51	141.58	
Channel Bandwidth: 3 MHz / 16QAM							
Z	19965	1711.5	-17.92	42.49	24.57	286.09	H
	20175	1732.5	-17.71	42.33	24.62	289.53	
	20385	1753.5	-17.58	42.10	24.52	283.14	
	19965	1711.5	-22.45	42.99	20.54	113.24	V
	20175	1732.5	-22.14	42.74	20.60	114.82	
	20385	1753.5	-21.71	42.21	20.50	112.20	

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	-16.88	42.49	25.61	363.50	H
	20175	1732.5	-16.66	42.33	25.67	368.72	
	20375	1752.5	-16.53	42.10	25.57	360.58	
	19975	1712.5	-21.40	42.99	21.59	144.21	V
	20175	1732.5	-21.09	42.74	21.65	146.22	
	20375	1752.5	-20.67	42.21	21.54	142.56	
Channel Bandwidth: 5 MHz / 16QAM							
Z	19975	1712.5	-17.89	42.49	24.60	288.07	H
	20175	1732.5	-17.66	42.33	24.67	292.89	
	20375	1752.5	-17.54	42.10	24.56	285.76	
	19975	1712.5	-22.41	42.99	20.58	114.29	V
	20175	1732.5	-22.10	42.74	20.64	115.88	
	20375	1752.5	-21.68	42.21	20.53	112.98	

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	-16.84	42.49	25.65	366.86	H
	20175	1732.5	-16.63	42.33	25.70	371.28	
	20350	1750.0	-16.49	42.10	25.61	363.92	
	20000	1715.0	-21.37	42.99	21.62	145.21	V
	20175	1732.5	-21.06	42.74	21.68	147.23	
	20350	1750.0	-20.64	42.21	21.57	143.55	
Channel Bandwidth: 10 MHz / 16QAM							
Z	20000	1715.0	-17.84	42.49	24.65	291.41	H
	20175	1732.5	-17.64	42.33	24.69	294.24	
	20350	1750.0	-17.50	42.10	24.60	288.40	
	20000	1715.0	-22.37	42.99	20.62	115.35	V
	20175	1732.5	-22.06	42.74	20.68	116.95	
	20350	1750.0	-21.65	42.21	20.56	113.76	

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	-16.80	42.49	25.69	370.25	H
	20175	1732.5	-16.59	42.33	25.74	374.71	
	20325	1747.5	-16.45	42.10	25.65	367.28	
	20025	1717.5	-21.33	42.99	21.66	146.55	V
	20175	1732.5	-21.02	42.74	21.72	148.59	
	20325	1747.5	-20.60	42.21	21.61	144.88	
Channel Bandwidth: 15 MHz / 16QAM							
Z	20025	1717.5	-17.80	42.49	24.69	294.10	H
	20175	1732.5	-17.59	42.33	24.74	297.65	
	20325	1747.5	-17.46	42.10	24.64	291.07	
	20025	1717.5	-22.34	42.99	20.65	116.14	V
	20175	1732.5	-22.02	42.74	20.72	118.03	
	20325	1747.5	-21.61	42.21	20.60	114.82	

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	-16.76	42.49	25.73	373.68	H
	20175	1732.5	-16.55	42.33	25.78	378.18	
	20300	1745.0	-16.41	42.10	25.69	370.68	
	20050	1720.0	-21.29	42.99	21.70	147.91	V
	20175	1732.5	-20.98	42.74	21.76	149.97	
	20300	1745.0	-20.56	42.21	21.65	146.22	
Channel Bandwidth: 20 MHz / 16QAM							
Z	20050	1720.0	-17.76	42.49	24.73	296.82	H
	20175	1732.5	-17.55	42.33	24.78	300.40	
	20300	1745.0	-17.42	42.10	24.68	293.76	
	20050	1720.0	-22.29	42.99	20.70	117.49	V
	20175	1732.5	-21.98	42.74	20.76	119.12	
	20300	1745.0	-21.57	42.21	20.64	115.88	

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.

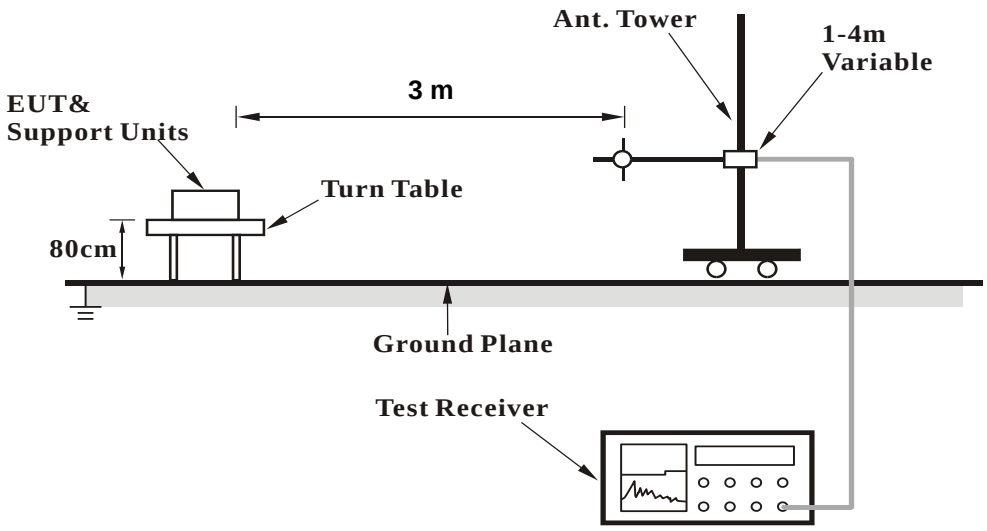
Note: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.2.3 Deviation from Test Standard

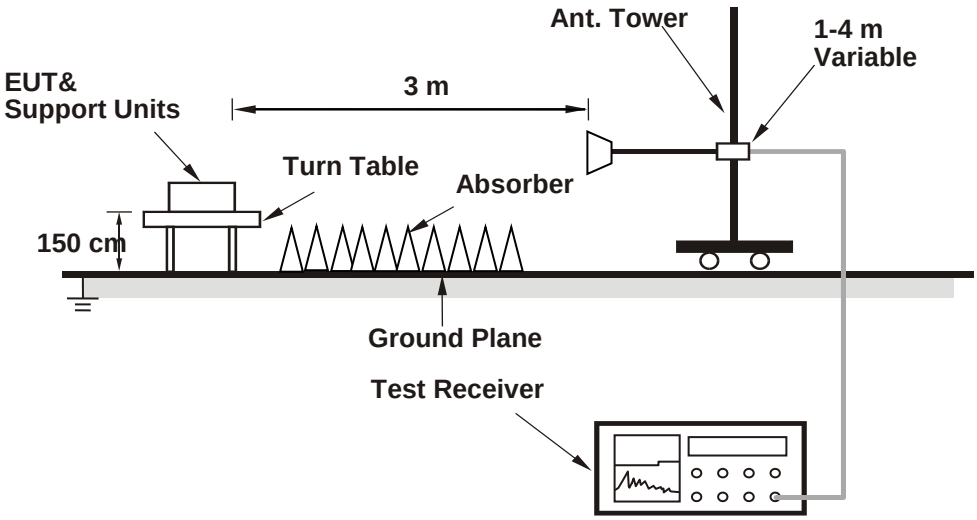
No deviation.

4.2.4 Test Setup

<Radiated Emission below or equal 1 GHz>



<Radiated Emission above 1 GHz>



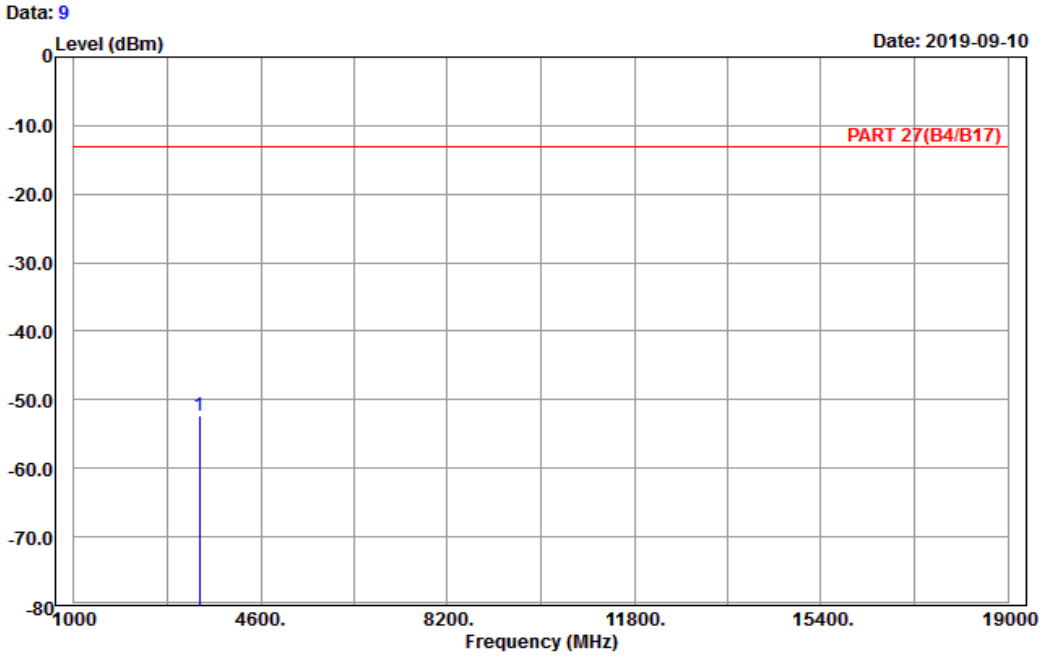
For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.5 Test Results

WCDMA:

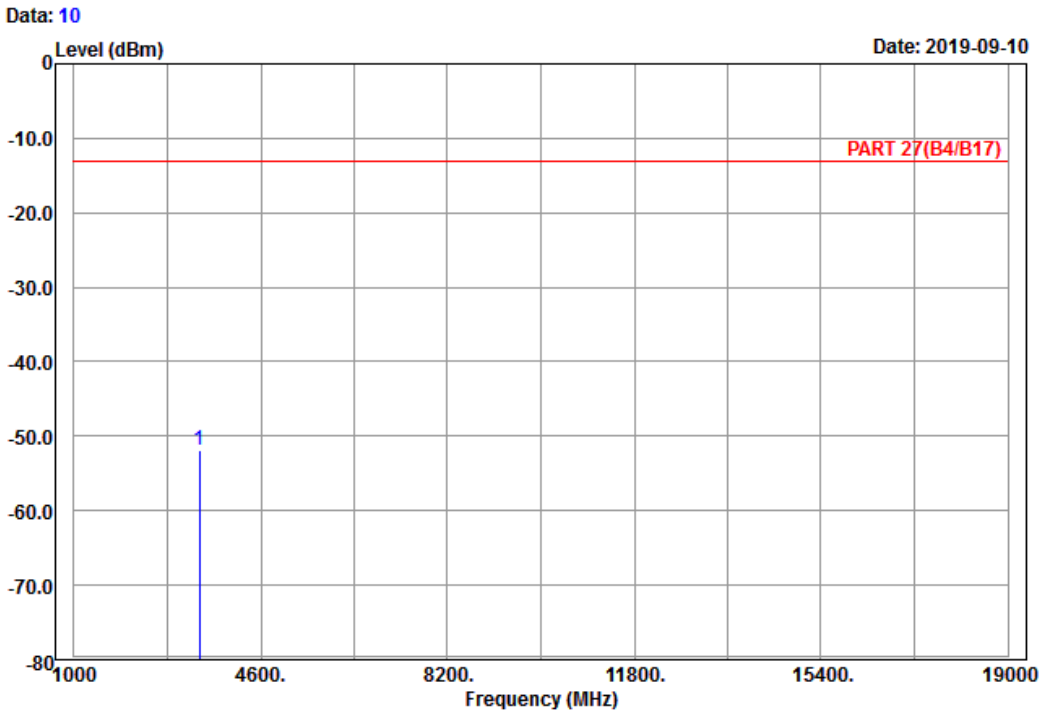
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : Band IV_Link_L-Ch
Tested by: Charles Hsiao

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	3424.80	-52.42	-66.79	14.37	-13.00	-39.42	Peak

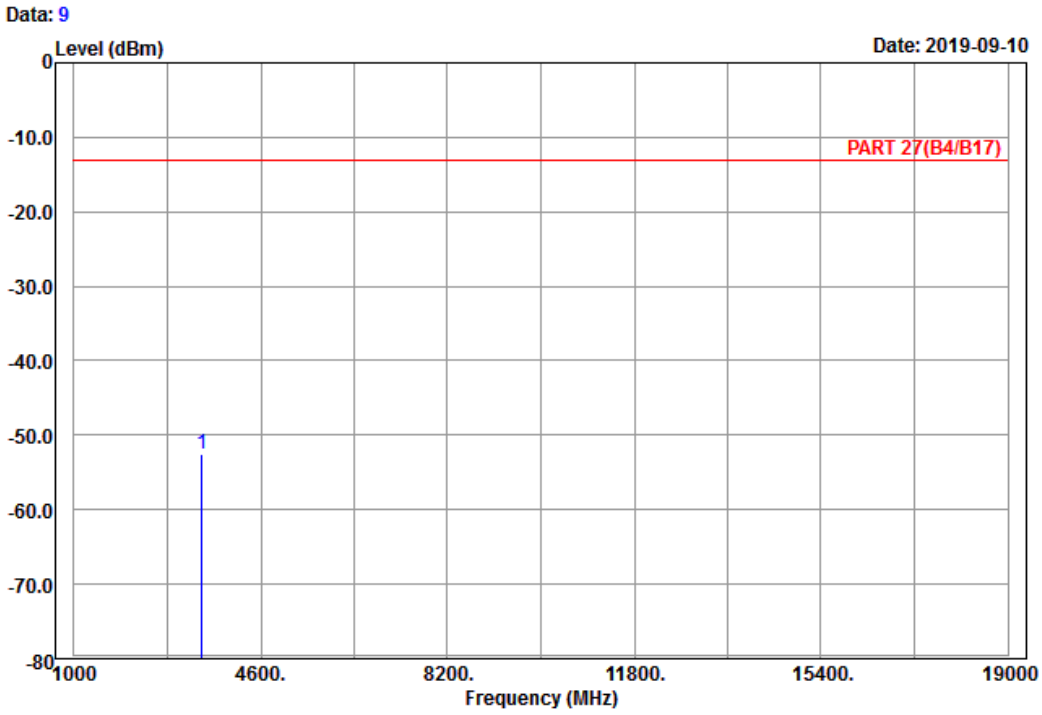


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : Band IV_Link_L-Ch
Tested by: Charles Hsiao

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	3424.80	-51.89	-66.26	14.37	-13.00	-38.89	Peak

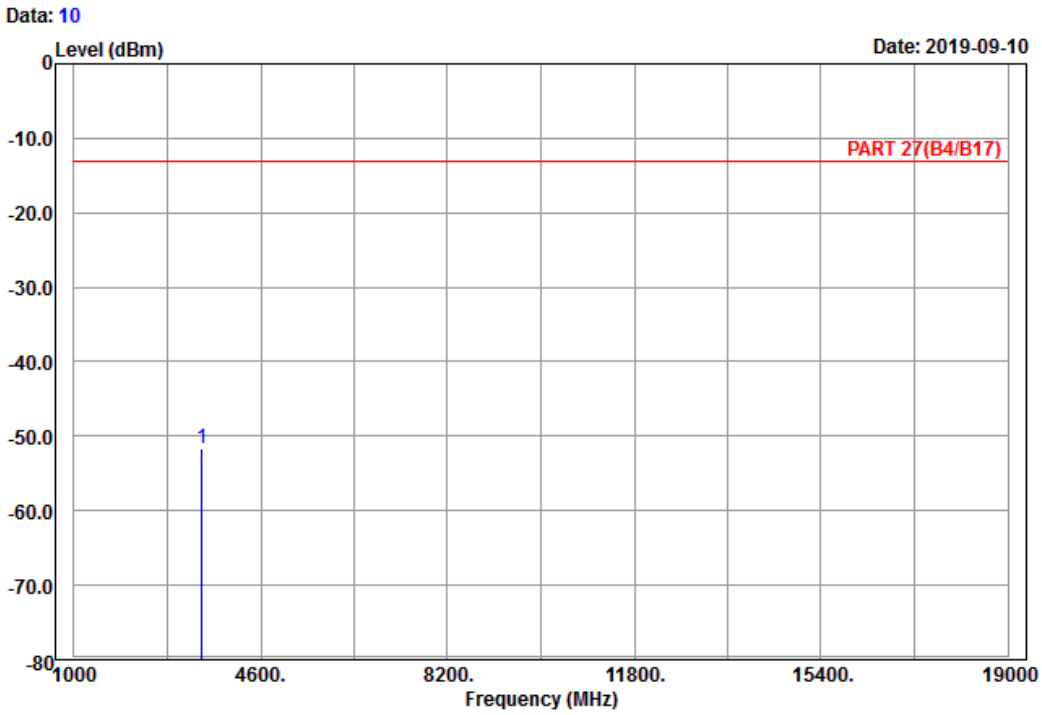
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : Band IV_Link_M-Ch
Tested by: Charles Hsiao

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	3465.20	-52.44	-66.78	14.34	-13.00	-39.44	Peak

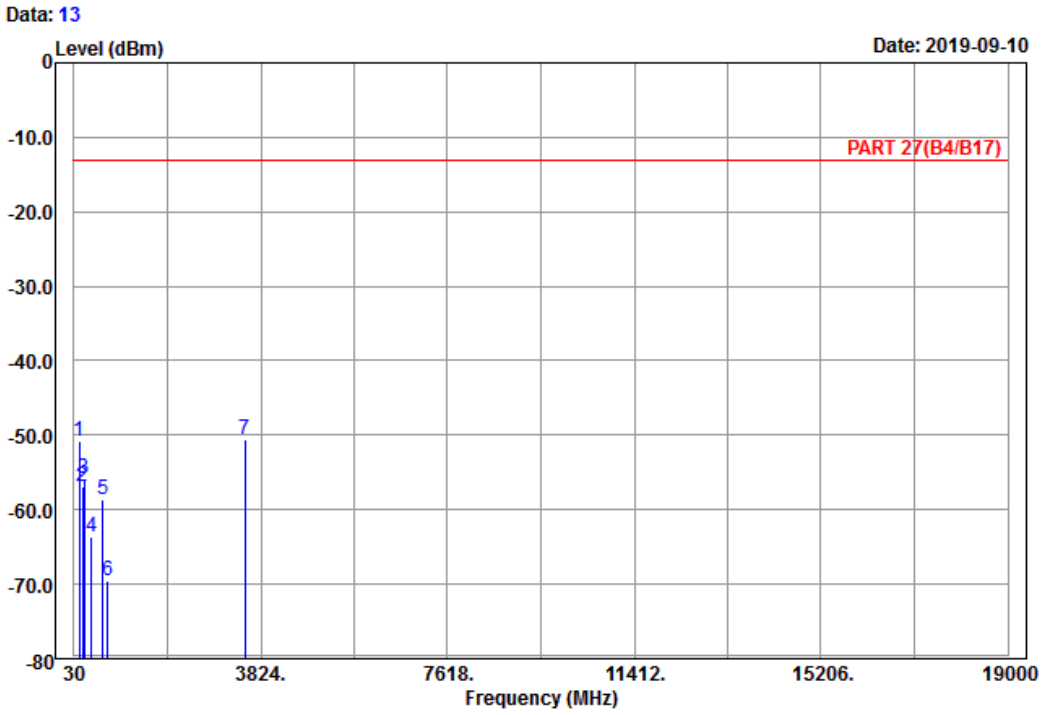


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : Band IV_Link_M-Ch
Tested by: Charles Hsiao

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
		MHz	dBm	dBm	dB	dBm	dB	
1	pp	3465.20	-51.71	-66.05	14.34	-13.00	-38.71	Peak

High Channel

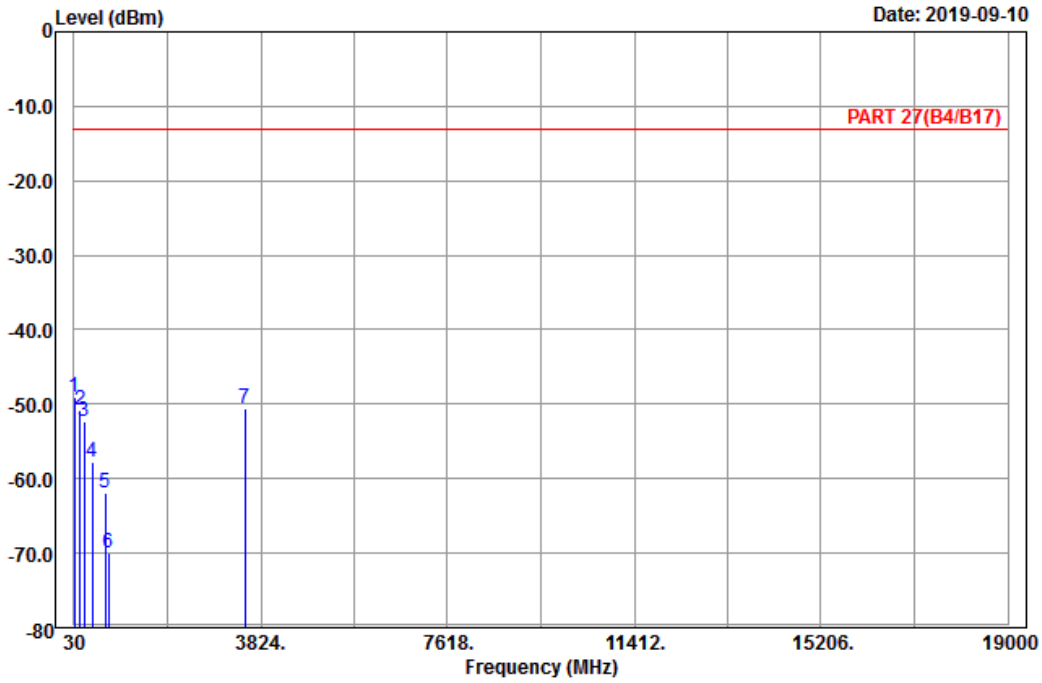
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : Band IV_Link_H-Ch
Tested by: Charles Hsiao

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	141.51	-50.82	-43.08	-7.74	-13.00	-37.82	Peak
2	204.96	-56.82	-50.70	-6.12	-13.00	-43.82	Peak
3	230.34	-55.84	-50.07	-5.77	-13.00	-42.84	Peak
4	377.00	-63.65	-59.72	-3.93	-13.00	-50.65	Peak
5	610.10	-58.66	-58.98	0.32	-13.00	-45.66	Peak
6	710.20	-69.45	-68.89	-0.56	-13.00	-56.45	Peak
7 pp	3505.20	-50.52	-64.80	14.28	-13.00	-37.52	Peak

Data: 14



Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : Band IV_Link_H-Ch
Tested by: Charles Hsiao

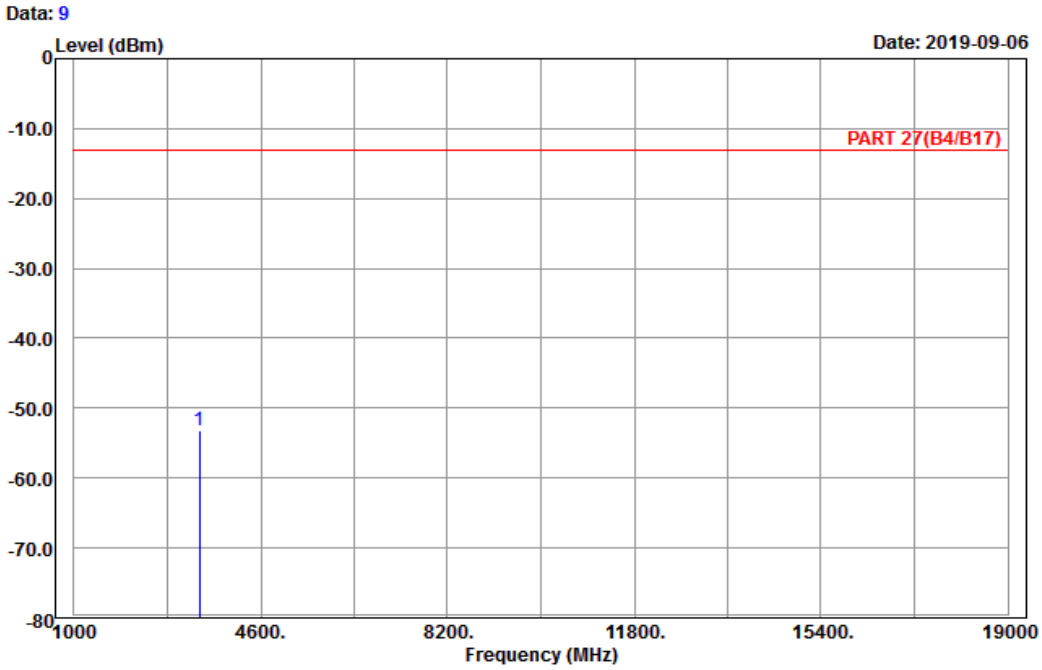
	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	31.89	-48.96	-38.20	-10.76	-13.00	-35.96	Peak
2	147.72	-50.87	-42.99	-7.88	-13.00	-37.87	Peak
3	243.30	-52.26	-46.66	-5.60	-13.00	-39.26	Peak
4	401.50	-57.82	-55.04	-2.78	-13.00	-44.82	Peak
5	657.70	-61.82	-61.65	-0.17	-13.00	-48.82	Peak
6	734.70	-69.89	-68.87	-1.02	-13.00	-56.89	Peak
7	3505.20	-50.62	-64.90	14.28	-13.00	-37.62	Peak

LTE Band 4

Channel Bandwidth: 1.4 MHz / QPSK

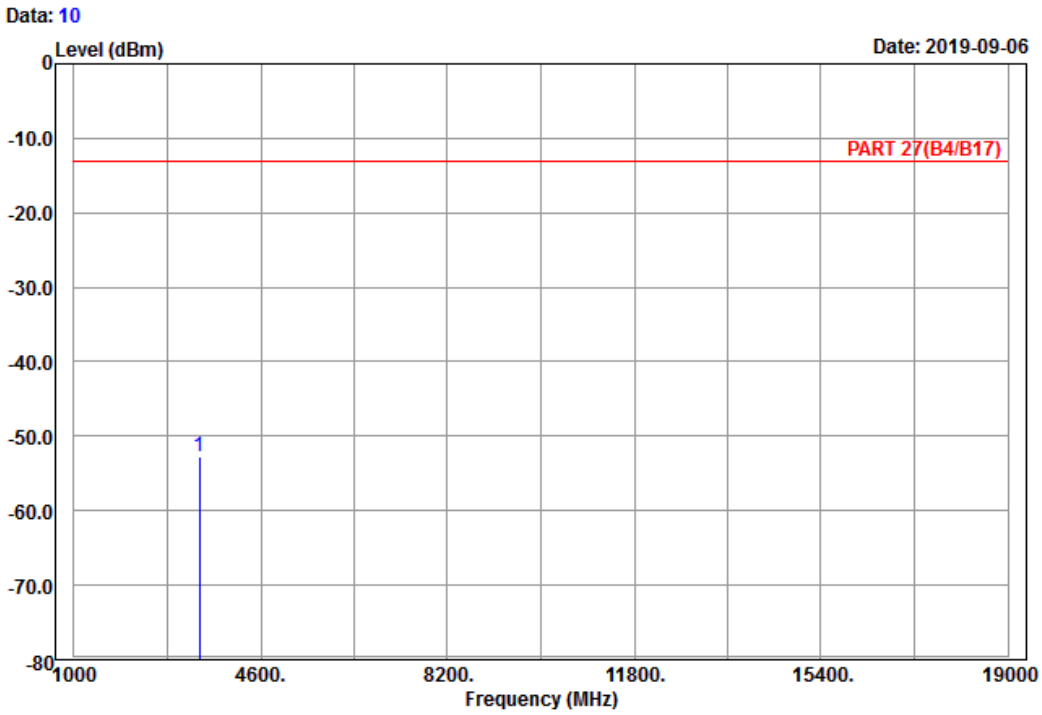
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	3421.40	-53.17	-67.54	14.37	-13.00	-40.17	Peak

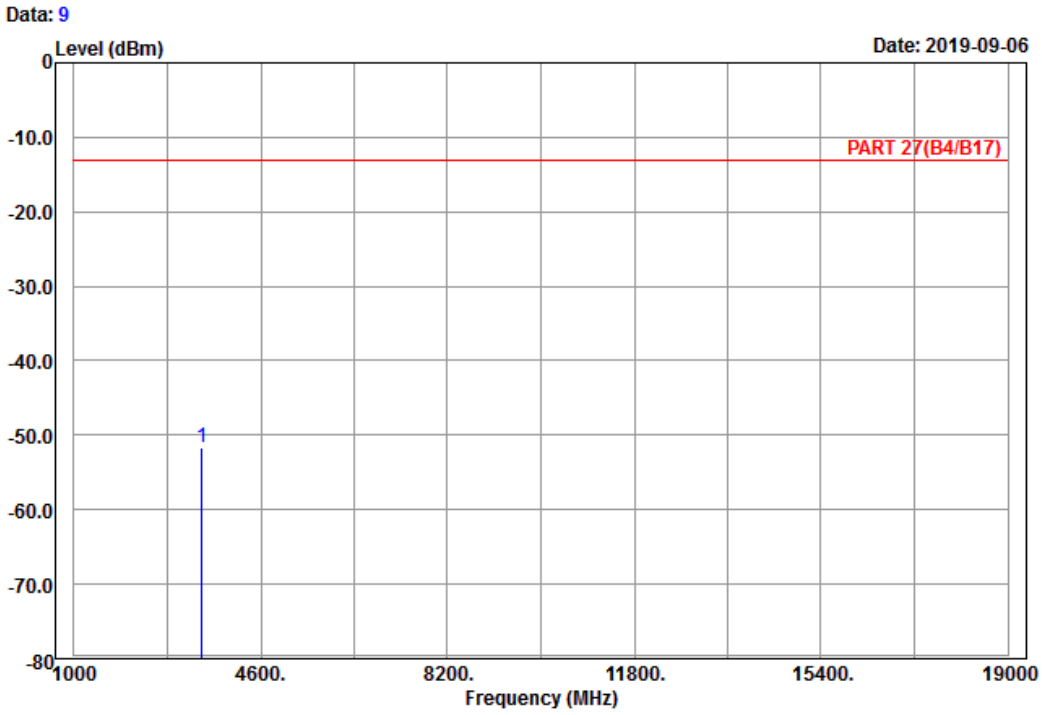


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_L-Ch
Tested by: Karl Lee

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
		MHz	dBm	dBm	dB	dBm	dB	
1	pp	3421.40	-52.84	-67.21	14.37	-13.00	-39.84	Peak

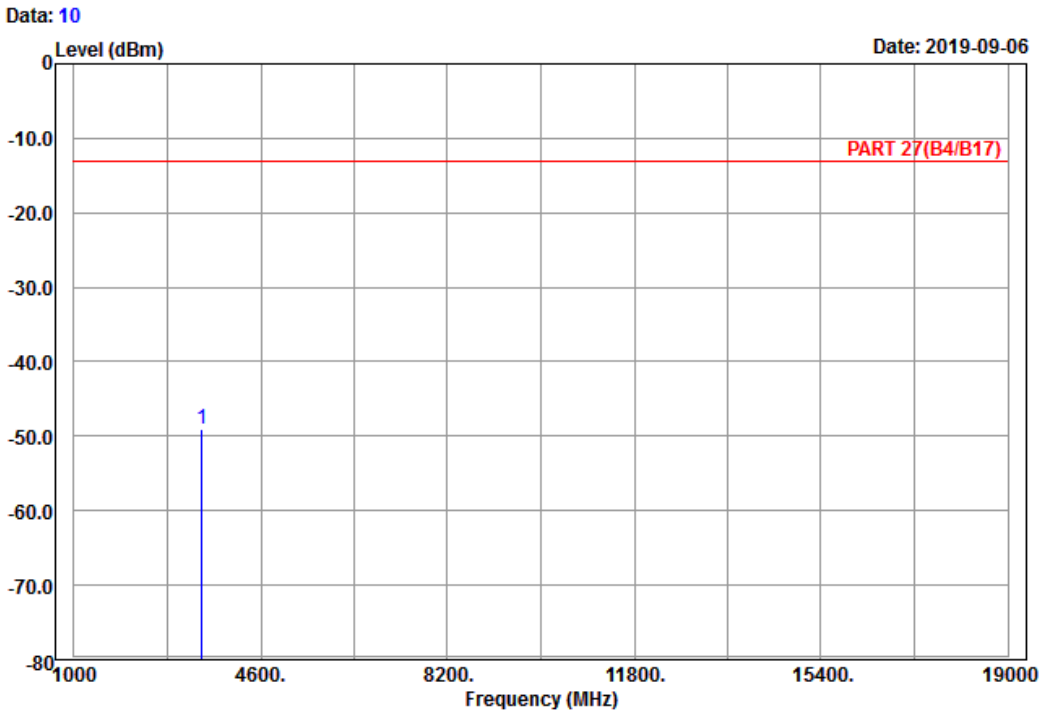
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	3465.00	-51.61	-65.95	14.34	-13.00	-38.61	Peak

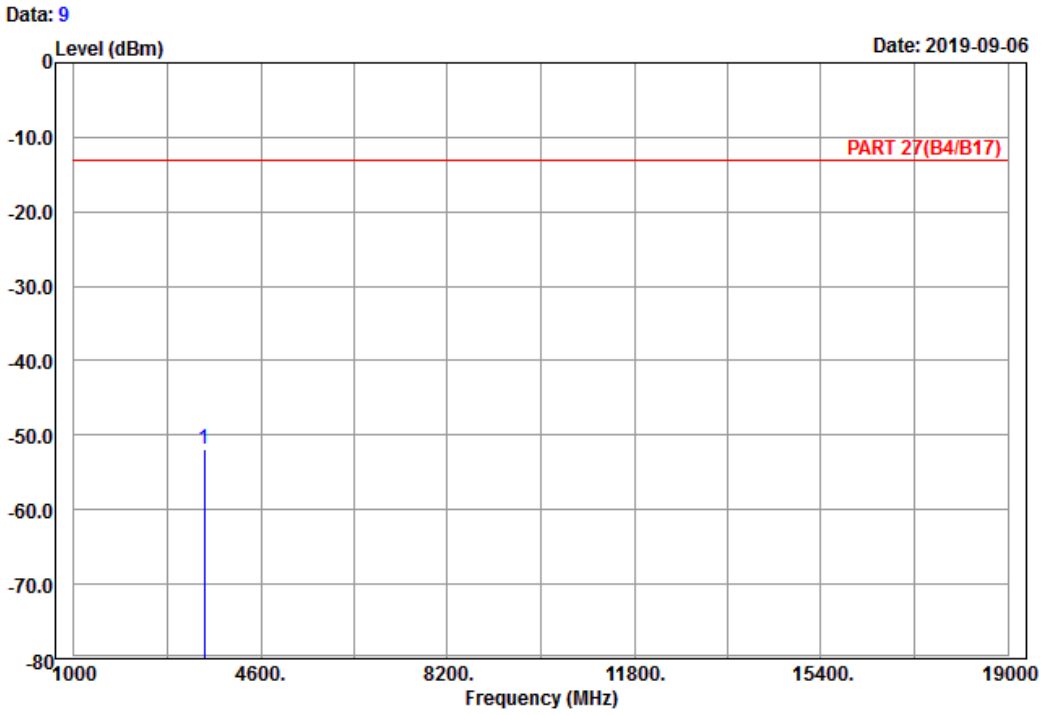


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_M-Ch
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	3465.00	-49.14	-63.48	14.34	-13.00	-36.14	Peak

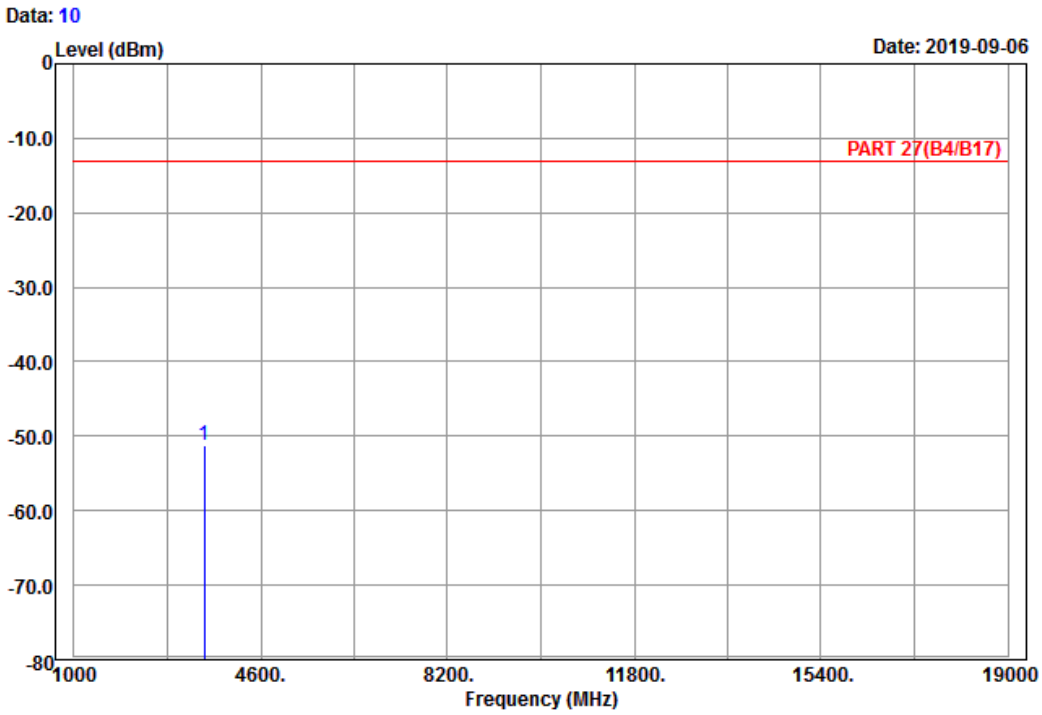
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	3508.60	-51.95	-66.23	14.28	-13.00	-38.95	Peak

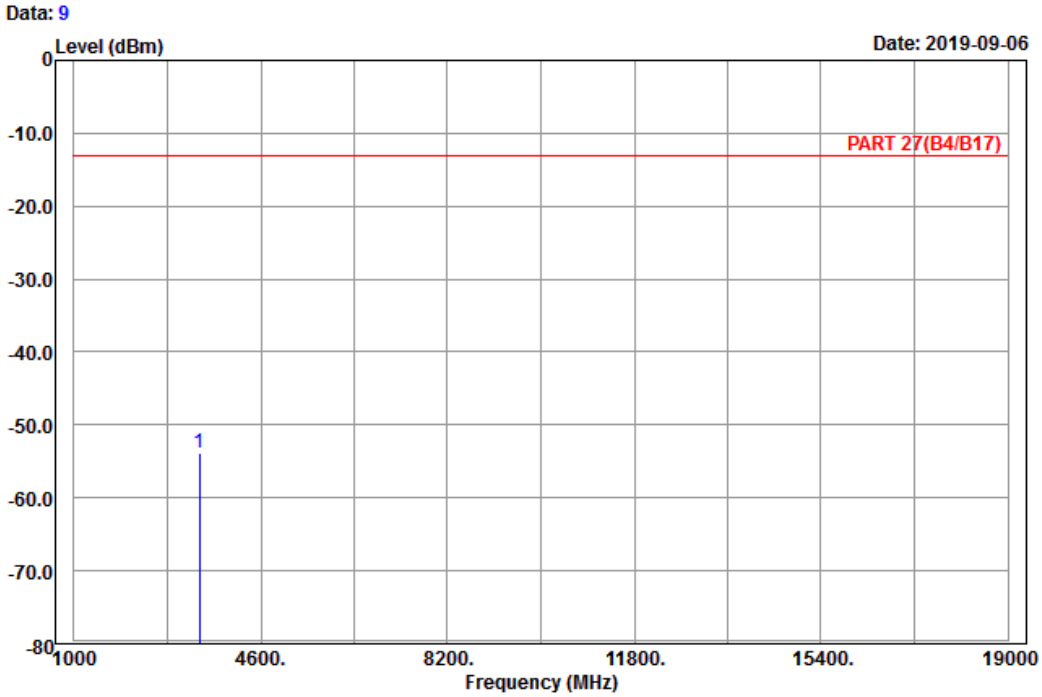


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_H-Ch
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	3508.60	-51.26	-65.54	14.28	-13.00	-38.26	Peak

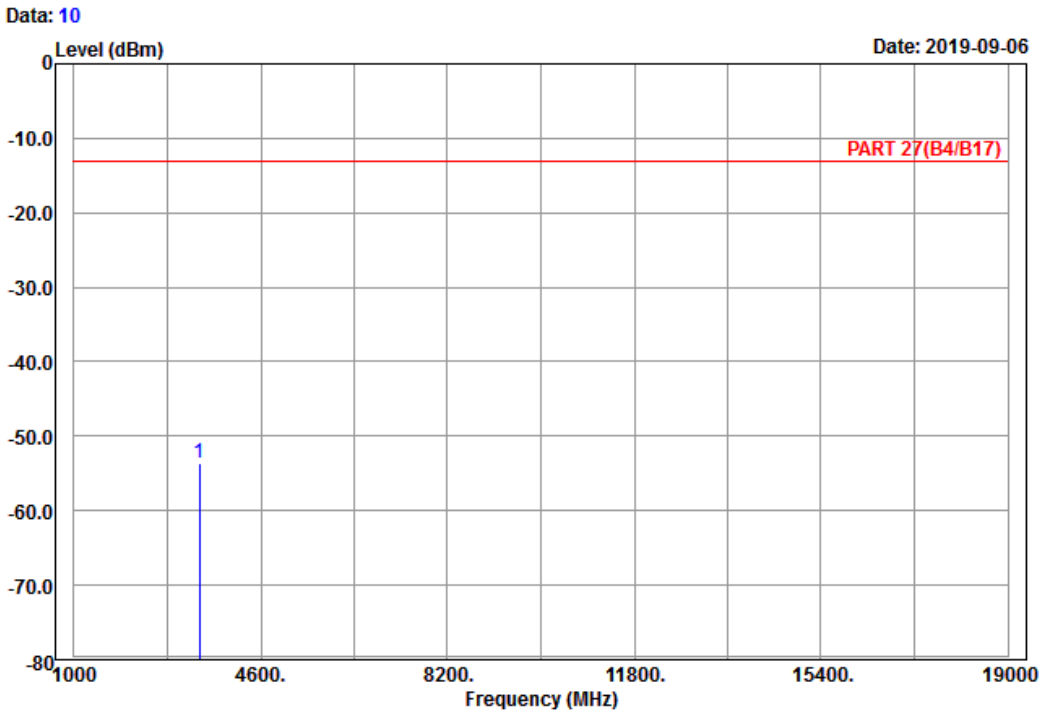
Channel Bandwidth: 5 MHz / QPSK
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	3425.00	-53.77	-68.14	14.37	-13.00	-40.77	Peak

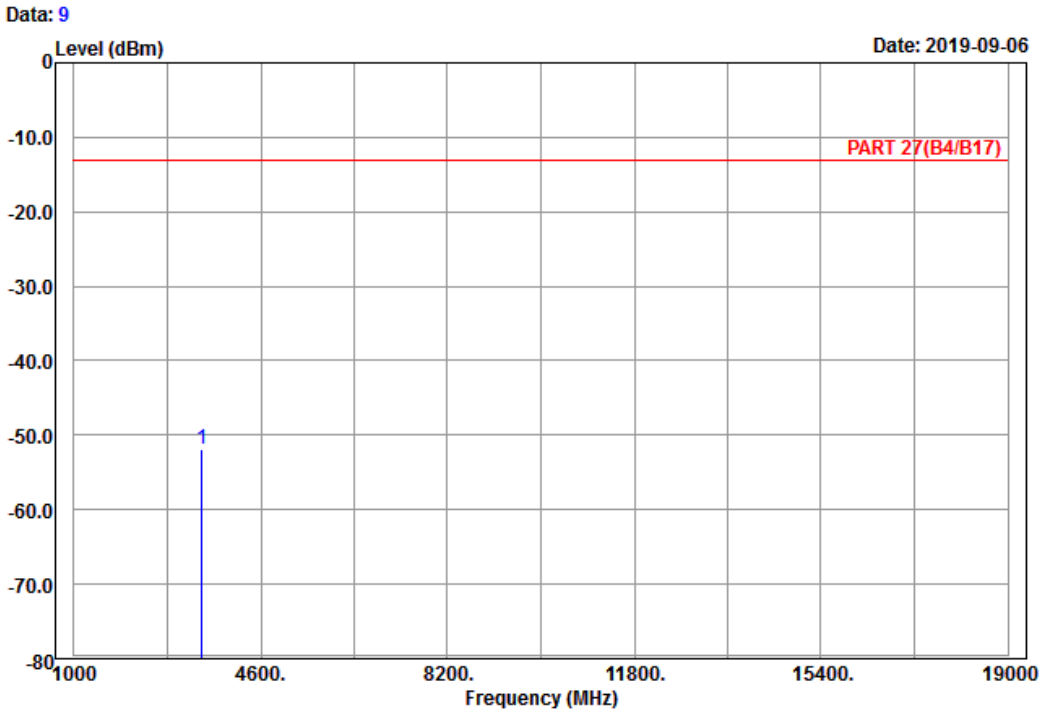


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_L-Ch
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	3425.00	-53.53	-67.90	14.37	-13.00	-40.53	Peak

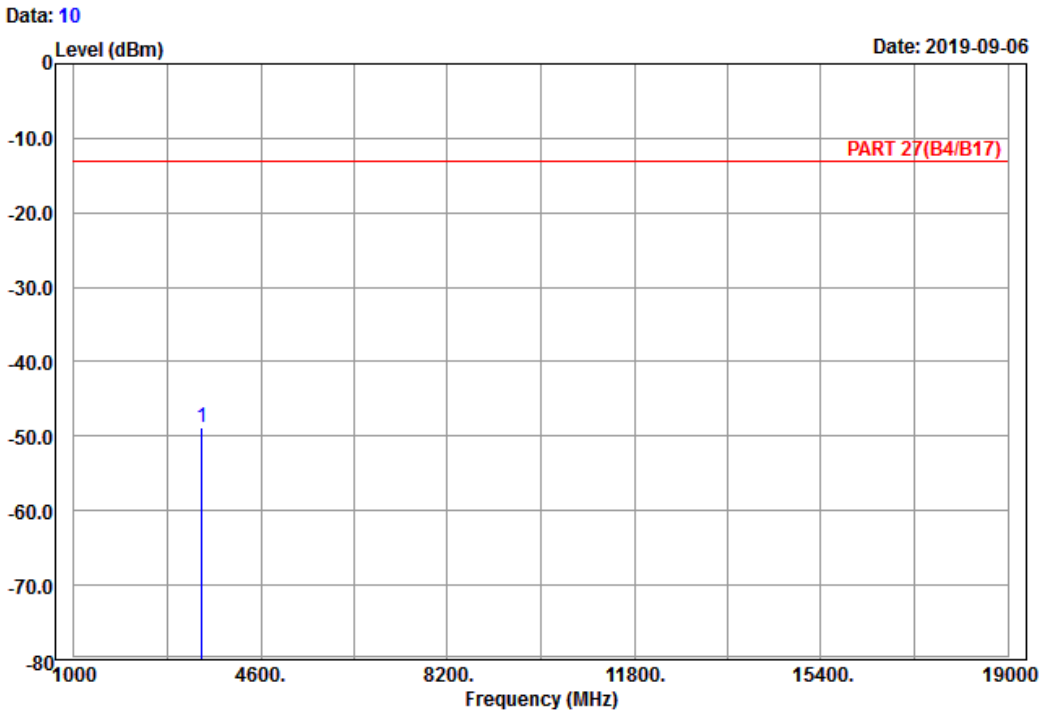
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	3465.00	-51.93	-66.27	14.34	-13.00	-38.93	Peak

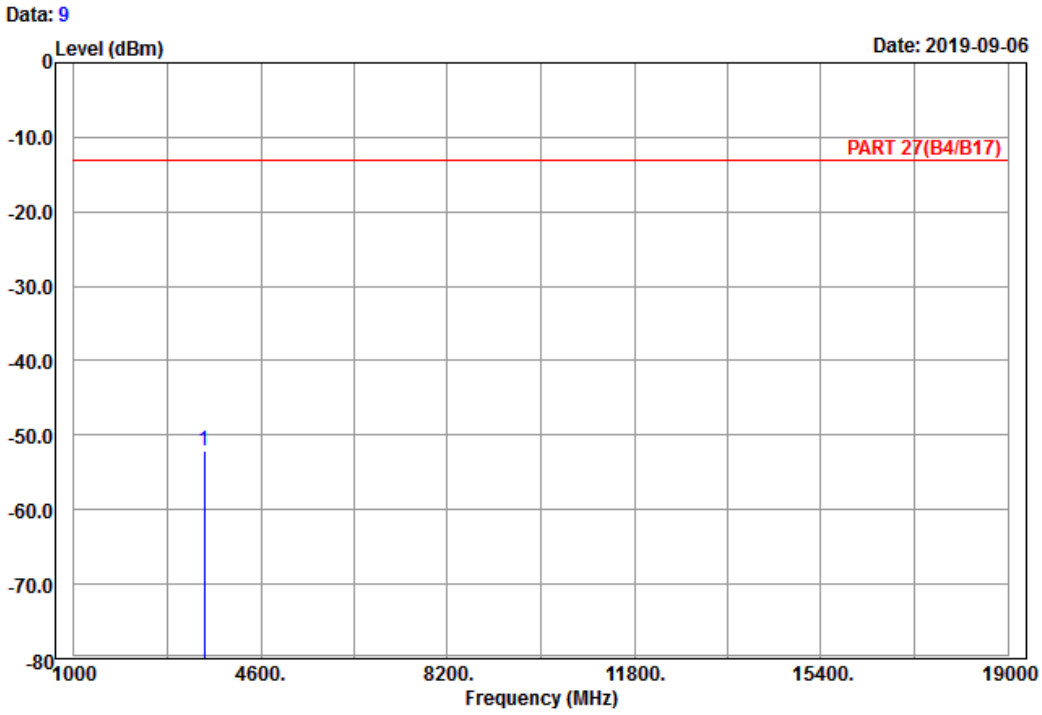


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_M-Ch
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	3465.00	-48.74	-63.08	14.34	-13.00	-35.74	Peak

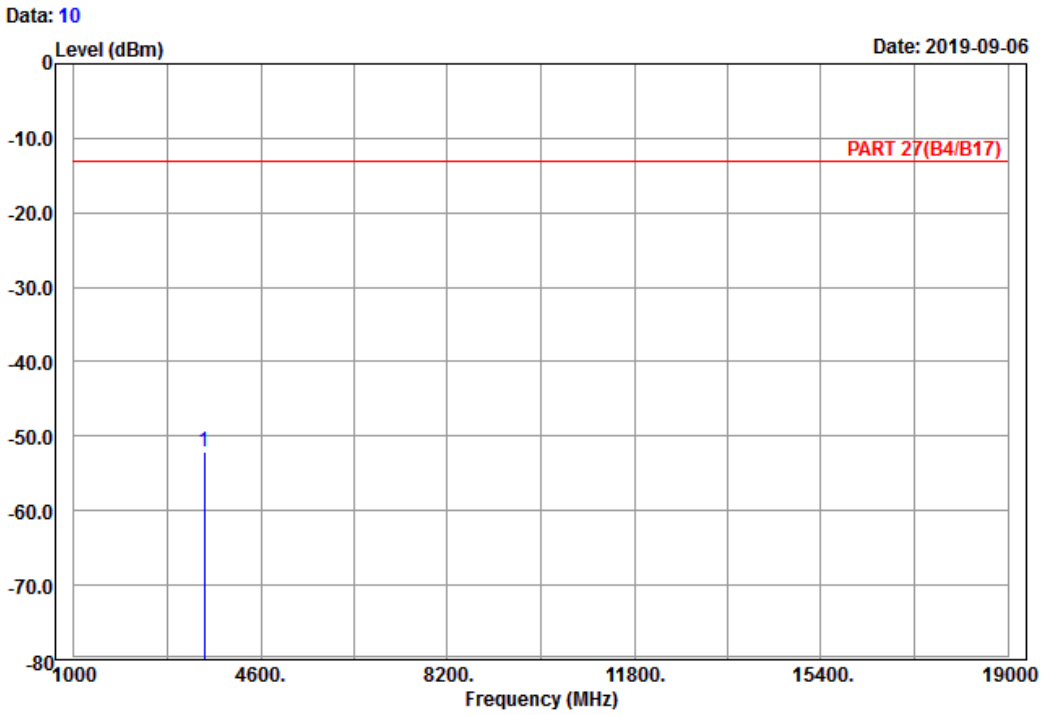
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	3505.00	-52.04	-66.32	14.28	-13.00	-39.04	Peak

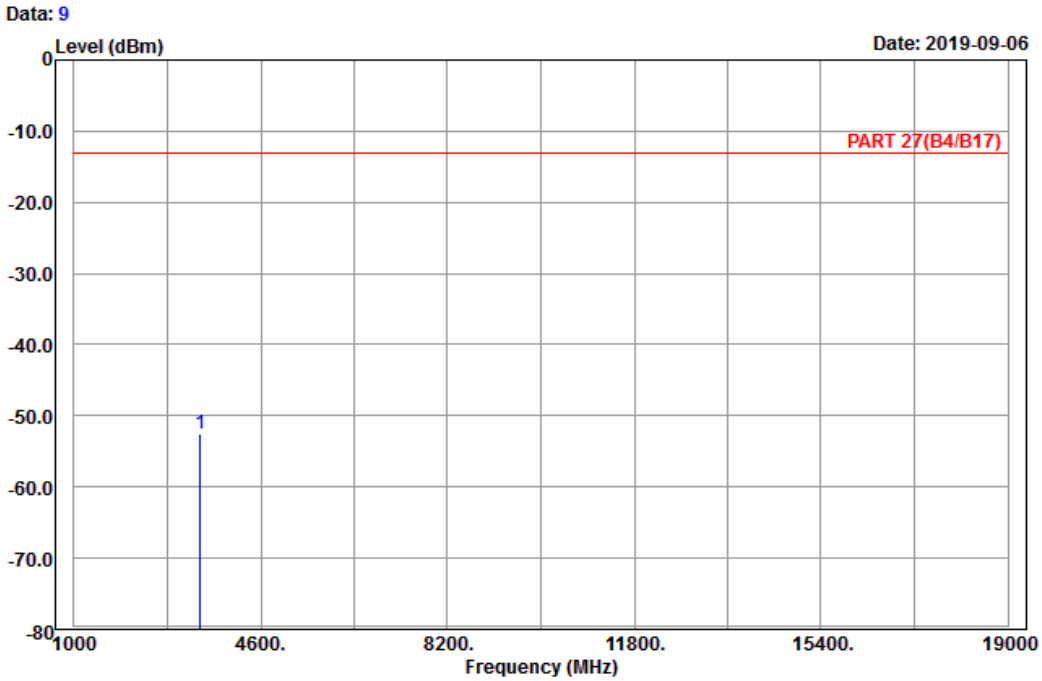


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_H-Ch
Tested by: Karl Lee

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
		MHz	dBm	dBm	dB	dBm	dB	
1	pp	3505.00	-52.08	-66.36	14.28	-13.00	-39.08	Peak

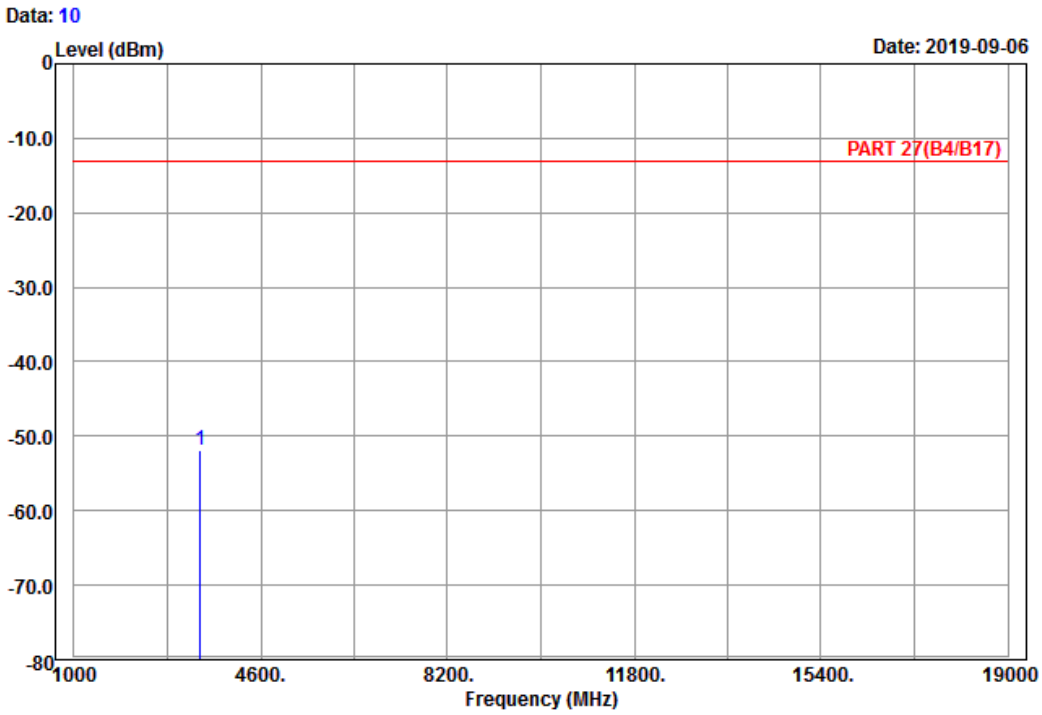
Channel Bandwidth: 20 MHz / QPSK
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	3440.00	-52.63	-66.98	14.35	-13.00	-39.63	Peak

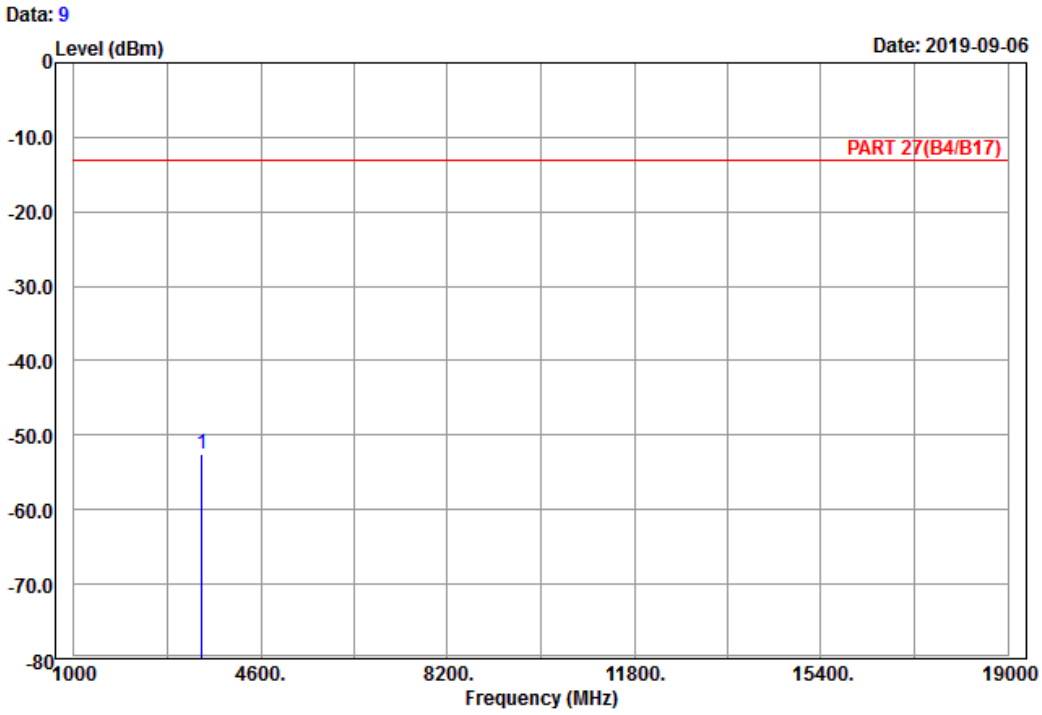


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_L-Ch
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	3440.00	-51.90	-66.25	14.35	-13.00	-38.90	Peak

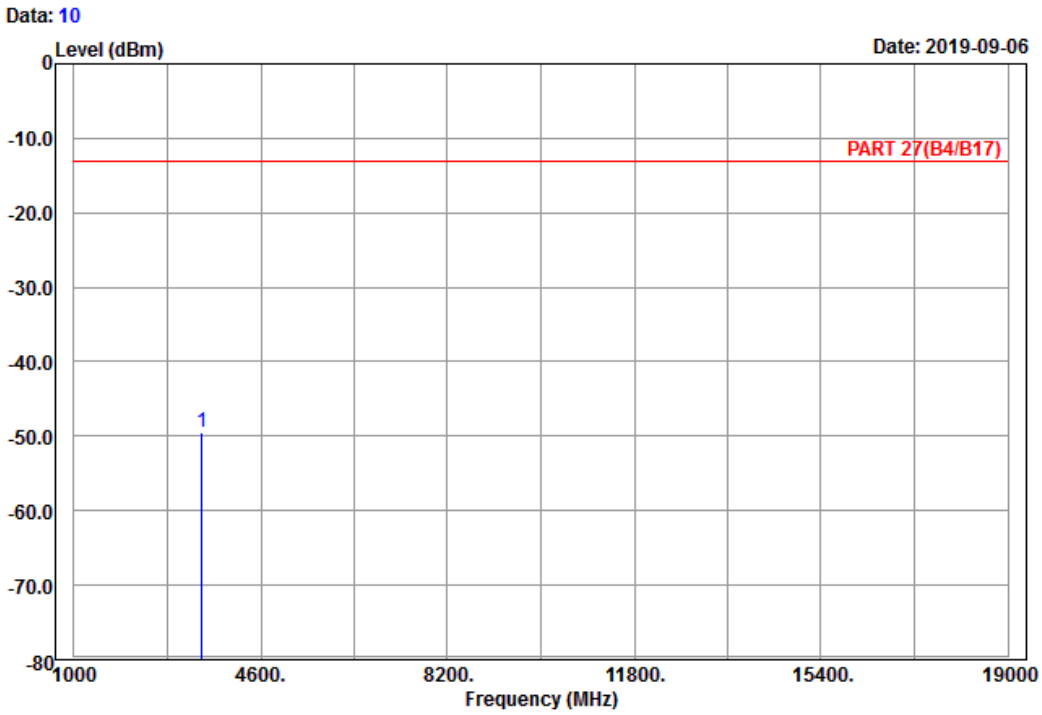
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	3465.00	-52.54	-66.88	14.34	-13.00	-39.54	Peak

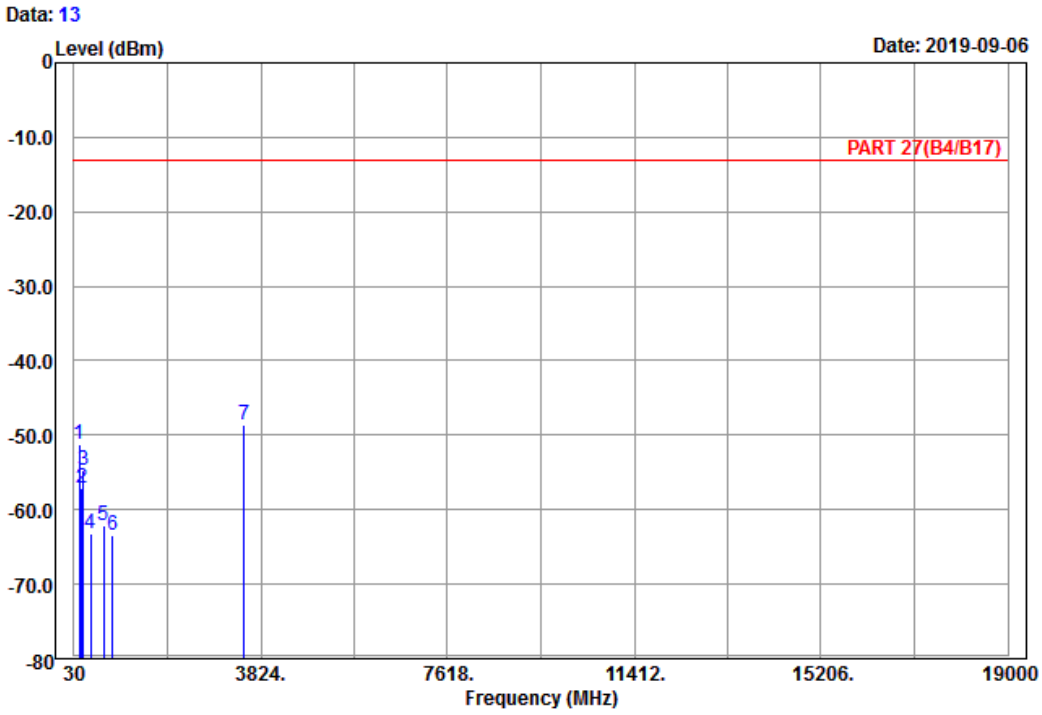


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_M-Ch
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	3465.00	-49.42	-63.76	14.34	-13.00	-36.42	Peak

High Channel

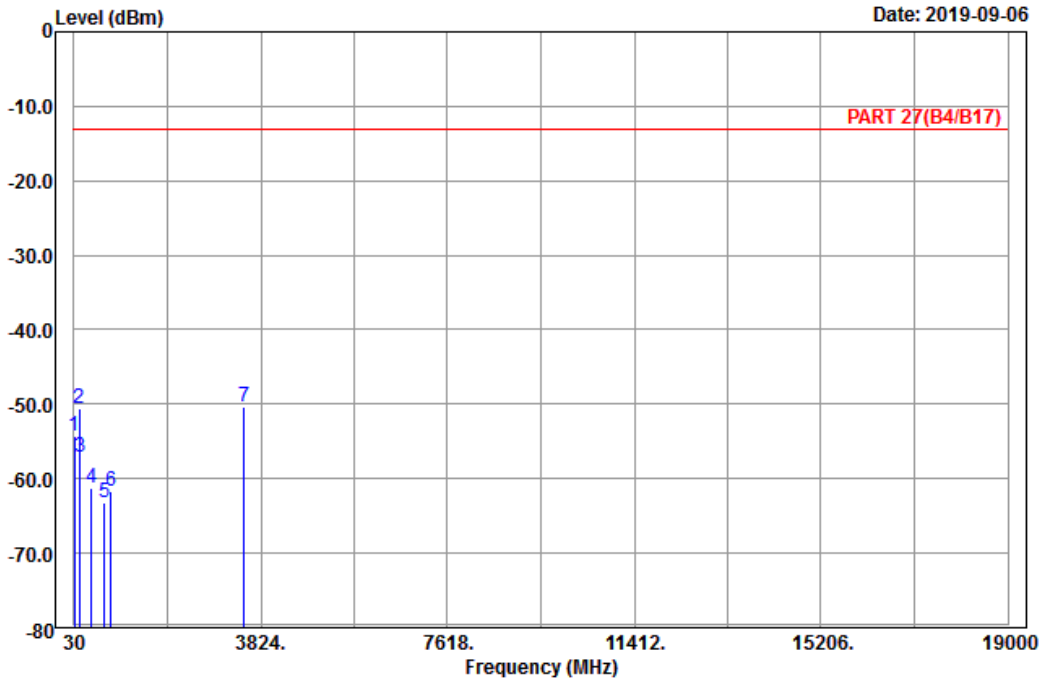
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	134.76	-51.24	-43.57	-7.67	-13.00	-38.24	Peak
2	182.82	-57.01	-51.39	-5.62	-13.00	-44.01	Peak
3	226.56	-54.75	-48.93	-5.82	-13.00	-41.75	Peak
4	375.60	-63.29	-59.26	-4.03	-13.00	-50.29	Peak
5	639.50	-62.07	-62.06	-0.01	-13.00	-49.07	Peak
6	809.60	-63.41	-65.31	1.90	-13.00	-50.41	Peak
7 pp	3490.00	-48.68	-62.99	14.31	-13.00	-35.68	Peak

Data: 14

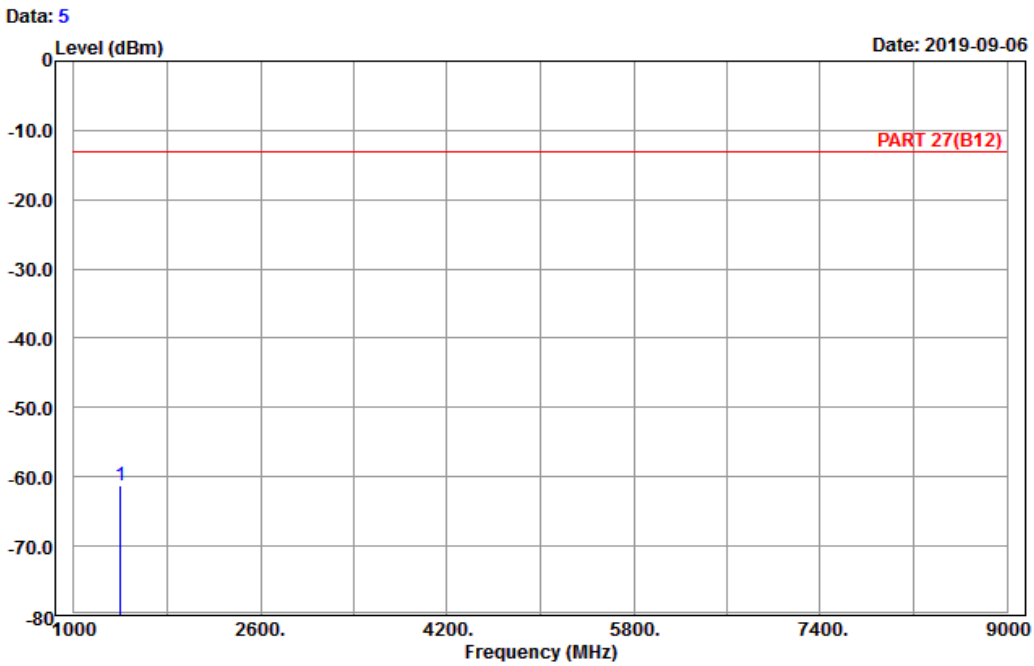


Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_H-Ch
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	31.89	-54.31	-43.55	-10.76	-13.00	-41.31	Peak
2	135.84	-50.57	-42.90	-7.67	-13.00	-37.57	Peak
3	152.31	-57.13	-49.24	-7.89	-13.00	-44.13	Peak
4	384.00	-61.36	-57.79	-3.57	-13.00	-48.36	Peak
5	648.60	-63.31	-63.19	-0.12	-13.00	-50.31	Peak
6	780.90	-61.62	-62.35	0.73	-13.00	-48.62	Peak
7 pp	3490.00	-50.28	-64.59	14.31	-13.00	-37.28	Peak

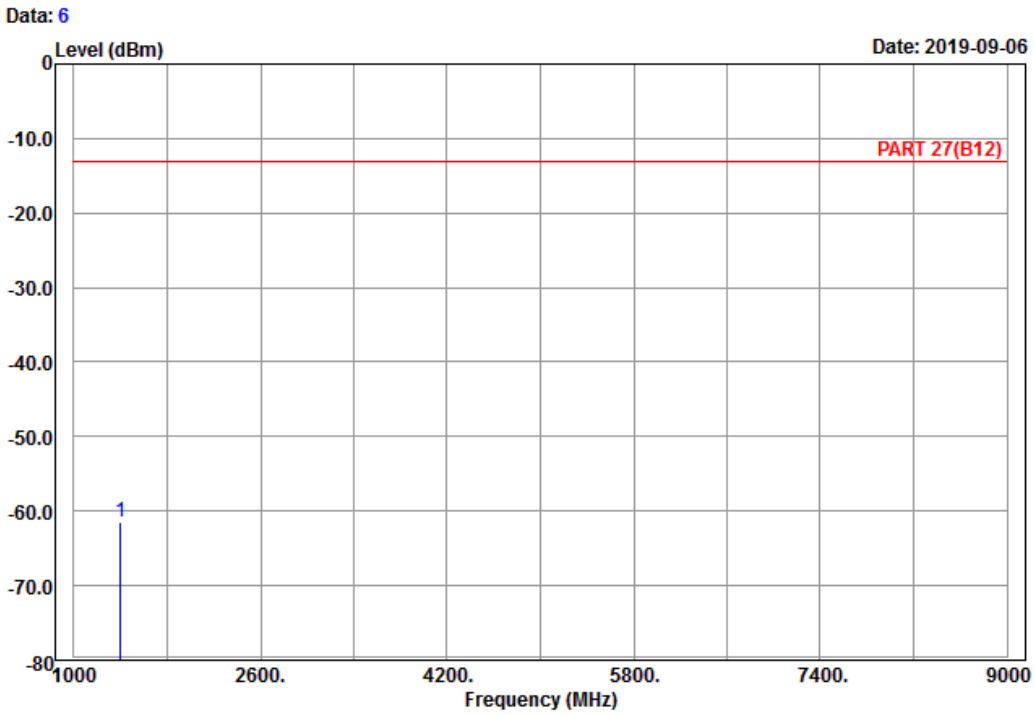
LTE Band 12
Channel Bandwidth: 1.4 MHz / QPSK
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B12) Horizontal
Remark : LTE_Band 12_Link_L-Ch
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1399.40	-61.28	-67.38	-13.00	-48.28	6.10	Peak

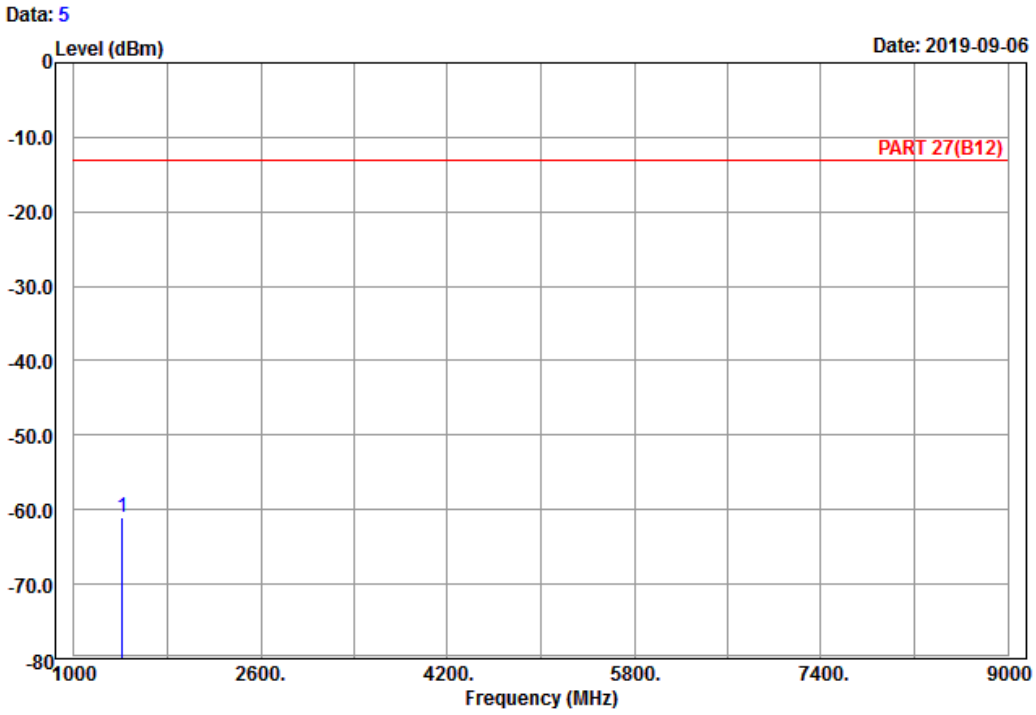


Site : 966 chamber 1
Condition: PART 27(B12) Vertical
Remark : LTE_Band 12_Link_L-Ch
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1399.40	-61.57	-67.67	-13.00	-48.57	6.10	Peak

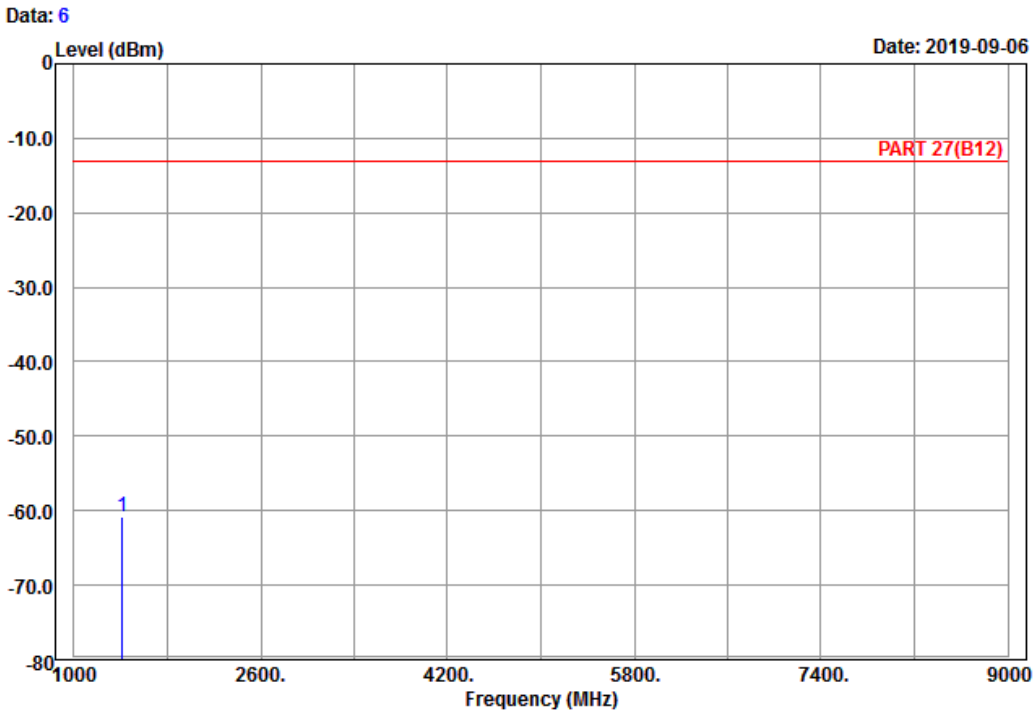
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B12) Horizontal
Remark : LTE_Band 12_Link_M-Ch
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1415.00	-61.05	-67.41	-13.00	-48.05	6.36	Peak

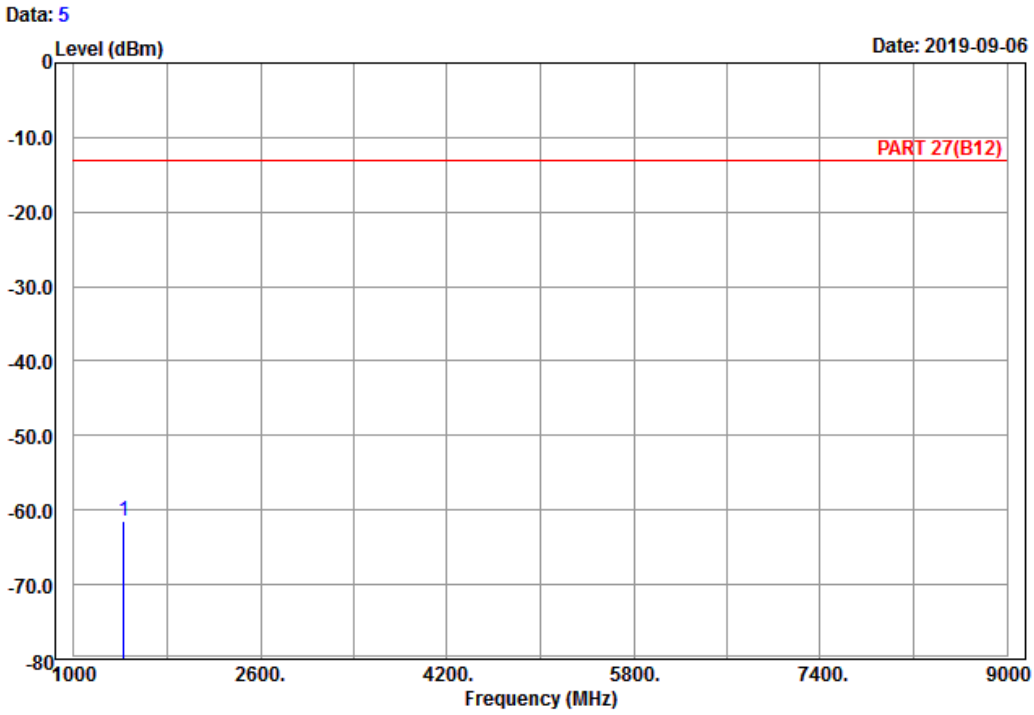


Site : 966 chamber 1
Condition: PART 27(B12) Vertical
Remark : LTE_Band 12_Link_M-Ch
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1415.00	-60.90	-67.26	-13.00	-47.90	6.36	Peak

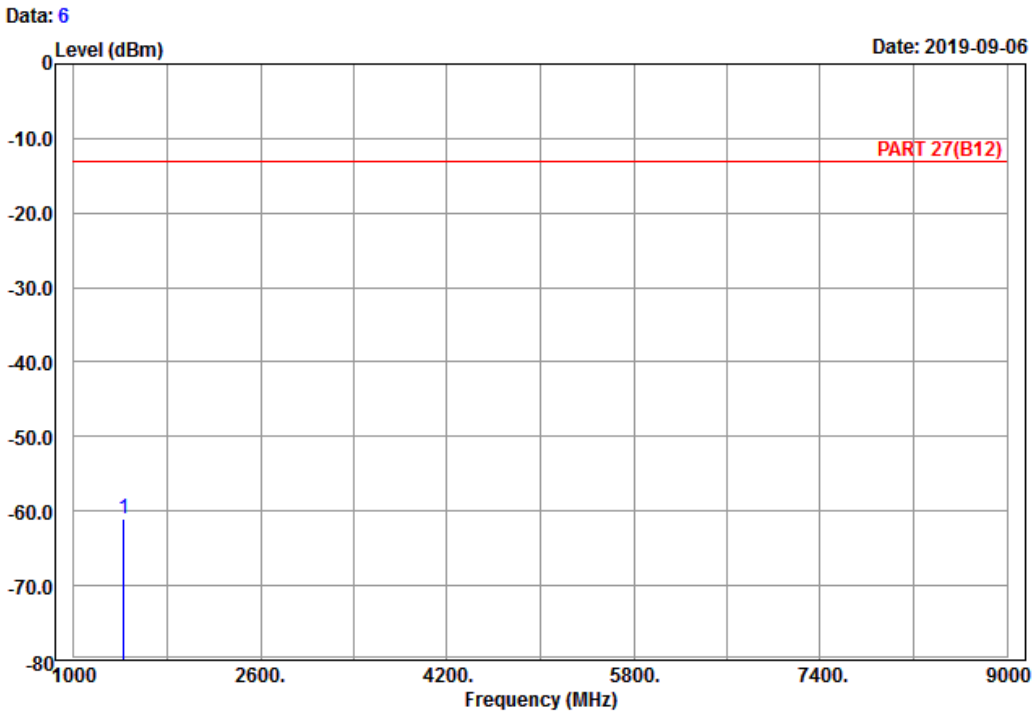
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B12) Horizontal
Remark : LTE_Band 12_Link_H-Ch
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1430.60	-61.53	-67.77	-13.00	-48.53	6.24	Peak

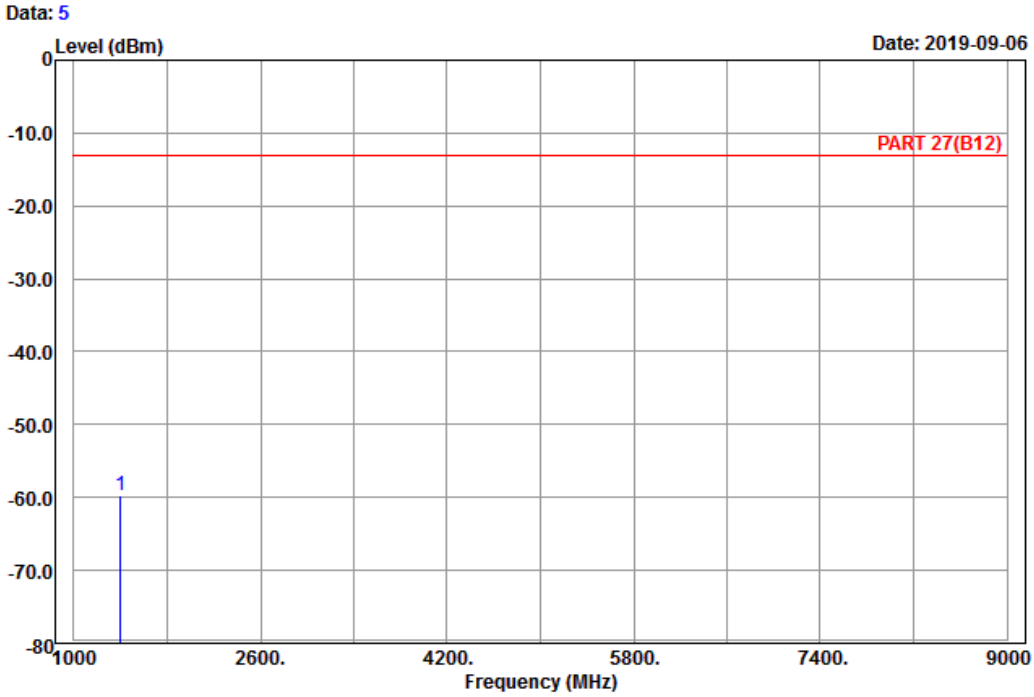


Site : 966 chamber 1
Condition: PART 27(B12) Vertical
Remark : LTE_Band 12_Link_H-Ch
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1430.60	-60.96	-67.20	-13.00	-47.96	6.24	Peak

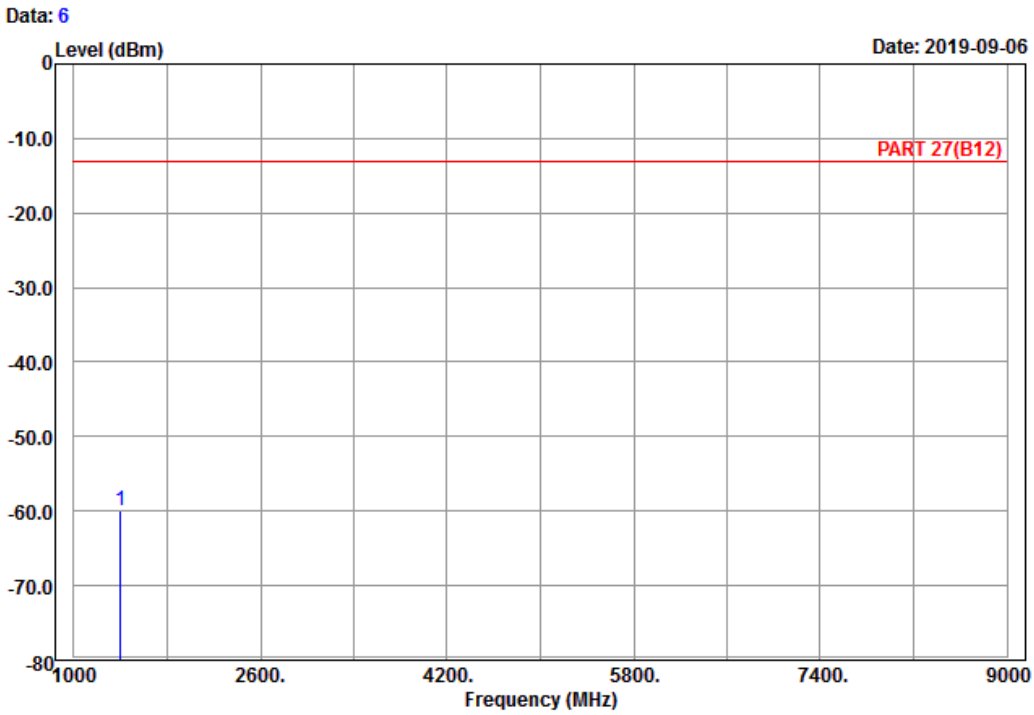
Channel Bandwidth: 5 MHz / QPSK
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B12) Horizontal
Remark : LTE_Band 12_Link_L-Ch
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1403.00	-59.74	-65.84	-13.00	-46.74	6.10	Peak

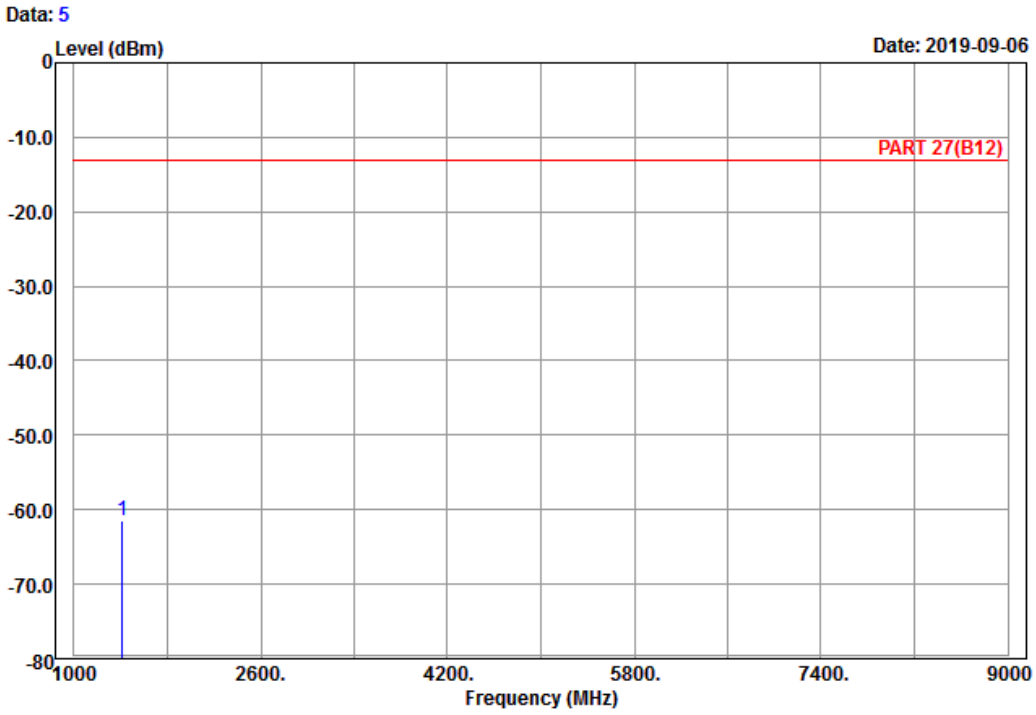


Site : 966 chamber 1
Condition: PART 27(B12) Vertical
Remark : LTE_Band 12_Link_L-Ch
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1403.00	-59.88	-65.98	-13.00	-46.88	6.10	Peak

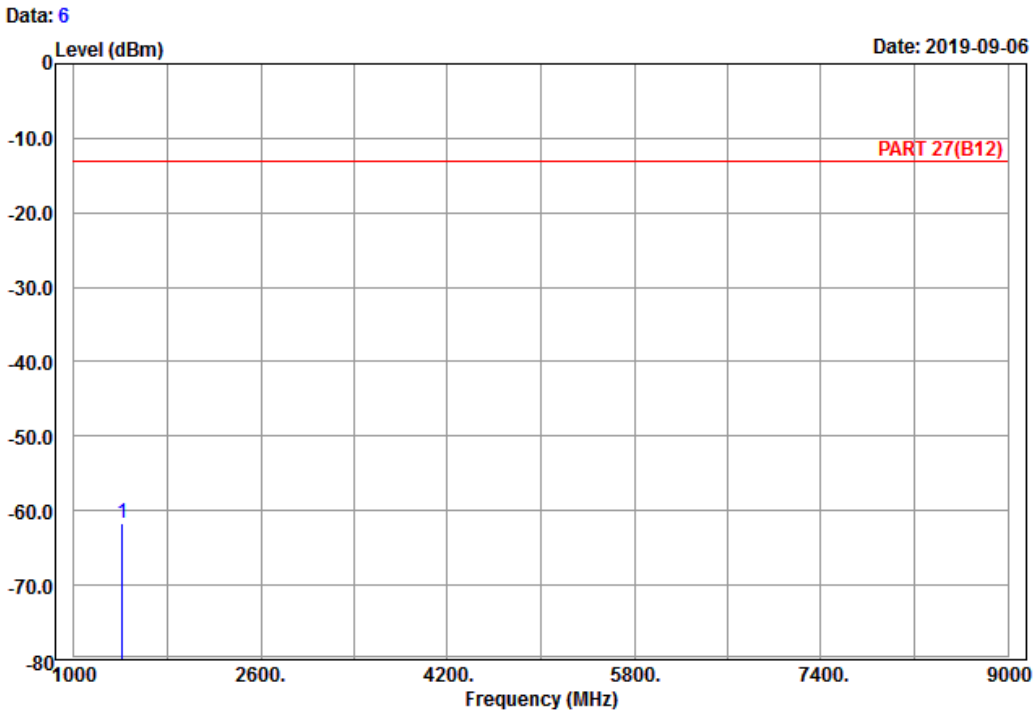
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B12) Horizontal
Remark : LTE_Band 12_Link_M-Ch
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1415.00	-61.51	-67.87	-13.00	-48.51	6.36	Peak

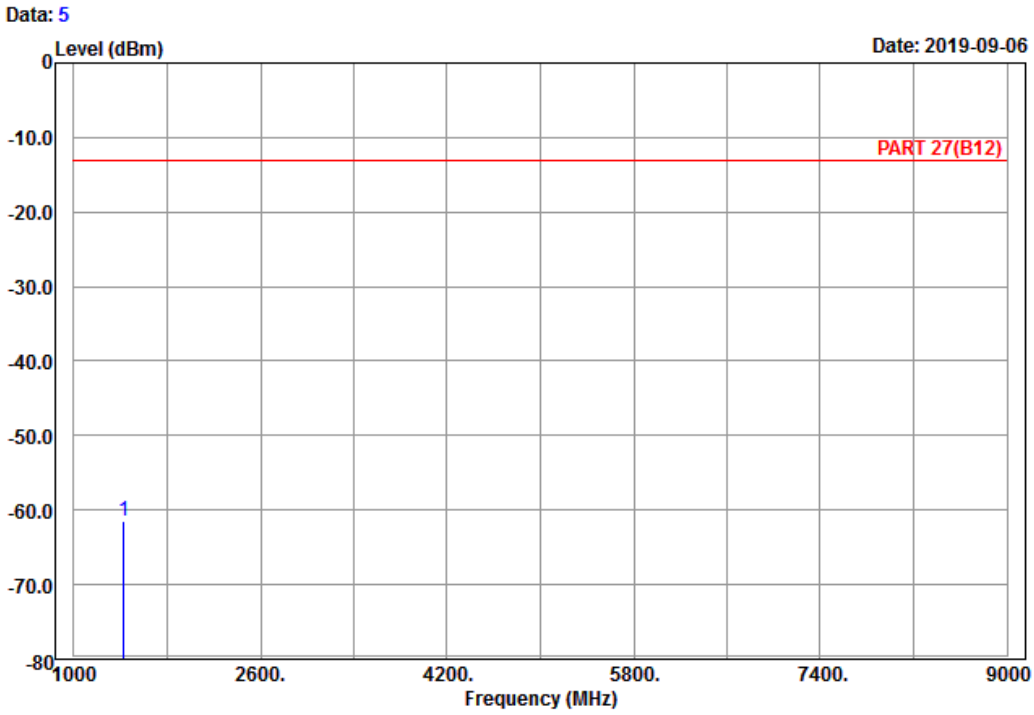


Site : 966 chamber 1
Condition: PART 27(B12) Vertical
Remark : LTE_Band 12_Link_M-Ch
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1415.00	-61.71	-68.07	-13.00	-48.71	6.36	Peak

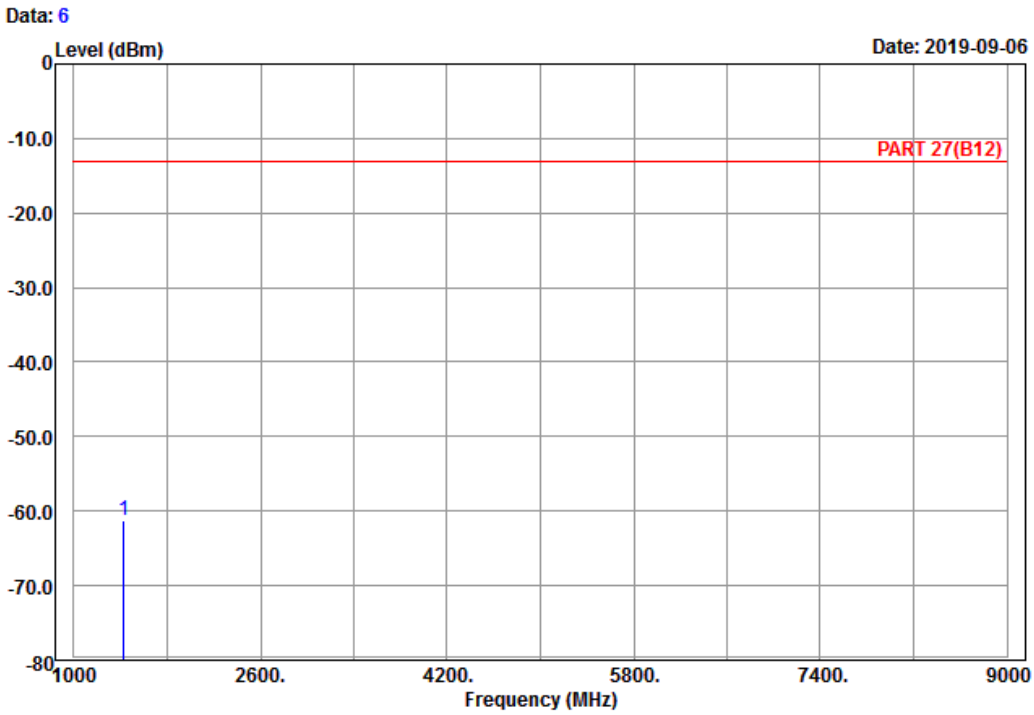
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B12) Horizontal
Remark : LTE_Band 12_Link_H-Ch
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1427.00	-61.46	-67.70	-13.00	-48.46	6.24	Peak

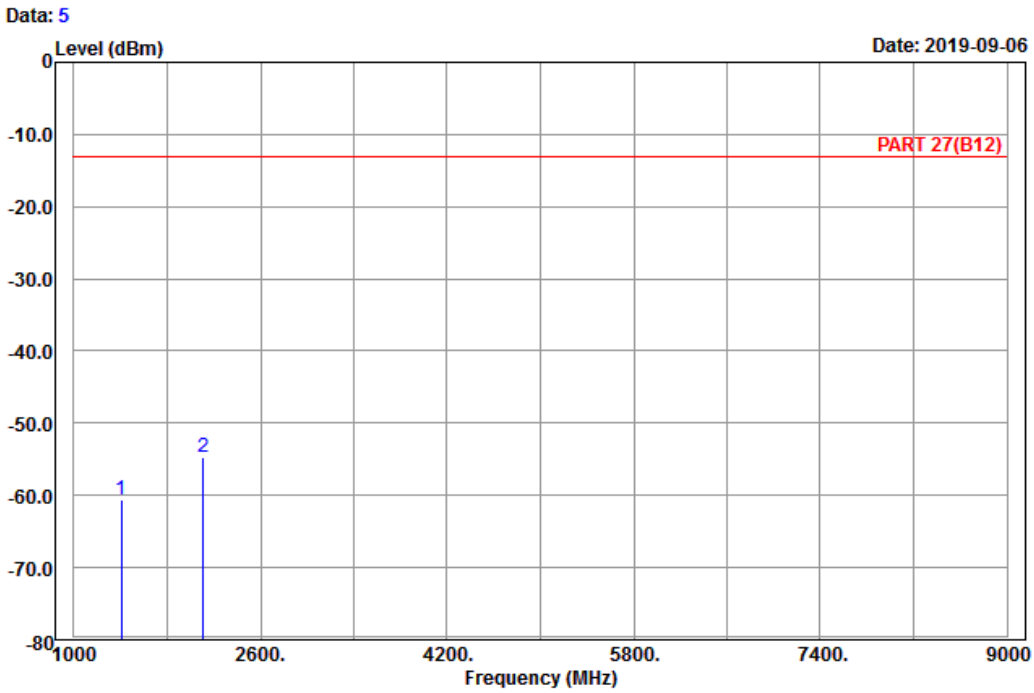


Site : 966 chamber 1
Condition: PART 27(B12) Vertical
Remark : LTE_Band 12_Link_H-Ch
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1427.00	-61.28	-67.52	-13.00	-48.28	6.24	Peak

Channel Bandwidth: 10 MHz / QPSK
Low Channel

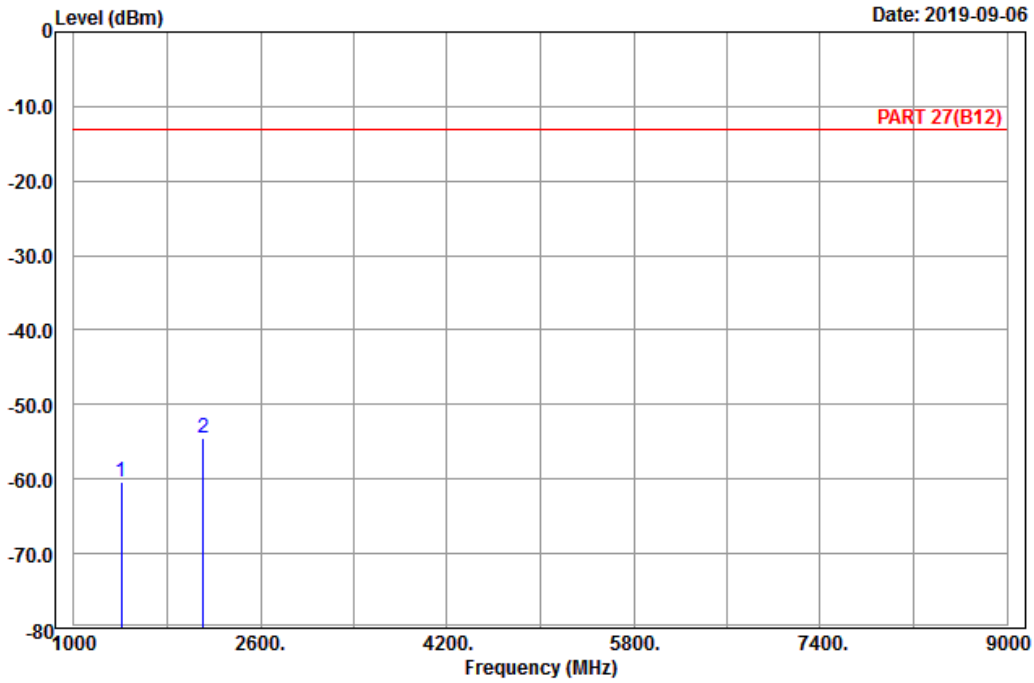
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B12) Horizontal
Remark : LTE_Band 12_Link_L-Ch
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1408.00	-60.68	-67.04	-13.00	-47.68	6.36	Peak
2 pp	2112.00	-54.66	-65.77	-13.00	-41.66	11.11	Peak

Data: 6

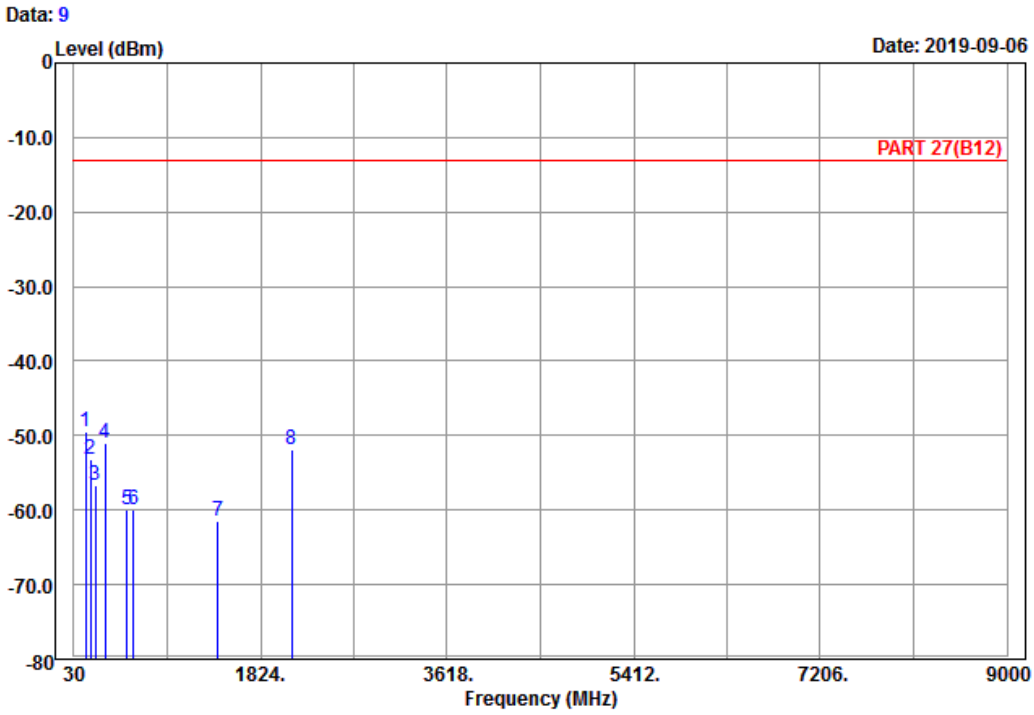


Site : 966 chamber 1
Condition: PART 27(B12) Vertical
Remark : LTE_Band 12_Link_L-Ch
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1408.00	-60.28	-66.64	-13.00	-47.28	6.36	Peak
2 pp	2112.00	-54.45	-65.56	-13.00	-41.45	11.11	Peak

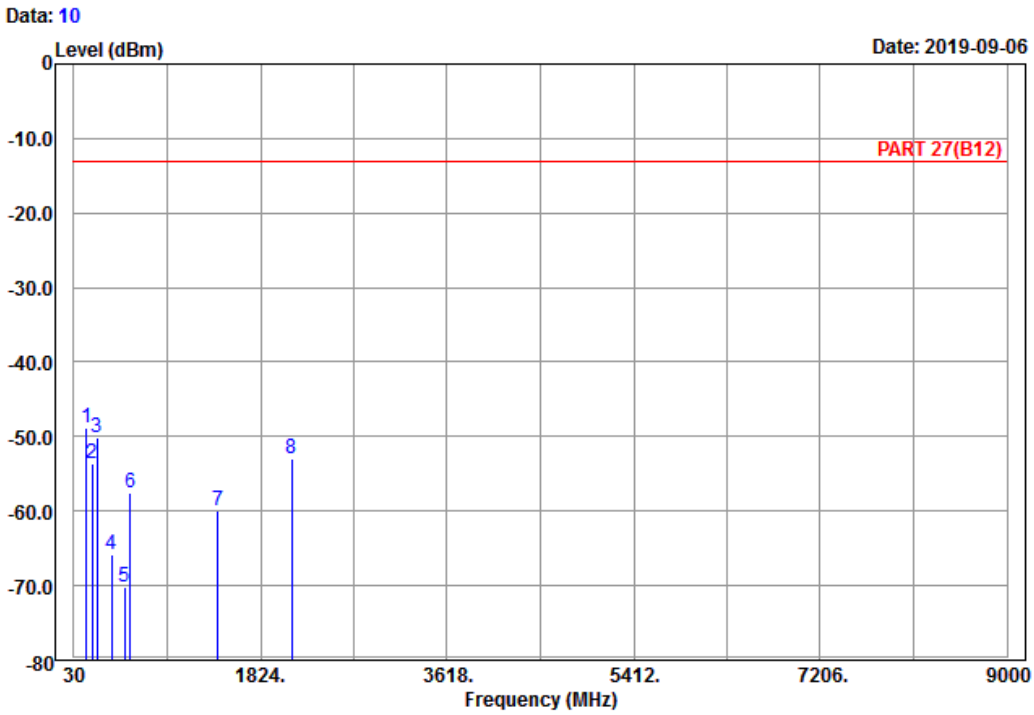
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B12) Horizontal
Remark : LTE_Band 12_Link_M-Ch
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	142.59	-49.52	-41.76	-13.00	-36.52	-7.76	Peak
2	190.38	-53.14	-47.41	-13.00	-40.14	-5.73	Peak
3	239.52	-56.61	-50.96	-13.00	-43.61	-5.65	Peak
4	327.30	-51.02	-45.37	-13.00	-38.02	-5.65	Peak
5	541.50	-59.98	-57.68	-13.00	-46.98	-2.30	Peak
6	604.50	-59.99	-60.37	-13.00	-46.99	0.38	Peak
7	1415.00	-61.50	-67.86	-13.00	-48.50	6.36	Peak
8	2122.50	-51.96	-63.07	-13.00	-38.96	11.11	Peak

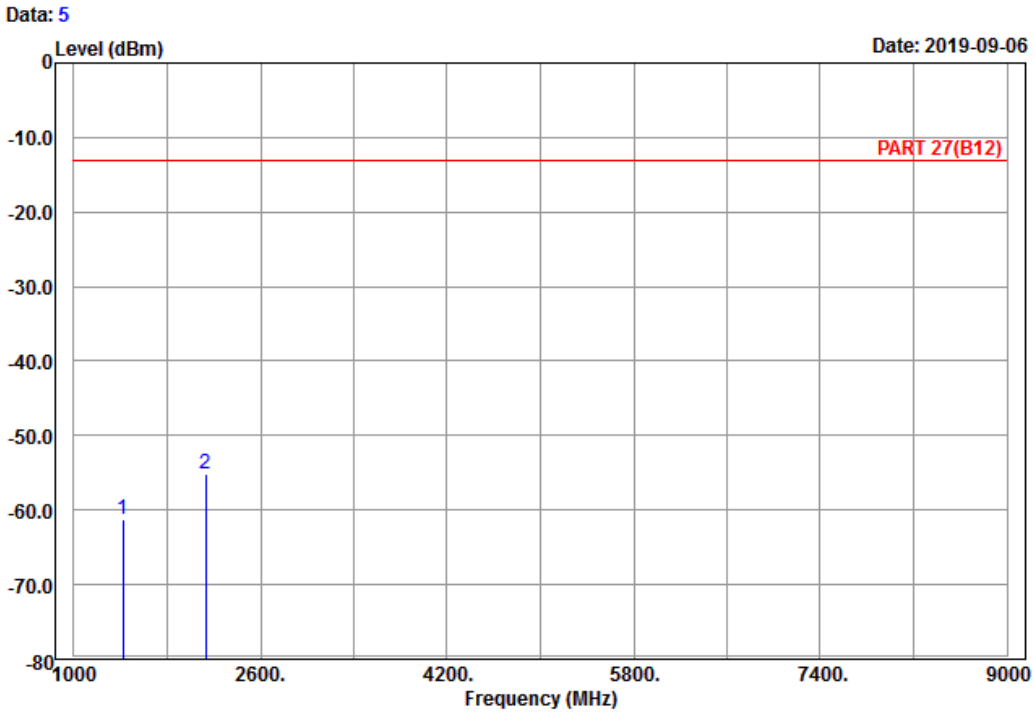


Site : 966 chamber 1
Condition: PART 27(B12) Vertical
Remark : LTE_Band 12_Link_M-Ch
Tested by: Charles Hsiao

		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
		MHz	dBm	dBm	dBm	dB	dB	
1	pp	151.50	-48.79	-40.87	-13.00	-35.79	-7.92	Peak
2		209.28	-53.57	-47.52	-13.00	-40.57	-6.05	Peak
3		249.51	-50.06	-44.54	-13.00	-37.06	-5.52	Peak
4		396.60	-65.80	-62.90	-13.00	-52.80	-2.90	Peak
5		517.00	-70.23	-66.15	-13.00	-57.23	-4.08	Peak
6		575.80	-57.65	-57.07	-13.00	-44.65	-0.58	Peak
7		1415.00	-59.96	-66.32	-13.00	-46.96	6.36	Peak
8		2122.50	-52.91	-64.02	-13.00	-39.91	11.11	Peak

High Channel

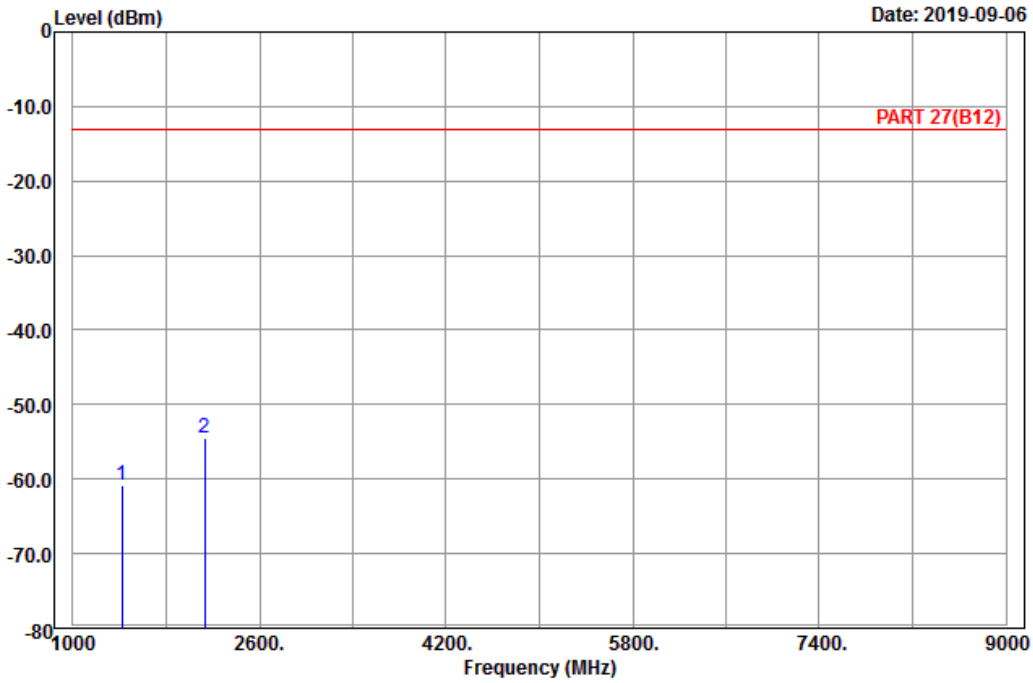
Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B12) Horizontal
Remark : LTE_Band 12_Link_H-Ch
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1422.00	-61.28	-67.64	-13.00	-48.28	6.36	Peak
2 pp	2133.00	-55.18	-66.46	-13.00	-42.18	11.28	Peak

Data: 6

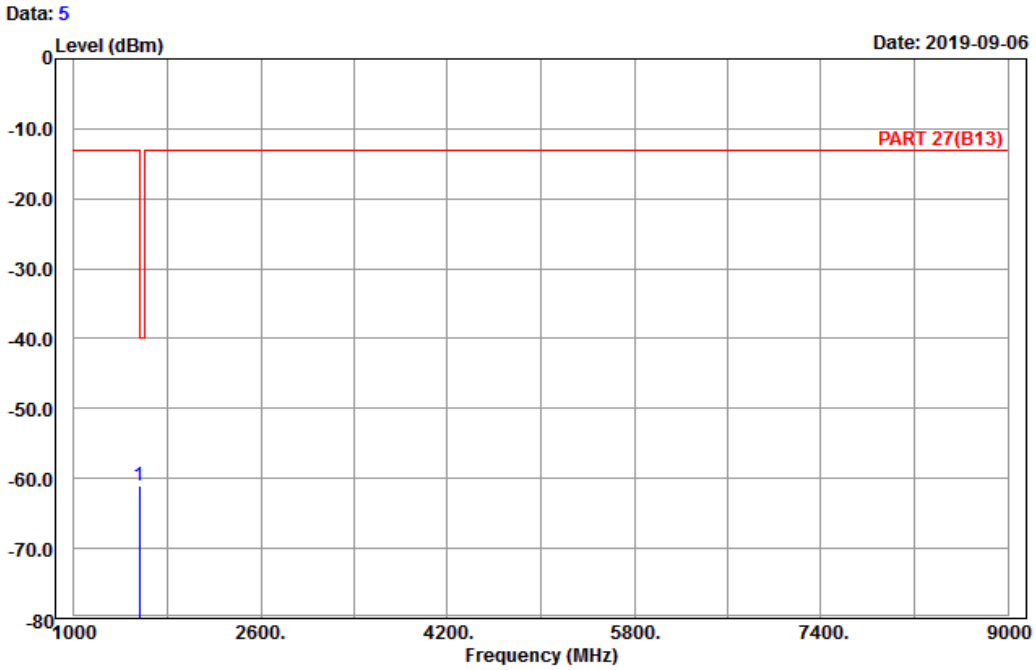


Site : 966 chamber 1
Condition: PART 27(B12) Vertical
Remark : LTE_Band 12_Link_H-Ch
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1422.00	-60.90	-67.26	-13.00	-47.90	6.36	Peak
2 pp	2133.00	-54.46	-65.74	-13.00	-41.46	11.28	Peak

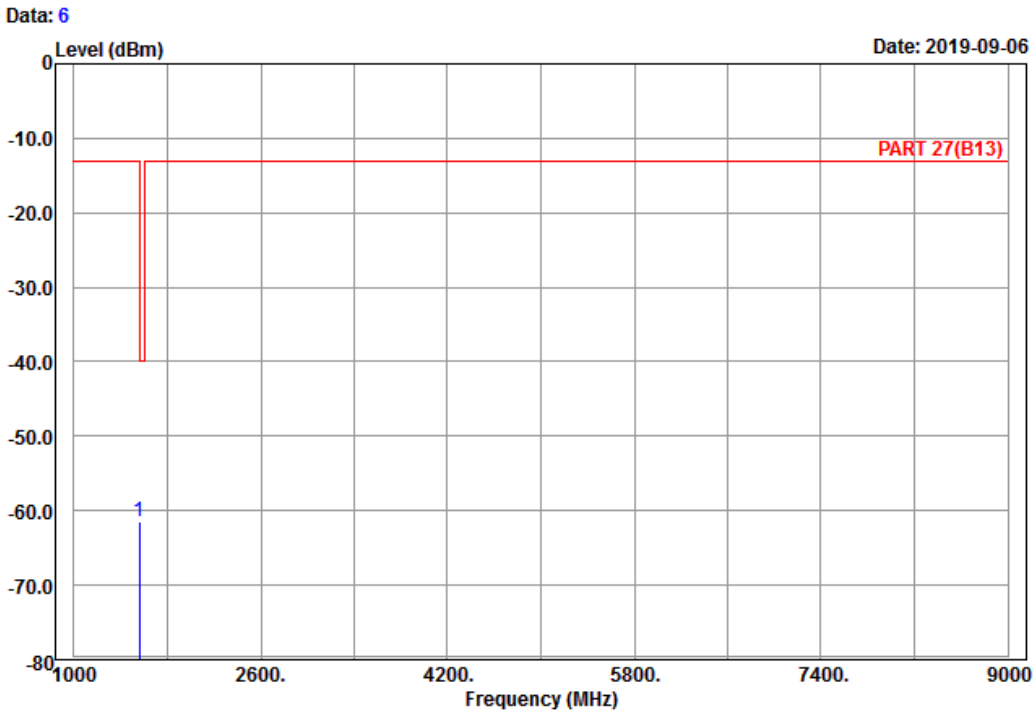
LTE Band 13
Channel Bandwidth: 5 MHz / QPSK
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch




```
Site      : 966 chamber 1
Condition: PART 27(B13) Horizontal
Remark    : LTE_Band 13_Link_L-Ch
Tested by: Karl Lee
                          Read  Limit   Over
           Freq  Level  Level   Line  Limit Factor Remark
      ________ ______ ______ ______ ______ ______ __________
            MHz    dBm    dBm    dBm     dB     dB

  1 pp  1559.00 -61.06 -67.92 -40.00 -21.06   6.86 Peak
```

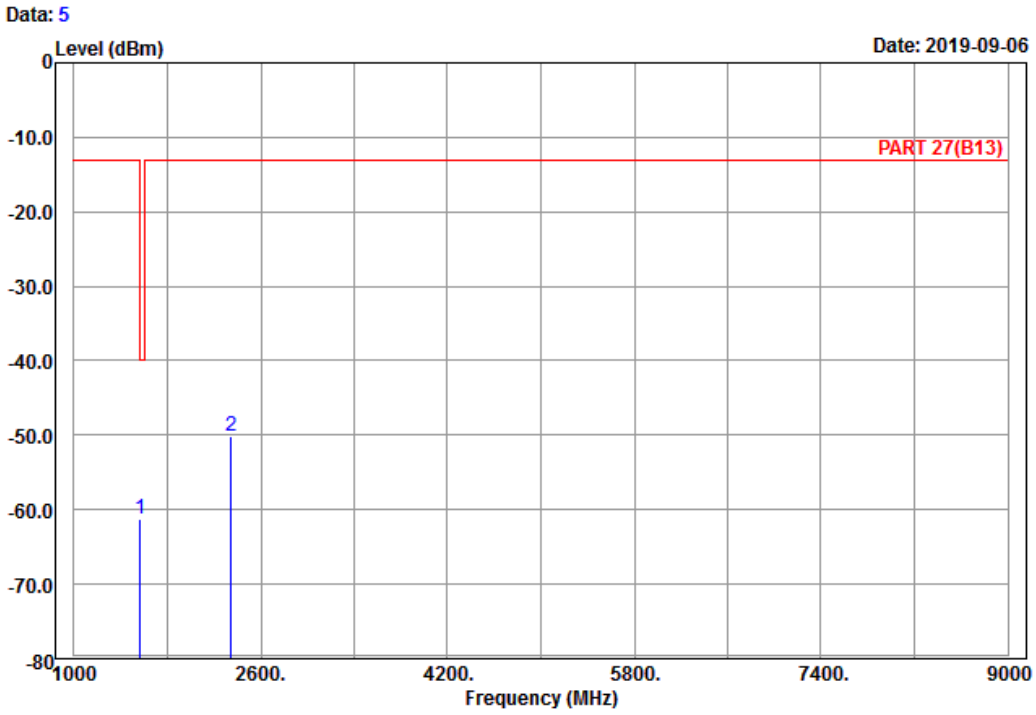


Site : 966 chamber 1
Condition: PART 27(B13) Vertical
Remark : LTE_Band 13_Link_L-Ch
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1559.00	-61.50	-68.36	-40.00	-21.50	6.86	Peak

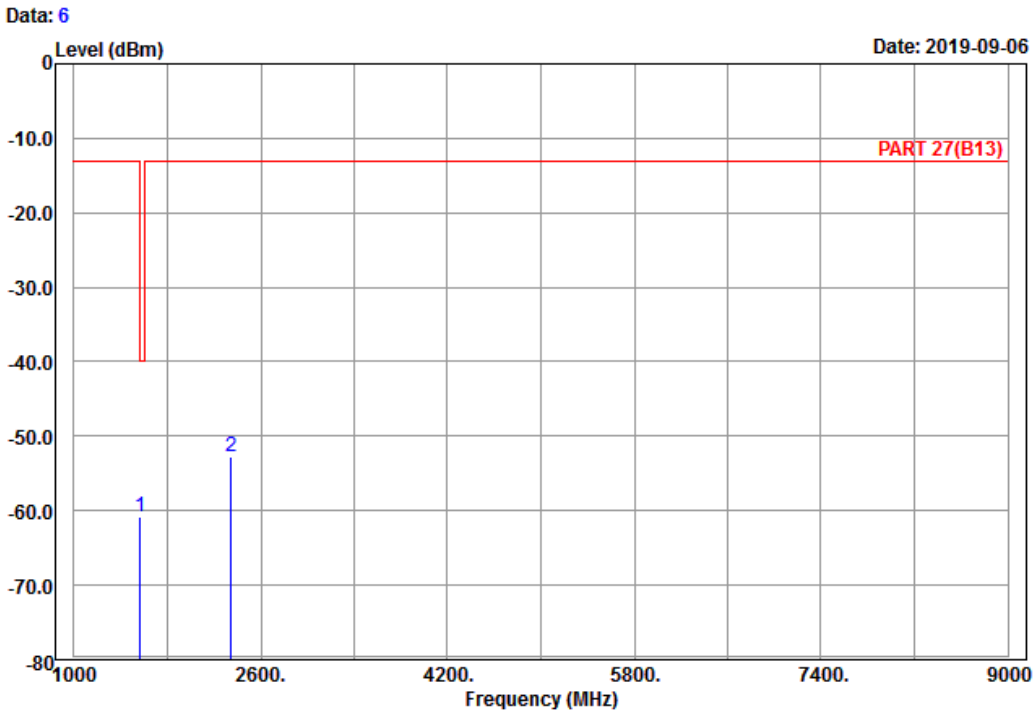
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1564.00	-61.35	-68.21	-40.00	-21.35	6.86	Peak
2	2346.00	-50.21	-61.15	-13.00	-37.21	10.94	Peak

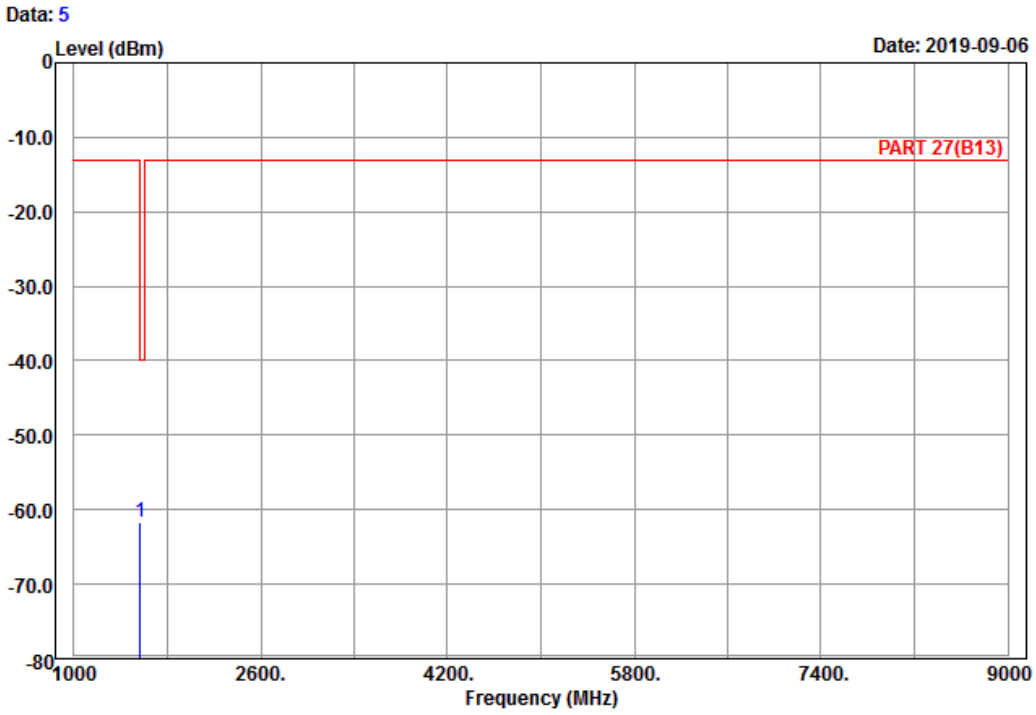


Site : 966 chamber 1
Condition: PART 27(B13) Vertical
Remark : LTE_Band 13_Link_M-Ch
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1564.00	-60.91	-67.77	-40.00	-20.91	6.86	Peak
2	2346.00	-52.66	-63.60	-13.00	-39.66	10.94	Peak

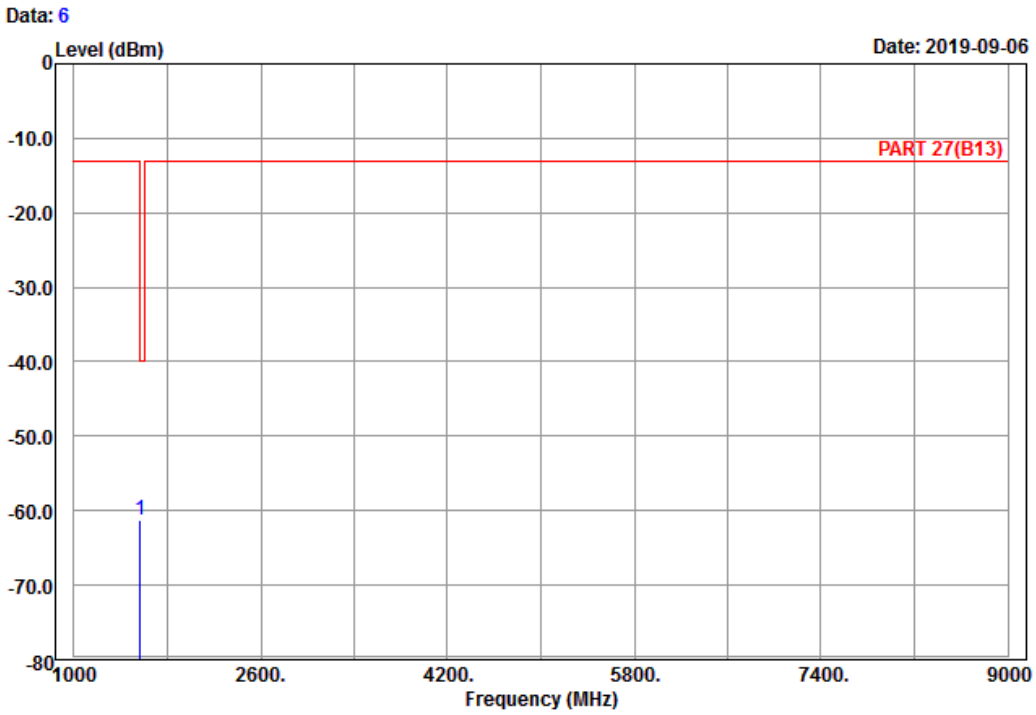
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1569.00	-61.79	-68.83	-40.00	-21.79	7.04	Peak

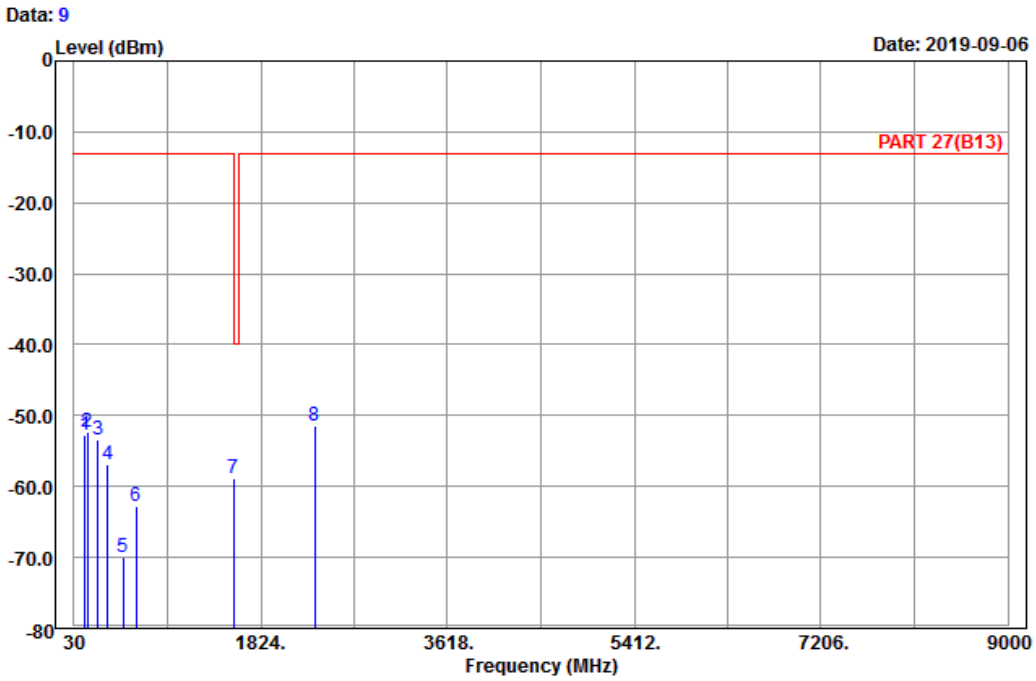


Site : 966 chamber 1
Condition: PART 27(B13) Vertical
Remark : LTE_Band 13_Link_H-Ch
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1569.00	-61.24	-68.28	-40.00	-21.24	7.04	Peak

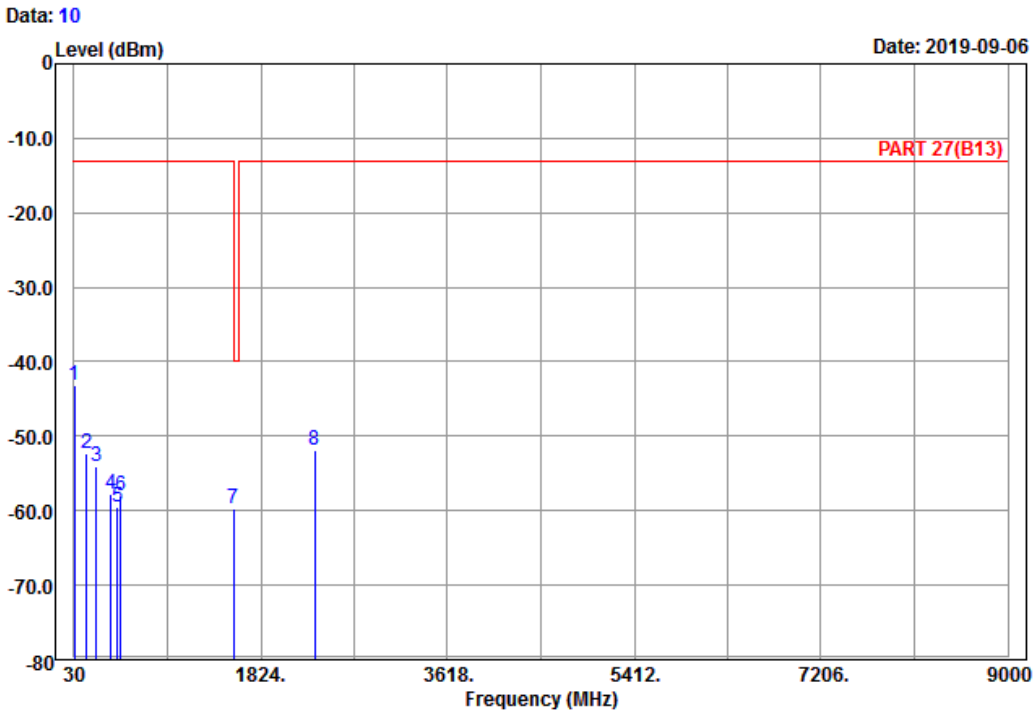
Channel Bandwidth: 10 MHz / QPSK
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	135.57	-52.67	-45.00	-13.00	-39.67	-7.67	Peak
2	156.90	-52.37	-44.62	-13.00	-39.37	-7.75	Peak
3	263.82	-53.37	-47.74	-13.00	-40.37	-5.63	Peak
4	355.30	-56.89	-51.77	-13.00	-43.89	-5.12	Peak
5	499.50	-70.01	-64.75	-13.00	-57.01	-5.26	Peak
6	629.70	-62.74	-62.84	-13.00	-49.74	0.10	Peak
7 pp	1564.00	-58.93	-65.79	-40.00	-18.93	6.86	Peak
8	2346.00	-51.55	-62.49	-13.00	-38.55	10.94	Peak



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	32.16	-43.13	-32.37	-13.00	-30.13	-10.76	Peak
2	148.80	-52.35	-44.45	-13.00	-39.35	-7.90	Peak
3	241.41	-53.99	-48.37	-13.00	-40.99	-5.62	Peak
4	385.40	-57.82	-54.30	-13.00	-44.82	-3.52	Peak
5	449.80	-59.45	-55.60	-13.00	-46.45	-3.85	Peak
6	479.20	-57.96	-53.28	-13.00	-44.96	-4.68	Peak
7 pp	1564.00	-59.66	-66.52	-40.00	-19.66	6.86	Peak
8	2346.00	-51.88	-62.82	-13.00	-38.88	10.94	Peak

5 Pictures of Test Arrangements

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

Appendix – Information of the Testing Laboratories

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

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

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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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