

## Partial FCC Test Report

### (PART 24)

**Report No.:** RF180604C04-1 R1

**FCC ID:** A4R-WT3

**Test Model:** L850-GL

**Received Date:** Jun. 04, 2018

**Test Date:** Jun. 21, 2018 ~ Jul. 03, 2018

**Issued Date:** Sep. 03, 2018

**Applicant:** Google LLC

**Address:** 1600 Amphitheatre Parkway, Mountain View, California, United States  
94043

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

**Lab Address:** No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan  
( R.O.C )

**Test Location:** No.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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## Table of Contents

<b>Release Control Record .....</b>	<b>3</b>
<b>1 Certificate of Conformity .....</b>	<b>4</b>
<b>2 Summary of Test Results .....</b>	<b>5</b>
2.1 Measurement Uncertainty .....	5
2.2 Test Site and Instruments .....	6
<b>3 General Information .....</b>	<b>8</b>
3.1 General Description of EUT .....	8
3.2 Configuration of System under Test .....	9
3.2.1 Description of Support Units .....	9
3.3 Test Mode Applicability and Tested Channel Detail .....	10
3.4 EUT Operating Conditions .....	11
3.5 General Description of Applied Standards .....	11
<b>4 Test Types and Results .....</b>	<b>12</b>
4.1 Output Power Measurement .....	12
4.1.1 Limits of Output Power Measurement .....	12
4.1.2 Test Procedures .....	12
4.1.3 Test Setup .....	13
4.1.4 Test Results .....	14
4.2 Radiated Emission Measurement .....	18
4.2.1 Limits of Radiated Emission Measurement .....	18
4.2.2 Test Procedure .....	18
4.2.3 Deviation from Test Standard .....	18
4.2.4 Test Setup .....	19
4.2.5 Test Results .....	20
<b>5 Pictures of Test Arrangements .....</b>	<b>44</b>
<b>Appendix – Information on the Testing Laboratories .....</b>	<b>45</b>

### Release Control Record

Issue No.	Description	Date Issued
RF180604C04-1	Original Release	Jul. 23, 2018
RF180604C04-1 R1	Revised to C2PC.	Sep. 03, 2018

## 1 Certificate of Conformity

**Product:** LTE module  
**Brand:** Fibocom  
**Test Model:** L850-GL  
**Sample Status:** Production Unit  
**Applicant:** Google LLC  
**Test Date:** Jun. 21, 2018 ~ Jul. 03, 2018  
**Standards:** FCC Part 24, Subpart E

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

**Prepared by :** Rona Chen , **Date:** Sep. 03, 2018  
Rona Chen / Specialist

**Approved by :** Dylan Chiou , **Date:** Sep. 03, 2018  
Dylan Chiou / Project Engineer

## 2 Summary of Test Results

Applied Standard: FCC Part 24 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 24.232	Effective Isotropic Radiated Power	Pass	Meet the requirement of limit.
2.1046 24.232(d)	Peak to Average Ratio	N/A	Refer to Note
2.1055 24.235	Frequency Stability	N/A	Refer to Note
2.1049 24.238(b)	Occupied Bandwidth	N/A	Refer to Note
24.238(b)	Band Edge Measurements	N/A	Refer to Note
2.1051 24.238	Conducted Spurious Emissions	N/A	Refer to Note
2.1053 24.238	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -24.62 dB at 3760.00 MHz.

### Note:

This report is a partial report. Therefore, only test item of Effective Isotropic Radiated Power and Radiated Spurious Emissions tests were performed for this report. Other testing data please refer to BV CPS report no.: RF170106C02-1 for module (Brand: Fibocom, Model: L850-GL)

### 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) (±)
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.44 dB
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 Agilent	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
Power Meter Anritsu	ML2495A	1012010	Aug. 15, 2017	Aug. 14, 2018
Power Sensor Anritsu	MA2411B	1315050	Aug. 15, 2017	Aug. 14, 2018
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(RF C-SMS-100-SMS- 120+RFC-SMS-1 00-SMS-400)	Jun. 19, 2018	Jun. 18, 2019
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(RF C-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
Communications Tester-Wireless Agilent	8960 Series 10	MY53201073	Jun. 28, 2017	Jun. 27, 2019
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. 30, 2017 Jun. 29, 2018	Jun. 29, 2018 Jun. 28, 2019
HORN Antenna Schwarzbeck	BBHA 9120D	9120D-969	Dec. 12, 2017	Dec. 11, 2018

- 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

<b>Product</b>	LTE module	
<b>Brand</b>	Fibocom	
<b>Test Model</b>	L850-GL	
<b>Status of EUT</b>	Production Unit	
<b>Power Supply Rating</b>	5.0 Vdc (Host equipment)	
<b>Modulation Type</b>	WCDMA	QPSK
	LTE	QPSK, 16QAM
<b>Frequency Range</b>	WCDMA	1852.4 ~ 1907.6 MHz
	LTE Band 2 (Channel Bandwidth: 1.4 MHz)	1850.7 ~ 1909.3 MHz
	LTE Band 2 (Channel Bandwidth: 3 MHz)	1851.5 ~ 1908.5 MHz
	LTE Band 2 (Channel Bandwidth: 5 MHz)	1852.5 ~ 1907.5 MHz
	LTE Band 2 (Channel Bandwidth: 10 MHz)	1855.0 ~ 1905.0 MHz
	LTE Band 2 (Channel Bandwidth: 15 MHz)	1857.5 ~ 1902.5 MHz
	LTE Band 2 (Channel Bandwidth: 20 MHz)	1860.0 ~ 1900.0 MHz
<b>Max. EIRP Power</b>	WCDMA	401.79 mW
	LTE Band 2 (Channel Bandwidth: 1.4 MHz)	196.34 mW
	LTE Band 2 (Channel Bandwidth: 3 MHz)	197.70 mW
	LTE Band 2 (Channel Bandwidth: 5 MHz)	199.53 mW
	LTE Band 2 (Channel Bandwidth: 10 MHz)	200.91 mW
	LTE Band 2 (Channel Bandwidth: 15 MHz)	202.30 mW
	LTE Band 2 (Channel Bandwidth: 20 MHz)	205.59 mW
<b>Antenna Type</b>	Refer to Note as below	
<b>Accessory Device</b>	Refer to Note as below	
<b>Data Cable Supplied</b>	Refer to Note as below	

Note:

1. The EUT was installed in a specific End-product.

Product	Brand	Model
Study Hub	Verily	WT3

2. The antenna information is listed as below.

Antenna Type	Fixed Internal	
	WCDMA	LTE
Band	II	2
Gain	3.81	3.81

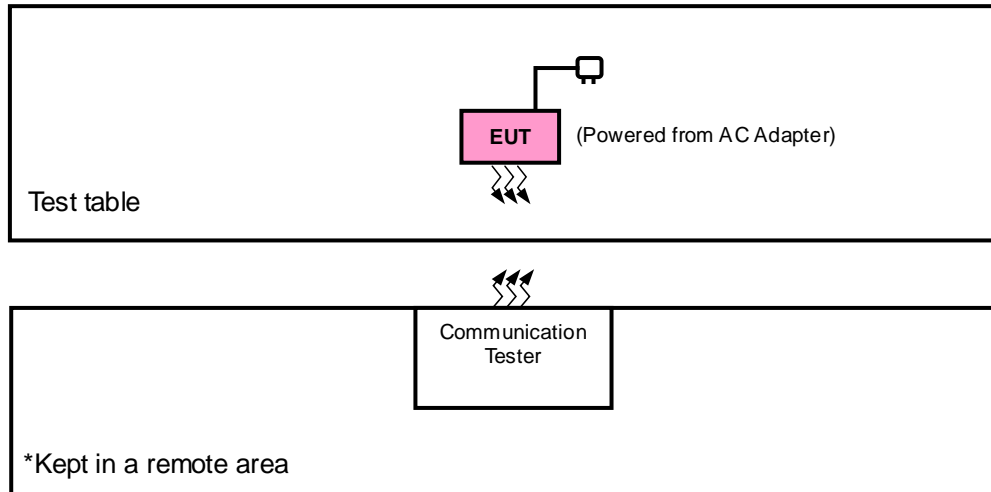
3. The End-product contains following accessory devices.

Product	Brand	Model	Description
Adapter	TPT	MSS050200WI	I/P: 100-240 Vac, 50-60 Hz, 0.3 A O/P: 5 Vdc, 2 A 1.5m shielded cable w/o core
BT/WLAN Module	AzureWave	AW-CM389NF	--
WWAN Module	Fibocom	L850-GL	--

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.	Communications Tester-Wireless	Agilent	8960 Series 10	MY53201073	N/A
2.	Radio Communication Analyzer	Anritsu	MT8820C	6201300640	N/A

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

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Items 1-2 acted as communication partners to transfer data.

### 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	EIRP	Radiated Emission
WCDMA	Y-plane	X-axis
LTE Band 2	Y-plane	X-axis

#### WCDMA

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	EIRP	9262 to 9538	9262, 9400, 9538	WCDMA
-	Radiated Emission	9262 to 9538	9262, 9400, 9538	WCDMA

#### LTE Band 2

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	18607 to 19193	18607, 18900, 19193	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Radiated Emission	18607 to 19193	18607, 18900, 19193	1.4 MHz	QPSK	1 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5 MHz	QPSK	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20 MHz	QPSK	1 RB / 0 RB Offset

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

#### Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
EIRP	25 deg. C, 65 % RH	120 Vac, 60 Hz	Charles Hsiao
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 24**

**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

Mobile / Portable station are limited to 2 watts e.i.r.p.

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

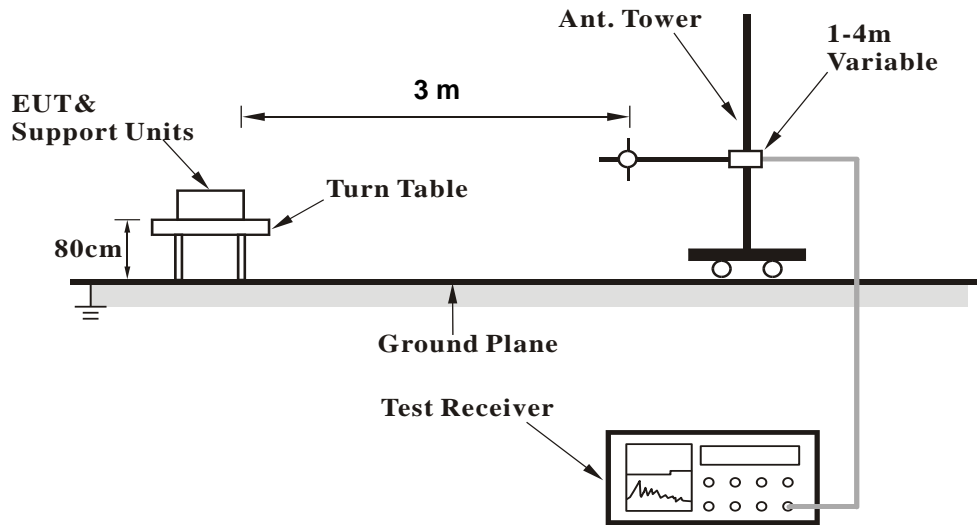
##### **Conducted Power Measurement:**

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

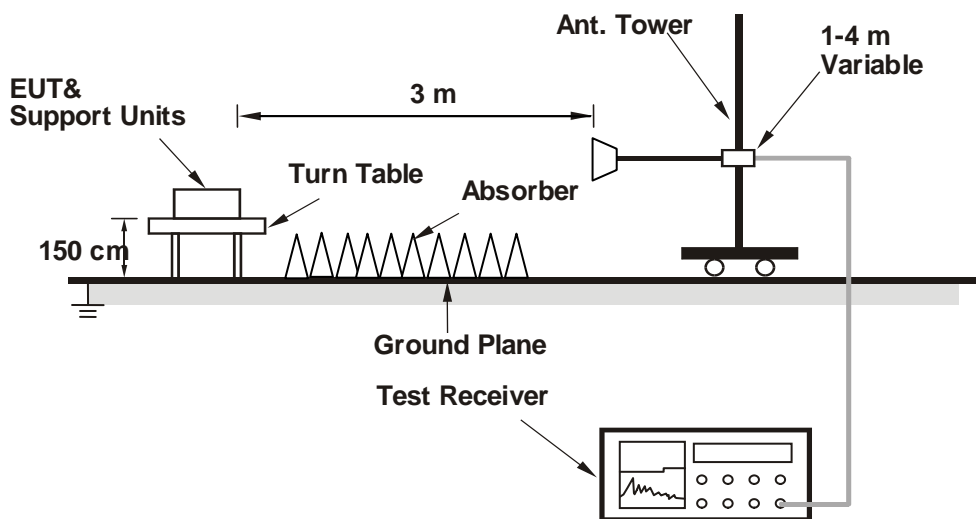
4.1.3 Test Setup

**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

**EIRP Power (dBm)**

WCDMA							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Y	9262	1852.4	-15.12	38.19	23.07	202.77	H
	9400	1880.0	-15.60	38.70	23.10	204.17	
	9538	1907.6	-16.34	39.35	23.01	199.99	
	9262	1852.4	-12.46	38.48	26.02	399.94	V
	9400	1880.0	-12.55	38.59	26.04	401.79	
	9538	1907.6	-12.87	38.87	26.00	398.11	

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

LTE Band 2							
Channel Bandwidth: 1.4 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Y	18607	1850.7	-28.78	44.70	15.92	39.08	H
	18900	1880.0	-28.75	44.70	15.95	39.36	
	19193	1909.3	-28.71	44.57	15.86	38.57	
	18607	1850.7	-21.38	44.27	22.89	194.54	V
	18900	1880.0	-21.94	44.87	22.93	196.34	
	19193	1909.3	-21.73	44.61	22.88	194.22	
Channel Bandwidth: 1.4 MHz / 16QAM							
Y	18607	1850.7	-29.80	44.70	14.90	30.90	H
	18900	1880.0	-29.79	44.70	14.91	30.97	
	19193	1909.3	-29.73	44.57	14.84	30.50	
	18607	1850.7	-22.39	44.27	21.88	154.17	V
	18900	1880.0	-22.96	44.87	21.91	155.24	
	19193	1909.3	-22.74	44.61	21.87	153.92	

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

LTE Band 2							
Channel Bandwidth: 3 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Y	18615	1851.5	-28.74	44.70	15.96	39.45	H
	18900	1880.0	-28.72	44.70	15.98	39.63	
	19185	1908.5	-28.67	44.57	15.90	38.93	
	18615	1851.5	-21.34	44.27	22.93	196.34	V
	18900	1880.0	-21.91	44.87	22.96	197.70	
	19185	1908.5	-21.70	44.61	22.91	195.57	
Channel Bandwidth: 3 MHz / 16QAM							
Y	18615	1851.5	-29.77	44.70	14.93	31.12	H
	18900	1880.0	-29.74	44.70	14.96	31.33	
	19185	1908.5	-29.69	44.57	14.88	30.78	
	18615	1851.5	-22.35	44.27	21.92	155.60	V
	18900	1880.0	-22.91	44.87	21.96	157.04	
	19185	1908.5	-22.72	44.61	21.89	154.63	

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

LTE Band 2							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Y	18625	1852.5	-28.71	44.70	15.99	39.72	H
	18900	1880.0	-28.69	44.70	16.01	39.90	
	19175	1907.5	-28.63	44.57	15.94	39.29	
	18625	1852.5	-21.30	44.27	22.97	198.15	V
	18900	1880.0	-21.87	44.87	23.00	199.53	
	19175	1907.5	-21.65	44.61	22.96	197.83	
Channel Bandwidth: 5 MHz / 16QAM							
Y	18625	1852.5	-29.72	44.70	14.98	31.48	H
	18900	1880.0	-29.69	44.70	15.01	31.70	
	19175	1907.5	-29.64	44.57	14.93	31.14	
	18625	1852.5	-22.31	44.27	21.96	157.04	V
	18900	1880.0	-22.88	44.87	21.99	158.12	
	19175	1907.5	-22.67	44.61	21.94	156.42	

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

LTE Band 2							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Y	18650	1855.0	-28.67	44.70	16.03	40.09	H
	18900	1880.0	-28.65	44.70	16.05	40.27	
	19150	1905.0	-28.58	44.57	15.99	39.75	
	18650	1855.0	-21.25	44.27	23.02	200.45	V
	18900	1880.0	-21.84	44.87	23.03	200.91	
	19150	1905.0	-21.61	44.61	23.00	199.66	
Channel Bandwidth: 10 MHz / 16QAM							
Y	18650	1855.0	-29.68	44.70	15.02	31.77	H
	18900	1880.0	-29.67	44.70	15.03	31.84	
	19150	1905.0	-29.58	44.57	14.99	31.57	
	18650	1855.0	-22.26	44.27	22.01	158.85	V
	18900	1880.0	-22.85	44.87	22.02	159.22	
	19150	1905.0	-22.63	44.61	21.98	157.87	

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

LTE Band 2							
Channel Bandwidth: 15 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Y	18675	1857.5	-28.64	44.70	16.06	40.36	H
	18900	1880.0	-28.61	44.70	16.09	40.64	
	19125	1902.5	-28.53	44.57	16.04	40.21	
	18675	1857.5	-21.24	44.27	23.03	200.91	V
	18900	1880.0	-21.81	44.87	23.06	202.30	
	19125	1902.5	-21.61	44.61	23.00	199.66	
Channel Bandwidth: 15 MHz / 16QAM							
Y	18675	1857.5	-29.66	44.70	15.04	31.92	H
	18900	1880.0	-29.63	44.70	15.07	32.14	
	19125	1902.5	-29.54	44.57	15.03	31.86	
	18675	1857.5	-22.25	44.27	22.02	159.22	V
	18900	1880.0	-22.82	44.87	22.05	160.32	
	19125	1902.5	-22.63	44.61	21.98	157.87	

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



LTE Band 2							
Channel Bandwidth: 20 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Y	18700	1860.0	-28.60	44.70	16.10	40.74	H
	18900	1880.0	-28.58	44.70	16.12	40.93	
	19100	1900.0	-28.50	44.57	16.07	40.49	
	18700	1860.0	-21.16	44.27	23.11	204.64	V
	18900	1880.0	-21.74	44.87	23.13	205.59	
	19100	1900.0	-21.54	44.61	23.07	202.91	
Channel Bandwidth: 20 MHz / 16QAM							
Y	18700	1860.0	-29.61	44.70	15.09	32.28	H
	18900	1880.0	-29.58	44.70	15.12	32.51	
	19100	1900.0	-29.51	44.57	15.06	32.08	
	18700	1860.0	-22.17	44.27	22.10	162.18	V
	18900	1880.0	-22.75	44.87	22.12	162.93	
	19100	1900.0	-22.56	44.61	22.05	160.44	

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

## 4.2 Radiated Emission Measurement

### 4.2.1 Limits of Radiated Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. The emission limit is equal to -13 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.  $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$ .
- d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole,  $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15 \text{ dB}$ .

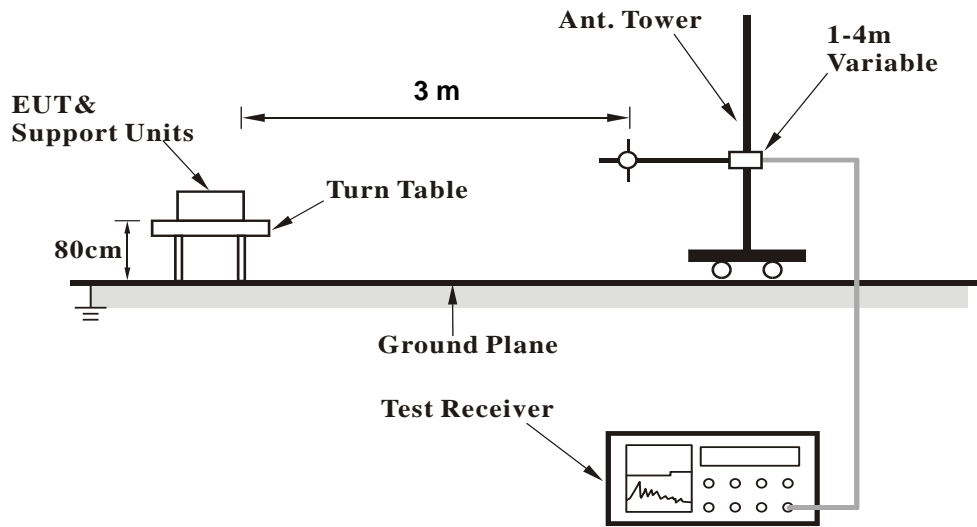
**NOTE:** The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz/3 MHz.

### 4.2.3 Deviation from Test Standard

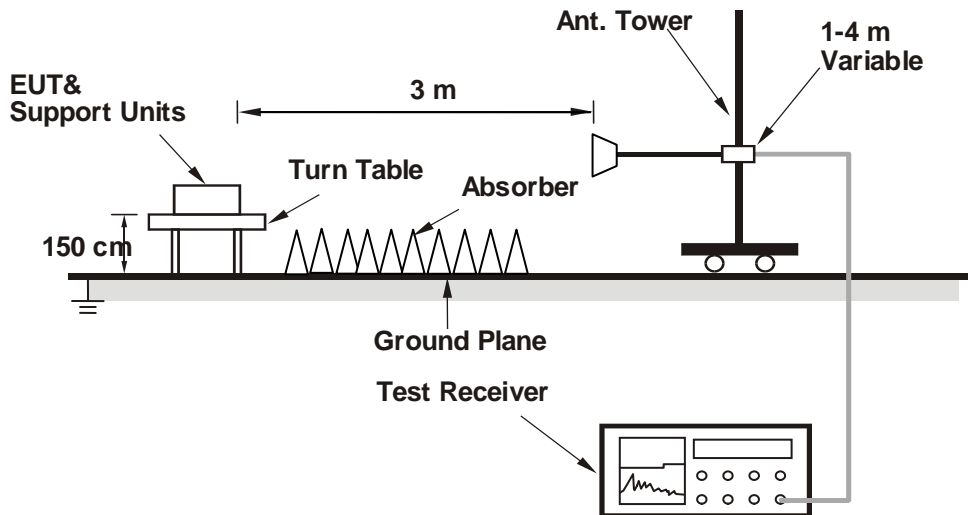
No deviation.

#### 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

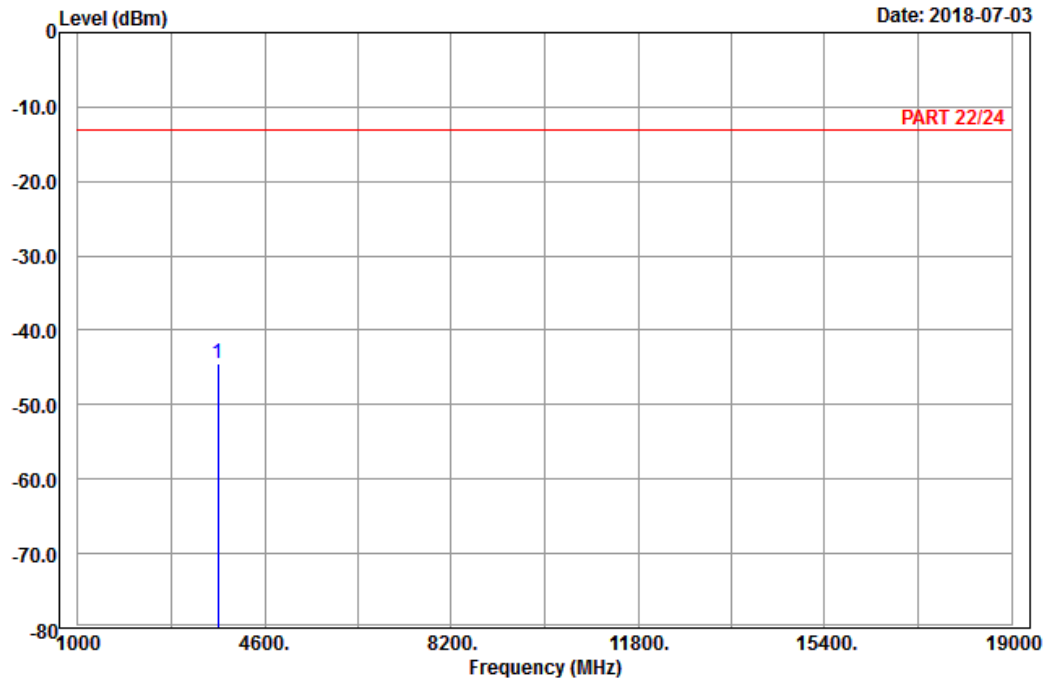


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2018-07-03



Site : 966 chamber 1  
 Condition: PART 22/24 Horizontal  
 Remark : Bnad II\_Link\_CH9262  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	pp 3704.80	-44.56	-60.44	-13.00	-31.56	15.88	Peak

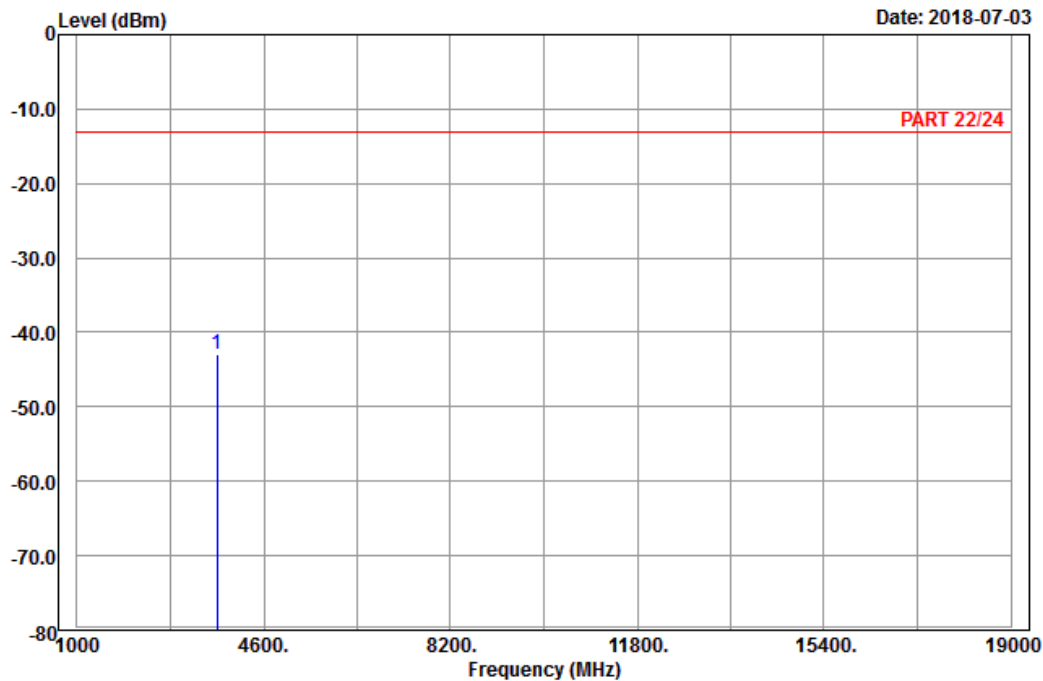


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2018-07-03



Site : 966 chamber 1  
 Condition: PART 22/24 Vertical  
 Remark : Bnad II\_Link\_CH9262  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	pp 3704.80	-43.02	-58.90	-13.00	-30.02	15.88	Peak

Middle Channel

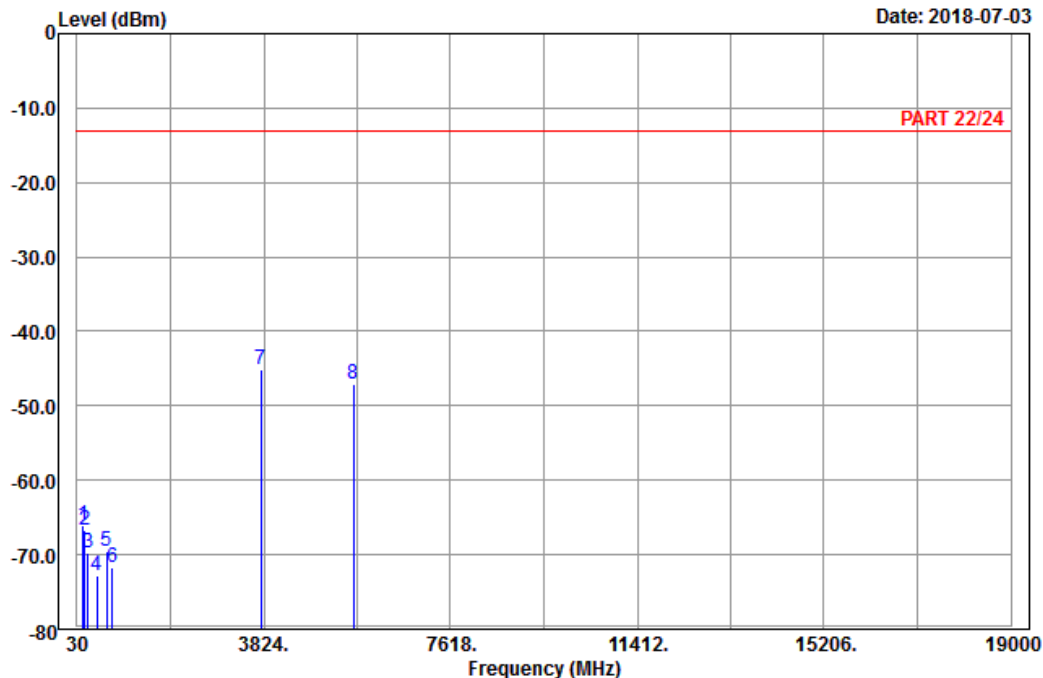


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 13

Date: 2018-07-03



Site : 966 chamber 1  
 Condition: PART 22/24 Horizontal  
 Remark : Bnad II\_Link\_CH9400  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	152.85	-66.04	-58.18	-13.00	-53.04	-7.86	Peak
2	193.35	-66.73	-60.86	-13.00	-53.73	-5.87	Peak
3	250.05	-69.78	-64.27	-13.00	-56.78	-5.51	Peak
4	428.10	-72.89	-69.53	-13.00	-59.89	-3.36	Peak
5	636.70	-69.45	-69.47	-13.00	-56.45	0.02	Peak
6	746.60	-71.70	-70.44	-13.00	-58.70	-1.26	Peak
7 pp	3760.00	-45.05	-61.19	-13.00	-32.05	16.14	Peak
8	5640.00	-47.12	-67.59	-13.00	-34.12	20.47	Peak

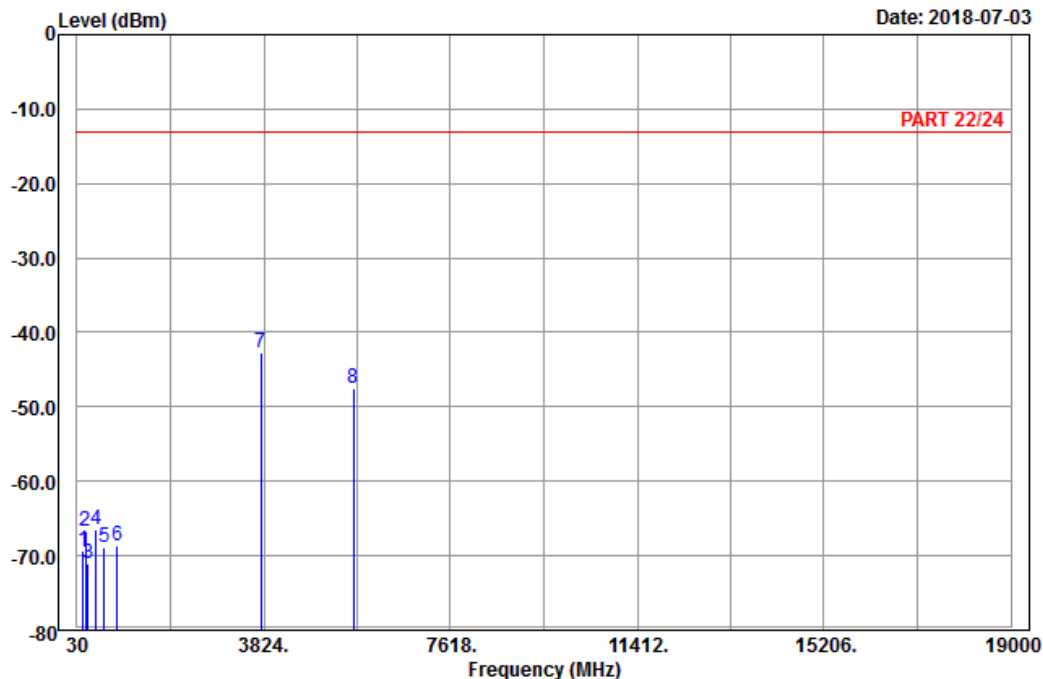


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 14

Date: 2018-07-03



Site : 966 chamber 1  
 Condition: PART 22/24 Vertical  
 Remark : Bnad II\_Link\_CH9400  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	154.47	-69.39	-61.55	-13.00	-56.39	-7.84	Peak
2	194.97	-66.71	-60.75	-13.00	-53.71	-5.96	Peak
3	255.72	-71.01	-65.45	-13.00	-58.01	-5.56	Peak
4	418.30	-66.46	-63.32	-13.00	-53.46	-3.14	Peak
5	577.90	-68.77	-68.27	-13.00	-55.77	-0.50	Peak
6	843.20	-68.72	-70.25	-13.00	-55.72	1.53	Peak
7 pp	3760.00	-42.70	-58.84	-13.00	-29.70	16.14	Peak
8	5640.00	-47.60	-68.07	-13.00	-34.60	20.47	Peak

# High Channel

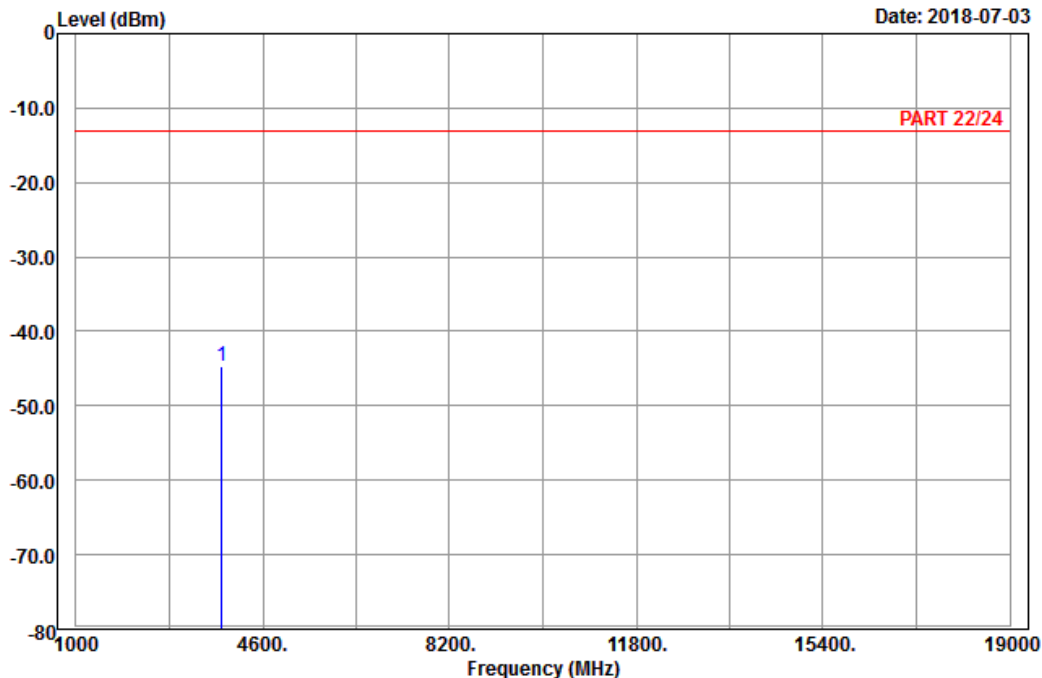


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2018-07-03



Site : 966 chamber 1  
 Condition: PART 22/24 Horizontal  
 Remark : Bnad II\_Link\_CH9538  
 Tested by: Karl Lee

Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3815.20	-44.68	-61.09	-13.00	-31.68	16.41	Peak



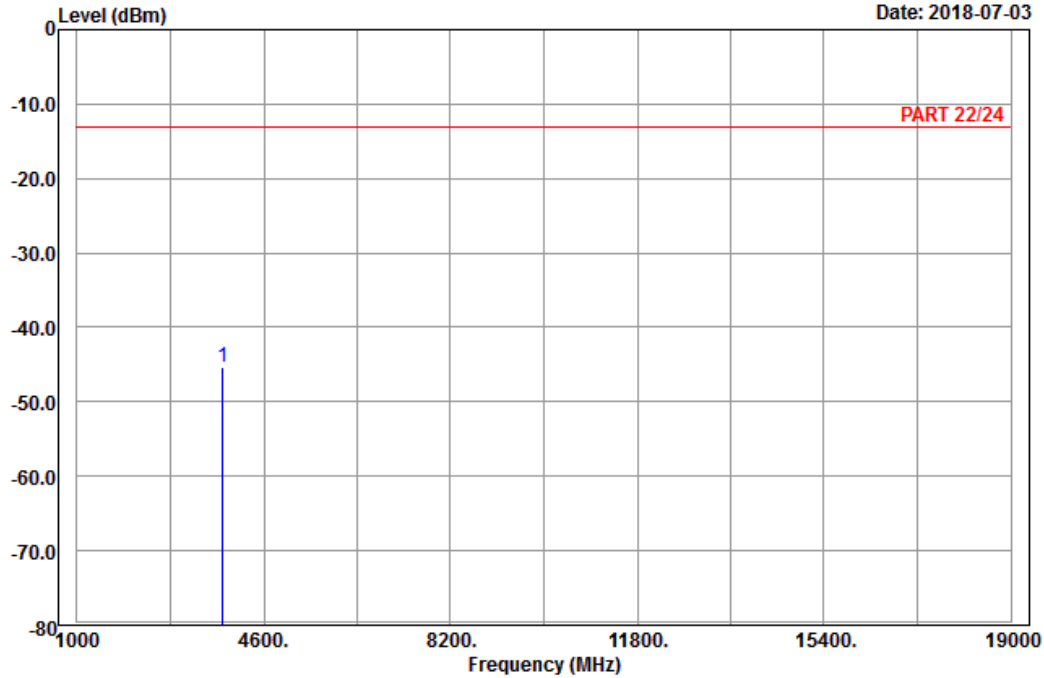


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2018-07-03



Site : 966 chamber 1  
 Condition: PART 22/24 Vertical  
 Remark : Bnad II\_Link\_CH9538  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	pp 3815.20	-45.44	-61.85	-13.00	-32.44	16.41	Peak

LTE Band 2  
 Channel Bandwidth: 1.4 MHz / QPSK  
 Low Channel

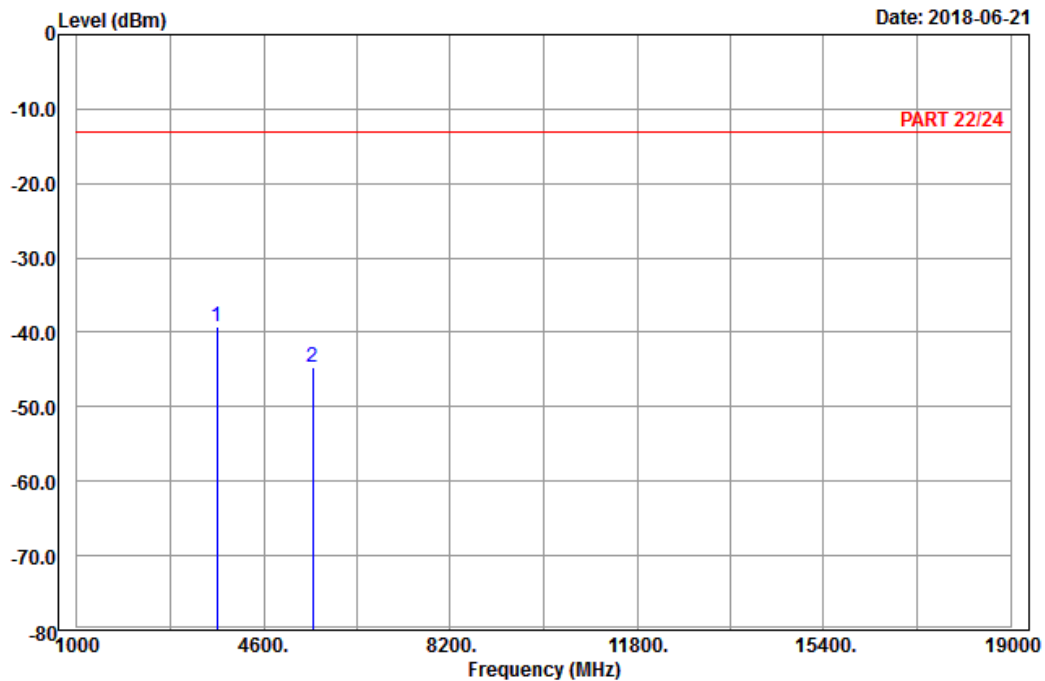


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2018-06-21



Site : 966 chamber 1  
 Condition: PART 22/24 Horizontal  
 Remark : LTE\_Band 2\_Link\_CH18607  
 Tested by: Karl Lee

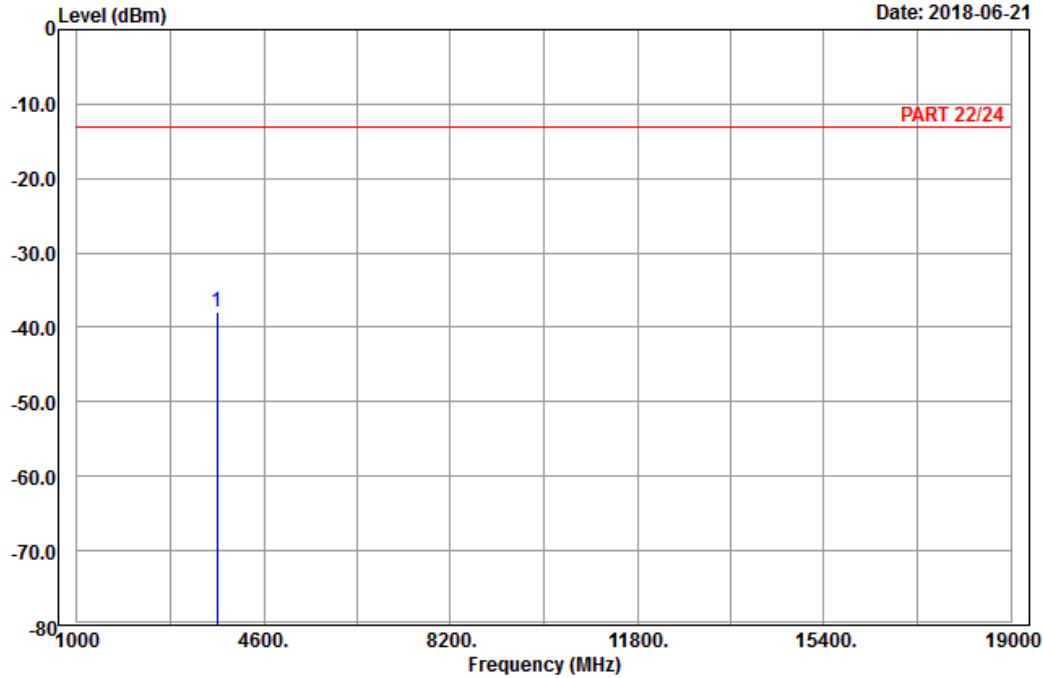
	Read	Limit	Over				
Freq	Level	Level	Line	Limit	Factor	Remark	
MHz	dBm	dBm	dBm	dB	dB		
1 pp	3701.40	-39.31	-55.19	-13.00	-26.31	15.88	Peak
2	5552.10	-44.68	-65.02	-13.00	-31.68	20.34	Peak



A D T

Data: 10

Date: 2018-06-21



Site : 966 chamber 1  
 Condition: PART 22/24 Vertical  
 Remark : LTE\_Band 2\_Link\_CH18607  
 Tested by: Karl Lee

	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3701.40	-38.02	-53.90	-13.00	-25.02	15.88	Peak

Middle Channel

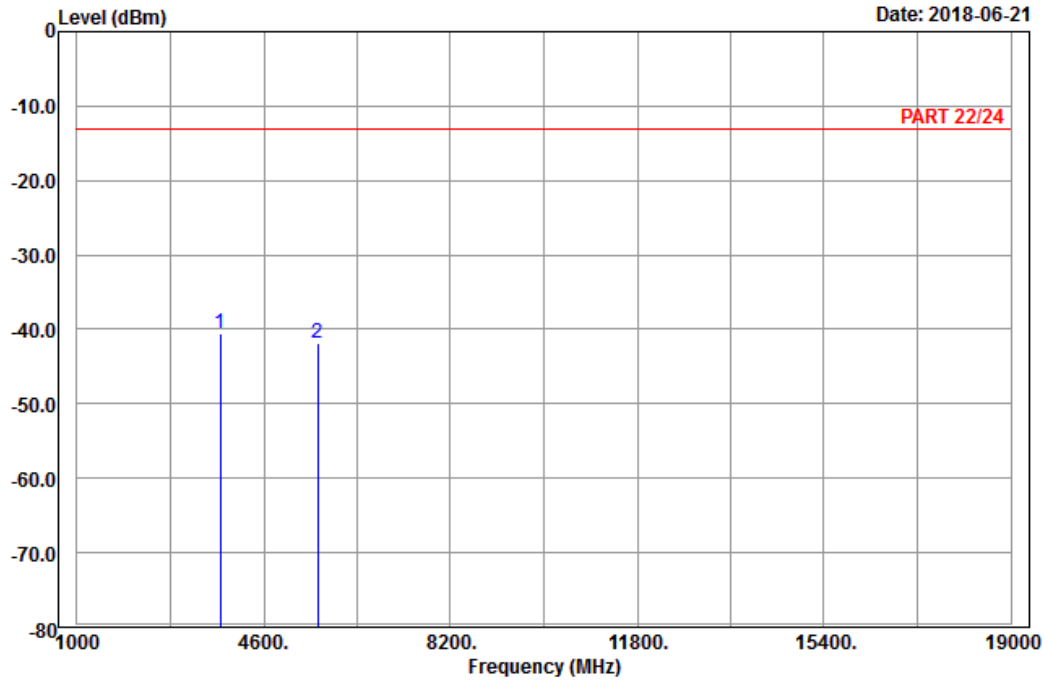


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2018-06-21



Site : 966 chamber 1  
 Condition: PART 22/24 Horizontal  
 Remark : LTE\_Band 2\_Link\_CH18900  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	pp 3760.00	-40.58	-56.72	-13.00	-27.58	16.14	Peak
2	5640.00	-41.95	-62.42	-13.00	-28.95	20.47	Peak

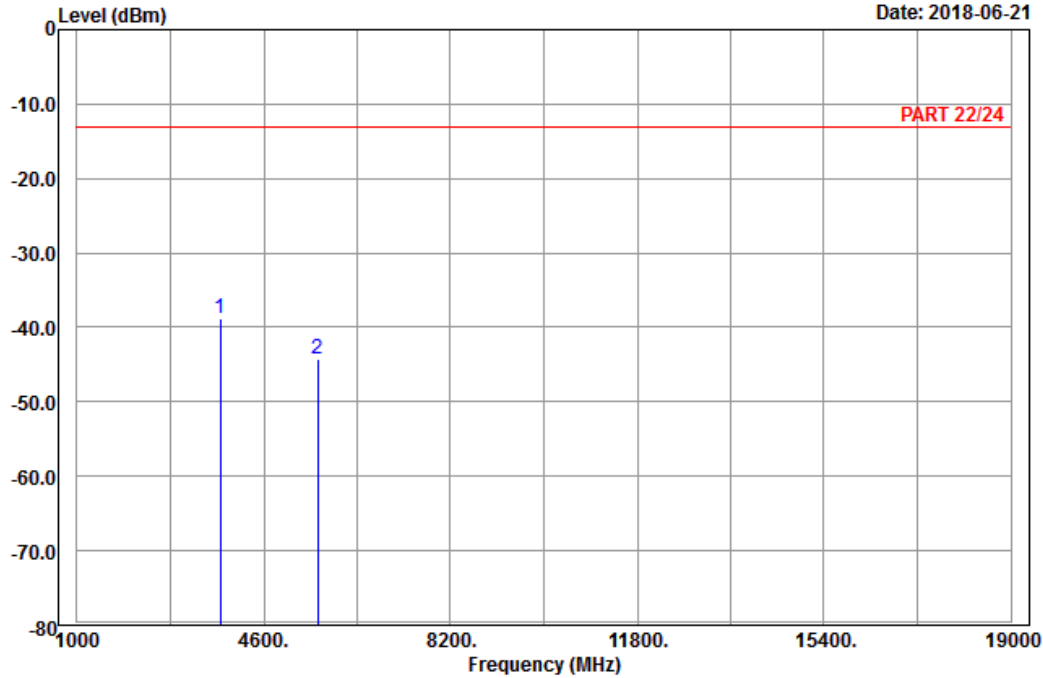


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2018-06-21



Site : 966 chamber 1  
 Condition: PART 22/24 Vertical  
 Remark : LTE\_Band 2\_Link\_CH18900  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	pp	3760.00	-38.89	-55.03	-13.00	-25.89	16.14 Peak
2		5640.00	-44.32	-64.79	-13.00	-31.32	20.47 Peak

High Channel

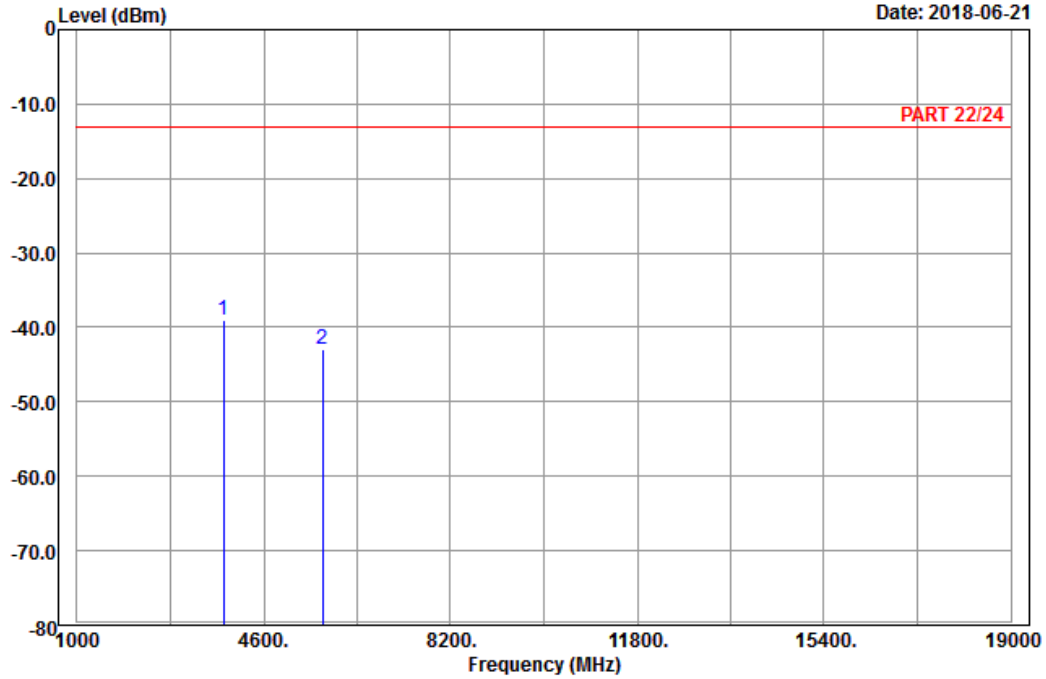


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2018-06-21



Site : 966 chamber 1  
 Condition: PART 22/24 Horizontal  
 Remark : LTE\_Band 2\_Link\_CH19193  
 Tested by: Karl Lee

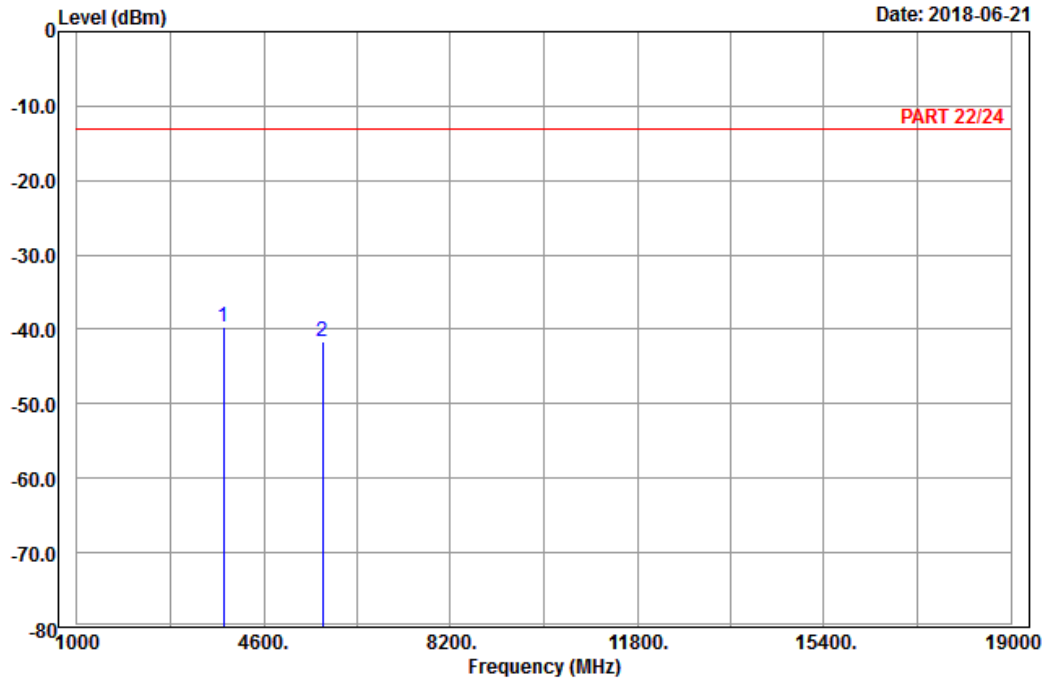
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	pp 3818.60	-39.01	-55.51	-13.00	-26.01	16.50	Peak
2	5727.90	-42.97	-63.31	-13.00	-29.97	20.34	Peak



A D T

Data: 10

Date: 2018-06-21



Site : 966 chamber 1  
 Condition: PART 22/24 Vertical  
 Remark : LTE\_Band 2\_Link\_CH19193  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3818.60	-39.76	-56.26	-13.00	-26.76	16.50	Peak
2	5727.90	-41.62	-61.96	-13.00	-28.62	20.34	Peak

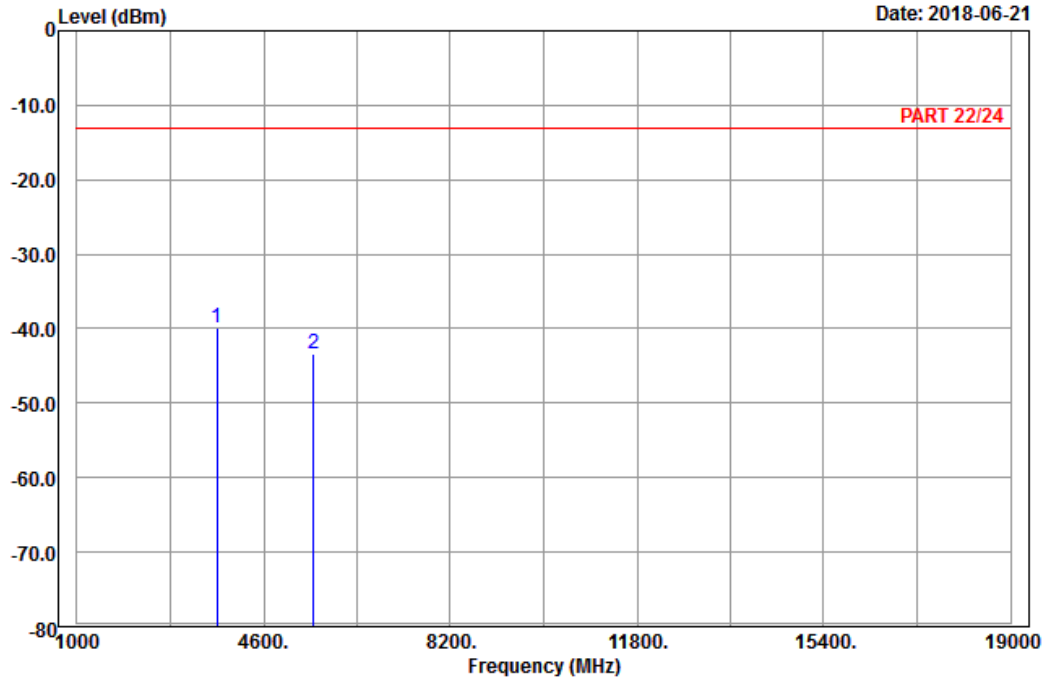
Channel Bandwidth: 5 MHz / QPSK  
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9



Site : 966 chamber 1  
Condition: PART 22/24 Horizontal  
Remark : LTE\_Band 2\_Link\_CH18625  
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3705.00	-39.87	-55.75	-13.00	-26.87	15.88	Peak
2	5557.50	-43.40	-63.74	-13.00	-30.40	20.34	Peak

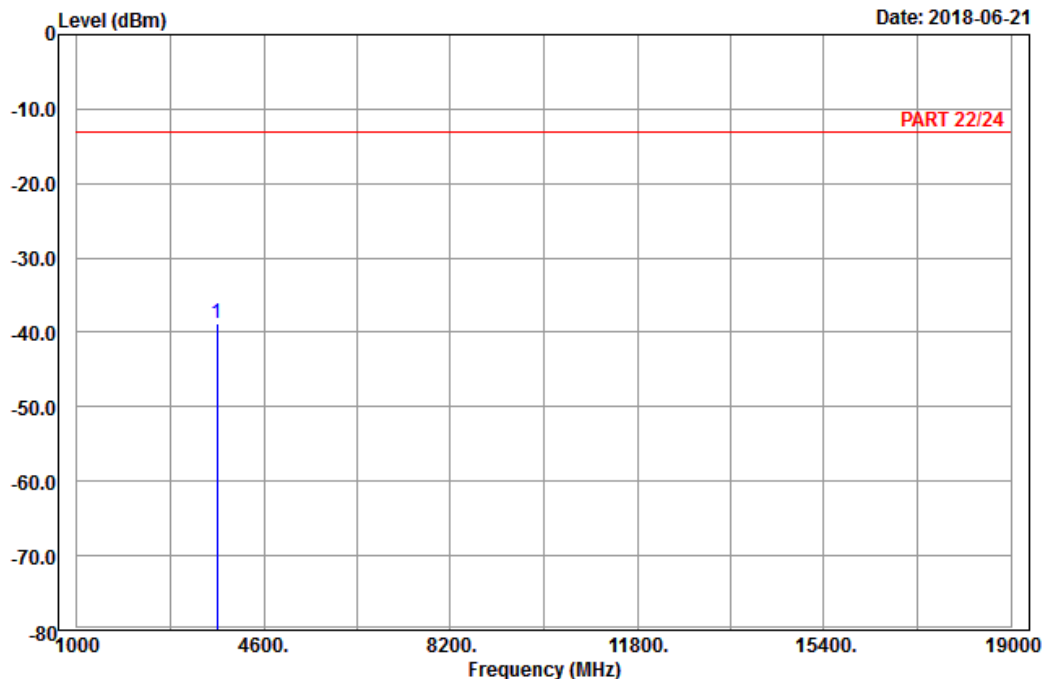




A D T

Data: 10

Date: 2018-06-21



Site : 966 chamber 1  
 Condition: PART 22/24 Vertical  
 Remark : LTE\_Band 2\_Link\_CH18625  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	pp 3705.00	-38.81	-54.69	-13.00	-25.81	15.88	Peak

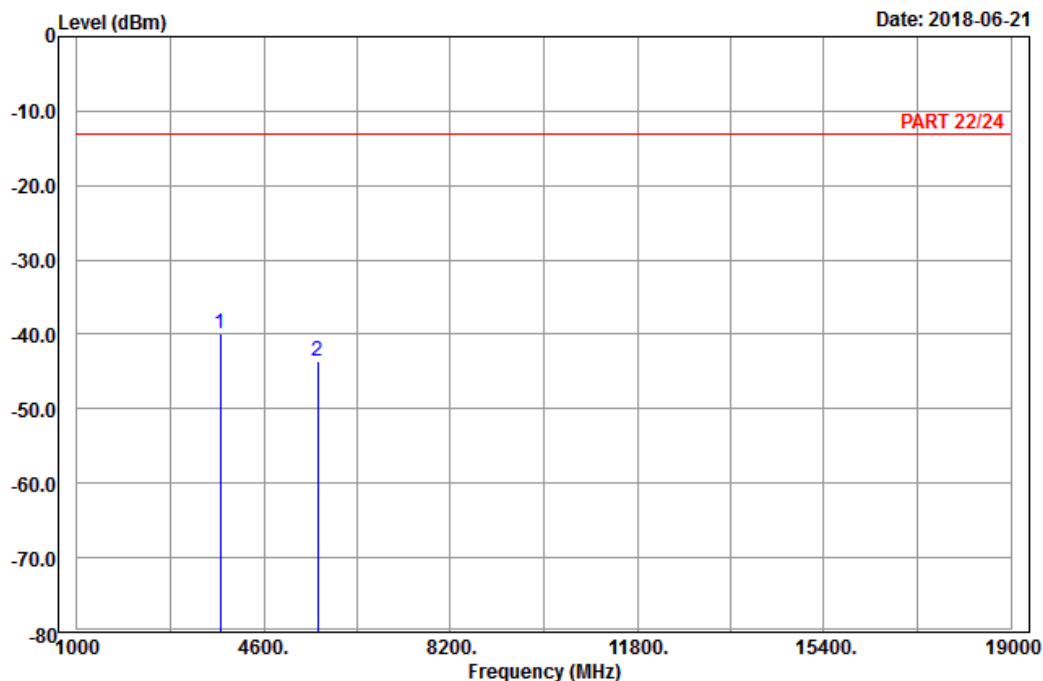
Middle Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9



Site : 966 chamber 1  
 Condition: PART 22/24 Horizontal  
 Remark : LTE\_Band 2\_Link\_CH18900  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3760.00	-39.83	-55.97	-13.00	-26.83	16.14	Peak
2	5640.00	-43.64	-64.11	-13.00	-30.64	20.47	Peak

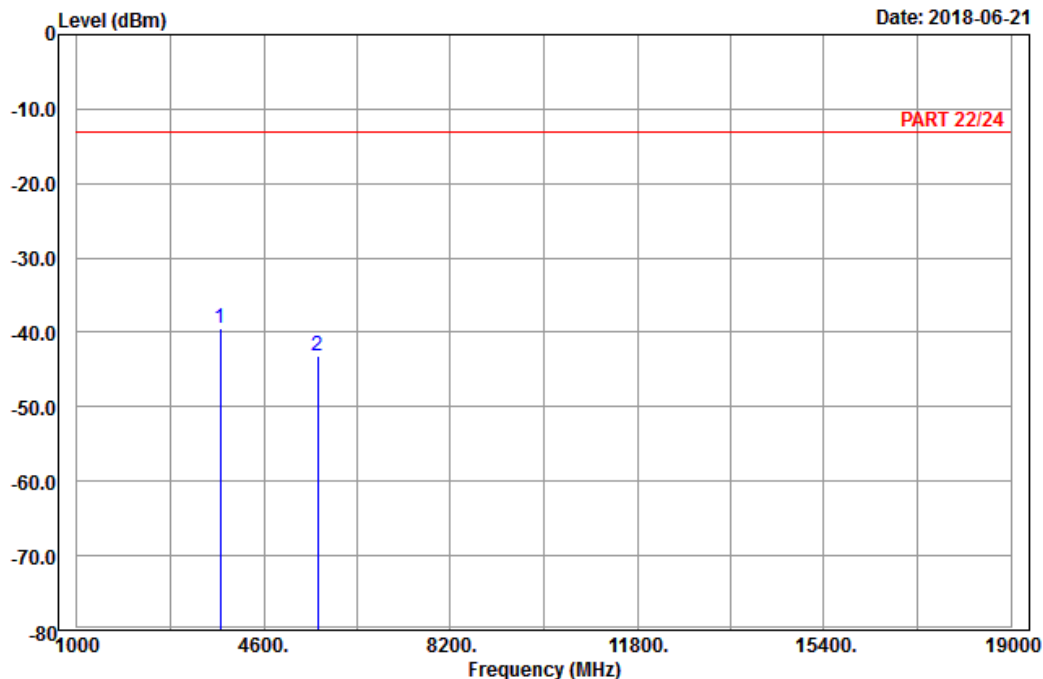


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2018-06-21



Site : 966 chamber 1  
 Condition: PART 22/24 Vertical  
 Remark : LTE\_Band 2\_Link\_CH18900  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	pp 3760.00	-39.46	-55.60	-13.00	-26.46	16.14	Peak
2	5640.00	-43.19	-63.66	-13.00	-30.19	20.47	Peak

# High Channel

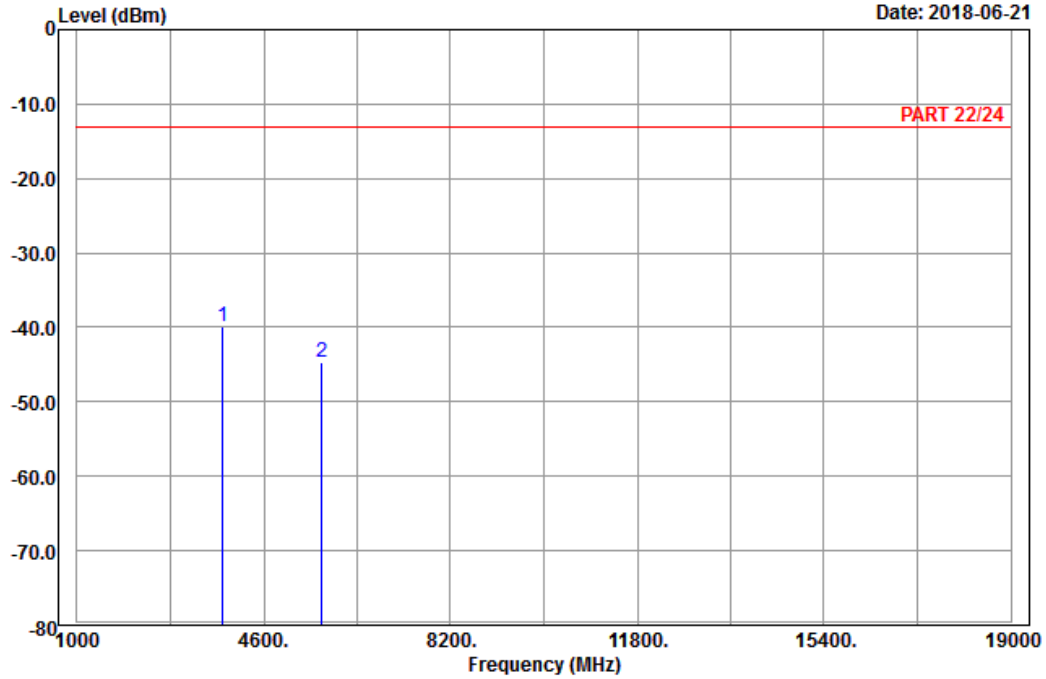


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2018-06-21



Site : 966 chamber 1  
 Condition: PART 22/24 Horizontal  
 Remark : LTE\_Band 2\_Link\_CH19175  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	pp 3815.00	-39.81	-56.22	-13.00	-26.81	16.41	Peak
2	5722.50	-44.76	-65.03	-13.00	-31.76	20.27	Peak

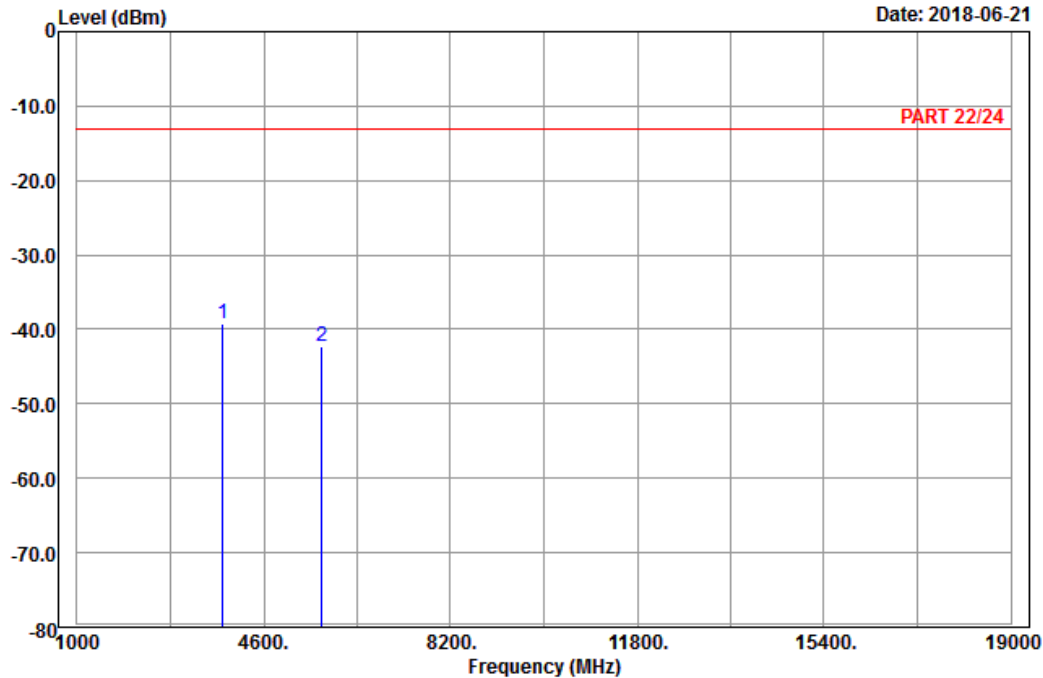


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2018-06-21



Site : 966 chamber 1  
 Condition: PART 22/24 Vertical  
 Remark : LTE\_Band 2\_Link\_CH19175  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3815.00	-39.30	-55.71	-13.00	-26.30	16.41	Peak
2	5722.50	-42.33	-62.60	-13.00	-29.33	20.27	Peak

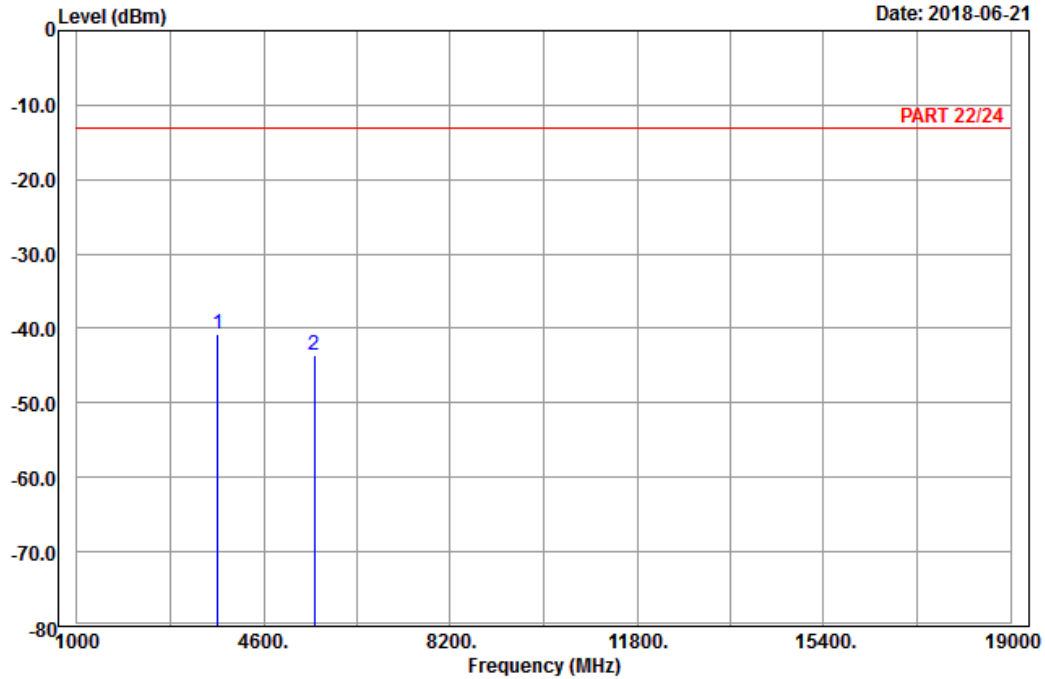
Channel Bandwidth: 20 MHz / QPSK  
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9



Site : 966 chamber 1  
Condition: PART 22/24 Horizontal  
Remark : LTE\_Band 2\_Link\_CH18700  
Tested by: Karl Lee

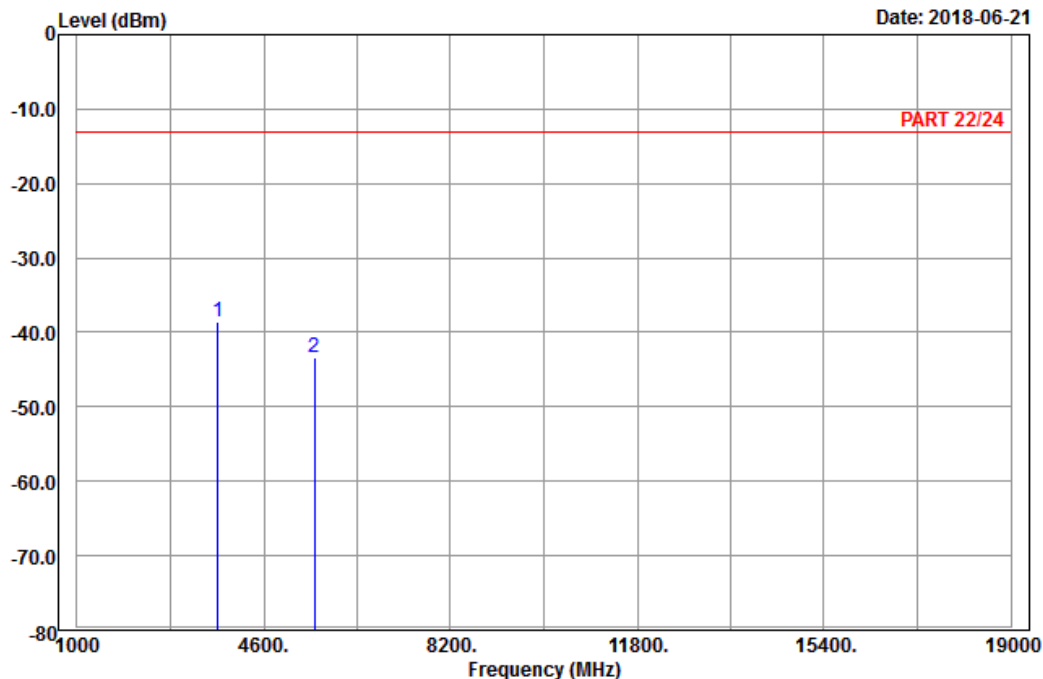
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3720.00	-40.83	-56.80	-13.00	-27.83	15.97	Peak
2	5580.00	-43.50	-63.87	-13.00	-30.50	20.37	Peak



A D T

Data: 10

Date: 2018-06-21



Site : 966 chamber 1  
 Condition: PART 22/24 Vertical  
 Remark : LTE\_Band 2\_Link\_CH18700  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3720.00	-38.60	-54.57	-13.00	-25.60	15.97	Peak
2	5580.00	-43.35	-63.72	-13.00	-30.35	20.37	Peak

Middle Channel

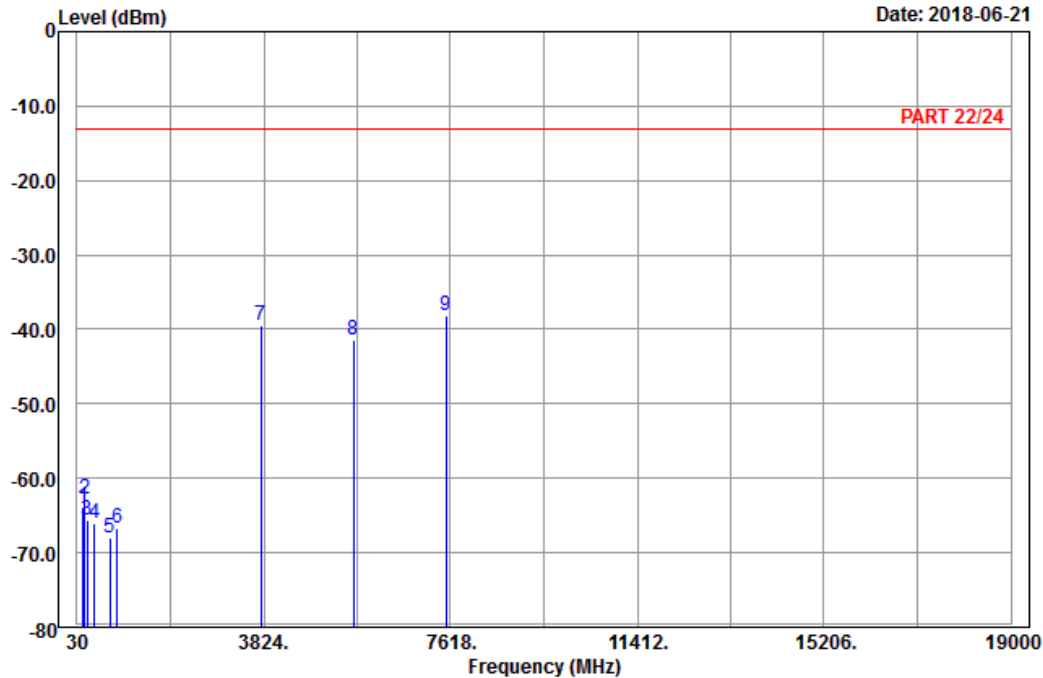


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 13

Date: 2018-06-21



Site : 966 chamber 1  
 Condition: PART 22/24 Horizontal  
 Remark : LTE\_Band 2\_Link\_CH18900  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	152.04	-63.82	-55.93	-13.00	-50.82	-7.89	Peak
2	188.76	-62.83	-57.11	-13.00	-49.83	-5.72	Peak
3	240.33	-65.59	-59.95	-13.00	-52.59	-5.64	Peak
4	388.20	-65.95	-62.59	-13.00	-52.95	-3.36	Peak
5	701.80	-67.96	-67.55	-13.00	-54.96	-0.41	Peak
6	850.20	-66.64	-68.12	-13.00	-53.64	1.48	Peak
7	3760.00	-39.55	-55.69	-13.00	-26.55	16.14	Peak
8	5640.00	-41.50	-61.97	-13.00	-28.50	20.47	Peak
9 pp	7520.00	-38.10	-60.78	-13.00	-25.10	22.68	Peak



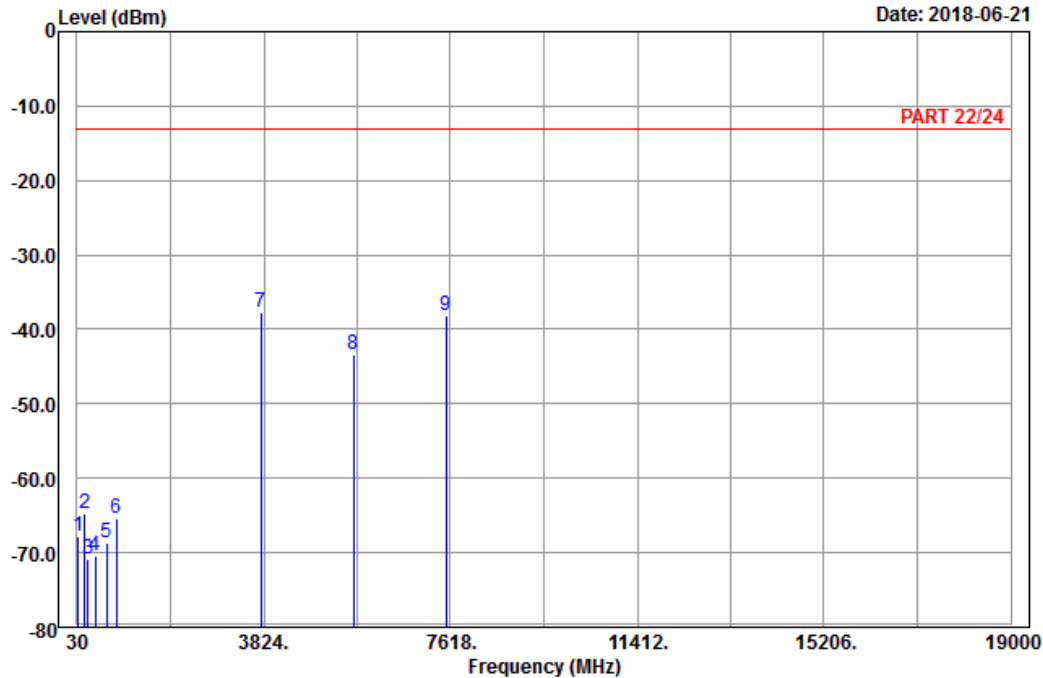


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 14

Date: 2018-06-21



Site : 966 chamber 1  
 Condition: PART 22/24 Vertical  
 Remark : LTE\_Band 2\_Link\_CH18900  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	51.87	-67.76	-53.70	-13.00	-54.76	-14.06	Peak
2	188.76	-64.64	-58.92	-13.00	-51.64	-5.72	Peak
3	249.51	-70.93	-65.41	-13.00	-57.93	-5.52	Peak
4	402.90	-70.43	-67.63	-13.00	-57.43	-2.80	Peak
5	630.40	-68.57	-68.66	-13.00	-55.57	0.09	Peak
6	831.30	-65.41	-67.07	-13.00	-52.41	1.66	Peak
7 pp	3760.00	-37.62	-53.76	-13.00	-24.62	16.14	Peak
8	5640.00	-43.44	-63.91	-13.00	-30.44	20.47	Peak
9	7520.00	-38.20	-60.88	-13.00	-25.20	22.68	Peak

# High Channel

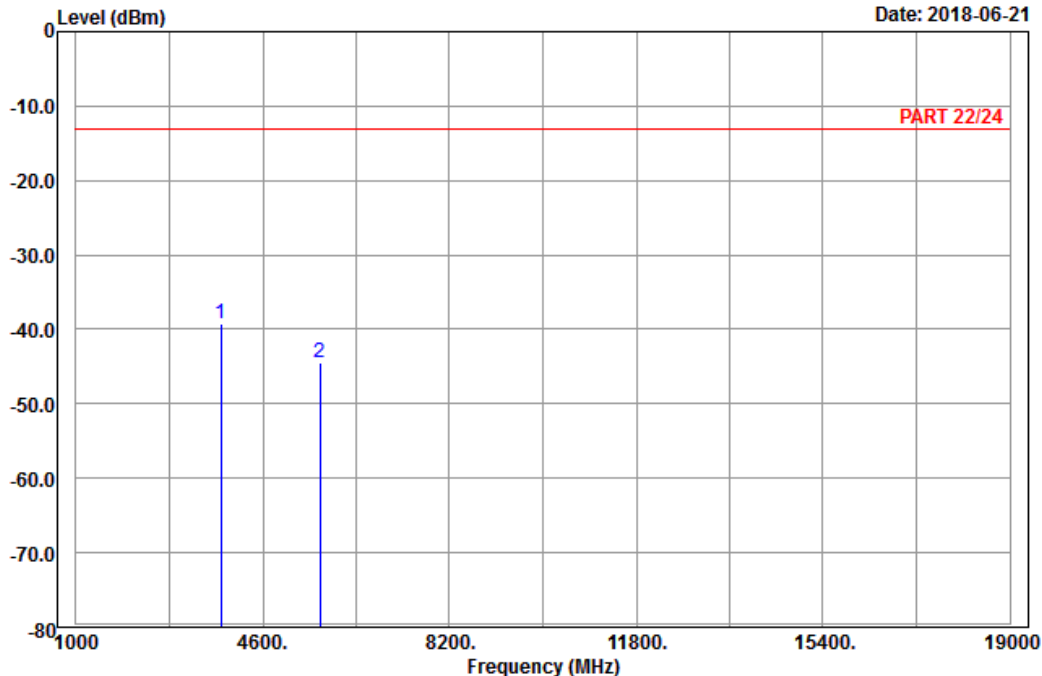


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2018-06-21



Site : 966 chamber 1  
 Condition: PART 22/24 Horizontal  
 Remark : LTE\_Band 2\_Link\_CH19100  
 Tested by: Karl Lee

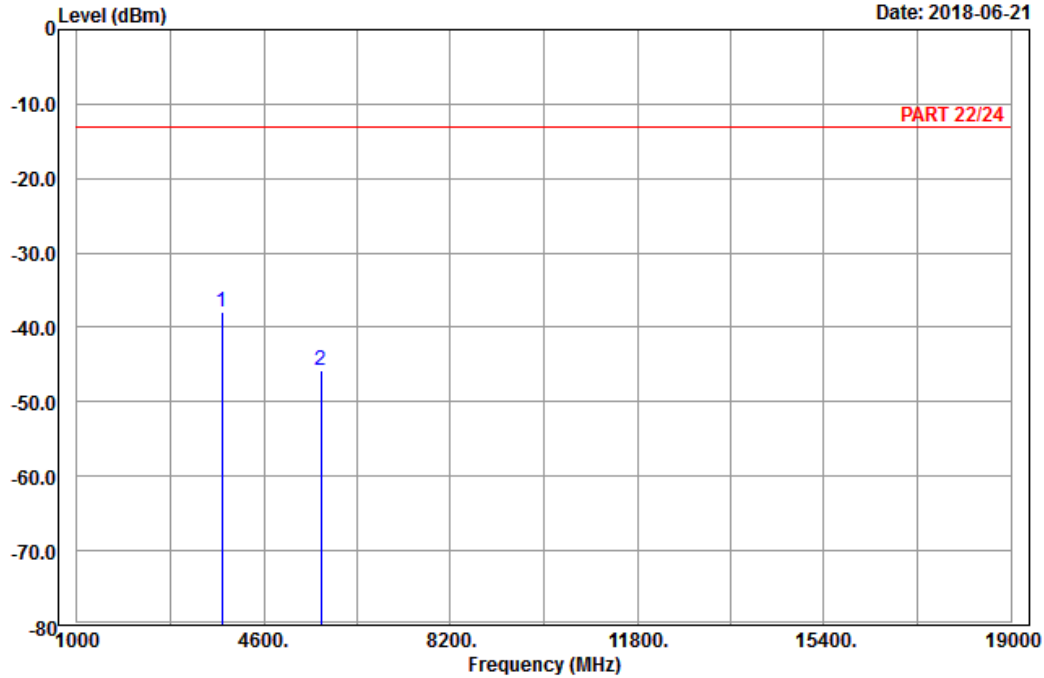
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	pp 3800.00	-39.14	-55.55	-13.00	-26.14	16.41	Peak
2	5700.00	-44.39	-64.60	-13.00	-31.39	20.21	Peak



A D T

Data: 10

Date: 2018-06-21



Site : 966 chamber 1  
 Condition: PART 22/24 Vertical  
 Remark : LTE\_Band 2\_Link\_CH19100  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3800.00	-37.92	-54.33	-13.00	-24.92	16.41	Peak
2	5700.00	-45.69	-65.90	-13.00	-32.69	20.21	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

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

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