

Partial FCC Test Report

(PART 27)

Report No.: RF180709C05B-8

FCC ID: S9E-EM7455

Test Model: EM7455

Received Date: Jul. 09, 2018

Test Date: Aug. 04, 2018

Issued Date: Aug. 28, 2018

Applicant: Trimble Navigation Limited

Address: 345 SW Avery Ave Corvallis, Oregon, United States, 97333

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

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(R.O.C)

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Test Location (2): No.215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan,
R.O.C

**FCC Registration /
Designation Number:** 427177 / TW0011



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Table of Contents

Release Control Record	3
1 Certificate of Conformity	4
2 Summary of Test Results.....	5
2.1 Measurement Uncertainty.....	5
2.2 Test Site and Instruments	6
3 General Information	7
3.1 General Description of EUT	7
3.2 Configuration of System under Test.....	8
3.2.1 Description of Support Units.....	8
3.3 Test Mode Applicability and Tested Channel Detail	9
3.4 EUT Operating Conditions	10
3.5 General Description of Applied Standards.....	10
4 Test Types and Results	11
4.1 Output Power Measurement.....	11
4.1.1 Limits of Output Power Measurement	11
4.1.2 Test Procedures.....	11
4.1.3 Test Setup.....	12
4.1.4 Test Results	13
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
5 Pictures of Test Arrangements.....	44
Appendix – Information on the Testing Laboratories	45

Release Control Record

Issue No.	Description	Date Issued
RF180709C05B-8	Original Release	Aug. 28, 2018

1 Certificate of Conformity

Product: Wireless Modules

Brand: Trimble

Test Model: EM7455

Sample Status: Engineering Sample

Applicant: Trimble Navigation Limited

Test Date: Aug. 04, 2018

Standards: FCC Part 27, Subpart C, M

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:

Aug. 28, 2018

Ivonne Wu / Supervisor

Approved by :



Date:

Aug. 28, 2018

Dylan Chiou / Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 27 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50(h)(2)	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 27.53(m)(6)	Occupied Bandwidth	N/A	Refer to Note
--	Peak to Average Ratio	N/A	Refer to Note
2.1051 27.53(l)(m)	Out-of-Band Emissions Measurements	N/A	Refer to Note
2.1051 27.53(m)	Conducted Spurious Emissions	N/A	Refer to Note
2.1053 27.53(m)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -10.73 dB at 7605.00 MHz.

Note: Only test item of E.I.R.P. and Radiated Spurious Emissions tests were performed for this addendum. For other test data, refer to module report No.: B15W50341-FCC-RF_Rev1.

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) ($\pm$)
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	N9010A	MY52220314	Nov. 24, 2017	Nov. 23, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Jan. 11, 2018	Jan. 10, 2019
HORN Antenna ETS-Lindgren	3117	00143293	Dec. 13, 2017	Dec. 12, 2018
BILOG Antenna SCHWARZBECK	VULB 9168	9168-616	Dec. 14, 2017	Dec. 13, 2018
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 01, 2017	Nov. 30, 2018
Fixed Attenuator Mini-Circuits	00801A1GGAM02Y	NA	May 17, 2018	May 16, 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
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
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Software BV ADT	E3 8.130425b	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA
Radio Communication Analyzer Anritsu	MT8820C	6201010284	Dec. 28, 2017	Dec. 27, 2018

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

3 General Information

3.1 General Description of EUT

Product	Wireless Modules	
Brand	Trimble	
Test Model	EM7455	
Status of EUT	Engineering Sample	
Power Supply Rating	19 Vdc (Adapter) 7.27 Vdc (Battery)	
Modulation Type	QPSK, 16QAM	
Frequency Range	LTE Band 7 (Channel Bandwidth: 5 MHz)	2502.5 ~ 2567.5 MHz
	LTE Band 7 (Channel Bandwidth: 10 MHz)	2505 ~ 2565 MHz
	LTE Band 7 (Channel Bandwidth: 15 MHz)	2507.5 ~ 2562.5 MHz
	LTE Band 7 (Channel Bandwidth: 20 MHz)	2510 ~ 2560 MHz
	LTE Band 41 (Channel Bandwidth: 5 MHz)	2498.5 ~ 2687.5 MHz
	LTE Band 41 (Channel Bandwidth: 10 MHz)	2501.0 ~ 2685.0 MHz
	LTE Band 41 (Channel Bandwidth: 15 MHz)	2503.5 ~ 2682.5 MHz
	LTE Band 41 (Channel Bandwidth: 20 MHz)	2506.0 ~ 2680.0 MHz
Max. EIRP Power	LTE Band 7 (Channel Bandwidth: 5 MHz)	175.67 mW
	LTE Band 7 (Channel Bandwidth: 10 MHz)	191.91 mW
	LTE Band 7 (Channel Bandwidth: 15 MHz)	193.11 mW
	LTE Band 7 (Channel Bandwidth: 20 MHz)	206.54 mW
	LTE Band 41 (Channel Bandwidth: 5 MHz)	238.84 mW
	LTE Band 41 (Channel Bandwidth: 10 MHz)	232.33 mW
	LTE Band 41 (Channel Bandwidth: 15 MHz)	222.74 mW
	LTE Band 41 (Channel Bandwidth: 20 MHz)	248.31 mW
Antenna Type	Coupling Antenna	
Antenna Gain	LTE Band 7	0.61 dBi (Main) / 0.76 dBi (Aux.)
	LTE Band 41	0.76 dBi (Main) / -0.76 dBi (Aux.)
Accessory Device	Refer to Note as below	
Data Cable Supplied	Refer to Note as below	

Note:

- The EUT is authorized for use in specified End-product. Please refer to below for more details.

Product	Brand Name	Model Name
Handheld PC	Trimble	121600

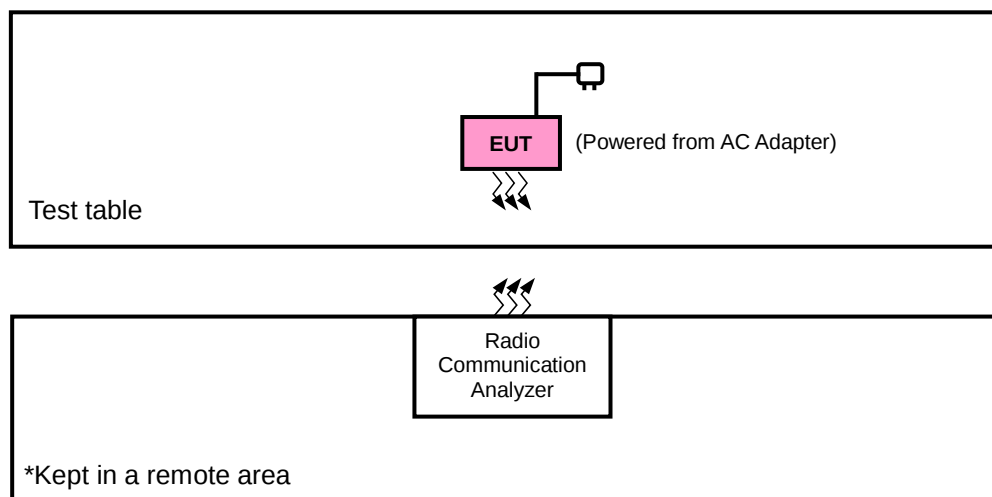
- The end-product contains following accessory devices.

Product	Brand	Model	Description
Adapter	DELTA Electronics, INC.	ADP-90MD H	I/P: 100-240 Vac, 50-60 Hz, 1.5 A O/P: 19 Vdc, 4.74 A 1.75m shielded cable with 1 core
Battery	Trimble	121300	7.27 Vdc, 3150 mAh, 22.9Wh
BT/WLAN Module	AzureWave	AW-CB260NF	--

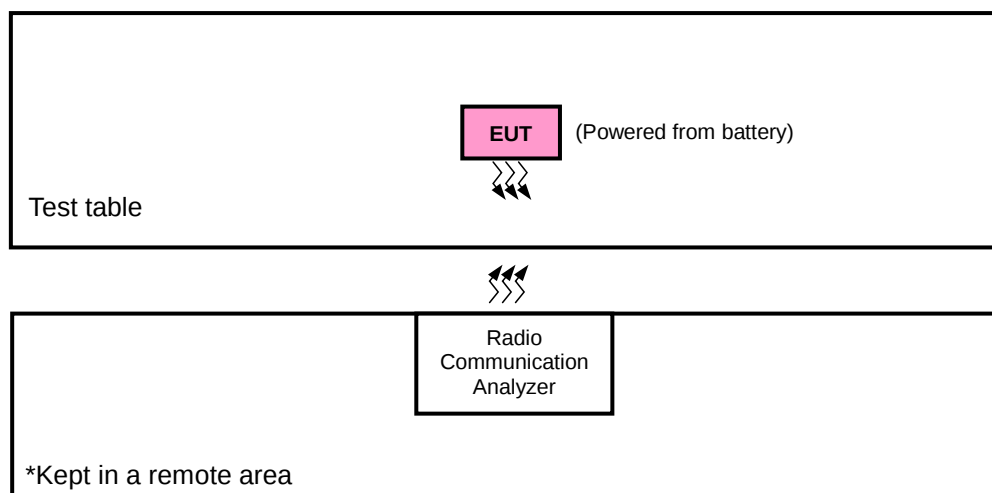
3. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

3.2 Configuration of System under Test

<Radiated Emission Test>



<E.I.R.P. Test>



3.2.1 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units.

3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, 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
LTE Band 7	X-plane	X-axis
LTE Band 41	X-plane	Z-axis

LTE Band 7

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	20775 to 21425	20775, 21100, 21425	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20800 to 21400	20800, 21100, 21400	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20825 to 21375	20825, 21100, 21375	15 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20850 to 21350	20850, 21100 21350	20 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Radiated Emission	20775 to 21425	20775, 21100, 21425	5 MHz	QPSK	1 RB / 0 RB Offset
		20850 to 21350	20850, 21100 21350	20 MHz	QPSK	1 RB / 0 RB Offset

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

LTE Band 41

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	39675 to 41565	39675, 40620, 41565	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		39700 to 41540	39700, 40620, 41540	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		39725 to 41515	39725, 40620, 41515	15 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		39750 to 41490	39750, 40620, 41490	20 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Radiated Emission	39675 to 41565	39675, 40620, 41565	5 MHz	QPSK	1 RB / 0 RB Offset
		39750 to 41490	39750, 40620, 41490	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	Karl Lee
Radiated Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Karl Lee & Harry Hsueh

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

The radiated peak output power shall be according to the specific rule Part 27.50(h)(2) that "User stations are limited to 2 watts" and 27.50(i) specific that "Peak transmit power must be measure over any interval of continuous transmission using instrumentation calibration in terms of rms-equivalent voltage."

4.1.2 Test Procedures

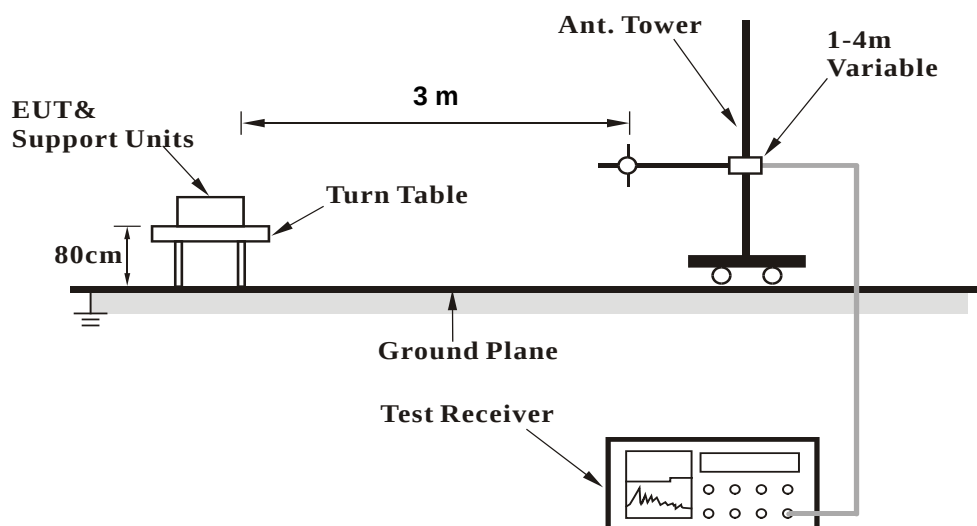
EIRP Measurement:

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

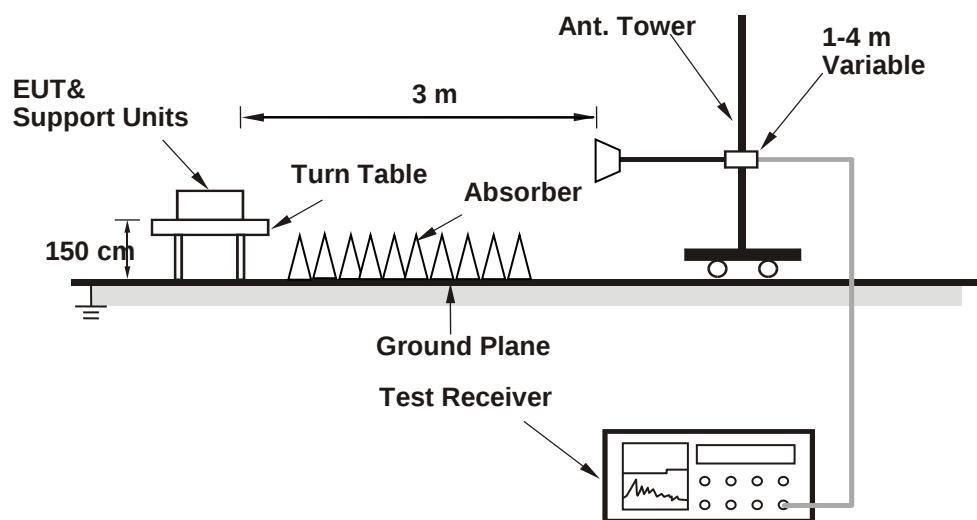
4.1.3 Test Setup

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

EIRP Power (dBm)

LTE Band 7							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	20775	2502.5	-21.81	44.24	22.43	174.90	H
	21100	2535.0	-21.75	44.20	22.45	175.67	
	21425	2567.5	-22.36	44.80	22.44	175.43	
	20775	2502.5	-24.51	44.19	19.68	92.92	V
	21100	2535.0	-24.24	44.09	19.85	96.56	
	21425	2567.5	-24.61	44.50	19.89	97.48	
Channel Bandwidth: 5 MHz / 16QAM							
X	20775	2502.5	-22.51	44.24	21.73	148.87	H
	21100	2535.0	-22.26	44.20	21.94	156.21	
	21425	2567.5	-22.89	44.80	21.91	155.27	
	20775	2502.5	-25.74	44.19	18.45	70.00	V
	21100	2535.0	-25.58	44.09	18.51	70.93	
	21425	2567.5	-25.62	44.50	18.88	77.25	

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

LTE Band 7							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	20800	2505.0	-21.51	44.34	22.83	191.91	H
	21100	2535.0	-21.62	44.20	22.58	181.01	
	21400	2565.0	-22.33	44.72	22.39	173.50	
	20800	2505.0	-24.85	44.23	19.38	86.62	V
	21100	2535.0	-24.75	44.09	19.34	85.86	
	21400	2565.0	-24.92	44.41	19.49	88.84	
Channel Bandwidth: 10 MHz / 16QAM							
X	20800	2505.0	-22.55	44.34	21.79	151.04	H
	21100	2535.0	-22.63	44.20	21.57	143.45	
	21400	2565.0	-23.18	44.72	21.54	142.66	
	20800	2505.0	-25.58	44.23	18.65	73.21	V
	21100	2535.0	-25.20	44.09	18.89	77.41	
	21400	2565.0	-25.90	44.41	18.51	70.89	

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

LTE Band 7							
Channel Bandwidth: 15 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	20825	2507.5	-21.81	44.32	22.51	178.16	H
	21100	2535.0	-21.76	44.20	22.44	175.27	
	21375	2562.5	-21.99	44.85	22.86	193.11	
	20825	2507.5	-24.25	43.99	19.74	94.23	V
	21100	2535.0	-24.61	44.09	19.48	88.67	
	21375	2562.5	-24.75	44.51	19.76	94.62	
Channel Bandwidth: 15 MHz / 16QAM							
X	20825	2507.5	-22.67	44.32	21.65	146.22	H
	21100	2535.0	-22.85	44.20	21.35	136.36	
	21375	2562.5	-23.56	44.85	21.29	134.52	
	20825	2507.5	-25.37	43.99	18.62	72.81	V
	21100	2535.0	-25.59	44.09	18.50	70.76	
	21375	2562.5	-25.74	44.51	18.77	75.34	

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

LTE Band 7							
Channel Bandwidth: 20 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	20850.0	2510.0	-21.01	44.16	23.15	206.54	H
	21100.0	2535.0	-21.56	44.20	22.64	183.53	
	21350.0	2560.0	-22.51	44.81	22.30	169.71	
	20850.0	2510.0	-24.85	44.78	19.93	98.40	V
	21100.0	2535.0	-24.75	44.09	19.34	85.86	
	21350.0	2560.0	-25.02	44.72	19.70	93.33	
Channel Bandwidth: 20 MHz / 16QAM							
X	20850.0	2510.0	-22.48	44.16	21.68	147.23	H
	21100.0	2535.0	-22.83	44.20	21.37	136.99	
	21350.0	2560.0	-22.85	44.81	21.96	156.93	
	20850.0	2510.0	-26.30	44.78	18.48	70.47	V
	21100.0	2535.0	-25.85	44.09	18.24	66.65	
	21350.0	2560.0	-26.25	44.72	18.47	70.31	

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

LTE Band 41							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	39675	2498.5	-20.50	44.24	23.74	236.48	H
	40620	2593.0	-20.75	44.20	23.45	221.16	
	41565	2687.5	-21.02	44.80	23.78	238.84	
	39675	2498.5	-23.22	44.19	20.97	125.05	V
	40620	2593.0	-23.62	44.09	20.47	111.38	
	41565	2687.5	-24.47	44.50	20.03	100.67	
Channel Bandwidth: 5 MHz / 16QAM							
X	39675	2498.5	-21.55	44.24	22.69	185.69	H
	40620	2593.0	-21.84	44.20	22.36	172.07	
	41565	2687.5	-22.42	44.80	22.38	173.02	
	39675	2498.5	-24.23	44.19	19.96	99.11	V
	40620	2593.0	-24.41	44.09	19.68	92.85	
	41565	2687.5	-25.25	44.50	19.25	84.12	

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

LTE Band 41							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	39700	2501.0	-20.68	44.34	23.66	232.33	H
	40620	2593.0	-20.75	44.20	23.45	221.16	
	41540	2685.0	-21.20	44.72	23.52	225.06	
	39700	2501.0	-23.52	44.23	20.71	117.65	V
	40620	2593.0	-23.33	44.09	20.76	119.07	
	41540	2685.0	-23.51	44.41	20.90	122.91	
Channel Bandwidth: 10 MHz / 16QAM							
X	39700	2501.0	-21.36	44.34	22.98	198.66	H
	40620	2593.0	-21.51	44.20	22.69	185.65	
	41540	2685.0	-22.29	44.72	22.43	175.11	
	39700	2501.0	-24.72	44.23	19.51	89.25	V
	40620	2593.0	-24.42	44.09	19.67	92.64	
	41540	2685.0	-24.88	44.41	19.52	89.62	

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

LTE Band 41							
Channel Bandwidth: 15 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	39725	2503.5	-20.84	44.32	23.48	222.74	H
	40620	2593.0	-20.76	44.20	23.44	220.65	
	41515	2682.5	-21.53	44.85	23.32	214.68	
	39725	2503.5	-23.62	43.99	20.37	108.94	V
	40620	2593.0	-23.85	44.09	20.24	105.63	
	41515	2682.5	-23.75	44.51	20.76	119.12	
Channel Bandwidth: 15 MHz / 16QAM							
X	39725	2503.5	-21.67	44.32	22.65	183.99	H
	40620	2593.0	-21.51	44.20	22.69	185.65	
	41515	2682.5	-22.35	44.85	22.50	177.75	
	39725	2503.5	-24.01	43.99	19.98	99.59	V
	40620	2593.0	-24.58	44.09	19.51	89.25	
	41515	2682.5	-25.29	44.51	19.22	83.56	

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

LTE Band 41							
Channel Bandwidth: 20 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	39750	2506.0	-20.21	44.16	23.95	248.31	H
	40620	2593.0	-20.56	44.20	23.64	231.05	
	41490	2680.0	-21.75	44.81	23.06	202.16	
	39750	2506.0	-24.25	44.78	20.53	112.98	V
	40620	2593.0	-23.62	44.09	20.47	111.38	
	41490	2680.0	-24.33	44.72	20.39	109.40	
Channel Bandwidth: 20 MHz / 16QAM							
X	39750	2506.0	-21.95	44.16	22.21	166.34	H
	40620	2593.0	-21.55	44.20	22.65	183.95	
	41490	2680.0	-21.68	44.81	23.13	205.45	
	39750	2506.0	-25.52	44.78	19.26	84.33	V
	40620	2593.0	-24.26	44.09	19.83	96.18	
	41490	2680.0	-25.51	44.72	19.21	83.37	

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 a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $55 + 10 \log_{10}(P)$ dB. The limit of emission is equal to -25 dBm.

4.2.2 Test Procedure

- 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.
- 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.
- $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}.$
- E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, $E.R.P \text{ power} = E.I.R.P \text{ power} - 2.15 \text{ dB}.$

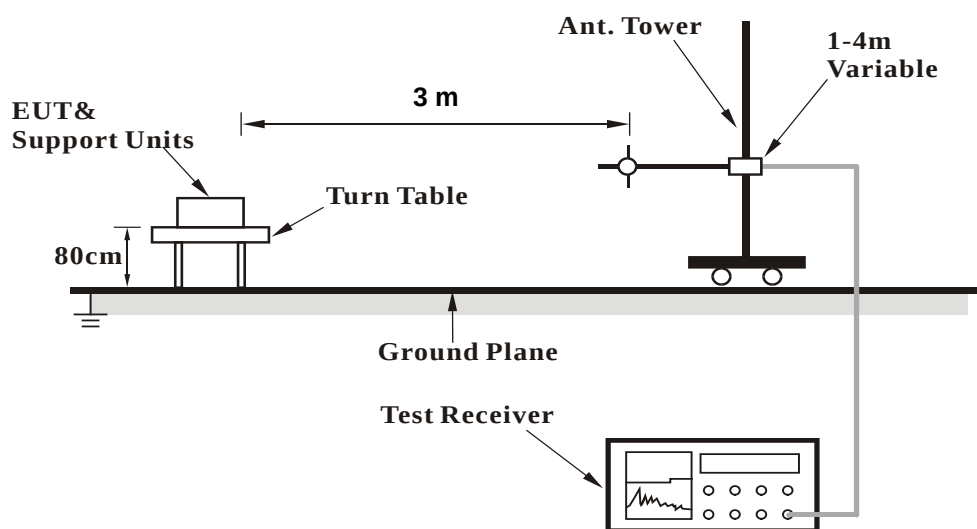
NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.2.3 Deviation from Test Standard

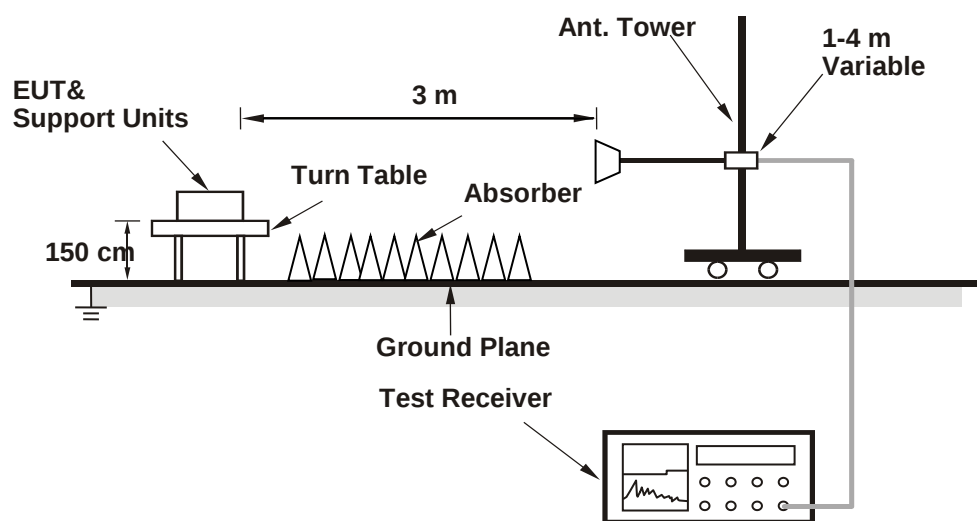
No deviation.

4.2.4 Test Setup

<Radiated Emission below or equal 1 GHz>



<Radiated Emission above 1 GHz>



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

4.2.5 Test Results

LTE Band 7

Channel Bandwidth: 5 MHz / QPSK

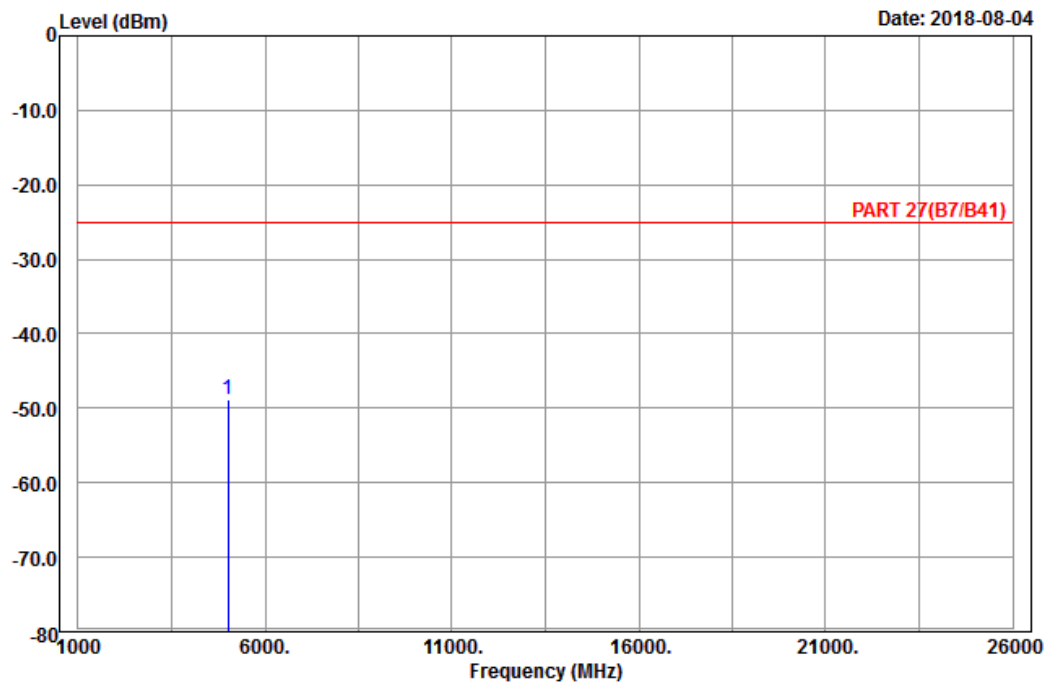
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9



Site : 966 chamber 1

Condition: PART 27(B7/B41) Horizontal

Remark : LTE_Band 7_Link_CH20775

Tested by: Harry Hsueh

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5005.00	-48.81	-68.39	-25.00	-23.81	19.58	Peak

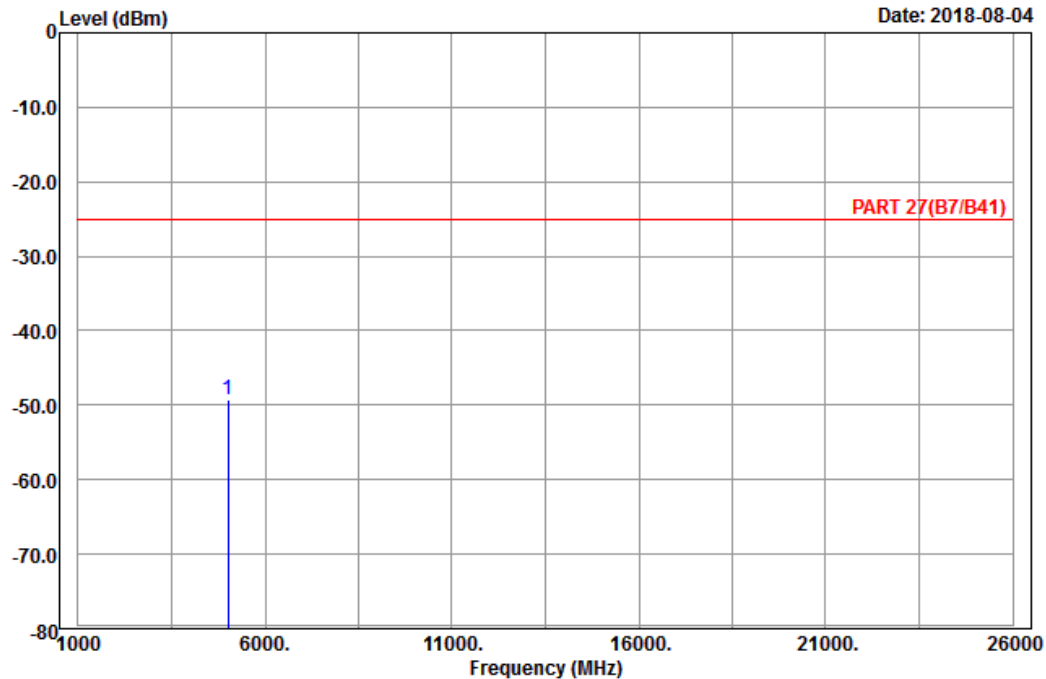


Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

A D T

Data: 10

Date: 2018-08-04



Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 7_Link_CH20775
Tested by: Harry Hsueh

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5005.00	-49.24	-68.82	-25.00	-24.24	19.58	Peak

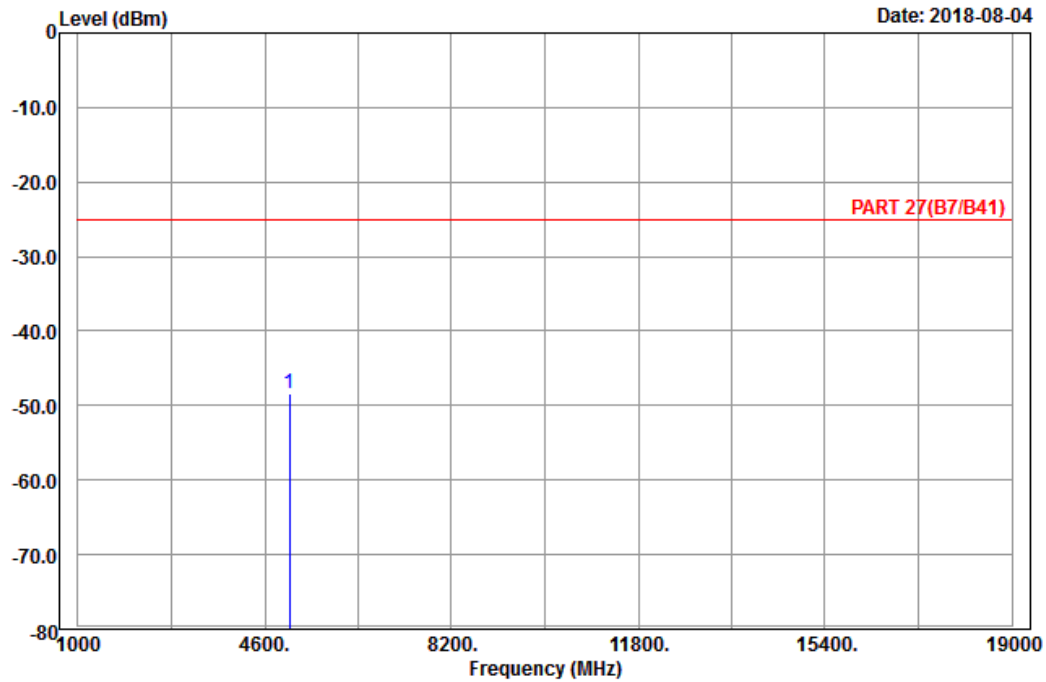
Middle Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9



Site : 966 chamber 1
Condition: PART 27(B7/B41) Horizontal
Remark : LTE_Band 7_Link_CH21100
Tested by: Harry Hsueh

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5070.00	-48.35	-67.74	-25.00	-23.35	19.39	Peak

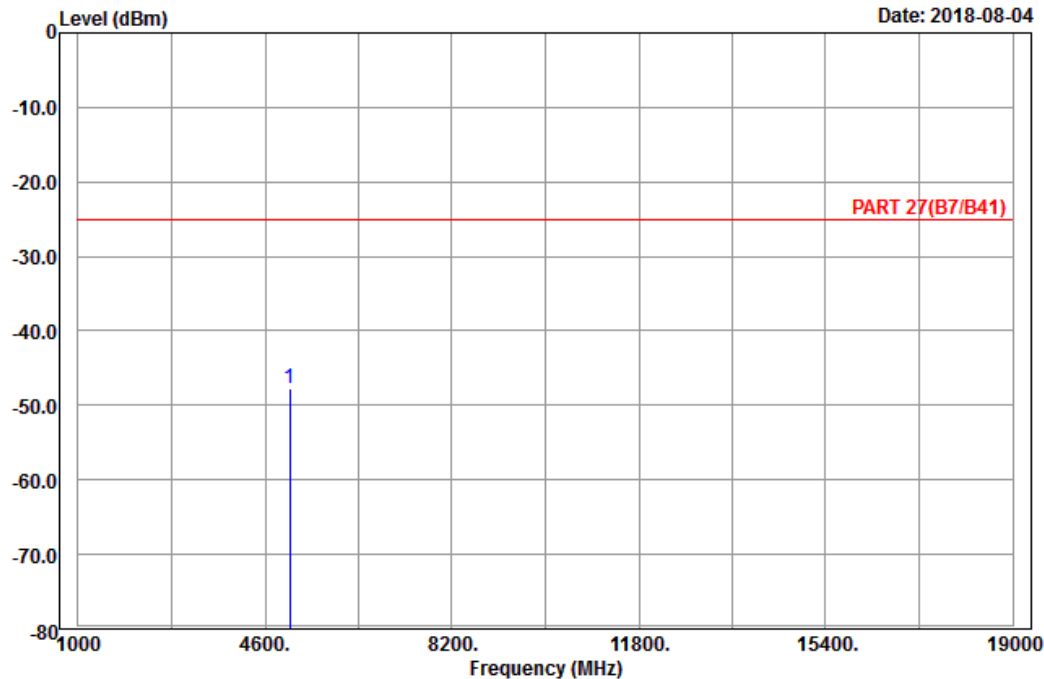


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2018-08-04



Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 7_Link_CH21100
Tested by: Harry Hsueh

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5070.00	-47.67	-67.06	-25.00	-22.67	19.39	Peak

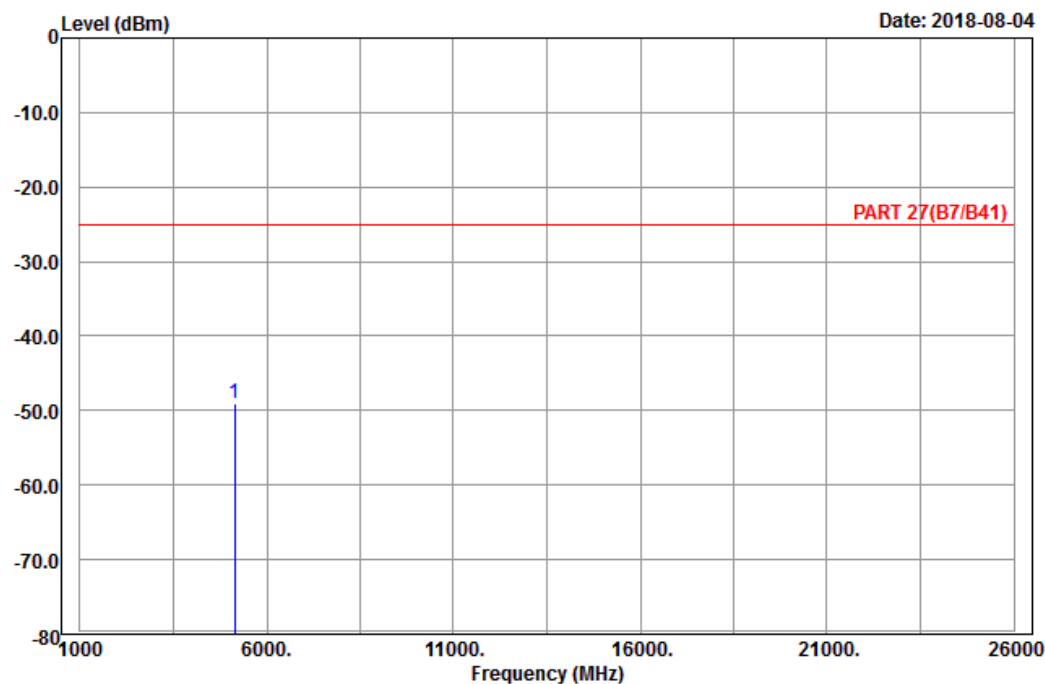
High Channel



Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

A D T

Data: 9



Site : 966 chamber 1
Condition: PART 27(B7/B41) Horizontal
Remark : LTE_Band 7_Link_CH21425
Tested by: Harry Hsueh

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5135.00	-49.12	-68.93	-25.00	-24.12	19.81	Peak

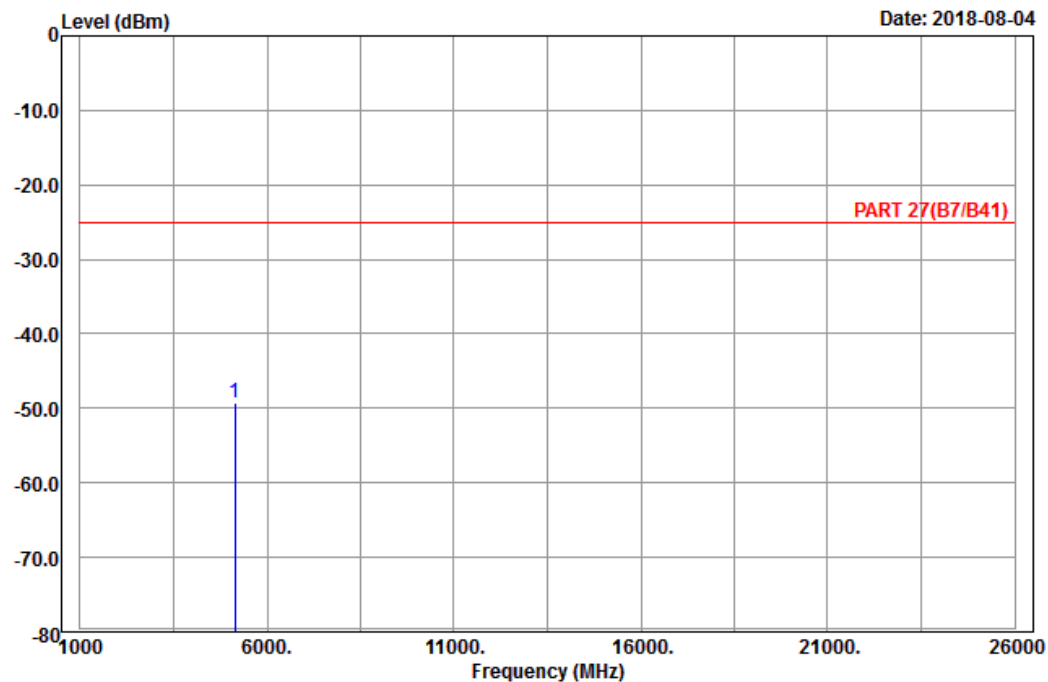


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2018-08-04



Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 7_Link_CH21425
Tested by: Harry Hsueh

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5135.00	-49.37	-69.18	-25.00	-24.37	19.81	Peak

Channel Bandwidth: 20 MHz / QPSK
Low Channel

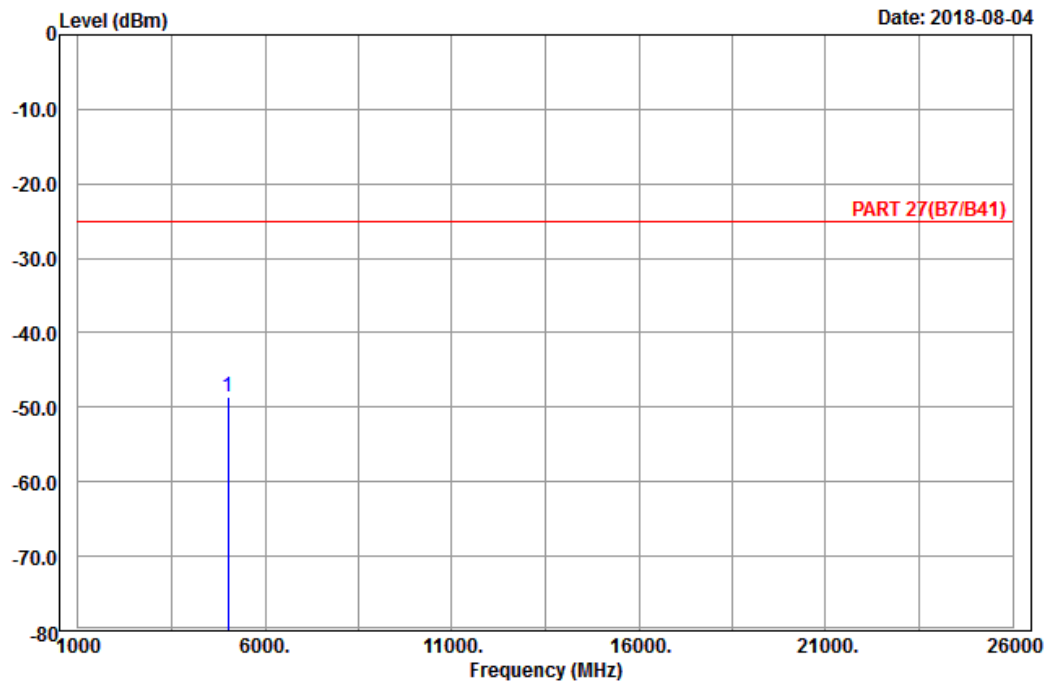


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2018-08-04



Site : 966 chamber 1
Condition: PART 27(B7/B41) Horizontal
Remark : LTE_Band 7_Link_CH20850
Tested by: Harry Hsueh

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5020.00	-48.64	-67.72	-25.00	-23.64	19.08	Peak

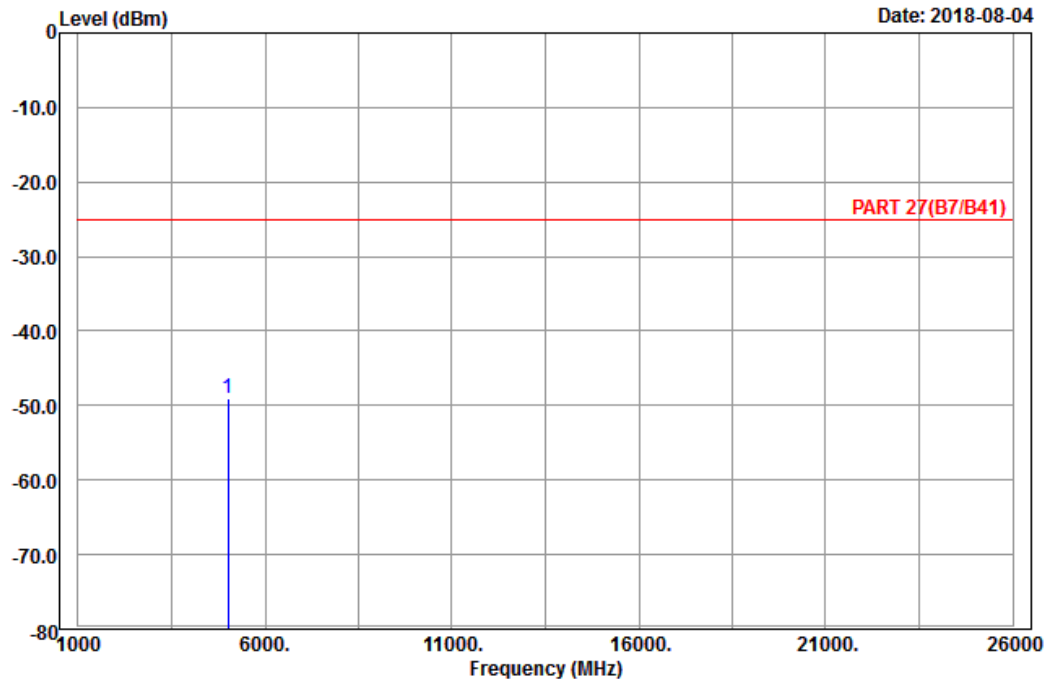


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2018-08-04



Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 7_Link_CH20850
Tested by: Harry Hsueh

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5020.00	-49.11	-68.19	-25.00	-24.11	19.08	Peak

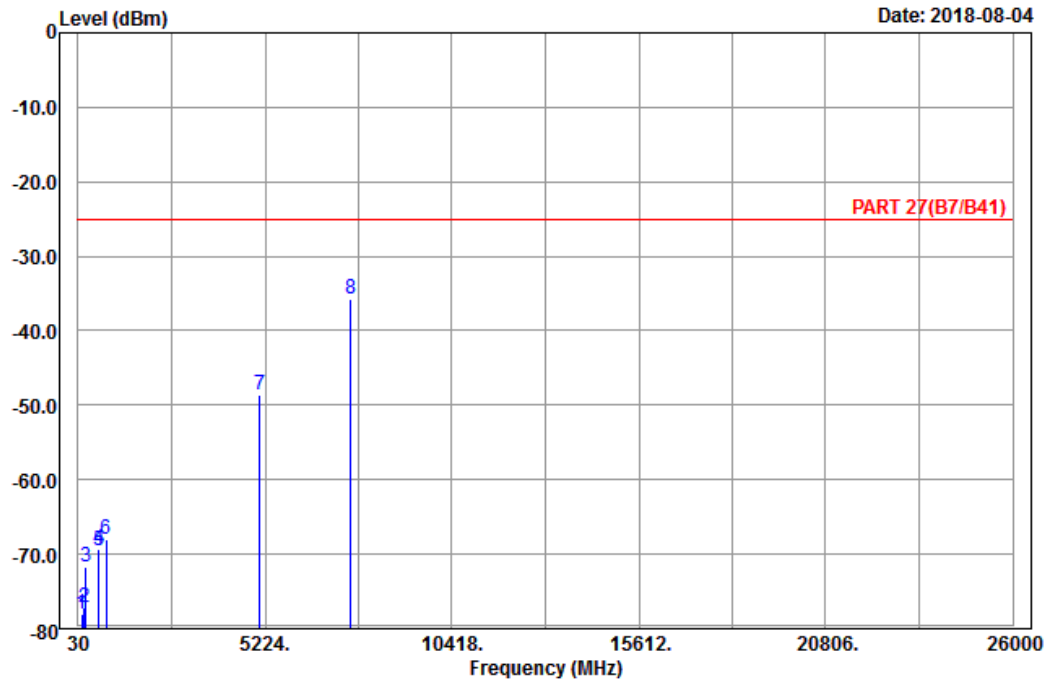
Middle Channel



Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

A D T

Data: 13



Site : 966 chamber 1
Condition: PART 27(B7/B41) Horizontal
Remark : LTE_Band 7_Link_CH21100
Tested by: Harry Hsueh

		Read	Limit	Over			
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	128.28	-78.08	-70.31	-25.00	-53.08	-7.77	Peak
2	193.35	-77.15	-71.28	-25.00	-52.15	-5.87	Peak
3	236.01	-71.62	-65.92	-25.00	-46.62	-5.70	Peak
4	598.20	-69.36	-69.71	-25.00	-44.36	0.35	Peak
5	608.70	-69.62	-69.95	-25.00	-44.62	0.33	Peak
6	817.30	-68.01	-69.82	-25.00	-43.01	1.81	Peak
7	5070.00	-48.58	-67.97	-25.00	-23.58	19.39	Peak
8 pp	7605.00	-35.73	-58.72	-25.00	-10.73	22.99	Peak

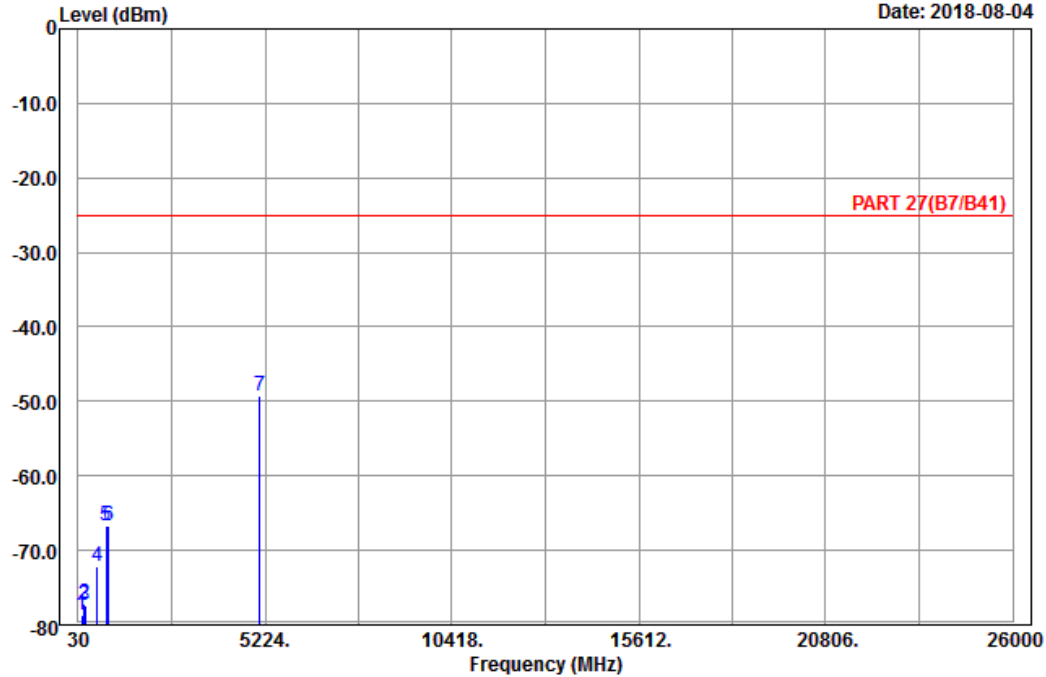


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 14

Date: 2018-08-04



Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 7_Link_CH21100
Tested by: Harry Hsueh

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	127.74	-78.76	-70.99	-25.00	-53.76	-7.77	Peak
2	198.75	-77.25	-71.11	-25.00	-52.25	-6.14	Peak
3	229.53	-77.28	-71.50	-25.00	-52.28	-5.78	Peak
4	558.30	-72.11	-70.81	-25.00	-47.11	-1.30	Peak
5	818.00	-66.67	-68.48	-25.00	-41.67	1.81	Peak
6	883.80	-66.61	-69.03	-25.00	-41.61	2.42	Peak
7 pp	5070.00	-49.29	-68.68	-25.00	-24.29	19.39	Peak

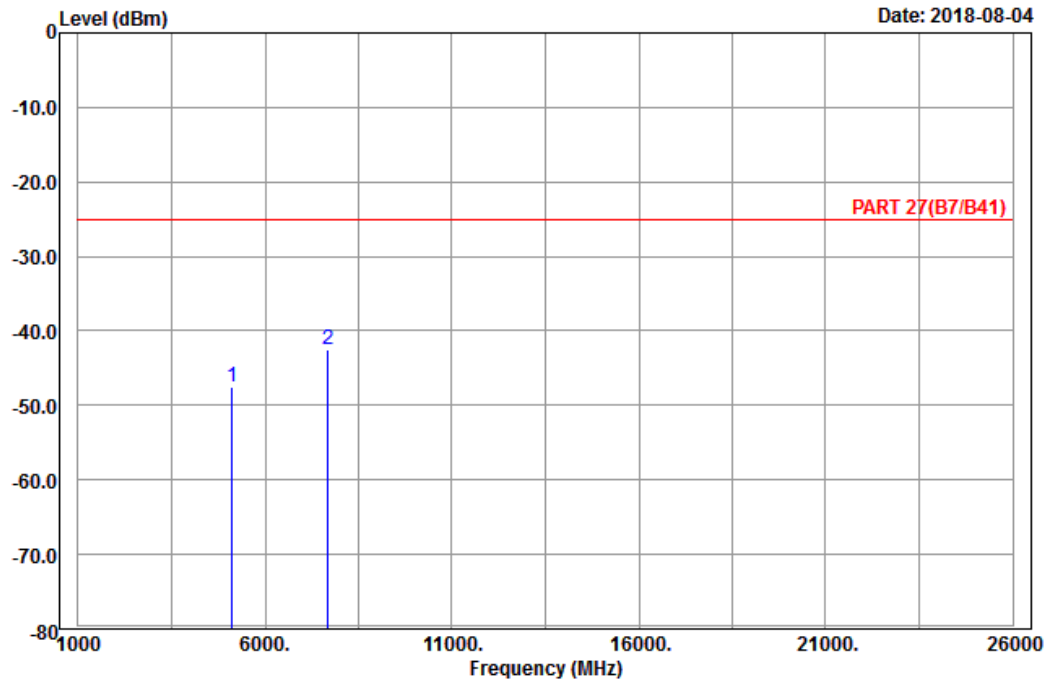
High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9



Site : 966 chamber 1
Condition: PART 27(B7/B41) Horizontal
Remark : LTE_Band 7_Link_CH21350
Tested by: Harry Hsueh

		Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark	
MHz	dBm	dBm	dBm	dB	dB		
1	5120.00	-47.59	-67.30	-25.00	-22.59	19.71	Peak
2	pp 7680.00	-42.51	-65.63	-25.00	-17.51	23.12	Peak

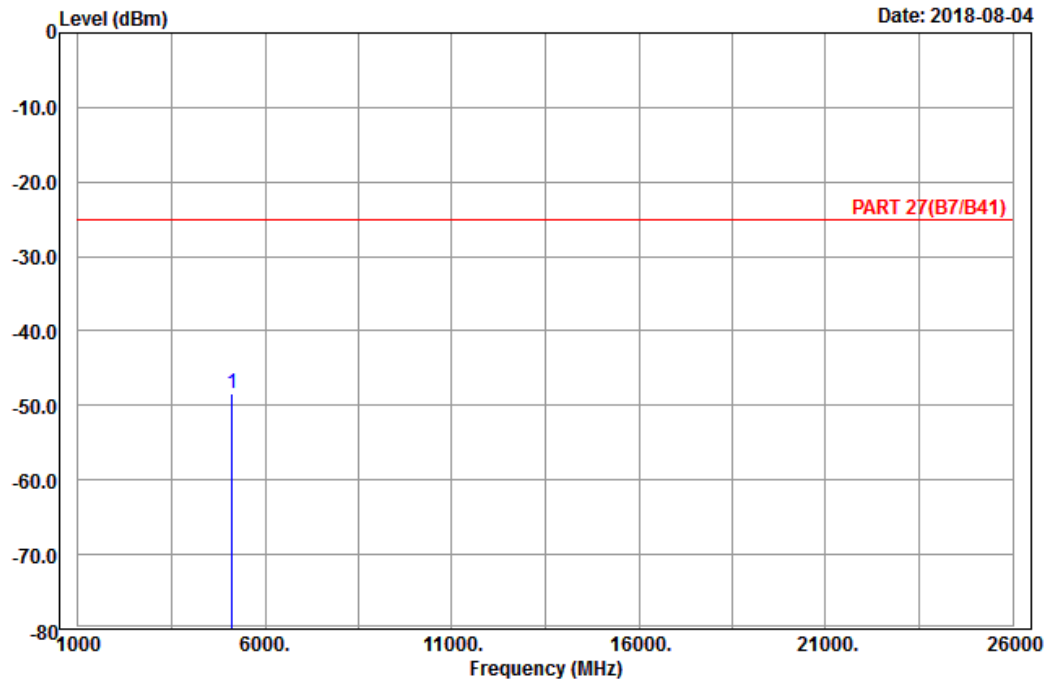


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2018-08-04



Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 7_Link_CH21350
Tested by: Harry Hsueh

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5120.00	-48.42	-68.13	-25.00	-23.42	19.71	Peak

LTE Band 41
Channel Bandwidth: 5 MHz / QPSK
Low Channel

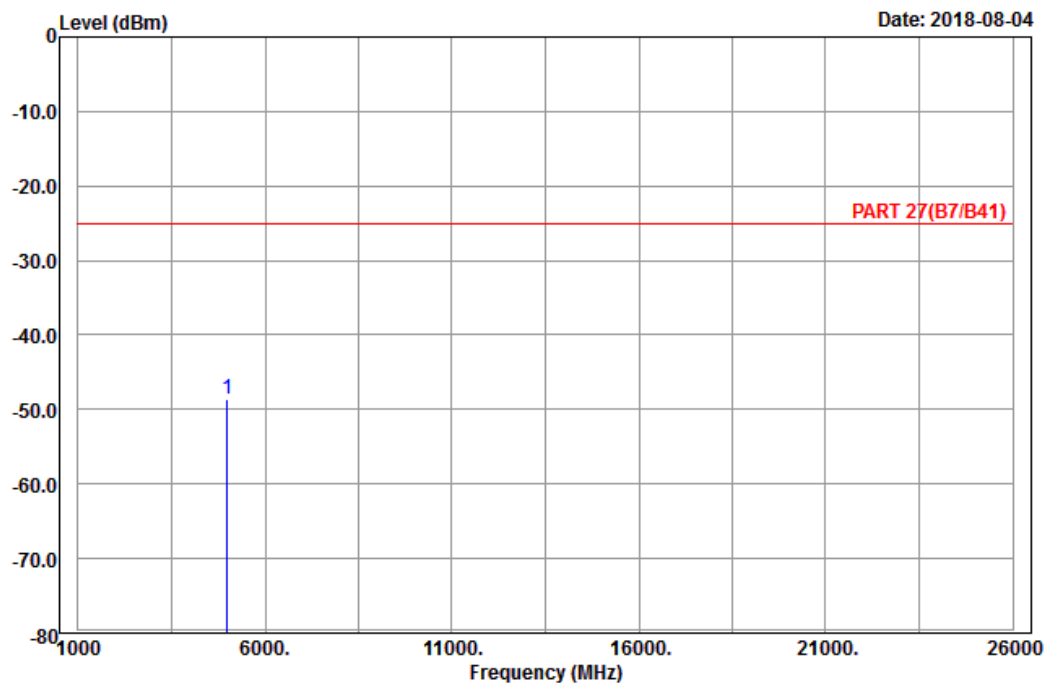


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2018-08-04



Site : 966 chamber 1
Condition: PART 27(B7/B41) Horizontal
Remark : LTE_Band 41_Link_CH39675
Tested by: Karl Lee

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 4997.00	-48.56	-68.14	-25.00	-23.56	19.58	Peak

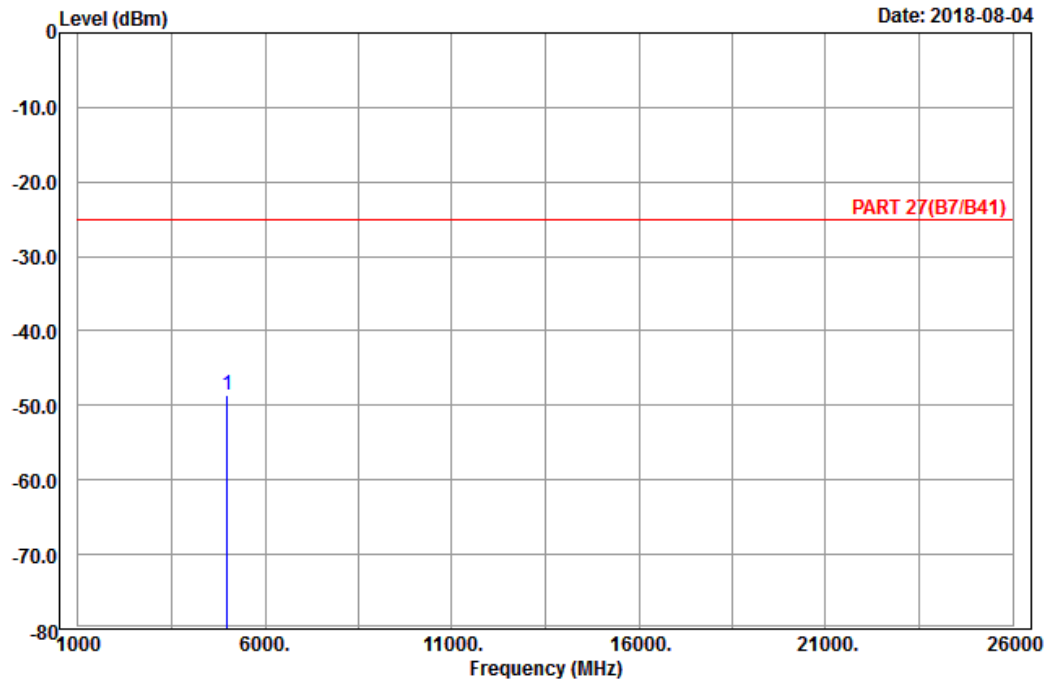


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2018-08-04



Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 41_Link_CH39675
Tested by: Karl Lee

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 4997.00	-48.61	-68.19	-25.00	-23.61	19.58	Peak

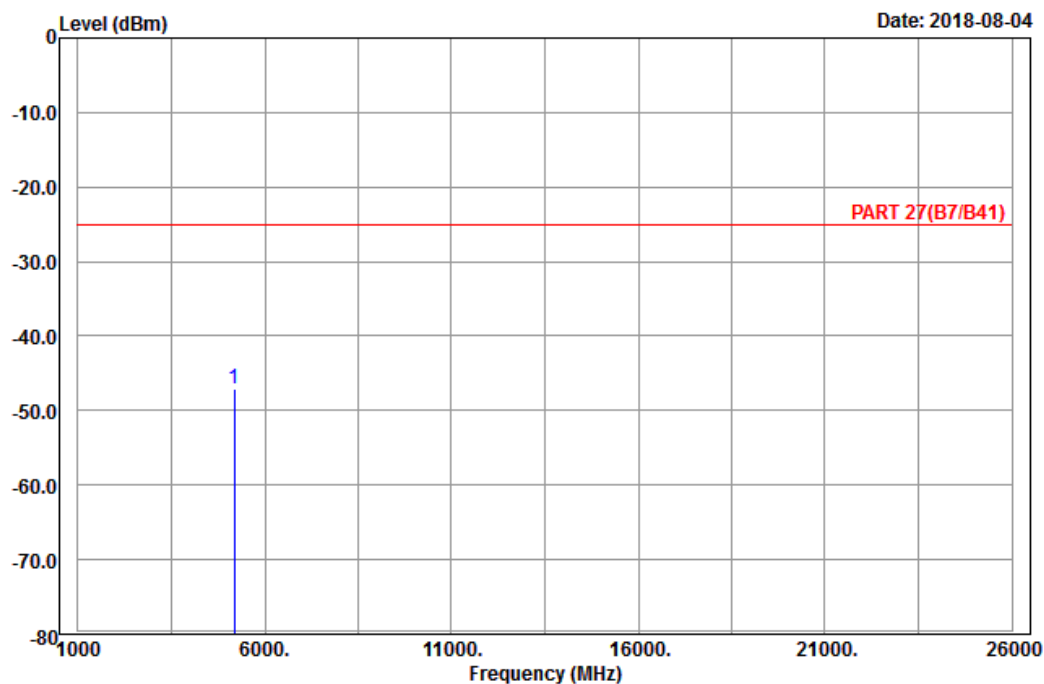
Middle Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9



Site : 966 chamber 1
Condition: PART 27(B7/B41) Horizontal
Remark : LTE_Band 41_Link_CH40620
Tested by: Karl Lee

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5186.00	-47.08	-67.20	-25.00	-22.08	20.12	Peak

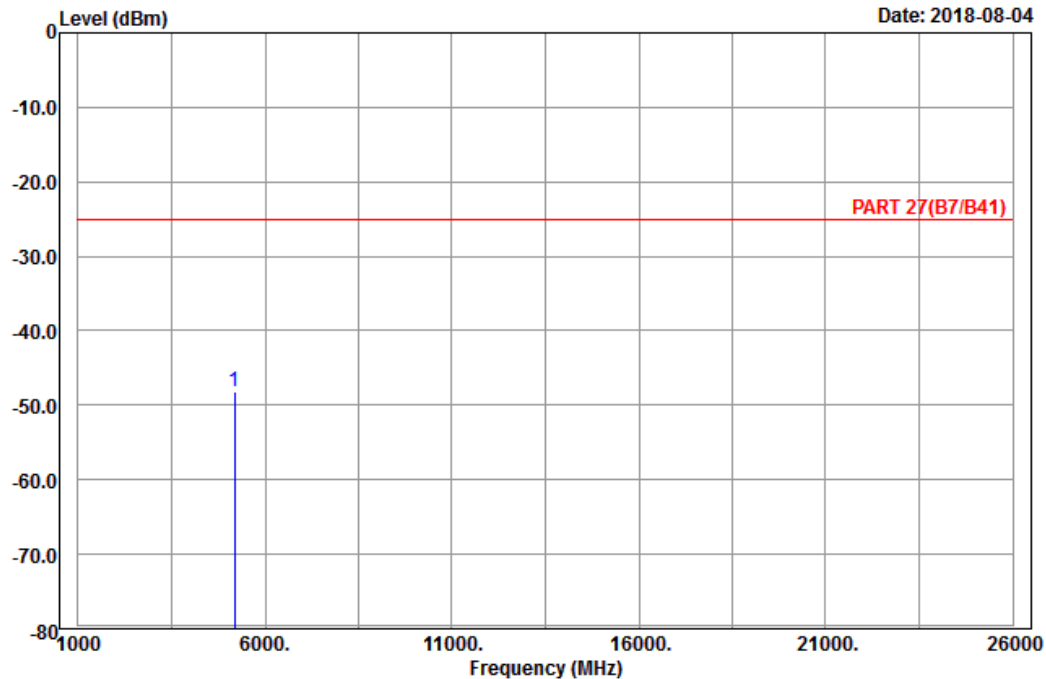


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2018-08-04



Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 41_Link_CH40620
Tested by: Karl Lee

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5186.00	-48.16	-68.28	-25.00	-23.16	20.12	Peak

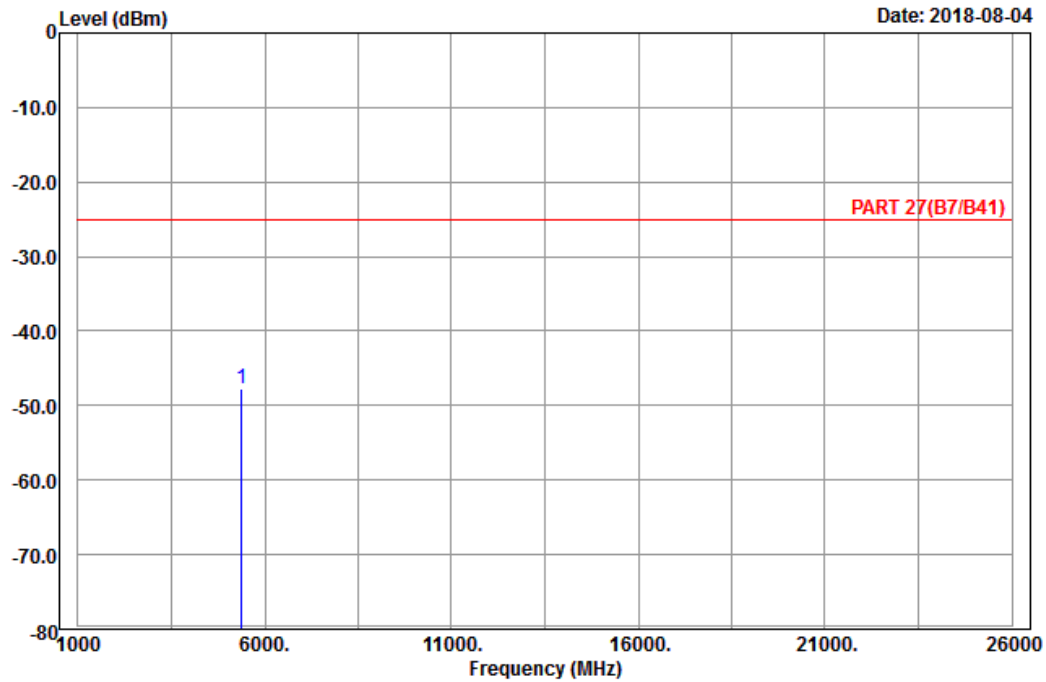
High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Horizontal
 Remark : LTE_Band 41_Link_CH41565
 Tested by: Karl Lee

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5375.00	-47.84	-68.16	-25.00	-22.84	20.32	Peak

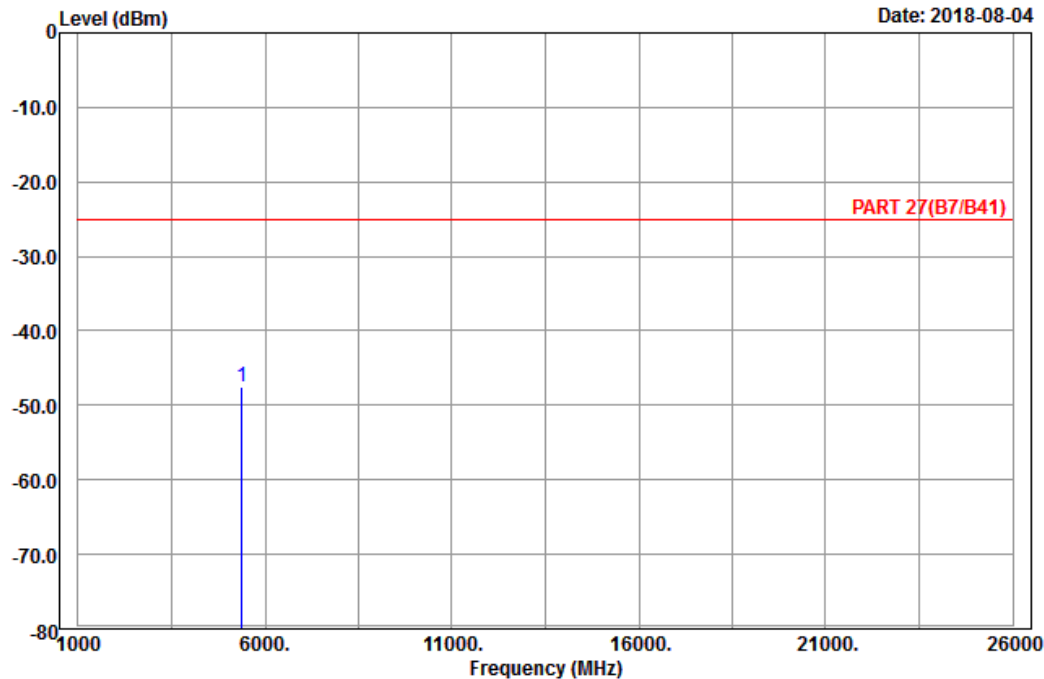


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2018-08-04



Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 41_Link_CH41565
Tested by: Karl Lee

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5375.00	-47.45	-67.77	-25.00	-22.45	20.32	Peak

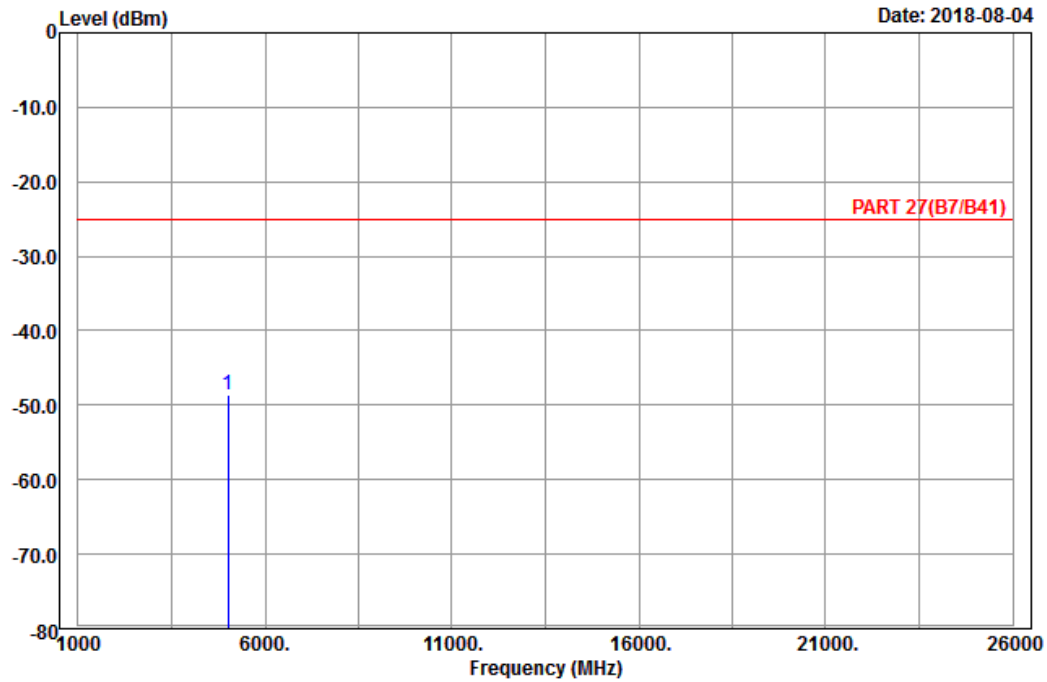
Channel Bandwidth: 20 MHz / QPSK
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9



Site : 966 chamber 1
Condition: PART 27(B7/B41) Horizontal
Remark : LTE_Band 41_Link_CH39750
Tested by: Karl Lee

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5012.00	-48.61	-67.69	-25.00	-23.61	19.08	Peak

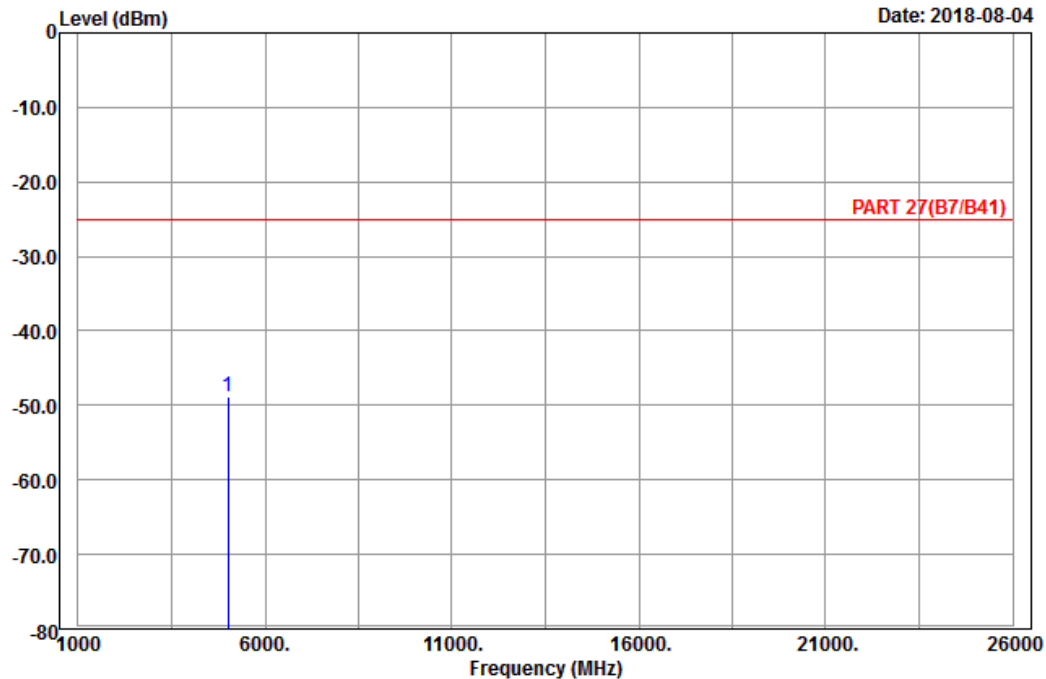


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2018-08-04



Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 41_Link_CH39750
Tested by: Karl Lee

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5012.00	-48.90	-67.98	-25.00	-23.90	19.08	Peak

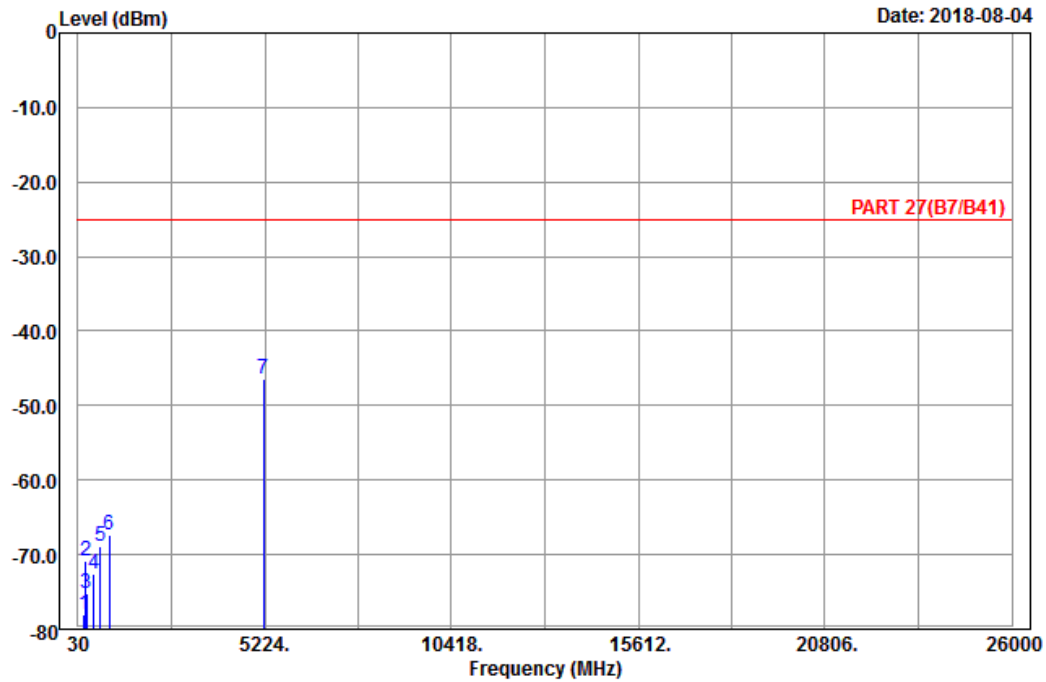
Middle Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 13



Site : 966 chamber 1
Condition: PART 27(B7/B41) Horizontal
Remark : LTE_Band 41_Link_CH40620
Tested by: Karl Lee

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	192.27	-77.97	-72.15	-25.00	-52.97	-5.82	Peak
2	246.81	-70.81	-65.26	-25.00	-45.81	-5.55	Peak
3	264.63	-75.17	-69.53	-25.00	-50.17	-5.64	Peak
4	461.00	-72.48	-68.33	-25.00	-47.48	-4.15	Peak
5	652.10	-68.95	-68.81	-25.00	-43.95	-0.14	Peak
6	904.10	-67.32	-70.38	-25.00	-42.32	3.06	Peak
7 pp	5186.00	-46.41	-66.53	-25.00	-21.41	20.12	Peak

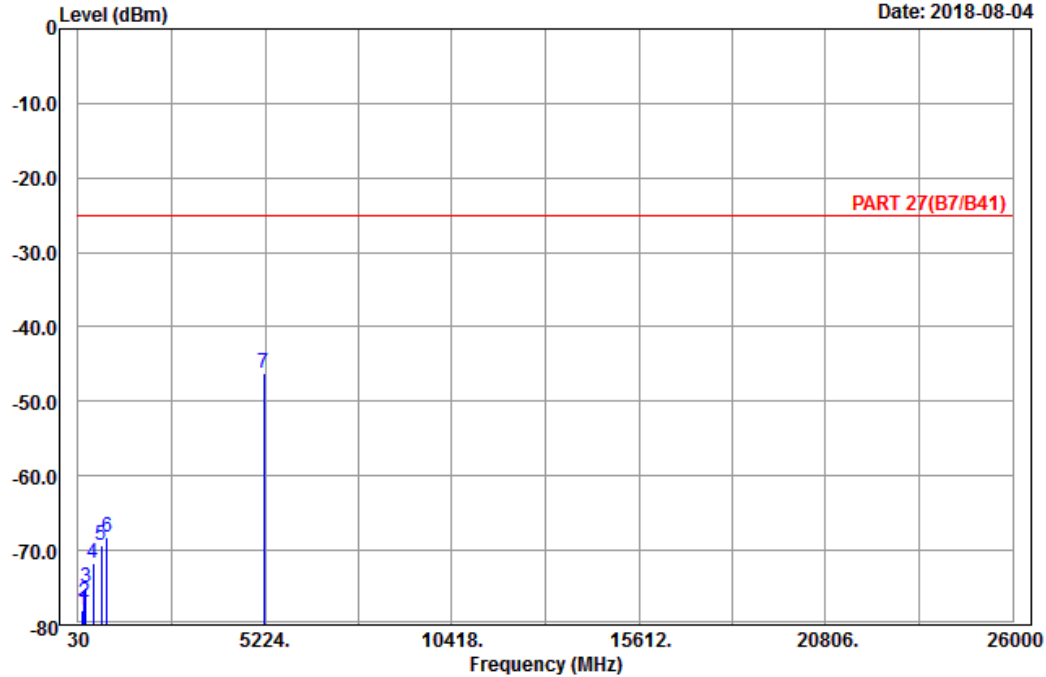


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 14

Date: 2018-08-04



Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 41_Link_CH40620
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	144.48	-77.99	-70.18	-25.00	-52.99	-7.81	Peak
2	200.37	-76.93	-70.76	-25.00	-51.93	-6.17	Peak
3	235.20	-75.09	-69.39	-25.00	-50.09	-5.70	Peak
4	439.30	-71.61	-68.00	-25.00	-46.61	-3.61	Peak
5	666.80	-69.29	-69.08	-25.00	-44.29	-0.21	Peak
6	830.60	-68.31	-69.98	-25.00	-43.31	1.67	Peak
7 pp	5186.00	-46.29	-66.41	-25.00	-21.29	20.12	Peak

High Channel

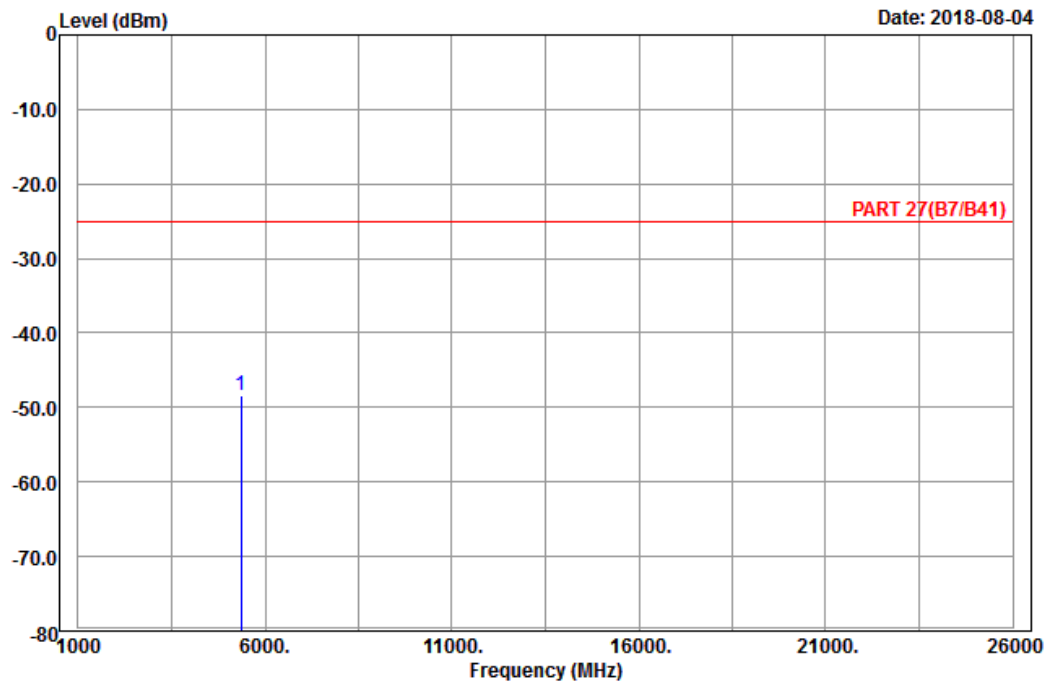


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2018-08-04



Site : 966 chamber 1
Condition: PART 27(B7/B41) Horizontal
Remark : LTE_Band 41_Link_CH41490
Tested by: Karl Lee

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5360.00	-48.48	-68.78	-25.00	-23.48	20.30	Peak

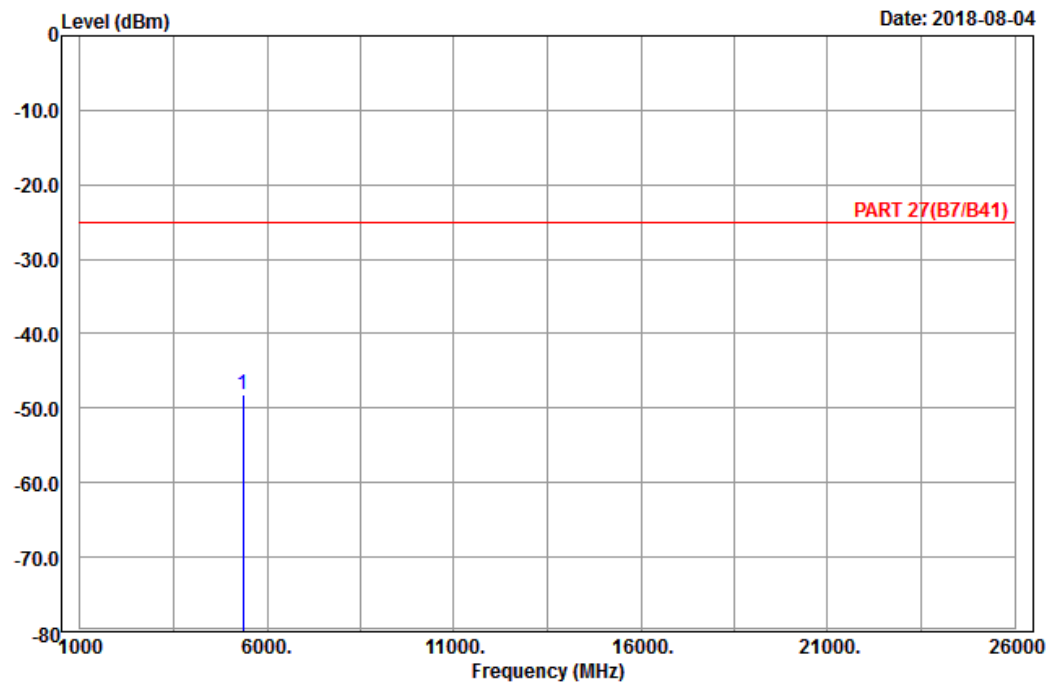


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2018-08-04



Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 41_Link_CH41490
Tested by: Karl Lee

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5360.00	-48.12	-68.42	-25.00	-23.12	20.30	Peak

5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

--- END ---