Partial FCC Test Report

(PART 27)

Report No.:	RF140313C20E-6
FCC ID:	QYLEM7455T
Test Model:	EM7455
Received Date:	Oct. 03, 2018
Test Date:	Nov. 10, 2018 ~ Nov. 13, 2018
Issued Date:	Nov. 22, 2018
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
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist.,New Taipei City, Taiwan (R.O.C)
Test Location :	B2F., No.215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan, R.O.C
FCC Registration / Designation Number:	427177 / TW0011

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Release Control Record

Issue No.	Description	Date Issued
RF140313C20E-6	Original Release	Nov. 22, 2018

1 Certificate of Conformity

Product:	Wireless Module
Brand:	Sierra wireless Inc.
Test Model:	EM7455
Sample Status:	Identical Prototype
Applicant:	Getac Technology Corporation.
Test Date:	Nov. 10, 2018 ~ Nov. 13, 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 : Flora Huang , **Date:** Nov. 22, 2018

Flora Huang / Specialist

Approved by : , **Date:** Nov. 22, 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)(4)(6)	Out-of-Band Emissions Measurements	N/A	Refer to Note
2.1051 27.53(m)(4)(6)	Conducted Spurious Emissions	N/A	Refer to Note
2.1053 27.53(m)(4)(6)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -10.82dB at 5186.00MHz.

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 TTS report no.:B15W50341-FCC-RF_Rev1 for module (Brand: Sierra Wireless Inc. , Model:EM7455)

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	2.0153 dB
	200MHz ~1000MHz	2.0224 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	1.0121 dB
	18GHz ~ 40GHz	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. 20, 2018	Aug. 19, 2019
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Jan. 11, 2018	Jan. 10, 2019
BILOG Antenna SCHWARZBECK	VULB9168	9168-616	Dec. 14, 2017	Dec. 13, 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
Preamplifier Agilent	310N	187226	Jun. 19, 2018	Jun. 18, 2019
Preamplifier Agilent	83017A	MY39501357	Jun. 19, 2018	Jun. 18, 2019
Preamplifier EMCI	EMC 184045	980116	Oct. 12, 2018	Oct. 11, 2019
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(RFC-SMS-100-SMS-120+RFC-SMS-100-SMS-400)	Jun. 19, 2018	Jun. 18, 2019
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(RFC-SMS-100-SMS-24)	Jun. 19, 2018	Jun. 18, 2019
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	MT8821C	6261786083	Dec. 21, 2017	Dec. 20, 2018
Temperature & Humidity Chamber	GTH-120-40-CP-AR	MAA1306-019	Sep. 05, 2018	Sep. 04, 2019

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 1GHz if tested.
4. The IC Site Registration No. is 7450I-1.

3 General Information

3.1 General Description of EUT

Product	Wireless Module	
Brand	Sierra wireless Inc.	
Test Model	EM7455	
Status of EUT	Identical Prototype	
Power Supply Rating	3.3Vdc(Host equipment)	
Modulation Type	QPSK, 16QAM	
Frequency Range	LTE Band 7 (Channel Bandwidth: 5MHz)	2502.5 ~ 2567.5MHz
	LTE Band 7 (Channel Bandwidth: 10MHz)	2505 ~ 2565MHz
	LTE Band 7 (Channel Bandwidth: 15MHz)	2507.5 ~ 2562.5MHz
	LTE Band 7 (Channel Bandwidth: 20MHz)	2510 ~ 2560MHz
	LTE Band 41 (Channel Bandwidth: 5 MHz)	2498.5 ~ 2687.5MHz
	LTE Band 41 (Channel Bandwidth: 10 MHz)	2501.0 ~ 2685.0MHz
	LTE Band 41 (Channel Bandwidth: 15 MHz)	2503.5 ~ 2682.5MHz
	LTE Band 41 (Channel Bandwidth: 20 MHz)	2506.0 ~ 2680.0MHz
Max. EIRP Power	LTE Band 7 (Channel Bandwidth: 5 MHz)	184.37mW
	LTE Band 7 (Channel Bandwidth: 10 MHz)	186.08mW
	LTE Band 7 (Channel Bandwidth: 15 MHz)	187.80mW
	LTE Band 7 (Channel Bandwidth: 20 MHz)	189.54mW
	LTE Band 41 (Channel Bandwidth: 5 MHz)	207.06mW
	LTE Band 41 (Channel Bandwidth: 10 MHz)	209.07mW
	LTE Band 41 (Channel Bandwidth: 15 MHz)	210.77mW
	LTE Band 41 (Channel Bandwidth: 20 MHz)	212.67mW
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 used in specific End-product. Please refer to below for more details.

Product	Brand	Model
Tablet PC	Getac	T800

2. The antenna information is listed as below.

Antenna Type	Model	Antenna Gain	
		LTE Band 7	LTE Band 41
PIFA	Main: 422122800006 Aux.: 422122800007	Main: 1.25 Aux.: 0.73	Main: 1.25 Aux.: 1.66

3. TheEnd-product contains following accessory devices.

Product	Brand	Model	Description
Adapter 1	CHICONY	A12-065N2A	I/P: 100-240Vac, 50-60Hz, 1.7A O/P: 19.0Vdc, 3.42A
Adapter 2	FSP GROUP INC.	FSP065-REB	I/P: 100-240Vac, 50-60Hz, 1.5A O/P: 19.0Vdc, 3.42A
Battery	Getac	BP2S2P2100S	7.4Vdc, 4200mAh, 32WAh
CPU	INTEL	Z8700	Speed:1.6GHz
LCD Panel	INNOLUX	HE080IA-06B	--
SSD	Hynix	H26M78103CCR	64GB
	Sandisk	SDIN8CE4-128G	128GB
OCD	FOXLINK	FO20FF-505H	Camera
		FO80AF-506H	Webcam
Digitizer	N/A	N/A	--
WWAN Module	Sierra	EM7455	--
GPS	GlobalSat	MT-5110C	--
WiFi& BT Module	Intel	7265NGW	--

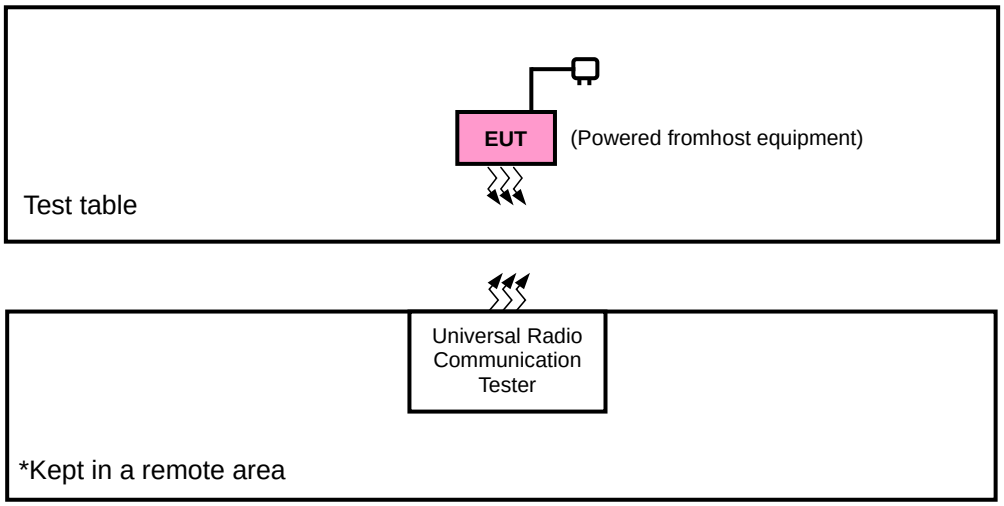
4. The End-product contains 4 SKU. The configurations of all SKU are listed as below. Only SKU D was tested and presented in the report.

Part	Brand	Model	Specification	Configuration			
				SKU A	SKU B	SKU C	SKU D
GPS	GlobalSat	MT-5110C	GPS	V	V	V	V
CPU	N/A	Z8700	Speed:1.6GHz	V	V	V	V
SSD	Hynix	H26M78103CCR	64GB	V			V
	Sandisk	SDIN8CE4-128G	128GB		V	V	
OCD	FOXLINK	FO20FF-505H	Camera	V	V	V	V
		FO80AF-506H	Webcam	V	V	V	V
Option Bay	N/A	N/A	LAN	V			V
	N/A	N/A	Barcode Reader		V	V	
WWAN Module	Sierra	EM7355	--	V	V	V	
	Sierra	EM7455	--				V
WiFi& BT Module	Intel	7265NGW	--	V	V	V	V
Digitizer	Hanvon	TP-018S-H1S1-GT	--			V	

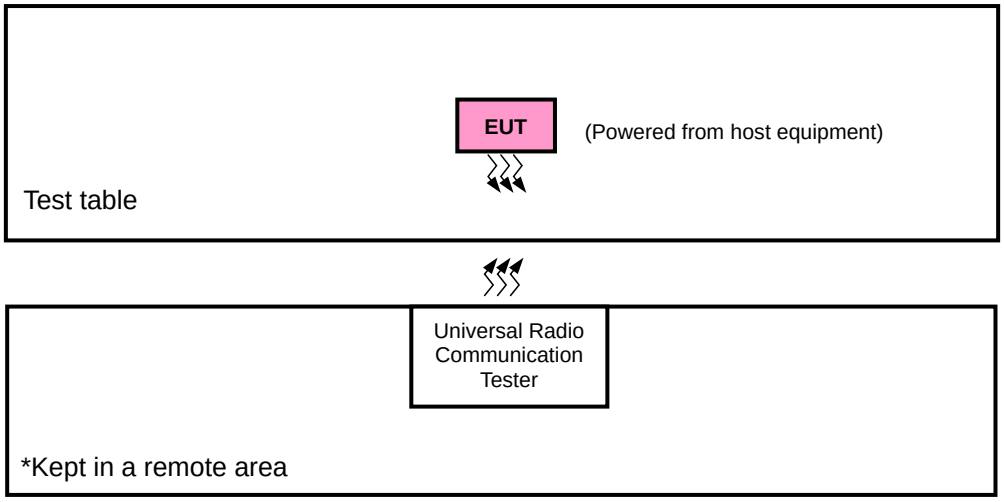
5. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

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	Z-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	5MHz	QPSK, 16QAM	1 RB / 12 RB Offset
		20800 to 21400	20800, 21100, 21400	10MHz	QPSK, 16QAM	1 RB / 24 RB Offset
		20825 to 21375	20825, 21100, 21375	15MHz	QPSK, 16QAM	1 RB / 37 RB Offset
		20850 to 21350	20850, 21100 21350	20MHz	QPSK, 16QAM	1 RB / 50 RB Offset
-	Radiated Emission	20775 to 21425	20775, 21100, 21425	5MHz	QPSK	1 RB / 12 RB Offset
		20850 to 21350	20850, 21100 21350	20MHz	QPSK	1 RB / 50 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	5MHz	QPSK, 16QAM	1 RB / 12 RB Offset
		39700 to 41540	39700, 40620, 41540	10MHz	QPSK, 16QAM	1 RB / 24 RB Offset
		39725 to 41515	39725, 40620, 41515	15MHz	QPSK, 16QAM	1 RB / 37 RB Offset
		39750 to 41490	39750, 40620, 41490	20MHz	QPSK, 16QAM	1 RB / 50 RB Offset
-	Radiated Emission	39675 to 41565	39675, 40620, 41565	5MHz	QPSK	1 RB / 12 RB Offset
		39750 to 41490	39750, 40620, 41490	20MHz	QPSK	1 RB / 50 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	25deg. C, 60%RH	120Vac, 60Hz	Karl Lee
Radiated Emission	25deg. C, 60%RH	120Vac, 60Hz	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

The radiated peak output power shall be according to the specific rule Part 27.50(h)(2) that “Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2 watts transmitter output power” 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:

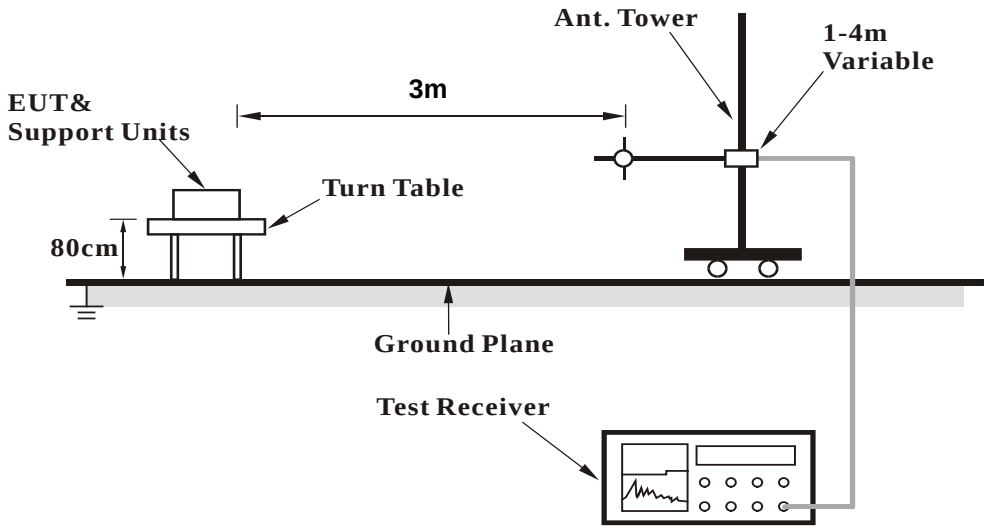
a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 10MHz for LTE mode.
b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m (below or equal 1GHz) and/or 1.5 m (above 1GHz) height of Turn Table, rotated 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 1m to 4m 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.

Conducted Power Measurement:

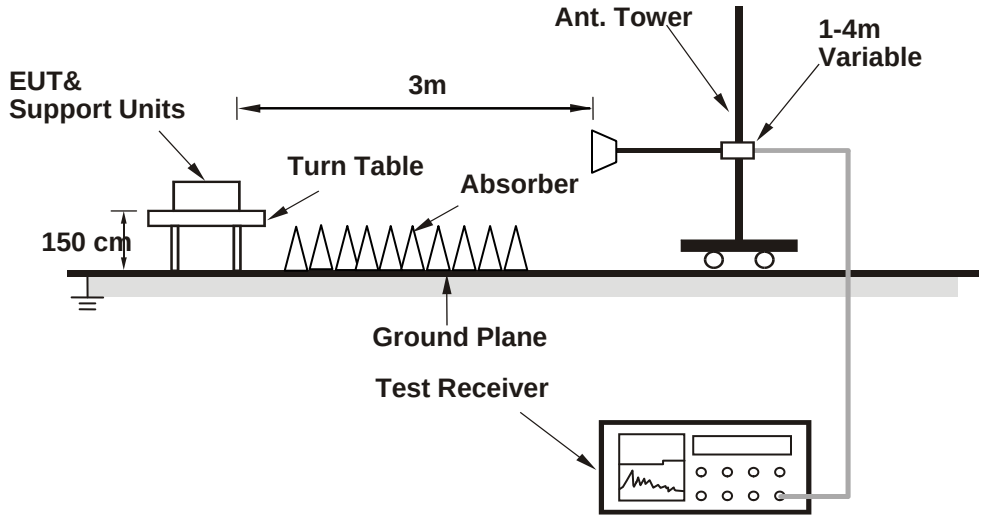
a. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
b. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

4.1.3 Test Setup

EIRP / ERP Measurement:
<Radiated Emission below or equal 1GHz>



<Radiated Emission above 1GHz>



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

Conducted Power Measurement:

4.1.4 Test Results

Conducted Output Power (dBm)

LTE Band 7																
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		20850	21100	21350				Channel		20825	21100	21375	
		Frequency (MHz)		2510.0	2535.0	2560.0				Frequency (MHz)		2507.5	2535.0	2562.5	
20M	QPSK	1	0	21.01	21.25	21.03	0	15M	QPSK	1	0	21.08	21.23	21.03	0
		1	50	21.28	21.49	21.31	0			1	37	21.22	21.48	21.24	0
		1	99	21.10	21.15	21.13	0			1	74	21.10	21.17	21.11	0
		50	0	20.16	20.41	20.19	1			36	0	20.06	20.35	20.11	1
		50	25	20.24	20.49	20.27	1			36	19	20.20	20.48	20.25	1
		50	50	20.25	20.50	20.28	1			36	39	20.19	20.43	20.23	1
		100	0	20.20	20.45	20.23	1			75	0	20.19	20.39	20.18	1
	16QAM	1	0	20.12	20.25	20.13	1		16QAM	1	0	20.05	20.10	20.03	1
		1	50	20.21	20.50	20.29	1			1	37	20.20	20.38	20.29	1
		1	99	20.06	20.12	20.03	1			1	74	20.01	20.20	20.07	1
		50	0	19.15	19.36	19.18	2			36	0	19.03	19.25	19.08	2
		50	25	19.20	19.48	19.19	2			36	19	19.05	19.30	19.14	2
		50	50	19.18	19.40	19.26	2			36	39	19.15	19.40	19.13	2
		100	0	19.20	19.38	19.18	2			75	0	19.05	19.40	19.11	2
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		20800	21100	21400				Channel		20775	21100	21425	
		Frequency (MHz)		2505.0	2535.0	2565.0				Frequency (MHz)		2502.5	2535.0	2567.5	
10M	QPSK	1	0	21.02	21.17	21.06	0	5M	QPSK	1	0	21.04	21.25	21.10	0
		1	24	21.05	21.40	21.28	0			1	12	21.17	21.37	21.14	0
		1	49	21.03	21.13	21.01	0			1	24	21.03	21.30	21.04	0
		25	0	20.10	20.31	20.07	1			12	0	20.03	20.26	20.06	1
		25	12	20.04	20.31	20.15	1			12	6	20.16	20.36	20.14	1
		25	25	20.08	20.30	20.07	1			12	13	20.16	20.40	20.13	1
		50	0	20.10	20.34	20.07	1			25	0	20.05	20.37	20.13	1
	16QAM	1	0	20.06	20.20	20.09	1		16QAM	1	0	20.09	20.16	20.03	1
		1	24	20.19	20.30	20.19	1			1	12	20.09	20.30	20.07	1
		1	49	20.09	20.35	20.10	1			1	24	20.09	20.31	20.16	1
		25	0	19.01	19.16	19.05	2			12	0	19.03	19.36	19.14	2
		25	12	19.04	19.29	19.05	2			12	6	19.18	19.21	19.09	2
		25	25	19.05	19.26	19.11	2			12	13	19.10	19.34	19.03	2
		50	0	19.09	19.24	19.10	2			25	0	19.07	19.25	19.02	2

LTE Band 41																
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		39750	40620	41490				Channel		39725	40620	41515	
		Frequency (MHz)		2506.0	2593.0	2680.0				Frequency (MHz)		2503.5	2593.0	2682.5	
20M	QPSK	1	0	21.30	21.15	21.32	0	15M	QPSK	1	0	21.27	21.11	21.25	0
		1	50	21.57	21.42	21.59	0			1	37	21.57	21.39	21.58	0
		1	99	21.38	21.23	21.40	0			1	74	21.33	21.18	21.30	0
		50	0	20.36	20.21	20.38	1			36	0	20.32	20.20	20.29	1
		50	25	20.58	20.43	20.60	1			36	19	20.49	20.36	20.58	1
		50	50	20.43	20.28	20.45	1			36	39	20.35	20.23	20.36	1
		100	0	20.48	20.33	20.50	1			75	0	20.46	20.32	20.49	1
	16QAM	1	0	20.25	20.11	20.25	1		16QAM	1	0	20.26	20.07	20.24	1
		1	50	20.53	20.36	20.49	1			1	37	20.49	20.36	20.53	1
		1	99	20.34	20.15	20.39	1			1	74	20.38	20.21	20.36	1
		50	0	19.29	19.14	19.34	2			36	0	19.35	19.15	19.29	2
		50	25	19.56	19.42	19.52	2			36	19	19.53	19.41	19.52	2
		50	50	19.42	19.27	19.40	2			36	39	19.37	19.28	19.35	2
		100	0	19.46	19.26	19.48	2			75	0	19.48	19.31	19.49	2
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		39700	40620	41540				Channel		39675	40620	41565	
		Frequency (MHz)		2501.0	2593.0	2685.0				Frequency (MHz)		2498.5	2593.0	2687.5	
10M	QPSK	1	0	21.24	21.09	21.14	0	5M	QPSK	1	0	21.20	21.08	21.15	0
		1	24	21.52	21.32	21.56	0			1	12	21.55	21.31	21.50	0
		1	49	21.30	21.13	21.37	0			1	24	21.31	21.15	21.29	0
		25	0	20.24	20.07	20.33	1			12	0	20.31	20.14	20.28	1
		25	12	20.47	20.28	20.51	1			12	6	20.51	20.38	20.42	1
		25	25	20.24	20.18	20.30	1			12	13	20.39	20.15	20.44	1
		50	0	20.48	20.26	20.42	1			25	0	20.39	20.24	20.47	1
	16QAM	1	0	20.25	20.10	20.13	1		16QAM	1	0	20.21	20.01	20.17	1
		1	24	20.48	20.30	20.51	1			1	12	20.51	20.37	20.50	1
		1	49	20.30	20.08	20.32	1			1	24	20.24	20.21	20.24	1
		25	0	19.34	19.11	19.35	2			12	0	19.32	19.20	19.31	2
		25	12	19.48	19.24	19.54	2			12	6	19.55	19.35	19.46	2
		25	25	19.26	19.15	19.27	2			12	13	19.40	19.18	19.40	2
		50	0	19.42	19.22	19.34	2			25	0	19.48	19.25	19.38	2

EIRP Power (dBm)

LTE Band 7							
Channel Bandwidth: 5MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**Reading (dBm)**	**Correction Factor(dB)**	**EIRP(dBm)**	**EIRP(mW)**	**Polarization (H/V)**
Z	20775	2502.5	-21.73	44.24	22.51	178.16	H
	21100	2535.0	-21.54	44.20	22.66	184.37	
	21425	2567.5	-22.22	44.80	22.58	181.18	
	20775	2502.5	-25.67	44.19	18.52	71.14	V
	21100	2535.0	-25.43	44.09	18.66	73.42	
	21425	2567.5	-25.89	44.50	18.61	72.59	
Channel Bandwidth: 5MHz / 16QAM							
Z	20775	2502.5	-22.74	44.24	21.50	141.19	H
	21100	2535.0	-22.55	44.20	21.65	146.12	
	21425	2567.5	-23.23	44.80	21.57	143.58	
	20775	2502.5	-26.68	44.19	17.51	56.38	V
	21100	2535.0	-26.44	44.09	17.65	58.18	
	21425	2567.5	-26.90	44.50	17.60	57.53	

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

LTE Band 7							
Channel Bandwidth: 10MHz / QPSK							
Plane	**Channel**	**Frequency (MHz)**	**Reading (dBm)**	**Correction Factor(dB)**	**EIRP(dBm)**	**EIRP(mW)**	**Polarization (H/V)**
Z	20800	2505.0	-21.79	44.34	22.55	179.93	H
	21100	2535.0	-21.50	44.20	22.70	186.08	
	21400	2565.0	-22.10	44.72	22.62	182.94	
	20800	2505.0	-25.67	44.23	18.56	71.71	V
	21100	2535.0	-25.40	44.09	18.69	73.93	
	21400	2565.0	-25.76	44.41	18.65	73.21	
Channel Bandwidth: 10MHz / 16QAM							
Z	20800	2505.0	-22.82	44.34	21.52	141.94	H
	21100	2535.0	-22.51	44.20	21.69	147.47	
	21400	2565.0	-23.12	44.72	21.60	144.64	
	20800	2505.0	-26.68	44.23	17.55	56.83	V
	21100	2535.0	-26.41	44.09	17.68	58.59	
	21400	2565.0	-26.77	44.41	17.64	58.02	

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

LTE Band 7							
Channel Bandwidth: 15MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
Z	20825	2507.5	-21.73	44.32	22.59	181.47	H
	21100	2535.0	-21.46	44.20	22.74	187.80	
	21375	2562.5	-22.19	44.85	22.66	184.42	
	20825	2507.5	-25.39	43.99	18.60	72.48	V
	21100	2535.0	-25.36	44.09	18.73	74.61	
	21375	2562.5	-25.82	44.51	18.69	73.96	
Channel Bandwidth: 15MHz / 16QAM							
Z	20825	2507.5	-22.74	44.32	21.58	143.81	H
	21100	2535.0	-22.47	44.20	21.73	148.83	
	21375	2562.5	-23.20	44.85	21.65	146.15	
	20825	2507.5	-26.40	43.99	17.59	57.44	V
	21100	2535.0	-26.37	44.09	17.72	59.13	
	21375	2562.5	-26.83	44.51	17.68	58.61	

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

LTE Band 7							
Channel Bandwidth: 20MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
Z	20850.0	2510.0	-21.53	44.16	22.63	183.23	H
	21100.0	2535.0	-21.42	44.20	22.78	189.54	
	21350.0	2560.0	-22.11	44.81	22.70	186.08	
	20850.0	2510.0	-26.14	44.78	18.64	73.11	V
	21100.0	2535.0	-25.32	44.09	18.77	75.30	
	21350.0	2560.0	-26.00	44.72	18.72	74.47	
Channel Bandwidth: 20MHz / 16QAM							
Z	20850.0	2510.0	-22.54	44.16	21.62	145.21	H
	21100.0	2535.0	-22.42	44.20	21.78	150.56	
	21350.0	2560.0	-23.12	44.81	21.69	147.47	
	20850.0	2510.0	-27.15	44.78	17.63	57.94	V
	21100.0	2535.0	-26.32	44.09	17.77	59.81	
	21350.0	2560.0	-27.00	44.72	17.72	59.16	

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

LTE Band 41							
Channel Bandwidth: 5MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
X	39675	2498.5	-21.15	44.24	23.09	203.61	H
	40620	2593.0	-21.18	44.20	23.02	200.31	
	41565	2687.5	-21.64	44.80	23.16	207.06	
	39675	2498.5	-25.07	44.19	19.12	81.68	V
	40620	2593.0	-25.06	44.09	19.03	79.95	
	41565	2687.5	-25.37	44.50	19.13	81.83	
Channel Bandwidth: 5MHz / 16QAM							
X	39675	2498.5	-22.16	44.24	22.08	161.36	H
	40620	2593.0	-22.19	44.20	22.01	158.74	
	41565	2687.5	-22.65	44.80	22.15	164.10	
	39675	2498.5	-26.08	44.19	18.11	64.73	V
	40620	2593.0	-26.07	44.09	18.02	63.36	
	41565	2687.5	-26.38	44.50	18.12	64.85	

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

LTE Band 41							
Channel Bandwidth: 10MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
X	39700	2501.0	-21.21	44.34	23.13	205.64	H
	40620	2593.0	-21.14	44.20	23.06	202.16	
	41540	2685.0	-21.52	44.72	23.20	209.07	
	39700	2501.0	-25.08	44.23	19.15	82.15	V
	40620	2593.0	-25.02	44.09	19.07	80.69	
	41540	2685.0	-25.24	44.41	19.17	82.53	
Channel Bandwidth: 10MHz / 16QAM							
X	39700	2501.0	-22.21	44.34	22.13	163.34	H
	40620	2593.0	-22.15	44.20	22.05	160.21	
	41540	2685.0	-22.53	44.72	22.19	165.69	
	39700	2501.0	-26.09	44.23	18.14	65.10	V
	40620	2593.0	-26.03	44.09	18.06	63.94	
	41540	2685.0	-26.25	44.41	18.16	65.40	

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

LTE Band 41							
Channel Bandwidth: 15MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
X	39725	2503.5	-21.15	44.32	23.17	207.40	H
	40620	2593.0	-21.10	44.20	23.10	204.03	
	41515	2682.5	-21.61	44.85	23.24	210.77	
	39725	2503.5	-24.80	43.99	19.19	83.02	V
	40620	2593.0	-24.98	44.09	19.11	81.43	
	41515	2682.5	-25.30	44.51	19.21	83.37	
Channel Bandwidth: 15MHz / 16QAM							
X	39725	2503.5	-22.16	44.32	22.16	164.36	H
	40620	2593.0	-22.11	44.20	22.09	161.70	
	41515	2682.5	-22.61	44.85	22.24	167.42	
	39725	2503.5	-25.81	43.99	18.18	65.80	V
	40620	2593.0	-25.99	44.09	18.10	64.54	
	41515	2682.5	-26.31	44.51	18.20	66.07	

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

LTE Band 41							
Channel Bandwidth: 20MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
X	39750	2506.0	-20.95	44.16	23.21	209.41	H
	40620	2593.0	-21.06	44.20	23.14	205.92	
	41490	2680.0	-21.53	44.81	23.28	212.67	
	39750	2506.0	-25.56	44.78	19.22	83.56	V
	40620	2593.0	-24.94	44.09	19.15	82.19	
	41490	2680.0	-25.47	44.72	19.25	84.14	
Channel Bandwidth: 20MHz / 16QAM							
X	39750	2506.0	-21.96	44.16	22.20	165.96	H
	40620	2593.0	-22.07	44.20	22.13	163.19	
	41490	2680.0	-22.54	44.81	22.27	168.54	
	39750	2506.0	-26.56	44.78	18.22	66.37	V
	40620	2593.0	-25.95	44.09	18.14	65.13	
	41490	2680.0	-26.48	44.72	18.24	66.68	

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(P) dB. The limit of emission is equal to -25dBm.

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 0.8m (below or equal 1GHz) and/or 1.5 m (above 1GHz) 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 1m to 4m 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 - 2.15dB.

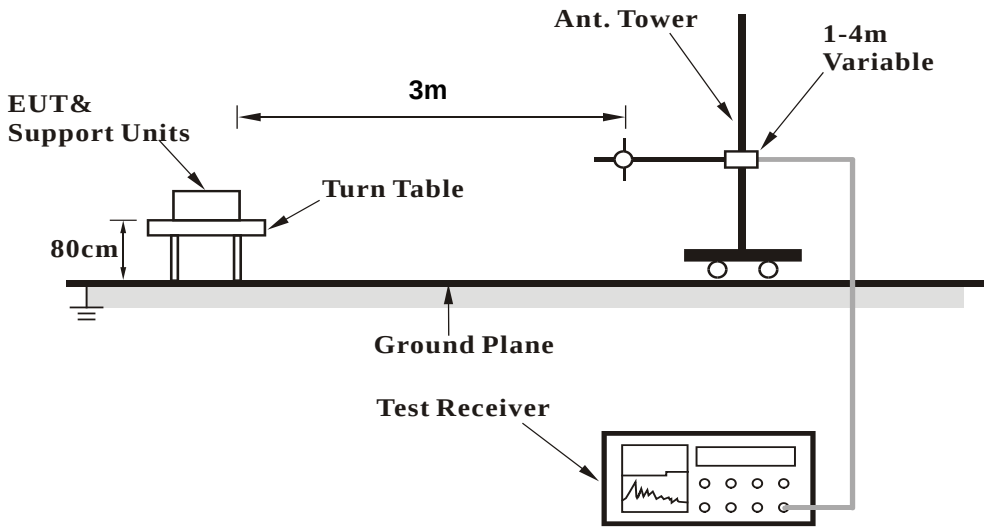
NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.2.3 Deviation from Test Standard

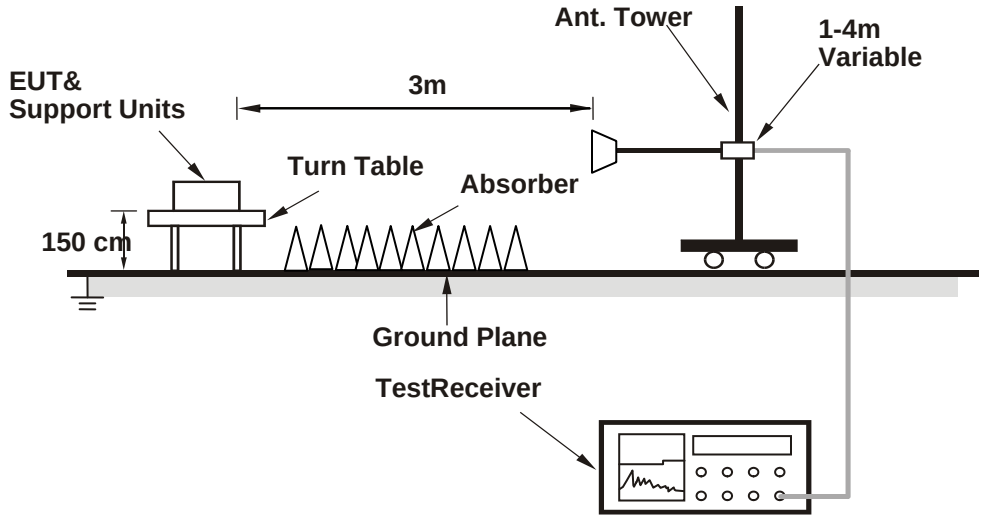
No deviation.

4.2.4 Test Setup

<Radiated Emission below or equal 1GHz>



<Radiated Emission above 1GHz>



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

4.2.5 Test Results

LTE Band 7

Channel Bandwidth: 5MHz / QPSK

Low Channel

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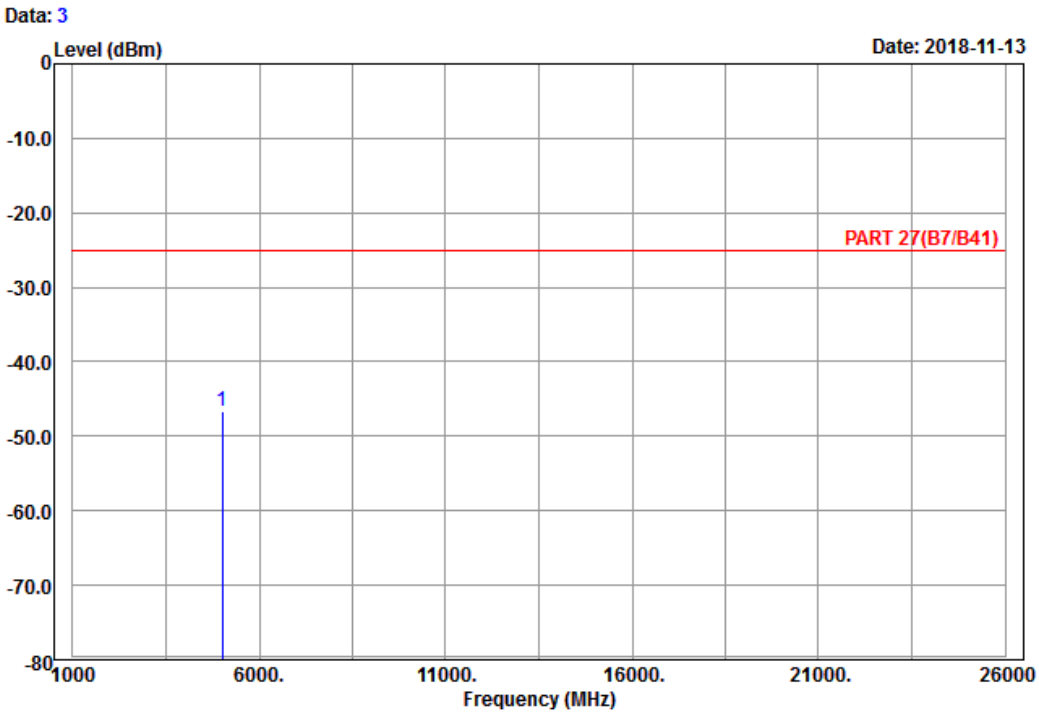
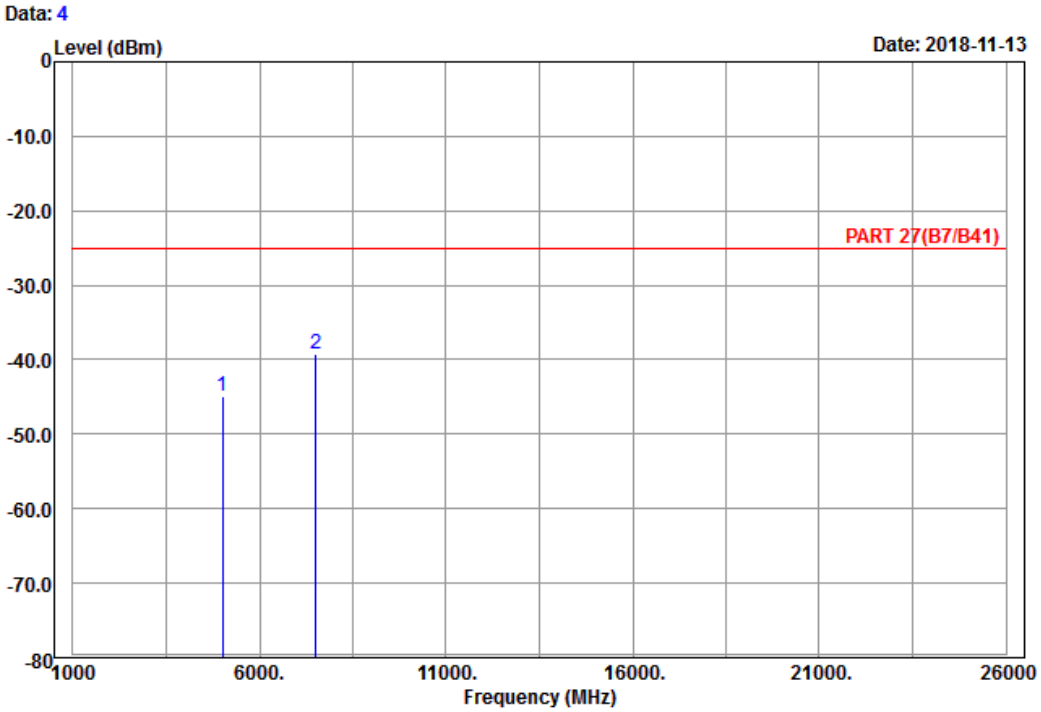



```
Site     : 966 chamber 1
Condition: PART 27(B7/B41) Horizontal
Remark   : LTE_Band 7_Link_CH20775
Tested by: Karl Lee
                        Read  Limit   Over
          Freq  Level  Level   Line  Limit Factor Remark
          ____  _____  _____  _____  _____ ______ _______
           MHz    dBm    dBm    dBm     dB     dB

  1 pp  5005.00 -46.66 -66.24 -25.00 -21.66  19.58 Peak
```

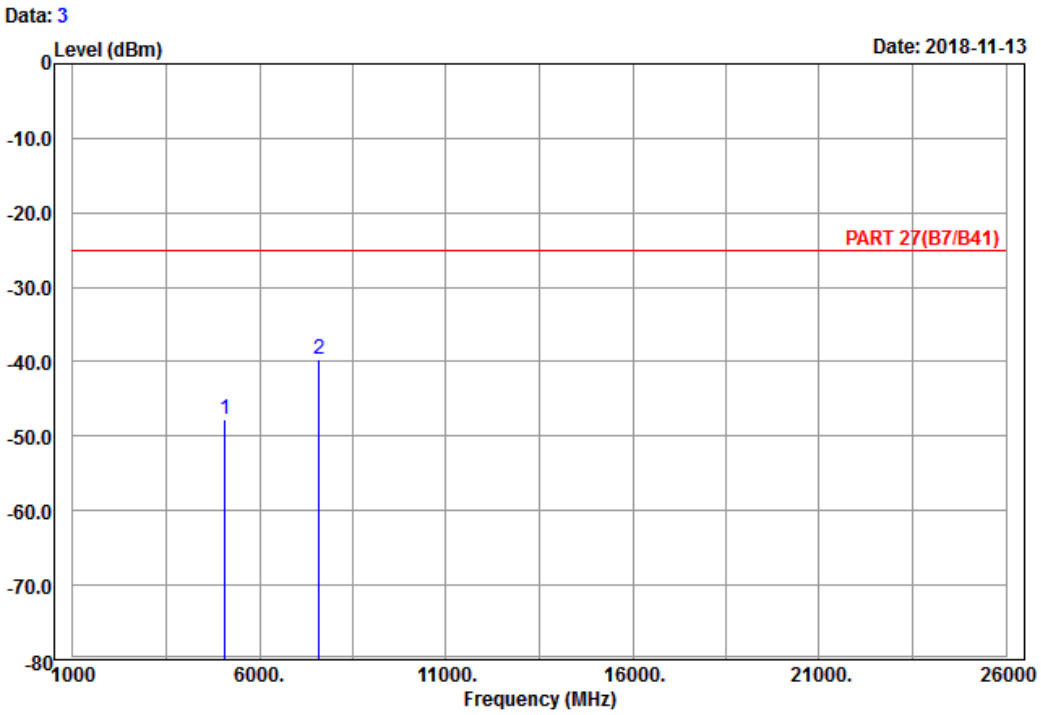


Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 7_Link_CH20775
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	5005.00	-44.95	-64.53	-25.00	-19.95	19.58	Peak
2 pp	7507.50	-39.32	-62.00	-25.00	-14.32	22.68	Peak

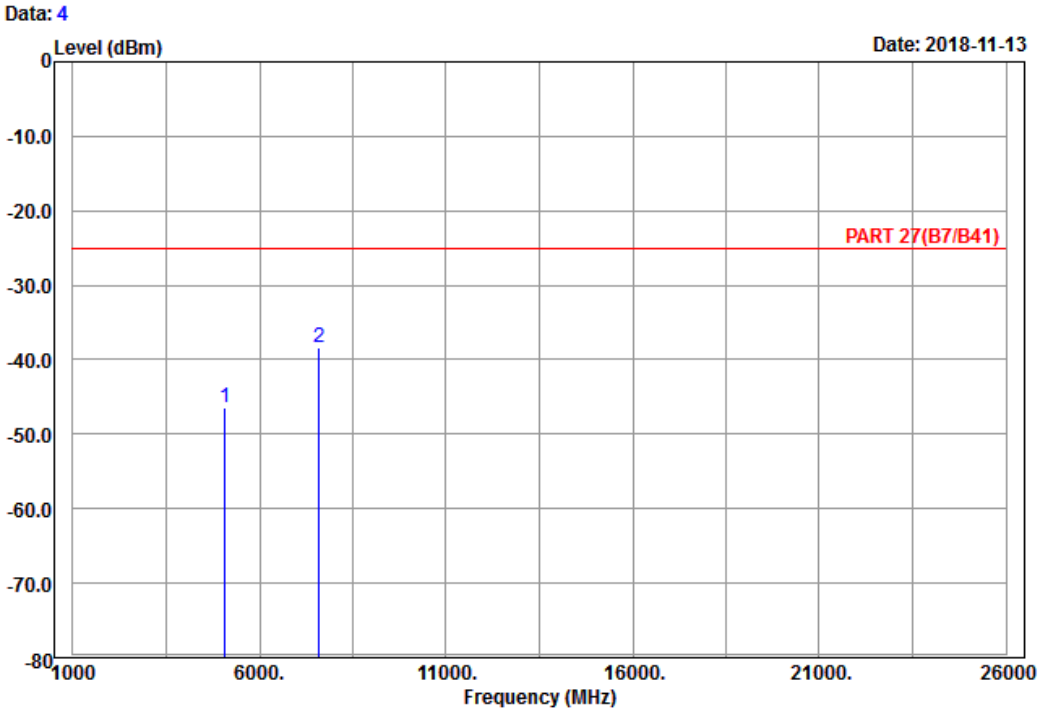
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	5070.00	-47.76	-67.15	-25.00	-22.76	19.39	Peak
2 pp	7605.00	-39.77	-62.76	-25.00	-14.77	22.99	Peak

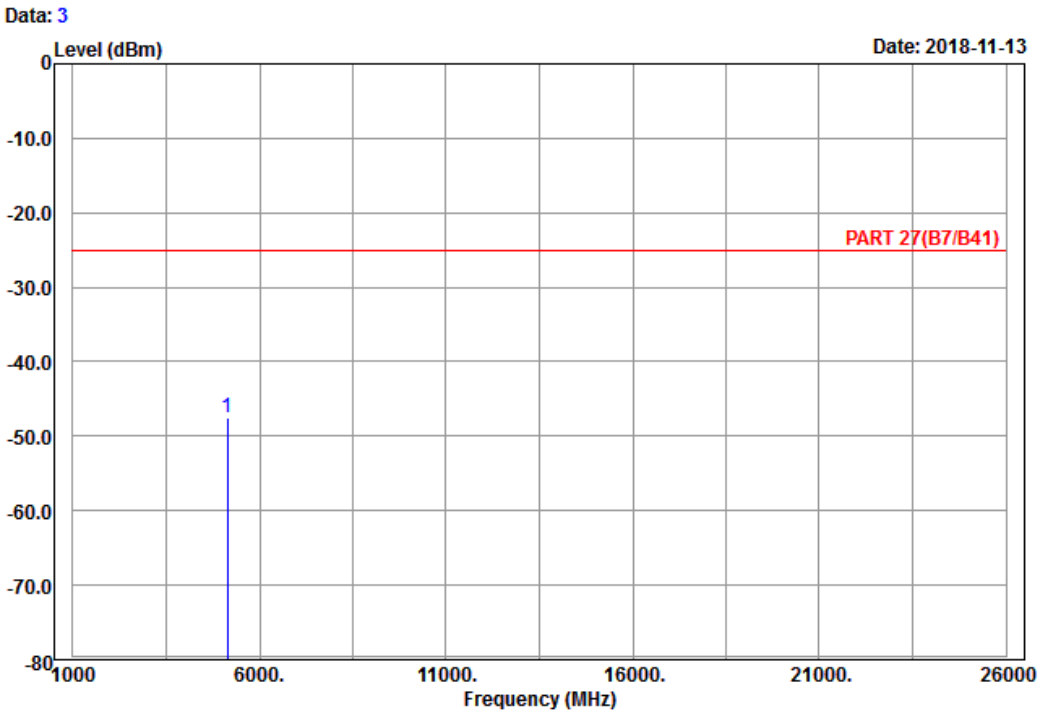


Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 7_Link_CH21100
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	5070.00	-46.41	-65.80	-25.00	-21.41	19.39	Peak
2 pp	7605.00	-38.29	-61.28	-25.00	-13.29	22.99	Peak

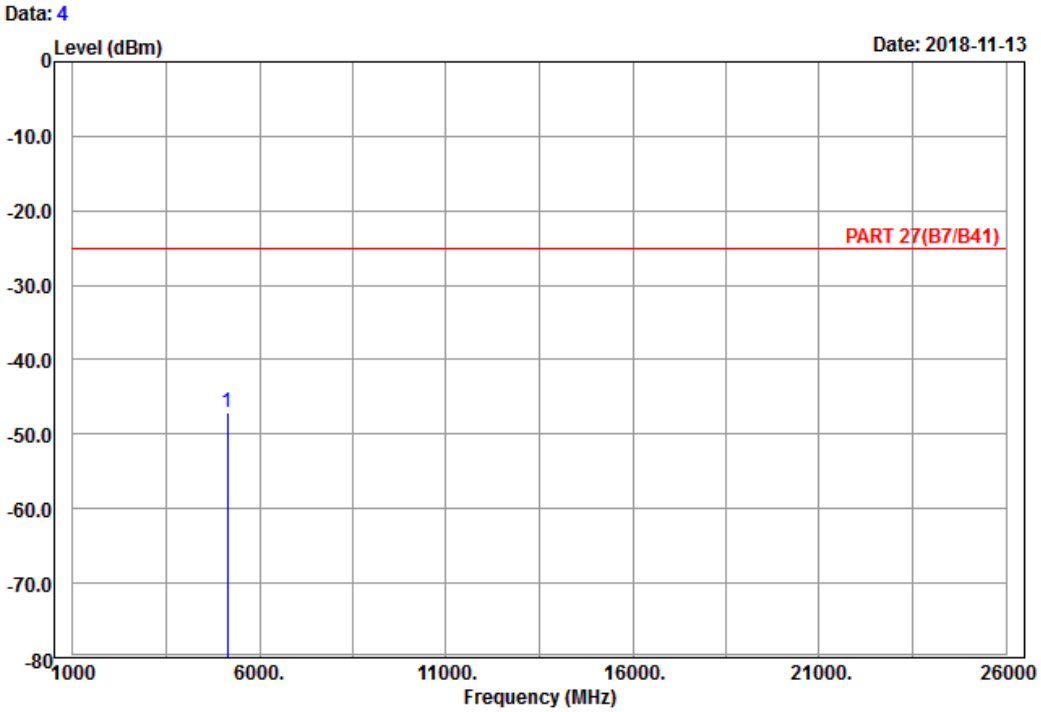
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	5135.00	-47.47	-67.28	-25.00	-22.47	19.81	Peak

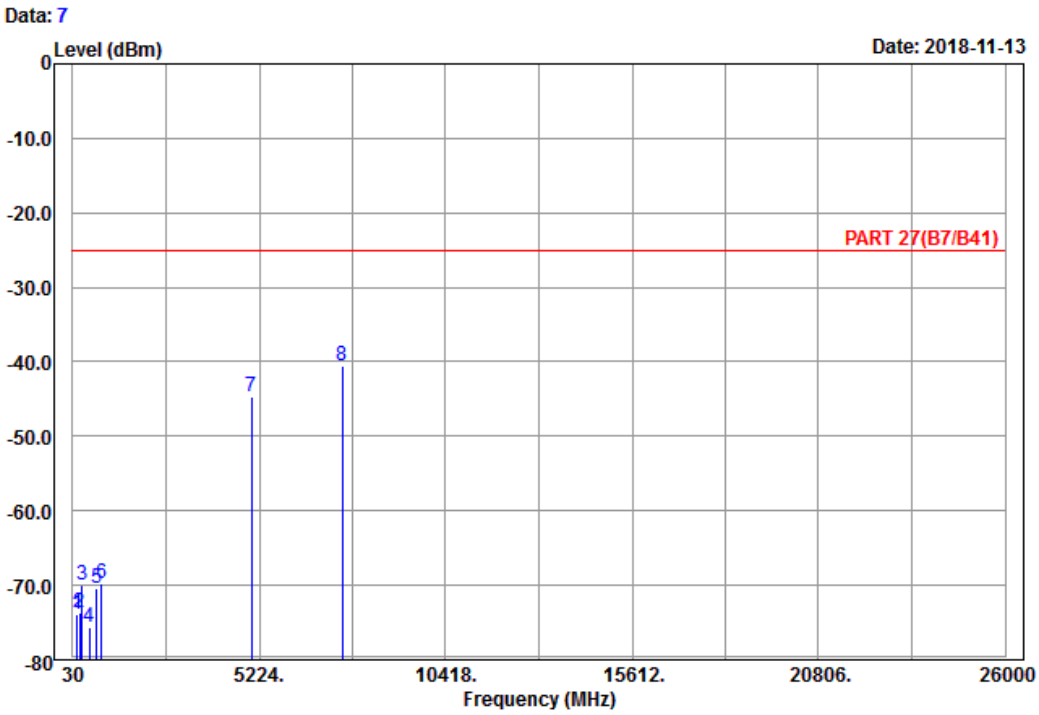


Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 7_Link_CH21425
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	5135.00	-47.10	-66.91	-25.00	-22.10	19.81	Peak

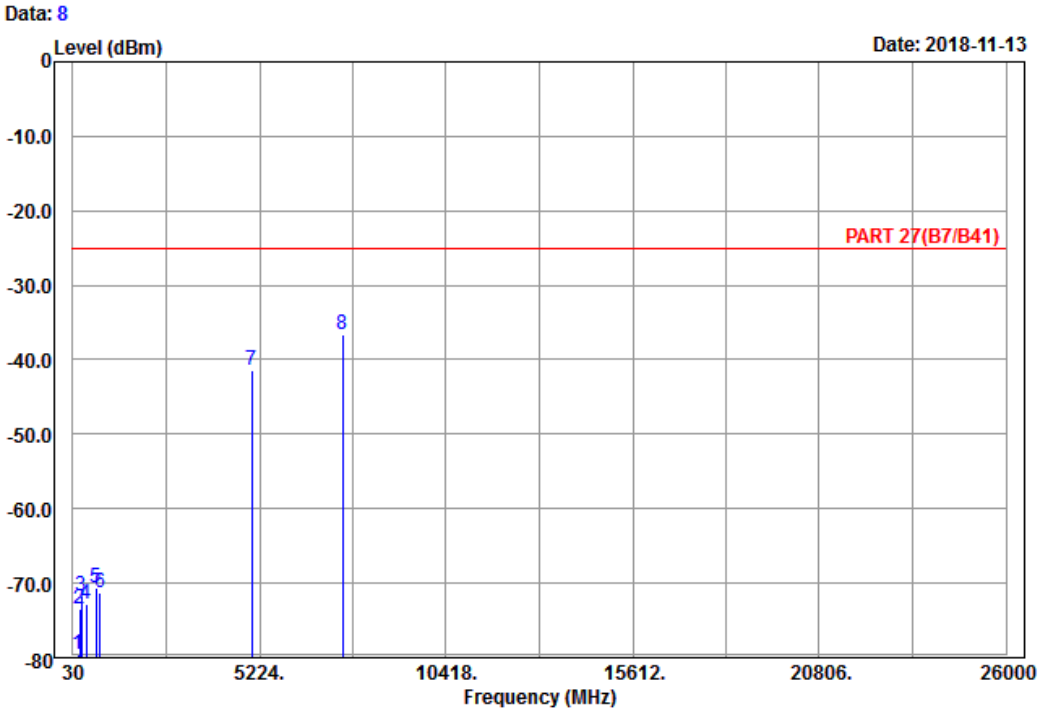
Channel Bandwidth: 20MHz / QPSK
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	162.84	-73.87	-66.49	-25.00	-48.87	-7.38	Peak
2	224.67	-73.74	-67.89	-25.00	-48.74	-5.85	Peak
3	300.00	-69.93	-63.97	-25.00	-44.93	-5.96	Peak
4	492.50	-75.69	-70.63	-25.00	-50.69	-5.06	Peak
5	703.20	-70.51	-70.08	-25.00	-45.51	-0.43	Peak
6	829.90	-69.67	-71.34	-25.00	-44.67	1.67	Peak
7	5020.00	-44.65	-63.73	-25.00	-19.65	19.08	Peak
8 pp	7530.00	-40.56	-63.41	-25.00	-15.56	22.85	Peak

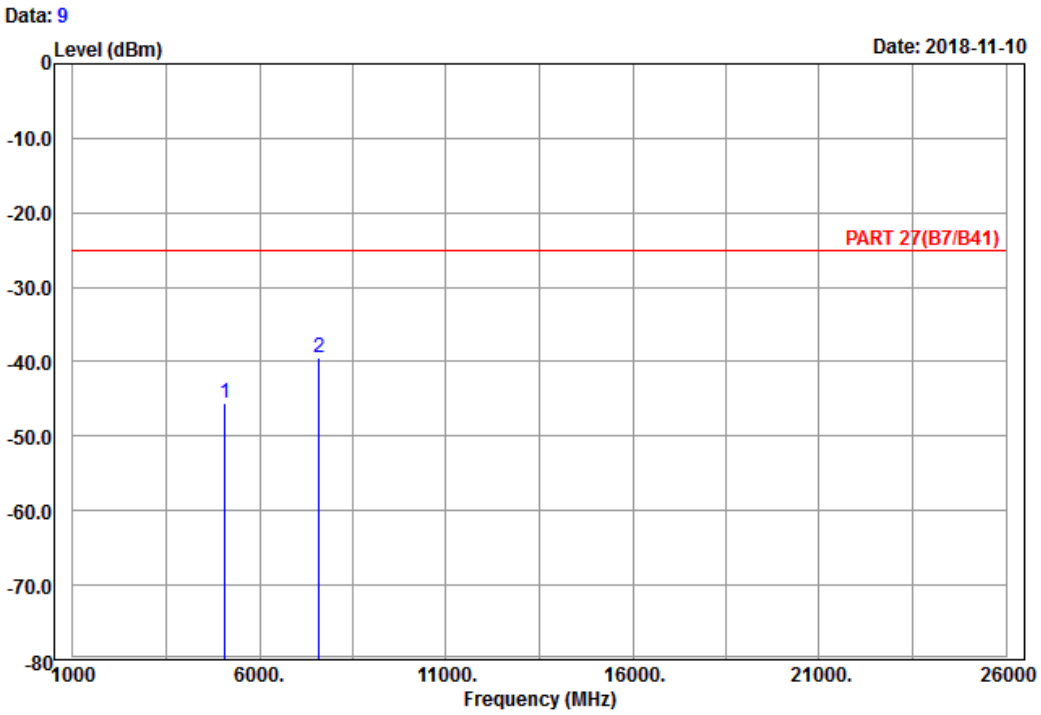


Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 7_Link_CH20850
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	167.43	-79.51	-72.61	-25.00	-54.51	-6.90	Peak
2	228.72	-73.46	-67.67	-25.00	-48.46	-5.79	Peak
3	269.49	-71.80	-66.12	-25.00	-46.80	-5.68	Peak
4	403.60	-72.75	-69.92	-25.00	-47.75	-2.83	Peak
5	665.40	-70.64	-70.43	-25.00	-45.64	-0.21	Peak
6	787.20	-71.24	-72.42	-25.00	-46.24	1.18	Peak
7	5020.00	-41.39	-60.47	-25.00	-16.39	19.08	Peak
8 pp	7530.00	-36.63	-59.48	-25.00	-11.63	22.85	Peak

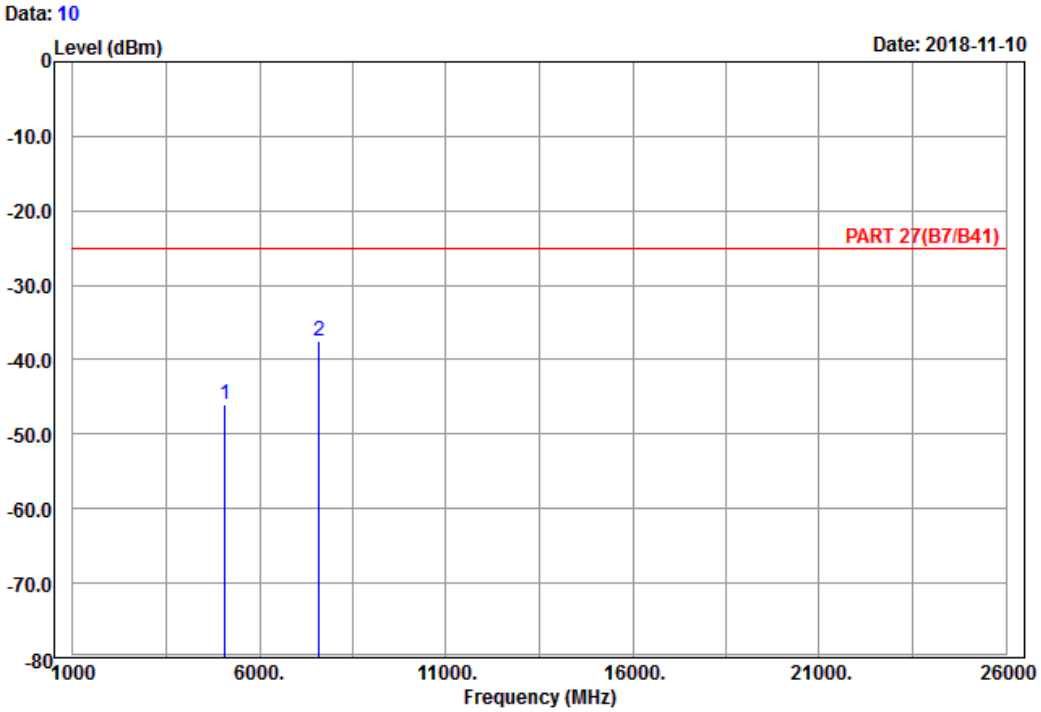
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	5070.00	-45.65	-65.04	-25.00	-20.65	19.39	Peak
2 pp	7605.00	-39.35	-62.34	-25.00	-14.35	22.99	Peak

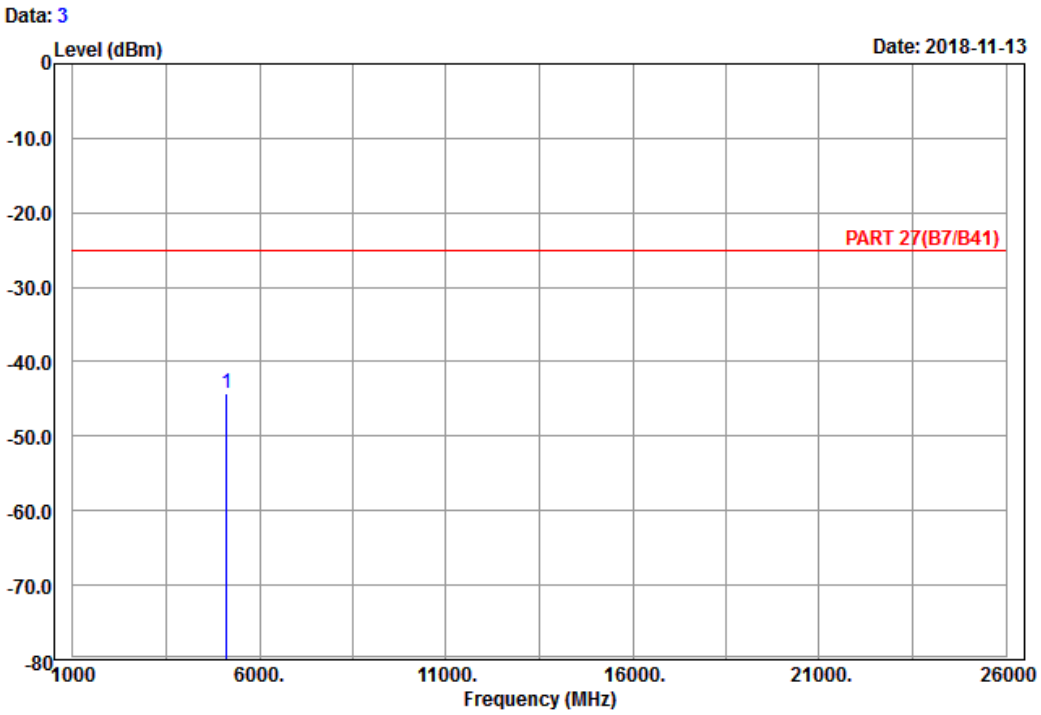


Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 7_Link_CH21100
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	5070.00	-45.95	-65.34	-25.00	-20.95	19.39	Peak
2 pp	7605.00	-37.54	-60.53	-25.00	-12.54	22.99	Peak

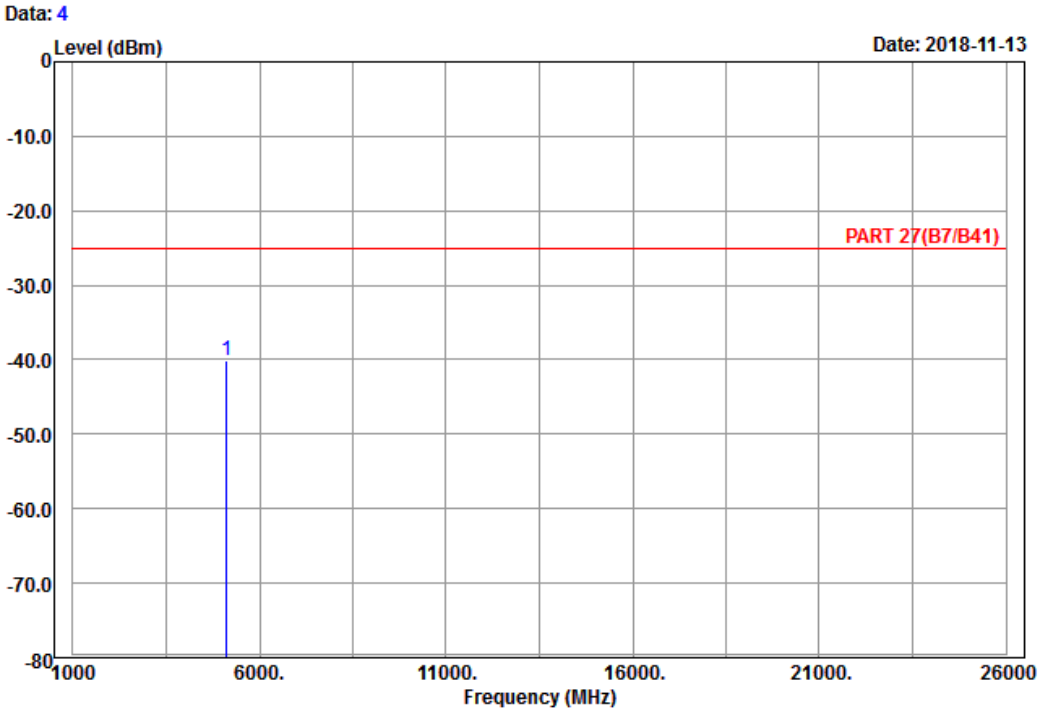
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	5120.00	-44.18	-63.89	-25.00	-19.18	19.71	Peak

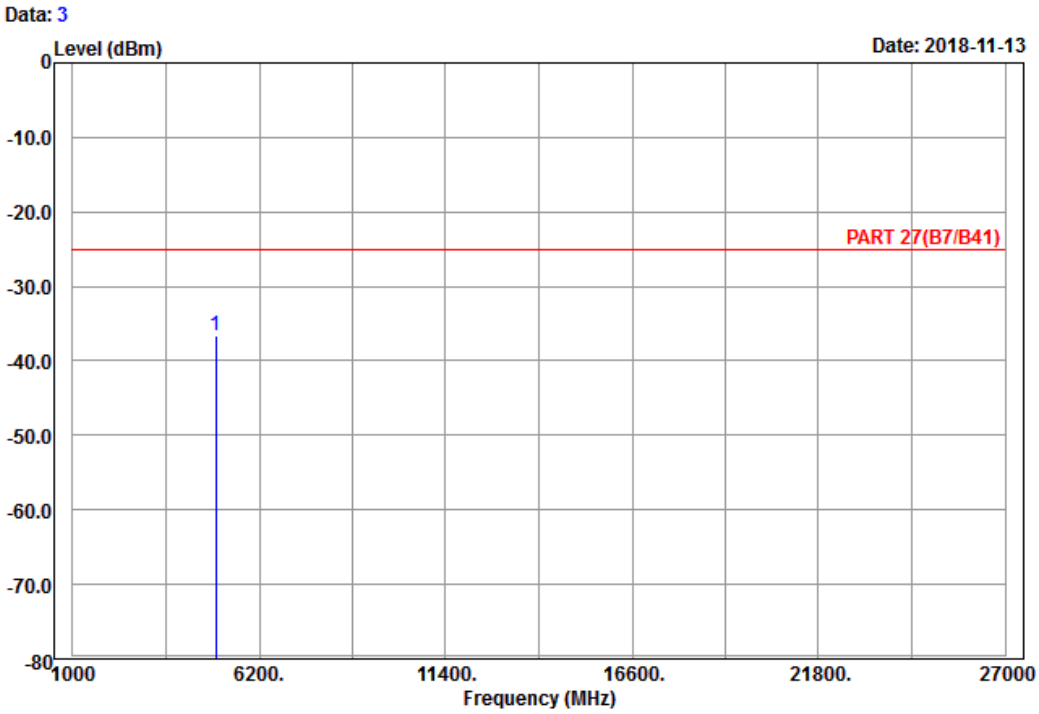


Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 7_Link_CH21350
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	5120.00	-40.20	-59.91	-25.00	-15.20	19.71	Peak

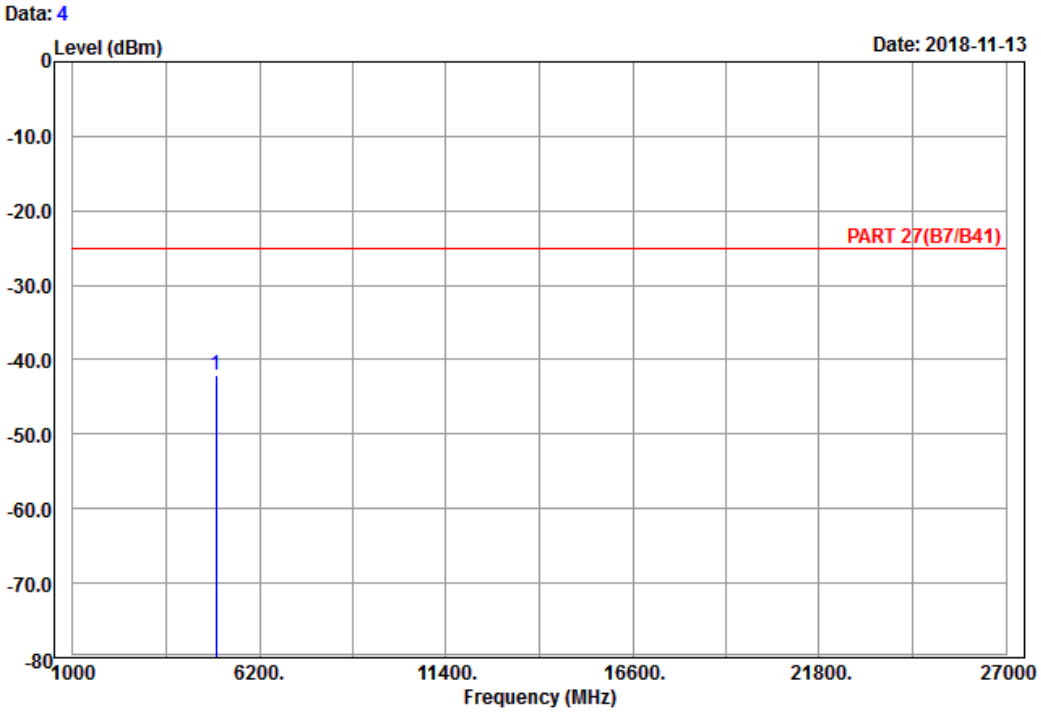
LTE Band 41
Channel Bandwidth: 5MHz / QPSK
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	4997.00	-36.53	-56.11	-25.00	-11.53	19.58	Peak

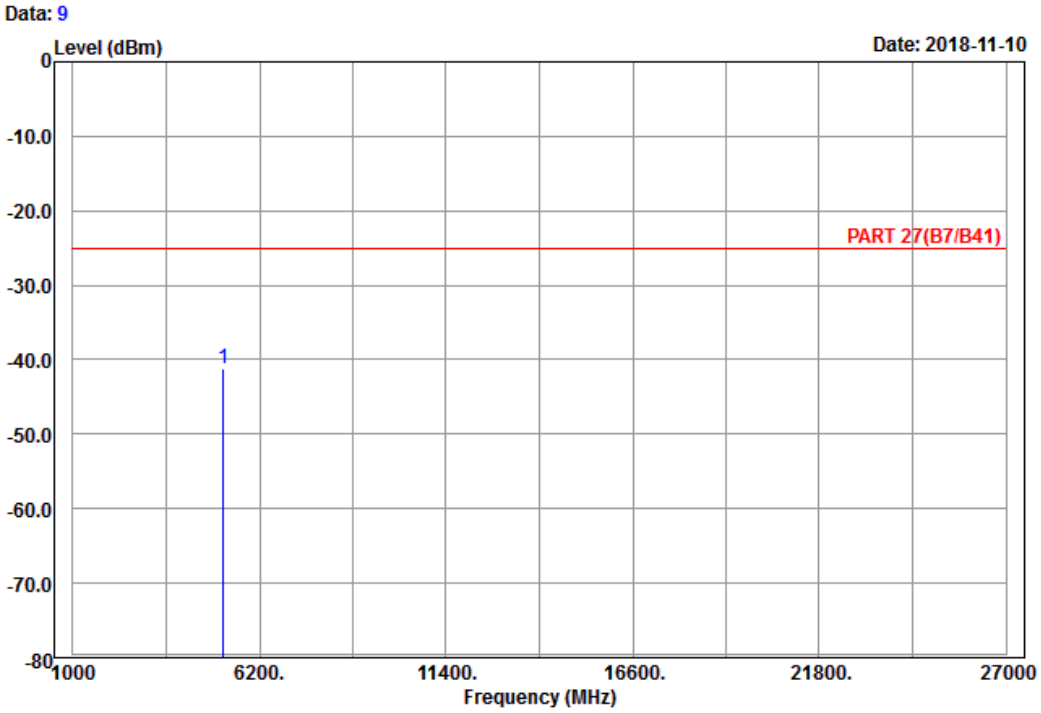


Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 41_Link_CH39675
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	4997.00	-42.18	-61.76	-25.00	-17.18	19.58	Peak

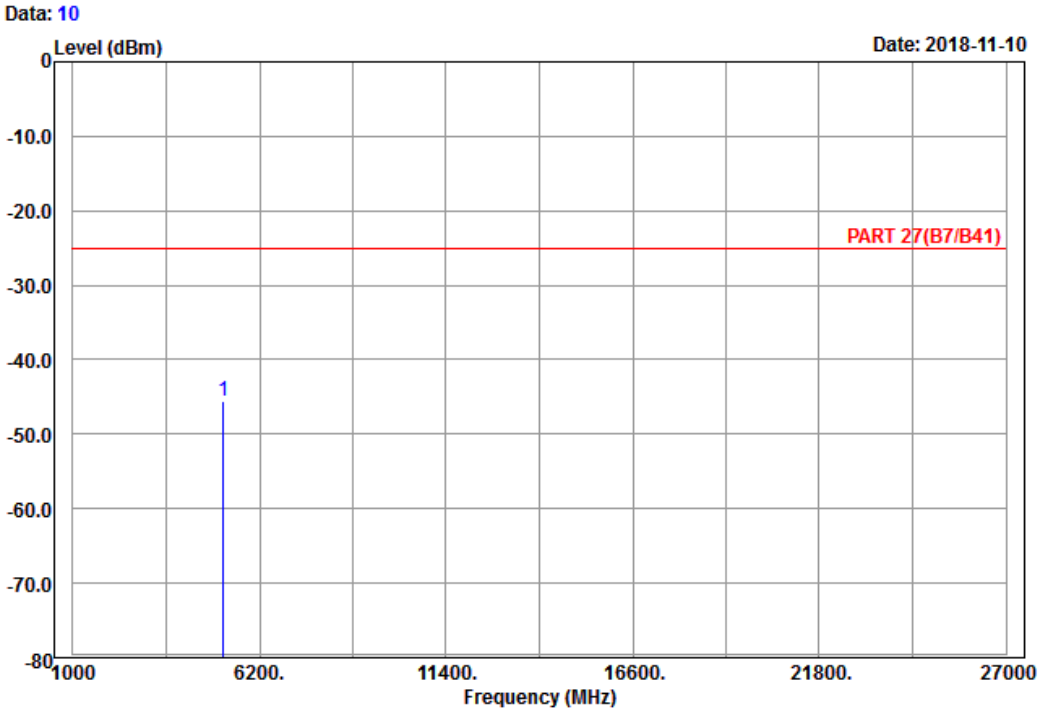
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B7/B41) Horizontal
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 pp	5186.00	-41.27	-61.39	-25.00	-16.27	20.12	Peak

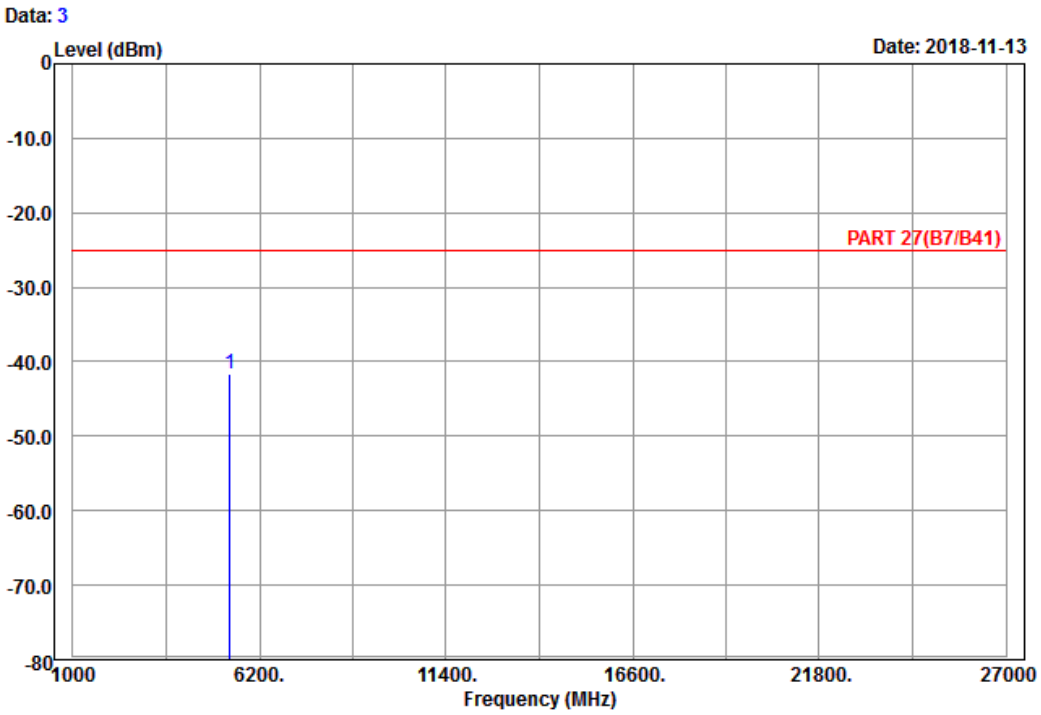


Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 41_Link_CH40620
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	5186.00	-45.46	-65.58	-25.00	-20.46	20.12	Peak

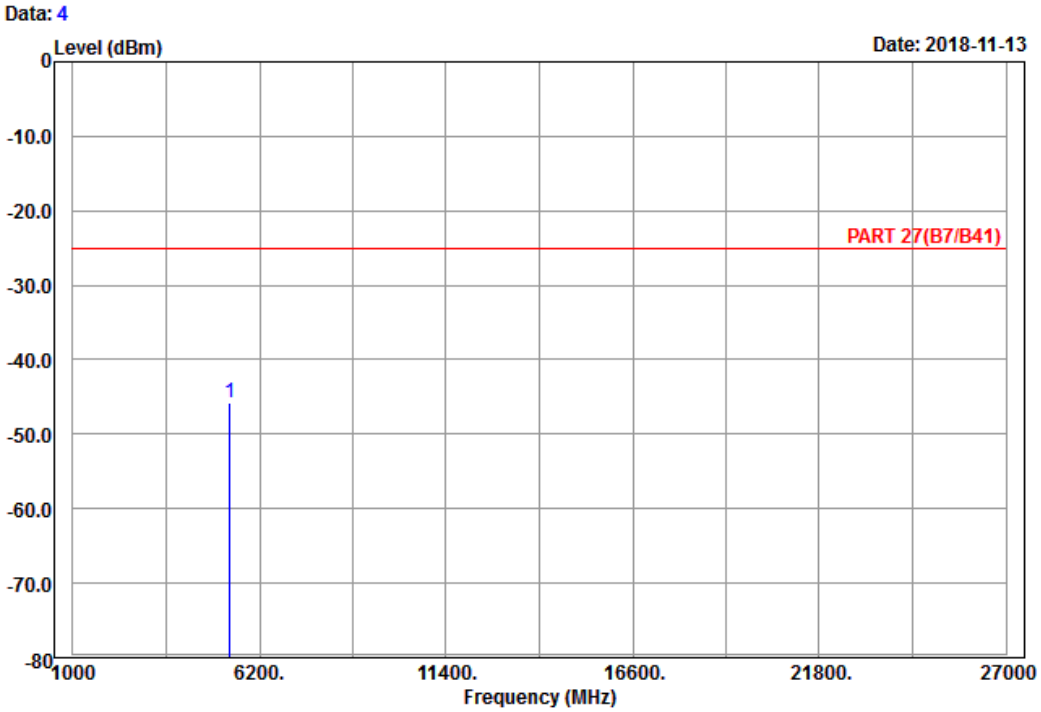
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	5375.00	-41.61	-61.93	-25.00	-16.61	20.32	Peak

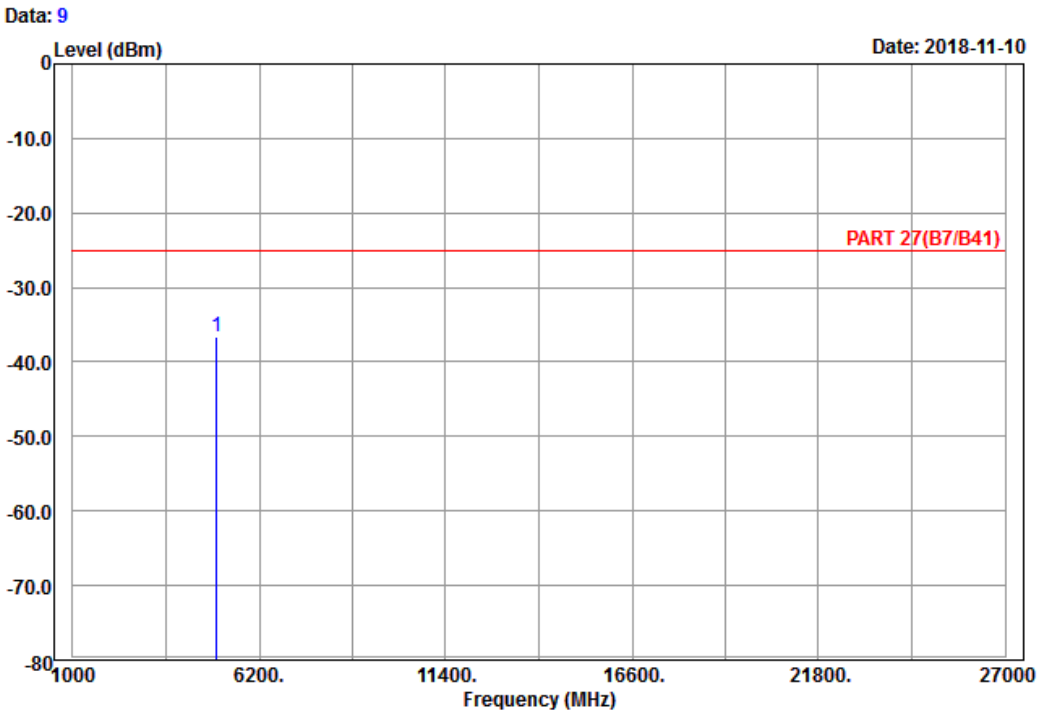


Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 41_Link_CH41565
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	5375.00	-45.76	-66.08	-25.00	-20.76	20.32	Peak

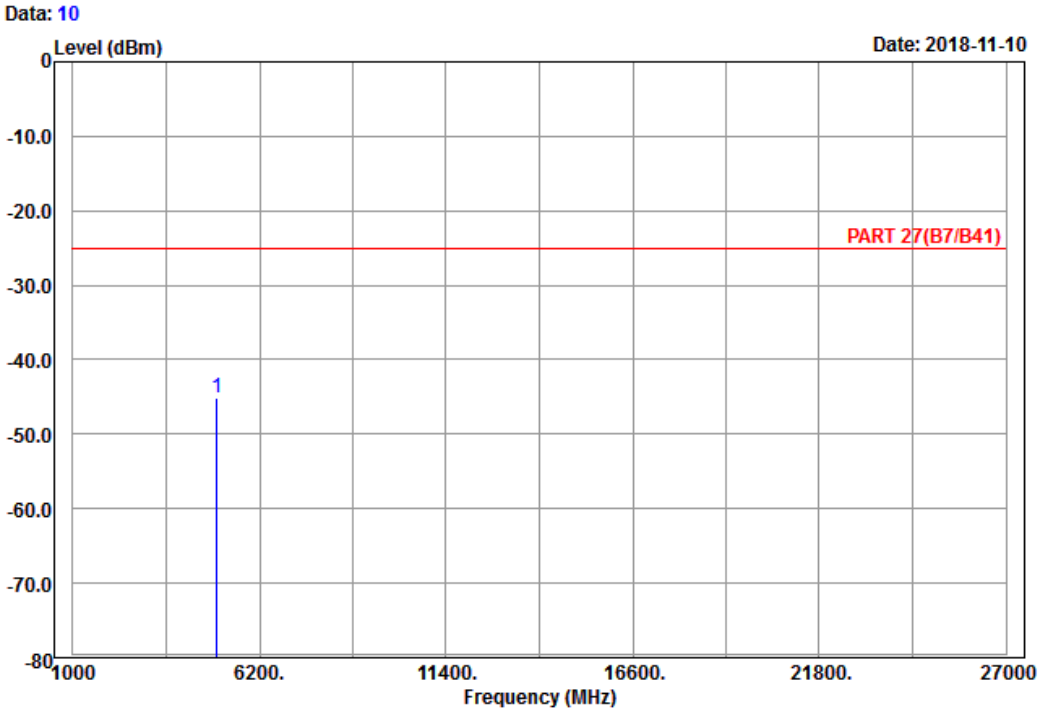
Channel Bandwidth: 20MHz / QPSK
Low Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	5012.00	-36.65	-55.73	-25.00	-11.65	19.08	Peak

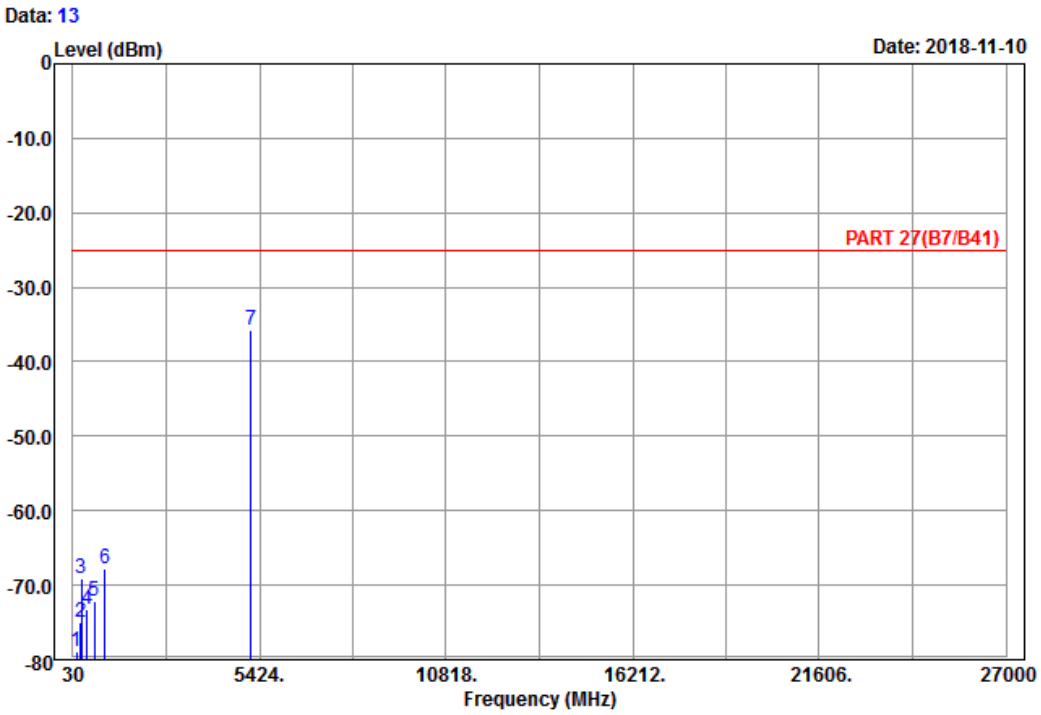


Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 41_Link_CH39750
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	5012.00	-45.06	-64.14	-25.00	-20.06	19.08	Peak

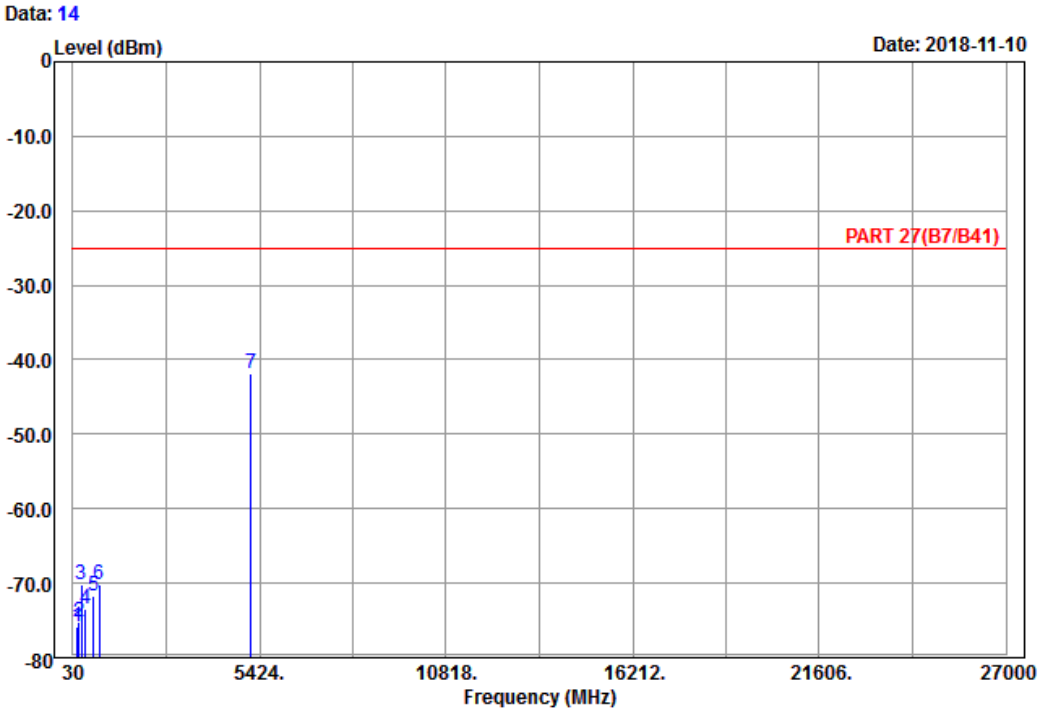
Middle Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 27(B7/B41) Horizontal
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	140.97	-78.94	-71.22	-25.00	-53.94	-7.72	Peak
2	253.02	-75.02	-69.49	-25.00	-50.02	-5.53	Peak
3	275.97	-69.07	-63.32	-25.00	-44.07	-5.75	Peak
4	448.40	-73.18	-69.38	-25.00	-48.18	-3.80	Peak
5	645.80	-72.15	-72.06	-25.00	-47.15	-0.09	Peak
6	965.00	-67.83	-72.99	-25.00	-42.83	5.16	Peak
7 pp	5186.00	-35.82	-55.94	-25.00	-10.82	20.12	Peak

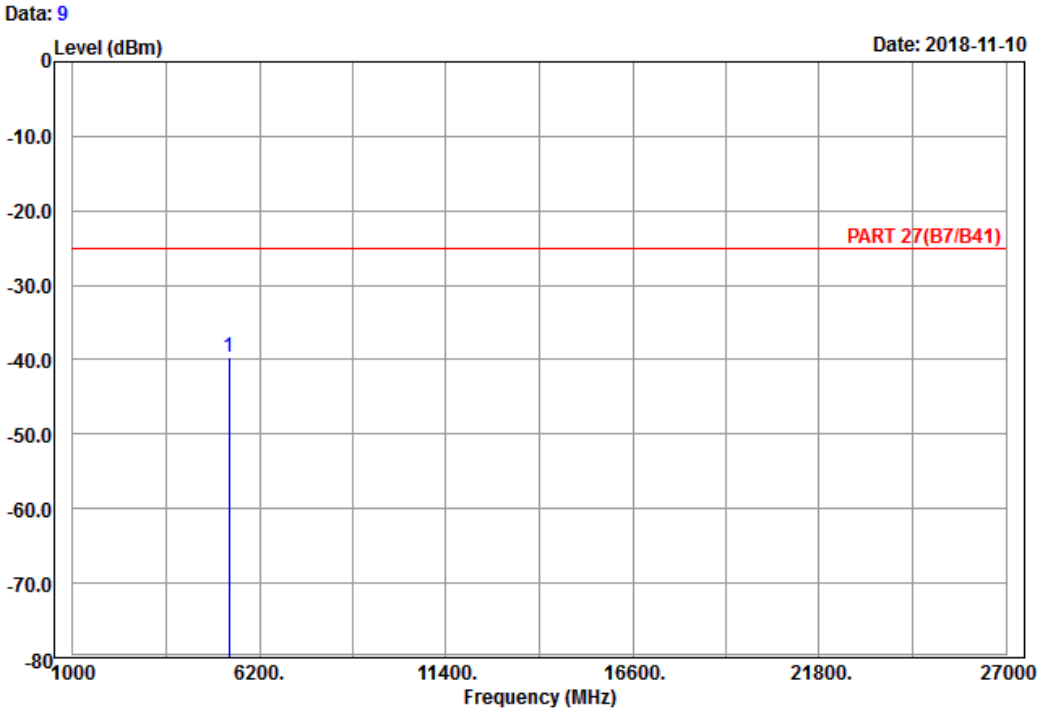


Site : 966 chamber 1
Condition: PART 27(B7/B41) Vertical
Remark : LTE_Band 41_Link_CH40620
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	165.00	-75.96	-68.77	-25.00	-50.96	-7.19	Peak
2	212.79	-75.29	-69.28	-25.00	-50.29	-6.01	Peak
3	280.29	-70.09	-64.31	-25.00	-45.09	-5.78	Peak
4	398.00	-73.51	-70.67	-25.00	-48.51	-2.84	Peak
5	622.70	-71.70	-71.87	-25.00	-46.70	0.17	Peak
6	786.50	-70.27	-71.39	-25.00	-45.27	1.12	Peak
7 pp	5186.00	-41.96	-62.08	-25.00	-16.96	20.12	Peak

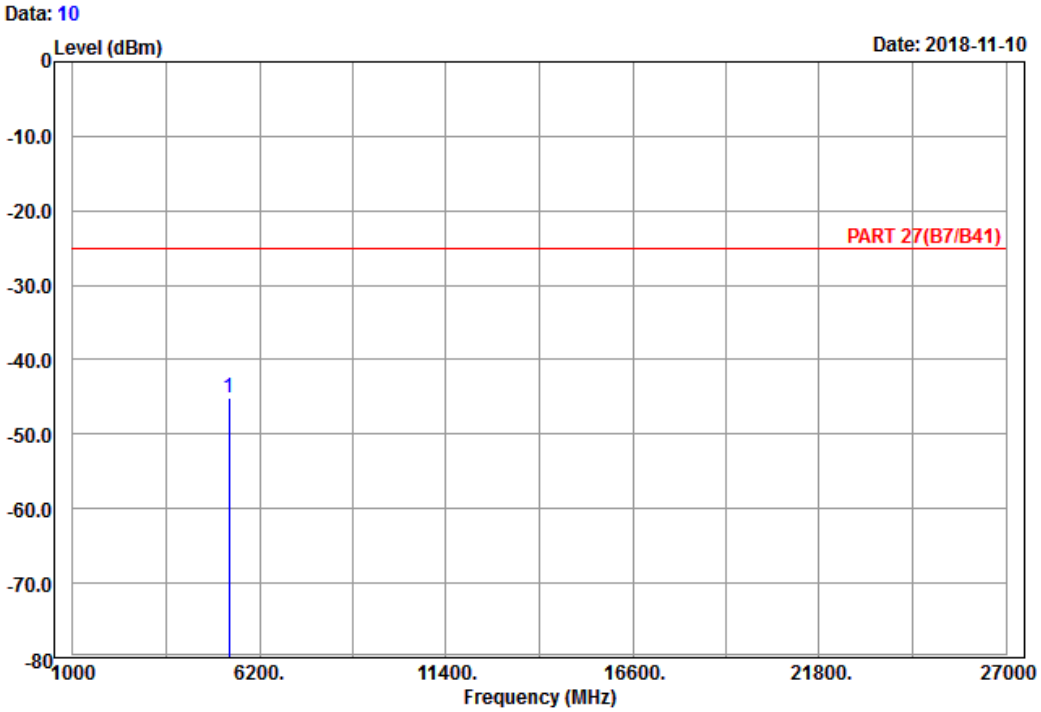
High Channel

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	5360.00	-39.63	-59.93	-25.00	-14.63	20.30	Peak



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	5360.00	-45.18	-65.48	-25.00	-20.18	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:

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Fax: 886-2-26051924

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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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