

FCC Test Report

(PART 27)

Report No.: RF180125C14-6

FCC ID: B94HNQ10CPD

Test Model: HSN-Q10C

Received Date: Feb. 05, 2018

Test Date: Mar. 22, 2018 ~ May 23, 2018

Issued Date: Jun. 01, 2018

Applicant: HP Inc.

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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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Release Control Record

Issue No.	Description	Date Issued
RF180125C14-6	Original Release	Jun. 01, 2018

1 Certificate of Conformity

Product: Notebook Computer

Brand: HP

Test Model: HSN-Q10C

Sample Status: Production Unit

Applicant: HP Inc.

Test Date: Mar. 22, 2018 ~ May 23, 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 : Evonne Liu, **Date:** Jun. 01, 2018
Evonne Liu / Specialist

Approved by : Dylan Chiou, **Date:** Jun. 01, 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)	Equivalent Isotropic Radiated Power	Pass	Meet the requirement of limit.
2.1055 27.54	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
--	Peak to Average Ratio	Pass	Meet the requirement of limit.
2.1051 27.53(l)	Out-of-Band Emissions Measurements	Pass	Meet the requirement of limit.
2.1051 27.53(m)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53(m)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -4.75 dB at 7518 MHz.

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	MY52260177	Jul. 05, 2017	Jul. 04, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Jan. 11, 2018	Jan. 10, 2019
Double Ridge Guide Horn Antenna EMCO	3115	5619	Nov. 30, 2017	Nov. 29, 2018
HORN Antenna ETS	3117	00034128	Dec. 14, 2017	Dec. 13, 2018
BILOG Antenna SCHWARZBECK	VULB 9168	9168-153	Dec. 06, 2017	Dec. 05, 2018
Fixed Attenuator Mini-Circuits	BW-N10W5+	NA	Jul. 07, 2017	Jul. 06, 2018
Preamplifier Agilent	310N	187226	Jun. 23, 2017	Jun. 22, 2018
Preamplifier Agilent	83017A	MY39501357	Jun. 23, 2017	Jun. 22, 2018
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(R FC-SMS-100-SM S-120+RFC-SMS -100-SMS-400)	Jun. 23, 2017	Jun. 22, 2018
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(R FC-SMS-100-SM S-24)	Jun. 23, 2017	Jun. 22, 2018
Software BV ADT	E3 8.130425b	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA
Radio Communication Analyzer Anritsu	MT8820C	6201010284	Dec. 28, 2017	Dec. 27, 2018
Temperature & Humidity Chamber	GTH-120-40-CP-A R	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

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

3 General Information

3.1 General Description of EUT

Product	Notebook Computer	
Brand	HP	
Test Model	HSN-Q10C	
Status of EUT	Production Unit	
Power Supply Rating	20 or 15 or 12 or 9 or 5 Vdc (Adapter)	
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)	78.90 mW
	LTE Band 7 (Channel Bandwidth: 10 MHz)	63.40 mW
	LTE Band 7 (Channel Bandwidth: 15 MHz)	63.94 mW
	LTE Band 7 (Channel Bandwidth: 20 MHz)	64.86 mW
	LTE Band 41 (Channel Bandwidth: 5 MHz)	56.60 mW
	LTE Band 41 (Channel Bandwidth: 10 MHz)	56.77 mW
	LTE Band 41 (Channel Bandwidth: 15 MHz)	57.39 mW
	LTE Band 41 (Channel Bandwidth: 20 MHz)	58.34 mW
Emission Designator	LTE Band 7 (Channel Bandwidth: 5 MHz)	4M50W7D
	LTE Band 7 (Channel Bandwidth: 10 MHz)	9M0G7D
	LTE Band 7 (Channel Bandwidth: 15 MHz)	13M5G7D
	LTE Band 7 (Channel Bandwidth: 20 MHz)	18M0G7D
	LTE Band 41 (Channel Bandwidth: 5 MHz)	4M49G7D
	LTE Band 41 (Channel Bandwidth: 10 MHz)	9M0W7D
	LTE Band 41 (Channel Bandwidth: 15 MHz)	13M5G7D
	LTE Band 41 (Channel Bandwidth: 20 MHz)	18M0W7D
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 WWAN module (Brand: Fibocom, Model: L850-GL) was installed in the EUT.
2. The EUT contains following accessory devices.

Product	Brand	Model	Description
Adapter	hp	TPN-LA12	I/P: 100-240 Vac, 50-60 Hz, 1.6 A O/P: 20 Vdc, 3.25 A, 15 Vdc, 4.33 A, 12 Vdc, 5 A, 9 Vdc, 3 A, 5 Vdc, 3 A

3. The antenna information is listed as below.

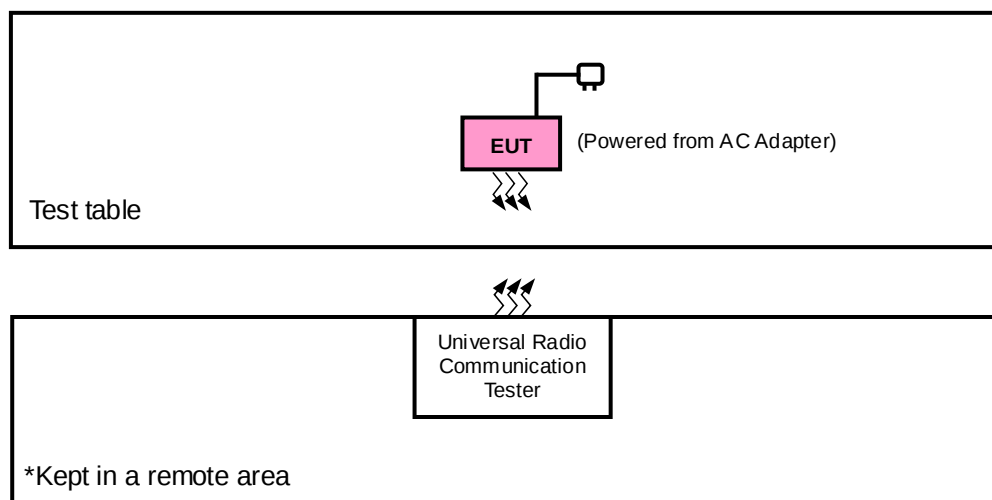
Ant. Type	Manuf.	Parts Number	Antenna Gain							
			LTE 2 / LTE 25 / WCDMA Band II	LTE 4 / LTE 66 / WCDMA Band IV	LTE 5 / LTE 26 / WCDMA Band V	LTE 7	LTE 12 / LTE 17	LTE 13	LTE 30	LTE 41
PIFA	INPAQ	Main Ant.: DQ6LB020017 (WA-P-LTE8LTE12LBB-02-001) Aux Ant.: DQ6LB020017 (WA-P-LTE8LTE12LBB-02-001)	-6.19	-5.79	-5.86	-4.9	-5.21	-4.32	-3.68	-4.9

Antenna Type	Vendor	Part Number	Antenna Gain (dBi)			
			Laptop PC Mode			
			WLAN 2.4GHz	WLAN 5.2GHz	WLAN 5.5GHz	WLAN 5.8GHz
PIFA	INPAQ	WLAN Main Antenna: DQ6LB020509 (WA-P-LBB-02-059)	1.66	0.54	0.56	-0.21
		WLAN Aux Antenna: DQ6LB020509 (WA-P-LBB-02-059)	Tablet PC Mode			
			WLAN 2.4GHz	WLAN 5.2GHz	WLAN 5.5GHz	WLAN 5.8GHz
			-0.36	3.36	2.21	3.08

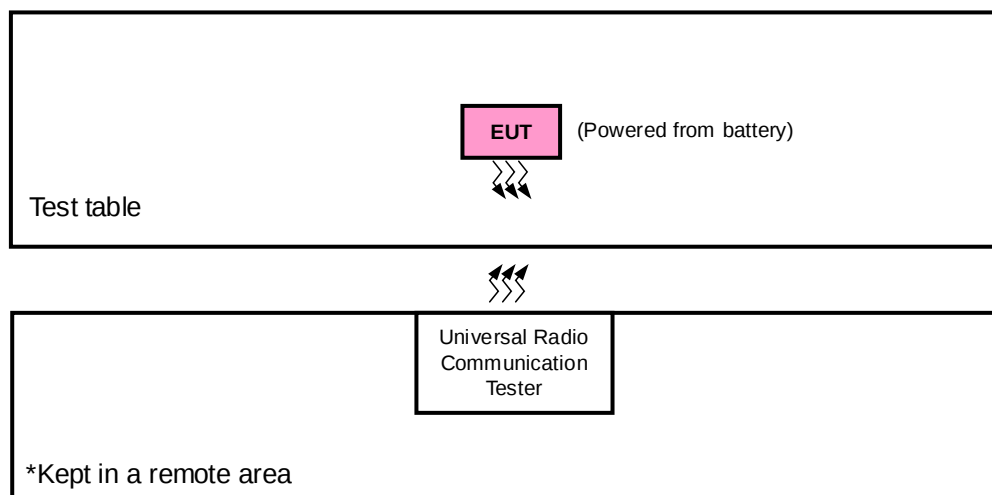
4. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

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	NB-axis
LTE Band 41	X-plane	X-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 / 12 RB Offset
		20800 to 21400	20800, 21100, 21400	10 MHz	QPSK, 16QAM	1 RB / 24 RB Offset
		20825 to 21375	20825, 21100, 21375	15 MHz	QPSK, 16QAM	1 RB / 37 RB Offset
		20850 to 21350	20850, 21100 21350	20 MHz	QPSK, 16QAM	1 RB / 50 RB Offset
-	Frequency Stability	20775 to 21425	20775, 21425	5 MHz	QPSK	1 RB / 12 RB Offset
		20800 to 21400	20800, 21400	10 MHz	QPSK	1 RB / 24 RB Offset
		20825 to 21375	20825, 21375	15 MHz	QPSK	1 RB / 37 RB Offset
		20850 to 21350	20850, 21350	20 MHz	QPSK	1 RB / 50 RB Offset
-	Occupied Bandwidth	20775 to 21425	20775, 21100, 21425	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		20800 to 21400	20800, 21100, 21400	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
		20825 to 21375	20825, 21100, 21375	15 MHz	QPSK, 16QAM	75 RB / 0 RB Offset
		20850 to 21350	20850, 21100 21350	20 MHz	QPSK, 16QAM	100 RB / 0 RB Offset
-	Peak to Average Ratio	20775 to 21425	20775, 21100, 21425	5 MHz	QPSK, 16QAM	1 RB / 12 RB Offset
		20800 to 21400	20800, 21100, 21400	10 MHz	QPSK, 16QAM	1 RB / 24 RB Offset
		20825 to 21375	20825, 21100, 21375	15 MHz	QPSK, 16QAM	1 RB / 37 RB Offset
		20850 to 21350	20850, 21100 21350	20 MHz	QPSK, 16QAM	1 RB / 50 RB Offset
-	Out-of-Band Emissions	20775 to 21425	20775, 21425	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		20800 to 21400	20800, 21400	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
		20825 to 21375	20825, 21375	15 MHz	QPSK, 16QAM	75 RB / 0 RB Offset
		20850 to 21350	20850, 21350	20 MHz	QPSK, 16QAM	100 RB / 0 RB Offset
-	Conducted Emission	20775 to 21425	20775, 21100, 21425	5 MHz	QPSK	1 RB / 12 RB Offset
		20800 to 21400	20800, 21100, 21400	10 MHz	QPSK	1 RB / 24 RB Offset
		20825 to 21375	20825, 21100, 21375	15 MHz	QPSK	1 RB / 37 RB Offset
		20850 to 21350	20850, 21100 21350	20 MHz	QPSK	1 RB / 50 RB Offset
-	Radiated Emission	20775 to 21425	20775, 21100, 21425	5 MHz	QPSK	1 RB / 12 RB Offset
		20850 to 21350	20850, 21100 21350	20 MHz	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	5 MHz	QPSK, 16QAM	1 RB / 12 RB Offset
		39700 to 41540	39700, 40620, 41540	10 MHz	QPSK, 16QAM	1 RB / 24 RB Offset
		39725 to 41515	39725, 40620, 41515	15 MHz	QPSK, 16QAM	1 RB / 37 RB Offset
		39750 to 41490	39750, 40620, 41490	20 MHz	QPSK, 16QAM	1 RB / 50 RB Offset
-	Frequency Stability	39675 to 41565	39675, 41565	5 MHz	QPSK	1 RB / 12 RB Offset
		39700 to 41540	39700, 41540	10 MHz	QPSK	1 RB / 24 RB Offset
		39725 to 41515	39725, 41515	15 MHz	QPSK	1 RB / 37 RB Offset
		39750 to 41490	39750, 41490	20 MHz	QPSK	1 RB / 50 RB Offset
-	Occupied Bandwidth	39675 to 41565	39675, 40620, 41565	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		39700 to 41540	39700, 40620, 41540	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
		39725 to 41515	39725, 40620, 41515	15 MHz	QPSK, 16QAM	75 RB / 0 RB Offset
		39750 to 41490	39750, 40620, 41490	20 MHz	QPSK, 16QAM	100 RB / 0 RB Offset
-	Peak to Average Ratio	39675 to 41565	39675, 40620, 41565	5 MHz	QPSK, 16QAM	25 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
-	Out-of-Band Emissions	39675 to 41565	39675, 41565	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		39700 to 41540	39700, 41540	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
		39725 to 41515	39725, 41515	15 MHz	QPSK, 16QAM	75 RB / 0 RB Offset
		39750 to 41490	39750, 41490	20 MHz	QPSK, 16QAM	100 RB / 0 RB Offset
-	Conducted Emission	39675 to 41565	39675, 40620, 41565	5 MHz	QPSK	1 RB / 12 RB Offset
		39700 to 41540	39700, 40620, 41540	10 MHz	QPSK	1 RB / 24 RB Offset
		39725 to 41515	39725, 40620, 41515	15 MHz	QPSK	1 RB / 37 RB Offset
		39750 to 41490	39750, 40620, 41490	20 MHz	QPSK	1 RB / 50 RB Offset
-	Radiated Emission	39675 to 41565	39675, 40620, 41565	5 MHz	QPSK	1 RB / 12 RB Offset
		39750 to 41490	39750, 40620, 41490	20 MHz	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	25 deg. C, 65 % RH	6.54 Vdc	Anson Lin
Frequency Stability	25 deg. C, 65 % RH	6.54 Vdc	Wayne Lin
Occupied Bandwidth	25 deg. C, 65 % RH	6.54 Vdc	Wayne Lin
Out-of-Band Emissions	25 deg. C, 65 % RH	6.54 Vdc	Wayne Lin
Peak to Average Ratio	25 deg. C, 65 % RH	6.54 Vdc	Wayne Lin
Conducted Emission	25 deg. C, 65 % RH	6.54 Vdc	Wayne Lin
Radiated Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Anson Lin

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 v02r02

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

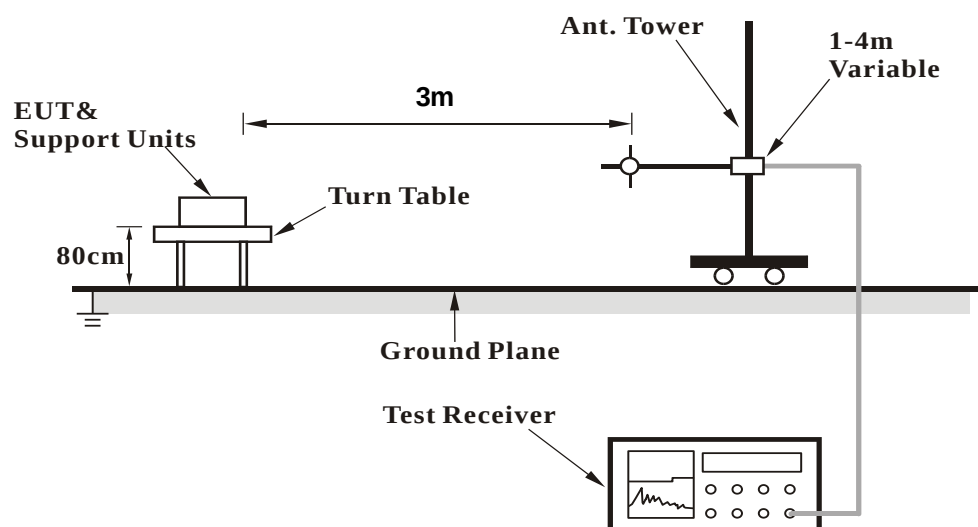
EIRP Measurement:

- 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. $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}.$

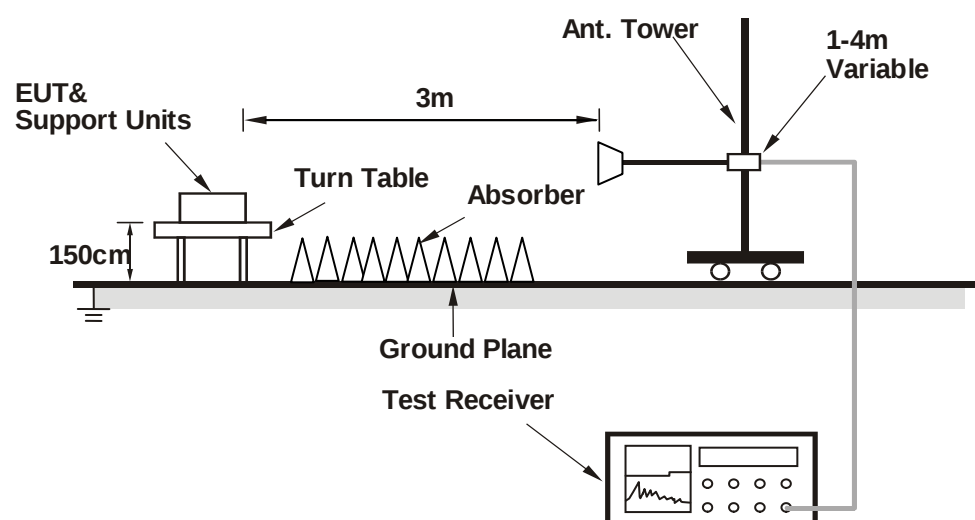
4.1.3 Test Setup

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

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	22.68	22.87	23.08	0	15M	QPSK	1	0	22.57	22.79	23.02	0
		1	50	22.78	22.90	23.13	0			1	37	22.68	22.82	23.08	0
		1	99	22.93	23.10	23.16	0			1	74	22.86	23.04	23.11	0
		50	0	21.81	21.86	22.13	1			36	0	21.66	21.72	22.01	1
		50	25	21.87	22.01	22.19	1			36	19	21.73	21.88	22.08	1
		50	50	21.82	21.92	22.18	1			36	39	21.67	21.78	22.06	1
	16QAM	100	0	21.81	22.03	22.31	1			75	0	21.66	21.90	22.20	1
		1	0	21.69	21.89	22.11	1		16QAM	1	0	21.63	21.84	22.06	1
		1	50	21.79	21.92	22.16	1			1	37	21.74	21.87	22.12	1
		1	99	21.95	22.13	22.20	1			1	74	21.90	22.08	22.16	1
		50	0	20.78	20.83	21.11	2			36	0	20.61	20.69	21.03	2
		50	25	20.84	20.99	21.18	2			36	19	20.70	20.86	21.11	2
10M	QPSK	50	50	20.79	20.89	21.16	2			36	39	20.62	20.77	21.09	2
		100	0	20.78	21.01	21.31	2			75	0	20.61	20.91	21.24	2
	16QAM	1	0	21.51	21.58	21.90	1		QPSK	1	0	22.43	22.66	22.91	0
		1	24	22.59	22.73	23.01	0			1	12	22.54	22.69	22.96	0
		1	49	22.76	22.98	23.05	0			1	24	22.73	22.93	23.01	0
		25	0	21.51	21.58	21.90	1			12	0	21.39	21.49	21.83	1
		25	12	21.61	21.77	21.96	1			12	6	21.51	21.69	21.92	1
		25	25	21.54	21.66	21.95	1			12	13	21.44	21.58	21.90	1
	16QAM	50	0	21.51	21.79	22.09	1			25	0	21.39	21.71	22.04	1
		1	0	21.51	21.73	21.98	1		16QAM	1	0	21.45	21.68	21.94	1
		1	24	21.63	21.77	22.07	1			1	12	21.58	21.72	22.02	1
		1	49	21.81	22.03	22.10	1			1	24	21.77	21.98	22.06	1
		25	0	20.47	20.54	20.89	2			12	0	20.32	20.39	20.77	2
		25	12	20.55	20.73	20.96	2			12	6	20.42	20.62	20.90	2
5M	QPSK	25	25	20.49	20.63	20.94	2			12	13	20.35	20.49	20.84	2
		50	0	20.47	20.78	21.13	2			25	0	20.32	20.67	21.03	2
	16QAM	1	0	21.51	21.73	21.98	1		QPSK	1	0	22.43	22.66	22.91	0
		1	24	21.63	21.77	22.07	1			1	12	22.54	22.69	22.96	0
		1	49	21.81	22.03	22.10	1			1	24	22.73	22.93	23.01	0
		25	0	20.47	20.54	20.89	2			12	0	21.39	21.49	21.83	1
		25	12	20.55	20.73	20.96	2			12	6	21.51	21.69	21.92	1
		25	25	20.49	20.63	20.94	2			12	13	21.44	21.58	21.90	1
5M	QPSK	50	0	20.47	20.78	21.13	2			25	0	21.39	21.71	22.04	1
		1	0	21.51	21.73	21.98	1		16QAM	1	0	21.45	21.68	21.94	1
		1	24	21.63	21.77	22.07	1			1	12	21.58	21.72	22.02	1
		1	49	21.81	22.03	22.10	1			1	24	21.77	21.98	22.06	1
		25	0	20.47	20.54	20.89	2			12	0	20.32	20.39	20.77	2
		25	12	20.55	20.73	20.96	2			12	6	20.42	20.62	20.90	2
5M	QPSK	25	25	20.49	20.63	20.94	2			12	13	20.35	20.49	20.84	2
		50	0	20.47	20.78	21.13	2			25	0	20.32	20.67	21.03	2
	16QAM	1	0	21.51	21.73	21.98	1		QPSK	1	0	22.43	22.66	22.91	0
		1	24	21.63	21.77	22.07	1			1	12	22.54	22.69	22.96	0
		1	49	21.81	22.03	22.10	1			1	24	22.73	22.93	23.01	0
		25	0	20.47	20.54	20.89	2			12	0	21.39	21.49	21.83	1
		25	12	20.55	20.73	20.96	2			12	6	21.51	21.69	21.92	1
		25	25	20.49	20.63	20.94	2			12	13	21.44	21.58	21.90	1

LTE Band 41																					
BW	MCS Index	RB Size	RB Offset	Low	Mid	Mid	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	Mid	Mid	High	3GPP MPR (dB)		
		Channel	39750	40185	40620	41055	41490	Channel				39725	40173	40620	41068	41515					
		Frequency (MHz)	2506.0	2549.5	2593.0	2636.5	2680.0	Frequency (MHz)				2503.5	2548.3	2593.0	2637.8	2682.5					
20M	QPSK	1	0	22.96	22.84	22.63	22.66	22.99	0	15M	QPSK	1	0	22.91	22.79	22.55	22.58	22.94	0		
		1	50	22.95	22.76	22.68	22.58	22.83	0			1	37	22.90	22.69	22.60	22.50	22.76	0		
		1	99	22.84	21.71	22.76	21.53	22.77	0			1	74	22.77	21.61	22.69	21.40	22.70	0		
		50	0	21.94	21.76	21.68	21.58	21.82	1			36	0	21.85	21.67	21.58	21.46	21.70	1		
		50	25	21.80	21.71	21.67	21.53	21.75	1			36	19	21.70	21.61	21.56	21.40	21.63	1		
		50	50	21.74	21.68	21.58	21.50	21.71	1			36	39	21.63	21.58	21.45	21.35	21.58	1		
		100	0	21.68	21.62	21.40	21.44	21.65	1			75	0	21.55	21.51	21.25	21.29	21.51	1		
		16QAM	1	0	21.94	21.89	21.65	21.68	21.96			1	16QAM	1	0	21.95	21.84	21.59	21.63	21.99	1
	1		50	21.90	21.79	21.70	21.59	21.86	1		1	37		21.93	21.75	21.65	21.54	21.75	1		
	1		99	21.88	20.71	21.79	20.49	21.78	1		1	74		21.79	20.65	21.75	20.37	21.68	1		
	50		0	20.95	20.76	20.67	20.57	20.82	2		36	0		20.84	20.72	20.60	20.45	20.70	2		
	50		25	20.80	20.71	20.66	20.49	20.74	2		36	19		20.68	20.65	20.55	20.37	20.60	2		
	50		50	20.74	20.67	20.56	20.46	20.68	2		36	39		20.62	20.60	20.43	20.32	20.56	2		
	100		0	20.66	20.61	20.35	20.39	20.62	2		75	0		20.53	20.49	20.20	20.25	20.48	2		
	10M		QPSK	1	0	22.85	22.74	22.49	22.54		22.89	0		5M	QPSK	1	0	22.81	22.67	22.43	22.46
		1		24	22.83	22.66	22.56	22.41	22.70		0	1	12			22.80	22.59	22.49	22.36	22.63	0
1		49		22.71	21.52	22.66	21.25	22.64	0	1	24	22.67	21.44			22.59	21.12	22.55	0		
25		0		21.76	21.58	21.48	21.32	21.64	1	12	0	21.69	21.51			21.36	21.18	21.52	1		
25		12		21.60	21.52	21.44	21.25	21.56	1	12	6	21.50	21.44			21.32	21.12	21.42	1		
25		25		21.54	21.48	21.30	21.21	21.51	1	12	13	21.43	21.36			21.18	21.07	21.34	1		
50		0		21.45	21.37	21.10	21.14	21.44	1	25	0	21.30	21.23			20.95	21.00	21.26	1		
16QAM		1		0	21.90	21.78	21.50	21.55	21.94	1	16QAM	1	0			21.85	21.74	21.43	21.48	21.88	1
		1	24	21.87	21.68	21.59	21.43	21.72	1	1		12	21.84		21.64	21.52	21.36	21.65	1		
		1	49	21.75	20.54	21.67	20.25	21.65	1	1		24	21.72		20.46	21.61	20.11	21.57	1		
		25	0	20.75	20.60	20.49	20.33	20.63	2	12		0	20.72		20.52	20.35	20.19	20.52	2		
		25	12	20.59	20.54	20.44	20.25	20.55	2	12		6	20.53		20.46	20.32	20.11	20.40	2		
		25	25	20.52	20.49	20.32	20.19	20.46	2	12		13	20.46		20.35	20.18	20.02	20.32	2		
		50	0	20.43	20.39	20.05	20.10	20.37	2	25		0	20.32		20.23	19.90	19.94	20.22	2		

EIRP Power (dBm)

LTE Band 7							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	20775	2502.5	-26.21	44.24	18.03	63.50	H
	21100	2535.0	-26.19	44.20	18.01	63.20	
	21425	2567.5	-25.83	44.80	18.97	78.90	
	20775	2502.5	-29.18	44.19	15.01	31.70	V
	21100	2535.0	-29.10	44.09	14.99	31.54	
	21425	2567.5	-29.53	44.50	14.97	31.40	
Channel Bandwidth: 5 MHz / 16QAM							
X	20775	2502.5	-27.22	44.24	17.02	50.33	H
	21100	2535.0	-27.21	44.20	16.99	49.97	
	21425	2567.5	-26.86	44.80	17.94	62.27	
	20775	2502.5	-30.19	44.19	14.00	25.12	V
	21100	2535.0	-30.12	44.09	13.97	24.93	
	21425	2567.5	-30.52	44.50	13.98	25.00	

LTE Band 7							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	20800	2505.0	-26.32	44.34	18.02	63.40	H
	21100	2535.0	-26.19	44.20	18.01	63.20	
	21400	2565.0	-26.73	44.72	17.99	62.99	
	20800	2505.0	-29.18	44.23	15.05	31.96	V
	21100	2535.0	-29.08	44.09	15.01	31.68	
	21400	2565.0	-29.38	44.41	15.03	31.81	
Channel Bandwidth: 10 MHz / 16QAM							
X	20800	2505.0	-27.31	44.34	17.03	50.48	H
	21100	2535.0	-27.18	44.20	17.02	50.32	
	21400	2565.0	-27.72	44.72	17.00	50.15	
	20800	2505.0	-30.16	44.23	14.07	25.50	V
	21100	2535.0	-30.05	44.09	14.04	25.34	
	21400	2565.0	-30.36	44.41	14.05	25.39	

LTE Band 7							
Channel Bandwidth: 15 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	20825	2507.5	-26.26	44.32	18.06	63.94	H
	21100	2535.0	-26.16	44.20	18.04	63.64	
	21375	2562.5	-26.83	44.85	18.02	63.36	
	20825	2507.5	-28.92	43.99	15.07	32.15	V
	21100	2535.0	-29.04	44.09	15.05	31.97	
	21375	2562.5	-29.48	44.51	15.03	31.84	
Channel Bandwidth: 15 MHz / 16QAM							
X	20825	2507.5	-27.25	44.32	17.07	50.91	H
	21100	2535.0	-27.13	44.20	17.07	50.90	
	21375	2562.5	-27.80	44.85	17.05	50.68	
	20825	2507.5	-29.90	43.99	14.09	25.66	V
	21100	2535.0	-30.02	44.09	14.07	25.52	
	21375	2562.5	-30.45	44.51	14.06	25.47	

LTE Band 7							
Channel Bandwidth: 20 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	20850.0	2510.0	-26.04	44.16	18.12	64.86	H
	21100.0	2535.0	-26.10	44.20	18.10	64.52	
	21350.0	2560.0	-26.74	44.81	18.07	64.08	
	20850.0	2510.0	-29.64	44.78	15.14	32.66	V
	21100.0	2535.0	-28.98	44.09	15.11	32.42	
	21350.0	2560.0	-29.63	44.72	15.09	32.28	
Channel Bandwidth: 20 MHz / 16QAM							
X	20850.0	2510.0	-27.00	44.16	17.16	52.00	H
	21100.0	2535.0	-27.05	44.20	17.15	51.84	
	21350.0	2560.0	-27.71	44.81	17.10	51.25	
	20850.0	2510.0	-30.62	44.78	14.16	26.06	V
	21100.0	2535.0	-29.96	44.09	14.13	25.87	
	21350.0	2560.0	-30.63	44.72	14.09	25.64	

LTE Band 41							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	39675	2498.5	-26.71	44.24	17.53	56.60	H
	40620	2593.0	-26.72	44.20	17.48	55.94	
	41565	2687.5	-27.32	44.80	17.48	55.99	
	39675	2498.5	-29.64	44.19	14.55	28.52	V
	40620	2593.0	-29.58	44.09	14.51	28.24	
	41565	2687.5	-30.03	44.50	14.47	27.98	
Channel Bandwidth: 5 MHz / 16QAM							
X	39675	2498.5	-27.72	44.24	16.52	44.85	H
	40620	2593.0	-27.74	44.20	16.46	44.23	
	41565	2687.5	-28.30	44.80	16.50	44.68	
	39675	2498.5	-30.65	44.19	13.54	22.60	V
	40620	2593.0	-30.59	44.09	13.50	22.38	
	41565	2687.5	-31.04	44.50	13.46	22.18	

LTE Band 41							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	39700	2501.0	-26.80	44.34	17.54	56.77	H
	40620	2593.0	-26.68	44.20	17.52	56.45	
	41540	2685.0	-27.21	44.72	17.51	56.40	
	39700	2501.0	-29.66	44.23	14.57	28.62	V
	40620	2593.0	-29.56	44.09	14.53	28.37	
	41540	2685.0	-29.90	44.41	14.51	28.22	
Channel Bandwidth: 10 MHz / 16QAM							
X	39700	2501.0	-27.78	44.34	16.56	45.30	H
	40620	2593.0	-27.66	44.20	16.54	45.05	
	41540	2685.0	-28.20	44.72	16.52	44.91	
	39700	2501.0	-30.68	44.23	13.55	22.63	V
	40620	2593.0	-30.58	44.09	13.51	22.43	
	41540	2685.0	-30.91	44.41	13.50	22.37	

LTE Band 41							
Channel Bandwidth: 15 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	39725	2503.5	-26.73	44.32	17.59	57.39	H
	40620	2593.0	-26.63	44.20	17.57	57.11	
	41515	2682.5	-27.29	44.85	17.56	56.99	
	39725	2503.5	-29.41	43.99	14.58	28.72	V
	40620	2593.0	-29.52	44.09	14.57	28.63	
	41515	2682.5	-29.96	44.51	14.55	28.51	
Channel Bandwidth: 15 MHz / 16QAM							
X	39725	2503.5	-27.74	44.32	16.58	45.48	H
	40620	2593.0	-27.65	44.20	16.55	45.15	
	41515	2682.5	-28.31	44.85	16.54	45.06	
	39725	2503.5	-30.42	43.99	13.57	22.76	V
	40620	2593.0	-30.54	44.09	13.55	22.64	
	41515	2682.5	-30.99	44.51	13.52	22.49	

LTE Band 41							
Channel Bandwidth: 20 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	39750	2506.0	-26.50	44.16	17.66	58.34	H
	40620	2593.0	-26.57	44.20	17.63	57.90	
	41490	2680.0	-27.21	44.81	17.60	57.50	
	39750	2506.0	-30.11	44.78	14.67	29.31	V
	40620	2593.0	-29.43	44.09	14.66	29.23	
	41490	2680.0	-30.10	44.72	14.62	28.97	
Channel Bandwidth: 20 MHz / 16QAM							
X	39750	2506.0	-27.51	44.16	16.65	46.24	H
	40620	2593.0	-27.60	44.20	16.60	45.68	
	41490	2680.0	-28.24	44.81	16.57	45.36	
	39750	2506.0	-31.13	44.78	13.65	23.17	V
	40620	2593.0	-30.45	44.09	13.64	23.11	
	41490	2680.0	-31.11	44.72	13.61	22.96	

4.2 Frequency Stability Measurement

4.2.1 Limits of Frequency Stability Measurement

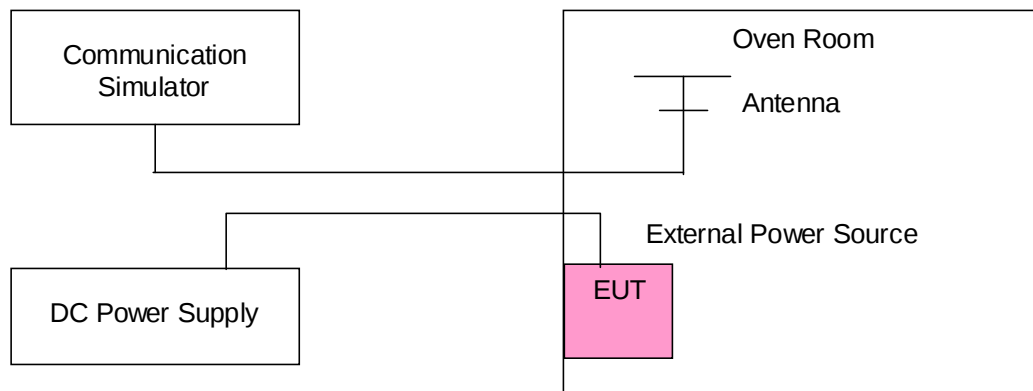
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

4.2.2 Test Procedure

- Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ± 0.5 °C during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

NOTE: The frequency error was recorded frequency error from the communication simulator.

4.2.3 Test Setup



4.2.4 Test Results

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 7				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
7.7	2502.500002	0.001	2567.500001	0.001	2.5
6.54	2502.500003	0.001	2567.500004	0.002	2.5
8.85	2502.500003	0.001	2567.500001	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 7				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	2502.500002	0.001	2567.500003	0.001	2.5
-20	2502.500003	0.001	2567.500002	0.001	2.5
-10	2502.500003	0.001	2567.500001	0.000	2.5
0	2502.500001	0.000	2567.500004	0.001	2.5
10	2502.500003	0.001	2567.500003	0.001	2.5
20	2502.499998	-0.001	2567.499999	0.000	2.5
30	2502.499997	-0.001	2567.499996	-0.001	2.5
40	2502.499997	-0.001	2567.499998	-0.001	2.5
50	2502.499996	-0.002	2567.499999	0.000	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 7				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
7.7	2505.000003	0.001	2565.000002	0.001	2.5
6.54	2505.000001	0.001	2565.000002	0.001	2.5
8.85	2505.000003	0.001	2565.000002	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 7				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	2505.000004	0.002	2565.000001	0.000	2.5
-20	2505.000001	0.001	2565.000004	0.001	2.5
-10	2505.000002	0.001	2565.000003	0.001	2.5
0	2505.000002	0.001	2565.000003	0.001	2.5
10	2505.000003	0.001	2565.000002	0.001	2.5
20	2504.999997	-0.001	2564.999997	-0.001	2.5
30	2504.999997	-0.001	2564.999997	-0.001	2.5
40	2504.999998	-0.001	2564.999999	0.000	2.5
50	2504.999998	-0.001	2564.999998	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 7				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
7.7	2507.500004	0.002	2562.500002	0.001	2.5
6.54	2507.500003	0.001	2562.500004	0.002	2.5
8.85	2507.500003	0.001	2562.500004	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 7				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	2507.500004	0.001	2562.500002	0.001	2.5
-20	2507.500002	0.001	2562.500003	0.001	2.5
-10	2507.500004	0.002	2562.500001	0.001	2.5
0	2507.500002	0.001	2562.500004	0.002	2.5
10	2507.500004	0.001	2562.500003	0.001	2.5
20	2507.499999	-0.001	2562.499999	-0.001	2.5
30	2507.499998	-0.001	2562.499996	-0.001	2.5
40	2507.499999	0.000	2562.499997	-0.001	2.5
50	2507.499997	-0.001	2562.499997	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 7				Limit (ppm)
	Channel Bandwidth: 20 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
7.7	2510.000004	0.001	2560.000002	0.001	2.5
6.54	2510.000004	0.002	2560.000002	0.001	2.5
8.85	2510.000003	0.001	2560.000003	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 7				Limit (ppm)
	Channel Bandwidth: 20 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	2510.000004	0.001	2560.000002	0.001	2.5
-20	2510.000002	0.001	2560.000002	0.001	2.5
-10	2510.000003	0.001	2560.000003	0.001	2.5
0	2510.000001	0.000	2560.000002	0.001	2.5
10	2510.000001	0.000	2560.000003	0.001	2.5
20	2509.999997	-0.001	2559.999998	-0.001	2.5
30	2509.999998	-0.001	2559.999997	-0.001	2.5
40	2509.999996	-0.001	2559.999997	-0.001	2.5
50	2509.999999	0.000	2559.999996	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 41				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
7.7	2498.500002	0.001	2687.500002	0.001	2.5
6.54	2498.500004	0.001	2687.500003	0.001	2.5
8.85	2498.500002	0.001	2687.500002	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 41				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	2498.500001	0.001	2687.500003	0.001	2.5
-20	2498.500003	0.001	2687.500003	0.001	2.5
-10	2498.500002	0.001	2687.500002	0.001	2.5
0	2498.500003	0.001	2687.500004	0.001	2.5
10	2498.500003	0.001	2687.500004	0.001	2.5
20	2498.499998	-0.001	2687.499999	0.000	2.5
30	2498.499997	-0.001	2687.499999	0.000	2.5
40	2498.499998	-0.001	2687.499996	-0.001	2.5
50	2498.499998	-0.001	2687.499999	0.000	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 41				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
7.7	2501.000002	0.001	2685.000003	0.001	2.5
6.54	2501.000002	0.001	2685.000002	0.001	2.5
8.85	2501.000001	0.000	2685.000002	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 41				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	2501.000002	0.001	2685.000002	0.001	2.5
-20	2501.000003	0.001	2685.000001	0.000	2.5
-10	2501.000001	0.001	2685.000003	0.001	2.5
0	2501.000003	0.001	2685.000002	0.001	2.5
10	2501.000003	0.001	2685.000003	0.001	2.5
20	2500.999997	-0.001	2684.999998	-0.001	2.5
30	2500.999997	-0.001	2684.999997	-0.001	2.5
40	2500.999998	-0.001	2684.999999	0.000	2.5
50	2500.999996	-0.002	2684.999997	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 41				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
7.7	2503.500004	0.001	2682.500002	0.001	2.5
6.54	2503.500002	0.001	2682.500003	0.001	2.5
8.85	2503.500002	0.001	2682.500003	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 41				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	2503.500003	0.001	2682.500003	0.001	2.5
-20	2503.500002	0.001	2682.500004	0.001	2.5
-10	2503.500002	0.001	2682.500003	0.001	2.5
0	2503.500003	0.001	2682.500004	0.001	2.5
10	2503.500002	0.001	2682.500002	0.001	2.5
20	2503.499998	-0.001	2682.499998	-0.001	2.5
30	2503.499997	-0.001	2682.499998	-0.001	2.5
40	2503.499998	-0.001	2682.499997	-0.001	2.5
50	2503.499996	-0.002	2682.499996	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 41				Limit (ppm)
	Channel Bandwidth: 20 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
7.7	2506.000003	0.001	2680.000002	0.001	2.5
6.54	2506.000001	0.000	2680.000003	0.001	2.5
8.85	2506.000002	0.001	2680.000002	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 41				Limit (ppm)
	Channel Bandwidth: 20 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	2506.000002	0.001	2680.000001	0.000	2.5
-20	2506.000003	0.001	2680.000002	0.001	2.5
-10	2506.000001	0.000	2680.000003	0.001	2.5
0	2506.000002	0.001	2680.000002	0.001	2.5
10	2506.000004	0.002	2680.000002	0.001	2.5
20	2505.999998	-0.001	2679.999997	-0.001	2.5
30	2505.999998	-0.001	2679.999997	-0.001	2.5
40	2505.999997	-0.001	2679.999997	-0.001	2.5
50	2505.999998	-0.001	2679.999997	-0.001	2.5

4.3 Occupied Bandwidth Measurement

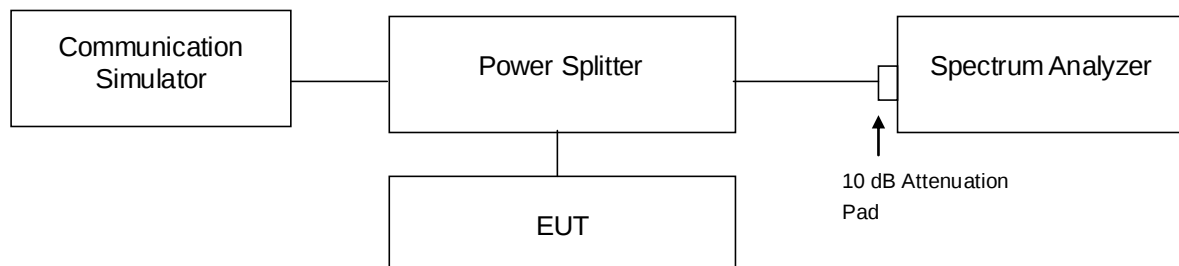
4.3.1 Limits of Occupied Bandwidth Measurement

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

4.3.2 Test Procedure

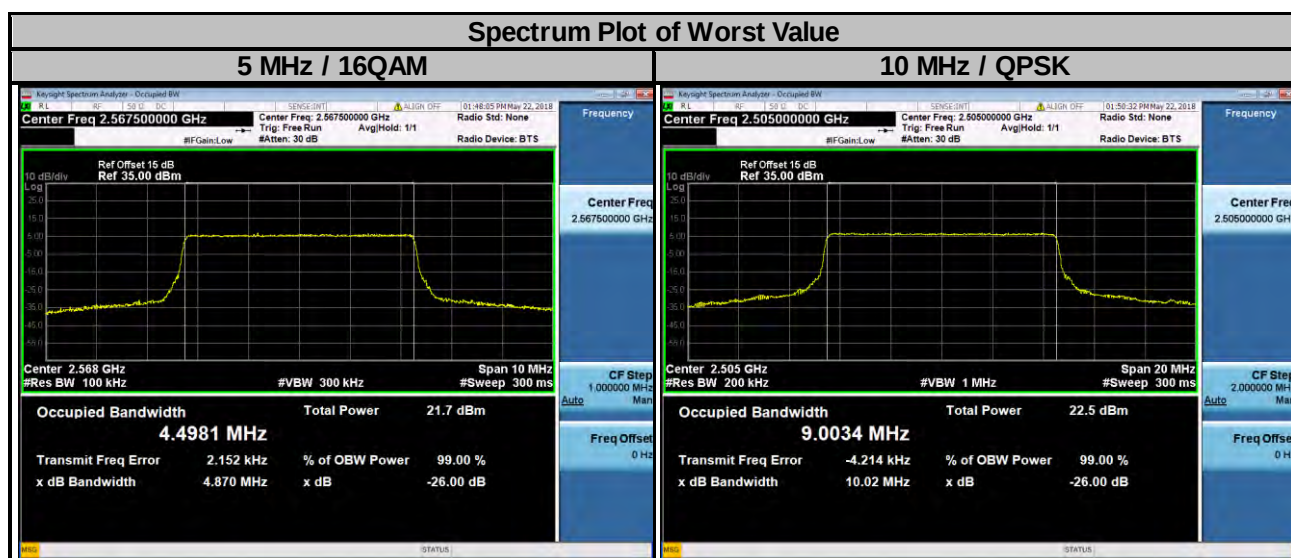
- The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

4.3.3 Test Setup

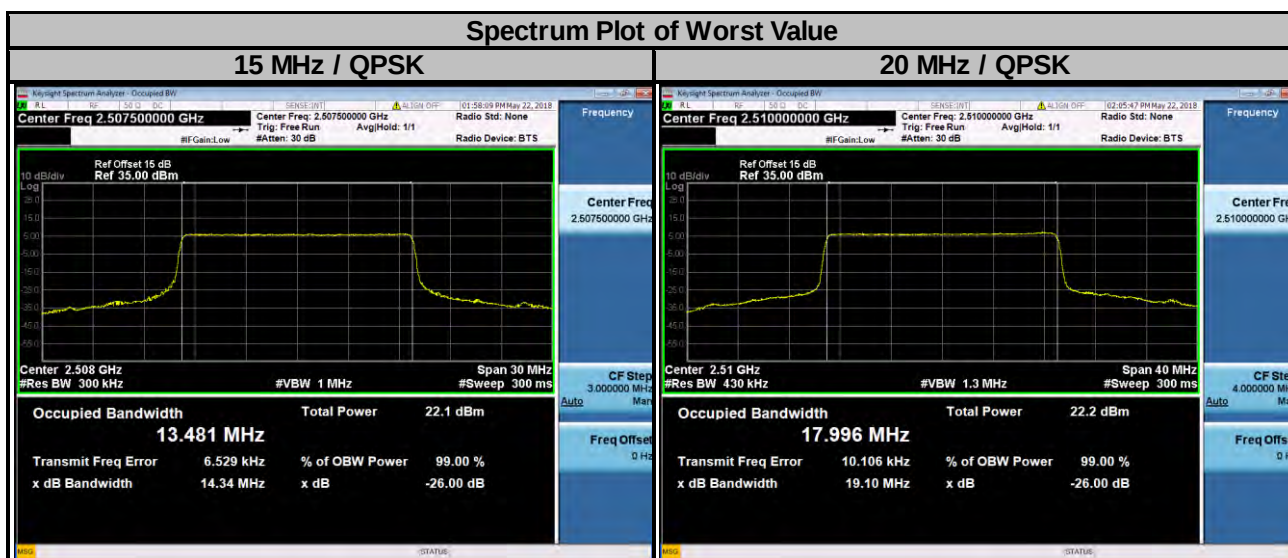


4.3.4 Test Result

LTE Band 7							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
20775	2502.5	4.4907	4.4966	20800	2505.0	9.0034	8.9865
21100	2535.0	4.4903	4.4944	21100	2535.0	8.9861	8.9813
21425	2567.5	4.4961	4.4981	21400	2565.0	8.9928	8.9875



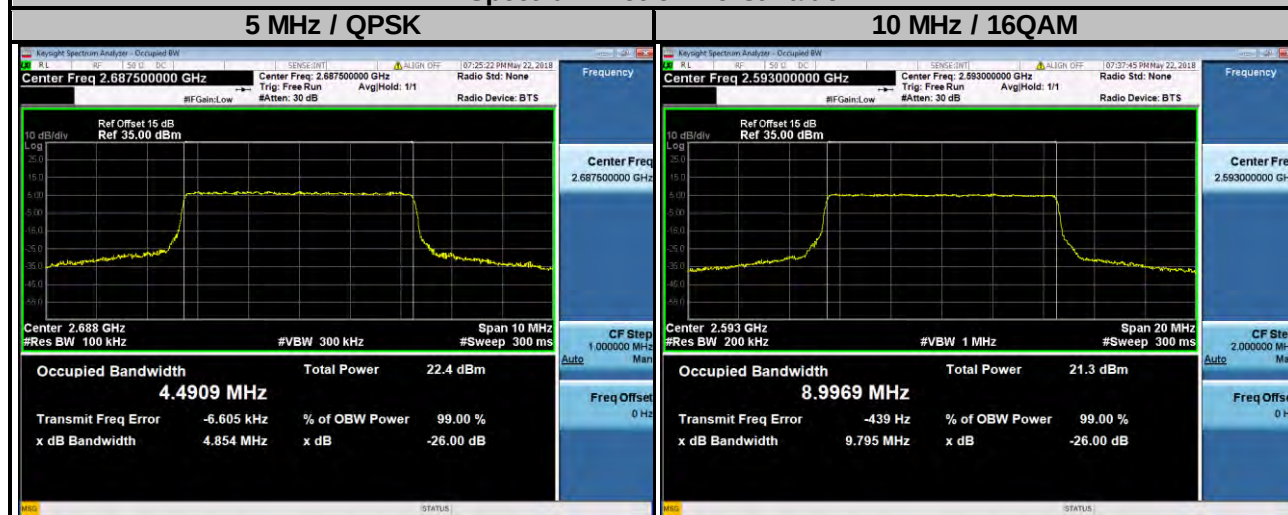
LTE Band 7							
Channel Bandwidth: 15 MHz				Channel Bandwidth: 20 MHz			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
20825	2507.5	13.481	13.468	20850	2510.0	17.996	17.991
21100	2535.0	13.462	13.456	21100	2535.0	17.945	17.934
21375	2562.5	13.475	13.475	21350	2560.0	17.992	17.982



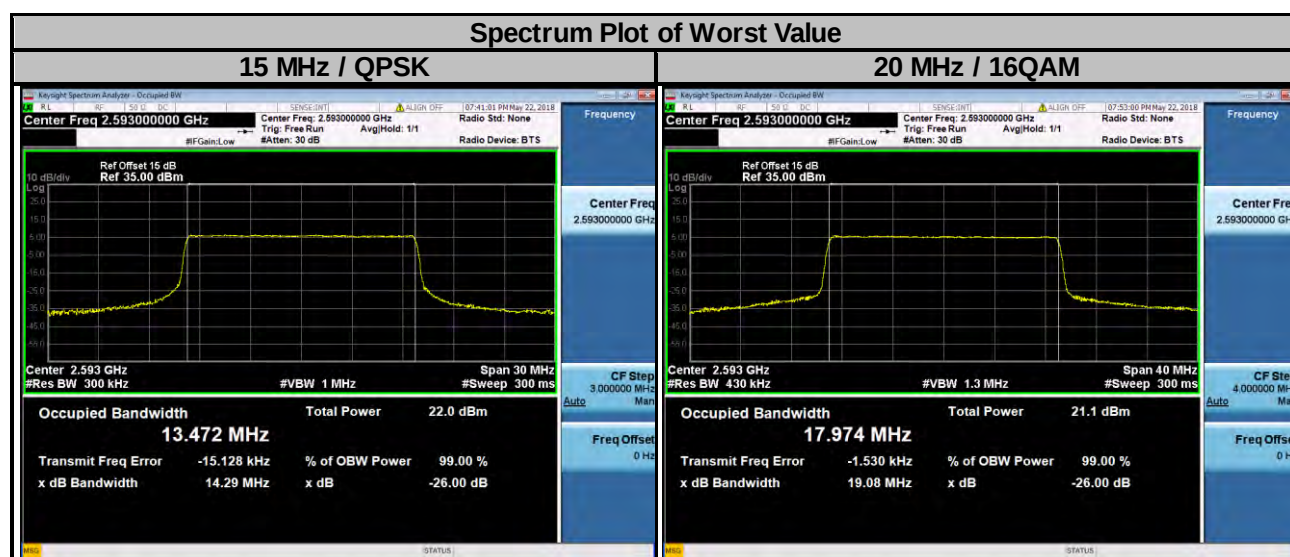
LTE Band 41

Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
39675	2498.5	4.4865	4.4877	39700	2501.0	8.9882	8.9931
40620	2593.0	4.4862	4.4859	40620	2593.0	8.9805	8.9969
41565	2687.5	4.4909	4.4904	41540	2685.0	8.9875	8.9943

Spectrum Plot of Worst Value



LTE Band 41							
Channel Bandwidth: 15 MHz				Channel Bandwidth: 20 MHz			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
39725	2503.5	13.464	13.465	39750	2506.0	17.964	17.959
40620	2593.0	13.472	13.460	40620	2593.0	17.973	17.974
41515	2682.5	13.465	13.466	41490	2680.0	17.941	17.951

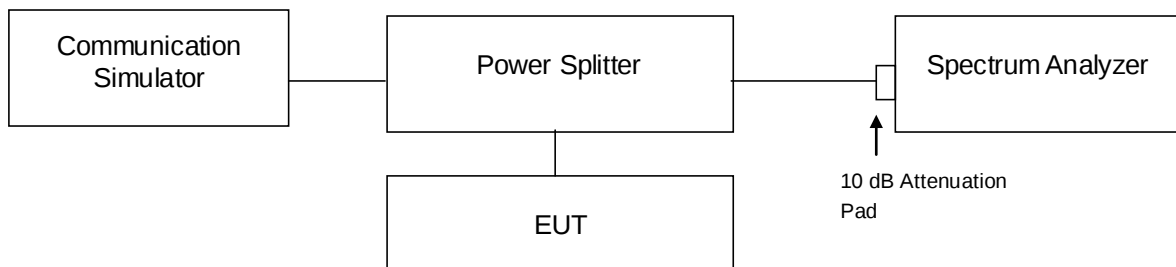


4.4 Out-of-Band Emissions Measurement

4.4.1 Limits of Out-of-Band Emissions Measurement

According to FCC 27.53(l)(4) specified that power of any emission outside of the channel edge must be attenuated below the transmitting power (P) by a factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth. In addition, the attenuation factor shall not be less that $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed.

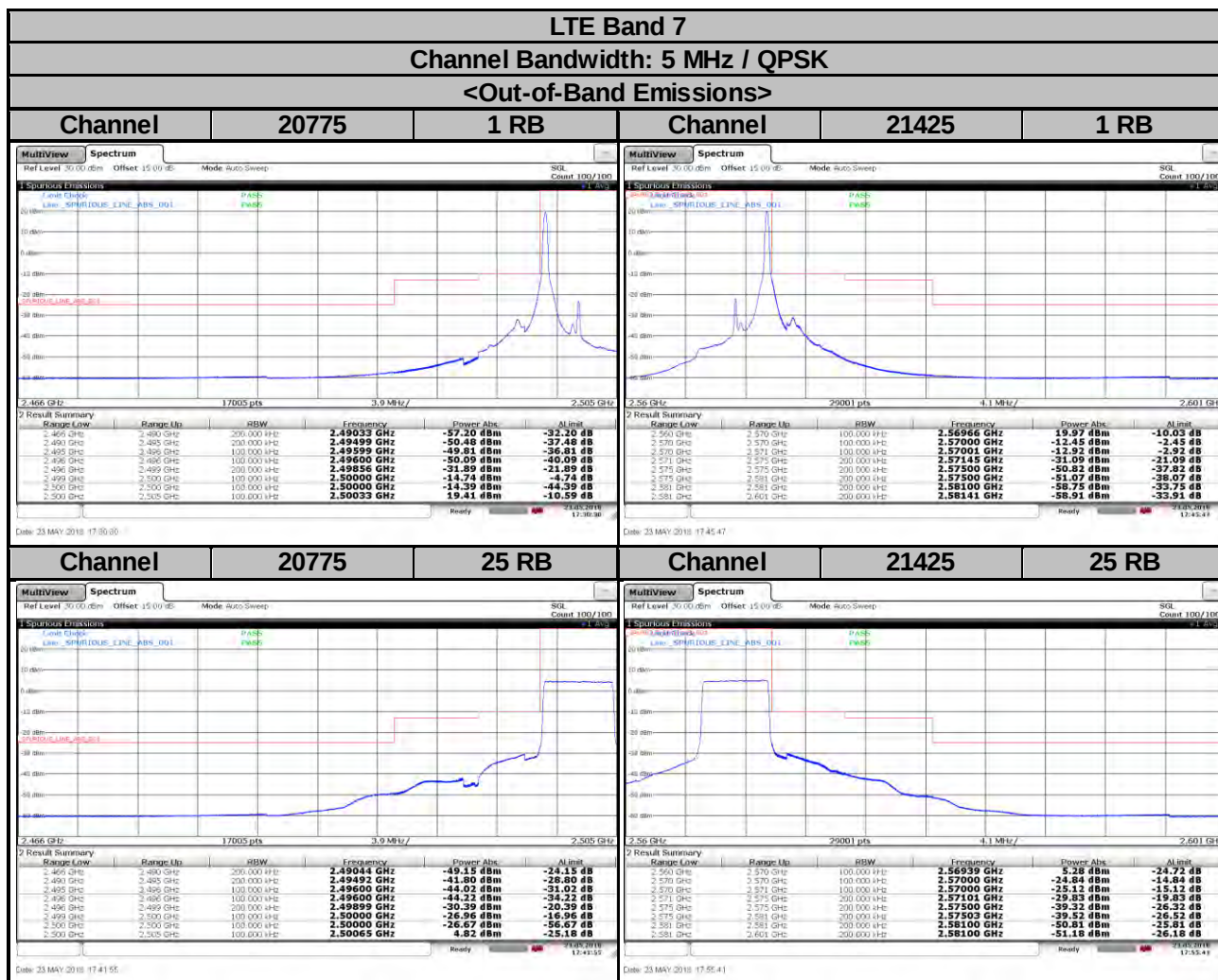
4.4.2 Test Setup

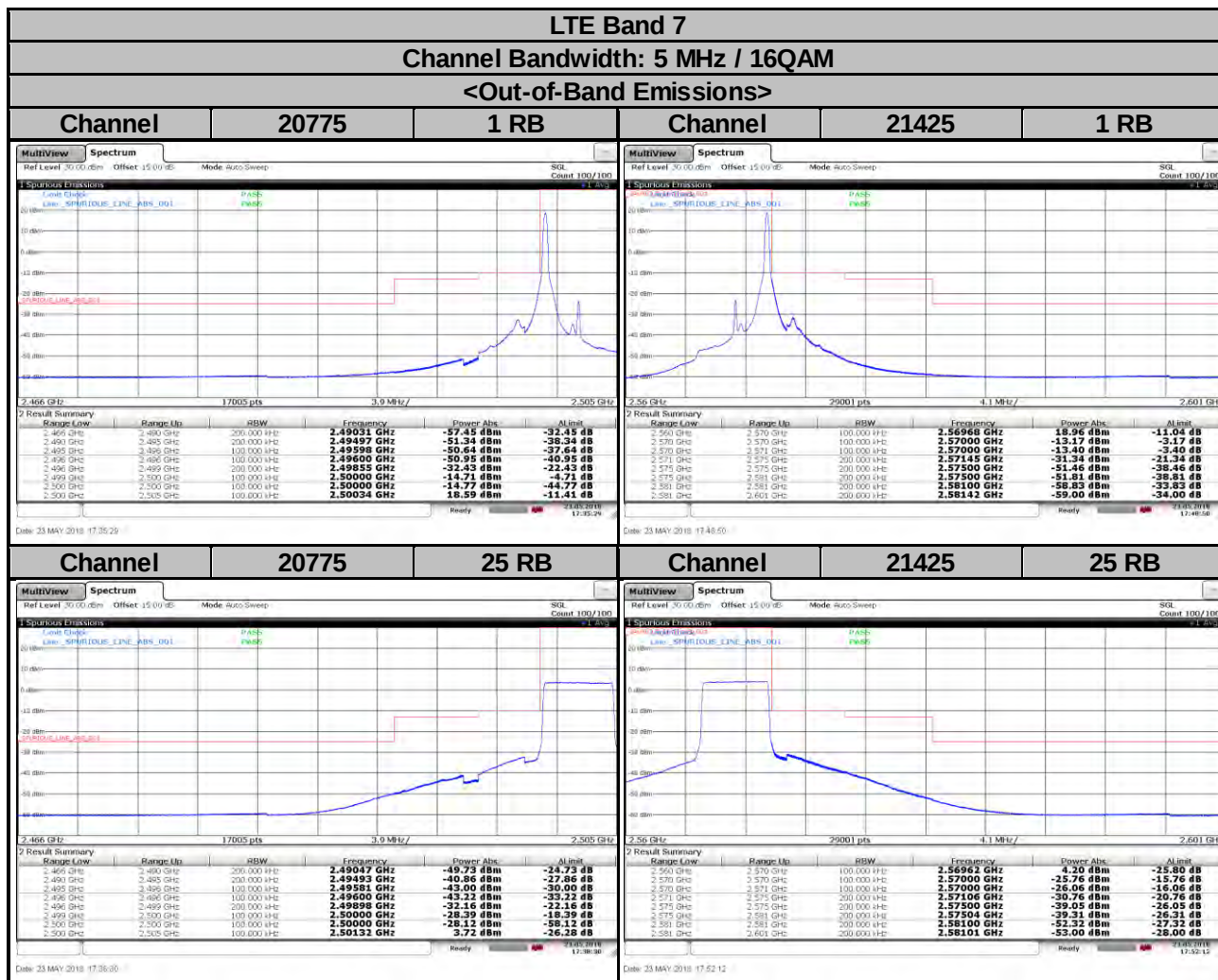


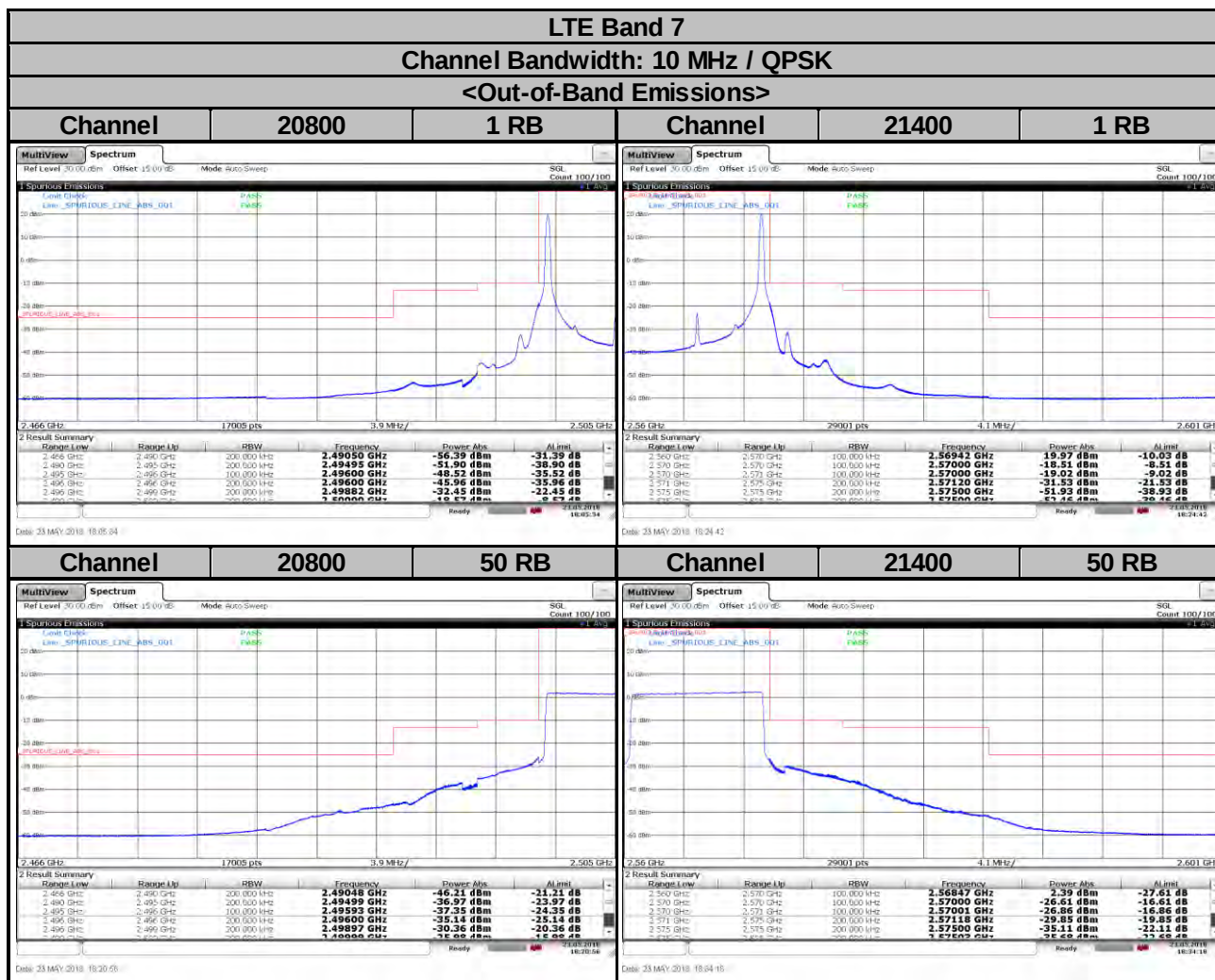
4.4.3 Test Procedures

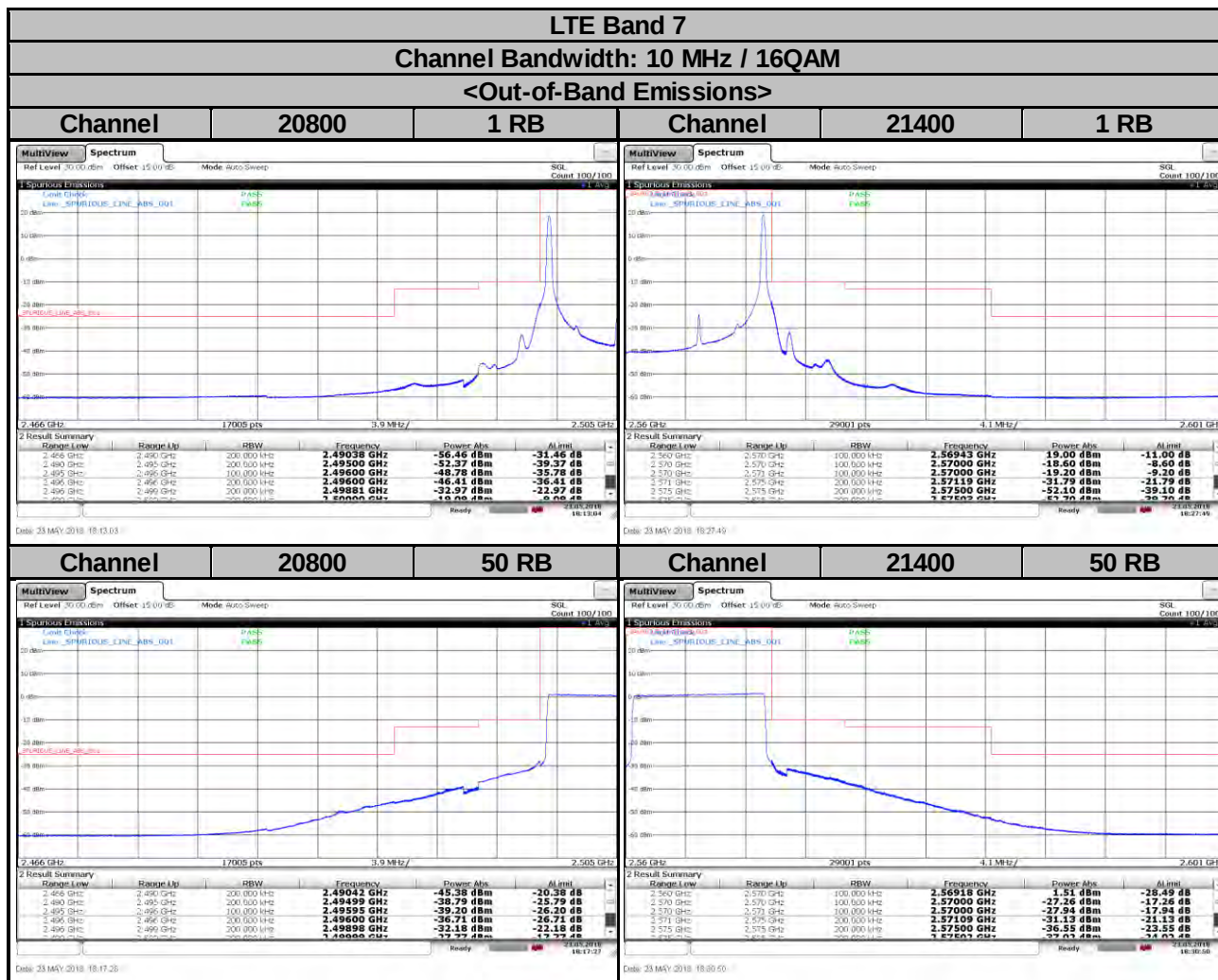
- The EUT was set up for the maximum peak power with LTE link data modulation. The power was measured with R&S Spectrum Analyzer. All measurements were done at 2 channels (low and high operational frequency range.).
- The out-of-band emissions measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- Record the max. trace plot into the test report.

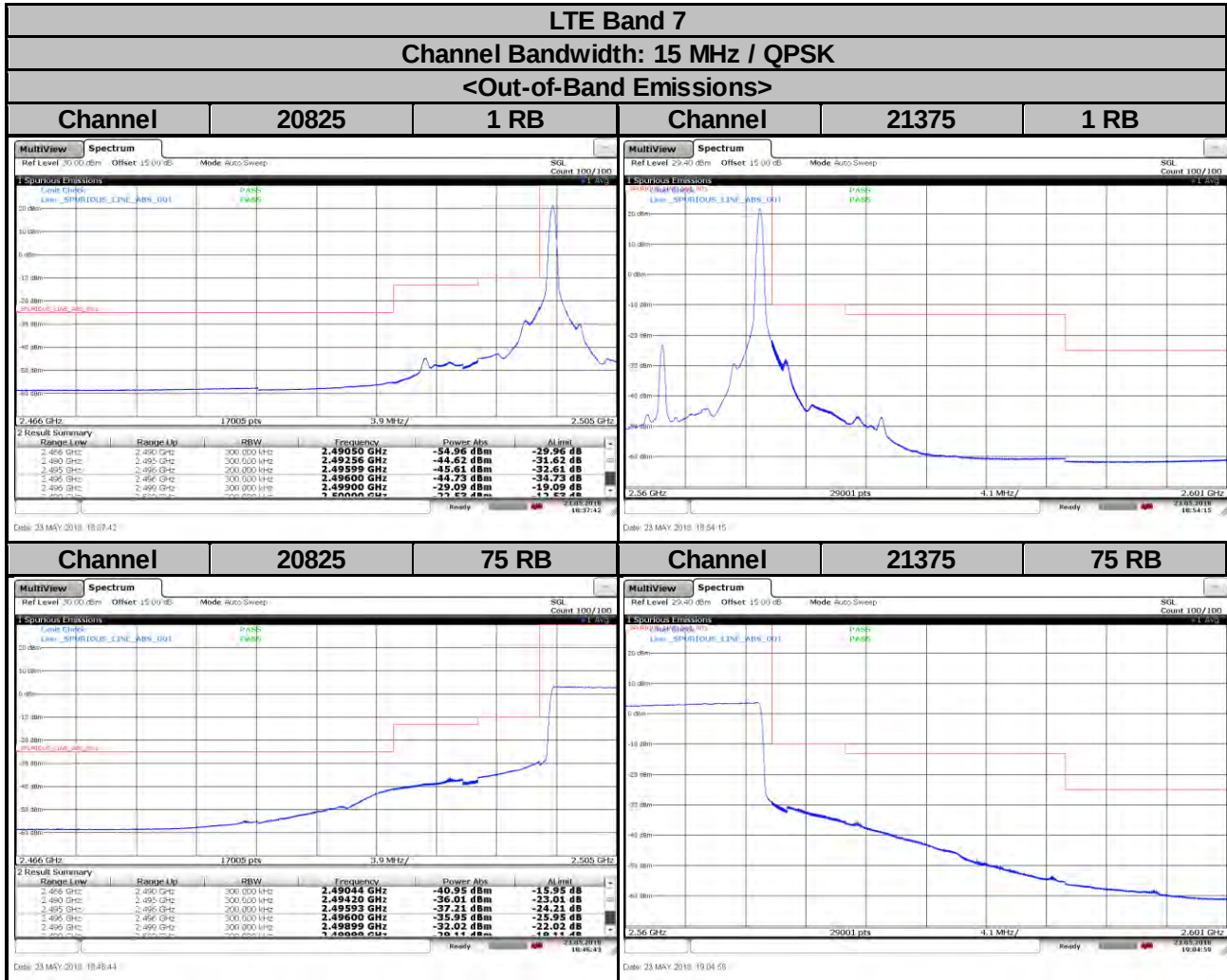
4.4.4 Test Results

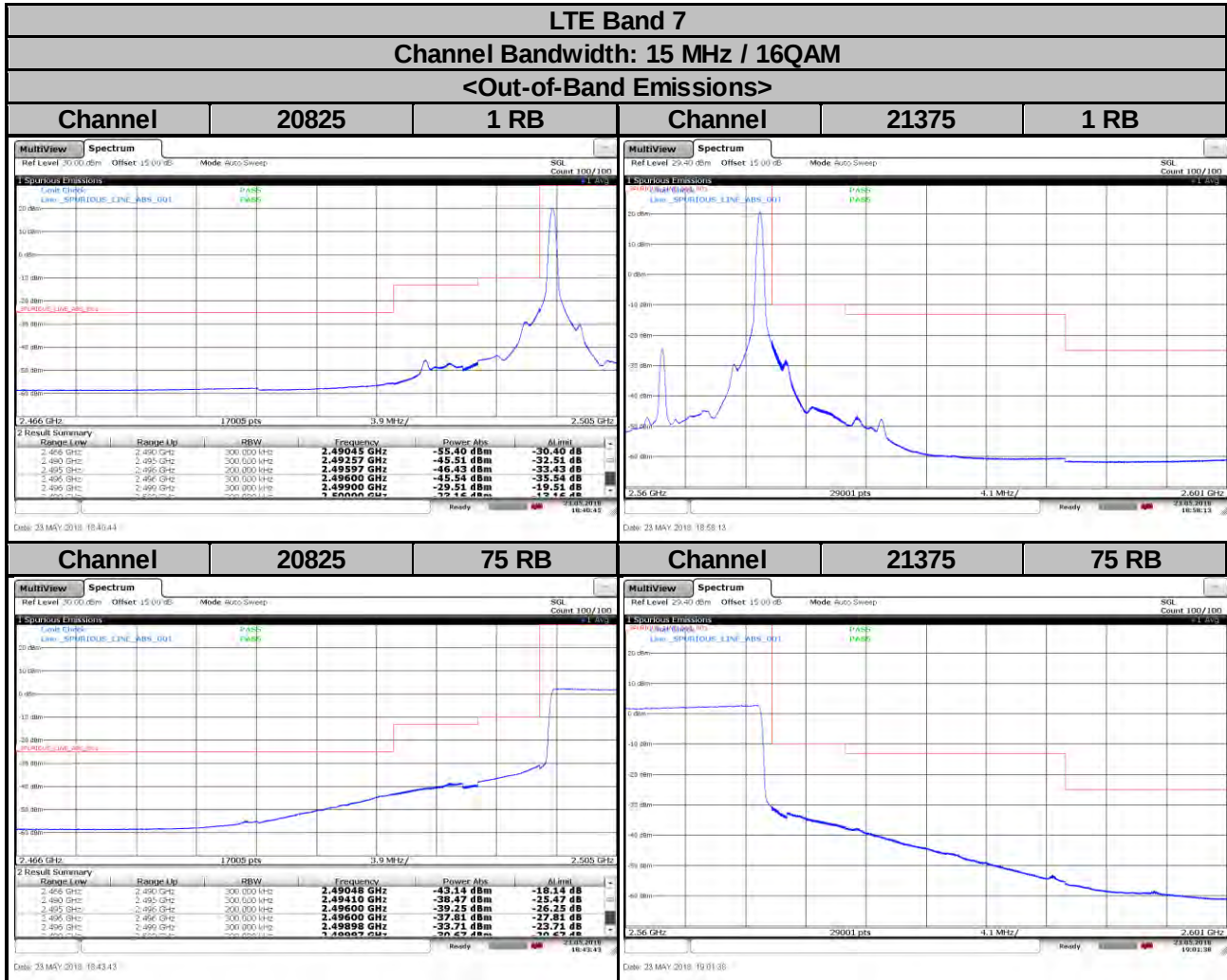


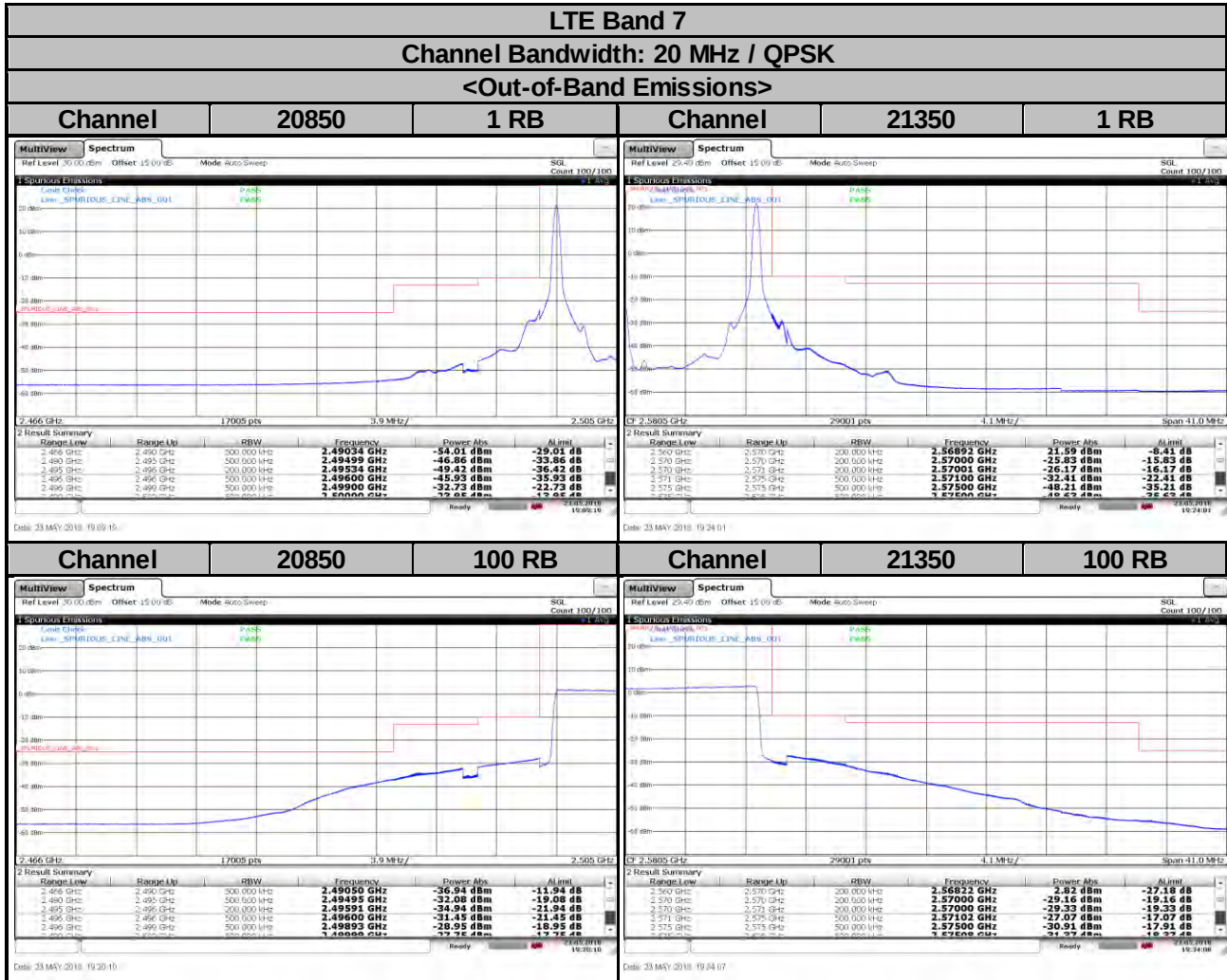


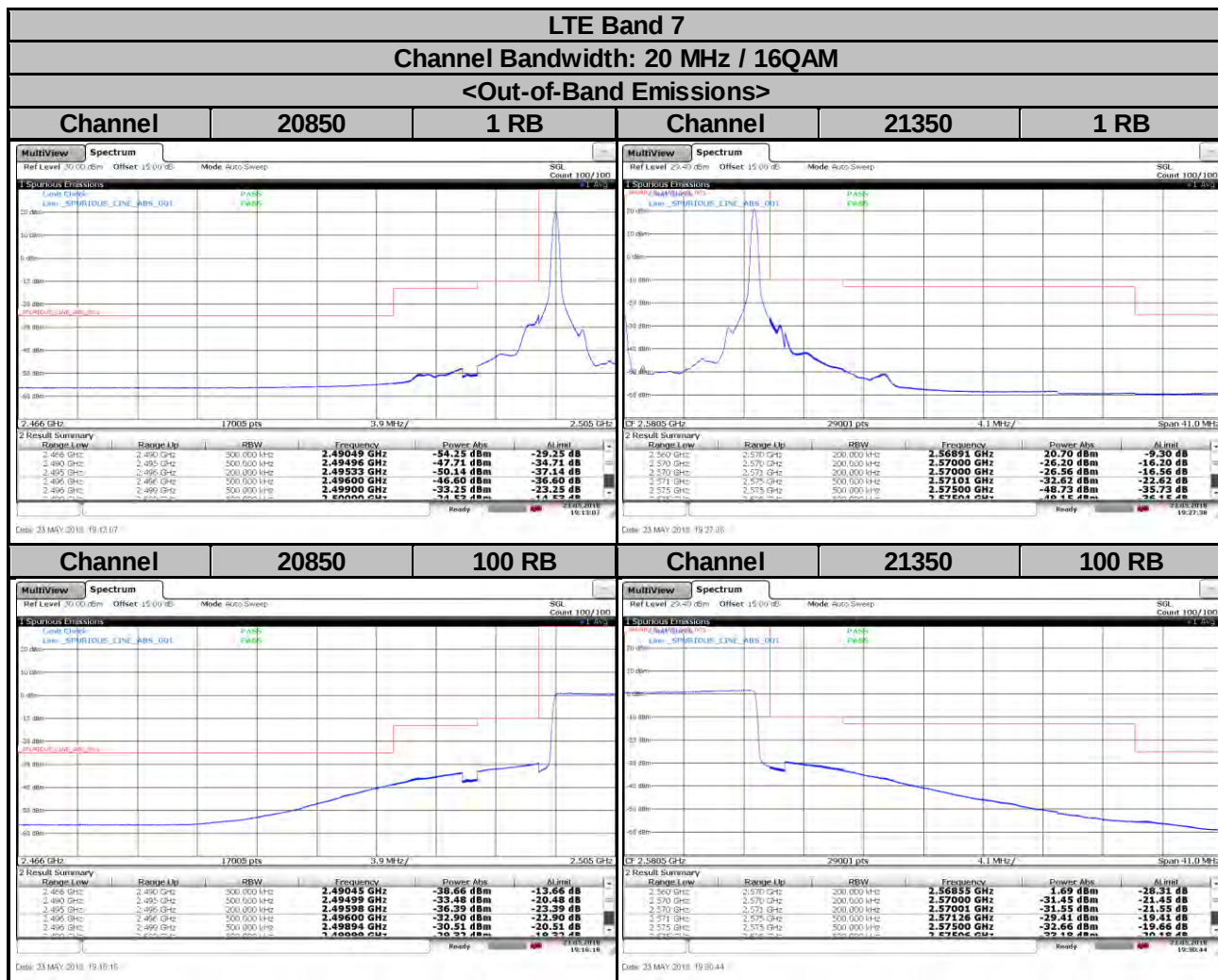


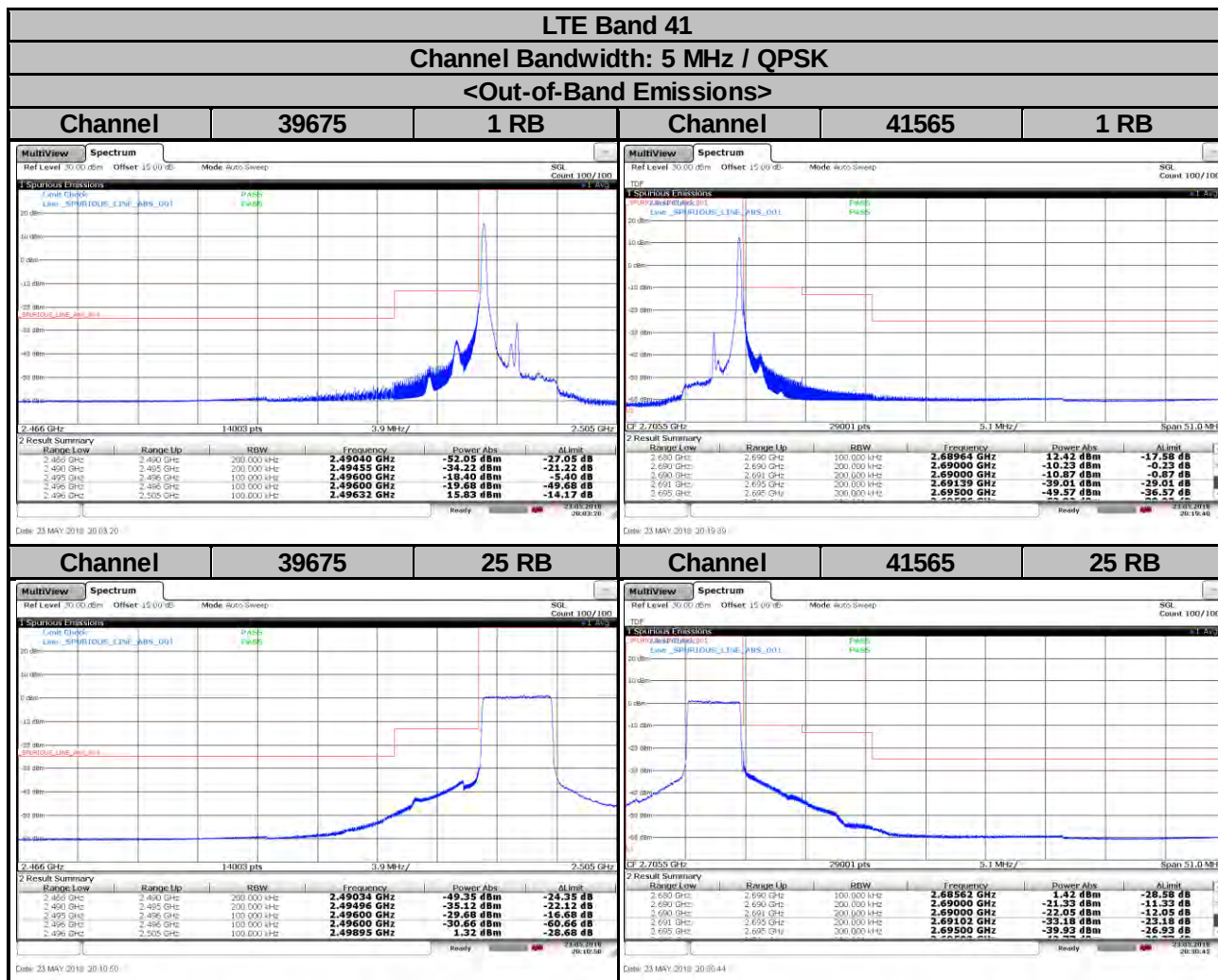


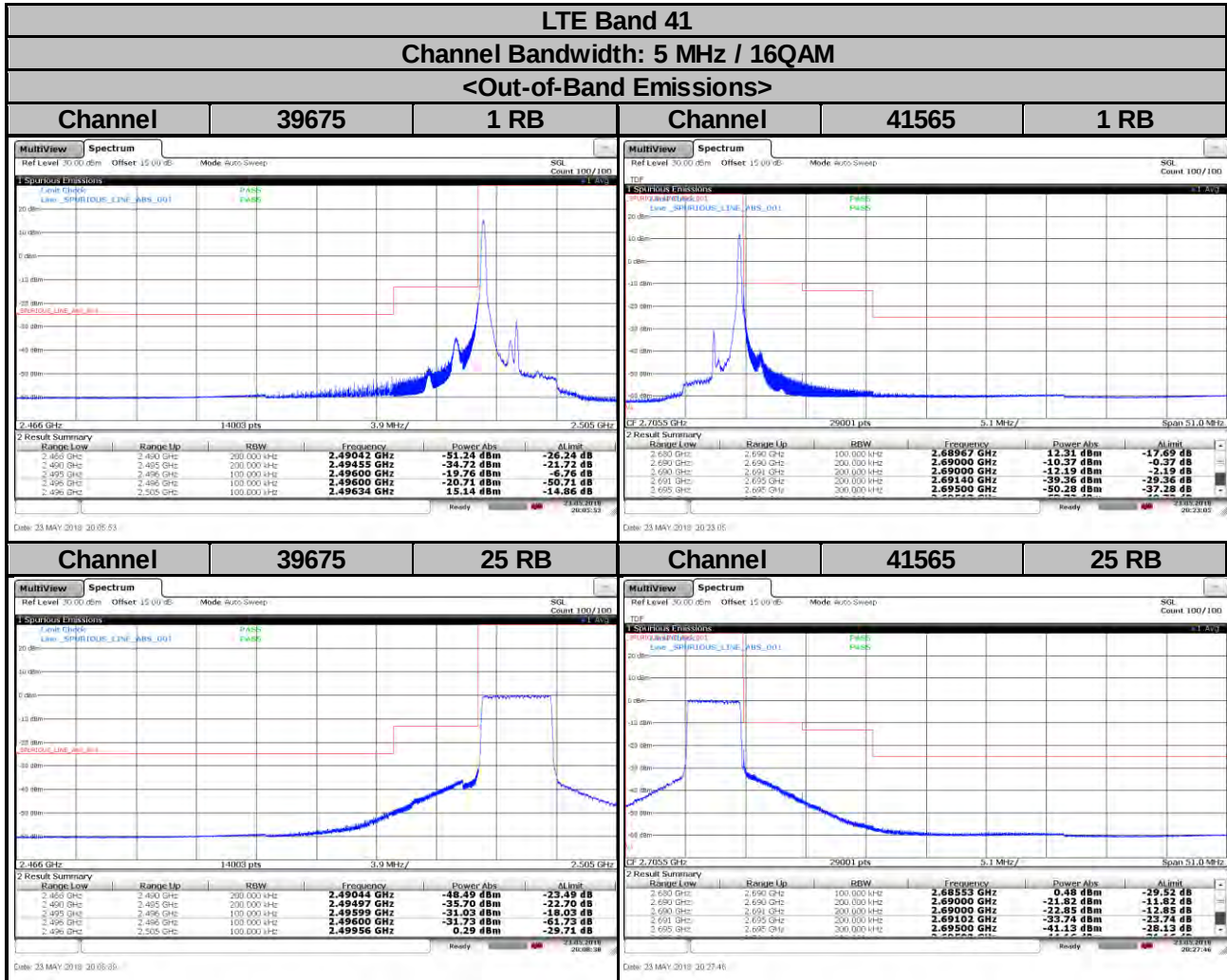


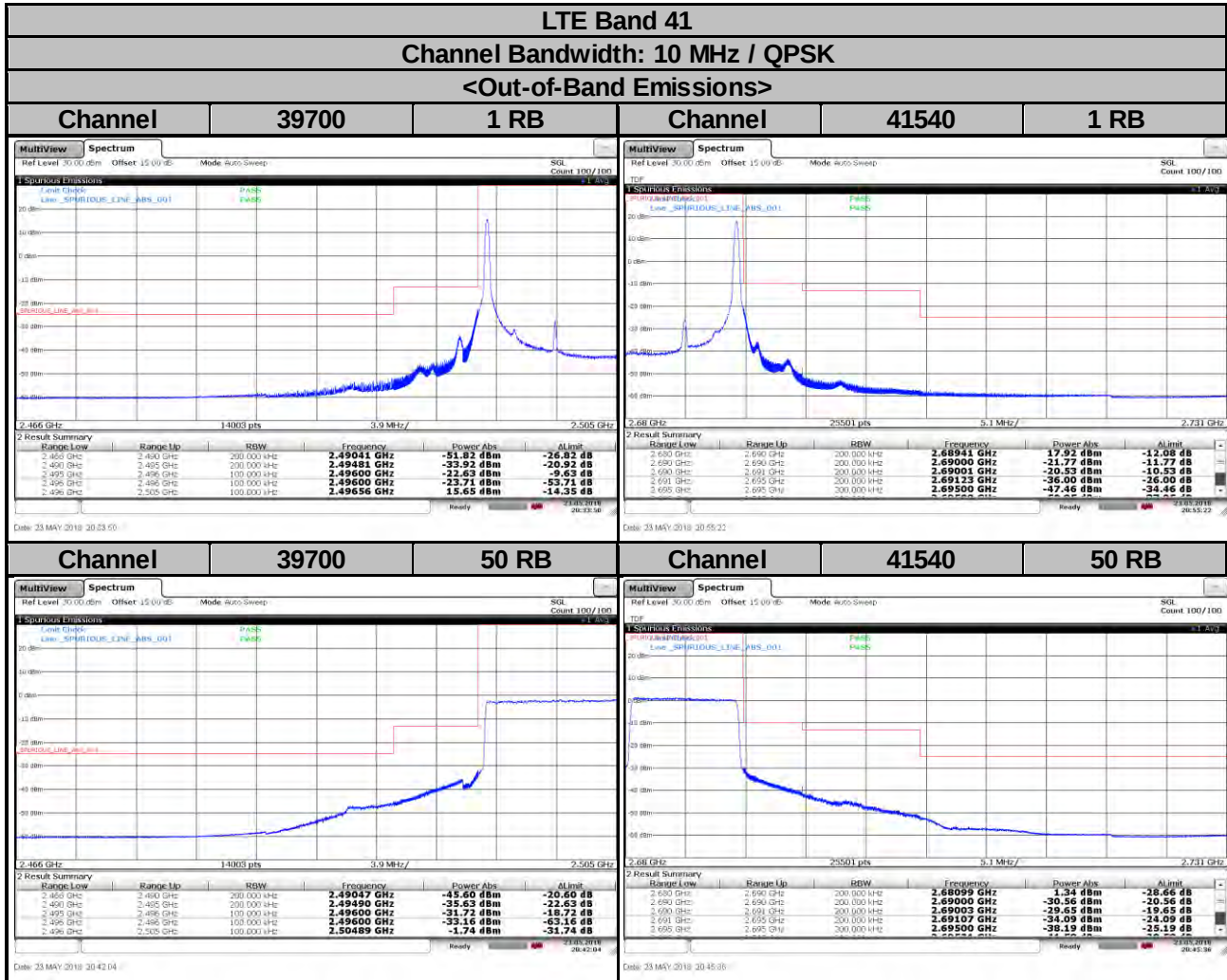


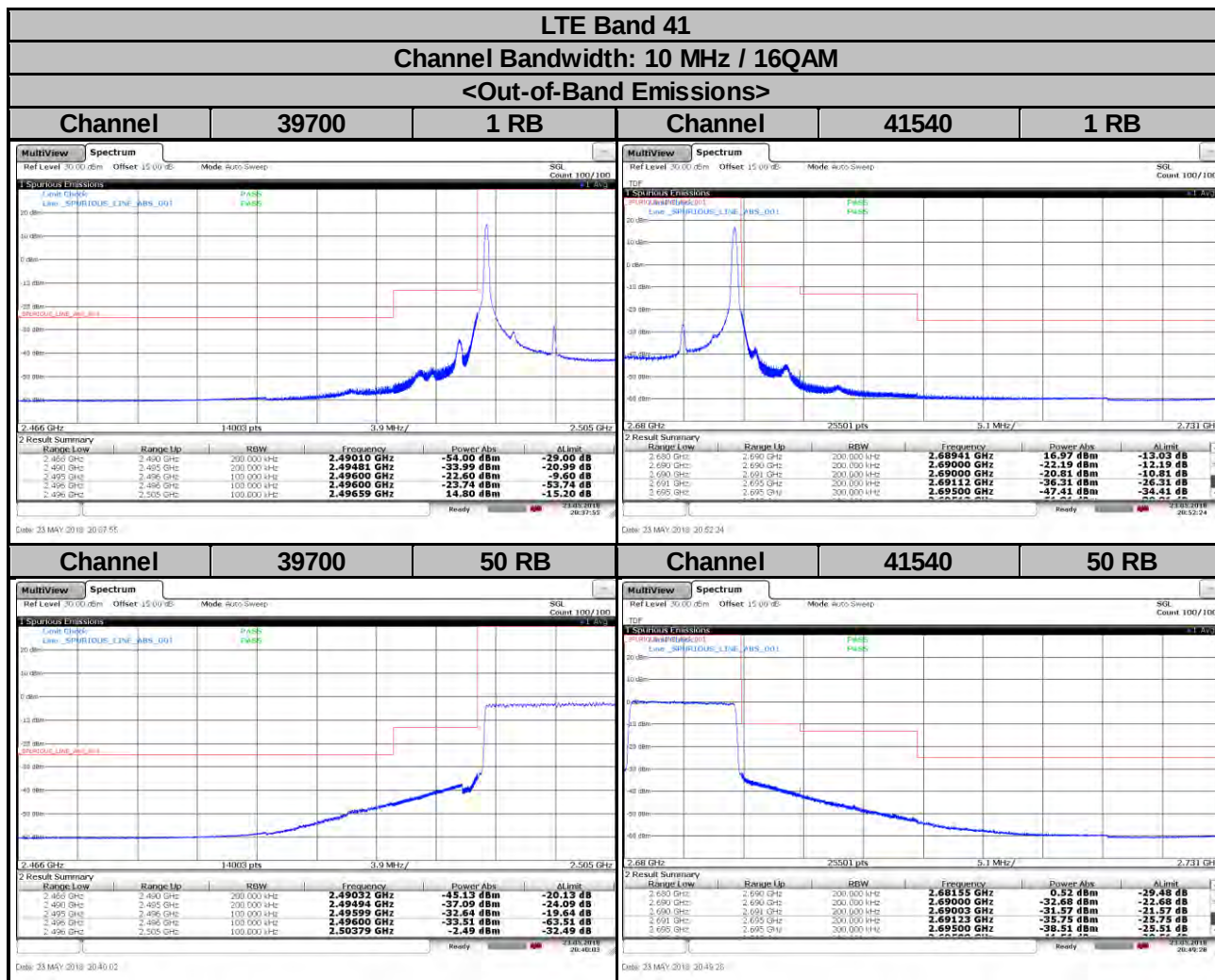


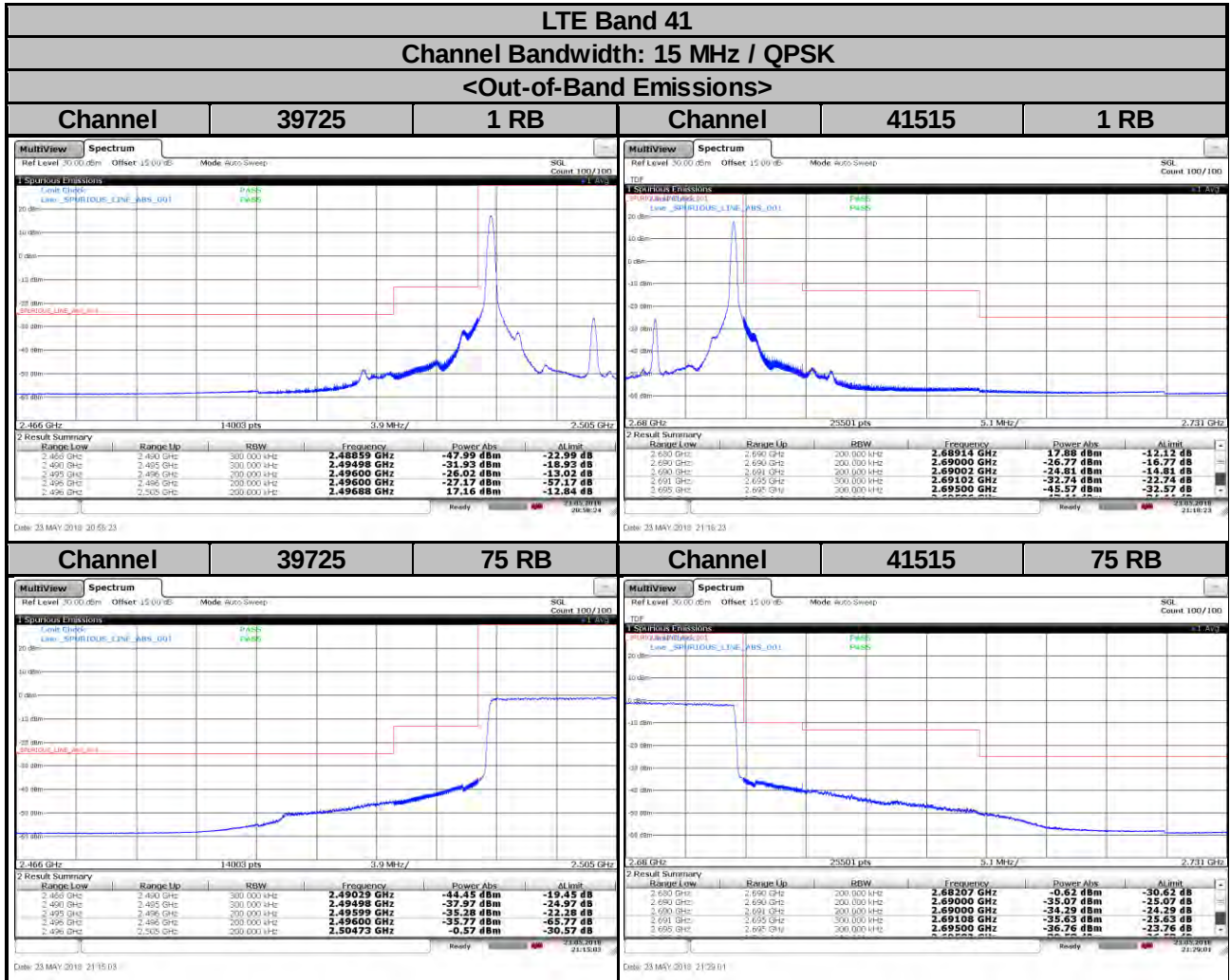


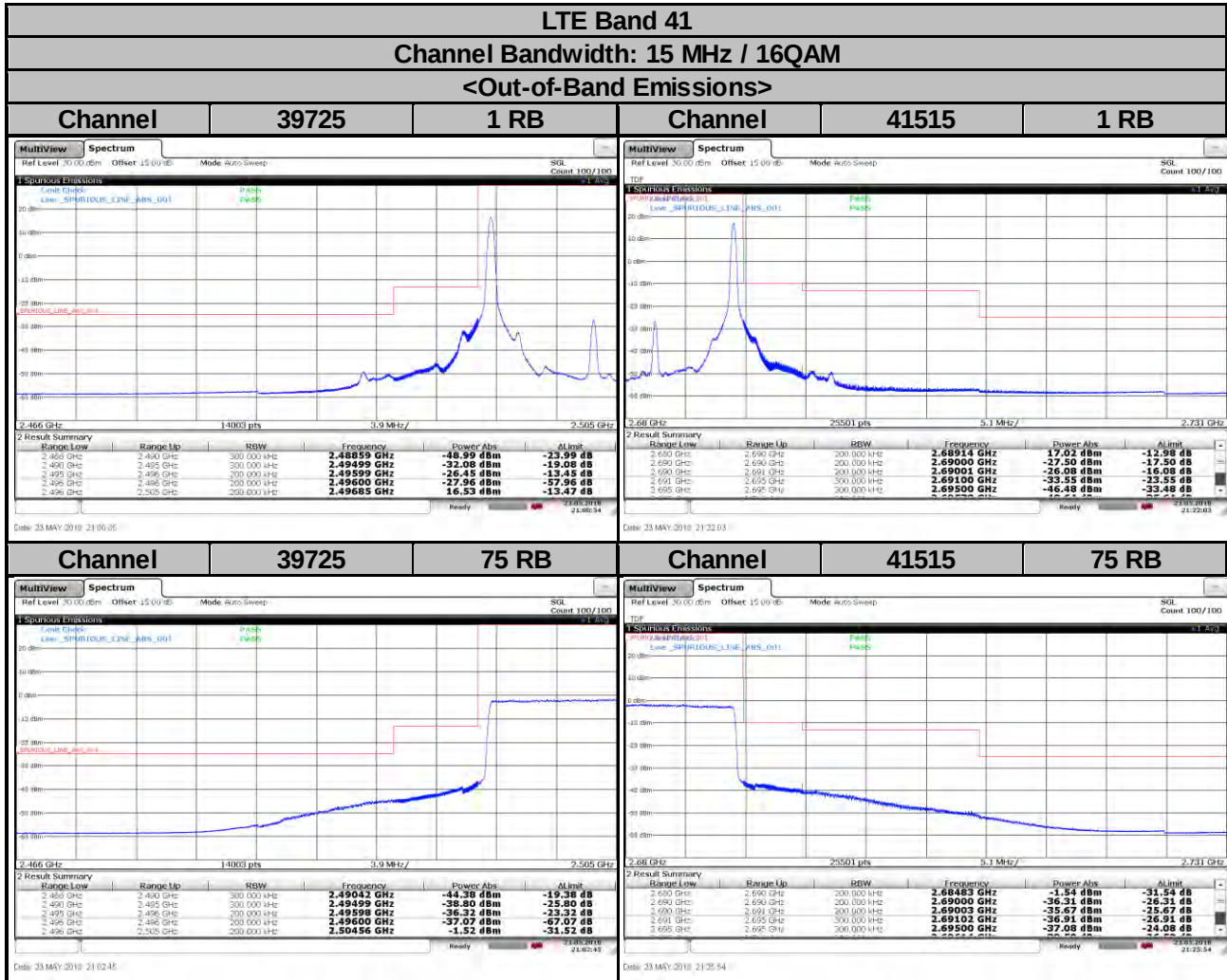


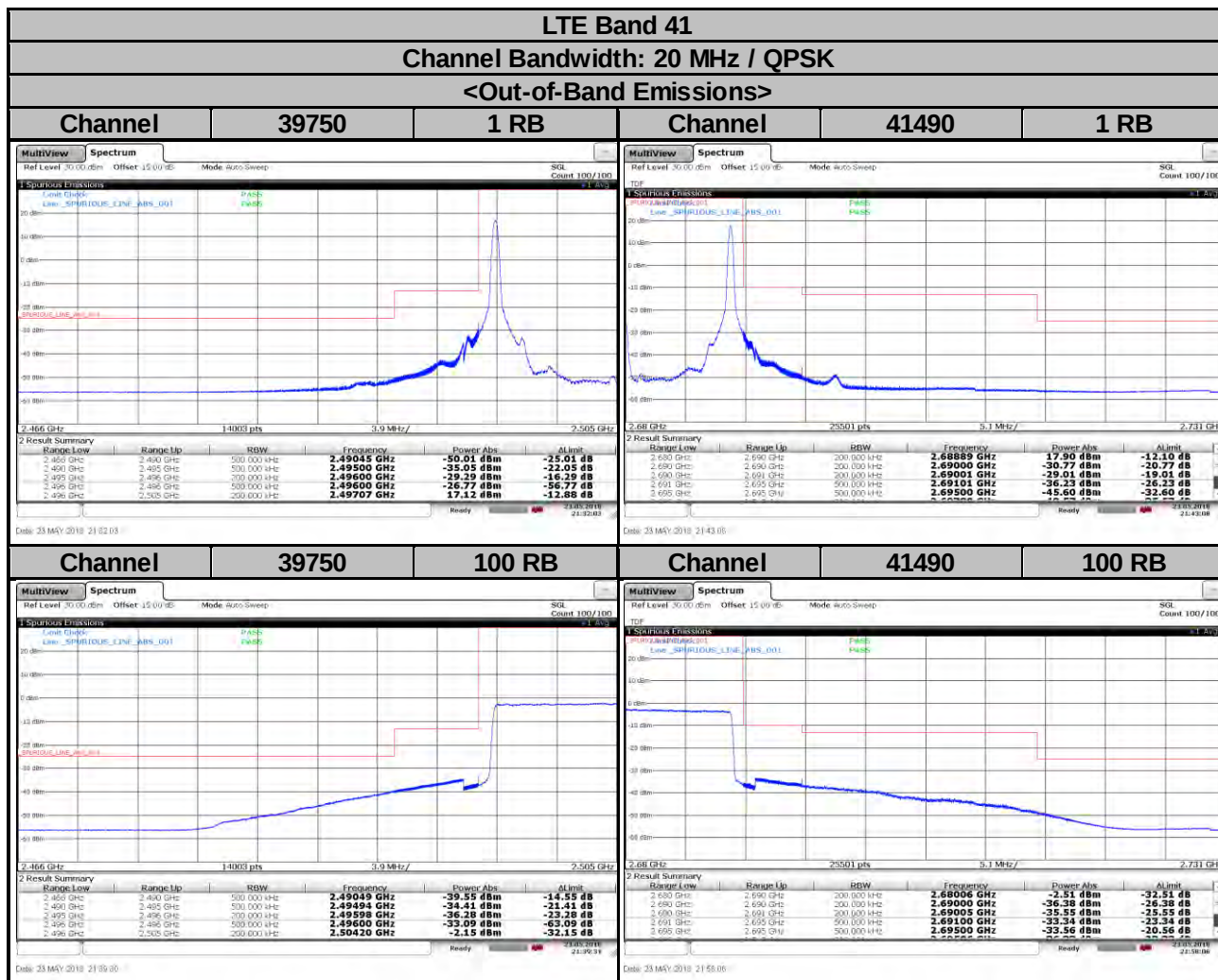


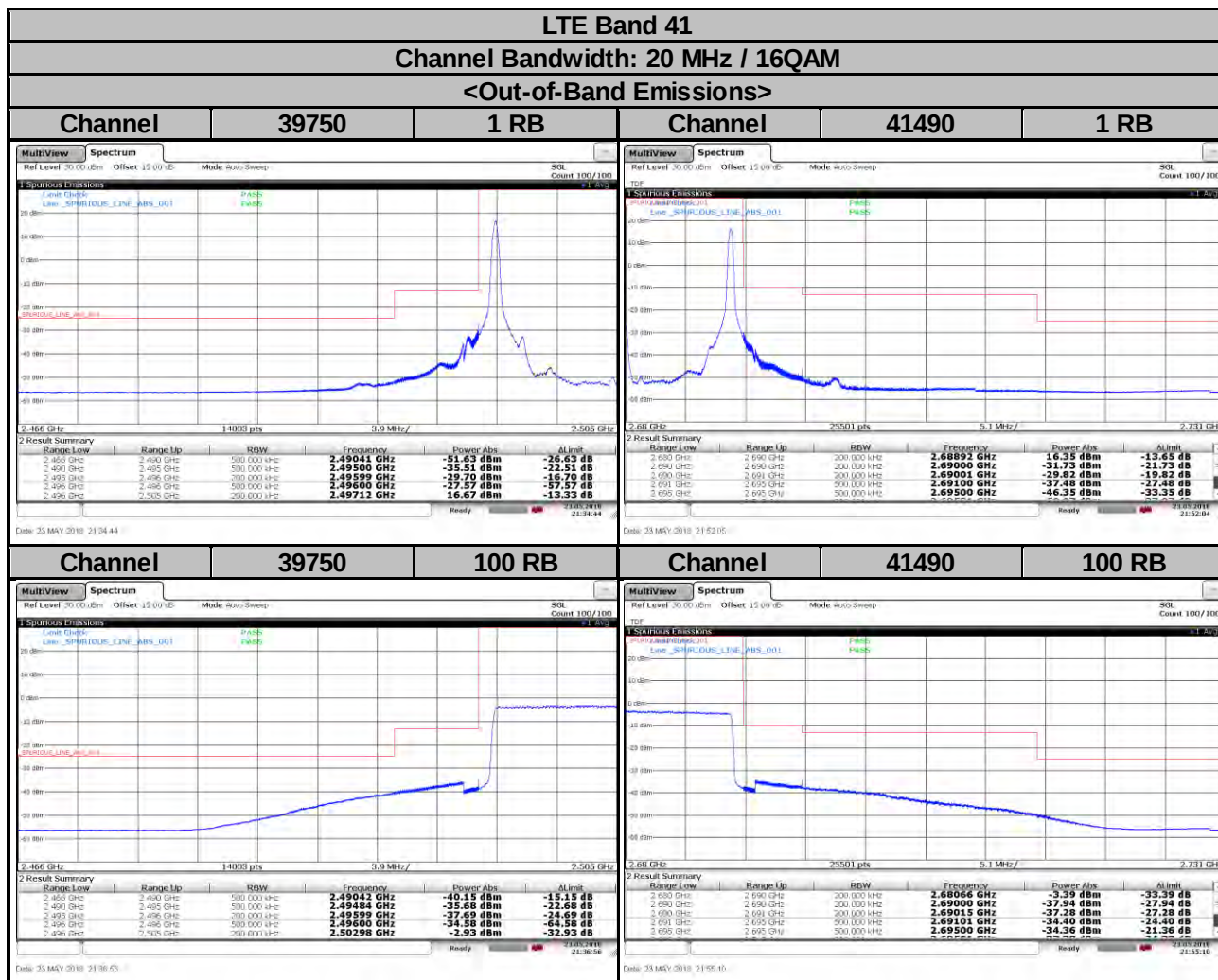










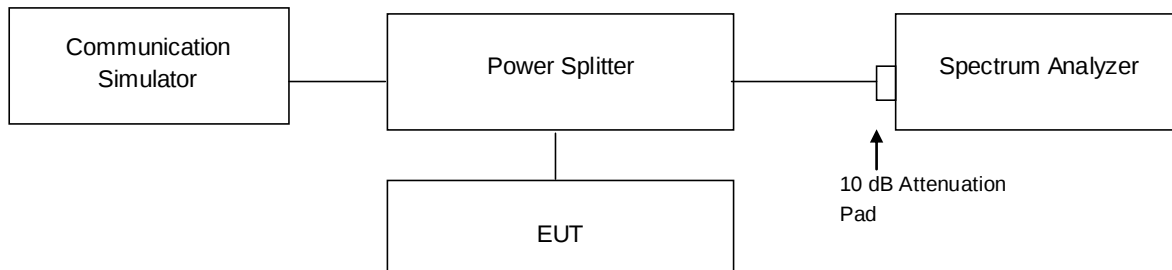


4.5 Peak to Average Ratio

4.5.1 Limits of Peak to Average Ratio Measurement

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

4.5.2 Test Setup

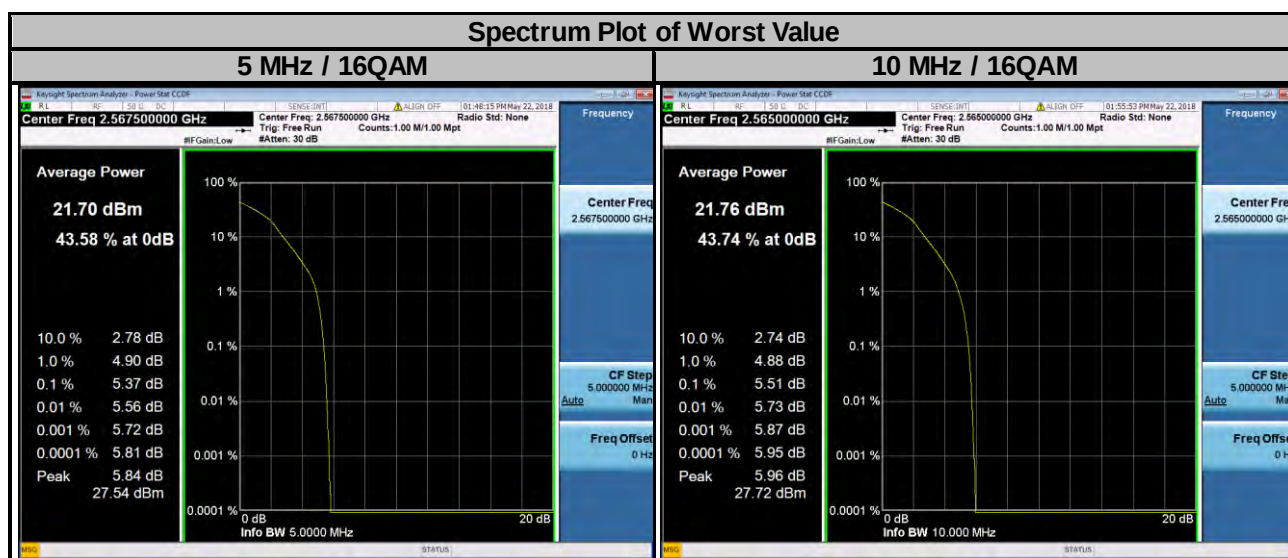


4.5.3 Test Procedures

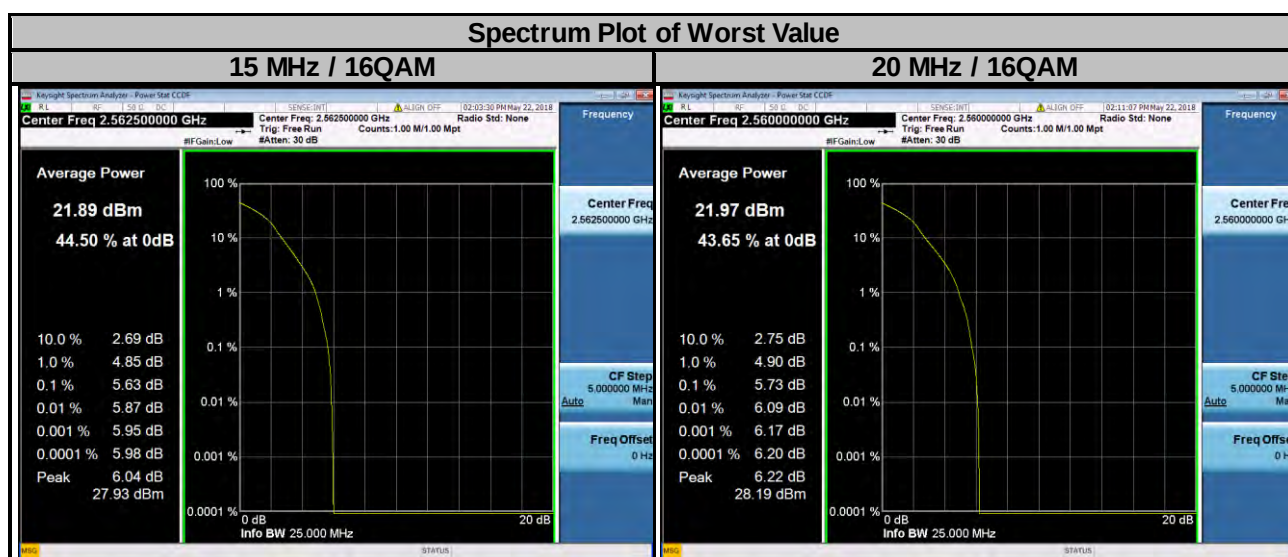
1. Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1 %.

4.5.4 Test Results

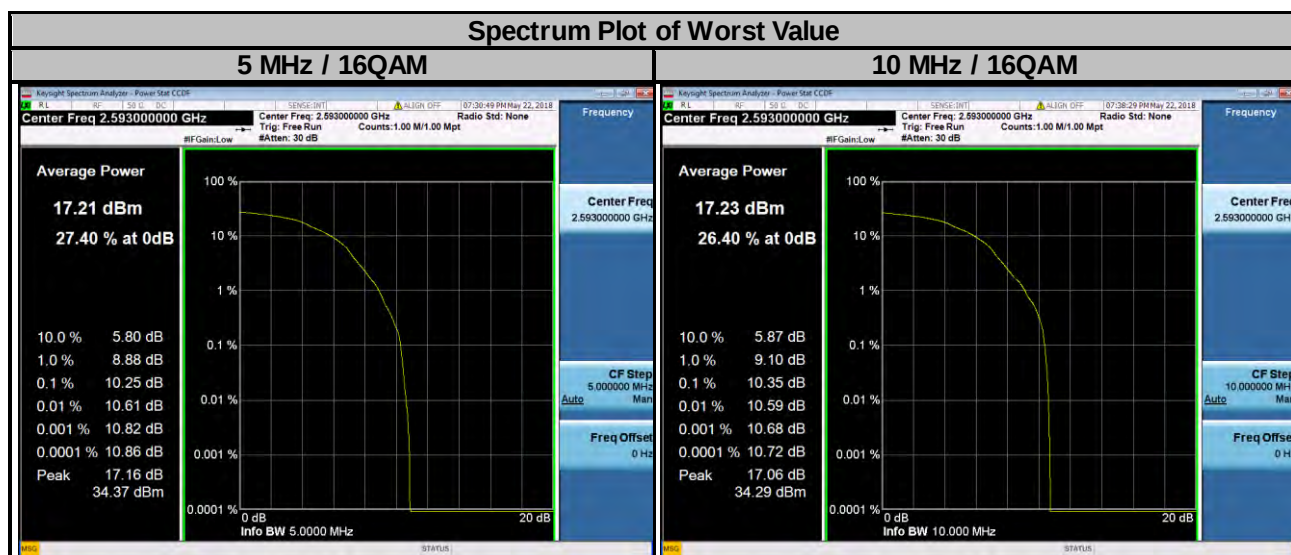
LTE Band 7							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
20775	2502.5	4.16	4.56	20800	2505.0	4.17	4.56
21100	2535.0	4.62	5.13	21100	2535.0	4.60	5.18
21425	2567.5	4.90	5.37	21400	2565.0	5.01	5.51



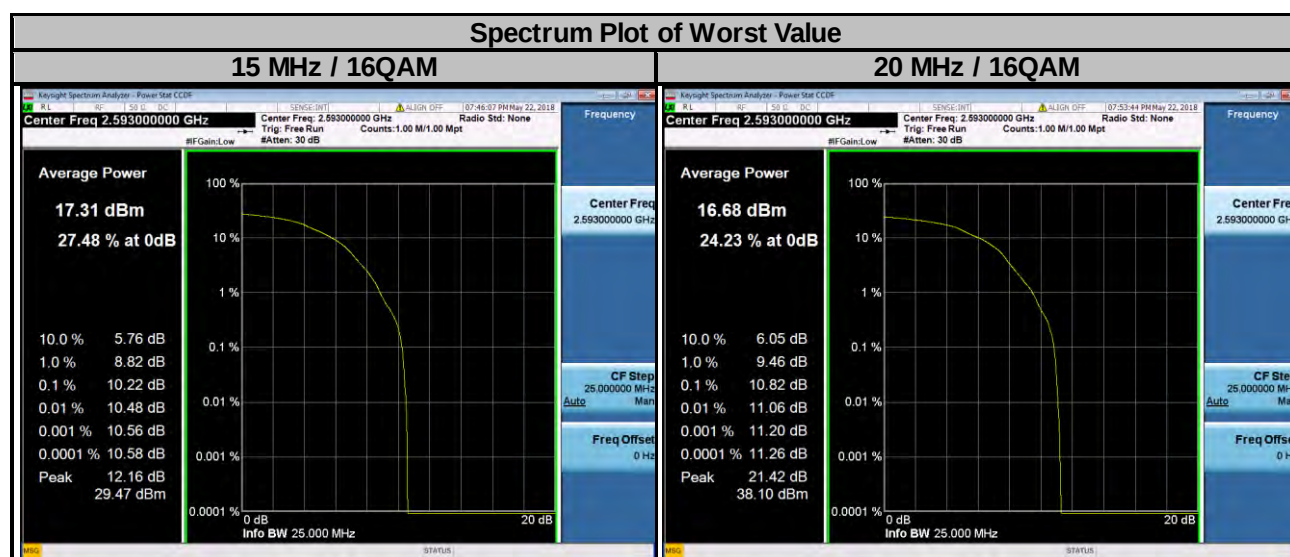
LTE Band 7							
Channel Bandwidth: 15 MHz				Channel Bandwidth: 20 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
20825	2507.5	4.22	4.55	20850	2510.0	4.25	4.57
21100	2535.0	4.72	5.15	21100	2535.0	4.68	5.41
21375	2562.5	4.82	5.63	21350	2560.0	4.77	5.73



LTE Band 41							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
39675	2498.5	8.41	9.24	39700	2501.0	8.62	9.17
40620	2593.0	8.99	10.25	40620	2593.0	10.03	10.35
41565	2687.5	8.61	9.25	41540	2685.0	8.31	9.81



LTE Band 41							
Channel Bandwidth: 15 MHz				Channel Bandwidth: 20 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
39725	2503.5	9.07	9.89	39750	2506.0	8.72	9.06
40620	2593.0	9.60	10.22	40620	2593.0	10.38	10.82
41515	2682.5	7.62	9.08	41490	2680.0	10.09	9.39

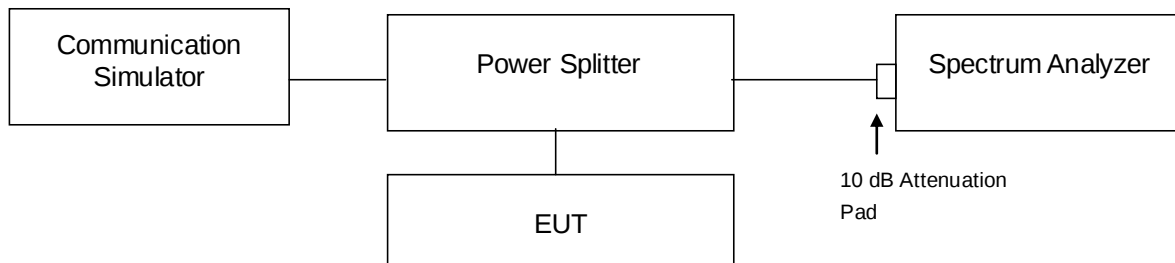


4.6 Conducted Spurious Emissions

4.6.1 Limits of Conducted Spurious Emissions 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.

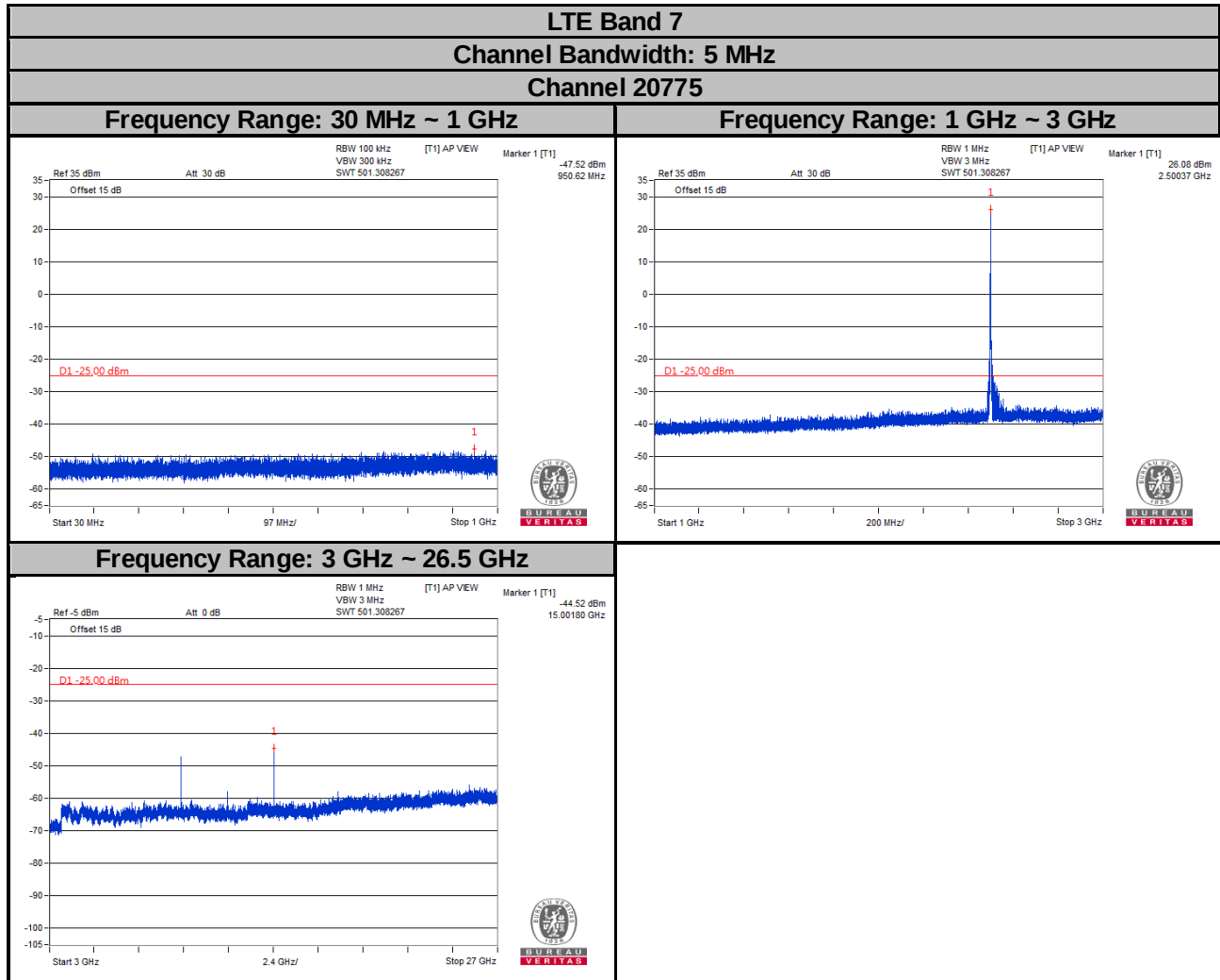
4.6.2 Test Setup



4.6.3 Test Procedure

- The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- Measuring frequency range is from 30 MHz to 26.5 GHz for LTE Band 7 and from 30 MHz to 27 GHz for LTE Band 41. 10 dB attenuation pad is connected with spectrum. RBW = 1 MHz and VBW = 3 MHz are used for conducted emission measurement.

4.6.4 Test Results

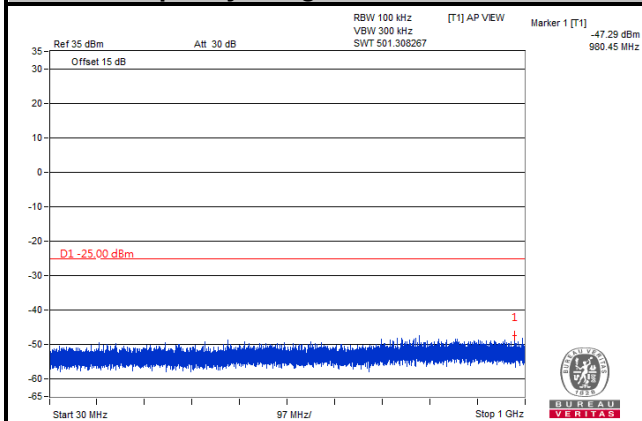


LTE Band 7

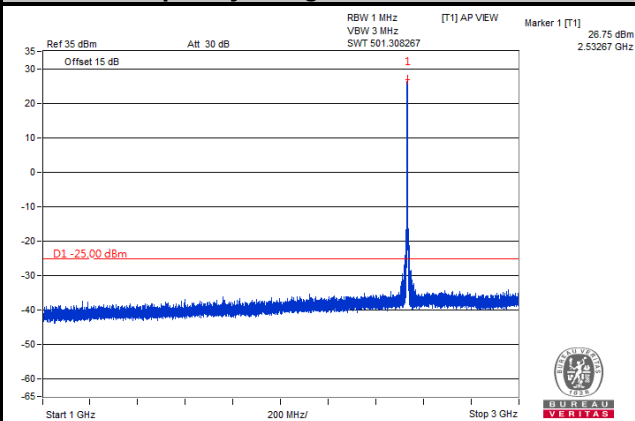
Channel Bandwidth: 5 MHz

Channel 21100

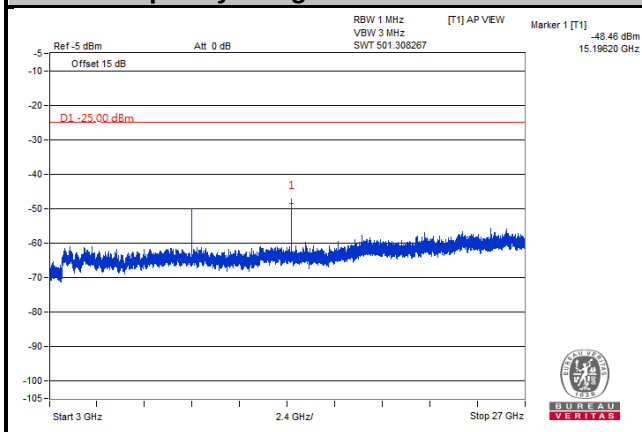
Frequency Range: 30 MHz ~ 1 GHz



Frequency Range: 1 GHz ~ 3 GHz



Frequency Range: 3 GHz ~ 26.5 GHz

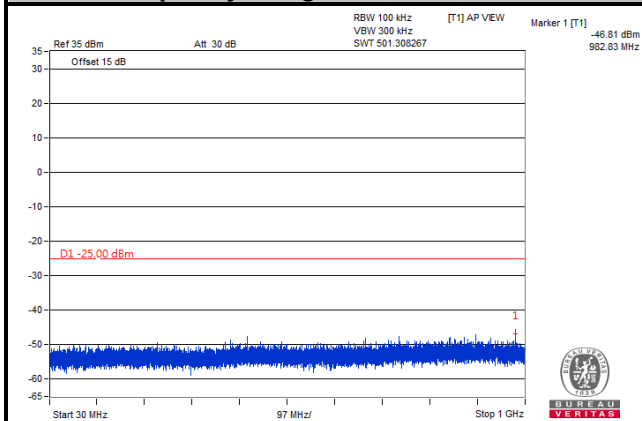


LTE Band 7

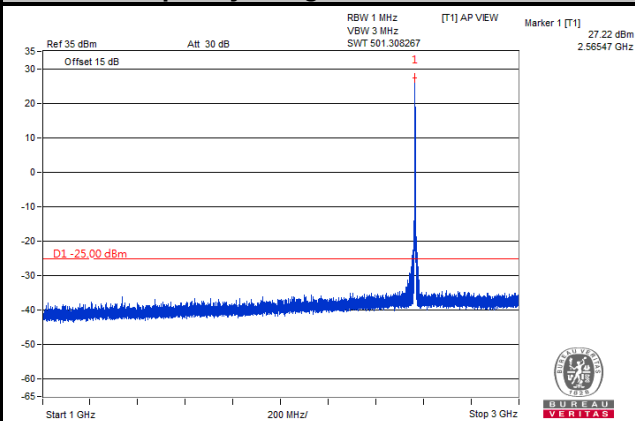
Channel Bandwidth: 5 MHz

Channel 21425

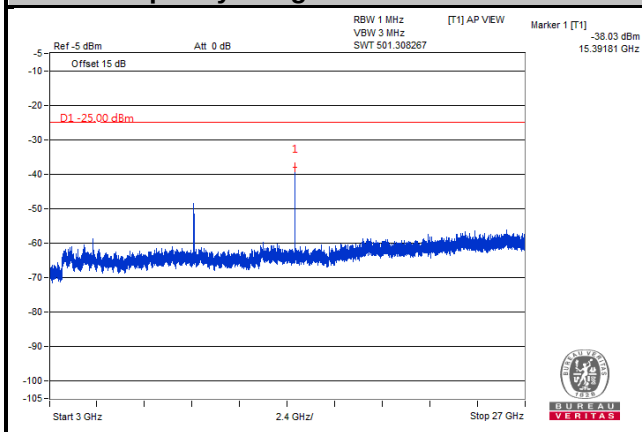
Frequency Range: 30 MHz ~ 1 GHz



Frequency Range: 1 GHz ~ 3 GHz



Frequency Range: 3 GHz ~ 26.5 GHz

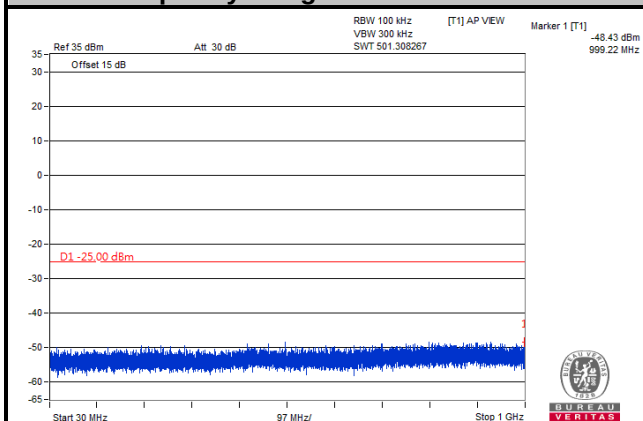


LTE Band 7

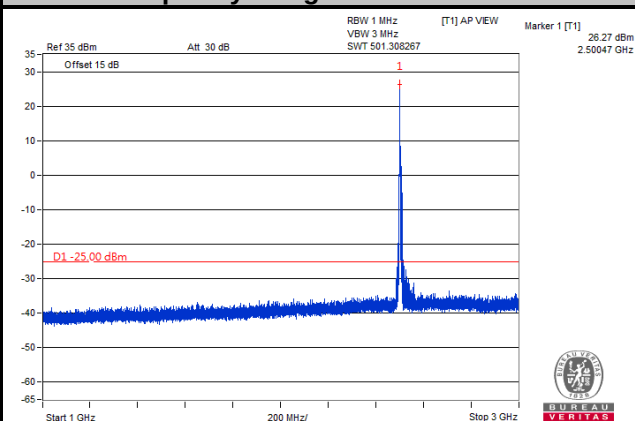
Channel Bandwidth: 10 MHz

Channel 20800

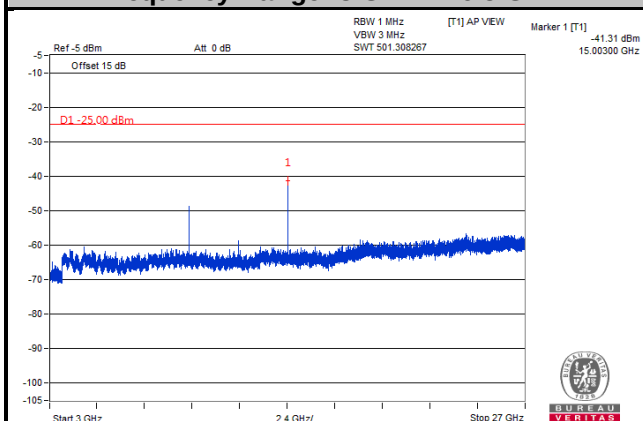
Frequency Range: 30 MHz ~ 1 GHz

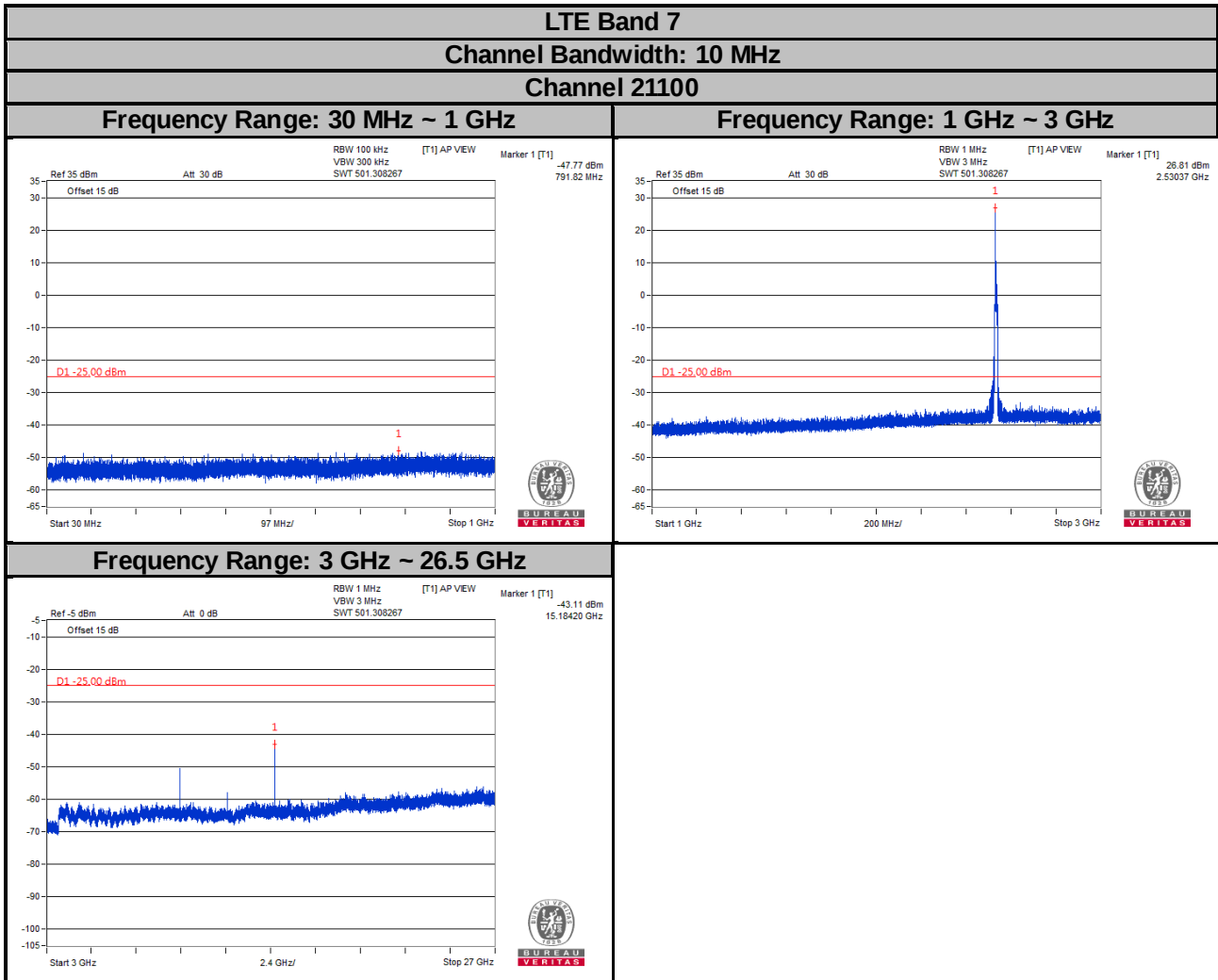


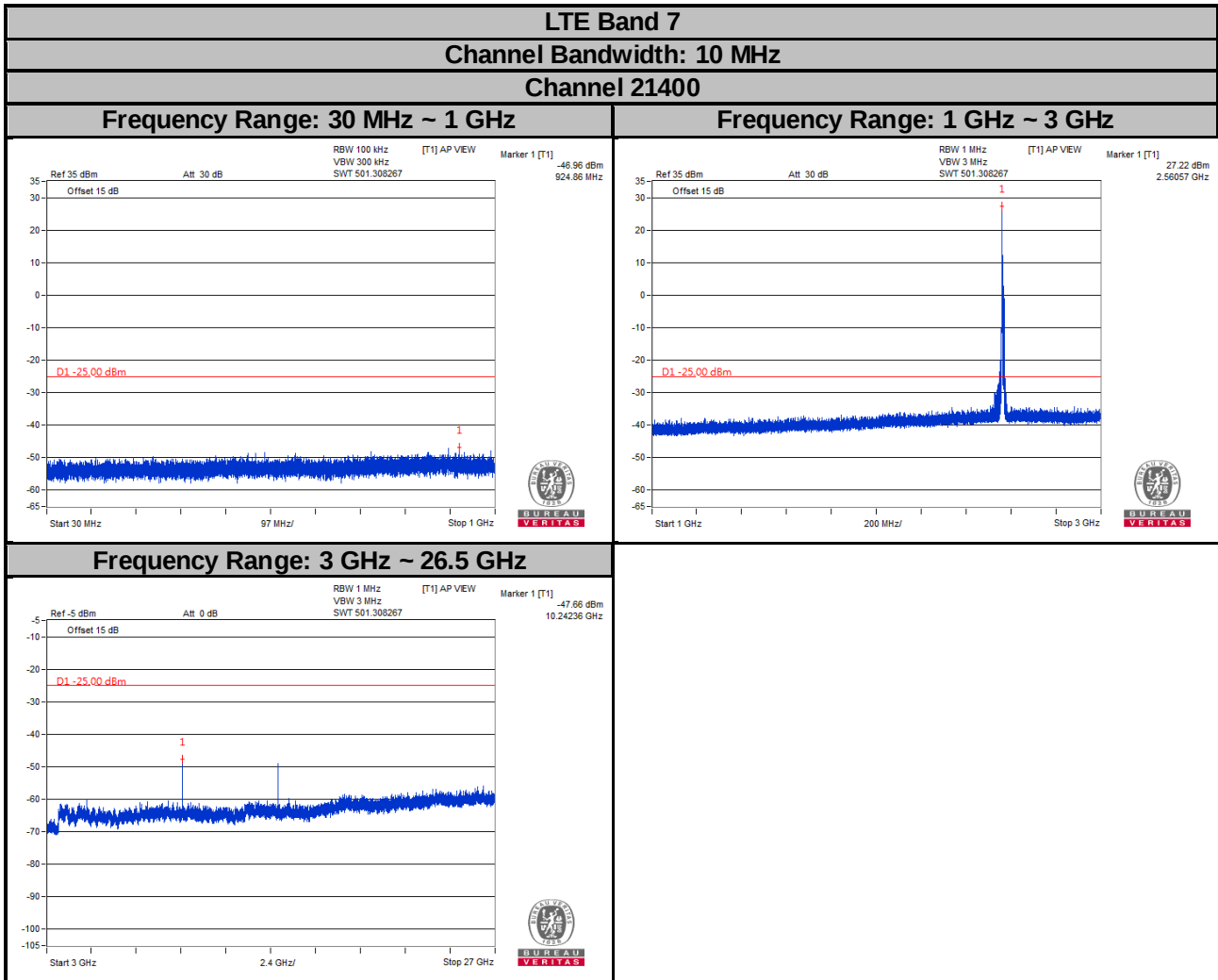
Frequency Range: 1 GHz ~ 3 GHz



Frequency Range: 3 GHz ~ 26.5 GHz







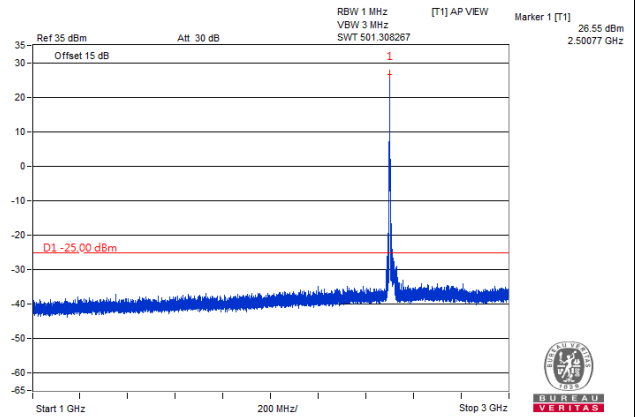
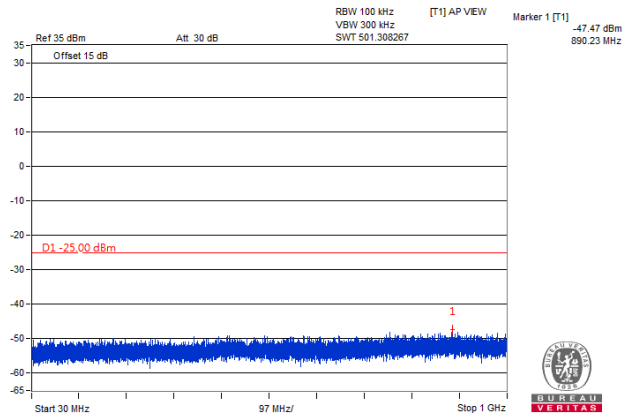
LTE Band 7

Channel Bandwidth: 15 MHz

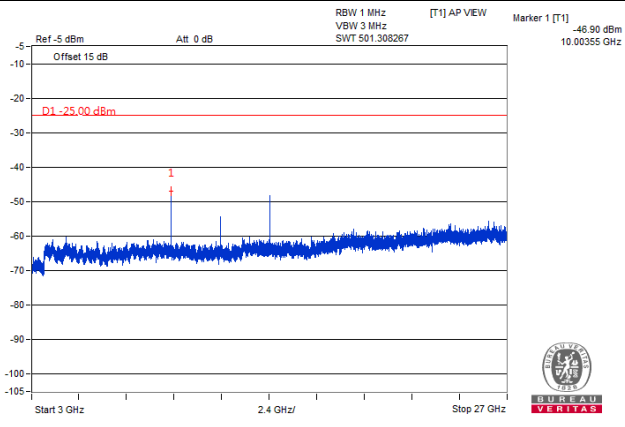
Channel 20825

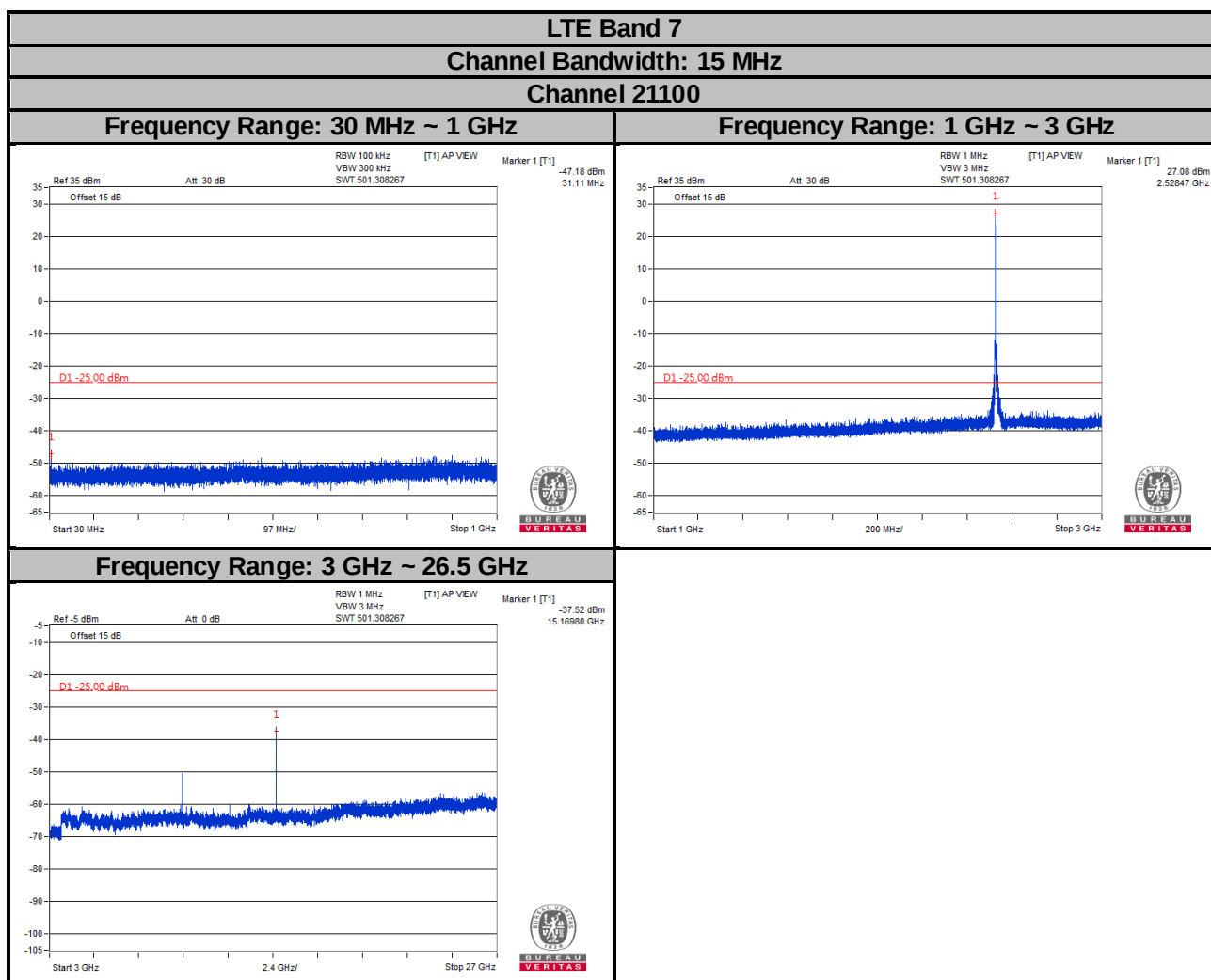
Frequency Range: 30 MHz ~ 1 GHz

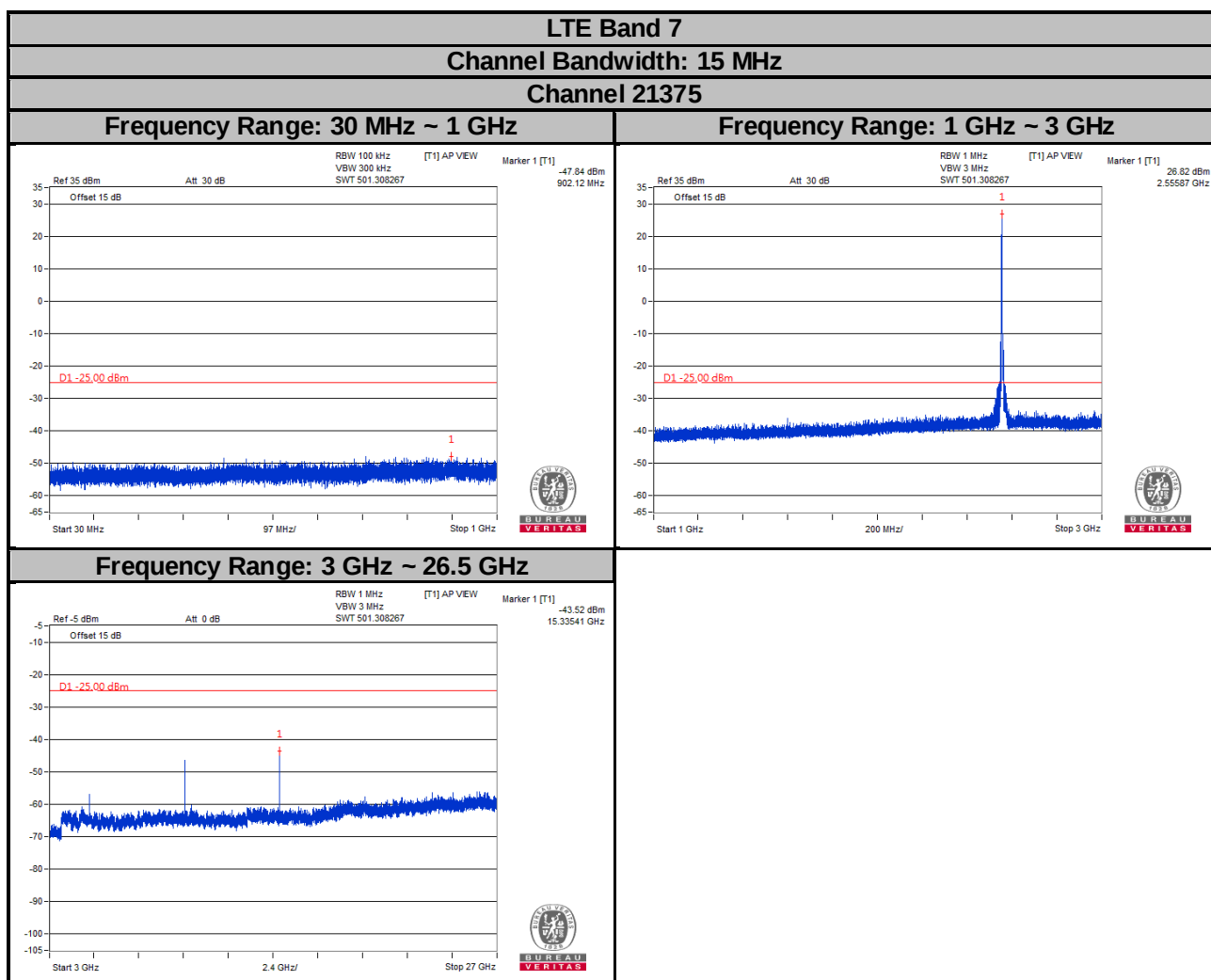
Frequency Range: 1 GHz ~ 3 GHz

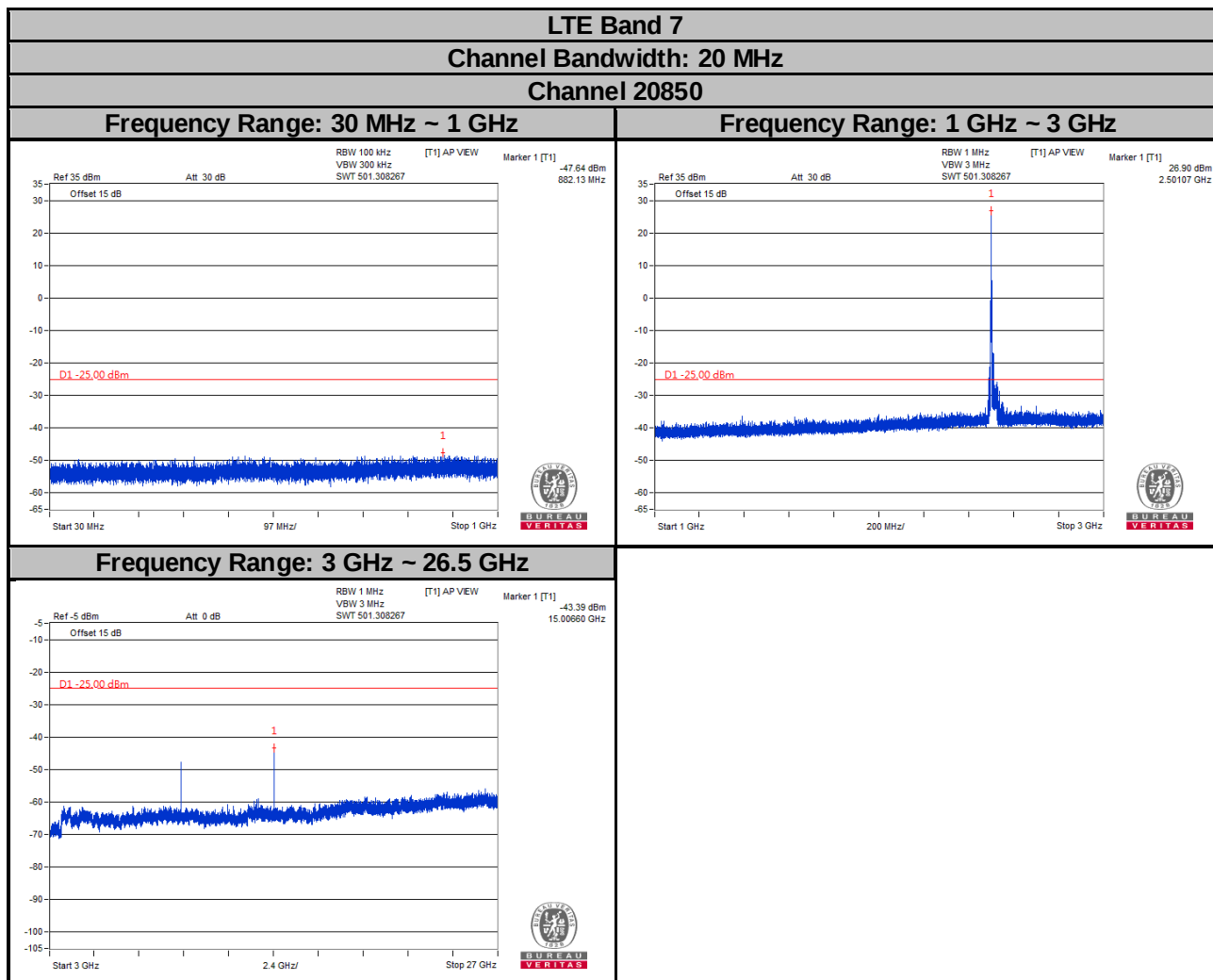


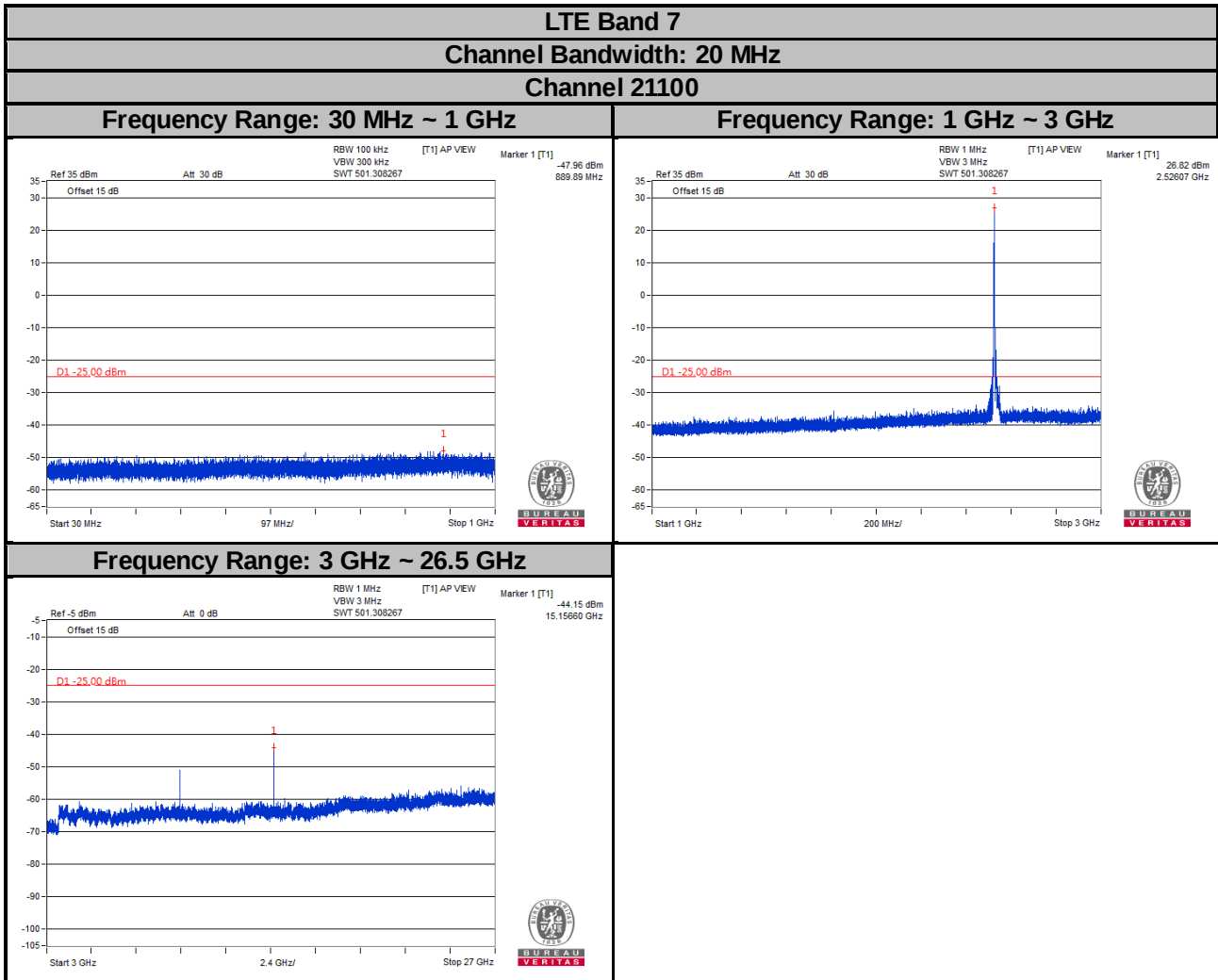
Frequency Range: 3 GHz ~ 26.5 GHz

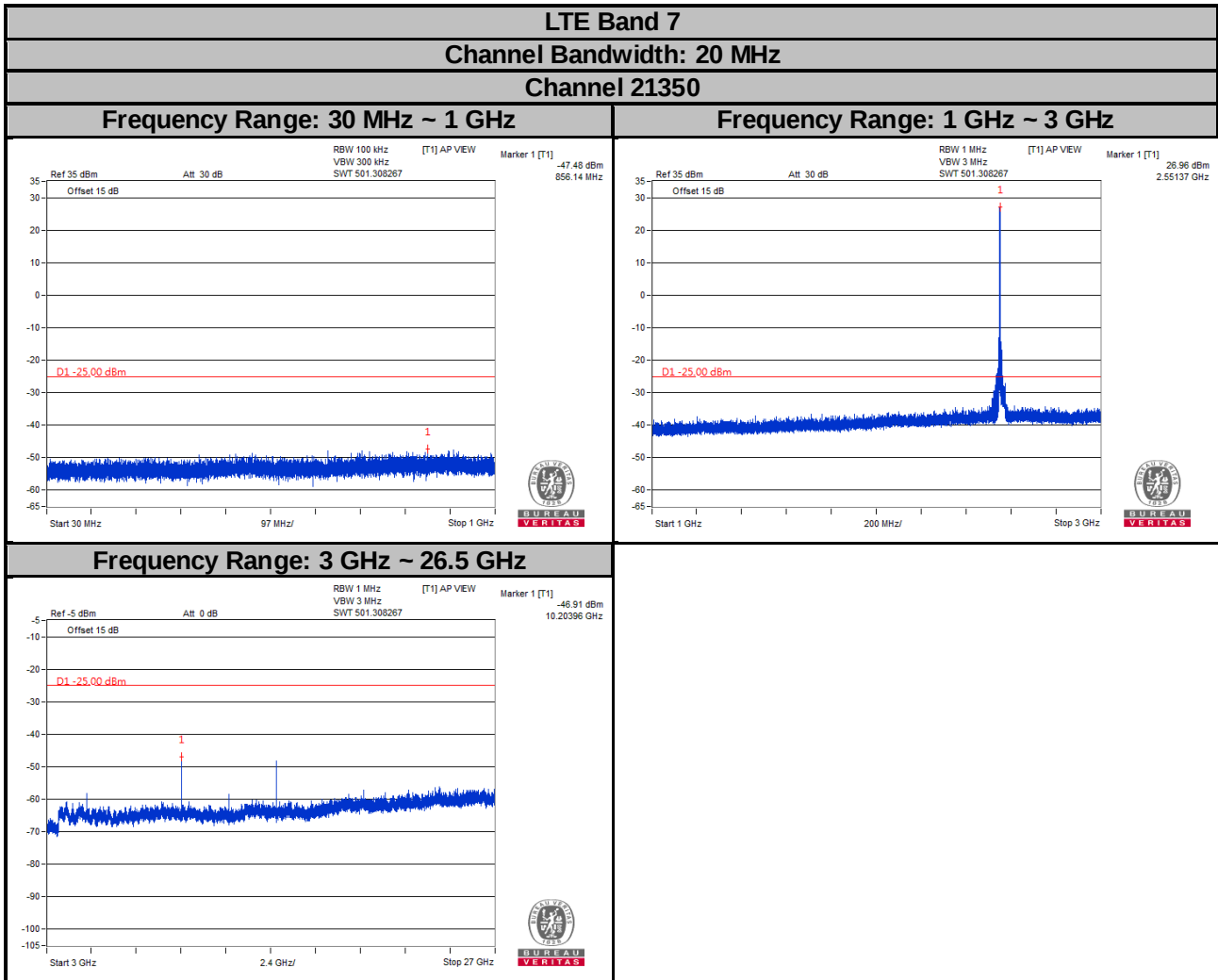












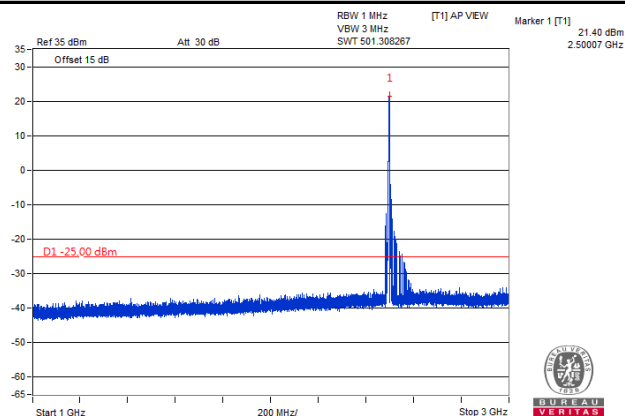
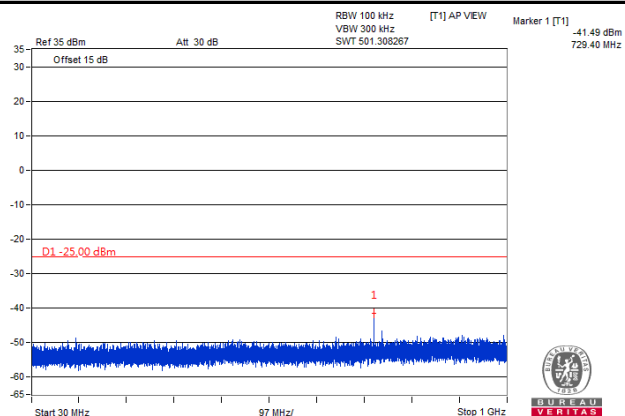
LTE Band 41

Channel Bandwidth: 5 MHz

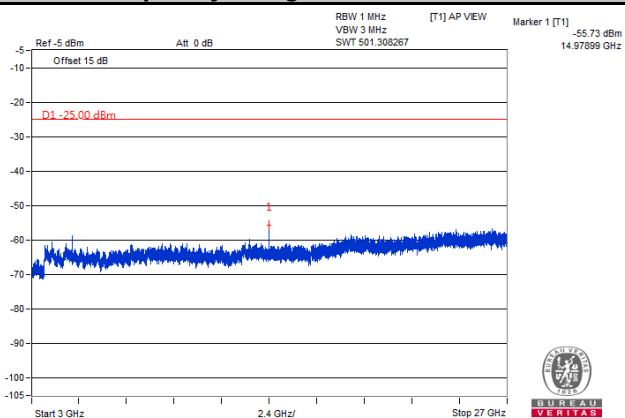
Channel 39675

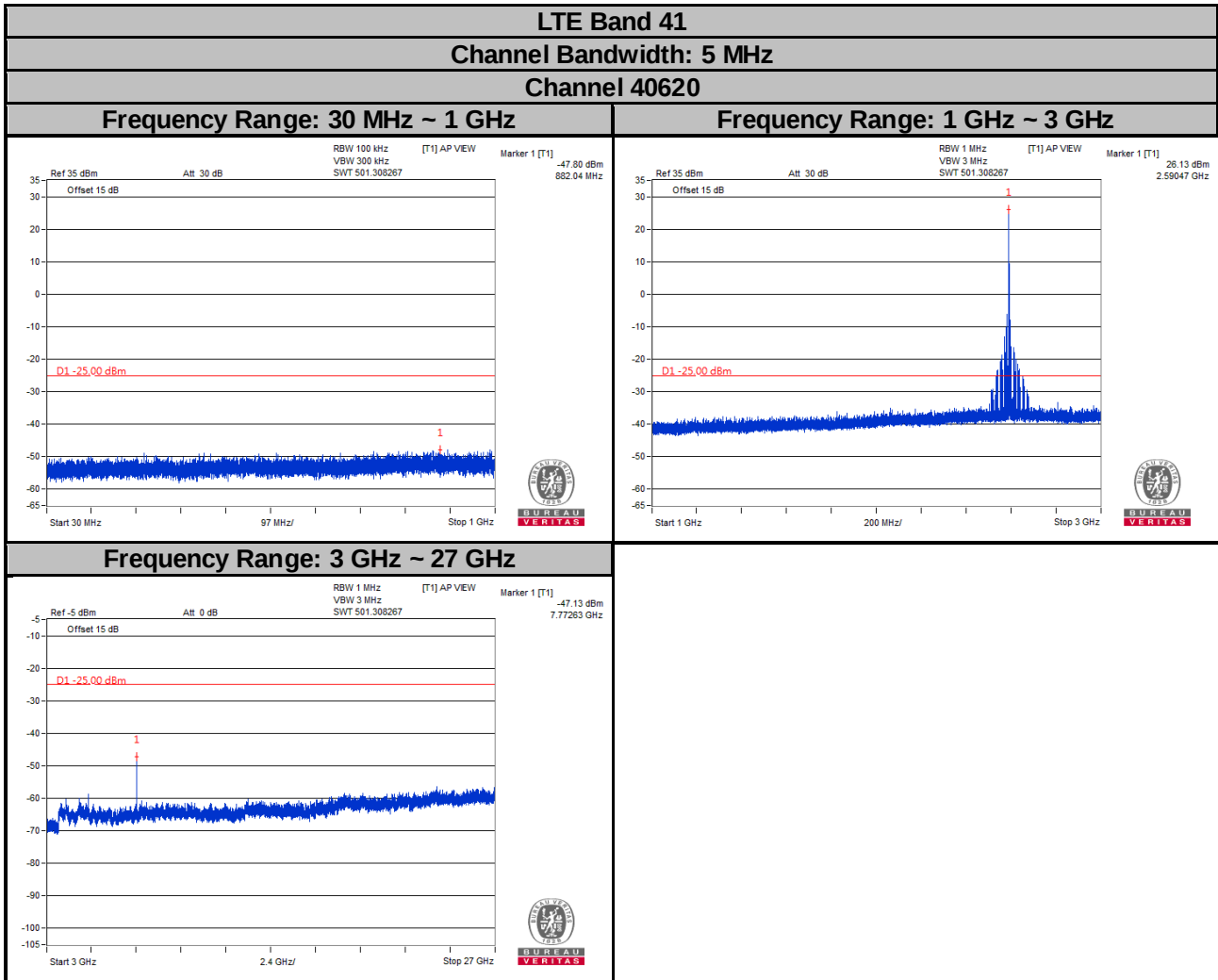
Frequency Range: 30 MHz ~ 1 GHz

Frequency Range: 1 GHz ~ 3 GHz



Frequency Range: 3 GHz ~ 27 GHz





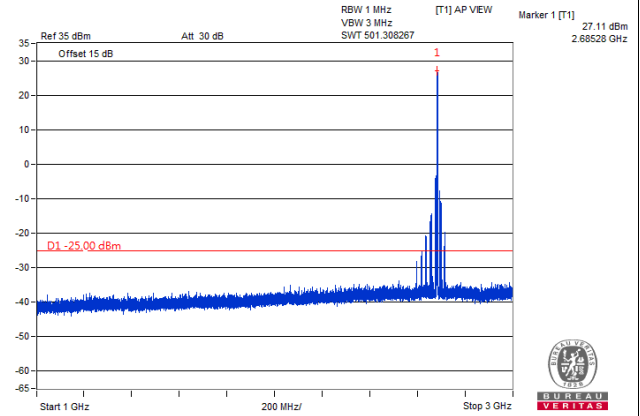
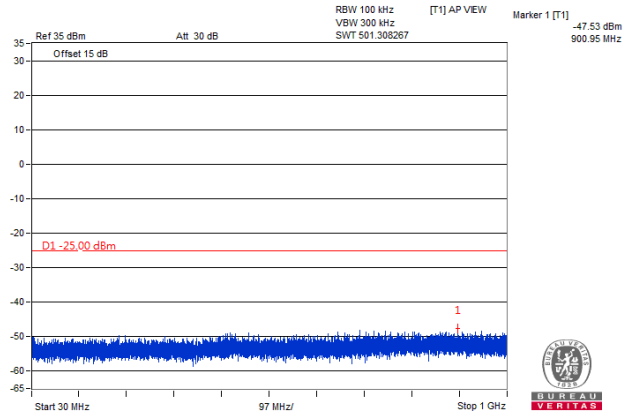
LTE Band 41

Channel Bandwidth: 5 MHz

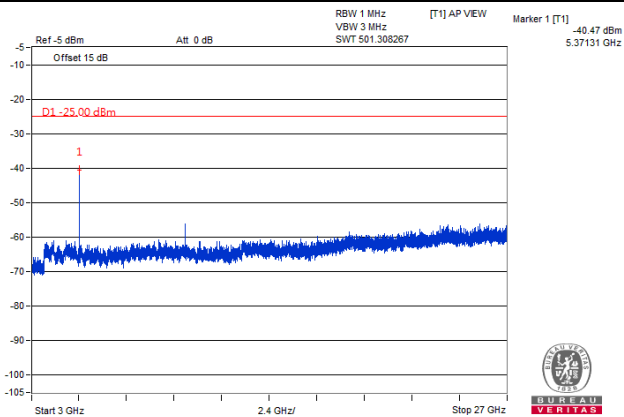
Channel 41565

Frequency Range: 30 MHz ~ 1 GHz

Frequency Range: 1 GHz ~ 3 GHz



Frequency Range: 3 GHz ~ 27 GHz



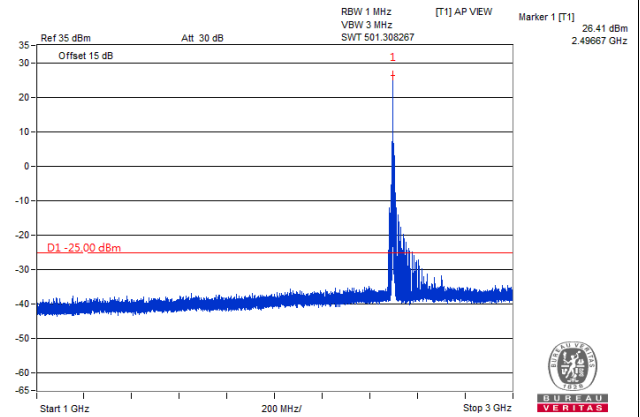
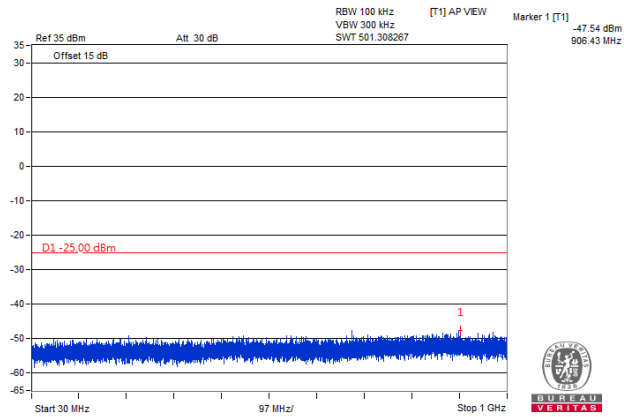
LTE Band 41

Channel Bandwidth: 10 MHz

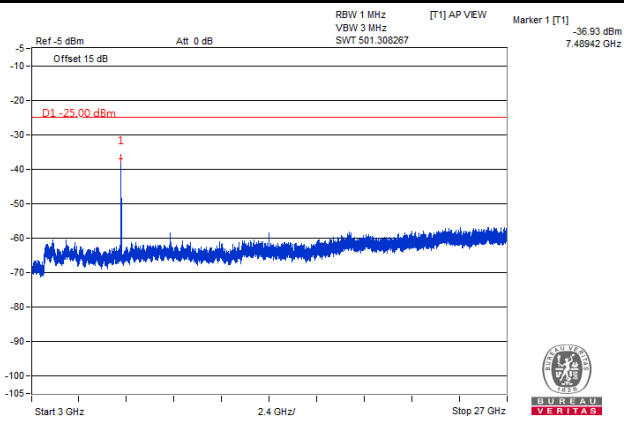
Channel 39700

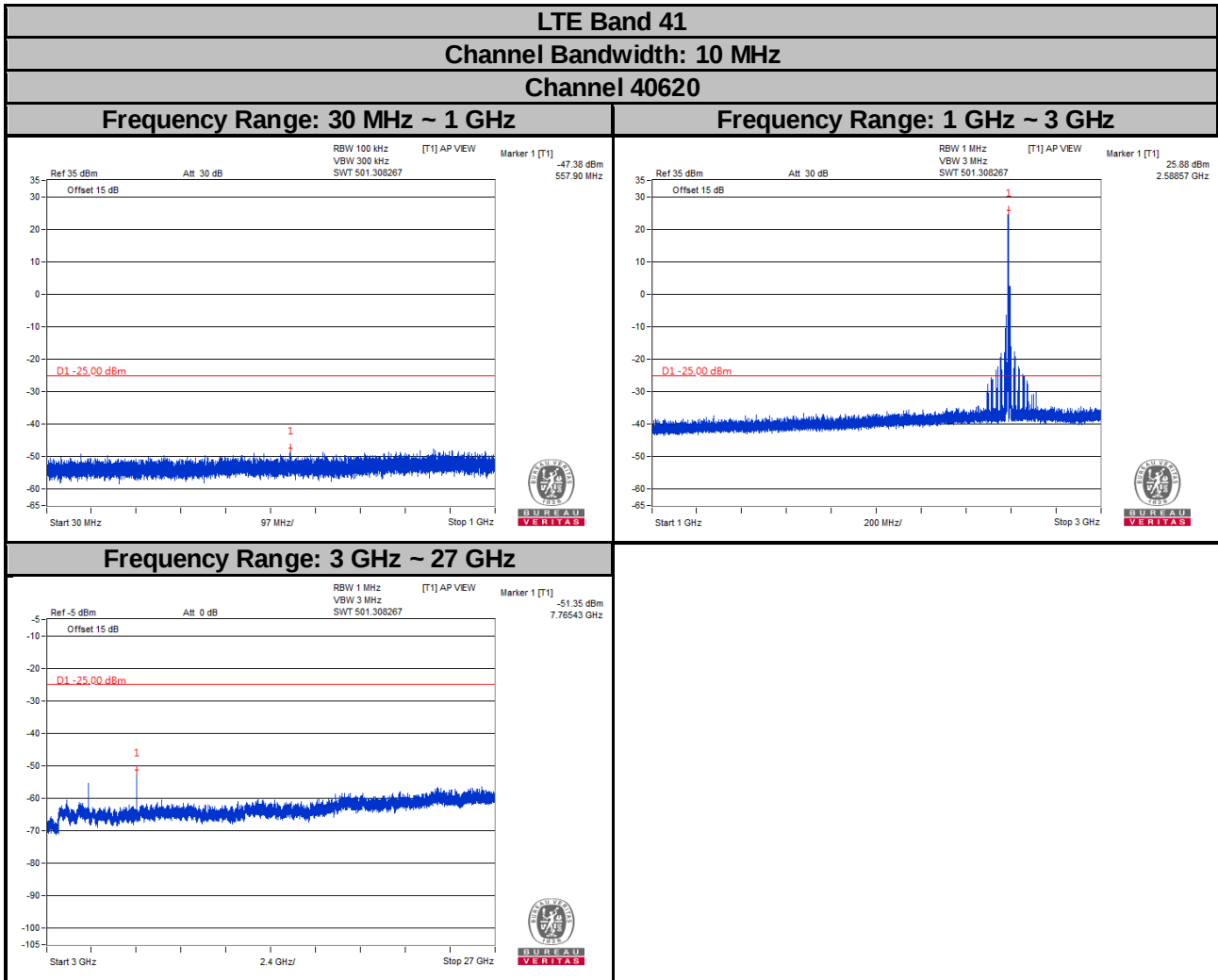
Frequency Range: 30 MHz ~ 1 GHz

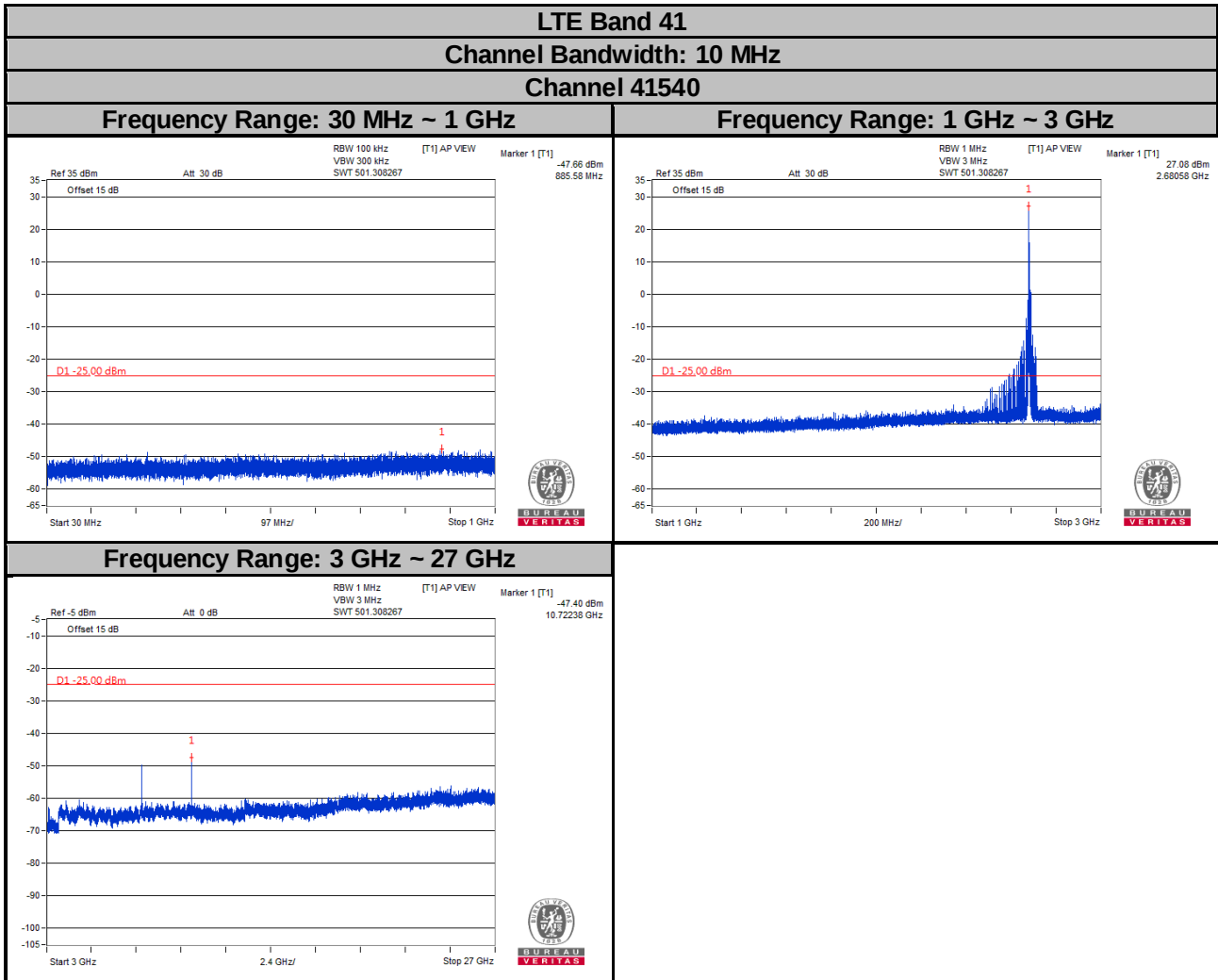
Frequency Range: 1 GHz ~ 3 GHz



Frequency Range: 3 GHz ~ 27 GHz





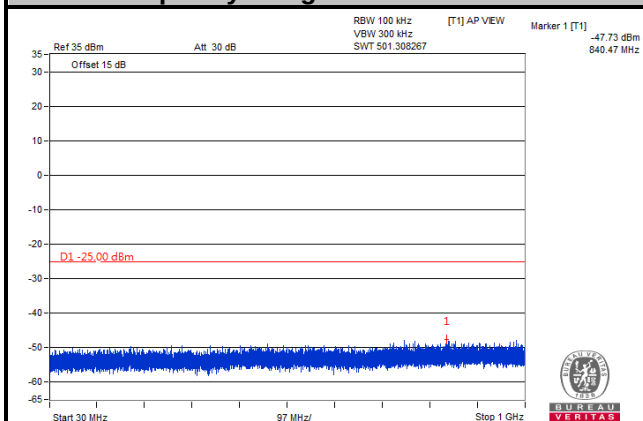


LTE Band 41

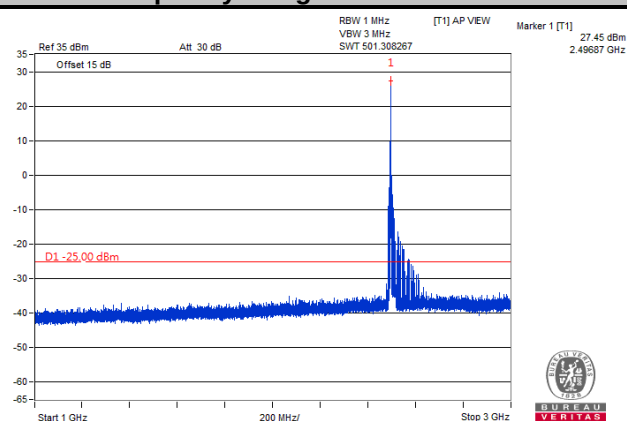
Channel Bandwidth: 15 MHz

Channel 39725

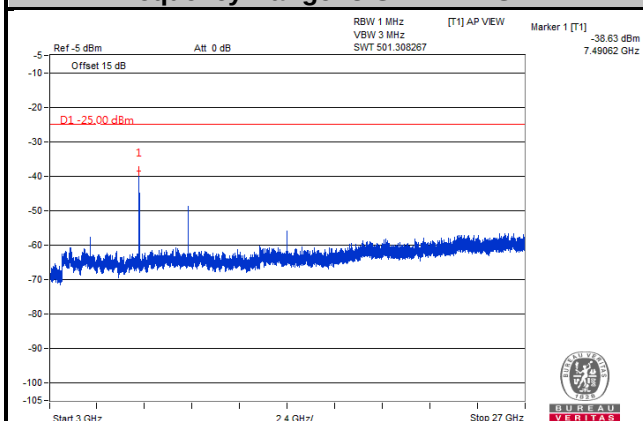
Frequency Range: 30 MHz ~ 1 GHz

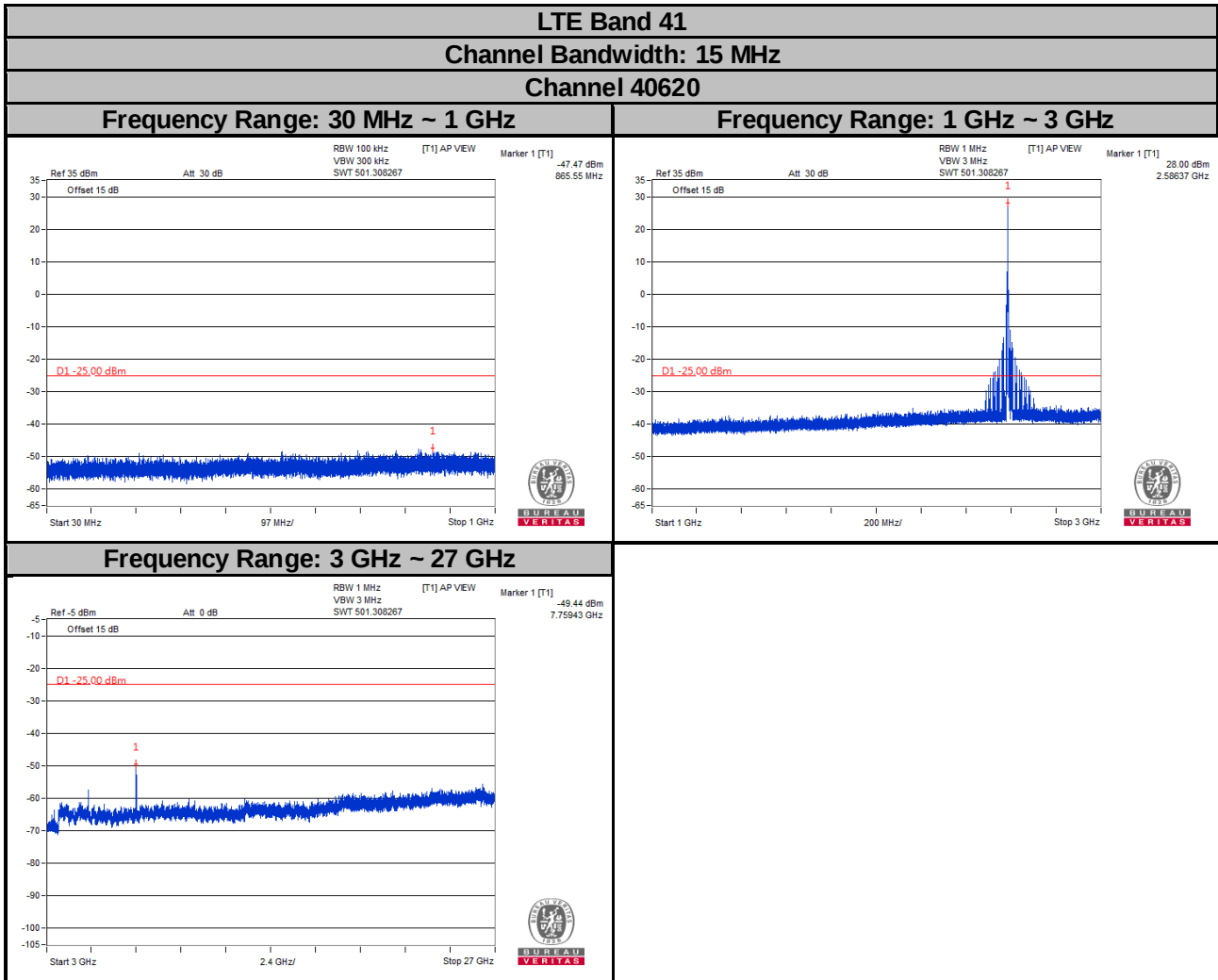


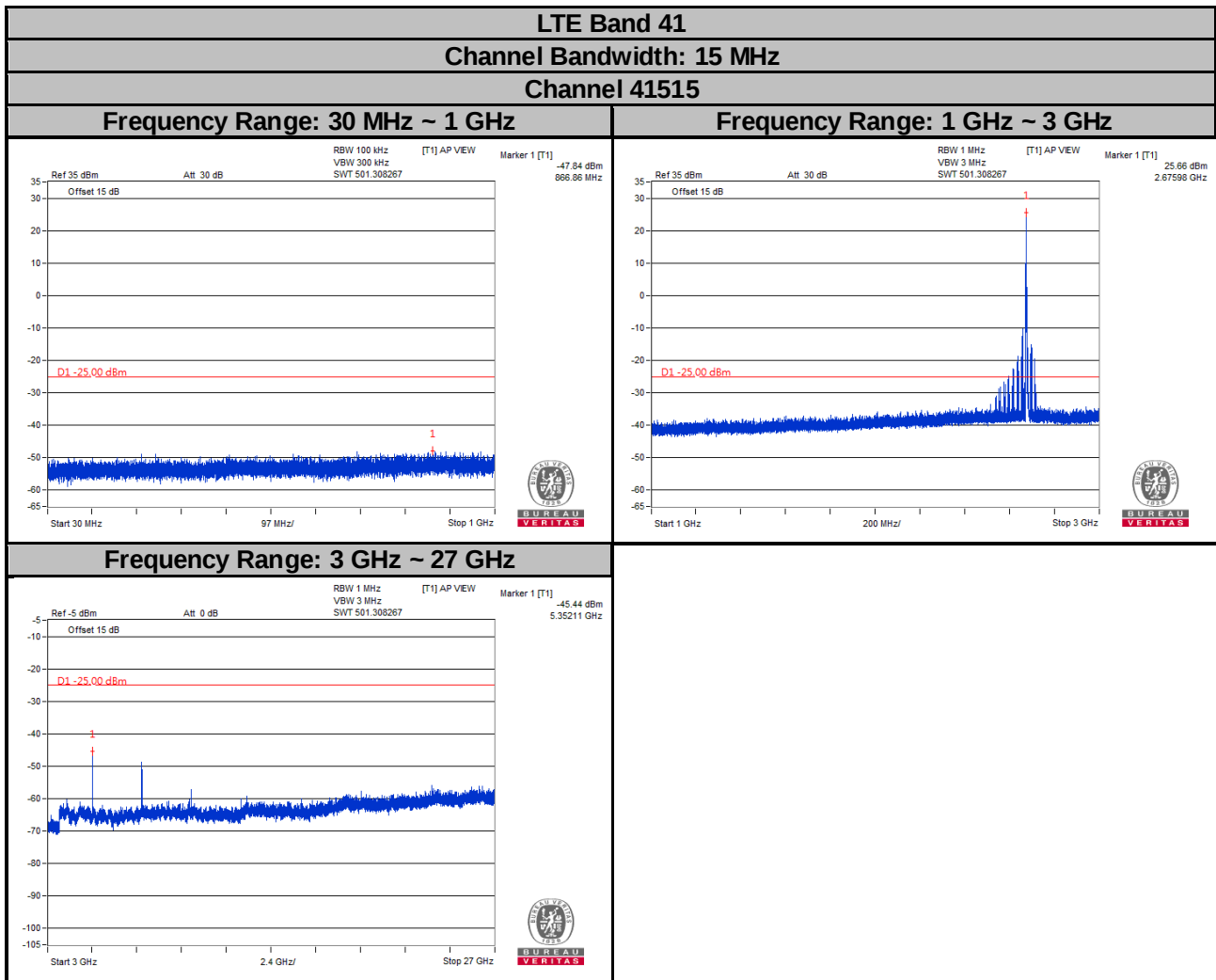
Frequency Range: 1 GHz ~ 3 GHz



Frequency Range: 3 GHz ~ 27 GHz





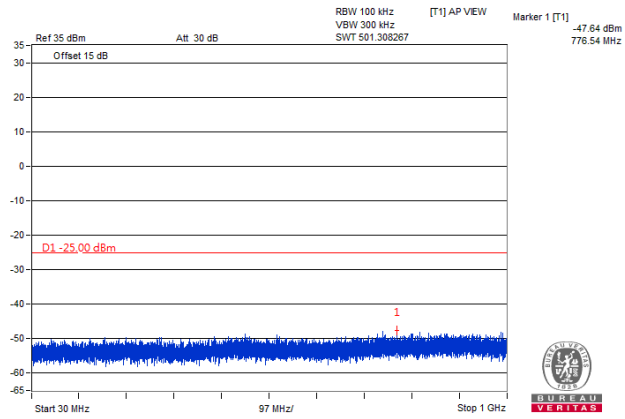


LTE Band 41

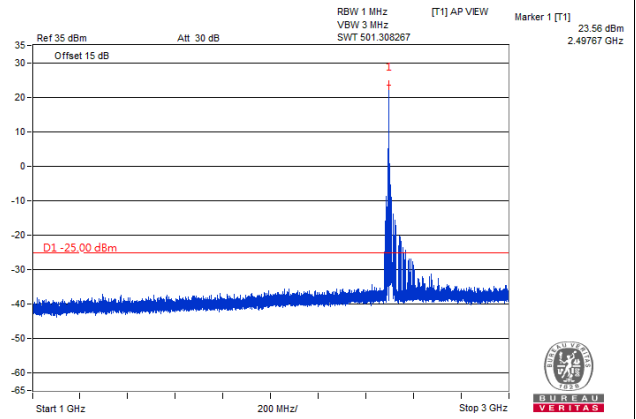
Channel Bandwidth: 20 MHz

Channel 39750

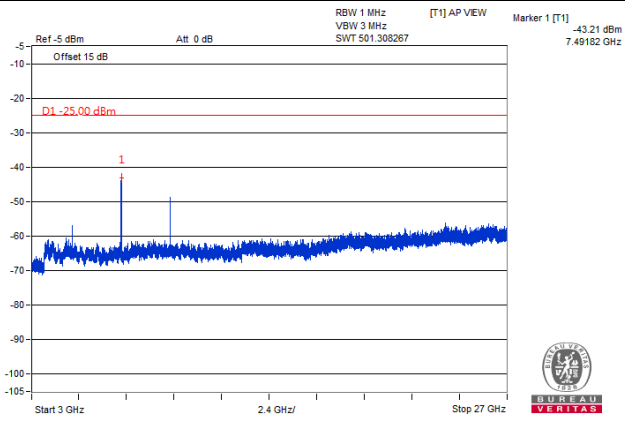
Frequency Range: 30 MHz ~ 1 GHz

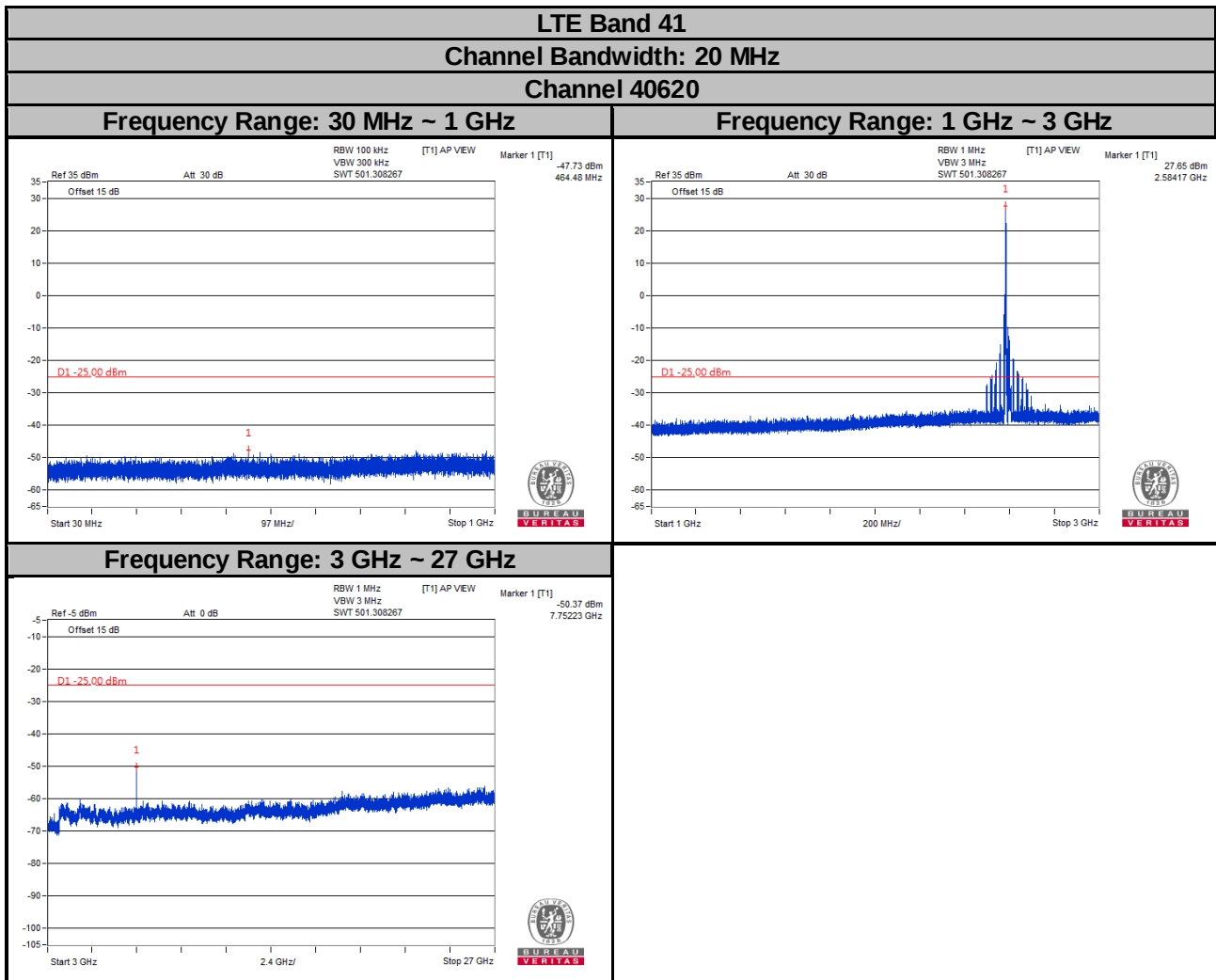


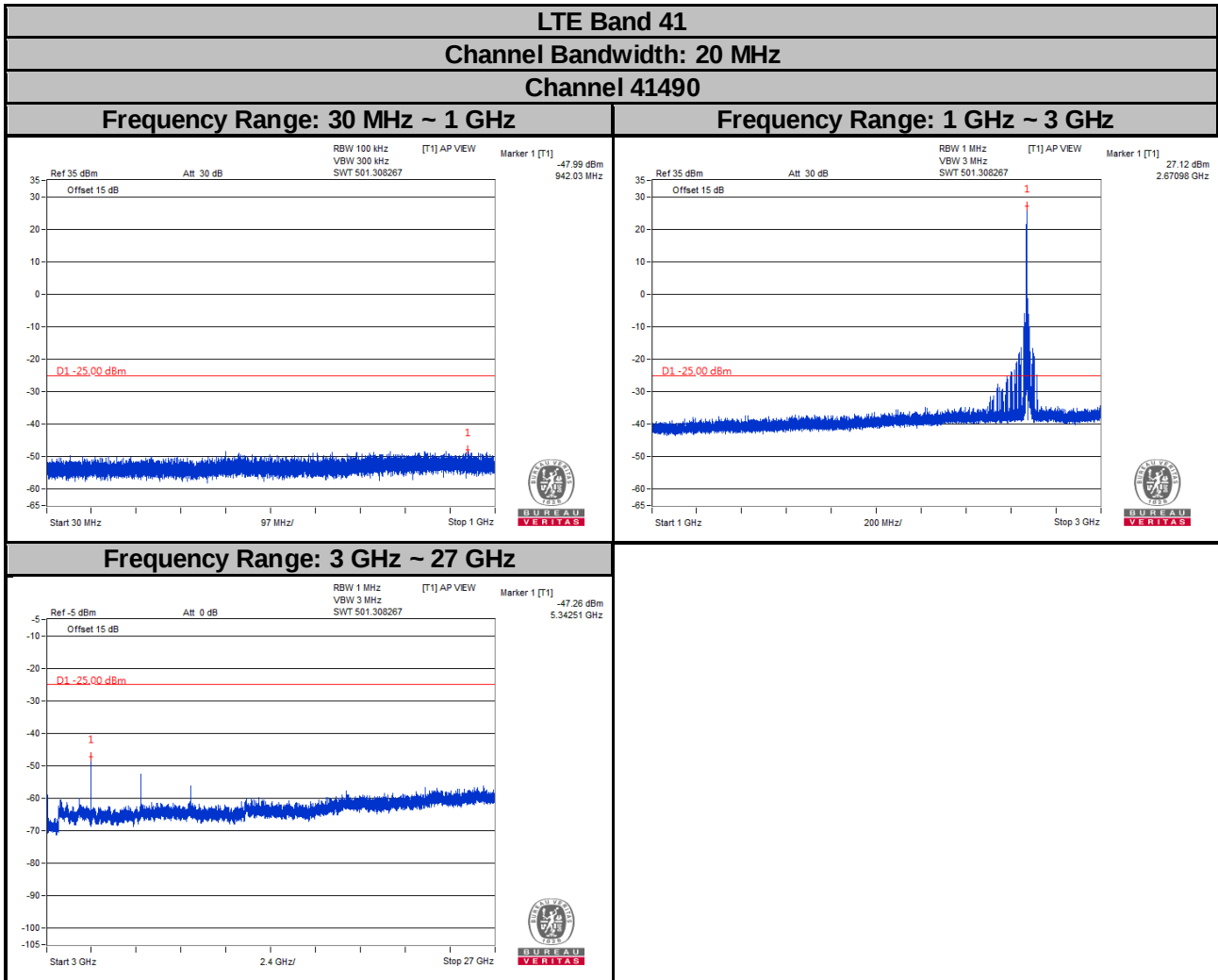
Frequency Range: 1 GHz ~ 3 GHz



Frequency Range: 3 GHz ~ 27 GHz







4.7 Radiated Emission Measurement

4.7.1 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.

4.7.2 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, $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15 \text{ dBi}.$

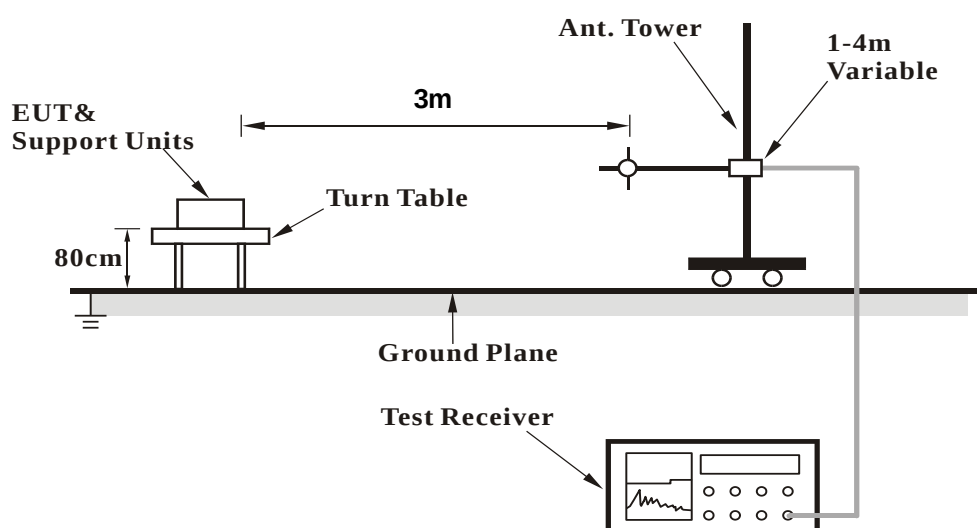
NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.7.3 Deviation from Test Standard

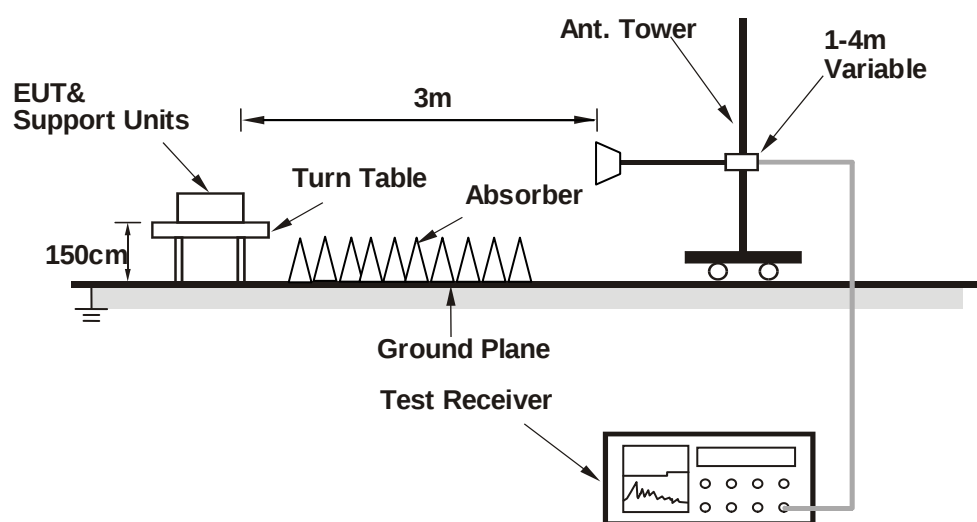
No deviation.

4.7.4 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).

4.7.5 Test Results

LTE Band 7

Channel Bandwidth: 5 MHz / QPSK

Low Channel

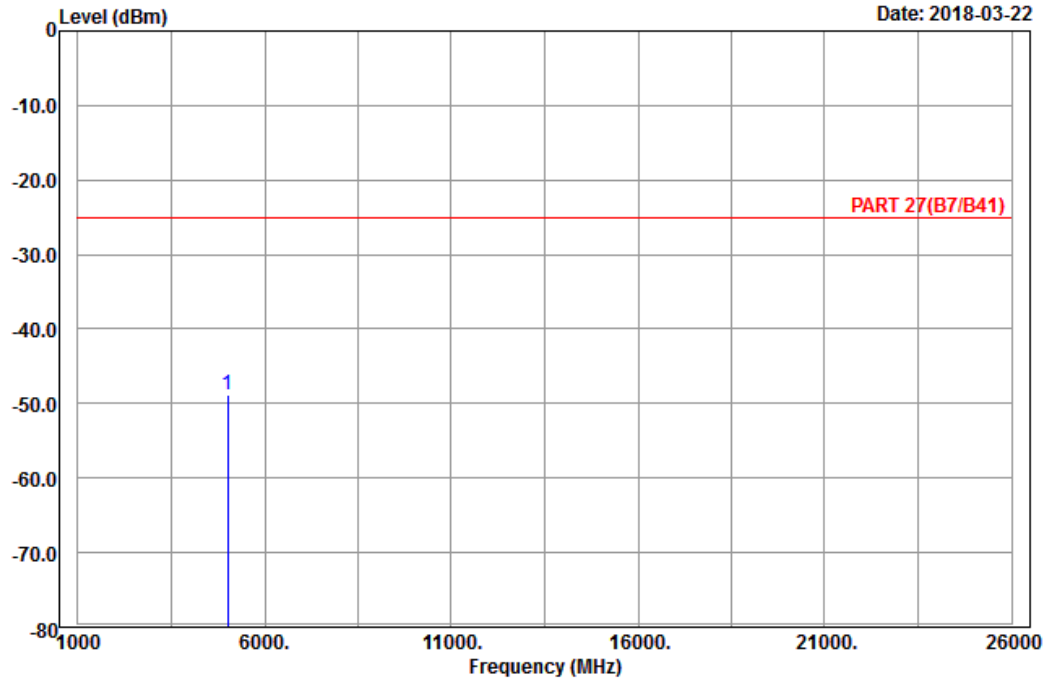


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A D T

Data: 9

Date: 2018-03-22



Site : 966 chamber 1

Condition: PART 27(B7/B41) Horizontal

Remark : LTE_Band 7_Link_CH20775

Tested by: Charles Hsiao

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5005.00	-48.82	-68.40	-25.00	-23.82	19.58	Peak

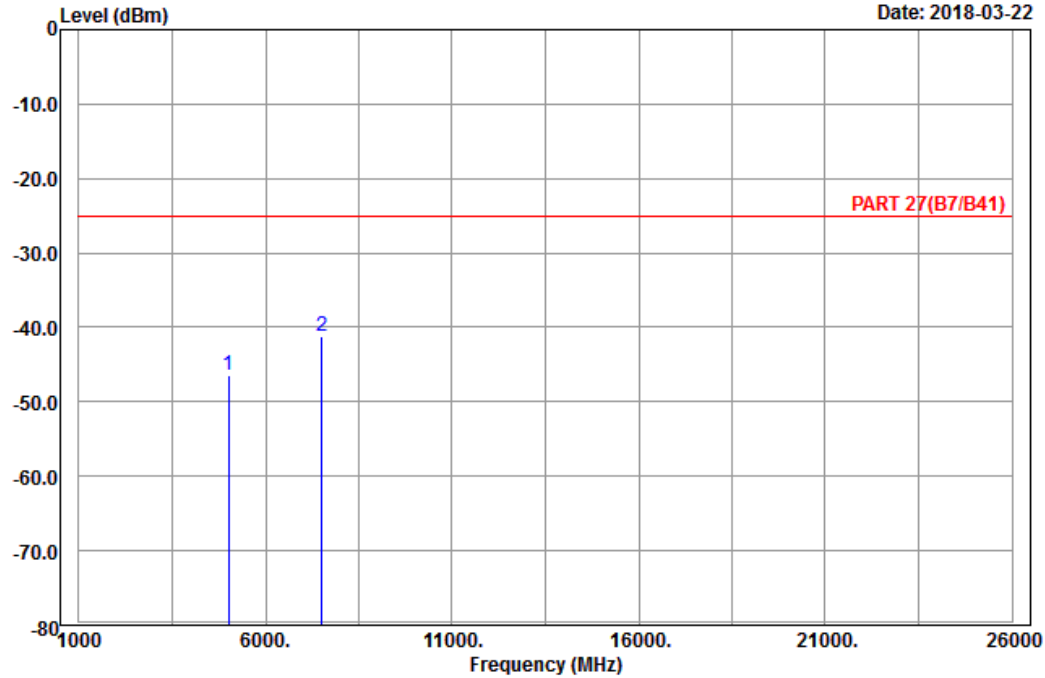


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A D T

Data: 10

Date: 2018-03-22



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

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	5005.00	-46.45	-66.03	-25.00	-21.45	19.58	Peak
2 pp	7507.50	-41.09	-63.77	-25.00	-16.09	22.68	Peak

Middle Channel

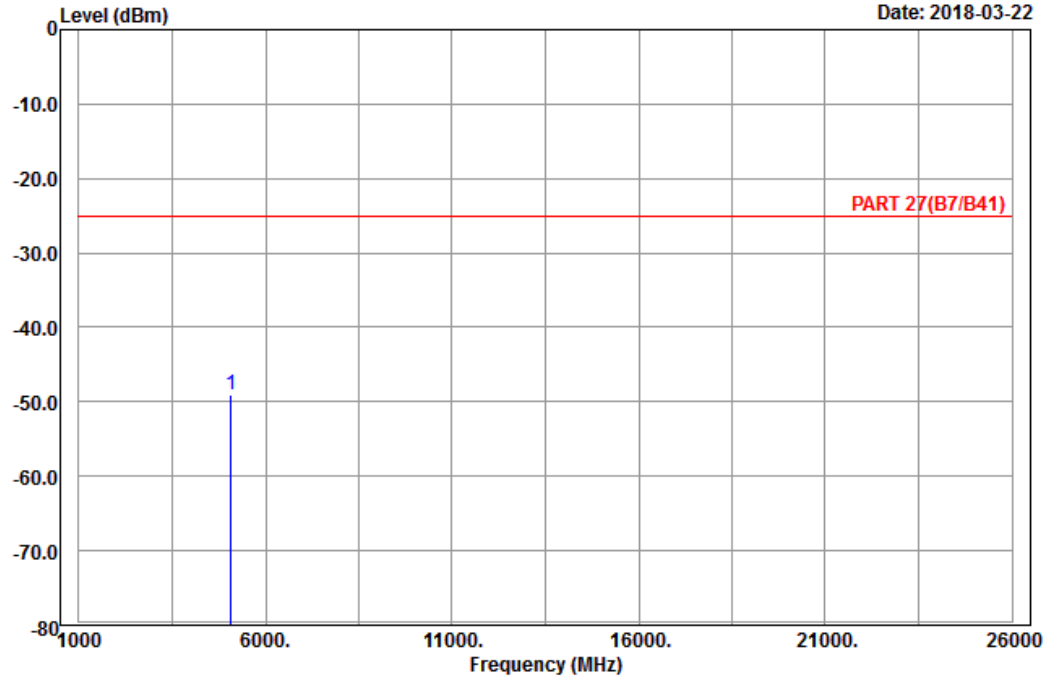


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Data: 9

Date: 2018-03-22



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

Freq	Level	Read	Limit	Over	Factor	Remark
		Level	Line	Limit		
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5070.00	-49.02	-68.41	-25.00	-24.02	19.39	Peak

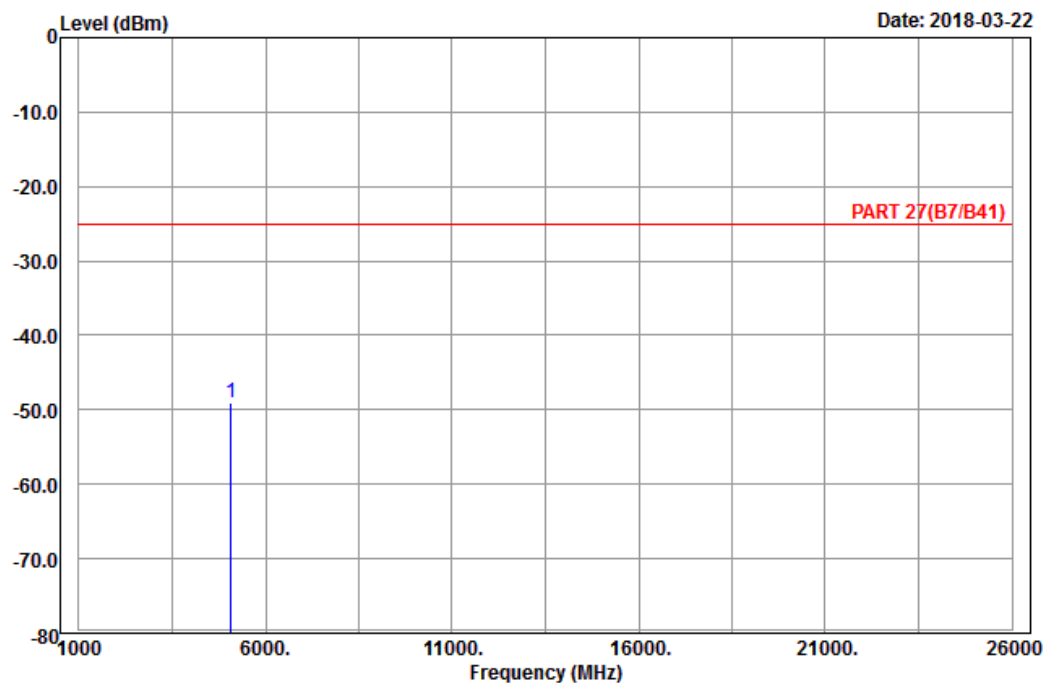


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A D T

Data: 10

Date: 2018-03-22



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

Freq	Level	Read	Limit	Over	Factor	Remark
		Level	Line	Limit		
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5070.00	-49.14	-68.53	-25.00	-24.14	19.39	Peak

High Channel

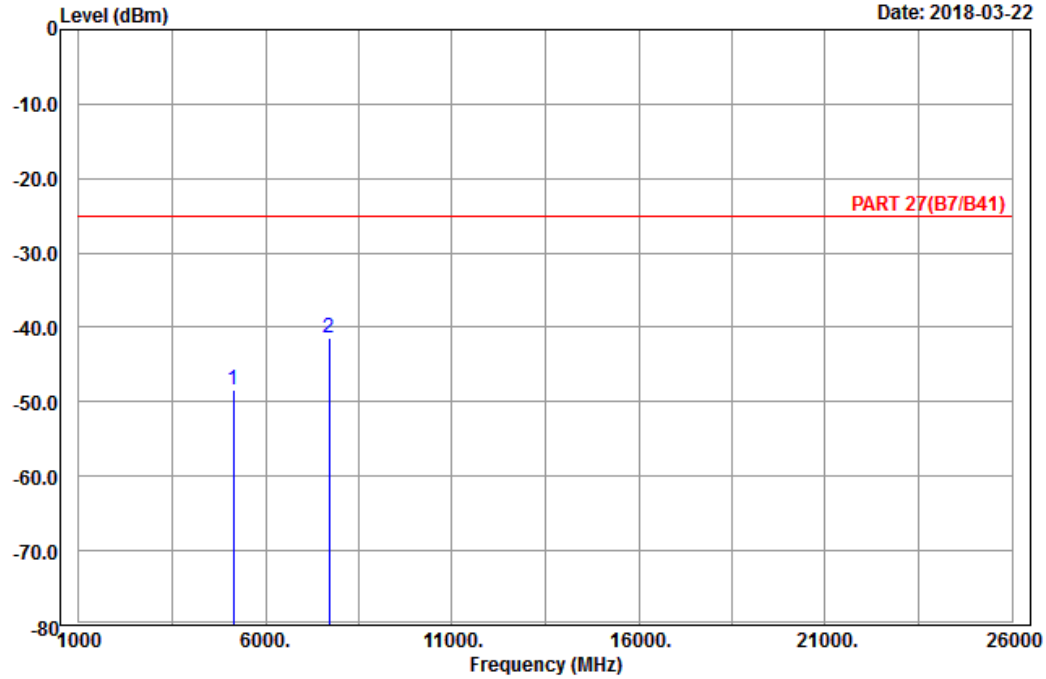


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A D T

Data: 9

Date: 2018-03-22



Site : 966 chamber 1

Condition: PART 27(B7/B41) Horizontal

Remark : LTE_Band 7_Link_CH21425

Tested by: Charles Hsiao

			Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark	
MHz	dBm	dBm	dBm	dB	dB		
1	5135.00	-48.36	-68.17	-25.00	-23.36	19.81	Peak
2	pp 7702.50	-41.39	-64.55	-25.00	-16.39	23.16	Peak

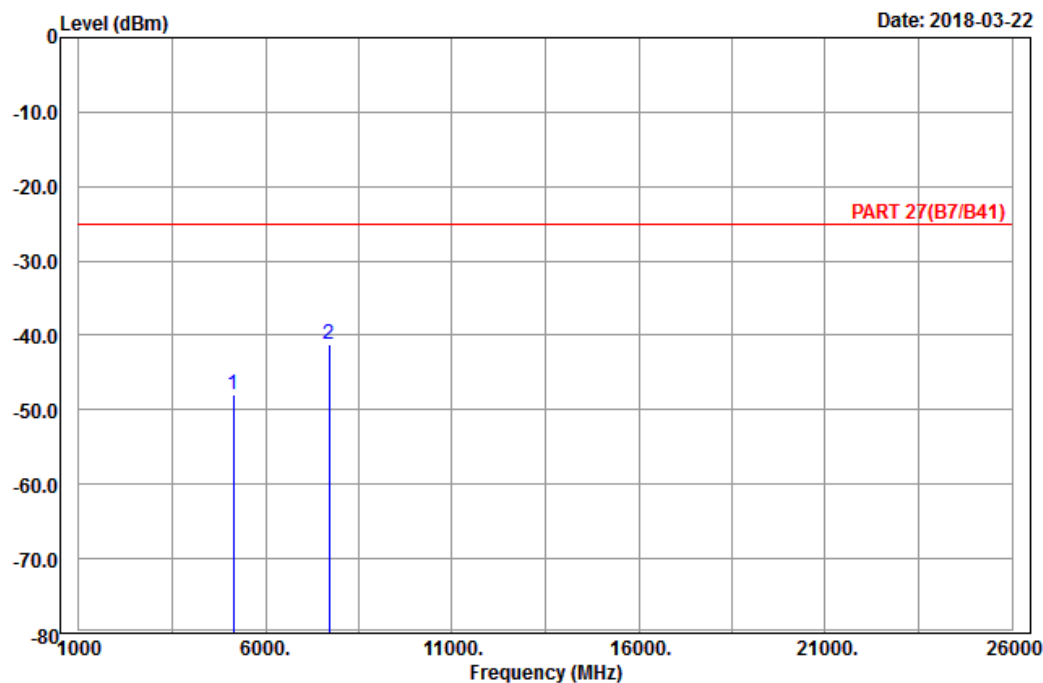


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A D T

Data: 10

Date: 2018-03-22



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

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	5135.00	-47.99	-67.80	-25.00	-22.99	19.81	Peak
2 pp	7702.50	-41.22	-64.38	-25.00	-16.22	23.16	Peak

Channel Bandwidth: 20 MHz / QPSK
Low Channel

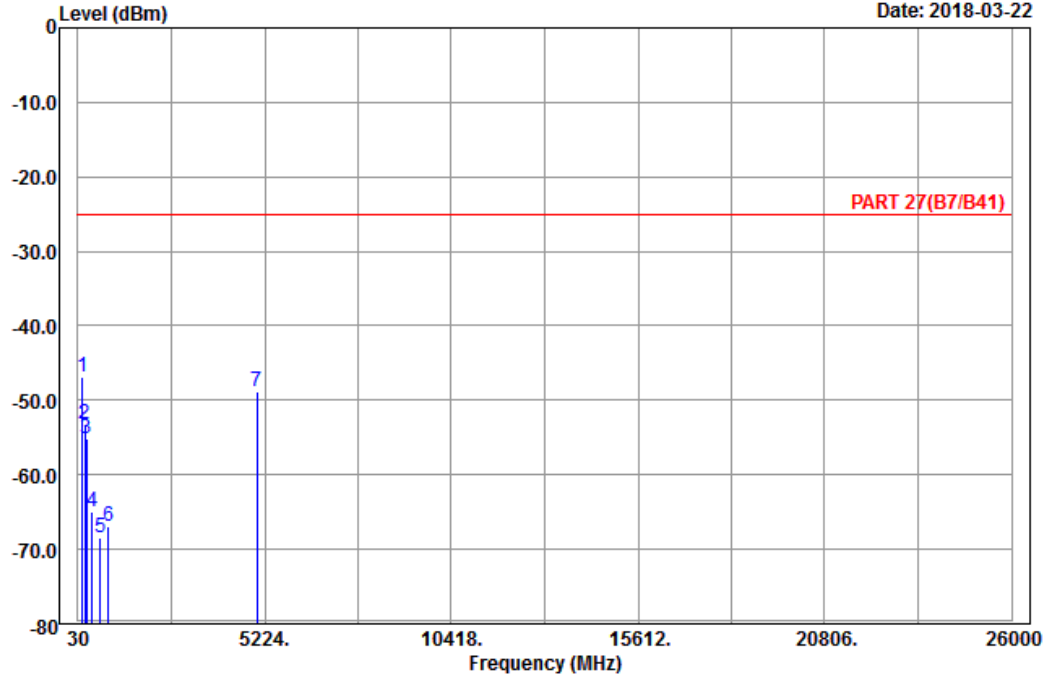


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A D T

Data: 13

Date: 2018-03-22



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

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	pp	157.44	-46.92	-39.17	-25.00	-21.92	-7.75 Peak
2		211.98	-53.24	-47.23	-25.00	-28.24	-6.01 Peak
3		274.62	-55.12	-49.39	-25.00	-30.12	-5.73 Peak
4		432.30	-64.99	-61.53	-25.00	-39.99	-3.46 Peak
5		650.70	-68.48	-68.34	-25.00	-43.48	-0.14 Peak
6		883.80	-66.87	-69.29	-25.00	-41.87	2.42 Peak
7		5020.00	-48.74	-67.82	-25.00	-23.74	19.08 Peak

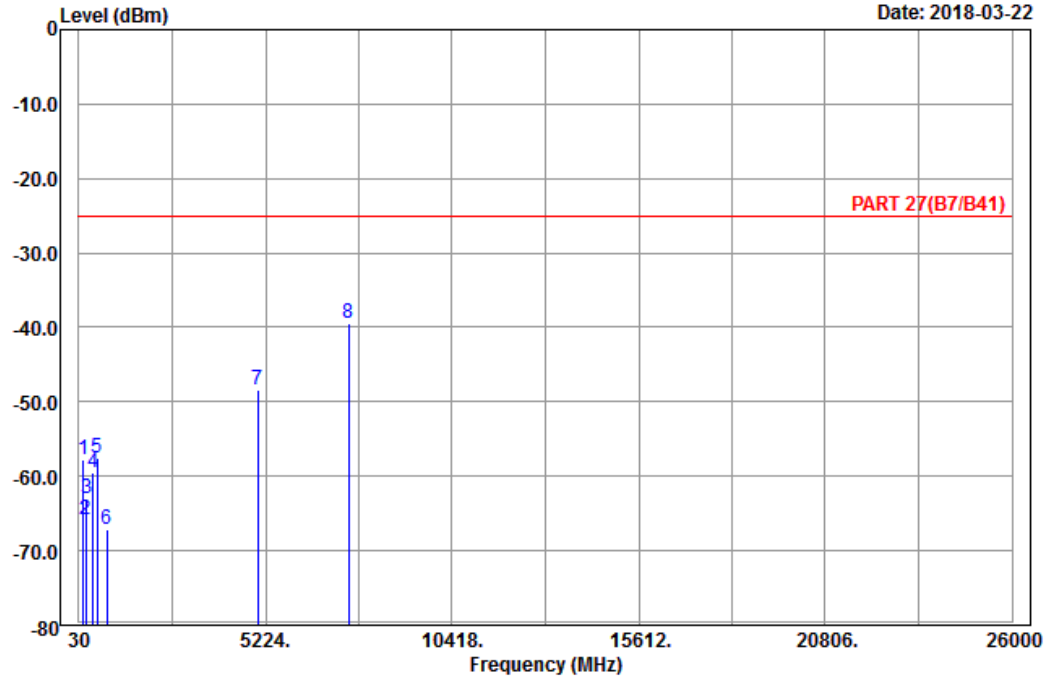


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Data: 14

Date: 2018-03-22



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

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	152.04	-57.73	-49.84	-25.00	-32.73	-7.89	Peak
2	216.84	-65.73	-59.78	-25.00	-40.73	-5.95	Peak
3	251.94	-62.92	-57.40	-25.00	-37.92	-5.52	Peak
4	430.90	-59.55	-56.13	-25.00	-34.55	-3.42	Peak
5	532.40	-57.54	-54.60	-25.00	-32.54	-2.94	Peak
6	807.50	-67.14	-69.06	-25.00	-42.14	1.92	Peak
7	5020.00	-48.47	-67.55	-25.00	-23.47	19.08	Peak
8 pp	7530.00	-39.54	-62.39	-25.00	-14.54	22.85	Peak

Middle Channel

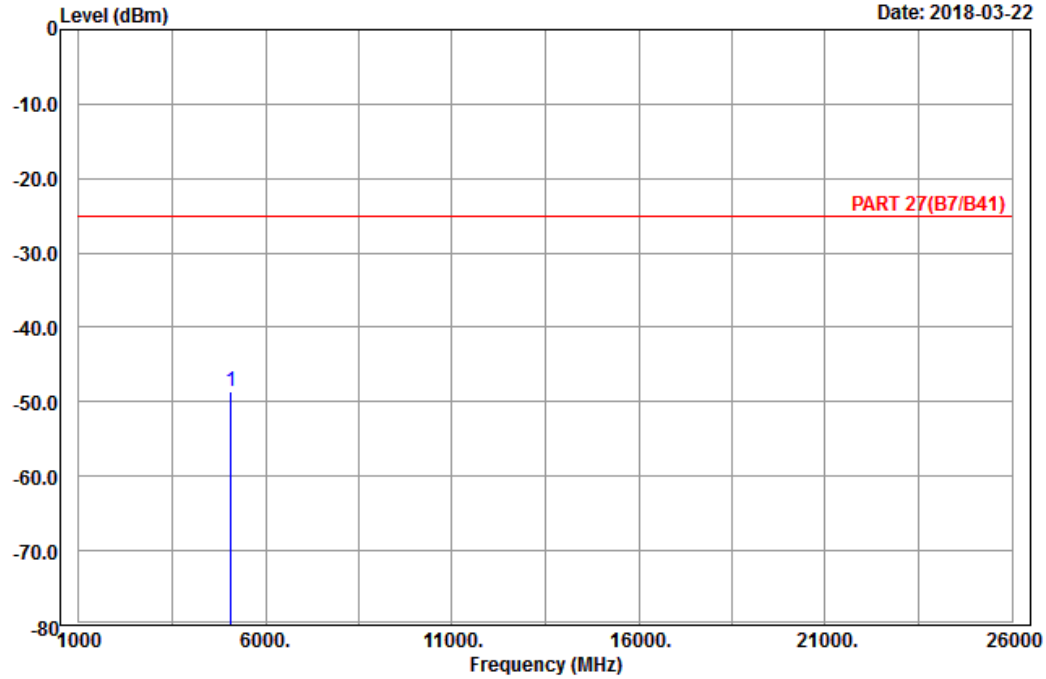


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A D T

Data: 9

Date: 2018-03-22



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

Freq	Level	Read	Limit	Over	Factor	Remark
		Level	Line	Limit		
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5070.00	-48.56	-67.95	-25.00	-23.56	19.39	Peak

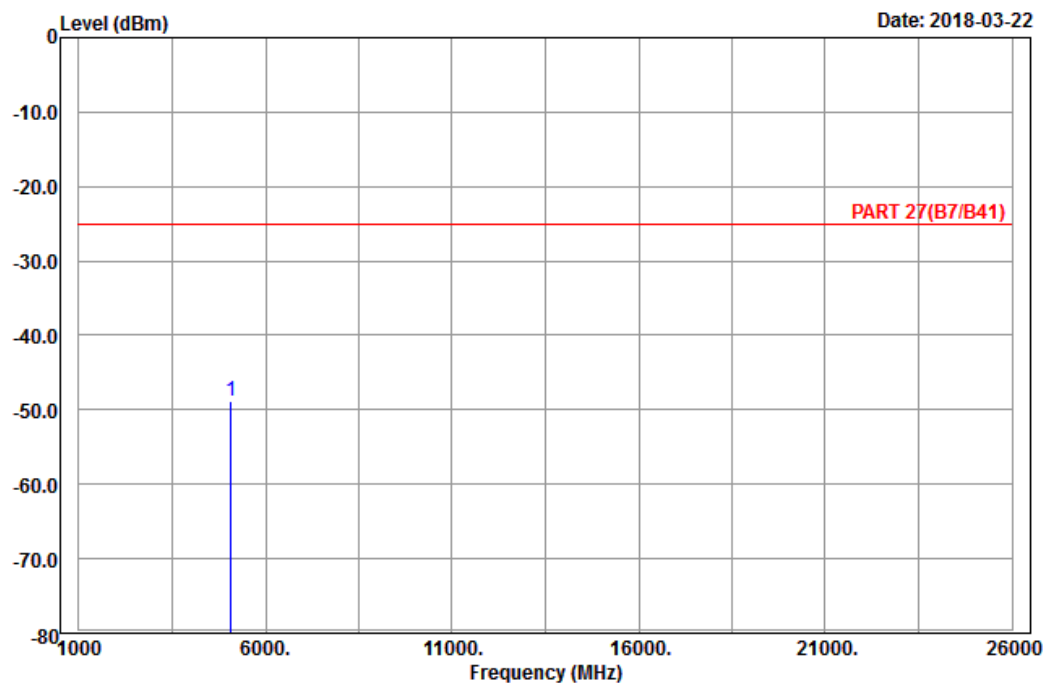


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2018-03-22



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

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 5070.00	-48.84	-68.23	-25.00	-23.84	19.39	Peak

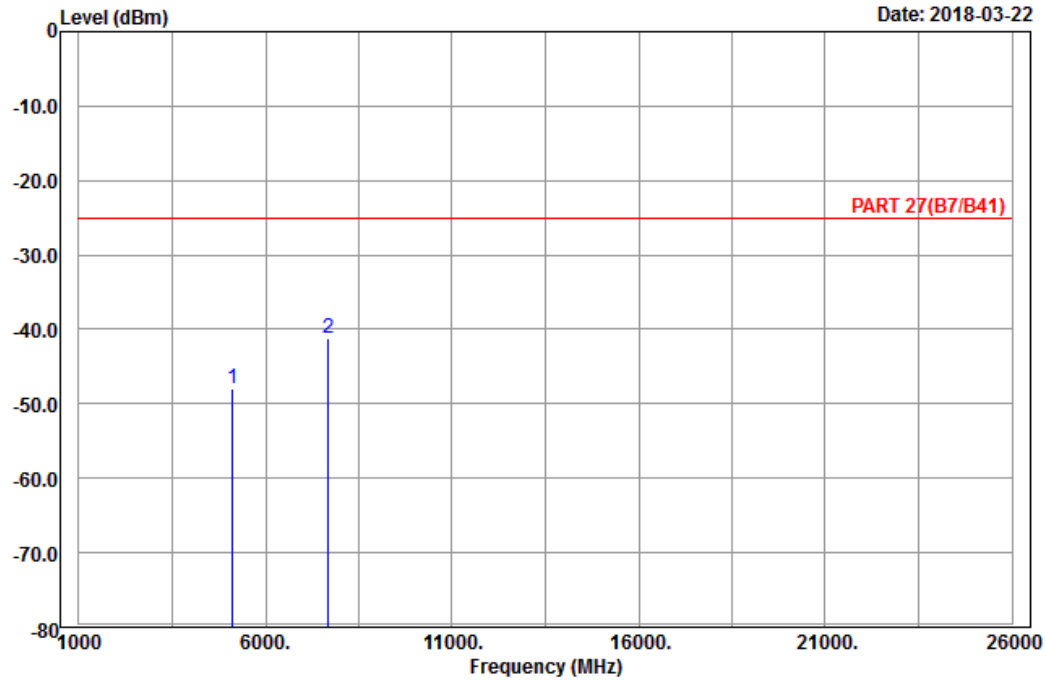
High Channel



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A D T

Data: 9



Site : 966 chamber 1

Condition: PART 27(B7/B41) Horizontal

Remark : LTE_Band 7_Link_CH21350

Tested by: Charles Hsiao

			Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark	
MHz	dBm	dBm	dBm	dB	dB		
1	5120.00	-48.02	-67.73	-25.00	-23.02	19.71	Peak
2	pp 7680.00	-41.28	-64.40	-25.00	-16.28	23.12	Peak

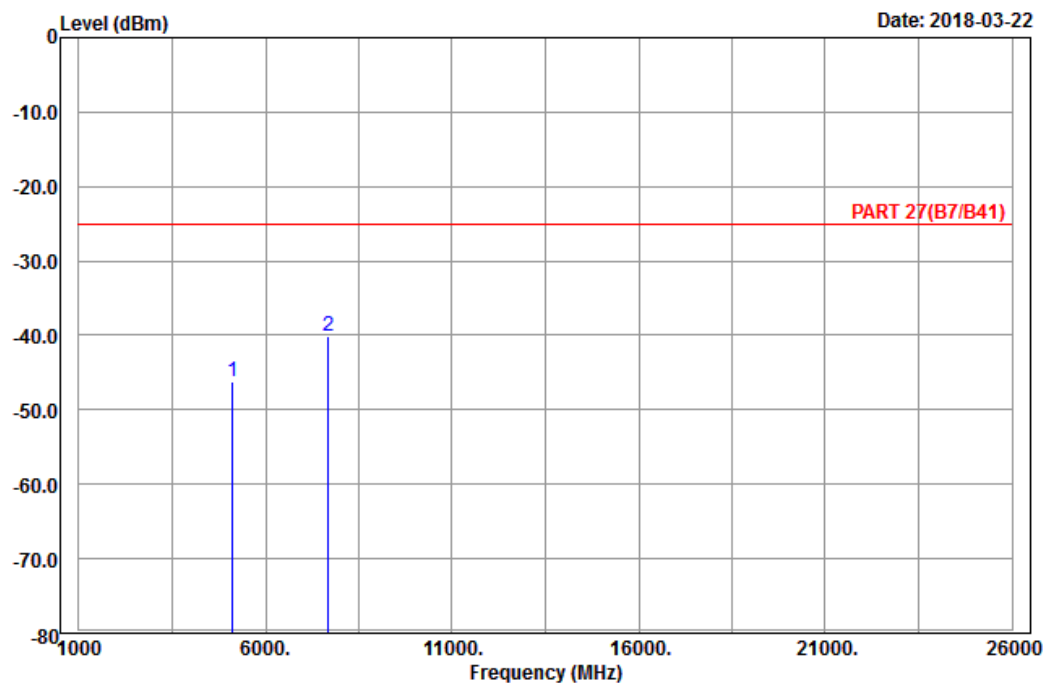


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A D T

Data: 10

Date: 2018-03-22



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

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	5120.00	-46.10	-65.81	-25.00	-21.10	19.71	Peak
2 pp	7680.00	-40.18	-63.30	-25.00	-15.18	23.12	Peak

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

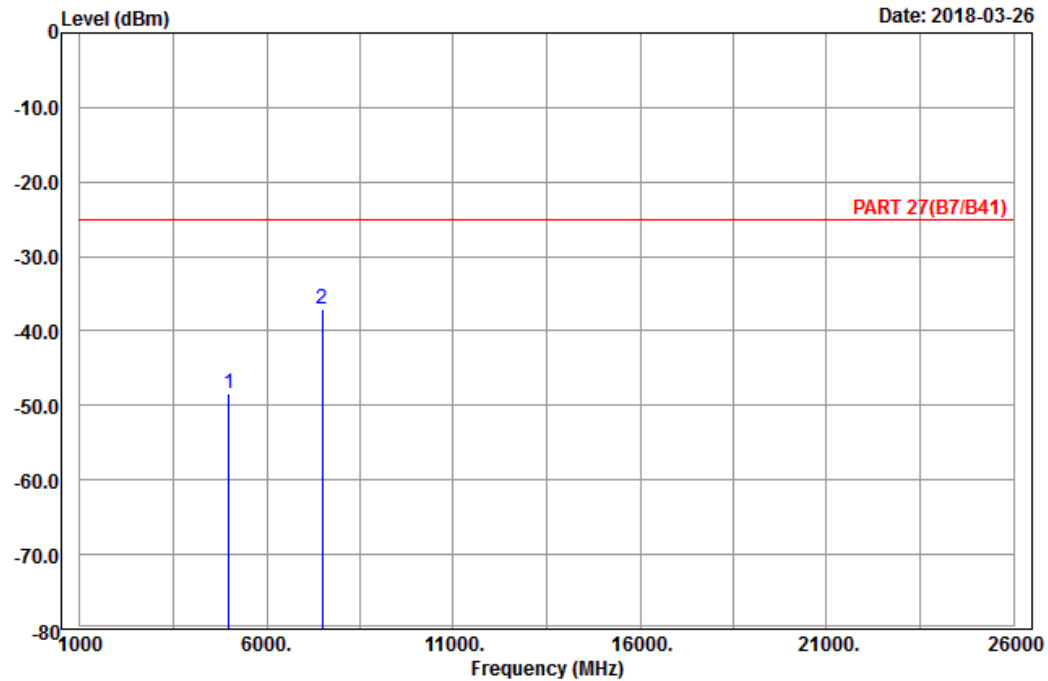


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A D T

Data: 9

Date: 2018-03-26



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	4997.00	-48.34	-67.92	-25.00	-23.34	19.58 Peak
2 pp	7495.50	-37.12	-59.32	-25.00	-12.12	22.20 Peak

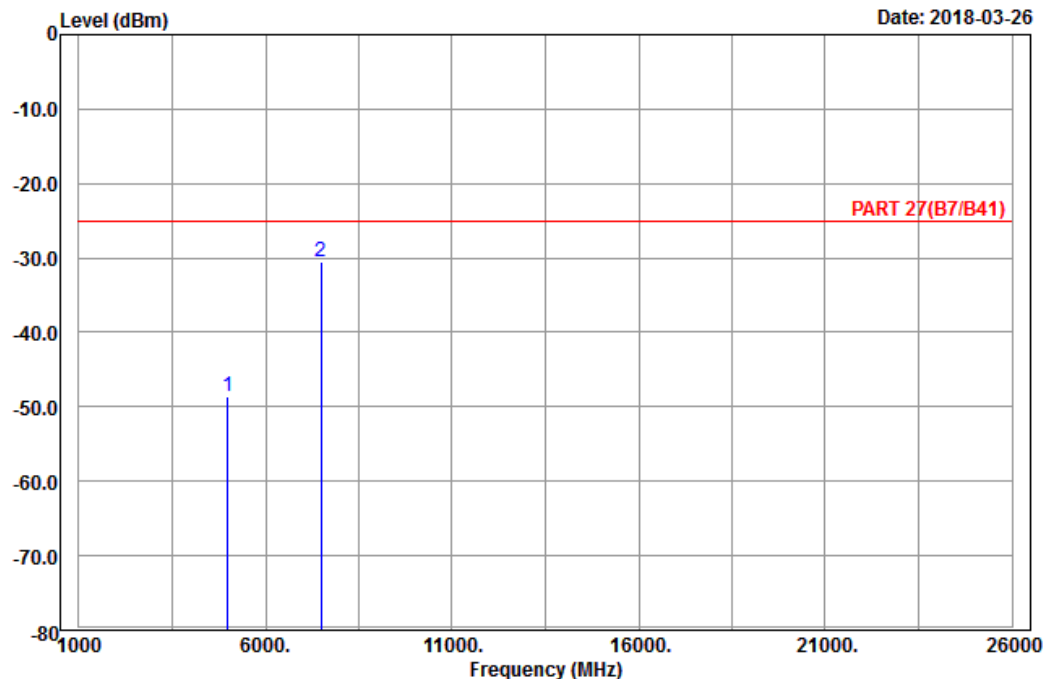


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2018-03-26



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	4997.00	-48.52	-68.10	-25.00	-23.52	19.58	Peak
2 pp	7495.50	-30.42	-52.62	-25.00	-5.42	22.20	Peak

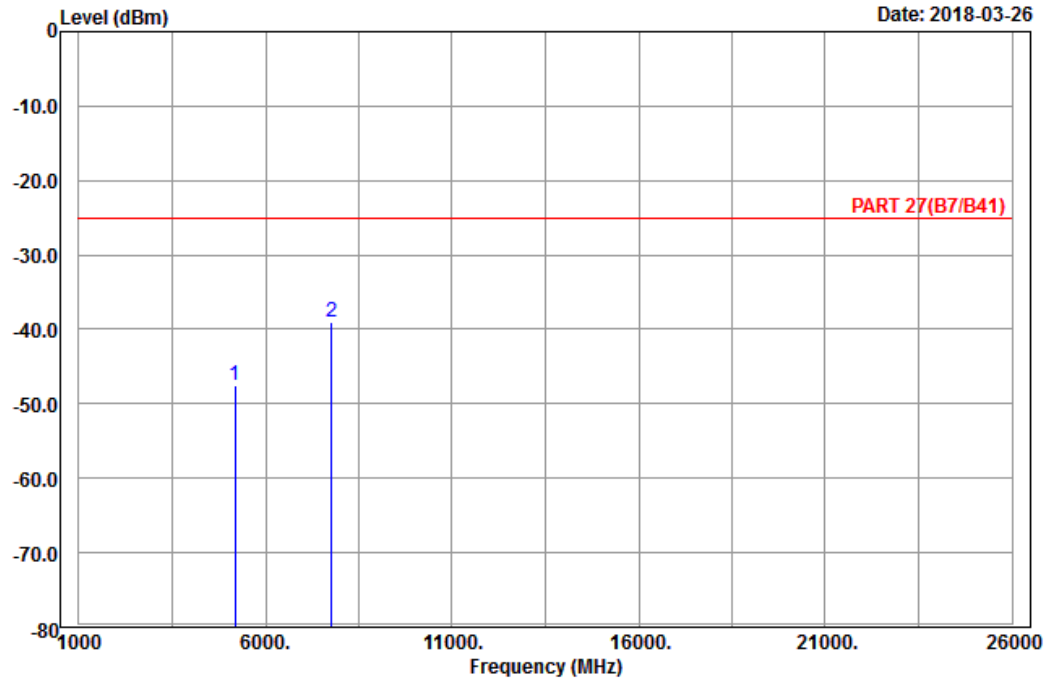
Middle Channel



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	5186.00	-47.57	-67.69	-25.00	-22.57	20.12	Peak
2	pp 7779.00	-39.00	-62.33	-25.00	-14.00	23.33	Peak

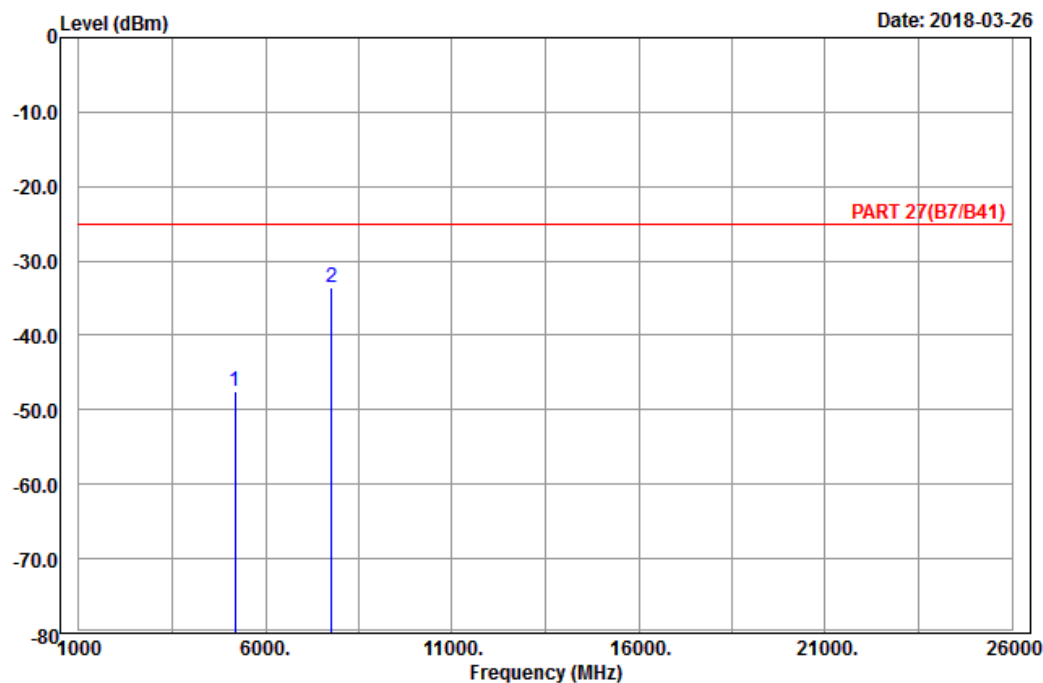


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2018-03-26



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	5186.00	-47.48	-67.60	-25.00	-22.48	20.12	Peak
2 pp	7779.00	-33.62	-56.95	-25.00	-8.62	23.33	Peak

High Channel

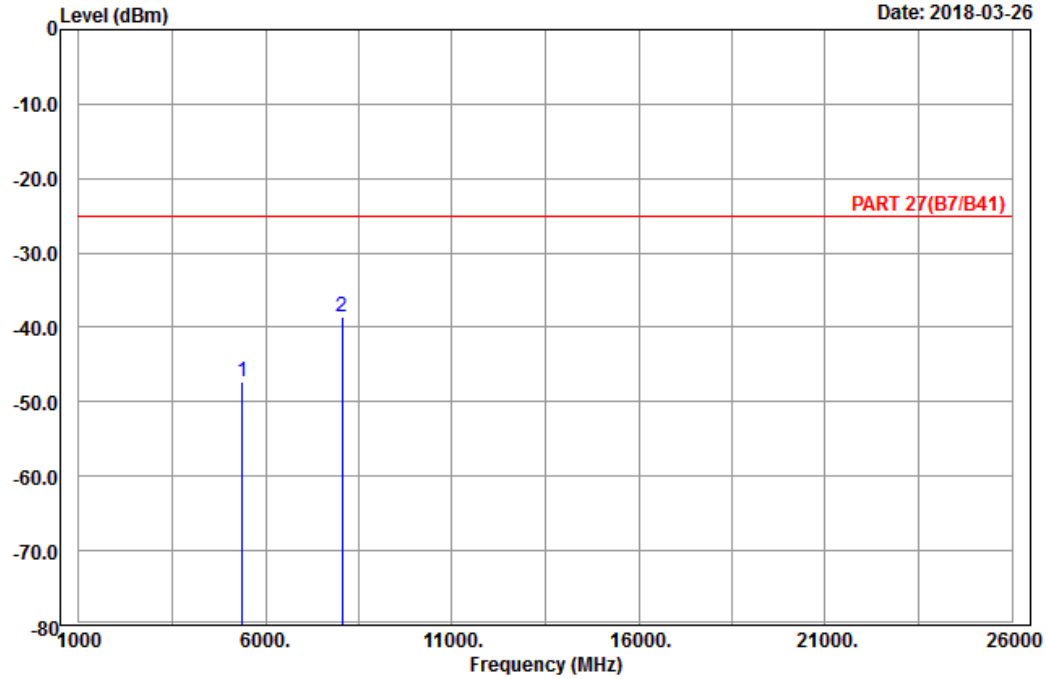


Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

A D T

Data: 9

Date: 2018-03-26



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	5375.00	-47.26	-67.58	-25.00	-22.26	20.32	Peak
2	pp 8062.50	-38.69	-62.46	-25.00	-13.69	23.77	Peak

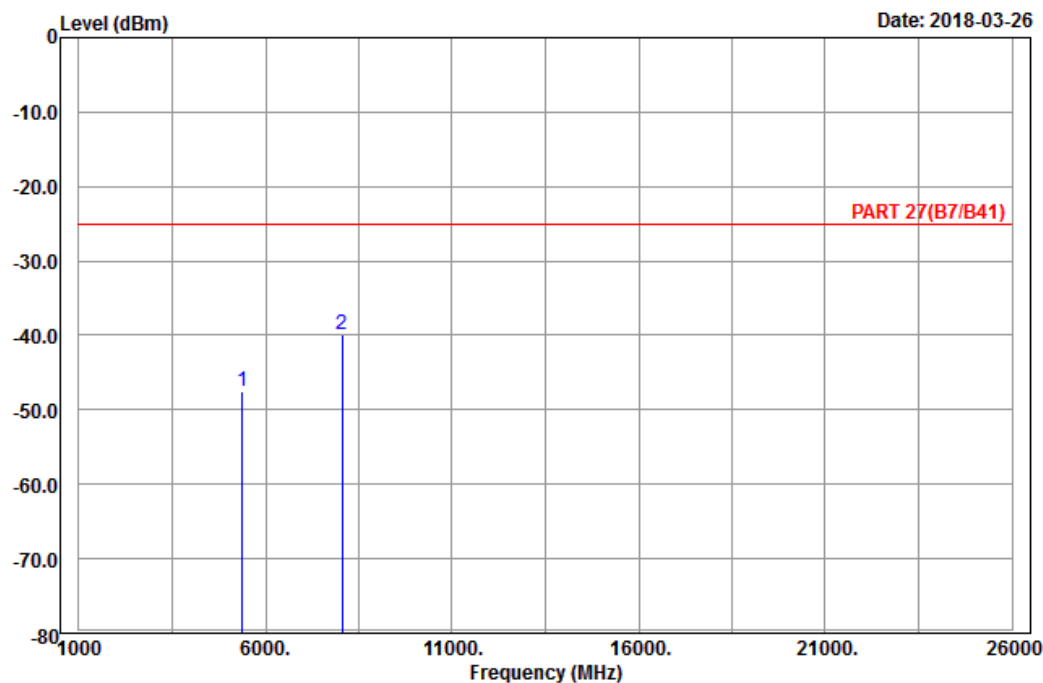


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2018-03-26



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	5375.00	-47.56	-67.88	-25.00	-22.56	20.32	Peak
2 pp	8062.50	-39.86	-63.63	-25.00	-14.86	23.77	Peak

Channel Bandwidth: 20 MHz / QPSK
Low Channel

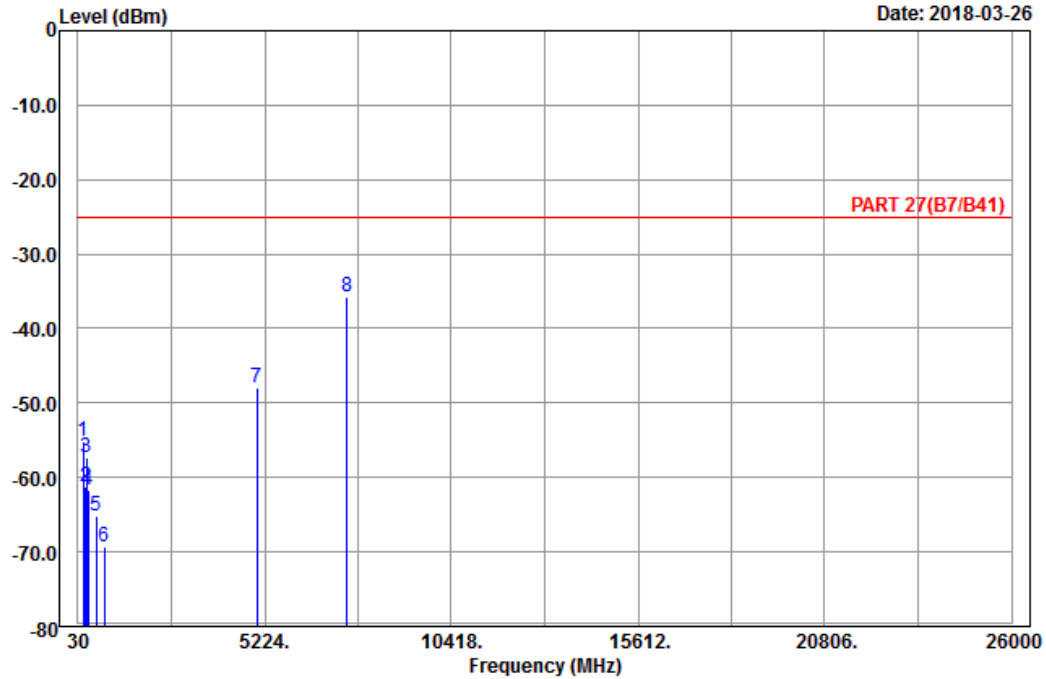


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 13

Date: 2018-03-26



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	179.04	-55.15	-49.47	-25.00	-30.15	-5.68	Peak
2	240.33	-61.30	-55.66	-25.00	-36.30	-5.64	Peak
3	277.86	-57.38	-51.62	-25.00	-32.38	-5.76	Peak
4	312.60	-61.76	-55.95	-25.00	-36.76	-5.81	Peak
5	532.40	-65.20	-62.26	-25.00	-40.20	-2.94	Peak
6	768.30	-69.25	-69.15	-25.00	-44.25	-0.10	Peak
7	5012.00	-47.91	-66.99	-25.00	-22.91	19.08	Peak
8 pp	7518.00	-35.71	-58.39	-25.00	-10.71	22.68	Peak

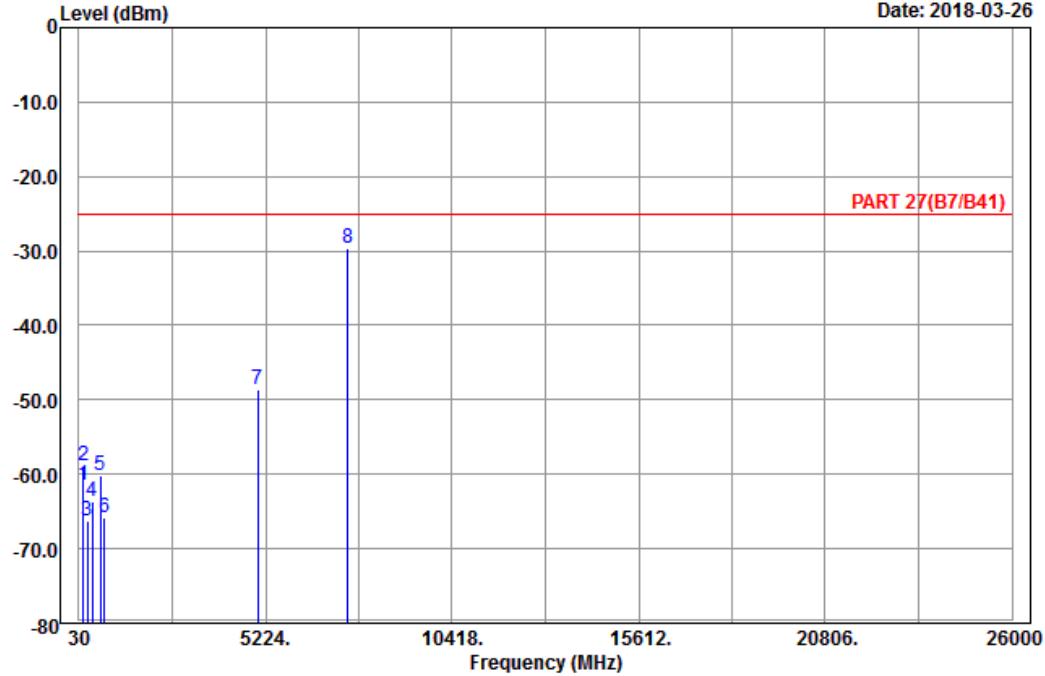


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 14

Date: 2018-03-26



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	144.75	-61.43	-53.62	-25.00	-36.43	-7.81	Peak
2	157.98	-58.94	-51.22	-25.00	-33.94	-7.72	Peak
3	273.00	-66.22	-60.50	-25.00	-41.22	-5.72	Peak
4	397.30	-63.58	-60.74	-25.00	-38.58	-2.84	Peak
5	630.40	-60.08	-60.17	-25.00	-35.08	0.09	Peak
6	732.60	-65.88	-64.90	-25.00	-40.88	-0.98	Peak
7	5012.00	-48.71	-67.79	-25.00	-23.71	19.08	Peak
8 pp	7518.00	-29.75	-52.43	-25.00	-4.75	22.68	Peak

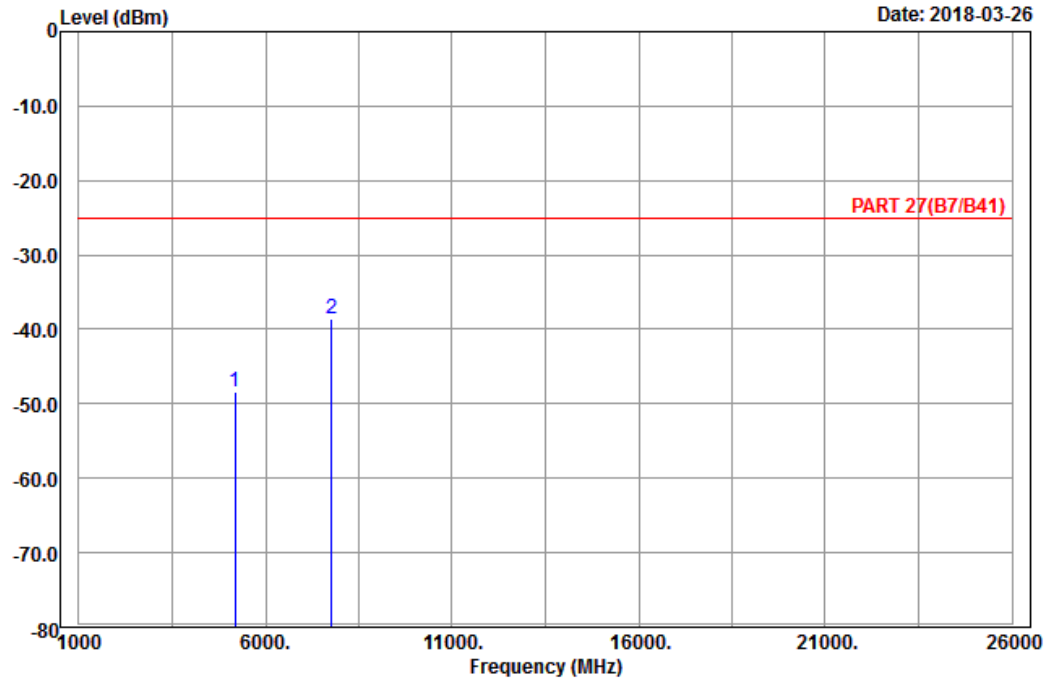
Middle Channel



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	5186.00	-48.44	-68.56	-25.00	-23.44	20.12	Peak
2 pp	7779.00	-38.51	-61.84	-25.00	-13.51	23.33	Peak

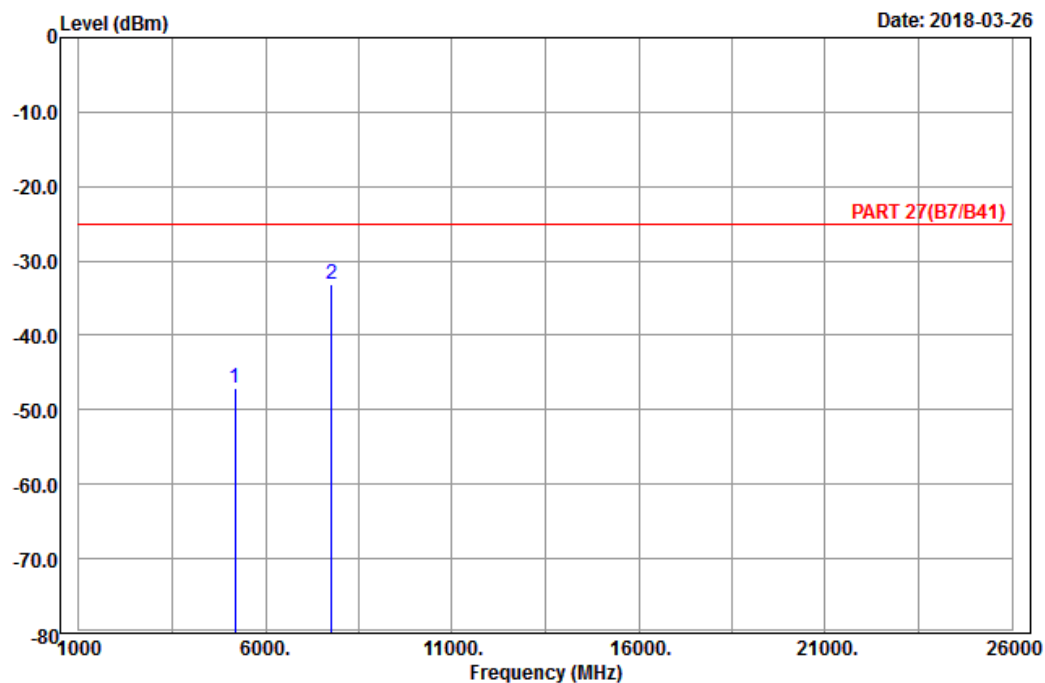


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2018-03-26



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	5186.00	-47.11	-67.23	-25.00	-22.11	20.12	Peak
2 pp	7779.00	-33.17	-56.50	-25.00	-8.17	23.33	Peak

High Channel

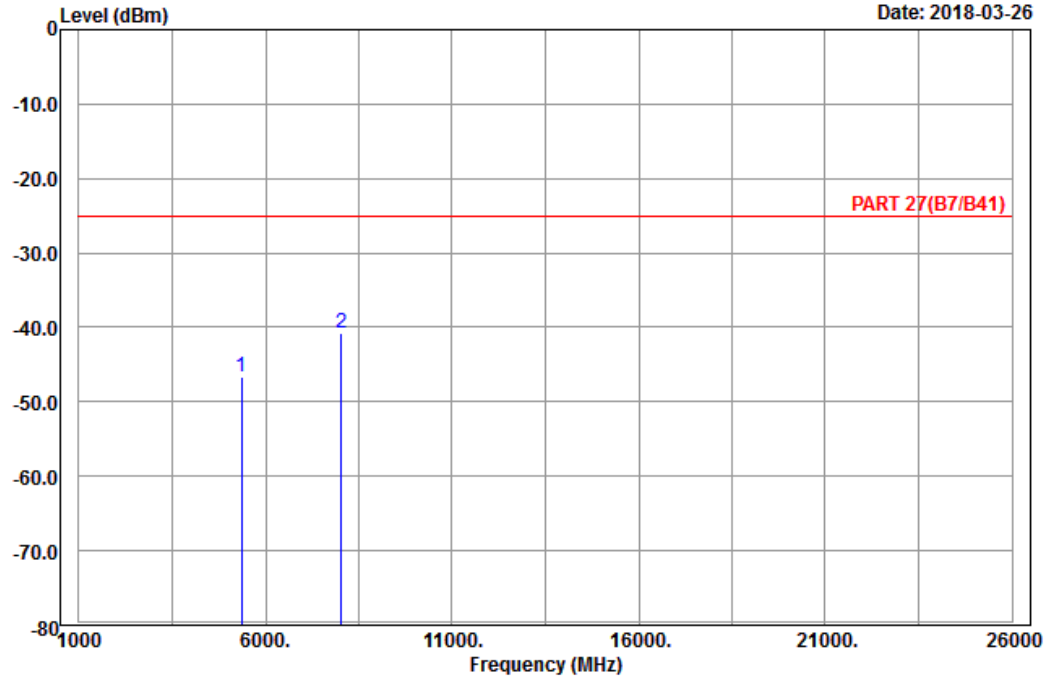


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2018-03-26



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	5360.00	-46.60	-66.90	-25.00	-21.60	20.30	Peak
2	8040.00	-40.87	-64.62	-25.00	-15.87	23.75	Peak

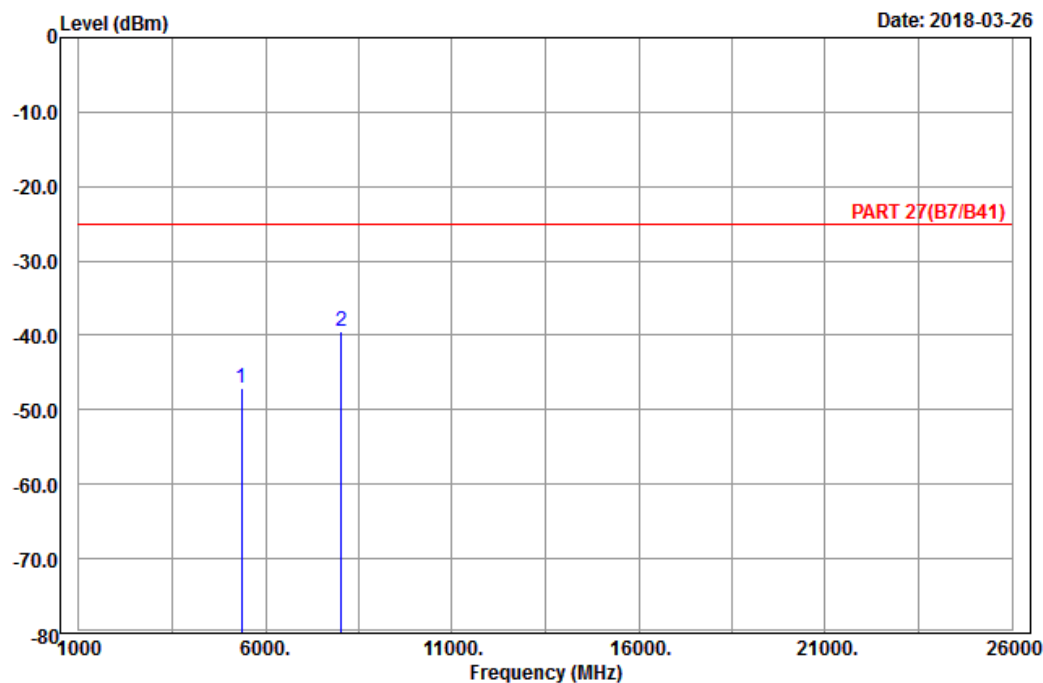


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2018-03-26



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	5360.00	-47.05	-67.35	-25.00	-22.05	20.30	Peak
2 pp	8040.00	-39.54	-63.29	-25.00	-14.54	23.75	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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Tel: 886-3-3183232

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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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