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Report No.: SZEMO11030139601

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FCC REPORT

Application No. : SZEMO110301396RF

**Applicant/
Manufacturer/Factory:** VSO TECHNOLOGY (DONG GUAN) CO., LTD.

Product Name: KEYBOARD

Model No.: JK-760G24,00053818,3FMNB2020WBK-R, JK-761,JK-762,JK-763,
JK-681,JK-682M ♣

♣ Please refer to section 2 of this report which indicates which item was actually tested and which were electrically identical.

Trade mark: VSO, Filemate

Operation Frequency: 2403MHz to 2479MHz

FCC ID: YLDJK-760G24

Standards: FCC CFR Title 47 Part 15 Subpart C Section 15.249: 2009

Date of Receipt 2011-03-30

Date of Test 2011-03-31 to 2011-04-12

Date of Issue 2011-04-14

Test Result :	PASS *
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* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Jack Zhang
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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3 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
Field strength of the fundamental signal	15.249 (a)	Pass
Spurious emissions	15.249 (a)/15.209	Pass
Band edge (Radiated Emission)	15.249(a)/15.205	Pass
20dB Occupied Bandwidth	15.215 (c)	Pass

Remark: Pass: The EUT complies with the essential requirements in the standard.

Fail: The EUT does not comply with the essential requirements in the standard.

Model No.: JK-760G24,00053818,3FMNB2020WBK-R, JK-761,JK-762,JK-763, JK-681,JK-682M

Only the model No. JK-760G24 was tested, since the electrical circuit design,PCB layout, main board, components used and internal wiring were identical for the above models. Only difference is model name.

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4 General Information

4.1 Client Information

Applicant/ Manufacturer /Factory:	VSO TECHNOLOGY (DONG GUAN) CO., LTD.
Address of Applicant /Manufacturer/Factory:	No.58 Long Tou Road, Long Jian Tian, Huang Jiang, Dong Guan, Guang Dong, China

4.2 General Description of E.U.T.

Product Name:	KEYBOARD
Trade Name:	VSO, Filemate
Model No.:	JK-760G24,00053818,3FMNB2020WBK-R, JK-761,JK-762,JK-763, JK-681,JK-682M
Operation Frequency:	2403MHz to 2479MHz
Channel numbers:	39
Channel separation:	2MHz
Modulation type:	GFSK
Antenna Type:	Integral
Antenna gain:	0dBi
Power supply:	1.5V DC (1.5V x 1 "AAA" Size Battery)

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Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2403 MHz	11	2423 MHz	21	2443 MHz	31	2463 MHz
2	2405 MHz	12	2425 MHz	22	2445 MHz	32	2465 MHz
3	2407 MHz	13	2427 MHz	23	2447 MHz	33	2467 MHz
4	2409 MHz	14	2429 MHz	24	2449 MHz	34	2469 MHz
5	2411 MHz	15	2431 MHz	25	2451 MHz	35	2471 MHz
6	2413 MHz	16	2433 MHz	26	2453 MHz	36	2473 MHz
7	2415 MHz	17	2435 MHz	27	2455 MHz	37	2475 MHz
8	2417 MHz	18	2437 MHz	28	2457 MHz	38	2477 MHz
9	2419 MHz	19	2439 MHz	29	2459 MHz	39	2479 MHz
10	2421 MHz	20	2441 MHz	30	2461 MHz		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The lowest channel	2403MHz
The middle channel	2441MHz
The Highest channel	2479MHz

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4.3 E.U.T Operation mode

Operating Environment:

Temperature:	24.0 °C
Humidity:	52 % RH
Atmospheric Pressure:	1010 mbar

Test mode:

Transmitting mode:	Transmitting a continuous modulation signal at the specific channel
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4.4 Description of Support Units

The EUT has been tested independently.

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4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **VCCI**

The 3m Semi-anechoic chamber and Shielded Room (7.5m x 4.0m x 3.0m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2197 and C-2383 respectively.

Date of Registration: September 29, 2008. Valid until September 28, 2011.

- **FCC – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 556682, June 27, 2008.

- **Industry Canada (IC)**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1.

4.6 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch E&E Lab

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China
518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

4.7 Other Information Requested by the Customer

None.

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4.8 Test Instruments list:

RE in Chamber						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	2010-06-17	2011-06-16
2	Shielding effectiveness of Anechoic Chamber	ChangZhou ZhongYu	854	SEL0169	2010-08-20	2011-08-20
3	EMI Test Receiver	Rohde & Schwarz	ESIB26	SEL0023	2011-03-11	2012-03-11
4	EMI Test software	AUDIX	E3	SEL0050	N/A	N/A
5	Coaxial cable	SGS	N/A	SEL0028	2008-06-18	2011-06-18
6	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0015	2010-11-09	2011-11-09
7	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	2010-06-02	2011-06-02
8	Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEL0168	2010-10-27	2011-10-27
9	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0006	2010-11-09	2011-11-09
10	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEL0076	2010-11-09	2011-11-09
11	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	SEL0080	2010-06-04	2011-06-04
12	Band filter	Amindeon	Asi 3314	SEL0094	2010-06-02	2011-06-02
13	Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	2010-11-09	2011-11-09

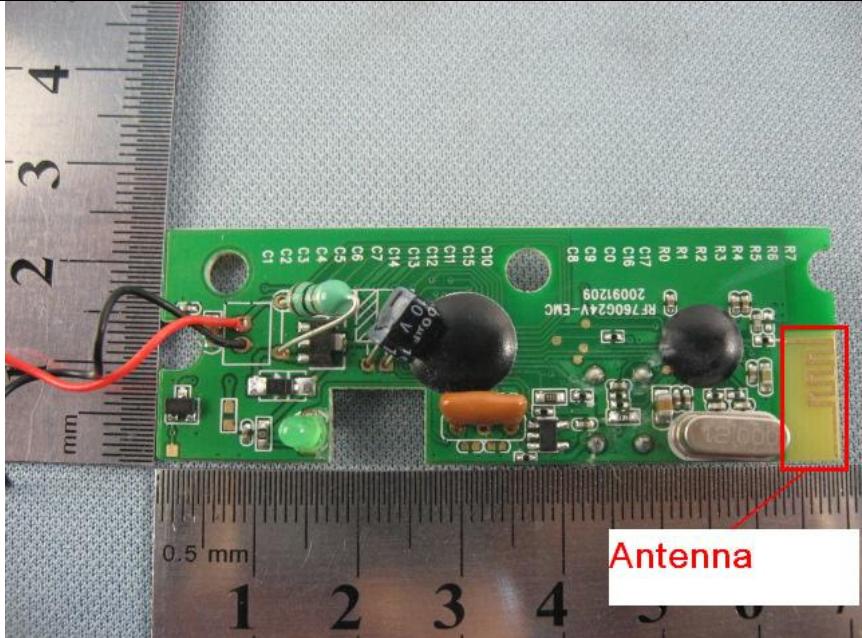
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5 Test results and Measurement Data

5.1 Antenna requirement:

Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement: <i>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.</i>	
E.U.T Antenna:	The antenna is integrated on the main PCB and no consideration of replacement. The maximum gain of the antenna is 0dBi.
	

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5.2 Radiated Emission

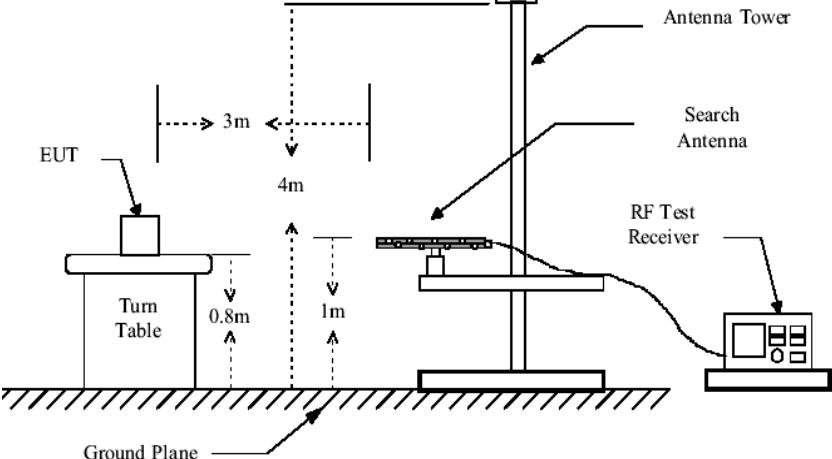
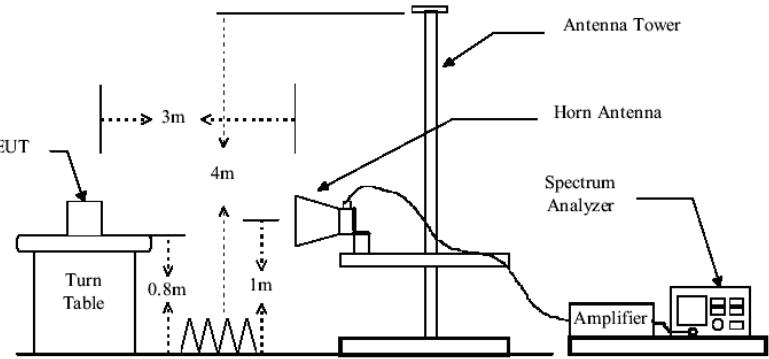
Test Requirement:	FCC Part15 C Section 15.249 and 15.209								
Test Method:	ANSI C63.10: 2009								
Test Frequency Range:	30MHz to 25000MHz								
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)								
Receiver setup:	Frequency	Detector	RBW	VBW	Remark				
	30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak Value				
	Above 1GHz	Peak	1MHz	3MHz	Peak Value				
		Peak	1MHz	10Hz	Average Value				
Limit: (Field strength of the fundamental signal)	Frequency	Limit (dBuV/m @3m)		Remark					
	2400MHz-2483.5MHz		94.0	Average Value					
			114.0	Peak Value					
Limit: (Spurious Emissions)	Frequency	Limit (dBuV/m @3m)		Remark					
	30MHz-88MHz	40.0		Quasi-peak Value					
	88MHz-216MHz	43.5		Quasi-peak Value					
	216MHz-960MHz	46.0		Quasi-peak Value					
	960MHz-1GHz	54.0		Quasi-peak Value					
	Above 1GHz	54.0		Average Value					
		74.0		Peak Value					
Limit: (band edge)	Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.								
Test Procedure:	<ol style="list-style-type: none"> a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported 								

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	<p>in a data sheet.</p> <p>g. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.</p>
Test Instruments:	Refer to section 4.7 for details
Test setup:	<p>Below 1GHz</p>  <p>Above 1GHz</p> 
Test mode:	Transmitting mode
Test results:	Pass

Note:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

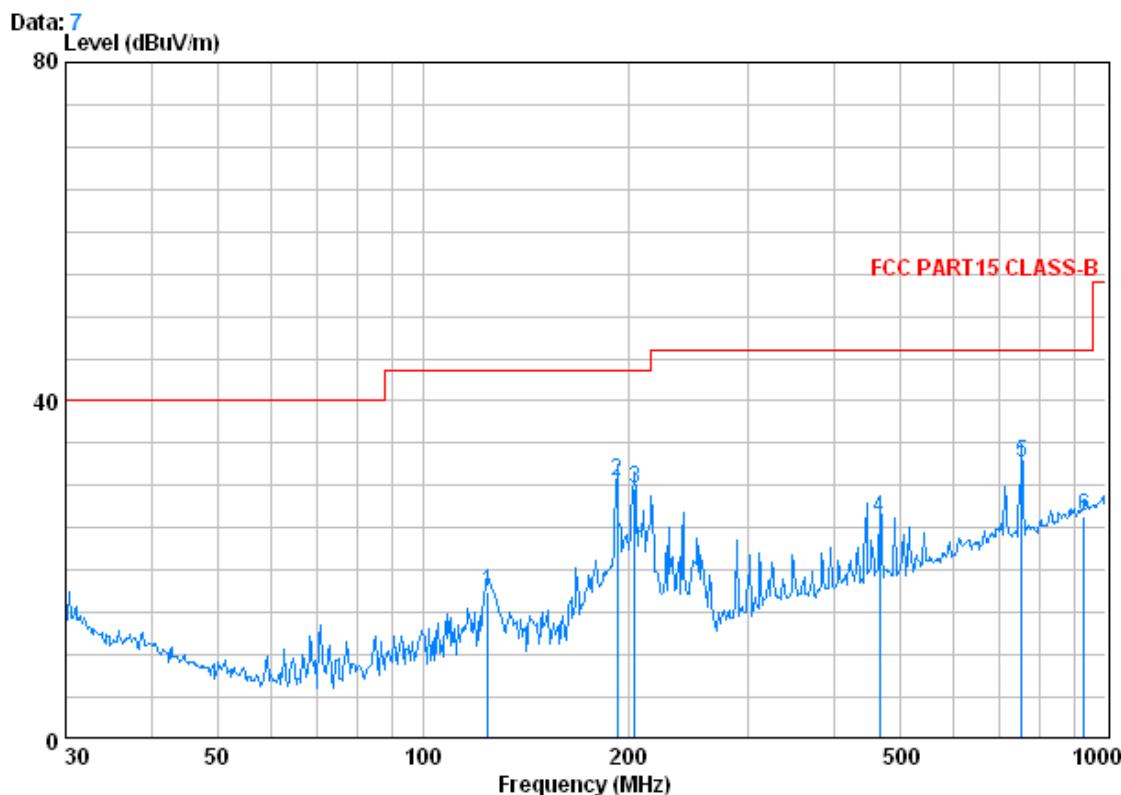
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Measurement Data

Horizontal:



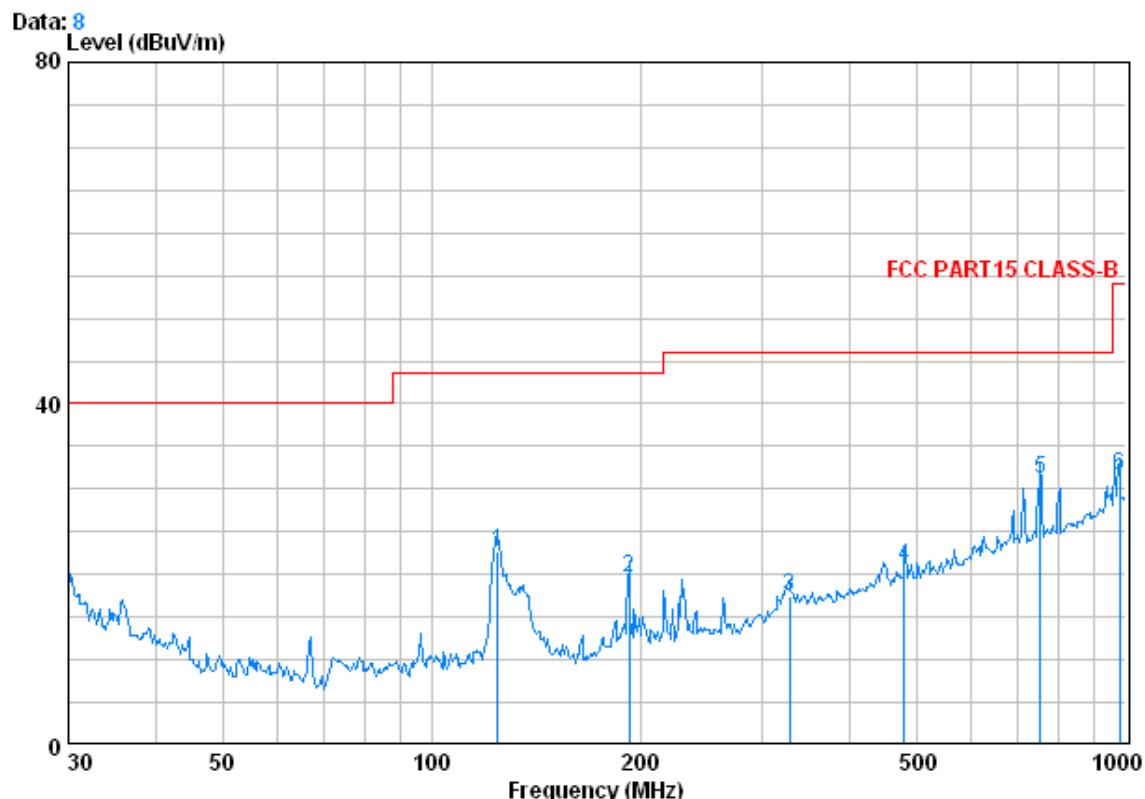
Freq	Cable		Antenna	Preamp	Read	Limit	Over	
	Loss	Factor	Factor	Level	Level			
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	124.569	1.26	7.81	27.04	35.38	17.41	43.50	-26.09
2	192.419	1.39	10.12	26.73	45.74	30.53	43.50	-12.97
3	204.238	1.43	10.40	26.68	44.50	29.65	43.50	-13.85
4	467.235	2.48	17.54	27.54	33.76	26.25	46.00	-19.75
5	752.743	3.07	21.73	27.35	35.35	32.80	46.00	-13.20
6	929.008	3.63	23.30	26.64	26.11	26.40	46.00	-19.60

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Vertical:



Freq	Cable	Antenna	Preamp	Read	Limit	Over	Limit	
	Loss	Factor	Factor	Level	Level	Line		
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	124.569	1.26	7.81	27.04	40.54	22.57	43.50	-20.93
2	192.419	1.39	10.12	26.73	34.86	19.65	43.50	-23.85
3	327.887	1.99	14.89	26.62	27.23	17.49	46.00	-28.51
4	480.528	2.53	17.80	27.60	28.26	21.00	46.00	-25.00
5	752.743	3.07	21.73	27.35	33.70	31.15	46.00	-14.85
6	979.180	3.68	24.04	26.40	30.29	31.61	54.00	-22.39

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5.2.1 Field Strength Of The Fundamental Signal

Peak value:

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Peak Level (dBuV/m)	Average Limit Line (dBuV/m)	Over Limit (dB)	polarization
2403.34	2.99	32.54	39.86	84.66	80.33	94.00	-13.67	Horizontal
2403.35	2.99	32.54	39.86	90.17	85.84	94.00	-8.16	Vertical
2440.67	3.01	32.61	39.89	82.37	78.10	94.00	-15.90	Horizontal
2440.70	3.01	32.61	39.89	86.11	81.84	94.00	-12.16	Vertical
2478.67	3.03	32.67	39.92	84.34	80.12	94.00	-13.88	Horizontal
2478.66	3.03	32.67	39.92	86.71	82.49	94.00	-11.51	Vertical

Remark:

As shown in this section, for field strength of the fundamental signal measurements, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits. So, only the peak measurements were shown in the report.

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5.2.2 Spurious Emissions

Above 1GHz

Test mode:	Transmitting	Test channel:	Lowest	Remark:	Peak			
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
3103.250	3.39	33.36	40.38	46.67	43.04	74.00	-30.96	Vertical
4078.500	4.22	34.03	41.09	46.63	43.79	74.00	-30.21	Vertical
4783.500	4.68	34.73	41.61	52.44	50.24	74.00	-23.76	Vertical
6111.250	5.16	35.84	40.83	47.49	47.66	74.00	-26.34	Vertical
8179.250	6.20	36.07	39.03	46.32	49.56	74.00	-24.44	Vertical
11833.500	6.43	38.73	38.21	43.61	50.56	74.00	-23.44	Vertical
2997.500	3.32	33.40	40.30	45.03	41.45	74.00	-32.55	Horizontal
3843.500	4.04	33.61	40.93	46.69	43.41	74.00	-30.59	Horizontal
4795.250	4.68	34.73	41.63	52.58	50.36	74.00	-23.64	Horizontal
6675.250	5.30	36.13	40.33	47.16	48.26	74.00	-25.74	Horizontal
8179.250	6.20	36.07	39.03	45.84	49.08	74.00	-24.92	Horizontal
11892.250	6.44	38.80	38.23	43.29	50.30	74.00	-23.70	Horizontal

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Test mode:	Transmitting	Test channel:	Middle	Remark:	Peak			
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2692.000	3.15	32.98	40.07	45.67	41.73	74.00	-32.27	Vertical
3890.500	4.07	33.68	40.95	45.87	42.67	74.00	-31.33	Vertical
4877.500	4.72	34.59	41.68	51.23	48.86	74.00	-25.14	Vertical
7568.250	6.19	36.00	39.56	46.61	49.24	74.00	-24.76	Vertical
10200.250	6.02	37.94	37.53	43.28	49.71	74.00	-24.29	Vertical
11939.250	6.45	38.83	38.25	43.57	50.60	74.00	-23.40	Vertical
2680.250	3.14	32.96	40.06	46.48	42.52	74.00	-31.48	Horizontal
4360.500	4.40	34.83	41.30	46.51	44.44	74.00	-29.56	Horizontal
4877.500	4.72	34.59	41.68	51.41	49.04	74.00	-24.96	Horizontal
7509.500	6.13	36.00	39.61	47.09	49.61	74.00	-24.39	Horizontal
10611.500	6.13	38.34	37.70	42.91	49.68	74.00	-24.32	Horizontal
12597.250	6.62	39.44	38.52	43.64	51.18	74.00	-22.82	Horizontal

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Test mode:	Transmitting	Test channel:	Highest	Remark:	Peak			
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
3103.250	3.39	33.36	40.38	45.84	42.21	74.00	-31.79	Vertical
4231.250	4.31	34.45	41.21	46.75	44.30	74.00	-29.70	Vertical
4936.250	4.75	34.48	41.72	51.86	49.37	74.00	-24.63	Vertical
7744.500	6.22	36.00	39.41	47.08	49.89	74.00	-24.11	Vertical
9530.500	6.01	37.23	37.86	44.83	50.21	74.00	-23.79	Vertical
12750.000	6.66	39.50	38.58	43.80	51.38	74.00	-22.62	Vertical
3091.500	3.39	33.37	40.37	46.47	42.86	74.00	-31.14	Horizontal
4419.250	4.44	34.97	41.35	46.32	44.38	74.00	-29.62	Horizontal
4936.250	4.75	34.48	41.72	51.56	49.07	74.00	-24.93	Horizontal
6099.500	5.15	35.82	40.84	48.38	48.51	74.00	-25.49	Horizontal
7744.500	6.22	36.00	39.41	46.92	49.73	74.00	-24.27	Horizontal
12127.250	6.50	39.04	38.33	43.18	50.39	74.00	-23.61	Horizontal

Remarks:

As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.

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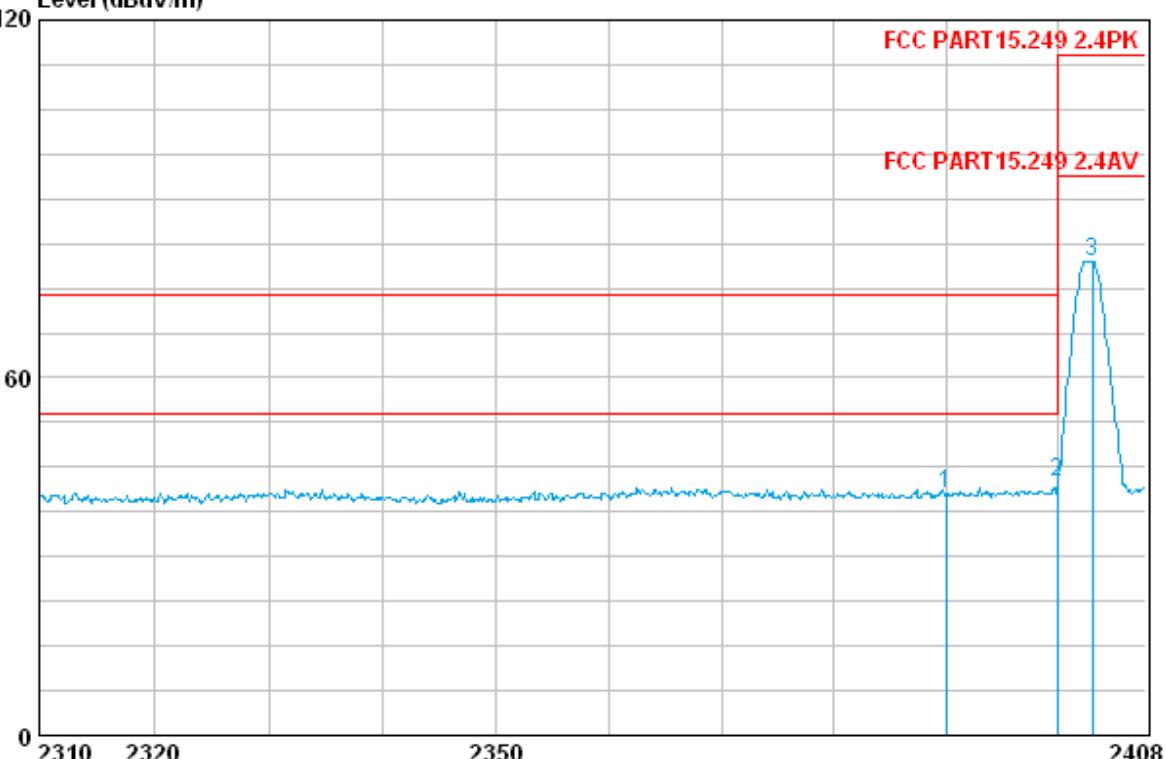
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5.2.3 Band edge (Radiated Emission)

Test mode:	Transmitting	Test channel:	Lowest	Remark:	Peak
------------	--------------	---------------	--------	---------	------

Horizontal:

Data: 5
Level (dBuV/m)



Freq	Frequency (MHz)								Over Limit
	Cable Loss	Antenna Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Line		
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2390.000	2.98	32.51	39.85	44.75	40.39	74.00	-33.61	
2	2400.000	2.98	32.51	39.86	46.89	42.52	74.00	-31.48	
3	2403.198	2.99	32.54	39.86	83.85	79.52	114.00	-34.48	

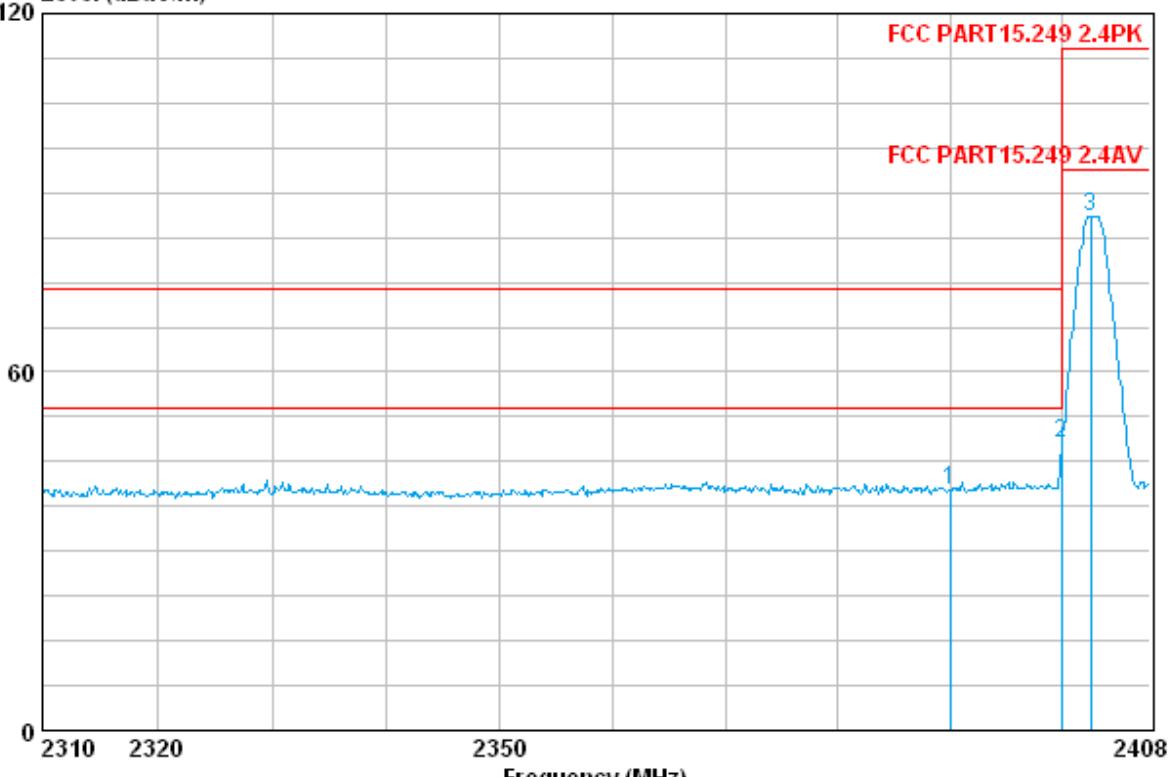
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Vertical;

Data: 6
Level (dBuV/m)



	Cable Freq	Antenna Loss	Antenna Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit
--	------------	--------------	----------------	---------------	------------	-------------	------------	------------

	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.000	2.98	32.51	39.85	44.68	40.32	74.00	-33.68
2	2400.000	2.98	32.51	39.86	52.39	48.02	74.00	-25.98
3	2402.708	2.98	32.54	39.86	90.48	86.15	114.00	-27.85

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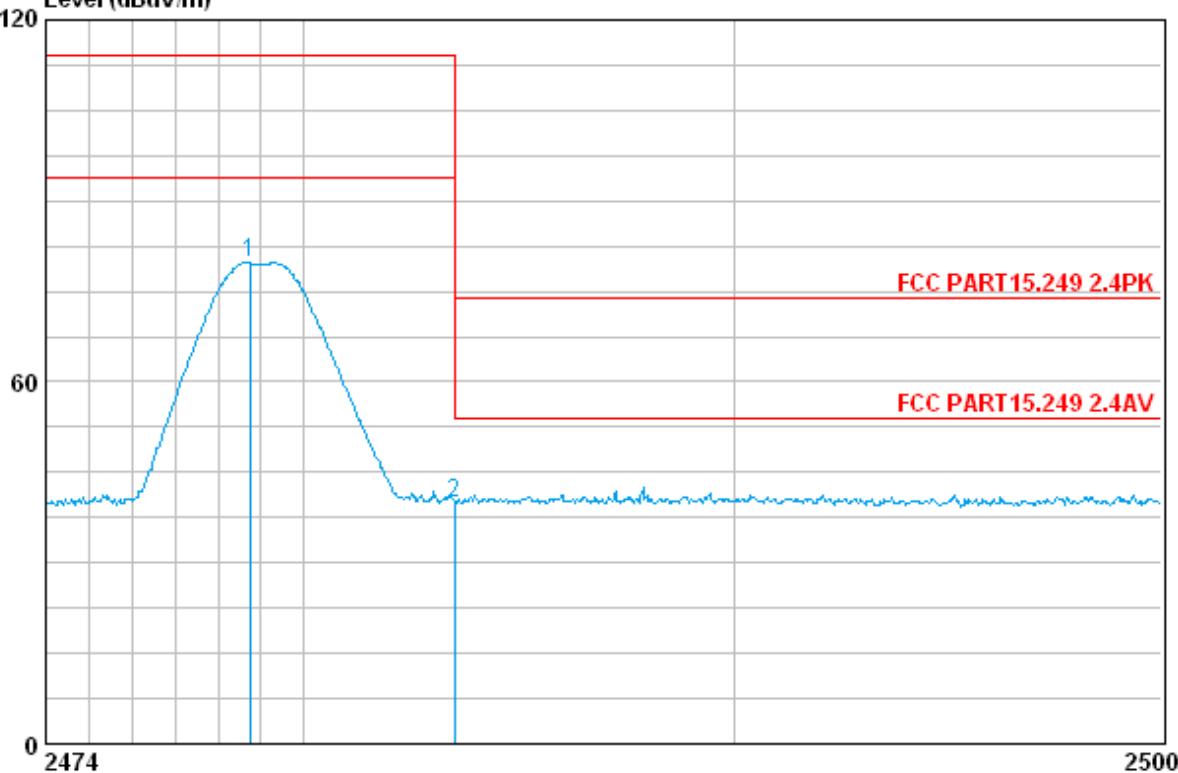
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Test mode:	Transmitting	Test channel:	Highest	Remark:	Peak
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Horizontal:

Data: 15
Level (dBuV/m)



Frequency (MHz)

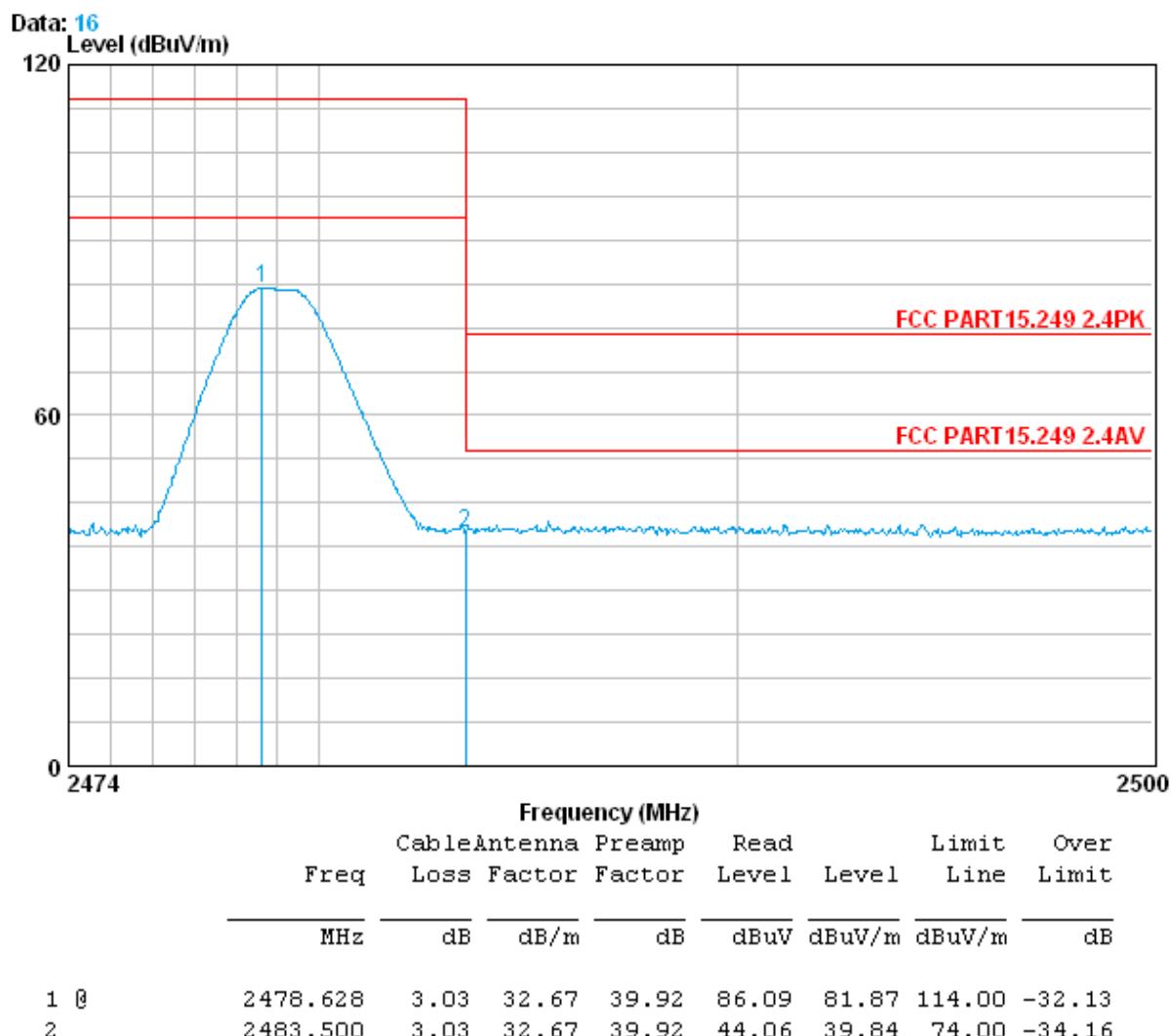
Freq	Cable	Antenna	Preamp	Read	Limit	Over		
	Loss	Factor	Factor	Level	Level	Line	Limit	
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2478.732	3.03	32.67	39.92	83.94	79.72	114.00	-34.28
2	2483.500	3.03	32.67	39.92	44.12	39.90	74.00	-34.10

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Vertical;



Remark:

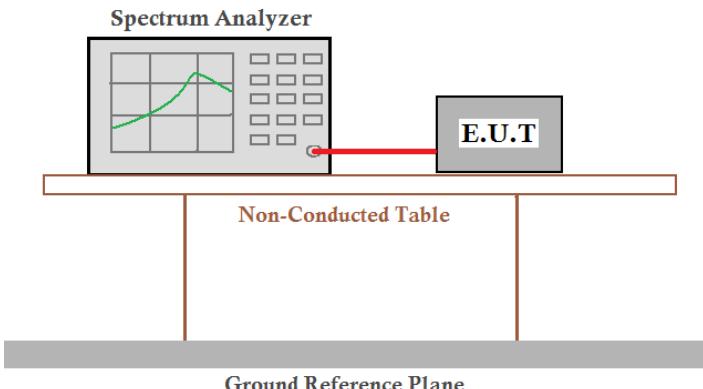
As shown in this section, for radiated Band-edge measurements, the limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.

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5.3 20dB Bandwidth

Test Requirement:	FCC Part15 C Section 15.249/15.215
Test Method:	ANSI C63.10:2009
Receiver setup:	RBW=100KHz, VBW=300KHz, detector: Peak
Limit:	Operation Frequency range 2400MHz-2483.5MHz
Test Procedure:	<ol style="list-style-type: none"> 1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. 2. Set the EUT to proper test channel. 3. Max hold the radiated emissions, mark the peak power frequency point and the -20dB upper and lower frequency points. 4. Read 20dB bandwidth.
Test setup:	 <p style="text-align: center;">Spectrum Analyzer</p> <p style="text-align: center;">E.U.T</p> <p style="text-align: center;">Non-Conducted Table</p> <p style="text-align: center;">Ground Reference Plane</p>
Test Instruments:	Refer to section 4.7 for details
Test mode:	Transmitting mode
Test results:	Pass

Measurement Data

Test channel	20dB bandwidth (MHz)	Results
Lowest	1.216	----
Middle	1.224	----
Highest	1.256	----

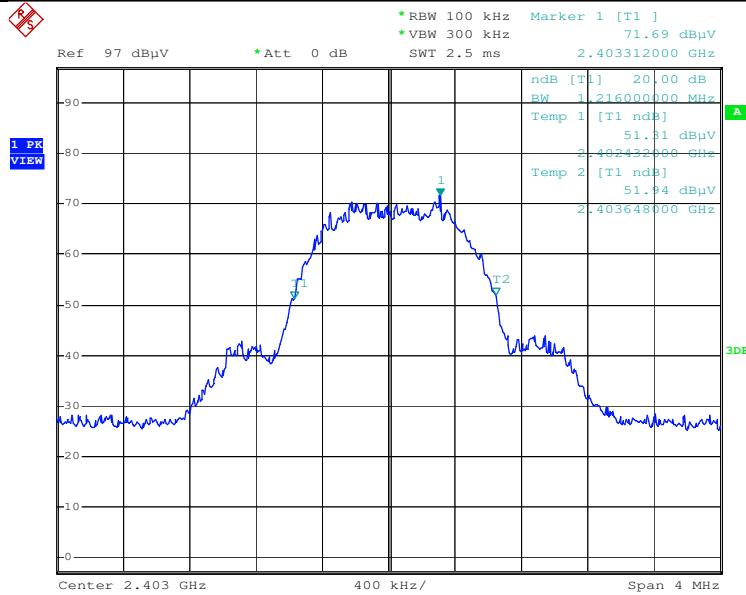
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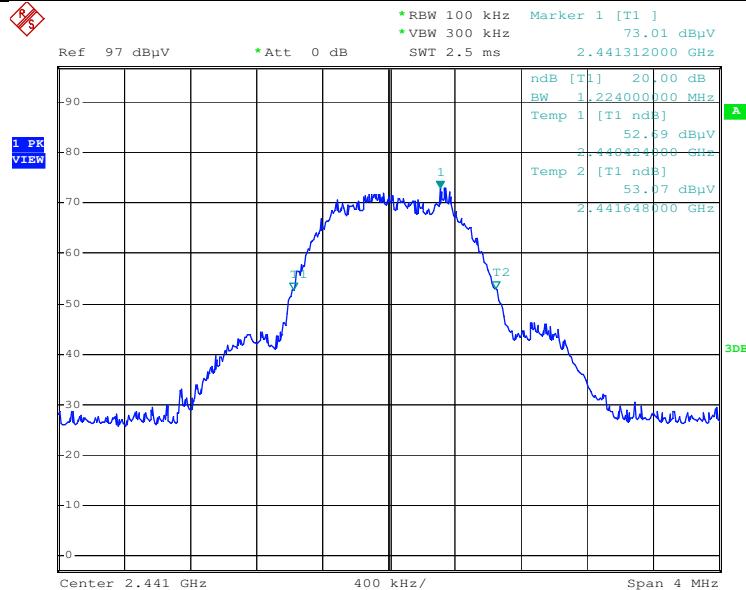
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Test plot as follows:

Test channel:	Lowest
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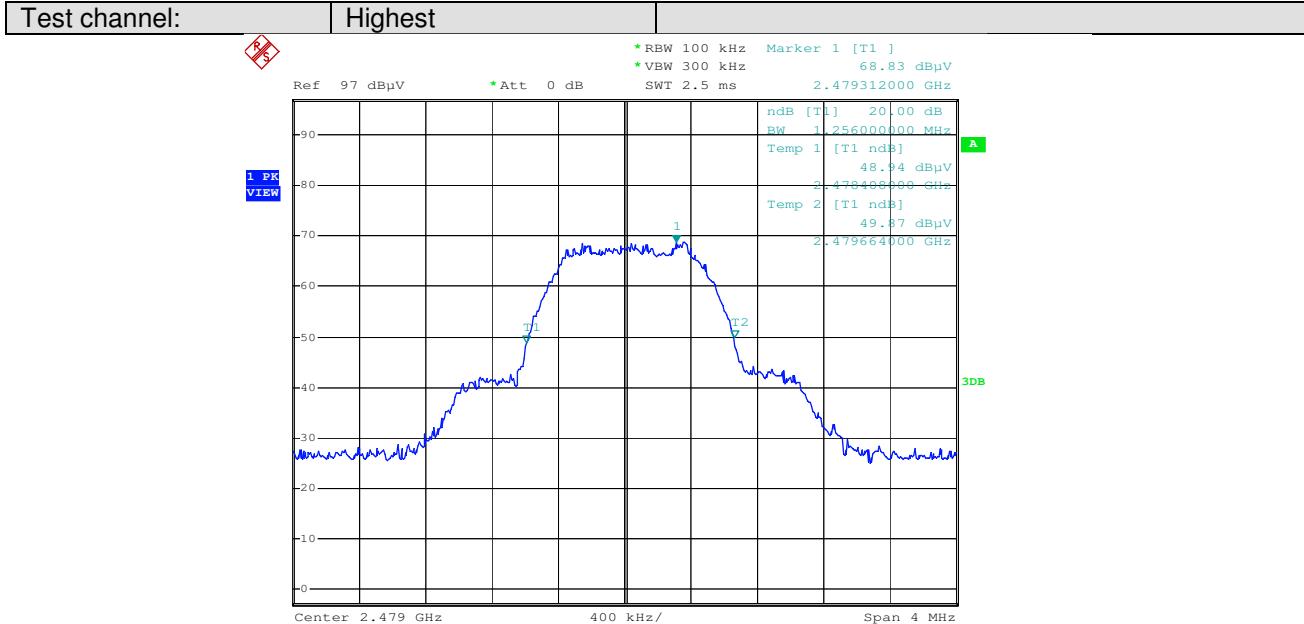
Test channel:	Middle
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