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FCC RF TEST REPORT

# FCC RF TEST REPORT

<b>Report No.:</b>	R201811002
<b>Model No.:</b>	JA32
<b>Grant No.:</b>	JOY
<b>FCC ID:</b>	JOYJA32
<b>Date of Receipt:</b>	Oct 10,2018
<b>Date of Test:</b>	Oct 10,2018~ Nov 15,2018
<b>Date of Issue:</b>	Nov 26,2018
<b>Test Result:</b>	PASS
 <b>Applicant:</b>	KYOCERA CORPORATION
<b>Manufacturer:</b>	KYOCERA CORPORATION
<b>Factory:</b>	KYOCERA CORPORATION
<b>Product Name</b>	SMART PHONE
<b>Trade Mark</b>	KYOCERA
<b>Address:</b>	Yokohama Office 2-1-1 Kagahara,Tsuzuki-ku Yokohama-shi,Kanagawa,Japan
<b>ISSUED BY:</b>	BYD Precise Manufacture Co., Ltd.
<b>LAB LOCATION:</b>	No. 3001, Baohe Road, Baolong Longgang, Shenzhen, 518116, People's Republic of China

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## Table of Contents

<b>1</b>	<b>REPORT ISSUED HISTORY.....</b>	<b>4</b>
<b>2</b>	<b>CERTIFICATION.....</b>	<b>5</b>
<b>3</b>	<b>SUMMARY OF TEST RESULTS .....</b>	<b>6</b>
3.1	MEASUREMENT UNCERTAINTY.....	6
<b>4</b>	<b>GENERAL INFORMATION .....</b>	<b>7</b>
4.1	TEST EQUIPMENTS LIST .....	7
4.2	DESCRIPTION OF TEST MODES .....	8
4.3	TEST ENVIRONMENT AND LIST OF SOFTWARE AND PARTS .....	8
4.4	CONFIGURATION OF SYSTEM UNDER TEST.....	9
4.5	TESTING LOCATION .....	9
4.6	TEST FACILITY .....	9
4.7	GENERAL DESCRIPTION OF APPLIED STANDARDS.....	10
<b>5</b>	<b>TEST TYPES AND RESULTS .....</b>	<b>11</b>
5.1	NUMBER OF CHANNEL .....	11
5.1.1	<i>Description .....</i>	11
5.1.2	<i>Test Instruments .....</i>	11
5.1.3	<i>Test Procedure .....</i>	12
5.1.4	<i>Test Setup .....</i>	12
5.1.5	<i>Test Results.....</i>	12
5.2	HOPPING CHANNEL SEPARATION .....	14
5.2.1	<i>Description .....</i>	14
5.2.2	<i>Test Instruments .....</i>	14
5.2.3	<i>Test Procedure .....</i>	14
5.2.4	<i>Test Setup .....</i>	14
5.2.5	<i>Test Result.....</i>	15
5.3	DWELL TIME .....	25
5.3.1	<i>Description .....</i>	25
5.3.2	<i>Test Instruments .....</i>	25
5.3.3	<i>Test Procedure .....</i>	25
5.3.4	<i>Test Setup .....</i>	25
5.3.5	<i>Test Result.....</i>	26
5.4	20DB AND 99% BANDWIDTH.....	29
5.4.1	<i>Description .....</i>	29
5.4.2	<i>Test Instruments .....</i>	29
5.4.3	<i>Test Procedure .....</i>	29
5.4.4	<i>Test Setup .....</i>	29
5.4.5	<i>Test Result.....</i>	30
5.5	PEAK OUTPUT POWER .....	49
5.5.1	<i>Description .....</i>	49
5.5.2	<i>Test Instruments .....</i>	49
5.5.3	<i>Test Procedure .....</i>	49
5.5.4	<i>Test Setup .....</i>	49
5.5.5	<i>Test Result.....</i>	50
5.6	BAND EDGES.....	60
5.6.1	<i>Description .....</i>	60
5.6.2	<i>Test Instruments .....</i>	60



Build Your Dreams!

FCC RF TEST REPORT

5.6.3	<i>Test Procedure</i> .....	60
5.6.4	<i>Test Setup</i> .....	60
5.6.5	<i>Test Result</i> .....	61
5.7	CONDUCTED SPURIOUS EMISSION .....	74
5.7.1	<i>Description</i> .....	74
5.7.2	<i>Test Instruments</i> .....	74
5.7.3	<i>Test Procedure</i> .....	74
5.7.4	<i>Test Setup</i> .....	74
5.7.5	<i>Test Result</i> .....	75
6	SAMPLE PICTURE .....	93
7	APPENDIX - INFORMATION ON THE TESTING LABORATORIES .....	94



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*FCC RF TEST REPORT*

## 1 REPORT ISSUED HISTORY

Version	Description	Issued Data
Rev. 01	Original issue	Nov 26, 2018



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FCC RF TEST REPORT

## 2 CERTIFICATION

<b>PRODUCT:</b>	Smart Phone
<b>MODEL:</b>	JA32
<b>BRAND:</b>	KYOCERA
<b>APPLICANT:</b>	KYOCERA
<b>TEST SAMPLE:</b>	ENGINEERING SAMPLE
<b>SN.:</b>	JA32125479850089K0676
<b>HW Version:</b>	JA32
<b>SW Version:</b>	Sdm660_64-userdebug 9
<b>TESTED:</b>	Oct 10,2018~ Nov 15,2018
<b>STANDARDS:</b>	FCC 47 CFR Part15 Subpart C §15.247

The above equipment has been tested by **BYD Precise Manufacture Co., Ltd**, 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 :** BYD , **DATE:** 2018-11-26  
(Yan Chen / Engineer)

**TECHNICAL  
ACCEPTANCE :** ZH Feng , **DATE:** 2018-11-26  
Responsible for EMS (Zhaohui Feng / Manager)

**APPROVED BY :** Jie Yan , **DATE:** 2018-11-26  
(Jie Yan / Director )



### 3 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART15 Subpart C § 15.247			
STANDARD SECTION	TEST ITEMS	RESULT	REMARK
§15.247(a)(1)	Number of Channel	PASS	$\geq 15\text{Chs}$
§15.247(a)(1)	Hopping Channel Separation	PASS	$\geq 2/3$ of 20dB BW
§15.247(a)(1)	Dwell Time	PASS	$\leq 0.4\text{sec}$ in 31.6sec period
§15.247(a)(1)	20dB Bandwidth	PASS	
-	99% Bandwidth	PASS	
§15.247(b)(1)	Peak Output Power	PASS	$\leq 125\text{mW}$
§15.247(d)	Band edges	PASS	$\leq 20\text{dBc}$
§15.247(d)	Conducted Spurious	PASS	$\leq 20\text{dBc}$

#### 3.1 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 Ed 1.0.

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

This lab's measurement uncertainty  $U_{\text{Lab}}$ , is low than  $U_{\text{Cispr}}$ , Table 1 – Values of  $U_{\text{Cispr}}$  of CISPR 16-4-2 Ed. 1.0, therefore compliance is deemed to occur if no measured disturbance exceeds the disturbance limit.

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	$\pm 5\%$
RF output power, Conducted	$\pm 0.59\text{dB}$
Power Spectral Density, conducted	$\pm 0.59\text{dB}$
Unwanted Emissions, conducted	$\pm 0.9\text{dB}$
Temperature	$\pm 1^\circ\text{C}$
Humidity	$\pm 5\%$
DC and low frequency voltages	$\pm 0.4\%$
Duty Cycle	$\pm 1\%$



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## 4 GENERAL INFORMATION

### 4.1 Test Equipments List

Description & Manufacturer	MODEL NO.	SERIAL NO.	Next Calibration date
CBT BLUETOOTH TESTER ROHDE & SCHWARZ	CBT	100430	2019/2/25
SIGNAL ANALYZER ROHDE & SCHWARZ	FSQ26	200393	2019/4/9
DC Power Supply Agilent	E3632A	MY40029031	2019/3/5
LC Filters	-	L2000-9C1AS	-
RF cable		-	-
Power Divider	-	C279810-01	-
PC	-	30008979	-

NOTE: Calibration cycle 12 months.



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## 4.2 Description of Test Modes

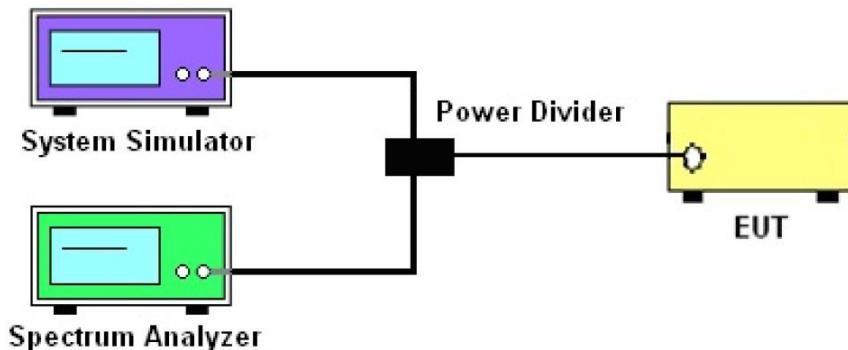
Test Items	Data Rate	Operating Mode	Channel
Number of Channel	-	Hopping	00~78
Hopping Channel Separation	1/2/3Mbps	Hopping	00/78
Dwell Time	1/2/3Mbps	Hopping	00~78
20dB Bandwidth	1/2/3Mbps	Fixed	00/39/78
99% Bandwidth	1/2/3Mbps	Fixed	00/39/78
Peak Output Power	1/2/3Mbps	Fixed	00/39/78
Band edges	1/2/3Mbps	Fixed	00/78
Conducted Spurious	1/2/3Mbps	Fixed	00/39/78

## 4.3 Test Environment and List of Software and Parts

Test Items	Software	Parts	Environment
Number of Channel	QRCT Version3.0	USB Cable、Fake battery、Power Divider	Temp.:25°C±3 Humi:30%~60% Volt.:3.8V
Hopping Channel Separation	QRCT Version3.0	USB Cable、Fake battery、Power Divider	Temp.:25°C±3 Humi:30%~60% Volt.:3.8V
Dwell Time	QRCT Version3.0	USB Cable、Fake battery、Power Divider	Temp.:25°C±3 Humi:30%~60% Volt.:3.8V
20dB Bandwidth	QRCT Version3.0	USB Cable、Fake battery、Power Divider	Temp.:25°C±3 Humi:30%~60% Volt.:3.8V
99% Bandwidth	QRCT Version3.0	USB Cable、Fake battery、Power Divider	Temp.:25°C±3 Humi:30%~60% Volt.:3.8V
Peak Output Power	QRCT Version3.0	USB Cable、Fake battery、Power Divider	Temp.:25°C±3 Humi:30%~60% Volt.:3.8V
Band edges	QRCT Version3.0	USB Cable、Fake battery、Power Divider	Temp.:25°C±3 Humi:30%~60% Volt.:3.8V
Conducted Spurious	QRCT Version3.0	USB Cable、Fake battery、Power Divider	Temp.:25°C±3 Humi:30%~60% Volt.:3.8V



#### 4.4 Configuration of System Under Test



#### 4.5 Testing Location

<b>Test Site</b>	BYD Precise Manufacture Co., Ltd.
<b>Test Site Location</b>	No. 3001, Baohe Road, Baolong Longgang, Shenzhen, 518116, People's Republic of China
<b>Post Code</b>	518116
<b>Telephone</b>	+86-755 8489 8888 55501
<b>Fax</b>	+86-755 8964 3771

#### 4.6 Test Facility

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

- **A2LA (Certificate No. 4886.01)**

BYD Precise Manufacture Co., Ltd., Baolong Shenzhen Laboratory is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 4886.01.

- **FCC –Designation Number: CN1232**

BYD Precise Manufacture Co., Ltd., Baolong Shenzhen Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1232.



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#### **4.7 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 Part15 Subpart C §15.247

FCC Public Notice DA 00-705

ANSI C63.4-2003

All test items have been performed and recorded as per the above standards.



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## 5 TEST TYPES AND RESULTS

### 5.1 Number of Channel

#### 5.1.1 Description

Frequency hopping systems in the 2400-2483.5MHz band shall use at least 15 channels.

#### 5.1.2 Test Instruments

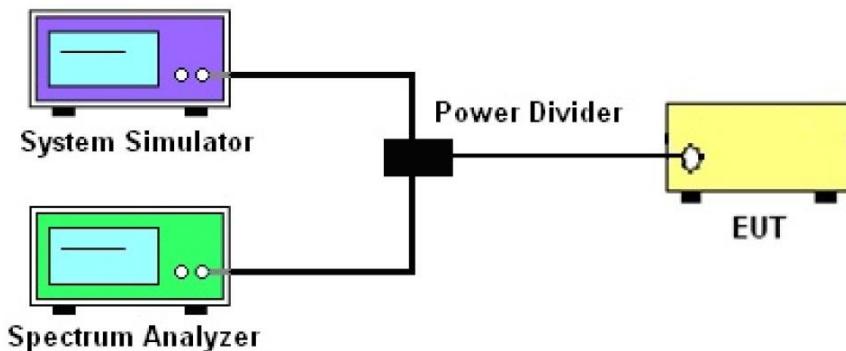
The measuring equipment is listed in the section 4.1 of this test report.



### 5.1.3 Test Procedure

- a. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss compensated to the results for each measurement.
- b. Set to the maximum power setting and enable the EUT transmit continuously.
- c. Enable the EUT hopping function.
- d. Use the following spectrum analyzer setting: Span=the frequency band of operation;  $RBW \geq 1\%$  of the span;  $VBW \geq RBW$ ; Sweep = auto; Detector function = peak; Trace = max hold.
- e. The number of hopping frequency used is defined as the number of total channel.
- f. Record the measurement data derived from spectrum analyzer.

### 5.1.4 Test Setup



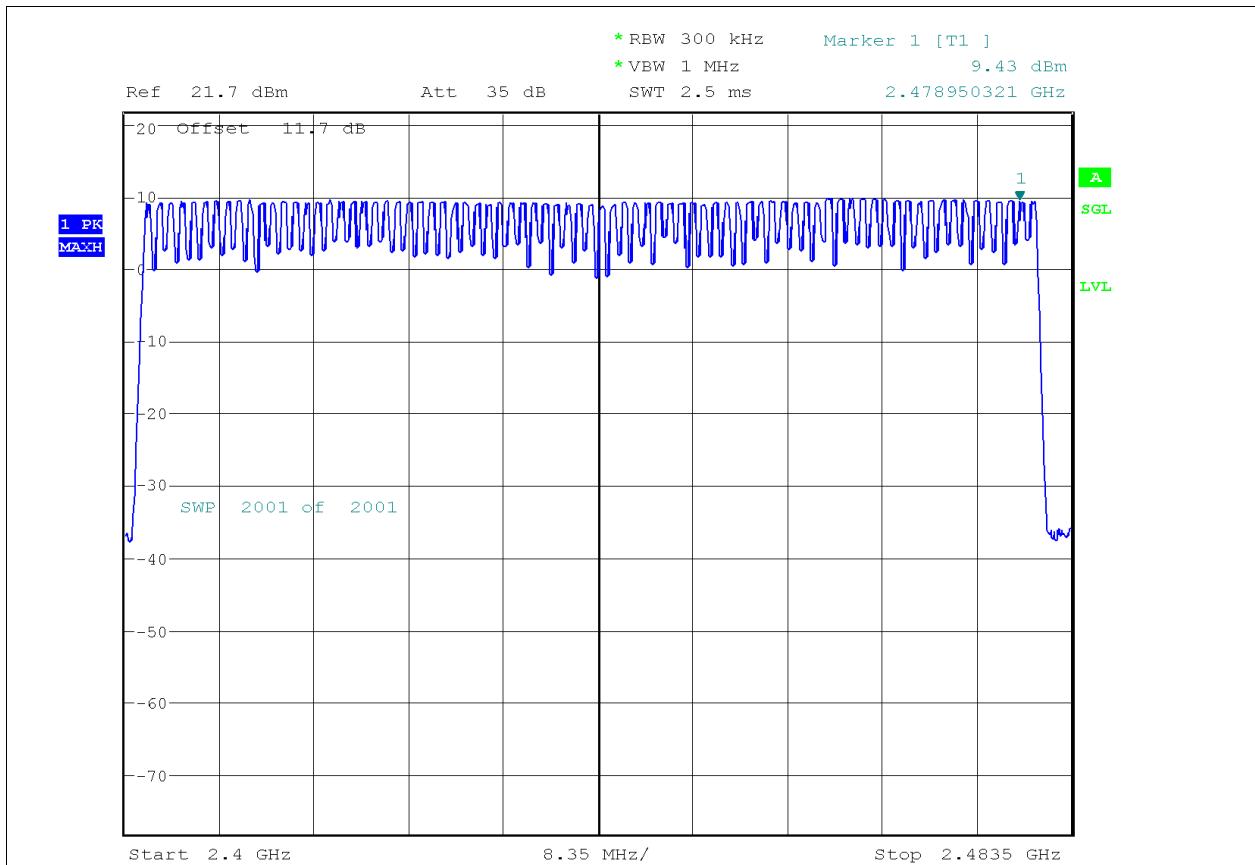
### 5.1.5 Test Results

Number of Hopping Frequency(Channel)	Adaptive Hopping Frequency(Channel)	Limit(Channel)	P/F
79	20	15	PASS



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BAND

Date: 10.OCT.2018 03:59:24

BT2.0 Number of Channel



## 5.2 Hopping Channel Separation

### 5.2.1 Description

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25kHz or two-thirds of the 20dB bandwidth off the hopping channel, whichever is greater.

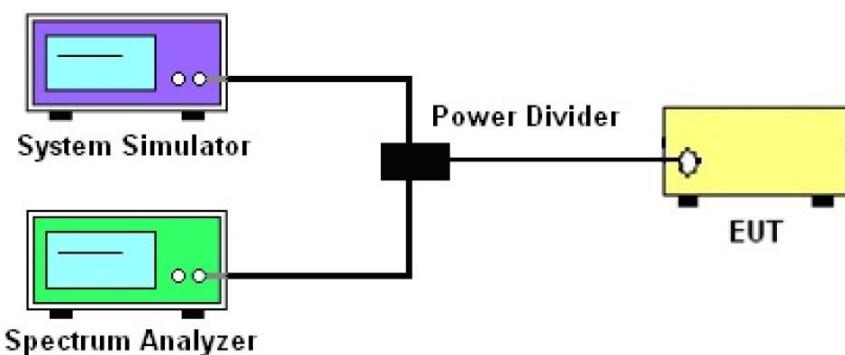
### 5.2.2 Test Instruments

The measuring equipment is listed in the section 4.1 of this test report.

### 5.2.3 Test Procedure

- a. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss compensated to the results for each measurement.
- b. Set to the maximum power setting and enable the EUT transmit continuously.
- c. Enable the EUT hopping function.
- d. Use the following spectrum analyzer setting: Span=wide enough to capture the peaks of two adjacent channels; RBW $\geq$ 1% of the span; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
- e. Record the measurement the results in the test report.

### 5.2.4 Test Setup





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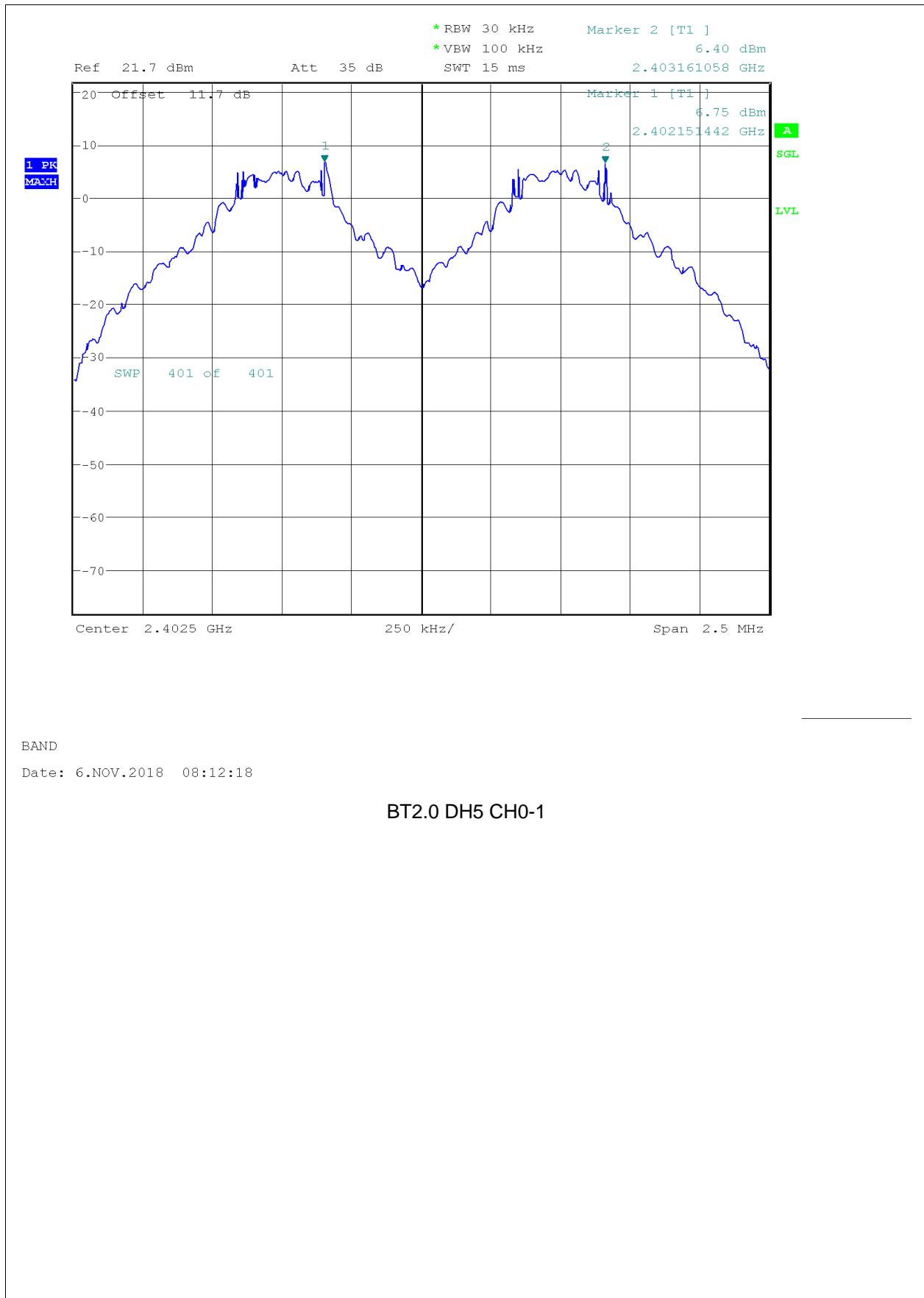
### 5.2.5 Test Result

DH5				
Channel	Frequency(M Hz)	Hopping Channel Separation(kHz)	Limit(kHz)( 25kHz or 2/3 20dB BW whichever is greater)	P/F
0-1	2402-2403	1009.62	576.92	PASS
39-40	2441-2442	1005.61	632.48	PASS
77-78	2479-2480	1021.63	549.15	PASS
2DH5				
Channel	Frequency(M Hz)	Hopping Channel Separation(MHz)	Limit(MHz)( 25kHz or 2/3 20dB BW whichever is greater)	P/F
0-1	2402-2403	1157.85	868.59	PASS
39-40	2441-2442	1169.87	865.38	PASS
77-78	2479-2480	1165.87	855.77	PASS
3DH5				
Channel	Frequency(M Hz)	Hopping Channel Separation(MHz)	Limit(MHz)( 25kHz or 2/3 20dB BW whichever is greater)	P/F
0-1	2402-2403	1005.61	855.77	PASS
39-40	2441-2442	1322.12	858.97	PASS
77-78	2479-2480	1005.61	868.59	PASS



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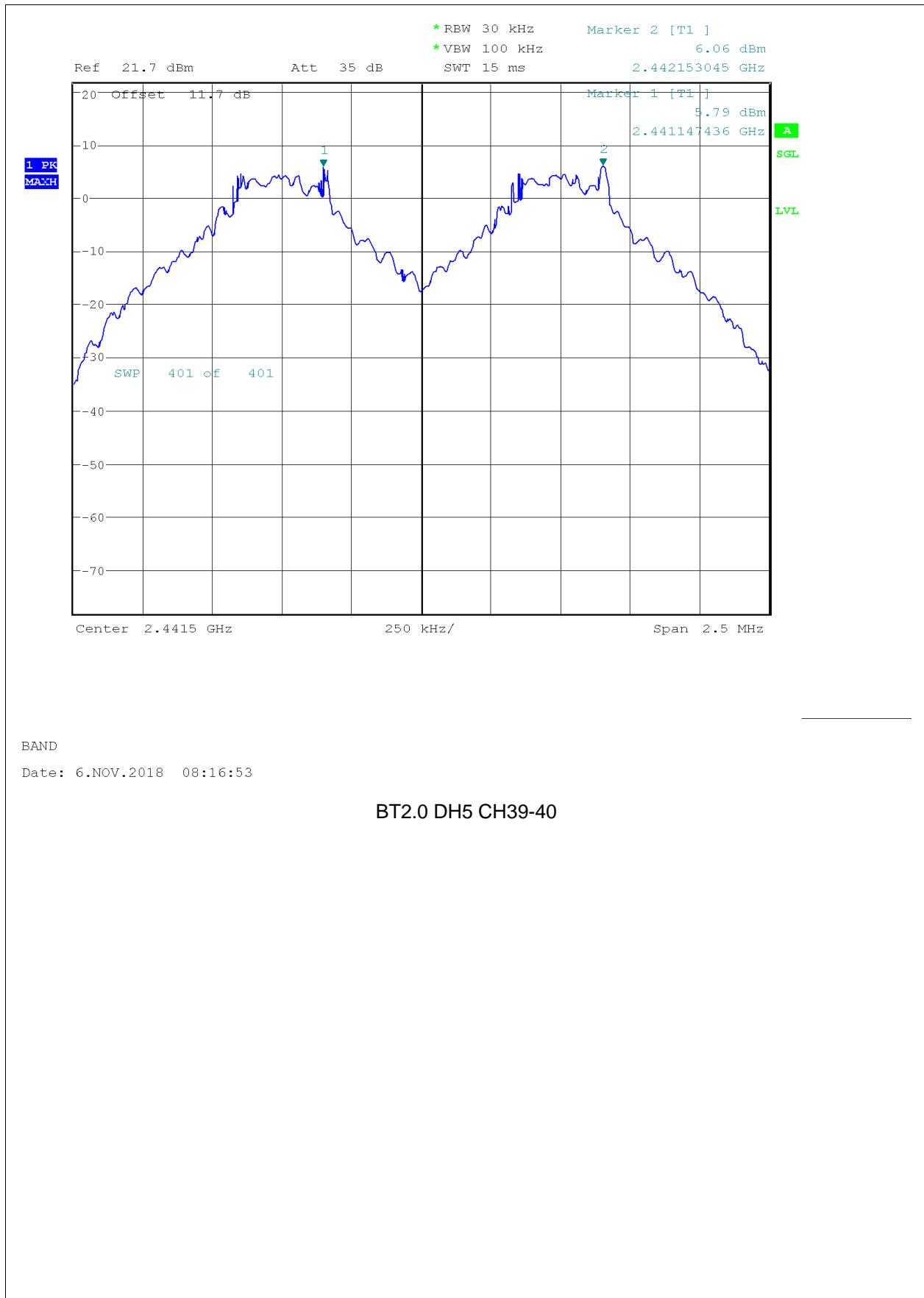
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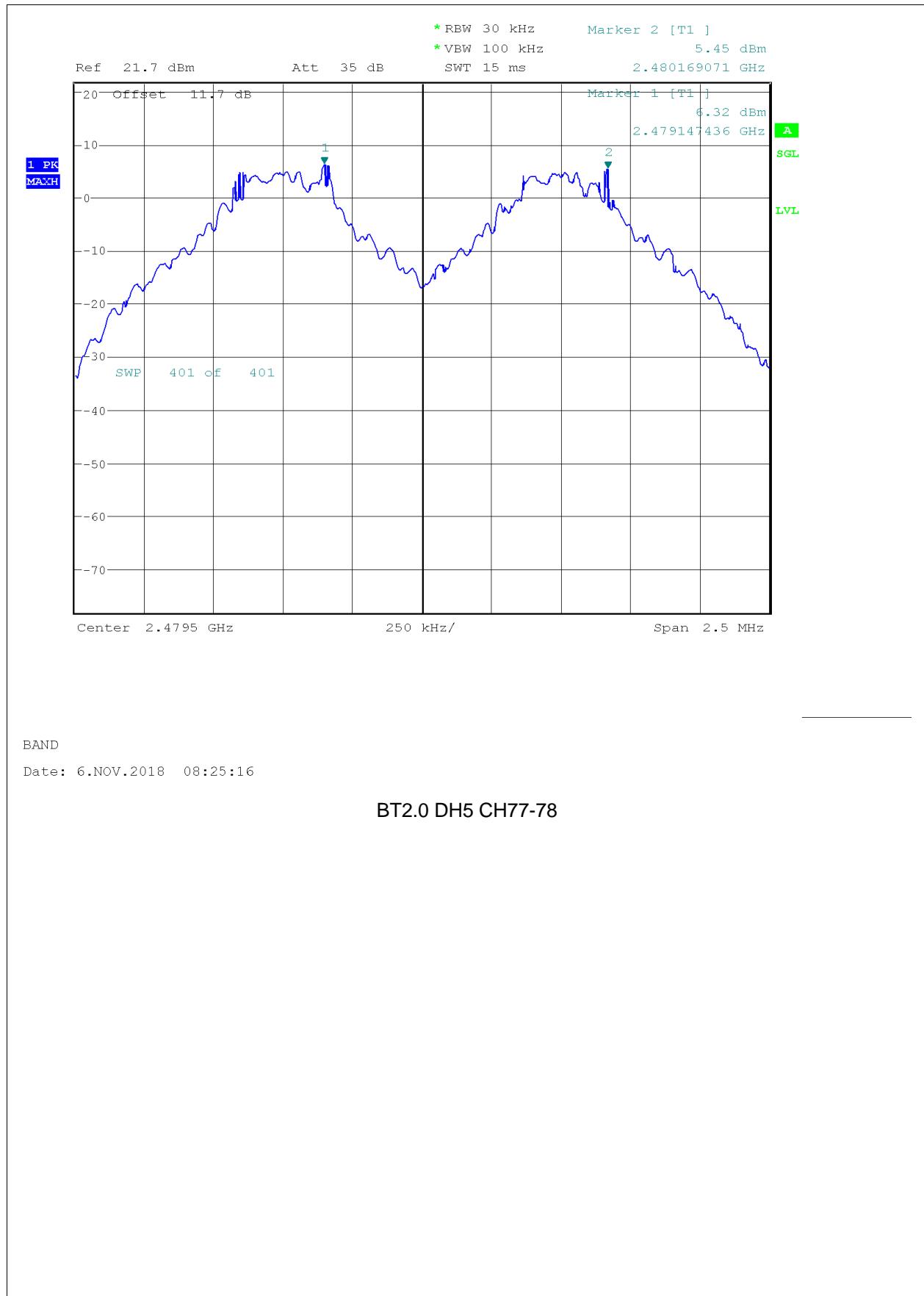
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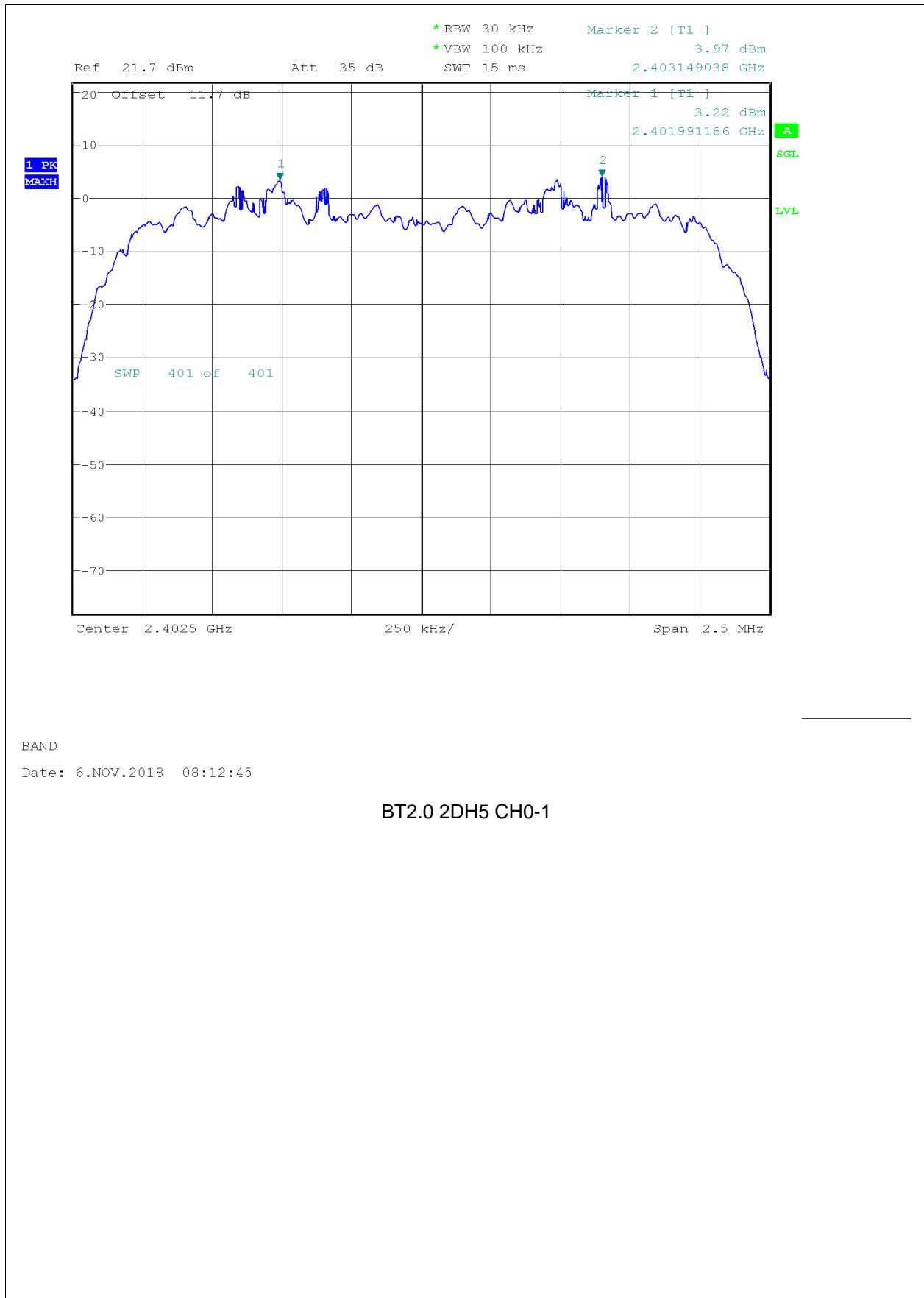
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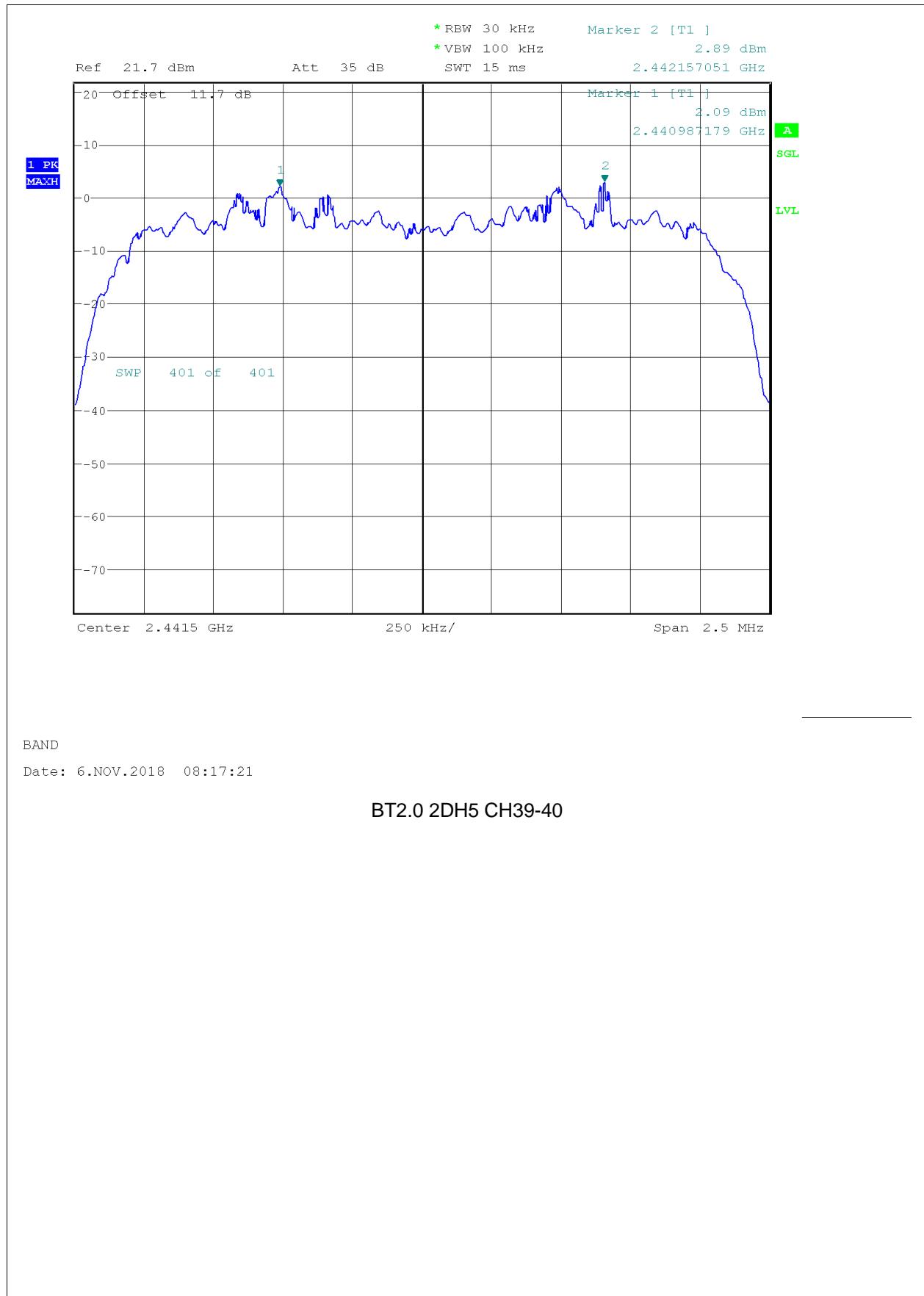
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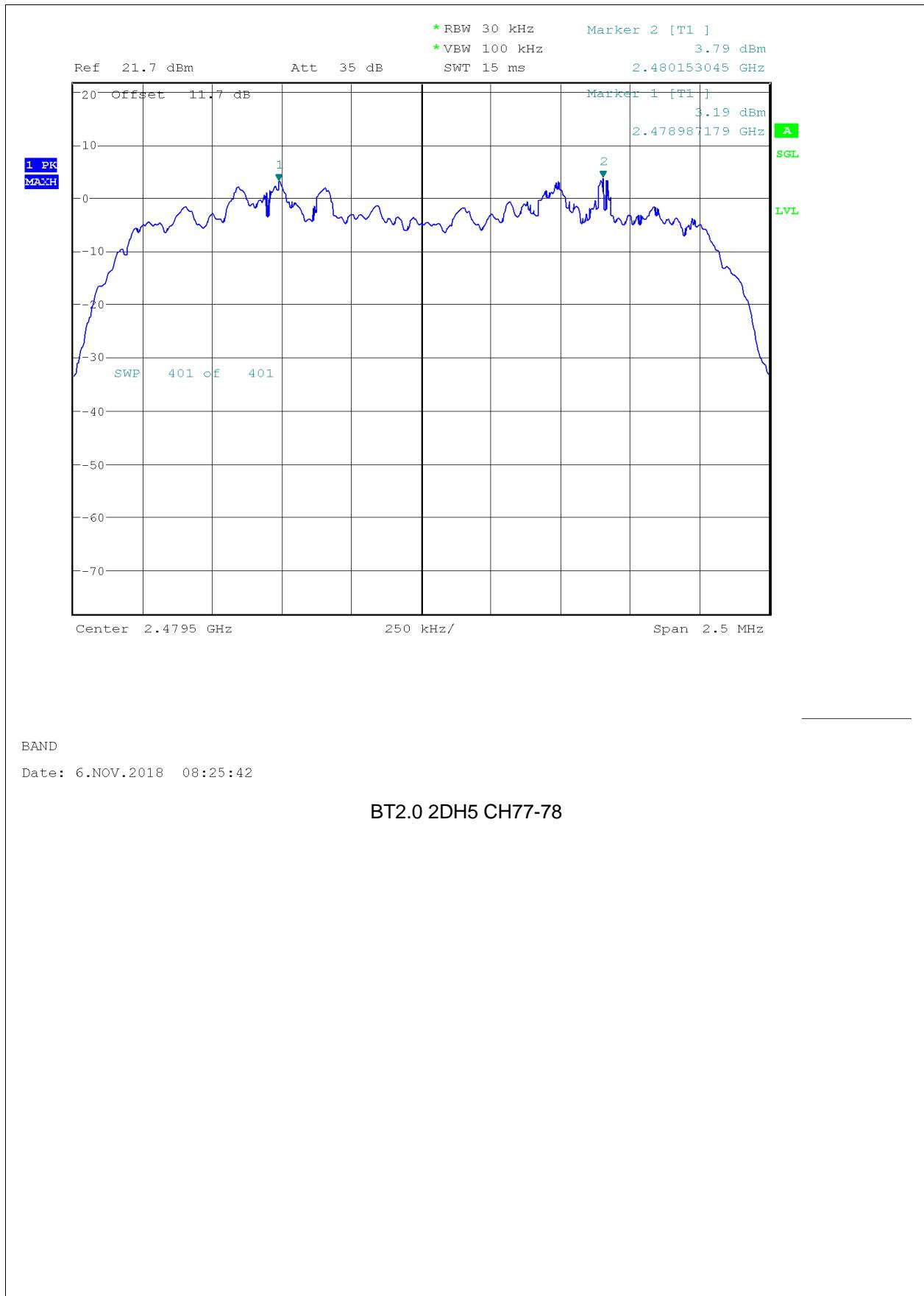
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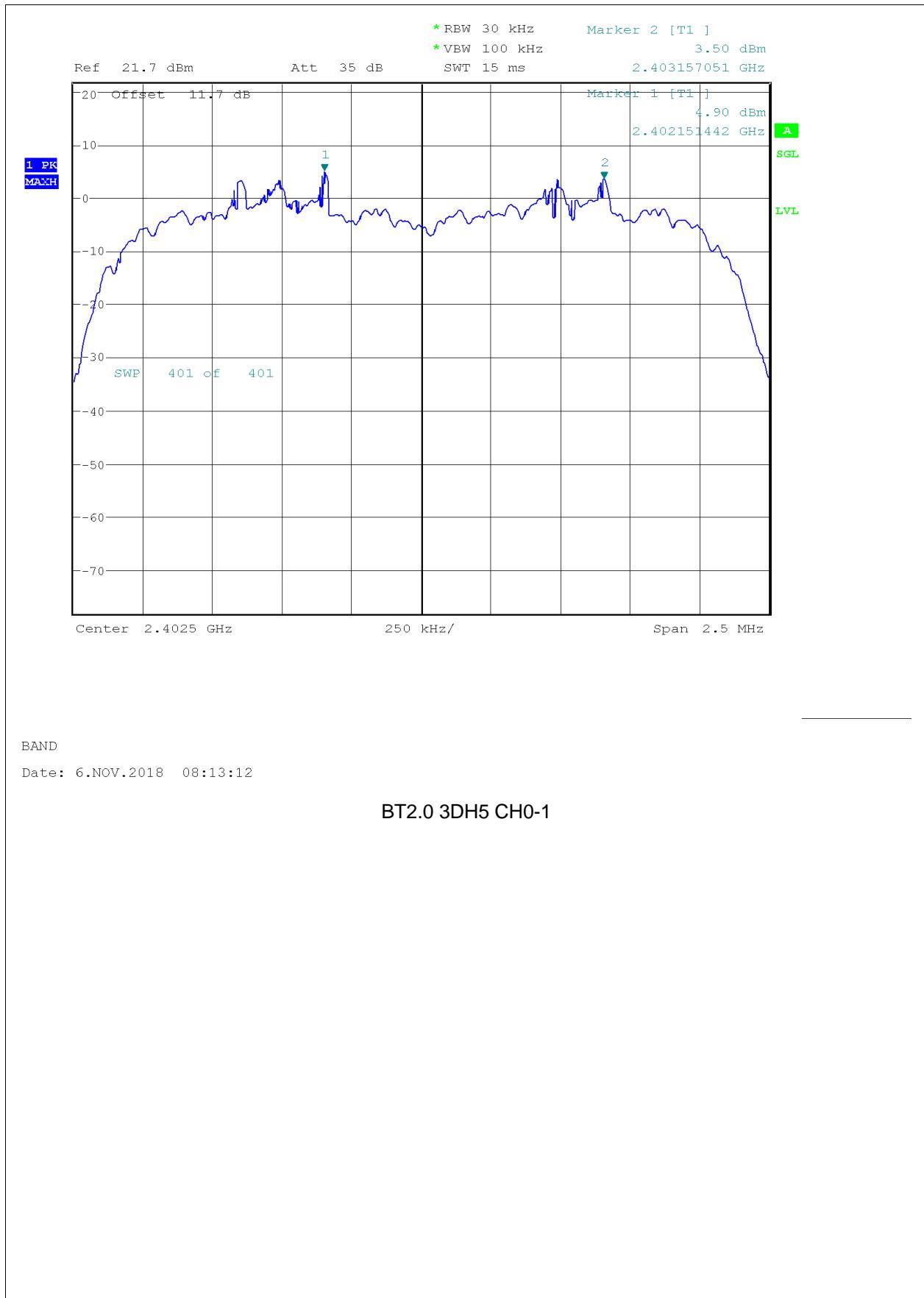
FCC RF TEST REPORT





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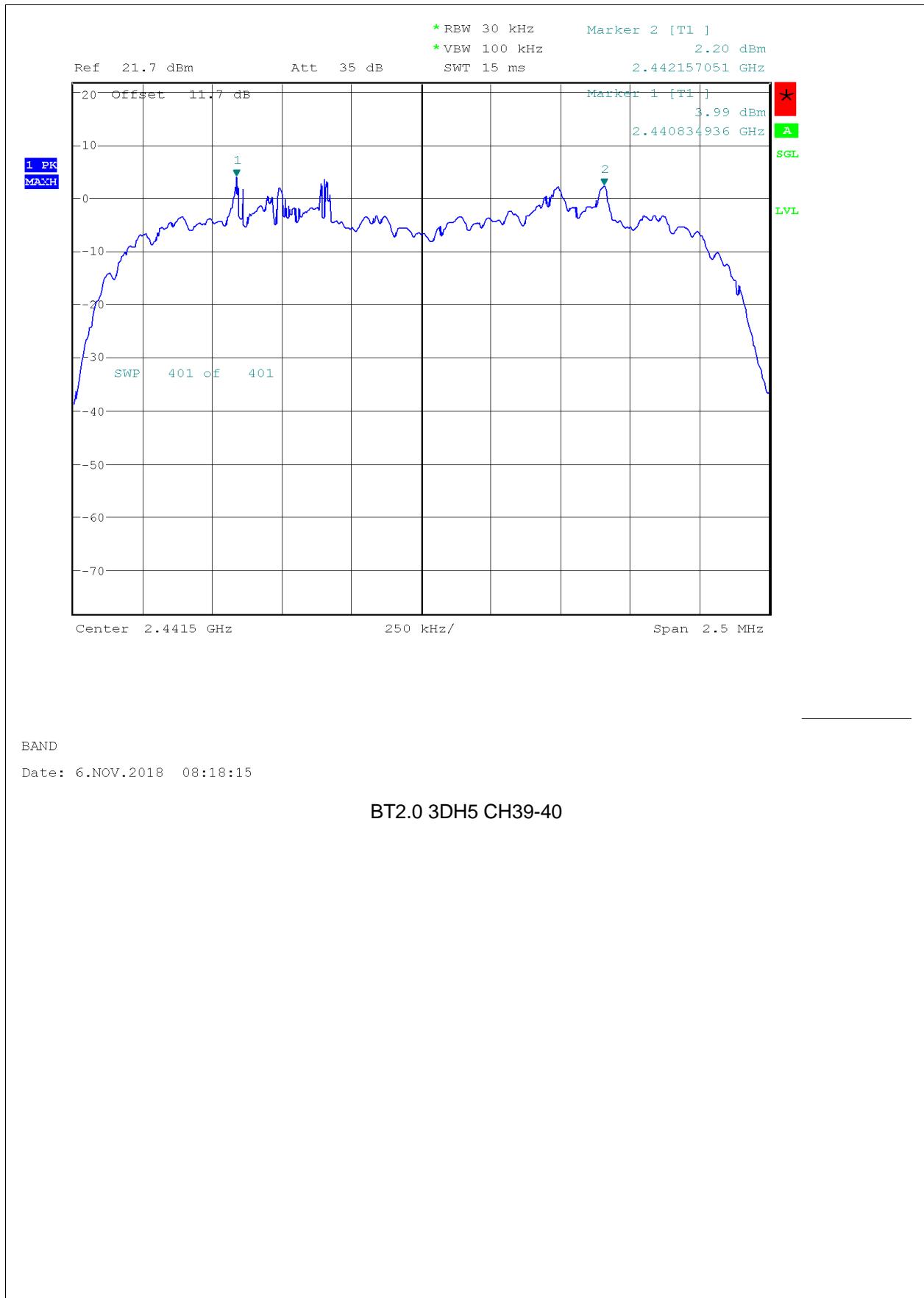
FCC RF TEST REPORT





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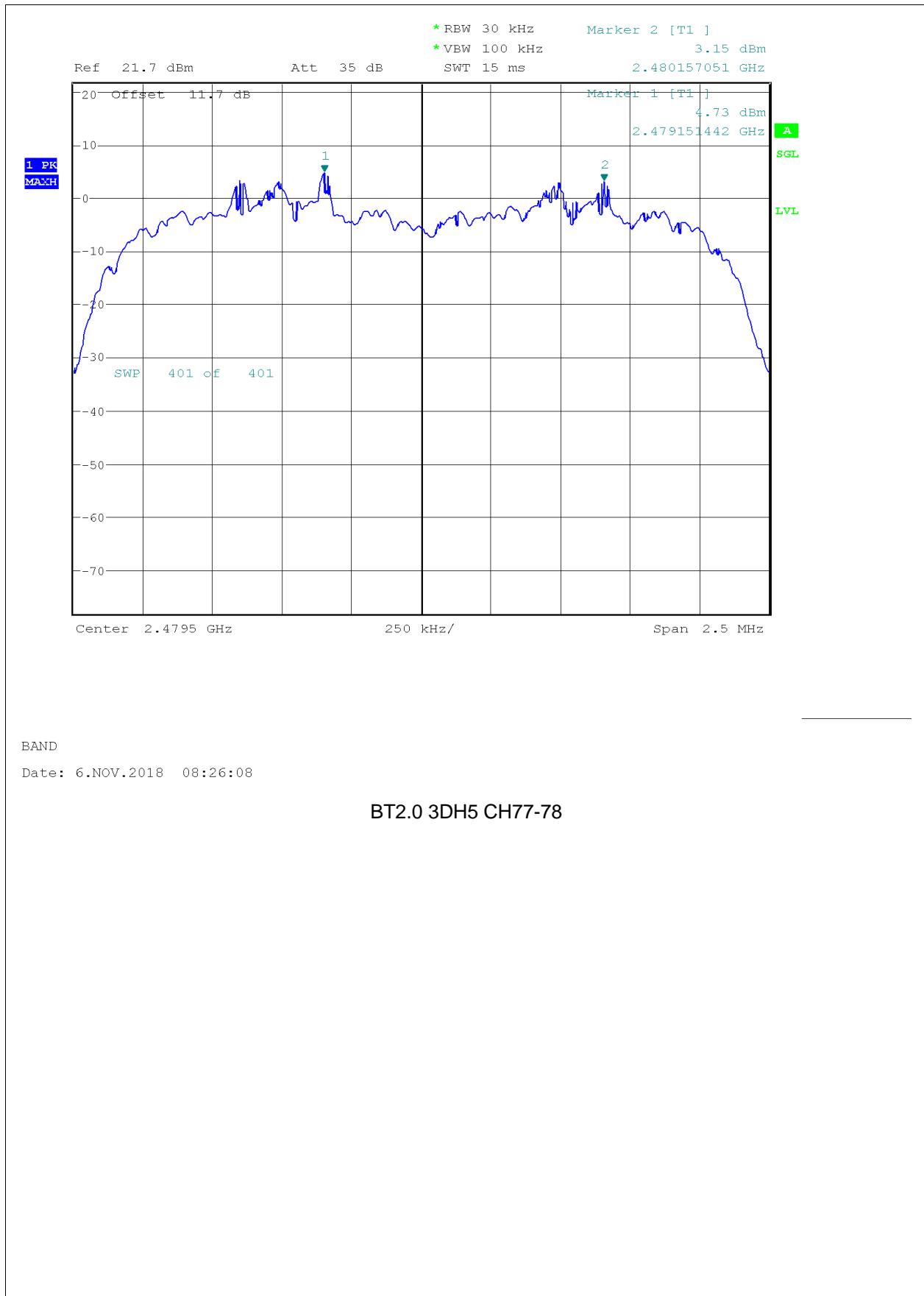
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## 5.3 Dwell Time

### 5.3.1 Description

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

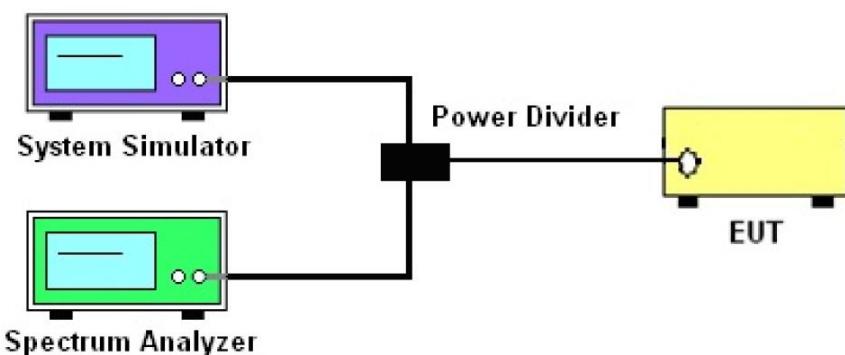
### 5.3.2 Test Instruments

The measuring equipment is listed in the section 4.1 of this test report.

### 5.3.3 Test Procedure

- a. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss compensated to the results for each measurement.
- b. Set to the maximum power setting and enable the EUT transmit continuously.
- c. Enable the EUT hopping function.
- d. Use the following spectrum analyzer setting: Span=zero span, center on a hopping channel; RBW=1MHz; VBW $\geq$ RBW; Sweep =as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold.
- e. Record the measurement the results in the test report.

### 5.3.4 Test Setup



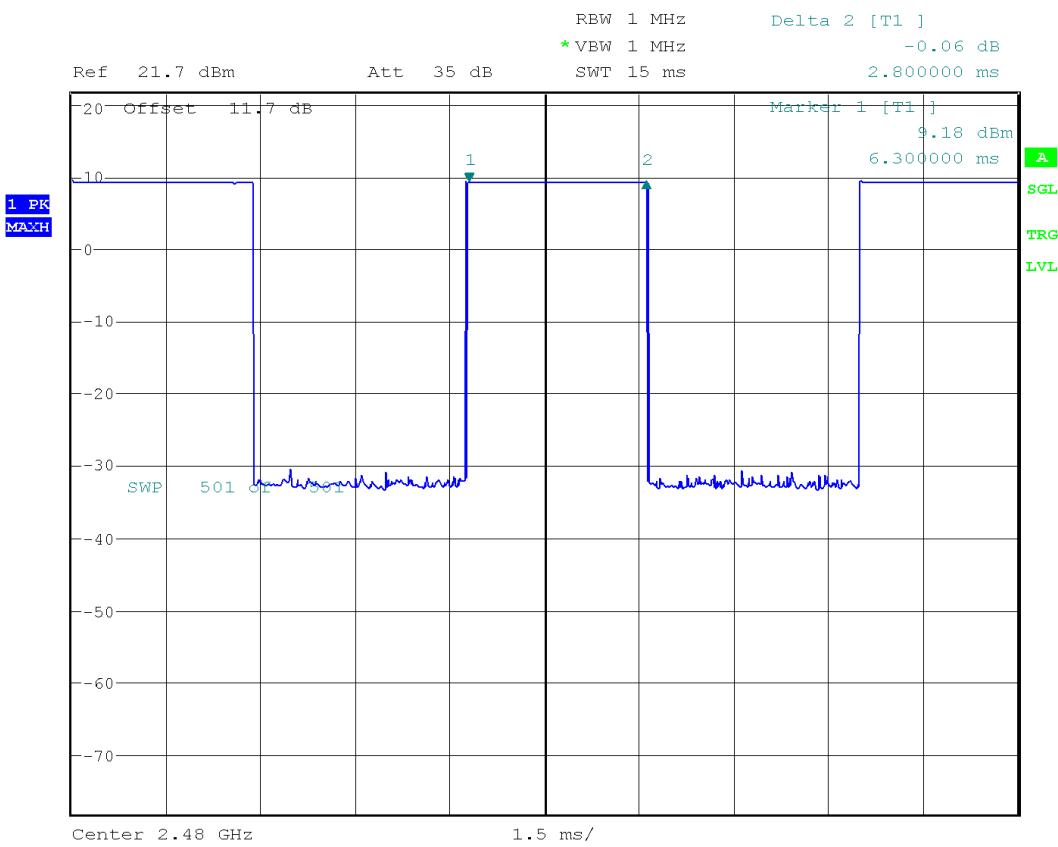


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### 5.3.5 Test Result

MODE	Number of Hopping Channel	Hops Over Occupany Time(hops)	Package Transfer Time(ms)	Dwell Time(ms)	Limit(ms )	P/F
DH5/NOR	79	106.67	2.80	298.68	400	PASS
2DH5/NOR	79	106.67	2.80	298.68	400	PASS
3DH5/NOR	79	106.67	2.80	298.68	400	PASS



BAND

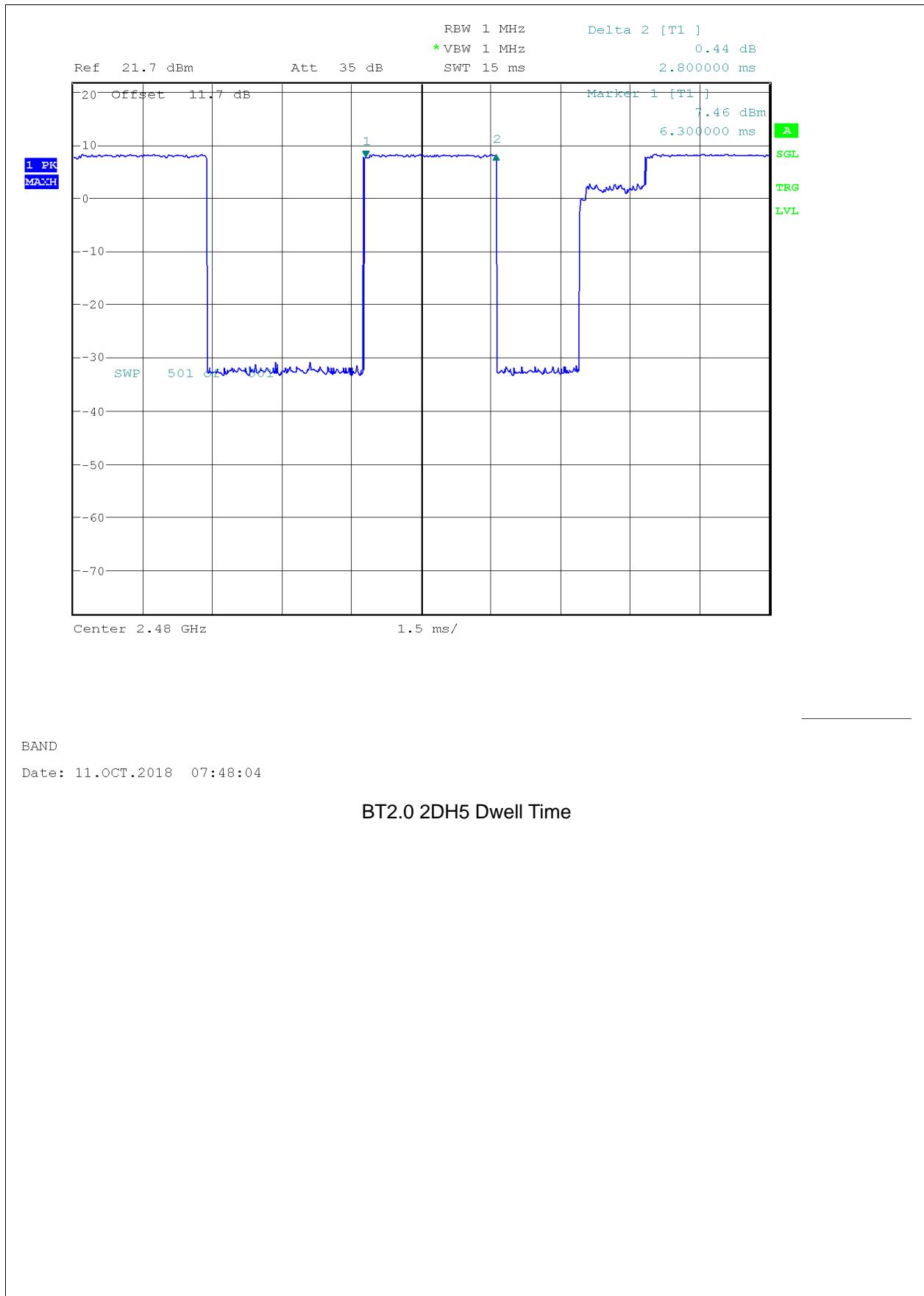
Date: 11.OCT.2018 07:47:32

BT2.0 DH5 Dwell Time



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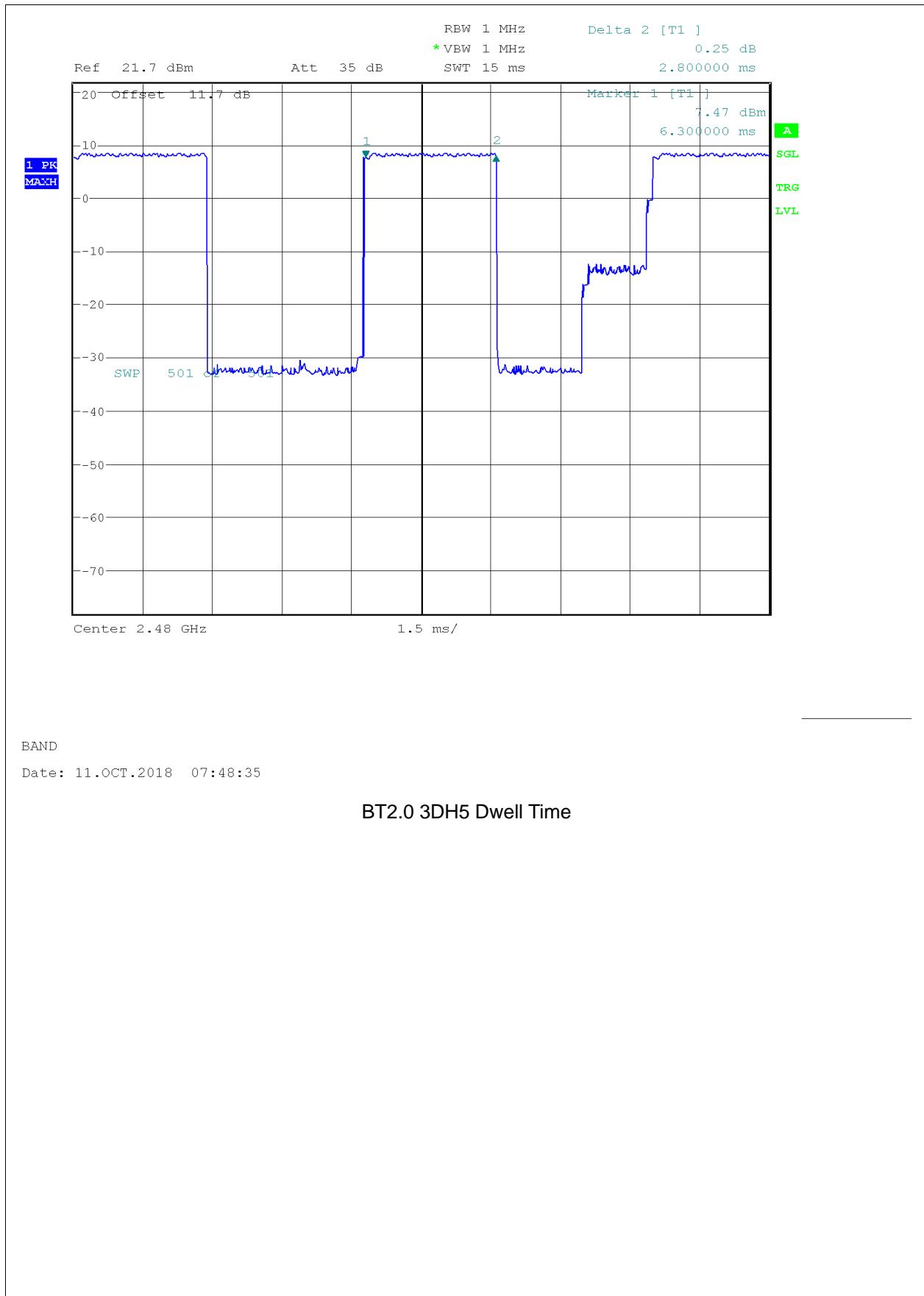
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## 5.4 20dB and 99% Bandwidth

### 5.4.1 Description

Reporting only.

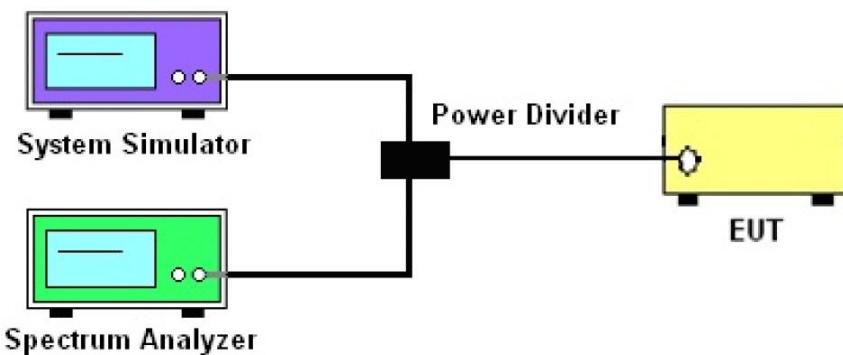
### 5.4.2 Test Instruments

The measuring equipment is listed in the section 4.1 of this test report.

### 5.4.3 Test Procedure

- a. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss compensated to the results for each measurement.
- b. Set to the maximum power setting and enable the EUT transmit continuously.
- c. Use the following spectrum analyzer setting for 20 dB Bandwidth: Span=approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel; RBW $\geq$ 1 % of the 20 dB bandwidth; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
- d. Use the following spectrum analyzer setting for 99 % Bandwidth: RBW=30kHz; VBW=100kHz; Sweep = auto; Detector function = sample; Trace = max hold.
- e. Record the measurement the results in the test report.

### 5.4.4 Test Setup





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#### 5.4.5 Test Result

DH5		
Channel	Frequency(MHz)	20dB Bandwidth(kHz)
0	2402	865.38
39	2441	948.72
78	2480	823.72

2DH5		
Channel	Frequency(MHz)	20dB Bandwidth(kHz)
0	2402	1302.88
39	2441	1298.08
78	2480	1283.65

3DH5		
Channel	Frequency(MHz)	20dB Bandwidth(kHz)
0	2402	1283.65
39	2441	1288.46
78	2480	1302.88

DH5		
Channel	Frequency(MHz)	OBW(kHz)
0	2402	855.77
39	2441	855.77
78	2480	862.18

2DH5		
Channel	Frequency(MHz)	OBW(kHz)
0	2402	1179.49
39	2441	1176.28
78	2480	1185.9

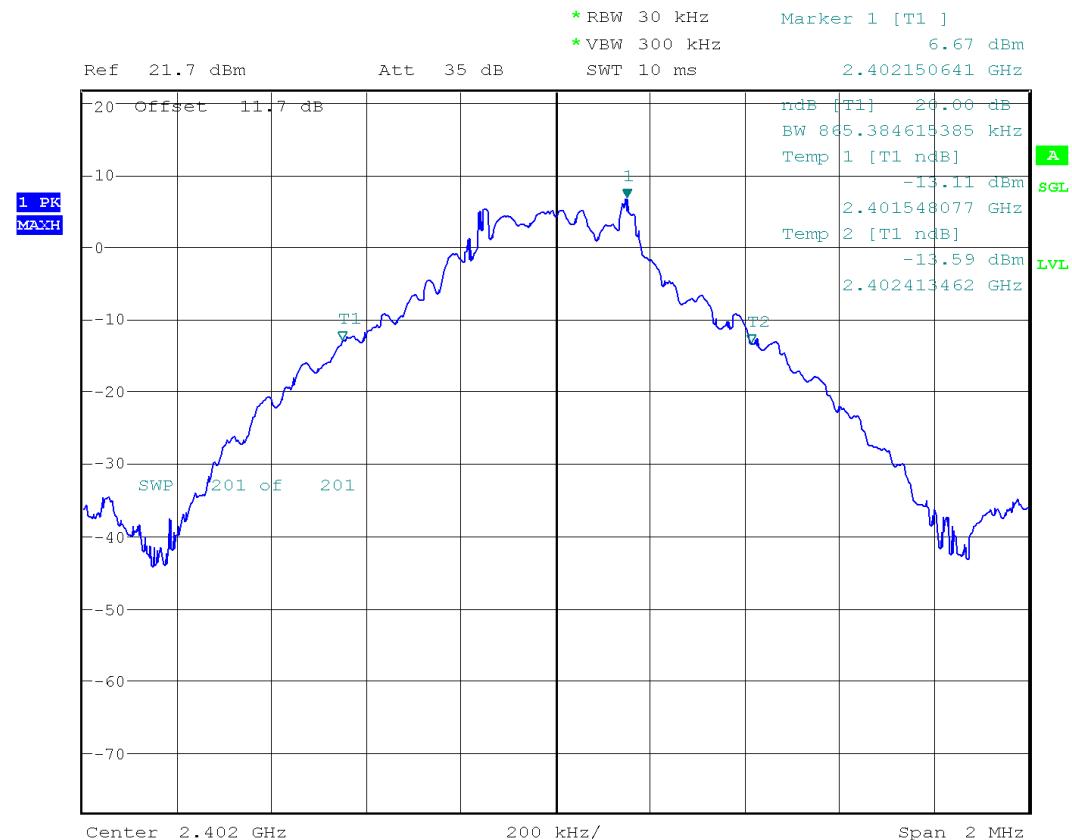
3DH5		
Channel	Frequency(MHz)	OBW(kHz)
0	2402	1185.9
39	2441	1185.9
78	2480	1192.31



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### 20dB Bandwidth:



BAND

Date: 6.NOV.2018 08:11:08

BT2.0 DH5 CH0 2402MHz



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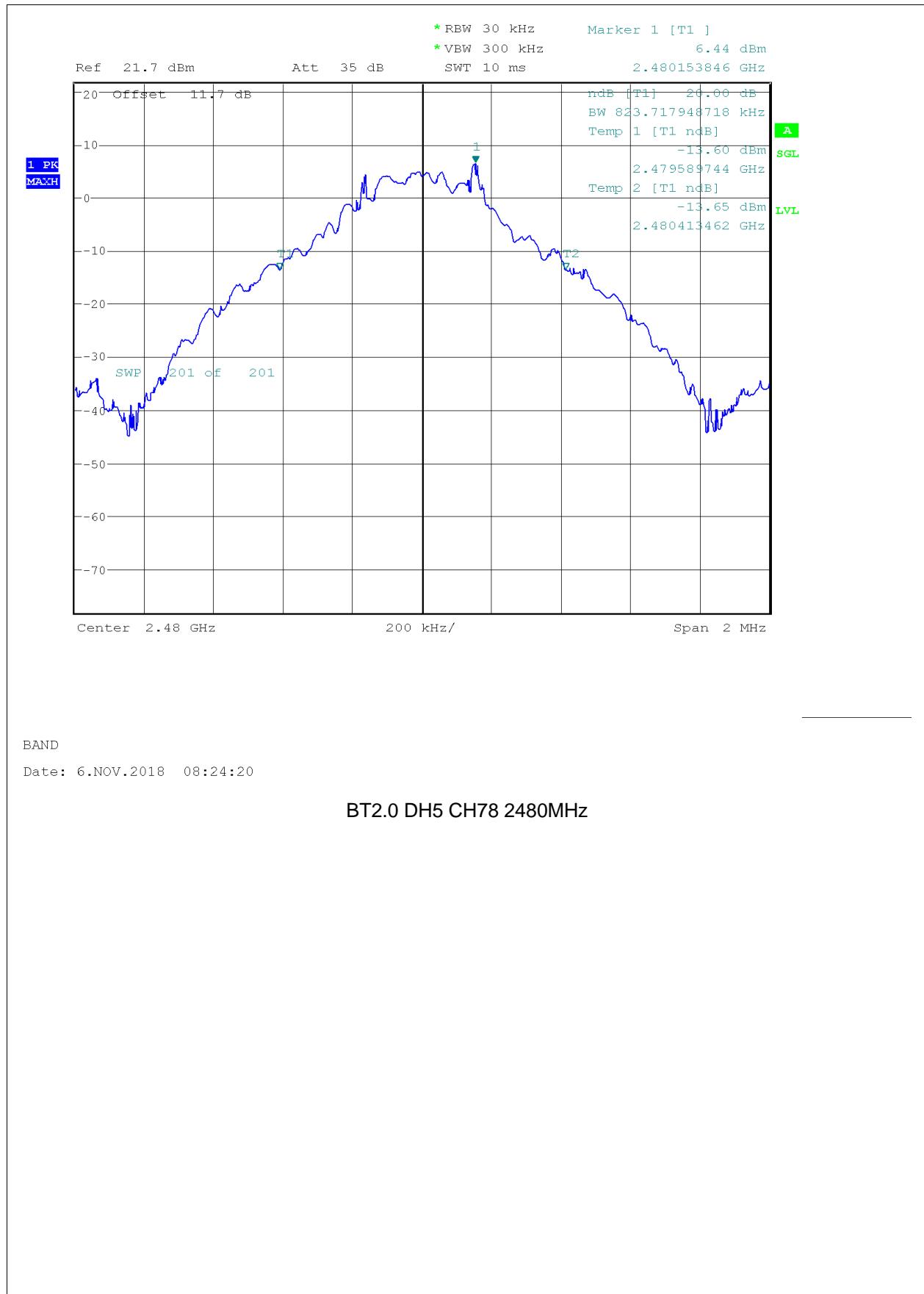
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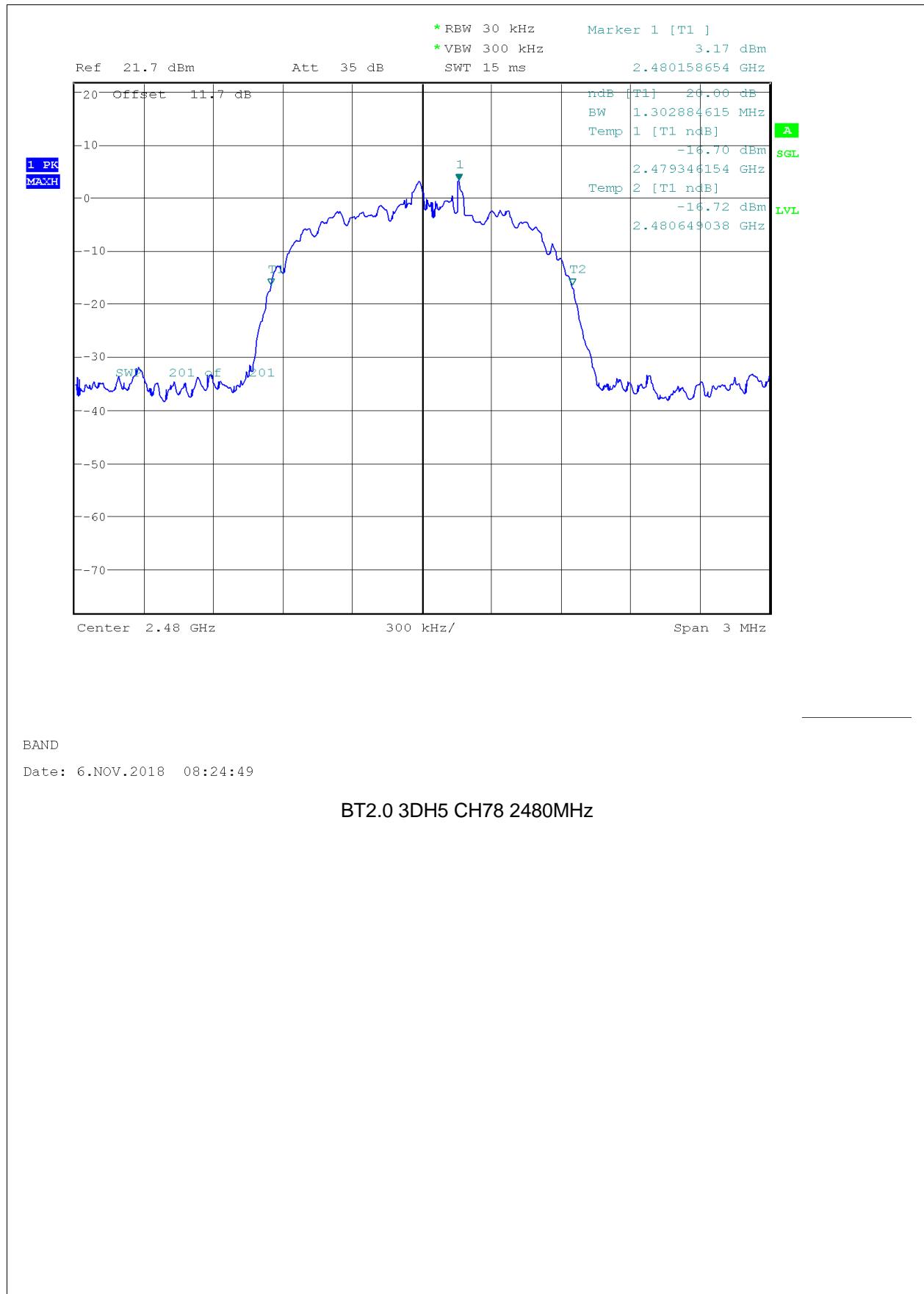
Date: 6.NOV.2018 08:14:59

BT2.0 3DH5 CH39 2441MHz



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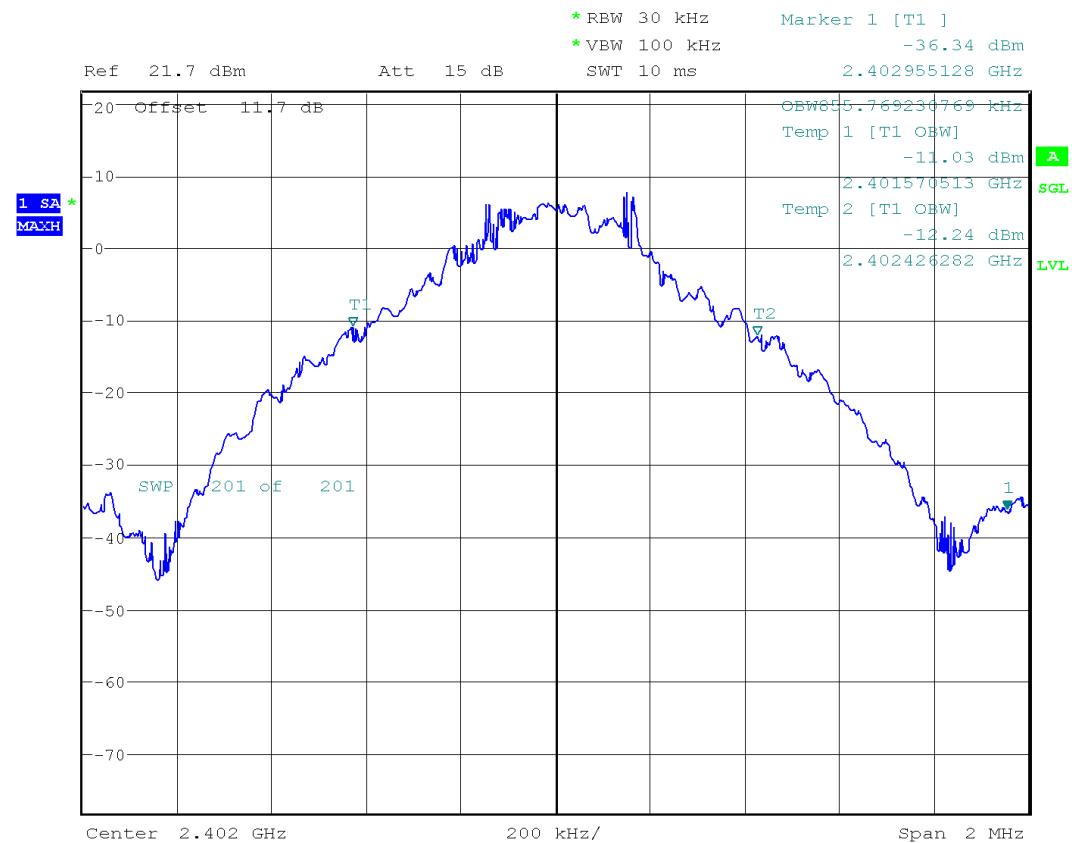




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### 99 % Bandwidth:



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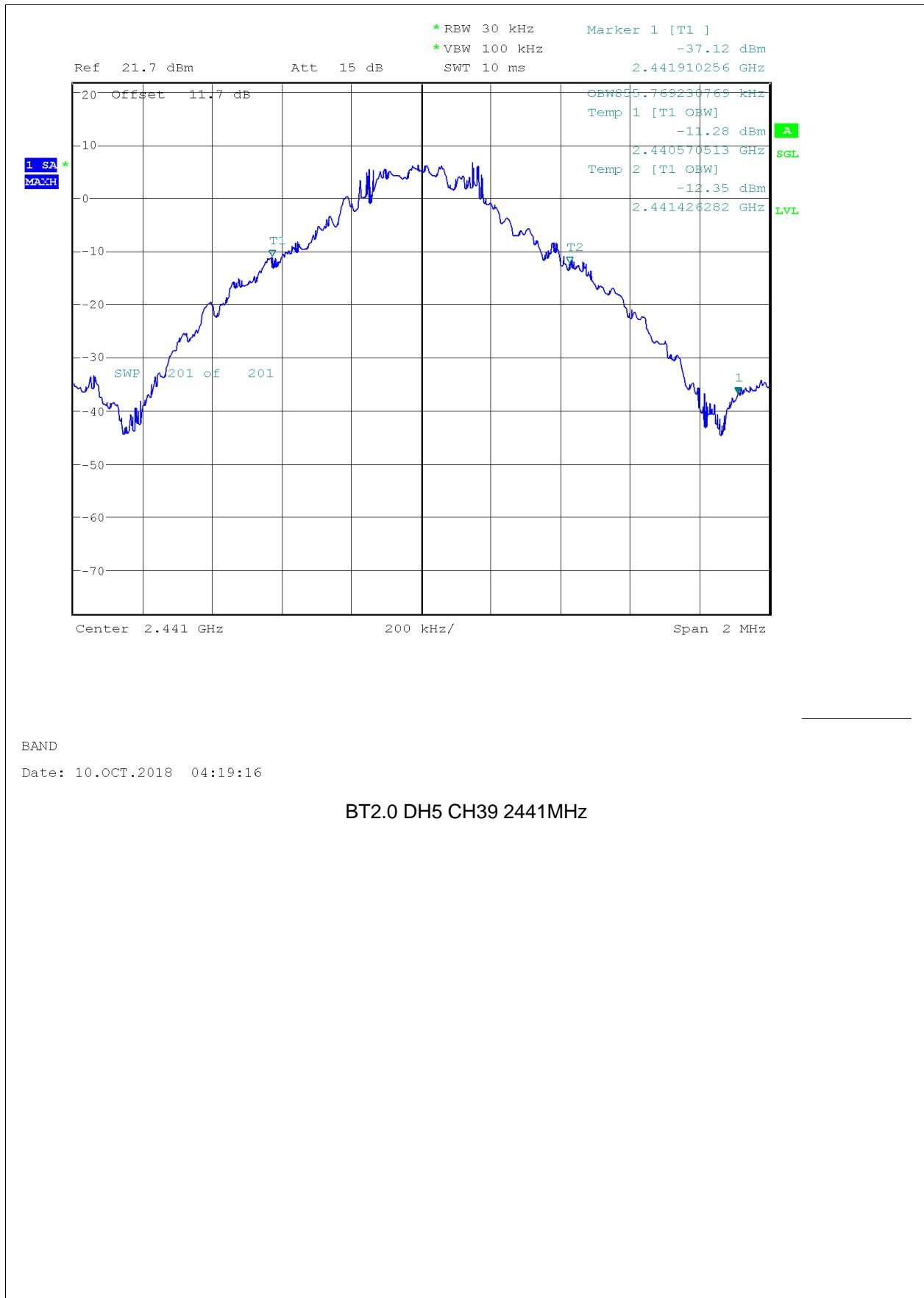
Date: 10.OCT.2018 03:57:17

BT2.0 DH5 CH0 2402MHz



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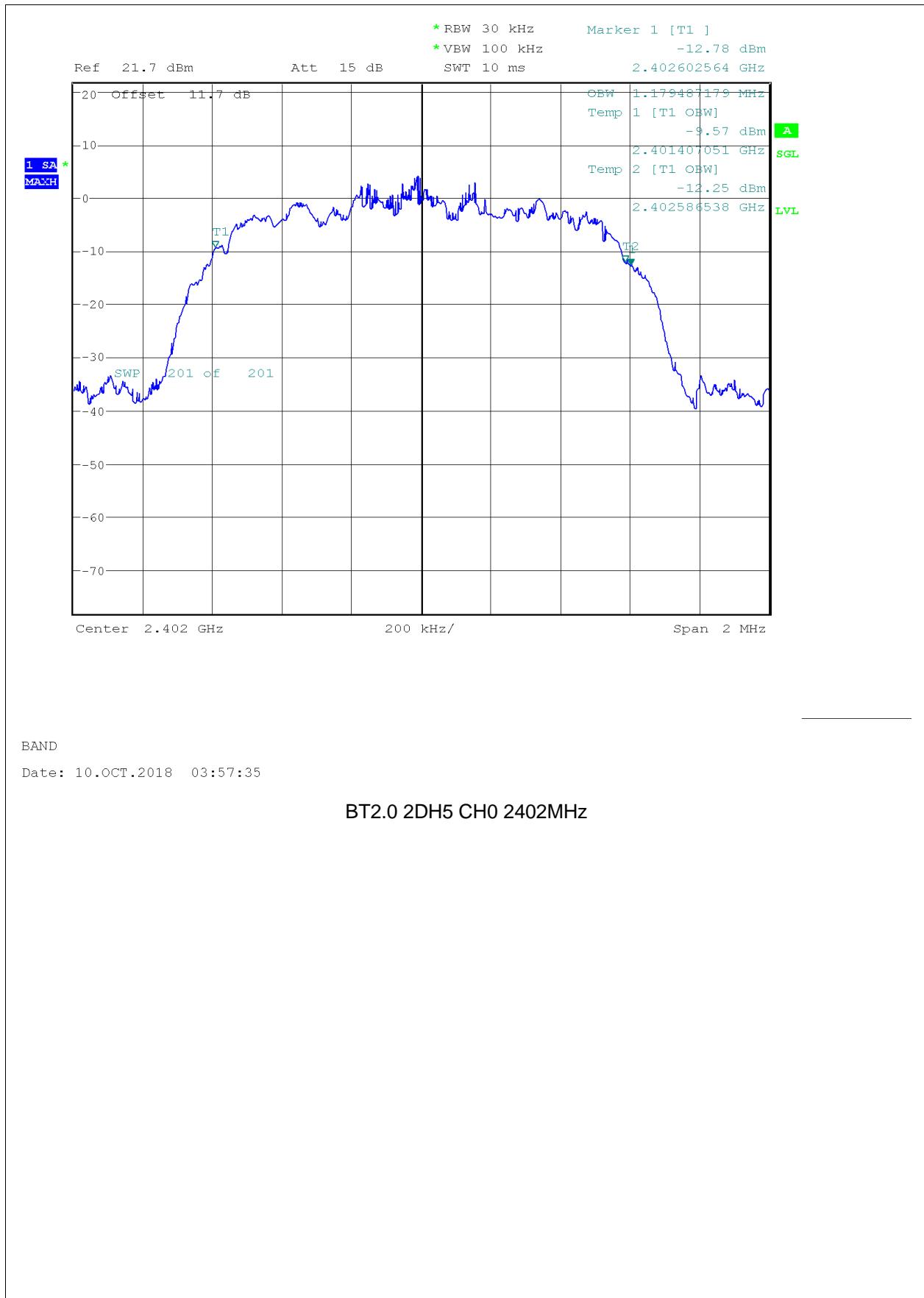
FCC RF TEST REPORT





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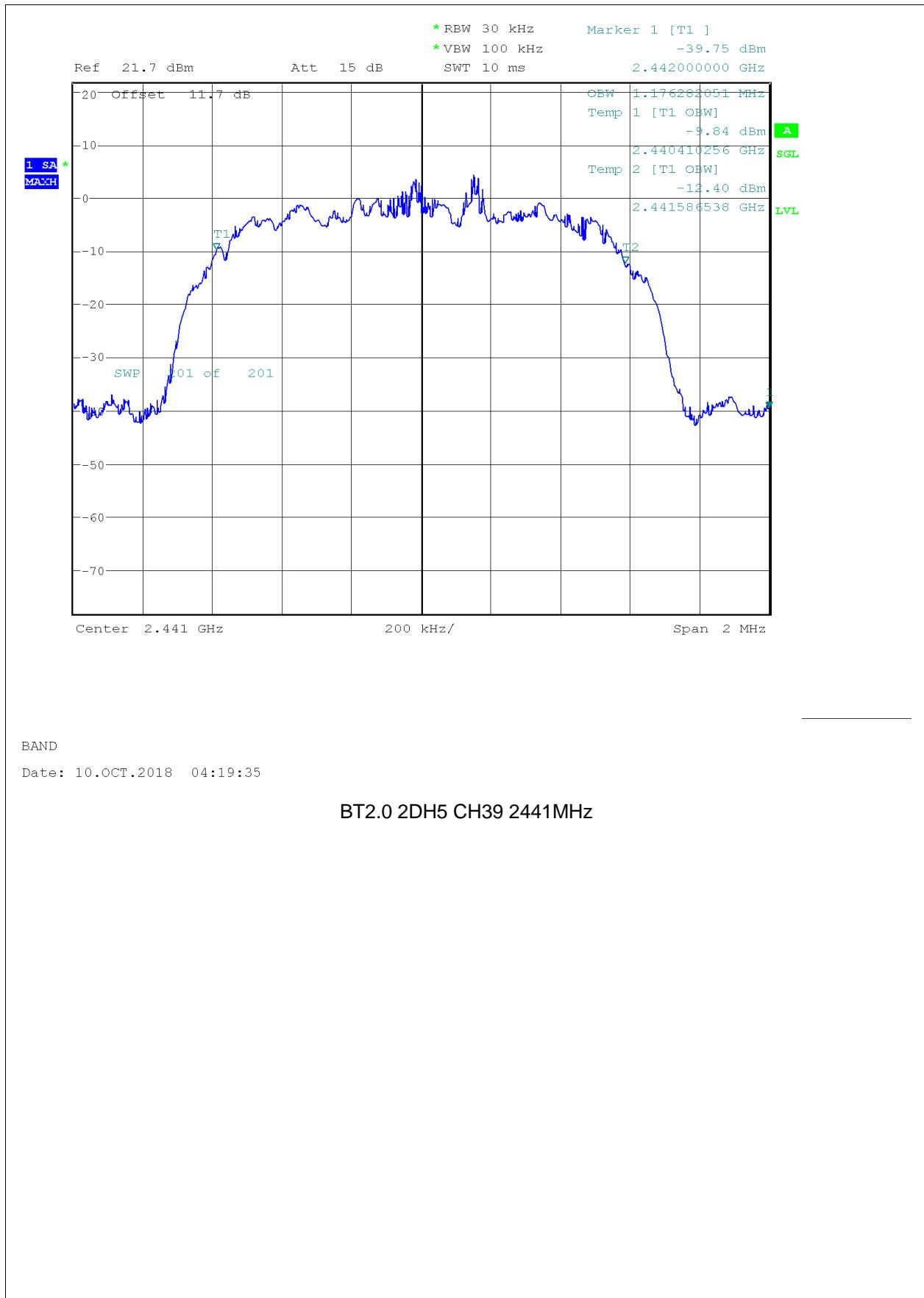
FCC RF TEST REPORT





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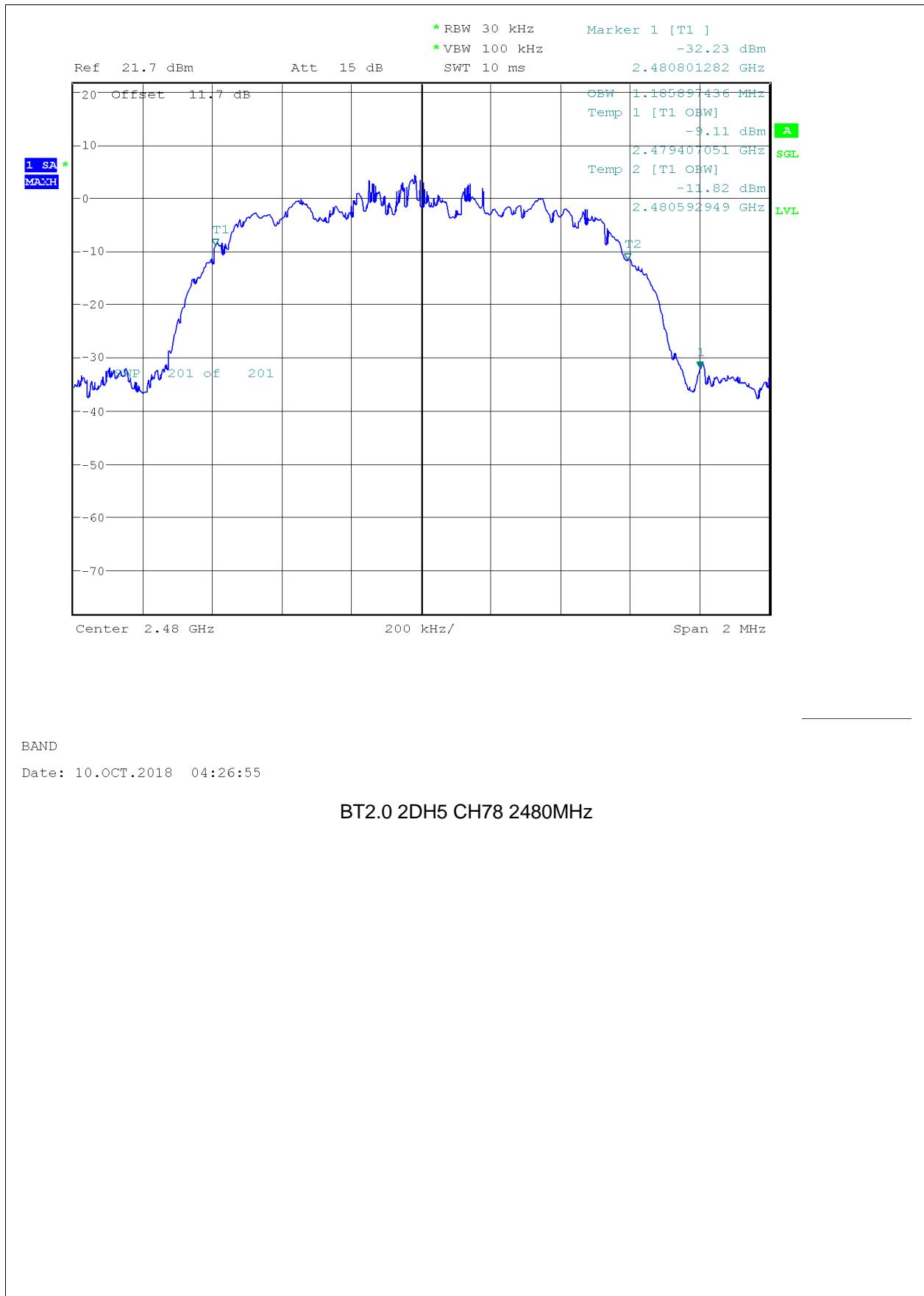
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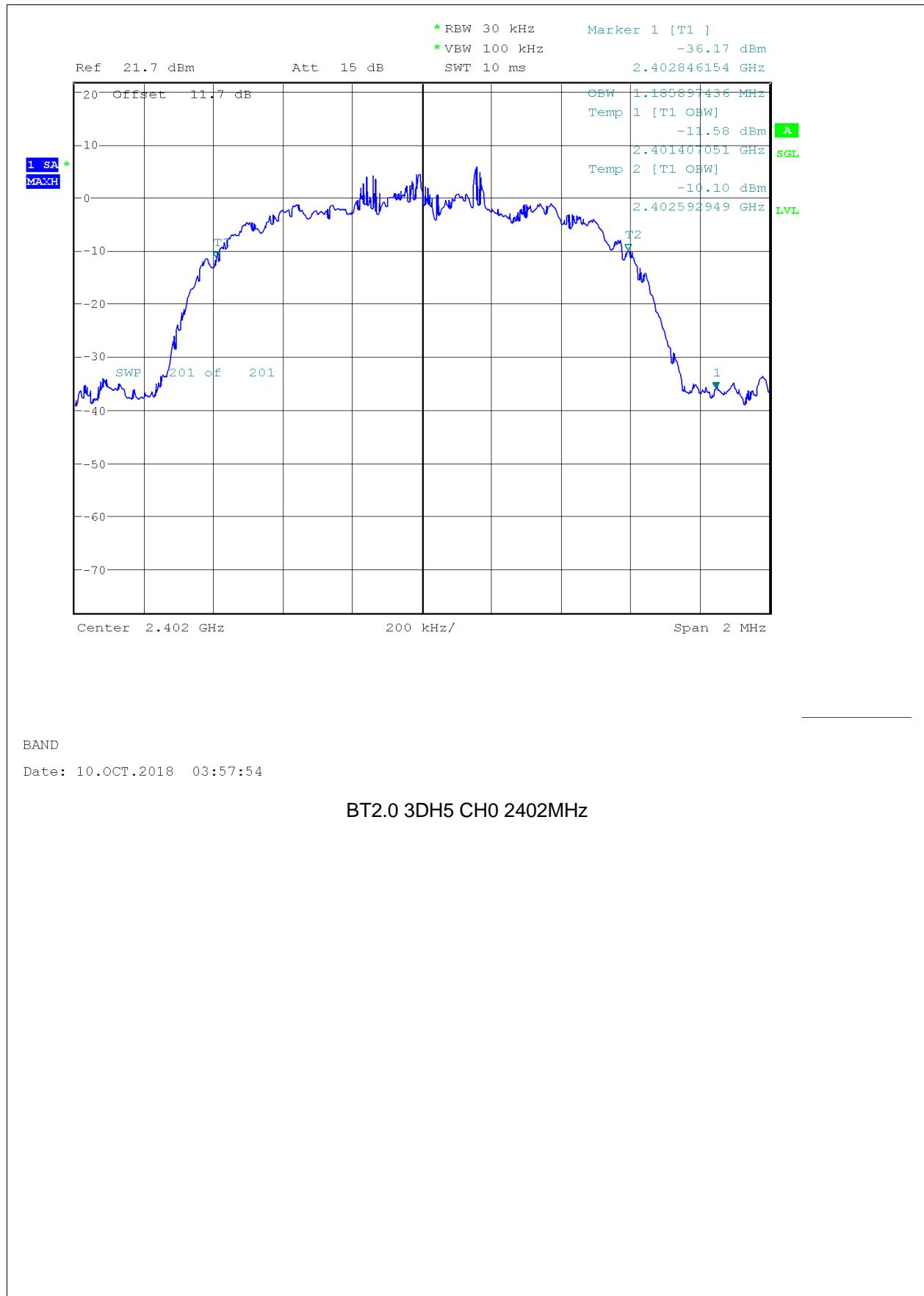
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BAND

Date: 10.OCT.2018 04:19:53

BT2.0 3DH5 CH39 2441MHz



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## 5.5 Peak Output Power

### 5.5.1 Description

Section 15.247(b) The maximum peak conducted output power of the intentional radiator shall not exceed the following: (1) For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850MHz band:1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band 0.125 watts.

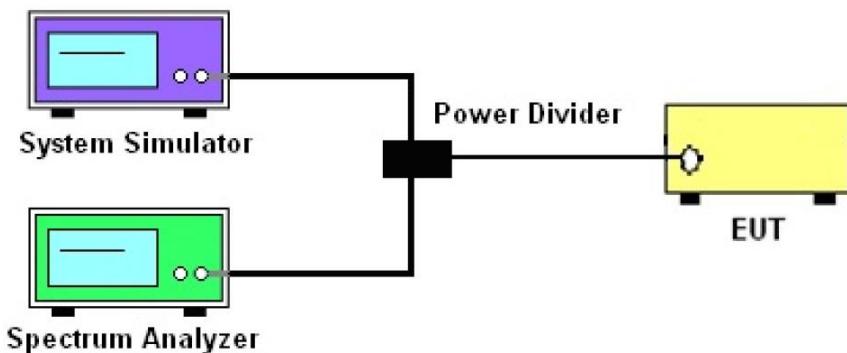
### 5.5.2 Test Instruments

The measuring equipment is listed in the section 4.1 of this test report.

### 5.5.3 Test Procedure

- a. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss compensated to the results for each measurement.
- b. Set to the maximum power setting and enable the EUT transmit continuously.
- c. Measure the conducted output power with cable loss and record the results in the test report.
- d. Record the measurement the results in the test report.

### 5.5.4 Test Setup





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### 5.5.5 Test Result

DH5				
Channel	Frequency(MHz)	Power(dBm)	Limit(dBm)	P/F
0	2402	9.52	21	PASS
39	2441	9.25	21	PASS
78	2480	9.72	21	PASS

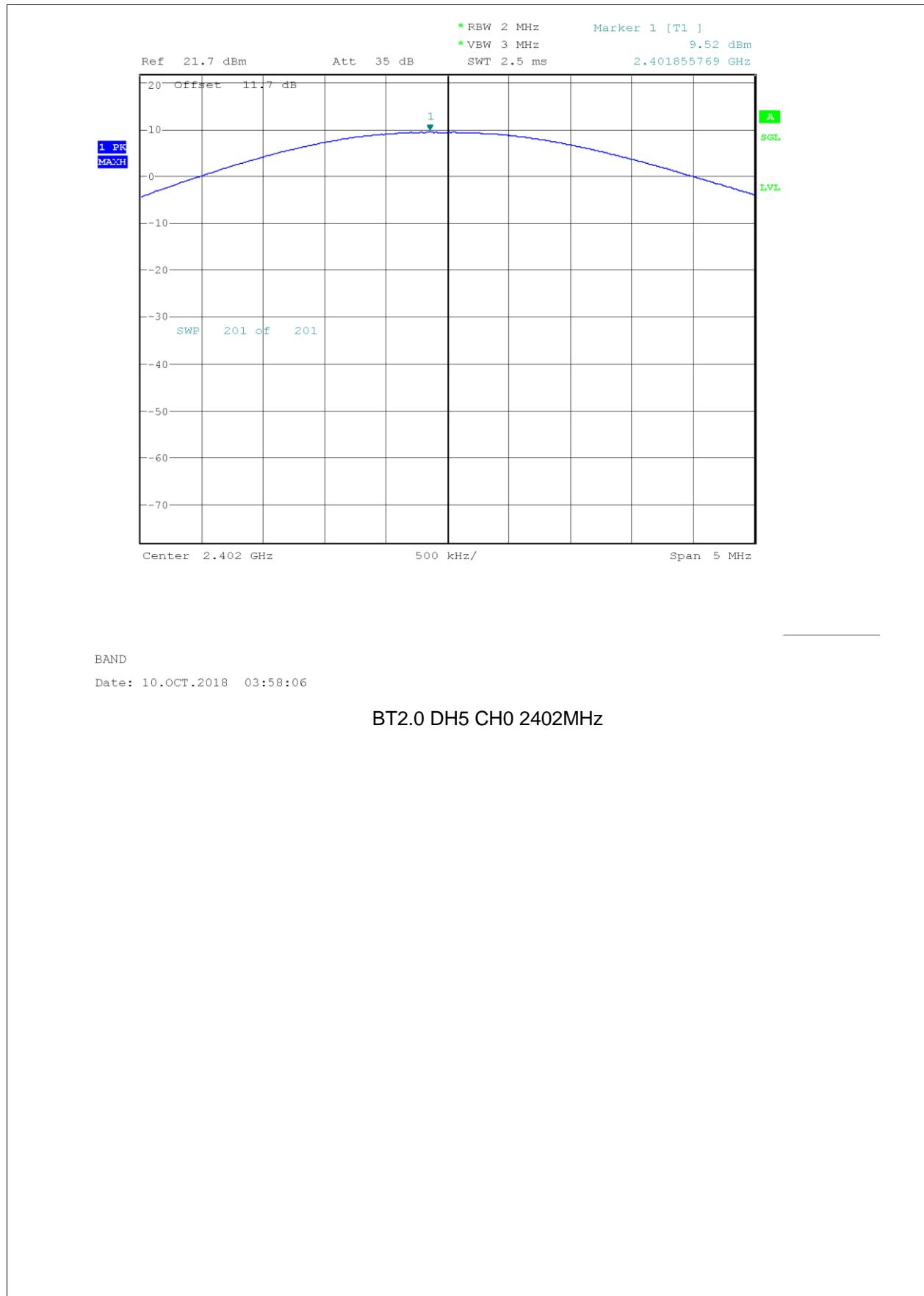
2DH5				
Channel	Frequency(MHz)	Power(dBm)	Limit(dBm)	P/F
0	2402	8.79	21	PASS
39	2441	8.36	21	PASS
78	2480	8.99	21	PASS

3DH5				
Channel	Frequency(MHz)	Power(dBm)	Limit(dBm)	P/F
0	2402	8.92	21	PASS
39	2441	8.67	21	PASS
78	2480	9.16	21	PASS



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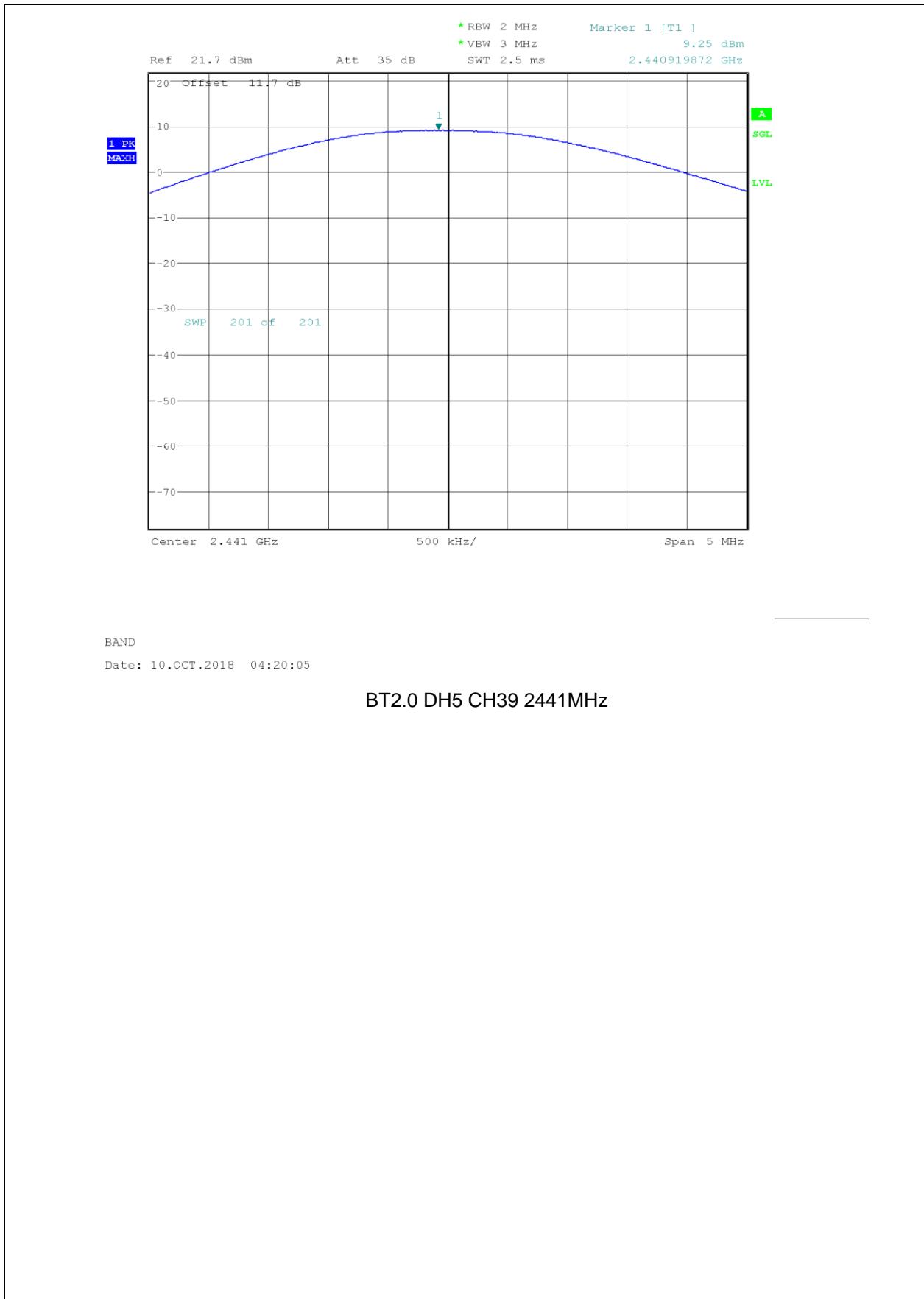
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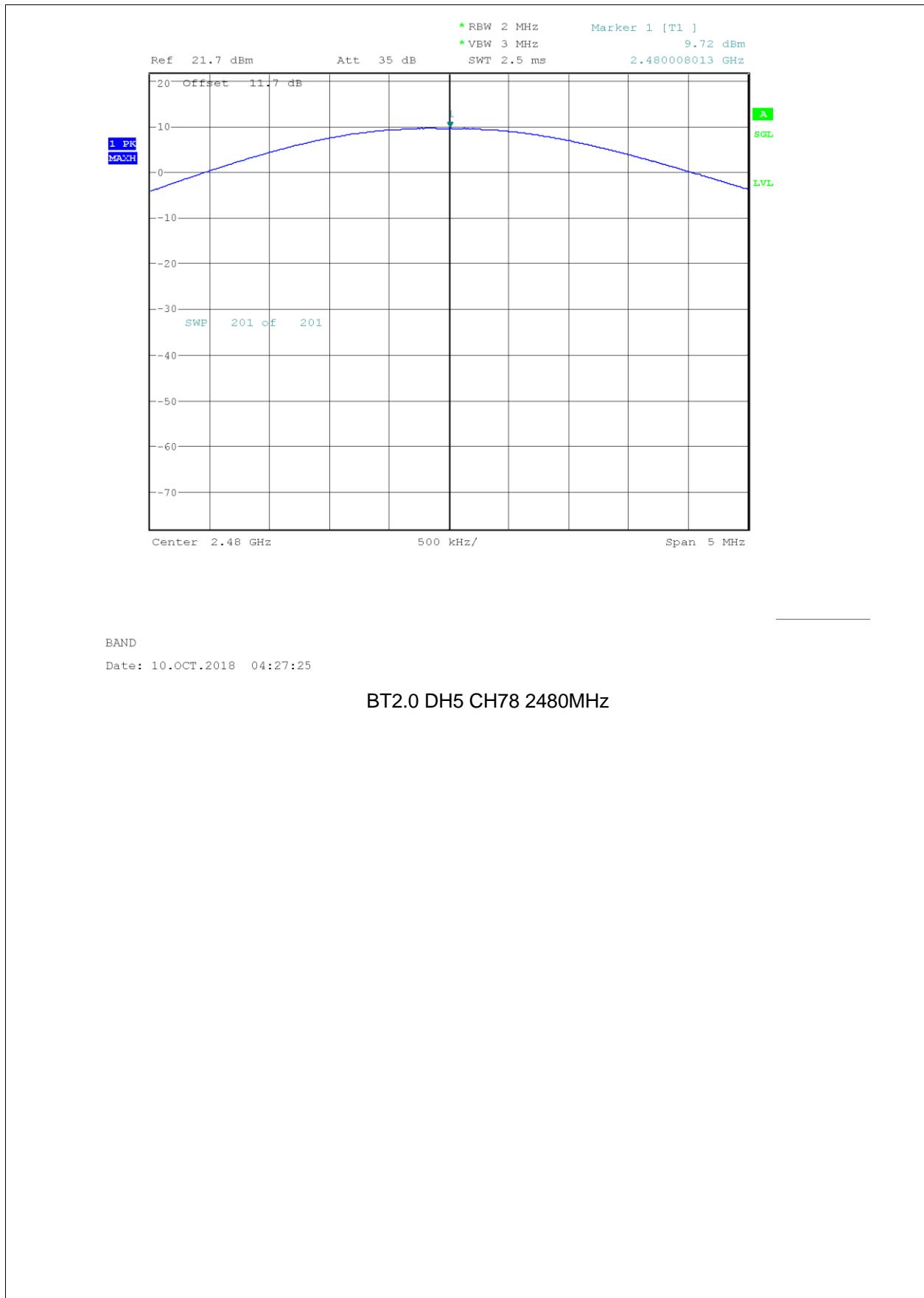
FCC RF TEST REPORT





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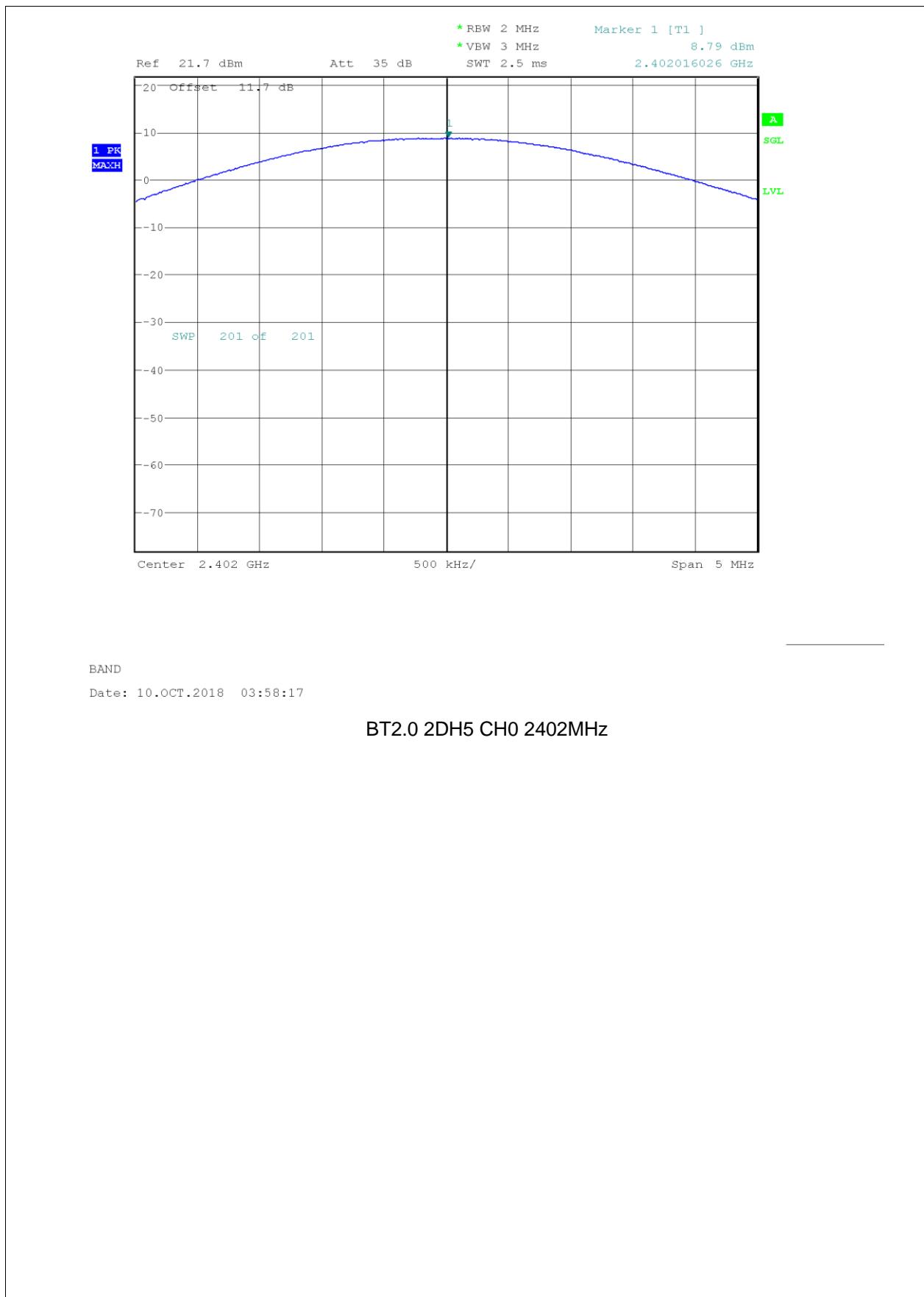
FCC RF TEST REPORT





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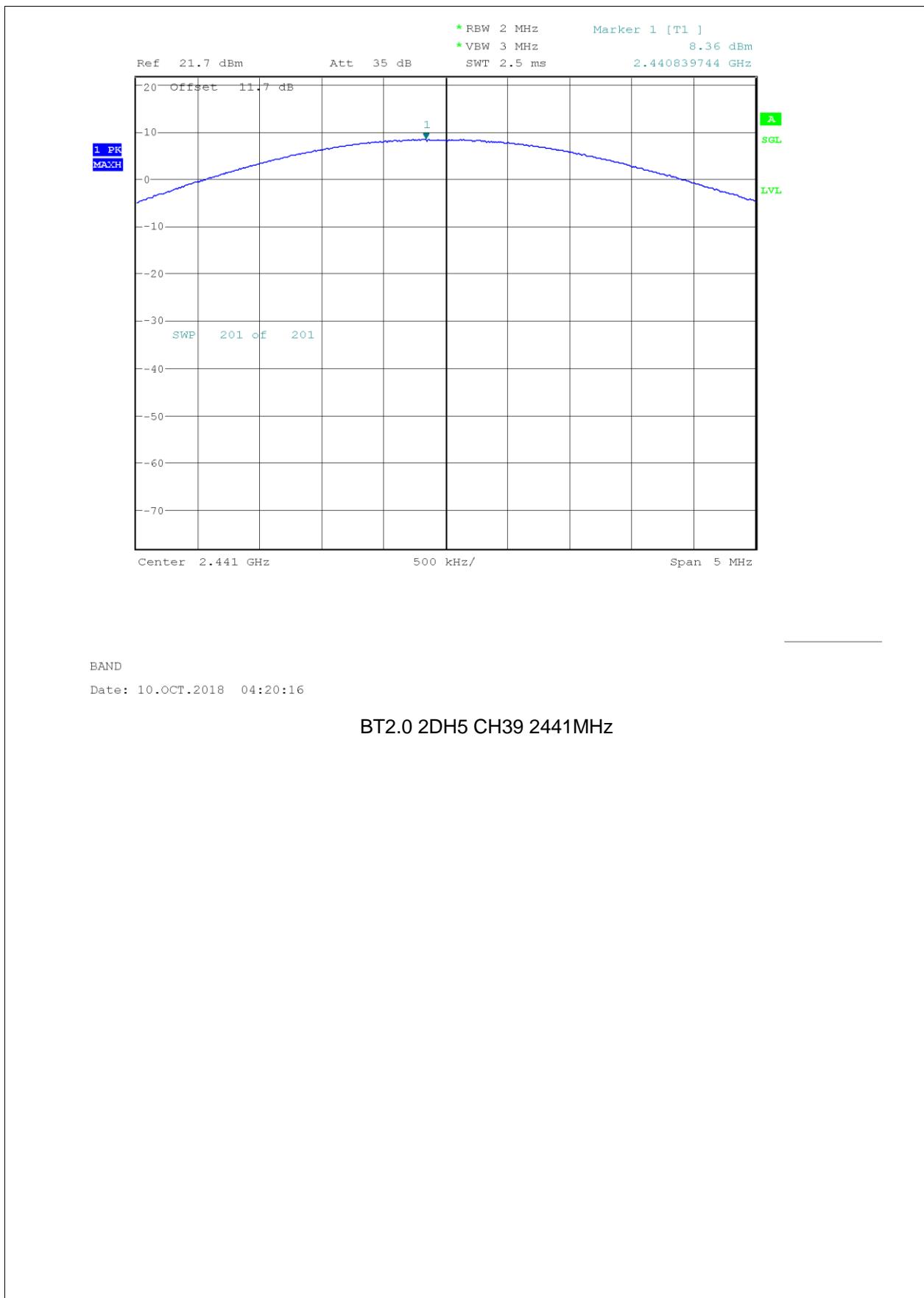
FCC RF TEST REPORT





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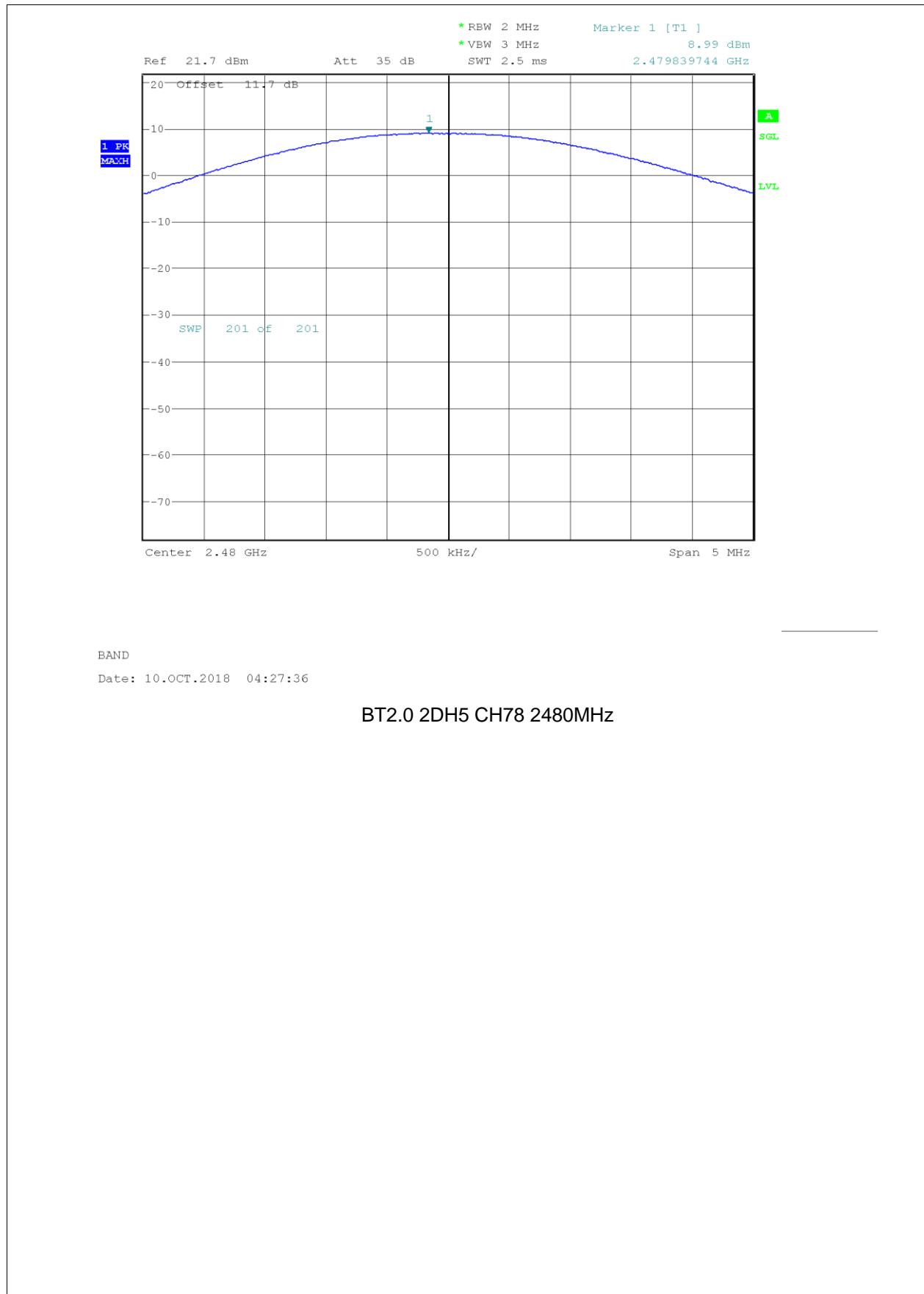
FCC RF TEST REPORT





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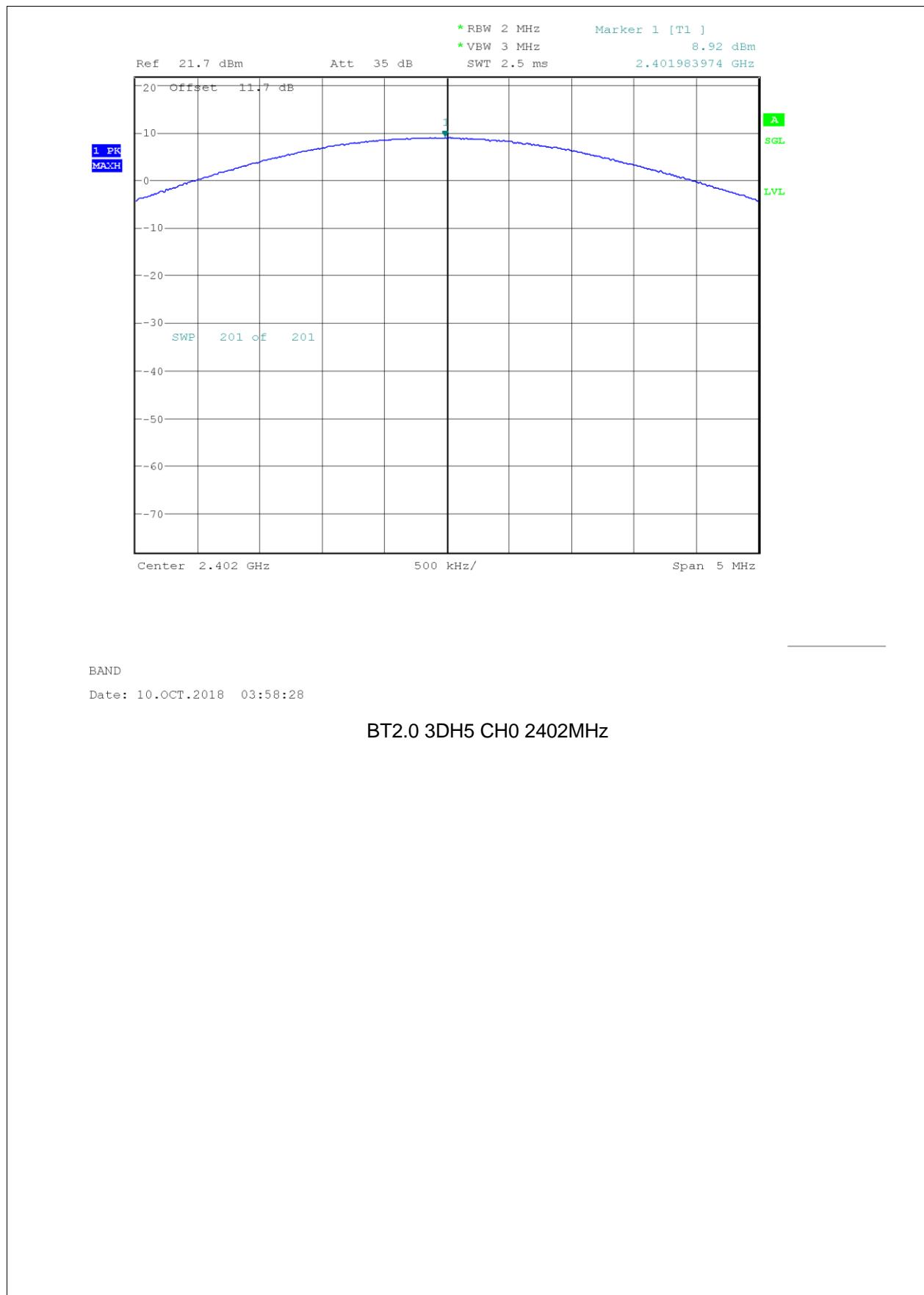
FCC RF TEST REPORT





Build Your Dreams!

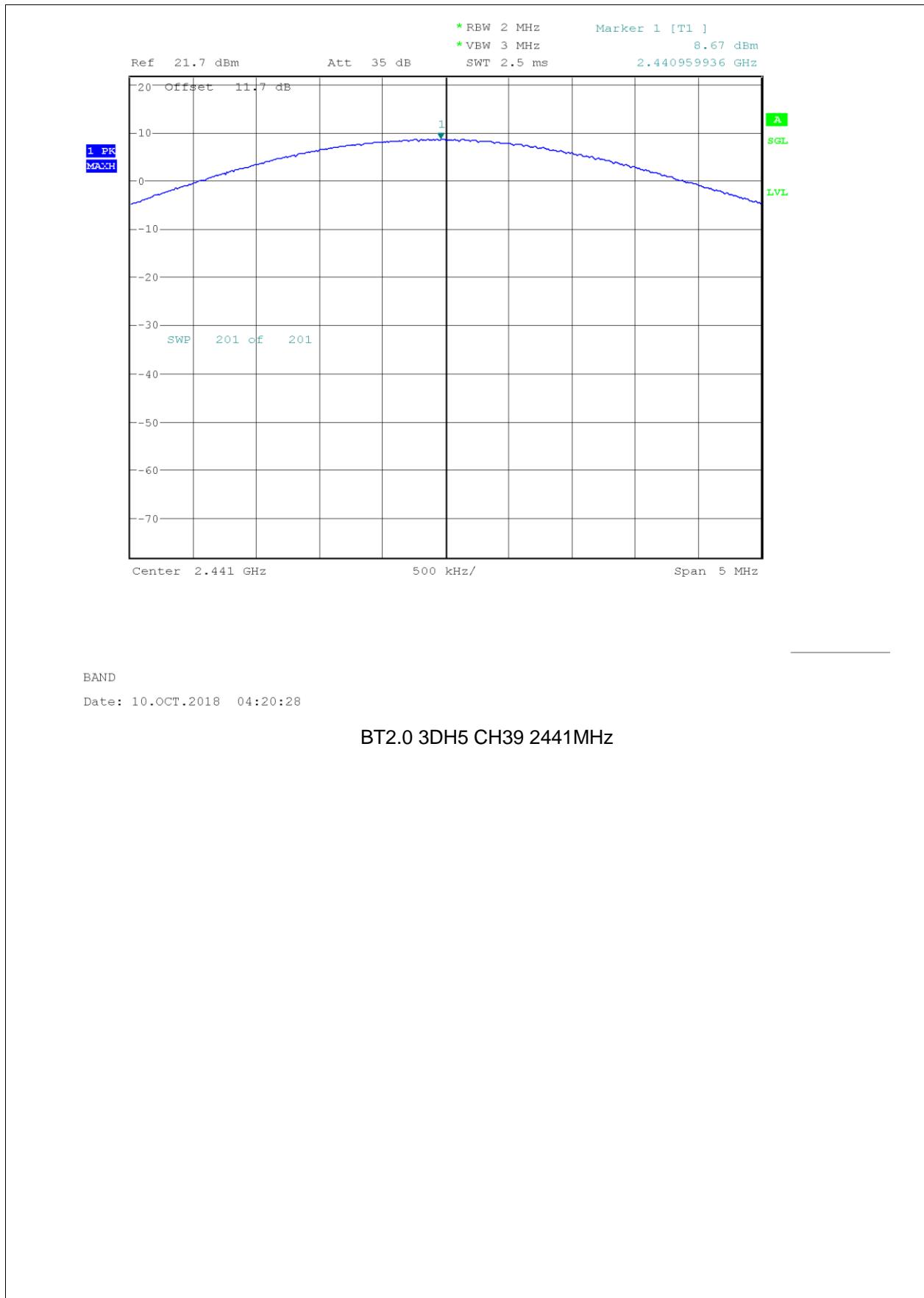
FCC RF TEST REPORT





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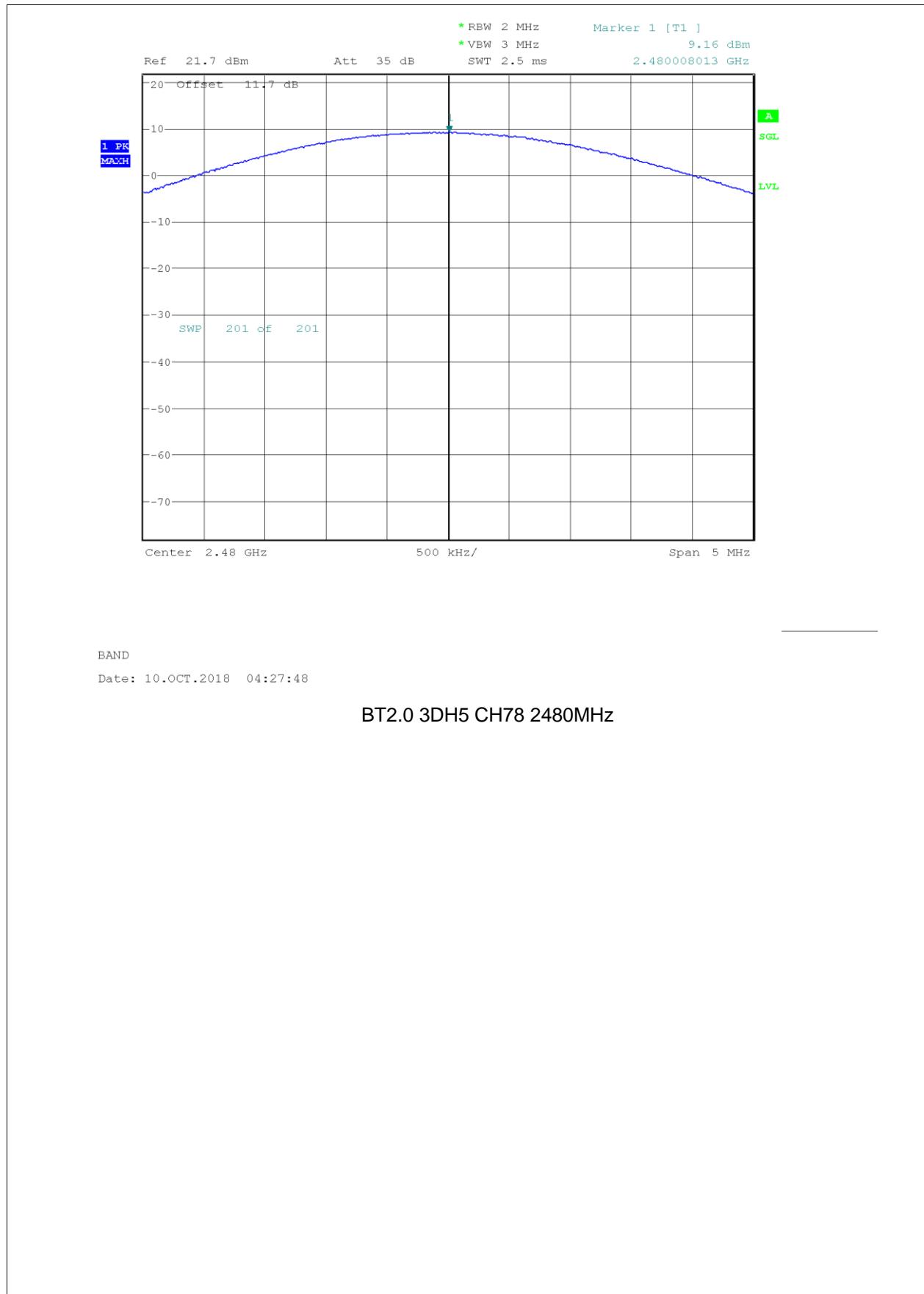
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## 5.6 Band Edges

### 5.6.1 Description

In any 100kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

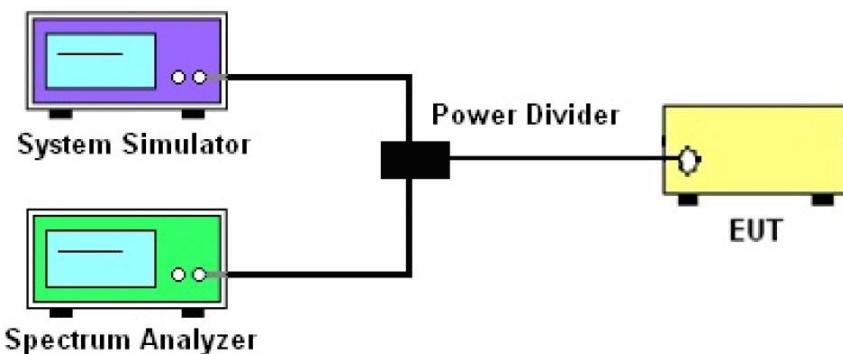
### 5.6.2 Test Instruments

The measuring equipment is listed in the section 4.1 of this test report.

### 5.6.3 Test Procedure

- a. Set to the maximum power setting and enable the EUT transmit continuously.
- b. Set RBW = 100kHz ( $\geq 1\%$  span=10MHz), VBW=300kHz ( $\geq$  RBW). Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100kHz RBW. The attenuation shall be 30 dB instead of 20 dB when RMS conducted output power procedure is used.
- c. Enable hopping function of the EUT and then repeat step 2. And 3.
- d. Record the measurement the results in the test report.

### 5.6.4 Test Setup



**5.6.5 Test Result**

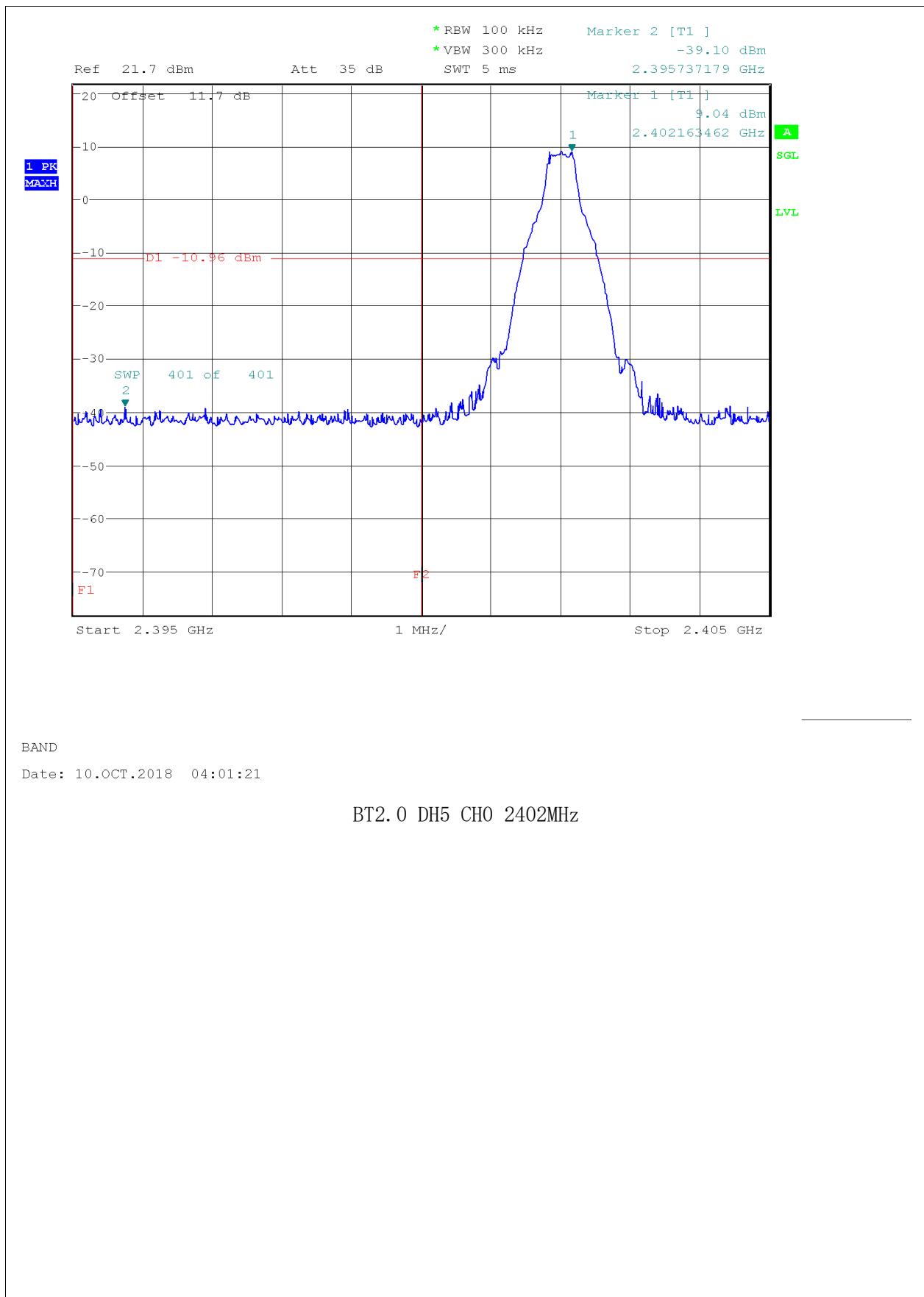
DH5				
Channel	Frequency (MHz)	Band Edge Value(dBm)	Limit(20dBc)	P/F
0	2402	-39.1	-10.96	PASS
78	2480	-38.89	-10.85	PASS
2DH5				
Channel	Frequency (MHz)	Band Edge Value(dBm)	Limit(20dBc)	P/F
0	2402	-38.86	-12.99	PASS
78	2480	-38.83	-12.62	PASS
3DH5				
Channel	Frequency (MHz)	Band Edge Value(dBm)	Limit(20dBc)	P/F
0	2402	-39.7	-12.88	PASS
78	2480	-37.83	-12.57	PASS

DH5(Hopping mode)				
Channel	Frequency( MHz)	Band Edge Value(dBm)	Limit(20dBc)	P/F
0	2402	-39.16	-11.58	PASS
78	2480	-37.8	-11.36	PASS
2DH5(Hopping mode)				
Channel	Frequency( MHz)	Band Edge Value(dBm)	Limit(20dBc)	P/F
0	2402	-38.81	-15.79	PASS
78	2480	-38.6	-12.68	PASS
3DH5(Hopping mode)				
Channel	Frequency( MHz)	Band Edge Value(dBm)	Limit(20dBc)	P/F
0	2402	-38.12	-15.11	PASS
78	2480	-38.84	-14.79	PASS



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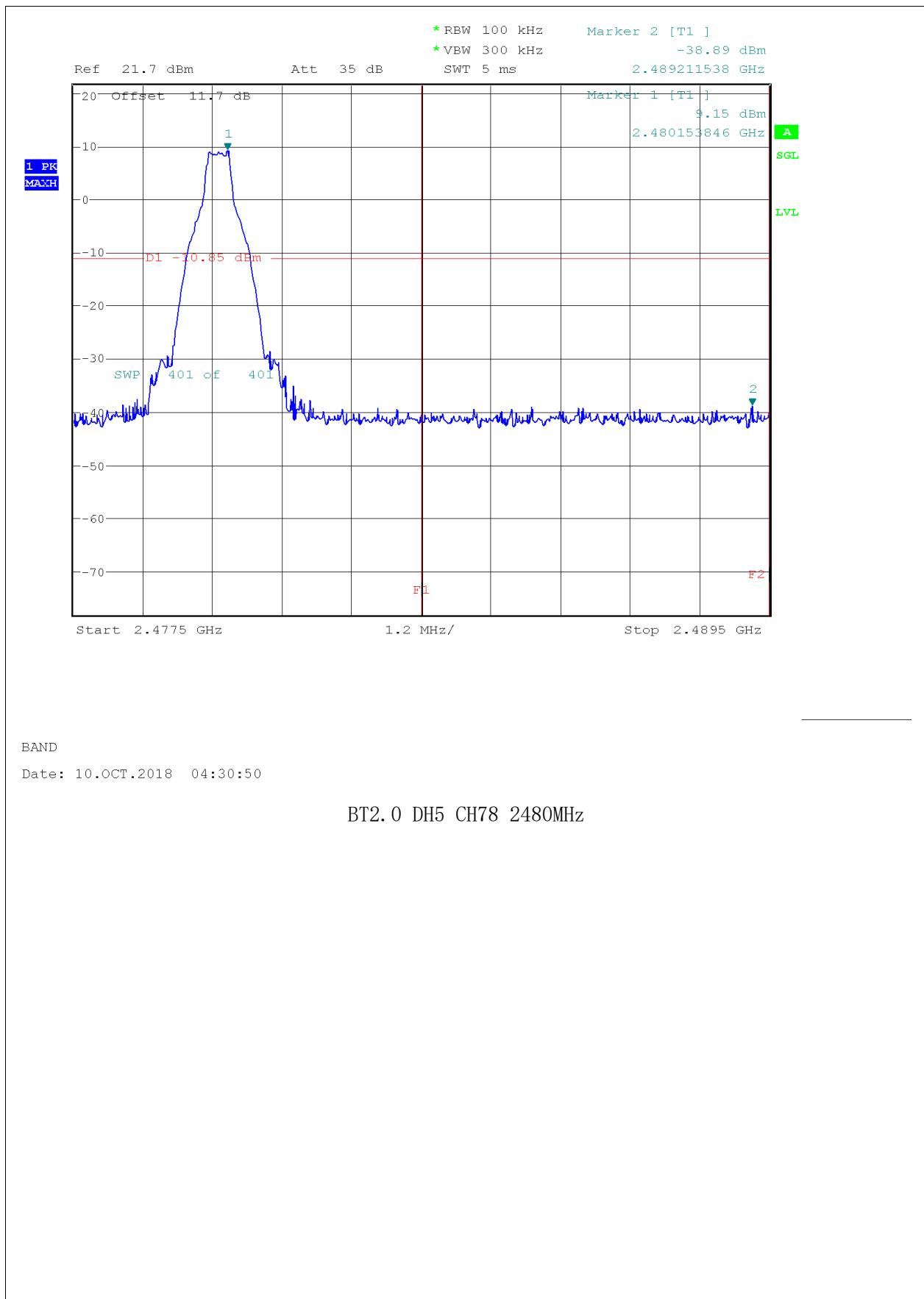
FCC RF TEST REPORT





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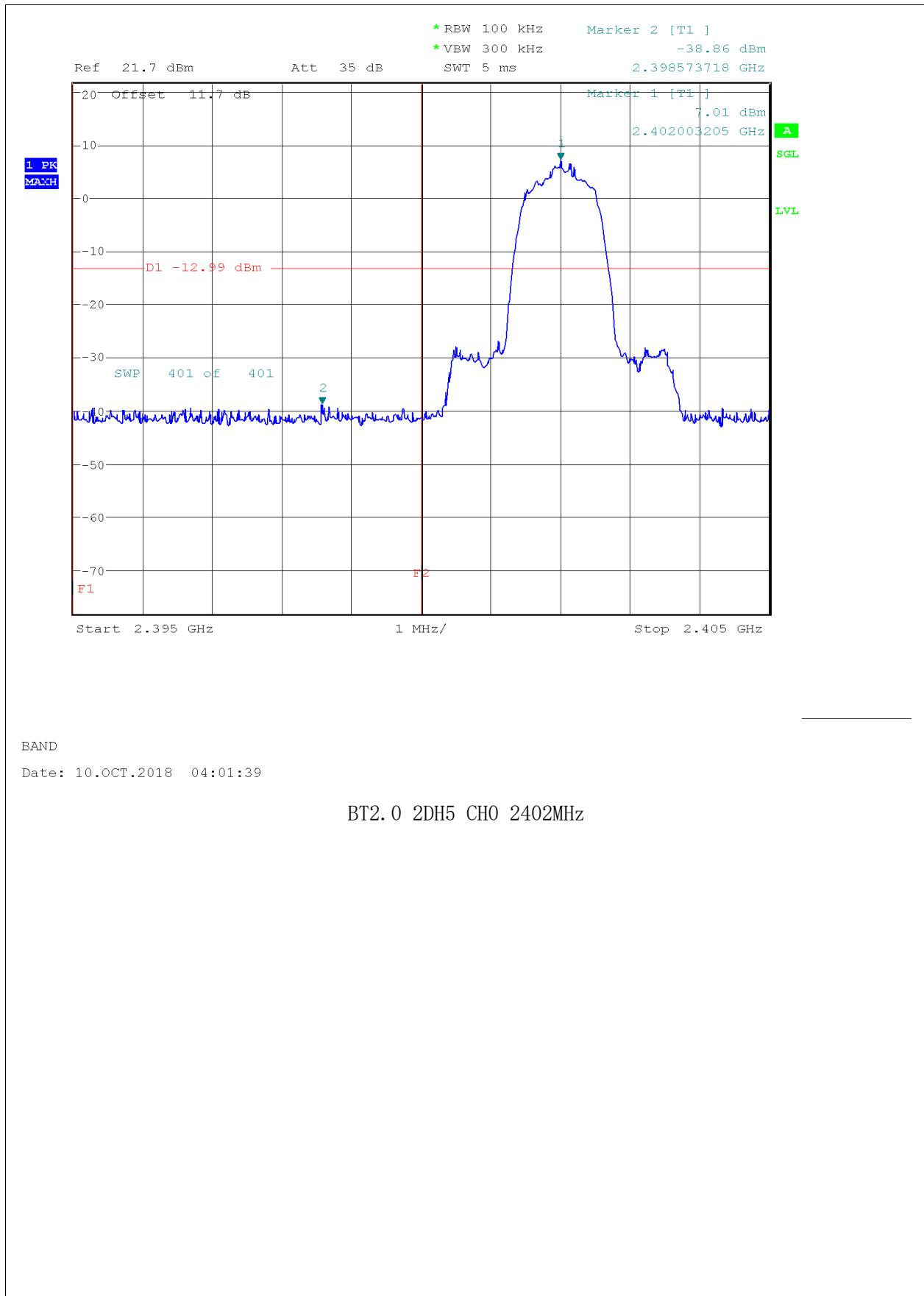
FCC RF TEST REPORT





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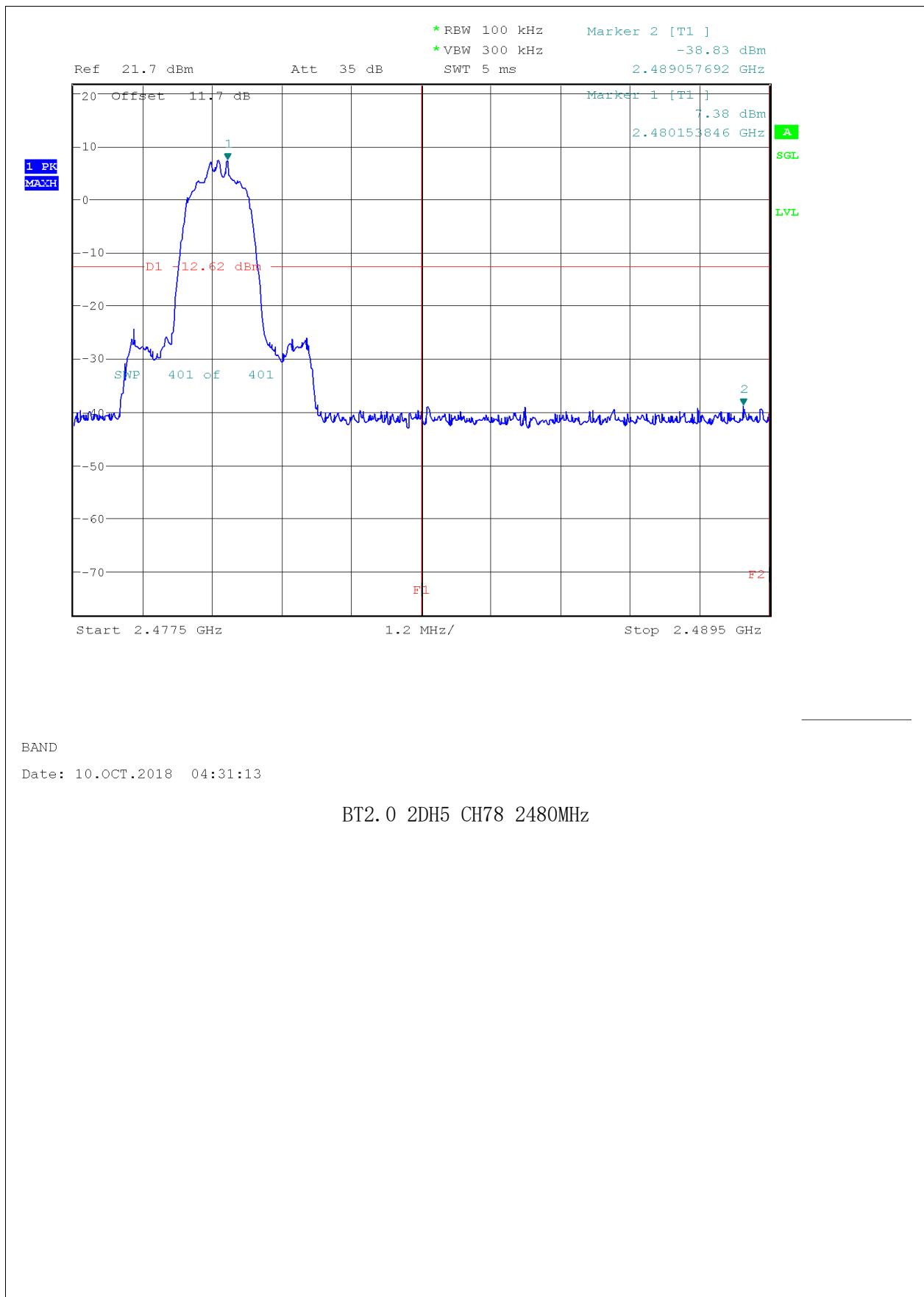
FCC RF TEST REPORT





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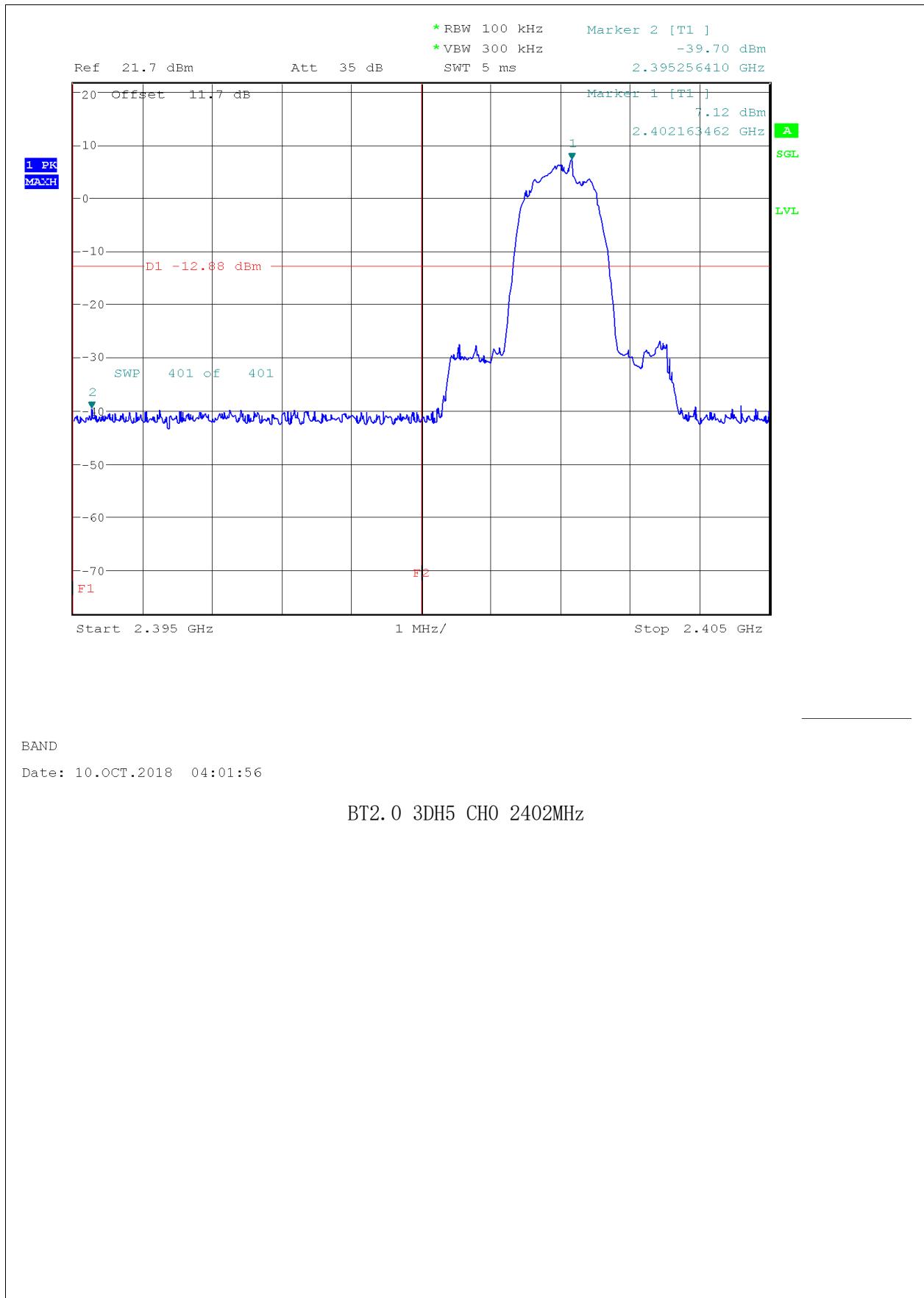
FCC RF TEST REPORT





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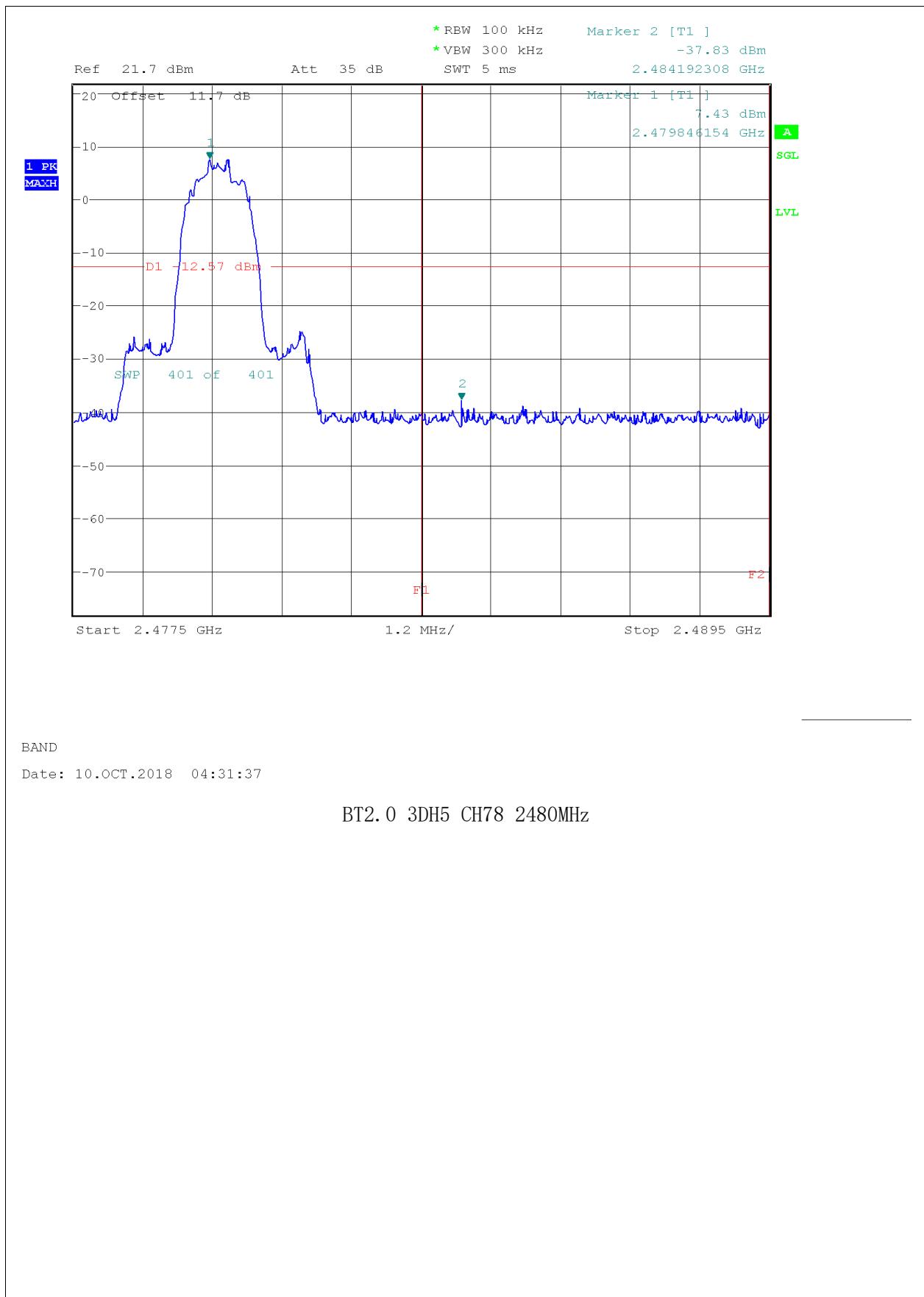
FCC RF TEST REPORT





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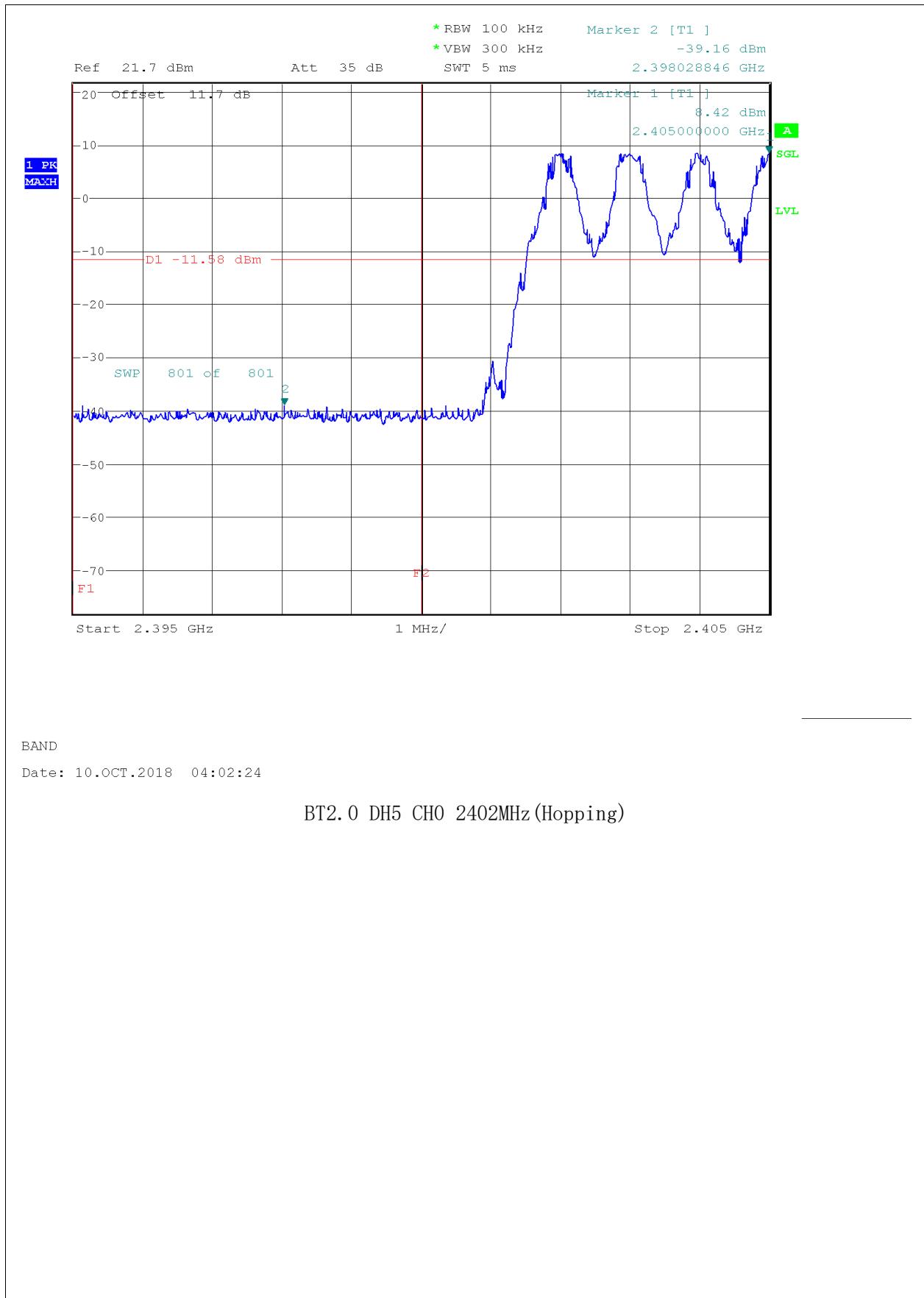
FCC RF TEST REPORT





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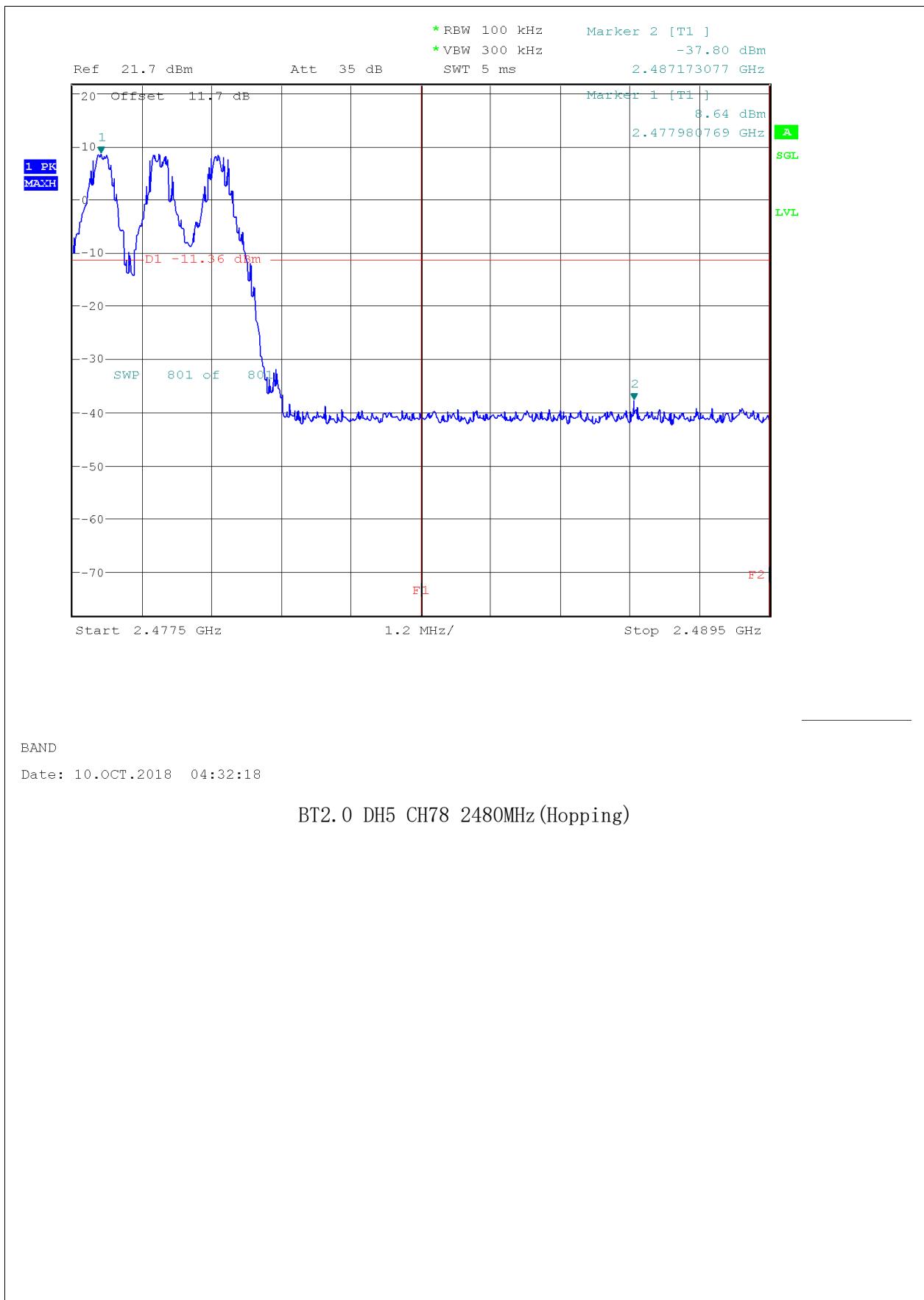
FCC RF TEST REPORT





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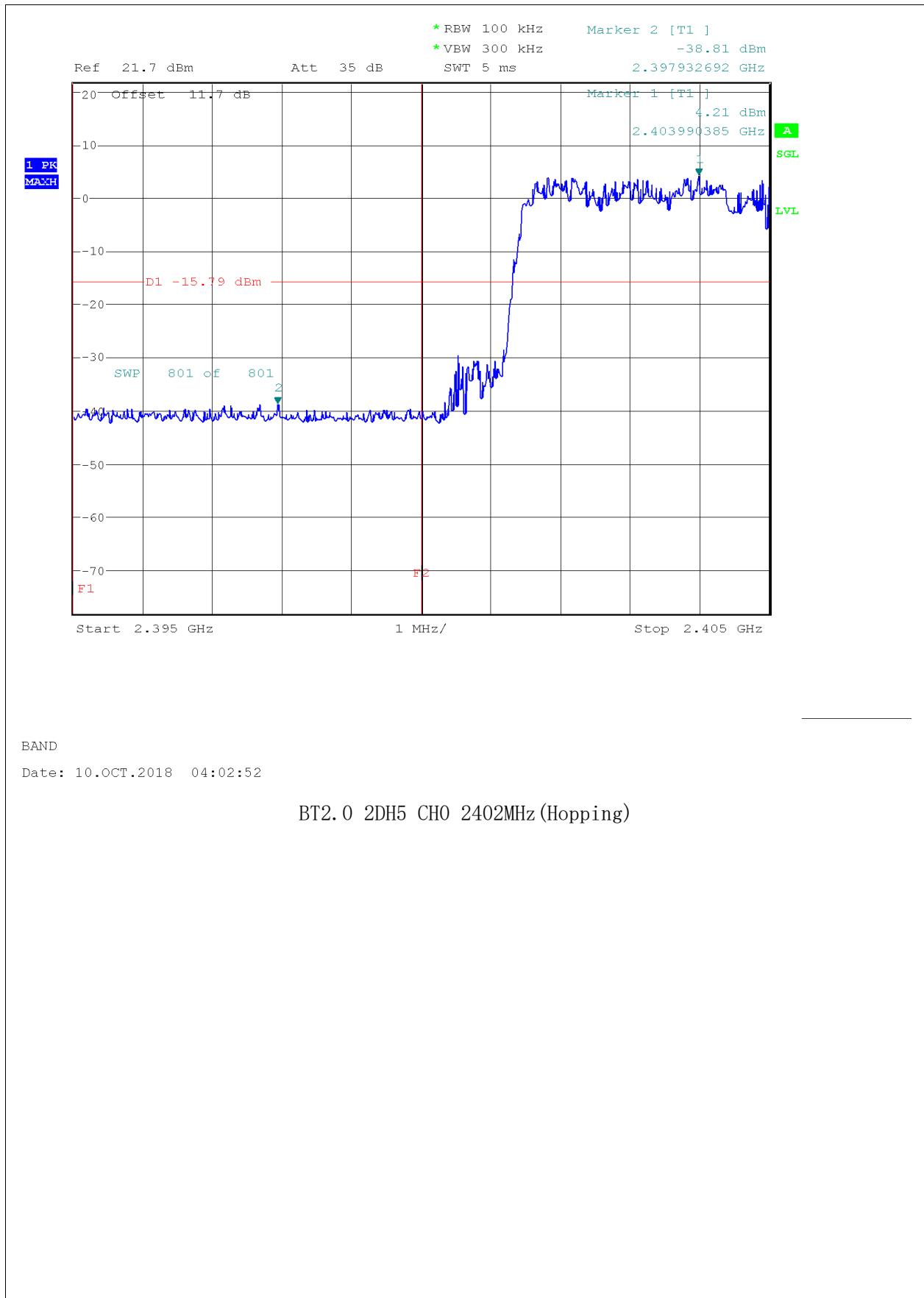
FCC RF TEST REPORT





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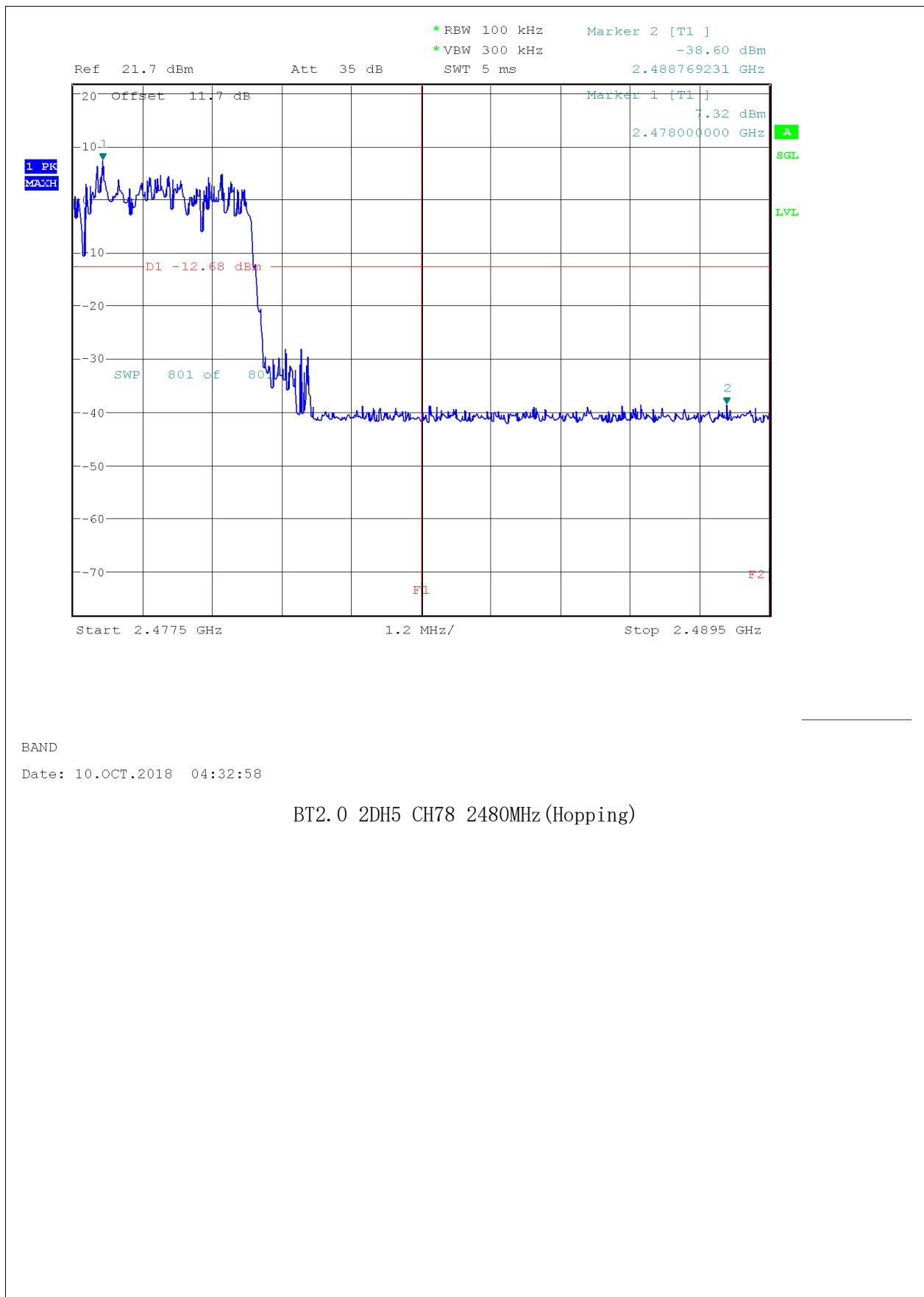
FCC RF TEST REPORT





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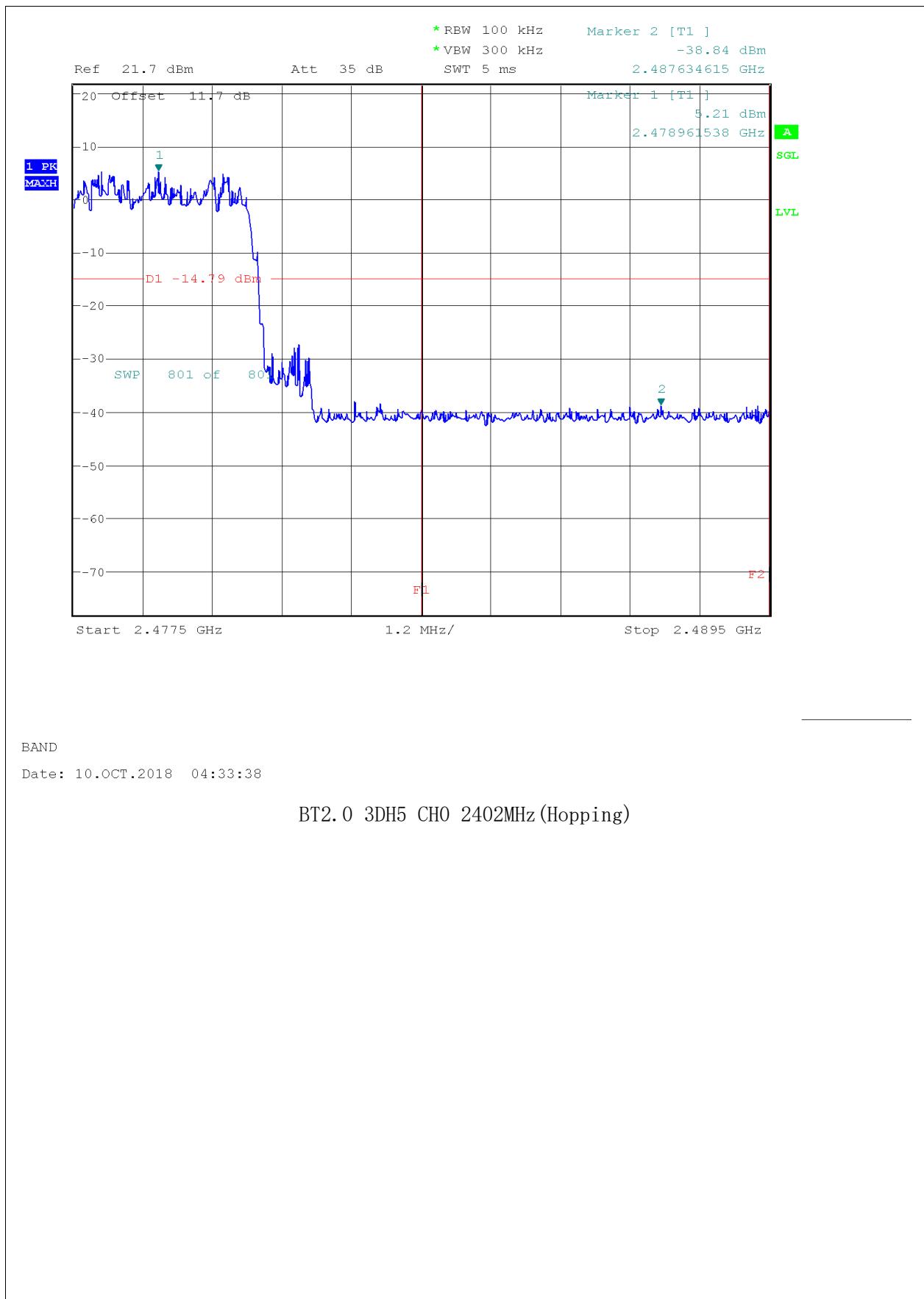
FCC RF TEST REPORT





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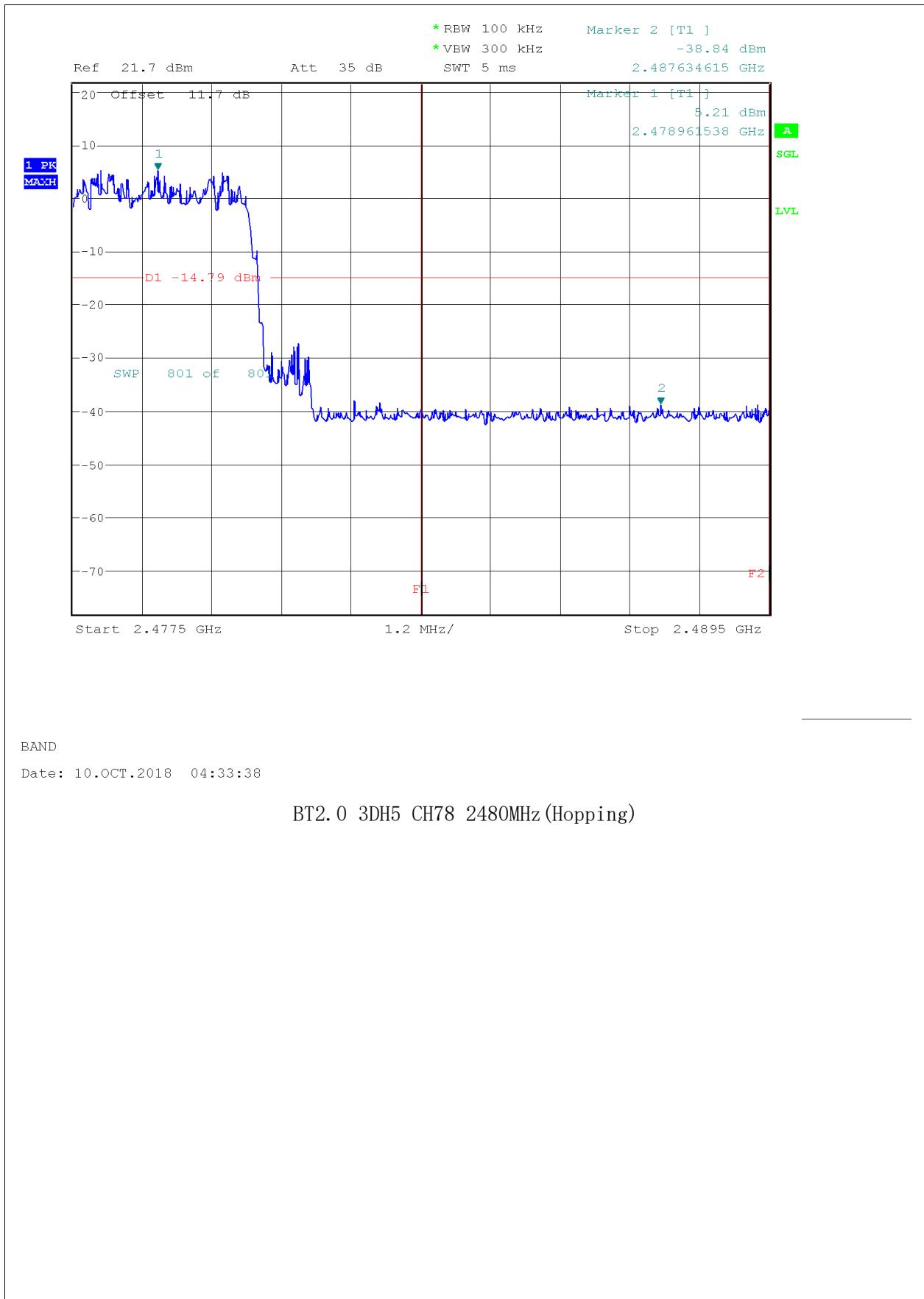
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## 5.7 Conducted Spurious Emission

### 5.7.1 Description

In any 100kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

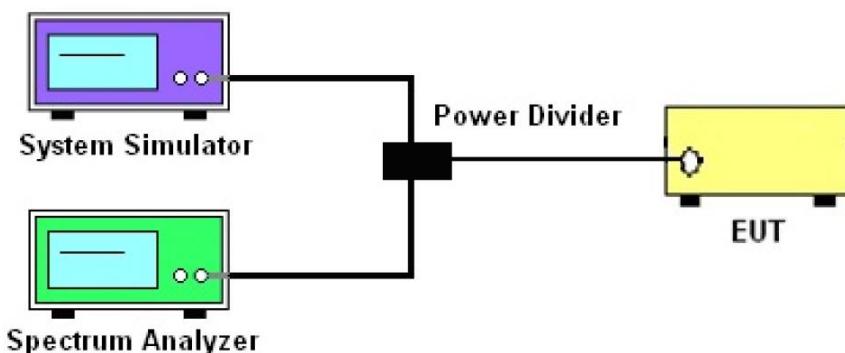
### 5.7.2 Test Instruments

The measuring equipment is listed in the section 4.1 of this test report.

### 5.7.3 Test Procedure

- a. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- b. Set to the maximum power setting and enable the EUT transmit continuously.
- c. Set RBW = 100 kHz, VBW=300 kHz. Scan up through 10<sup>th</sup> harmonic. All harmonics/spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.
- d. Record the measurement the results in the test report.
- e. The RF fundamental frequency should be excluded against the limit line in the operation frequency band.

### 5.7.4 Test Setup

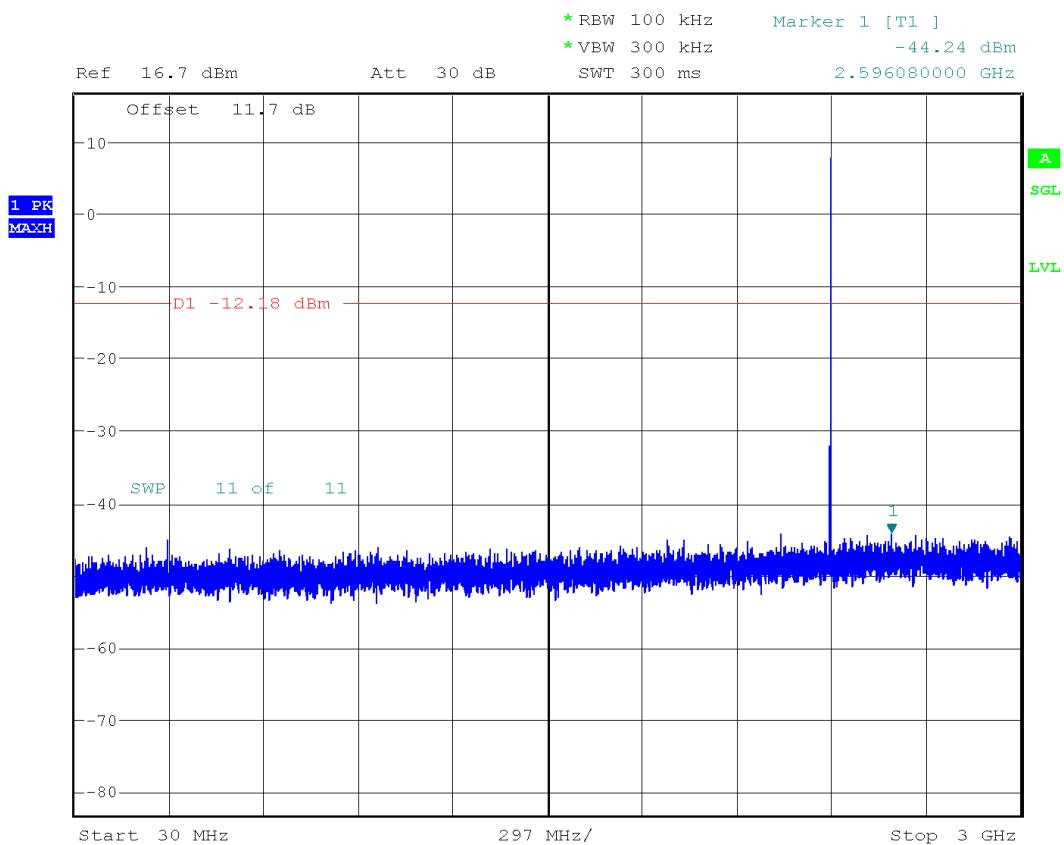




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### 5.7.5 Test Result



BAND

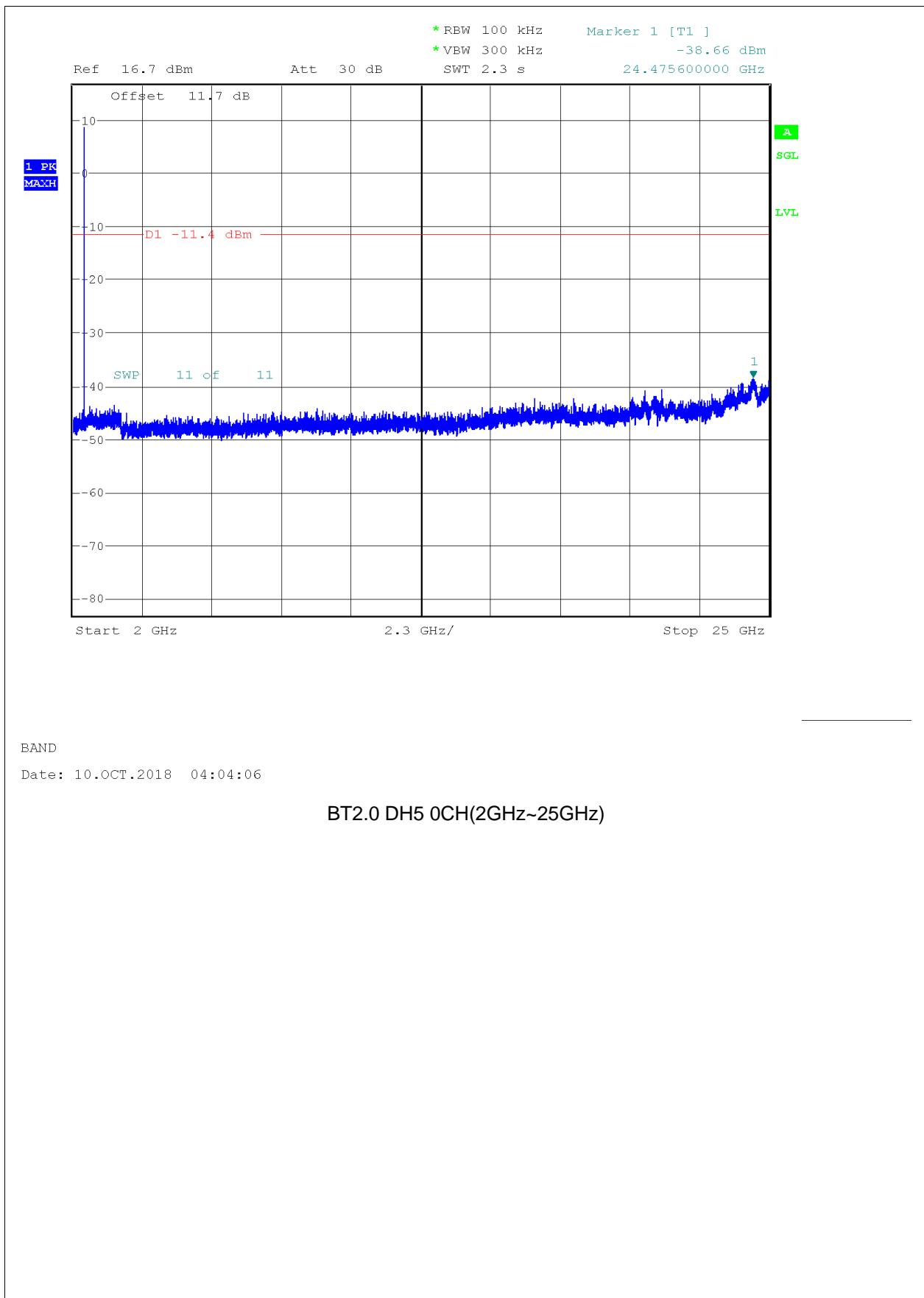
Date: 10.OCT.2018 04:03:33

BT2.0 DH5 0CH(30MHz~3GHz)



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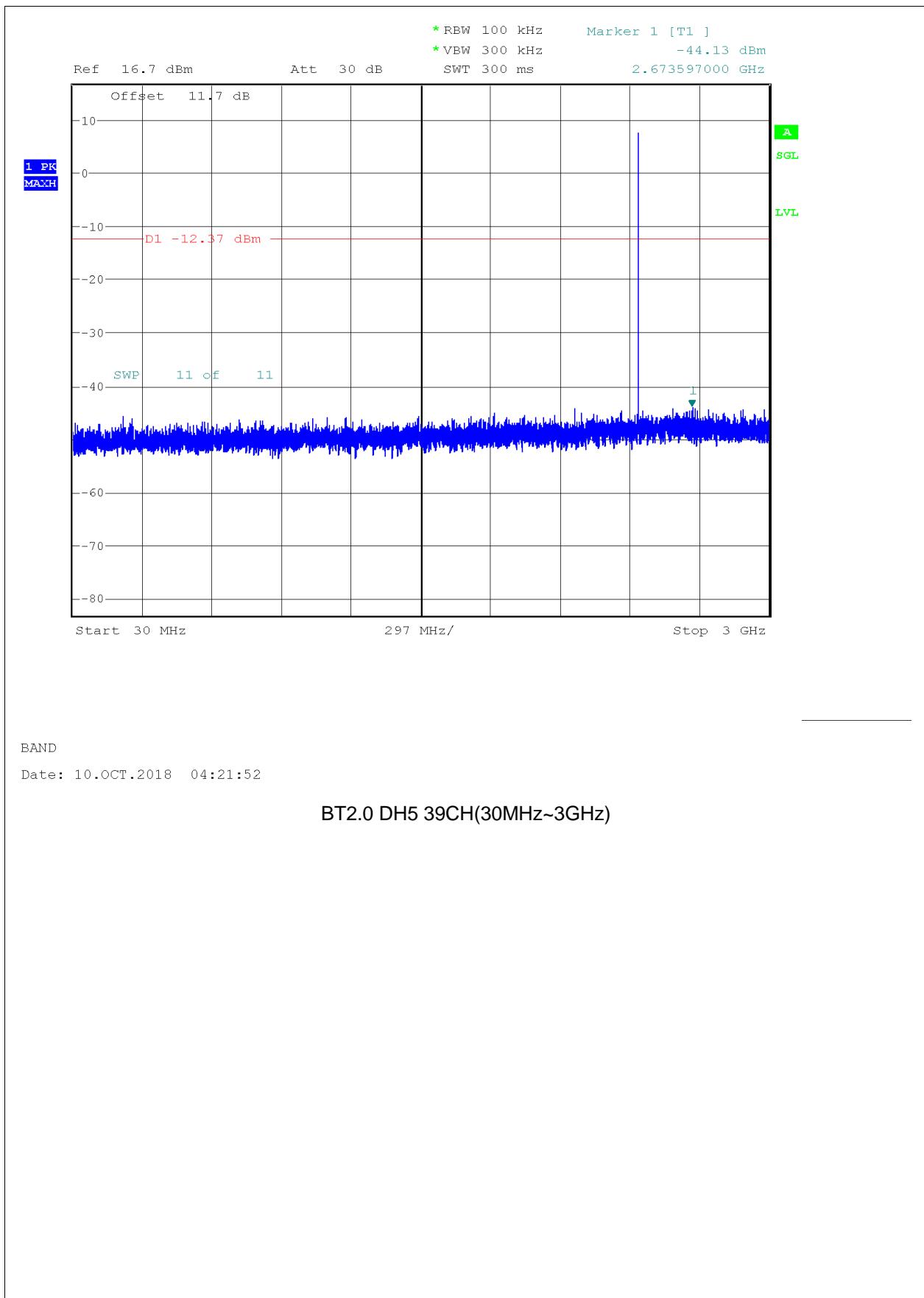
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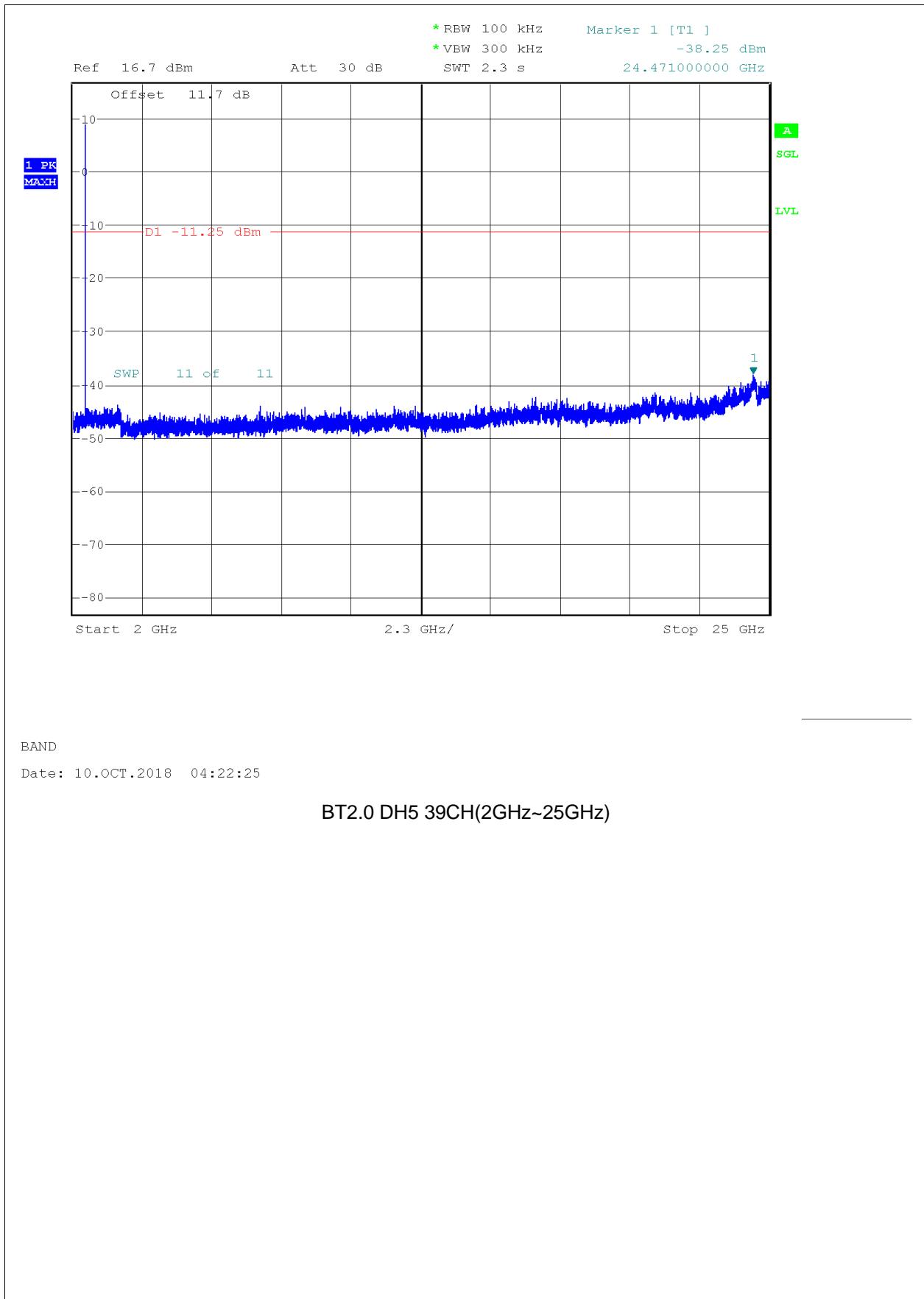
FCC RF TEST REPORT





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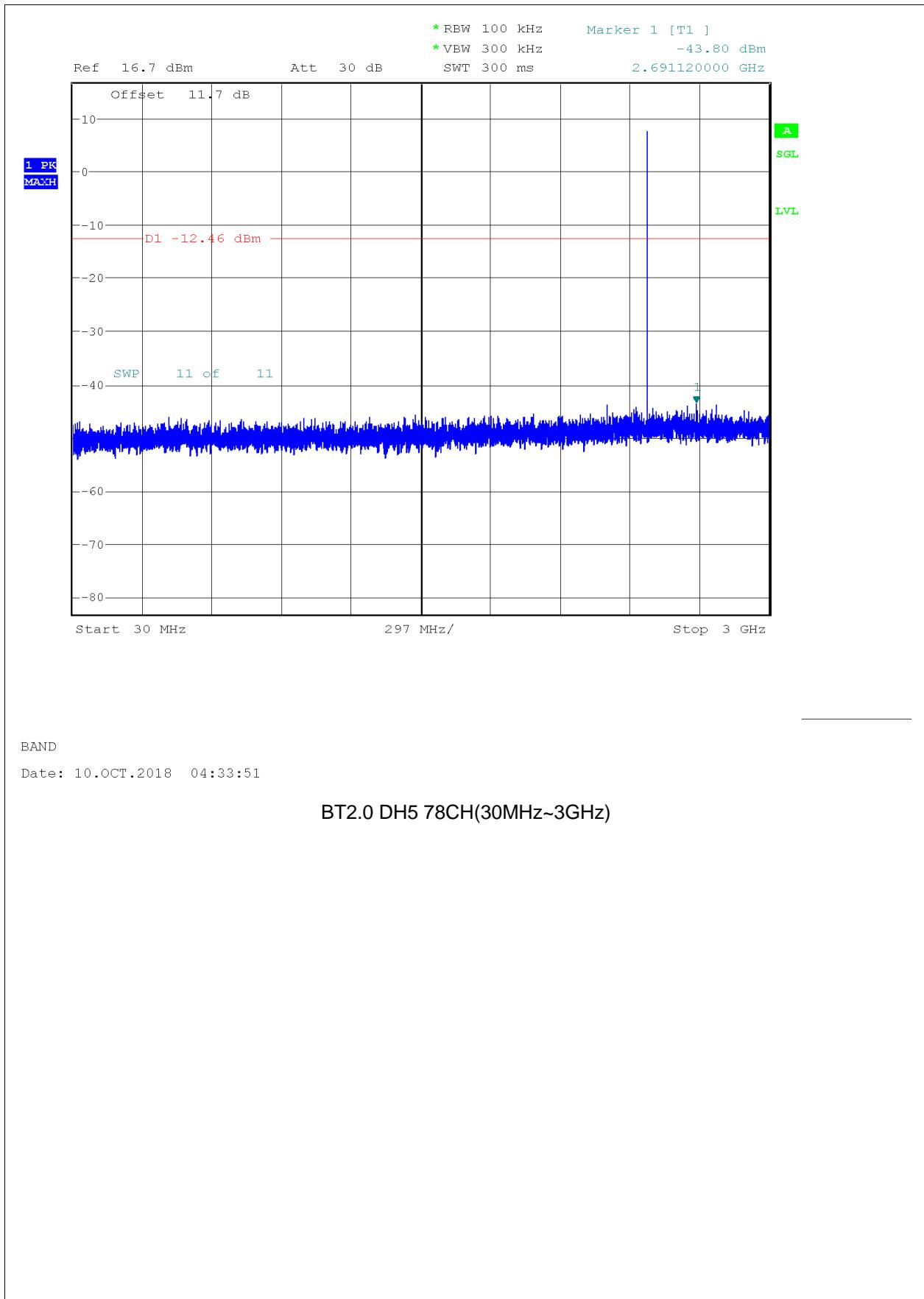
FCC RF TEST REPORT





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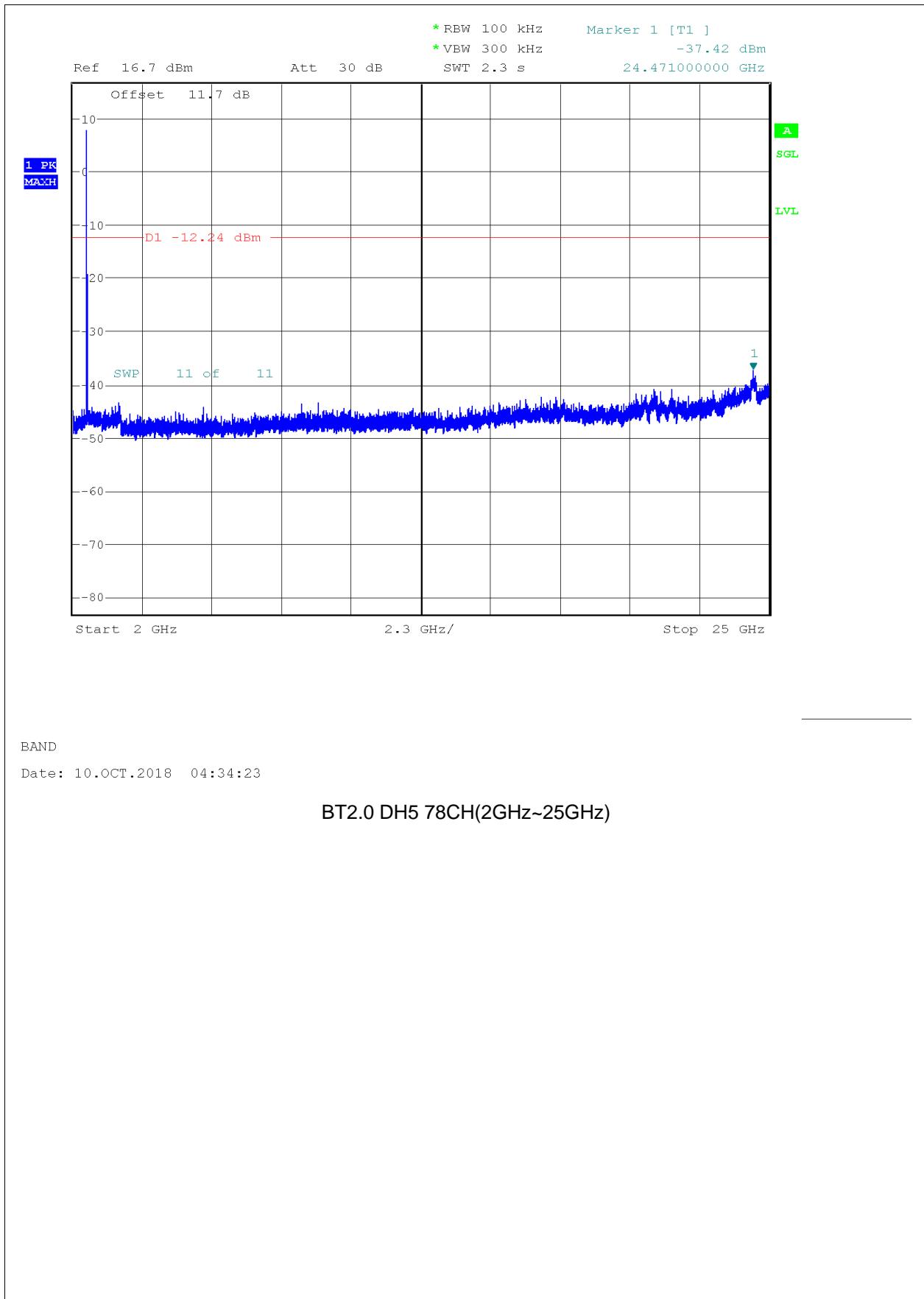
FCC RF TEST REPORT





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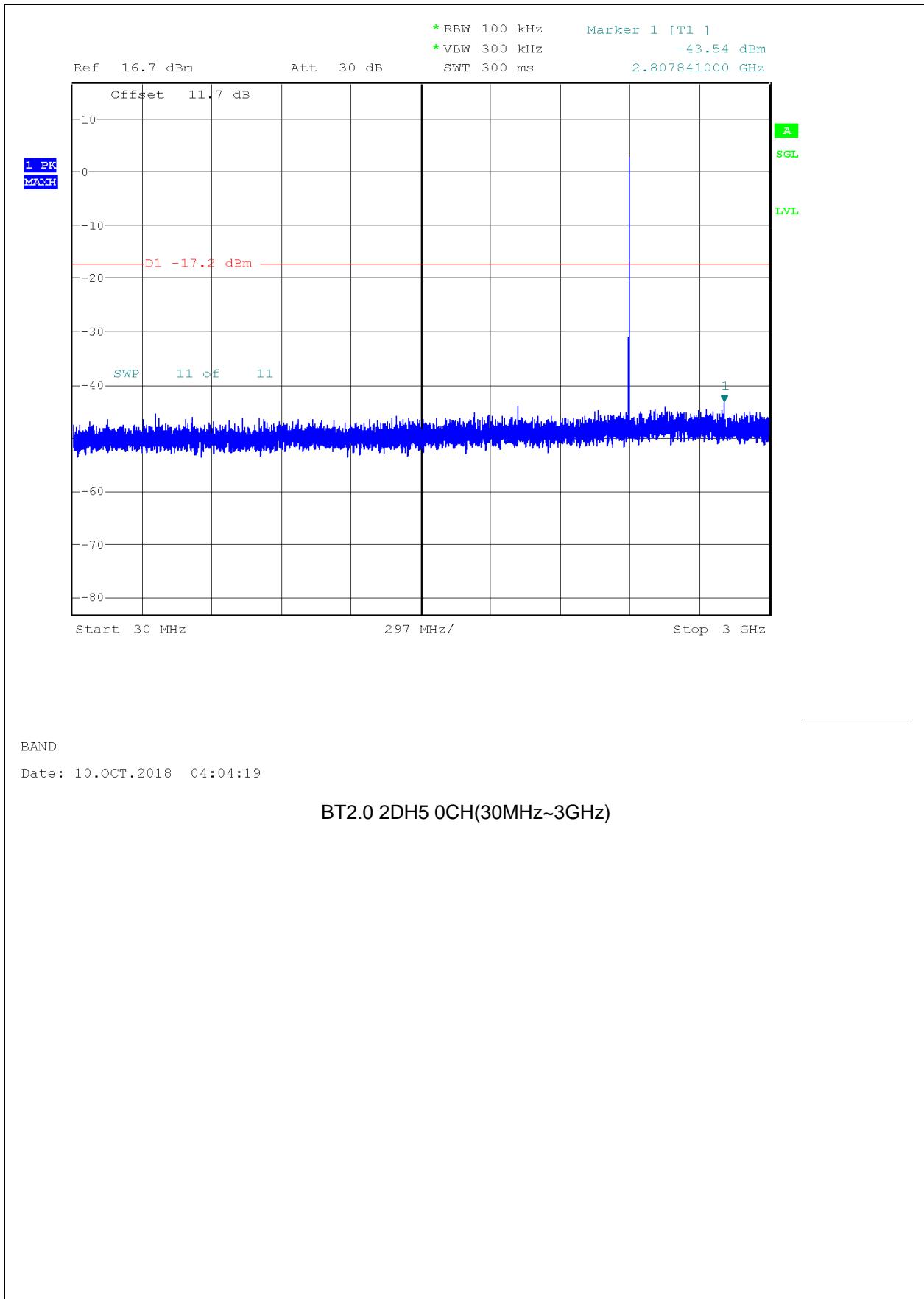
FCC RF TEST REPORT





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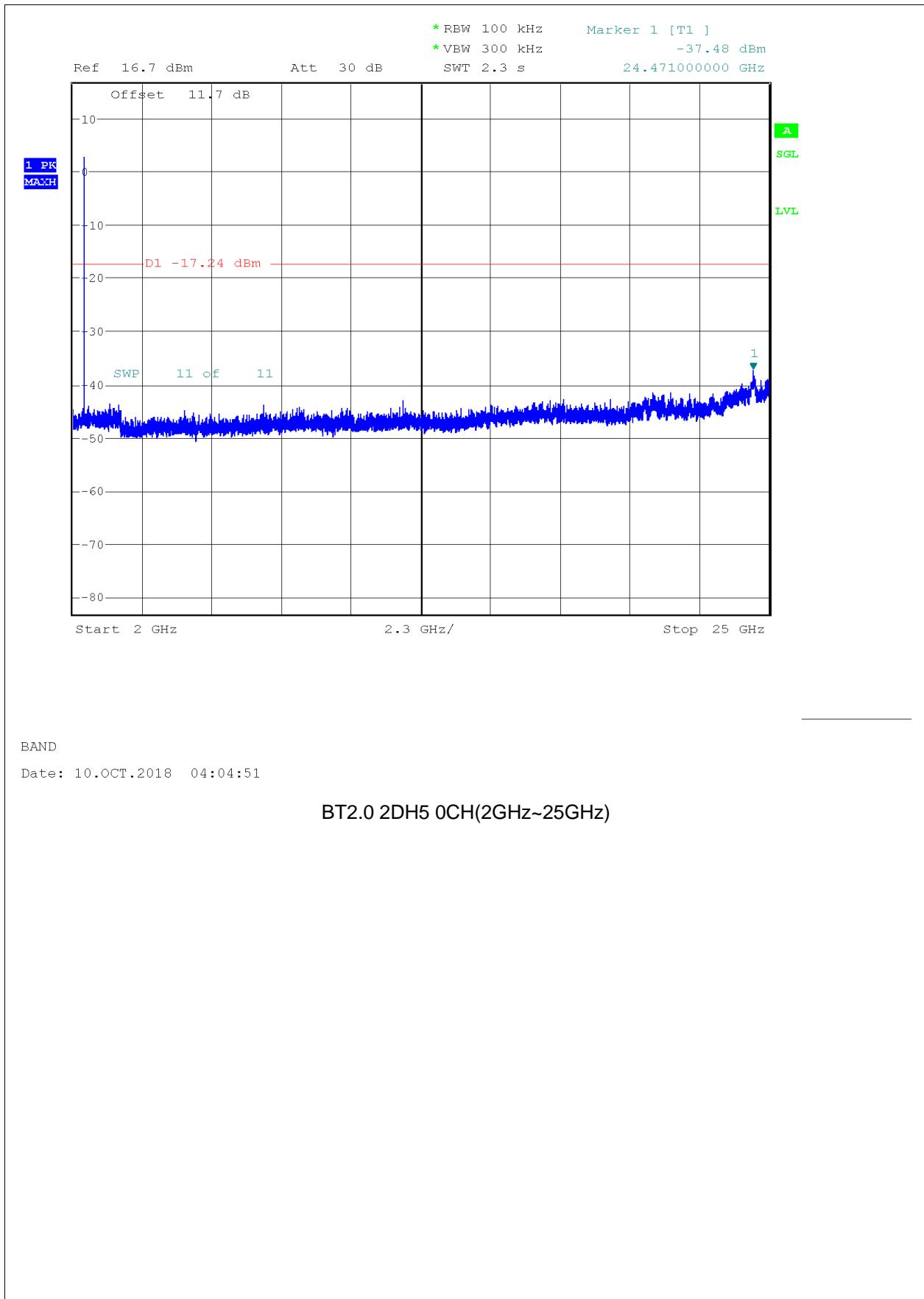
FCC RF TEST REPORT





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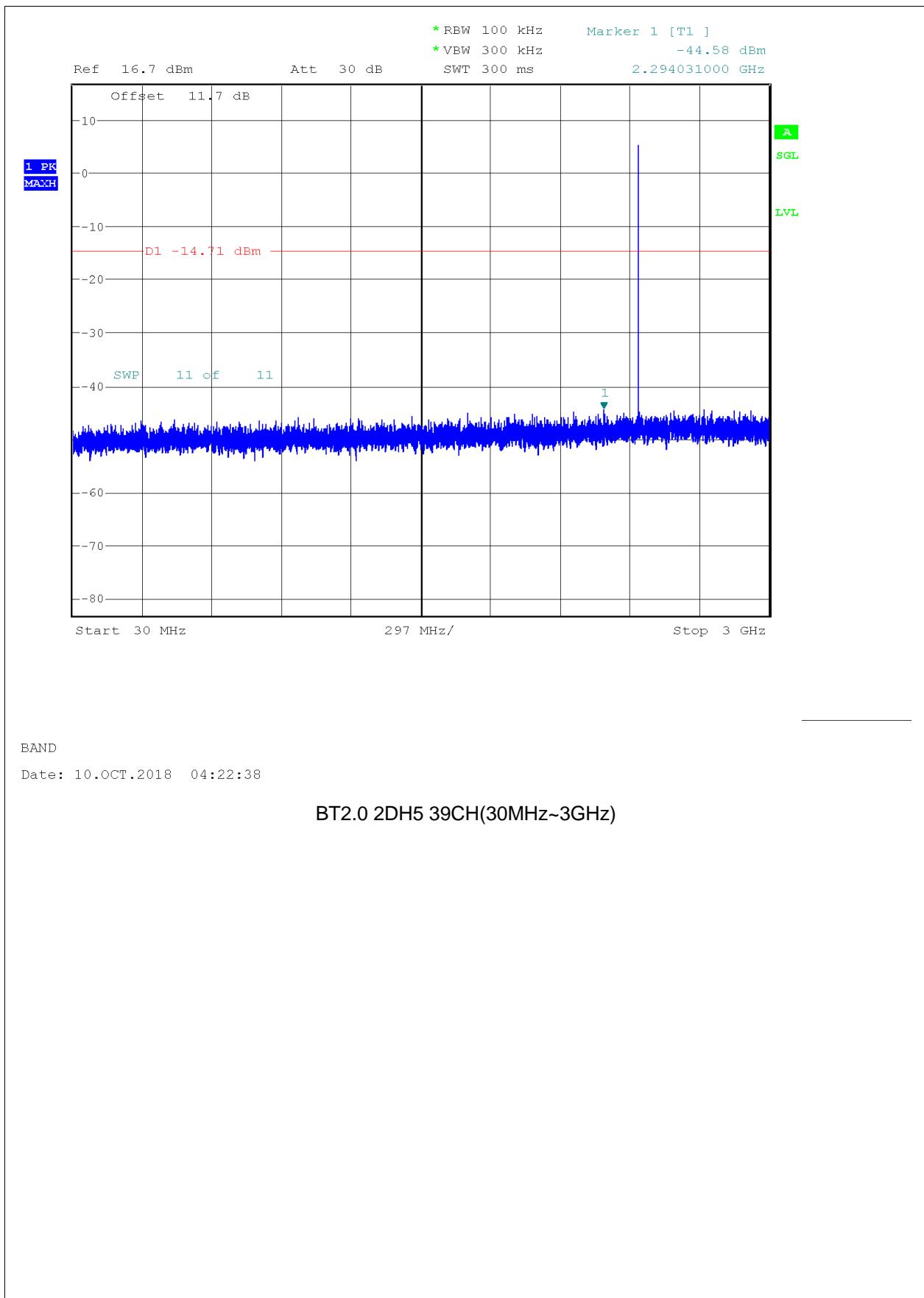
FCC RF TEST REPORT





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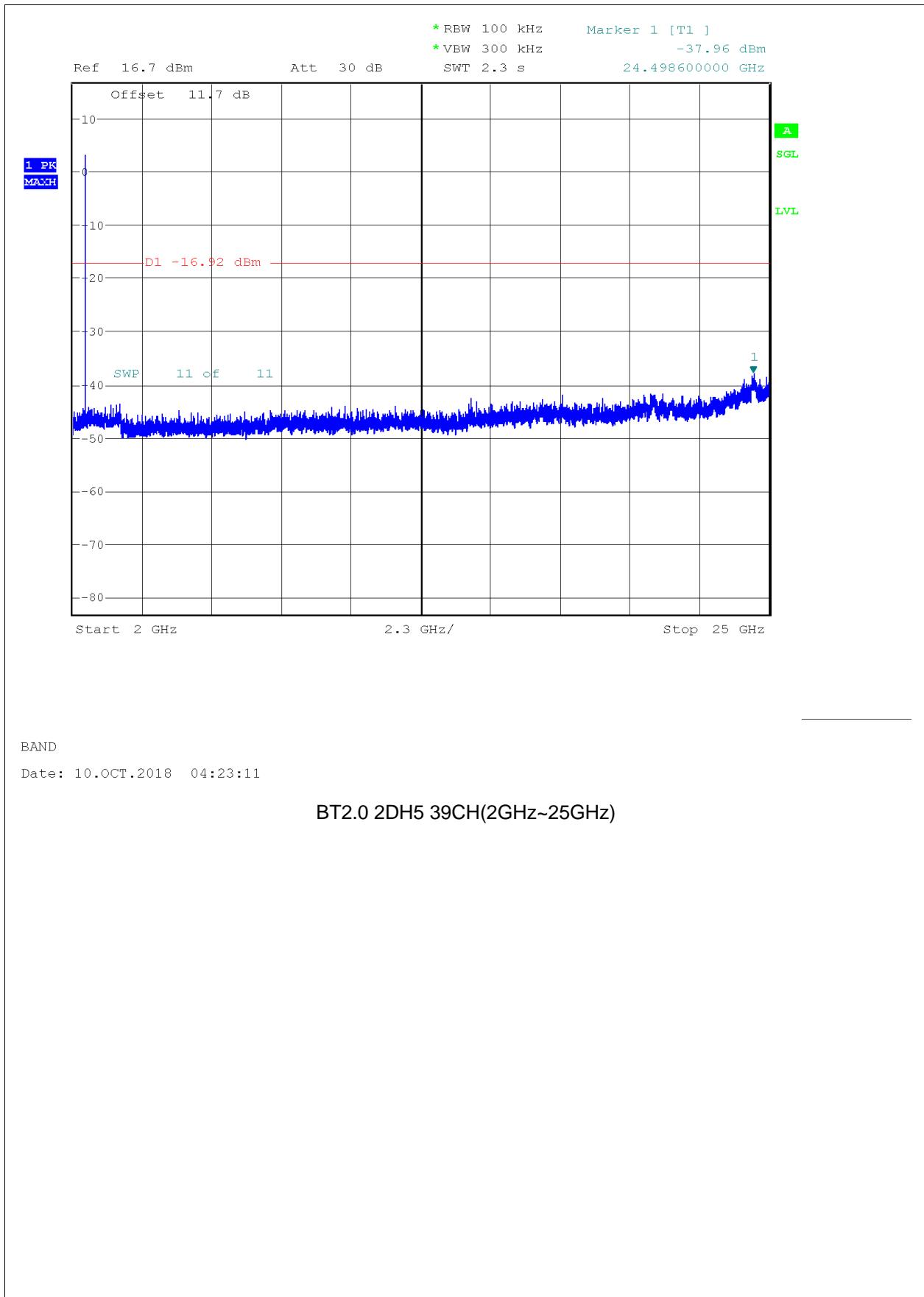
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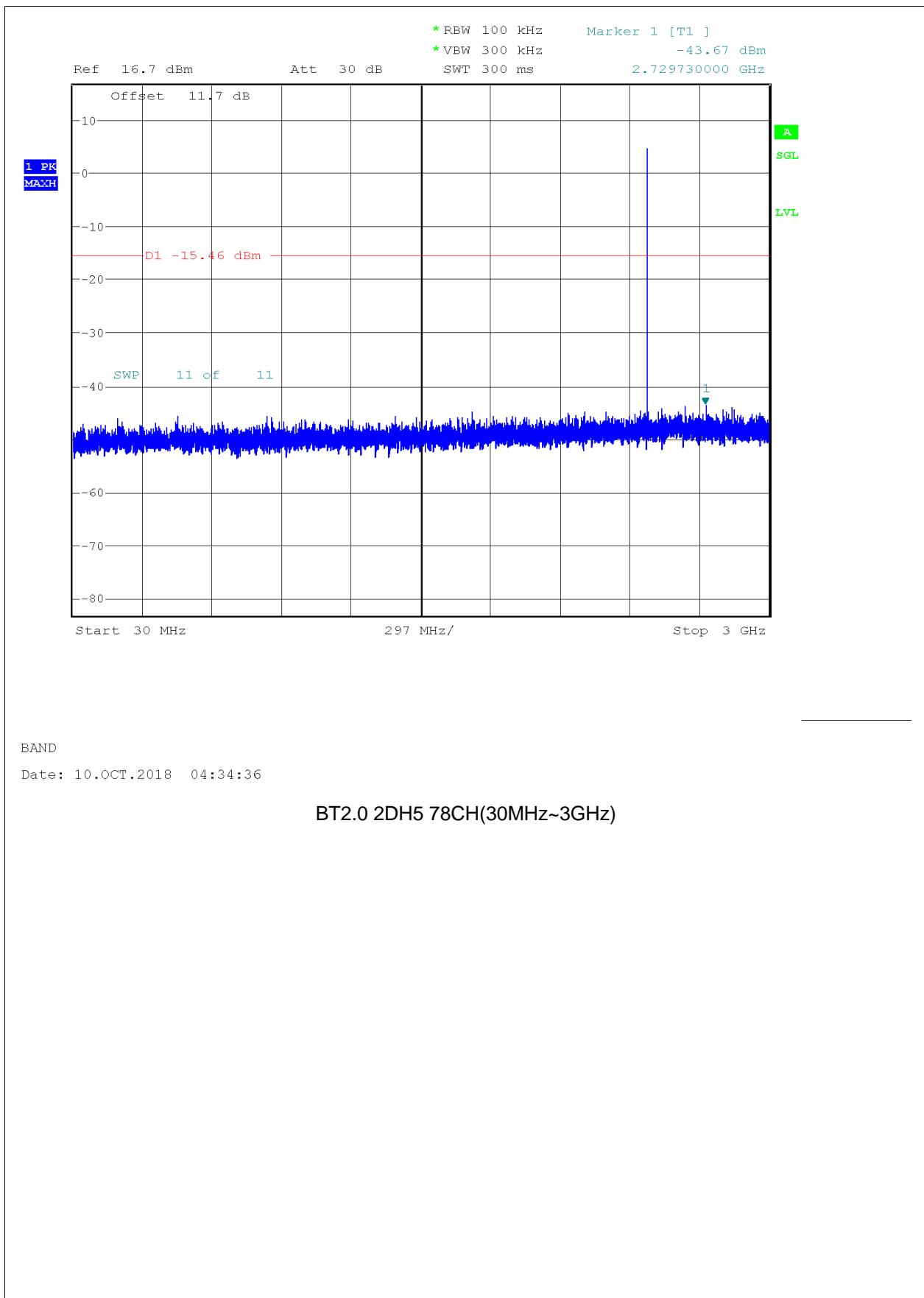
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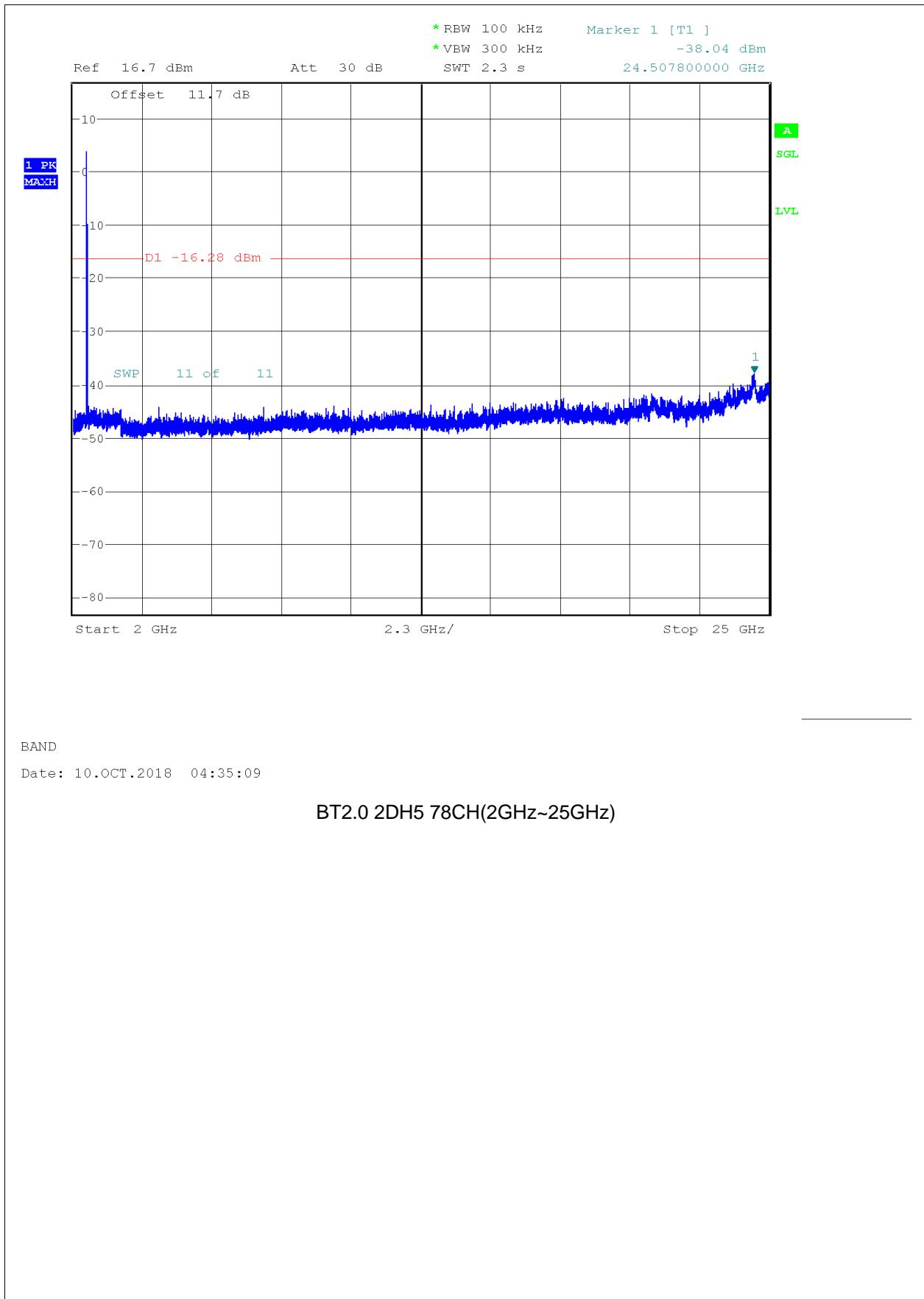
FCC RF TEST REPORT





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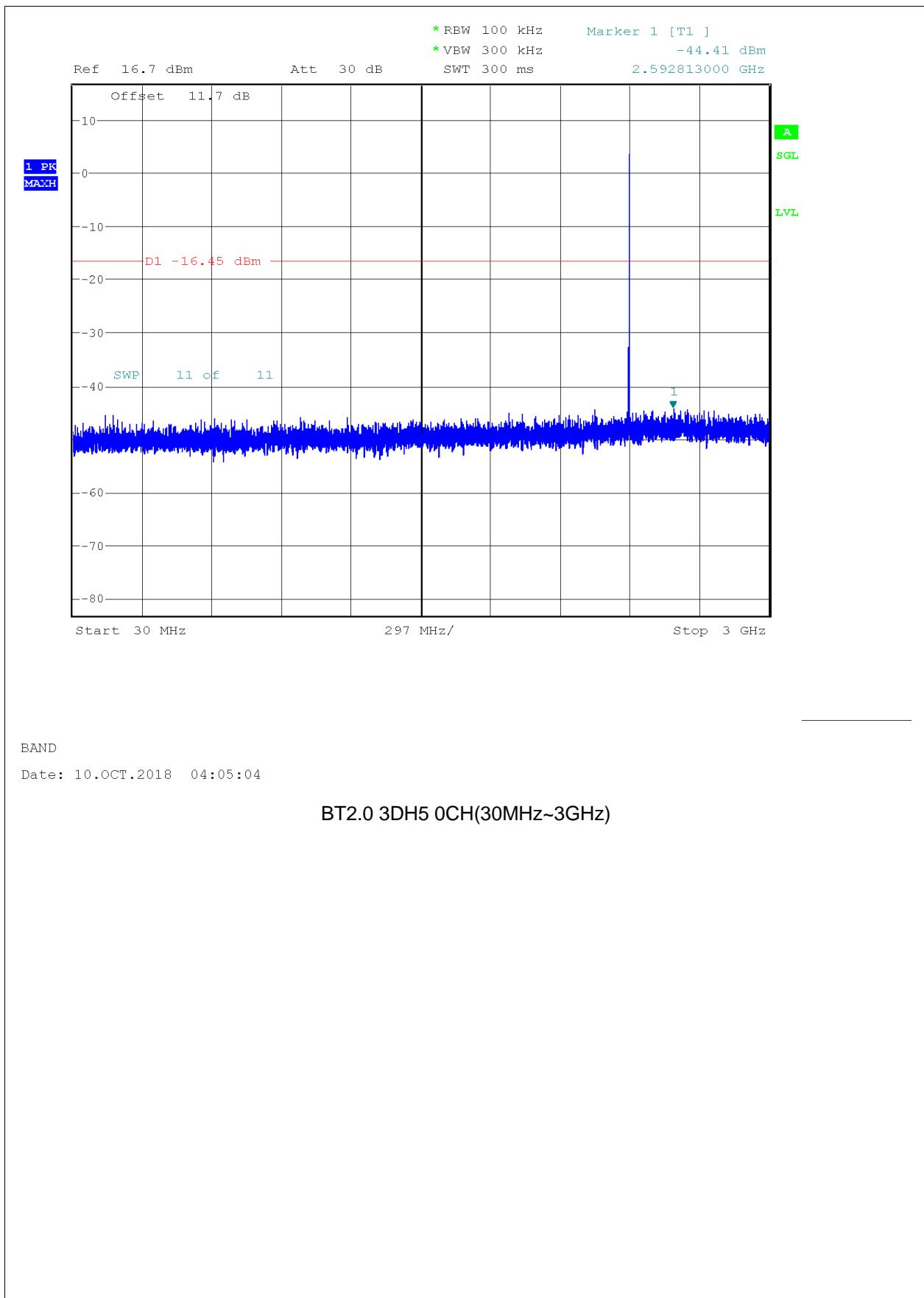
FCC RF TEST REPORT





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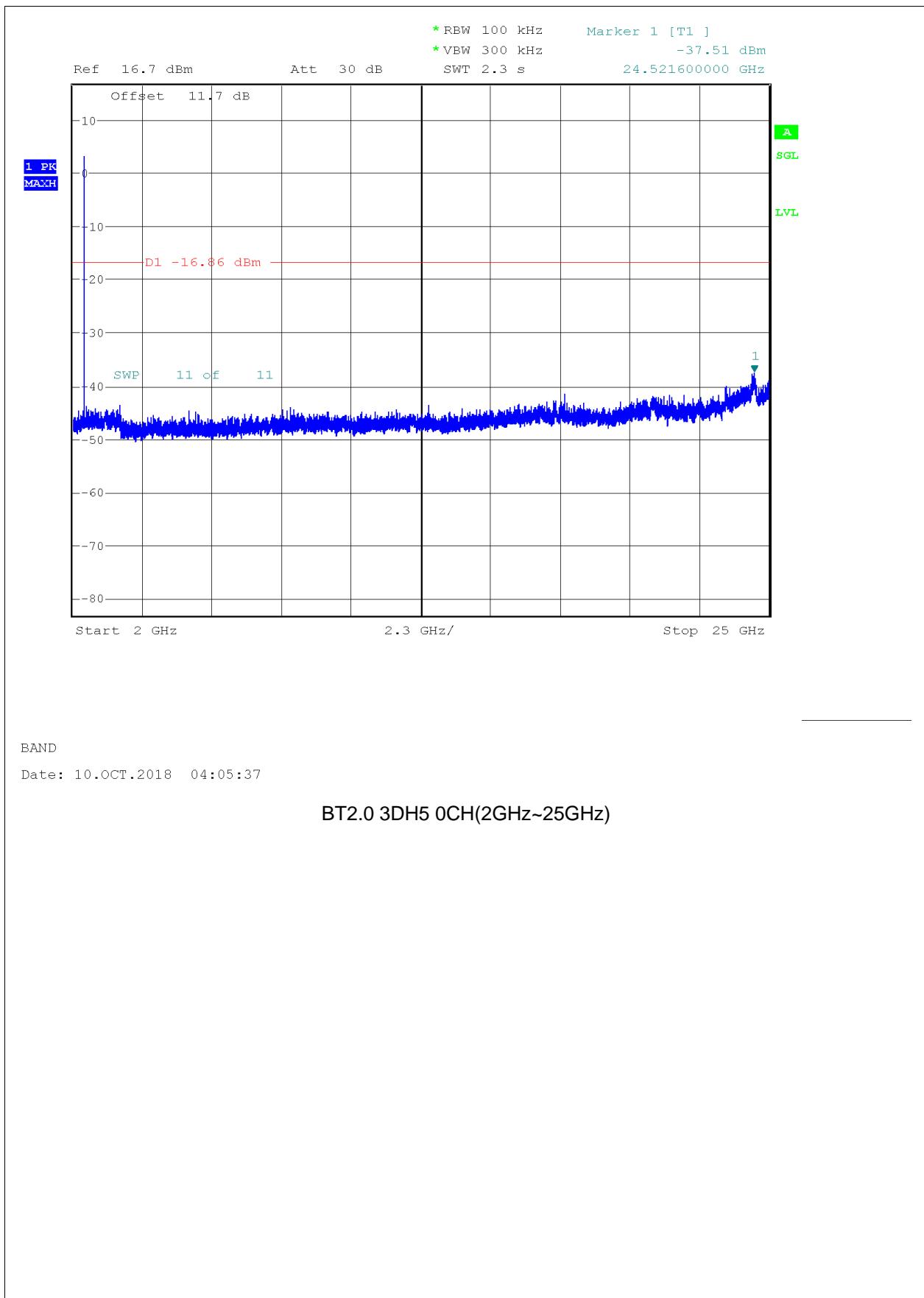
FCC RF TEST REPORT





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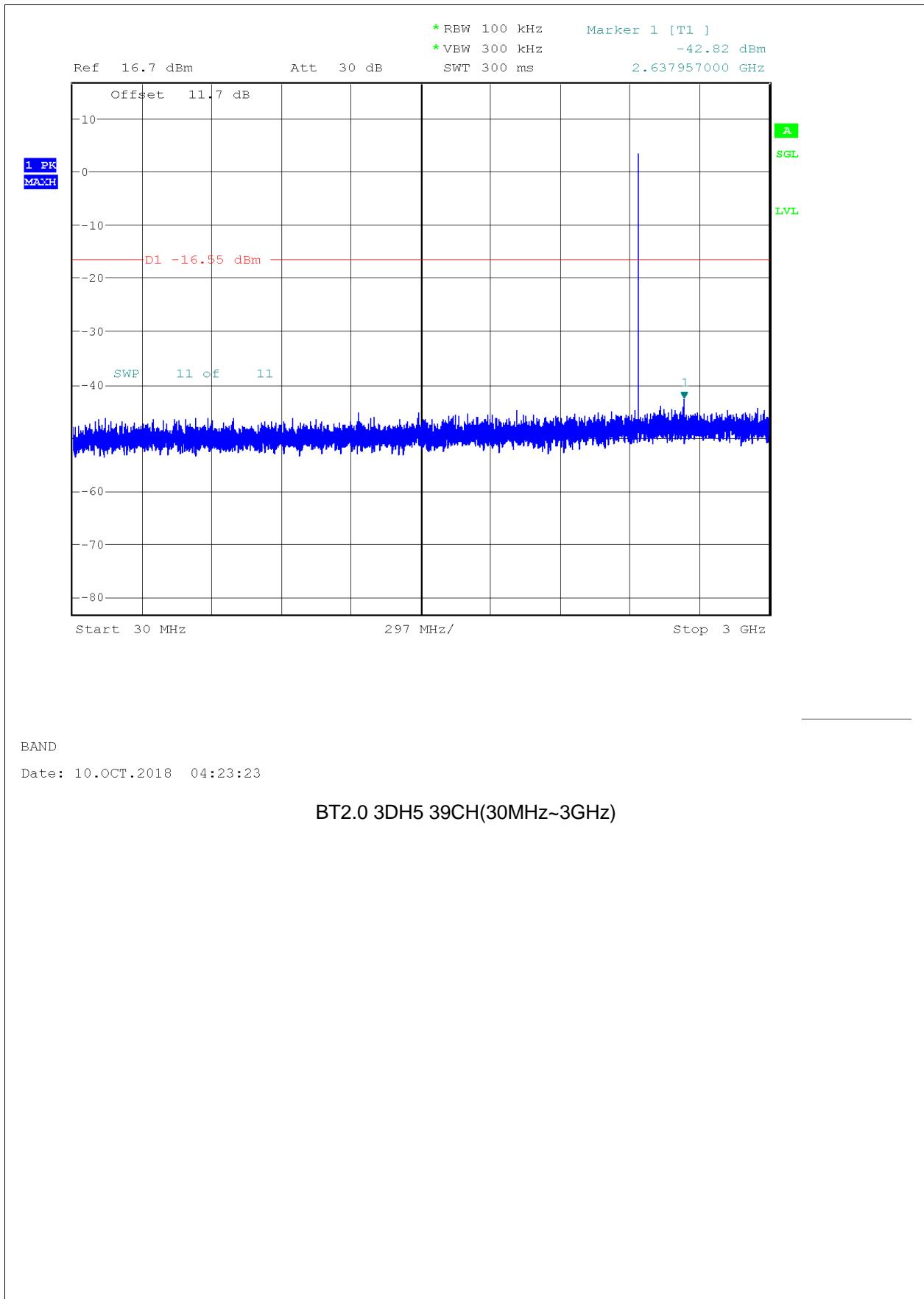
FCC RF TEST REPORT





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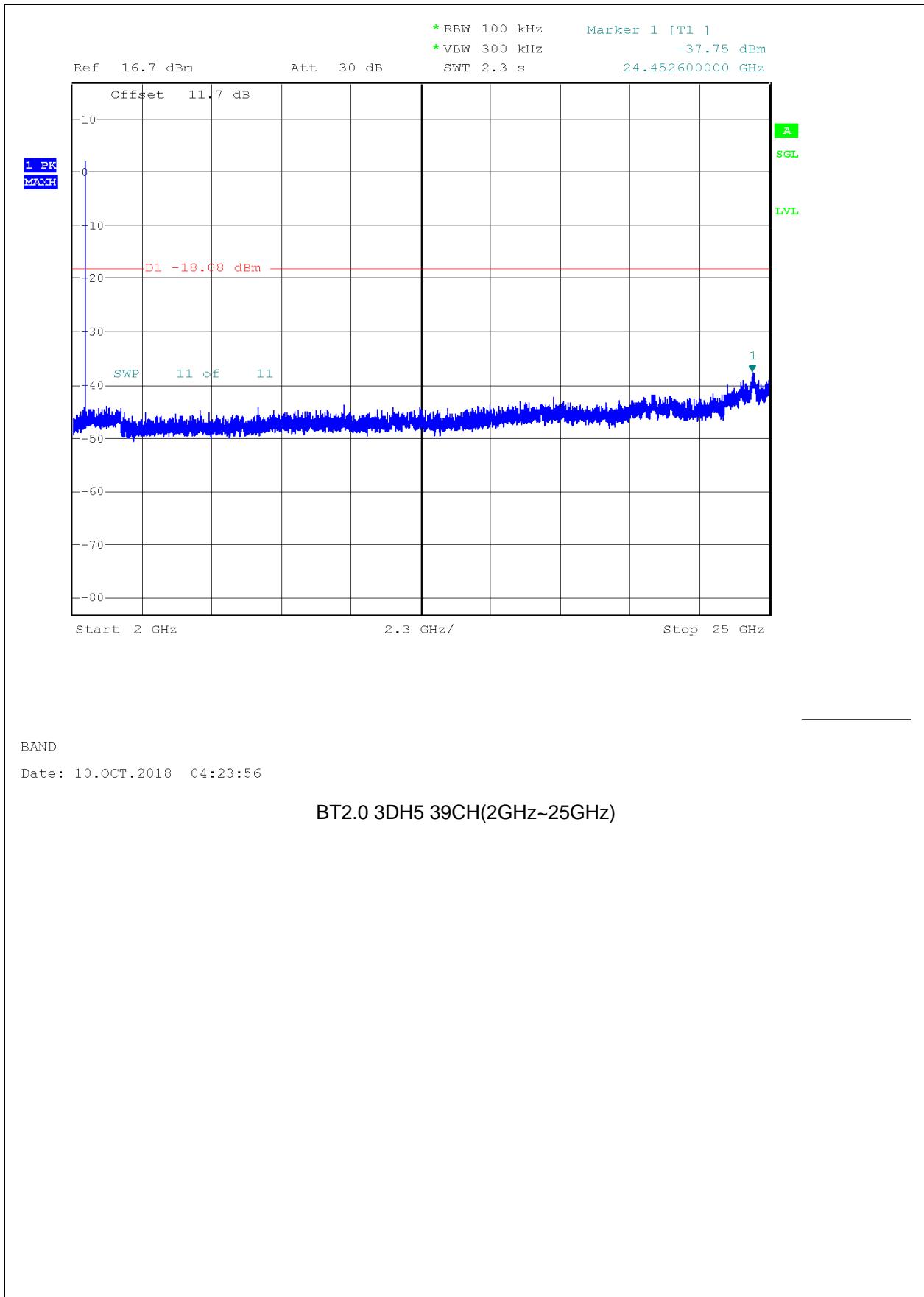
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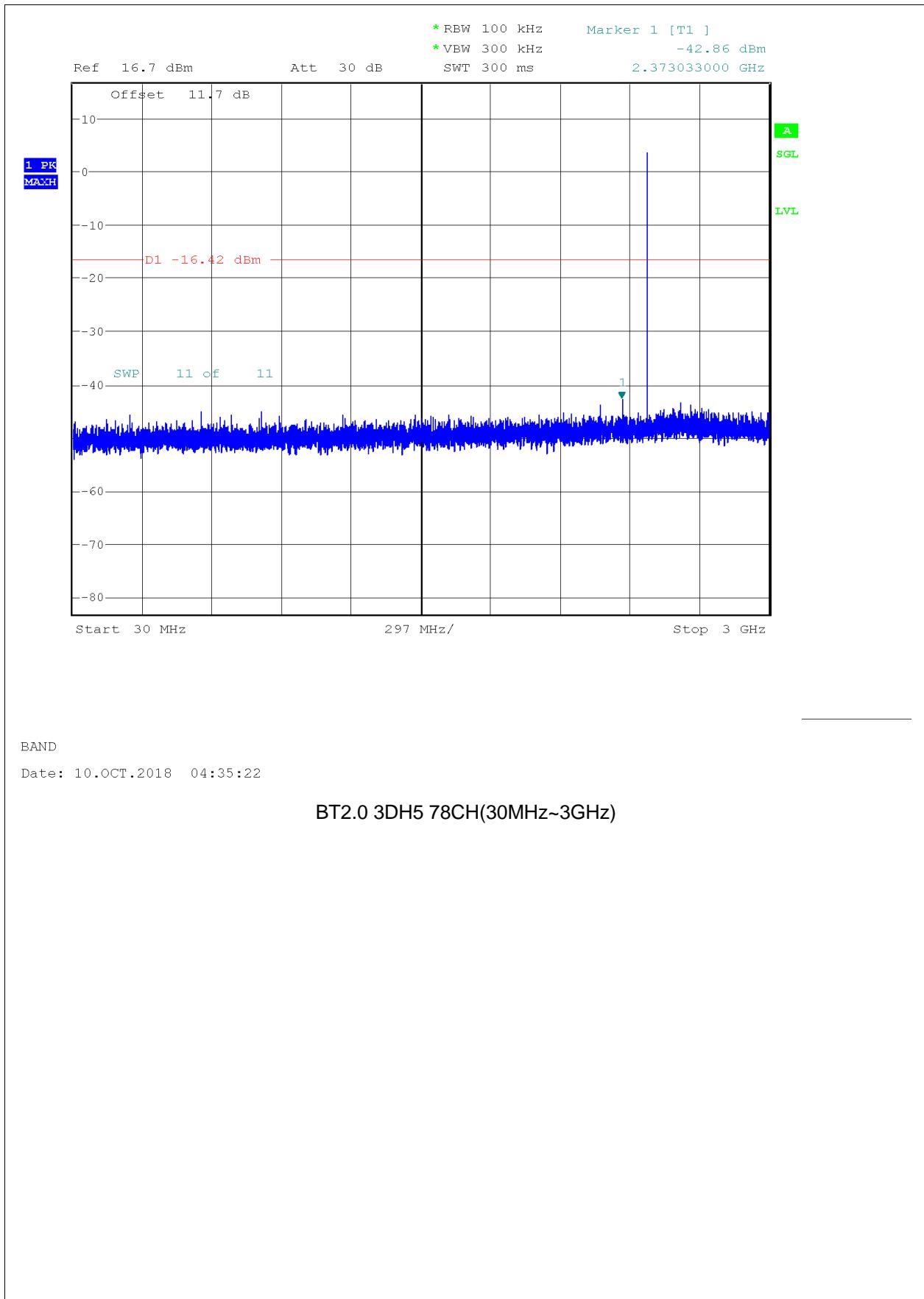
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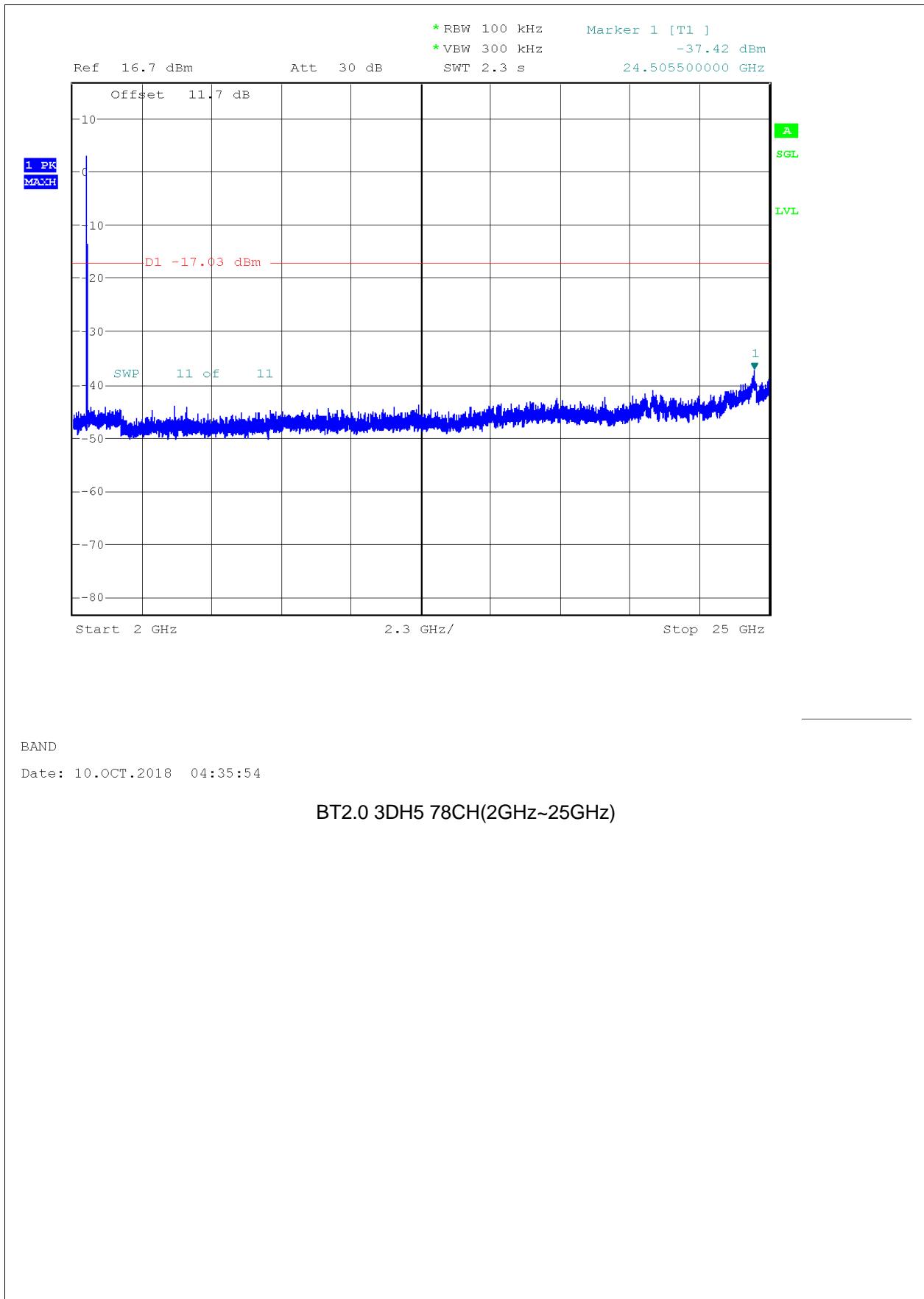
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## **6 SAMPLE PICTRUE**

Reference attachment : Test Setup Photos\_2



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## 7 APPENDIX - INFORMATION ON THE TESTING LABORATORIES

We, BYD Precision Manufacturing Company Limited, were founded in 2007 to provide our best service in RF, Radio consultation. Our laboratories are accredited by the following accreditation bodies according to ISO/IEC 17025 (2005) .

**USA**

A2LA

Certificate No.: 4886.01

Copies of accreditation certificates could be inquired from our office. If you have any comments, please feel free to contact us at the following:

**EMC / RF / Lab:**

Tel: +86-755 8489 8888 55501

Fax: +86-755 8964 3771

**--- END ---**