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TEST REPORT

Report No. ……:	**GTI20191291F**
FCC ID……:	**2ASZNSTRC0001**
Applicant……:	Sensethink Technology(Shenzhen) Co., Ltd.
Address……:	16F,Tower A,UniCenter,Chuang Ye Yi Road,Bao An District,Shenzhen
Manufacturer……:	Sensethink Technology(Shenzhen) Co., Ltd.
Address……:	16F,Tower A,UniCenter,Chuang Ye Yi Road,Bao An District,Shenzhen
Product Name……:	**Senseplay Remote Control**
Trade Mark……:	SENSEPLAY, NAVATICS
Model/Type reference……:	SRC0001
Listed Model(s) ……:	--
Standard……:	**FCC CFR Title 47 Part 15 Subpart C Section 15.247** **RSS 247 Issue 2**
Date of receipt of test sample…:	2019-06-10
Date of testing……..:	2019-06-13 to 2019-07-08
Date of issue……....:	2019-07-10
Result……..:	**PASS**

Compiled by: (Printed name+signature)	Zaki Zhang	Zaki Zhang
Supervised by: (Printed name+signature)	Miller Ma	Miller Ma
Approved by: (Printed name+signature)	Walter Chen	Walter Chen

Testing Laboratory Name.....	**CTC Laboratories, Inc.**
Address.....	1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China

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Any objections must be raised to CTC within 15 days since the date when the report is received. It will not be taken into consideration beyond this limit. The test report merely correspond to the test sample.

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1. TEST SUMMARY

1.1. Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.247: Operation within the bands of 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz.
RSS 247 Issue 2: Standard Specifications for Frequency Hopping Systems (FHSs) and Digital Transmission Systems (DTSs) Operating in the Bands 902-928MHz, 2400-2483.5MHz and 5725-5850MHz.
ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.

1.2. Report version

Revised No.	Date of issue	Description
01	2019-07-10	Original

1.3. Test Description

FCC Part 15 Subpart C(15.247)/ RSS 247 Issue 5				
Test Item	Standard Section		Result	Test Engineer
	FCC	IC		
Antenna Requirement	15.203	/	Pass	Roy Luo
Conducted Emission	15.207	RSS-GEN 7.2.2	Pass	Roy Luo
Restricted Bands	15.205	RSS-Gen 7.2.3	Pass	Roy Luo
Hopping Channel Separation	15.247(a)(1)	RSS 247 5.1 (2)	Pass	Roy Luo
Dwell Time	15.247(a)(1)	RSS 247 5.1 (4)	Pass	Roy Luo
Peak Output Power	15.247(b)(1)	RSS 247 5.4 (2)	Pass	Roy Luo
Number of Hopping Frequency	15.247(b)(1)	RSS 247 5.1 (4)	Pass	Roy Luo
Band Edge Emissions	15.247(d)	RSS 247 5.5	Pass	Roy Luo
Radiated Spurious Emission	15.247(c)&15.209	RSS 247 5.5	Pass	Roy Luo
99% Occupied Bandwidth & 20dB Bandwidth	15.247(a)	RSS 247 5.1 (1)	Pass	Roy Luo

Note: The measurement uncertainty is not included in the test result.

1.4. Test Facility

Address of the report laboratory

CTC Laboratories, Inc.

Add: 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China

Laboratory accreditation

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

CNAS-Lab Code: L5365
CTC Laboratories, Inc. has been assessed and proved to be in compliance
with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No.: 4340.01
CTC Laboratories, Inc. EMC Laboratory has been accredited by A2LA for
technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

ISED Registration No.: CN0029

The 3m alternate test site of CTC Laboratories, Inc. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: CN0029 on Dec, 2018.

FCC-Registration No.: CN1208

CTC Laboratories, Inc. 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 CN1208, Sep 07, 2017

1.5. Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the CTC Laboratories, Inc. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Below is the best measurement capability for CTC Laboratories, Inc.

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.42 dB	(1)
Transmitter power Radiated	2.14 dB	(1)
Conducted spurious emissions 9kHz~40GHz	1.60 dB	(1)
Radiated spurious emissions 9kHz~40GHz	2.20 dB	(1)
Conducted Emissions 9kHz~30MHz	3.20 dB	(1)
Radiated Emissions 30~1000MHz	4.70 dB	(1)
Radiated Emissions 1~18GHz	5.00 dB	(1)
Radiated Emissions 18~40GHz	5.54 dB	(1)
Occupied Bandwidth	---------	(1)

Note (1): This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

1.6. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15~35°C
Relative Humidity:	30~60 %
Air Pressure:	101.3kPa

2. GENERAL INFORMATION

2.1. Client Information

Applicant:	Sensethink Technology(Shenzhen) Co., Ltd.
Address:	16F,Tower A, UniCenter, Chuang Ye Yi Road, Bao An District, Shenzhen
Manufacturer:	Sensethink Technology(Shenzhen) Co., Ltd.
Address:	16F,Tower A,UniCenter,Chuang Ye Yi Road,Bao An District,Shenzhen

2.2. General Description of EUT

Product Name:	Senseplay Remote Control
Model/Type reference:	SRC0001
Marketing Name:	SENSEPLAY, NAVATICS
Listed Model(s):	--
Power supply:	3.8Vdc 3000mAh from Li-ion Battery
Hardware version:	C1-PCB1-SB
Software version:	C1-8B01-00-01.01.022
FHSS	
Modulation:	QPSK
Operation frequency:	2402MHz~2483.5MHz
Max Peak Output Power:	20.89dBm
Channel number:	18
Channel separation:	4MHz
Antenna type:	PIFA Antenna
Antenna gain:	3.5dBi

2.3. Operation state

Operation Frequency List: The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing. BT EDR, 79 channels are provided to the EUT. Channels 00/39/78 were selected for testing.

Operation Frequency List:

Channel	Frequency (MHz)
1	**2405**
2	2409
⋮	⋮
8	
9	**2441**
10	2445
⋮	⋮
17	
18	**2473**

Note: The display in grey were the channel selected for testing.

Test mode

For RF test items:
The engineering test program was provided and enabled to make EUT continuous transmit
For AC power line conducted emissions:
The EUT was set to connect with the Bluetooth instrument under large package sizes transmission.
For Radiated spurious emissions test item:
The engineering test program was provided and enabled to make EUT continuous transmit. The EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

2.4. Measurement Instruments List

Tonscend JS0806-2 Test system						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated until
1	Spectrum Analyzer	Rohde & Schwarz	FSU26	100105	Dec. 29, 2018	Dec. 28, 2019
2	Spectrum Analyzer	Rohde & Schwarz	FUV40-N	101331	Dec. 29, 2018	Dec. 28, 2019
3	MXG Vector Signal Generator	Agilent	N5182A	MY47420864	Dec. 29, 2018	Dec. 28, 2019
4	Signal Generator	Agilent	E8257D	MY46521908	Dec. 29, 2018	Dec. 28, 2019
5	Power Sensor	Agilent	U2021XA	MY5365004	Dec. 29, 2018	Dec. 28, 2019
6	Power Sensor	Agilent	U2021XA	MY5365006	Dec. 29, 2018	Dec. 28, 2019
7	Simultaneous Sampling DAQ	Agilent	U2531A	TW54493510	Dec. 29, 2018	Dec. 28, 2019
8	Climate Chamber	TABAI	PR-4G	A8708055	Dec. 29, 2018	Dec. 28, 2019
9	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	116410	Dec. 29, 2018	Dec. 28, 2019
10	Climate Chamber	ESPEC	MT3065	/	Dec. 29, 2018	Dec. 28, 2019
11	300328 v2.1.1 test system	TONSCEND	v2.6	/	/	/

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	EMI Test Receiver	Rohde & Schwarz	ESCI	100658	Dec. 28, 2019
2	High pass filter	micro-tranics	HPM50111	142	Dec. 28, 2019
3	Log-Bicon Antenna	Schwarzbeck	CBL6141A	4180	Dec. 28, 2019
4	Ultra-Broadband Antenna	ShwarzBeck	BBHA9170	25841	Dec. 28, 2019
5	Loop Antenna	LAPLAC	RF300	9138	Dec. 28, 2019
6	Spectrum Analyzer	Rohde & Schwarz	FSU26	100105	Dec. 28, 2019
7	Horn Antenna	Schwarzbeck	BBHA 9120D	647	Dec. 28, 2019
8	Pre-Amplifier	HP	8447D	1937A03050	Dec. 28, 2019
9	Pre-Amplifier	EMCI	EMC051835	980075	Dec. 28, 2019
10	Antenna Mast	UC	UC3000	N/A	N/A
11	Turn Table	UC	UC3000	N/A	N/A
12	Cable Below 1GHz	Schwarzbeck	AK9515E	33155	Dec. 28, 2019
13	Cable Above 1GHz	Hubersuhner	SUCOFLEX102	DA1580	Dec. 28, 2019
14	Splitter	Mini-Circuit	ZAPD-4	400059	Dec. 28, 2019
15	RF Connection Cable	HUBER+SUHNER	RE-7-FL	N/A	Dec. 28, 2019
16	RF Connection Cable	Chengdu E-Microwave	---	---	Dec. 28, 2019
17	High pass filter	Compliance Direction systems	BSU-6	34202	Dec. 28, 2019

18	Attenuator	Chengdu E-Microwave	EMCAXX-10R NZ-3	---	Dec. 28, 2019
19	High and low temperature box	ESPEC	MT3065	12114019	Dec. 28, 2019

Note:1. The Cal. Interval was one year.
2. The cable loss has calculated in test result which connection between each test instruments.

3. TEST ITEM AND RESULTS

3.1. Conducted Emission

Limit

Conducted Emission Test Limit

Frequency	Maximum RF Line Voltage (dBμV)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

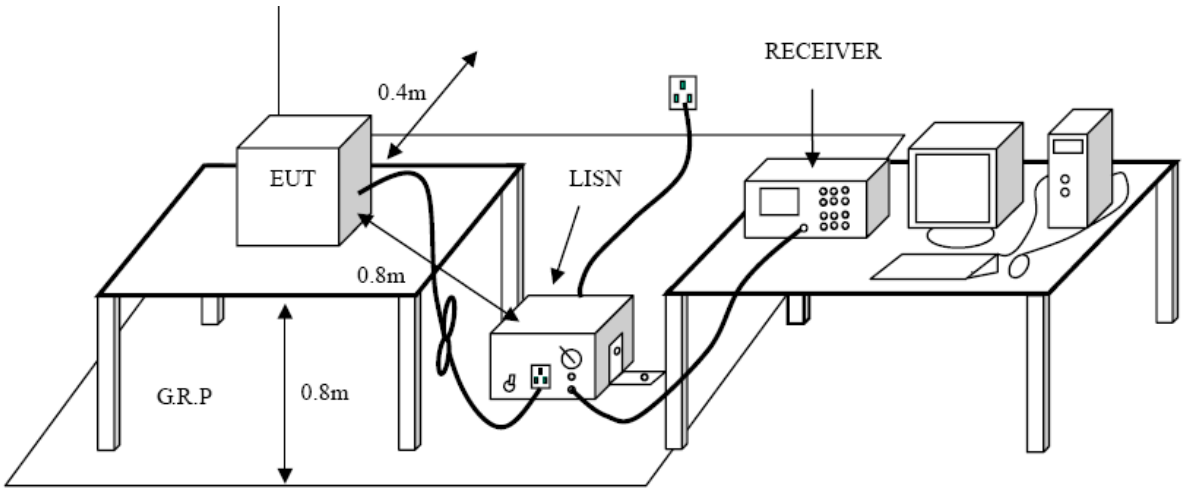
Notes:

(1) *Decreasing linearly with logarithm of the frequency.

(2) The lower limit shall apply at the transition frequencies.

(3) The limit decrease in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

Test Configuration



Test Procedure

1. The EUT was setup according to ANSI C63.10:2013 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50ohm /50uH coupling impedance for the measuring equipment.
   The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
4. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
5. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
6. Conducted Emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
7. During the above scans, the emissions were maximized by cable manipulation.

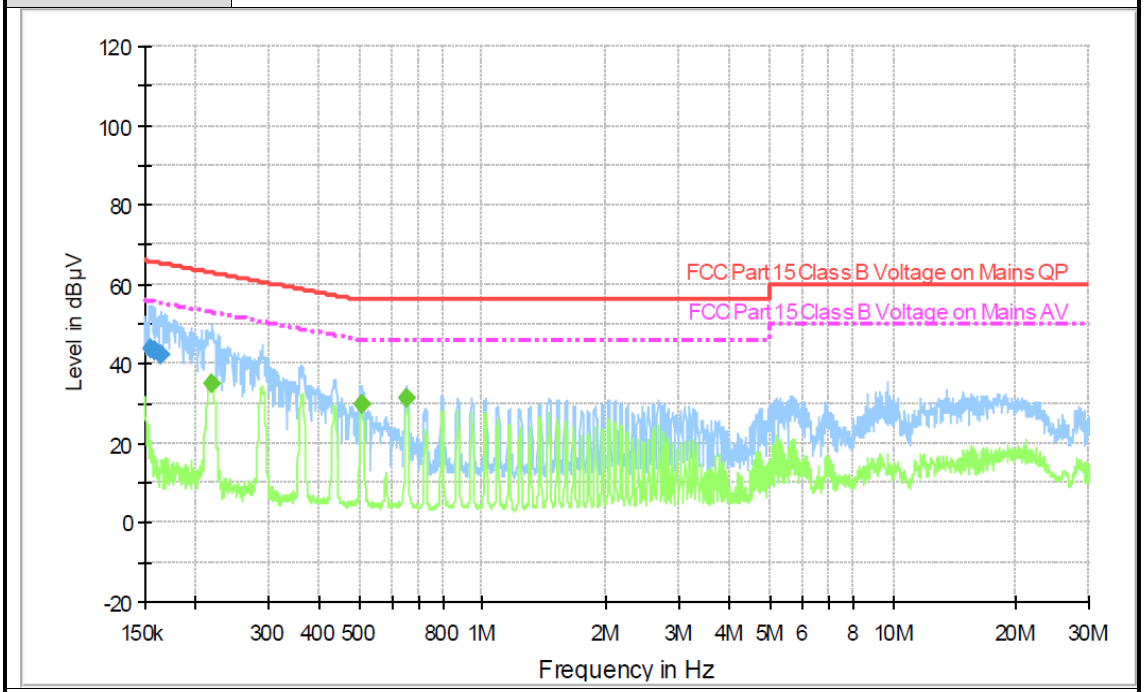
Test Mode:

Please refer to the clause 2.2.

Test Results

Only show worst adapter data.

Test Voltage:	AC 120V/60 Hz
Terminal:	Line



Final Measurement Detector 1

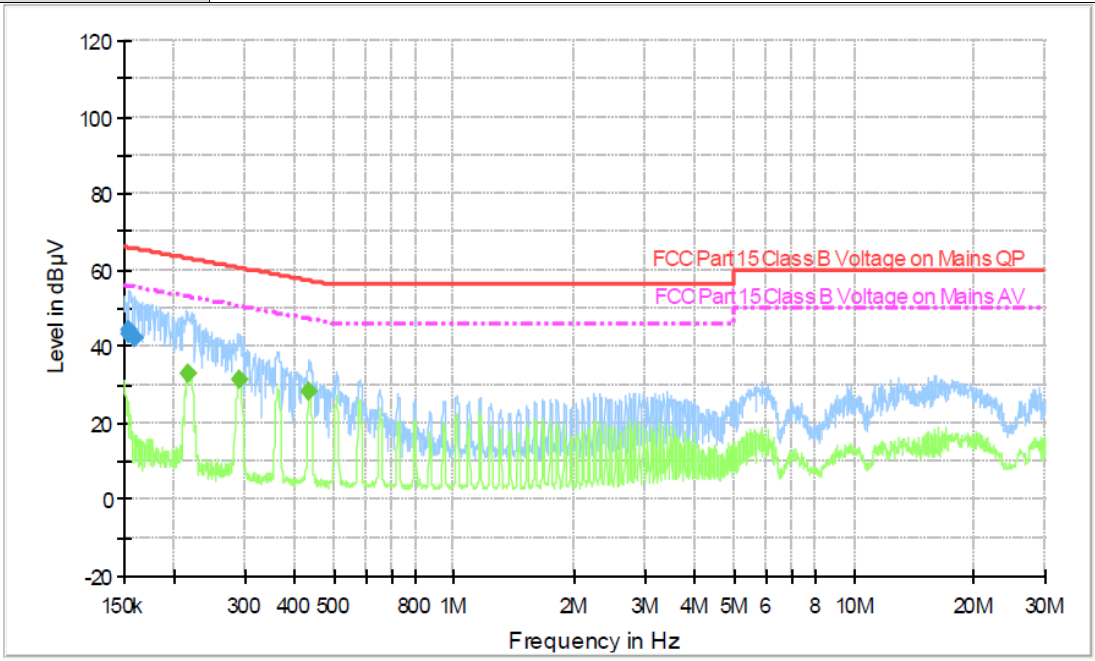
Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.155800	43.5	1000.00	9.000	Off	L1	10.0	22.2	65.7	
0.158310	43.4	1000.00	9.000	Off	L1	10.0	22.2	65.6	
0.164110	42.3	1000.00	9.000	Off	L1	10.0	23.0	65.3	

Final Measurement Detector 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.217950	35.2	1000.00	9.000	Off	L1	10.0	17.7	52.9	
0.506450	29.7	1000.00	9.000	Off	L1	10.0	16.3	46.0	
0.652730	31.2	1000.00	9.000	Off	L1	10.0	14.8	46.0	

Emission Level= Read Level+ Correct Factor

Test Voltage:	AC 120V/60 Hz
Terminal:	Neutral



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.153030	44.2	1000.00	9.000	Off	N	9.5	21.6	65.8	
0.154260	43.5	1000.00	9.000	Off	N	9.5	22.3	65.8	
0.158310	42.1	1000.00	9.000	Off	N	9.5	23.5	65.6	

Final Measurement Detector 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.215780	32.4	1000.00	9.000	Off	N	9.5	20.6	53.0	
0.288870	31.2	1000.00	9.000	Off	N	9.5	19.4	50.6	
0.434230	28.3	1000.00	9.000	Off	N	9.5	18.9	47.2	

Emission Level= Read Level+ Correct Factor

3.2. Radiated Emission

Limit

Radiated Emission Limits (9 kHz~1000 MHz)

Frequency (MHz)	Field Strength (microvolt/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Radiated Emission Limit (Above 1000MHz)

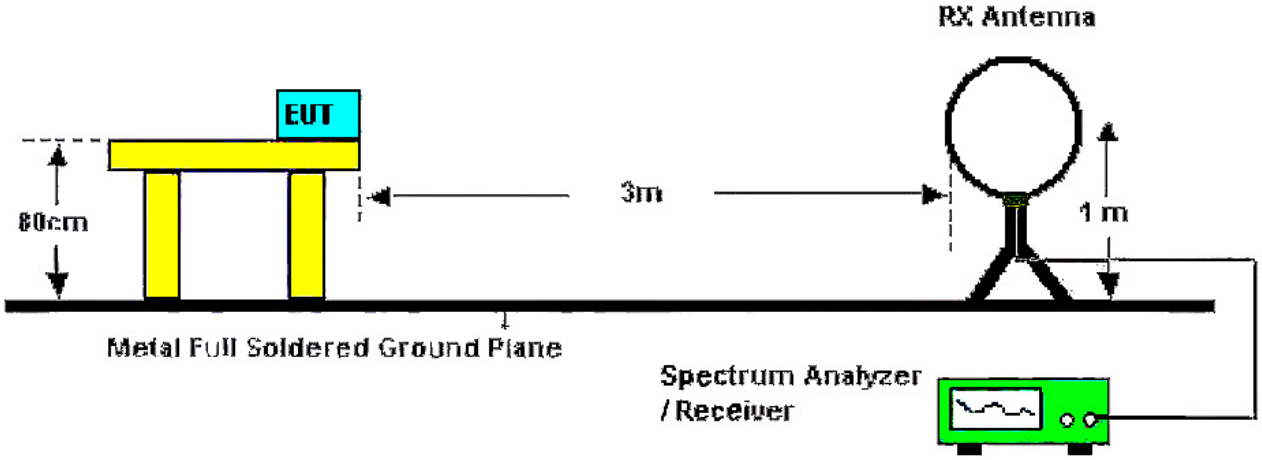
Frequency (MHz)	Distance Meters(at 3m)	
	Peak	Average
Above 1000	74	54

Note:

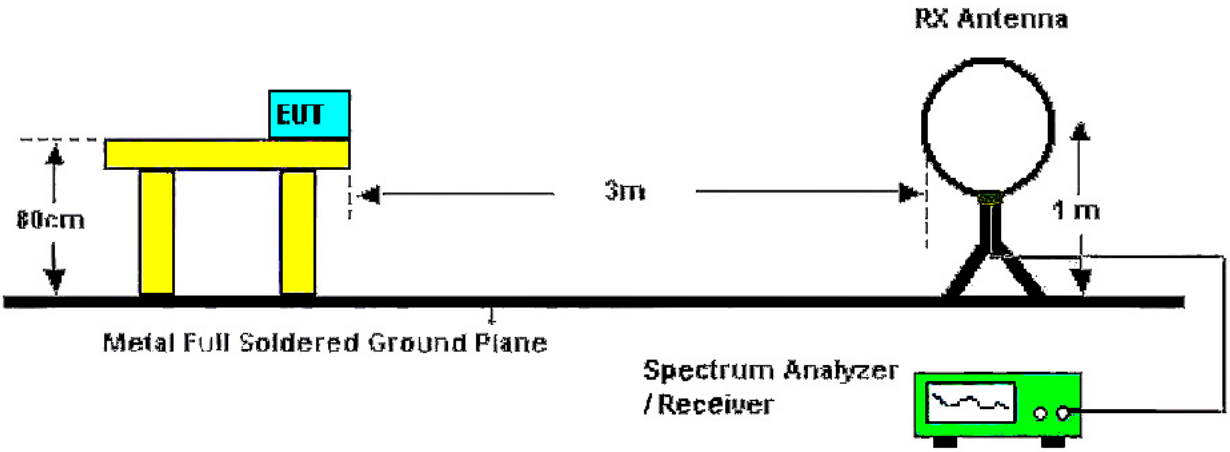
(1) The tighter limit applies at the band edges.

(2) Emission Level (dBuV/m)=20log Emission Level (uV/m).

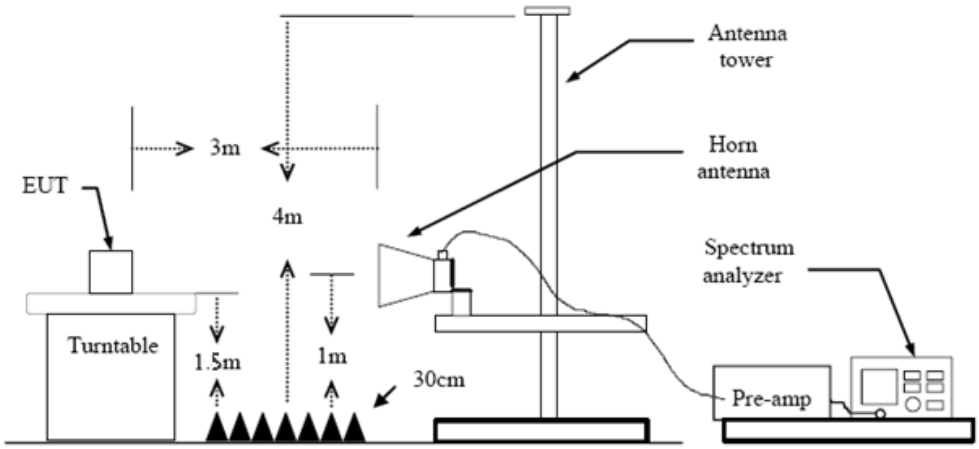
Test Configuration



Below 30MHz Test Setup



Below 1000MHz Test Setup



1000MHz Test Setup

Above 1GHz Test Setup

Test Procedure

1. The EUT was setup and tested according to ANSI C63.10:2013
2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Use the following spectrum analyzer settings

   (1) Span shall wide enough to fully capture the emission being measured;

   (2) Below 1 GHz:

   RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold;

   If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

   (3) From 1 GHz to 10th harmonic:

   RBW=1MHz, VBW=3MHz Peak detector for Peak value.

   RBW=1MHz, VBW=3MHz RMS detector for Average value.

Test Mode

Please refer to the clause 2.2.

Test Result

9 KHz~30 MHz

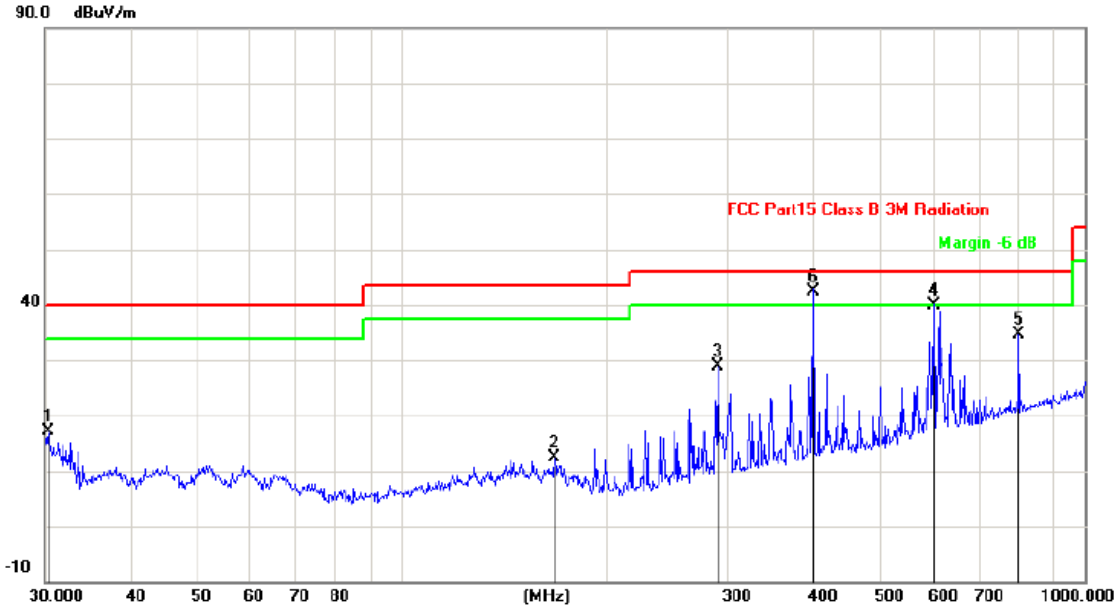
From 9 KHz to 30 MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Above 18G test data reference to the test report No.: C180811Z01-RP1.

30MHz-1GHz

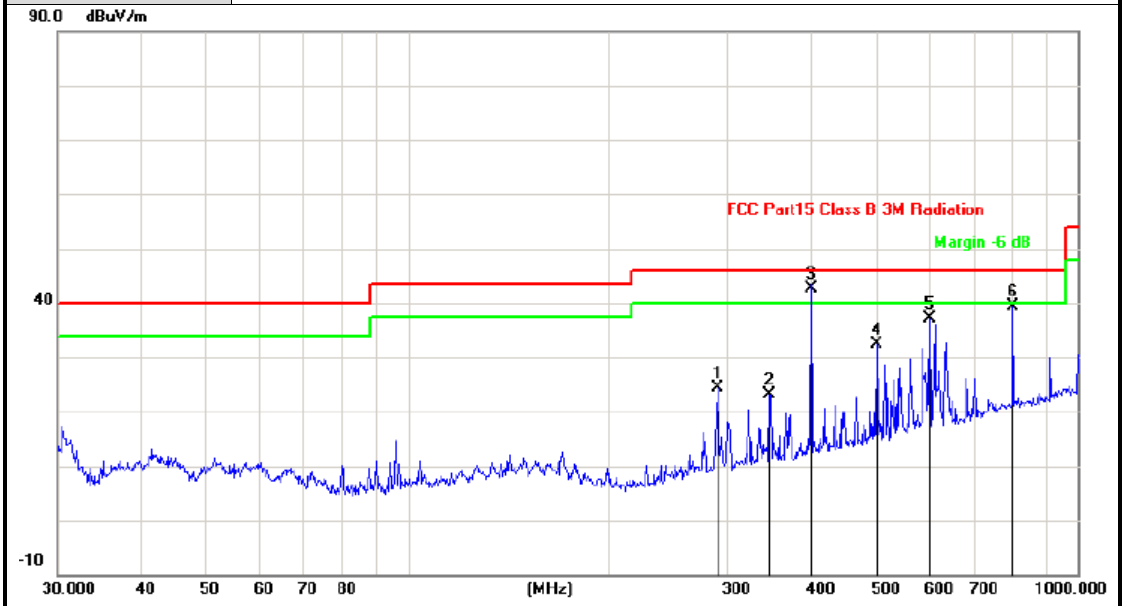
Ant. Pol.	Horizontal



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	30.3173	-19.20	36.33	17.13	40.00	-22.87	QP
2	167.2368	-18.36	30.72	12.36	43.50	-31.14	QP
3	290.0172	-18.51	47.34	28.83	46.00	-17.17	QP
4	601.4265	-11.27	51.17	39.90	46.00	-6.10	QP
5	801.7863	-7.96	42.65	34.69	46.00	-11.31	QP
6	400.4318	-15.81	58.31	42.50	46.00	-3.50	QP

Emission Level= Read Level+ Correct Factor

Ant. Pol.	Vertical



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	290.0172	-18.51	42.84	24.33	46.00	-21.67	QP
2	346.8092	-17.06	40.30	23.24	46.00	-22.76	QP
3	400.4318	-15.81	58.41	42.60	46.00	-3.40	QP
4	501.1790	-13.71	46.00	32.29	46.00	-13.71	QP
5	601.4265	-11.27	48.49	37.22	46.00	-8.78	QP
6	801.7863	-7.96	47.38	39.42	46.00	-6.58	QP

Emission Level= Read Level+ Correct Factor

HORIZONTAL

Frequency(MHz):				2405.00			Polarity:
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height(m)	Table Angle (Degree)
1	4824.00	51.14	PK	74.00	22.86	1.00	225.00
1	4824.00	45.93	AV	54.00	8.07	1.00	225.00
2	7236.00	43.22	PK	74.00	30.78	1.00	225.00
2	7236.00	37.99	AV	54.00	16.01	1.00	225.00

VERTICAL

Frequency(MHz):				2405.00			Polarity:
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height(m)	Table Angle (Degree)
1	4824.00	51.59	PK	74.00	22.41	1.00	125.00
1	4824.00	46.50	AV	54.00	7.50	1.00	125.00
2	7236.00	43.13	PK	74.00	30.87	1.00	325.00
2	7236.00	38.11	AV	54.00	15.89	1.00	325.00

HORIZONTAL

Frequency(MHz):				2473.00			Polarity:
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin(dB)	Antenna Height(m)	Table Angle (Degree)
1	4824.00	52.91	PK	74.00	21.09	1.00	104.00
1	4824.00	46.10	AV	54.00	7.90	1.00	104.00
2	7236.00	44.41	PK	74.00	29.59	1.00	28.00
2	7236.00	37.73	AV	54.00	16.27	1.00	28.00

VERTICAL

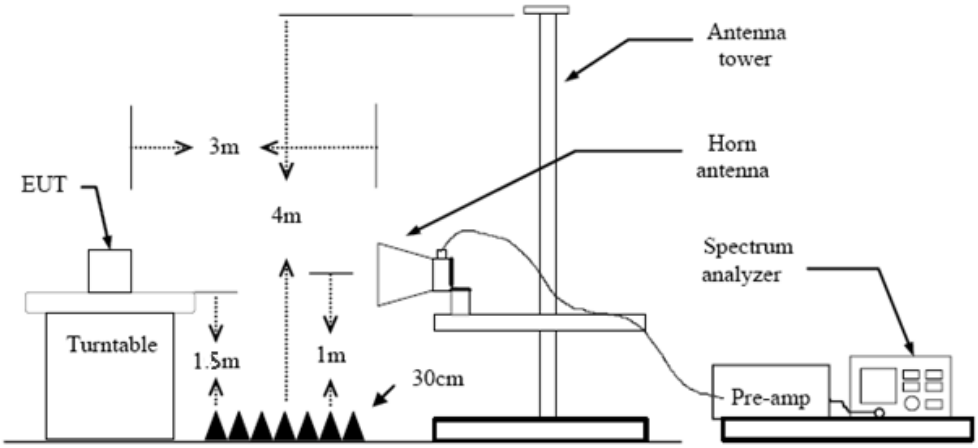
Frequency(MHz):				2473.00			Polarity:
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height(m)	Table Angle (Degree)
1	4824.00	52.18	PK	74.00	21.82	1.00	141.00
1	4824.00	45.04	AV	54.00	8.96	1.00	141.00
2	7236.00	44.30	PK	74.00	29.70	1.00	84.00
2	7236.00	38.41	AV	54.00	15.59	1.00	84.00

3.3. Band Edge Emissions

Limit

Restricted Frequency Band (MHz)	(dBuV/m)(at 3m)	
	Peak	Average
2310 ~2390	74	54
2483.5 ~2500	74	54
Note: All restriction bands have been tested, only the worst case is reported.		

Test Configuration



Test Procedure

1. The EUT was setup and tested according to ANSI C63.10:2013 requirements.
2. The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT waspositioned such that the distance from antenna to the EUT was 3 meters.
4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. Thisis repeated for both horizontal and vertical polarization of the antenna. In order to find themaximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
5. The receiver set as follow:
   RBW=1MHz, VBW=3MHz PEAK detector for Peak value.
   RBW=1MHz, VBW=10Hz with PEAK Detector for Average Value.

Test Mode

Please refer to the clause 2.2.

Test Results

(1) Radiation Test

HORIZONTAL

Frequency(MHz):				2405.00			Polarity:
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height(m)	Table Angle (Degree)
1	4810	49.75	PK	74.00	24.25	1.00	275.00
1	4810	38.04	AV	54.00	15.96	1.00	275.00
2	7215	43.87	PK	74.00	30.13	1.00	289.00
2	7215	--	AV	--	--	--	289.00

VERTICAL

Frequency(MHz):				2405.00			Polarity:
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height(m)	Table Angle (Degree)
1	4810	48.86	PK	74.00	25.14	1.00	291.00
1	4810	38.70	AV	54.00	15.30	1.00	291.00
2	7215	44.55	PK	74.00	29.45	1.00	351.00
2	7215	--	AV	--	--	1.00	351.00

HORIZONTAL

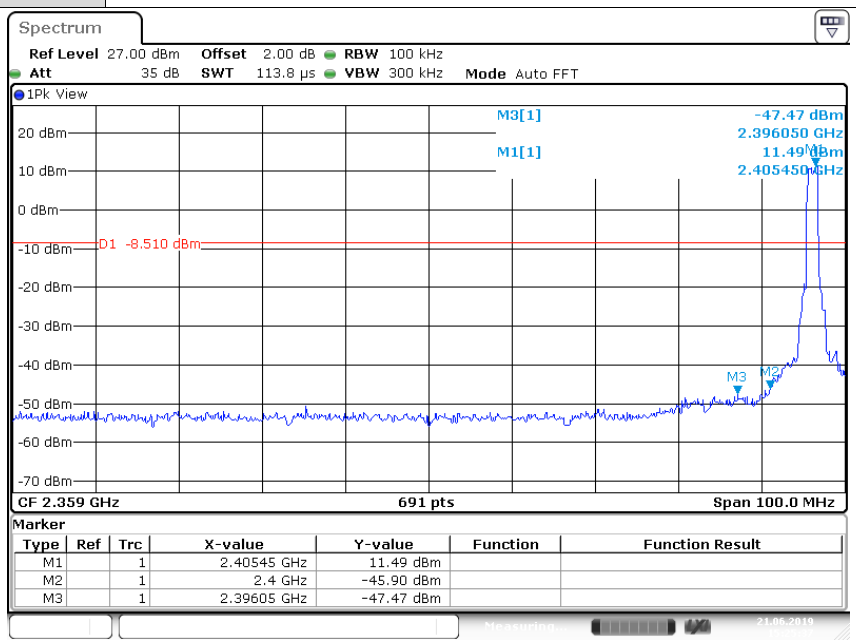
Frequency(MHz):				2473.00			Polarity:
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin(dB)	Antenna Height(m)	Table Angle (Degree)
1	4946	50.26	PK	74.00	23.74	1.00	114.00
1	4946	38.76	AV	54.00	15.24	1.00	114.00
2	7419	45.01	PK	74.00	28.99	1.00	326.00
2	7419	--	AV	--	--	--	326.00

VERTICAL

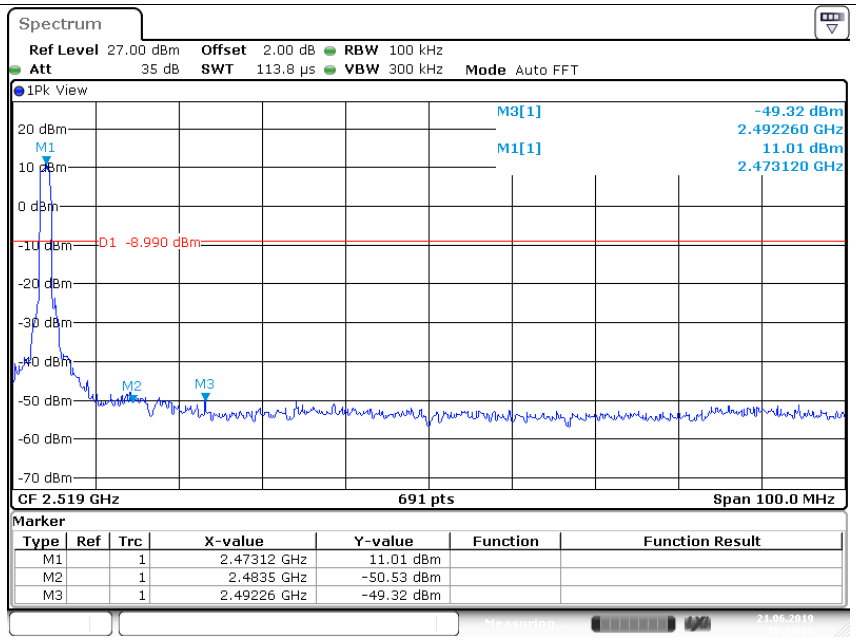
Frequency(MHz):				2473.00			Polarity:
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height(m)	Table Angle (Degree)
1	4946	50.68	PK	74.00	23.32	1.00	210．00
1	4946	38.89	AV	54.00	15.11	1.00	210.00
2	7419	44.25	PK	74.00	29.75	1.00	198.00
2	7419	--	AV	--	--	--	198.00

(2) Conducted Test

Test Mode:	QPSK Mode 2402MHz/2480 MHz

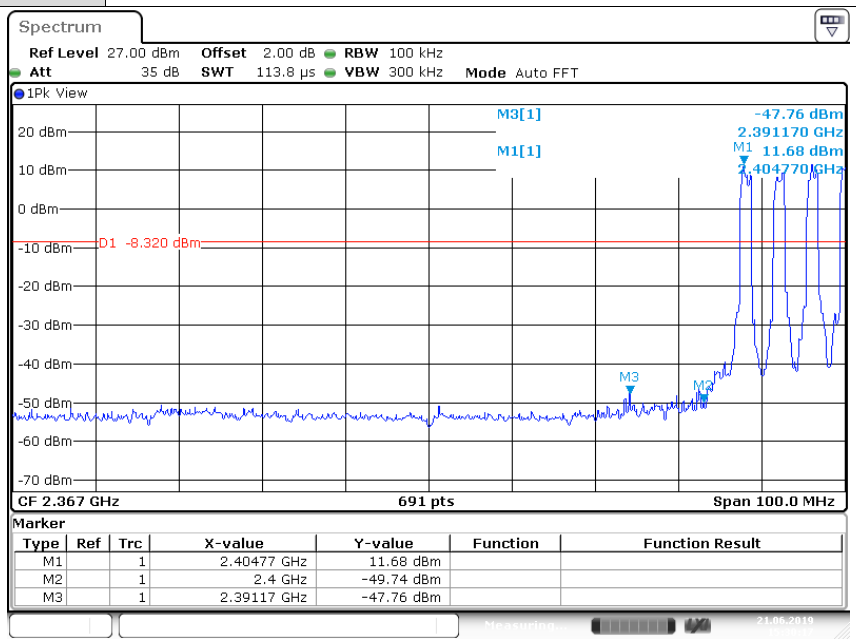


Date: 21.JUN.2019 15:25:37

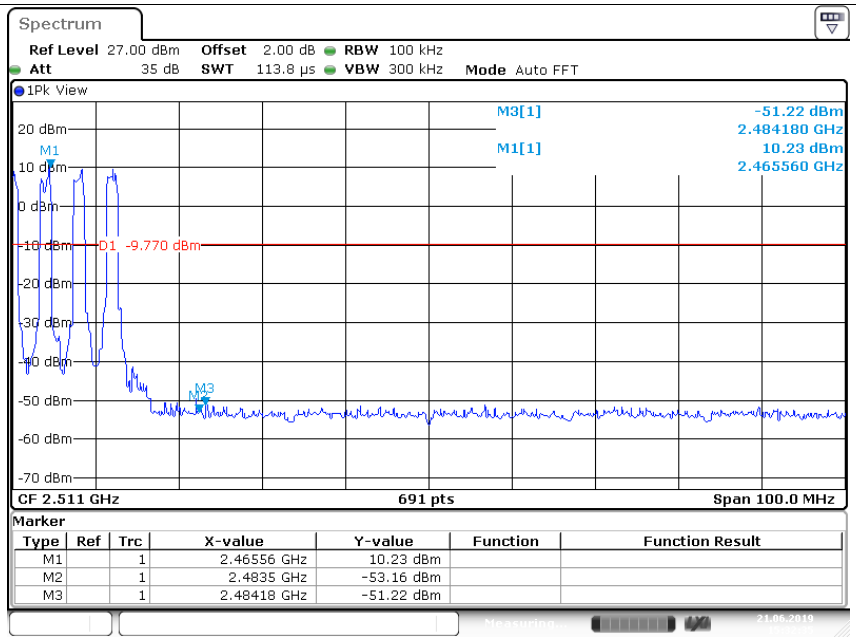


Date: 21.JUN.2019 15:34:26

Test Mode:	QPSK Hopping Mode



Date: 21.JUN.2019 15:30:16



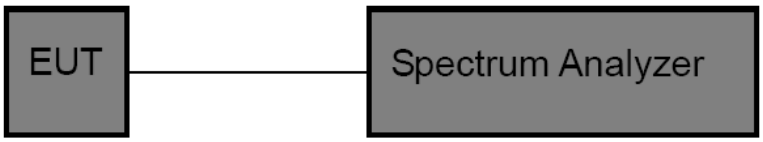
Date: 21.JUN.2019 15:32:36

3.4. Channel Separation and Bandwidth

Limit

Test Item	Limit	Frequency Range(MHz)
Bandwidth	<=1 MHz (20dB bandwidth)	2400~2483.5
Channel Separation	>25KHz or >two-thirds of the 20 dB bandwidth Which is greater	2400~2483.5

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. Spectrum Setting:
   (1) Set RBW = 100 kHz.
   (2) Set the video bandwidth (VBW) ≥ 3 RBW.
   (3) Detector = Peak.
   (4) Trace mode = Max hold.
   (5) Sweep = Auto couple.

NOTE: The EUT was set to continuously transmitting in each mode and low, Middle and high channel for the test.

Test Mode

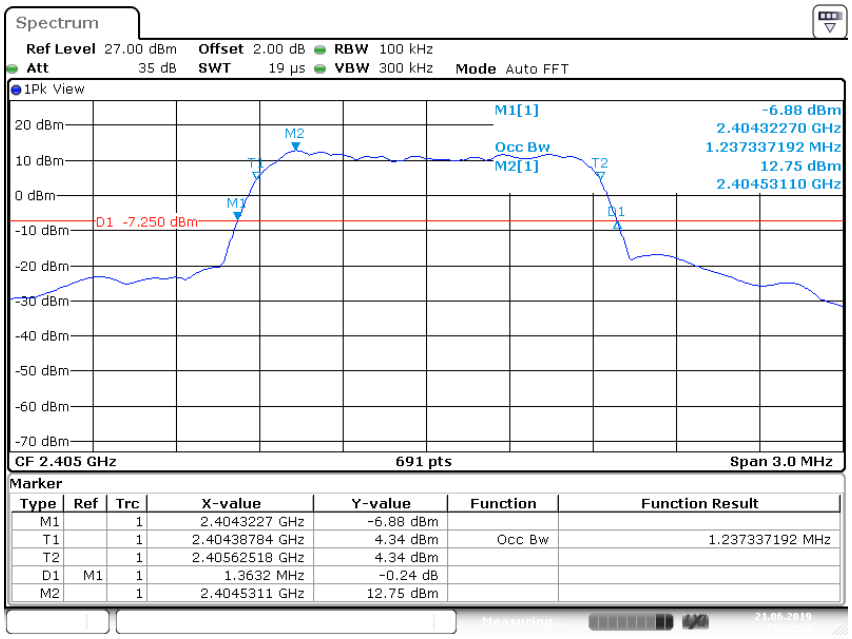
Please refer to the clause 2.2.

Test Results

Test Mode:	QPSK Mode		
Channel frequency (MHz)	**99% OBW (kHz)**	**20dB Bandwidth (kHz)**	**20dB Bandwidth *2/3 (kHz)**
2405	1237	1363	908.6
2441	1250	1380	920
2473	1241	1371	914

QPSK Mode

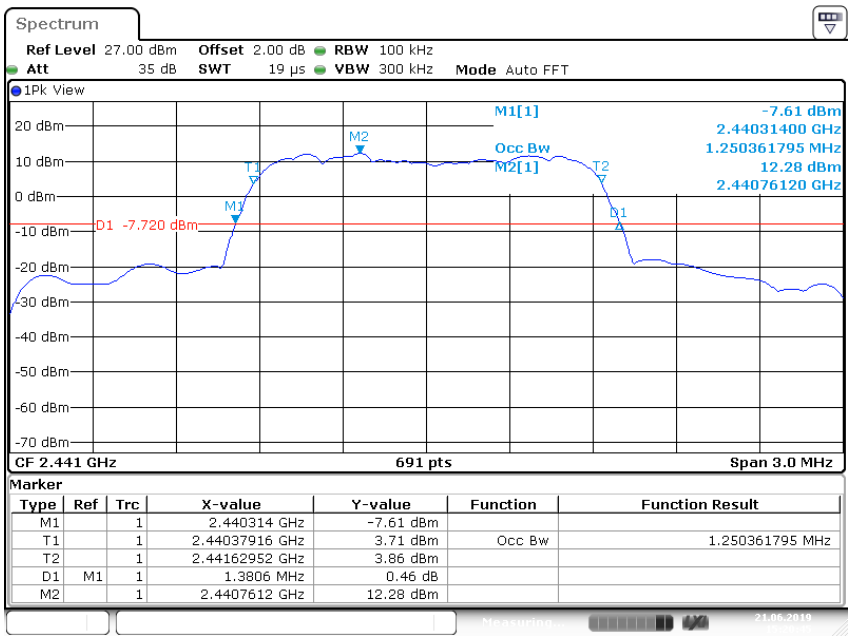
2405 MHz



Date: 21.JUN.2019 15:22:24

QPSK **Mode**

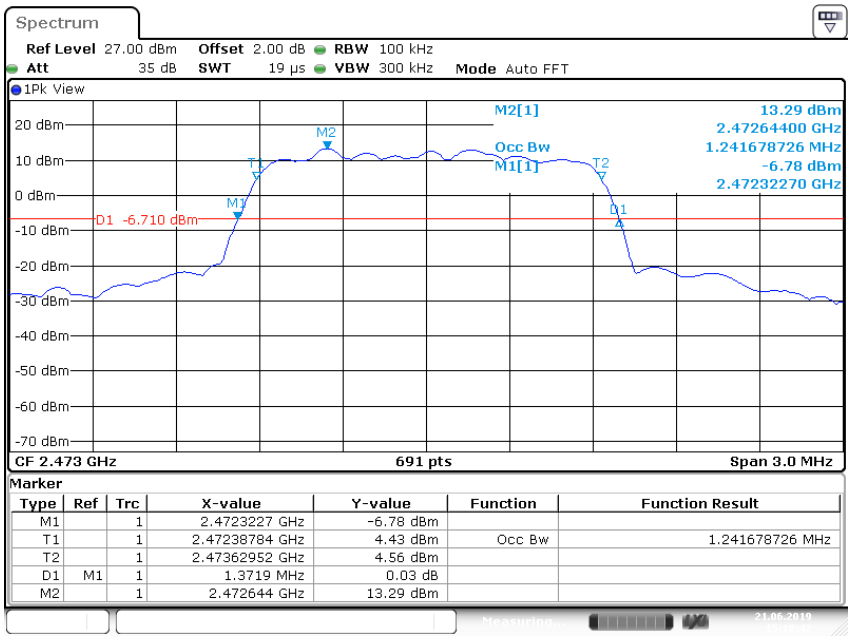
2441 MHz



Date: 21.JUN.2019 15:20:45

QPSK Mode

2473 MHz

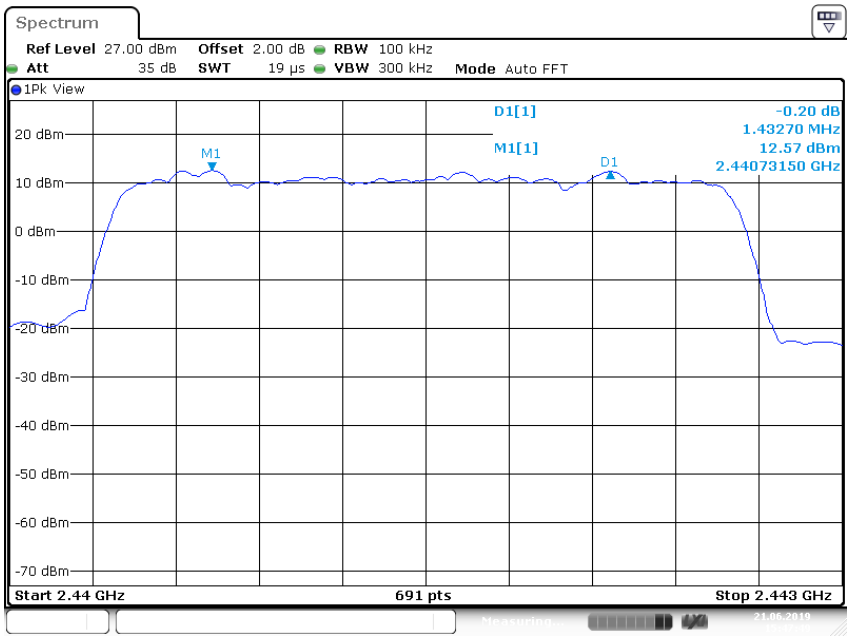


Date: 21.JUN.2019 15:18:43

Test Mode:	QPSK Hopping Mode	
Channel frequency (MHz)	**Separation Read Value (kHz)**	**Separation Limit (kHz)**
2441	1432.70	701.92

QPSK Hopping Mode

2441 MHz



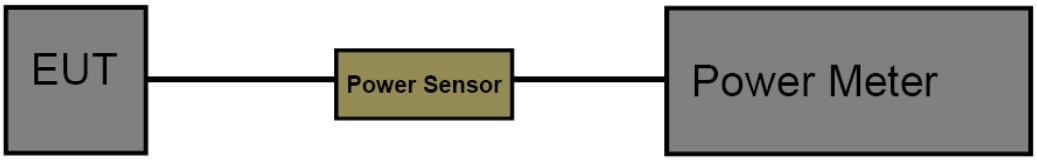
Date: 21.JUN.2019 15:47:50

3.5. Number of Hopping Channel

Limit

Section	Test Item	Limit
15.247	Number of Hopping Channel	>15

Test Configuration



Test Procedure

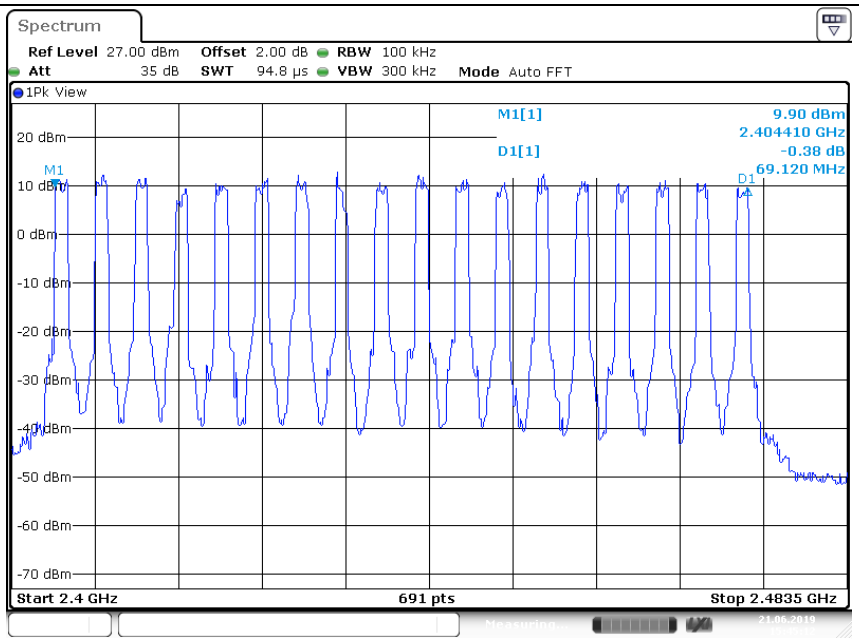
1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. Spectrum Setting:
   (1) Peak Detector: RBW=100 kHz, VBW≥RBW, Sweep time= Auto.

Test Mode

Please refer to the clause 2.2.

Test Result

Test Mode:	Hopping Mode		
Frequency Range	**Test Mode**	**Quantity of Hopping Channel**	**Limit**
2402MHz~2483.5MHz	QPSK	18	**>15**
QPSK Mode			



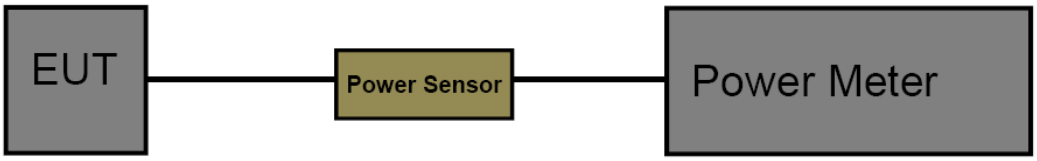
Date: 21.JUN.2019 15:45:13

3.6. Dwell Time

Limit

Section	Test Item	Limit
15.247(a)(1)/ RSS-210 Annex 8(A8.1d)	Average Time of Occupancy	0.4 sec

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. Spectrum Setting:
   (1) Spectrum Setting: RBW=1MHz, VBW≥RBW.
   (2) Use video trigger with the trigger level set to enable triggering only on full pulses.
   (3) Sweep Time is more than once pulse time.
   (4) Set the center frequency on any frequency would be measure and set the frequency span to zero.
   (5) Measure the maximum time duration of one single pulse.
   (6) Set the EUT for packet transmitting.

Test Mode

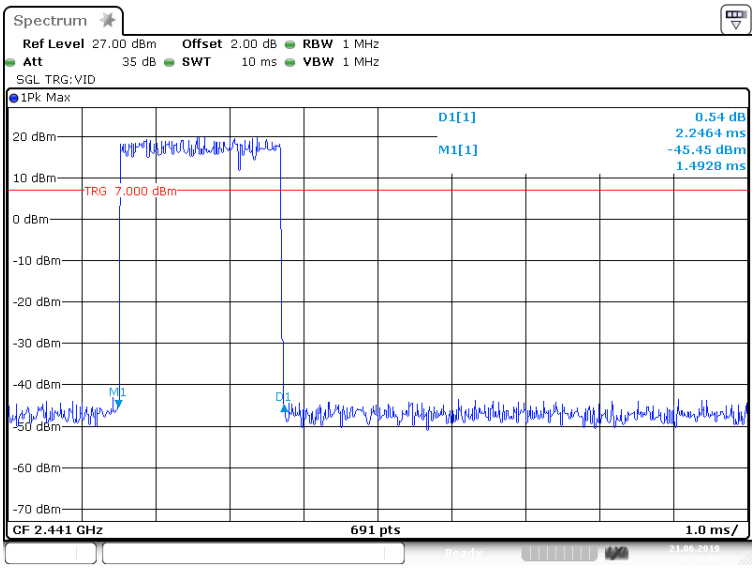
Please refer to the clause 2.2

Test Result

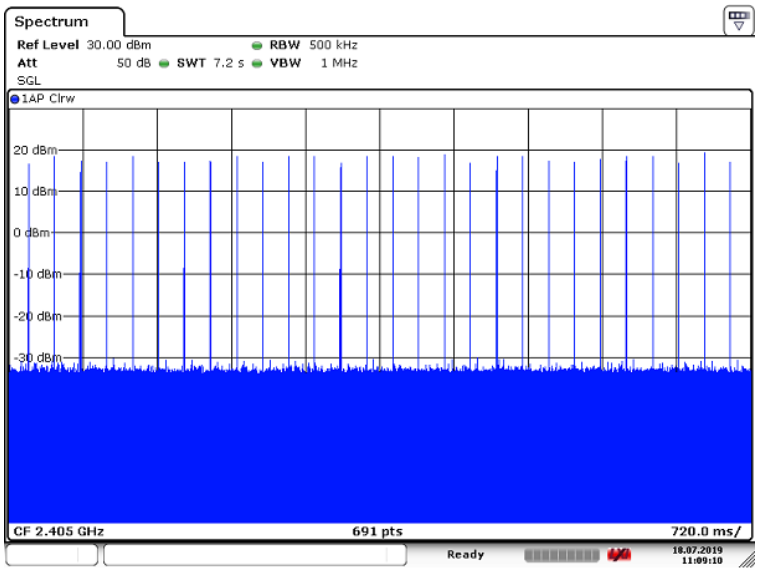
Test Mode:	Hopping Mode (QPSK)					
Test Mode	**Channel (MHz)**	**Pulse Time (ms)**	**Total of Dwell (ms)**	**Period Time (s)**	**Limit (ms)**	**Result**
QPSK	2441	2.246	62.88	7.2	**400**	**PASS**
*Total of Dwell= Pulse Time*28*						

QPSK Hopping Mode

2441 MHz



Date: 21.JUN.2019 15:39:09

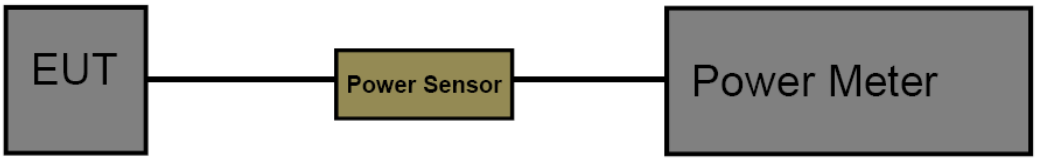


3.7. Peak Output Power

Limit

Test Item	Limit	Frequency Range(MHz)
Peak Output Power	Hopping Channels>75 Power<1W(30dBm) Other <125mW(21dBm)	2400~2483.5

Test Configuration



Test Procedure

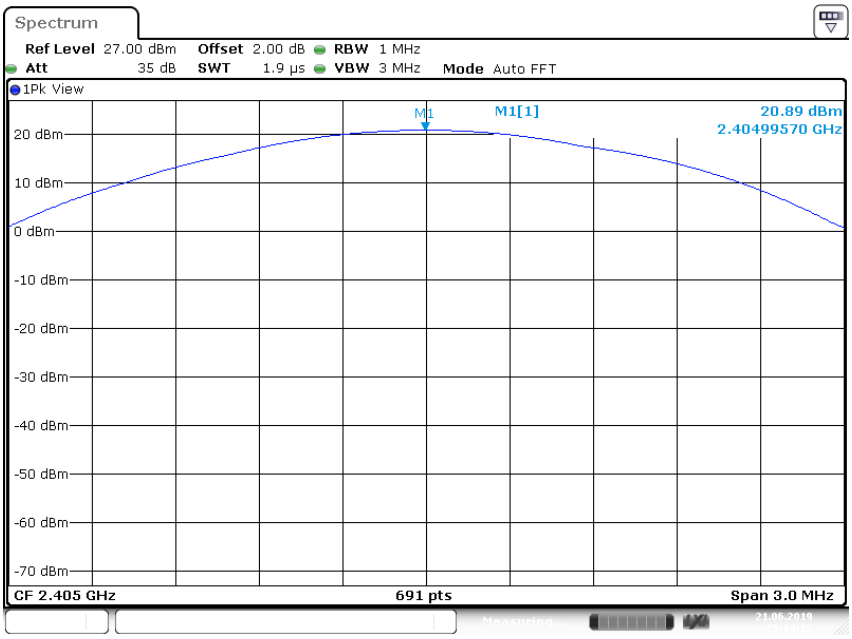
1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. Spectrum Setting:
   Peak Detector: RBW=1 MHz, VBW=3 MHz for bandwidth less than 1MHz.
   RBW=3 MHz, VBW=3 MHz for bandwidth more than 1MHz.

Test Mode

Please refer to the clause 2.2

Test Result

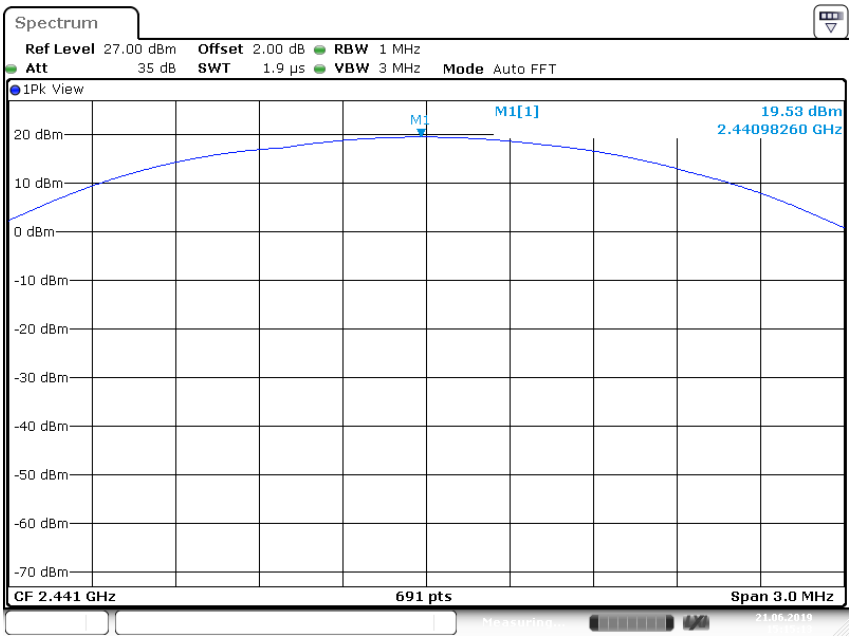
Test Mode:	QPSK Mode	
Channel frequency (MHz)	**Test Result (dBm)**	**Limit (dBm)**
2405	20.89	**30**
2441	19.53	
2473	19.50	
QPSK Mode		
2402 MHz		



Date: 21.JUN.2019 15:14:14

QPSK Mode

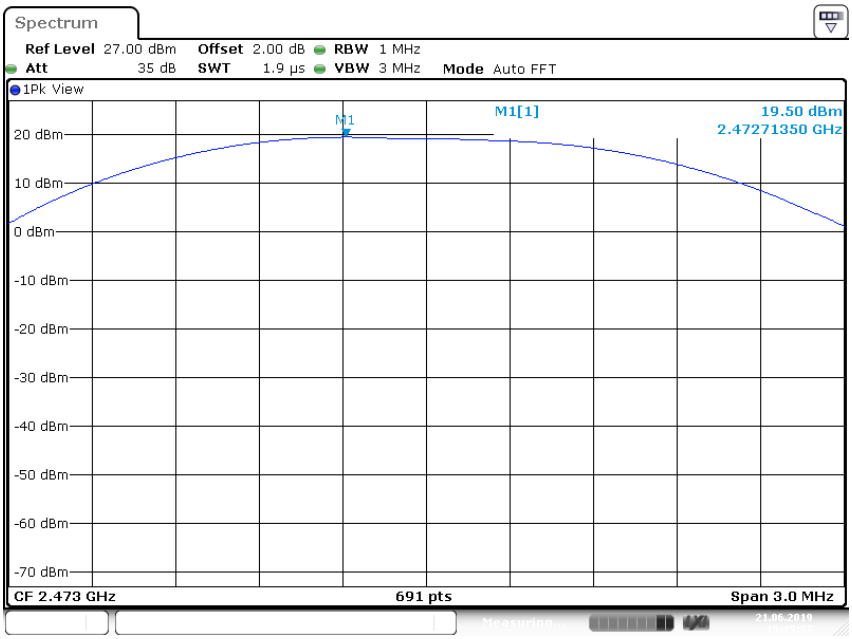
2441 MHz



Date: 21.JUN.2019 15:15:12

QPSK Mode

2473 MHz



Date: 21.JUN.2019 15:15:57

3.8. Antenna requirement

Requirement

FCC CFR Title 47 Part 15 Subpart C Section 15.203:

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 anantenna 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.

FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):

(i) Systems operating in the 2400~2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

Test Result

The directional gain of the antenna less than 6dBi, please refer to the EUT internal photographs antenna photo.

4.EUT TEST PHOTOS

Reference to the document No.: Test Photographs .

5.PHOTOGRAPHS OF EUT CONSTRUCTIONAL

Reference to the document No.: External Photographs and Internal Photographs.

**********THE END**********