

Prüfbericht-Nr.: <i>Test report No.:</i>	60357211 001	Auftrags-Nr.: <i>Order No.:</i>	168257717	Seite 1 von 22 <i>Page 1 of 22</i>
Kunden-Referenz-Nr.: <i>Client reference No.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	23.03.2020	
Auftraggeber: <i>Client:</i>	Sunwoda Electronic Co., Ltd. No.2, Yihe Rd., Shilong Community, Shiyan Street, Baoan District, Shenzhen, China			
Prüfgegenstand: <i>Test item:</i>	Lenovo E-Color Pen			
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	Lenovo E-Color Pen (Trademark: Lenovo)			
Auftrags-Inhalt: <i>Order content:</i>	FCC and IC approval			
Prüfgrundlage: <i>Test specification:</i>	CFR47 FCC Part 15: Subpart C Section 15.247 CFR47 FCC Part 15: Subpart C Section 15.207 CFR47 FCC Part 15: Subpart C Section 15.209 CFR47 FCC Part 2: Subpart J Section 2.1093 FCC KDB Publication 447498 D01 V06		RSS-247 Issue 2 February 2017 RSS-Gen Issue 5 March 2019 RSS-102 Issue 5 March 2015 ICES-003	
Wareneingangsdatum: <i>Date of receipt:</i>	14.04.2020	Please refer to photo documents		
Prüfmuster-Nr.: <i>Test sample No.:</i>	A001078696			
Prüfzeitraum: <i>Testing period:</i>	15.04.2020 - 05.05.2020			
Ort der Prüfung: <i>Place of testing:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von / tested by:		kontrolliert von / reviewed by:		
 15.05.2020 Alex Lan / Senior Project Engineer		 15.05.2020 Sam Lin / Technical Certifier		
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>
Sonstiges / Other:				
FCC ID: 2ABWEECOLORPEN, IC: 23012-ECOLORPEN, HVIN: Lenovo E-Color Pen				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged:</i>		
* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m. test specifications(s) F(ail) = failed a.m. test specifications(s) N/A = not applicable N/T = not tested				
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

TEST SUMMARY

5.1.1. ANTENNA REQUIREMENT

RESULT: Pass

5.1.2. PEAK OUTPUT POWER

RESULT: Pass

5.1.3. CONDUCTED POWER SPECTRAL DENSITY

RESULT: Pass

5.1.4. -6DB BANDWIDTH

RESULT: Pass

5.1.5. 99% BANDWIDTH

RESULT: Pass

5.1.6. CONDUCTED SPURIOUS EMISSIONS MEASURED IN 100kHz BANDWIDTH

RESULT: Pass

5.1.7. SPURIOUS EMISSION

RESULT: Pass

5.1.8. CONDUCTED EMISSIONS

RESULT: Pass

6.1.1. ELECTROMAGNETIC FIELDS

RESULT: Pass

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1. General Remarks

1.1.Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: Test setup photos.

Appendix B: Test Result.

2. Test Sites

2.1.Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.

No. 362 Huanguan Road Middle, Longhua District, Shenzhen 518110, People's Republic of China

FCC Registration No.: 694916

IC Registration No.: 25069

2.2.List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Radio Spectrum Testing (TS8997)					
Equip. No.	Equipment	Manufacturer	Model	Serial No.	Cal. until
1825795	Signal Analyzer	R&S	FSV 40	101441	20.08.2020
1825798	OSP	R&S	OSP 150	101017	17.12.2020
1825799	Control PC	DELL	OptiPlex 7050	FTJZ9P2	N/A
1825800	Test Software	R&S	WMS32 (V10.50.10)	N/A	N/A
1825801	Power Meter	R&S	NRP2	107105	17.12.2020
1825802	Wideband Power Sensor	R&S	NRP-Z81	105350	17.12.2020
1826431	Shielding Room 8#	Albatross	SR8	APC17151-SR8	23.07.2020
Unwanted Emission Testing (TS9975)					
Equip. No.	Equipment	Manufacturer	Model	Serial No.	Cal. until
1826021	EMI Test Receiver	R&S	ESR 7	102021	19.08.2020
1826023	Signal Analyzer	R&S	FSV 40	101439	21.08.2020
1826024	System Controller Interface	R&S	SCI-100	S10010038	N/A
1826025	Filterbank	R&S	Wlan	100759	21.08.2020
1826026	OSP	R&S	OSP 120	102040	N/A
1826028	Pre-amplifier	R&S	SCU08F1	08320031	20.08.2020
1826029	Amplifier	R&S	SCU-18F	180070	20.08.2020
1826030	Amplifier	R&S	SCU40A	100475	20.09.2020
1826031	Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	02.09.2020
1826032	Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	02.09.2020
1826033	Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	02.09.2020
1826034	Active Loop Antenna	Schwarzbeck	FMZB 1513	302	01.09.2020
1826035	Wideband Ridged Horn Antenna (12-18 GHz)	Steatite	QMS-00208	18313	02.09.2020
1826036	Test software	R&S	EMC32 (V10.50.40)	N/A	N/A
1826037	Control PC	Dell	OptiPlex 7050	36NV9P2	N/A
1826433	3m Semi-Anechoic Chamber	Albatross	SAC-3m	APC17151-SAC	06.07.2020

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Conducted Emission on AC Mains

Equip. No.	Equipment	Manufacturer	Model	Serial No.	Cal. until
1822625	EMI Test Receiver	R&S	ESR3	102428	03.09.2020
1822627	Artificial Mains Network	R&S	ENV216	102333	19.08.2020
1822626	Artificial Mains Network	R&S	ENV432	101411	19.08.2020
1822629	Attenuator	R&S	ESH2Z31	100300	19.08.2020
1825090	EMC32 test software	R&S	EMC32(Ver.10.5 0.01)	N/A	N/A

2.3.Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

2.4.Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5.Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table:

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-7}$
RF Power (conducted)	± 2.5 dB
Radiated Emission of Transmitter, valid up to 26.5 GHz	± 6 dB
Radiated Emission of Receiver, valid up to 26.5 GHz	± 6 dB
Conducted Emission, (9kHz to 150kHz)/(150kHz to 30MHz)	± 3.70 dB / ± 3.30 dB
Radiated Emission (3m SAC), 30MHz to 1000MHz	± 4.52 dB
Radiated Emission (3m SAC), above 1000MHz	± 4.37 dB
Temperature	± 1 °C
Humidity	± 5 %
Voltage (DC)	± 1 %
Voltage (AC, <10kHz)	± 2 %

2.6.Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix A & B of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) file for certification follow-up purposes.

2.7.Status of Facility Used for Testing

The TÜV Rheinland (Shenzhen) Co., Ltd. test facility located at No. 362 Huanguan Road Middle, Longhua District, Shenzhen 518110, People's Republic of China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3. General Product Information

3.1. Product Function and Intended Use

The EUT is Active stylus which supports Bluetooth Low Energy and operate with a drawing board use 1.8MHz frequency.

For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2. Ratings and System Details

Table 2: Technical Specification of EUT

General Information of EUT	Value
Kind of Equipment	Lenovo E-Color Pen
Type Designation	Lenovo E-Color Pen
FCC ID	2ABWEECOLORPEN
IC:	23012-ECOLORPEN
HVIN:	Lenovo E-Color Pen
Extreme Temperature Range	0°C to +40°C
Operating Voltage	DC 5V via Type-C interface for charging DC 3.7V, 50mAh via built-in Lithium Battery
Testing Voltage	DC 5V via Type-C interface for charging DC 3.7V, 50mAh via built-in Lithium Battery
Technical Specification of Bluetooth Low Energy	
Operating Frequency	2402 – 2480 MHz
Bluetooth Core Version	5.0, 1Mbps
Channel Number	40 channels
Channel separation	2MHz
Modulation	GFSK
Antenna Type	Integral Antenna
Antenna Gain	-7.41 dBi
Technical Specification of 1.8MHz	
Operating Frequency	1.8MHz
Channel Number	1
Type of Modulation	ASK
Antenna Type	Integral Antenna
Antenna number	1
Antenna Gain	0 dBi Max

3.3.Independent Operation Modes

The basic operation modes are:

- A. On, Bluetooth transmitting mode
 - 1. Low channel
 - 2. Middle channel
 - 3. High channel
- B. On, Operating
- C. On, Charging
- D. Off

3.4.Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.5.Submitted Documents

- | | |
|-------------------------|----------------------|
| - Bill of Material | - Circuit Diagram |
| - PCB Layout | - Instruction Manual |
| - Photo Document | - Rating Label |
| - Technical Description | |

4. Test Set-up and Operation Modes

4.1.Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum power level. The test modes were adapted accordingly in reference to the instructions for use.

4.2.Test Operation and Test Software

Test operation refers to test setup in chapter 5. All testing were performed according to the procedures in ANSI C63.10: 2013.

4.3.Special Accessories and Auxiliary Equipment

The EUT was tested with following accessories

Description	Manufacturer	Type	S/N	Rating
Notebook	Lenovo	YOGA Duet 7-13-5	AYX00300G	N/A
AC/DC Adapter	Lenovo	ADLX45YLC3D	N/A	Input: AC 100-240V, 50/60Hz Output: DC 5V, 2A or DC 9V, 2A or DC 15V, 3A or DC 20V, 2.25A

4.4.Countermeasures to achieve EMC Compliance

The test sample, which has been tested, contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

4.5. Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

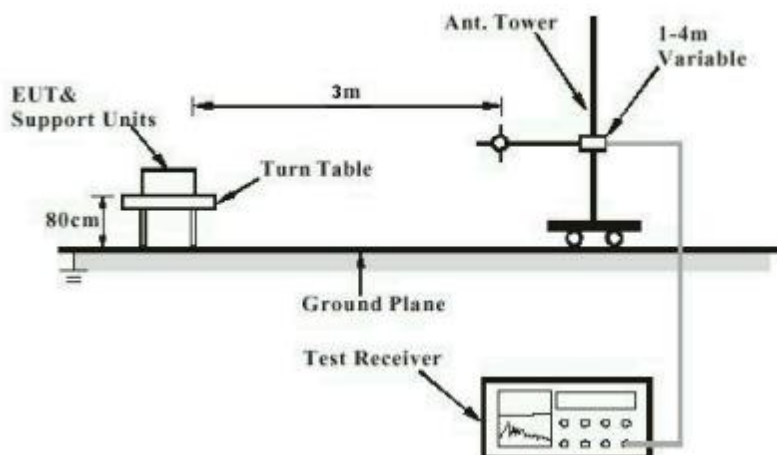


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

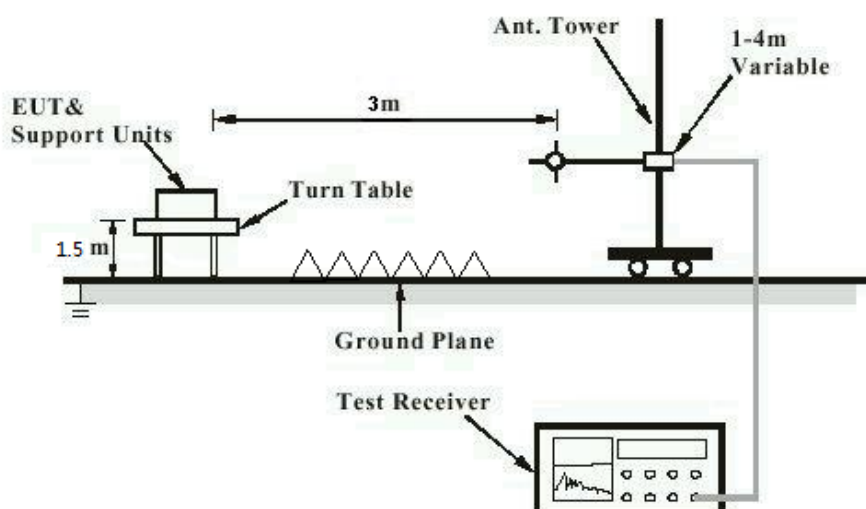


Diagram of Measurement Configuration for Mains Conduction Measurement

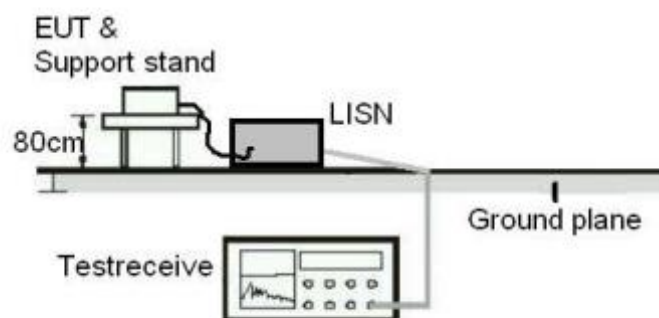
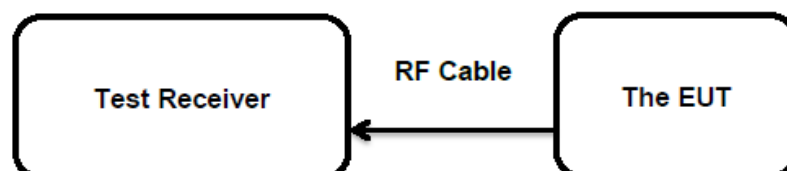


Diagram of Measurement Configuration for Conducted Transmitter Measurement



5. Test Results

5.1. Transmitter Requirement & Test Suites

5.1.1. Antenna Requirement

RESULT:**Pass****Test Specification**

Test standard : FCC Part 15.203
RSS-Gen Clause 6.8

According to the manufacturer declared, the EUT has two internal antenna, the directional gain of antenna are -7.41 dBi for Bluetooth and 0dBi for 1.8MHz and the antenna connector is designed with permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

5.1.2. Peak Output Power

RESULT:**Pass****Test Specification**

Test standard	:	FCC Part 15.247(b)(3) RSS-247 Clause 5.4 (d)
Basic standard	:	ANSI C63.10: 2013
Limit	:	1 Watt
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	30.04.2020
Input voltage	:	DC 3.7V, 50mAh via built-in Lithium Battery
Operation mode	:	A
Ambient temperature	:	25°C
Relative humidity	:	55 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix B.

Table 3: Test result of Peak Output Power

Channel	Channel Frequency (MHz)	Peak Output Power		Limit
		(dBm)	(W)	(W)
Low Channel	2402	2.4	0.00174	1
Middle Channel	2440	2.2	0.00166	1
High Channel	2480	-0.2	0.00095	1

Remark: The e.i.r.p. of EUT is -4.83dBm, less than 4W (36dBm).

5.1.3. Conducted Power Spectral Density

RESULT:**Pass****Test Specification**

Test standard	: FCC Part 15.247(e) RSS-247 Clause 5.2(b)
Basic standard	: ANSI C63.10: 2013
Limit	: 8dBm/3kHz
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 30.04.2020
Input voltage	: DC 3.7V, 50mAh via built-in Lithium Battery
Operation mode	: A
Ambient temperature	: 25°C
Relative humidity	: 55 %
Atmospheric pressure	: 101 kPa

For the measurement records, refer to the appendix B.

Table 4: Test result of Conducted Power Spectral Density

Channel	Channel Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
Low Channel	2402	-6.45	8
Middle Channel	2440	-10.24	8
High Channel	2480	-10.13	8

5.1.4.-6dB Bandwidth**RESULT:****Pass****Test Specification**

Test standard : FCC Part 15.247(a)(2)
RSS-247 Clause 5.2(a)
Basic standard : ANSI C63.10: 2013
Limit : 500KHz
Kind of test site : Shielded Room

Test Setup

Date of testing : 30.04.2020
Input voltage : DC 3.7V, 50mAh via built-in Lithium Battery
Operation mode : A
Ambient temperature : 25°C
Relative humidity : 55 %
Atmospheric pressure : 101 kPa

For the measurement records, refer to the appendix B.

Table 5: Test result of -6dB Bandwidth

Channel	Channel Frequency (MHz)	-6dB Bandwidth (kHz)	Limit (kHz)	Result
Low Channel	2402	712.9	500	Pass
Mid Channel	2440	752.4	500	Pass
High Channel	2480	712.9	500	Pass

5.1.5.99% Bandwidth**RESULT:****Pass****Test Specification**

Test standard : RSS-Gen clause 6.7

Basic standard : ANSI C63.10: 2013

Kind of test site : Shielded Room

Test Setup

Date of testing : 30.04.2020

Input voltage : DC 3.7V, 50mAh via built-in Lithium Battery

Operation mode : A

Ambient temperature : 25°C

Relative humidity : 55 %

Atmospheric pressure : 101 kPa

For the measurement records, refer to the appendix B.

Table 6: Test result of 99% Bandwidth

Channel	Channel Frequency (MHz)	99% Bandwidth (kHz)	Limit (MHz)	Result
Low Channel	2402	1075	/	Pass
Mid Channel	2440	1085	/	Pass
High Channel	2480	1075	/	Pass

5.1.6. Conducted spurious emissions measured in 100kHz Bandwidth**RESULT:****Pass****Test Specification**

Test standard	: FCC part 15.247(d)
	: RSS-247 Clause 5.5
Basic standard	: ANSI C63.10: 2013
	20dB (below that in the 100kHz bandwidth within the band that contains the highest level of the desired power);
Limit	: In addition, radiated emissions which fall in the restricted bands, must also comply with the radiated emission limits specified in 15.209(a)
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 30.04.2020
Input voltage	: DC 3.7V, 50mAh via built-in Lithium Battery
Operation mode	: A
Ambient temperature	: 25°C
Relative humidity	: 55 %
Atmospheric pressure	: 101 kPa

All emissions are more than 20dB below fundamental, details refer to Appendix B.

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5.1.7.Spurious Emission**RESULT:****Pass****Test Specification**

	FCC part 15.247(d)
Test standard	: FCC Part 15.205
	RSS-247 Clause 3.3
Basic standard	: ANSI C63.10: 2013
Limit	: Refer to 15.209(a) of FCC part 15.247(d)
	: RSS-Gen Table 4 & Table 5
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 04.05.2020
Input voltage	: DC 3.7V, 50mAh via built-in Lithium Battery
Operation mode	: A
Ambient temperature	: 25°C
Relative humidity	: 55 %
Atmospheric pressure	: 101 kPa

For details refer to Appendix C

5.1.8. Conducted emissions**RESULT:****Pass****Test Specification**

Test standard	:	FCC Part 15.207(a) RSS-Gen, 7.2.2
Basic standard	:	ANSI C63.10: 2013
Frequency range	:	150KHz - 30MHz
Classification	:	Class B
Limit	:	FCC Part 15.207(a)
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	15.04.2020
Input voltage	:	DC 5V via Type-C interface for charging
Operation mode	:	C
Earthing	:	Not connected
Ambient temperature	:	23 °C
Relative humidity	:	48 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the following test plots.

6. Safety Human Exposure

6.1. Radio Frequency Exposure Compliance

6.1.1. Electromagnetic Fields

RESULT:**Pass****Test Specification**

Test standard : CFR47 FCC Part 2.1093
RSS-102

Limit : FCC KDB Publication 447498 V06
RSS-102 Clause 2.5.1

Measurement Record:

The minimum distance for the EUT is 5mm, since maximum peak output power of the transmitter is 1.66mW < 10mW, hence the EUT is excluded from SAR evaluation according to FCC KDB publication 447498 D01: Mobile and Portable RF Exposure. Guidance v06.

The maximum peak output power of the transmitter is 1.66mW and maximum e.i.r.p. is 0.33mW only, which is less than 4mW. Hence the EUT is exempted from routine evaluation limits (SAR Evaluation) according to clause 2.5.1 of RSS-102 Issue 5.

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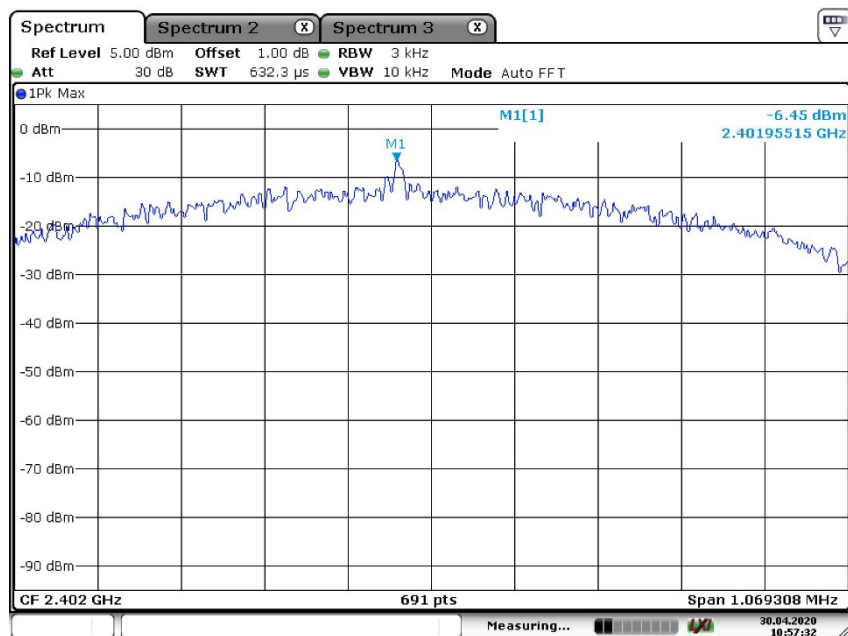
Refer to appendix A.

Appendix B: Test Results

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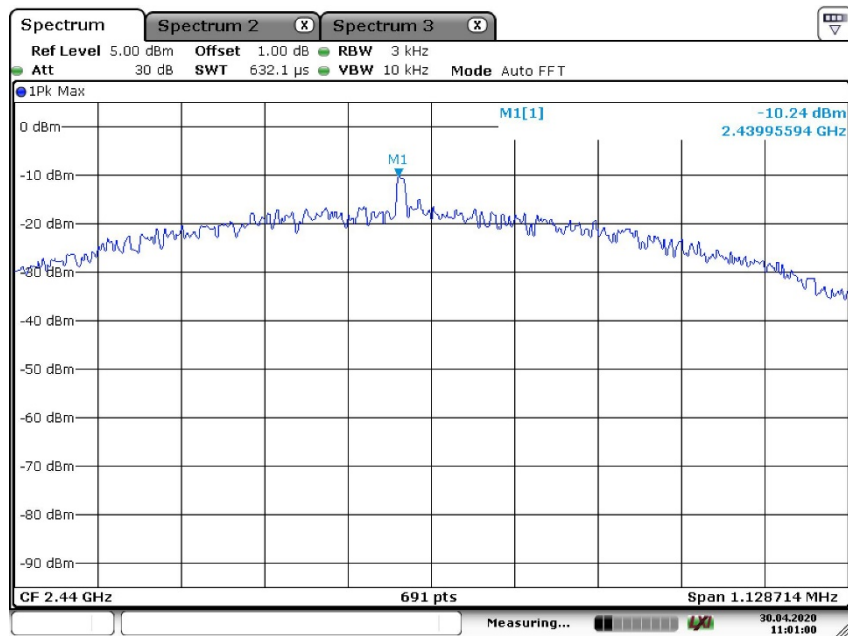
Appendix B.1: Conducted Power Spectral Density

Low Channel



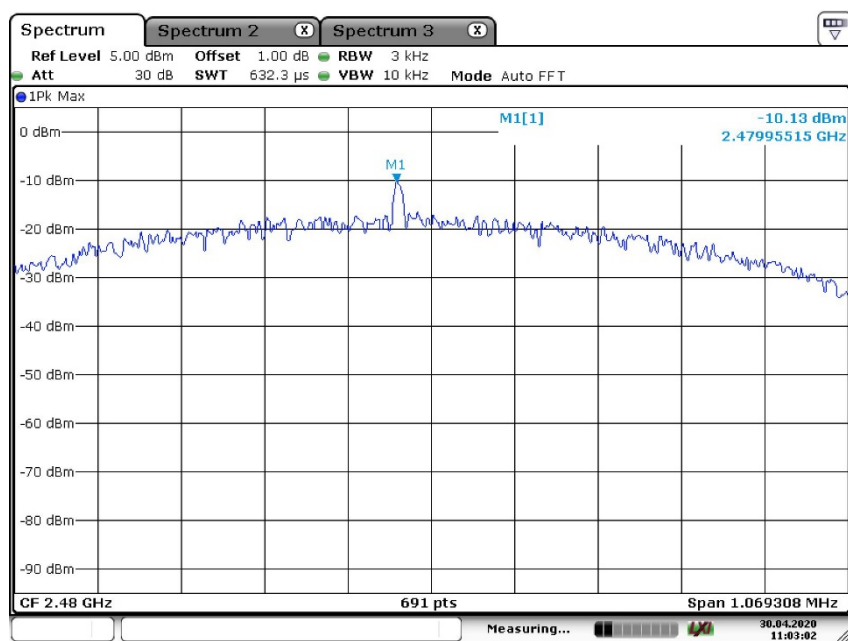
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Middle Channel



Date: 30.APR.2020 11:01:01

High Channel



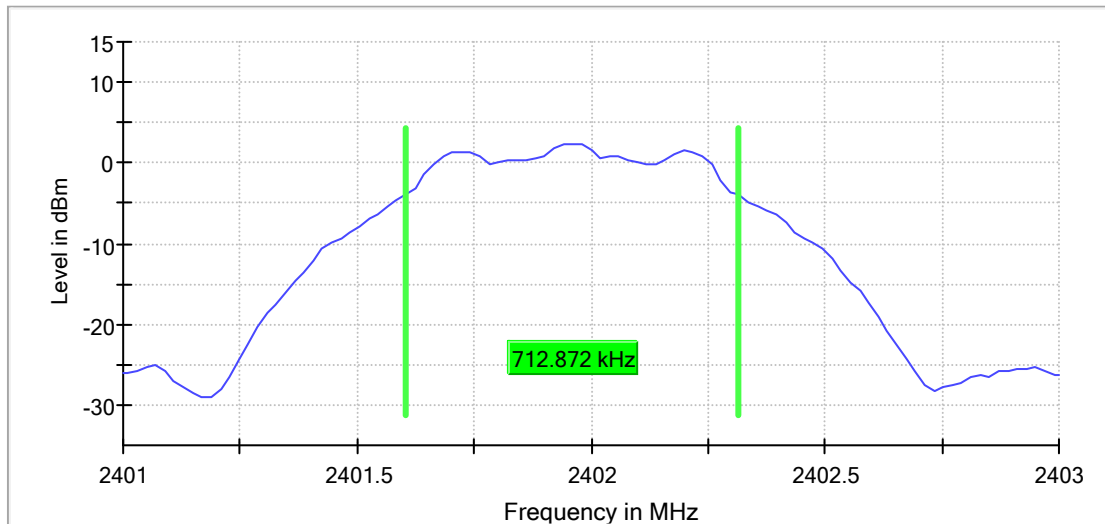
Date: 30.APR.2020 11:03:03

Appendix B.2: 6dB Bandwidth

Low Channel

RBW=100KHz, VBW=300KHz

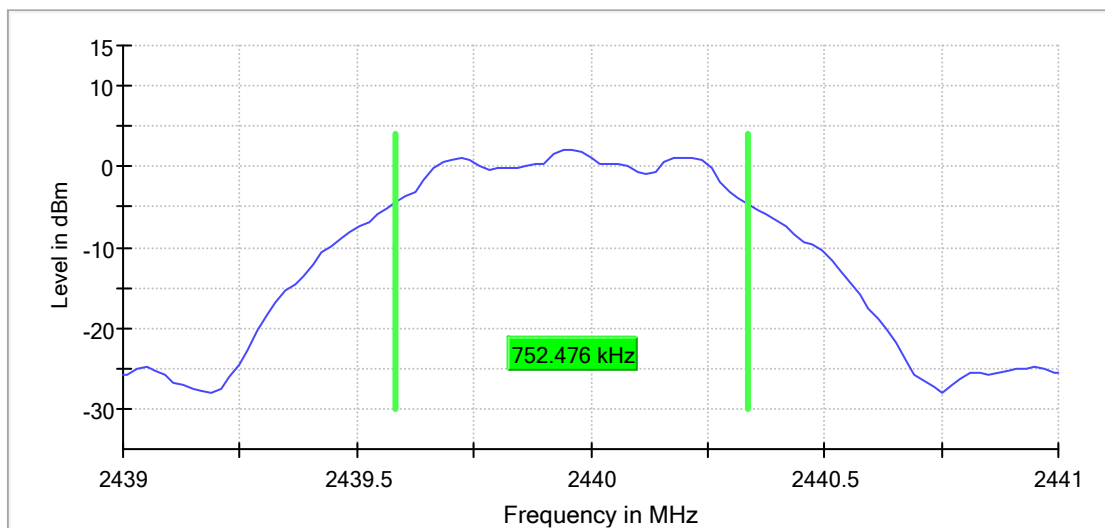
6 dB Bandwidth



Middle Channel

RBW=100KHz, VBW=300KHz

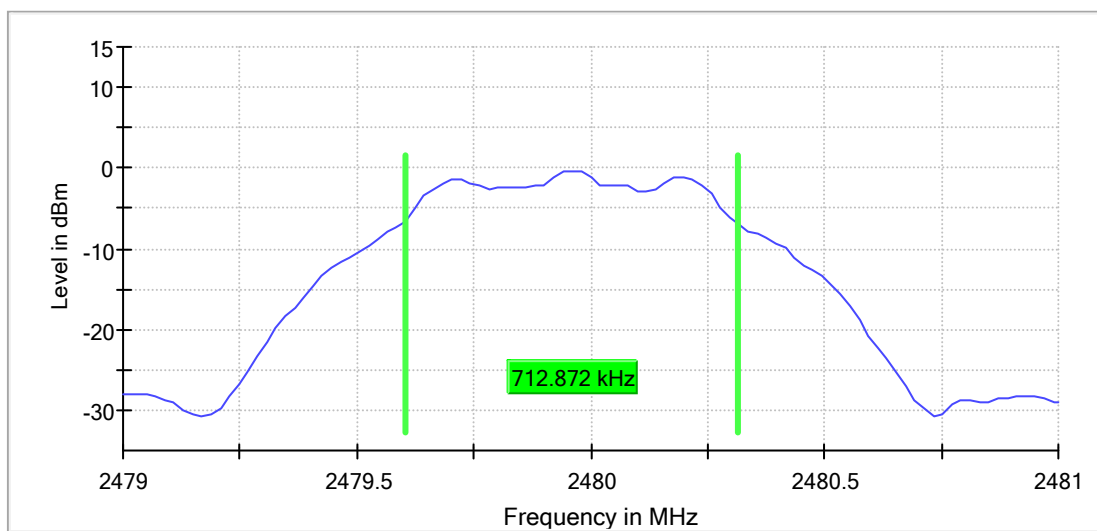
6 dB Bandwidth



High Channel

RBW=100KHz, VBW=300KHz

6 dB Bandwidth

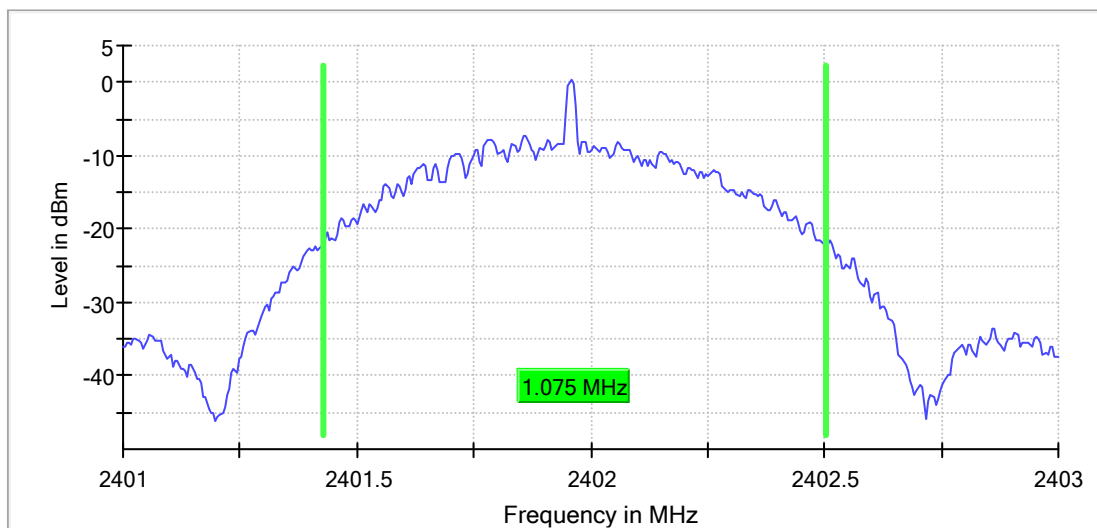


Appendix B.3: 99% Bandwidth

Low Channel

RBW=20KHz, VBW=60KHz

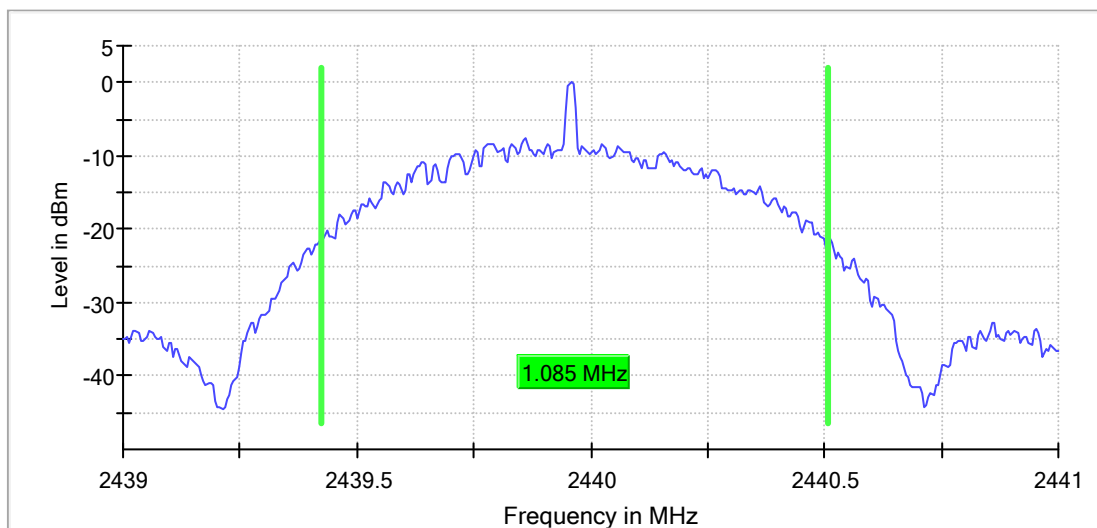
99 % Bandwidth



Middle Channel

RBW=20KHz, VBW=60KHz

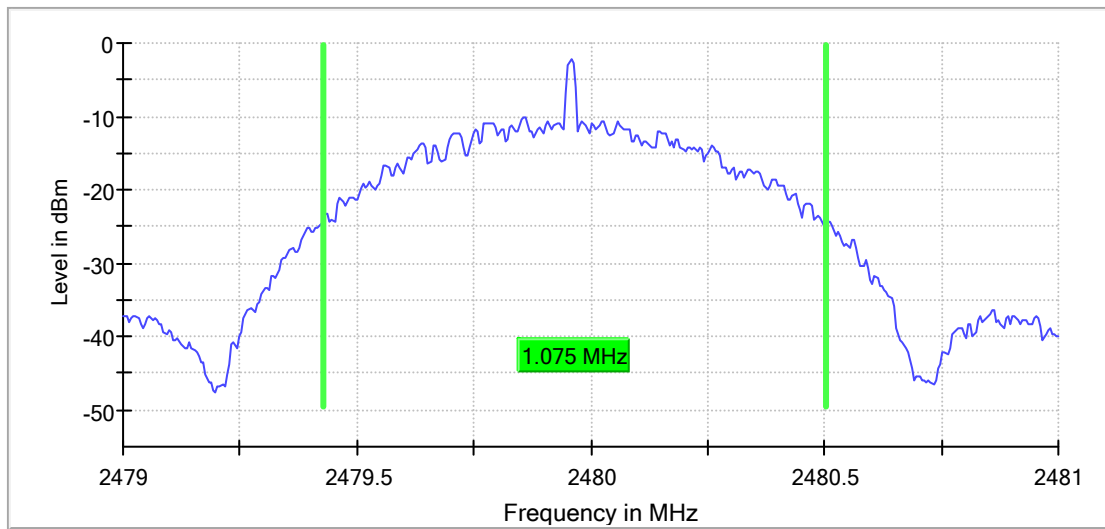
99 % Bandwidth



High Channel

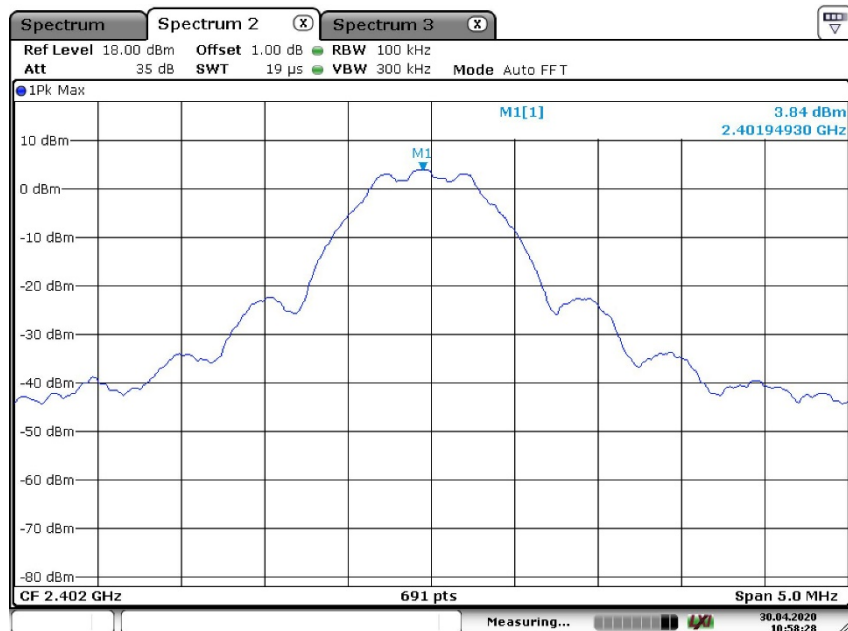
RBW=20KHz, VBW=60KHz

99 % Bandwidth

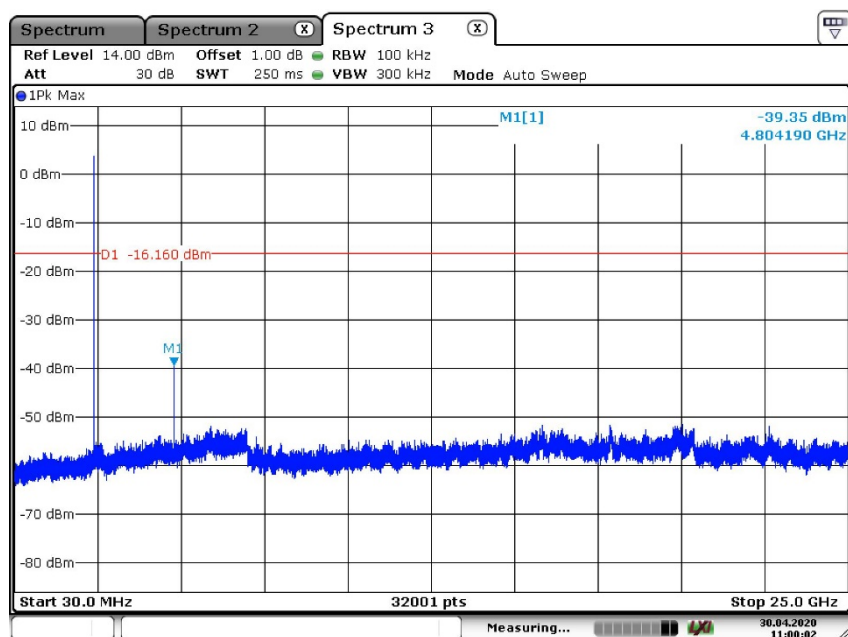


Appendix B.4: Conducted Spurious Emissions Measured in 100 kHz Bandwidth

Low Channel

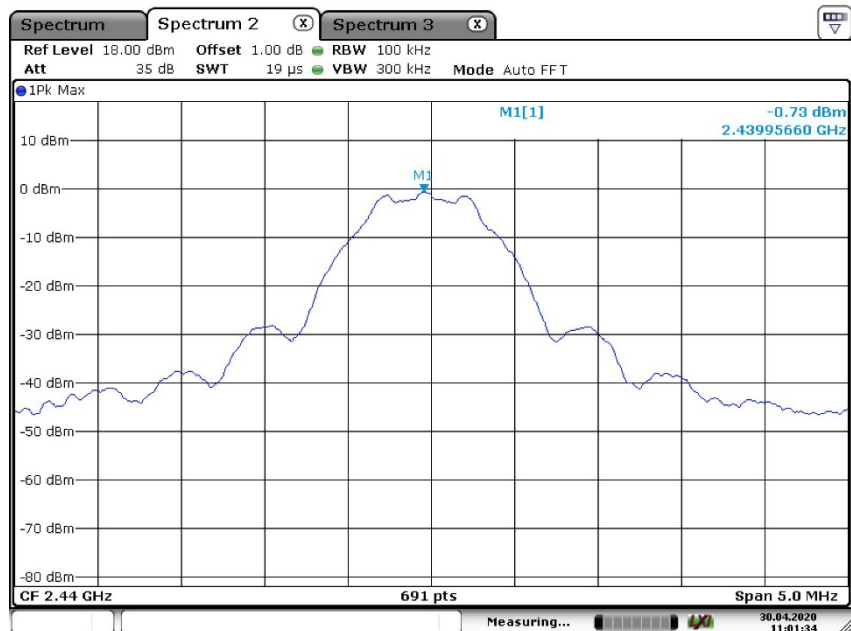


Date: 30.APR.2020 10:58:29

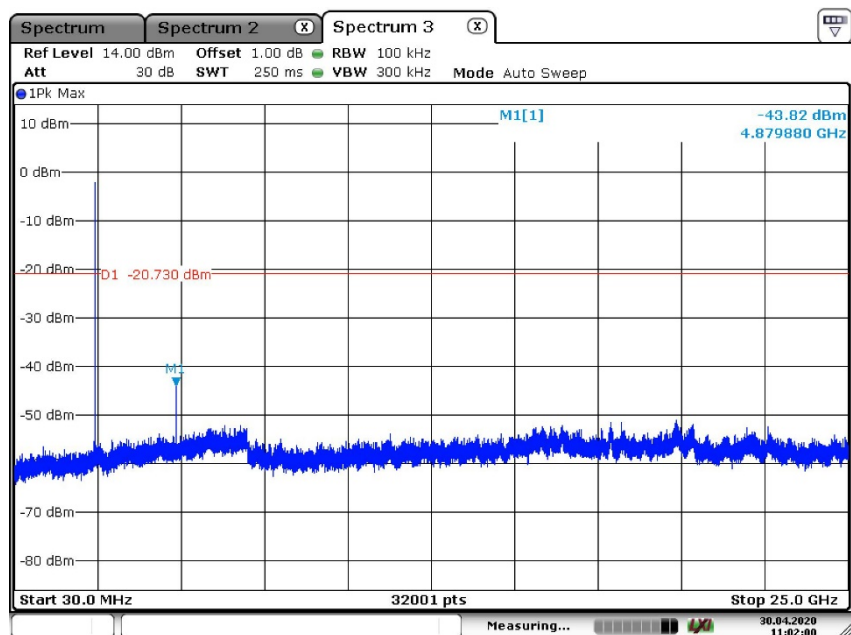


Date: 30.APR.2020 11:00:02

Middle Channel

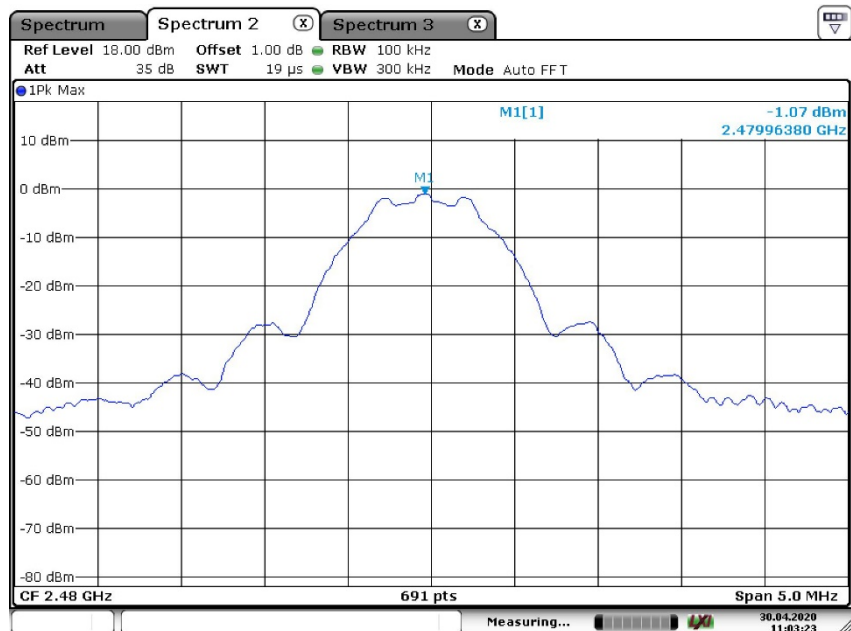


Date: 30.APR.2020 11:01:34

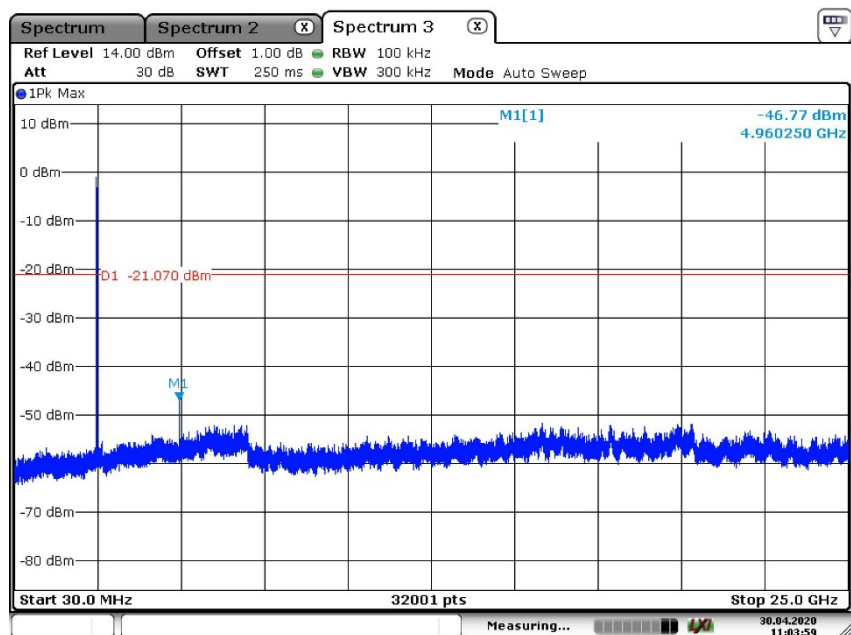


Date: 30.APR.2020 11:02:01

High Channel

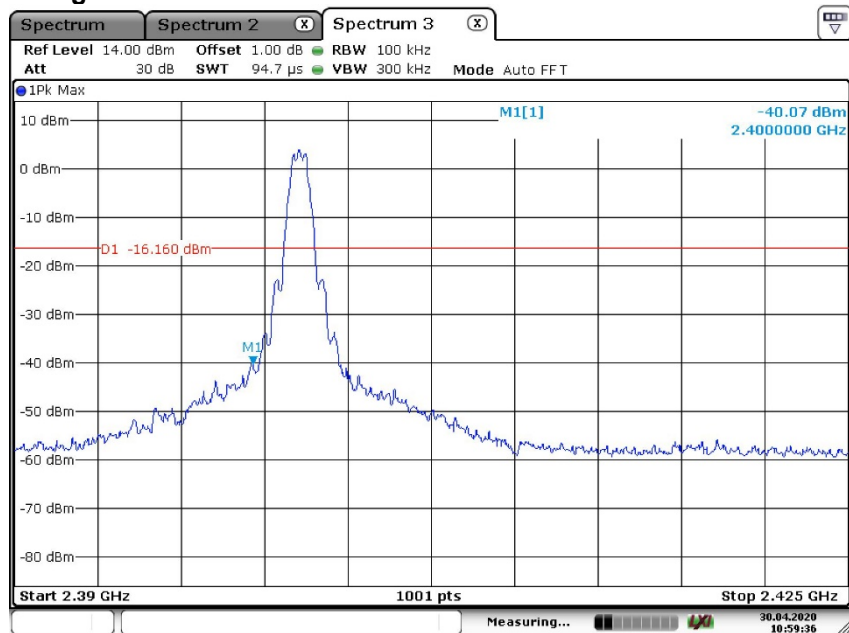


Date: 30.APR.2020 11:03:23



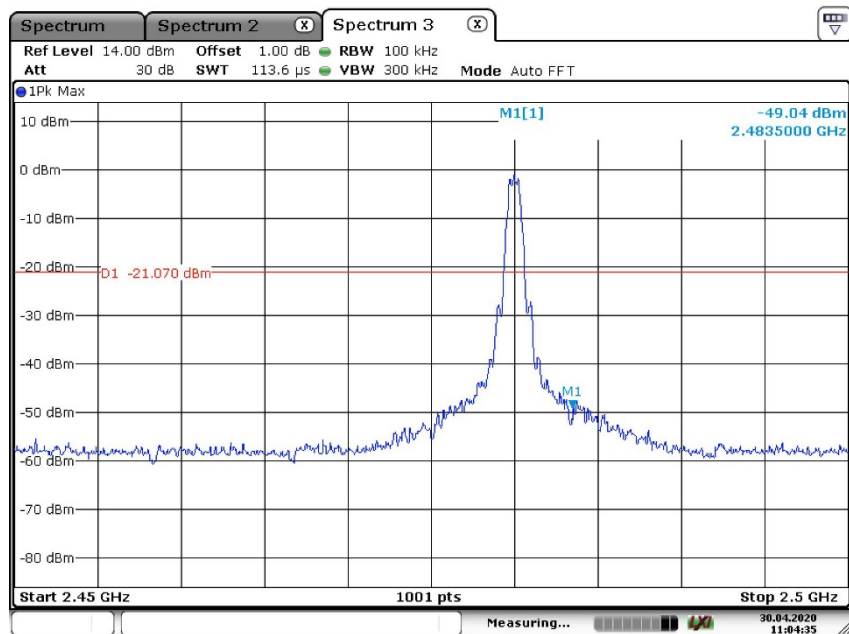
Date: 30.APR.2020 11:03:59

Low Channel_Band Edge



Date: 30.APR.2020 10:59:37

High Channel_Band Edge

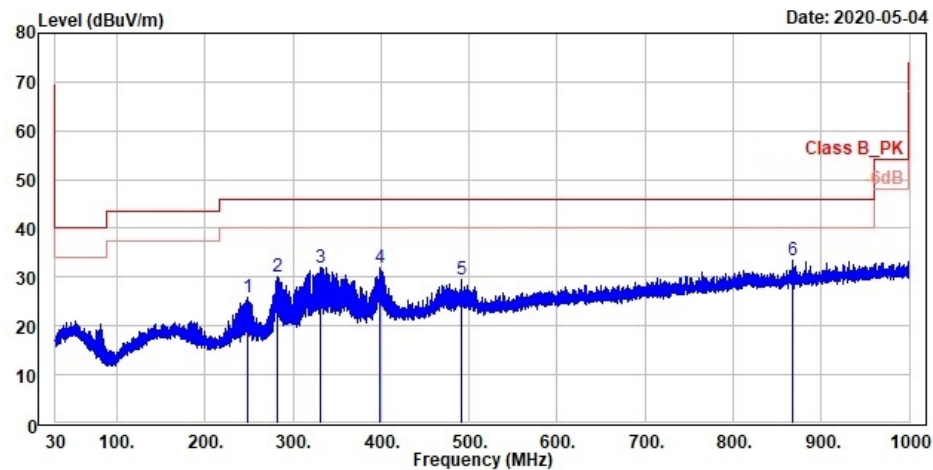


Date: 30.APR.2020 11:04:36

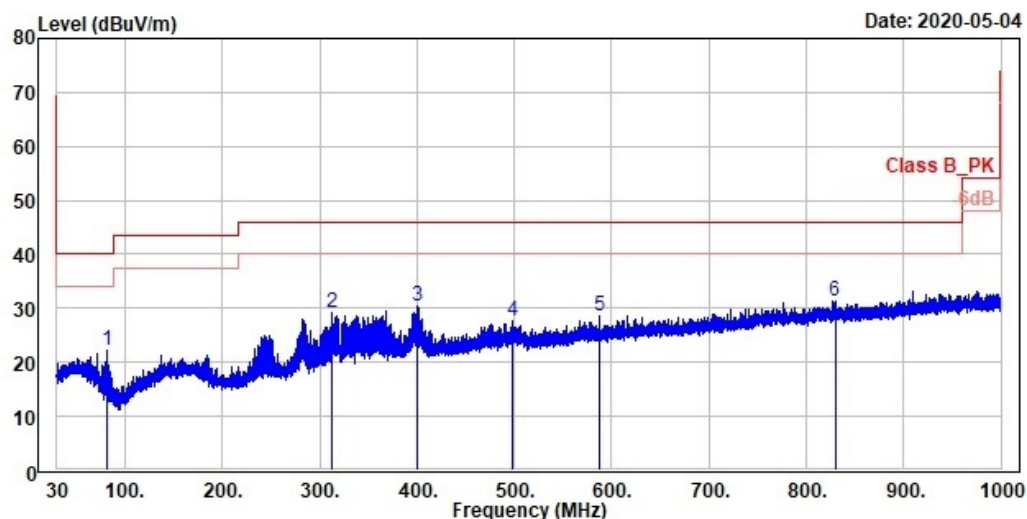
Appendix B.5: Test Results of Radiated Spurious Emissions

Note 1: Testing was carried out within frequency range 9 kHz to the tenth harmonics. The measurement results below 30MHz and above 18GHz were greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 26.5GHz were reported.

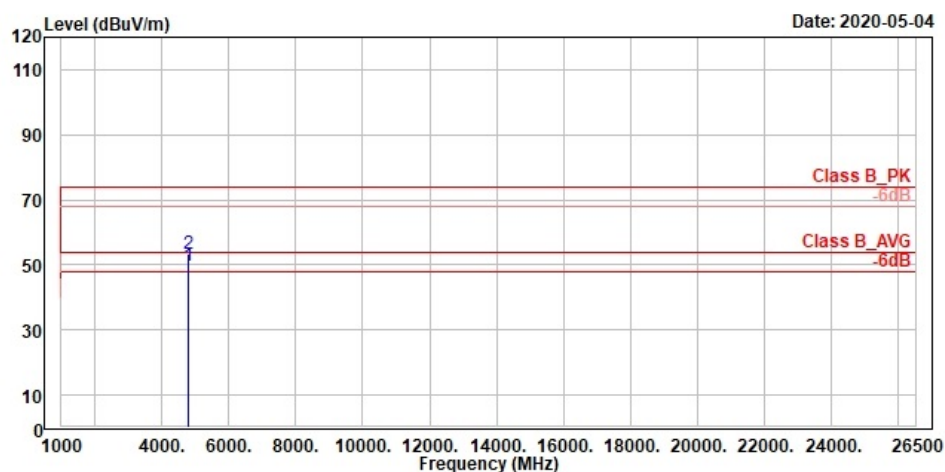
Low Channel



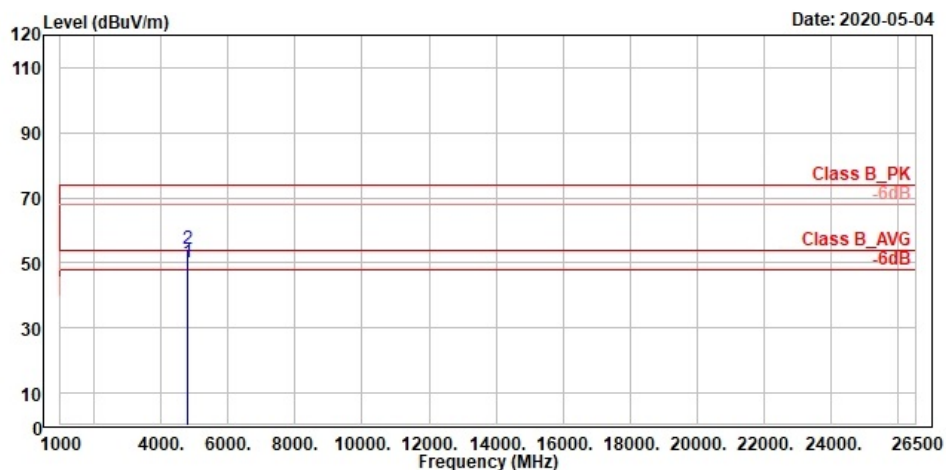
	Freq	Level	Read	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	248.06	25.86	33.96	-8.10	46.00	-20.14	100	215 QP		horizontal
2	282.01	30.17	37.08	-6.91	46.00	-15.83	100	328 QP		horizontal
3	331.96	31.98	37.75	-5.77	46.00	-14.02	300	201 QP		horizontal
4	398.02	31.95	36.68	-4.73	46.00	-14.05	100	116 QP		horizontal
5	492.01	29.39	32.71	-3.32	46.00	-16.61	200	196 QP		horizontal
6	867.11	33.33	30.69	2.64	46.00	-12.67	100	174 QP		horizontal



	Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	Level	Line	Limit				
			Factor						
			dB/m	dBuV/m	dB	cm	deg		
1	81.02	22.24	34.56	-12.32	40.00	-17.76	200	168 QP	vertical
2	312.08	29.20	35.42	-6.22	46.00	-16.80	100	309 QP	vertical
3	400.06	30.42	35.11	-4.69	46.00	-15.58	100	339 QP	vertical
4	498.03	27.83	31.06	-3.23	46.00	-18.17	200	177 QP	vertical
5	588.04	28.65	30.30	-1.65	46.00	-17.35	300	360 QP	vertical
6	829.67	31.42	29.17	2.25	46.00	-14.58	200	82 QP	vertical

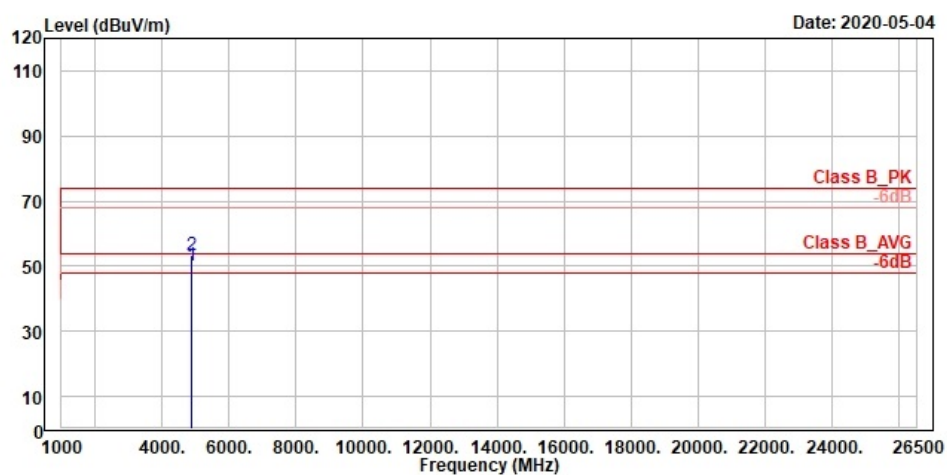


	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1 !	4804.00	49.53	59.73	-10.20	54.00	-4.47	335	150	Average	Horizontal
2	4804.00	53.43	63.63	-10.20	74.00	-20.57	335	150	Peak	Horizontal

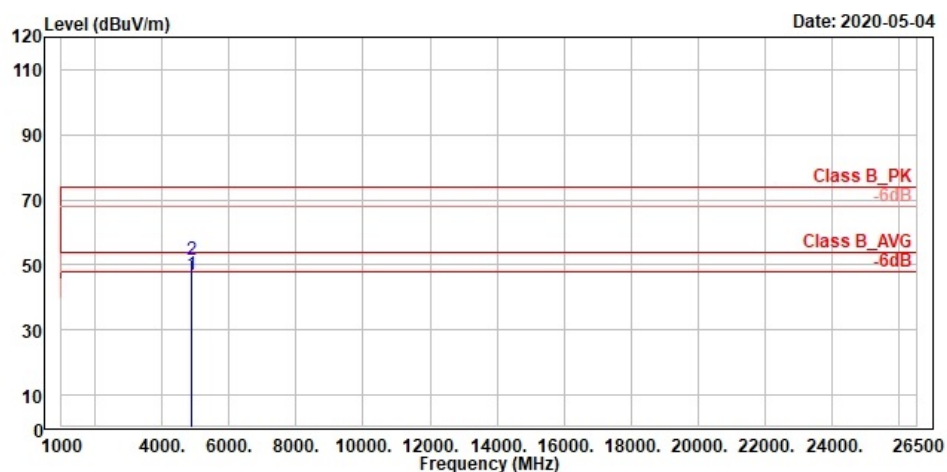


	Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	Level	Factor	Line	Limit			
			dBuV	dB/m	dBuV/m	dB	cm	deg	
1 !	4804.00	50.34	60.54	-10.20	54.00	-3.66	374	184 Average	Vertical
2	4804.00	54.11	64.31	-10.20	74.00	-19.89	374	184 Peak	Vertical

Middle Channel

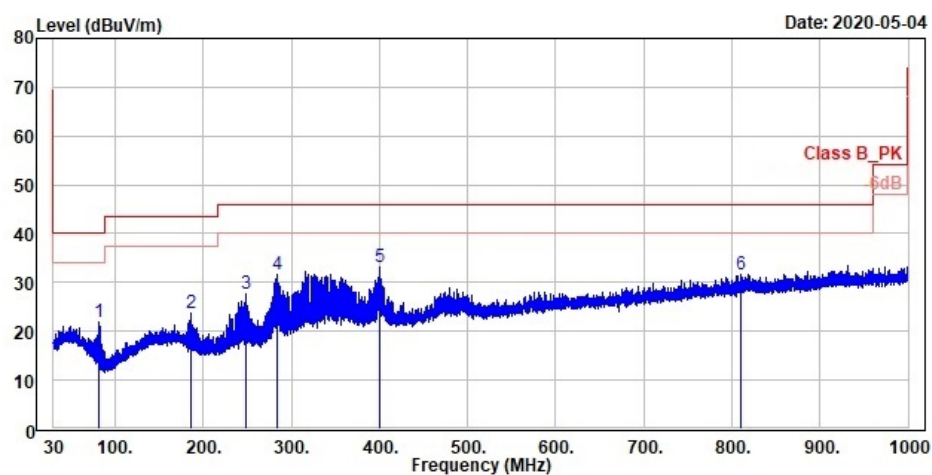


	Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	Level	Line	Limit				
			Factor						
1 !	4880.00	50.00	60.06	-10.06	54.00	-4.00	344	133 Average	Horizontal
2	4880.00	53.47	63.53	-10.06	74.00	-20.53	344	133 Peak	Horizontal

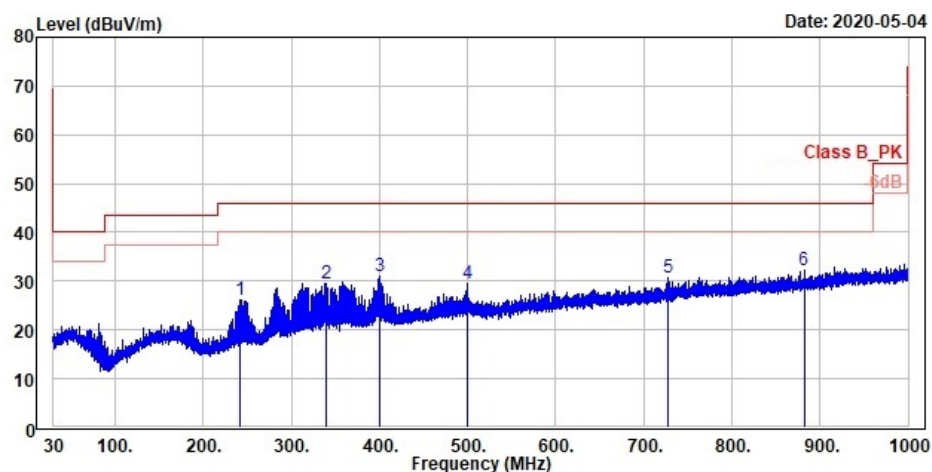


	Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	Level	Factor	Line	Limit			
			dBuV	dB/m	dBuV/m	dB	cm	deg	
1	4880.00	46.87	56.93	-10.06	54.00	-7.13	389	180 Average	Vertical
2	4880.00	51.50	61.56	-10.06	74.00	-22.50	389	180 Peak	Vertical

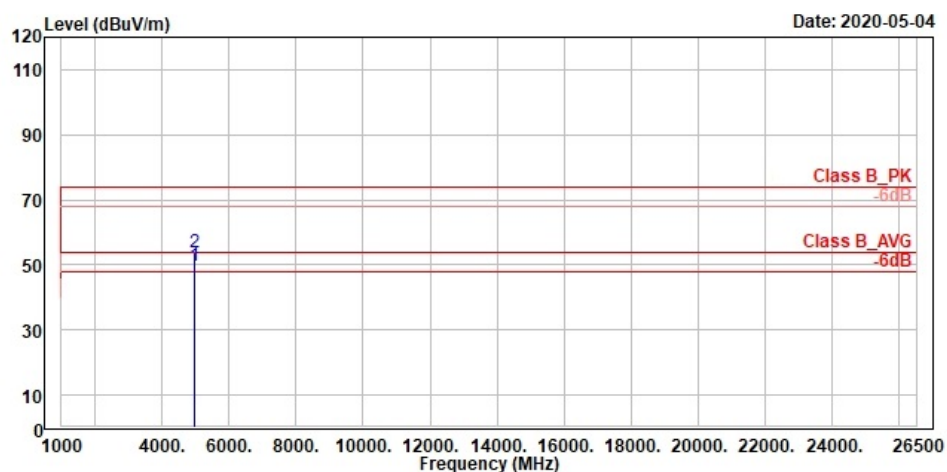
High Channel



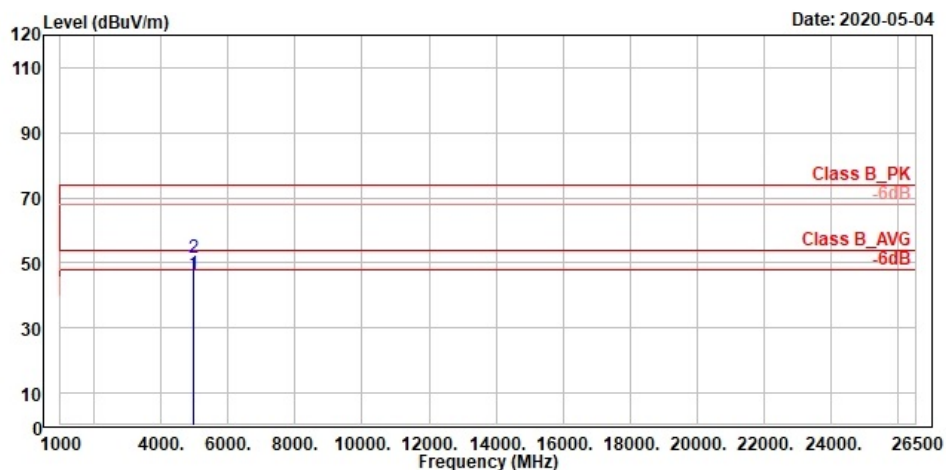
	Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	Level	Line	Limit				
			Factor						
1	81.02	22.02	34.34	-12.32	40.00	-17.98	400	86 QP	horizontal
2	186.07	23.63	32.95	-9.32	43.50	-19.87	200	70 QP	horizontal
3	248.06	27.70	35.80	-8.10	46.00	-18.30	100	217 QP	horizontal
4	284.04	31.77	38.62	-6.85	46.00	-14.23	100	53 QP	horizontal
5	400.06	33.04	37.73	-4.69	46.00	-12.96	100	312 QP	horizontal
6	810.56	31.68	29.77	1.91	46.00	-14.32	100	312 QP	horizontal



	Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	Level	Line	Limit				
			Factor						
				dB/m	dBuV/m	dB	cm	deg	
1	241.95	26.23	34.47	-8.24	46.00	-19.77	100	210 QP	vertical
2	340.01	29.63	35.32	-5.69	46.00	-16.37	100	200 QP	vertical
3	400.06	30.88	35.57	-4.69	46.00	-15.12	100	330 QP	vertical
4	500.06	29.54	32.74	-3.20	46.00	-16.46	200	182 QP	vertical
5	726.85	30.69	30.06	0.63	46.00	-15.31	100	157 QP	vertical
6	881.95	32.13	29.25	2.88	46.00	-13.87	122	360 QP	vertical



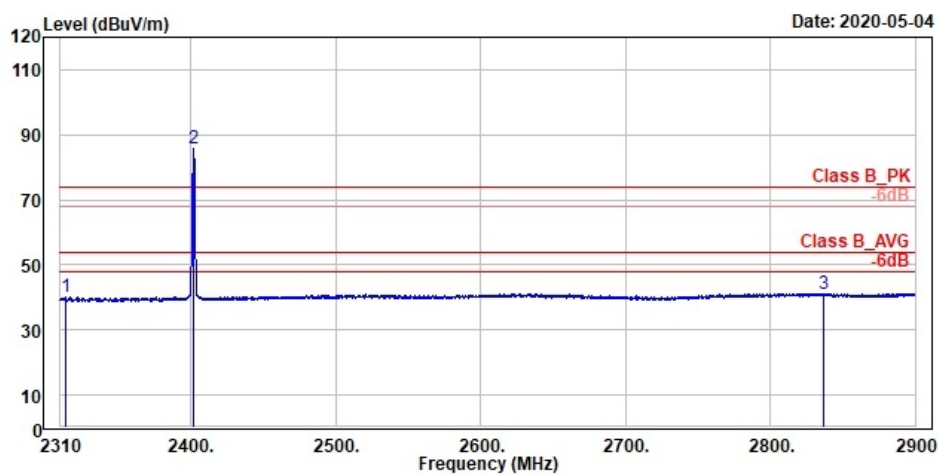
	Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	Level	Line	Limit				
			Factor						
1 !	4960.00	49.67	59.43	-9.76	54.00	-4.33	334	131 Average	Horizontal
2	4960.00	53.91	63.67	-9.76	74.00	-20.09	334	131 Peak	Horizontal



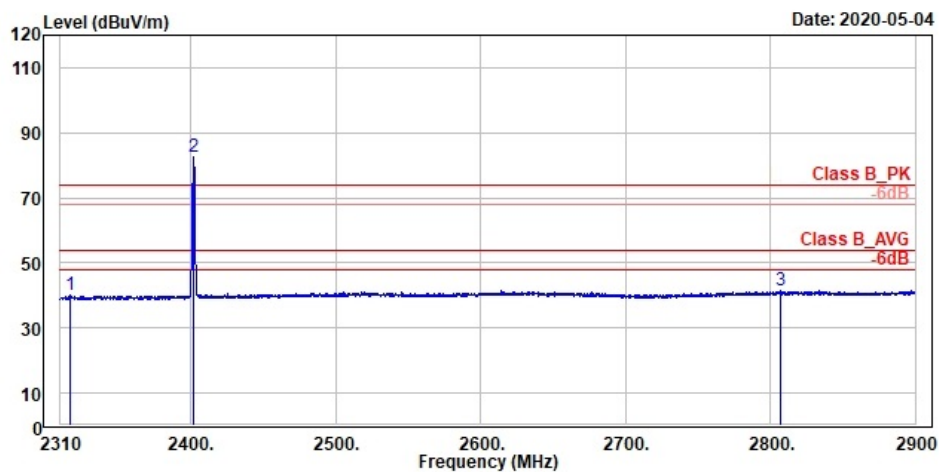
	Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	Level	Factor	Line	Limit			
			dBuV	dB/m	dBuV/m	dB	cm	deg	
1	4960.00	46.72	56.48	-9.76	54.00	-7.28	353	193 Average	Vertical
2	4960.00	51.38	61.14	-9.76	74.00	-22.62	353	193 Peak	Vertical

Appendix B.6: Test Results of Radiated Emissions in Restricted Bands

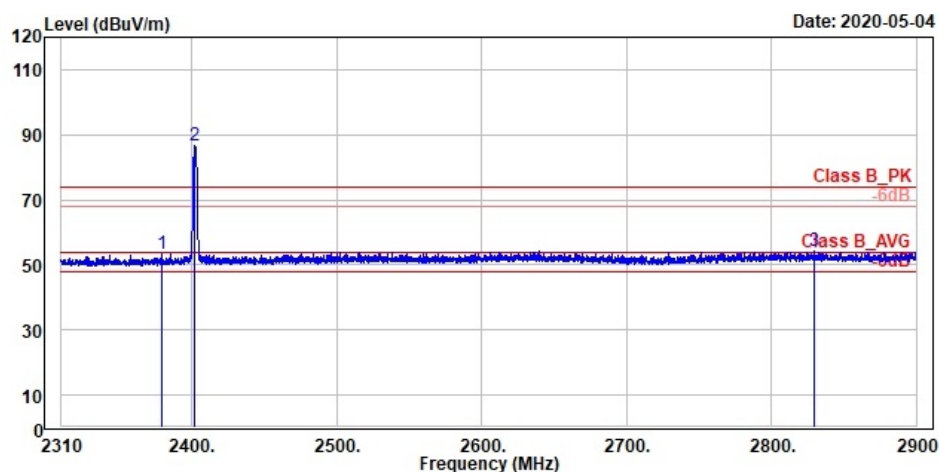
Low Channel



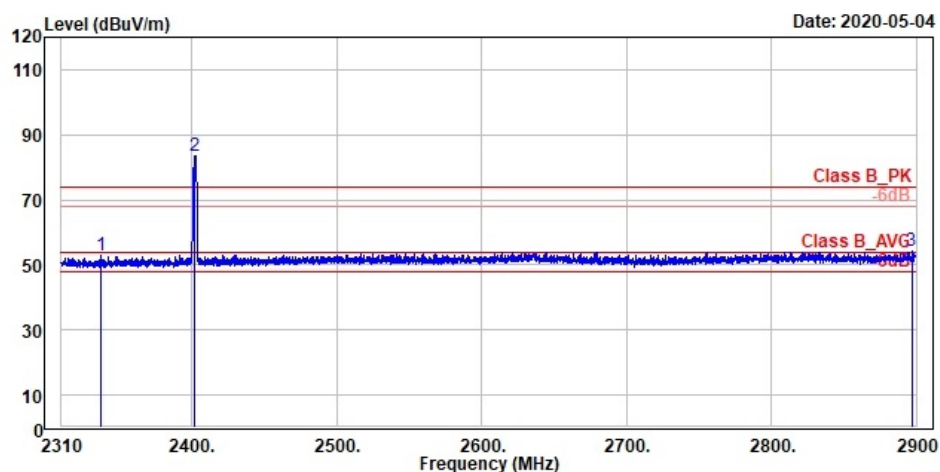
	Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	Level	Line	Limit				
			Factor						
				dBuV/m	dB	cm	deg		
1	2314.01	40.00	2.91	37.09	54.00	-14.00	274	91 Average	Horizontal
2 *	2402.00	85.70	48.33	37.37	54.00	31.70	274	91 Average	Horizontal
3	2836.75	41.24	3.22	38.02	54.00	-12.76	274	91 Average	Horizontal



	Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	Level	Factor	Line	Limit			
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	2316.84	39.93	2.83	37.10	54.00	-14.07	348	141 Average	Vertical
2 *	2402.00	82.52	45.15	37.37	54.00	28.52	348	141 Average	Vertical
3	2807.49	41.46	3.53	37.93	54.00	-12.54	348	141 Average	Vertical

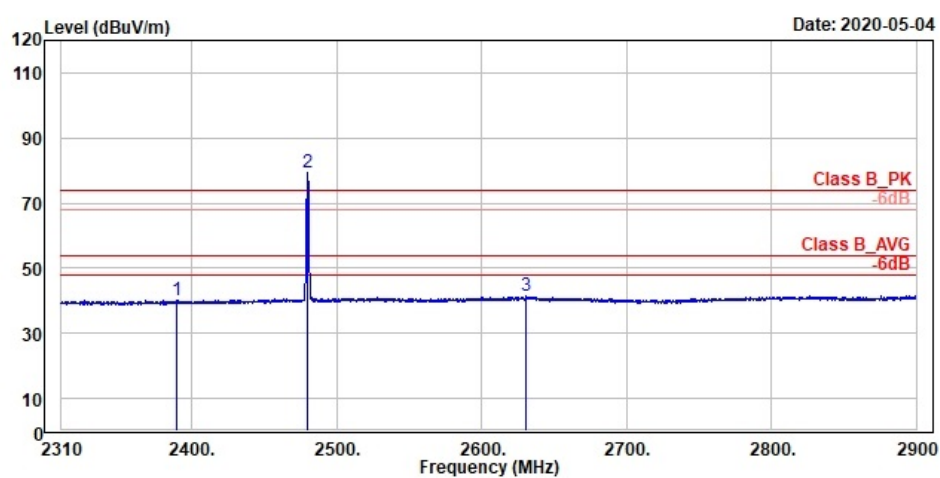


	Freq	Level	Read	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2379.62	53.51	16.21	37.30	74.00	-20.49	274	91	Peak	Horizontal
2 *	2402.00	86.77	49.40	37.37	74.00	12.77	274	91	Peak	Horizontal
3	2829.79	54.34	16.34	38.00	74.00	-19.66	274	91	Peak	Horizontal

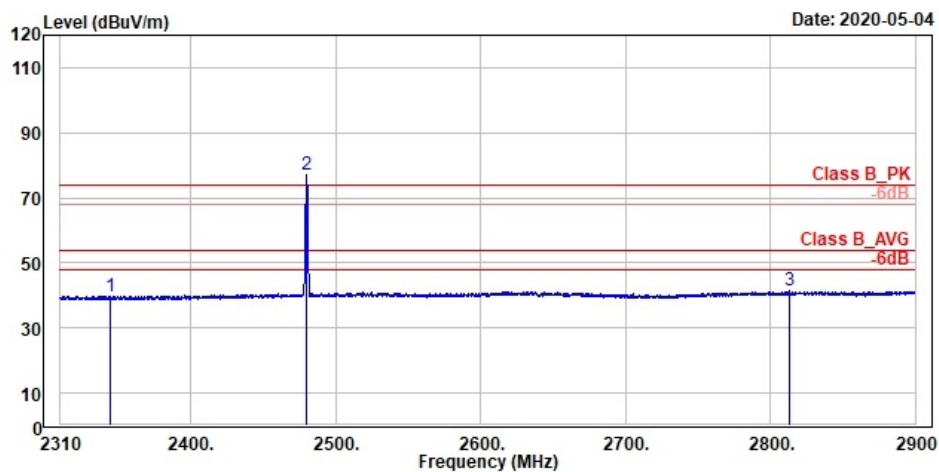


	Freq	Level	Read	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2337.14	53.01	15.85	37.16	74.00	-20.99	348	141	Peak	Vertical
2 *	2402.00	83.65	46.28	37.37	74.00	9.65	348	141	Peak	Vertical
3	2896.93	54.07	15.76	38.31	74.00	-19.93	348	141	Peak	Vertical

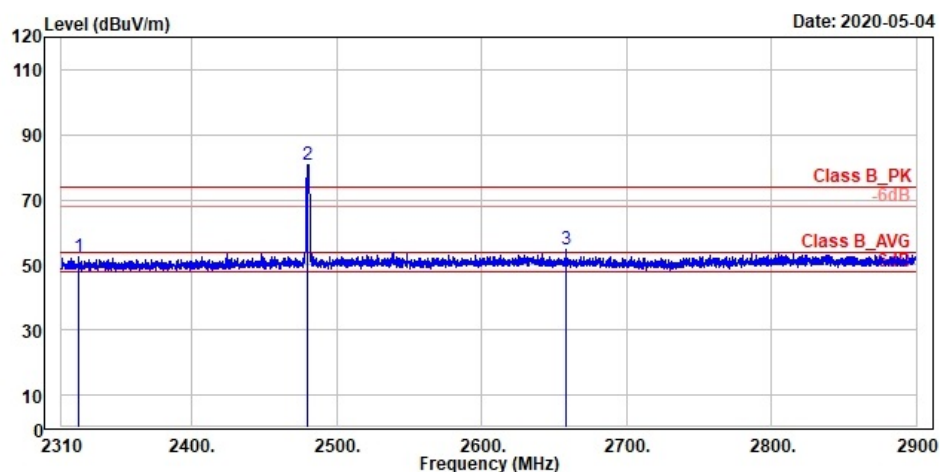
High Channel



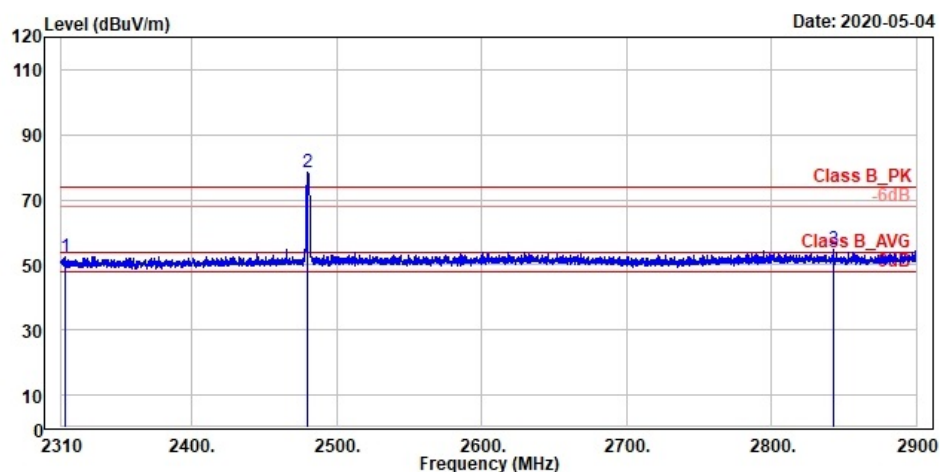
	Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	Level	Line	Limit				
			Factor						
1	2390.00	40.13	2.80	37.33	54.00	-13.87	315	102 Average	Horizontal
2 *	2480.00	79.52	41.96	37.56	54.00	25.52	315	102 Average	Horizontal
3	2630.72	41.48	3.58	37.90	54.00	-12.52	315	102 Average	Horizontal



	Freq	Level	Read	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2344.34	39.85	2.66	37.19	54.00	-14.15	322	142	Average	Vertical
2 *	2480.00	77.00	39.44	37.56	54.00	23.00	322	142	Average	Vertical
3	2813.03	41.33	3.38	37.95	54.00	-12.67	322	142	Average	Vertical



	Freq	Level	Read	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2321.45	52.62	15.51	37.11	74.00	-21.38	315	102	Peak	Horizontal
2 *	2480.00	80.67	43.11	37.56	74.00	6.67	315	102	Peak	Horizontal
3	2658.69	54.65	16.82	37.83	74.00	-19.35	315	102	Peak	Horizontal

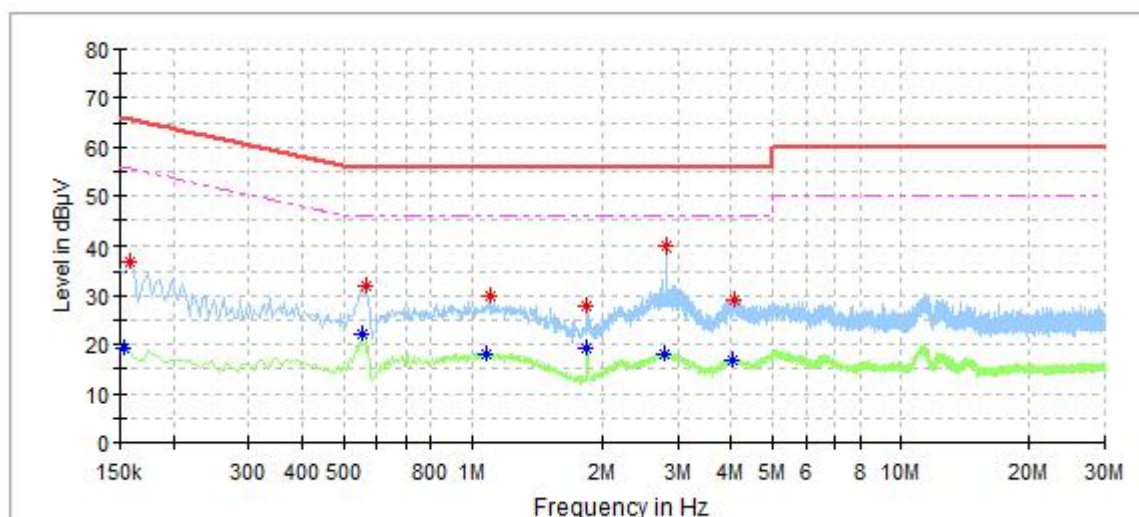


	Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase
	MHz	dBuV/m	Level	Line	Limit				
			Factor						
			dBuV	dB/m	dBuV/m	dB	cm	deg	
1	2312.83	52.65	15.56	37.09	74.00	-21.35	322	142 Peak	Vertical
2 *	2480.00	78.28	40.72	37.56	74.00	4.28	322	142 Peak	Vertical
3	2842.89	54.92	16.87	38.05	74.00	-19.08	322	142 Peak	Vertical

Appendix B.7: Test Results of Conducted Emissions

EUT Information

EUT Name: Lenovo E-Color Pen
Model: Lenovo E-Color Pen
Order No.: 168257717
Test Mode: TX
Test Voltage: AC 120V, 60Hz
Test By: Charlie Wang
Review By: Gary Chen
Remark:

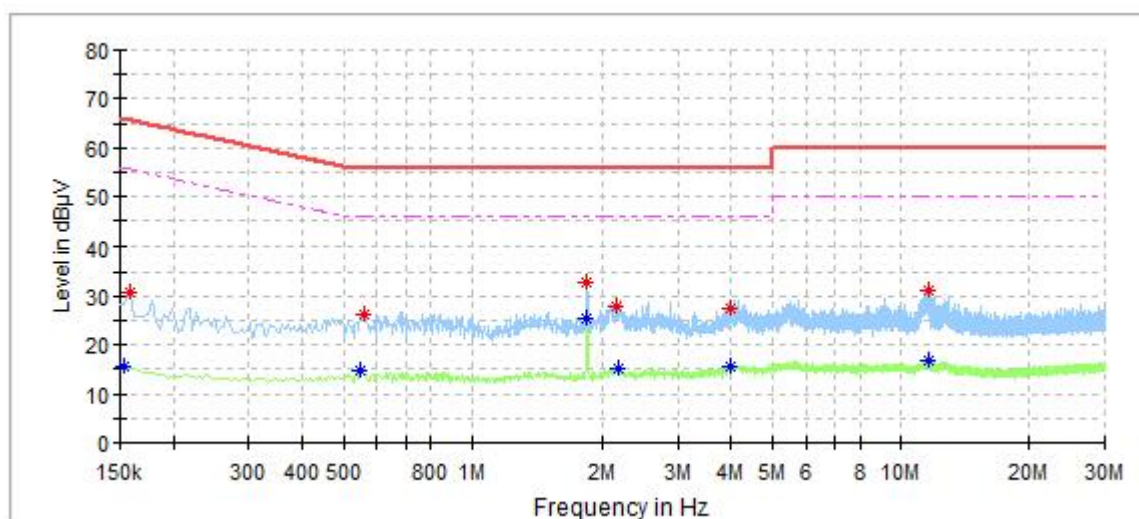


Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.154000	---	19.31	55.78	36.47	L1	9.6
0.158000	36.72	---	65.57	28.85	L1	9.6
0.556000	---	22.24	46.00	23.76	L1	9.7
0.564000	31.81	---	56.00	24.19	L1	9.7
1.080000	---	17.96	46.00	28.04	L1	9.7
1.100000	29.79	---	56.00	26.21	L1	9.7
1.840000	27.99	---	56.00	28.01	L1	9.7
1.840000	---	19.12	46.00	26.88	L1	9.7
2.804000	---	18.18	46.00	27.82	L1	9.8
2.828000	39.98	---	56.00	16.02	L1	9.8
4.032000	---	17.02	46.00	28.98	L1	9.8
4.056000	29.32	---	56.00	26.68	L1	9.8

EUT Information

EUT Name: Lenovo E-Color Pen
Model: Lenovo E-Color Pen
Order No.: 168257717
Test Mode: TX
Test Voltage: AC 120V, 60Hz
Test By: Charlie Wang
Review By: Gary Chen
Remark:



Critical Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.154000	---	15.65	55.78	40.13	N	9.6
0.158000	30.85	---	65.57	34.71	N	9.6
0.548000	---	14.81	46.00	31.19	N	9.7
0.560000	26.40	---	56.00	29.60	N	9.7
1.840000	32.62	---	56.00	23.38	N	9.7
1.840000	---	25.23	46.00	20.77	N	9.7
2.152000	27.81	---	56.00	28.19	N	9.7
2.172000	---	15.01	46.00	30.99	N	9.7
3.996000	---	15.44	46.00	30.56	N	9.8
4.004000	27.44	---	56.00	28.56	N	9.8
11.580000	30.98	---	60.00	29.02	N	10.2
11.656000	---	17.01	50.00	32.99	N	10.2