



NCC RADIO TEST REPORT

Equipment : Short Range Radar
Brand Name : APTIV
Model Name : RN5TR
Applicant : Aptiv Services Deutschland GmbH
Am Technologiepark 1, 42119 Wuppertal, Germany
Manufacturer : Aptiv Services Deutschland GmbH
Am Technologiepark 1, 42119 Wuppertal, Germany
Standard : LP0002 Section 3.14 (2018-01-10)

The product was received on Feb. 12, 2020, and testing was started from Mar. 11, 2020 and completed on Mar. 17, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.


Approved by: Sam Chen

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



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TEL : 886-3-656-9065
FAX : 886-3-656-9085
Report Template No.: CB-B3_3 Ver1.0



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	2.3	AC Power-line Conducted Emissions	PASS	-
3.2	C63.10 Clause 6.9	Occupied Bandwidth	PASS	-
3.3	76~77GHz Band: 3.14.1.2	Radiated E.I.R.P Power	PASS	-
3.4	76~77GHz Band: 3.14.1.3	Transmitter Radiated Unwanted Emissions	PASS	-
3.5	76~77GHz Band: 3.14.1.4	Frequency Stability	PASS	-

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sam Chen

Report Producer: Viola Huang



1 General Description

1.1 Information

1.1.1 RF General Information

RF General Information		
Frequency Range (GHz)	Operating Frequency (GHz)	Modulation
76-77	BW 175MHz: 76.155~76.835 BW 300MHz: 76.210~76.760 BW 425MHz: 76.325~76.680	FMCW

Bandwidth 175 MHz	
Peak - EIRP Power (dBm)	99% Occupied Bandwidth (MHz)
25.57	211.43

Bandwidth 300 MHz	
Peak - EIRP Power (dBm)	99% Occupied Bandwidth (MHz)
25.71	408.10

Bandwidth 425 MHz	
Peak - EIRP Power (dBm)	99% Occupied Bandwidth (MHz)
25.32	576.56

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Boresight Gain (One Way)	60 Deg Gain (One Way)
1	APTIV	Turn 7 TSMD53B	Integral Planar array antenna	N/A	11.5 dBi	12.5 dBi

Note: The above information was declared by manufacturer.

1.1.3 EUT Operational Condition

EUT Power Type	From DC power supply			
Supply Voltage	☐	AC	State AC voltage	-
Supply Voltage	☒	DC	State DC voltage	12V or 24V

**1.1.4 Test Signal Duty Cycle**

Test Signal Duty Cycle
For Bandwidth 175 MHz
☒ Continuous transmission - 49.99%
For Bandwidth 300 MHz
☒ Continuous transmission - 49.99%
For Bandwidth 425 MHz
☒ Continuous transmission - 50.10%
☐ Transmissions occur regularly in time - ...%



1.2 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ LP0002 Section 3.14 (2018-01-10)
- ♦ ANSI C63.10 - Testing Unlicensed Wireless Devices
- ♦ KDB653005 D01 76-81 GHz Radars v01r01
- ♦ FCC KDB 414788 D01 v01r01

1.3 Testing Location Information

Testing Location		
☐	HWA YA	ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL : 886-3-327-3456 FAX : 886-3-327-0973
☒	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH03-CB	Eddie Weng	22.3~22.6°C / 49~55%	Mar. 12, 2020 ~ Mar. 17, 2020
Radiated	03CH05-CB	Cola Fan	21.3~21.5°C / 45~49%	Mar. 12, 2020 ~ Mar. 17, 2020
AC Conduction	CO01-CB	Max Lin	21~22°C / 58~59%	Mar. 11, 2020

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086D with Industry Canada.

1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	2.0 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	5.1 dB	Confidence levels of 95%
Radiated Emission (40GHz ~ 60GHz)	4.6 dB	Confidence levels of 95%
Radiated Emission (60GHz ~ 90GHz)	5.1 dB	Confidence levels of 95%
Radiated Emission (90GHz ~ 200GHz)	5.6 dB	Confidence levels of 95%
Radiated Emission (200GHz ~ 280GHz)	6.7 dB	Confidence levels of 95%
Temperature	1°C	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Channel Frequencies Configuration

Test Channel Frequencies Configuration			
Bandwidth (MHz)	Test Channel Frequencies (GHz)		
	Low	Middel	High
175	76.155	76.515	76.835
300	76.210	76.550	76.760
425	76.325	76.570	76.680

2.2 Conformance Tests and Related Test Frequencies

Test Item	Test Frequencies (GHz)
AC Power-line Conducted Emissions	76.835
Occupied Bandwidth	BW 175MHz: 76.155, 76.515, 76.835
	BW 300MHz: 76.210, 76.550, 76.760
	BW 425MHz: 76.325, 76.570, 76.680
Radiated E.I.R.P Power	BW 175MHz: 76.155, 76.515, 76.835
	BW 300MHz: 76.210, 76.550, 76.760
	BW 425MHz: 76.325, 76.570, 76.680
Transmitter Spurious Emissions (below 1 GHz)	BW 175MHz: 76.835
	BW 300MHz: 76.760
	BW 425MHz: 76.680
Transmitter Spurious Emissions (1 GHz-40 GHz)	BW 175MHz: 76.155, 76.515, 76.835
	BW 300MHz: 76.210, 76.550, 76.760
	BW 425MHz: 76.325, 76.570, 76.680
Transmitter Spurious Emissions (above 40 GHz)	BW 175MHz: 76.155, 76.515, 76.835
	BW 300MHz: 76.210, 76.550, 76.760
	BW 425MHz: 76.325, 76.570, 76.680
Unintentional Radiated Emissions (below 1 GHz)	BW 175MHz: 76.835
	BW 300MHz: 76.760
	BW 425MHz: 76.680
Unintentional Radiated Emissions (1 GHz-40 GHz)	BW 175MHz: 76.155, 76.515, 76.835
	BW 300MHz: 76.210, 76.550, 76.760
	BW 425MHz: 76.325, 76.570, 76.680
Frequency Stability	BW 175MHz: 76.155, 76.515, 76.835
	BW 300MHz: 76.210, 76.550, 76.760
	BW 425MHz: 76.325, 76.570, 76.680

2.3 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral
Operating Mode	Intentional - CTX
1	CTX - EUT
Operating Mode	Unintentional - CRX
1	CRX - EUT

The Worst Case Mode for Following Conformance Tests	
Tests Item	Occupied Bandwidth Radiated E.I.R.P Frequency Stability
Test Condition	Radiated measurement
Operating Mode	CTX



The Worst Case Mode for Following Conformance Tests	
Tests Item	Transmitter Radiated Unwanted Emissions
Test Condition	Radiated measurement
Operating Mode < 1GHz	CTX
The EUT was performed at X axis, Z axis and Y axis position for Radiated Unwanted Emissions test. "EUT in Y axis" generated the worst test result for Transmitter Radiated Unwanted Emissions 1~18GHz test, thus the measurement for Transmitter Radiated Unwanted Emissions below 1GHz test will follow this same test configuration.	
1	EUT in Y axis + Bandwidth 175 MHz + 76.835 GHz
2	EUT in Y axis + Bandwidth 300 MHz + 76.76 GHz
3	EUT in Y axis + Bandwidth 425 MHz + 76.680 GHz
For operating mode 3 is the worst case and it was record in this test report.	
Operating Mode 1GHz~18GHz	CTX
1	EUT in X axis + Bandwidth 425 MHz + 76.680 GHz
2	EUT in Y axis + Bandwidth 425 MHz + 76.680 GHz
3	EUT in Z axis + Bandwidth 425 MHz + 76.680 GHz
Mode 2 has been evaluated to be the worst case among Mode 1~3, thus measurement for Mode 4~11 will follow this same test mode.	
4	EUT in Y axis + Bandwidth 175 MHz + 76.155 GHz
5	EUT in Y axis + Bandwidth 175 MHz + 76.515 GHz
6	EUT in Y axis + Bandwidth 175 MHz + 76.835 GHz
7	EUT in Y axis + Bandwidth 300 MHz + 76.21 GHz
8	EUT in Y axis + Bandwidth 300 MHz + 76.55 GHz
9	EUT in Y axis + Bandwidth 300 MHz + 76.76 GHz
10	EUT in Y axis + Bandwidth 425 MHz + 76.325 GHz
11	EUT in Y axis + Bandwidth 425 MHz + 76.570 GHz
Operating Mode 18GHz~40GHz	CTX
The EUT was performed at X axis, Z axis and Y axis position for Radiated Unwanted Emissions test. "EUT in Y axis" generated the worst test result for Transmitter Radiated Unwanted Emissions 1~18GHz test, thus the measurement for Transmitter Radiated Unwanted Emissions 18~40GHz test will follow this same test configuration.	
1	EUT in Y axis + Bandwidth 175 MHz + 76.155 GHz
2	EUT in Y axis + Bandwidth 175 MHz + 76.515 GHz
3	EUT in Y axis + Bandwidth 175 MHz + 76.835 GHz
4	EUT in Y axis + Bandwidth 300 MHz + 76.21 GHz
5	EUT in Y axis + Bandwidth 300 MHz + 76.55 GHz
6	EUT in Y axis + Bandwidth 300 MHz + 76.76 GHz

7	EUT in Y axis + Bandwidth 425 MHz + 76.325 GHz
8	EUT in Y axis + Bandwidth 425 MHz + 76.570 GHz
9	EUT in Y axis + Bandwidth 425 MHz + 76.680 GHz

The Worst Case Mode for Following Conformance Tests	
Tests Item	Unintentional Radiated Emissions
Test Condition	Radiated measurement
Operating Mode < 1GHz	CRX
The EUT was performed at X axis, Z axis and Y axis position for Transmitter Radiated Unwanted Emissions test. "EUT in Y axis" generated the worst test result for Transmitter Radiated Unwanted Emissions 1~18GHz test, thus the measurement for Unintentional Radiated Emissions below 1GHz test will follow this same test configuration.	
1	EUT in Y axis + Bandwidth 175 MHz + 76.835 GHz
2	EUT in Y axis + Bandwidth 300 MHz + 76.76 GHz
3	EUT in Y axis + Bandwidth 425 MHz + 76.680 GHz
For operating mode 3 is the worst case and it was record in this test report.	
Operating Mode 1~40GHz	CRX
The EUT was performed at X axis, Z axis and Y axis position for Transmitter Radiated Unwanted Emissions test. "EUT in Y axis" generated the worst test result for Transmitter Radiated Unwanted Emissions 1~18GHz test, thus the measurement for Unintentional Radiated Emissions 1~40GHz test will follow this same test configuration.	
1	EUT in Y axis + Bandwidth 175 MHz + 76.155 GHz
2	EUT in Y axis + Bandwidth 175 MHz + 76.515 GHz
3	EUT in Y axis + Bandwidth 175 MHz + 76.835 GHz
4	EUT in Y axis + Bandwidth 300 MHz + 76.21 GHz
5	EUT in Y axis + Bandwidth 300 MHz + 76.55 GHz
6	EUT in Y axis + Bandwidth 300 MHz + 76.76 GHz
7	EUT in Y axis + Bandwidth 425 MHz + 76.325 GHz
8	EUT in Y axis + Bandwidth 425 MHz + 76.570 GHz
9	EUT in Y axis + Bandwidth 425 MHz + 76.680 GHz

Note: The applicant declared that the accessories of this case were for measurement only and it would not be marketed. The accessories will be provided and inspected by the laboratory (or the applicant).

2.4 EUT Operation during Test

The EUT was programmed to be in continuously transmitting/receiving mode.

2.5 Accessories

N/A

2.6 Support Equipment

For Test Site No: CO01-CB

Support Equipment					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
A	Power Supply	Advanced	LPS-305	N/A	Provided by Lab.
B	Netzwerk-Interfaces	VECTOR	VN1640A	N/A	Provided by applicant.
C	NB	Dell	Latitude E5470	N/A	Provided by applicant.
D	Earphone	e-Power	S90W	N/A	Provided by Lab.
E	Mouse	HP	FM100	N/A	Provided by Lab.

For Test Site No: 03CH05-CB

Support Equipment					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
A	Power Supply	Advanced	LPS-305	N/A	Provided by Lab.
B	NB	Dell	Latitude E5470	N/A	Provided by applicant.
C	Netzwerk-Interfaces	VECTOR	VN1640A	N/A	Provided by applicant.

For Test Site No: TH03-CB

Support Equipment					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
A	Power Supply	Advanced	LPS-305	N/A	Provided by Lab.
B	NB	Dell	Latitude E5470	N/A	Provided by applicant.
C	Netzwerk-Interfaces	VECTOR	VN1640A	N/A	Provided by applicant.

2.7 Far Field Boundary Calculations

The far-field boundary is given as:

$$\text{far field} = (2 * L^2) / \lambda$$

where:

L = Largest Antenna Dimension, including the reflector, in meters

λ = wavelength in meters

For Bandwidth 175 MHz

Far Field (m)				
Frequency (GHz)	L (m)	Lambda (m)	d(Far Field) (m)	d(Far Field) (cm)
76.155	0.04	0.0039393	0.812	81.23
76.515	0.04	0.0039208	0.816	81.62
76.835	0.04	0.0039045	0.820	81.96

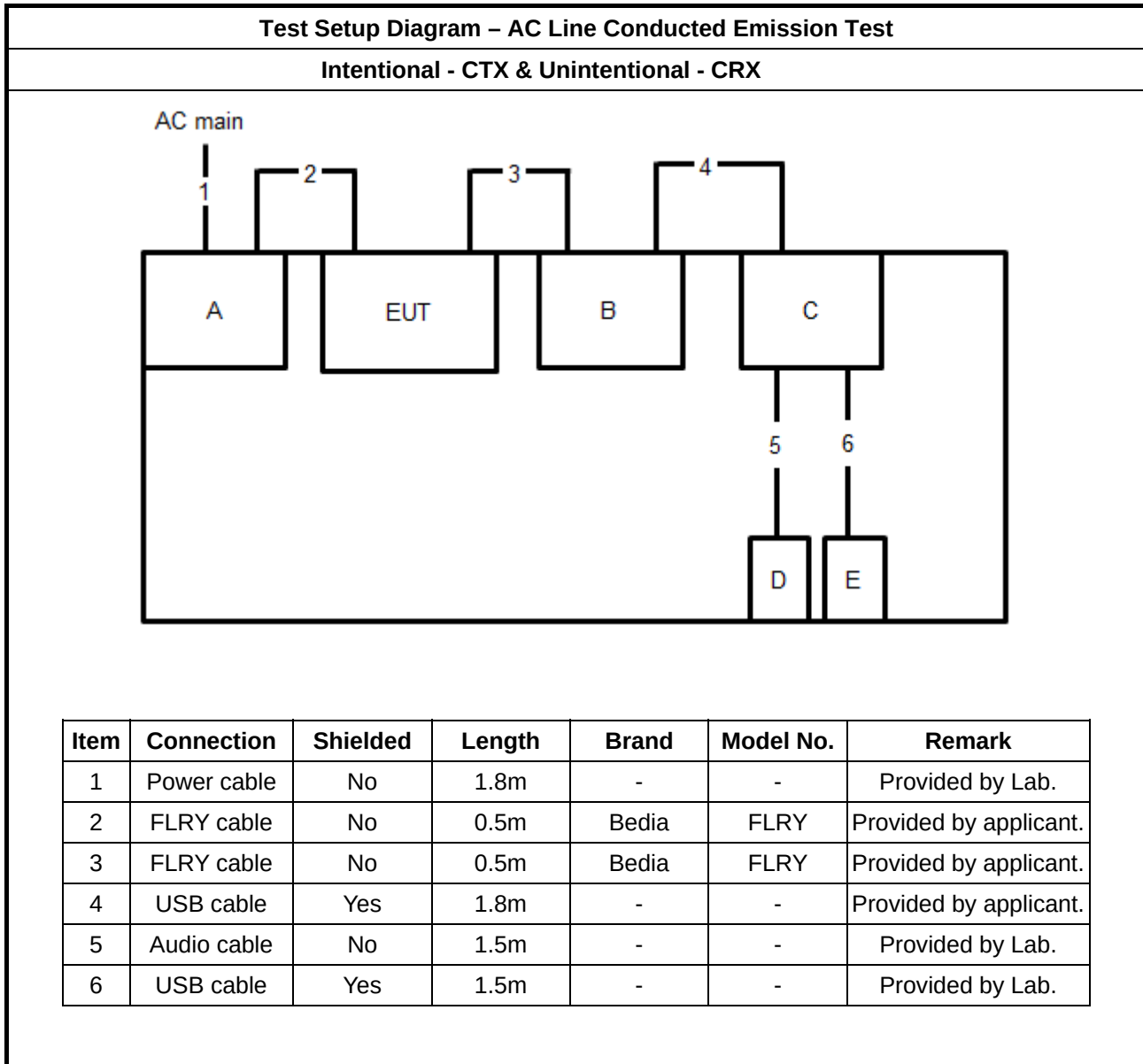
For Bandwidth 300 MHz

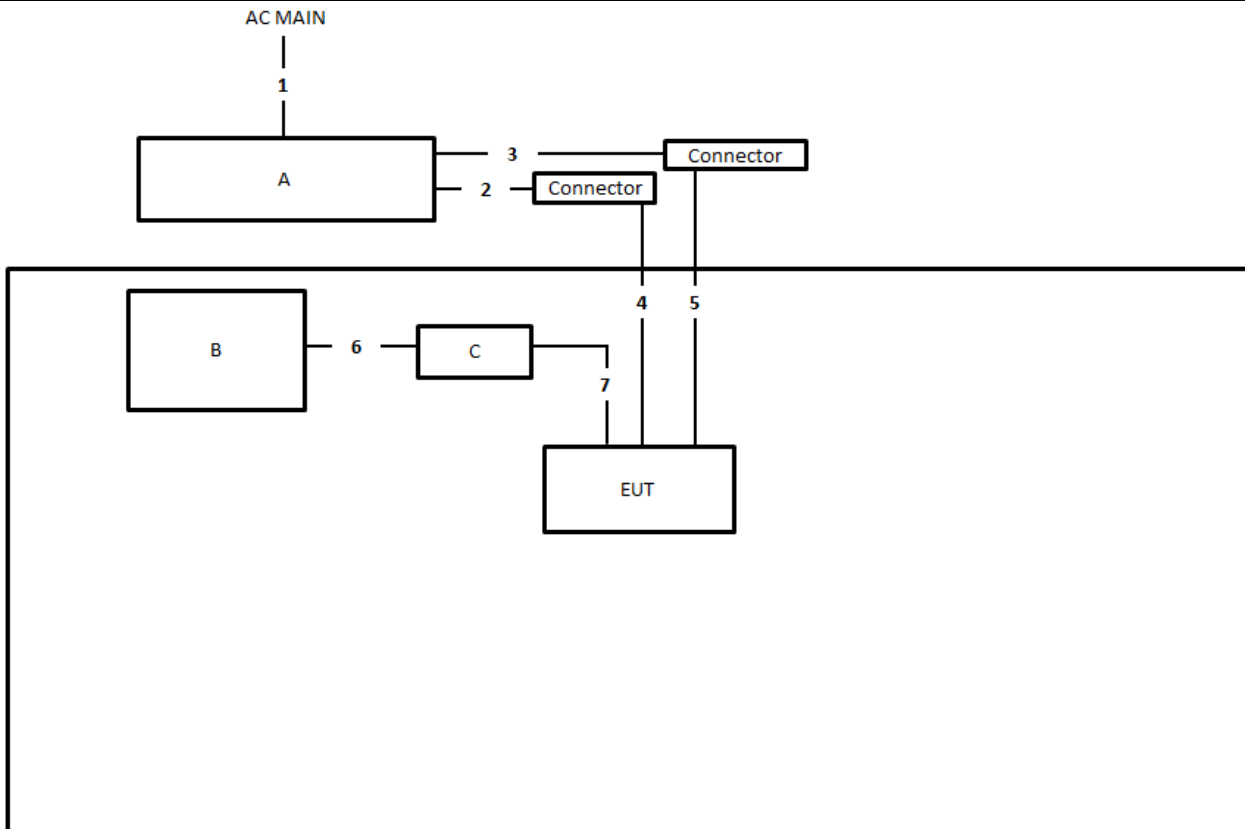
Far Field (m)				
Frequency (GHz)	L (m)	Lambda (m)	d(Far Field) (m)	d(Far Field) (cm)
76.210	0.04	0.0039365	0.813	81.29
76.550	0.04	0.0039190	0.817	81.65
76.760	0.04	0.0039083	0.819	81.88

For Bandwidth 425 MHz

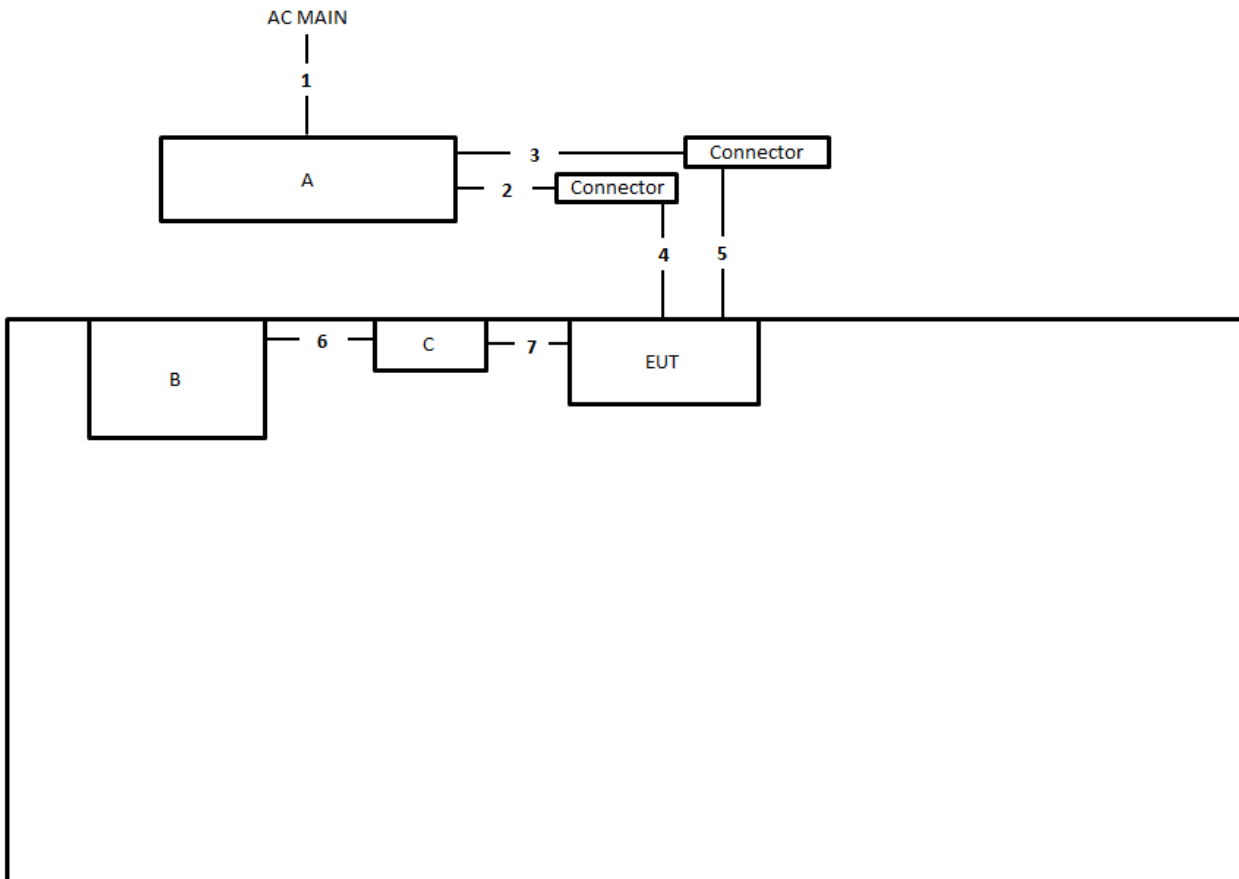
Far Field (m)				
Frequency (GHz)	L (m)	Lambda (m)	d(Far Field) (m)	d(Far Field) (cm)
76.325	0.04	0.0039306	0.814	81.41
76.570	0.04	0.0039180	0.817	81.67
76.680	0.04	0.0039124	0.818	81.79

2.8 Test Setup Diagram



Test Setup Diagram - Radiated Test
Intentional - CTX


Item	Connection	Shielded	Length	Brand	Model No.	Remark
1	Power cable	No	1.8m	-	-	Provided by Lab.
2	Crocodile clip	No	1.5m	-	-	Provided by Lab.
3	Crocodile clip	No	1.5m	-	-	Provided by Lab.
4	FLRY cable	No	0.5m	Bedia	FLRY	Provided by applicant.
5	FLRY cable	No	0.5m	Bedia	FLRY	Provided by applicant.
6	USB cable	Yes	1.8m	-	-	Provided by applicant.
7	FLRY cable	No	0.5m	Bedia	FLRY	Provided by applicant.

Test Setup Diagram - Radiated Test
Unintentional - CRX


Item	Connection	Shielded	Length	Brand	Model No.	Remark
1	Power cable	No	1.8m	-	-	Provided by Lab.
2	Crocodile clip	No	1.5m	-	-	Provided by Lab.
3	Crocodile clip	No	1.5m	-	-	Provided by Lab.
4	FLRY cable	No	0.5m	Bedia	FLRY	Provided by applicant.
5	FLRY cable	No	0.5m	Bedia	FLRY	Provided by applicant.
6	USB cable	Yes	1.8m	-	-	Provided by applicant.
7	FLRY cable	No	0.5m	Bedia	FLRY	Provided by applicant.

3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 Limit of AC Power-line Conducted Emissions

AC Power-line Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

Note: * Decreases with the logarithm of the frequency.

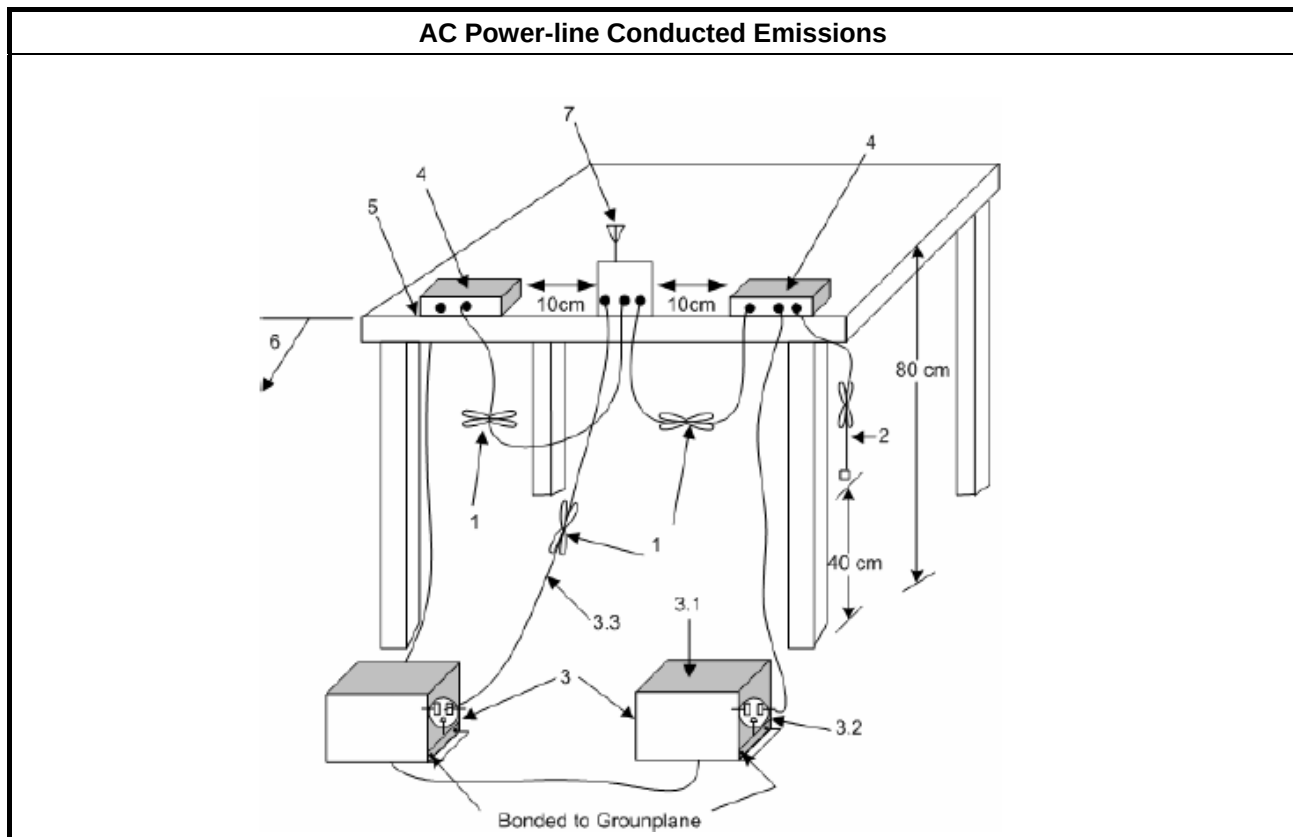
3.1.2 Measuring Instruments

Refer a measuring instruments list in this test report.

3.1.3 Test Procedures

Method of measurement: Refer as ANSI C63.10, clause 6.2.

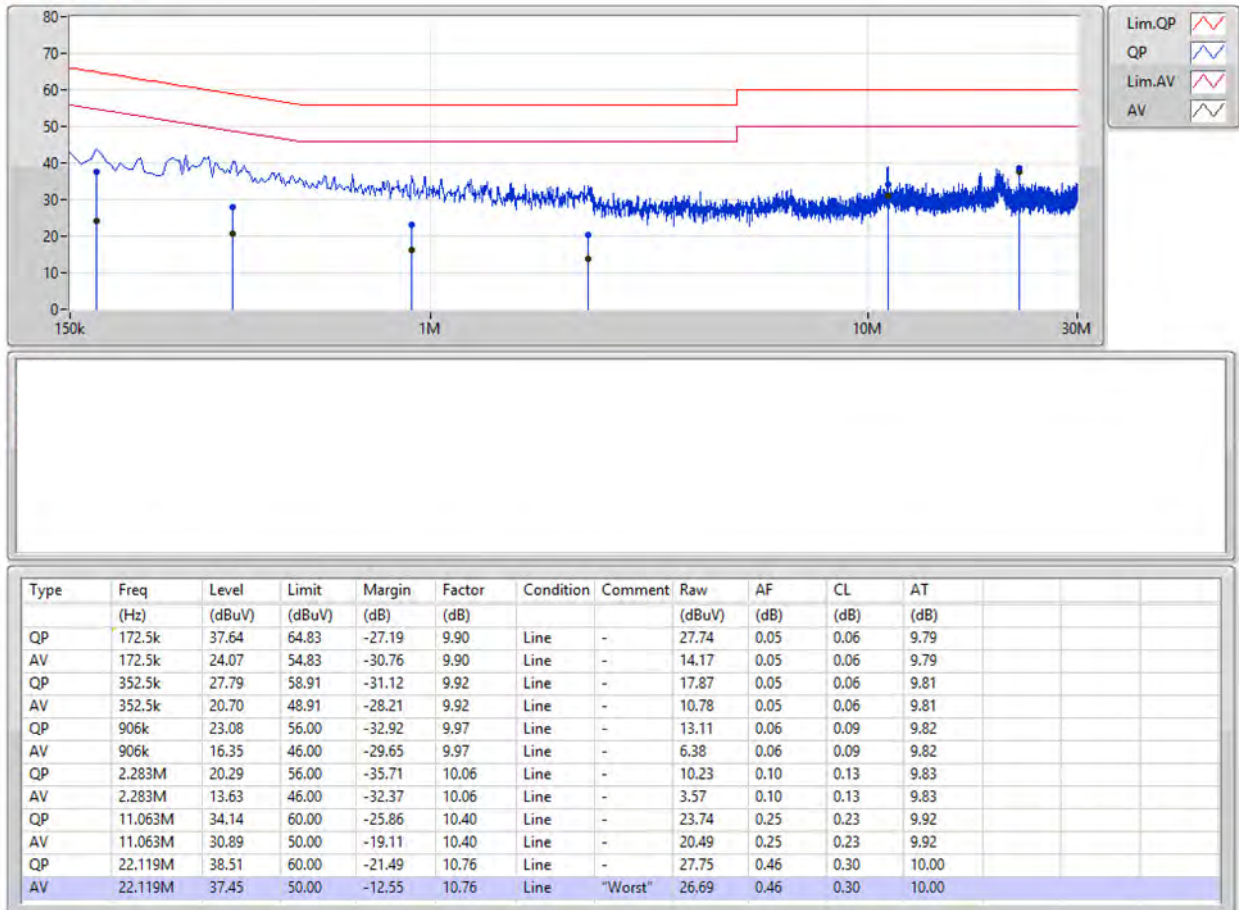
3.1.4 Test Setup



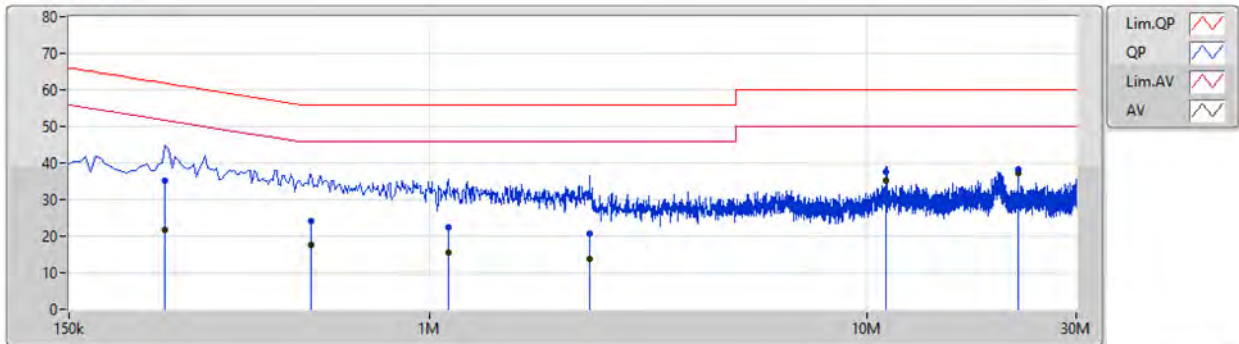
3.1.5 Test Result of AC Power-line Conducted Emissions

Intentional - CTX / Test Mode: Mode 1

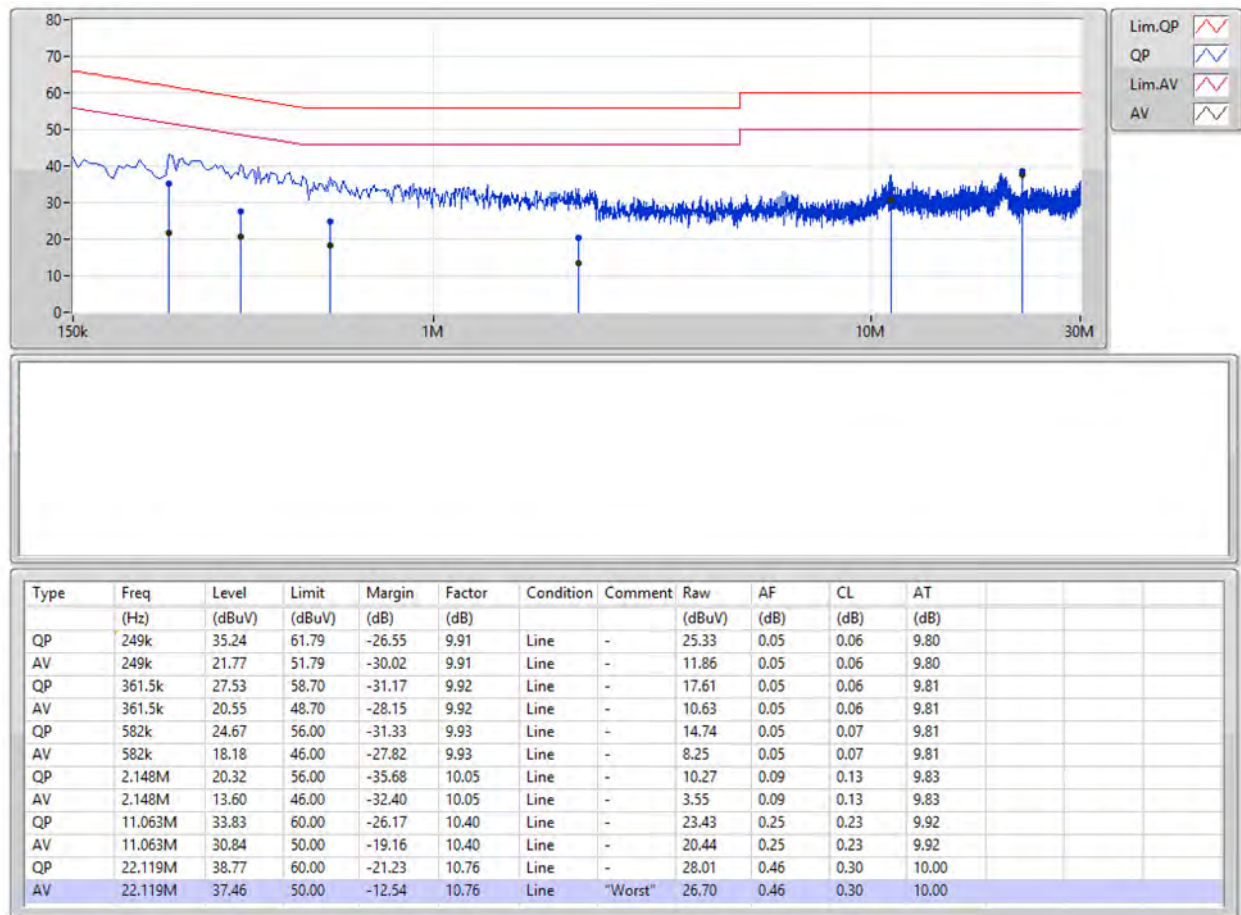
Phase: Line



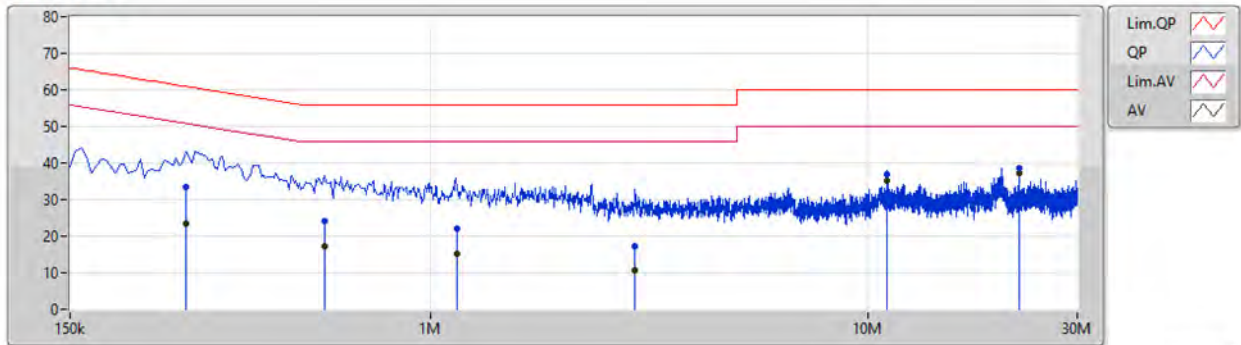
Phase: Neutral



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	AF (dB)	CL (dB)	AT (dB)				
QP	249k	35.05	61.79	-26.74	9.91	Neutral	-	25.14	0.05	0.06	9.80				
AV	249k	21.78	51.79	-30.01	9.91	Neutral	-	11.87	0.05	0.06	9.80				
QP	537k	24.12	56.00	-31.88	9.93	Neutral	-	14.19	0.05	0.07	9.81				
AV	537k	17.52	46.00	-28.48	9.93	Neutral	-	7.59	0.05	0.07	9.81				
QP	1.104M	22.29	56.00	-33.71	9.97	Neutral	-	12.32	0.06	0.09	9.82				
AV	1.104M	15.37	46.00	-30.63	9.97	Neutral	-	5.40	0.06	0.09	9.82				
QP	2.319M	20.55	56.00	-35.45	10.05	Neutral	-	10.50	0.09	0.13	9.83				
AV	2.319M	13.78	46.00	-32.22	10.05	Neutral	-	3.73	0.09	0.13	9.83				
QP	11.058M	37.58	60.00	-22.42	10.35	Neutral	-	27.23	0.20	0.23	9.92				
AV	11.058M	35.17	50.00	-14.83	10.35	Neutral	-	24.82	0.20	0.23	9.92				
QP	22.119M	38.37	60.00	-21.63	10.59	Neutral	-	27.78	0.29	0.30	10.00				
AV	22.119M	37.29	50.00	-12.71	10.59	Neutral	"Worst"	26.70	0.29	0.30	10.00				

**Unintentional - CRX / Test Mode: Mode 1
Phase: Line**

Phase: Neutral



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	AF (dB)	CL (dB)	AT (dB)			
QP	276k	33.29	60.93	-27.64	9.91	Neutral	-	23.38	0.05	0.06	9.80			
AV	276k	23.30	50.93	-27.63	9.91	Neutral	-	13.39	0.05	0.06	9.80			
QP	573k	23.97	56.00	-32.03	9.93	Neutral	-	14.04	0.05	0.07	9.81			
AV	573k	17.20	46.00	-28.80	9.93	Neutral	-	7.27	0.05	0.07	9.81			
QP	1.145M	22.05	56.00	-33.95	9.98	Neutral	-	12.07	0.06	0.10	9.82			
AV	1.145M	15.31	46.00	-30.69	9.98	Neutral	-	5.33	0.06	0.10	9.82			
QP	2.931M	17.26	56.00	-38.74	10.07	Neutral	-	7.19	0.10	0.15	9.82			
AV	2.931M	10.52	46.00	-35.48	10.07	Neutral	-	0.45	0.10	0.15	9.82			
QP	11.058M	36.87	60.00	-23.13	10.35	Neutral	-	26.52	0.20	0.23	9.92			
AV	11.058M	35.06	50.00	-14.94	10.35	Neutral	-	24.71	0.20	0.23	9.92			
QP	22.119M	38.51	60.00	-21.49	10.59	Neutral	-	27.92	0.29	0.30	10.00			
AV	22.119M	37.29	50.00	-12.71	10.59	Neutral	"Worst"	26.70	0.29	0.30	10.00			

3.2 Occupied Bandwidth

3.2.1 Occupied Bandwidth (OBW) Limit

Occupied Bandwidth (EBW) Limit
Information only

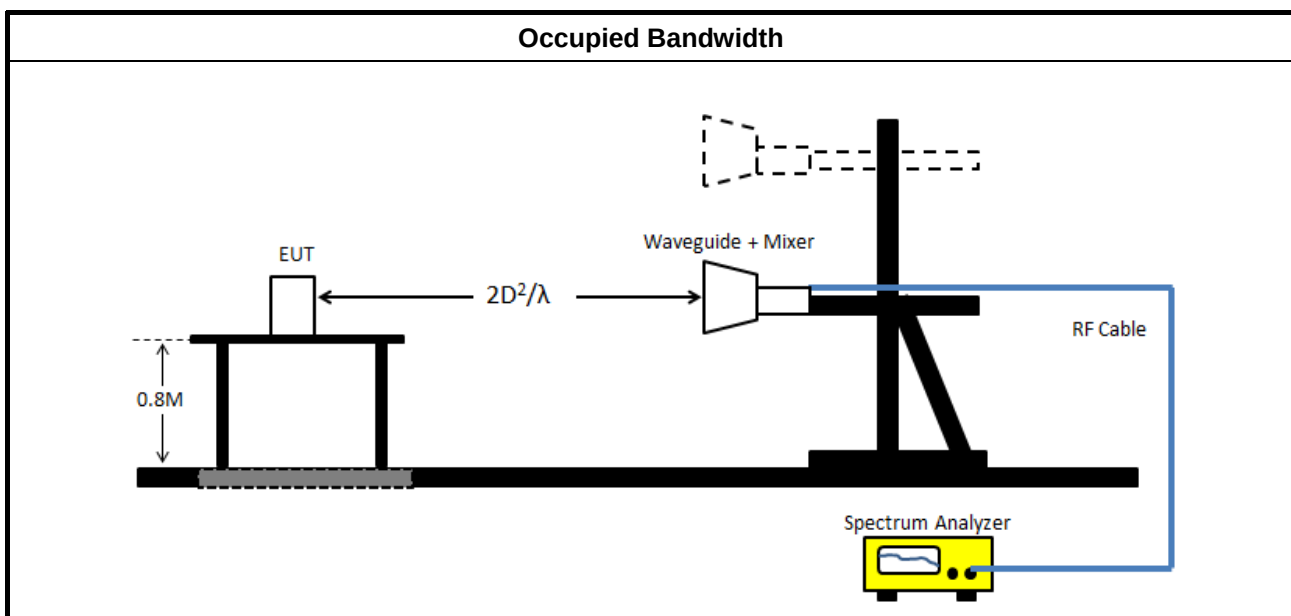
3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

Test Method
☒ For the Occupied bandwidth shall be measured using one of the options below:
☒ Refer as ANSI C63.10, clause 7.8.7 for EBW measurement.
☐ Refer as ANSI C63.10, clause 6.9.2 for occupied bandwidth testing.
☒ Refer as ANSI C63.10, clause 9 for radiated measurement.
☒ Radiated test was conducted at far-field distance. the distance from the radiating element of the EUT to the edge of the far field may be calculated from $[r \geq 2D^2/\lambda]$ r is the distance from the radiating element of the EUT to the edge of the far field, in m D is the largest dimension of both the radiating element and the test antenna (horn), in m λ is the wavelength of the emission under investigation $[300/f \text{ (MHz)}]$, in m

3.2.4 Test Setup



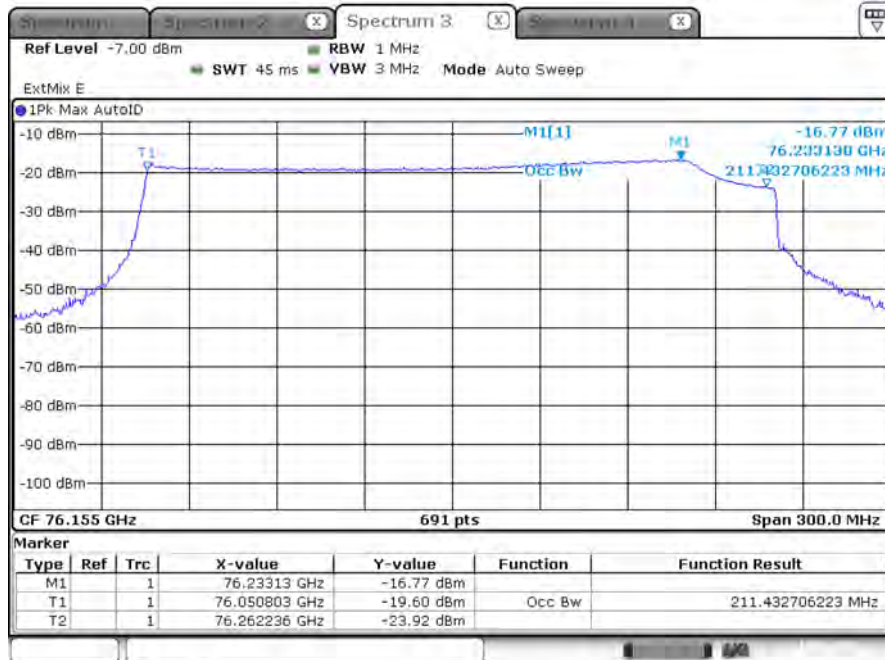
**3.2.5 Test Result of Occupied Bandwidth**

For Bandwidth 175 MHz

Test Results		
Test Freq. (GHz)	99% Occupied Bandwidth (MHz)	Limit (MHz)
76.155	211.43	N/A
76.515	210.56	N/A
76.835	208.83	N/A

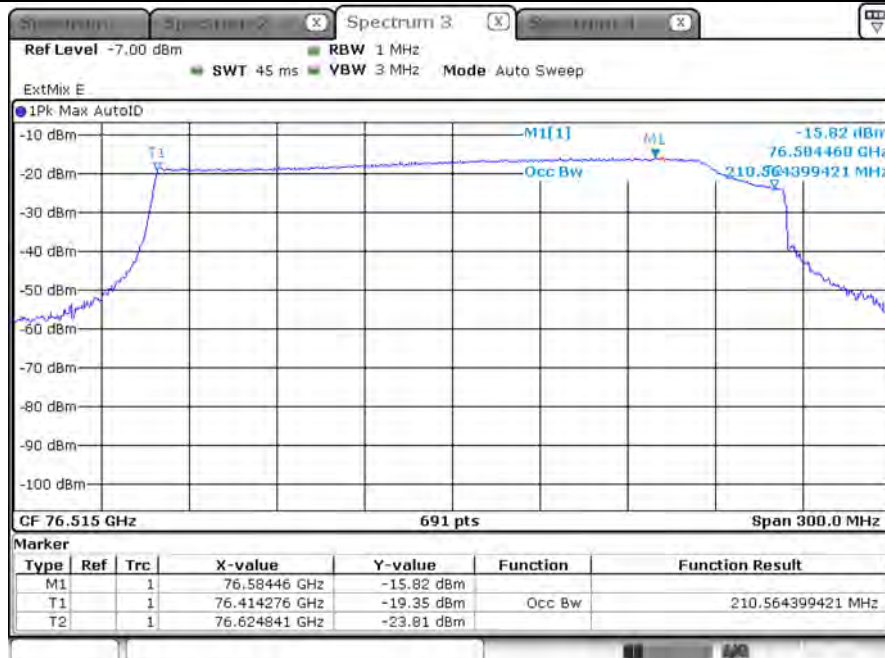
Occupied Bandwidth Plots

Test Frequency: 76.155 GHz



Date: 13.MAR.2020 18:46:28

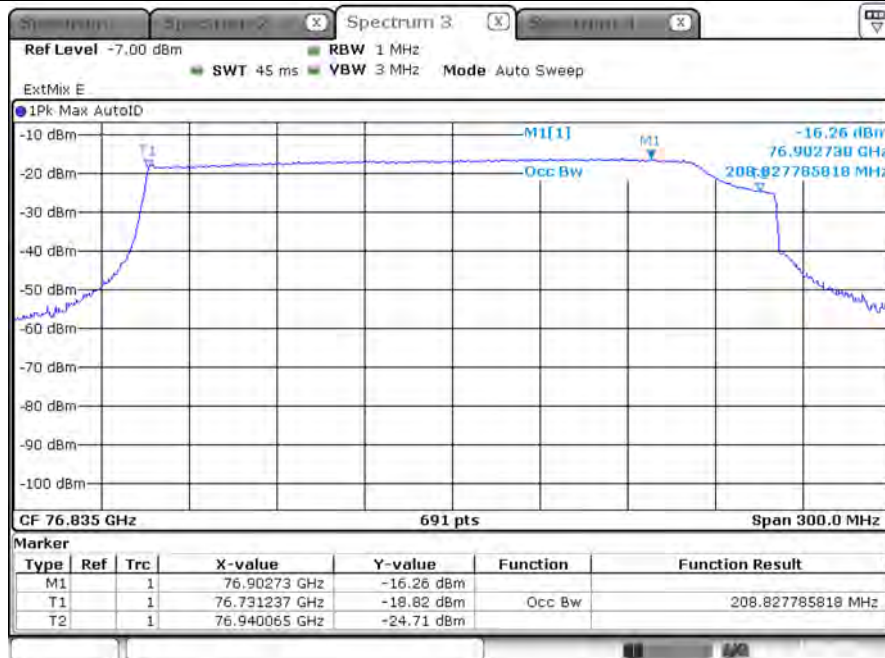
Test Frequency: 76.515 GHz



Date: 13.MAR.2020 18:50:18



Test Frequency: 76.835 GHz



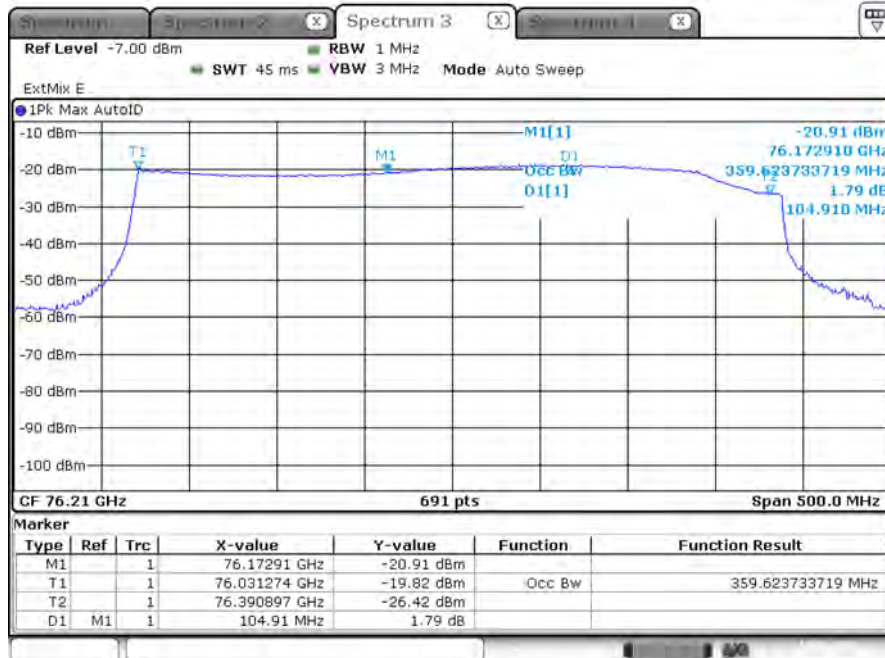
Date: 13.MAR.2020 18:55:39

**For Bandwidth 300 MHz**

Test Results		
Test Freq. (GHz)	99% Occupied Bandwidth (MHz)	Limit (MHz)
76.210	359.62	N/A
76.550	408.10	N/A
76.760	407.38	N/A

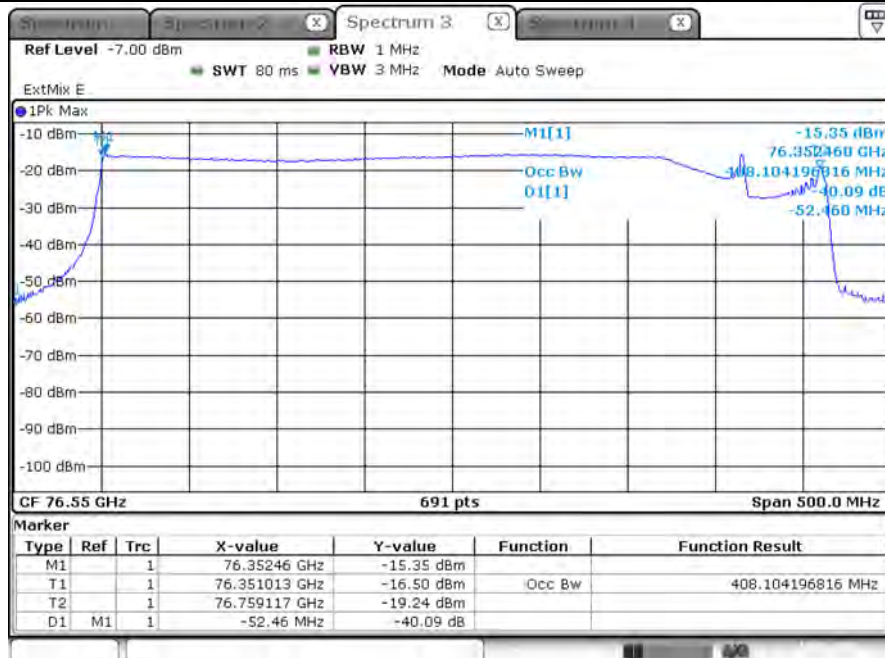
Occupied Bandwidth Plots

Test Frequency: 76.210 GHz

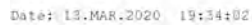


Date: 13.MAR.2020 19:13:25

Test Frequency: 76.550 GHz



Date: 13.MAR.2020 19:21:19

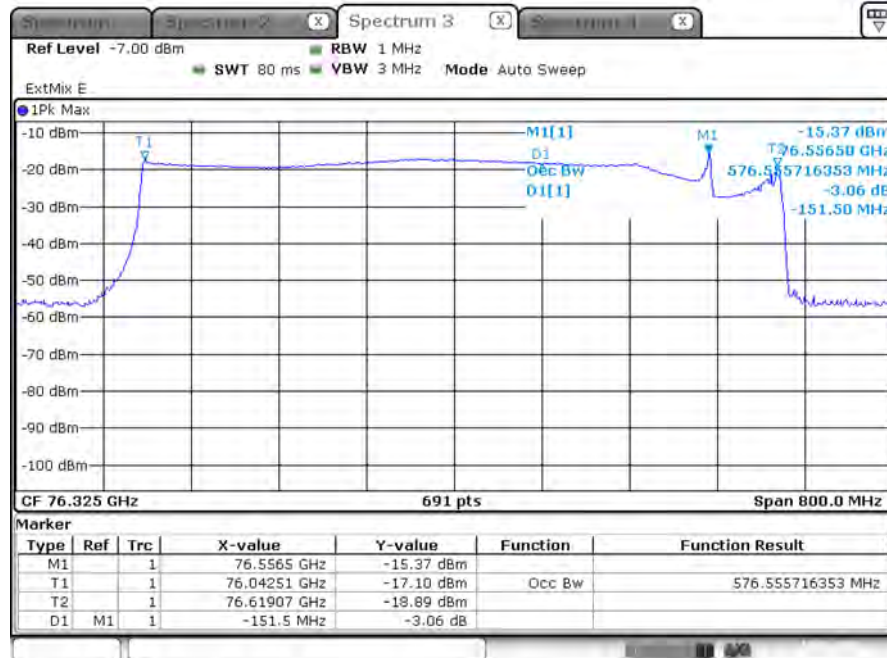


**For Bandwidth 425 MHz**

Test Results		
Test Freq. (GHz)	99% Occupied Bandwidth (MHz)	Limit (MHz)
76.325	576.56	N/A
76.570	576.56	N/A
76.680	575.40	N/A

Occupied Bandwidth Plots

Test Frequency: 76.325 GHz



Date: 13.MAR.2020 19:45:19

Test Frequency: 76.570 GHz



Date: 13.MAR.2020 20:04:04

Test Frequency: 76.680 GHz



Date: 13.MAR.2020 20:23:38

3.3 Radiated E.I.R.P Power

3.3.1 Radiated E.I.R.P Power

Radiated E.I.R.P Power Limit	
☒	76-77 GHz Band:
☒	Peak: EIRP 55 dBm [279uW/cm ² at 3m] Average: EIRP 50 dBm [88uW/cm ² at 3m]

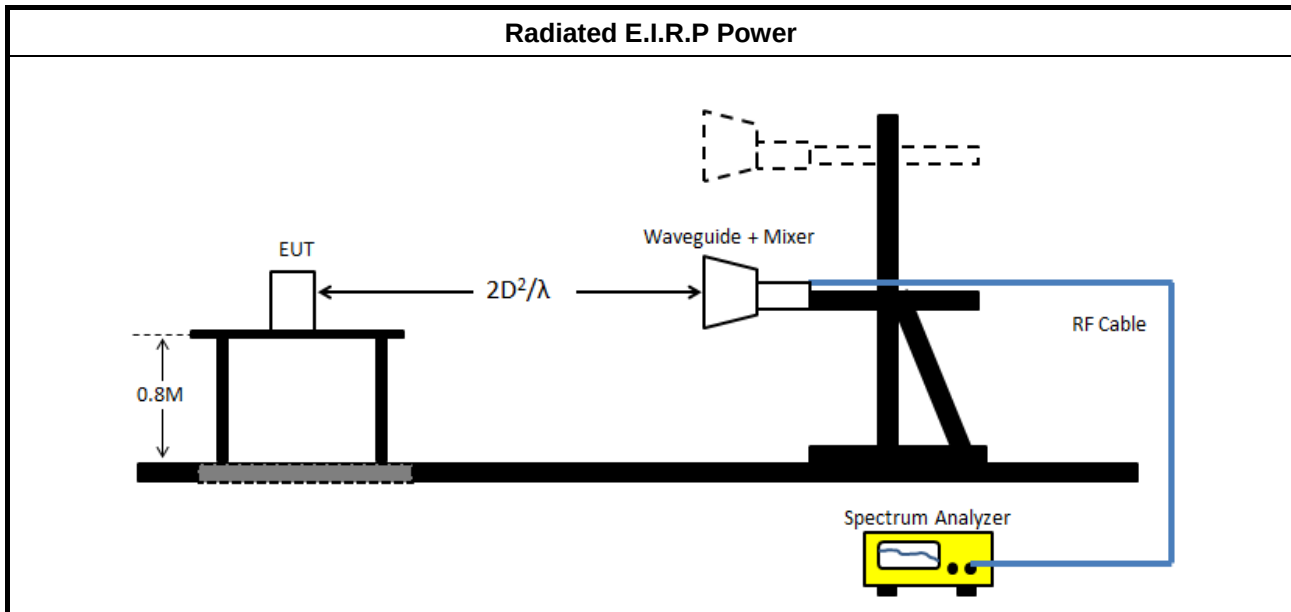
3.3.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

Test Method	
☒	For the Occupied bandwidth shall be measured using one of the options below:
☒	Refer as ANSI C63.10, clause 9 for radiated measurement.
☒	Radiated test was conducted at far-field distance. the distance from the radiating element of the EUT to the edge of the far field may be calculated from $[r \geq 2D^2/\lambda]$ r is the distance from the radiating element of the EUT to the edge of the far field, in m D is the largest dimension of both the radiating element and the test antenna (horn), in m λ is the wavelength of the emission under investigation $[300/f \text{ (MHz)}]$, in m
☒	The measured power level is converted to EIRP using the Friis equation: $E \text{ Meas} = 126.8 - 20\log(\lambda) + P - G$ where E is the field strength of the emission at the measurement distance, in dBμV/m P is the power measured at the output of the test antenna, in dBm λ is the wavelength of the emission under investigation $[300/f\text{MHz}]$, in m G is the gain of the test antenna, in dBi $EIRP = E \text{ Meas} + 20 \log(d \text{ Meas}) - 104.7$ where $EIRP$: is the equivalent isotropically radiated power, in dBm. $E \text{ Meas}$: is the field strength of the emission at the measurement distance, in dBμV/m. $d \text{ Meas}$: is the measurement distance, in m.

3.3.4 Test Setup



3.3.5 Test Result of Radiated E.I.R.P Power

For Bandwidth 175 MHz

Freq. (GHz)	Rx Gain (dBi)	P-Peak (dBm)	P-Average (dBm)	E-Meas- Peak (dBuV/m)	E-Meas- Average (dBuV/m)	Distance (m)	EIRP- Peak (dBm)	EIRP- Average (dBm)
76.155	23	-20.80	-38.09	131.09	113.80	0.85	24.88	7.59
76.515	23	-20.15	-37.17	131.78	114.76	0.85	25.57	8.55
76.835	23	-20.25	-37.20	131.72	114.77	0.85	25.51	8.56
Limit							55	50

For Bandwidth 300 MHz

Freq. (GHz)	Rx Gain (dBi)	P-Peak (dBm)	P-Average (dBm)	E-Meas- Peak (dBuV/m)	E-Meas- Average (dBuV/m)	Distance (m)	EIRP- Peak (dBm)	EIRP- Average (dBm)
76.210	23	-20.83	-38.21	131.07	113.69	0.85	24.86	7.48
76.550	23	-20.44	-37.73	131.50	114.21	0.85	25.28	7.99
76.760	23	-20.04	-37.34	131.92	114.62	0.85	25.71	8.41
Limit							55	50

For Bandwidth 425 MHz

Freq. (GHz)	Rx Gain (dBi)	P-Peak (dBm)	P-Average (dBm)	E-Meas- Peak (dBuV/m)	E-Meas- Average (dBuV/m)	Distance (m)	EIRP- Peak (dBm)	EIRP- Average (dBm)
76.325	23	-20.59	-38.24	131.32	113.67	0.85	25.11	7.46
76.570	23	-20.41	-38.09	131.53	113.85	0.85	25.32	7.64
76.680	23	-20.5	-37.64	131.45	114.31	0.85	25.24	8.10
Limit							55	50

3.4 Transmitter Radiated Unwanted Emissions

3.4.1 Transmitter Radiated Unwanted Emissions Limit

Transmitter Radiated Unwanted Emissions Limit (Below 40 GHz)			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960 - 40000	500	54	3

Frequency Range (GHz)	EIRP (dBm)	Power Density (pW/cm ² @ 3m)
40 - 200	-1.7	600
200 - 231	0.5	1000

3.4.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

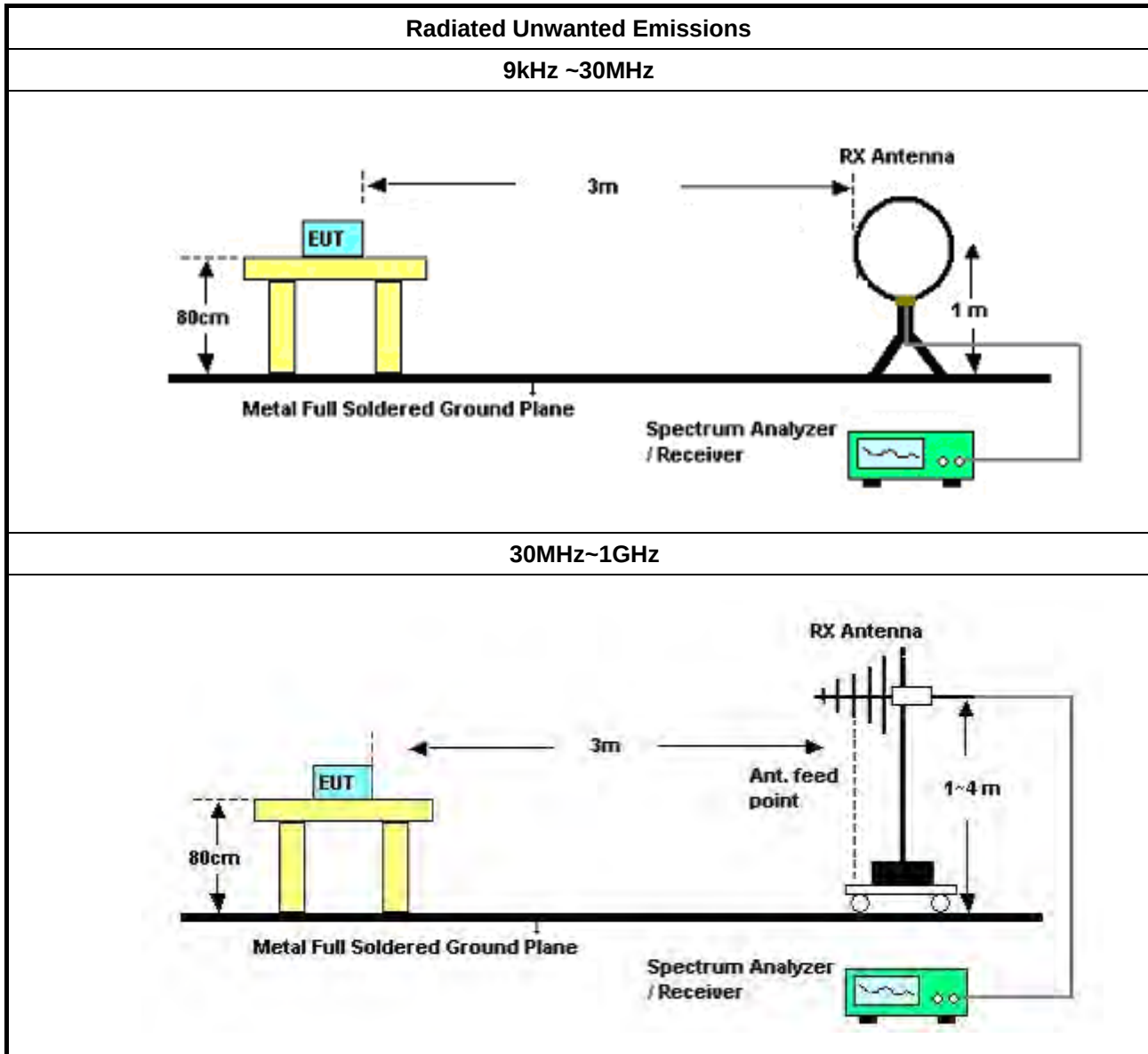
Test Method – General Information	
☒ For the transmitter unwanted emissions shall be measured using following options below:	
☒	Refer as ANSI C63.10, clause 6.3 for unwanted emissions into non-restricted bands.
☒	For unwanted emissions below 40GHz bands.
☒	Radiated emissions below 40 GHz shall not exceed the general limits in LP0002 Section 2.8
☒	Refer as ANSI C63.10, clause 4.1.4.2.3 (Video Averaging) average measurements using spectrum reduced video bandwidth (VBW≥10Hz) - [duty cycle ≥ 98 or external power trigger].
☐	Refer as ANSI C63.10, clause 4.1.4.2.4 average value of pulsed emissions.
☐	Refer as ANSI C63.10, clause 4.1.4.2.2 measurement procedure peak limit.

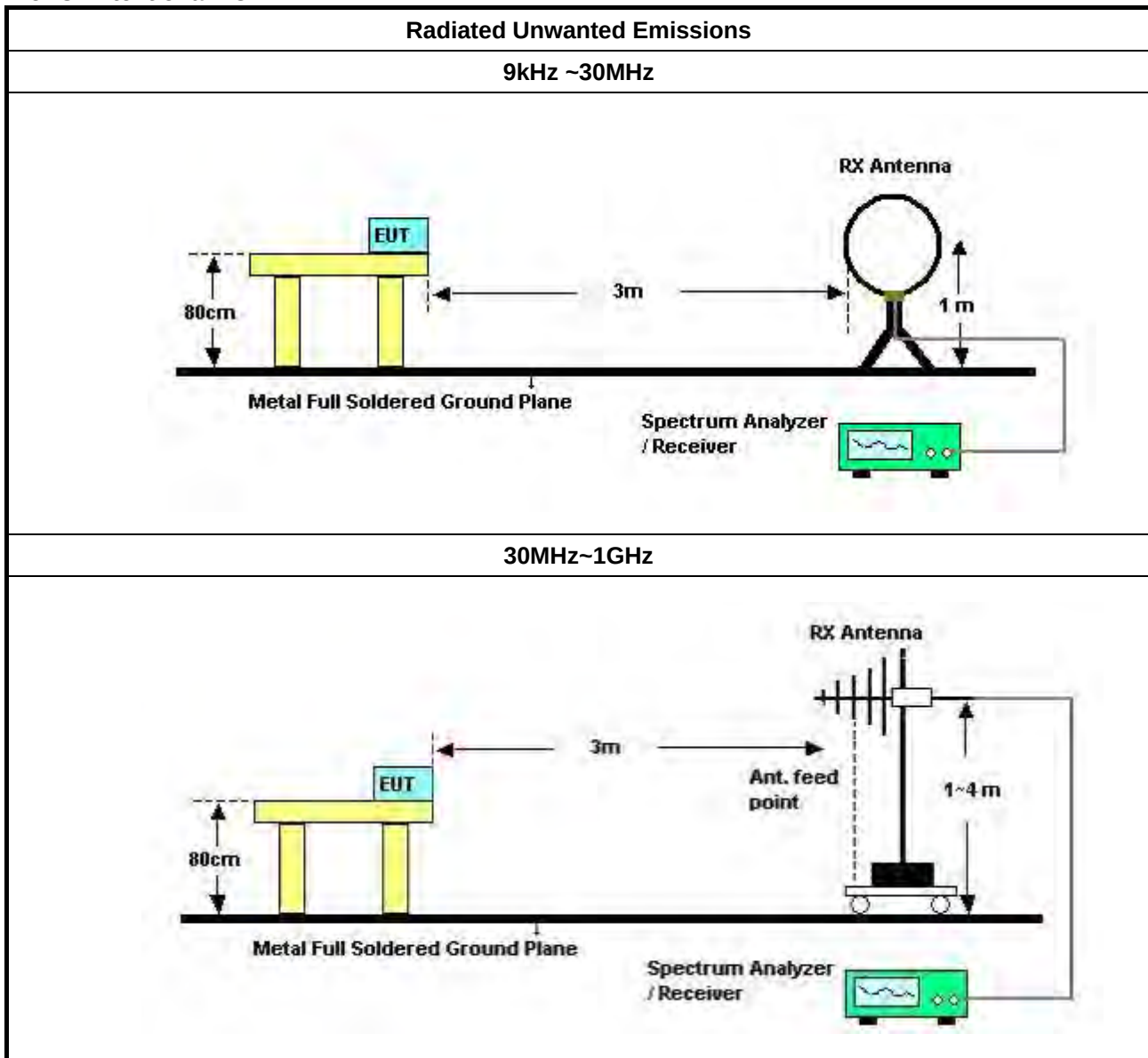
Test Method	
☒ For radiated measurement below 40GHz.	
☒	Refer as ANSI C63.10, clause 6.3 through 6.6 for radiated emissions from below 40 GHz.
☒	For radiated measurement above 40GHz. Refer as ANSI C63.10, clause 9.12 for radiated measurement.
☒	Radiated test was conducted at far-field distance the distance from the radiating element of the

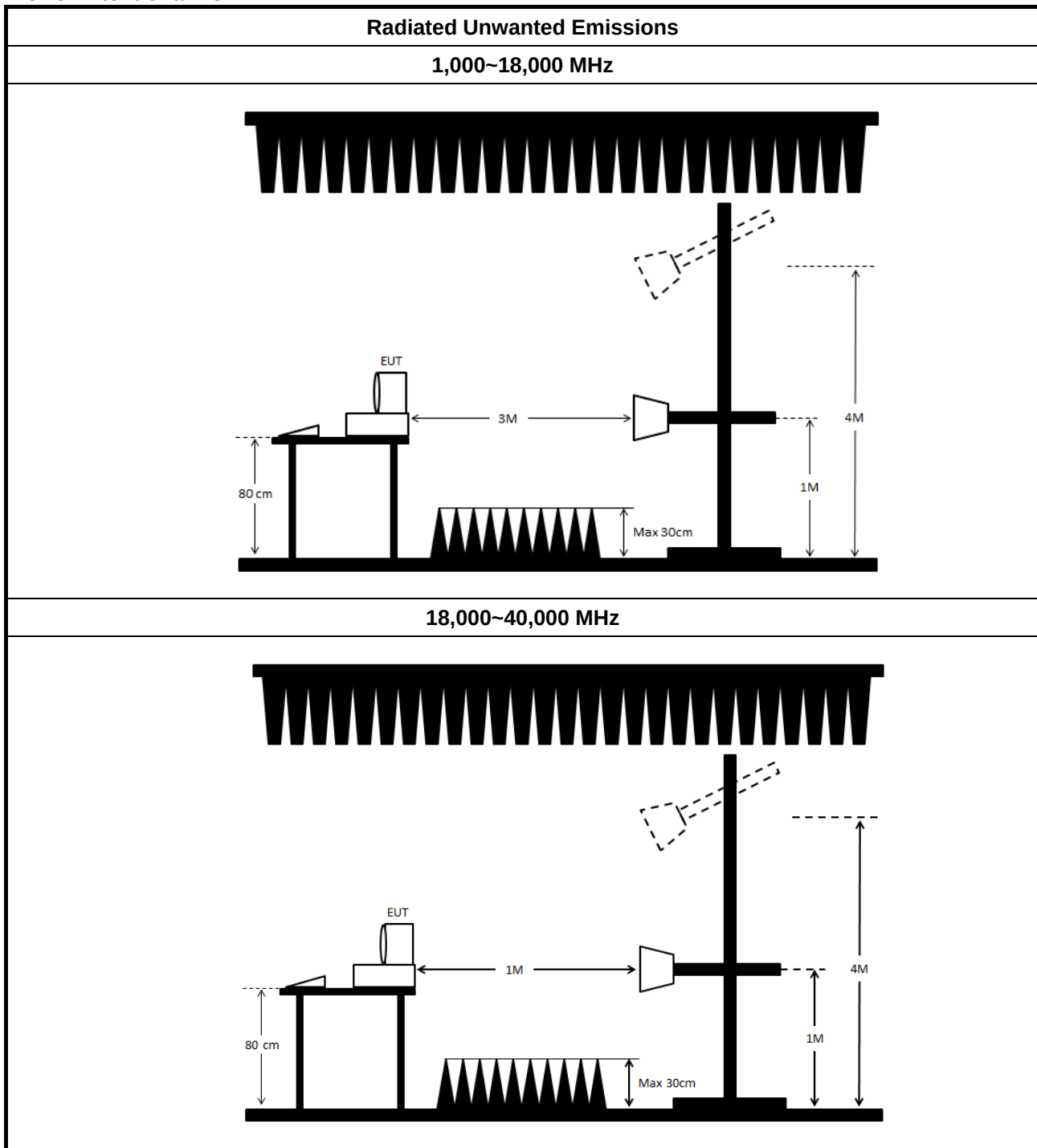
Test Method	
	EUT to the edge of the far field may be calculated from $[r \geq 2D^2/\lambda]$ r is the distance from the radiating element of the EUT to the edge of the far field, in m D is the largest dimension of both the radiating element and the test antenna (horn), in m λ is the wavelength of the emission under investigation $[300/f \text{ (MHz)}]$, in m
☒	The measured power level is converted to EIRP using the Friis equation: $E \text{ Meas} = 126.8 - 20\log(\lambda) + P - G$ where E is the field strength of the emission at the measurement distance, in dBμV/m P is the power measured at the output of the test antenna, in dBm λ is the wavelength of the emission under investigation $[300/f \text{ (MHz)}]$, in m G is the gain of the test antenna, in dBi $EIRP = E \text{ Meas} + 20 \log(d \text{ Meas}) - 104.7$ where $EIRP$: is the equivalent isotropically radiated power, in dBm. $E \text{ Meas}$: is the field strength of the emission at the measurement distance, in dBμV/m. $d \text{ Meas}$: is the measurement distance, in m. Equations to calculate power density Calculate the power density at the distance specified by the limit from the EIRP in watts using Equation: $PD = \frac{EIRP_{Linear}}{4\pi d^2}$ where PD is the power density at the distance specified by the limit, in W/m² $EIRP_{Linear}$ is the equivalent isotropically radiated power, in watts d is the distance at which the power density limit is specified, in m.

3.4.4 Test Setup

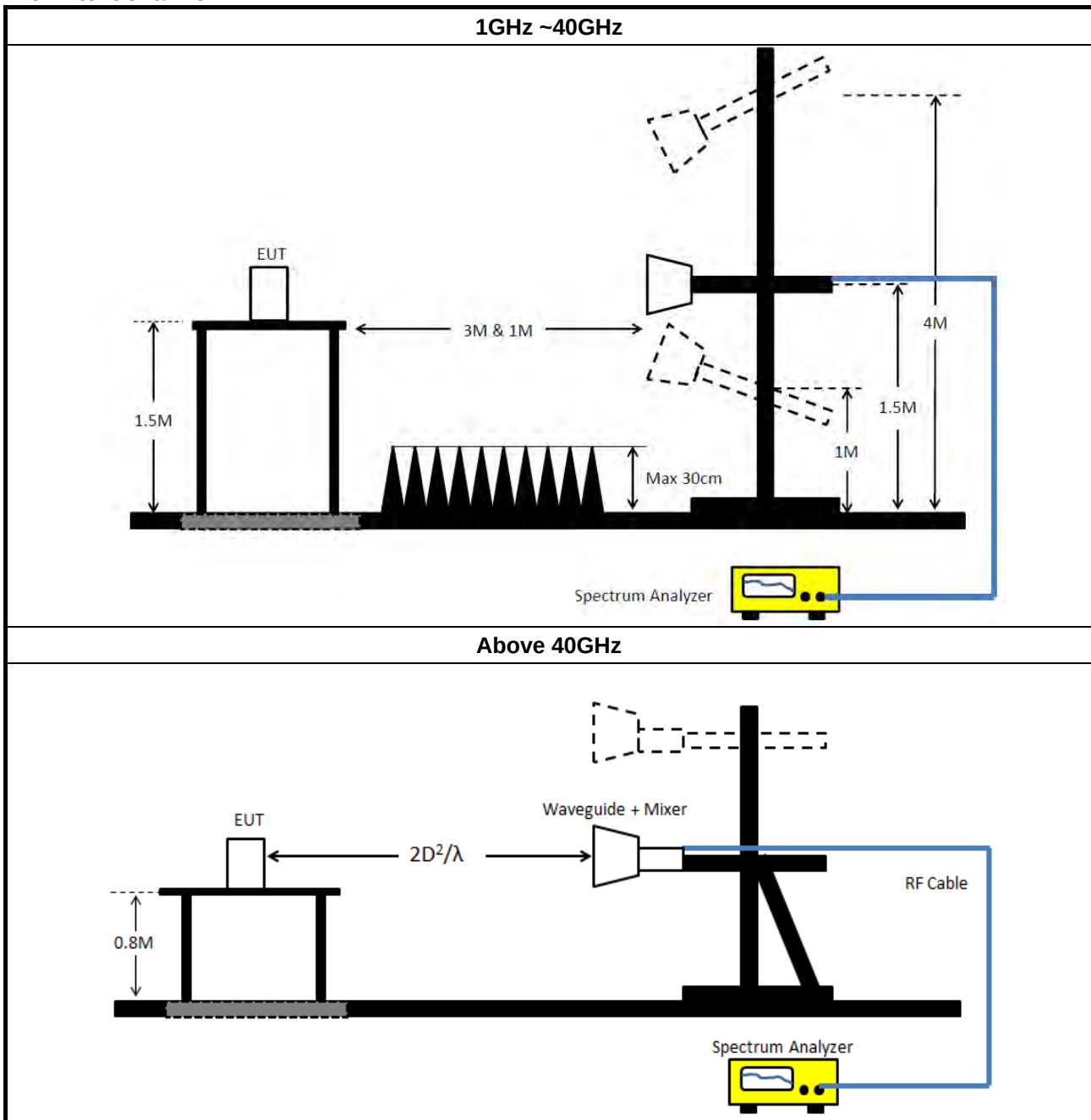
For Intentional - CTX



For Unintentional - CRX


For Unintentional - CRX


For Intentional - CTX





3.4.5 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

3.4.6 Test Result of Transmitter Radiated Unwanted Emissions (Below 30MHz)

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to KDB414788 Radiated Test Site, and the result came out very similar.

All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

The radiated emissions were investigated from 9 kHz or the lowest frequency generated within the device, up to the 10 harmonic or 40 GHz, whichever is appropriate.

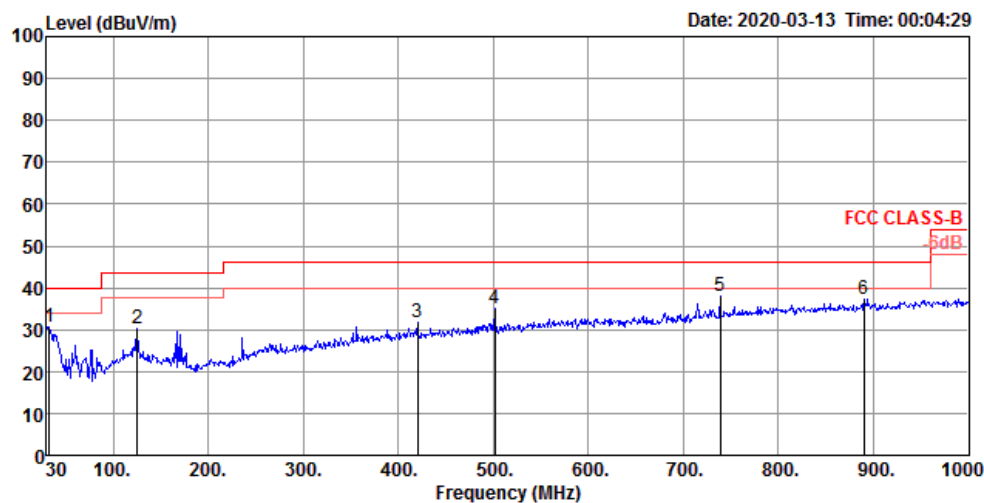


3.4.7 Test Result of Transmitter Radiated Unwanted Emissions (30MHz ~ 1GHz)

For Intentional - CTX

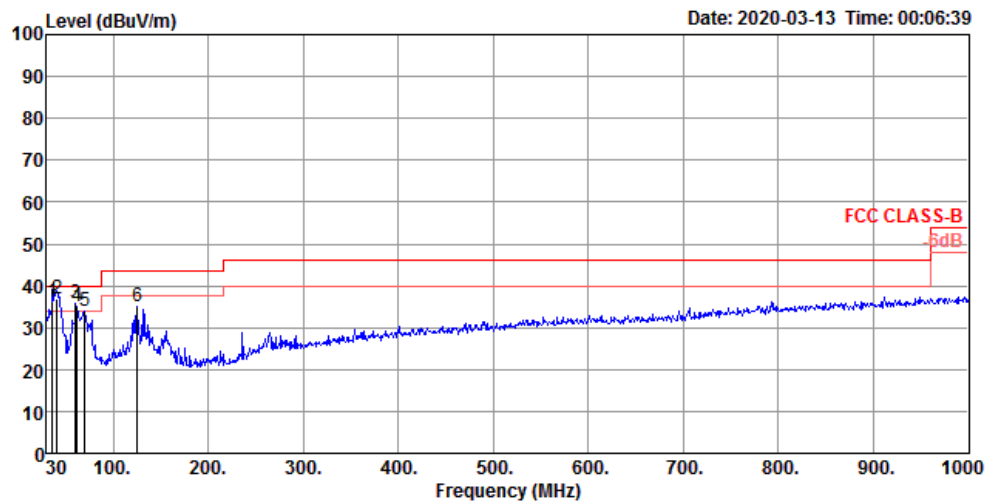
Test Range	30 MHz – 1000 MHz	Test Freq. (GHz)	76.680
Test Distance	3 m	Test Mode	Mode 3
Bandwidth	425 MHz		

Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	32.91	30.77	40.00	-9.23	37.58	0.72	23.99	31.52	150	158 Peak	HORIZONTAL
2	125.06	30.30	43.50	-13.20	42.11	1.44	18.60	31.85	200	213 Peak	HORIZONTAL
3	419.94	31.58	46.00	-14.42	38.45	2.65	22.71	32.23	125	226 Peak	HORIZONTAL
4	501.42	34.91	46.00	-11.09	40.62	2.94	23.83	32.48	150	92 Peak	HORIZONTAL
5	739.07	37.95	46.00	-8.05	40.62	3.61	26.08	32.36	300	355 Peak	HORIZONTAL
6	890.39	37.27	46.00	-8.73	38.03	4.03	27.62	32.41	100	136 Peak	HORIZONTAL

Vertical



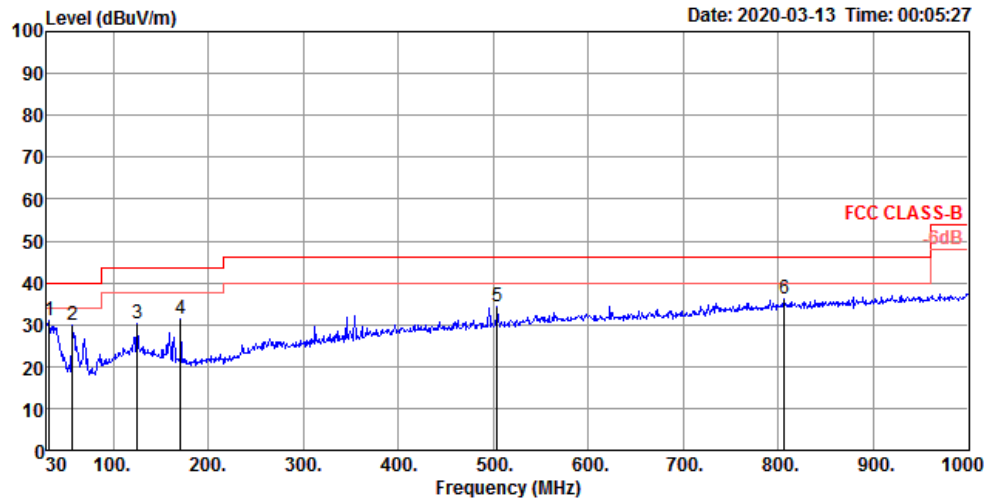
	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	35.82	36.12	40.00	-3.88	44.59	0.77	22.25	31.49	105	249 QP	VERTICAL
2	40.67	36.72	40.00	-3.28	48.01	0.84	19.39	31.52	102	304 QP	VERTICAL
3	60.07	35.78	40.00	-4.22	54.04	0.99	12.60	31.85	100	360 Peak	VERTICAL
4	62.01	35.21	40.00	-4.79	53.47	1.00	12.60	31.86	100	151 Peak	VERTICAL
5	69.77	33.79	40.00	-6.21	52.05	1.02	12.60	31.88	200	32 Peak	VERTICAL
6	125.06	34.99	43.50	-8.51	46.80	1.44	18.60	31.85	100	216 Peak	VERTICAL



For Unintentional - CRX

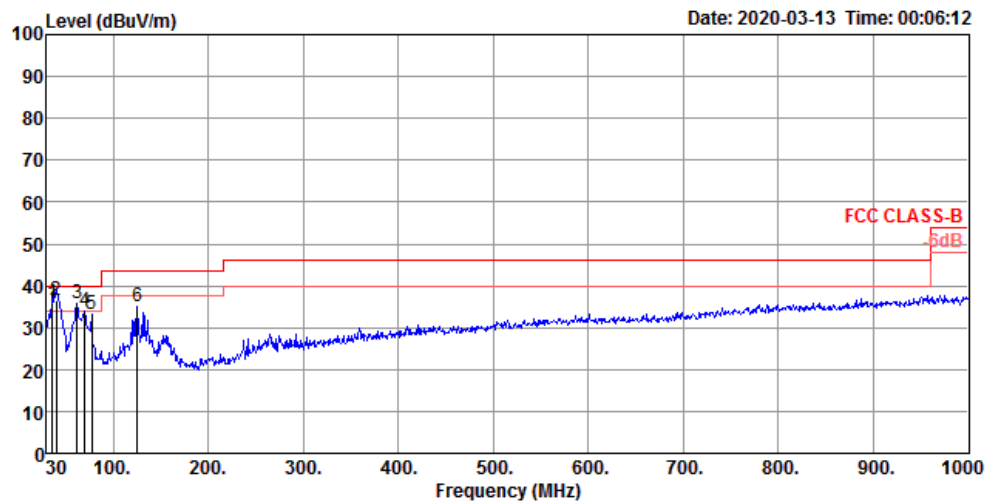
Test Range	30 MHz – 1000 MHz	Test Freq. (GHz)	76.680
Test Distance	3 m	Test Mode	Mode 3
Bandwidth	425 MHz		

Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	32.91	30.82	40.00	-9.18	37.63	0.72	23.99	31.52	200	126 Peak	HORIZONTAL
2	57.16	29.77	40.00	-10.23	47.45	0.95	13.19	31.82	125	185 Peak	HORIZONTAL
3	125.06	30.38	43.50	-13.12	42.19	1.44	18.60	31.85	150	206 Peak	HORIZONTAL
4	170.65	31.45	43.50	-12.05	45.72	1.67	15.97	31.91	200	358 Peak	HORIZONTAL
5	504.33	34.26	46.00	-11.74	39.89	2.95	23.89	32.47	300	200 Peak	HORIZONTAL
6	806.00	36.24	46.00	-9.76	38.07	3.72	26.77	32.32	200	189 Peak	HORIZONTAL

Vertical



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	35.82	35.93	40.00	-4.07	44.40	0.77	22.25	31.49	112	292 QP	VERTICAL
2	39.70	36.37	40.00	-3.63	47.09	0.83	19.96	31.51	104	220 QP	VERTICAL
3	62.01	35.61	40.00	-4.39	53.87	1.00	12.60	31.86	100	150 Peak	VERTICAL
4	69.77	34.11	40.00	-5.89	52.37	1.02	12.60	31.88	200	261 Peak	VERTICAL
5	77.53	33.13	40.00	-6.87	50.73	1.14	13.13	31.87	150	127 Peak	VERTICAL
6	125.06	35.03	43.50	-8.47	46.84	1.44	18.60	31.85	100	220 Peak	VERTICAL

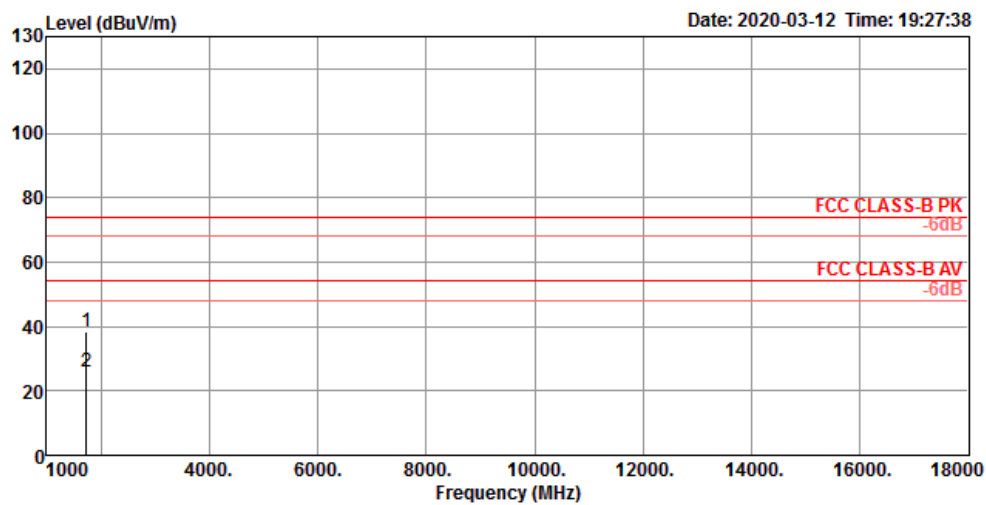


3.4.8 Test Result of Transmitter Radiated Unwanted Emissions (1GHz – 40GHz)

For Intentional - CTX

Test Range	1GHz – 18GHz	Test Freq. (GHz)	76.680
Test Distance	3 m	Test Mode	Mode 1
Bandwidth	425 MHz		

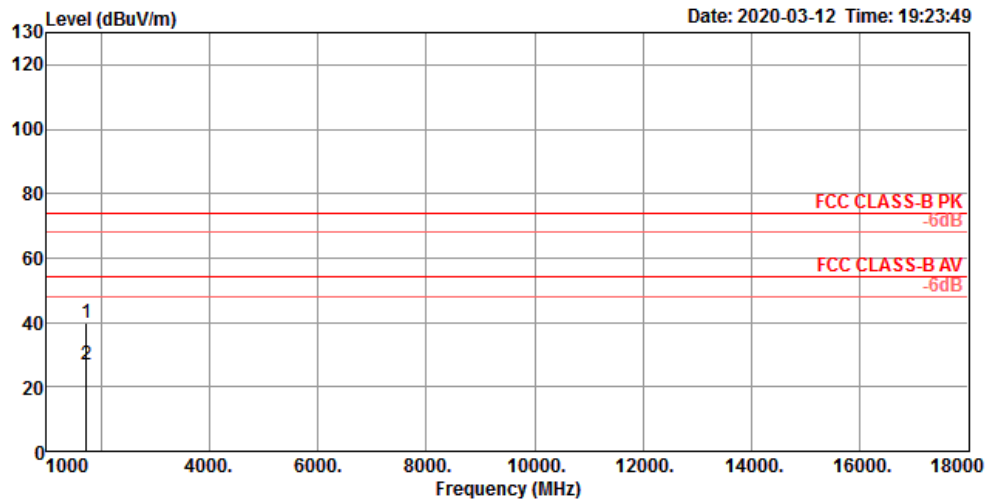
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	1736.33	38.40	74.00	-35.60	46.72	3.60	25.04	36.96	127	315 Peak	HORIZONTAL
2	1737.57	25.88	54.00	-28.12	34.20	3.60	25.04	36.96	127	315 Average	HORIZONTAL



Vertical

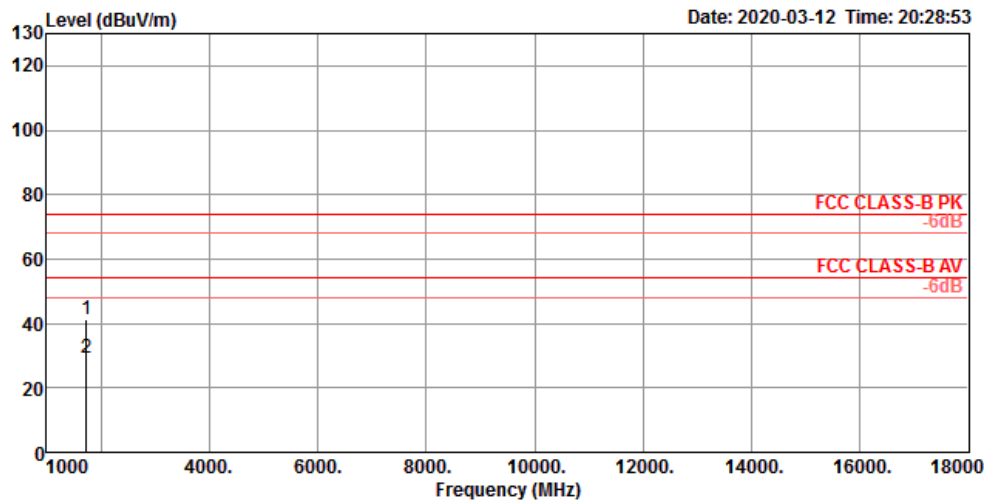


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos		
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	cm	deg	Remark
			dBuV/m	dB	dBuV	dB	dB/m	dB			Pol/Phase
1	1736.72	39.59	74.00	-34.41	47.91	3.60	25.04	36.96	127	98	Peak
2	1736.88	26.96	54.00	-27.04	35.28	3.60	25.04	36.96	127	98	Average



Test Range	1GHz – 18GHz	Test Freq. (GHz)	76.680
Test Distance	3 m	Test Mode	Mode 2
Bandwidth	425 MHz		

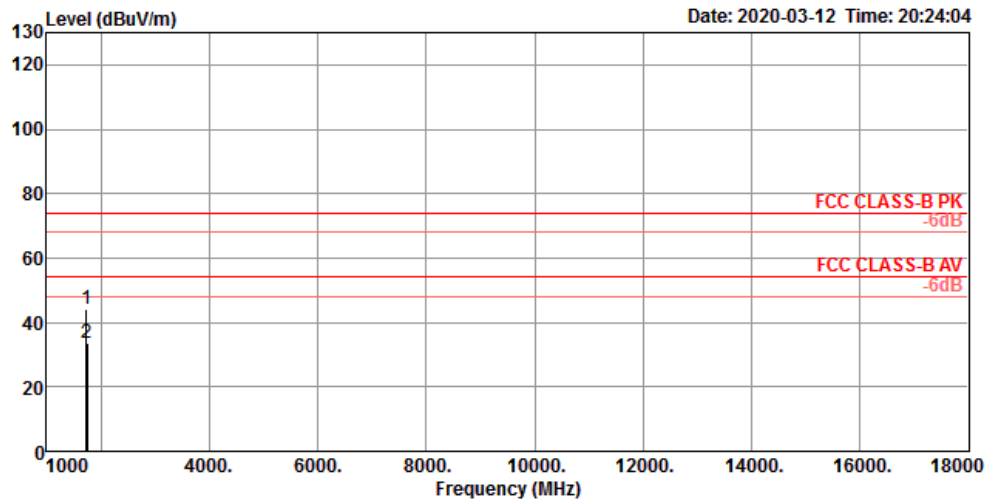
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	1736.85	41.39	74.00	-32.61	49.71	3.60	25.04	36.96	130	98 Peak	HORIZONTAL
2	1736.92	29.50	54.00	-24.50	37.82	3.60	25.04	36.96	130	98 Average	HORIZONTAL



Vertical

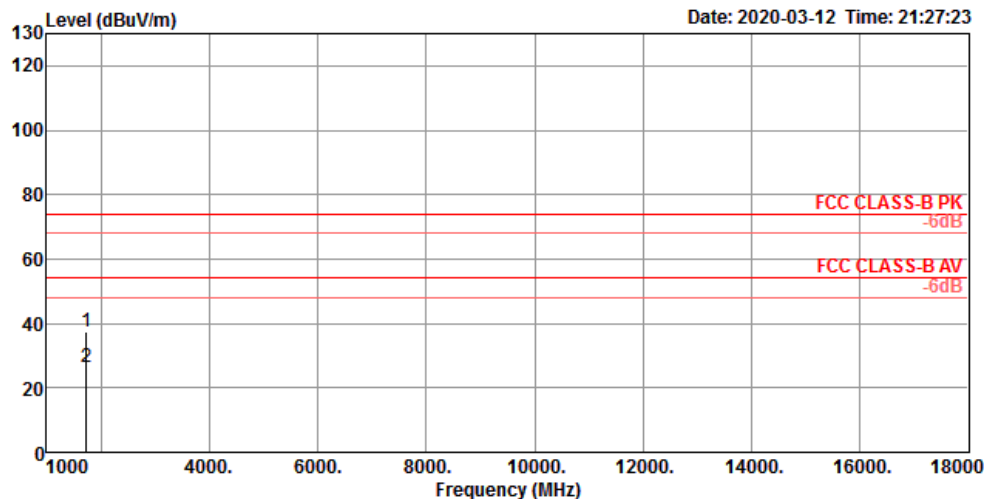


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos		
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	cm	deg	Remark
			dBuV/m	dB	dBuV	dB	dB/m	dB			Pol/Phase
1	1737.61	44.13	74.00	-29.87	52.45	3.60	25.04	36.96	130	112	Peak
2	1737.88	33.56	54.00	-20.44	41.88	3.60	25.04	36.96	130	112	Average



Test Range	1GHz – 18GHz	Test Freq. (GHz)	76.680
Test Distance	3 m	Test Mode	Mode 3
Bandwidth	425 MHz		

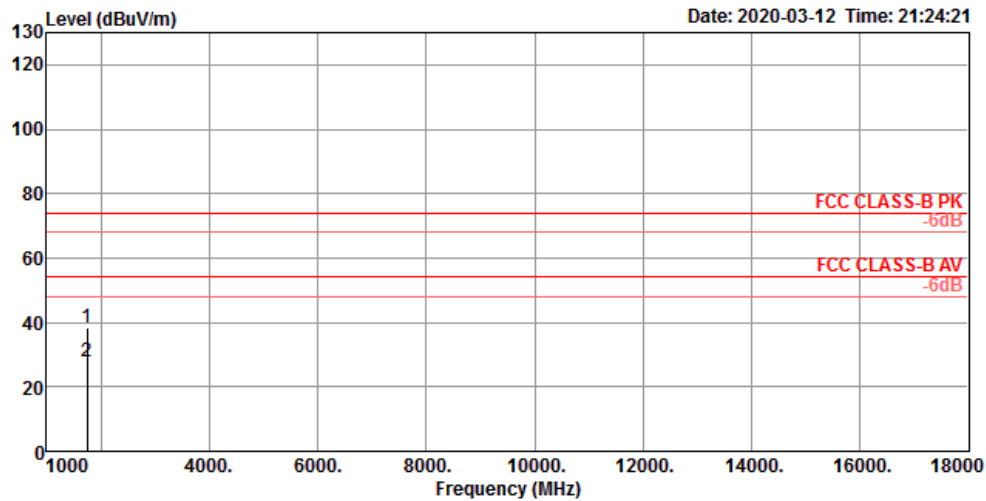
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	cm	deg	
1	1737.35	37.59	74.00	-36.41	45.91	3.60	25.04	36.96	125	351 Peak	HORIZONTAL
2	1737.54	26.55	54.00	-27.45	34.87	3.60	25.04	36.96	125	351 Average	HORIZONTAL



Vertical

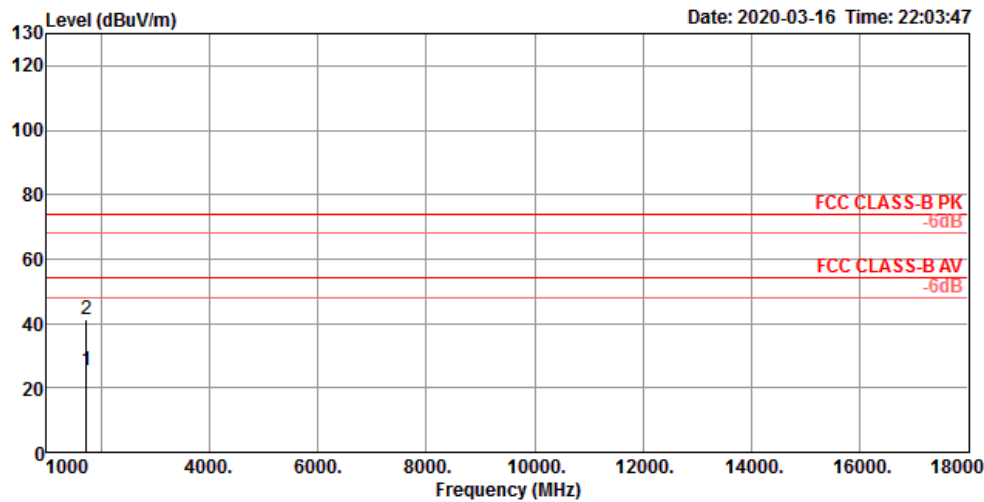


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	1738.62	38.14	74.00	-35.86	46.46	3.60	25.04	36.96	118	78 Peak	VERTICAL
2	1738.70	27.83	54.00	-26.17	36.15	3.60	25.04	36.96	118	78 Average	VERTICAL



Test Range	1GHz – 18GHz	Test Freq. (GHz)	76.155
Test Distance	3 m	Test Mode	Mode 4
Bandwidth	175 MHz		

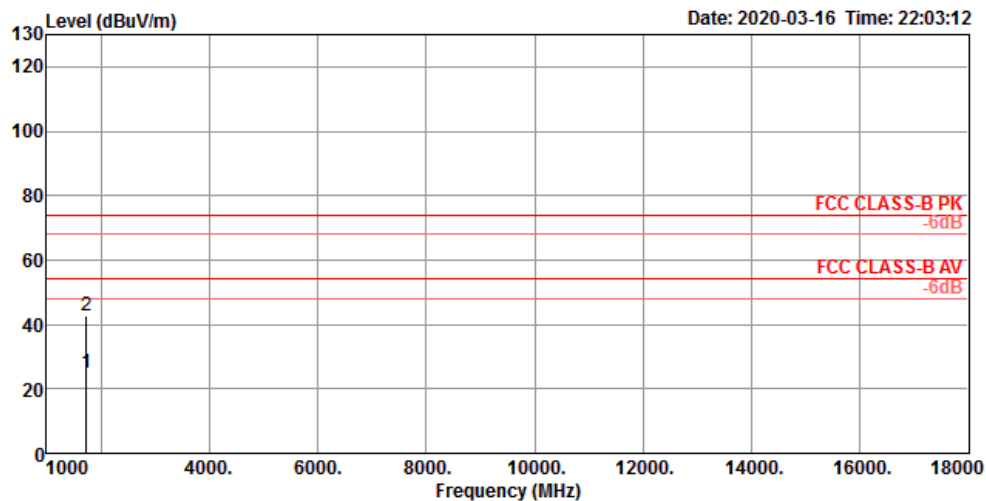
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	1736.84	25.30	54.00	-28.70	33.62	3.60	25.04	36.96	104	296 Average	HORIZONTAL
2	1736.84	41.31	74.00	-32.69	49.63	3.60	25.04	36.96	104	296 Peak	HORIZONTAL



Vertical

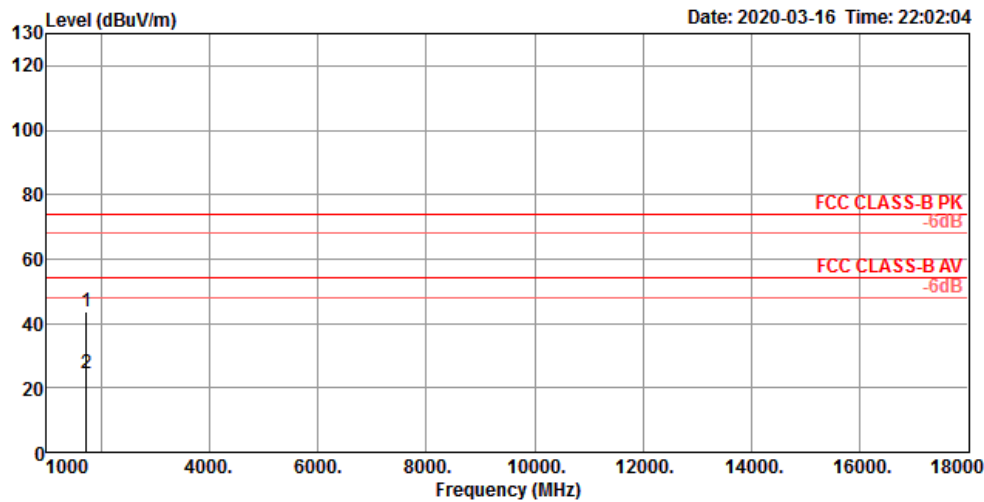


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	1734.04	25.02	54.00	-28.98	33.36	3.60	25.02	36.96	118	230 Average	VERTICAL
2	1736.70	42.52	74.00	-31.48	50.84	3.60	25.04	36.96	118	230 Peak	VERTICAL



Test Range	1GHz – 18GHz	Test Freq. (GHz)	76.515
Test Distance	3 m	Test Mode	Mode 5
Bandwidth	175 MHz		

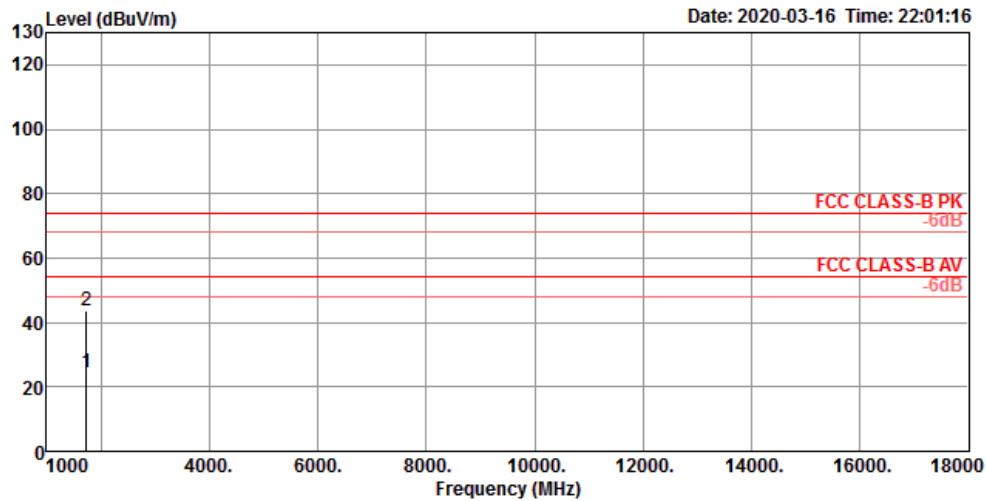
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	1735.49	43.73	74.00	-30.27	52.05	3.60	25.04	36.96	103	189 Peak	HORIZONTAL
2	1737.38	24.27	54.00	-29.73	32.59	3.60	25.04	36.96	103	189 Average	HORIZONTAL



Vertical

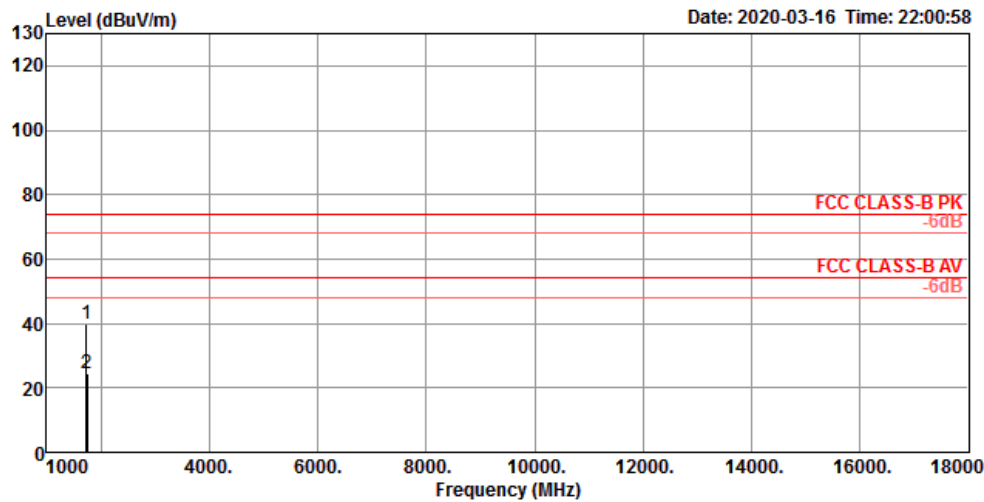


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	1733.73	24.33	54.00	-29.67	32.67	3.60	25.02	36.96	121	109 Average	VERTICAL
2	1737.38	43.72	74.00	-30.28	52.04	3.60	25.04	36.96	121	109 Peak	VERTICAL



Test Range	1GHz – 18GHz	Test Freq. (GHz)	76.835
Test Distance	3 m	Test Mode	Mode 6
Bandwidth	175 MHz		

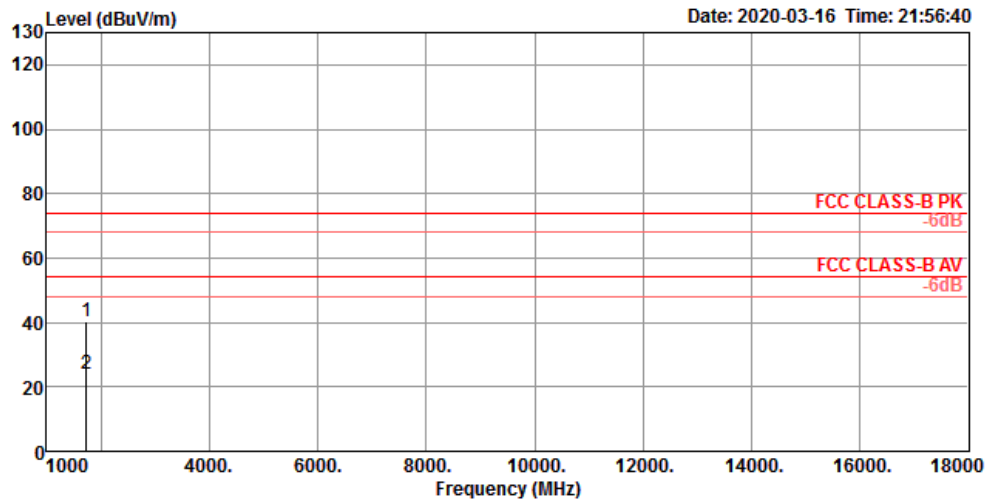
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	1735.48	39.62	74.00	-34.38	47.94	3.60	25.04	36.96	106	58 Peak	HORIZONTAL
2	1738.32	24.58	54.00	-29.42	32.90	3.60	25.04	36.96	106	58 Average	HORIZONTAL



Vertical

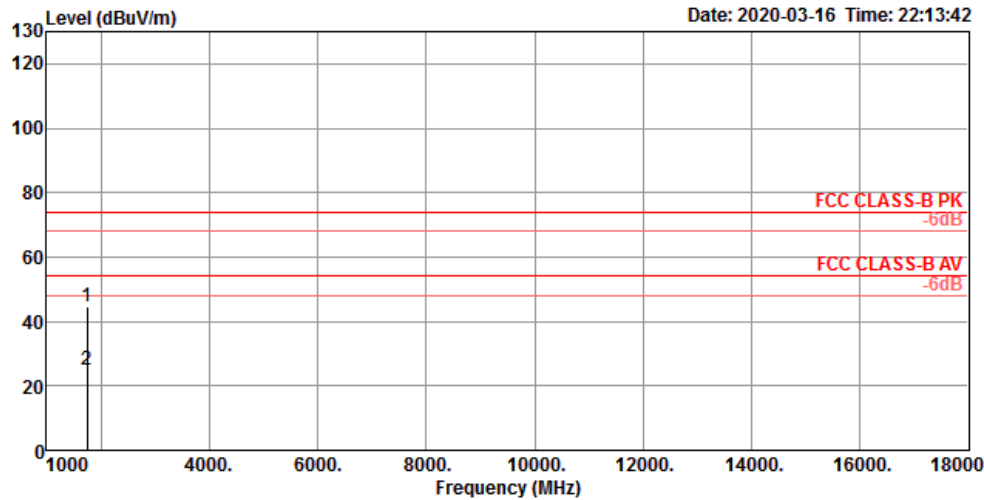


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos		
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	cm	deg	Remark
			dBuV/m	dB	dBuV	dB	dB/m	dB			Pol/Phase
1	1735.03	40.19	74.00	-33.81	48.51	3.60	25.04	36.96	113	8 Peak	VERTICAL
2	1736.00	24.00	54.00	-30.00	32.32	3.60	25.04	36.96	113	8 Average	VERTICAL



Test Range	1GHz – 18GHz	Test Freq. (GHz)	76.210
Test Distance	3 m	Test Mode	Mode 7
Bandwidth	300 MHz		

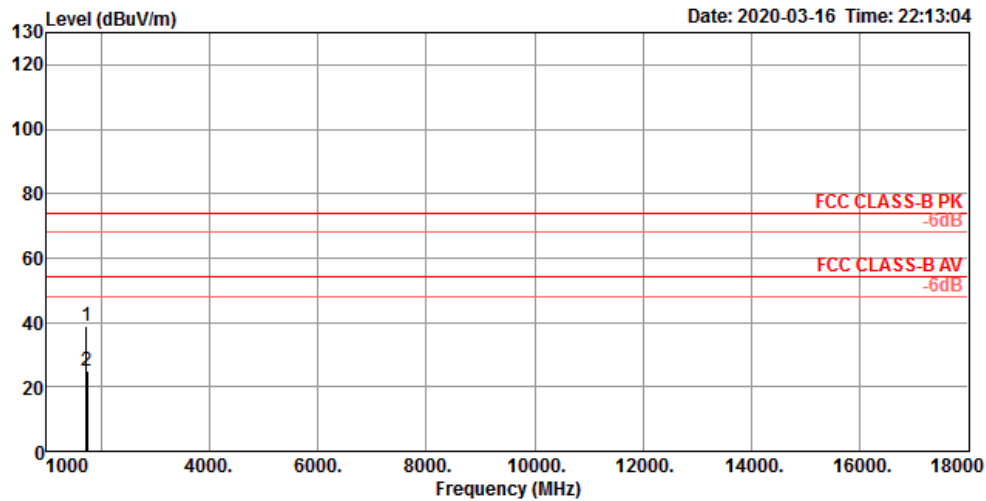
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	cm	deg	
1	1738.76	44.39	74.00	-29.61	52.71	3.60	25.04	36.96	109	170 Peak	HORIZONTAL
2	1740.38	24.94	54.00	-29.06	33.23	3.61	25.06	36.96	109	170 Average	HORIZONTAL



Vertical

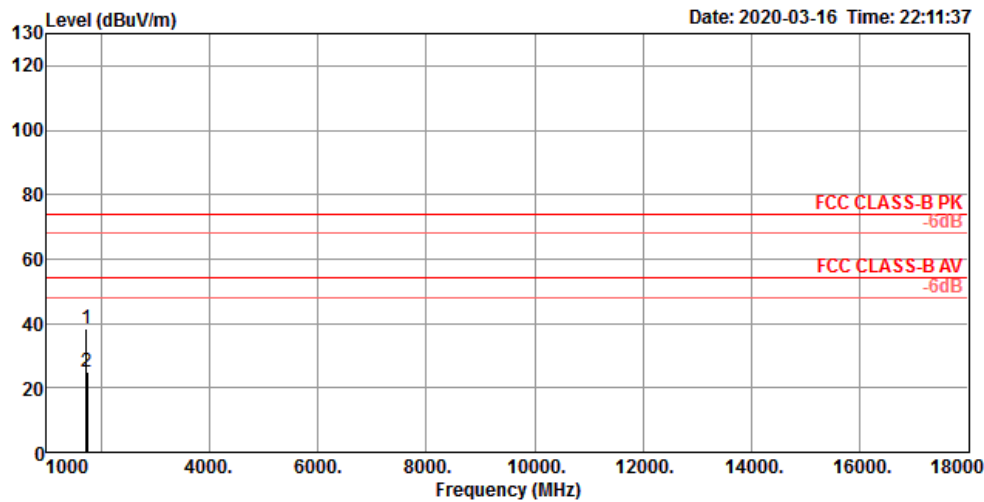


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos		
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	cm	deg	Remark
			dBuV/m	dB	dBuV	dB	dB/m	dB			Pol/Phase
1	1737.52	39.08	74.00	-34.92	47.40	3.60	25.04	36.96	125	144	Peak
2	1740.74	24.82	54.00	-29.18	33.11	3.61	25.06	36.96	125	144	Average



Test Range	1GHz – 18GHz	Test Freq. (GHz)	76.550
Test Distance	3 m	Test Mode	Mode 8
Bandwidth	300 MHz		

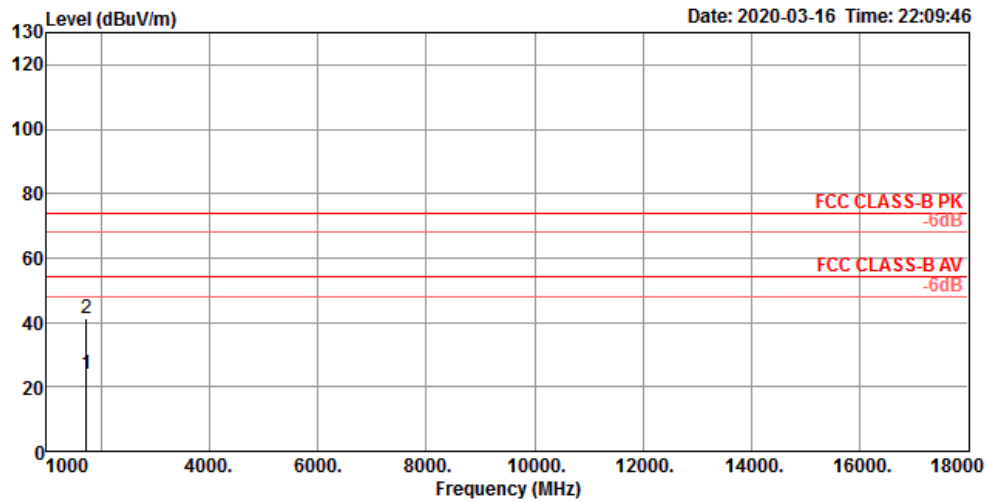
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	1733.60	38.36	74.00	-35.64	46.70	3.60	25.02	36.96	103	128 Peak	HORIZONTAL
2	1737.92	25.11	54.00	-28.89	33.43	3.60	25.04	36.96	103	128 Average	HORIZONTAL



Vertical

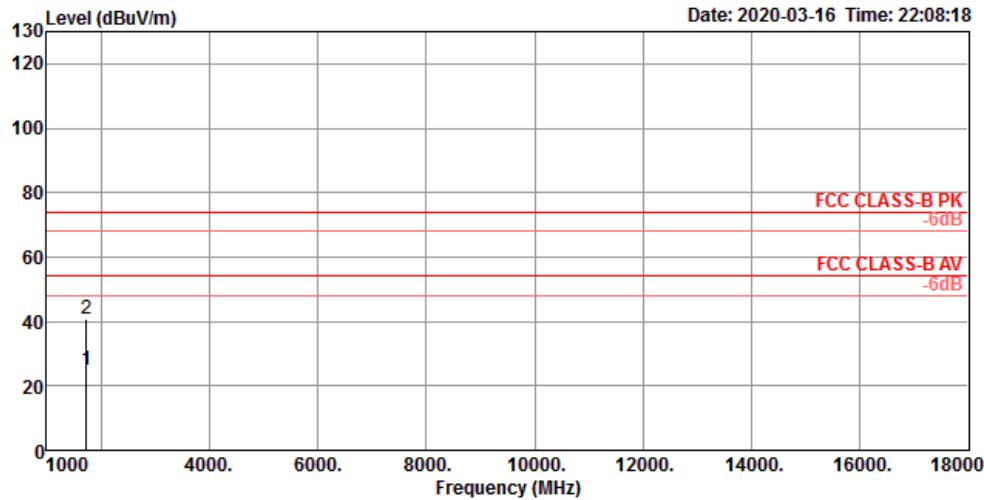


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos		
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	cm	deg	Remark
			dBuV/m	dB	dBuV	dB	dB/m	dB			Pol/Phase
1	1735.45	24.07	54.00	-29.93	32.39	3.60	25.04	36.96	145	152	Average
2	1736.64	41.30	74.00	-32.70	49.62	3.60	25.04	36.96	145	152	Peak



Test Range	1GHz – 18GHz	Test Freq. (GHz)	76.760
Test Distance	3 m	Test Mode	Mode 9
Bandwidth	300 MHz		

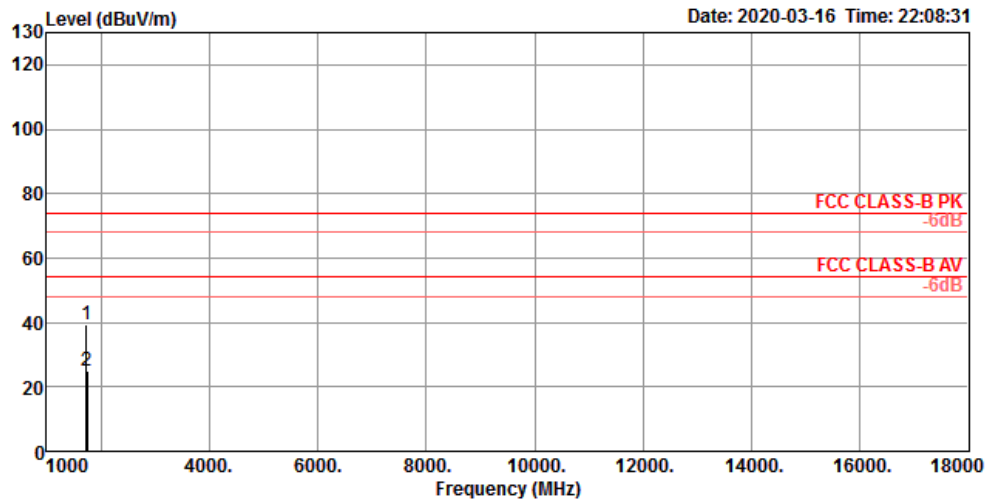
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	1734.55	25.15	54.00	-28.85	33.47	3.60	25.04	36.96	117	257 Average	HORIZONTAL
2	1735.45	40.62	74.00	-33.38	48.94	3.60	25.04	36.96	117	257 Peak	HORIZONTAL



Vertical

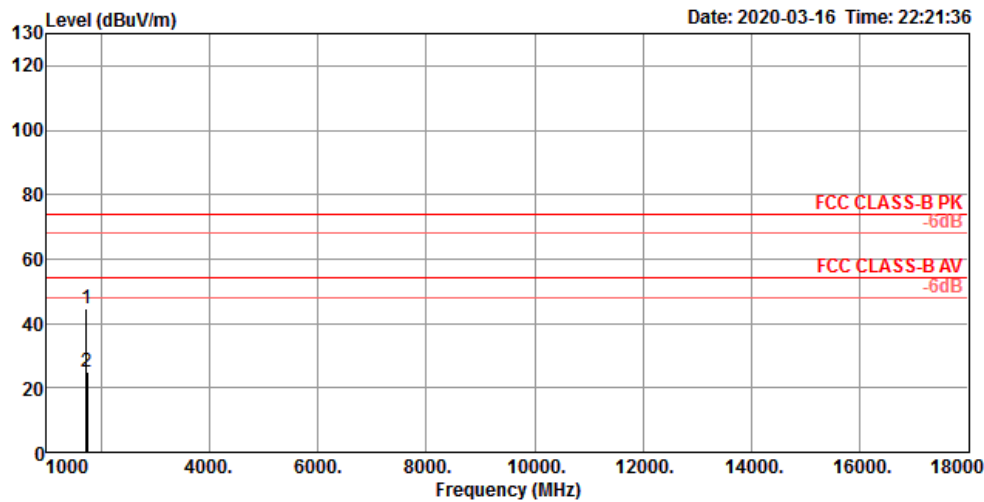


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos		
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	cm	deg	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	Pol/Phase
1	1734.73	39.42	74.00	-34.58	47.74	3.60	25.04	36.96	109	272	Peak
2	1738.43	24.93	54.00	-29.07	33.25	3.60	25.04	36.96	109	272	Average



Test Range	1GHz – 18GHz	Test Freq. (GHz)	76.325
Test Distance	3 m	Test Mode	Mode 10
Bandwidth	425 MHz		

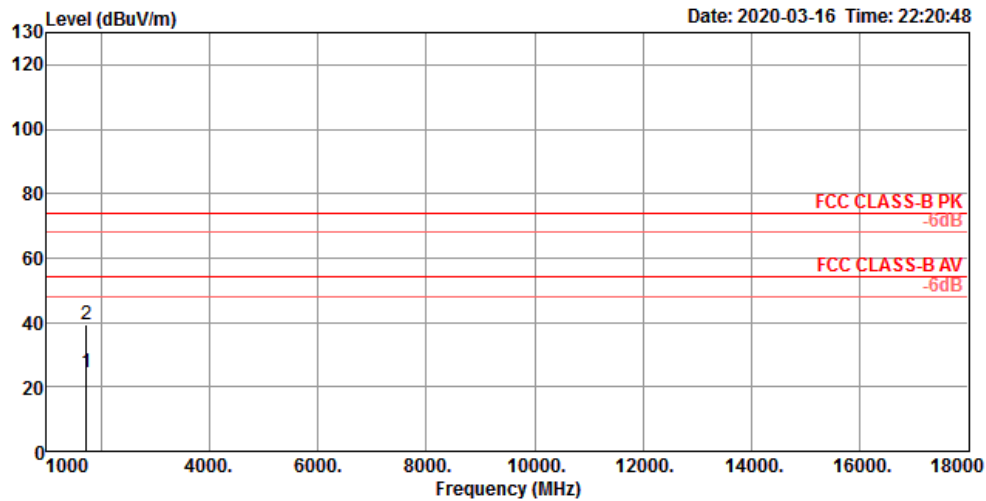
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	cm	deg	
1	1737.02	44.83	74.00	-29.17	53.15	3.60	25.04	36.96	102	211	Peak
2	1739.34	24.71	54.00	-29.29	33.03	3.60	25.04	36.96	102	211	Average



Vertical

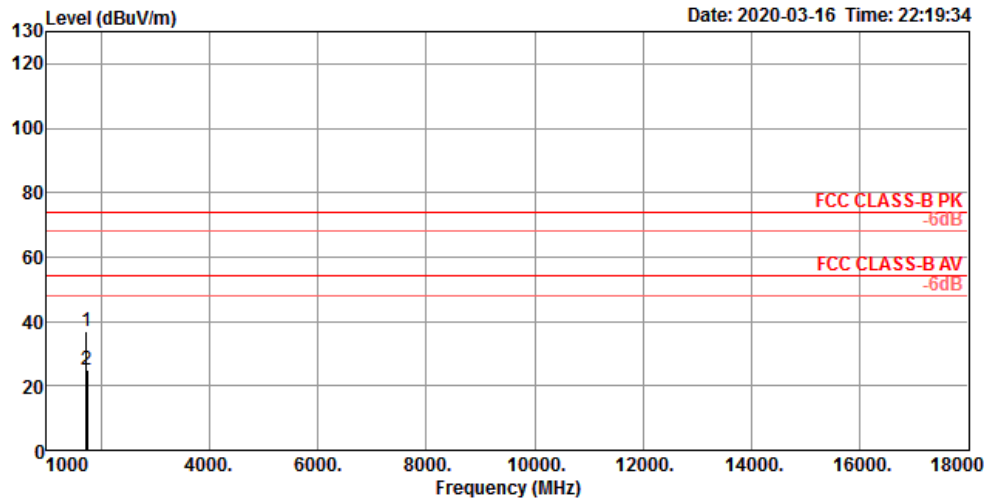


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos		
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	Remark
1	1732.86	24.57	54.00	-29.43	32.91	3.60	25.02	36.96	108	218	Average
2	1734.80	39.25	74.00	-34.75	47.57	3.60	25.04	36.96	108	218	Peak



Test Range	1GHz – 18GHz	Test Freq. (GHz)	76.570
Test Distance	3 m	Test Mode	Mode 11
Bandwidth	425 MHz		

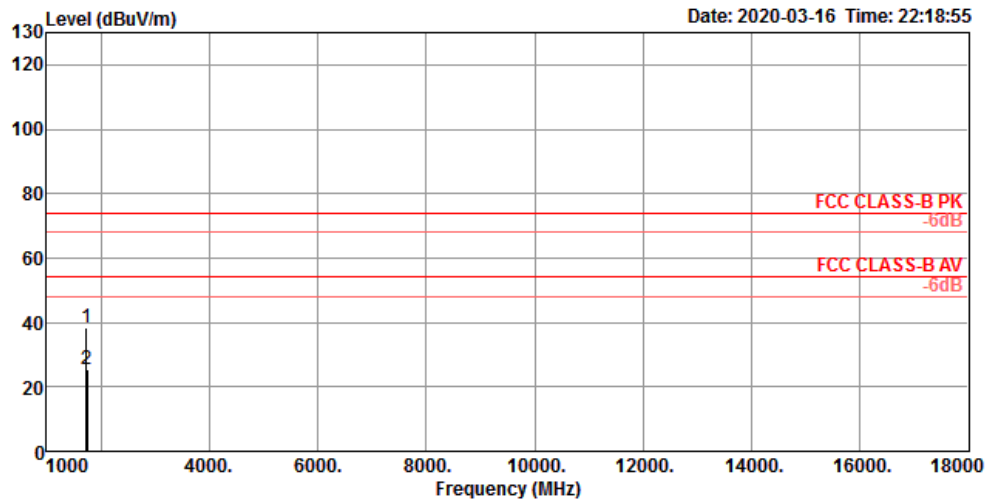
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	1731.84	36.76	74.00	-37.24	45.10	3.60	25.02	36.96	102	179 Peak	HORIZONTAL
2	1737.92	24.85	54.00	-29.15	33.17	3.60	25.04	36.96	102	179 Average	HORIZONTAL



Vertical

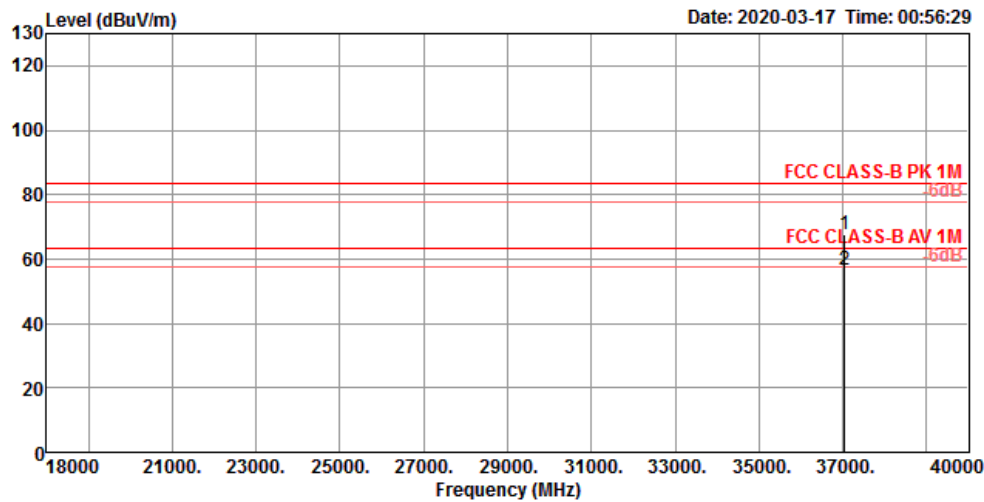


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos		
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	cm	deg	Remark
			dBuV/m	dB	dBuV	dB	dB/m	dB			Pol/Phase
1	1731.28	38.44	74.00	-35.56	46.78	3.60	25.02	36.96	115	153	Peak
2	1739.36	25.47	54.00	-28.53	33.76	3.61	25.06	36.96	115	153	Average



Test Range	18GHz – 40GHz	Test Freq. (GHz)	76.155
Test Distance	1 m	Test Mode	Mode 1
Bandwidth	175 MHz		

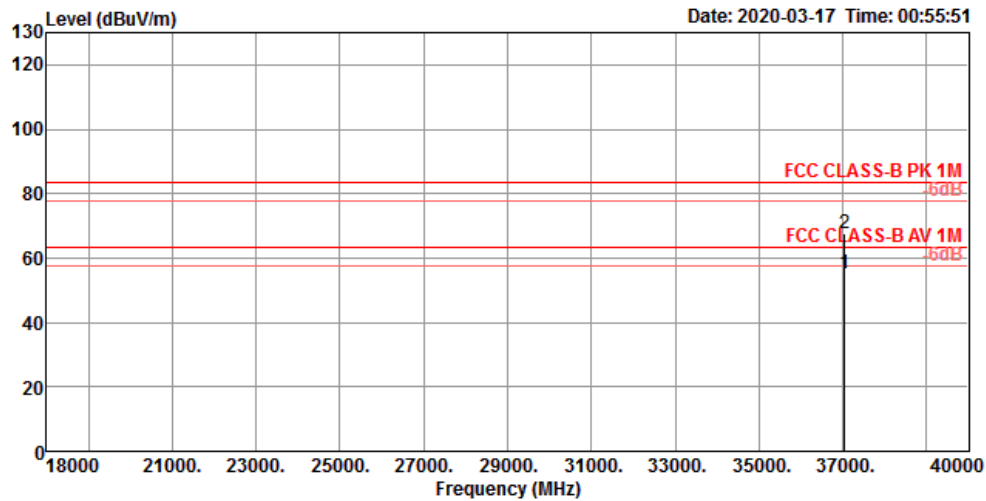
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	cm	deg	
1	37050.44	67.46	83.54	-16.08	56.26	20.00	41.84	50.64	102	206 Peak	HORIZONTAL
2	37051.50	56.59	63.54	-6.95	45.39	20.00	41.84	50.64	102	206 Average	HORIZONTAL



Vertical

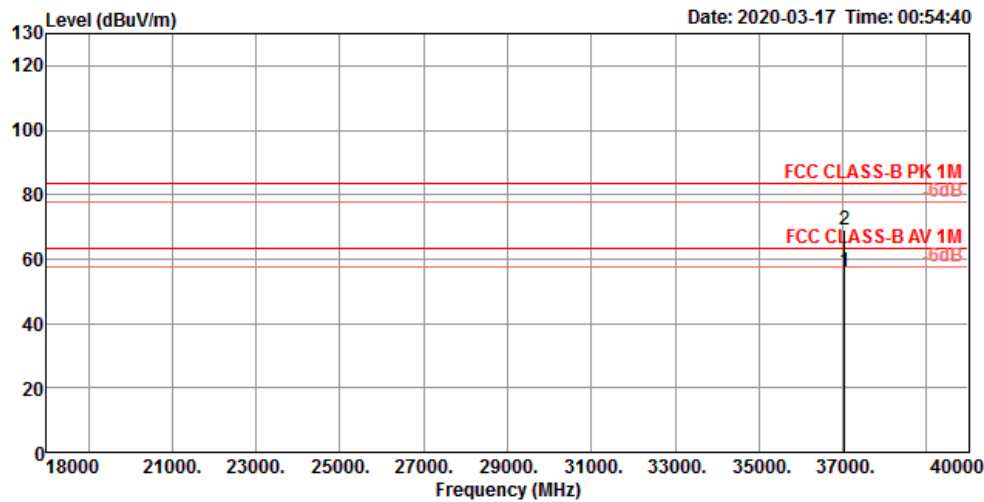


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37051.64	55.39	63.54	-8.15	44.19	20.00	41.84	50.64	104	143 Average	VERTICAL
2	37051.64	67.70	83.54	-15.84	56.50	20.00	41.84	50.64	104	143 Peak	VERTICAL



Test Range	18GHz – 40GHz	Test Freq. (GHz)	76.515
Test Distance	1 m	Test Mode	Mode 2
Bandwidth	175 MHz		

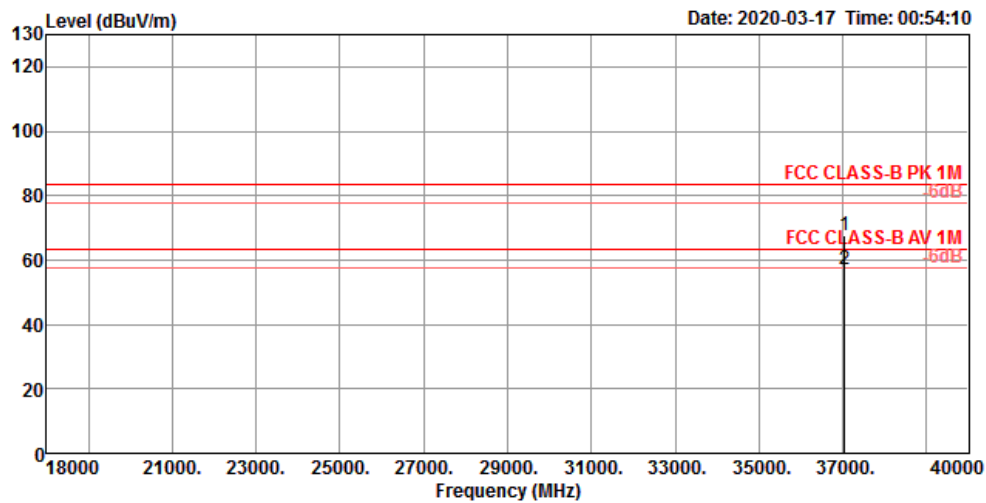
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37048.42	56.29	63.54	-7.25	45.09	20.00	41.84	50.64	102	146 Average	HORIZONTAL
2	37051.30	69.08	83.54	-14.46	57.88	20.00	41.84	50.64	102	146 Peak	HORIZONTAL



Vertical

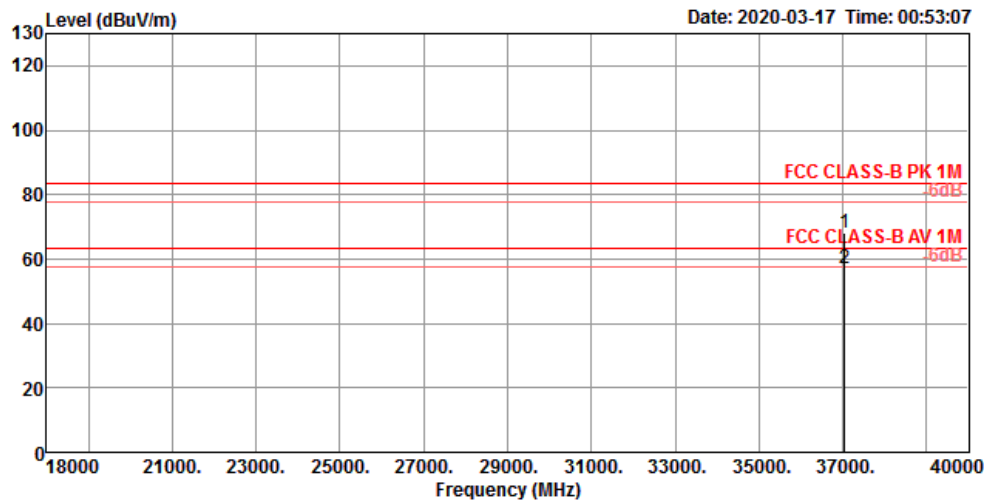


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37050.46	67.79	83.54	-15.75	56.59	20.00	41.84	50.64	104	118 Peak	VERTICAL
2	37050.70	56.94	63.54	-6.60	45.74	20.00	41.84	50.64	104	118 Average	VERTICAL



Test Range	18GHz – 40GHz	Test Freq. (GHz)	76.835
Test Distance	1 m	Test Mode	Mode 3
Bandwidth	175 MHz		

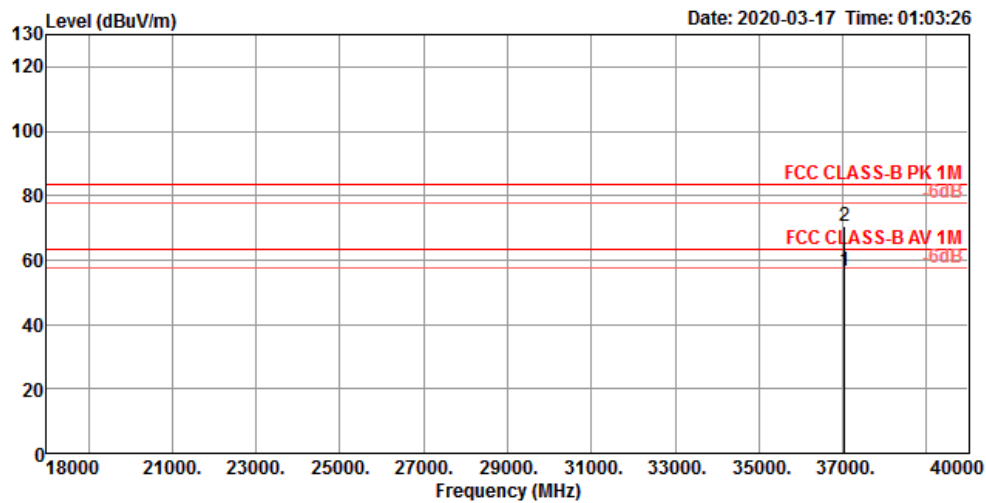
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37048.94	67.96	83.54	-15.58	56.76	20.00	41.84	50.64	102	79 Peak	HORIZONTAL
2	37050.68	57.21	63.54	-6.33	46.01	20.00	41.84	50.64	102	79 Average	HORIZONTAL



Vertical

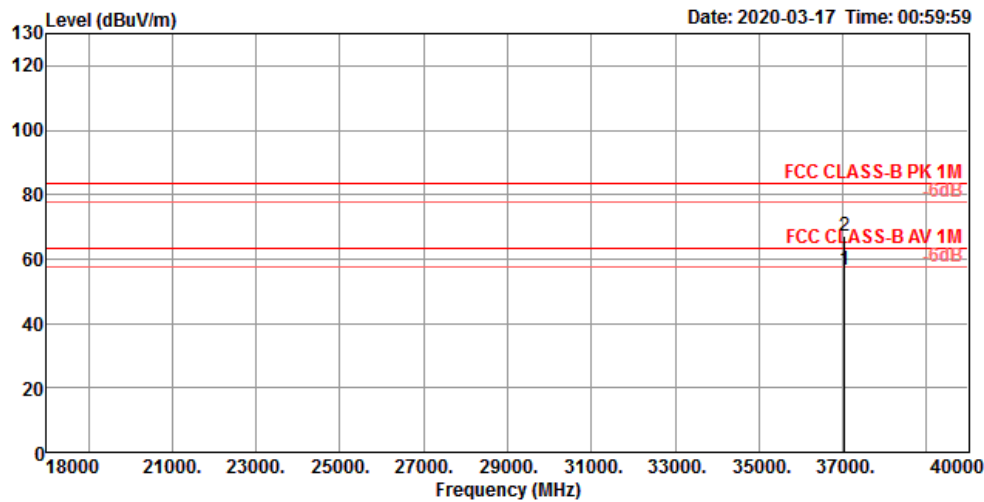


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37051.08	56.46	63.54	-7.08	45.26	20.00	41.84	50.64	103	151 Average	VERTICAL
2	37051.34	70.42	83.54	-13.12	59.22	20.00	41.84	50.64	103	151 Peak	VERTICAL



Test Range	18GHz – 40GHz	Test Freq. (GHz)	76.210
Test Distance	1 m	Test Mode	Mode 4
Bandwidth	300 MHz		

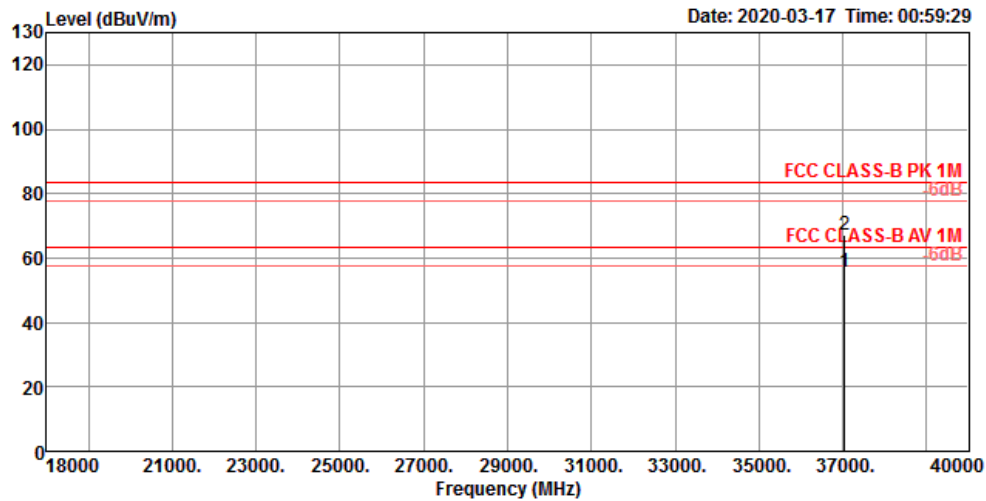
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37043.06	56.50	63.54	-7.04	45.30	20.00	41.84	50.64	102	228 Average	HORIZONTAL
2	37047.20	67.28	83.54	-16.26	56.08	20.00	41.84	50.64	102	228 Peak	HORIZONTAL



Vertical

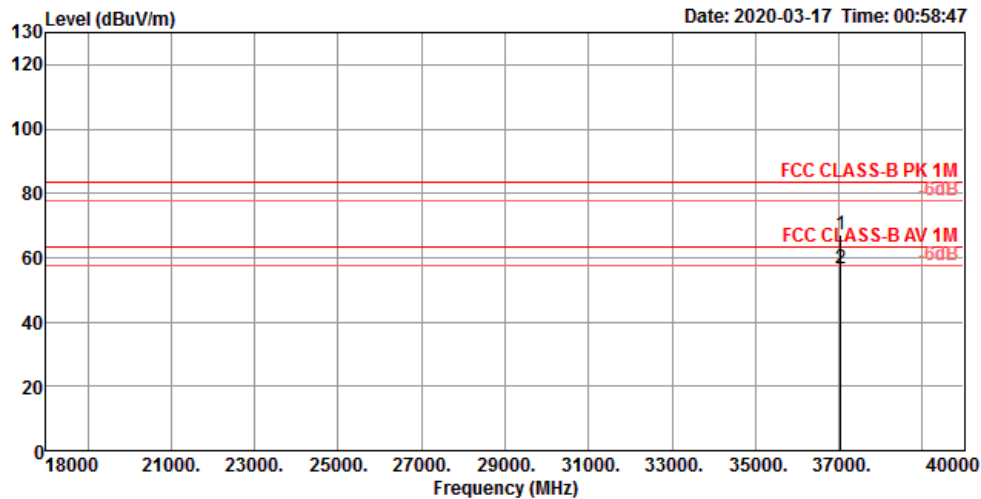


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37051.46	55.72	63.54	-7.82	44.52	20.00	41.84	50.64	103	232 Average	VERTICAL
2	37051.92	67.14	83.54	-16.40	55.94	20.00	41.84	50.64	103	232 Peak	VERTICAL



Test Range	18GHz – 40GHz	Test Freq. (GHz)	76.550
Test Distance	1 m	Test Mode	Mode 5
Bandwidth	300 MHz		

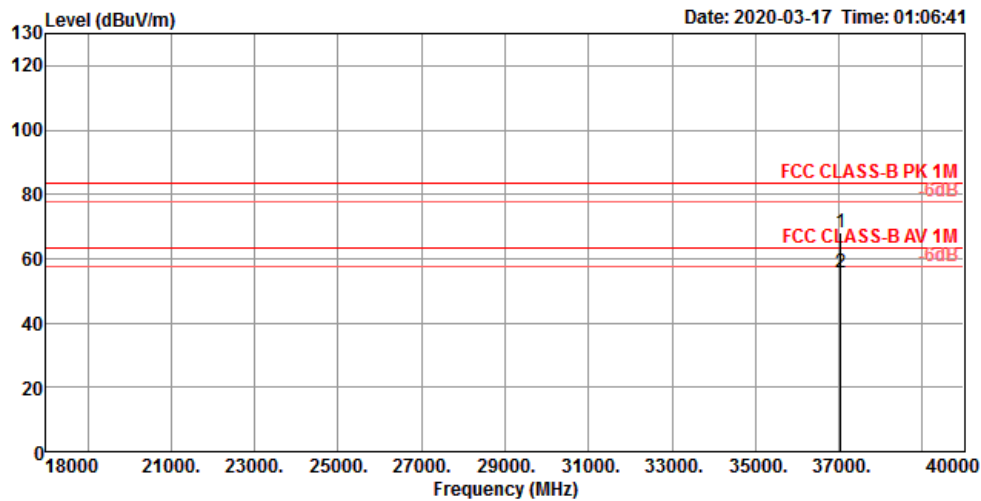
Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	37043.64	67.36	83.54	-16.18	56.16	20.00	41.84	50.64	104	249	Peak	HORIZONTAL
2	37051.84	56.45	63.54	-7.09	45.25	20.00	41.84	50.64	104	249	Average	HORIZONTAL



Vertical

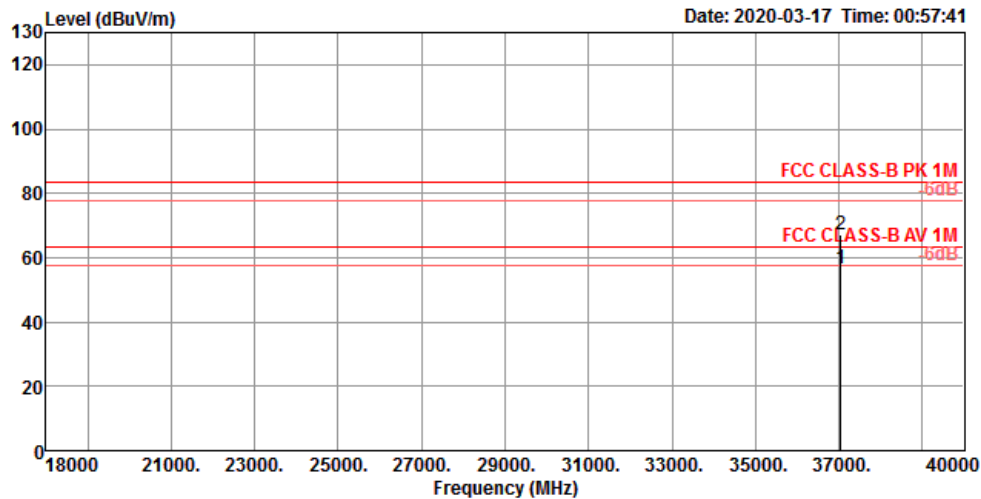


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37050.52	68.07	83.54	-15.47	56.87	20.00	41.84	50.64	104	211 Peak	VERTICAL
2	37051.52	55.80	63.54	-7.74	44.60	20.00	41.84	50.64	104	211 Average	VERTICAL



Test Range	18GHz – 40GHz	Test Freq. (GHz)	76.760
Test Distance	1 m	Test Mode	Mode 6
Bandwidth	300 MHz		

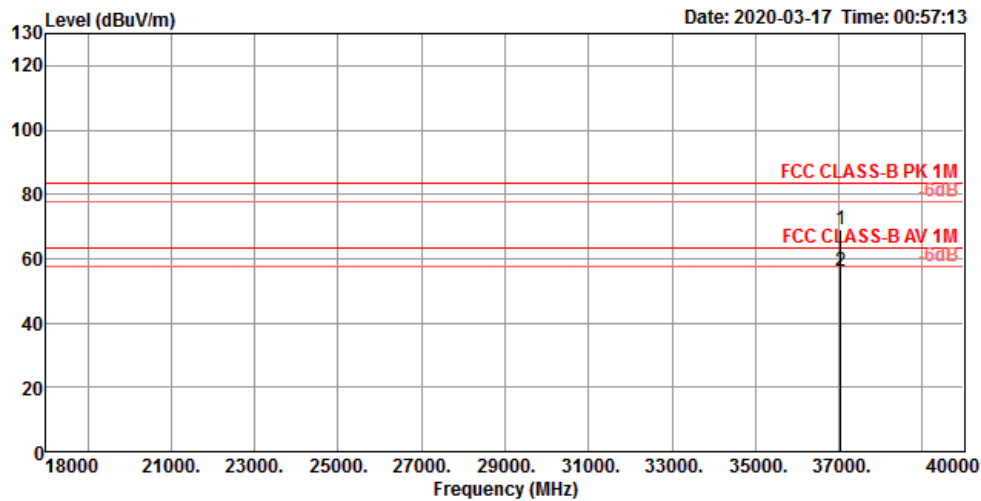
Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	37043.16	56.41	63.54	-7.13	45.21	20.00	41.84	50.64	102	232	Average	HORIZONTAL
2	37048.72	67.20	83.54	-16.34	56.00	20.00	41.84	50.64	102	232	Peak	HORIZONTAL



Vertical

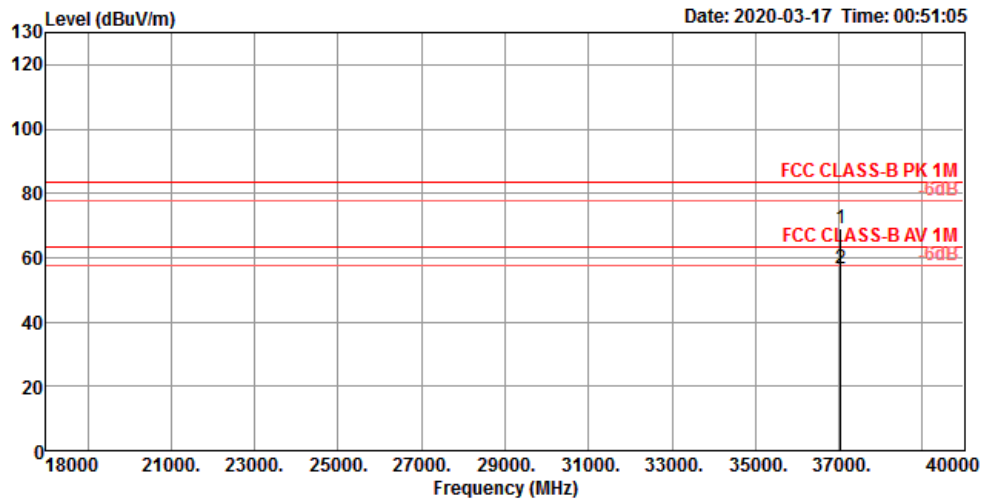


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37048.38	69.26	83.54	-14.28	58.06	20.00	41.84	50.64	106	209 Peak	VERTICAL
2	37052.48	56.00	63.54	-7.54	44.80	20.00	41.84	50.64	106	209 Average	VERTICAL



Test Range	18GHz – 40GHz	Test Freq. (GHz)	76.325
Test Distance	1 m	Test Mode	Mode 7
Bandwidth	425 MHz		

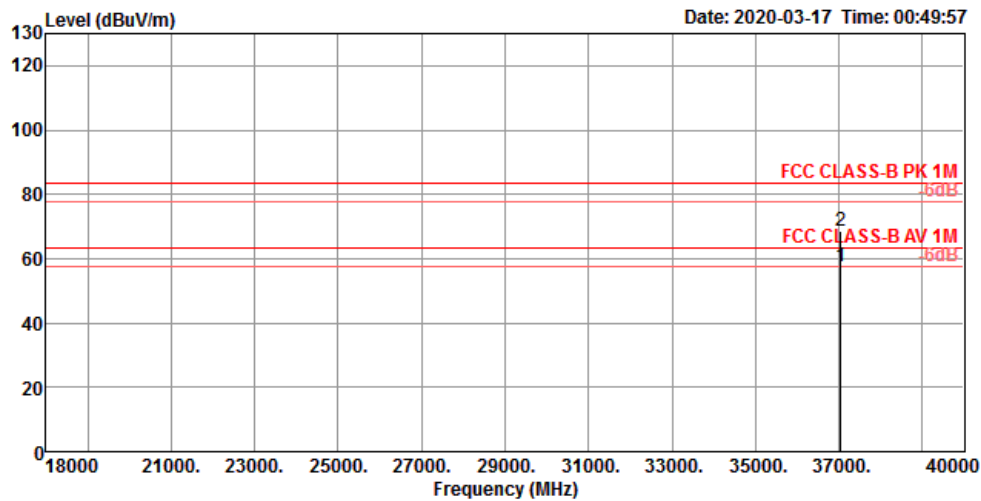
Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	37046.58	69.11	83.54	-14.43	57.91	20.00	41.84	50.64	102	145	Peak	HORIZONTAL
2	37047.16	56.75	63.54	-6.79	45.55	20.00	41.84	50.64	102	145	Average	HORIZONTAL



Vertical

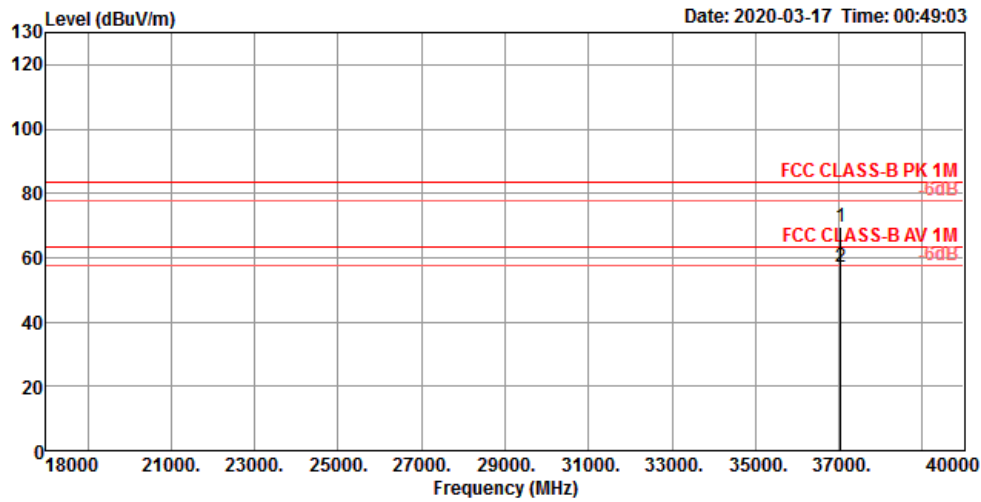


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37043.12	57.52	63.54	-6.02	46.32	20.00	41.84	50.64	107	113 Average	VERTICAL
2	37047.84	68.59	83.54	-14.95	57.39	20.00	41.84	50.64	107	113 Peak	VERTICAL



Test Range	18GHz – 40GHz	Test Freq. (GHz)	76.570
Test Distance	1 m	Test Mode	Mode 8
Bandwidth	425 MHz		

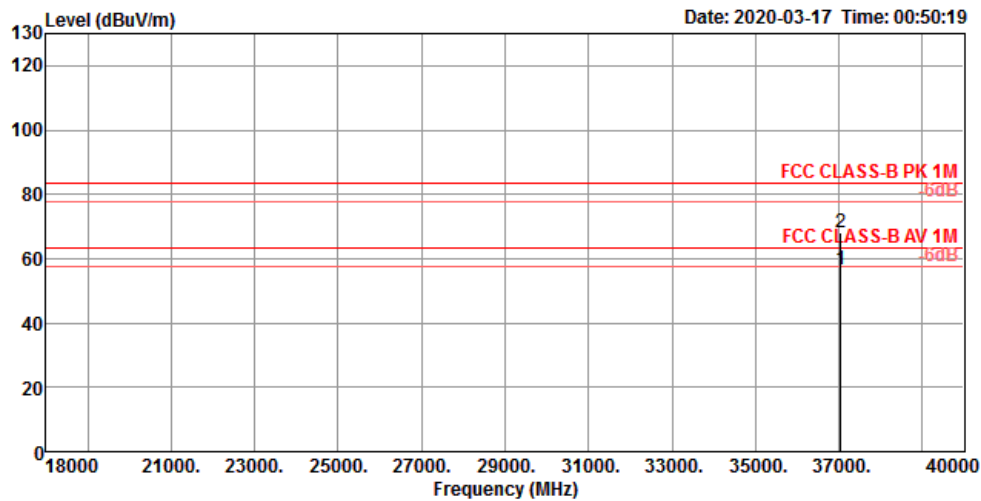
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37048.70	69.33	83.54	-14.21	58.13	20.00	41.84	50.64	102	151	Peak
2	37052.30	56.99	63.54	-6.55	45.79	20.00	41.84	50.64	102	151	Average



Vertical

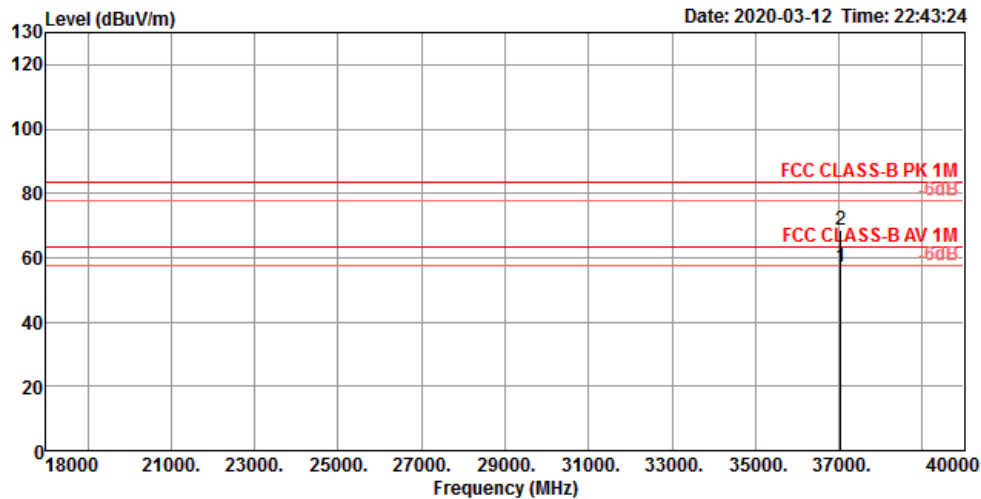


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37046.12	56.65	63.54	-6.89	45.45	20.00	41.84	50.64	100	186 Average	VERTICAL
2	37050.22	68.26	83.54	-15.28	57.06	20.00	41.84	50.64	100	186 Peak	VERTICAL



Test Range	18GHz – 40GHz	Test Freq. (GHz)	76.680
Test Distance	1 m	Test Mode	Mode 9
Bandwidth	425 MHz		

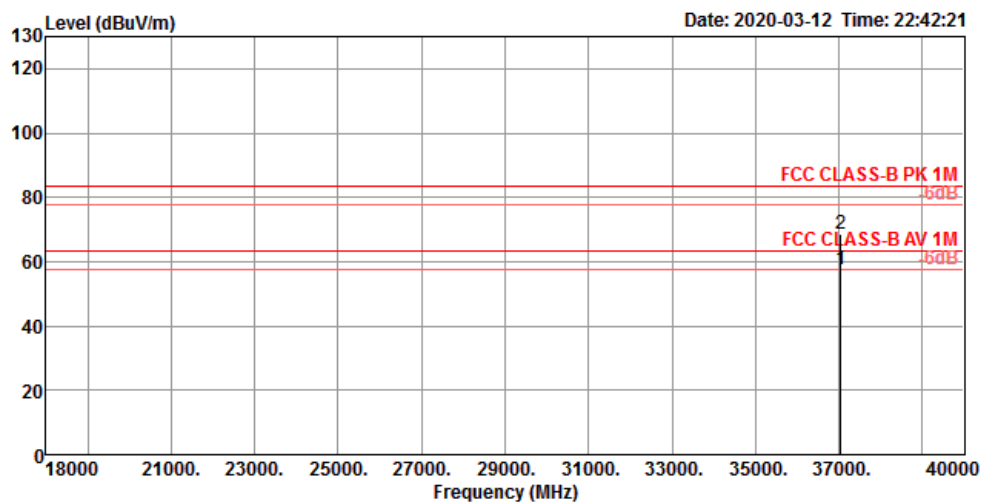
Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37053.02	57.26	63.54	-6.28	46.06	20.00	41.84	50.64	103	152	Average
2	37054.18	68.48	83.54	-15.06	57.28	20.00	41.84	50.64	103	152	Peak



Vertical



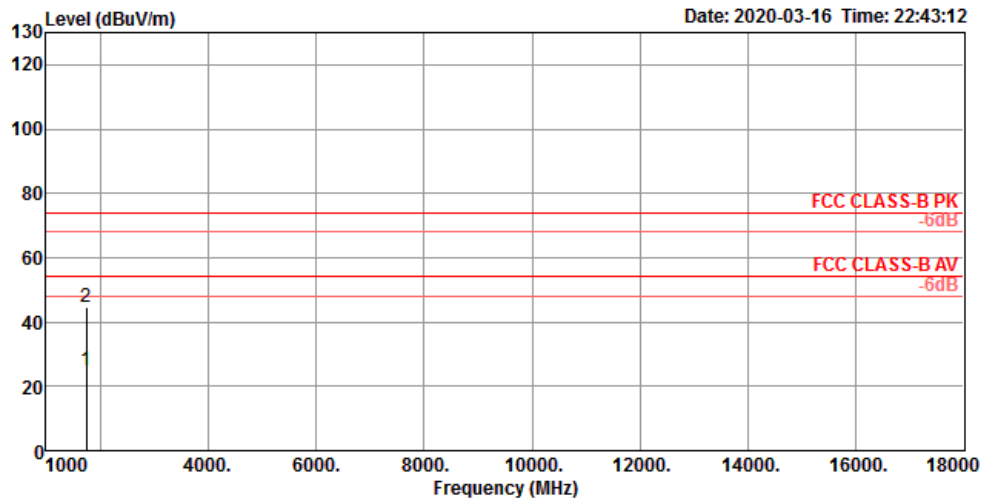
	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37054.48	57.74	63.54	-5.80	46.54	20.00	41.84	50.64	105	352 Average	VERTICAL
2	37054.48	68.80	83.54	-14.74	57.60	20.00	41.84	50.64	105	352 Peak	VERTICAL



For Unintentional - CRX

Test Range	1GHz – 18GHz	Test Freq. (GHz)	76.155
Test Distance	3 m	Test Mode	Mode 1
Bandwidth	175 MHz		

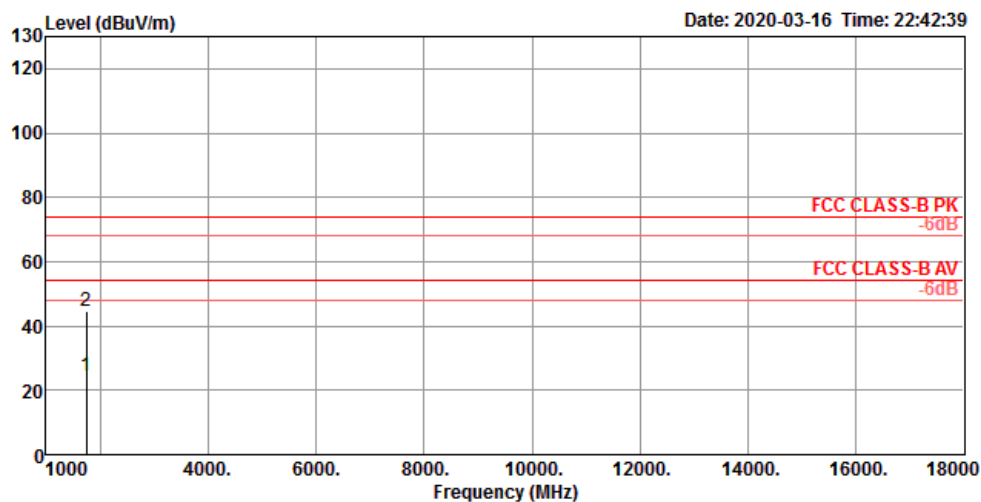
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	1739.18	25.02	54.00	-28.98	33.34	3.60	25.04	36.96	106	140	Average
2	1740.36	44.68	74.00	-29.32	52.97	3.61	25.06	36.96	106	140	Peak



Vertical

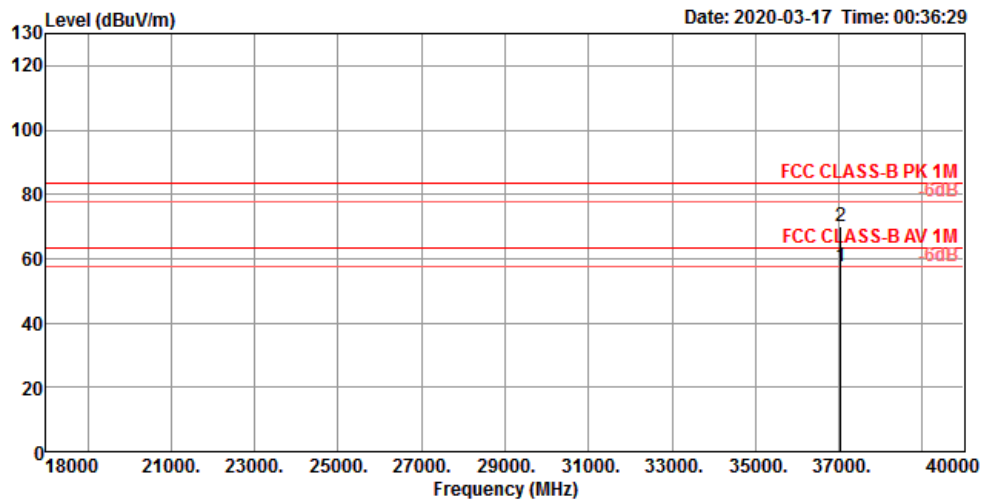


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	1737.90	24.62	54.00	-29.38	32.94	3.60	25.04	36.96	111	164	Average
2	1740.36	44.68	74.00	-29.32	52.97	3.61	25.06	36.96	111	164	Peak



Test Range	18GHz – 40GHz	Test Freq. (GHz)	76.155
Test Distance	1 m	Test Mode	Mode 1
Bandwidth	175 MHz		

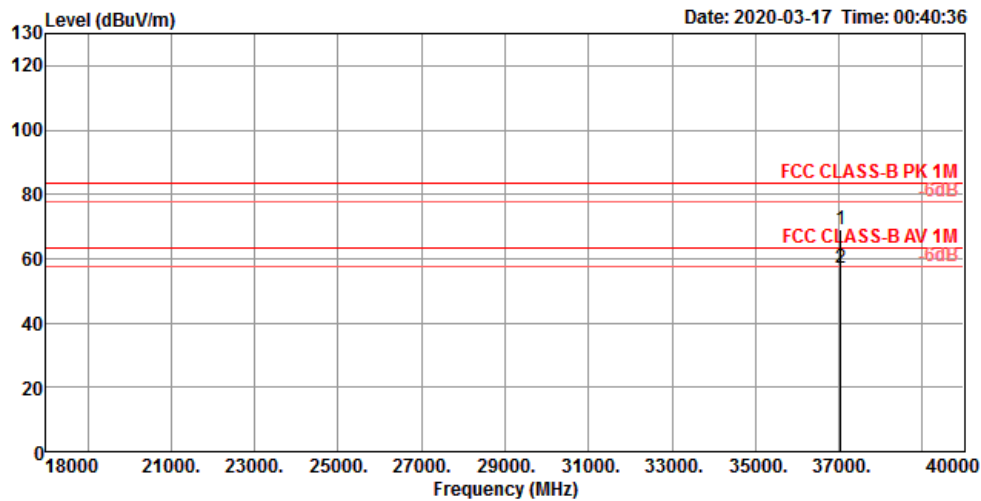
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37046.50	57.36	63.54	-6.18	46.16	20.00	41.84	50.64	102	152 Average	HORIZONTAL
2	37049.60	69.89	83.54	-13.65	58.69	20.00	41.84	50.64	102	152 Peak	HORIZONTAL



Vertical

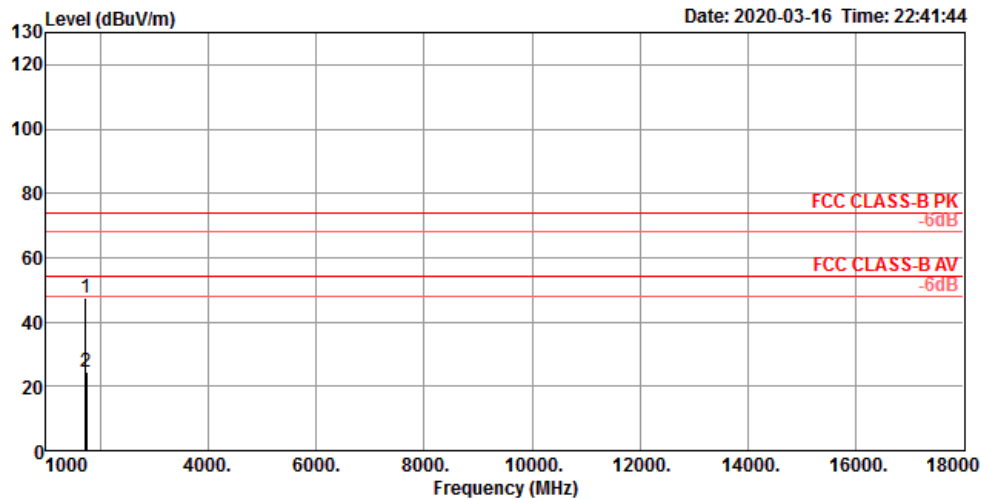


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37050.90	68.86	83.54	-14.68	57.66	20.00	41.84	50.64	104	191 Peak	VERTICAL
2	37052.88	56.97	63.54	-6.57	45.77	20.00	41.84	50.64	104	191 Average	VERTICAL



Test Range	1GHz – 18GHz	Test Freq. (GHz)	76.515
Test Distance	3 m	Test Mode	Mode 2
Bandwidth	175 MHz		

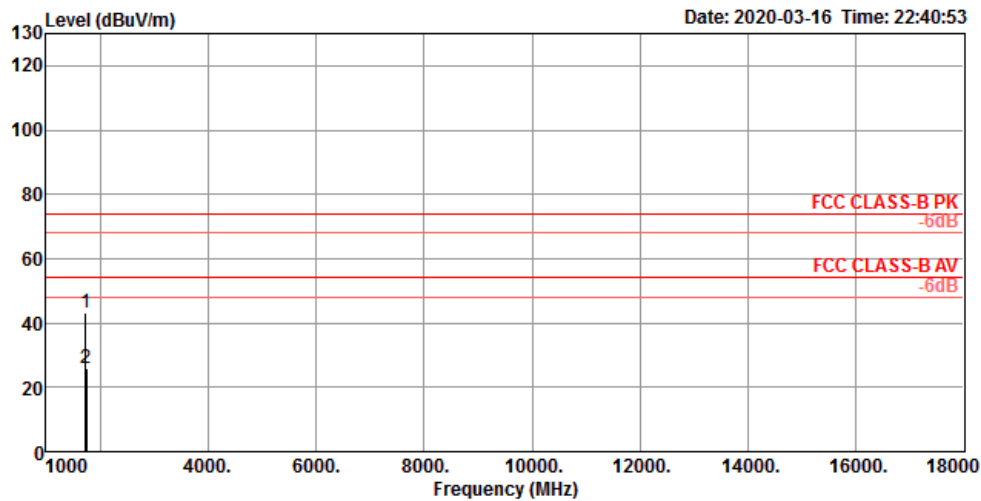
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	1736.66	47.39	74.00	-26.61	55.71	3.60	25.04	36.96	129	156	Peak
2	1739.94	24.64	54.00	-29.36	32.93	3.61	25.06	36.96	129	156	Average



Vertical

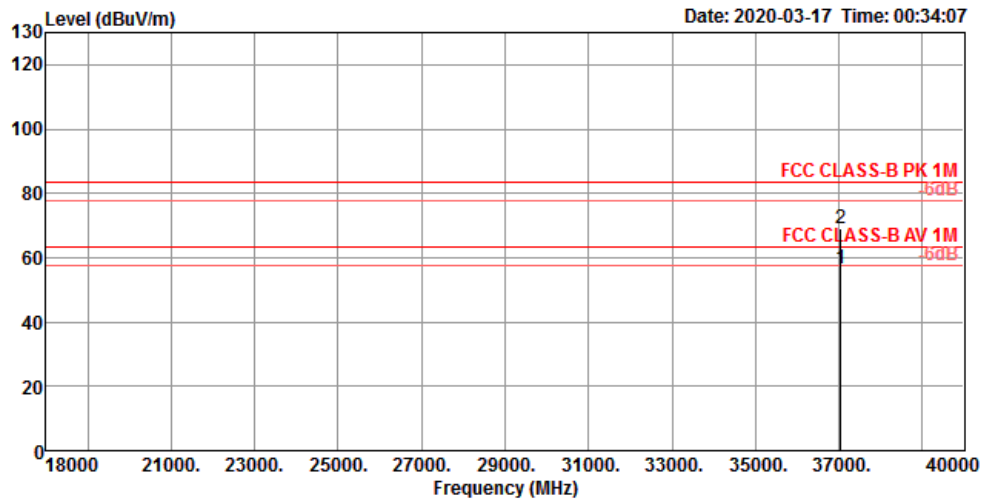


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	1737.68	43.03	74.00	-30.97	51.35	3.60	25.04	36.96	103	146 Peak	VERTICAL
2	1739.50	25.68	54.00	-28.32	33.97	3.61	25.06	36.96	103	146 Average	VERTICAL



Test Range	18GHz – 40GHz	Test Freq. (GHz)	76.515
Test Distance	1 m	Test Mode	Mode 2
Bandwidth	175 MHz		

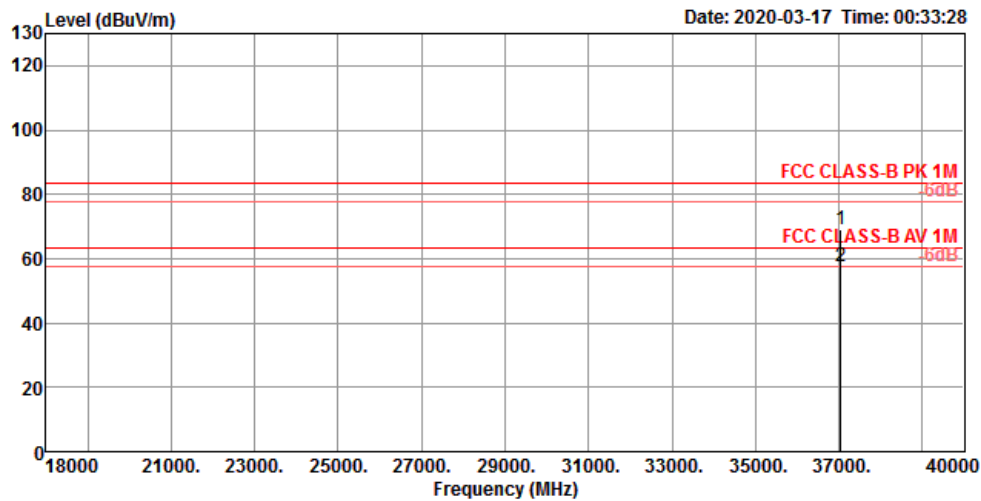
Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	37048.14	56.71	63.54	-6.83	45.51	20.00	41.84	50.64	102	287	Average	HORIZONTAL
2	37048.14	69.03	83.54	-14.51	57.83	20.00	41.84	50.64	102	287	Peak	HORIZONTAL



Vertical

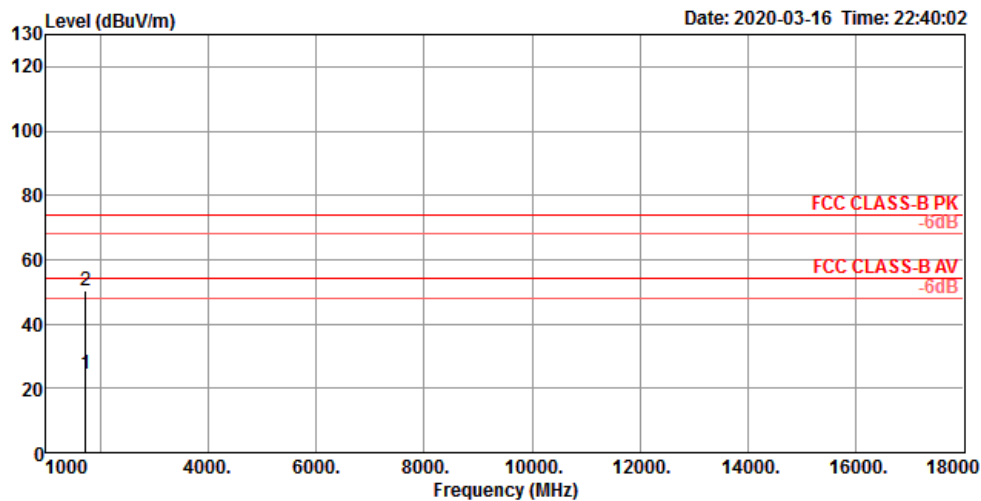


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37044.02	68.84	83.54	-14.70	57.64	20.00	41.84	50.64	106	350 Peak	VERTICAL
2	37047.68	57.54	63.54	-6.00	46.34	20.00	41.84	50.64	106	350 Average	VERTICAL



Test Range	1GHz – 18GHz	Test Freq. (GHz)	76.835
Test Distance	3 m	Test Mode	Mode 3
Bandwidth	175 MHz		

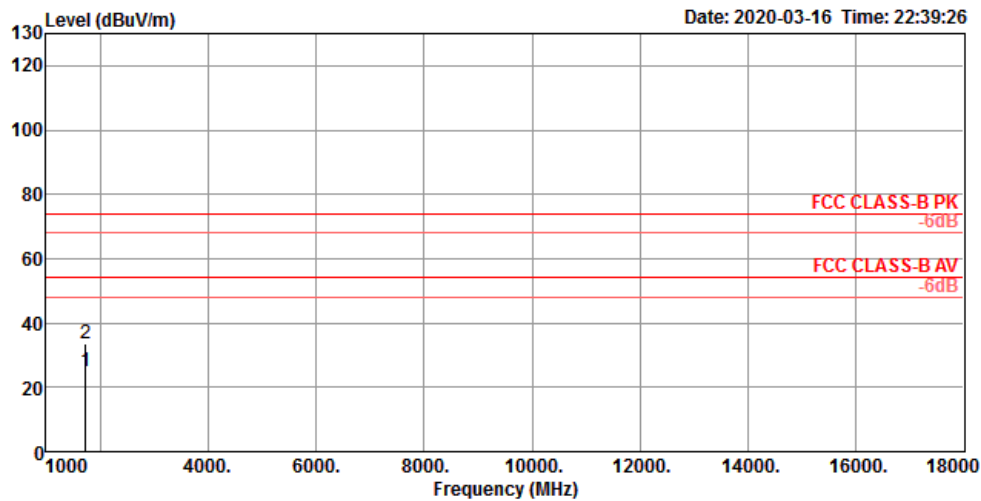
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	1734.14	24.63	54.00	-29.37	32.97	3.60	25.02	36.96	113	132	Average
2	1735.52	50.44	74.00	-23.56	58.76	3.60	25.04	36.96	113	132	Peak



Vertical

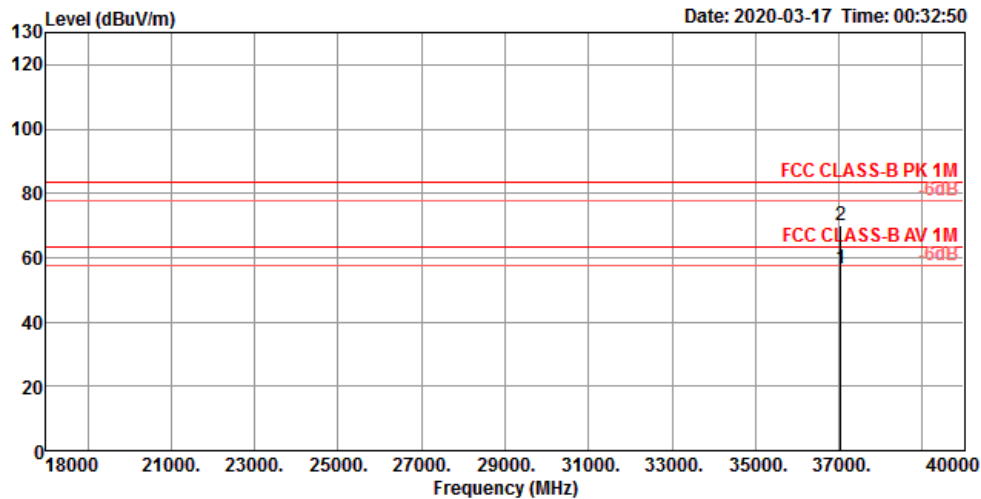


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	1736.04	25.10	54.00	-28.90	33.42	3.60	25.04	36.96	104	57 Average	VERTICAL
2	1736.04	33.44	74.00	-40.56	41.76	3.60	25.04	36.96	104	57 Peak	VERTICAL



Test Range	18GHz – 40GHz	Test Freq. (GHz)	76.835
Test Distance	1 m	Test Mode	Mode 3
Bandwidth	175 MHz		

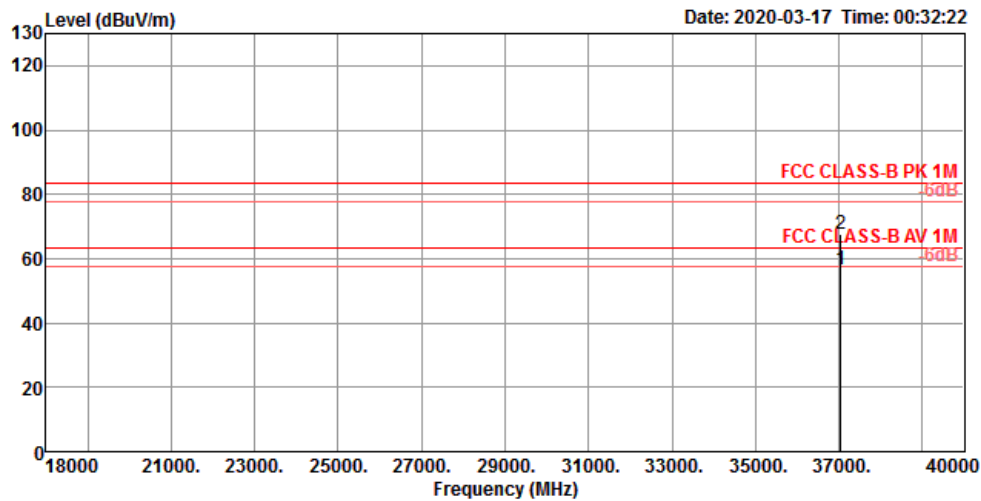
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37051.56	56.56	63.54	-6.98	45.36	20.00	41.84	50.64	106	350 Average	HORIZONTAL
2	37051.56	70.05	83.54	-13.49	58.85	20.00	41.84	50.64	106	350 Peak	HORIZONTAL



Vertical

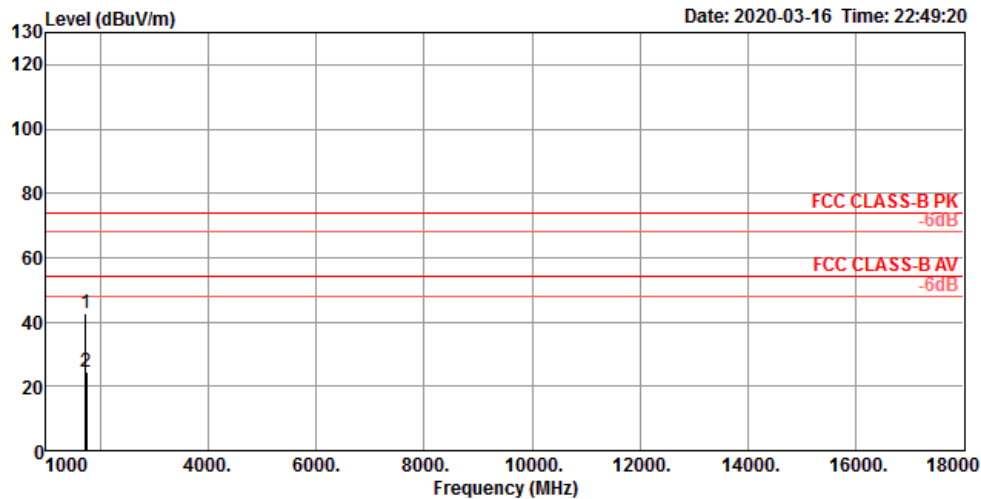


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37048.00	56.83	63.54	-6.71	45.63	20.00	41.84	50.64	102	321 Average	VERTICAL
2	37048.00	67.43	83.54	-16.11	56.23	20.00	41.84	50.64	102	321 Peak	VERTICAL



Test Range	1GHz – 18GHz	Test Freq. (GHz)	76.210
Test Distance	3 m	Test Mode	Mode 4
Bandwidth	300 MHz		

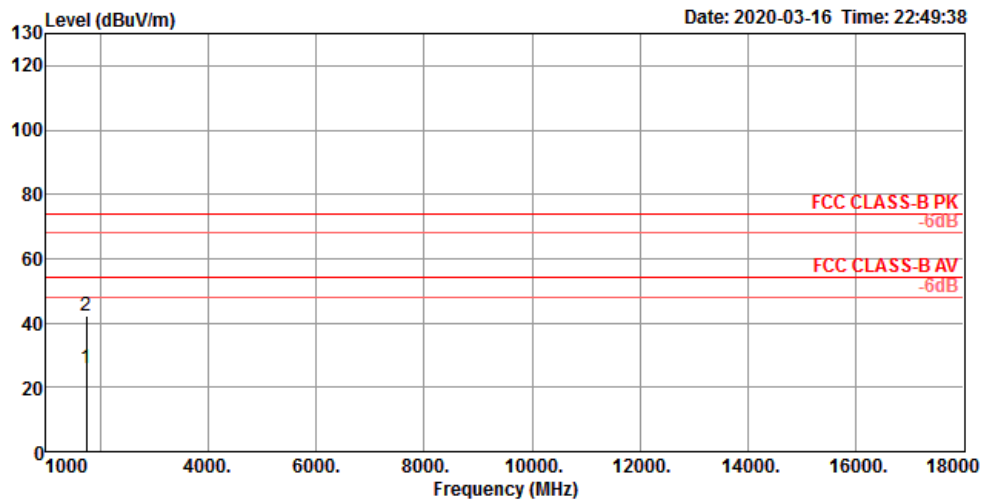
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	1734.96	42.74	74.00	-31.26	51.06	3.60	25.04	36.96	101	176 Peak	HORIZONTAL
2	1738.86	24.62	54.00	-29.38	32.94	3.60	25.04	36.96	101	176 Average	HORIZONTAL



Vertical

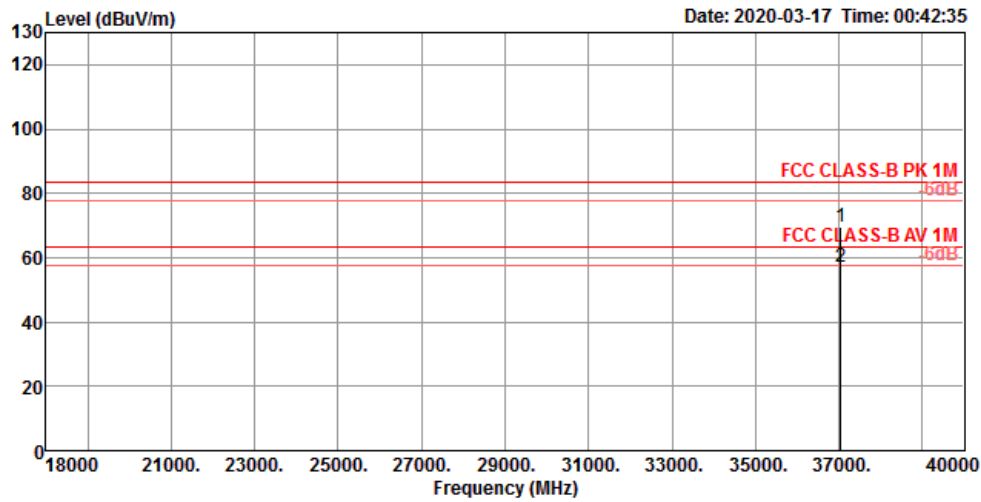


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos		
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	cm	deg	Remark
1	1740.64	25.86	54.00	-28.14	34.15	3.61	25.06	36.96	112	168	Average
2	1742.48	42.19	74.00	-31.81	50.48	3.61	25.06	36.96	112	168	Peak



Test Range	18GHz – 40GHz	Test Freq. (GHz)	76.210
Test Distance	1 m	Test Mode	Mode 4
Bandwidth	300 MHz		

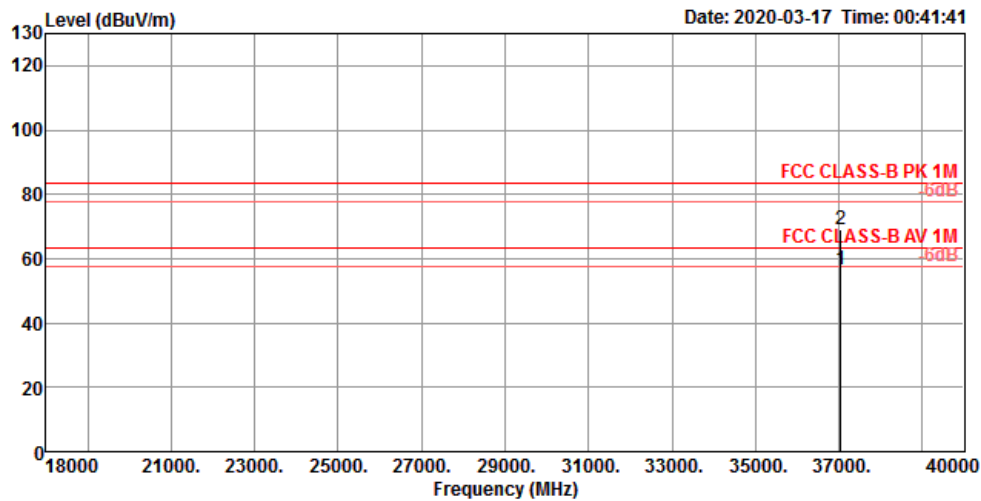
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37045.60	69.39	83.54	-14.15	58.19	20.00	41.84	50.64	103	119	Peak
2	37049.62	57.23	63.54	-6.31	46.03	20.00	41.84	50.64	103	119	Average



Vertical

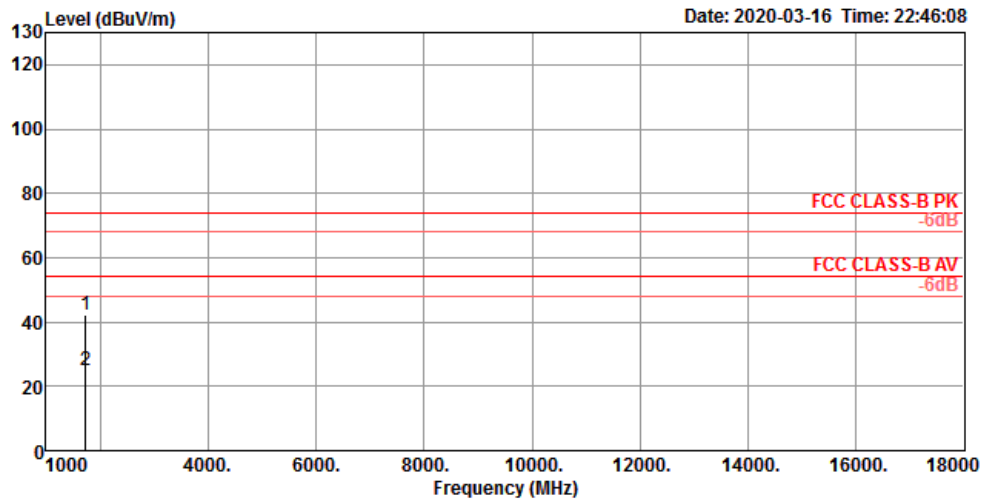


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37044.68	56.73	63.54	-6.81	45.53	20.00	41.84	50.64	105	200 Average	VERTICAL
2	37049.52	69.16	83.54	-14.38	57.96	20.00	41.84	50.64	105	200 Peak	VERTICAL



Test Range	1GHz – 18GHz	Test Freq. (GHz)	76.550
Test Distance	3 m	Test Mode	Mode 5
Bandwidth	300 MHz		

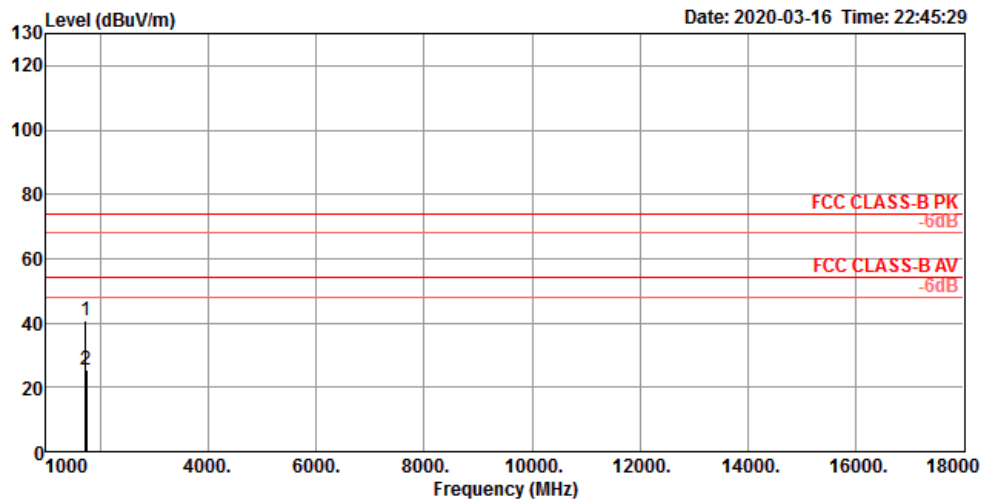
Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	1736.20	42.30	74.00	-31.70	50.62	3.60	25.04	36.96	105	169	Peak	HORIZONTAL
2	1736.52	24.96	54.00	-29.04	33.28	3.60	25.04	36.96	105	169	Average	HORIZONTAL



Vertical

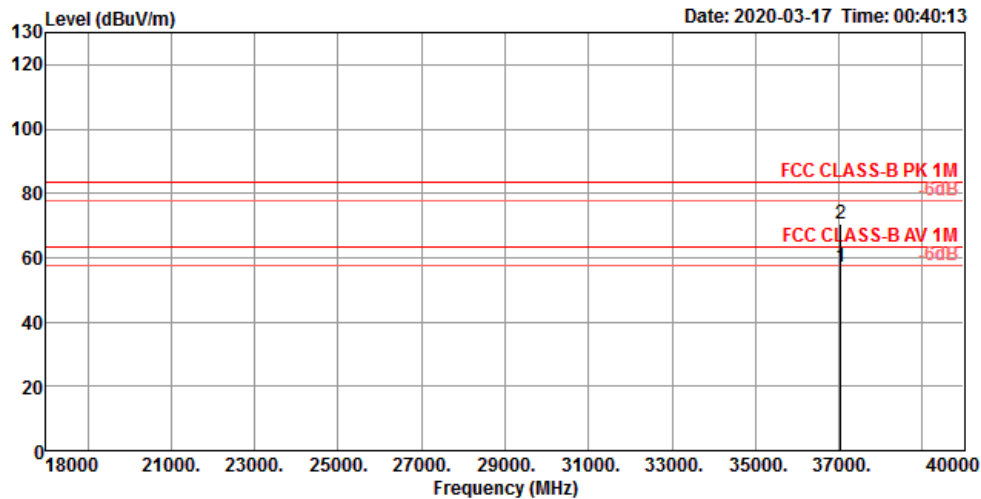


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	1735.34	40.96	74.00	-33.04	49.28	3.60	25.04	36.96	117	213	Peak
2	1741.58	25.26	54.00	-28.74	33.55	3.61	25.06	36.96	117	213	Average



Test Range	18GHz – 40GHz	Test Freq. (GHz)	76.550
Test Distance	1 m	Test Mode	Mode 5
Bandwidth	300 MHz		

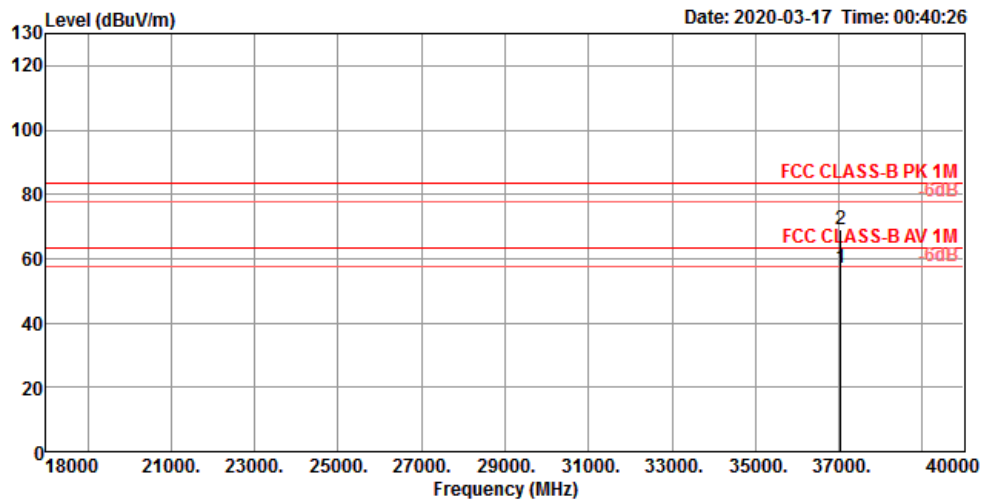
Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	37045.78	57.18	63.54	-6.36	45.98	20.00	41.84	50.64	103	166	Average	HORIZONTAL
2	37046.62	70.67	83.54	-12.87	59.47	20.00	41.84	50.64	103	166	Peak	HORIZONTAL



Vertical

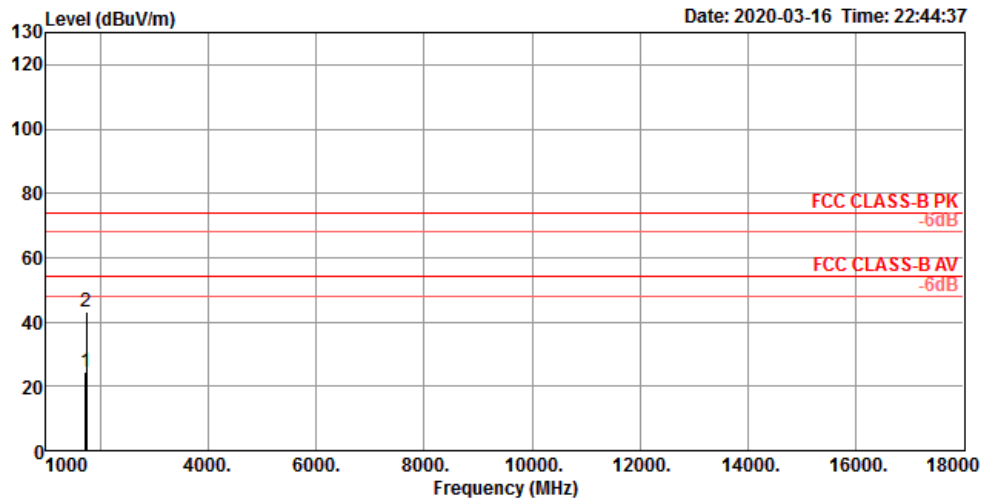


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37049.14	57.09	63.54	-6.45	45.89	20.00	41.84	50.64	105	97 Average	VERTICAL
2	37049.70	69.09	83.54	-14.45	57.89	20.00	41.84	50.64	105	97 Peak	VERTICAL



Test Range	1GHz – 18GHz	Test Freq. (GHz)	76.760
Test Distance	3 m	Test Mode	Mode 6
Bandwidth	300 MHz		

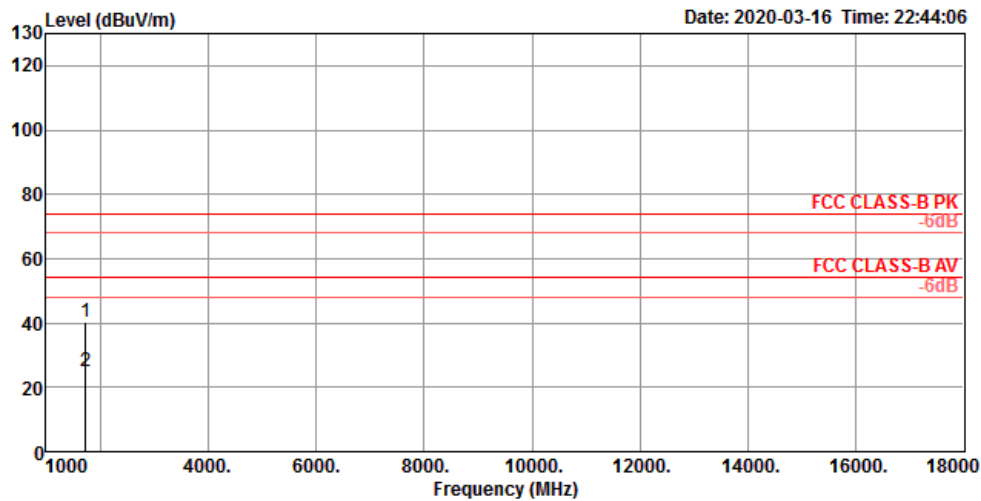
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	1735.36	24.64	54.00	-29.36	32.96	3.60	25.04	36.96	105	187 Average	HORIZONTAL
2	1740.84	43.39	74.00	-30.61	51.68	3.61	25.06	36.96	105	187 Peak	HORIZONTAL



Vertical

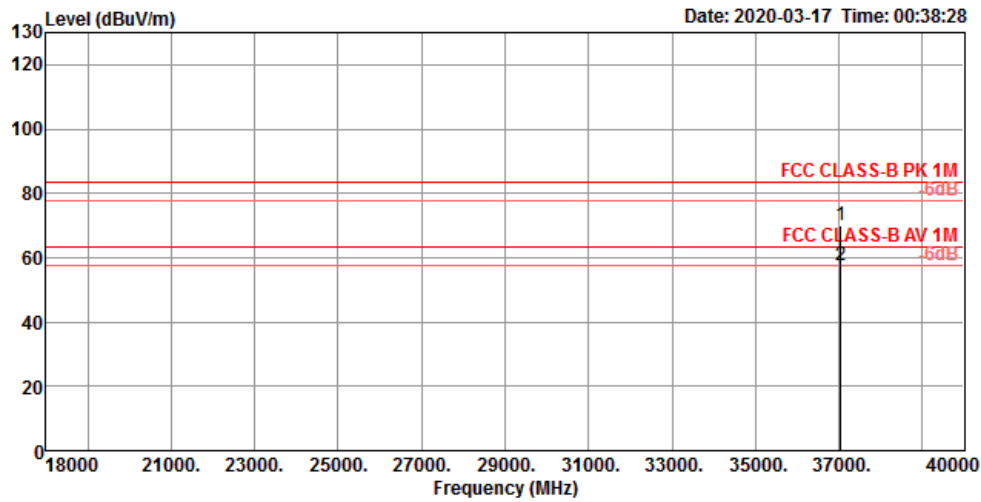


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	1736.34	40.21	74.00	-33.79	48.53	3.60	25.04	36.96	116	170 Peak	VERTICAL
2	1737.62	24.99	54.00	-29.01	33.31	3.60	25.04	36.96	116	170 Average	VERTICAL



Test Range	18GHz – 40GHz	Test Freq. (GHz)	76.760
Test Distance	1 m	Test Mode	Mode 6
Bandwidth	300 MHz		

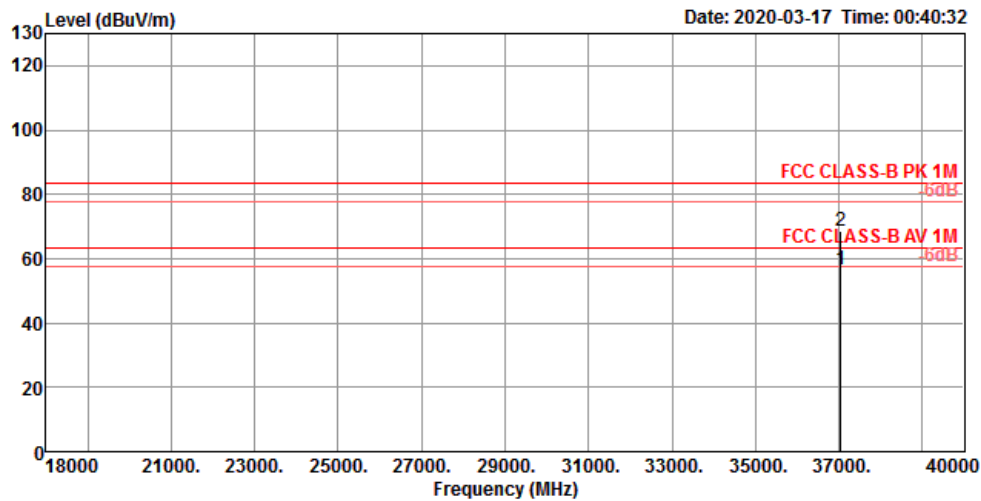
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37047.86	70.09	83.54	-13.45	58.89	20.00	41.84	50.64	103	130	Peak
2	37050.84	57.33	63.54	-6.21	46.13	20.00	41.84	50.64	103	130	Average



Vertical

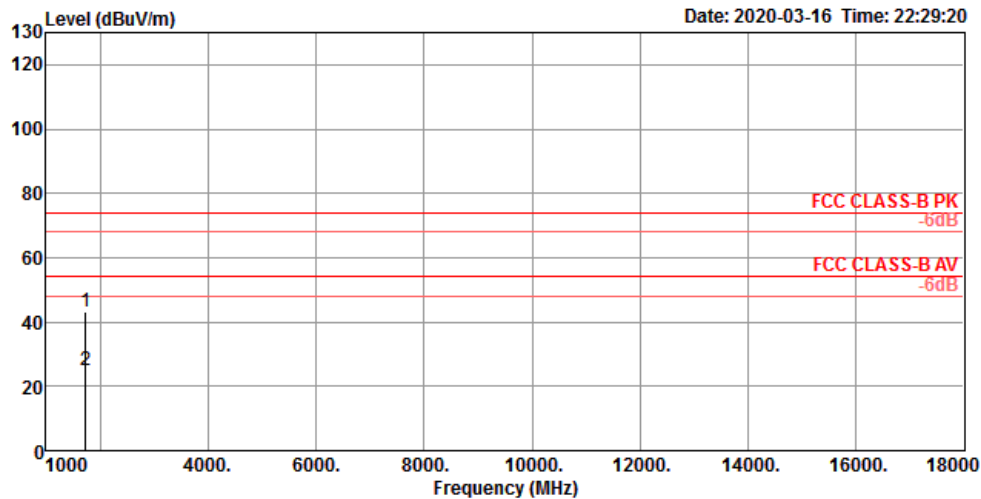


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37044.98	56.83	63.54	-6.71	45.63	20.00	41.84	50.64	105	164 Average	VERTICAL
2	37049.86	68.77	83.54	-14.77	57.57	20.00	41.84	50.64	105	164 Peak	VERTICAL



Test Range	1GHz – 18GHz	Test Freq. (GHz)	76.325
Test Distance	3 m	Test Mode	Mode 7
Bandwidth	425 MHz		

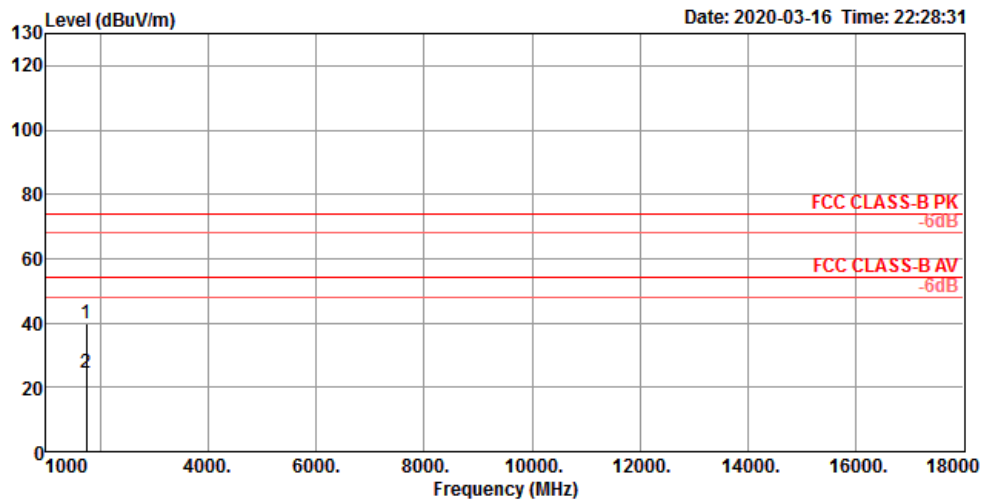
Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	1731.64	43.12	74.00	-30.88	51.46	3.60	25.02	36.96	112	213	Peak
2	1734.42	24.76	54.00	-29.24	33.08	3.60	25.04	36.96	112	213	Average



Vertical

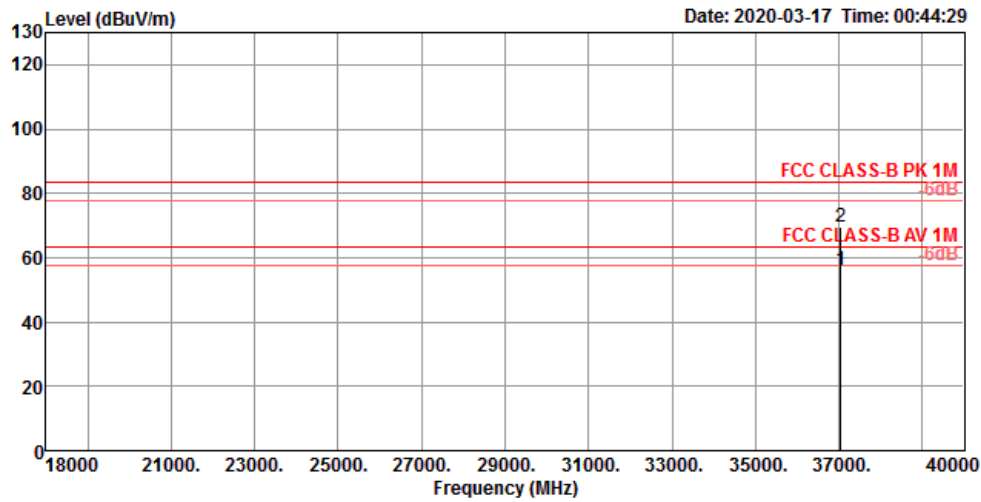


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	1738.54	39.71	74.00	-34.29	48.03	3.60	25.04	36.96	104	231 Peak	VERTICAL
2	1739.74	24.67	54.00	-29.33	32.96	3.61	25.06	36.96	104	231 Average	VERTICAL



Test Range	18GHz – 40GHz	Test Freq. (GHz)	76.325
Test Distance	1 m	Test Mode	Mode 7
Bandwidth	425 MHz		

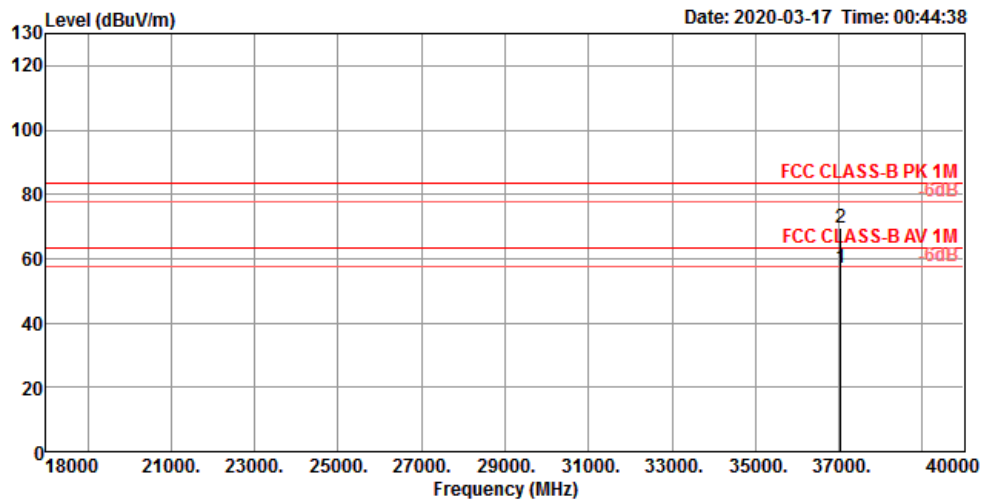
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37046.36	56.16	63.54	-7.38	44.96	20.00	41.84	50.64	103	134	Average
2	37046.36	69.41	83.54	-14.13	58.21	20.00	41.84	50.64	103	134	Peak



Vertical

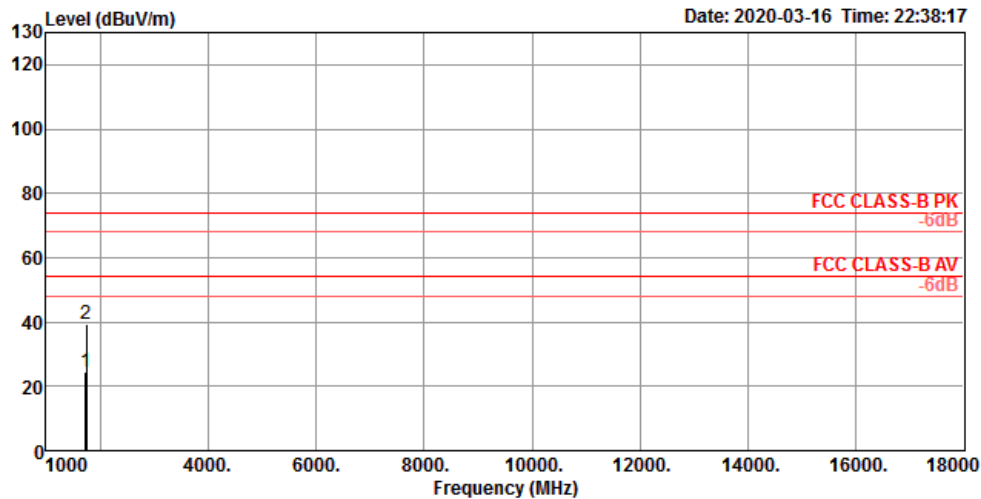


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37044.18	56.89	63.54	-6.65	45.69	20.00	41.84	50.64	105	24 Average	VERTICAL
2	37049.18	69.34	83.54	-14.20	58.14	20.00	41.84	50.64	105	24 Peak	VERTICAL



Test Range	1GHz – 18GHz	Test Freq. (GHz)	76.570
Test Distance	3 m	Test Mode	Mode 8
Bandwidth	425 MHz		

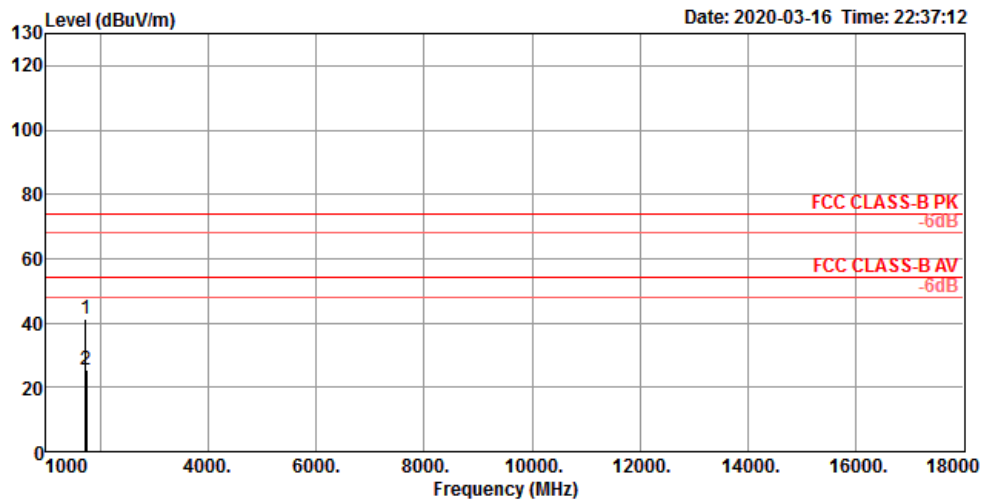
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	1736.14	24.50	54.00	-29.50	32.82	3.60	25.04	36.96	116	168	Average HORIZONTAL
2	1739.12	39.55	74.00	-34.45	47.87	3.60	25.04	36.96	116	168	Peak HORIZONTAL



Vertical

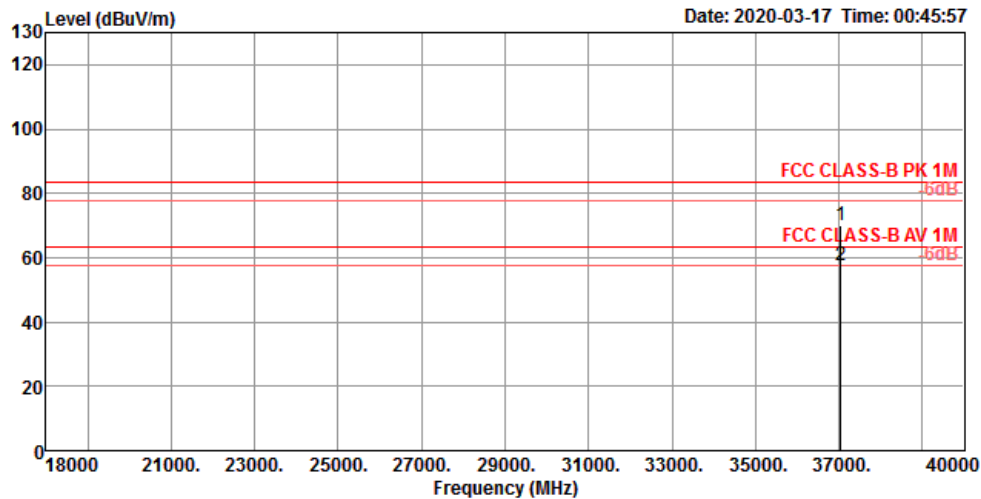


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	1735.56	41.39	74.00	-32.61	49.71	3.60	25.04	36.96	137	241 Peak	VERTICAL
2	1738.62	25.62	54.00	-28.38	33.94	3.60	25.04	36.96	137	241 Average	VERTICAL



Test Range	18GHz – 40GHz	Test Freq. (GHz)	76.570
Test Distance	1 m	Test Mode	Mode 8
Bandwidth	425 MHz		

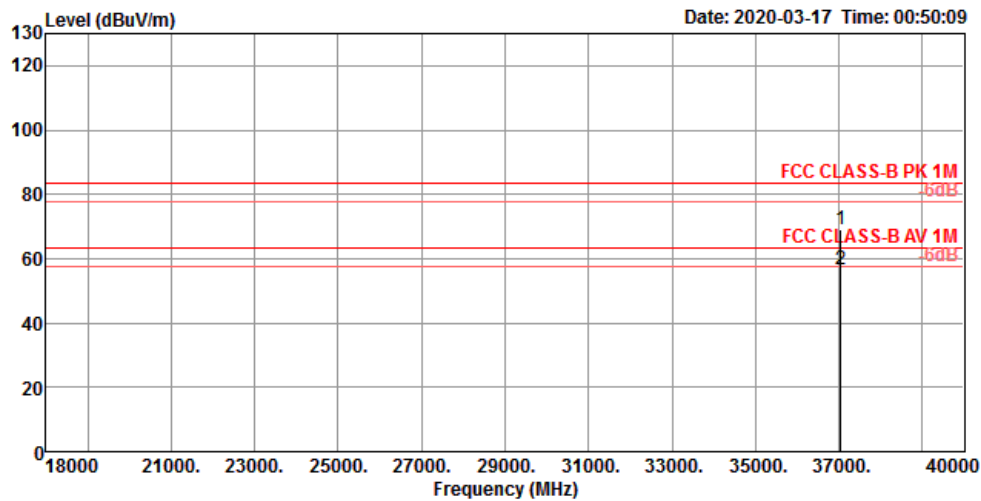
Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	37046.62	70.23	83.54	-13.31	59.03	20.00	41.84	50.64	106	135	Peak	HORIZONTAL
2	37052.34	57.52	63.54	-6.02	46.32	20.00	41.84	50.64	106	135	Average	HORIZONTAL



Vertical

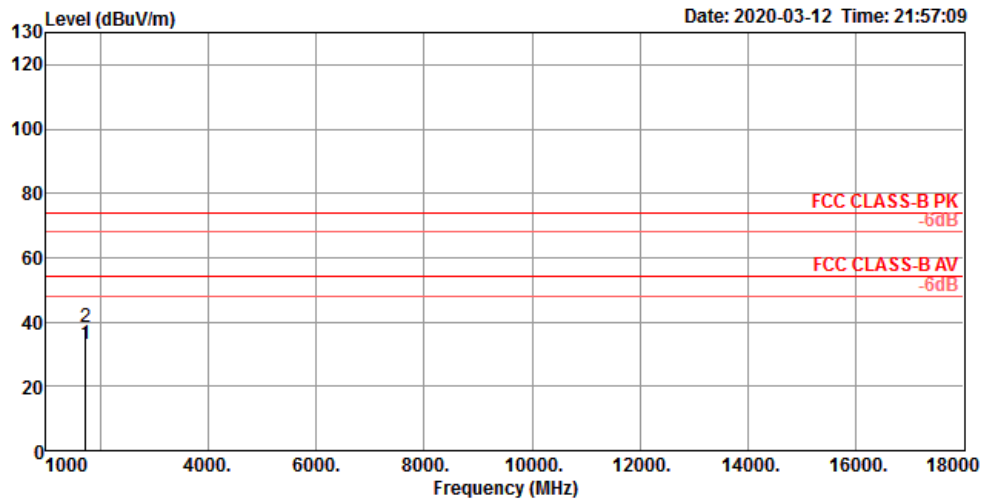


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37048.44	68.91	83.54	-14.63	57.71	20.00	41.84	50.64	101	153 Peak	VERTICAL
2	37052.46	56.78	63.54	-6.76	45.58	20.00	41.84	50.64	101	153 Average	VERTICAL



Test Range	1GHz – 18GHz	Test Freq. (GHz)	76.680
Test Distance	3 m	Test Mode	Mode 9
Bandwidth	425 MHz		

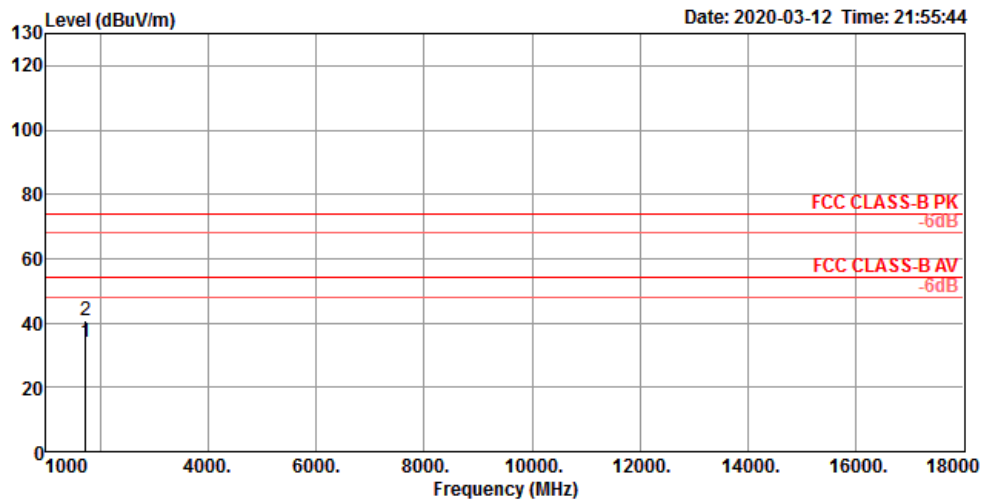
Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	1737.30	32.90	54.00	-21.10	41.22	3.60	25.04	36.96	100	254	Average	HORIZONTAL
2	1737.30	38.50	74.00	-35.50	46.82	3.60	25.04	36.96	100	254	Peak	HORIZONTAL



Vertical

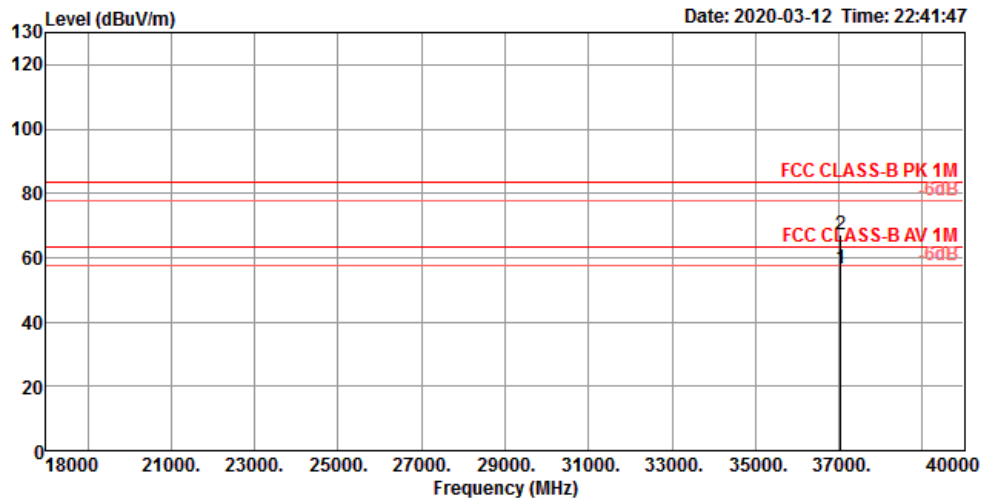


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos		
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	cm	deg	Remark
1	1737.02	34.02	54.00	-19.98	42.34	3.60	25.04	36.96	112	267	Average
2	1737.02	40.68	74.00	-33.32	49.00	3.60	25.04	36.96	112	267	Peak



Test Range	18GHz – 40GHz	Test Freq. (GHz)	76.680
Test Distance	1 m	Test Mode	Mode 9
Bandwidth	425 MHz		

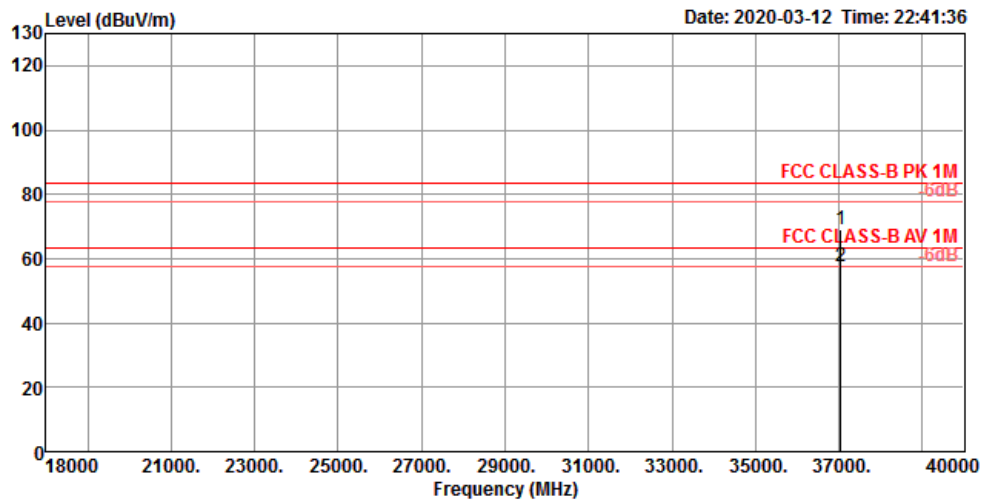
Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37050.13	56.56	63.54	-6.98	45.36	20.00	41.84	50.64	104	112	Average HORIZONTAL
2	37051.23	67.33	83.54	-16.21	56.13	20.00	41.84	50.64	104	112	Peak HORIZONTAL



Vertical



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	37050.88	68.98	83.54	-14.56	57.78	20.00	41.84	50.64	102	245 Peak	VERTICAL
2	37052.02	57.60	63.54	-5.94	46.40	20.00	41.84	50.64	102	245 Average	VERTICAL

3.4.9 Test Result of Transmitter Radiated Unwanted Emissions (40GHz – 200GHz)

For Bandwidth 175 MHz

Test Freq. (GHz)	Rx Gain (dBi)	Distance (m)	Read Worse Frequency (GHz)	Read Level (dBm)	EIRP (dBm)	Specification Distance (m)	Power Density (pW/cm ²)	Test Result
76.155	23	0.85	71.32	-56.47	-11.38	3	64.4147	PASS
76.515	23	0.85	72.35	-57.22	-12.00	3	55.7750	PASS
76.835	23	0.85	71.58	-56.54	-11.41	3	63.8478	PASS
Limit							600	-

For Bandwidth 300 MHz

Test Freq. (GHz)	Rx Gain (dBi)	Distance (m)	Read Worse Frequency (GHz)	Read Level (dBm)	EIRP (dBm)	Specification Distance (m)	Power Density (pW/cm ²)	Test Result
76.210	23	0.85	71.32	-55.21	-10.12	3	86.0964	PASS
76.550	23	0.85	71.32	-56.84	-11.75	3	59.1541	PASS
76.760	23	0.85	71.38	-55.66	-10.56	3	77.7527	PASS
Limit							600	-

For Bandwidth 425 MHz

Test Freq. (GHz)	Rx Gain (dBi)	Distance (m)	Read Worse Frequency (GHz)	Read Level (dBm)	EIRP (dBm)	Specification Distance (m)	Power Density (pW/cm ²)	Test Result
76.325	23	0.85	74.22	-57.85	-12.41	3	50.7697	PASS
76.570	23	0.85	73.85	-57.63	-12.23	3	52.8766	PASS
76.680	23	0.85	74.38	-58.22	-12.76	3	46.8247	PASS
Limit							600	-

Note :

EIRP = Read Level - Rx Gain +20*LOG(4*3.14159* Distance / (300/(Test Freq.*1000))).

Power Density = ((10^{^(EIRP/10)})/1000)/(4*3.14159*(Specification Distance *100)²)*1000000000000.

3.4.10 Test Result of Transmitter Radiated Unwanted Emissions (200GHz – 231GHz)

For Bandwidth 175 MHz

Test Freq. (GHz)	Rx Gain (dBi)	Distance (m)	Read Worse Frequency (GHz)	Read Level (dBm)	EIRP (dBm)	Specification Distance (m)	Power Density (pW/cm ²)	Test Result
76.155	23	0.85	201.52	-88.54	-34.42	3	0.3193	PASS
76.515	23	0.85	201.24	-88.32	-34.22	3	0.3350	PASS
76.835	23	0.85	201.55	-88.67	-34.55	3	0.3100	PASS
Limit							1000	-

For Bandwidth 300 MHz

Test Freq. (GHz)	Rx Gain (dBi)	Distance (m)	Read Worse Frequency (GHz)	Read Level (dBm)	EIRP (dBm)	Specification Distance (m)	Power Density (pW/cm ²)	Test Result
76.210	23	0.85	201.33	-88.63	-34.52	3	0.3122	PASS
76.550	23	0.85	202.54	-89.52	-35.36	3	0.2574	PASS
76.760	23	0.85	201.87	-89.02	-34.89	3	0.2869	PASS
Limit							1000	-

For Bandwidth 425 MHz

Test Freq. (GHz)	Rx Gain (dBi)	Distance (m)	Read Worse Frequency (GHz)	Read Level (dBm)	EIRP (dBm)	Specification Distance (m)	Power Density (pW/cm ²)	Test Result
76.325	23	0.85	202.55	-87.52	-33.36	3	0.4080	PASS
76.570	23	0.85	204.32	-89.33	-35.09	3	0.2736	PASS
76.680	23	0.85	203.56	-87.96	-33.76	3	0.3723	PASS
Limit							1000	-

Note :

EIRP = Read Level - Rx Gain +20*LOG(4*3.14159* Distance / (300/(Test Freq.*1000))).

Power Density = ((10^{^(EIRP/10)})/1000)/((4*3.14159*(Specification Distance *100)²))*1000000000000.

3.5 Frequency Stability

3.5.1 Frequency Stability Limit

Frequency Stability Limit
Fundamental emissions must be contained within the frequency bands specified in this 76-81GHz band during all conditions of operation. Equipment is presumed to operate over the temperature range -20 to +50 degrees Celsius with an input voltage variation of 85% to 115% of rated input voltage.

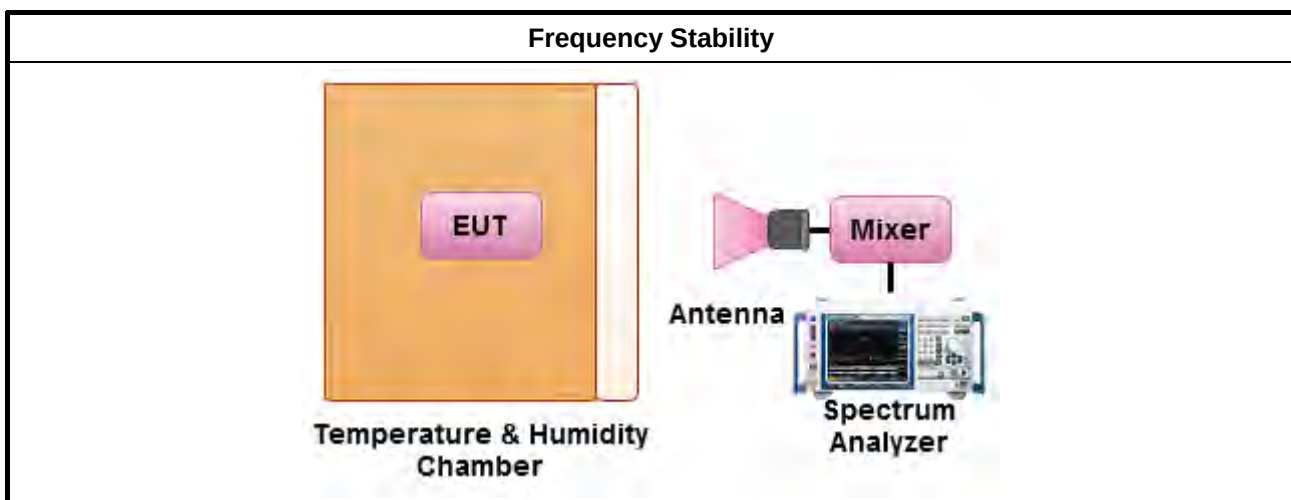
3.5.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

Test Method
☒ For the frequency stability shall be measured using one of the options below:
☒ Refer as ANSI C63.10, clause 9.14 for frequency stability measurement.
☒ Refer as ANSI C63.10, clause 9 for radiated measurement.
☒ Radiated test was conducted at far-field distance. the distance from the radiating element of the EUT to the edge of the far field may be calculated from $[r \geq 2D^2/\lambda]$ r is the distance from the radiating element of the EUT to the edge of the far field, in m D is the largest dimension of both the radiating element and the test antenna (horn), in m λ is the wavelength of the emission under investigation $[300/f \text{ (MHz)}]$, in m
☒ The mixer may be placed outside the chamber in front of the temperature chamber door, and the chamber door opened for each reading.

3.5.4 Test Setup



3.5.5 Test Result of Frequency Stability

For Bandwidth 175 MHz

Test Freq. (GHz): 76.155

Test Temperature: (°C)	Measured Frequency (MHz)	Delta Frequency (kHz)	Limit (±kHz)
-40	76.158	3	within band
-30	76.156	1	within band
-20	76.157	2	within band
-10	76.158	3	within band
0	76.159	4	within band
10	76.159	4	within band
20	76.155	Reference	within band
30	76.155	0	within band
40	76.152	-3	within band
50	76.152	-3	within band
60	76.153	-2	within band
70	76.152	-3	within band
80	76.152	-3	within band
Test Voltage: (Vdc)	Measured Frequency (MHz)	Delta Frequency (kHz)	Limit (±kHz)
10.2	76.156	1	within band
12	76.155	Reference	within band
13.8	76.155	0	within band

**Test Freq. (GHz): 76.515**

Test Temperature: (°C)	Measured Frequency (MHz)	Delta Frequency (kHz)	Limit (±kHz)
-40	76.517	2	within band
-30	76.516	1	within band
-20	76.513	-2	within band
-10	76.516	1	within band
0	76.514	-1	within band
10	76.515	0	within band
20	76.515	Reference	within band
30	76.515	0	within band
40	76.515	0	within band
50	76.515	0	within band
60	76.513	-2	within band
70	76.513	-2	within band
80	76.511	-4	within band
Test Voltage: (Vdc)	Measured Frequency (MHz)	Delta Frequency (kHz)	Limit (±kHz)
10.2	76.515	0	within band
12	76.515	Reference	within band
13.8	76.515	0	within band

**Test Freq. (GHz): 76.835**

Test Temperature: (°C)	Measured Frequency (MHz)	Delta Frequency (kHz)	Limit (±kHz)
-40	76.835	0	within band
-30	76.832	-3	within band
-20	76.834	-1	within band
-10	76.834	-1	within band
0	76.835	0	within band
10	76.835	0	within band
20	76.835	Reference	within band
30	76.835	0	within band
40	76.832	-3	within band
50	76.832	-3	within band
60	76.834	-1	within band
70	76.832	-3	within band
80	76.834	-1	within band
Test Voltage: (Vdc)	Measured Frequency (MHz)	Delta Frequency (kHz)	Limit (±kHz)
10.2	76.834	-1	within band
12	76.835	Reference	within band
13.8	76.835	0	within band



For Bandwidth 300 MHz
Test Freq. (GHz): 76.210

Test Temperature: (°C)	Measured Frequency (MHz)	Delta Frequency (kHz)	Limit (±kHz)
-40	76.208	-2	within band
-30	76.205	-5	within band
-20	76.207	-3	within band
-10	76.209	-1	within band
0	76.209	-1	within band
10	76.209	-1	within band
20	76.210	Reference	within band
30	76.208	-2	within band
40	76.209	-1	within band
50	76.208	-2	within band
60	76.210	0	within band
70	76.208	-2	within band
80	76.209	-1	within band
Test Voltage: (Vdc)	Measured Frequency (MHz)	Delta Frequency (kHz)	Limit (±kHz)
10.2	76.209	-1	within band
12	76.210	Reference	within band
13.8	76.210	0	within band

**Test Freq. (GHz): 76.550**

Test Temperature: (°C)	Measured Frequency (MHz)	Delta Frequency (kHz)	Limit (±kHz)
-40	76.548	-2	within band
-30	76.548	-2	within band
-20	76.547	-3	within band
-10	76.548	-2	within band
0	76.550	0	within band
10	76.550	0	within band
20	76.550	Reference	within band
30	76.552	2	within band
40	76.552	2	within band
50	76.554	4	within band
60	76.551	1	within band
70	76.551	1	within band
80	76.552	2	within band
Test Voltage: (Vdc)	Measured Frequency (MHz)	Delta Frequency (kHz)	Limit (±kHz)
10.2	76.548	-2	within band
12	76.550	Reference	within band
13.8	76.550	0	within band

**Test Freq. (GHz): 76.760**

Test Temperature: (°C)	Measured Frequency (MHz)	Delta Frequency (kHz)	Limit (±kHz)
-40	76.758	-2	within band
-30	76.758	-2	within band
-20	76.759	-1	within band
-10	76.759	-1	within band
0	76.759	-1	within band
10	76.761	1	within band
20	76.760	Reference	within band
30	76.763	3	within band
40	76.762	2	within band
50	76.761	1	within band
60	76.762	2	within band
70	76.761	1	within band
80	76.762	2	within band
Test Voltage: (Vdc)	Measured Frequency (MHz)	Delta Frequency (kHz)	Limit (±kHz)
10.2	76.759	-1	within band
12	76.760	Reference	within band
13.8	76.759	-1	within band



For Bandwidth 425 MHz
Test Freq. (GHz): 76.325

Test Temperature: (°C)	Measured Frequency (MHz)	Delta Frequency (kHz)	Limit (±kHz)
-40	76.321	-4	within band
-30	76.325	0	within band
-20	76.322	-3	within band
-10	76.324	-1	within band
0	76.325	0	within band
10	76.325	0	within band
20	76.325	Reference	within band
30	76.325	0	within band
40	76.325	0	within band
50	76.325	0	within band
60	76.326	1	within band
70	76.324	-1	within band
80	76.324	-1	within band
Test Voltage: (Vdc)	Measured Frequency (MHz)	Delta Frequency (kHz)	Limit (±kHz)
10.2	76.325	0	within band
12	76.325	Reference	within band
13.8	76.326	1	within band

**Test Freq. (GHz): 76.570**

Test Temperature: (°C)	Measured Frequency (MHz)	Delta Frequency (kHz)	Limit (±kHz)
-40	76.569	-1	within band
-30	76.568	-2	within band
-20	76.568	-2	within band
-10	76.568	-2	within band
0	76.570	0	within band
10	76.570	0	within band
20	76.570	Reference	within band
30	76.571	1	within band
40	76.574	4	within band
50	76.572	2	within band
60	76.572	2	within band
70	76.571	1	within band
80	76.571	1	within band
Test Voltage: (Vdc)	Measured Frequency (MHz)	Delta Frequency (kHz)	Limit (±kHz)
10.2	76.571	1	within band
12	76.570	Reference	within band
13.8	76.570	0	within band

**Test Freq. (GHz): 76.680**

Test Temperature: (°C)	Measured Frequency (MHz)	Delta Frequency (kHz)	Limit (±kHz)
-40	76.679	-1	within band
-30	76.677	-3	within band
-20	76.678	-2	within band
-10	76.677	-3	within band
0	76.678	-2	within band
10	76.677	-3	within band
20	76.680	Reference	within band
30	76.681	1	within band
40	76.681	1	within band
50	76.682	2	within band
60	76.682	2	within band
70	76.682	2	within band
80	76.682	2	within band
Test Voltage: (Vdc)	Measured Frequency (MHz)	Delta Frequency (kHz)	Limit (±kHz)
10.2	76.680	0	within band
12	76.680	Reference	within band
13.8	76.680	0	within band

4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.45GHz	Feb. 26, 2020	Feb. 25, 2021	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-1 6-2	04083	150kHz~100MHz	Dec. 25, 2019	Dec. 24, 2020	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Feb. 25, 2020	Feb. 24, 2021	Conduction (CO01-CB)
COND Cable	Woken	Cable	Low cable-CO01	9kHz ~ 30MHz	May 21, 2019	May 20, 2020	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	N.C.R.	Conduction (CO01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 29, 2019	Mar. 28, 2020	Radiation (03CH05-CB)
Bilog Antenna with 6dB Attenuator	TESEQ & EMCi	CBL 6112D & N-6-06	35236 & AT-N0610	30MHz ~ 2GHz	Mar. 28, 2019	Mar. 27, 2020	Radiation (03CH05-CB)
Horn Antenna	SCHWARZBECK	BBHA9120D	BBHA 9120D-1291	1GHz~18GHz	Oct. 05, 2019	Oct. 04, 2020	Radiation (03CH05-CB)
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170507	15GHz ~ 40GHz	Jun. 12, 2019	Jun. 11, 2020	Radiation (03CH05-CB)
Pre-Amplifier	EMCI	EMC330N	980331	20MHz ~ 3GHz	May 01, 2019	Apr. 30, 2020	Radiation (03CH05-CB)
Pre-Amplifier	EMCI	EMC12630SE	980287	1GHz ~ 26.5GHz	Apr. 16, 2019	Apr. 15, 2020	Radiation (03CH05-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jul. 03, 2019	Jul. 02, 2020	Radiation (03CH05-CB)
Spectrum Analyzer	R&S	FSP40	100304	9kHz ~ 40GHz	Aug. 15, 2019	Aug. 14, 2020	Radiation (03CH05-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	May 15, 2019	May 14, 2020	Radiation (03CH05-CB)
RF Cable-low	Woken	RG402	LOW Cable-04+23	30MHz~1GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-28	1GHz~18GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-04+28	1GHz~18GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH05-CB)
Mixer	OML	M19HWA	U91113-1	40 ~ 60 GHz	Oct. 01 2019	Sep. 30, 2020	Radiation (03CH05-CB)
Mixer	OML	M15HWA	V91113-1	50 ~ 75 GHz	Oct. 25 2019	Oct. 24, 2020	Radiation (03CH05-CB)
Mixer	OML	M12HWA	E91113-1	60 ~ 90 GHz	Oct. 25 2019	Oct. 24, 2020	Radiation (03CH05-CB)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Mixer	OML	M08HWA	F91113-1	90 ~ 140 GHz	Oct. 25 2019	Oct. 24, 2020	Radiation (03CH05-CB)
Mixer	OML	M05HW/A	G91113-1	140 ~ 220 GHz	Oct. 25 2019	Oct. 24, 2020	Radiation (03CH05-CB)
Mixer	OML	M03HWD	120320-1	220 ~ 325 GHz	Oct. 25 2019	Oct. 24, 2020	Radiation (03CH05-CB)
Standard Horn Antenna	Custom Microwave	M19RH	U91113-A	40 ~ 60 GHz	N.C.R.	N.C.R.	Radiation (03CH05-CB)
Standard Horn Antenna	Custom Microwave	M15RH	V91113-A	50 ~ 75 GHz	N.C.R.	N.C.R.	Radiation (03CH05-CB)
Standard Horn Antenna	Custom Microwave	M12RH	E91113-A	60 ~ 90 GHz	N.C.R.	N.C.R.	Radiation (03CH05-CB)
Standard Horn Antenna	Custom Microwave	M08RH	F91113-A	90 ~ 140 GHz	N.C.R.	N.C.R.	Radiation (03CH05-CB)
Standard Horn Antenna	Custom Microwave	M05RH	G91113-A	140 ~ 220 GHz	N.C.R.	N.C.R.	Radiation (03CH05-CB)
Standard Horn Antenna	Custom Microwave	M03RH	120320-A	220 ~ 325 GHz	N.C.R.	N.C.R.	Radiation (03CH05-CB)
Temp. and Humidity Chamber	Gaint Force	GTH-408-40-CP-AR	MAA1410-011	-40~100 degree	Sep. 12, 2019	Sep. 11, 2020	Conducted (TH03-CB)

Note: Calibration Interval of instruments listed above is one year.

N.C.R. means Non-Calibration required.