RADIO TEST REPORT

(for Bluetooth Low Energy)

Project No.	:	JB-Z0625-A
Client	:	Sony Corporation
Client's Address	:	1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan
Product Name	:	Shooting Grip With Wireless Remote Commander
Model No.	:	GP-VPT2BT
FCC ID	:	AK8GP-VPT2BT
Test Standard	:	47 CFR Part 15 Subpart C
Sample Receipt Date	:	August 29, 2019
Test Date	:	September 12, 2019 to September 20, 2019
Original Report Date	:	October 2, 2019
Amend Report Date	:	October 18, 2019
Test Result	:	Complied

Notice :

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** All test results are traceable to the national and / or international standards.*
** The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in Sony Global Manufacturing & Operations Corporation EMC/RF Test Laboratory.*
** This report replaces and supersedes all previous versions. Refer to Revision History on the following page.*

Reported by:

T. Oho

Takanori Oho
Technical Manager
EMC/RF Test Laboratory, Main Lab.
Design Technology Division

Approved Signatory:

T. Kurihara

Teruki Kurihara
Technical Manager
EMC/RF Test Laboratory, Main Lab.
Design Technology Division

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Note

☒-indicates that the listed condition, standard or equipment is applicable for this report.

☐-indicates that the listed condition, standard or equipment is not applicable for this report.

Revision History

Revision	Date	Overview	Page
JB-Z0625 (Original)	October 2, 2019	-	-
JB-Z0625-A	October 18, 2019	Corrected the note of AC Power-line Conducted Emissions.	P.3

1. General Information

1.1. Description of Equipment Under Test (EUT)

General Specification

Test Sample Condition : ☐ Prototype ☒ Pre-production ☐ Mass-production
Product Name : Shooting Grip With Wireless Remote Commander
Trade Name : SONY
Model No. : GP-VPT2BT
Serial No. : 1, 2
Power Rating of the EUT : DC 3 V (The EUT was supplied with the power from the built-in battery)

Similar model(s) to be covered by this report
Model No. : None

Radio Specification

Function of the Equipment : Transceiver
Operating Frequency : 2402 - 2480 MHz
Modulation Type : GFSK
Channel Spacing : 2 MHz
Channel Bandwidth : 1 MHz
Number of channels : 40
Antenna Type : Monopole Antenna
Antenna Connector Type : None
Antenna Gain : 0.21 dBi
Operating Temperature : -10 to +50 deg.C

1.2. Summary of Test Result

Test Item	Test Method	Worst Margin	Results	Note
AC Power-line Conducted Emissions	-	-	N/A	*2
6dB Bandwidth	Conducted	Refer to the test data	Complied	-
Maximum Peak Conducted Output Power	Conducted	26.17 dB	Complied	-
Power Spectral Density	Conducted	4.48 dB	Complied	-
Radiated Spurious Emissions	Radiated	6.8 dB (AV) 2387.007 MHz Vertical	Complied	-
Conducted Spurious Emissions for Band Edge	Conducted	22.48 dB 2399.97 MHz	Complied	*1

Note
*1: Conducted Spurious Emissions measurement was tested for frequencies in the non-restricted carrier band edges, since the spurious emissions in other non-restricted band were complied with Radiated Spurious Emissions measurement.
*2: This item does not apply since the EUT is powered by primary battery.

Other requirements

Part 15.31(e) Supply voltage requirement
: Complied (The EUT was tested with a new battery.)
Part 15.203 / 212 Antenna requirement
: Complied (The EUT has an internal antenna which cannot be replaced by users.)

1.3. Tested Methodology

Test Standard : 47 CFR Part15 Subpart C
Test Method : ANSI C63.10 - 2013
KDB 558074 D01 15.247 Meas Guidance v05r02

Test Condition

Radiated Spurious Emissions

Test Distance : ☒ 3 m ☐ 10m (9 kHz to 30 MHz)
☒ 3 m ☐ 10m (30 MHz to 1000 MHz)
☒ 3 m (1 GHz to 26.5 GHz)

Dimensions of the EUT table : 0.8 m (below 1 GHz) or 1.5 m (above 1 GHz) height, 1.5 m width and 1 m depth.
Dimensions of validated test volume : 2 m diameter, 3 m top height, 0.5 m bottom height.

1.4. Measurement Procedures

We performed the measurements in accordance with NV3-06, available upon the request.

☒ No deviation
☐ Deviation from the above procedure

The summary of the above procedure is mentioned below

Antenna-port Conducted Measurements

1. Antenna-port of the EUT was connected to the power sensor (Maximum Peak Conducted Output Power) or the spectrum analyzer. (other test items).
2. For each EUT operation mode, the Antenna-port Conducted Measurements were measured with the power sensor or the spectrum analyzer.

Test Item Antenna-port Conducted Measurements	Detector	RBW
6dB Bandwidth	Peak	100 kHz
Maximum Peak Conducted Output Power	Peak	-
Power Spectral Density	Peak	100 kHz
Conducted Spurious Emissions for Band Edge	Peak	100 kHz

Radiated Spurious Emissions

1. The non-conductive table (EUT table) made of (☐ FRP, ☒ Styrene Foam, ☐ other non-conductive material) was placed in the center of the turntable.
2. The EUT was placed on the center of the tabletop.
3. The test antenna was placed away from the EUT at test distance.
4. The limits were compensated the distance factor with follows;
   9 kHz to 490 kHz [Limit at 3 m] = [Limit at 300 m] + 40log (300[m] / 3[m])
   490 kHz to 30 MHz [Limit at 3 m] = [Limit at 30 m] + 40log (30[m] / 3[m])
5. Find the worst arrangement of the EUT according to follows;
   - Rotating the turntable and/ or scanning the antenna.
   - On every condition, exploring the highest emissions with the spectrum analyzer. (9 kHz to 26.5 GHz, peak detector)
6. On the worst arrangement of the EUT found in above, choose the six highest harmonics or spurious emissions on the spectrum data.(*excluding carrier band edges)
   The final measurements of all test operating modes carried out on these emissions as follows;

   The test antenna and the turntable were performed with follows;

	9 kHz to 30 MHz	30 MHz to 1000 MHz	1 GHz to 26.5 GHz
Antenna	Loop Antenna	Bi-conical Antenna, Log-periodic Antenna	Horn Antenna
Antenna scanning range	1 m, Vertical, 360 degrees	1 m to 4 m, Horizontal and Vertical	1 m to 4 m *, Horizontal and Vertical
Turntable rotating range	360 degrees	360 degrees	360 degrees

   *: When the measurement frequencies above 1 GHz, final measurements are performed keeping the antenna in the "cone of radiation" from EUT area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.

   Instruments settings were carried out with follows;

	9 kHz to 90 kHz 110 kHz to 490 kHz	90 kHz to 110 kHz 490 kHz to 30 MHz	30 MHz to 1000 MHz	1 GHz to 26.5 GHz
Detector	Peak / Average	Quasi-peak	Quasi-peak	Peak / Average
RBW	200 Hz (6 dB) or 9 kHz (6 dB) *1	200 Hz (6 dB) or 9 kHz (6 dB) *1	120 kHz (6 dB)	1 MHz (6 dB)
VBW	N/A	N/A	N/A	3 MHz (for peak) 10 kHz (for average) *2
Instrument	EMI test receiver	EMI test receiver	EMI test receiver	Spectrum analyzer

   *1: When the measurement frequencies below 150 kHz, RBW: 200 Hz was used.
   *2: VBW setting (for average) was higher than 1/T. (T is the minimum transmission duration)

7. If the final measurement result exceeded the limit in non-restricted band(excluding carrier band edges), the measurement is carried out additionally with follows;

   Measurement points
   - Fundamental Frequency
   - Frequency that exceeded the limit in non-restricted band (excluding carrier band edges)

	9 kHz to 150 kHz	150 kHz to 30 MHz	30 MHz to 26.5 GHz
Detector	Peak	Peak	Peak
RBW	300 Hz (6 dB) *	10 kHz (6 dB) *	100 kHz (6 dB)
Instrument	Spectrum analyzer	Spectrum analyzer	Spectrum analyzer

   *: Correction factor of RBW was compensated to a measurement result by the following formula.
   C.F. of RBW [dB] = 10*log (100 kHz / used RBW)

8. If the final average measurement result exceeded the limit in the authorized band edge, the integration method is carried out with follows;

	2.4835 GHz to 2.4855 GHz
Detector	Peak
RBW	100 kHz (6 dB)
Instrument	Spectrum analyzer
Function	Channel Power (integration BW : 1 MHz)

9. Although these tests for below 30MHz were performed other than open field area test site, adequate comparison measurements were confirmed against 30 m open field area test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788 D01.
   Further these test for above 1GHz were performed test site complied with CISPR 16-1-4.
   In the case of EUT size smaller than the validated test volume, the antenna position is adjusted such that the distance between the EUT and the antenna reference point is identical to the 3m used for the S-VSWR validation measurements. These method based on clause 7.3.1 of CISPR16-1-4 Edition 4, therefore correcting distance factor is not applied.

1.5. Test Location

Test Facility Name : Sony Global Manufacturing & Operations Corporation
EMC/RF Test Laboratory, Main Lab.
Address : 8-4 Shiomi Kisarazu-shi, Chiba-ken, 292-0834, Japan
Phone : +81 438 37 2750

A2LA Certificate No. : 3203.01
Cert. Validated Date : Oct. 31, 2019

Antenna-port Conducted Measurements
Shielded Room
☒ 4th Site SR1

Radiated Spurious Emissions
Semi-Anechoic chamber
☐ 4th Site ☒ EMC Site

1.6. Uncertainty

Test Item	Frequency	4th Site SR1
Maximum Conducted Output Power	1 GHz to 6 GHz	± 0.84 dB
Power Spectral Density, Conducted Spurious Emissions	below 6 GHz	± 1.25 dB

Test Item	Frequency	Distance	4th Site	EMC Site
AC Power-line Conducted Emissions	150 kHz to 30 MHz	-	± 3.34 dB	± 3.35 dB
Radiated Emissions	9 kHz to 30 MHz	3m	± 2.60 dB	± 3.13 dB
	30 MHz to 1000 MHz	3m	± 4.96 dB	± 5.26 dB
	1 GHz to 18 GHz	3m	± 5.22 dB	± 5.50 dB
	18 GHz to 26.5 GHz	3m	± 5.36 dB	± 5.63 dB

2. Test Specification

2.1. Validation

The system was configured for testing in a typical (as a customer would normally use it).
The tests were conducted with the worst-case modes as follows.

2.2. Operating Condition

The tests have been carried out the following conditions.
[Transmitting mode]

Test Items	Test Channels	Data Rate
Radiated Spurious Emissions (below 1GHz) *1	2402 MHz	1 Mbps
6dB Bandwidth, Maximum Conducted Output Power, Power Spectral Density, Radiated Spurious Emissions (above 1GHz)	2402 MHz 2440 MHz 2480 MHz	1 Mbps
Conducted Spurious Emissions for Band Edge	2402 MHz	1 Mbps

Note
*1: The test was performed with the representative mode that had been found as the worst emissions while exploratory testing.

The Software for Operating Mode

Software Name : dtm
Software Version : 18.11.26

2.3. Special Accessories

Special accessories needed for connecting the EUT to achieve compliance:

Item	Manufacturer	Model No.	Serial No.	Remark
-	-	-	-	-

2.4. EUT Modifications

☒ No equipment modification to achieve compliance to the standard levels was done during the tests.
☐ Equipment was modified to achieve compliance to the standard level as below.

Responsible Party Signature

Typed/ Print Name :
Responsible Party :
Position :
Date :

2.5. Configuration of EUT System

Antenna-port Conducted Measurements

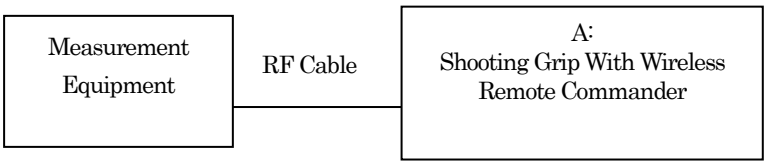
[EUT and Associated Equipment (AE)]

Symbol	EUT/ AE	Item	Manufacturer	Model No.	Serial No.
A	EUT	Shooting Grip With Wireless Remote Commander	SONY	GP-VPT2BT	2

[Type of Cable]

Symbol	Description	Identification (Manufacturer etc.)	Shielded Yes / No	Ferrite Core	Length (m)	Bundled
-	-	-	-	-	-	-

[Connecting Diagram]



Radiated Spurious Emissions

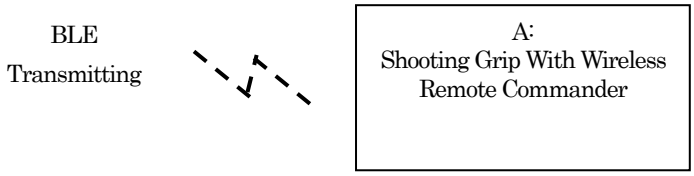
[EUT and Associated Equipment (AE)]

Symbol	EUT/ AE	Item	Manufacturer	Model No.	Serial No.
A	EUT	Shooting Grip With Wireless Remote Commander	SONY	GP-VPT2BT	1

[Type of Cable]

Symbol	Description	Identification (Manufacturer etc.)	Shielded Yes / No	Ferrite Core	Length (m)	Bundled
-	-	-	-	-	-	-

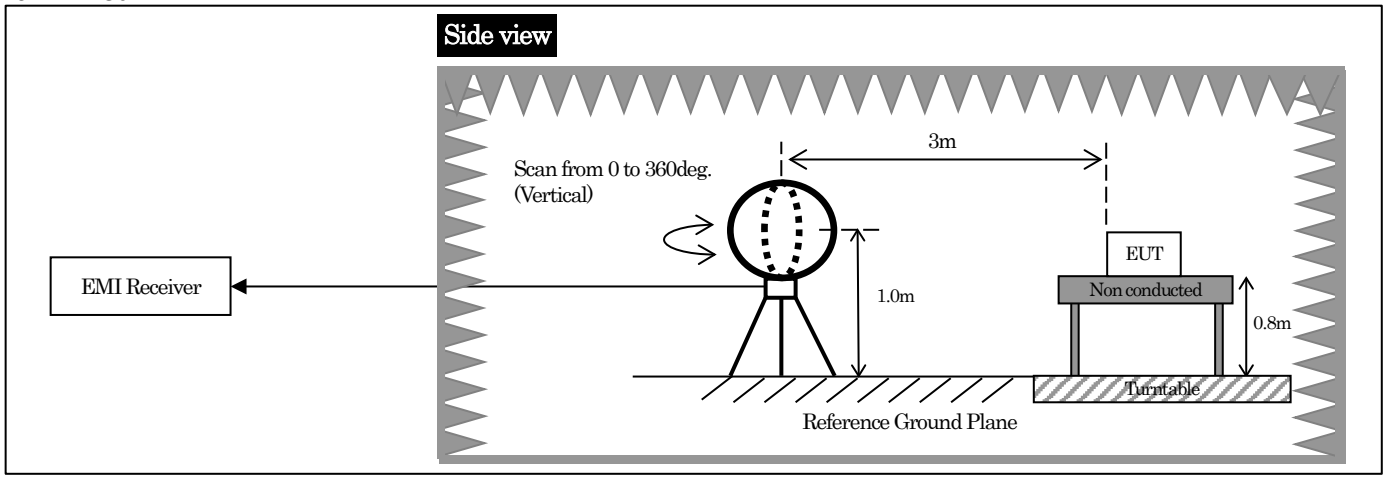
[Connecting Diagram]



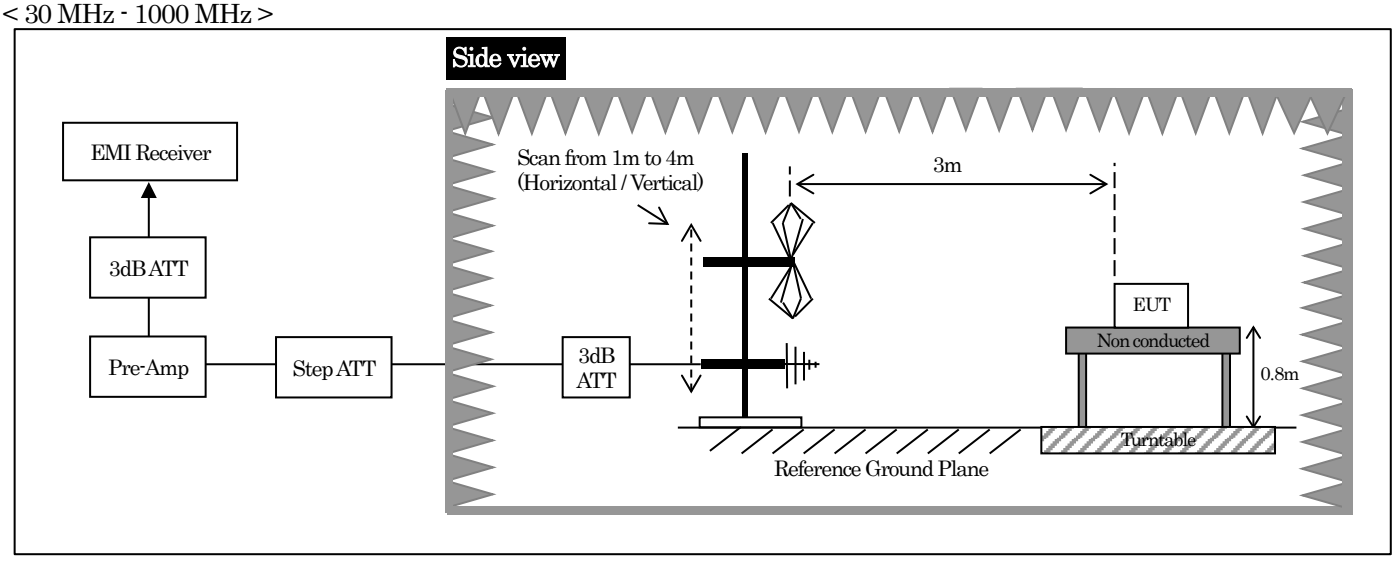
2.6. View of Measurement Facility

Radiated spurious emissions

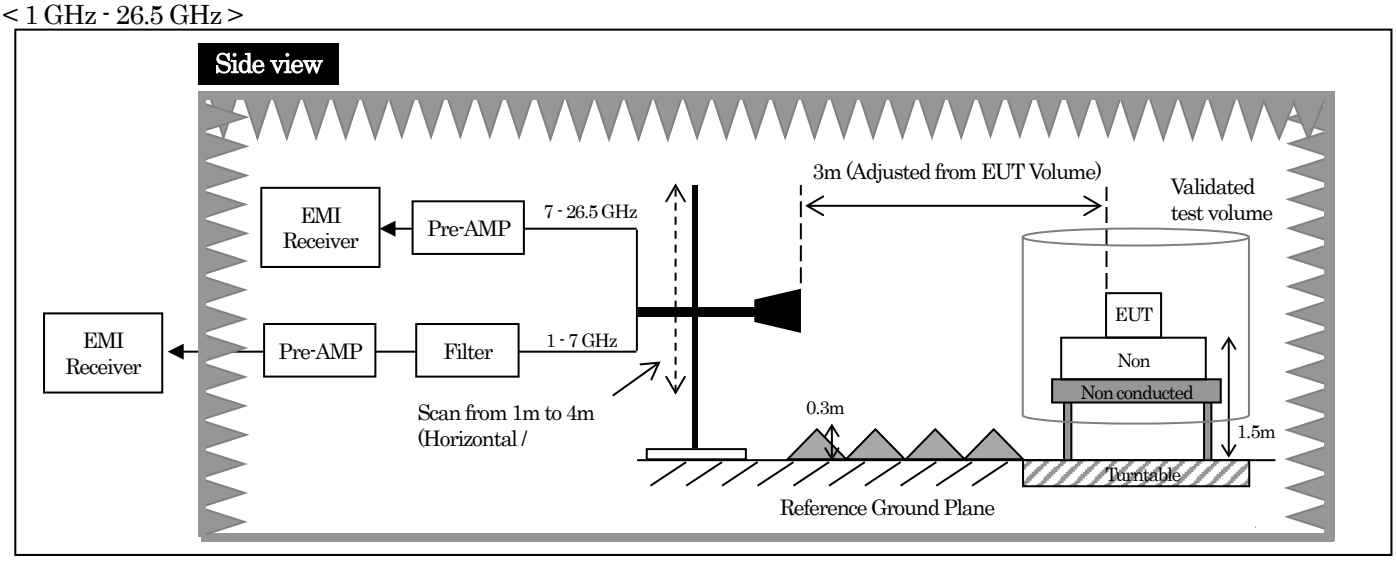
< 9 kHz - 30 MHz >



< 30 MHz - 1000 MHz >



< 1 GHz - 26.5 GHz >



3. Test Data

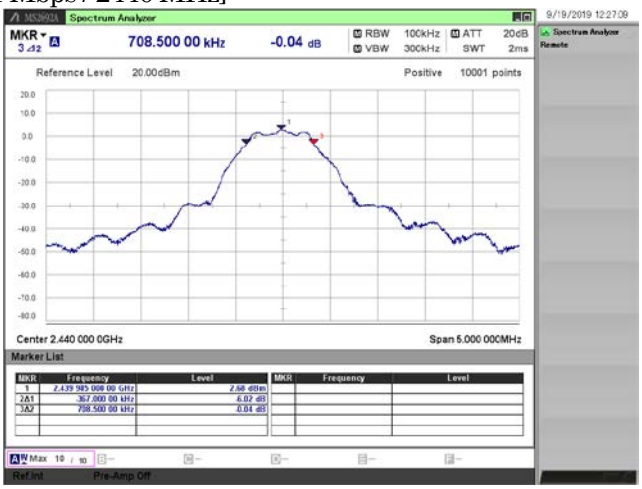
3.1. 6dB Bandwidth

1) Ambient temperature : 22.2 deg.C
2) Relative humidity : 70.6 %
3) Date of measurement : September 19, 2019
4) Measured by : M.KOUGA
5) Operating mode : Transmitting mode

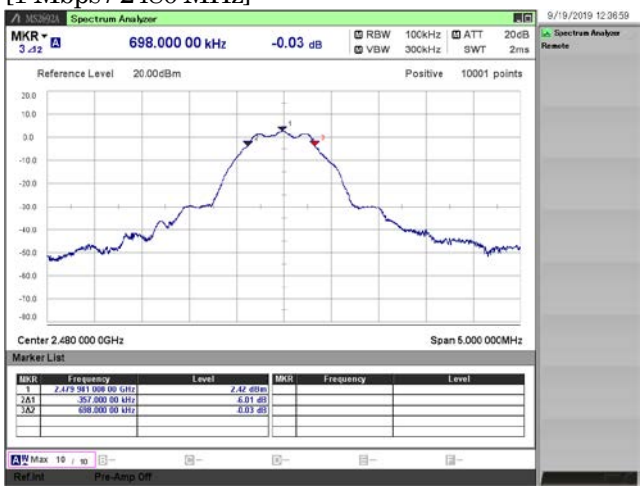
Mode	Rate [Mbps]	Channel [MHz]	Result [MHz]	Limit [MHz]
BLE	1	2402	0.698	0.5
		2440	0.709	0.5
		2480	0.698	0.5

[1 Mbps / 2402 MHz]

[1 Mbps / 2440 MHz]



[1 Mbps / 2480 MHz]



3.2. Maximum Peak Conducted Output Power

1) Ambient temperature : 23.0 deg.C
2) Relative humidity : 56.1 %
3) Date of measurement : September 12, 2019
4) Measured by : M.KOUGA
5) Operating mode : Transmitting mode

Maximum Peak Conducted Output Power

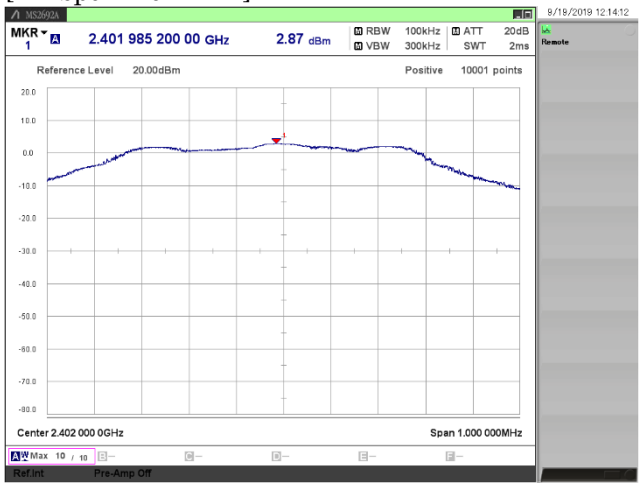
Mode	Rate [Mbps]	Channel [MHz]	Reading(PK) [dBm]	C.F. [dB]	Result(PK) [dBm]	Result(PK) [W]	Limit [dBm]	Margin [dB]
BLE	1	2402	3.48	0.35	3.83	0.00242	30.0	26.17
		2440	3.37	0.35	3.72	0.00236	30.0	26.28
		2480	2.95	0.35	3.30	0.00214	30.0	26.70

3.3. Power Spectral Density

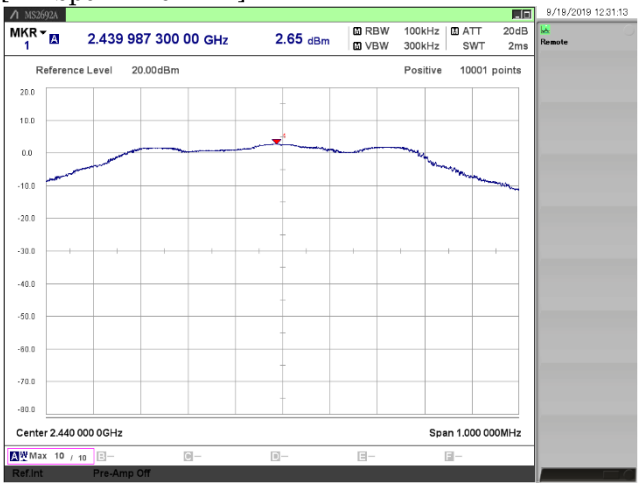
1) Ambient temperature : 22.2 deg.C
2) Relative humidity : 70.6 %
3) Date of measurement : September 19, 2019
4) Measured by : M.KOUGA
5) Operating mode : Transmitting mode

Mode	Rate [Mbps]	Channel [MHz]	Reading(PK) [dBm]	C.F. [dB]	Result(PK) [dBm]	Limit [dBm]	Margin [dB]
BLE	1	2402	2.87	0.65	3.52	8.0	4.48
		2440	2.65	0.65	3.30	8.0	4.70
		2480	2.41	0.65	3.06	8.0	4.94

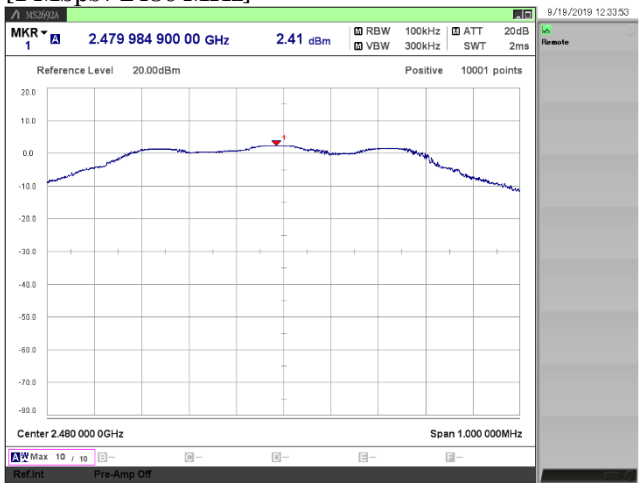
[1 Mbps / 2402 MHz]



[1 Mbps / 2440 MHz]



[1 Mbps / 2480 MHz]



3.4. Radiated Spurious Emissions

1) Date of measurement

9 kHz to 30 MHz	: September 20, 2019	(all mode)	
30 MHz to 1000 MHz	: September 20, 2019	(all mode)	
1 GHz to 7 GHz	: September 17, 2019	(all mode)	(band edge plot data)
7 GHz to 18 GHz	: September 18, 2019	(all mode)	
18 GHz to 26.5 GHz	: September 18, 2019	(all mode)	

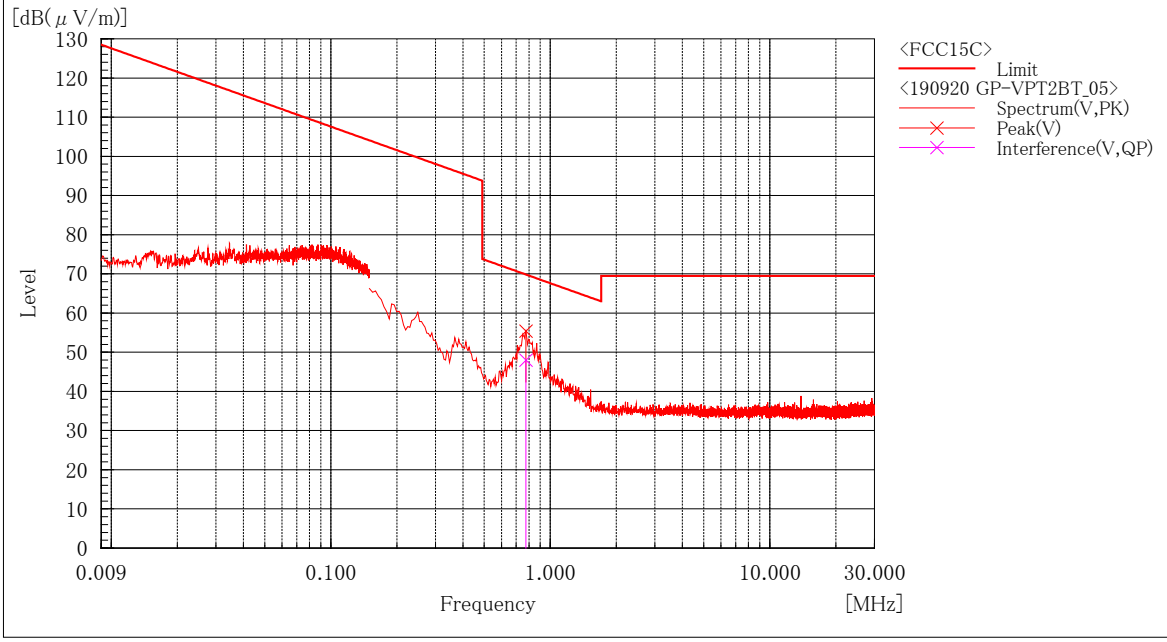
The test data is mentioned as follows.

9 kHz to 30 MHz
[1 Mbps / 2402 MHz]

Sony Global M&O Corp
Kisarazu No.1

<<Radiated Emission>>

Model	: GP-VPT2BT	Limit	: FCC Part15C_15.209 (3m)
Serial	: 1	Remark1	: 0°
Operator	: T.NAKAMURA	Remark2	: Y
Power	: DC 3.0V	Remark3	: 1M
Environment	: 22deg.C / 46% / 1012hPa	Remark4	: Low



Final Result

--- Vertical Polarization (QP)---

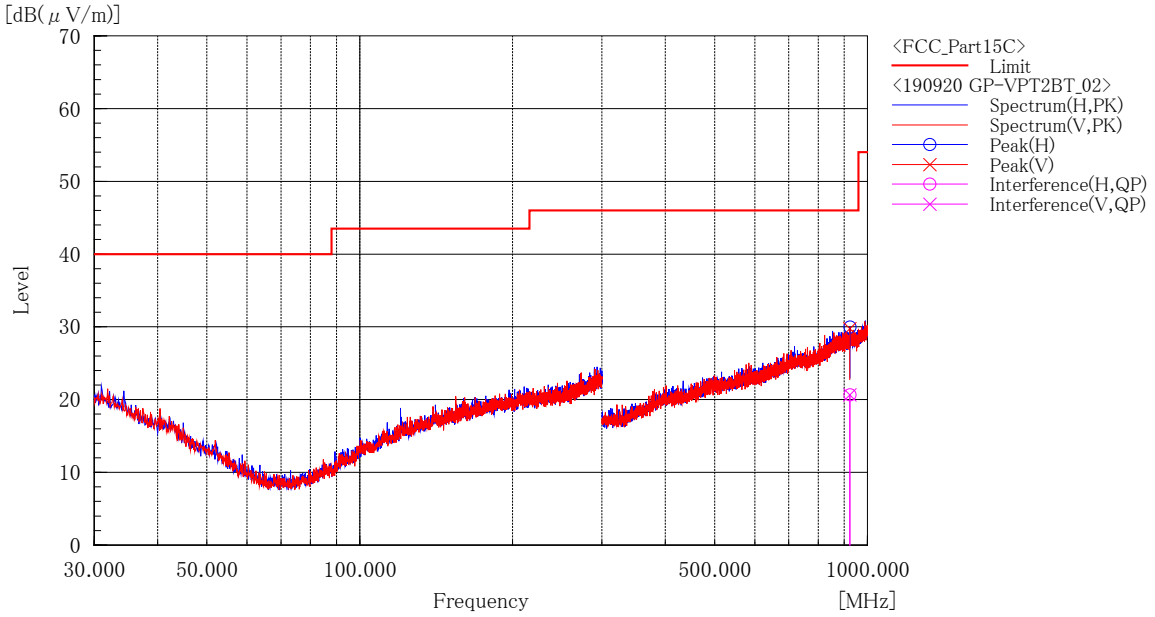
No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	0.774	28.3	19.7	48.0	69.8	21.8	100.0	19.3

30 MHz to 1000 MHz
[1 Mbps / 2402 MHz]

Sony Global M&O Corp
Kisarazu No.1

<<Radiated Emission>>

Model	: GP-VPT2BT	Limit	: FCC Part15C 15.209(a) 3m
Serial	: 1	Remark1	:
Operator	: T.NAKAMURA	Remark2	: Y
Power	: DC 3.0V	Remark3	: 1M
Environment	: 22deg.C / 46% / 1012hPa	Remark4	: Low



Final Result

--- Horizontal Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	924.157	19.9	0.8	20.7	46.0	25.3	240.5	276.6

--- Vertical Polarization (QP)---

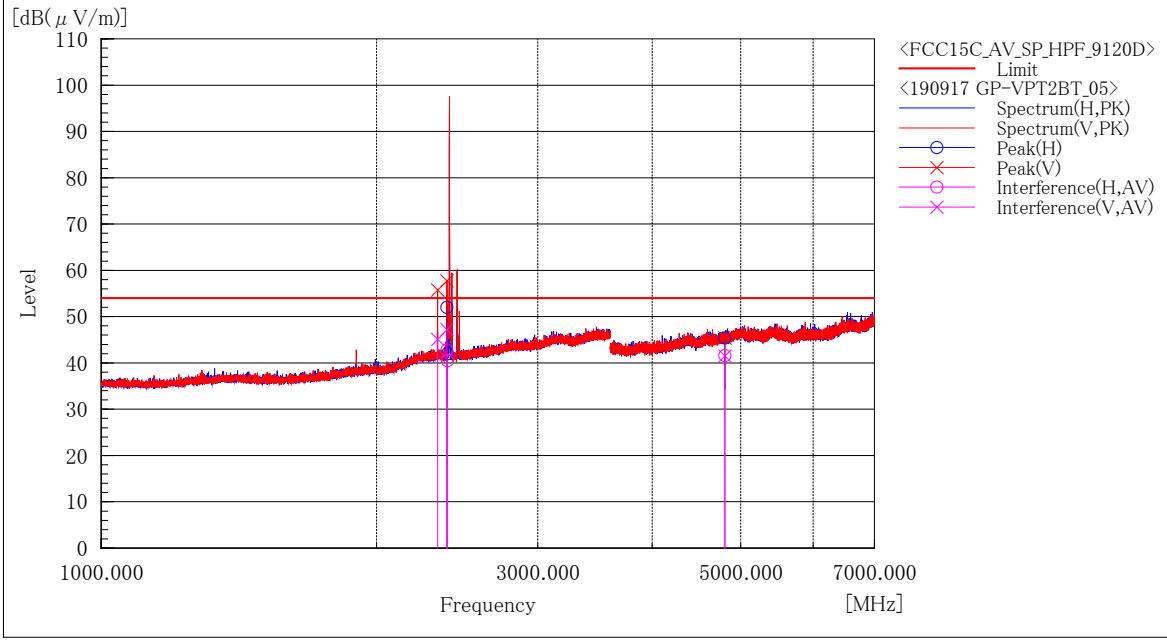
No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	923.063	19.9	0.8	20.7	46.0	25.3	161.9	51.2

1 GHz to 7 GHz
[1 Mbps / 2402 MHz]

Sony Global M&O Corp
Kisarazu TEC No.1

<<Radiated Emission>>

Model	: GP-VPT2BT	Limit	: FCC Part15C 15.209(a) 3m
Serial	: 1	Remark1	:
Operator	: T.NAKAMURA	Remark2	: Y
Power	: DC 3.0V	Remark3	: 1M
Environment	: 22deg.C / 41% / 1008hPa	Remark4	: Low



Final Result

--- Horizontal Polarization (AV)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	2387.170	40.1	2.7	42.8	54.0	11.2	136.2	297.2
2	2390.000	37.8	2.7	40.5	54.0	13.5	119.3	298.9
3	4804.000	30.7	10.9	41.6	54.0	12.4	246.0	10.4

--- Vertical Polarization (AV)---

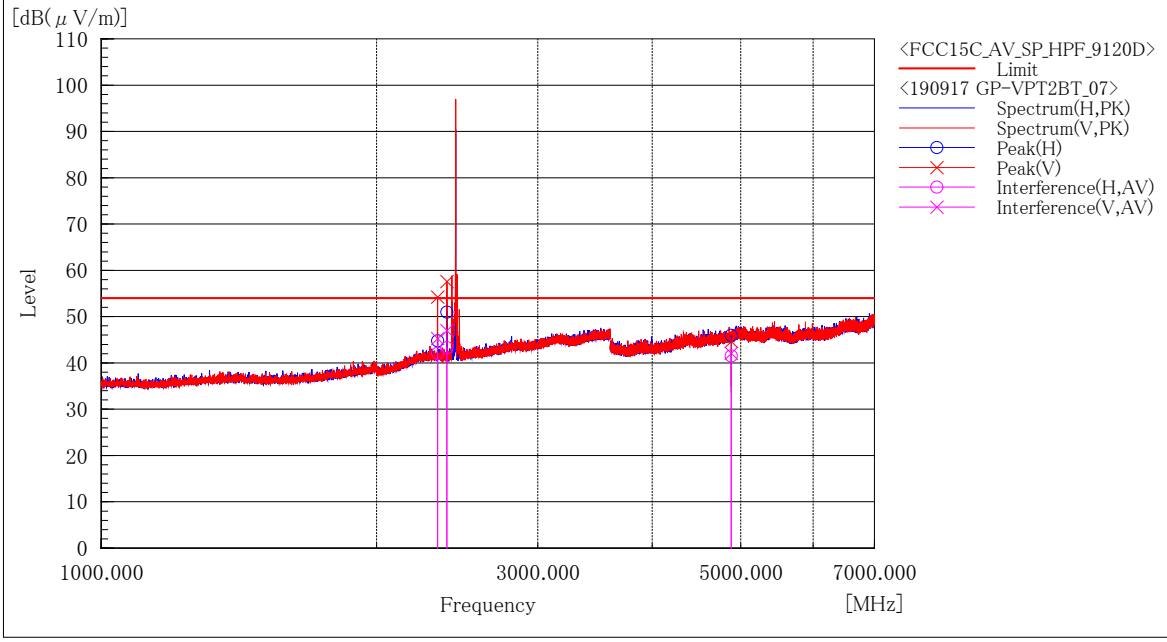
No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	2331.042	42.2	2.9	45.1	54.0	8.9	227.2	344.7
2	2387.007	44.5	2.7	47.2	54.0	6.8	106.9	203.0
3	4804.000	30.6	10.9	41.5	54.0	12.5	122.4	173.4

[1 Mbps / 2440 MHz]

Sony Global M&O Corp
Kisarazu TEC No.1

<<Radiated Emission>>

Model	: GP-VPT2BT	Limit	: FCC Part15C 15.209(a) 3m
Serial	: 1	Remark1	:
Operator	: T.NAKAMURA	Remark2	: Y
Power	: DC 3.0V	Remark3	: 1M
Environment	: 22deg.C / 41% / 1008hPa	Remark4	: Mid



Final Result

--- Horizontal Polarization (AV)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	2331.172	39.2	2.9	42.1	54.0	11.9	100.0	304.7
2	2387.168	40.6	2.7	43.3	54.0	10.7	100.0	305.6
3	4880.000	30.5	11.0	41.5	54.0	12.5	129.9	53.2

--- Vertical Polarization (AV)---

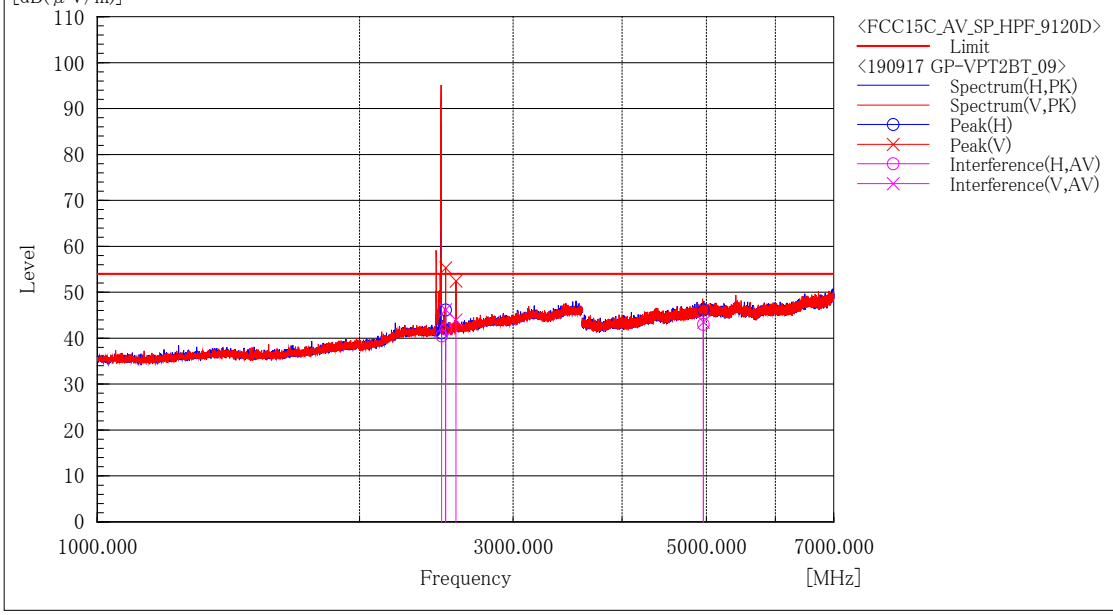
No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	2331.058	42.4	2.9	45.3	54.0	8.7	235.7	342.2
2	2386.986	44.3	2.7	47.0	54.0	7.0	111.6	192.2
3	4880.000	31.1	11.0	42.1	54.0	11.9	138.6	101.8

[1 Mbps / 2480 MHz]

Sony Global M&O Corp
Kisarazu TEC No.1

<<Radiated Emission>>

Model	: GP-VPT2BT	Limit	: FCC Part15C 15.209(a) 3m
Serial	: 1	Remark1	:
Operator	: T.NAKAMURA	Remark2	: Y
Power	: DC 3.0V	Remark3	: 1M
Environment	: 22deg.C / 41% / 1008hPa	Remark4	: High



Final Result

--- Horizontal Polarization (AV)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	2483.500	37.4	3.1	40.5	54.0	13.4	131.8	155.1
2	2510.289	38.8	3.2	42.0	54.0	12.0	196.7	140.9
3	4960.000	31.7	11.3	43.0	54.0	11.0	277.4	150.9

--- Vertical Polarization (AV)---

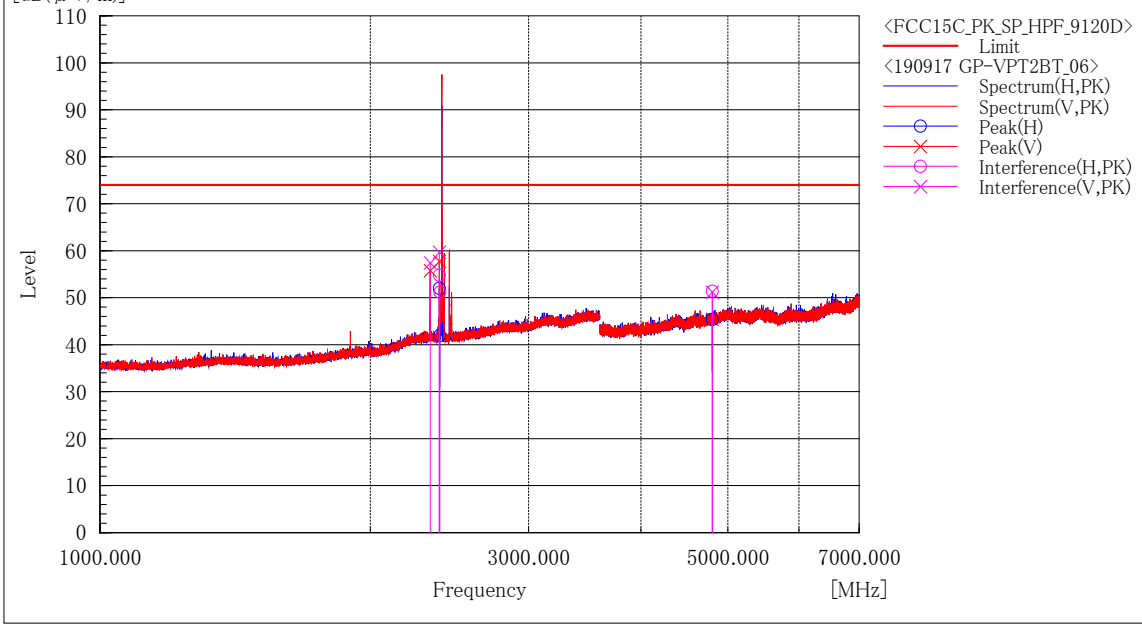
No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	2510.245	43.0	3.2	46.2	54.0	7.8	175.6	344.8
2	2580.277	40.6	3.4	44.0	54.0	10.0	139.0	317.0
3	4960.000	32.2	11.3	43.5	54.0	10.5	174.4	107.9

[1 Mbps / 2402 MHz]

Sony Global M&O Corp
Kisarazu TEC No.1

<<Radiated Emission>>

Model	: GP-VPT2BT	Limit	: FCC Part15C 15.209(a) 3m
Serial	: 1	Remark1	:
Operator	: T.NAKAMURA	Remark2	: Y
Power	: DC 3.0V	Remark3	: 1M
Environment	: 22deg.C / 41% / 1008hPa	Remark4	: Low



Final Result

--- Horizontal Polarization (PK)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	2387.089	52.1	2.7	54.8	74.0	19.2	136.0	297.5
2	2390.000	48.5	2.7	51.2	74.0	22.8	117.0	296.3
3	4804.000	40.5	10.9	51.4	74.0	22.6	243.7	11.7

--- Vertical Polarization (PK)---

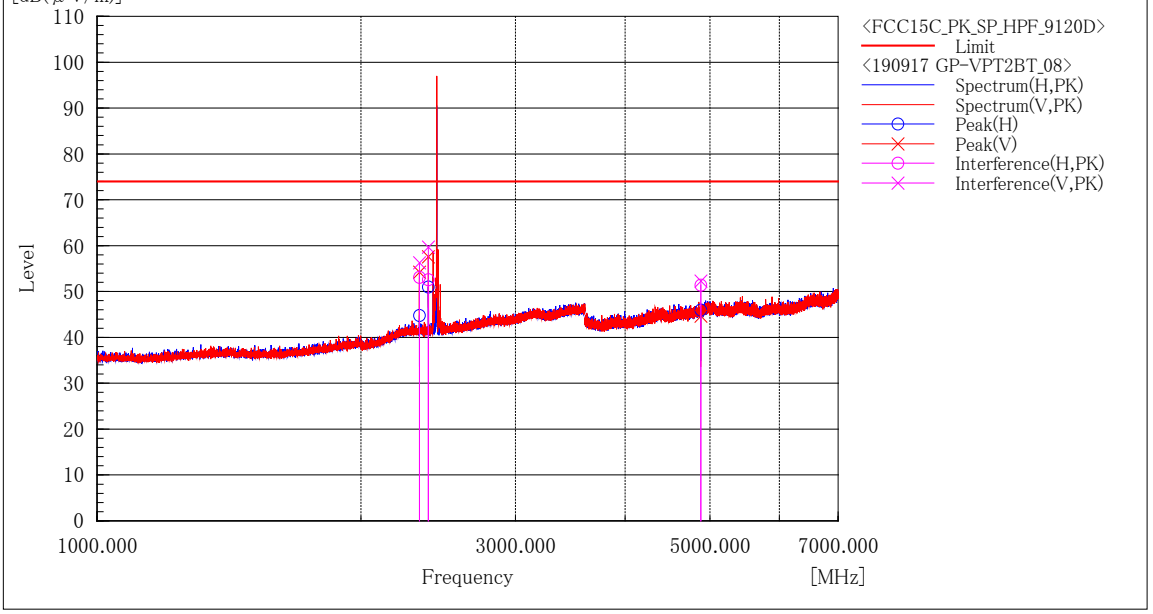
No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	2331.112	54.5	2.9	57.4	74.0	16.6	231.9	343.9
2	2387.094	57.0	2.7	59.7	74.0	14.3	103.8	204.5
3	4804.000	40.3	10.9	51.2	74.0	22.8	119.6	174.6

[1 Mbps / 2440 MHz]

Sony Global M&O Corp
Kisarazu TEC No.1

<<Radiated Emission>>

Model	: GP-VPT2BT	Limit	: FCC Part15C 15.209(a) 3m
Serial	: 1	Remark1	:
Operator	: T.NAKAMURA	Remark2	: Y
Power	: DC 3.0V	Remark3	: 1M
Environment	: 22deg.C / 41% / 1008hPa	Remark4	: Mid



Final Result

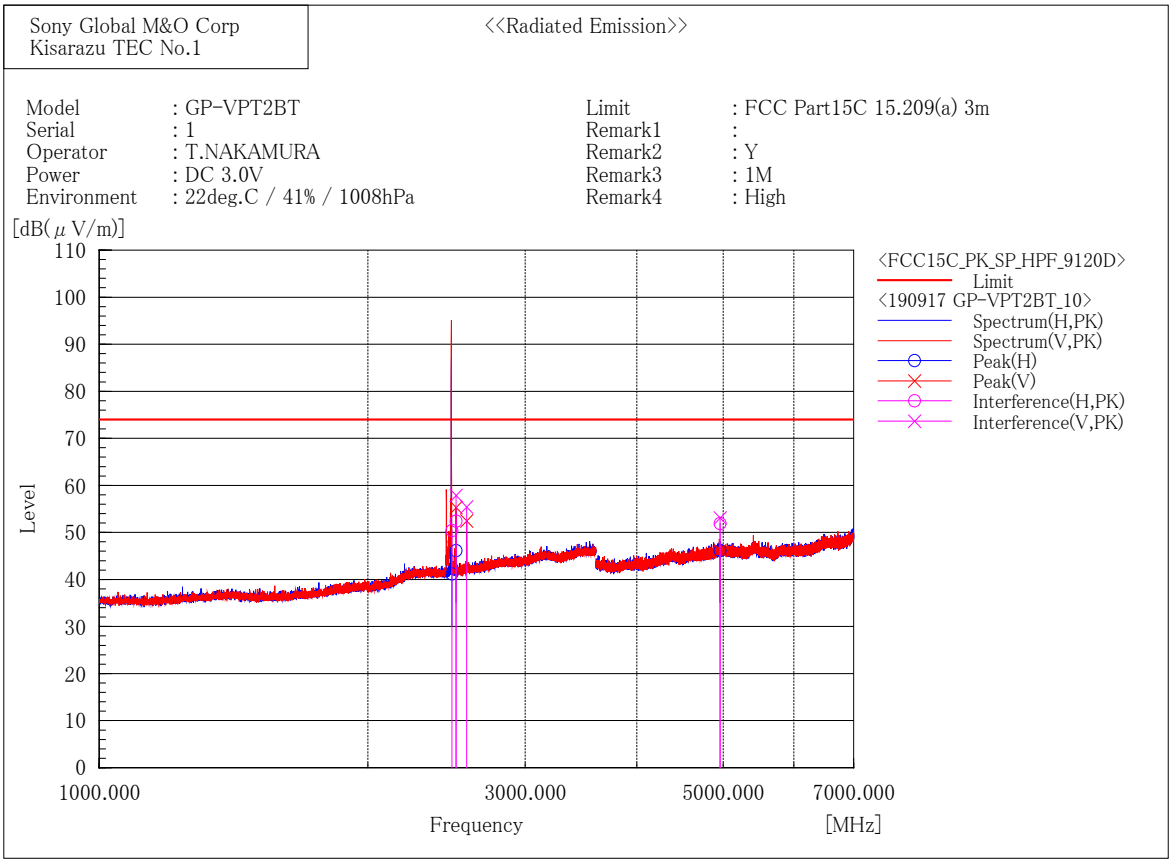
--- Horizontal Polarization (PK)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	2330.980	50.2	2.9	53.1	74.0	20.9	100.0	306.7
2	2386.965	49.9	2.7	52.6	74.0	21.4	100.0	306.7
3	4880.000	40.4	11.0	51.4	74.0	22.6	126.3	54.6

--- Vertical Polarization (PK)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	2331.005	53.4	2.9	56.3	74.0	17.7	235.0	341.6
2	2386.960	57.0	2.7	59.7	74.0	14.3	113.6	192.7
3	4880.000	41.3	11.0	52.3	74.0	21.7	135.5	105.2

[1 Mbps / 2480 MHz]



Final Result

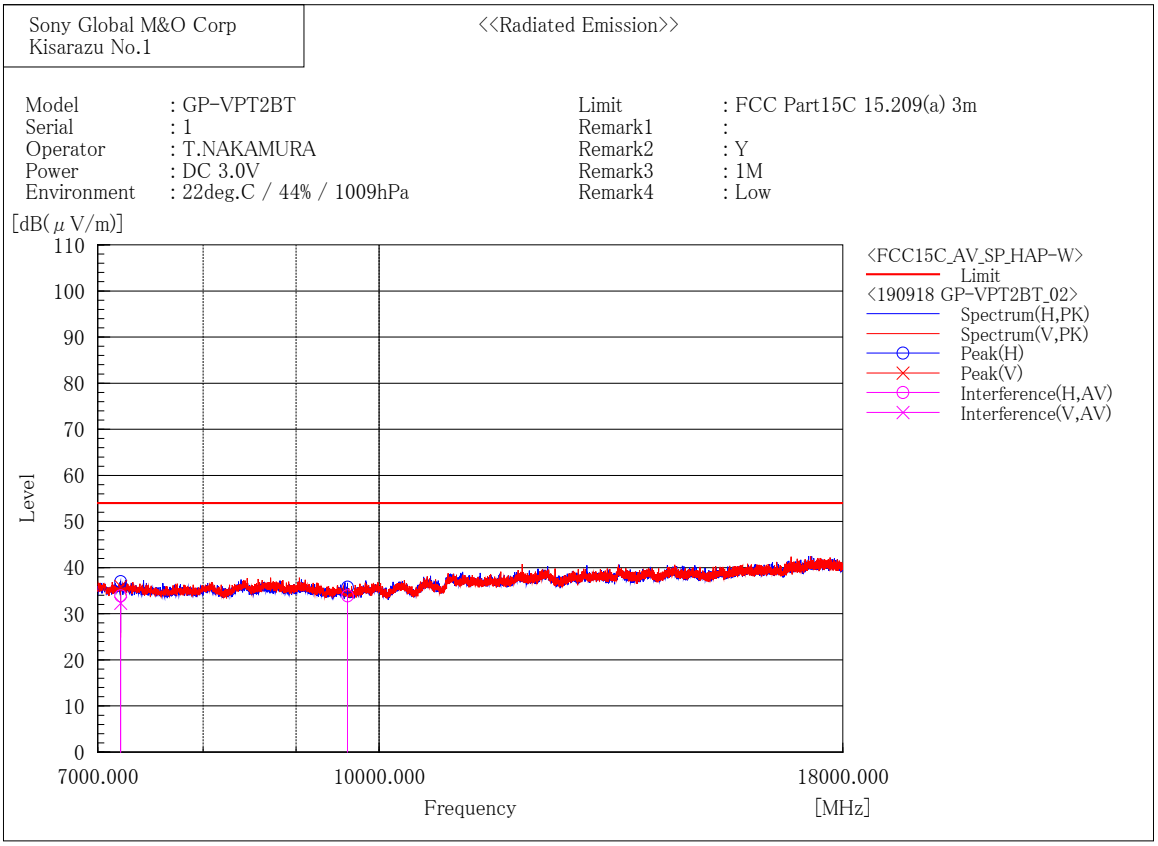
--- Horizontal Polarization (PK)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	2483.500	47.3	3.1	50.4	74.0	23.6	133.3	156.0
2	2510.289	49.2	3.2	52.4	74.0	21.6	198.1	141.7
3	4960.000	40.6	11.3	51.9	74.0	22.1	276.0	153.3

--- Vertical Polarization (PK)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	2510.316	54.7	3.2	57.9	74.0	16.1	174.6	345.4
2	2580.342	52.0	3.4	55.4	74.0	18.6	140.2	317.5
3	4960.000	41.8	11.3	53.1	74.0	20.9	172.8	109.7

7 GHz to 18 GHz
[1 Mbps / 2402 MHz]



Final Result

--- Horizontal Polarization (AV)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	7205.268	41.8	-7.9	33.9	54.0	20.1	100.0	239.7
2	9608.920	39.9	-6.0	33.9	54.0	20.1	100.0	192.2

--- Vertical Polarization (AV)---

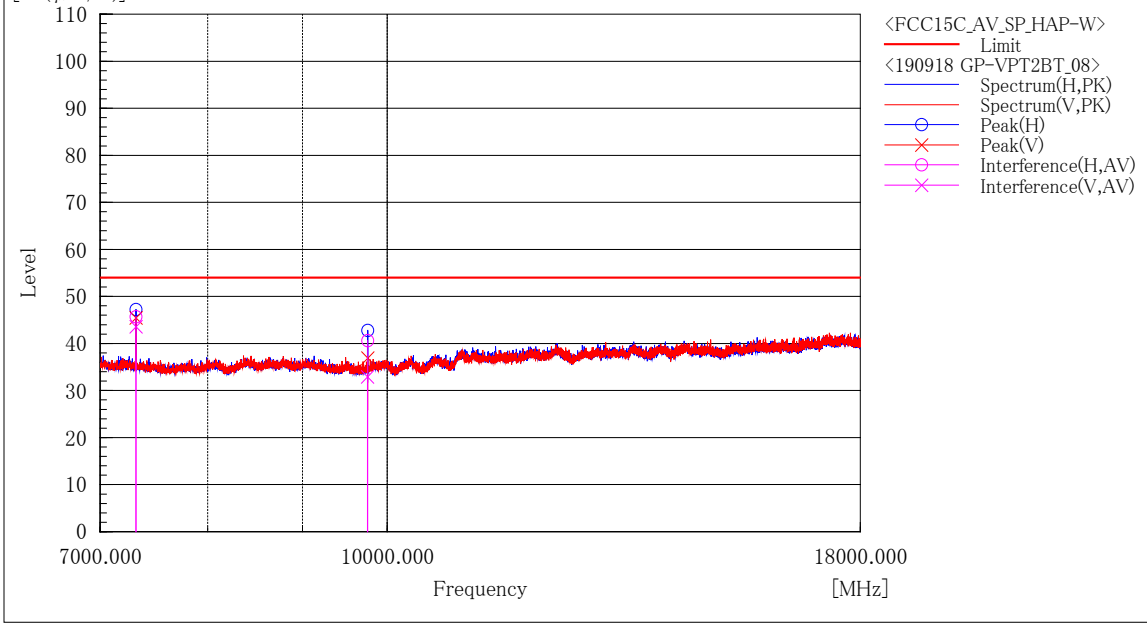
No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	7206.652	40.2	-7.9	32.3	54.0	21.7	100.0	160.0

[1 Mbps / 2440 MHz]

Sony Global M&O Corp
Kisarazu No.1

<<Radiated Emission>>

Model	: GP-VPT2BT	Limit	: FCC Part15C 15.209(a) 3m
Serial	: 1	Remark1	:
Operator	: T.NAKAMURA	Remark2	: Y
Power	: DC 3.0V	Remark3	: 1M
Environment	: 22deg.C / 44% / 1009hPa	Remark4	: Mid



Final Result

--- Horizontal Polarization (AV)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	7319.965	53.6	-7.9	45.7	54.0	8.3	100.0	218.7
2	9759.919	46.1	-5.5	40.6	54.0	13.4	100.0	180.8

--- Vertical Polarization (AV)---

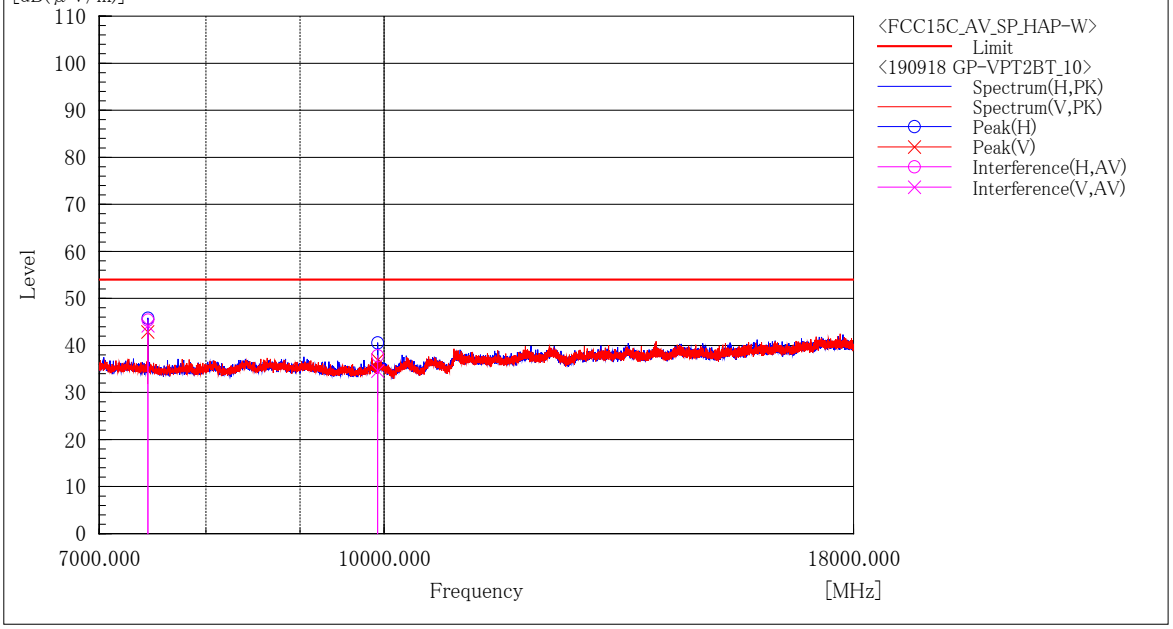
No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	7319.972	51.5	-7.9	43.6	54.0	10.4	100.0	127.4
2	9758.887	38.4	-5.5	32.9	54.0	21.1	245.0	147.1

[1 Mbps / 2480 MHz]

Sony Global M&O Corp
Kisarazu No.1

<<Radiated Emission>>

Model	: GP-VPT2BT	Limit	: FCC Part15C 15.209(a) 3m
Serial	: 1	Remark1	:
Operator	: T.NAKAMURA	Remark2	: Y
Power	: DC 3.0V	Remark3	: 1M
Environment	: 22deg.C / 44% / 1009hPa	Remark4	: High



Final Result

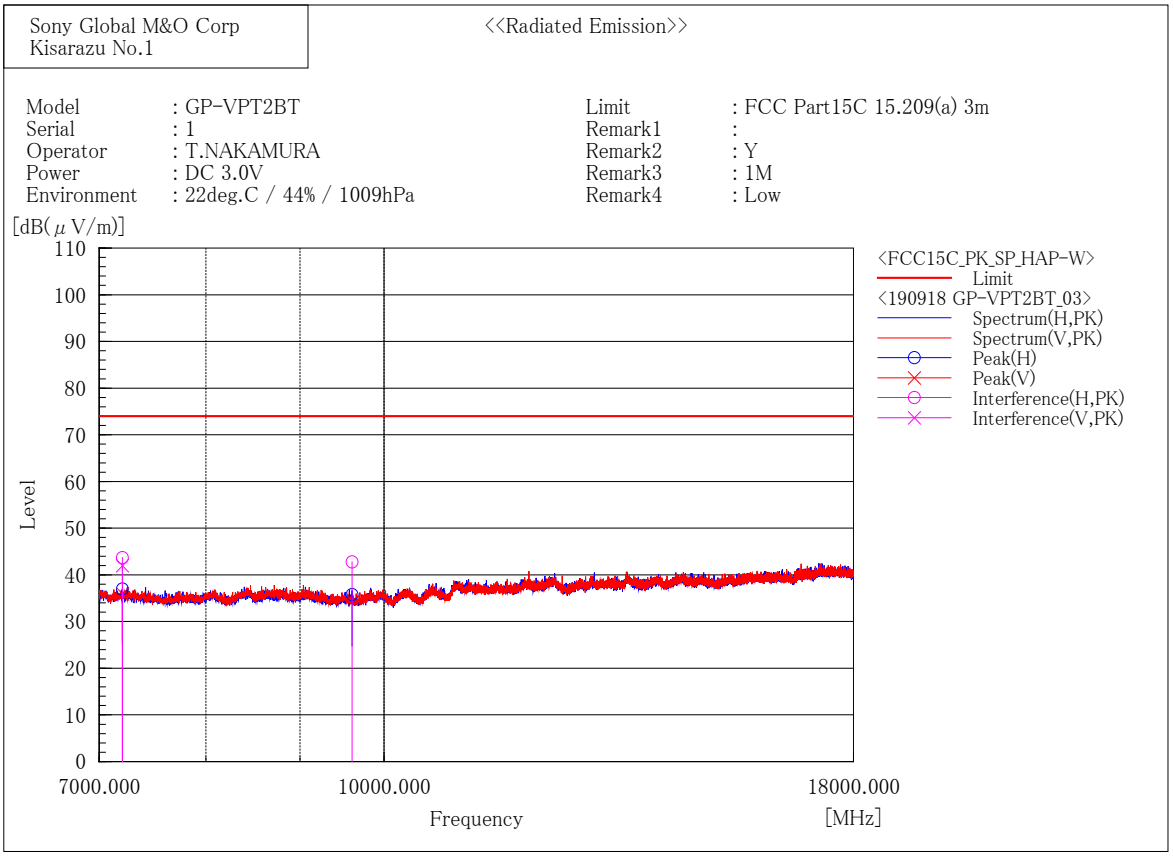
--- Horizontal Polarization (AV)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	7439.972	53.3	-7.9	45.4	54.0	8.6	100.0	200.8
2	9919.993	43.1	-5.3	37.8	54.0	16.2	100.0	178.8

--- Vertical Polarization (AV)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	7439.980	52.1	-7.9	44.2	54.0	9.8	100.0	130.0
2	9919.969	39.9	-5.3	34.6	54.0	19.4	100.0	133.0

[1 Mbps / 2402 MHz]



Final Result

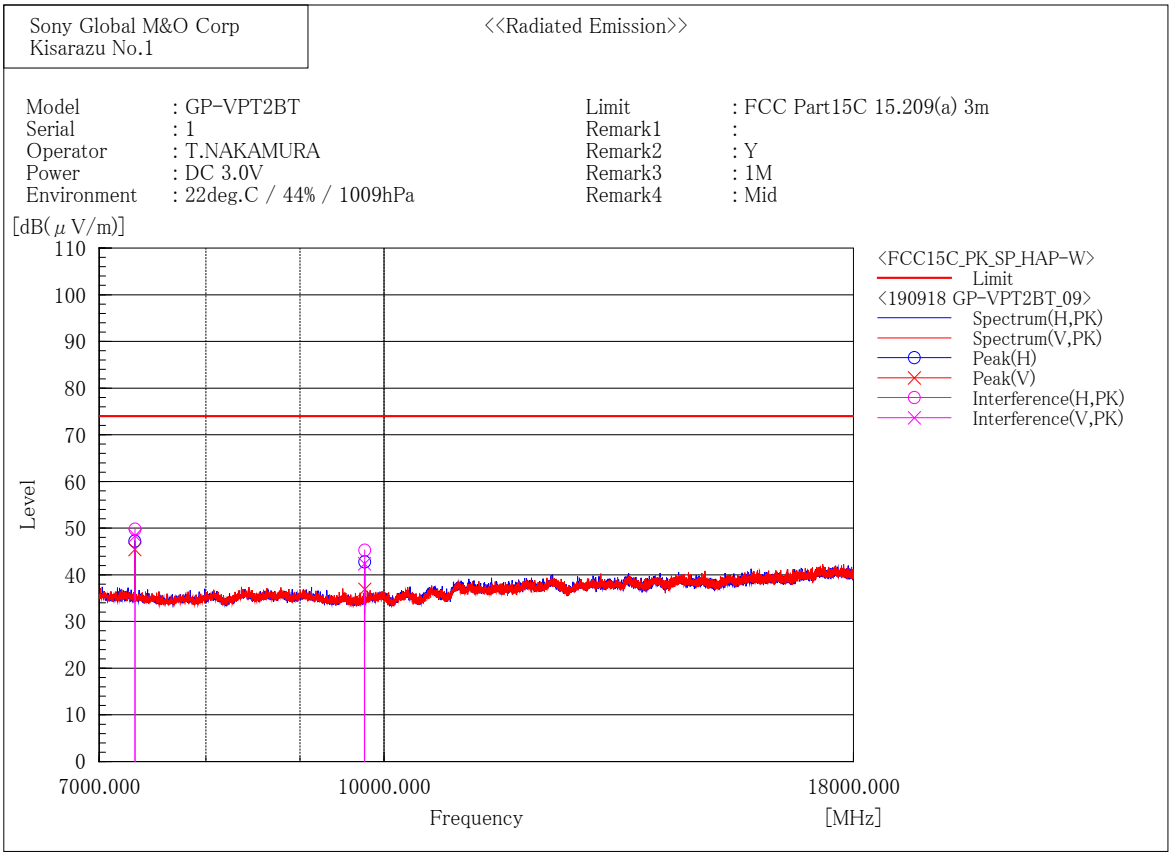
--- Horizontal Polarization (PK)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	7205.258	51.6	-7.9	43.7	74.0	30.3	100.0	237.7
2	9608.930	48.8	-6.0	42.8	74.0	31.2	100.0	192.0

--- Vertical Polarization (PK)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	7206.711	49.9	-7.9	42.0	74.0	32.0	100.0	160.5

[1 Mbps / 2440 MHz]



Final Result

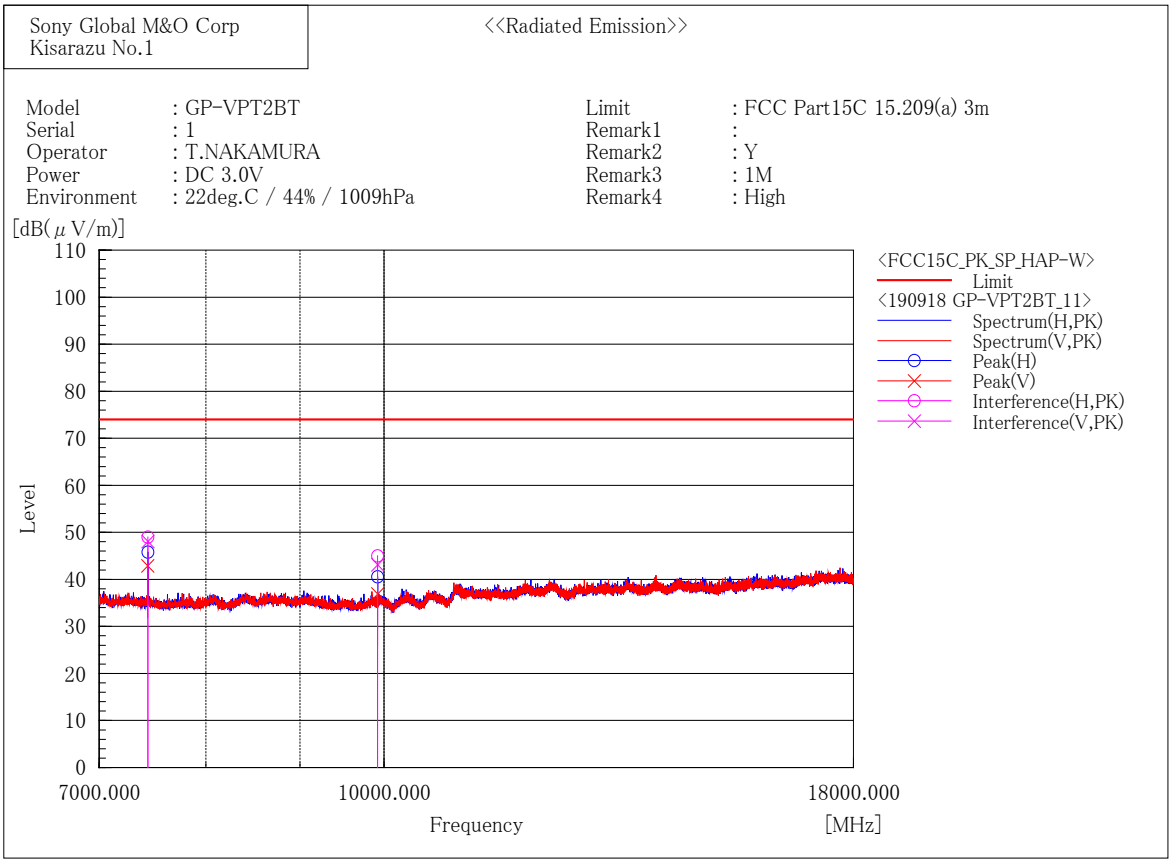
--- Horizontal Polarization (PK)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	7320.801	57.7	-7.9	49.8	74.0	24.2	100.0	215.1
2	9759.920	50.8	-5.5	45.3	74.0	28.7	100.0	182.5

--- Vertical Polarization (PK)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	7320.649	56.3	-7.9	48.4	74.0	25.6	100.0	128.7
2	9758.895	47.9	-5.5	42.4	74.0	31.6	246.5	149.0

[1 Mbps / 2480 MHz]



Final Result

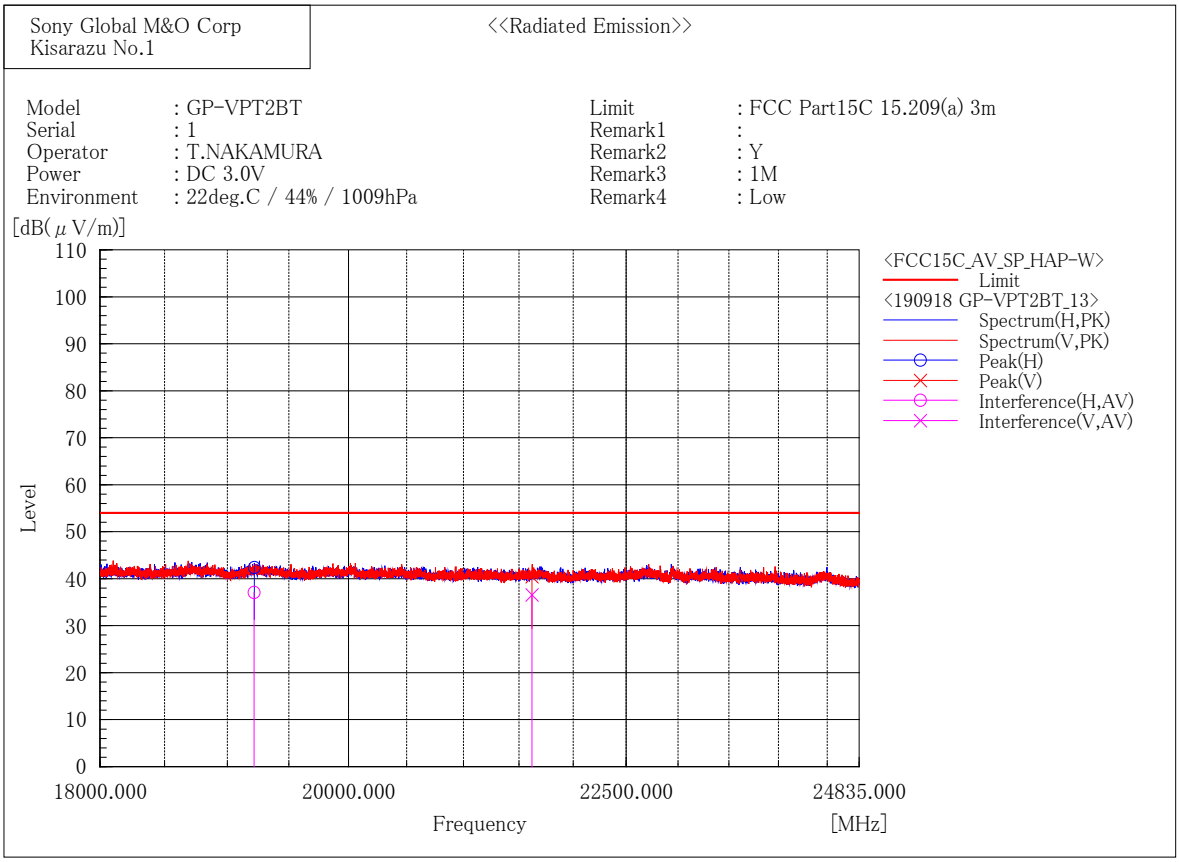
--- Horizontal Polarization (PK)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	7440.695	56.9	-7.9	49.0	74.0	25.0	100.0	203.5
2	9920.900	50.2	-5.2	45.0	74.0	29.0	100.0	181.2

--- Vertical Polarization (PK)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	7440.743	56.0	-7.9	48.1	74.0	25.9	100.0	129.3
2	9920.909	48.3	-5.2	43.1	74.0	30.9	100.0	135.5

18 GHz to 24.835 GHz
[1 Mbps / 2402 MHz]



Final Result

--- Horizontal Polarization (AV)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	19216.000	37.9	-0.8	37.1	54.0	16.9	100.0	236.9

--- Vertical Polarization (AV)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	21618.000	38.4	-1.8	36.6	54.0	17.4	179.9	6.0

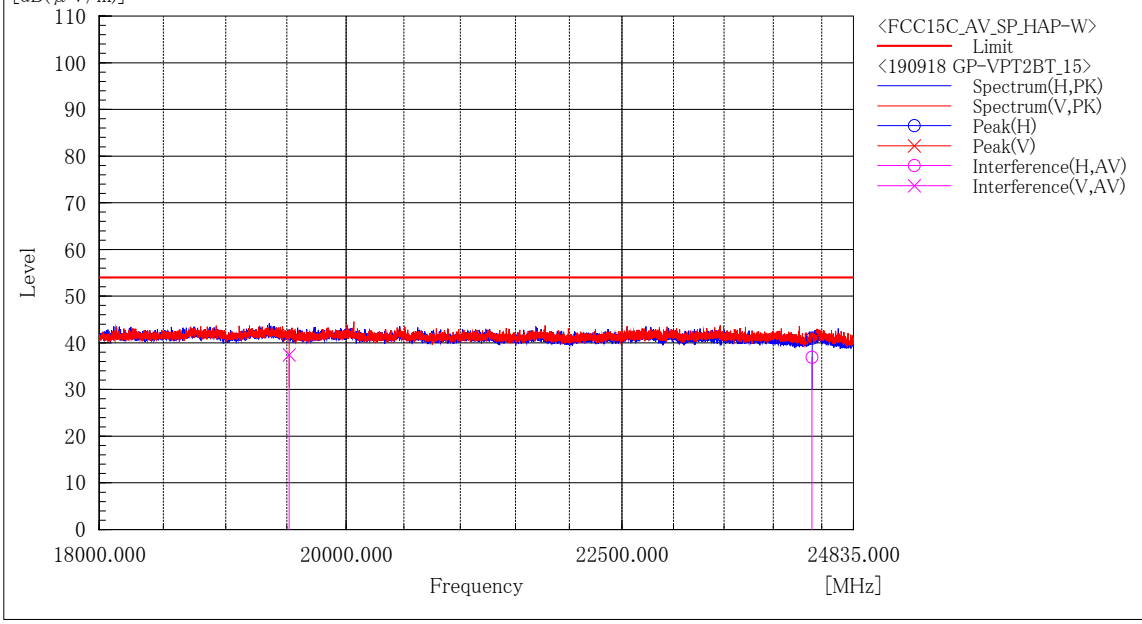
[1 Mbps / 2440 MHz]

Sony Global M&O Corp
Kisarazu No.1

<<Radiated Emission>>

Model : GP-VPT2BT
Serial : 1
Operator : T.NAKAMURA
Power : DC 3.0V
Environment : 22deg.C / 44% / 1009hPa

Limit : FCC Part15C 15.209(a) 3m
Remark1 :
Remark2 : Y
Remark3 : 1M
Remark4 : Mid



Final Result

--- Horizontal Polarization (AV)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	24400.000	39.5	-2.6	36.9	54.0	17.1	117.3	357.1

--- Vertical Polarization (AV)---

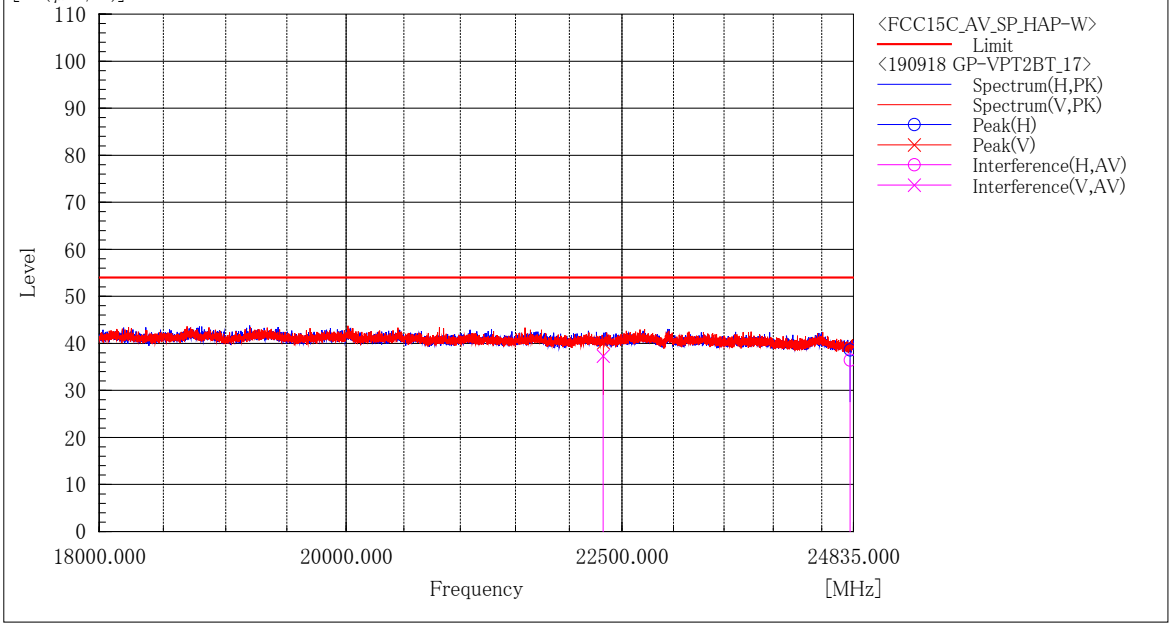
No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	19520.000	38.2	-0.8	37.4	54.0	16.6	274.6	23.8

[1 Mbps / 2480 MHz]

Sony Global M&O Corp
Kisarazu No.1

<<Radiated Emission>>

Model	: GP-VPT2BT	Limit	: FCC Part15C 15.209(a) 3m
Serial	: 1	Remark1	:
Operator	: T.NAKAMURA	Remark2	: Y
Power	: DC 3.0V	Remark3	: 1M
Environment	: 22deg.C / 44% / 1009hPa	Remark4	: High



Final Result

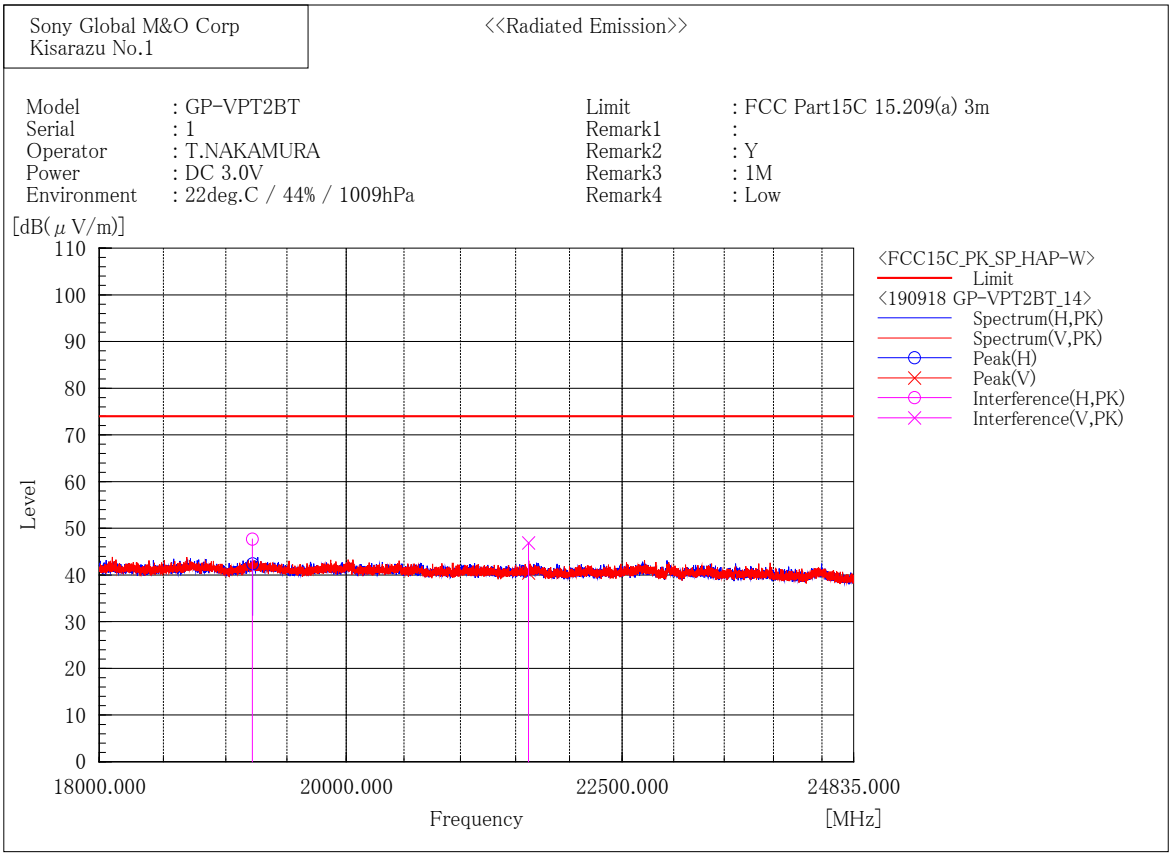
--- Horizontal Polarization (AV)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	24800.180	39.3	-2.8	36.5	54.0	17.5	195.3	19.3

--- Vertical Polarization (AV)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	22320.000	39.3	-2.0	37.3	54.0	16.7	212.6	116.6

[1 Mbps / 2402 MHz]



Final Result

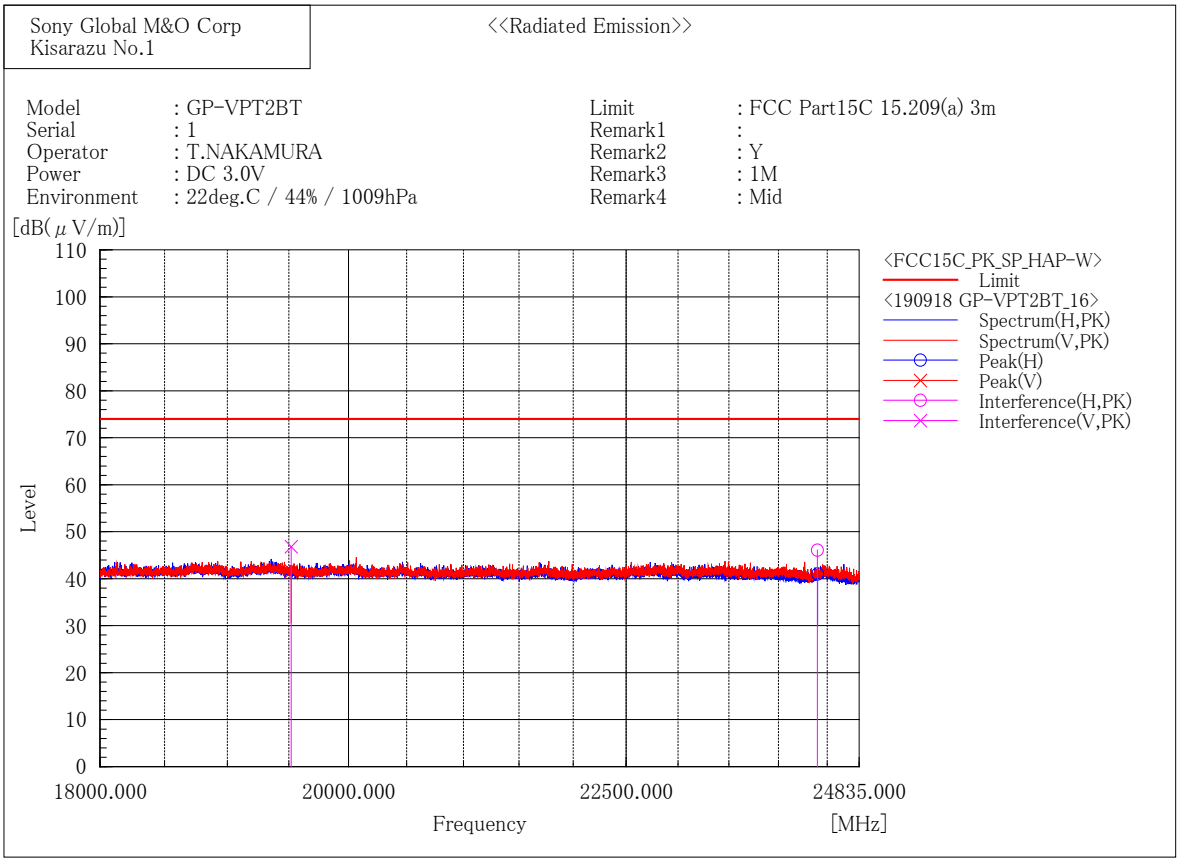
--- Horizontal Polarization (PK)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	19216.000	48.5	-0.8	47.7	74.0	26.3	100.0	245.7

--- Vertical Polarization (PK)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	21618.000	48.7	-1.8	46.9	74.0	27.1	158.2	20.1

[1 Mbps / 2440 MHz]



Final Result

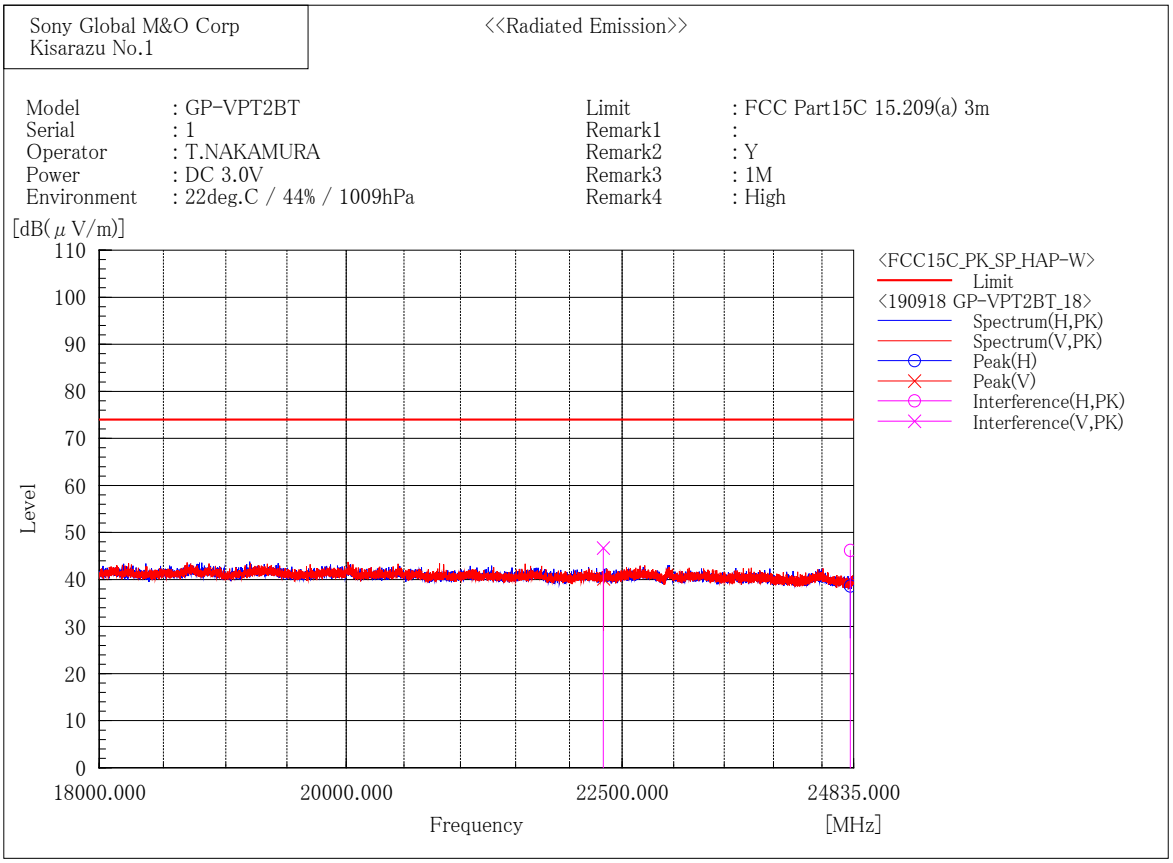
--- Horizontal Polarization (PK)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	24400.000	48.7	-2.6	46.1	74.0	27.9	112.6	358.4

--- Vertical Polarization (PK)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	19520.000	47.6	-0.8	46.8	74.0	27.2	266.7	29.1

[1 Mbps / 2480 MHz]



Final Result

--- Horizontal Polarization (PK)---

No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	24800.000	49.0	-2.8	46.2	74.0	27.8	193.9	20.7

--- Vertical Polarization (PK)---

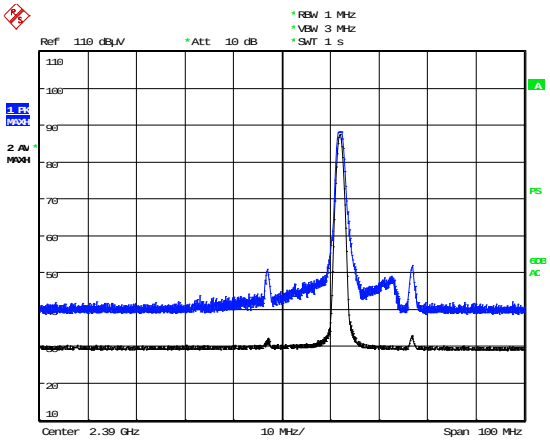
No.	Frequency [MHz]	Reading [dB(μV)]	c.f [dB(1/m)]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]	Height [cm]	Angle [°]
1	22320.000	48.7	-2.0	46.7	74.0	27.3	195.1	128.8

2.4 GHz Restricted-Band Edge (Plot data)

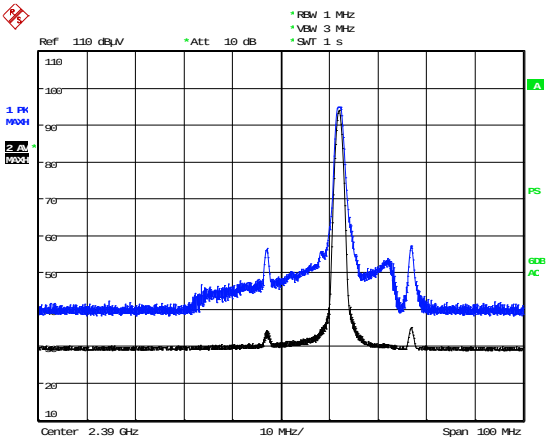
These plot data show peak (trace blue) and average (trace black) spectrum for worst case emissions in the restricted-band edges. (Restricted band edges: below 2390 MHz and above 2483.5 MHz)
The result of the final radiated spurious emissions measurement refers in previous pages.

[1 Mbps / 2402 MHz]

Horizontal

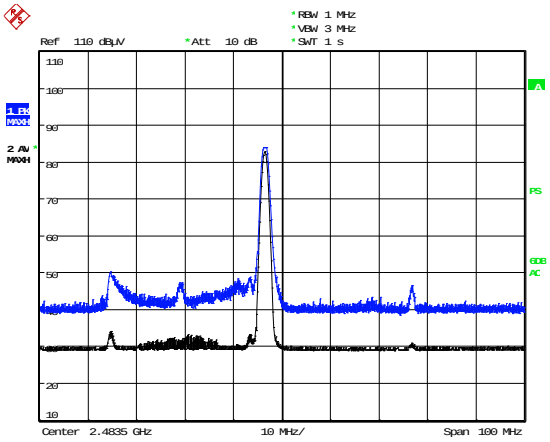


Vertical

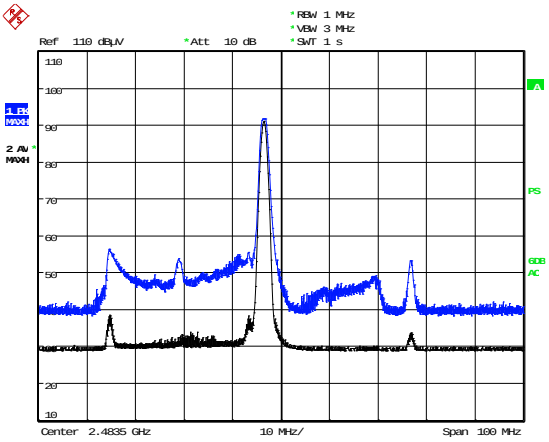


[1 Mbps / 2480 MHz]

Horizontal



Vertical

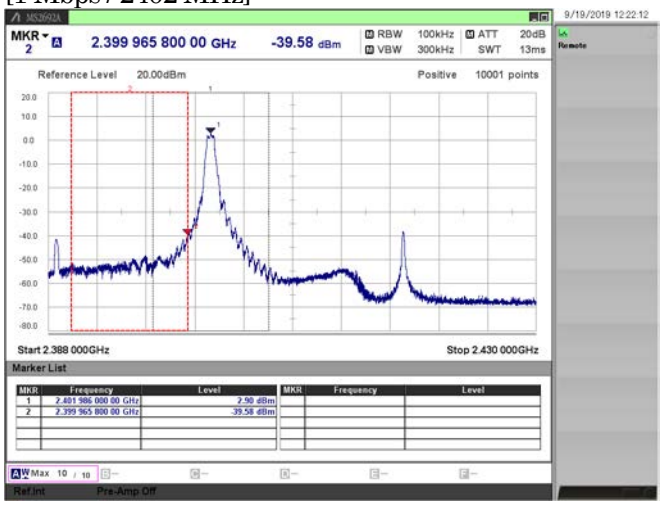


3.5. Conducted Spurious Emissions for Band Edge

1) Ambient temperature : 22.2 deg.C
2) Relative humidity : 70.6 %
3) Date of measurement : September 19, 2019
4) Measured by : M.KOUGA
5) Operating mode : Transmitting mode

Mode	Rate [Mbps]	Channel [MHz]	Frequency [MHz]	Reading(PK) [dBm]	C.F. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
BLE	1	2402	2401.99	2.90	0.65	3.55	-	-
			2399.97	-39.58	0.65	-38.93	-16.5	22.48

[1 Mbps / 2402 MHz]



4. Method of Calculation

4.1. Maximum Peak Conducted Output Power

Method of calculation : Software
Software Name : SW-0316
Software Version : Ver.2

Test Result (PK) [dBm] = Meter Reading [dBm] + C.F. [dB]

Note (a) Meter Reading : Reading of the power meter
(b) C.F. : System Cable Loss + EUT Cable Loss

4.2. Power Spectral Density

Method of calculation : Software
Software Name : SW-0316
Software Version : Ver.2

Test Result [dBm] = Meter Reading [dBm] + C.F. [dB]

Note (a) Meter Reading : Reading of the spectrum analyzer
(b) C.F. : System Cable Loss + EUT Cable Loss

4.3. Radiated Spurious Emissions

Method of calculation : Software
Software Name : V-Scan
Software Version : Ver.4.0.30

Test Result [dBuV/ m] = Meter Reading [dBuV] + C.F. [dB/ m]

Note (a) Meter Reading : Reading of the EMI test receiver or the spectrum analyzer.
(b) C.F. : ☒ Antenna Factor (including Balun Loss) + System GainLoss
: ☐ Antenna Factor (including Balun Loss) + System GainLoss + 20 log (3 m/ 10 m)

4.4. Conducted Spurious Emissions for Band Edge

Method of calculation : Software
Software Name : SW-0316
Software Version : Ver.2

Test Result [dBm] = Meter Reading [dBm] + C.F. [dB]

Note (a) Meter Reading : Reading of the spectrum analyzer.
(b) C.F. : System Cable Loss + EUT Cable Loss

5. List of Test Equipment

All test results are traceable to the national and/or international standards.

5.1. Antenna-port Conducted Measurements

	Ctrl.#	Equipment	Model No.	Serial No.	Manufacturer	Cal.Interval	Last Cal.
-	W0140	Spectrum Analyzer	FSU26	200717	Rohde & Schwarz	12 months	18.09.01
x	W0100	Spectrum Analyzer	MS2692A	6201338954	Anritsu	12 months	19.05.09
x	W0006	Power Meter	N1911A	MY50000295	Agilent Technologies	12 months	18.10.06
x	W0007	Power Sensor	N1922A	MY50180022	Agilent Technologies	12 months	18.10.06
-	W0029	10dB Attenuator	8493C	76549	Agilent Technologies	12 months	18.09.01
-	WC0002	RF Cable	SUCOFLEX 102	34124/2	HUBER + SUHNER	12 months	18.09.01
	WC0003	RF Cable	SUCOFLEX 102	34127/2	HUBER + SUHNER	12 months	18.09.01
-	WC0004	RF Cable	SUCOFLEX 102	34288/2	HUBER + SUHNER	12 months	18.09.01
x	WC0005	RF Cable	SUCOFLEX 102	34287/2	HUBER + SUHNER	12 months	18.09.01
-	WC0006	RF Cable	SUCOFLEX 102	34289/2	HUBER + SUHNER	12 months	18.09.01
-	WC0007	RF Cable	SUCOFLEX 102	34286/2	HUBER + SUHNER	12 months	18.09.01
x	M0719	Thermo Meter	TH-321	140053	AS ONE	12 months	19.05.20

5.2. Radiated Spurious Emissions

	Ctrl.#	Equipment	Model No.	Serial No.	Manufacturer	Cal.Interval	Last Cal.
x	M0686	EMI Receiver	N9038A	MY52260113	Agilent Technologies	12 months	18.11.13
x	M0486	EMI Receiver	ESU40	100050	Rohde & Schwarz	12 months	18.10.01
-	M0562	EMI Receiver	ESU26	100068	Rohde & Schwarz	12 months	19.07.08
-	M0959	EMI Receiver	ESU40	100041	Rohde & Schwarz	12 months	19.03.17
x	A0073	Loop Antenna	HFH2-Z2	100171	Rohde & Schwarz	12 months	18.12.10
x	A0089	Biconical Antenna	BBA9106	VHA91032835	Schwarzbeck	12 months	18.12.03
x	A0088	Log periodic Antenna	UHALP9108A1	0649	Schwarzbeck	12 months	18.12.03
x	A0064	Horn Antenna	BBHA9120D	746	Schwarzbeck	12 months	18.11.04
x	A0057	Horn Antenna	HAP06-18W	00000037	Toyo Corporation	12 months	19.06.01
x	A0058	Horn Antenna	HAP18-26W	00000016	Toyo Corporation	12 months	18.12.01
x	CS0017	N-RE Cable System 1	-	-	-	12 months	18.11.04
x	CS0018	N-RE Cable System 2	-	-	-	12 months	18.11.04
x	CS0045	N-3m EMF Cable System	-	-	-	12 months	18.11.04
x	CS0074/0075	N-RE Cable SYSTEM 4	-	-	-	12 months	18.11.04
x	M0126	Step Attenuator	8494H	3837M01144	Agilent Technologies	12 months	18.11.04
x	M0752	Pre Amplifier	310N	320621	SONOMA INSTRUMENT	12 months	18.11.04
x	M0128	3dB Attenuator	8491A	53541	Agilent Technologies	12 months	18.11.04
x	M0609	3dB Attenuator	8491B	MY39265960	Agilent Technologies	12 months	18.11.04
x	M0737	GHz Filter Box	FB-G1	001	Sony EMCS	12 months	18.11.04
x	M5079	Temperature Meter	608-H2	41475953	testo	12 months	18.10.18

About calibration interval

Valid until the end of the month listed in “Cal. Int.” column.