47 CFR Part 15 Subpart B
Electromagnetic Compatibility Test Report

For

Smart Wearable

ORDER NO.:	BVCO-WAY-P21090030
REPORT NO.:	FCCBVCO-WAY-P21090030-4
ISSUED DATE:	18 October, 2021
MODEL NO.:	SM-R875U

Samsung Electronics Co., Ltd.

129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, Korea

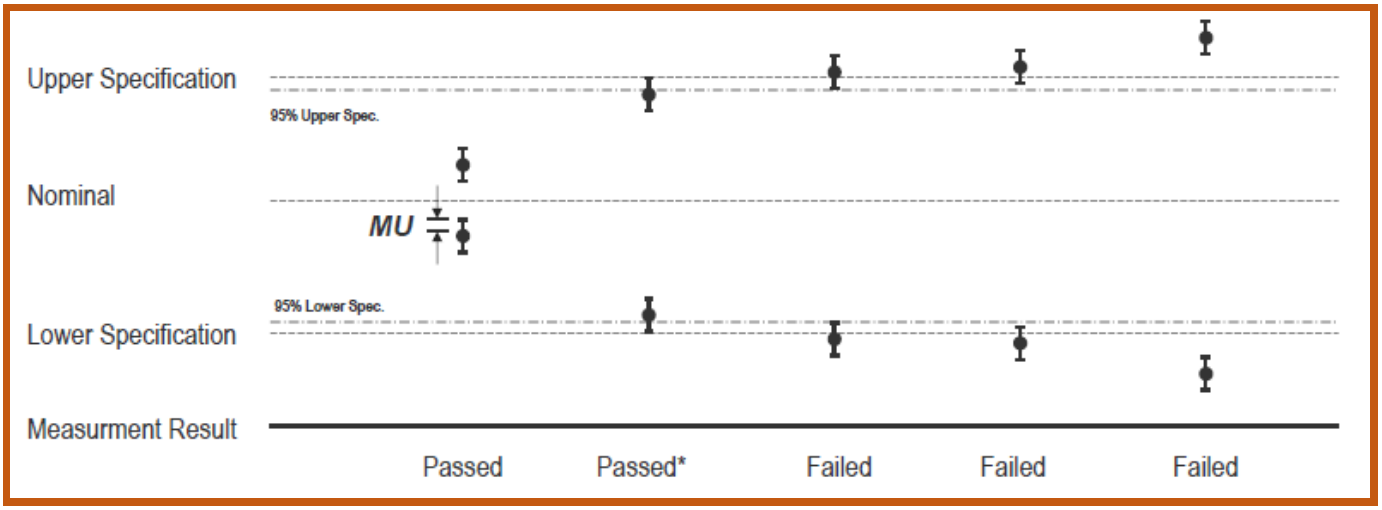
Certificate #4068.03

Test Report Details

Test Report No.	FCCBVCO-WAY-P21090030-4
Tests Performed By:	Bureau Veritas CPS ADT Korea Ltd. Innoplex No.2 106, Sinwon-ro 306, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Republic of Korea
Test site:	Bureau Veritas CPS ADT Korea Ltd. HeungAn-daero 49, DongAn-gu, Anyang-si, Gyeonggi-do, 14119, Republic of Korea
Applicant:	Samsung Electronics Co., Ltd.
Applicant address:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, Korea
Manufacturer:	AG TECH Co., Ltd.
Manufacturer address:	Lot G3, Que Vo Industrial Park (Expanded Area), Nam Son Ward, Bac Ninh City, Bac Ninh Province, Vietnam
Product Type:	Smart Wearable
Brand:	Samsung
Model Number:	SM-R875U
Multi-listing model number:	SM-R875F
FCC Classification:	Part 15 Class B Digital Devices (JAB)
Equipment Authorization	Supplier's Declaration of Conformity
Product Standards:	47 CFR Part 15 Subpart B / ANSI C63.4: 2014
Sample Serial Number:	R3AR400CD3M
Sample Receive Date:	29 September, 2021
Testing Start Date:	01 October, 2021
Date Testing Complete:	06 October, 2021

Overall Results

I. DECISION RULE FOR STATEMENT OF CONFORMITY



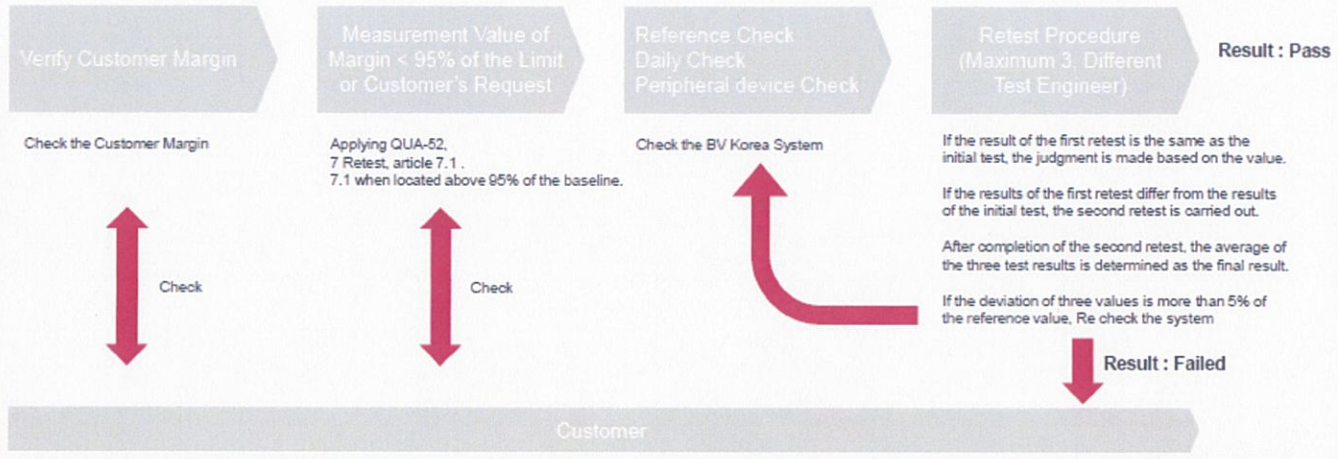
MU =95% expanded measurement uncertainty
QUA-52 Decision Rule Applied
Step 1: Reference Check, Daily Check, Peripheral device Check
Step 2: Retest Procedure (Maximum 3, Different Test Engineer)
1) If the result of the first retest is the same as the initial test, the judgment is made based on the value.
2) If the results of the first retest differ from the initial test result, the second retest is carried out.
After completion of the second retest, the average of the three test results is determined as the final result.
If the deviation of three values is more than 5% of the reference value, Re check the system

II. Measurement uncertainty

Test Item	Measurement uncertainty
Conducted RF emission (150 kHz to 30 MHz) - AMN	2.46 dB
Radiated RF emission (30 MHz to 1 000 MHz)	4.00 dB
Radiated RF emission (1 GHz to 6 GHz)	6.54 dB
Radiated RF emission (6 GHz to 18 GHz)	5.94 dB
Radiated RF emission (18 GHz to 26.5 GHz)	5.16 dB
Radiated RF emission (26.5 GHz to 40 GHz)	5.40 dB
Note 1: Measurement uncertainty is calculated in according with CISPR 16-4-2: 2011+A1: 2014+A2: 2018 The measurement uncertainty is given with a confidence of 95 % with the coverage factor, k=2.	

III. FLOW CHART FOR DECISION RULE

The propose is to establish and apply a decision rule for calculating test result to ensure the validity of the test results and to inform the customer
Reference : ISO/IEC 17025 : 2017, BV CPS Quality Manual, QUA-52 Decision Rule for Statement of Conformity.



IV. FINAL DECISION

RELEASE CONTROL RECORD

REPORT NO.	REASON FOR CHANGE	DATE ISSUED
FCCBVCO-WAY-P21090030-4	Original release	18 October, 2021
-	-	-

This project has been tested and verified to comply with the requirements of ***Bureau Veritas CPS ADT Korea Ltd.*** Therefore, this certificate is issued.

PREPARED BY : _____ , **DATE :** 18 October, 2021
Junil Park / Senior Engineer

APPROVED BY : _____ , **DATE :** 18 October, 21
Rina Bae / Technical Manager

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1. EMC Result Conclusion (With Justification)

The following tests were performed on a sample submitted for evaluation of compliance with 47 CFR Part 15.107(b) / 47 CFR Part 15.109 (b).			
Test requirements	**Standard**	**Results**	**Verdict**
Emissions	☐ Class A / ☒ Class B		
Conducted RF Emissions	47 CFR Part 15 Subpart B ANSI C63.4: 2014	Pass	Complied
Radiated RF Emissions (Below 1 GHz)		Pass	Complied
Radiated RF Emissions (Above 1 GHz)		Pass	Complied
We tested the Smart Wearable, Model: SM-R875U, to determine if it was in compliance with the relevant standards as marked on the EMC Verification Summary. We found that the unit met the requirement of 47 CFR Part 15 Subpart B / ANSI C63.4: 2014 standards when tested as received. The production units are required to conform to the initial sample as received when the units are placed on the market.			

2. General Product Description

2.1 Equipment Description

Description
The EUT is a watch type Smart Wearable which can operate on WCDMA FDD2/4/5, LTE FDD2/4/5/12/13/25/26/66/71 bands and incorporates a Bluetooth, Wi-Fi(802.11 a/b/g/n), GNSS, NFC, Wireless Charging and Audio.

2.2 Technical Data

-General specifications

CPU	Exynos W920
Ports	-
H/W Version	REV 1.0
S/W Version	R875U.001
FCC ID	A3LSMR875
Wireless Communication	1. UMTS Band 2/4/5 2. LTE Band 2/4/5/12/13/25/26/66/71 3. WLAN a/b/g/n(HT20) 4. DFS (UNII client without radar detection) 5. Bluetooth BDR/EDR/LE 1M/LE 2M 6. NFC (Card emulation only)

2.3 Detail information of Multi-listing model

No.	Model	Description	Comment
1	SM-R875F	Due to marketing purpose, addition variant model.	-

***Note:** The manufacturer has declared to all the multiple model names into the basic model without any further evaluation by Bureau Veritas CPS ADT Korea.

3. Test Condition

3.1 Ancillary Equipment

Use*	Product Type	Manufacturer	Model	Comments
Conducted Emission (Mode 1,2), Radiated Emission (Mode 1)				
EUT	Smart Wearable	Samsung Electronics Co., Ltd.	SM-R875U	EUT
EUT	Wireless Charger	Samsung Electronics Co., Ltd.	EP-OR825	In box (FCC ID: A3LEPOR825)
AE	Travel Adapter	RFTECH THAI NGUYEN CO.,LTD.	EP-TA20KWK	-
Radiated Emission (Mode 2)				
EUT	Smart Wearable	Samsung Electronics Co., Ltd.	SM-R875U	EUT
Conducted Emission (Mode 3), Radiated Emission (Mode 3)				
EUT	Smart Wearable	Samsung Electronics Co., Ltd.	SM-R875U	EUT
EUT	Wireless Charger	Samsung Electronics Co., Ltd.	EP-OR825	In box (FCC ID: A3LEPOR825)
AE	Laptop Computer	Lenovo Information Products(Shenzhen) Co.,Ltd.	TP00087A	-
AE	Laptop AC adapter	CHICONY POWER TECHNOLOGY (SUZHOU) CO., LTD.	ADLX45NCC3A	-
AE	Mouse	Microsoft	1405	-
AE	Router	PLANET Technology Corp.	FSD-803	-
AE	Router AC adapter	BILLION	BA018-050250AXB	-
AE	DONGLE-USB 3.0 C to RJ 45	Samsung Electronics Co., Ltd.	-	-
*** Note:** EUT - Equipment Under Test, AE - Auxiliary/Associated Equipment				

3.2 Input/Output Ports

START		END		CABLE		
Name	**I/O Port**	**Name**	**I/O Port**	**Length (m)**	**Shield**	**With Ferrite**
Conducted Emission (Mode 1,2), Radiated Emission (Mode 1)						
EUT	-	Wireless Charger	-	-	-	-
Wireless Charger	-	Travel Adapter	USB Type-A	0.8	Unshield	-
Travel Adapter	AC In	AC Mains	AC Out	-	-	-
Radiated Emission (Mode 2)						
EUT	-	-	-	-	-	-
Conducted Emission (Mode 3), Radiated Emission (Mode 3)						
EUT	-	Wireless Charger	-	-	-	-
Laptop Computer	USB Type-A	Wireless Charger	-	0.8	Unshield	-
Laptop Computer	DC In	Laptop AC adapter	DC Out	1.8	Unshield	-
Laptop AC adapter	AC In	AC Mains	AC Out	1.5	Unshield	-
Laptop Computer	USB Type-A	Mouse	-	1.5	Unshield	-
Router	DC In	Router AC adapter	DC Out	1.5	Unshield	-
Router AC adapter	AC In	AC Mains	AC Out	-	-	-
Laptop Computer	LAN	Router	LAN	1.0	Unshield	-
Laptop Computer	USB Type-C	DONGLE-USB 3.0 C to RJ 45	-	0.1	Unshield	-
DONGLE-USB 3.0 C to RJ 45	LAN	Router	LAN	1.0	Unshield	-

3.3 Power Interface:

Rated Voltage	Wireless Charging: DC 5 V, 1 A
	Operating: DC 3.88 V
Test Voltage	Wireless Charging: AC 120 V, 60 Hz (Using wireless charger AC power) Operating: DC 3.88 V (Using internal battery power)

3.4 EUT Internal Operating Frequency

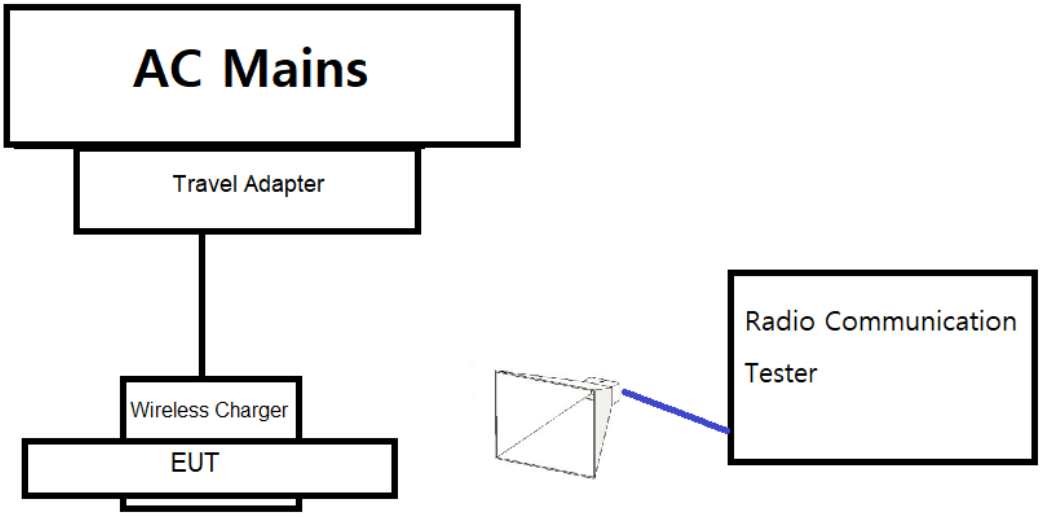
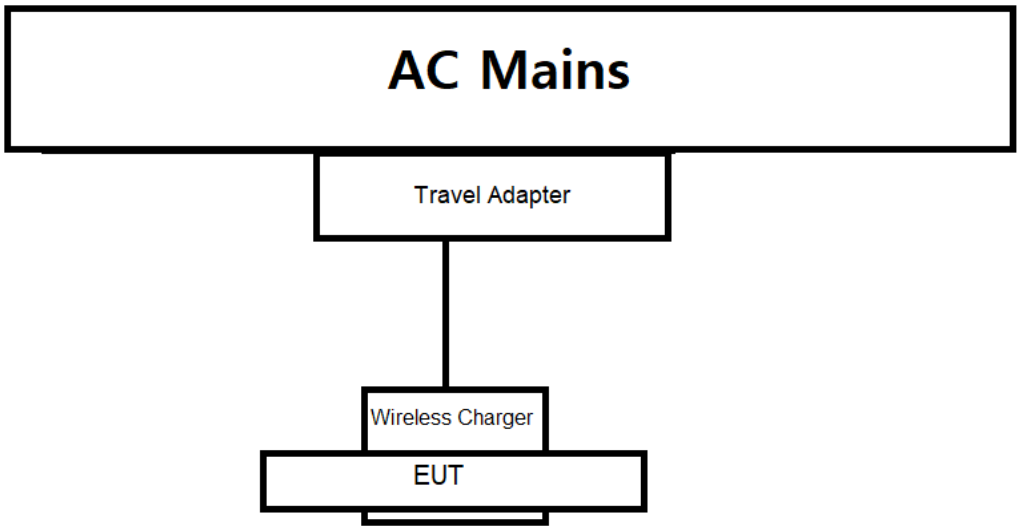
The Highest Frequency (Generated or Used)	Wi-Fi : 5 825 MHz

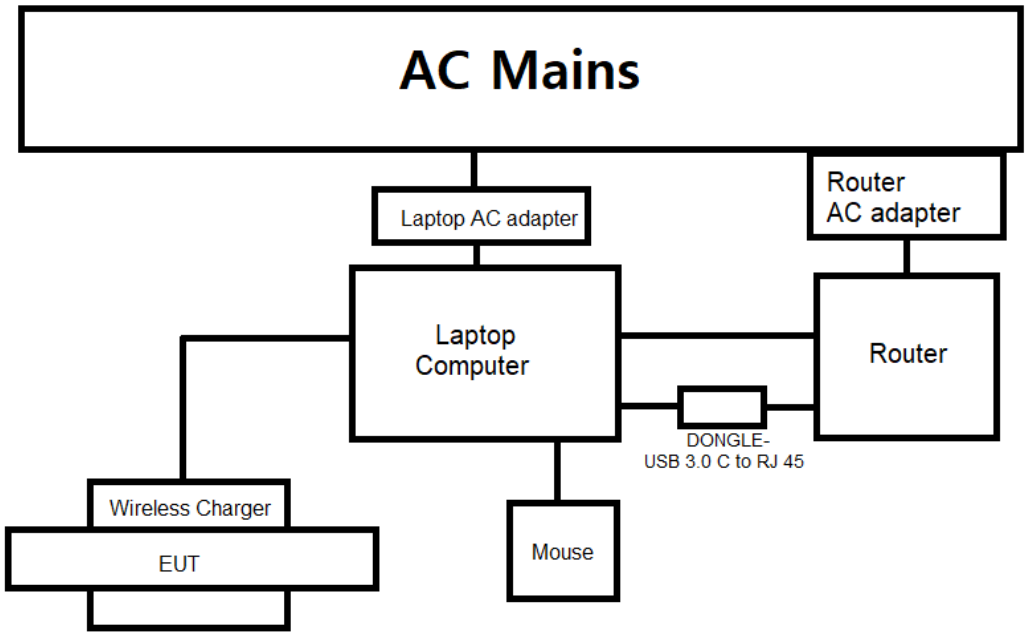
3.5 Modes of Description

Mode #	Description	Comments
Conducted Emission Note2)		
1	Wireless Charging (w/TA) + Cellular Receiver (LTE FDD Band13 Center Frequency)	-
2	Audio playback from internal memory data + Wireless Charging (w/TA)	-
3	Wireless Charging (w/USB port of Laptop Computer)	-
Radiated Emission Note3)		
1	Wireless Charging (w/TA)	-
2	Audio playback from internal memory data	-
3	Wireless Charging (w/USB port of Laptop Computer)	-

Note1) Bluetooth + Wi-Fi Standby
Note2) RX mode testing was performed with the LTE B13 RX test mode at center frequency. All licensed communication RX mode, WCDMA/LTE, test results do not affect conducted emission test.
Note3) Compliance with Part 15B requirements for the receiver part of the licensed transmitter (equipment code CXX) is covered by other test report (FCCBVCO-WAY-P21090030-5).

3.6 Configuration

Mode #	Description
1 (Conducted Emission)	
2 (Conducted Emission) 1 (Radiated Emission)	

Mode #	Description
2 (Radiated Emission)	
3 (Conducted Emission) 3 (Radiated Emission)	

4. Test Condition and Results

4.1 Conducted RF Emissions

TEST: Limits of mains terminal conducted RF emission				
Method	The AMN placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane. This distance was between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment were at least 0.8 m from the AMN. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN.			
Basic Standard		ANSI 63.4: 2014		
Test Date		01 October, 2021		
Parameters recorded during the test		Laboratory Ambient Temperature		(23.1 ± 1.0) °C
		Relative Humidity		(53.8 ± 1.0) %
		Frequency range on each side of line		**Measurement Point**
Fully configured sample scanned over the following frequency range		150 kHz to 30 MHz		AC mains power ports
Limits – AC mains power ports (Class A)				
Frequency (MHz)	Limit (dBµV)			
	Quasi-Peak	Result	Average	Result
0.15 to 0.5	79	-	66	-
0.5 to 30	73	-	60	-
Limits – AC mains power ports (Class B)				
Frequency (MHz)	Limit (dBµV)			
	Quasi-Peak	Result	Average	Result
0.15 to 0.5	66 to 56	Pass	56 to 46	Pass
0.5 to 5	56	Pass	46	Pass
5 to 30	60	Pass	50	Pass

Note1) Formula
Final Value (QP and/or CAV) = Reading Value (QP and/or CAV) + Corr. (AMN Insertion Loss + Cable Loss)
Margin (QP and/or CAV) = Limit – Final Value (QP and/or CAV)
QP = Quasi-Peak, CAV = CISPR-Average, Corr. = Correction Factor

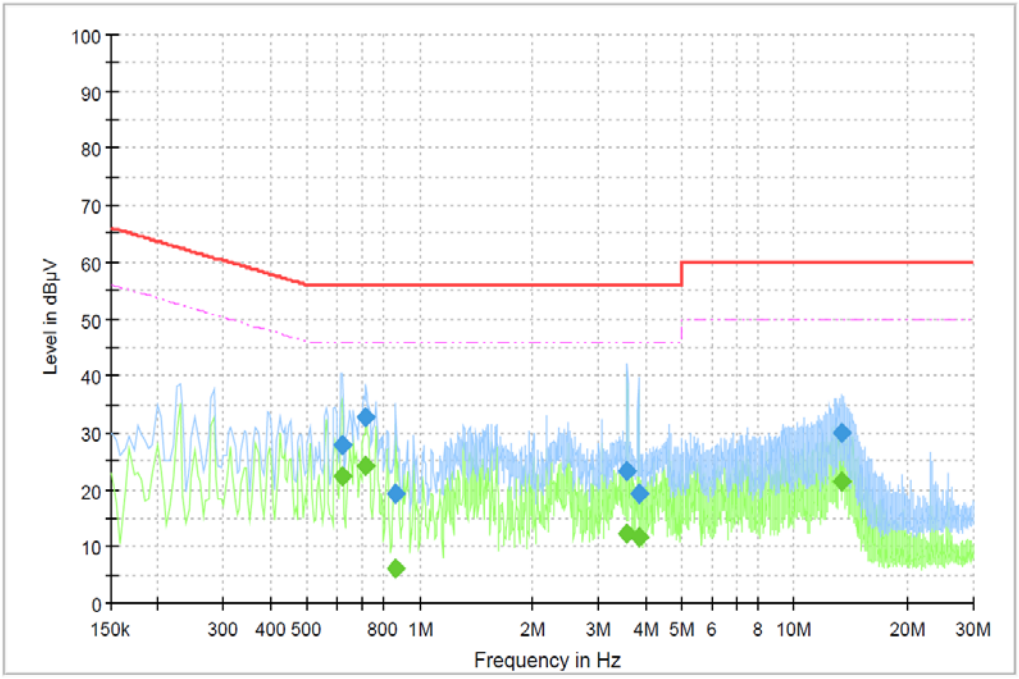
Table 1. Test data for conducted RF emissions

#1

Test Report

Common Information

Project Number	BVCO-WAY-P21090030
Location	EMI Test Site (AC Line)
Date	2021.10.01
Environment	23.1 'C / 53.8 % R.H.



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.619699	27.70	---	56.00	28.30	15000.0	9.000	L1	ON	10.0
0.619699	---	22.21	46.00	23.79	15000.0	9.000	L1	ON	10.0
0.716272	32.71	---	56.00	23.29	15000.0	9.000	N	ON	10.0
0.716272	---	24.13	46.00	21.87	15000.0	9.000	N	ON	10.0
0.861132	---	6.08	46.00	39.92	15000.0	9.000	L1	ON	9.9
0.861132	19.12	---	56.00	36.88	15000.0	9.000	L1	ON	9.9
3.582750	23.18	---	56.00	32.82	15000.0	9.000	L1	ON	9.9
3.582750	---	12.31	46.00	33.69	15000.0	9.000	L1	ON	9.9
3.832963	---	11.56	46.00	34.44	15000.0	9.000	L1	ON	9.9
3.832963	19.40	---	56.00	36.60	15000.0	9.000	L1	ON	9.9
13.354235	29.96	---	60.00	30.04	15000.0	9.000	N	ON	10.3
13.354235	---	21.47	50.00	28.53	15000.0	9.000	N	ON	10.3

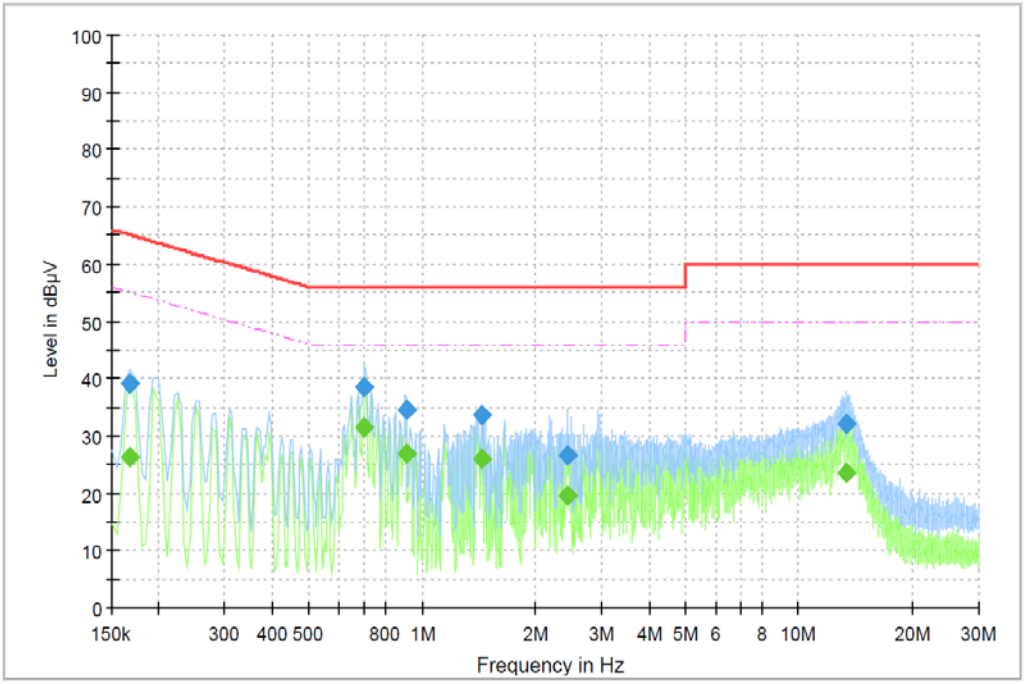
Note1) Two graphs measured for both Line 1(L1) and Neutral (N) of the LISN are combined into one graph.

#2

Test Report

Common Information

Project Number	BVCO-WAY-P21090030
Location	EMI Test Site (AC Line)
Date	2021.10.01
Environment	23.1 'C / 53.8 % R.H.



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.167559	39.24	---	65.08	25.84	15000.0	9.000	L1	ON	10.1
0.167559	---	26.44	55.08	28.64	15000.0	9.000	L1	ON	10.1
0.703103	38.56	---	56.00	17.44	15000.0	9.000	N	ON	10.0
0.703103	---	31.58	46.00	14.42	15000.0	9.000	N	ON	10.0
0.905029	---	27.02	46.00	18.98	15000.0	9.000	L1	ON	9.9
0.905029	34.48	---	56.00	21.52	15000.0	9.000	L1	ON	9.9
1.440574	33.55	---	56.00	22.45	15000.0	9.000	L1	ON	9.9
1.440574	---	26.11	46.00	19.89	15000.0	9.000	L1	ON	9.9
2.428257	26.69	---	56.00	29.31	15000.0	9.000	N	ON	9.9
2.428257	---	19.55	46.00	26.45	15000.0	9.000	N	ON	9.9
13.398132	---	23.55	50.00	26.45	15000.0	9.000	L1	ON	10.4
13.398132	32.09	---	60.00	27.91	15000.0	9.000	L1	ON	10.4

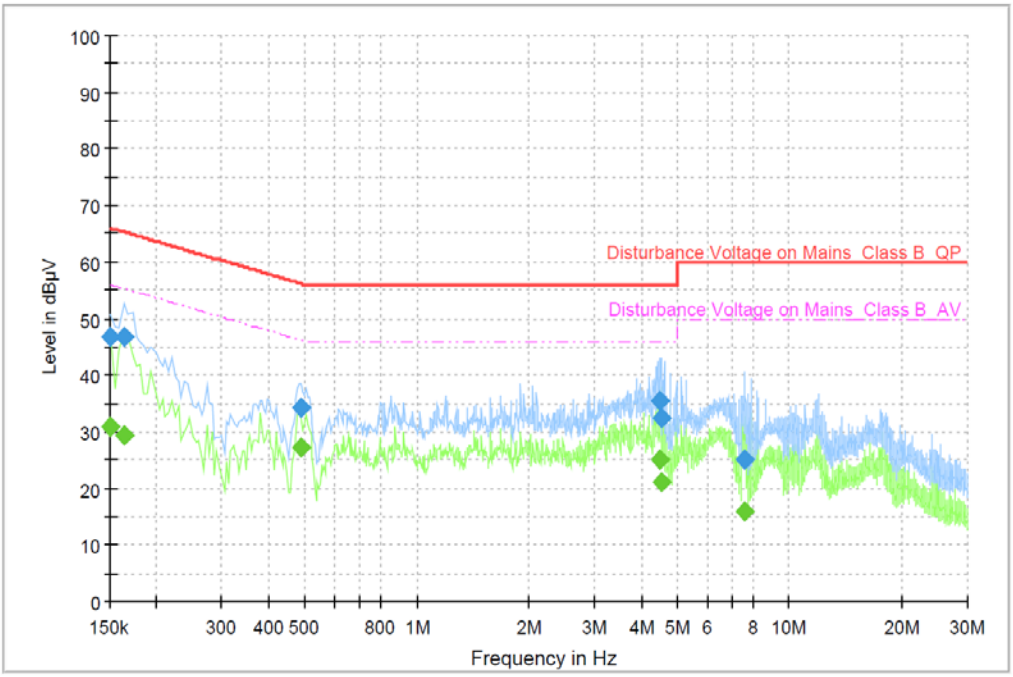
Note1) Two graphs measured for both Line 1(L1) and Neutral (N) of the LISN are combined into one graph.

#3

Test Report

Common Information

Project Number	BVCO-WAY-P21090030
Location	EMI Test Site (AC Line)
Date	2021.10.01
Environment	23.1 'C / 53.8 % R.H.



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.150000	46.89	---	66.00	19.11	15000.0	9.000	N	ON	9.7
0.150000	---	31.02	56.00	24.98	15000.0	9.000	N	ON	9.7
0.163169	---	29.40	55.30	25.90	15000.0	9.000	N	ON	9.9
0.163169	46.73	---	65.30	18.57	15000.0	9.000	N	ON	9.9
0.488007	---	27.30	46.20	18.90	15000.0	9.000	L1	ON	9.9
0.488007	34.39	---	56.20	21.81	15000.0	9.000	L1	ON	9.9
4.465081	35.37	---	56.00	20.63	15000.0	9.000	N	ON	9.7
4.465081	---	25.21	46.00	20.79	15000.0	9.000	N	ON	9.7
4.508978	---	21.15	46.00	24.85	15000.0	9.000	L1	ON	9.7
4.508978	32.41	---	56.00	23.59	15000.0	9.000	L1	ON	9.7
7.572993	---	15.83	50.00	34.17	15000.0	9.000	L1	ON	9.9
7.572993	25.02	---	60.00	34.98	15000.0	9.000	L1	ON	9.9

Note1) Two graphs measured for both Line 1(L1) and Neutral (N) of the LISN are combined into one graph.

4.2 Radiated RF Emissions (30 MHz - 1 000 MHz)

TEST: Limits for radiated RF emissions		
Method	Measurements were made in a 10-meter semi-anechoic chamber that complies to ANSI C63.4. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3 or 10-meter. The EUT was rotated 360° about its azimuth with the receive antenna located at 1, 2, 3 and 4 meter heights in both horizontal and vertical polarities. Final measurements (quasi-peak as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4 meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.	
Basic Standards	ANSI C63.4: 2014	
Test Date	05 October, 2021	
Parameters recorded during the test	Laboratory Ambient Temperature	(21.2 ± 1.0) °C
	Relative Humidity	(52.1 ± 1.0) %
	Frequency range	**Measurement Point**
Fully configured sample scanned over the following frequency range	30 MHz – 1 000 MHz	3 or 10 meter measurement distance
Limits – Class A (10 m distance)		
Frequency (MHz)	Limit (dBµV/m)	
	Quasi-Peak	Results
30 to 88	39.0	-
88 to 216	43.5	-
216 to 960	46.4	-
960 to 1000	49.5	-
Limits –Class B (3 m distance)		
Frequency (MHz)	Limit (dBµV/m)	
	Quasi-Peak	Results
30 to 88	40.0	Pass
88 to 216	43.5	Pass
216 to 960	46.0	Pass
960 to 1000	54.0	Pass

Note1) Formula
Final Value (PK and/or QP and/or CAV) = Reading Value (PK and/or QP and/or CAV) + Corr. (Antenna Factor + Cable Loss - Amplifier Gain)
Margin (PK and/or QP and/or CAV) = Limit – Final Value (PK and/or QP and/or CAV)
PK = Peak, QP = Quasi-Peak, CAV = CISPR-Average, Corr. = Correction Factor
Note2) Distance (Antenna to Centre of Turntable), Antenna Height
Below 1 GHz, Distance = 3 or 10 m, Antenna Height = (1 to 4) m

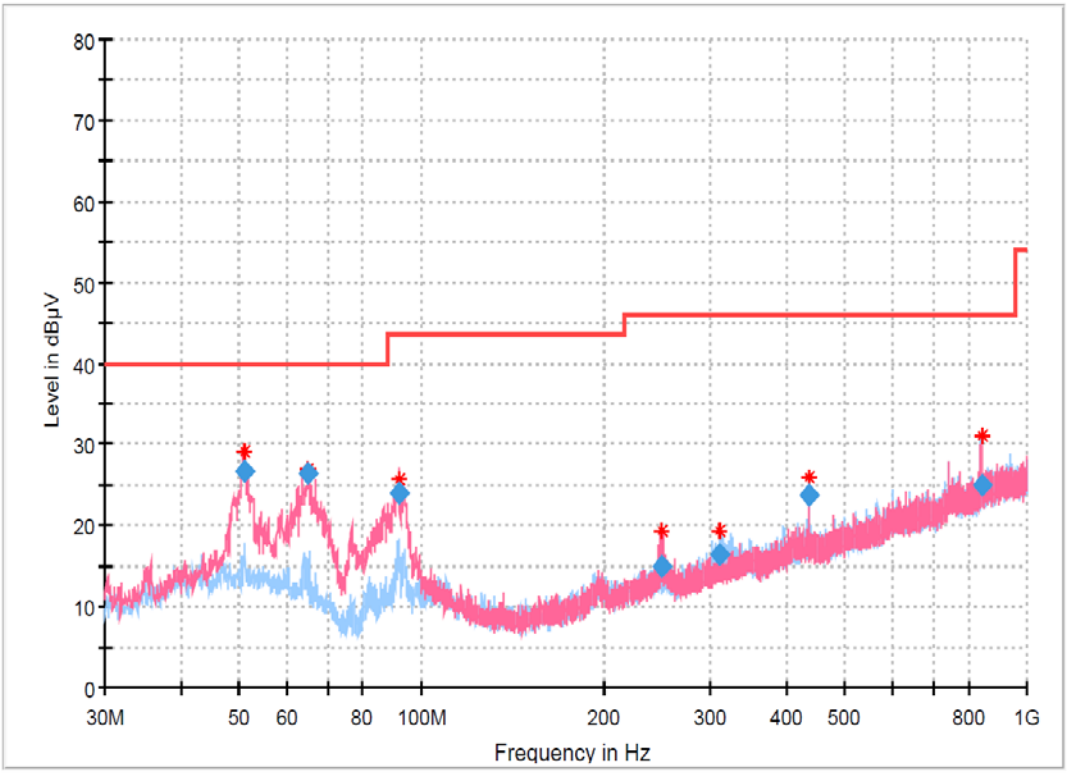
Table 2. Test data for radiated RF emissions

#1

Test Report

Common Information

Project Number	BVCO-WAY-P21090030
Location	10 m SAC
System:	Below 1 GHz
Date:	2021.10.05
Environment	21.2 'C / 52.1 % R.H.



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
50.855000	26.71	40.00	13.29	15000	120	100.0	V	267.0	-19.6
64.968500	26.37	40.00	13.63	15000	120	100.0	V	6.0	-22.6
91.643500	23.95	43.50	19.55	15000	120	100.0	V	146.0	-23.7
249.608000	15.02	46.00	30.98	15000	120	115.0	V	62.0	-20.3
310.427000	16.51	46.00	29.49	15000	120	100.0	H	2.0	-19.5
437.497000	23.69	46.00	22.31	15000	120	115.0	V	149.0	-16.2
844.703000	24.86	46.00	21.14	15000	120	315.0	V	15.0	-10.5

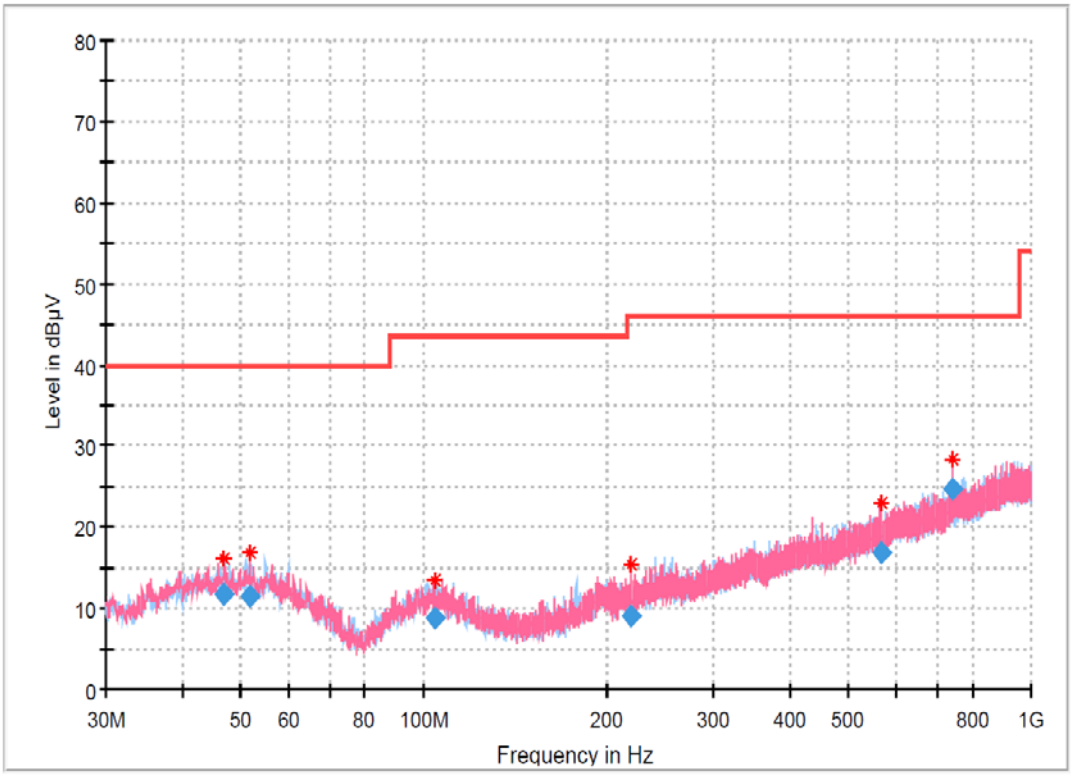
Note1) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#2

Test Report

Common Information

Project Number	BVCO-WAY-P21090030
Location	10 m SAC
System:	Below 1 GHz
Date:	2021.10.05
Environment	21.2 'C / 52.1 % R.H.



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
46.975000	11.72	40.00	28.28	15000	120	400.0	V	188.0	-19.6
51.776500	11.59	40.00	28.41	15000	120	185.0	V	300.0	-19.7
104.205000	8.82	43.50	34.68	15000	120	115.0	V	256.0	-22.2
220.023000	9.06	46.00	36.94	15000	120	400.0	V	315.0	-22.3
566.604000	16.76	46.00	29.24	15000	120	115.0	V	53.0	-14.2
741.689000	24.60	46.00	21.40	15000	120	107.0	H	355.0	-11.2

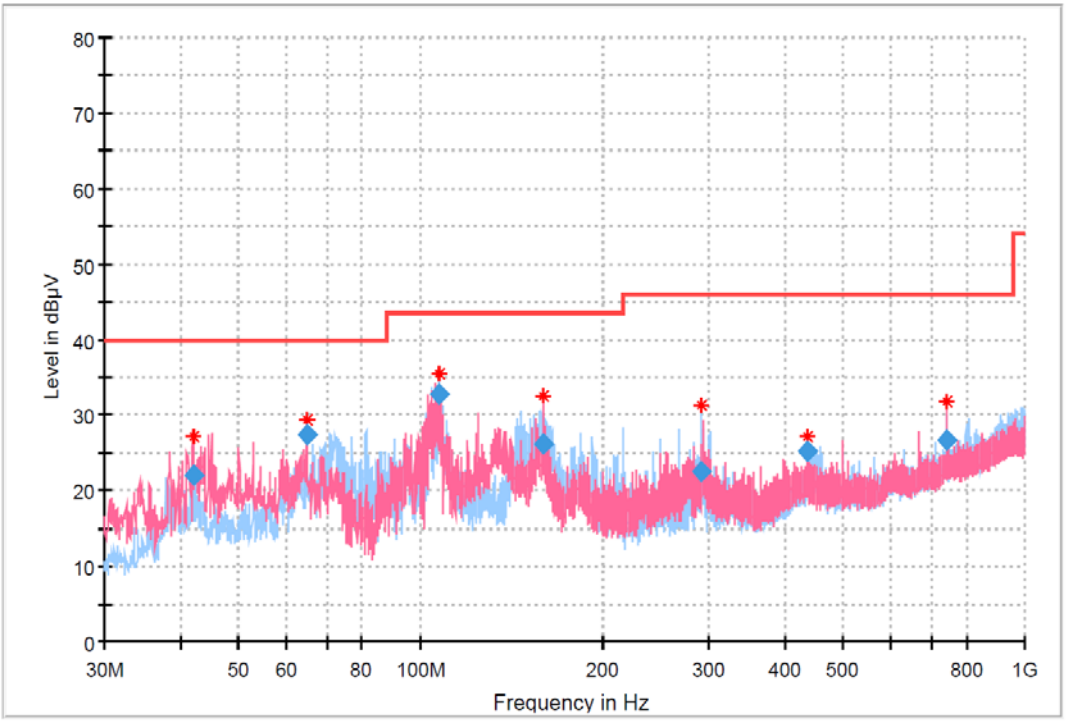
Note1) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#3

Test Report

Common Information

Project Number	BVCO-WAY-P21090030
Location	10 m SAC
System:	Below 1 GHz
Date:	2021.10.05
Environment	21.2 'C / 52.1 % R.H.



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
42.028000	22.14	40.00	17.86	15000	120	106.0	V	295.0	-20.0
64.774500	27.37	40.00	12.63	15000	120	106.0	V	272.0	-22.6
107.163500	32.67	43.50	10.83	15000	120	299.0	H	-11.0	-22.3
159.252500	26.14	43.50	17.36	15000	120	106.0	V	232.0	-25.3
291.512000	22.42	46.00	23.58	15000	120	110.0	H	160.0	-19.8
437.497000	25.31	46.00	20.69	15000	120	115.0	V	150.0	-16.2
741.689000	26.74	46.00	19.26	15000	120	215.0	V	178.0	-11.2

Note1) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

4.3 Radiated RF Emissions (Above 1 GHz)

TEST: Limits for radiated RF emissions				
Method	Measurements were made in a 10-meter semi-anechoic chamber that complies to ANSI C63.4. Rotate the EUT from 0° to 360° and position the receiving antenna at heights from 1 m to 4 m above the reference ground plane continuously to determine associated with higher emission levels and record them. The measurement was made in both the vertical and horizontal polarization, and the maximum value is presented in the report.			
Basic Standards	ANSI C63.4: 2014			
Test Date	05 October, 2021 ~ 06 October, 2021			
Parameters recorded during the test	Laboratory Ambient Temperature	(21.0 ± 1.0) ~ (22.4 ± 1.0) °C		
	Relative Humidity	(48.5 ± 1.0) ~ (54.2 ± 1.0) %		
	Frequency range	**Measurement Point**		
Fully configured sample scanned over the following frequency range	1 GHz – 40 GHz	3 meter measurement distance		
Limits – Class A				
Frequency (GHz)	Limit (dBµV/m)			
	Peak	Result	Average	Result
1 to --	80	-	60	-
Limits – Class B				
Frequency (GHz)	Limit (dBµV/m)			
	Peak	Result	Average	Result
1 to 30	74	Pass	54	Pass

Note1) Formula
Final Value (PK and/or QP and/or CAV) = Reading Value (PK and/or QP and/or CAV) + Corr. (Antenna Factor + Cable Loss - Amplifier Gain)
Margin (PK and/or QP and/or CAV) = Limit – Final Value (PK and/or QP and/or CAV)
PK = Peak, QP = Quasi-Peak, CAV = CISPR-Average, Corr. = Correction Factor
Note2) Distance (Antenna to Centre of Turntable), Antenna Height
Above 1 GHz, Distance = 4.5 m, Antenna Height (Considering size of EUT) = (1 to 4) m
L2 = L1 + 20 log (d1 (m) / d2 (m)) = 20 log (4.5 / 3) = **3.5**

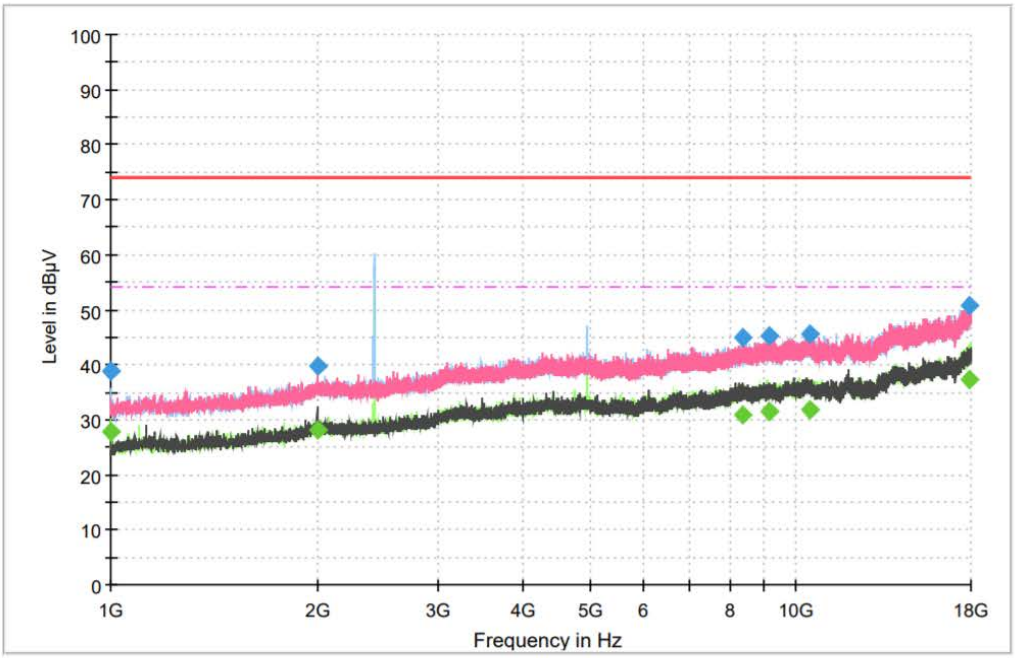
Table 3. Test data for radiated RF emissions

#1 (1 ~ 18 GHz)

Test Report

Common Information

Project Number	BVCO-WAY-P21090030
Location	10 m SAC
System:	Above 1 GHz
Date:	2021.10.05
Environment	21.7 'C / 54.2 % R.H.



Final_Result

Frequency (MHz)	MaxPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1000.000000	---	27.82	54.00	26.18	15000	1000	285.0	H	132.0	-11.4
1000.000000	38.90	---	74.00	35.10	15000	1000	285.0	H	132.0	-11.4
1999.894444	39.82	---	74.00	34.18	15000	1000	315.0	V	296.0	-6.5
1999.894444	---	28.04	54.00	25.96	15000	1000	315.0	V	296.0	-6.5
8342.705556	---	30.98	54.00	23.02	15000	1000	299.0	V	123.0	3.6
8342.705556	44.86	---	74.00	29.14	15000	1000	299.0	V	123.0	3.6
9159.038889	---	31.53	54.00	22.47	15000	1000	115.0	H	42.0	4.5
9159.038889	45.23	---	74.00	28.77	15000	1000	115.0	H	42.0	4.5
10457.938889	45.61	---	74.00	28.39	15000	1000	400.0	V	259.0	6.3
10457.938889	---	31.95	54.00	22.05	15000	1000	400.0	V	259.0	6.3
17847.022222	---	37.45	54.00	16.55	15000	1000	188.0	V	254.0	14.4
17847.022222	50.89	---	74.00	23.11	15000	1000	188.0	V	254.0	14.4

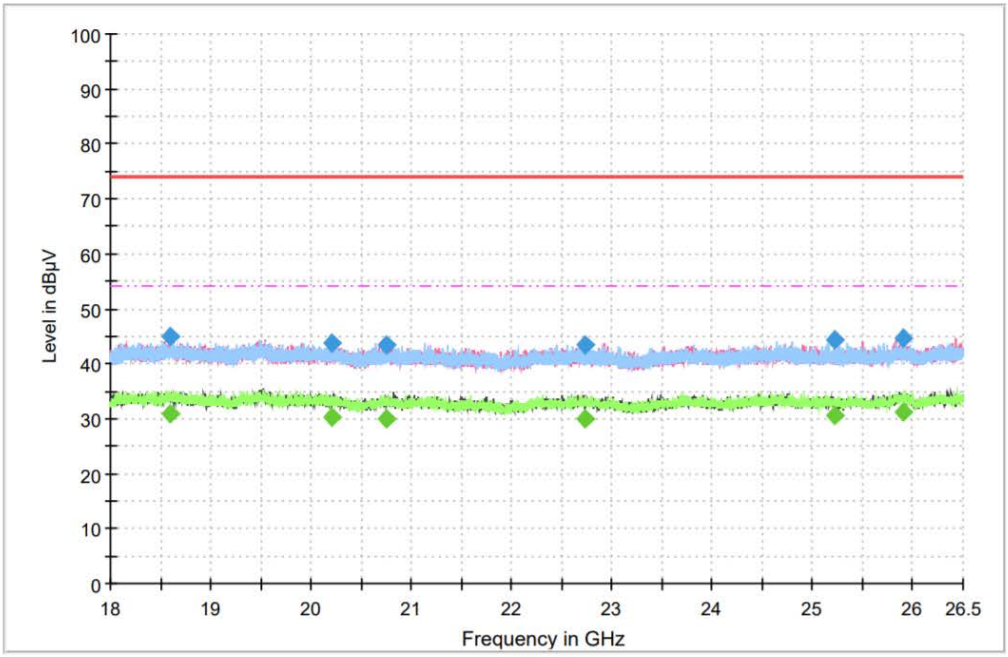
Note1) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.
Note2) Radiated emissions (Tx / Rx frequency) from the transceiver shall be ignored.
-Data transmission in the 2.4 GHz ISM Fundamental band (Bluetooth/Wi-Fi 802.11 a/b/g/n)
-Data transmission in the 4.8 GHz ISM Harmonic band (Bluetooth/Wi-Fi 802.11 a/b/g/n)

#1 (18 ~ 26.5 GHz)

Test Report

Common Information

Project Number	BVCO-WAY-P21090030
Location	10 m SAC
System:	Above 1 GHz
Date:	2021.10.06
Environment	21.0 'C / 50.8 % R.H.



Final_Result

Frequency (MHz)	MaxPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
18592.550000	---	31.03	54.00	22.97	15000	1000	289.0	V	97.0	-0.6
18592.550000	44.99	---	74.00	29.01	15000	1000	289.0	V	97.0	-0.6
20210.488889	43.82	---	74.00	30.18	15000	1000	400.0	V	292.0	0.8
20210.488889	---	30.29	54.00	23.71	15000	1000	400.0	V	292.0	0.8
20752.927778	43.41	---	74.00	30.59	15000	1000	106.0	V	-20.0	0.8
20752.927778	---	29.84	54.00	24.16	15000	1000	106.0	V	-20.0	0.8
22736.950000	---	29.83	54.00	24.17	15000	1000	396.0	V	25.0	1.9
22736.950000	43.32	---	74.00	30.68	15000	1000	396.0	V	25.0	1.9
25222.288889	---	30.51	54.00	23.49	15000	1000	194.0	V	188.0	1.0
25222.288889	44.19	---	74.00	29.81	15000	1000	194.0	V	188.0	1.0
25903.344444	---	31.04	54.00	22.96	15000	1000	287.0	V	-1.0	1.7
25903.344444	44.56	---	74.00	29.44	15000	1000	287.0	V	-1.0	1.7

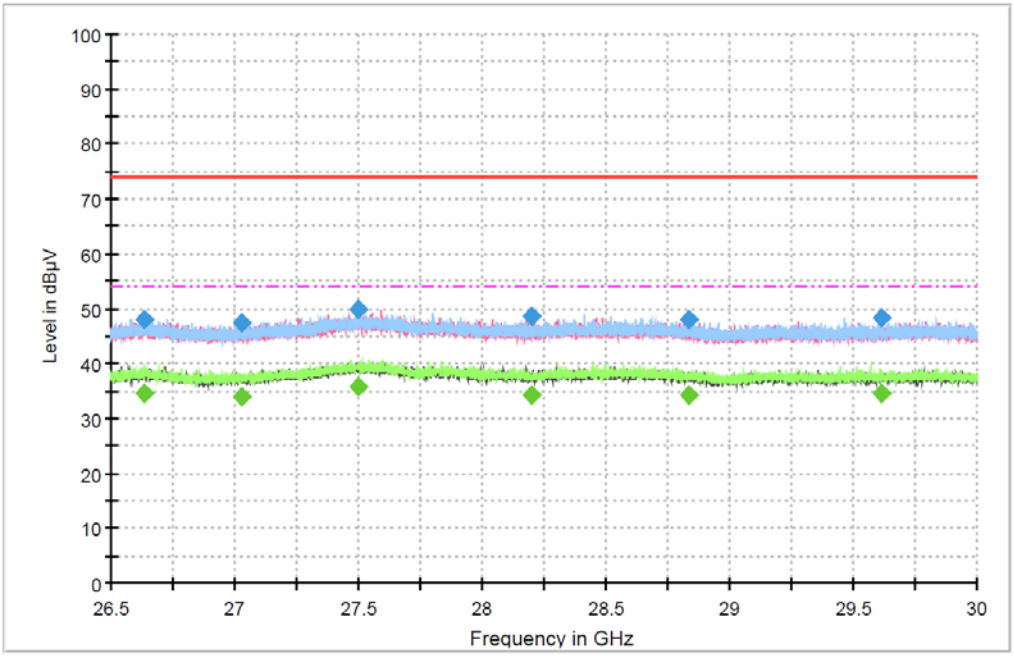
Note1) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#1 (26.5 ~ 30 GHz)

Test Report

Common Information

Project Number	BVCO-WAY-P21090030
Location	10 m SAC
System:	Above 1 GHz
Date:	2021.10.06
Environment	22.4 'C / 48.5 % R.H.



Final_Result

Frequency (MHz)	MaxPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
26635.250000	48.13	---	74.00	25.87	15000	1000	176.0	H	51.0	7.1
26635.250000	---	34.60	54.00	19.40	15000	1000	176.0	H	51.0	7.1
27029.250000	---	33.92	54.00	20.08	15000	1000	112.0	H	94.0	7.6
27029.250000	47.38	---	74.00	26.62	15000	1000	112.0	H	94.0	7.6
27502.750000	---	35.82	54.00	18.18	15000	1000	112.0	V	314.0	10.0
27502.750000	49.93	---	74.00	24.07	15000	1000	112.0	V	314.0	10.0
28198.000000	48.50	---	74.00	25.50	15000	1000	216.0	V	140.0	9.2
28198.000000	---	34.20	54.00	19.80	15000	1000	216.0	V	140.0	9.2
28833.750000	---	34.24	54.00	19.76	15000	1000	225.0	H	22.0	8.9
28833.750000	48.02	---	74.00	25.98	15000	1000	225.0	H	22.0	8.9
29612.250000	---	34.53	54.00	19.47	15000	1000	125.0	H	268.0	8.3
29612.250000	48.37	---	74.00	25.63	15000	1000	125.0	H	268.0	8.3

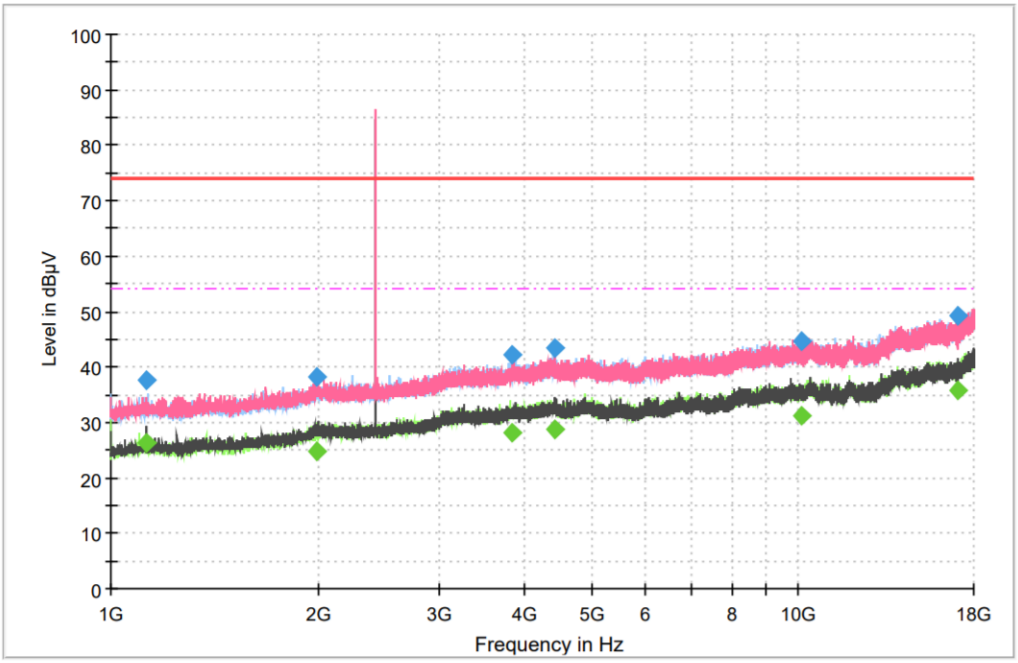
Note1) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#2 (1 ~ 18 GHz)

Test Report

Common Information

Project Number	BVCO-WAY-P21090030
Location	10 m SAC
System:	Above 1 GHz
Date:	2021.10.05
Environment	21.7 'C / 54.2 % R.H.



Final_Result

Frequency (MHz)	MaxPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1124.938889	37.62	---	74.00	36.38	15000	1000	186.0	V	64.0	-10.9
1124.938889	---	26.39	54.00	27.61	15000	1000	186.0	V	64.0	-10.9
1987.944444	---	24.62	54.00	29.38	15000	1000	315.0	V	66.0	-6.6
1987.944444	38.37	---	74.00	35.63	15000	1000	315.0	V	66.0	-6.6
3832.044444	---	28.05	54.00	25.95	15000	1000	102.0	H	27.0	-1.8
3832.044444	42.30	---	74.00	31.70	15000	1000	102.0	H	27.0	-1.8
4422.944444	---	28.82	54.00	25.18	15000	1000	400.0	H	84.0	-0.3
4422.944444	43.45	---	74.00	30.55	15000	1000	400.0	H	84.0	-0.3
10130.038889	---	31.04	54.00	22.96	15000	1000	289.0	V	162.0	5.9
10130.038889	44.78	---	74.00	29.22	15000	1000	289.0	V	162.0	5.9
17072.177778	49.29	---	74.00	24.71	15000	1000	210.0	H	342.0	12.1
17072.177778	---	35.88	54.00	18.12	15000	1000	210.0	H	342.0	12.1

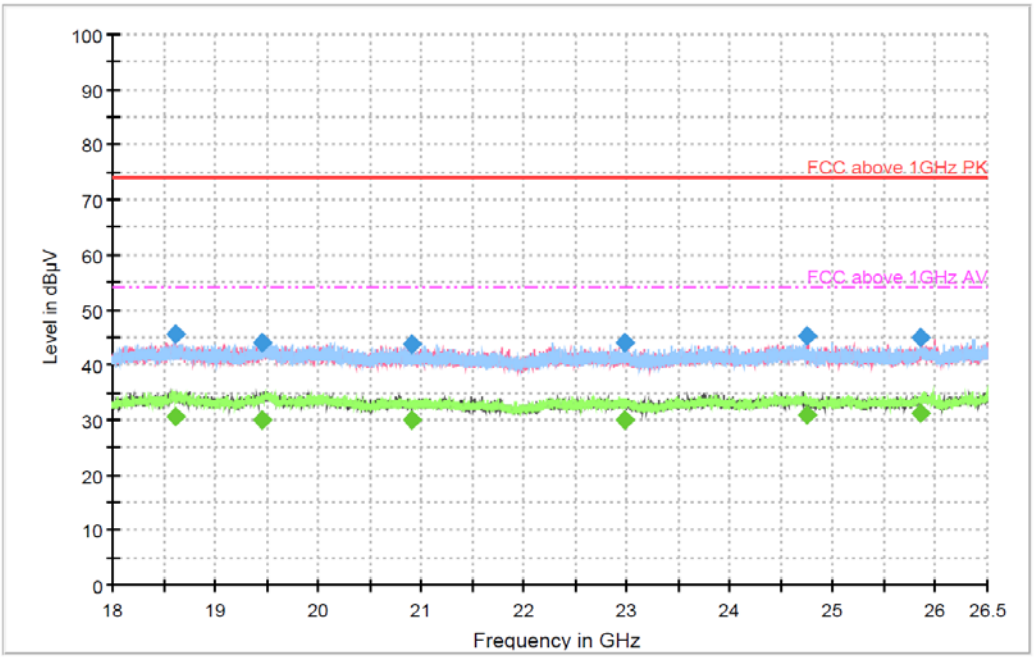
Note1) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.
Note2) Radiated emissions (Tx / Rx frequency) from the transceiver shall be ignored.
-Data transmission in the 2.4 GHz ISM Fundamental band (Bluetooth/Wi-Fi 802.11 a/b/g/n)
-Data transmission in the 4.8 GHz ISM Harmonic band (Bluetooth/Wi-Fi 802.11 a/b/g/n)

#2 (18 ~ 26.5 GHz)

Test Report

Common Information

Project Number	BVCO-WAY-P21090030
Location	10 m SAC
System:	Above 1 GHz
Date:	2021.10.06
Environment	21.0 'C / 50.8 % R.H.



Final_Result

Frequency (MHz)	MaxPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
18605.477778	---	30.73	54.00	23.27	15000	1000	291.0	V	15.0	-0.6
18605.477778	45.58	---	74.00	28.42	15000	1000	291.0	V	15.0	-0.6
19461.544444	---	30.11	54.00	23.89	15000	1000	106.0	H	286.0	-0.8
19461.544444	44.16	---	74.00	29.84	15000	1000	106.0	H	286.0	-0.8
20908.611111	---	29.89	54.00	24.11	15000	1000	315.0	H	109.0	0.9
20908.611111	43.65	---	74.00	30.35	15000	1000	315.0	H	109.0	0.9
22982.872222	43.92	---	74.00	30.08	15000	1000	108.0	V	298.0	1.1
22982.872222	---	30.02	54.00	23.98	15000	1000	108.0	V	298.0	1.1
24744.083333	45.12	---	74.00	28.88	15000	1000	115.0	V	270.0	0.6
24744.083333	---	31.01	54.00	22.99	15000	1000	115.0	V	270.0	0.6
25860.227778	---	31.17	54.00	22.83	15000	1000	290.0	V	92.0	1.6
25860.227778	44.82	---	74.00	29.18	15000	1000	290.0	V	92.0	1.6

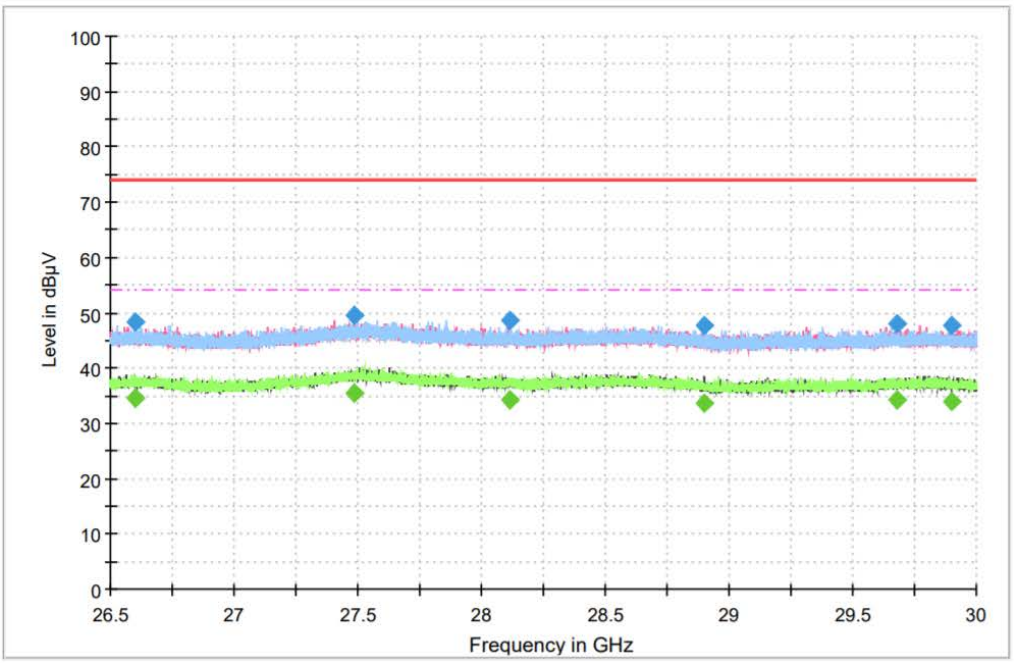
Note1) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#2 (26.5 ~ 30 GHz)

Test Report

Common Information

Project Number	BVCO-WAY-P21090030
Location	10 m SAC
System:	Above 1 GHz
Date:	2021.10.06
Environment	22.4 'C / 48.5 % R.H.



Final_Result

Frequency (MHz)	MaxPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
26596.500000	---	34.44	54.00	19.56	15000	1000	197.0	H	51.0	7.0
26596.500000	48.44	---	74.00	25.56	15000	1000	197.0	H	51.0	7.0
27488.500000	49.46	---	74.00	24.54	15000	1000	386.0	V	32.0	10.0
27488.500000	---	35.61	54.00	18.39	15000	1000	386.0	V	32.0	10.0
28116.500000	48.76	---	74.00	25.24	15000	1000	400.0	H	110.0	9.2
28116.500000	---	34.24	54.00	19.76	15000	1000	400.0	H	110.0	9.2
28897.750000	47.61	---	74.00	26.39	15000	1000	377.0	V	86.0	8.8
28897.750000	---	33.74	54.00	20.26	15000	1000	377.0	V	86.0	8.8
29676.500000	---	34.15	54.00	19.85	15000	1000	108.0	V	289.0	8.4
29676.500000	47.92	---	74.00	26.08	15000	1000	108.0	V	289.0	8.4
29902.250000	47.56	---	74.00	26.44	15000	1000	111.0	H	82.0	8.6
29902.250000	---	34.06	54.00	19.94	15000	1000	111.0	H	82.0	8.6

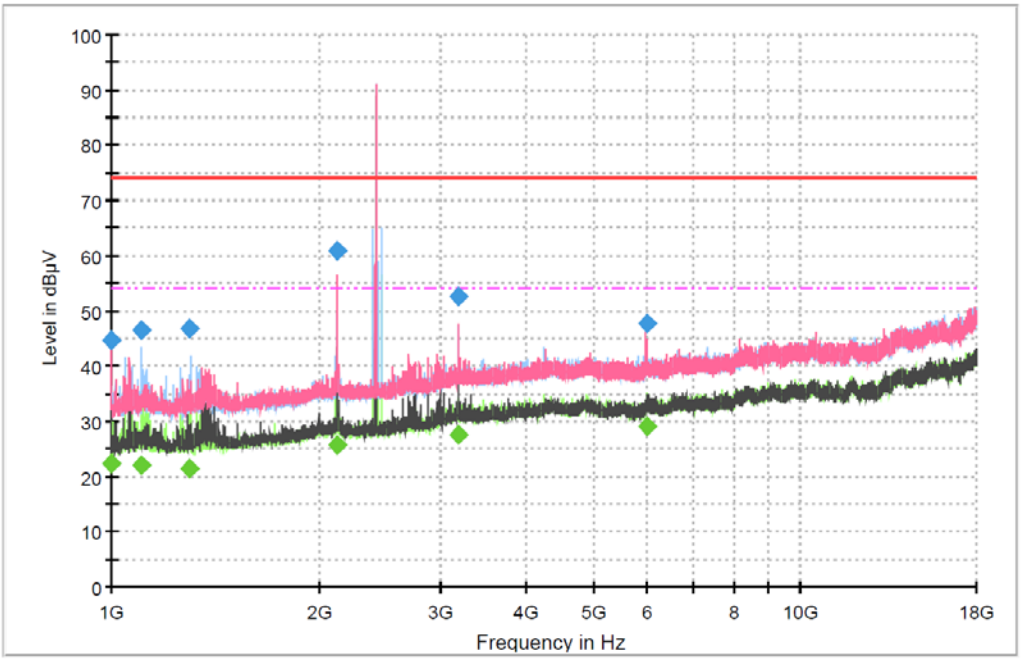
Note1) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#3 (1 ~ 18 GHz)

Test Report

Common Information

Project Number	BVCO-WAY-P21090030
Location	10 m SAC
System:	Above 1 GHz
Date:	2021.10.05
Environment	21.7 'C / 54.2 % R.H.



Final_Result

Frequency (MHz)	MaxPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1000.000000	---	22.43	54.00	31.57	15000	1000	101.0	V	20.0	-11.4
1000.000000	44.73	---	74.00	29.27	15000	1000	101.0	V	20.0	-11.4
1107.033333	46.39	---	74.00	27.61	15000	1000	315.0	H	300.0	-10.9
1107.033333	---	22.00	54.00	32.00	15000	1000	315.0	H	300.0	-10.9
1301.911111	---	21.53	54.00	32.47	15000	1000	315.0	H	99.0	-10.7
1301.911111	46.88	---	74.00	27.12	15000	1000	315.0	H	99.0	-10.7
2133.283333	---	25.58	54.00	28.42	15000	1000	305.0	V	65.0	-6.7
2133.283333	60.74	---	74.00	13.26	15000	1000	305.0	V	65.0	-6.7
3190.661111	52.65	---	74.00	21.35	15000	1000	297.0	V	225.0	-3.2
3190.661111	---	27.52	54.00	26.48	15000	1000	297.0	V	225.0	-3.2
5976.555556	---	29.02	54.00	24.98	15000	1000	207.0	V	3.0	0.5
5976.555556	47.82	---	74.00	26.18	15000	1000	207.0	V	3.0	0.5

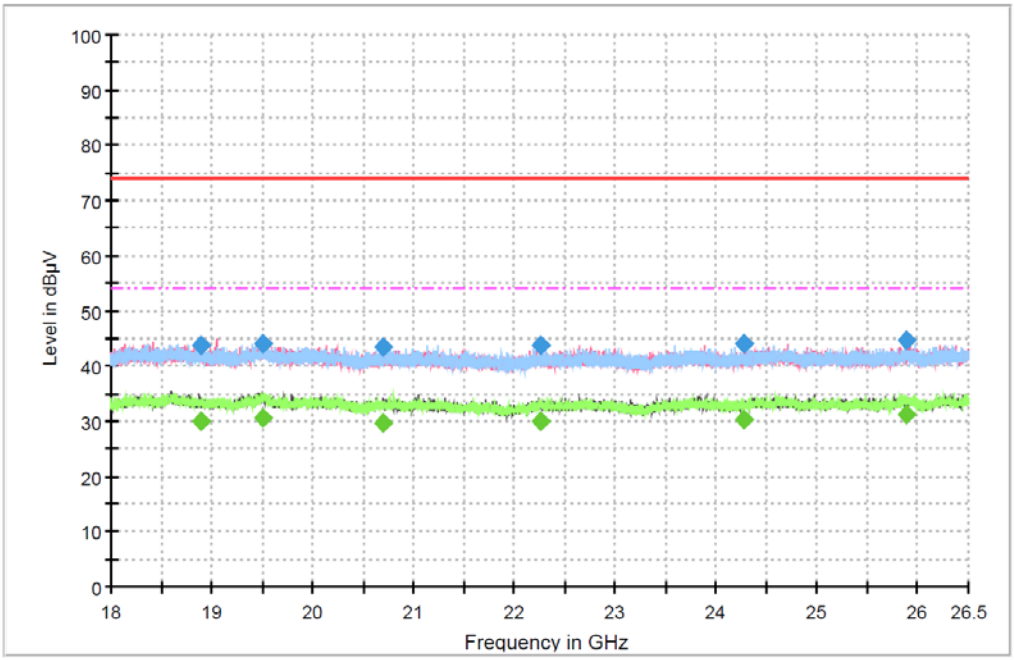
Note1) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.
Note2) Radiated emissions (Tx / Rx frequency) from the transceiver shall be ignored.
-Data transmission in the 2.4 GHz ISM Fundamental band (Bluetooth/Wi-Fi 802.11 a/b/g/n)
-Data transmission in the 4.8 GHz ISM Harmonic band (Bluetooth/Wi-Fi 802.11 a/b/g/n)

#3 (18 ~ 26.5 GHz)

Test Report

Common Information

Project Number	BVCO-WAY-P21090030
Location	10 m SAC
System:	Above 1 GHz
Date:	2021.10.06
Environment	21.0 'C / 50.8 % R.H.



Final_Result

Frequency (MHz)	MaxPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
18885.105556	43.69	---	74.00	30.31	15000	1000	387.0	V	31.0	-0.7
18885.105556	---	29.93	54.00	24.07	15000	1000	387.0	V	31.0	-0.7
19499.761111	---	30.55	54.00	23.45	15000	1000	215.0	V	330.0	-0.7
19499.761111	43.96	---	74.00	30.04	15000	1000	215.0	V	330.0	-0.7
20690.916667	---	29.78	54.00	24.22	15000	1000	115.0	H	134.0	0.8
20690.916667	43.30	---	74.00	30.70	15000	1000	115.0	H	134.0	0.8
22266.250000	---	29.91	54.00	24.09	15000	1000	385.0	H	44.0	1.7
22266.250000	43.73	---	74.00	30.27	15000	1000	385.0	H	44.0	1.7
24274.838889	44.18	---	74.00	29.82	15000	1000	315.0	V	349.0	0.3
24274.838889	---	30.37	54.00	23.63	15000	1000	315.0	V	349.0	0.3
25893.900000	---	31.04	54.00	22.96	15000	1000	104.0	V	24.0	1.7
25893.900000	44.75	---	74.00	29.25	15000	1000	104.0	V	24.0	1.7

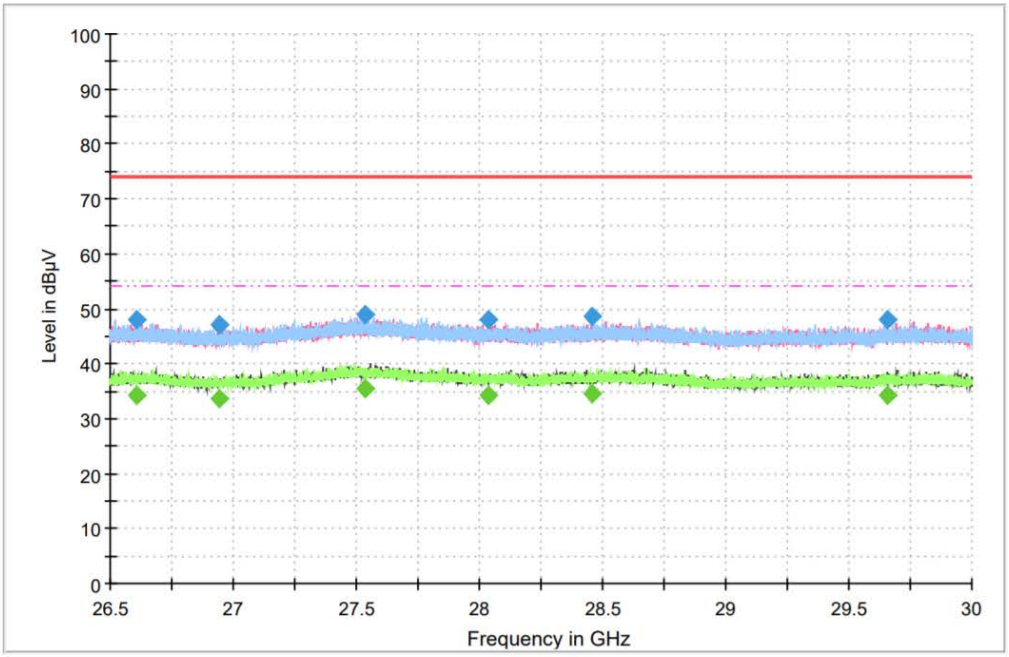
Note1) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#3 (26.5 ~ 30 GHz)

Test Report

Common Information

Project Number	BVCO-WAY-P21090030
Location	10 m SAC
System:	Above 1 GHz
Date:	2021.10.06
Environment	22.4 'C / 48.5 % R.H.



Final Result

Frequency (MHz)	MaxPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
26603.750000	---	34.35	54.00	19.65	15000	1000	208.0	H	91.0	7.0
26603.750000	47.90	---	74.00	26.10	15000	1000	208.0	H	91.0	7.0
26943.000000	---	33.62	54.00	20.38	15000	1000	115.0	H	7.0	7.4
26943.000000	47.11	---	74.00	26.89	15000	1000	115.0	H	7.0	7.4
27534.000000	48.85	---	74.00	25.15	15000	1000	387.0	H	356.0	9.9
27534.000000	---	35.52	54.00	18.48	15000	1000	387.0	H	356.0	9.9
28036.000000	---	34.32	54.00	19.68	15000	1000	188.0	V	352.0	9.0
28036.000000	47.98	---	74.00	26.02	15000	1000	188.0	V	352.0	9.0
28456.250000	---	34.52	54.00	19.48	15000	1000	400.0	V	93.0	9.6
28456.250000	48.68	---	74.00	25.32	15000	1000	400.0	V	93.0	9.6
29658.250000	47.96	---	74.00	26.04	15000	1000	104.0	V	350.0	8.3
29658.250000	---	34.16	54.00	19.84	15000	1000	104.0	V	350.0	8.3

Note1) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

Appendix A. Test site accreditations

Certificate	Nation	Agency	Code	Remark
Accreditation	USA	A2LA	4068.03	31 July, 2019
Accreditation	KOREA	RRA	KR0158	10 January, 2020
Registration	Japan	VCCI	4013	17 February, 2020
Accreditation	USA MRA	FCC	KR0158, 666061	17 March, 2020
Accreditation	CANADA MRA	ISED	KR0158, 25944	17 March, 2020
Accreditation	Vietnam MRA	MIC	KR0158	20 April, 2020

Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the “General requirements for the competent of calibration and testing laboratory”.

Appendix B. Test Equipment

Conducted Emissions					
Description	**Manufacturer**	**Model**	**Identifier**	**Cal. Date**	**Cal. Due**
EMI Test Receiver	R&S	ESR	102529	2020.12.08	2021.12.08
LISN	R&S	ENV216	102437	2020.12.08	2021.12.08
LISN	R&S	ENV432	101474	2020.12.08	2021.12.08
50 ohm Termination	R&S	50 OHM	3	2020.12.09	2021.12.09
Software	R&S	EMC 32	10.50.40 Version	-	-
Wide Band Radio Communication Tester	R&S	CMW500	140398	2021.08.12	2022.08.12

Radiated Emissions (30 MHz ~ 1 GHz)					
Equipment Name	**Manufacturer**	**Model**	**Serial No.**	**Cal. Date**	**Cal. Due**
EMI Test Receiver	R&S	ESW44	101812	2020.12.09	2021.12.09
Trilog Antenna (with 6dB ATT.)	Schwarzbeck	VULB9163	01199	2021.02.22	2023.02.22
SIGNAL CONDITIONING UNIT	R&S	SCU08F2	08400016	2020.12.09	2021.12.09
Software	R&S	EMC 32	10.35.10 Version	-	-

Radiated Emissions (1 GHz ~ 30 GHz)					
Equipment Name	**Manufacturer**	**Model**	**Serial No.**	**Cal. Date**	**Cal. Due**
EMI Test Receiver	R&S	ESW44	101812	2020.12.09	2021.12.09
HORN ANTENNA	R&S	HF907	102772	2020.12.09	2021.12.09
HORN ANTENNA	Steatite Antenna	QSH-SL-18-26-S-20	19926	2020.12.09	2021.12.09
HORN ANTENNA	Steatite Antenna	QSH-SL-26-40-K-20	18320	2020.12.09	2021.12.09
SIGNAL CONDITIONING UNIT	R&S	SCU-18F	180111	2020.12.09	2021.12.09
SIGNAL CONDITIONING UNIT	R&S	SCU-26F	260005	2020.12.08	2021.12.08
SIGNAL CONDITIONING UNIT	R&S	SCU-40F	400010	2020.12.08	2021.12.08
Software	R&S	EMC 32	10.35.10 Version	-	-

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