



47 CFR Part 15 Subpart B Electromagnetic Compatibility Test Report

For

Smart Wearable

ORDER NO.: BVCO-WAY-P21090030

REPORT NO.: FCCBVCO-WAY-P21090030-5

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

Copyright © 2020 Bureau Veritas CPS ADT Korea Ltd.

Bureau Veritas CPS ADT Korea Ltd. authorizes the above-named company to reproduce this Report provided it is reproduced in its entirety. This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification.

Test Report Details

Test Report No. FCCBVCO-WAY-P21090030-5

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: Communications Rcvr for use w/ licensed Tx and CBs (CXX)

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

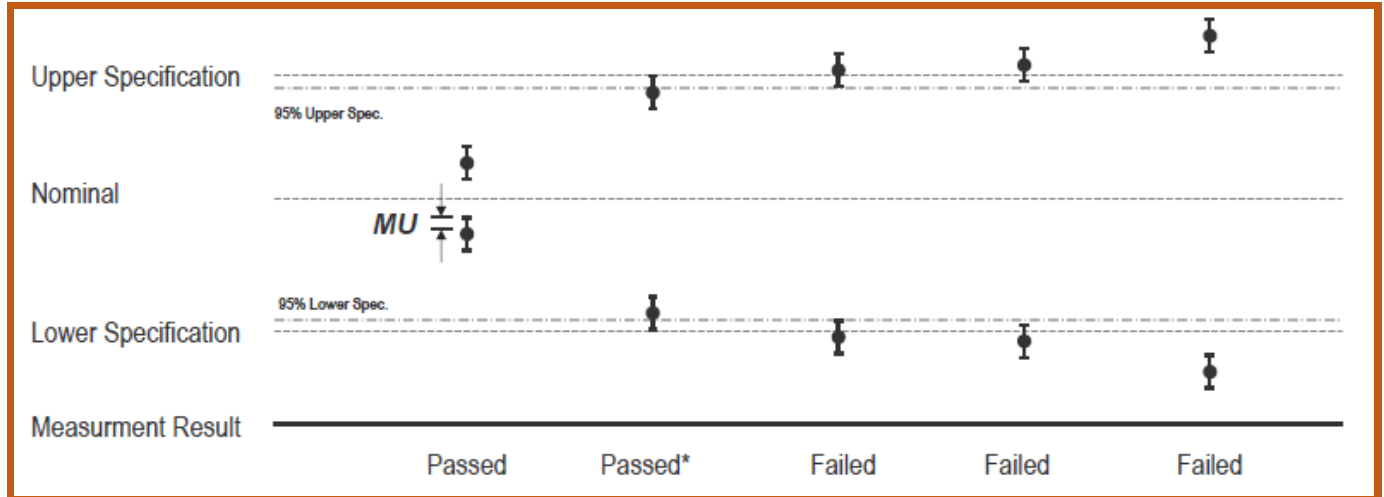
Testing Start Date: 05 October, 2021

Date Testing Complete: 05 October, 2021

This test report apply only to the specific samples tested under stated test conditions. All samples tested were in good operating condition throughout the entire test program. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components Bureau Veritas CPS ADT Korea Ltd. shall have no liability for any deductions, inferences or generalizations drawn by the client or others from Bureau Veritas CPS ADT Korea Ltd. issued reports.

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.

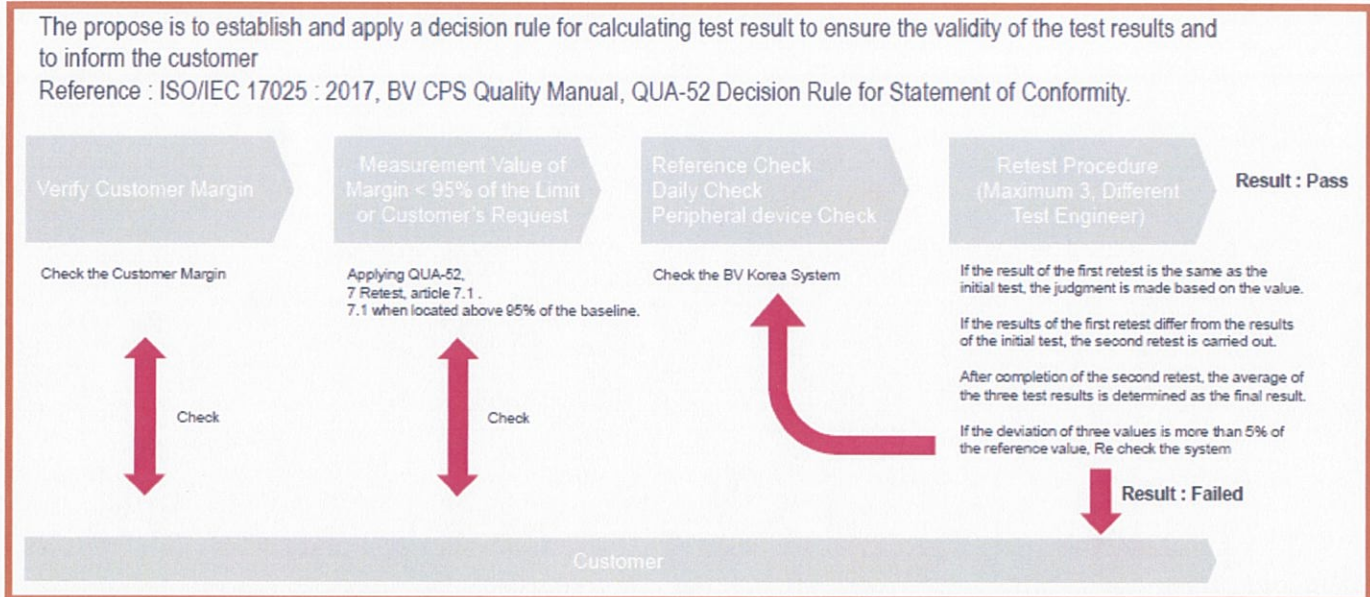
If the deviation of three values is more than 5% of the reference value, Re check the system

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
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



IV. FINAL DECISION

RELEASE CONTROL RECORD

REPORT NO.	REASON FOR CHANGE	DATE ISSUED
FCCBVCO-WAY-P210 90030-5	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 :

Junil Park / Senior Engineer

, DATE : 18 October, 2021

APPROVED BY :

Rina Bae / Technical Manager

, DATE : 18 October, 2021

Table of Contents

1.	EMC Result Conclusion (With Justification)	6
2.	General Product Description	7
2.1	Equipment Description	7
2.2	Technical Data	7
2.3	Detail information of Multi-listing model	7
3.	Test Condition	8
3.1	Ancillary Equipment	8
3.2	Input/Output Ports	8
3.3	Power Interface:	8
3.4	Modes of Description	9
3.5	Configuration	10
4.	Test Condition and Results	11
4.1	Conducted RF Emissions	11
4.2	Radiated RF Emissions (30 MHz - 1 000 MHz)	13
4.3	Radiated RF Emissions (Above 1 GHz)	16
	Appendix A. Test site accreditations	19
	Appendix B. Test Equipment	19



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	<input type="checkbox"/> Class A / <input checked="" type="checkbox"/> Class B		
Conducted RF Emissions	47 CFR Part 15 Subpart B ANSI C63.4: 2014	Not Applicable	Not Applicable ^{Note1)}
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.			
Note1) Compliance with Part 15B requirement for the conducted emissions is covered by JAB(FCCBVCO-WAY-P21090030-4) test report.			



2. General Product Description

2.1 Equipment Description

Description
The Equipment Under Test (EUT) is the Smart Wearable. The test data contained in this report pertains only to the emissions due to receiver circuitry of the licensed transmitter of the EUT. The device contains receivers which tune and operating between 30 MHz – 960 MHz in the following bands: WCDMA B5, LTE B5/B12/B13/B26/B71

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
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	-
Mode 2				
EUT	Smart Wearable	Samsung Electronics Co., Ltd.	SM-R875U	EUT
* Note: EUT - Equipment Under Test, AE - Auxiliary/Associated Equipment, SIM - Simulator (Not Subjected to Test)				

3.2 Input/Output Ports

START		END		CABLE		
Name	I/O Port	Name	I/O Port	Length (m)	Shield	With Ferrite
Mode 1						
EUT	-	Wireless Charger	-	-	-	-
Wireless Charger	-	Travel Adapter	USB Type-A	0.8	Unshield	-
Travel Adapter	AC In	AC Mains	AC Out	-	-	-
Mode 2						
EUT	-	-	-	-	-	-

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 Modes of Description

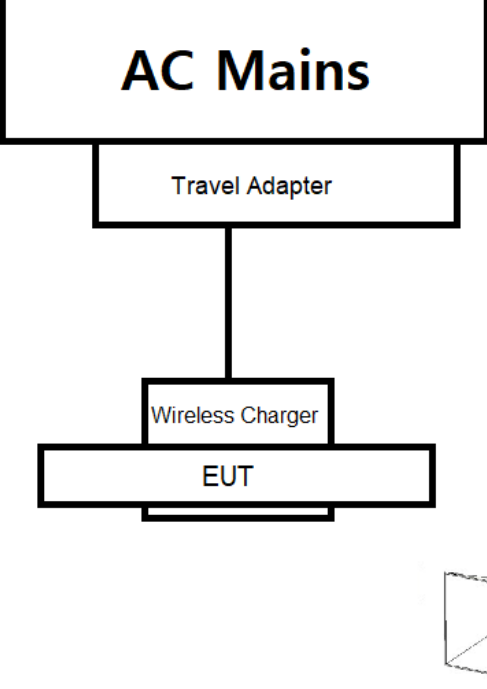

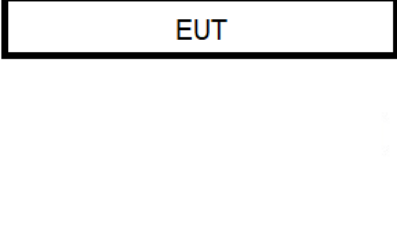

Mode #	Description	Comments
1	Wireless Charging(w/TA) + Cellular receiver (LTE FDD Band13 Center Frequency)	Low/Middle/High Channel
2	Battery + Cellular receiver (LTE FDD Band13 Center Frequency)	Low/Middle/High Channel

*Worst case by LTE FDD Band13

Note1) All cellular RX bands operating below 1 GHz, including WCDMA and LTE have been investigated with Low/Middle/High channels. Among the bands, LTE 13_Middle (751 MHz) is the worst mode.

Note2) The device was determined in the worst orientation y of the 3 orientations (x, y and z). Accordingly, all final radiated emission tests were performed in the y orientation of the EUT and contained test result in this report.

3.5 Configuration

Mode #	Description	
1	<p style="text-align: center;">Inside the chamber</p> 	<p style="text-align: center;">Outside the chamber</p> 
2	<p style="text-align: center;">Inside the chamber</p> 	<p style="text-align: center;">Outside the chamber</p> 



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	-			
Parameters recorded during the test	Laboratory Ambient Temperature	----- °C		
	Relative Humidity	----- %		
	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 (dB μ V)			
	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 (dB μ V)			
	Quasi-Peak	Result	Average	Result
0.15 to 0.5	66 to 56	-	56 to 46	-
0.5 to 5	56	-	46	-
5 to 30	60	-	50	-

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
<p style="text-align: center;">Not Applicable</p>



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	(20.7 ± 1.0) °C
	Relative Humidity	(54.5 ± 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)

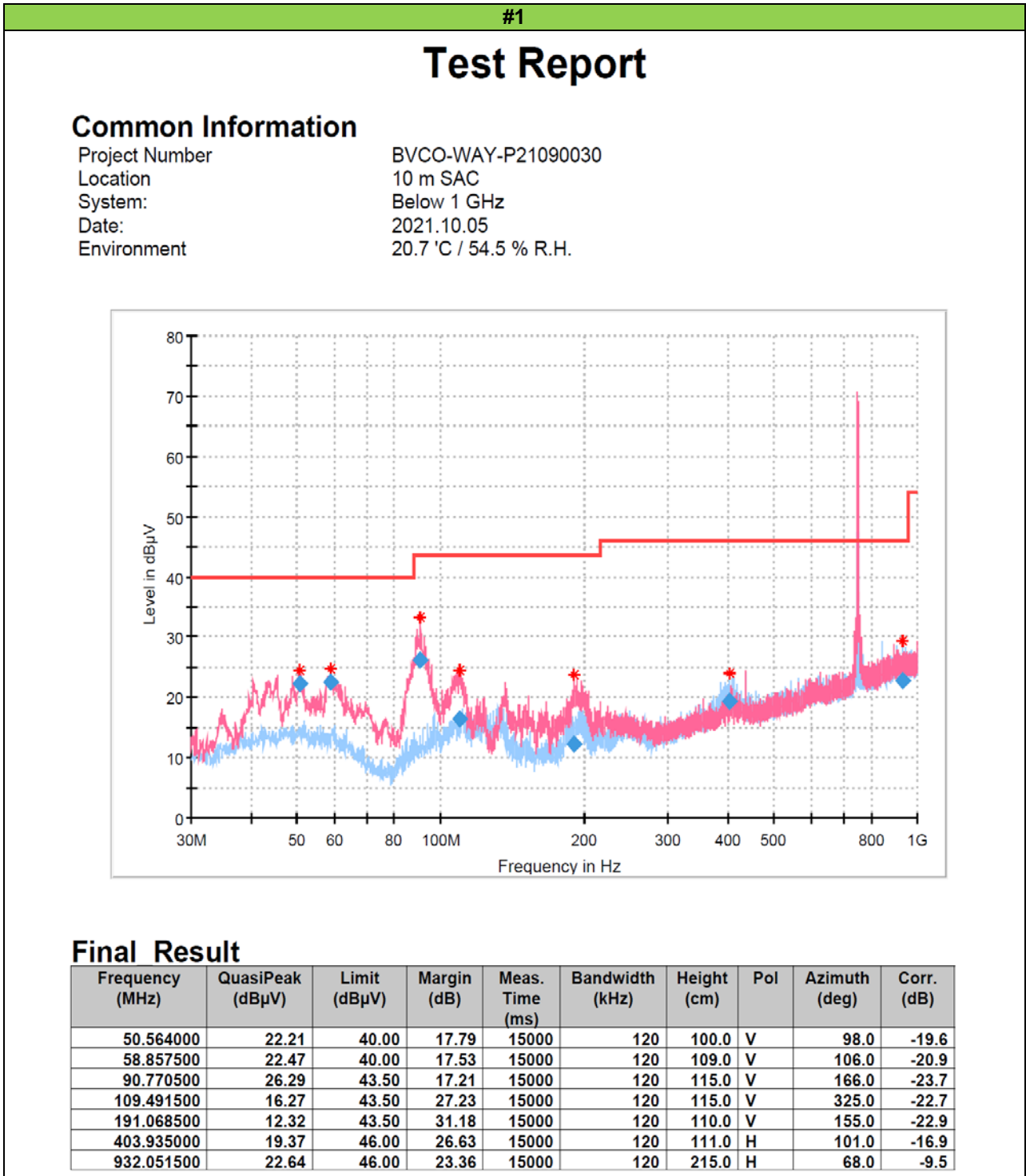
PK = Peak, QP = Quasi-Peak, CAV = CISPR-Average, Corr. = Correction Factor

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



Note1) Unwanted emissions captured from LTE B13 Middle channel (Carrier Frequency: RX 751 MHz) were the RX signals generated from the call-simulator.

Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

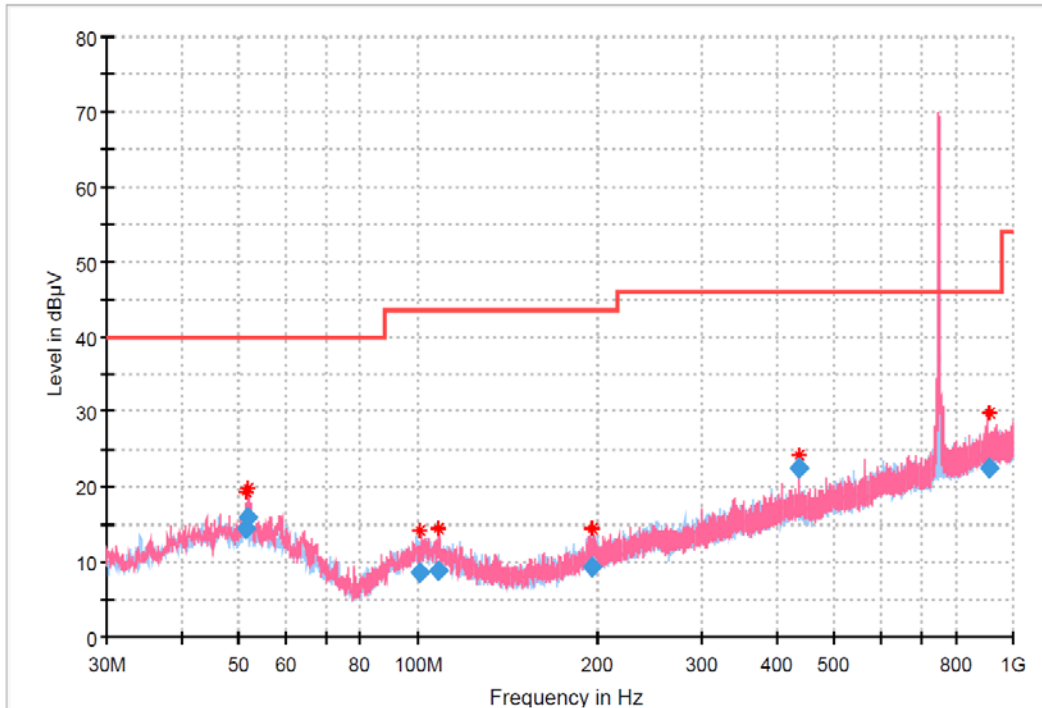


#2

Test Report

Common Information

Project Number	BVCO-WAY-P21090030
Location	10 m SAC
System:	Below 1 GHz
Date:	2021.10.05
Environment	20.7 °C / 54.5 % R.H.



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
51.345000	14.46	40.00	25.54	15000	120	111.0	V	172.0	-19.7
51.853000	15.88	40.00	24.12	15000	120	100.0	V	61.0	-19.7
100.880500	8.50	43.50	35.00	15000	120	111.0	V	137.0	-22.2
107.944500	8.87	43.50	34.63	15000	120	395.0	V	200.0	-22.3
196.046000	9.36	43.50	34.14	15000	120	385.0	H	197.0	-21.9
437.497000	22.41	46.00	23.59	15000	120	299.0	V	50.0	-16.2
908.840500	22.53	46.00	23.47	15000	120	115.0	V	10.0	-9.5

Note1) Unwanted emissions captured from LTE B13 Middle channel (Carrier Frequency: RX 751 MHz) were the RX signals generated from the call-simulator.
 Note2) 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			
Parameters recorded during the test	Laboratory Ambient Temperature	(21.4 ± 1.0) °C		
	Relative Humidity	(53.2 ± 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 10	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

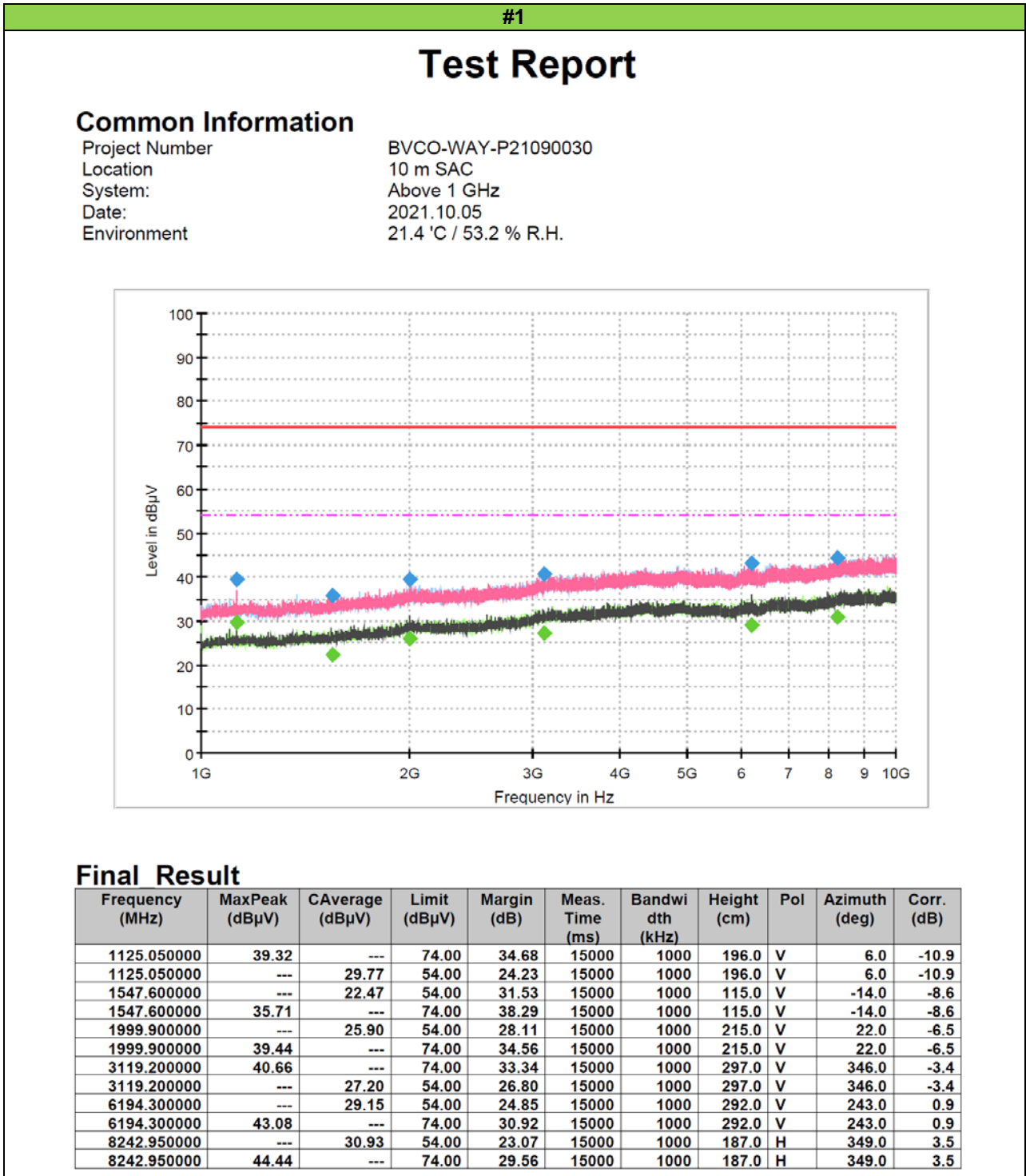
Note2) Distance (Antenna to Centre of Turntable), Antenna Height

Above 1 GHz, Distance = 4.5 m, Antenna Height (Considering size of EUT) = (1 to 4) m

$L2 = L1 + 20 \log (d1 (m) / d2 (m)) = 20 \log (4.5 / 3) = \underline{3.5}$



Table 3. Test data for radiated RF emissions



Note1) LTE B13 Middle channel (Carrier Frequency: RX 751 MHz)

Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

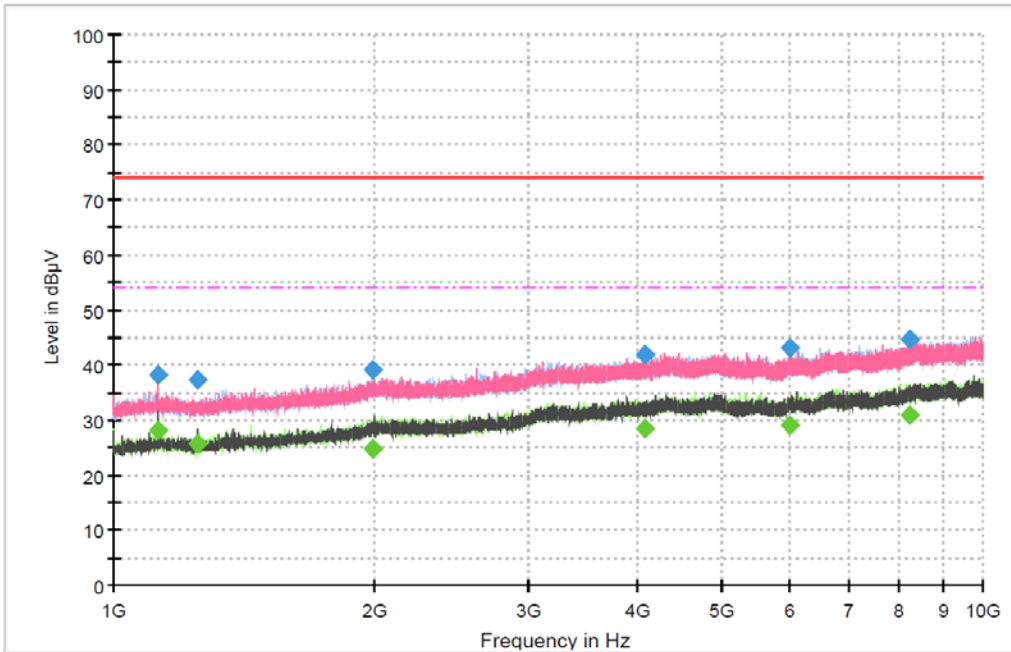


#2

Test Report

Common Information

Project Number	BVCO-WAY-P21090030
Location	10 m SAC
System:	Above 1 GHz
Date:	2021.10.05
Environment	21.4 °C / 53.2 % 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)
1124.950000	---	28.13	54.00	25.87	15000	1000	215.0	V	19.0	-10.9
1124.950000	38.29	---	74.00	35.71	15000	1000	215.0	V	19.0	-10.9
1250.200000	---	25.68	54.00	28.32	15000	1000	203.0	V	155.0	-11.0
1250.200000	37.43	---	74.00	36.57	15000	1000	203.0	V	155.0	-11.0
1990.300000	---	24.80	54.00	29.20	15000	1000	315.0	H	-2.0	-6.6
1990.300000	39.07	---	74.00	34.93	15000	1000	315.0	H	-2.0	-6.6
4075.800000	---	28.33	54.00	25.67	15000	1000	100.0	H	336.0	-1.5
4075.800000	41.89	---	74.00	32.11	15000	1000	100.0	H	336.0	-1.5
5990.800000	---	29.18	54.00	24.82	15000	1000	190.0	V	102.0	0.7
5990.800000	43.24	---	74.00	30.76	15000	1000	190.0	V	102.0	0.7
8231.600000	---	30.90	54.00	23.10	15000	1000	215.0	H	225.0	3.5
8231.600000	44.76	---	74.00	29.24	15000	1000	215.0	H	225.0	3.5

Note1) LTE B13 Middle channel (Carrier Frequency: RX 751 MHz)

Note2) 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

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	-	-
WIDE BAND RADIO COMMUNICATION TESTER	R&S	CMW500	140398	2021.08.12	2022.08.12

Radiated Emissions (1 GHz ~ 10 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
SIGNAL CONDITIONING UNIT	R&S	SCU-18F	180111	2020.12.09	2021.12.09
Software	R&S	EMC 32	10.35.10 Version	-	-
WIDE BAND RADIO COMMUNICATION TESTER	R&S	CMW500	140398	2021.08.12	2022.08.12

- The End -