47 CFR Part 15 Subpart B
Electromagnetic Compatibility Test Report

For

Notebook computer

ORDER NO.:	BVCO-WAY-P21070008
REPORT NO.:	FCCBVCO-WAY-P21070008-3R1
ISSUED DATE:	27 August, 2021
MODEL NO.:	NP935QDC

Samsung Electronics Co., Ltd.

129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16667, Korea

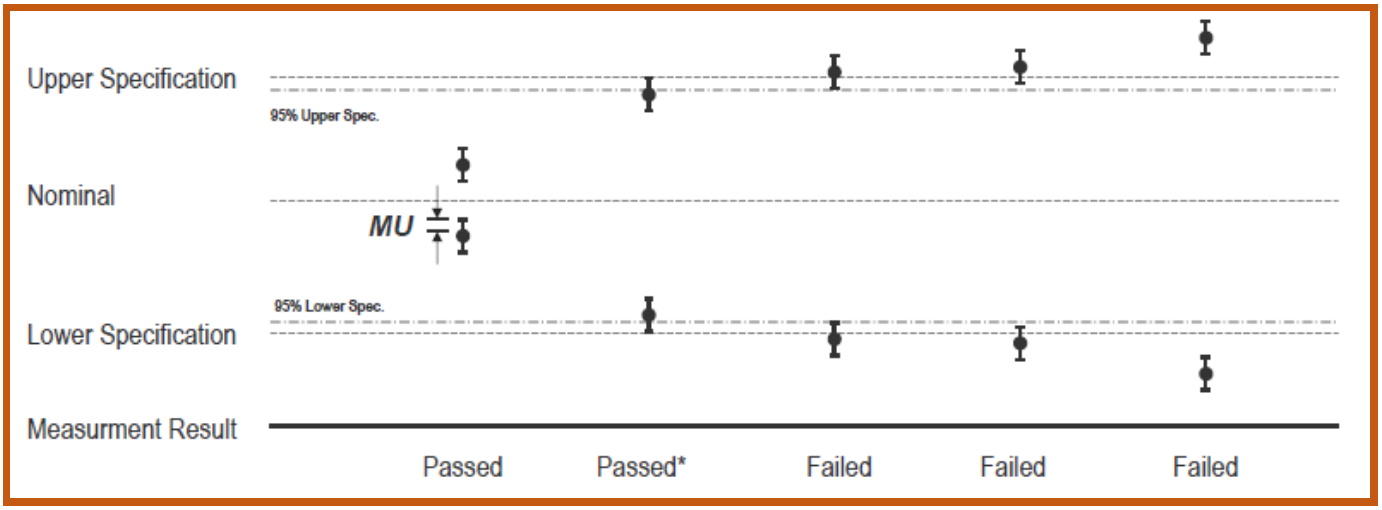
Certificate #4068.03

Test Report Details

Test Report No.	FCCBVCO-WAY-P21070008-3R1
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, 16667, Korea
Manufacturer:	Samsung Electronics Co., Ltd.
Manufacturer address:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16667, Korea
Product Type:	Notebook computer
Model Number:	NP935QDC
Multi-listing model number:	-
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:	1J9F91ZR700002M
Sample Receive Date:	05 July, 2021
Testing Start Date:	01 August, 2021
Date Testing Complete:	07 August, 2021

Overall Results

I. DECISION RULE FOR STATEMENT OF CONFORMITY



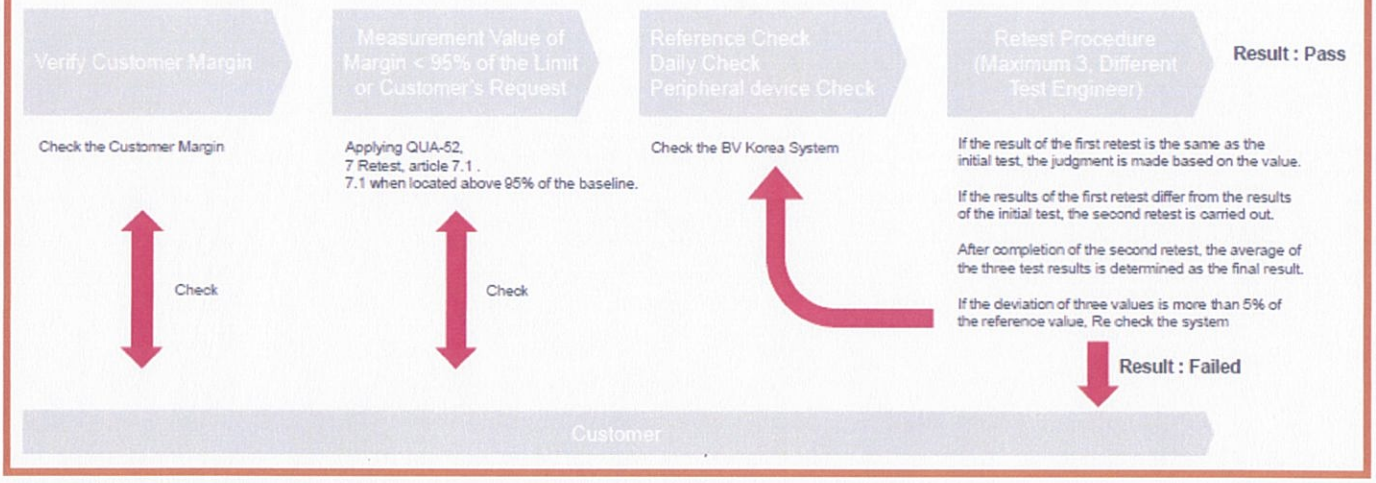
MU =95% expanded measurement uncertainty
QUA-52 Decision Rule Applied
Step 1: Reference Check, Daily Check, Peripheral device Check
Step 2: Retest Procedure (Maximum 3, Different Test Engineer)
1) If the result of the first retest is the same as the initial test, the judgment is made based on the value.
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
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-P21070008-3	Original release	10 August, 2021
FCCBVCO-WAY-P21070008-3R1	Overall Modification	27 August, 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 :** 27 August, 2021
Taejoo Kim / Senior Engineer

APPROVED BY : _____ , **DATE :** 27 August, 2021
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	Not Applicable	Not Applicable[Note1)]
Radiated RF Emissions (Below 1 GHz)		Pass	Complied
Radiated RF Emissions (Above 1 GHz)		Pass	Complied
We tested the Notebook computer, Model: NP935QDC, 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 JBC(FCCBVCO-WAY-P21070008-2R1) test report			

2. General Product Description

2.1 Equipment Description

Description
The Equipment under Test (EUT) is the Notebook computer. 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/B14/B17/B29/B71, 5G n5/n71 - Bluetooth 5.2(BDR/EDR/LE)(2400.0-2483.5 MHz) - 802.11b/g/n/ax(2400.0-2483.5 MHz) - 802.11a/n/ac/ax(5150.0-5850.0 MHz) - 802.11a/n/ac/ax(5925.0-7125.0 MHz) - WCDMA Band : 2/4/5 - LTE Band : 2/4/5/7/12/13/14/17/25/29/41/66/71 - 5G NR : 2/5/41/66/71/77

2.2 Technical Data

CPU	Intel, TGL-UP4 i7-1160G7
Main Memory	Samsung, LPDDR4x 16GB
Graphic Controller	Intel, Shared Internal Memory
Display	Samsung, 13.3" AMOLED display FHD Up to 400nit
Storage	Samsung, NVMe x2 256 / 512G
WLAN/Bluetooth	Intel, AX210 Wi-Fi 6E
	Intel, AX210 BT 5.1
Battery	SAMSUNG SDI, AA-PBMN4MR, 62.5Wh Li-ion, Quick Charging
Camera	Kingcome, 720p HD Camera
Input Devices	Keyboard, Touchpad
Ports	TBT4 x1, Type-C x2, uSD, Audio Jack, USIM Slot
H/W Version	REV 1.0
S/W Version	0
Un-licensed Module	Samsung, AX210D2W (FCC ID : A3LAX210D),
Licensed Module	Samsung, SM-H111U (FCC ID : A3LH111U935QDC)

2.3 Detail information of Multi-listing model

No.	Model	Description	Comment
-	-	-	-
***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
EUT	Notebook computer	Samsung Electronics Co., Ltd.	NP935QDC	-
EUT	Travel adapter	Samsung Electronics Co., Ltd.	EP-TA865	In box
AE	Micro USIM	-	-	-
*** 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**
EUT	USB Type-C (Left)	Travel adapter	USB Type-C (DC Out)	1.8	Shield	-
EUT	USIM Slot	Micro USIM	-	-	-	-
Travel adapter	AC IN	AC Mains	AC Out	-	-	-

3.3 Power Interface:

Rated Voltage	**Travel adapter**	Input: AC (100-240) V, (50-60) Hz Output: (PDO) DC 5 V, 3 A / DC 9 V, 3 A / DC 15 V, 3 A / DC 20 V, 3.25 A (PPS) DC (5-20) V, 3.25 A
	Notebook computer rating	DC 20 V, 3.25 A, 65 W
Test Voltage		AC 120 V, 60 Hz

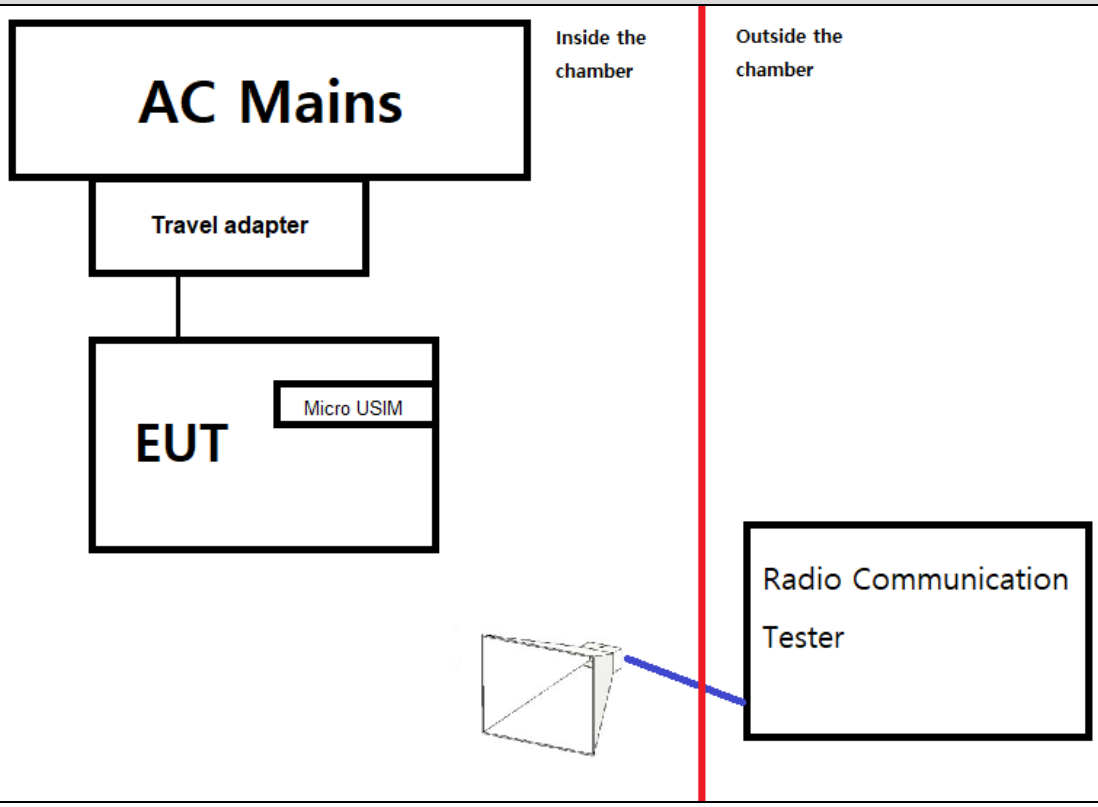
3.4 Modes of Description

Mode #	Mode	Description	Comments
1	Notebook mode (WCDMA B5)	Cellular receiver (WCDMA B5) + Charging(w/ TA) RX Frequency range: (871.4 to 891.6) MHz	Low/Middle/High Channel
2	Notebook mode (LTE B5)	Cellular receiver (LTE B5) + Charging(w/ TA) RX Frequency range: (869 to 894) MHz	Low/Middle/High Channel
3	Notebook mode (LTE B12)	Cellular receiver (LTE B12) + Charging(w/ TA) RX Frequency range: (729 to 746) MHz	Low/Middle/High Channel
4	Notebook mode (LTE B13)	Cellular receiver (LTE B13) + Charging(w/ TA) RX Frequency range: (746 to 756) MHz	Low/Middle/High Channel
5	Notebook mode (LTE B14)	Cellular receiver (LTE B14) + Charging(w/ TA) RX Frequency range: (758 to 768) MHz	Low/Middle/High Channel
6	Notebook mode (LTE B17)	Cellular receiver (LTE B17) + Charging(w/ TA) RX Frequency range: (734 to 746) MHz	Low/Middle/High Channel
7	Notebook mode (LTE B29)	Cellular receiver (LTE B29) + Charging(w/ TA) RX Frequency range: (717 to 728) MHz	Low/Middle/High Channel
8	Notebook mode (LTE B71)	Cellular receiver (LTE B71) + Charging(w/ TA) RX Frequency range: (617 to 652) MHz	Low/Middle/High Channel
9	Notebook mode (5G n5)	Cellular receiver (5G n5) + Charging(w/ TA) RX Frequency range: (869 to 894) MHz	Low/Middle/High Channel
10	Notebook mode (5G n71)	Cellular receiver (5G n71) + Charging(w/ TA) RX Frequency range: (617 to 652) MHz	Low/Middle/High Channel
11	Tablet mode (WCDMA B5)	Cellular receiver (WCDMA B5)+ Charging(w/ TA) RX Frequency range: (871.4 to 891.6) MHz	Low/Middle/High Channel
12	Tablet mode (LTE B5)	Cellular receiver (LTE B5) + Charging(w/ TA) RX Frequency range: (869 to 894) MHz	Low/Middle/High Channel
13	Tablet mode (LTE B12)	Cellular receiver (LTE B12) + Charging(w/ TA) RX Frequency range: (729 to 746) MHz	Low/Middle/High Channel
14	Tablet mode (LTE B13)	Cellular receiver (LTE B13) + Charging(w/ TA) RX Frequency range: (746 to 756) MHz	Low/Middle/High Channel
15	Tablet mode (LTE B14)	Cellular receiver (LTE B14) + Charging(w/ TA) RX Frequency range: (758 to 768) MHz	Low/Middle/High Channel
16	Tablet mode (LTE B17)	Cellular receiver (LTE B17) + Charging(w/ TA) RX Frequency range: (734 to 746) MHz	Low/Middle/High Channel
17	Tablet mode (LTE B29)	Cellular receiver (LTE B29) + Charging(w/ TA) RX Frequency range: (717 to 728) MHz	Low/Middle/High Channel
18	Tablet mode (LTE B71)	Cellular receiver (LTE B71) + Charging(w/ TA) RX Frequency range: (617 to 652) MHz	Low/Middle/High Channel

19	Tablet mode (5G n5)	Cellular receiver (5G n5) + Charging(w/ TA) RX Frequency range: (869 to 894) MHz	Low/Middle/High Channel
20	Tablet mode (5G n71)	Cellular receiver (5G n71) + Charging(w/ TA) RX Frequency range: (617 to 652) MHz	Low/Middle/High Channel

Note1) The connection status of Ancillary Equipment in Notebook mode and Tablet mode is the same.
Note2) The EUT was investigated in three orthogonal orientations X, Y and Z it was determined that X orientation was worst-case orientation.
Note3) The worst channel data of each band was recorded.

3.5 Configuration

Mode #	Description
1~20	

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 (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	-	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
Not Applicable

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	01 August, 2021 ~ 03 August, 2021	
Parameters recorded during the test	Laboratory Ambient Temperature	(20.5 ~ 23.1) °C
	Relative Humidity	(45.3 ~ 48.3) %
	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

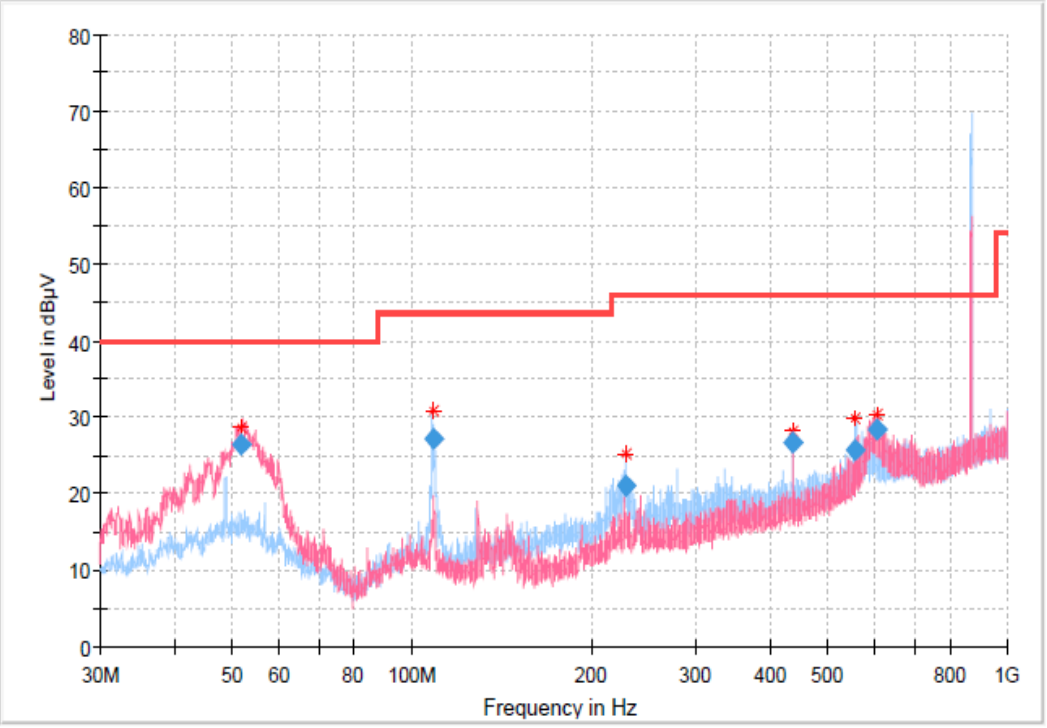
Table 2. Test data for radiated RF emissions

#1 WCDMA B5

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	Below 1 GHz
Date:	2021.08.01
Environment	22.1 'C / 46.3 % R.H.



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
51.759500	26.45	40.00	13.55	15000	120	115.0	V	197.0	-19.7
108.590500	27.15	43.50	16.35	15000	120	385.0	H	339.0	-22.9
228.584500	21.04	46.00	24.96	15000	120	111.0	H	202.0	-20.8
437.497000	26.67	46.00	19.34	15000	120	215.0	H	140.0	-15.7
556.784000	25.68	46.00	20.32	15000	120	190.0	H	352.0	-13.2
606.391000	28.28	46.00	17.72	15000	120	100.0	V	149.0	-12.3

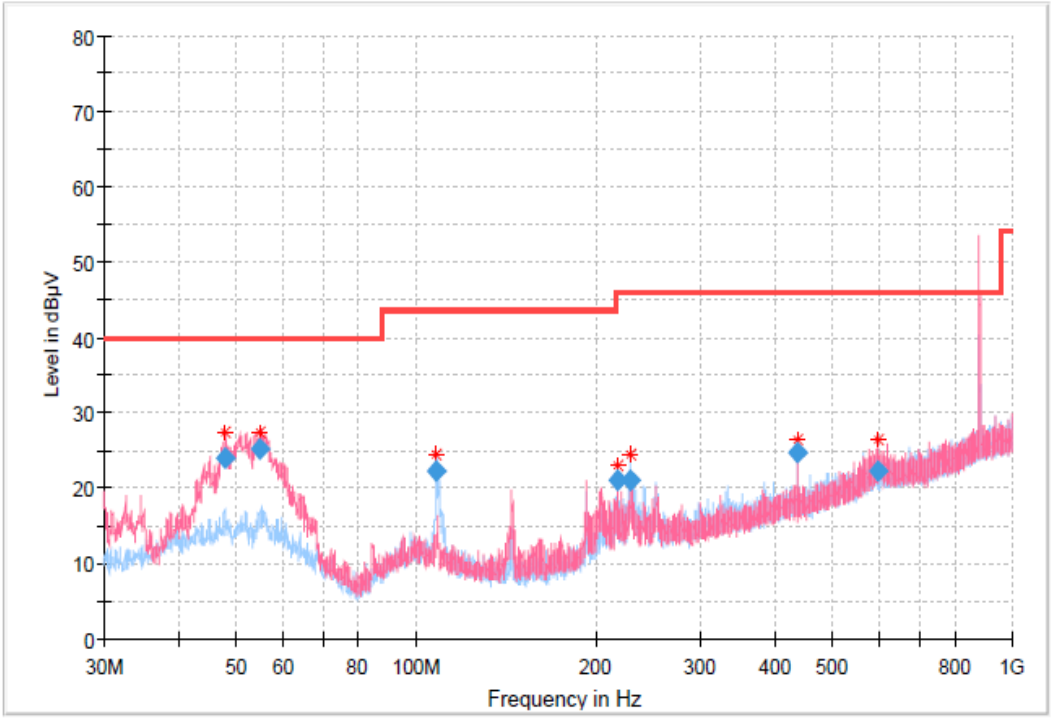
Note1) Unwanted emissions captured from WCDMA B5 Middle channel (Carrier Frequency: RX 881.5 MHz) were the RX signals generated from the call-simulator.
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#2 LTE B5

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	Below 1 GHz
Date:	2021.08.01
Environment	22.1 'C / 46.3 % R.H.



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
48.042000	23.94	40.00	16.06	15000	120	115.0	V	115.0	-19.5
54.686500	25.24	40.00	14.76	15000	120	104.0	V	17.0	-20.1
108.473000	22.21	43.50	21.29	15000	120	211.0	H	8.0	-22.9
217.549500	21.00	46.00	25.00	15000	120	109.0	H	334.0	-21.3
229.674500	21.08	46.00	24.92	15000	120	115.0	H	274.0	-20.8
437.497000	24.71	46.00	21.29	15000	120	315.0	V	342.0	-15.7
595.558500	22.17	46.00	23.83	15000	120	104.0	V	152.0	-12.4

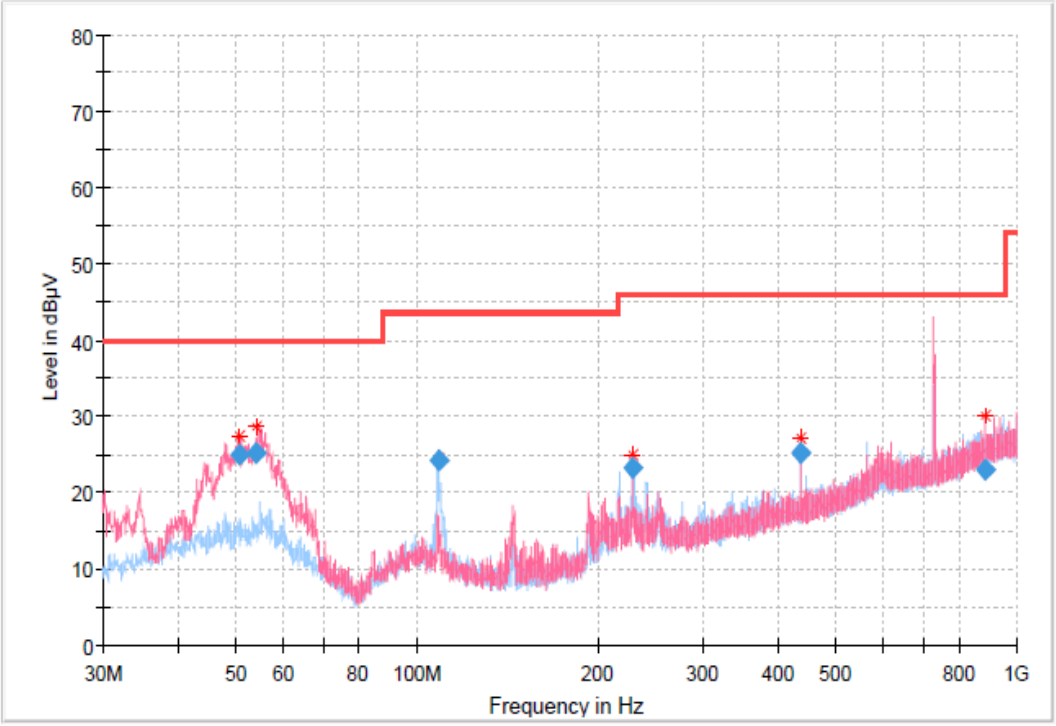
Note1) Unwanted emissions captured from LTE B5 Middle channel (Carrier Frequency: RX 881.5 MHz) were the RX signals generated from the call-simulator.
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#3 LTE B12

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	Below 1 GHz
Date:	2021.08.01
Environment	22.1 'C / 46.3 % R.H.



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
50.583500	24.90	40.00	15.10	15000	120	104.0	V	354.0	-19.6
54.189500	25.22	40.00	14.78	15000	120	109.0	V	18.0	-20.0
108.758000	24.19	43.50	19.31	15000	120	207.0	H	4.0	-22.9
229.434500	23.16	46.00	22.84	15000	120	111.0	H	317.0	-20.8
437.497000	25.21	46.00	20.79	15000	120	400.0	V	36.0	-15.7
886.033500	23.01	46.00	22.99	15000	120	210.0	V	75.0	-8.9

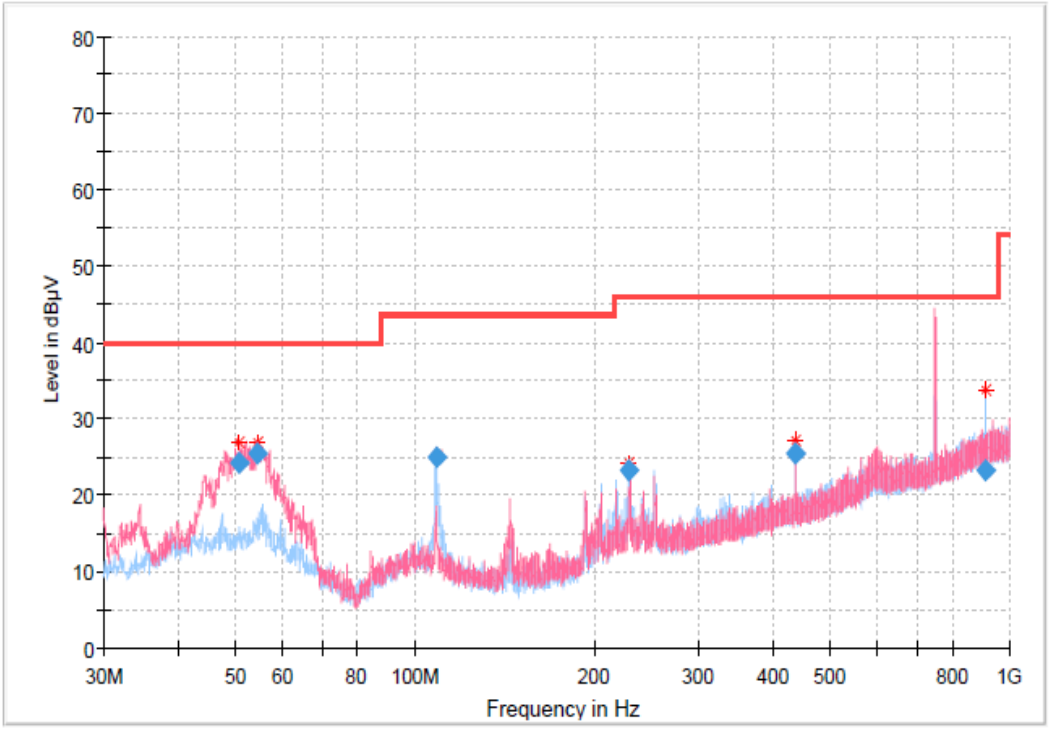
Note1) Unwanted emissions captured from LTE B12 Low channel (Carrier Frequency: RX 729.0 MHz) were the RX signals generated from the call-simulator.
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#4 LTE B13

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	Below 1 GHz
Date:	2021.08.02
Environment	21.9 'C / 46.9 % R.H.



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
50.849000	24.16	40.00	15.84	15000	120	100.0	V	254.0	-19.6
54.512000	25.35	40.00	14.65	15000	120	115.0	V	32.0	-20.1
108.895000	24.97	43.50	18.53	15000	120	215.0	H	-12.0	-22.9
229.440500	23.36	46.00	22.64	15000	120	106.0	H	312.0	-20.8
437.497000	25.49	46.00	20.51	15000	120	305.0	V	-9.0	-15.7
913.454000	23.18	46.00	22.82	15000	120	400.0	H	121.0	-8.7

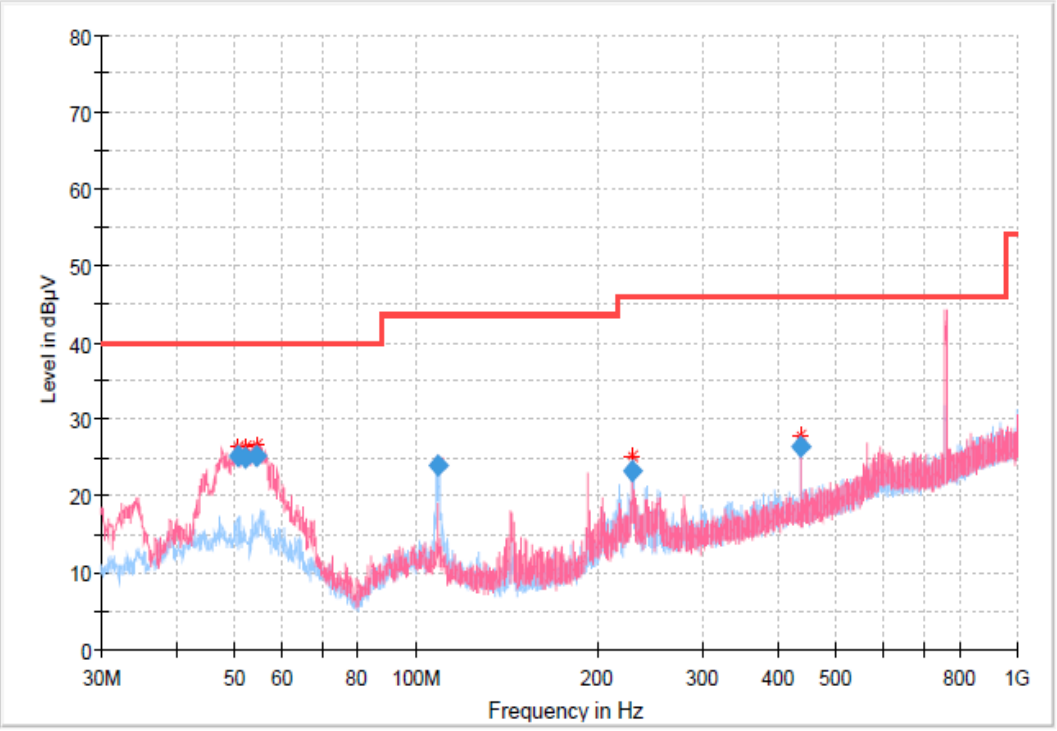
Note1) Unwanted emissions captured from LTE B13 Middle channel (Carrier Frequency: RX 751.0 MHz) were the RX signals generated from the call-simulator.
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#5 LTE B14

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	Below 1 GHz
Date:	2021.08.02
Environment	21.9 'C / 46.9 % R.H.



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
50.533500	25.11	40.00	14.89	15000	120	100.0	V	2.0	-19.6
52.144000	25.03	40.00	14.97	15000	120	100.0	V	16.0	-19.8
54.377500	25.26	40.00	14.74	15000	120	104.0	V	47.0	-20.0
108.698500	24.06	43.50	19.44	15000	120	400.0	H	173.0	-22.9
229.782500	23.14	46.00	22.86	15000	120	105.0	H	310.0	-20.7
437.505500	26.50	46.00	19.50	15000	120	106.0	V	-18.0	-15.7

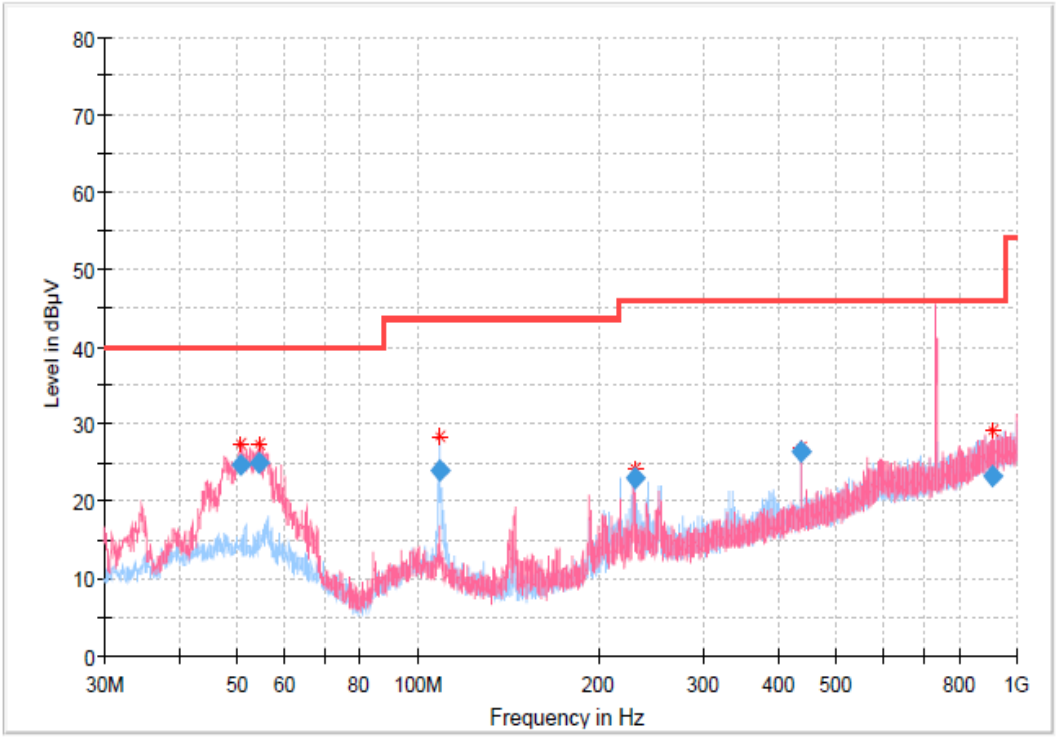
Note1) Unwanted emissions captured from LTE B14 Middle channel (Carrier Frequency: RX 763.0 MHz) were the RX signals generated from the call-simulator.
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#6 LTE B17

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	Below 1 GHz
Date:	2021.08.02
Environment	21.9 'C / 46.9 % R.H.



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
50.735000	24.69	40.00	15.31	15000	120	100.0	V	64.0	-19.6
54.495000	25.01	40.00	14.99	15000	120	115.0	V	18.0	-20.0
108.747000	23.99	43.50	19.51	15000	120	306.0	H	-7.0	-22.9
230.020000	22.97	46.00	23.03	15000	120	115.0	H	327.0	-20.7
437.505500	26.46	46.00	19.54	15000	120	115.0	V	346.0	-15.7
914.817000	23.32	46.00	22.68	15000	120	315.0	V	140.0	-8.7

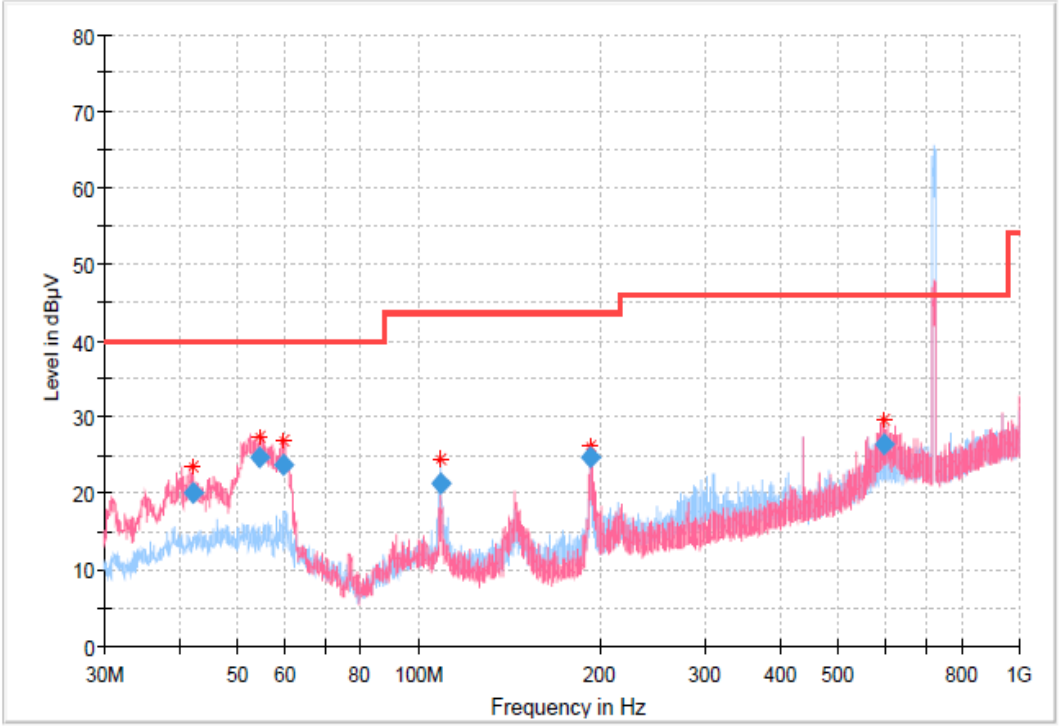
Note1) Unwanted emissions captured from LTE B17 Low channel (Carrier Frequency: RX 734.0 MHz) were the RX signals generated from the call-simulator.
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#7 LTE B29

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	Below 1 GHz
Date:	2021.08.03
Environment	21.5 'C / 47.3 % R.H.



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
42.160000	20.07	40.00	19.93	15000	120	108.0	V	136.0	-19.8
54.377500	24.80	40.00	15.20	15000	120	106.0	V	314.0	-20.0
59.748500	23.85	40.00	16.15	15000	120	110.0	V	209.0	-20.6
108.886500	21.19	43.50	22.31	15000	120	285.0	H	11.0	-22.9
193.670500	24.65	43.50	18.85	15000	120	105.0	V	94.0	-22.7
597.131000	26.51	46.00	19.49	15000	120	107.0	V	146.0	-12.4

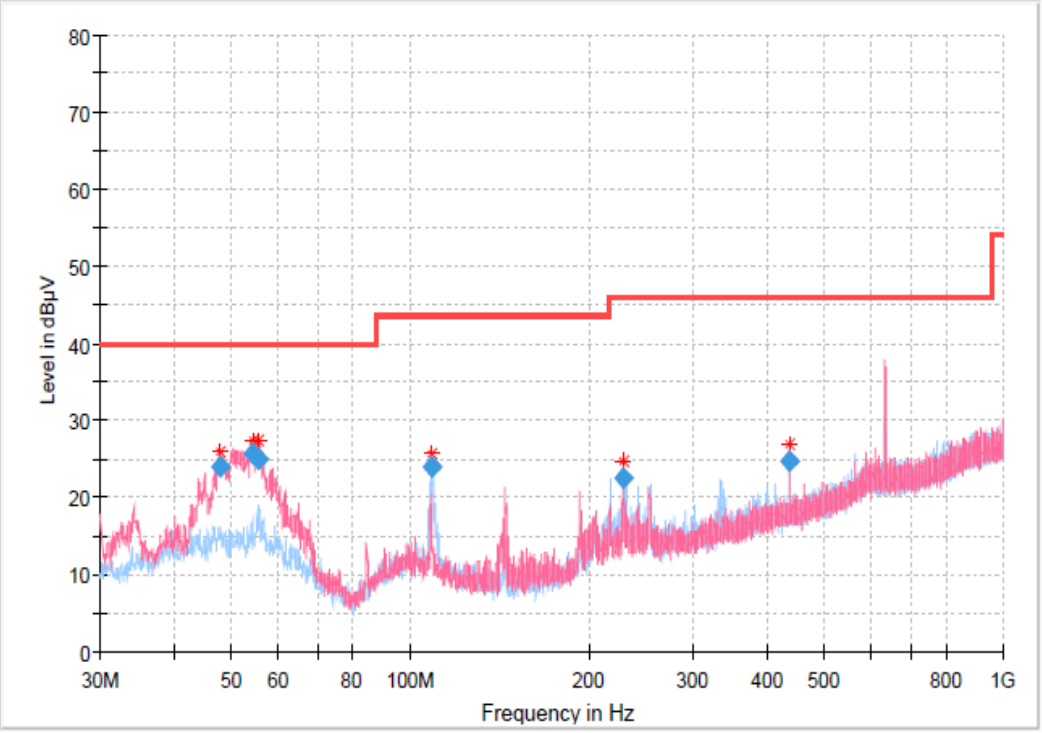
Note1) Unwanted emissions captured from LTE B29 High channel (Carrier Frequency: RX 728.0 MHz) were the RX signals generated from the call-simulator.
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#8 LTE B71

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	Below 1 GHz
Date:	2021.08.03
Environment	21.5 'C / 47.3 % R.H.



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
47.970500	23.92	40.00	16.08	15000	120	115.0	V	-22.0	-19.5
54.313000	25.65	40.00	14.35	15000	120	106.0	V	68.0	-20.0
55.467500	24.87	40.00	15.14	15000	120	112.0	V	8.0	-20.2
108.718000	24.04	43.50	19.46	15000	120	391.0	H	-22.0	-22.9
229.508500	22.52	46.00	23.48	15000	120	111.0	H	163.0	-20.8
437.537000	24.80	46.00	21.20	15000	120	400.0	H	335.0	-15.7

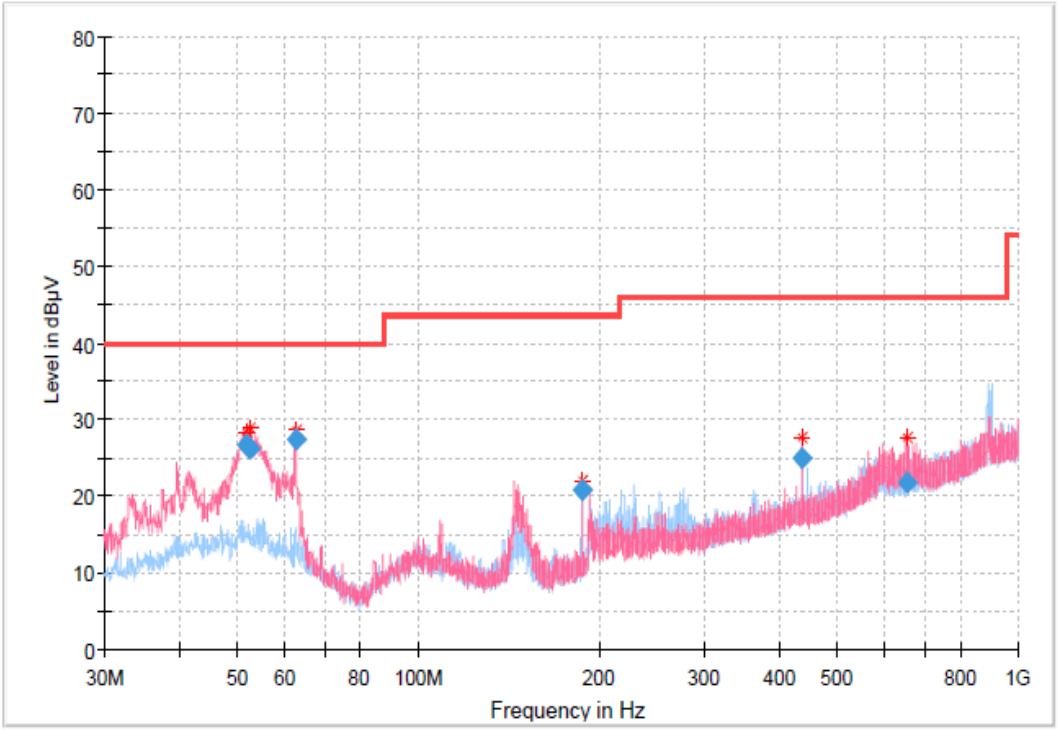
Note1) Unwanted emissions captured from LTE B71 Middle channel (Carrier Frequency: RX 634.5 MHz) were the RX signals generated from the call-simulator.
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#9 5G n5

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	Below 1 GHz
Date:	2021.08.03
Environment	21.5 'C / 47.3 % R.H.



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
51.774000	26.66	40.00	13.34	15000	120	115.0	V	5.0	-19.7
52.332000	26.11	40.00	13.89	15000	120	115.0	V	161.0	-19.8
62.535000	27.46	40.00	12.54	15000	120	100.0	V	253.0	-21.6
187.528000	20.75	43.50	22.75	15000	120	111.0	H	176.0	-23.2
437.497000	25.03	46.00	20.97	15000	120	191.0	H	338.0	-15.7
654.737000	21.76	46.00	24.24	15000	120	108.0	V	42.0	-12.0

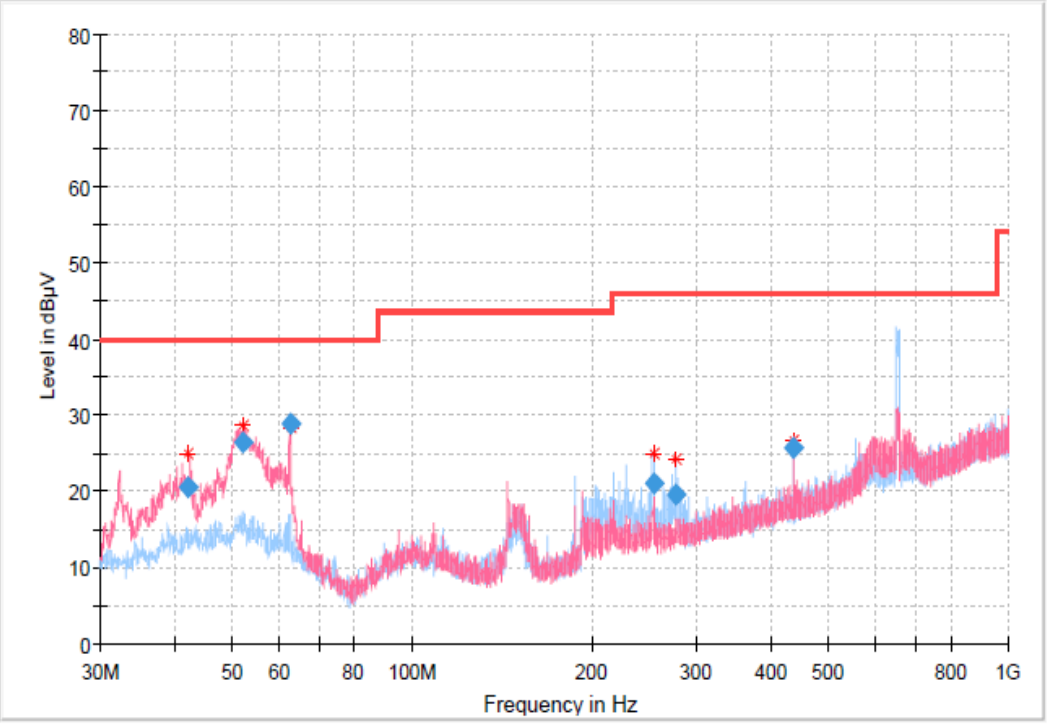
Note1) Unwanted emissions captured from 5G n5 High channel (Carrier Frequency: RX 894.0 MHz) were the RX signals generated from the call-simulator.
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#10 5G n71

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	Below 1 GHz
Date:	2021.08.03
Environment	21.5 'C / 47.3 % R.H.



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
42.096000	20.46	40.00	19.54	15000	120	100.0	V	230.0	-19.8
52.112500	26.47	40.00	13.53	15000	120	115.0	V	-17.0	-19.8
62.495000	28.93	40.00	11.07	15000	120	105.0	V	174.0	-21.6
253.996000	21.08	46.00	24.92	15000	120	115.0	H	184.0	-19.8
278.151500	19.45	46.00	26.55	15000	120	204.0	H	262.0	-19.5
437.505500	25.59	46.00	20.41	15000	120	308.0	V	283.0	-15.7

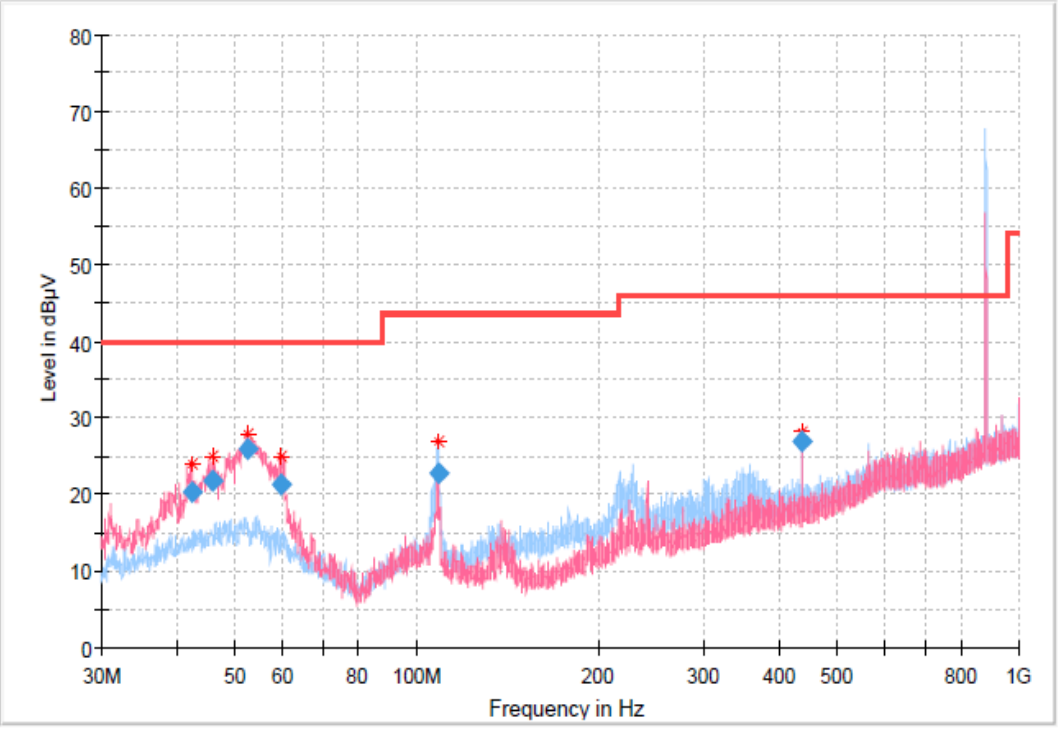
Note1) Unwanted emissions captured from 5G n71 High channel (Carrier Frequency: RX 652.0 MHz) were the RX signals generated from the call-simulator.
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#11 WCDMA B5

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	Below 1 GHz
Date:	2021.08.01
Environment	22.1 'C / 46.3 % R.H.



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
42.319000	20.42	40.00	19.58	15000	120	115.0	V	311.0	-19.8
45.819500	21.76	40.00	18.24	15000	120	100.0	V	83.0	-19.4
52.564500	26.02	40.00	13.98	15000	120	104.0	V	38.0	-19.8
59.792500	21.35	40.00	18.65	15000	120	115.0	V	77.0	-20.6
108.901000	22.77	43.50	20.73	15000	120	400.0	H	187.0	-22.9
437.505500	26.80	46.00	19.20	15000	120	400.0	H	326.0	-15.7

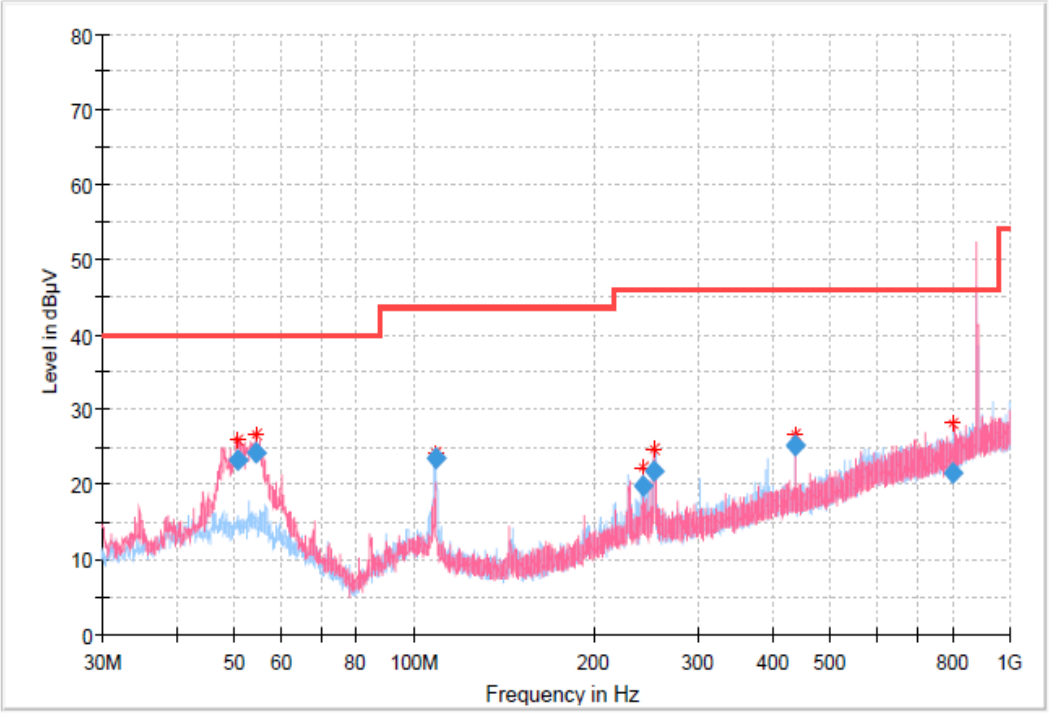
Note1) Unwanted emissions captured from WCDMA B5 Middle channel (Carrier Frequency: RX 881.5 MHz) were the RX signals generated from the call-simulator.
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#12 LTE B5

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	Below 1 GHz
Date:	2021.08.01
Environment	22.1 'C / 46.3 % R.H.



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
50.789500	23.25	40.00	16.75	15000	120	115.0	V	288.0	-19.6
54.355500	24.29	40.00	15.71	15000	120	115.0	V	22.0	-20.0
108.675500	23.55	43.50	19.95	15000	120	400.0	H	336.0	-22.9
242.050500	19.91	46.00	26.09	15000	120	208.0	H	205.0	-20.2
253.667500	21.87	46.00	24.13	15000	120	115.0	V	335.0	-19.8
437.537000	25.15	46.00	20.85	15000	120	400.0	V	15.0	-15.7
802.102000	21.45	46.00	24.55	15000	120	215.0	H	293.0	-10.1

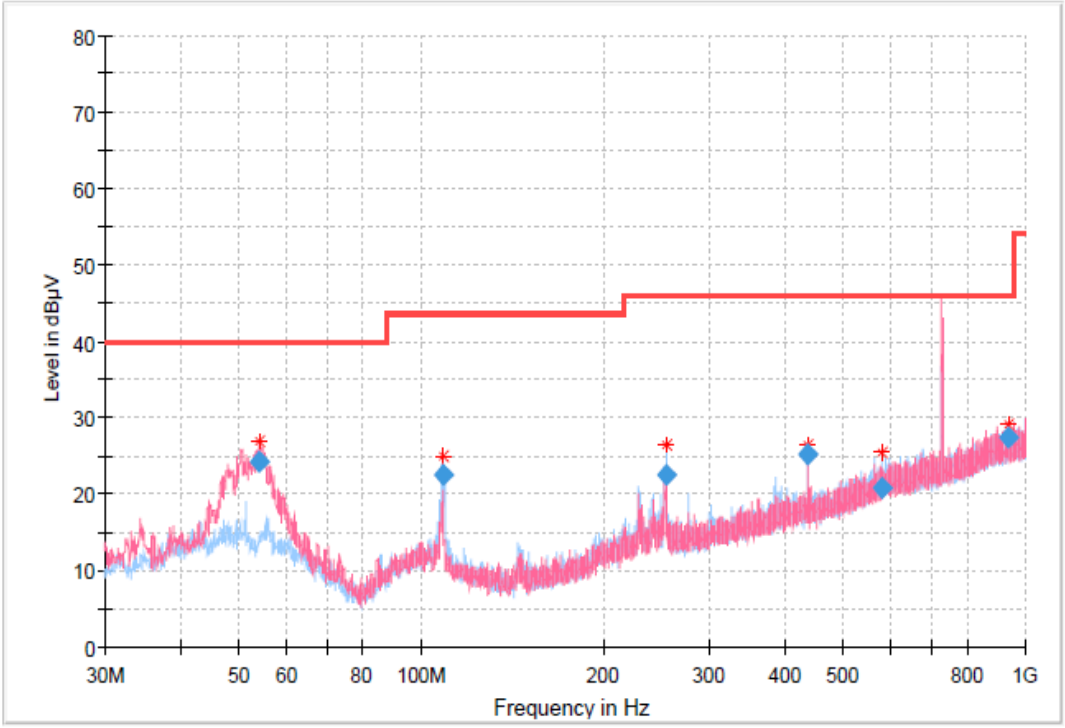
Note1) Unwanted emissions captured from LTE B5 Middle channel (Carrier Frequency: RX 881.5 MHz) were the RX signals generated from the call-simulator.
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#13 LTE B12

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	Below 1 GHz
Date:	2021.08.01
Environment	22.1 'C / 46.3 % R.H.



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
53.910500	24.18	40.00	15.82	15000	120	115.0	V	22.0	-20.0
108.715500	22.62	43.50	20.88	15000	120	304.0	H	7.0	-22.9
254.070000	22.56	46.00	23.44	15000	120	104.0	H	215.0	-19.8
437.497000	25.22	46.00	20.78	15000	120	400.0	V	356.0	-15.7
580.911500	20.77	46.00	25.23	15000	120	215.0	H	328.0	-12.7
937.532000	27.38	46.00	18.62	15000	120	385.0	V	222.0	-8.6

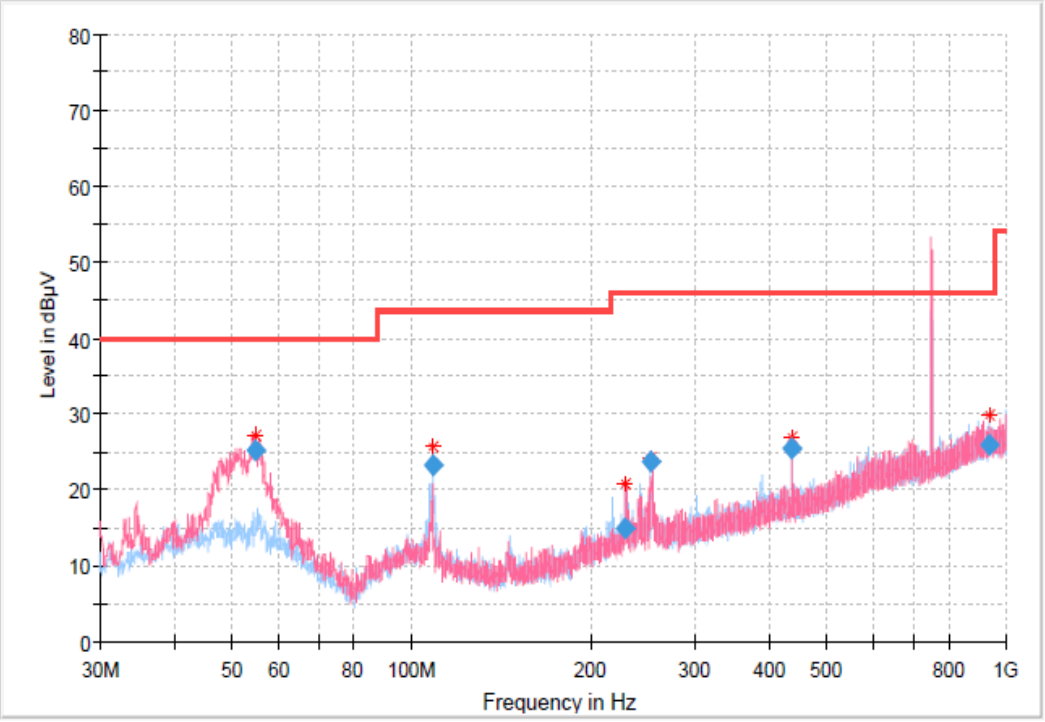
Note1) Unwanted emissions captured from LTE B12 Low channel (Carrier Frequency: RX 729.0 MHz) were the RX signals generated from the call-simulator.
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#14 LTE B13

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	Below 1 GHz
Date:	2021.08.02
Environment	21.9 'C / 46.9 % R.H.



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
54.589500	25.30	40.00	14.70	15000	120	105.0	V	38.0	-20.1
108.667000	23.28	43.50	20.22	15000	120	311.0	H	-22.0	-22.9
228.995500	14.96	46.00	31.04	15000	120	115.0	V	348.0	-20.8
253.633500	23.61	46.00	22.39	15000	120	115.0	H	223.0	-19.8
437.497000	25.38	46.00	20.62	15000	120	395.0	V	20.0	-15.7
937.580500	25.83	46.00	20.17	15000	120	190.0	H	194.0	-8.6

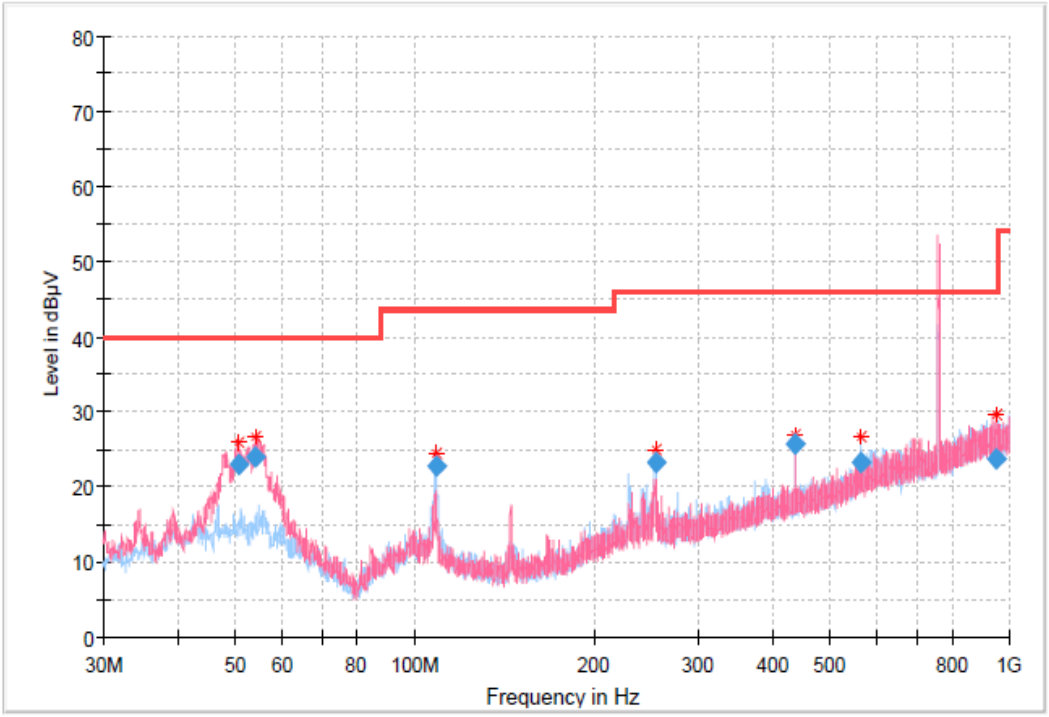
Note1) Unwanted emissions captured from LTE B13 Middle channel (Carrier Frequency: RX 751.0 MHz) were the RX signals generated from the call-simulator.
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#15 LTE B14

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	Below 1 GHz
Date:	2021.08.02
Environment	21.9 'C / 46.9 % R.H.



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
50.709500	22.91	40.00	17.09	15000	120	106.0	V	235.0	-19.6
54.153000	23.93	40.00	16.07	15000	120	115.0	V	316.0	-20.0
108.909500	22.85	43.50	20.65	15000	120	400.0	H	356.0	-22.9
253.973000	23.33	46.00	22.67	15000	120	110.0	H	204.0	-19.8
437.497000	25.69	46.00	20.31	15000	120	289.0	V	102.0	-15.7
562.530000	23.30	46.00	22.70	15000	120	106.0	H	90.0	-13.1
949.123500	23.74	46.00	22.26	15000	120	312.0	V	328.0	-8.6

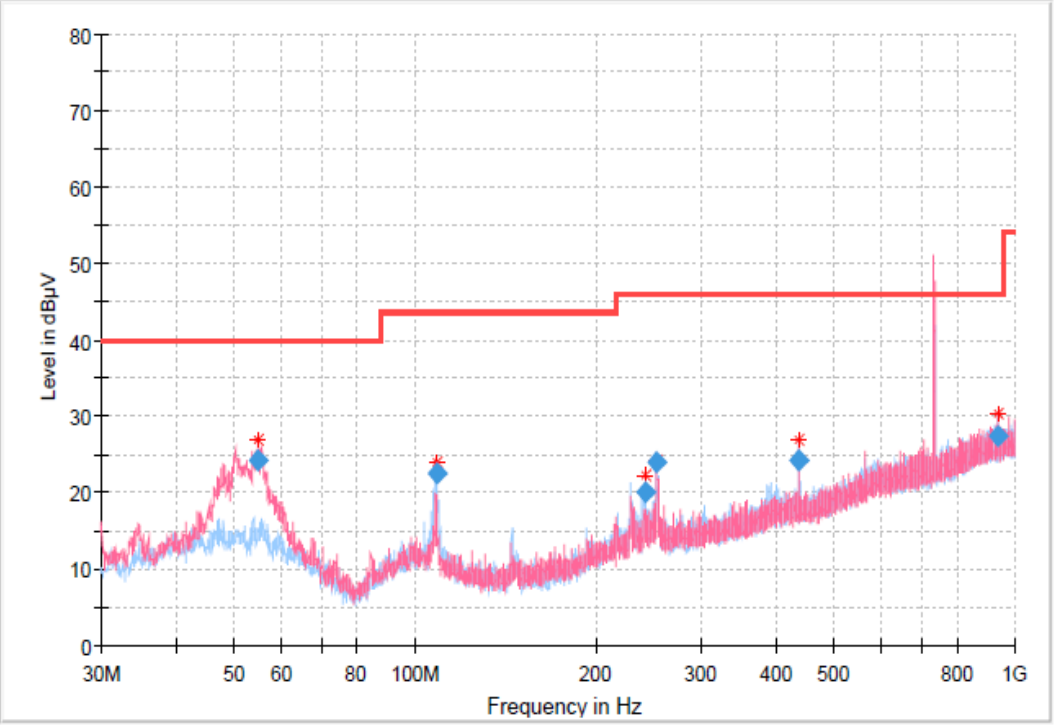
Note1) Unwanted emissions captured from LTE B14 Middle channel (Carrier Frequency: RX 763.0 MHz) were the RX signals generated from the call-simulator.
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#16 LTE B17

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	Below 1 GHz
Date:	2021.08.02
Environment	21.9 'C / 46.9 % R.H.



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
54.735000	24.29	40.00	15.71	15000	120	100.0	V	346.0	-20.1
108.521500	22.46	43.50	21.04	15000	120	385.0	H	11.0	-22.9
241.702500	20.01	46.00	25.99	15000	120	195.0	H	219.0	-20.2
253.585000	24.06	46.00	21.94	15000	120	109.0	H	206.0	-19.8
437.545500	24.33	46.00	21.67	15000	120	215.0	H	116.0	-15.7
937.532000	27.39	46.00	18.61	15000	120	285.0	H	172.0	-8.6

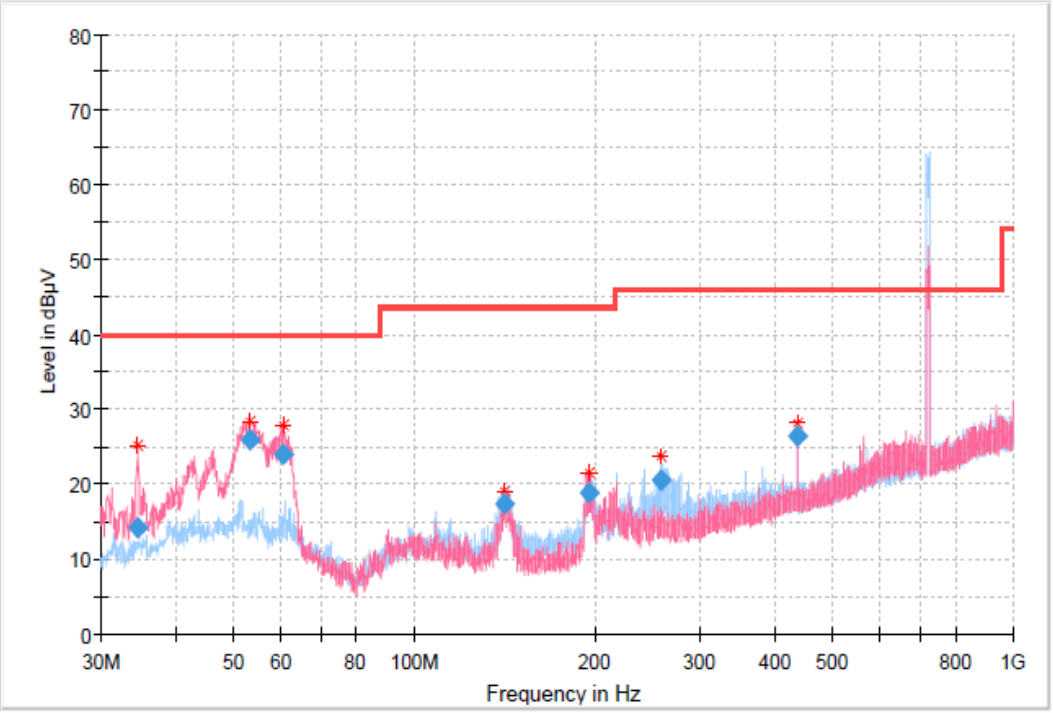
Note1) Unwanted emissions captured from LTE B17 Low channel (Carrier Frequency: RX 734.0 MHz) were the RX signals generated from the call-simulator.
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#17 LTE B29

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	Below 1 GHz
Date:	2021.08.03
Environment	21.5 'C / 47.3 % R.H.



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
34.559000	14.28	40.00	25.72	15000	120	104.0	V	152.0	-22.1
53.086000	25.98	40.00	14.02	15000	120	109.0	V	338.0	-19.9
60.700500	24.01	40.00	15.99	15000	120	104.0	V	220.0	-20.9
141.695500	17.48	43.50	26.02	15000	120	215.0	H	124.0	-25.5
196.597500	18.74	43.50	24.76	15000	120	215.0	H	352.0	-22.4
259.211000	20.50	46.00	25.50	15000	120	105.0	H	207.0	-19.8
437.497000	26.39	46.00	19.61	15000	120	295.0	V	304.0	-15.7

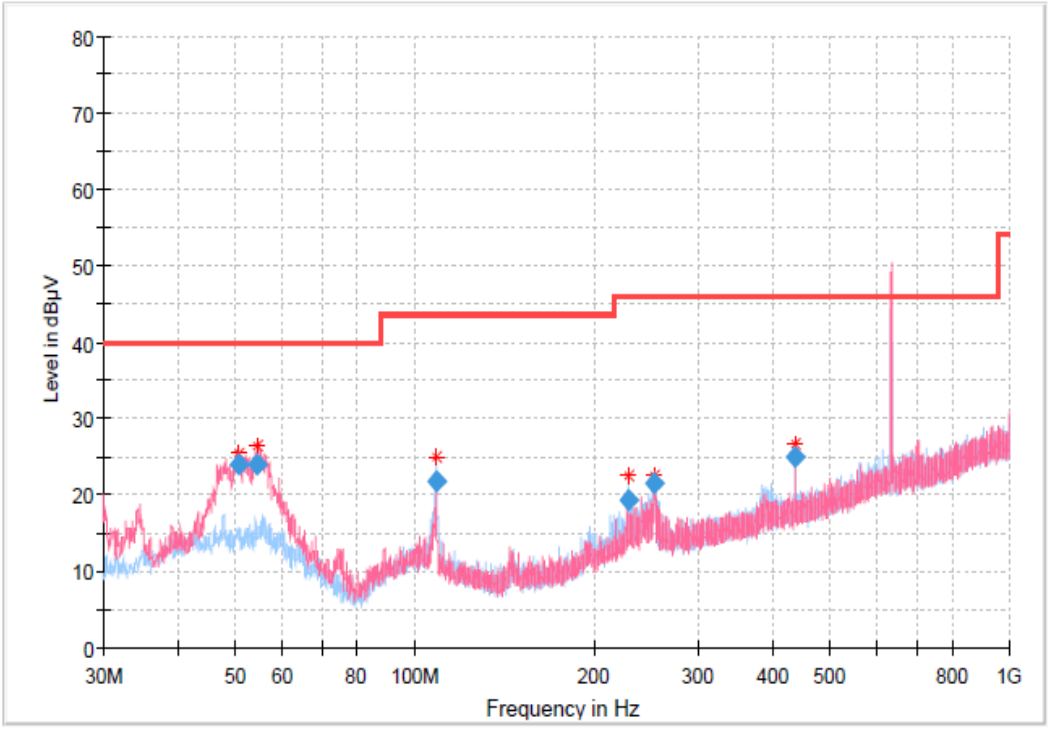
Note1) Unwanted emissions captured from LTE B29 High channel (Carrier Frequency: RX 728.0 MHz) were the RX signals generated from the call-simulator.
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#18 LTE B71

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	Below 1 GHz
Date:	2021.08.03
Environment	21.5 'C / 47.3 % R.H.



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
50.612500	23.95	40.00	16.05	15000	120	100.0	V	19.0	-19.6
54.309500	23.96	40.00	16.04	15000	120	115.0	V	301.0	-20.0
108.747000	21.78	43.50	21.72	15000	120	310.0	H	172.0	-22.9
229.615000	19.26	46.00	26.74	15000	120	185.0	H	226.0	-20.8
253.751000	21.60	46.00	24.40	15000	120	115.0	H	189.0	-19.8
437.505500	25.00	46.00	21.00	15000	120	115.0	V	46.0	-15.7

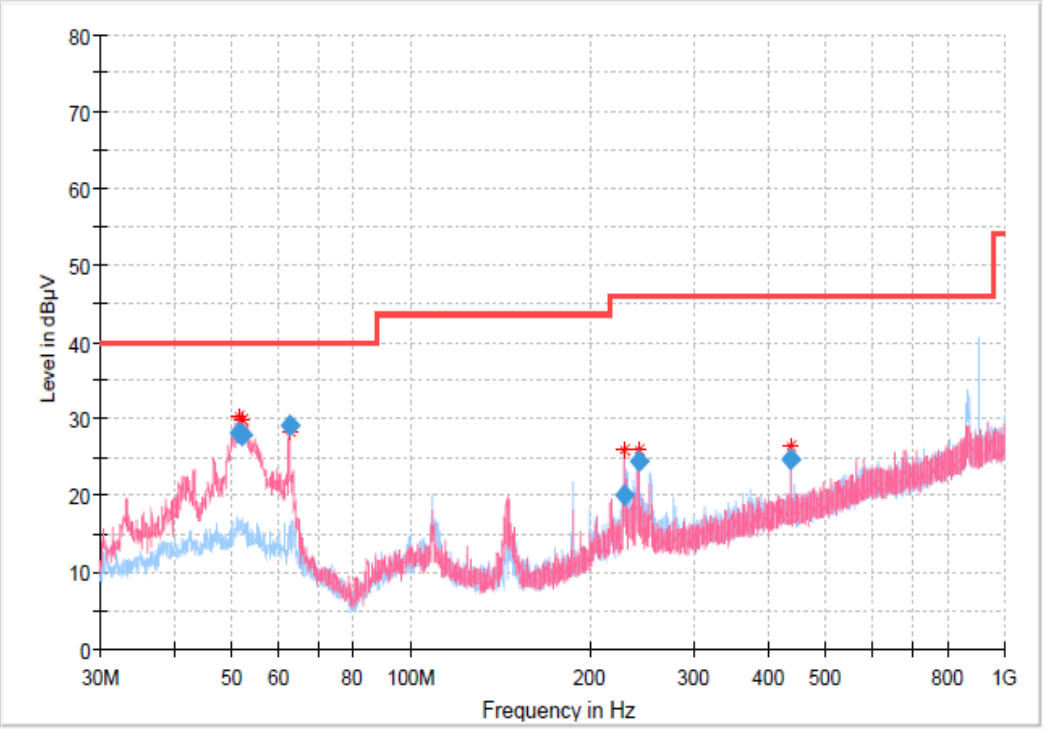
Note1) Unwanted emissions captured from LTE B71 Middle channel (Carrier Frequency: RX 634.5 MHz) were the RX signals generated from the call-simulator.
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#19 5G n5

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	Below 1 GHz
Date:	2021.08.03
Environment	21.5 'C / 47.3 % R.H.



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
51.371500	28.14	40.00	11.86	15000	120	110.0	V	338.0	-19.7
51.996000	28.01	40.00	11.99	15000	120	115.0	V	32.0	-19.7
62.495000	29.02	40.00	10.98	15000	120	100.0	V	286.0	-21.6
229.417500	20.16	46.00	25.84	15000	120	115.0	V	71.0	-20.8
242.065000	24.39	46.00	21.61	15000	120	210.0	H	290.0	-20.2
437.537000	24.63	46.00	21.37	15000	120	215.0	H	44.0	-15.7

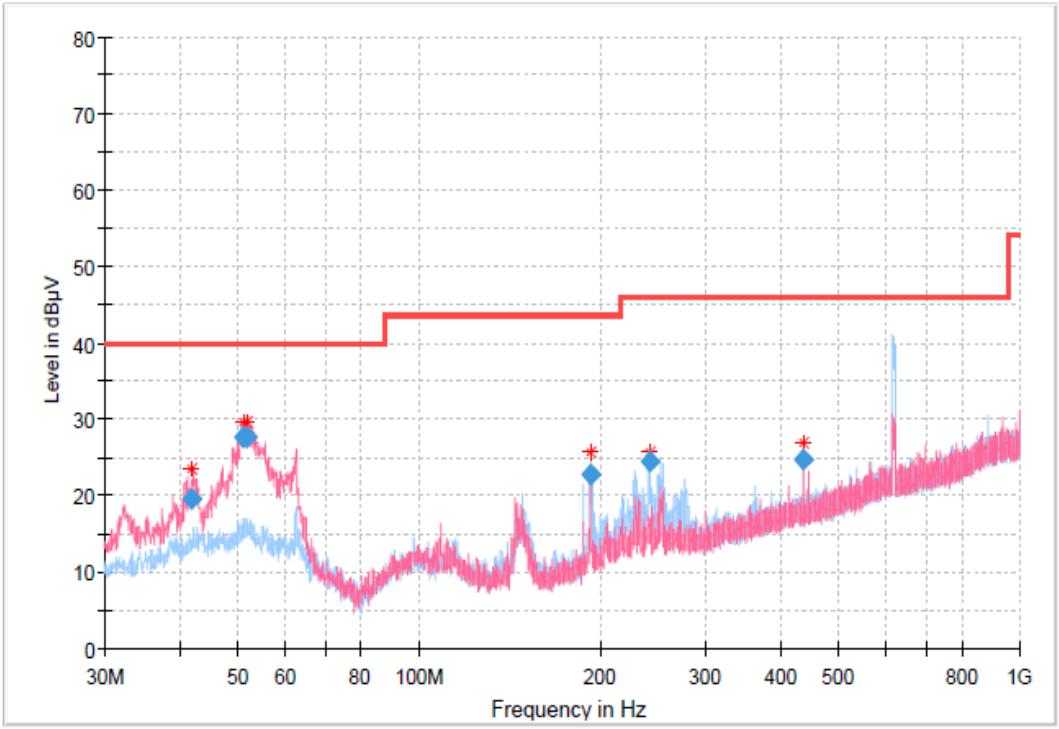
Note1) Unwanted emissions captured from 5G n5 Low channel (Carrier Frequency: RX 869 MHz) were the RX signals generated from the call-simulator.
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#20 5G n71

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	Below 1 GHz
Date:	2021.08.03
Environment	21.5 'C / 47.3 % R.H.



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
41.996500	19.57	40.00	20.43	15000	120	105.0	V	110.0	-19.9
51.128000	27.62	40.00	12.38	15000	120	111.0	V	70.0	-19.6
51.828500	27.73	40.00	12.27	15000	120	108.0	V	73.0	-19.7
193.493500	22.75	43.50	20.75	15000	120	215.0	H	150.0	-22.7
242.147500	24.46	46.00	21.54	15000	120	185.0	H	206.0	-20.2
437.537000	24.69	46.00	21.31	15000	120	207.0	H	-4.0	-15.7

Note1) Unwanted emissions captured from 5G n71 Low channel (Carrier Frequency: RX 617.0 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	04 August, 2021 ~ 07 August, 2021			
Parameters recorded during the test	Laboratory Ambient Temperature	(20.3 ~ 22.6) °C		
	Relative Humidity	(45.4 ~ 47.7) %		
	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 (3 / 4.5) = **-3.5**

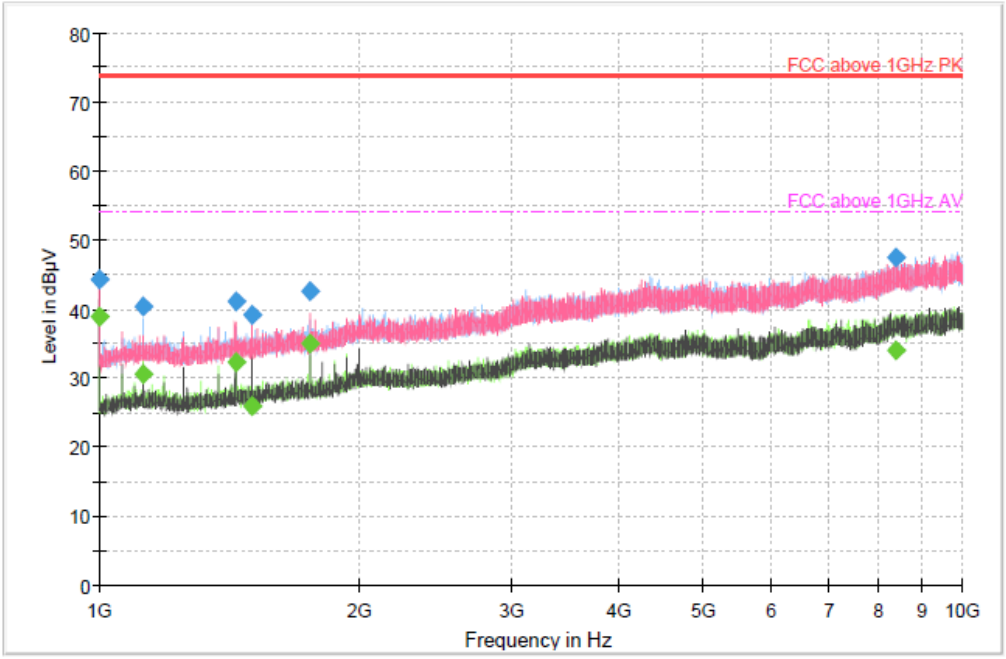
Table 3. Test data for radiated RF emissions

#1 WCDMA B5

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	(1 to 10) GHz
Date:	2021.08.04
Environment	21.3 'C / 46.4 % R.H.



Final_Result

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1000.000000	44.31	---	74.00	29.69	15000	1000	395.0	V	148.0	-11.4
1000.000000	---	38.94	54.00	15.06	15000	1000	395.0	V	148.0	-11.4
1125.350000	40.40	---	74.00	33.60	15000	1000	102.0	H	274.0	-10.9
1125.350000	---	30.52	54.00	23.48	15000	1000	102.0	H	274.0	-10.9
1437.700000	---	32.39	54.00	21.61	15000	1000	194.0	V	14.0	-9.5
1437.700000	41.04	---	74.00	32.96	15000	1000	194.0	V	14.0	-9.5
1500.050000	39.09	---	74.00	34.91	15000	1000	104.0	V	322.0	-8.9
1500.050000	---	26.02	54.00	27.98	15000	1000	104.0	V	322.0	-8.9
1750.050000	42.56	---	74.00	31.44	15000	1000	185.0	V	74.0	-8.2
1750.050000	---	34.97	54.00	19.03	15000	1000	185.0	V	74.0	-8.2
8383.850000	---	33.93	54.00	20.07	15000	1000	215.0	V	8.0	3.6
8383.850000	47.57	---	74.00	26.43	15000	1000	215.0	V	8.0	3.6

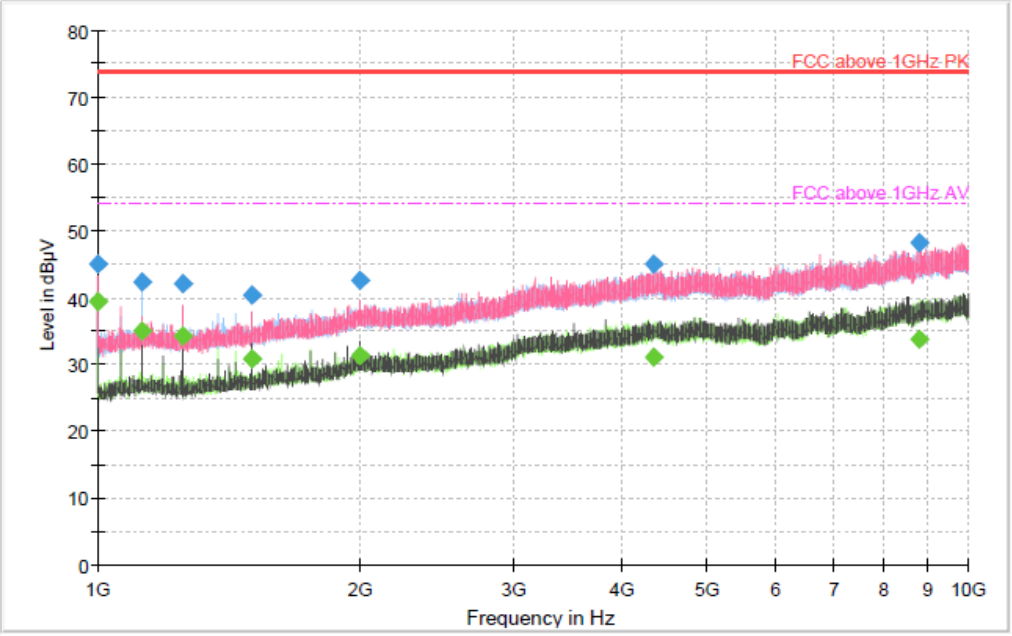
Note1) WCDMA B5 Middle channel (Carrier Frequency: RX 881.5 MHz)
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#2 LTE B5

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	(1 to 10) GHz
Date:	2021.08.04
Environment	21.3 'C / 46.4 % 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	---	39.32	54.00	14.68	15000	1000	385.0	V	8.0	-11.4
1000.000000	44.98	---	74.00	29.02	15000	1000	385.0	V	8.0	-11.4
1125.000000	42.29	---	74.00	31.71	15000	1000	100.0	H	106.0	-10.9
1125.000000	---	34.96	54.00	19.04	15000	1000	100.0	H	106.0	-10.9
1250.250000	42.15	---	74.00	31.85	15000	1000	294.0	V	248.0	-11.0
1250.250000	---	34.23	54.00	19.77	15000	1000	294.0	V	248.0	-11.0
1500.000000	---	30.89	54.00	23.11	15000	1000	210.0	V	60.0	-8.9
1500.000000	40.35	---	74.00	33.65	15000	1000	210.0	V	60.0	-8.9
2000.250000	---	31.42	54.00	22.58	15000	1000	115.0	V	238.0	-6.5
2000.250000	42.68	---	74.00	31.32	15000	1000	115.0	V	238.0	-6.5
4343.250000	45.07	---	74.00	28.93	15000	1000	387.0	V	41.0	-0.3
4343.250000	---	31.07	54.00	22.93	15000	1000	387.0	V	41.0	-0.3
8758.500000	48.10	---	74.00	25.90	15000	1000	115.0	V	258.0	4.2
8758.500000	---	33.81	54.00	20.19	15000	1000	115.0	V	258.0	4.2

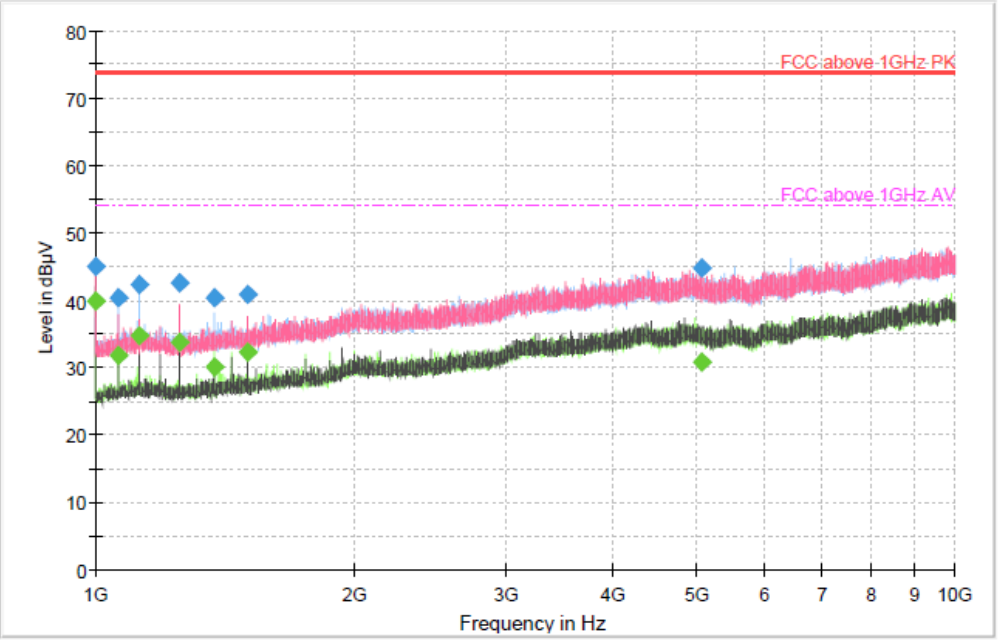
Note1) LTE B5 Middle channel (Carrier Frequency: RX 881.5 MHz)
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#3 LTE B12

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	(1 to 10) GHz
Date:	2021.08.04
Environment	21.3 'C / 46.4 % 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	45.07	---	74.00	28.93	15000	1000	393.0	V	56.0	-11.4
1000.000000	---	39.78	54.00	14.22	15000	1000	393.0	V	56.0	-11.4
1062.500000	40.38	---	74.00	33.62	15000	1000	102.0	H	191.0	-11.0
1062.500000	---	31.70	54.00	22.30	15000	1000	102.0	H	191.0	-11.0
1125.000000	42.28	---	74.00	31.72	15000	1000	100.0	H	228.0	-10.9
1125.000000	---	34.64	54.00	19.36	15000	1000	100.0	H	228.0	-10.9
1250.000000	42.50	---	74.00	31.50	15000	1000	285.0	V	274.0	-11.0
1250.000000	---	33.76	54.00	20.24	15000	1000	285.0	V	274.0	-11.0
1375.000000	40.32	---	74.00	33.68	15000	1000	100.0	H	100.0	-10.0
1375.000000	---	30.14	54.00	23.86	15000	1000	100.0	H	100.0	-10.0
1500.250000	---	32.34	54.00	21.66	15000	1000	215.0	V	4.0	-8.9
1500.250000	40.88	---	74.00	33.12	15000	1000	215.0	V	4.0	-8.9
5068.250000	---	30.89	54.00	23.11	15000	1000	400.0	H	340.0	-0.1
5068.250000	44.74	---	74.00	29.26	15000	1000	400.0	H	340.0	-0.1

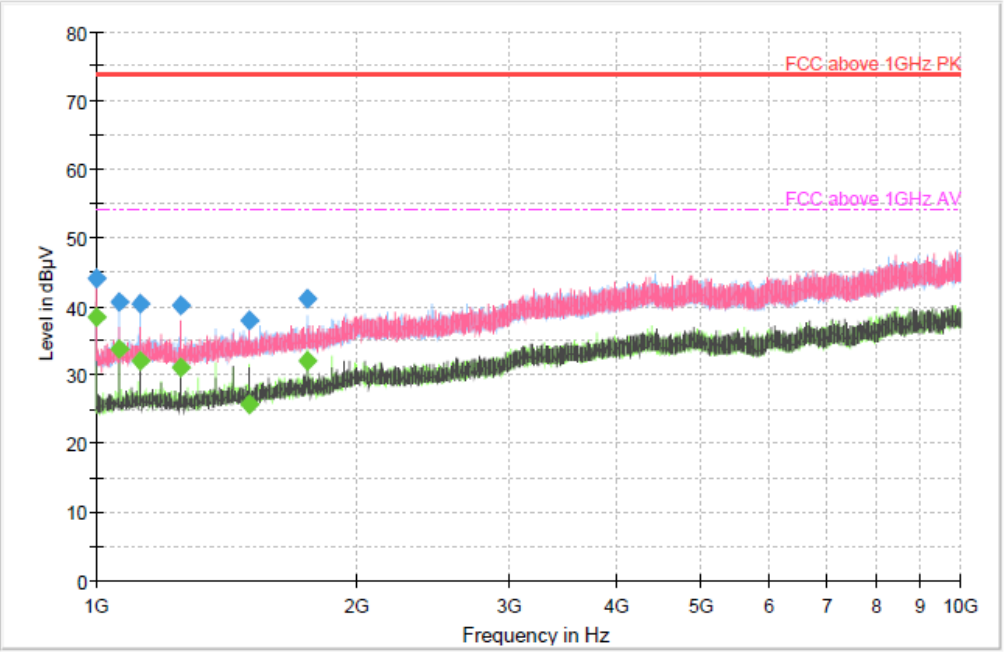
Note1) LTE B12 Low channel (Carrier Frequency: RX 729.0 MHz)
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#4 LTE B13

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	(1 to 10) GHz
Date:	2021.08.05
Environment	21.4 'C / 46.5 % 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)
1000.000000	44.00	---	74.00	30.00	15000	1000	400.0	V	8.0	-11.4
1000.000000	---	38.52	54.00	15.48	15000	1000	400.0	V	8.0	-11.4
1062.700000	40.62	---	74.00	33.38	15000	1000	104.0	H	221.0	-11.0
1062.700000	---	33.69	54.00	20.31	15000	1000	104.0	H	221.0	-11.0
1124.950000	---	32.09	54.00	21.91	15000	1000	100.0	H	43.0	-10.9
1124.950000	40.39	---	74.00	33.61	15000	1000	100.0	H	43.0	-10.9
1250.050000	---	31.01	54.00	22.99	15000	1000	285.0	V	198.0	-11.0
1250.050000	40.01	---	74.00	33.99	15000	1000	285.0	V	198.0	-11.0
1500.600000	37.95	---	74.00	36.05	15000	1000	388.0	V	350.0	-8.9
1500.600000	---	25.68	54.00	28.32	15000	1000	388.0	V	350.0	-8.9
1750.300000	41.22	---	74.00	32.78	15000	1000	115.0	H	76.0	-8.2
1750.300000	---	32.07	54.00	21.93	15000	1000	115.0	H	76.0	-8.2

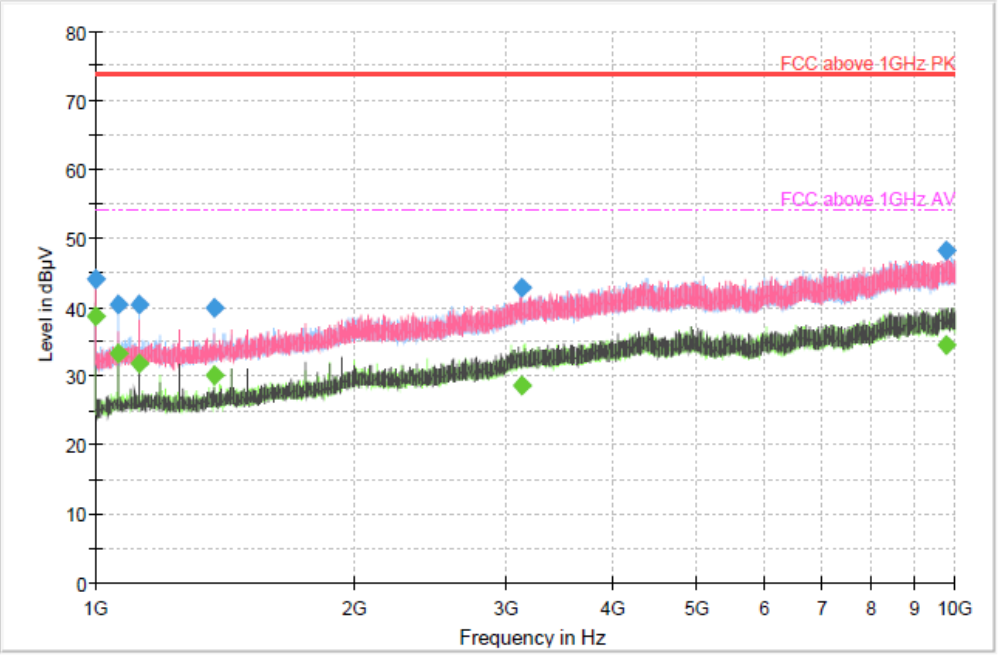
Note1) LTE B13 Middle channel (Carrier Frequency: RX 751.0 MHz)
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#5 LTE B14

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	(1 to 10) GHz
Date:	2021.08.05
Environment	21.4 'C / 46.5 % 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)
1000.000000	---	38.60	54.00	15.40	15000	1000	388.0	V	90.0	-11.4
1000.000000	44.11	---	74.00	29.89	15000	1000	388.0	V	90.0	-11.4
1062.550000	40.26	---	74.00	33.74	15000	1000	104.0	H	174.0	-11.0
1062.550000	---	33.25	54.00	20.75	15000	1000	104.0	H	174.0	-11.0
1125.350000	40.37	---	74.00	33.63	15000	1000	104.0	H	282.0	-10.9
1125.350000	---	31.73	54.00	22.27	15000	1000	104.0	H	282.0	-10.9
1375.200000	---	30.09	54.00	23.91	15000	1000	100.0	H	164.0	-10.0
1375.200000	39.97	---	74.00	34.03	15000	1000	100.0	H	164.0	-10.0
3127.850000	---	28.59	54.00	25.41	15000	1000	399.0	H	224.0	-3.3
3127.850000	42.91	---	74.00	31.09	15000	1000	399.0	H	224.0	-3.3
9762.500000	---	34.53	54.00	19.47	15000	1000	115.0	V	260.0	5.3
9762.500000	48.09	---	74.00	25.91	15000	1000	115.0	V	260.0	5.3

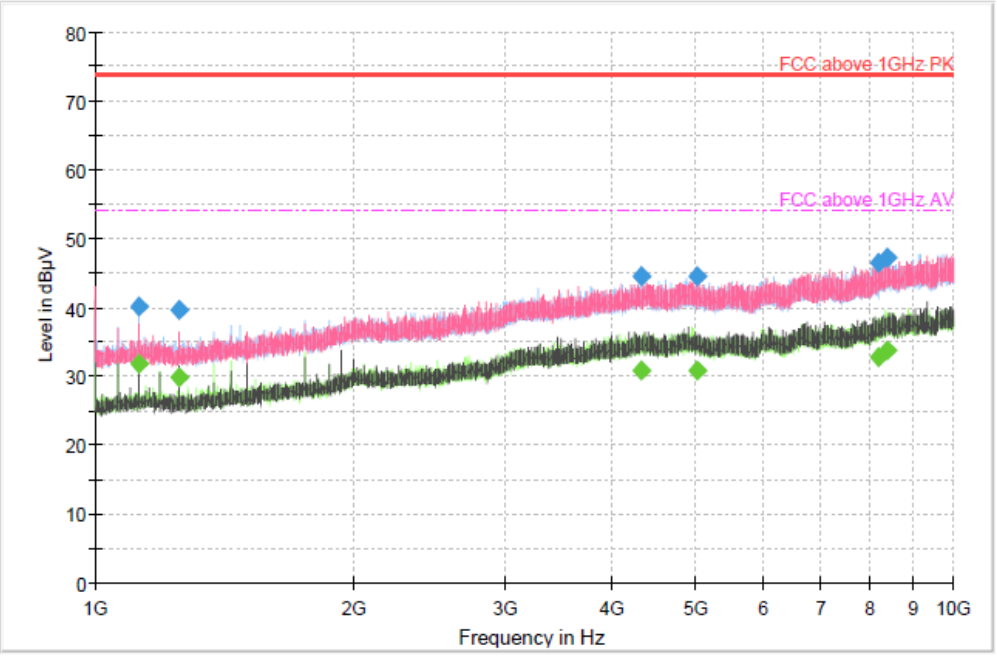
Note1) LTE B14 Middle channel (Carrier Frequency: RX 763.0 MHz)
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#6 LTE B17

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	(1 to 10) GHz
Date:	2021.08.05
Environment	21.4 'C / 46.5 % 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)
1125.200000	---	31.76	54.00	22.24	15000	1000	100.0	H	8.0	-10.9
1125.200000	40.17	---	74.00	33.83	15000	1000	100.0	H	8.0	-10.9
1250.200000	---	29.91	54.00	24.09	15000	1000	287.0	V	240.0	-11.0
1250.200000	39.64	---	74.00	34.36	15000	1000	287.0	V	240.0	-11.0
4336.550000	---	30.71	54.00	23.29	15000	1000	288.0	H	25.0	-0.3
4336.550000	44.64	---	74.00	29.36	15000	1000	288.0	H	25.0	-0.3
5031.350000	---	30.79	54.00	23.21	15000	1000	400.0	V	95.0	0.0
5031.350000	44.46	---	74.00	29.54	15000	1000	400.0	V	95.0	0.0
8191.250000	---	32.79	54.00	21.21	15000	1000	205.0	V	160.0	3.5
8191.250000	46.50	---	74.00	27.50	15000	1000	205.0	V	160.0	3.5
8386.000000	---	33.83	54.00	20.17	15000	1000	315.0	V	96.0	3.6
8386.000000	47.24	---	74.00	26.76	15000	1000	315.0	V	96.0	3.6

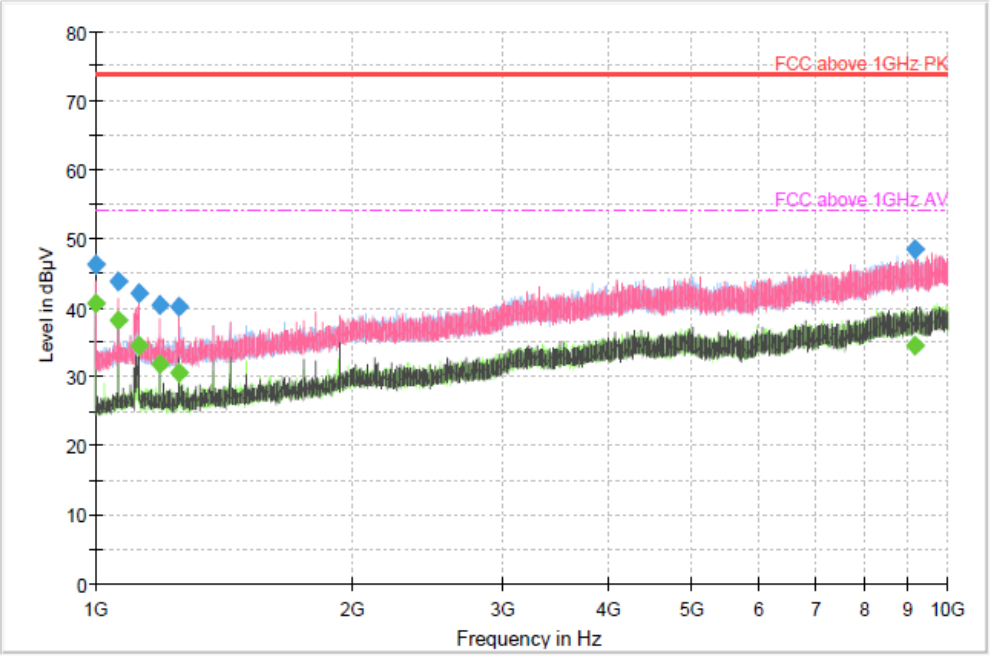
Note1) LTE B17 Low channel (Carrier Frequency: RX 734.0 MHz)
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#7 LTE B29

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	(1 to 10) GHz
Date:	2021.08.06
Environment	21.4 'C / 45.6 % 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	46.24	---	74.00	27.76	15000	1000	188.0	V	107.0	-11.4
1000.000000	---	40.73	54.00	13.27	15000	1000	188.0	V	107.0	-11.4
1062.550000	43.89	---	74.00	30.11	15000	1000	215.0	V	192.0	-11.0
1062.550000	---	38.07	54.00	15.93	15000	1000	215.0	V	192.0	-11.0
1125.100000	42.20	---	74.00	31.80	15000	1000	215.0	V	137.0	-10.9
1125.100000	---	34.42	54.00	19.58	15000	1000	215.0	V	137.0	-10.9
1187.700000	40.34	---	74.00	33.66	15000	1000	215.0	V	178.0	-11.0
1187.700000	---	31.70	54.00	22.30	15000	1000	215.0	V	178.0	-11.0
1250.200000	40.13	---	74.00	33.87	15000	1000	187.0	H	219.0	-11.0
1250.200000	---	30.65	54.00	23.35	15000	1000	187.0	H	219.0	-11.0
9132.500000	48.56	---	74.00	25.44	15000	1000	106.0	V	8.0	4.4
9132.500000	---	34.56	54.00	19.44	15000	1000	106.0	V	8.0	4.4

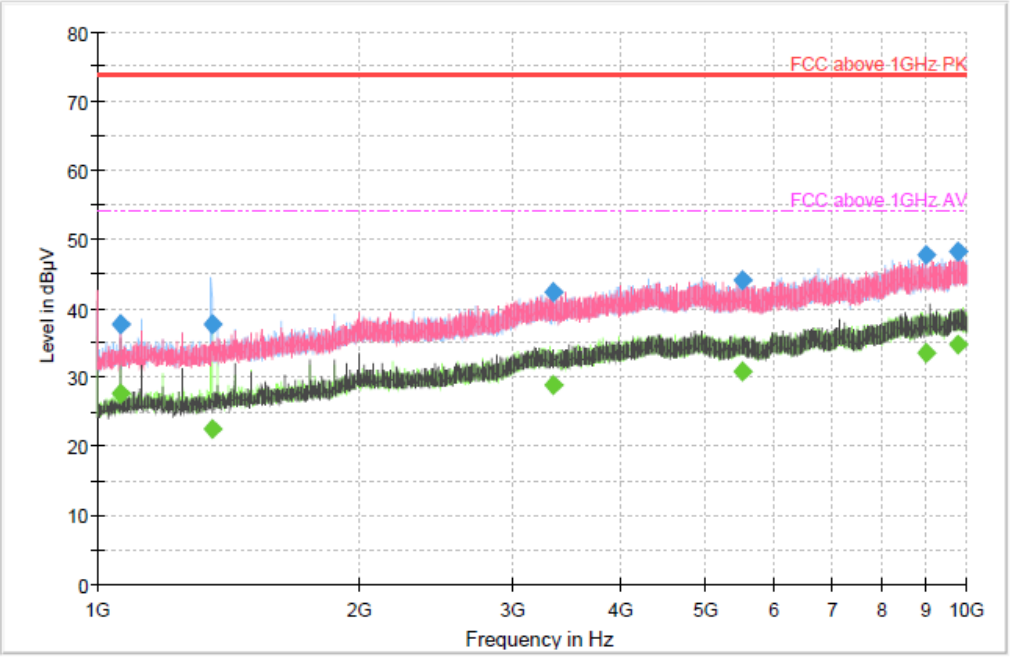
Note1) LTE B29 High channel (Carrier Frequency: RX 728.0 MHz)
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#8 LTE B71

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	(1 to 18) GHz
Date:	2021.08.06
Environment	21.4 'C / 45.6 % 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)
1062.550000	---	27.53	54.00	26.47	15000	1000	109.0	V	279.0	-11.0
1062.550000	37.77	---	74.00	36.23	15000	1000	109.0	V	279.0	-11.0
1357.250000	37.79	---	74.00	36.21	15000	1000	287.0	H	97.0	-10.2
1357.250000	---	22.57	54.00	31.43	15000	1000	287.0	H	97.0	-10.2
3346.550000	42.36	---	74.00	31.64	15000	1000	215.0	V	284.0	-3.1
3346.550000	---	28.91	54.00	25.09	15000	1000	215.0	V	284.0	-3.1
5512.850000	---	30.75	54.00	23.25	15000	1000	108.0	V	208.0	0.1
5512.850000	44.07	---	74.00	29.93	15000	1000	108.0	V	208.0	0.1
8999.150000	---	33.63	54.00	20.37	15000	1000	387.0	V	244.0	4.3
8999.150000	47.73	---	74.00	26.27	15000	1000	387.0	V	244.0	4.3
9767.800000	---	34.63	54.00	19.37	15000	1000	315.0	V	6.0	5.3
9767.800000	48.12	---	74.00	25.88	15000	1000	315.0	V	6.0	5.3

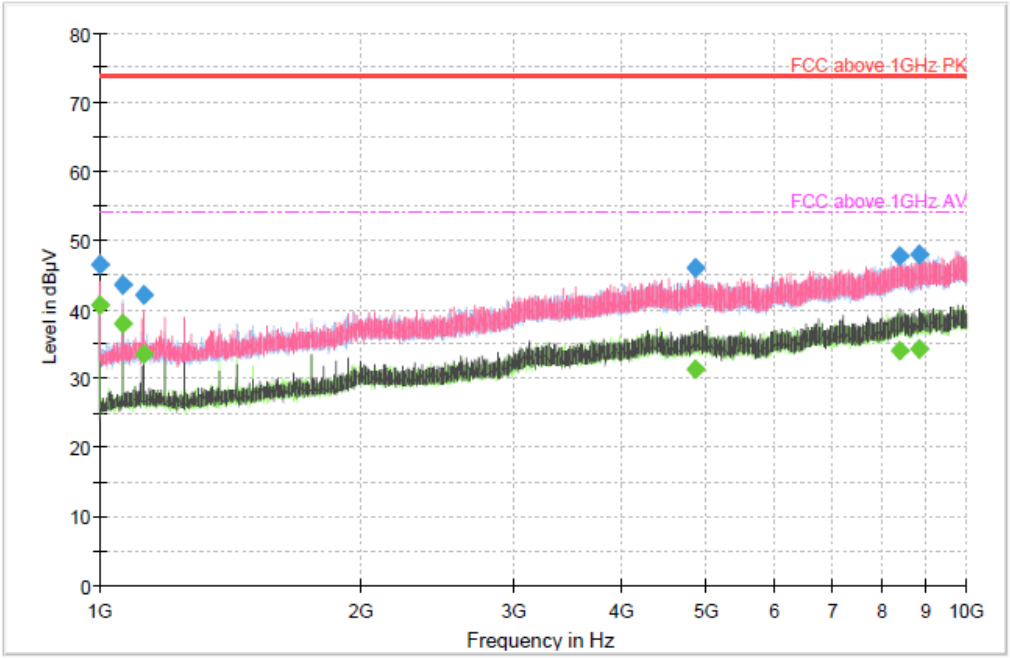
Note1) LTE B71 Middle channel (Carrier Frequency: RX 634.5 MHz)
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#9 5G n5

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	(1 to 10) GHz
Date:	2021.08.07
Environment	21.6 'C / 46.7 % 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	46.39	---	74.00	27.61	15000	1000	185.0	V	148.0	-11.4
1000.000000	---	40.59	54.00	13.41	15000	1000	185.0	V	148.0	-11.4
1062.550000	43.60	---	74.00	30.40	15000	1000	215.0	V	148.0	-11.0
1062.550000	---	37.80	54.00	16.20	15000	1000	215.0	V	148.0	-11.0
1124.950000	---	33.43	54.00	20.57	15000	1000	215.0	V	82.0	-10.9
1124.950000	42.10	---	74.00	31.90	15000	1000	215.0	V	82.0	-10.9
4867.000000	46.00	---	74.00	28.01	15000	1000	306.0	V	228.0	0.0
4867.000000	---	31.37	54.00	22.63	15000	1000	306.0	V	228.0	0.0
8386.250000	---	34.11	54.00	19.89	15000	1000	285.0	V	142.0	3.6
8386.250000	47.74	---	74.00	26.26	15000	1000	285.0	V	142.0	3.6
8799.500000	47.86	---	74.00	26.14	15000	1000	115.0	V	-6.0	4.3
8799.500000	---	34.33	54.00	19.67	15000	1000	115.0	V	-6.0	4.3

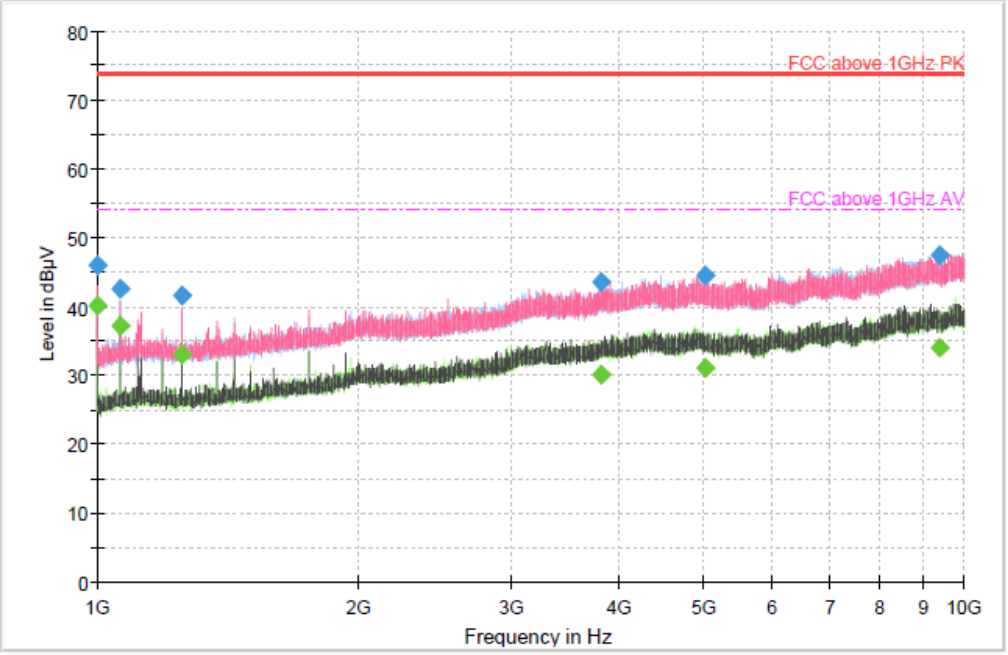
Note1) 5G n5 High channel (Carrier Frequency: RX 894.0 MHz)
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#10 5G n71

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	(1 to 10) GHz
Date:	2021.08.07
Environment	21.6 'C / 46.7 % 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	45.99	---	74.00	28.01	15000	1000	185.0	V	-6.0	-11.4
1000.000000	---	40.13	54.00	13.87	15000	1000	185.0	V	-6.0	-11.4
1062.550000	42.60	---	74.00	31.40	15000	1000	215.0	V	46.0	-11.0
1062.550000	---	37.18	54.00	16.82	15000	1000	215.0	V	46.0	-11.0
1250.050000	---	33.12	54.00	20.88	15000	1000	191.0	V	6.0	-11.0
1250.050000	41.61	---	74.00	32.39	15000	1000	191.0	V	6.0	-11.0
3810.800000	---	29.98	54.00	24.02	15000	1000	115.0	V	34.0	-1.9
3810.800000	43.54	---	74.00	30.46	15000	1000	115.0	V	34.0	-1.9
5029.500000	---	30.99	54.00	23.01	15000	1000	315.0	V	259.0	0.0
5029.500000	44.60	---	74.00	29.40	15000	1000	315.0	V	259.0	0.0
9361.200000	---	33.93	54.00	20.07	15000	1000	108.0	V	216.0	5.0
9361.200000	47.48	---	74.00	26.52	15000	1000	108.0	V	216.0	5.0

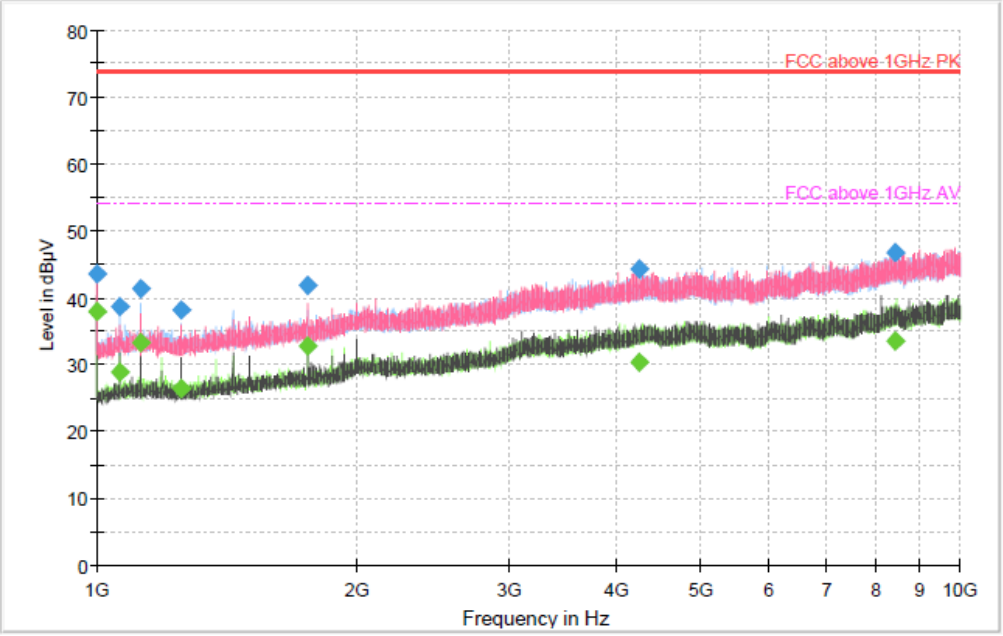
Note1) 5G n71 High channel (Carrier Frequency: RX 652.0 MHz)
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#11 WCDMA B5

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	(1 to 10) GHz
Date:	2021.08.04
Environment	21.3 'C / 46.4 % 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	---	37.86	54.00	16.14	15000	1000	400.0	V	-8.0	-11.4
1000.000000	43.56	---	74.00	30.44	15000	1000	400.0	V	-8.0	-11.4
1062.500000	38.64	---	74.00	35.36	15000	1000	103.0	H	158.0	-11.0
1062.500000	---	28.92	54.00	25.08	15000	1000	103.0	H	158.0	-11.0
1125.000000	---	33.32	54.00	20.68	15000	1000	100.0	H	34.0	-10.9
1125.000000	41.31	---	74.00	32.70	15000	1000	100.0	H	34.0	-10.9
1250.000000	---	26.49	54.00	27.51	15000	1000	115.0	H	86.0	-11.0
1250.000000	38.27	---	74.00	35.73	15000	1000	115.0	H	86.0	-11.0
1750.250000	41.78	---	74.00	32.22	15000	1000	187.0	V	106.0	-8.2
1750.250000	---	32.75	54.00	21.25	15000	1000	187.0	V	106.0	-8.2
4241.500000	44.28	---	74.00	29.73	15000	1000	215.0	V	77.0	-0.7
4241.500000	---	30.42	54.00	23.58	15000	1000	215.0	V	77.0	-0.7
8428.500000	46.82	---	74.00	27.18	15000	1000	398.0	H	164.0	3.6
8428.500000	---	33.43	54.00	20.57	15000	1000	398.0	H	164.0	3.6

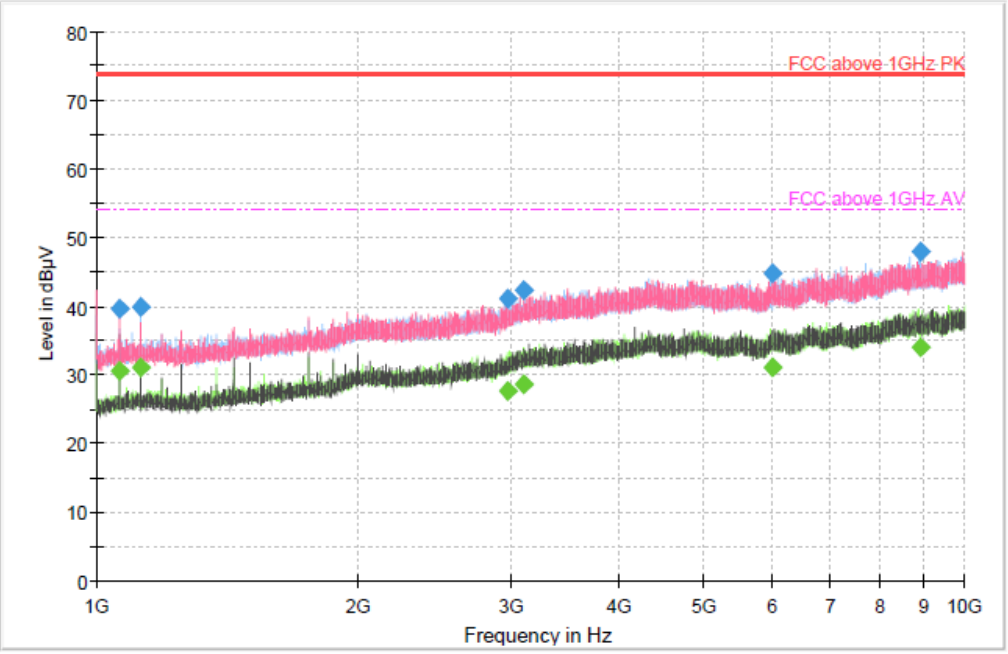
Note1) WCDMA B5 Middle channel (Carrier Frequency: RX 881.5 MHz)
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#12 LTE B5

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	(1 to 10) GHz
Date:	2021.08.04
Environment	21.3 'C / 46.4 % 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)
1062.450000	39.53	---	74.00	34.47	15000	1000	101.0	V	8.0	-11.0
1062.450000	---	30.47	54.00	23.53	15000	1000	101.0	V	8.0	-11.0
1125.050000	---	31.19	54.00	22.81	15000	1000	101.0	H	338.0	-10.9
1125.050000	39.81	---	74.00	34.19	15000	1000	101.0	H	338.0	-10.9
2973.350000	---	27.60	54.00	26.40	15000	1000	189.0	V	8.0	-4.6
2973.350000	40.99	---	74.00	33.01	15000	1000	189.0	V	8.0	-4.6
3106.700000	42.42	---	74.00	31.58	15000	1000	189.0	V	24.0	-3.4
3106.700000	---	28.65	54.00	25.35	15000	1000	189.0	V	24.0	-3.4
6017.450000	44.73	---	74.00	29.27	15000	1000	215.0	V	350.0	0.7
6017.450000	---	31.10	54.00	22.90	15000	1000	215.0	V	350.0	0.7
8884.150000	47.93	---	74.00	26.07	15000	1000	400.0	H	6.0	4.4
8884.150000	---	34.00	54.00	20.00	15000	1000	400.0	H	6.0	4.4

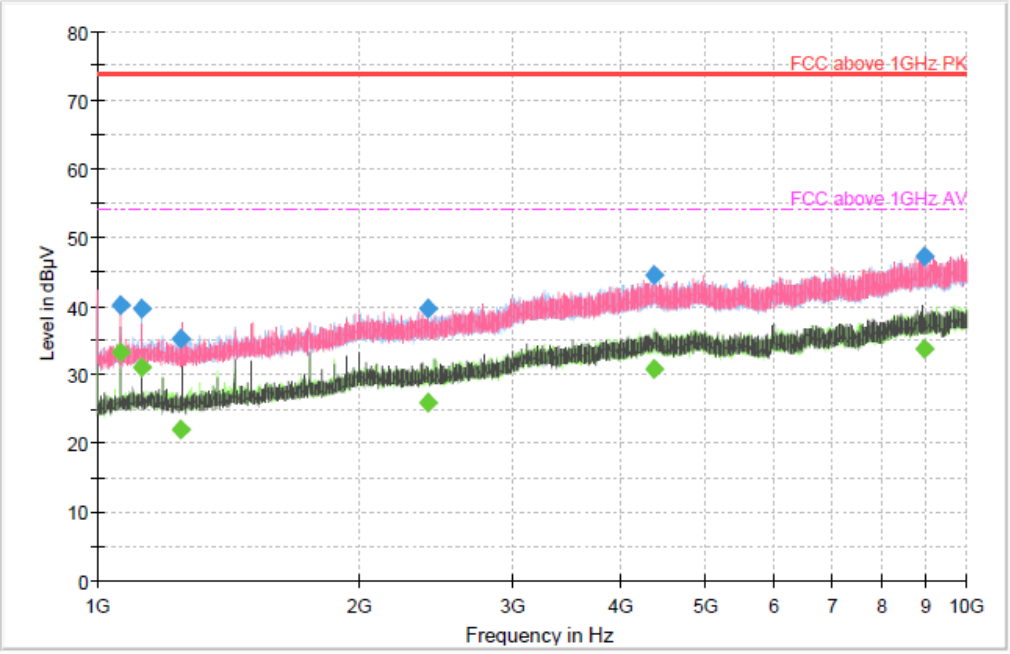
Note1) LTE B5 Middle channel (Carrier Frequency: RX 881.5 MHz)
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#13 LTE B12

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	(1 to 10) GHz
Date:	2021.08.04
Environment	21.1 'C / 47.5 % 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)
1062.700000	---	33.23	54.00	20.77	15000	1000	100.0	V	0.0	-11.0
1062.700000	40.01	---	74.00	33.99	15000	1000	100.0	V	0.0	-11.0
1125.200000	39.69	---	74.00	34.31	15000	1000	100.0	H	30.0	-10.9
1125.200000	---	31.11	54.00	22.89	15000	1000	100.0	H	30.0	-10.9
1246.600000	---	21.93	54.00	32.07	15000	1000	100.0	V	186.0	-11.0
1246.600000	35.31	---	74.00	38.69	15000	1000	100.0	V	186.0	-11.0
2400.750000	39.53	---	74.00	34.47	15000	1000	395.0	V	328.0	-6.0
2400.750000	---	26.05	54.00	27.95	15000	1000	395.0	V	328.0	-6.0
4361.200000	---	30.78	54.00	23.22	15000	1000	215.0	V	8.0	-0.3
4361.200000	44.57	---	74.00	29.43	15000	1000	215.0	V	8.0	-0.3
8953.450000	---	33.73	54.00	20.27	15000	1000	195.0	H	280.0	4.4
8953.450000	47.23	---	74.00	26.77	15000	1000	195.0	H	280.0	4.4

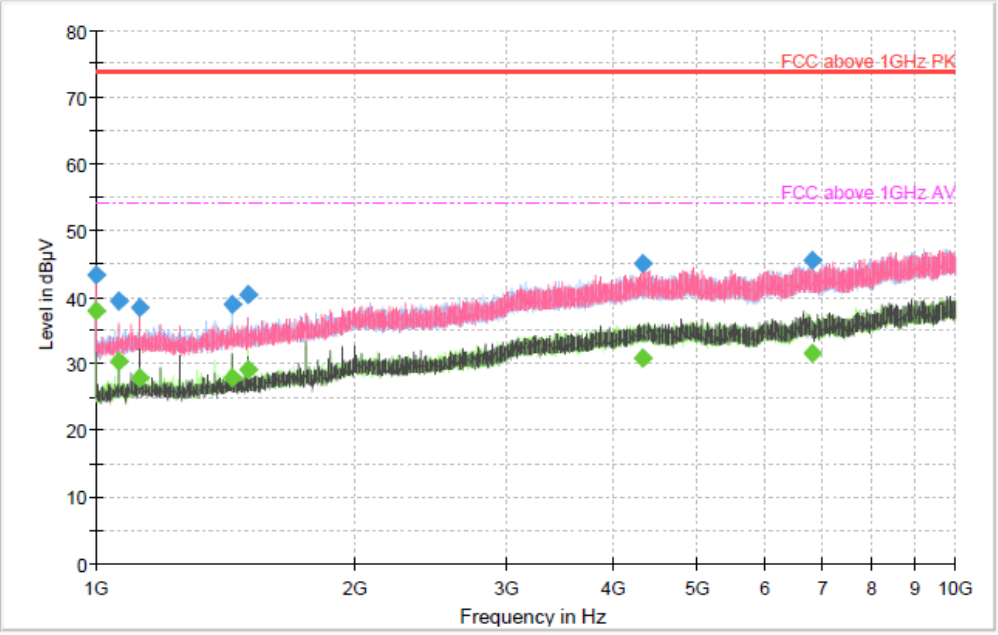
Note1) LTE B12 Low channel (Carrier Frequency: RX 729.0 MHz)
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#14 LTE B13

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	(1 to 10) GHz
Date;	2021.08.05
Environment	21.4 'C / 46.5 % 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)
1000.000000	---	37.81	54.00	16.19	15000	1000	385.0	V	42.0	-11.4
1000.000000	43.36	---	74.00	30.64	15000	1000	385.0	V	42.0	-11.4
1062.750000	---	30.32	54.00	23.68	15000	1000	396.0	V	91.0	-11.0
1062.750000	39.29	---	74.00	34.71	15000	1000	396.0	V	91.0	-11.0
1124.750000	38.44	---	74.00	35.56	15000	1000	102.0	H	217.0	-10.9
1124.750000	---	27.86	54.00	26.14	15000	1000	102.0	H	217.0	-10.9
1437.750000	38.86	---	74.00	35.14	15000	1000	400.0	H	234.0	-9.5
1437.750000	---	27.86	54.00	26.14	15000	1000	400.0	H	234.0	-9.5
1500.000000	---	29.05	54.00	24.95	15000	1000	215.0	V	68.0	-8.9
1500.000000	40.40	---	74.00	33.60	15000	1000	215.0	V	68.0	-8.9
4324.250000	45.04	---	74.00	28.96	15000	1000	102.0	V	312.0	-0.3
4324.250000	---	30.71	54.00	23.29	15000	1000	102.0	V	312.0	-0.3
6798.750000	45.52	---	74.00	28.48	15000	1000	215.0	V	-1.0	1.9
6798.750000	---	31.63	54.00	22.37	15000	1000	215.0	V	-1.0	1.9

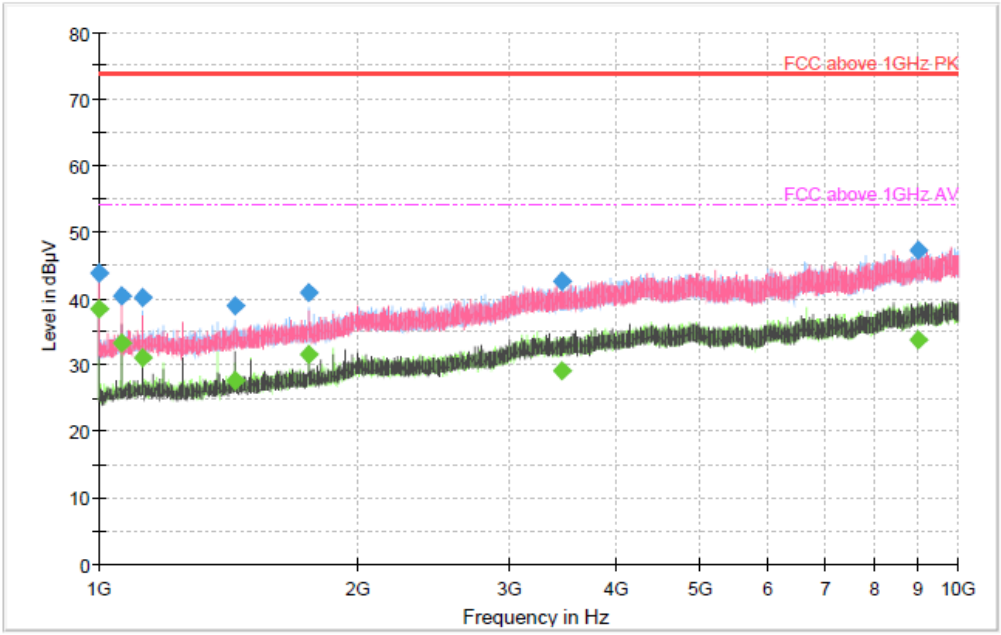
Note1) LTE B13 Middle channel (Carrier Frequency: RX 751.0 MHz)
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph

#15 LTE B14

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	(1 to 10) GHz
Date:	2021.08.05
Environment	21.4 'C / 46.5 % 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)
1000.250000	---	38.53	54.00	15.47	15000	1000	394.0	V	8.0	-11.4
1000.250000	43.78	---	74.00	30.22	15000	1000	394.0	V	8.0	-11.4
1062.500000	---	33.36	54.00	20.65	15000	1000	100.0	V	211.0	-11.0
1062.500000	40.45	---	74.00	33.55	15000	1000	100.0	V	211.0	-11.0
1125.000000	40.01	---	74.00	33.99	15000	1000	102.0	H	116.0	-10.9
1125.000000	---	31.16	54.00	22.84	15000	1000	102.0	H	116.0	-10.9
1437.500000	39.00	---	74.00	35.00	15000	1000	106.0	H	96.0	-9.5
1437.500000	---	27.66	54.00	26.34	15000	1000	106.0	H	96.0	-9.5
1750.500000	40.96	---	74.00	33.04	15000	1000	100.0	H	302.0	-8.2
1750.500000	---	31.48	54.00	22.52	15000	1000	100.0	H	302.0	-8.2
3455.000000	---	29.02	54.00	24.98	15000	1000	110.0	V	308.0	-2.9
3455.000000	42.59	---	74.00	31.41	15000	1000	110.0	V	308.0	-2.9
8965.750000	47.25	---	74.00	26.75	15000	1000	215.0	H	229.0	4.3
8965.750000	---	33.75	54.00	20.25	15000	1000	215.0	H	229.0	4.3

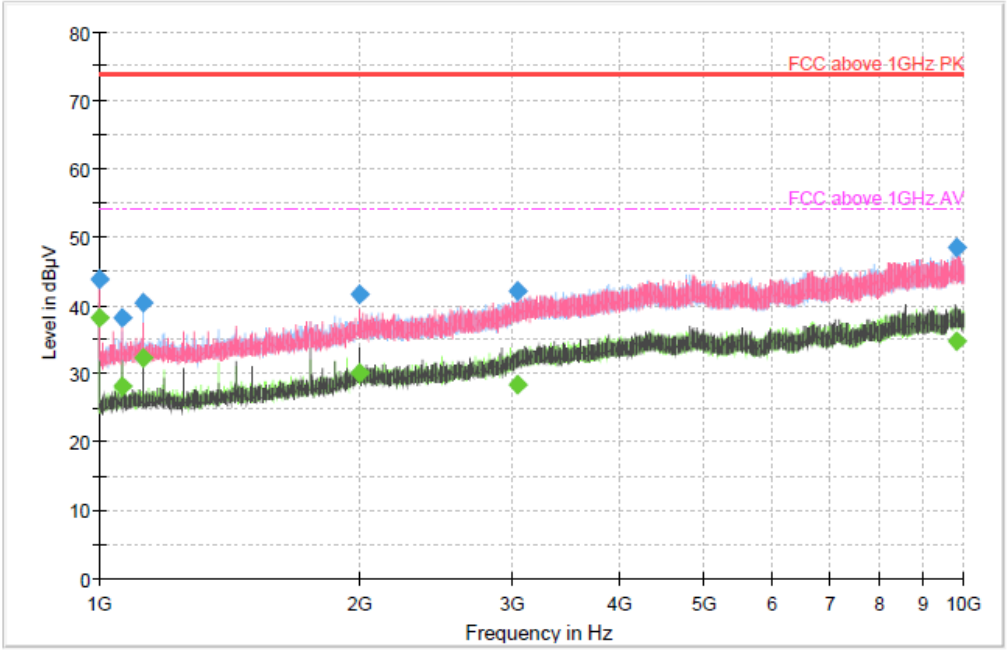
Note1) LTE B14 Middle channel (Carrier Frequency: RX 763.0 MHz)
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#16 LTE B17

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	(1 to 10) GHz
Date:	2021.08.05
Environment	21.4 'C / 46.5 % 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)
1000.000000	---	38.21	54.00	15.79	15000	1000	396.0	V	176.0	-11.4
1000.000000	43.87	---	74.00	30.13	15000	1000	396.0	V	176.0	-11.4
1062.750000	38.19	---	74.00	35.81	15000	1000	115.0	V	130.0	-11.0
1062.750000	---	28.05	54.00	25.95	15000	1000	115.0	V	130.0	-11.0
1125.000000	40.28	---	74.00	33.72	15000	1000	102.0	H	328.0	-10.9
1125.000000	---	32.20	54.00	21.80	15000	1000	102.0	H	328.0	-10.9
2000.250000	41.70	---	74.00	32.30	15000	1000	107.0	V	152.0	-6.5
2000.250000	---	30.08	54.00	23.92	15000	1000	107.0	V	152.0	-6.5
3045.750000	---	28.30	54.00	25.70	15000	1000	215.0	H	164.0	-3.8
3045.750000	42.13	---	74.00	31.87	15000	1000	215.0	H	164.0	-3.8
9818.250000	48.55	---	74.00	25.45	15000	1000	398.0	H	8.0	5.4
9818.250000	---	34.68	54.00	19.32	15000	1000	398.0	H	8.0	5.4

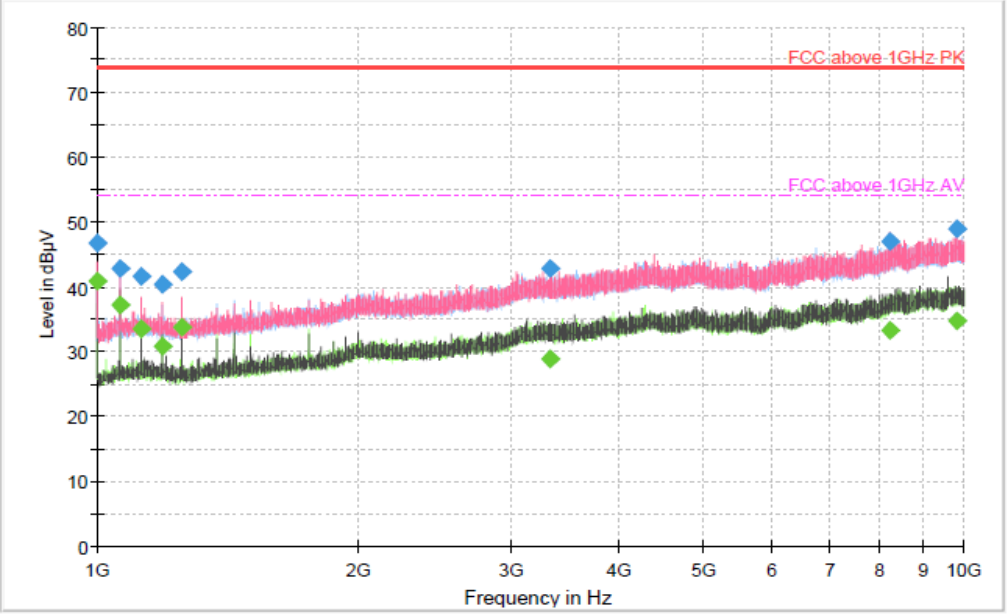
Note1) LTE B17 Low channel (Carrier Frequency: RX 734.0 MHz)
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#17 LTE B29

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	(1 to 10) GHz
Date:	2021.08.06
Environment	21.4 'C / 45.6 % 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	---	40.89	54.00	13.11	15000	1000	188.0	V	17.0	-11.4
1000.000000	46.63	---	74.00	27.37	15000	1000	188.0	V	17.0	-11.4
1062.500000	---	37.20	54.00	16.80	15000	1000	399.0	H	166.0	-11.0
1062.500000	42.87	---	74.00	31.13	15000	1000	399.0	H	166.0	-11.0
1125.000000	---	33.51	54.00	20.49	15000	1000	215.0	V	326.0	-10.9
1125.000000	41.70	---	74.00	32.30	15000	1000	215.0	V	326.0	-10.9
1187.750000	40.31	---	74.00	33.69	15000	1000	202.0	V	4.0	-11.0
1187.750000	---	30.93	54.00	23.07	15000	1000	202.0	V	4.0	-11.0
1250.250000	---	33.87	54.00	20.13	15000	1000	190.0	V	84.0	-11.0
1250.250000	42.23	---	74.00	31.77	15000	1000	190.0	V	84.0	-11.0
3328.250000	42.77	---	74.00	31.23	15000	1000	385.0	H	328.0	-3.1
3328.250000	---	28.77	54.00	25.23	15000	1000	385.0	H	328.0	-3.1
8209.000000	47.02	---	74.00	26.98	15000	1000	115.0	V	120.0	3.5
8209.000000	---	33.17	54.00	20.83	15000	1000	115.0	V	120.0	3.5
9831.000000	48.83	---	74.00	25.17	15000	1000	298.0	H	246.0	5.4
9831.000000	---	34.78	54.00	19.22	15000	1000	298.0	H	246.0	5.4

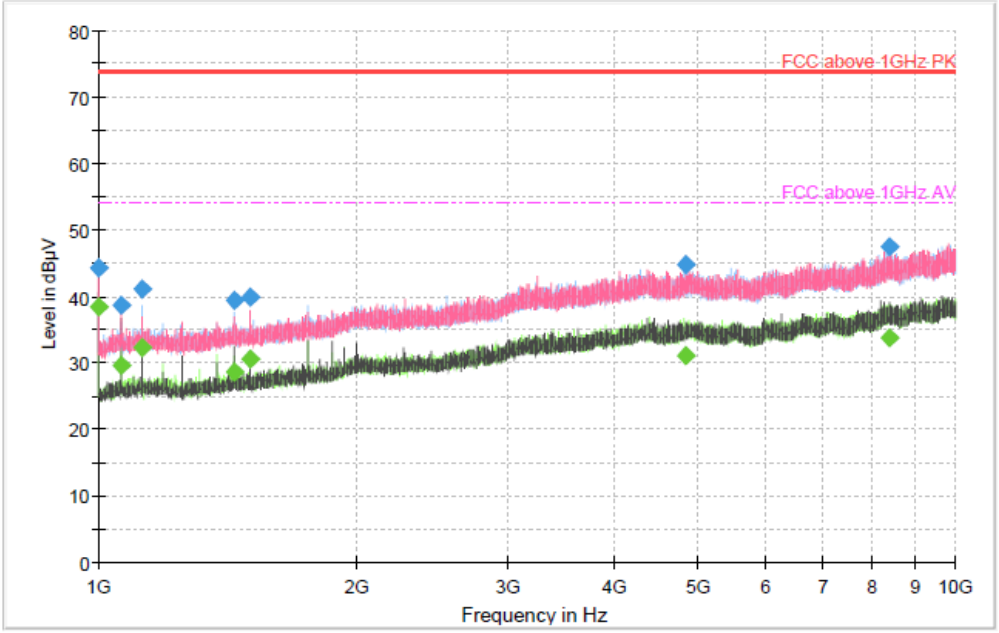
Note1) LTE B29 High channel (Carrier Frequency: RX 728.0 MHz)
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#18 LTE B71

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	(1 to 10) GHz
Date:	2021.08.06
Environment	21.4 'C / 45.6 % 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	---	38.44	54.00	15.56	15000	1000	397.0	V	142.0	-11.4
1000.000000	44.21	---	74.00	29.79	15000	1000	397.0	V	142.0	-11.4
1062.500000	38.71	---	74.00	35.29	15000	1000	106.0	V	337.0	-11.0
1062.500000	---	29.64	54.00	24.36	15000	1000	106.0	V	337.0	-11.0
1125.250000	41.07	---	74.00	32.93	15000	1000	100.0	H	114.0	-10.9
1125.250000	---	32.30	54.00	21.70	15000	1000	100.0	H	114.0	-10.9
1437.750000	---	28.56	54.00	25.44	15000	1000	192.0	H	306.0	-9.5
1437.750000	39.35	---	74.00	34.65	15000	1000	192.0	H	306.0	-9.5
1500.250000	---	30.49	54.00	23.51	15000	1000	215.0	V	234.0	-8.9
1500.250000	39.81	---	74.00	34.19	15000	1000	215.0	V	234.0	-8.9
4845.250000	44.89	---	74.00	29.11	15000	1000	386.0	H	216.0	0.0
4845.250000	---	31.16	54.00	22.84	15000	1000	386.0	H	216.0	0.0
8389.750000	47.34	---	74.00	26.66	15000	1000	315.0	H	8.0	3.6
8389.750000	---	33.86	54.00	20.14	15000	1000	315.0	H	8.0	3.6

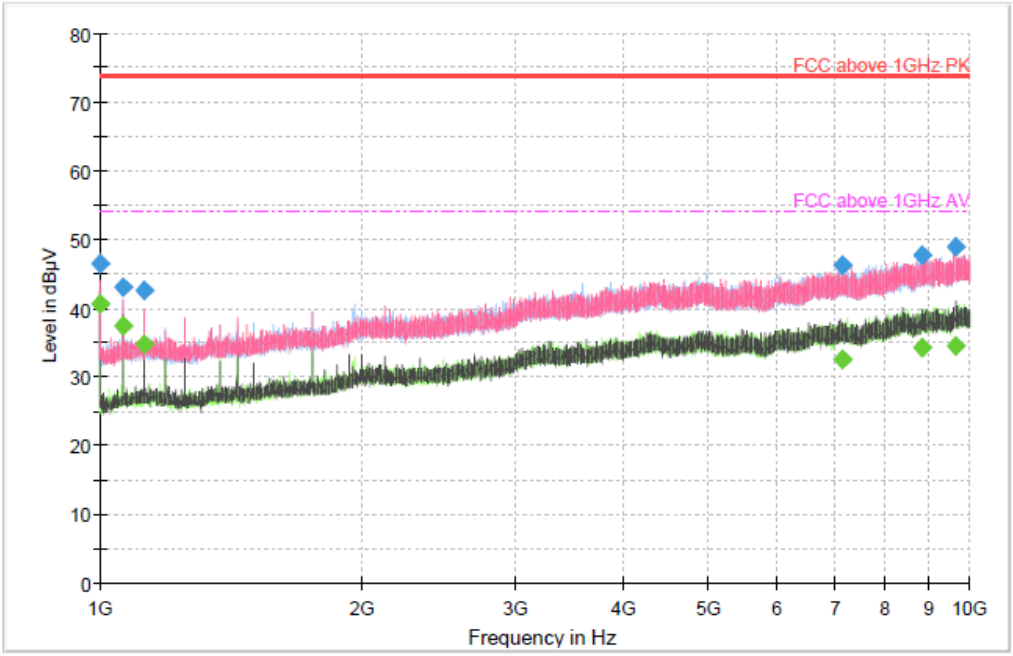
Note1) LTE B71 Middle channel (Carrier Frequency: RX 634.5 MHz)
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#19 5G n5

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	(1 to 10) GHz
Date:	2021.08.07
Environment	21.6 'C / 46.7 % 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	---	40.71	54.00	13.29	15000	1000	185.0	V	230.0	-11.4
1000.000000	46.37	---	74.00	27.63	15000	1000	185.0	V	230.0	-11.4
1062.700000	---	37.53	54.00	16.47	15000	1000	215.0	V	8.0	-11.0
1062.700000	43.13	---	74.00	30.87	15000	1000	215.0	V	8.0	-11.0
1125.050000	---	34.69	54.00	19.31	15000	1000	185.0	V	338.0	-10.9
1125.050000	42.56	---	74.00	31.44	15000	1000	185.0	V	338.0	-10.9
7148.550000	---	32.58	54.00	21.42	15000	1000	395.0	H	344.0	2.4
7148.550000	46.33	---	74.00	27.67	15000	1000	395.0	H	344.0	2.4
8814.550000	47.63	---	74.00	26.37	15000	1000	115.0	V	327.0	4.3
8814.550000	---	34.19	54.00	19.81	15000	1000	115.0	V	327.0	4.3
9617.600000	48.91	---	74.00	25.09	15000	1000	293.0	V	340.0	5.1
9617.600000	---	34.43	54.00	19.57	15000	1000	293.0	V	340.0	5.1

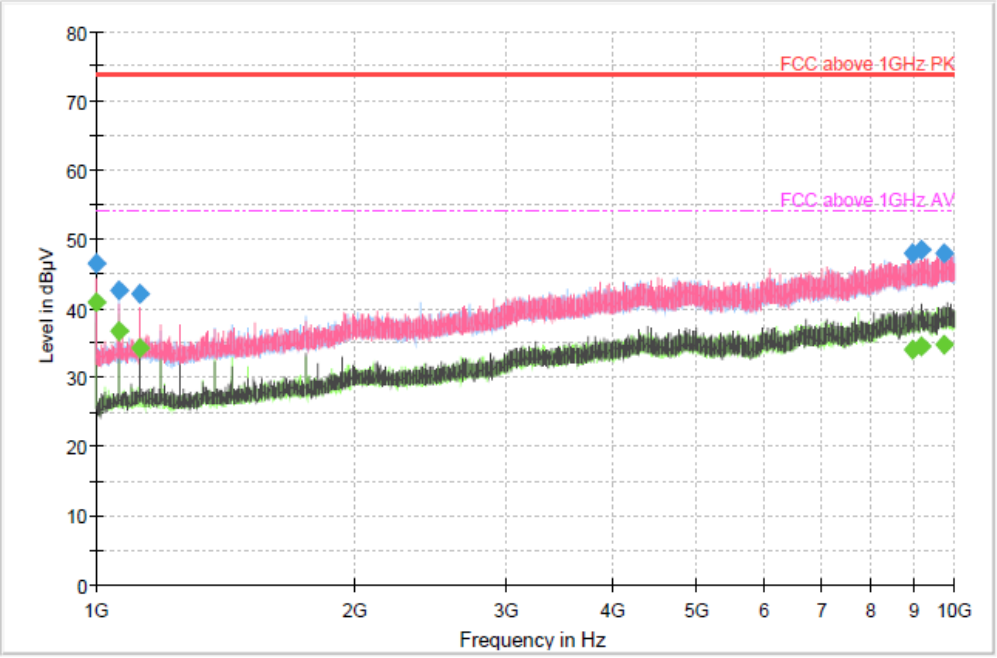
Note1) 5G n5 Low channel (Carrier Frequency: RX 869 MHz).
Note2) Two graphs measured for both Vertical and Horizontal of the Antenna are combined into one graph.

#20 5G n71

Test Report

Common Information

Project Number	BVCO-WAY-P21070008
Location	10 m SAC
System:	(1 to 10) GHz
Date:	2021.08.07
Environment	21.6 'C / 46.7 % 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	46.39	---	74.00	27.61	15000	1000	185.0	V	86.0	-11.4
1000.000000	---	40.80	54.00	13.20	15000	1000	185.0	V	86.0	-11.4
1062.550000	42.45	---	74.00	31.55	15000	1000	398.0	H	302.0	-11.0
1062.550000	---	36.67	54.00	17.33	15000	1000	398.0	H	302.0	-11.0
1125.200000	42.07	---	74.00	31.93	15000	1000	215.0	V	290.0	-10.9
1125.200000	---	34.35	54.00	19.65	15000	1000	215.0	V	290.0	-10.9
8920.150000	---	34.10	54.00	19.90	15000	1000	295.0	V	268.0	4.4
8920.150000	47.96	---	74.00	26.04	15000	1000	295.0	V	268.0	4.4
9139.800000	---	34.41	54.00	19.59	15000	1000	208.0	V	258.0	4.4
9139.800000	48.44	---	74.00	25.56	15000	1000	208.0	V	258.0	4.4
9732.450000	47.99	---	74.00	26.01	15000	1000	315.0	V	118.0	5.2
9732.450000	---	34.81	54.00	19.19	15000	1000	315.0	V	118.0	5.2

Note1) 5G n71 Low channel (Carrier Frequency: RX 617.0 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	2019.08.26	2021.08.26
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	133256	2020.12.07	2021.12.07
Signaling Tester	Anritsu	MT8821C	6262170397	2020.08.21	2021.08.21
Signaling Tester	Anritsu	MT8000A	6262134986	2020.08.24	2021.08.24

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	133256	2020.12.07	2021.12.07
Signaling Tester	Anritsu	MT8821C	6262170397	2020.08.21	2021.08.21
Signaling Tester	Anritsu	MT8000A	6262134986	2020.08.24	2021.08.24

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