EMC TEST REPORT

Applicant	AXIS COMMUNICATIONS AB
FCC ID	PNB-AXISW100
Product	AXIS W100 BODY WORN CAMERA
Brand	AXIS
Model	AXIS W100 BODY WORN CAMERA
Report No.	R1912A0744-E1V1
Issue Date	May 19, 2020

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC Code CFR47 Part15B (2019)/ ANSI C63.4 (2014)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Wei Liu

Performed by: Wei Liu/ Manager

Guangchang Fan

Approved by: Guangchang Fan/ Director

TA Technology (Shanghai) Co., Ltd.

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Summary of measurement results

Number	Test Case	Clause in FCC Rules	Conclusion
1	Radiated Emission	FCC Part15.109, ANSI C63.4-2014	PASS
2	Conducted Emission	FCC Part15.107, ANSI C63.4-2014	PASS
Test Date: February 14,2020 ~ February 15,2020 and March 11,2020			
Note: All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.			

Note: This revised report (Report No.: R1912A0744-E1V1) supersedes and replaces the previously issued report (Report No.: R1912A0744-E1). Please discard or destroy the previously issued report and dispose of it accordingly.

1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein .Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2. Test facility

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

1.3 Testing Location

Company:	TA Technology (Shanghai) Co., Ltd.
Address:	No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China
City:	Shanghai
Post code:	201201
Country:	P. R. China
Contact:	Xu Kai
Telephone:	+86-021-50791141/2/3
Fax:	+86-021-50791141/2/3-8000
Website:	http://www.ta-shanghai.com
E-mail:	xukai@ta-shanghai.com

2 General Description of Equipment under Test

2.1 Applicant and Manufacturer Information

Applicant	AXIS COMMUNICATIONS AB
Applicant address	Emdalavagen 14 ,SE-223 69 Lund, Sweden
Manufacturer	AXIS COMMUNICATIONS AB
Manufacturer address	Emdalavagen 14 ,SE-223 69 Lund, Sweden

2.2 General information

EUT Description			
Device Type:	Portable Device		
Model:	AXIS W100 BODY WORN CAMERA		
SN:	1#		
HW Version:	M10		
SW Version:	9.65alpha1		
Antenna Type:	Chip Antenna for WIFI 2.4G Chip Antenna and Internal Antenna for Bluetooth		
Frequency:	Band	Tx (MHz)	Rx (MHz)
	Bluetooth:	2402 ~ 2480	2402 ~ 2480
	WIFI 2.4G:	2412 ~ 2472	2412 ~ 2472
Modulation:	Bluetooth: GFSK, π/4-DQPSK, 8-DPSK Bluetooth v4.1 LE: GFSK WLAN 802.11b: DSSS WLAN 802.11g/n: OFDM		
EUT Accessory			
Battery	Manufacturer: Icon Energy System (Shenzhen) Co., Ltd. Model: ID1058		
BODY WORN MINI BULLET SENSOR	Manufacturer: AXIS Model: AXIS TW1200		
Auxiliary test equipment			
PC	PC Manufacturer: Microsoft Corporation Model: L20170076		
Note: The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant.			

2.3 Applied Standards

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

Test standards
FCC Code CFR47 Part15B (2019)
ANSI C63.4 (2014)

2.4 Test Mode

Test Mode	
Mode 1:	Adapter + EUT +Idle
Mode 2:	Adapter + EUT + wifi on
Mode 3	Adapter + EUT +camera on
Mode 4:	Adapter + EUT +camera on + wifi on
Mode 5:	EUT + Auxiliary camera +camera on
Mode 6:	EUT + camera on

During the test, the preliminary test was performed in all modes. The test data of the worst-case condition was recorded in this report.

3 Test Case Results

3.1 Radiated Emission

Ambient condition

Temperature	Relative humidity	Pressure
24°C~26°C	45%~50%	102.5kPa

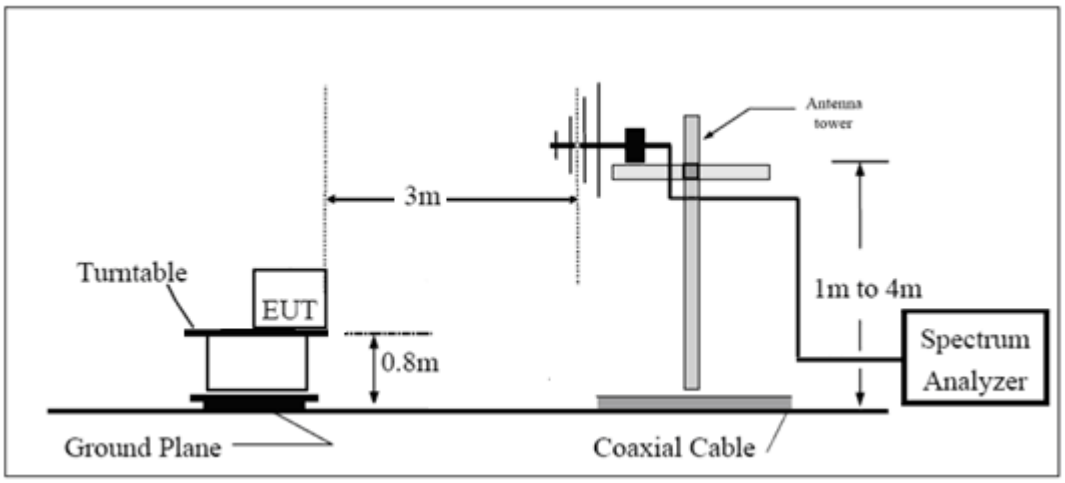
Methods of Measurement

The EUT is placed on a non-metallic table 0.8m above the horizontal metal reference ground plane. The distance between EUT and receive antenna should be 3 meters. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.4-2014. Sweep the whole frequency band through the range from 30MHz to the 5th harmonic of the carrier. During the test, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum of radiated signal level.
The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing. During the test, the EUT is worked at maximum output power.
Set the spectrum analyzer in the following:
Below 1GHz:
RBW=100 kHz / VBW=300 kHz / Sweep=AUTO
Above 1GHz:
(a) PEAK Detector: RBW=1MHz / VBW=3MHz/ Sweep=AUTO
(b) AVERAGE Detector: RBW=1MHz / VBW=3MHz / Sweep=AUTO

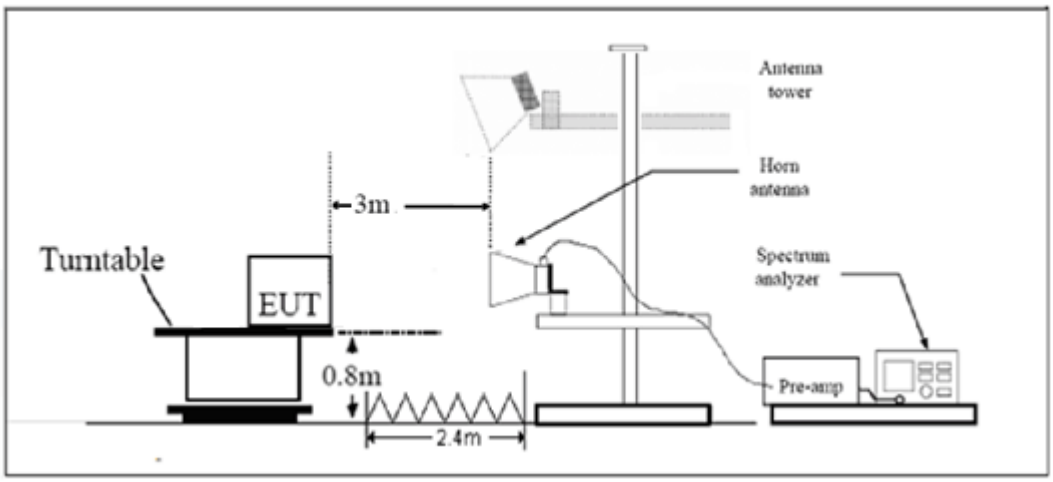
The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (X axis) and the worst case was recorded.

Test Setup

Below 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

Antenna Tower meets ANSI C63.4 requirements for measurements above 1 GHz by keeping the antenna aimed at the EUT during the antenna's ascent/ descent along the antenna mast.

Limits

Frequency (MHz)	Field Strength (dBμV/m)	Detector
30 -88	40.0	Quasi-peak
88-216	43.5	Quasi-peak
216 – 960	46.0	Quasi-peak
960-1000	54.0	Quasi-peak
1000-5th harmonic of the highest frequency or 40GHz,which is lower	54 74	Average Peak

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor *k* = 1.96.

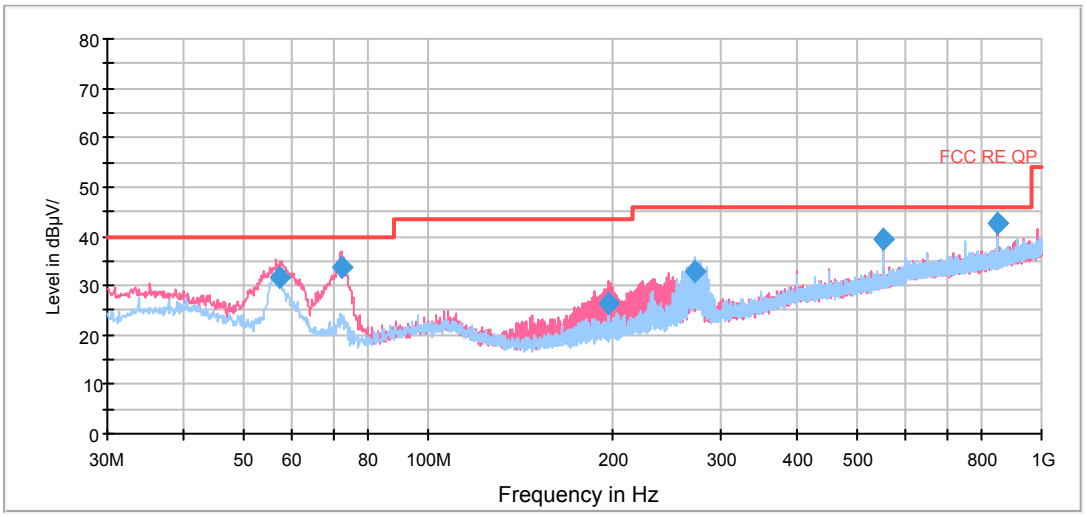
Frequency	Uncertainty
30MHz~200MHz	4.02 dB
200MHz~1000MHz	3.28 dB
1GHz~18GHz	3.70 dB
18GHz~26.5GHz	5.78 dB

Test Results

Sweep the whole frequency band through the range from 30MHz to the 5th harmonic of the carrier, the Emissions in the frequency band 18GHz- 26.5 GHz is more than 20dB below the limit are not reported.

The following graphs display the maximum values of horizontal and vertical by software.
For above 1GHz, Blue trace uses the peak detection, Green trace uses the average detection.

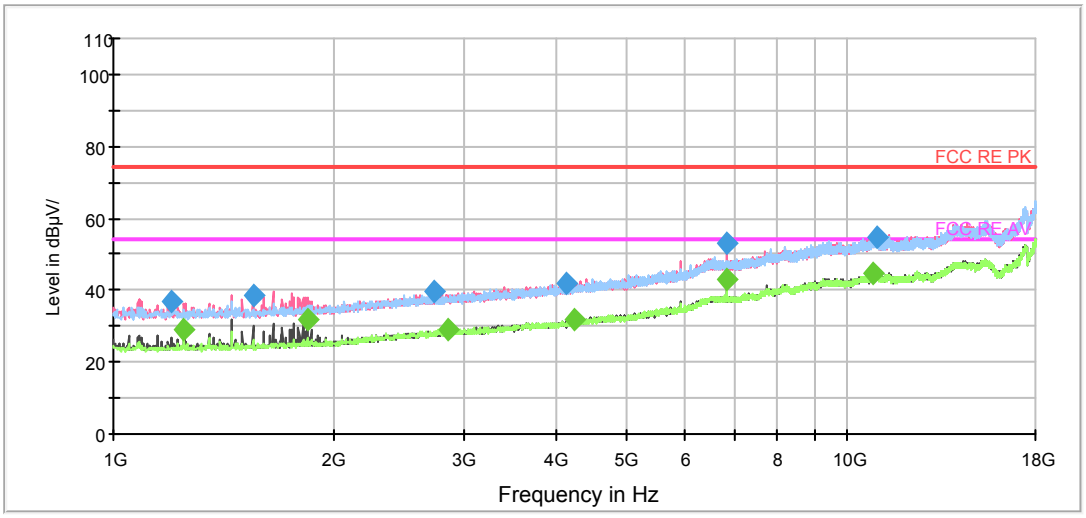
Mode 4



Radiated Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
57.153750	31.8	114.0	V	102.0	13.9	8.2	40.0
72.195000	33.6	100.0	V	46.0	9.9	6.4	40.0
197.532500	26.4	100.0	V	28.0	11.9	13.6	40.0
272.542500	32.8	114.0	H	111.0	14.6	14.2	47.0
550.001250	39.4	100.0	H	33.0	22.1	7.6	47.0
850.013750	42.8	114.0	V	22.0	25.6	4.2	47.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)
2. Margin = Limit – Quasi-Peak

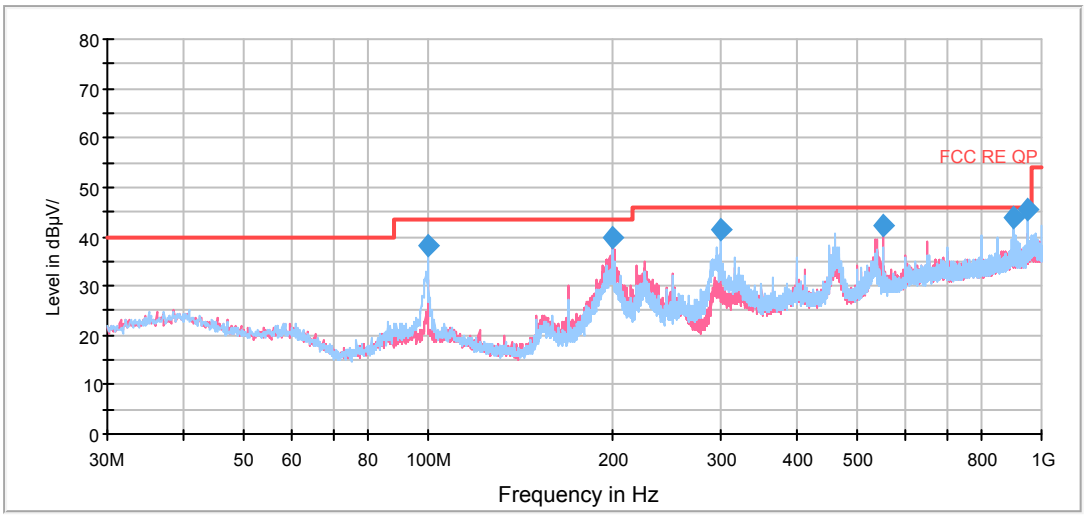


Radiated Emission from 1GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1199.750000	36.9	100.0	V	17.0	-11.2	37.1	74.0
1548.250000	38.7	100.0	V	0.0	-10.2	35.3	74.0
2736.125000	39.7	100.0	H	8.0	-5.9	34.3	74.0
4136.500000	42.0	200.0	V	5.0	-2.3	32.0	74.0
6839.500000	52.8	200.0	V	197.0	5.1	21.2	74.0
10955.625000	54.8	200.0	V	1.0	13.5	19.2	74.0

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1248.625000	28.8	100.0	V	354.0	-11.1	25.2	54.0
1835.125000	31.8	100.0	V	33.0	-9.3	22.2	54.0
2861.500000	28.9	100.0	V	336.0	-5.6	25.1	54.0
4234.250000	31.6	100.0	V	214.0	-2.0	22.4	54.0
6839.500000	43.2	200.0	V	197.0	5.1	10.8	54.0
10843.000000	44.7	200.0	V	148.0	13.5	9.3	54.0

Mode 5

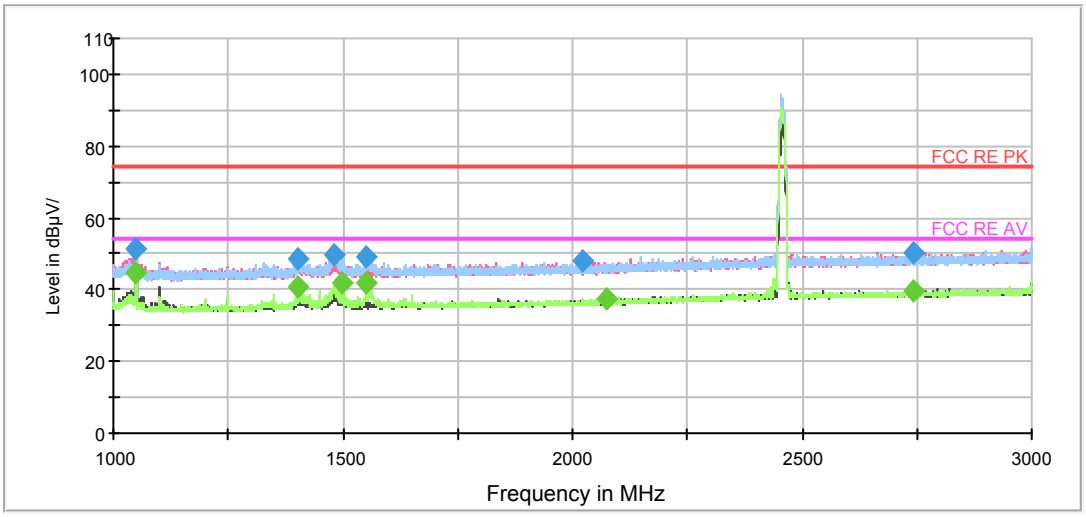


Radiated Emission from 30MHz to 1GHz

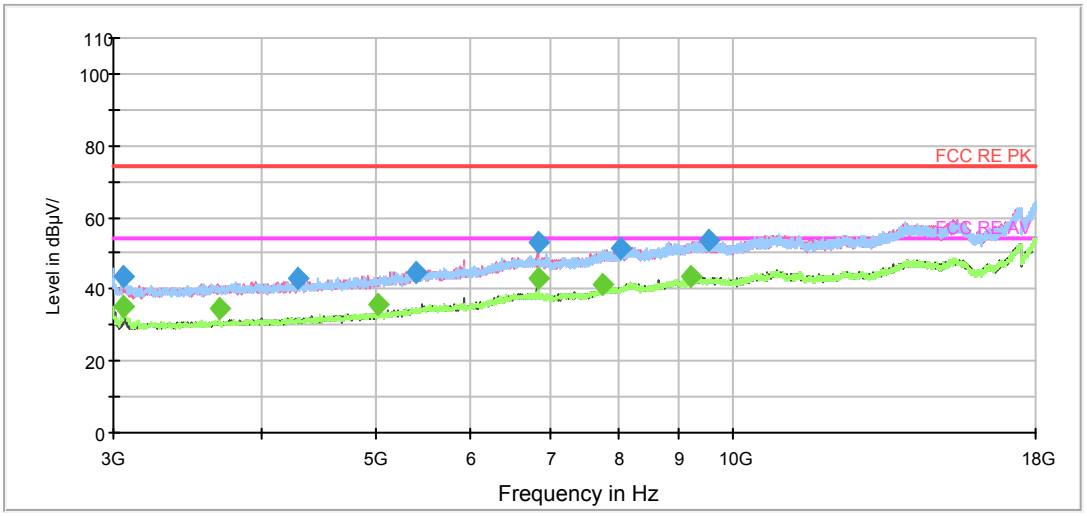
Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
100.001250	38.1	200.0	H	0.0	13.4	5.4	43.5
199.992500	39.6	100.0	V	101.0	12.0	3.9	43.5
299.983750	41.6	100.0	H	279.0	15.3	4.4	46.0
550.001250	42.1	125.0	V	298.0	22.1	3.9	46.0
899.970000	44.0	125.0	H	286.0	26.4	2.0	46.0
949.965000	45.6	100.0	H	282.0	27.0	0.4	46.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)

2. Margin = Limit – Quasi-Peak



Radiated Emission from 1GHz to 3GHz

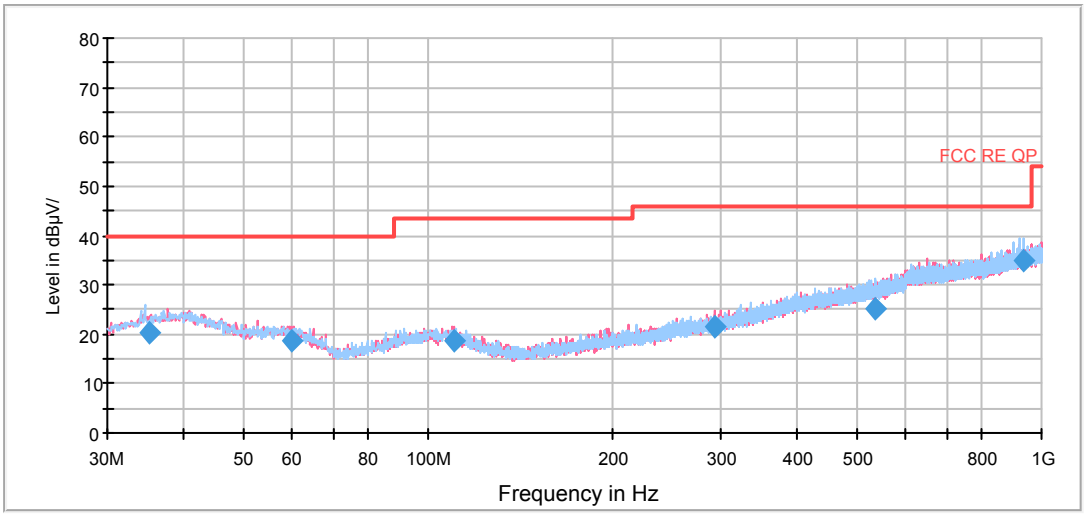


Radiated Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1049.500000	51.6	200.0	V	1.0	-1.7	22.4	74.0
1400.750000	48.4	200.0	H	249.0	-0.7	25.6	74.0
1479.500000	49.7	100.0	H	338.0	-0.5	24.3	74.0
1549.750000	49.1	100.0	H	280.0	-0.2	24.9	74.0
2020.250000	47.8	100.0	H	51.0	1.2	26.2	74.0
2740.250000	50.1	200.0	H	330.0	4.1	23.9	74.0

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1049.750000	44.7	200.0	V	0.0	-1.7	9.3	54.0
1399.750000	40.9	200.0	H	233.0	-0.7	13.1	54.0
1499.500000	41.6	100.0	H	338.0	-0.4	12.4	54.0
1550.000000	41.6	100.0	H	280.0	-0.2	12.4	54.0
2075.250000	37.7	100.0	V	127.0	1.5	16.3	54.0
2741.250000	39.4	100.0	H	357.0	4.1	14.6	54.0

Mode 6

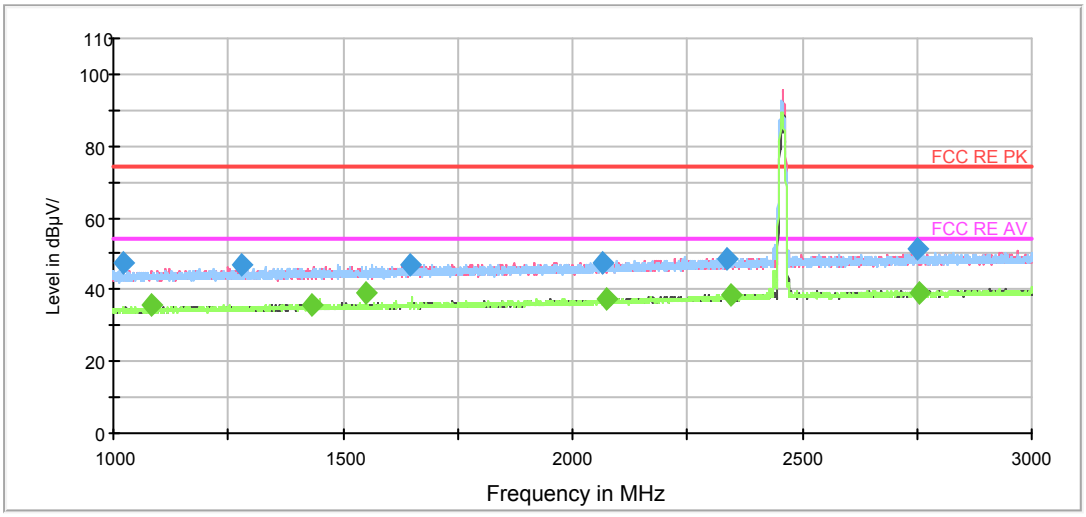


Radiated Emission from 30MHz to 1GHz

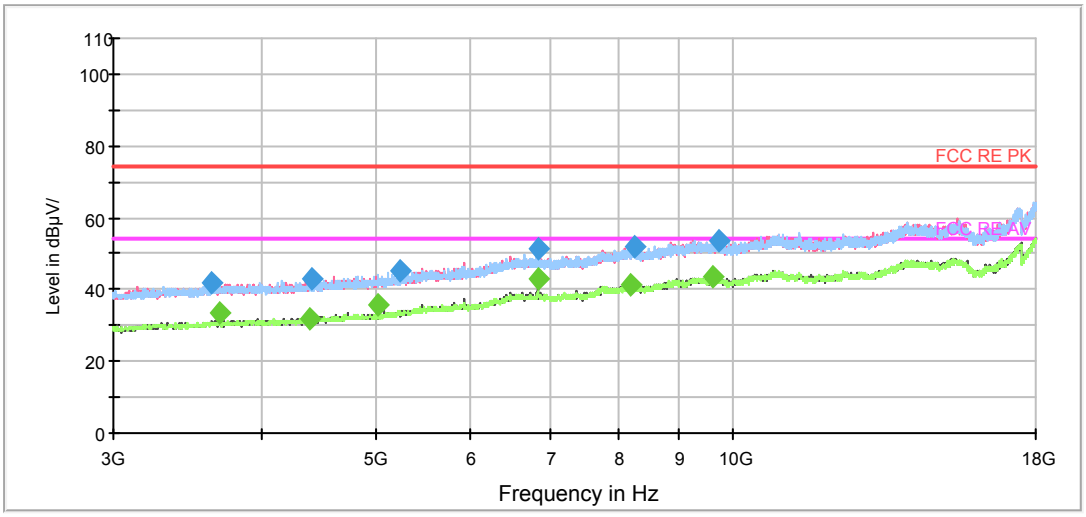
Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
35.006250	20.3	125.0	H	344.0	16.3	19.7	40.0
59.983750	18.5	125.0	V	138.0	14.0	21.5	40.0
110.303750	18.8	100.0	V	224.0	13.5	24.7	43.5
292.916250	21.6	114.0	V	350.0	15.2	24.4	46.0
533.877500	25.3	100.0	H	256.0	21.8	20.7	46.0
935.981250	34.9	100.0	H	305.0	26.8	11.1	46.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)

2. Margin = Limit – Quasi-Peak



Radiated Emission from 1GHz to 3GHz



Radiated Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1023.750000	47.4	100.0	V	8.0	-1.8	26.6	74.0
1281.250000	46.8	200.0	V	248.0	-1.0	27.2	74.0
1645.500000	47.0	100.0	H	79.0	0.2	27.0	74.0
2066.750000	47.6	200.0	V	31.0	1.5	26.4	74.0
2337.000000	48.8	100.0	H	1.0	3.0	25.2	74.0
2752.500000	51.4	200.0	H	0.0	4.2	22.6	74.0

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1082.750000	35.7	200.0	V	8.0	-1.5	18.3	54.0
1430.750000	36.0	200.0	V	230.0	-0.6	18.0	54.0
1549.750000	38.9	100.0	H	95.0	-0.2	15.1	54.0
2074.250000	37.5	100.0	V	0.0	1.5	16.5	54.0
2345.750000	38.5	200.0	V	112.0	3.0	15.5	54.0
2756.500000	39.0	200.0	H	308.0	4.2	15.0	54.0

3.2 Conducted Emission

Ambient condition

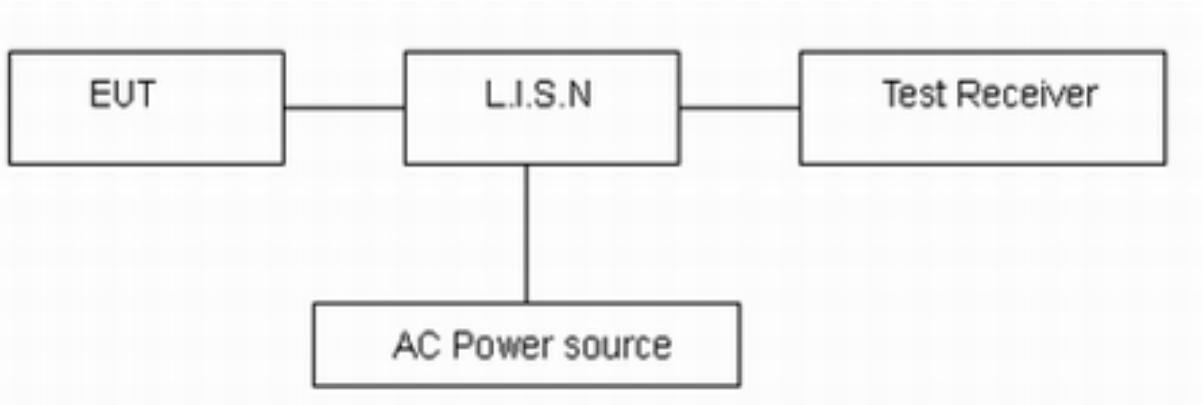
Temperature	Relative humidity	Pressure
24°C ~26°C	50%~55%	102.5kPa

Methods of Measurement

The EUT is placed on a non-metallic table of 80cm height above the horizontal metal reference ground plane. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.4-2014. Connect the AC power line of the EUT to the L.I.S.N. Use EMI receiver to detect the average and Quasi-peak value. RBW is set to 9 kHz, VBW is set to 30kHz. The measurement result should include both L line and N line.

During the test, EUT is connected to a laptop via a USB cable in the case of Transfer Data mode. The EUT is used as the peripheral equipment of the PC. The data is transferred from EUT to PC; PC is connected to server via a long LAN cable.

Test Setup



Note: Power Supply is AC Power source and it is used to change the voltage 120V/60Hz.

Limits

Frequency (MHz)	Conducted Limits(dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46 *
0.5 - 5	56	46
5 - 30	60	50
*: Decreases with the logarithm of the frequency.		

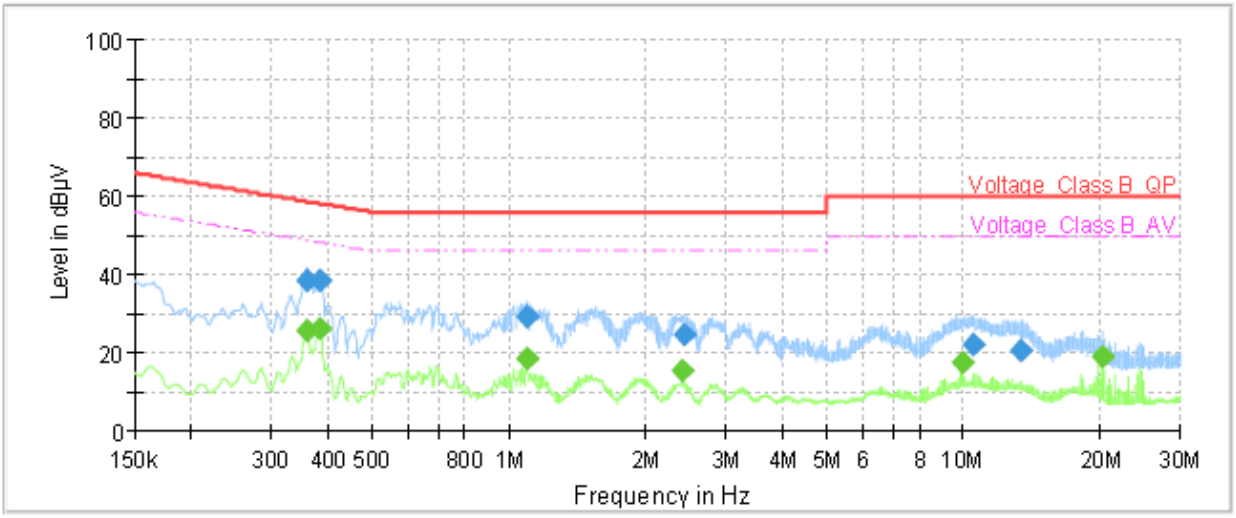
Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor *k* = 1.96. U= 2.57 dB.

Test Results

Following plots, Blue trace uses the peak detection; Green trace uses the average detection.

Mode 4

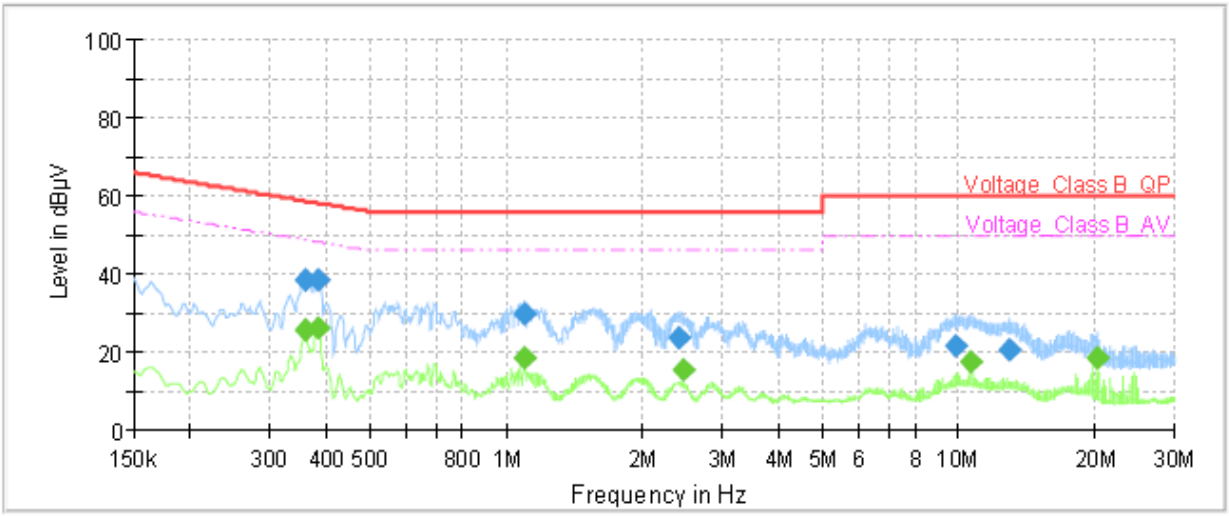


Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.36	---	25.45	48.75	23.30	1000.0	9.000	L1	ON	19
0.36	38.26	---	58.75	20.49	1000.0	9.000	L1	ON	19
0.38	---	26.22	48.24	22.02	1000.0	9.000	L1	ON	19
0.38	38.47	---	58.24	19.77	1000.0	9.000	L1	ON	19
1.09	---	18.47	46.00	27.53	1000.0	9.000	L1	ON	19
1.10	29.44	---	56.00	26.56	1000.0	9.000	L1	ON	19
2.40	---	15.27	46.00	30.73	1000.0	9.000	L1	ON	19
2.42	24.54	---	56.00	31.46	1000.0	9.000	L1	ON	19
9.90	---	17.25	50.00	32.75	1000.0	9.000	L1	ON	19
10.55	21.93	---	60.00	38.07	1000.0	9.000	L1	ON	19
13.42	20.45	---	60.00	39.55	1000.0	9.000	L1	ON	19
20.26	---	18.81	50.00	31.19	1000.0	9.000	L1	ON	20

Remark: Correct factor=cable loss + LISN factor

L line

Conducted Emission from 150 KHz to 30 MHz



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.36	---	25.48	48.75	23.27	1000.0	9.000	N	ON	19
0.36	38.33	---	58.75	20.42	1000.0	9.000	N	ON	19
0.38	---	26.15	48.24	22.09	1000.0	9.000	N	ON	19
0.38	38.42	---	58.24	19.82	1000.0	9.000	N	ON	19
1.10	---	18.68	46.00	27.32	1000.0	9.000	N	ON	19
1.10	29.49	---	56.00	26.51	1000.0	9.000	N	ON	19
2.40	23.47	---	56.00	32.53	1000.0	9.000	N	ON	19
2.45	---	15.59	46.00	30.41	1000.0	9.000	N	ON	19
9.82	21.49	---	60.00	38.51	1000.0	9.000	N	ON	19
10.66	---	17.21	50.00	32.79	1000.0	9.000	N	ON	19
12.96	20.65	---	60.00	39.35	1000.0	9.000	N	ON	19
20.26	---	18.28	50.00	31.72	1000.0	9.000	N	ON	19

Remark: Correct factor=cable loss + LISN factor

N line

Conducted Emission from 150 KHz to 30 MHz

4 Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Time
Spectrum Analyzer	R&S	FSV40	15195-01-00	2019-05-19	2020-05-18
EMI Test Receiver	R&S	ESCI	100948	2019-05-19	2020-05-18
Trilog Antenna	SCHWARZBECK	VULB 9163	9163-201	2017-11-18	2020-11-17
Horn Antenna	R&S	HF907	100126	2018-07-07	2020-07-06
Standard Gain Horn	ETS-Lindgren	3160-09	00102643	2018-06-20	2020-06-19
EMI Test Receiver	R&S	ESR	101667	2019-05-19	2020-05-18
LISN	R&S	ENV216	101171	2018-12-15	2021-12-14
Bore Sight Antenna mast	ETS	2171B	00058752	/	/
Test software	EMC32	R&S	9.26.0	/	/

********END OF REPORT ********