EMC Test Report

Report No.: STS2403064E02

Issued for

UbiqiSense Aps

Amagerfaelledvej 106,2300 Koebenhavn S, Denmark

Product Name:	PoE Adaptor
Brand Name:	Ubiqisense
Model Name:	UPA-1
Series Model(s):	UPA
FCC ID:	2AXKGUPA1
Test Standards:	FCC 47 CFR Part 15: Subpart B

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TEST REPORT

Applicant's Name	:	UbiqiSense Aps
Address	:	Amagerfaelledvej 106,2300 Koebenhavn S, Denmark
Manufacturer's Name	:	SHENZHEN HIGHLAND TECHNOLOGY Co., LIMITED
Address	:	901, Building A3, Tianrui Industrial Park, No. 35, Fuyuan 1st Road, Fuhai Street, Baoan District, Shenzhen, Guangdong, China

Product Description

Product Name	:	PoE Adaptor
Brand Name	:	Ubiqisense
Model Name	:	UPA-1
Series Model(s)	:	UPA
Test Standards	:	FCC 47 CFR Part 15: Subpart B
Test Procedure	:	ANSI C63.4-2014

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Date of Test	:	
Date of Receipt of Test Item	:	14 Mar. 2024
Date of Performance of Tests	:	14 Mar. 2024 ~ 23 Apr. 2024
Date of Issue	:	23 Apr. 2024
Test Result	:	**Pass**

Testing Engineer : Stan · Deng

(Star Deng)

Technical Manager : Chris Chen

(Chris Chen)

Authorized Signatory : Bovey Yang

(Bovey Yang)

SHENZHEN STS TEST SERVICES CO.,LTD. TESTING APPROVAL

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Revision History

Rev.	Issue Date	Report No.	Effect Page	Contents
00	23 Apr. 2024	STS2403064E02	ALL	Initial Issue

1. SUMMARY OF THE TEST RESULTS

Test procedures according to the technical standards:

EMISSION			
Standard	Item	Result	Remarks
FCC 47 CFR Part 15: Subpart B	Conducted Emission	N/A	Meet Class B limit
	Radiated Emission	PASS	Meet Class B limit

NOTE:

(1) N/A=Not Applicable.

1.1 TEST FACTORY

Company Name:	SHENZHEN STS TEST SERVICES CO.,LTD.
Address:	101, Building B, Zhuoke Science Park, No.190 Chongqing Road, ZhanChengShequ, Fuhai Sub-District, Bao'an District, Shenzhen, Guang Dong, China
Telephone:	+86-755 3688 6288
Fax:	+86-755 3688 6277
Registration No.:	FCC test Firm Registration Number: 625569
	IC test Firm Registration Number: 12108A
	A2LA Certificate No.: 4338.01

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %。

No.	Item	Uncertainty
1	Conducted Emission (9KHz-150KHz)	±2.19dB
2	Conducted Emission (150KHz-30MHz)	±2.53dB
3	All emissions,radiated(<1G) 30MHz-1000MHz	±4.18dB
4	All emissions,radiated(>1G) 1GHz-6GHz	±4.90dB
5	All emissions,radiated(>1G) 6GHz-18GHz	±5.24dB

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	PoE Adaptor
Brand Name	Ubiqisense
Model Name	UPA-1
Series Model(s)	UPA
Model Difference	Different models
Product Description	The EUT is a PoE Adaptor ITE equipment having a primary function of either (or a combination of) entry, storage, display, retrieval, transmission, processing, switching, or control of data and/or telecommunication messages and which may be equipped with one or more ports typically for information transfer.
Rating	Input: 44 - 57V⎓ 0.3A Output: 5V⎓2A 10W
Maximum operating frequency	250kHz
Hardware Version Number	UPA_V1_20240325
Software Version Number	v1.3.0_R3

Note: For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.2 DESCRIPTION OF THE TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possibly have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	LAN（POE）

For Radiated Test	
Final Test Mode	Description
Mode 1	LAN（POE）

Note:

1. For radiated emission test, test mode 1 was the worst case and only this mode was presented in this report.
2. We have be tested for all avaiable U.S. voltage and frequencies (For 120V, 50/60Hz) for which the device is capable of operation.

2.3 DESCRIPTION OF THE TEST SETUP

The EUT has been tested with associated equipment below and the test setup please refer to appendix 1 - test setup.

Necessary accessories

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note
	N/A	N/A	N/A	N/A	N/A

Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note
	Personal computer	DELL	Inspiron 14-3467	N/A	N/A

Note:

(1) For detachable type I/O cable should be specified the length in cm in『Length』column.

(2) “YES” is means “with core”; “NO” is means “without core”.

2.4 EQUIPMENTS LIST FOR ALL TEST ITEMS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
EMI Test Receiver	R&S	ESCI	101427	2023.9.25	2024.9.24
Bi-log Antenna	TESEQ	CBL6111D	45873	2023.9.27	2024.9.26
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1343	2023.9.27	2024.9.26
Pre-amplifier(1G-26.5G)	Agilent	HP8449B	3008A02383	2024.2.23	2025.2.22
Pre-amplifier(0.1M-3GHz)	EM	EM330	060665	2024.2.23	2025.2.22
Spectrum Analyzer	Agilent	N9020A	MY49100060	2023.9.26	2024.9.25
RE Cable (9K-1G)	N/A	R01	N/A	2023.9.25	2024.9.24
RE Cable (1G-26G)	N/A	R02	N/A	2023.9.25	2024.9.24
Temperature & Humidity	Mieo	HH660	N/A	2023.9.28	2024.9.27
Testing Software	EZ-EMC(Ver.STSLAB-03A1 RE)				

Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
EMI Test Receiver	R&S	ESCI	101427	2023.9.25	2024.9.24
LISN	R&S	AiT-F01220	8130179	2023.9.25	2024.9.24
Absorbing Clamp	R&S	MDS-21	100668	2024.2.23	2025.2.22
CE Cable	N/A	C01	N/A	2023.9.25	2024.9.24
EMF Antenna	SCHWARZBECK	VDHH 9502	147	2023.9.25	2024.9.24
Temperature & Humidity	Mieo	HH660	N/A	2023.9.28	2024.9.27
Testing Software	EZ-EMC(Ver.STSLAB-03A1 CE)				

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

FREQUENCY (MHz)	☐Class A (dBμV)		☒Class B (dBμV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 ~ 0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.5 ~ 5	73.00	60.00	56.00	46.00
5 ~ 30	73.00	60.00	60.00	50.00

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

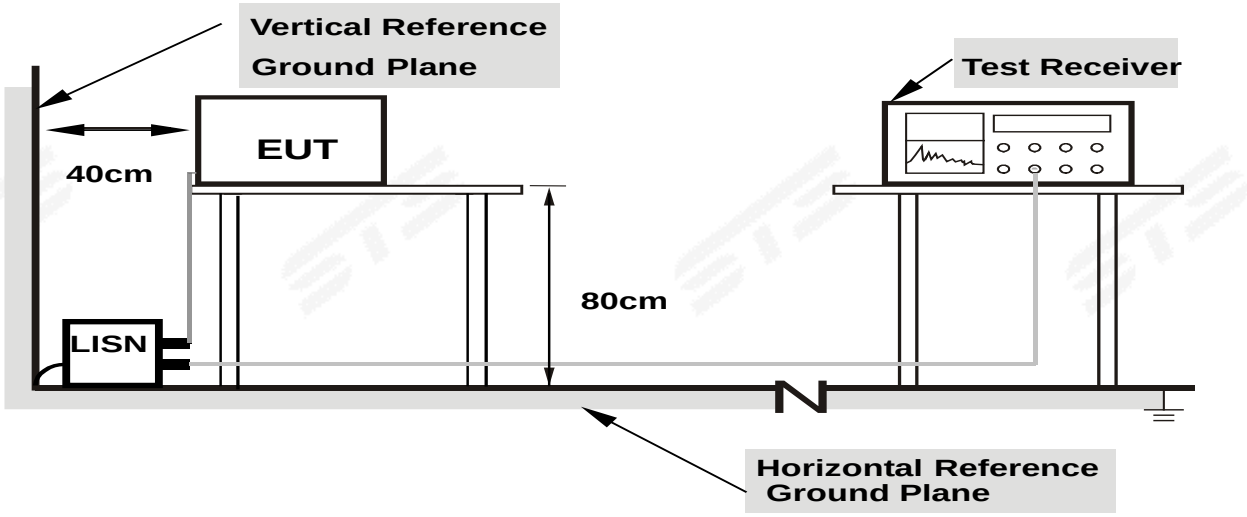
3.1.2 TEST PROCEDURE

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.1.6 TEST RESULTS

Temperature:	--℃	Relative Humidity:	--%
Phase:	L/N	Test Mode:	N/A
Test Voltage:	N/A	Test Date:	N/A

NOTE: N/A

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS

Below 1 GHz
Measurement Method and Applied Limits:
ANSI C63.4:

Frequency (MHz)	☐Class A		☒Class B
	Field strength (dBuV/m) (at 10m)	Field strength (dBuV/m) (at 3m)	Field strength (dBuV/m) (at 3m)
30 ~ 88	39	49.5	40
88 ~ 216	43.5	54	43.5
216 ~ 960	46.4	56.9	46
Above 960	49.5	60	54

Above 1 GHz
Measurement Method and Applied Limits:
ANSI C63.4:

Frequency (MHz)	☐Class A				☒Class B	
	(dBuV/m) (at 3m)		(dBuV/m) (at 10m)		(dBuV/m) (at 3m)	
	Peak	Average	Peak	Average	Peak	Average
Above 1000	80	60	69.5	49.5	74	54

Frequency Range of Radiated Disturbance Measurement

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 ~ 108	1000
108 ~ 500	2000
500 ~ 1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

Note:

(1) The limit for radiated test was performed in the following: FCC PART 15B.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m) = 20log Emission level (uV/m).

3.2.2 TEST PROCEDURE

a. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
b. EUT as the center to the edge of the auxiliary device, the distance from the maximum edge to the center of the antenna is 3 meter.
c. The height of antenna is varied from 1 meter to 4 meter above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meter and the rotatable table was turned from 0 degrees to 360 degree to find the maximum reading.
e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1GHz.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

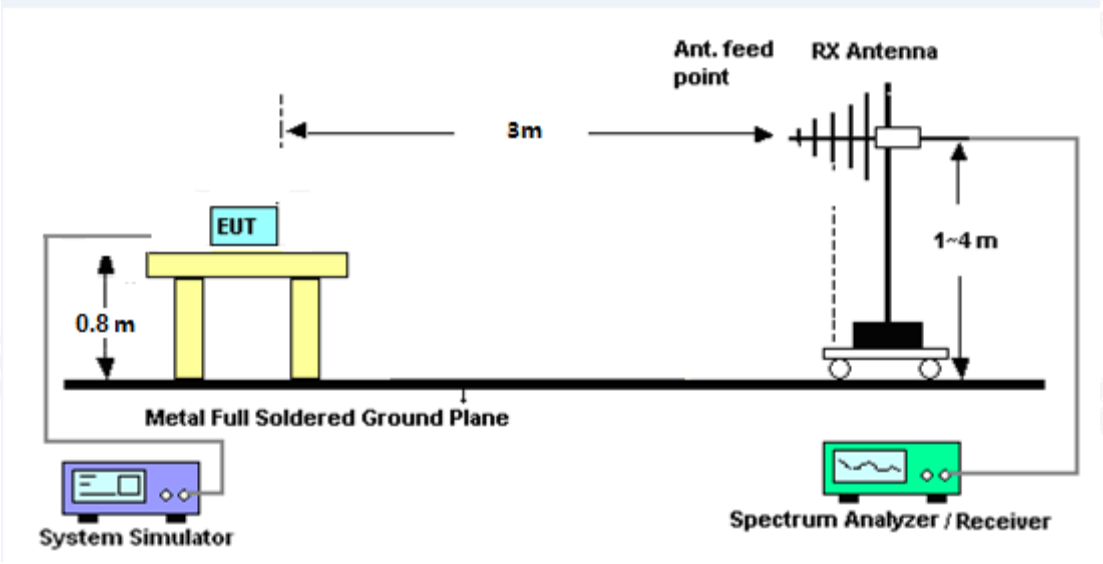
Note: Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

3.2.3 DEVIATION FROM TEST STANDARD

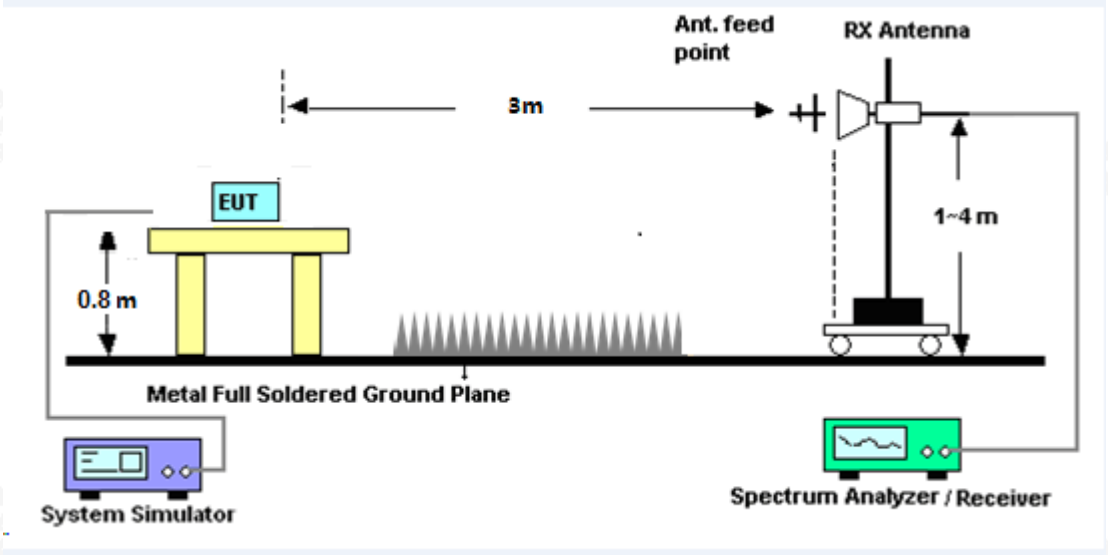
No deviation

3.2.4 TEST SETUP

（A）Radiated Emission Test-Up Frequency Below 1 GHz



（B）Radiated Emission Test-Up Frequency Above 1GHz



3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 described unless otherwise a special operating condition is specified in the following during the testing.

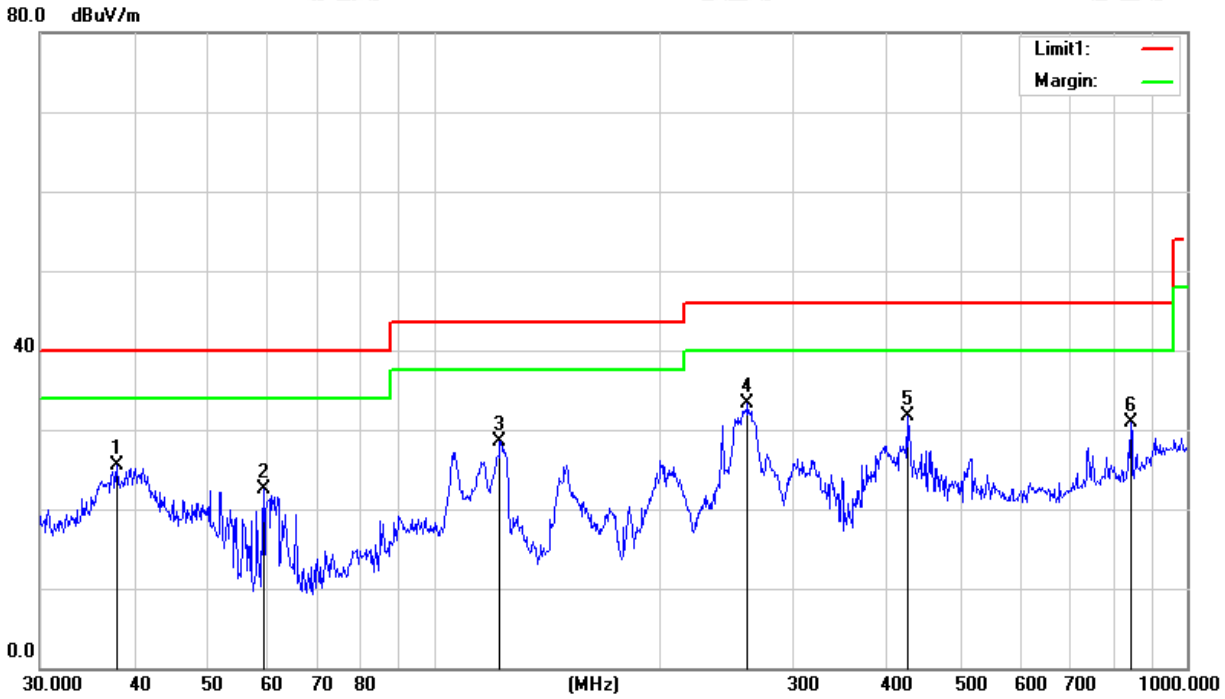
3.2.6 TEST RESULTS

30MHz - 1000MHz

Temperature:	26.1℃	Relative Humidity:	53%
Phase:	Horizontal	Test Mode:	Mode 1
Test Voltage:	DC 57V	Test Date:	2024.04.22

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	37.9450	40.90	-15.45	25.45	40.00	-14.55	QP
2	59.4405	48.16	-25.67	22.49	40.00	-17.51	QP
3	122.4040	46.71	-18.23	28.48	43.50	-15.02	QP
4	261.0581	48.08	-14.83	33.25	46.00	-12.75	QP
5	425.0280	44.17	-12.54	31.63	46.00	-14.37	QP
6	842.1295	35.87	-4.94	30.93	46.00	-15.07	QP

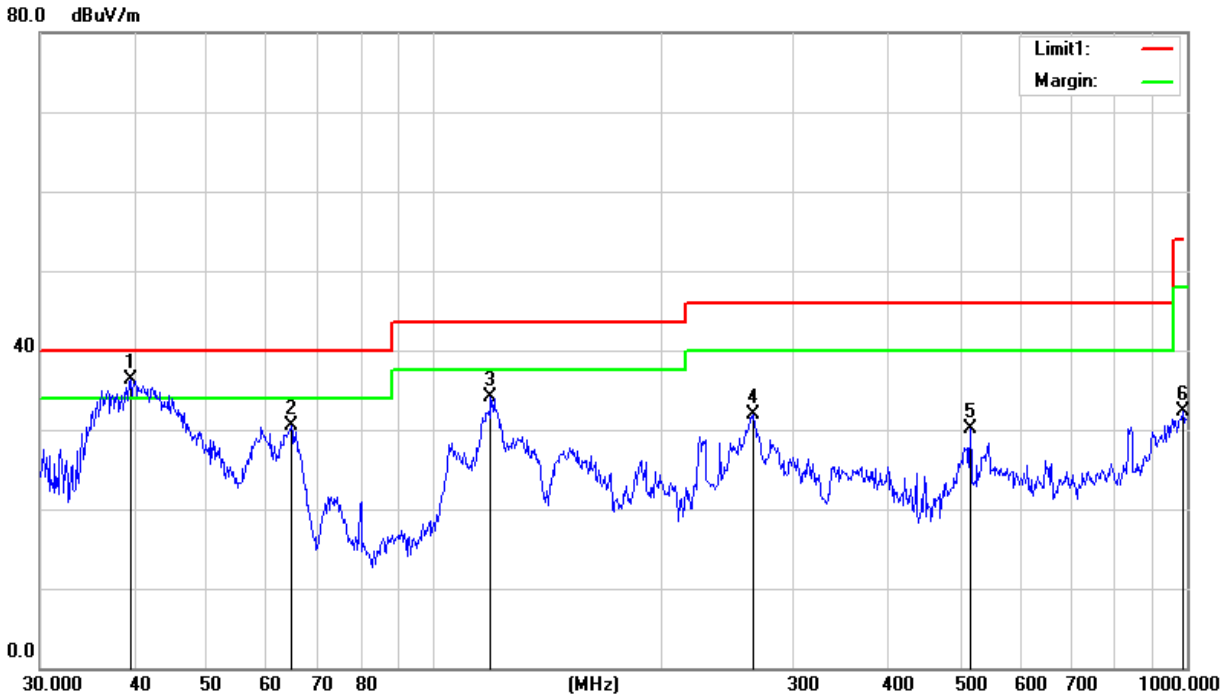
Remark:
1. All readings are Quasi-Peak
2. Margin = Result (Result =Reading + Factor)–Limit
3. Factor= Cable Loss +Antenna Factor-Amplifier Gain



Temperature:	26.1℃	Relative Humidity:	53%
Phase:	Vertical	Test Mode:	Mode 1
Test Voltage:	DC 57V	Test Date:	2024.04.22

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	39.5756	52.71	-16.37	36.34	40.00	-3.66	QP
2	64.6594	56.43	-25.97	30.46	40.00	-9.54	QP
3	119.0180	52.44	-18.37	34.07	43.50	-9.43	QP
4	265.6757	47.37	-15.55	31.82	46.00	-14.18	QP
5	515.4374	40.94	-10.83	30.11	46.00	-15.89	QP
6	986.0715	34.46	-2.13	32.33	54.00	-21.67	QP

Remark:
1. All readings are Quasi-Peak
2. Margin = Result (Result =Reading + Factor)–Limit
3. Factor= Cable Loss +Antenna Factor-Amplifier Gain



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