SMQ 深圳市计量质量检测研究院
Shenzhen Academy of Metrology & Quality Inspection

TEST REPORT

For

Thermal Camera

Model Number: TIMNBLT319, TIMNBLT325, TIMNBLT619, TIMNBLT625

FCC ID: 2BGKL-TIMNBLT

Test Laboratory	:	Shenzhen Academy of Metrology and Quality Inspection
Site Location	:	No.4 Tongfa Rd., Xili, Nanshan, Shenzhen, China
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Revision History

No	Date	Remark
V1.0	2024-7-5	Initial issue

TEST REPORT DECLARATION

Applicant	:	Hangzhou Shunli Optotech Co., Ltd.
Address	:	3rd Floor, Building 2, No. 526 Binkang Road, Binjiang District, Hangzhou, Zhejiang, China
Manufacturer	:	Hangzhou Shunli Optotech Co., Ltd.
Address	:	3rd Floor, Building 2, No. 526 Binkang Road, Binjiang District, Hangzhou, Zhejiang, China
EUT Description	:	Thermal Camera
Model No.	:	TIMNBLT319, TIMNBLT325, TIMNBLT619, TIMNBLT625
Trade mark	:	EMDI
Serial Number	:	--------
Date of EUT Receive	:	2024-4-24
Test Standards:	:	FCC Part 15 Subpart B

The EUT described above is tested by Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory to determine the maximum emissions from the EUT and ensure the EUT to be compliance with the immunity requirements of the EUT. Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory is assumed full responsibility for the accuracy of the test results, unless they depend on the manufacturer information.

The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Project Engineer: _____ Date: 2024-7-3
(周芳媛 Zhou FangAi)

Checked by: _____ Date: 2024-7-4
(万晓婧 Wan XiaoJing)

Approved by: _____ Date: 2024-7-5
(林斌 Lin Bin)

TABLE OF CONTENTS

1 TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	Test Results
Conducted Emission	PASS
Radiated Emission	PASS

Remark: “N/A” means “Not applicable.”

2 GENERAL INFORMATION

2.1 Report Information

This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that SMQ approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that SMQ in any way guarantees the later performance of the product/equipment.

The sample/s mentioned in this report is/are supplied by Applicant, SMQ therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

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The lab will not be liable for any loss or damage resulting for false, inaccurate, inappropriate or incomplete product information provided by the applicant/manufacturer.

2.2 Laboratory Accreditation and Relationship to Customer

The testing report were performed by the Shenzhen Academy of Metrology and quality Inspection EMC Laboratory (Guangdong EMC compliance testing center), in their facilities located at NETC Building, No.4 Tongfa Rd., Xili, Nanshan, Shenzhen, China. At the time of testing, Laboratory is accredited by the following organizations:

China National Accreditation Service for Conformity Assessment (CNAS) accredits the Laboratory for conformance to FCC standards, EMC international standards and EN standards. The Registration Number is CNAS L0579.

The Laboratory is Accredited Testing Laboratory of FCC with Designation numberCN1165 and Site registration number 582918.

The Laboratory is registered to perform emission tests with Innovation, Science andEconomic Development (ISED), and the registration number is 11177A.

The Laboratory is registered to perform emission tests with VCCI, and the registration number are C-20048, G20076, R-20077, R-20078 and T-20047.

The Laboratory is Accredited Testing Laboratory of American Association for Laboratory Accreditation (A2LA) and certificate number is 3292.01.

2.3 Measurement Uncertainty

Conducted Emission for Mains
AMN
$U = 2u_c$ (V) =3.74 dB k =2 (9 kHz -150 kHz)
$U = 2u_c$ (V) =3.34 dB k =2 (0.15 MHz -30 MHz)

Radiated Emission
$U = 2u_c$ (E) =4.26 dB k =2 (Below 1GHz)
$U = 2u_c$ =4.64 dB k =2 (1GHz~6GHz)
$U = 2u_c$ =5.08 dB k =2 (6GHz~40GHz)

3 PRODUCT DESCRIPTION

NOTE: The extreme test conditions for temperature and antenna gain were declared by the manufacturer.

3.1 EUT Description

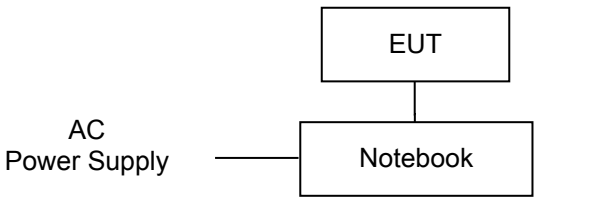
Operating voltage	:	3.6 Vdc (Low)/3.8 Vdc (Normal)/4.2 Vdc (Max)
Test voltage	:	120 Vac/60 Hz
Software Version	:	V2.630.0000000.0.R.240427
Hardware Version	:	26_1300
Frequency	:	2.4GWiFi:2412MHz~2462MHz
Type(s) of Modulation	:	DSSS (DBPSK, DQPSK, CCK) for 802.11b OFDM (BPSK, QPSK, 16QAM, 64QAM) for 802.11g/n
Antenna Type	:	2.4G WiFi: IFA -0.588 dBi

Remark: The product differences are as follows, and the others are the same.

Model	Effective Pixel (Thermal Imaging Sensor)	Focal Length
TIMNBLT319	384×288	19mm
TIMNBLT325		25mm
TIMNBLT619	640×512	19mm
TIMNBLT625		25mm

Unless otherwise specified, the model TIMNBLT319 was chosen as the representative model to perform all the tests.

3.2 Block Diagram of EUT Configuration



Setup of test

3.3 Operating Condition of EUT

Test mode 1: Connected to a pc and data transmission.
Test Mode 2: Charging
EUT has more than one typical operation, only the worst test mode will be recorded in this report.
The Radiated emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission (X plane).

3.4 Support Equipment List

Table 2 Support Equipment List

Name	Model No.	S/N	Manufacturer
Adapter	VCB3HDUH	---	Huizhou Golden Lake Industrial Co., Ltd.
Rechargeable Li-ion Polymer Battery for EUT	PFI-3265-N	---	Dongguan Anyfine Electronic Technology Co., Ltd
Notebook	HP ProBook 440 G6	---	HP

3.5 Test Conditions

Date of test: May.10,2024 – May.13,2024

Temperature: 22℃-23℃

Relative Humidity: 48%-55%

3.6 Modifications

No modification was made.

4 CONDUCTED EMISSION TEST

4.1 Test Standard and Limit

4.1.1 Test Standard

FCC Part 15 Subpart B

4.1.2 Test Limit

Table 3 Conducted Emission Test Limit

Frequency range MHz	Class B		Class A	
	Quasi Peak dB(μV)	Average dB(μV)	Quasi Peak dB(μV)	Average dB(μV)
0.15 to 0.5	66 to 56	56 to 46	79	66
0.5 to 5	56	46	73	60
5 to 30	60	50	73	60

* Decreasing linearly with logarithm of the frequency

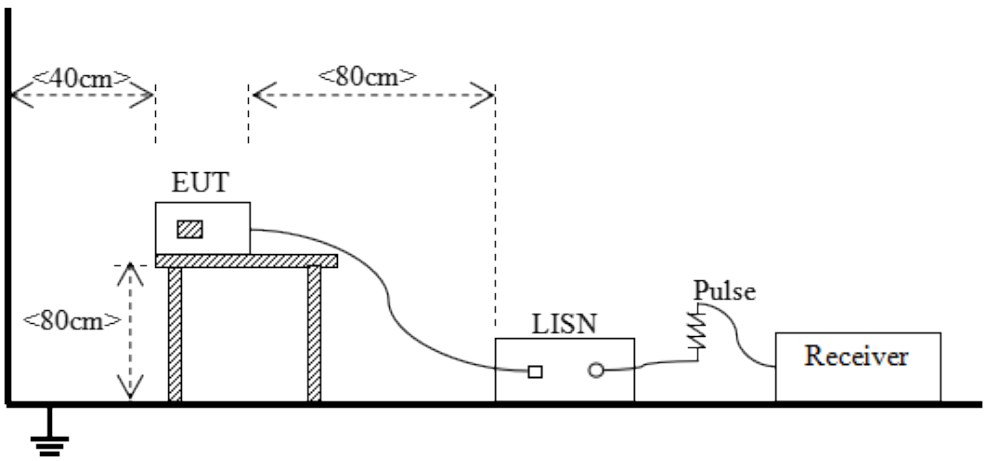
4.2 Test Procedure

The EUT is put on a table of non-conducting material that is 80 cm high. The vertical conducting wall of shielding is located 40 cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through an Artificial Mains Network (A.M.N.). A EMI test receiver used to test the emissions from both sides of AC line. The bandwidth of EMI test receiver is set at 9 kHz.

4.3 Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

4.4 Test Setup



4.5 Test Equipment

No.	Equipment	Manufacturer	Model No.	LAST CALIB	Period
SB8501/06	AMN	ROHDE&SCHWARZ	ESH2-Z5	2024-01-16	12Months
SB9054/05	EMI Test Receiver	ROHDE& SCHWARZ	R&S□ESCI	2023-06-30	12Months
SB9548	Shielded Room	Albatross	SR	2023-08-30	12Months

4.6 Test Condition

Date of test: May.10,2024
Temperature: 22℃
Relative Humidity: 55%RH
Atmospheric Pressure: 101.2kPa

4.7 Test Data

Note: Emissions not reported below are too low against the prescribed limits. "/" means the test data is too low against the limit.

Classification of Equipment: Class B

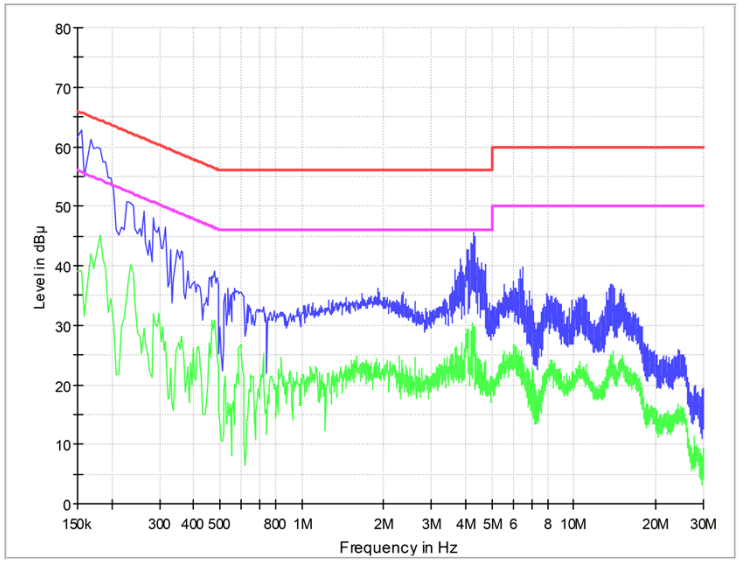
Table 4 Conducted Emission Test Data

Test mode: 1										
	Frequency (MHz)	Correction Factor (dB)	Quasi-Peak				Average			
			Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)
Line	0.154	10.1	43.3	53.4	65.8	12.4	23.7	33.8	55.8	22.0
Line	0.168	10.1	46.2	56.3	65.1	8.8	26.3	36.4	55.1	18.7
Line	0.235	10.1	37.7	47.8	62.3	14.5	25.3	35.4	52.3	16.9
Line	0.316	10.1	28.3	38.4	59.8	21.4	12.8	22.9	49.8	26.9
Line	0.469	10.1	25.7	35.8	56.5	20.7	17.1	27.2	46.5	19.3
Line	4.290	10.0	27.9	37.9	56.0	18.1	16.3	26.3	46.0	19.7
Neutral	0.150	10.1	34.0	44.1	66.0	21.9	18.9	29.0	56.0	27.0
Neutral	0.177	10.1	46.3	56.4	64.6	8.2	33.0	43.1	54.6	11.5
Neutral	0.231	10.1	35.0	45.1	62.4	17.3	21.6	31.7	52.4	20.7
Neutral	0.294	10.1	31.7	41.8	60.4	18.6	16.2	26.3	50.4	24.1
Neutral	0.357	10.1	26.8	36.9	58.8	21.9	13.4	23.5	48.8	25.3
Neutral	4.173	10.0	24.5	34.5	56.0	21.5	13.6	23.6	46.0	22.4

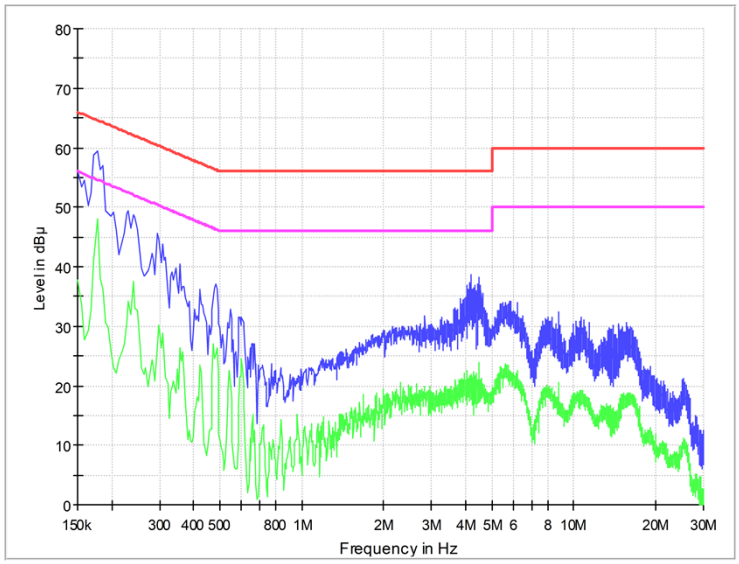
REMARKS: 1. Emission level (dBuV) =Read Value (dBuV) + Correction Factor (dB)
2. Correction Factor (dB) =LISN Factor (dB) + Cable Factor (dB) +Limiter Factor (dB)

Test Mode 1

Line



Neutral



5 RADIATED EMISSION TEST

5.1 Test Standard and Limit

5.1.1 Test Standard

FCC Part 15 Subpart B

5.1.2 Test Limit

Table 5 Radiated Emission Test Limit for FCC (Class A)

Frequency MHz	Test distance m	Limit dB(μV/m)		
		Quasi-peak	Average	Peak
30~88	10	39.1		
88~216		43.5		
216~960		46.4		
960~1000		49.5		
30~88	3	49.1		
88~216		53.5		
216~960		56.4		
960~1000		59.5		
>1000	3		59.5	79.5
Conditional testing procedure for above 1 GHz：				
Highest frequency generated or used in the device or on which the device operates or tunes (MHz)		Upper frequency of measurement 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.		
* The lower limit shall apply at the transition frequency.				

Table 6 Radiated Emission Test Limit for FCC (Class B)

Frequency MHz	Test distance m	Limit dB(μV/m)		
		Quasi-peak	Average	Peak
30~88	10	30		
88~216		33.5		
216~960		36		
960~1000		44		
30~88	3	40		
88~216		43.5		
216~960		46		
960~1000		54		
>1000	3		54	74
Conditional testing procedure for above 1 GHz：				
Highest frequency generated or used in the device or on which the device operates or tunes (MHz)		Upper frequency of measurement 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.
* The lower limit shall apply at the transition frequency.	

5.2 Test Procedure

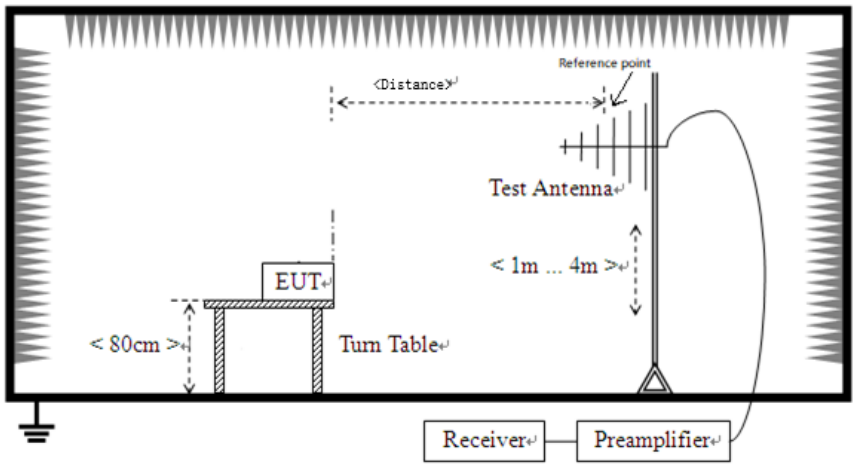
The EUT is placed on a turntable, which is 0.8 meter above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3 meters or 10 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.
RBW = 100 kHz (less than or equal to 1 GHz); 1 MHz (above 1 GHz)
VBW ≥ 3 x RBW
Detector = Peak & Quasi-Peak (frequency range 30 MHz to 1 GHz);
Peak & Average (frequency range above 1 GHz);
Changing VBW to 10 Hz for average measurement
The use of a higher-than-specified video bandwidth produces a conservative measurement result.

5.3 Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

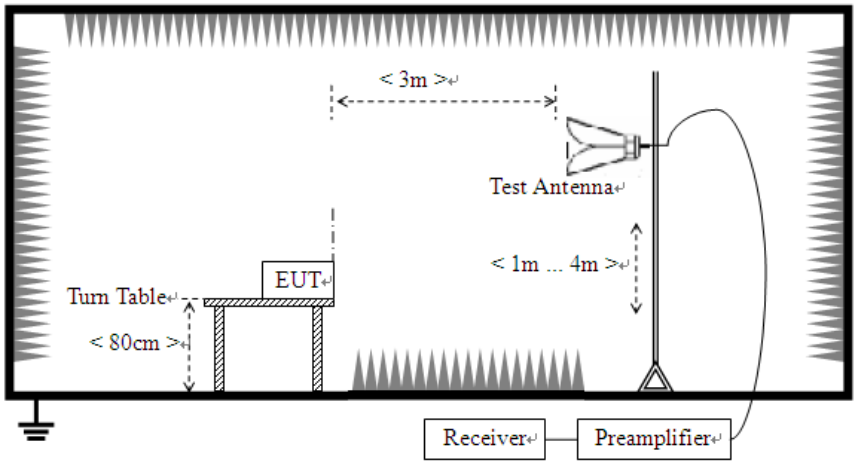
5.4 Test Setup

Below 1 GHz



Distance = 3 meters or 10 meters

Above 1 GHz



5.5 Test Equipment

No.	Equipment	Manufacturer	Model No.	LAST CALIB	Period
SB13958	Horn Antenna	ROHDE&SCHWARZ	HF907	2024-04-30	12 Months
SB17366	Test Receiver	ROHDE&SCHWARZ	ESR26	2024-04-30	12 Months
SB20321/02	Spectrum Analyzer	Rohde & Schwarz	FSW43	2024-04-22	12 Months
SB3955	Broadband Antenna	SCHWARZBECK	VULB9163	2024-04-30	12 Months
SB9555/01	Anechoic chamber	Albatross	/	2023-08-15	12 Months

5.6 Test Condition

Date of test: May.13,2024
Temperature: 23 ℃
Relative Humidity: 48 %RH
Atmospheric Pressure: 100.9 kPa

5.7 Test Data

Note: Emissions not reported below are too low against the prescribed limits. “/” means the test data is too low against the limit.

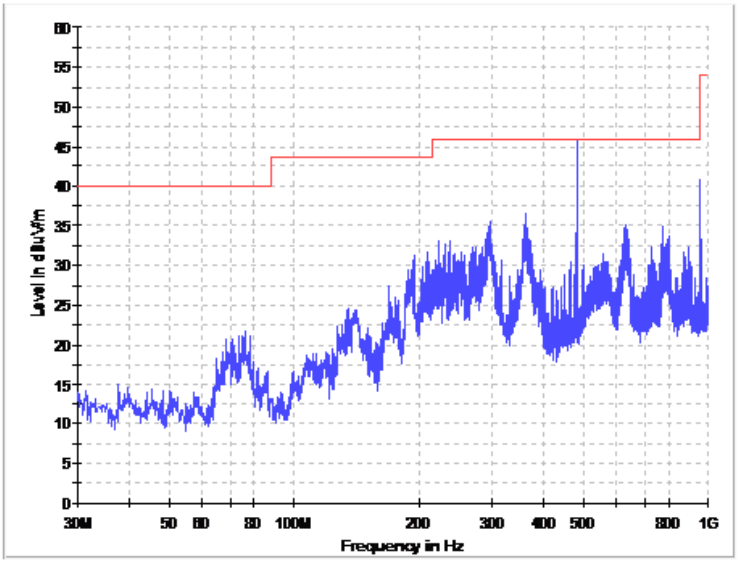
Classification of Equipment: Class B
Below 1 GHz Test Distance: 3 m

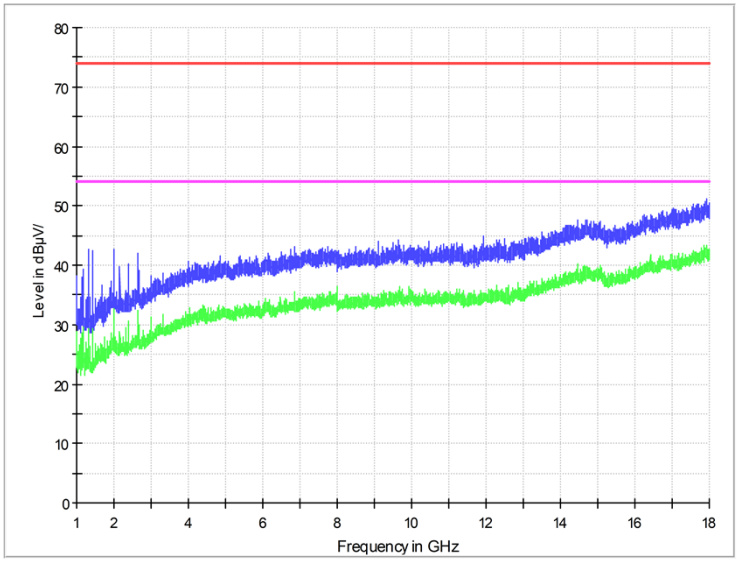
Table 7 Radiated Emission Test Data

Test mode: 1								
Frequency (MHz)	Cable Loss +preamp (dB)	Antenna Factor (dB)	Reading Value (dBμV/m)	Emission Level (dBμV/m)	Polarity (Horizontal/ Vertical)	Limits (dBμV/m)	Margin (dB)	Note
360.015	1.6	14.3	18.2	34.1	H	46.0	11.9	QP
479.972	1.9	16.1	25.9	43.9	H	46.0	2.1	QP
960.014	3.0	21.7	12.6	37.3	H	54.0	16.7	QP
207.186	1.2	10.6	13.0	24.8	V	43.5	18.7	QP
479.972	1.9	16.1	21.6	39.6	V	46.0	6.4	QP
830.034	2.7	20.1	8.4	31.2	V	46.0	14.8	QP
1994.500	-38.8	28.6	58.7	48.5	H	74.0	25.5	PK
14455.000	-32.7	40.2	41.3	48.8	H	74.0	25.2	PK
16235.000	-32.1	41.4	40.1	49.4	H	74.0	24.6	PK
1333.200	-39.5	25.1	71.6	57.2	V	74.0	16.8	PK
1996.200	-38.8	28.6	64.3	54.1	V	74.0	19.9	PK
3986.900	-36.9	32.9	57.4	53.4	V	74.0	20.6	PK
1994.500	-38.8	28.6	35.8	25.6	H	54.0	28.4	AV
14455.000	-32.7	40.2	27.5	35.0	H	54.0	19.0	AV
16235.000	-32.1	41.4	26.5	35.8	H	54.0	18.2	AV
1333.200	-39.5	25.1	41.6	27.2	V	54.0	26.8	AV
1996.200	-38.8	28.6	36.5	26.3	V	54.0	27.7	AV
3986.900	-36.9	32.9	32.9	28.9	V	54.0	25.1	AV

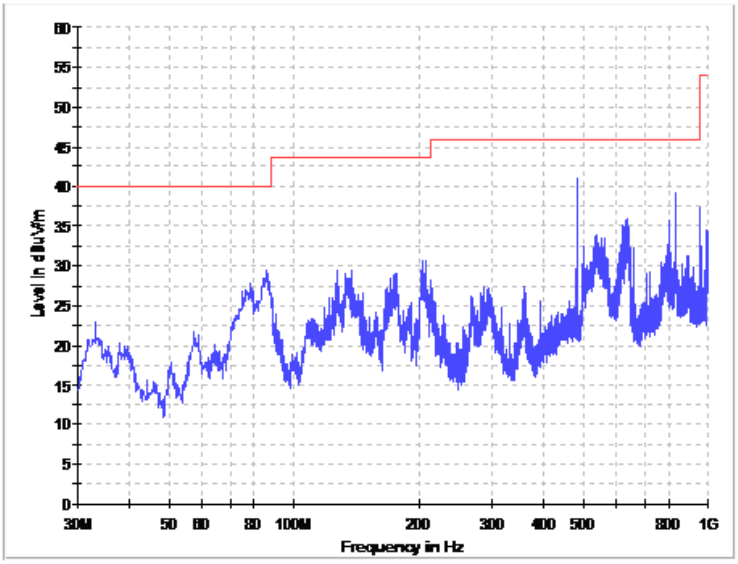
REMARKS: Emission level (dBuV)=Read Value(dBuV/m) + Antenna Factor(dB)+ Cable Loss +preamp(dB)

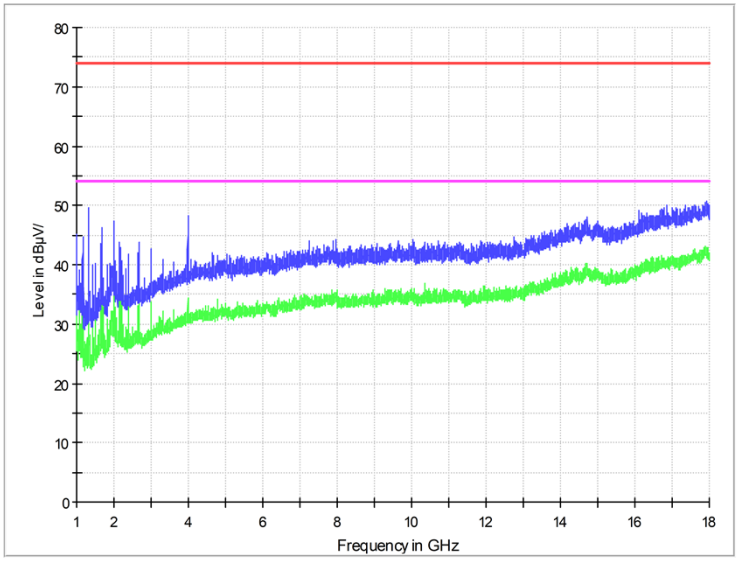
Test Mode 1
Horizontal





Vertical





----------End of Report----------