

## TEST REPORT

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**EUT DESCRIPTION** Control Equipment for Inverter

**EUT TRADEMARK** Power-One

**EUT MODEL** PVI-DESKTOP-BT-US

**DERIVED MODEL** PVI-DESKTOP-US

**REFERENCE STANDARDS :** FCC 47 CFR Part 15 B  
§ 15.107 § 15.109

**TEST REPORT NUMBER** FCCTR\_100137A-0

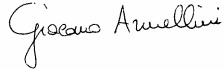
**TEST REPORT ISSUE DATE** 28/04/2010

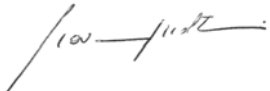
**TESTING LABORATORY** Prima Ricerca & Sviluppo S.r.l.  
Via Campagna, 92 -22020 Faloppio (Co) –Italy

**TESTING LOCATION** As Above

**DATE OF TEST SAMPLE RECEIPT** 28/04/2010

**DATE OF TEST** 28/04/2010

**TESTED BY** Giacomo Armellini 

**APPROVED BY** Giovanni Molteni 

*The test results reported in this test report shall refer only to the sample actually tested and shall not refer or be deemed to refer to bulk from which such a sample may be said to have been obtained.  
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## 1. TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

### 1.1 Identification

Brand name: POWER-ONE  
Manufacturer: POWER-ONE ITALY SPA  
Equipment : Control Equipment for Inverter  
Serial number : Not present  
Model PVI-DESKTOP-BT-US  
Derived model PVI-DESKTOP-US (see following manufacturer declaration)  
FCC ID : X6W-DESK  
Country of manufacturer: ITALY



*rif. 3188 US (Dichiarazione Differenze Modelli)*

## Declaration

We Power-One Italy S.p.a. - Via San Giorgio, 642 – 52028 Terranuova B.ni (AR) - Italy, declare that :

**Model PVI-DESKTOP-BT-US is the same in construction (including the printed wiring board) respect to model PVI-DESKTOP-US except for added integrated Bluetooth Module and SMD Antenna.**

Terranuova B.ni, 2010 February 08

Ing. Gianfranco Iannuzzi  
(Test Houses Liaison Engineer)

## 1.2 *Technical data*

FCC class:	Unintentional radiators, Class B
Product type:	Control Equipment for Inverter USB connected
Power type :	110V 60Hz Power supply adapter / output 5 Vdc
Typical usage :	Control Equipment for Inverter
EUT single or system:	Single
EUT dimensions :	See photographic documentation

## 1.3 *Modifications incorporated in E.U.T.*

The following items are the modifications introduced in the equipment under test :

- **None**

### 1.4 **Ports identification**

This section contains descriptions of all ports, the length and the type of the cable provided by manufacturer needed for the tests.

Moreover it is specified if the ports are ever or optionally connected.

<b>Port</b>		<b>Description</b>	<b>Connection</b>
1	Enclosure	Plastic case	By screws and by pressure
2	AC power input/output ports	110Vac 60Hz/ 12 Vdc external power supply adapter	By plug
3	DC power input/output ports	(Internal battery supplied)	Port not present
4	Signals / control lines	RS485 port (Type 2.0) (how declared by the client, cable < 3mt)	Female type A plug
		USB port	USB mini B connector
5	Telecommunication ports	Port no present	----

Note: During the tests all cables must be what provided the manufacturer or the same that used in the real employment of the EUT.

### 1.5 **Auxiliary equipment**

- Toshiba Satellite Pro Notebook



## 2. TEST CONDITIONS

### 2.1 Operating test modes and test conditions

The equipment has been tested according to the operative conditions described in the user/installation manual provided by the manufacturer and by following reference standards :

Reference Standard:

- FCC Part 15, Subpart B

In the following table there are the operating conditions adopted during tests identified by an indicator (#..) at which has been referred the item “Operating condition of the equipment under test” of all technical sheets of the tests (see Section 4)

<b>Operating condition</b>	<b>Description</b>
<b>#1</b>	EUT connected at USB port for transfer data to PC

### 2.2 Test overview

The appliance is classified as “*unintentional radiator*” in conformity to FCC Part 15 Sub. B §15.109, §15.107.

The application is mainly used as radio equipment for inverter check.

### 3. REFERENCE STANDARD FOR PERFORMED TESTS

Reference standard :	Title :
FCC Part 15 part A	Code of Regulations Part 15 (Radio Frequency Devices), Subpart A (General) of the Federal Communication Commission (FCC)
FCC Part 15 part B	Code of Regulations Part 15 (Radio Frequency Devices), Subpart B (Unintentional Radiators) of the Federal Communication Commission (FCC)
ANSI C63.4	American National Standard for Methods of Measuring of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz – 40 GHz

## 4. SUMMARY OF TEST RESULTS

### 4.1 Emission tests

Port		Phenomena	Basic standard	Operating condition <sup>1</sup>	Result
1	Enclosure	Radiated emission	FCC Part 15 § 15 109	#1	Within the limit
2	AC mains Input ports	RF Disturbance voltage: • continuous	FCC Part 15 § 15 107	#1	Within the limit

<sup>1</sup> Ref. Tab. of Section 2



## 5. TEST RESULTS

EMISSION OF MAINS TERMINAL DISTURBANCE VOLTAGE (CONTINUOUS DISTURBANCE) .....	10
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**TEST  
1.**

**EMISSION OF MAINS TERMINAL DISTURBANCE VOLTAGE  
(CONTINUOUS DISTURBANCE)**

**REFERENCE  
DOCUMENT**

FCC47CFR Part 15

- **TEST SETUP:** According to reference standard
- **TEST LOCATION:** Semianechoic chamber
- **TEST EQUIPMENT USED FOR TEST:** EMI receiver Rohde & Schwarz Mod. ESU40  
Artificial Network Rohde & Schwarz Mod. ESH3-Z5

- **TESTED PORT:** AC mains
- **FREQUENCY RANGE:** 0.15 - 30 MHz
- **EMISSION LIMITS:** Section 15.107 of Standard
- **MEASUREMENT UNCERTAINTY:** Total uncertainty (k=2)  $\pm 2.5$  dB

TEST CONDITIONS:	MEASURED
Ambient temperature : 15 - 35 °C	24 $\pm$ 3 °C
Ambient humidity : 25 - 75 %rH	38 $\pm$ 5 %rH
Pressure : 85 - 106 kPa (860 mbar - 1060 mbar)	975 $\pm$ 50 mbar
Voltage :	110Vac 60Hz

**OPERATING CONDITION (Rif. Section. 2) : #1**

**RESULT: WITHIN THE LIMIT**



## EMI Auto Test Template: Voltage with 2-Line-LISN

Hardware Setup: Voltage with 2-Line-LISN  
 Measurement Type: 2 Line LISN  
 Frequency Range: 150 kHz - 30 MHz  
 Graphics Level Range: 0 dB $\mu$ V - 80 dB $\mu$ V

Preview Measurements:  
 Scan Test Template: Voltage with 2-Line-LISN pre

Data Reduction:  
 Limit Line #1: FCC Part 15 Class B Voltage on Mains QP  
 Limit Line #2: FCC Part 15 Class B Voltage on Mains AV  
 Peak Search: 6 dB  
 Maximum Results: 10  
 Subrange Maxima: 0  
 Maxima per Subrange: 1  
 Acceptance Offset: -10 dB  
 Maximum Number of Results: 6

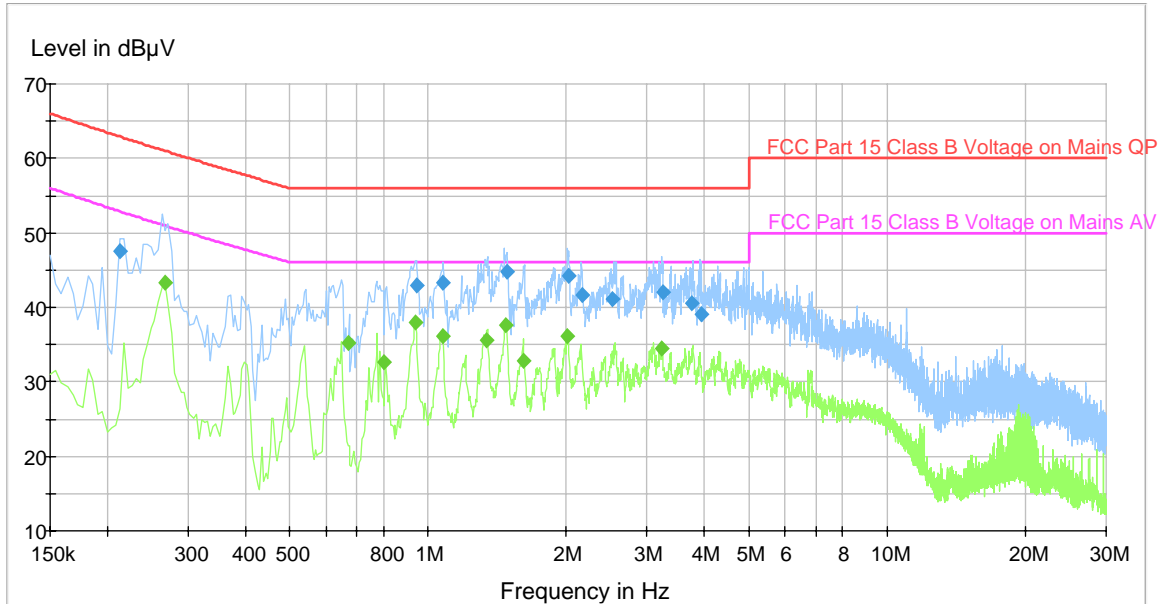
Frequency Zoom:  
 Zoom Scan Template: Voltage with 2-Line-LISN max

Final Measurements:  
 Template for Single Meas.: Voltage with 2-Line-LISN fin

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150 kHz - 30 MHz	QuasiPeak; CAverage	9 kHz	1.5 s	Receiver

L1

Voltage with 2-Line-LISN



— FCC Part 15 Class B Voltage on Mains QP.LimitLine  
— FCC Part 15 Class B Voltage on Mains AV.LimitLine  
— Preview Result 1  
— Preview Result 2  
◆ Final Result 1  
◆ Final Result 2

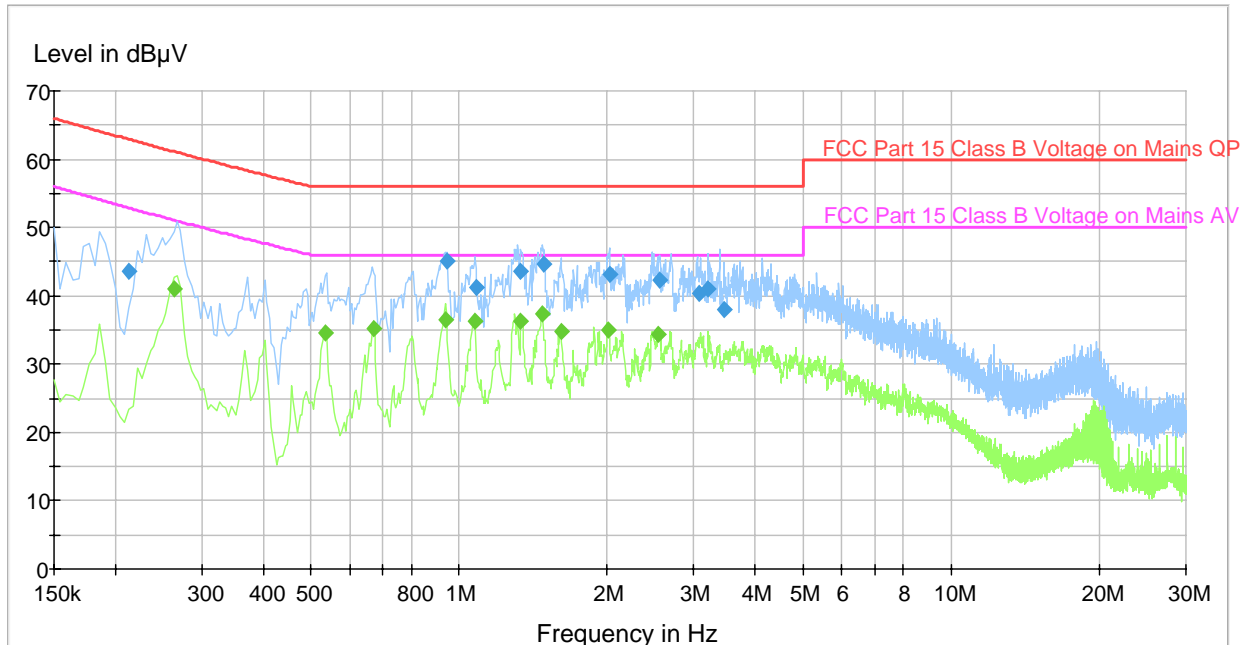
**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.213000	47.5	1000.000	9.000	GND	L1	10.1	15.4	62.9	
0.946500	43.0	1000.000	9.000	GND	L1	10.1	13.0	56.0	
1.077000	43.3	1000.000	9.000	GND	L1	10.1	12.7	56.0	
1.482000	44.9	1000.000	9.000	GND	L1	10.1	11.1	56.0	
2.017500	44.3	1000.000	9.000	GND	L1	10.1	11.7	56.0	
2.161500	41.7	1000.000	9.000	GND	L1	10.1	14.3	56.0	
2.526000	41.0	1000.000	9.000	GND	L1	10.1	15.0	56.0	
3.237000	42.1	1000.000	9.000	GND	L1	10.2	13.9	56.0	
3.750000	40.6	1000.000	9.000	GND	L1	10.2	15.4	56.0	
3.925500	39.1	1000.000	9.000	GND	L1	10.2	16.9	56.0	

**Final Result 2**

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.267000	43.3	1000.000	9.000	GND	L1	10.1	7.7	51.0	
0.667500	35.2	1000.000	9.000	GND	L1	10.1	10.8	46.0	
0.802500	32.6	1000.000	9.000	GND	L1	10.1	13.4	46.0	
0.937500	38.0	1000.000	9.000	GND	L1	10.1	8.0	46.0	
1.072500	36.1	1000.000	9.000	GND	L1	10.1	9.9	46.0	
1.342500	35.6	1000.000	9.000	GND	L1	10.1	10.4	46.0	
1.477500	37.7	1000.000	9.000	GND	L1	10.1	8.3	46.0	
1.617000	32.7	1000.000	9.000	GND	L1	10.1	13.3	46.0	
2.013000	36.1	1000.000	9.000	GND	L1	10.1	9.9	46.0	
3.228000	34.5	1000.000	9.000	GND	L1	10.2	11.5	46.0	

Voltage with 2-Line-LISN



— FCC Part 15 Class B Voltage on Mains QP.LimitLine     — FCC Part 15 Class B Voltage on Mains AV.LimitLine  
— Preview Result 1     — Preview Result 2  
◆ Final Result 1     ◆ Final Result 2

### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.213000	43.6	1000.000	9.000	GND	N	10.1	19.3	62.9	
0.942000	45.0	1000.000	9.000	GND	N	10.1	11.0	56.0	
1.081500	41.2	1000.000	9.000	GND	N	10.1	14.8	56.0	
1.333500	43.6	1000.000	9.000	GND	N	10.1	12.4	56.0	
1.482000	44.8	1000.000	9.000	GND	N	10.1	11.2	56.0	
2.022000	43.2	1000.000	9.000	GND	N	10.1	12.8	56.0	
2.557500	42.2	1000.000	9.000	GND	N	10.1	13.8	56.0	
3.070500	40.3	1000.000	9.000	GND	N	10.1	15.7	56.0	
3.210000	40.9	1000.000	9.000	GND	N	10.1	15.1	56.0	
3.462000	38.0	1000.000	9.000	GND	N	10.1	18.0	56.0	

### Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.262500	41.0	1000.000	9.000	GND	N	10.1	10.1	51.1	
0.532500	34.7	1000.000	9.000	GND	N	10.1	11.3	46.0	
0.667500	35.2	1000.000	9.000	GND	N	10.1	10.8	46.0	
0.937500	36.5	1000.000	9.000	GND	N	10.1	9.5	46.0	
1.072500	36.3	1000.000	9.000	GND	N	10.1	9.7	46.0	
1.333500	36.2	1000.000	9.000	GND	N	10.1	9.8	46.0	
1.477500	37.5	1000.000	9.000	GND	N	10.1	8.5	46.0	
1.608000	34.8	1000.000	9.000	GND	N	10.1	11.2	46.0	
2.013000	34.9	1000.000	9.000	GND	N	10.1	11.1	46.0	
2.544000	34.3	1000.000	9.000	GND	N	10.1	11.7	46.0	

**TEST  
2.**

**RADIATED EMISSION 30 - 5000 MHz**

**REFERENCE  
DOCUMENT**

FCC PART 15 subpart B

- **TEST LOCATION:** Semi-anechoic chamber
- **TEST EQUIPMENT USED FOR TEST:** EMI receiver Rohde & Schwarz Mod. ESU40  
Chase Antenna Mod. CBL 6111A
- **TESTED PORT:** Enclosure
- **EMISSION LIMITS:** Acc. to Section 15.109 of reference document
- **UNCERTAINTY OF MEASURE:** Combined uncertainty =  $\pm 1.75$  dB  
Total uncertainty = (k=2)  $\pm 3.5$  dB

TEST CONDITIONS:	MEASURED
Ambient temperature : 15 - 35 °C	23,5 $\pm$ 3 °C
Ambient humidity : 25 - 75 %rH	39 $\pm$ 5 %rH
Pressure : 85 - 106 kPa (860 mbar - 1060 mbar)	950 $\pm$ 50 mbar
Voltage :	110Vac 60Hz

**OPERATING CONDITION (Rif. Section. 2) : #1**

**RESULT: WITHIN THE LIMIT**



## EMI Auto Test Template: Electric Field Strength FCC

Hardware Setup: Electric Field Strength FCC  
 Measurement Type: Open-Area-Test-Site  
 Frequency Range: 30 MHz - 1 GHz  
 Graphics Level Range: 0 dBµV/m - 80 dBµV/m

Preview Measurements:  
 Scan Test Template: Electric Field Strength FCC pre

Data Reduction:  
 Limit Line #1: FCC Part 15 Class B Electric Field Strength QP+AV  
 Limit Line #2: FCC Part 15 Class B Electric Field Strength QP+AV  
 Peak Search: 6 dB  
 Maximum Results: 5  
 Subrange Maxima: 0  
 Maxima per Subrange: 1  
 Acceptance Offset: -10 dB  
 Maximum Number of Results: 5

Adjustment:  
 Template for Single Meas.: Electric Field Strength FCC fin

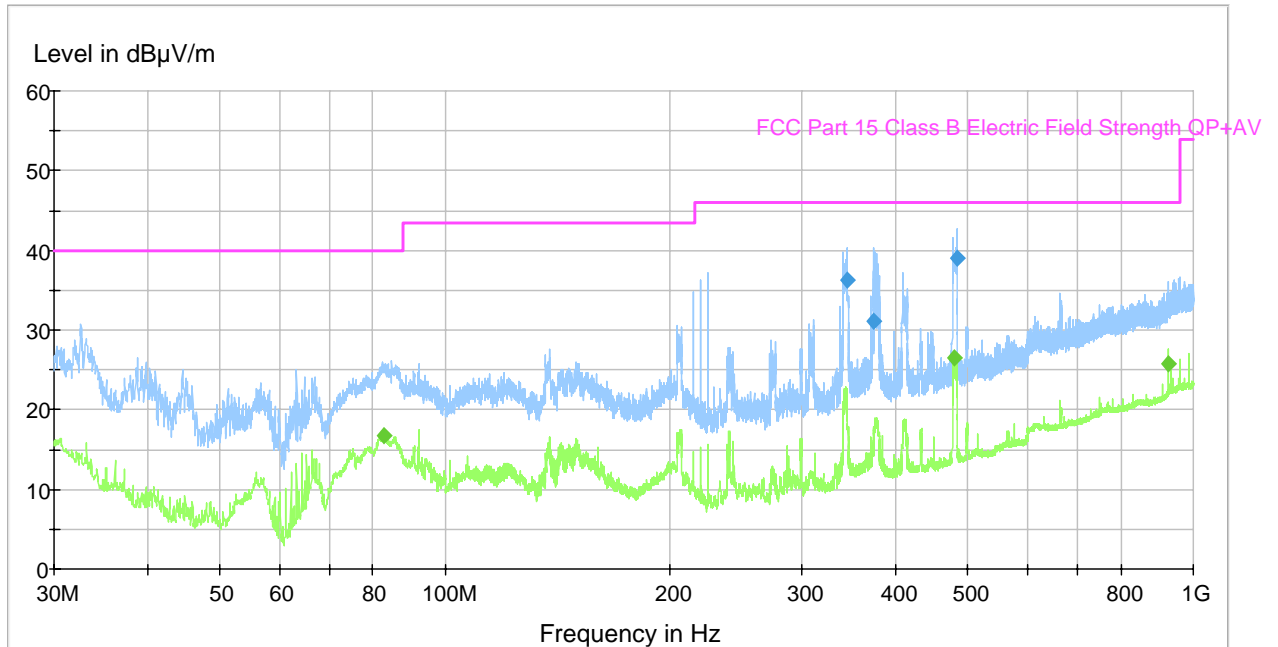
Final Measurements:  
 Template for Single Meas.: Electric Field Strength FCC fin

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1 GHz	QuasiPeak; Average	120 kHz	1 s	Receiver
1 GHz - 3.6 GHz	QuasiPeak; Average	1 MHz	1 s	Receiver
3.6 GHz - 18 GHz	QuasiPeak; Average	1 MHz	1 s	Receiver



### Vertical polarization 30MHz – 1GHz

Electric Field Strength FCC



— FCC Part 15 Class B Electric Field Strength QP+AV.LimitLine  
— Preview Result 1  
— Preview Result 2  
◆ Final Measurement Result 1  
◆ Final Measurement Result 2

### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
345,080000	36,2	1000.00	120,000	122,0	V	201,0	17,9	9.8	46.0
374,520000	31,2	1000.00	120,000	122,0	V	201,0	18,7	14.8	46.0
483,200000	38,9	1000.00	120,000	100,0	V	201,0	21,5	7.1	46.0

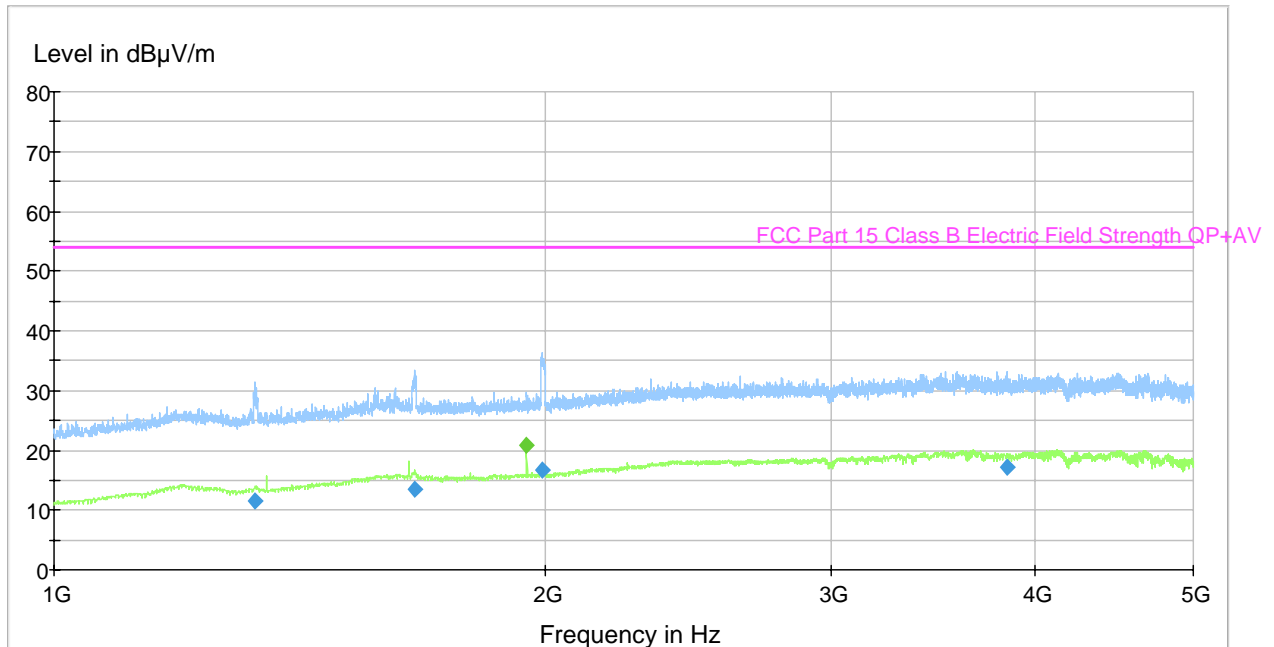
### Final Result 2

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
82,880000	16,8	1000.00	120,000	100,0	V	201,0	9,6	23.2	40.0
480,040000	26,6	1000.00	120,000	100,0	V	201,0	21,5	19.4	46.0
925,800000	25,9	1000.00	120,000	100,0	V	185,0	28,7	20.1	46.0



**Vertical polarization 1GHz – 5GHz**

Electric Field Strength FCC



— FCC Part 15 Class B Electric Field Strength QP+AV.LimitLine  
— Preview Result 1  
— Preview Result 2  
◆ Final Result 1  
◆ Final Result 2

**Final Result 1**

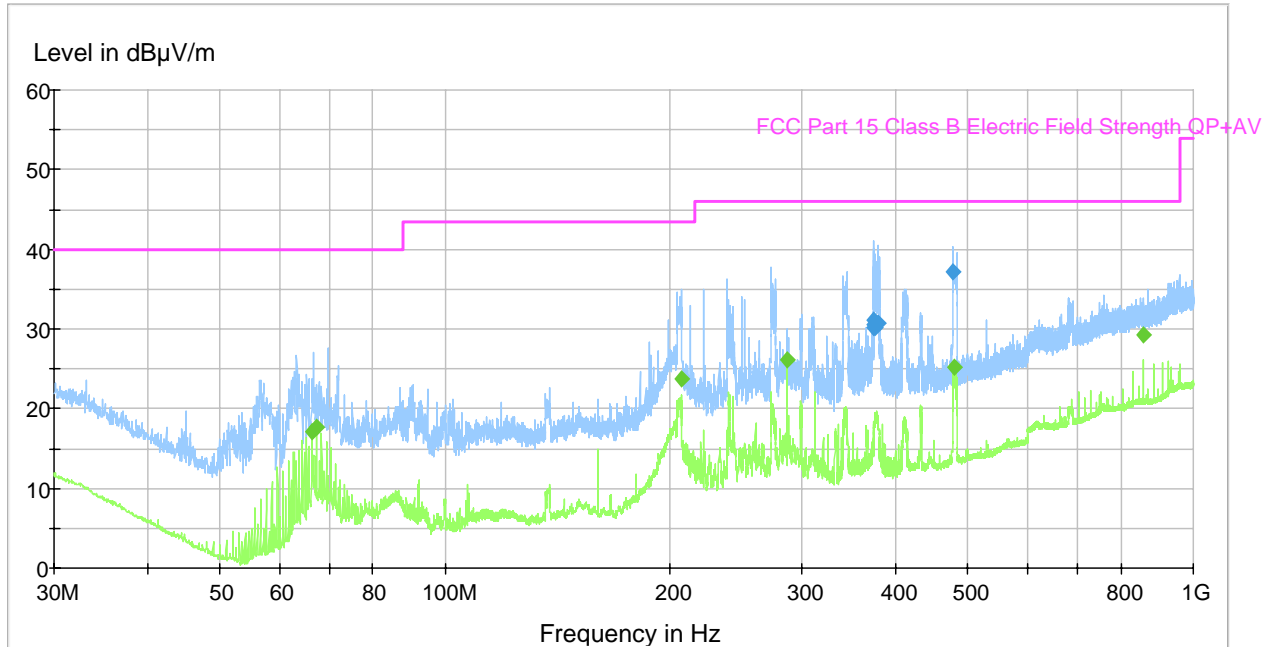
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1328.25000	11.5	1000.00	1000.000	100.0	V	204.0	-15.9	42.4	53.9
1665.75000	13.6	1000.00	1000.000	158.0	V	96.0	-13.2	40.3	53.9
1991.50000	16.6	1000.00	1000.000	141.0	V	89.0	-12.6	37.3	53.9
3842.75000	17.2	1000.00	1000.000	133.0	V	25.0	-7.9	36.7	53.9

**Final Result 2**

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1949.75000	20.8	1000.00	1000.000	100.0	V	2.0	-12.8	33.1	53.9

Horizontal polarization 30MHz – 1GHz

Electric Field Strength FCC



— FCC Part 15 Class B Electric Field Strength QP+AV.LimitLine  
— Preview Result 1  
— Preview Result 2  
◆ Final Result 1  
◆ Final Result 2

Final Result 1

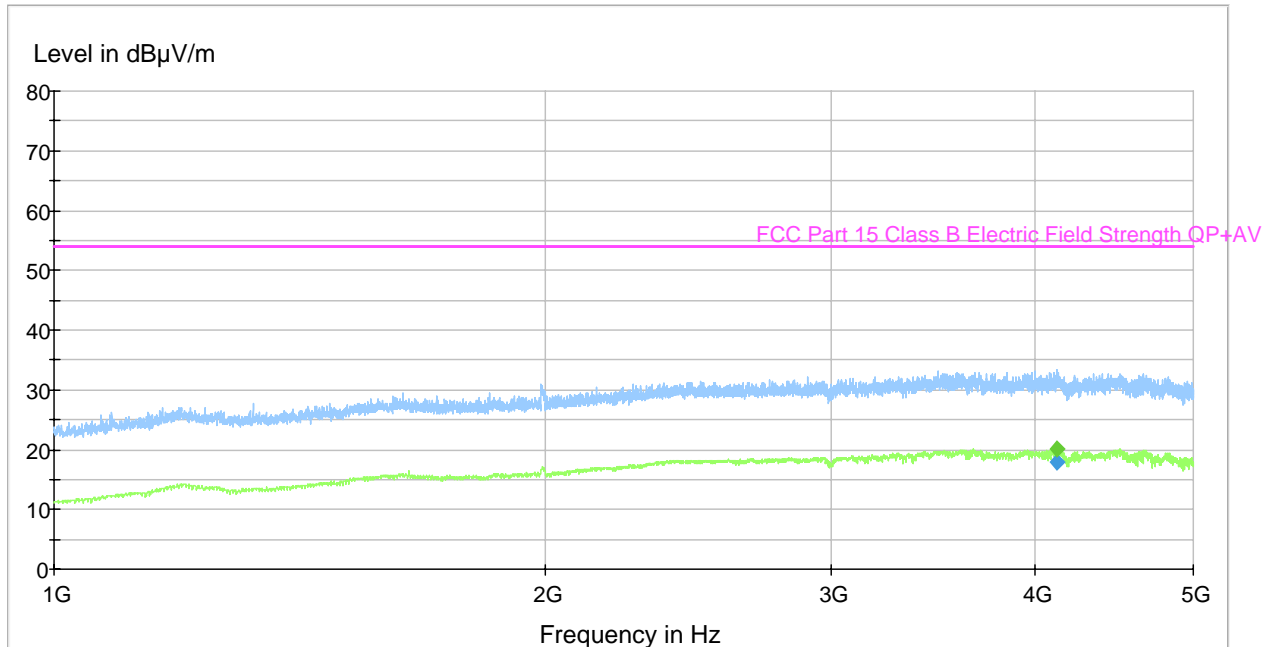
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
374.440000	30.2	1000.00	120.000	100.0	H	94.0	18.7	15.8	46.0
374.560000	31.1	1000.00	120.000	100.0	H	94.0	18.7	14.9	46.0
374.640000	30.6	1000.00	120.000	100.0	H	94.0	18.7	15.4	46.0
375.480000	30.2	1000.00	120.000	100.0	H	94.0	18.7	15.8	46.0
379.680000	30.7	1000.00	120.000	100.0	H	94.0	18.8	15.3	46.0
476.680000	37.2	1000.00	120.000	100.0	H	80.0	21.3	8.8	46.0

Final Result 2

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
66.320000	17.2	1000.00	120.000	174.0	H	181.0	7.5	22.8	40.0
67.320000	17.7	1000.00	120.000	174.0	H	184.0	7.6	22.3	40.0
206.600000	23.8	1000.00	120.000	175.0	H	25.0	12.4	19.7	43.5
286.000000	26.1	1000.00	120.000	100.0	H	80.0	16.0	19.9	46.0
480.040000	25.2	1000.00	120.000	100.0	H	80.0	21.5	20.8	46.0
858.000000	29.2	1000.00	120.000	100.0	H	201.0	27.5	16.8	46.0

**Horizontal polarization 1GHz – 5GHz**

Electric Field Strength FCC



— FCC Part 15 Class B Electric Field Strength QP+AV.LimitLine  
— Preview Result 1  
— Preview Result 2  
◆ Final Result 2  
◆ Final Result 1

**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
4124.00000	18.0	1000.00	1000.000	126.0	H	2.0	-7.7	35.9	53.9

**Final Result 2**

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
4122.75000	20.2	1000.00	1000.000	140.0	H	89.0	-7.7	33.7	53.9

**6. EUT PHOTOGRAPHIC DOCUMENTATION**

**PHOTO N° 1 – EUT IDENTIFICATION**



**PHOTO N° 1 – SET-UP OF RADIATED EMISSIONS**

