

FCC & ISED TEST REPORT

Product Name: IP Phone
Trade Mark: GRANDSTREAM
Model No.: GRP2601P, GRP2602P
Add. Model No.: GRP2601, GRP2602
Report Number: 200408001EMC-1
Test Standards: FCC 47 CFR Part 15 Subpart B
 ICES-003 Issue 6
FCC ID: YZZGRP2602P
Test Result: PASS
Date of Issue: May 22, 2020

Prepared for:

Grandstream Networks, Inc.
 126 Brookline Ave., 3rd Floor Boston, MA 02215, USA

Prepared by:

Shenzhen UnionTrust Quality and Technology Co., Ltd.
 16/F, Block A, Building 6, Baoneng Science and Technology Park,
 Qingxiang Road No.1, Longhua New District, Shenzhen, China
TEL: +86-755-2823 0888
FAX: +86-755-2823 0886

Prepared by: Eric Yu

Eric Yu
Team Leader

Reviewed by: Kevin Liang

Kevin Liang
Assistant Manager

Approved by: Billy Li



Billy Li
Technical Director

Date: May 22, 2020

Shenzhen UnionTrust Quality and Technology Co., Ltd.

Version

Version No.	Date	Description
V1.0	May 22, 2020	Original

**Shenzhen UnionTrust Quality and Technology Co., Ltd.**

Address: 16/F, Block A, Building 6, Baoneng Science and Technology Park, Qingxiang Road No.1, Longhua New District, Shenzhen, China

Tel: +86-755-28230888

Fax: +86-755-28230886

E-mail: info@uttlab.com

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1. GENERAL INFORMATION

1.1 CLIENT INFORMATION

Applicant:	Grandstream Networks, Inc.
Address of Applicant:	126 Brookline Ave., 3rd Floor Boston, MA 02215, USA
Manufacturer:	Grandstream Networks, Inc.
Address of Manufacturer:	126 Brookline Ave., 3rd Floor Boston, MA 02215, USA

1.2 EUT INFORMATION

1.2.1 General Description of EUT

Product Name:	IP Phone
Model No.:	GRP2601P, GRP2602P
Add. Model No.:	GRP2601, GRP2602
Trade Mark:	GRANDSTREAM
DUT Stage:	Production Unit
Rated Voltage:	<input checked="" type="checkbox"/> 100-240V~50/60Hz <input checked="" type="checkbox"/> Powered by POE port
Classification of digital devices:	Class B
Highest Internal Frequency:	1.3 GHz
Software Version:	0.0.0.14
Hardware Version:	V1.3
Sample Received Date:	April 11, 2020
Sample Tested Date:	May 7, 2020 to May 14, 2020
Remark: Compared with GRP2601P, GRP2602P supports more keypads and supports LCD backlight; Compared with GRP2601 and GRP2602, GRP2601P and GRP2602P support POE function, but only the BOM is different, the PCB is the same. Declared by manufacturer.	

1.2.2 Description of Accessories

Adapter 1	
Model No.:	GQ06-050060-ZU
Input:	100-240 V~50/60 Hz 0.3 A Max
Output:	5.0 V = 0.6 A
DC Cable:	1.50 Meter, Unshielded without ferrite

Adapter 2	
Model No.:	PS05L050K0600UD
Input:	100-240 V~50/60 Hz 0.25 A Max
Output:	5.0 V = 0.6 A
DC Cable:	1.50 Meter, Unshielded without ferrite

Adapter 3	
Model No.:	F06US0500060A
Input:	100-240 V~50/60 Hz 0.2 A Max
Output:	5.0 V = 0.6 A
DC Cable:	1.50 Meter, Unshielded without ferrite

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Cable (1)	
Description:	Ethernet Cable (RJ45)
Cable Type:	Unshielded without ferrite
Length:	1.5 Meter

Cable (2)	
Description:	Phone Cord (RJ9)
Cable Type:	Unshielded without ferrite
Length:	3.5 Meter

1.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested with associated equipment below.

1) Support Equipment

Description	Manufacturer	Model No.	Serial Number	FCC ID	Supplied by
Notebook	Lenovo	B40-80	MP12NEQ6	N/A	UnionTrust
Notebook	DELL	Latitude 3400	6GJQKT2	N/A	UnionTrust
Mouse	DELL	MS111	CN-011D3V-738	N/A	UnionTrust
Mouse	DELL	MOCZUL	CN-0V7623-73826-65K-00XR	N/A	UnionTrust
Headset	YEY	VE120-MV	N/A	N/A	UnionTrust
Standard POE Power supply	TP-LINK	TL-POE160S	N/A	N/A	UnionTrust
IP Phone	GRANDSTREAM	GRP2602P	N/A	N/A	Applicant
IP Phone	GRANDSTREAM	GRP2601P	N/A	N/A	Applicant

2) Support Cable

Cable No.	Description	Connector	Length	Supplied by
1	Ethernet Cable	RJ45	1.0 Unshielded without ferrite	UnionTrust
2	Ethernet Cable	RJ45	5.0 Unshielded without ferrite	UnionTrust
3	Ethernet Cable	RJ45	2.0 Unshielded without ferrite	UnionTrust

1.4 TEST LOCATION

Shenzhen UnionTrust Quality and Technology Co., Ltd.

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 Telephone: +86 (0) 755 2823 0888
 Fax: +86 (0) 755 2823 0886

1.5 TEST FACILITY

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L9069

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC/EN 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

A2LA-Lab Certificate No.: 4312.01

Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

ISED Wireless Device Testing Laboratories

CAB identifier: CN0032

FCC Accredited Lab.

Designation Number: CN1194

Test Firm Registration Number: 259480

1.6 DEVIATION FROM STANDARDS

None.

1.7 ABNORMALITIES FROM STANDARD CONDITIONS

None.

1.8 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

1.9 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

No.	Item	Measurement Uncertainty
1	Conducted emission 9KHz-150KHz	±3.8 dB
2	Conducted emission 150KHz-30MHz	±3.4 dB
3	Radiated emission 9KHz-30MHz	±4.9 dB
4	Radiated emission 30MHz-1GHz	±4.7 dB
5	Radiated emission 1GHz-18GHz	±5.1 dB
6	Radiated emission 18GHz-26GHz	±5.2 dB
7	Radiated emission 26GHz-40GHz	±5.2 dB

2. TEST SUMMARY

FCC 47 CFR Part 15 Subpart B Test Cases			
Test Item	Test Requirement	Test Method	Result
Conducted Emission	FCC 47 CFR Part 15.107 ICES-003 Issue 6 Section 6.1	ANSI C63.4-2014	PASS
Radiated Emission	FCC 47 CFR Part 15.109 ICES-003 Issue 6 Section 6.2	ANSI C63.4-2014	PASS

3. EQUIPMENT LIST

Radiated Emission Test Equipment List						
Used	Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm dd, yyyy)	Cal. Due date (mm dd, yyyy)
<input checked="" type="checkbox"/>	3M Chamber & Accessory Equipment	ETS-LINDGREN	3M	N/A	Dec. 03, 2018	Dec. 03, 2021
<input checked="" type="checkbox"/>	Receiver	R&S	ESIB26	100114	Nov. 24, 2019	Nov. 23, 2020
<input checked="" type="checkbox"/>	Broadband Antenna	ETS-LINDGREN	3142E	00201566	Nov. 16, 2019	Nov. 15, 2020
<input checked="" type="checkbox"/>	6dB Attenuator	Talent	RA6A5-N-18	18103001	Nov. 16, 2019	Nov. 15, 2020
<input checked="" type="checkbox"/>	Preamplifier	HP	8447F	2805A02960	Nov. 24, 2019	Nov. 23, 2020
<input checked="" type="checkbox"/>	Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3117-PA	00201874	May 18, 2019	May 18, 2020
<input checked="" type="checkbox"/>	Multi device Controller	ETS-LINDGREN	7006-001	00160105	N/A	N/A
<input checked="" type="checkbox"/>	Test Software	Audix	e3	Software Version: 9.160323		

Conducted Emission Test Equipment List						
Used	Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm dd, yyyy)	Cal. Due date (mm dd, yyyy)
<input checked="" type="checkbox"/>	Receiver	R&S	ESR7	1316.3003K07-101181-K3	Nov. 24, 2019	Nov. 23, 2020
<input checked="" type="checkbox"/>	Pulse Limiter	R&S	ESH3-Z2	0357.8810.54	Nov. 24, 2019	Nov. 23, 2020
<input checked="" type="checkbox"/>	LISN	R&S	ESH2-Z5	860014/024	Nov. 24, 2019	Nov. 23, 2020
<input checked="" type="checkbox"/>	LISN	R&S	ESH2-Z5	860014/024	Nov. 24, 2019	Nov. 23, 2020
<input checked="" type="checkbox"/>	Test Software	Audix	e3	Software Version: 9.160323		

4. TEST CONFIGURATION

4.1 ENVIRONMENTAL CONDITIONS FOR TESTING

4.1.1 Normal or Extreme Test Conditions

Environment Parameter	Selected Values During Tests		
Test Condition	Ambient		
	Temperature (°C)	Voltage	Relative Humidity (%)
NT/NV	+15 to +35	AC 120V/60Hz or AC 240V/50Hz	20 to 75
Remark: 1) NV: Normal Voltage; NT: Normal Temperature			

4.1.2 Record of Normal Environment

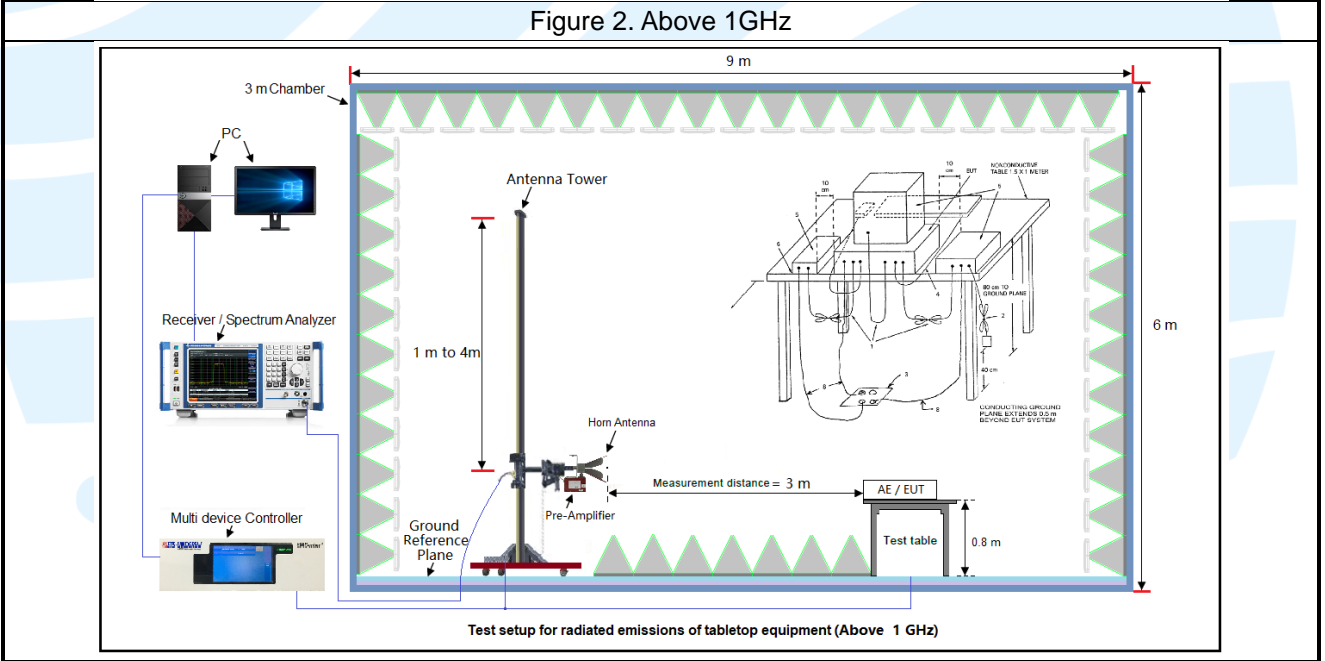
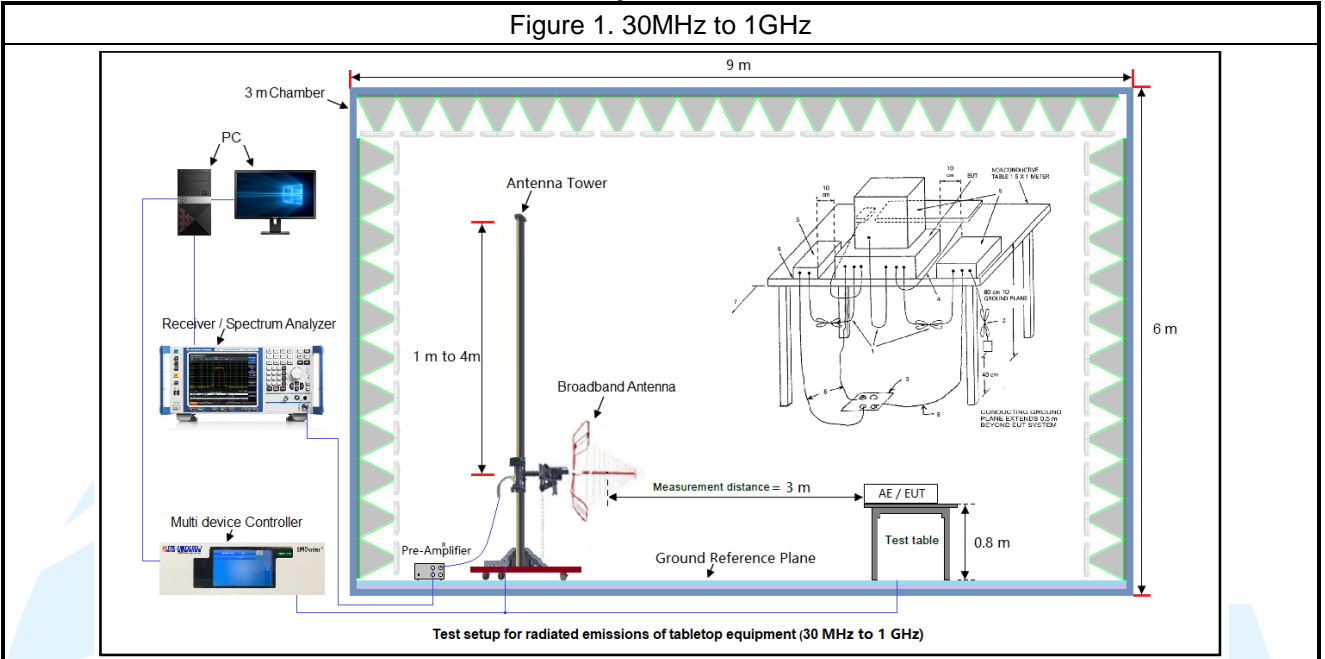
Test Item	Temperature (°C)	Relative Humidity (%)	Pressure (kPa)	Tested by
Conducted Emission	25.0	49.0	100.2	Bert Xiong
Radiated Emission	25.4	57.0	100.6	Asia Yan

4.2 TEST MODES

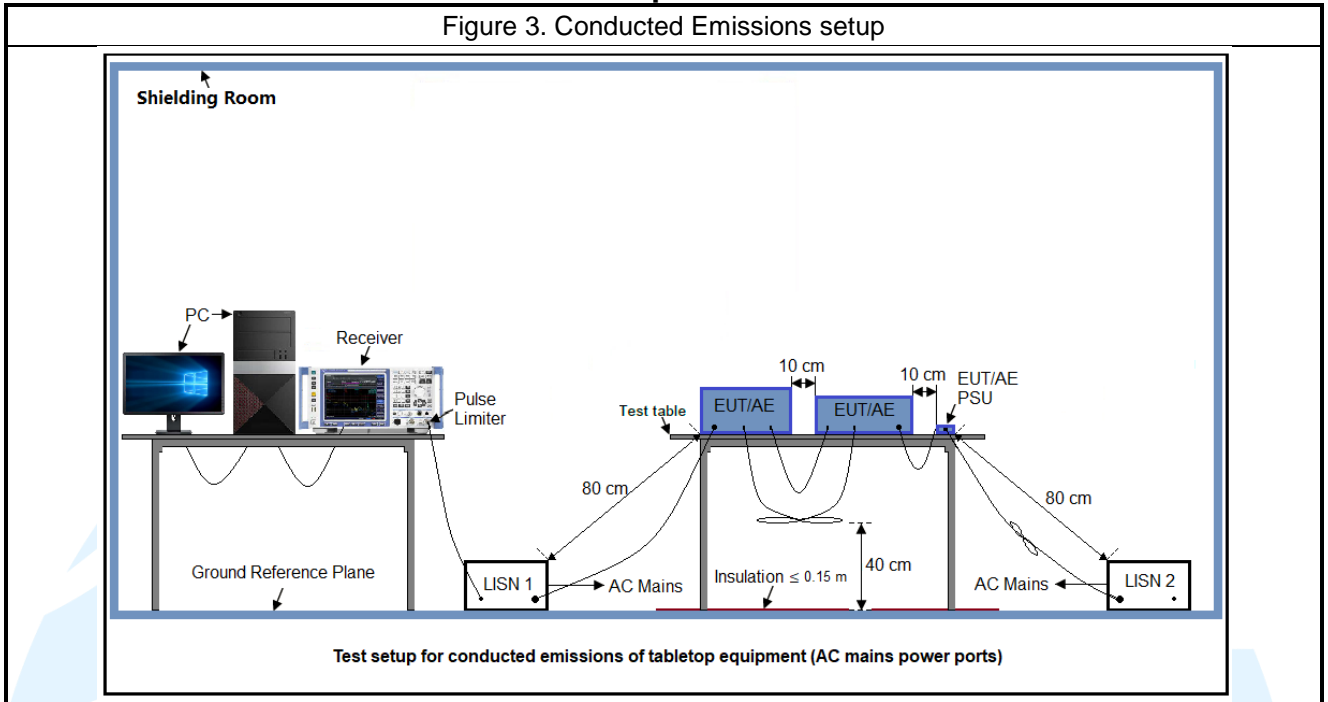
Test Item	EMI Test Modes
Radiated Emission	TM1: AC120V/60Hz (Adaptor1) + Hands Free (with GRP2601P) TM2: AC120V/60Hz (Adaptor1) + Ringing (with GRP2601P) TM3: AC120V/60Hz (Adaptor1) + Handset (with GRP2601P) TM4: AC120V/60Hz (Adaptor1) + Headset (with GRP2601P) TM5: AC240V/50Hz (Adaptor1) + Worse from mode 1~4(with GRP2601P) TM6: Worse from mode 1~5 (Adaptor2 with GRP2601P) TM7: Worse from mode 1~5 (Adaptor3 with GRP2601P) TM8: Worse from mode 1~5 (Adaptor1 with GRP2601) TM9: Worse from mode 1~5 (Adaptor2 with GRP2601) TM10: Worse from mode 1~5 (Adaptor3 with GRP2601) TM11: AC120V/60Hz (Adaptor1) + Hands Free (with GRP2602P) TM12: AC120V/60Hz (Adaptor1) + Ringing (with GRP2602P) TM13: AC120V/60Hz (Adaptor1) + Handset (with GRP2602P) TM14: AC120V/60Hz (Adaptor1) + Headset (with GRP2602P) TM15: AC240V/50Hz (Adaptor1) + Worse from mode 11~14(with GRP2602P) TM16: Worse from mode 11~15 (Adaptor2 with GRP2602P) TM17: Worse from mode 11~15 (Adaptor3 with GRP2602P) TM18: Worse from mode 11~15 (Adaptor1 with GRP2602) TM19: Worse from mode 11~15 (Adaptor2 with GRP2602) TM20: Worse from mode 11~15 (Adaptor3 with GRP2602) TM21: AC120V/60Hz (POE) +Worse from mode 1~4(with GRP2601P) TM22: AC120V/60Hz (POE) +Worse from mode 11~14(with GRP2602P)
Conducted Emission	TM1: AC120V/60Hz (Adaptor1) + Hands Free (with GRP2601P) TM2: AC120V/60Hz (Adaptor1) + Ringing (with GRP2601P) TM3: AC120V/60Hz (Adaptor1) + Handset (with GRP2601P) TM4: AC120V/60Hz (Adaptor1) + Headset (with GRP2601P) TM5: AC240V/50Hz (Adaptor1) + Worse from mode 1~4(with GRP2601P) TM6: Worse from mode 1~5 (Adaptor2 with GRP2601P) TM7: Worse from mode 1~5 (Adaptor3 with GRP2601P) TM8: Worse from mode 1~5 (Adaptor1 with GRP2601) TM9: Worse from mode 1~5 (Adaptor2 with GRP2601) TM10: Worse from mode 1~5 (Adaptor3 with GRP2601) TM11: AC120V/60Hz (Adaptor1) + Hands Free (with GRP2602P) TM12: AC120V/60Hz (Adaptor1) + Ringing (with GRP2602P) TM13: AC120V/60Hz (Adaptor1) + Handset (with GRP2602P) TM14: AC120V/60Hz (Adaptor1) + Headset (with GRP2602P) TM15: AC240V/50Hz (Adaptor1) + Worse from mode 11~14(with GRP2602P) TM16: Worse from mode 11~15 (Adaptor2 with GRP2602P) TM17: Worse from mode 11~15 (Adaptor3 with GRP2602P) TM18: Worse from mode 11~15 (Adaptor1 with GRP2602) TM19: Worse from mode 11~15 (Adaptor2 with GRP2602) TM20: Worse from mode 11~15 (Adaptor3 with GRP2602) TM21: AC120V/60Hz (POE) +Worse from mode 1~4(with GRP2601P) TM22: AC120V/60Hz (POE) +Worse from mode 11~14(with GRP2602P)

4.3 TEST SETUP

4.3.1 For Radiated Emissions test setup



4.3.2 For Conducted Emissions test setup



4.4 SYSTEM TEST CONFIGURATION

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000MHz. The resolution is 1 MHz or greater for frequencies above 1000MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic (according to KDB 896810 D02 SDoC FAQ v01r01) of the highest fundamental frequency or to 40 GHz, whichever is lower.

5. REFERENCE DOCUMENTS FOR TESTING

No.	Identity	Document Title
1	FCC 47 CFR Part15 Subpart B	Unintentional Radiators
2	ICES-003 Issue 6	Information Technology Equipment (Including Digital Apparatus) —Limits and Methods of Measurement
3	ANSI C63.4-2014	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
4	KDB 174176 D01 Line Conducted FAQ v01r01	AC power-line conducted emission frequency asked questions
5	KDB 896810 D02 SDoC FAQ v01r02	Supplier’s Declaration of Conformity frequency asked questions

6. EMC REQUIREMENTS SPECIFICATION

6.1 RADIATED EMISSION

Test Requirement: FCC 47 CFR Part 15.109
ICES-003 Issue 6 Clause 6.2

Test Method: ANSI C63.4-2014

Receiver Setup:

Frequency: (f) (MHz)	Detector type	Measurement receiver bandwidth	
		RBW	VBW
$30 \leq f \leq 1\,000$	Quasi Peak	120 kHz	300 kHz
$f \geq 1000$	Peak	1 MHz	3 MHz
	Average	1 MHz	3 MHz

Measured frequency range

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.

Limits:

Limits for Class B devices

Frequency (MHz)	limits at 3m (dBµV/m)		
	QP Detector	PK Detector	AV Detector
30-88	40.0	--	--
88-216	43.5	--	--
216-960	46.0	--	--
960 to 1000	54.0	--	--
Above 1000	--	74.0	54.0

Remark:

- The lower limit shall apply at the transition frequencies.
- Emission level (dBµV/m) = 20 log Emission level (µV/m).
- For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

Shenzhen UnionTrust Quality and Technology Co., Ltd.

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Test Setup: Refer to section 4.3.1 for details.

Test Procedures:

1. From 30 MHz to 1GHz test procedure as below:

- 1) The Product was placed on the non-conductive turntable 0.8 m above the ground at a chamber.
- 2) Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- 3) For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

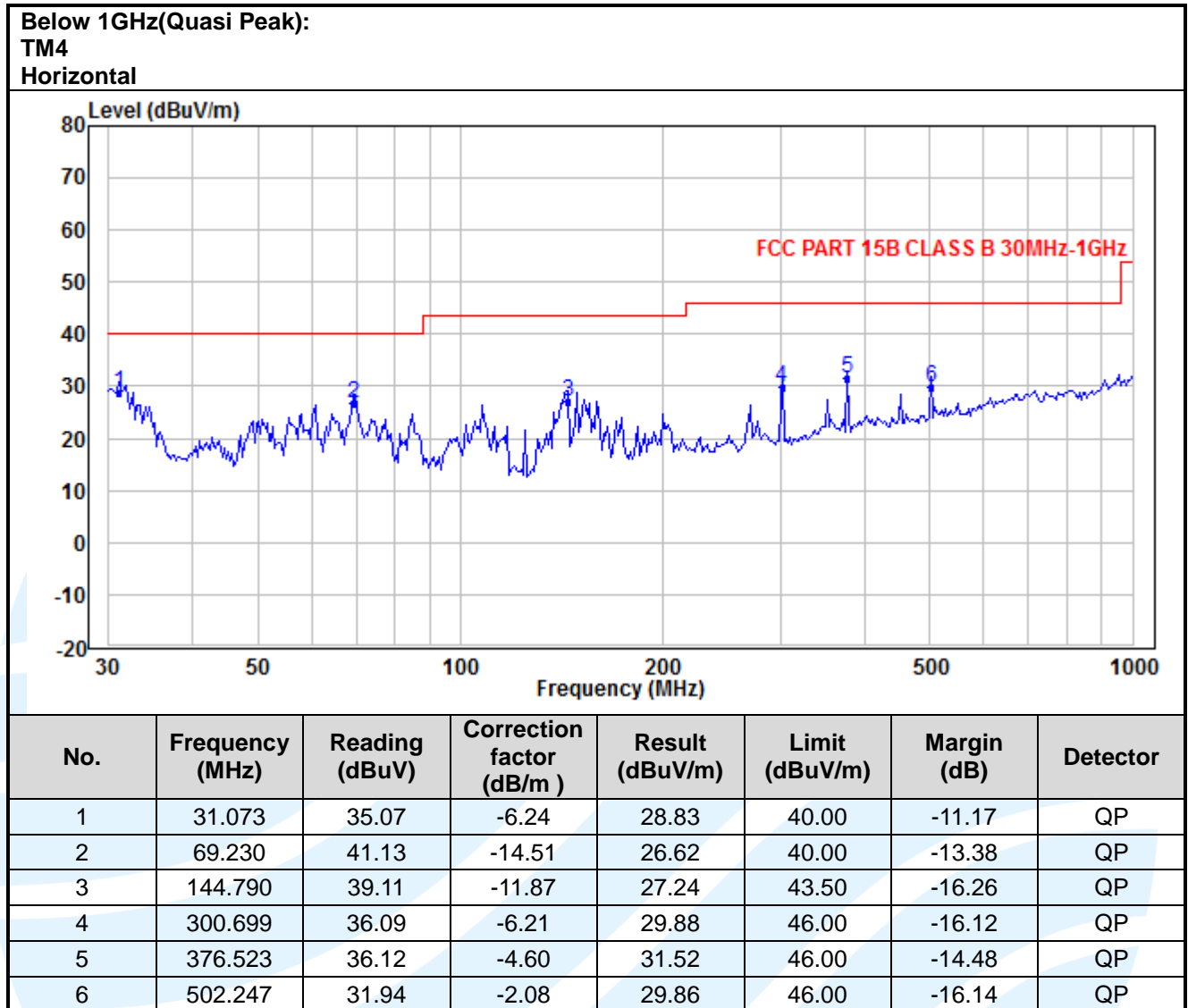
2. Above 1GHz test procedure as below:

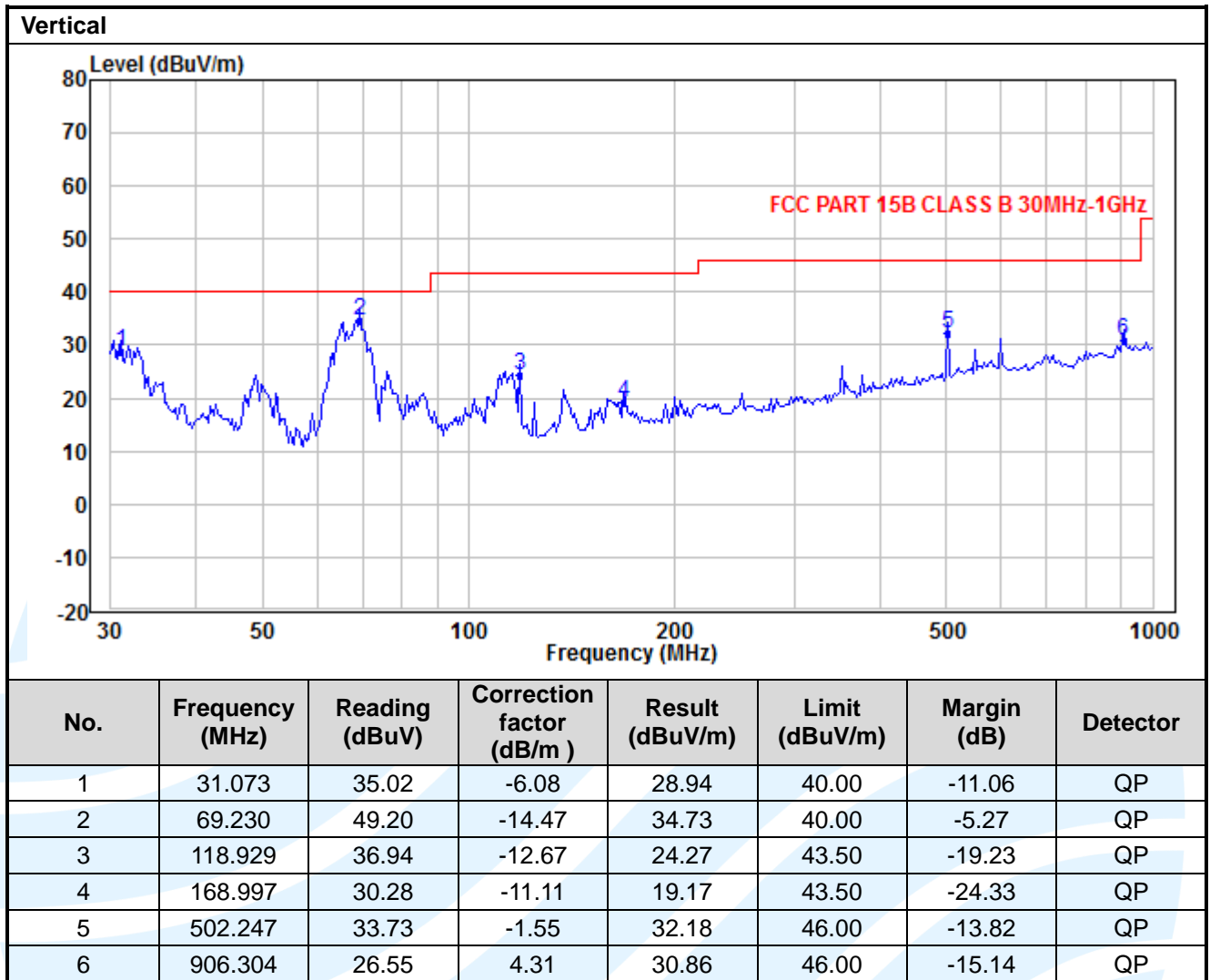
- 1) The Product was placed on the non-conductive turntable 0.8 m above the ground at a chamber.
- 2) Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- 3) For each frequency whose maximum record was higher or close to limit, measure its AV value: rotate the turntable from 0 to 360 degrees to find the degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to AV value and specified bandwidth with Maximum Hold Mode, and record the maximum value.

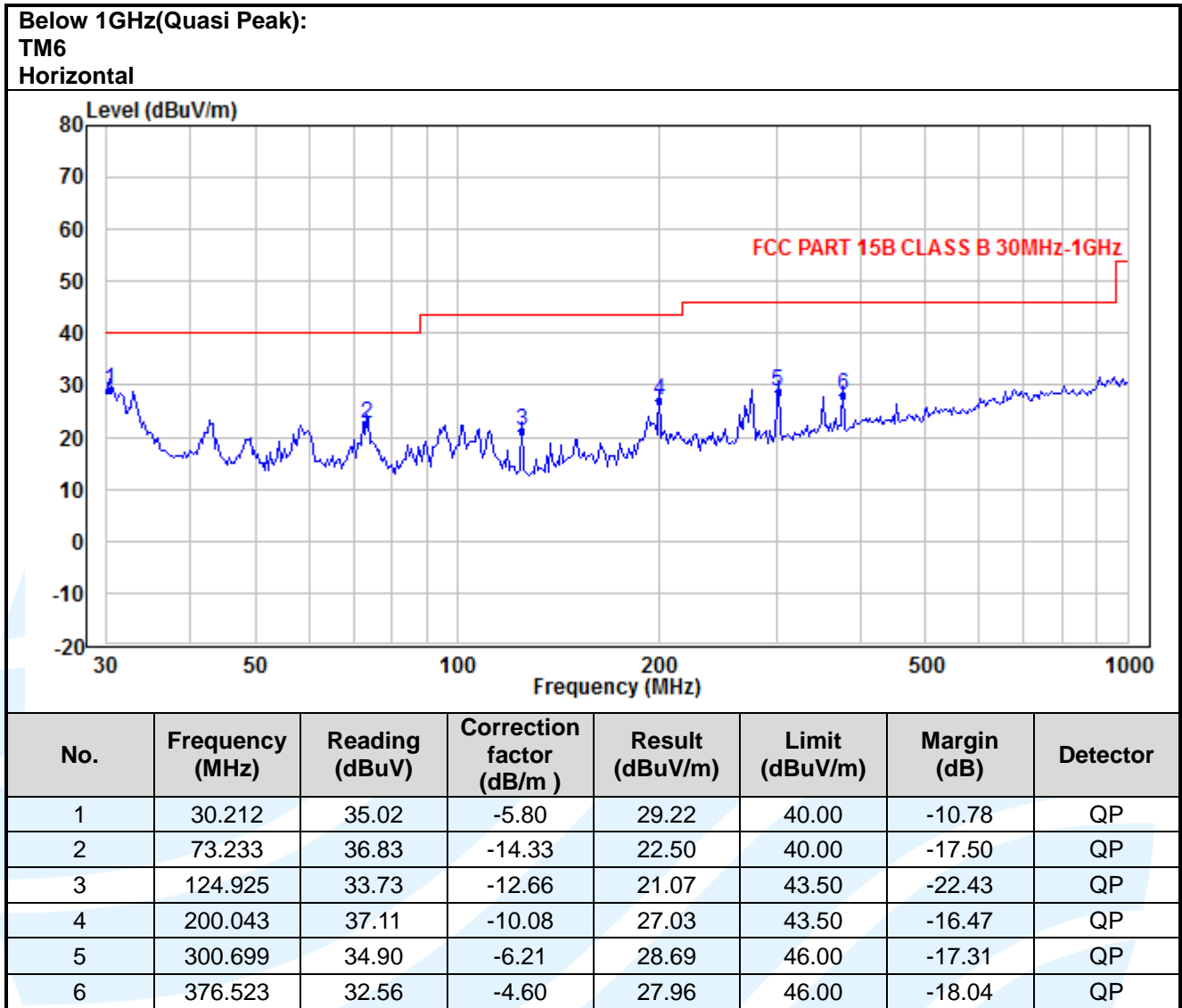
Equipment Used: Refer to section 3 for details.

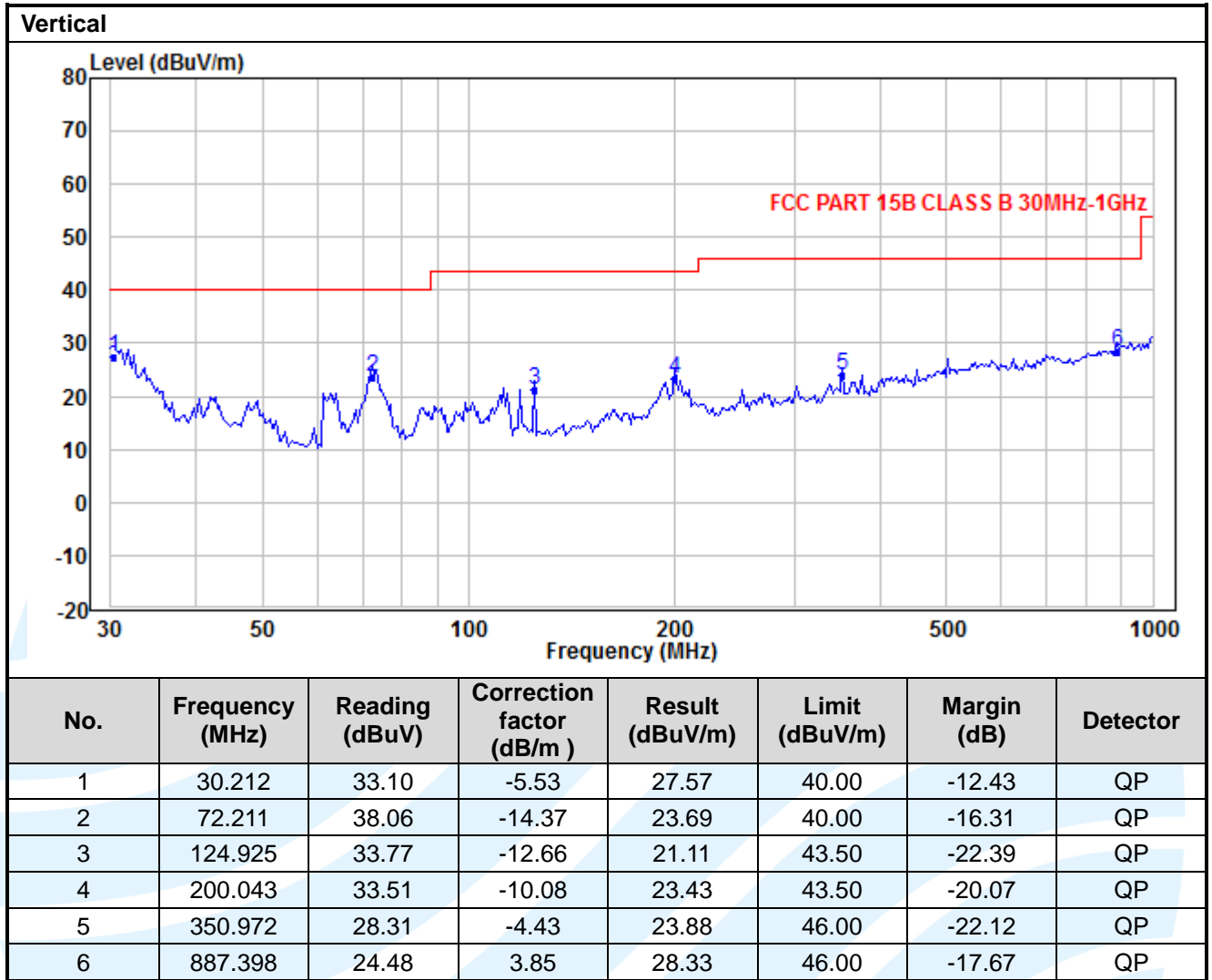
Test Result: Pass

The measurement data as follows:









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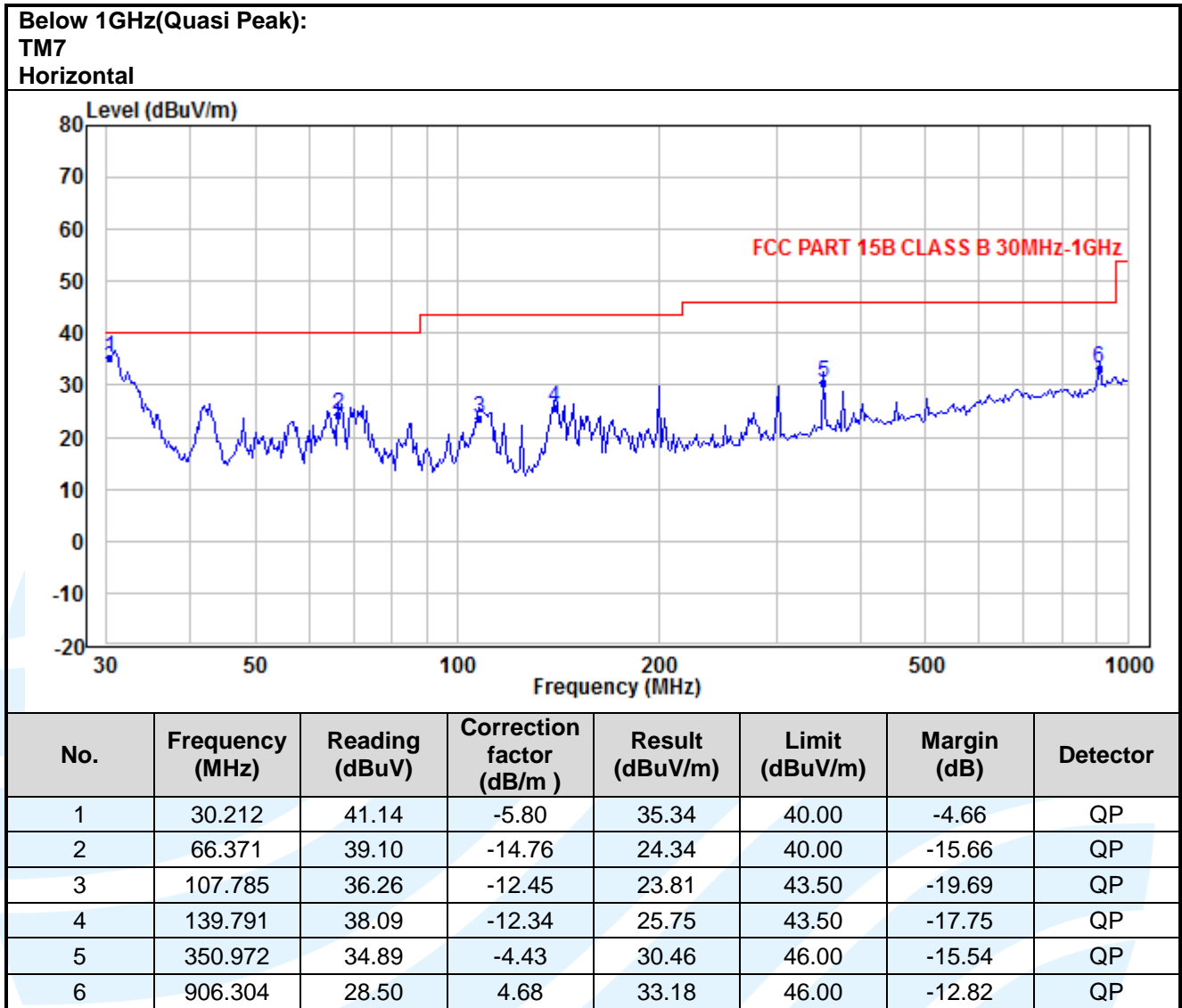
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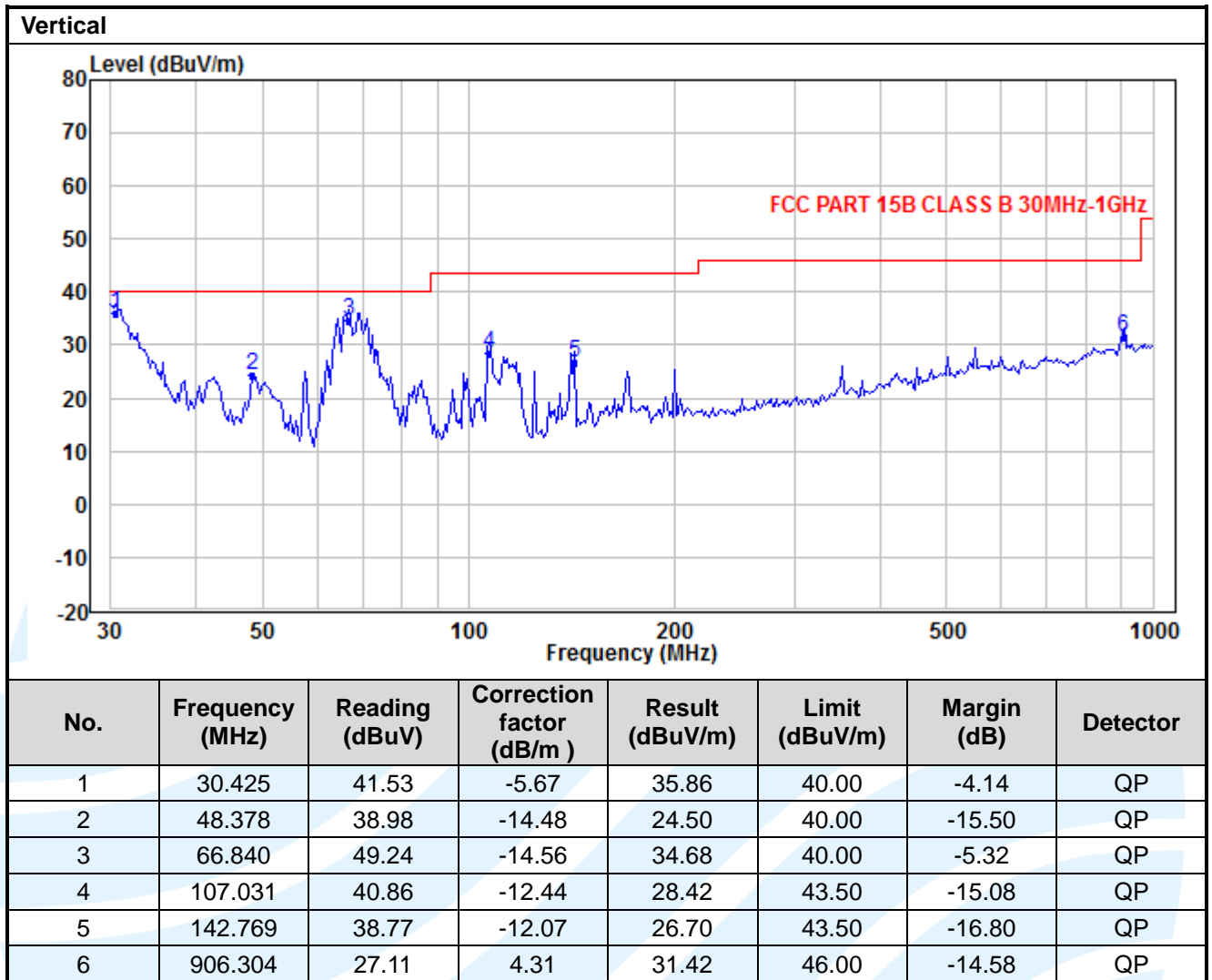
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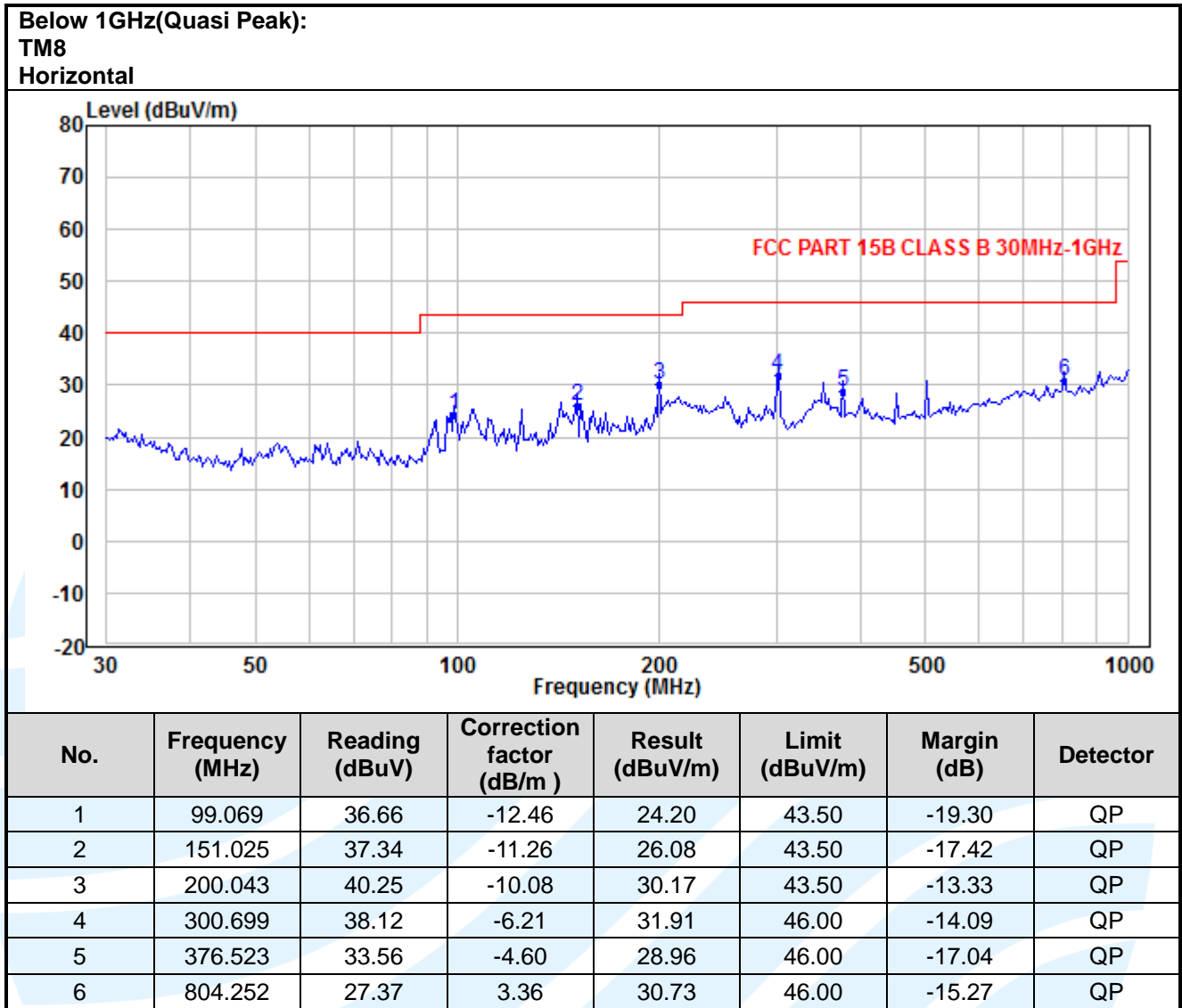
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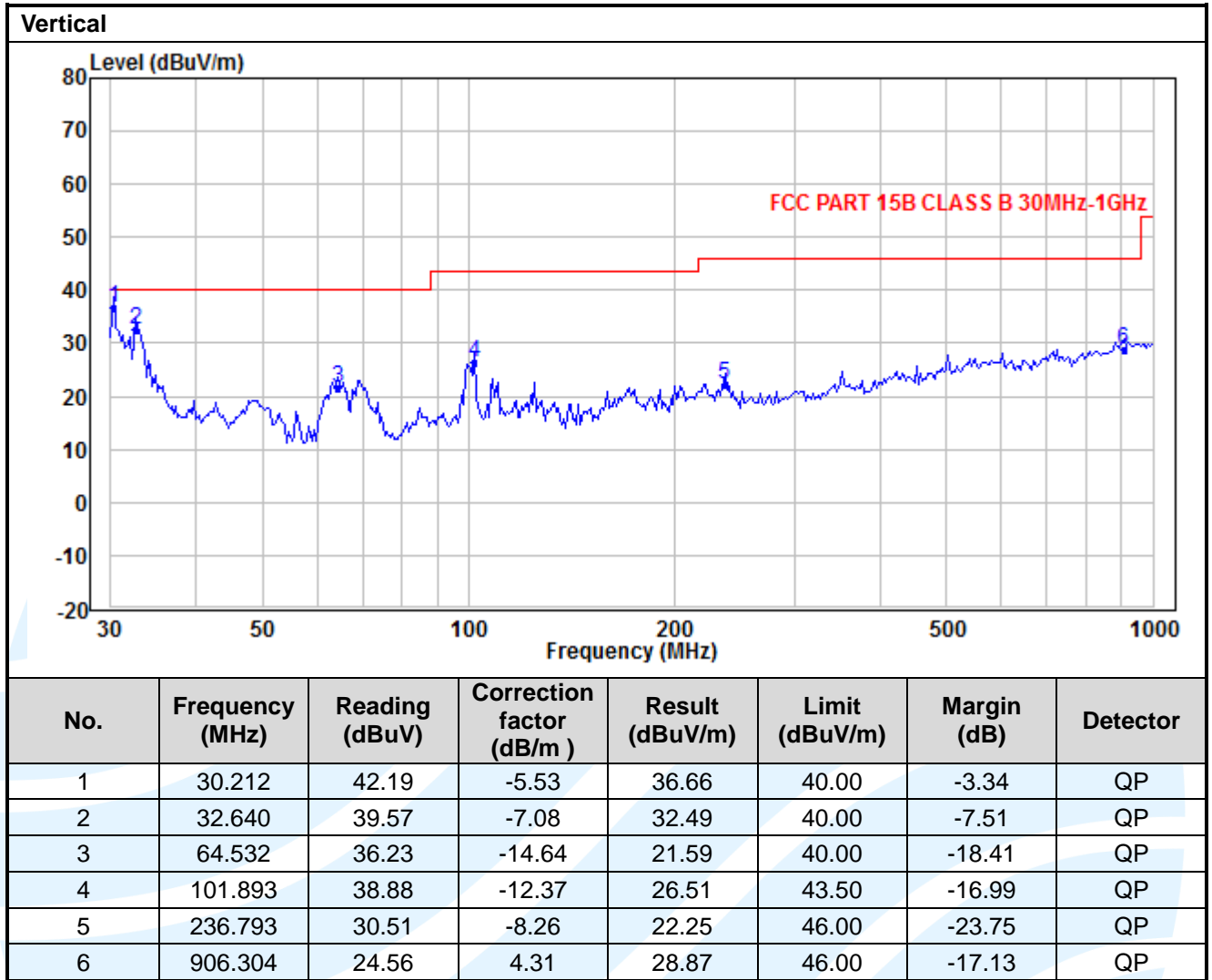
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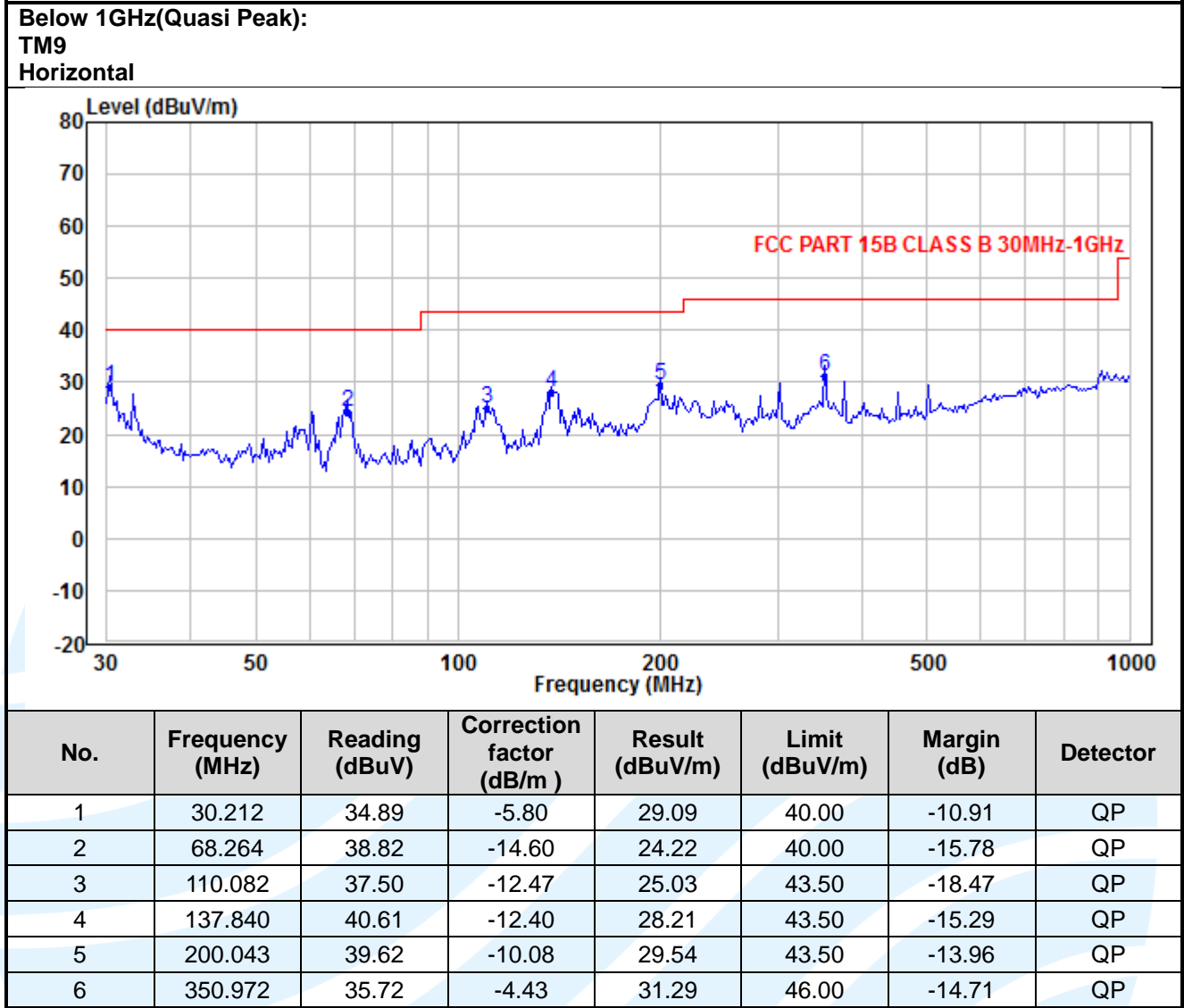
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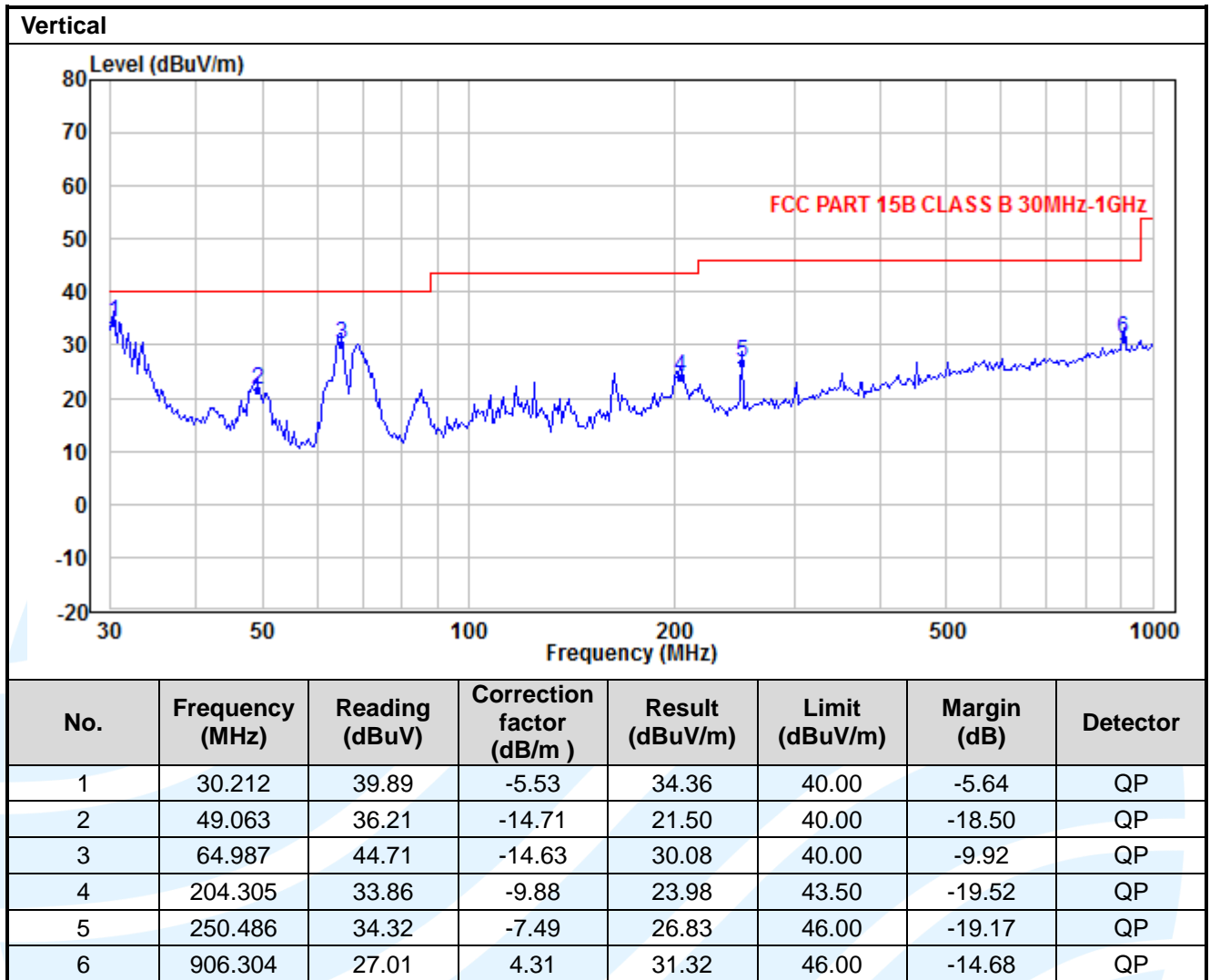
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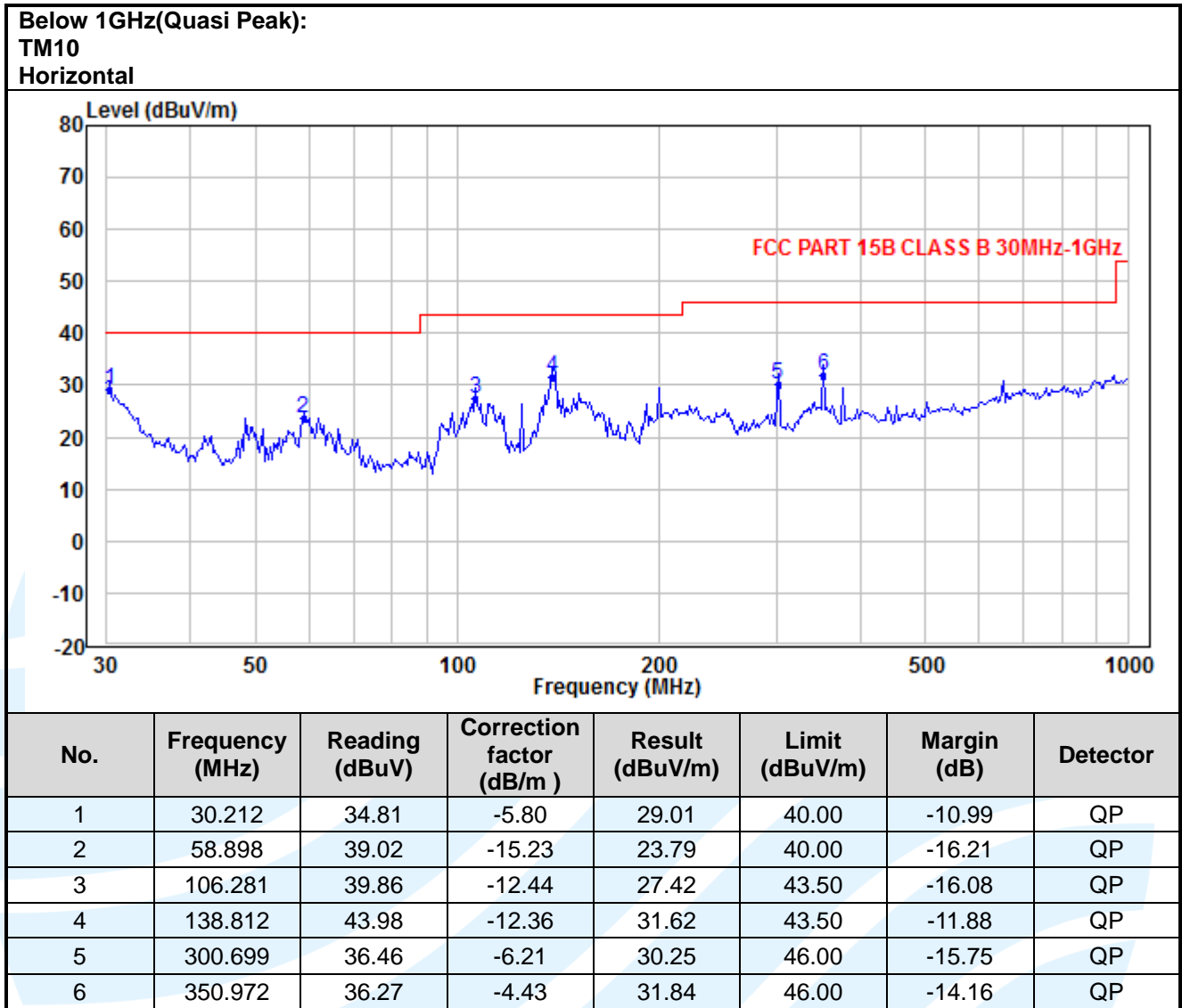
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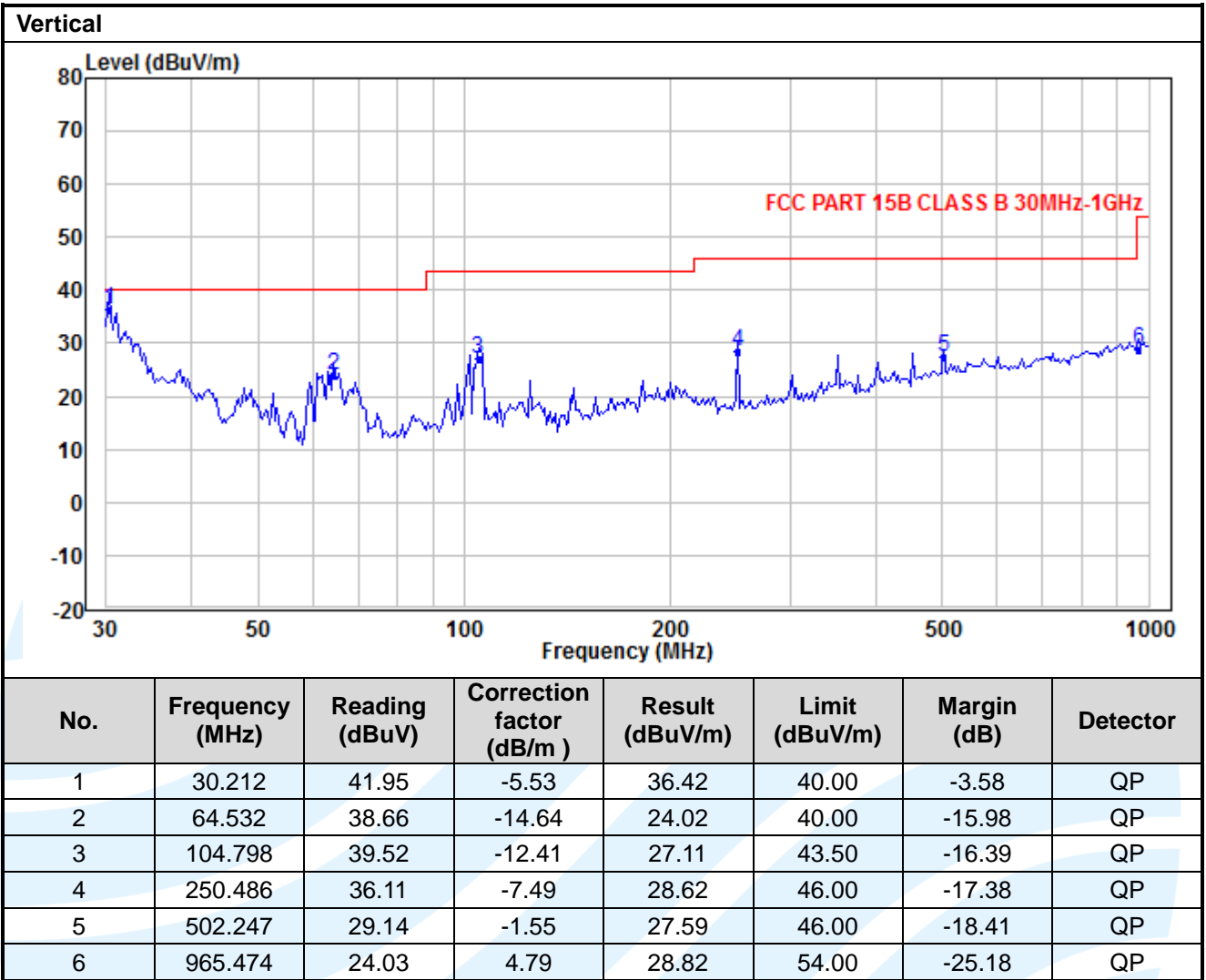
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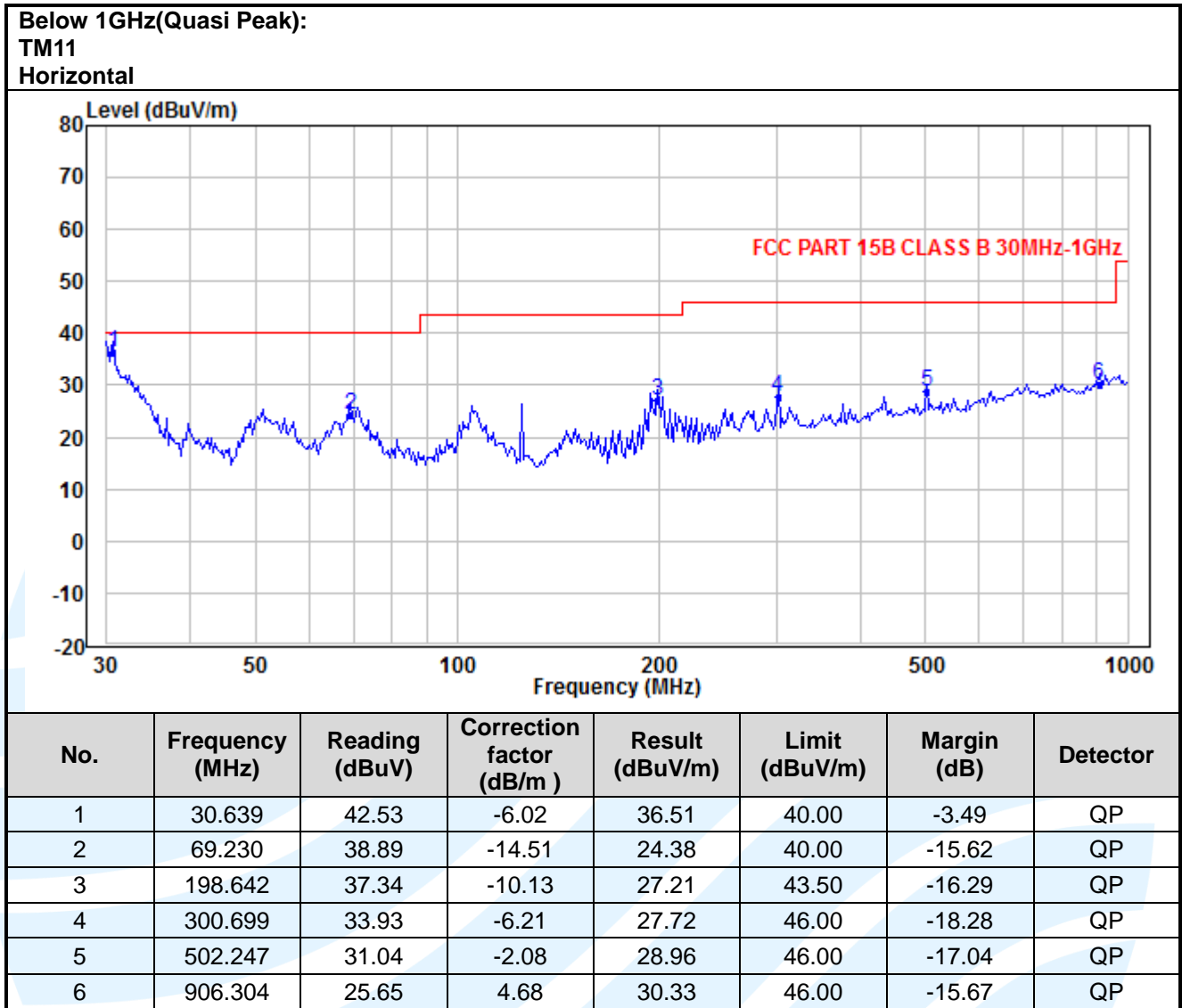
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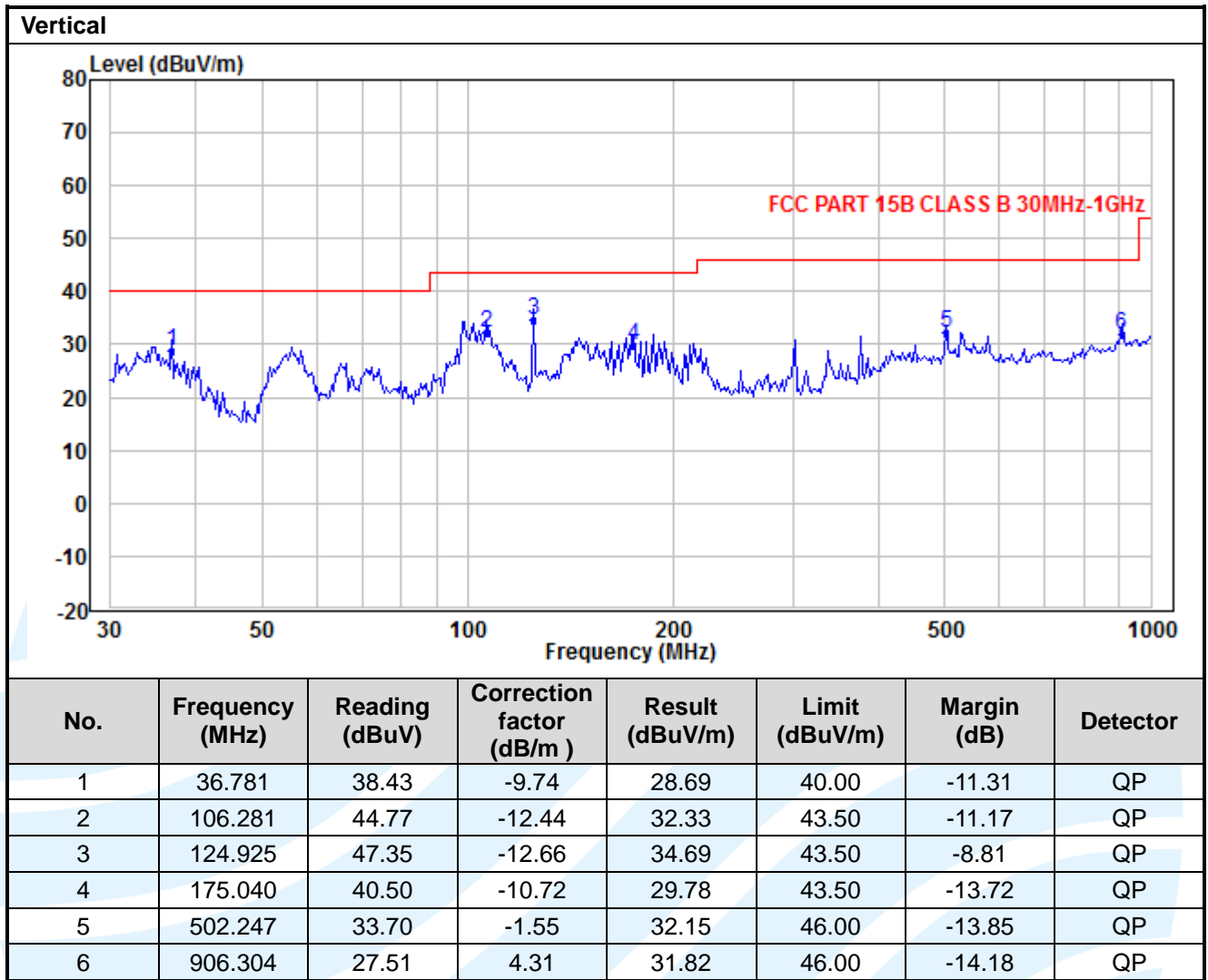
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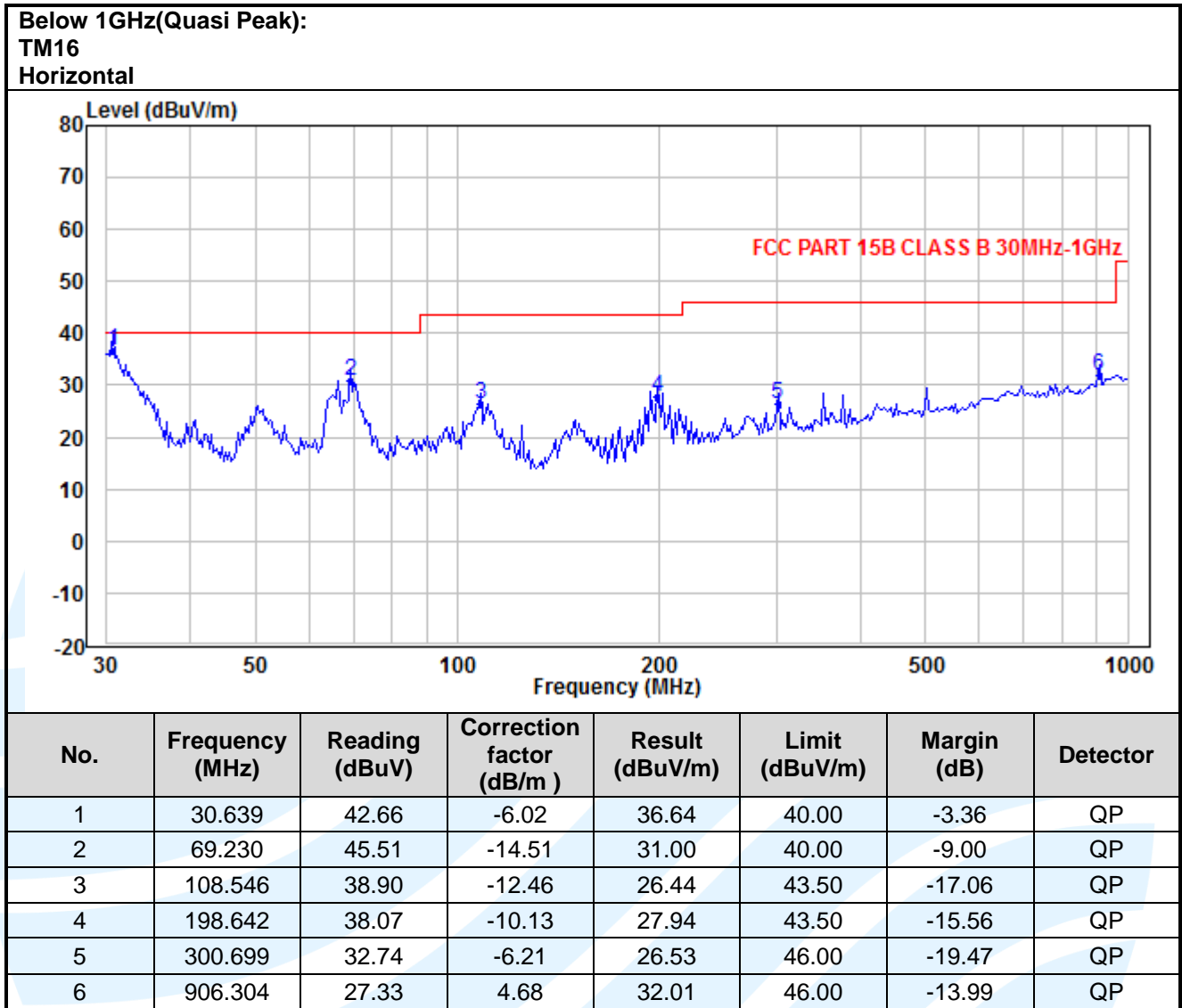
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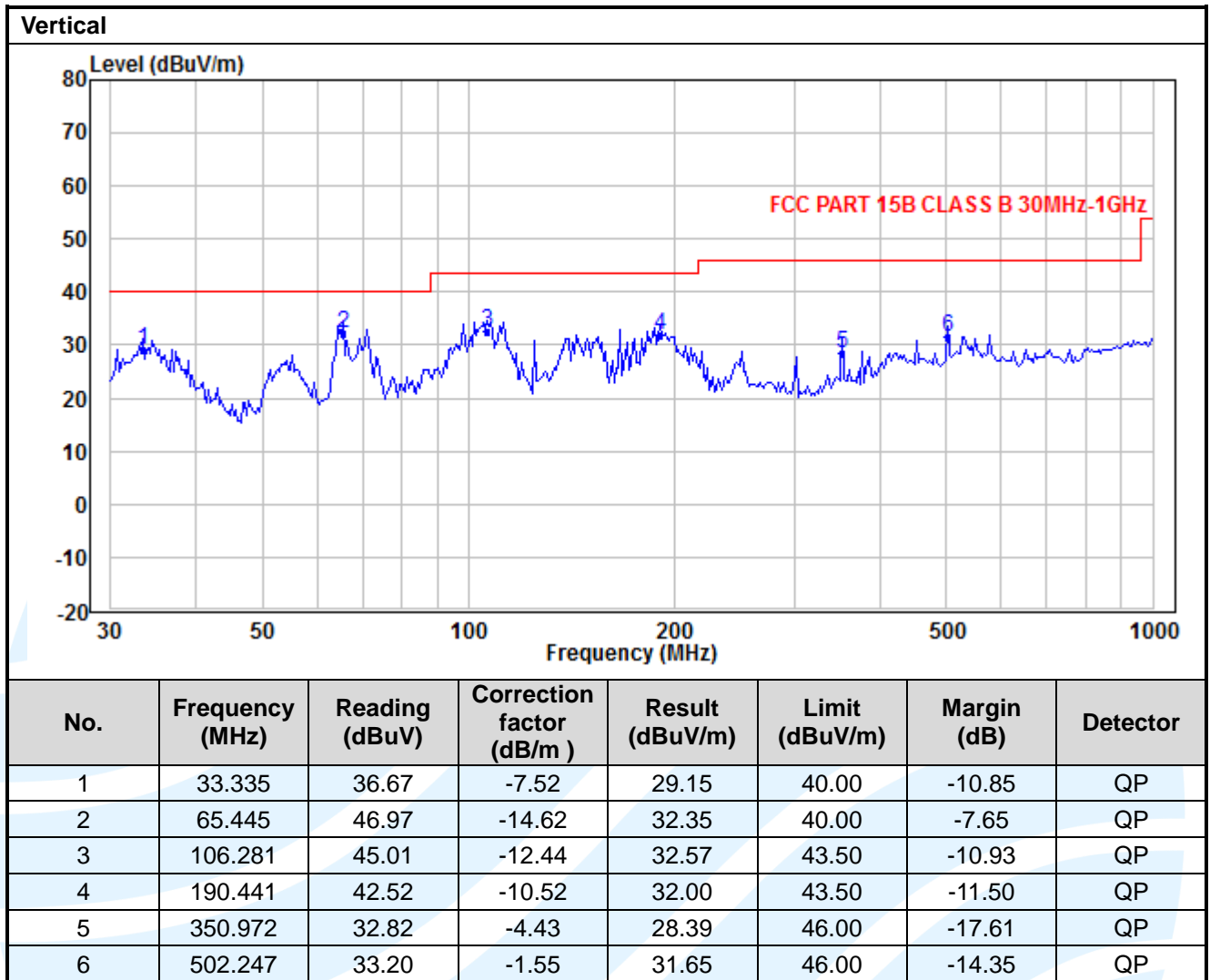
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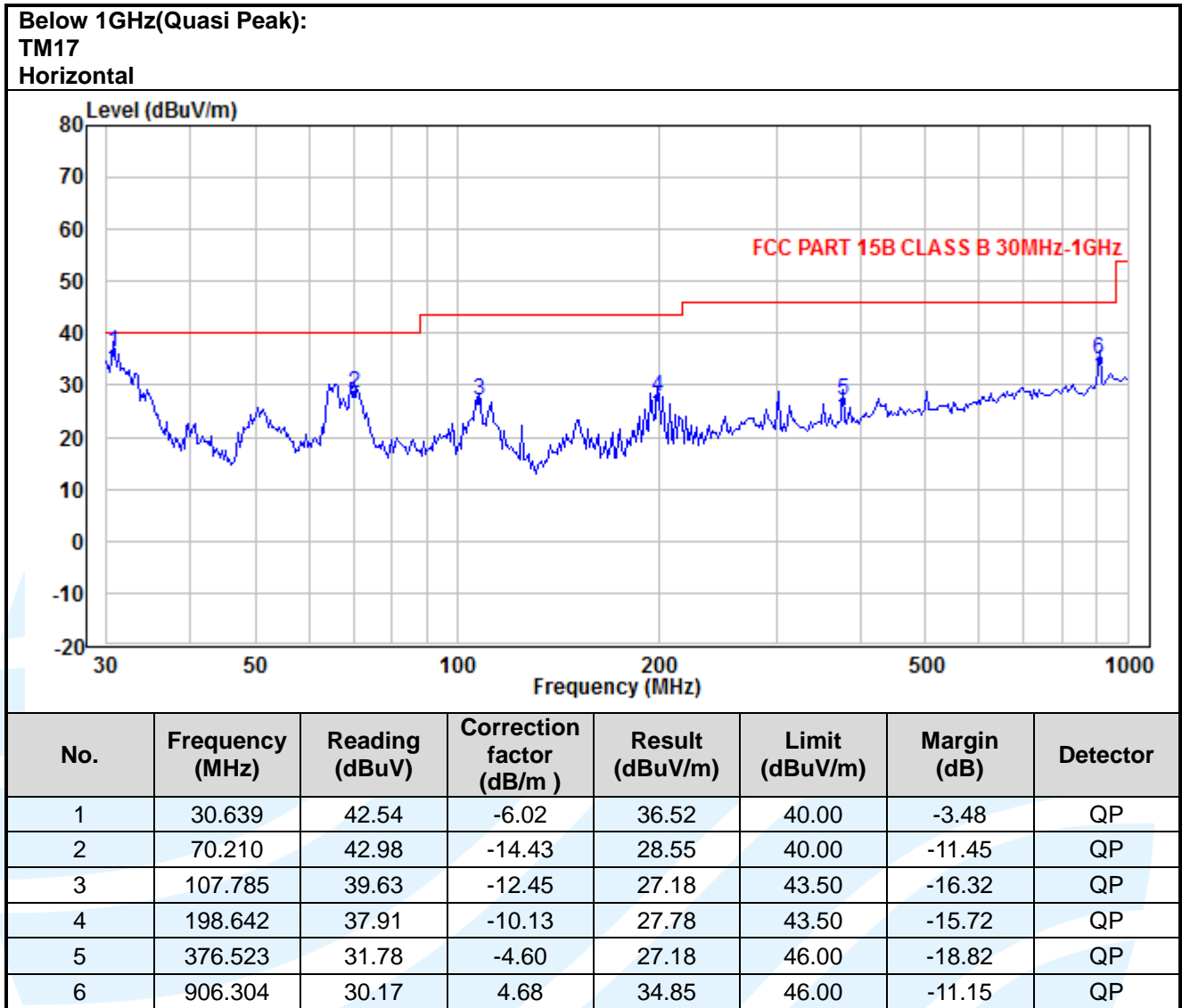
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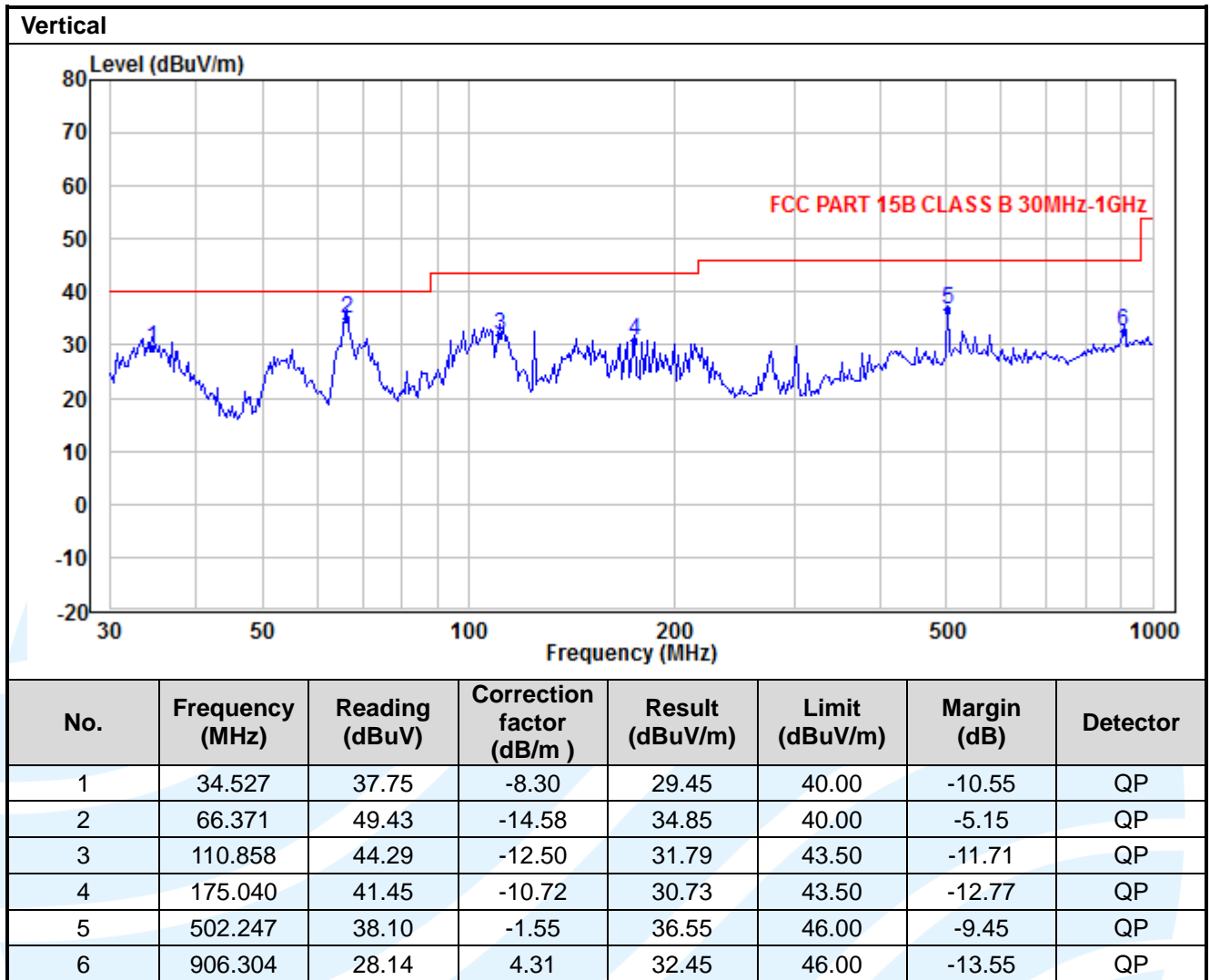
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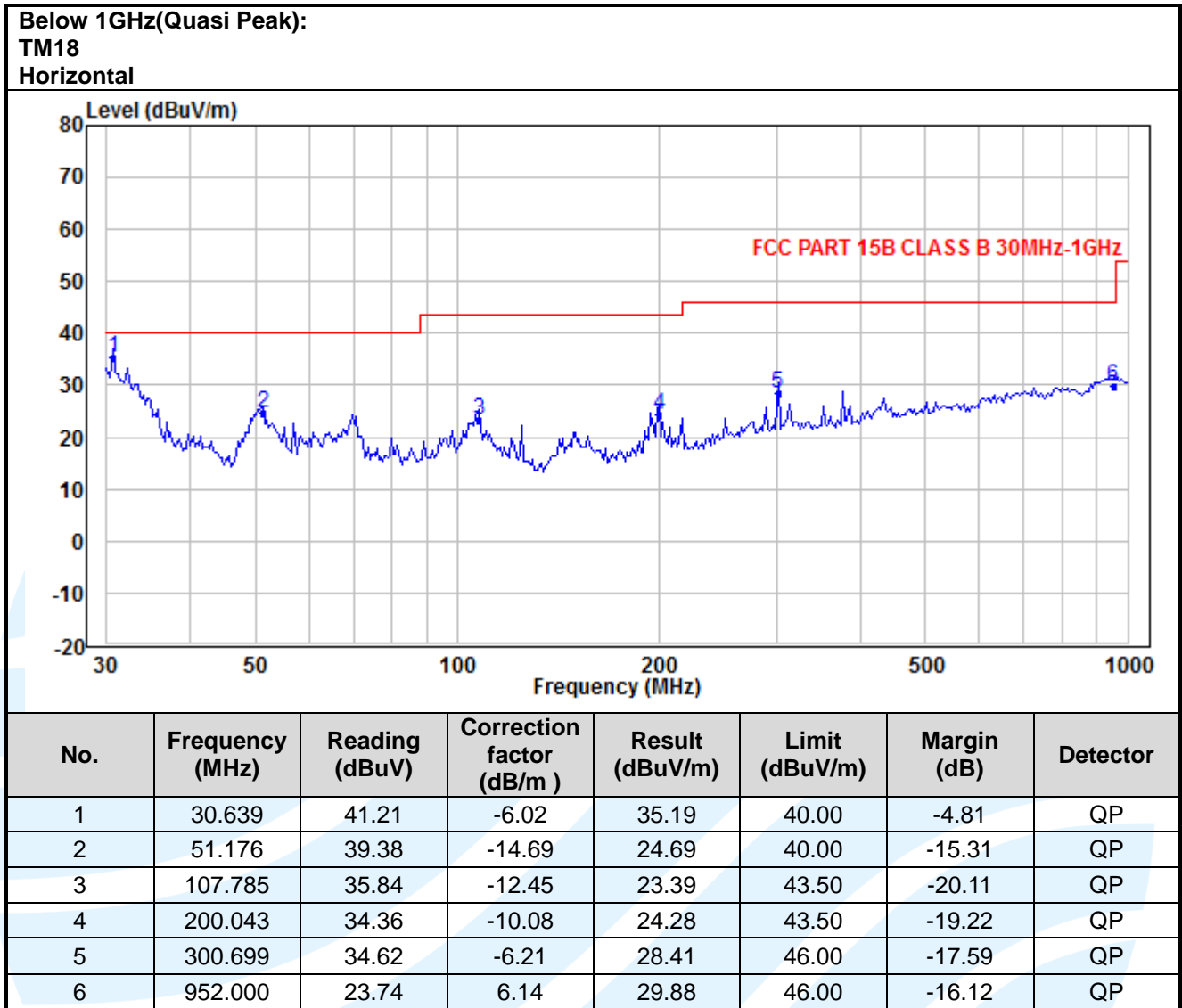
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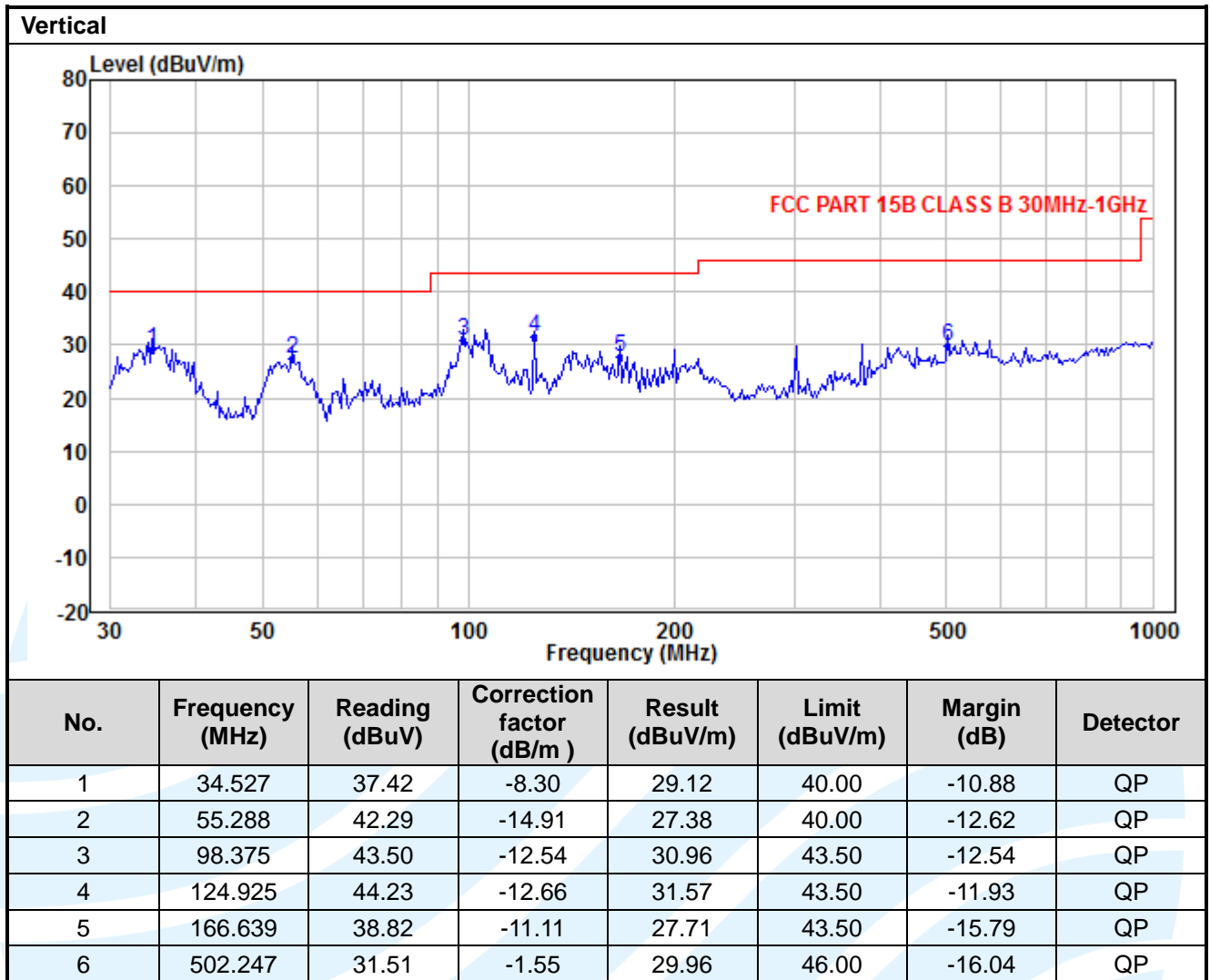
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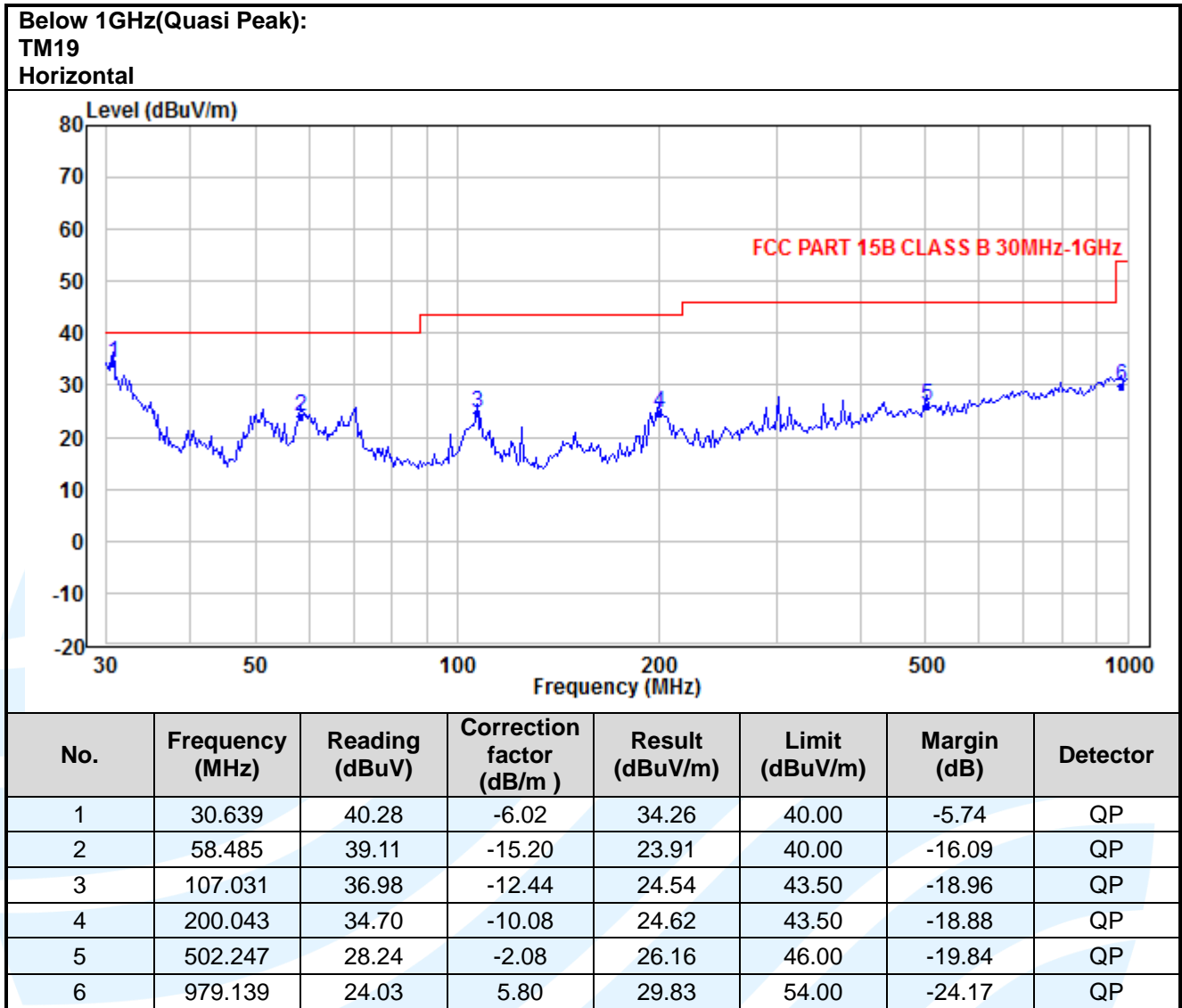
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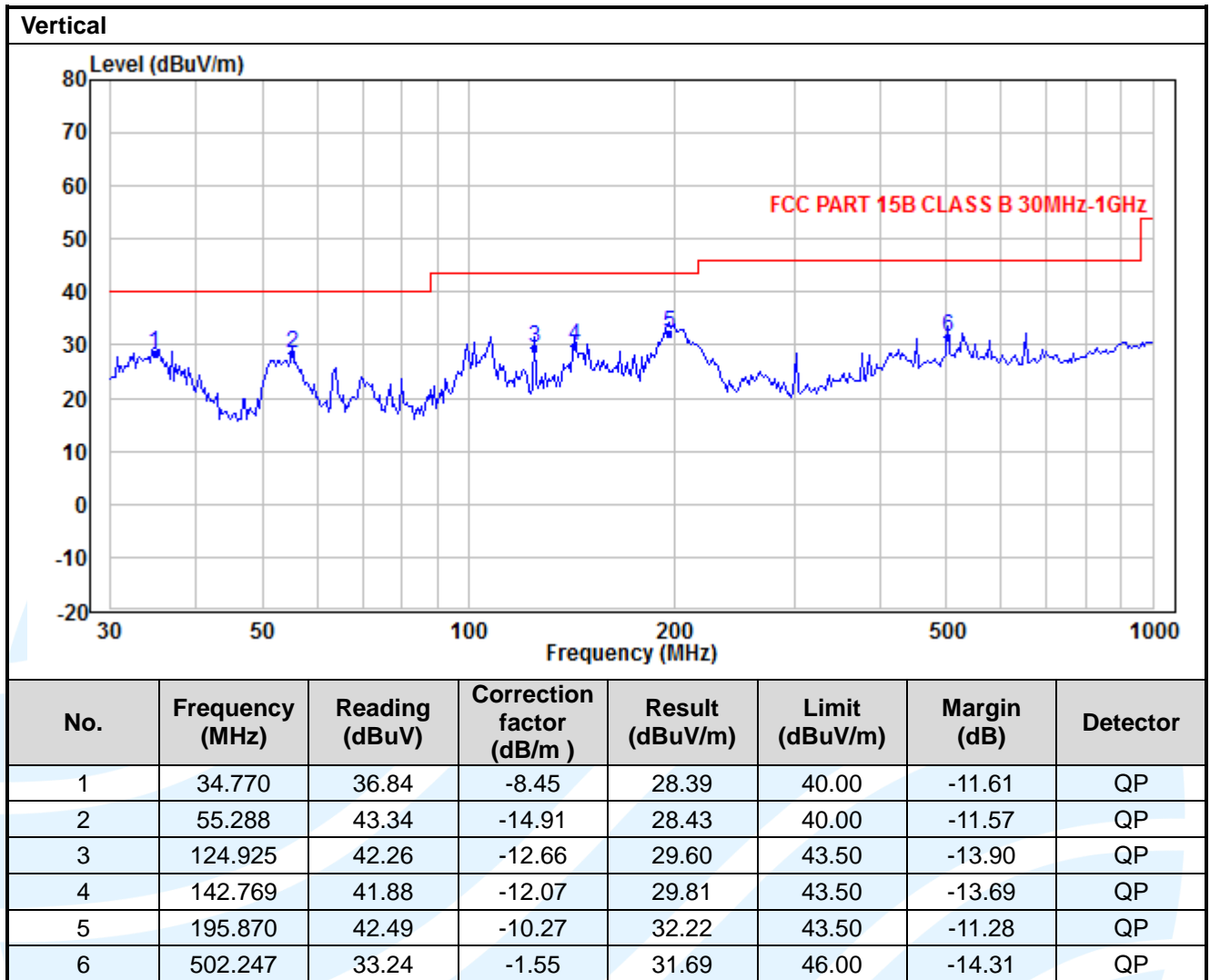
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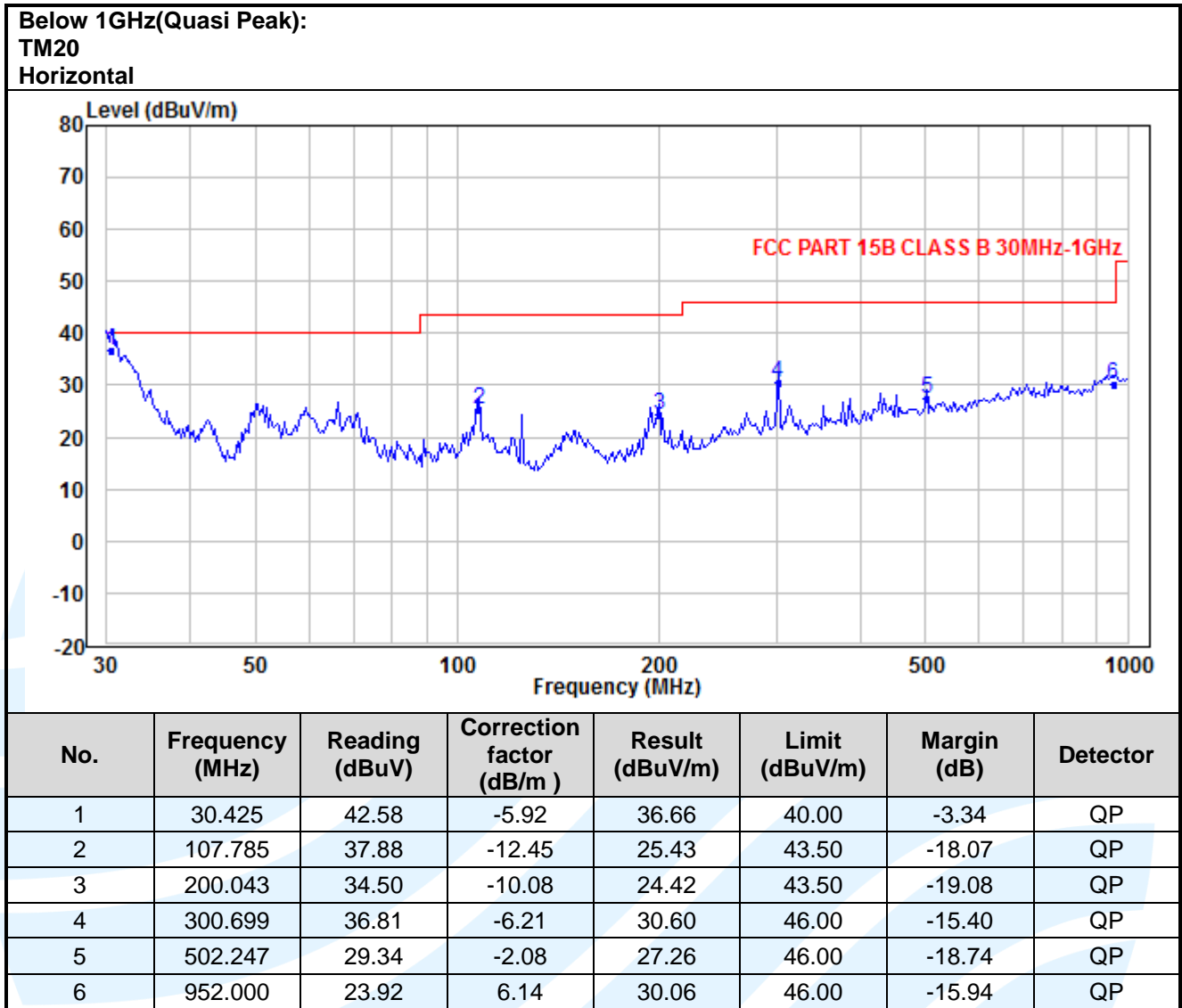
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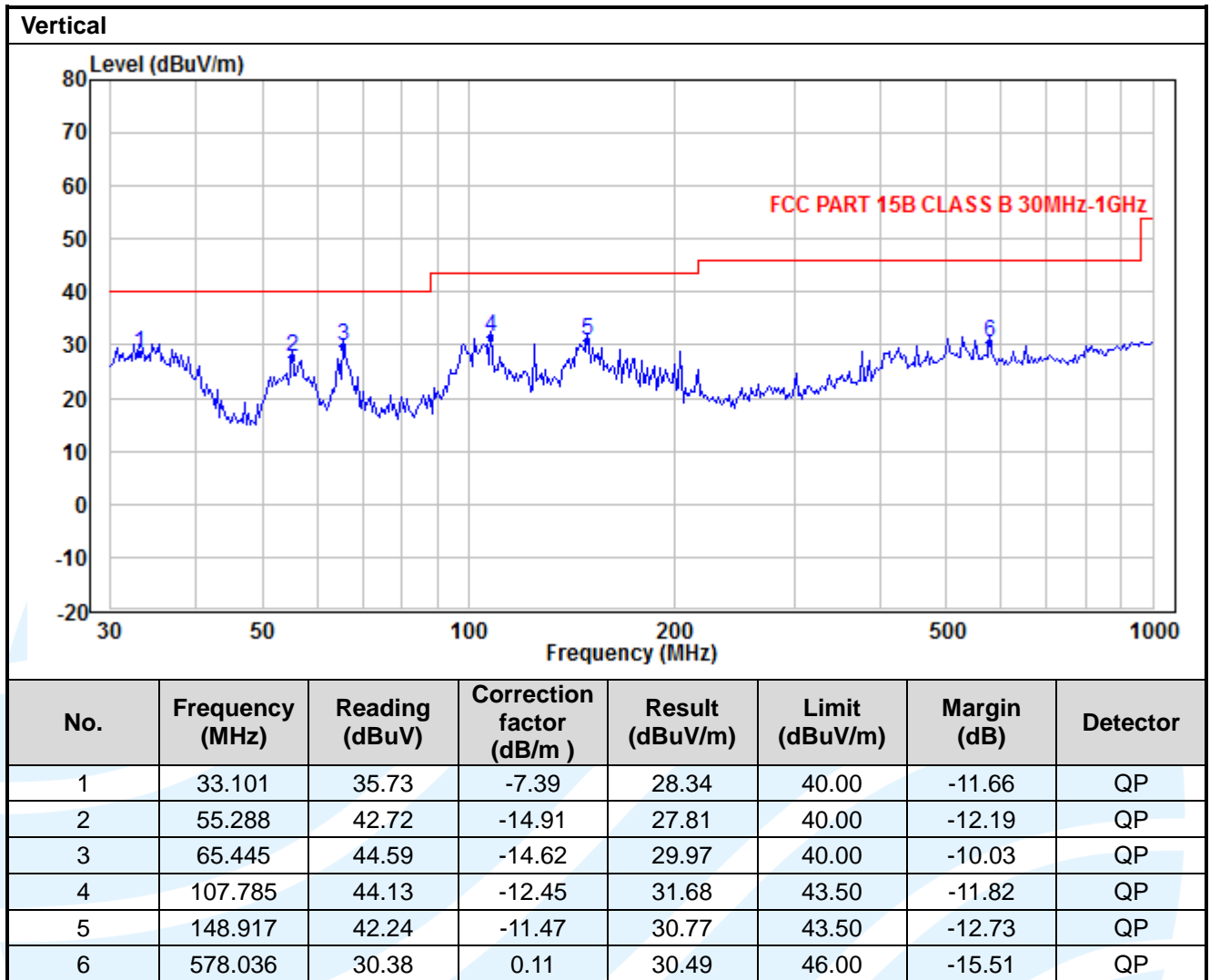
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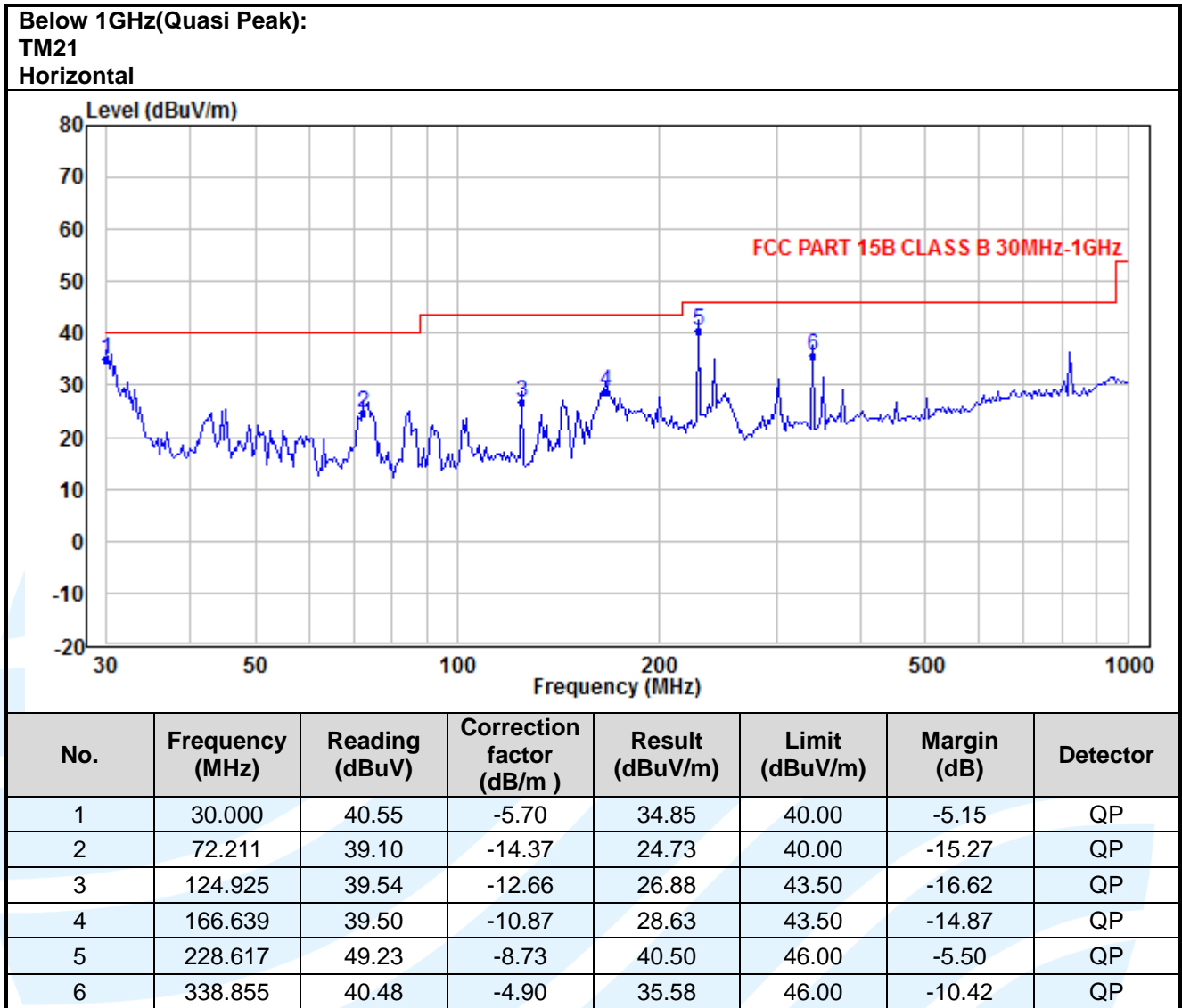
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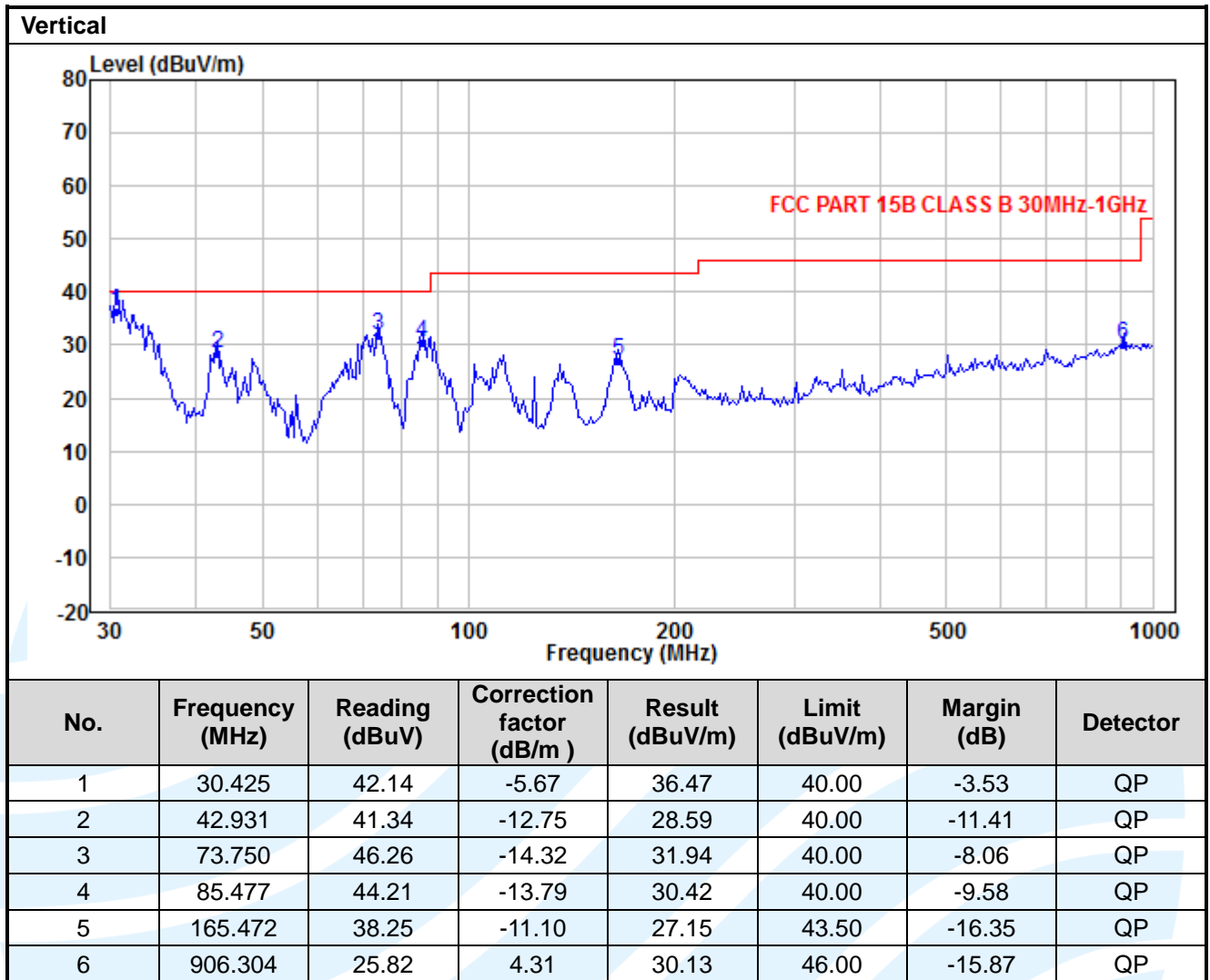
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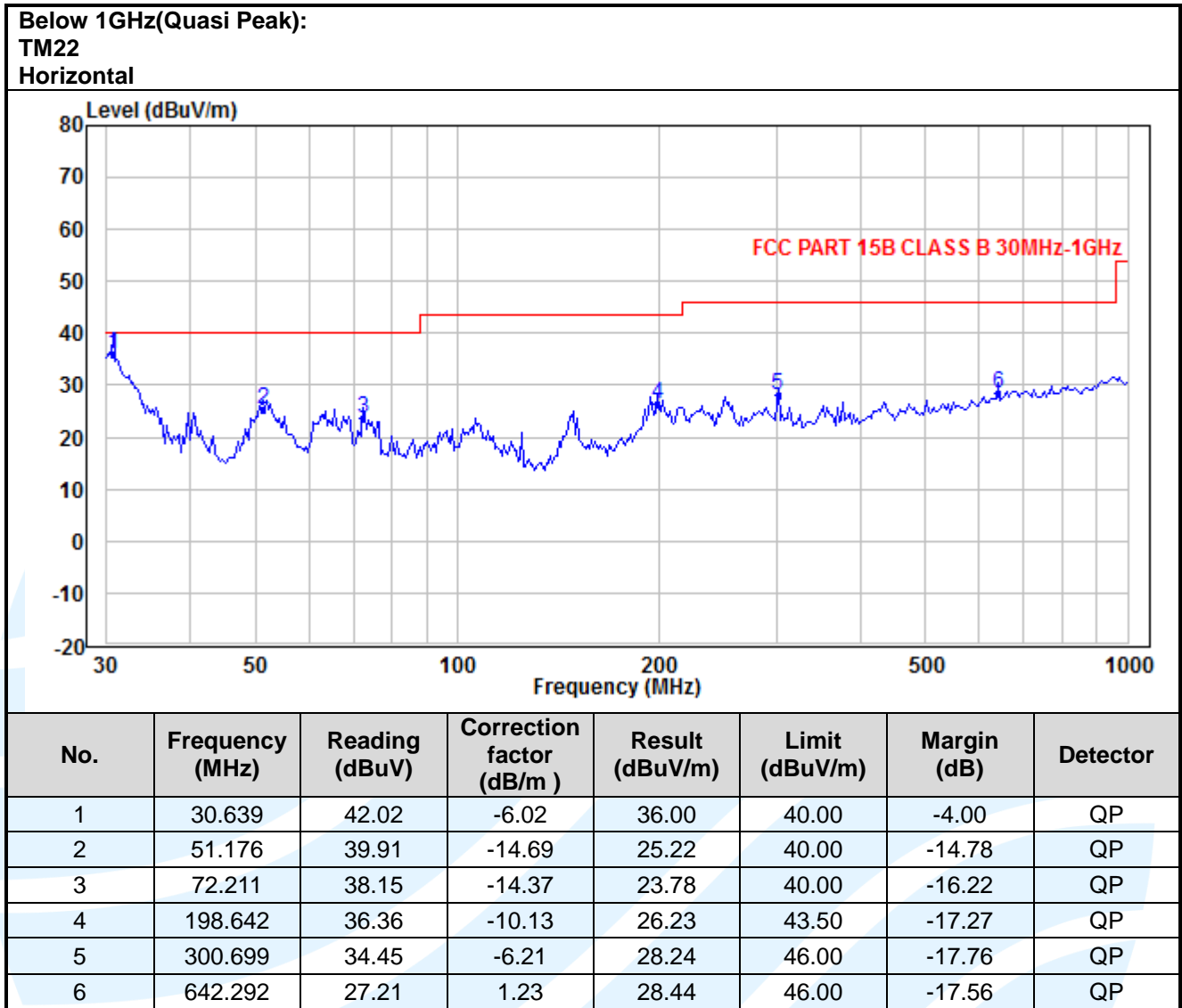
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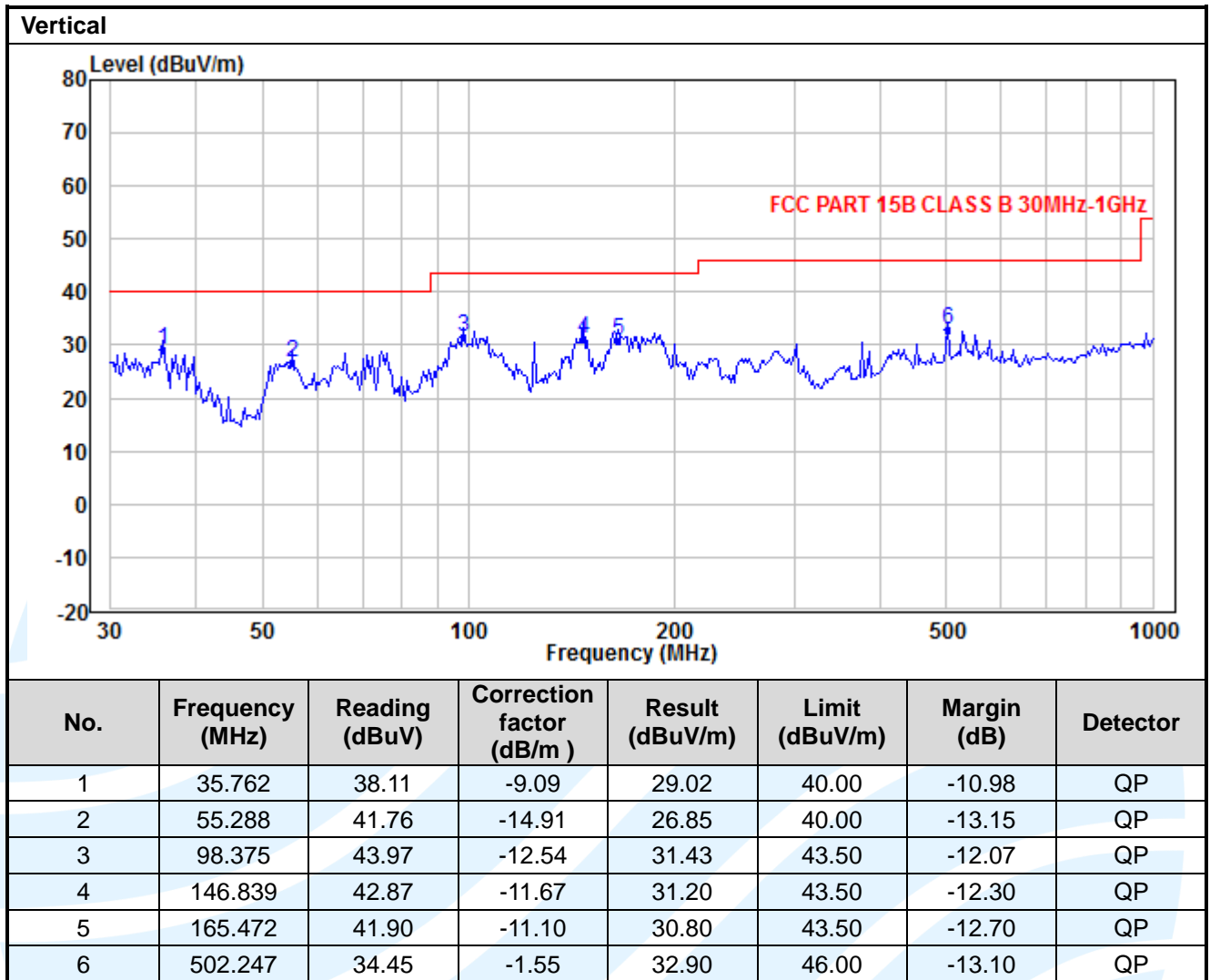
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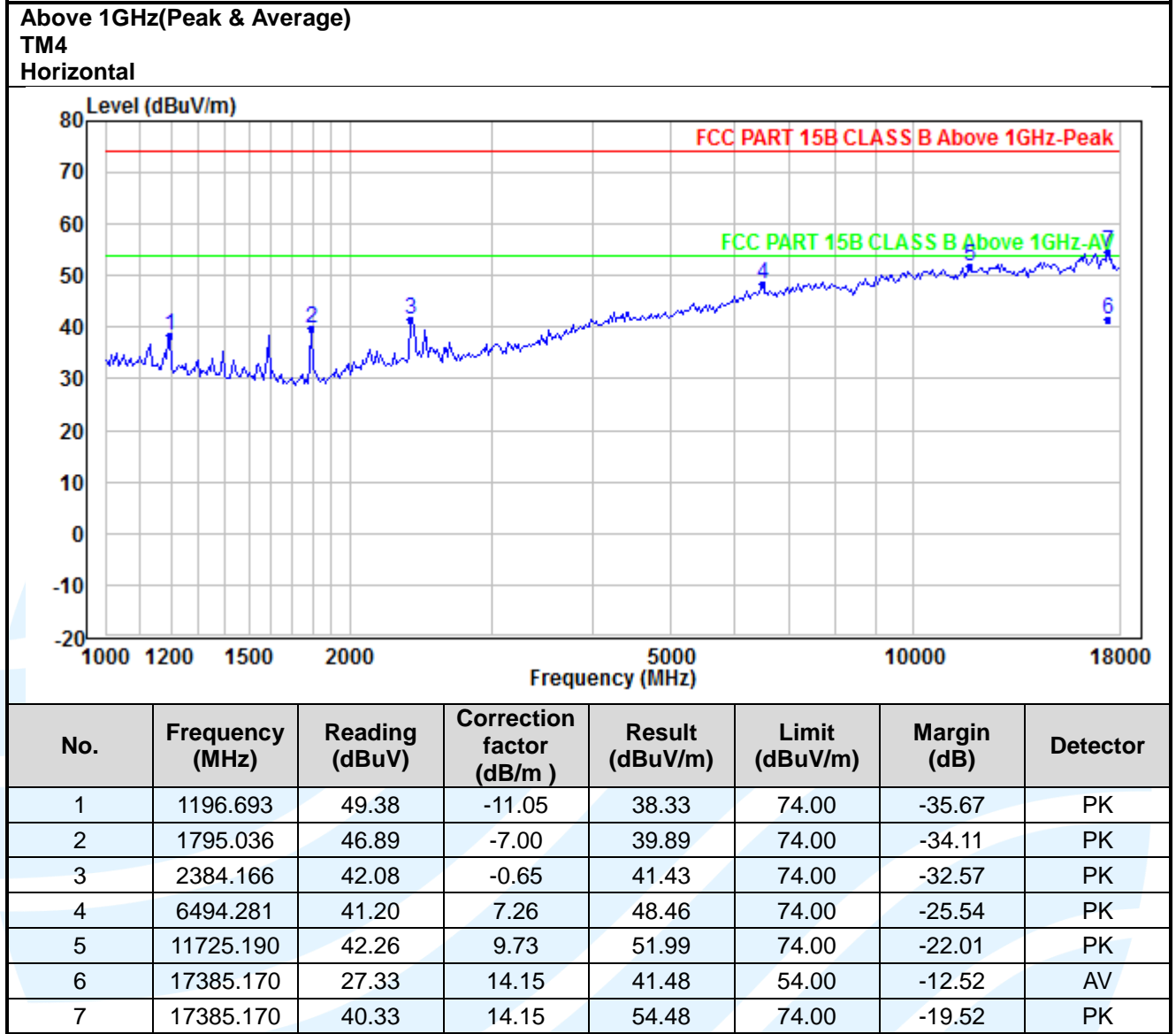
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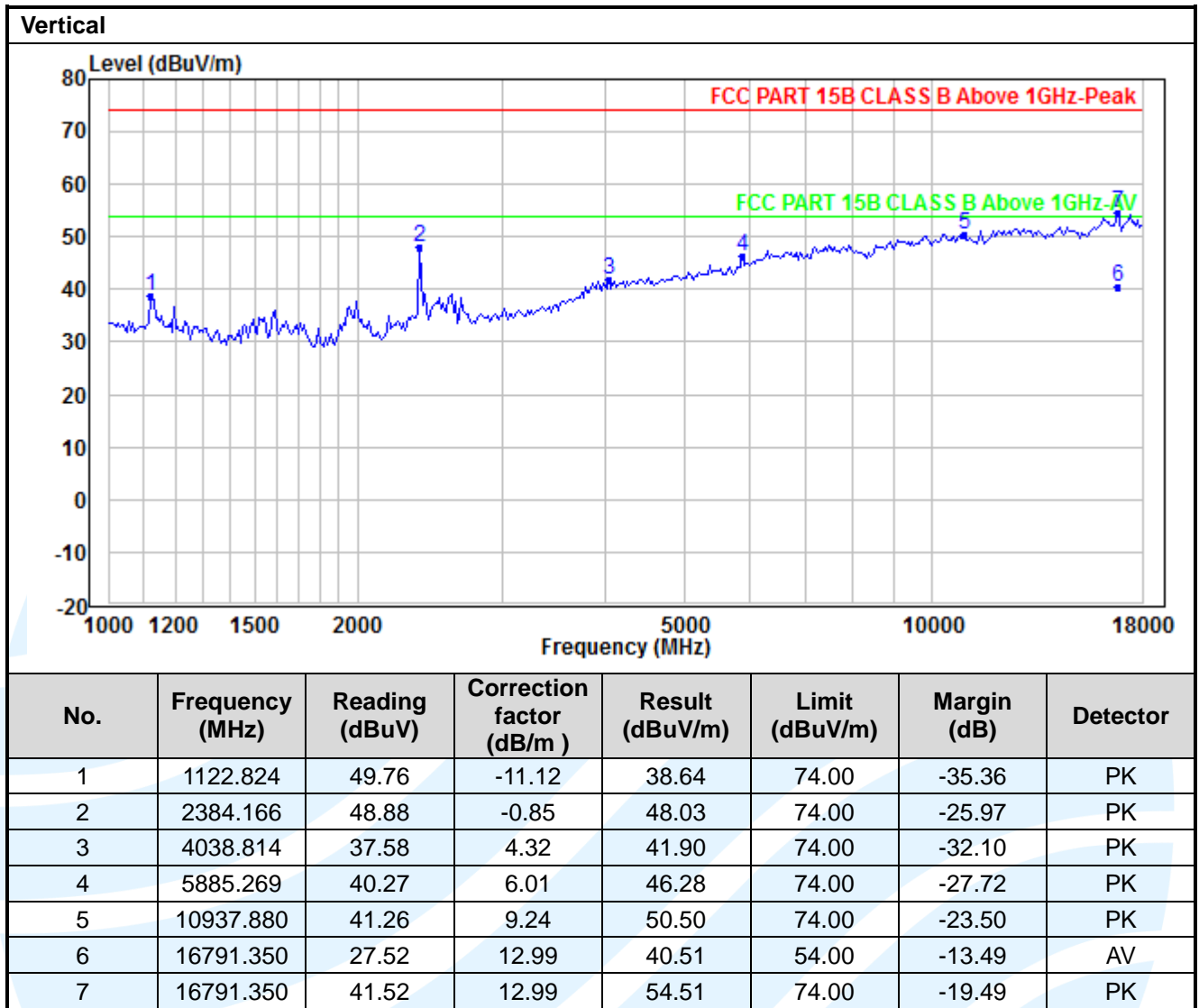
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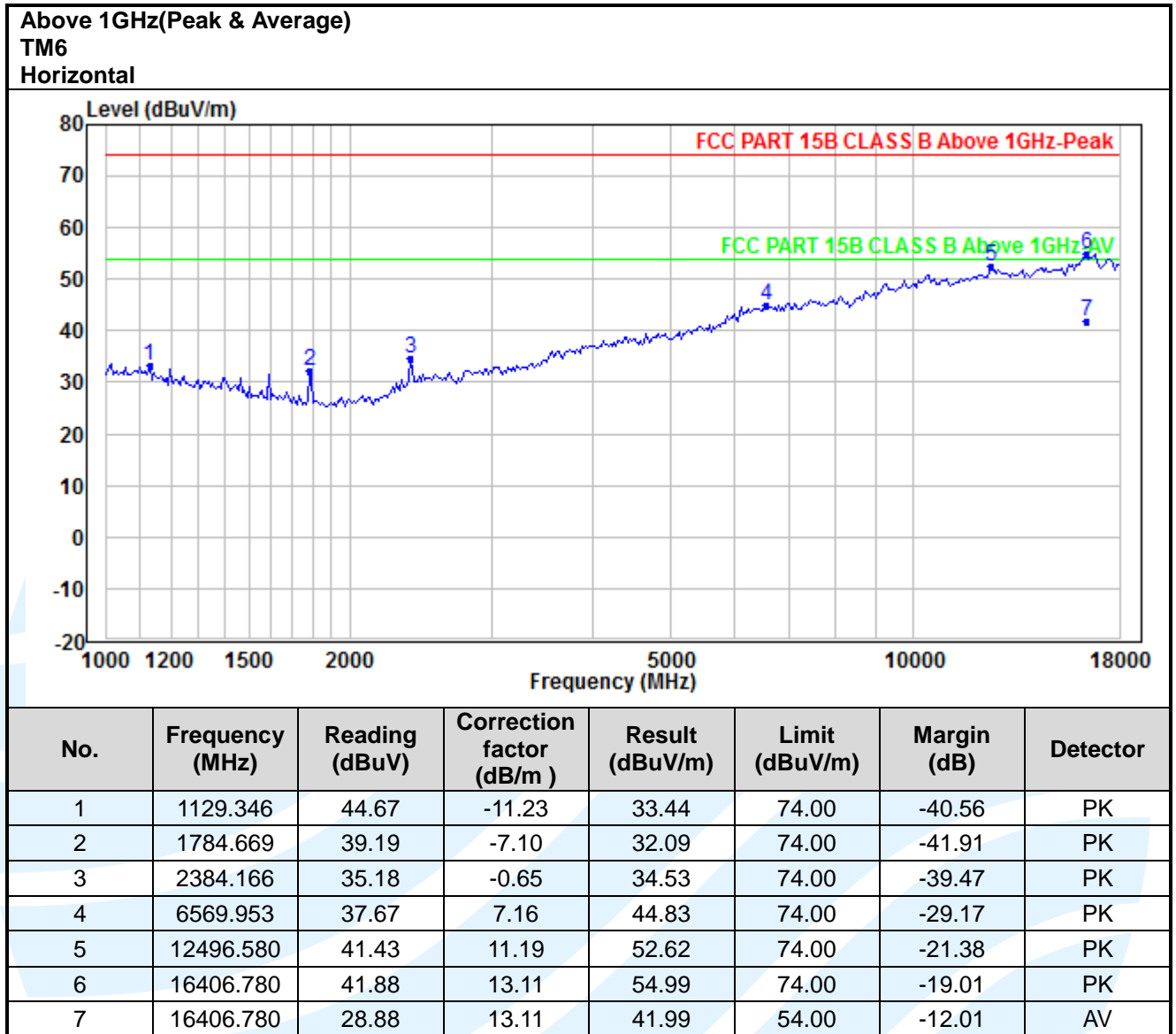
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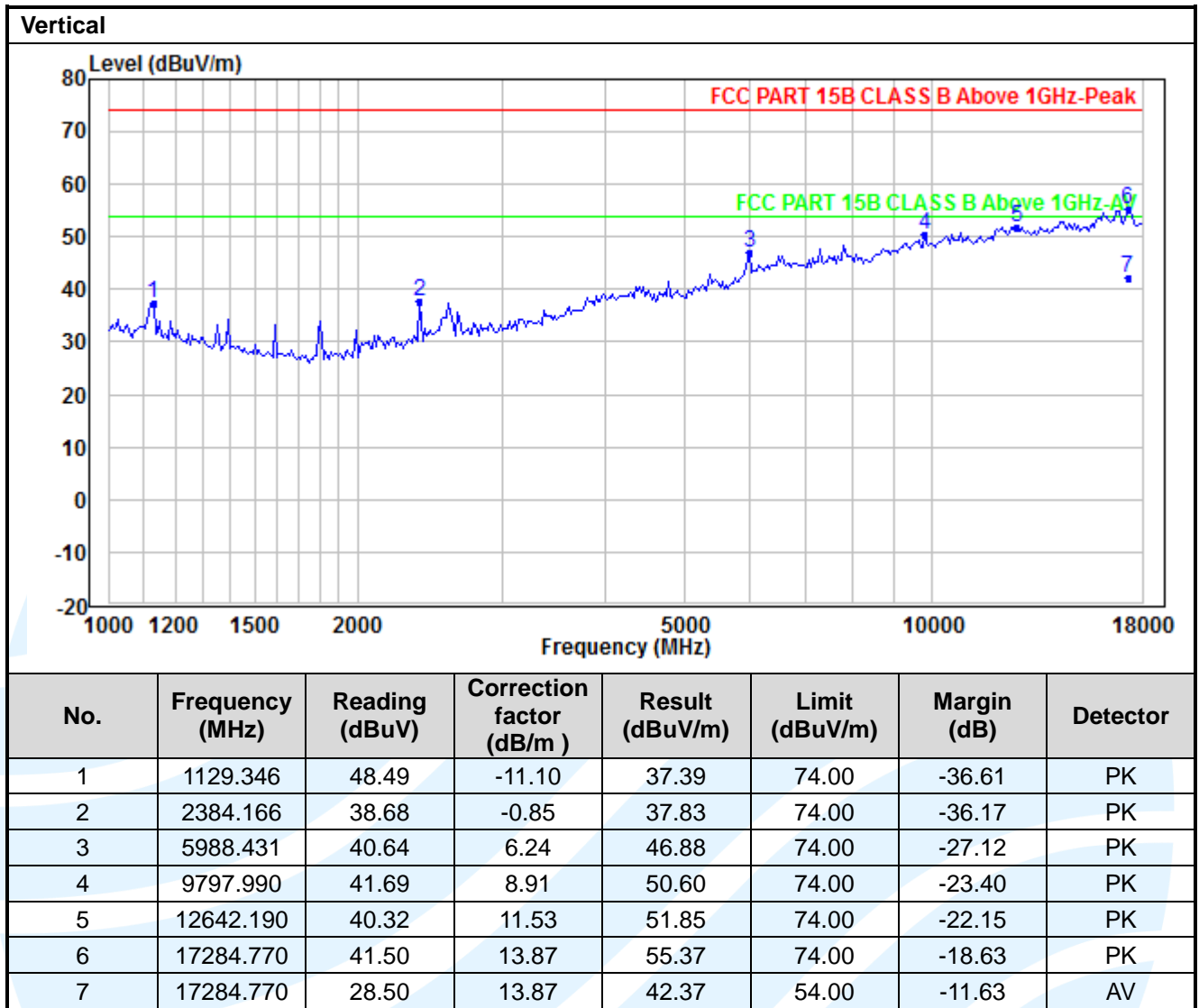
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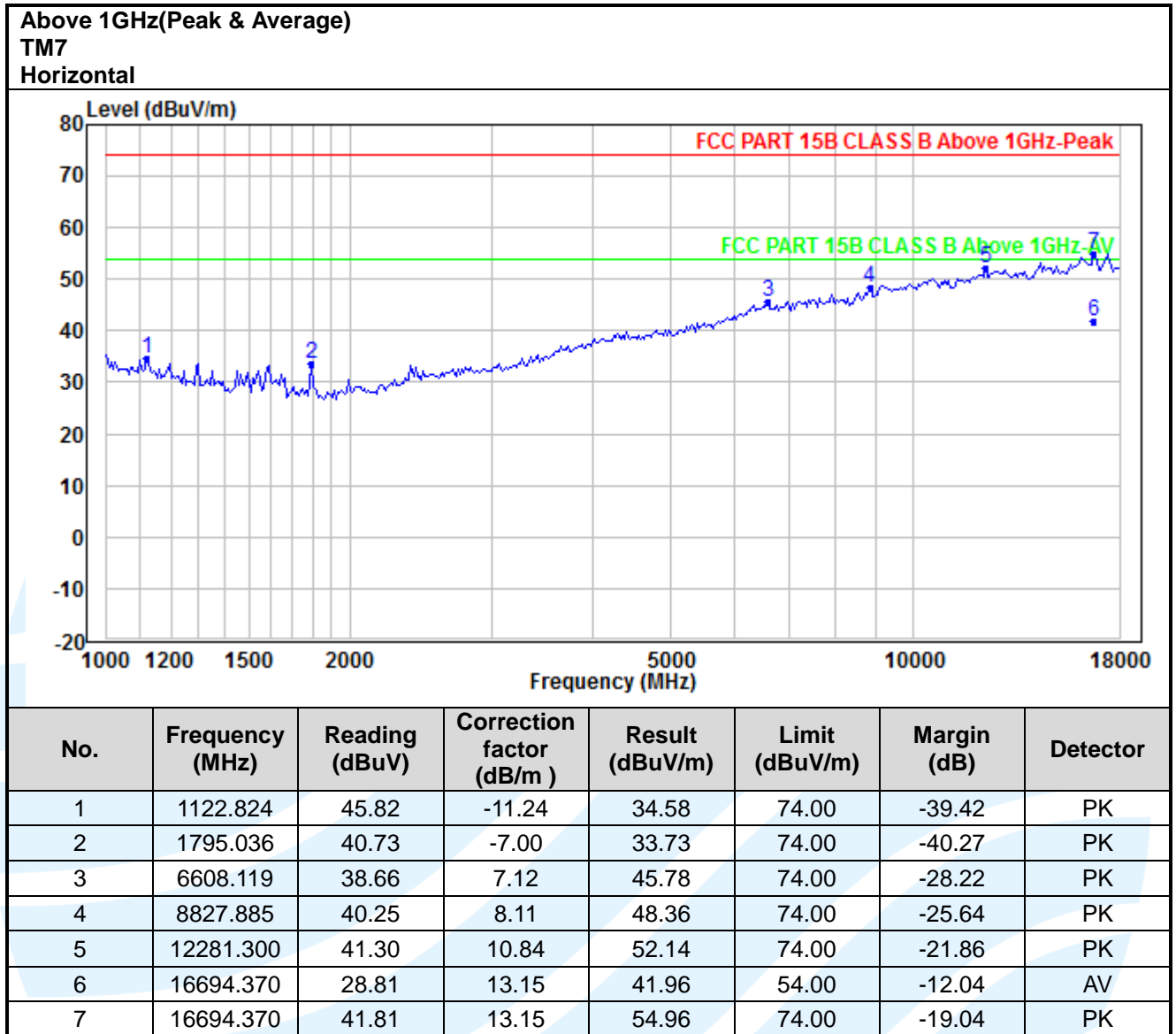
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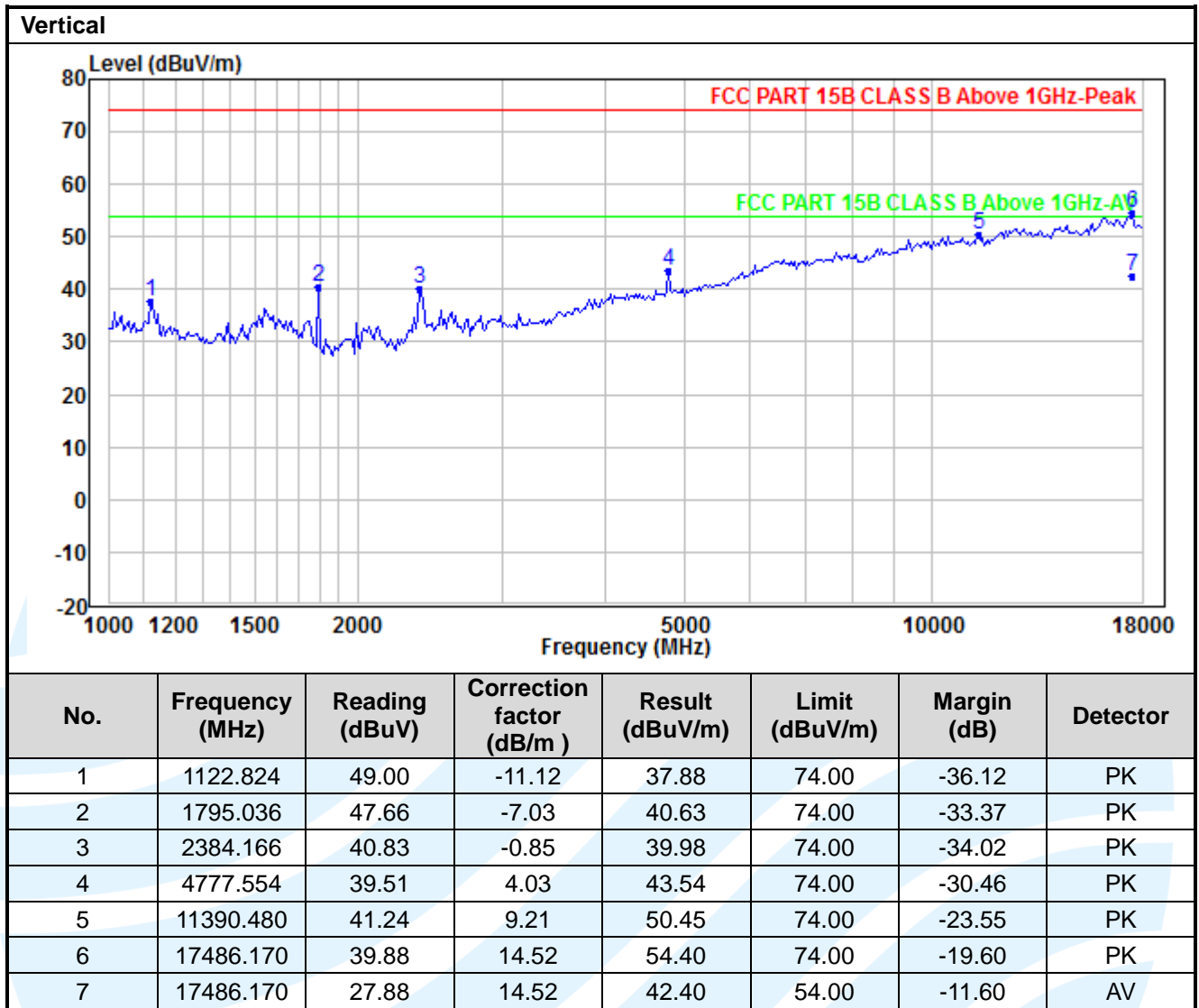
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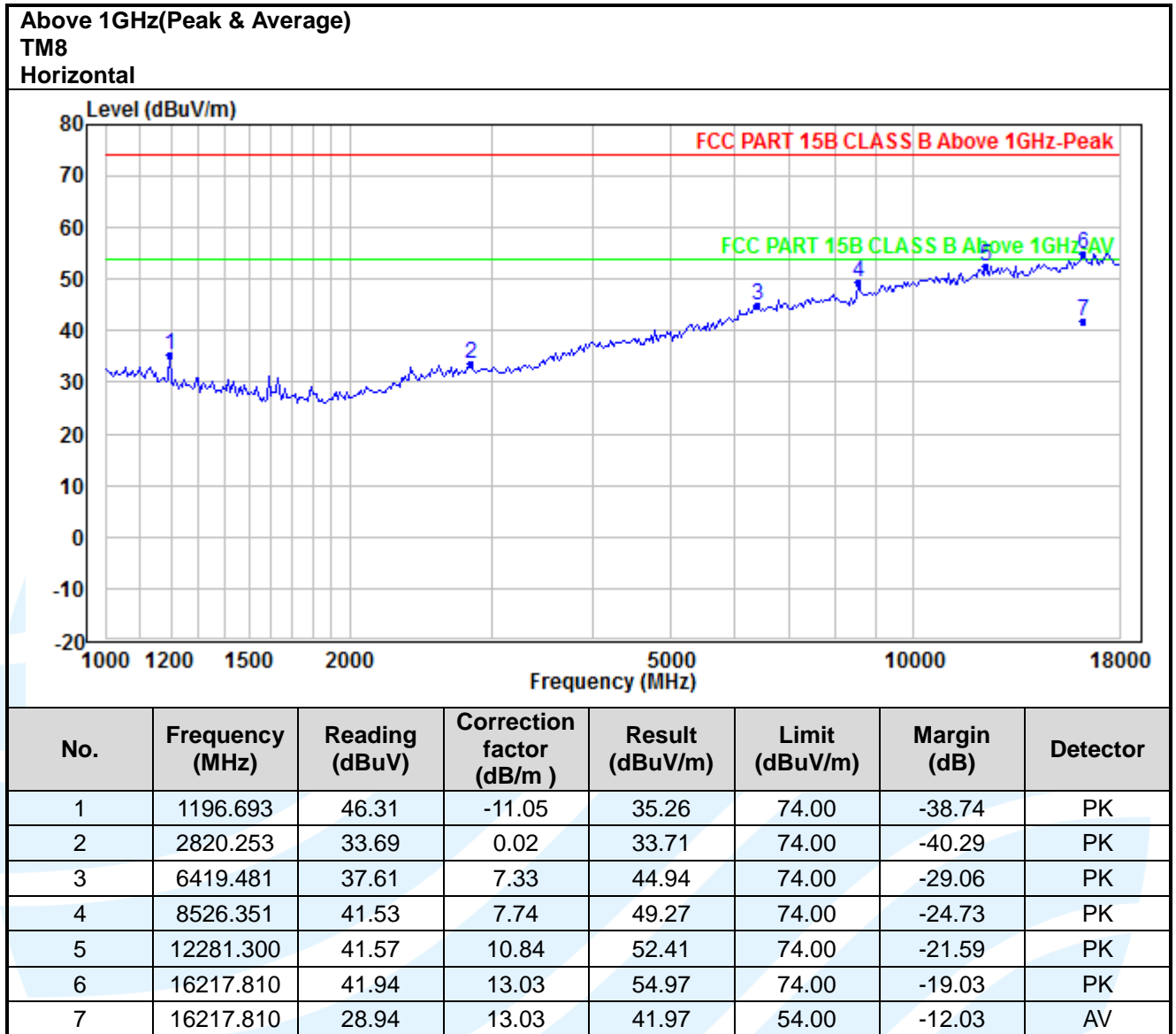
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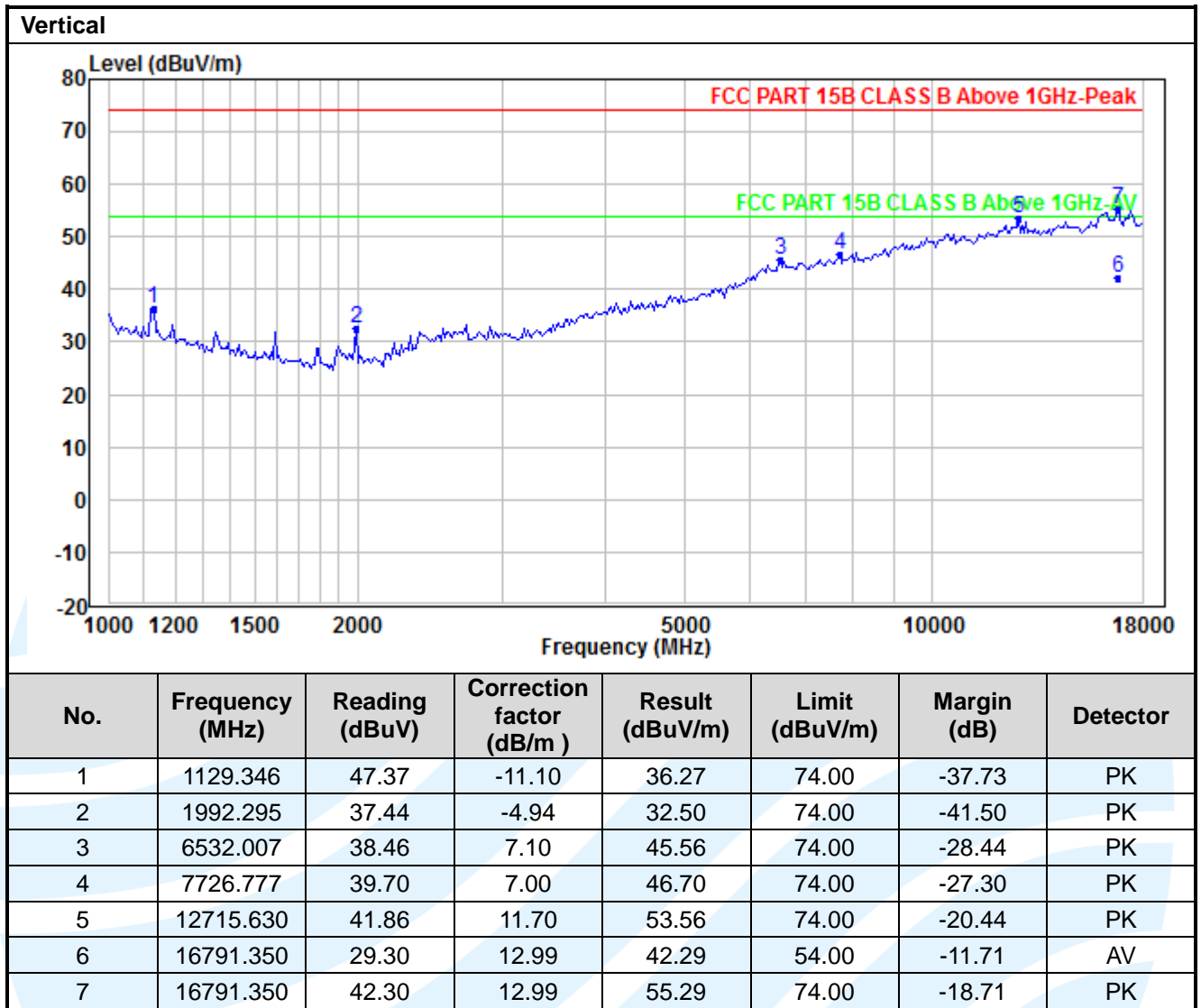
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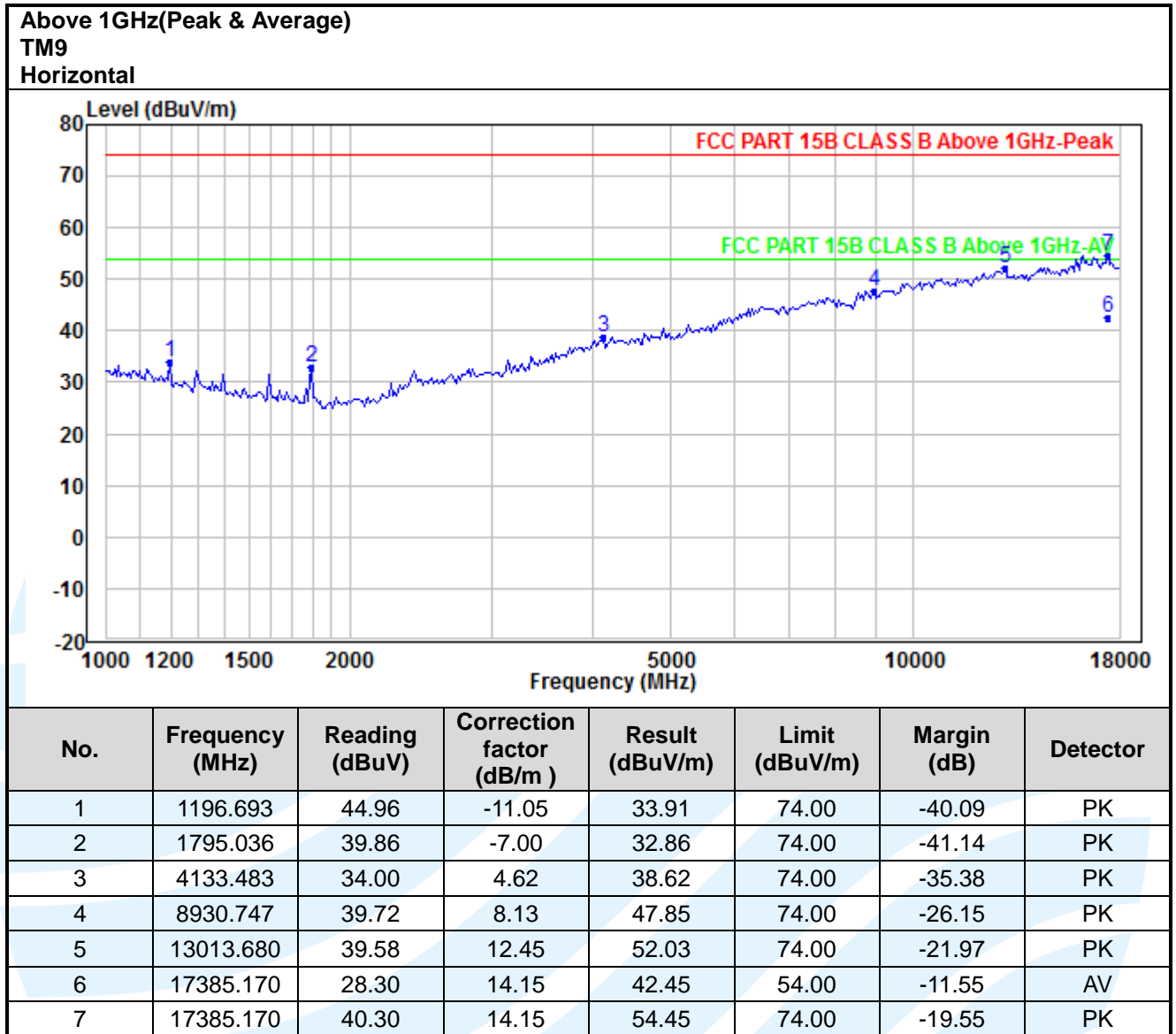
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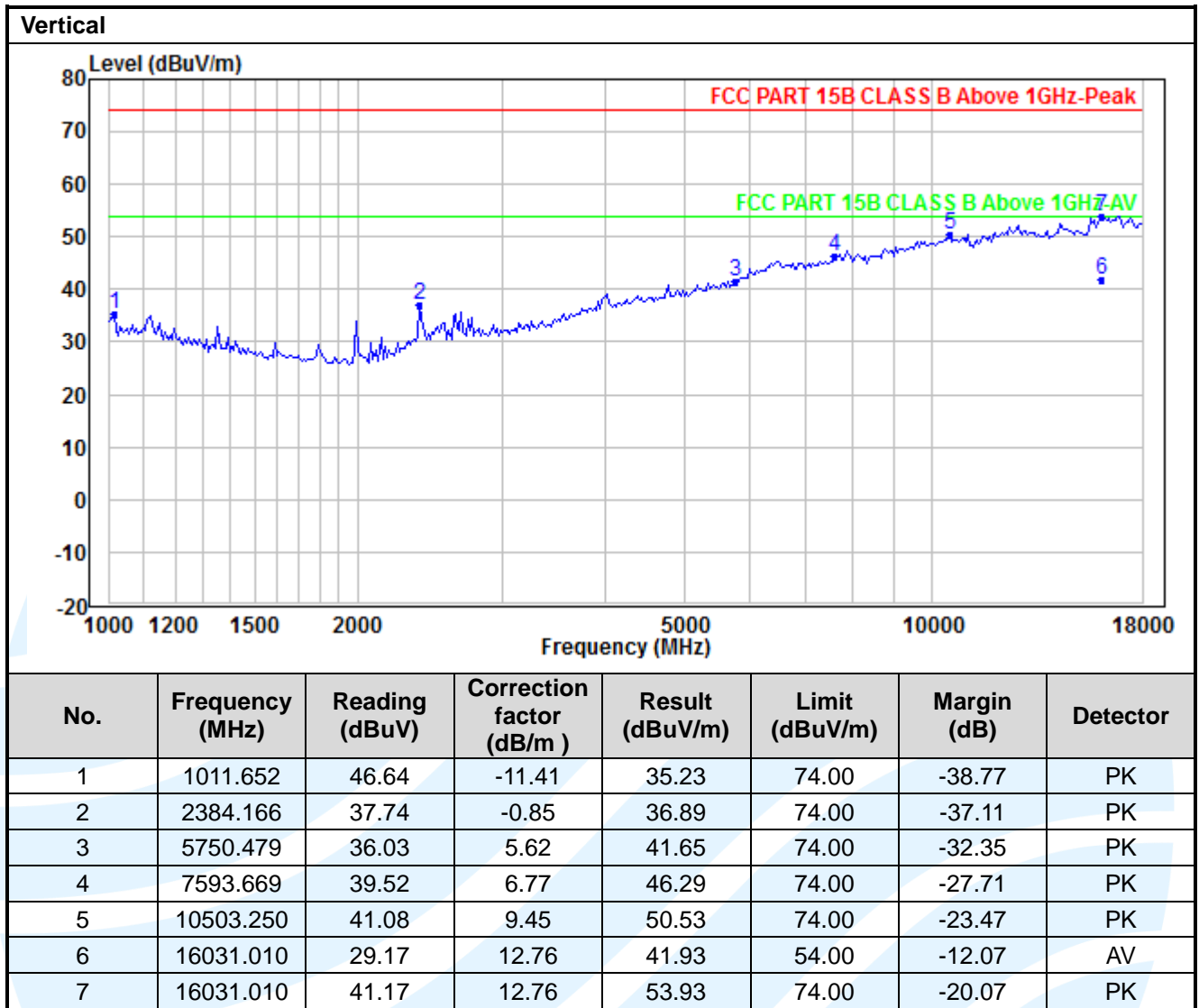
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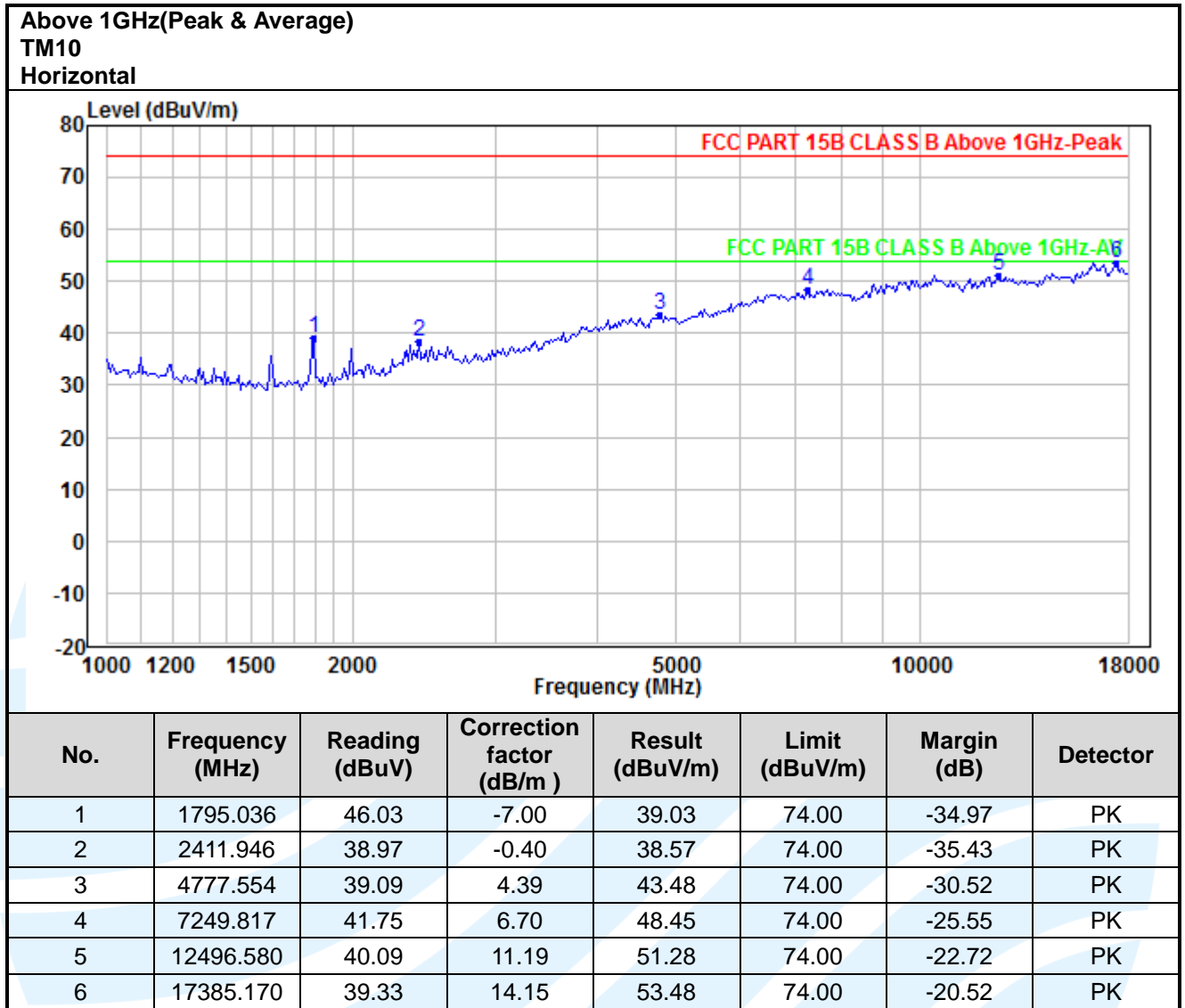
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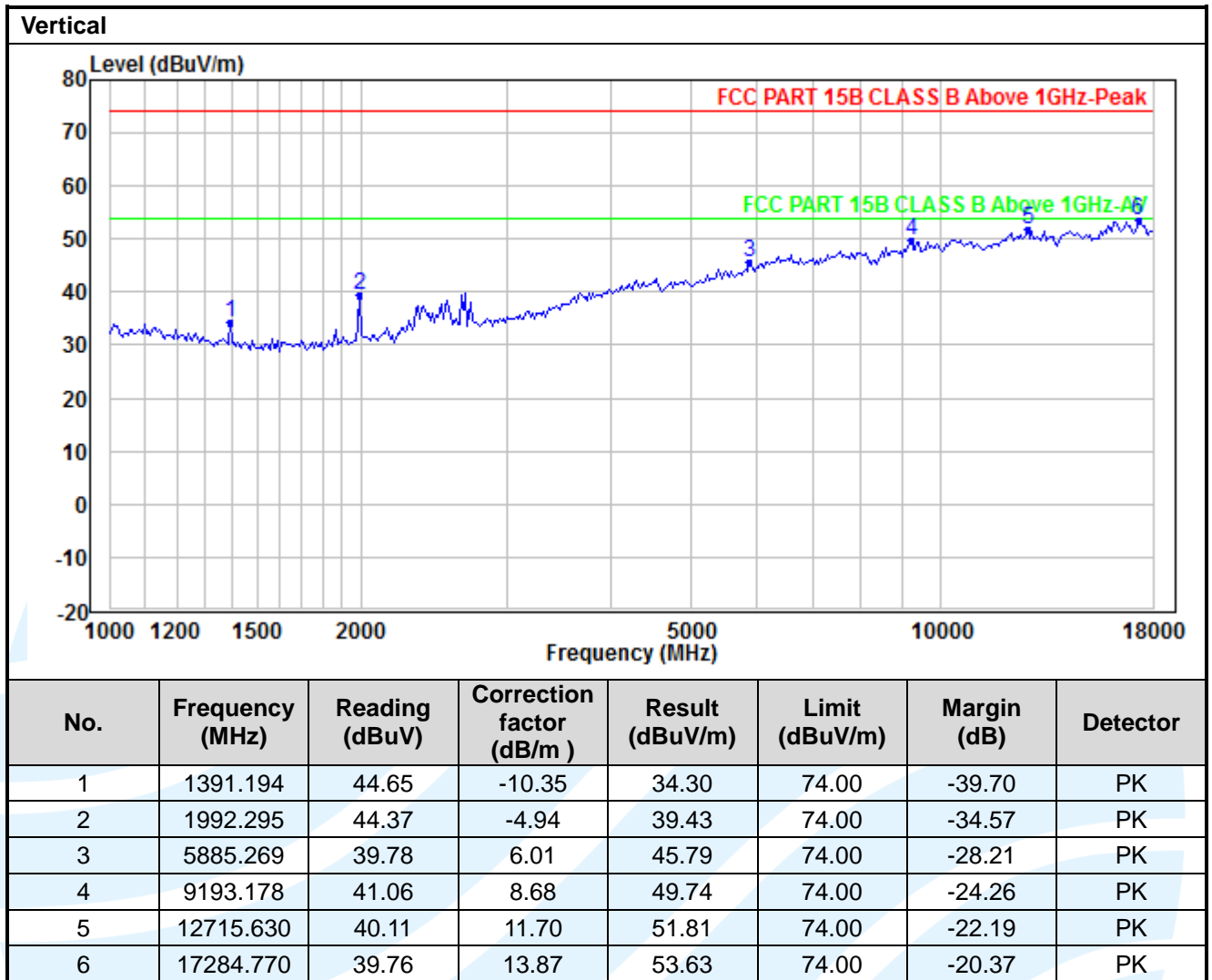
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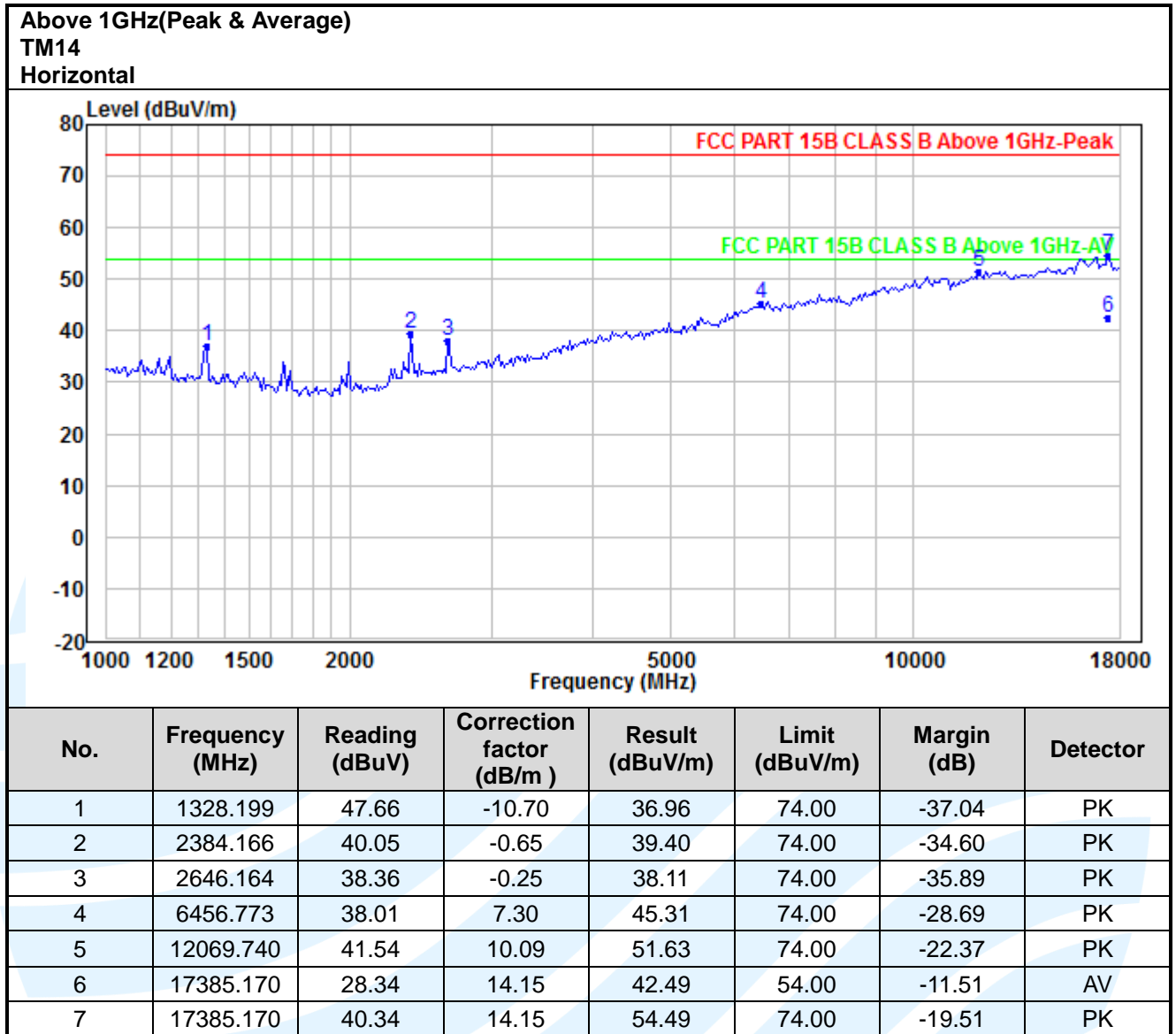
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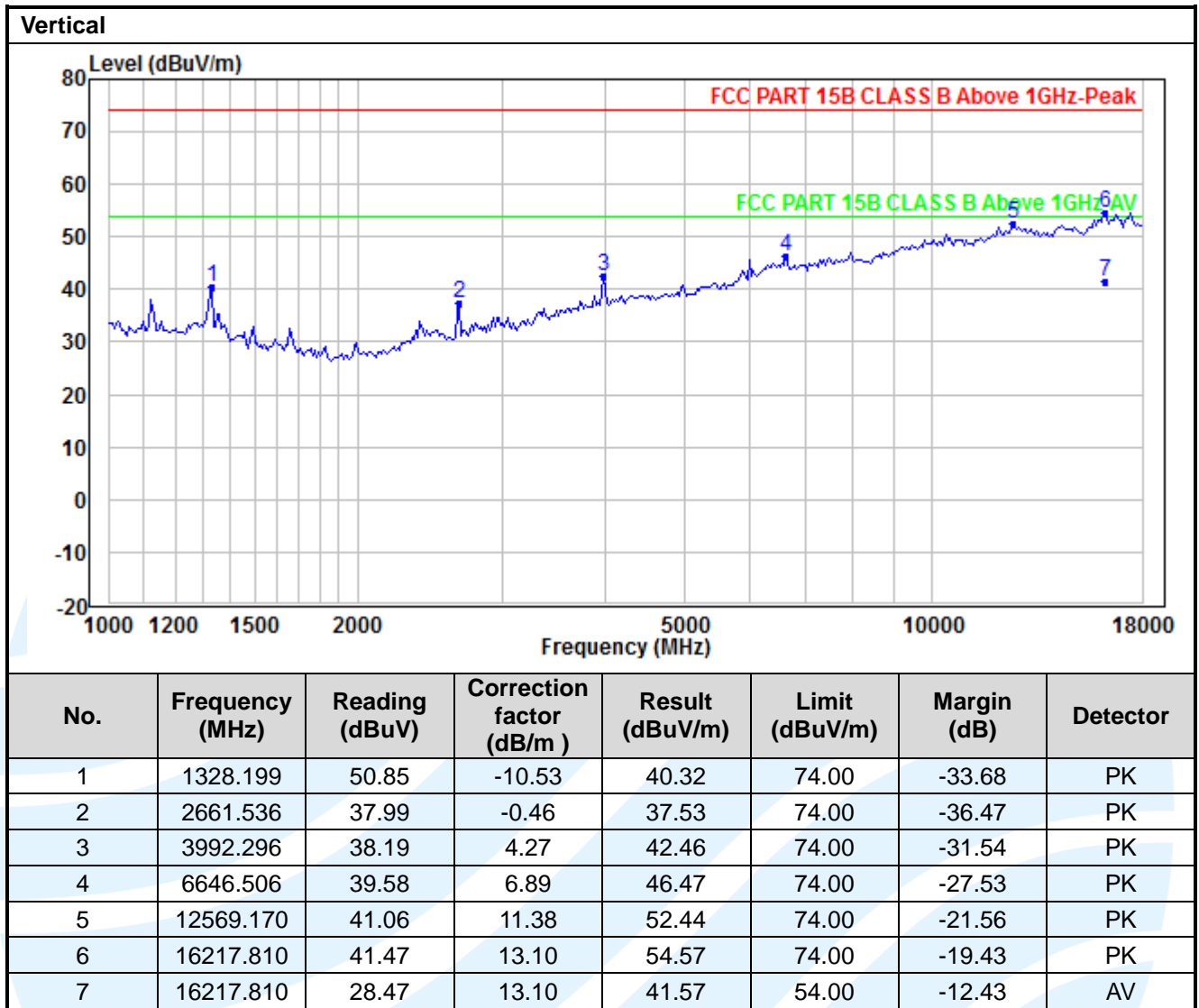
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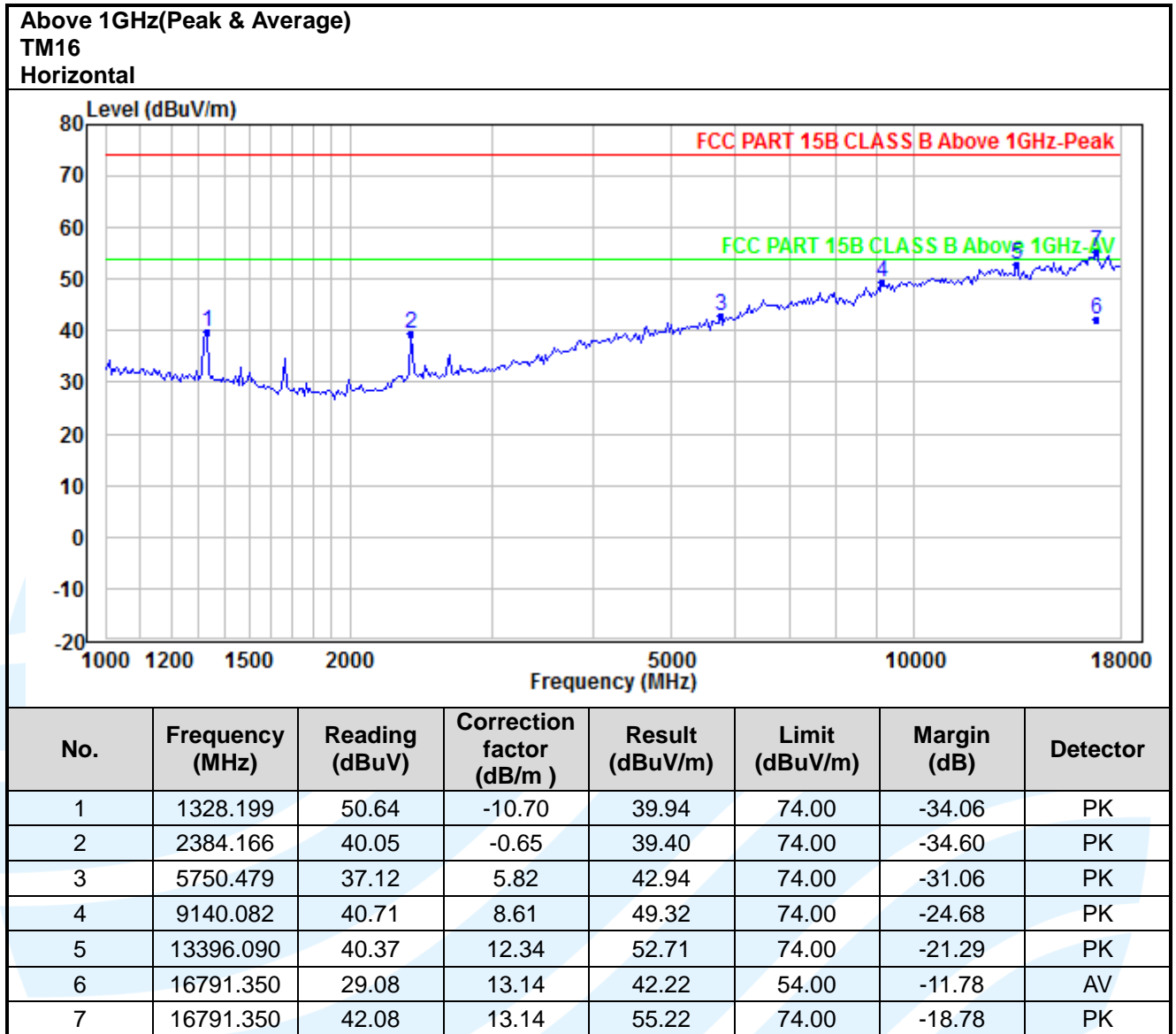
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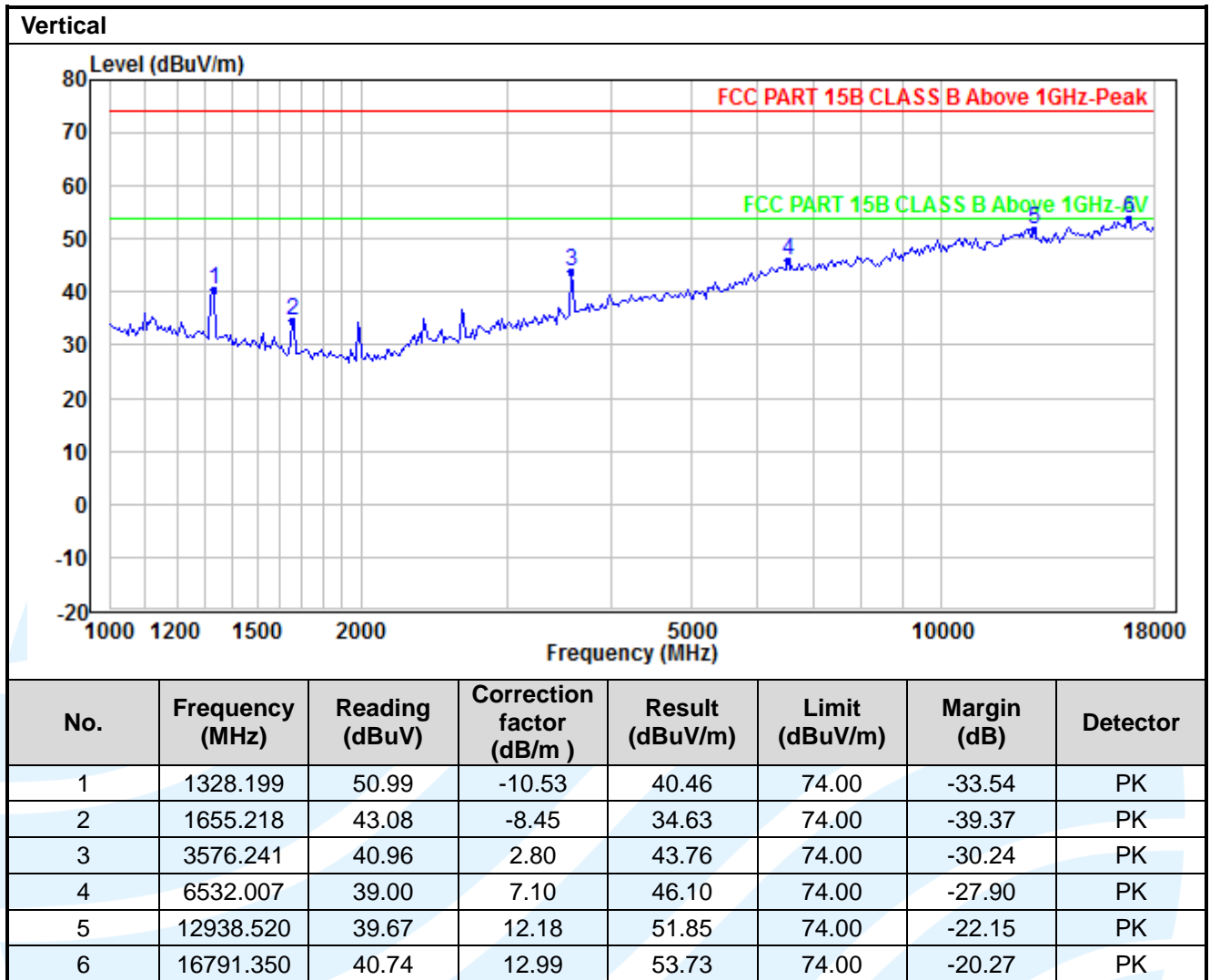
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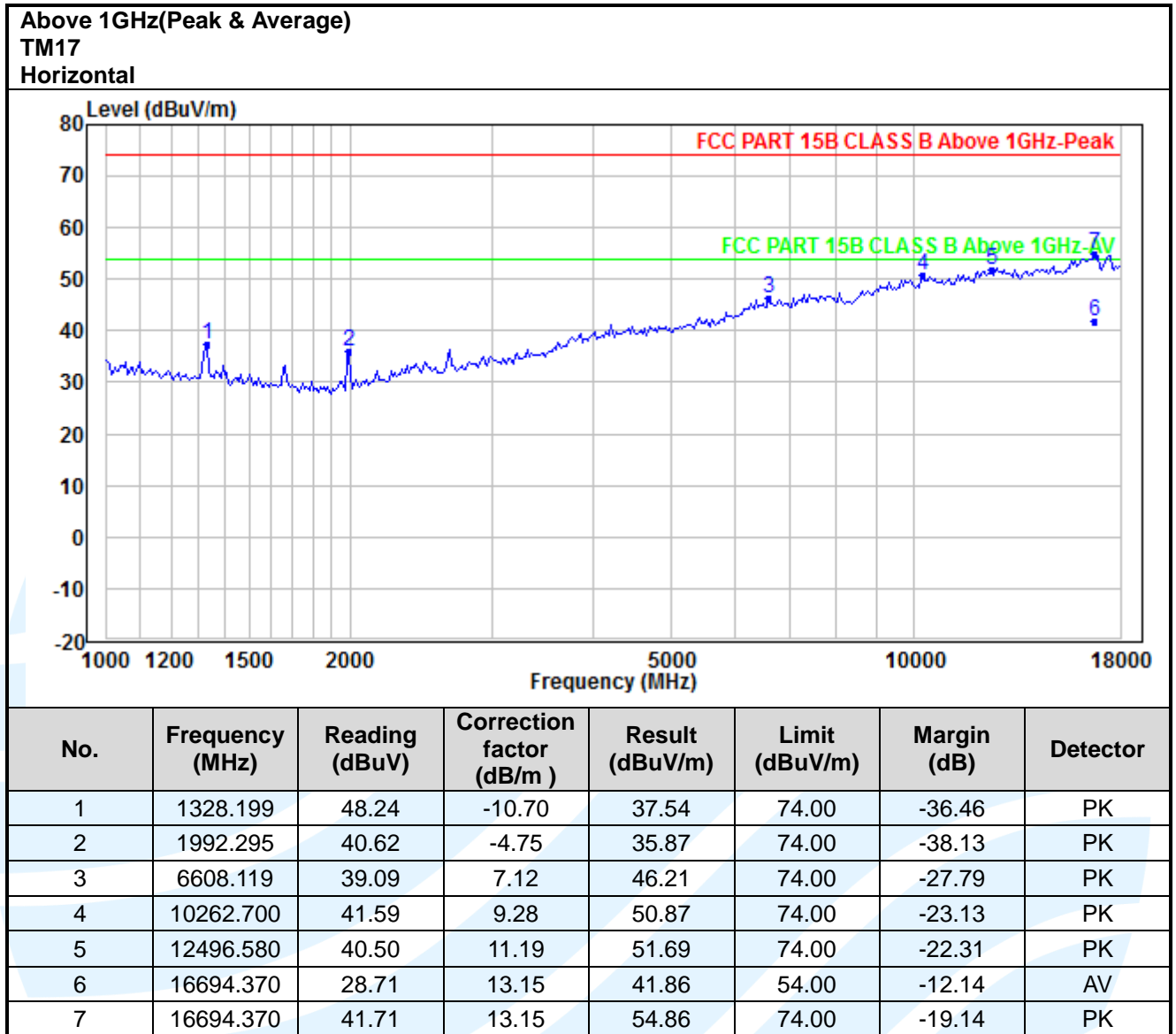
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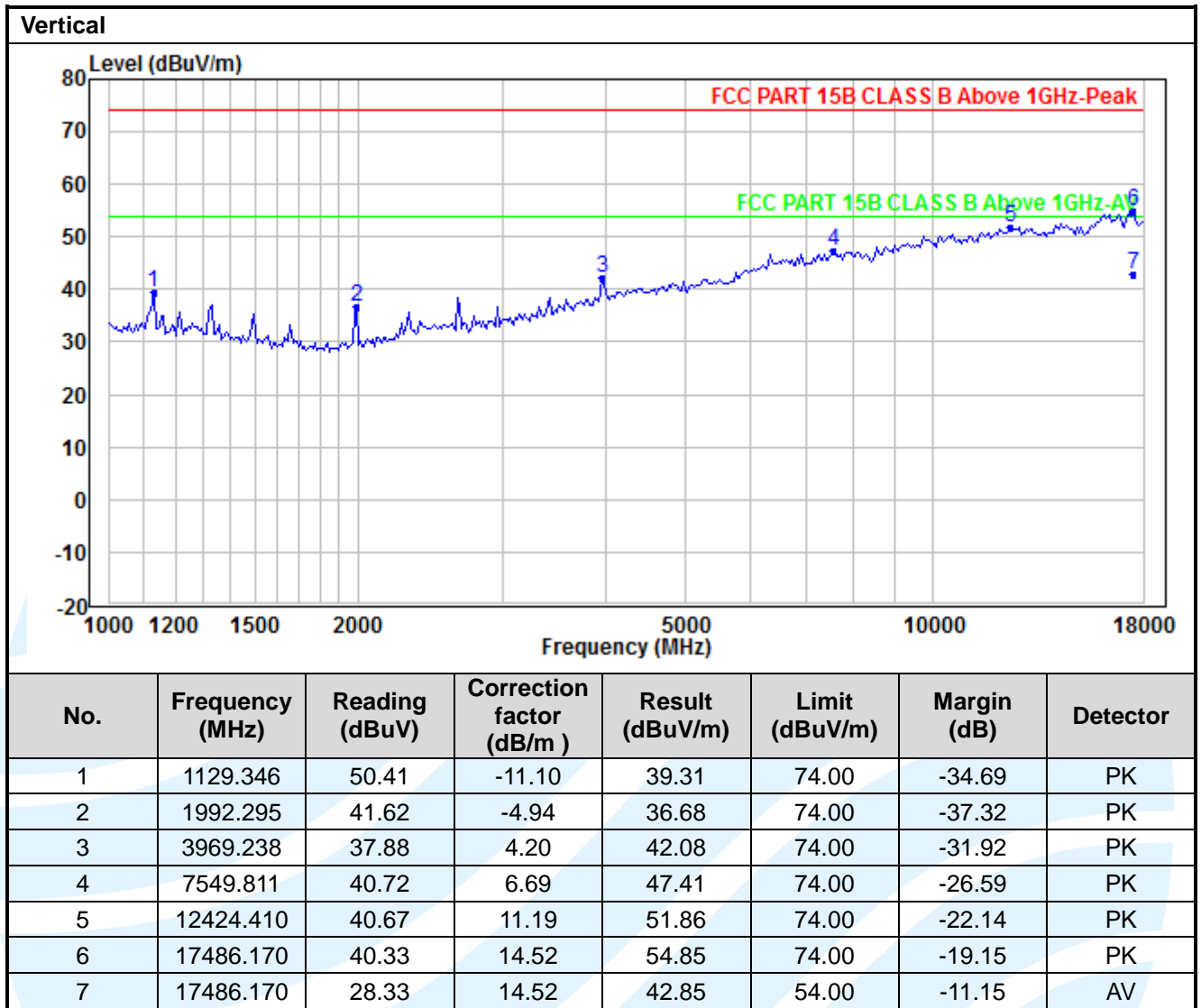
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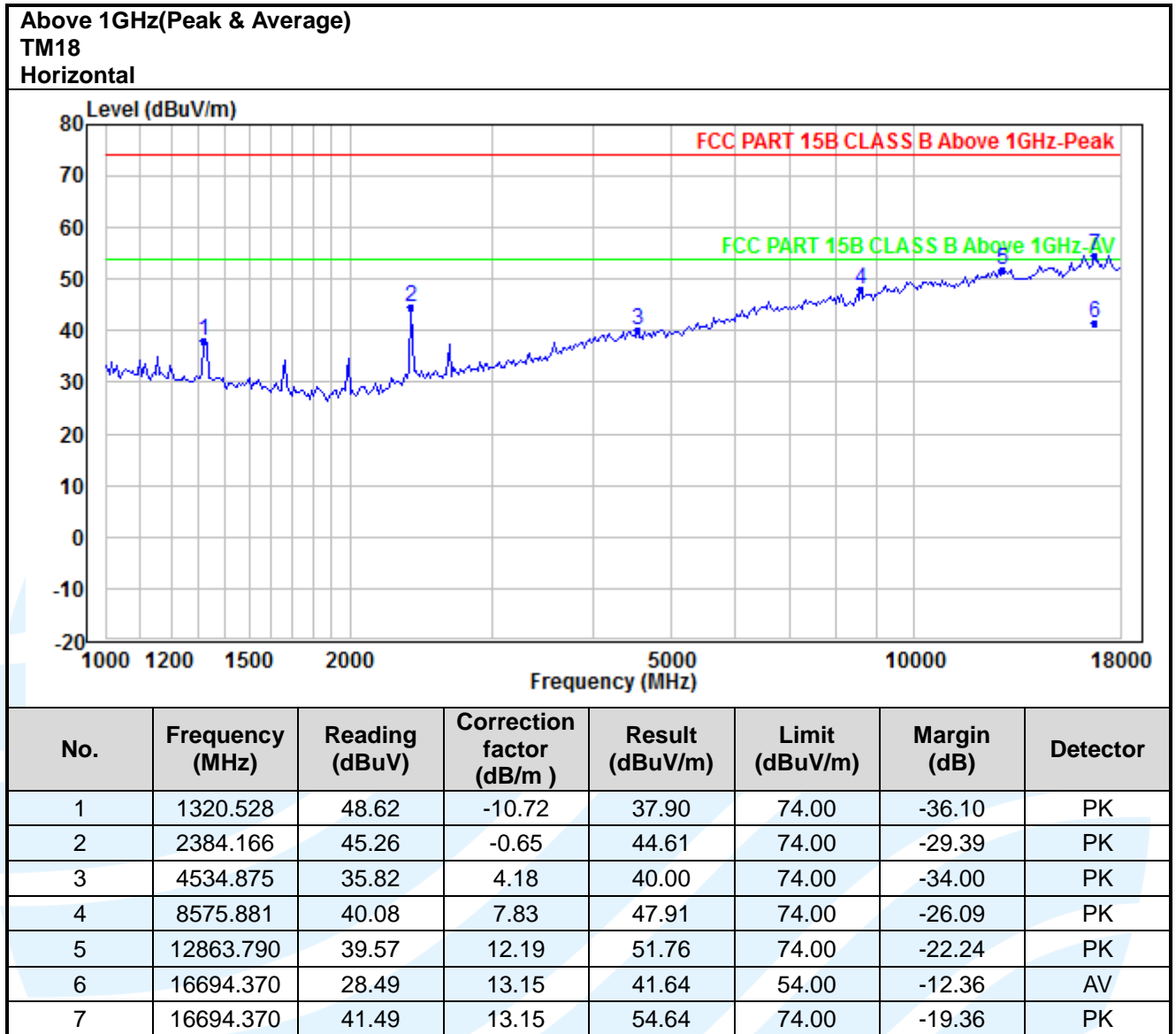
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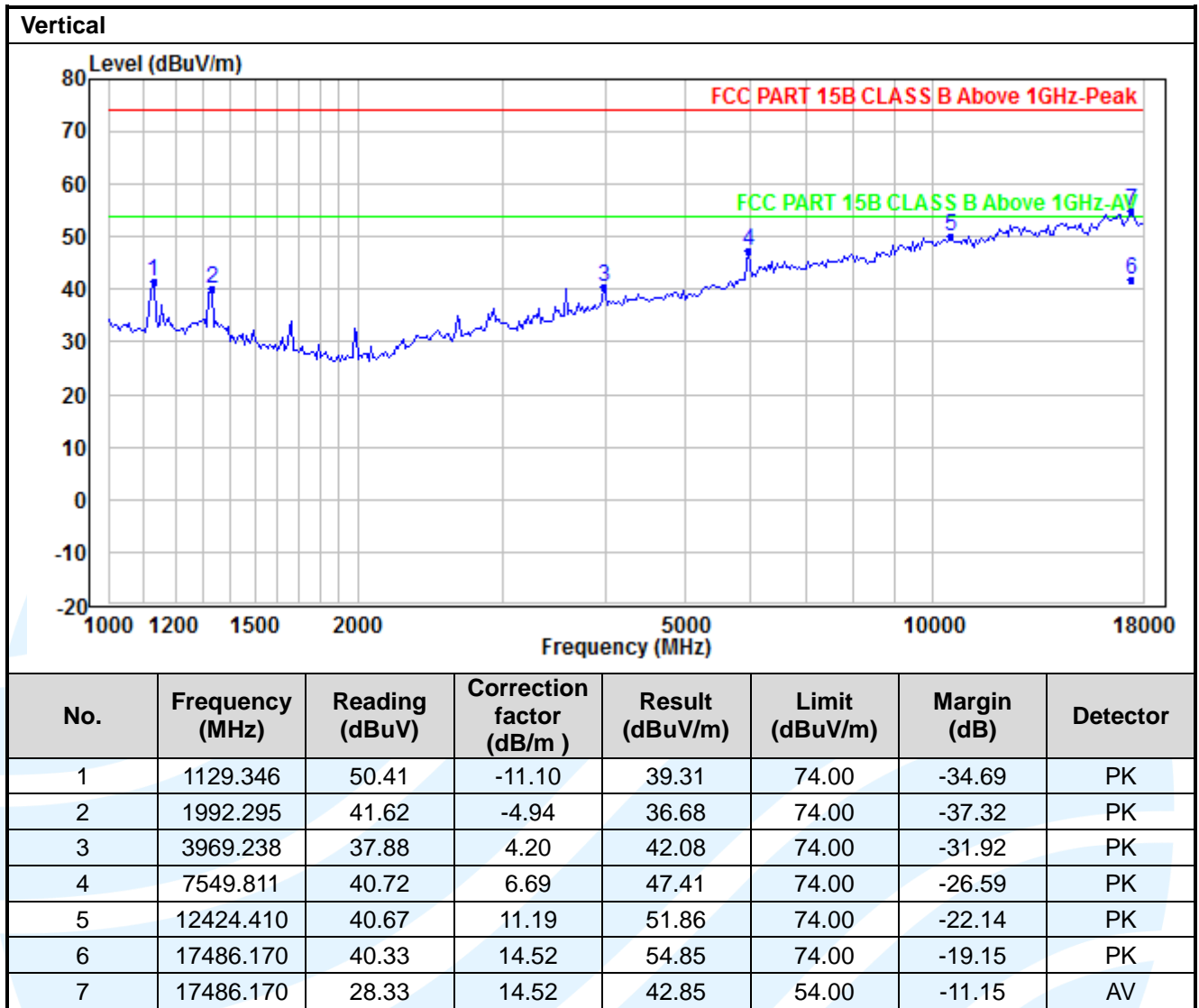
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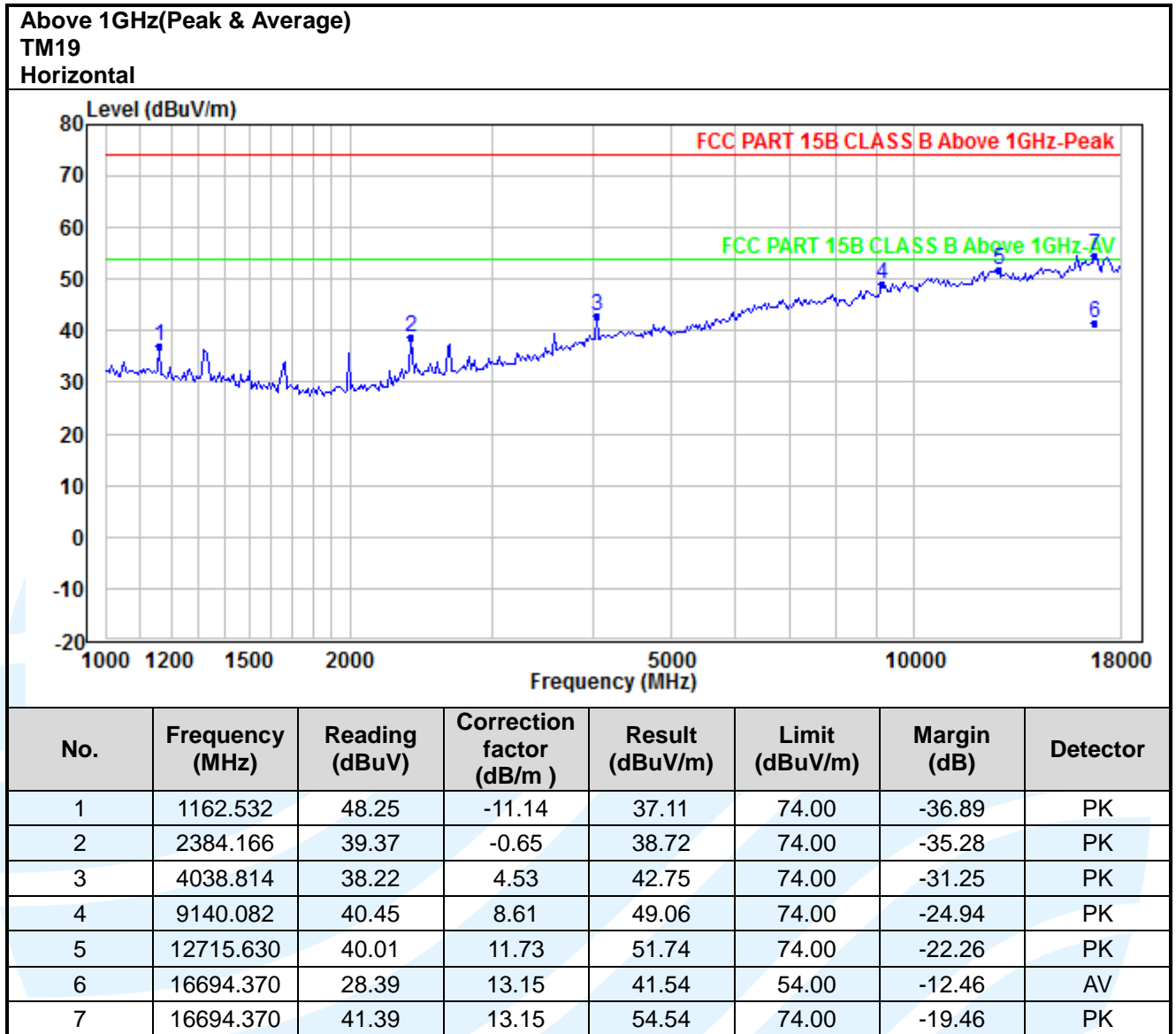
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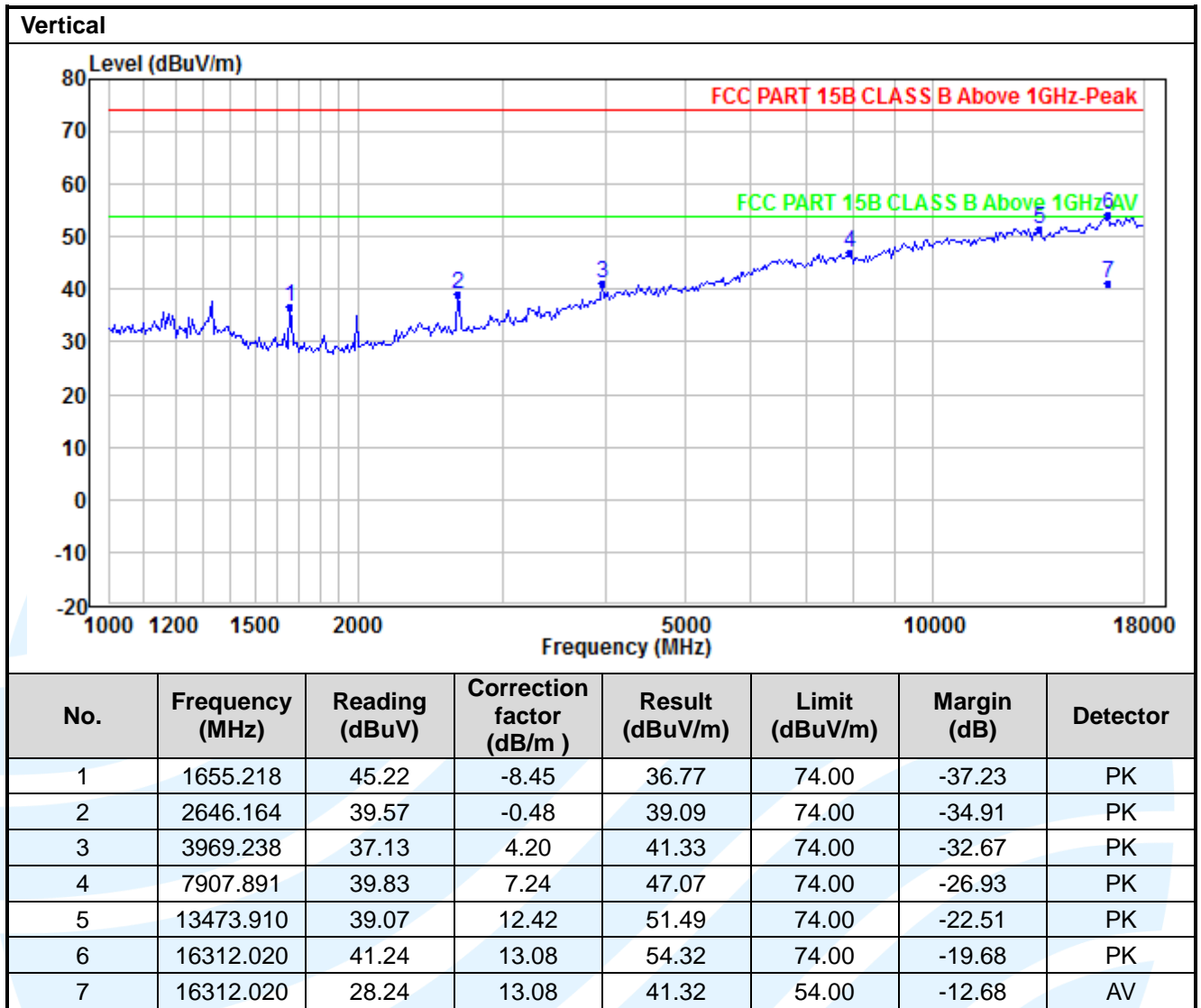
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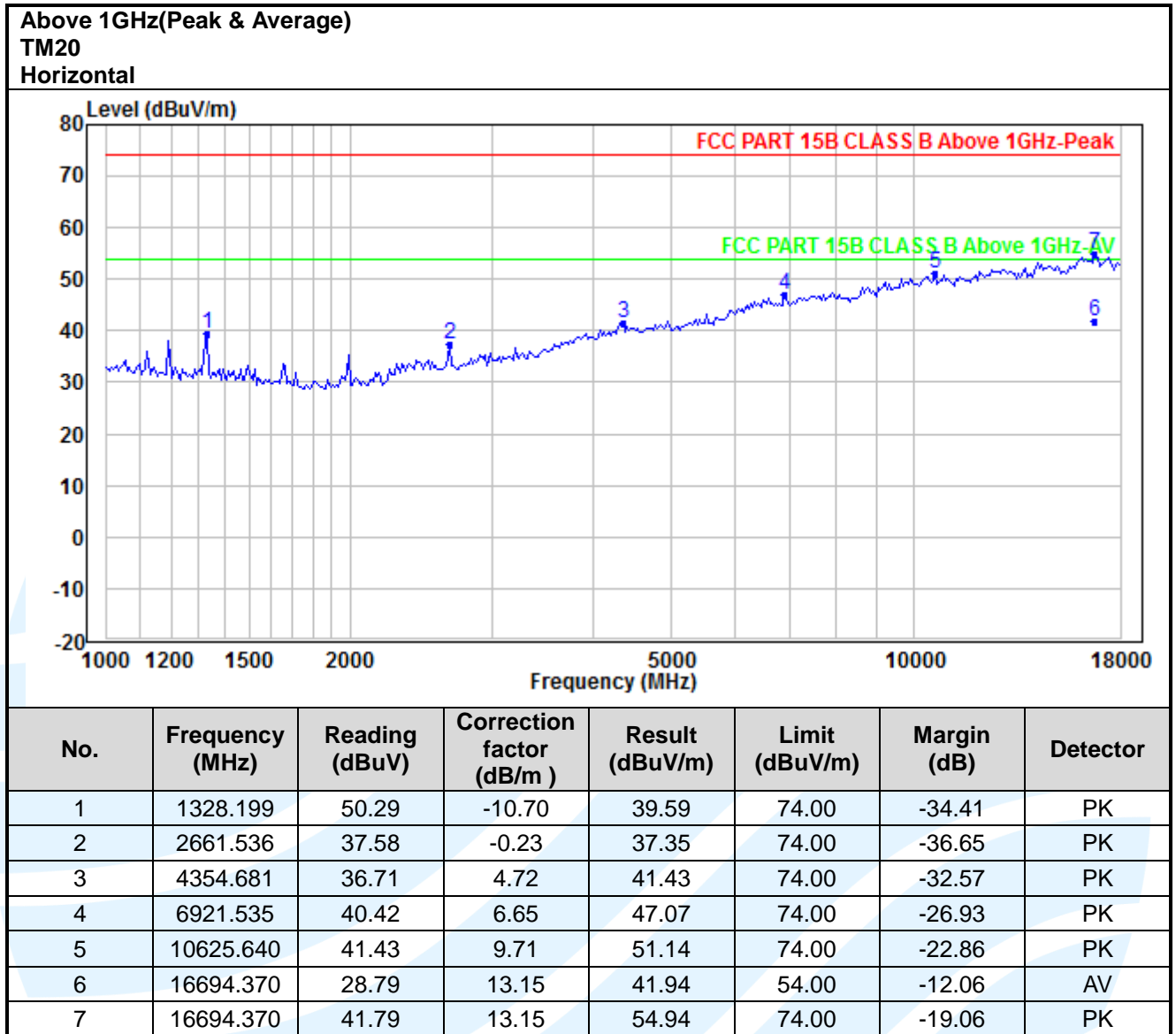
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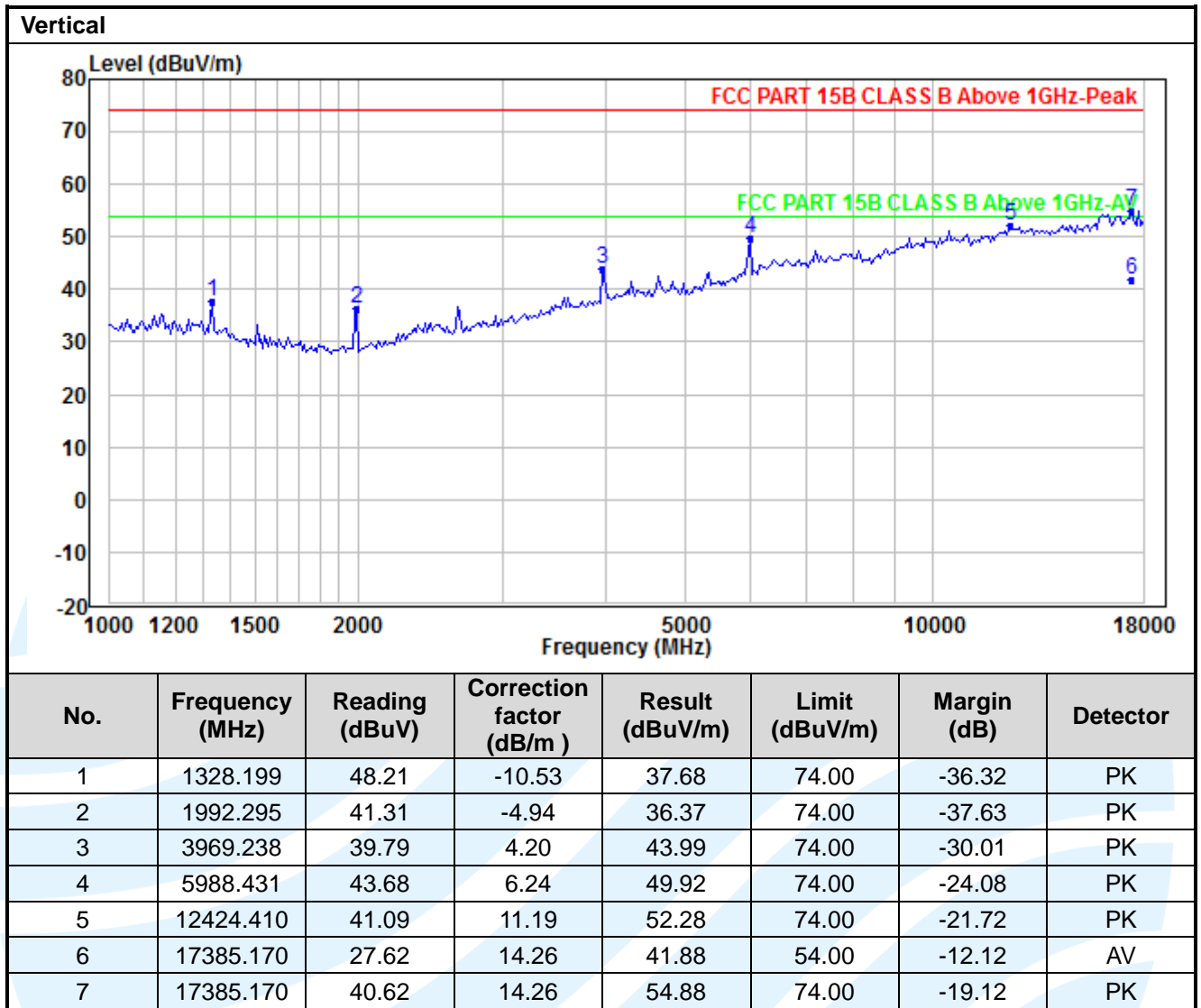
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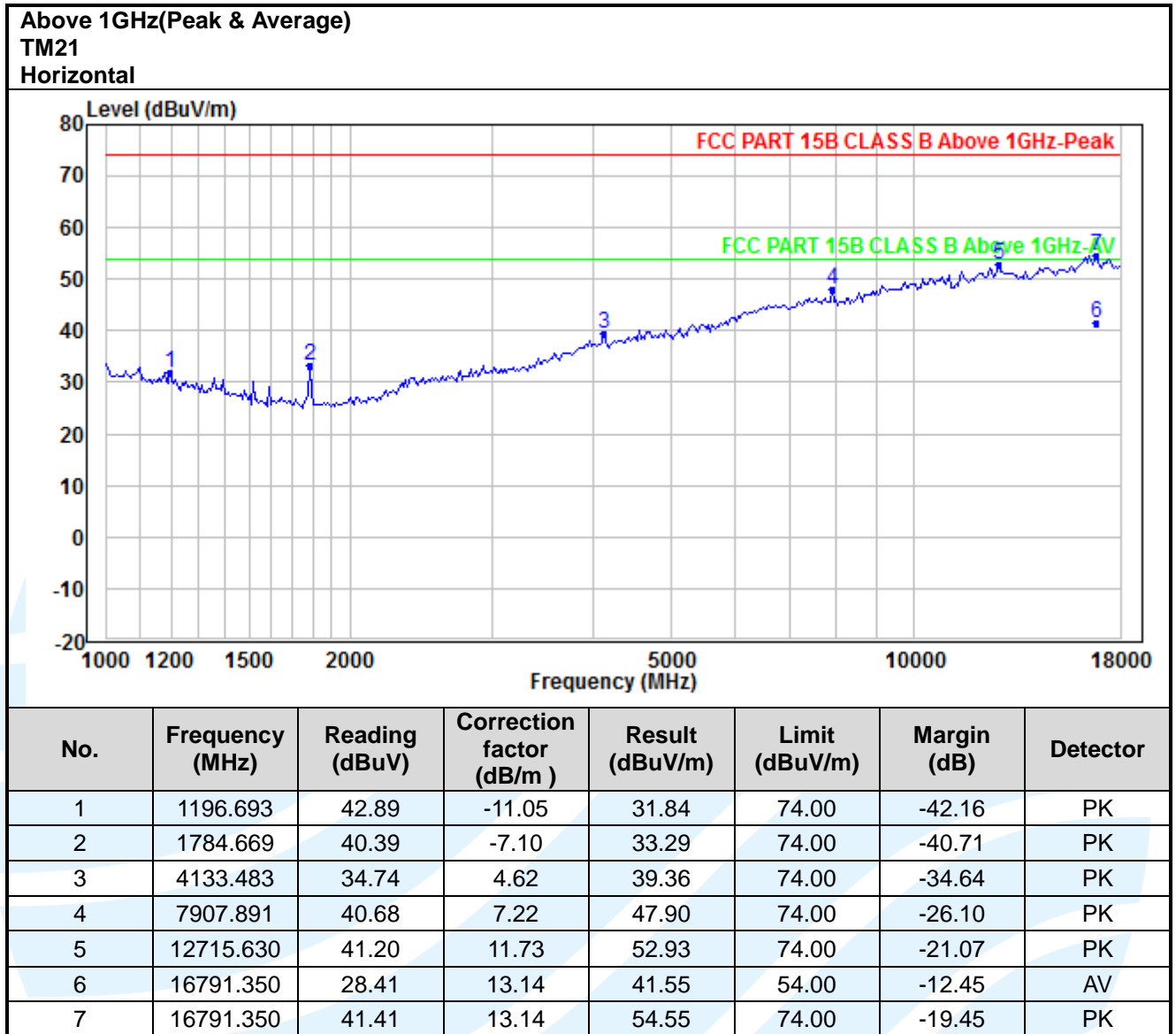
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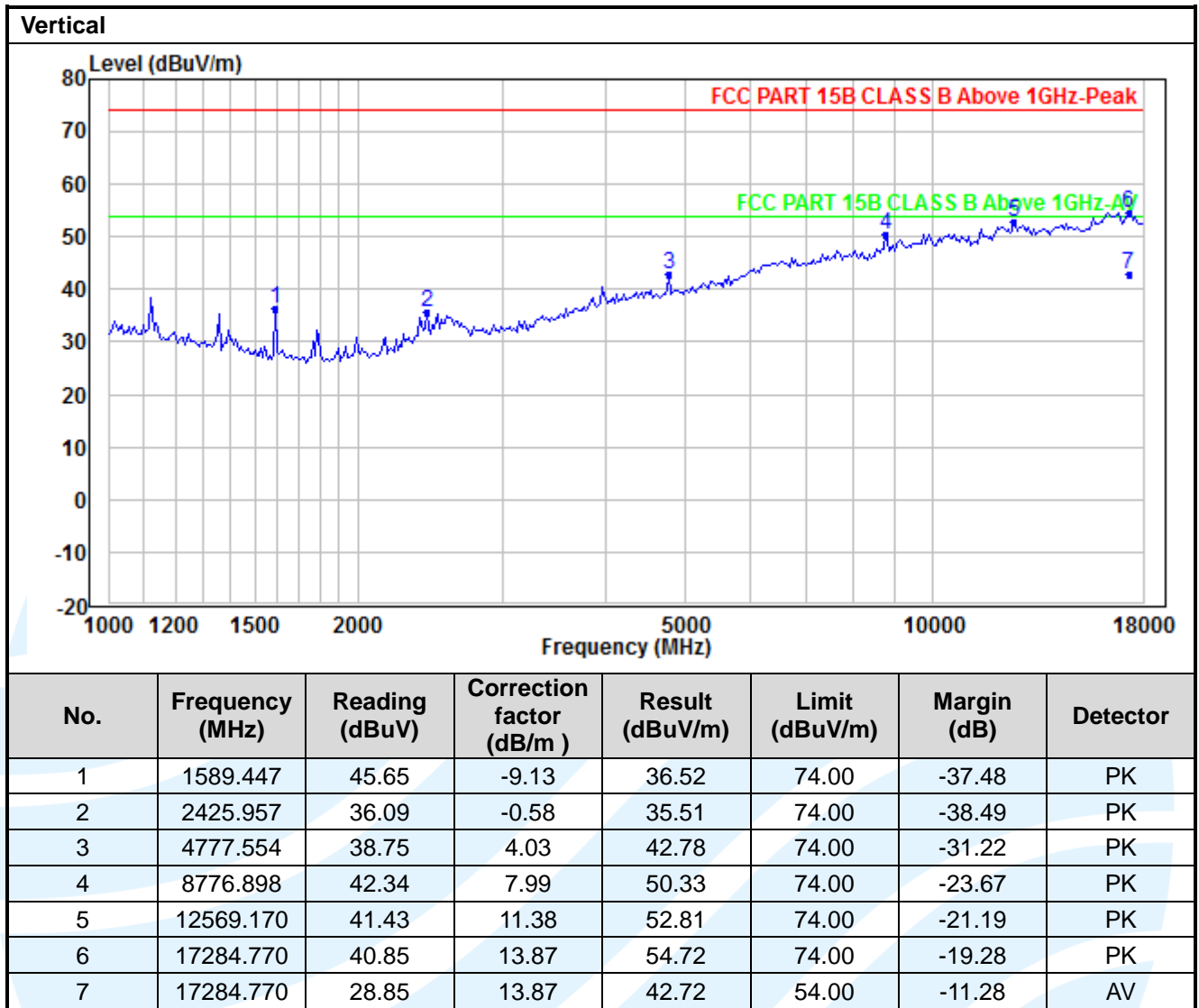
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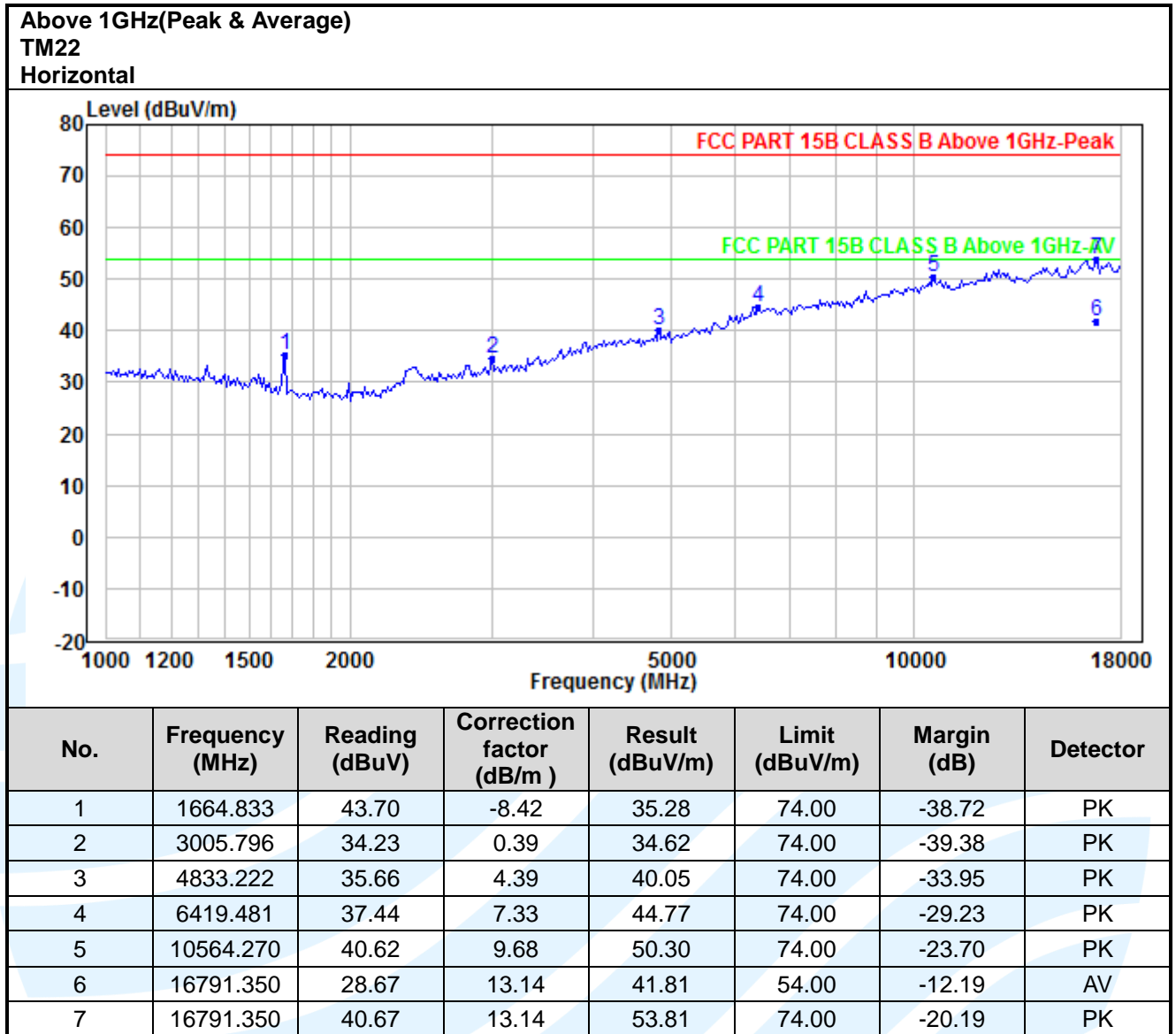
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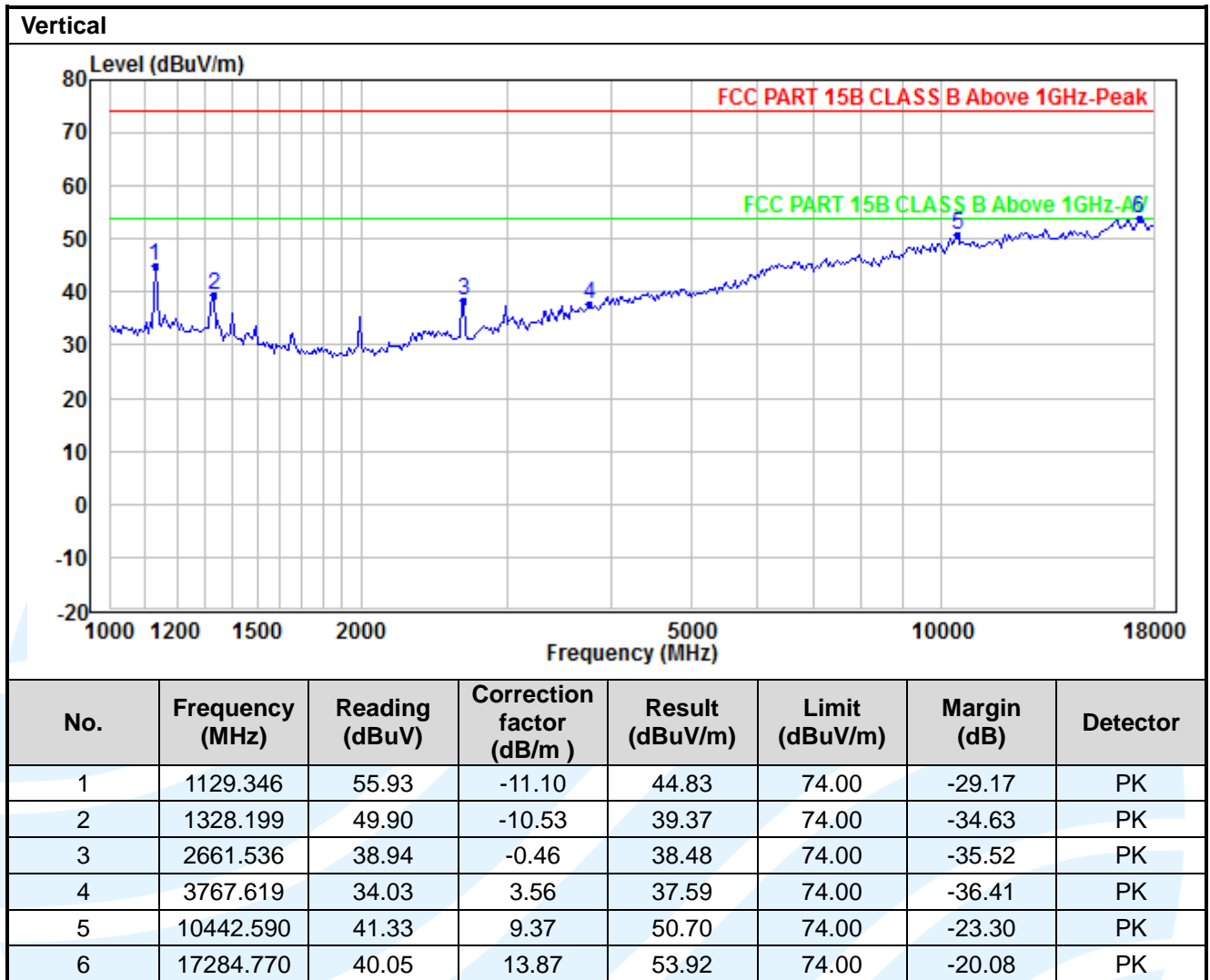
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Remark:

1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result – Limit
4. All possible modes of operation were investigated, and testing at two nominal voltages of 240V/50Hz and 120V/60Hz, only the worst case emissions reported.
5. For Radiated Emission above 18GHz, there was not any unwanted emission detected.
6. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits.

6.2 CONDUCTED EMISSION

Test Requirement: FCC 47 CFR Part 15.107
ICES-003 Issue 6 Section 6.1

Test Method: ANSI C63.4-2014

Limits:

Limits for Class B devices

Frequency range (MHz)	Limits (dB(μV))	
	Quasi-peak	Average
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50

Remark:

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz.

Test Setup: Refer to section 4.3.2 for details.

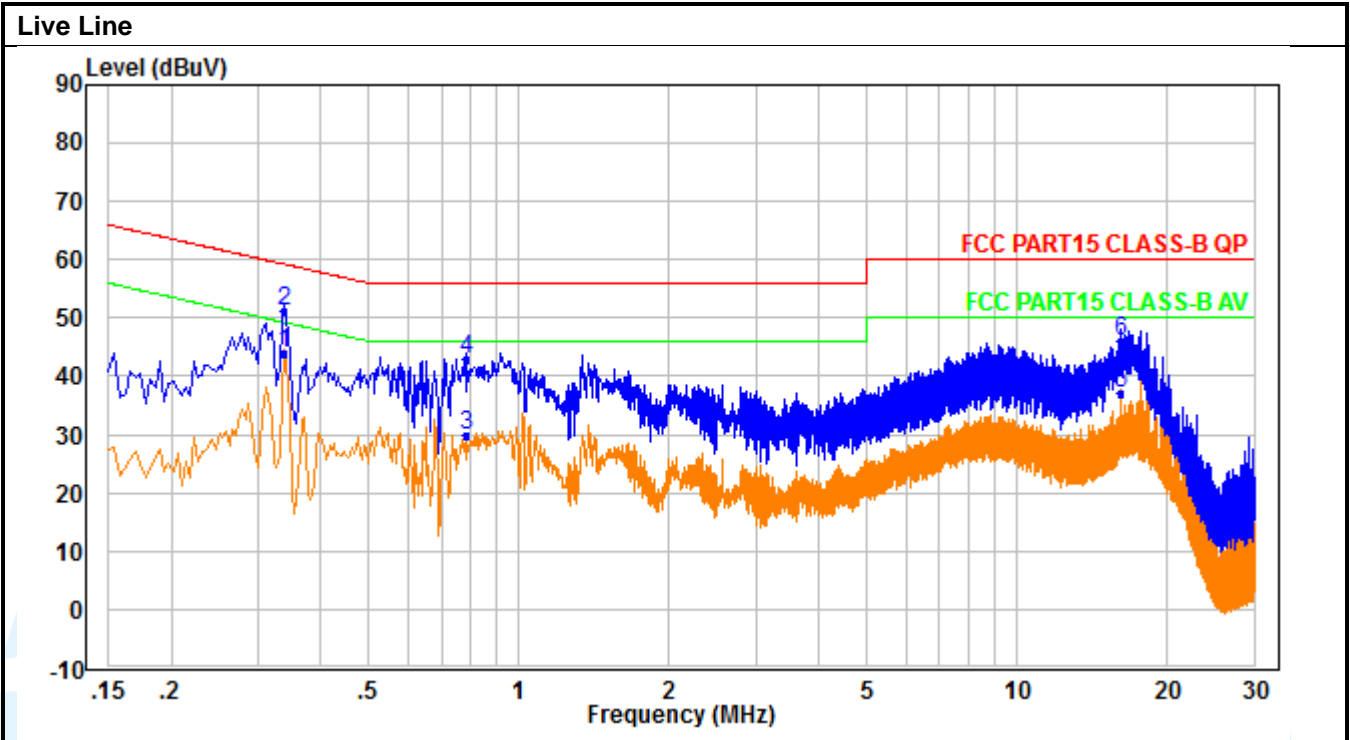
Test Procedures:

- 1) The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
- 2) The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.
- 3) For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

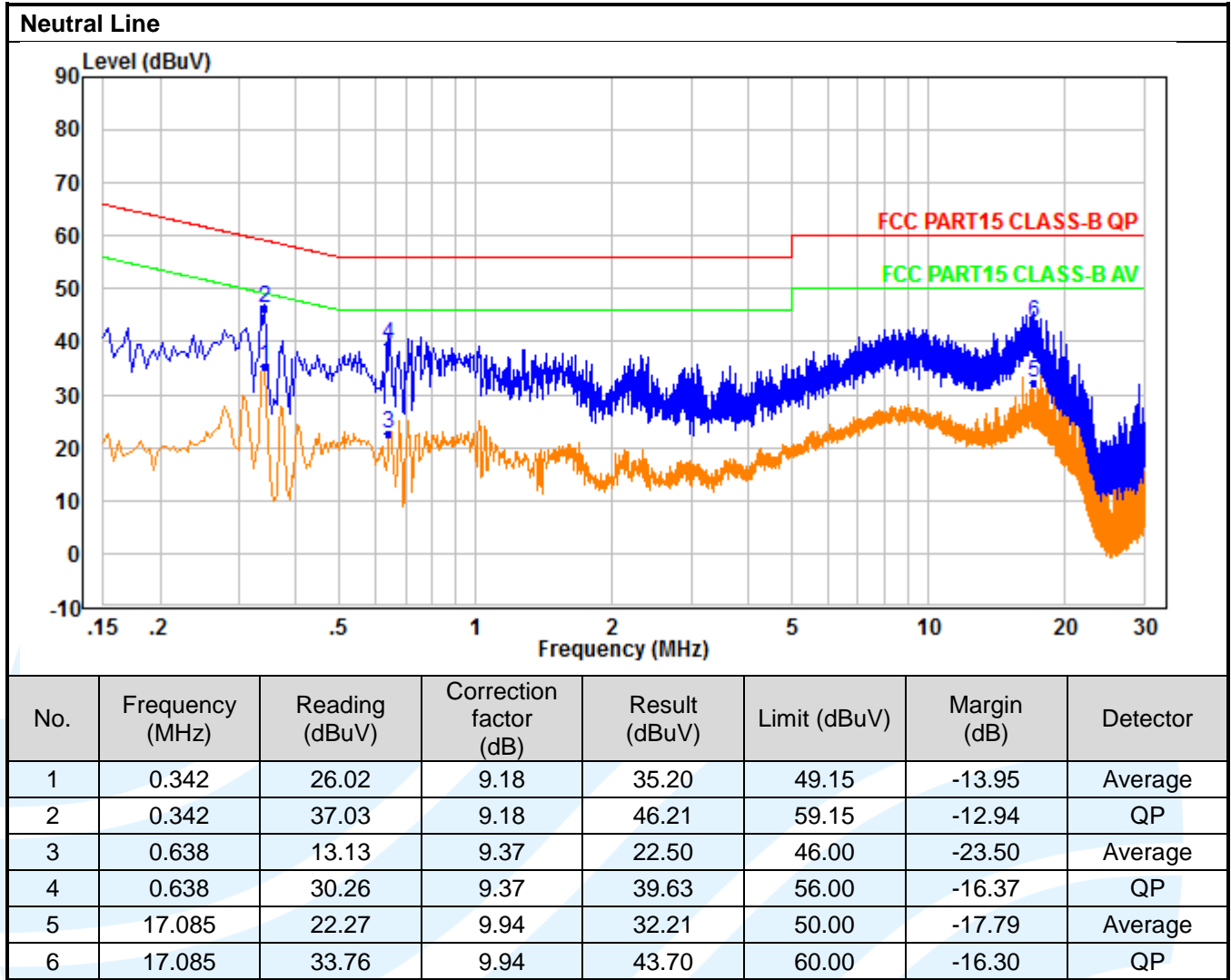
Equipment Used: Refer to section 3 for details.

Test Result: Pass

The measurement data as follows:
 Quasi Peak and Average:
 TM5

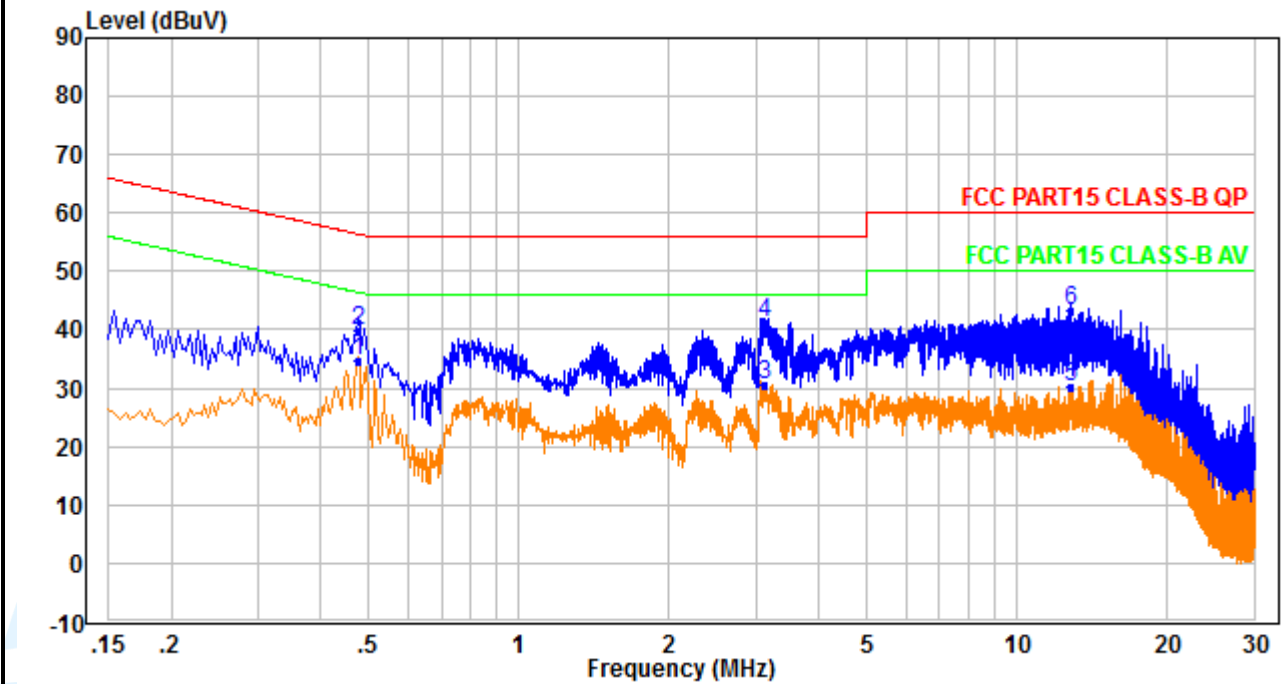


No.	Frequency (MHz)	Reading (dBUV)	Correction factor (dB)	Result (dBUV)	Limit (dBUV)	Margin (dB)	Detector
1	0.338	34.75	9.20	43.95	49.25	-5.30	Average
2	0.338	41.98	9.20	51.18	59.25	-8.07	QP
3	0.782	20.41	9.42	29.83	46.00	-16.17	Average
4	0.782	33.49	9.42	42.91	56.00	-13.09	QP
5	16.225	27.05	9.92	36.97	50.00	-13.03	Average
6	16.225	36.06	9.92	45.98	60.00	-14.02	QP

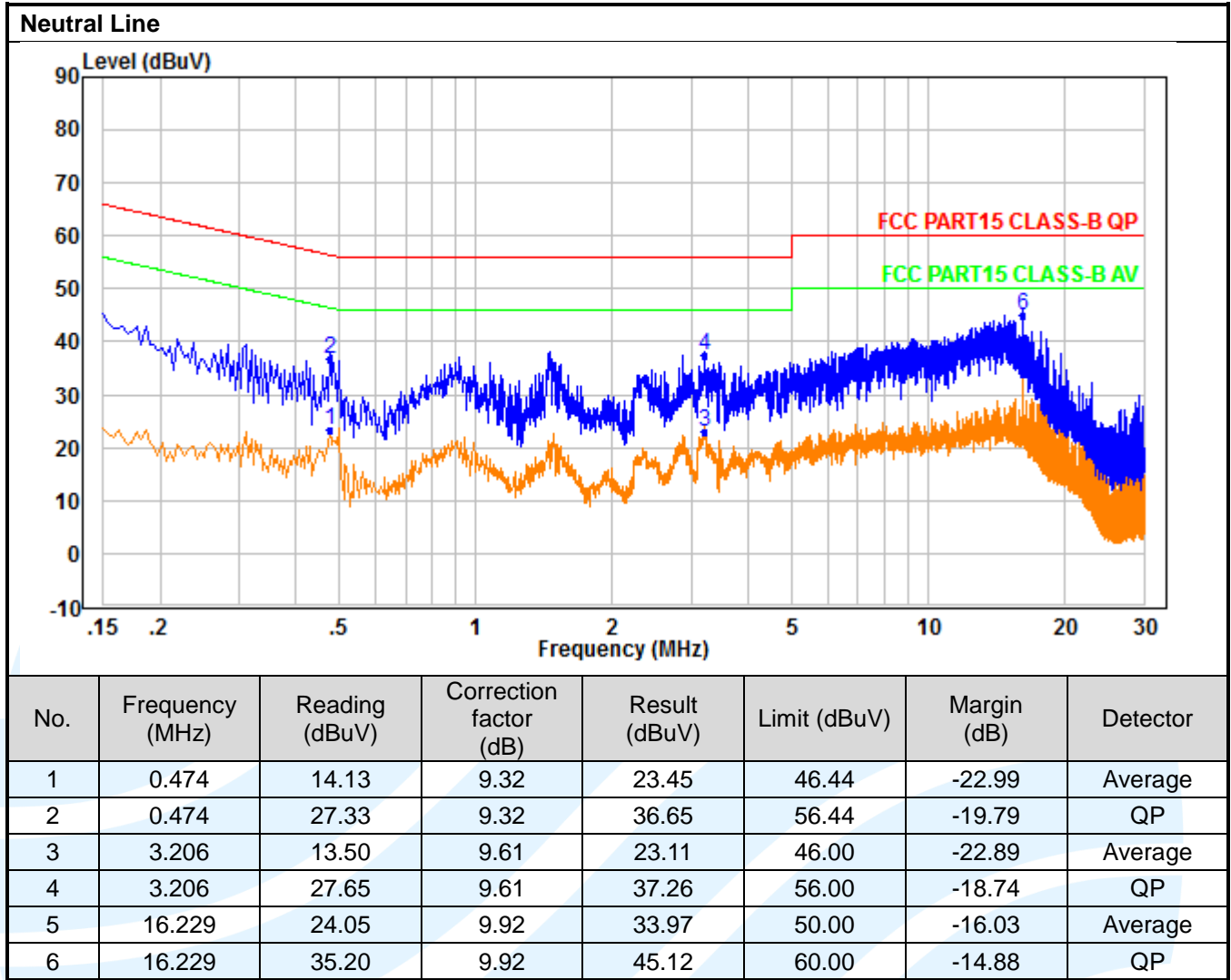


**Quasi Peak and Average:
TM6**

Live Line



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.474	25.22	9.30	34.52	46.44	-11.92	Average
2	0.474	30.58	9.30	39.88	56.44	-16.56	QP
3	3.106	21.08	9.60	30.68	46.00	-15.32	Average
4	3.106	31.44	9.60	41.04	56.00	-14.96	QP
5	12.885	20.34	9.80	30.14	50.00	-19.86	Average
6	12.885	33.44	9.80	43.24	60.00	-16.76	QP



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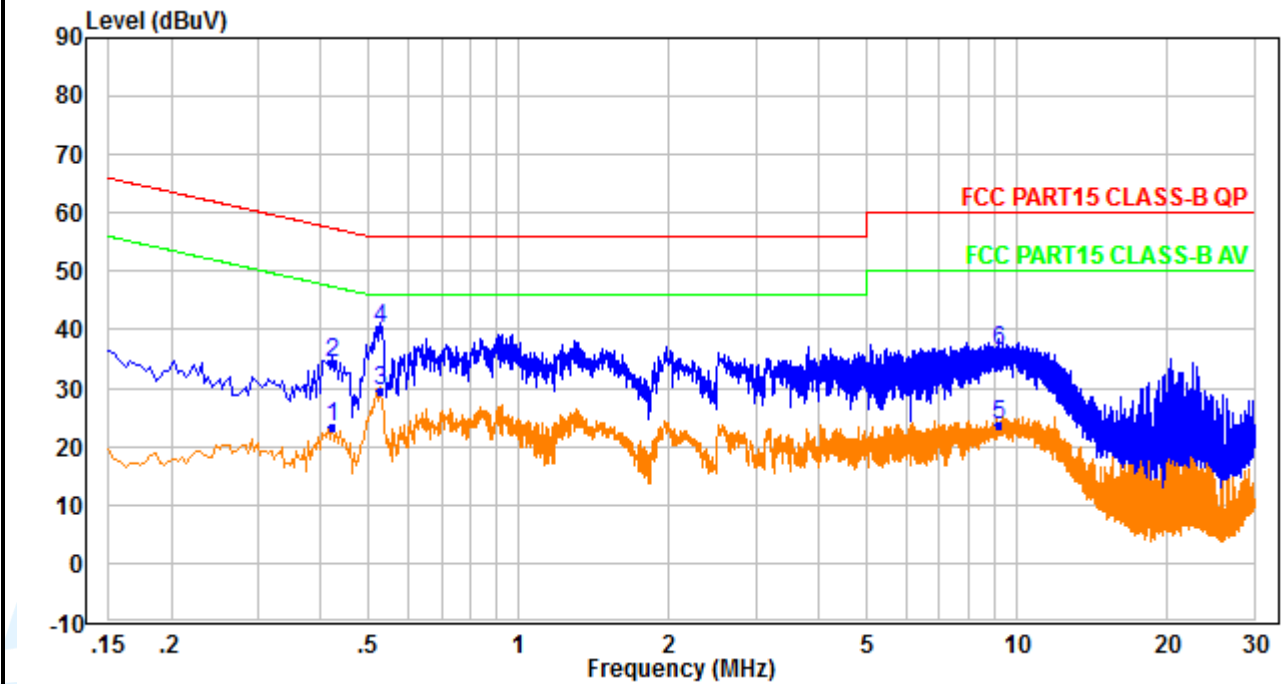
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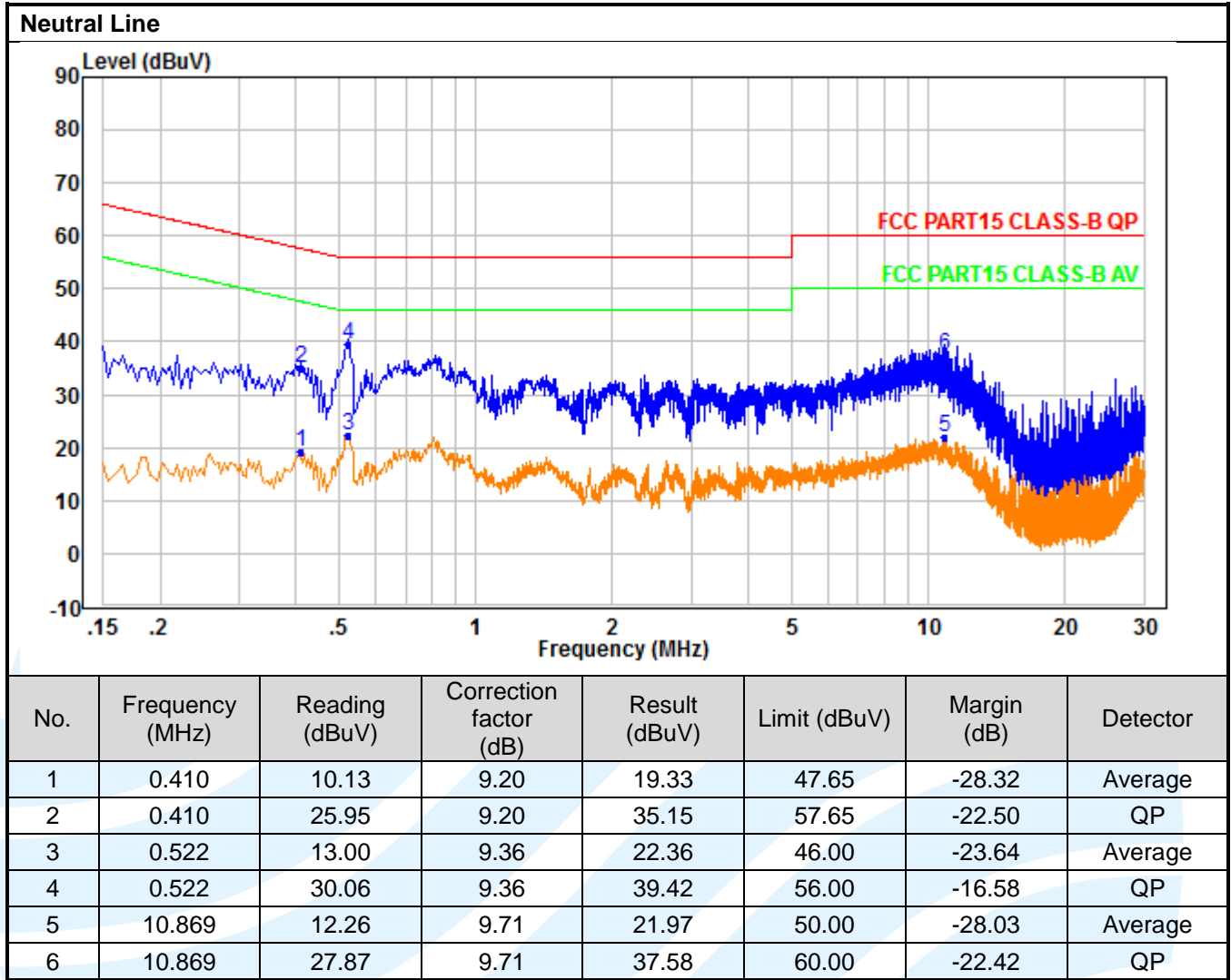
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**Quasi Peak and Average:
TM7**

Live Line

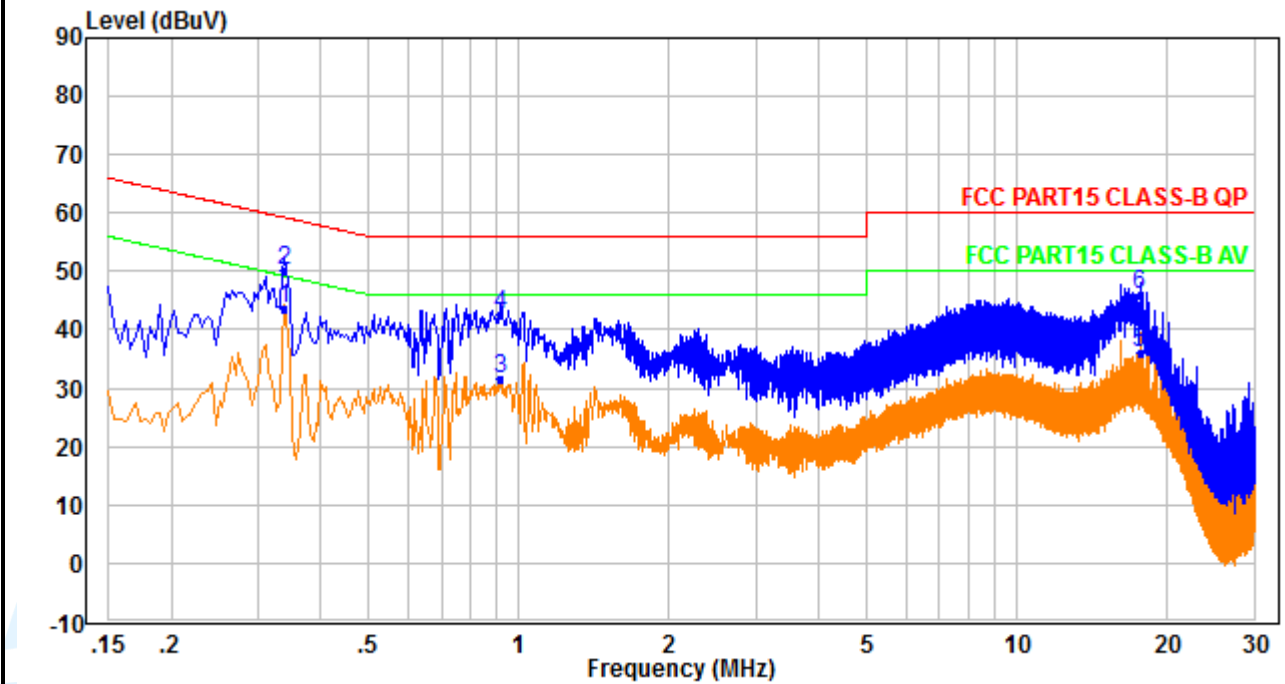


No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.422	14.11	9.23	23.34	47.41	-24.07	Average
2	0.422	25.17	9.23	34.40	57.41	-23.01	QP
3	0.526	20.10	9.33	29.43	46.00	-16.57	Average
4	0.526	30.81	9.33	40.14	56.00	-15.86	QP
5	9.193	14.09	9.67	23.76	50.00	-26.24	Average
6	9.193	26.76	9.67	36.43	60.00	-23.57	QP

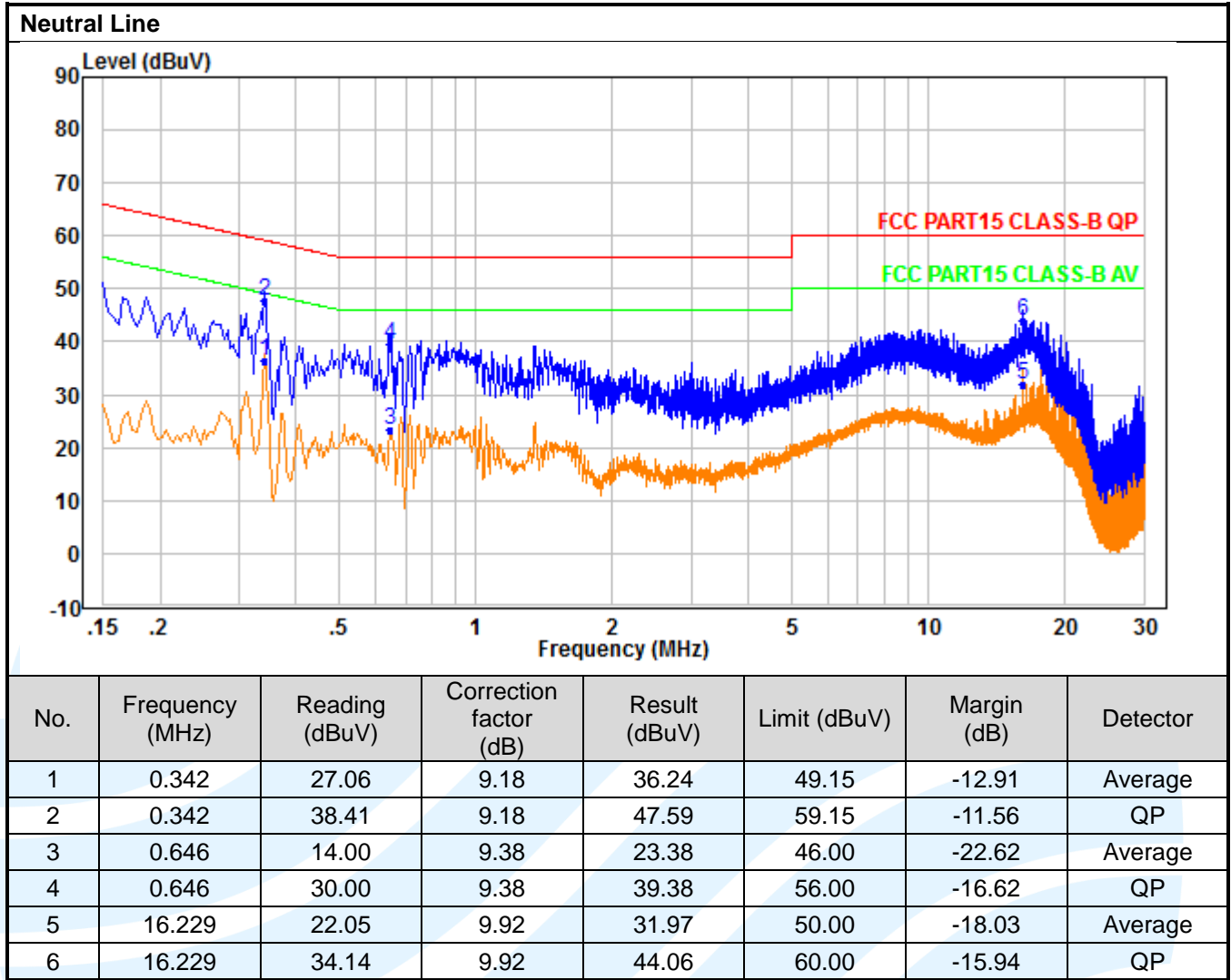


**Quasi Peak and Average:
TM8**

Live Line

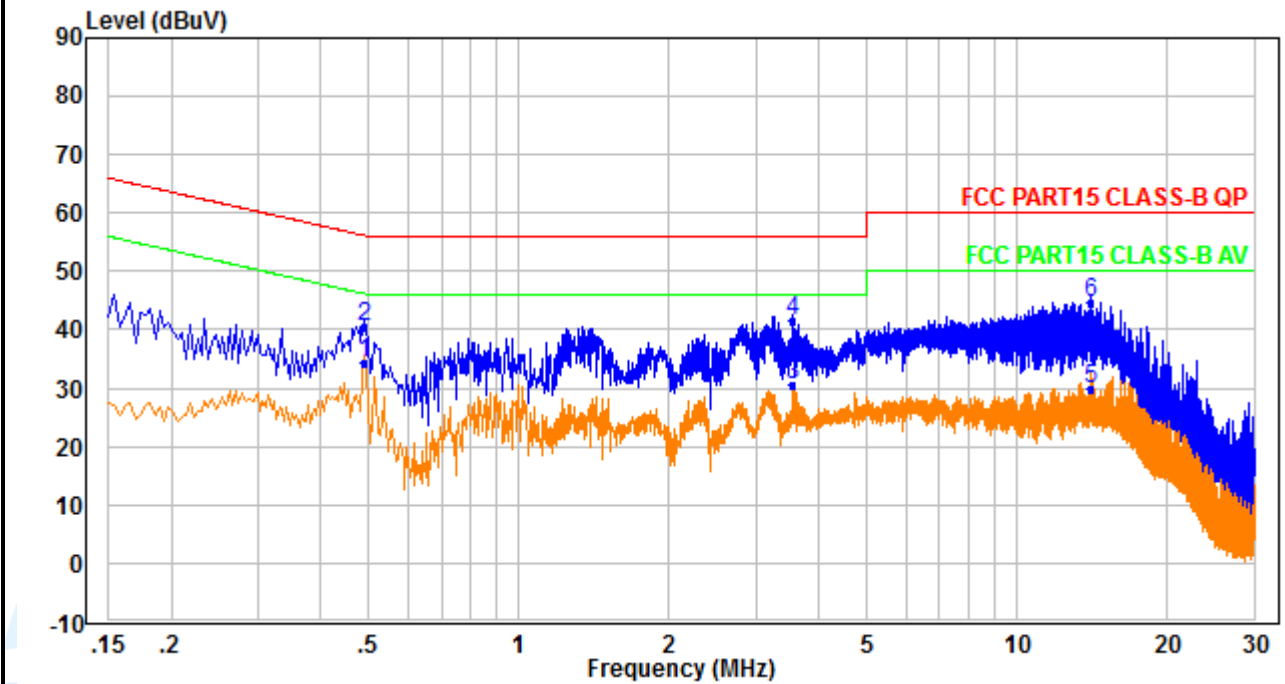


No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.338	34.38	9.20	43.58	49.25	-5.67	Average
2	0.338	40.84	9.20	50.04	59.25	-9.21	QP
3	0.914	22.05	9.42	31.47	46.00	-14.53	Average
4	0.914	33.07	9.42	42.49	56.00	-13.51	QP
5	17.693	26.04	9.97	36.01	50.00	-13.99	Average
6	17.693	36.17	9.97	46.14	60.00	-13.86	QP

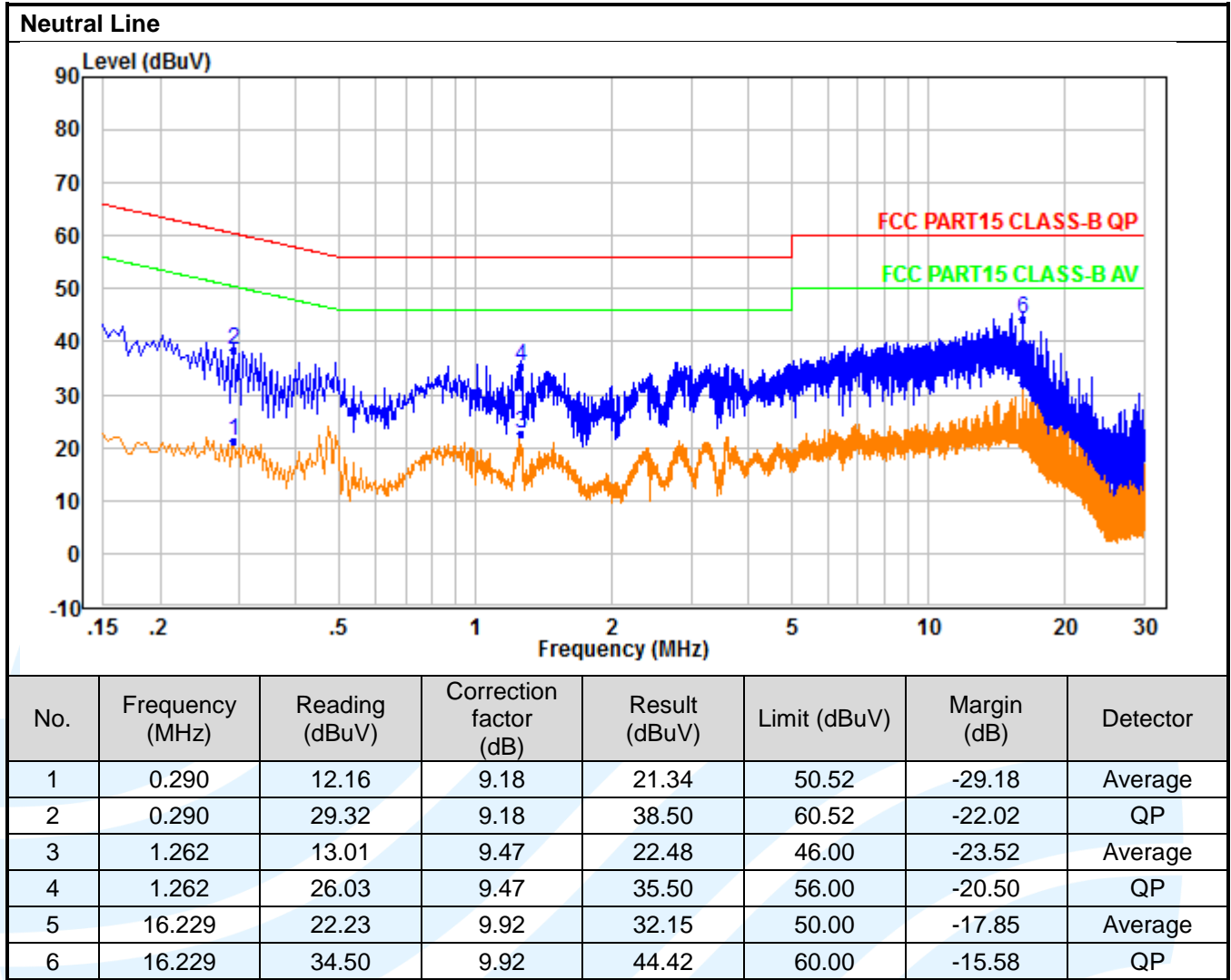


**Quasi Peak and Average:
TM9**

Live Line



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.490	25.05	9.32	34.37	46.17	-11.80	Average
2	0.490	31.09	9.32	40.41	56.17	-15.76	QP
3	3.550	21.12	9.60	30.72	46.00	-15.28	Average
4	3.550	31.87	9.60	41.47	56.00	-14.53	QP
5	14.153	20.11	9.86	29.97	50.00	-20.03	Average
6	14.153	34.88	9.86	44.74	60.00	-15.26	QP



Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: 16/F, Block A, Building 6, Baoneng Science and Technology Park, Qingxiang Road No.1, Longhua New District, Shenzhen, China

Tel: +86-755-28230888

Fax: +86-755-28230886

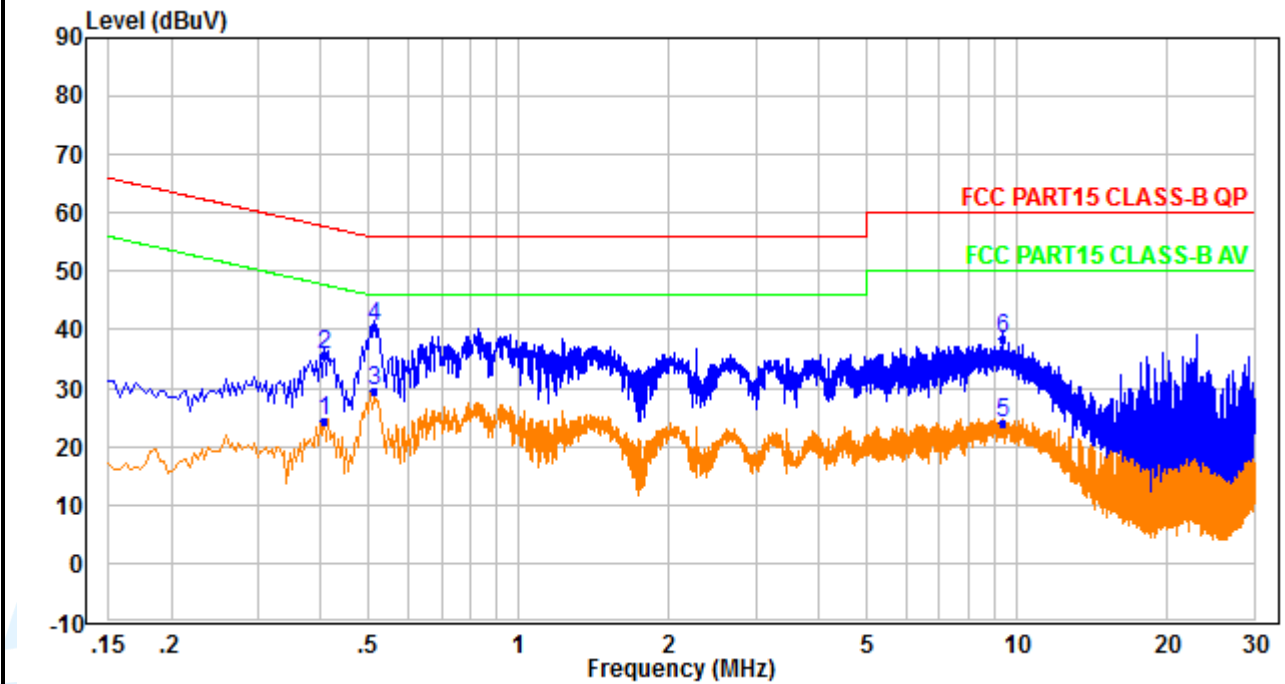
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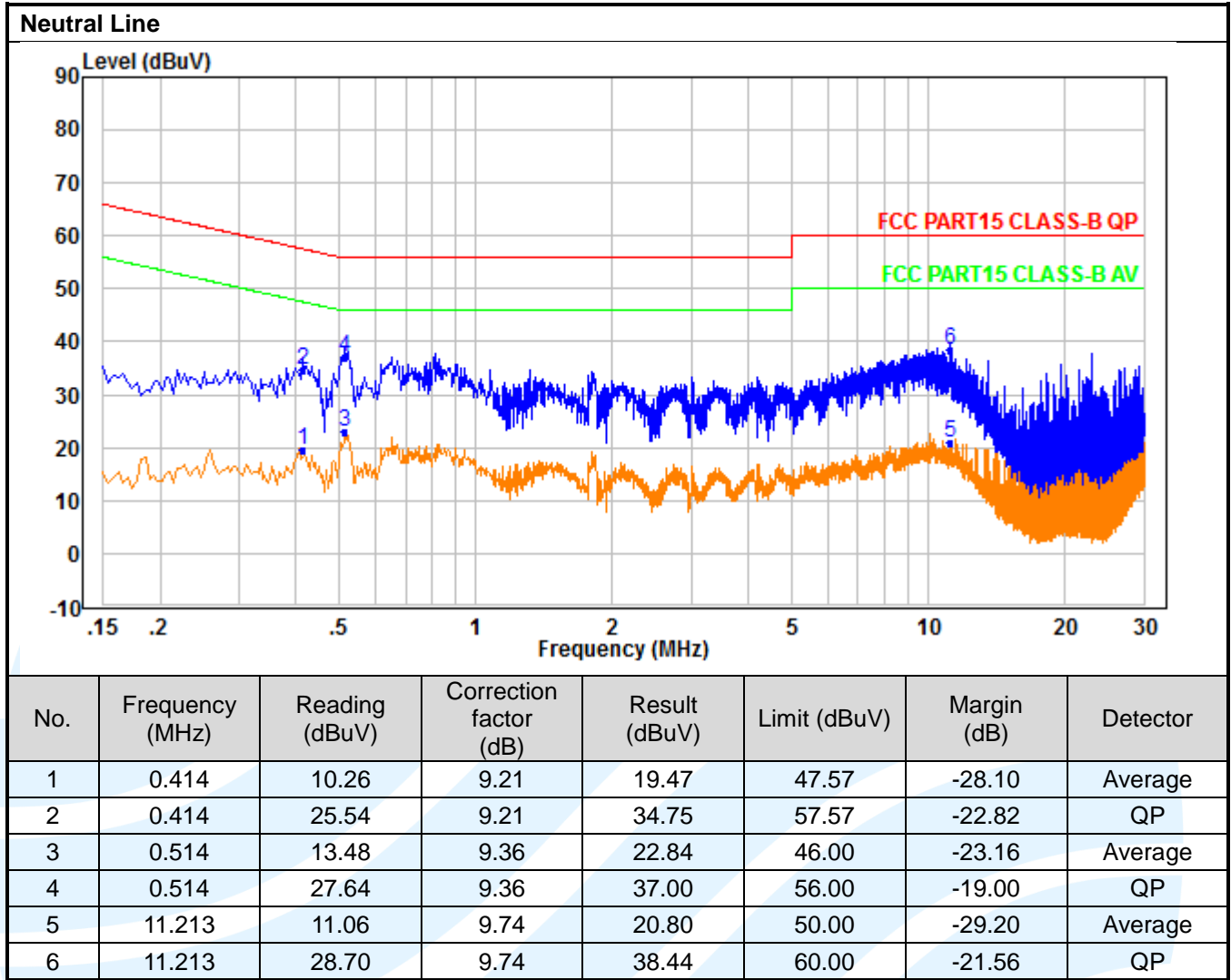
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**Quasi Peak and Average:
TM10**

Live Line



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.406	15.03	9.21	24.24	47.73	-23.49	Average
2	0.406	26.44	9.21	35.65	57.73	-22.08	QP
3	0.510	20.17	9.33	29.50	46.00	-16.50	Average
4	0.510	31.23	9.33	40.56	56.00	-15.44	QP
5	9.389	14.37	9.67	24.04	50.00	-25.96	Average
6	9.389	28.84	9.67	38.51	60.00	-21.49	QP



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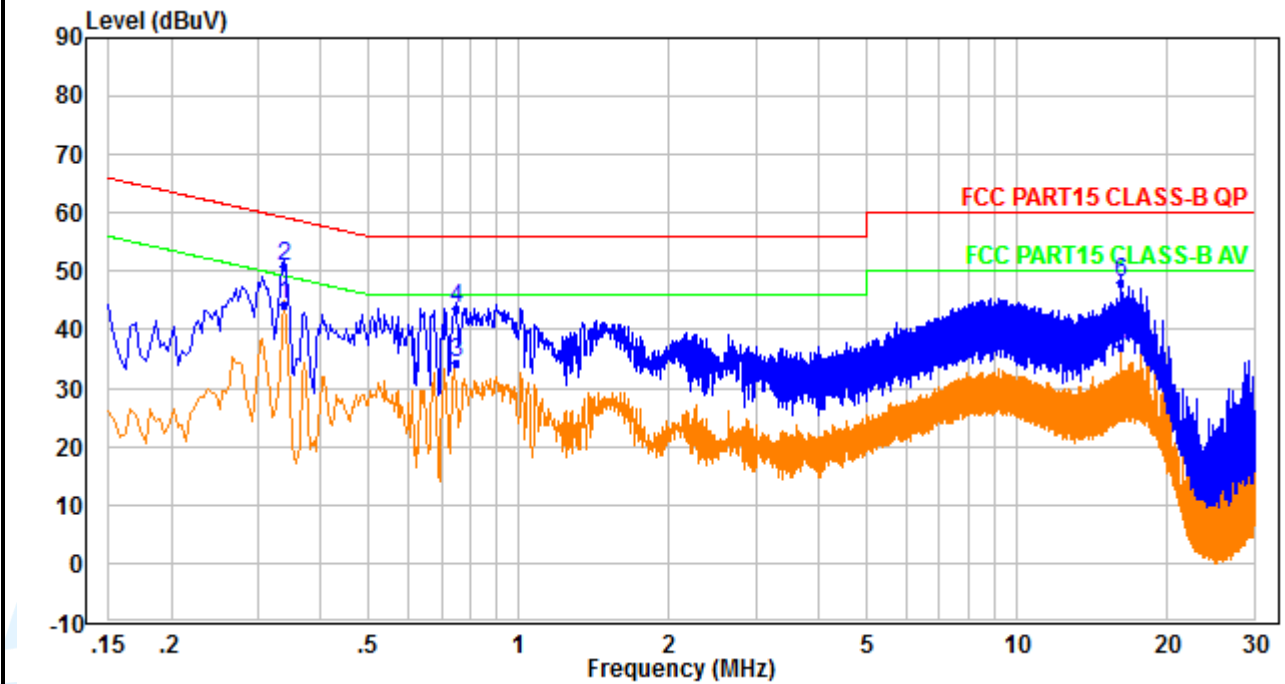
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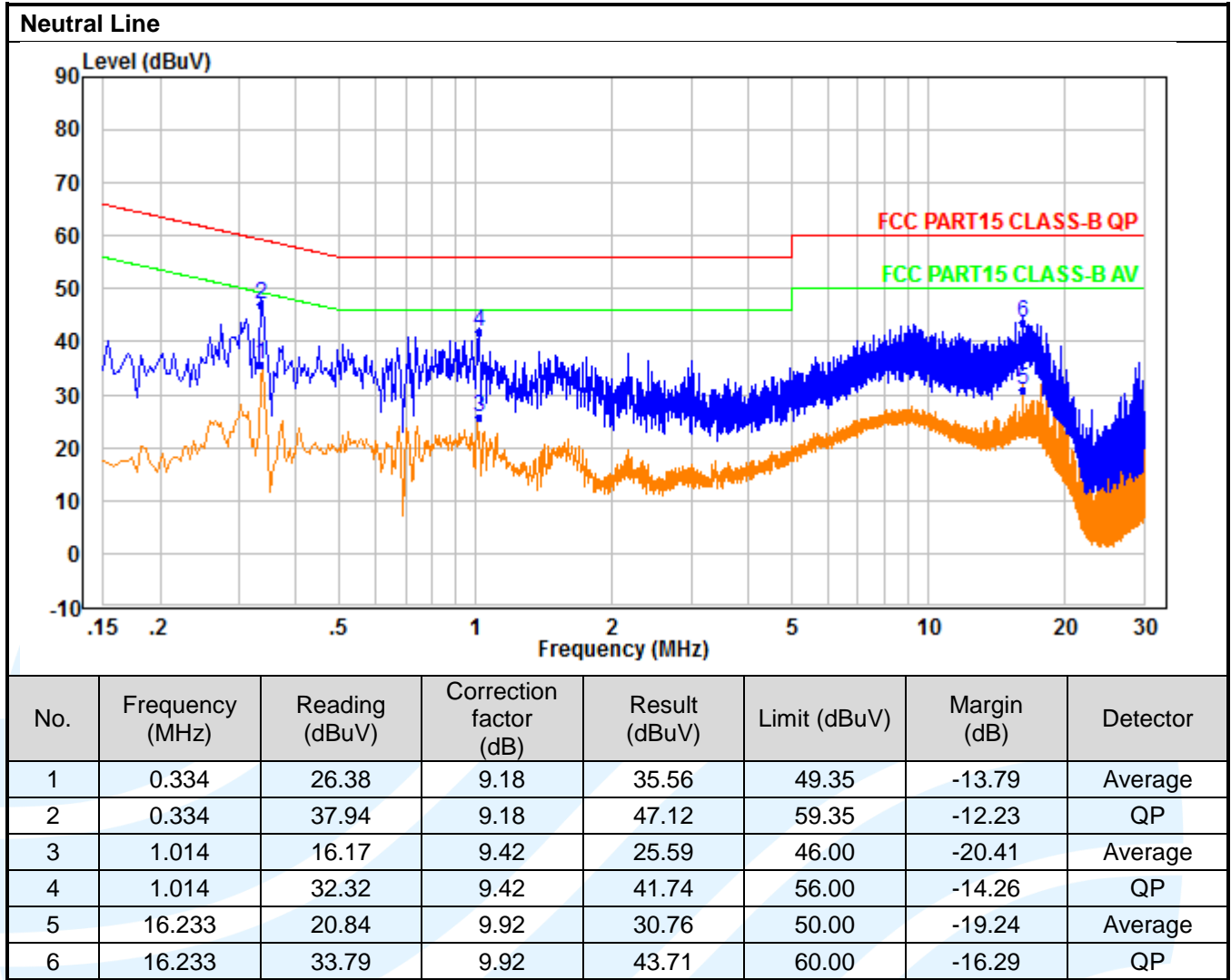
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**Quasi Peak and Average:
TM15**

Live Line



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.338	35.21	9.20	44.41	49.25	-4.84	Average
2	0.338	41.53	9.20	50.73	59.25	-8.52	QP
3	0.750	25.02	9.42	34.44	46.00	-11.56	Average
4	0.750	34.09	9.42	43.51	56.00	-12.49	QP
5	16.229	27.10	9.92	37.02	50.00	-12.98	Average
6	16.229	38.14	9.92	48.06	60.00	-11.94	QP



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Tel: +86-755-28230888

Fax: +86-755-28230886

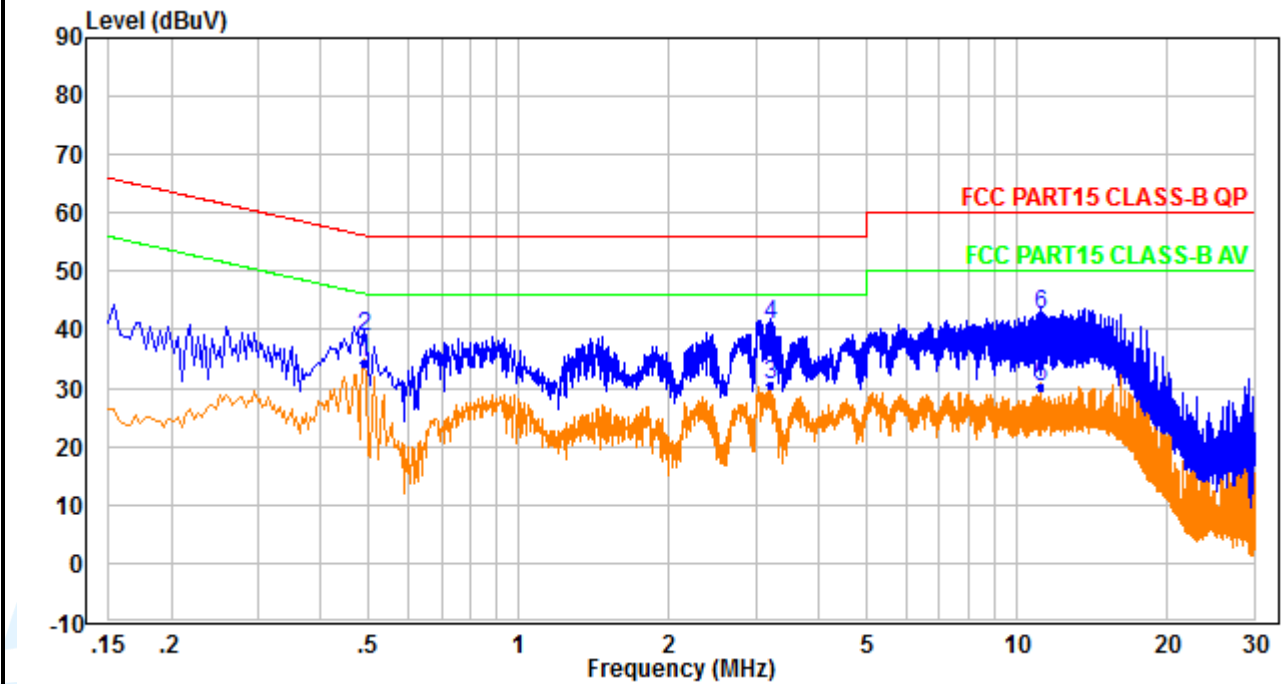
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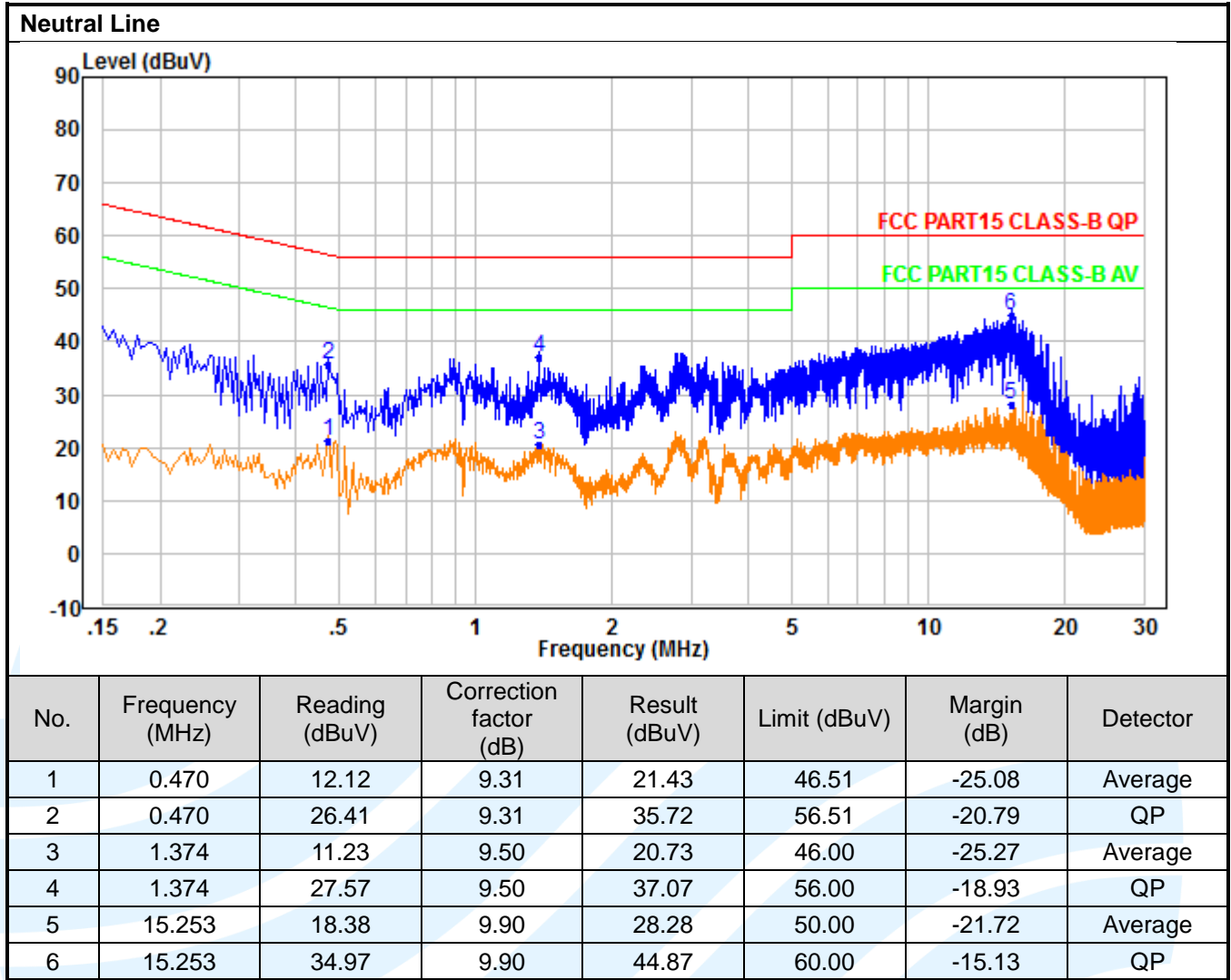
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**Quasi Peak and Average:
TM16**

Live Line



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.490	25.09	9.32	34.41	46.17	-11.76	Average
2	0.490	29.48	9.32	38.80	56.17	-17.37	QP
3	3.210	21.00	9.60	30.60	46.00	-15.40	Average
4	3.210	31.35	9.60	40.95	56.00	-15.05	QP
5	11.233	20.49	9.74	30.23	50.00	-19.77	Average
6	11.233	32.79	9.74	42.53	60.00	-17.47	QP



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Tel: +86-755-28230888

Fax: +86-755-28230886

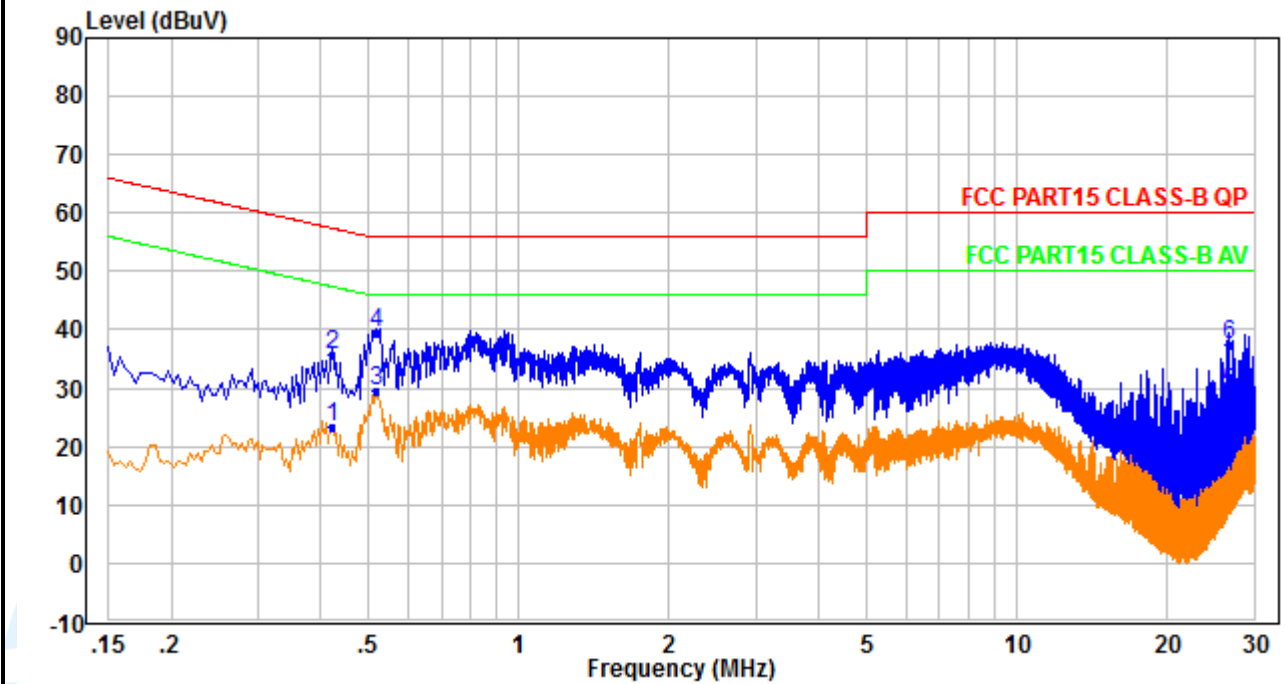
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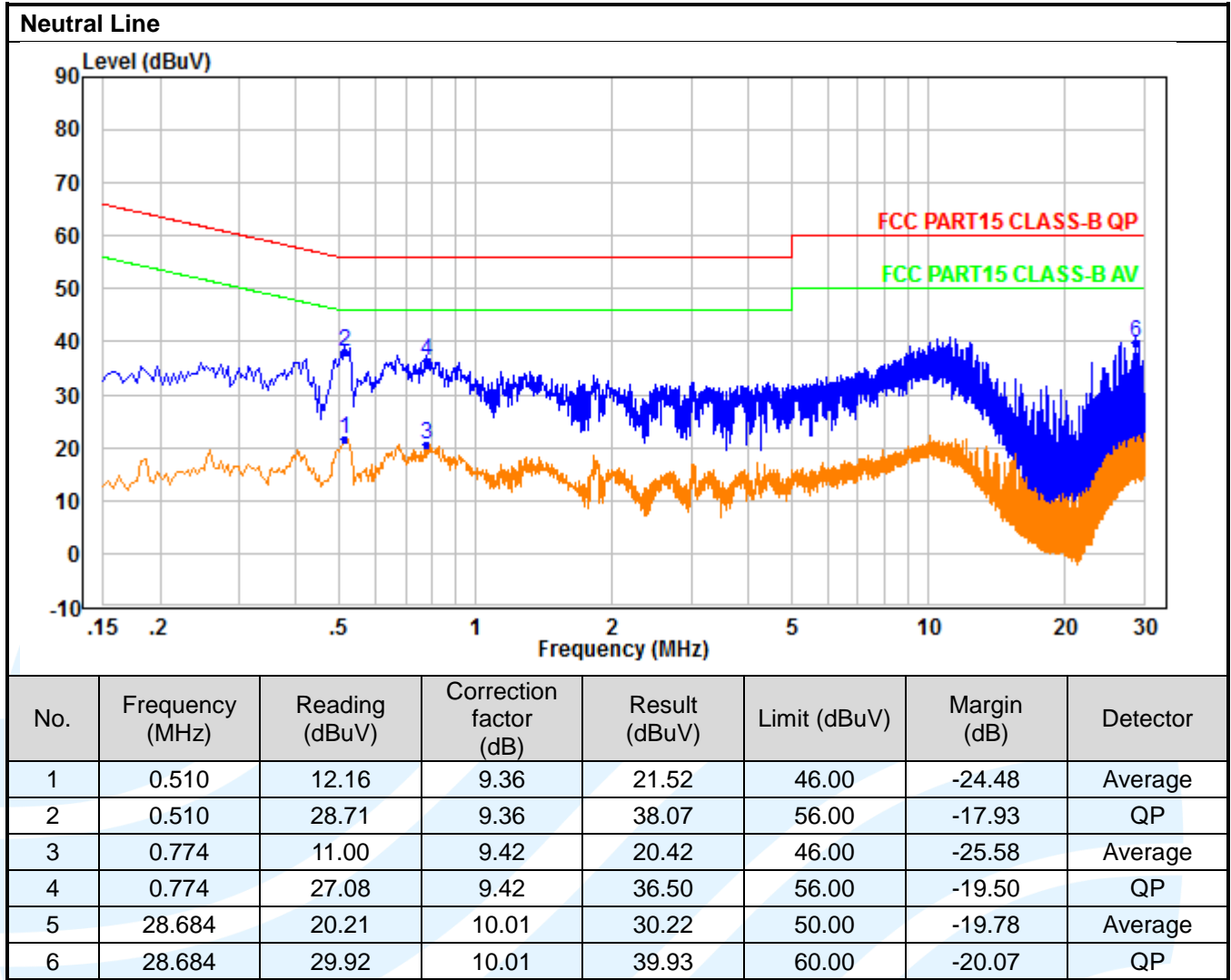
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**Quasi Peak and Average:
TM17**

Live Line



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.422	14.22	9.23	23.45	47.41	-23.96	Average
2	0.422	26.43	9.23	35.66	57.41	-21.75	QP
3	0.518	20.05	9.33	29.38	46.00	-16.62	Average
4	0.518	30.01	9.33	39.34	56.00	-16.66	QP
5	26.608	19.07	10.00	29.07	50.00	-20.93	Average
6	26.608	27.33	10.00	37.33	60.00	-22.67	QP



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Tel: +86-755-28230888

Fax: +86-755-28230886

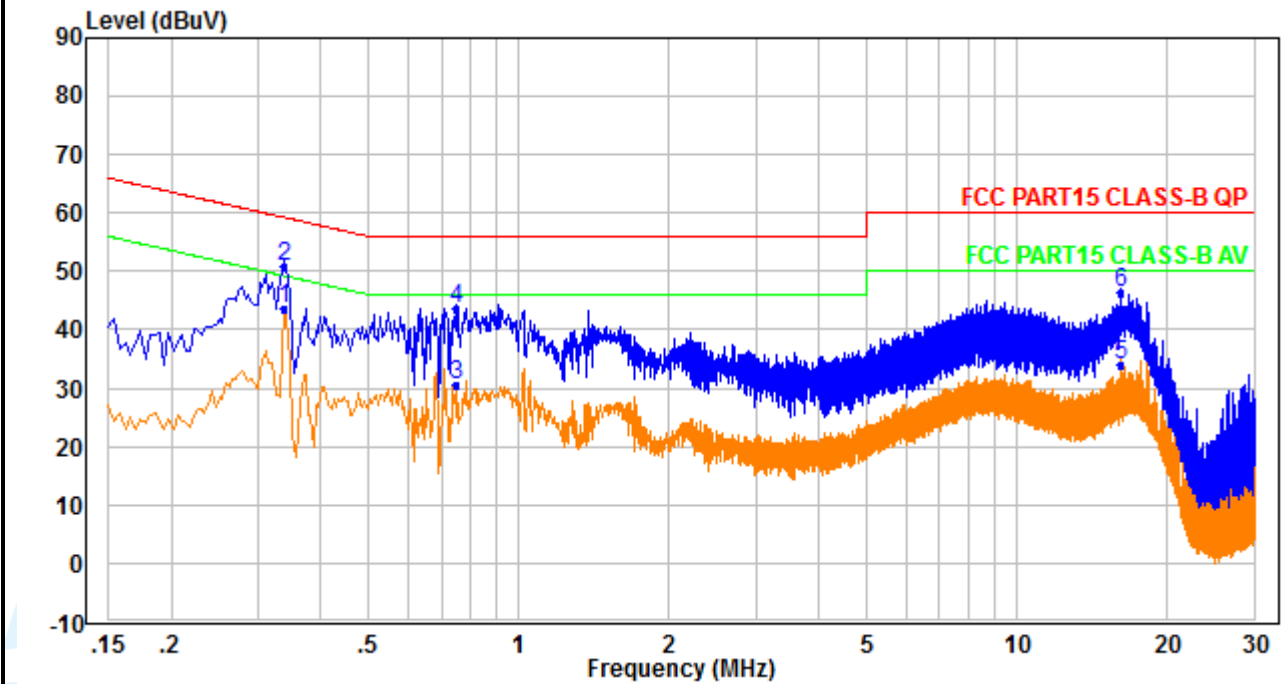
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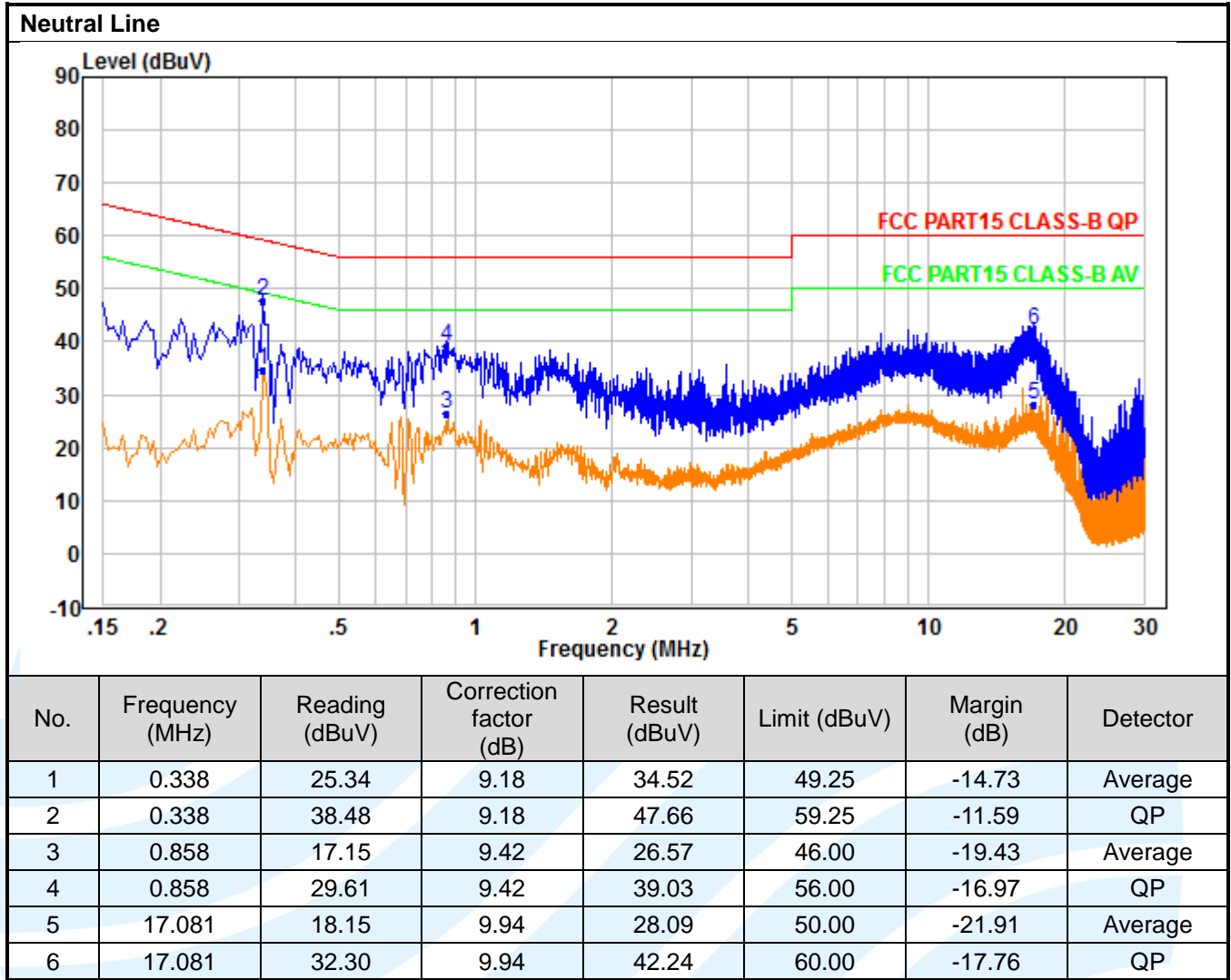
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**Quasi Peak and Average:
TM18**

Live Line



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.338	34.34	9.20	43.54	49.25	-5.71	Average
2	0.338	41.77	9.20	50.97	59.25	-8.28	QP
3	0.746	21.02	9.42	30.44	46.00	-15.56	Average
4	0.746	34.05	9.42	43.47	56.00	-12.53	QP
5	16.229	24.12	9.92	34.04	50.00	-15.96	Average
6	16.229	36.27	9.92	46.19	60.00	-13.81	QP



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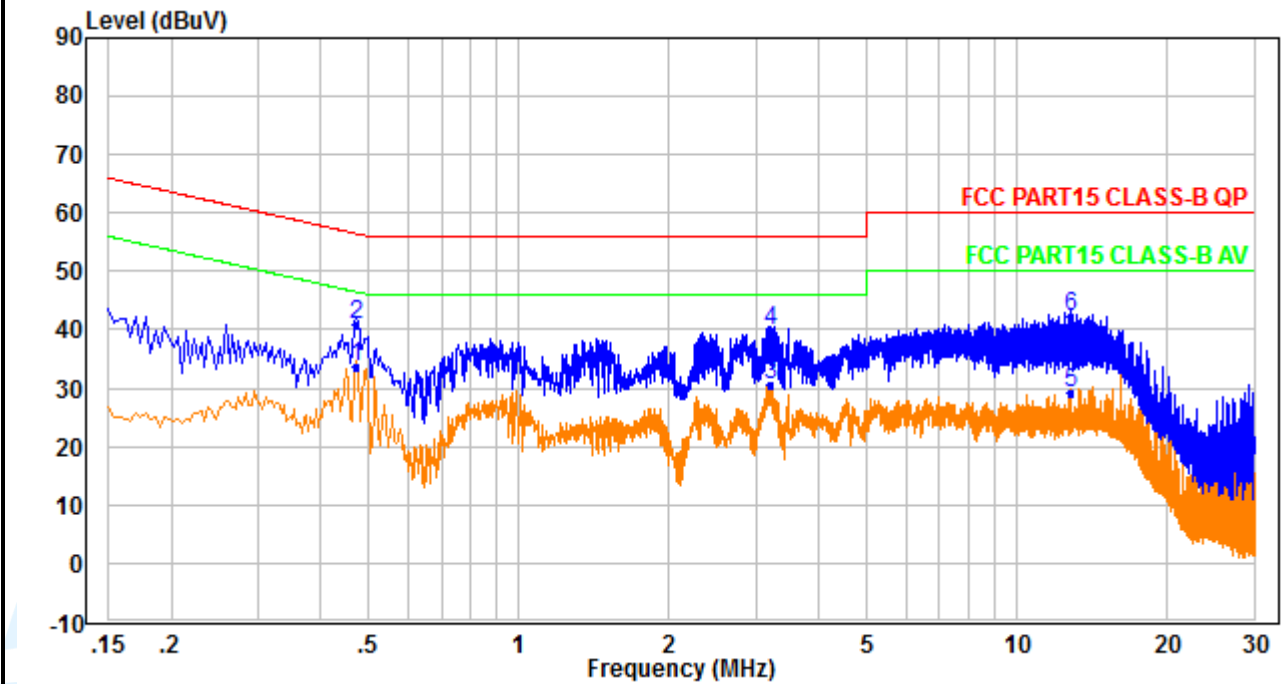
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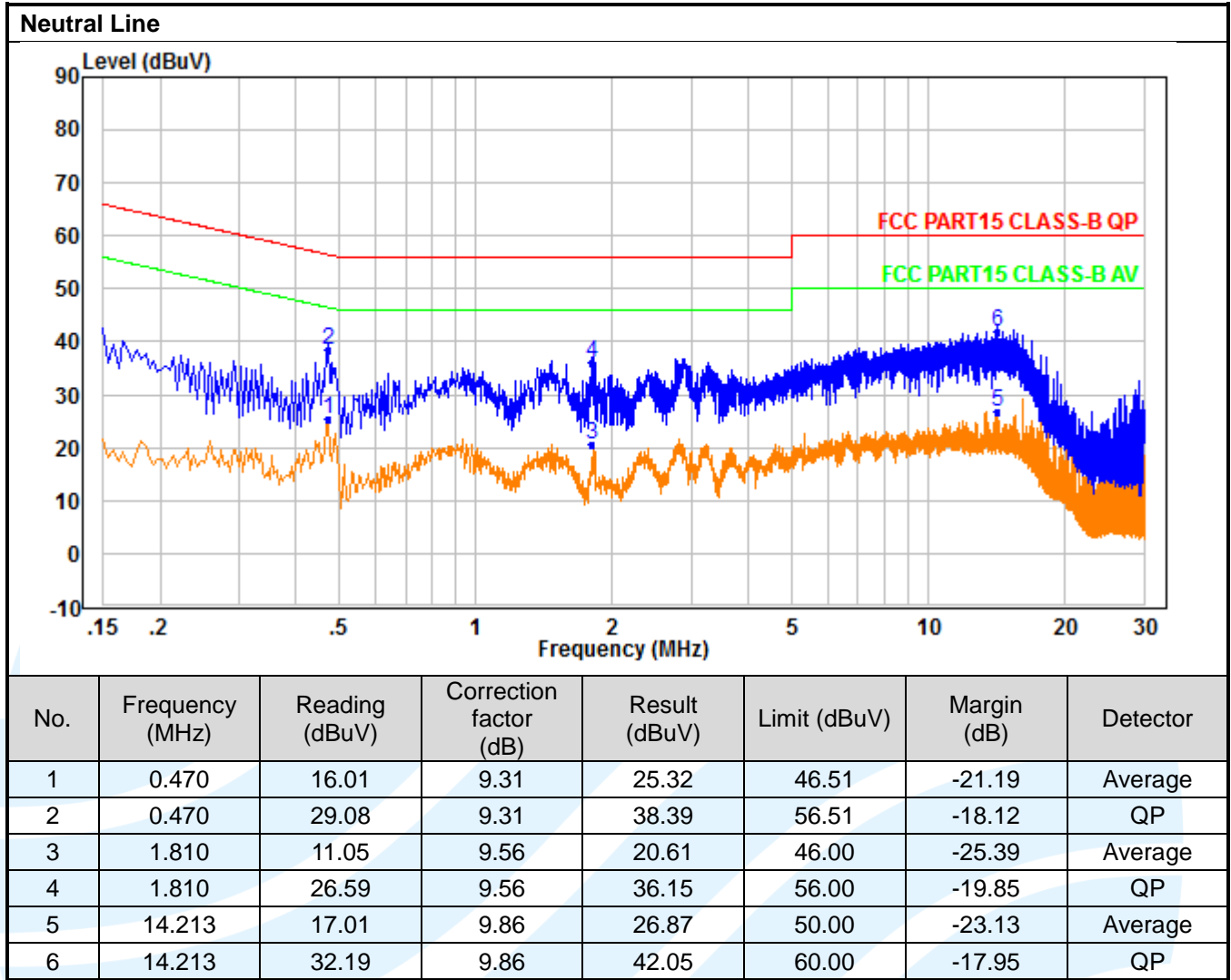
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**Quasi Peak and Average:
TM19**

Live Line

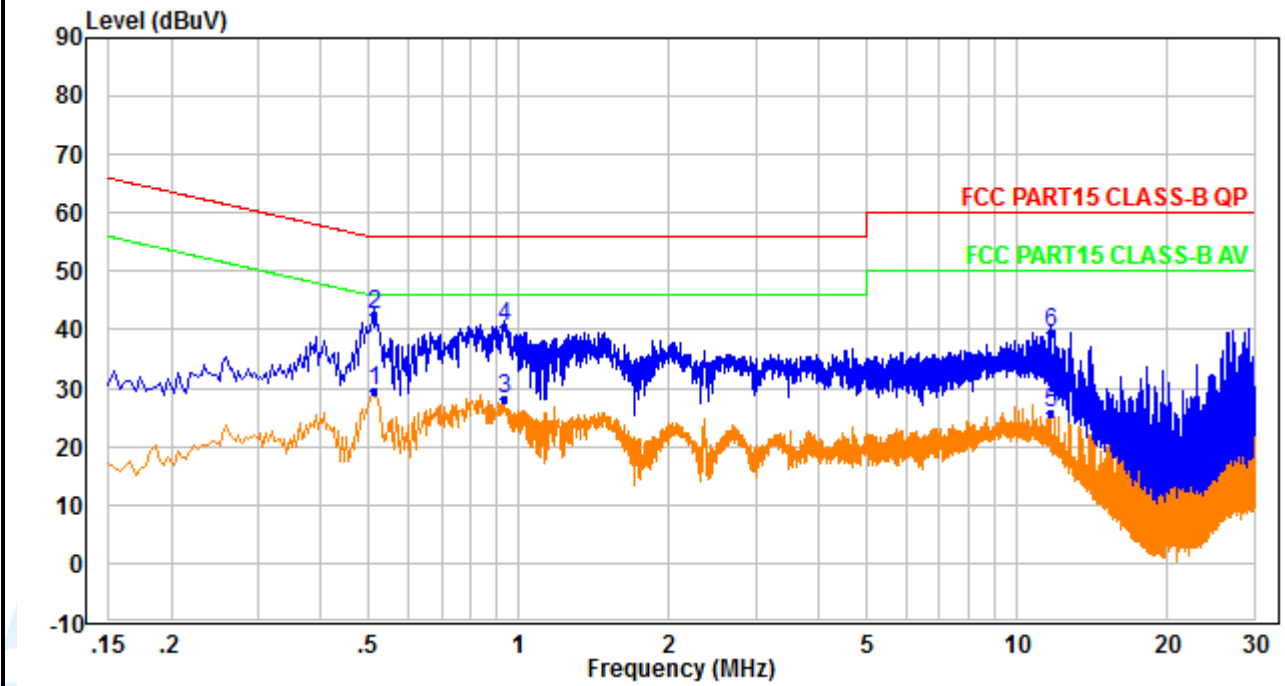


No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.470	24.37	9.29	33.66	46.51	-12.85	Average
2	0.470	31.46	9.29	40.75	56.51	-15.76	QP
3	3.190	21.00	9.60	30.60	46.00	-15.40	Average
4	3.190	30.06	9.60	39.66	56.00	-16.34	QP
5	12.809	19.23	9.80	29.03	50.00	-20.97	Average
6	12.809	32.34	9.80	42.14	60.00	-17.86	QP

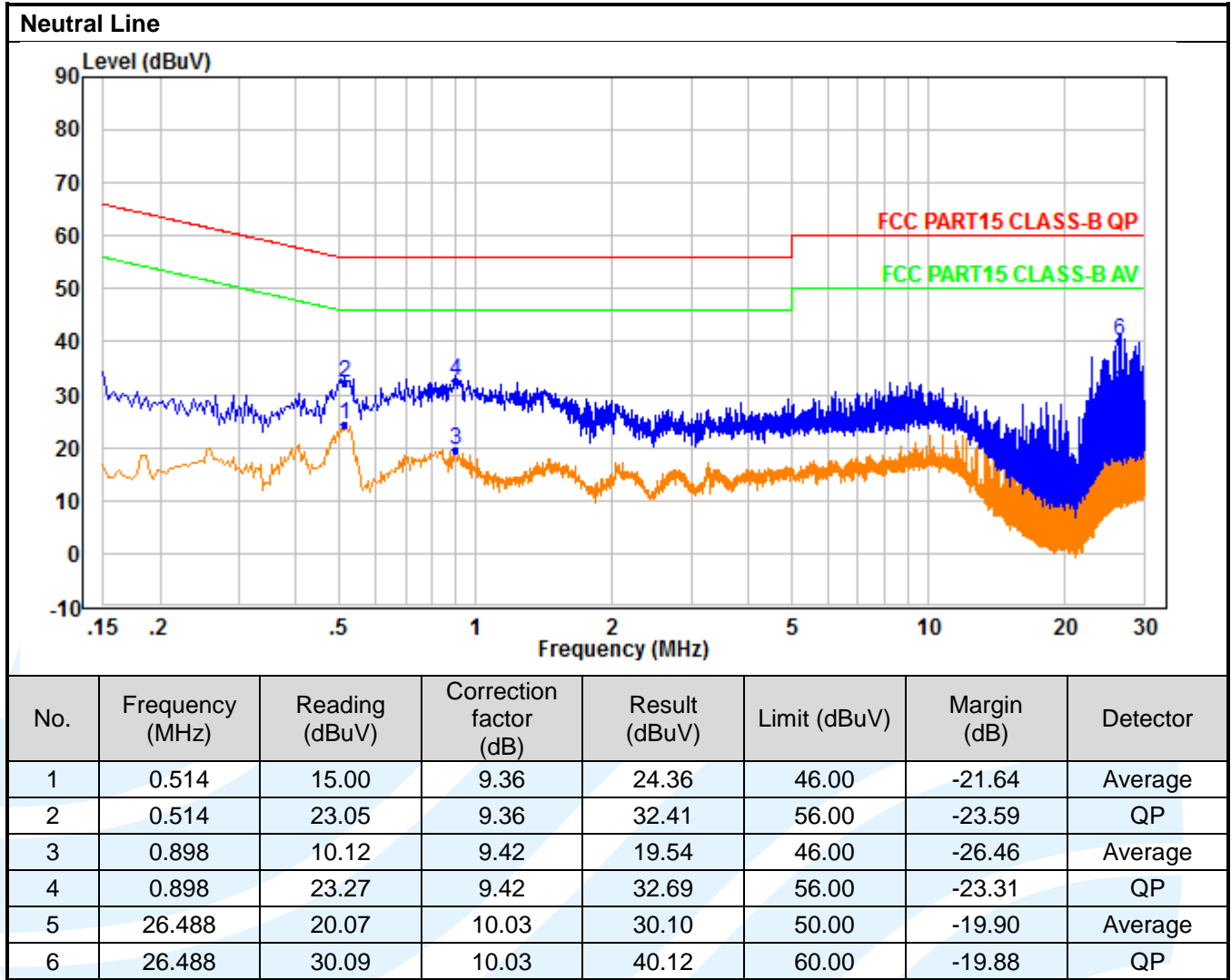


**Quasi Peak and Average:
TM20**

Live Line



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.514	20.03	9.33	29.36	46.00	-16.64	Average
2	0.514	33.14	9.33	42.47	56.00	-13.53	QP
3	0.938	18.66	9.42	28.08	46.00	-17.92	Average
4	0.938	30.97	9.42	40.39	56.00	-15.61	QP
5	11.709	16.14	9.76	25.90	50.00	-24.10	Average
6	11.709	29.82	9.76	39.58	60.00	-20.42	QP



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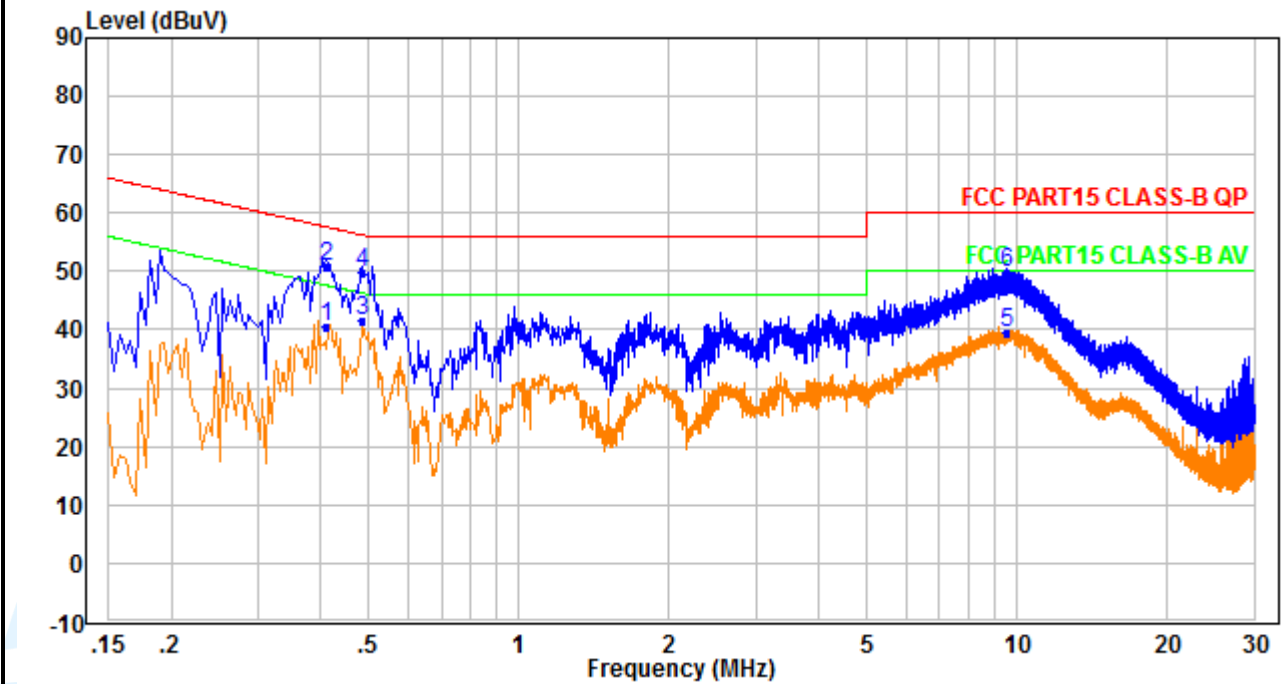
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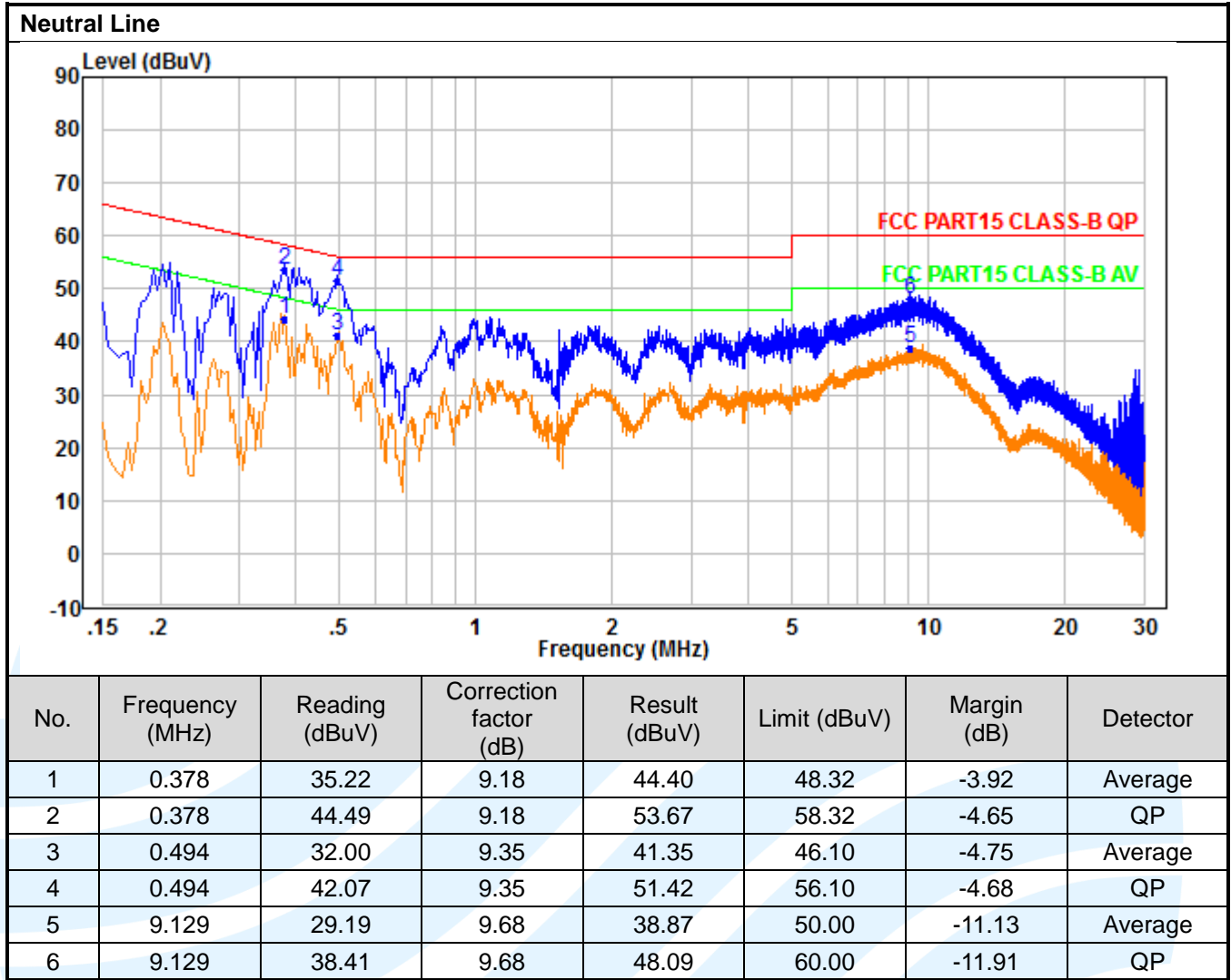
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**Quasi Peak and Average:
TM21**

Live Line



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.410	31.47	9.21	40.68	47.65	-6.97	Average
2	0.410	41.75	9.21	50.96	57.65	-6.69	QP
3	0.486	32.32	9.31	41.63	46.24	-4.61	Average
4	0.486	40.39	9.31	49.70	56.24	-6.54	QP
5	9.525	29.86	9.67	39.53	50.00	-10.47	Average
6	9.525	39.97	9.67	49.64	60.00	-10.36	QP



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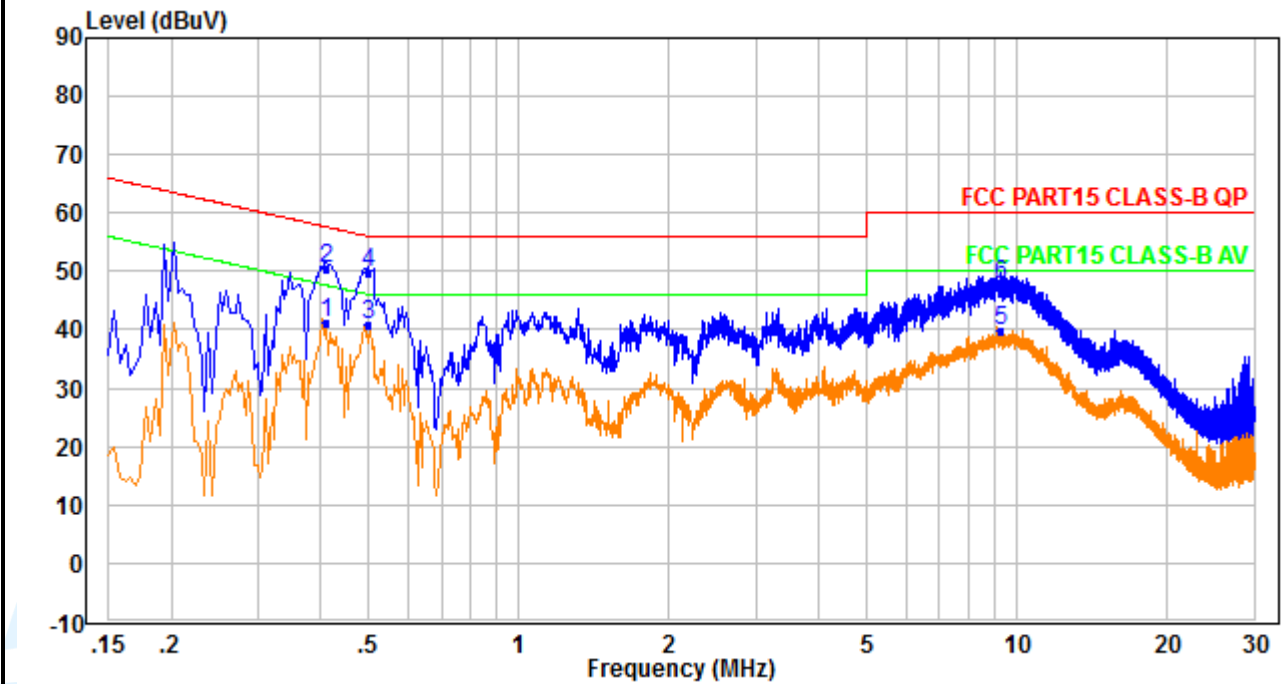
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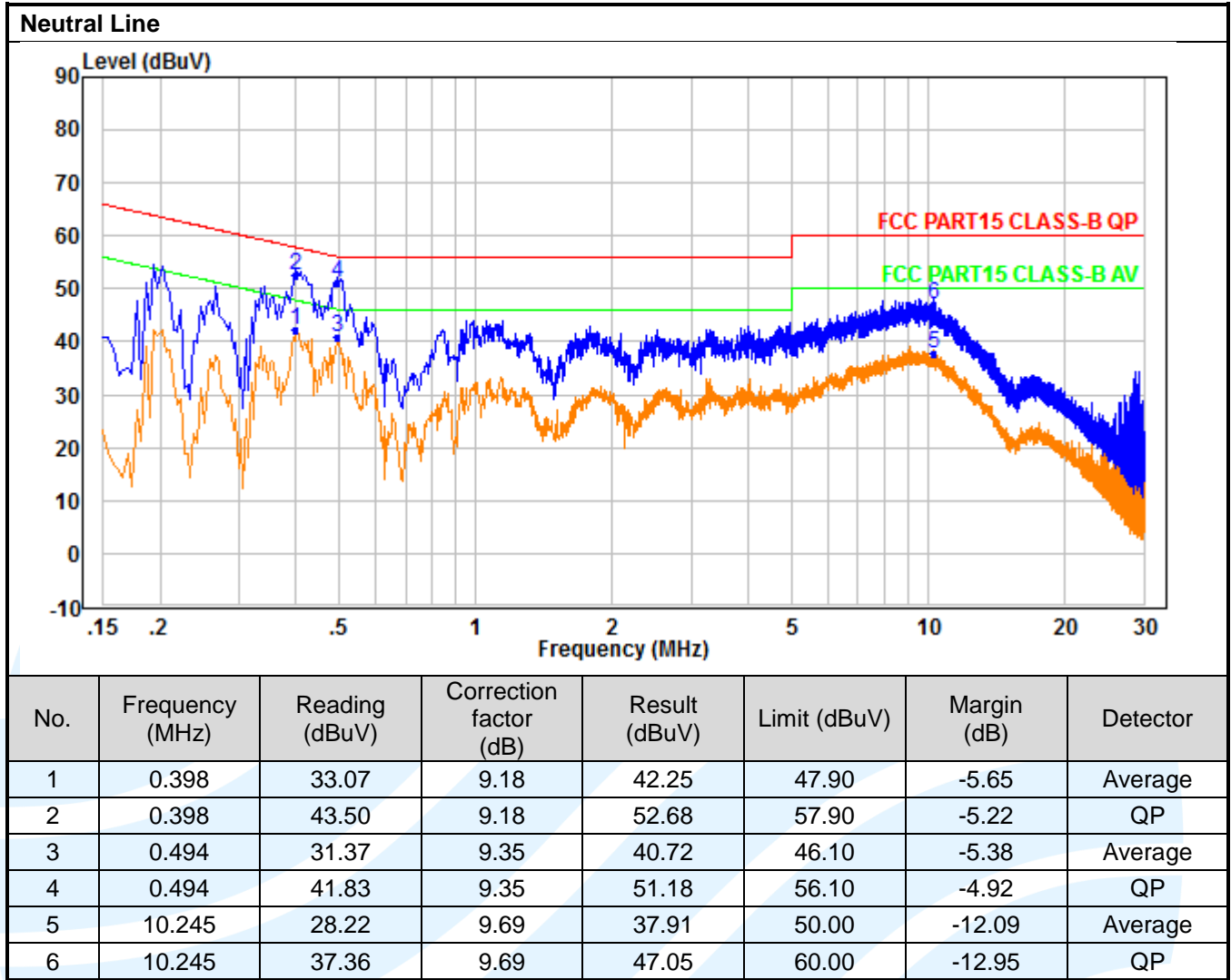
UTTR-EMC-ICES003-V1.0

Quasi Peak and Average:
TM22

Live Line



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.410	32.15	9.21	41.36	47.65	-6.29	Average
2	0.410	41.42	9.21	50.63	57.65	-7.02	QP
3	0.498	31.45	9.33	40.78	46.03	-5.25	Average
4	0.498	40.54	9.33	49.87	56.03	-6.16	QP
5	9.317	30.03	9.67	39.70	50.00	-10.30	Average
6	9.317	38.01	9.67	47.68	60.00	-12.32	QP



Remark:

1. Correct Factor = LISN Factor + Cable Loss + Pulse Limiter Factor, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result - Limit
4. An initial pre-scan was performed on the Phase and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.
5. All possible modes of operation were investigated, and testing at two nominal voltages of 240V/50Hz and 120V/60Hz, only the worst case emissions reported.

***** End of Report *****

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