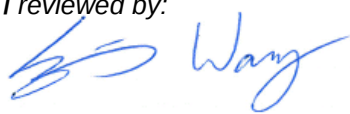


Prüfbericht-Nr.: Test Report No.:	60363111 001	Auftrags-Nr.: Order No.:	238136542	Seite 1 von 18 Page 1 of 18
Kunden-Referenz-Nr.: Client Reference No.:	2058062	Auftragsdatum: Order date.:	18 Mar. 2020	
Auftraggeber: Client:	Vencer Co., Ltd. 14F-12, No. 79, Sec. 1, Hsin Tai Wu Rd., Hsi-Chih, New Taipei City, Taiwan 22101, R.O.C. [Manufacture] WANSTONIC ELECTRONICS (DONG GUAN) CO., LTD. Tung Fu Rd. West, Shi Jie Town, Dongguan City, Guangdong, China			
Prüfgegenstand: Test item:	Charging Case			
Bezeichnung / Typ-Nr.: Identification / Type No.:	TW-E7A (Yamaha)			
Auftrags-Inhalt: Order content:	TUV Rheinland - EMC service			
Prüfgrundlage: Test specification:	FCC 47 CFR Part 15, Subpart B: 2019			
Wareneingangsdatum: Date of receipt:	19 Mar. 2020			
Prüfmuster-Nr.: Test sample No.:	A001029320-003 A001073395-002			
Prüfzeitraum: Testing period:	07 Apr. 2020 – 28 May 2020			
Ort der Prüfung: Place of testing:	Taichung Testing Laboratories.			
Prüflaboratorium: Testing laboratory:	TÜV Rheinland Taiwan Ltd.			
Prüfergebnis*: Test result*:	Pass			
geprüft von / tested by:		kontrolliert von / reviewed by:		
 23 Jul. 2020 George C. H. Yang/ Project Engineer		 23 Jul. 2020 Spring C. Y. Wang/ Department Manager		
Datum Date	Name/Stellung Name/Position	Unterschrift Signature	Datum Date	Name/Stellung Name/Position
Sonstiges / Other:				
Zustand des Prüfgegenstandes bei Anlieferung: Condition of the test item at delivery:		Prüfmuster vollständig und unbeschädigt Test item complete and undamaged		
* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m. test specifications(s) F(ail) = failed a.m. test specifications(s) N/A = not applicable N/T = not tested				
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

Prüfbericht - Nr.: 60363111 001
Test Report No.:

Seite 2 von 18
Page 2 of 18

TEST SUMMARY

5.1 CONDUCTED EMISSION PER SECTION 15.107, FCC 47 CFR PART 15 SUBPART B

RESULT: Pass

5.2 RADIATED EMISSION PER SECTION 15.109, FCC 47 CFR PART 15 SUBPART B

RESULT: Pass

Contents

1.	GENERAL REMARKS	4
1.1.	COMPLEMENTARY MATERIALS	4
2.	TEST SITES	4
2.1.	LIST OF TEST AND MEASUREMENT INSTRUMENTS.....	5
2.2.	CALIBRATION.....	6
2.3.	ABBREVIATIONS.....	6
2.4.	MEASUREMENT UNCERTAINTY	6
3.	GENERAL PRODUCT INFORMATION	7
3.1.	PRODUCT FUNCTION AND INTENDED USE	7
3.2.	RATINGS AND PHYSICAL CHARACTERISTICS	7
3.3.	NOISE GENERATING	7
3.4.	NOISE SUPPRESSING PARTS.....	7
3.5.	SUBMITTED DOCUMENTS	7
4.	TEST SET-UP AND OPERATION MODES	8
4.1.	TEST METHODOLOGY	8
4.2.	INDEPENDENT OPERATION MODES.....	8
4.3.	SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT.....	9
4.4.	COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE	9
4.5.	TEST SETUP.....	9
5.	TEST RESULTS E M I S S I O N	10
5.1.	CONDUCTED EMISSION PER SECTION 15.107, 47 CFR PART 15 SUBPART B.....	10
5.2.	RADIATED EMISSION PER SECTION 15.109, 47 CFR PART 15 SUBPART B	13
6.	PHOTOGRAPHS OF TEST SETUP.....	16
7.	LIST OF TABLES	18
8.	LIST OF FIGURES	18
9.	LIST OF PICTURES	18

1. General Remarks

1.1. Complementary Materials

All attachments are integral parts of this test report.

2. Test Sites

Laboratory:

TUV Rheinland Taiwan Ltd. Taichung Testing Laboratories
No.9, Lane 36, Minsheng Rd., Sec. 3, Daya District, Taichung City 428, Taiwan, R.O.C.

Facility:

TÜV Rheinland Taiwan Ltd.
11F., No.758, Sec. 4, Bade Rd., Songshan Dist., Taipei City 105, Taiwan, R.O.C.

The Federal Communications Commission has reviewed the technical characteristics of the radiated and conducted emission facilities and has found these test sites to be in compliance with the requirements under 47 CFR sections 2.948. The registration number: 365730.

The Industry Canada has reviewed the technical characteristics of the radiated and conducted emission facilities and has found these test sites to be in compliance with the Canadian requirements. The filing number: 9465A.

The test facility is accredited by TAF (member of ILAC), under number 0759 according to ISO/IEC 17025:2017.

TÜV Rheinland Taiwan Ltd. is accredited by the Federal Communications Commission as a Conformity Assessment Body under Designation Number TW1065 and Test Firm Registration#: 799772.

Prüfbericht - Nr.: 60363111 001
Test Report No.:

Seite 5 von 18
Page 5 of 18

2.1. List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

For EMI/ Conduction Measurement (Taipei: Shield Room)

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
1	EMI Test Receiver	Rohde & Schwarz	ESCI 7	100797	2020/03/13	2021/03/13
2	Two-Line V-Network (for EUT)	Rohde & Schwarz	ENV216	101243	2019/06/23	2020/06/23
3	Two-Line V-Network	Rohde & Schwarz	ENV216	101262	2019/07/16	2020/07/16
4	Test Software	Audix	e3	Ver. 9	N/A	N/A

For EMI/Radiation Measurement (Taipei: Semi-Anechoic Chamber B)

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
1	EMI Test Receiver	Rohde & Schwarz	ESR 7	101549	2020/02/19	2021/02/19
2	Pre-Amplifier	Hewlett Packard	8447D	2944A09270	2019/09/18	2020/09/18
3	Bilog Antenna	TESEQ	CBL 6111D	40101	2019/10/23	2020/10/23
4	Test Software	Audix	e3	Ver. 9	N/A	N/A

2.2. Calibration

All equipment requiring calibration is calibrated periodically by the manufacturer or accredited calibration services according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.3. Abbreviations

PASS means 'complied with requirement'	N/A means 'not applicable'
FAIL means 'not complied'	N.C.R. means 'no calibration required'

2.4. Measurement Uncertainty

Table 2: Measurement Uncertainty

Testing Item	Frequency Range	Uncertainty
Conducted Emission (LISN)	9kHz - 30MHz	2.69 dB
Radiated Emission (966 Chamber: 3m)	30MHz - 1000MHz	2.82 dB

Note:

The uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3. General Product Information

3.1. Product Function and Intended Use

The tested sample is “**Charging Case**” with type designation as described on the cover page for new approval. The device contains Qi function to charge the internal battery through wireless interface.

3.2. Ratings and Physical Characteristics

Model:	TW-E7A
Input rating (Qi):	5Vdc, 0.5A
Protection Class:	Class III
Operation frequency	110 - 205 kHz (Qi, Charging Case Only supports RX)
Internal highest frequency:	205 kHz (only Charging Case on Qi function)

For details, refer to technical information provided by manufacturer.

3.3. Noise Generating

- 1) IC circuits design

3.4. Noise Suppressing Parts

Please refer to Attachment Photo Documentation for details.

3.5. Submitted Documents

- 1) Rating label
- 2) Circuit diagram
- 3) User's manual

4. Test Set-up and Operation Modes

4.1. Test Methodology

The test methodology used is based on the requirement of 47 CFR PART 15, section 15.31, 15.33, 15.35, 15.107 and 15.109, and of ICES-003.

The test methods, which have been used, are based on ANSI C63.4 or CAN/CSA-CEI/IEC CISPR 22. The final used method is recorded in test procedure of section 5.1 and 5.2 of this report.

The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the instructions for use.

The decision rule of conformity of this test report is following the requirements of the requested standard in this test report, and agreed among testing laboratory and manufacturer (applicant) to exclude the consideration of Measurement Uncertainty.

4.2. Independent Operation Modes

Put EUT on a wireless charger for charging mode test.

The justification and manipulation of cables and equipment in order to simulate a worst-case behavior of the test setup has been carried out as prescribed in ANSI C 63.4 or CAN/CSA-CEI/IEC CISPR22.

The final operation mode:

- A. Wireless charging mode.

Refer to Test setup in chapter 4.5.

4.3. Special Accessories and Auxiliary Equipment

The EUT was tested as an independent unit with the following equipment:

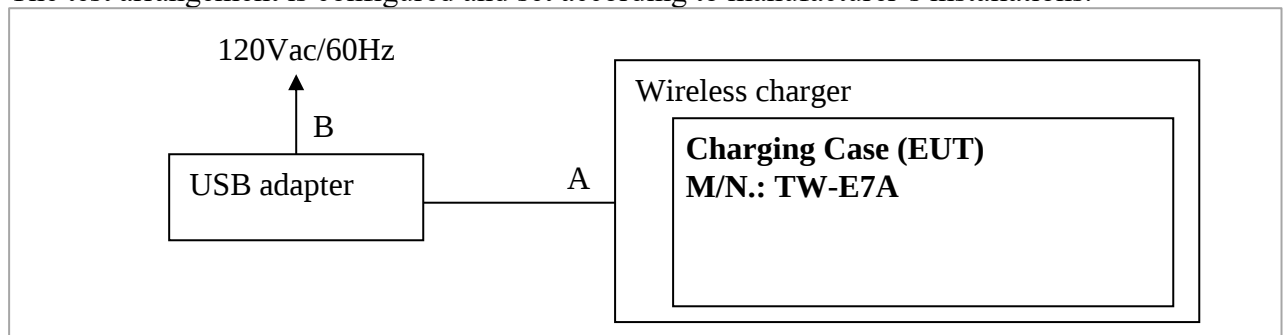
Description	Manufacturer	Model No.	S/N	Certification
USB adapter	PHIHONG	PSB05R-050Q	Q060387	N/A
Wireless charger	Bang & Olufsen	Beoplay Charging Pad	910204	FCC ID

4.4. Countermeasures to achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the constructional data form or technical construction file or refer to the attachment photo document of test report. No additional measures were employed to achieve compliance.

4.5. Test Setup

The test setup was realized on a non-conducted table of 80cm height during all the tests. The test arrangement is configured and set according to manufacturer's installations.



Cable description:

No.	Cable Type	Length (m)	Shield	Core No.	Detachable
A	Extend outlet	1.2	No	0	Yes
B	USB cable	1.27	Yes	0	Yes

5. Test Results EMISSION

5.1. Conducted Emission per section 15.107, 47 CFR part 15 subpart B

RESULT:

Pass

Date of Testing : 28 May 2020
Test Procedure : ANSI C63.4 (2014) Clause 7.3
Deviations from standard
test procedure : None
Frequency Range : 0.15 – 30MHz
Limits : FCC Part 15 Subpart B Section 15.107 (a) class B
Kind of Test Site : Shielded room

Test Setup

The following setup caused the highest disturbance:

Input Voltage : 5Vdc via wireless charger
Operating Condition : ANSI C63.4 (2014) Clause 6.2
Operational Mode : see 4.2
Temperature : 22.2 °C
Relative Humidity : 54 %

For test results, please refer to next page.

Note 1: Level = Read Level + Factor
Over Limit = Level – Limit Line
Factor = LISN insertion loss + Cable loss

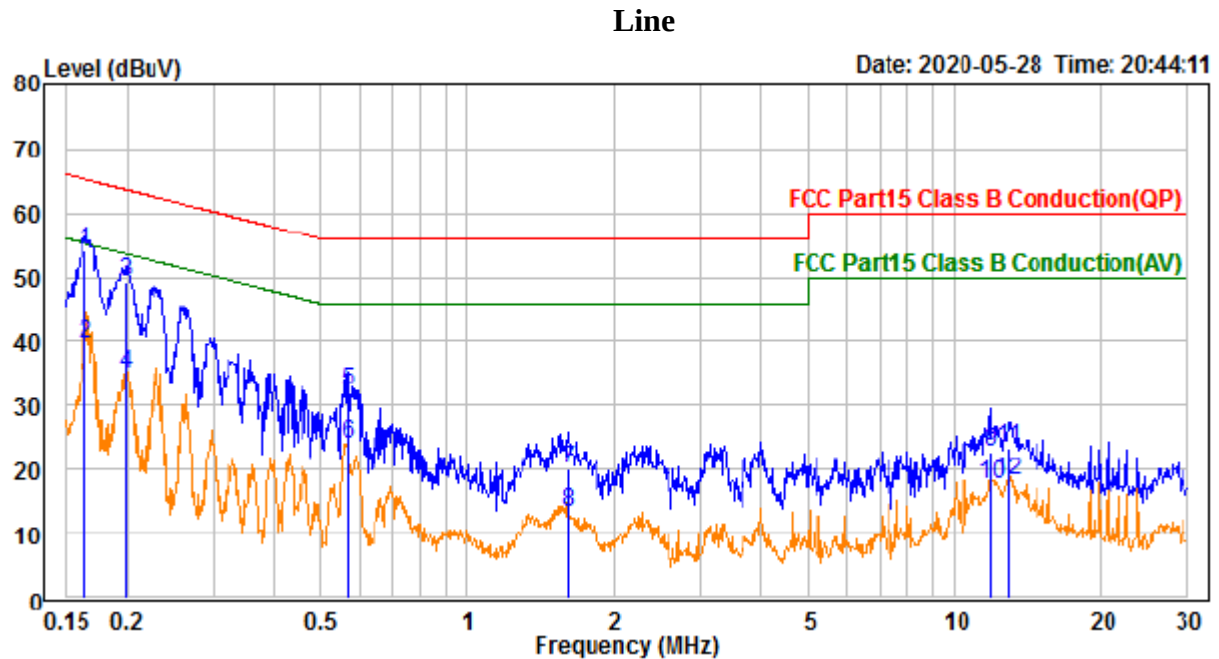
Note 2: The EUT in wireless charging mode is not intended to be connected to AC mains supply.
Therefore, this test is not applicable but performed per client requirement.

For test results, please refer to next pages.

Prüfbericht - Nr.: 60363111 001
Test Report No.:

Seite 11 von 18
Page 11 of 18

Figure 1: Conducted Emission, 0.15 – 30 MHz

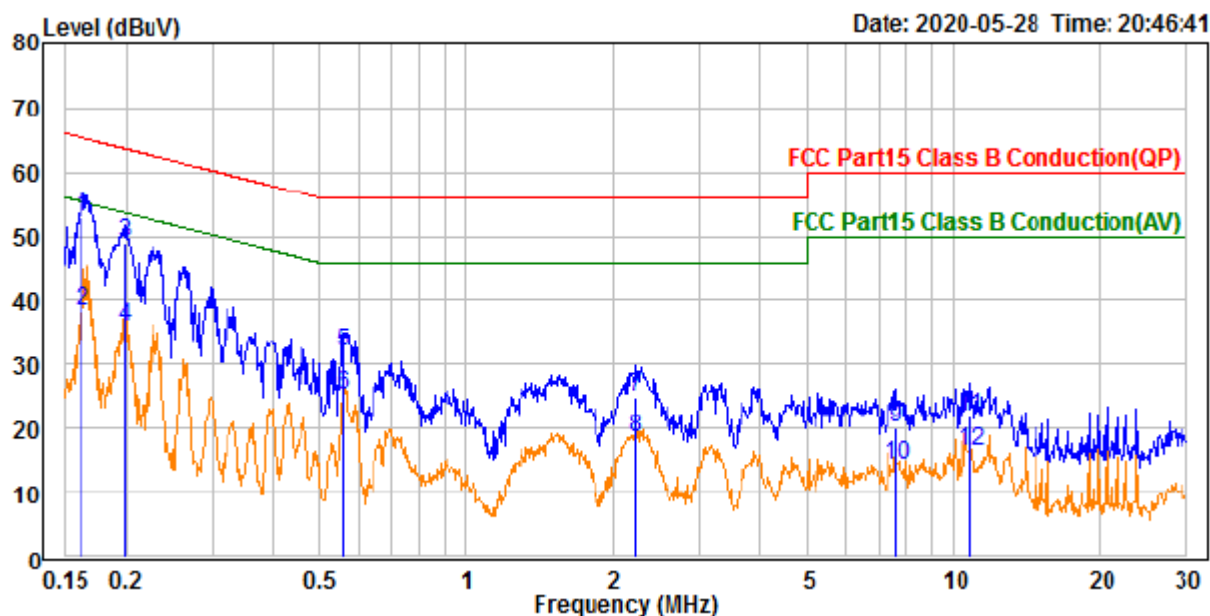


	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.163	44.66	9.61	54.27	65.30	-11.03	QP
2	0.163	30.03	9.61	39.64	55.30	-15.66	Average
3	0.198	39.59	9.61	49.20	63.68	-14.48	QP
4	0.198	25.33	9.61	34.94	53.68	-18.74	Average
5	0.568	22.72	9.62	32.34	56.00	-23.66	QP
6	0.568	14.47	9.62	24.09	46.00	-21.91	Average
7	1.609	10.30	9.64	19.94	56.00	-36.06	QP
8	1.609	3.82	9.64	13.46	46.00	-32.54	Average
9	11.871	13.12	9.75	22.87	60.00	-37.13	QP
10	11.871	7.74	9.75	17.49	50.00	-32.51	Average
11	12.857	13.79	9.75	23.54	60.00	-36.46	QP
12	12.857	8.63	9.75	18.38	50.00	-31.62	Average

Prüfbericht - Nr.: 60363111 001
Test Report No.:

Seite 12 von 18
Page 12 of 18

Neutral



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.162	43.20	9.62	52.82	65.38	-12.56	QP
2	0.162	28.64	9.62	38.26	55.38	-17.12	Average
3	0.199	39.42	9.62	49.04	63.64	-14.60	QP
4	0.199	26.18	9.62	35.80	53.64	-17.84	Average
5	0.559	22.37	9.63	32.00	56.00	-24.00	QP
6	0.559	15.55	9.63	25.18	46.00	-20.82	Average
7	2.224	15.19	9.65	24.84	56.00	-31.16	QP
8	2.224	8.98	9.65	18.63	46.00	-27.37	Average
9	7.618	10.46	9.73	20.19	60.00	-39.81	QP
10	7.618	4.66	9.73	14.39	50.00	-35.61	Average
11	10.799	12.15	9.75	21.90	60.00	-38.10	QP
12	10.799	6.53	9.75	16.28	50.00	-33.72	Average

Prüfbericht - Nr.: 60363111 001
Test Report No.:

Seite 13 von 18
Page 13 of 18

5.2. Radiated Emission per section 15.109, 47 CFR part 15 subpart B

RESULT:

Pass

Date of Testing : 07 Apr. 2020
Test Procedure : ANSI C63.4 (2014) Clause 8.3
Deviations from standard
test procedure : None
Frequency Range : 30 – 1000MHz, and above 1GHz
Limits : FCC Part 15 Subpart B Section 15.109 (a) class B
Kind of Test Site : 966 Semi-anechoic chamber (3m distance)

The highest frequency of the internal sources of the EUT is

- ☒ below 1.705M, per client request measuring up to 1000MHz
☐ 1.705-108M, measuring up to 1000MHz
☐ 108-500MHz, measuring up to 2000MHz
☐ 500-1000MHz, measuring up to 5000MHz
☐ above 1000MHz, measuring up to 5th harmonic of the highest frequency or 40GHz, which is

Test Setup

The following setup caused the highest disturbance:

Input Voltage : 5Vdc via wireless charger
Operating Condition : ANSI C63.4 (2014) Clause 6.2
Operational Mode : see 4.2
Temperature : 22.5 °C
Relative Humidity : 58 %

For test results, please refer to next page.

Note: Level = Read Level + Factor

Over Limit = Level – Limit Line

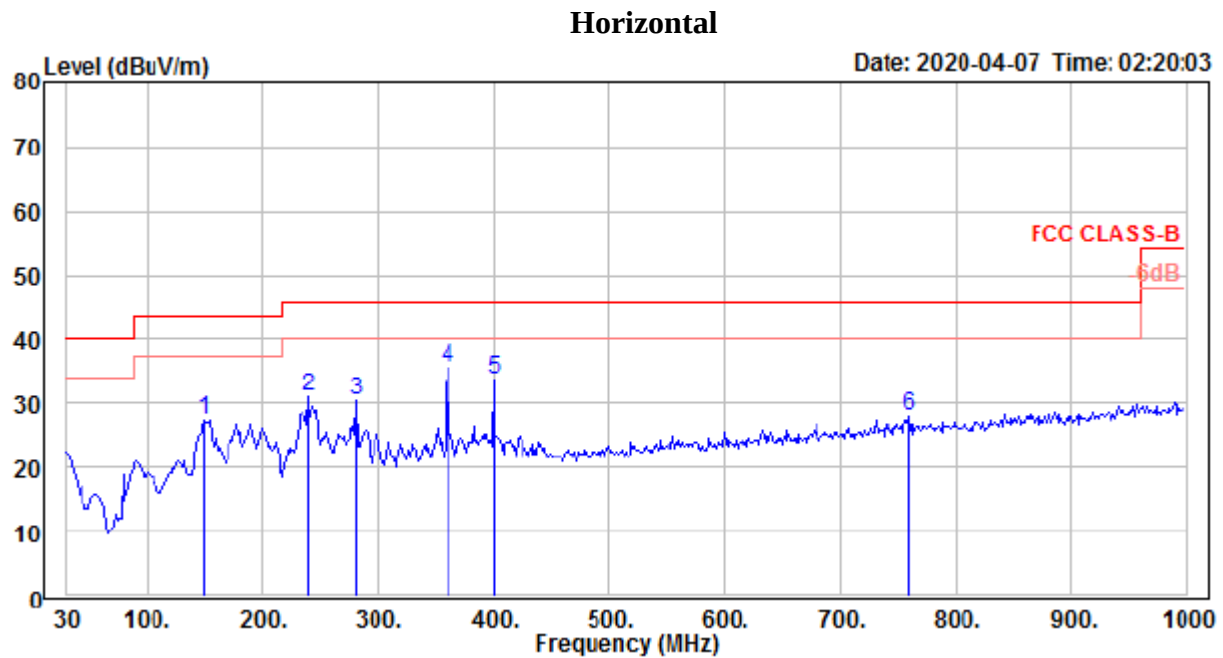
Factor = Antenna factor + Cable loss - Amplifier gain

For test results, please refer to next pages.

Prüfbericht - Nr.: 60363111 001
Test Report No.:

Seite 14 von 18
Page 14 of 18

Figure 2: Radiated Emission, 30 – 1000 MHz

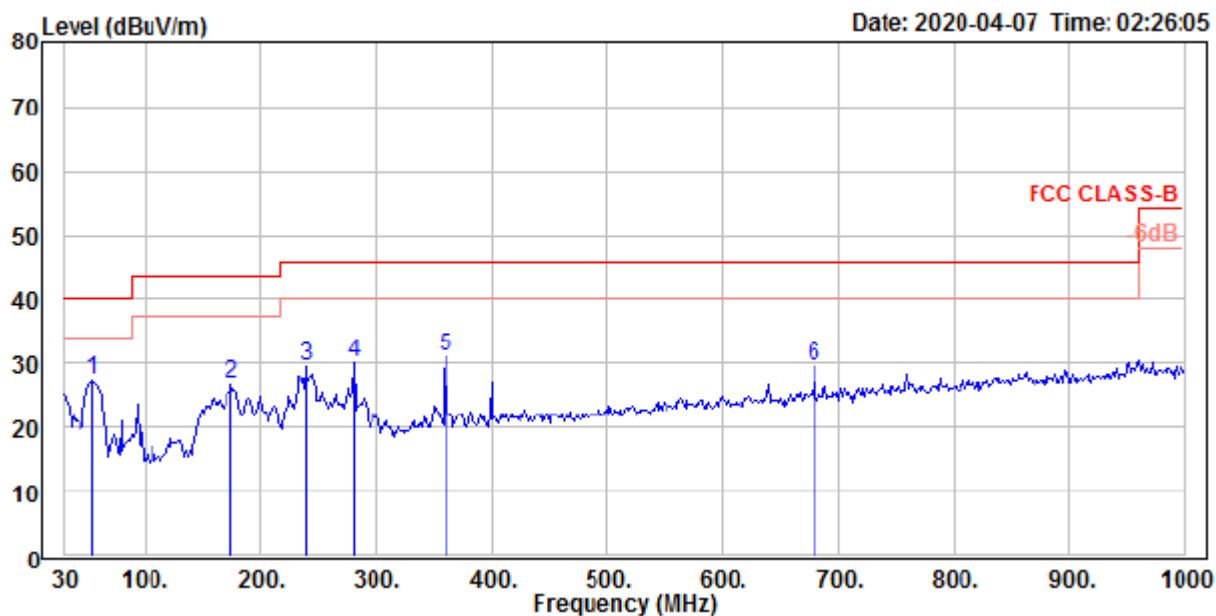


	Freq	Read Level	Factor	Level	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	deg	
1	149.493	38.09	-10.62	27.47	43.50	-16.03	200	270	QP
2	239.464	41.06	-10.09	30.97	46.00	-15.03	100	239	QP
3	280.232	38.66	-8.33	30.33	46.00	-15.67	100	249	QP
4	360.362	42.01	-6.39	35.62	46.00	-10.38	100	228	QP
5	399.725	39.26	-5.60	33.66	46.00	-12.34	100	120	QP
6	759.609	28.49	-0.43	28.06	46.00	-17.94	200	202	QP

Prüfbericht - Nr.: 60363111 001
Test Report No.:

Seite 15 von 18
Page 15 of 18

Vertical



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	deg	
1	53.899	42.96	-15.73	27.23	40.00	-12.77	100	195	QP
2	174.797	39.21	-12.51	26.70	43.50	-16.80	100	148	QP
3	239.464	39.57	-10.09	29.48	46.00	-16.52	100	66	QP
4	280.232	38.38	-8.33	30.05	46.00	-15.95	200	188	QP
5	360.362	37.48	-6.39	31.09	46.00	-14.91	200	203	QP
6	679.478	31.17	-1.77	29.40	46.00	-16.60	100	214	QP