



FCC RADIO TEST REPORT

FCC ID : QYLGET116F
Equipment : Digitizer Module
Brand Name : EMRight
Model Name : GET-116
Applicant : Getac Technology Corporation.
5F., Building A, No. 209, Sec.1, Nangang
Rd., Nangang Dist., Taipei City 11568, Taiwan, R.O.C.
Standard : FCC Part 15 Subpart C §15.209

The product was received on Jan. 13, 2021 and testing was started from Feb. 03, 2021 and completed on Apr. 15, 2021. We, Sporton International Inc. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Louis Wu

Reviewed by: Louis Wu

Sporton International Inc. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)



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History of this test report

Report No.	Version	Description	Issued Date
FR111327	01	Initial issue of report	Apr. 16, 2021

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.207	AC Power Line Conducted Emissions	Pass	-
3.2	15.215(c)	20dB Spectrum Bandwidth	Reporting only	-
	2.1049	99% OBW Spectrum Bandwidth	Reporting only	-
3.3	15.209	Field Strength of Fundamental Emissions	Pass	-
		Radiated Spurious Emissions	Pass	-
3.4	15.203	Antenna Requirements	Pass	-

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Wii Chang

Report Producer: Yimin Ho

1. General Description

1.1 Product Feature of Equipment Under Test

Digitizer

Product Specification subjective to this standard	
Sample 1	EUT with Host 1
Sample 2	EUT with Host 2
Antenna Type	Loop Antenna

Remark: The above EUT's information was declared by manufacturer. Please refer to Comments and Explanations in report summary.

The product was installed into Tablet (Brand Name: Getac, Model Name: F110, F110G6, F110-Ex, F110-621, F110-601) during test, and the host information was recorded in the following table.

Host Information		
Host 1	Host with SKU A	
Host 2	Host with SKU C	
SKU	SKU A	SKU C
CPU	i3-1115G7 (Non Vpro)	i7-1165G7 (Vpro)
DDR	Kingston DDR4-3200 8GB	Kingston DDR4-3200 32GB
SSD	256GB	1TB
PANEL	Full HD AUO	Full HD AUO
DIGITIZER	EMRright Digitizer	EMRright Digitizer
OPTION BAY	Micro SD	RS232 + LAN
Expansion Bay	N/A	Smart Card
Right side option	Finger Print	Finger Print
WLAN/BT	Intel AX201	Intel AX201
WWAN(4G)	NA	EM7511
GPS/GNS	GPS/GNSS (MC-1010- V2b)	EM7511
Rear 8M Camera	Support	Support
Webcam FHD	Support	Not Support
IR Webcam	Not Support	Support
USB3.2 Gen2 x 1 Type-A	Support	Support
Type-C (thunder bolt)	Support	Support
Audio/MIC	Support	Support

1.2 Modification of EUT

No modifications are made to the EUT during all test items.

1.3 Testing Location

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory	
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978	
Test Site No.	Sporton Site No.	
	TH03-HY	CO05-HY
Test Engineer	Oscar Chi	Howard Huang
Temperature	22~24°C	24~26°C
Relative Humidity	53~55%	40~50

Note: The test site complies with ANSI C63.4 2014 requirement.

Test Site	Sporton International Inc. Wensan Laboratory	
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855	
Test Site No.	Sporton Site No.	
	03CH11-HY (TAF Code: 3786)	
Test Engineer	Fu Chen and Troye Hsieh	
Temperature	19.3~21.4°C	
Relative Humidity	57.3~66%	
Remark	The Radiated Spurious Emission test item subcontracted to Sporton International Inc. Wensan Laboratory.	

Note: The test site complies with ANSI C63.4 2014 requirement.

FCC designation No.: TW1190 and TW0007

1.4 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC Part 15 Subpart C §15.209
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01
- ♦ ANSI C63.10-2013

Remark: The TAF code is not including all the FCC KDB listed without accreditation.

2. Test Configuration of Equipment Under Test

2.1 Descriptions of Test Mode

Investigation has been done on all the possible configurations.

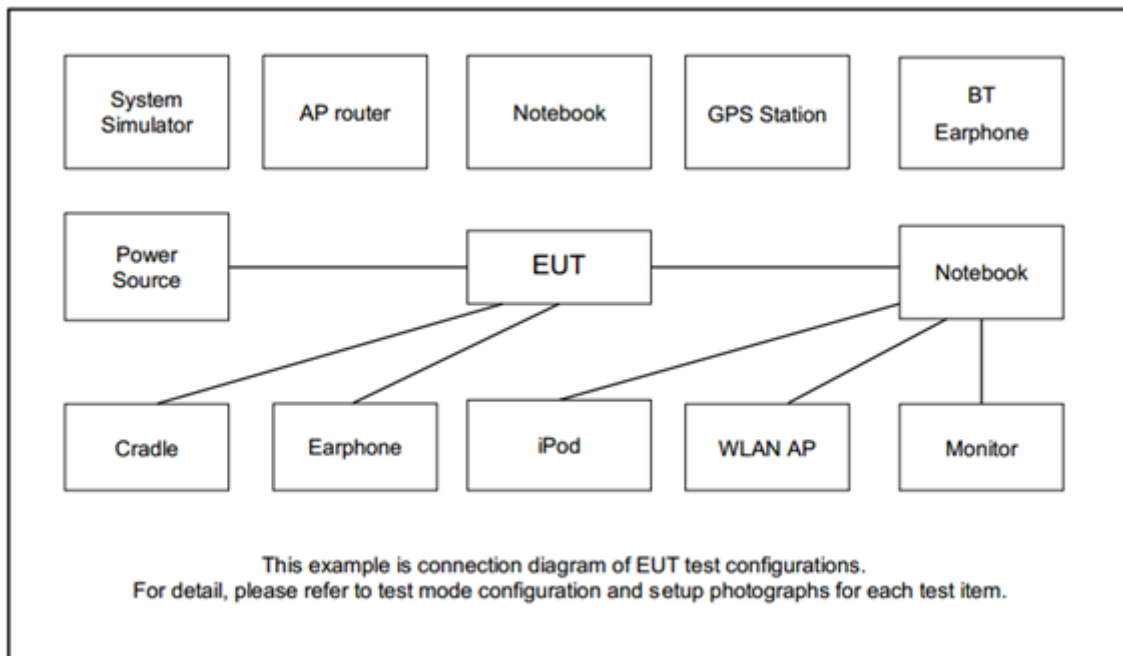
The following table is a list of the test modes shown in this test report.

Test Items	
AC Power Line Conducted Emissions	Field Strength of Fundamental Emissions
20dB Spectrum Bandwidth	
Radiated Emissions 9kHz~30MHz	Radiated Emissions 30MHz~1GHz

Pre-scanned tests, X, Y, Z in three orthogonal panels to determine the final configuration (X plane as worst plane) from all possible combinations.

Test Cases	
AC Conducted Emission	Mode 1 : Digitizer Link + H-Pattern + Earphone + AC Adapter 1 for Sample 1 Mode 2 : Digitizer Link + H-Pattern + Earphone + AC Adapter 1 for Sample 2
Remark: 1. The worst case of conducted emission is mode 2; only the test data of it was reported. 2. For Radiated Test Cases, the tests were performed with Adapter 1, Battery 1, and Sample 1	

2.2 Connection Diagram of Test System





2.3 Table for Supporting Units

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A

2.4 EUT Operation Test Setup

The ancillary equipment, Touch pen, is used to make the EUT (Digitizer Module) continuously transmitting signal and is touched to the panel of notebook.

3. Test Results

3.1 AC Power Line Conducted Emissions Measurement

3.1.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

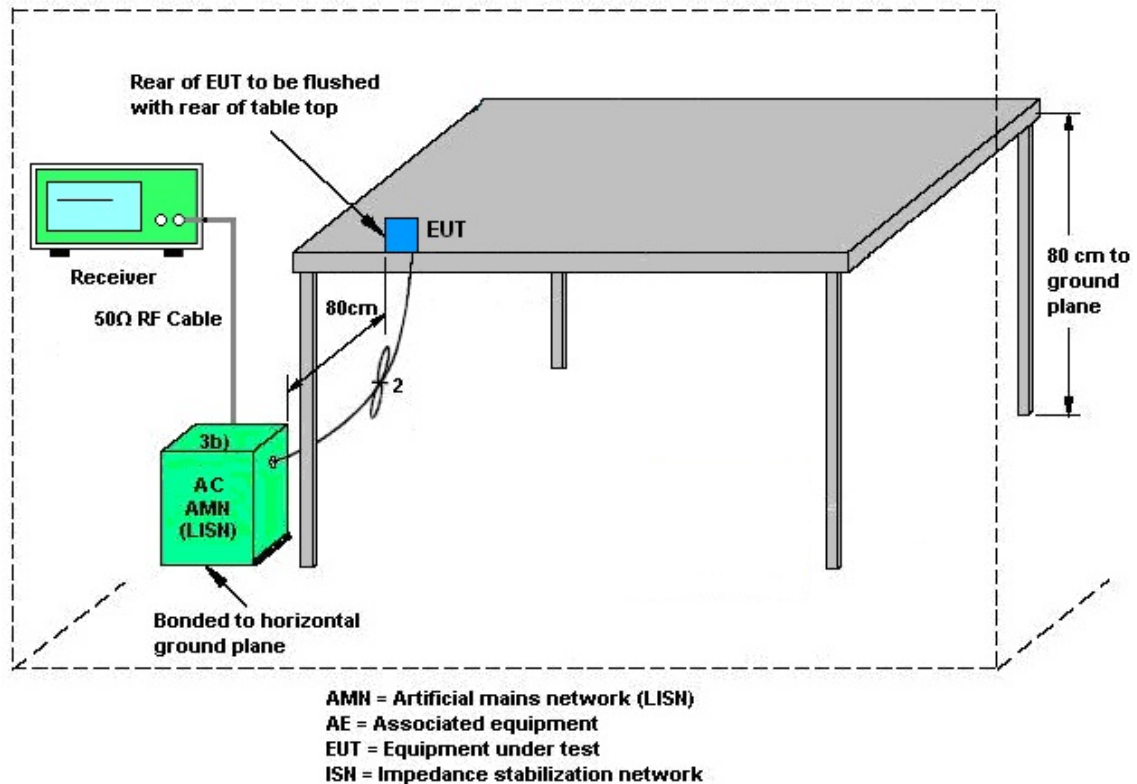
3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN shall be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

3.1.4 Test setup



3.1.5 Test Result of AC Conducted Emission

Please refer to Appendix A.

3.2 20dB and 99% OBW Spectrum Bandwidth Measurement

3.2.1 Limit

Reporting only

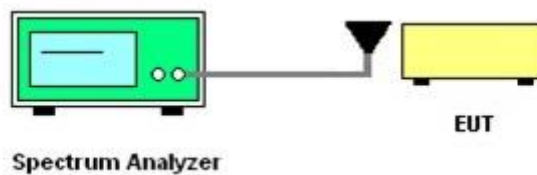
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The spectrum analyzer connected via a receive antenna placed near the EUT in peak Max Hold Mode.
2. The resolution bandwidth of 1 kHz and the video bandwidth of 3 kHz were used.
3. Measured the spectrum width with power higher than 20 dB below carrier.
4. Measured the 99% OBW.

3.2.4 Test Setup



3.2.5 Test Result of Conducted Test Items

Please refer to Appendix B.

3.3 Radiated Emissions Measurement

3.3.1 Limit

The field strength of any emissions which appear band shall not exceed the general radiated emissions limits.

Frequencies (MHz)	Field Strength ($\mu\text{V/m}$)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Measuring Instrument Setting

The following table is the setting of receiver:

Receiver Parameter	Setting
Attenuation	Auto
Frequency Range: 9kHz~150kHz	RBW 200Hz for QP
Frequency Range: 150kHz~30MHz	RBW 9kHz for QP
Frequency Range: 30MHz~1000MHz	RBW 120kHz for Peak

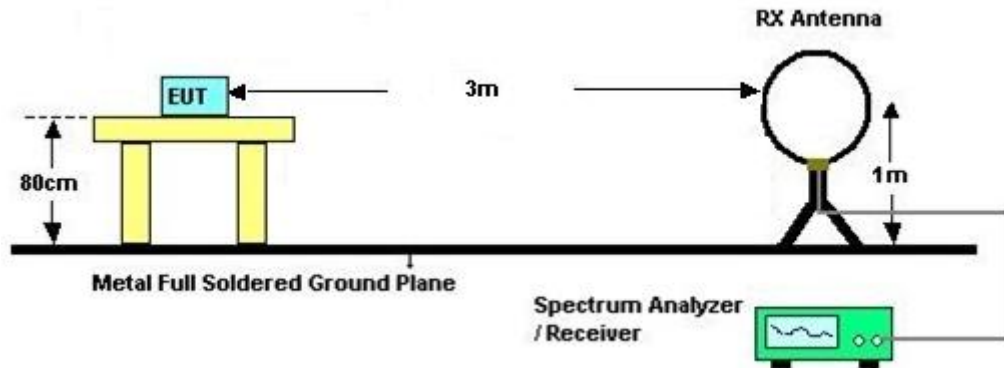
Note: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz and 110-490 kHz. Radiated emission limits in these two bands are based on measurements employing an average detector.

3.3.4 Test Procedures

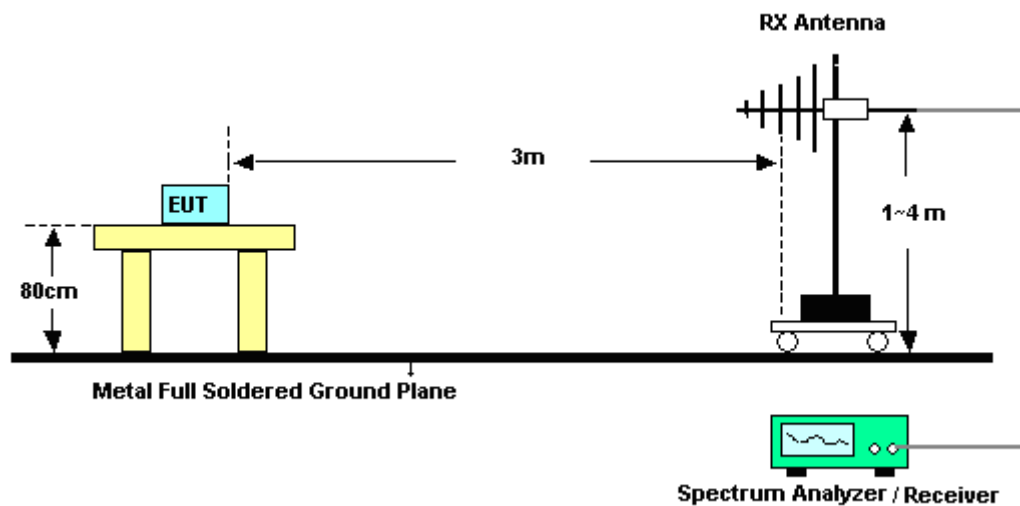
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
7. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver.

3.3.5 Test Setup

For radiated emissions below 30MHz



For radiated emissions above 30MHz



3.3.6 Test Result of Radiated Emissions Measurement

Please refer to Appendix C.

Remark: There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.



3.4 Antenna Requirements

3.4.1 Standard Applicable

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited.

The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the rule.

3.4.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.



4. List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Software	Audix	E3 6.2009-8-24	RK-00105 3	N/A	N/A	Mar. 08, 2021~ Mar. 09 2021	N/A	Radiation (03CH11-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Dec. 02, 2020	Mar. 08, 2021~ Mar. 09 2021	Dec. 01, 2021	Radiation (03CH11-HY)
Bilog Antenna	TESEQ	CBL 6111D & N-6-06	35414 & AT-N0602	30MHz~1GHz	Oct. 11, 2020	Mar. 08, 2021~ Mar. 09 2021	Oct. 10, 2021	Radiation (03CH11-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Jul. 14, 2020	Mar. 08, 2021~ Mar. 09 2021	Jul. 13, 2021	Radiation (03CH11-HY)
Controller	EMEC	EM 1000	N/A	Control Turn table & Ant Mast	N/A	Mar. 08, 2021~ Mar. 09 2021	N/A	Radiation (03CH11-HY)
Antenna Mast	EMEC	AM-BS-4500- B	N/A	1~4m	N/A	Mar. 08, 2021~ Mar. 09 2021	N/A	Radiation (03CH11-HY)
Turn Table	EMEC	TT 2000	N/A	0~360 Degree	N/A	Mar. 08, 2021~ Mar. 09 2021	N/A	Radiation (03CH11-HY)
EMI Test Receiver	Keysight	N9038A (MXE)	MY554201 70	20MHz~8.4GHz	May 21, 2020	Mar. 08, 2021~ Mar. 09 2021	May 20, 2021	Radiation (03CH11-HY)
Spectrum Analyzer	Keysight	N9010A	MY542004 86	10Hz~44GHz	Oct. 23, 2020	Mar. 08, 2021~ Mar. 09 2021	Oct. 22, 2021	Radiation (03CH11-HY)
Filter	Wainwright	WHK20/1000 C7/40SS	SN2	20M High Pass	Sep. 14, 2020	Mar. 08, 2021~ Mar. 09 2021	Sep. 13, 2021	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4 PE	9kHz-30MHz	Mar. 12, 2020	Mar. 08, 2021~ Mar. 09 2021	Mar. 11, 2021	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4 PE	30M-18G	Mar. 12, 2020	Mar. 08, 2021~ Mar. 09 2021	Mar. 11, 2021	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2859/2	30MHz-40GHz	Mar. 12, 2020	Mar. 08, 2021~ Mar. 09 2021	Mar. 11, 2021	Radiation (03CH11-HY)
Hygrometer	TECPEL	DTN-303B	TP200880	QA-3-031	Oct. 22, 2020	Mar. 08, 2021~ Mar. 09 2021	Oct. 21, 2021	Radiation (03CH11-HY)
Hygrometer	TECPEL	DTN-303B	TP140325	N/A	Nov. 18, 2020	Mar. 08, 2021~ Mar. 09 2021	Nov. 17, 2021	Radiation (03CH11-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Feb. 03, 2021~ Feb. 24, 2021	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102317	9kHz~3.6GHz	Sep. 11, 2020	Feb. 03, 2021~ Feb. 24, 2021	Sep. 10, 2021	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Nov. 18, 2020	Feb. 03, 2021~ Feb. 24, 2021	Nov. 17, 2021	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Nov. 16, 2020	Feb. 03, 2021~ Feb. 24, 2021	Nov. 15, 2021	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Feb. 03, 2021~ Feb. 24, 2021	N/A	Conduction (CO05-HY)
LISN Cable	MVE	RG-400	260260	N/A	Dec. 31, 2020	Feb. 03, 2021~ Feb. 24, 2021	Dec. 30, 2021	Conduction (CO05-HY)
Pulse Limiter	SCHWARZBE CK	ESHVTS 9561-F N3-Z2	109561-F N0037308 51	9kHz-200MHz	Nov. 02, 2020	Feb. 03, 2021~ Feb. 24, 2021	Nov. 01, 2021	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34893241	N/A	Mar. 02, 2020	Feb. 22, 2021	Mar. 01, 2021	Conducted (TH03-HY)
Hygrometer	Testo	608-H1	34893241	N/A	Mar. 03, 2021	Apr. 15, 2021	Mar. 02, 2022	Conducted (TH03-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101329	9kHz~30GHz	Sep. 03, 2020	Feb. 22, 2021~ Apr. 15, 2021	Sep. 02, 2021	Conducted (TH03-HY)

5. Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.3
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Uncertainty of Radiated Emission Measurement (9 kHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.4
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.4
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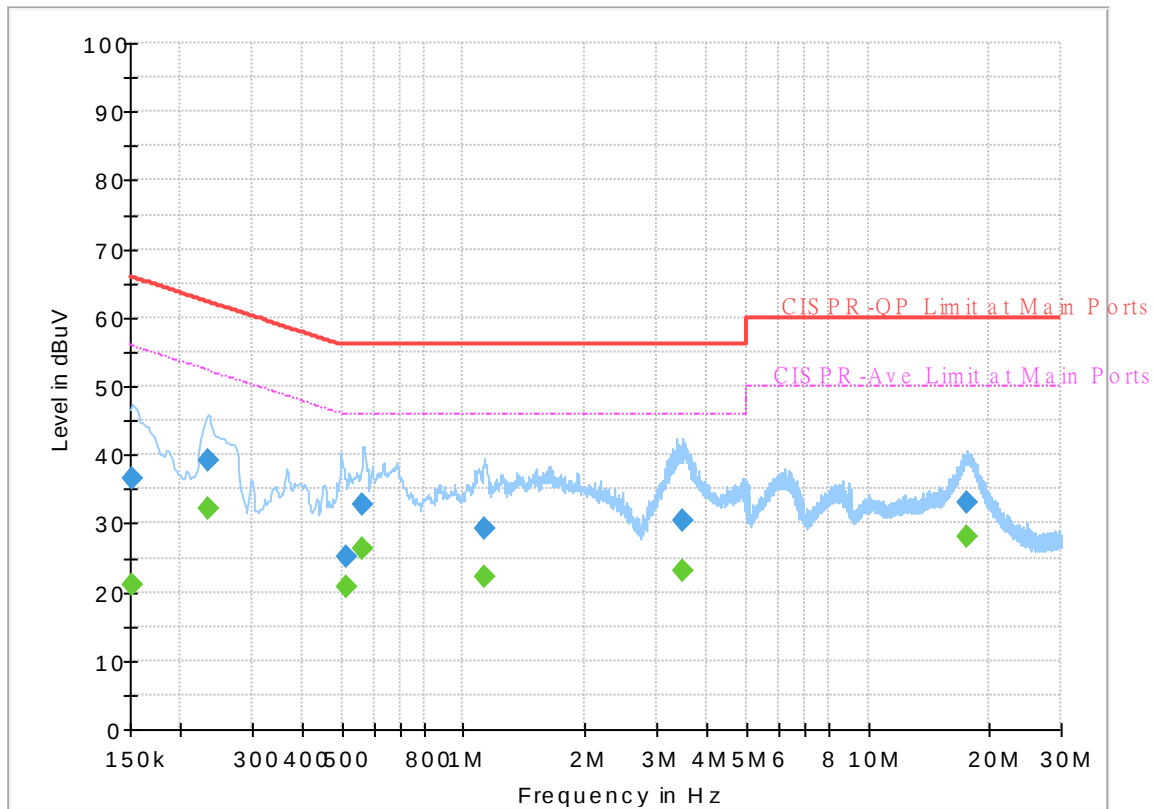
Appendix A. Test Results of Conducted Emission Test

Test Engineer :	Howard Huang	Temperature :	24~26℃
		Relative Humidity :	40~50%

EUT Information

Report NO : 111327
Test Mode : Mode 2
Test Voltage : 120Vac/60Hz
Phase : Line

Full Spectrum



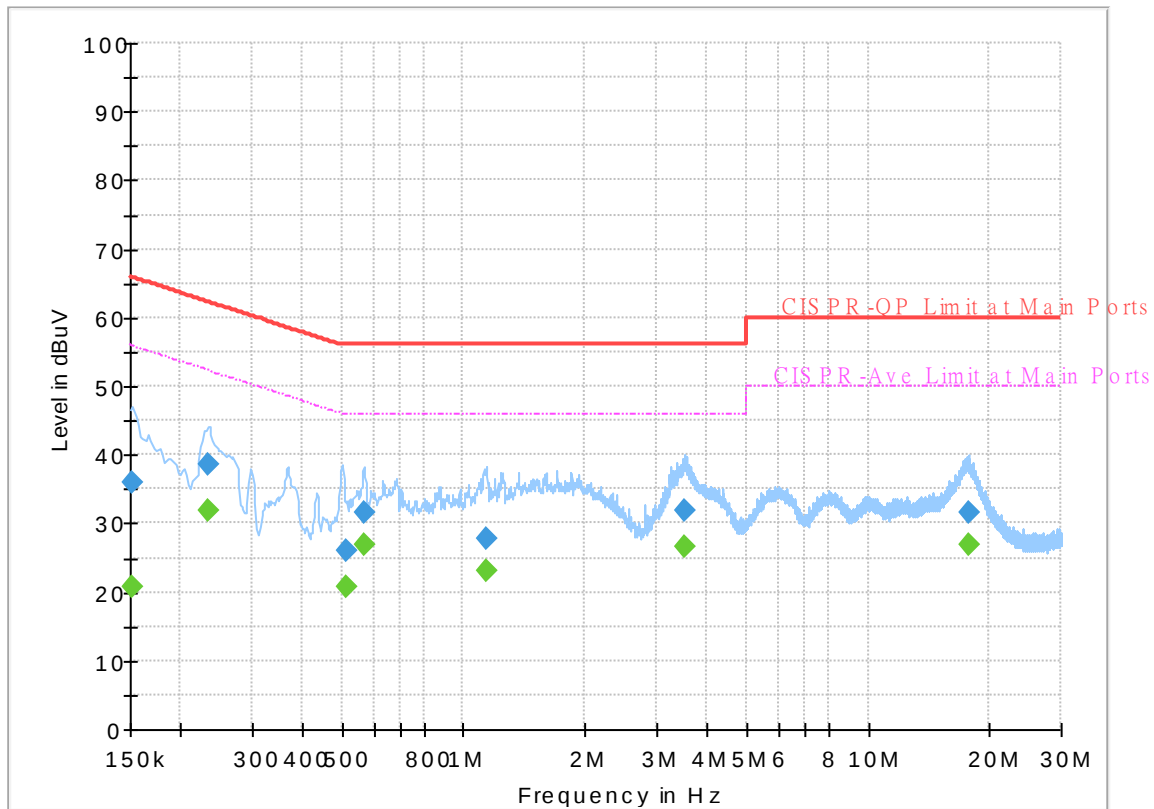
Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	20.98	55.88	34.90	L1	OFF	19.7
0.152250	36.45	---	65.88	29.43	L1	OFF	19.7
0.233250	---	32.22	52.33	20.11	L1	OFF	19.7
0.233250	39.30	---	62.33	23.03	L1	OFF	19.7
0.511000	---	20.66	46.00	25.34	L1	OFF	19.9
0.511000	25.25	---	56.00	30.75	L1	OFF	19.9
0.564000	---	26.36	46.00	19.64	L1	OFF	19.9
0.564000	32.81	---	56.00	23.19	L1	OFF	19.9
1.124250	---	22.14	46.00	23.86	L1	OFF	20.2
1.124250	29.32	---	56.00	26.68	L1	OFF	20.2
3.466500	---	23.05	46.00	22.95	L1	OFF	20.0
3.466500	30.30	---	56.00	25.70	L1	OFF	20.0
17.576250	---	28.18	50.00	21.82	L1	OFF	20.0
17.576250	33.18	---	60.00	26.82	L1	OFF	20.0

EUT Information

Report NO : 111327
Test Mode : Mode 2
Test Voltage : 120Vac/60Hz
Phase : Neutral

Full Spectrum

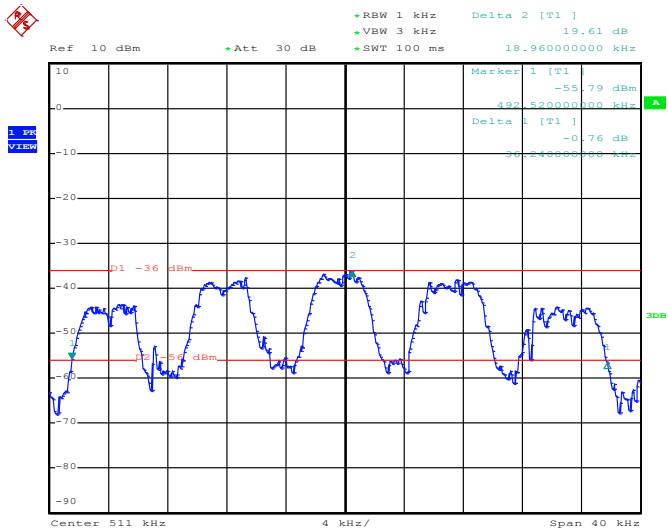
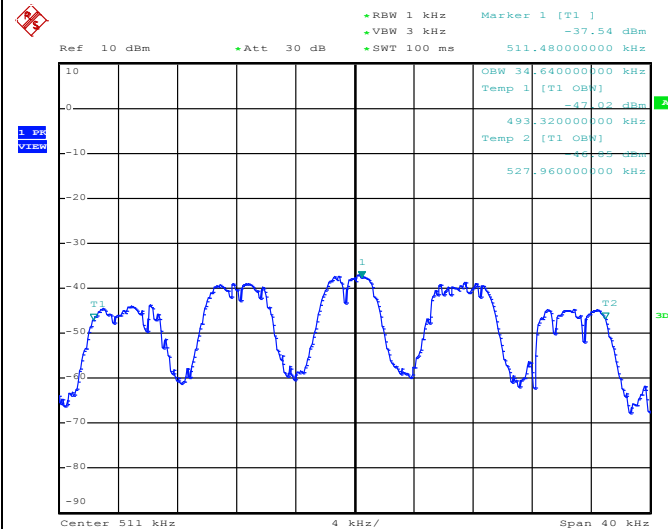


Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	20.87	55.88	35.01	N	OFF	19.7
0.152250	35.98	---	65.88	29.90	N	OFF	19.7
0.233250	---	31.86	52.33	20.47	N	OFF	19.7
0.233250	38.47	---	62.33	23.86	N	OFF	19.7
0.511000	---	20.79	46.00	25.21	N	OFF	19.9
0.511000	26.05	---	56.00	29.95	N	OFF	19.9
0.566250	---	26.86	46.00	19.14	N	OFF	19.9
0.566250	31.49	---	56.00	24.51	N	OFF	19.9
1.137750	---	23.19	46.00	22.81	N	OFF	20.2
1.137750	27.88	---	56.00	28.12	N	OFF	20.2
3.529500	---	26.64	46.00	19.36	N	OFF	20.0
3.529500	31.95	---	56.00	24.05	N	OFF	20.0
17.661750	---	26.81	50.00	23.19	N	OFF	20.1
17.661750	31.65	---	60.00	28.35	N	OFF	20.1

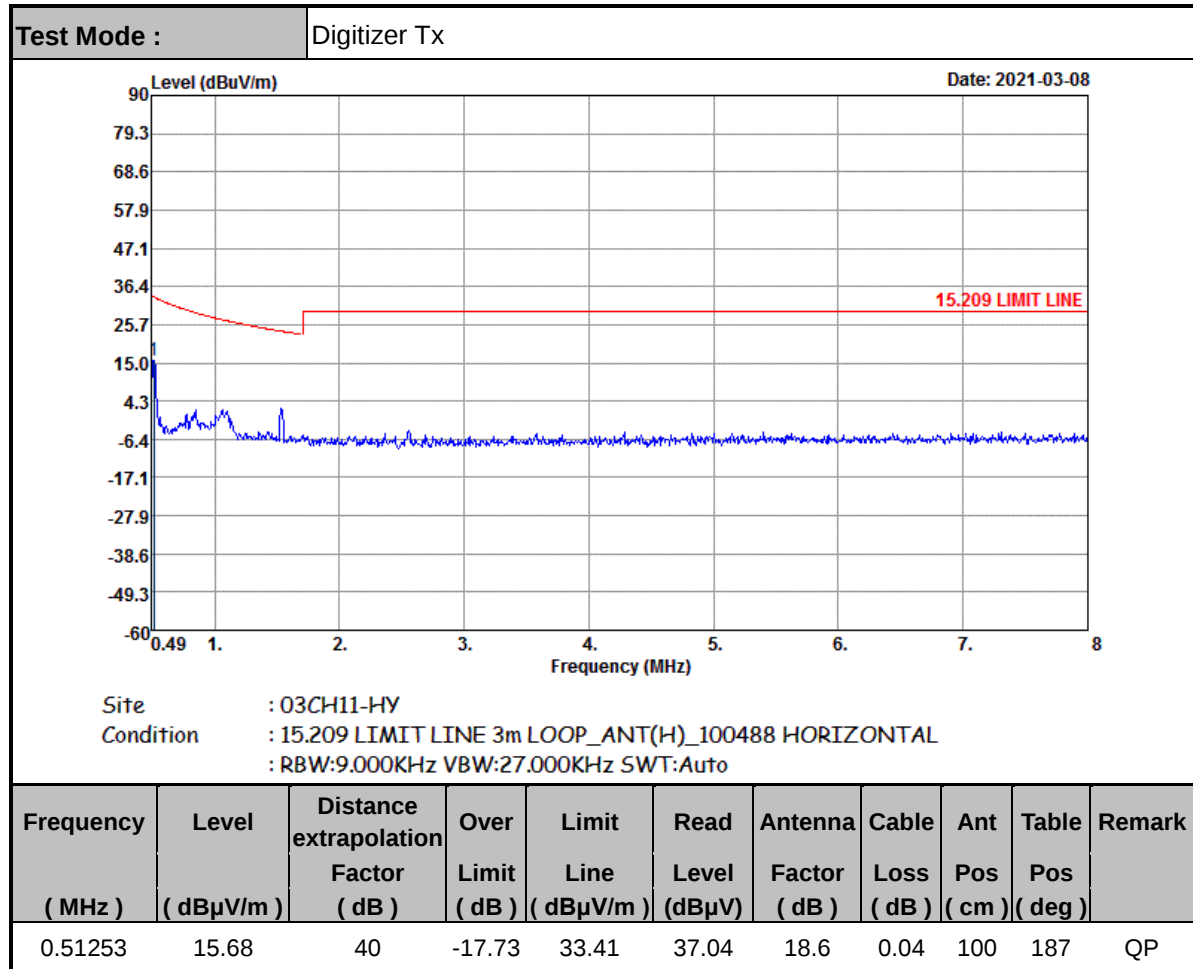


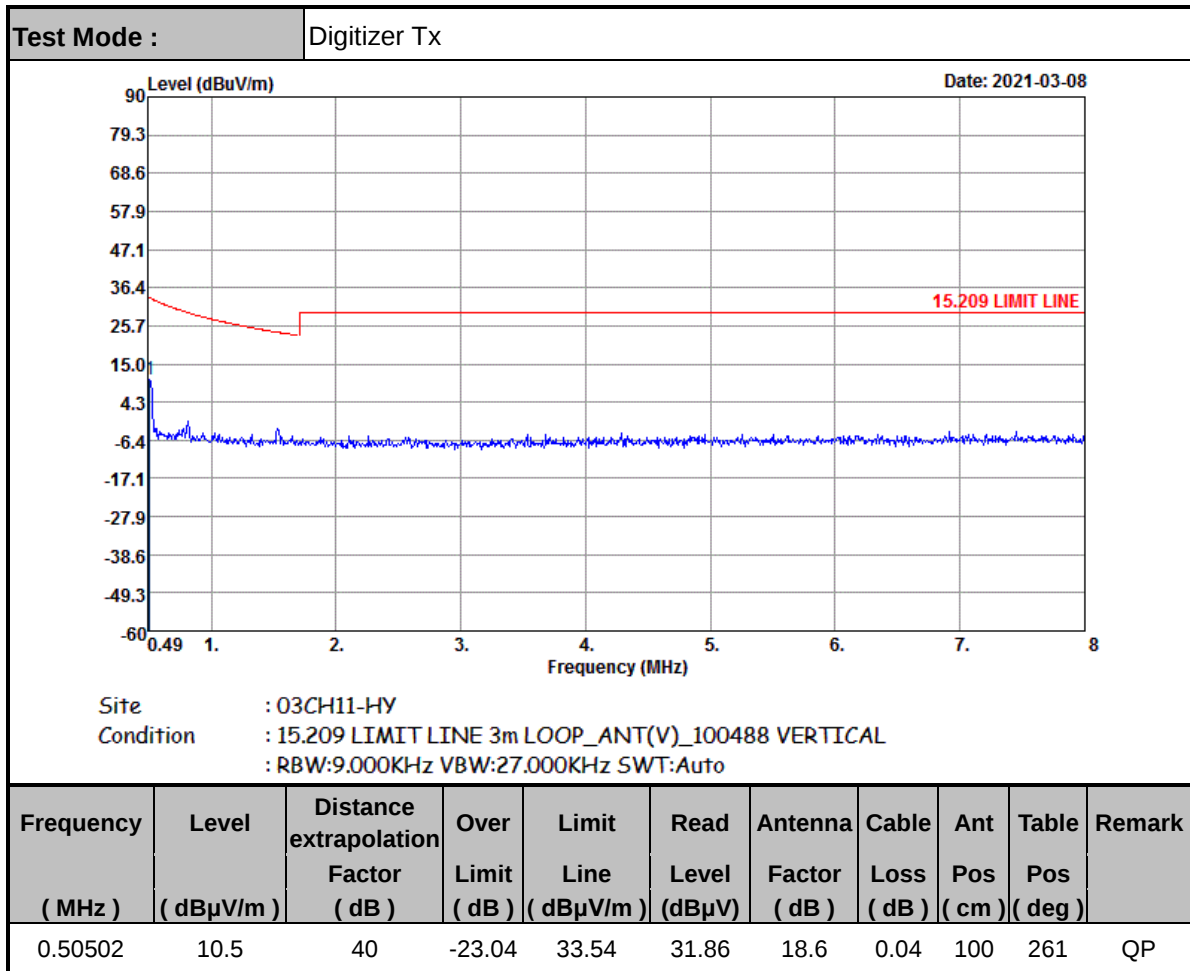
Appendix B. Test Results of Conducted Test Items

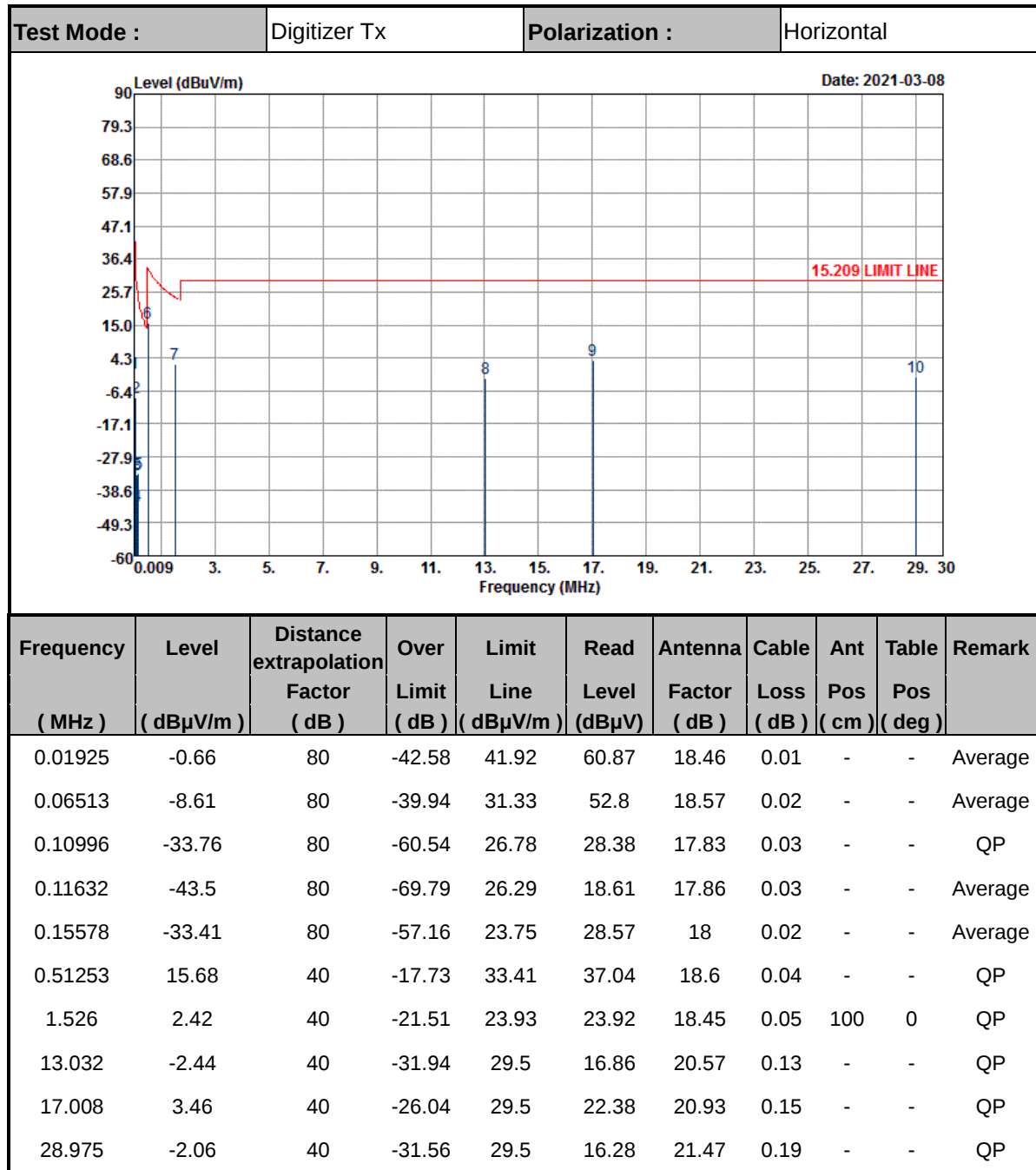
Test mode	Digitizer Tx	Test Frequency (kHz)	511		
 Date: 15.APR.2021 16:16:37	 Date: 15.APR.2021 16:18:59	20dB Bandwidth (kHz)	36.240	99% OccupiedBW(kHz)	34.640

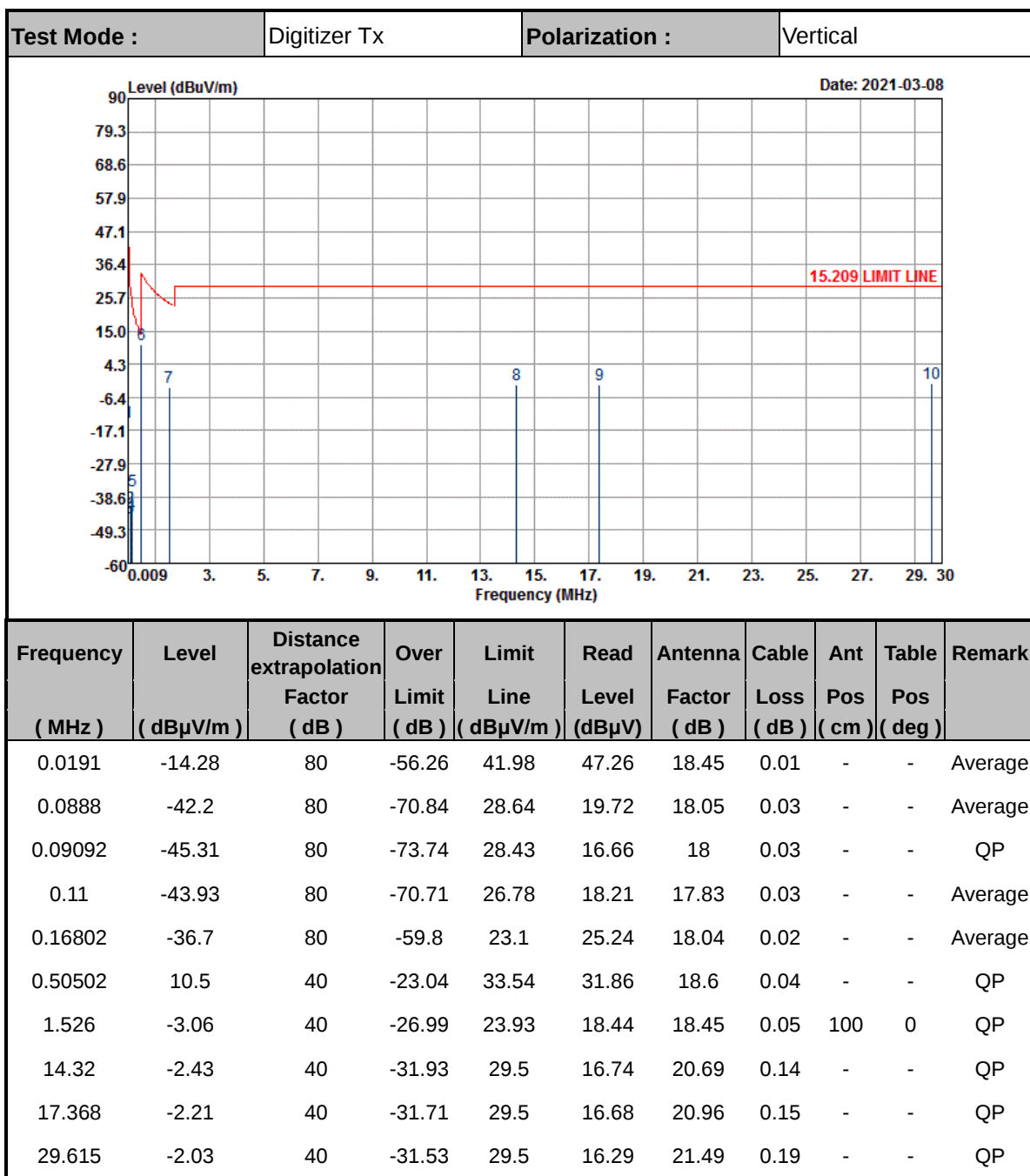
Appendix C. Test Results of Radiated Test Items

C1. Test Result of Field Strength of Fundamental Emissions

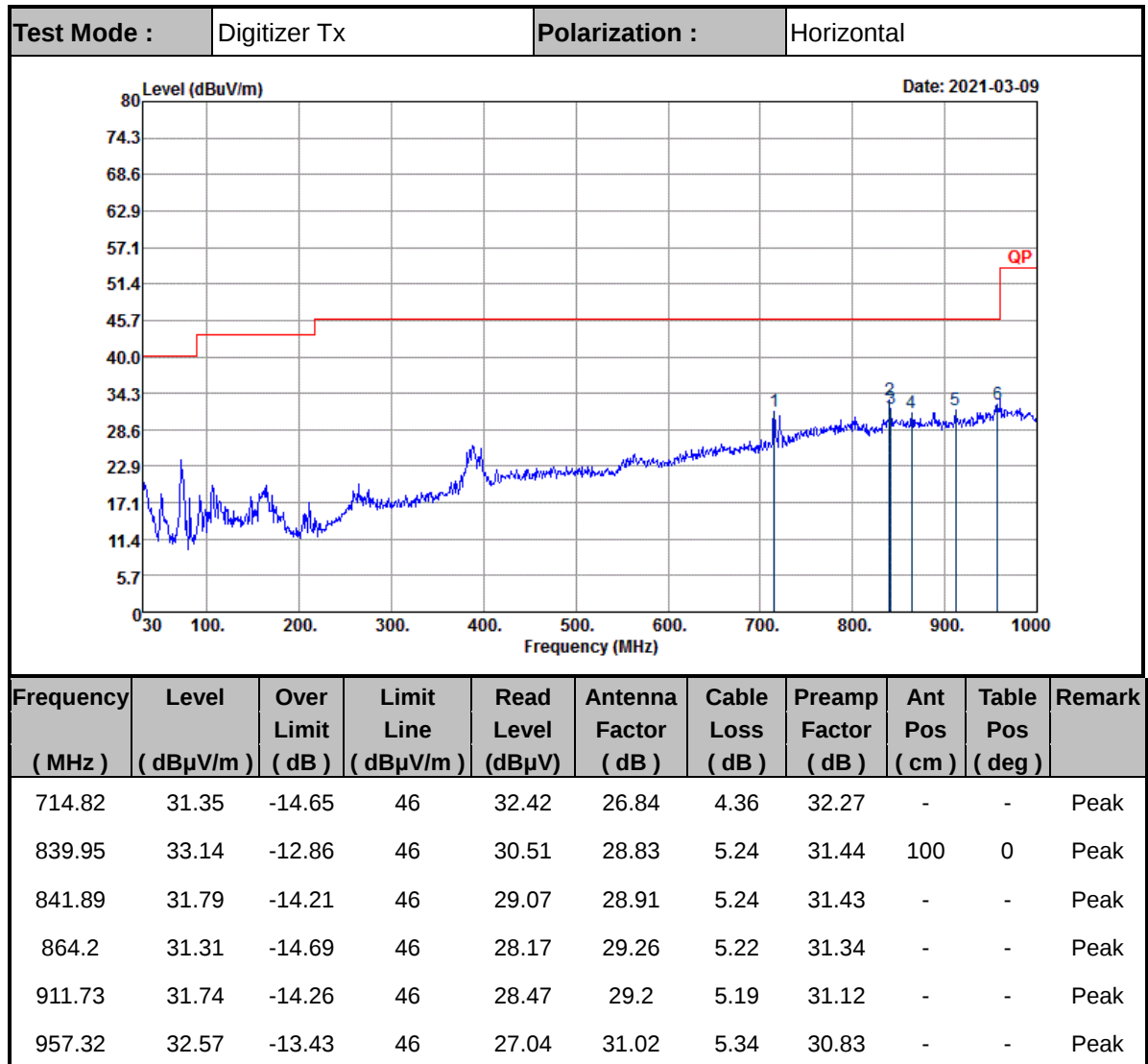


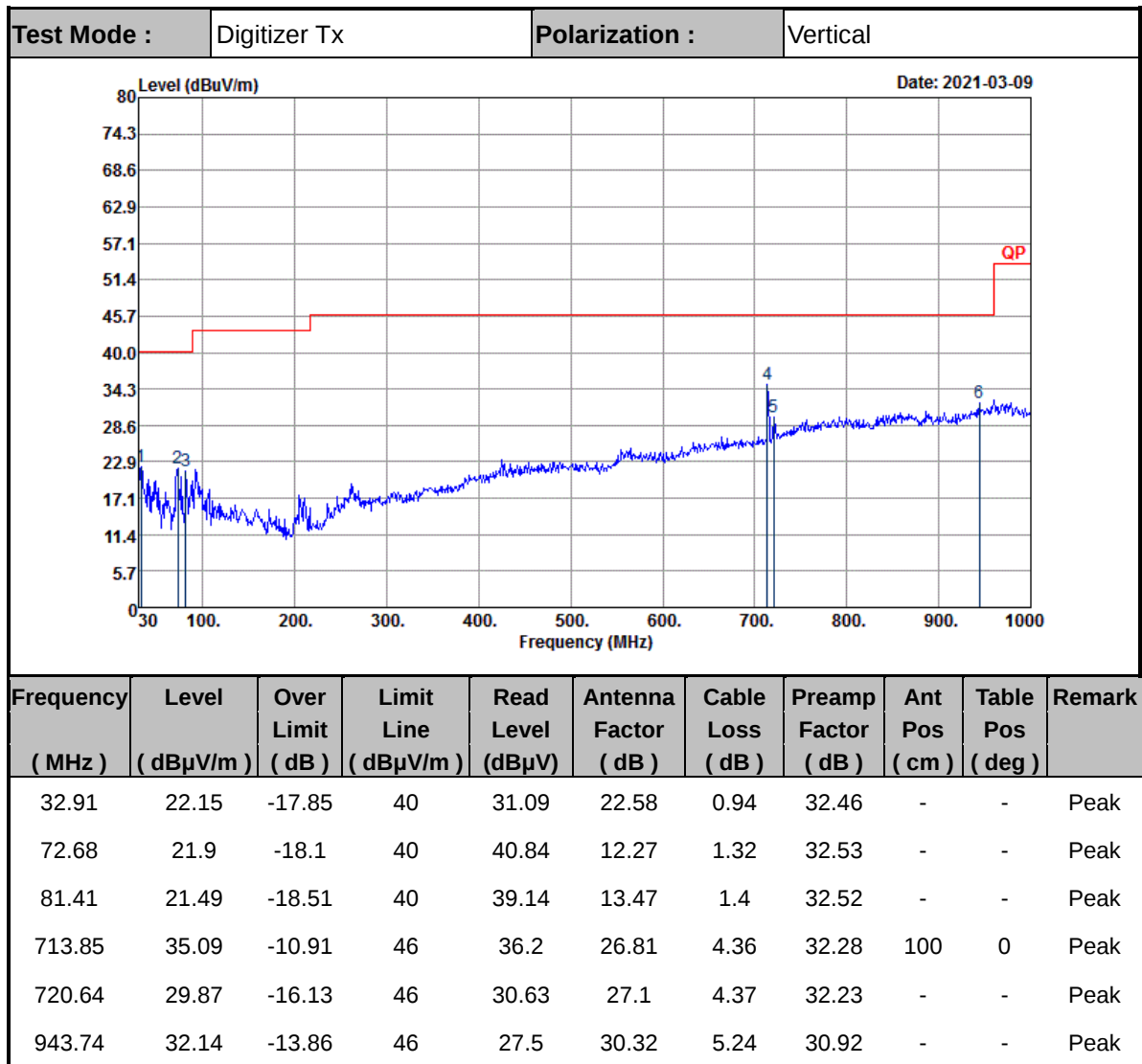


C2. Results of Radiated Spurious Emissions (9 kHz~30MHz)



Note:

1. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
2. Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB)
3. Limit line = specific limits (dBμV) + distance extrapolation factor

C3. Results of Radiated Spurious Emissions (30MHz~1GHz)



Note:

1. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
2. Emission level (dBμV/m) = 20 log Emission level (μV/m).
3. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor= Level.