FCC PART 15 SUBPART C TEST REPORT

FOR

USB FM Transmitter

Model No.: KFRT

FCC ID: Y2TTWFRT101129

of

Applicant: **Kooner Technology (Taiwan) Co.,Ltd**
Address: **5F-1, No.736. Zhong-Zheng Rd., Zhong-He City, Taipei County Taiwan**

Tested and Prepared

by

Worldwide Testing Services (Taiwan) Co., Ltd.

FCC Registration No.: 930600

Industry Canada filed test laboratory Reg. No. IC 5679A-1

A2LA Accredited No.: 2732.01

Testing Laboratory
1477

Report No.: W6M21010-10954-P-15

6F, NO. 58, LANE 188, RUEY-KUANG RD., NEIHU TAIPEI 114, TAIWAN, R.O.C.
TEL: 886-2-66068877 FAX: 886-2-66068879 E-mail: wts@wts-lab.com

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1 General Information

1.1 Notes

The purpose of conformity testing is to increase the probability of adherence to the essential requirements or conformity specifications, as appropriate.
The complexity of the technical specifications, however, means that full and thorough testing is impractical for both technical and economic reasons.
Furthermore, there is no guarantee that a test sample which has passed all the relevant tests conforms to a specification.
Neither is there any guarantee that such a test sample will interwork with other genuinely open systems.
The existence of the tests nevertheless provides the confidence that the test sample possesses the qualities as maintained and that is performance generally conforms to representative cases of communications equipment.

The test results of this test report relate exclusively to the item tested as specified in 1.5.
The test report may only be reproduced or published in full.
Reproduction or publication of extracts from the report requires the prior written approval of the Worldwide Testing Services(Taiwan) Co., Ltd.

Tester:

December 3, 2010 Rick Chen Rick Chen.

Date WTS-Lab. Name Signature

Technical responsibility for area of testing:

December 3, 2010 Chang Tse-Ming Chang Tse-Ming

Date WTS Name Signature

Registration number: W6M21010-10954-P-15
FCC ID: Y2TTWFRT101129

1.2 Testing laboratory

1.2.1 Location

OATS
No.5-1, Shuang Sing Village,
LiShuei Rd., Wanli Township,
Taipei County 207, Taiwan (R.O.C.)
Company
Worldwide Testing Services(Taiwan) Co., Ltd.
6F, NO. 58, LANE 188, RUEY-KUANG RD.
NEIHU, TAIPEI 114, TAIWAN R.O.C.
Tel : 886-2-66068877
Fax : 886-2-66068879

1.2.2 Details of accreditation status

Accredited testing laboratory

A2LA accredited number: 2732.01

FCC filed test laboratory Reg. No. 930600

Industry Canada filed test laboratory Reg. No. IC 5679A-1

Test location, where different from Worldwide Testing Services (Taiwan) Co., Ltd. :

Name:	./.
Accredited number:	./.
Street:	./.
Town:	./.
Country:	./.
Telephone:	./.
Fax:	./.

1.3 Details of approval holder

Name:	Kooner Technology (Taiwan) Co.,Ltd
Street:	5F-1, No.736. Zhong-Zheng Rd.,
Town:	Zhong-He City,Taipei County
Country:	Taiwan
Telephone:	+886-2-8228-0373
Fax:	+886-2-8228-0241
Teletex:	./.

1.4 Application details

Date of receipt of test item:	October 9, 2010
Date of test:	From October 10, 2010 to December 2, 2010

1.5 General information of Test item

Type of test item:	USB FM Transmitter
Model Number:	KFRT
Brand name:	My Music radio
Multi-listing model number:	./.
Transmitting frequency:	88.1 – 107.9 MHz
Operation mode:	simplex
Modulation Type:	FM
Voltage supply:	DC 5 V
Channel Numbers:	200
Frequency of selectable channel:	
Frequency 1:	88.1 MHz
Frequency 2:	98.1 MHz
Frequency 3:	107.9 MHz

Antenna Type:	PCB flat helical with copper slice Antenna
Photos:	see Appendix

Manufacturer:(if different from Approval Holder)

Name:	Glory Enterprise Securities Limted
Street:	3Th Floor Hongxing Building, Shagang Road, West District,
Town:	Zhongshan, GuangDong,
Country:	China

1.6 Test standards

Technical standard :

FCC RULES PART 15 SUBPART B/ SUBPART C § 15.203, § 15.209, § 15.239 (2009-10)

2 Technical test

2.1 Summary of test results

No deviations from the technical specification(s) were ascertained in the course of the tests performed. ☒

or

The deviations as specified in 3 were ascertained in the course of the tests performed. ☐

2.2 Test environment

Temperature:	23 °C
Relative humidity content:	20 ... 75 %
Air pressure:	86 ... 103 kPa
Details of power supply:	USB 5 VDC (power on PC)

2.3 Test equipment utilized

No.	Test equipment	Type	Serial No.	Manufacturer	Cal. Date	Next Cal. Date
ETSTW-CE 001	EMI TEST RECEIVER	ESHS10	842121/013	R&S	2010/9/2	2011/9/1
ETSTW-CE 004	ZWEILEITER-V-NETZNACHBILDUNG TWO-LINE V-NETWORK	ESH3-Z5	840731/011	R&S	2010/3/2	2011/3/1
ETSTW-CE 005	Line-Impedance Stabilisation Network	NNBM 8126D	137	Schwarzbeck	2010/9/8	2011/9/7
ETSTW-CE 006	IMPULSBEGRENZER PULSE LIMITER	ESH3-Z2	100226	R&S	2010/5/8	2011/5/7
ETSTW-CE 007	SPECTRUM ANALYZER 5GHz	FSB	849670/001	R&S	Pre-test Use NCR	
ETSTW-CE 008	HF-EICHLEITUNG RF STEP ATTENUATOR 139dB DPSP	334.6010.02	844581/024	R&S	Function Test	
ETSTW-CE 009	TEMP.&HUMIDITY CHAMBER	GTH-225-40-1P-U	MAA0305-009	GIANT FORCE	2010/7/21	2011/7/20
ETSTW-CE 013	CISPR 22 TWO BALANCED TELECOM PAIRS IMPEDANCE STABILIZATION NETWORK	FCC-TLISN-T4-02	20242	FCC	2010/10/21	2011/10/20
ETSTW-CE 015	CISPR 22 TWO BALANCED TELECOM PAIRS IMPEDANCE STABILIZATION NETWORK	FCC-TLISN-T8-02	20307	FCC	2010/9/6	2011/9/5
ETSTW-RE 002	Function Generator	33220A	MY43004982	Agilent	Function Test	
ETSTW-RE 003	EMI TEST RECEIVER	ESI 26	831438/001	R&S	2010/8/10	2011/8/9
ETSTW-RE 004	EMI TEST RECEIVER	ESI 40	832427/004	R&S	2010/9/14	2011/9/13
ETSTW-RE 005	EMI TEST RECEIVER	ESVS10	843207/020	R&S	2010/9/2	2011/9/1
ETSTW-RE 006	Attenuator 10dB	50HF-010-5N-1	None	STEP	2010/3/5	2011/3/4
ETSTW-RE 010	ABSORBING CLAMP	MDS 21	3469	Schwarzbeck	2010/9/6	2011/9/5
ETSTW-RE 012	TUNABLE BANDREJECT FILTER	D.C 0309	146	K&L	Function Test	
ETSTW-RE 013	TUNABLE BANDREJECT FILTER	D.C 0336	397	K&L	Function Test	
ETSTW-RE 018	MICROWAVE HORN ANTENNA	AT4560	27212	AR	2010/10/4	2011/10/3
ETSTW-RE 020	MICROWAVE HORN ANTENNA	AT4002A	306915	AR	Function Test	
ETSTW-RE 021	SWEEP GENERATOR	SWM05	835130/010	R&S	2010/8/20	2011/8/19
ETSTW-RE 027	Passive Loop Antenna	6512	00034563	EMCO	2010/7/22	2011/7/21
ETSTW-RE 028	Log-Periodic Dipole Array Antenna	3148	34429	EMCO	2010/4/14	2011/4/13
ETSTW-RE 029	Biconical Antenna	3109	33524	EMCO	2010/4/14	2011/4/13
ETSTW-RE 030	Double-Ridged Guide Horn Antenna	3117	00035224	EMCO	2010/3/2	2011/3/1
ETSTW-RE 032	Millivoltmeter	URV 55	849086/013	R&S	2010/10/4	2011/10/3
ETSTW-RE 033	WaveRunner 6000A Serise Oscilloscope	WAVERUNNER 6100A	LCRY0604P14508	LeCroy	Function Test	
ETSTW-RE 034	Power Sensor	URV5-Z4	839313/006	R&S	2010/10/4	2011/10/3
ETSTW-RE 044	Log-Periodic Antenna	HL050	100094	R&S	2010/5/11	2011/5/10
ETSTW-RE 047	PSA SERIES SPECTRUM ANALYZER	E4445A	MY46181369	Agilent	Pre-test Use NCR	
ETSTW-RE 048	Triple Loop Antenna	HXYZ 9170	HXYZ 9170-134	Schwarzbeck	2010/8/30	2011/8/29
ETSTW-RE 049	TRILOG Super Broadband test Antenna	VULB 9160	9160-3185	Schwarzbeck	2010/4/13	2011/4/12
ETSTW-RE 050	Attenuator 10dB	50HF-010-1	None	JFW	2010/3/5	2011/3/4
ETSTW-RE 051	Attenuator 6dB	50HF-006-1	None	JFW	2010/3/5	2011/3/4

ETSTW-RE 053	Attenuator 3dB	50HF-003-1	None	JFW	2010/3/5	2011/3/4
ETSTW-RE 055	SPECTRUM ANALYZER	FSU 26	200074	R&S	2010/6/3	2011/6/2
ETSTW-RE 060	Attenuator 30dB	5015-30	F651012z-01	ATM	Pre-test Use NCR	
ETSTW-RE 061	Amplifier Module	CHC 1	None	ETS	2010/9/27	2011/9/26
ETSTW-RE 062	Amplifier Module	CHC 2	None	KMIC	2010/11/10	2011/11/9
ETSTW-RE 064	Bluetooth Test Set	MT8852B-042	6K00005709	Anritsu	Function Test	
ETSTW-RE 065	Amplifier	AMF-6F-18002650-25-10P	941608	MITEQ	2010/4/13	2011/4/12
ETSTW-RE 066	Highpass Filter	H1G013G1	206015	MICROWAVE CIRCUITS, INC.	2010/3/5	2011/3/4
ETSTW-RE 072	CELL SITE TEST SET	8921A	3339A00375	HP	2010/10/7	2011/10/6
ETSTW-RE 073	Power Meter	N1911A	MY45100769	Agilent	2010/1/7	2011/1/6
ETSTW-RE 074	Power Sensor	N1921A	MY45241198	Agilent	2010/1/7	2011/1/6
ETSTW-RE 081	Highpass Filter	H03G13G1	4260-02 DC0428	MICROWAVE CIRCUITS, INC.	2010/3/5	2011/3/4
ETSTW-RE 096	SIGNAL GENERATOR	SMIQ 03B	102274	R&S	2010/5/31	2011/5/30
ETSTW-RE 099	DC Block	50DB-007-1	None	JFW	2010/3/5	2011/3/4
ETSTW-RE 105	2.4GHz Notch Filter	NO124411	39555	MICROWAVE CIRCUITS, INC.	2010/3/25	2011/3/24
ETSTW-RE 106	Humidity Temperature Meter	TES-1366	091011113	TES	2010/3/25	2011/3/24
ETSTW-GSM 002	Universal Radio Communication Tester	CMU 200	109439	R&S	2010/10/7	2011/10/6
ETSTW-GSM 019	Band Reject Filter	WRCTF824/849-822/851-40/12+9SS	3	WI	Function Test	
ETSTW-GSM 020	Band Reject Filter	WRCD1747/1748-1743/1752-32/5SS	1	WI	Function Test	
ETSTW-GSM 021	Band Reject Filter	WRCD1879.5/1880.5-1875.5/1884.5-32/5SS	3	WI	Function Test	
ETSTW-GSM 022	Band Reject Filter	WRCT901.9/903.1-904.25-50/8SS	1	WI	Function Test	
ETSTW-GSM 023	Power Divider	4901.19.A	None	SUHNER	2010/9/20	2011/9/19
ETSTW-Cable 002	Microwave Cable	SUCOFLEX 104（S_Cable 7）	238093	HUBER+SUHNER	2010/9/27	2011/9/26
ETSTW-Cable 003	Microwave Cable	SUCOFLEX 104（S_Cable 11）	209953	HUBER+SUHNER	2010/9/27	2011/9/26
ETSTW-Cable 006	Microwave Cable	SUCOFLEX 104（S_Cable 8）	238095	HUBER+SUHNER	2010/3/5	2011/3/4
ETSTW-Cable 010	BNC Cable	5 M BNC Cable	None	JYE BAO CO.,LTD.	2010/3/5	2011/3/4
ETSTW-Cable 011	BNC Cable	BNC Cable 1	None	JYE BAO CO.,LTD.	2010/8/19	2011/8/18
ETSTW-Cable 012	BNC Cable	BNC Cable 2	None	JYE BAO CO.,LTD.	2010/8/19	2011/8/18
ETSTW-Cable 013	Microwave Cable	SUCOFLEX 104（S_Cable 5）	232345	HUBER+SUHNER	2010/3/5	2011/3/4
ETSTW-Cable 022	N TYPE Cable	OATS Cable 3	0002	JYE BAO CO.,LTD.	2010/3/5	2011/3/4
ETSTW-Cable 028	Microwave Cable	FA147A0015M2020	30064-2	UTIFLEX	2010/9/13	2011/9/12
ETSTW-Cable 029	Microwave Cable	FA147A0015M2020	30064-3	UTIFLEX	2010/9/13	2011/9/12
ETSTW-Cable 039	Microwave Cable	SUCOFLEX 104（S_Cable 19）	316739	HUBER+SUHNER	2010/3/5	2011/3/4
WTSTW-SW 001	EMI TEST SOFTWARE	Harmonics-1000	None	EMC PARTNER	HARCS Version 4.16 Firmware Version 2.18	
WTSTW-SW 002	EMI TEST SOFTWARE	EZ_EMC	None	Farad	Version ETS-03A1	

WTSTW-SW 003	EMS TEST SOFTWARE	i2	None	AUDIX	Version 3.2007-8-17b
WTSTW-SW 005	GSM Fading Level Correction	GSMFadLevCor	None	R&S	Version 1.66

2.4 General Test Procedure

POWER LINE CONDUCTED INTERFERENCE: The procedure used was ANSI STANDARD C63.4-2003 using a 50µH LISN (if necessary). Both lines were observed. The bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed.

RADIATION INTERFERENCE: The test procedure used was according to ANSI STANDARD C63.4-2003 employing a spectrum analyzer. For investigated frequency is equal to or below 1GHz, the RBW and VBW of the spectrum analyzer was 100 kHz and 100kHz respectively with an appropriate sweep speed. For investigated frequency is above 1GHz, both of RBW and VBW of the spectrum analyzer were 1 MHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna.

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBµV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB.

Example:

Freq (MHz)	METER READING + ACF + CABLE LOSS (to the receiver) = FS
33	20 dBµV + 10.36 dB + 6 dB = 36.36 dBµV/m @3m

The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m (non metallic table) and arranged according to ANSI C63.4-2003 Section 13.1.2. The table used for radiated measurements is capable of continuous rotation. The spectrum was scanned from 30 MHz to the frequency specified as follows:

(1) If the intentional radiator operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
(2) If the intentional radiator operates at or above 10 GHz and below 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.
(3) If the intentional radiator operates at or above 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 200 GHz, whichever is lower, unless specified otherwise elsewhere in the rules.
(4) If the intentional radiator contains a digital device, regardless of whether this digital device controls the functions of the intentional radiator or the digital device is used for additional control or function purposes other than to enable the operation of the intentional radiator, the frequency range shall be investigated up to the range specified in paragraphs (a)(1)-(a)(3) of this section or the range applicable to the digital device, as shown in paragraph (b)(1) of this Section, whichever is the higher frequency range of investigation.

For hand-held devices, a exploratory test was performed with three (3) orthogonal planes to determine the highest emissions.
Measurements were made by Worldwide Testing Services(Taiwan) Co., Ltd. at the registered open field test site located at No.5-1, Shuang Sing Village, LiShuei Rd., Wanli Township, Taipei County 207, Taiwan (R.O.C.) The Registration Number: **930600**.

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

When the radiated emission limits are expressed in terms of the average value of the emission, 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.

The formula is as follows:
Average = Peak + Duty Factor
Duty Factor = 20 log (dwell time/T)
T = 100ms when the pulse train period is over 100 ms or the period of the pulse train.

Modified Limits for peak according to 15.35 (b) = Max Permitted average Limits + 20dB

2.5 Product Description and System Test Configuration

2.5.1 Production Description

The USB FM transmitter will be used for sending personal or laptop computer's audio signal from USB to traditional FM radio.
The device can plug into a USB port of a computer; tune in to a clear frequency channel to converts the stereo audio signal into an FM radio signal, which can then be picked up by appliances such as car or portable radios. User can use it as a wireless sound box to listen the music from PC in indoor, inside of a car, an office, a kitchen and so on.

2.5.2 System Test Configuration

2.5.2.1 Supported Ancillary Equipment

Digital

Item	Equipment	Manufacturer	Model no.	Note
1	EUT: USB FM Transmitter	Glory Enterprise Securities Limted	KFRT	N/A
2	Printer	LEXMARK	Z42	N/A
3	External USB 2.0 Hard Disk	TERASYS	F12-UF	N/A
4	HUB	Corega	Corega-HUB-5PN	N/A
5	Modem	ZyXEL	Omnl 56K smart	N/A
6	Far End Network Server	D-Link	DES-1024R	N/A
7	Note Book	FUJITSU	LIFEBOOK	N/A

RF

Item	Equipment	Manufacturer	Model no.	Note
1	EUT: USB FM Transmitter	Glory Enterprise Securities Limted	KFRT	N/A
2	Note Book	FUJITSU	LIFEBOOK	N/A

2.5.2.2 The relevant cables of Supported Ancillary Equipment

Digital

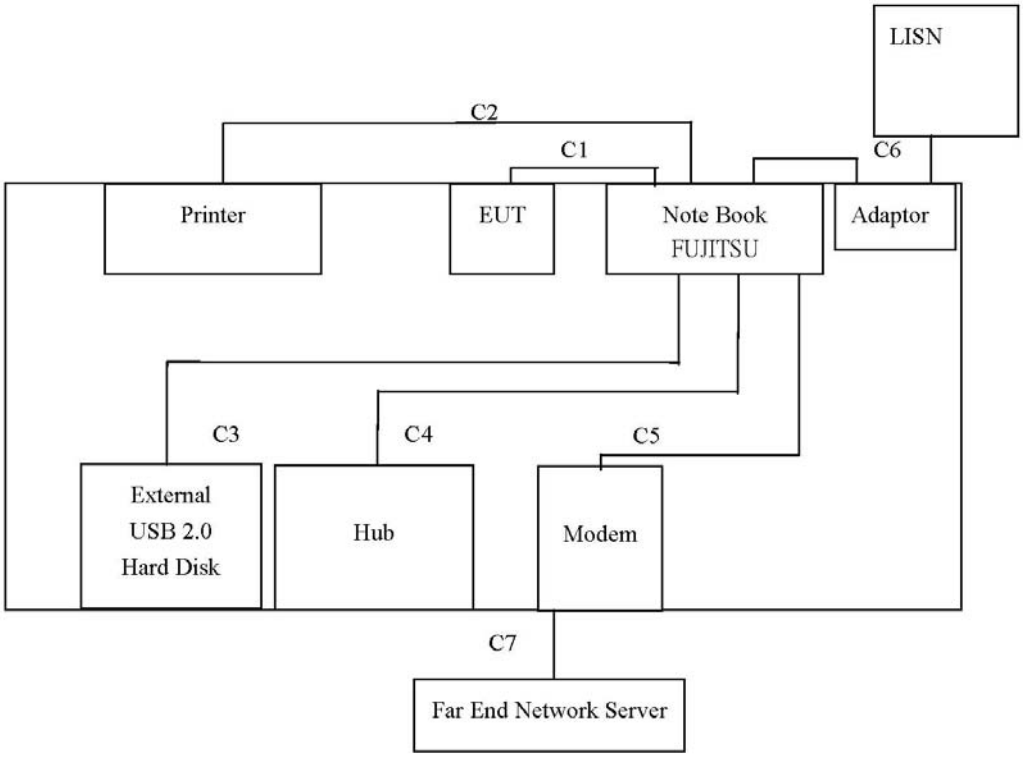
Item	Name of Cables	Shielded Used	Ferrite Used	Length	Note
C1	Data Cable	Non-Shielded	N/A	1.8m	Type:USB
C2	Data Cable	Non-Shielded	N/A	1.8m	T Type:RS232
	Adaptor	Non-Shielded	N/A	2.0m	Detachable
C3	Data Cable	Non-Shielded	N/A	1.8m	Detachable
	Adaptor	Non-Shielded	N/A	1.5m	Detachable
C4	Data Cable	Non-Shielded		2.0m	RJ45
	Data Cable	Non-Shielded	N/A	2.0m	RJ45
	Adaptor	Non-Shielded		1.8m	Detachable
C5	Data Cable	Non-Shielded		1.8m	RS232
	Data Cable	Non-Shielded	N/A	2.1m	Line
	Adaptor	Non-Shielded		1.8m	Detachable
C6	Data Cable	Non-Shielded	N/A	2.0m	Detachable
	Adaptor	Non-Shielded	N/A	2.0m	Detachable
C7	Adaptor	Non-Shielded	N/A	1.8m	Detachable

RF

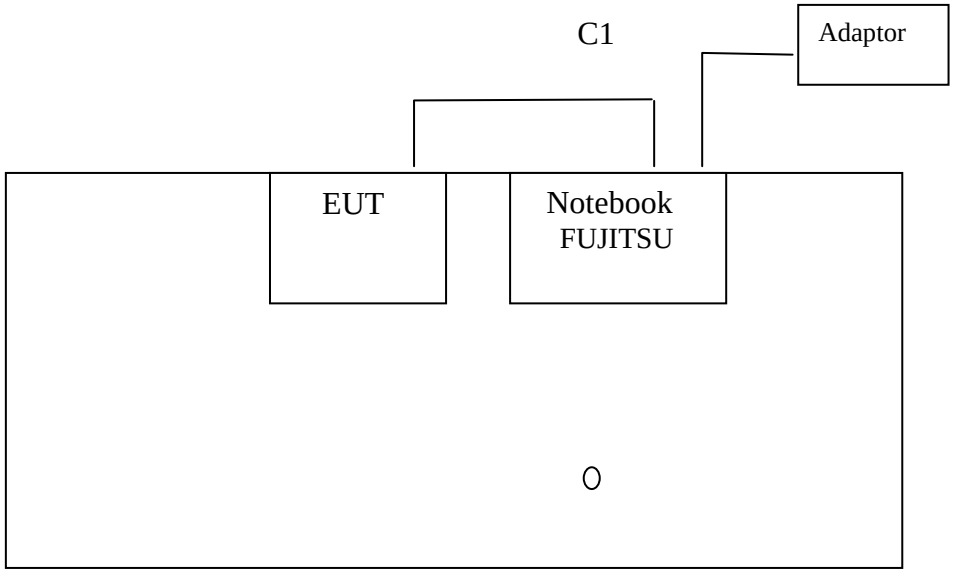
Item	Name of Cables	Shielded Used	Ferrite Used	Length	Note
C1	Adaptor	Non-Shielded	N/A	1.8m	Detachable

2.5.2.3 Setup Configuration

Digital



RF



2.5.2.4 Description of RFTest Mode

The EUT was connected to Notebook. After that, we started the software and play the music.

2.6 The Description of Modification

No modification was made during the all test items been performed.

3 Test results (enclosure)

TEST CASE	Required	Test passed	Test failed
Emission bandwidth 15.239 (a)	☒	☒	☐
Band Edge Measurement 15.239 (a)	☒	☒	☐
Carrier (Field Strength) 15.239 (b)	☒	☒	☐
Spurious Emissions 15.239 (c)	☒	☒	☐
Radiated Emissions from digital part 15.109	☒	☒	☐
Power Line Conducted Emission 15.207	☒	☒	☐

Note: The lowest channel is 88.1 MHz and the highest channel is 107.9 MHz. The tuning control were adjusted by software to verify maximum tuning range.

(The follows is intended to leave blank.)

3.1 Emission Bandwidth

FCC Rule: 15.239(a)

88.1 MHz:

Test condition		Detector	Bandwidth (kHz)	Limit (kHz)
T_{nom}= 23°C	V_{nom} = 5 V	Peak	56.11222445 kHz	200

98.1 MHz:

Test condition		Detector	Bandwidth (kHz)	Limit (kHz)
T_{nom}= 23°C	V_{nom} = 5 V	Peak	56.11222445 kHz	200

107.9 MHz:

Test condition		Detector	Bandwidth (kHz)	Limit (kHz)
T_{nom}= 23°C	V_{nom} = 5 V	Peak	56.11222445 kHz	200

Limit: 15.239(a)
Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency. The 200 kHz band shall lie wholly within the frequency range of 88-108 MHz.

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 029

Explanation: See attached diagrams as Appendix.

3.2 Band Edge Measurement

FCC Rule: 15.239(a)

Modulation

Channel	Frequency MHz	Detector	Test Results (dBμV/m)	Limit (dBμV/m)
Lower Band-edge	88.0000	Peak	32.03	40
Upper Band-edge	108.000	Peak	31.35	43.5

Un-modulation

Channel	Frequency MHz	Detector	Test Results (dBμV/m)	Limit (dBμV/m)
Lower Band-edge	88.0000	Peak	32.04	40
Upper Band-edge	108.000	Peak	31.35	43.5

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 029

Explanation: See attached diagrams as Appendix.

3.3 Carrier (Field Strength)

FCC Rule: 15.239(b) , 15.35

Model: KFRT Date: 2010/10/12
Mode: 88.1MHz Temperature: 33.9 °C Engineer: Rick
Polarization: Horizontal Humidity: 59 %

Frequency (MHz)	Reading (dBuV) Peak	Reading (dBuV) Ave.	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave.	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
88.1015	36.77	35.99	9.35	46.12	45.34	67.95	47.95	-2.61	130	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV) Peak	Reading (dBuV) Ave.	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave.	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
88.0915	36.25	35.72	9.35	45.60	45.07	67.95	47.95	-2.88	110	150

Mode: 98.1MHz
Polarization: Horizontal

Frequency (MHz)	Reading (dBuV) Peak	Reading (dBuV) Ave.	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave.	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
98.0975	37.70	36.55	9.63	47.33	46.18	67.95	47.95	-1.77	120	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV) Peak	Reading (dBuV) Ave.	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave.	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
98.0995	36.07	35.42	9.63	45.70	45.05	67.95	47.95	-2.90	220	150

Mode: 107.9MHz
Polarization: Horizontal

Frequency (MHz)	Reading (dBuV) Peak	Reading (dBuV) Ave.	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave.	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
107.9045	36.68	36.68	10.38	47.06	47.06	67.95	47.95	-20.89	150	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV) Peak	Reading (dBuV) Ave.	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave.	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
107.9045	31.52	30.98	10.38	41.90	41.36	67.95	47.95	-6.59	170	150

Limit:
15.239(b)
The field strength of any emissions within the permitted 200 kHz band shall not exceed 250 microvolts/meter (47.90 dBuV/m) at 3 meters.

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 029

Explanation: See attached diagrams as Appendix.

3.4 Spurious Emission

FCC Rules: 15.239 (c), 15.209
Radiated emission measurements were performed from 30 MHz to 1000 MHz.
For radiated emission tests, the analyzer setting was as followings:

Frequency ≦ 1 GHz, RBW:100 kHz, VBW: 100 kHz (Peak measurements)
Frequency ＞1 GHz, RBW: 1 MHz, VBW: 1 MHz (Peak measurements)
Frequency ＞1 GHz , RBW:1 MHz , VBW: 10Hz (Average measurements)

The peak and average spurious emission plots was measured with the average limits.
In the Table being listed the critical peak and average value an exhibit the compliance with the above calculated Limits.

Summary table with radiated data of the test plots

Model: KFRT Date: 2010/10/12
Mode: 88.1 MHz_TX Temperature: 33.9 °C Engineer: Rick
Polarization: Horizontal Humidity: 59 %

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
178.2566	17.99	peak	13.87	31.86	43.50	-11.64	140	150
200.4410	25.34	peak	11.99	37.33	43.50	-6.17	230	150
266.4530	13.44	peak	15.07	28.51	46.00	-17.49	230	150
352.4000	7.79	peak	17.45	25.24	46.00	-20.76	260	150
443.0862	8.24	peak	20.06	28.30	46.00	-17.70	290	150
527.2545	10.70	peak	21.66	32.36	46.00	-13.64	140	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
178.2566	17.55	peak	13.87	31.42	43.50	-12.08	240	150
200.4410	26.49	peak	11.99	38.48	43.50	-5.02	230	150
264.3000	11.20	peak	14.98	26.18	46.00	-19.82	130	150
352.4000	9.31	peak	17.45	26.76	46.00	-19.24	260	150
440.4000	7.84	peak	19.99	27.83	46.00	-18.17	220	150
528.6000	7.96	peak	21.69	29.65	46.00	-16.35	210	150

Mode: 98.1 MHz_TX
Polarization: Horizontal

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
177.1744	17.61	peak	14.01	31.62	43.50	-11.88	200	150
200.4410	26.07	peak	11.99	38.06	43.50	-5.44	110	150
292.9658	17.66	peak	16.05	33.71	46.00	-12.29	230	150
392.4000	9.36	peak	18.61	27.97	46.00	-18.03	260	150
493.5871	9.34	peak	20.95	30.29	46.00	-15.71	210	150
591.7834	8.06	peak	23.30	31.36	46.00	-14.64	140	150

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
196.2000	26.46	peak	12.17	38.63	43.50	-4.87	260	150
200.4410	26.42	peak	11.99	38.41	43.50	-5.09	230	150
294.3000	14.52	peak	16.09	30.61	46.00	-15.39	210	150
392.4000	8.56	peak	18.61	27.17	46.00	-18.83	140	150
490.5000	7.51	peak	20.91	28.42	46.00	-17.58	200	150
588.6000	5.70	peak	23.20	28.90	46.00	-17.10	210	150

Mode: 107.9 MHz_TX
Polarization: Horizontal

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
217.2145	21.03	peak	13.15	34.18	46.00	-11.82	210	150
323.7000	9.57	peak	16.75	26.32	46.00	-19.68	130	150
431.6000	9.00	peak	19.73	28.73	46.00	-17.27	260	150
537.0742	8.75	peak	21.88	30.63	46.00	-15.37	110	150
647.4000	7.04	peak	24.08	31.12	46.00	-14.88	210	150

Frequency	Reading (dBuV)		Factor (dB)	Result (dBuV/m)		Limit (dBuV/m)		Margin	Table Degree	Ant. High
(MHz)	Peak	Ave.	Corr.	Peak	Ave.	Peak	Ave.	(dB)	(Deg.)	(cm)
1867.7360	46.13	---	-10.20	35.93	---	74.00	54.00	-38.07	140	150

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Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
215.8000	19.74	peak	13.05	32.78	43.50	-10.72	110	150
323.7000	8.87	peak	16.75	25.62	46.00	-20.38	230	150
431.6000	9.10	peak	19.73	28.83	46.00	-17.17	270	150
541.2826	8.58	peak	21.97	30.55	46.00	-15.45	110	150
645.0901	8.10	peak	24.06	32.16	46.00	-13.84	210	150

Frequency	Reading (dBuV)		Factor	Result (dBuV/m)		Limit (dBuV/m)		Margin	Table Degree	Ant. High
(MHz)	Peak	Ave.	(dB) Corr.	Peak	Ave.	Peak	Ave.	(dB)	(Deg.)	(cm)
1947.8960	46.01	---	-10.09	35.92	---	74.00	54.00	-38.08	110	150

Radiated Emissions from digital part

Mode: Temperature: 24.1 °C Engineer: Rick
Polarization: Horizontal Humidity: 60 %

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
132.2645	10.20	QP	13.60	23.80	30.00	-6.20	120	300
167.9760	11.11	QP	14.09	25.20	30.00	-4.80	250	350
200.4407	13.70	QP	11.36	25.06	30.00	-4.94	130	320
499.1984	8.30	QP	20.53	28.83	37.00	-8.17	250	110
660.5210	8.10	QP	23.76	31.86	37.00	-5.14	140	150
727.8557	7.30	QP	25.06	32.36	37.00	-4.64	290	120

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
167.9760	10.11	QP	14.09	24.20	30.00	-5.80	160	120
198.2760	14.00	QP	11.52	25.52	30.00	-4.48	140	150
276.1923	8.30	QP	14.77	23.07	37.00	-13.93	280	130
499.1983	8.20	QP	20.53	28.73	37.00	-8.27	230	350
660.5210	8.10	QP	23.76	31.86	37.00	-5.14	200	330
900.4004	7.20	QP	27.45	34.65	37.00	-2.35	120	320

Note
1. **Correction Factor = Antenna factor + Cable loss - Preamplifier**
2. **The formula of measured value as: Test Result = Reading + Correction Factor**
3. **Detector function in the form : PK = Peak, QP = Quasi Peak, AV = Average**
4. **All not in the table noted test results are more than 20 dB below the relevant limits.**
5. **See the attached diagram as appendix.**

Limits: 15.209 & 15.109

Frequency of Emission (MHz)	Field strength (microvolts/meter)	Field Strength (dB microvolts/meter)
30 – 88	100	40.0
88 – 216	150	43.5
216 – 960	200	46.0
Above 960	500	54.0

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 028, ETSTW-RE 029, ETSTW-RE 030, ETSTW-RE 044

3.5 Power Line Conducted Emission

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the table bellows with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals.

This measurement was transact first with instrumentation using an average and peak detector and a 10 kHz bandwidth. If the peak detector achieves a calculated level, the measurement is repeated by an instrumentation using a quasi-peak detector.

Model: KFRT Date: 2010/10/22
Mode: Temperature: 24 °C Engineer: Rick
Polarization: N Humidity: 60 %

Frequency (MHz)	Reading (dBuV) QP	Reading (dBuV) Ave.	Factor (dB) Corr.	Result (dBuV) QP	Result (dBuV) Ave.	Limit (dBuV) QP	Limit (dBuV) Ave.	Margin (dB)
0.1573	42.54	26.14	10.74	53.28	36.88	65.61	55.61	-12.33
0.1870	43.53	25.21	10.76	54.29	35.97	64.17	54.17	-9.88
0.2460	35.20	21.42	10.72	45.92	32.14	61.89	51.89	-15.97
0.4850	20.68	12.01	10.65	31.33	22.66	56.25	46.25	-23.59
0.6447	29.01	22.53	10.59	39.60	33.12	56.00	46.00	-12.88
0.8130	24.84	17.46	10.49	35.33	27.95	56.00	46.00	-18.05

Polarization: L1

Frequency (MHz)	Reading (dBuV) QP	Reading (dBuV) Ave.	Factor (dB) Corr.	Result (dBuV) QP	Result (dBuV) Ave.	Limit (dBuV) QP	Limit (dBuV) Ave.	Margin (dB)
0.1547	43.15	25.13	10.74	53.89	35.87	65.74	55.74	-11.85
0.1883	44.65	25.19	10.76	55.41	35.95	64.11	54.11	-8.70
0.2452	36.22	20.67	10.72	46.94	31.39	61.92	51.92	-14.98
0.2811	34.85	18.31	10.72	45.57	29.03	60.78	50.78	-15.21
0.5560	24.61	10.15	10.64	35.25	20.79	56.00	46.00	-20.75
0.7313	24.95	19.47	10.54	35.49	30.01	56.00	46.00	-15.99

Note

1. **The formula of measured value as: Test Result = Reading + Correction Factor**
2. **The Correction Factor = Cable Loss + LISN Insertion Loss + Pulse Limit Loss**
3. **Detector function in the form : PK = Peak, QP = Quasi Peak, AV = Average**
4. **All not in the table noted test results are more than 20 dB below the relevant limits.**
5. **Measurement uncertainty = ±1.30 dB; Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.**
6. **See attached diagrams as appendix.**

Limits:

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

Test equipment used: ETSTW-CE 001, ETSTW-CE 004, ETSTW-CE 006

Appendix

A Measurement diagrams

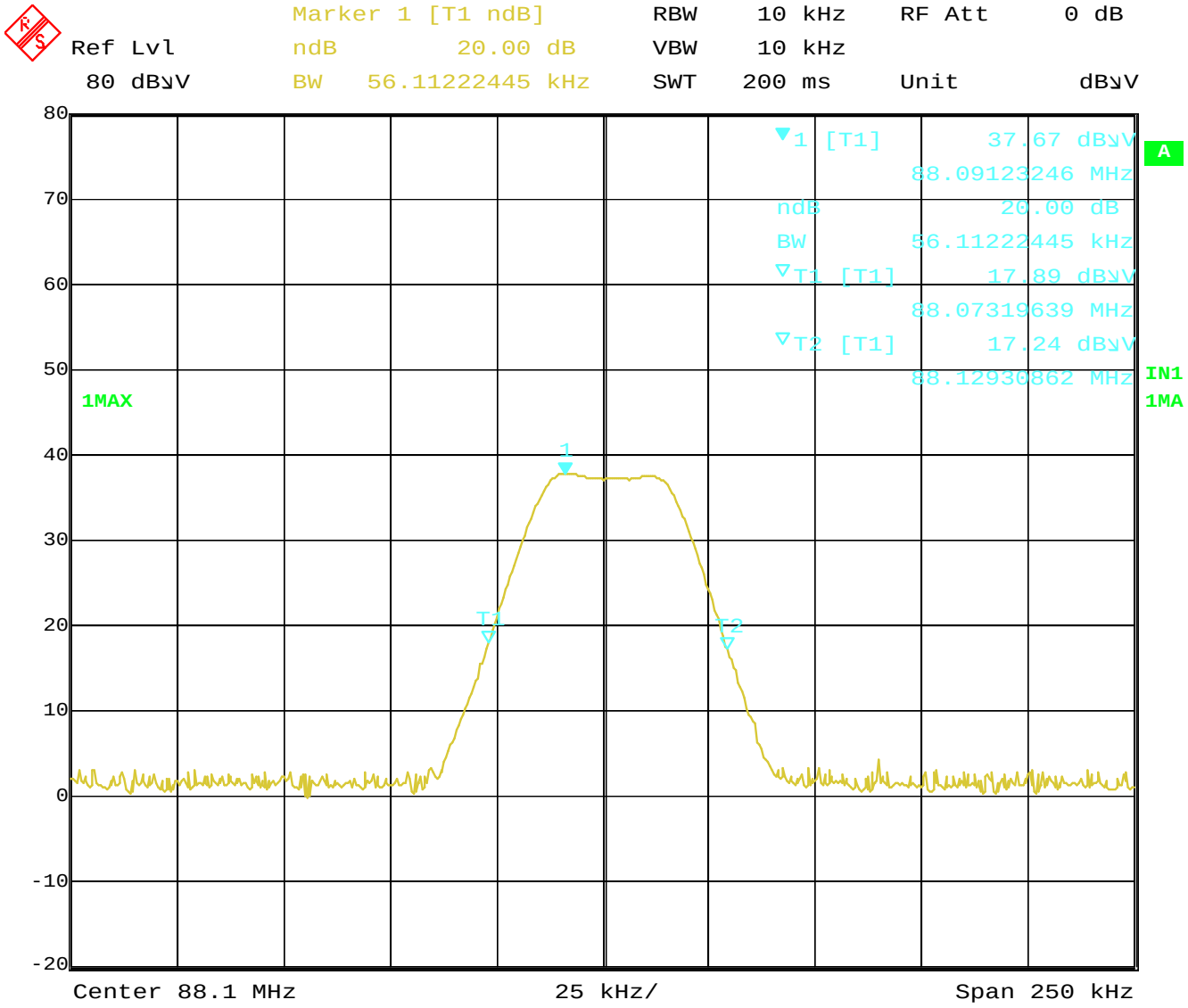
1. Emission Bandwidth
2. Band Edge Measurement
3. Carrier Field Strength
4. Spurious Emissions
5. Conducted Emission

B Photos

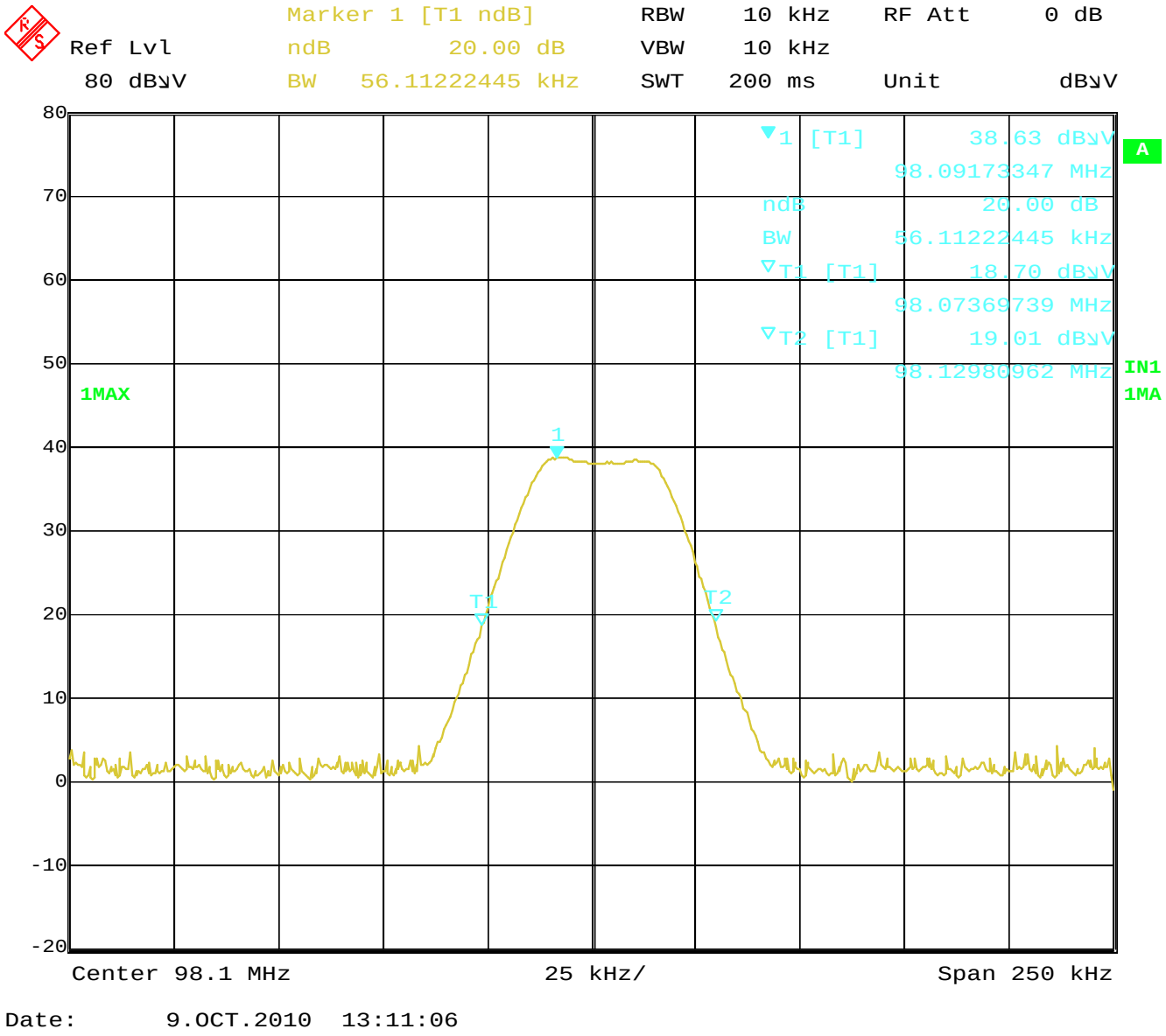
1. External Photos
2. Internal Photos
3. Set Up Photo of Radiated Emission
4. Set Up Photo of Conducted Emission

Registration number: W6M21010-10954-P-15
FCC ID: Y2TTWFRT101129

Emission Bandwidth



Registration number: W6M21010-10954-P-15
FCC ID: Y2TTWFRT101129



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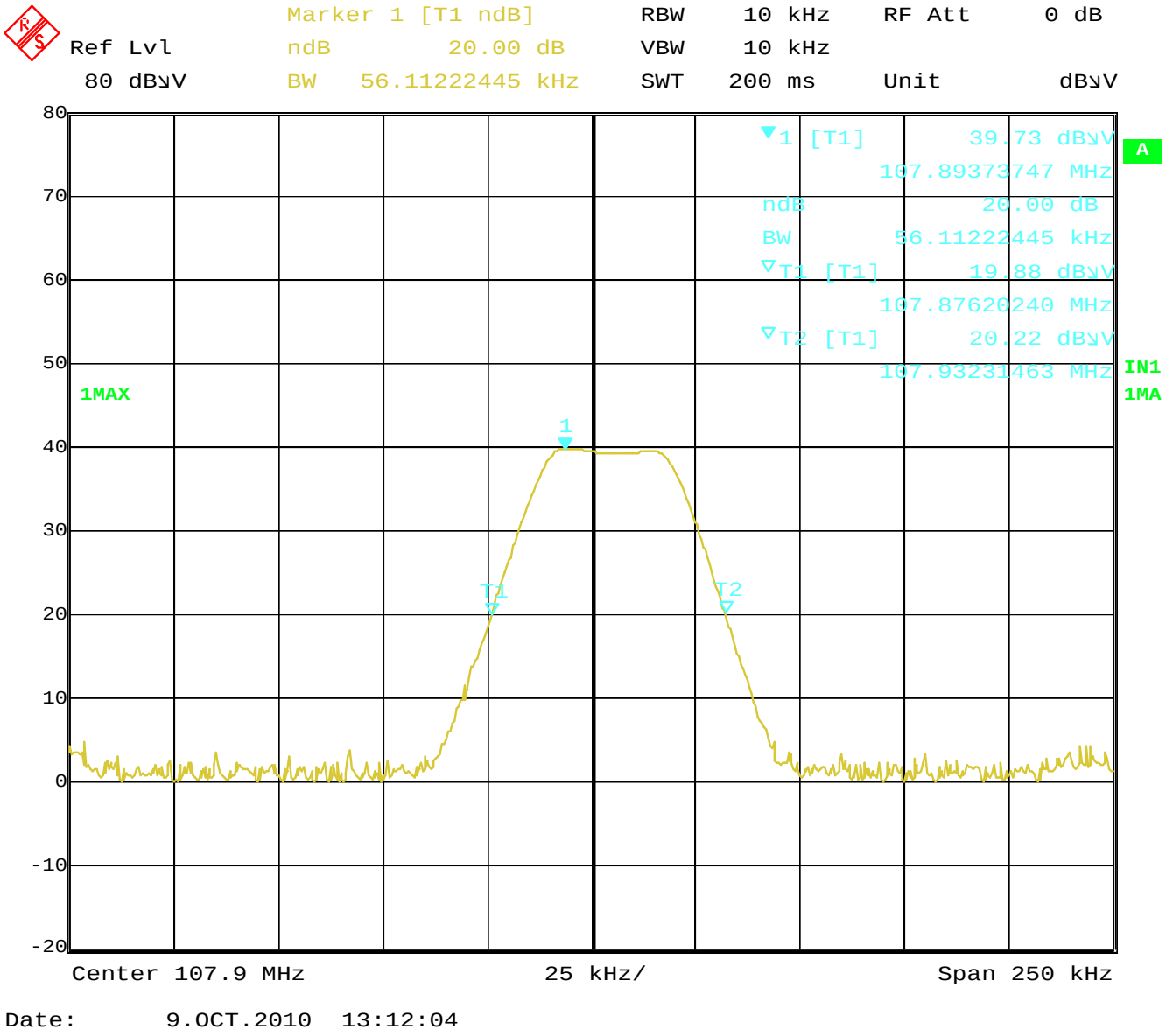
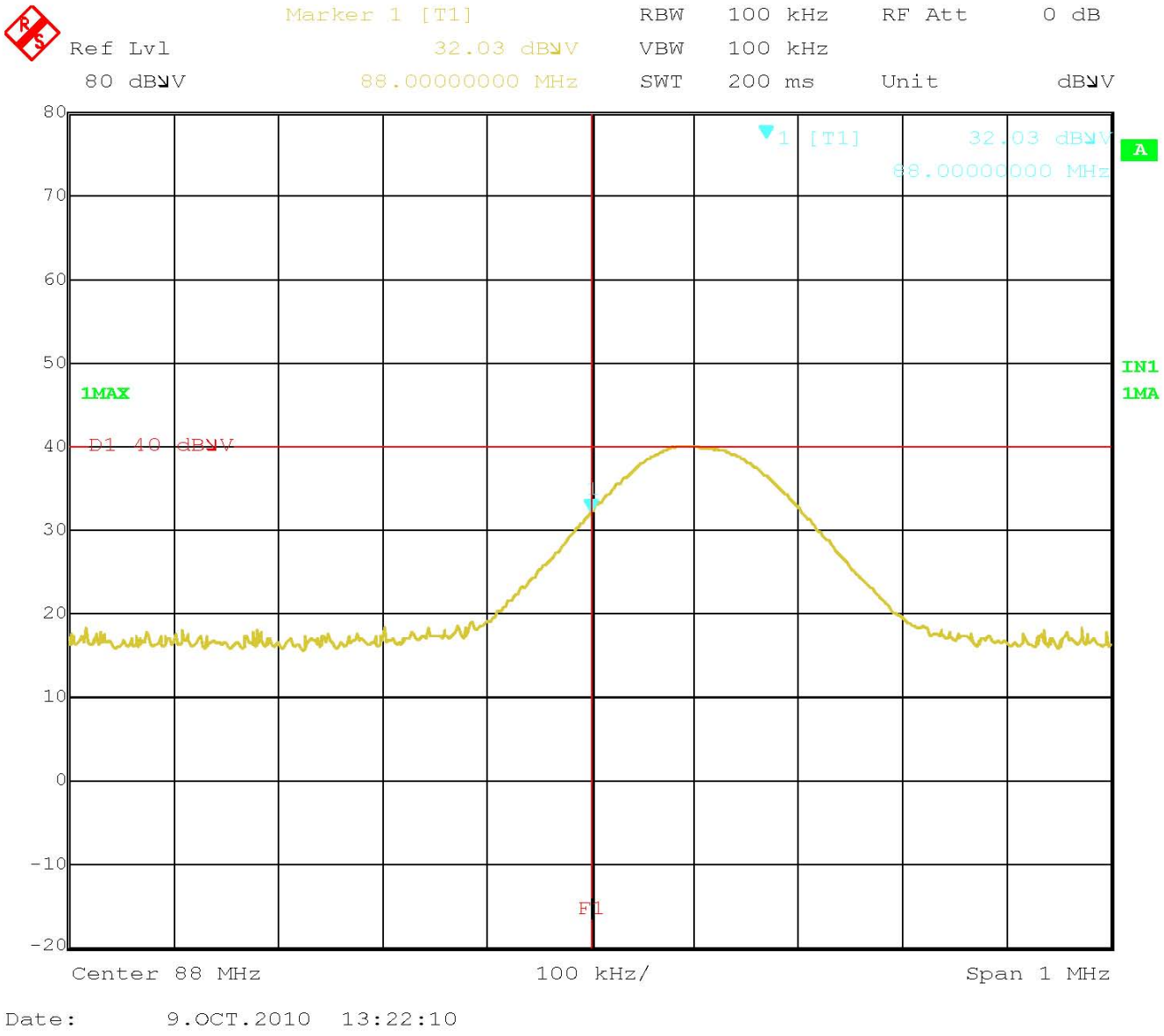
FCC ID: Y2TTWFRT101129

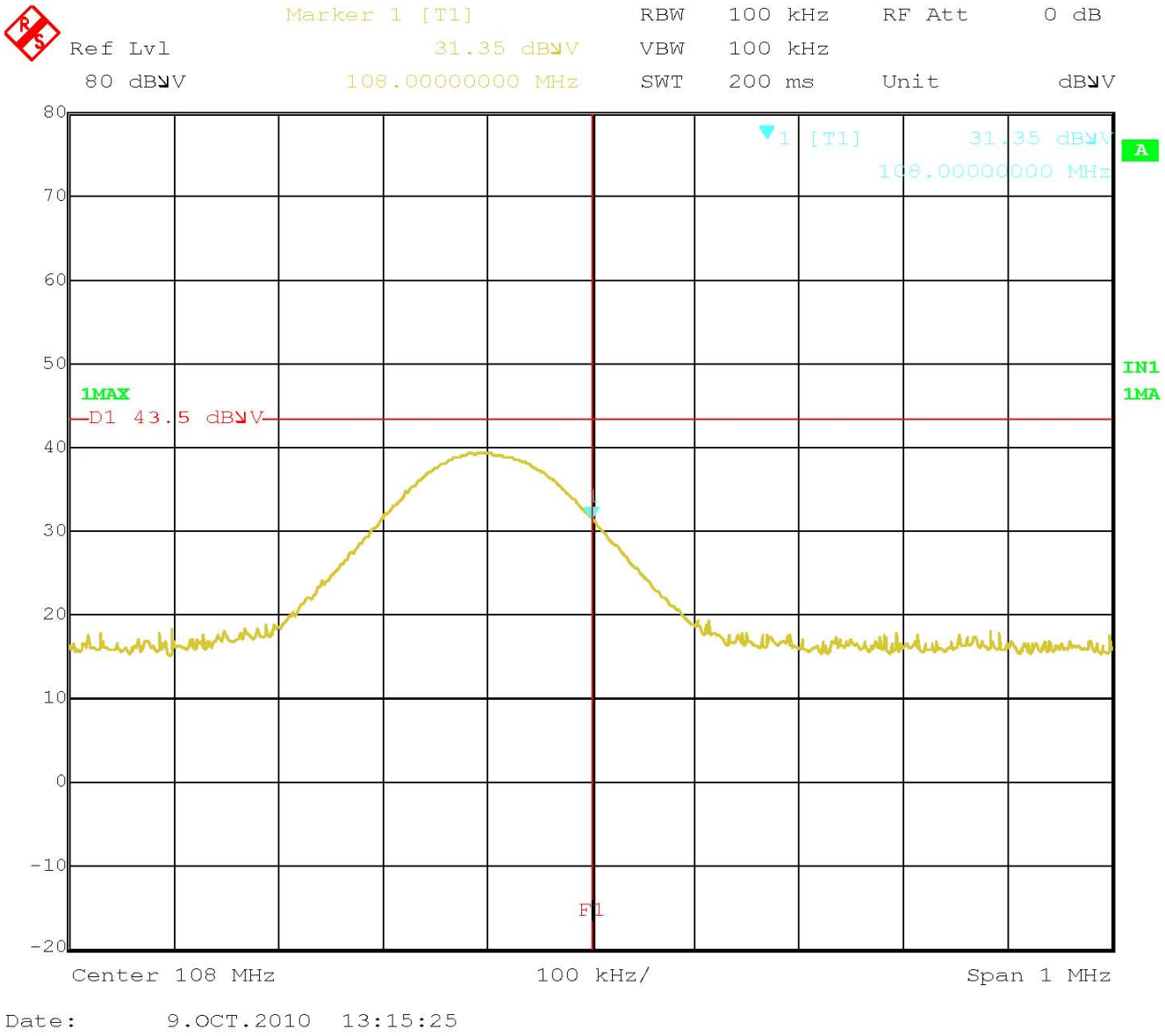


Registration number: W6M21010-10954-P-15
FCC ID: Y2TTWFRT101129

Band Edge Measurement
Modulation

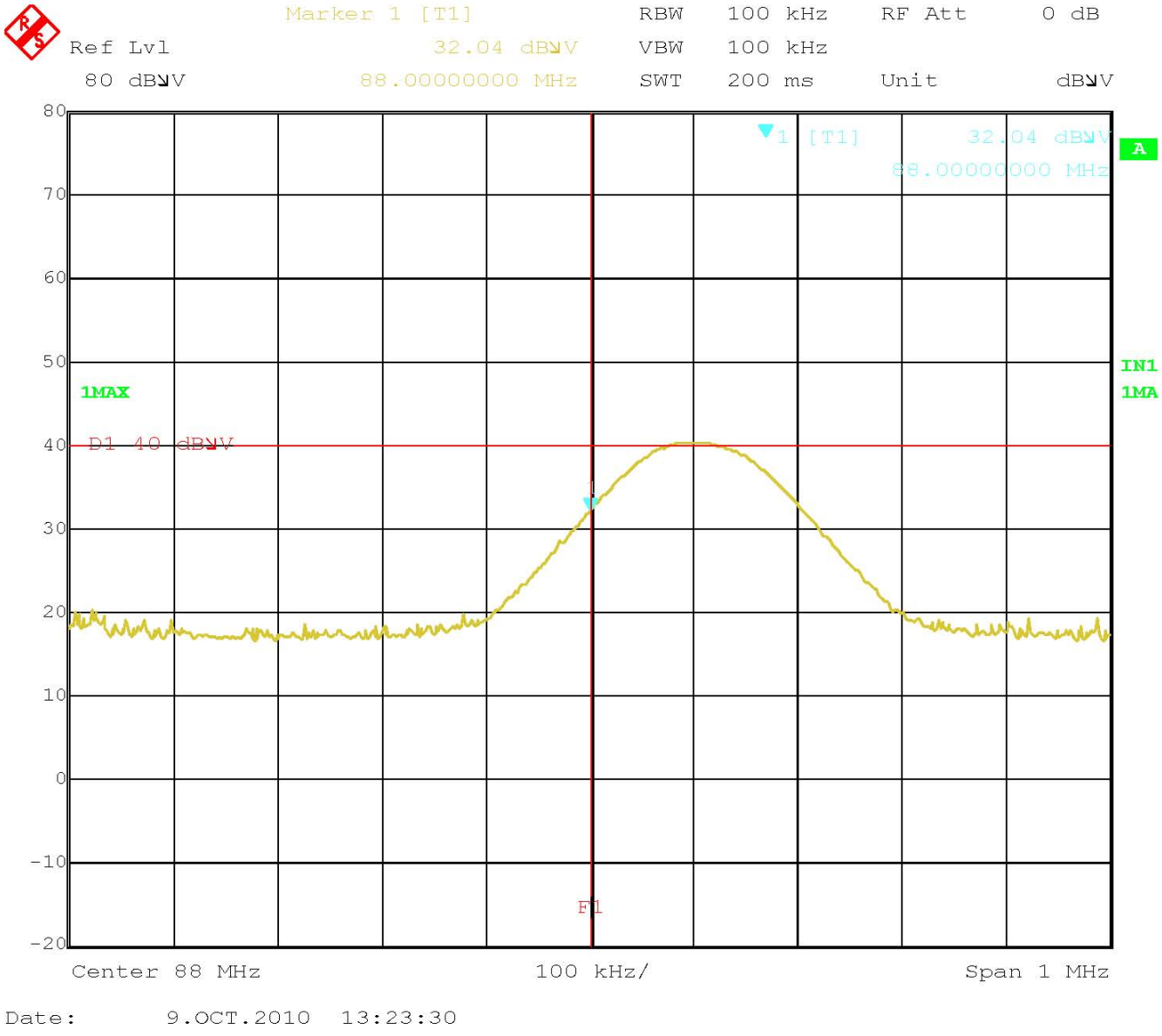


Registration number: W6M21010-10954-P-15
FCC ID: Y2TTWFRT101129



Registration number: W6M21010-10954-P-15
FCC ID: Y2TTWFRT101129

Un-modulation



Registration number: W6M21010-10954-P-15
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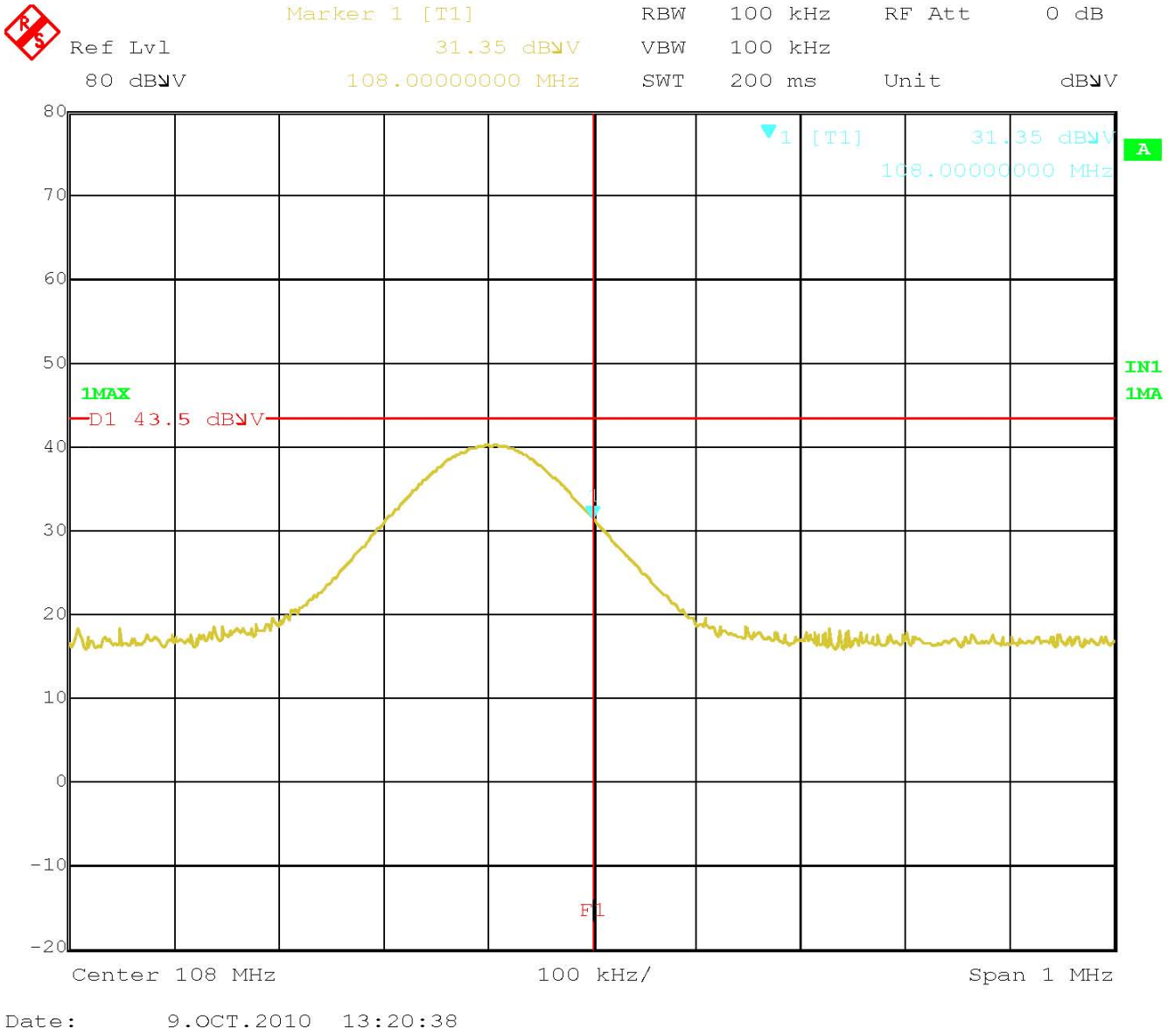
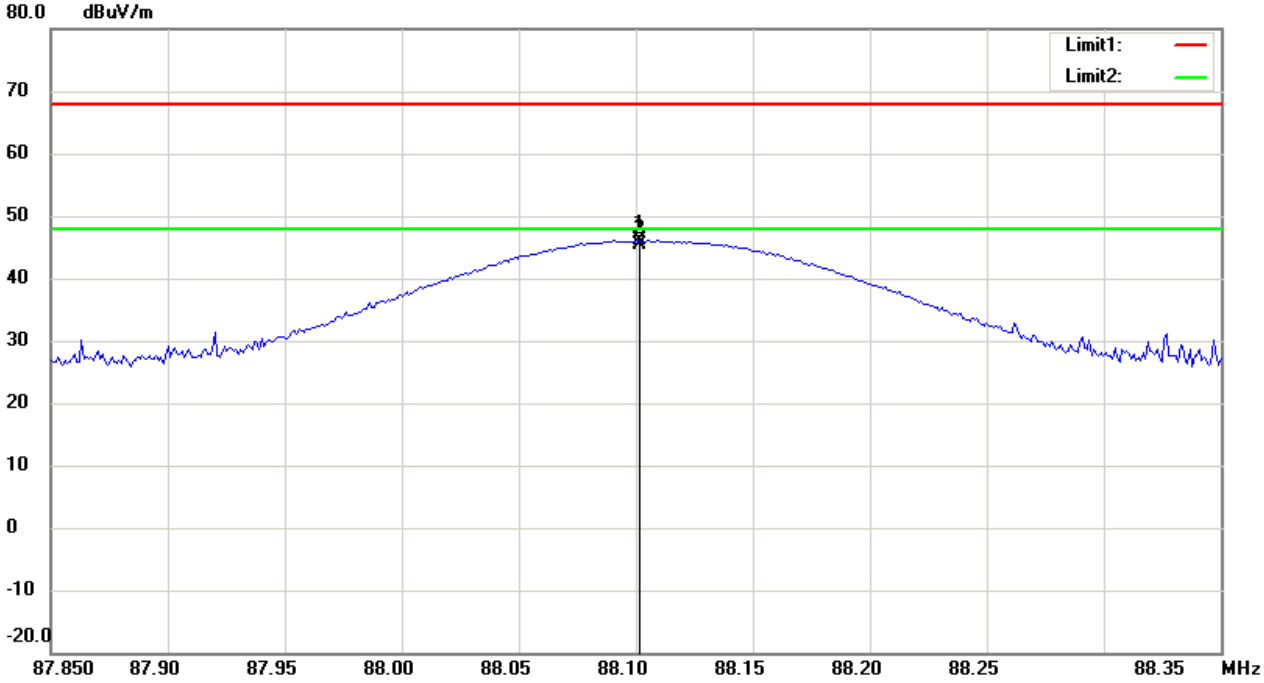


Registration number: W6M21010-10954-P-15
FCC ID: Y2TTWFRT101129

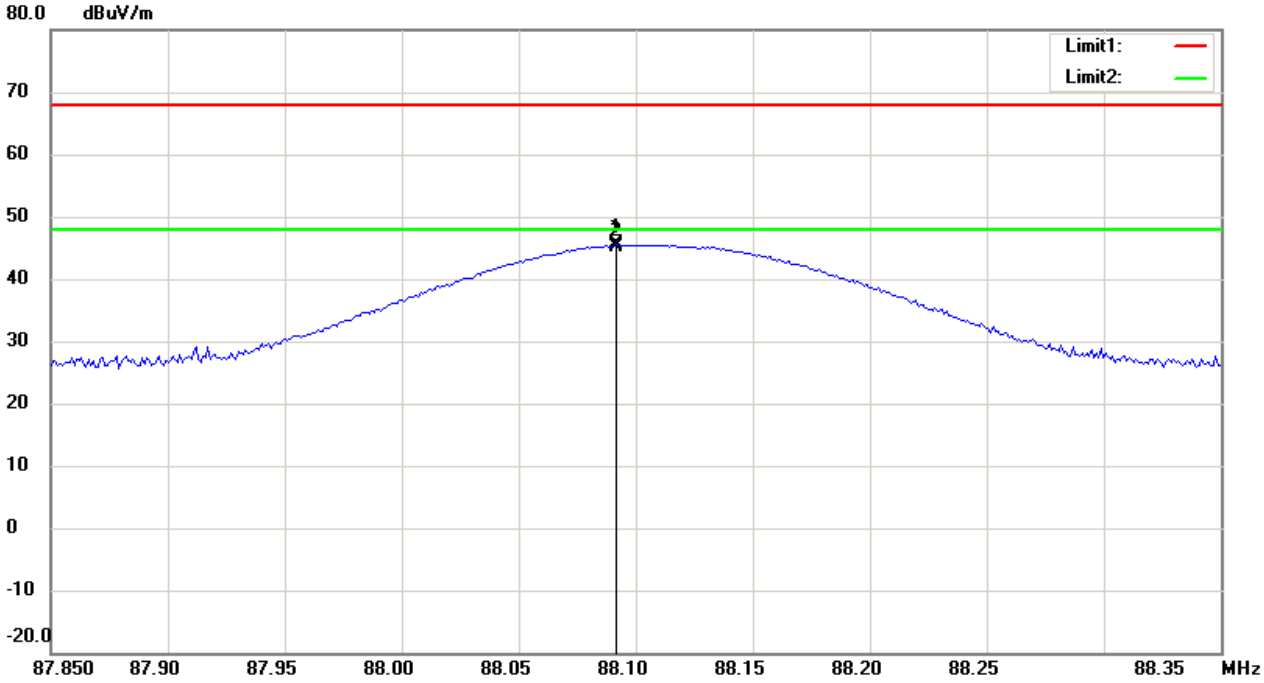
Carrier Field Strength

88.1 MHz

Antenna Polarization H



Antenna Polarization V



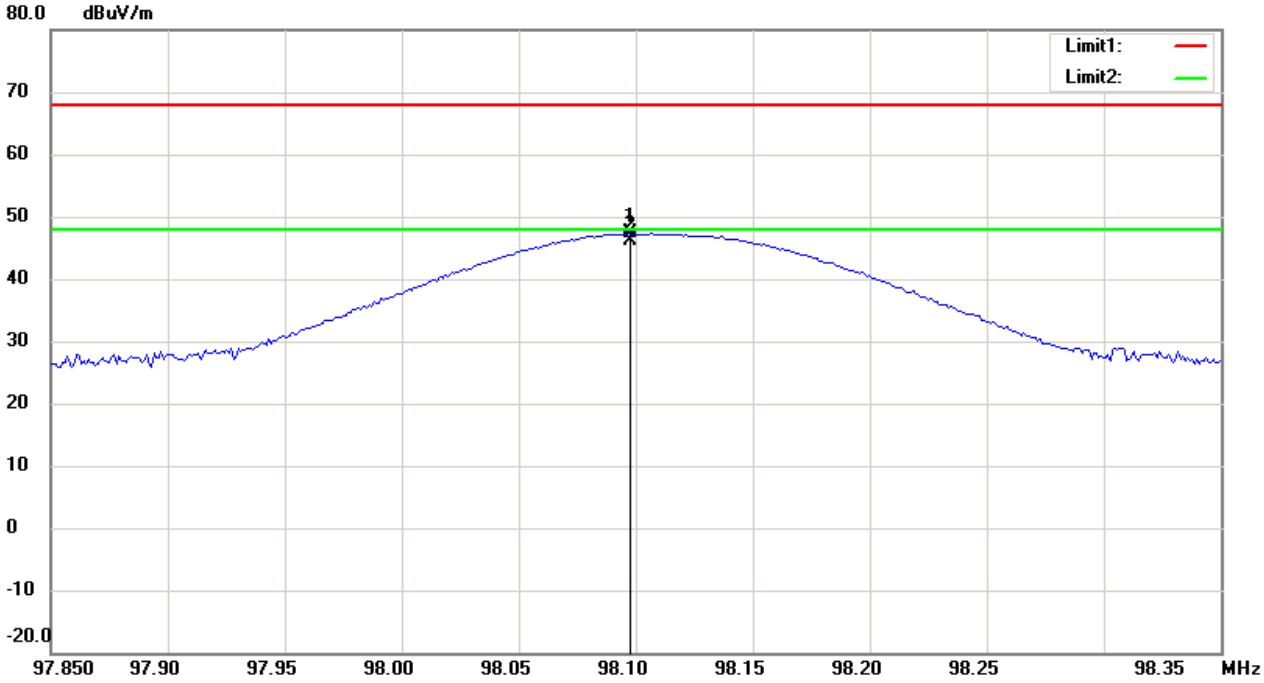
Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

1. **The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.**
2. **The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.**
3. **For corrected test results are listed in the relevant table of Carrier Field Strength test data of this test report.**

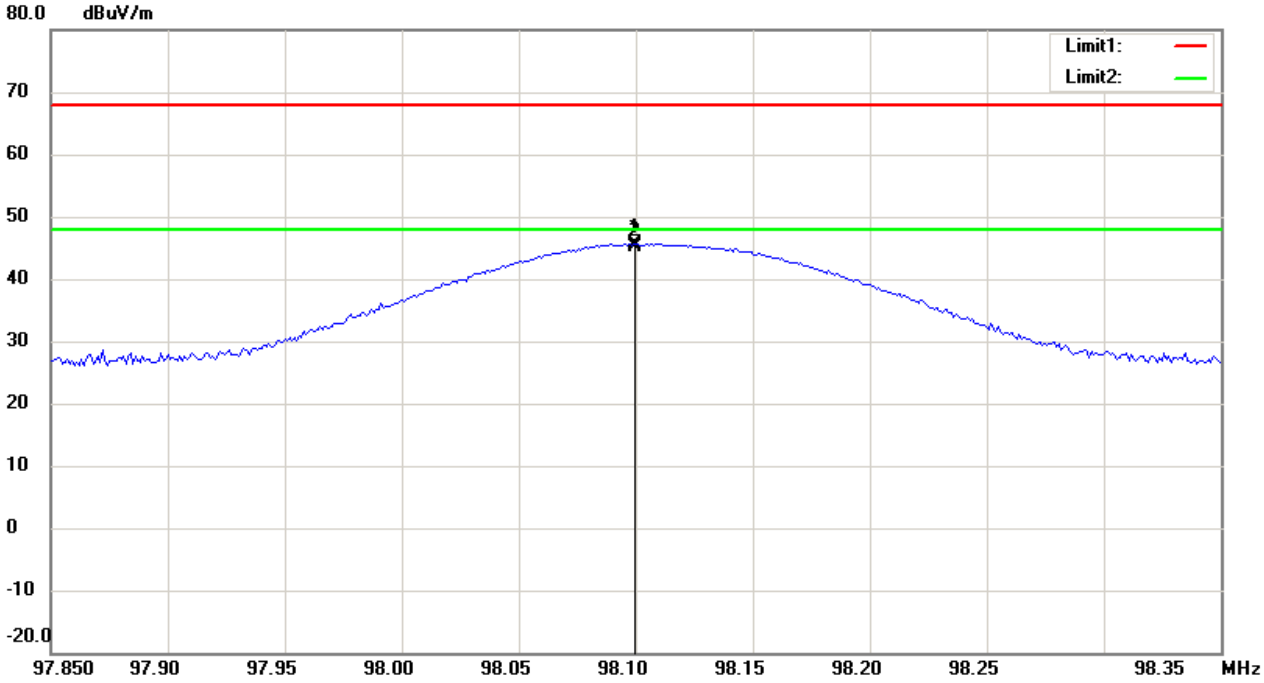
Registration number: W6M21010-10954-P-15
FCC ID: Y2TTWFRT101129

98.1 MHz

Antenna Polarization H



Antenna Polarization V



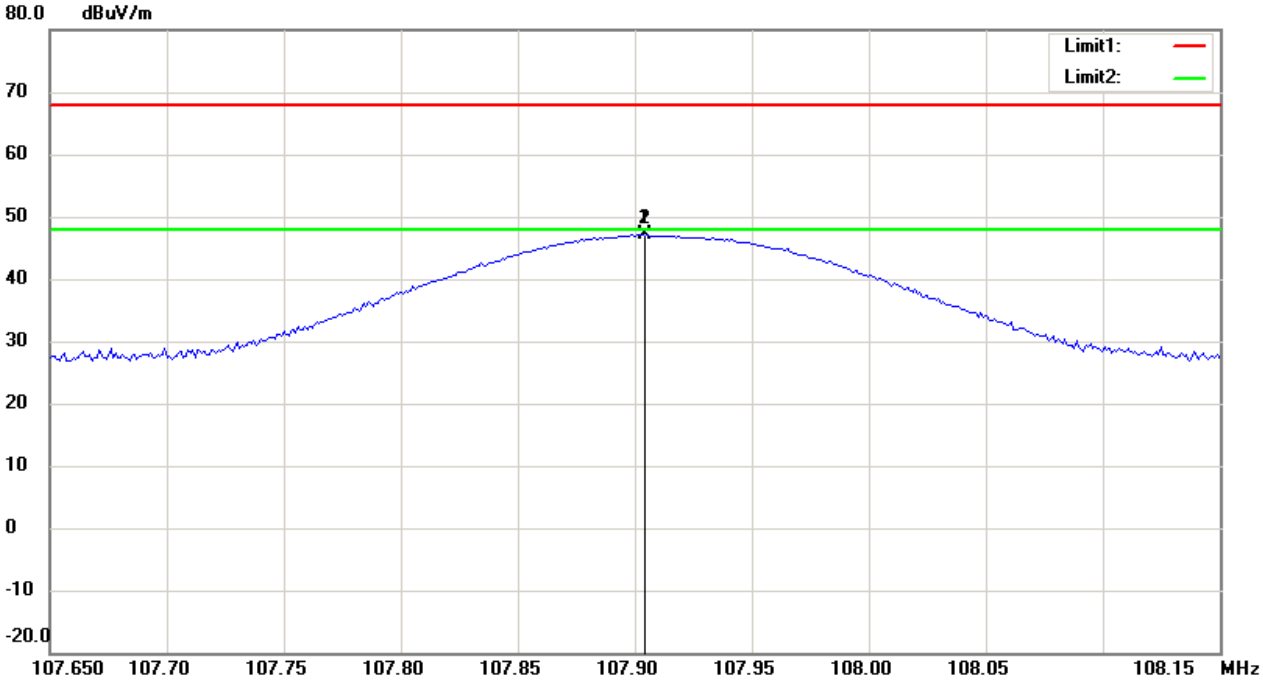
Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

1. **The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.**
2. **The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.**
3. **For corrected test results are listed in the relevant table of Carrier Field Strength test data of this test report.**

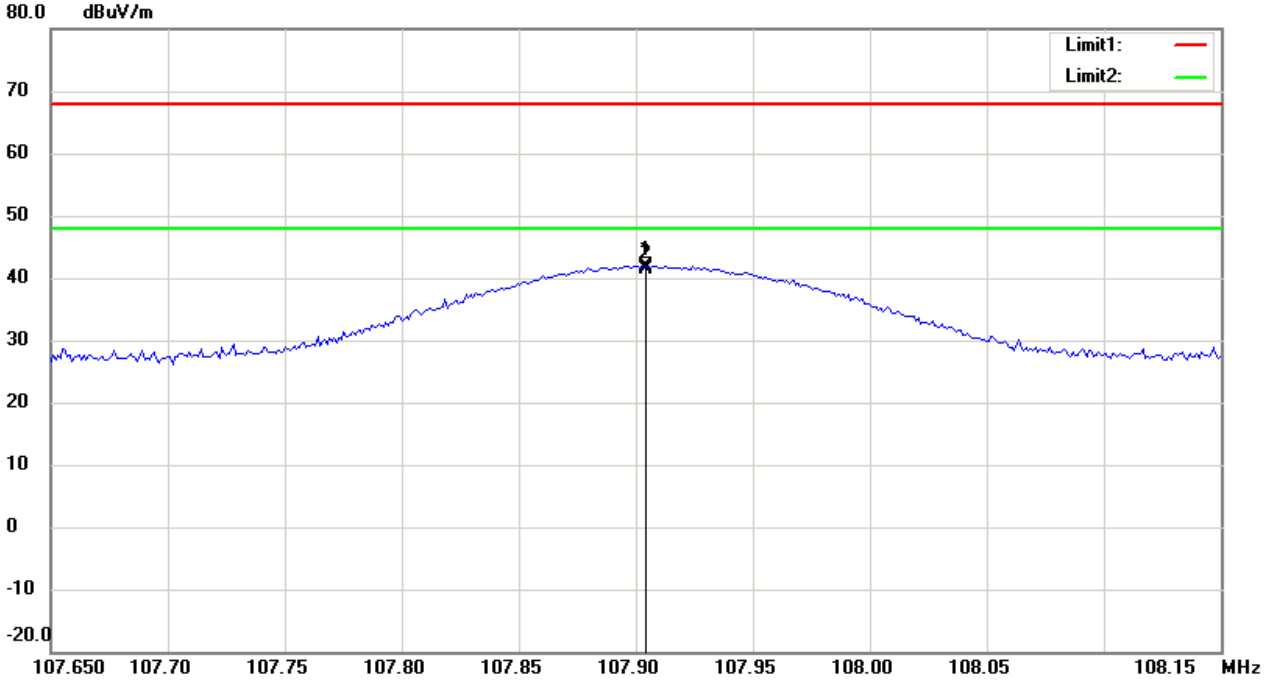
Registration number: W6M21010-10954-P-15
FCC ID: Y2TTWFRT101129

107.9 MHz

Antenna Polarization H



Antenna Polarization V

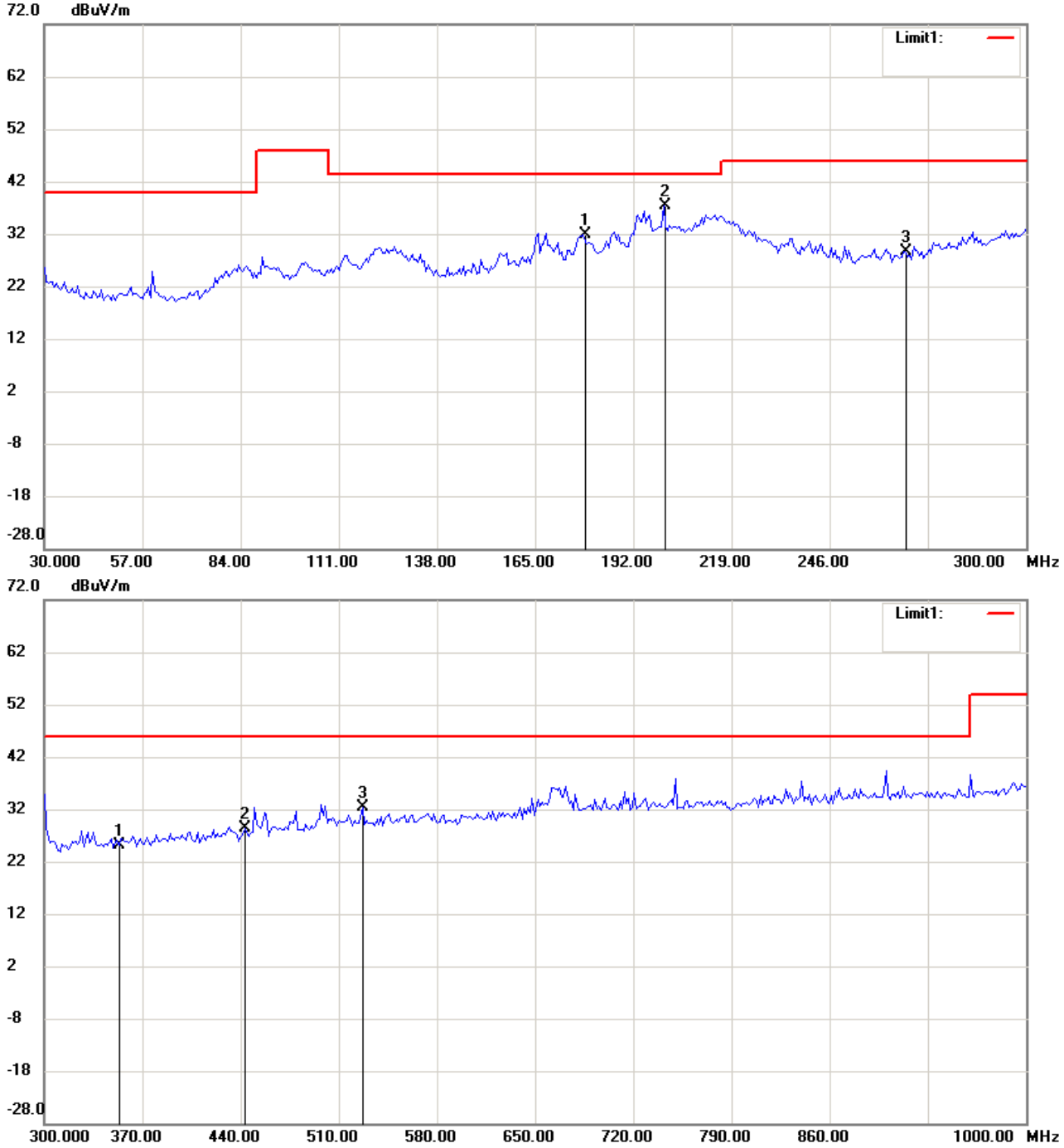


Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

1. **The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.**
2. **The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.**
3. **For corrected test results are listed in the relevant table of Carrier Field Strength test data of this test report.**

Registration number: W6M21010-10954-P-15
FCC ID: Y2TTWFRT101129

Spurious Emissions
88.1 MHz
Antenna Polarization H

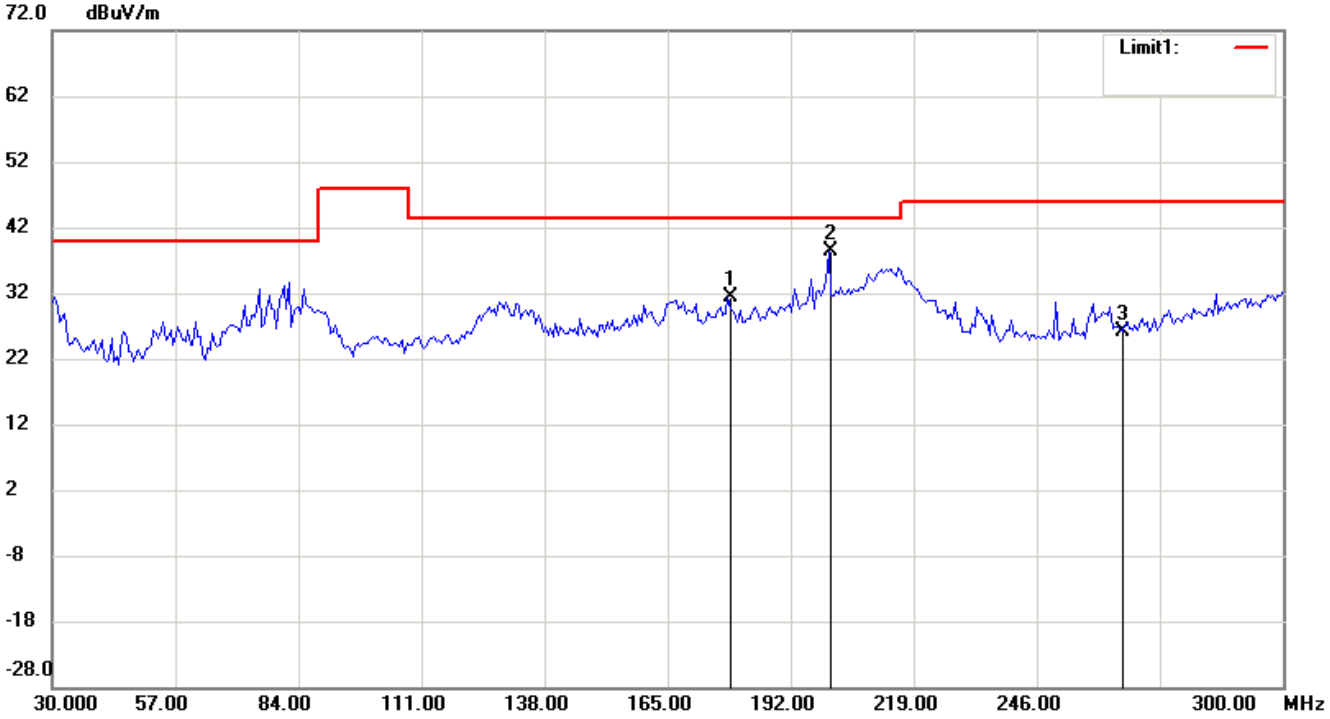


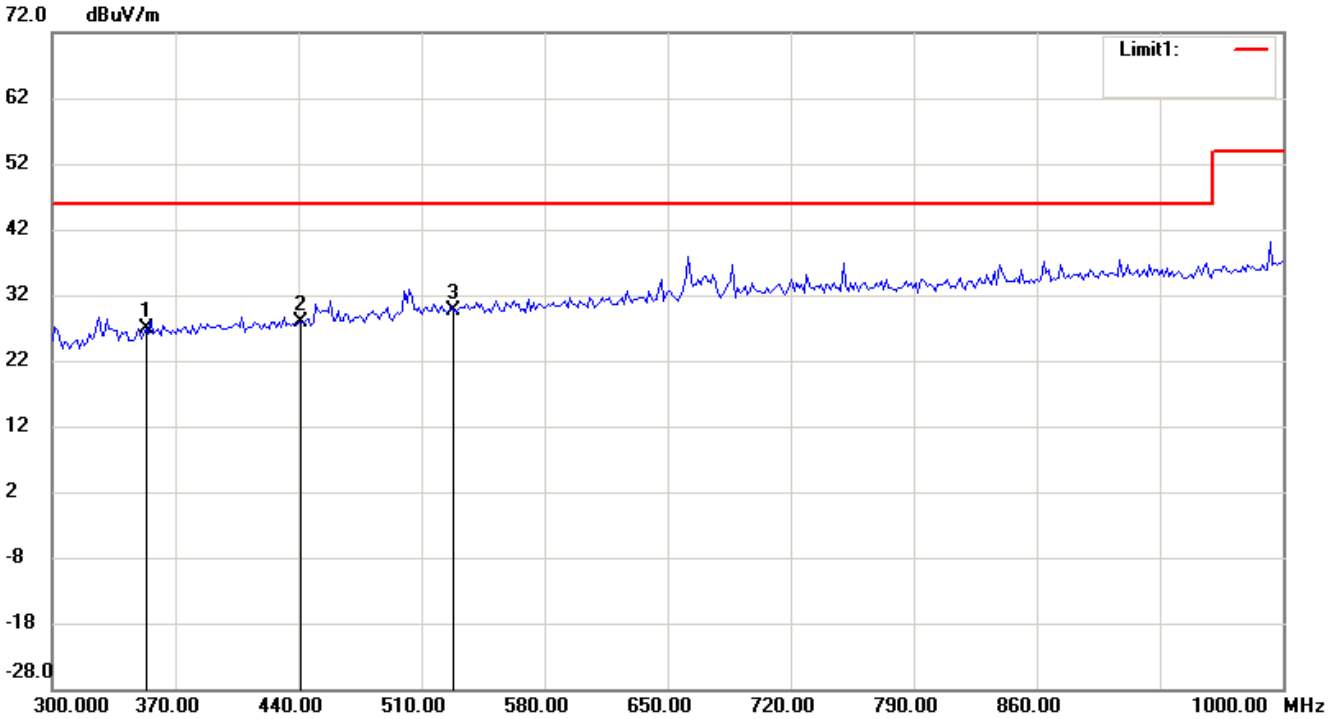
Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

1. **The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.**
2. **The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.**
3. **For corrected test results are listed in the relevant table of radiated test data of this test report.**

Registration number: W6M21010-10954-P-15
FCC ID: Y2TTWFRT101129

Antenna Polarization V



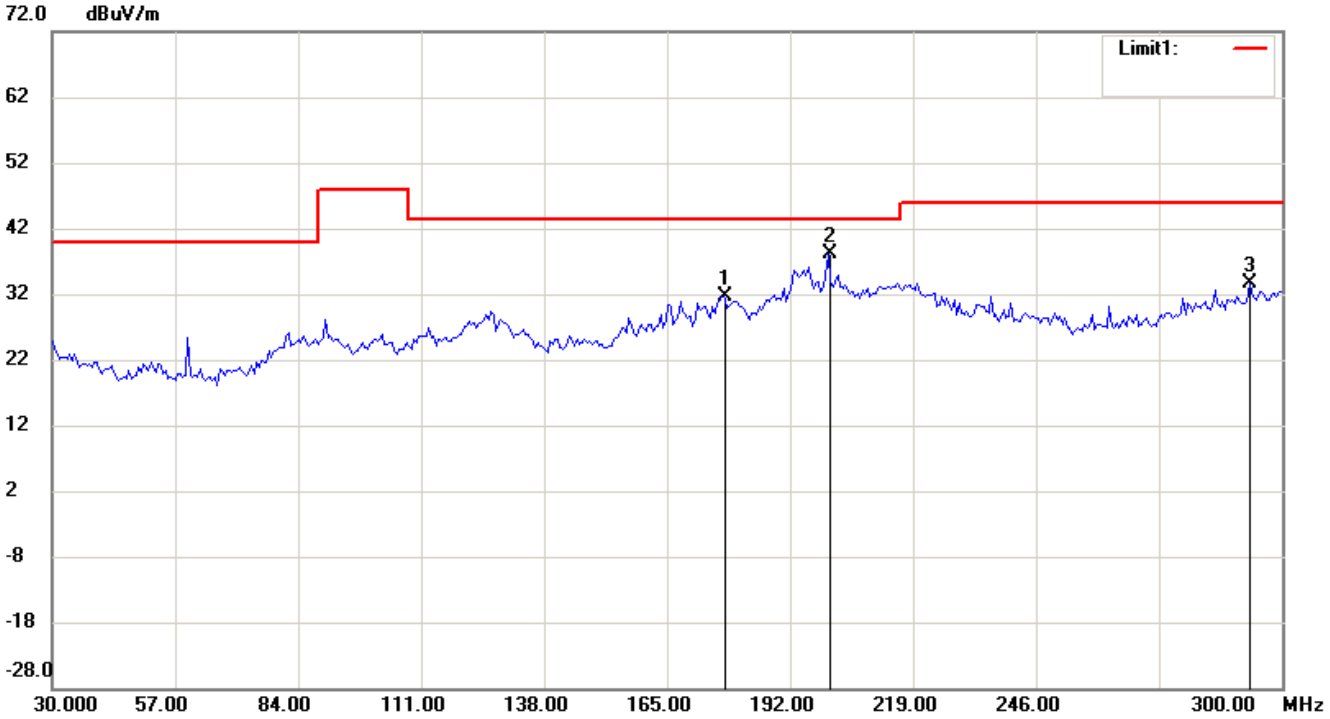


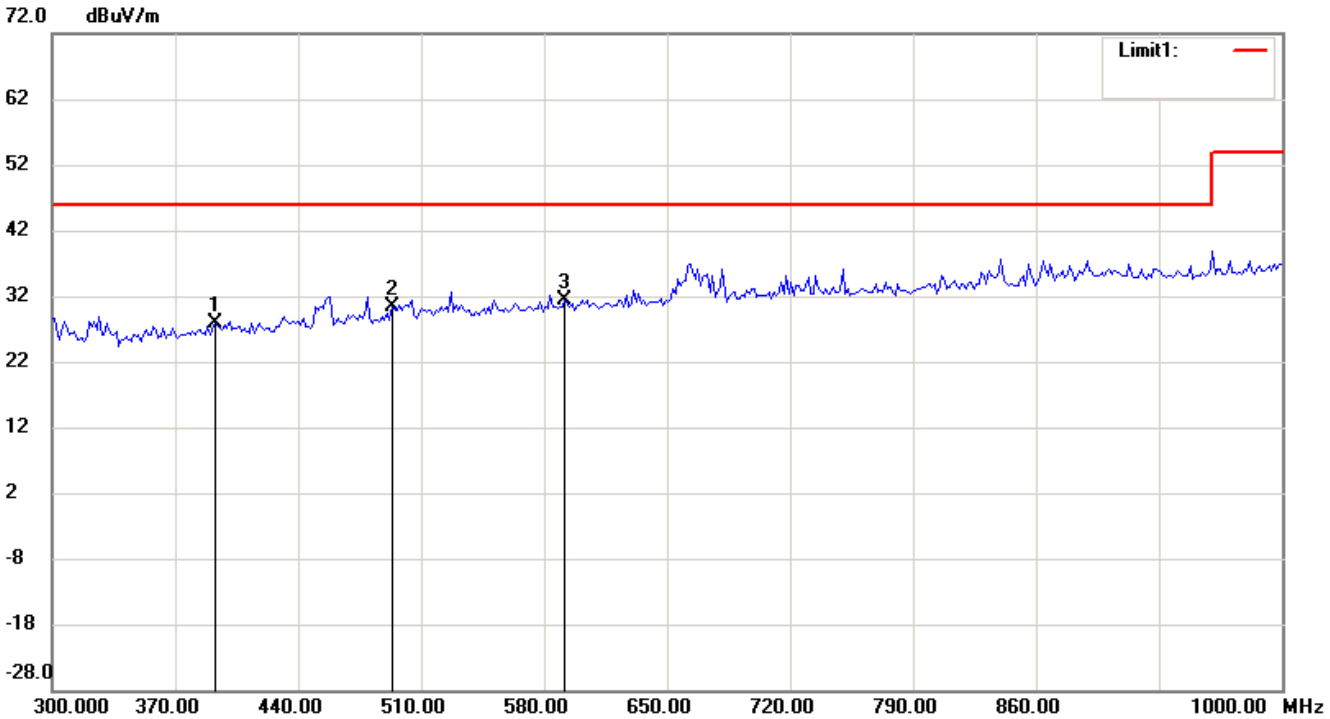
Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

1. **The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.**
2. **The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.**
3. **For corrected test results are listed in the relevant table of radiated test data of this test report.**

Registration number: W6M21010-10954-P-15
FCC ID: Y2TTWFRT101129

98.1 MHz
Antenna Polarization H



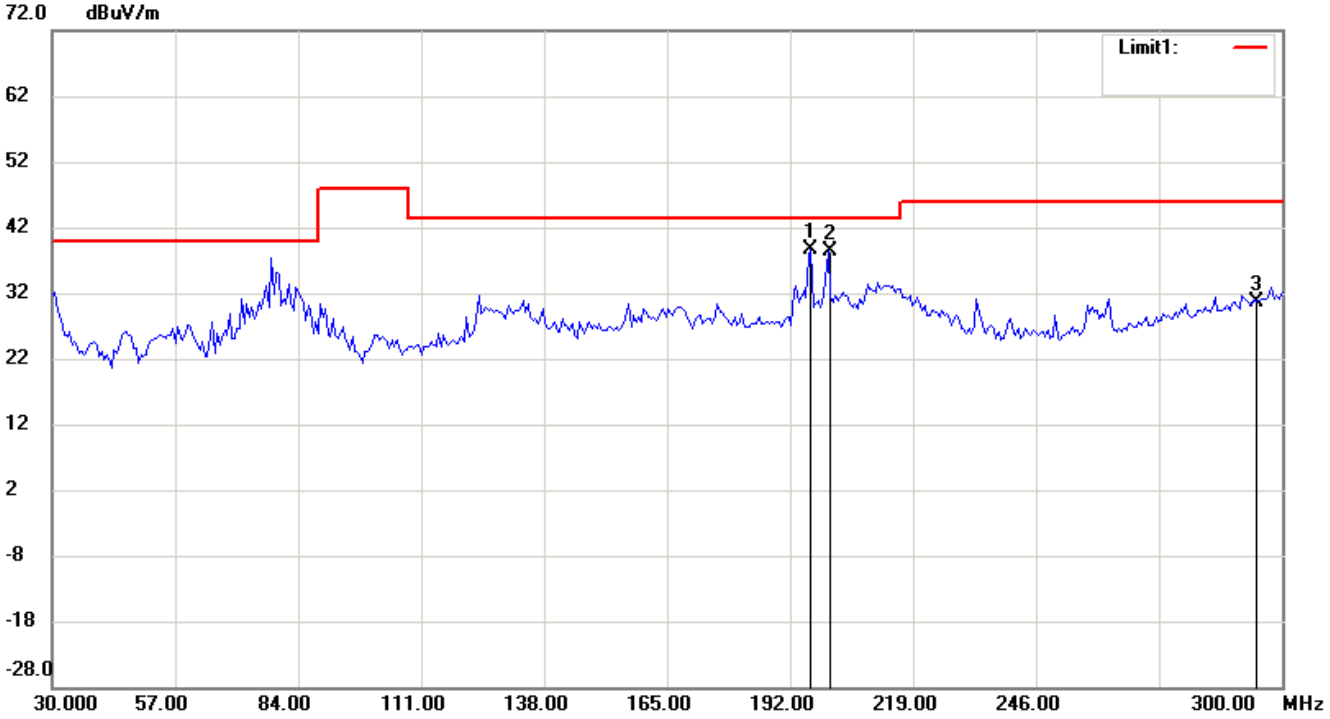


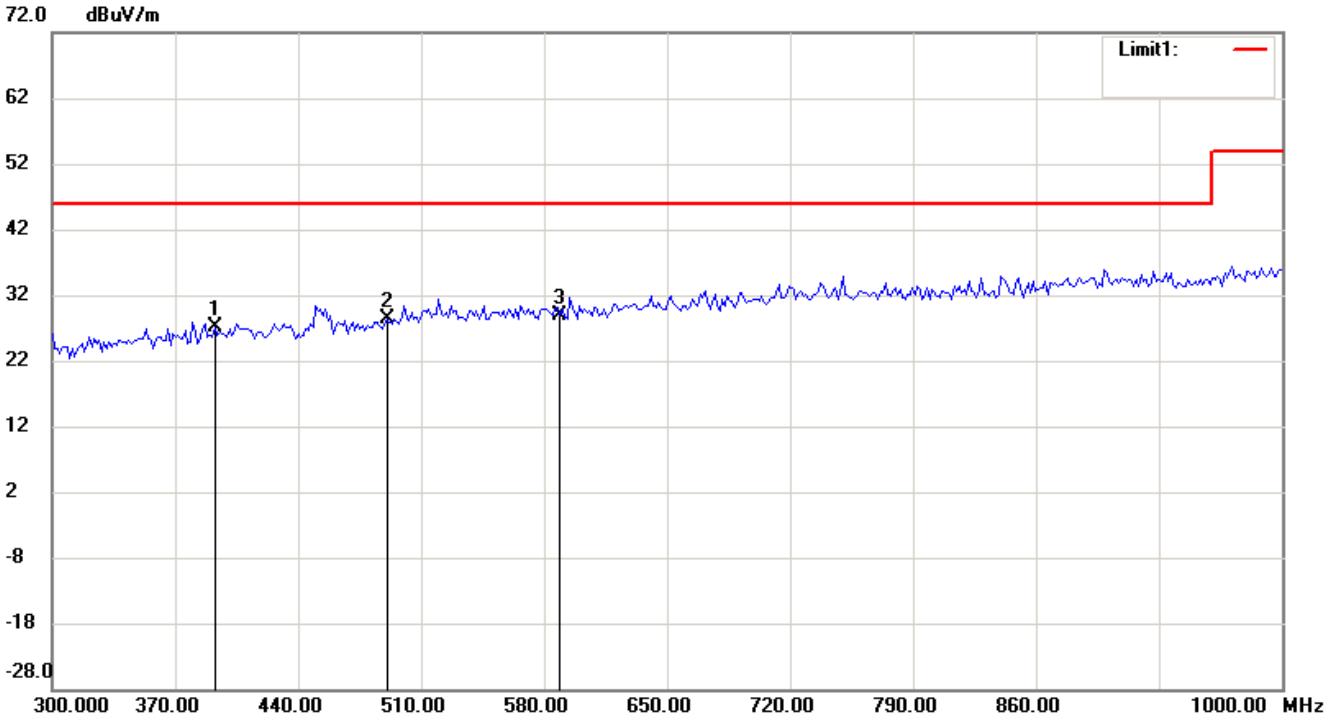
Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

1. **The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.**
2. **The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.**
3. **For corrected test results are listed in the relevant table of radiated test data of this test report.**

Registration number: W6M21010-10954-P-15
FCC ID: Y2TTWFRT101129

Antenna Polarization V



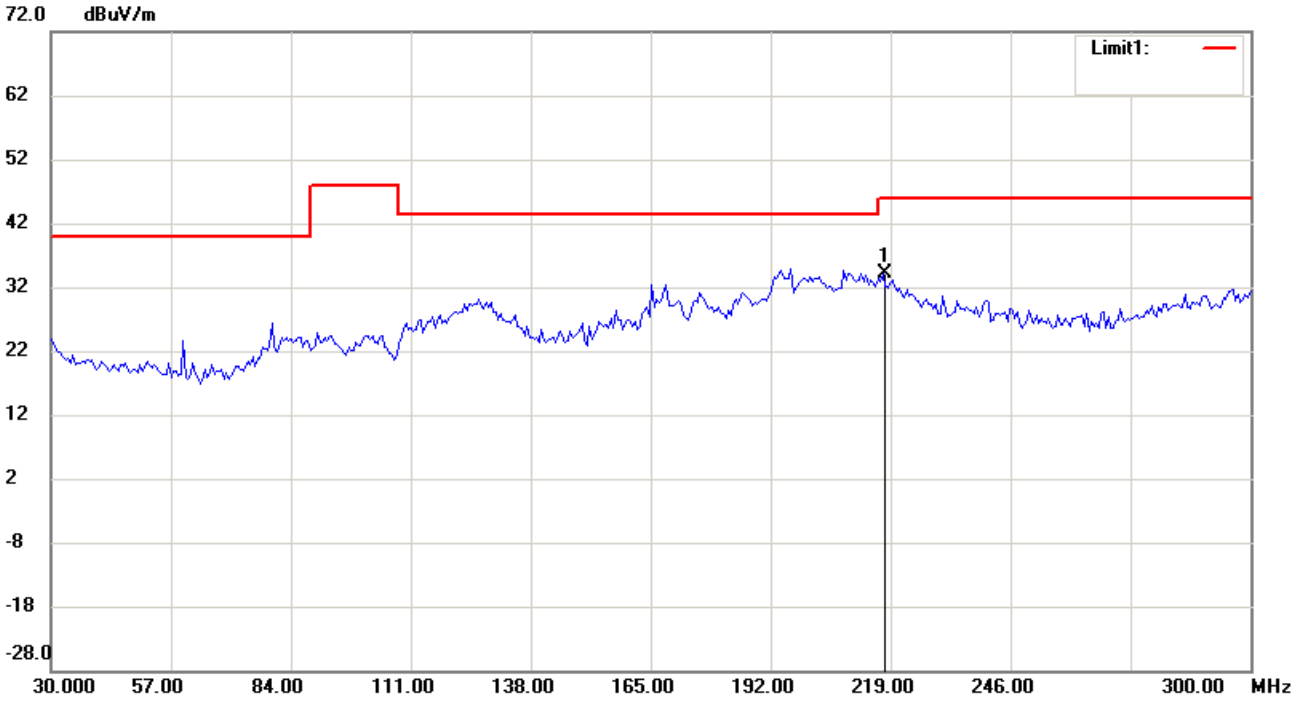


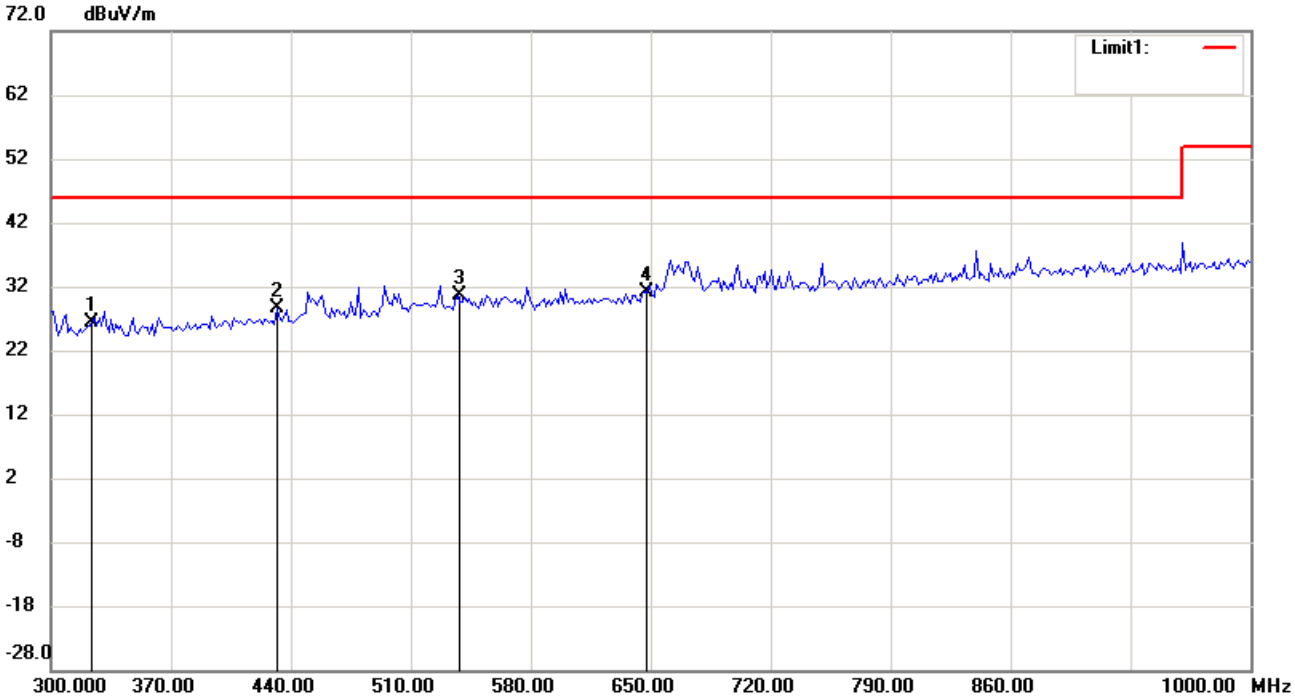
Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

1. **The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.**
2. **The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.**
3. **For corrected test results are listed in the relevant table of radiated test data of this test report.**

Registration number: W6M21010-10954-P-15
FCC ID: Y2TTWFRT101129

107.9 MHz
Antenna Polarization H





Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

1. **The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.**
2. **The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.**
3. **For corrected test results are listed in the relevant table of radiated test data of this test report.**

Registration number: W6M21010-10954-P-15
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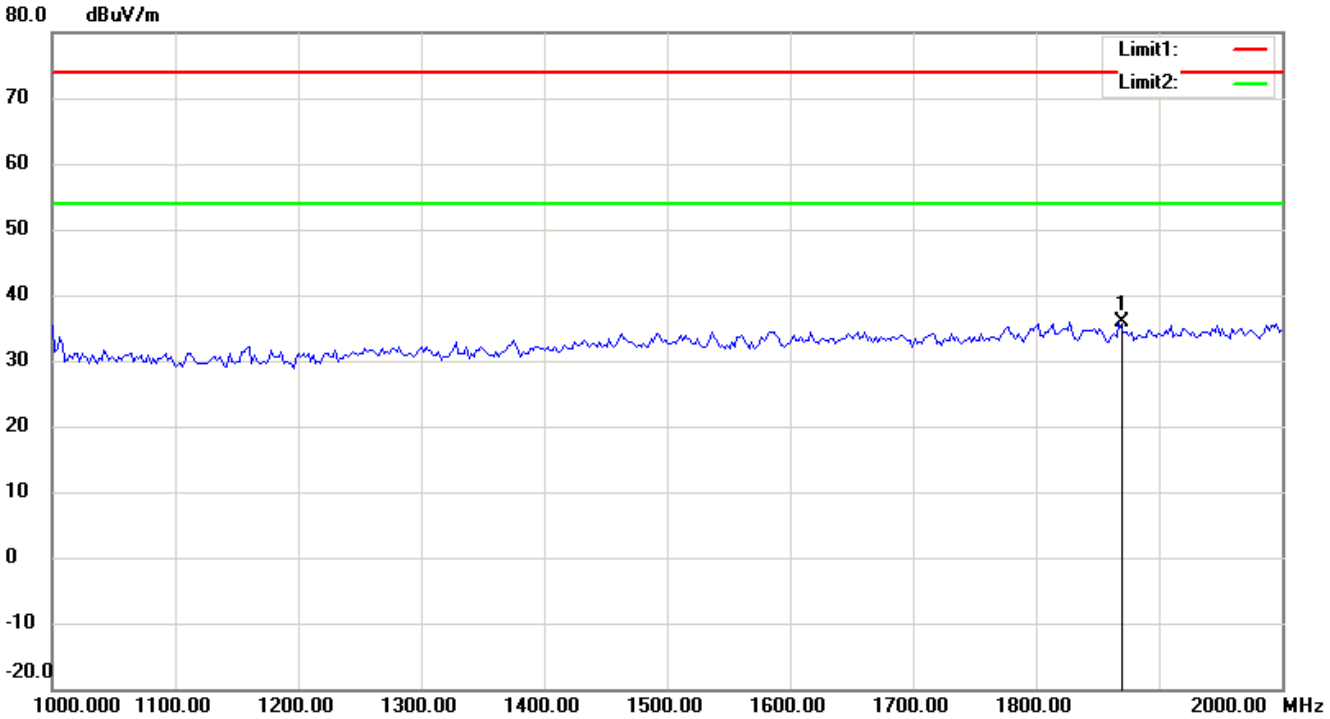
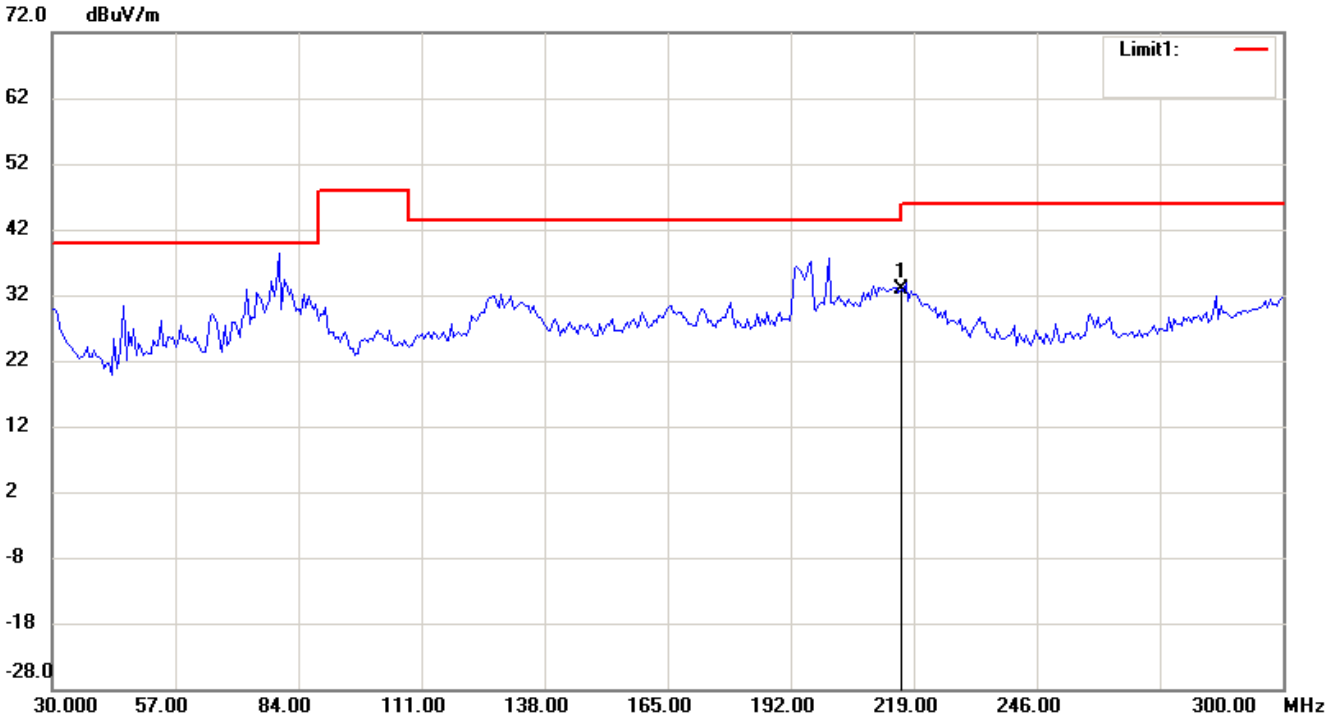


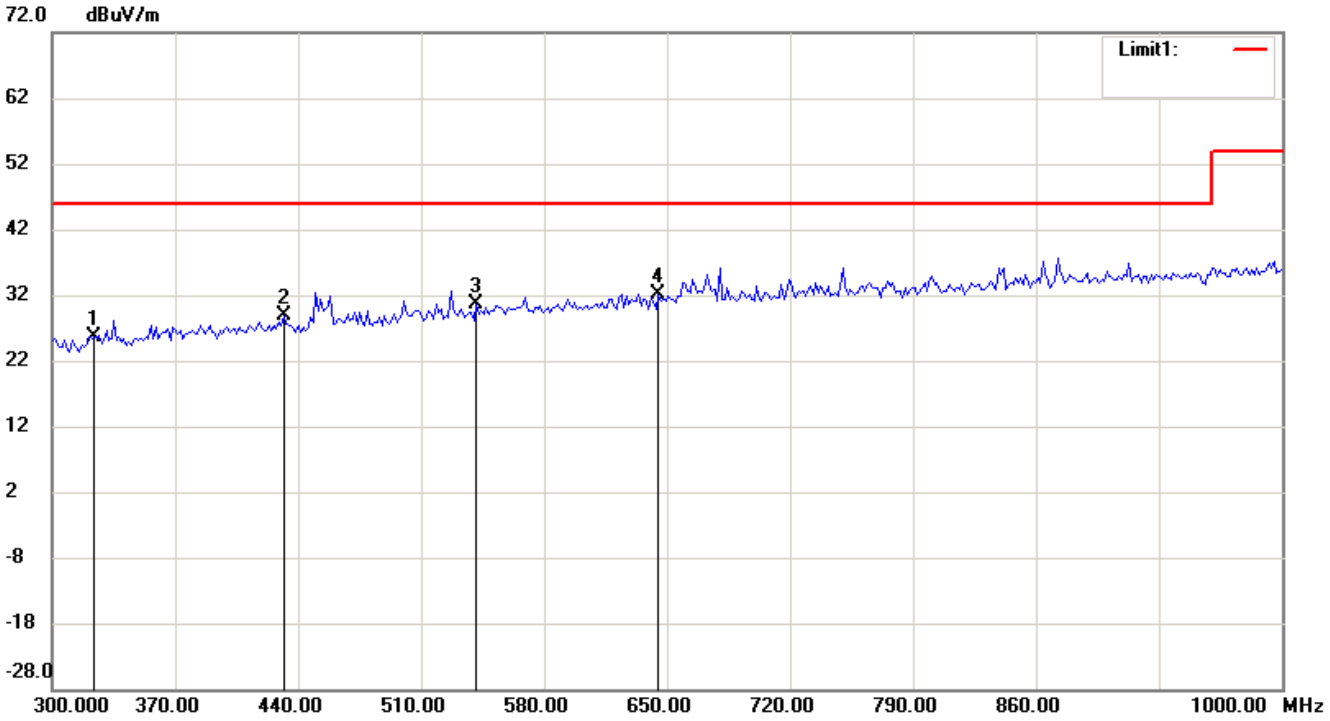
Antenna Polarization V

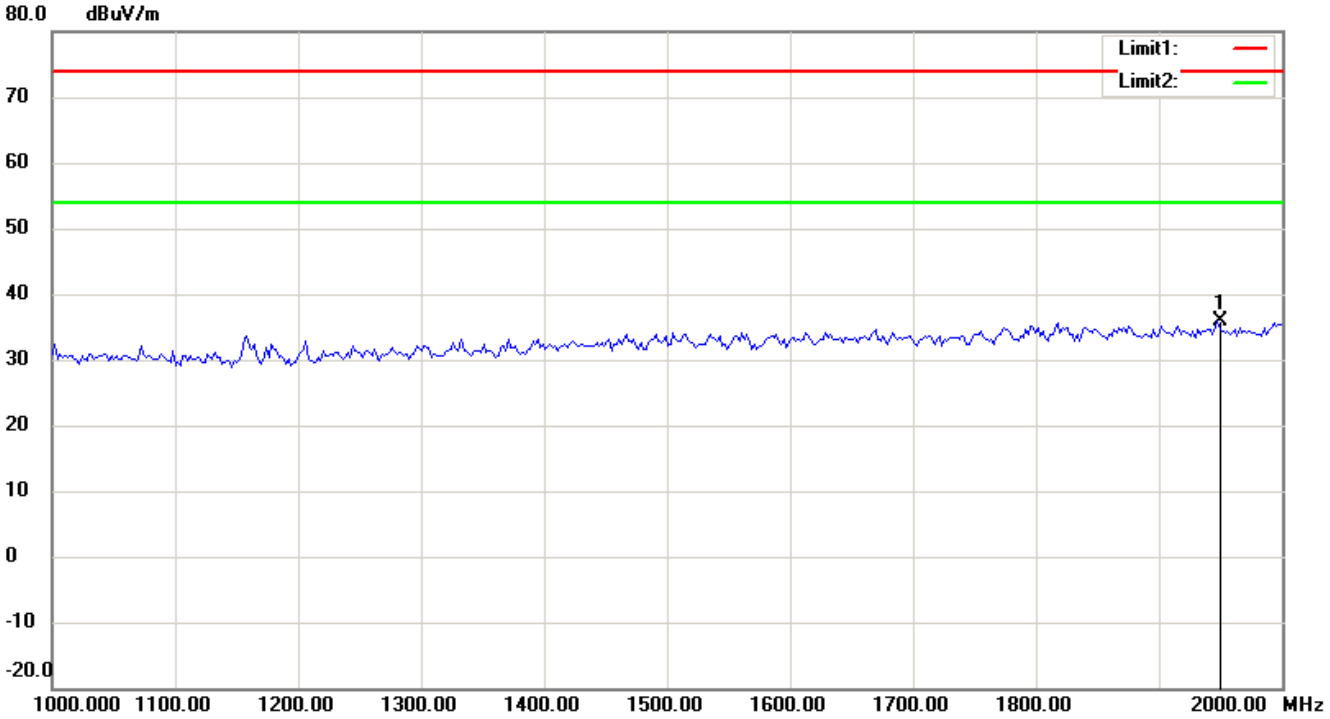


Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

1. **The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.**
2. **The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.**
3. **For corrected test results are listed in the relevant table of radiated test data of this test report.**

Registration number: W6M21010-10954-P-15
FCC ID: Y2TTWFRT101129





Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

1. **The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.**
2. **The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.**
3. **For corrected test results are listed in the relevant table of radiated test data of this test report.**

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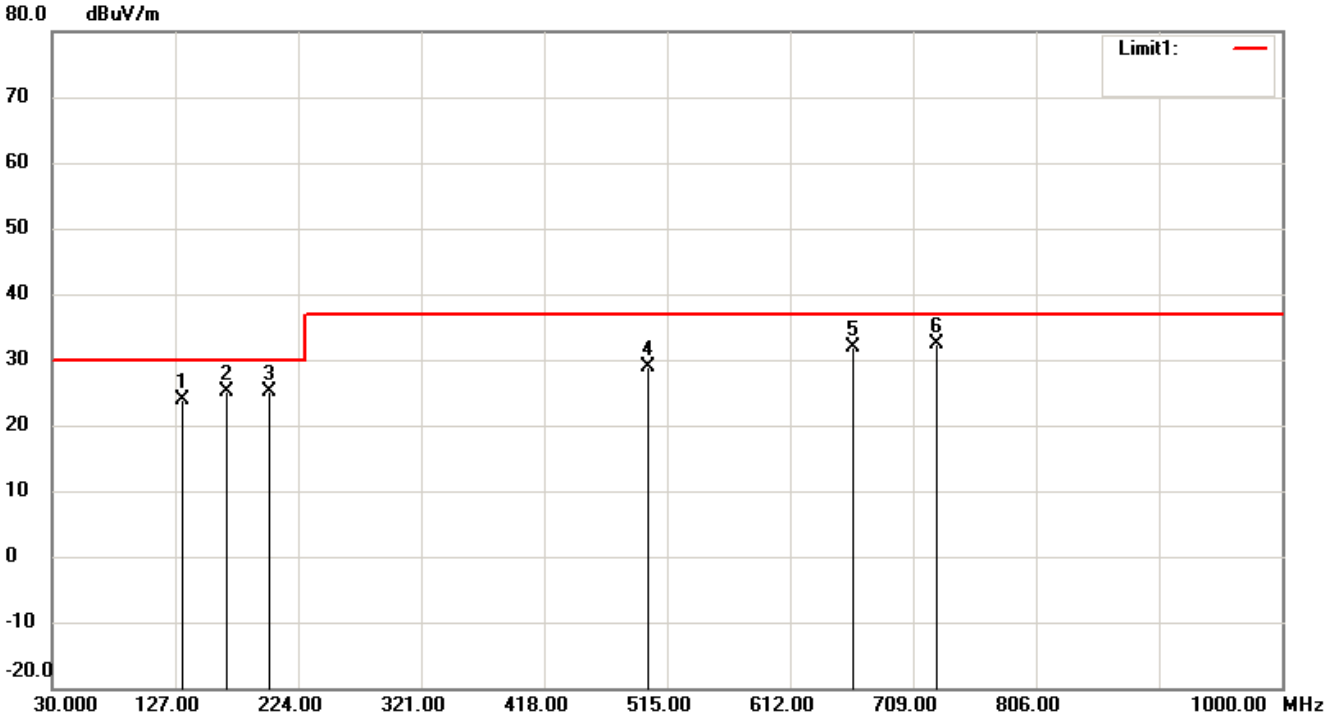
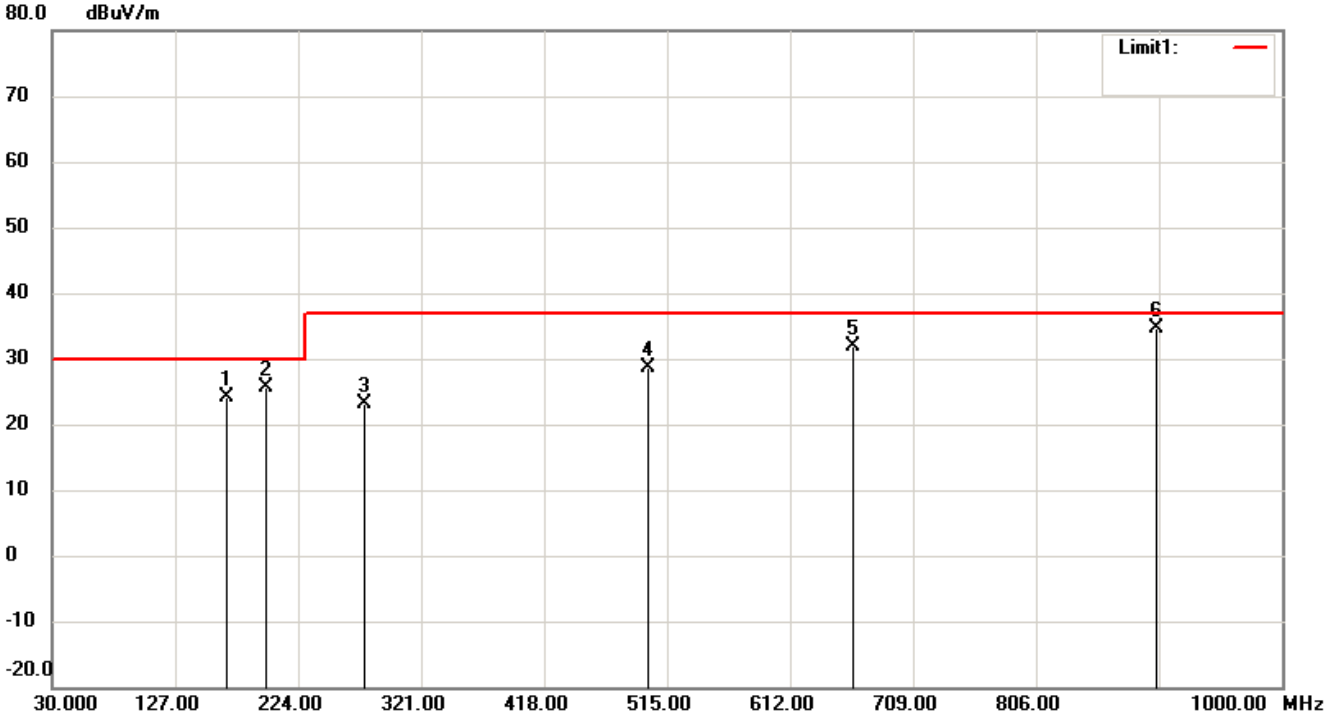
Digital part

Antenna Polarization H



Antenna Polarization V



Up Line: Peak Limit Line Down Line: Ave Limit Line
Note:

1. **The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.**
2. **The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.**
3. **For corrected test results are listed in the relevant table of radiated test data of this test report.**

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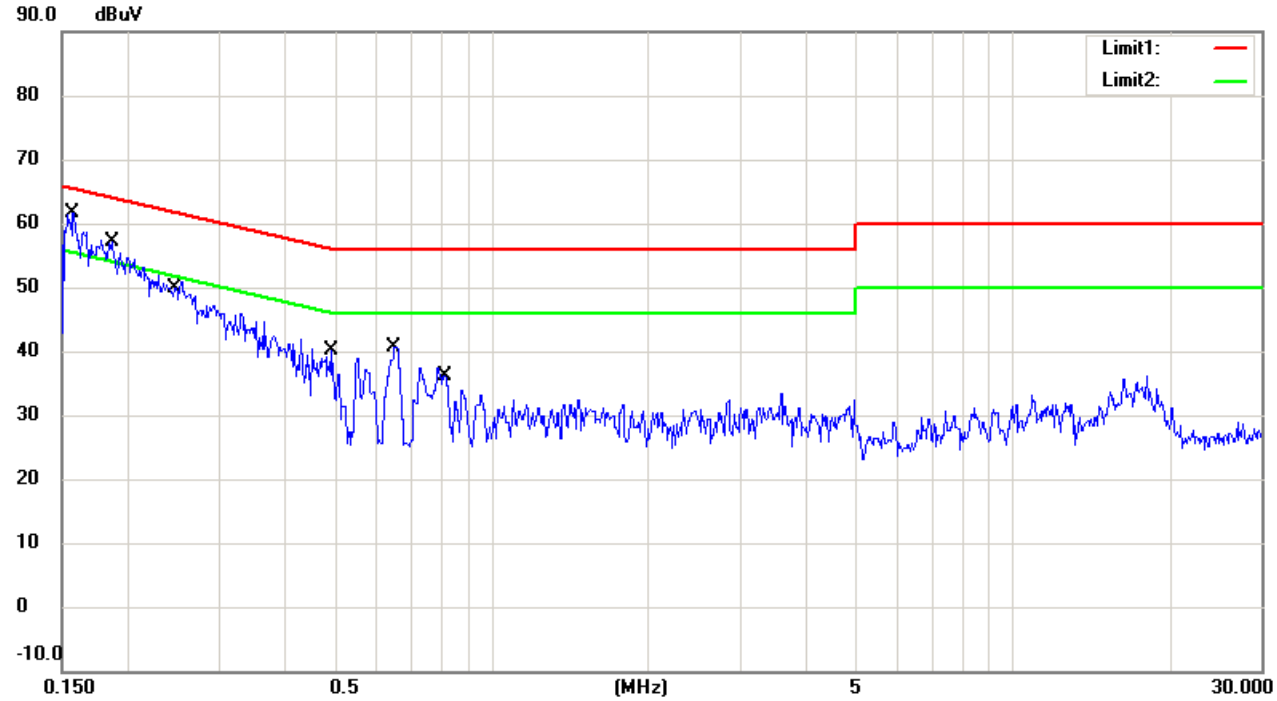
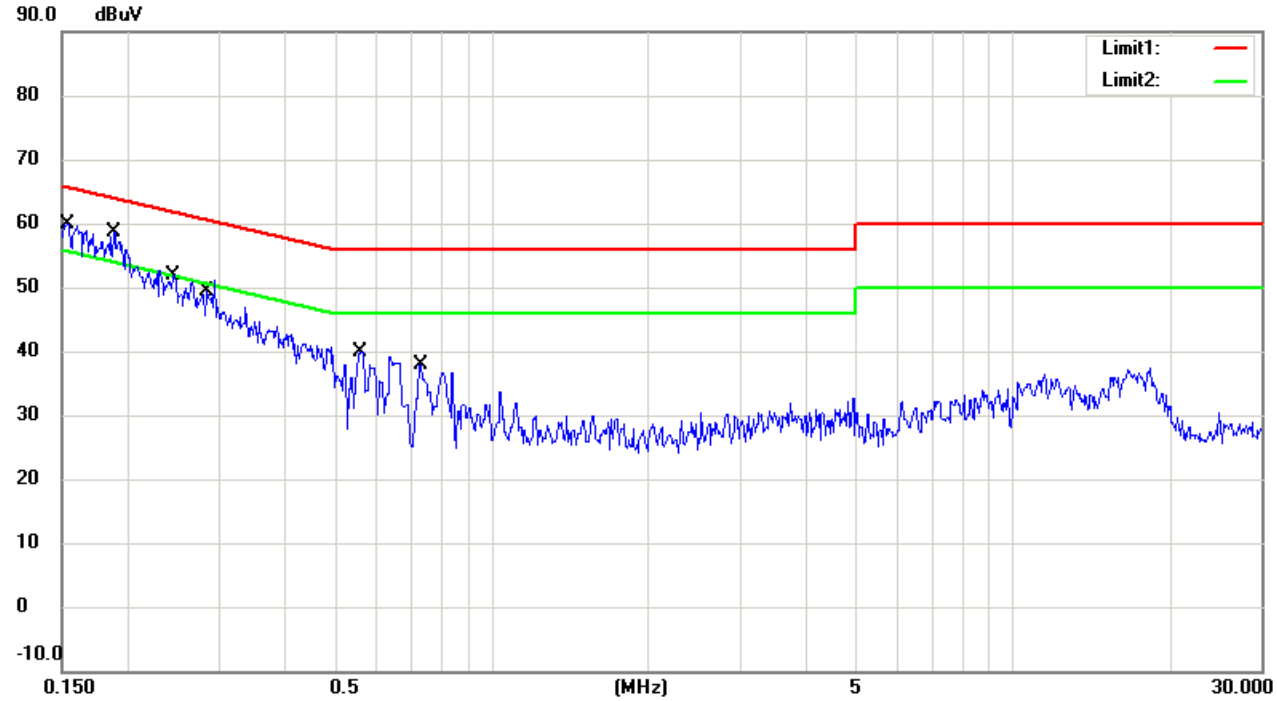
FCC ID: Y2TTWFRT101129

Conducted Emission

LISN N



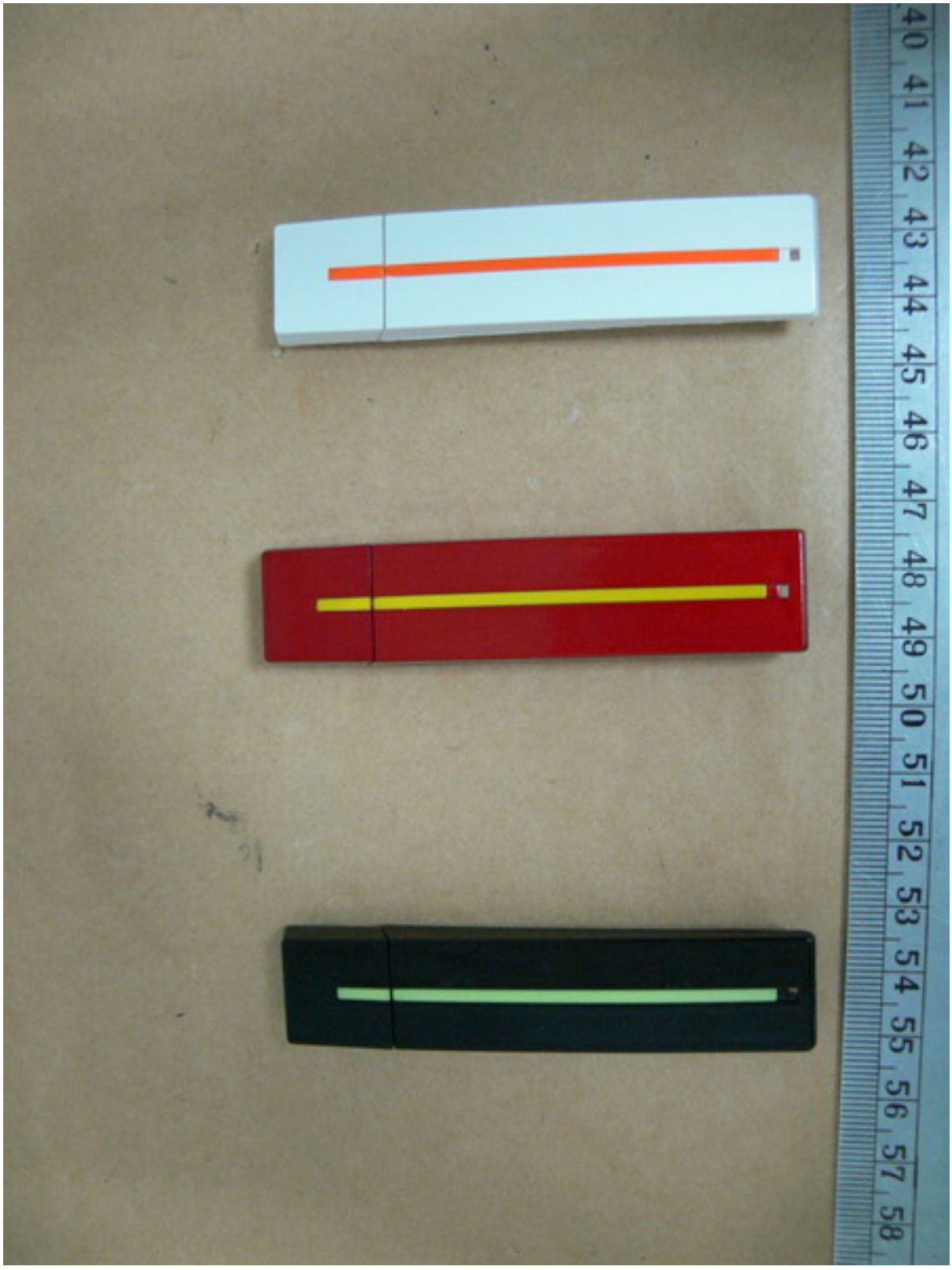
LISN L1



Up Line: QP Limit Line Down Line: Ave Limit Line
Note:

1. **The attached measurement plots are preliminarily pre-scanned with peak detector for determining the final checking frequencies and are for reference only.**
2. **The some frequencies may exceed the limit line without the specified detectors, but that cannot present the results are failed to the specification of test standard.**
3. **For corrected test results are listed in the relevant table of AC conducted test data of this test report.**

External Photos

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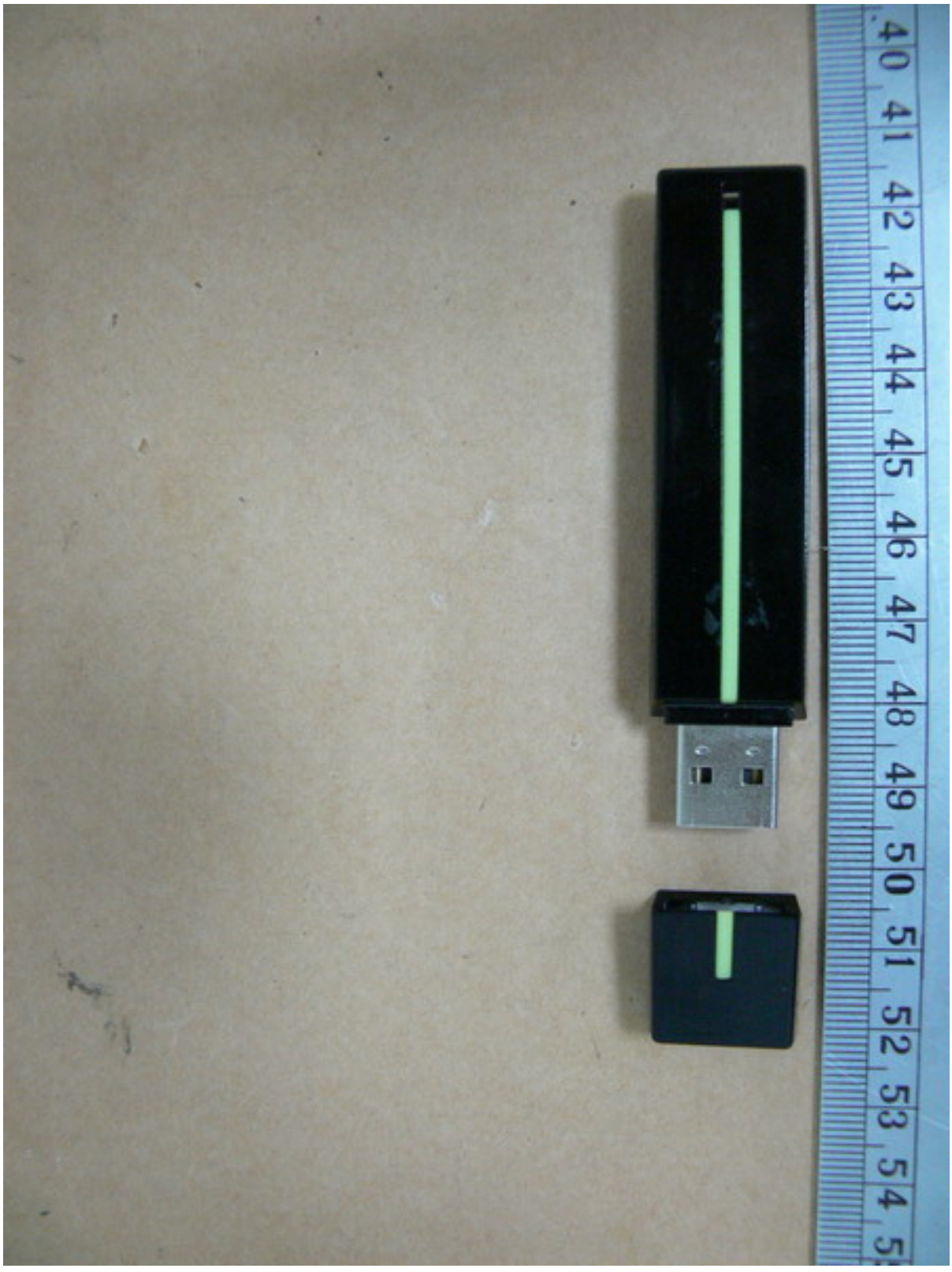
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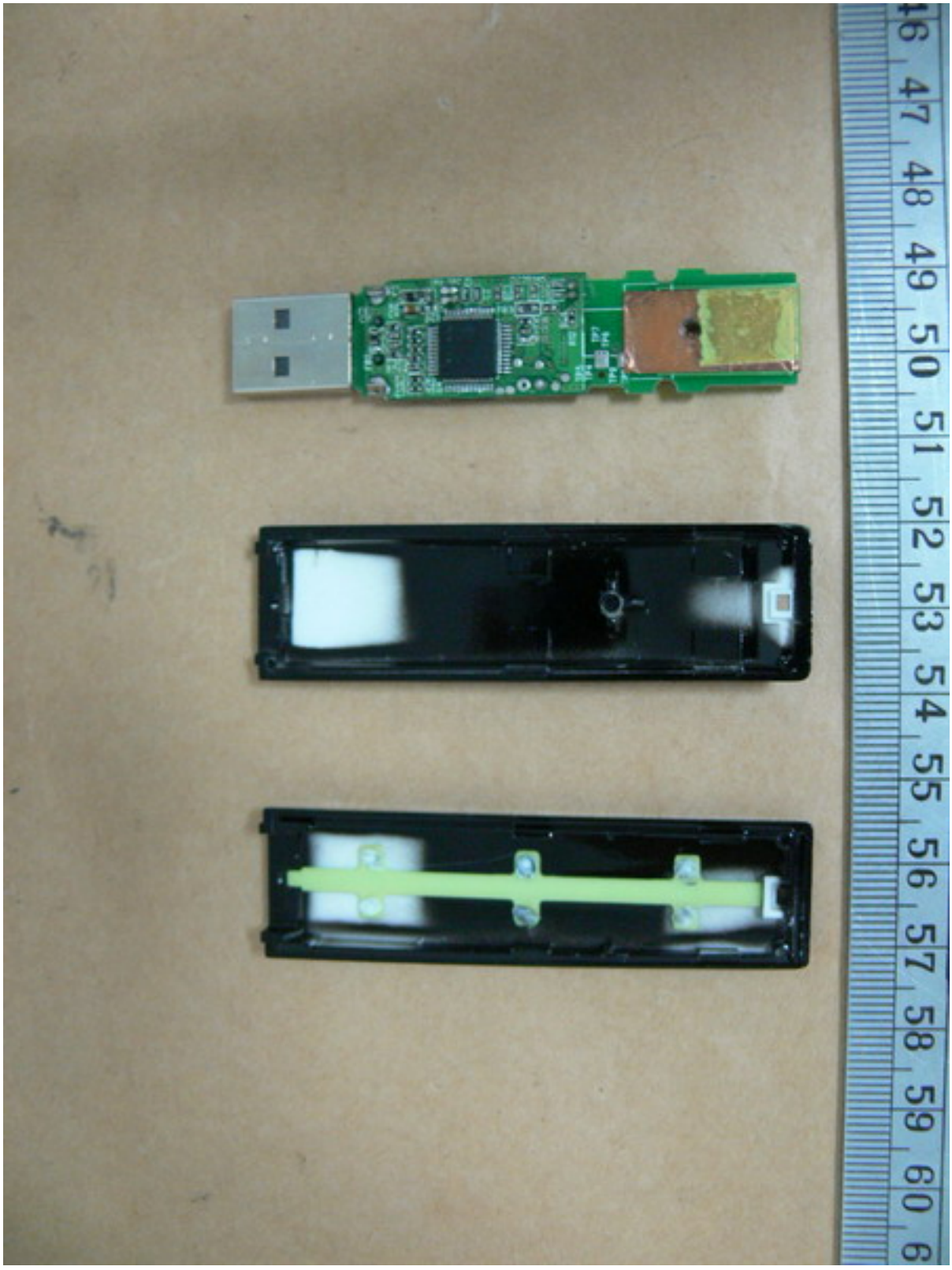
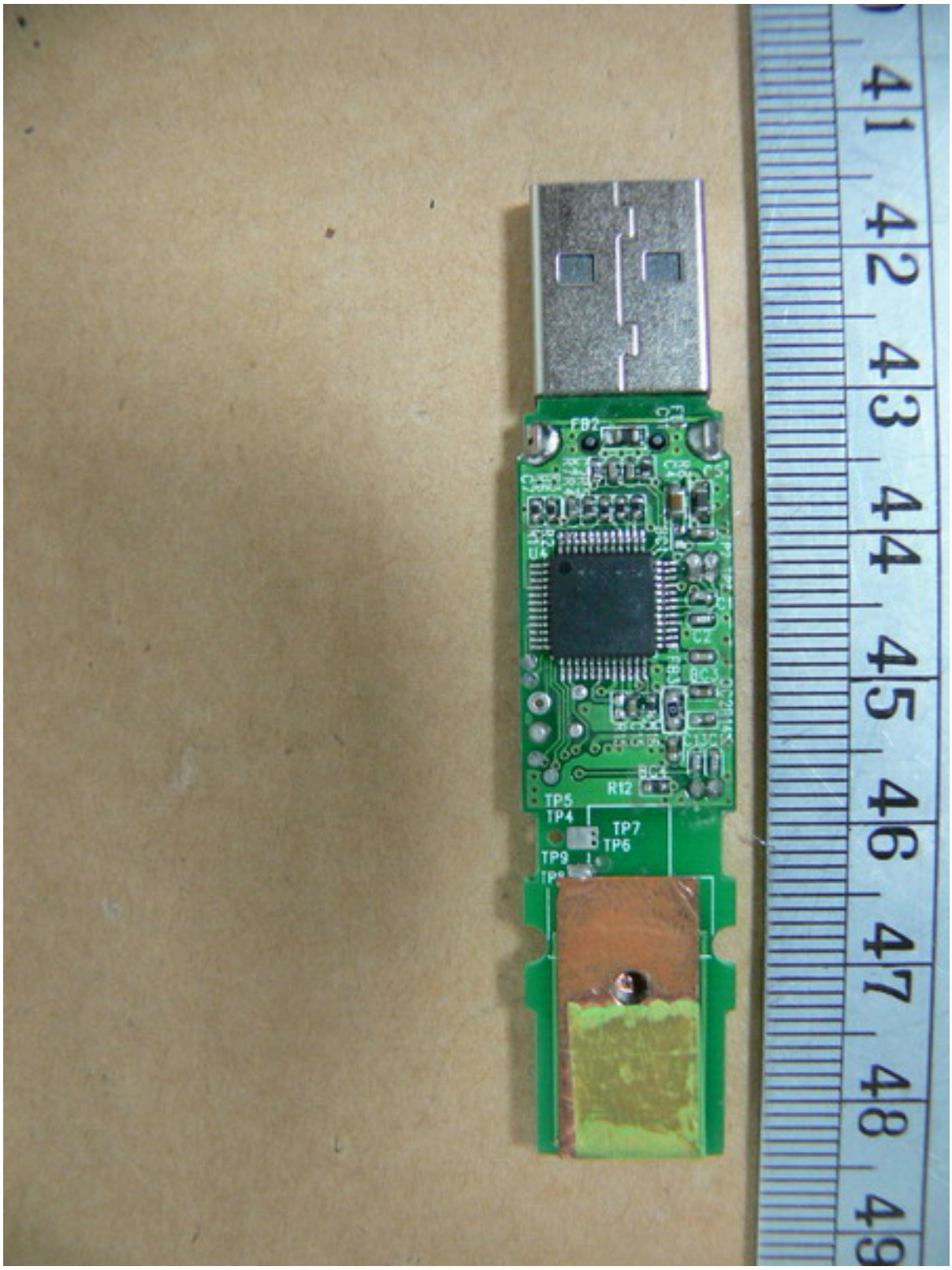
Internal Photos

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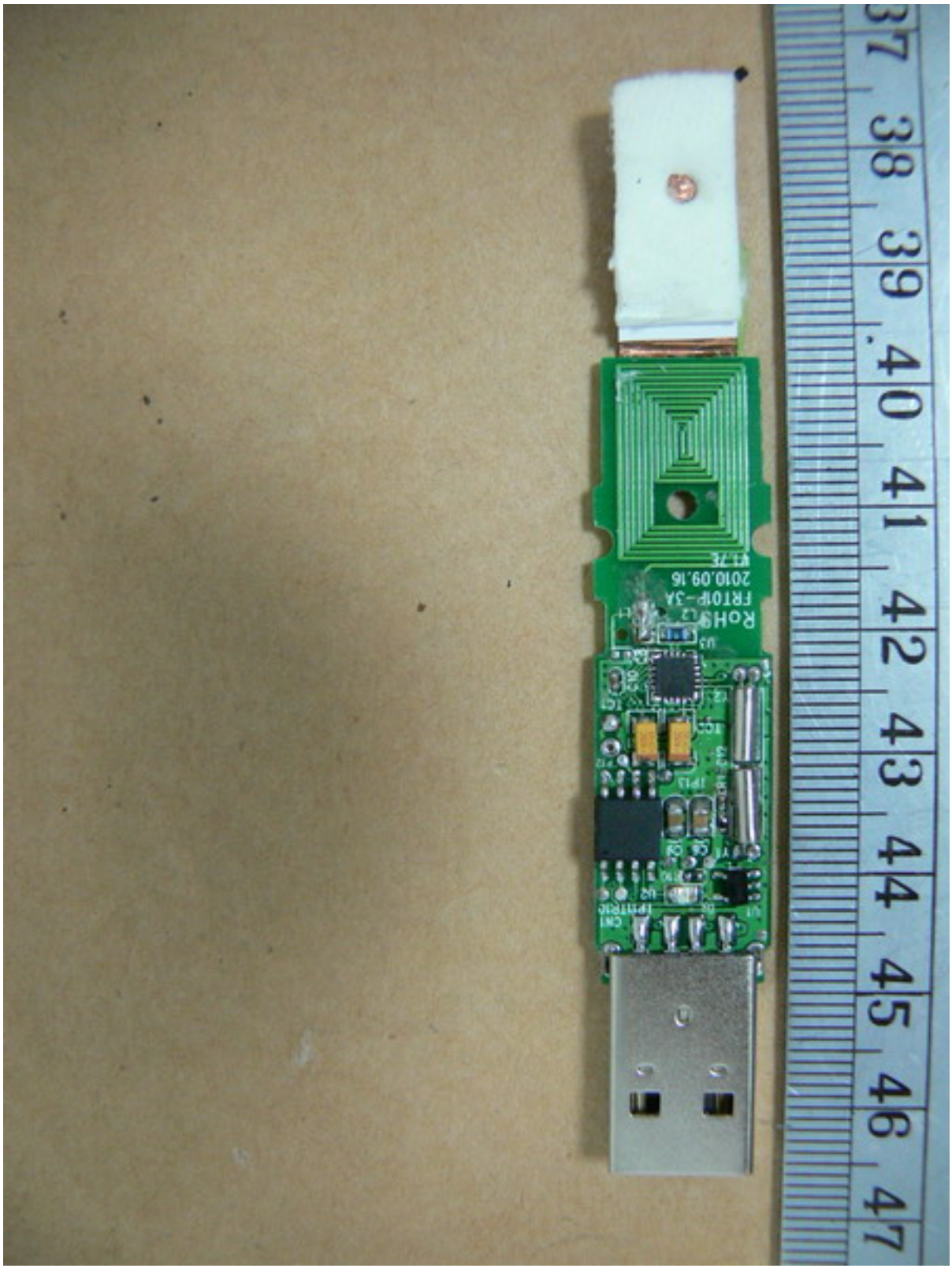
TP6
TP9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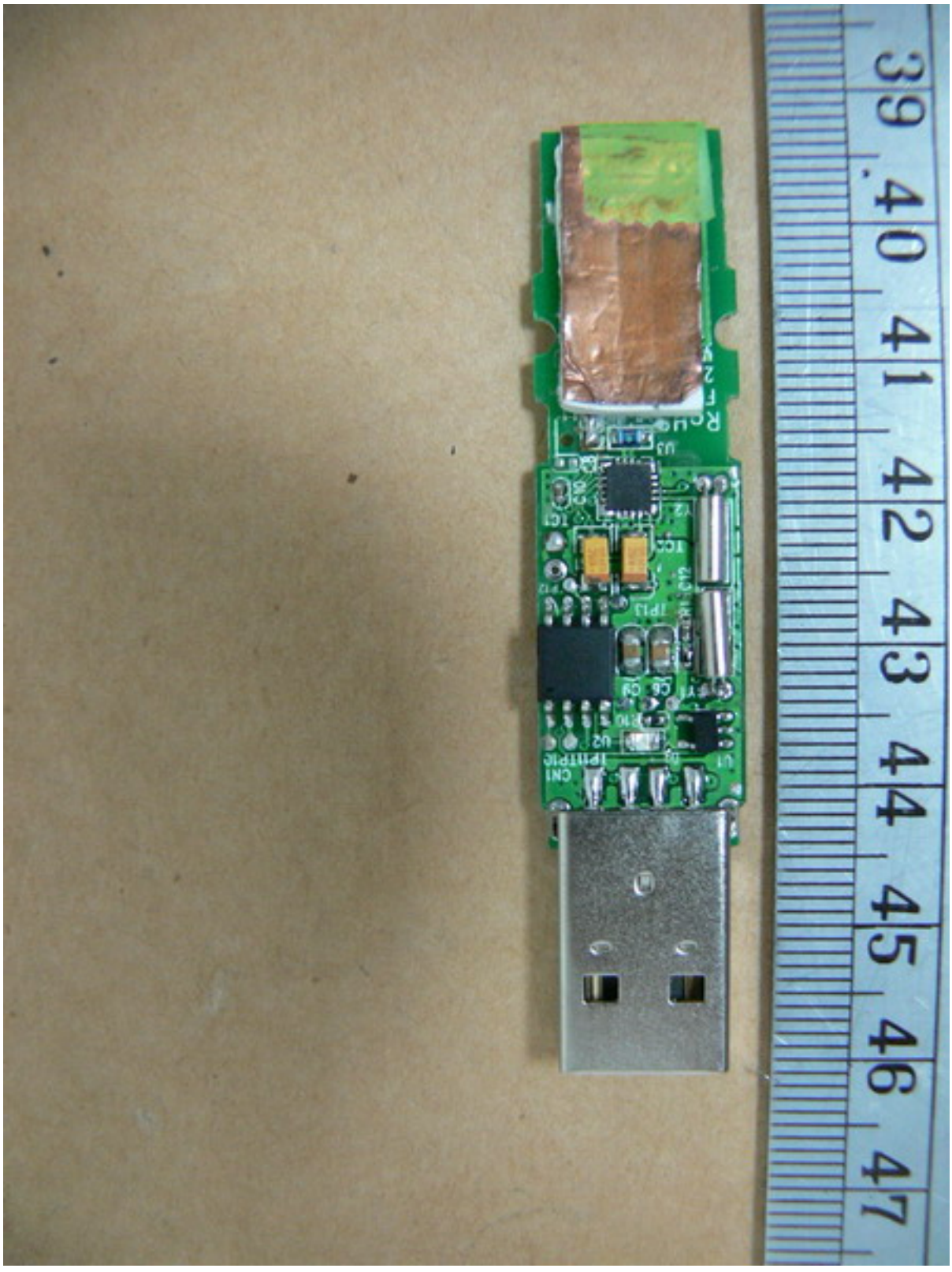

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FCC ID: Y2TTWFRT101129

Set Up Photo of Radiated Emission

EMI

RF

Set Up Photo of Conducted Emission