

FCC PART 15 SUBPART C TEST REPORT

for

IP Based Biometric Terminal

Model No.: MT430

FCC ID: 2ANUXMT430NHF

of

Applicant: TASHI Smartech Co., Ltd.

Address 3F, No.188, Baoqiao Rd., Xindian Dist., New Taipei City 231,
Taiwan, R.O.C.

Tested and Prepared

by

Worldwide Testing Services (Taiwan) Co., Ltd.

FCC Registration No.: TW1477, TW0020, TW1072

Industry Canada filed test laboratory Reg. No. IC 5679A-1, IC 5107A-1

A2LA Accredited No.: 2732.01



Report No.: W6M21711-17538-C-2

6F, NO. 58, LANE 188, RUEY-KUANG RD., NEIHU TAIPEI 114, TAIWAN, R.O.C.
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Registration number: W6M21711-17538-C-2
FCC ID: 2ANUXMT430NHF

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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 its 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.

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Tester:

May 07, 2018

Leon Chueh

Date

WTS-Lab.

Name

Signature

Technical responsibility for area of testing:

May 07, 2018

Kevin Wang

Date

WTS

Name

Signature



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1.2 Testing laboratory

1.2.1 Location

OATS

No.5-1, Shuang Sing Village,

LiShuei Rd., Wanli Dist.,

New Taipei City 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. TW1477, TW0020, TW1072

Industry Canada filed test laboratory Reg. No. IC 5679A-1, IC 5107A-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: TASHI Smartech Co., Ltd.

Street: 3F, No.188, Baoqiao Rd., Xindian Dist.,

Town: New Taipei City 231,

Country: Taiwan, R.O.C.

Telephone: (02) 8912-1268

Fax: (02) 2911-3918



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1.4 Application details

Date of receipt of test item: February 08, 2018

Date of test: from February 09, 2018 to April 30, 2018

1.5 General information of Test item

Type of test item: IP Based Biometric Terminal

Model Number: MT430

Multi-listing model number: ./.

Brand name: TASHI/unitech

Photos: see Appendix

Technical data

Transmitting Frequency: 125 kHz

Operation modes: Half-duplex

Antenna Type: Loop Antenna

Power supply: Adapter(I/P: 100-240Vac~1.0A MAX, 50-60Hz
O/P: 12Vdc, 2.0A)
Battery: 3.7Vdc, 5000mAh, 18.5Wh
DC 12V
POE 48Vdc

Manufacturer: (if different from Approval Holder)

Name: unitech electronics co., ltd.
Street: 5F., No.136, Lane 235, Pao-Chiao Rd., Hsin-Tien Dist,
Town: New Taipei City,
Country: Taiwan 231, R.O.C.

Additional information: ./.

1.6 Test standards

Technical standard :

FCC RULES 15 SUBPART C § 2.1049, § 15.203, § 15.209 (2017-10)



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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 Adapter(I/P: 100-240Vac~1.0A MAX, 50-60Hz
 O/P: 12Vdc, 2.0A)
 Battery: 3.7Vdc, 5000mAh, 18.5Wh
 DC 12V
 POE 48Vdc

Extreme conditions parameters: test voltage : -- extreme
 min : -- V
 max : -- V

Test item Name	Measurement Uncertainty
Estimation Result of Uncertainty of Conducted Emission	Expanded Uncertainty : 1.54 dB
Estimation Result of Uncertainty of Radiated Emission(3M)	Expanded Uncertainty : 0.009-30 MHz : 2.17 dB 30-1000 MHz : 3.57 dB 1-18 GHz : 2.60 dB 18-40 GHz : 2.58 dB
Estimation Result of Uncertainty of Bandwidth Measurement 20 dB Bandwidth, Occupied bandwidth, Channel bandwidth, Necessary Bandwidth	Expanded Uncertainty : 0.45 kHz
Estimation Result of Uncertainty of Frequency Drift Measurement Frequency stability	Expanded Uncertainty : 6.09 Hz



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2.3 Test Equipment List

No.	Test equipment	Type	Serial No.	Manufacturer	Cal. Date	Next Cal. Date
ETSTW-CE 001	EMI TEST RECEIVER	ESHS10	842121/013	R&S	2017/5/26	2018/5/25
ETSTW-CE 003	AC POWER SOURCE	APS-9102	D161137	GW	Function Test	
ETSTW-CE 004	ZWEILEITER-V-NETZNACHBILDUNG TWO-LINE V-NETWORK	ESH3-Z5	840731/011	R&S	2017/10/26	2018/10/25
ETSTW-CE 006	IMPULSBEGRENZER PULSE LIMITER	ESH3-Z2	100226	R&S	2017/8/22	2018/8/21
ETSTW-CE 008	HF-EICHLITUNG 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	2017/7/14	2018/7/13
ETSTW-CE 016	TWO-LINE V-NETWORK	ENV216	100050	R&S	2017/8/31	2018/8/30
ETSTW-CE 028	MXE EMI Receiver	N9038A	MY53220110	Agilent	2017/7/11	2018/7/10
ETSTW-RE 003	EMI TEST RECEIVER	ESI 26	831438/001	R&S	2017/5/26	2018/5/25
ETSTW-RE 004	EMI TEST RECEIVER	ESI 40	832427/004	R&S	2017/5/17	2018/5/16
ETSTW-RE 005	EMI TEST RECEIVER	ESVS10	843207/020	R&S	2017/8/25	2018/8/24
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	2017/7/4	2018/7/3
ETSTW-RE 027	Passive Loop Antenna	6512	00034563	ETS-Lindgren	2017/7/3	2018/7/2
ETSTW-RE 030	Double-Ridged Guide Horn Antenna	3117	00035224	ETS-Lindgren	2018/3/26	2019/3/25
ETSTW-RE 042	Biconical Antenna	HK116	100172	R&S	2018/1/23	2019/1/22
ETSTW-RE 043	Log-Periodic Dipole Antenna	HL223	100166	R&S	2018/4/9	2019/4/8
ETSTW-RE 044	Log-Periodic Antenna	HL050	100094	R&S	2018/4/18	2019/4/17
ETSTW-RE 045	ESA-E SERIES SPECTRUM ANALYZER	E4404B	MY45111242	Agilent	Pre-test Use	
ETSTW-RE 050	Attenuator 10dB	50HF-010-1	None	JFW	2018/3/1	2019/2/28
ETSTW-RE 051	Attenuator 6dB	50HF-006-1	None	JFW	2018/3/1	2019/2/28
ETSTW-RE 053	Attenuator 3dB	50HF-003-1	None	JFW	2018/3/1	2019/2/28
ETSTW-RE 055	SPECTRUM ANALYZER	FSU 26	200074	R&S	2018/3/6	2019/3/5
ETSTW-RE 060	Attenuator 30dB	5015-30	F651012z-01	ATM	2018/3/1	2019/2/28
ETSTW-RE 062	Amplifier Module	CHC 2	None	KMIC	2018/3/30	2019/3/29
ETSTW-RE 064	Bluetooth Test Set	MT8852B-042	6K00005709	Anritsu	Function Test	
ETSTW-RE 069	Double-Ridged Guide Horn Antenna	3117	00069377	ETS-Lindgren	Function Test	
ETSTW-RE 072	CELL SITE TEST SET	8921A	3339A00375	HP	2017/9/11	2018/9/10
ETSTW-RE 088	SOLID STATE AMPLIFIER	KMA180265A01	99057	KMIC	2017/9/19	2018/9/18
ETSTW-RE 091	Match Pad	MDCS1500	None	WOKEN	2018/4/9	2019/4/8
ETSTW-RE 099	DC Block	50DB-007-1	None	JFW	2018/2/23	2019/2/22



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ETSTW-RE 112	AC POWER SOURCE	TFC-1005	T-0A023536	T-Power	Function test	
ETSTW-RE 115	2.4GHz Notch Filter	N0124411	473874	MICROWAVE CIRCUITS	2018/1/15	2019/1/14
ETSTW-RE 120	RF Player	MP9200	MP9210-111022	ADIVIC	Function test	
ETSTW-RE 122	SIGNAL GENERATOR	SMF100A	102149	R&S	2017/5/26	2018/5/25
ETSTW-RE 125	5GHz Notch filter	5NSL11-5200/E221.3-O/O	1	K&L Microwave	2017/8/9	2018/8/8
ETSTW-RE 126	5GHz Notch filter	5NSL12-5800/E221.3-O/O	1	K&L Microwave	2017/8/9	2018/8/8
ETSTW-RE 127	RF Switch Box	RFS-01	None	WTS	2018/2/27	2019/2/26
ETSTW-RE 128	5.3GHz Notch filter	N0153001	SN487233	Microwave Circuits	2017/8/9	2018/8/8
ETSTW-RE 129	5.5GHz Notch filter	N0555984	SN487234	Microwave Circuits	2017/8/9	2018/8/8
ETSTW-RE 130	Handheld RF Spectrum Analyzer	N9340A	CN0147000204	Agilent	Pre-test Use	
ETSTW-RE 142	Amplifier	8447D	2805A03378	Agilent	2018/3/30	2019/3/29
ETSTW-RE 147	Bi-log Hybrid Antenna	MCTD 2786B	BLB16M04005	ETC	2018/3/23	2019/3/22
ETSTW-RE 151	Thermohygrometer	608-h1	45104376	TESTO	2017/8/30	2018/8/29
ETSTW-EMI 011	USB Compact Modulator	SFC-U	101689	R&S	2017/5/10	2018/5/9
ETSTW-GSM 002	Universal Radio Communication Tester	CMU 200	109439	R&S	2018/2/27	2019/2/26
ETSTW-GSM 003	Radio Communication Analyzer	MT8820C	6201342073	Anritsu	2018/3/2	2019/3/1
ETSTW-GSM 004	Wideband Radio Communication Tester	CMW500	128092	R&S	2017/10/16	2018/10/15
ETSTW-GSM 019	Band Reject Filter	WRCTF824/849-822/851-40 /12+9SS	3	WI	2018/1/11	2019/1/10
ETSTW-GSM 020	Band Reject Filter	WRCD1747/1748-1743/1752-32/5SS	1	WI	2018/1/11	2019/1/10
ETSTW-GSM 021	Band Reject Filter	WRCD1879.5/1880.5-1875.5/1884.5-32/5SS	3	WI	2018/1/11	2019/1/10
ETSTW-GSM 022	Band Reject Filter	WRCT901.9/903.1-904.25-50/8SS	1	WI	2018/1/11	2019/1/10
ETSTW-GSM 023	Power Divider	4901.19.A	None	SUHNER	2017/9/13	2018/9/12
ETSTW-GSM 024	Radio Communication Analyzer	MT8821C	None	Anritsu	2018/3/7	2019/3/6
ETSTW-Cable 011	SMA to N type Cable	RGU-400	None	THERMAX	Pre-test Use NCR	
ETSTW-Cable 016	BNC Cable	Switch Box	B Cable 1	Schwarz beck	2018/2/22	2019/2/21
ETSTW-Cable 017	BNC Cable	X Cable	B Cable 2	Schwarz beck	2018/2/22	2019/2/21
ETSTW-Cable 018	BNC Cable	Y Cable	B Cable 3	Schwarz beck	2018/2/22	2019/2/21
ETSTW-Cable 019	BNC Cable	Z Cable	B Cable 4	Schwarz beck	2018/2/22	2019/2/21
ETSTW-Cable 020	N TYPE Cable	OATS Cable 1	N30N30-L335-15M	JYE BAO CO.,LTD.	2017/7/3	2018/7/2
ETSTW-Cable 026	Microwave Cable	SUCOFLEX 104	279075	HUBER+SUHNER	2018/2/27	2019/2/26
ETSTW-Cable 027	Microwave Cable	SUCOFLEX 104	279083	HUBER+SUHNER	2017/5/12	2018/5/11
ETSTW-Cable 028	Microwave Cable	FA147A0015M2020	30064-2	UTIFLEX	2017/9/7	2018/9/6
ETSTW-Cable 029	Microwave Cable	FA147A0015M2020	30064-3	UTIFLEX	2017/9/7	2018/9/6
ETSTW-Cable 030	Microwave Cable	SUCOFLEX 104 (S Cable 9)	279067	HUBER+SUHNER	2018/2/27	2019/2/26
ETSTW-Cable 031	Microwave Cable	SUCOFLEX 104 (S Cable 10)	238092	HUBER+SUHNER	2018/3/30	2019/3/29
ETSTW-Cable 043	Microwave Cable	SUCOFLEX 104	317576	HUBER+SUHNER	2018/3/30	2019/3/29



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ETSTW-Cable 048	Microwave Cable	SUCOFLEX 104	325519	HUBER+SUHNER	2018/3/30	2019/3/29
ETSTW-Cable 058	Microwave Cable	SUCOFLEX 104	none	HUBER+SUHNER	2018/2/21	2019/2/20
ETSTW-Cable 064	Microwave Cable	SUCOFLEX 104	MY28891	HUBER+SUHNER	2018/3/30	2019/3/29
ETSTW-Cable 066	SMA type cable	32022	None	ASTROLAB	2017/8/31	2018/8/30
ETSTW-Cable 071	N TYPE CABLE	EMCCFD400-NM-NM-25000	170239	EMCI	2018/2/21	2019/2/20
WTSTW-SW 002	EMI TEST SOFTWARE	EZ EMC	None	Farad	Version ETS-03A1	
WTSTW-SW 006	EMI TEST SOFTWARE	e3	None	AUDIX	Version 9.161014	
WTSTW-SW 008	Signal studio	Agilent	None	AUDIX	Version 2.0.0.1	



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2.4 General Test Procedure

POWER LINE CONDUCTED INTERFERENCE: The procedure used was ANSI STANDARD C63.10-2013 6.2 using a 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 C63.10-2013 6.3 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 dB μ V) 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 dB μ V + 10.36 dB + 6 dB = 36.36 dB μ V/m @3m

ANSI STANDARD C63.10-2013 6.2.2 MEASUREMENT PROCEDURES: The EUT was placed on a table 80 cm height and with dimensions of 1m by 1.5m (non metallic table). The EUT was placed in the centre of the table. The table used for radiated measurements is capable of continuous rotation. The spectrum was scanned from 30 MHz to 10th harmonic of the fundamental.

Peak readings were taken in three (3) orthogonal planes and the highest readings.

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.

ANSI STANDARD C63.10-2013 B.2.7: Any measurements that utilize special test software shall be indicated and referenced in the test report. During testing, test software 'EZ EMC' was used for setting up different operation modes.



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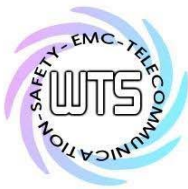
Registration number: W6M21711-17538-C-2

FCC ID: 2ANUXMT430NHF

3 Test results (enclosure)

Test case	Para. Number	Required	Test passed	Test failed
Peak Output Power	15.209	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Spurious Emissions radiated – Transmitter operating	15.209	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Spurious Emissions radiated – Receiver operating	15.109	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Occupied bandwidth	2.1049	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Antenna Requirement	FCC 15.203	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Power Line Conducted Emission	FCC 15.207	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

The following is intentionally left blank.

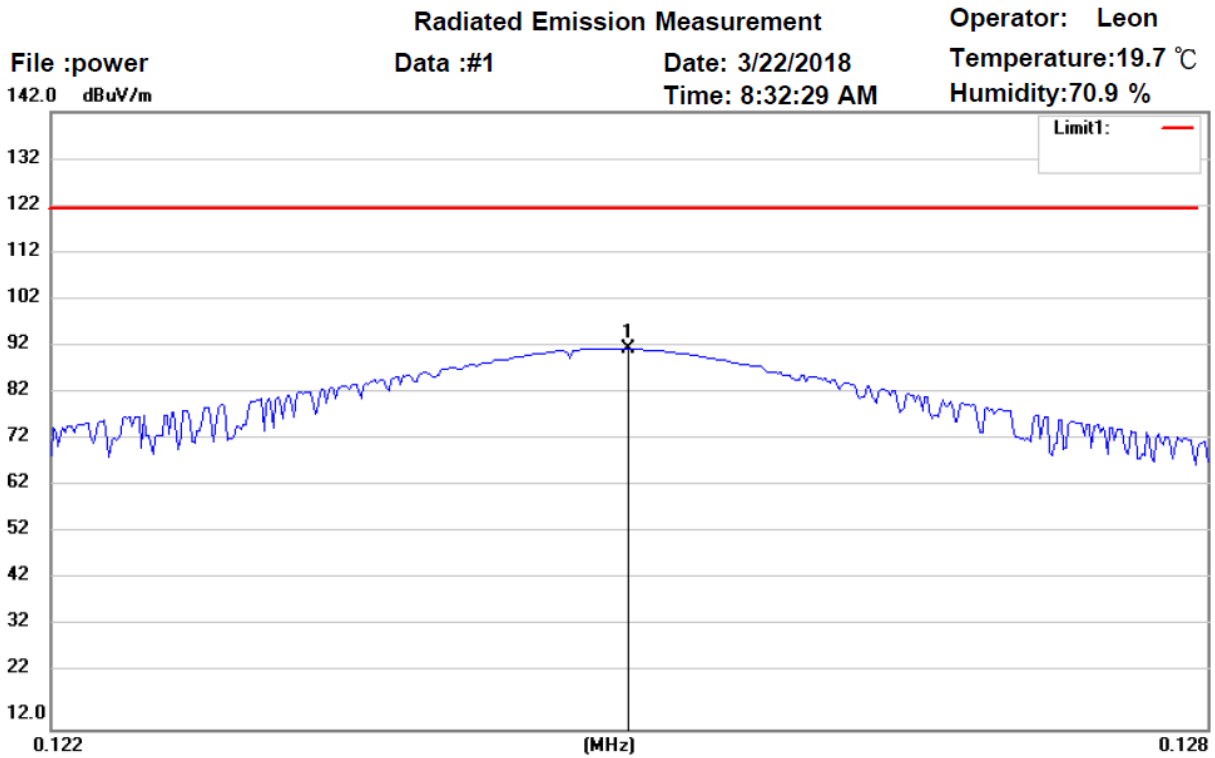


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3.1 Peak Output Power

FCC Rules: 15.209

The power was measured with modulation (declared by the applicant).



Site : Chamber

Condition : FCC 15.209 Power (125kHz)

EUT : W6M21711-17538

M/N:

Test Mode : TX 125kHz

Note :

Polarization:

Power : 120 Va.c.

Distance: 1.2m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
*	0.1250	27.14	peak	65.04	92.18	121.58	100	0	-29.40	



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Limits: 15.209

Frequency of Emission (MHz)	Field Strength of Fundamental Limit uV/m	Measurement distance
0.009 – 0.490	2400 / f (KHz)	300
0.49 – 1.705	24000 / f (KHz)	30
1.705 – 30	30	30
30 – 88	100	3
88 – 216	150	3
216 – 960	200	3
Above 960	500	3

The test was performed in the anechoic chamber at 1.2 meter test distance, i.e. the distance between measuring antenna and EUT boundary. The results were extrapolated by using the square of an inverse linear distance factor DF:

$DF (\text{distance factor}) = 40 \log (D_1/D_2) = 95.92 \text{ dB}$, where

D_1 is the 300 meter specified measurement distance,

D_2 is the 1.2 meter test measurement distance.

For 125 kHz frequency the calculated limit is:

$\text{Limit}_{1.2m} = \text{Limit}_{300m} + DF = 25.66 \text{ dBuV/m} + 95.92 \text{ dB} = 121.58 \text{ dBuV/m}$

Test equipment used: ETSTW-RE 004, ETSTW-RE 027, ETSTW-RE 055.



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3.2 Spurious Emissions radiated – Transmitter operating

FCC Rules: 15.209

The field strength of any emission appearing outside of the specific band shall not exceed the general radiated emission limits in 15.209.

Model: MT430 Date: --
 Mode: -- Temperature: -- °C Engineer: --
 Polarization: Horizontal Humidity: -- %

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

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. Measurement uncertainty for 3m measurement : 0.009-30 MHz : ±2.17 dB, 30-1000 MHz = ± 3.57 dB, 1-18 GHz = ± 2.60 dB, 18-40 GHz = ± 2.58 dB ;Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.
6. See attached diagrams in the Appendix.

All other not noted test plots do not contain significant test results in relation to the limits.

TEST RESULT (Transmitter): The unit DOES meet the FCC requirements.

Limits: 15.209

Frequency of Emission (MHz)	Field Strength of Fundamental Limit uV/m	Measurement distance
0.009 – 0.490	2400 / f (KHz)	300
0.49 – 1.705	24000 / f (KHz)	30
1.705 – 30	30	30
30 – 88	100	3
88 – 216	150	3
216 – 960	200	3
Above 960	500	3

* In the emission table above, the tighter limit applies at the band edges.



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The test was performed in the anechoic chamber at 1.2 meter test distance, i.e. the distance between measuring antenna and EUT boundary. The results were extrapolated by using the square of an inverse linear distance factor DF:

$DF = 40 \log (D_1/D_2)$, where

For D_1 is the 300 meter specified measurement distance.

D_2 is the 1.2 meter test measurement distance.

The DF = 95.92 dB was applied for limit calculation at 1.2 meter test distance measurements.

For D_1 is the 30 meter specified measurement distance.

D_2 is the 1.2 meter test measurement distance.

The DF = 55.92 dB was applied for limit calculation at 1.2 meter test distance measurements.

If the frequency between 9 – 490 kHz,

Limit = $20\log(2400/f(\text{kHz})) + 95.92$

If the frequency between 490 – 1705 kHz,

Limit = $20\log(2400/f(\text{kHz})) + 55.92$

If the frequency between 1705 – 30000 kHz,

Limit = $20\log 30 + 55.92$

Test equipment used: ETSTW-RE 004, ETSTW-RE 027, ETSTW-RE 055,
ETSTW-RE 146, ETSTW-RE 148.



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3.3 Occupied Bandwidth

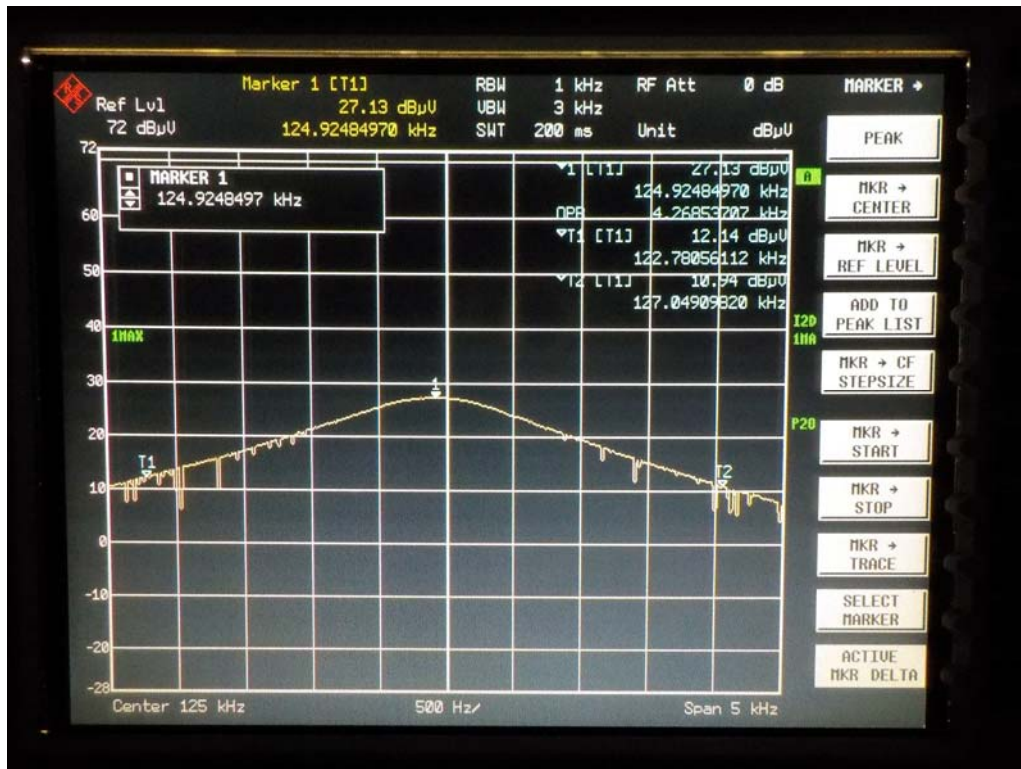
FCC Rules: 2.1049

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated are each equal to 0.5% of the total mean power radiated by a given emission.

The resolution bandwidth of the spectrum analyzer shall be set to a value greater than 5.0% of the allowed bandwidth specifications are given, the following guidelines are used:

Fundamental frequency	Minimum resolution bandwidth
9 kHz to 30 MHz	1 kHz
30 MHz to 1000 MHz	10 kHz
1000 MHz to 40 GHz	100 kHz

Test result:



Test equipment: ETSTW-RE 055



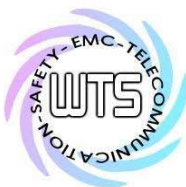
Registration number: W6M21711-17538-C-2
FCC ID: 2ANUXMT430NHF

3.4 Antenna requirement

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 a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

Explanation: This antenna is Loop antenna which passes antenna requirement.

The equipment meets the requirements	yes <input checked="" type="checkbox"/>	no <input type="checkbox"/>
--------------------------------------	--	--------------------------------



Registration number: W6M21711-17538-C-2

FCC ID: 2ANUXMT430NHF

3.5 Radiated Emissions from Receiver Section of Receiver Part

For the frequency from 9 kHz to 30 MHz:

FCC Rule: 15.209

The field strength of any emission appearing outside of the specific band shall not exceed the general radiated emission limits in 15.209.

Frequency of Emission (MHz)	Field Strength of Fundamental Limit uV/m	Measurement distance
0.009 – 0.490	2400 / f (KHz)	300
0.49 – 1.705	24000 / f (KHz)	30
1.705 – 30	30	30
30 – 88	100	3
88 – 216	150	3
216 – 960	200	3
Above 960	500	3

* In the emission table above, the tighter limit applies at the band edges.

Note: The above field strength limits are specified at a distance of 3 meters.

The test was performed in the anechoic chamber at 1.2 meter test distance, i.e. the distance between measuring antenna and EUT boundary. The results were extrapolated by using the square of an inverse linear distance factor DF:

$$DF = 40 \log (D_1/D_2), \text{ where}$$

For D_1 is the 300 meter specified measurement distance.

D_2 is the 1.2 meter test measurement distance.

The DF = 95.92 dB was applied for limit calculation at 1.2 meter test distance measurements.

For D_1 is the 30 meter specified measurement distance.

D_2 is the 1.2 meter test measurement distance.

The DF = 55.92 dB was applied for limit calculation at 1.2 meter test distance measurements.

If the frequency between 9 – 490 kHz, limit = $20\log(2400/f(\text{kHz})) + 95.92$

If the frequency between 490 – 1705 kHz, limit = $20\log(2400/f(\text{kHz})) + 55.92$

If the frequency between 1705 – 30000 kHz, limit = $20\log 30 + 55.92$

Test equipment used: ETSTW-RE 004, ETSTW-RE 027, ETSTW-RE 055, ETSTW-RE 146, ETSTW-RE 148

Explanation: See attached diagrams in appendix.



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21711-17538-C-2

FCC ID: 2ANUXMT430NHF

For the frequency from 30 MHz to 1000 MHz.:

FCC Rule: 15.109

Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

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

Model: MT430 Date: --
 Mode: -- Temperature: -- °C Engineer: --
 Polarization: Horizontal Humidity: -- %

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

Test equipment used: ETSTW-RE 004, ETSTW-RE 030, ETSTW-RE 062, ETSTW-RE 064, ETSTW-RE 142, ETSTW-RE 147

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. Measurement uncertainty for 3m measurement : 30-1000 MHz = ± 3.57 dB, 1-18 GHz = ± 2.60 dB, 18-40 GHz = ± 2.58 dB ; Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.
6. See attached diagrams in the Appendix.

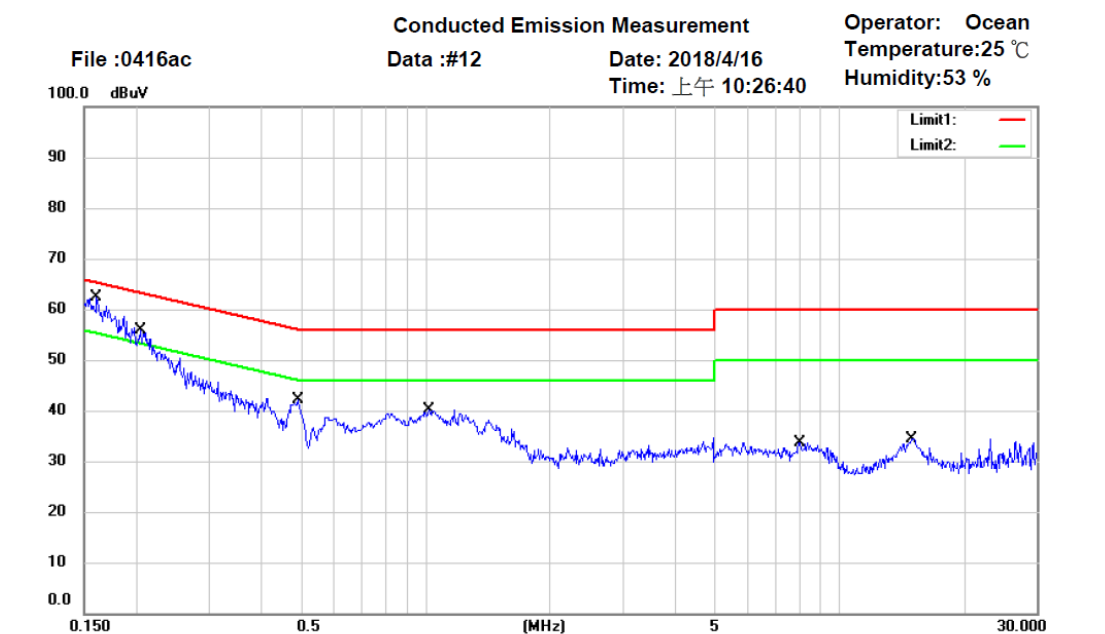


Registration number: W6M21711-17538-C-2
 FCC ID: 2ANUXMT430NHF

3.6 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.



Site : Chamber_03

Condition : FCC Part 15 Class B Conduction (QP)

Phase: N

EUT : W6M21711-17538

Power : 120 Va.c.

M/N:

Test Mode :

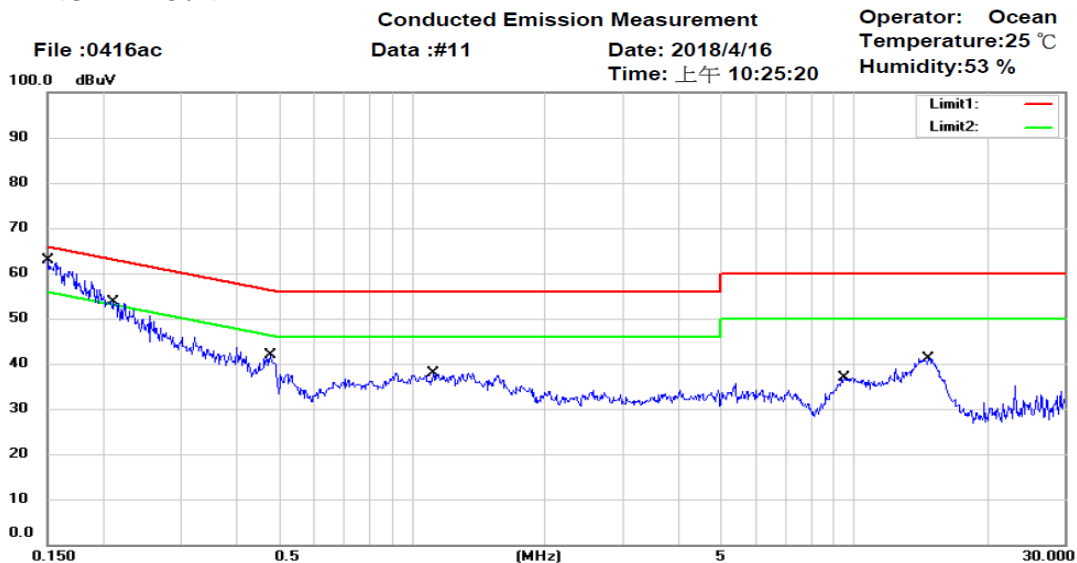
Note :

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Comment
*	0.1603	46.99	QP	9.74	56.73	65.45	-8.72	
	0.1603	25.97	AVG	9.74	35.71	55.45	-19.74	
	0.2046	39.34	QP	9.73	49.07	63.42	-14.35	
	0.2046	23.51	AVG	9.73	33.24	53.42	-20.18	
	0.4891	28.62	QP	9.74	38.36	56.18	-17.82	
	0.4891	20.90	AVG	9.74	30.64	46.18	-15.54	
	1.0196	27.21	QP	9.76	36.97	56.00	-19.03	
	1.0196	20.14	AVG	9.76	29.90	46.00	-16.10	
	7.9875	16.13	QP	10.03	26.16	60.00	-33.84	
	7.9875	9.84	AVG	10.03	19.87	50.00	-30.13	
	14.9750	18.16	QP	10.17	28.33	60.00	-31.67	
	14.9750	12.80	AVG	10.17	22.97	50.00	-27.03	



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21711-17538-C-2
 FCC ID: 2ANUXMT430NHF



Site : Chamber_03
 Condition : FCC Part 15 Class B Conduction (QP) Phase: L1
 EUT : W6M21711-17538 Power : 120 V.a.c.
 M/N:
 Test Mode :
 Note :

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Comment
*	0.1504	48.67	QP	9.73	58.40	65.98	-7.58	
	0.1504	26.81	AVG	9.73	36.54	55.98	-19.44	
	0.2111	38.06	QP	9.72	47.78	63.16	-15.38	
	0.2111	22.85	AVG	9.72	32.57	53.16	-20.59	
	0.4781	27.03	QP	9.73	36.76	56.37	-19.61	
	0.4781	19.61	AVG	9.73	29.34	46.37	-17.03	
	1.1142	23.66	QP	9.75	33.41	56.00	-22.59	
	1.1142	17.52	AVG	9.75	27.27	46.00	-18.73	
	9.4875	21.85	QP	10.03	31.88	60.00	-28.12	
	9.4875	16.03	AVG	10.03	26.06	50.00	-23.94	
	14.6875	26.78	QP	10.08	36.86	60.00	-23.14	
	14.6875	20.99	AVG	10.08	31.07	50.00	-18.93	

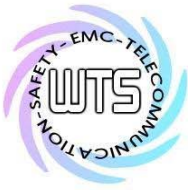
Note

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 = ±1.54 dB; Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.
6. Up Line: QP Limit Line, Down Line: Ave Limit Line.

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 016, ETSTW-RE 045.



Registration number: W6M21711-17538-C-2
FCC ID: 2ANUXMT430NHF

Appendix

Measurement diagrams

Spurious Emissions Radiated



Radiated Emission Measurement

Operator: Leon

File :1

Data :#1

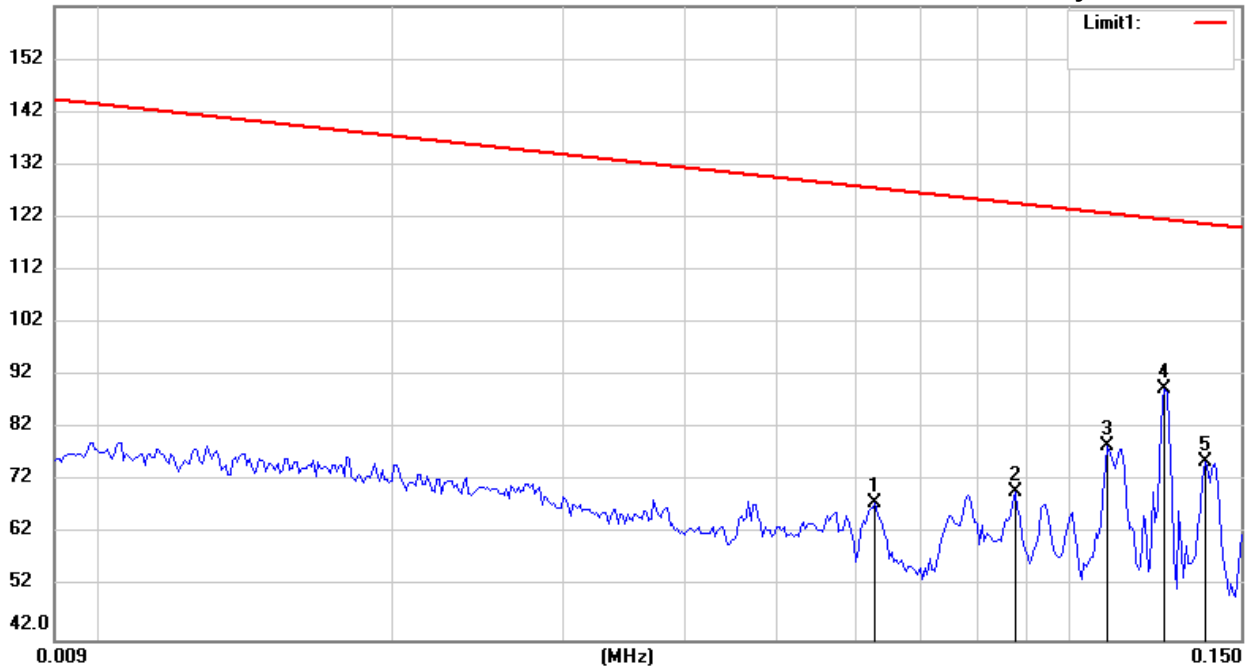
Date: 3/22/2018

Temperature:19.7 °C

162.0 dBuV/m

Time: 8:34:52 AM

Humidity:70.9 %



Site : Chamber

Condition : FCC 15.209 RE (<30MHz)

EUT : W6M21711-17538

M/N:

Test Mode : TX 125kHz

Note :

Polarization:

Power : 120 Va.c.

Distance: 1.2m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	0.0630	-2.99	peak	70.85	67.86	127.54	100	95	-59.68	
	0.0878	2.28	peak	67.77	70.05	124.65	100	60	-54.60	
	0.1094	13.04	peak	65.80	78.84	122.74	100	33	-43.90	
*	0.1252	24.61	peak	65.03	89.64	121.57	100	205	-31.93	RF Power
	0.1378	11.39	peak	64.42	75.81	120.74	100	240	-44.93	



Radiated Emission Measurement

Operator: Leon

File :2

Data :#1

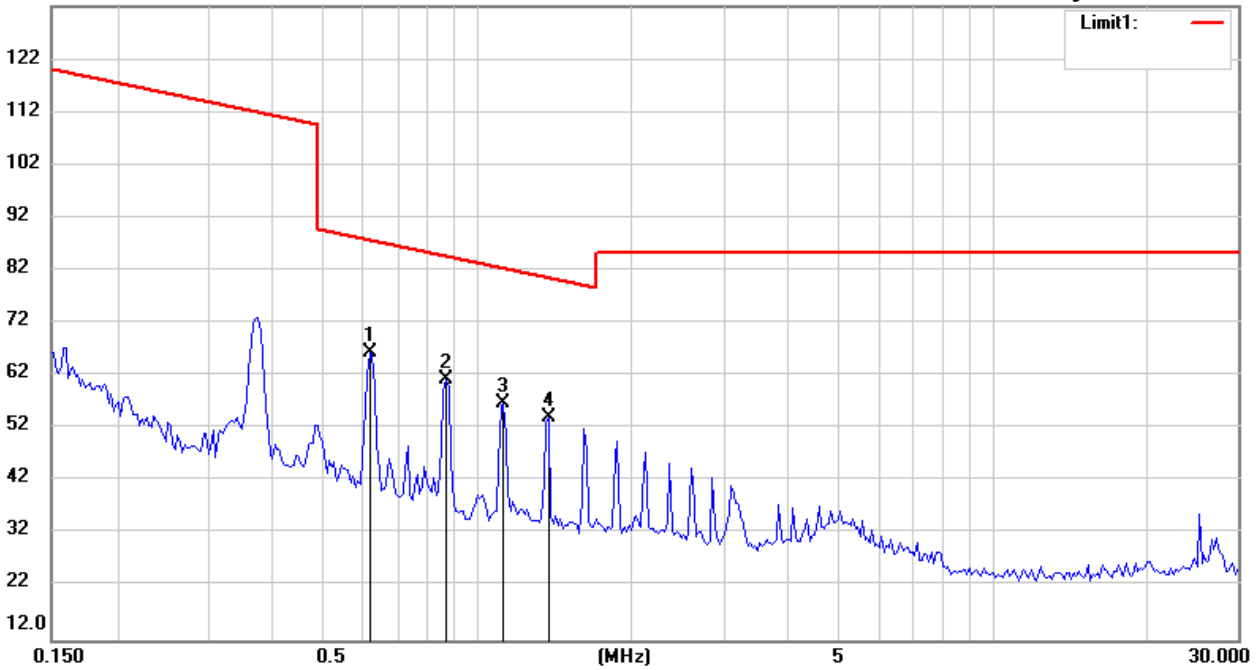
Date: 3/22/2018

Temperature:19.7 °C

132.0 dBuV/m

Time: 8:38:06 AM

Humidity:70.9 %



Site : Chamber

Condition : FCC 15.209 RE (<30MHz)

EUT : W6M21711-17538

M/N:

Test Mode : TX 125kHz

Note :

Polarization:

Power : 120 Va.c.

Distance: 1.2m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
*	0.6223	15.58	peak	50.79	66.37	87.64	100	24	-21.27	
	0.8741	13.31	peak	48.00	61.31	84.69	100	70	-23.38	
	1.1278	10.84	peak	46.04	56.88	82.48	100	110	-25.60	
	1.3798	9.31	peak	44.95	54.26	80.73	100	95	-26.47	



Radiated Emission Measurement

Operator: Leon

File :3

Data :#1

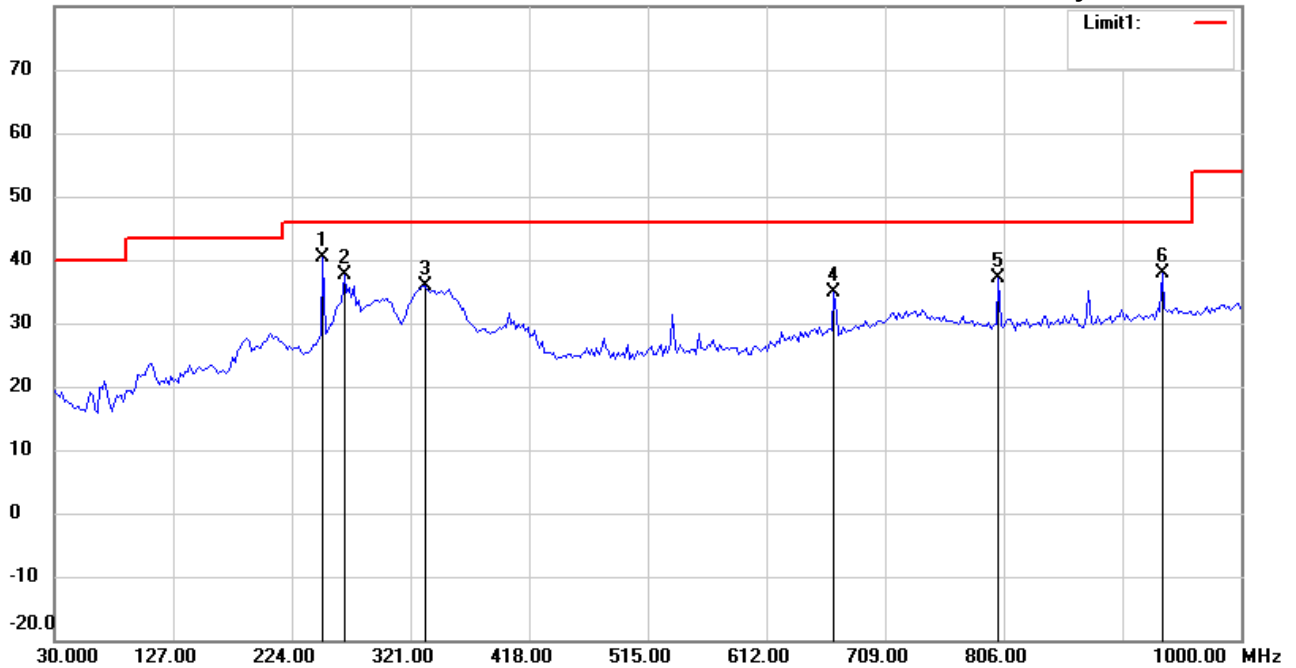
Date: 3/25/2018

Temperature:24.2 °C

80.0 dBuV/m

Time: 10:23:28 AM

Humidity:65.3 %



Site : Chamber

Condition : FCC_part 15 RE-Class C_30-1000MHz

Polarization: *Horizontal*

EUT : W6M21711-17538

Power : 120 Va.c.

M/N:

Distance: 3m

Test Mode : TX 125kHz

Note :

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
*	249.6593	48.27	peak	-7.81	40.46	46.00	100	245	-5.54	
	267.1543	44.58	peak	-6.87	37.71	46.00	100	70	-8.29	
	333.2465	40.95	peak	-5.10	35.85	46.00	100	110	-10.15	
	667.5952	35.02	peak	-0.26	34.76	46.00	100	93	-11.24	
	801.7234	35.81	peak	1.43	37.24	46.00	100	165	-8.76	
	935.8517	33.80	peak	4.20	38.00	46.00	100	240	-8.00	



Radiated Emission Measurement

Operator: Leon

File :3

Data :#2

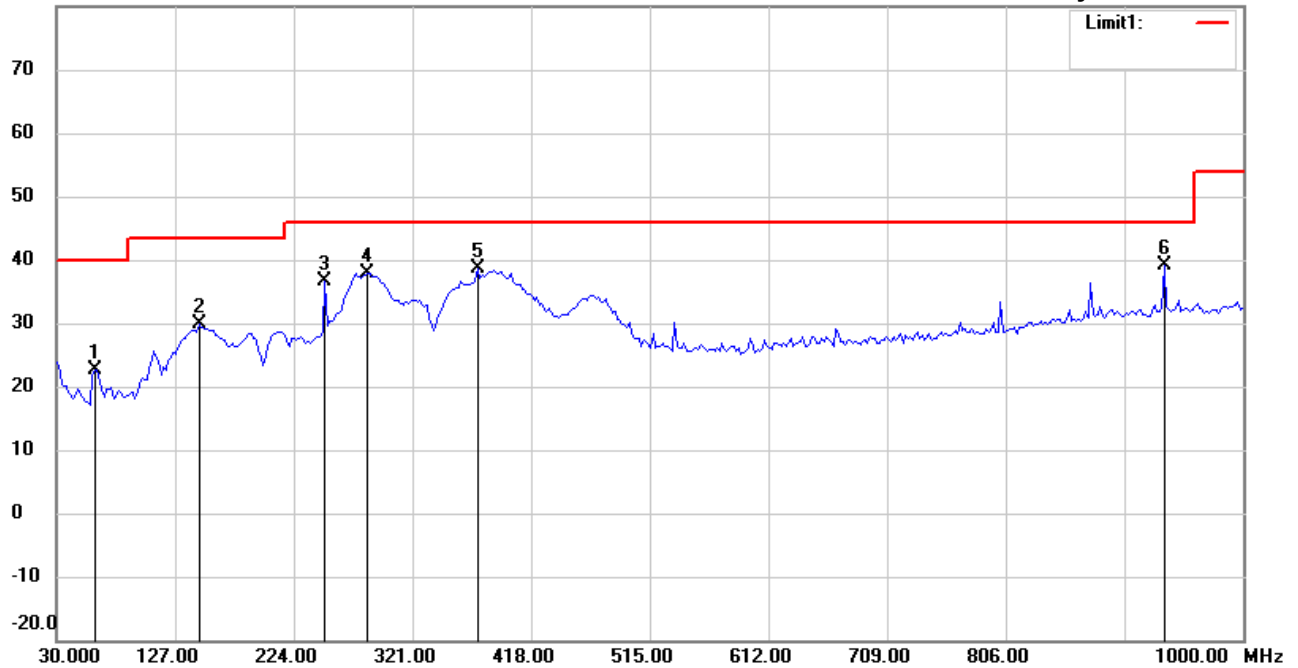
Date: 3/25/2018

Temperature:24.2 °C

80.0 dBuV/m

Time: 10:29:38 AM

Humidity:65.3 %



Site : Chamber

Condition : FCC_part 15 RE-Class C_30-1000MHz

Polarization: **Vertical**

EUT : W6M21711-17538

Power : 120 Va.c.

M/N:

Distance: 3m

Test Mode : TX 125kHz

Note :

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	61.1022	35.01	peak	-12.26	22.75	40.00	100	275	-17.25	
	146.6333	37.32	peak	-7.53	29.79	43.50	100	80	-13.71	
	249.6593	44.36	peak	-7.81	36.55	46.00	100	110	-9.45	
	284.6492	44.10	peak	-6.24	37.86	46.00	100	237	-8.14	
	374.0681	42.71	peak	-4.13	38.58	46.00	100	290	-7.42	
*	935.8517	34.92	peak	4.20	39.12	46.00	100	240	-6.88	



Radiated Emission Measurement

Operator: Leon

File :1

Data :#1

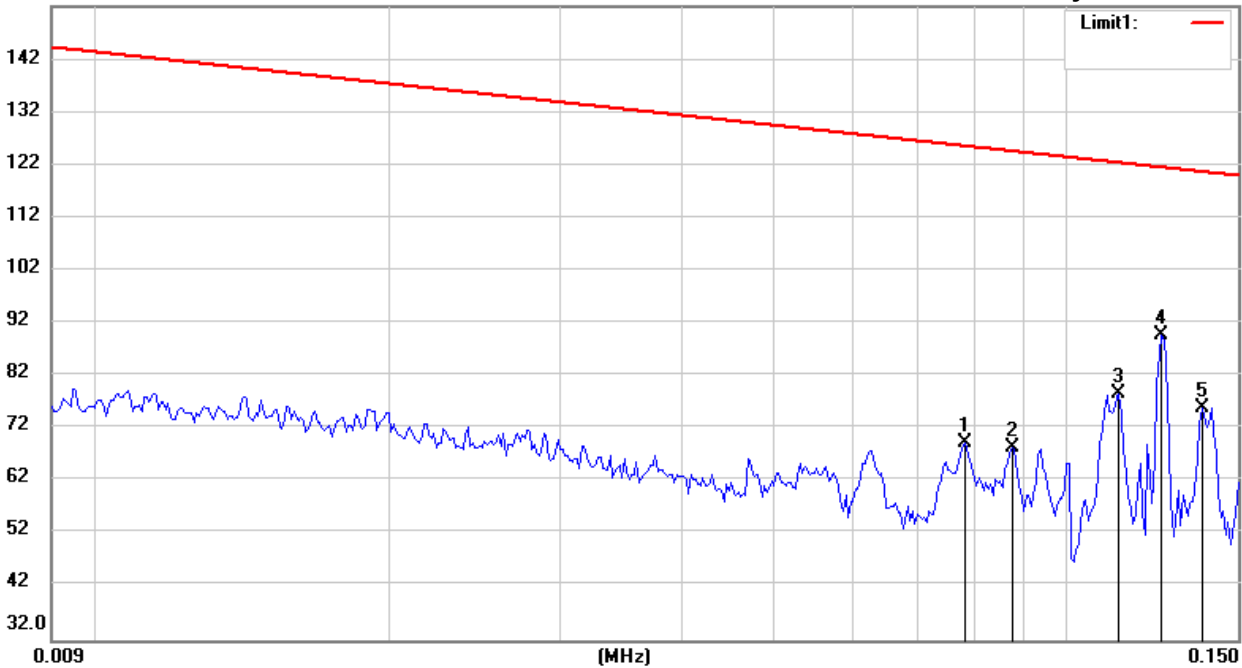
Date: 3/22/2018

Temperature:19.7 °C

152.0 dBuV/m

Time: 8:36:11 AM

Humidity:70.9 %



Site : Chamber

Condition : FCC 15.209 RE (<30MHz)

EUT : W6M21711-17538

M/N:

Test Mode : RX 125kHz

Note :

Polarization:

Power : 120 Va.c.

Distance: 1.2m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	0.0784	0.38	peak	68.94	69.32	125.64	100	25	-56.32	
	0.0878	0.62	peak	67.77	68.39	124.65	100	80	-56.26	
	0.1132	13.17	peak	65.61	78.78	122.45	100	110	-43.67	
*	0.1252	24.62	peak	65.03	89.65	121.57	100	140	-31.92	RF Power
	0.1378	11.39	peak	64.42	75.81	120.74	100	130	-44.93	



Radiated Emission Measurement

Operator: Leon

File :2

Data :#1

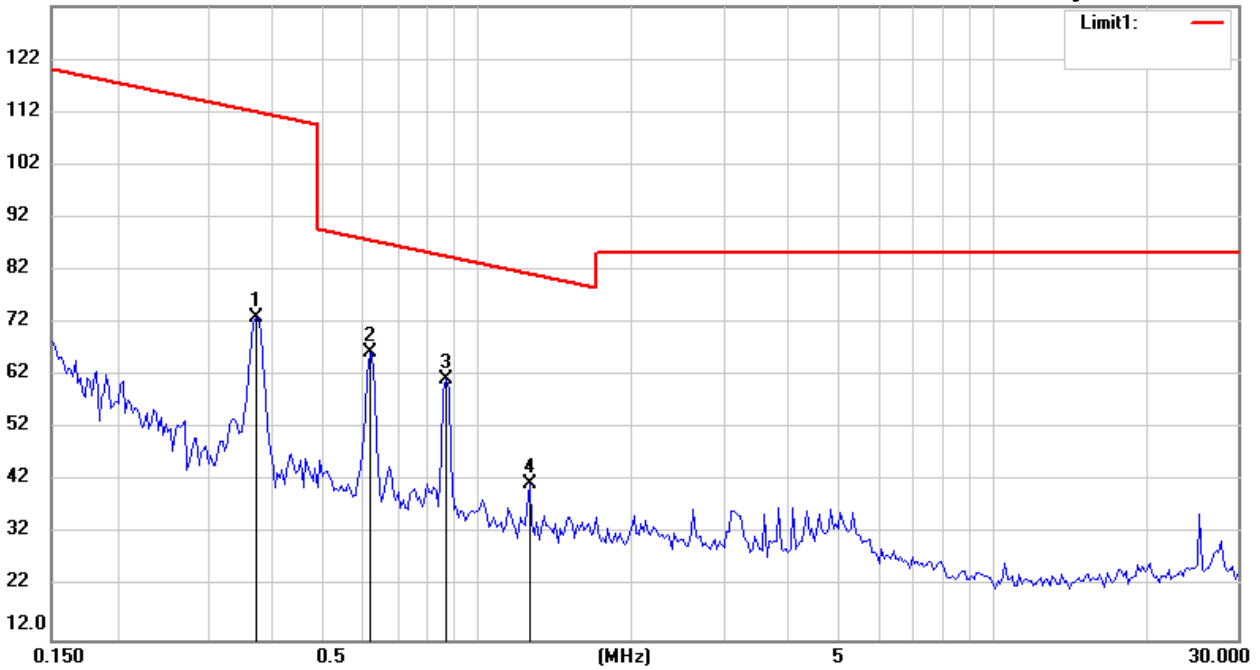
Date: 3/22/2018

Temperature:19.7 °C

132.0 dBuV/m

Time: 8:37:04 AM

Humidity:70.9 %



Site : Chamber

Condition : FCC 15.209 RE (<30MHz)

EUT : W6M21711-17538

M/N:

Test Mode : RX 125kHz

Note :

Polarization:

Power : 120 Va.c.

Distance: 1.2m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	0.3738	18.24	peak	54.94	73.18	112.07	100	145	-38.89	
*	0.6223	15.53	peak	50.79	66.32	87.64	100	80	-21.32	
	0.8741	13.20	peak	48.00	61.20	84.69	100	25	-23.49	
	1.2675	-3.87	peak	45.44	41.57	81.47	100	90	-39.90	



Radiated Emission Measurement

Operator: Leon

File :3

Data :#1

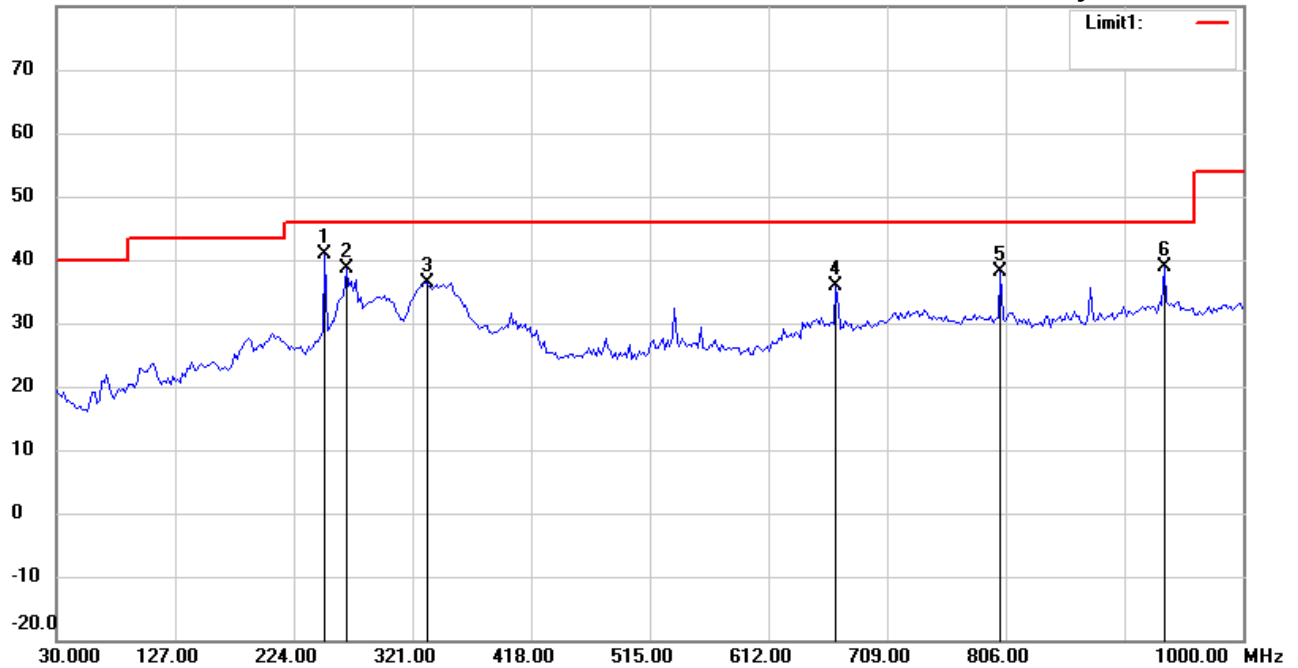
Date: 3/28/2018

Temperature:24.2 °C

80.0 dBuV/m

Time: 2:15:31 AM

Humidity:65.3 %



Site : Chamber

Condition : FCC_part 15 RE-Class B_30-1000MHz

Polarization: *Horizontal*

EUT : W6M21711-17538

Power : 120 Va.c.

M/N:

Distance: 3m

Test Mode : RX 125kHz

Note :

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
*	249.6593	48.77	peak	-7.81	40.96	46.00	100	255	-5.04	
	267.1542	45.58	peak	-6.87	38.71	46.00	100	140	-7.29	
	333.2465	41.45	peak	-5.10	36.35	46.00	100	75	-9.65	
	667.5951	36.02	peak	-0.26	35.76	46.00	100	30	-10.24	
	801.7233	36.81	peak	1.43	38.24	46.00	100	155	-7.76	
	935.8517	34.80	peak	4.20	39.00	46.00	100	245	-7.00	



Radiated Emission Measurement

Operator: Leon

File :3

Data :#2

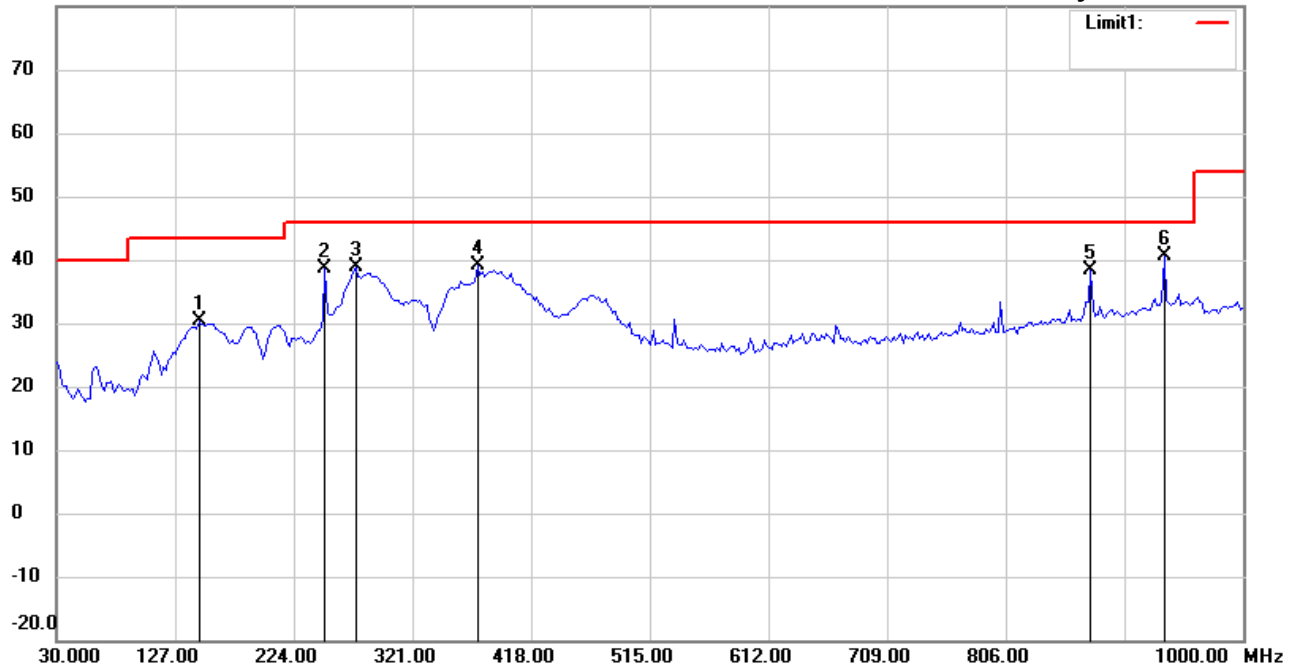
Date: 3/28/2018

Temperature:24.2 °C

80.0 dBuV/m

Time: 2:18:24 AM

Humidity:65.3 %



Site : Chamber

Condition : FCC_part 15 RE-Class B_30-1000MHz

Polarization: **Vertical**

EUT : W6M21711-17538

Power : 120 Va.c.

M/N:

Distance: 3m

Test Mode : RX 125kHz

Note :

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	146.6332	37.82	peak	-7.53	30.29	43.50	100	245	-13.21	
	249.6593	46.36	peak	-7.81	38.55	46.00	100	110	-7.45	
	274.9297	45.31	peak	-6.55	38.76	46.00	100	37	-7.24	
	374.0681	43.21	peak	-4.13	39.08	46.00	100	50	-6.92	
	875.5911	35.46	peak	2.85	38.31	46.00	100	249	-7.69	
*	935.8517	36.42	peak	4.20	40.62	46.00	100	310	-5.38	