ETS Dr.Genz Taiwan PS Co., Ltd.

FCC Registration No.: 930600

Industry Canada Field test laboratory Reg. No. IC 5679

A2LA Cert.No.: 2300.01

PTCRB Accredited Type Certification Test House

TEST - REPORT

FCC RULES PART 15 / SUBPART C

FCC ID: GX9IRP9

Test report no.:

W6M20611-7535-C-1

FCC

ETS DR. GENZ TAIWAN PS CO., LTD
6F, NO. 58, LANE 188, RUEY-KUANG RD., NEIHU, TAIPEI 114, TAIWAN, R.O.C.
PHONE 886-2-66068877 FAX 886-2-66068879

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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 ETS DR. GENZ TAIWAN PS CO., LTD

Tester:

Date	ETS-Lab.	Name	Signature
November 9, 2006		Jay Chaing	Jay Chaing

Technical responsibility for area of testing:

Date	ETS	Name	Signature
November 9, 2006		Steven Chuang	Steven Chuang

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
ETS DR. GENZ TAIWAN PS 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-registration number: 2300.01

FCC filed test laboratory Reg. No. 930600

Industry Canada filed test laboratory Reg. No. IC 5679

PTCRB Accredited Type Certification Test House

Town:	./.
Country:	./.
Telephone:	./.
Fax:	./.

1.3 Details of approval holder

Name	: CLIMAX TECHNOLOGY CO., LTD.
Street	: No. 258, Sinhu 2nd Rd., Neihu District
Town	: 114, Taipei City
Country	: Taiwan (R.O.C.)
Telephone	: +886-2-2794-0001
Fax	: +886-2-2794-5512

1.4 Application details

Date of receipt of application : November 2, 2006
Date of receipt of test item : November 2, 2006
Date of test : from November 3, 2006 to November 9, 2006

1.5 Test item

Description of test item : PET IMMUNE PIR Motion Sensor

Type identification : IRP-9

Brand name : Climax

Serial number : Test sample without serial number

Transmitting frequency : 315 MHz

Operation mode : simplex

Voltage supply : 1.5 VDC (battery)

(If the device is using battery, please check if the device is tested under fresh battery condition.)

Highest clock frequency : 315 MHz

Antenna type : dipole antenna

Photos : see Annex

Manufacturer
(if applicable)

Name : ./.
Street : ./.
Town : ./.
Country : ./.

Additional information : ./.

1.6 Test standards

Technical standard : FCC RULES PART 15 / SUBPART B § 15.109/ SUBPART C
§ 15.203, § 15.209, § 15.231 (a)

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 2.5 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	: 1.5 VDC (battery)

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	2006/10/16	2007/10/15
ETSTW-CE 002	PREREULATOR MODE DC POWER SUPPLY	None	None		Function Test	
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	2006/10/16	2007/10/15
ETSTW-CE 005	Line-Impedance Stabilisation Network	NNBM 8126D	137	Schwarzbeck	2006/10/16	2007/10/15
ETSTW-CE 006	IMPULS-BEGRENZER PULSE LIMITER	ESH3-Z2	100226	R&S	In House Certificate	
ETSTW-CE 008	ABSORBING CLAMP	MDS 21	3469	ABSORPTIONS-MESSWANDLER-ZANGE	2005/10/24	2007/10/23
ETSTW-CE 009	TEMP.&HUMIDITY CHAMBER	GTH-225-40-1P-U	MAA0305-009	GIANT FORCE	2006/8/17	2007/8/16
ETSTW-CE 012	Dual-Phase-V-Network	NNB-2/16Z	03/10201	Telemeter	2006/6/13	2007/6/12
ETSTW-RE 002	Function Generator	33220A	MY43004982	Agilent	2005/10/14	2007/10/13
ETSTW-RE 003	EMI TEST RECEIVER	ESI 26	831438/001	R&S	2006/10/20	2007/10/19
ETSTW-RE 004	EMI TEST RECEIVER	ESI 40	832427/004	R&S	2006/10/30	2007/10/29
ETSTW-RE 005	EMI TEST RECEIVER	ESVS10	843207/020	R&S	2006/10/12	2007/10/11
ETSTW-RE 010	PROGRAMMABLE LINEAR POWER SUPPLY	LPS-305	30503070181	MOTECH	Function Test	
ETSTW-RE 011	PROGRAMMABLE LINEAR POWER SUPPLY	LPS-305	30503070165	MOTECH	Function Test	
ETSTW-RE 017	ANTENNA	HL025	352886/001	R&S	2006/5/4	2008/5/3
ETSTW-RE 018	ANTENNA	AT4560	27212	AR	2004/11/8	2007/11/7
ETSTW-RE 021	SWEEP GENERATOR	SWM05	835130/010	R&S	2006/10/11	2007/10/10
ETSTW-RE 027	Passive Loop Antenna	6512	34563	EMCO	2004/6/30	2007/6/29
ETSTW-RE 028	Log-Periodic DipoleArray Antenna	3148	34429	EMCO	2006/5/26	2008/5/25
ETSTW-RE 029	Biconical Antenna	3109	33524	EMCO	2006/5/26	2008/5/25
ETSTW-RE 030	Double-Ridged Waveguide Horm Antenna	3117	35224	EMCO	2006/5/3	2008/5/2
ETSTW-RE 032	Millivoltmeter	URV 55	849086/013	R&S	2006/10/11	2007/10/10
ETSTW-RE 033	4CH 1GHz 5GS/s DSO	WAVERUNNER 6100A	LCRY0604P14508	LeCroy	2006/7/27	2007/7/26
ETSTW-RE 034	Power Sensor	URV5-Z4	839313/006	R&S	2006/10/11	2007/10/10
ETSTW-RE 042	ANTENNA	HK116	100172	R&S	2005/1/14	2007/1/13
ETSTW-RE 043	ANTENNA	HL223	100166	R&S	2006/5/8	2008/5/7
ETSTW-RE 044	ANTENNA	HL050	100094	R&S	2006/5/29	2008/5/28
ETSTW-RE 048	Triple Loop Antenna	HXYZ 9170	HXYZ 9170-134	Schwarzbeck	2005/3/22	2008/3/21

ETSTW-RE 049	TRILOG Super Broadband test Antenna	VULB 9160	9160-3185	Schwarzbeck	2005/5/19	2007/5/18
ETSTW-RE 055	SPECTRUM ANALYZER	FSU-26	200074	R&S	2006/7/28	2007/7/27
ETSTW-EMS 002	Frequency Converter	YF-6020	308014	T-Power	Function Test	
ETSTW-EMS 013	CISPR 22 TWO BALANCED TELECOM PAIRS IMPEDANCE STABILIZATION NETWORK	FCC-TLISN-T4-02	20242	FCC	2005/12/8	2008/12/8
ETSTW-EMS 014	CISPR 22 TWO BALANCED TELECOM PAIRS IMPEDANCE STABILIZATION NETWORK	FCC-TLISN-T2-02	20241	FCC	2005/12/7	2007/12/7
ETSTW-GSM 01	SIM Simulator	IT3	B2004-50106	ORGA	2006/7/26	2007/7/25
ETSTW-GSM 02	Universal Radio Communication Tester	CMU 200	103489	R&S	2005/11/15	2006/11/14
ETSTW-GSM 03	Agilent 8960 Test Set 1	E5515C	GB44052675	Agilent	2006/6/26	2008/6/25
ETSTW-GSM 04	Agilent 8960 Test Set 2	E5515C	GB44052665	Agilent	2006/7/13	2008/7/12
ETSTW-GSM 05	Agilent 8960 Test Set 3	E5515C	GB44052652	Agilent	2006/7/16	2008/7/15
ETSTW-GSM 06	Agilent 8960 Test Set 4	E5515C	GB44052684	Agilent	2006/7/4	2008/4/3
ETSTW-GSM 07	Agilent 8960 Test Set 5	E5515C	GB44052658	Agilent	2006/7/12	2008/7/11
ETSTW-GSM 08	Agilent 8960 Test Set 6	E5515C	GB44052666	Agilent	2006/7/6	2008/7/5
ETSTW-GSM 09	Controller PC	Dell GX 270	700F61J	Dell	Function Test	
ETSTW-GSM 10	Combiner Wessex / Anite	B4605/100	0053	Wessex / Anite	2006/7/13	2008/7/12
ETSTW-GSM 11	GSM 850,900,1800,1900 Test system	TS8950G	101087	R&S	2005/11/1	2007/4/30
ETSTW-GSM 12	Acoustical Calibrator	4231	2463874	Brüel&Kjær	2006/7/26	2007/7/25
ETSTW-GSM 13	Conditioning Amplifier	2690	2437856	Brüel&Kjær	2006/7/26	2007/7/25
ETSTW-GSM 15	Mouth Simulator	4227	2462516	Brüel&Kjær	2006/7/26	2007/7/25
ETSTW-GSM 16	TEMP.&HUMIDITY CHAMBER	GTH-120-40-1P-U	MAA0501002	GIANT FORCE	2005/12/29	2006/12/28
ETSTW-GSM 18	AUDIO ANALYZER	UPL16	100173	R&S	2006/10/28	2007/10/27
ETSTW-GSM 23	SPLITTER	4901.19.A	None	SUHNER	Function Test	
ETSTW-GSM 24	Vibration Testing System	VS-100V	5494	Vibration	2005/12/20	2006/12/19
ETSTW-GSM 29	Microphone	4192	2458739	Brüel&Kjær	2006/7/26	2007/7/25
ETSTW-GSM 30	Ear Simulator	4195	2457416	Brüel&Kjær	2006/7/26	2007/7/25

2.4 General Test Procedure

POWER LINE CONDUCTED INTERFERENCE: The procedure used was ANSI STANDARD C63.4-2003 5.2 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 ANSI STANDARD C63.4-2003 6.4 using a spectrum analyzer. The bandwidth of the spectrum analyzer was 100 kHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was the 100 kHz and the video bandwidth was 300 kHz. The ambient. temperature of the UUT was 23°C with a humidity of 40 %.

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/m + 6 dB = 36.36 dBµV/m @3m

ANSI STANDARD C63.4-2003 6.2.1 MEASUREMENT PROCEDURES: The UUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m (non metallic table). The UUT was placed in the center 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.
Measurements were made by ETS Dr. Genz Taiwan PS Co., Ltd. at the registered open field test site located at. 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.

ANTENNA & GROUND:
This unit uses dipole antenna. (see photo).

3 Test results (enclosure)

☒ 1st test ☐ test after modification ☐ production test

TEST CASE	Para. Number	Required	Test passed	Test failed
Transmission Requirements	FCC 15.231(a)	☒	☒	☐
Radiated Emission	FCC 15.231(b)	☒	☒	☐
Bandwidth of Emission	FCC 15.231(c)	☒	☒	☐
Frequency Tolerance	FCC 15.231(d)	☐	☐	☐
Period Alternate Field Strength Requirements	FCC 15.231(e)	☐	☐	☐
Antenna Requirement	FCC 15.203	☒	☒	☐
Radiated Emission from Receiver	FCC 15.109	☐	☐	☐
Radiated Emission from Digital Part	FCC 15.109	☐	☐	☐
Conducted Measurement at (AC) Power Line	FCC 15.207	☐	☐	☐

The follows is intended to leave blank.

3.1 Transmission Requirements

FCC 15.231(a)

3.1.1 Limit of Transmission Time

☐ According to 15.231(a)(1), a manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

☒ According to 15.231(a)(2), a transmitter activated automatically shall cease transmission within 5 seconds after activation.

3.1.2 Active Time

☐ This manually operated transmitter employs a switch that automatically deactivate the transmitter within ____ms of being released.

☒ This transmitter is operated by automatic activation and active will cease transmission in 380.761 ms after activation..

Remark: See attached appendix A

Test equipment used : ETSTW-RE 003 ETSTW-RE 004 ETSTW-RE 028 ETSTW-RE 029
ETSTW-RE 042 ETSTW-RE 043

3.2 Output Power (Field Strength)

Test condition		Transmitter field strength (dBµV/m)	
T_{nom}= 23 °C	V_{nom} = 1.5V DC	PK	AV
		90.99	69.67
Measurement uncertainty		< 3 dB	

Limit 15.231(b)

Fundamental Frequency (MHz)	Field strength of fundamental, limit µV/m
40.66 – 40.70	2,250
70 – 130	1,250
130 – 174	1,250 to 3,750
174 – 260	3,750
260 – 470	3,750 to 12,500** (315 MHz: 75.62 dBµV/m = 6041.6772 µV/m)
Above 470	12,500

** linear interpolation

Remarks: see attached diagrams
Test equipment used: ETSTW-RE 003 ETSTW-RE 004 ETSTW-RE 028 ETSTW-RE 029 ETSTW-RE 042 ETSTW-RE 043

3.3 Out of Band Radiated Emissions

FCC Rule: 15.231(b) , 15.35
For out of band emissions that are close to or that exceed the 20 dB attenuation requirement described in the specification, radiated measurements were performed at a 3 m separation distance to determine whether these emissions complied with the general radiated emission requirement.

Limits:
For frequencies below 1GHz :
Max permitted average Limits = Max. reading – 20 dB

75.62 dBµV/m- 20 dB= 55.62 dBµV/m

Guidance on Measurement of pulsed emission: 815.231 (b), §15.35(c)
"If the emission is pulsed, modify the unit for continues operation , use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation." Here the correction was added to the limit instead subtracted from the reading.

Duty Cycle correction = 20 log (dwell time/100ms)

For frequencies above 1GHz (Peak measurements).
Modified Limits for peak conform 15.35 (b) = Max Permitted average Limits + 20dB (because Peak detector is used)

55.62 dBµV/m

For frequencies above 1GHz (Average measurements).
Correction factor conform 15.35 (c) (Average measurements)
Duty cycle correction :
Max. reading – 20 dB – duty cycle correction

No duty cycle correction was added to the reading:

75.62 dBµV/m- 20 dB= 55.62 dBµV/m

Remarks: See attached diagrams.

Test equipment used: ETSTW-RE 003 ETSTW-RE 004 ETSTW-RE 017 ETSTW-RE 028
ETSTW-RE 029 ETSTW-RE 030 ETSTW-RE 042 ETSTW-RE 043
ETSTW-RE 044

3.4 Transmitter Radiated Emissions in restricted Bands

FCC Rules: 15.231 (b), 15.205, 15.209, 15.35
Radiated emission measurements were performed from 30 MHz to 8000 MHz.
For radiated emission tests, the analyzer setting was as followings:
RES BW VID BW
Frequency <1 GHz 100 kHz 100 kHz (Peak measurements)
Frequency >1 GHz 1 MHz 1 MHz (Peak measurements)
1 MHz 1 MHz (Average measurements)
Limits:

For frequencies below 1GHz :

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

For frequencies above 1GHz (Average measurements).
Guidance on Measurement of pulsed emission:
“If the emission is pulsed, modify the unit for continues operation , use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation.

For frequencies above 1GHz (Average measurements).

The correction factor, based on the channel dwell tine in a 100 ms period, may be mathematically applied to a measurement made with an average detector, to further reduce the value.

Duty cycle correction = 20 log (dwell time/100ms)
No duty cycle correction was added to the reading

Modified Limits for peak conform 15.35 (b) = Max Permitted average Limits + 20dB (because Peak detector is used)

Above 960 MHz
For mode DSSS CW: 54 dBµV/m + 20 dB = 74 dBµV/m

Remarks: See attached diagrams.

3.5 Spurious Emission radiated, Transmitter

Spurious emission was measured with modulation (declared by manufacturer).

The limits on the field strength of the spurious emission in the table § 15.231(b) are based on the fundamental frequency of the intentional radiator. Spurious emission shall be attenuated to the average (or alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in § 15.209, whichever limit permits a higher field strength.
In addition, radiated emission which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

SAMPLE CALCULATION OF LIMIT. All results will be updated by an automatic measuring system in accordance to point 2.3.

Calculation of test results:
Such factors like antenna correction, cable loss, external attenuation etc. are already included in the provided measurement results. This is done by using validated test software and calibrated test system according the accreditation requirements.

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

Antenna Polarization	Frequency Marker (MHz)	Corrected Reading (dBuV)	Correction Factor (dB)	Detector	Test Result (dBuV/m)	Compliance Limit (dBuV/m)	Margin (dB)	Table Azimuth (degree)	Antenna Height (cm)
H	629.9850	38.98	22.33	PK	61.31	75.62	14.31	217	180
	629.9850	17.66	22.33	AV	39.99	55.62	15.63	217	180
	944.9820	33.42	27.11	PK	60.53	75.62	15.09	243	195
	944.9820	12.10	27.11	AV	39.21	55.62	16.41	243	195
	1259.9184	67.19	-7.92	PK	59.27	75.62	16.35	311	140
	1259.9184	45.87	-7.92	AV	37.95	55.62	17.67	311	140
	1574.9975	70.24	-7.09	PK	63.15	74.00	10.85	301	155
	1574.9975	48.92	-7.09	AV	41.83	54.00	12.17	301	155
	1890.1230	70.53	-5.03	PK	65.50	75.62	10.12	292	160
	1890.1230	49.21	-5.03	AV	44.18	55.62	11.44	292	160
	2204.9975	69.24	-2.59	PK	66.65	74.00	7.35	299	125
	2204.9975	47.92	-2.59	AV	45.33	54.00	8.67	299	125
	2520.0631	59.73	-1.31	PK	58.42	75.62	17.20	278	150
	2520.0631	38.41	-1.31	AV	37.10	55.62	18.52	278	150
	3149.9125	58.99	0.13	PK	59.12	75.62	16.50	160	274
	3149.9125	37.67	0.13	AV	37.80	55.62	17.82	160	274
	3779.8544	55.30	2.09	PK	57.39	74.00	16.61	180	213
	3779.8544	33.98	2.09	AV	36.07	54	17.93	180	213

Antenna Polarization	Frequency Marker (MHz)	Corrected Reading (dBuV)	Correction Factor (dB)	Detector	Test Result (dBuV/m)	Compliance Limit (dBuV/m)	Margin (dB)	Table Azimuth (degree)	Antenna Height (cm)
V	629.9935	43.54	22.33	PK	65.87	75.62	9.75	223	175
	629.9935	22.22	22.33	AV	44.55	55.62	11.07	223	175
	944.9940	37.13	27.11	PK	64.24	75.62	11.38	311	190
	944.9940	15.81	27.11	AV	42.92	55.62	12.70	311	190
	1574.9919	68.10	-7.09	PK	61.01	74.00	12.99	284	180
	1574.9919	46.78	-7.09	AV	39.69	54.00	14.31	284	180
	2204.9433	61.64	-2.59	PK	59.05	74.00	14.95	308	120
	2204.9433	40.32	-2.59	AV	37.73	54.00	16.27	308	120
	1260.0015	64.65	-7.93	PK	56.72	75.62	18.90	276	155
	1260.0015	43.33	-7.93	AV	35.40	55.62	20.22	276	155
	1890.0295	64.50	-5.03	PK	59.47	75.62	16.15	303	145
	1890.0295	43.18	-5.03	AV	38.15	55.62	17.47	303	145
	3150.0412	58.35	0.14	PK	58.49	75.62	17.13	266	175
	3150.0412	37.03	0.14	AV	37.17	55.62	18.45	266	175
	3779.9413	54.23	2.09	PK	56.32	74.00	17.68	333	135
	3779.9413	32.910	2.09	AV	35.000	54.00	19.00	333	135

Note 1. Correction Factor = Antenna factor + Cable loss - Preamplifier
2. The formula of measured value as: Test Result = Corrected Reading + Correction Factor
3. Detector function in the form : P = Peak, QP = Quasi Peak, AV = Average

Freq. – Frequency Range:

1: 30 - 200 MHz
2: 200 - 1000MHz
3: 1 - 4 GHz
4: 4 - 8 GHz

All other not noted test plots do not contain significant test results in relation to the limits
Test results: The unit meet the FCC requirements.

Comment: See attached diagrams.

Test equipment used: ETSTW-RE 003 ETSTW-RE 004 ETSTW-RE 017 ETSTW-RE 028 ETSTW-RE 029 ETSTW-RE 030 ETSTW-RE 042 ETSTW-RE 043 ETSTW-RE 044

3.6 Channel Bandwidth

Measurement of Necessary Bandwidth (BN)

Used frequency	Bandwidth	Limit
315 MHz	48.096 kHz	1.0828 MHz
Measurement uncertainty	< 10 Hz	

Remarks: The bandwidth fulfills the requirements of FCC § 15.231,
see attached diagrams

Limits:

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 028, ETSTW-RE 029
ETSTW-RE 042 ETSTW-RE 043

3. 7 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.

Remark: This dipole antenna is integral antenna which passes antenna requirement.

The equipment meets the requirements	yes ☒	no ☐

3.8 Duty Cycle

The correction factor, based on the channel dwell time in a 100ms period, may be mathematically applied to a measurement made with an average detector, to further reduce the measured value.

Average Reading = Peak Reading (dBuV/m) + Duty Cycle Correction

Duty Cycle Correction = 20 log (Cycle)
In order to determine the Duty Cycle, the EUT is measured as:

Testing Mode	T period (ms)	T on (ms)	Duty Cycle (%) (Ton/Tp)*100%	Duty Cycle Correction 20*log(Duty Cycle)
Mode	100	8.59	0.0859	-21.320

Remarks: see attached diagram.

Test equipment used: ETSTW-RE 003 ETSTW-RE 004 ETSTW-RE 028 ETSTW-RE 029
ETSTW-RE 042 ETSTW-RE 043

3.10 Conducted Measurement at (AC) Power Line

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.

Frequency	Level	
	quasi-peak (dBµV/m)	average (dBµV/m)
-- kHz	--	--

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

Comment: Test is not required because the sample is using a battery.

Test equipment used: ETSTW-CE 001 ETSTW-CE 003 ETSTW-CE 004 ETSTW-CE 006
ETSTW-EMS 013 ETSTW-EMS 014

Appendix

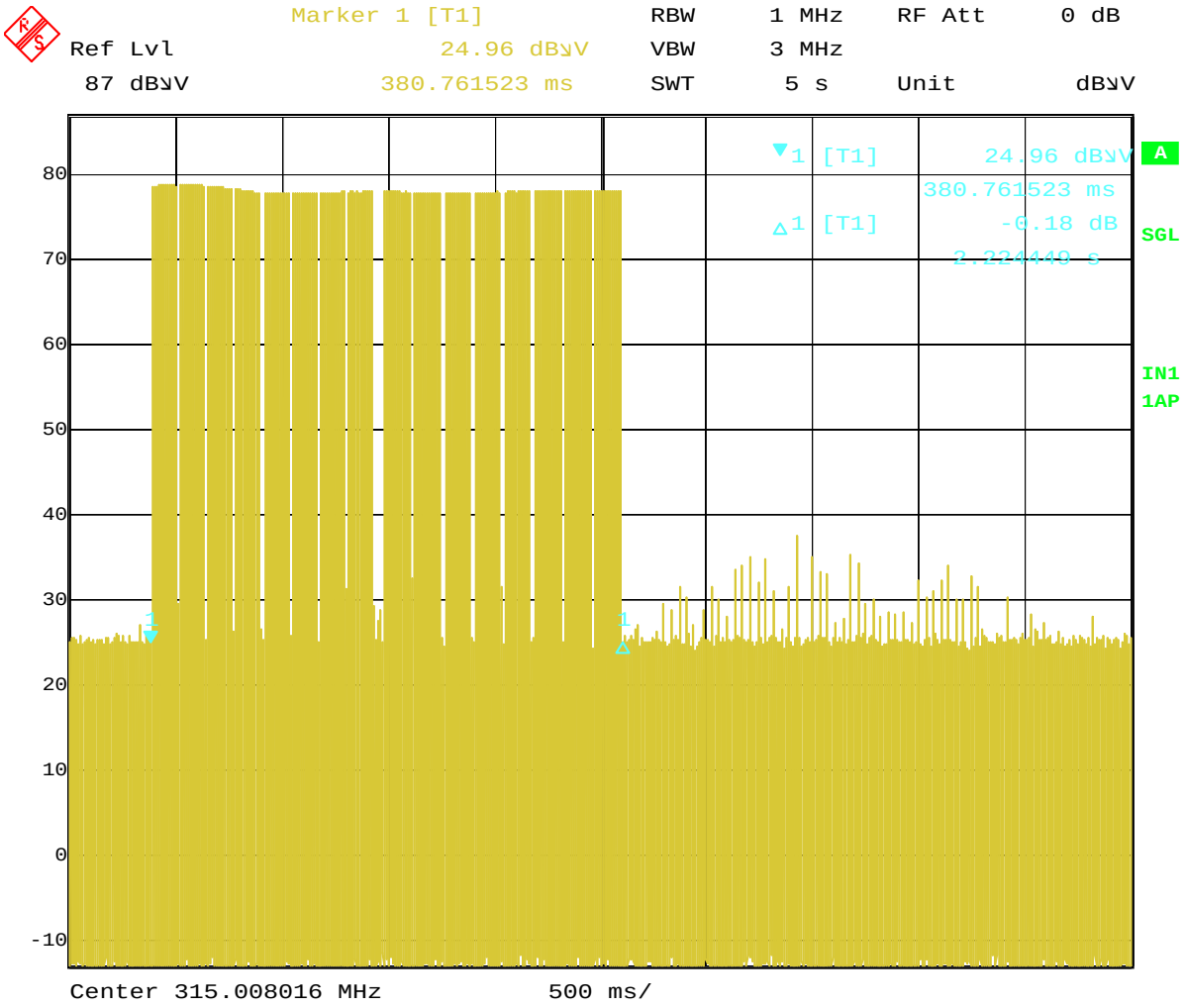
A Active Time
B Output Power
C Spurious Emissions radiated
D Bandwidth
E Duty Cycle
F Pictures

Appendix

A Active Time
B Output Power
C Spurious Emissions radiated
D Bandwidth
E Duty Cycle
F Pictures

Appendix A

Active Time



Comment A: Duration time
Date: 3.NOV.2006 16:34:08

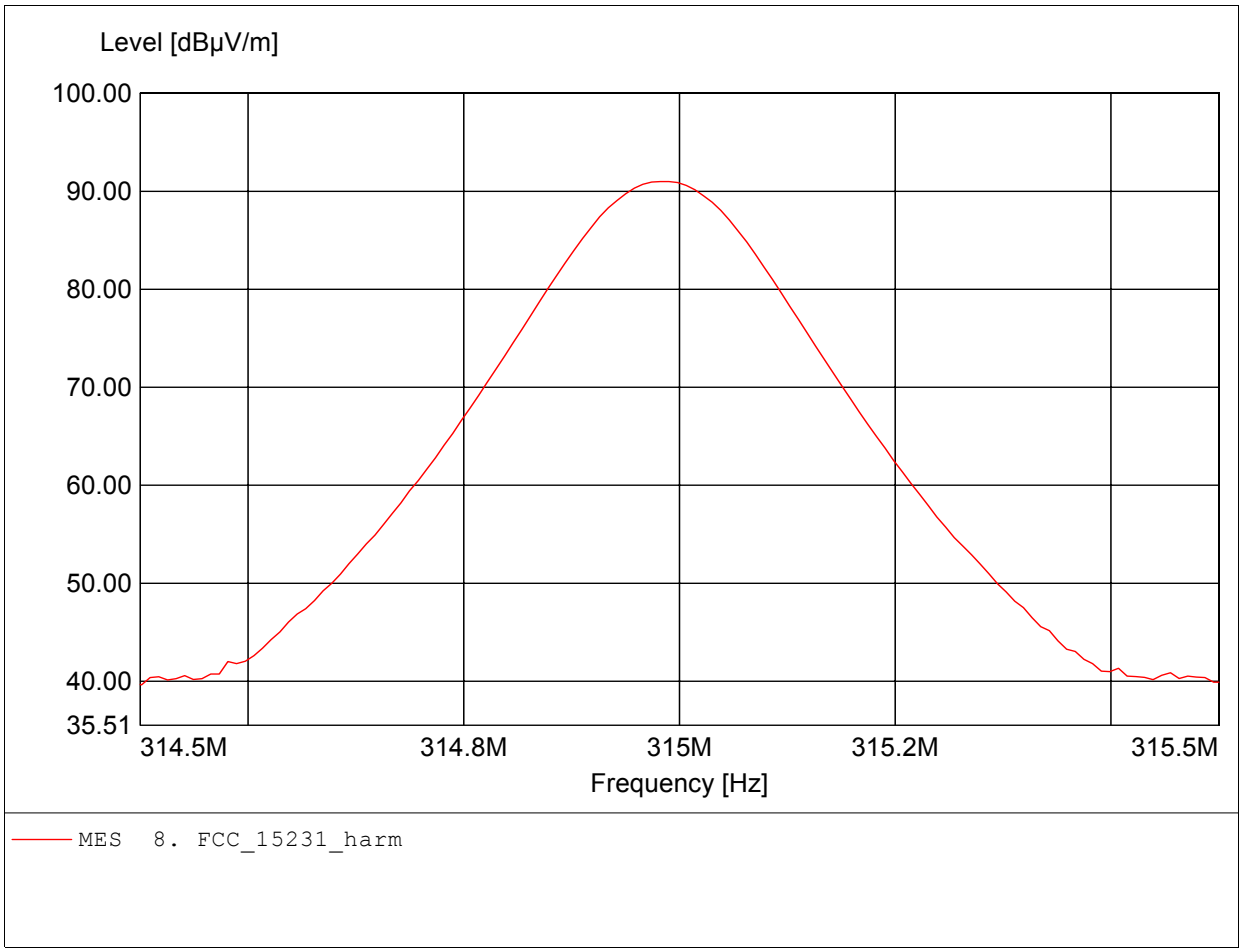
Appendix B

Output Power

Field Strength of Fundamental

FCC RULES PART 15, SUBPART C / LP0002

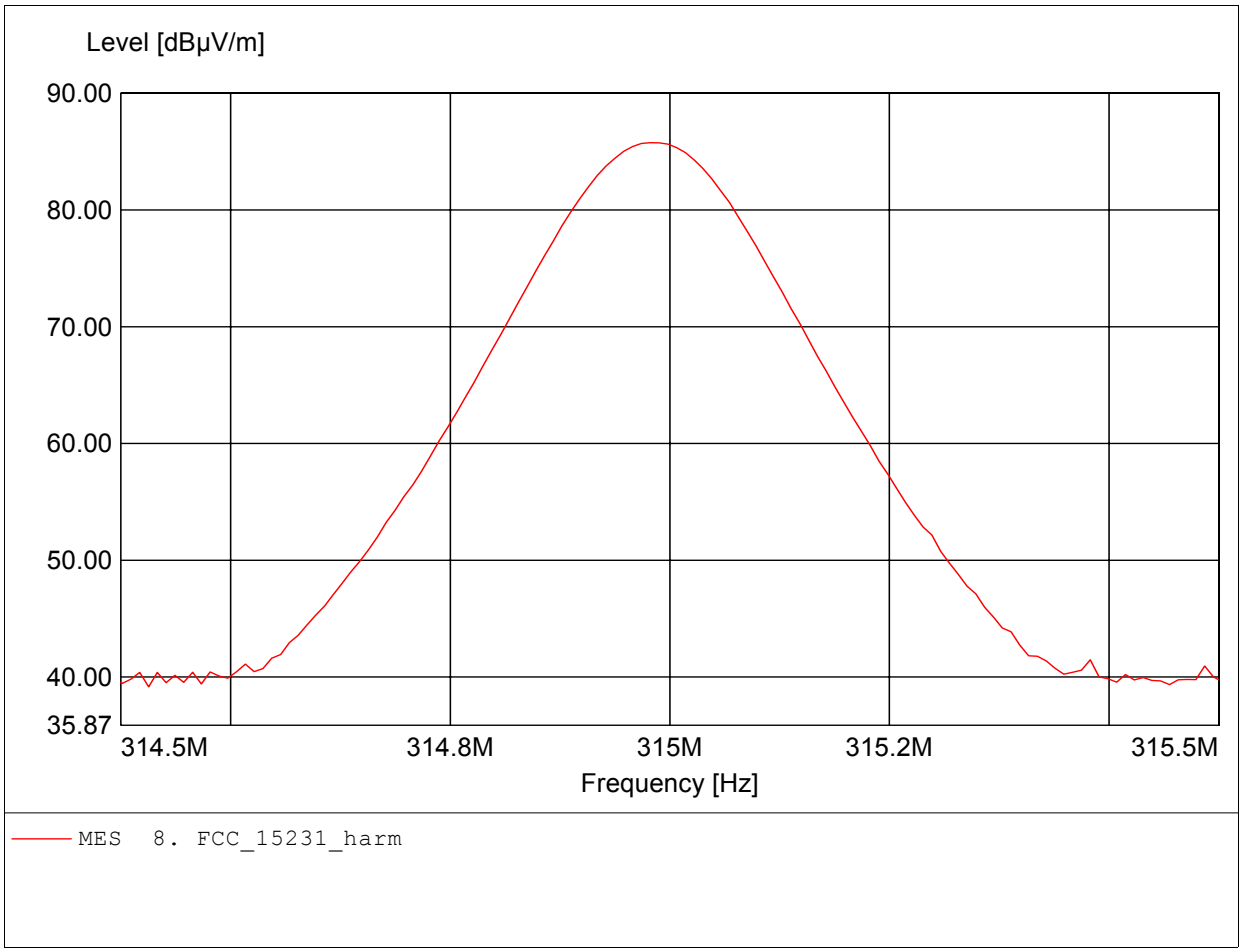
Order Number:	W6M20611-7535
Test Site / Operator:	ETS / Michael
Temperature:	Temp.: 23.9°C
Test Specification:	according to Section15.231
Comment 1:	Dist.: 3m, Ant.: HL223
	Freq: 314.982MHz, Emax: 90.99dBµV/m, RBW: 100kHz



Field Strength of Fundamental

FCC RULES PART 15, SUBPART C / LP0002

Order Number:	W6M20611-7535
Test Site / Operator:	ETS / Michael
Temperature:	Temp.: 23.9°C
Test Specification:	according to Section15.231
Comment 1:	Dist.: 3m, Ant.: HL223
	Freq: 314.982MHz, Emax: 85.76dBµV/m, RBW: 100kHz



Appendix C

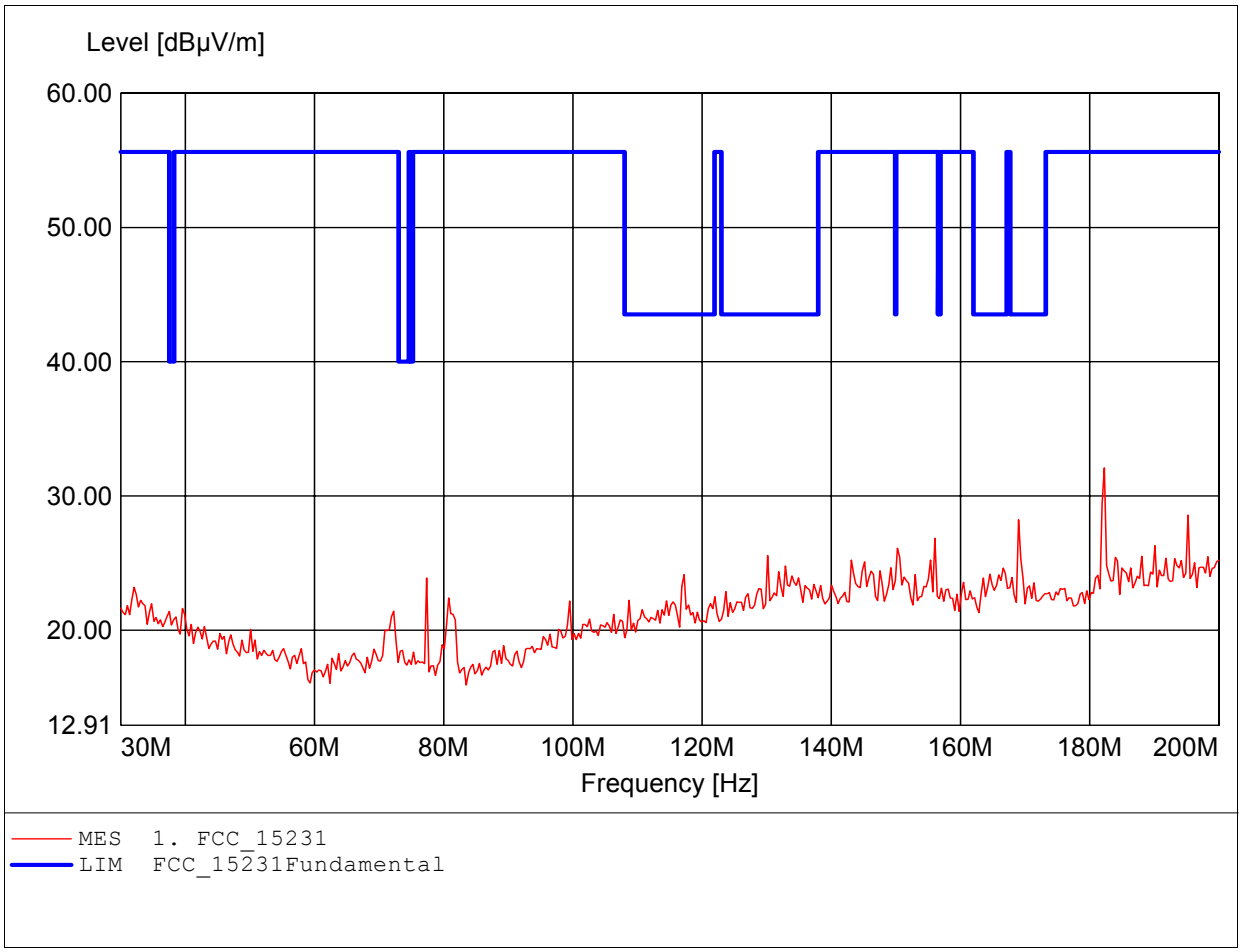
Spurious Emissions radiated - Transmitter

The measurement diagrams plots attached below are preliminary wideband scan with a peak detector for reference only. The final test results are listed on section 3.5

Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C / LP0002

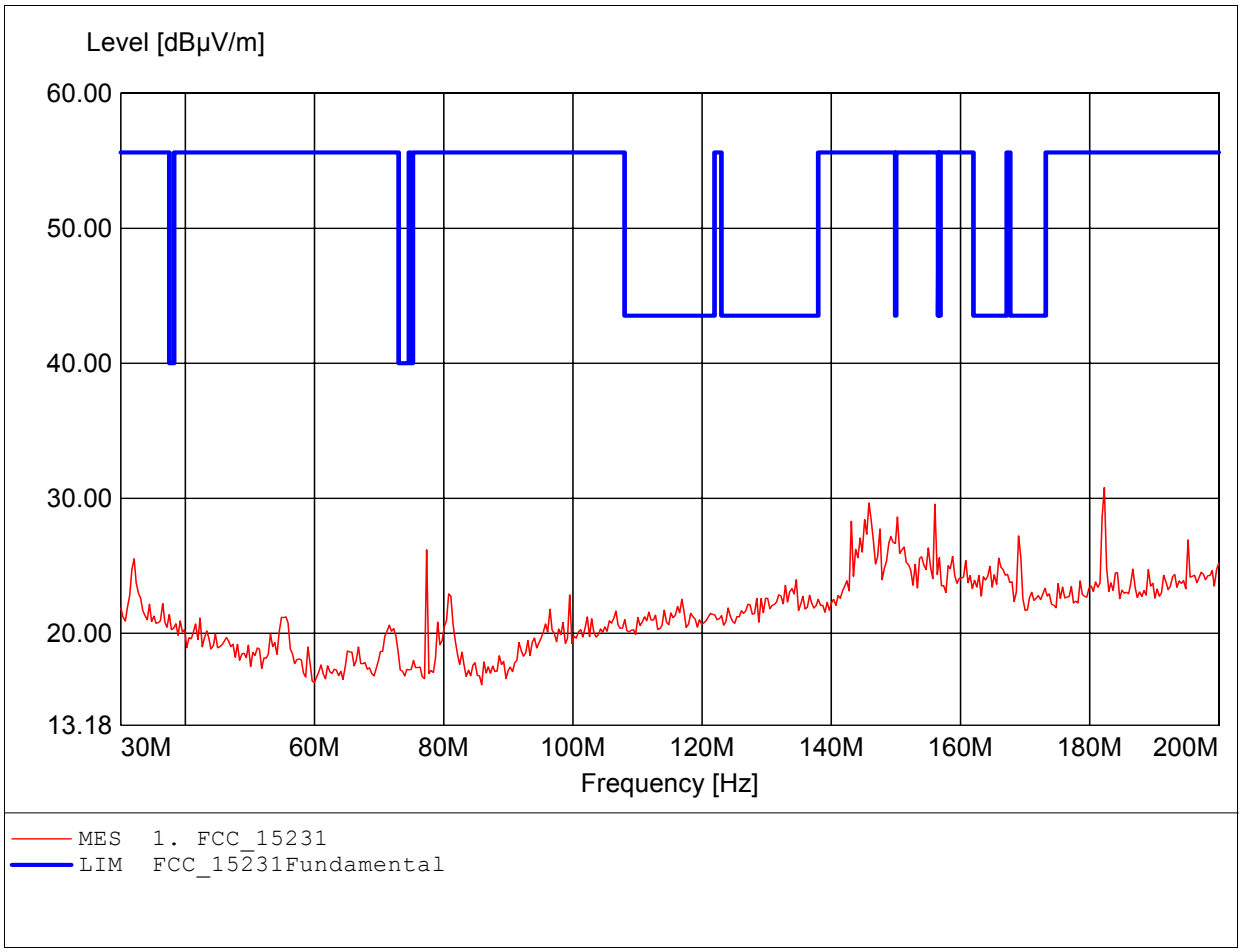
```
Order Number:          W6M20611-7535
Test Site / Operator:  ETS / Michael
Temperature:           Temp.: 23.9°C
Test Specification:    according to Section15.231
Comment 1:             Dist.: 3m, Ant.: HK 116
                       Freq: 182.285MHz, Emax: 32.09dBµV/m, RBW: 100kHz
```



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C / LP0002

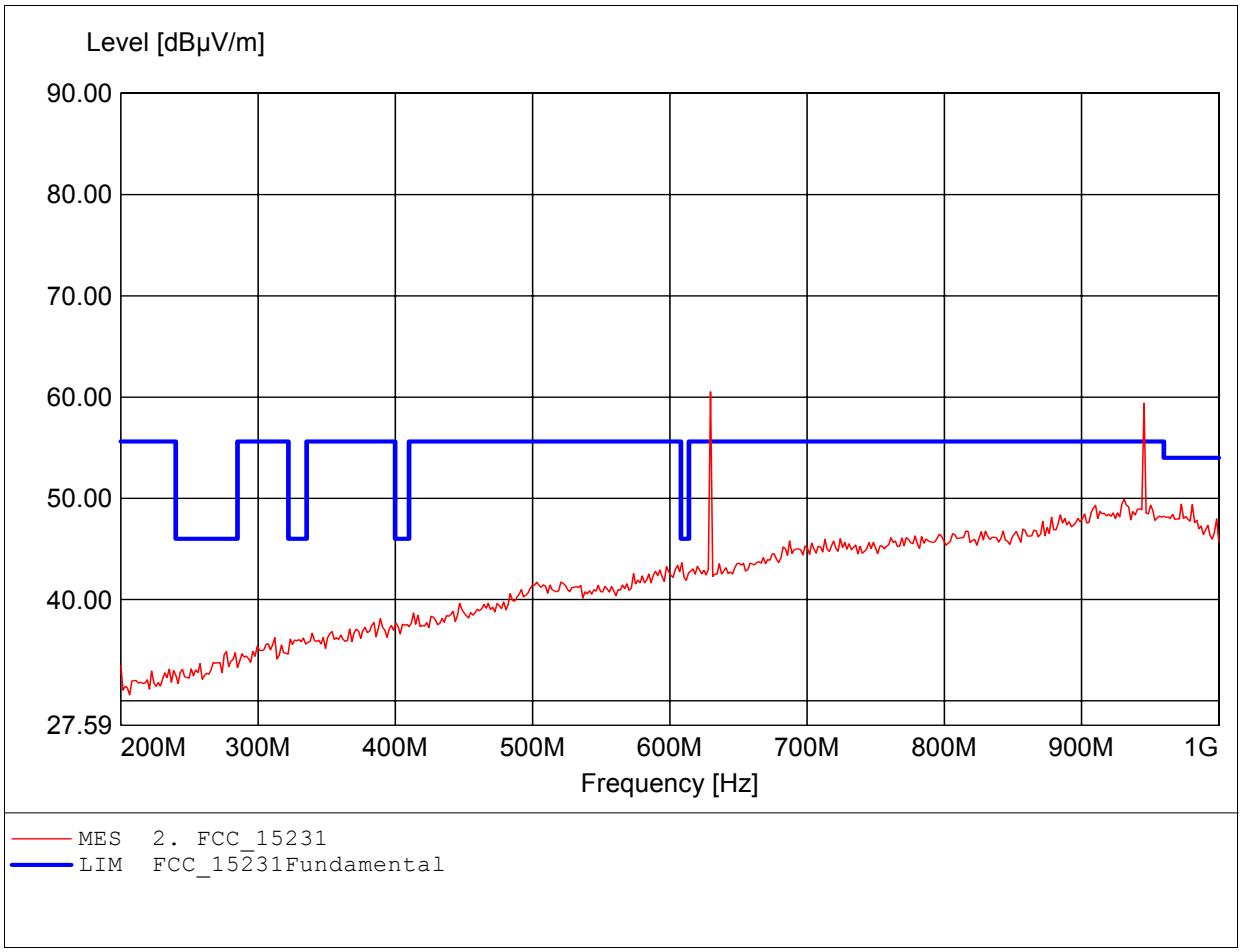
```
Order Number:          W6M20611-7535
Test Site / Operator:  ETS / Michael
Temperature:           Temp.: 23.9°C
Test Specification:    according to Section15.231
Comment 1:             Dist.: 3m, Ant.: HK 116
                       Freq: 182.285MHz, Emax: 30.78dBµV/m, RBW: 100kHz
```



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C / LP0002

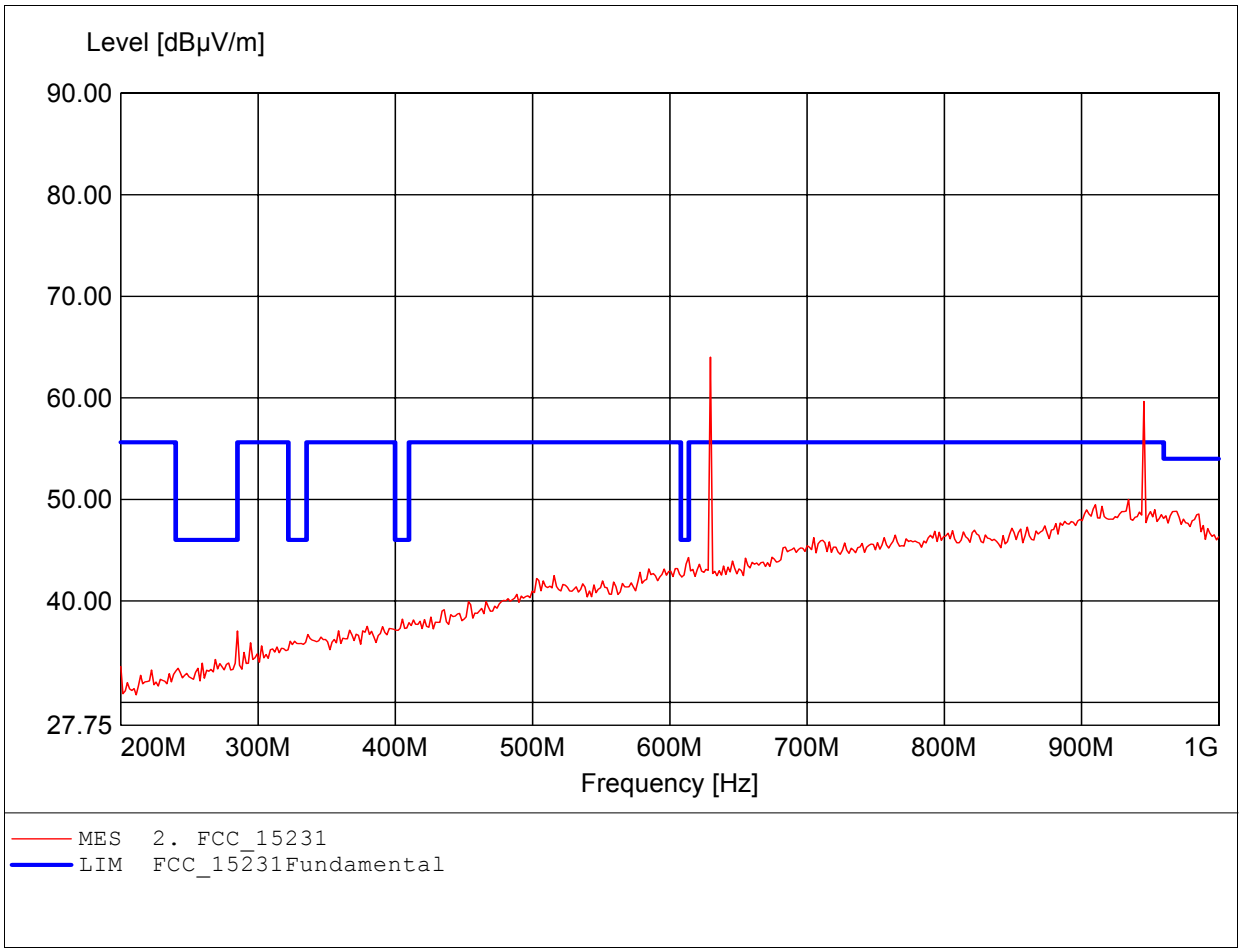
```
Order Number:          W6M20611-7535
Test Site / Operator:  ETS / Michael
Temperature:           Temp.: 23.9°C
Test Specification:    according to Section15.231
Comment 1:             Dist.: 3m, Ant.: HL 223, amplif.
                       Freq: 629.659MHz, Emax: 60.51dBµV/m, RBW: 100kHz
```



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C / LP0002

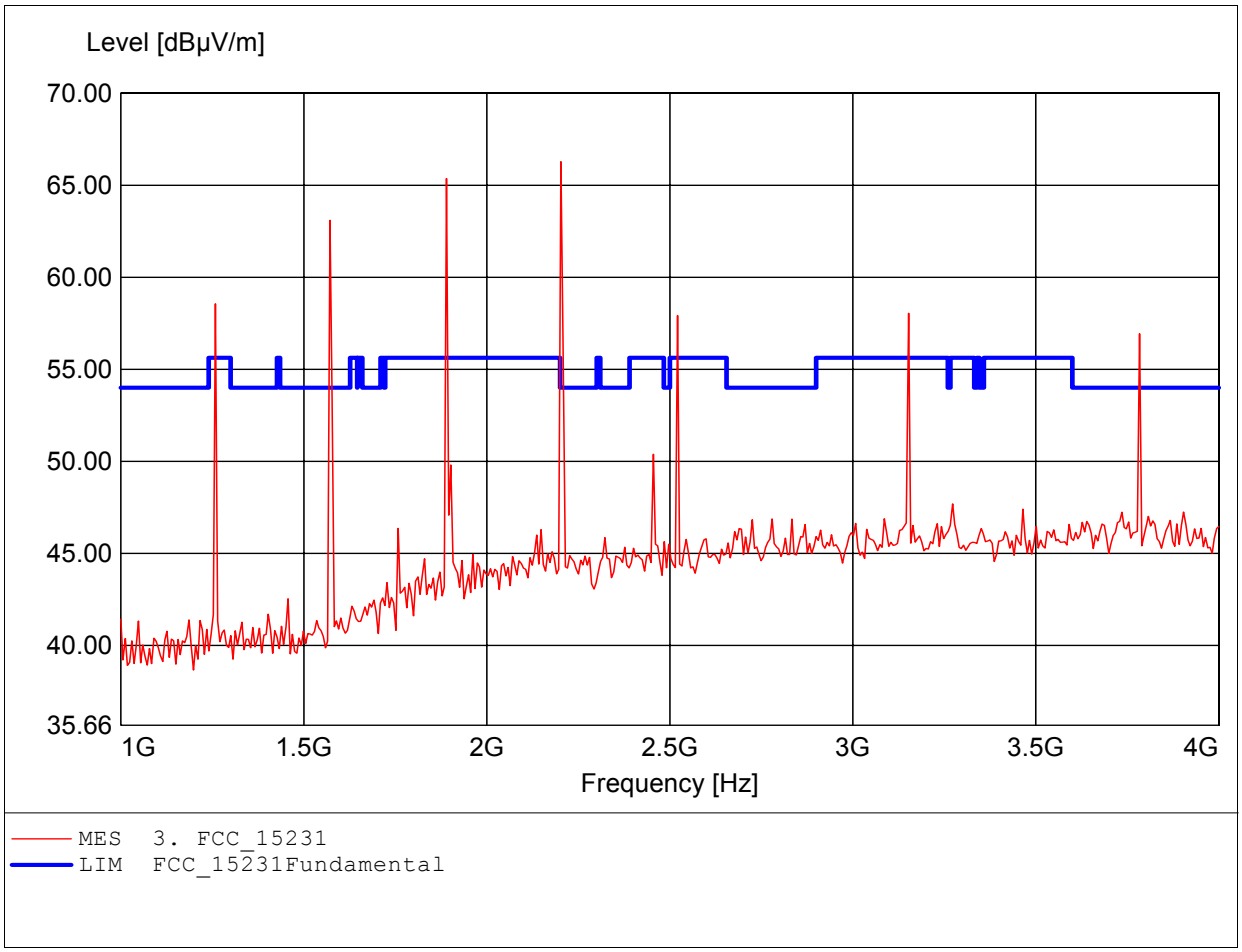
Order Number:	W6M20611-7535
Test Site / Operator:	ETS / Michael
Temperature:	Temp.: 23.9°C
Test Specification:	according to Section15.231
Comment 1:	Dist.: 3m, Ant.: HL 223, amplif.
	Freq: 629.994MHz, Emax: 65.87dBµV/m, RBW: 100kHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C / LP0002

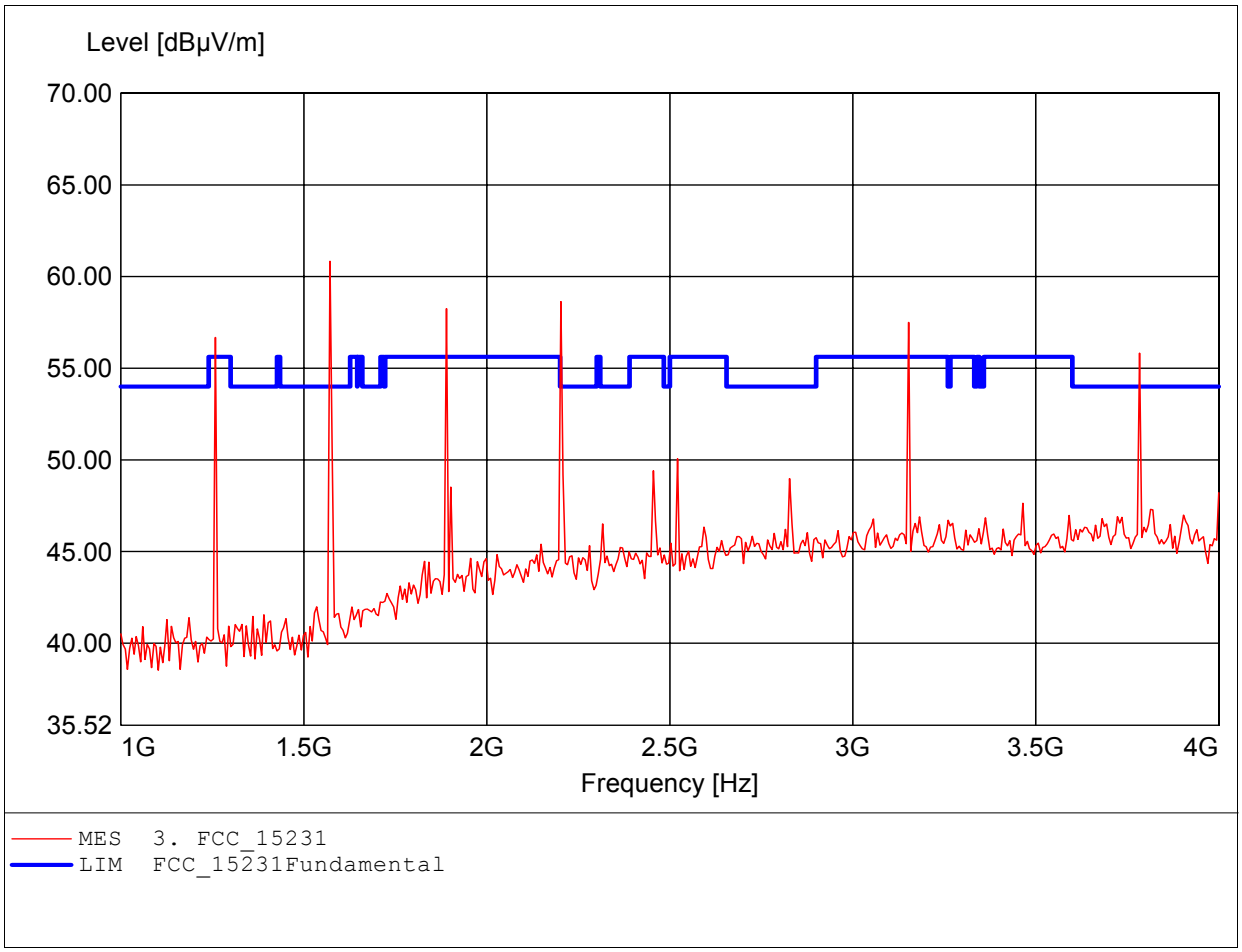
```
Order Number:          W6M20611-7535
Test Site / Operator:  ETS / Michael
Temperature:           Temp.: 23.9°C
Test Specification:    according to Section 15.231, peak detector
Comment 1:             Dist.: 3m, Ant.: HL025, amplif.
                       Freq: 2.202GHz, Emax: 66.28dBµV/m, RBW: 1MHz
```



Spurious emissions Field Strength

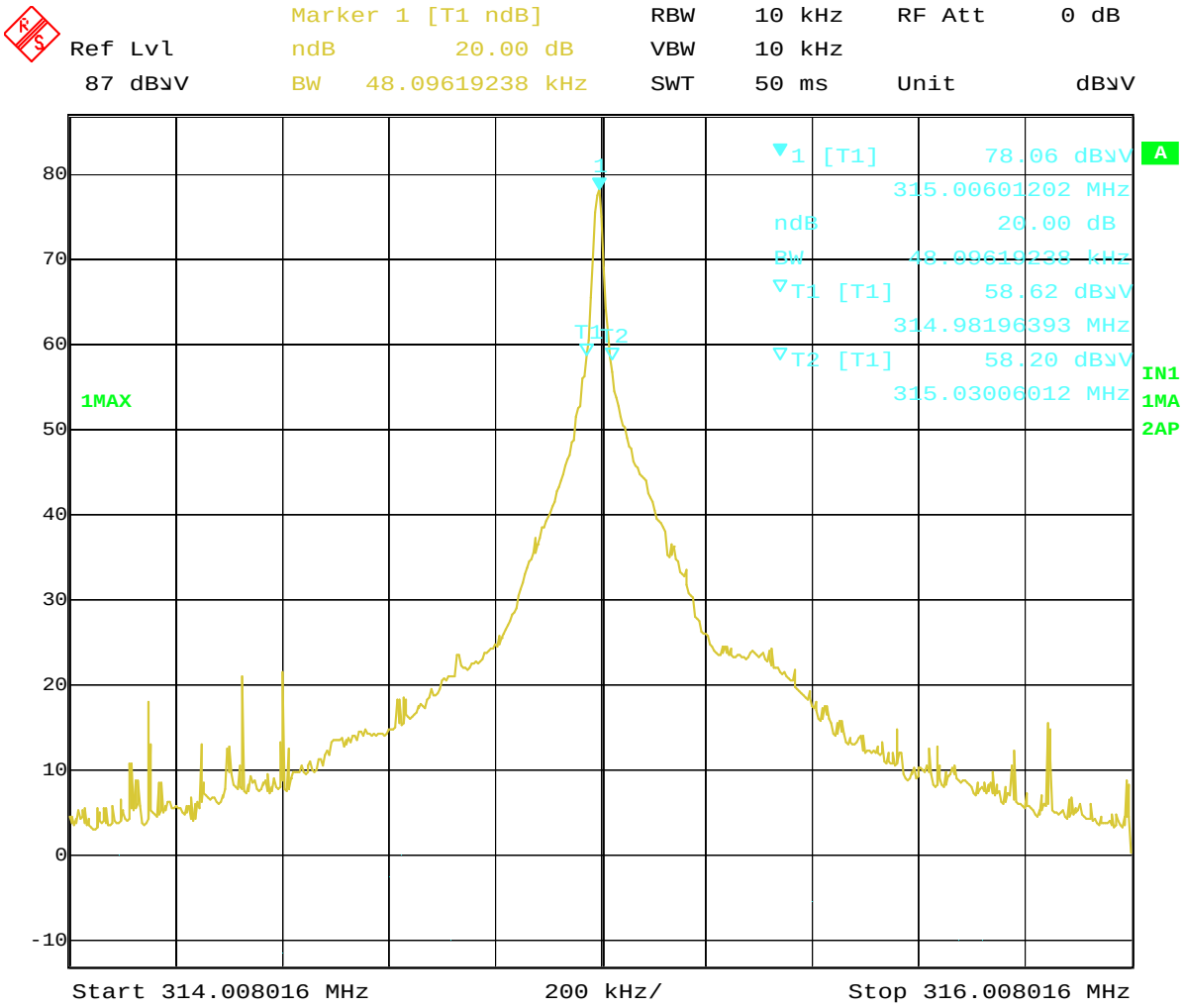
FCC RULES PART 15, SUBPART C / LP0002

Order Number: W6M20611-7535
Test Site / Operator: ETS / Michael
Temperature: Temp.: 23.9°C
Test Specification: according to Section 15.231, peak detector
Comment 1: Dist.: 3m, Ant.: HL025, amplif.
Freq: 1.571GHz, Emax: 60.83dBµV/m, RBW: 1MHz



Appendix D

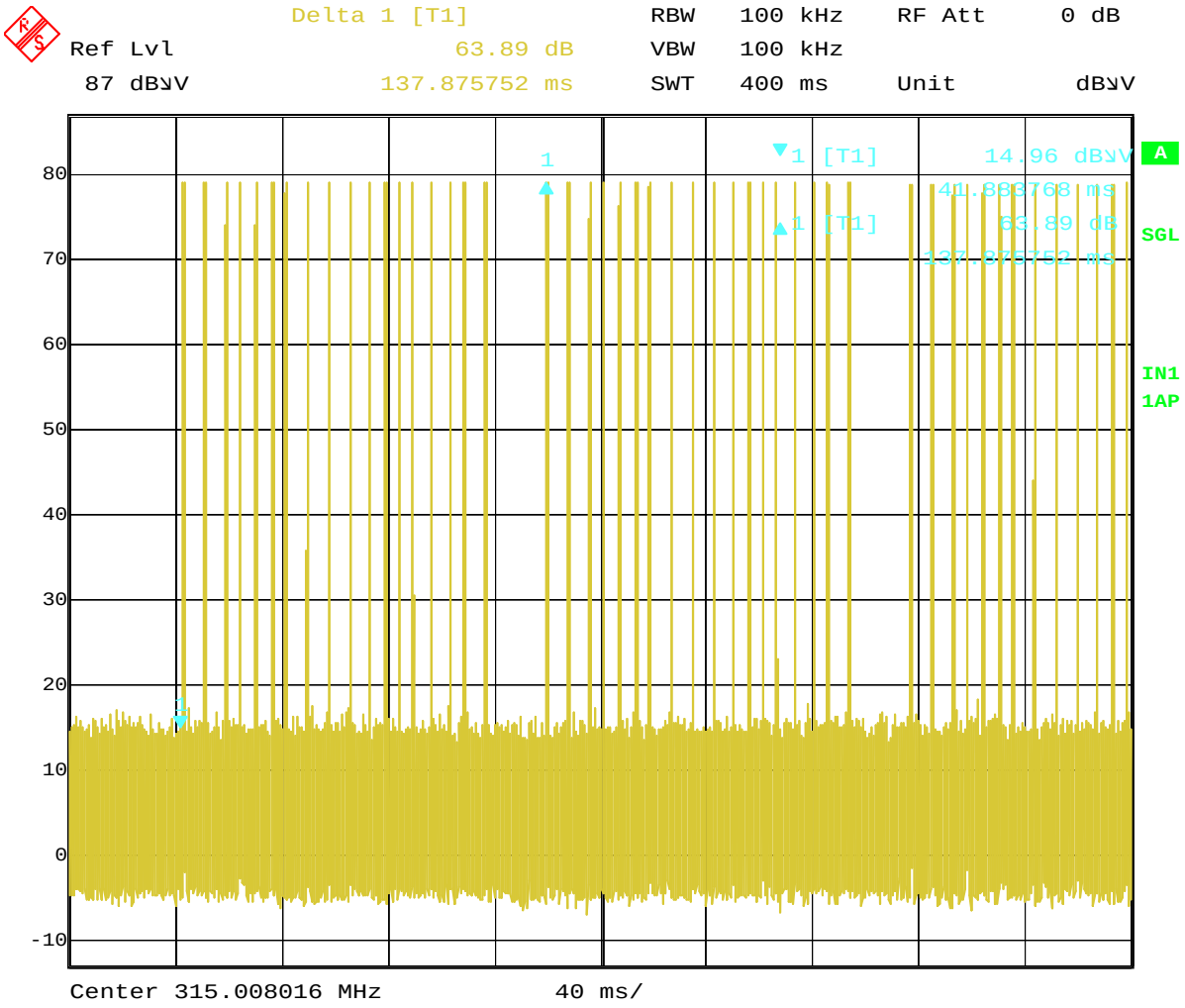
Bandwidth



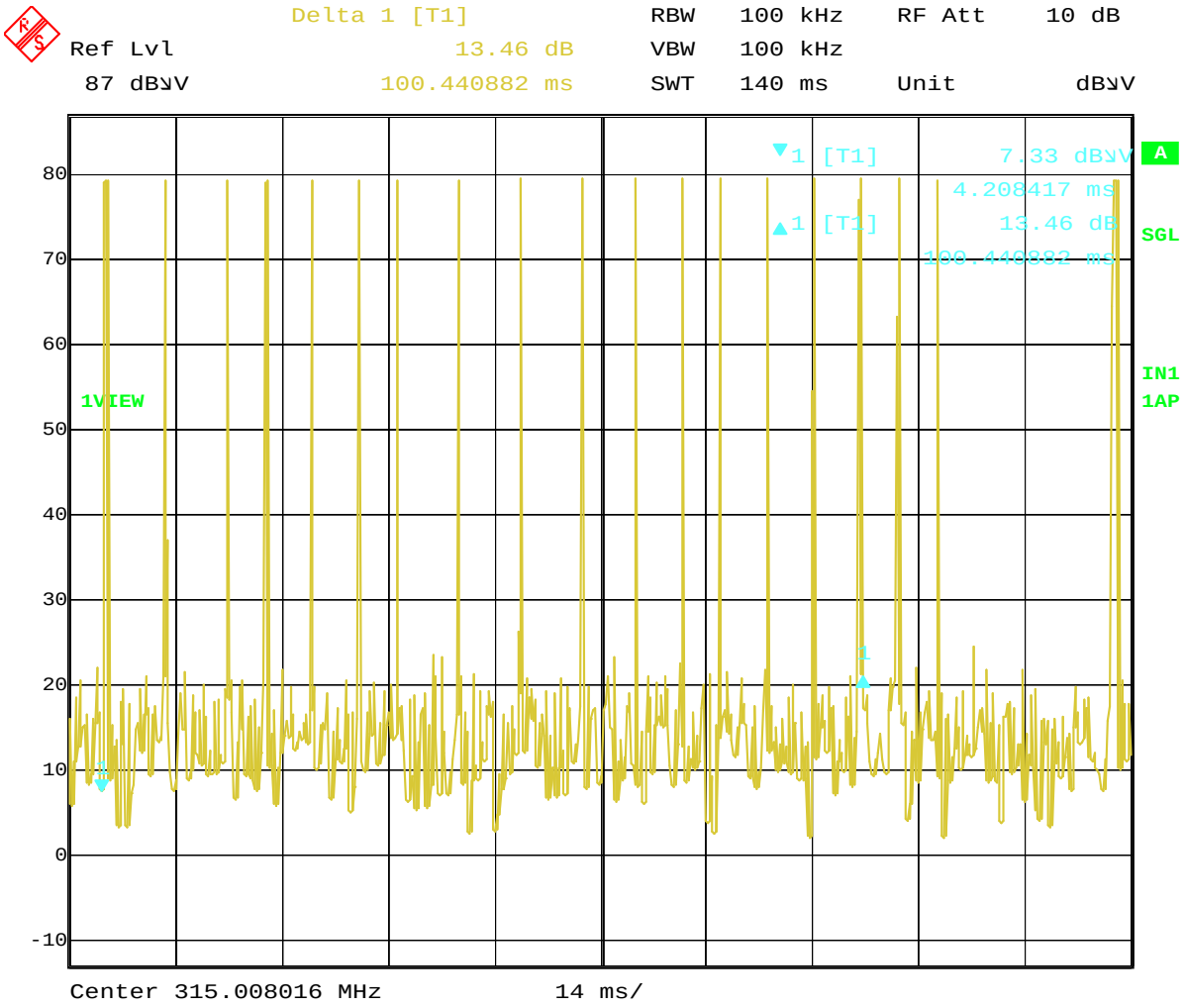
Comment A: 20dB bandwidth
Date: 3.NOV.2006 16:25:50

Appendix E

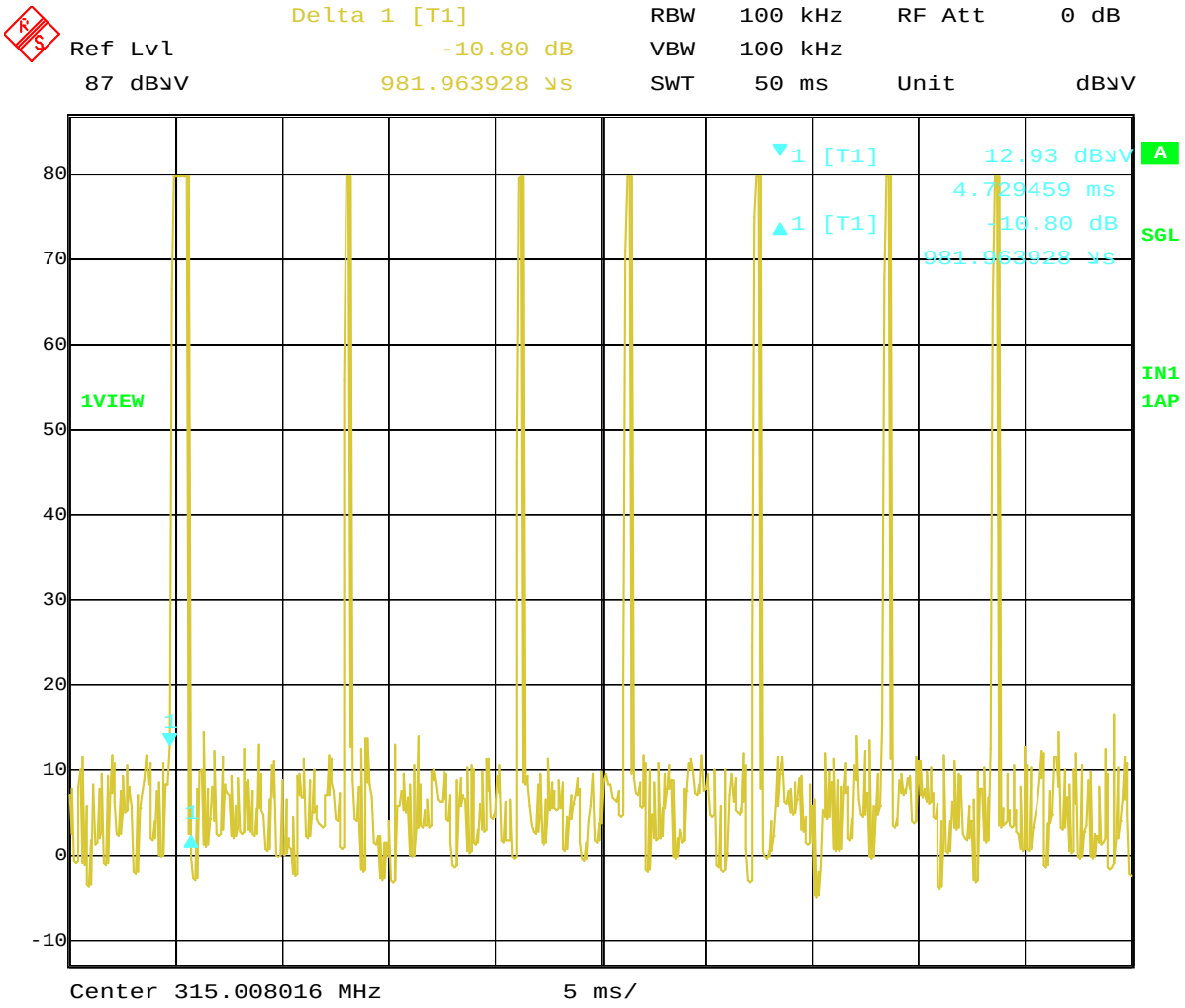
Duty Cycle



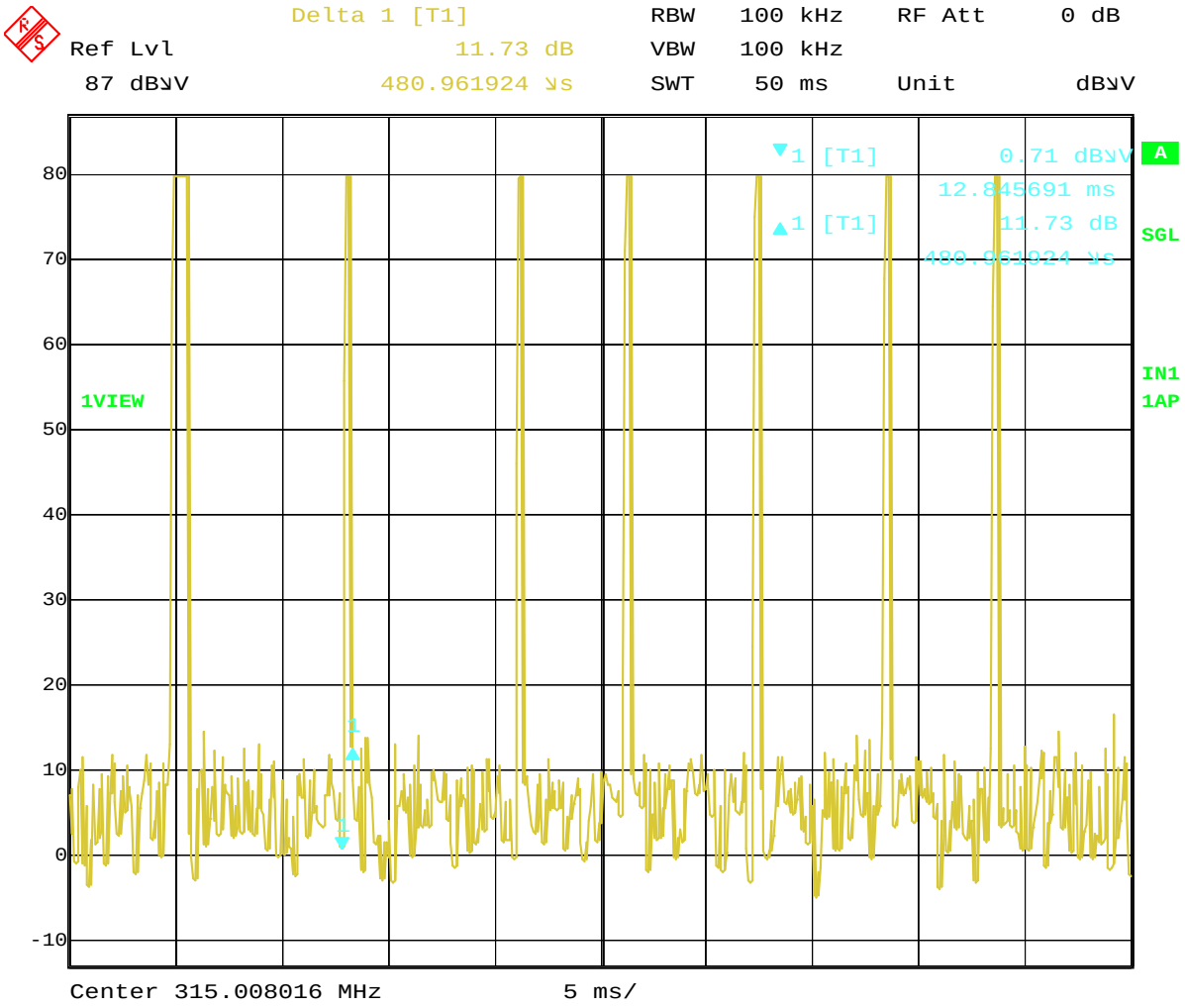
Comment A: Duty cycle
Date: 3.NOV.2006 16:36:58



Comment A: Duty cycle
Date: 3.NOV.2006 17:31:55



Comment A: Duty cycle
Date: 3.NOV.2006 16:41:43



Comment A: Duty cycle
Date: 3.NOV.2006 16:42:12

Appendix F

Pictures