

ETS Dr.GenZ Taiwan PS Co., Ltd.

FCC Registration No.: 930600

Accredited Testing Laboratory



A2LA Cert.No.: 2300.01

PTCRB Accredited Type Certification Test House

TEST - REPORT

FCC RULES PART 15 / SUBPART C

FCC ID: ELVNTRFA

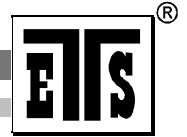
Test report no.:

W6M20608-7251-C-1

FCC

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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.

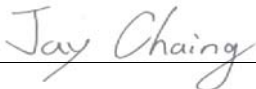
The existence of the tests nevertheless provides the confidence that the test sample possesses the qualities as maintained and that its performance generally conforms to representative cases of communications equipment.

The test results of this test report relate exclusively to the item tested as specified in 1.5.

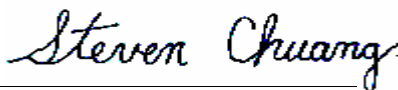
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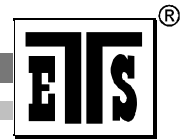
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Tester:

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

Technical responsibility for area of testing:

August 9, 2006		Steven Chuang	
_____	_____	_____	_____
Date	ETS	Name	Signature



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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: ./.

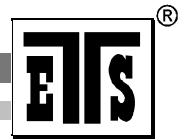
Country: ./.

Telephone: ./.

Fax: ./.

1.3 Details of approval holder

Name : NUTEK CORPORATION
Street : 5F, NO.3, ALLEY 6, LANE 45 PAO-HSING RD
Town : HSING-TIEN CITY, TAIPEI
Country : Taiwan R.O.C.
Telephone : +886-2-2918-9478*190
Fax : +886-2-2917-9069



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1.4 Application details

Date of receipt of application : August 2, 2006
Date of receipt of test item : August 3, 2006
Date of test : from August 4, 2006 to August 9, 2006

1.5 Test item

Description of test item : ALARM DEVICE
Type identification : CA-RFLCD2
Brand name : ./.
Serial number : Test sample without serial number
Transmitting frequency : 433.9 MHz
Operation mode : duplex
Voltage supply : 1.5 VDC (battery)

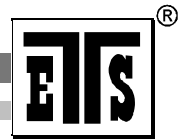
(If the device is using battery, please check if the device is tested under fresh battery condition.)

Highest clock frequency : 433.9 MHz
Antenna type : spiral antenna
Photos : see Annex

Manufacturer (if applicable)

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

Additional information : ./.



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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)

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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	2005/10/27	2006/10/26
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	2005/10/25	2006/10/24
ETSTW-CE 005	Line-Impedance Stabilisation Network	NNBM 8126D	137	Schwarzbeck	2005/10/21	2006/10/20
ETSTW-CE 006	IMPULS-BEGRENZER PULSE LIMITER	ESH3-Z2	100226	R&S	2004/11/11	2006/11/10
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	2005/8/18	2006/8/17
ETSTW-CE 011	Power Line Conducted Emission Only	None	None	ETS	2005/10/25	2006/10/24
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	2005/10/24	2006/10/23
ETSTW-RE 004	EMI TEST RECEIVER	ESI 40	832427/004	R&S	2005/10/29	2006/10/30
ETSTW-RE 005	EMI TEST RECEIVER	ESVS10	843207/020	R&S	2005/10/16	2006/10/15
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	2005/10/14	2006/10/13
ETSTW-RE 022	AMPLIFIER	8447D	2944A09837	Agilent	2005/10/14	2006/10/13
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 Horn Antenna	3117	35224	EMCO	2006/5/3	2008/5/2
ETSTW-RE 032	Millivoltmeter	URV 55	849086/013	R&S	2005/10/17	2006/10/16
ETSTW-RE 033	4CH 1GHz 5GS/s DSO	WAVERUNNER 6100A	LCRY0604P14508	LeCory	2005/8/11	2006/8/10
ETSTW-RE 034	Power Sensor	URV5-Z4	839313/006	R&S	2005/10/17	2006/10/16
ETSTW-RE 037	Log-Periodic DipoleArray Antenna	3148	00034546	EMCO	2004/11/18	2006/11/17
ETSTW-RE 038	Log-Periodic DipoleArray Antenna	3148	00034547	EMCO	2004/11/18	2006/11/17
ETSTW-RE 039	Biconical Antenna	3110B	41760	EMCO	2004/11/18	2006/11/17

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ETSTW-RE 040	Biconical Antenna	3110B	41761	EMCO	2004/11/18	2006/11/17
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	2005/9/6	2006/9/5
ETSTW-EMI 001	HARMONICS 1000	HAR1000-1P	93	EMC-PARTNER	2005/9/12	2006/9/11
ETSTW-EMS 002	Frequency Converter	YF-6020	0308014	T-Power	Function Test	
ETSTW-GSM 01	SIM Simulator	IT3	B2004-50106	ORGA	2005/9/15	2006/9/14
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	2006/7/13	2008/7/12
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	2006/7/16	2008/7/15
ETSTW-GSM 07	Agilent 8960 Test Set 5	E5515C	GB44052658	Agilent	2006/7/13	2008/7/12
ETSTW-GSM 08	Agilent 8960 Test Set 6	E5515C	GB44052666	Agilent	2006/7/16	2008/7/15
ETSTW-GSM 10	Combiner Wessex / Anite	B4605/100	053	Wessex / Anite	2006/7/13	2008/7/12
ETSTW-GSM 11	GSM 850,900,1800,1900 Test system	TS8950G		R&S	2005/11/1	2006/10/31
ETSTW-GSM 12	Acoustical Calibrator	4231	2463874	Brüel&Kjær	2005/10/31	2006/10/30
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	2005/10/29	2006/10/28
ETSTW-GSM 24	Vibration Testing System	VS-100V	5494	Vibration	2005/12/20	2006/12/19

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2.4 General Test Procedure

POWER LINE CONDUCTED INTERFERENCE: The procedure used was ANSI STANDARD C63.4-2003 5.2 using a 50 μ H 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 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/m + 6 dB = 36.36 dB μ V/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.

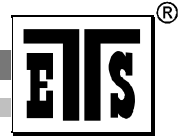
Peak readings were taken in three (3) orthogonal planes and the highest readings.

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 spiral antenna. (see photo).



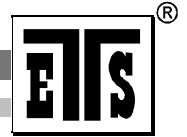
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3 Test results (enclosure)

1st test test after modification production test

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

The follows is intended to leave blank.



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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 780 ms of being released.
- This transmitter is operated by automatic activation and active will cease transmission in ___second after activation..

Remark: See attached appendix A

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3.2 Output Power (Field Strength)

Test condition		Transmitter field strength (dB μ V/m)	
$T_{nom} = 23\text{ }^{\circ}\text{C}$	$V_{nom} = 1.5\text{V DC}$	PK	AV
		82.09	71.413
Measurement uncertainty		< 3 dB	

Limit 15.231(b)

Fundamental Frequency (MHz)	Field strength of fundamental, limit μ V/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** (433.92 MHz: 80.8 dB μ V/m = 10,965 μ V/m)
Above 470	12,500

** linear interpolation

Remarks: see attached diagrams

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 055, ETSTW-RE 049

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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

$80.80 \text{ dB}\mu\text{V/m} - 20 \text{ dB} = 60.80 \text{ dB}\mu\text{V/m}$

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 = $20 \log (\text{dwell time}/100\text{ms})$

For frequencies above 1GHz (Peak measurements).

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

$80.80 \text{ dB}\mu\text{V/m}$

For frequencies above 1GHz (Average measurements).

Correction factor conform 15.35 (c) (Average measurements)

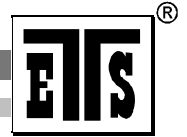
Duty cycle correction :

Max. reading – 20 dB – duty cycle correction

No duty cycle correction was added to the reading:

$80.80 \text{ dB}\mu\text{V/m} - 20 \text{ dB} = 60.80 \text{ dB}\mu\text{V/m}$

Remarks: See attached diagrams.



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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 time 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 = $20 \log(\text{dwell time}/100\text{ms})$

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: $54 \text{ dB}\mu\text{V}/\text{m} + 20 \text{ dB} = 74 \text{ dB}\mu\text{V}/\text{m}$

Remarks: See attached diagrams.

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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:

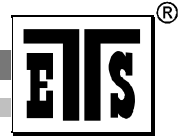
Such factors like antenna correction, cable loss, external attenuation etc. are already included in the provided measurement results. This is done by using validated test software and calibrated test system according the accreditation requirements.

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	868.537	43.89	3.64	PK	47.53	60.8	13.27	105	163
	1733.466	67.88	-5.91	PK	61.97	80.8	18.83	255	131
	1733.466	54.25	-5.91	AV	48.34	60.8	12.46	255	131
	2166.332	75.15	-2.78	PK	72.37	80.8	8.43	305	142
	2166.332	61.52	-2.78	AV	58.74	60.8	2.06	305	142
	3038.076	62.88	-0.17	PK	62.71	80.8	18.09	225	170
	3038.076	49.28	-0.17	AV	49.11	60.8	11.69	225	170
	4336.673	55.45	3.23	PK	58.68	74.0	15.32	185	184
	4336.673	41.82	3.23	AV	45.05	54.0	8.95	185	184



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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	868.537	48.12	3.64	PK	51.76	60.8	9.04	215	338
	1733.466	73.49	-5.91	PK	67.58	80.8	13.22	165	143
	1733.466	59.86	-5.91	AV	53.95	60.8	6.85	165	143
	2172.344	72.19	-2.87	PK	69.32	80.8	11.48	335	128
	2172.344	58.56	-2.87	AV	55.69	60.8	5.11	335	128
	2605.210	60.64	-0.17	PK	60.47	80.8	20.33	300	147
	2605.210	47.01	-0.17	AV	46.84	60.8	13.96	300	147
	4336.673	49.82	3.23	PK	53.05	74.0	20.95	275	170
	4336.673	36.19	3.23	AV	39.42	54.0	14.58	275	170

- 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 055, ETSTW-RE 049,
 ETSTW-RE 030, ETSTW-RE 044, ETSTW-RE 017



Registration number: W6M20608-7251-C-1

FCC ID: ELVNTRFA

3.6 Channel Bandwidth

Measurement of Necessary Bandwidth (BN)

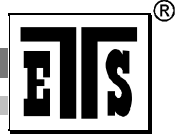
Used frequency	Bandwidth	Limit
433.9 MHz	60.00 kHz	1.0828 MHz
Measurement uncertainty	< 10 Hz	

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 055, ETSTW-RE 049



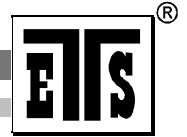
Registration number: W6M20608-7251-C-1
FCC ID: ELVNTRFA

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 spiral antenna is integral antenna which passes antenna requirement.

The equipment meets the requirements	yes <input checked="" type="checkbox"/>	no <input type="checkbox"/>
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Registration number: W6M20608-7251-C-1
 FCC ID: ELVNTRFA

3.8 Spurious Emission radiated, Receiver

FCC 15.109

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	144.809	22.60	1.47	PK	24.07	43.5	19.43	130	311
	434.068	38.28	2.52	PK	40.80	46.0	5.20	200	132
	871.743	33.51	3.66	PK	37.17	46.0	8.83	105	106
	1270.541	49.82	-7.94	PK	41.88	54.0	12.12	45	173
	2196.392	48.49	-2.65	PK	45.84	54.0	8.16	165	161

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	181.262	23.03	1.58	PK	24.61	43.5	18.89	270	118
	434.068	30.35	2.52	PK	32.87	46.0	13.13	315	320
	881.362	33.96	3.67	PK	37.63	46.0	8.37	210	338
	1226.252	49.88	-7.82	PK	42.06	54.0	11.94	345	191
	2130.260	48.24	-3.18	PK	45.06	54.0	8.94	120	144

Limits:

Frequency (MHz)	E-field field strength limit dBuV/m
30 – 88	40.00
88 – 216	43.52
216 – 960	46.02
Above 960	53.98 (73.98 dBuV/m 20 dB peak detector)

The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.

Remarks: see attached diagram.

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 055, ETSTW-RE 049, ETSTW-RE 030, ETSTW-RE 044, ETSTW-RE 017



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3.9 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

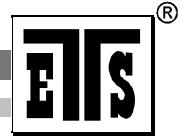
Duty Cycle Correction = 20 log (Cycle)

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	29.25	29.25	-10.677

Remarks: see attached diagram.

Test equipment used: ETSTW-RE 003, ETSTW-RE 004, ETSTW-RE 055, ETSTW-RE 049



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 FCC ID: ELVNTRFA

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 (dB μ V/m)	average (dB μ V/m)
-- kHz	--	--

Limits:

Frequency of Emission (MHz)	Conducted Limit (dB μ V)	
	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



Registration number: W6M20608-7251-C-1
FCC ID: ELVNTRFA

Appendix

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

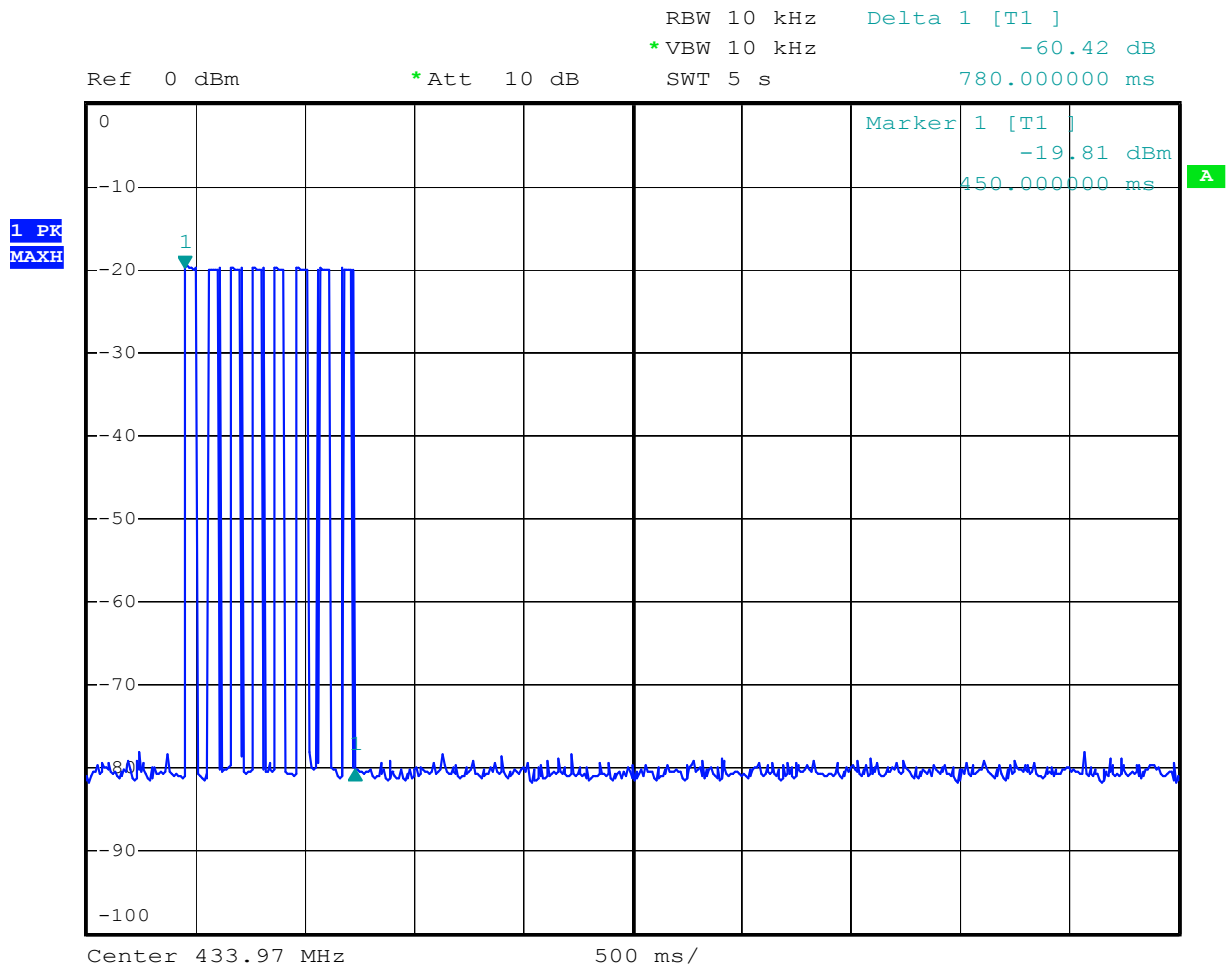


Registration number: W6M20608-7251-C-1

FCC ID: ELVNTRFA

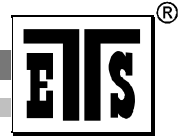
Appendix A

Active Time



duration time

Date: 4.AUG.2006 15:32:41



Registration number: W6M20608-7251-C-1

FCC ID: ELVNTRFA

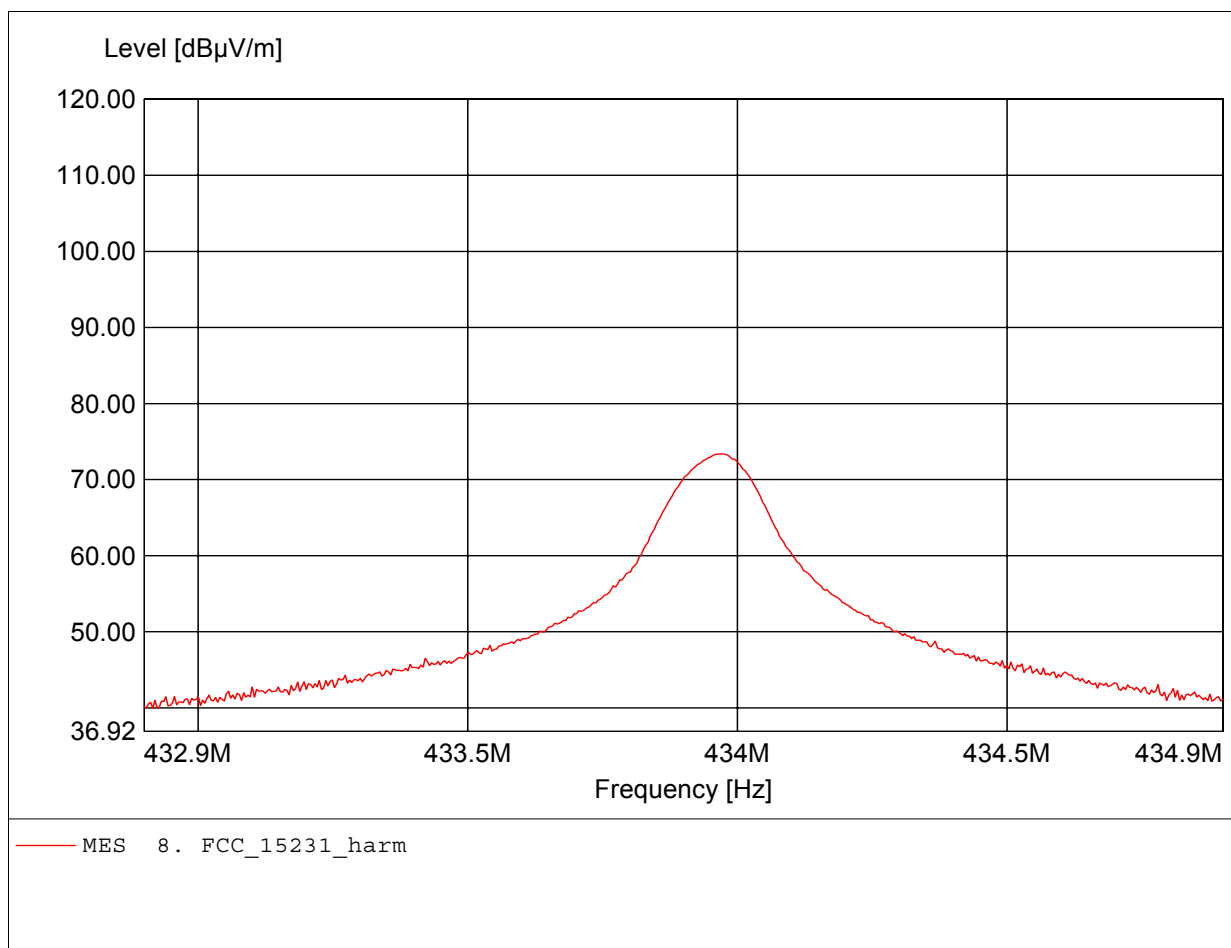
Appendix B

Output Power

Field Strength of Fundamental

FCC RULES PART 15, SUBPART C / LP0002

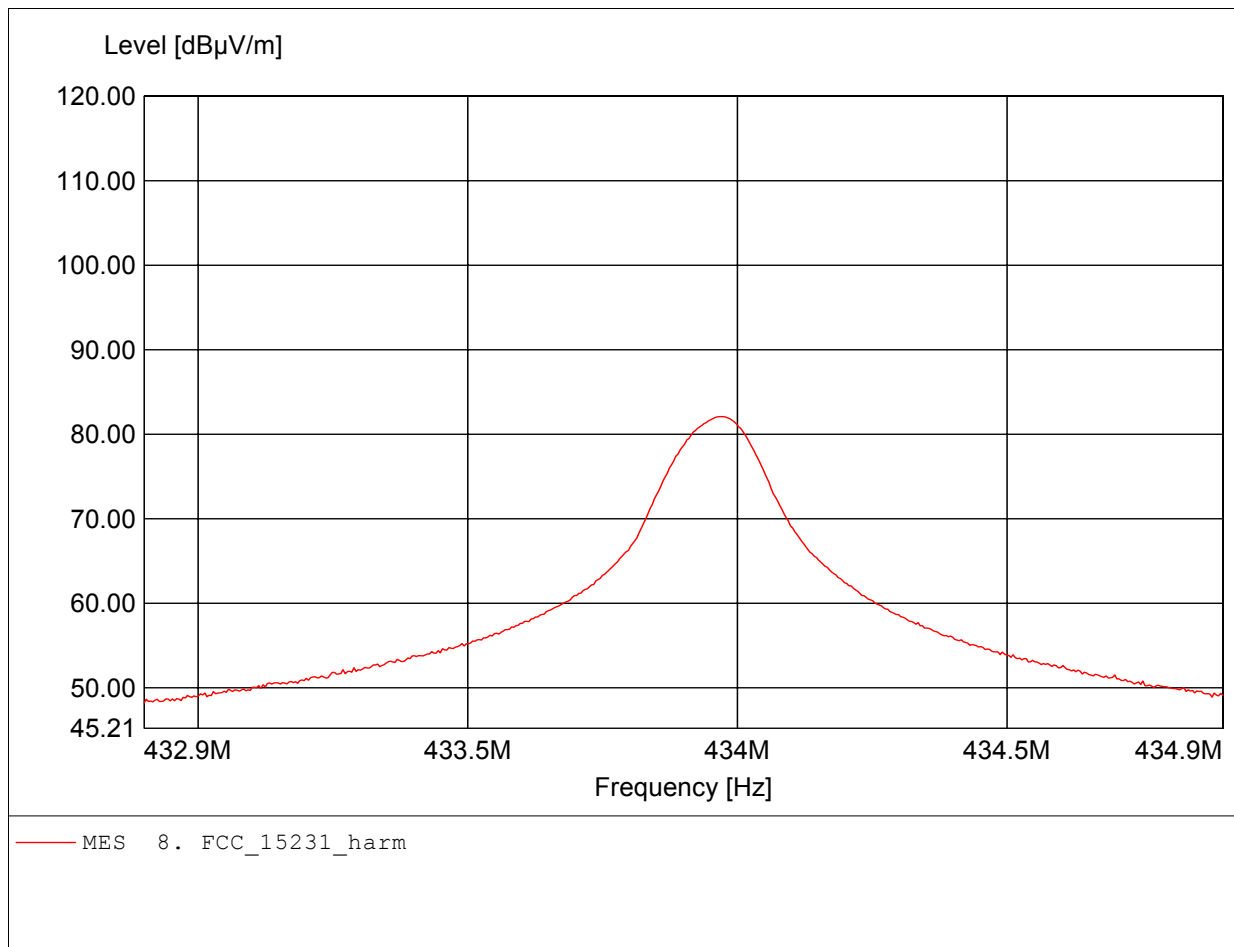
Order Number : W6M20608-7251
Test Site / Operator: ETS /Derek
Temperature/Voltage: Temp.: 23.9°C/ Unom.: 1.5VDC (battery)
Test Specification: according to Section15.231
Comment 1: Dist.: 3m, Ant.: HL223
Freq: 433.970MHz, Emax: 73.38dBμV/m, RBW: 100kHz



Field Strength of Fundamental

FCC RULES PART 15, SUBPART C / LP0002

Order Number : W6M20608-7251
Test Site / Operator: ETS /Derek
Temperature/Voltage: Temp.: 23.9°C/ Unom.: 1.5VDC (battery)
Test Specification: according to Section15.231
Comment 1: Dist.: 3m, Ant.: HL223
Freq: 433.970MHz, Emax: 82.09dBμV/m, RBW: 100kHz





Registration number: W6M20608-7251-C-1

FCC ID: ELVNTRFA

Appendix C

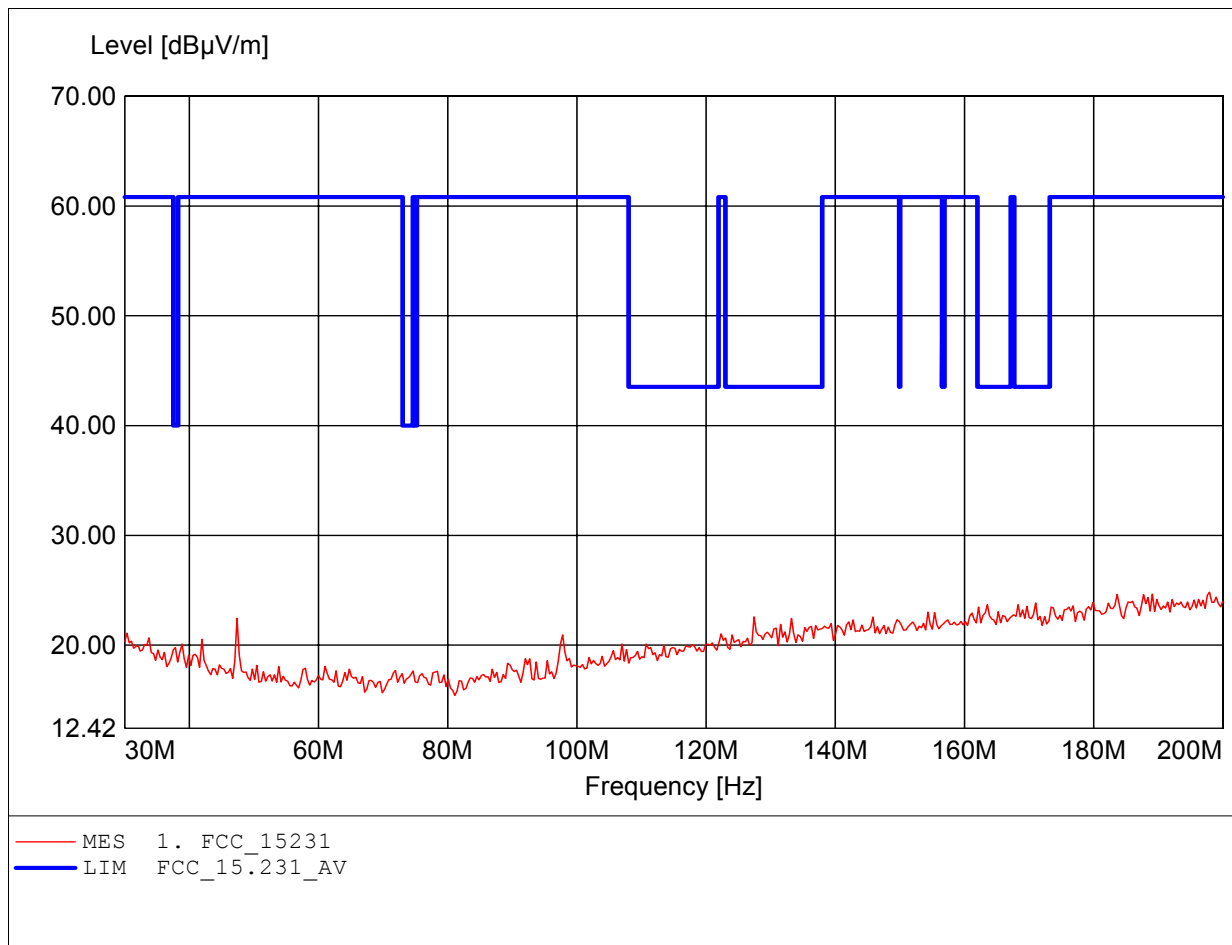
Spurious Emissions radiated - Transmitter

(The measurement diagrams are wideband pre-scan results; only for reference)

Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C / LP0002

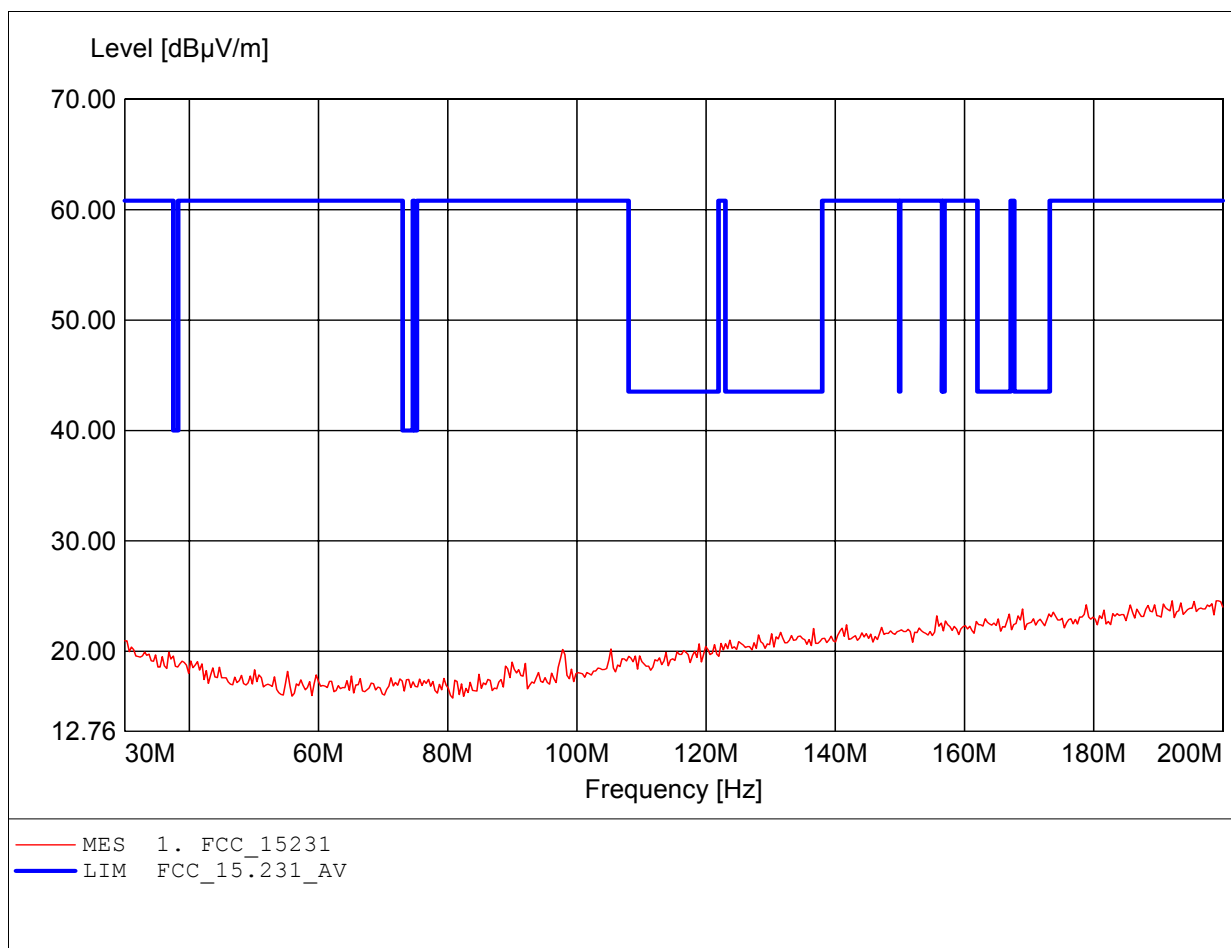
Order Number : W6M20608-7251
Test Site / Operator: ETS /Derek
Temperature/Voltage: Temp.: 23.9°C/ Unom.: 1.5VDC (battery)
Test Specification: according to Section15.231
Comment 1: Dist.: 3m, Ant.: HK 116
Freq: 197.956MHz, Emax: 24.81dBµV/m, RBW: 100kHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C / LP0002

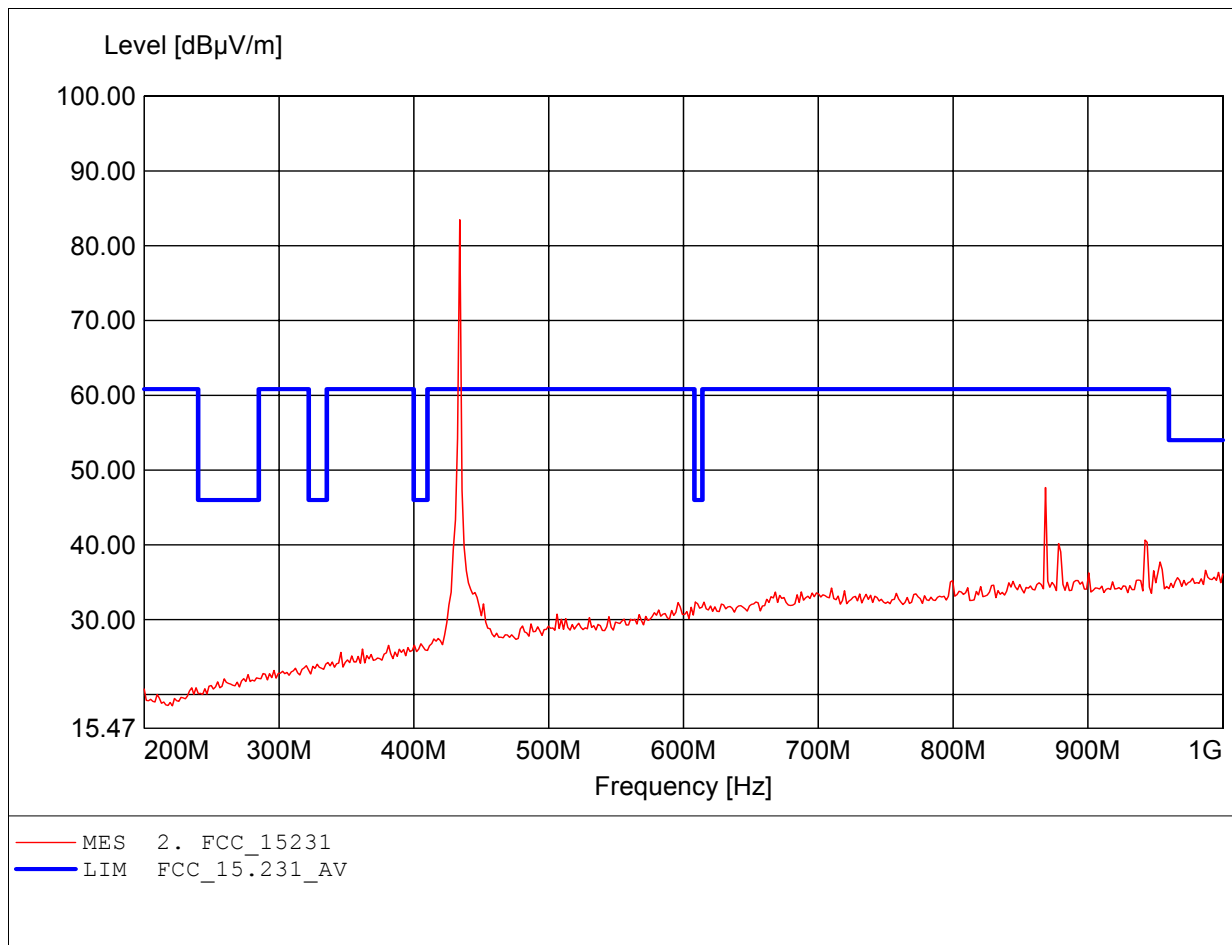
Order Number : W6M20608-7251
Test Site / Operator: ETS /Derek
Temperature/Voltage: Temp.: 23.9°C/ Unom.: 1.5VDC (battery)
Test Specification: according to Section15.231
Comment 1: Dist.: 3m, Ant.: HK 116
Freq: 198.978MHz, Emax: 24.58dBµV/m, RBW: 100kHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C / LP0002

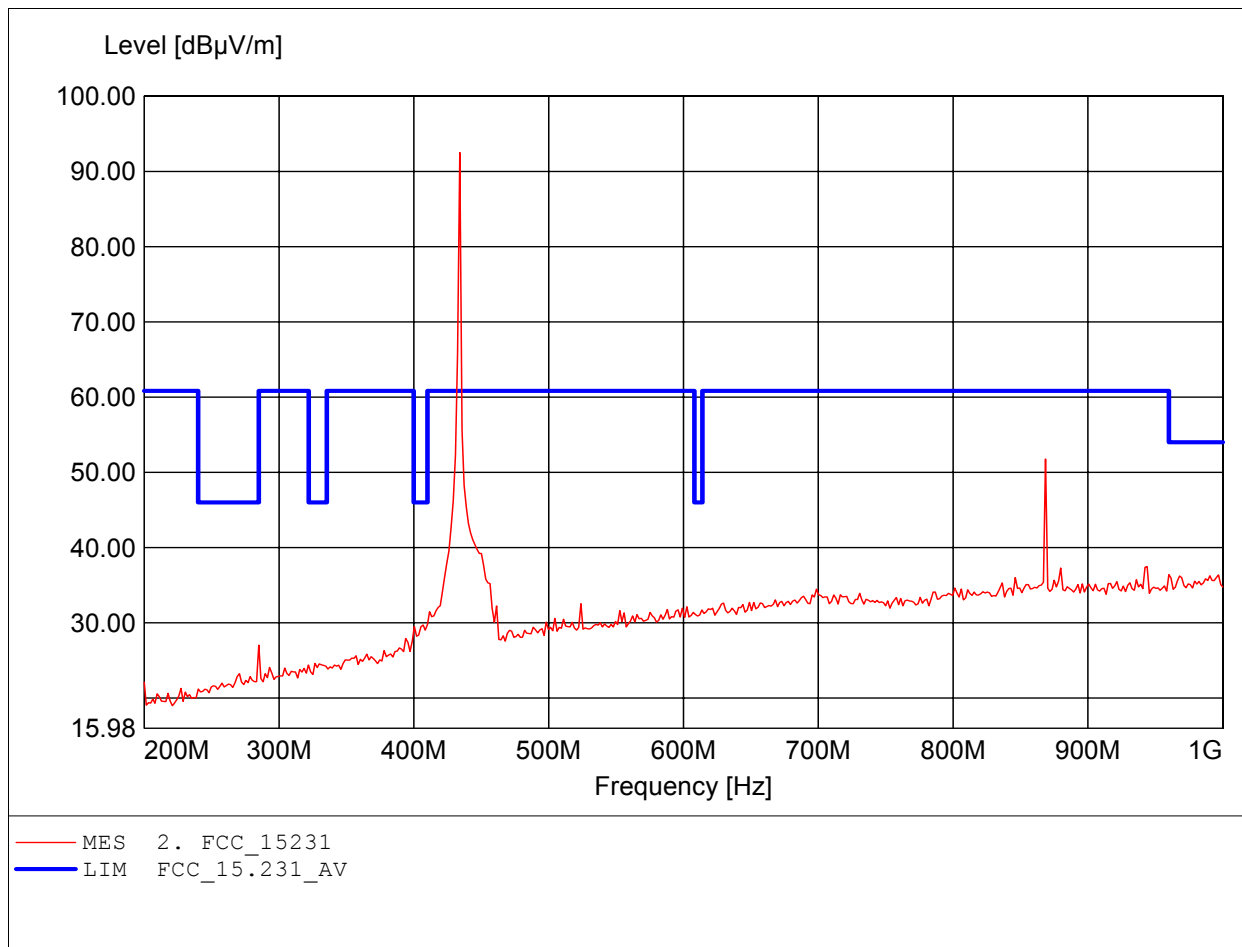
Order Number : W6M20608-7251
Test Site / Operator: ETS /Derek
Temperature/Voltage: Temp.: 23.9°C/ Unom.: 1.5VDC (battery)
Test Specification: according to Section15.231
Comment 1: Dist.: 3m, Ant.: HL 223, amplif.
Freq: 434.068MHz, Emax: 83.47dB μ V/m, RBW: 100kHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C / LP0002

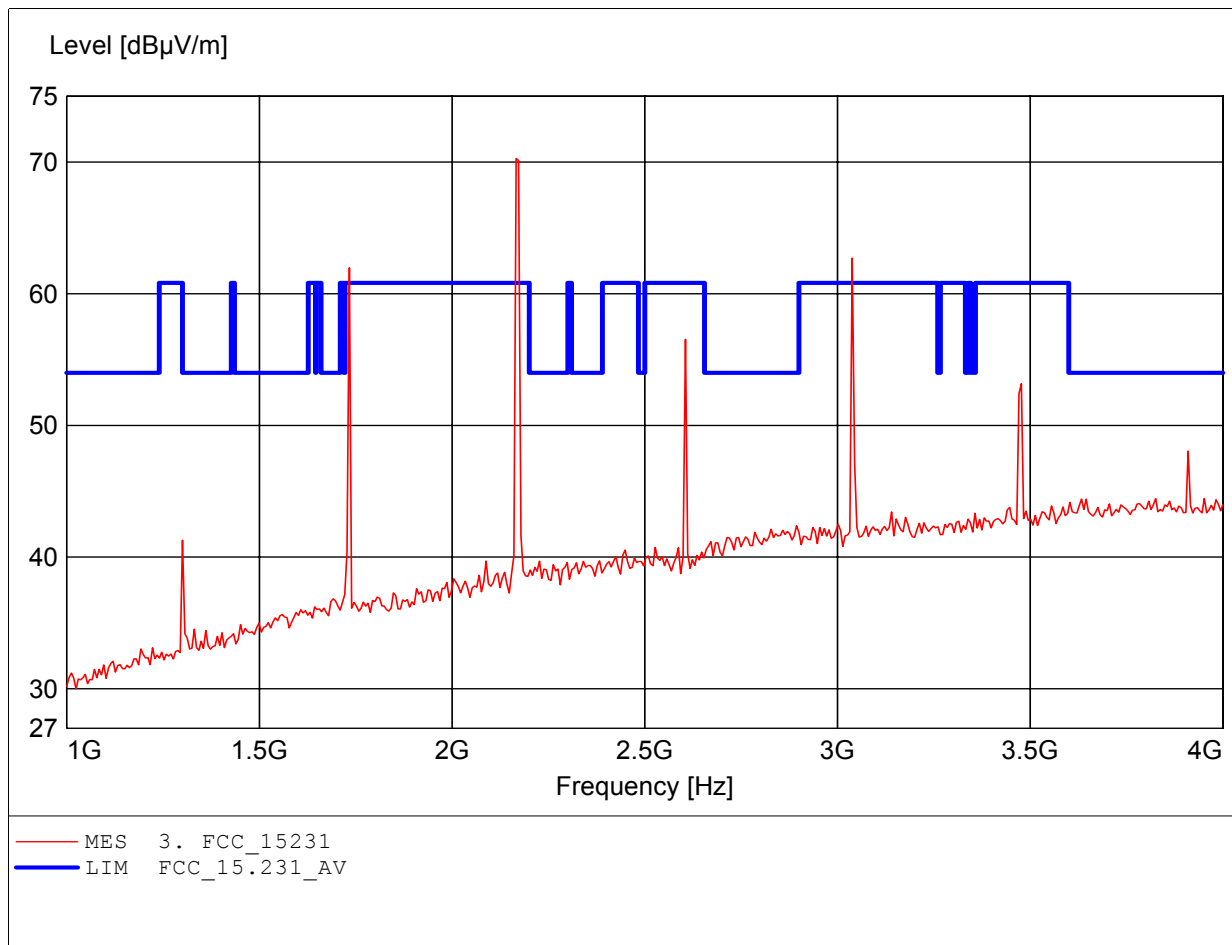
Order Number : W6M20608-7251
Test Site / Operator: ETS /Derek
Temperature/Voltage: Temp.: 23.9°C/ Unom.: 1.5VDC (battery)
Test Specification: according to Section15.231
Comment 1: Dist.: 3m, Ant.: HL 223, amplif.
Freq: 434.068MHz, Emax: 92.51dB μ V/m, RBW: 100kHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C / LP0002

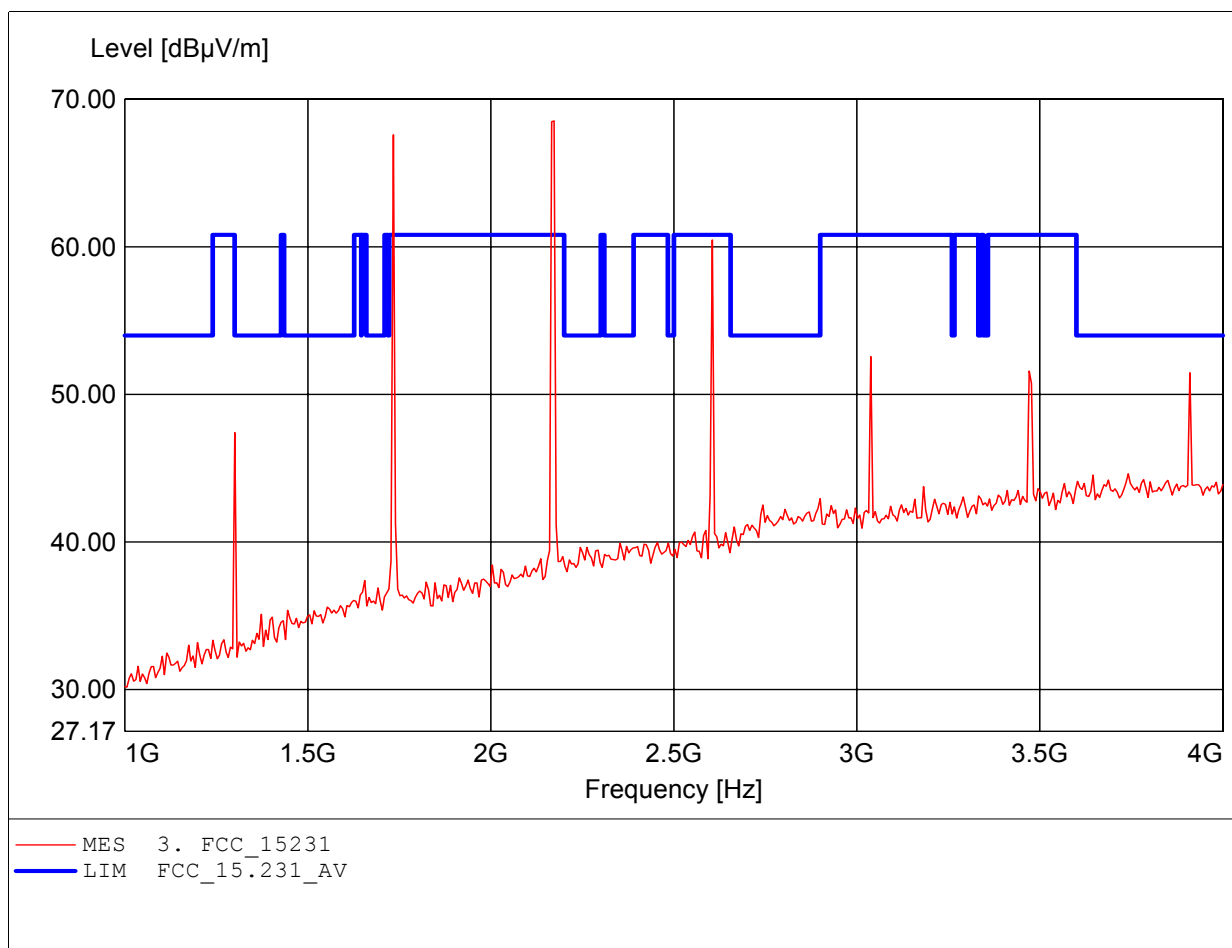
Order Number : W6M20608-7251
Test Site / Operator: ETS /Derek
Temperature/Voltage: Temp.: 23.9°C/ Unom.: 1.5VDC (battery)
Test Specification: according to Section 15.231, peak detector
Comment 1: Dist.: 3m, Ant.: HL025, amplif.
Freq: 2.166GHz, Emax: 70.27dBμV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C / LP0002

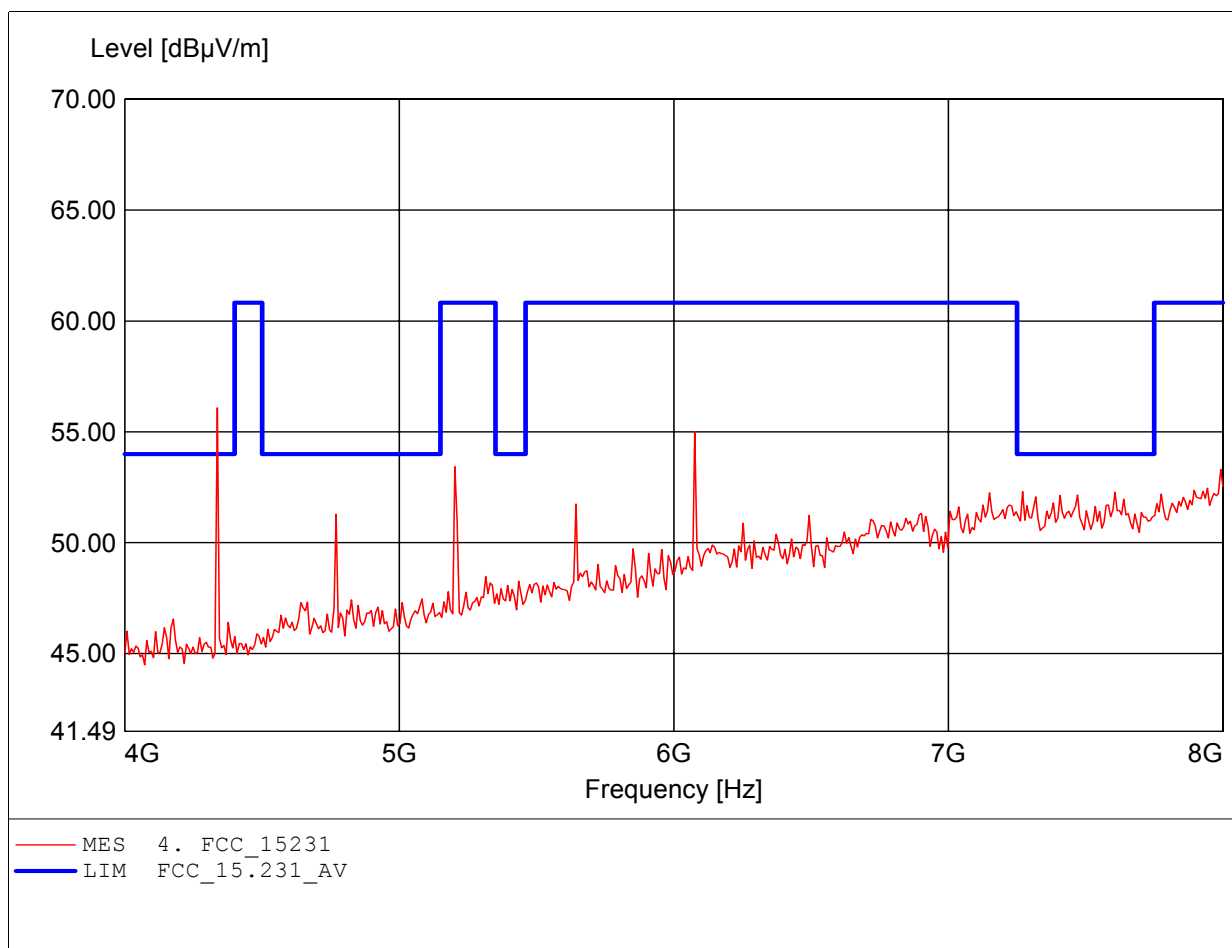
Order Number : W6M20608-7251
Test Site / Operator: ETS /Derek
Temperature/Voltage: Temp.: 23.9°C/ Unom.: 1.5VDC (battery)
Test Specification: according to Section 15.231, peak detector
Comment 1: Dist.: 3m, Ant.: HL025, amplif.
Freq: 2.172GHz, Emax: 68.54dBμV/m, RBW: 1MHz



Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C / LP0002

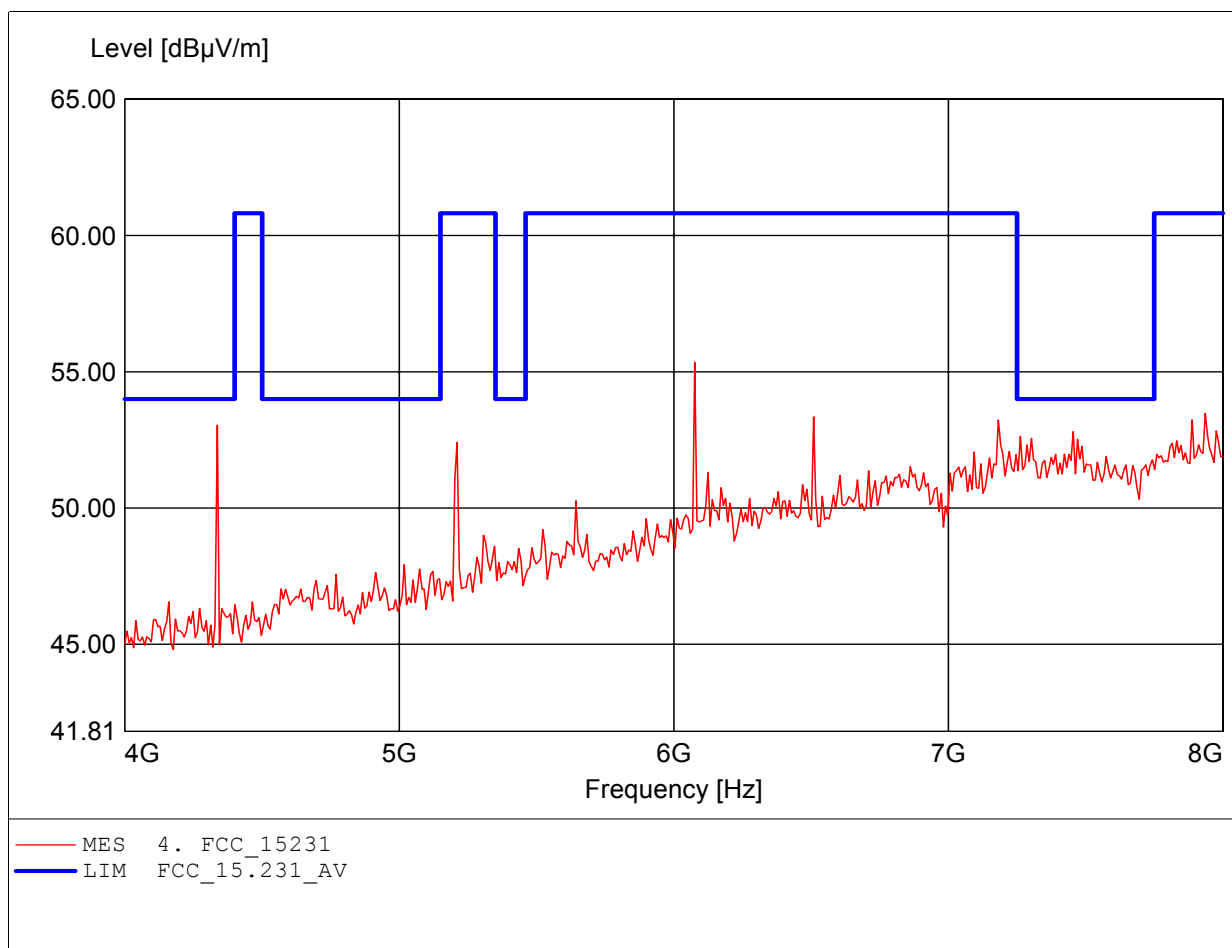
Order Number : W6M20608-7251
Test Site / Operator: ETS /Derek
Temperature/Voltage: Temp.: 23.9°C/ Unom.: 1.5VDC (battery)
Test Specification: according to Section 15.231, peak detector
Comment 1: Dist.: 3m, Ant.: HL025, ampl.+HP.
Freq: 4.337GHz, Emax: 56.08dBμV/m, RBW: 1MHz

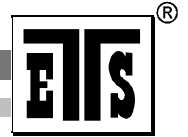


Spurious emissions Field Strength

FCC RULES PART 15, SUBPART C / LP0002

Order Number : W6M20608-7251
Test Site / Operator: ETS /Derek
Temperature/Voltage: Temp.: 23.9°C/ Unom.: 1.5VDC (battery)
Test Specification: according to Section 15.231, peak detector
Comment 1: Dist.: 3m, Ant.: HL025, ampl.+HP.
Freq: 6.076GHz, Emax: 55.35dBμV/m, RBW: 1MHz



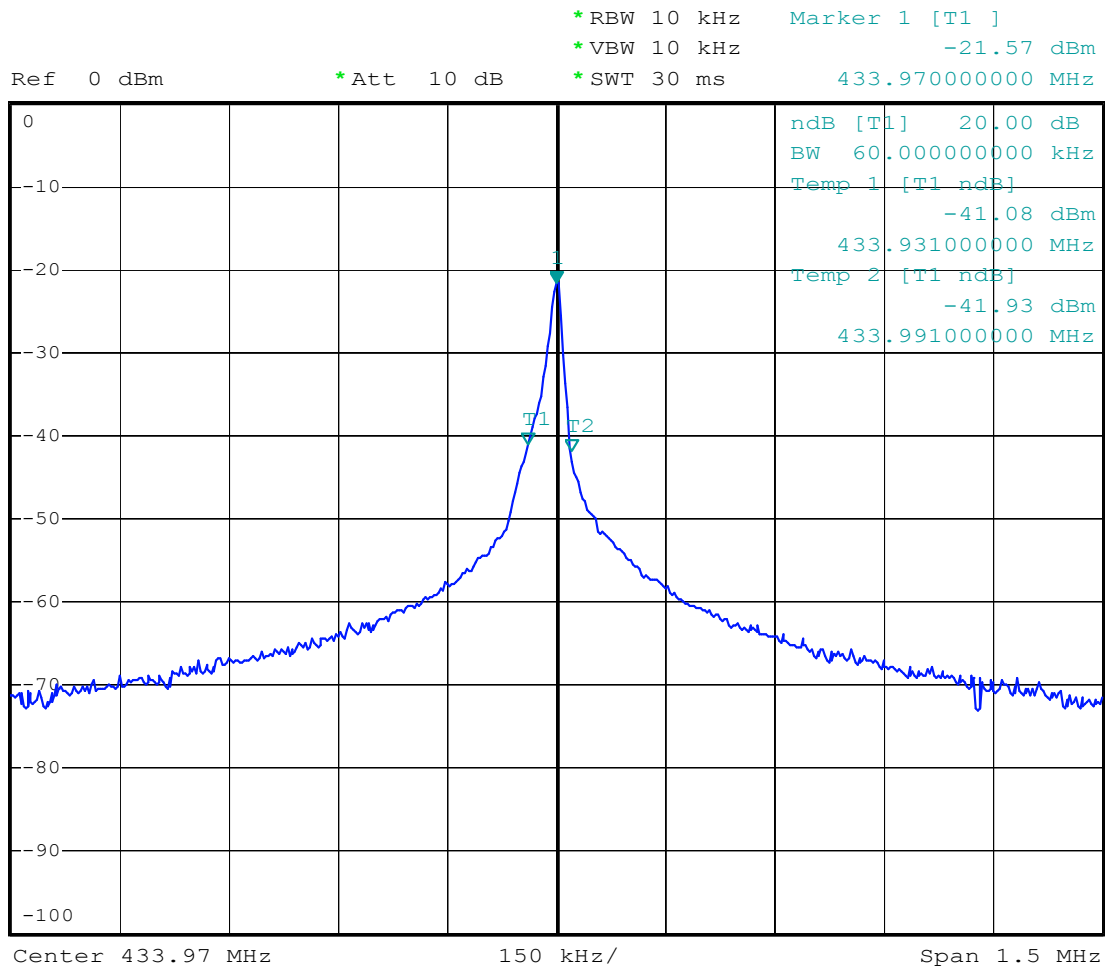


Registration number: W6M20608-7251-C-1

FCC ID: ELVNTRFA

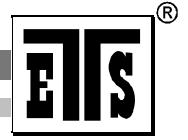
Appendix D

Bandwidth



20dB Bandwidth

Date: 4.AUG.2006 15:29:30



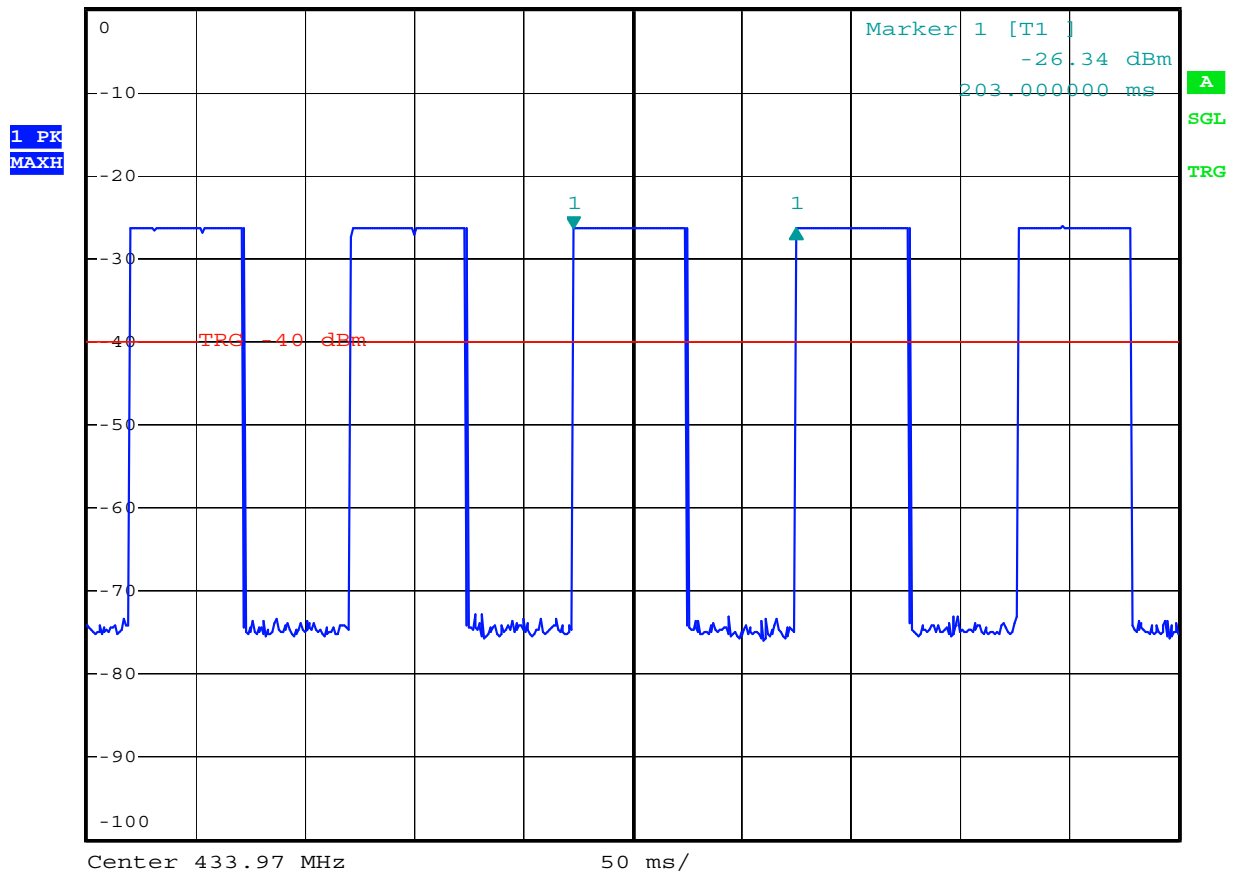
Registration number: W6M20608-7251-C-1

FCC ID: ELVNTRFA

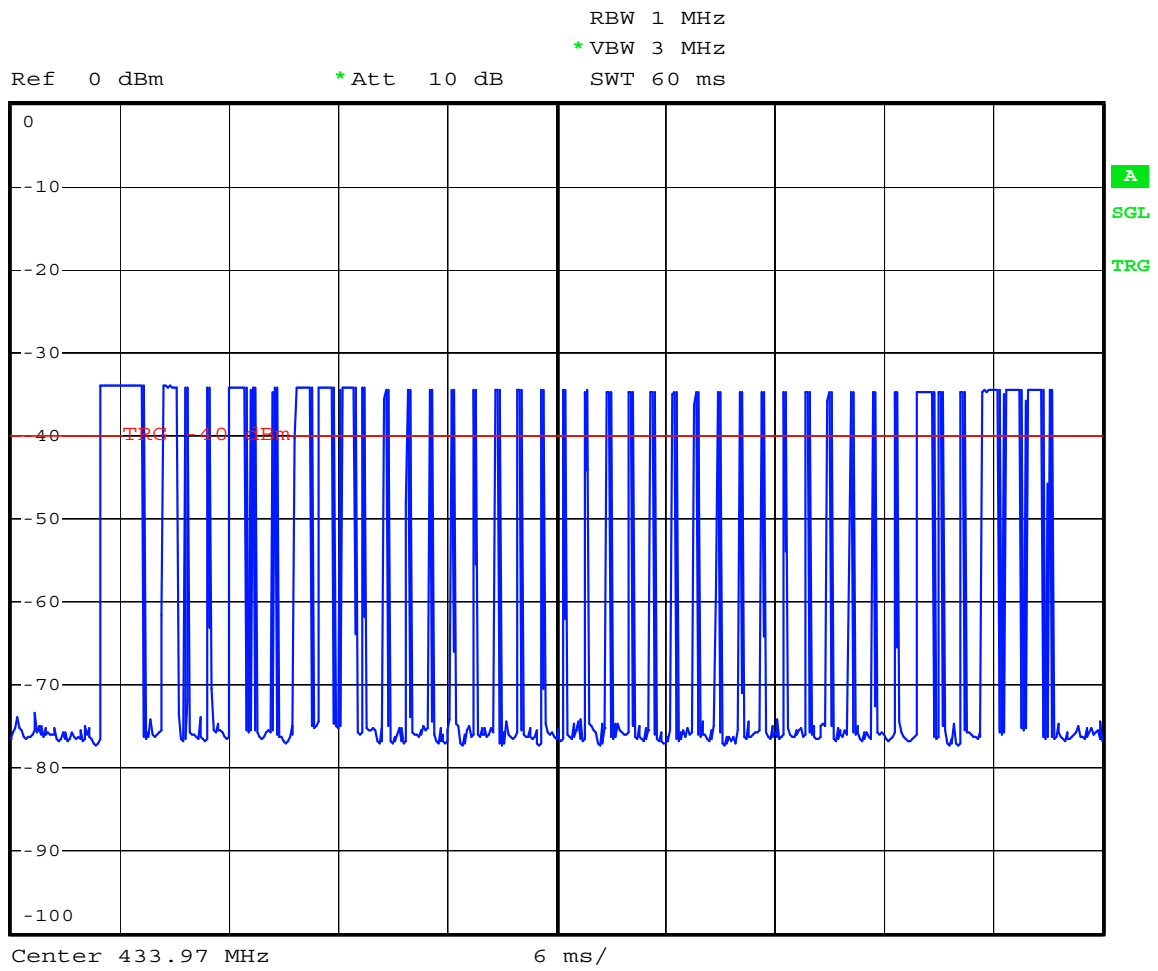
Appendix E

Duty Cycle

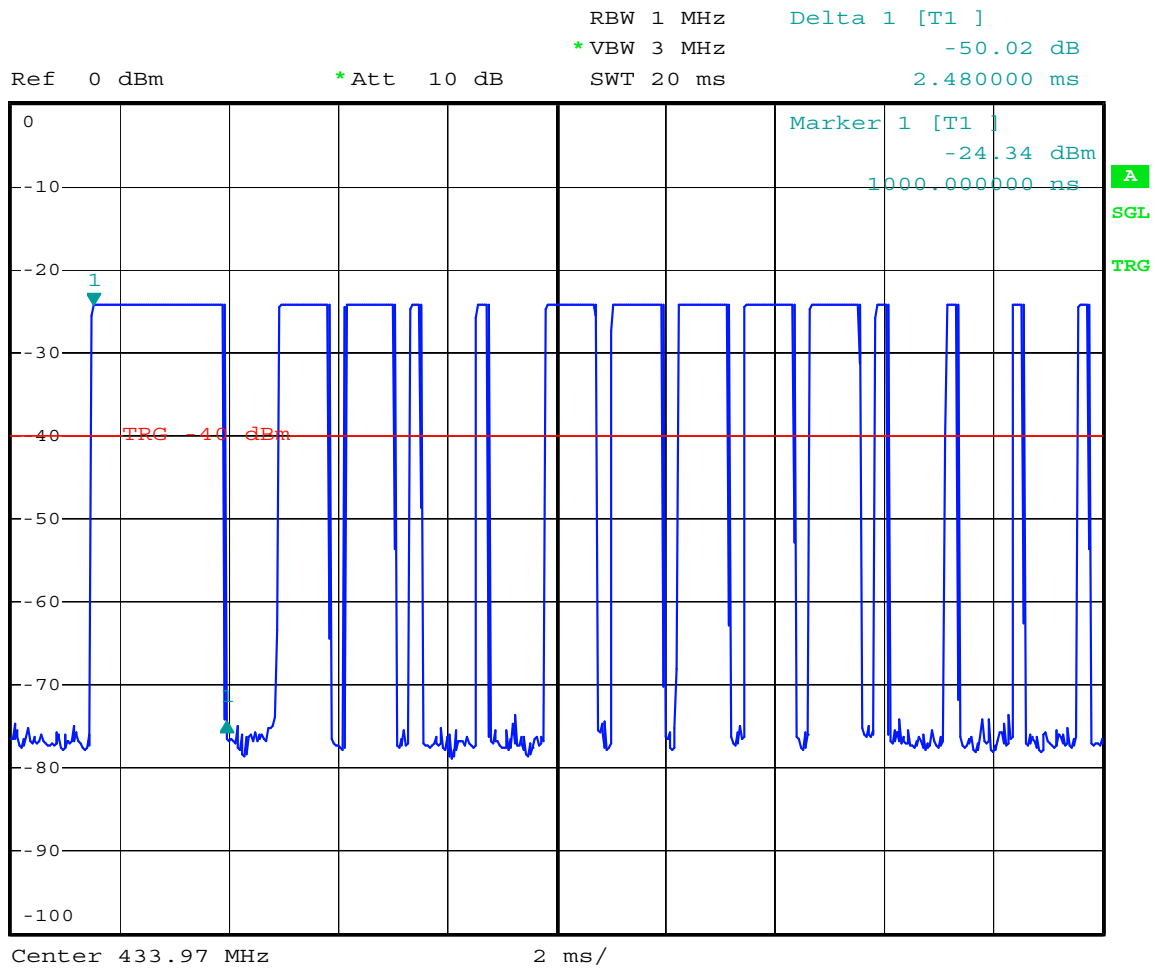
RBW 1 MHz Delta 1 [T1]
*VBW 3 MHz 0.08 dB
Ref 0 dBm *Att 10 dB SWT 500 ms 102.000000 ms



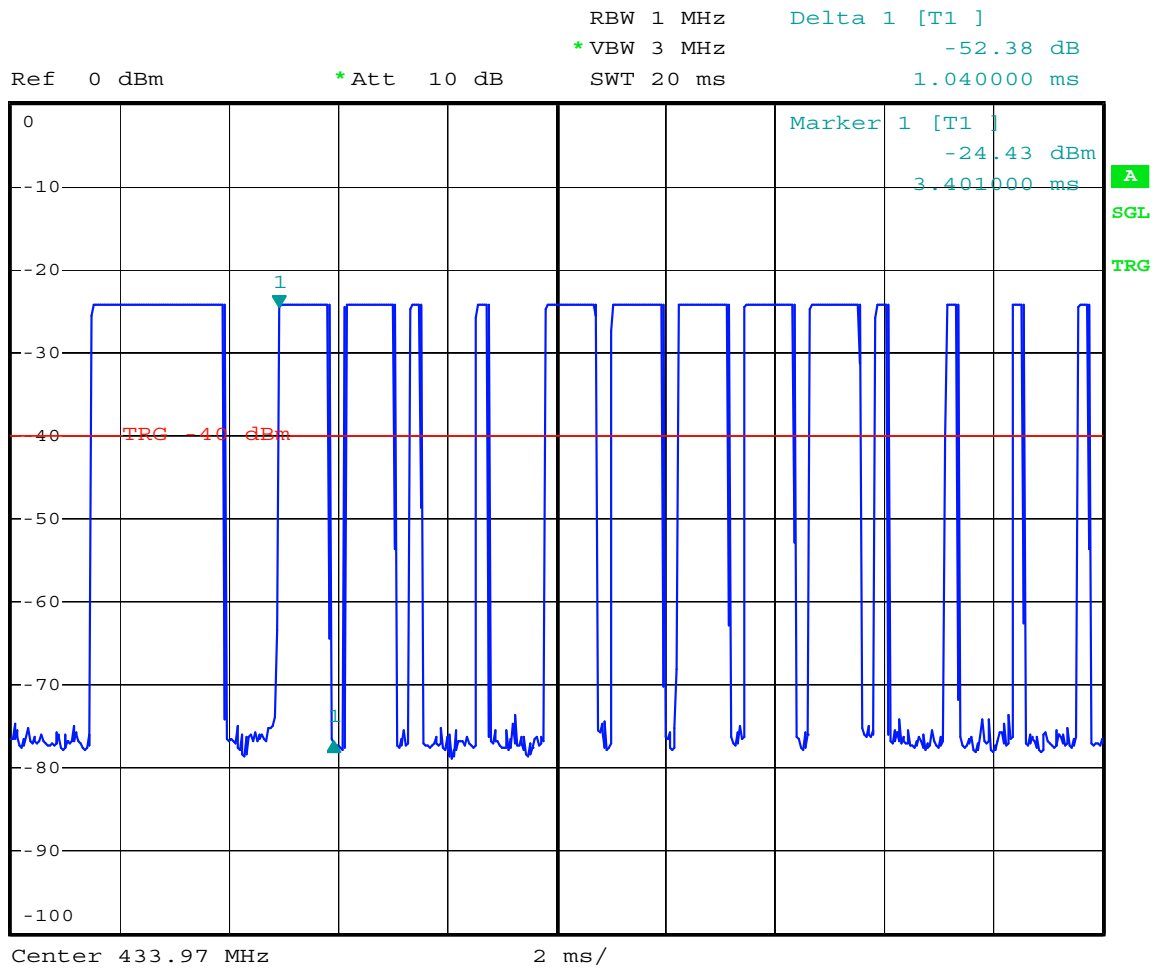
Date: 4.AUG.2006 15:35:43



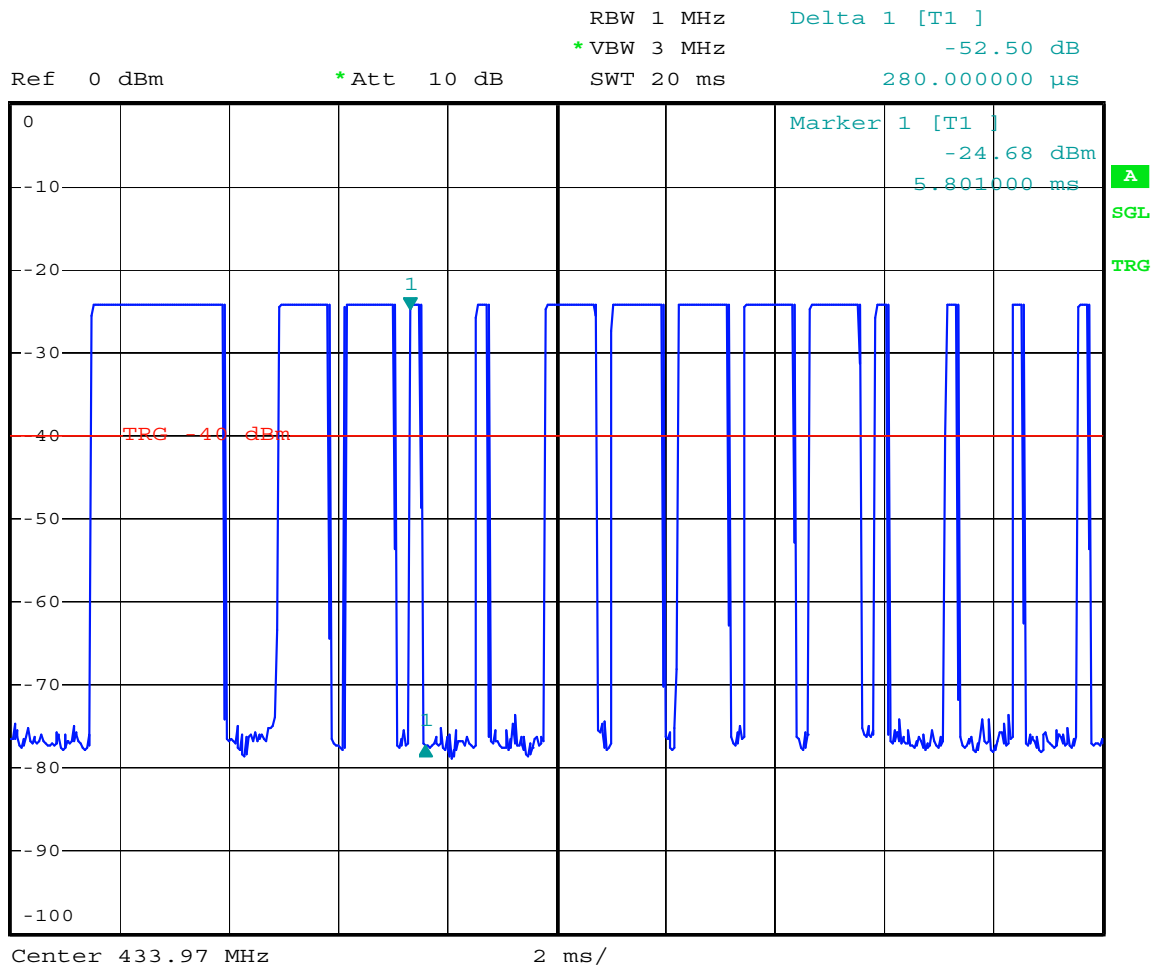
Date: 4.AUG.2006 15:38:53



Date: 4.AUG.2006 15:43:23



Date: 4.AUG.2006 15:44:16



Date: 4.AUG.2006 15:44:55

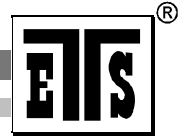


Registration number: W6M20608-7251-C-1

FCC ID: ELVNTRFA

Appendix F

Pictures



Registration number: W6M20608-7251-C-1

FCC ID: ELVNTRFA

External photos

Registration number: W6M20608-7251-C-1

FCC ID: ELVNTRFA



Registration number: W6M20608-7251-C-1
FCC ID: ELVNTRFA



Registration number: W6M20608-7251-C-1

FCC ID: ELVNTRFA





Registration number: W6M20608-7251-C-1

FCC ID: ELVNTRFA

Internal photos

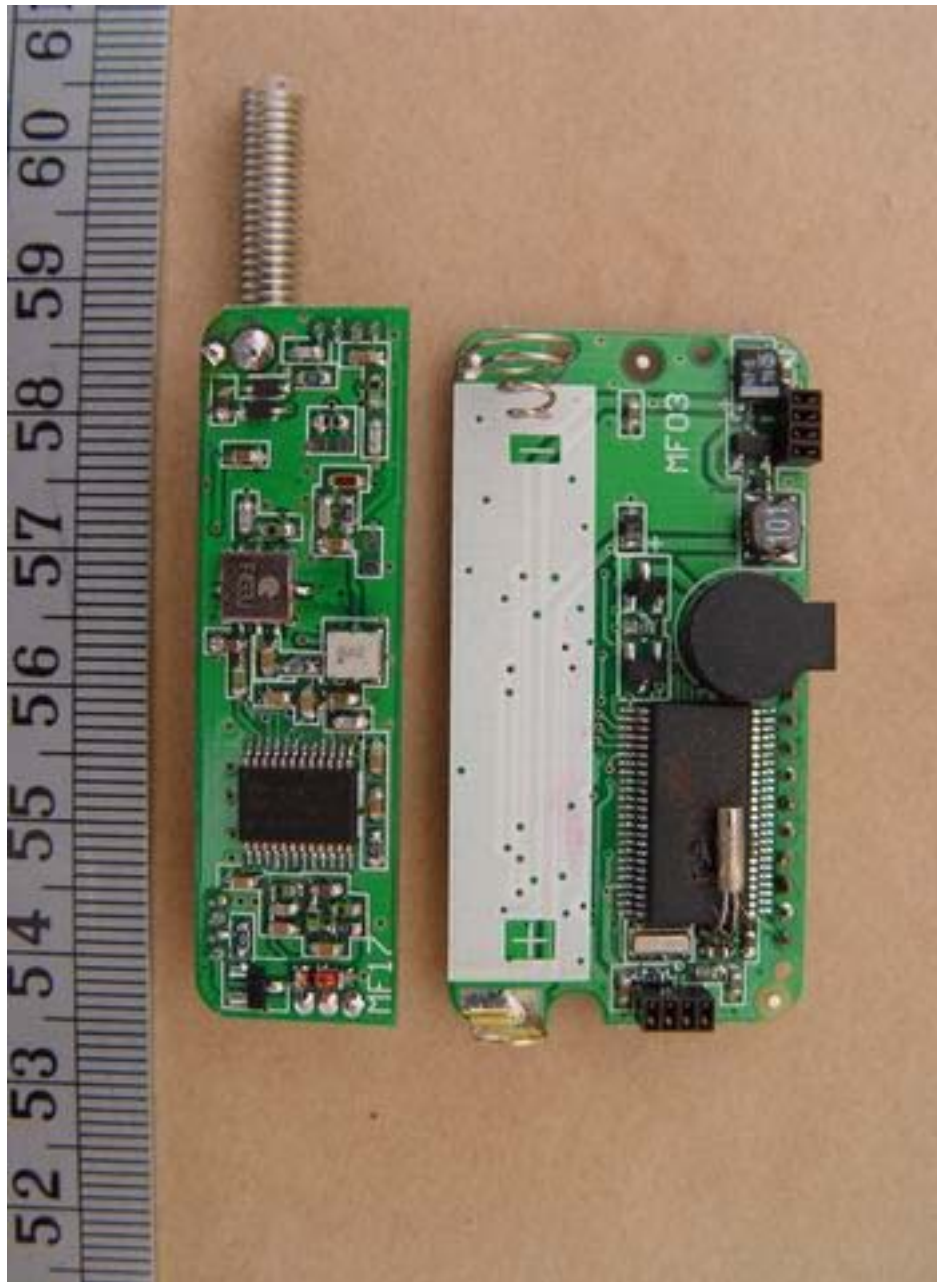
Registration number: W6M20608-7251-C-1

FCC ID: ELVNTRFA

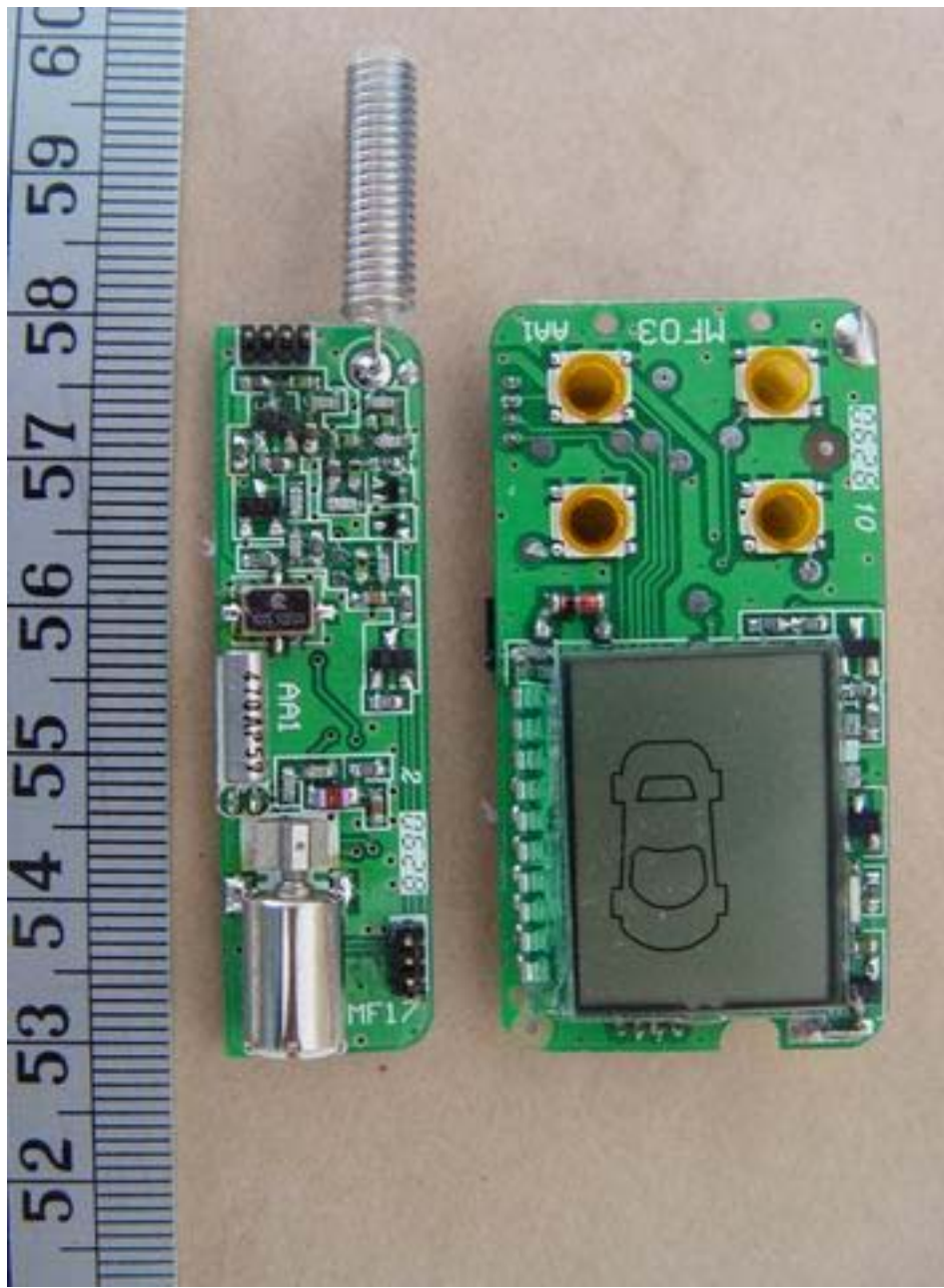


Registration number: W6M20608-7251-C-1

FCC ID: ELVNTRFA



Registration number: W6M20608-7251-C-1
FCC ID: ELVNTRFA





Registration number: W6M20608-7251-C-1

FCC ID: ELVNTRFA

Set Up photos

Registration number: W6M20608-7251-C-1

FCC ID: ELVNTRFA

