FCC PART 15 SUBPART C / RSS-210 TEST REPORT

for

Remote Control

Model No.: GLG1

FCC ID: 2APSVGLG1

IC: 23885-GLG1

of

Applicant: GLG Farms LLC DBA Auger Jogger
Address: 242 3rd Ave West, Sherwood, ND 58782, U.S.A

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.: W6M21805-18060-C-1

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Registration number: W6M21805-18060-C-1
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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.
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Tester:

Date	WTS-Lab.	Name	Signature
June 08, 2018		Leon Chueh	Leon Chueh

Technical responsibility for area of testing:

Date	WTS	Name	Signature
June 08, 2018		Kevin Wang	Kevin Wang

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1.2 Testing laboratory

1.2.1 Location

OATS
No.5-1, Lishui, Shuang Sing Village,
Wanli Dist., New Taipei City 207,
Taiwan (R.O.C.)
3 meter semi-anechoic chamber
No.35, Aly. 21, Ln. 228, Ankang Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)
TEL:886-2-6613-0228
FAX:886-2-2791-5046

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. 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:	GLG Farms LLC DBA Auger Jogger
Street:	242 3rd Ave West,
Town:	Sherwood, ND 58782,
Country:	U.S.A
Telephone:	1-701-264-7397
Fax:	./.

1.4 Application details

Date of receipt of test item: May 04, 2018
Date of test: from May 07, 2018 to June 08, 2018

1.5 Test item

Description of test item: Remote Control

Type identification: GLG1

Brand name: ./.

Multi-listing model number: ./.

Transmitting frequency: 433.92 MHz

Operation mode: simplex

Voltage supply: Battery 12Vdc

(The device is tested under fresh battery condition.)

Highest clock frequency: 433.92 MHz

Antenna type: PCB Antenna

Photos: see Annex

Manufacturer (if applicable)
Name: LIBERTY TECHNOLOGY CO., LTD.
Street: 4F-6, No.880, Zhong Zheng Rd.,
Town: Chung-Ho Dist., New Taipei City
Country: Taiwan

Additional information: ./.

1.6 Test standards

Technical standard : FCC RULES PART 15 SUBPART C § 15.231 (a) (2017-10)
CANADA RSS-210 Issue 9 (2016-08)
RSS-Gen Issue 5 April 2018

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

Relative humidity content: 20 ... 75 %

Air pressure: 86 ... 103 kPa

Test item Name	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
Estimation Result of Uncertainty of Band Edge Measurement	Expanded Uncertainty：0.98 dBc

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	2018/5/18	2019/5/17
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-EICHLEITUNG RF STEP ATTENUATOR 139dB DPSP	334.6010.02	844581/024	R&S	Function Test	
ETSTW-CE 009	TEMP.&HUMIDITY CHAMBER	GTH-225-40-1P-U	MAA0305-009	GIANT FORCE	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	2018/5/18	2019/5/17
ETSTW-RE 004	EMI TEST RECEIVER	ESI 40	832427/004	R&S	2018/5/9	2019/5/8
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	2018/4/13	2019/4/12
ETSTW-RE 044	Log-Periodic Antenna	HL050	100094	R&S	2018/4/26	2019/4/25
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	2018/4/16	2019/4/15
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	2018/5/18	2019/5/17
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	2018/5/10	2019/5/9
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	2018/5/9	2019/5/8
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
ETSTW-Cable 048	Microwave Cable	SUCOFLEX 104	325519	HUBER+SUHNER	2018/3/30	2019/3/29

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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	

2.5 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 ANSI STANDARD C63.10-2013 6.3 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.

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 C63.10-2013 6.2.2 MEASUREMENT PROCEDURES: The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m (non metallic table). The EUT 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.

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.

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) IC RSS-210 A1.1	☒	☒	☐
Radiated Emission	FCC 15.231(b) IC RSS-210 A1.2	☒	☒	☐
Bandwidth of Emission	FCC 15.231(c) IC RSS-210 A1.3	☒	☒	☐
Frequency Tolerance	FCC 15.231(d) IC RSS-210 B.7	☐	☐	☐
Period Alternate Field Strength Requirements	FCC 15.231(e) IC RSS-210 B.7	☐	☐	☐
Antenna Requirement	FCC 15.203 IC RSS-Gen Table 2	☒	☒	☐
Conducted Measurement at (AC) Power Line	FCC 15.207 IC RSS-Gen	☐	☐	☐

The following is intentionally left 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 230.4609218 ms of being released.

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

Explanation: See attached diagrams in appendix.

Test equipment used : ETSTW-RE 004

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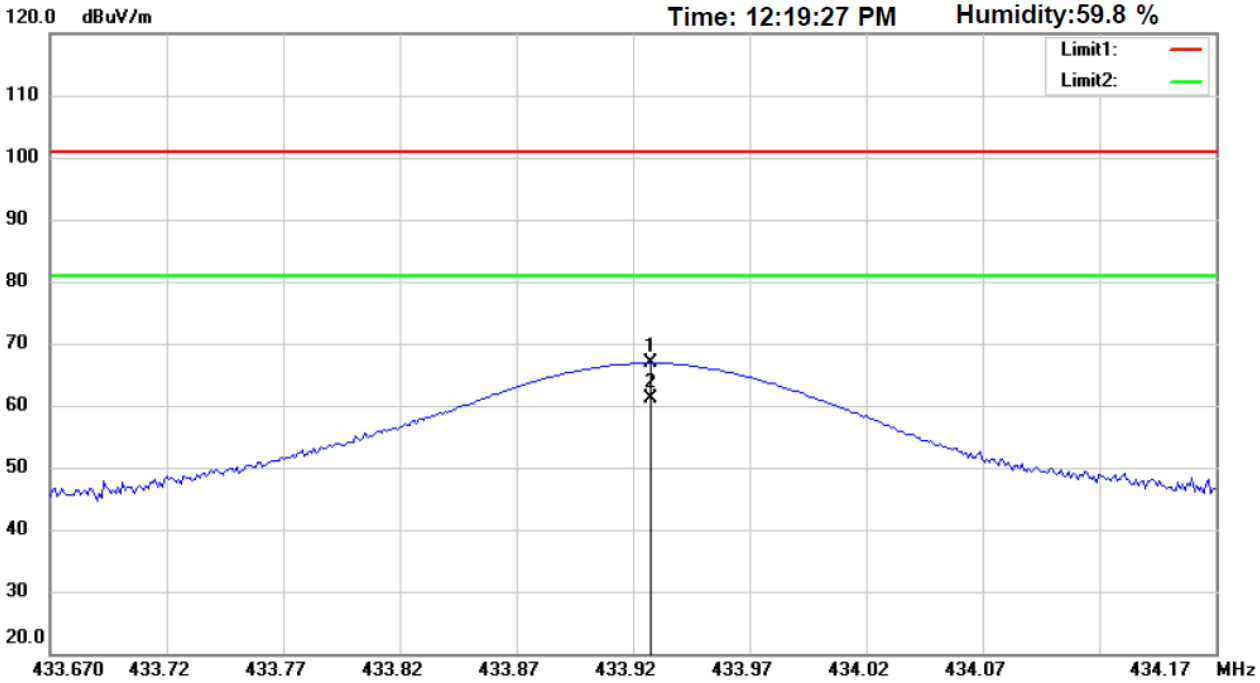
3.2 Output Power (Field Strength)

Radiated Emission Measurement

Operator: Leon

File :power | Data :#1 | Date: 5/11/2018 | Time: 12:19:27 PM | Temperature:24.9 ℃ | Humidity:59.8 %



Site : Chamber
Condition : FCC 15.231(433MHz)Power(PK)
EUT : W6M21805-18060
M/N:
Test Mode : TX 433.92MHz
Note :

Polarization: *Horizontal*
Power : 12 Vd.c.
Distance: 3m

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
	433.9275	41.41	peak	25.49	66.90	100.80	375	360	-33.90	
*	433.9275	35.54	AVG	25.49	61.03	80.80	375	360	-19.77	

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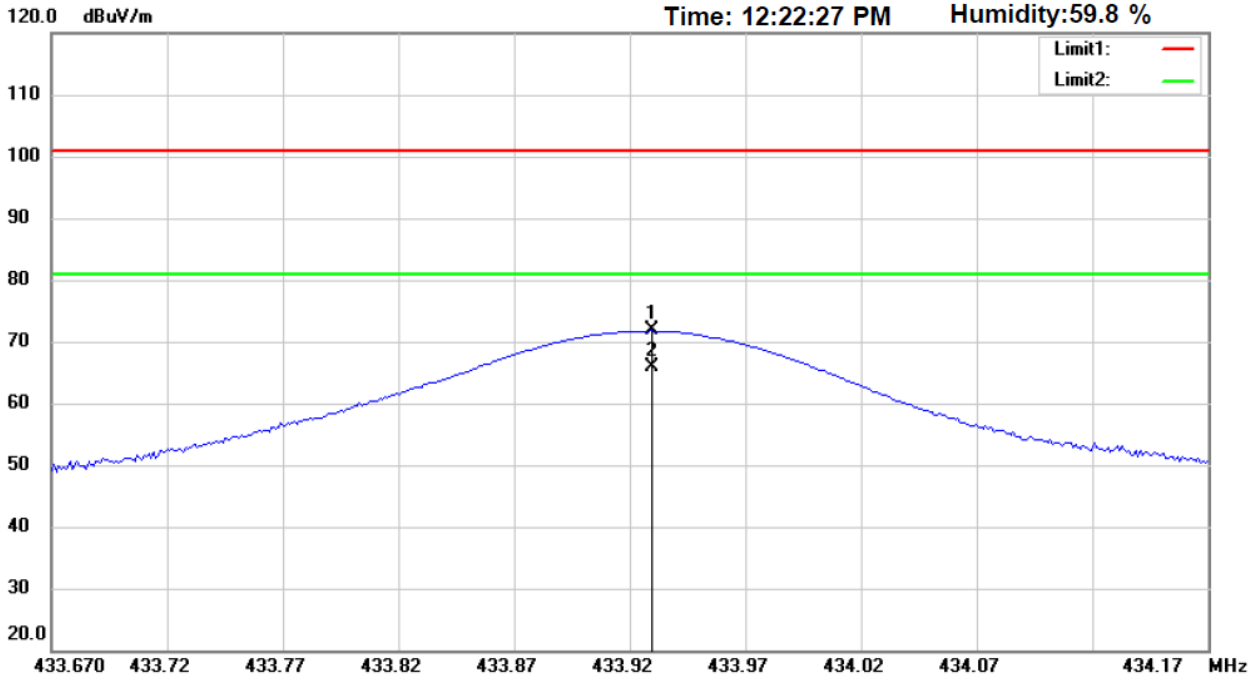
Radiated Emission Measurement

Operator: Leon
File :power
Data :#2
Date: 5/11/2018
Time: 12:22:27 PM
Temperature:24.9 ℃
Humidity:59.8 %



Site : Chamber
Condition : FCC 15.231(433MHz)Power(PK)
EUT : W6M21805-18060
M/N:
Test Mode : TX 433.92MHz
Note :

Polarization: *Vertical*
Power : 12 Vd.c.
Distance: 3m

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
	433.9295	46.29	peak	25.49	71.78	100.80	130	255	-29.02	
*	433.9295	40.42	AVG	25.49	65.91	80.80	130	255	-14.89	

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** (433.92 MHz: 80.83 dBµV/m = 10996.68 µV/m)
Above 470	12,500

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

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.

Guidance on Measurement of pulsed emission: 15.35(c)
"the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value."

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

Limits:
For frequencies (Average measurements)
Correction factor conform 15.35 (c) (Average measurements)
Duty cycle correction :
Max. Peak reading – duty cycle correction

Max permitted average Limits = Max permitted Fundamental limit – 20 dB

For example for 433.92 fundamental carrier:
Max permitted average Limit: 80.83 dBμV/m - 20 dB= 60.83 dBμV/m

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

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

Explanation: See attached diagrams in appendix.

3.5 Spurious Emission radiated, Transmitter

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

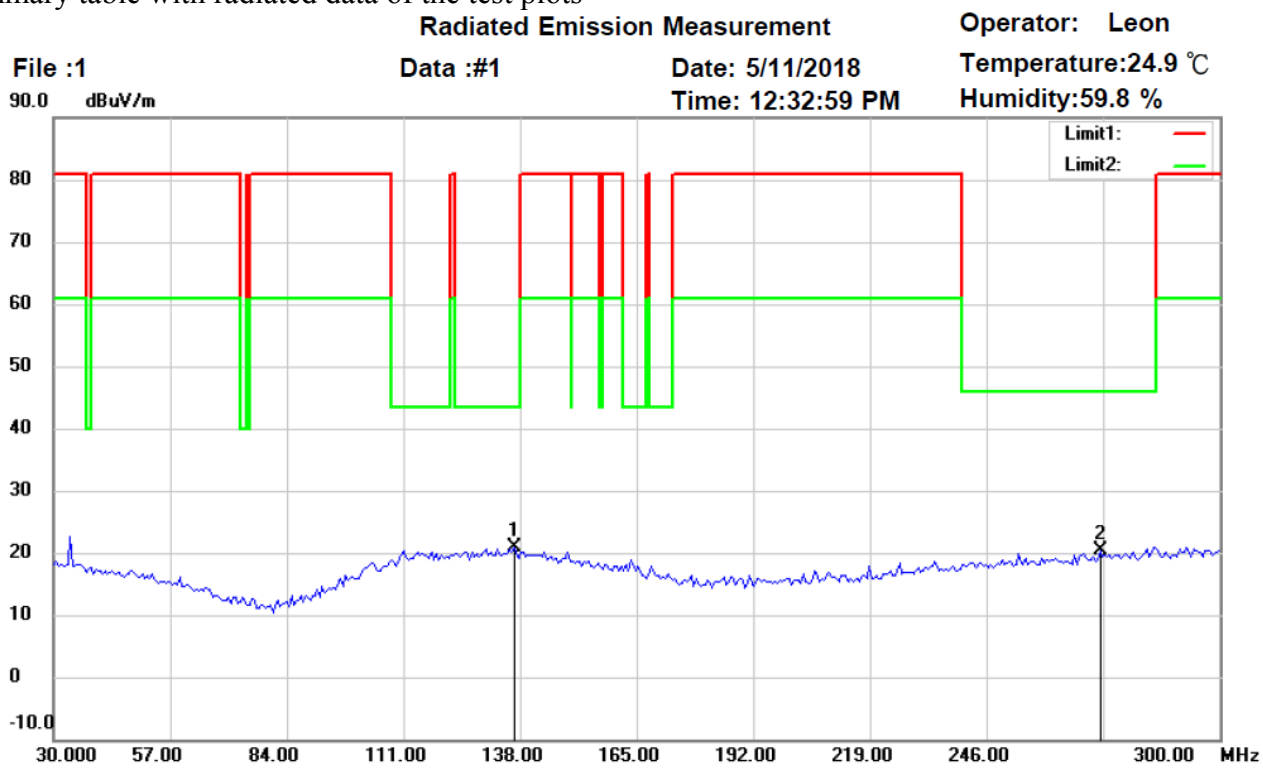
The limits on the field strength of the spurious emission in the table § 15.231(b) are based on the fundamental frequency of the intentional radiator. Spurious emission shall be attenuated to the average (or alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in § 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.

Registration number: W6M21805-18060-C-1
FCC ID: 2APSVGLG1
IC: 23885-GLG1

Summary table with radiated data of the test plots



Site : Chamber
Condition : FCC 15.231(433MHz) 30-300(PK)
EUT : W6M21805-18060
M/N:
Test Mode : TX 433.92MHz
Note :

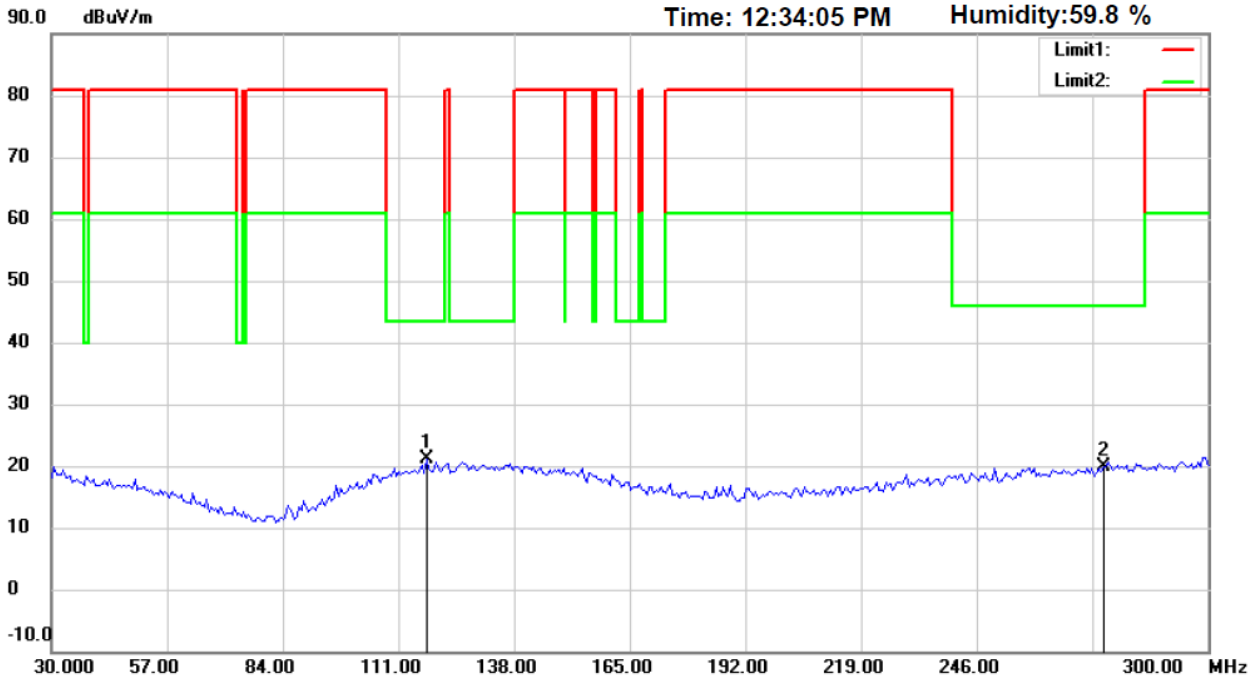
Polarization: *Horizontal*
Power : 12 Vd.c.
Distance: 3m

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
*	136.5930	27.17	peak	-6.40	20.77	43.50	100	70	-22.73	
	272.4048	26.80	peak	-6.38	20.42	46.00	100	115	-25.58	

Registration number: W6M21805-18060-C-1
FCC ID: 2APSVGLG1
IC: 23885-GLG1

Radiated Emission Measurement

Operator: Leon
File :1 Data :#2 Date: 5/11/2018 Time: 12:34:05 PM
Temperature:24.9 ℃
Humidity:59.8 %



Site : Chamber
Condition : FCC 15.231(433MHz) 30-300(PK)
EUT : W6M21805-18060
M/N:
Test Mode : TX 433.92MHz
Note :

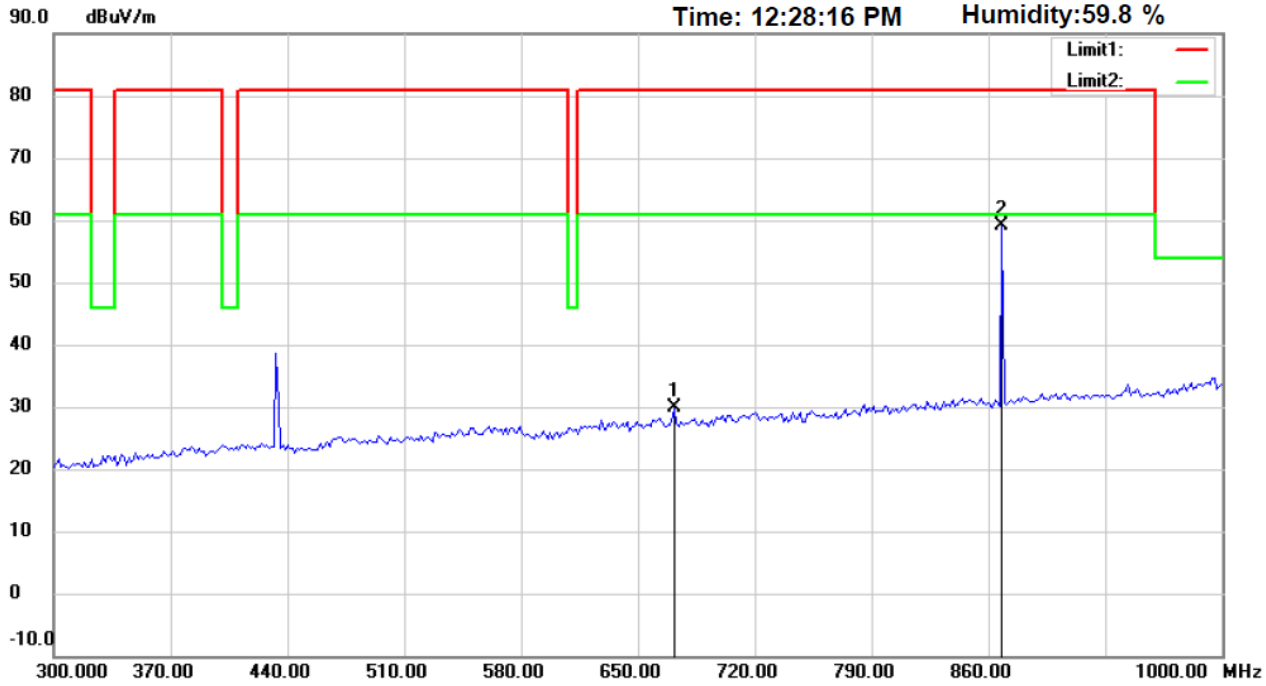
Polarization: *Vertical*
Power : 12 Vd.c.
Distance: 3m

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
*	117.6551	27.84	peak	-6.78	21.06	43.50	100	90	-22.44	
	275.6512	26.06	peak	-6.24	19.82	46.00	100	265	-26.18	

Registration number: W6M21805-18060-C-1
FCC ID: 2APSVGLG1
IC: 23885-GLG1

Radiated Emission Measurement

Operator: Leon
File :2 Data :#1 Date: 5/11/2018 Time: 12:28:16 PM
Temperature:24.9 ℃
Humidity:59.8 %



Site : Chamber
Condition : FCC 15.231(433MHz) 300-1000(PK)
EUT : W6M21805-18060
M/N:
Test Mode : TX 433.92MHz
Note :

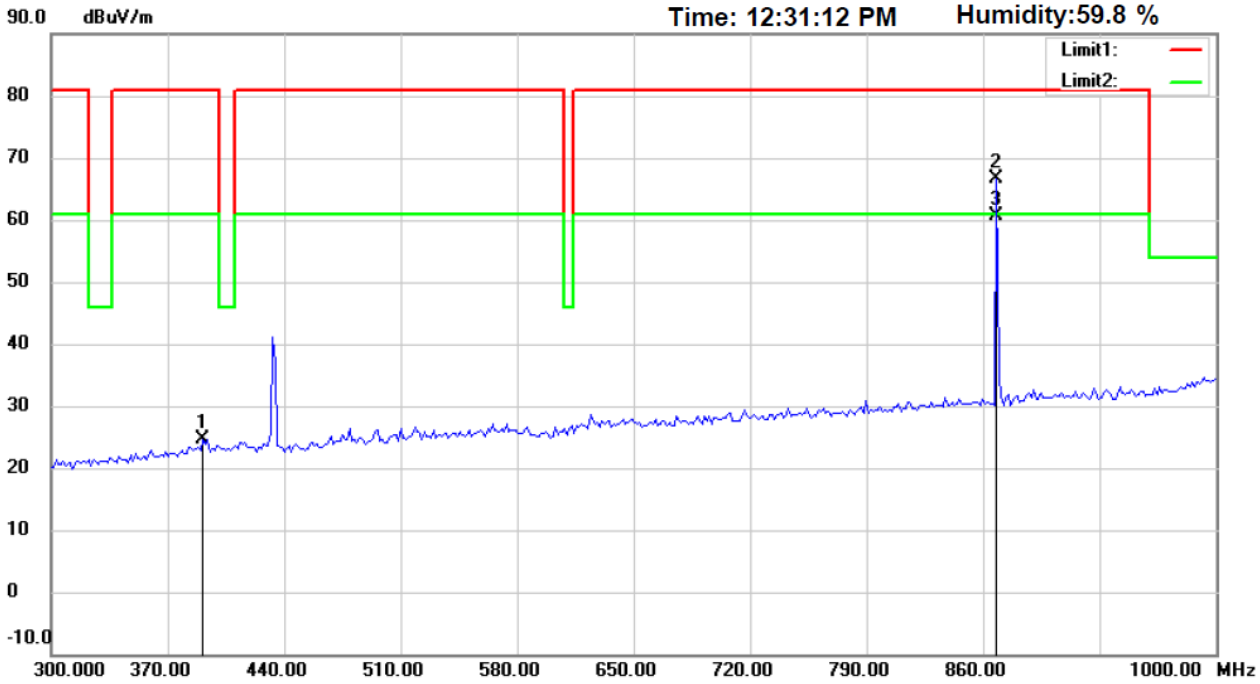
Polarization: *Horizontal*
Power : 12 Vd.c.
Distance: 3m

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
	671.7435	29.41	peak	0.57	29.98	80.80	100	240	-50.82	
*	868.1363	55.00	peak	4.25	59.25	80.80	100	335	-21.55	

Registration number: W6M21805-18060-C-1
FCC ID: 2APSVGLG1
IC: 23885-GLG1

Radiated Emission Measurement

Operator: Leon
File :2 Data :#2 Date: 5/11/2018 Time: 12:31:12 PM
Temperature:24.9 ℃
Humidity:59.8 %



Site : Chamber
Condition : FCC 15.231(433MHz) 300-1000(PK)
EUT : W6M21805-18060
M/N:
Test Mode : TX 433.92MHz
Note :

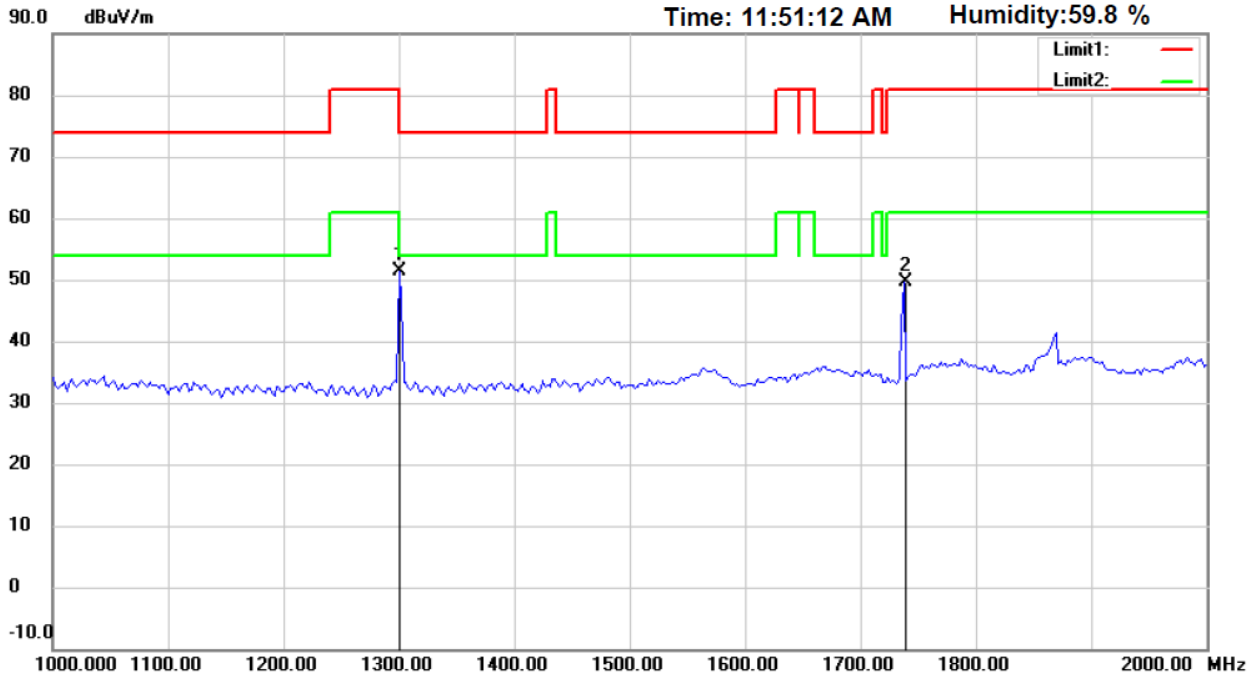
Polarization: *Vertical*
Power : 12 Vd.c.
Distance: 3m

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
	391.1822	28.16	peak	-3.45	24.71	80.80	100	175	-56.09	
	868.1363	62.33	peak	4.25	66.58	80.80	100	57	-14.22	
*	868.1363	56.46	AVG	4.25	60.71	60.80	100	57	-0.09	

Registration number: W6M21805-18060-C-1
FCC ID: 2APSVGLG1
IC: 23885-GLG1

Radiated Emission Measurement

Operator: Leon
File :3 Data :#1 Date: 5/11/2018 Time: 11:51:12 AM
Temperature:24.9 ℃
Humidity:59.8 %



Site : Chamber
Condition : FCC 15.231(433MHz) 1000-2000(PK)
EUT : W6M21805-18060
M/N:
Test Mode : TX 433.92MHz
Note :

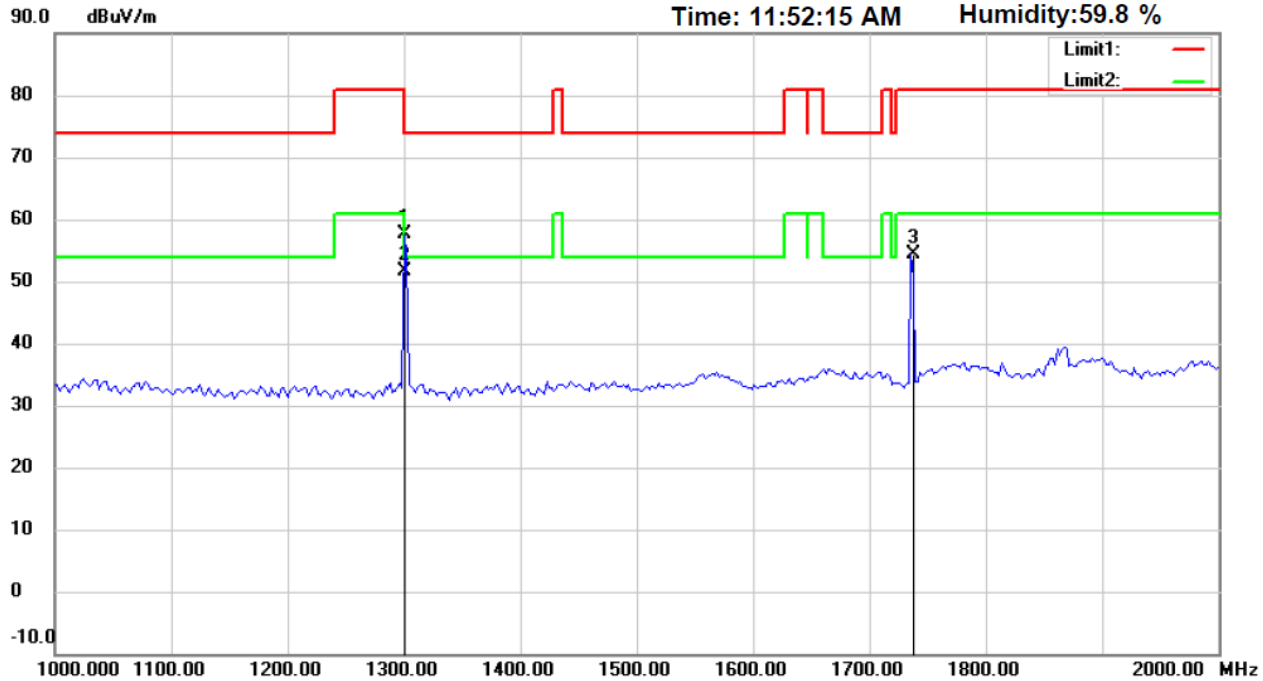
Polarization: *Horizontal*
Power : 12 Vd.c.
Distance: 3m

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
*	1300.601	60.35	peak	-9.00	51.35	74.00	150	135	-22.65	
	1737.475	56.82	peak	-7.07	49.75	80.80	150	80	-31.05	

Registration number: W6M21805-18060-C-1
FCC ID: 2APSVGLG1
IC: 23885-GLG1

Radiated Emission Measurement

Operator: Leon
File :3 Data :#4 Date: 5/11/2018 Time: 11:52:15 AM
Temperature:24.9 ℃
Humidity:59.8 %



Site : Chamber
Condition : FCC 15.231(433MHz) 1000-2000(PK)
EUT : W6M21805-18060
M/N:
Test Mode : TX 433.92MHz
Note :

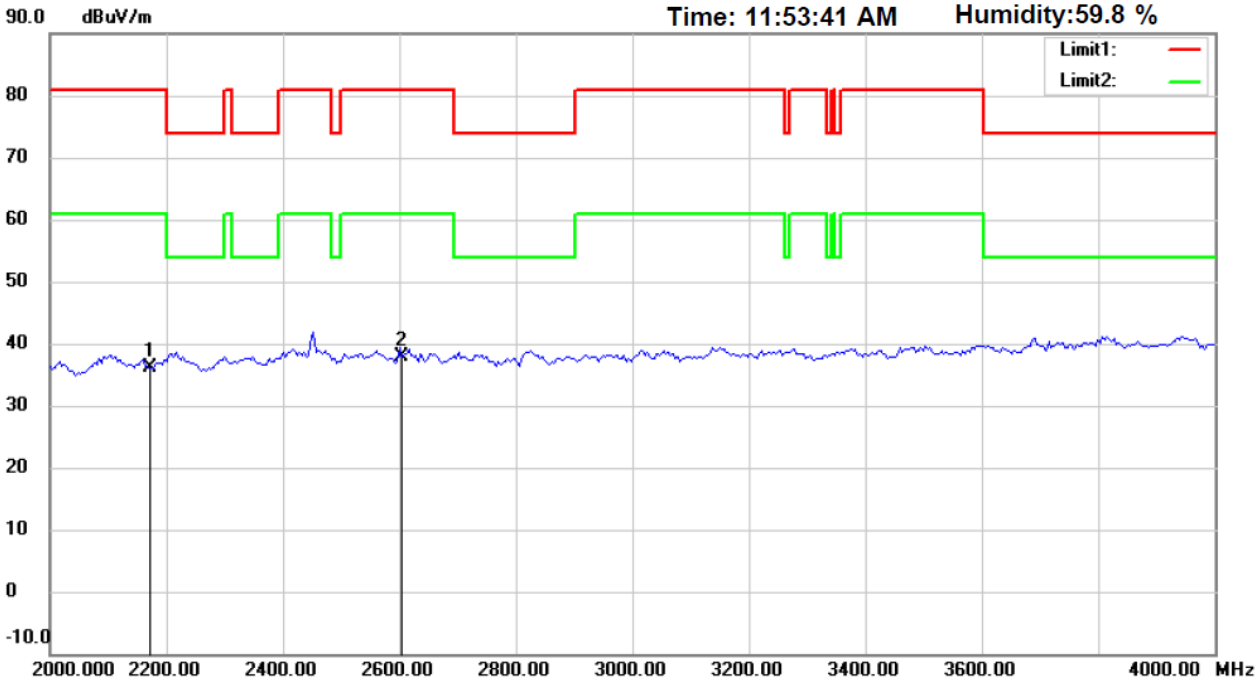
Polarization: *Vertical*
Power : 12 Vd.c.
Distance: 3m

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
	1300.601	66.62	peak	-9.00	57.62	74.00	150	193	-16.38	
*	1300.601	60.75	AVG	-9.00	51.75	54.00	150	193	-2.25	
	1735.471	61.49	peak	-7.09	54.40	80.80	150	254	-26.40	

Registration number: W6M21805-18060-C-1
FCC ID: 2APSVGLG1
IC: 23885-GLG1

Radiated Emission Measurement

Operator: Leon
File :3 Data :#2 Date: 5/11/2018 Time: 11:53:41 AM
Temperature:24.9 ℃
Humidity:59.8 %



Site : Chamber
Condition : FCC 15.231(433MHz) 2000-4000(PK)
EUT : W6M21805-18060
M/N:
Test Mode : TX 433.92MHz
Note :

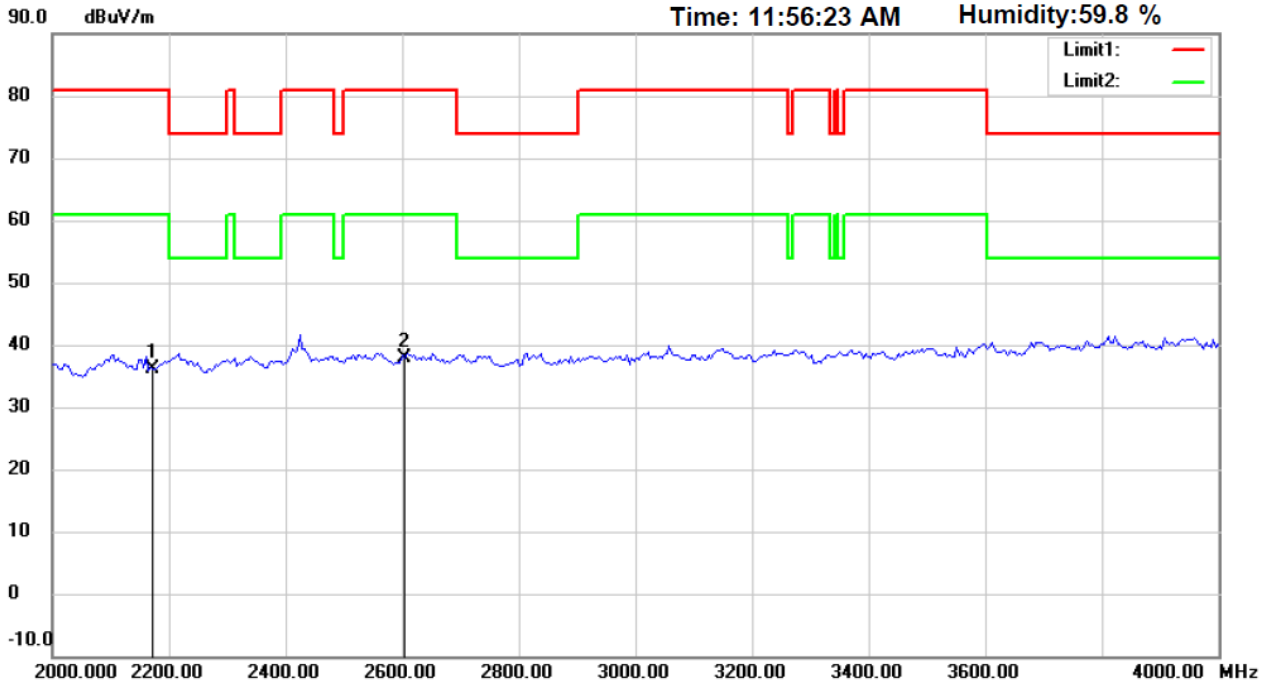
Polarization: *Horizontal*
Power : 12 Vd.c.
Distance: 3m

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
	2169.000	41.35	peak	-5.13	36.22	80.80	150	70	-44.58	
*	2603.000	41.25	peak	-3.30	37.95	80.80	150	216	-42.85	

Registration number: W6M21805-18060-C-1
FCC ID: 2APSVGLG1
IC: 23885-GLG1

Radiated Emission Measurement

Operator: Leon
File :3 Data :#5 Date: 5/11/2018 Time: 11:56:23 AM
Temperature:24.9 ℃
Humidity:59.8 %



Site : Chamber
Condition : FCC 15.231(433MHz) 2000-4000(PK)
EUT : W6M21805-18060
M/N:
Test Mode : TX 433.92MHz
Note :

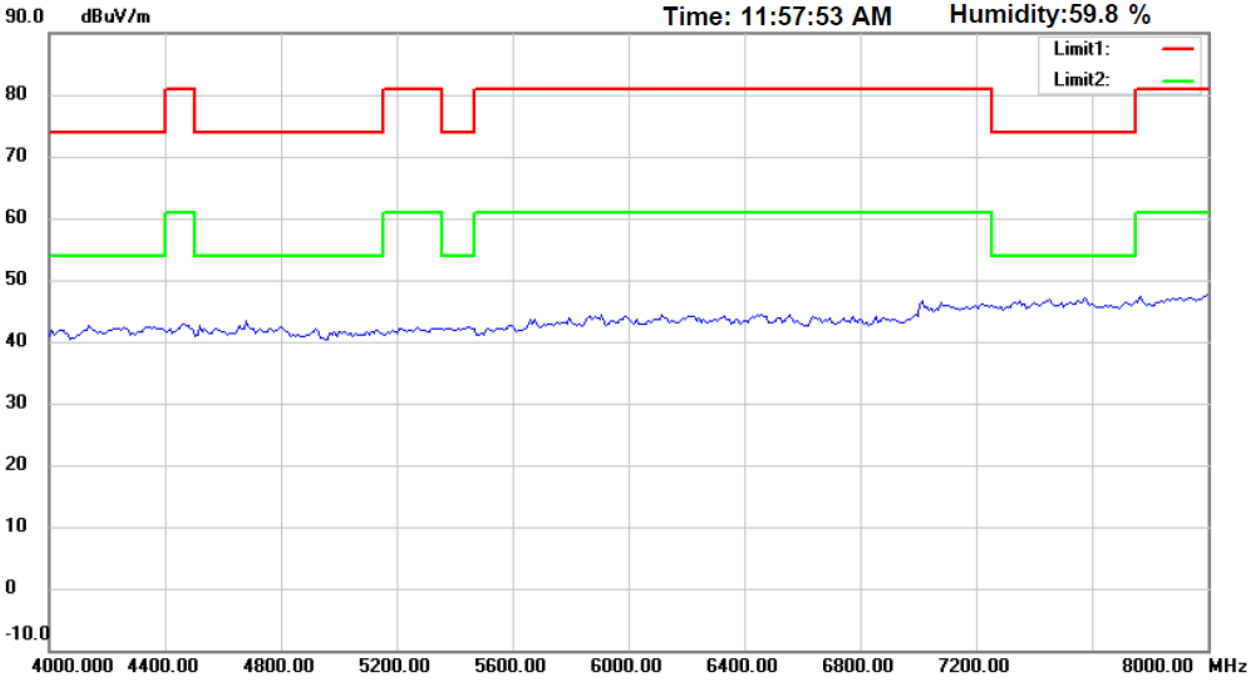
Polarization: *Vertical*
Power : 12 Vd.c.
Distance: 3m

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
	2169.600	41.33	peak	-5.13	36.20	80.80	150	58	-44.60	
*	2603.520	41.25	peak	-3.30	37.95	80.80	150	270	-42.85	

Registration number: W6M21805-18060-C-1
FCC ID: 2APSVGLG1
IC: 23885-GLG1

Radiated Emission Measurement

Operator: Leon
File :3 Data :#3 Date: 5/11/2018 Time: 11:57:53 AM
Temperature:24.9 ℃
Humidity:59.8 %

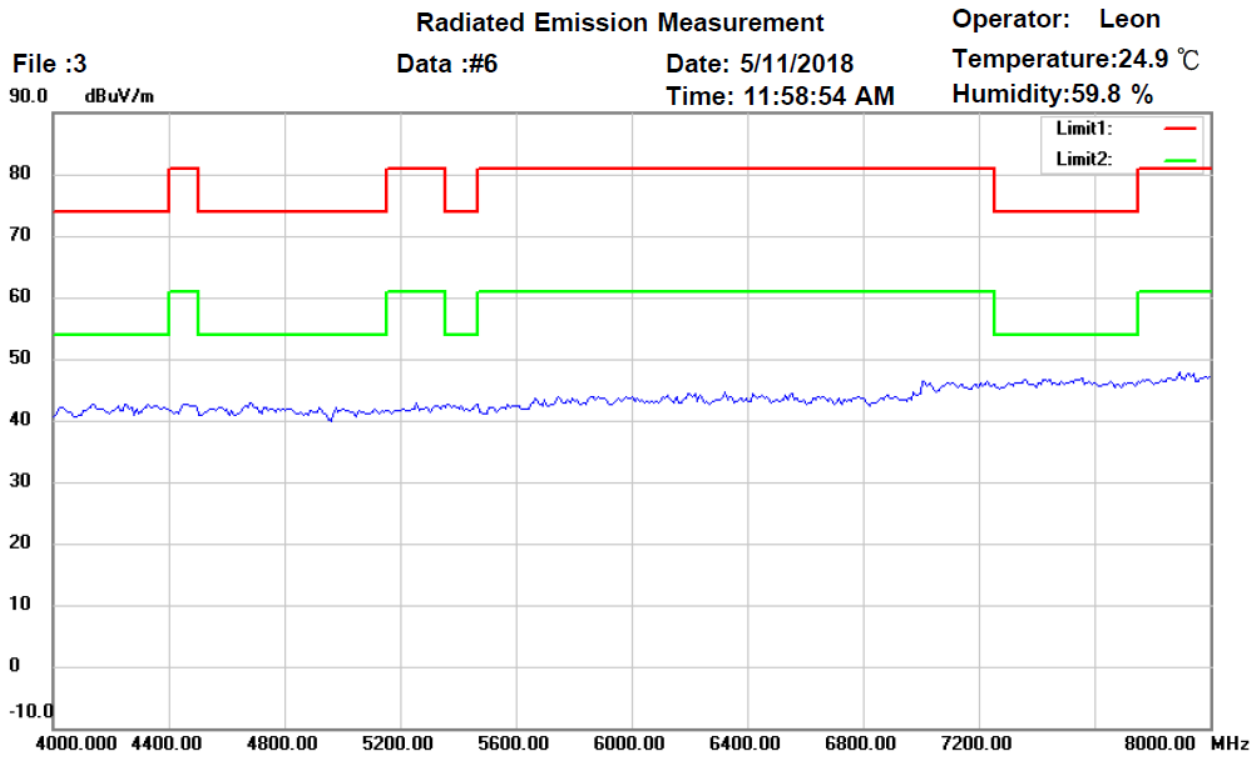


Site : Chamber
Condition : FCC 15.231(433MHz) 4000-8000(PK)
EUT : W6M21805-18060
M/N:
Test Mode : TX 433.92MHz
Note :

Polarization: *Horizontal*
Power : 12 Vd.c.
Distance: 3m

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

Registration number: W6M21805-18060-C-1
FCC ID: 2APSVGLG1
IC: 23885-GLG1



Site : Chamber
Condition : FCC 15.231(433MHz) 4000-8000(PK)
EUT : W6M21805-18060
M/N:
Test Mode : TX 433.92MHz
Note :

Polarization: *Vertical*
Power : 12 Vd.c.
Distance: 3m

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

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. **Up Line: PK Limit Line, Down Line: Ave Limit Line.**

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.

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

3.6 Channel Bandwidth

Measurement of Necessary Bandwidth (BN)

20dB bandwidth

Used frequency	Bandwidth	Limit
433.92 MHz	49.09819639 kHz	1.0848 MHz

Occupied bandwidth

Used frequency	Bandwidth	Limit
433.92 MHz	109.21843687 kHz	1.0848 MHz

Explanation: The bandwidth fulfills the requirements of FCC § 15.231 and IC RSS-210, see attached diagrams in appendix.

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 004

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.

Explanation: This PCB 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	Duty Cycle Correction 20*log(Duty Cycle)
Transmitting mode	100	50.88141	0.508814103	-5.87

Explanation: See attached diagrams in appendix.

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

3.9 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	--	--

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. **This test is not required because the EUT is battery-used.**

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.

Appendix

A Measurement diagrams

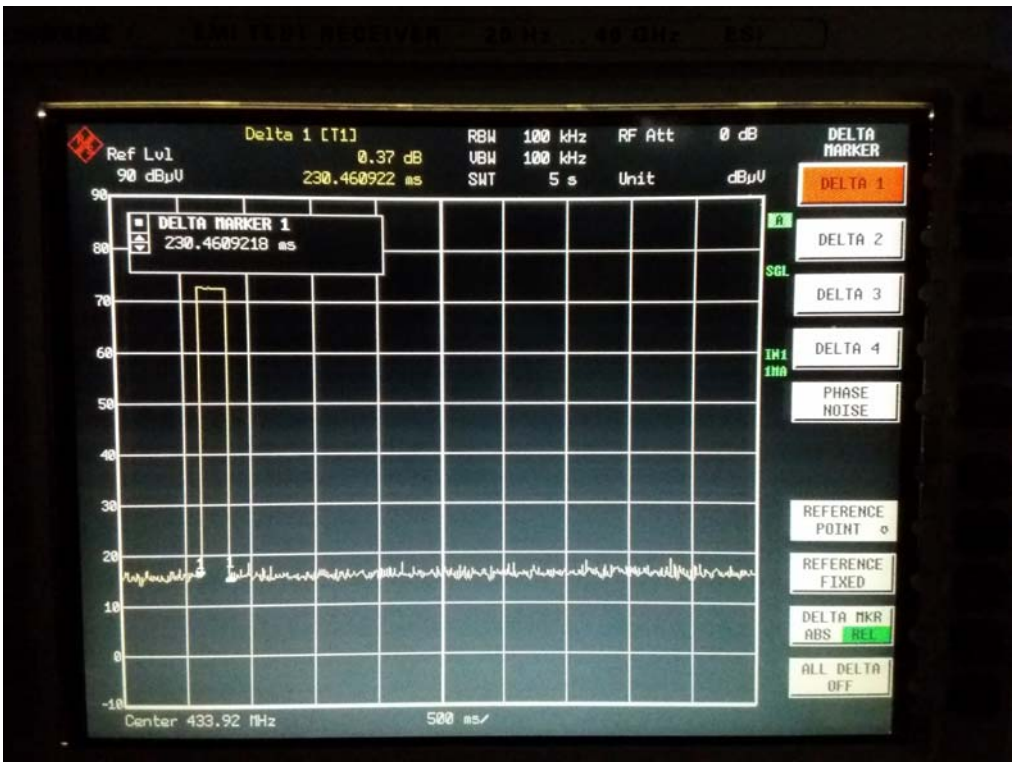
1. Active Time
2. Bandwidth
3. Occupied bandwidth
4. Duty Cycle

B Photos

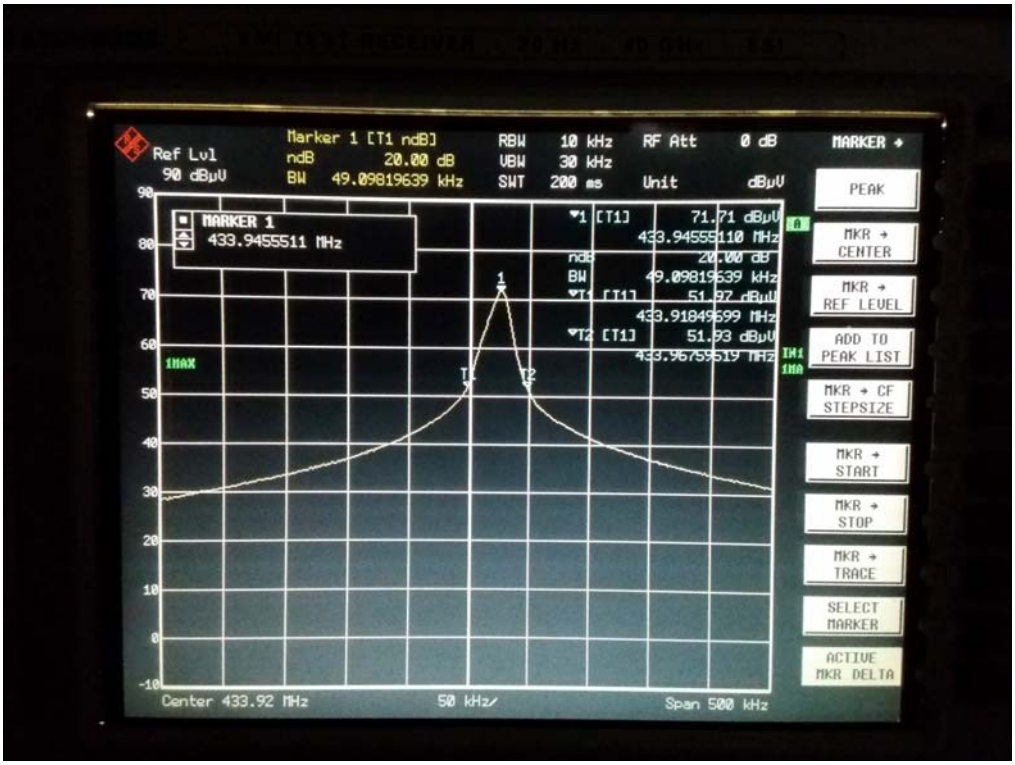
1. External Photos
2. Internal Photos
3. Set Up Photos of Radiated emission

Registration number: W6M21805-18060-C-1
FCC ID: 2APSVGLG1
IC: 23885-GLG1

Active Time

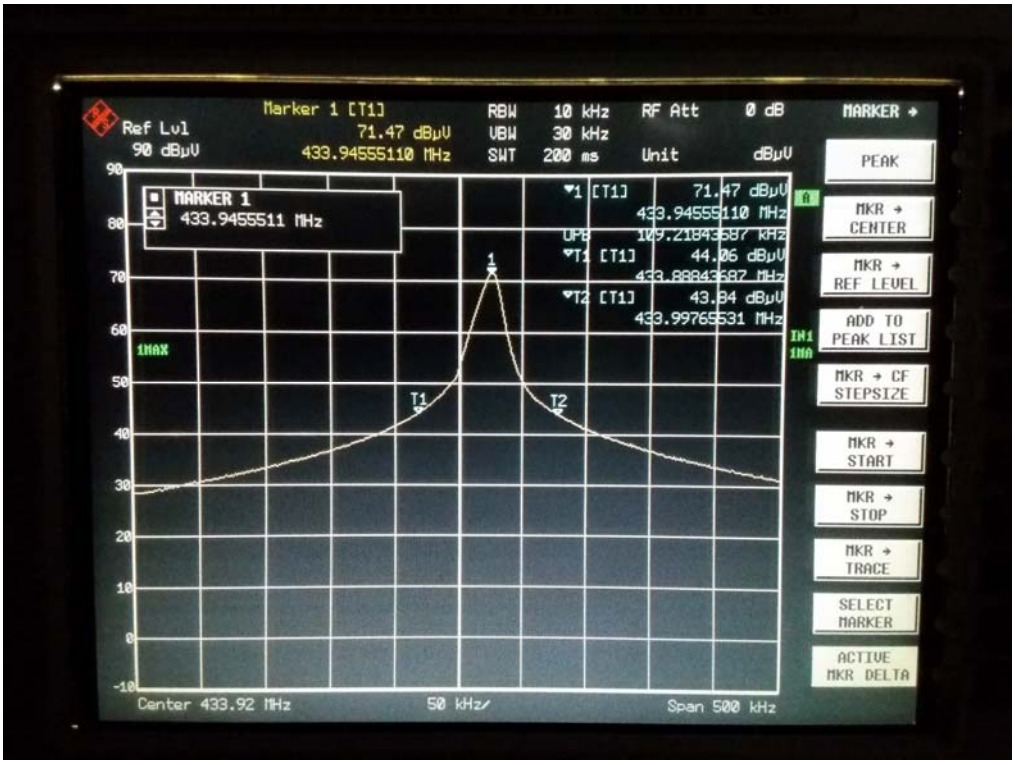


Bandwidth

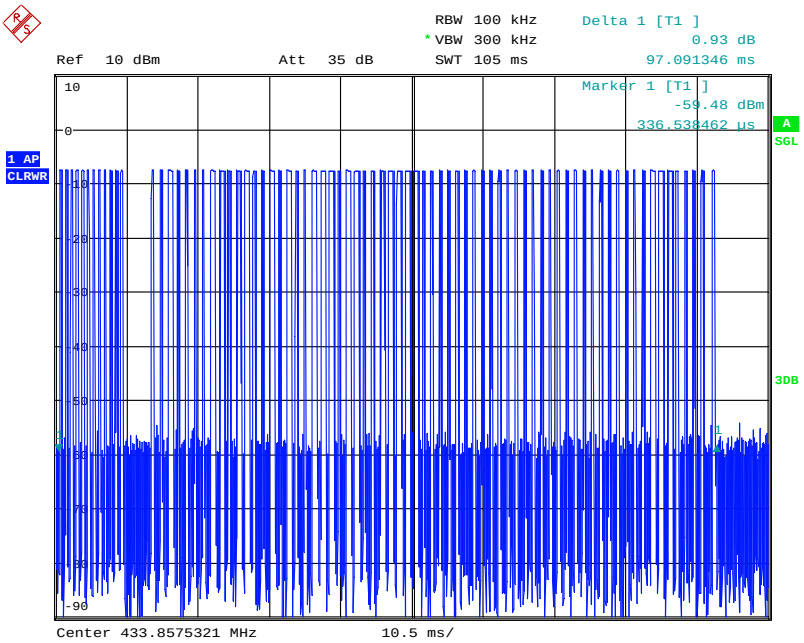


Registration number: W6M21805-18060-C-1
FCC ID: 2APSVGLG1
IC: 23885-GLG1

Occupied bandwidth

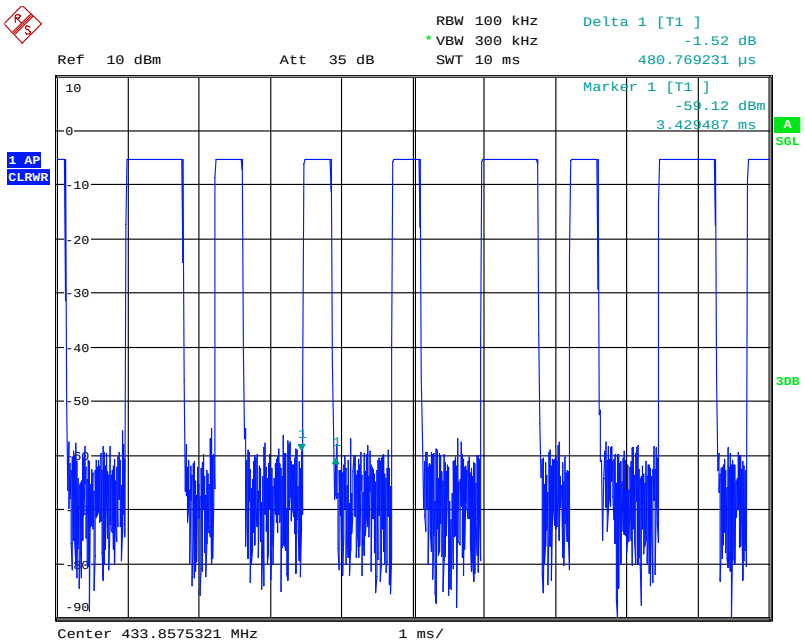


Duty Cycle

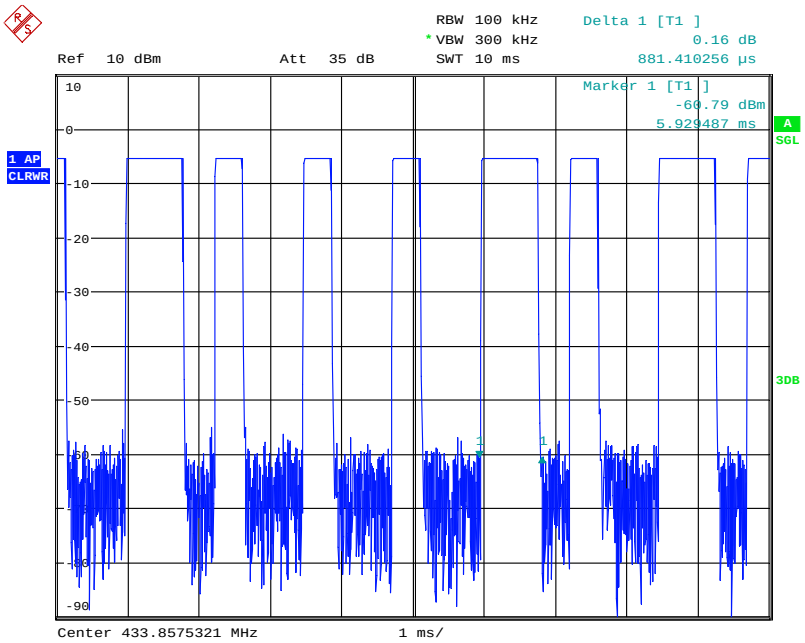


Date: 3.MAY.2018 20:44:27

Registration number: W6M21805-18060-C-1
FCC ID: 2APSVGLG1
IC: 23885-GLG1



Date: 3.MAY.2018 20:42:06



Date: 3.MAY.2018 20:42:39

Registration number: W6M21805-18060-C-1
FCC ID: 2APSVGLG1
IC: 23885-GLG1

External Photos

Registration number: W6M21805-18060-C-1
FCC ID: 2APSVGLG1
IC: 23885-GLG1

mm
10 20 30 40 50 60 70 80 90 100

Registration number: W6M21805-18060-C-1
FCC ID: 2APSVGLG1
IC: 23885-GLG1

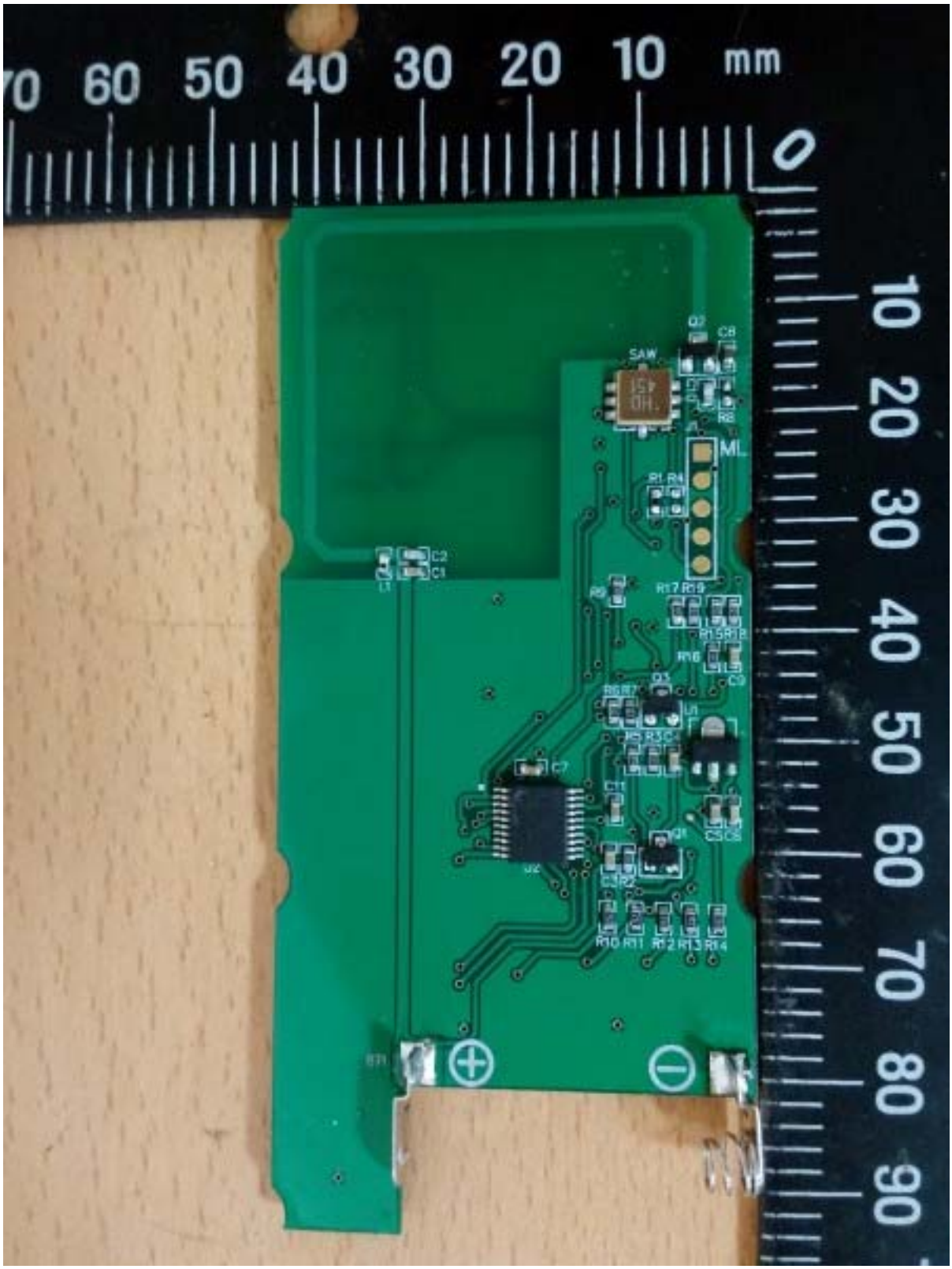
mm

Registration number: W6M21805-18060-C-1
FCC ID: 2APSVGLG1
IC: 23885-GLG1

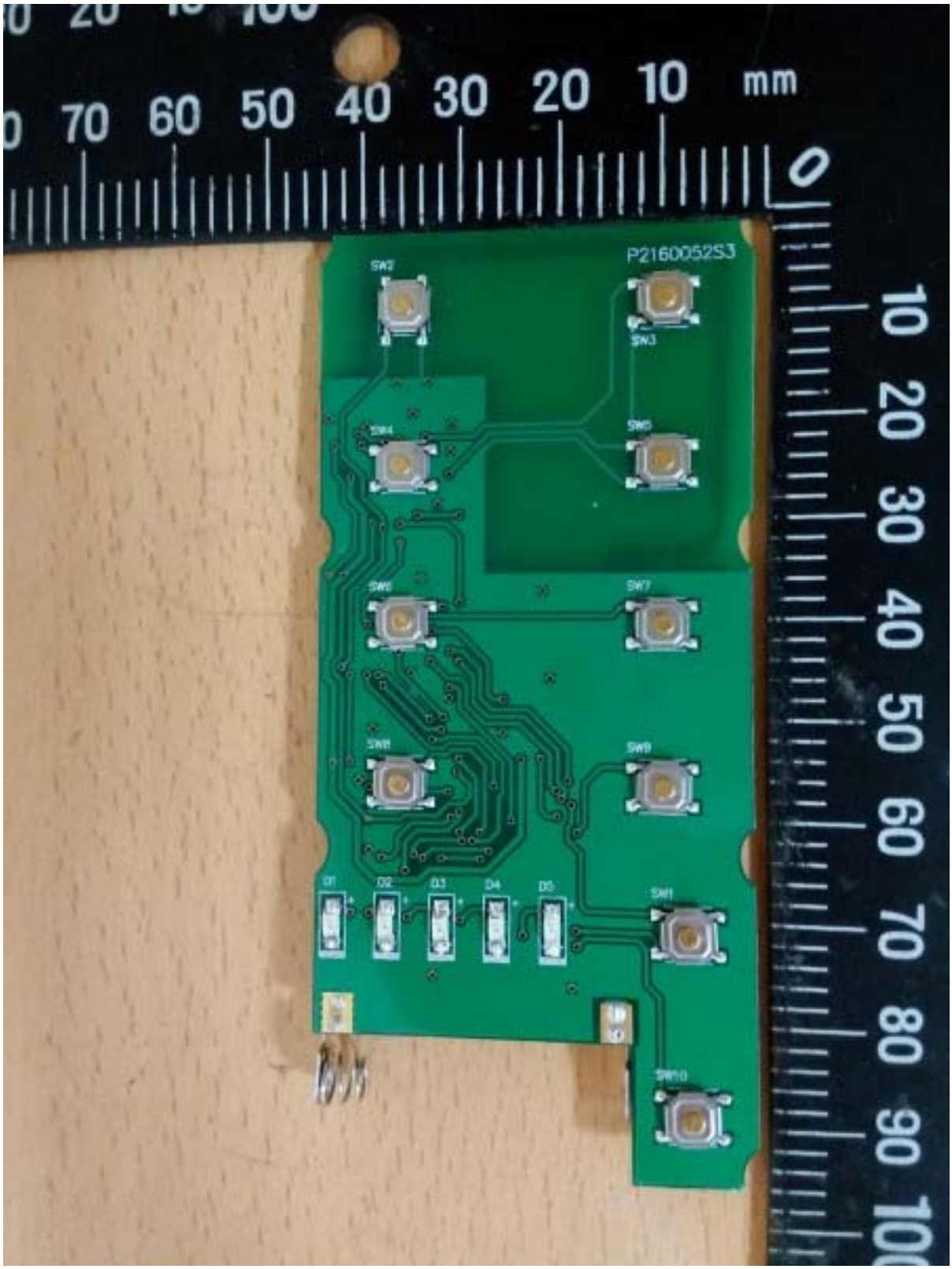
Registration number: W6M21805-18060-C-1
FCC ID: 2APSVGLG1
IC: 23885-GLG1

Internal Photos

Registration number: W6M21805-18060-C-1
FCC ID: 2APSVGLG1
IC: 23885-GLG1



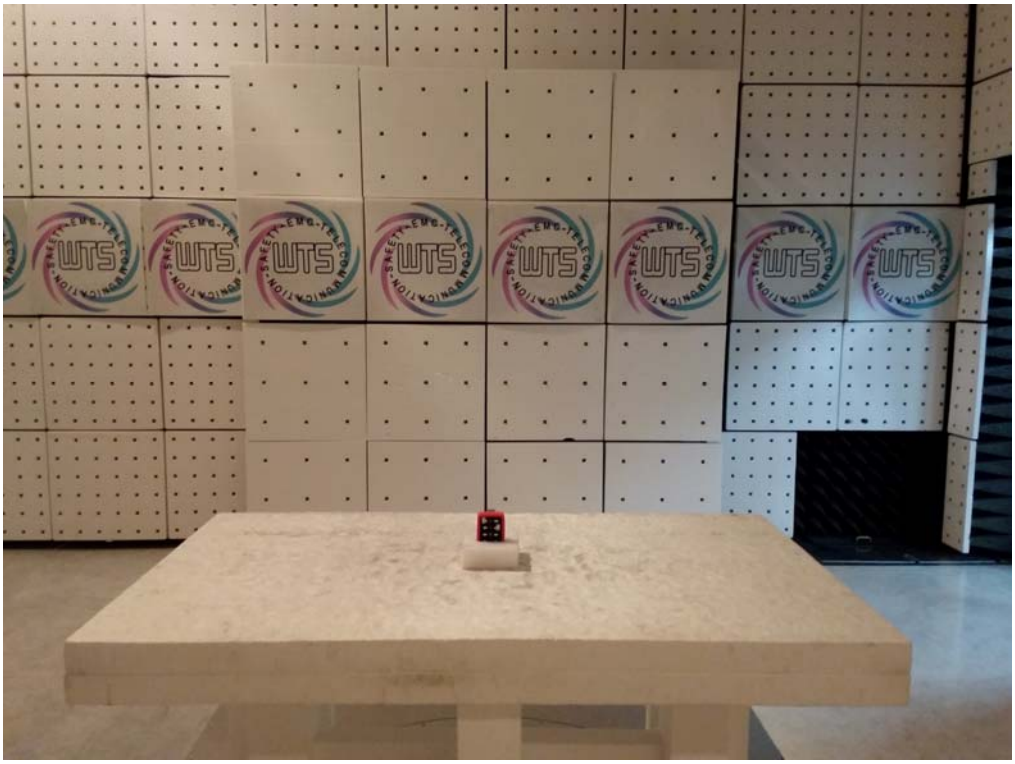
Registration number: W6M21805-18060-C-1
FCC ID: 2APSVGLG1
IC: 23885-GLG1



Registration number: W6M21805-18060-C-1
FCC ID: 2APSVGLG1
IC: 23885-GLG1

Registration number: W6M21805-18060-C-1
FCC ID: 2APSVGLG1
IC: 23885-GLG1

Set Up Photos of Radiated emission
Below 1GHz



Above 1GHz