



FCC 47 CFR PART 15
SUBPART C TEST REPORT

FOR

Wireless Door Entry Alarm & Counting System (Infrared Beam)/
Solar Panel Included

Model : E-931CS22RFCQ, E-931CS22RFPQ

Issued to
Superior Electronics Corporation
No. 10, Lane 31, Chongde St., Sinyl District, Taipei City 110,
Taiwan (R.O.C.)

Issued by

PEP Certification Corp.

Open Site	No. 120, Ln. 5, Hudong St., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)	
EMC Test Site	Xizhi Office and Lab	12F.-3, No.27-1, Ln. 169, Kangning St., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

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**APPENDIX 1 PHOTOS OF TEST CONFIGURATION
PHOTOS OF TEST**



1. GENERAL INFORMATION

Applicant : Superior Electronics Corporation
Address : No. 10, Lane 31, Chongde St., Sinyl District, Taipei City 110, Taiwan (R.O.C.)
Manufacturer : Superior Electronics Corporation
Address : No. 10, Lane 31, Chongde St., Sinyl District, Taipei City 110, Taiwan (R.O.C.)
EUT : Wireless Door Entry Alarm & Counting System (Infrared Beam)/Solar Panel Included
Model Name : E-931CS22RFCQ, E-931CS22RFPQ
Model Differences : The difference between series of models E-931CS22RFCQ, E-931CS22RFPQ are different for marketing purpose. The model, E-931CS22RFCQ, is the testing sample, and the final test data are shown on this test report.

Is here with confirmed to comply with the requirements set out in the FCC Rules and Regulations Part 15 Subpart C and the measurement procedures were according to ANSI C63.4-2003. The said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment are within the compliance requirements.

FCC part 15 subpart C

Receipt Date : 04/26/2013

Final Test Date : 09/06/2013

Approved By:

Alex Chou / Manager

Issued Date: 09.09.2013



1.1 DESCRIPTION OF THE TESTED SAMPLES

EUT Type : Engineer Type

Condition when received : Good Damage :

EUT Name : Wireless Door Entry Alarm & Counting System
(Infrared Beam)/Solar Panel Included

Model Number : E-931CS22RFCQ

Receipt Date : 04/26/2013

Input Voltage : (1) 3.7 Vdc (From Li-ion Battery)
Input : AC 100-240V 50-60Hz 0.18A
Output: DC 12V 0.5A

Power From Inside Outside
Adaptor BATTERY AC Power Source DC Power Source
Support Unit PC

Modulation Technique : ASK

Number of Channels : 1

Channel spacing : N/A _____MHz

Operating Mode : Simplex Duplex

Antenna Type : integral antenna: 1/4λ antenna a dedicated antenna_

Frequency Band : 433.92 MHz



2. TEST SPECIFICATION, PROCEDURE & RESULT

2.1 TEST SPECIFICATION

Test Specification: FCC Part 15 Subpart C
Title: FCC 47CFR Part 15 Radio Frequency Device Subpart C Intentional Radiators Section 15.231
Periodic operation in the band 40.66~40.70MHz and above 70MHz

2.2 TEST RESULTS

No.	Item	Test Procedure	Specification	Remarks	Result
1	Field Strength of Fundamental Emissions & Spurious Emission	ANSI C63.4:2003	FCC Section 15.231(b)	Radiated	Passed
2	Radiated Emission 30MHz to 1GHz Above 1GHz	ANSI C63.4:2003	FCC Section 15.231(b)	Radiated	Passed
3	-20dB Bandwidth	ANSI C63.4:2003	FCC Section 15.231(c)	Radiated	Passed
4	Conducted Emission 0.15MHz to 30MHz	ANSI C63.4:2003	FCC Section 15.207	AC Mains	Passed
5	Release Time Measurement	ANSI C63.4:2003	FCC Section 15.231(a)(1)	N/A	Passed
6	Antenna Requirement	ANSI C63.4:2003	FCC Section 15.203	N/A	Passed

2.3 TEST PROCEDURES

Conducted Emissions

The EUT is placed on a wood table, which is at 0.8 m above ground plane according to clause 15.207 and requirements of ANSI C63.4:2003. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz are using CISPR Quasi-Peak / Average detectors.



Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable was rotated through 360 degrees to determine the position of maximum emission level. The EUT is placed at 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.



2.4 DESCRIPTION OF TEST MODES

The EUT was tested under following modes:

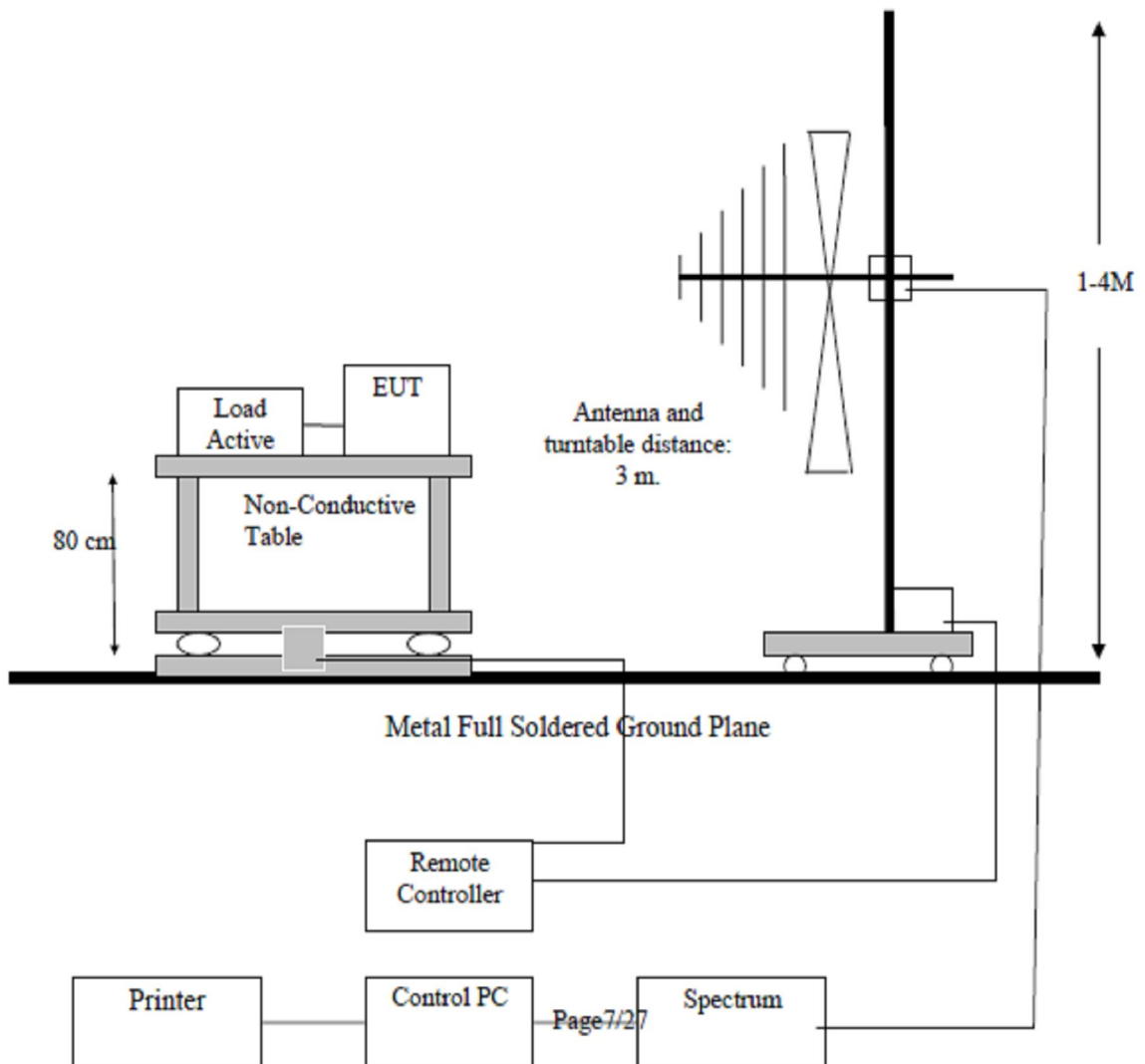
Modes:

1. Continuous transmitting
2. Normal mode

2.5 DESCRIPTION OF THE SUPPORT EQUIPMENTS

Setup Diagram

See test photographs attached in appendix 1 for the actual connections between EUT and support equipment.





Support Equipment

OUTSIDE SUPPORT EQUIPMENT							
No.	Equipment	Model	Serial No.	FCC ID/ BSMI ID	Trade name	Data Cable	Power Cord
	N/A						
EUT							
No.	Equipment	Model	Serial No.	FCC ID/ BSMI ID	Trade name	Data Cable	Power Cord
1.	MB	P-250 VX	N/A	N/A	N/A	N/A	N/A
2.	Li-ion Battery	OM6C	N/A	N/A	N/A	N/A	N/A
3.	Adapter	CH0612-B	N/A	N/A	JENTEC	Shielded 1.8m	N/A

Note: All the above equipment/cable were placed in worse case position to maximize emission signals during emission test

Grounding: Grounding was in accordance with the manufacturer's requirement and conditions for the intended use.



3. TEST AND MEASUREMENT EQUIPMENT

3.1 CALIBRATION

The measuring equipment utilized to perform the tests documented in the report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

3.2 EQUIPMENT

The following list contains measurement equipment used for testing. The equipment conforms to the requirement of CISPR 16-1, ANSI C63.2 and. Other required standards.

Calibration of all test and measurement, including any accessories that may effect such calibration, is checked frequently to ensure the accuracy. Adjustments are made and correction factors are applied in accordance with the instructions contained in the respective.

TABLE LIST OF TEST AND MEASUREMENT EQUIPMENT

Instrument	Manufacturer	Model No.	S/N	Next Cal. Date	Cal. Interval
Receiver	R&S	ESHS10	830223/008	Mar. 24, 2014	1 Year
Spectrum Analyzer	R&S	FSP3	833387	Mar. 25, 2014	1 Year
RF Cable	MIYAZAKI & Anritsu	RG58A0 & MP59B	M79094	Apr. 08, 2014	1 Year
L.I.S.N	Rolf Heine Hochfrequenztechnik	NNB-2/16z	98062	Feb. 26, 2014	1 Year
Four Balanced Telecom Pairs ISN	FCC	FCC-TLISN-T8-02	20520	Mar,27,2014	1 Year
Four Balanced Telecom Pairs ISN	FCC	FCC-TLISN-T4-02	20612	Jan.14.2014	1 Year
Four Balanced Telecom Pairs ISN	FCC	FCC-TLISN-T2-02	20611	Jan.14.2014	1 Year
Click Analyzer	Schaffner	DIA1512C	5218	Mar 15, 2014	1 Year
Absorbing Clamp	R&S	MDS-21	841077/010	Mar. 28, 2014	1 Year
Receiver	R&S	ESVS30	863342/012	Oct. 11,2013	1 Year
Spectrum Analyzer	Nex1 Future	NS-265	NO5044006	Oct. 02, 2013	1 Year
Antenna	Schwarzbeck	VULB 9160	VULB 9160/3074	Oct. 02, 2013	1 Year
RF Cable	N/A	8DFB	N/A	Oct. 07, 2013	1 Year
Pre-Amp	Anritsv	MH648A	M15180	Oct. 07, 2013	1 Year
Harmonic/ Flicker	EMC-PARTNER	HAR-1000	066	Oct. 17, 2013	1 Year



ESD Simulator	NOISEKEN	ESS-2002	ESS0767151	Mar. 18. 2014	1 Year
EFT Noise Generator	EMC-PARTNER	TRANSIENT -2000	N/A	Oct. 17, 2013	1 Year
Surge Tester	EMC-PARTNET	TRANSIENT -2000	N/A	Oct. 17, 2013	1 Year
CDN	FRANKONIA	CDN M2+M3	A3011021	Oct. 17, 2013	1 Year
T4 CDN	FRANKONIA	CDN-RJ45	A3023011	Oct. 17, 2013	1 Year
Conducted Immunity Test System	FRANKONIA	CIT-10175	102C3117	Jul.07, 2014	1Year
Spectrum Analyzer	Nex1	NS-265	NO5044006	Oct. 02, 2013	1 Year
1GHz~18GHz RF Cable	EMCI	SMA(male) 4M+7M (1~18G)	N/A	Oct. 04, 2013	1 Year
Hron Antenna 1GHZ~18GHZ	COM-POWER	AH-118	10056	Oct.04, 2013	1 Year
Pre-Amplifier 500M~18G	EMCI	EMC051845	500M~18G	Oct.16, 2013	1 Year
18G~26G RF Cable	HUBER+SUHNER	SUCOFLEX 102	SMA(male) (18G~26G)	Oct.24, 2013	1 Year
Hron Antenna 18G~26G	COM-Power	AH-826	081000	Oct.14, 2013	1 Year
Preamplifier 18G~26G	MITEQ	30-5A	808329	Oct.07, 2013	1Year

※Calibration interval of instruments listed above is one year



4. SECTION 15.231(b) REQUIREMENTS (FUNDAMENTAL AND SPURIOUS EMISSION)

4.1 LIMIT

Limits for Field Strength of Fundamental Emissions [FCC 47 CFR 15.231b]:

Frequency Range of Fundamental (MHz)	Field Strength of Fundamental Emission (Peak)	Field Strength of Fundamental Emission (Average)
40.66-40.70	1,000	300
70-130	500	30
130-174	500 to 1,500*	30
174-260	1,500	3
260-470	1,500 to 5,000*	3
Above 470	5,000	3

**Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follow: for the band 130-174 MHz, $\mu\text{V/m}$ at 3meters= $56.81818(F)-6136.3636$; for the band 260-470 MHz, $\mu\text{V/m}$ at 3 meters= $41.6667(F)-7083.3333$. The maximum permitted unwanted emission level is 20dB below the maximum permitted fundamental level .*



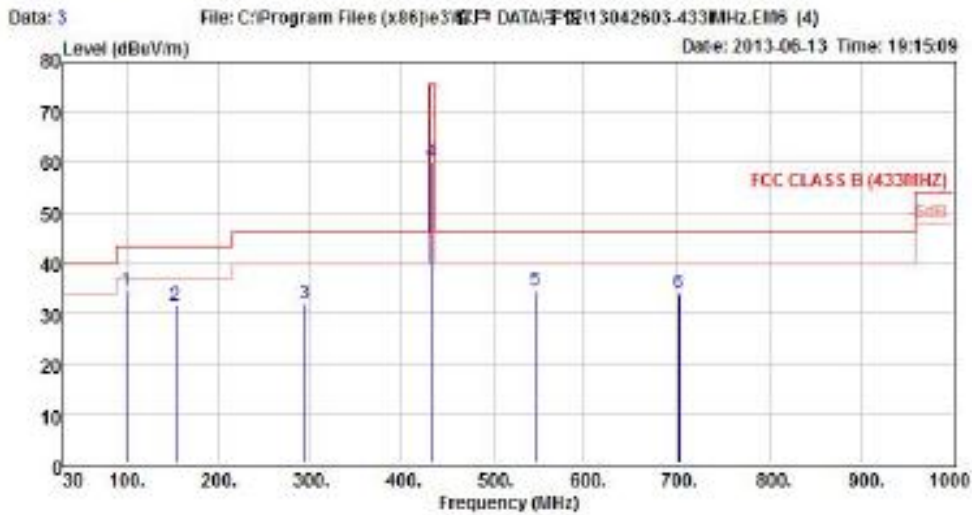
4.2 RESULT: PASSED

4.3 TEST DATA:

Horizontal



PEP Certification Corp.



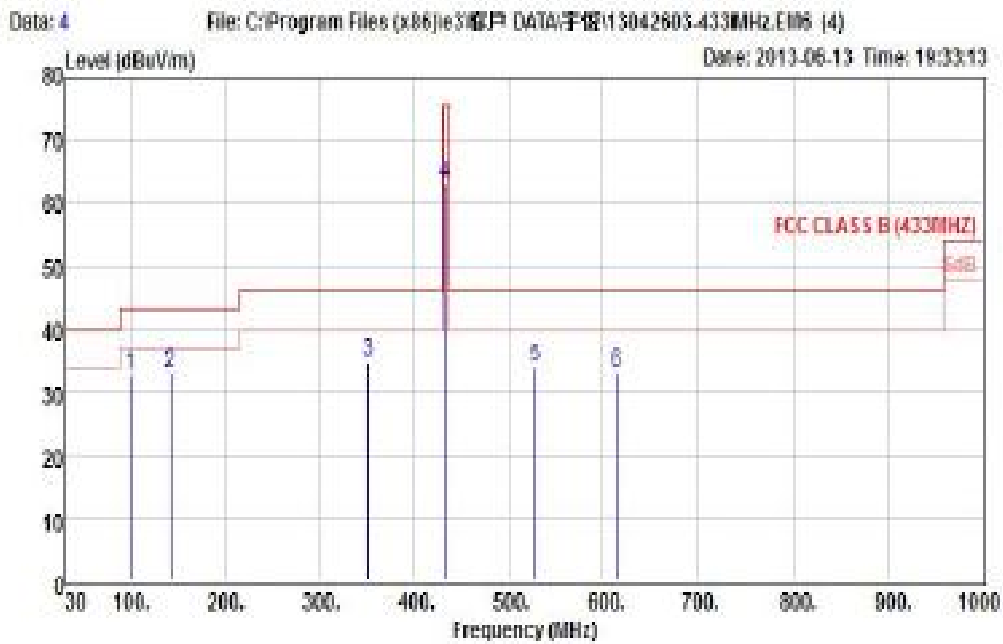
	Read Freq	Read Level	Level	Factor	Over Limit	Limit Line	Remark
	MHz	dBuV	dBuV/m	dB/m	dB	dBuV/m	
1	99.84	55.90	34.41	-21.49	-8.59	43.00	QP
2	153.19	48.99	31.46	-17.53	-11.54	43.00	QP
3	293.84	50.40	31.88	-18.52	-14.12	46.00	QP
4	433.52	75.62	59.93	-15.69	-15.67	75.60	QP
5	547.01	48.84	34.64	-14.20	-11.36	46.00	QP
6	703.18	43.13	33.92	-9.21	-12.08	46.00	QP



Vertical



PEP Certification Corp.



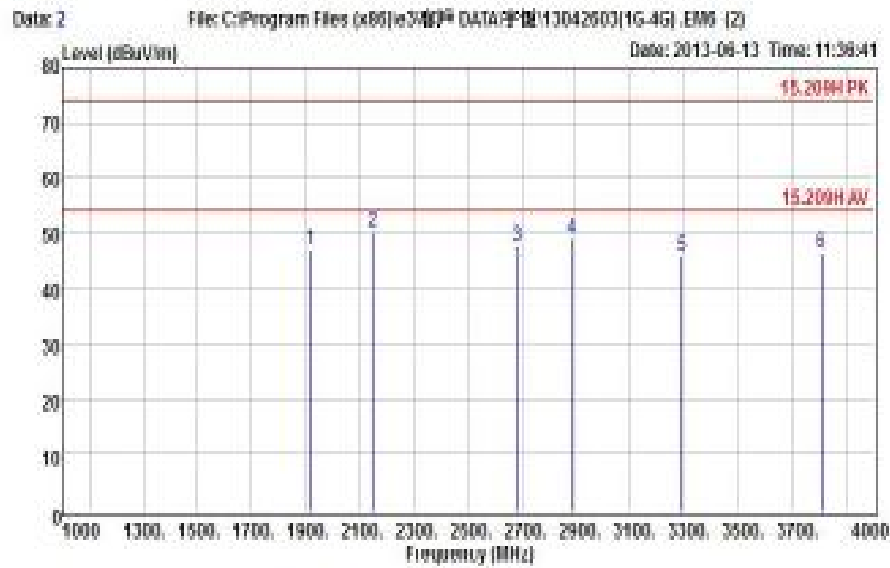
	Read	Over	Limit				
Freq	Level	Level	Factor	Limit			
MHz	dBuV	dBuV/m	dB/m	dB			
1	99.84	54.19	32.70	-21.49	-10.30	43.00	QP
2	141.55	50.80	33.11	-17.69	-9.89	43.00	QP
3	351.07	52.55	34.92	-17.63	-11.08	46.00	QP
4	433.52	78.68	62.99	-15.69	-12.61	75.60	QP
5	528.58	48.11	33.90	-14.21	-12.10	46.00	QP
6	615.88	46.08	32.98	-13.10	-13.02	46.00	QP



Horizontal



PEP Certification Corp.



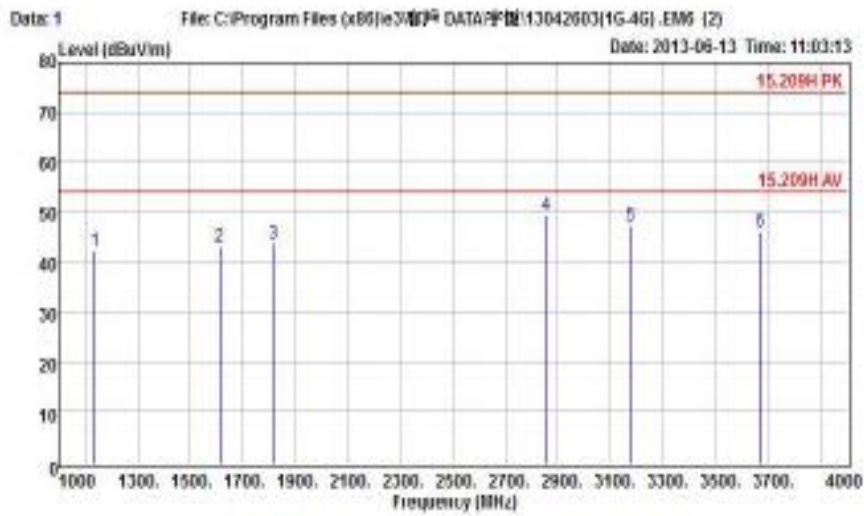
	Read			Over	Limit	
	Freq	Level	Level	Factor	Limit	Line Remark
	MHz	dBuV	dBuV/m	dB/m	dB	dBuV/m
1	1918.00	75.40	47.09	-28.31	-26.91	74.00 Peak
2	2148.00	78.05	50.18	-27.87	-23.82	74.00 Peak
3	2683.00	74.99	47.58	-27.41	-26.42	74.00 Peak
4	2887.00	76.00	49.01	-26.99	-24.99	74.00 Peak
5	3292.00	72.37	45.68	-26.69	-28.32	74.00 Peak
6	3808.00	72.38	46.44	-25.94	-27.56	74.00 Peak



Vertical



PEP Certification Corp.

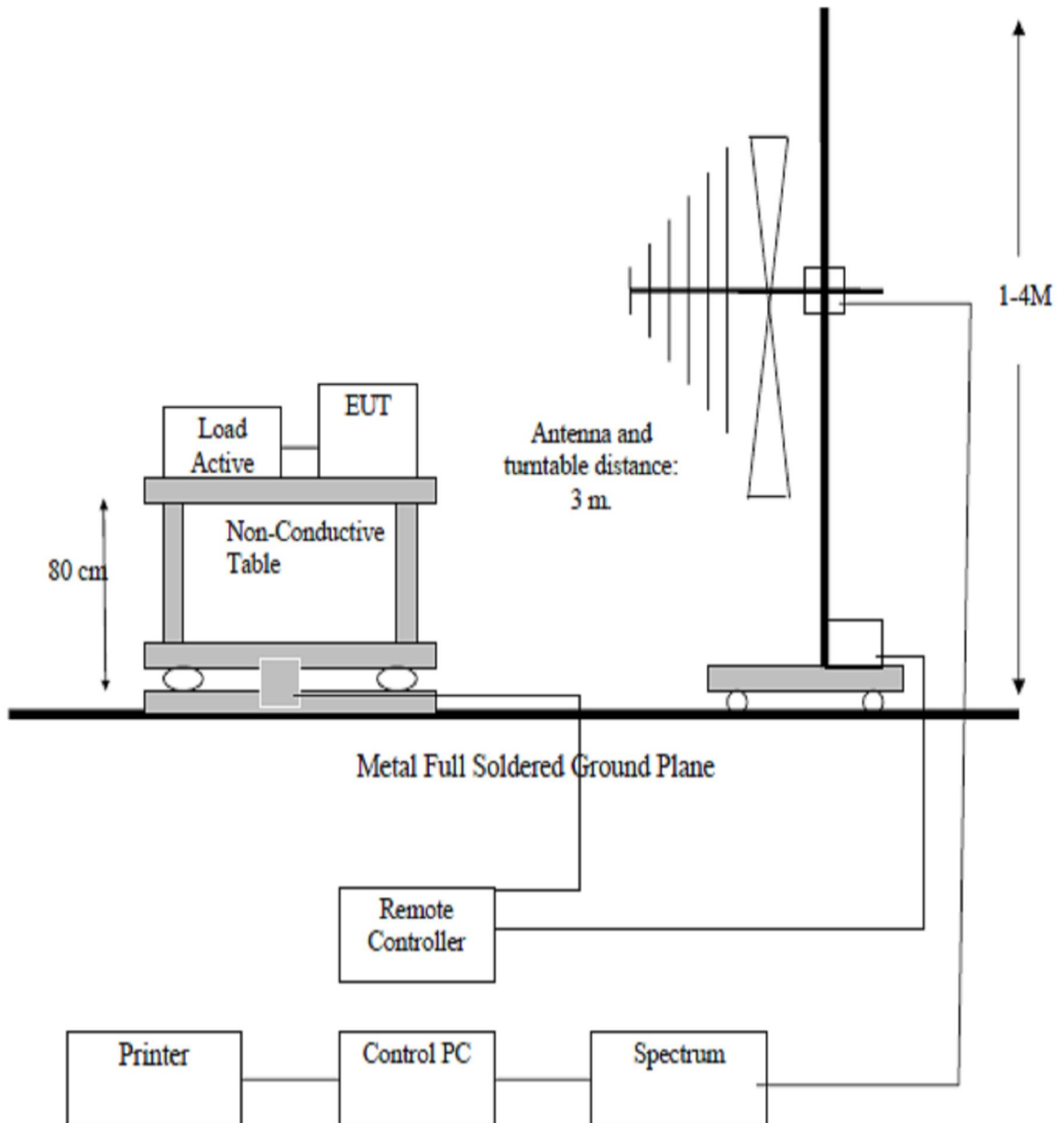


	Read	Over	Limit				
Freq	Level	Level	Factor	Limit	Line	Remark	
MHz	dBuV	dBuV/m	dB/m	dB	dBuV/m		
1	1136.00	72.38	42.32	-30.06	-31.68	74.00	Peak
2	1612.00	72.86	43.12	-29.74	-30.88	74.00	Peak
3	1816.00	72.36	43.57	-28.79	-30.43	74.00	Peak
4	2853.00	76.29	49.22	-27.07	-24.78	74.00	Peak
5	3176.00	73.98	47.27	-26.71	-26.73	74.00	Peak
6	3669.00	72.21	45.95	-26.26	-28.05	74.00	Peak



5. SECTION 15.231(b) REQUIREMENTS (GENERAL RADIATED EMISSION)

5.1 TEST SETUP





5.2 LIMIT

Limits for Field Strength of Fundamental Emissions [FCC 47 CFR 15.209 Class B]:.

Frequency (MHz)	Field Strength (mV/m)	Measurement Distance
1.705-	30	30
30-88	100*	3
88-	150*	3
216-	200*	3
Above 960	500*	3

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz,*

174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

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

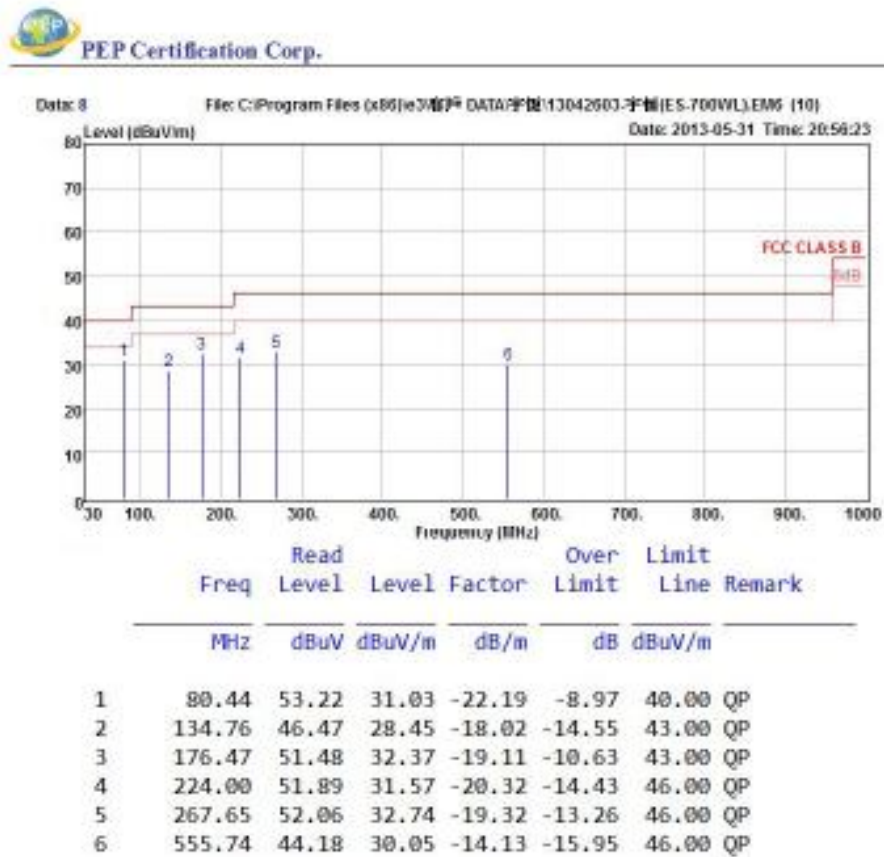
Frequency (Hz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
1.705-	30 (at 30-meter)	49.5
30-88	100	40
88-	150	43.5
216-	200	46
Above 960	500	54

5.3 RESULT: PASSED



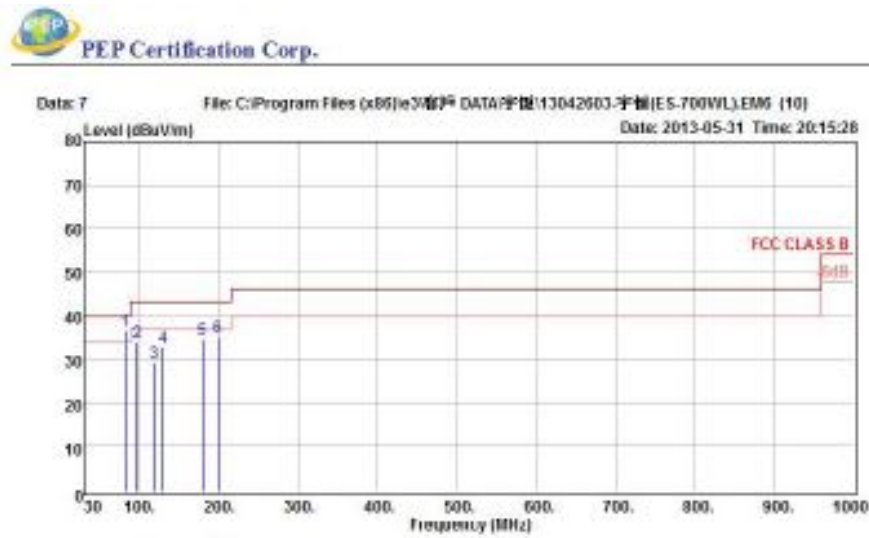
5.4 TEST DATA:

Horizontal





Vertical



	Read Freq	Read Level	Read Level	Over Factor	Limit	Limit	Remark
	MHz	dBuV	dBuV/m	dB/m	dB	dBuV/m	
1 !	81.41	58.73	36.50	-22.23	-3.50	40.00	QP
2	96.93	55.73	33.94	-21.79	-9.06	43.00	QP
3	119.24	48.30	29.07	-19.23	-13.93	43.00	QP
4	129.91	50.88	32.58	-18.30	-10.42	43.00	QP
5	179.38	54.12	34.59	-19.53	-8.41	43.00	QP
6	198.78	56.12	34.98	-21.14	-8.02	43.00	QP



6. SECTION 15.231(c) REQUIREMENTS (20dB BANKWIDTH)

6.1 TEST METHOS

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

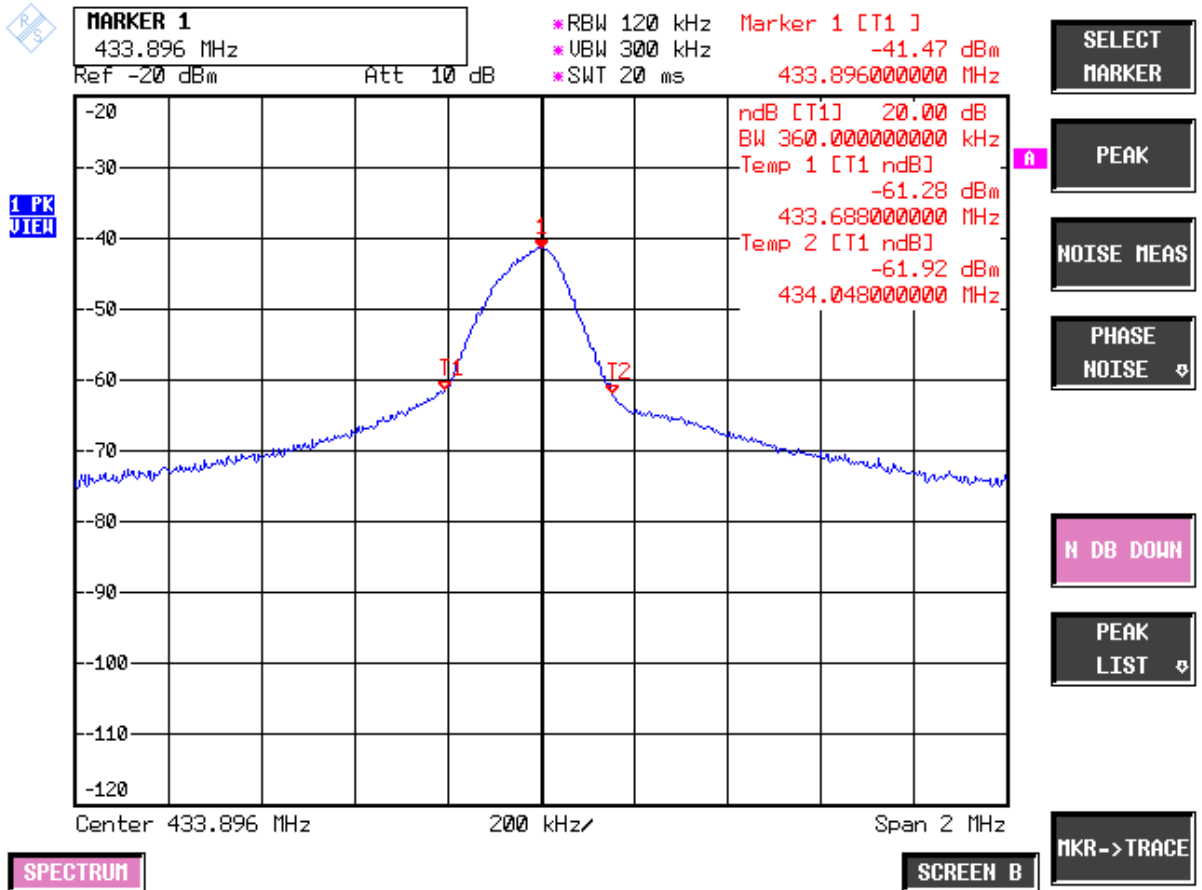
6.2 LIMIT:

Frequency Range (MHz)	20dB Bandwidth (kHz)	FCC Limits* (kHz)
433	360	787

6.3 RESULT: PASSED



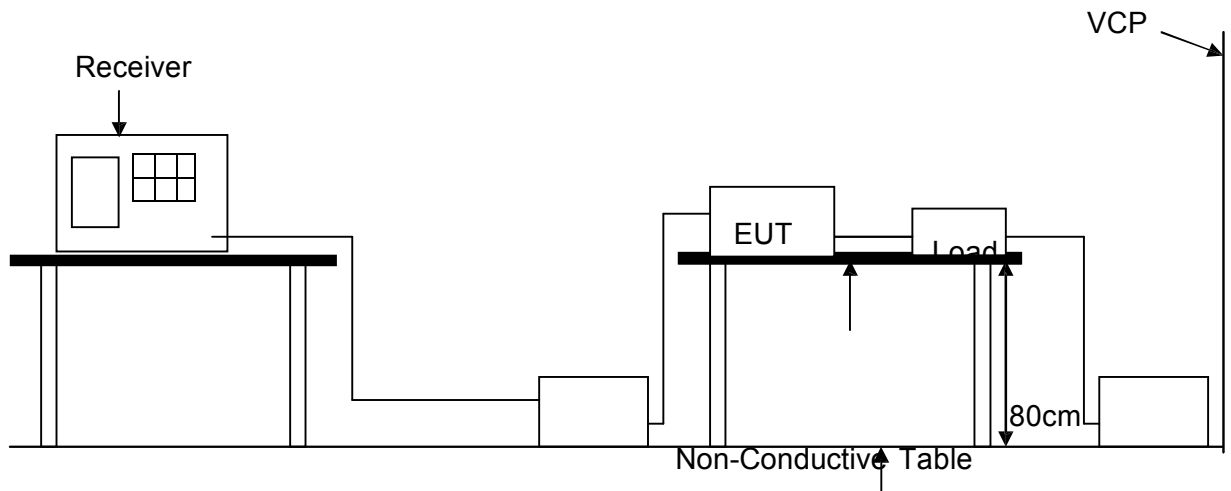
6.4 TEST DATA:





7. SECTION 15.207 REQUIREMENTS (POWERLINE CONDUCTED EMISSIONS)

7.1 TEST SETUP



7.2 TEST LIMIT

Frequency range (MHz)	CLASS A		CLASS B	
	QP dB(uV)	Average dB(uV)	QP dB(uV)	Average dB(uV)
0.15-0.5	79 dBuV	66 dBuV	66 - 56 dBuV	56 - 46 dBuV
0.5-	73 dBuV	60 dBuV	56 dBuV	46 dBuV
5.0-30.0	73 dBuV	60 dBuV	60 dBuV	50 dBuV

Remark: In the above table, the tighter limit applies at the band edges.

7.3 TEST PROCEDURE

The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). It provides a 50 ohm / 50 μH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50 ohm / 50 μH coupling impedance with 50 ohm termination. (Please refer to the block diagram of the test setup and photograph.)

Both sides of AC line are checked for the maximum conducted emission interference. In

order to find the maximum emissions, the relating positions of equipment and all of the interference cables must be changed according to EN 55022 regulations: The measurement procedure on conducted emission interference.

The resolution bandwidth of the field strength meter is set at 9 KHz.



7.4 TEST SPECIFICATION

According to PART15.207

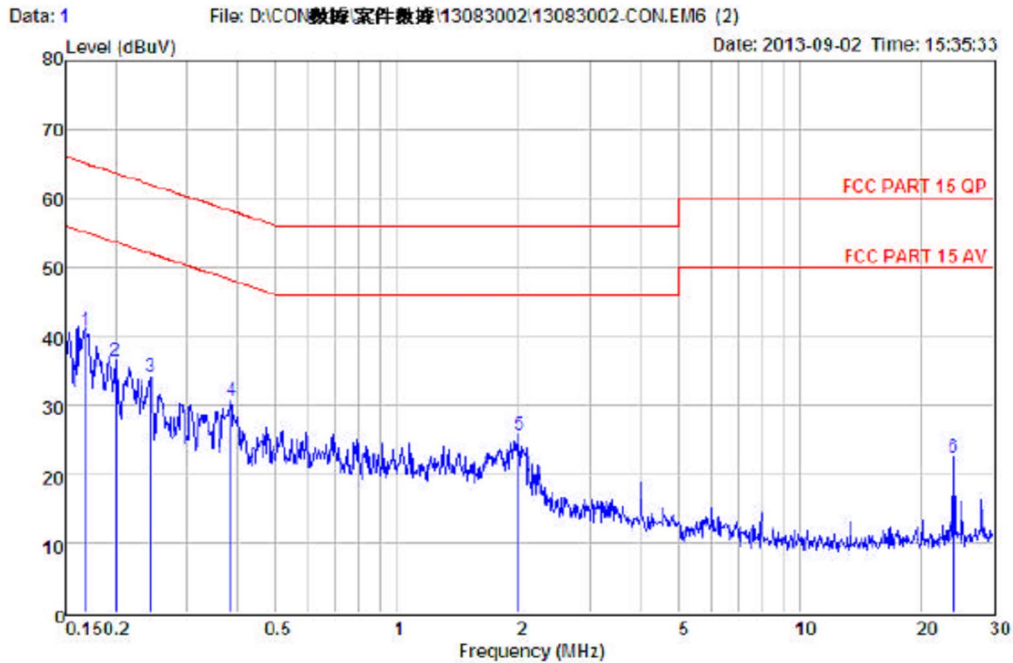
7.5 RESULT: Pass

7.6 TEST DATA:



PEP Certification Corp.

PEP Certification Corp.
tel:02-2692-2097
fax:02-2695-6236
email:alex@gtest.tw



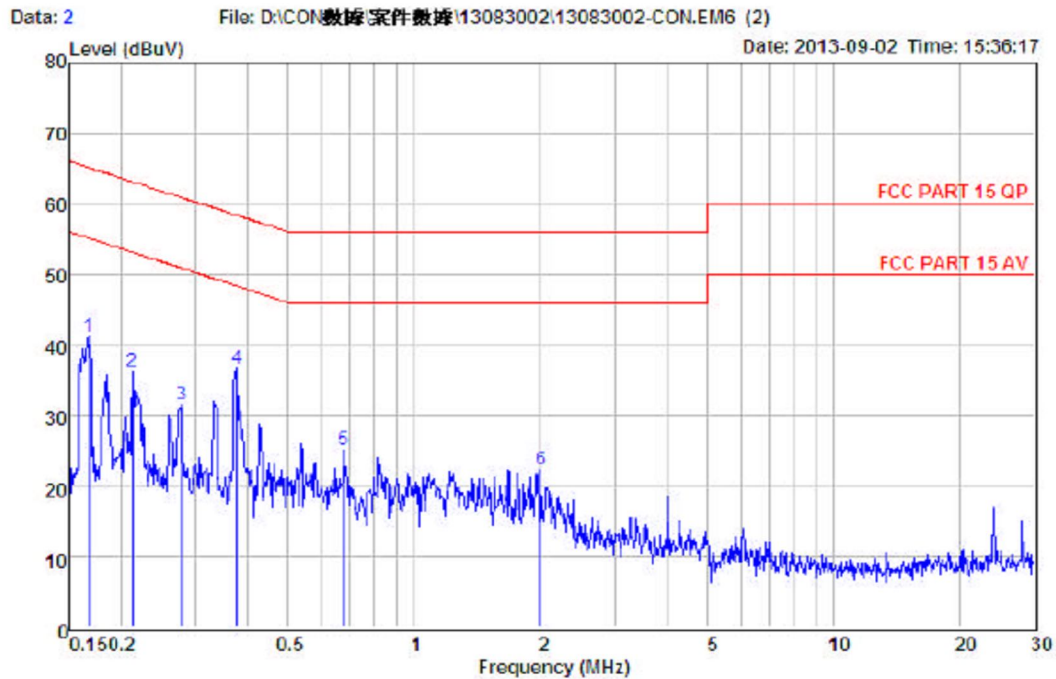
Site : Conduction
Condition: FCC PART 15 QP CON-LISN(103) LINE
EUT : Please refer to page 1 of report
MODEL : E931CS22RPCQ
MEMO : WORKING
T/H :

	Freq	Read Level	Level Factor	Over Limit	Limit Line	Remark
	MHz	dBuV	dBuV	dB	dBuV	
1	0.17	40.76	40.90	0.14	-24.18	65.08 Peak
2	0.20	36.43	36.57	0.14	-27.10	63.67 Peak
3	0.24	34.04	34.18	0.14	-27.82	62.00 Peak
4	0.39	30.50	30.66	0.16	-27.51	58.17 Peak
5	2.00	25.49	25.79	0.30	-30.21	56.00 Peak
6	24.01	21.32	22.44	1.12	-37.56	60.00 Peak



PEP Certification Corp.

PEP Certification Corp.
tel:02-2692-2097
fax:02-2695-6236
email:alex@gtest.tw



Site : Conduction
Condition: FCC PART 15 QP CON-LISN(103) NEUTRAL
EUT : Please refer to page 1 of report
MODEL : E931CS22RPCQ
MEMO : WORKING
T/H :

	Freq	Read Level	Level Factor	Over Limit	Limit Line	Remark
	MHz	dBuV	dBuV	dB	dBuV	
1	0.17	41.09	41.23	0.14	-23.89	65.12 Peak
2	0.21	36.20	36.33	0.13	-26.81	63.14 Peak
3	0.28	31.37	31.50	0.13	-29.40	60.90 Peak
4	0.38	36.57	36.71	0.14	-21.68	58.39 Peak
5	0.68	24.92	25.08	0.16	-30.92	56.00 Peak
6	2.00	22.11	22.39	0.28	-33.61	56.00 Peak



8. DUTY CYCLE (AVERAGE FACTOR MEASUREMENT)

8.1 DUTY CYCLE CORRECTION DURING 100MSEC

1. $\left[\frac{\text{Pulse duration}}{\text{Pulse period}} \right] = 66\%$ (worst case, customer declaration)

2. Burst duration = $64 + 27 = 91$ msec

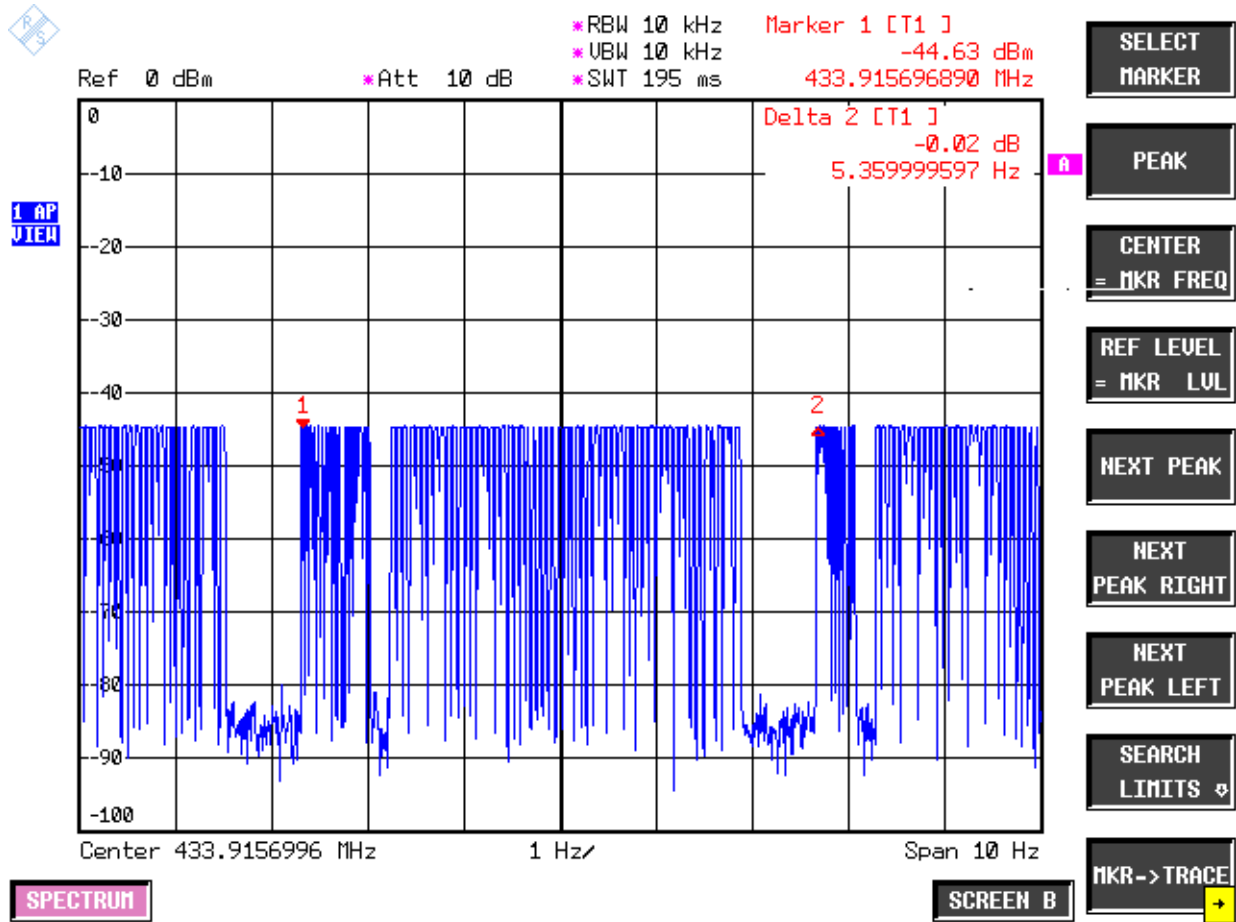
3. Time between bursts = 9 msec

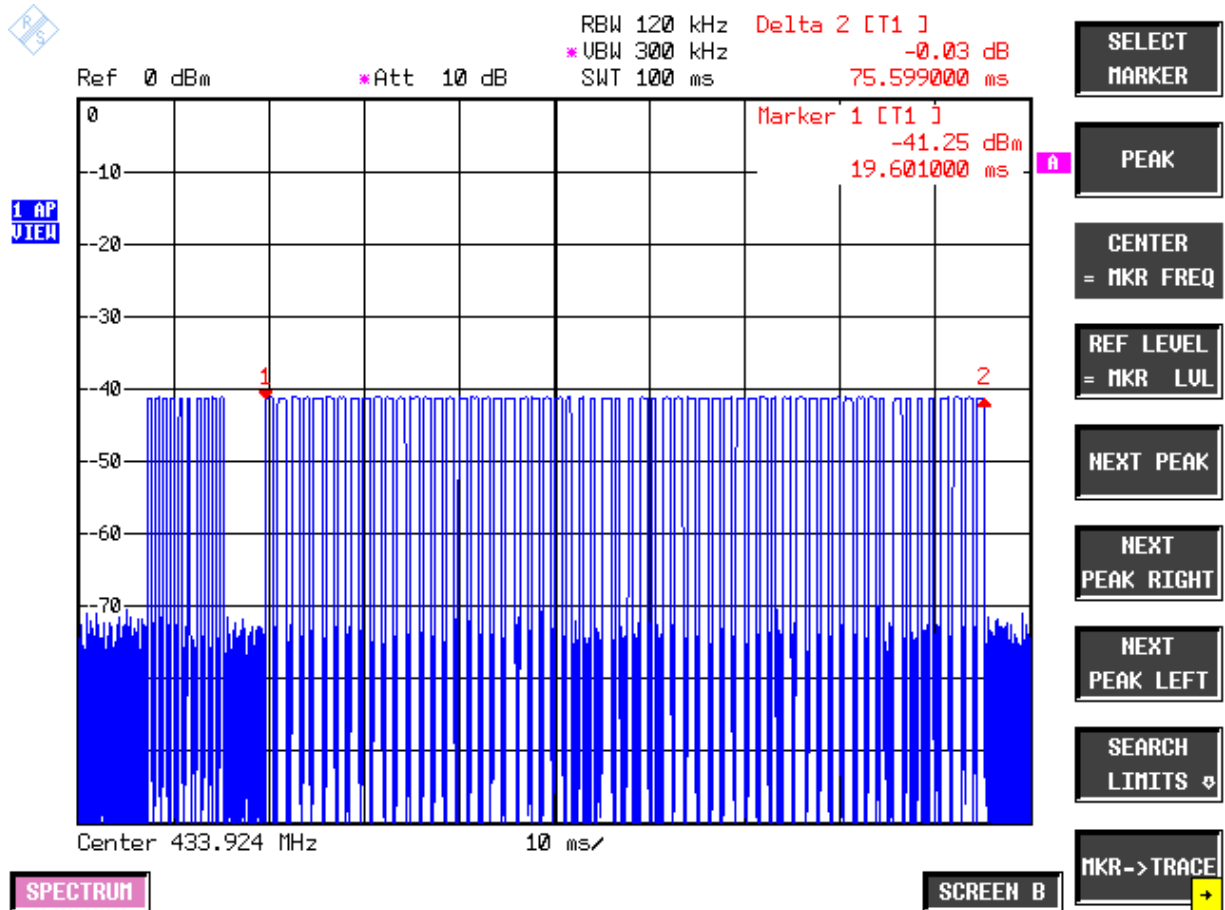
4. **Duty Cycle** = $20 \log \left[\frac{\text{Pulse duration}}{\text{Pulse period}} \times \frac{\text{burst duration}}{100\text{msec}} \right]$

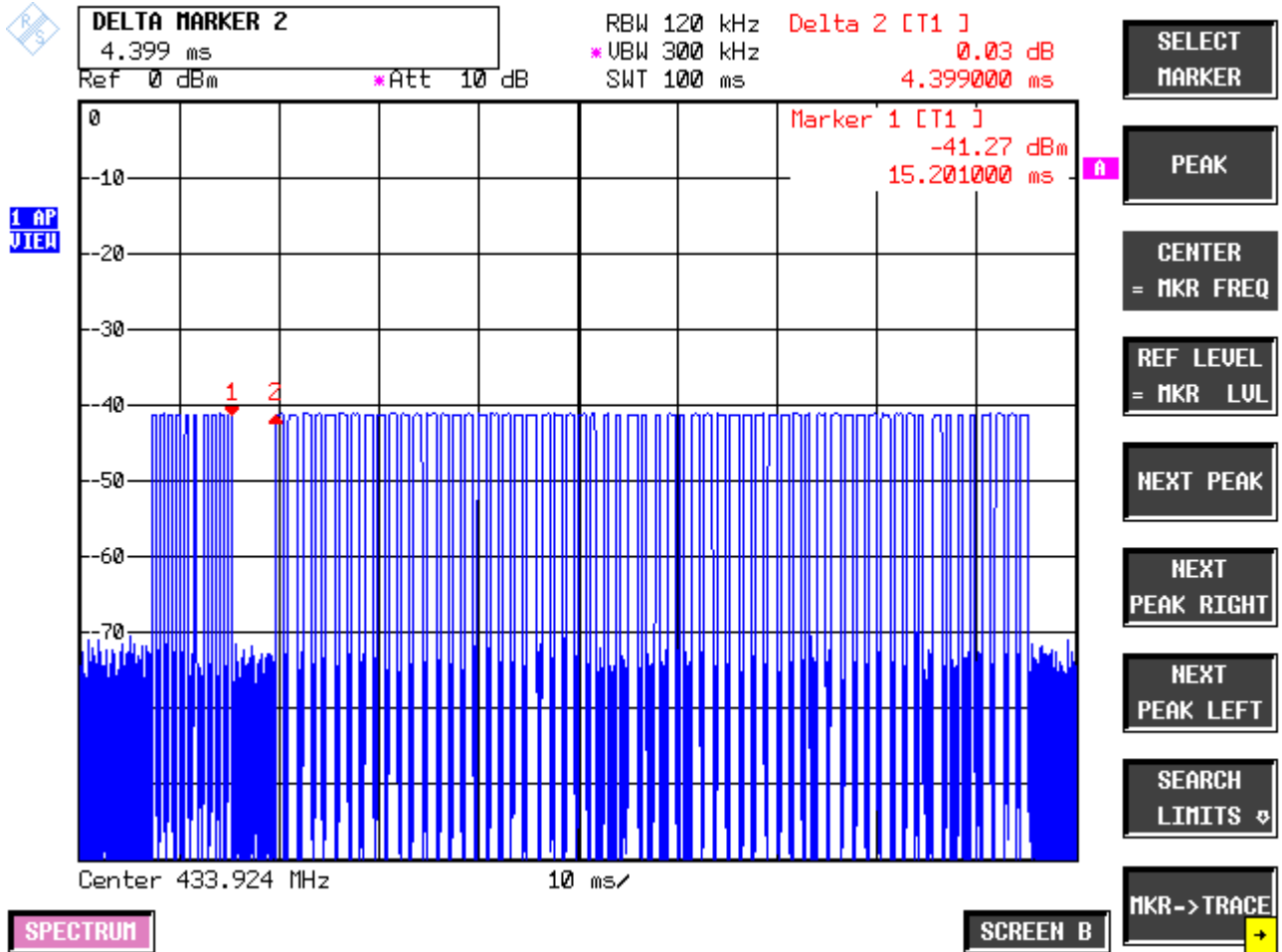
$$\text{Duty Cycle} = 20 \log \left[\frac{2}{3} \times \frac{91}{100} \right] = -4.34 \text{ dB}$$

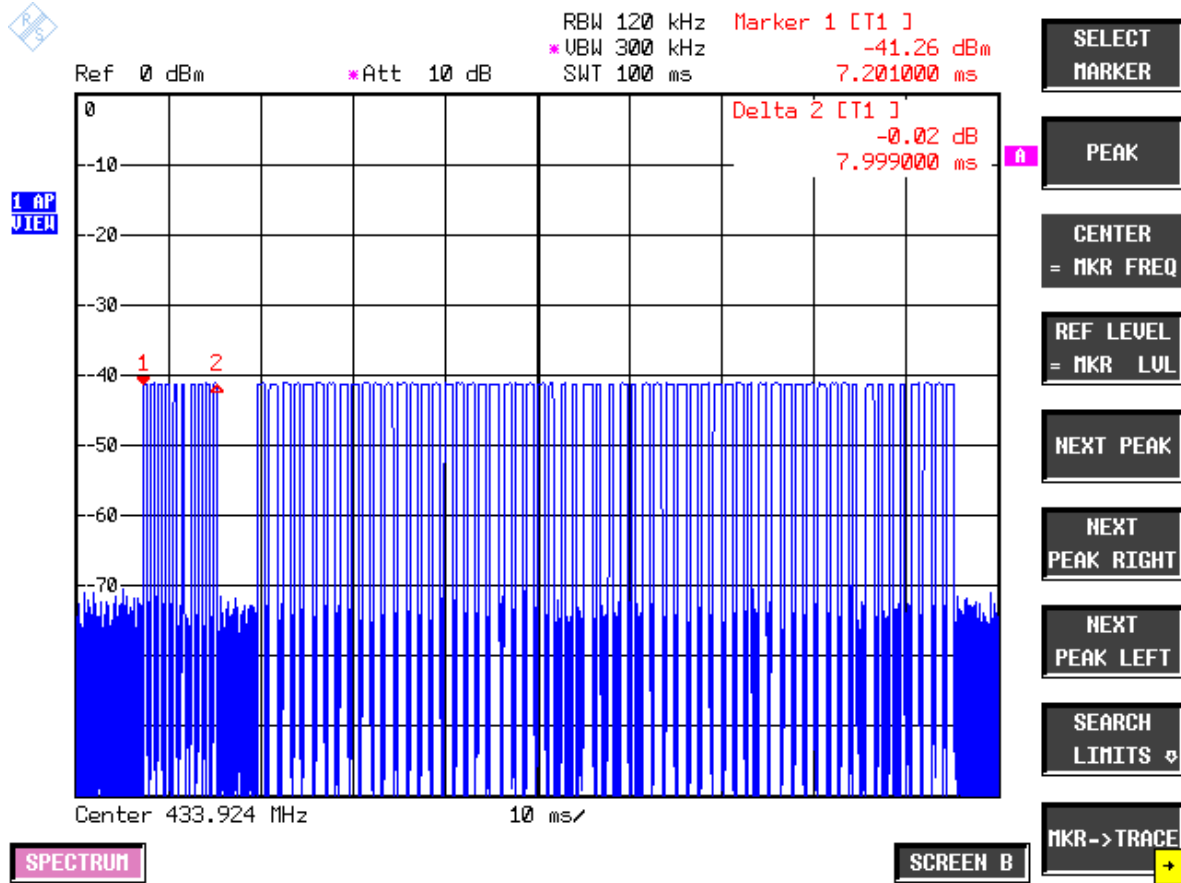
8.2 RESULT: PASSED

8.3 TEST DATA:











9. SECTION 15.231(a)(1) REQUIREMENTS (RELEASE TIME MEASUREMENT)

9.1 TEST PROCEDURE

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Set center frequency=433MHz

Set SPAN=0Hz

Set RBW=10kHz

Set VBW=30kHz

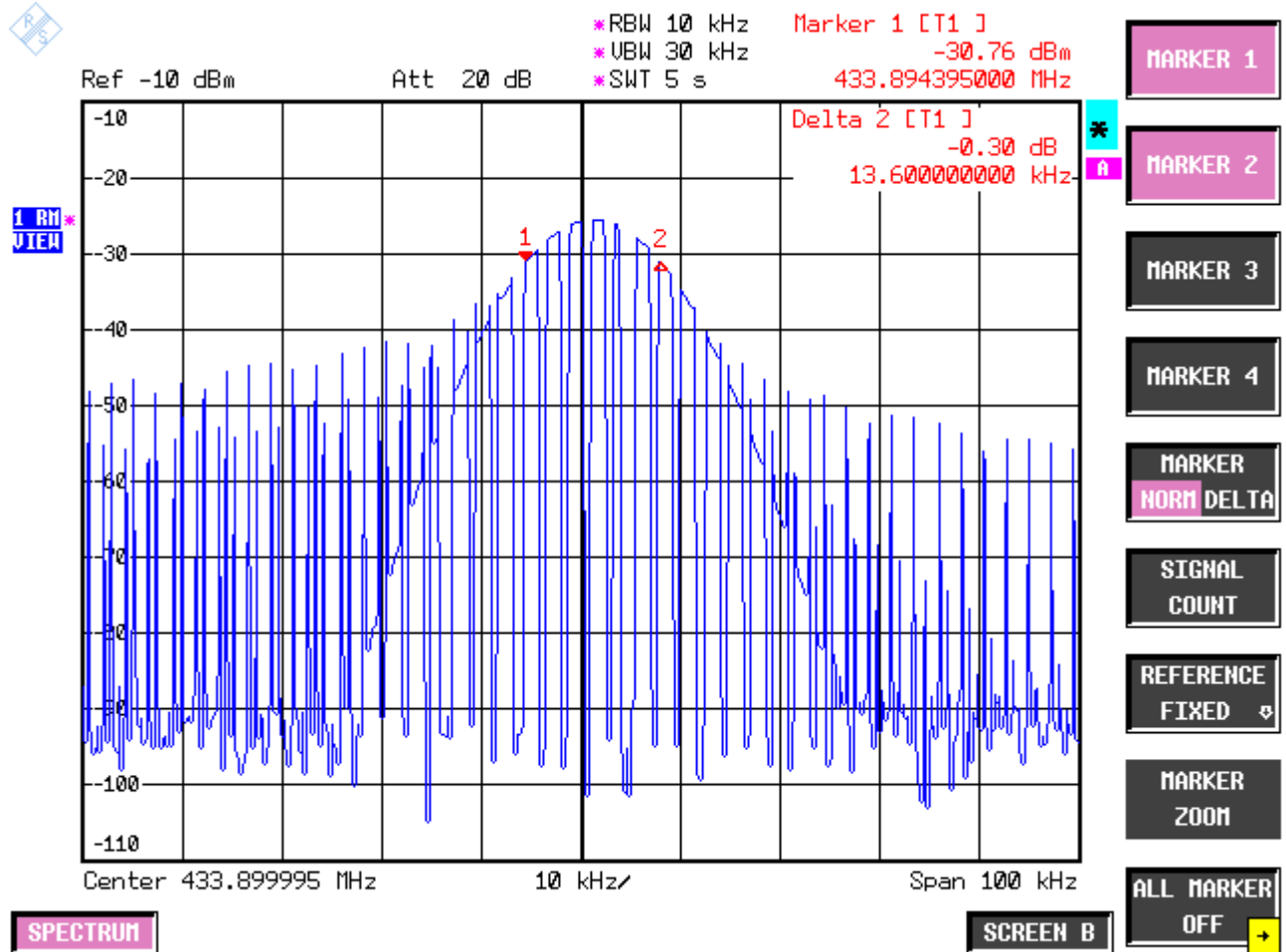
Set SWEET TIME=5s

9.2 RELEASE TIME REQUIREMENT

Per 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.

9.3 RESULT: PASSED

9.4 TEST DATA:





10. SECTION 15.203 REQUIREMENTS (ANTENNA REQUIREMENT)

10.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, 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.

10.2 ANTENNA CONNECTED CONSTRUCTION

According to § 15.203, 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. The antenna used for this product is a short metal soldered wire. The antenna is permanently attached. Refer to the product photo.

10.3 RESULT: PASSED