TEST REPORT

Applicant:	Elektra GmbH
Address of Applicant:	Werkstrasse 7 D-32130 Enger Germany
Manufacturer/Factory:	Shenzhen Sunricher Technology Limited
Address of Manufacturer/Factory:	3rd &4thFloor,B building,Jia'an Industrial Building,Liu Xian Third road,No.72 area,Xin'an Street, Baoan District,Shenzhen,China

Equipment Under Test (EUT)

Product Name:	RF Wireless CCT Dimmer
Model No.:	Receiver: SR-2501M Transmitter: SR-2833CCT, SR-2833CCT-6Z
FCC ID:	2AWW9-2833CCT
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.231
Date of sample receipt:	June 24, 2020
Date of Test:	July 03, 2020-July 06, 2020
Date of report issued:	July 07, 2020
Test Result :	PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Robinson Lo
Laboratory Manager

2 Version

Version No.	Date	Description
01	*July 07, 2020*	*Original*

Prepared By: ***Date:*** *July 07, 2020*

Project Engineer

Check By: ***Date:*** *July 07, 2020*

Reviewer

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna Requirement	15.203	Pass
Conduction Emission	15.207	N/A
Field strength of the Fundamental Signal	15.231 (b)	Pass
Spurious Emissions	15.231 (b)/15.209	Pass
20dB Bandwidth	15.231 (c)	Pass
Dwell Time	15.231 (a) (1)	Pass

Pass: The EUT complies with the essential requirements in the standard.

N/A: Not applicable.

4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	30MHz-200MHz	3.8039dB	(1)
Radiated Emission	200MHz-1GHz	3.9679dB	(1)
Radiated Emission	1GHz-18GHz	4.29dB	(1)
Radiated Emission	18GHz-40GHz	3.30dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	3.44dB	(1)
Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.			

5 General Information

5.1 General Description of EUT

Product Name:	RF Wireless CCT Dimmer
Model No.:	Receiver: SR-2501M Transmitter: SR-2833CCT, SR-2833CCT-6Z
Test Model No:	SR-2833CCT
Remark: The product model(s) SR-2833CCT-6Z are identical in the same PCB layout, interior structure and electrical circuits with the model SR-2833CCT which tested in Global United Technology Services Co. Ltd., The differences are the model name and appearance, Functional Differences: SR-2833CCT has 6 zones in which the S button is used to save the current scene, the Play /pause button is used to pause or play the scene, and the 4 zones NO/OFF button is used to close the corresponding scene.Sr-2833CCT-6Z has 6 zones NO/OFF buttons to shut down the corresponding scenes.	
Serial No.:	2AHST-2833CCT01
Test sample(s) ID:	GTS202006000259-1
Sample(s) Status:	Engineer sample
Operation Frequency:	869.5MHz
Modulation technology:	FSK
Antenna Type:	PCB Antenna
Antenna gain:	0dBi(declare by applicant)
Power supply:	DC 3V (1 x 3V“CR2032”button cell)

Note：The report is only for Transmitter

5.2 Test mode

Transmitting mode	Keep the EUT in transmitting mode.
Remark: New battery is used during all tests.	

Per-test mode.

We have verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which only the worst case was shown in this test report and defined as follows:

	Axis	X	Y	Z
869.5MHz	Field Strength(dBuV/m)	78.35	81.54	80.22

5.3 Description of Support Units

None.

5.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

● **FCC —Registration No.: 381383**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 381383.

● **IC —Registration No.: 9079A**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A.

● **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). LAB CODE:600179-0

5.5 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.
No.123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone,
Xixiang Road, Baoan District, Shenzhen, Guangdong, China
Tel: 0755-27798480
Fax: 0755-27798960

5.6 Other Information Requested by the Customer

None.

5.7 Additional Instructions

EUT Software Settings:

Mode	Special test software was pre-built-in by manufacturer, power set default

6 Test Instruments list

Radiated Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July. 02 2020	July. 01 2025
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June. 25 2020	June. 24 2021
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 25 2020	June. 24 2021
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 25 2020	June. 24 2021
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 25 2020	June. 24 2021
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 25 2020	June. 24 2021
9	Coaxial Cable	GTS	N/A	GTS211	June. 25 2020	June. 24 2021
10	Coaxial cable	GTS	N/A	GTS210	June. 25 2020	June. 24 2021
11	Coaxial Cable	GTS	N/A	GTS212	June. 25 2020	June. 24 2021
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 25 2020	June. 24 2021
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 25 2020	June. 24 2021
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 25 2020	June. 24 2021
15	Band filter	Amindeon	82346	GTS219	June. 25 2020	June. 24 2021
16	Power Meter	Anritsu	ML2495A	GTS540	June. 25 2020	June. 24 2021
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 25 2020	June. 24 2021
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 25 2020	June. 24 2021
19	Splitter	Agilent	11636B	GTS237	June. 25 2020	June. 24 2021
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 25 2020	June. 24 2021
21	Breitband hornantenne	SCHWARZBECK	BBHA 9170	GTS579	Oct. 19 2019	Oct. 18 2020
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 19 2019	Oct. 18 2020
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 19 2019	Oct. 18 2020
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	June. 25 2020	June. 24 2021

RF Conducted Test:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	June. 25 2020	June. 24 2021
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 25 2020	June. 24 2021
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June. 25 2020	June. 24 2021
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	June. 25 2020	June. 24 2021
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	June. 25 2020	June. 24 2021
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	June. 25 2020	June. 24 2021
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	June. 25 2020	June. 24 2021
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	June. 25 2020	June. 24 2021

General used equipment:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 25 2020	June. 24 2021
2	Barometer	ChangChun	DYM3	GTS255	June. 25 2020	June. 24 2021

7 Test results and Measurement Data

7.1 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.231 (b)& Section 15.209
Test Method:	ANSI C63.10:2013
Test Frequency Range:	9kHz to 10GHz
Test site:	Measurement Distance: 3m

Receiver setup:

Frequency	Detector	RBW	VBW	Value
9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

Limit:
(Field strength of the fundamental signal)

Frequency	Limit (dBuV/m @3m)	Remark
869.5MHz	101.94	Peak Value
	81.94	Average Value

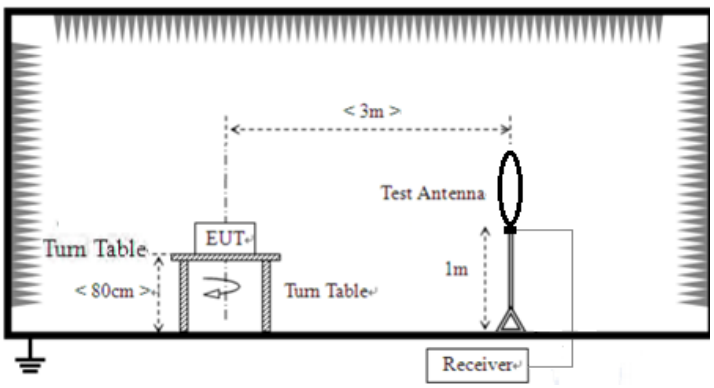
Limit:
(Spurious Emissions)

Frequency	Limit (uV/m)	Value	Measurement Distance
0.009MHz-0.490MHz	2400/F(KHz)	QP	300m
0.490MHz-1.705MHz	24000/F(KHz)	QP	30m
1.705MHz-30MHz	30	QP	30m
30MHz-88MHz	100	QP	3m
88MHz-216MHz	150	QP	
216MHz-960MHz	200	QP	
960MHz-1GHz	500	QP	
Above 1GHz	500	Average	
	5000	Peak	

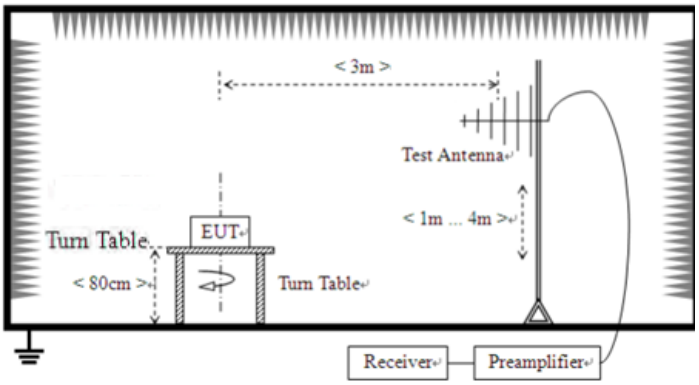
Or The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level whichever limit permits a higher field strength.

Test setup:

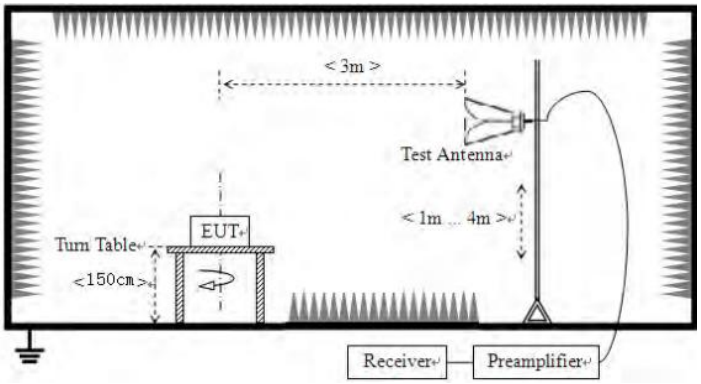
Below 30MHz



Below 1GHz



Above 1GHz



Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test environment:	Temp.:	25 °C	Humid.:	50%	Press.:	1 010mbar
Test results:	Pass					

Measurement data:

7.1.1 Field Strength of The Fundamental Signal

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
869.50	92.35	22.06	4.74	37.61	81.54	101.94	-20.40	Horizontal
869.50	81.72	22.06	4.74	37.61	70.91	101.94	-31.03	Vertical

Remarks:

1. *Peak Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *PK Value under PK limit more than 20db, then pass for AV value.*

7.1.2 Field Strength of The Spurious Emissions

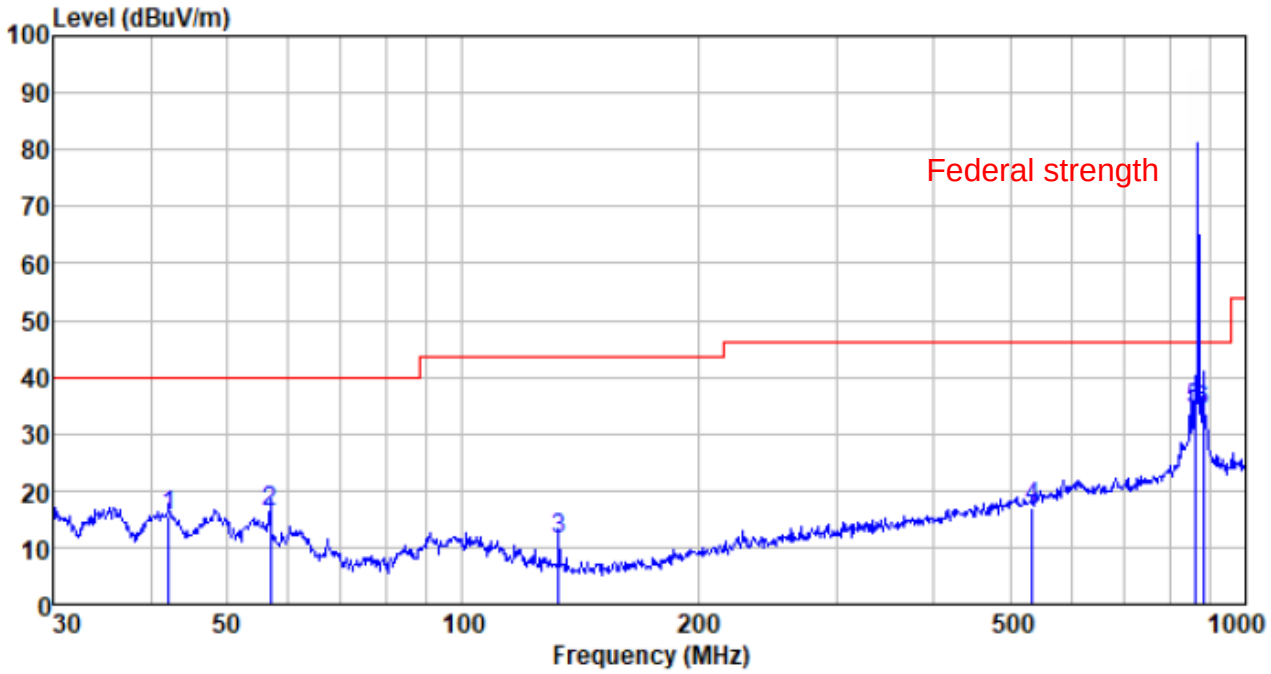
Measurement data:

9 kHz ~ 30 MHz

The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

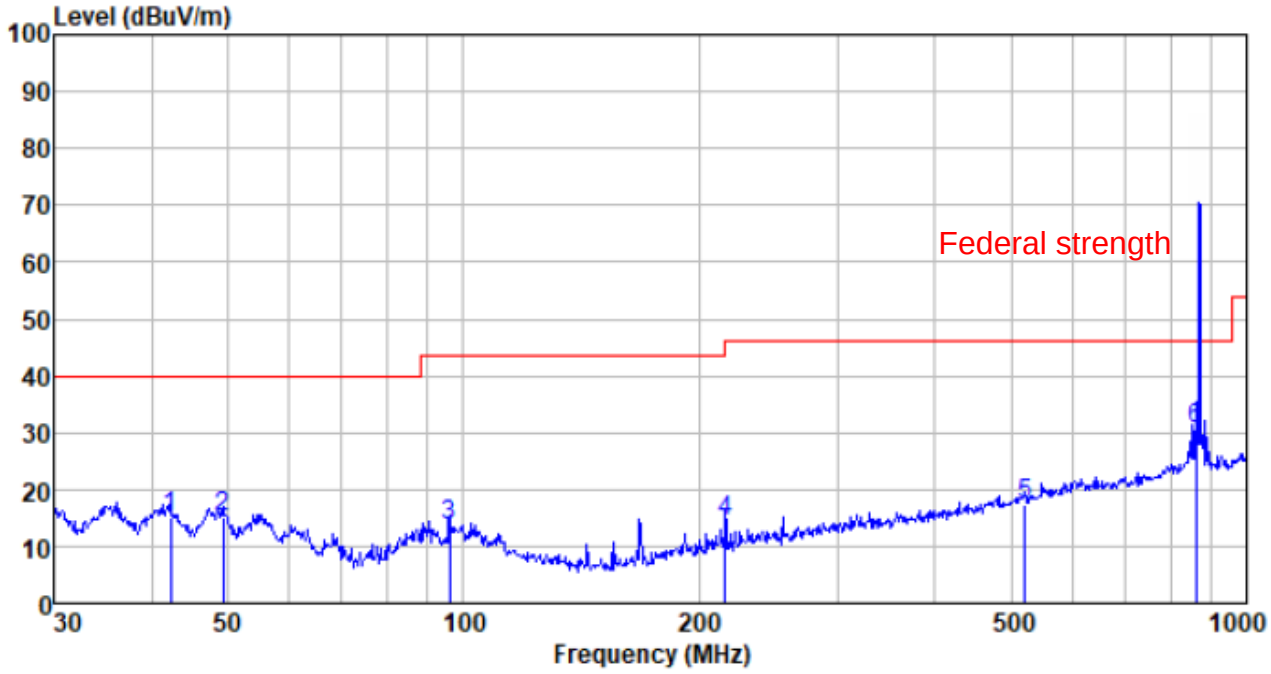
Below 1GHz:

Mode:	**Transmitting mode**	**Polarization:**	**Horizontal**



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
42.154	38.53	12.22	0.69	35.79	15.65	40.00	-24.35	QP
56.792	40.17	11.60	0.83	36.28	16.32	40.00	-23.68	QP
132.685	38.87	7.96	1.45	36.97	11.31	43.50	-32.19	QP
533.832	32.80	18.07	3.46	37.52	16.81	46.00	-29.19	QP
860.035	45.21	21.95	4.69	37.61	34.24	46.00	-11.76	QP
881.407	44.79	22.13	4.79	37.60	34.11	46.00	-11.89	QP

Mode:	Transmitting mode	Polarization:	Vertical



Freq	Reading level	Antenna factor	Cable loss	Preamp factor	level	Limit level	Over limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
42.302	37.94	12.23	0.69	35.79	15.07	40.00	-24.93	QP
49.359	38.20	12.29	0.77	36.15	15.11	40.00	-24.89	QP
96.099	37.38	11.65	1.16	36.69	13.50	43.50	-30.00	QP
216.024	38.97	11.02	1.93	37.35	14.57	46.00	-31.43	QP
520.888	33.82	17.80	3.39	37.52	17.49	46.00	-28.51	QP
860.035	41.43	21.95	4.69	37.61	30.46	46.00	-15.54	QP

Above 1G:

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
3244.00	37.19	28.40	3.62	37.33	31.88	74.00	-42.12	Vertical
3890.00	34.64	29.50	3.92	37.39	30.67	74.00	-43.33	Vertical
4536.00	33.38	30.76	4.45	37.62	30.97	74.00	-43.03	Vertical
6168.00	31.59	33.18	5.68	36.28	34.17	74.00	-39.83	Vertical
7579.00	29.86	36.91	6.81	35.52	38.06	74.00	-35.94	Vertical
9704.00	29.96	38.03	8.01	34.99	41.01	74.00	-32.99	Vertical
3380.00	37.93	28.40	3.64	37.34	32.63	74.00	-41.37	Horizontal
5182.00	31.93	31.57	4.98	37.53	30.95	74.00	-43.05	Horizontal
6525.00	31.59	34.45	5.82	36.02	35.84	74.00	-38.16	Horizontal
8106.00	29.24	37.38	6.81	35.29	38.14	74.00	-35.86	Horizontal
8905.00	28.71	37.47	7.49	34.57	39.10	74.00	-34.90	Horizontal
9772.00	29.58	38.13	8.03	35.05	40.69	74.00	-33.31	Horizontal

Average value:

Frequency (MHz)	Level (dBuV/m)	Duty cycle factor	Average value (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
3244.00	31.88	-5.42	26.46	54.00	-27.54	Vertical
3890.00	30.67	-5.42	25.25	54.00	-28.75	Vertical
4536.00	30.97	-5.42	25.55	54.00	-28.45	Vertical
6168.00	34.17	-5.42	28.75	54.00	-25.25	Vertical
7579.00	38.06	-5.42	32.64	54.00	-21.36	Vertical
9704.00	41.01	-5.42	35.59	54.00	-18.41	Vertical
3380.00	32.63	-5.42	27.21	54.00	-26.79	Horizontal
5182.00	30.95	-5.42	25.53	54.00	-28.47	Horizontal
6525.00	35.84	-5.42	30.42	54.00	-23.58	Horizontal
8106.00	38.14	-5.42	32.72	54.00	-21.28	Horizontal
8905.00	39.10	-5.42	33.68	54.00	-20.32	Horizontal
9772.00	40.69	-5.42	35.27	54.00	-18.73	Horizontal

Remark:

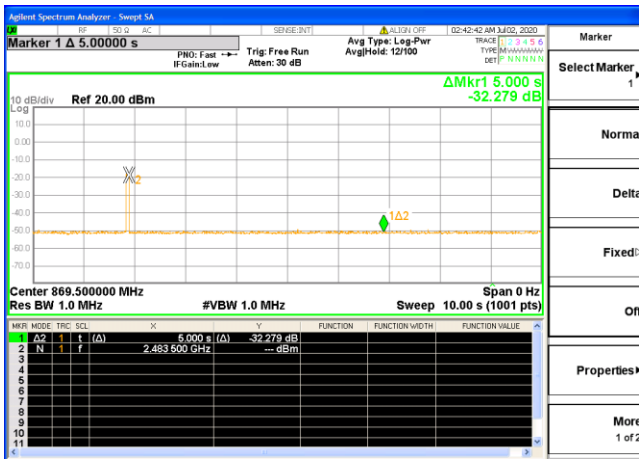
1. Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

2.Average value=Peak value + Duty cycle factor

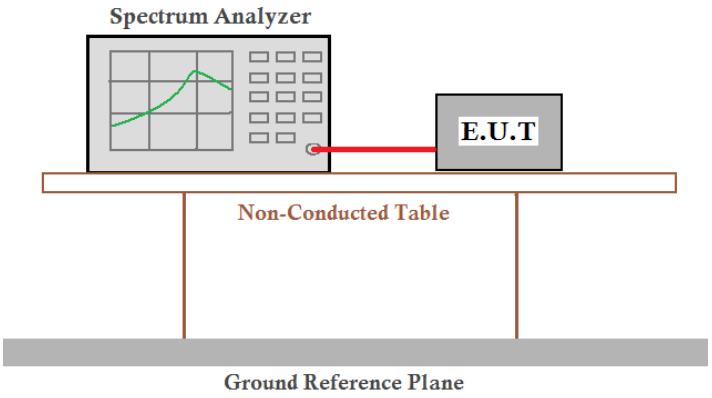
Average value:	
Calculate Formula:	Average value=Peak value + Duty Cycle Factor
	Duty cycle factor=20 log(Duty cycle)
	Duty cycle=on time/100 milliseconds or period, whichever is less
Test data:	T on time =53.6(ms)
	T period =100ms
	Duty cycle=0.536
	duty cycle factor=-5.42

Test plot as follows:
Ton time:

T period:



7.2 20dB Occupy Bandwidth

Test Requirement:	FCC Part15 C Section 15.231 (c)
Test Method:	ANSI C63.10:2013
Limit:	The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900MHz. 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 setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

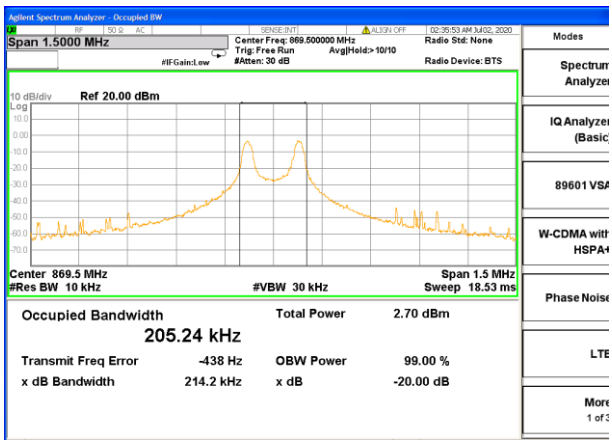
Measurement Data

Test Frequency (MHz)	20dB bandwidth (kHz)	Limit (MHz)	Result
869.5	214.2	2.17375	Pass

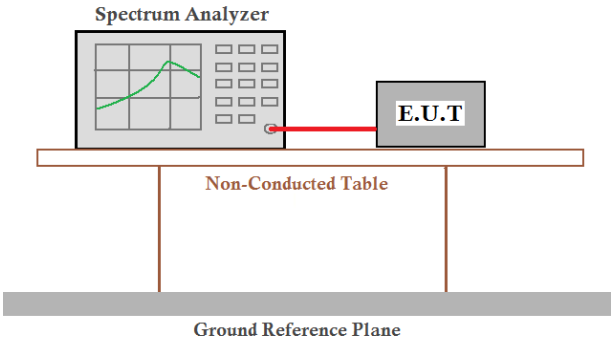
Note: Limit= Fundamental frequency×0.25%

869.5×0.25%=2.17375MHz

Test plot as follows:



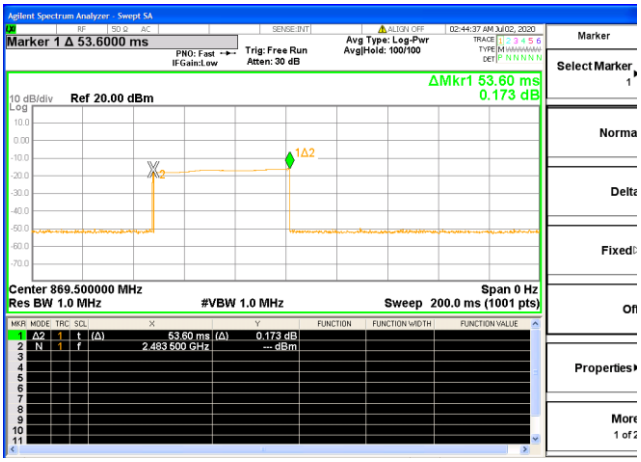
7.3 Dwell Time

Test Requirement:	FCC Part15 C Section 15.231 (a)(1)
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=1MHz, VBW=1MHz, span=0Hz, detector: Peak
Limit:	Not more than 5 seconds
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement data:

Frequency (MHz)	Duration of each TX (second)	Limit (second)	Result
869.5	0.0536	<5.0	Pass

Test plot as follows:



8 Test Setup Photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

------ End ------