FCC 47 CFR PART 15 SUBPART C 15.231

TEST REPORT

FOR

Model : HC-TX10, HC-TX20, FP-TX10

HC-TXyy, HC-Txyy-zz, FP-TXyy, FP-TXyy-zz

Trade Name: N/A

Issued to

H.S. CRAFT MANUFACTURING CO.

Issued by

WH Technology Corp.

Testing Laboratory
2954

EMC Test Site	**Xizhi Office and Lab**	**7F., No.262, Sec. 3, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)**
Tel.: +886-2-7729-7707 Fax: +886-2- 8648-1311		

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APPENDIX 1 PHOTOS OF TEST CONFIGURATION

PHOTOS OF EUT

1. General Information

Applicant	:	**H.S. CRAFT MANUFACTURING CO.**
Address	:	**No.9F,NO. 35, GUANG FU N,TAIPEI,TAIWAN**
Manufacturer	:	**H.S. CRAFT MANUFACTURING CO.**
Address	:	**No.1,Bushang E.Road,Shashi Town,Ganzhou City,Jiangxi Province**
EUT	:	**Remote control**
FCCID	:	**YLIHC-TX10**
Model Name	:	**HC-TX10, HC-TX20, FP-TX10 HC-TXyy, HC-Txyy-zz, FP-TXyy, FP-TXyy-zz. y="0"-"9" or blank, denotes the product type. z="A"-"Z" or blank,denotes the position of keys.**
Model Differences	:	**According to the confirmation from the applicant, since the electrical circuit design, layout, components used and internal wiring were identical for the above models, only difference being the model numbers. Please refer to page 5 for detail.**

Is here with confirmed to comply with the requirements set out in the FCC and Regulations Part 15 Subpart C and the measurement procedures were according to ANSI C63.4-2014. The said equipment in the configuration described in this report shows the maximum emission levels emanating

FCC part 15 subpart C

Receipt Date :2018.03.12 Final Test Date : 2018.03.19

Tested By: **Reviewed by:**

Date Bing/ Engineer **Date** Bell Wei / Manager
Designation Number: TW2954

HC-TXyy and HC-Txyy-zz and FP-TXyy and FP-TXyy-zz y="0"-"9" or blank, denotes the product type. z="A"-"Z" or blank,denotes the position of keys.				
ITEM NO.	MODEL NO.	Nation	Report Type	Product description
/	HC-TX01	USA	FCC	ON/OFF type product remote control for HC
/	HC-TX02	USA	FCC	Two Function product remote control for HC
/	HC-TX03	USA	FCC	Three Function product remote control for HC
/	HC-TX04	USA	FCC	Four Function product remote control for HC
/	HC-TX05	USA	FCC	Five Function product remote control for HC
/	HC-TX06	USA	FCC	Six Function product remote control for HC
/	HC-TX07	USA	FCC	Seven Function product remote control for HC
/	HC-TX08	USA	FCC	Eight Function product remote control for HC
/	HC-TX09	USA	FCC	Nine Function product remote control for HC
/	HC-TX10	USA	FCC	Multi Function product remote control for HC
……		……		
/	FP-TX01	USA	FCC	ON/OFF type product remote control for FP
/	FP-TX02	USA	FCC	Two Function product remote control for FP
……		……		
/	FP-TX10	USA	FCC	Multi Function product remote control for FP
……		……		
/	HC-T06-A	USA	FCC	Six Function product (A)remote control for HC
……		……		

ITEM NO.	MODEL NO.	Nation	Report Type	Product description
/	HC-TX10	CSA	IC	Multi Function product remote control for HC
/	HC-TX20	CSA	IC	Ⅱ-Multi Function product remote control
/	FP-TX10	CSA	IC	Multi Function product remote control for FP

2. Report of Measurements and Examinations

2.1 List of Measurements and Examinations

FCC Rule	Description of Test	Result
Section 15.203	Antenna Requirement	Pass
Section 15.207(a)	Conduction Emissions	N/A
Section 15.209,15.231(b)	Radiated Emissions	Pass
Section 15.231(c)	Occupied Bandwidth	Pass
Section 15.231(a) (e)	Transmit time	Pass

3. Test Configuration of Equipment under Test

3.1 Description of the tested samples

EUT Name	:	Remote control
Model Number	:	HC-TX10
Receipt Date	:	2018.03.12
Power From	:	☑Inside ☐Outside ☐Adaptor ☑Battery ☐AC Power Source ☐DC Power Source ☐Support Unit PC or NB
Operate Frequency	:	Refer to the channel list as described below (433.92 MHz)
Modulation Technique	:	ASK
Number of Channels	:	1
Channel spacing	:	☑N/A ☐_____MHz
Operating Mode	:	☑Simplex ☐ Half Duplex
Antenna Type	:	PCB Antenna
Antenna gain		0 dBi

3.2 Carrier Frequency of Channels

Channel	Frequency(MHz)	Channel	Frequency(MHz)
00	433.92	--	--

3.3 Test Mode and Test Software

a. During testing, the interface cables and equipment positions were varied according to ANSI C63.4.
b. The complete test system included Notebook and EUT for RF test.
c. Test Software: Radio Test.exe
d. New Battery was used for all testing and the worst radiated emission case from X,Y and Z axis evaluation was selected for testing.
e. The following test modes were performed for test:
   - CH00: 433.92MHz

3.4 TEST Methodology & General Test Procedures

All testing as described bellowed were performed in accordance with ANSI C63.4:2014 and ANSI C63.10:2013.

Conducted Emissions

The EUT is placed on a wood table, which is at 0.8 m above ground plane acceding to clause 15.207 and requirements of ANSI C63.4:2014. 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 a 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.

1) Putting the EUT on the platform and turning on the EUT (on/off button on the bottom of the EUT).
2) Setting test channel described as “Channel setting and operating condition”, and testing channel by channel.
3) For the maximum output power measurement, we followed the method of measurement KDB558074 D01.
4) For the spurious emission test based on ANSI(2014), at the frequency where below 1GHz used quasi-peak detector mode; where above 1GHz used the peak and average detector mode. IF the peak value may be under average limit, the average mode will not be performed.

3.5 Measurement Uncertainty

Measurement Item	Uncertainty
Peak Output Power(conducted)	±1.345dB
Power Spectral Density	±1.347dB
Radiated emission(1G-25GHz)	±5.00dB
Radiated emission(30M-1GHz)	±3.89dB
Conducted emission	±1.81dB

3.6 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

Peripherals Devices:

OUTSIDE SUPPORT EQUIPMENT							
No.	Equipment	Model	Serial No.	FCC ID/ BSMI ID	Trade name	Data Cable	Power Cord
1.	N/A	N/A	N/A	N/A	N/A	N/A	N/A
INSIDE SUPPORT EQUIPMENT							
No.	Equipment	Model	Serial No.	FCC ID/ BSMI ID	Trade name	Data Cable	Power Cord
1.	N/A	N/A	N/A	N/A	N/A	N/A	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.

4. Test and measurement equipment

4.1 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.

4.2 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.

TABLELIST OF TEST AND MEASUREMENT EQUIPMENT

Test Site	Instrument	Manufacturer	Model No.	S/N	Next Cal. Date
Conduction	Spectrum (9K--3GHz)	R&S	FSP3	833387/010	2018/09/20
	EMI Receiver	R&S	ESHS10	830223/008	2018/05/22
	LISN	Rolf Heine Hochfrequenztechnik	NNB-2/16z	98062	2018/05/25
	ISN	Schwarzbeck	8-Wire ISN CAT5	CAT5-8158-0094	2018/09/21
	RF Cable	N/A	N/A	EMI-3	2018/10/19
Radiation	Bilog antenna(30M-1G)	ETC	MCTD2786B	BLB16M04004/JB-5-004	2018/05/03
	Double Ridged Guide Horn antenna(1G-18G)	ETC	MCTD 1209	DRH15N02009	2018/11/23
	Horn antenna (18G-26G)	com-power	AH-826	81000	2018/08/15
	LOOP Antenna (Below 30M)	com-power	AL-130	17117	2018/10/04
	Pre amplifier (30M-1G)	EMC INSTRUMENT	EMC9135	980334	2018/05/04
	Microwave Preamplifier (1G-18G)	EMC INSTRUMENT	EMC051845	980108&AT-18001	2018/10/23
	Pre amplifier (18G~26G)	MITEQ	JS4-18002600-30-5A	808329	2018/08/10
	EMI Test	R&S	ESVS30	826006/002	2018/11/28

	Receiver		(20M-1000MHz)		
	RF Cable (open site)	EMCI	N male on end of both sides (EMI4)	30m	2018/10/19
	RF CABLE (1~26.5G)	HARBOUT INDUSTRIES	LL142MI(4M+4M)	NA	2018/03/08
	RF CABLE (1~26.5G)	HARBOUR INDUSTRIES	LL142MI(7M)	NA	2018/08/11
	Spectrum (9K--7GHz)	R&S	FSP7	830180/006	2018/03/25
	Spectrum (9K--40GHz)	AGILENT	8564EC	4046A0032	2019/03/01
--	Power Meter	R&S	NRVS	100696	2018/08/10
--	Power Sensor	R&S	URV5-Z4	0395.1619.05	2018/08/10

***CALIBRATION INTERVAL OF INSTRUMENTS LISTED ABOVE IS ONE YEAR**

5. Antenna Requirements

5.1 Standard Applicable

For intentional device, 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.

And according to FCC 47 CFR Section 15 &RSS-Gen, if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

5.2 Antenna Construction and Directional Gain

Antenna Type: PCB Antenna
Antenna Gain: 0 dBi

6. Test of Conducted Emission

6.1 Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 110 VAC power and return leads of the EUT according to the methods defined in ANSI C63.4-2014 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 2.2. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

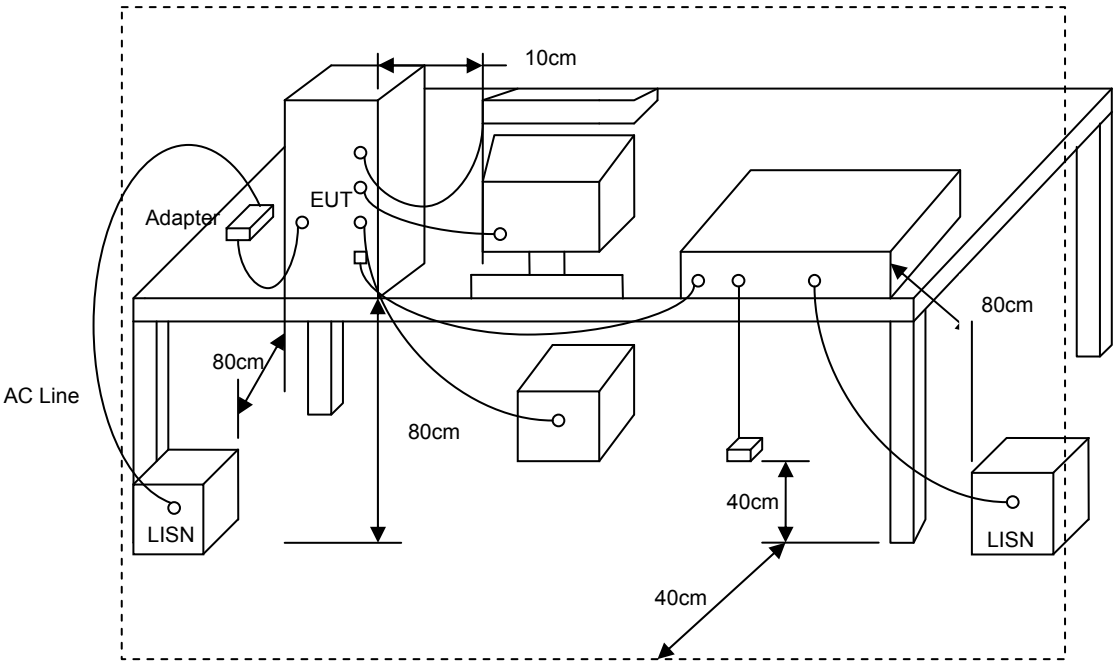
Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

*Decreases with the logarithm of the frequency.

6.2 Test Procedures

a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
c. All the support units are connecting to the other LISN.
d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
e. The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
f. Both sides of AC line were checked for maximum conducted interference.
g. The frequency range from 150 kHz to 30 MHz was searched.
h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

6.3 Typical Test Setup



6.4 Test Result and Data

Remark:
Because the EUT employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Measurements to demonstrate compliance with the conducted limits are not required for devices.

7. Test of Radiated Emission

7.1 Test Limit

the field strength of emissions from intentional radiators operated under this Section shall not exceed the following:

Fundamental Frequency MHz	Field Strength of Fundamental		Field Strength of Harmonics and Spurious Emissions	
	μV/m @ 3 m	dBμV/m @ 3 m	μV/m @ 3 m	dBμV/m @ 3 m
40.66 to 40.70	2250	67.00	225	47.00
70 to 130	1250	61.9	125	41.9
130 to 174	1250 to 3750	61.9 to 71.5	125 to 375	41.9 to 51.5
174 to 260	3750	71.5	375	51.5
260 to 470	3750 to 12500	71.5 to 81.94	375 to 1250	51.5 to 61.94
Above 470	12500	81.94	1250	61.94
Detector:	Peak for pre-scan			
	QP for 30MHz to1000 MHz:120 kHz resolution bandwidth Peak for Above 1 GHz: 1 MHz resolution bandwidth			

** linear interpolations

[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174 MHz, μV/m at 3 meters = 51.81818(F) – 6136.3636; for the band 260-470 MHz, μV/m at 3 meters = 41.6667(F) -7083.3333. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level

The fundamental frequency of the EUT is 433.92 MHz

The limit for average or QP field strength dBuv/m for the fundamental emission= 80.82 dBμV/m

No fundamental is allowed in the restricted bands.

The limit for average field strength dBuv/m for the spurious emission= 60.82 dBuV/m (433.92MHz). Spurious in the restricted bands must be less than average field strength or 15.209, whichever limit permits a higher field strength.

And according 15.35(a) On any frequency or frequencies below or equal to 1000 MHz, the limits shown are based on measuring equipment employing a CISPR quasi-peak detector function and related measurement bandwidths, unless otherwise specified. The specifications for the measuring instrument using the CISPR quasi-peak detector can be found in Publication 16 of the International Special Committee

on Radio Interference (CISPR) of the International Electrotechnical Commission. As an alternative to CISPR quasi-peak measurements, the responsible party, at its option, may demonstrate compliance with the emission limits using measuring equipment employing a peak detector function, properly adjusted for such factors as pulse desensitization, as long as the same bandwidths as indicated for CISPR quasi-peak measurements are employed.

Note: For pulse modulated devices with a pulse-repetition frequency of 20 Hz or less and for which CISPR quasi-peak measurements are specified, compliance with the regulations shall be demonstrated using measuring equipment employing a peak detector function, properly adjusted for such factors as pulse desensitization, using the same measurement bandwidths that are indicated for CISPR quasi-peak measurements.

Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1 MHz. When average radiated emission measurements are specified in this part, including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions. Unless otherwise specified, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device, e.g., the total peak power level. Note that the use of a pulse desensitization correction factor may be needed to determine the total peak emission level. The instruction manual or application note for the measurement instrument should be consulted for determining pulse desensitization factors, as necessary.

The average correction factor is computed by analyzing the on time in 100ms over one complete pulse train. Analysis of the remote transmitter on time in one complete pulse train, therefore the average value of fundamental frequency is: Average = Peak value + 20log (Duty cycle), where the duty factor is calculated from following formula:

The duty-cycle correction limit is 20dB since the peak level cannot exceed the average level by more than 20dB.

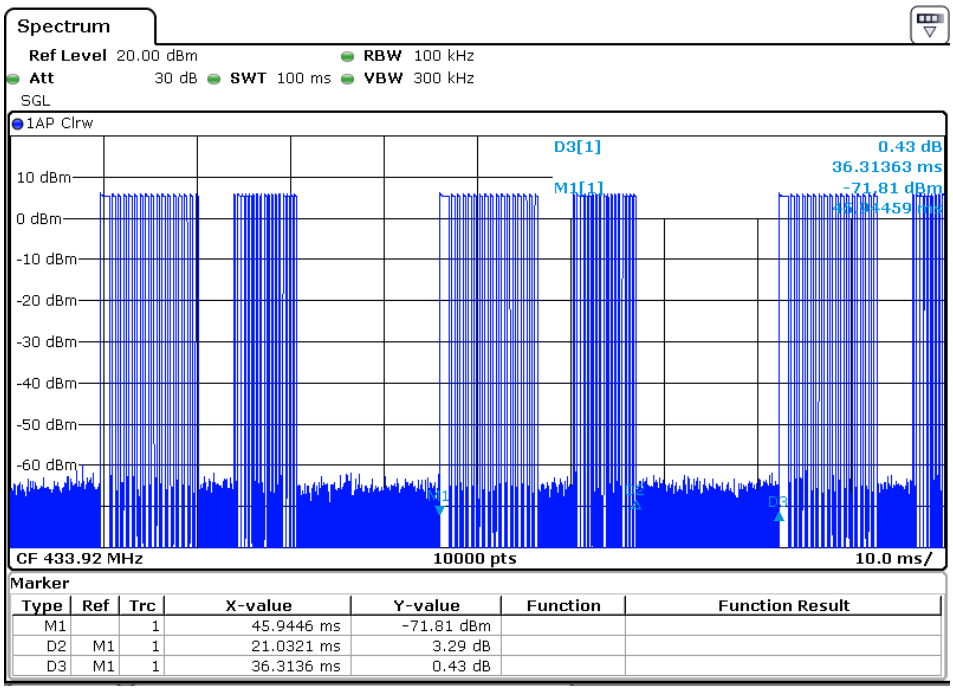
For 433.92 MHz:

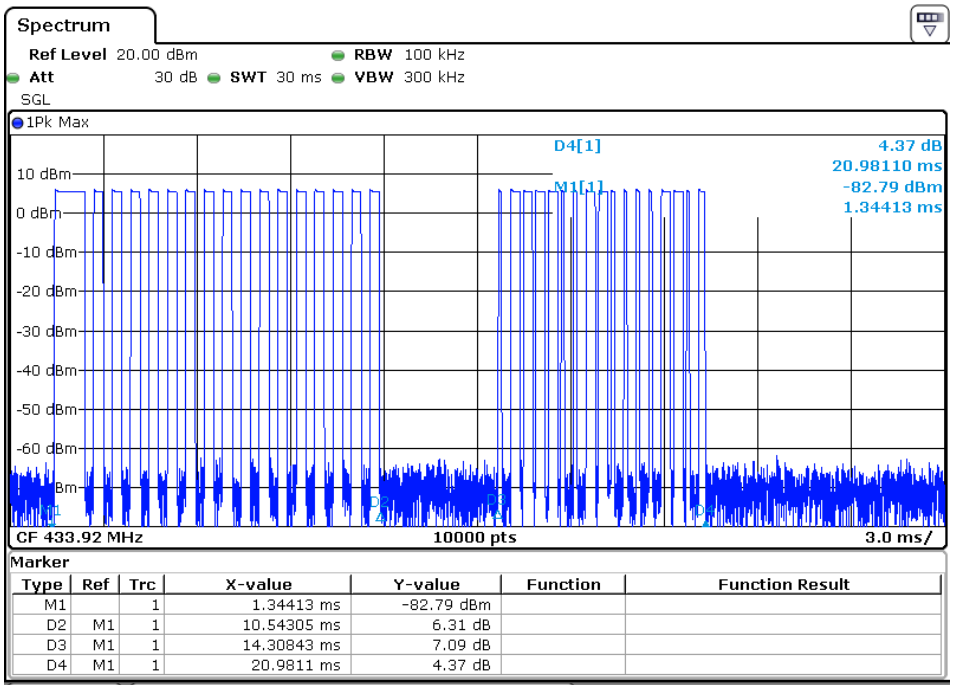
20log (Duty cycle) = 20log(T_{pulse}/36.3136) =20log(0.28601)= -10.87dB

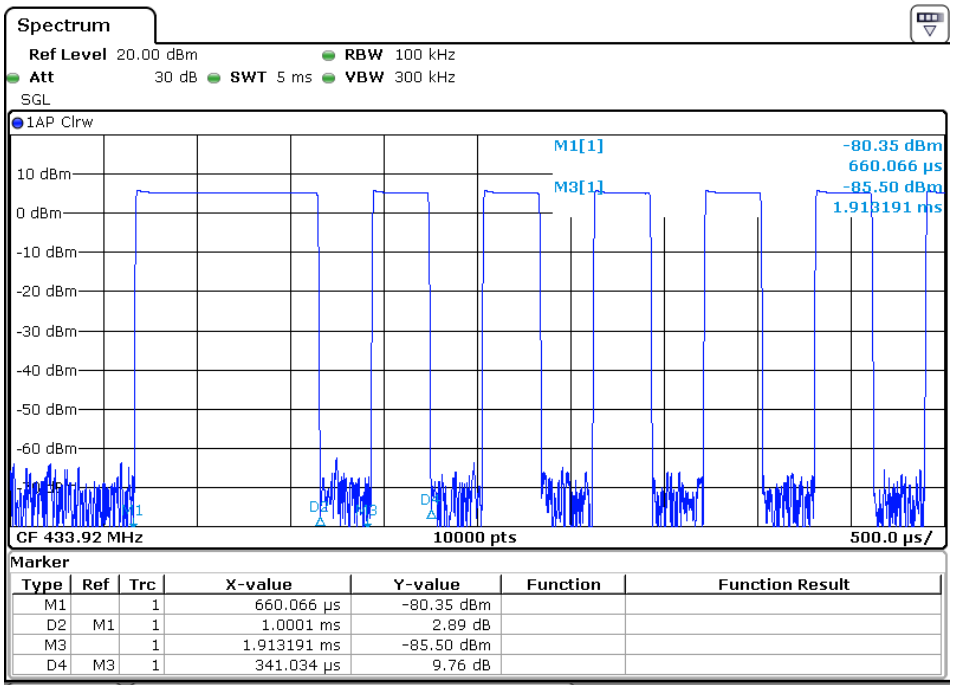
Here T_{pulse}=1.0001+24*0.341034+8*0.122812+0.218622 (ms)=10.386034(ms)

Please refer to below plots for more details

Temperature:	23 ℃	Test Data	2018-03-17
Pressure:	1010 hPa	Relative Humidity:	60%
Test Mode :	TX CH00		

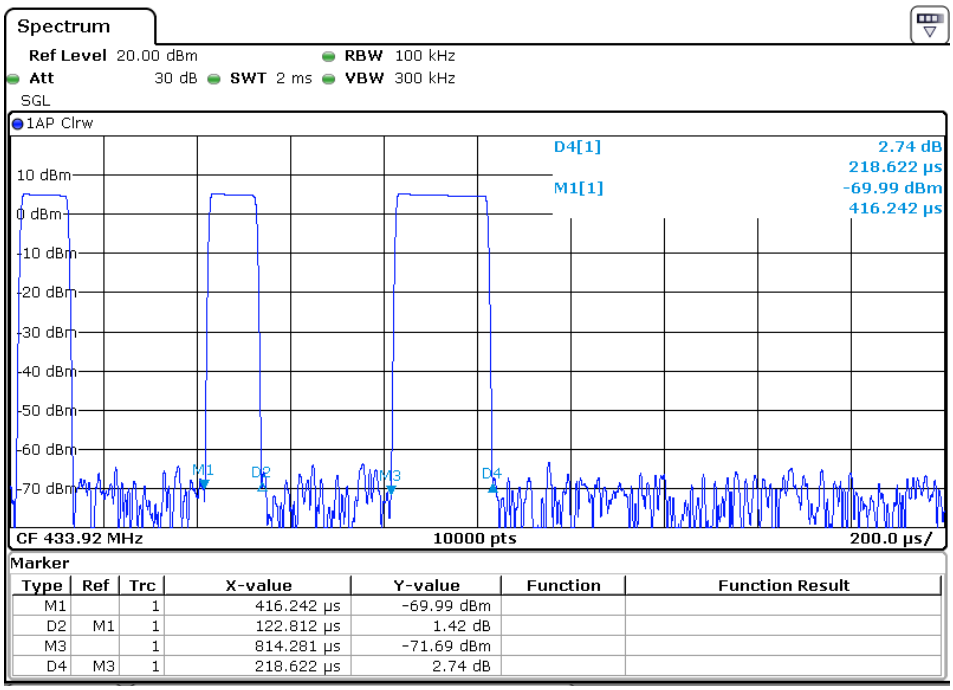






Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	660.066 µs	-80.35 dBm		
D2	M1	1	1.0001 ms	2.89 dB		
M3		1	1.913191 ms	-85.50 dBm		
D4	M3	1	341.034 µs	9.76 dB		



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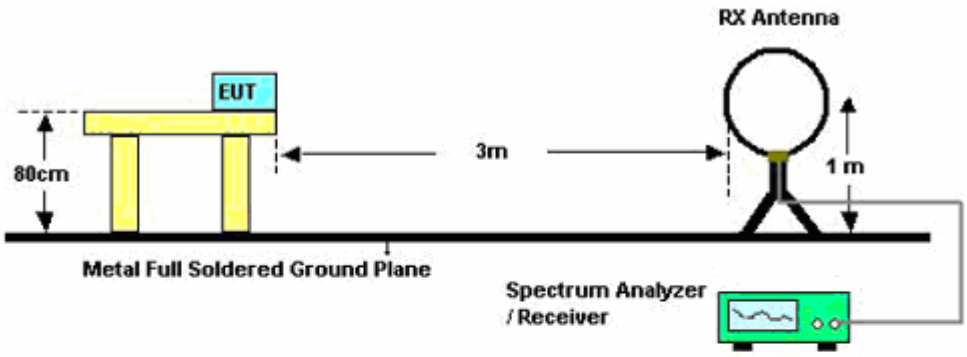
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	416.242 µs	-69.99 dBm		
D2	M1	1	122.812 µs	1.42 dB		
M3		1	814.281 µs	-71.69 dBm		
D4	M3	1	218.622 µs	2.74 dB		

7.2 Test Procedures

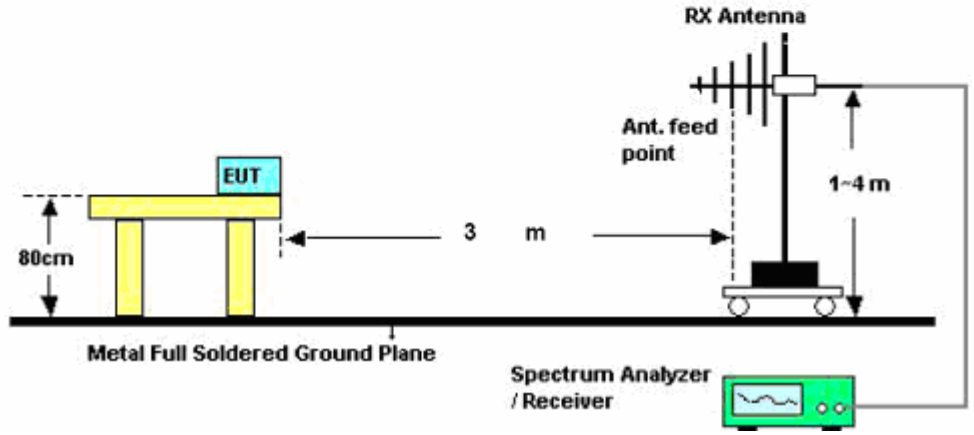
a. The EUT was placed on a rotatable table top 0.8 meter above ground.
b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
c. The table was rotated 360 degrees to determine the position of the highest radiation.
d. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
f. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
h. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
i. “Cone of radiation” has been considered to be 3dB bandwidth of the measurement antenna.

7.3 Typical Test Setup

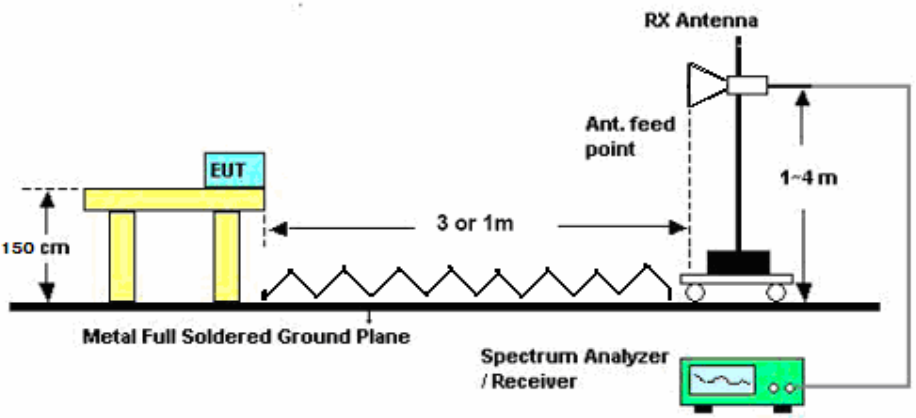
For radiated emissions below 30MHz



For radiated emissions 30MHz to 1GHz



For radiated emissions above 1 GHz



Above 10 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.
Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1m]) (dB);
Limit line = specific limits (dBuV) + distance extrapolation factor [9.54 dB].

7.4 Test Result and Data (9kHz ~ 30MHz)

The 9kHz - 30MHz spurious emission is under limit 20dB more.

7.5 Test Result and Data (30MHz ~ 1GHz, worst emissions found)

Power	:	DC 3V	Pol/Phase	:	HORIZONTAL
Test Mode 1	:	TX CH00	Temperature	:	22 °C
Memo	:		Humidity	:	59%

Antenna polarization: Horizontal:

Frequency (MHz)	Reading Level (dBuV)	Correct Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Type
433.92	91.64	-6.61	85.03	100.82	-15.79	Peak
867.84	57.00	1.86	58.86	80.82	-21.96	Peak
1302.060	56.82	-10.33	46.49	80.82	-34.33	Peak
2168.725	50.50	-7.68	42.82	80.82	-38	Peak
2605.477	55.35	-4.16	51.19	80.82	-29.63	Peak
3040.803	53.00	-1.58	51.42	80.82	-29.4	Peak
3475.384	50.74	-0.62	50.12	80.82	-30.7	Peak
3908.657	46.73	3.17	49.90	80.82	-30.92	Peak

Frequency (MHz)	20log (Duty cycle) (dB)	Peak Level (dBμV)	Average Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector Type
433.9200	-10.87	85.03	74.16	80.82	-6.66	AVG

Antenna polarization: Vertical:

Frequency (MHz)	Reading Level (dBuV)	Correct Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Type
433.92	71.56	-6.61	64.95	100.82	-35.87	Peak
867.84	49.51	1.86	51.37	80.82	-29.45	Peak
1302.060	53.70	-10.33	43.37	80.82	-37.45	Peak
2168.725	44.84	-7.68	37.16	80.82	-43.66	Peak
2605.477	48.32	-4.16	44.16	80.82	-36.66	Peak
3035.913	49.84	-1.59	48.25	80.82	-32.57	Peak
3475.384	46.78	-0.62	46.16	80.82	-34.66	Peak
4591.183	44.69	5.05	49.74	80.82	-31.08	Peak

Frequency (MHz)	20log (Duty cycle) (dB)	Peak Level (dBμV)	Average Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector Type
433.9200	-10.87	64.95	54.08	80.82	-26.74	AVG

Y: rotate EUT by 90° vertically.

X: rotate EUT by 90° clockwise.

Z: EUT as Radiated Emission test setup photograph of this report.

Remark: Radiated Emission test setup photograph of this report is the worst case and reported.

Other emissions:

The receive was scanned from the lowest frequency generated within the EUT to 5 GHz.When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. The worst case emissions were reported.

An initial pre-scan was performed in the 3 m chamber using the spectrum analyzer in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by Bilog antenna with 2 orthogonal polarities.

The field strength is calculated by adding the Antenna Factor, Cable Factor & Peramplifier. The basic equation with a sample calculation is as follows:

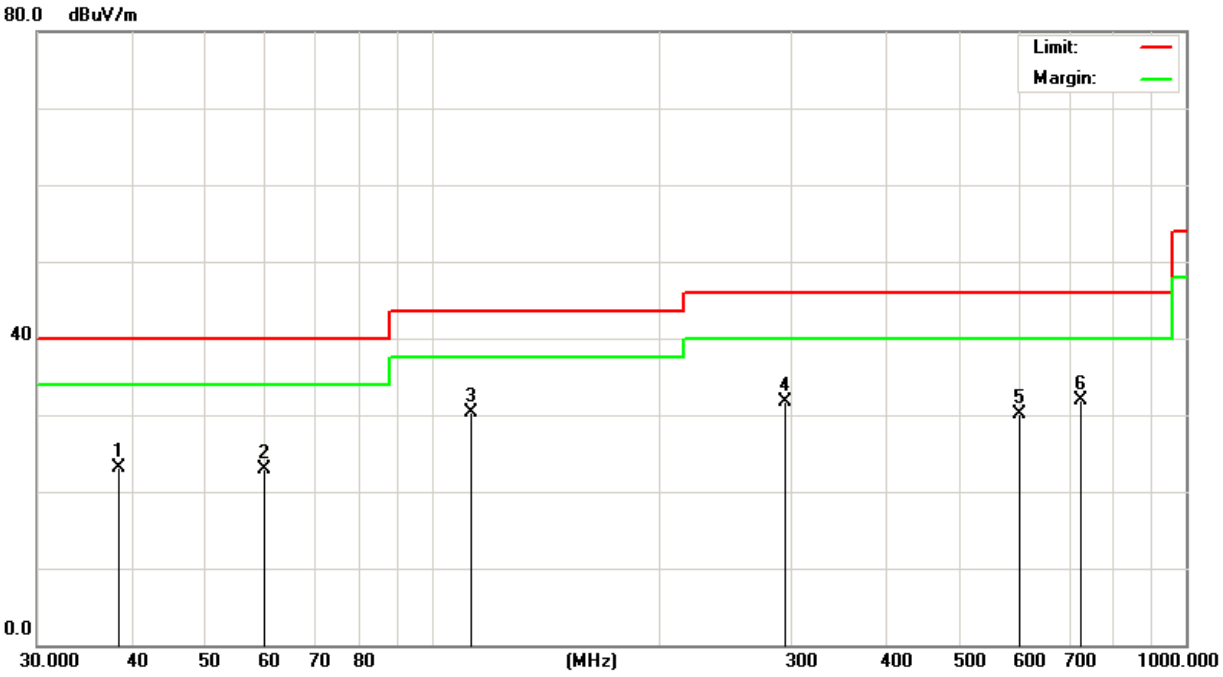
Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Peramplifier Factor.

The following test results were performed on the EUT.

Since the peak emission level is lower than the average limit, the average emission level does not need to show.

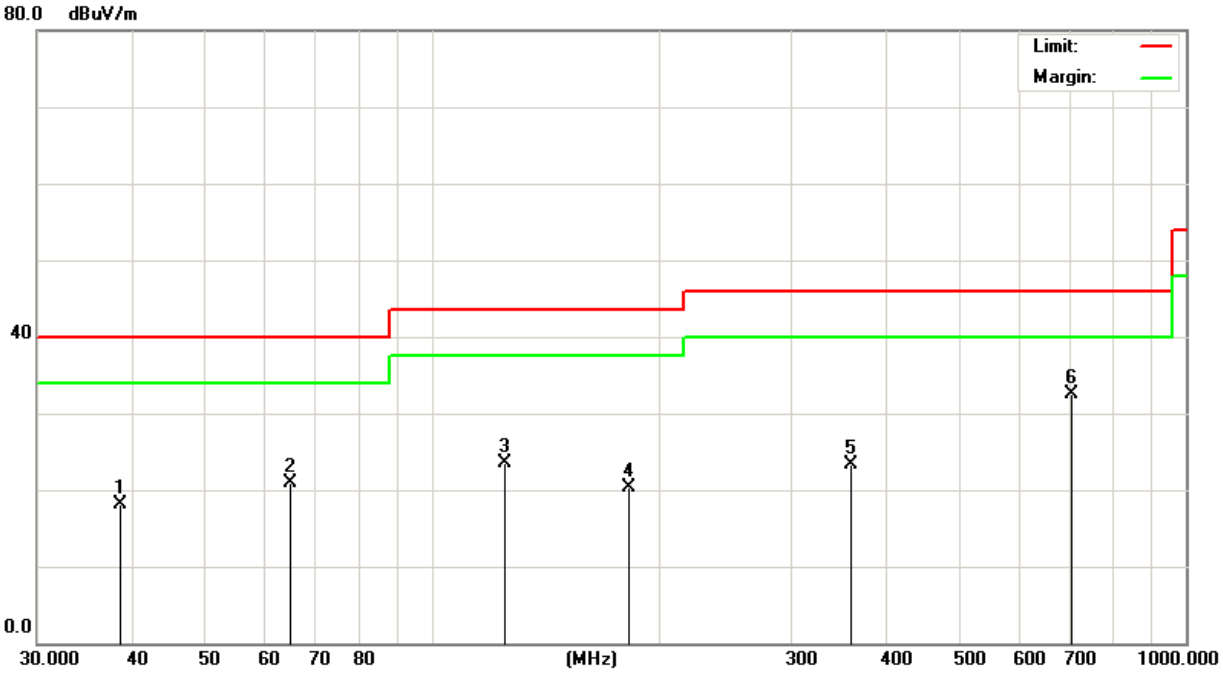
Test the EUT in transmitting mode.

Power	:	DC 3V	Pol/Phase	:	VERTICAL
Test Mode 1	:	TX CH00	Temperature	:	22 °C
Memo	:		Humidity	:	59%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		38.4808	39.77	-16.66	23.11	40.00	-16.89	QP
2		60.0690	42.28	-19.40	22.88	40.00	-17.12	QP
3	*	112.5243	44.07	-13.77	30.30	43.50	-13.20	QP
4		294.1136	42.07	-10.28	31.79	46.00	-14.21	QP
5		601.4265	30.98	-0.89	30.09	46.00	-15.91	QP
6		726.8052	32.43	-0.51	31.92	46.00	-14.08	QP

Power	:	DC 3.0V from battery	Pol/Phase	:	HORIZONTAL
Test Mode 1	:	TX CH00	Temperature	:	22 °C
Memo	:		Humidity	:	59 %



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		38.7518	32.60	-14.50	18.10	40.00	-21.90	QP
2		65.1145	38.40	-17.44	20.96	40.00	-19.04	QP
3		125.0066	38.65	-15.15	23.50	43.50	-20.00	QP
4		182.5592	31.57	-11.36	20.21	43.50	-23.29	QP
5		360.4476	30.84	-7.59	23.25	46.00	-22.75	QP
6	*	701.7610	32.10	0.32	32.42	46.00	-13.58	QP

All the modulation modes were tested, the data of the worst mode are recorded in the above pages and the others modulation methods do not exceed the limits.

8. Bandwidth Measurement Data

8.1 Test Limit

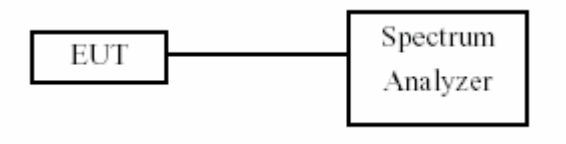
The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated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

Bandwidth (20dB) Limit = 0.25% * f(MHz) = 0.25% * 433.92MHz = 1084.8kHz.

8.2 Test Procedures

a. The transmitter output was connected to the spectrum analyzer.
b. Set RBW= 30KHz and VBW ≥ 3x RBW, Sweep time = Auto.
c. The 20 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20 dB.
d. The 20 dB Bandwidth was measured and recorded.

8.3 Test Setup Layout



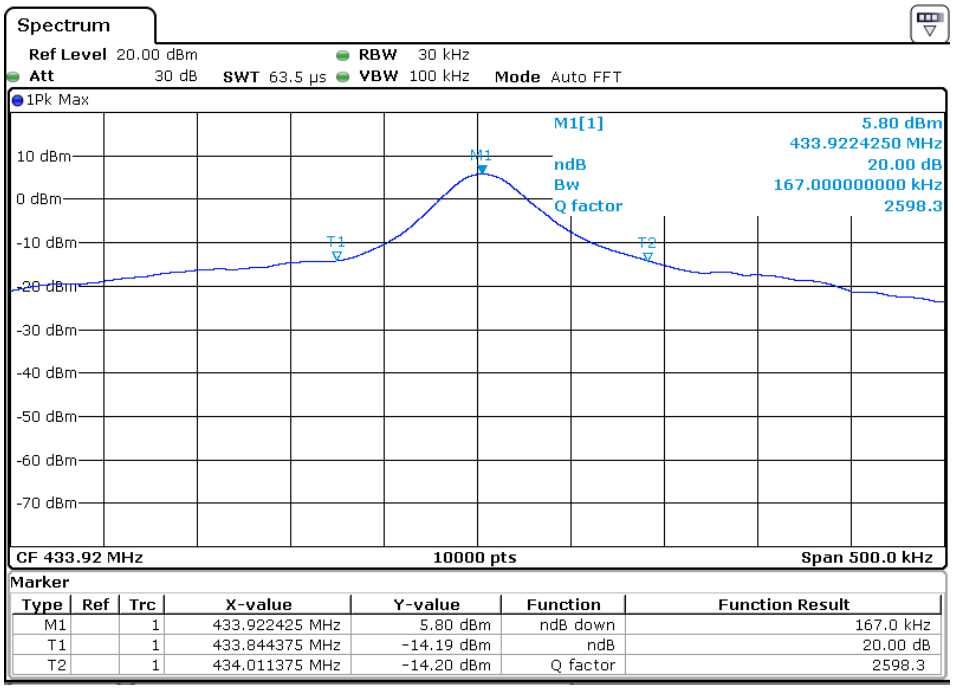
8.4 Test Result and Data

Test Date: Mar. 14, 2018 Temperature: 26℃

Atmospheric pressure: 1000 pha Humidity: 55%

Test Mode	Channel	Frequency (MHz)	20dB Bandwidth (MHz)
TX	00	433.92	0.167

20dB bandwidth
Channel: 0

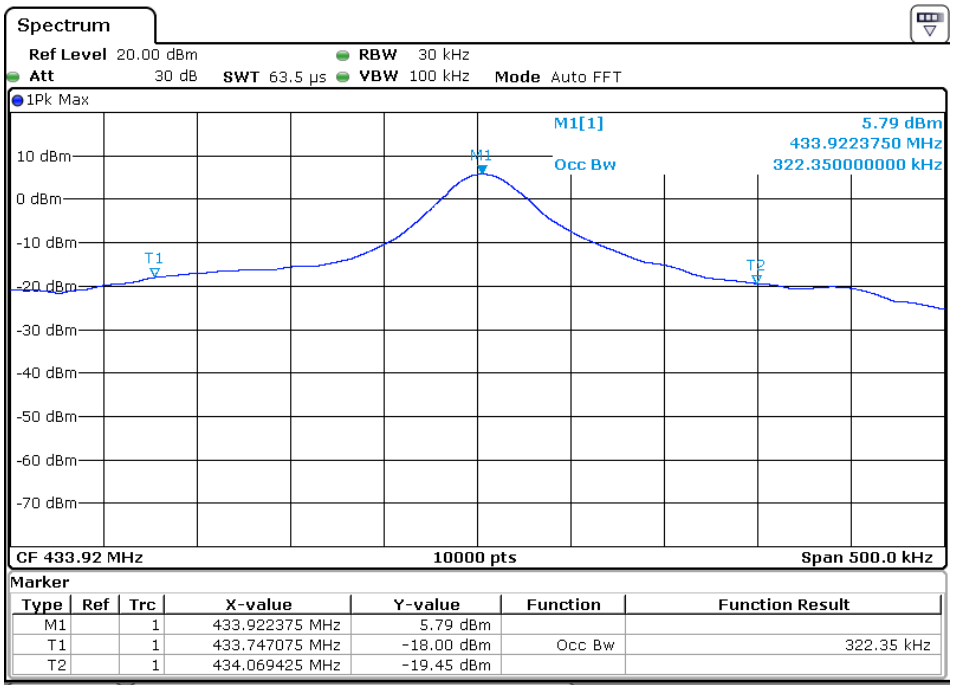


Test Date: Mar. 14, 2018 Temperature: 26℃

Atmospheric pressure: 1000 pha Humidity: 55%

Test Mode	Channel	Frequency (MHz)	99% Bandwidth (MHz)
TX	00	433.92	0.32235

99% bandwidth
Channel: 0



9. Transmit time

9.1 Test Limit

A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

9.2 Test Procedures

a. Peak power is measured using the wideband power meter.

b. Spectrum Setting: RBW=100 kHz, VBW≧RBW, Sweep time=10s, Detector Function=Peak.

9.3 Test Setup Layout

9.4 Test Result and Data

Test Date: Mar. 14, 2018 Temperature: 26℃

Atmospheric pressure: 1000 pha Humidity: 55%

Item	Duration of each transmission (Td)	Limit
Time	4.64446s	≤5 s

Channel 0: 433.92MHz