



FCC ID: R4UARCFLEXHANDY
Report No.: T190703W02-RP

Page: 1 / 37
Rev.: 01

FCC RADIO TEST REPORT

FCC 47 CFR PART 15 SUBPART C

Test Standard	FCC Part 15.231
Trade name	ARC
Product name	Industrial radio remote control systems
Model No.	FLEX HANDY 2X, FLEX HANDY 2S
Operation Freq.	433.050MHz – 434.575MHz
Test Result	Pass
Statements of Conformity	Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

The test Result was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were given in ANSI C63.10: 2013 and compliance standards.

The test results of this report relate only to the tested sample (EUT) identified in this report.

The test Report of full or partial shall not copy. Without written approval of SGS Compliance Certification Services Inc. (Wugu Laboratory)

Approved by:

Reviewed by:

Kevin Tsai
Deputy Manager

Dally Hong
Engineer

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.
除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部分複製。

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Report No.: T190703W02-RP

Page: 2 / 37

Rev.: 01

Revision History

Rev.	Issue Date	Revisions	Effect page	Revised By
00	September 27, 2019	Initial Issue	ALL	May Lin
01	November 06, 2019	See the following Note Rev. (01)	P.11-12, P.16, P.21, P.28-35	May Lin

Rev (01):

1. Revised the section 3.2 、section 3.3 、section 4.2.2 、section 4.3.4 and section 4.4.4.



Report No.: T190703W02-RP

Page: 3 / 37

Rev.: 01

Table of contents

1. GENERAL INFORMATION	4
1.1 EUT INFORMATION	4
1.2 EUT CHANNEL INFORMATION.....	5
1.3 ANTENNA INFORMATION	6
1.4 MEASUREMENT UNCERTAINTY	7
1.5 FACILITIES AND TEST LOCATION.....	8
1.6 INSTRUMENT CALIBRATION.....	8
1.7 SUPPORT AND EUT ACCESSORIES EQUIPMENT	9
1.8 TEST METHODOLOGY AND APPLIED STANDARDS	9
2. TEST SUMMERY.....	10
3. DESCRIPTION OF TEST MODES.....	11
3.1 THE WORST MODE OF OPERATING CONDITION.....	11
3.2 THE WORST MODE OF MEASUREMENT	11
3.3 FCC PART 15.231 PERIODIC OPERATION IN THE BAND 40.66-40.70 MHZ AND ABOVE 70 MHZ.....	12
3.4 EUT DUTY CYCLE.....	14
4. TEST RESULT.....	15
4.1 AC POWER LINE CONDUCTED EMISSION	15
4.2 EMISSION BANDWIDTH	16
4.3 FIELD STRENGTH OF FUNDAMENTAL	19
4.4 RADIATION UNWANTED EMISSION	24
4.5 OPERATION RESTRICTION	36
APPENDIX 1 – PHOTOGRAPHS OF EUT	



Report No.: T190703W02-RP

Page: 4 / 37

Rev.: 01

1. GENERAL INFORMATION

1.1 EUT INFORMATION

Applicant	ADVANCED RADIOTECH CORPORATION No.3, South 1st Road, Chien Chen District, Kaohsiung, Taiwan
Manufacturer	ADVANCED RADIOTECH CORPORATION No.3, South 1st Road, Chien Chen District, Kaohsiung, Taiwan
Equipment	Industrial radio remote control systems
Model Name	FLEX HANDY 2X, FLEX HANDY 2S
Model Discrepancy	FLEX HANDY 2X : 2 Push button Two step FLEX HANDY 2S : 2 Push button One step
Received Date	July 03, 2019
Date of Test	August 21 ~ 26, 2019
Periodic operation	☒ (1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released. ☐ (2) A transmitter activated automatically shall cease transmission within 5 seconds after activation ☐ (3) Periodic transmissions at regular predetermined intervals are not permitted. ☐ (4) Periodic transmissions (lower field strength): each transmission is not greater than 1 sec and the silent period between transmissions is at least 30 times the duration of the transmission but in no case less than 10 sec.
Power Operation	Power from battery: DC 3V
Operation Frequency	433.050MHz – 434.575MHz
S/W Version	ARC-107STD-EN1-1-4
H/W Version	V 1.0

1.2 EUT CHANNEL INFORMATION

Frequency Range	433.050MHz – 434.575MHz					
Modulation Type	GFSK					
Bandwidth	25 KHz					
Number of Channels	62 channels					
Channel List	CH	Freq.(MHz)	CH	Freq.(MHz)	CH	Freq.(MHz)
	1	433.050	22	433.575	43	434.100
	2	433.075	23	433.600	44	434.125
	3	433.100	24	433.625	45	434.150
	4	433.125	25	433.650	46	434.175
	5	433.150	26	433.675	47	434.200
	6	433.175	27	433.700	48	434.225
	7	433.200	28	433.725	49	434.250
	8	433.225	29	433.750	50	434.275
	9	433.250	30	433.775	51	434.300
	10	433.275	31	433.800	52	434.325
	11	433.300	32	433.825	53	434.350
	12	433.325	33	433.850	54	434.375
	13	433.350	34	433.875	55	434.400
	14	433.375	35	433.900	56	434.425
	15	433.400	36	433.925	57	434.450
	16	433.425	37	433.950	58	434.475
	17	433.450	38	433.975	59	434.500
	18	433.475	39	434.000	60	434.525
	19	433.500	40	434.025	61	434.550
	20	433.525	41	434.050	62	434.575
	21	433.550	42	434.075		



Report No.: T190703W02-RP

Page: 6 / 37

Rev.: 01

Remark:

Refer as ANSI 63.10:2013 clause 5.6.1 Table 4 for test channels

Number of frequencies to be tested		
Frequency range in which device operates	Number of frequencies	Location in frequency range of operation
☐ 1 MHz or less	1	Middle
☒ 1 MHz to 10 MHz	2	1 near top and 1 near bottom
☐ More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom

1.3 ANTENNA INFORMATION

Antenna Type	☐ PIFA ☒ PCB ☐ Dipole
Antenna Gain	0 dBi
Antenna Connector	N/A



Report No.: T190703W02-RP

Page: 7 / 37

Rev.: 01

1.4 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	+/- 1.2575
Emission bandwidth, 20dB bandwidth	+/- 0.0014
RF output power, conducted	+/- 1.14
Power density, conducted	+/- 1.40
3M Semi Anechoic Chamber / 30M~200M	+/- 4.12
3M Semi Anechoic Chamber / 200M~1000M	+/- 4.68
3M Semi Anechoic Chamber / 1G~8G	+/- 5.18
3M Semi Anechoic Chamber / 8G~18G	+/- 5.47
3M Semi Anechoic Chamber / 18G~26G	+/- 3.81
3M Semi Anechoic Chamber / 26G~40G	+/- 3.87

Remark:

1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$
2. ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report.

1.5 FACILITIES AND TEST LOCATION

All measurement facilities used to collect the measurement data are located at

No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.)

Test site	Test Engineer	Remark
AC Conduction Room	-	Not applicable, because EUT doesn't connect to AC Main Source direct.
Radiation	Jerry Lu	-
RF Conducted	Dally Hong	-

Remark: The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

1.6 INSTRUMENT CALIBRATION

RF Conducted Test Site					
Equipment	Manufacturer	Model	S/N	Cal Date	Cal Due
Coaxial Cable	Woken	WC12	CC003	06/28/2019	06/27/2020
Signal Analyzer	R&S	FSV 40	101073	09/27/2018	09/26/2019
Software	N/A				

3M 966 Chamber Test Site					
Equipment	Manufacturer	Model	S/N	Cal Date	Cal Due
Bilog Antenna	Sunol Sciences	JB3	A030105	07/26/2019	07/25/2020
Cable	HUBER SUHNER	SUCOFLEX 104PEA	25157	02/26/2019	02/25/2020
Cable	HUBER SUHNER	SUCOFLEX 104PEA	20995	02/26/2019	02/25/2020
Digital Thermo-Hygro Meter	WISEWIND	1206	D07	01/30/2019	01/29/2020
High Pass Filter	SOLVANG TECHNOLOGY INC.	STI15	9923	02/26/2019	02/25/2020
Horn Antenna	ETS LINDGREN	3117	00143280	07/16/2019	07/15/2020
Loop Ant	COM-POWER	AL-130	121051	03/22/2019	03/21/2020
Pre-Amplifier	EMEC	EM330	060609	02/26/2019	02/25/2020
Pre-Amplifier	HP	8449B	3008A00965	02/26/2019	02/25/2020
PSA Series Spectrum Analyzer	Agilent	E4446A	MY46180323	05/29/2019	05/28/2020
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Software	e3 6.11-20180413				

Remark: Each piece of equipment is scheduled for calibration once a year.



Report No.: T190703W02-RP

Page: 9 / 37

Rev.: 01

1.7 SUPPORT AND EUT ACCESSORIES EQUIPMENT

There are no accessories and support equipment be used during the test.

EUT Accessories Equipment					
No.	Equipment	Brand	Model	Series No.	FCC ID
	N/A				

Support Equipment					
No.	Equipment	Brand	Model	Series No.	FCC ID
	N/A				

1.8 TEST METHODOLOGY AND APPLIED STANDARDS

The test methodology, setups and results comply with all requirements in accordance with ANSI C63.10:2013, FCC 15.231.



Report No.: T190703W02-RP

Page: 10 / 37

Rev.: 01

2. TEST SUMMERY

Standard Sec.	Chapter	Test Item	Result
15.203	1.3	Antenna Requirement	Pass
15.207	4.1	AC Power-line Conducted Emission	Not applicable
15.231(c)	4.2	Emission Bandwidth	Pass
15.231(b)	4.3	Fundamental Emission	Pass
15.209(b)	4.4	Transmitter Radiated Emission	Pass
15.231(a)(1)	4.5	Operation Restriction	Pass

3. DESCRIPTION OF TEST MODES

3.1 THE WORST MODE OF OPERATING CONDITION

Operation mode	433.050 MHz	434.575MHz
RF Filed strength	<u>Peak: 86.49 dBuv/m</u> <u>Average : 74.91 dBuv/m</u>	<u>Peak: 87.29 dBuv/m</u> <u>Average : 75.71 dBuv/m</u>

Remark: Field strength performed Average level at 3m.

3.2 THE WORST MODE OF MEASUREMENT

Radiated Emission Measurement Above 1G	
Test Condition	Band edge, Emission for Unwanted and Fundamental
Power supply Mode	Mode 1: EUT power by Battery (DC 3V)
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4
Worst Position	☐ Placed in fixed position. ☒ Placed in fixed position at X-Plane (E2-Plane) ☐ Placed in fixed position at Y-Plane (E1-Plane) ☐ Placed in fixed position at Z-Plane (H-Plane)

Radiated Emission Measurement Below 1G	
Test Condition	Radiated Emission Below 1G
Power supply Mode	Mode 1: EUT power by Battery (DC 3V)
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4

Remark:

1. The worst mode was record in this test report.
2. EUT pre-scanned in three axis, X, Y, Z and two polarity, Horizontal and Vertical for radiated measurement. The worst case (X-Plane) were recorded in this report

3.3 FCC PART 15.231 PERIODIC OPERATION IN THE BAND 40.66-40.70 MHZ AND ABOVE 70 MHZ

According to FCC 15.231(b), 15.231(e),

(b) In addition to the provisions of §15.205, the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Fundamental frequency (MHz)	Field strength of fundamental (microvolts/meter)	Field strength of spurious emissions (microvolts/meter)
40.66-40.70	2,250	225
70-130	1,250	125
130-174	¹ 1,250 to 3,750	¹ 125 to 375
174-260	3,750	375
260-470	¹ 3,750 to 12,500	¹ 375 to 1,250
Above 470	12,500	1,250

¹Linear interpolations.

(1) The above field strength limits are specified at a distance of 3 meters. The tighter limits apply at the band edges.

(2) Intentional radiators operating under the provisions of this section shall demonstrate compliance with the limits on the field strength of emissions, as shown in the above table, based on the average value of the measured emissions. As an alternative, compliance with the limits in the above table may be based on the use of measurement instrumentation with a CISPR quasi-peak detector. The specific method of measurement employed shall be specified in the application for equipment authorization. If average emission measurements are employed, the provisions in §15.35 for averaging pulsed emissions and for limiting peak emissions apply. Further, compliance with the provisions of §15.205 shall be demonstrated using the measurement instrumentation specified in that section.

(3) The limits on the field strength of the spurious emissions in the above table are based on the fundamental frequency of the intentional radiator. Spurious emissions 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.

(e) Intentional radiators may operate at a periodic rate exceeding that specified in paragraph (a) of this section and may be employed for any type of operation, including operation prohibited in paragraph (a) of this section, provided the intentional radiator complies with the provisions of paragraphs (b) through (d) of this section, except the field strength table in paragraph (b) of this section is replaced by the following:

Fundamental frequency (MHz)	Field strength of fundamental (microvolts/meter)	Field strength of spurious emissions (microvolts/meter)
40.66-40.70	1,000	100
70-130	500	50
130-174	500 to 1,500 ¹	50 to 150 ¹
174-260	1,500	150
260-470	1,500 to 5,000 ¹	150 to 500 ¹
Above 470	5,000	500

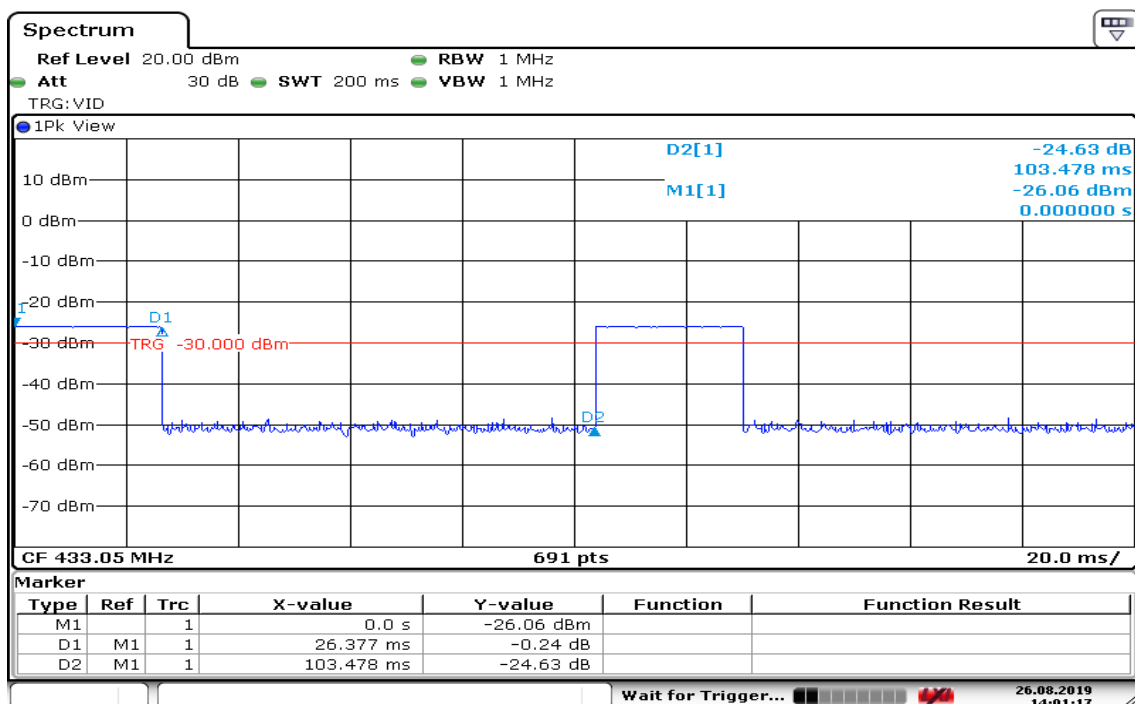
¹Linear interpolations.

In addition, devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

3.4 EUT DUTY CYCLE

433MHz - 434MHz

Duty Cycle			
TX ON (ms)	TX All(ms)	Duty Cycle (%)	Duty Factor(dB)
26.377	100	25.49%	-11.58



Date: 26.AUG.2019 14:01:17

Notes:

- The transmitter duty cycle was measured using a spectrum analyser in the time domain and calculated by $20 \log (\text{Time}_{\text{on}} / [\text{Period or 100 ms whichever is the lesser}])$
- The EUT transmits for a Time_{on} of 26.377 milliseconds.
 $20 \log (\text{Time}_{\text{on}} / [\text{Period or 100 ms whichever is the lesser}])$
 $20 \log (26.377/100) = -11.58\text{dB}$

4. TEST RESULT

4.1 AC POWER LINE CONDUCTED EMISSION

4.1.1 Test Limit

According to §15.207(a),

Frequency Range (MHz)	Limits(dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

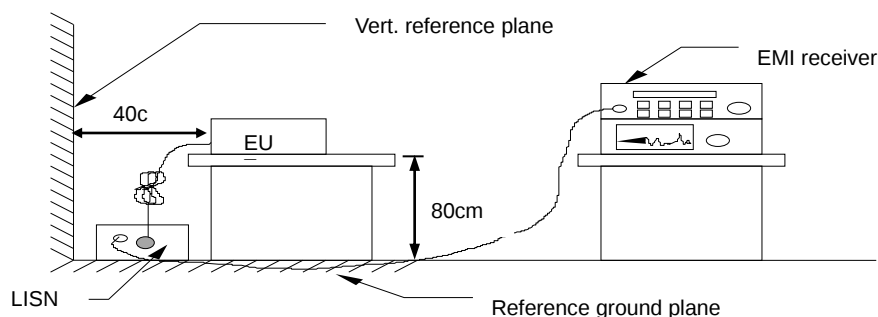
* Decreases with the logarithm of the frequency.

4.1.2 Test Procedure

Test method Refer as ANSI 63.10:2013 clause 6.2,

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete

4.1.3 Test Setup



4.1.4 Test Result

Not applicable

4.2 EMISSION BANDWIDTH

4.2.1 Test Limit

According to §15.231(c),

Limit	☒ 70 MHz – 900 MHz : $F_c * 0.25 \%$ ☐ Above 900 MHz : $F_c * 0.5 \%$
-------	---

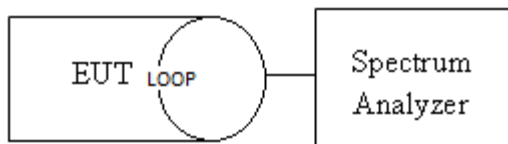
4.2.2 Test Procedure

Test method Refer as ANSI 63.10:2013 clause 6.9.2,

The Loop antenna connected to the spectrum analyzer, was touching to the transmitter antenna. Set the RBW=10KHz, VBW=30KHz, Detector = Peak, Trace mode = Max hold, Sweep = Auto. Measure the maximum width of the emission that is constrained by the frequencies associated with the 20dB Bandwidth.

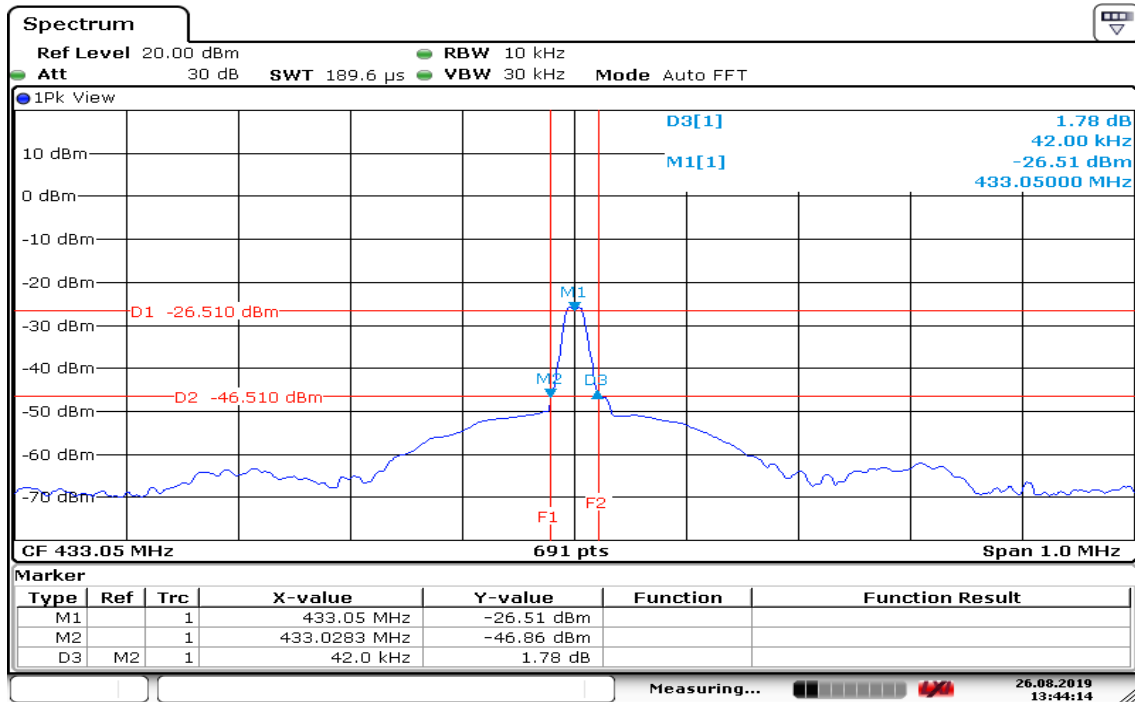
The Loop antenna connected to the spectrum analyzer, was touching to the transmitter antenna. SA set RBW = 1% ~ 5% OBW, VBW = three times the RBW and Detector = Peak, Trace mode = Max hold, Sweep = Auto. Measure the maximum width of the emission that is constrained by the frequencies associated with the Occupied Bandwidth (99%).

4.2.3 Test Setup

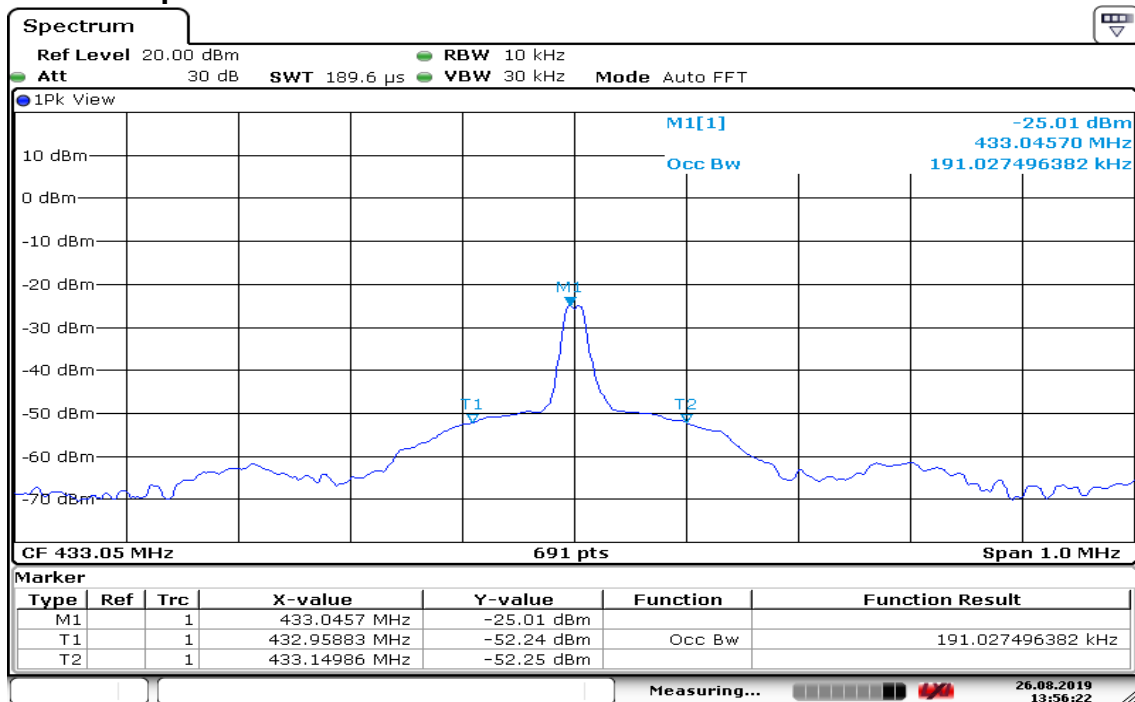


4.2.4 Test Result

Spectrum Bandwidth				
Frequency (MHz)	20dB Bandwidth (KHz)	20dB Bandwidth Limits (MHz)	99% Occupied BW (KHz)	99% Bandwidth Limits (MHz)
433.050	42.0	1.082625	191.027	1.082625
434.575	50.7	1.086437	240.231	1.086437

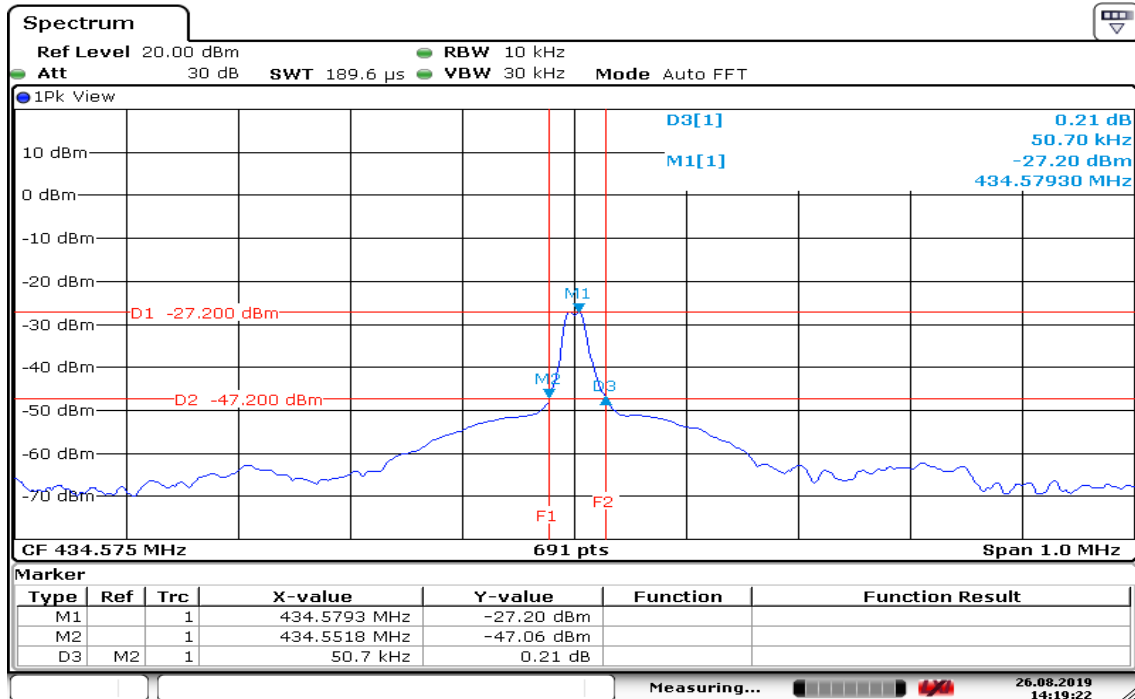
Test Data**433.050MHz****20dB Bandwidth**

Date: 26.AUG.2019 13:44:14

99% Occupied BW

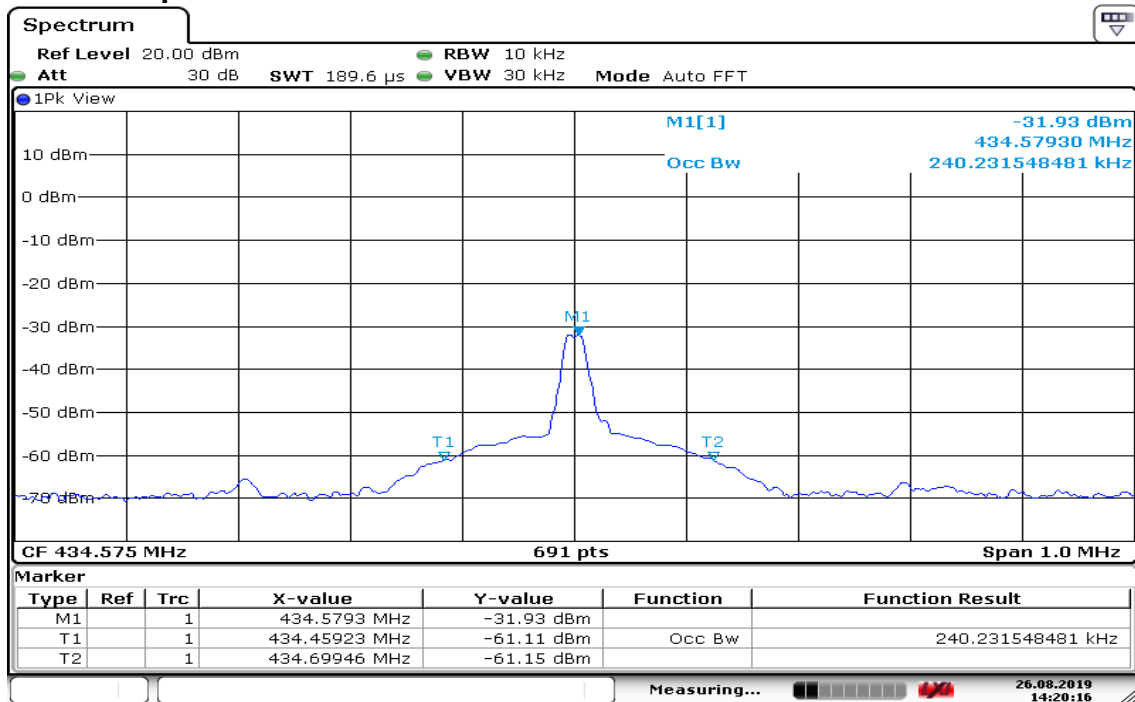
Date: 26.AUG.2019 13:56:22

434.575MHz 20dB Bandwidth



Date: 26.AUG.2019 14:19:23

99% Occupied BW



Date: 26.AUG.2019 14:20:17

4.3 FIELD STRENGTH OF FUNDAMENTAL

4.3.1 Test Limit

According to §15.231(b)

Fundamental frequency (MHz)	Field strength of fundamental (microvolts/meter)	Field strength of fundamental (microvolts/meter)
40.66-40.70	2,250	225
70-130	1,250	125
130-174	¹ 1,250 to 3,750	¹ 125 to 375
174-260	3,750	375
260-470	¹ 3,750 to 12,500	¹ 375 to 1,250
Above 470	12,500	1,250

* Linear interpolation with frequency, f, in MHz:

For 130-174 MHz: Field Strength ($\mu\text{V/m}$) = $(56.82 \times f) - 6136$

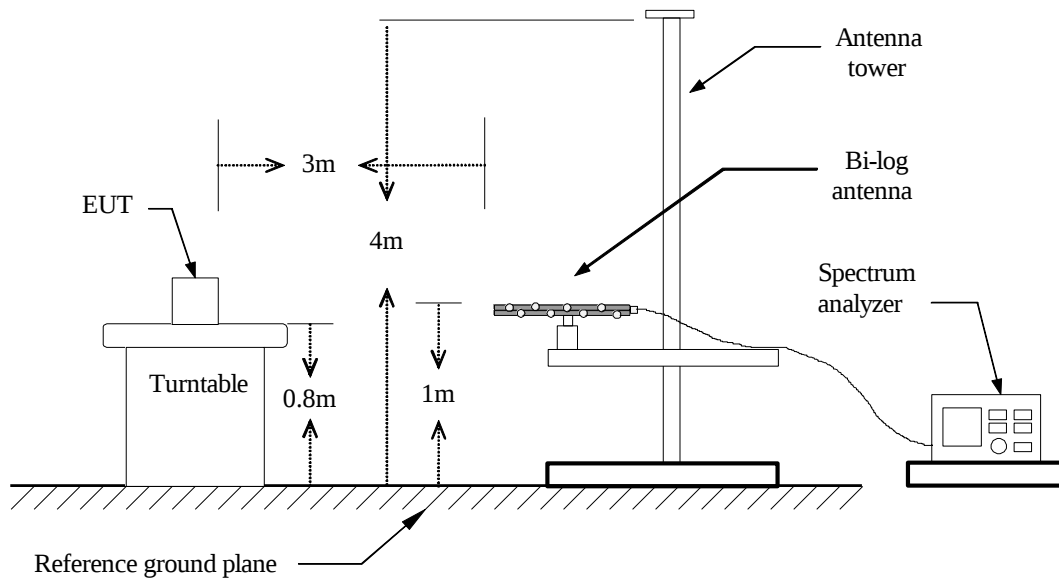
For 260-470 MHz: Field Strength ($\mu\text{V/m}$) = $(41.67 \times f) - 7083$

4.3.2 Test Procedure

Test method Refer as ANSI 63.10:2013 clause 4.1.4 and clause 6.5

clause 4.1.4	☒ 4.1.4.2.2: Measurement Peak value. ☐ 4.1.4.2.3: Duty cycle $\geq$ 100%. ☒ 4.1.4.2.4: Measurement Average value.
--------------	--

4.3.3 Test Setup



4.3.4 Test Result

Field Strength					
Frequency (MHz)	Fundamental (dBuV/m) at 3m	Limit (dBuV/m) at 3m	Margin (dB)	Axis/Pol.	Remark
433.05	74.91	80.80	-5.89	X/H	AVG

Remark:

1. Fundamental measured method setting on spectrum, RBW=100 kHz, VBW=100kHz and Detector=Peak.

2. Average result = Peak result + Duty factor = 86.49 dBuV/m –11.58= 74.91dBuV/m

3. 260MHz ~ 470MHz limit is $41.67 * (\text{Frequency, MHz}) - 7083$

Limit = $41.67 * (433.06 \text{ MHz}) - 7083$

= 10962.6102 (uV/m)

dBuV/m = $20 \text{ Log} (\text{uV/m}) = 20 \text{ Log} (10962.6102 \text{ uV/m}) = 80.80\text{dBuV/m}$

Field Strength					
Frequency (MHz)	Fundamental (dBuV/m) at 3m	Limit (dBuV/m) at 3m	Margin (dB)	Axis/Pol.	Remark
434.57	75.71	80.85	-5.14	X/H	AVG

Remark:

1. Fundamental measured method setting on spectrum, RBW=100 kHz, VBW=100kHz and Detector=Peak.

2. Average result = Peak result + Duty factor = 87.29 dBuV/m –11.58= 75.71dBuV/m

3. 260MHz ~ 470MHz limit is $41.67 * (\text{Frequency, MHz}) - 7083$

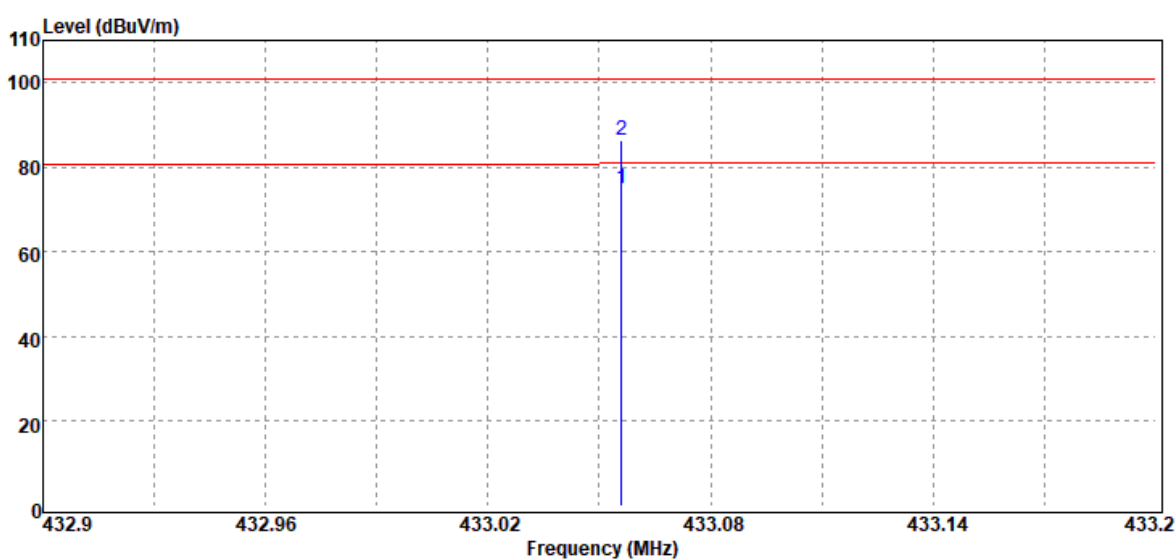
Limit = $41.67 * (434.57 \text{ MHz}) - 7083$

=11025.5319 (uV/m)

dBuV/m = $20 \text{ Log} (\text{uV/m}) = 20 \text{ Log} (11025.5319 \text{ uV/m}) = 80.85\text{dBuV/m}$

Test Data

Test Mode:	TX-433.06MHz	Temp/Hum	30.1(°C)/ 53%RH
Test Item	Fundamental	Test Date	2019/08/21
Axis/Polarize	X-Plane /Hor..	Test Engineer	Jerry Lu
Detector	Peak & AVG		



No	Frequency (MHz)	Detector Mode PK/QP/AV	Spectrum Reading Level (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit @3m (dBUV/m)	Margin (dB)
2	433.05	Peak	90.77	-4.28	86.49	100.80	-14.31

Note:

No.1 Average result = Peak result + Duty factor = 86.49 dBUV/m –11.58= 74.91dBUV/m

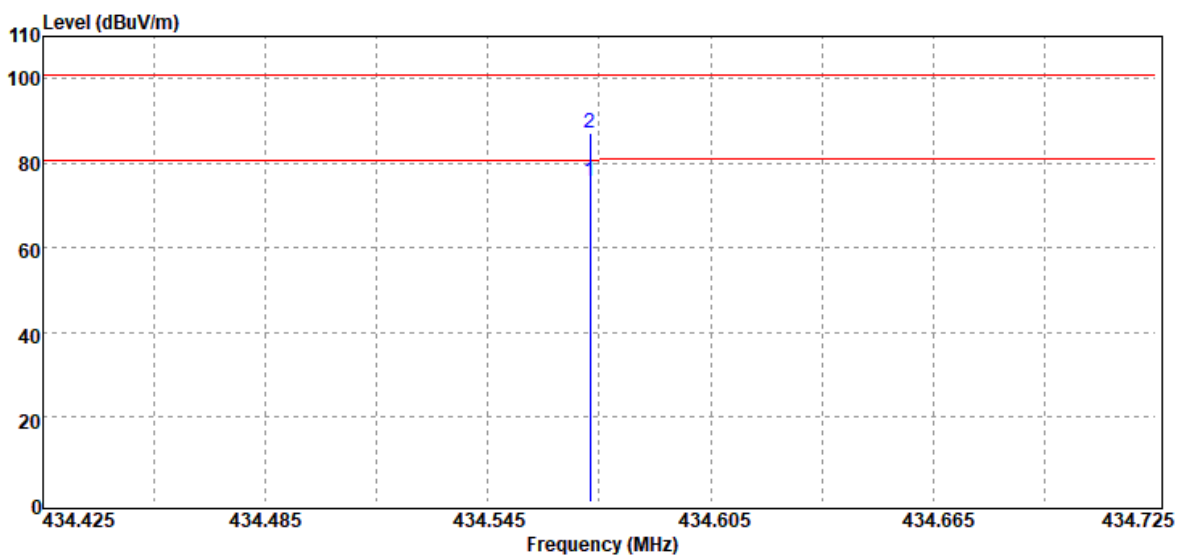


Report No.: T190703W02-RP

Page: 23 / 37

Rev.: 01

Test Mode:	TX-433.06MHz	Temp/Hum	30.1(°C)/ 53%RH
Test Item	Fundamental	Test Date	2019/08/21
Axis/Polarize	X-Plane /Hor..	Test Engineer	Jerry Lu
Detector	Peak & AVG		



No	Frequency (MHz)	Detector Mode PK/QP/AV	Spectrum Reading Level (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit @3m (dBuV/m)	Margin (dB)
2	434.57	Peak	91.53	-4.24	87.29	100.85	-13.56

Note:

No.1 Average result = Peak result + Duty factor = 87.29 dBuV/m -11.58= 75.71dBuV/m

4.4 RADIATION UNWANTED EMISSION

4.4.1 Test Limit

According to §15.231(b) and §15.209, §15.205

Unwanted emissions limit follow the table or the FCC Part 15.209, whichever limit permits higher field strength.

According to §15.231(b)

Fundamental frequency (MHz)	Field strength of fundamental (microvolts/meter)	Field strength of fundamental (microvolts/meter)
40.66-40.70	2,250	225
70-130	1,250	125
130-174	¹ 1,250 to 3,750	¹ 125 to 375
174-260	3,750	375
260-470	¹ 3,750 to 12,500	¹ 375 to 1,250
Above 470	12,500	1,250

¹Linear interpolations.

Below 30MHz

Frequency (MHz)	Field Strength				
	(μ V/m)	(dB μ V/m)	Measurement Distance (meter)	(dB μ V/m)	Measurement Distance (meter)
0.009 - 0.490	2400/F(kHz)	48.52 – 13.80	300	128.52–104.84	3
0.490 - 1.705	24000/F(kHz)	33.80 – 22.97	30	73.80– 62.97	3
1.705 – 30.0	30	29.54	30	69.54	3

Above 30MHz

Frequency (MHz)	Field Strength		Measurement Distance (meter)
	(μ V/m)	(dB μ V/m)	
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

4.4.2 Test Procedure

Test method Refer as ANSI 63.10:2013

☒ Unwanted Emission	☒ clause 4.1.4.2.2: Measurement Peak value. ☐ clause 4.1.4.2.3: Duty cycle $\geq 100\%$. ☒ clause 4.1.4.2.4: Measurement Average value.
---	---

☒ Radiated Emission	☒ clause 6.4: below 30 MHz and test distance is 3m. ☒ clause 6.5: below 30 MHz -1 GHz and test distance is 3m. ☒ clause 6.6: Above 30 MHz and test distance is 3m.
---	--

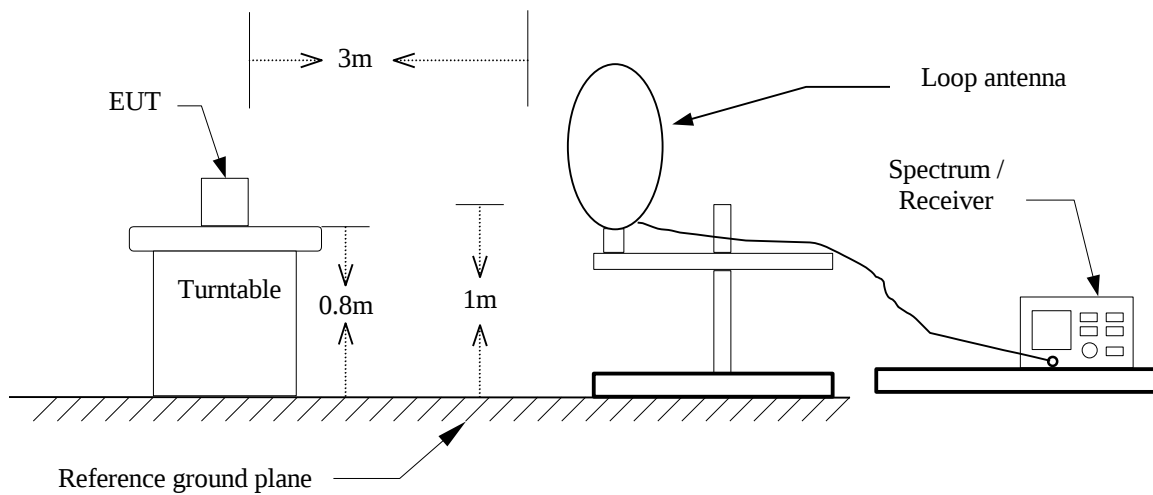
- The EUT is placed on a turntable, which is 0.8m for test below 1GHz and 1.5m for test above 1GHz, above ground plane.
- The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- Set the spectrum analyzer in the following setting as:
 Below 1GHz:
 RBW=100kHz / VBW=300kHz / Sweep=AUTO
 Above 1GHz:
 (a)PEAK: RBW=1MHz / VBW=3MHz / Sweep=AUTO
 (b)AVERAGE: RBW=1MHz,
- Repeat above procedures until the measurements for all frequencies are complete.

Remark.

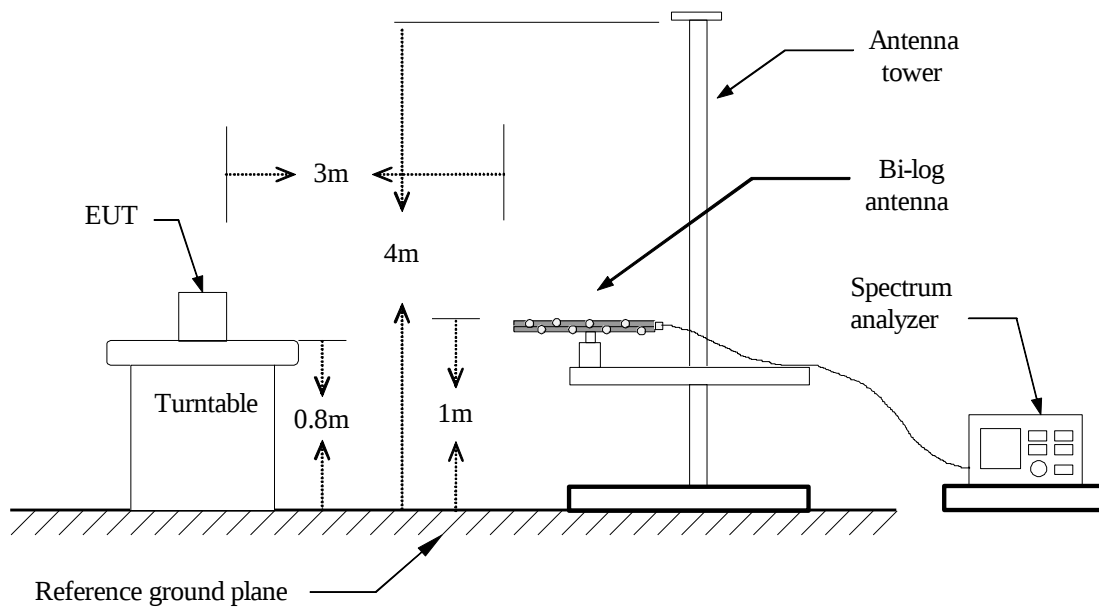
- Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open area test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.
- No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).

4.4.3 Test Setup

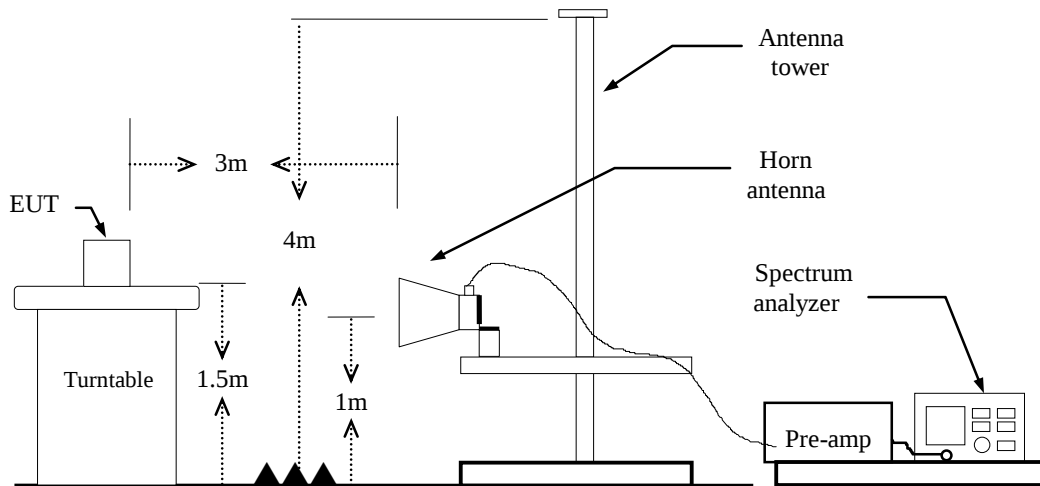
9kHz ~ 30MHz



30MHz ~ 1 GHz



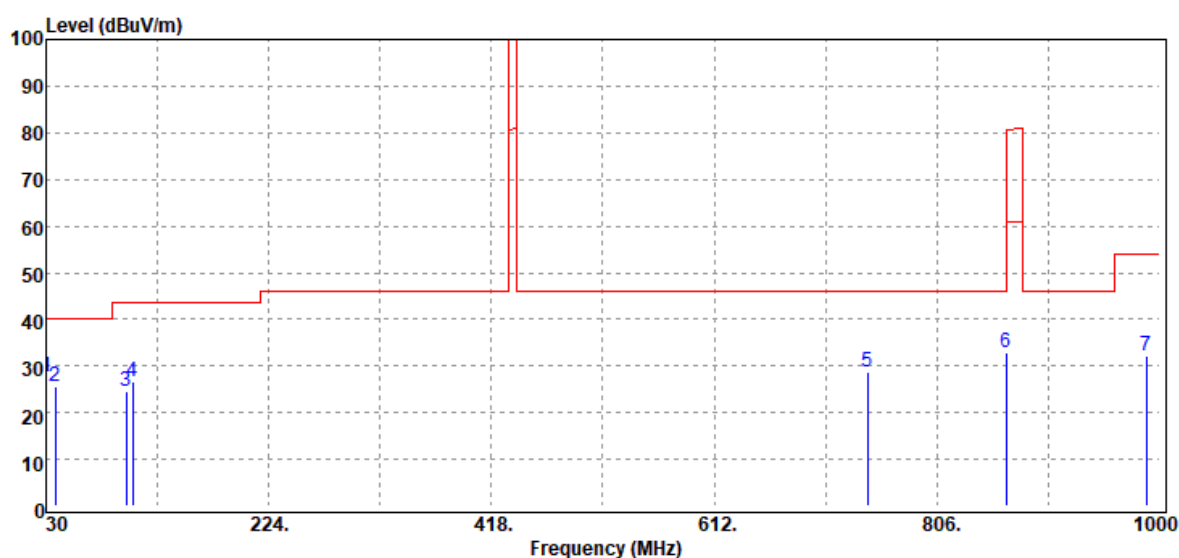
Report No.: T190703W02-RP

Above 1 GHz**4.4.4 Test Result****Pass.**

Test Data

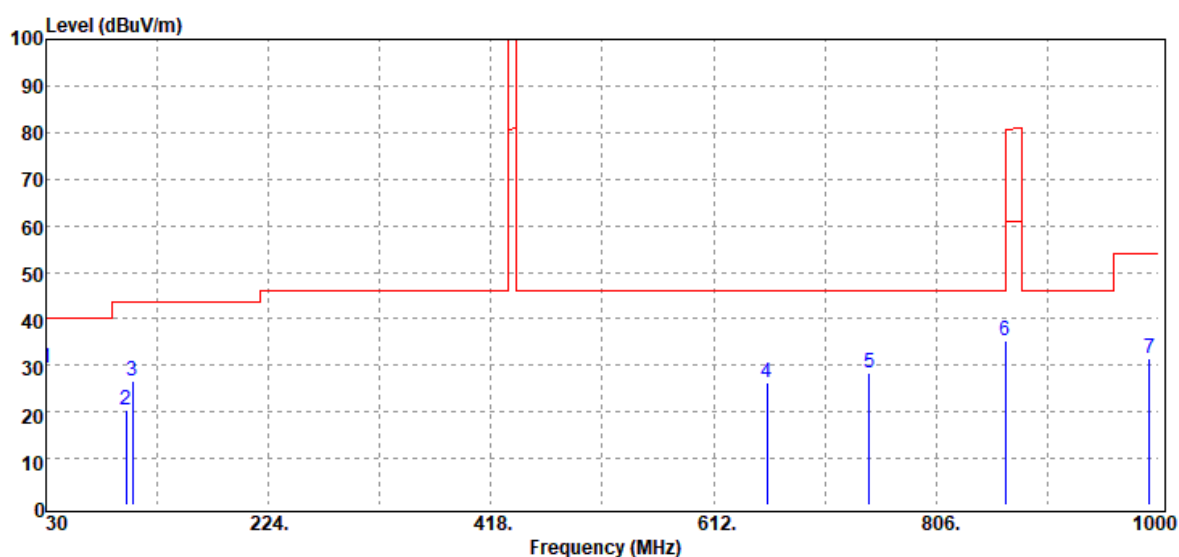
Below 1GHz

Test Mode:	TX-433.050MHz	Temp/Hum	30.1(°C)/ 53%RH
Test Item	Below 1GHz	Test Date	2019/08/21
Polarize	Vertical	Test Engineer	Jerry Lu
Detector	Peak		



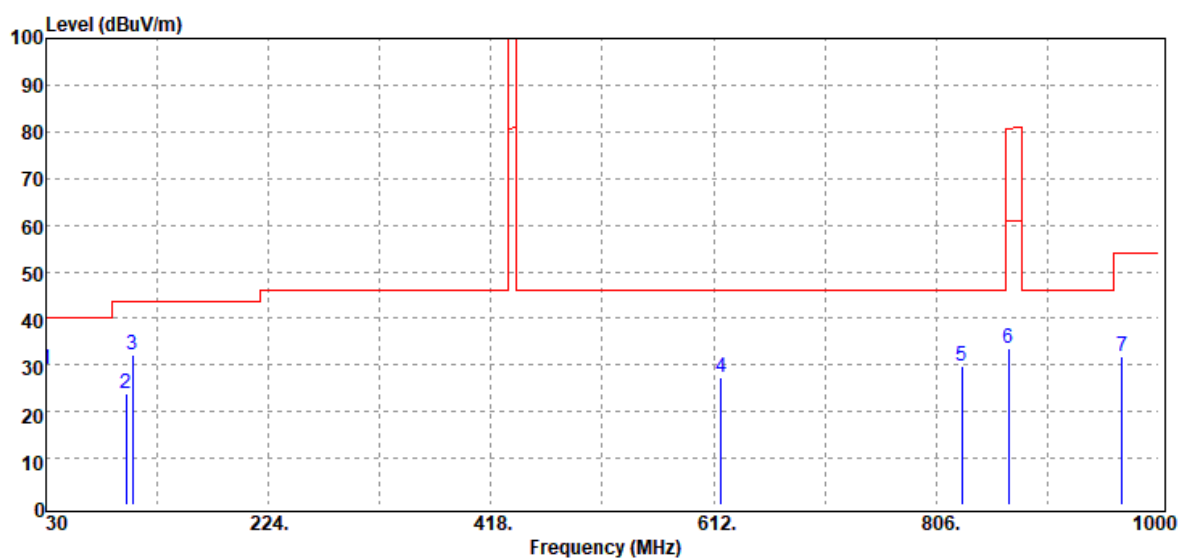
Frequency (MHz)	Detector Mode PK/QP/AV	Spectrum Reading Level (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit @3m (dBuV/m)	Margin (dB)
30.00	Peak	29.21	-1.51	27.70	40.00	-12.30
37.76	Peak	33.42	-7.85	25.57	40.00	-14.43
99.84	Peak	37.38	-12.75	24.63	43.50	-18.87
105.66	Peak	37.72	-11.02	26.70	43.50	-16.80
745.86	Peak	26.77	1.96	28.73	46.00	-17.27
866.10	Peak	30.13	2.80	32.93	80.79	-47.86
988.36	Peak	26.81	5.46	32.27	54.00	-21.73

Test Mode:	TX-433.050MHz	Temp/Hum	30.1(°C)/ 53%RH
Test Item	Below 1GHz	Test Date	2019/08/21
Polarize	Horizontal	Test Engineer	Jerry Lu
Detector	Peak		



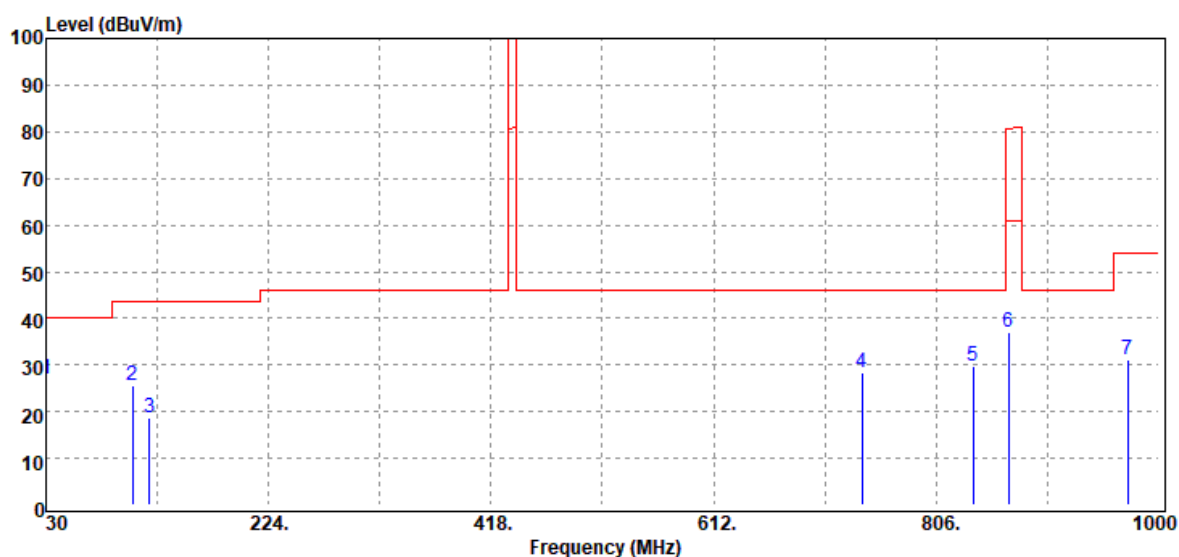
Frequency (MHz)	Detector Mode PK/QP/AV	Spectrum Reading Level (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit @3m (dBuV/m)	Margin (dB)
30.00	Peak	30.76	-1.51	29.25	40.00	-10.75
99.84	Peak	33.34	-12.75	20.59	43.50	-22.91
105.66	Peak	37.79	-11.02	26.77	43.50	-16.73
658.56	Peak	26.42	-0.21	26.21	46.00	-19.79
747.80	Peak	26.45	1.93	28.38	46.00	-17.62
866.10	Peak	32.61	2.80	35.41	80.79	-45.38
992.24	Peak	26.26	5.17	31.43	54.00	-22.57

Test Mode:	TX-434.575MHz	Temp/Hum	30.1(°C)/ 53%RH
Test Item	Below 1GHz	Test Date	2019/08/21
Polarize	Vertical	Test Engineer	Jerry Lu
Detector	Peak		



Frequency (MHz)	Detector Mode PK/QP/AV	Spectrum Reading Level (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit @3m (dBuV/m)	Margin (dB)
30.00	Peak	30.64	-1.51	29.13	40.00	-10.87
99.84	Peak	36.67	-12.75	23.92	43.50	-19.58
105.66	Peak	43.14	-11.02	32.12	43.50	-11.38
618.79	Peak	28.00	-0.78	27.22	46.00	-18.78
828.31	Peak	26.57	3.26	29.83	46.00	-16.17
869.15	Peak	30.37	3.04	33.41	80.85	-47.44
967.99	Peak	26.64	5.21	31.85	54.00	-22.15

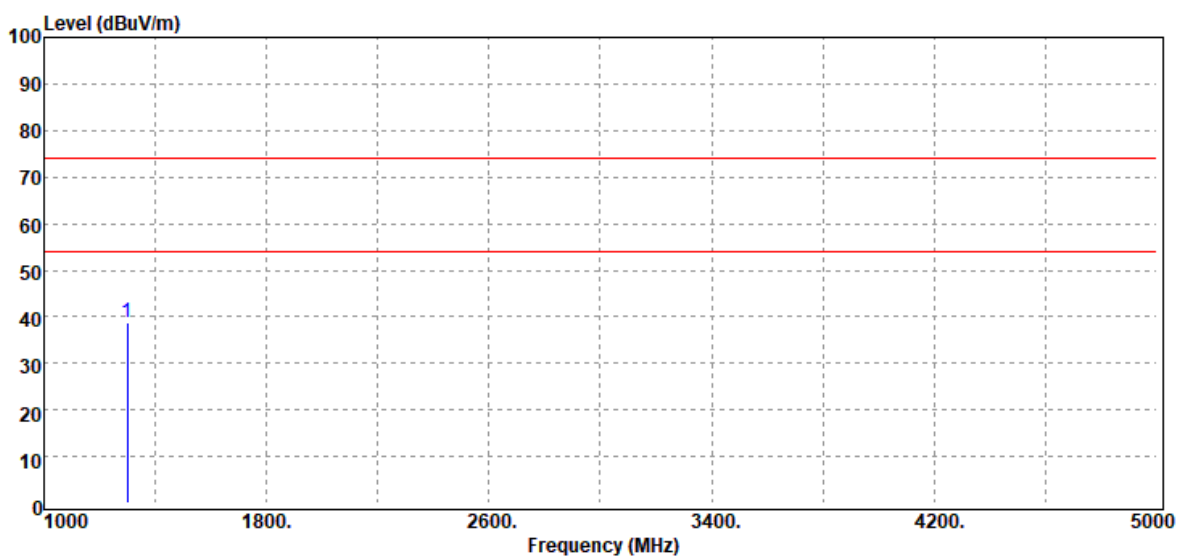
Test Mode:	TX-434.575MHz	Temp/Hum	30.1(°C)/ 53%RH
Test Item	Below 1GHz	Test Date	2019/08/21
Polarize	Horizontal	Test Engineer	Jerry Lu
Detector	Peak		



Frequency (MHz)	Detector Mode PK/QP/AV	Spectrum Reading Level (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit @3m (dBuV/m)	Margin (dB)
30.00	Peak	28.54	-1.51	27.03	40.00	-12.97
105.66	Peak	36.56	-11.02	25.54	43.50	-17.96
120.21	Peak	27.58	-8.88	18.70	43.50	-24.80
741.01	Peak	26.79	1.65	28.44	46.00	-17.56
838.01	Peak	26.55	3.36	29.91	46.00	-16.09
869.15	Peak	33.88	3.04	36.92	80.85	-43.93
972.84	Peak	25.46	5.56	31.02	54.00	-22.98

Above 1GHz

Test Mode:	TX-433.050MHz	Temp/Hum	30.1(°C)/ 53%RH
Test Item	Above 1GHz	Test Date	2019/08/21
Polarize	Vertical	Test Engineer	Jerry Lu
Detector	Peak		

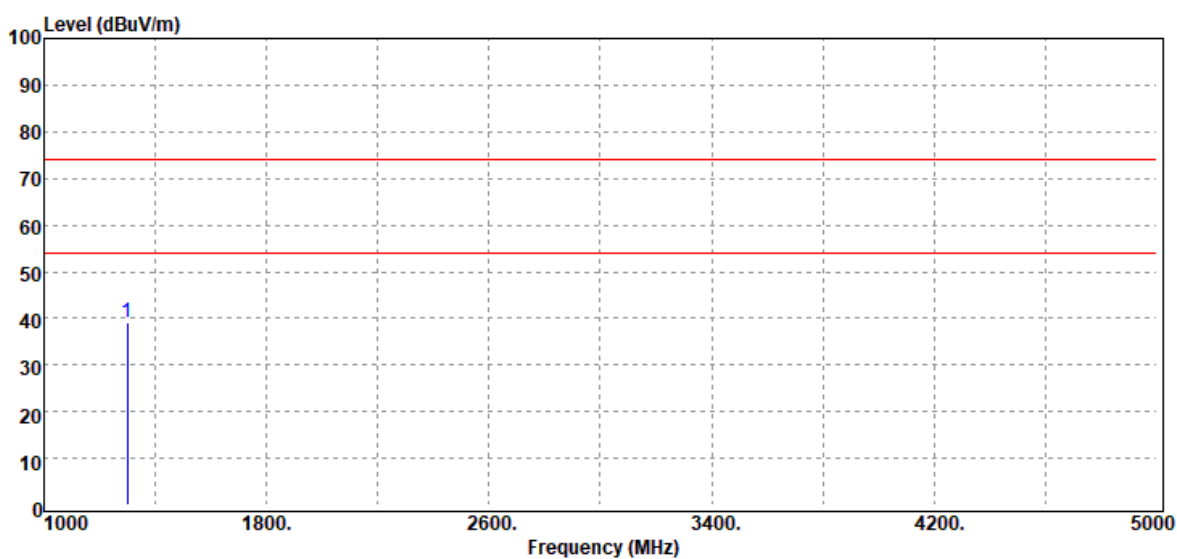


Frequency (MHz)	Detector Mode PK/QP/AV	Spectrum Reading Level (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit @3m (dBuV/m)	Margin (dB)
1299.15	Peak	46.27	-7.67	38.60	74.00	-35.40
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. For above 1GHz, the EUT peak value was under average limit, therefore the Average value compliance with the average limit

Test Mode:	TX-433.050MHz	Temp/Hum	30.1(°C)/ 53%RH
Test Item	Above 1GHz	Test Date	2019/08/21
Polarize	Horizontal	Test Engineer	Jerry Lu
Detector	Peak		

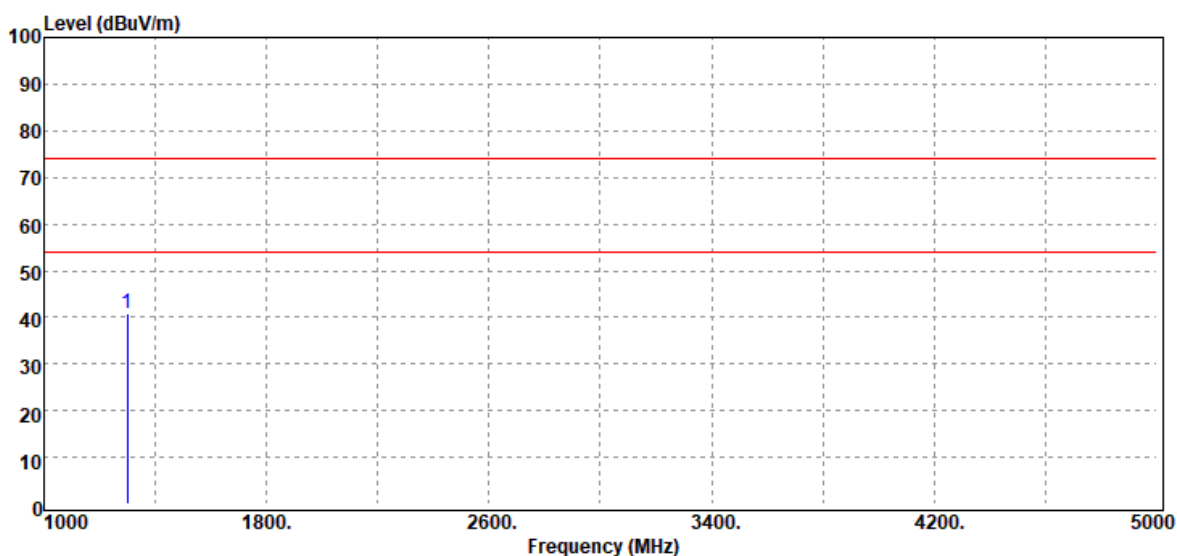


Frequency (MHz)	Detector Mode PK/QP/AV	Spectrum Reading Level (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit @3m (dBuV/m)	Margin (dB)
1299.15	Peak	46.83	-7.67	39.16	74.00	-34.84
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. For above 1GHz, the EUT peak value was under average limit, therefore the Average value compliance with the average limit

Test Mode:	TX-434.575MHz	Temp/Hum	30.1(°C)/ 53%RH
Test Item	Above 1GHz	Test Date	2019/08/21
Polarize	Vertical	Test Engineer	Jerry Lu
Detector	Peak		

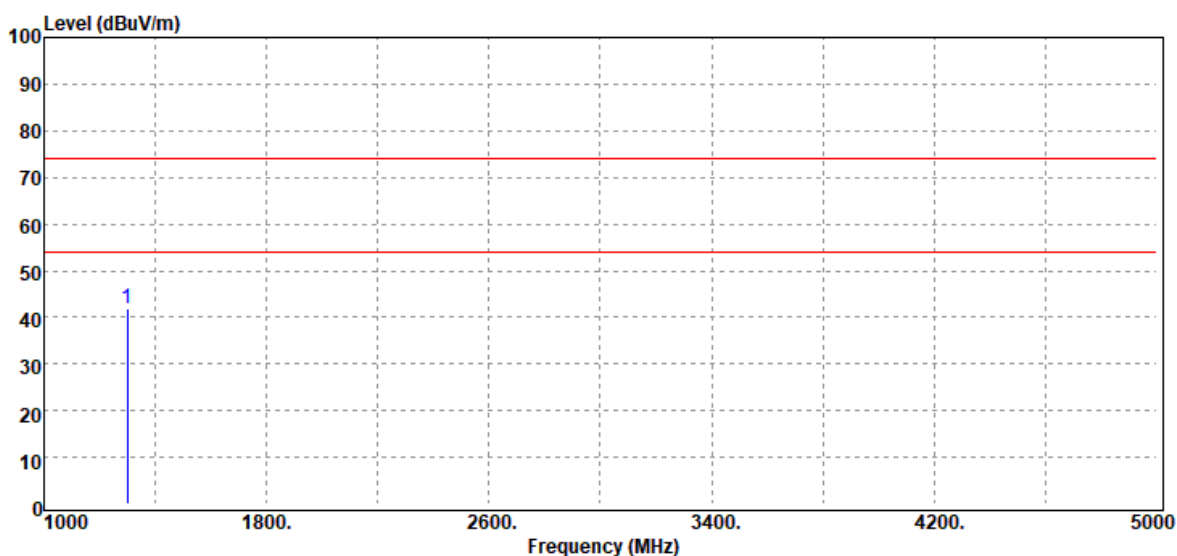


Frequency (MHz)	Detector Mode PK/QP/AV	Spectrum Reading Level (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit @3m (dBuV/m)	Margin (dB)
1300.73	Peak	48.31	-7.65	40.66	74.00	-33.34
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. For above 1GHz, the EUT peak value was under average limit, therefore the Average value compliance with the average limit

Test Mode:	TX-434.575MHz	Temp/Hum	30.1(°C)/ 53%RH
Test Item	Above 1GHz	Test Date	2019/08/21
Polarize	Horizontal	Test Engineer	Jerry Lu
Detector	Peak		



Frequency (MHz)	Detector Mode PK/QP/AV	Spectrum Reading Level (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit @3m (dBuV/m)	Margin (dB)
1300.73	Peak	49.63	-7.65	41.98	74.00	-32.02
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. For above 1GHz, the EUT peak value was under average limit, therefore the Average value compliance with the average limit

4.5 OPERATION RESTRICTION

4.5.1 Test Limit

15.231(a)(1),

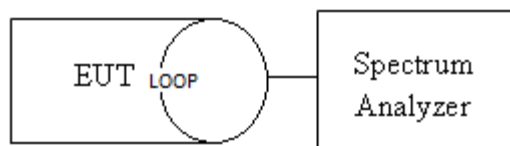
A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

4.5.2 Test Procedure

Test method Refer as ANSI 63.10:2013 clause 7.4

The Loop antenna connected to the spectrum analyzer, was touching to the transmitter antenna. Set the RBW=1MHz, VBW=1MHz, Detector = Peak, Trace mode = Max hold, Sweep = 1s. Measure

4.5.3 Test Setup



4.5.4 Test Result

433.050MHz

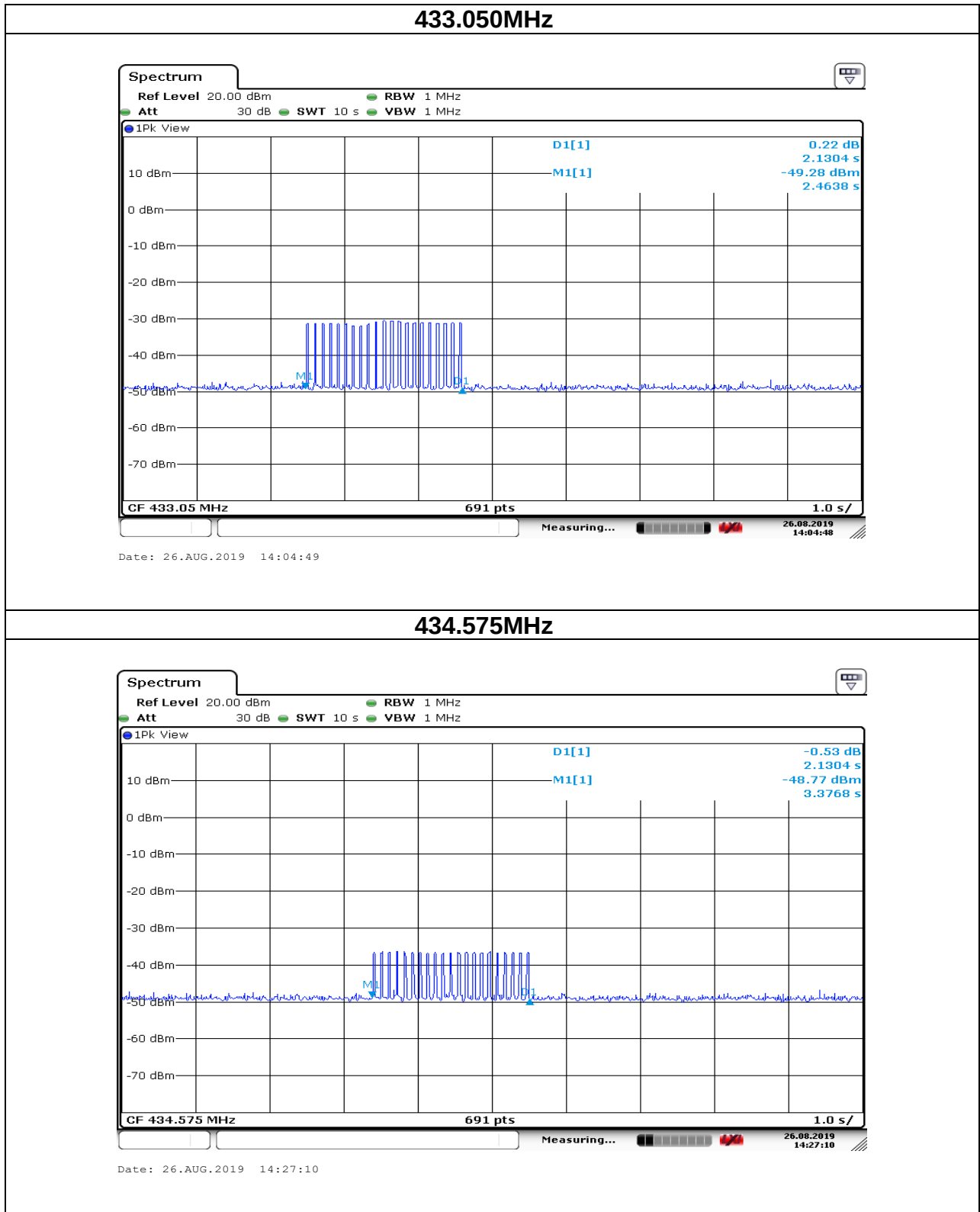
Dwell Time			
Operation condition	Pulse On Time (s)	Limits	Result
manually operated	2.1304s	5 sec	PASS

434.575MHz

Dwell Time			
Operation condition	Pulse On Time (s)	Limits	Result
manually operated	2.1304s	5 sec	PASS

Report No.: T190703W02-RP

Test Data



- End of Test Report -