RADIO TEST REPORT

Report No: STS1608059F01

Issued for

Rolling Code Limited

21/F C C WU BLDG, 302-308 HENNESSY RD WANCHAI, HONG KONG,China

Product Name:	remote control
Brand Name:	N/A
Model No.:	TX MULTI C
Series Model:	N/A
FCC ID:	2ADJ2TRXC
Test Standard:	FCC Part 15.231

Shenzhen STS Test Services Co., Ltd.
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TEST REPORT CERTIFICATION

Applicant's name :	Rolling Code Limited
Address :	21/F C C WU BLDG, 302-308 HENNESSY RD WANCHAI, HONG KONG,China
Manufacture's Name :	Rolling Code Limited .
Address :	21/F C C WU BLDG, 302-308 HENNESSY RD WANCHAI, HONG KONG,China

Product description

Product name :	remote control
Brand name :	N/A
Model and/or type reference :	TX MULTI C
Standards :	FCC Part 15.231
Test procedure :	ANSI C63.10-2013

This device described above has been tested by STS, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test :	
Date of performance of tests :	09 Aug. 2016 ~15 Aug . 2016
Date of Issue :	16 Aug . 2016
Test Result :	**Pass**

Testing Engineer : _____
(Tony Liu)

Technical Manager : _____
(Vita Li)

Authorized Signatory : _____
(Bovey Yang)

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Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	16 Aug. 2016	STS1608059F01	ALL	Initial Issue

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15.231 , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.205(a)/15.209/ 15.231.(b)	Radiated Spurious Emission	PASS	--
15.231(a)(1)/ 15.231(b)(2)	Transmission requirement	PASS	--
15.231(C)	20 dB Bandwidth	PASS	--
15.203	Antenna Requirement	PASS	--

NOTE: (1)"N/A" denotes test is not applicable in this Test Report

(2) All tests are according to ANSI C63.4-2014 and ANSI C63.10-2013

1.1 TEST FACILITY

Shenzhen STS Test Services Co., Ltd.
1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road,
Fuyong Street, Bao'an District, Shenzhen, Guangdong,China

CNAS Registration No.: L7649;

FCC Registration No.: 842334; IC Registration No.: 12108A-1

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **U**，where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95** %。

No.	Item	Uncertainty
1	RF power,conducted	±0.70dB
2	Spurious emissions,conducted	±1.19dB
3	All emissions,radiated(<1G) 30MHz-200MHz	±2.83dB
4	All emissions,radiated(<1G) 200MHz-1000MHz	±2.94dB
5	Temperature	±0.5°C
6	Humidity	±2%

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	remote control
Trade Name	N/A
Model Name	TX MULTI C
Series Model	N/A
Model Difference	N/A
Frequency band	315MHz,318MHz,390MHz
Power Rating	DC6.0V from battery
Hardware version number	--
Software versioning number	--
Connecting I/O Port(s)	Please refer to the User's Manual

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2. Table for filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	N/A	TX MULTI C	PCB	NA	0.5	Antenna

The EUT antenna is PCB Antenna. No antenna other than that furnished by the responsible party shall be used with the device.

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	TX Mode

	For Radiated Emission
Final Test Mode	Description
Mode 1	TX Mode

Note:

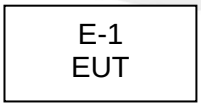
(1) The measurements are performed at the highest, middle, lowest available channels.

(2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters

Radiated Spurious EmissionTest



2.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	remote control	N/A	TX MULTI C	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note
N/A	N/A	N/A	N/A	N/A

Note:

(1)The support equipment was authorized by Declaration of Confirmation.

(2)For detachable type I/O cable should be specified the length in cm in『Length』column.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Spectrum Analyzer	Agilent	N9020A	MY49100060	2015.10.25	2016.10.24
Test Receiver	R&S	ESCI	101427	2015.10.25	2016.10.24
Bilog Antenna	TESEQ	CBL6111D	34678	2015.11.25	2016.11.24
Horn Antenna	Schwarzbeck	BBHA 9120D(1201) 1G-18G	9120D-1343	2016.03.06	2017.03.05
50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2016.06.06	2017.06.05
PreAmplifier	Agilent	8449B	60538	2015.10.25	2016.10.24
Loop Antenna	ARA	PLA-1030/B	1029	2016.06.08	2017.06.07
USB RF power sensor	DARE	RPR3006W	15I00041SNO03	2015.10.25	2016.10.24
Spectrum Analyzer	Agilent	N9020A	MY49100060	2015.10.25	2016.10.24
Semi-anechoic chamber	Changling	966	N/A	2015.10.25	2016.10.24

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

operating frequency Mobile Phone. In case the emission fall within the restricted Mobile Phone specified on Part 15. 207(a) limit in the table below has to be followed.

FREQUENCY (MHz)	Class B (dBuV)		Standard
	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	56.00	46.00	CISPR
5.0 -30.0	60.00	50.00	CISPR

0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

(1) The tighter limit applies at the Mobile Phone edges.

(2) The limit of " * " marked Mobile Phone means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.2 TEST PROCEDURE

a.The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

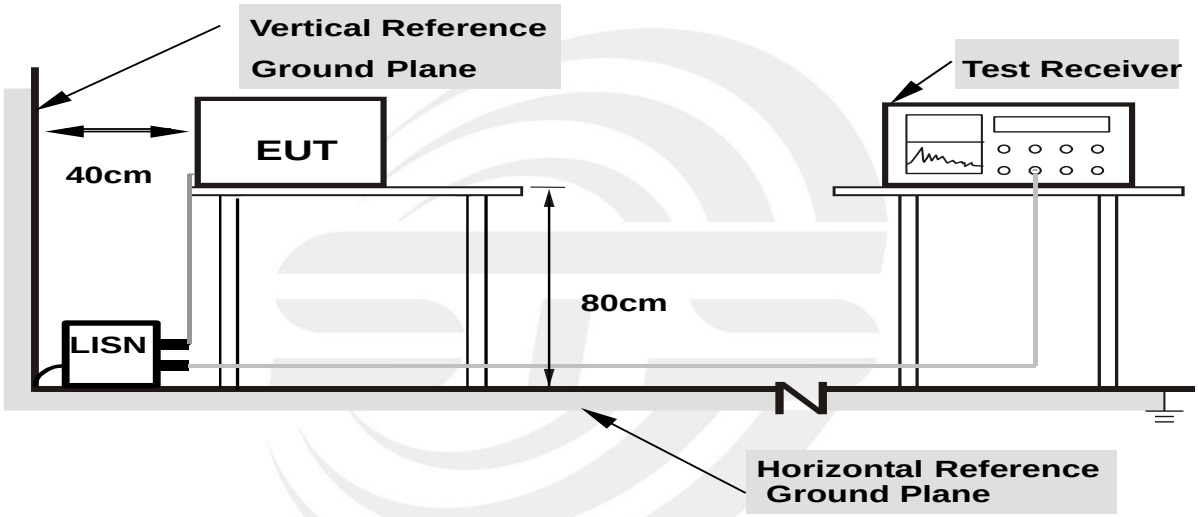
b.Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

c.I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

d.LISN at least 80 cm from nearest part of EUT chassis.

e.For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.3 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.4 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.5 TEST RESULTS

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	L/N
Test Voltage ：	DC 6.0V	Test Mode：	N/A

Note: EUT is battery-powered devices not applicable in this test.

4. RADIATED EMISSION MEASUREMENT

4.1 RADIATED EMISSION LIMITS

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on Part 15.205(a), then the Part 15.209(a)and Part 15.231(b) limit in the table below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (0.009MHz - 1000MHz)

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~40.66	100	3

Fundamental Frequency (MHz)	Field Strength of fundamental (microvolts/meter)	Field Strength of Unwanted Emissions (microvolts/meter)
40.66~40.70	2,250	225
70~130	1,250	125
130~174	1,250 to 3,750**	125 to 375**
174~260	3750	375
260~470	3,750 to 12,500**	375 to 1,250**
Above 470	12,500	1,250

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

NOTE:
(1)The limit for radiated test was performed according to FCC PART 15C.
(2)Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Detector	Peak
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 3 MHz

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

4.2 TEST PROCEDURE

a. The test is performed in a 3m Semi-Anechoic Chamber; the antenna factor, cable loss and so on of the site (factors) is calculated to correct the reading. The EUT is placed on a 0.8m high insulating Turn Table, and keeps 3m away from the Test Antenna, which is mounted on a variable-height antenna master tower. For the test Antenna
b. In the frequency range of 9KHz to 30MHz, magnetic field is measured with Loop Test Antenna. The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.
c. In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal and vertical polarizations should be tested.
f. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
g. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
h. For the actual test configuration, please refer to the related Item –EUT Test Photos.

NOTE:

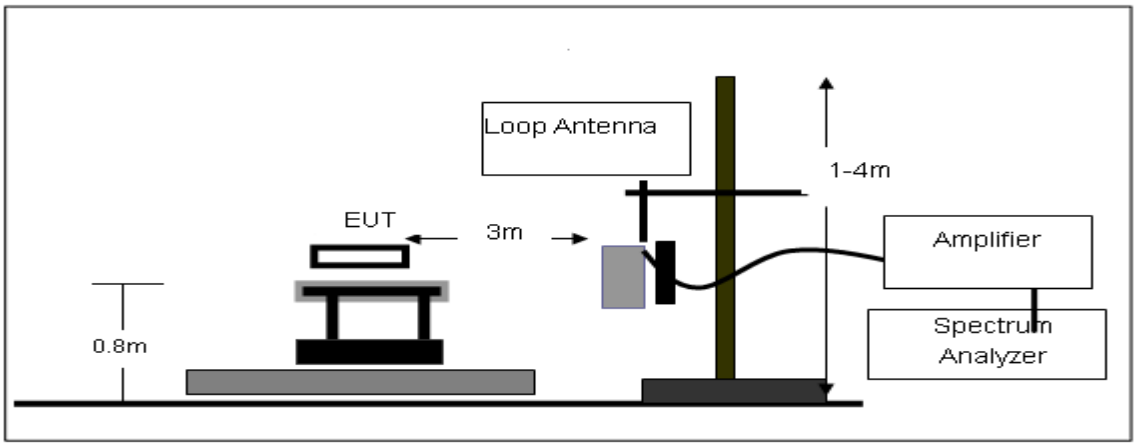
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

4.3 DEVIATION FROM TEST STANDARD

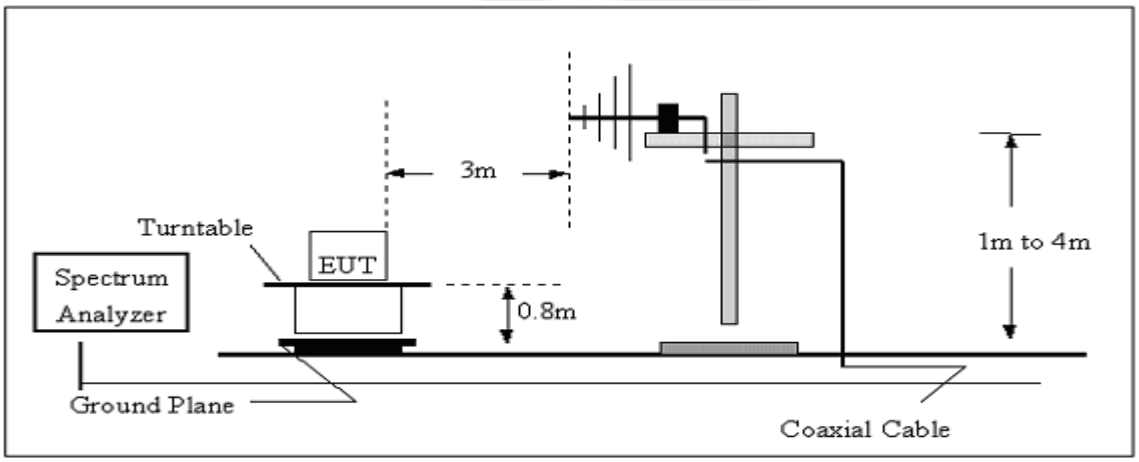
No deviation

4.4 TEST SETUP

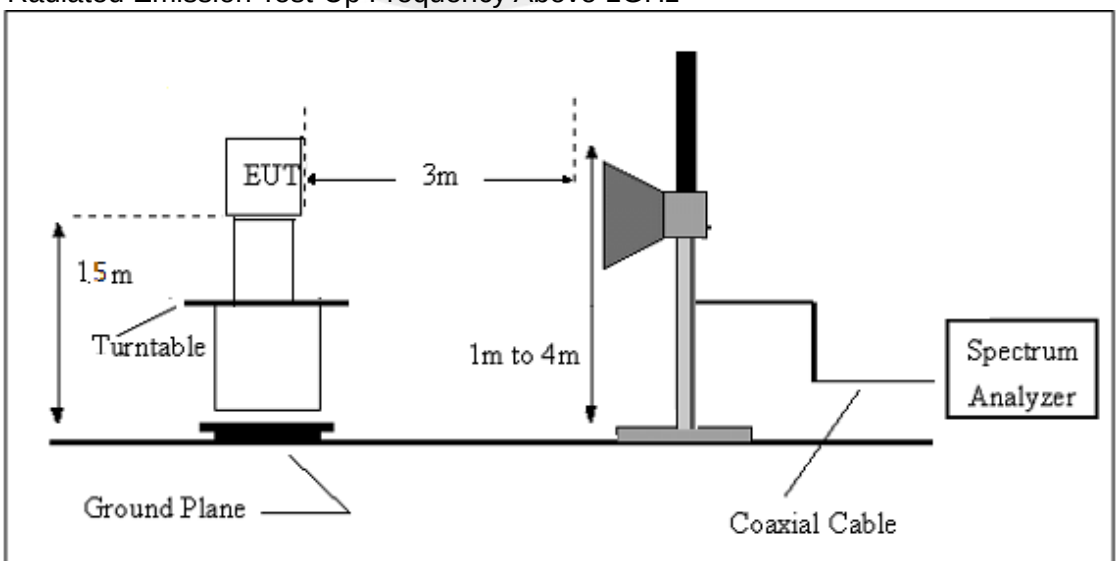
（A）Radiated Emission Test-Up Frequency Below 30MHz



（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



（C）Radiated Emission Test-Up Frequency Above 1GHz



4.5 EUT OPERATING CONDITIONS

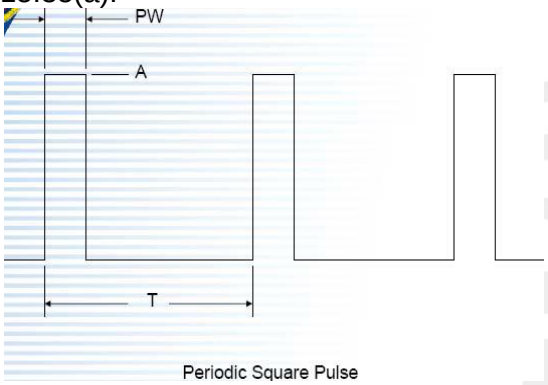
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

4.6 TEST RESULTS

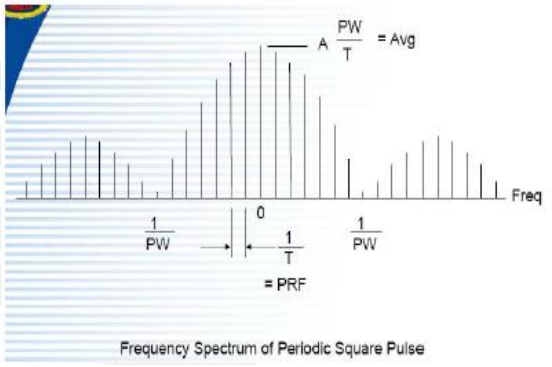
INTRODUCTION TO PDCF

reference: (§15.35 Measurement detector functions and bandwidths.)

a. Part 15 of the FCC Rules provides for the operation of low power communication devices without an individual license (e.g., intrusion detectors, pulsed water tank level gauges, etc.), subject to certain requirements. Some of these devices use extremely narrow pulses to generate wideband emissions, which are measured to determine compliance with the rules. These measurements are typically performed with a receiver or spectrum analyzer. Depending on a number of factors (e.g., resolution bandwidth, pulsewidth, etc.), the spectrum analyzer may not always display the true peak value of the measured emission. This effect, called “pulse desensitization,” relates to the capabilities of the measuring instrument. For the measurement and reporting of the true peak of pulsed emissions, it may be necessary to apply a “pulse desensitization correction factor” (PDCF) to the measured value, pursuant to 47 CFR 15.35(a).



Periodic Square Pulse



Frequency Spectrum of Periodic Square Pulse

If using spectrum analyzer to measure pulse signal , it have to make sure the RBW use is at least 2/PW.

•When RBW is less than 2/PW , you are able to measure the true peak level of the pulse signal. If this is the case , PDCF is required to compensate to determine true peak value.

Pulse desensitization:

PW =19003usec,Period=84330usec, Level=A

RBW>2/PW=0.1K , PRF=1/T=0.01K ,

NOTE: 2 / PW < RBW, first don't need

b. For the actual test, please refer to the ANSI C63.10,Annex C
refer to section 5 for more detail

4.7 TEST RESULTS

(Radiated Emission<30MHz (9KHz-30MHz, H-field))

Not: Vertical level have a test this is the worst.

Low Channel

Freq.	Reading	Limit	Margin	Detector	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	Type	P/F
0.030	85.25	118.06	-32.81	Peak	PASS
1.500	47.26	64.08	-16.82	QP	PASS
25.31	38.25	69.54	-31.29	QP	PASS
32.15	28.18	40.00	-11.82	QP	PASS
53.67	30.19	40.00	-9.81	QP	PASS

Middle Channel

Freq.	Reading	Limit	Margin	Detector	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	Type	P/F
0.028	84.49	118.66	-34.17	Peak	PASS
1.420	46.72	64.56	-17.84	QP	PASS
24.58	37.58	69.54	-31.96	QP	PASS
33.69	27.21	40.00	-12.79	QP	PASS
54.25	29.51	40.00	-10.49	QP	PASS

High Channel

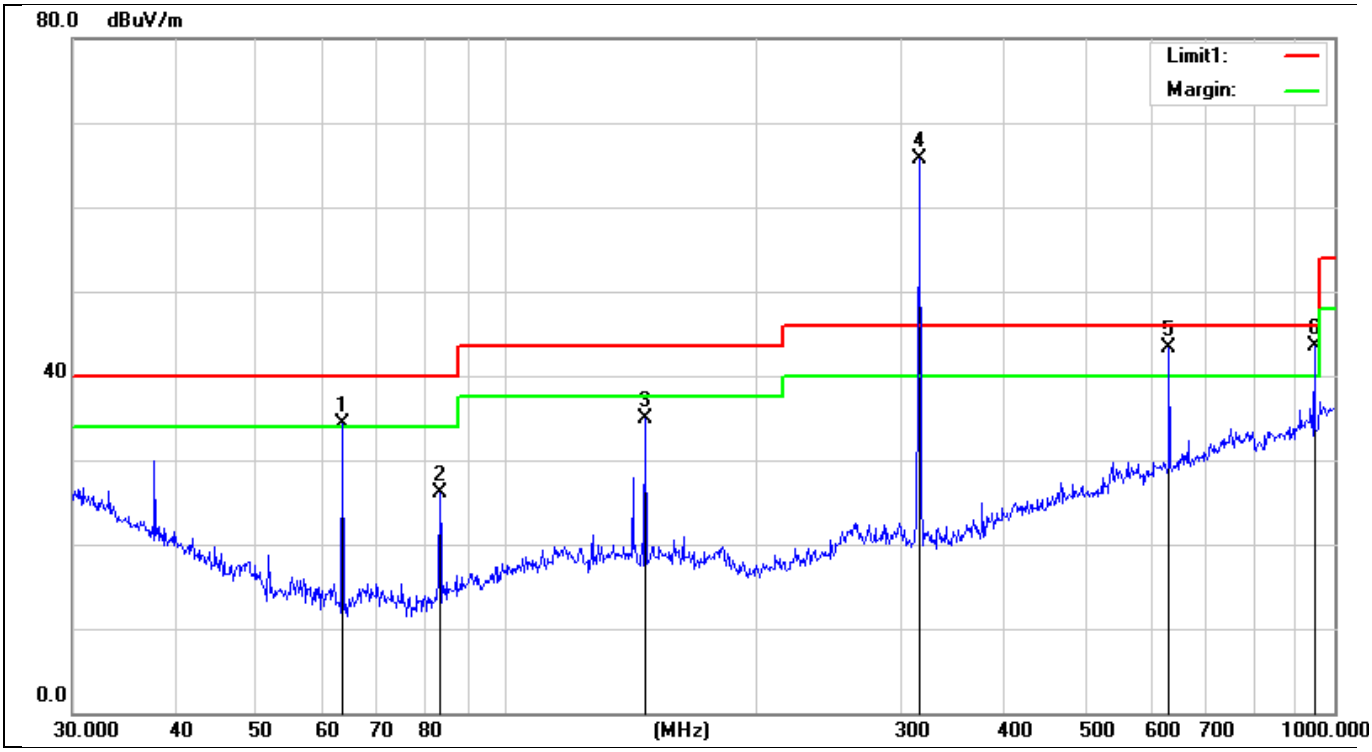
Freq.	Reading	Limit	Margin	Detector	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	Type	P/F
0.029	84.32	118.36	-34.04	Peak	PASS
1.526	46.43	63.93	-17.50	QP	PASS
26.75	37.37	69.54	-32.17	QP	PASS
33.42	27.43	40.00	-12.57	QP	PASS
54.36	29.20	40.00	-10.80	QP	PASS

Note:The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =40 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

Between 30MHz – 1000 MHz

Low Channel

Job No.:	STS1608059	Ant. Polar.:	Vertical
Standard:	FCC_PART15_B_03m_QP	Date:2016/8/16	Time:13:44:47
Test item:	Radiated Emission	Distance:	3m
Company:	remote control	Temp.(C)/Hum.(%RH):	26(C)/60%RH
Model:	TX-MVLTIC	Power:	DC 6V
Mode:	TX	Test By:	
Description:			

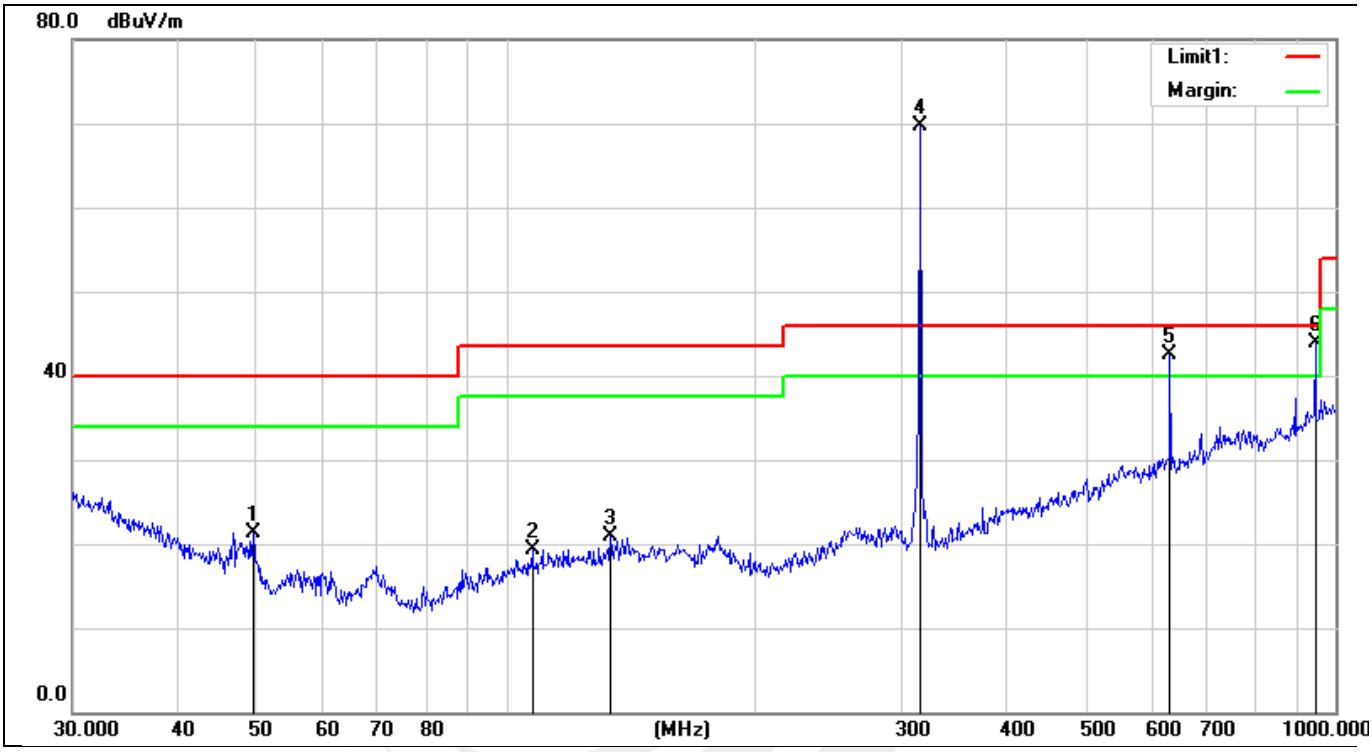


Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
63.5356	58.62	-24.26	34.36	40.00	-5.64	QP
83.2297	48.02	-21.89	26.13	40.00	-13.87	QP
147.4036	52.84	-17.85	34.99	43.50	-8.51	QP
315.0000	80.07	-14.32	65.75	95.62	-29.87	Peak
630.0000	49.72	-6.40	43.32	75.62	-32.30	Peak
945.0000	44.05	-0.54	43.51	75.62	-32.11	Peak

Frequency (MHz)	Reading (dBuV)	Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
315.0000	80.07	-12.94	67.13	75.62	-8.49	Avg
630.0000	49.72	-12.94	36.78	55.62	-18.84	Avg
945.0000	44.05	-12.94	31.11	55.62	-24.51	Avg

Note: AV=Peak+20*Log(Duty Cycle)=Peak+(-12.94)

Job No.:	STS1608059	Ant.Polar.:	Horizontal
Standard:	FCC_PART15_B_03m_QP	Date:2016/8/16	Time:13:47:58
Test item:	Radiated Emission	Distance:	3m
Company:	remote control	Temp.(C)/Hum.(%RH):	26(C)/60%RH
Model:	TX-MVLTIC	Power:	DC 6V
Mode:	TX	Test By:	
Description:			



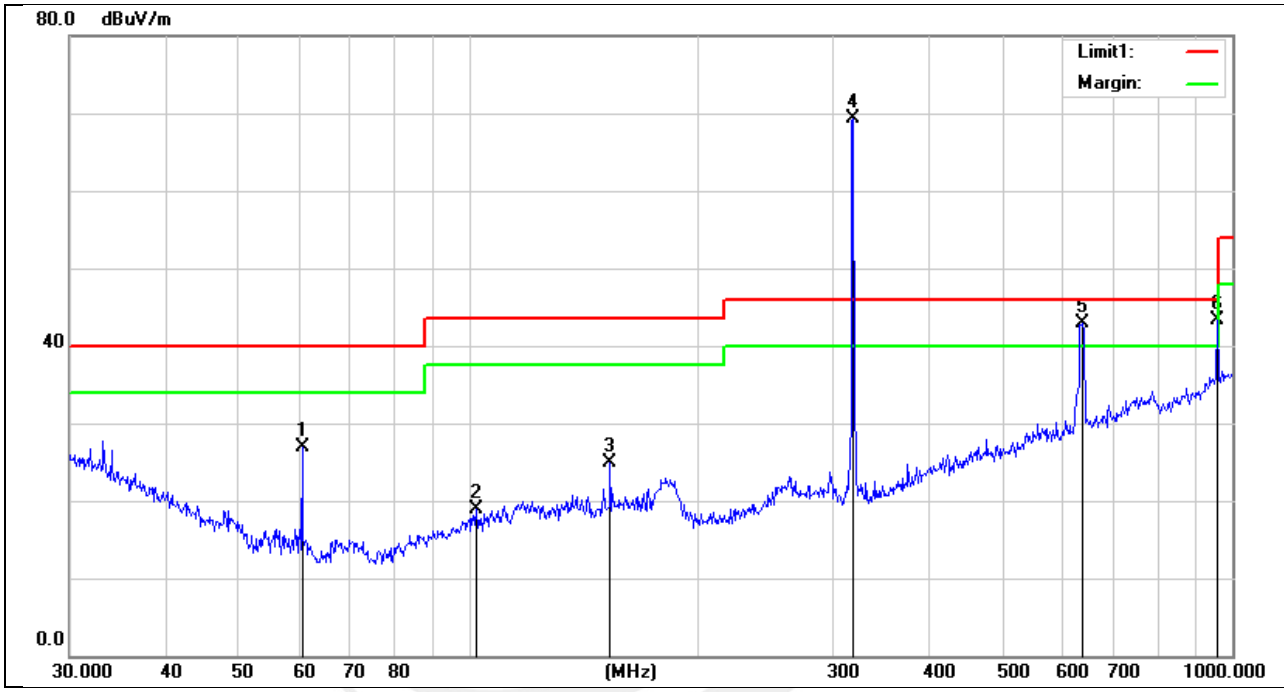
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
49.5328	42.56	-21.24	21.32	40.00	-18.68	QP
107.5100	37.78	-18.55	19.23	43.50	-24.27	QP
133.6187	38.37	-17.54	20.83	43.50	-22.67	QP
315.0000	83.95	-14.32	69.63	95.62	-26.62	Peak
630.0000	48.81	-6.40	42.41	75.62	-33.21	Peak
945.0000	44.50	-0.54	43.96	75.62	-31.66	Peak

Frequency (MHz)	Reading (dBuV)	Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
315.0000	83.95	-12.94	71.01	75.62	-4.61	Avg
630.0000	48.81	-12.94	35.87	55.62	-19.75	Avg
945.0000	44.50	-12.94	31.56	55.62	-24.06	Avg

Note: AV=Peak+20*Log(Duty Cycle)=Peak+(-12.94)

Middle Channel

Job No.:	STS1608059	Ant.Polar.:	Vertical
Standard:	FCC_PART15_B_03m_QP	Date:2016/8/16	Time:13:58:36
Test item:	Radiated Emission	Distance:	3m
Company:	remote control	Temp.(C)/Hum.(%RH):	26(C)/60%RH
Model:	TX-MVLTIC	Power:	DC 6V
Mode:	TX	Test By:	
Description :			

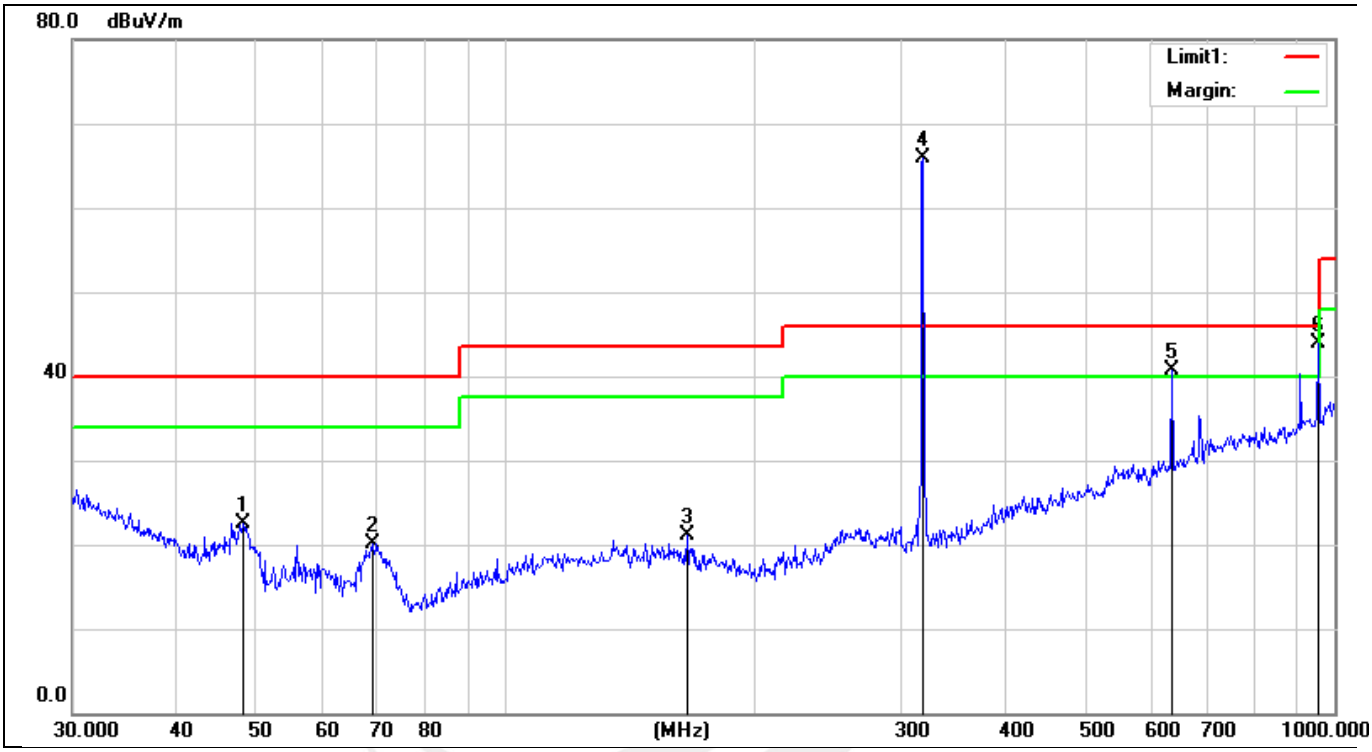


Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
60.4920	51.20	-24.33	26.87	40.00	-13.13	QP
102.3597	37.80	-18.99	18.81	43.50	-24.69	QP
153.2004	43.12	-18.14	24.98	43.50	-18.52	QP
318.0000	83.45	-14.21	69.24	95.80	-26.56	Peak
636.0000	49.22	-6.38	42.84	75.80	-32.96	Peak
954.0000	43.60	-0.26	43.34	75.80	-32.46	Peak

Frequency (MHz)	Reading (dBuV)	Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
318.0000	83.45	-12.94	70.51	75.80	-19.61	Avg
636.0000	49.22	-12.94	36.28	55.80	-25.92	Avg
954.0000	43.60	-12.94	30.66	55.80	-25.68	Avg

Note: AV=Peak+20*Log(Duty Cycle)=Peak+(-12.94)

Job No.:	STS1608059	Ant.Polar.:	Horizontal
Standard:	FCC_PART15_B_03m_QP	Date:2016/8/16	Time:13:57:01
Test item:	Radiated Emission	Distance:	3m
Company:	remote control	Temp.(C)/Hum.(%RH):	26(C)/60%RH
Model:	TX-MVLTIC	Power:	DC 6V
Mode:	TX	Test By:	
Description:			



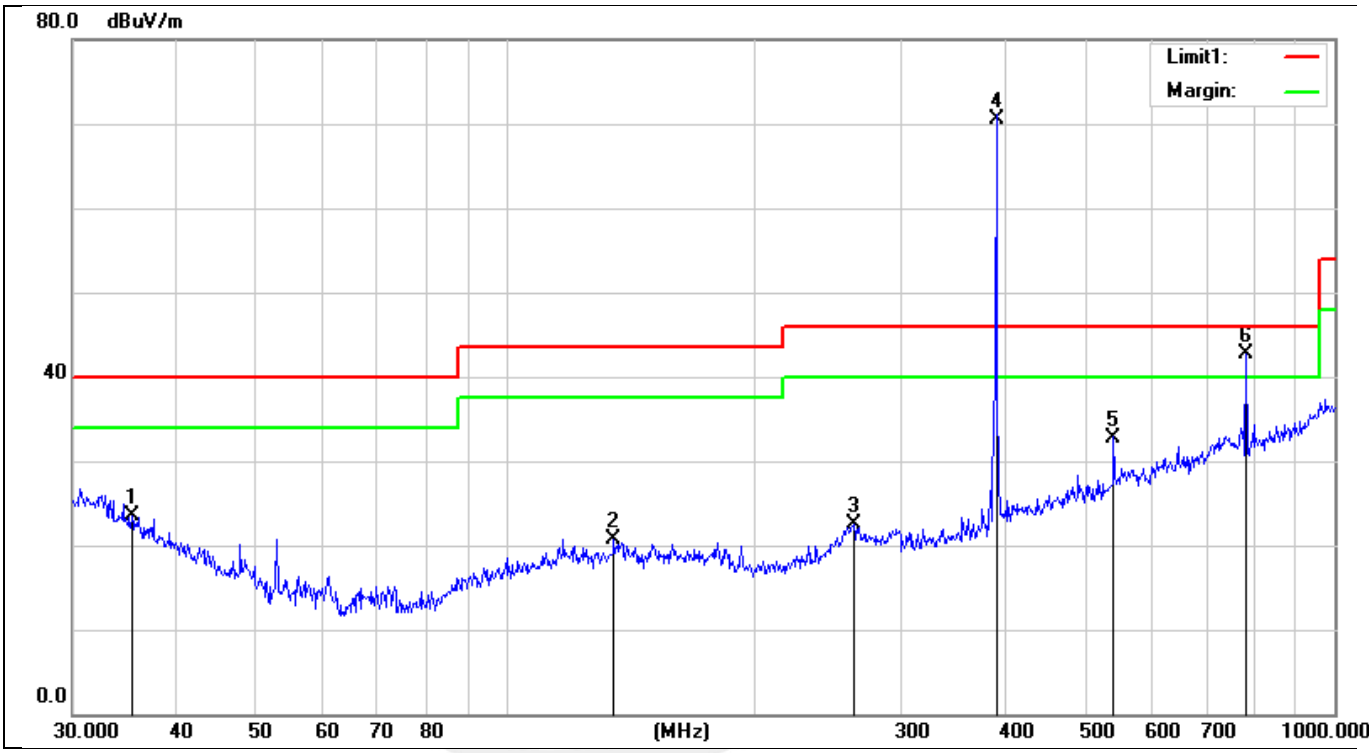
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
48.1626	42.96	-20.53	22.43	40.00	-17.57	QP
69.1141	44.30	-24.12	20.18	40.00	-19.82	QP
165.4866	40.15	-18.95	21.20	43.50	-22.30	QP
318.0000	80.04	-14.21	65.83	95.80	-29.97	Peak
636.0000	47.03	-6.38	40.65	75.80	-35.15	Peak
954.0000	44.19	-0.26	43.93	75.80	-31.87	Peak

Frequency (MHz)	Reading (dBuV)	Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
318.0000	80.04	-12.94	67.10	75.80	-8.70	Avg
636.0000	47.03	-12.94	34.09	55.80	-21.71	Avg
954.0000	44.19	-12.94	31.25	55.80	-24.55	Avg

Note: AV=Peak+20*Log(Duty Cycle)=Peak+(-12.94)

High Channel

Job No.:	STS1608059	Ant.Polar.:	Vertical
Standard:	FCC_PART15_B_03m_QP	Date:2016/8/16	Time:13:51:18
Test item:	Radiated Emission	Distance:	3m
Company:	remote control	Temp.(C)/Hum.(%RH):	26(C)/60%RH
Model:	TX-MVLTIC	Power:	DC 6V
Mode:	TX	Test By:	
Description:			

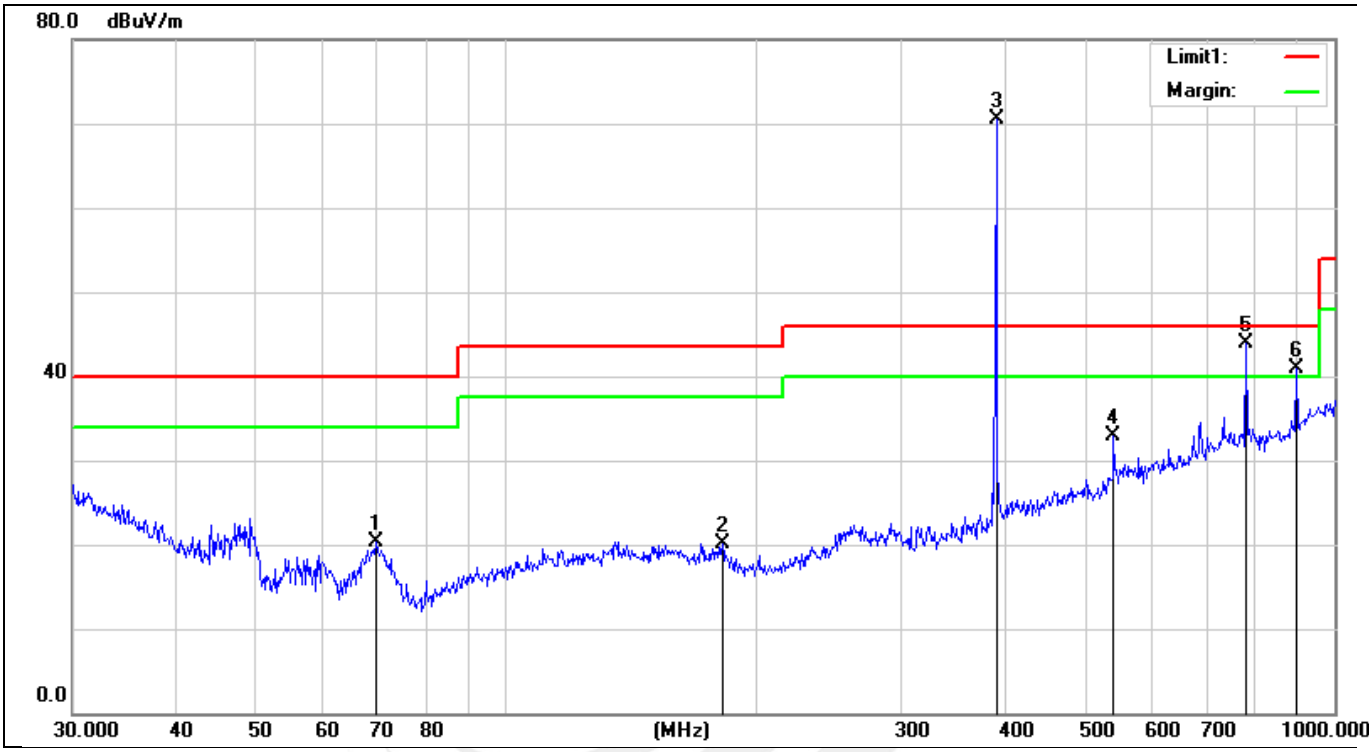


Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
35.3750	37.52	-13.94	23.58	40.00	-16.42	QP
135.0320	38.30	-17.52	20.78	43.50	-22.72	QP
262.8955	37.74	-15.17	22.57	46.00	-23.43	QP
541.3723	39.77	-6.97	32.80	46.00	-13.20	QP
390.0000	82.37	-11.92	70.45	99.24	-28.79	Peak
780.0000	45.93	-3.15	42.78	79.24	-36.46	Peak

Frequency (MHz)	Reading (dBuV)	Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
390.0000	82.37	-12.94	69.43	79.24	-9.81	Avg
780.0000	45.93	-12.94	32.99	59.24	-26.25	Avg

Note: AV=Peak+20*Log(Duty Cycle)=Peak+(-12.94)

Job No.:	STS1608059	Ant.Polar.:	Horizontal
Standard:	FCC_PART15_B_03m_QP	Date:2016/8/16	Time:13:54:37
Test item:	Radiated Emission	Distance:	3m
Company:	remote control	Temp.(C)/Hum.(%RH):	26(C)/60%RH
Model:	TX-MVLTIC	Power:	DC 6V
Mode:	TX	Test By:	
Description:			



Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
69.8450	44.38	-24.10	20.28	40.00	-19.72	QP
182.5592	39.81	-19.65	20.16	43.50	-23.34	QP
390.0000	82.45	-11.87	70.58	99.24	-28.66	Peak
780.0000	47.03	-3.15	43.88	79.24	-35.86	Peak
541.3725	39.88	-6.97	32.91	46.00	-13.09	QP
900.1472	43.08	-2.26	40.82	46.00	-5.18	QP

Frequency (MHz)	Reading (dBuV)	Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
390.0000	82.45	-12.94	69.51	79.24	-9.73	Avg
780.0000	47.03	-12.94	34.09	59.24	-25.15	Avg

Note: AV=Peak+20*Log(Duty Cycle)=Peak+(-12.94)

Above 1000MHz

Low Channel

Frequency (MHz)	Meter Reading (dBμV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Orrected Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Frequency (MHz)
1517.21	66.86	44.90	4.19	25.00	-15.71	51.15	74	-22.85	PK	Vertical
1517.36	66.9	44.90	4.19	25.00	-15.71	51.19	74	-22.81	PK	Horizontal
1816.84	67.27	44.10	5.30	25.00	-13.80	53.47	74	-20.53	PK	Vertical
1816.24	67.26	44.10	5.30	25.00	-13.80	53.46	74	-20.54	PK	Horizontal
2145.21	64.20	43.80	5.40	25.90	-12.50	51.70	74	-22.30	PK	Vertical
2145.35	64.13	43.80	5.40	25.90	-12.50	51.63	74	-22.37	PK	Horizontal
2725.26	68.25	44.40	6.20	27.60	-10.60	57.65	74	-16.35	PK	Vertical
2725.28	68.56	44.40	6.20	27.60	-10.60	57.96	74	-16.04	PK	Horizontal
3265.32	70.24	44.70	6.70	28.20	-9.80	60.44	74	-13.56	PK	Vertical
3265.29	70.19	44.70	6.70	28.20	-9.80	60.39	74	-13.61	PK	Horizontal
4000.28	71.08	44.20	7.90	29.70	-6.60	64.48	74	-9.52	PK	Vertical
4000.27	71.12	44.20	7.90	29.70	-6.60	64.52	74	-9.48	PK	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Frequency (MHz)
1517.21	51.15	-12.94	38.21	54	-15.79	AV	Vertical
1517.36	51.19	-12.94	38.25	54	-15.75	AV	Horizontal
1816.84	53.47	-12.94	40.53	54	-13.47	AV	Vertical
1816.24	53.46	-12.94	40.52	54	-13.48	AV	Horizontal
2145.21	51.70	-12.94	38.76	54	-15.24	AV	Vertical
2145.35	51.63	-12.94	38.69	54	-15.31	AV	Horizontal
2725.26	57.65	-12.94	44.71	54	-9.29	AV	Vertical
2725.28	57.96	-12.94	45.02	54	-8.98	AV	Horizontal
3265.32	60.44	-12.94	47.50	54	-6.50	AV	Vertical
3265.29	60.39	-12.94	47.45	54	-6.55	AV	Horizontal
4000.28	64.48	-12.94	51.54	54	-2.46	AV	Vertical
4000.27	64.52	-12.94	51.58	54	-2.42	AV	Horizontal

Note: AV=Peak+20*Log(Duty Cycle)=Peak+(-12.94)

Middle Channel

Frequency (MHz)	Meter Reading (dBμV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Orrected Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Frequency (MHz)
1517.21	66.83	44.90	4.19	25.00	-15.71	51.12	74	-22.88	PK	Vertical
1517.36	67.89	44.90	4.19	25.00	-15.71	52.18	74	-21.82	PK	Horizontal
1816.84	67.21	44.10	5.30	25.00	-13.80	53.41	74	-20.59	PK	Vertical
1816.24	68.22	44.10	5.30	25.00	-13.80	54.42	74	-19.58	PK	Horizontal
2145.21	64.17	43.80	5.40	25.90	-12.50	51.67	74	-22.33	PK	Vertical
2145.35	64.04	43.80	5.40	25.90	-12.50	51.54	74	-22.46	PK	Horizontal
2725.26	68.21	44.40	6.20	27.60	-10.60	57.61	74	-16.39	PK	Vertical
2725.28	69.51	44.40	6.20	27.60	-10.60	58.91	74	-15.09	PK	Horizontal
3265.32	74.23	44.70	6.70	28.20	-9.80	64.43	74	-9.57	PK	Vertical
3265.29	74.19	44.70	6.70	28.20	-9.80	64.39	74	-9.61	PK	Horizontal
4000.28	69.07	44.20	7.90	29.70	-6.60	62.47	74	-11.53	PK	Vertical
4000.27	69.05	44.20	7.90	29.70	-6.60	62.45	74	-11.55	PK	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Orrected Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Frequency (MHz)
1517.21	51.12	-12.94	38.18	54	-15.82	AV	Vertical
1517.36	52.18	-12.94	39.24	54	-14.76	AV	Horizontal
1816.84	53.41	-12.94	40.47	54	-13.53	AV	Vertical
1816.24	54.42	-12.94	41.48	54	-12.52	AV	Horizontal
2145.21	51.67	-12.94	38.73	54	-15.27	AV	Vertical
2145.35	51.54	-12.94	38.60	54	-15.40	AV	Horizontal
2725.26	57.61	-12.94	44.67	54	-9.33	AV	Vertical
2725.28	58.91	-12.94	45.97	54	-8.03	AV	Horizontal
3265.32	64.43	-12.94	51.49	54	-2.51	AV	Vertical
3265.29	64.39	-12.94	51.45	54	-2.55	AV	Horizontal
4000.28	62.47	-12.94	49.53	54	-4.47	AV	Vertical
4000.27	62.45	-12.94	49.51	54	-4.49	AV	Horizontal

Note: AV=Peak+20*Log(Duty Cycle)=Peak+(-12.94)

High Channel

Frequency (MHz)	Meter Reading (dBμV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Orrected Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Frequency (MHz)
1170.21	75.75	44.90	4.19	25.00	-15.71	60.04	74	-13.96	PK	Vertical
1170.36	76.83	44.90	4.19	25.00	-15.71	61.12	74	-12.88	PK	Horizontal
1816.84	63.16	44.10	5.30	25.00	-13.80	49.36	74	-24.64	PK	Vertical
1816.24	64.18	44.10	5.30	25.00	-13.80	50.38	74	-23.62	PK	Horizontal
2145.21	64.07	43.80	5.40	25.90	-12.50	51.57	74	-22.43	PK	Vertical
2145.35	65.02	43.80	5.40	25.90	-12.50	52.52	74	-21.48	PK	Horizontal
2725.26	67.11	44.40	6.20	27.60	-10.60	56.51	74	-17.49	PK	Vertical
2725.28	68.46	44.40	6.20	27.60	-10.60	57.86	74	-16.14	PK	Horizontal
3265.32	72.21	44.70	6.70	28.20	-9.80	62.41	74	-11.59	PK	Vertical
3265.29	72.17	44.70	6.70	28.20	-9.80	62.37	74	-11.63	PK	Horizontal
4000.28	69.00	44.20	7.90	29.70	-6.60	62.40	74	-11.60	PK	Vertical
4000.27	69.12	44.20	7.90	29.70	-6.60	62.52	74	-11.48	PK	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Frequency (MHz)
1170.21	60.04	-12.94	47.10	54	-6.90	AV	Vertical
1170.36	61.12	-12.94	48.18	54	-5.82	AV	Horizontal
1816.84	49.36	-12.94	36.42	54	-17.58	AV	Vertical
1816.24	50.38	-12.94	37.44	54	-16.56	AV	Horizontal
2145.21	51.57	-12.94	38.63	54	-15.37	AV	Vertical
2145.35	52.52	-12.94	39.58	54	-14.42	AV	Horizontal
2725.26	56.51	-12.94	43.57	54	-10.43	AV	Vertical
2725.28	57.86	-12.94	44.92	54	-9.08	AV	Horizontal
3265.32	62.41	-12.94	49.47	54	-4.53	AV	Vertical
3265.29	62.37	-12.94	49.43	54	-4.57	AV	Horizontal
4000.28	62.40	-12.94	49.46	54	-4.54	AV	Vertical
4000.27	62.52	-12.94	49.58	54	-4.42	AV	Horizontal

Note: AV=Peak+20*Log(Duty Cycle)=Peak+(-12.94)

5. BANDWIDTH TEST

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15.231 , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.231(C)	20 Bandwidth	The 20dB bandwidth of the emissions shall not exceed 0.25% of the center frequency	315	PASS
			318	
			390	

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth
RB	10 kHz (20dB Bandwidth)
VB	30 kHz (20dB Bandwidth)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

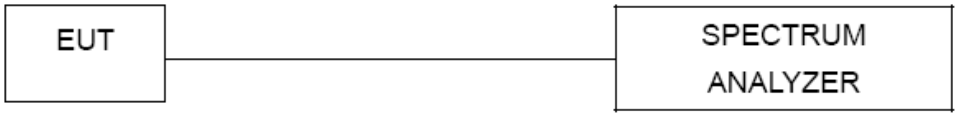
5.2 TEST REQUIREMENTS

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.

5.3 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. Spectrum Setting : RBW= 10KHz, VBW=30KHz, Sweep time = Auto.

5.4 TEST SETUP



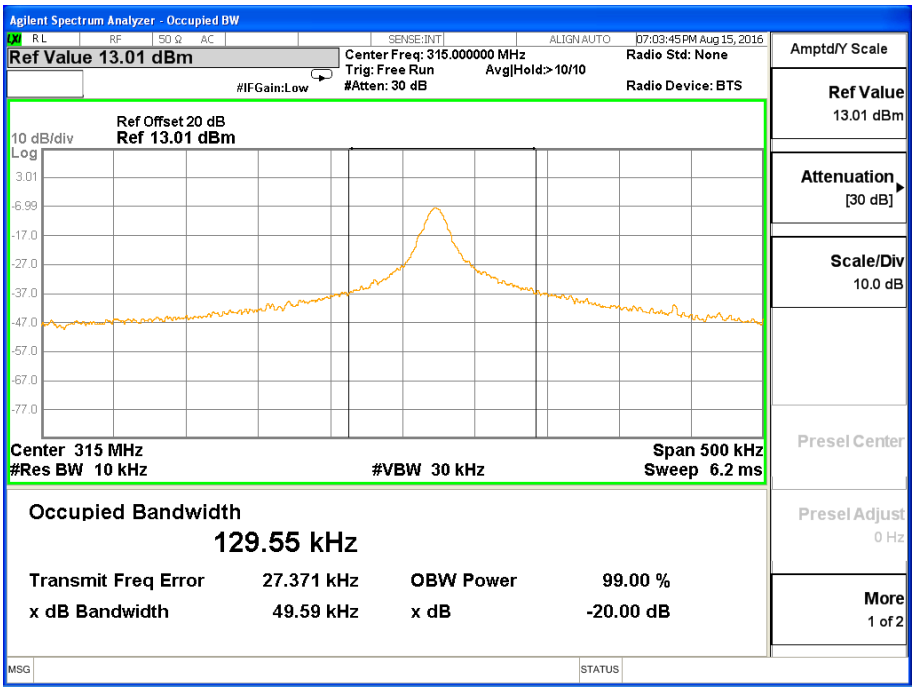
5.5 EUT OPERATION CONDITIONS

TX mode.

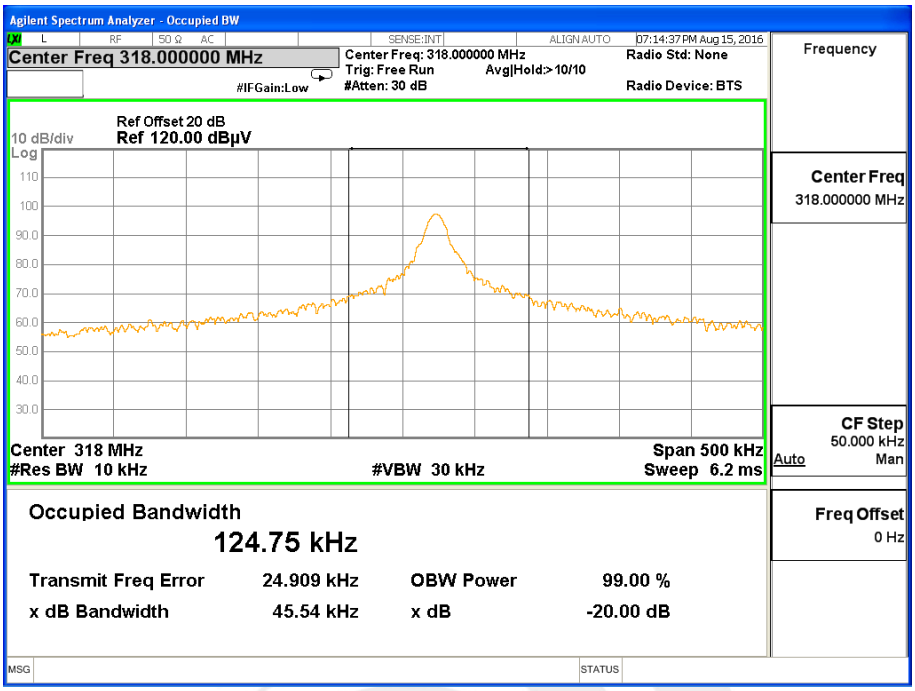
5.6 TEST RESULTS

Centre Frequency	Measurement		
	20dB Bandwidth (KHz)	Limit(kHz)	Frequency Range (MHz)
315 MHz	49.59	787.5	PASS
318 MHz	45.54	795.0	PASS
390 MHz	49.23	975.0	PASS

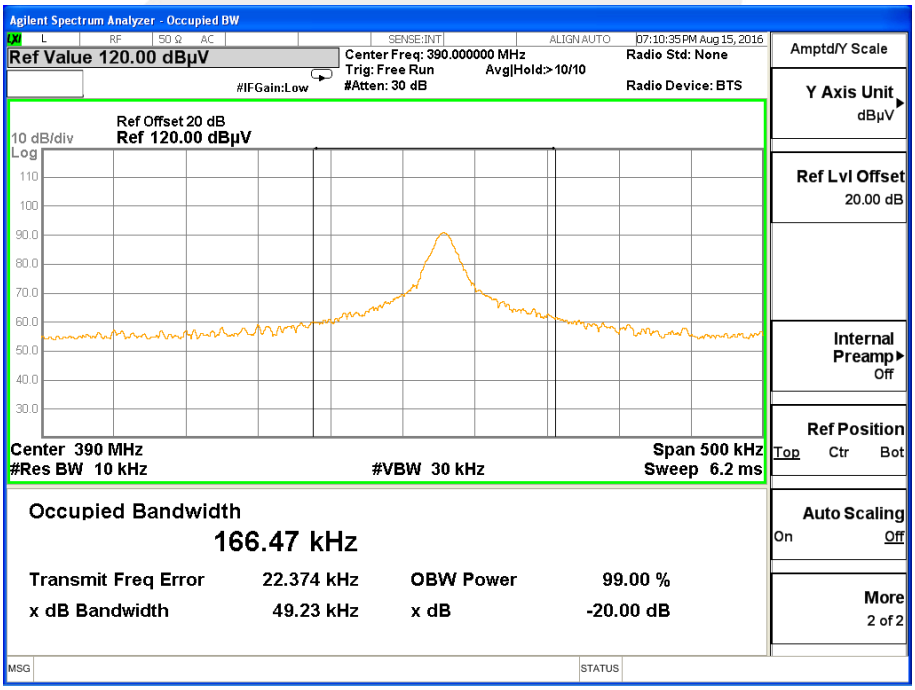
Low Channel



Middle Channel



High Channel



6. PERIODIC OPERATION

6.1 TEST PROCEDURE

The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
The Duty Cycle Was Determined By The Following Equation: To Calculate The Actual Field Intensity,The Duty Cycle Correction Factor In Decibel Is Needed For Later Use And Can Be Obtained From Following Conversion
Duty Cycle(%)=Total On Interval In A Complete Pulse Train/ Length Of A Complete Pulse Train * %
Duty Cycle Correction Factor(Db)=20 * Log10(Duty Cycle(%))

6.2 TEST SETUP

6.3 EUT OPERATION CONDITIONS

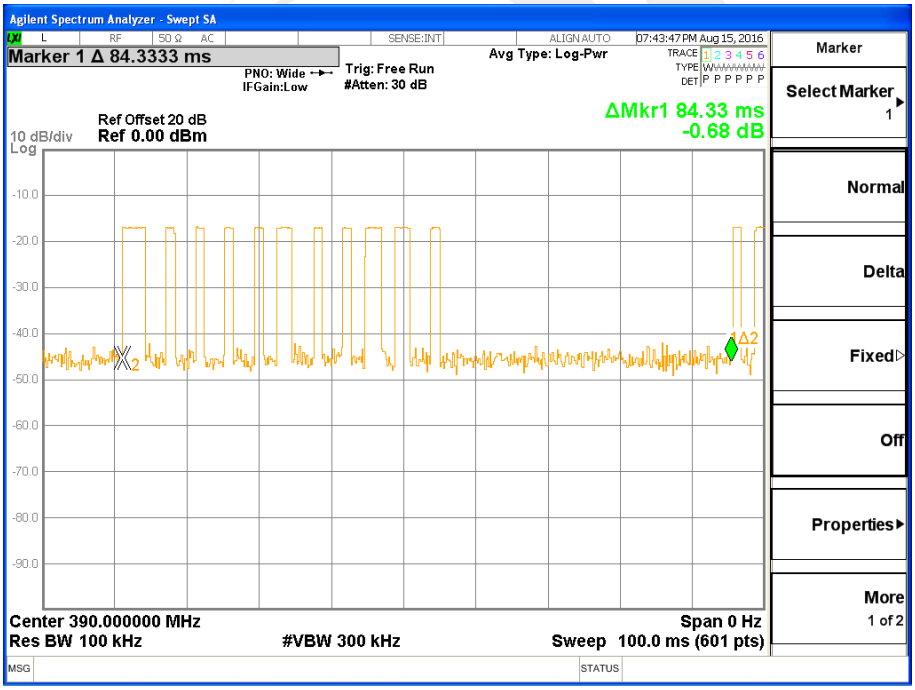
TX mode.

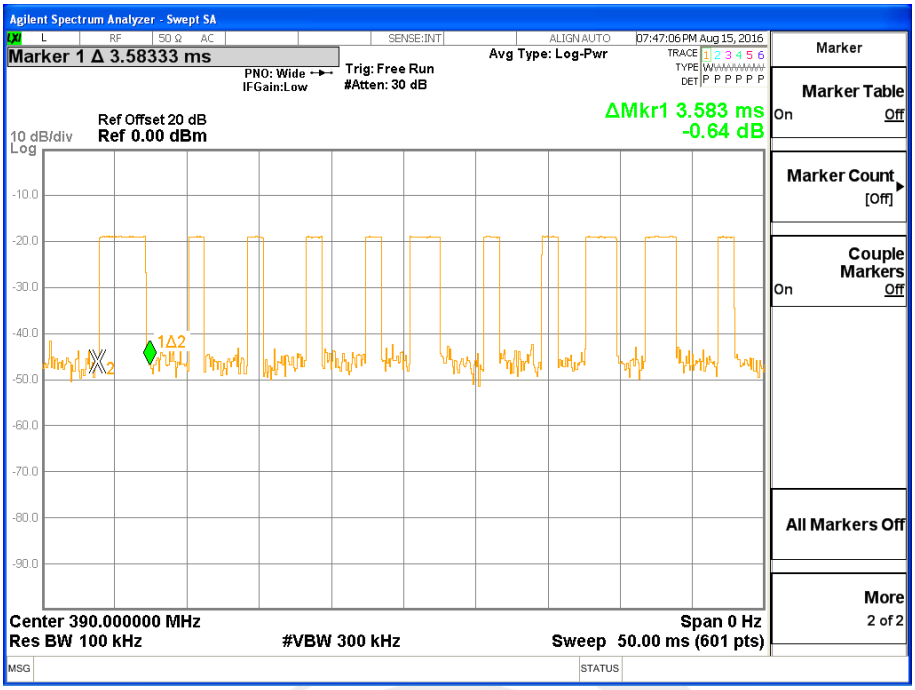
6.4 TEST RESULTS

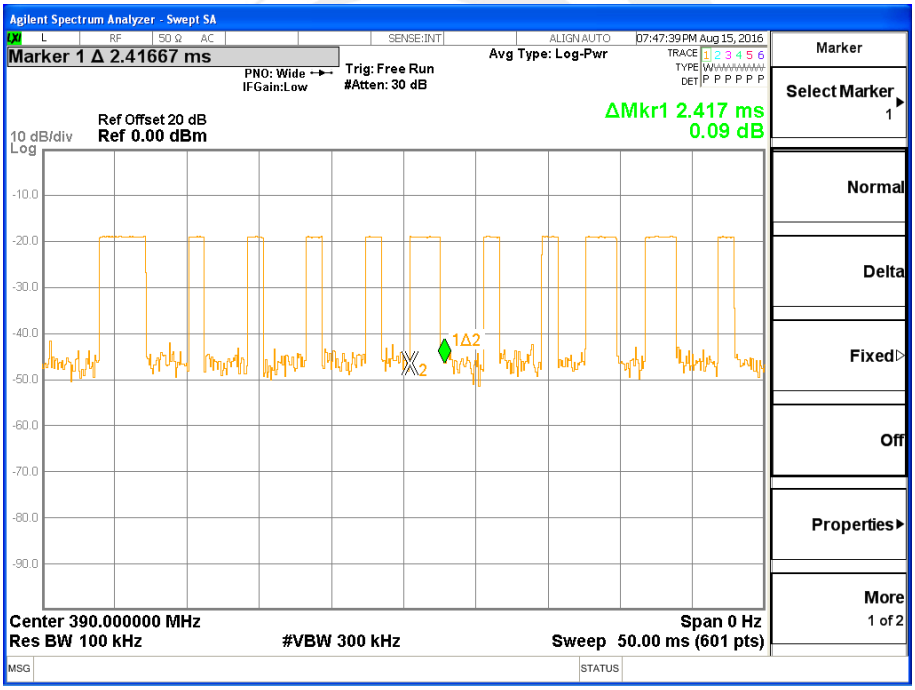
FCC Part15.231(a)	
Total On interval in a complete pulse train(ms)	3.583+(2.417*3)+(1.167*7)=19.003
Length of a complete pulse train(ms)	84.33
Duty Cycle(%)	22.53%
Duty Cycle Correction Factor(dB)	20*Log10(Duty Cycle)= -12.94

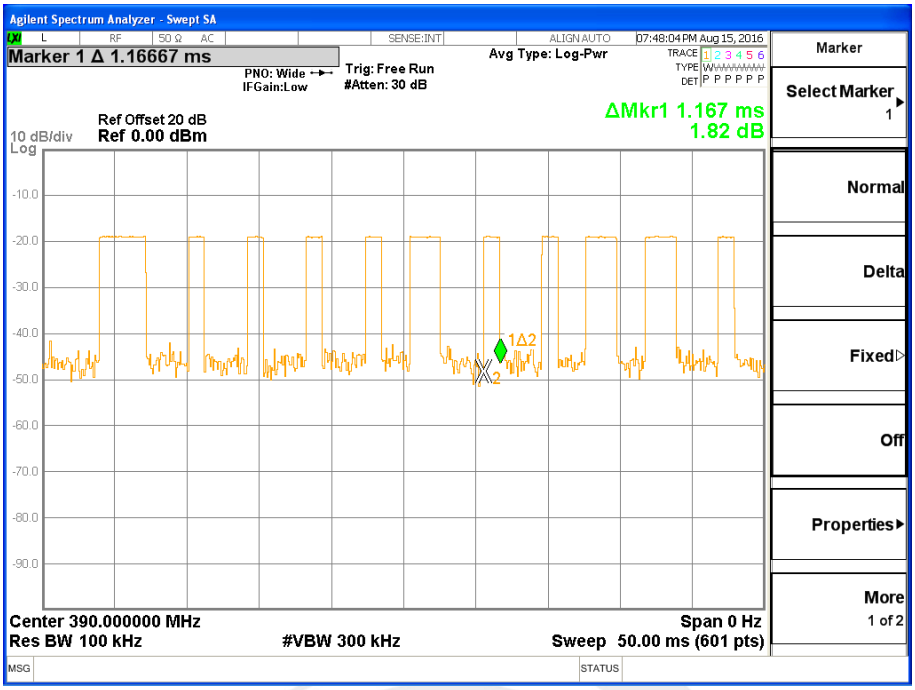
Refer to the duty cycle plot (as below),This device meets the FCC requirement. Length of a complete pulse train
Remark:FCC part15.35(c) required that a complete pulse train is more than 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.

TX Mode




Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 3.58333 ms
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
07:47:06 PM Aug 15, 2016
ΔMkr1 3.583 ms
-0.64 dB
Ref Offset 20 dB
10 dB/div
Ref 0.00 dBm
Center 390.000000 MHz
Res BW 100 kHz
#VBW 300 kHz
Span 0 Hz
Sweep 50.00 ms (601 pts)
Marker
Marker Table
On Off
Marker Count
[Off]
Couple Markers
On Off
All Markers Off
More
2 of 2

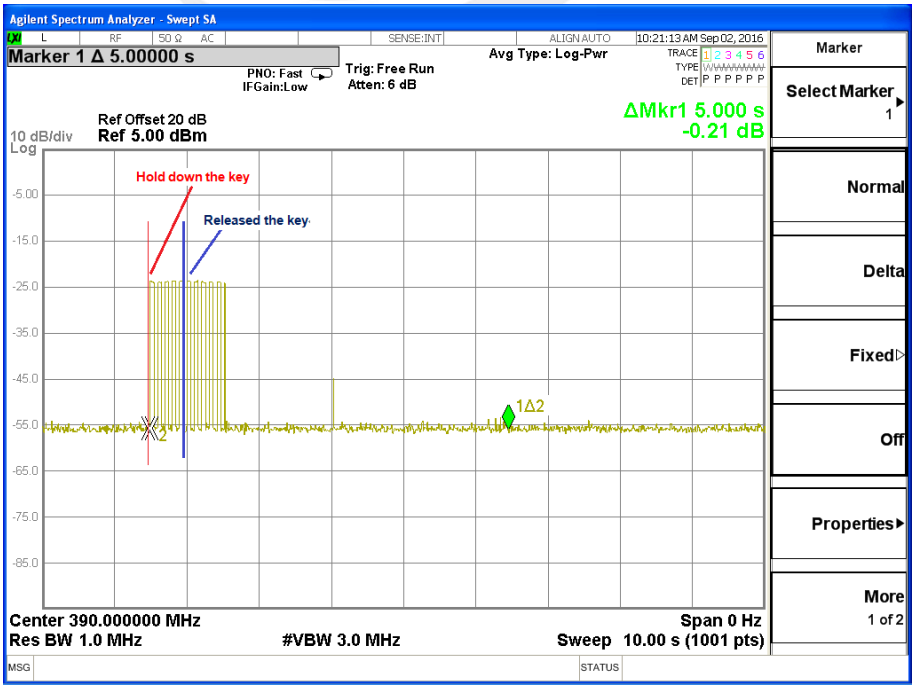

Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 2.41667 ms
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
07:47:39 PM Aug 15, 2016
ΔMkr1 2.417 ms
0.09 dB
Ref Offset 20 dB
10 dB/div
Ref 0.00 dBm
Center 390.000000 MHz
Res BW 100 kHz
#VBW 300 kHz
Span 0 Hz
Sweep 50.00 ms (601 pts)
Marker
Select Marker
1
Normal
Delta
Fixed
Off
Properties
More
1 of 2



Note:
(1)Refer to the plot (As Below),We find a manually operated transmitter shall employ a switch that will automatically deactivate the transmitter immediately, within not more than 5 seconds of being released.
(2)The EUT is comply with FCC PART 15 clause 15.231(a)(1).manually working mode are pre-tested.and only the worst result is reported.

Step 1: Using RF cable connect to Spectrum analyzer and antenna transmitter port
Step 2: Hold the key down and then release it
Step 3: Setup Spectrum analyzer, RBW=1MHz/VBW=3MHz, Detector=Peak, Span=0Hz
Sweep time=10s

TX Mode: transmitter time＜5S



Test Result: PASS

7. ANTENNA REQUIREMENT

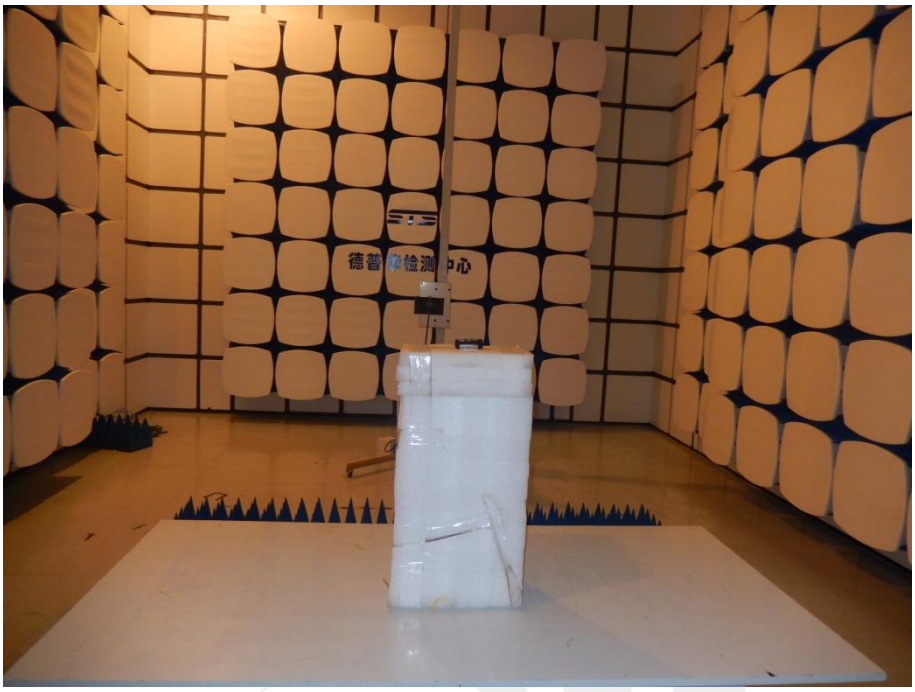
7.1 STANDARD REQUIREMENT

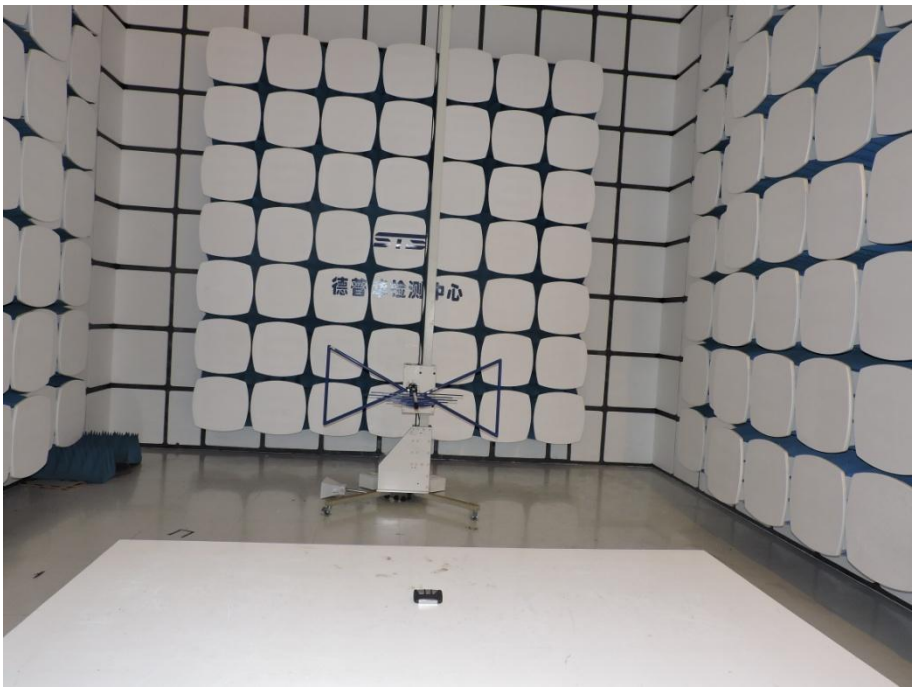
According to the FCC Part 15 Paragraph 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna to the intentional radiator shall be considered sufficient to comply with the provisions of this section. This product use a permanent ceramic printed antenna, fulfill the requirement of this section

7.2 EUT ANTENNA

The EUT antenna is PCB Antenna.It conforms to the standard requirements.

APPENDIX 1- PHOTOS OF TEST SETUP





※※※※※END OF THE REPORT※※※※※