FCC Part 15C Test Report

FCC ID: 2AEYLM98

Product Name:	**Rechargeable and Waterproof Training Collar**
Trademark:	**N/A**
Model Name :	M98, M328,M368,M388,M39,M518,M613,M661,M688,M81,M850, M853,M86,M87,M88,M89,M90,M900,M91,M99,M998
Prepared For : Address :	**Shenzhen Cuter Pet Supply Co., LTD.** 5F Building One,FuFengDa Industrial District,BaiShiXia Village,Fuyong street,Baoan Distric,Shenzhen, China
Prepared By : Address :	**Shenzhen BCTC Technology Co., Ltd.** No.101,Yousong Road,Longhua New District, Shenzhen,China
Test Date:	**May 25 – May 31, 2015**
Date of Report :	**Jun. 3, 2015**
Report No.:	**BCTC-15050059**

VERIFICATION OF COMPLIANCE

Applicant's name ..... :	**Shenzhen Cuter Pet Supply Co., LTD.**
Address ..... :	5F Building One,FuFengDa Industrial District,BaiShiXia Village,Fuyong street,Baoan Distric,Shenzhen, China
Manufacture's Name..... :	**Shenzhen Cuter Pet Supply Co., LTD.**
Address ..... :	5F Building One,FuFengDa Industrial District,BaiShiXia Village,Fuyong street,Baoan Distric,Shenzhen, China
Product description	
Product name ..... :	Rechargeable and Waterproof Training Collar
Trademark:	N/A
Model Name:	M98, M328,M368,M388,M39,M518,M613,M661,M688,M81, M850,M853,M86,M87,M88,M89,M90,M900,M91,M99,M998
Test procedure	FCC Part15.231
Standards	ANSI C63.10-2013

This device described above has been tested by BCTC, 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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Test Result.....: **Pass**

Testing Engineer : Eric Yang

(Eric Yang)

Technical Manager : Sophie Lu

(Sophia Lee)

Authorized Signatory : Carson. Zhang

(Carson. Zhang)

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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.231) , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.209,15.231b	Radiated Emission Test	PASS	
15.231c	20dB Occupy Bandwidth	PASS	
15.231a	Dwell time	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

(1)” N/A” denotes test is not applicable in this Test Report

1.1 TEST FACILITY

Shenzhen BCTC Technology Co., Ltd.
Add.:No.101,Yousong Road,Longhua New District, Shenzhen,China
FCC Registration No.:187086

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	Conducted Emission Test	±1.38dB
2	RF power,conducted	±0.16dB
3	Spurious emissions,conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.68dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Rechargeable and Waterproof Training Collar
Trade Name	N/A
Model Name	M98
Serial Model	M328,M368,M388,M39,M518,M613,M661,M688,M81, M850,M853,M86,M87,M88,M89,M90,M900,M91,M99, M998
Model Difference	All the same,Only model name is different.
Product Description	The EUT is a Rechargeable and Waterproof Training Collar Operation Frequency: 433.92MHz Modulation Type: ASK Antenna Designation: Integral Antenna Gain 3dBi Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.
Adapter	N/A
Battery	DC 3.7V
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.

2.2 DESCRIPTION OF TEST MODES

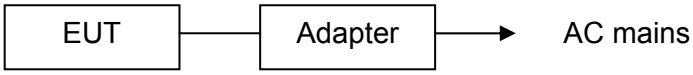
For All Emission	
Final Test Mode	Description
Mode 1	TX Mode

Note:

(1) Fully-charged battery is used during the test

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Conducted Emission Test



Radiated Spurious Emission Test

2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

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
1	Rechargeable and Waterproof Training Collar	N/A	M98	N/A	EUT
2	Adapter	N/A	BTC055	N/A	I/P:AC 100~240V 50/60Hz O/P:DC 5V/0.5A
3	USB Cable	N/A	USB003	N/A	1.0M

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.
(3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Agilent	E4407B	MY45108040	2014.07.06	2015.07.05	1 year
2	Test Receiver	R&S	ESPI	101318	2014.06.07	2015.06.06	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2014.07.06	2015.07.05	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2014.06.07	2015.06.06	1 year
5	Spectrum Analyzer	ADVANTEST	R3132	150900201	2014.06.07	2015.06.06	1 year
6	Horn Antenna	EM	EM-AH-10180	2011071402	2014.07.06	2015.07.05	1 year
7	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2014.07.06	2015.07.05	1 year
8	Amplifier	EM	EM-30180	060538	2014.12.22	2015.12.21	1 year
9	Loop Antenna	ARA	PLA-1030/B	1029	2014.06.08	2015.06.07	1 year
10	Power Meter	R&S	NRVS	100696	2014.07.06	2015.07.05	1 year
11	Power Sensor	R&S	URV5-Z4	0395.1619.05	2014.07.06	2015.07.05	1 year
12	RF cables	R&S	R203	R20X	2014.07.06	2015.07.05	1 year

Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Test Receiver	R&S	ESCI	101160	2014.06.06	2015.06.05	1 year
2	LISN	R&S	ENV216	101313	2014.08.24	2015.08.23	1 year
3	LISN	EMCO	3816/2	00042990	2014.08.24	2015.08.23	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2014.06.07	2015.06.06	1 year
5	Passive Voltage Probe	R&S	ESH2-Z3	100196	2014.06.07	2015.06.06	1 year
6	Absorbing clamp	R&S	MOS-21	100423	2014.06.08	2015.06.07	1 year
7	RF cables	R&S	R204	R20X	2014.07.06	2015.07.05	1 year

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQU NCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.1 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band 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

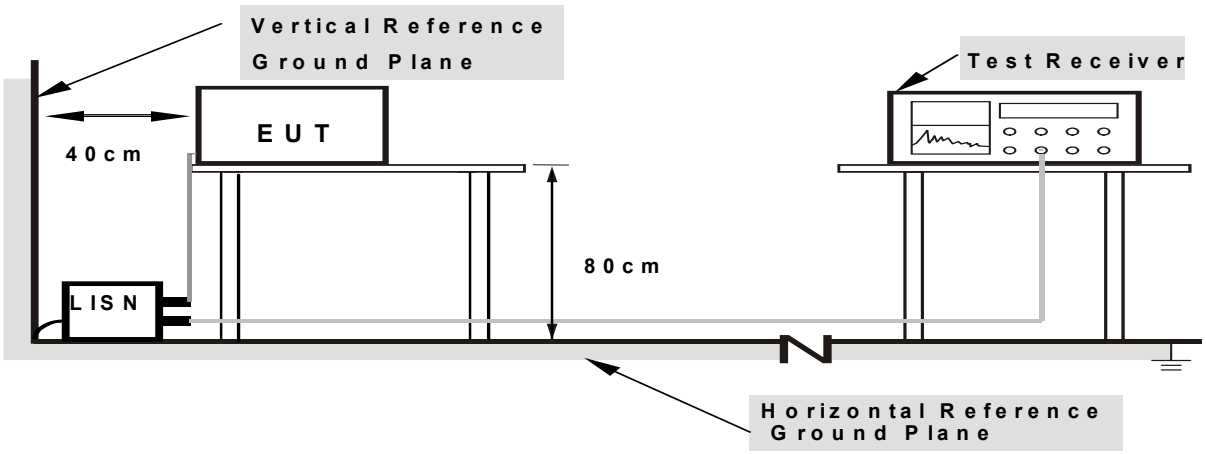
3.1.2 TEST PROCEDURE

a. The EUT was placed 0.8 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.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 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

3.1.5 EUT OPERATING CONDITIONS

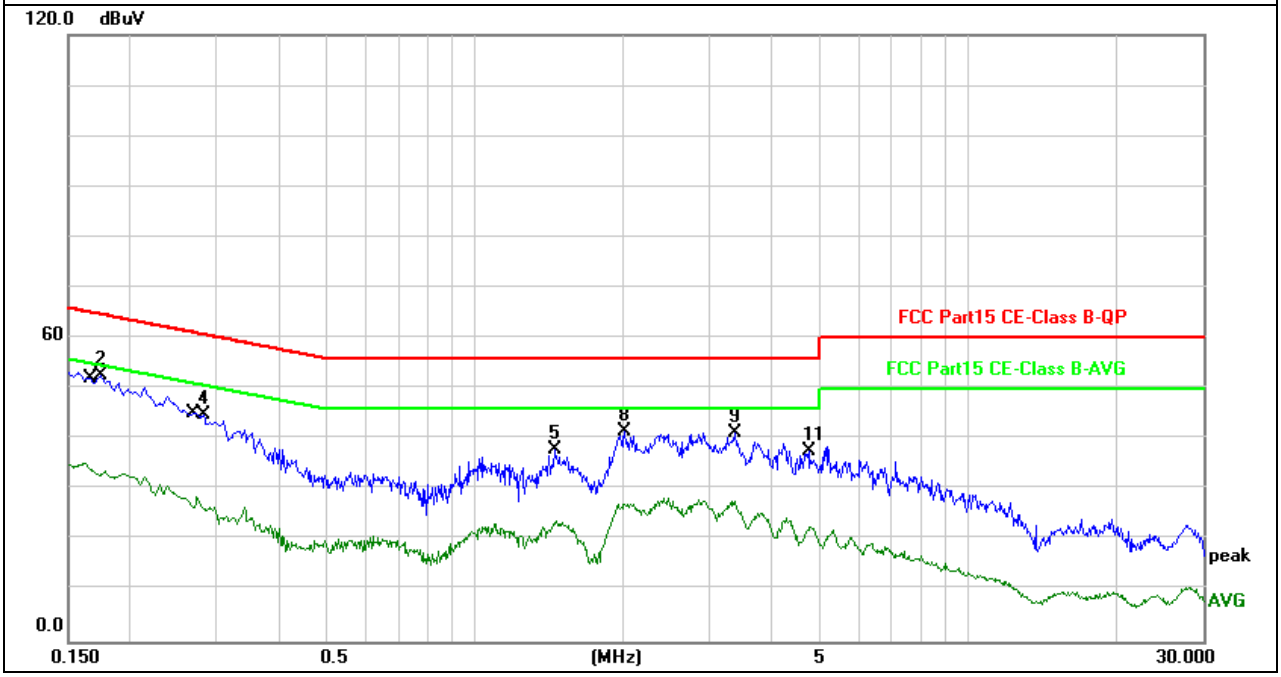
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.1.6 TEST RESULTS

EUT：	Rechargeable and Waterproof Training Collar	Model Name ：	M98
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	AC120V from adapter	Test Mode：	TX Mode

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.1740	42.56	10.06	52.62	64.77	-12.15	QP
0.1740	24.08	10.06	34.14	54.77	-20.63	AVG
0.2820	34.73	10.09	44.82	60.76	-15.94	QP
0.2820	18.42	10.09	28.51	50.76	-22.25	AVG
1.4500	27.76	10.17	37.93	56.00	-18.07	QP
1.4500	13.60	10.17	23.77	46.00	-22.23	AVG
2.0140	31.23	10.18	41.41	56.00	-14.59	QP
2.0140	17.09	10.18	27.27	46.00	-18.73	AVG
3.3780	31.01	10.18	41.19	56.00	-14.81	QP
3.3780	17.62	10.18	27.80	46.00	-18.20	AVG
4.7620	27.58	10.15	37.73	56.00	-18.27	QP
4.7620	12.60	10.15	22.75	46.00	-23.25	AVG

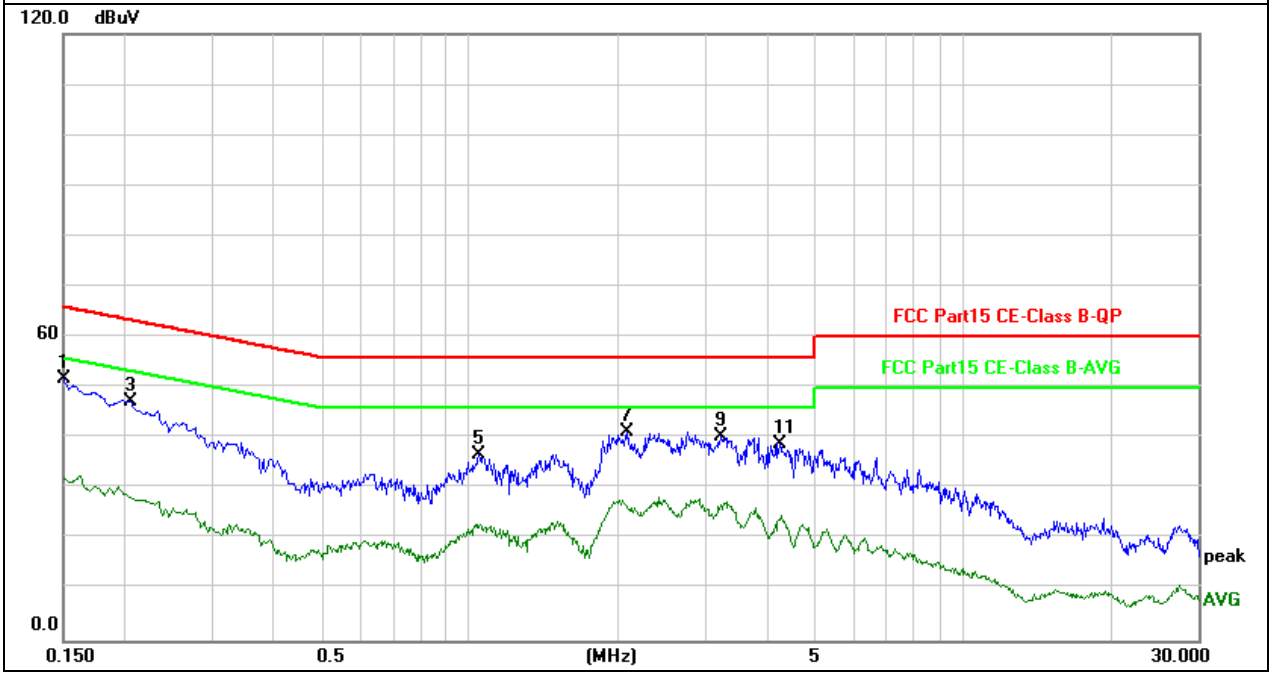
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



EUT：	Rechargeable and Waterproof Training Collar	Model Name ：	M98
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	AC120V from adapter	Test Mode：	TX Mode

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.1500	41.67	10.05	51.72	66.00	-14.28	QP
0.1500	22.20	10.05	32.25	56.00	-23.75	AVG
0.2060	37.29	10.07	47.36	63.37	-16.01	QP
0.2060	19.80	10.07	29.87	53.37	-23.50	AVG
1.0460	26.67	10.17	36.84	56.00	-19.16	QP
1.0460	12.76	10.17	22.93	46.00	-23.07	AVG
2.0980	31.01	10.18	41.19	56.00	-14.81	QP
2.0980	17.60	10.18	27.78	46.00	-18.22	AVG
3.2300	30.02	10.18	40.20	56.00	-15.80	QP
3.2300	17.07	10.18	27.25	46.00	-18.75	AVG
4.2540	28.70	10.16	38.86	56.00	-17.14	QP
4.2540	14.52	10.16	24.68	46.00	-21.32	AVG

Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

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

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
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class A (dBuV/m) (at 3M)		Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80	60	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

FUNDAMENTAL AND HARMONICS EMISSION LIMITS

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	1,250 to 3,750 **	125 to 375 **
174 - 260	3,750	375
260 - 470	3,750 to 12,500 **	375 to 1,250 **
Above 470	12,500	1,250

** 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 = 56.81818(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.]

FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW setting	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

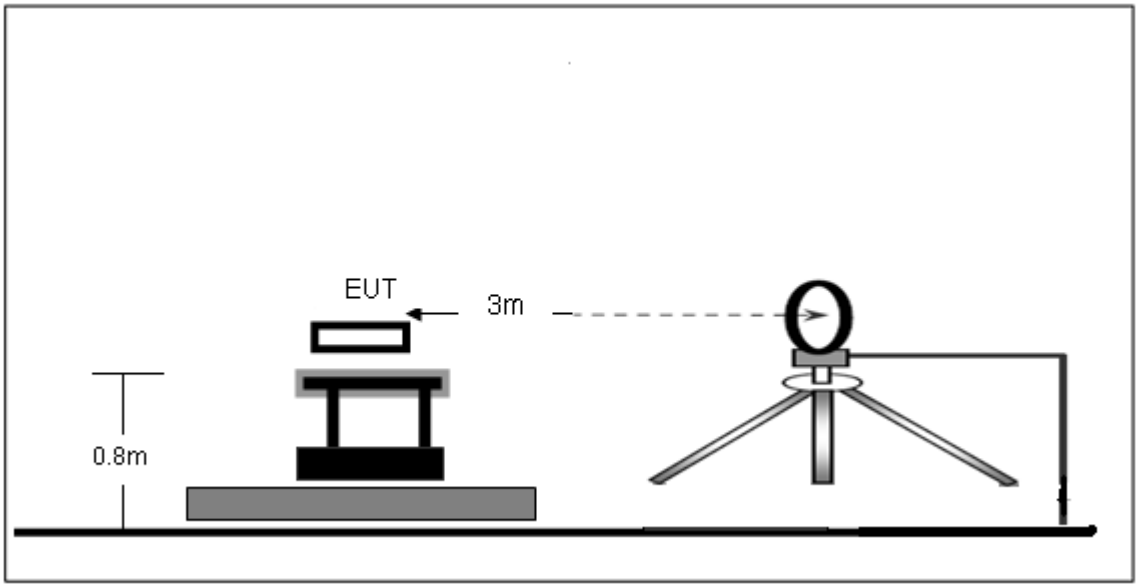
a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m; above 1GHz, the height was 1.5m, the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. 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.
e. 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.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

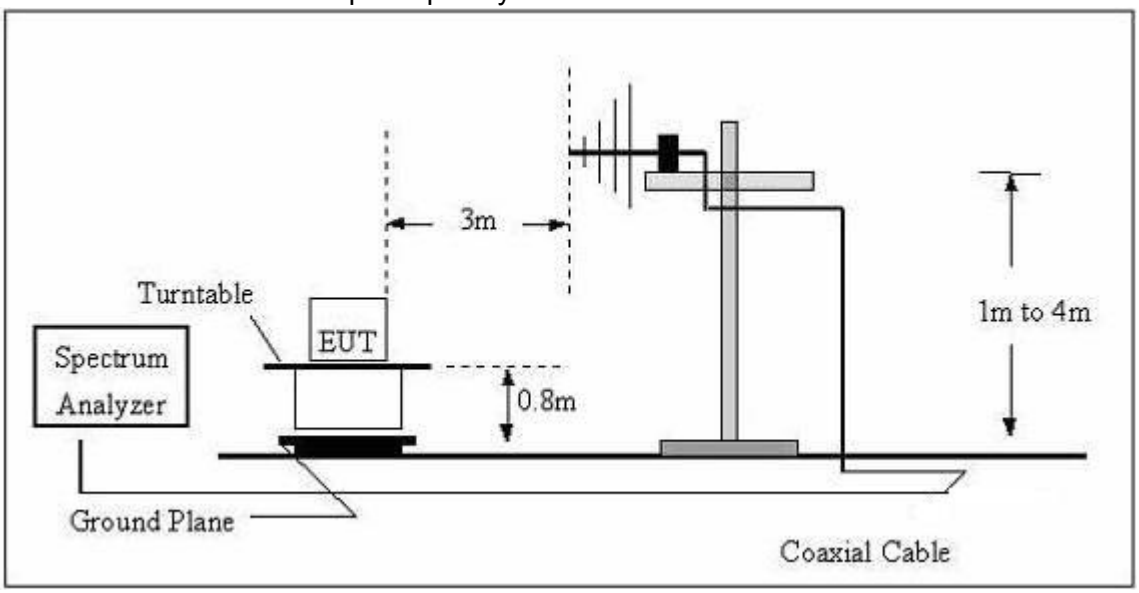
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case was X axis and the emissions were reported

3.2.3 TEST SETUP

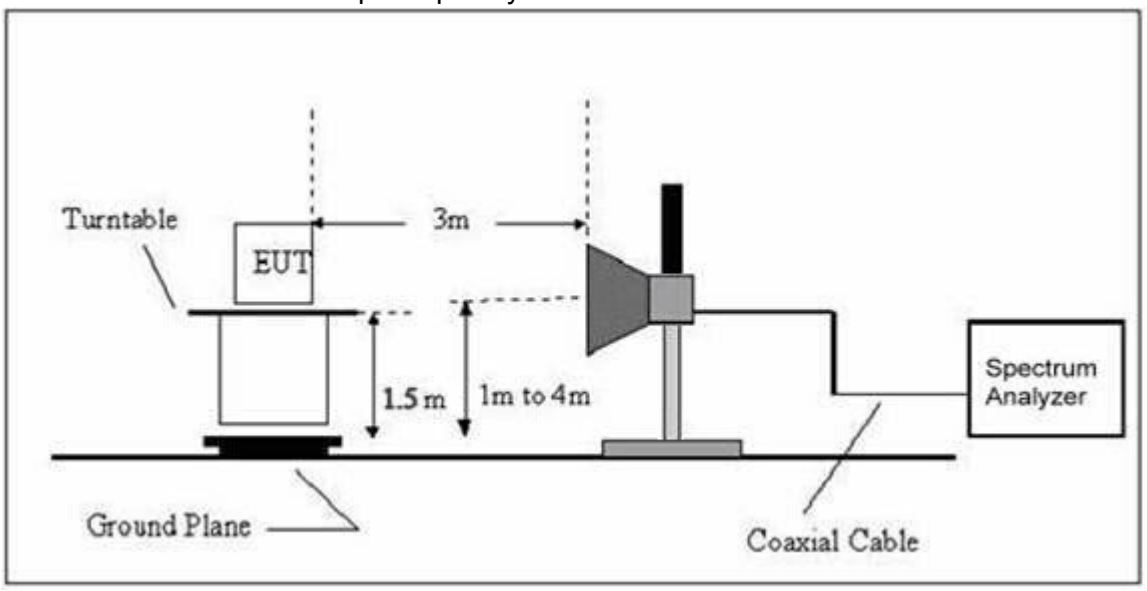
（A）Radiated Emission Test-Up Frequency Below 30MHz



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



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



3.2.4 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.

3.2.5 TEST RESULTS

Radiated Spurious Emission (Below 30MHz)

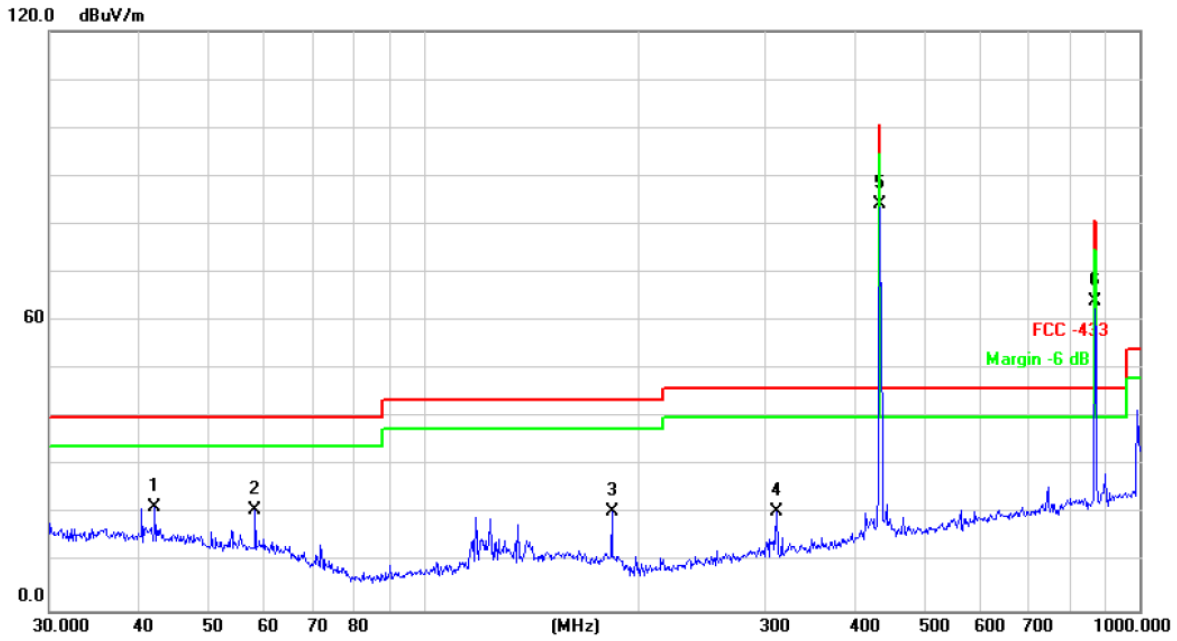
EUT：	Rechargeable and Waterproof Training Collar	Model Name ：	M98
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Polarization :	---
Test Voltage ：	By Battery		
Test Mode ：	TX Mode		

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	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.

Radiated Spurious Emission (Between 30MHz – 1GHz)

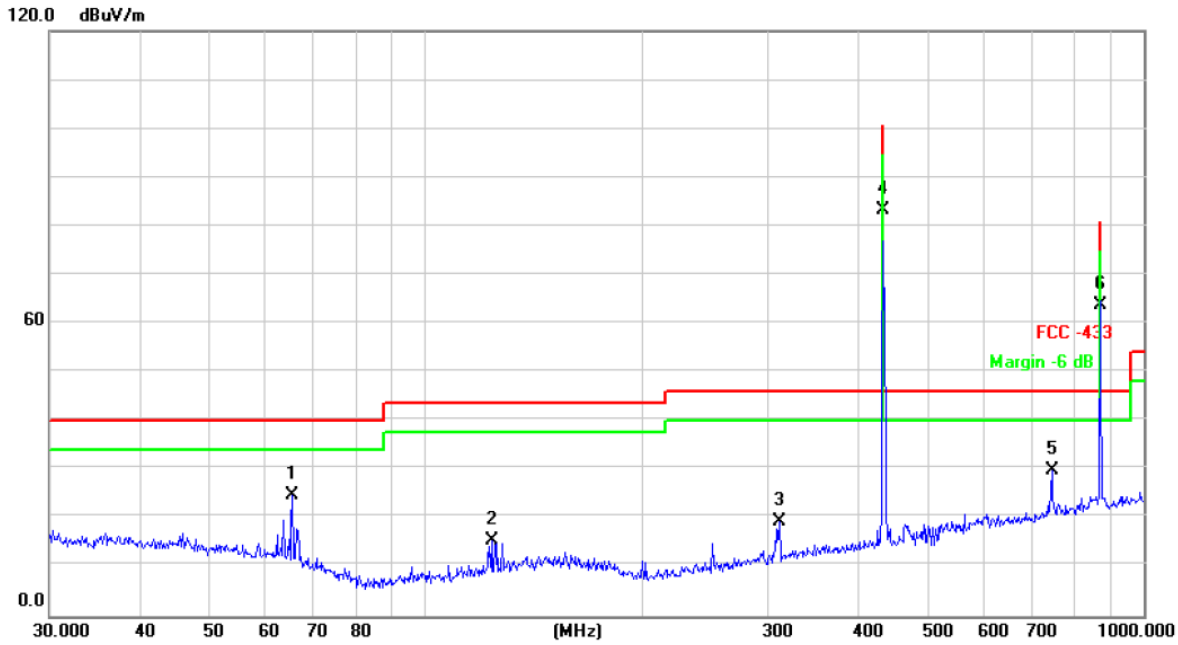
EUT：	Rechargeable and Waterproof Training Collar	Model Name ：	M98
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Polarization：	Horizontal
Test Voltage ：	DC 3.7V		
Test Mode ：	TX Mode		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		42.1542	30.50	-9.12	21.38	40.00	-18.62	QP			
2		58.2030	32.09	-11.38	20.71	40.00	-19.29	QP			
3		183.2005	35.43	-14.73	20.70	43.50	-22.80	QP			
4		311.0867	32.80	-12.29	20.51	46.00	-25.49	QP			
5	*	433.9200	93.58	-9.37	84.21	100.80	-16.59	peak			
6		867.8400	66.03	-2.05	63.98	80.80	-16.82	peak			

Remark:
Factor = Antenna Factor + Correct Factor.
Correct Factor= Cable Loss – Pre-amplifier

EUT：	Rechargeable and Waterproof Training Collar	Model Name ：	M98
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Polarization：	Vertical
Test Voltage ：	DC 3.7V		
Test Mode ：	TX Mode		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	65.3431	37.36	-12.66	24.70	40.00	-15.30	QP			
2		123.6984	29.80	-14.48	15.32	43.50	-28.18	QP			
3		311.0867	31.69	-12.29	19.40	46.00	-26.60	QP			
4		433.9200	92.53	-9.37	83.16	100.80	-17.64	peak			
5		744.8659	33.11	-3.22	29.89	46.00	-16.11	QP			
6		867.8400	65.67	-1.85	63.82	80.80	-16.98	peak			

Remark:
Factor = Antenna Factor + Correct Factor.
Correct Factor= Cable Loss – Pre-amplifier

For average Emission

Frequency MHz	Peak Level dBuV/m	Duty cycle factor	AverageLevel dBuV/m	Polarization	Limit AV	Margin
433.92	83.16	-7.27	75.89	Vertical	80.80	-4.91
867.84	63.82	-7.27	56.55	Vertical	60.80	-4.25

Notes: 1. Average emission Level = Peak Level + Duty cycle factor
2.Duty cycle level please see clause 5.

Frequency MHz	Peak Level dBuV/m	Duty cycle factor	AverageLevel dBuV/m	Polarization	Limit AV	Margin
433.92	84.21	-7.27	76.94	Horizontal	80.80	-3.86
867.84	63.98	-7.27	56.71	Horizontal	60.80	-4.09

Notes: 1. Average emission Level = Peak Level + Duty cycle factor
2.Duty cycle level please see clause 5.

Radiated Spurious Emission (1GHz to 10th harmonics)

Frequency MHz	Peak Level dBuV/m	Duty cycle factor	Average Level dBuV/m	Polarization	Limit		Margin dB	
					PK	AV	PK	AV
1301.76	65.36	-7.27	58.09	Vertical	80.80	60.80	-15.44	-2.71
1735.68	62.87	-7.27	55.60	Vertical	80.80	60.80	-17.93	-5.20
2169.60	60.03	-7.27	52.76	Vertical	80.80	60.80	-20.77	-8.04
2603.52	58.28	-7.27	51.01	Vertical	80.80	60.80	-22.52	-9.79
3037.44	52.03	-7.27	44.76	Vertical	80.80	60.80	-28.77	-16.04
3471.36	53.52	-7.27	46.25	Vertical	80.80	60.80	-27.28	-14.55

Frequency MHz	Peak Level dBuV/m	Duty cycle factor	Average Level dBuV/m	Polarization	Limit		Margin dB	
					PK	AV	PK	AV
1301.76	65.27	-7.27	58.00	Horizontal	80.80	60.80	-15.53	-2.80
1735.68	63.03	-7.27	55.76	Horizontal	80.80	60.80	-17.77	-5.04
2169.60	60.14	-7.27	52.87	Horizontal	80.80	60.80	-20.66	-7.93
2603.52	56.34	-7.27	49.07	Horizontal	80.80	60.80	-24.46	-11.73
3037.44	53.36	-7.27	46.09	Horizontal	80.80	60.80	-27.44	-14.71
3471.36	52.29	-7.27	45.02	Horizontal	80.80	60.80	-28.51	-15.78

Notes: 1. Average emission Level = Peak Level + Duty cycle factor

2.Duty cycle level please see clause 5.

3. Pulse Desensitization Correction Factor

Pulse Width (PW) = 25ms

2/PW = 2/25ms = 0.008kHz

RBW (100 kHz) > 2/PW (0.008kHz)

Therefore PDCF is not needed

4. BANDWIDTH TEST

4.1 APPLIED PROCEDURES / LIMIT

According to FCC 15.231(c) requirement:

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

B.W (20dBc) Limit = 0.25% * f(MHz) = 0.25% * 433.92MHz = 1.0848MHz

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	100kHz
VB	≥RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

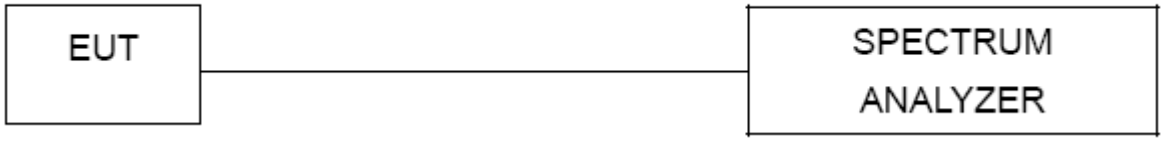
4.1.1 TEST PROCEDURE

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= 100kHz, VBW≥ RBW, Sweep time = Auto.

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



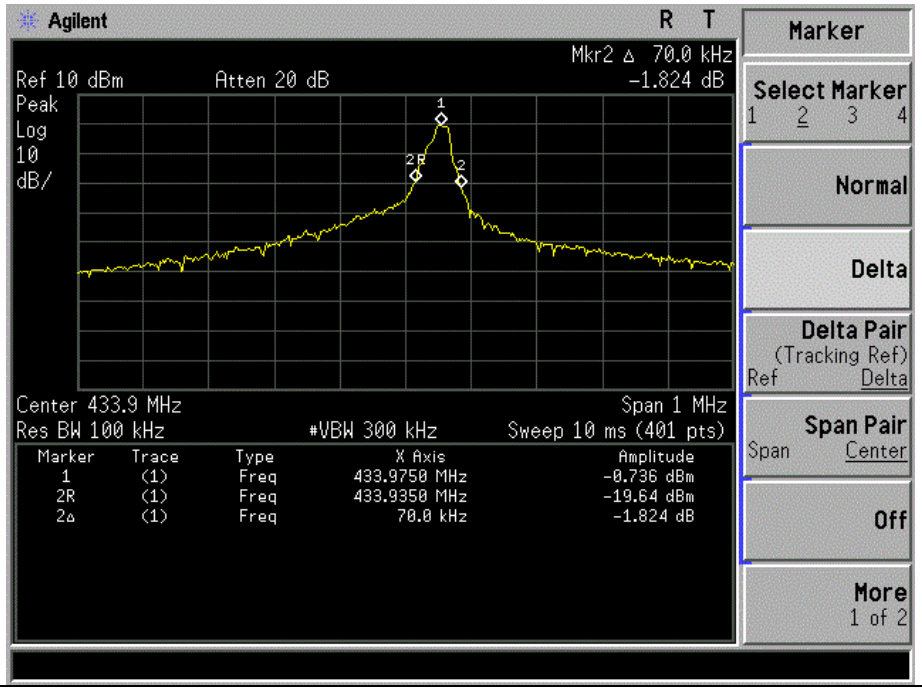
4.1.4 EUT OPERATION CONDITIONS

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.

4.1.5 TEST RESULTS

EUT：	Rechargeable and Waterproof Training Collar	Model Name ：	M98
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	By Battery
Test Mode ：	TX Mode		

Frequency	20dB Bandwidth (kHz)	Result
433.92MHz	70	**PASS**



5. CALCULATION OF AVERAGE FACTOR

The output field strengths of specification in accordance with the FCC rules specify measurements with an average detector. During the test, a spectrum analyzer incorporating a peak detector was used. Therefore, a reduction factor can be applied to the resultant peak signal level and compared to the limit for measurement instrumentation incorporating an average detector.

The duty cycle is measured in 100 ms or the repetition cycle period, whichever is a shorter time frame.

The duty cycle is measured by placing the spectrum analyzer to set zero span at 100kHz resolution bandwidth.

Averaging factor in dB =20log (duty cycle)

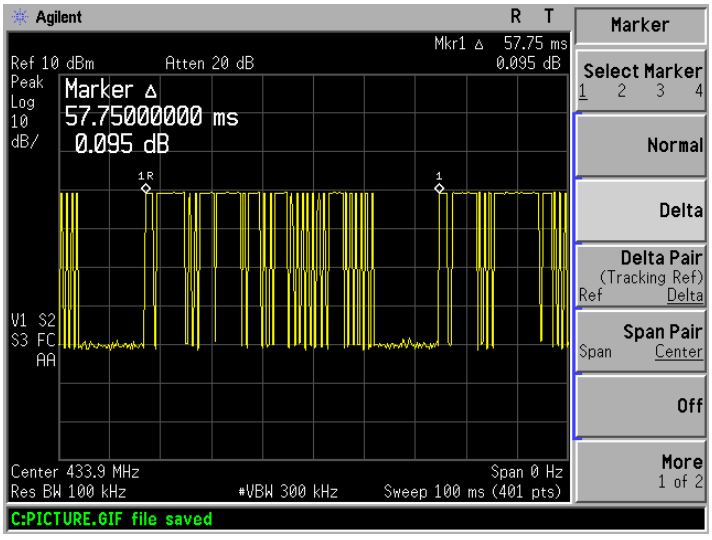
The duration of one cycle = 57.75ms

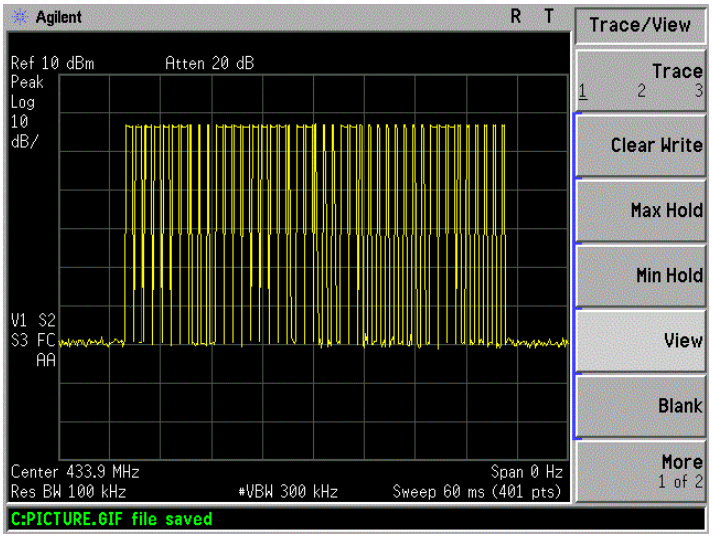
The duty cycle is simply the on-time divided the duration of one cycle

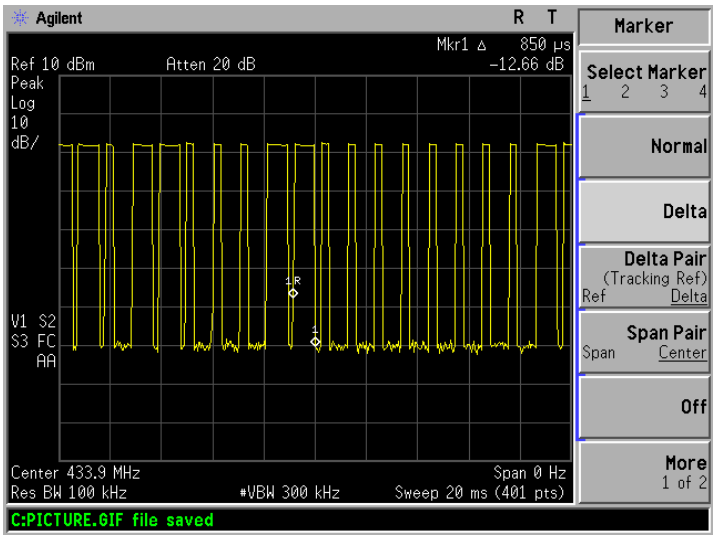
Duty Cycle = (0.85ms*22+0.3ms*21)/ 57.75=25.0ms / 57.75ms=0.433

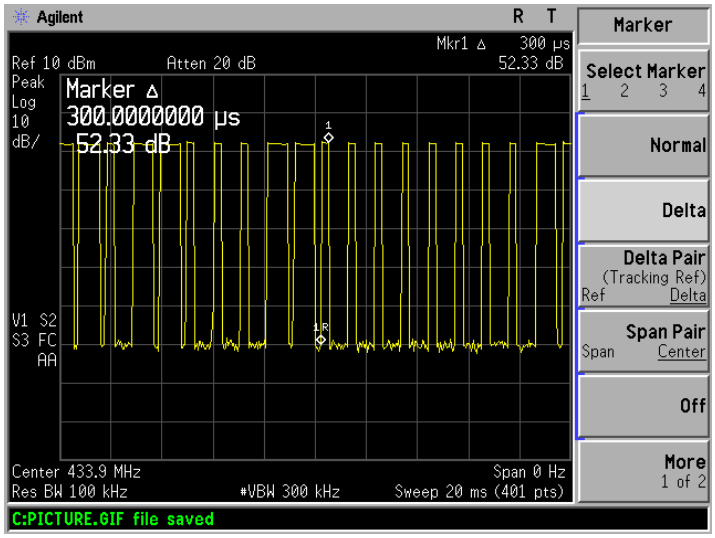
Therefore, the averaging factor is found by 20log0.433=-7.27dB

Test plot as follows:




Agilent
R T
Ref 10 dBm
Atten 20 dB
Peak
Log
10
dB/
V1 S2
S3 FC
AA
Center 433.9 MHz
Res BW 100 kHz
#VBW 300 kHz
Span 0 Hz
Sweep 60 ms (401 pts)
C:PICTURE.GIF file saved
Trace/View
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2


Agilent
R T
Mkr1 Δ 850 µs
-12.66 dB
Ref 10 dBm
Atten 20 dB
Peak
Log
10
dB/
V1 S2
S3 FC
AA
Center 433.9 MHz
Res BW 100 kHz
#VBW 300 kHz
Span 0 Hz
Sweep 20 ms (401 pts)
C:PICTURE.GIF file saved
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2


Agilent
R T
Mkr1 Δ 300 µs
52.33 dB
Ref 10 dBm
Atten 20 dB
Peak
Log
10
dB/
Marker Δ
300.0000000 µs
52.33 dB
V1 S2
S3 FC
AA
Center 433.9 MHz
Res BW 100 kHz
#VBW 300 kHz
Span 0 Hz
Sweep 20 ms (401 pts)
C:PICTURE.GIF file saved
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

6. DWELL TIME

APPLICABLE STANDARD

According to FCC 15.231(a) requirement:

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

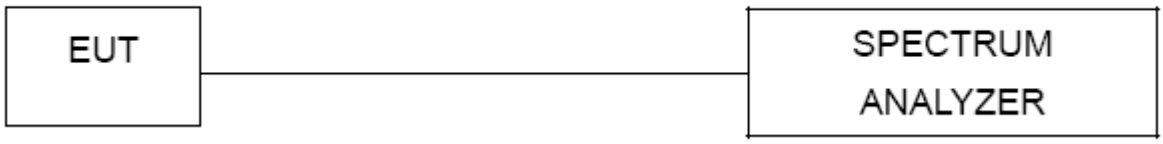
TEST PROCEDURE

a) Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
b) Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
c) Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
d) Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
e) Repeat above procedures until all measured frequencies were complete.

6.1 DEVIATION FROM STANDARD

No deviation.

6.2 TEST SETUP



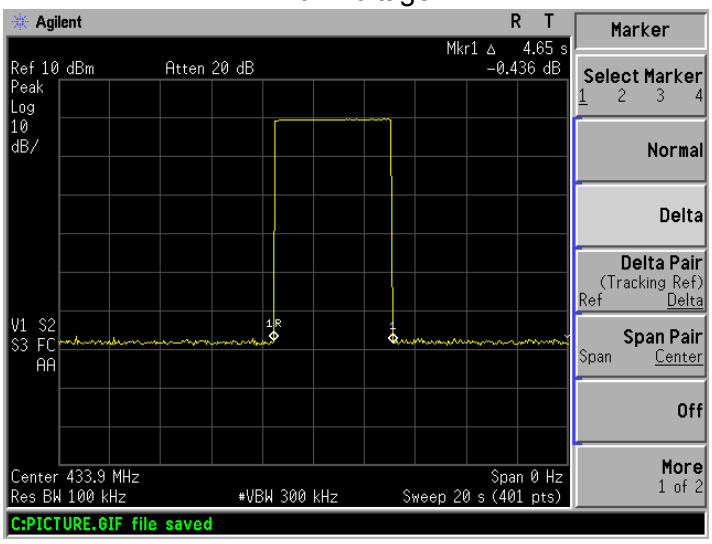
6.3 EUT OPERATION CONDITIONS

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.

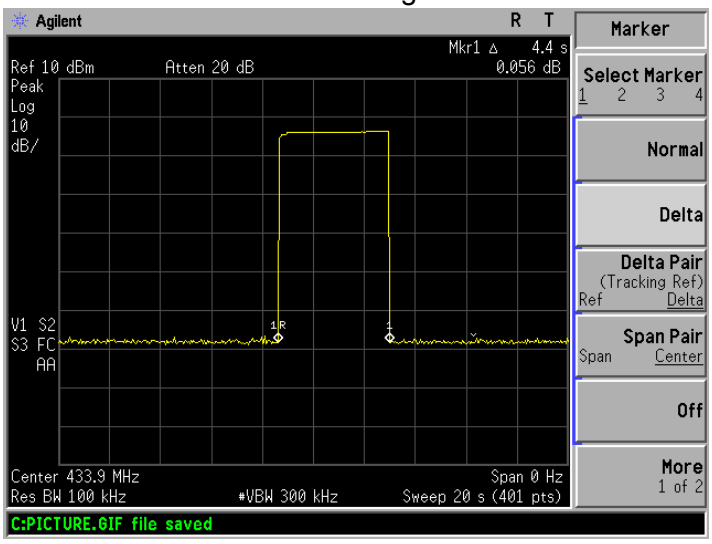
6.4 TEST RESULTS

	Dwell time (second)	Limit (second)	Result
Full voltage	4.65	<5s	Pass
Low voltage	4.40	<5s	Pass

Full Voltage



Low voltage



7. ANTENNA REQUIREMENT

7.1 STANDARD REQUIREMENT

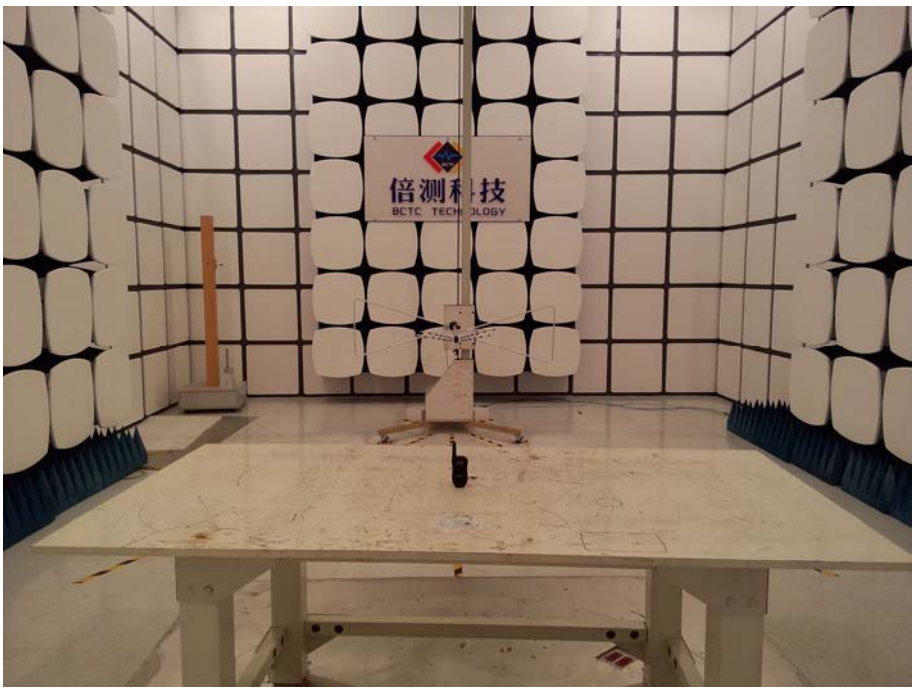
15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

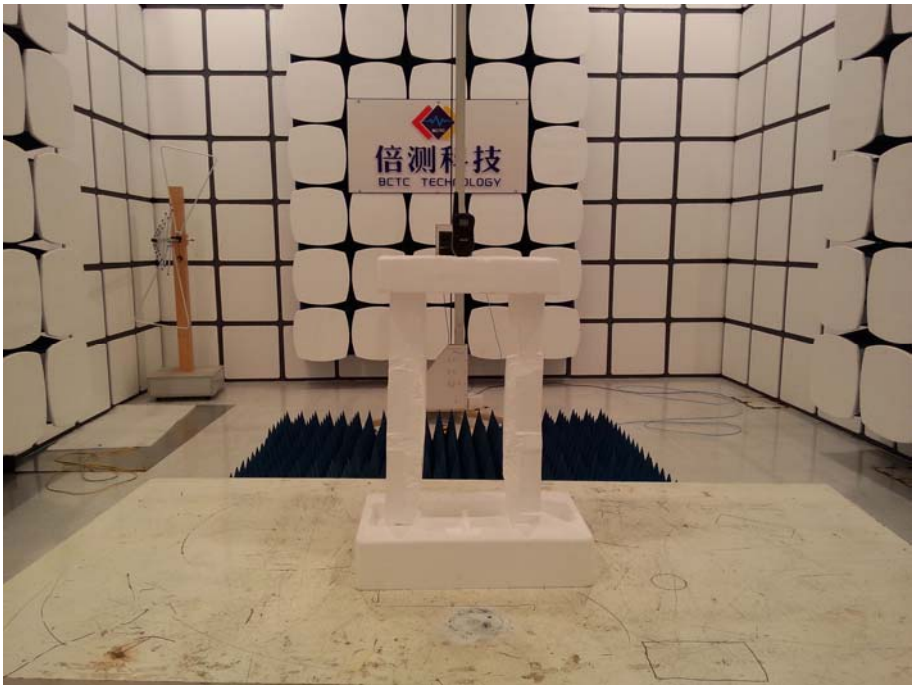
7.2 EUT ANTENNA

The EUT antenna is the permanent attached antenna. It comply with the standard requirement.

8. EUT TEST PHOTO

Radiated Measurement Photos





CONDUCTED EMISSION Photos