



FCC CERTIFICATION TEST REPORT

FOR

Applicant : Swiss Tech Acquisition, LLC
Address : 30725 Solon Industrial Parkway Solon, Ohio USA
Equipment under Test : Talking Dog Collar
Model No : 13021T
FCC ID : ORH13021T
Manufacturer : Provide Ltd
Address : 3D,Florida Mansion,9-11 Cleveland Street, Causeway
Bay, Hong Kong

Issued By: Dongguan Dongdian Testing Service Co., Ltd.

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Report No: DDT-RE120088

Issued Date: Aug.25.2012

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TEST REPORT DECLARE

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Manufacturer : Provide Ltd
Address : 3D,Florida Mansion,9-11 Cleveland Street, Causeway Bay, Hong Kong

Test Standard Used: FCC Rules and Regulations Part 15 Subpart C: 2010

Test procedure used: ANSI C63.10:2009

We Declare:

The equipment described above is tested by Dongguan Dongdian Testing Service Co., Ltd and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Dongguan Dongdian Testing Service Co., Ltd is assumed of full responsibility for the accuracy and completeness of these tests.

After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above FCC standards.

Report No:	DDT-RE120088		
Date of Test:	Aug.24.2012-Aug.24.2012	Date of Report:	Aug.25.2012

Prepared By:



Leo Liu/Engineer

Approved By:



Jamy Yu /EMC Manager

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Dongguan Dongdian Testing Service Co., Ltd.

1. Summary of test results

EMISSION		
Description of Test Item	Standard	Results
Conducted Emission Test	FCC Part 15C: 15.207 ANSI C63.10: 2009	N/A
Radiated Emission Test	FCC Part 15C: 15.231 (b) ANSI C63.10: 2009	PASS
Stop Transmitting Time Test	FCC Part 15C: 15.231(a)(1)	PASS
20 dB Bandwidth Test	FCC Part 15C: 15.231(c)	PASS
N/A is an abbreviation for Not Applicable.		

2. General test information

2.1. Description of EUT

EUT* Name	:	Talking Dog Collar
Model Number	:	13021T
EUT function description	:	Please reference user manual of this device
Power supply	:	DC 9V
FCC Operation frequency	:	315MHz
Modulation	:	OOK
Antenna Type	:	Integrated PCB antenna
Date of Receipt	:	Aug.02.2012
Sample Type	:	Series production

Note: EUT is the ab. of equipment under test.

2.2. Accessories of EUT

Description of Accessories	Manufacturer	Model number or Type	Other
/	/	/	/

2.3. Assistant equipment used for test

Description of Assistant equipment	Manufacturer	Model number or Type	Other
/	/	/	/

2.4. Block diagram of EUT configuration for test



Note: Before test, the duty cycle of each button of EUT was measured, and the maximum duty cycle of button was chosen for all the tests.

2.5. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature range:	21-25℃
Humidity range:	40-75%
Pressure range:	86-106kPa

2.6. Test laboratory

Dongguan Dongdian Testing Service Co., Ltd

Add: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City, Guangdong Province, China, 523808 Tel: +86-0769-22891499 <http://www.dgddt.com>

FCC Registration Number: 270092 Industry Canada site registration number: 10288A-1

2.7. Measurement uncertainty

Test Item	Uncertainty
Uncertainty for Conduction emission test	2.40dB
Uncertainty for Radiation Emission test (150KHz-30MHz)	3.21dB
Uncertainty for Radiation Emission test (30MHz-1GHz)	2.78 dB (Polarize: V)
	3.20 dB (Polarize: H)
Uncertainty for Radiation Emission test (1GHz to 25GHz)	2.08dB(Polarize: V)
	2.56dB (Polarize: H)
Uncertainty for radio frequency	1×10^{-9}
Uncertainty for conducted RF Power	0.65dB

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

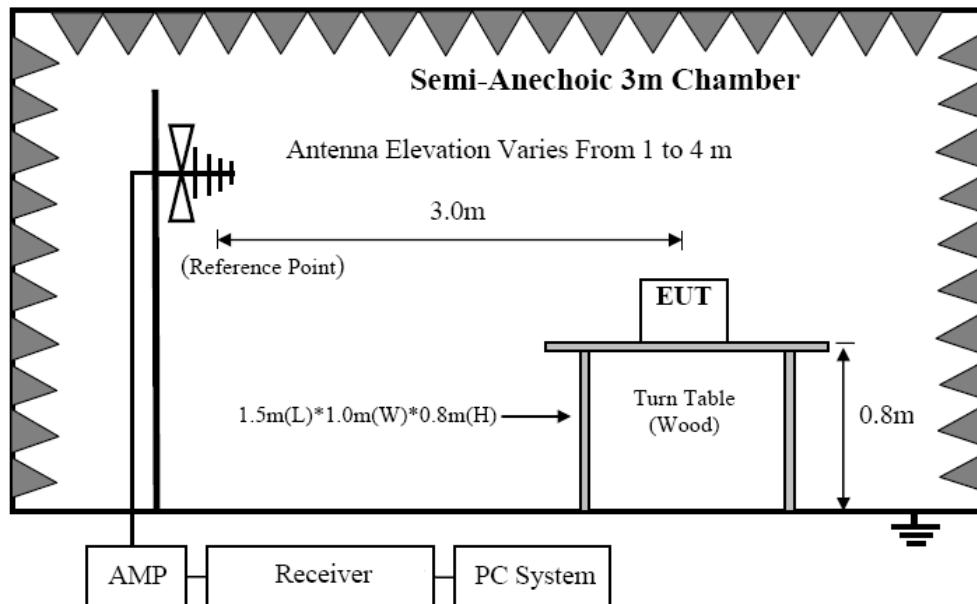
3. Radiated emission

3.1. Test equipment

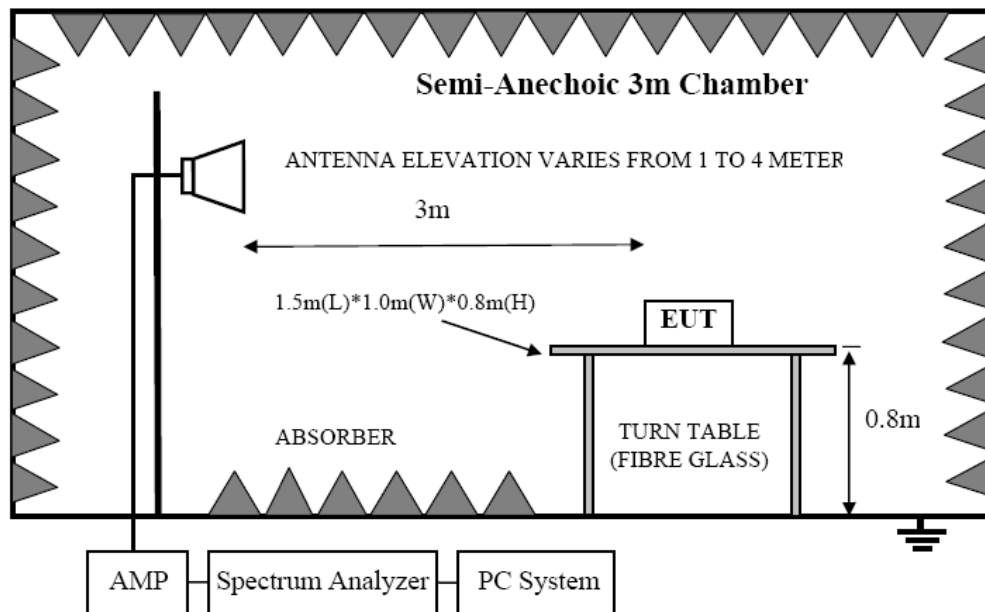
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	EMI Test Receiver	R&S	ESU8	100316	2011/11/23	1Y
2	Spectrum analyzer	R&S	FSU	1166.1660.26	2011/11/23	1Y
3	loop antenna	Chase	HLA6120	20129	2010/11/09	2 Y
4	Trilog Broadband Antenna	Schwarzbeck	VULB9163	9163-462	2010/11/09	2 Y
5	Double Ridged Horn Antenna	R&S	HF907	100276	2011/01/16	2 Y
6	Pre-Amplifier	R&S	SCU-01	10049	2011/11/23	1Y
7	Pre-amplifier	A.H.	PAM0-0118	360	2011-12-20	1Y
8	RF Cable	R&S	R01	10403	2011/11/23	1Y
9	RF Cable	R&S	R02	10512	2011/11/23	1Y

3.2. Block diagram of test setup

In 3m Anechoic Chamber Test Setup Diagram for below 1GHz



In 3m Anechoic Chamber Test Setup Diagram for frequency above 1GHz



Note: For harmonic emissions test a appropriate high pass filter was inserted in the input port of AMP.

3.3. Limit

3.3.1 FCC 15.205 Restricted frequency band

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)

3.3.2 FCC 15.209 Limit

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		μV/m	dB(μV)/m
0.009-0.490	300	2400/F(KHz)	67.6-20log(F)
0.490-1.705	30	24000/F(KHz)	87.6-20log(F)
1.705-30.0	30	30	29.54
30 ~ 88	3	100	40.0

88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 dB(μ V)/m (Peak) 54.0 dB(μ V)/m (Average)	

3.3.3 FCC 15.231 section (b) limit

Fundamental Frequency (MHz)	Field Strength of Fundamental	Field Strength of Spurious emissions
315	AV:75.62 dBuV/m at 3m distance PK:95.62 dBuV/m at 3m distance	AV:55.62dBuV/m at 3m distance PK:75.62dBuV/m at 3m distance

3.3.4 Limit for EUT

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions include fundamental emission shall not exceed FCC 15.231 section (b) limit of comply with FCC 15.209 limit which permit higher emission level, all the spurious emission shall be 20dB below fundamental emission.

3.4. Test Procedure

- (1) EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber.
- (2) Setup EUT and assistant system according clause 2.4 and 3.2
- (3) Test antenna was located 3m from the EUT on an adjustable mast.
- (4) Spectrum frequency from 30MHz to 4GHz (tenth harmonic of fundamental frequency) was swept with Spectrum Analyzer's RBW set at 120 KHz, VBW set at 300 KHz

Note: According FCC 15.33(a) the spectrum shall be investigated from the lowest radio frequency signal generated in the device. And this device's lowest radio frequency is 315MHz, so radiated emissions were investigated start from 30MHz.

Below pre-scan procedure was first performed in order to find prominent radiated emissions.

- (a) Change work frequency or channel of device if practicable.
 - (b) Change modulation type of device if practicable.
 - (c) Change power supply range from 85% to 115% of the rated supply voltage.
 - (d) Adjust the EUT's antenna length and position is practicable.
 - (e) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produce highest emissions.
 - (f) Rotated EUT from 0 degree to 360 degree and varied test antenna height from 1m to 4m in both horizontal and vertical polarities.
- (5) When the relative maximum emissions were swept in step 4, holding the EUT's state, use the follow procedures to measure out the final emissions of device.

- (a) Marked to the interested frequency point with appropriate span to see the whole signal wave.
- (b) For emissions below 1GHz except fundamental, the Spectrum Analyzer's RBW is set at 120 KHz, VBW is set at 300 KHz, for emissions above 1GHz except fundamental, the Spectrum Analyzer's RBW is set at 1MHz, and VBW is set at 3MHz. For fundamental emission the Spectrum Analyzer's RBW is set at 200 KHz (above 20dB bandwidth of fundamental signal), and VBW is set at 300 KHz.
- (c) At each measured frequency point, the maximum Peak levels were measured by rotated EUT and varied test antenna.
- (6) The duty cycle factor was use to calculate Average Level as below formula:

$$\text{Average level} = \text{PK Level} - \text{duty cycle factor}$$

3.5. Test result

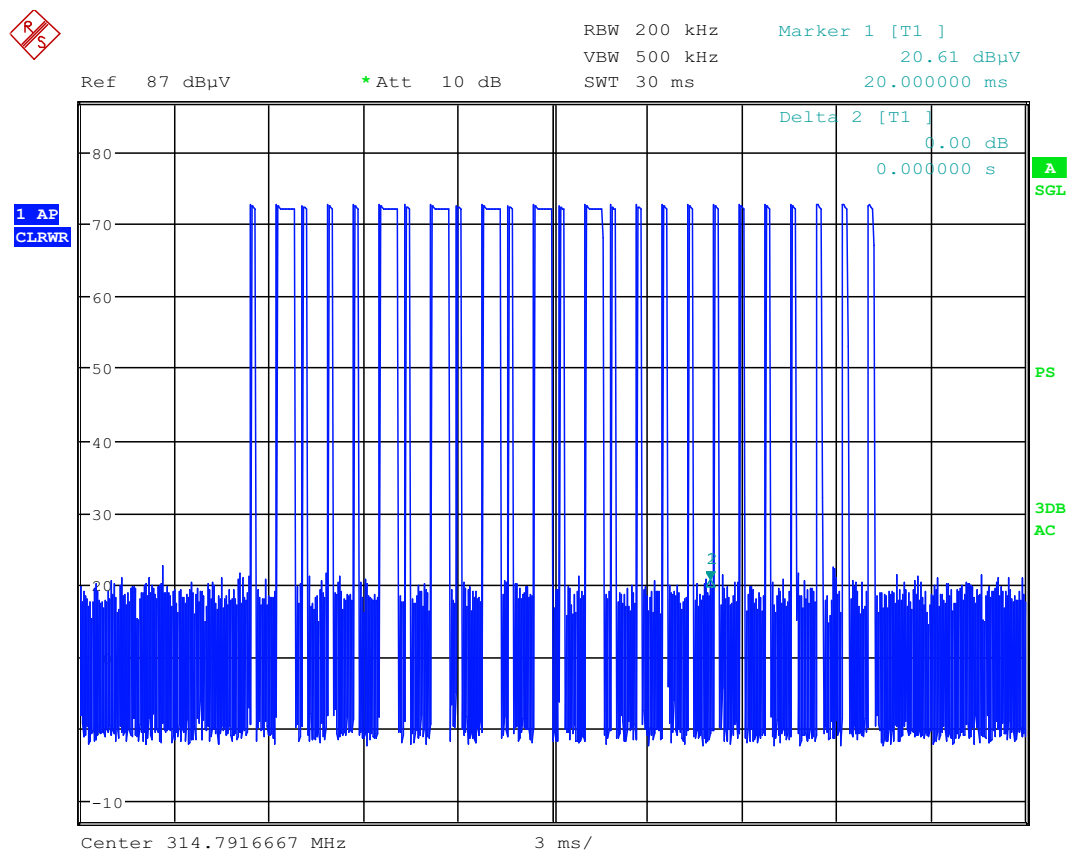
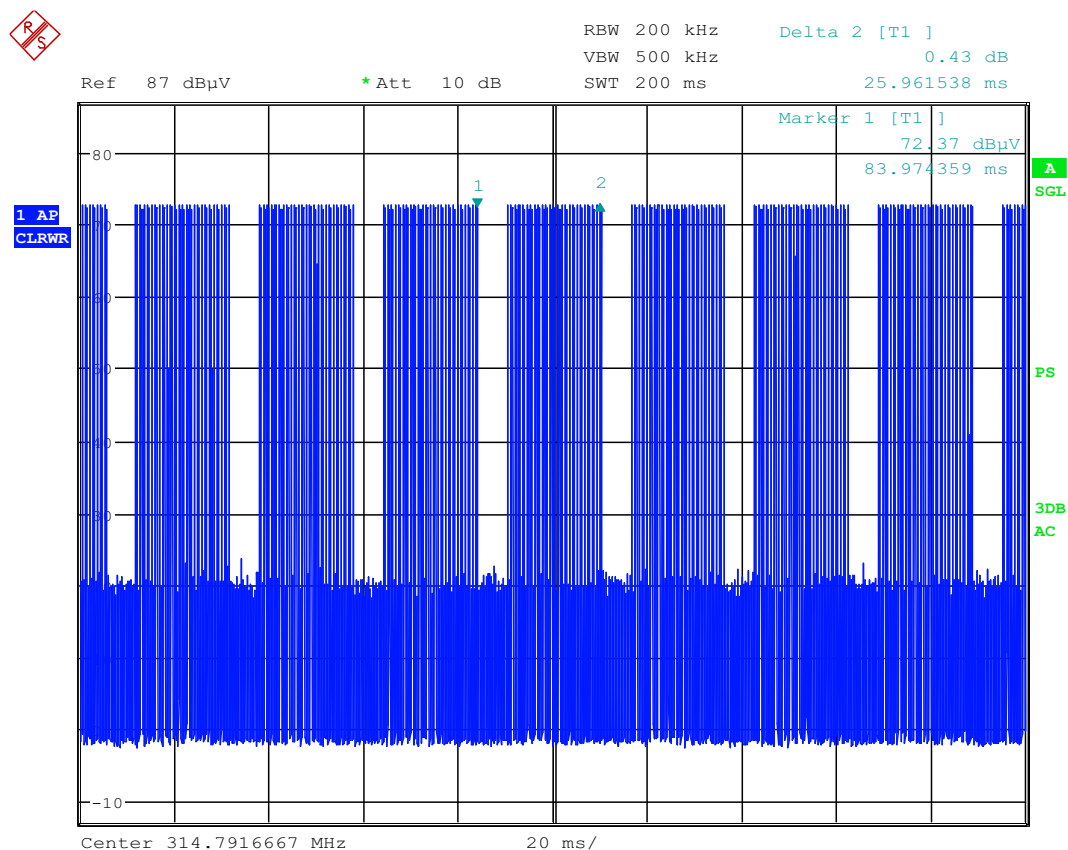
PASS. (See below detailed test result)

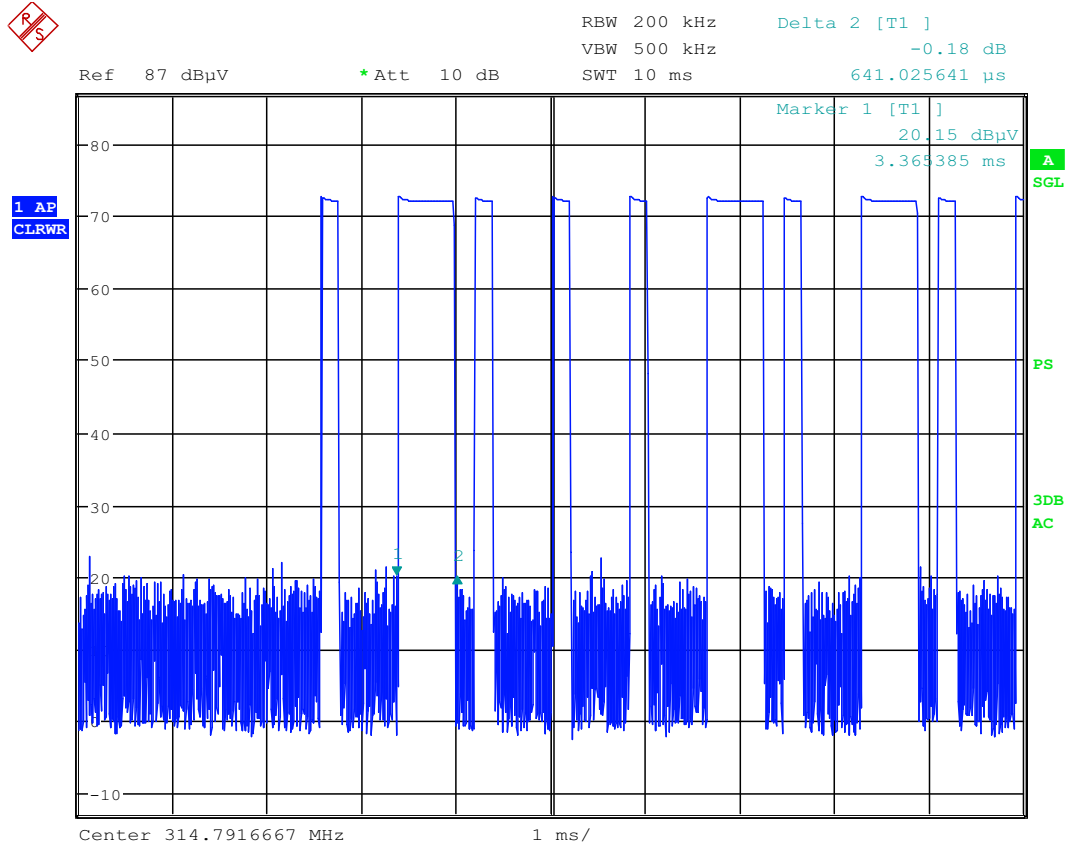
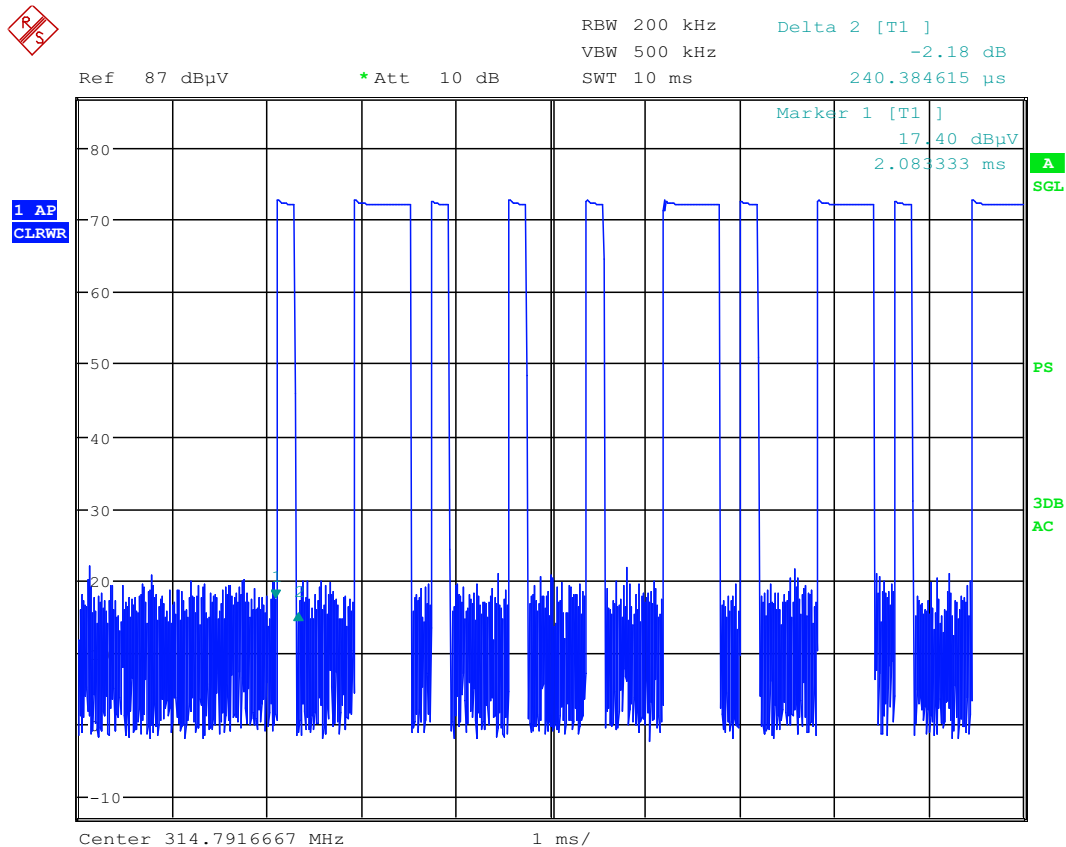
The frequency range from 30MHz to 4000MHz was investigated. When PK measured levels comply with average limit, then the average levels were deemed to comply with average limit. When PK measured levels exceed average limit, and then the duty cycle factor of 100ms was used to calculate average level.

Note: No emissions located in restricted frequency band for frequency below 1GHz, for frequency above 1GHz all the emissions comply with 15.209 limit.

$$\text{Duty cycle}(x) = (19 \times 0.240\text{ms} + 6 \times 0.641\text{ms}) / 25.96\text{ms} \times 100\% = 32.3\%$$

$$\text{Duty cycle factor} = 20 \log (1/x) = 9.82\text{dB}$$

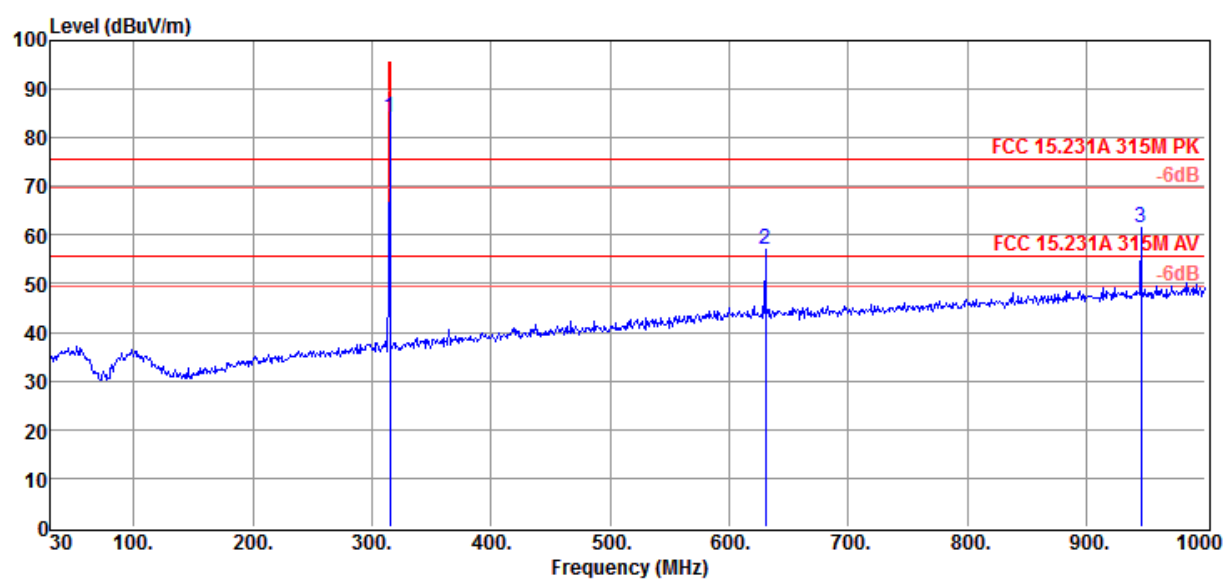




Radiated Emission Test Result

Test Site	: DDT 3m Chamber	E:\2012 Report Data\s\Swiss.EM6
Test Date	: 08-24-2012	Tested By : Leo
EUT	: Talking Dog Collar	Model Number : 13021T
Power Supply	: DC 9V	Test Mode : Tx
Condition	: Temp:24.5°C,Humi:55%	Antenna/Distance : VULB 9163/3m/HORIZONTAL
Memo	:	

Data : 1



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	315.0	67.83	13.28	0.00	2.23	83.34	95.62	-12.28	Peak	HORIZONTAL
2	630.43	35.19	18.55	0.00	3.35	57.09	75.62	-18.53	Peak	HORIZONTAL
3	945.10	35.95	21.40	0.00	4.28	61.63	75.62	-13.99	Peak	HORIZONTAL

Frequency (MHz)	PK Level (dBuV/m)	Duty cycle factor (dB)	Average Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
315.0	83.34	9.82	73.52	75.62	2.1
945.10	61.63	9.82	51.81	55.62	3.81

Note: 1. PK Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor

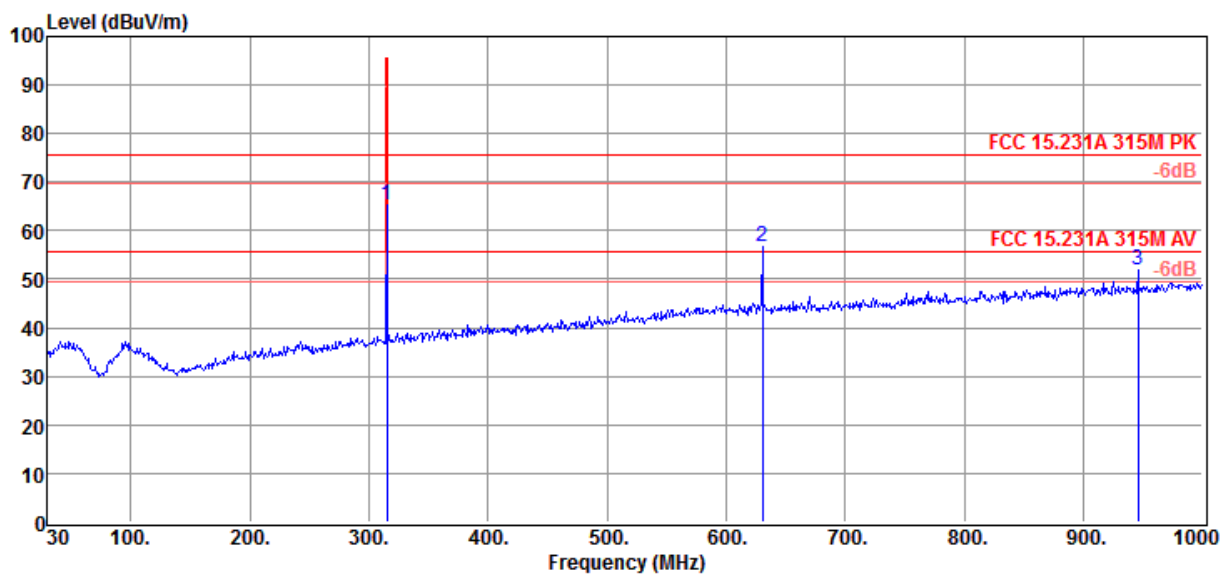
2. Average Level = PK level – Duty cycle factor

3. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit

Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:\2012 Report Data\s\Swiss.EM6**
Test Date : 08-24-2012 **Tested By** : Leo
EUT : Talking Dog Collar **Model Number** : 13021T
Power Supply : DC9V **Test Mode** : Tx
Condition : Temp:24.5°C,Humi:55% **Antenna/Distance** : VULB 9163/3m/VERTICAL
Memo :

Data : 2



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	315.0	49.95	13.28	0.00	2.23	65.46	95.62	-30.16	Peak	VERTICAL
2	630.12	34.71	18.55	0.00	3.35	56.61	75.62	-19.01	Peak	VERTICAL
3	945.23	26.16	21.40	0.00	4.28	51.84	75.62	-23.78	Peak	VERTICAL

Frequency (MHz)	PK Level (dBuV/m)	Duty cycle factor (dB)	Average Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
315.0	65.46	9.82	55.64	75.62	19.98
630.12	56.61	9.82	46.79	55.62	8.83

Note: 1.PK Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor

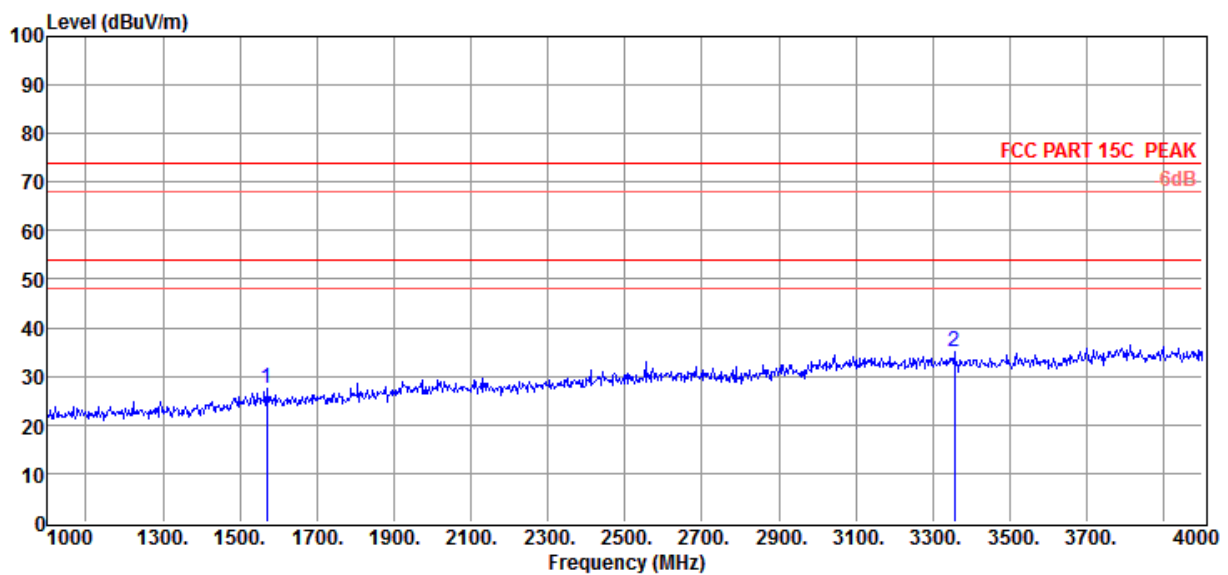
2. Average Level = PK level – Duty cycle factor

3. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit

Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:\2012 Report Data\s\Swiss.EM6**
Test Date : 08-24-2012 **Tested By** : Leo
EUT : Talking Dog Collar **Model Number** : 13021T
Power Supply : DC9V **Test Mode** : Tx
Condition : Temp:24.5°C,Humi:55% **Antenna/Distance** : HF907 SN100276/3m/VERTICAL
Memo :

Data : 14



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	1570.00	39.39	26.48	43.34	5.13	27.66	74.00	-46.34	Peak	VERTICAL
2	3355.00	39.05	31.92	43.80	7.73	34.90	74.00	-39.10	Peak	VERTICAL

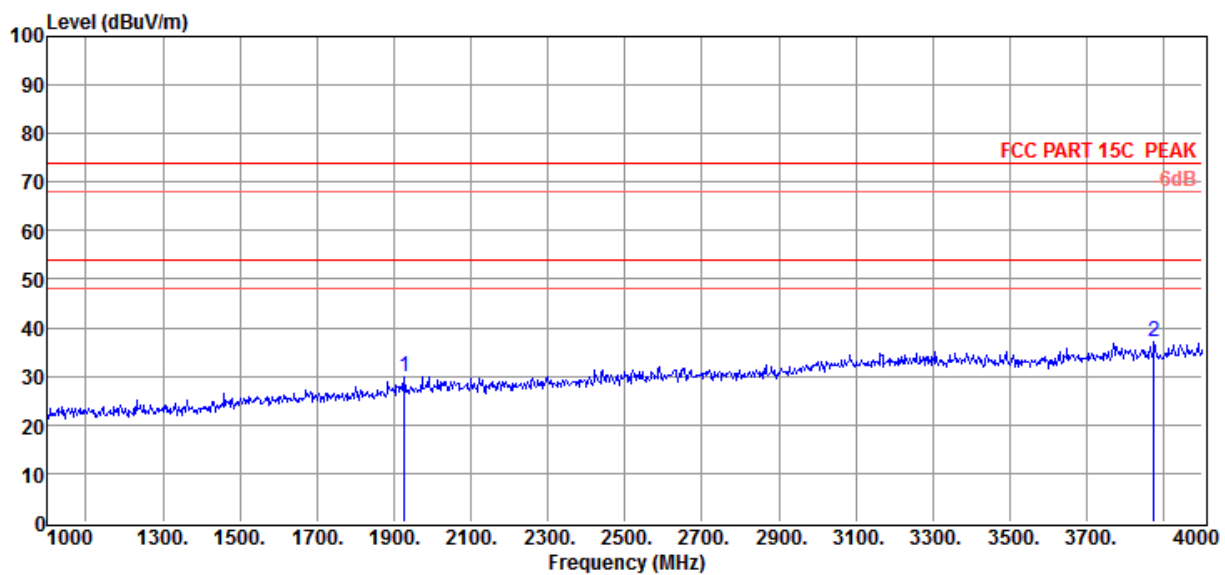
Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor

2. If Peak Result comply with AV limit, AV Result is deemed to comply with AV limit

Radiated Emission Test Result

Test Site	: DDT 3m Chamber	E:\2012 Report Data\s\Swiss.EM6
Test Date	: 08-24-2012	Tested By : Leo
EUT	: Talking Dog Collar	Model Number : 13021T
Power Supply	: DC9V	Test Mode : Tx
Condition	: Temp:24.5°C,Humi:55%	Antenna/Distance : HF907 SN100276/3m/HORIZONTAL
Memo	:	

Data : 15



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	1927.00	39.66	27.91	43.39	5.78	29.96	74.00	-44.04	Peak	HORIZONTAL
2	3874.00	39.70	32.99	44.00	8.34	37.03	74.00	-36.97	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor

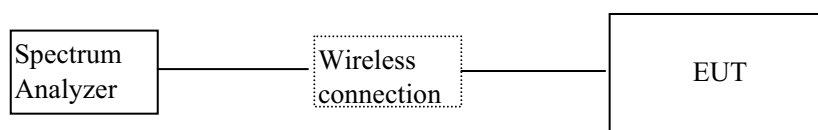
2. If Peak Result comply with AV limit, AV Result is deemed to comply with AV limit

4. stop transmitting time test

4.1. Test equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum analyzer	R&S	FSU	1166.1660.26	2011/11/23	1Y

4.2. Block diagram of test setup



4.3. Limits

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

4.4. Test Procedure

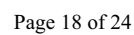
- (1) The EUT's RF signal was coupled to spectrum analyzer by a antenna connected to spectrum analyzer.
- (2) Set the spectrum to zero span mode, and centered of EUT frequency.
- (3) Measure the stop transmitting time after release EUT button.

4.5. Test result

Frequency (MHz)	Stop Transmitting Time	Limit	Conclusion
315	480.76ms	5s	PASS

Note1: See next page original test data.

Note2: For next page test data, press any button of EUT and capture the transmit signal, when the transmit signal reached to marker 1, released the button, after released the button in marker 1, the transmit signal will stop in marker 2, so according FCC require the transmitting time from marker 1 to marker 2 is the stop transmitting time and recorded it.

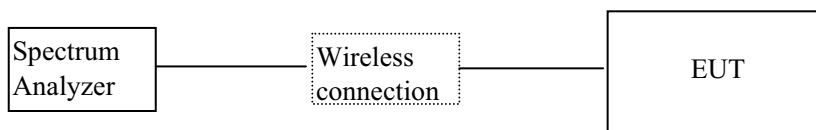


5. 20dB Bandwidth

5.1. Test equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum analyzer	R&S	FSU	1166.1660.26	2011/11/23	1Y

5.2. Block diagram of test setup



5.3. Limits

The bandwidth of the emission shall be no wider than 0.25% of the center frequency of devices operation above 70MHz and below 900MHz.

5.4. Test Procedure

- (1) The EUT's RF signal was coupled to spectrum analyzer by a antenna connected to spectrum analyzer.
- (2) The bandwidth of the fundamental frequency was measured by spectrum analyzer with 10 kHz RBW and 30 kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

5.5. Test result

Frequency (MHz)	20 dB Bandwidth (kHz)	Limit(kHz): No wider than 0.25% of the center frequency	Conclusion
315	173.08	$314.79 \times 0.25\% = 0.787\text{MHz}$	PASS

