

FCC TEST REPORT

for

telecontroller

Model No. : HS

FCC ID : XNU-HS

Operating
Frequency : 314.98MHz

Applicant : Fenghua Haisen Motor Tool Factory
NO. 28 Yonglin Road, Shangtian Town, Fenghua,
NingBo, China

Regulation : **FCC Part 15 Subpart C Section 15.231**

Prepared by : Shenzhen AOV Testing Technology Co., Ltd.
2-6/F, No.5, Yuantou Lane, Tanglang, Taoyuan Street,
Nanshan District, Shenzhen, Guangdong, China

Test Date : August 1-10, 2009

Date of Report : August 11, 2009

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TEST REPORT DECLARATION

Applicant : Fenghua Haisen Motor Tool Factory
Manufacturer : Fenghua Haisen Motor Tool Factory
EUT Description : telecontroller

Test Procedure Used:
FCC Part 15.231 Subpart C

The E. U. T. listed below has been completed RFI testing by Shenzhen AOV Testing Technology Co., Ltd at the test site of Bontek Compliance Testing Laboratory Ltd. And the Interference emissions can pass **FCC CLASS B** limitations.

The test configurations and the facility comply with the radiated and AC line conducted test site criteria in **ANSI C63.4-2003**.

Date of Test:

August 1-10, 2009

Prepared by:



Project Engineer

Reviewer :



Project Manager

1. GENERAL INFORMATION

1.1 General Information

EUT Description : telecontroller

Model No. : HS

Type of Antenna : Permanent attached

Applicant : Fenghua Haisen Motor Tool Factory
NO. 28 Yonglin Road, Shangtian Town, Fenghua,
NingBo, China

Manufacturer : Fenghua Haisen Motor Tool Factory
NO. 28 Yonglin Road, Shangtian Town, Fenghua,
NingBo, China

1.2 Test Facility

Test Firm : Bontek Compliance Testing Laboratory Ltd.
Certificated by FCC, Registration No.: 338263
Address : FL.1, Building H-3, Hua Qiao Cheng East Industrial Area
Qiaocheng East Road, Nanshan, Shenzhen, P.R.China
Tel : 86-755-86337020
Fax : 86-755-86337028

1.3 Test Summary

For the EUT described above. The standards used were FCC Part 15 Subpart C Section 15.231 for Emissions

Tests Carried Out Under FCC Part 15 Subpart C

Standard	Test Items	Status
Part 15 Subpart C Section 15.231	Disturbance Voltage at The Mains Terminals	N/A
	Transmitter time	Complied
	Radiation Emission	Complied
	20dB Bandwidth	Complied
	Duty Cycle	Complied
Part 15 Subpart C Section 15.203	ANTENNA REQUIREMENT	Complied

1.4 Test Instrument Used

No.	Equipment	Manufacturer	Model No.	S/N	Calculator date
1.	EMI Test Receiver	R&S	ESCI	100687	2009-2-22
2.	Amplifier	HP	8447D	1937A02492	2009-2-22
3.	TRILOG Broadband Test-Antenna	SCHWARZBECK	VULB9163	9163-324	2009-2-22
4.	Horn Antenna	SCHWARZBECK	BBHA9120A	B08000991-0001	2009-2-27
5.	High Field Biconical Antenna	ELECTRO-METRICS	EM-6913	166	2009-2-22
6.	Log Periodic Antenna	ELECTRO-METRICS	EM-6950	811	2009-2-22
7.	Remote Active Vertical Antenna	ELECTRO-METRICS	EM-6892	304	2009-2-22
8.	Teo Line Single Phase Module	SCHWARZBECK	NSLK8128	D-69250	2009-2-22
9.	Positioning Controller	C&C	CC-C-1F	MF7802113	2009-2-27
10.	Triple-Loop Antenna	EVERFINE	LLA-2	607004	2009-2-22
11.	10dB attenuator	SCHWARZBECK	MTAIMP-136	R65.90.0001#06	2009-2-22

2. TRANSMITTER TIME

2.1. Rules Part No.

FCC Part 15 Subpart C Section 15.231(a) (1)

2.2. Limit of transmitter time

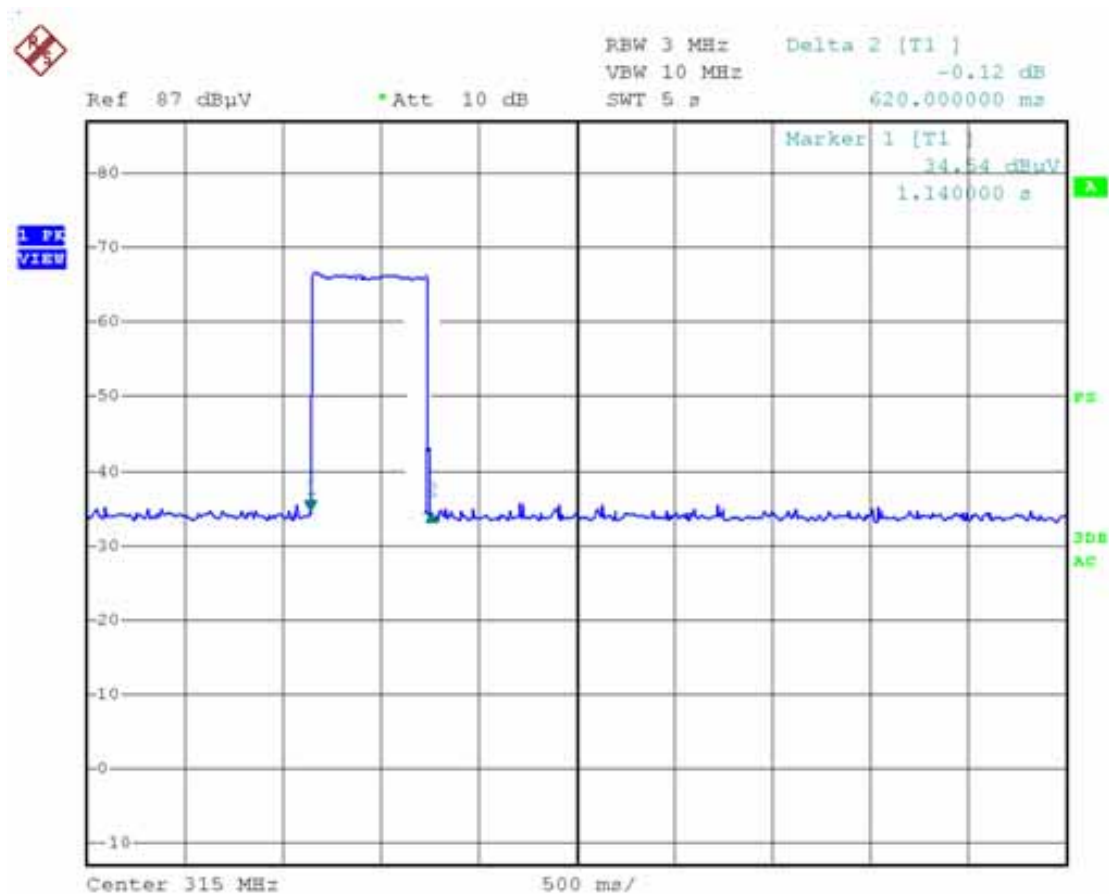
A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

2.3. Test result

PASS

Detailed information, Please refer to the following page.

$T=620\text{ms} < 5\text{s}$



3. RADIATION INTERFERENCE

3.1. Rules Part No.

15.231

3.2. Limit of Radiated Disturbances

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

Remark : (1) Emission level (dB) μ V = 20 log Emission level μ V/m

(2) The smaller limit shall apply at the cross point between two frequency bands.

(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

3.3. Test Procedure

ANSI STANDARD C63.4-2003 10.1.7 MEASUREMENT PROCEDURES:

The EUT is placed on a turned table that is 0.8 meter above the ground. The turned table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna that is mounted on the antenna tower. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (log periodical antenna and horn antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

The resolution bandwidth was 100 kHz and the video bandwidth was 300 kHz.

The spectrum was scanned from 30 MHz to 10th harmonic of the fundamental.

3.4.Test Result

PASS

Field Strength of Fundamental:

Horizontal:

Frequency (MHz)	PK (dBuV/m)	Read Level (dBuV/m)	Limit (dBuV/m)	(AV)Margin (dBuV/m)
314.98	50.38	47.60	75.6	28.0

Vertical:

Frequency (MHz)	PK (dBuV/m)	Read Level (dBuV/m)	Limit (dBuV/m)	(AV)Margin (dBuV/m)
314.98	50.60	48.50	75.6	27.6

Field Strength of Spurious Emission:

Horizontal:

Frequency (MHz)	PK (dBuV/m)	Read Level (dBuV/m)	Limit (dBuV/m)	(PK)Margin (dBuV/m)
125.29	23.13	---	43.5	20.20
353.05	34.96	---	46.0	11.10
383.18	34.23	---	46.0	11.77
440.08	35.84	---	46.0	10.16
586.93	35.34	---	46.0	10.66
592.58	33.58	---	54.0	20.42
630.45	40.60	---	54.0	13.40
755.26	40.55	---	54.0	13.45
945.80	44.50	---	54.0	9.50
1260.58	42.01	---	54.0	11.99
1482.95	40.35	---	54.0	13.65
1575.56	39.52	---	54.0	14.48
1783.58	39.35	---	54.0	14.65
1890.20	38.51	---	54.0	15.49
2205.68	39.85	---	54.0	14.15
2385.46	38.52	---	54.0	15.48
2520.84	39.54	---	54.0	14.46
2835.85	39.58	---	54.0	14.42
3150.80	37.54	---	54.0	16.46
3180.82	35.48	---	54.0	18.52
4152.08	35.64	---	54.0	18.36
4268.45	36.64	---	54.0	17.36

Vertical:

Frequency (MHz)	PK (dBuV/m)	Read Level (dBuV/m)	Limit (dBuV/m)	(PK)Margin (dBuV/m)
125.60	21.74	---	43.5	21.76
353.89	30.08	---	46.0	15.92
383.89	30.16	---	46.0	15.84
456.70	33.69	---	46.0	12.31
581.80	34.72	---	46.0	11.28
630.45	44.60	---	54.0	9.40
945.80	45.50	---	54.0	8.50
1260.85	40.52	---	54.0	13.48
1385.50	42.85	---	54.0	11.15
1575.60	41.50	---	54.0	12.50
1785.25	41.58	---	54.0	12.42
1890.85	42.62	---	54.0	11.38
2205.56	40.62	---	54.0	13.38
2350.85	39.52	---	54.0	14.48
2520.68	38.70	---	54.0	15.30
2758.50	39.80	---	54.0	14.20
2756.63	38.59	---	54.0	15.41
2835.69	40.55	---	54.0	13.45
3058.45	39.52	---	54.0	14.48
3150.25	38.18	---	54.0	15.82
4031.58	37.58	---	54.0	16.42
4425.10	38.20	---	54.0	15.80

4. BANDWIDTH

4.1. Test Standard

15.231

4.2. Limits

$(0.0025 \times 314.98 \text{ MHz} = 787 \text{ KHz})$

$186 \text{ KHz} + 174 \text{ KHz} = 260 \text{ KHz} < 787 \text{ KHz}$

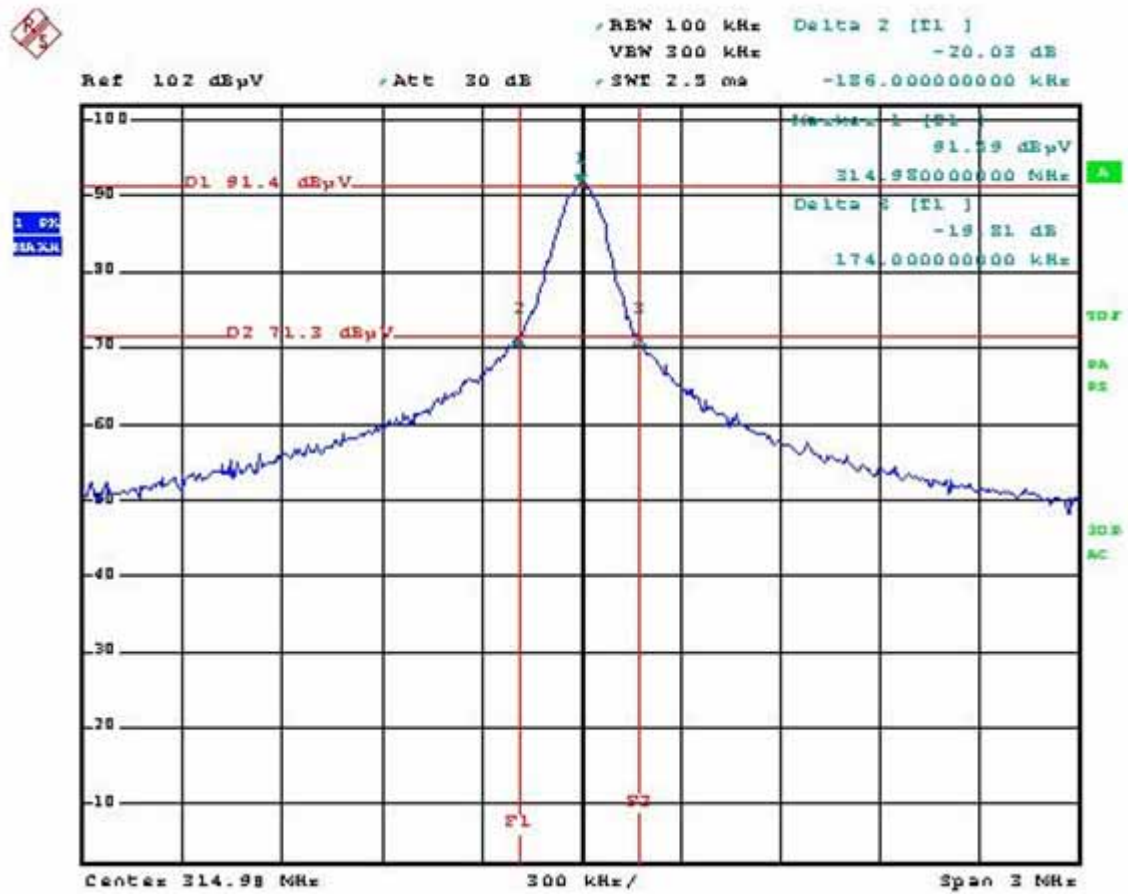
4.3. Test Procedure

- (1) Turn on the transmitter, and set it to transmit the pulse train continuously.
- (2) Set Test Receiver into spectrum analyzer mode, Tune the spectrum analyzer to the transmitter carrier frequency, and set the spectrum analyzer resolution bandwidth(RBW) to 100kHz and video bandwidth(VBW) to 100kHz, then select Peak function to scan the channel frequency.
- (3) The 20dB bandwidth was measured and recorded.
Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

4.4. Test Result

PASS

Detailed information, Please refer to the following page.



5. DUTY CYCLE

5.1. Test Standard

15.231

5.2. Test Procedure

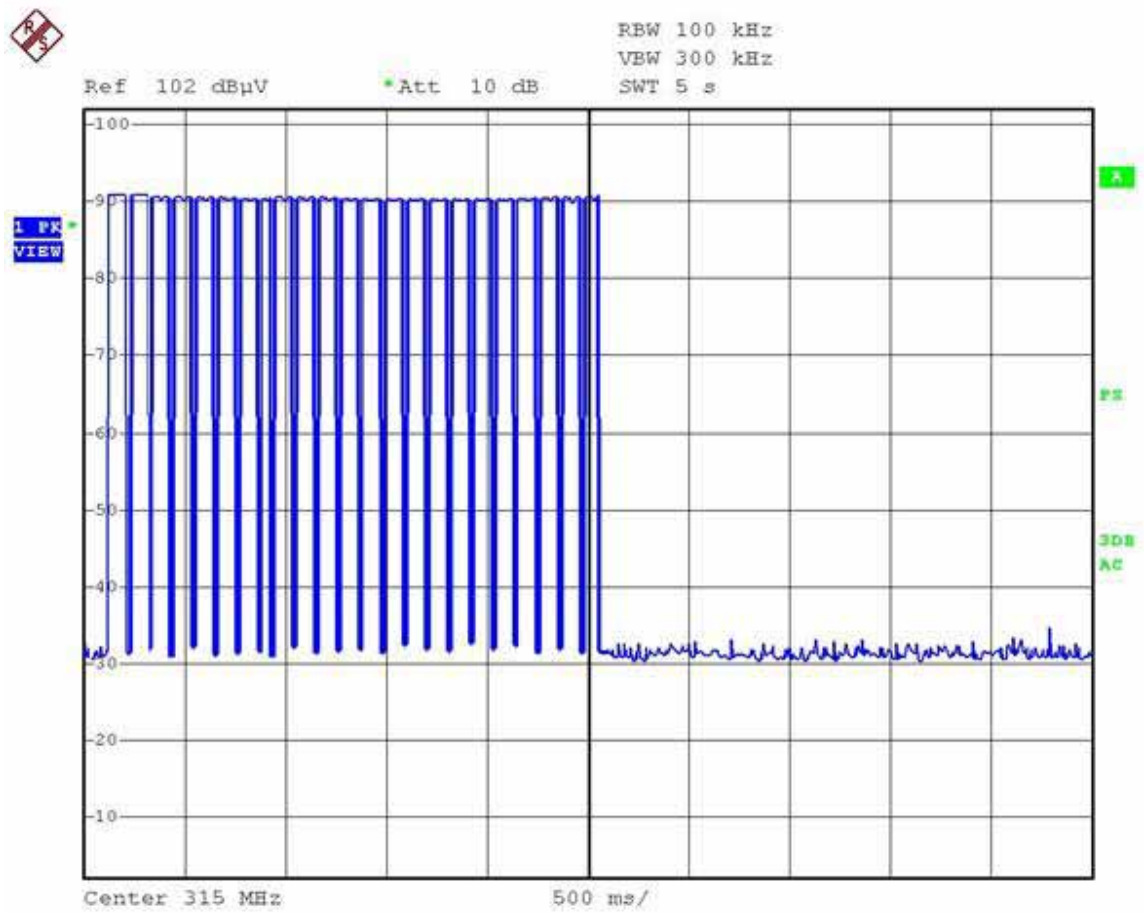
- (1) The EUT was placed on a turntable which is 0.8m above ground plane.
- (2) Set EUT operating in continuous transmitting mode
- (3) Set Test Receiver into spectrum analyzer mode, Tune the spectrum analyzer to the transmitter carrier frequency, and set the spectrum analyzer resolution bandwidth(RBW) to 100kHz and video bandwidth(VBW) to 300kHz, Span was set to 0Hz.
- (4) The Duty Cycle was measured and recorded.

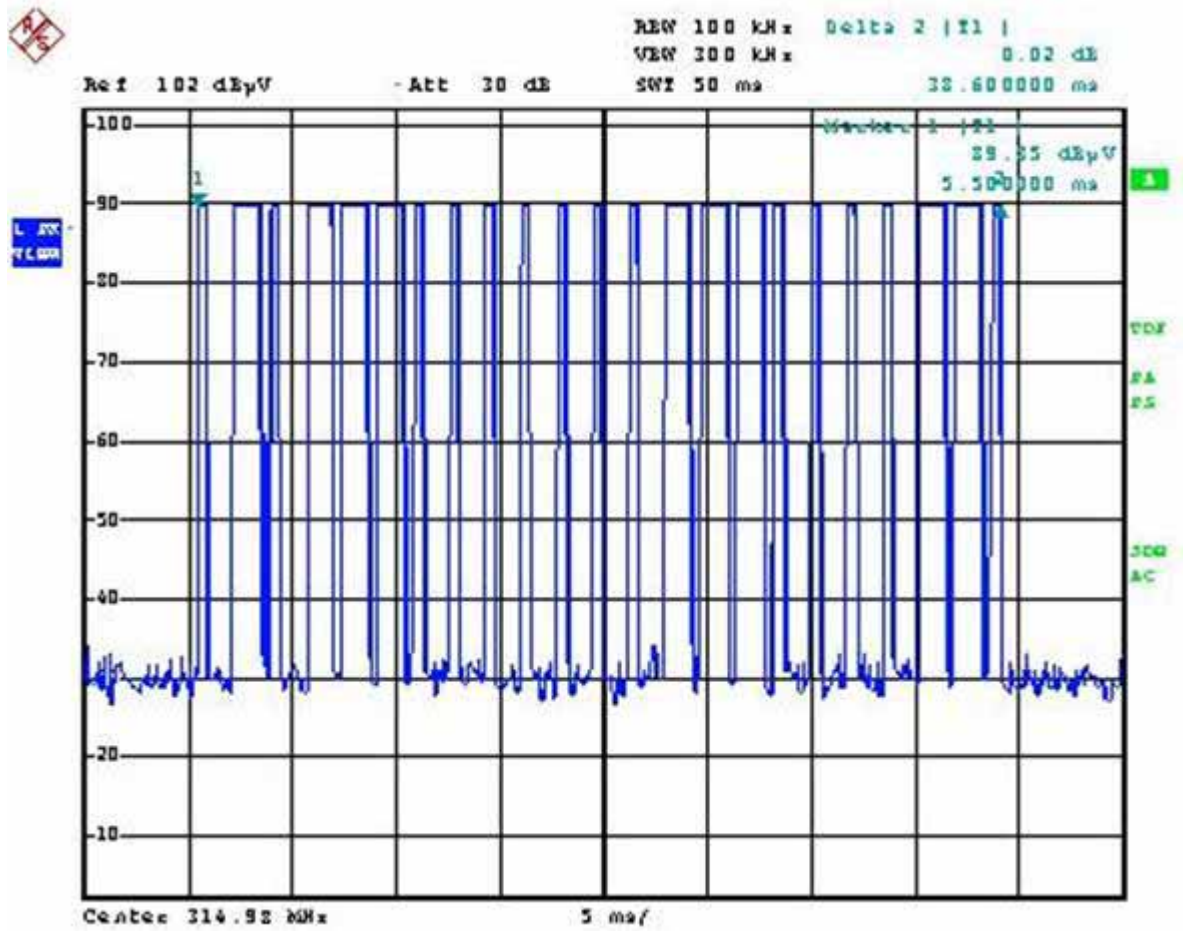
5.3. Test Result

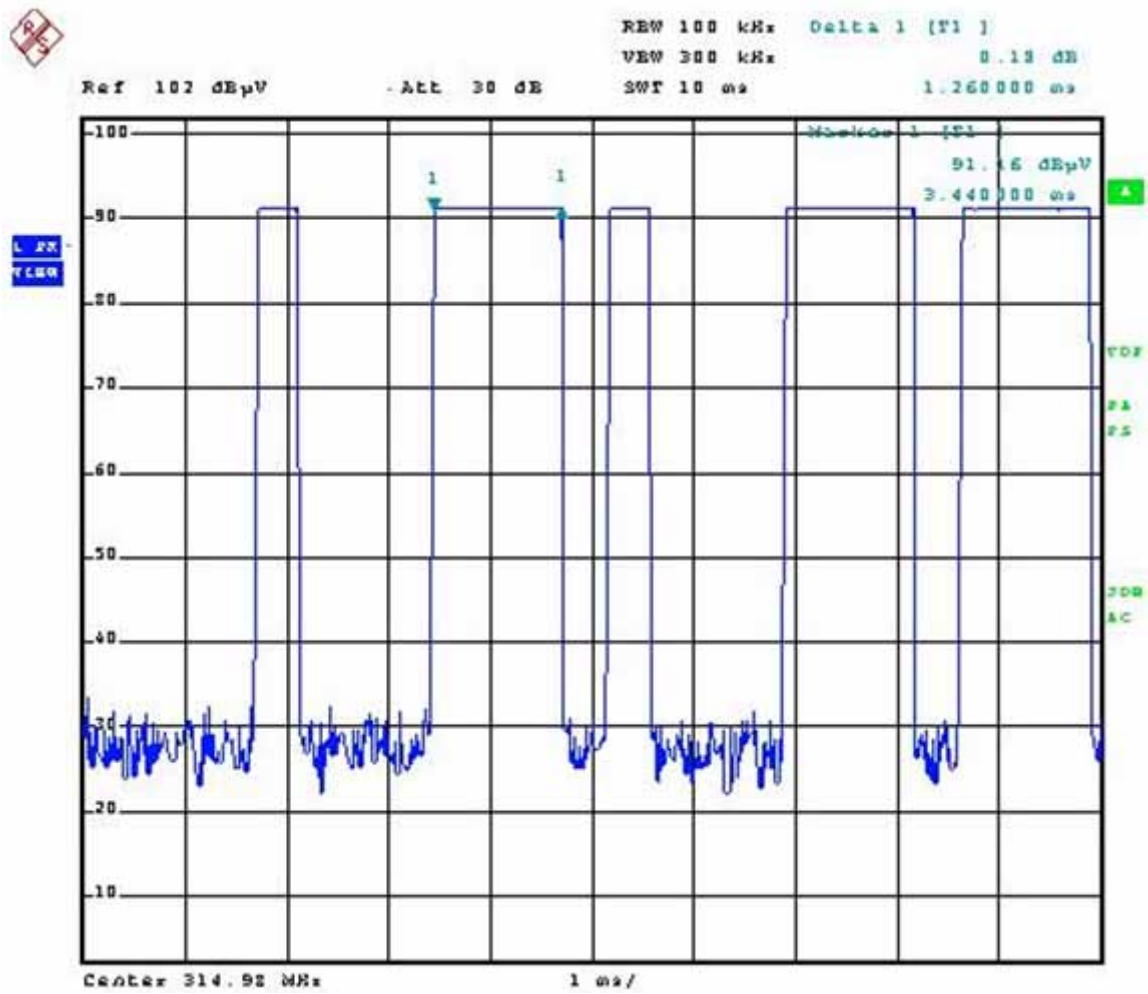
Test plots see following pages

Total Pulse Time of Transmitter = $1.26 \text{ msec} \times 9 + 0.36 \text{ msec} \times 14 = 16.40 \text{ msec}$

The Duty Cycle = $16.40 / 38.6 = 42\%$







6. ANTENNA REQUIREMENT

Requirement(s): 47 CFR §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.

Antenna requirement must meet at least one of the following:

- a) Antenna must be permanently attached to the device.
- b) Antenna must use a unique type of connector to attach to the device.
- c) Device must be professionally installed. Installer shall be responsible for ensuring that the correct antenna is employed with the device.

The antenna is integral antenna. Antenna maximum gain is 0dBi.

According to Section 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 EUT has no antenna connector for printed antenna. Therefore the EUT complies with Section 15.203 of the FCC rules.

7. PHOTOGRAPH OF TEST

Below 1GHz



Above 1GHz

