

FCC Test Report

Application No.: HKES140600114801
Applicant: RONDISH COMPANY LTD
Address Unit G & H, 4/F, Block 1 Kwai Tak Ind. Ctr
15-33 Kwai Tak St., Kwai Chung, N.T.
Hong Kong

Product Information:
Product Description: Cordless Pad Transmitter
Model: TM-11
Product Class : Low Power Communication Device – Transmitter (433.92 MHz)
FCC ID: WNGTM-11

Requirement: CFR 47 FCC PART 15 SUBPART C, 2013
- Intentional Radiators (Section 15.231)

Date of Receipt: 2014-06-13
Date of Test: 2014-06-23
Date of Issue: 2014-06-25

Test Result :	PASS*
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- * In the configuration tested, the EUT complied with the requirements for the relevant clauses of Federal Communications Commission Rules as specified above

Authorized Signature:



CHEN Jian-feng, Jeffrey

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of International Electrical Certification Centre Ltd. or testing done by International Electrical Certification Centre Ltd. in connection with, distribution or use of the product described in this report must be approved by International Electrical Certification Centre Ltd. in writing.

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2 Test Summary

Test	Test Requirement	Test Method	Result
Antenna Requirement	FCC PART 15, SUBPART C: 2013	ANSI C63.4:2009	PASS
Radiated Emission	FCC PART 15, SUBPART C: 2013	ANSI C63.4:2009	PASS
Bandwidth	FCC PART 15, SUBPART C: 2013	ANSI C63.4:2009	PASS
Provision of Momentary operation	FCC PART 15, SUBPART C: 2013	ANSI C63.4:2009	PASS
Remark : 1) Please refer to section 6.1 of this report for explanation			

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4 General Information

4.1 General Description of EUT

EUT Name: Cordless Pad Transmitter
Model: TM-11
Serial No.: --
Type of modification: ASK
Operating frequency: 433.92MHz
Antenna type: Integral antenna

4.2 Details of EUT

Power Supply: DC 3V (Lithium cell CR2477 x 2 in parallel)
Power Cord: --

4.3 Conditions of EUT

The received sample was under good condition.

4.4 Description of Support Units

The EUT has been tested with touch pad

4.5 Standards Applicable for Testing

CFR 47, FCC Part 15, Oct 2013
ANSI C63.4:2003

4.6 Test Location

All tests were performed at: -

SGS IECC Limited (Member of the SGS Group (SGS SA))

Units 303-305, 3/F., 31 Lok Yip Road, On Lok Tsuen, Fanling, N.T., Hong Kong

Tel: +852 2305 2570 Fax: +852 2756 4480.

No tests were sub-contracted.

4.7 Test Facility

Measurement facility located at Fanling (Hong Kong), placed on file with the FCC Pursuant to Section 2.948 of the FCC Rules (**FCC Registration No. : 97774**).

The test facility is recognized, certified, or accredited by the following organizations:

FCC – CAB Registration No.: 446297

Measurement facility located at Fanling (Hong Kong), accredited as a Conformity Assessment Body (CAB) and was designated by FCC to perform compliance testing on equipment subject to Declaration Of Conformity (DOC) and Certification under Part 15 and 18 of the Commission's Rules.

4.8 Deviation from Standards

None.

4.9 Abnormalities from Standard Conditions

None.

4.10 Declaration of Family Grouping

None.

4.11 Abbreviations

N/A: Not Applicable

EUT: Equipment Under Test

5 Equipments Used during Test

Radiated Emission				
Equipment	Manufacturer	Model / Serial No.	Cal. Date	Cal. Due Date
3m Semi-Anechoic Chamber (pre-test)	--	--	--	--
3m / 10m Open Area Test Site	--	--	2012/02/24	2015/02/23
Test Receiver	Rohde & Schwarz	ESCS 30 / 100388	2013/10/23	2014/10/22
Spectrum Analyzer	Rohde & Schwarz	FSP 30 / 101474	2013/8/8	2014/8/7
Antenna 30-1000MHz	Schaffner	CBL6111C / 2791	2012/10/12	2014/10/11
Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D / 9120D-1070	2014/1/13	2016/1/12
Preamplifier 10MHz – 6GHz	Schwarzbeck	BBV9743 / 9743-052	2014/1/13	2016/1/12
Preamplifier 1-18GHz	Schwarzbeck	BBV9718 / 9718-223	2014/1/13	2016/1/12
Coaxial Cable	--	E167	2013-06-28	2014-06-27
RF Cable	HUBER+SUHNER	E207	2012/11/14	2014/11/13
Antenna Mast System	Schwarzbeck	AM9104 / -	--	--
Turntable with Controller	Drehtisch	DT312 / -	--	--
General Use Equipment				
Equipment	Manufacturer	Model / Serial No.	Cal. Date	Cal. Due Date
Digital Multimeter	Fluke	189 / 83640020	2014/4/8	2015/4/7
Temperature / Humidity meter	-	E158	2013-11-05	2014/11/04

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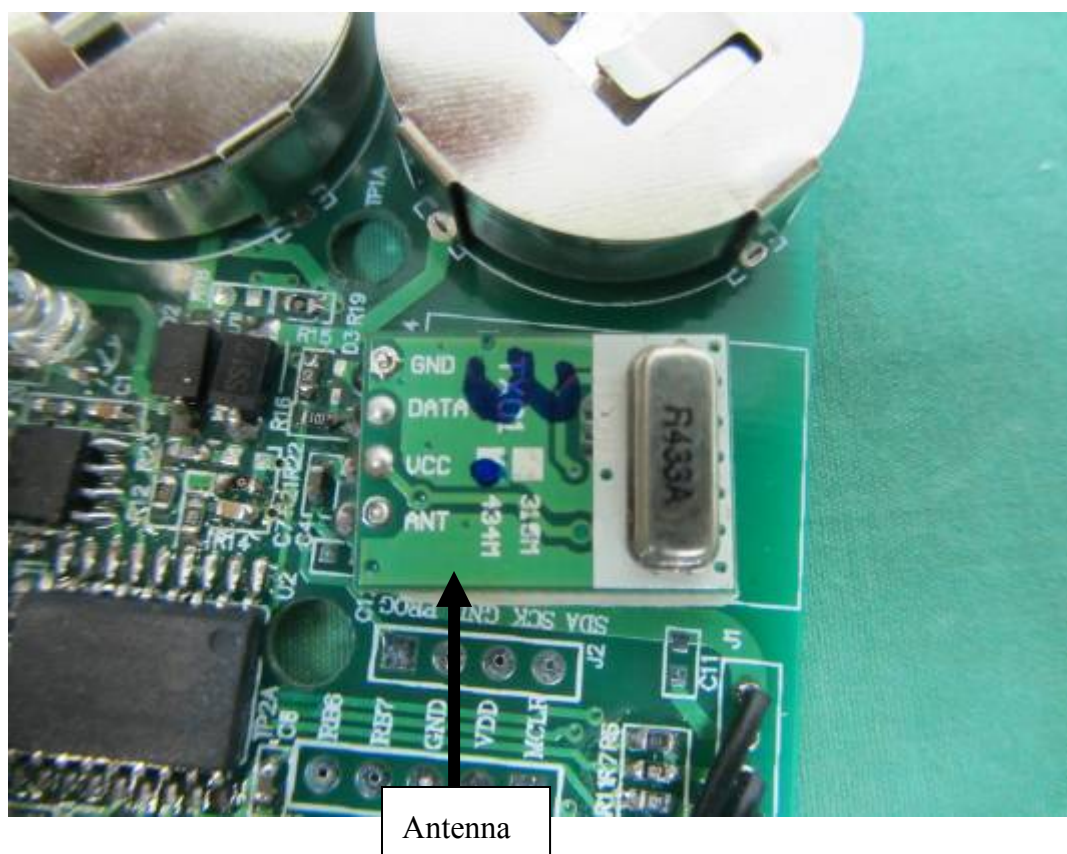
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6 Test Results

6.1 Antenna Requirement

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.

The EuT has component antenna, which accordance to the above sections, is considered sufficient to comply with the provisions of these sections.



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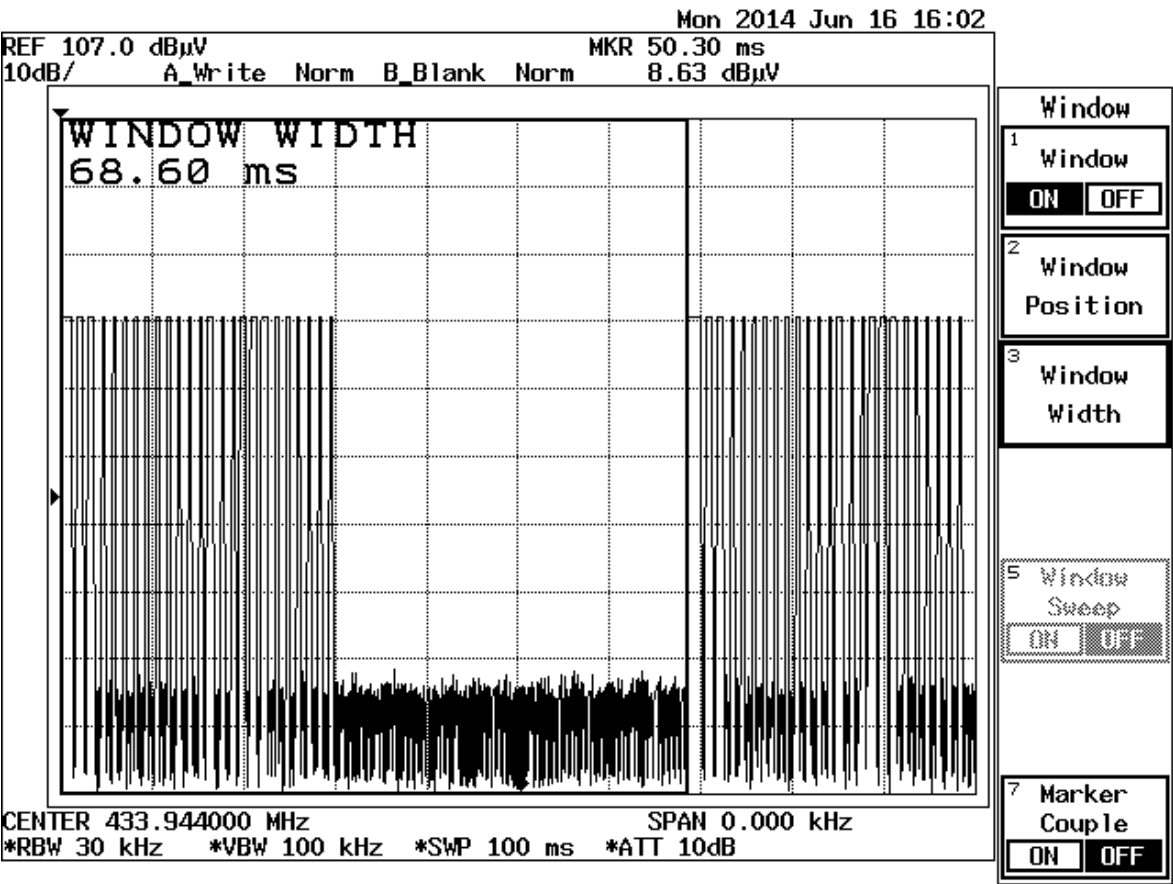
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6.2 Average Factor

6.2.1 Measurement Data

Time Domain Plots (Fundamental frequency of Transmitter at 433.92MHz, worst case):

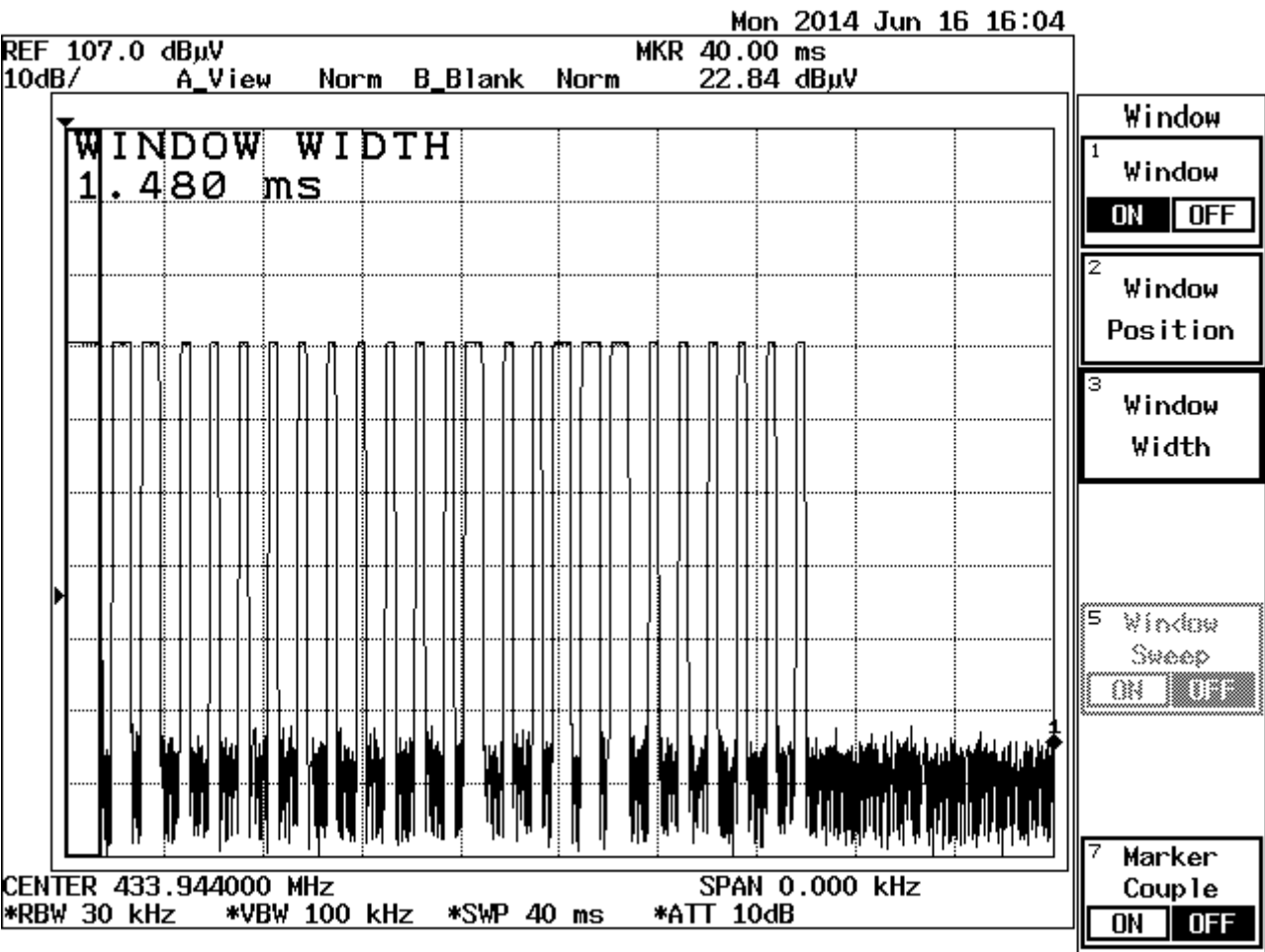
Test results on operation with control for transmission mode :



Pulse cycle period = 68.6ms

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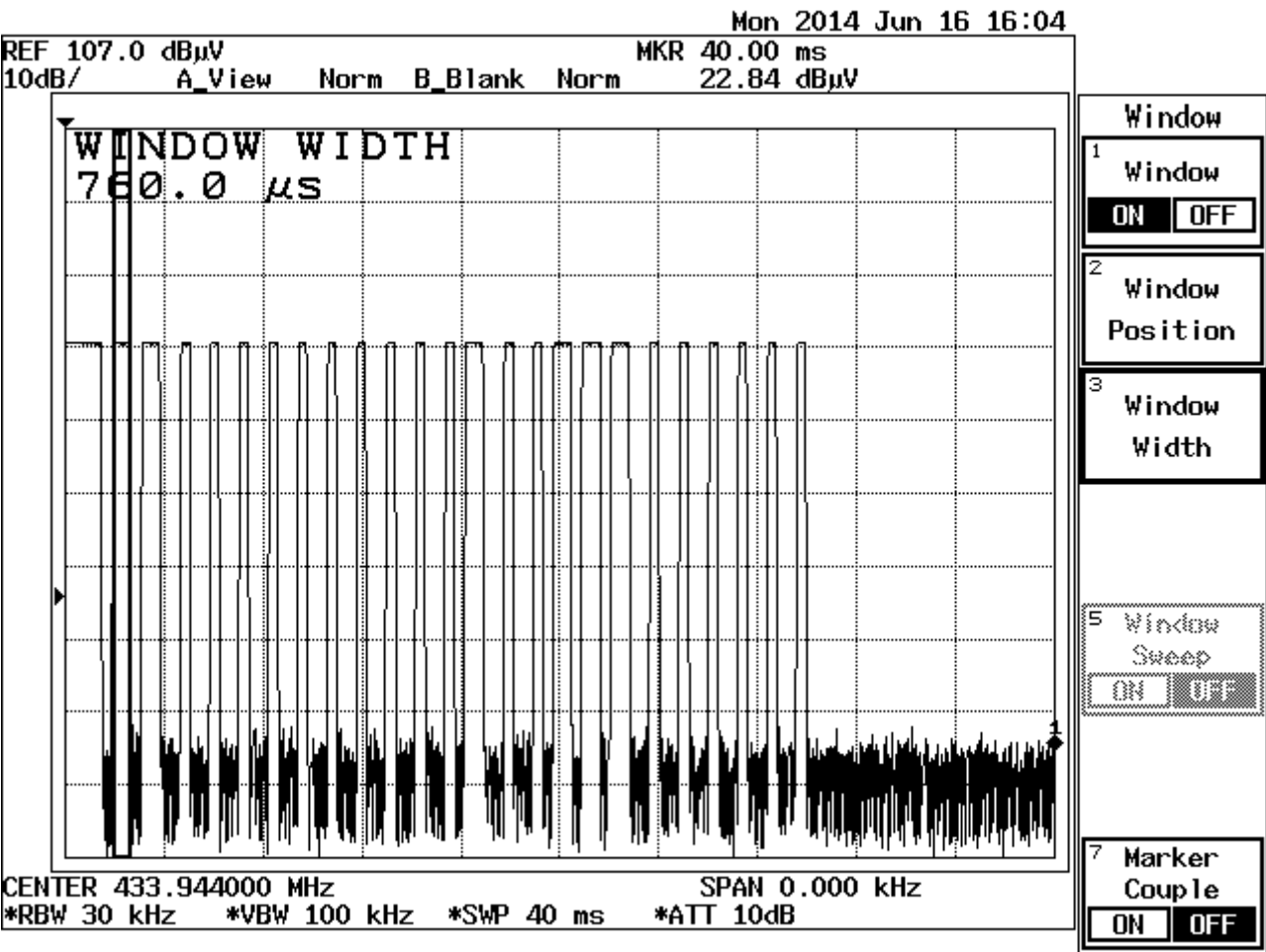
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Pulse width = 1.48ms (total no. of pulse : 1)

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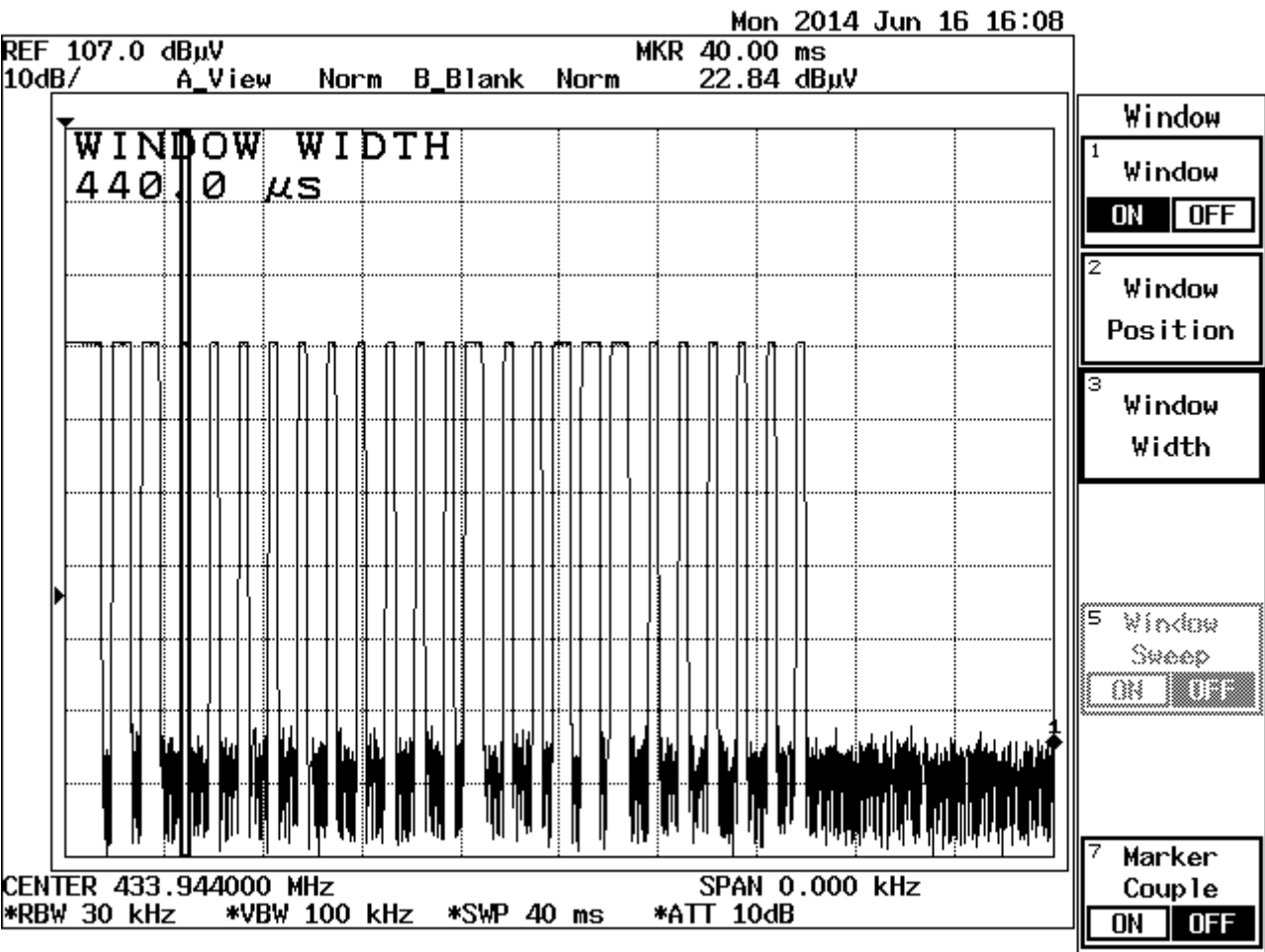
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Pulse width = 0.76ms (total no. of pulse : 6)

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Pulse width = 0.44 ms (total no. of pulse : 18)

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Calculation for radiation (average) :

Formula :

$$\text{Duty cycle} = (N_1L_1 + N_2L_2 + \dots + N_{n-1}L_{n-1} + N_nL_n) / 100 \text{ or } T$$

where

N_1 is the number of type 1 pulse, L_1 is length of type 1 pulse, etc.

T is the period of the pulse train (if less than 100ms)

According to the time domain plots shown on the next two pages :

$$\text{Duty cycle of the EUT} = (1.48 + 0.76 \times 6 + 0.44 \times 18) / 68.6 = 0.203$$

$$\text{Av correction factor} = 20 \times \log(0.203) \text{ dB}$$

$$= -13.85 \text{ dB}$$

6.3 Radiated Emissions

Test Requirement: FCC Part15 Subpart C Section 15.231(b)
Test Method: ANSI C63.4
Test Date: 2014-06-23
Frequency Range: 30MHz to 4339.2MHz
Measurement Distance: 3m
Detector: Peak for pre-scan (120kHz resolution bandwidth)
Quasi-Peak if maximised peak within 6dB of limit

Start frequency (MHz)	Stop frequency (MHz)	Resolution bandwidth	Video bandwidth	Step size	Measurement time	Detector
30	1000	120 kHz	1 MHz	40 kHz	100ms	Peak
1000	4339.2	1 MHz	3 MHz	400 kHz	100ms	Peak

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6.3.1 Measurement Data

An initial pre-scan was performed in the 3m chamber using the spectrum analyser in peak detection mode. The EUT was measured by Bilog antenna with 2 orthogonal polarities and frequencies of peak emissions from the EUT were detected within 6dB of the limit line. Final measurement was conducted in the open area test site with data as follows:

Test results on operation with control for transmission mode (Fundamental frequency of Transmitter at 433.92MHz):

Frequency (MHz)	Antenna Polarization	Correction Factor (dB/m)	Receiver Reading (dBμV)	Emission Level (dBμV/m)	PK Limit (dBμV/m)	Over Limit (dB)
433.94	H	18	68.7	86.7	100.8	-14.1
433.94	V	18	61	79	100.8	-21.8
867.89	H	22.2	39.1	61.3	80.8	-19.5
1301.84	H	-10.4	71.27	60.87	74	-13.13
1735.78	H	-7.62	61.86	54.24	80.8	-26.56
2169.73	H	-0.86	67.43	66.57	80.8	-14.23
2603.67	H	-0.1	69.5	69.4	80.8	-11.4

Frequency (MHz)	Antenna Polarization	Detector	Emission Level (dB μ V/m)	Average Factor (dB)	Calculated Average Value (dB μ V/m)	AV Limit (dB μ V/m)	Over Limit (dB)
433.94	H	Peak	86.7	-13.85	72.85	80.8	-7.95
433.94	V	Peak	79	-13.85	65.15	80.8	-15.65
867.89	H	Peak	61.3	-13.85	47.45	60.8	-13.35
1301.84	H	Peak	60.87	-13.85	47.02	54	-6.98
1735.78	H	Peak	54.24	-13.85	40.39	60.8	-20.41
2169.73	H	Peak	66.57	-13.85	52.72	60.8	-8.08
2603.67	H	Peak	69.4	-13.85	55.55	60.8	-5.25

Note:

1) Correction Factor = Antenna Factor + Cable Loss.

2) The actual frequencies of maximum emission were confirmed in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance.

3) The above results were the worst case results with the EUT positioned in all 3 axis during the test. The EUT was positioned vertically and horizontally on the table for vertical and horizontal measurement respectively.

4) Other emission more than 20dB below is not recorded.

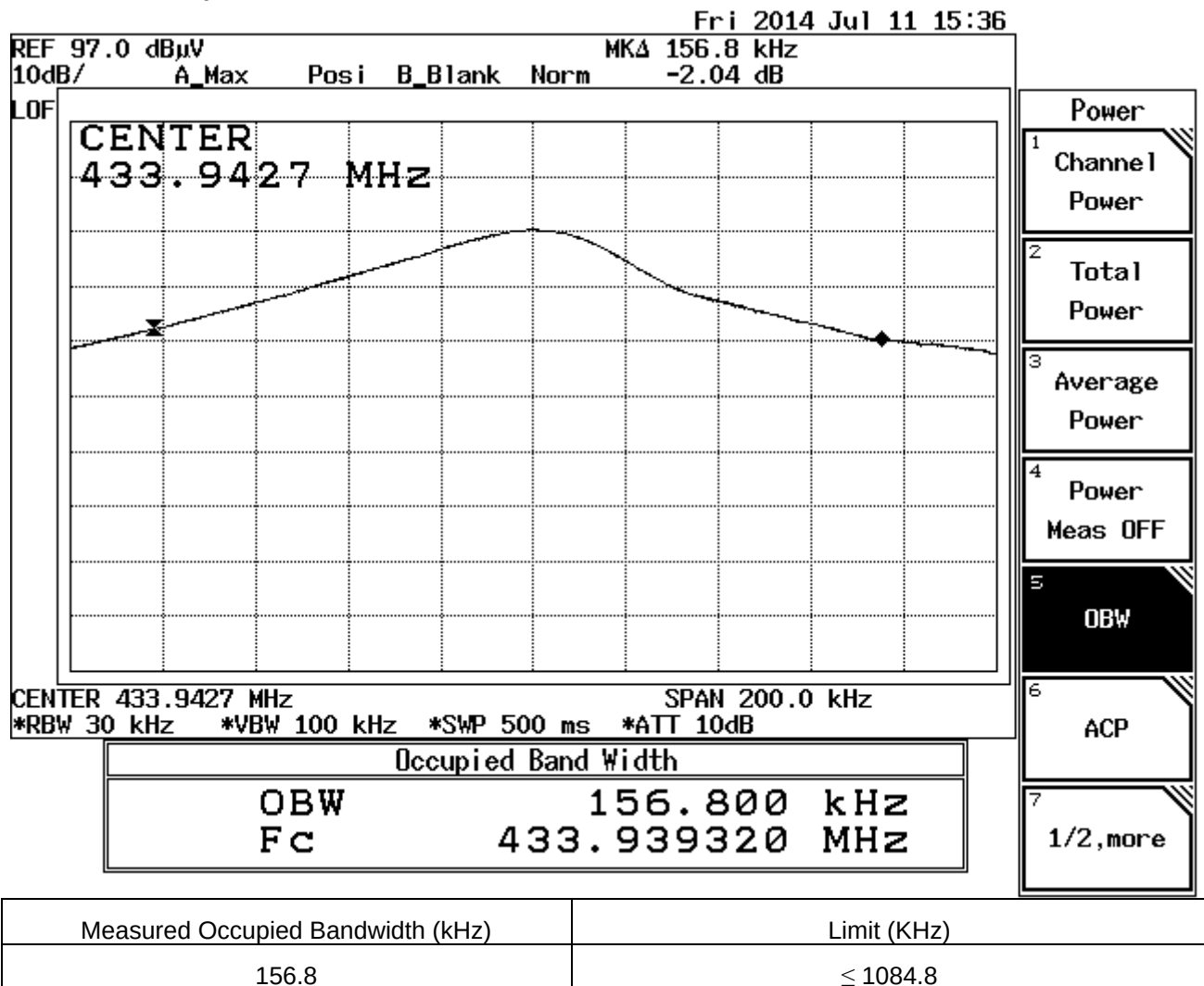
6.4 Bandwidth

Test Requirement: FCC Part15 Subpart C Section 15.231(C)
 Test Method: ANSI C63.4
 Test Date: 2014-06-23

6.4.1 Measurement data

Frequency Domain Plots (Fundamental frequency of Transmitter at 433.92MHz):

Test results on operation with control for transmission mode :



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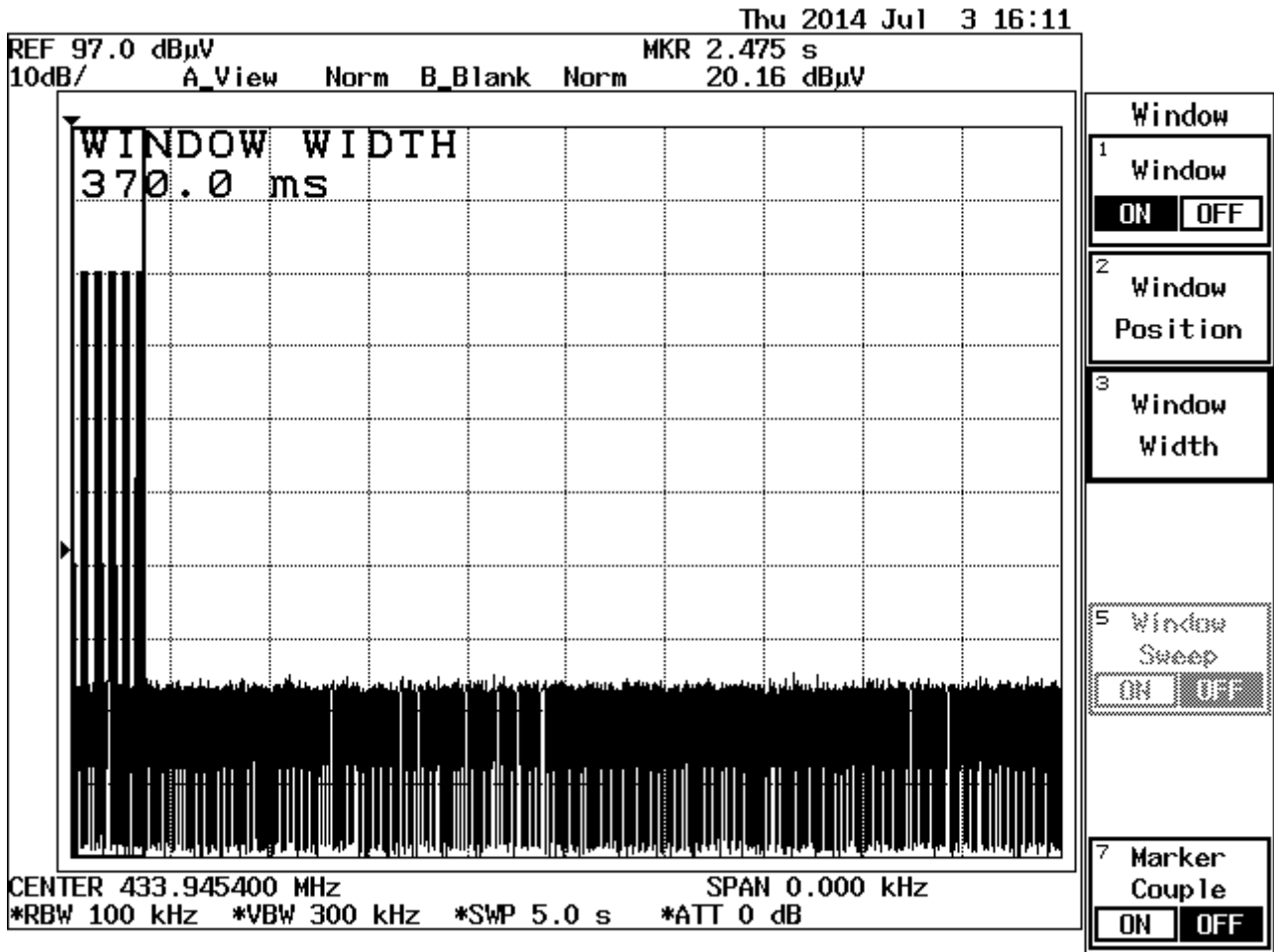
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6.5 Provision of Momentary operation

Test Requirement: FCC Part15 Subpart C Section 15.231(a) (1)
Test Method: ANSI C63.4
Test Date: 2014-06-23

6.5.1 Measurement data

Time Domain Plots (Fundamental frequency of Transmitter at 433.92MHz):
Test results on operation with control for transmission mode :



The time of stopping transmission after switch releasing (s)	Limit (s)
0.37s	5.00

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Photographs

6.6 Radiatd Emission Test Setup



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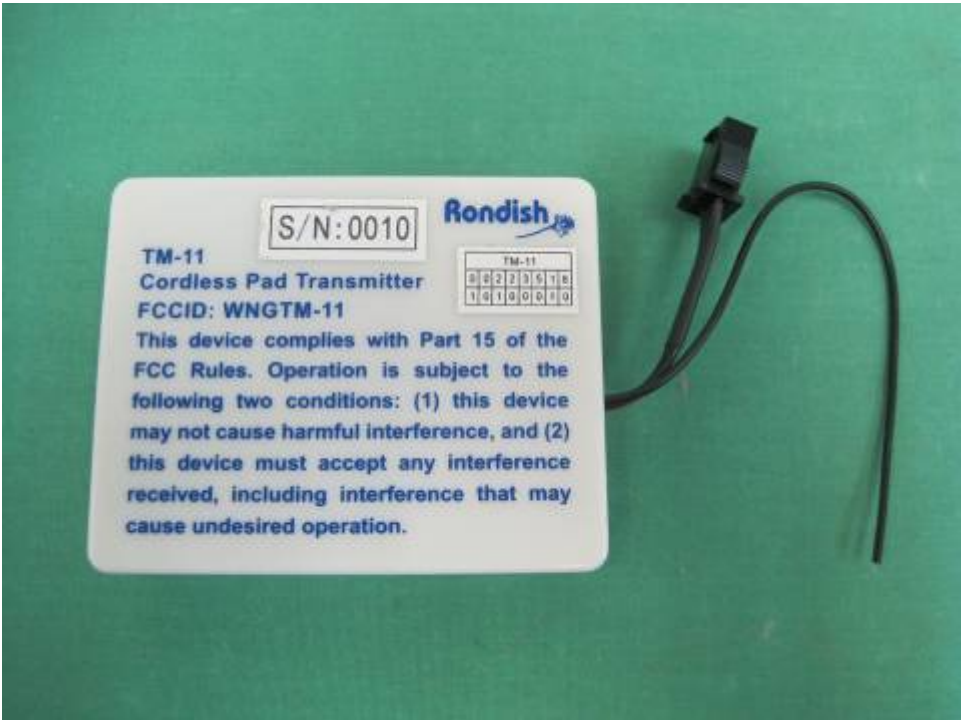
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6.7 EUT Constructional Details



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