FCC TEST REPORT

for

Advent Medical Products

Wireless USB Dongle

Model No.	:	TR102
FCC ID	:	ZAWA
Operating Frequency	:	2425-2480 MHz
Applicant	:	Advent Medical Products 87 Cambridge St., Burlington, Ma 01803 USA
Regulation	:	***FCC Part 15.249 Subpart C***
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	:	February 10-17, 2011
Date of Report	:	February 17, 2011

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Test Report Declaration

TEST REPORT DECLARATION

Applicant	:	Advent Medical Products
Manufacturer	:	Advent Medical Products
EUT Description	:	Wireless USB Dongle

Test Procedure Used:
FCC Part 15.249 Subpart C

The E. U. T. listed below has been completed RF 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 Part 15 Subpart B 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: February 10-17, 2011

Prepared by: Project Engineer

Reviewer : Project Manager

1. GENERAL INFORMATION

1.1 General Information

Description	:	Advent Medical Products
Number of Channels	:	4CH
Model No.	:	TR102
Applicant	:	Advent Medical Products 87 Cambridge St., Burlington, Ma 01803 USA
Manufacturer	:	Advent Medical Products 87 Cambridge St., Burlington, Ma 01803 USA

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 Instrument Used

No.	Equipment	Manufacturer	Model No.	S/N	Calculator date
1.	EMI Test Receiver	R&S	ESCI	100687	2010-11-22
2.	EMI Test Receiver	R&S	FSU	BCT-019	2010-11-22
3.	Amplifier	HP	8447D	1937A02492	2010-11-22
4.	TRILOG Broadband Test-Antenna	SCHWARZBECK	VULB9163	9163-324	2010-11-22
5.	Horn Antenna	SCHWARZBECK	BBHA9120A	B08000991-0001	2010-11-22
6.	High Field Biconical Antenna	ELECTRO-METRICS	EM-6913	166	2010-11-22
7.	Log Periodic Antenna	ELECTRO-METRICS	EM-6950	811	2010-11-22
8.	Remote Active Vertical Antenna	ELECTRO-METRICS	EM-6892	304	2010-11-22
9.	Teo Line Single Phase Module	SCHWARZBECK	NSLK8128	D-69250	2010-11-22
10.	Positioning Controller	C&C	CC-C-1F	MF7802113	2010-11-22
11.	Triple-Loop Antenna	EVERFINE	LLA-2	607004	2010-11-22
12.	10dB attenuator	SCHWARZBECK	MTAIMP-136	R65.90.0001#06	2010-11-22
13.	PC	IBM	R50e	RDFE7259	N/A

2. POWERLINE CONDUCTED EMISSION TEST

2.1.Test Standard

15.207

2.2.Limits

Frequency MHz	Limits (dBμV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66 ~ 56*	56 ~ 46*
0.50 ~ 5.00	56	46
5.00 ~ 30.00	60	50

Notes:

1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

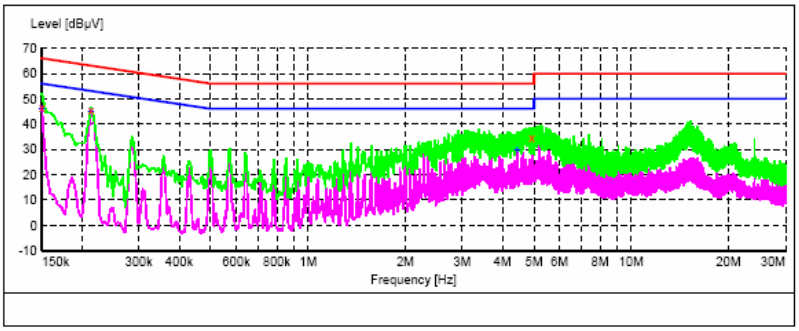
2.3.Test Procedure

The EUT is put on the table that is 0.8m high above the ground and at least away from other Metallic surface 0.4m. The EUT is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohms coupling impedance for the testing equipment; and the peripheral equipment powers form other L.I.S.N. Please refer to the block diagram of the test setup and photographs. Both sides of AC line (Line & Neutral) are checked for maximum conducted interference. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables must be changed according to FCC part 15 B.

2.4.Test Result

Pass

Detailed information, Please refer to the following page.

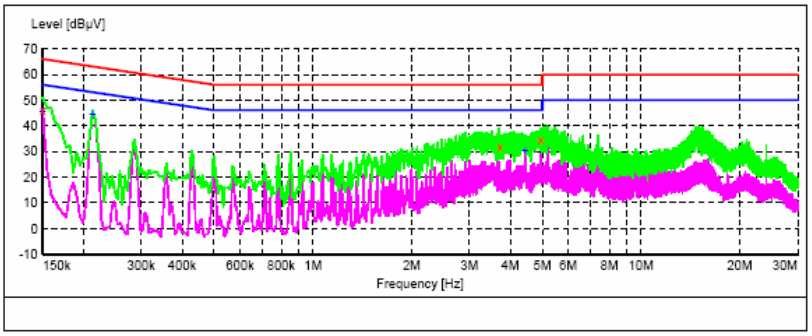


MEASUREMENT RESULT:

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	46.40	11.4	66	19.6	QP	L1	GND
0.213000	45.30	10.8	63	17.8	QP	L1	GND
4.924500	34.30	10.4	56	21.7	QP	L1	GND

MEASUREMENT RESULT:

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	46.40	11.4	56	9.6	AV	L1	GND
0.213000	45.50	10.8	53	7.6	AV	L1	GND
4.434000	30.40	10.3	46	15.6	AV	L1	GND



MEASUREMENT RESULT:

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	46.10	11.4	66	19.9	QP	N	GND
3.705000	32.10	10.3	56	23.9	QP	N	GND
4.938000	34.80	10.4	56	21.2	QP	N	GND

MEASUREMENT RESULT:

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	46.20	11.4	56	9.8	AV	N	GND
0.213000	45.10	10.8	53	8.0	AV	N	GND
4.434000	30.90	10.3	46	15.1	AV	N	GND

3. RADIATION INTERFERENCE

3.1.Rules Part No.

15.249

3.2.Limits

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
902 - 928 MHz	50	500
2400 - 2483.5 MHz	**50 (94)**	**500 (54)**
5725 - 5875 MHz	50	500
24.0 - 24.25 GHz	250	2500

The field strength of any emissions radiated on any frequency outside of the fundamental band shall not exceed the general radiated emission limits in Section 15.209.

Frequency of (MHz)	Emission Field Strength (microvolts/meter)
30 - 88	100 (40)
88 - 216	150 (43.5)
216 - 960	200 (46.0)
Above 960	500 (54.0)

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

Low Channel: 2425MHz

Field Strength of Fundamental:

Horizontal:

Frequency (MHz)	PK (dBuV/m)	AV (dBuV/m)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	PK Margin (dBuV/m)	AV Margin (dBuV/m)
2425.30	98.83	85.83	114.0	94.0	15.17	8.17

Vertical:

Frequency (MHz)	PK (dBuV/m)	AV (dBuV/m)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	PK Margin (dBuV/m)	AV Margin (dBuV/m)
2425.30	97.03	86.00	114.0	94.0	16.97	8.00

Field Strength of Spurious Emission:

Horizontal:

Frequency (MHz)	PK (dBuV/m)	Read Level (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)
47.46	24.60	---	40.0	15.40
95.96	24.00	---	43.5	19.50
103.72	25.30	---	43.5	18.20
225.94	24.40	---	46.0	21.60
544.10	30.70	---	46.0	15.30
4850.35	49.44	41.30(AV)	54.0	12.70
7300.95	44.16	40.70(AV)	54.0	13.30
9750.50	47.46	41.00(AV)	54.0	13.00
---	---	---	---	---
19400.05	48.06	40.00(AV)	54.0	14.00
21825.60	47.56	42.00(AV)	54.0	12.00
24250.50	48.00	42.80 (AV)	54.0	11.20

Vertical:

Frequency (MHz)	PK (dBuV/m)	Read Level (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)
51.34	22.50	---	40.0	17.50
94.02	22.70	---	43.5	20.80
101.78	24.30	---	43.5	19.20
208.48	22.80	---	43.5	20.70
540.22	29.80	---	46.0	16.20
4850.35	41.39	40.02(AV)	54.0	13.98
7300.95	42.78	42.50(AV)	54.0	11.50
9750.50	43.70	43.20(AV)	54.0	10.80
---	---	---	---	---
19400.05	46.50	41.02(AV)	54.0	12.98
21825.60	47.75	43.50(AV)	54.0	10.50
24250.50	47.70	43.20(AV)	54.0	10.80

Middle Channel: 2450MHz

Field Strength of Fundamental:

Horizontal:

Frequency (MHz)	PK (dBuV/m)	AV (dBuV/m)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	PK Margin (dBuV/m)	AV Margin (dBuV/m)
2450.30	95.83	85.83	114.0	94.0	15.17	8.17

Vertical:

Frequency (MHz)	PK (dBuV/m)	AV (dBuV/m)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	PK Margin (dBuV/m)	AV Margin (dBuV/m)
2450.30	93.03	86.00	114.0	94.0	16.97	8.00

Field Strength of Spurious Emission:

Horizontal:

Frequency (MHz)	PK (dBuV/m)	Read Level (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)
39.70	23.70	---	40.0	16.30
95.96	24.10	---	43.5	19.50
123.12	26.50	---	43.5	17.00
179.38	24.30	---	43.5	19.20
551.86	31.20	---	46.0	14.80
4900.95	49.34	42.02(AV)	54.0	11.98
7350.74	46.05	40.18(AV)	54.0	13.82
9800.56	45.60	43.30(AV)	54.0	10.70
---	---	---	---	---
19600.30	45.30	43.30(AV)	54.0	10.70
22050.38	46.50	43.02(AV)	54.0	10.98
24500.60	48.55	45.50(AV)	54.0	8.50

Vertical:

Frequency (MHz)	PK (dBuV/m)	Read Level (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)
30.00	21.30	---	40.0	18.70
92.08	24.30	---	43.5	19.20
123.20	25.10	---	43.5	18.40
179.38	24.80	---	43.5	18.70
542.16	30.70	---	46.0	15.30
4900.95	47.60	40.40(AV)	54.0	13.60
7350.74	45.30	40.10(AV)	54.0	13.90
9800.56	46.08	43.00(AV)	54.0	11.00
---	---	---	---	---
19600.30	46.30	43.50(AV)	54.0	10.50
22050.38	45.50	42.50(AV)	54.0	11.50
24500.60	48.20	43.50(AV)	54.0	10.50

High Channel: 2480MHz

Field Strength of Fundamental:

Horizontal:

Frequency (MHz)	PK (dBuV/m)	AV (dBuV/m)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	PK Margin (dBuV/m)	AV Margin (dBuV/m)
2480.39	95.63	85.50	114.0	94.0	18.37	8.50

Vertical:

Frequency (MHz)	PK (dBuV/m)	AV (dBuV/m)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	PK Margin (dBuV/m)	AV Margin (dBuV/m)
2480.39	95.53	86.02	114.0	94.0	18.47	7.98

Field Strength of Spurious Emission:

Horizontal:

Frequency (MHz)	PK (dBuV/m)	Read Level (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)
51.34	22.60	---	40.0	17.40
95.96	23.30	---	43.5	20.20
97.90	23.40	---	43.5	20.10
210.42	24.00	---	43.5	19.50
547.98	30.00	---	46.0	16.00
4960.58	44.26	40.82(AV)	54.0	13.18
7440.53	46.26	43.16(AV)	54.0	10.84
9920.50	49.13	42.44(AV)	54.0	11.56
---	---	---	---	---
19840.55	45.26	40.20(AV)	54.0	13.80
22320.60	46.56	42.50(AV)	54.0	11.50
24800.50	47.03	43.02(AV)	54.0	10.98

Vertical:

Frequency (MHz)	PK (dBuV/m)	Read Level (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)
47.46	24.00	---	40.0	16.00
95.96	23.80	---	43.5	19.70
99.84	24.90	---	43.5	18.60
204.60	24.20	---	43.5	19.30
544.10	31.20	---	46.0	14.80
4960.58	46.24	42.70(AV)	54.0	11.30
7440.53	46.25	40.00(AV)	54.0	14.00
9920.50	47.30	42.80(AV)	54.0	11.20
---	---	---	---	---
19840.55	45.24	42.20(AV)	54.0	11.80
22320.60	47.20	43.20(AV)	54.0	10.08
24800.50	47.00	43.50(AV)	54.0	10.05

4. BAND EDGE

4.1. Rules Part No.

15.249

4.2. Limits

In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 50dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

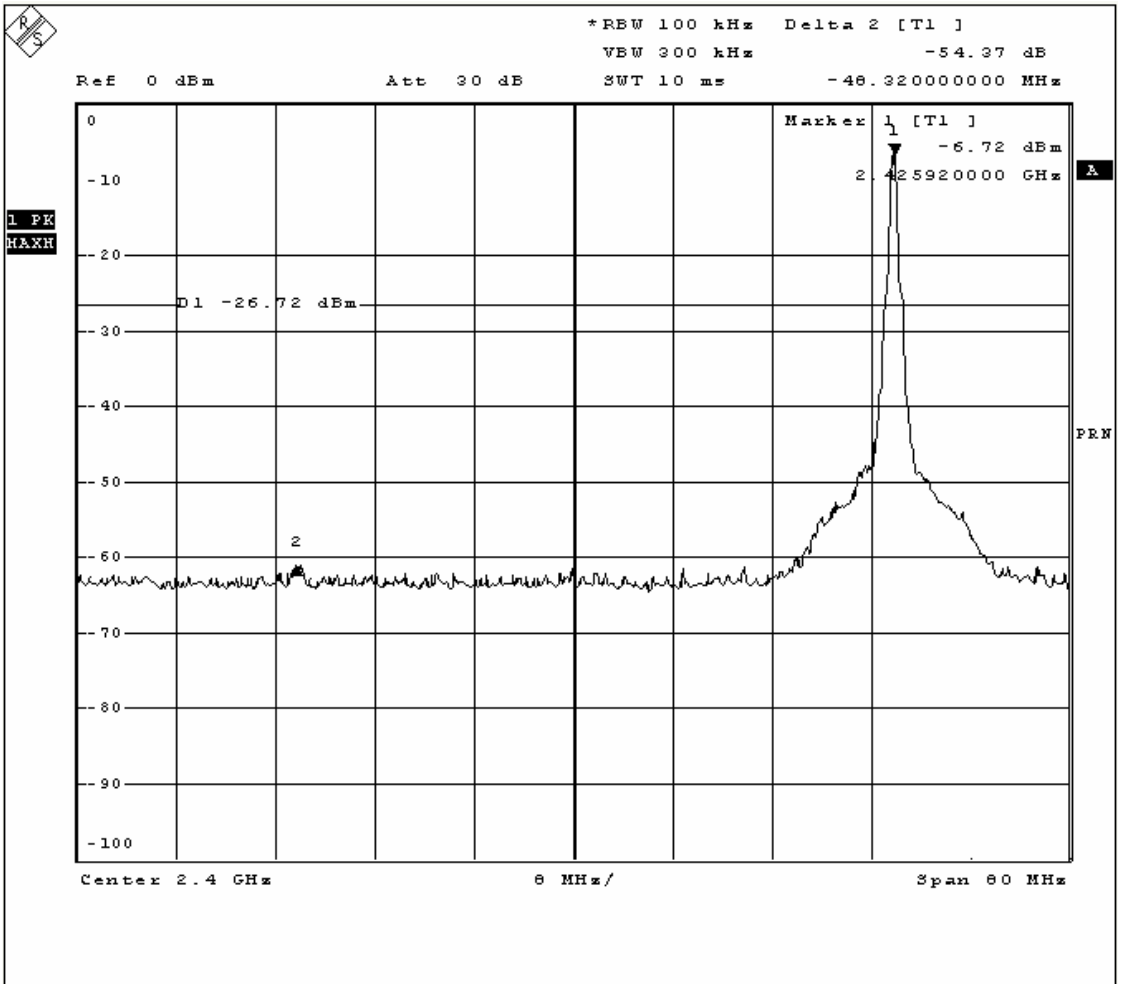
4.3. Test Procedure

Record the respond of frequency waveform when the EUT was working by a spectrum analyzer or EMI Receiver. Low and high channel were tested

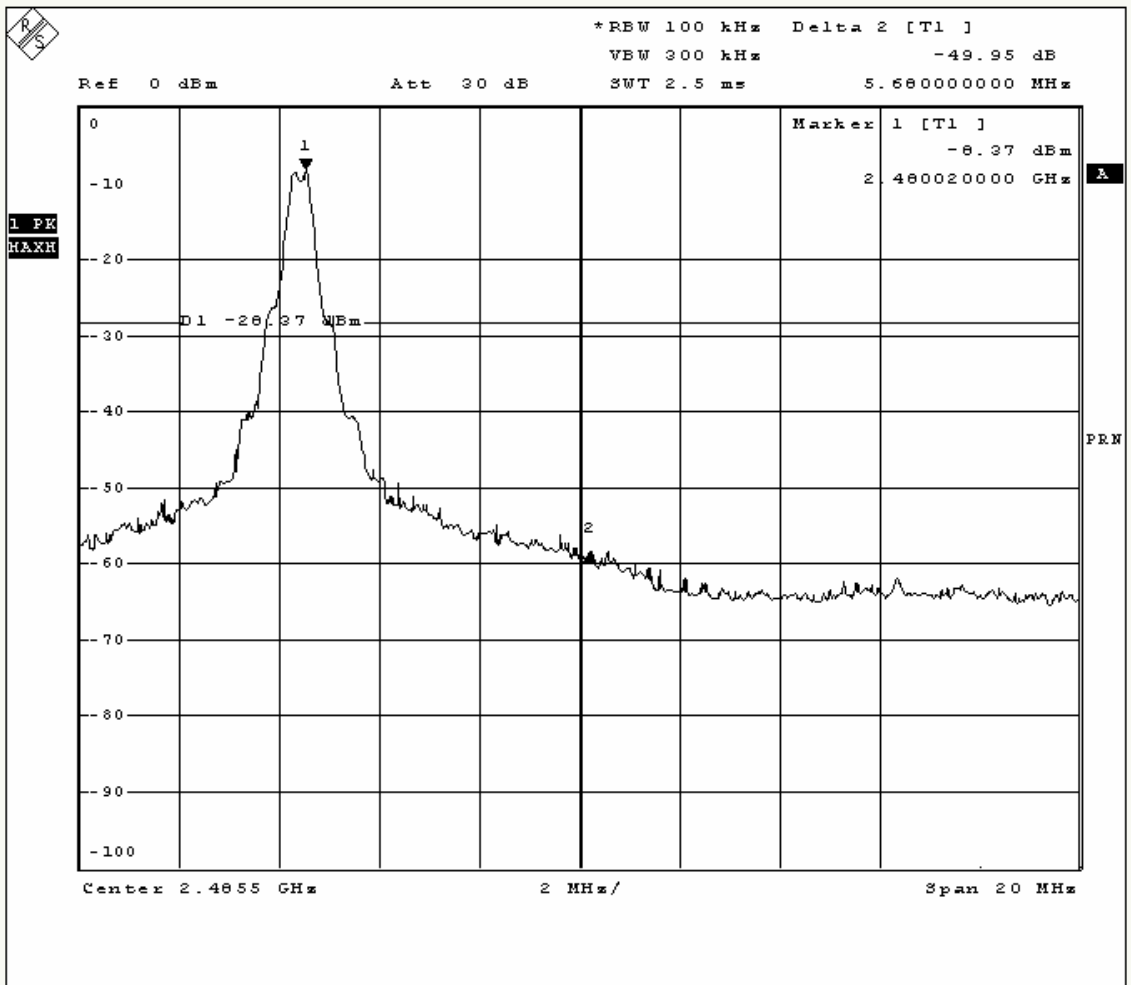
4.4. Test Result

PASS

Low Channel: 2425MHz



High Channel: 2480MHz



5. ANTENNA REQUIREMENT

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.

5. PHOTOGRAPH OF TEST

Radiated Emission test

(Below 1GHz)
EUT: Wireless USB Dongle

(Above 1GHz)
EUT: Wireless USB Dongle