

FCC TEST REPORT

Product : RFID Reader
Trade mark : N/A
Model/Type reference : AFD-R4302
Serial Number : N/A
Ratings : AC 100-240V 50/60Hz
FCC ID : SR8R4302
Report Number : EESZF04070017
Date : Apr. 25, 2013
Regulations : See below

Test Standards	Results
<input checked="" type="checkbox"/> 47 CFR FCC Part 15 Subpart B: 2012	PASS

Prepared for:
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Date: Apr. 25, 2013

Check No.: 1631587760

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(Note: N/A means not applicable)

1. GENERAL INFORMATION

Applicant: Anfudi Technology (Xiamen) Co., Ltd
4F, 598#, Jiahe Road, Huli District, Xiamen, Fujian, P.R.China

Manufacturer: Anfudi Technology (Xiamen) Co., Ltd
4F, 598#, Jiahe Road, Huli District, Xiamen, Fujian, P.R.China

Equipment Authorization: Certification

FCC ID: SR8R4302

Product: RFID Reader

Trade mark: N/A

Model/Type reference: AFD-R4302

Serial Number: N/A

Report Number: EESZF04070017

Sample Received Date: Apr. 07, 2013

Sample tested Date: Apr. 07, 2013 to Apr. 25, 2013

2. TEST SUMMARY

The Product has been tested according to the following specifications:

Standard	Test Item	Test
FCC 15.107	Conducted Emission	Yes
FCC 15.109	Radiated Emission	Yes

3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Test item	Value (dB)
Conducted disturbance	3.2
Radiated disturbance (30MHz to 1GHz)	4.5
Radiated disturbance (1GHz to 6GHz)	4.8

4. PRODUCT INFORMATION AND TEST SETUP

4.1. PRODUCT INFORMATION

Ratings: AC 100-240V 50/60Hz

Adapter information: Manufacture: XIAMEN UME ELECTRONICS CO., LTD
Model No. : SW-050100U
Input : AC100-240V 50/60Hz
Output: DC 5V 1.0A

Product Description: The AFD-R4302 is a RF(437MHz) receiver. The product is powered by adaptor It receives the RF signals emitted by the tags, and transmits the received data to the PC or other equipment.

Related Submittal(s) Grants: This is a single application for certification of a receiver. The transmitter for this receiver is authorized by Certification procedure with FCC ID: SR8T4303.

4.2. TEST SETUP CONFIGURATION

See test photographs attached in Appendix 1 for the actual connections between Product and support equipment.

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

5. FACILITIES AND ACCREDITATIONS

5.1. TEST FACILITY

All test facilities used to collect the test data are located at Hongwei Industrial Zone, 70 Area, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4, CISPR 16-1-1 and other equivalent standards.

5.2. TEST EQUIPMENT LIST

Instrumentation: The following list contains equipments used at CTI for testing.

The calibrations of the measuring instruments, including any accessories that may effect such calibration, are checked frequently to assure their accuracy. Adjustments are made and correction factors applied in accordance with instructions contained in the manual for the measuring instrument.

Equipment used during the tests:

Shielding Room No. 1 - Conducted Emission Test				
Equipment	Manufacturer	Model	Serial No.	Due Date
Receiver	R&S	ESCI	100009	07/19/2013
LISN	R&S	ENV216	100098	07/19/2013

3M Semi-anechoic Chamber - Radiated Emission Test				
Equipment	Manufacturer	Model	Serial No.	Due Date
3M Chamber & Accessory Equipment	ETS-LINDGREN	FACT-3	3510	07/09/2013
Receiver	R&S	ESCI	100435	07/19/2013
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	401	07/21/2013
Multi device Controller	ETS-LINGREN	2090	00057230	N/A
Horn Antenna	ETS-LINGREN	3117	00057407	07/07/2015
Microwave Preamplifier	Agilent	8449B	3008A02425	07/19/2013

Support Equipment List:

3M Semi-anechoic Chamber - Radiated Emission Test				
Equipment	Manufacturer	Model	Serial No.	Due Date
Notebook	Lenovo	E42L	R36037B10223	N/A
Mouse	Lselection	OP-200	B0820010665DBDN	Shielded
Signal generator	IFR	2023B	L202307/439	N/A

6. SYSTEM TEST CONFIGURATION

6.1. JUSTIFICATION

The system was configured for testing in a typical fashion (as a customer would normally use it), The Product was placed on a turn table, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes in receiving mode and in the confines as outlined in ANSI C63.4 (2003).

The Product was powered by AC 120V 60Hz (adaptor) during test.

For maximizing emissions, the Product was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed.

The unit was operated standalone and placed in the center of the turntable when it works in receiving mode

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

6.2. PRODUCT EXERCISING SOFTWARE

No Software was used during testing.

7. CONDUCTED EMISSION TEST

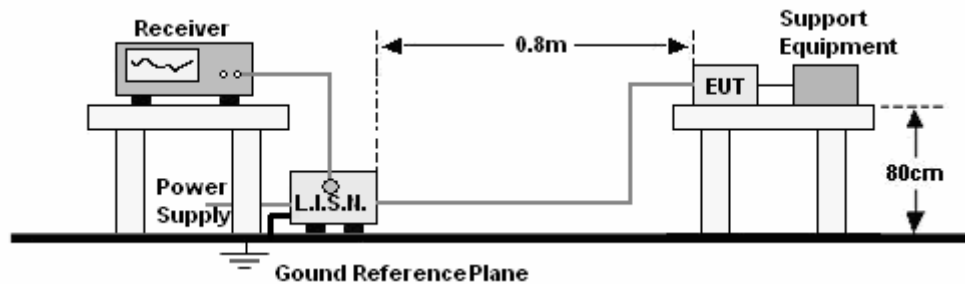
7.1. LIMITS

Limits for Class B digital devices

Frequency range (MHz)	Limits dB(μV)	
	Quasi-peak	Average
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50

NOTE: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz.

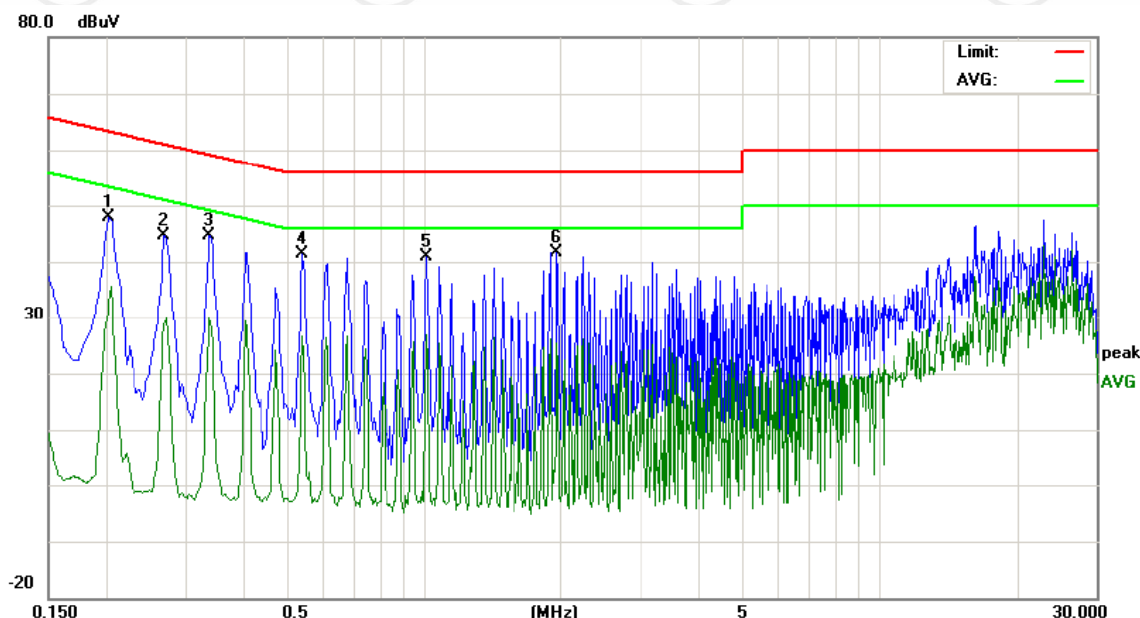
7.2. BLOCK DIAGRAM OF TEST SETUP



7.3. PROCEDURE OF CONDUCTED EMISSION TEST

- The Product was placed on a nonconductive table above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
- The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.
- For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

7.4. GRAPHS AND DATA



Site site #1

Phase: **L1**

Temperature: 23

Limit: FCC Class B CE (QP)

Power: AC 120V/60Hz

Humidity: 57 %

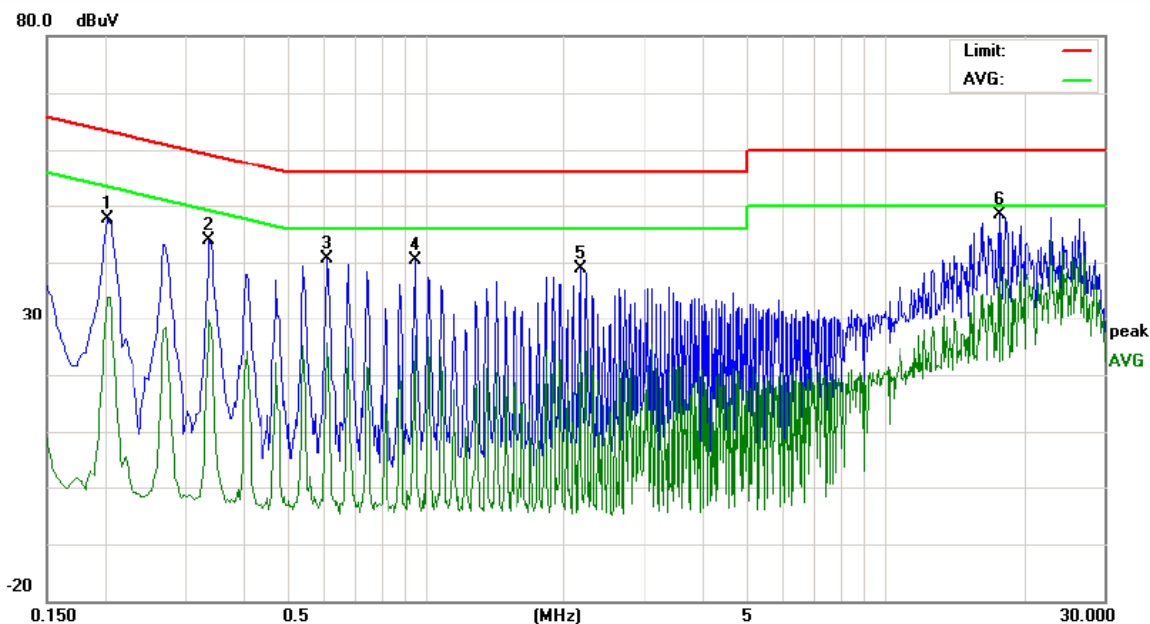
EUT: RFID Reader

M/N: AFD-R4302

Mode: RX

Note:

No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	0.2020	38.08		21.31	9.90	47.98		31.21	63.52	53.52	-15.54	-22.31	P	
2	0.2700	34.77		18.85	9.90	44.67		28.75	61.12	51.12	-16.45	-22.37	P	
3	0.3379	34.84		20.25	9.90	44.74		30.15	59.25	49.25	-14.51	-19.10	P	
4	0.5420	31.50		16.67	9.90	41.40		26.57	56.00	46.00	-14.60	-19.43	P	
5	1.0140	31.07		16.08	9.90	40.97		25.98	56.00	46.00	-15.03	-20.02	P	
6	1.9660	31.83		15.58	9.90	41.73		25.48	56.00	46.00	-14.27	-20.52	P	



Site site #1

Phase: **N**

Temperature: 23

Limit: FCC Class B CE (QP)

Power: AC 120V/60Hz

Humidity: 57 %

EUT: RFID Reader

M/N: AFD-R4302

Mode: RX

Note:

No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	0.2020	37.77		24.03	9.90	47.67		33.93	63.52	53.52	-15.85	-19.59	P	
2	0.3379	33.90		19.68	9.90	43.80		29.58	59.25	49.25	-15.45	-19.67	P	
3	0.6100	30.79		15.73	9.90	40.69		25.63	56.00	46.00	-15.31	-20.37	P	
4	0.9500	30.40		17.00	9.90	40.30		26.90	56.00	46.00	-15.70	-19.10	P	
5	2.1700	29.03		13.94	9.91	38.94		23.85	56.00	46.00	-17.06	-22.15	P	
6	17.6940	37.85		30.07	10.56	48.41		40.63	60.00	50.00	-11.59	-9.37	P	

8. RADIATED EMISSION TEST

8.1. LIMITS

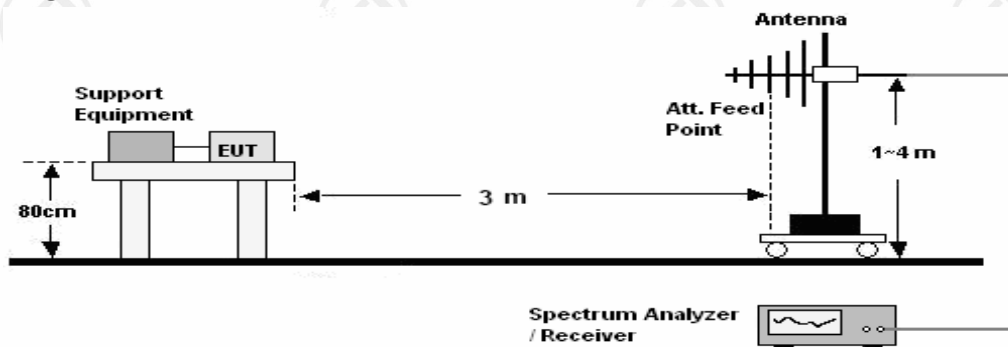
Limits for Class B digital devices

Frequency (MHz)	limits at 3m dB(μ V/m)
30-88	40.0
88-216	43.5
216-960	46.0
Above 960	54.0

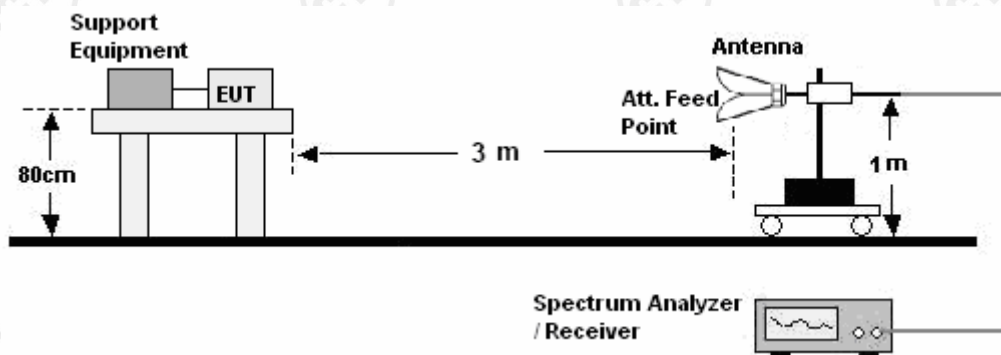
- NOTE:**
1. The lower limit shall apply at the transition frequency.
 2. The limits shown above are based on measuring equipment employing a CISPR quasi-peak detector function for frequencies below or equal to 1000MHz.
 3. The limits shown above are based on measuring equipment employing an average detector function for frequencies above 1000MHz.

8.2. BLOCK DIAGRAM OF TEST SETUP .

30MHz ~ 1GHz:



1GHz~2GHz:

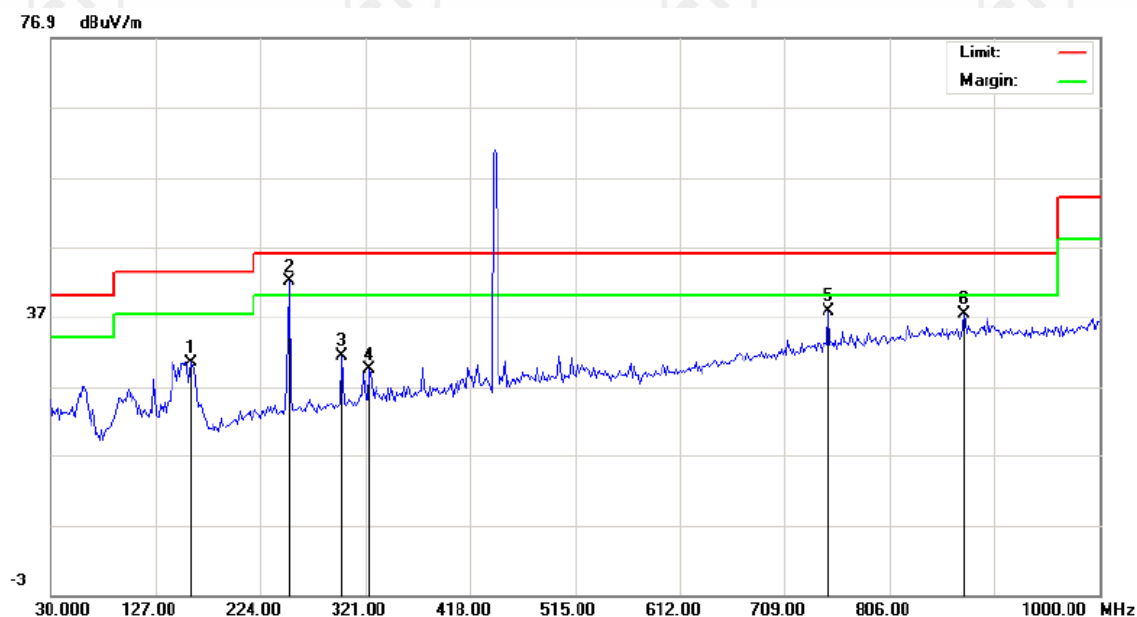


8.3. PROCEDURE OF RADIATED EMISSION TEST

FOR RECEIVING MODE:

- a. The Product was placed on the non-conductive turntable 0.8m above the ground at a chamber.
- b. Use a signal Generator to generate a 437MHz un-modulated CW signal to the receiver. And the signal level is from low signal about -80dBm up to -10dBm to sure the emission level which observed on the test receiver is not increased any more. Then begin testing.
- C, Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 100 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- c. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

8.4. GRAPHS AND DATA



Site site #1

Polarization: **Horizontal**

Temperature: 26

Limit: FCC PART15 B

Power: AC 120V/60Hz

Humidity: 57 %

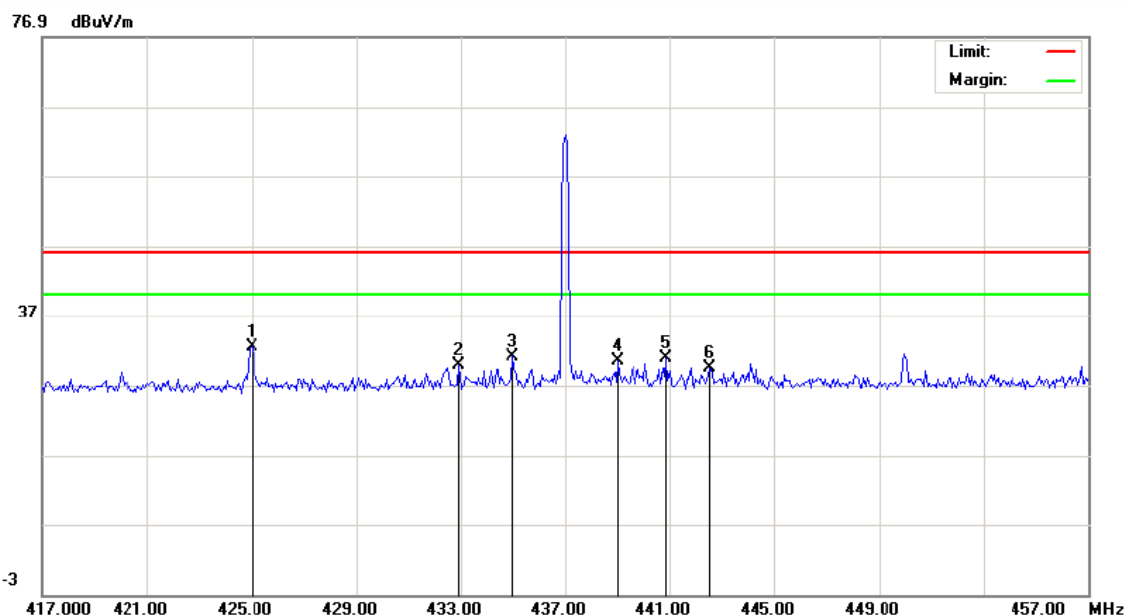
EUT: RFID Reader

M/N: AFD-R4302

Mode: RX

Note:

No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV/m)			Limit (dBuV/m)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	159.3333	19.00			11.48	30.48			43.50		-13.02		P	
2	249.8667	27.15	27.03		14.88	42.03	41.91		46.00		-4.09		P	
3	299.9832	15.49			15.87	31.36			46.00		-14.64		P	
4	324.2332	12.90			16.58	29.48			46.00		-16.52		P	
5	749.4167	13.83			24.01	37.84			46.00		-8.16		P	
6	875.5167	11.48			25.94	37.42			46.00		-8.58		P	



Site site #1

Polarization: **Horizontal**

Temperature: 23

Limit: FCC PART15 B

Power: AC 120V/60Hz

Humidity: 56 %

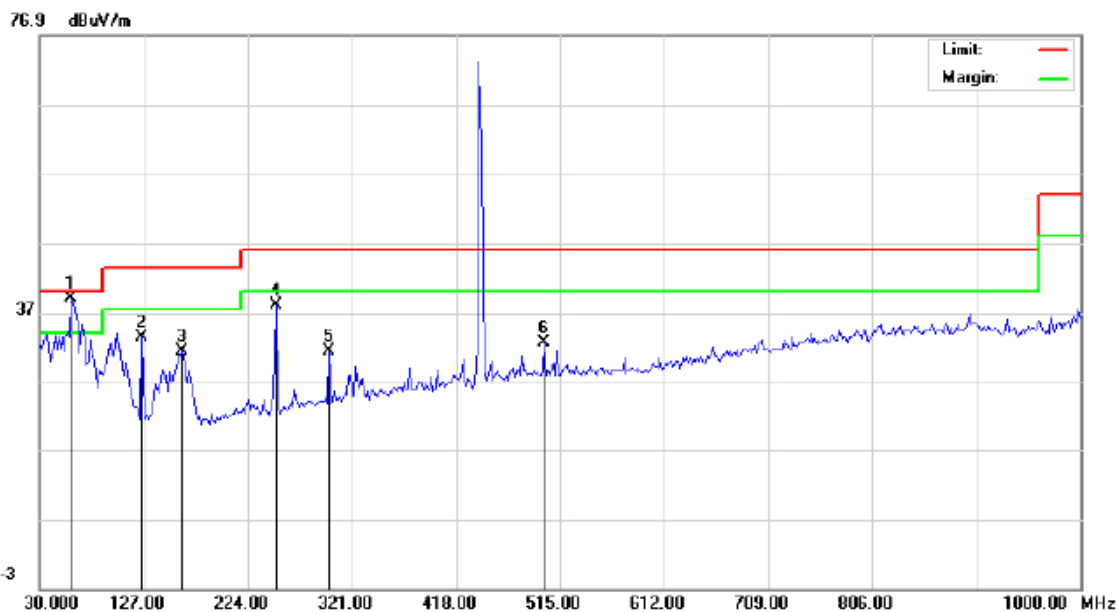
EUT: RFID Reader

M/N: AFD-R4302

Mode: RX

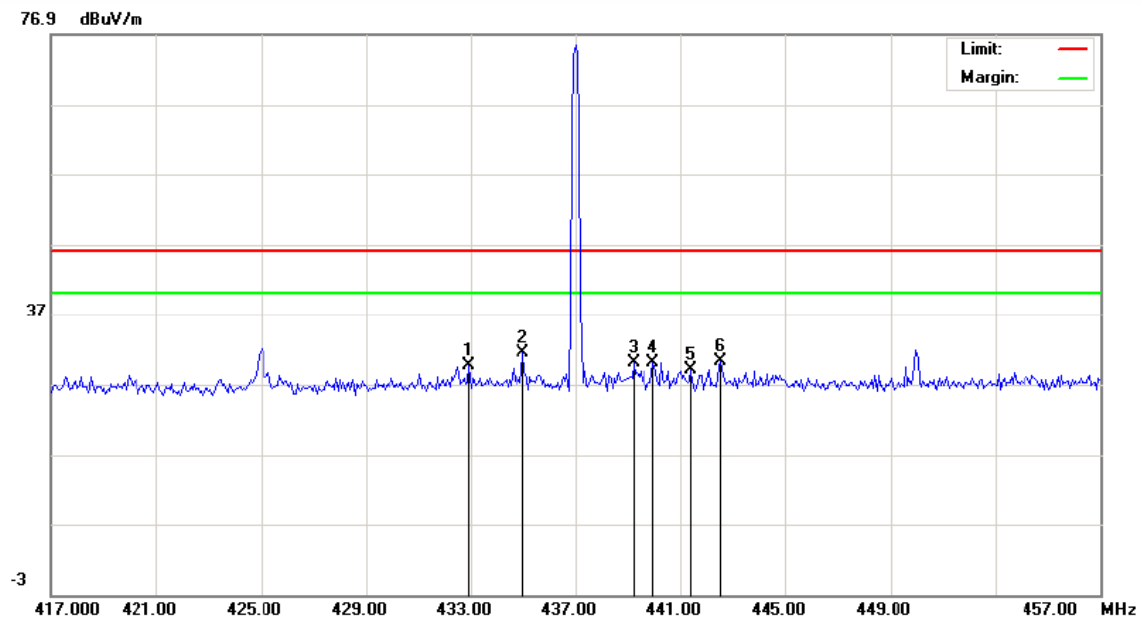
Note:

No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV/m)			Limit (dBuV/m)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	425.0000	13.74			18.75	32.49			46.00		-13.51		P	
2	432.9333	10.92			18.92	29.84			46.00		-16.16		P	
3	435.0000	12.14			18.96	31.10			46.00		-14.90		P	
4	439.0000	11.41			19.05	30.46			46.00		-15.54		P	
5	440.8667	11.73			19.09	30.82			46.00		-15.18		P	
6	442.5333	10.38			19.12	29.50			46.00		-16.50		P	



Site site #1 Polarization: **Vertical** Temperature: 26
Limit: FCC PART15 B Power: AC 120V/60Hz Humidity: 57 %
EUT: RFID Reader
M/N: ADF-R4302
Mode: RX
Note:

No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV/m)			Limit (dBuV/m)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	59.1000	24.29	21.74		14.67	38.96	36.41		40.00		-3.59		P	
2	125.3833	19.98			13.44	33.42			43.50		-10.08		P	
3	162.5667	19.72			11.64	31.36			43.50		-12.14		P	
4	249.8667	23.15			14.88	38.03			46.00		-7.97		P	
5	299.9833	15.53			15.87	31.40			46.00		-14.60		P	
6	500.4499	12.69			19.84	32.53			46.00		-13.47		P	



Site site #1 Polarization: **Vertical** Temperature: 23
 Limit: FCC PART15 B Power: AC 120V/60Hz Humidity: 56 %
 EUT: RFID Reader
 M/N: AFD-R4302
 Mode: RX
 Note:

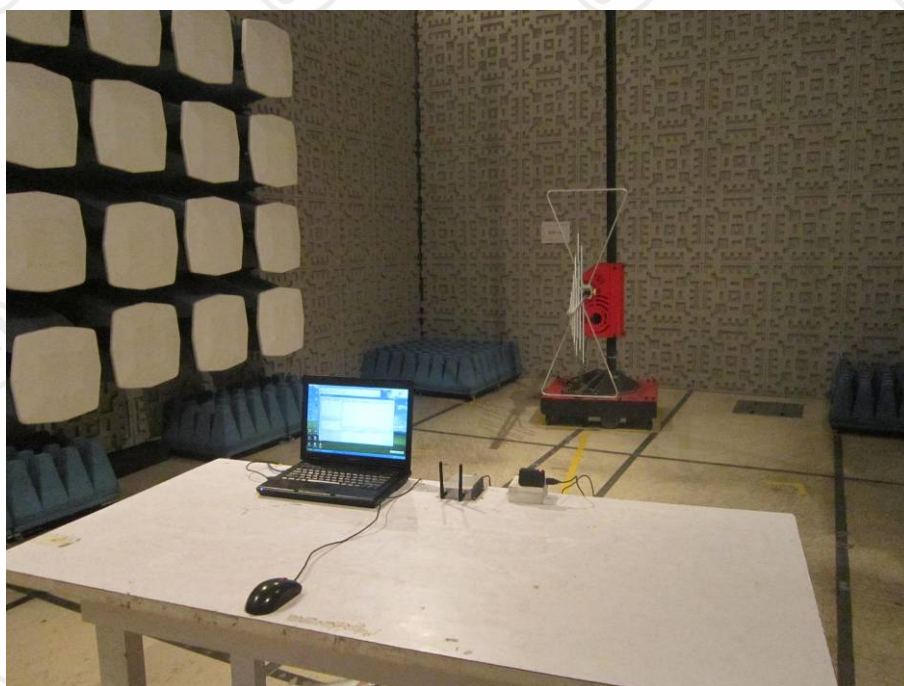
No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor			Measurement (dBuV/m)			Limit (dBuV/m)		Margin (dB)		P/F	Comment
		Peak	QP	AVG	dB	peak	QP	AVG	QP	AVG	QP	AVG	QP	AVG		
1	432.9333	10.66			18.92	29.58			46.00				-16.42		P	
2	435.0000	12.52			18.96	31.48			46.00				-14.52		P	
3	439.2000	10.89			19.05	29.94			46.00				-16.06		P	
4	439.9333	10.90			19.07	29.97			46.00				-16.03		P	
5	441.4000	9.93			19.10	29.03			46.00				-16.97		P	
6	442.5333	11.15			19.12	30.27			46.00				-15.73		P	

Note: The emissions are not reported in the 1GHz-2GHz band, they are lower at least 20dB from the limits.

APPENDIX 1 PHOTOGRAPHS OF TEST SETUP



CONDUCTED EMISSION TEST SETUP



RADIATED EMISSION TEST SETUP(30MHZ-1GHZ)



RADIATED EMISSION TEST SETUP(1GHZ-2GHZ)

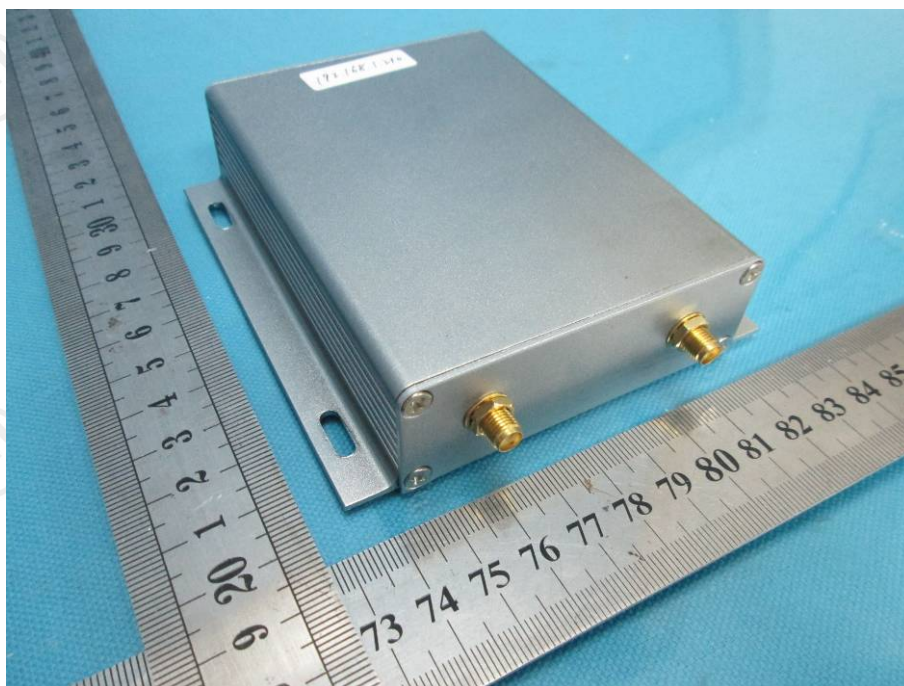
APPENDIX 2 PHOTOGRAPHS OF PRODUCT



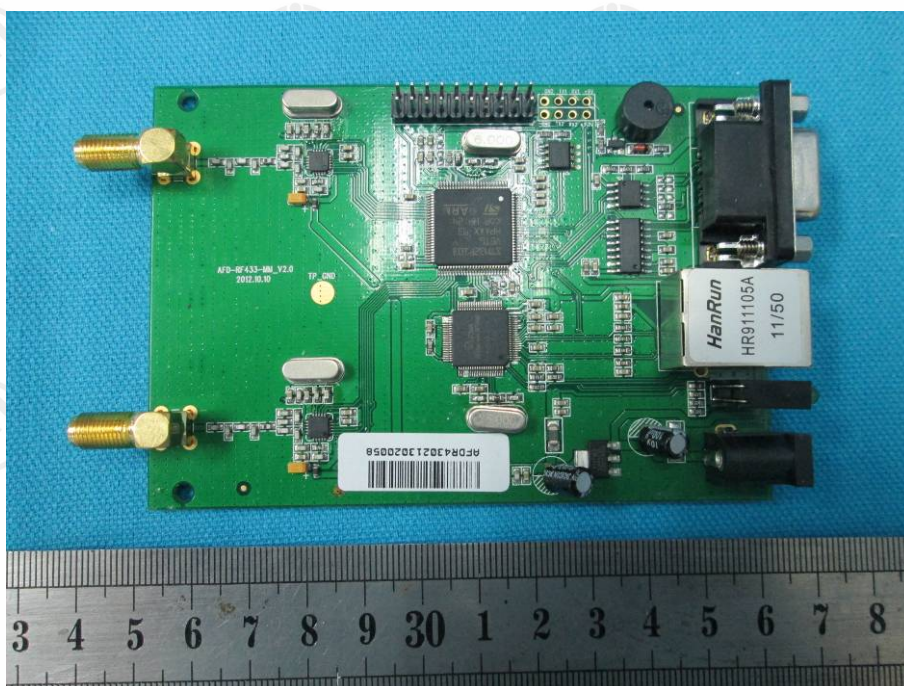
View of Product-1



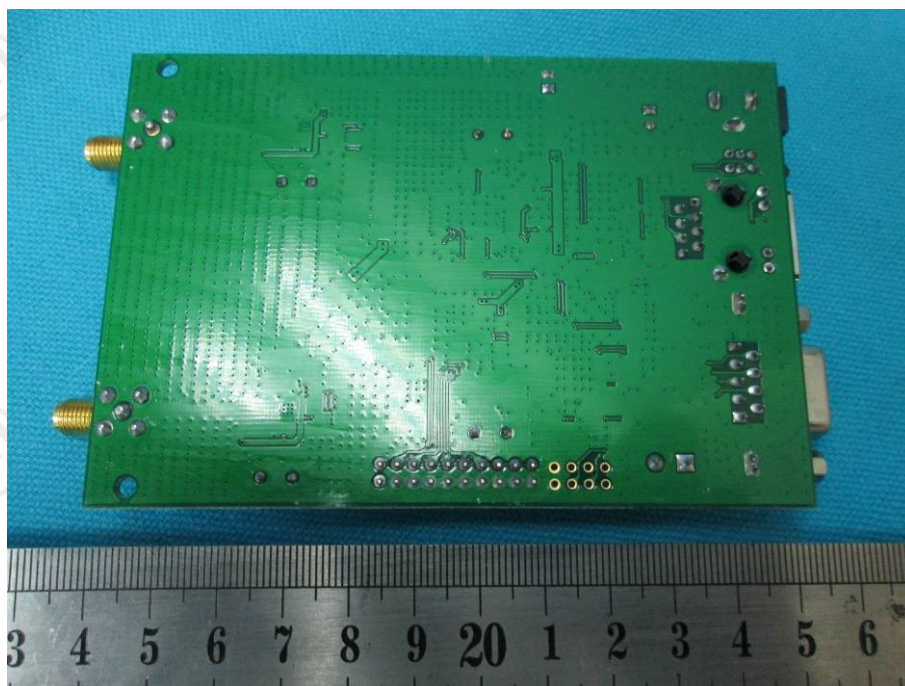
View of Product-2



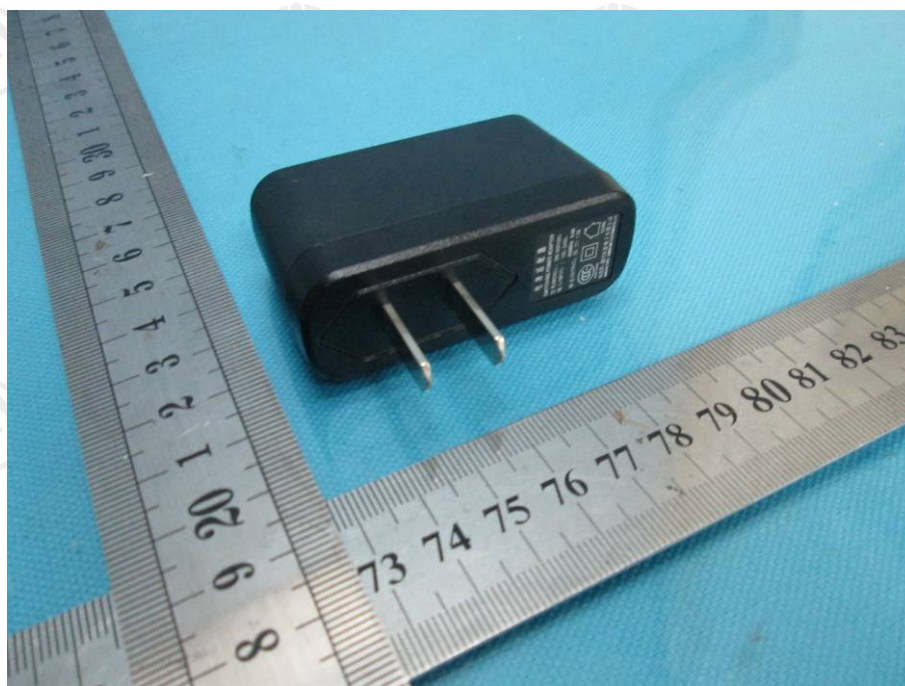
View of Product-3



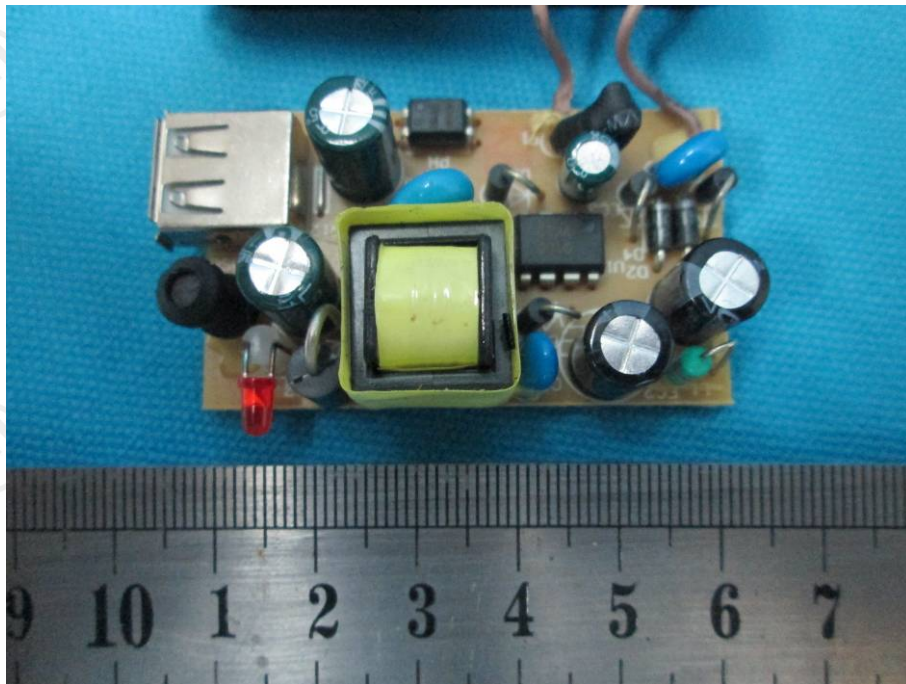
View of Product-4



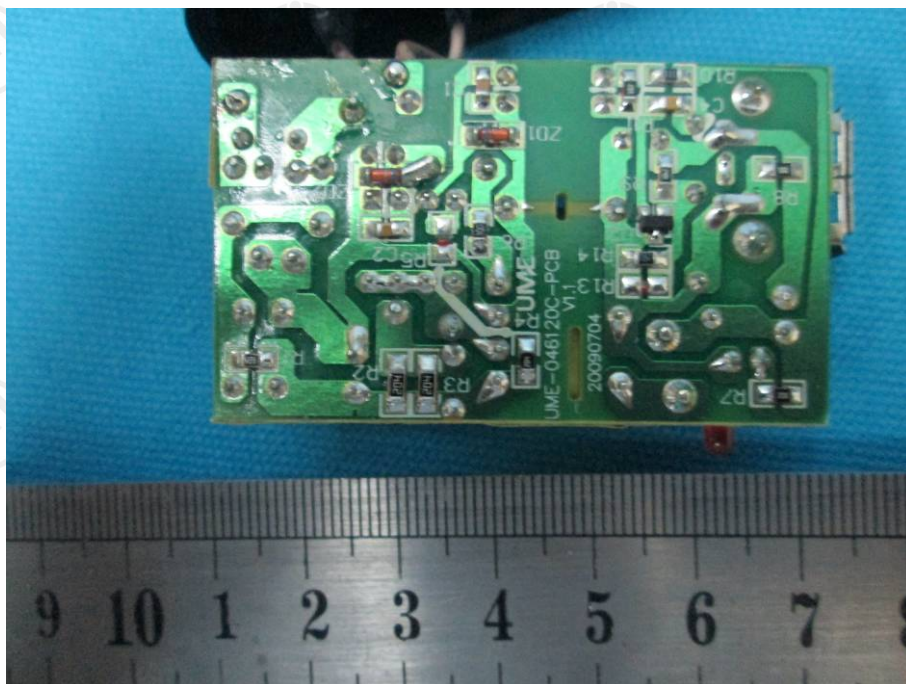
View of Product-5



View of Product-6



View of Product-7



View of Product-8

*** End of report ***

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