



Zacta

TEST REPORT

Report number : Z071C-13215

Issue date : July 3, 2013

The device, as described herewith, was tested pursuant to applicable test procedure and complies with the requirements of;

FCC Part15 Subpart C

The test results are traceable to the international or national standards.

Applicant	: FEC Inc.
Equipment under test (EUT)	: ISO-14443A Reader Writer module
Model number	: FRWA-C01U
FCC ID	: 2AAFCFRWA-C01U

Date of test : June 12, 24, July 3, 2013
Test place : TÜV SÜD Zacta Ltd. Yonezawa Testing Center
4149-7 Hachimanpara 5-chome
Yonezawa-shi Yamagata 992-1128 Japan
Phone: +81-238-28-2880 Fax: +81-238-28-2888
Test results : Complied

The results in this report are applicable only to the equipment tested.
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This test report must not be used by client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

Tested by : Taiki Watanabe
Taiki Watanabe

Tested by : Chiaki Kanno
Chiaki Kanno

Authorized by : Eiji Akiba
Eiji Akiba
Deputy General Manager of technical Department

NVLAP[®]
NVLAP LAB CODE 200306-0

Table of contents

	Page
1. Summary of Test	3
1.1 Purpose of test	3
1.2 Standards	3
1.3 List of applied test to the EUT	3
1.4 Modification to the EUT by laboratory	3
2. Equipment Under Test	4
2.1 General Description of equipment	4
2.2 EUT information	4
2.3 Variation of the family model(s)	4
2.4 Description of Test mode	5
2.5 Operating mode	5
3. Configuration of equipment	6
3.1 Equipment(s) used	6
3.2 Cable(s) used	6
3.3 System configuration	6
4. Occupied Bandwidth	7
4.1 Measurement procedure	7
4.2 Limit	7
4.3 Measurement result	7
4.4 Trace data	8
5. Operation within the band 13.110-14.010MHz	9
5.1 Measurement procedure	9
5.2 Calculation method	9
5.3 Limit	10
5.4 Test data	10
5.5 Trace data	11
6. Radiated Emissions	12
6.1 Measurement procedure	12
6.2 Calculation method	13
6.3 Limit	14
6.4 Test data	15
7. Frequency Tolerance	16
7.1 Measurement procedure	16
7.2 Limit	16
7.3 Test data	17
8. AC Power Line Conducted Emissions	18
8.1 Measurement procedure	18
8.2 Calculation method	18
8.3 Limit	18
8.4 Test data	19
9. Uncertainty of measurement	21
10. Laboratory description	22
Appendix A. Test equipment	23

1. Summary of Test

1.1 Purpose of test

It is the original test in order to verify conformance to FCC Part 15 Subpart C.

1.2 Standards

CFR47 FCC Part 15 Subpart C

1.2.1 Test Methods

ANSI C63.4-2003

1.2.2 Deviation from standards

None

1.3 List of applied test to the EUT

Test items Section	Classification of EUT	Condition	Result
RSS-Gen 4.6.1	Occupied Bandwidth	Conducted	PASS
15.209 15.225 (a)(b)(c)(d)	Operation within the band 13.110-14.010MHz	Radiated	PASS
15.209 15.225 (d)	Transmitter Radiated Spurious Emissions	Radiated	PASS
15.225 (e)	Frequency Tolerance	Conducted	PASS
15.207	AC Power Line Conducted Emissions	Conducted	PASS

1.3.1 Test set up

Table-Top

1.4 Modification to the EUT by laboratory

None

2. Equipment Under Test

2.1 General Description of equipment

The EUT is ISO-14443 Reader Writer module.

2.2 EUT information

Applicant	: FEC Inc. 1414, Higashi, Utsugi-machi, Kanazawa-shi, Ishikawa 920-0377 Japan Phone: +81-76-269-8890 Fax: +81-76-269-8897
Equipment under test	: ISO-14443A Reader Writer module
Trade name	: FEC Inc.
Model number	: FRWA-C01U
Serial number	: **0CS0242
EUT condition	: Pre-production
Max. frequency	: 13.56MHz
Power ratings	: DC 5V
Size	: (W) 47 × (D) 47 × (H) 5.5 mm
Environment	: Indoor and Outdoor USE
Terminal limitation	: -10°C to 60°C
RF Specification Frequency range	: 13.56MHz
Modulation method	: ASK
Antenna type	: Loop antenna

2.3 Variation of the family model(s)

Not applicable

2.4 Description of Test mode

The field strength of spurious emissions was measured at each position of all three axis X, Y and Z to compare the level, and the maximum noise.

The worst emission was found in X axis and the worst case recorded.

2.5 Operating mode

[Transmit mode]

- i) Power ON
- ii) Start test mode

3. Configuration of equipment

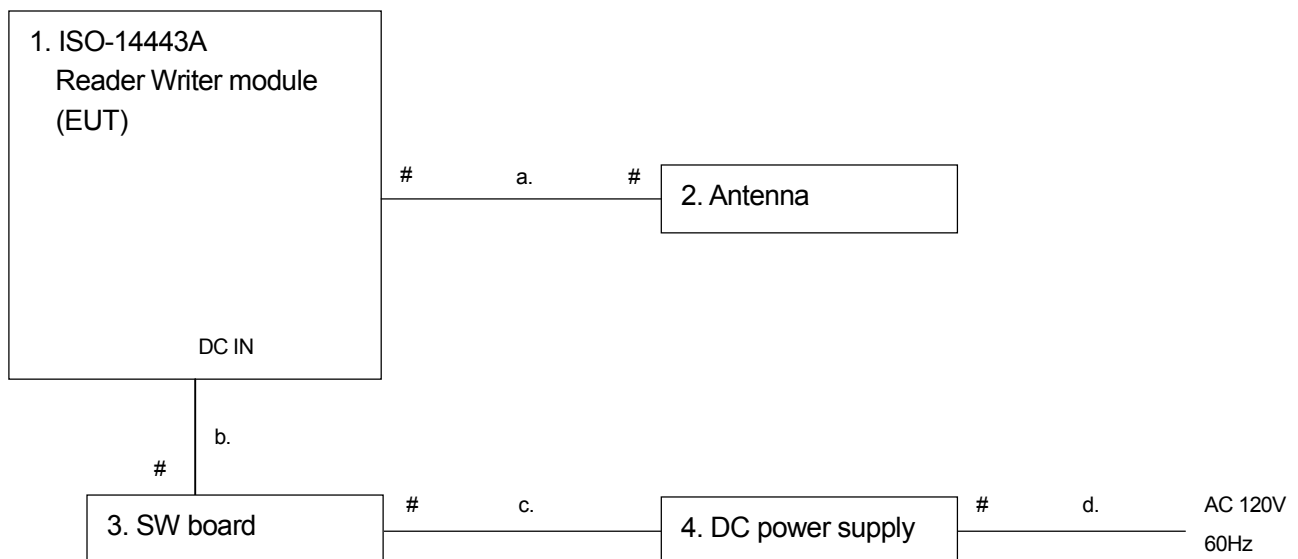
3.1 Equipment(s) used

No.	Equipment	Company	Model No.	Serial No.	FCC ID / DoC	Comment
1	ISO-14443A Reader Writer module	FEC	FRWA-C01U	**0CS0242	2AAFCFRWA-C01U	EUT
2	Antenna	FEC	FATH-3040	AJ0001635	-	-
3	SW board	FEC	N/A	N/A	-	-
4	DC power supply	KIKUSUI	PAB	47306490	-	-

3.2 Cable(s) used

No.	Cable	Length[m]	Shield	Connector	Comment
a	Coaxial cable	0.11	Yes	-	-
b	DC cable	0.03	No	Plastic	-
c	DC cable	1.61	No	Plastic	-
d	AC power cord for DC power supply	2.10	No	Plastic	-

3.3 System configuration



: Un-detachable cable

Note: Numbers assigned to equipment or cables on this diagram correspond to the list in “3.1 Equipment(s) used” and “3.2 Cable(s) used”.

4. Occupied Bandwidth

4.1 Measurement procedure [IC RSS-Gen 4.6.1]

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99% bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

The spectrum analyzer is set to;

- RBW=1kHz, VBW=3kHz, Span=100kHz, Sweep=auto, Detector=Sample

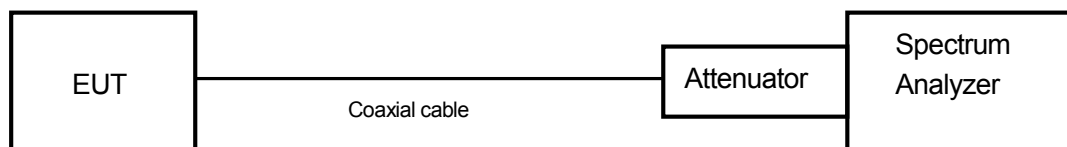
The EUT was set to operate with following conditions.

- 13.56MHz

The test mode of EUT is as follows.

- Transmit mode

- Test configuration



4.2 Limit

None

4.3 Measurement result

Date : Jun. 12, 2013
 Temperature : 24.9 [°C]
 Humidity : 43.1 [%]
 Test place : Shielded room

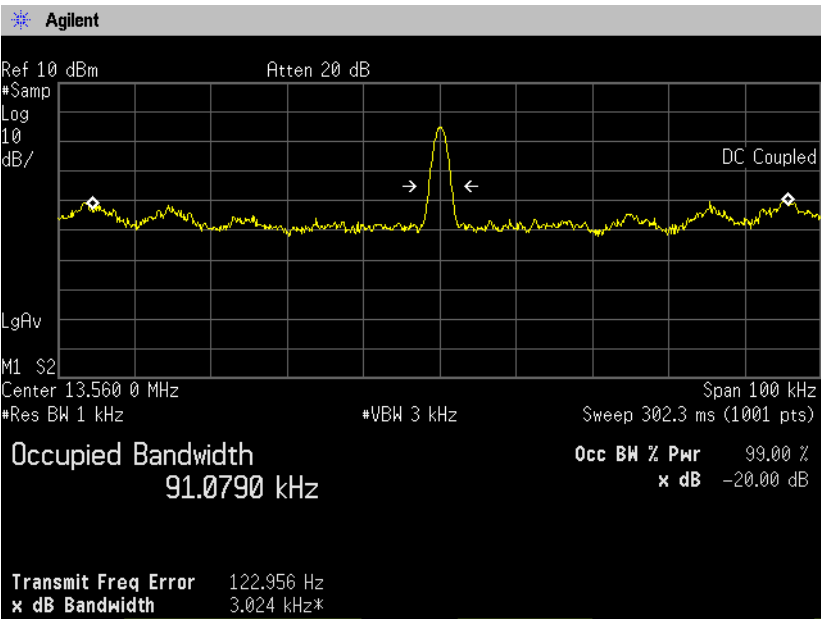
Test personnel :

Tested by :

Chiaki Kanno

Frequency [MHz]	Occupied bandwidth [kHz]
13.56	91.0790

4.4 Trace data



5. Operation within the band 13.110-14.010MHz

5.1 Measurement procedure

[FCC 15.209, 15.225 (a)(b)(c)(d)]

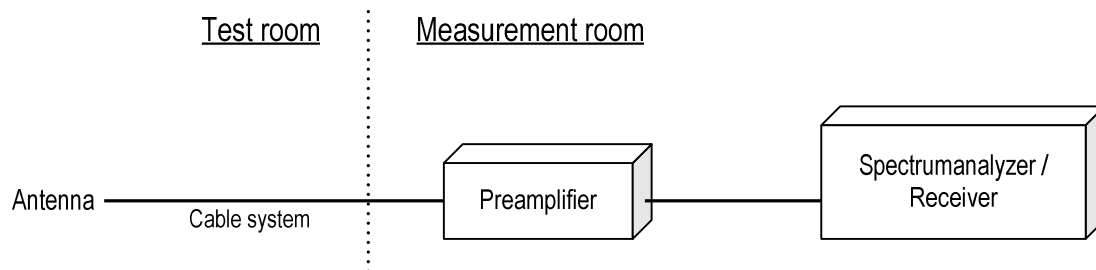
Test was applied by following conditions.

Test method	: ANSI C63.4
Frequency range	: 13.110MHz to 14.010MHz
Test place	: 3m Semi-anechoic chamber
EUT was placed on	: FRP table / (W)2.0m × (D)1.0m × (H)0.8m
Antenna distance	: 3m

Test receiver setting	
- Detector	: Quasi-peak
- Bandwidth	: 9kHz

EUT operating mode is selected to emit the maximum noise. Overall frequency range is investigated with spectrum analyzer using peak detector. Then, emission measurements frequency range 13.110MHz to 14.010MHz were performed with test receiver in above setting. The turntable and the Loop antenna are rotated by 360 degrees and stopped at azimuth of producing the maximum emission. Sufficient time for EUT, peripherals and test equipment is provided in order for them to warm up to their normal operating condition.

- Test configuration



5.2 Calculation method

Emission level = Reading + (Ant. factor + Cable system loss – Amp. Gain)

Margin = Limit – Emission level

5.3 Limit

- (a) The field strength of any emissions within the band 13.553-13.567MHz shall not exceed 15,848uV/m at 30m.
- (b) Within the band 13.410-13.553MHz and 13.567-13.710MHz, the field strength of any emissions shall not exceed 334uV/m at 30m.
- (c) Within the band 13.110-13.410MHz and 13.710-14.010MHz, the field strength of any emissions shall not exceed 106uV/m at 30m.
- (d) The field strength of any emissions appearing outside of the 13.110-14.010MHz and shall not exceed the general radiated emission limits in FCC 15.209.

Note:

1. The lower limit shall apply at the transition frequencies.
2. Emission level [dBuV/m] = 20log Emission [uV/m]
3. Measurements were corrected to 30m using $40\log(3/30) = -40.0\text{dB}$

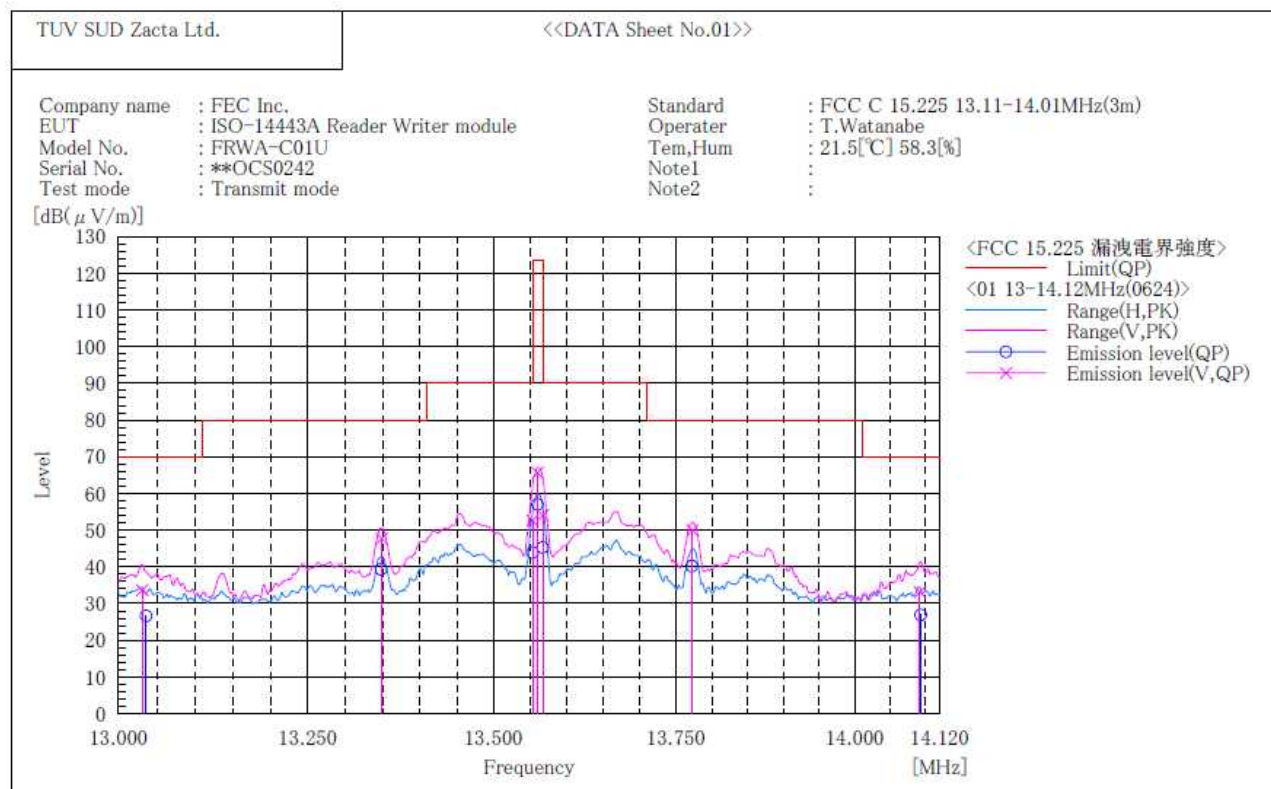
5.4 Test data

Date	: Jun. 24, 2013	Test personnel	:
Temperature	: 21.5 [°C]	Tested by	:
Humidity	: 58.3 [%]		
Test place	: 3m Semi-anechoic chamber		: <u>Taiki Watanabe</u>

Frequency range (MHz)	Frequency (MHz)	Level		Limit (dBuV/m)	Margin (dB)	Result
		Measured at 3m (dBuV/m)	Measured at 30m (dBuV/m)			
13.553-13.567	13.560	65.6	25.6	84.0	58.4	PASS
13.41-13.553	13.553	52.6	12.6	50.5	37.9	PASS
13.567-13.71	13.567	54.0	14	50.5	36.5	PASS
13.11-13.41	13.349	47.7	7.7	40.5	32.8	PASS
13.71-14.01	13.773	50.0	10	40.5	30.5	PASS
12.66-13.11	13.031	33.6	-6.4	29.5	35.9	PASS
14.01-14.46	14.092	33.1	-6.9	29.5	36.4	PASS

5.5 Trace data

***** RADIATED EMISSION *****
 << 3m Semi-anechoic chamber >>



Final Result

No.	Frequency	(P)	Reading	c. f	Result	Limit	Margin	Height	Angle	Remark
	[MHz]		QP [dB(μV)]	[dB(1/m)]	QP [dB(μV/m)]	QP [dB(μV/m)]	QP [dB]	[cm]	[°]	
1	13.560	V	75.4	-9.8	65.6	123.5	57.9	100.0	167.0	
2	13.567	V	63.8	-9.8	54.0	90.0	36.0	100.0	167.0	
3	13.553	V	62.4	-9.8	52.6	90.0	37.4	100.0	167.0	
4	13.773	V	59.8	-9.8	50.0	80.0	30.0	100.0	161.0	
5	13.349	V	57.5	-9.8	47.7	80.0	32.3	100.0	169.0	
6	13.031	V	43.5	-9.9	33.6	70.0	36.4	100.0	17.0	
7	14.092	V	42.9	-9.8	33.1	70.0	36.9	100.0	16.0	
8	13.560	H	66.8	-9.8	57.0	123.5	66.5	100.0	107.0	
9	13.567	H	55.1	-9.8	45.3	90.0	44.7	100.0	107.0	
10	13.553	H	53.7	-9.8	43.9	90.0	46.1	100.0	107.0	
11	13.772	H	50.0	-9.8	40.2	80.0	39.8	100.0	88.0	
12	13.348	H	49.1	-9.8	39.3	80.0	40.7	100.0	86.0	
13	14.093	H	36.7	-9.8	26.9	70.0	43.1	100.0	95.0	
14	13.036	H	36.5	-9.9	26.6	70.0	43.4	100.0	115.0	

6. Radiated Emissions

6.1 Measurement procedure [FCC 15.209, 15.225 (d)]

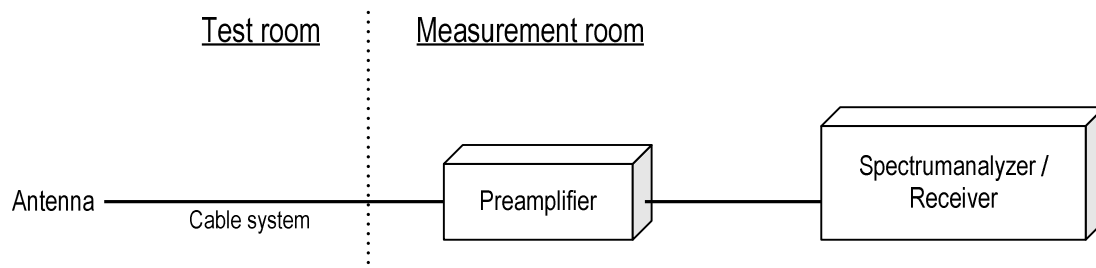
Test was applied by following conditions.

Test method	: ANSI C63.4
Frequency range	: 9kHz to 30MHz
Test place	: 3m Semi-anechoic chamber
EUT was placed on	: FRP table / (W)2.0m × (D)1.0m × (H)0.8m
Antenna distance	: 3m

Test receiver setting	
- Detector	: Average (9kHz-90kHz, 110kHz-490kHz), Quasi-peak
- Bandwidth	: 200Hz, 9kHz

EUT operating mode is selected to emit the maximum noise. Overall frequency range is investigated with spectrum analyzer using peak detector. Then, emission measurements up to 30MHz were performed with test receiver in above setting. The turntable and the Loop antenna are rotated by 360 degrees and stopped at azimuth of producing the maximum emission. Sufficient time for EUT, peripherals and test equipment is provided in order for them to warm up to their normal operating condition.

- Test configuration



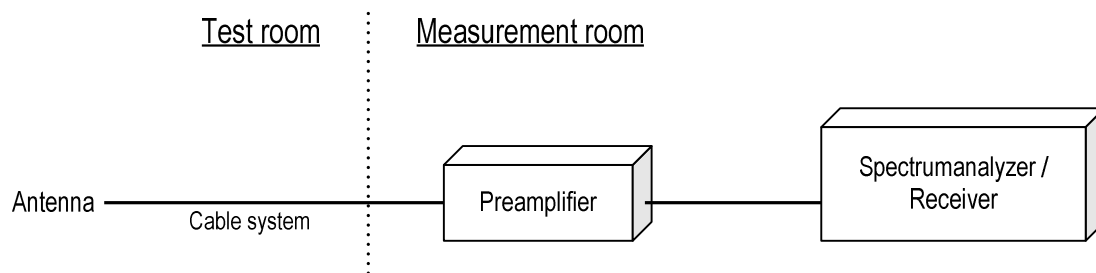
Test was applied by following conditions.

Test method	: ANSI C63.4
Frequency range	: 30MHz to 1000MHz
Test place	: 3m Semi-anechoic chamber
EUT was placed on	: FRP table / (W)2.0m × (D)1.0m × (H)0.8m
Antenna distance	: 3m

Test receiver setting	
- Detector	: Quasi-peak
- Bandwidth	: 120kHz

EUT operating mode is selected to emit the maximum noise. Overall frequency range is investigated with spectrum analyzer using peak detector. Then, emission measurements up to 1000MHz were performed with test receiver in above setting. In order to find the maximum emissions, antenna is adjusted between 1m and 4m in height and varied its polarization (horizontal and vertical), and EUT azimuth was also varied by rotating turntable 0 to 360 degrees. Sufficient time for EUT, peripherals and test equipment is provided in order for them to warm up to their normal operating condition.

- Test configuration



6.2 Calculation method

[9kHz to 150kHz]

Emission level = Reading + (Ant. factor + Cable system loss)

Margin = Limit – Emission level

[150kHz to 1000MHz]

Emission level = Reading + (Ant. factor + Cable system loss – Amp. Gain)

Margin = Limit – Emission level

6.3 Limit

Frequency [MHz]	Field strength		Distance [m]
	[uV/m]	[dBuV/m]	
0.009-0.490	$2400 / F$ [kHz]	$20\log E$ [uV/m]	300
0.490-1.705	$24000 / F$ [kHz]	$20\log E$ [uV/m]	30
1.705-30	30	29.5	30
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	300	54.0	3

Note:

1. The lower limit shall apply at the transition frequencies.
2. Emission level [dBuV/m] = $20\log$ Emission [uV/m]
3. Measurements were corrected to 30m using $40\log (3/30) = -40.0\text{dB}$
4. CISPR 22 limit was applied radiated emission measurements as prescribed in FCC Part 15 section 15.109(g).

6.4 Test data

Date : Jun. 24, 2013 Test personnel :
 Temperature : 21.5 [°C]
 Humidity : 58.3 [%] Tested by :
 Test place : 3m Semi-anechoic chamber Taiki Watanabe

[9kHz to 30MHz]

Frequency [MHz]	Reading [dBuV] At 3m	c.f [dB(1/m)]	Result [dBuV/m] At 3m	Result [dBuV/m] At 30m	Limit [dBuV/m] At 30m	Margin [dB]	Result
27.12	37.0	-8.2	28.8	-11.2	29.5	40.7	PASS

[30MHz to 1000MHz]

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [°]
1	40.680	V	39.8	-10.0	29.8	40.0	10.2	100.0	33.0
2	162.729	H	44.5	-8.4	36.1	43.5	7.4	189.0	253.0
3	203.395	H	42.1	-10.8	31.3	43.5	12.2	185.0	96.0
4	216.956	H	45.6	-10.2	35.4	46.0	10.6	149.0	243.0
5	230.525	H	48.1	-9.5	38.6	46.0	7.4	135.0	101.0
6	284.760	H	41.7	-7.8	33.9	46.0	12.1	100.0	115.0

7. Frequency Tolerance

7.1 Measurement procedure [FCC 15.205 (e)]

The EUT was placed inside of a constant temperature chamber as the temperature in the chamber was varied between -30°C and +60°C. The temperature was incremented by 10°C intervals and the unit was allowed to stabilize at each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded.

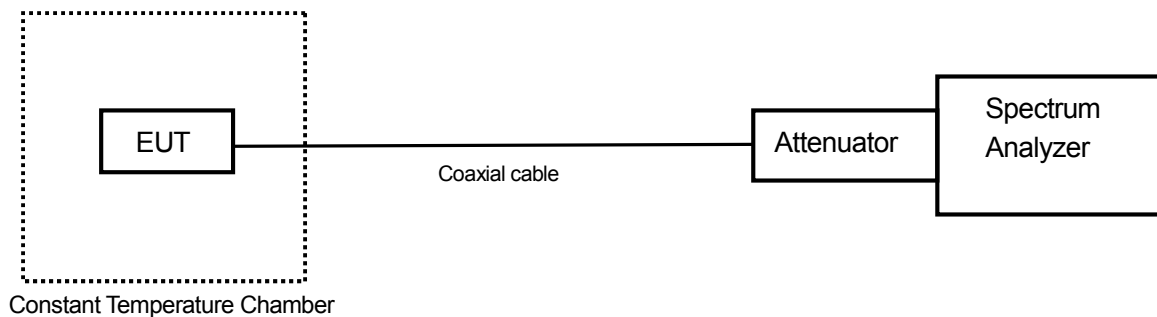
The EUT was set to operate with the following conditions.

- 13.56MHz

The test mode of EUT is as follows.

- Transmit mode

- Test configuration



7.2 Limit

The Frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ over a temperature variation of -30 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

7.3 Test data

Date : Jun. 12, 2013
 Temperature : 24.9 [°C]
 Humidity : 43.1 [%]
 Test place : Shielded room

Test personnel :

Tested by :

Chiaki Kanno

Reference Frequency: EUT Channel 13.56MHz at 20°C					
Limit: $\pm 0.01\% = \pm 100\text{ppm} = 0.135603\text{MHz}$					
Power Supply [V]	Temperature [°C]	Measurements Frequency [MHz]	Frequency Tolerance [ppm]	Limit [ppm]	Result
5	50	13.56	-7.374576884	± 100	PASS
	40	13.5601	0	± 100	PASS
	30	13.5601	0	± 100	PASS
	20	13.5601	-	± 100	PASS
	10	13.5601	0	± 100	PASS
	0	13.5602	7.374576884	± 100	PASS
	-10	13.5602	7.374576884	± 100	PASS
	-20	13.5601	0	± 100	PASS
	-30	13.5601	0	± 100	PASS
4.25	20	13.56	-7.374576884	± 100	PASS
5.75	20	13.5601	0	± 100	PASS

Note. Frequency Tolerance (ppm) = Measurements Frequency (MHz) – Reference Frequency (MHz) / Reference Frequency (MHz) x 1000000

8. AC Power Line Conducted Emissions

8.1 Measurement procedure [FCC 15.207]

Test was applied by following conditions.

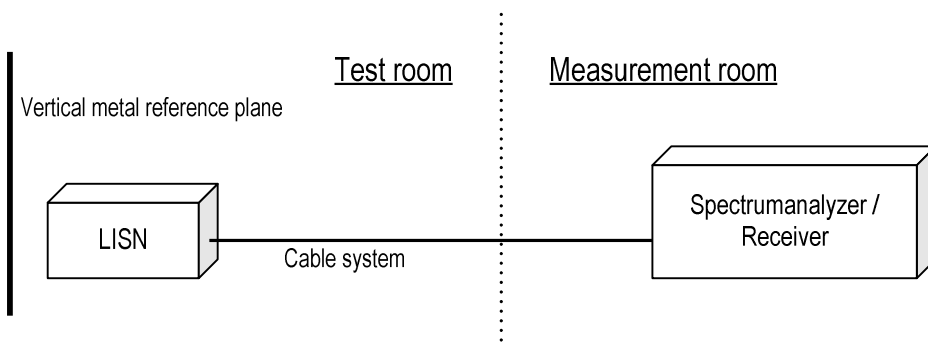
Test method	: ANSI C63.4
Frequency range	: 0.15MHz to 30MHz
Test place	: 3m Semi-anechoic chamber
EUT was placed on	: FRP table / (W)2.0m × (D)1.0m × (H)0.8m
Vertical Metal Reference Plane	: (W)2.0m × (H)2.0m 0.4m away from EUT
Test receiver setting	
- Detector	: Quasi-peak, Average
- Bandwidth	: 9kHz

EUT and peripherals are connected to 50Ω/50μH Line Impedance Stabilization Network (LISN) which are connected to reference ground plane, and are placed 80cm away from EUT. Excess of AC power cable is bundled in center.

LISN for peripheral is terminated in 50Ω.

EUT operating mode is selected to emit the maximum noise. Overall frequency range is investigated with spectrum analyzer using peak detector. Maximum emission configuration is determined by manipulating the EUT, peripherals, interconnecting cables. Then, emission measurements are performed with test receiver in above setting to each current-carrying conductor of the mains port. Sufficient time for EUT, peripherals and test equipment is provided in order for them to warm up to their normal operating condition. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits.

- Test configuration



8.2 Calculation method

Emission level = Reading + (LISN. factor + Cable system loss)

Margin = Limit – Emission level

8.3 Limit

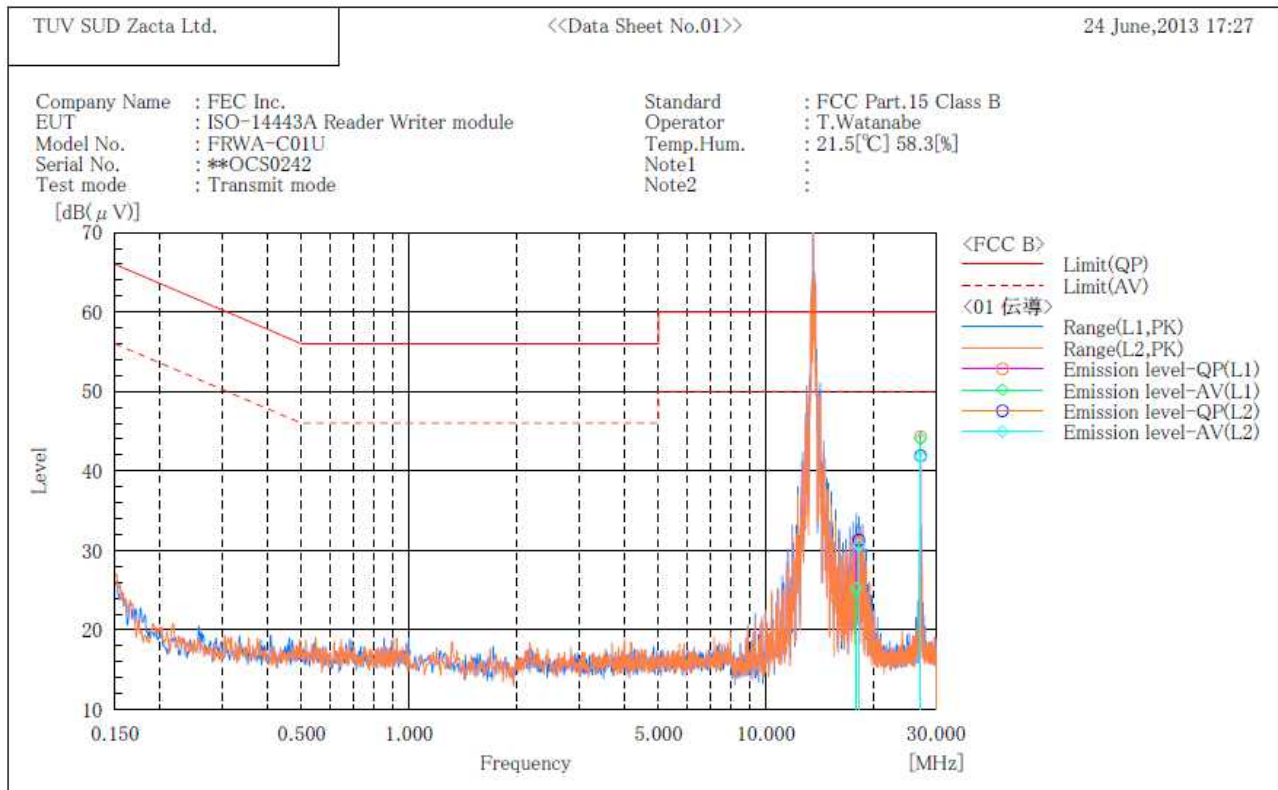
Frequency [MHz]	Limit	
	QP [dBuV]	AV [dBuV]
0.15-0.5	66-56*	56-46*
0.5-5	56	46
5-30	60	50

*: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

8.4 Test data

[Transmit mode]

***** CONDUCTED EMISSION at MAINS PORT *****
 << 3m Semi-anechoic chamber >>



Final Result

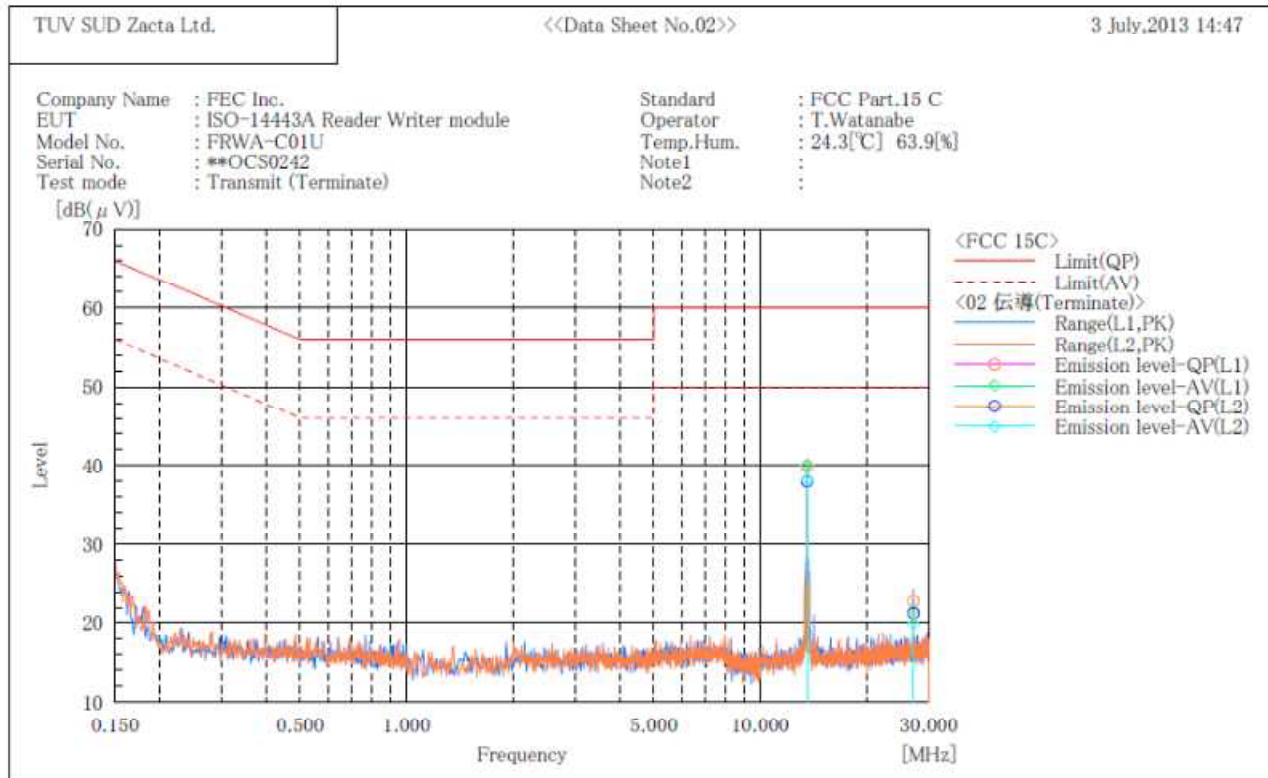
--- L1 Phase ---										
No.	Frequency	Reading QP	Reading AV	c. f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
	[MHz]	[dB(μV)]	[dB(μV)]	[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]
1	17.9039	20.2	14.2	11.0	31.2	25.2	60.0	50.0	28.8	24.8
2	27.120	32.9	32.6	11.4	44.3	44.0	60.0	50.0	15.7	6.0

--- L2 Phase ---										
No.	Frequency	Reading QP	Reading AV	c. f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
	[MHz]	[dB(μV)]	[dB(μV)]	[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]
1	18.2211	20.3	19.7	11.0	31.3	30.7	60.0	50.0	28.7	19.3
2	27.120	30.6	30.5	11.3	41.9	41.8	60.0	50.0	18.1	8.2

Note: Expect for above emissions, no emissions were observed during Conducted testing.

[Transmit mode (Antenna port termination)]

***** CONDUCTED EMISSION at MAINS PORT *****
 < 3m Semi-anechoic chamber >



Final Result

--- L1 Phase ---										
No.	Frequency	Reading	Reading	c.f	Result	Result	Limit	Limit	Margin	Margin
	[MHz]	QP	AV		QP	AV	QP	AV	QP	AV
		[dB(μV)]	[dB(μV)]	[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]
1	13.56015	29.1	29.3	10.8	39.9	40.1	60.0	50.0	20.1	9.9
2	27.12041	11.4	10.2	11.4	22.8	21.6	60.0	50.0	37.2	28.4

--- L2 Phase ---										
No.	Frequency	Reading	Reading	c.f	Result	Result	Limit	Limit	Margin	Margin
	[MHz]	QP	AV		QP	AV	QP	AV	QP	AV
		[dB(μV)]	[dB(μV)]	[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]
1	13.56034	27.2	27.4	10.8	38.0	38.2	60.0	50.0	22.0	11.8
2	27.12114	9.9	8.6	11.3	21.2	19.9	60.0	50.0	38.8	30.1

Note: Expect for above emissions, no emissions were observed during Conducted testing.

9. Uncertainty of measurement

Expanded uncertainties stated are calculated with a coverage Factor $k=2$.

Please note that these results are not taken into account when determining compliance or non-compliance with test result.

Test item	Measurement uncertainty
Conducted emission at mains port	$\pm 3.0\text{dB}$
Radiated emission (9kHz – 30MHz)	$\pm 4.4\text{dB}$
Radiated emission (30MHz – 1000MHz)	$\pm 4.5\text{dB}$
Radiated emission (1000MHz – 26GHz)	$\pm 3.9\text{dB}$

10. Laboratory description

1. Location:

TÜV SÜD Zacta Ltd. Yonezawa Testing Center
4149-7 Hachimanpara 5-chome Yonezawa-shi Yamagata 992-1128 Japan
Phone: +81-238-28-2880 Fax: +81-238-28-2888

2. Facility filing information:

1) NVLAP accreditation: NVLAP Lab. code: 200306-0

2) VLAC accreditation: Lab. code: VLAC-013

Site name	Radiated emission	Conducted emission for mains port	Conducted emission for telecom port	Radiated emission (CMAD)	Expiry Date
10m Semi-anechoic chamber	VLAC-013			VLAC-013	Jul. 3, 2013
3m Semi-anechoic chamber				-	
Shielded room No.1	-	VLAC-013		-	

3) FCC filing:

Site name	Registration Number	Expiry Date
Site 2	91065	Oct.31, 2014
Site 3		
10m Semi-anechoic chamber	540072	Jan. 9, 2016
3m Semi-anechoic chamber		
Shielded room No.1		

4) Industry Canada Oats site filing:

Site name	Sites on file: Oats 3m/10m	Expiry Date
Site 2	4224A-2	Jan. 23, 2015
Site 3	4224A-3	
10m Semi-anechoic chamber	4224A-4	
3m Semi-anechoic chamber	4224A-5	

5) VCCI site filing:

Site name	Radiated emission	Conducted emission for mains port	Expiry Date	Conducted emission for telecom port	Expiry Date
Site 2	R-137	C-133	Nov. 16, 2014	T-1221	Nov. 28, 2014
Site 3	R-138	C-134		T-1222	
10m Semi-anechoic chamber	R-2480	C-2722	Jul. 3, 2013	T-1474	Jul. 3, 2013
	G-81	-		-	-
3m Semi-anechoic chamber	R-2481	C-2723		T-1475	Jul. 3, 2013
	G-82	-		-	-
Shielded room No.1	-	C-2724		T-1476	Jul. 3, 2013

6) TÜV SÜD PS authorization:

Authorized as an EMC test laboratory

7) TÜV Rheinland authorization:

Authorized as an EMC test laboratory

Appendix A. Test equipment

Antenna port conducted test

Equipment	Company	Model No.	Serial No.	Cal. due	Cal. date
Spectrum analyzer	Agilent Technologies	E4440A	US40420937	Oct. 2013	Oct. 19, 2012
Microwave cable	RS	YH20_S1	N/A (S389)	Aug. 2013	Aug. 30, 2012
Microwave cable	SUHNER	SUCOFLEX104/1.5m	199121/4	Oct. 2013	Oct. 7, 2012
Attenuator	Weinschel	56-10	J4180	Nov. 2013	Nov. 12, 2012
Operation type temperature controlled bath	Espec	PL3KP	14016727	Dec. 2013	Dec. 27, 2012

Radiated emission

Equipment	Company	Model No.	Serial No.	Cal. due	Cal. date
EMI Receiver	ROHDE&SCHWARZ	ECSI	100764	Jul. 2013	Jul. 6, 2012
Preamplifier	ANRITSU	MH648A	M96057	Jun. 2014	Jun. 12, 2013
Loop antenna	ROHDE&SCHWARZ	HFH2-Z2	892246/010	Sep. 2013	Sep. 14, 2012
TRILOG antenna	Schwarzbeck	VULB9160	9160-3220	Apr. 2014	Apr. 10, 2013
Attenuator	TME	CFA-01NPJ-6	N/A (S274)	Jun. 2014	Jun. 12, 2013
Microwave cable	SUHNER	SUCOFLEX104/9m	346316/4	Oct. 2013	Oct. 6, 2012
		SUCOFLEX104/1m	322084/4	Oct. 2013	Oct. 6, 2012
		SUCOFLEX104/1.5m	317226/4	Oct. 2013	Oct. 6, 2012
		SUCOFLEX104/7m	41625/6	Oct. 2013	Oct. 6, 2012
PC	DELL	DIMENSION E521	75465BX	N/A	N/A
Software	TOYO Corporation	EP5/RE-AJ	0611193/V5.3.61	N/A	N/A
3m Semi-anechoic chamber	TOKIN	N/A	N/A (9002-NSA)	May 2014	May 19, 2013

Conducted emission at mains port

Equipment	Company	Model No.	Serial No.	Cal. due	Cal. date
EMI Receiver	ROHDE&SCHWARZ	ECSI	100764	Jul. 2013	Jul. 6, 2012
Attenuator	HUBER+SUHNER	6810.01.A	N/A (S411)	Feb. 2014	Feb. 28, 2013
Line impedance stabilization network for EUT	Kyoritsu Electrical Works, Ltd.	KNW-407F	8-2003-1	Mar. 2014	Mar. 12, 2013
Line impedance stabilization network for peripheral	Kyoritsu Electrical Works, Ltd.	KNW-242F	8-1973-1	Jun. 2014	Jun. 13, 2013
Coaxial cable	FUJIKURA	5D-2W/4m	N/A (S350)	Feb. 2014	Feb. 4, 2013
Coaxial cable	FUJIKURA	5D-2W/1.5m	N/A (S193)	Feb. 2014	Feb. 4, 2013
Coaxial cable	SUHNER	RG214/U/10m	N/A (S194)	Feb. 2014	Feb. 4, 2013
50Ω terminator	HRS	UG-88/U	N/A (S068)	Nov. 2013	Nov. 29, 2012
PC	DELL	DIMENSION E521	75465BX	N/A	N/A
Software	TOYO Corporation	EP5/CE-AJ	0611193/V5.2.41	N/A	N/A