FCC TEST REPORT

According to

FCC CFR Title 47 Part 15 Subpart C

Applicant	:	BQT Solutions（Australia）Pty Ltd
Address	:	Unit 29,1 Talavera Road,North Ryde,NSW2113, Australia
Manufacturer	:	BQT Solutions（Australia）Pty Ltd
Address	:	Unit 29,1 Talavera Road,North Ryde,NSW2113, Australia
Equipment	:	Biometric Contactless Smart Card Reader
Trade Mark	:	BQT
Model No.	:	BT910X-2
FCC ID	:	QVL-BT910X2

- The test result refers exclusively to the test presented test model / sample.,
- Without written approval of ***Cerpass Technology (Suzhou) Co.,Ltd***. the test report shall not be reproduced except in full.
- The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Rules and Regulations Part 15. The test report has been issued separately.
- The test report must not be used by the clients to claim product certification approval by ***NVLAP*** or any agency of the Government.

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Document history

Attachment No.	Date	Description

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I **HEREBY** CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.4 – 2009** and the energy emitted by this equipment was ***passed*** **CISPR PUB. 22 and FCC Part 15** in both radiated and conducted emission class B limits. Testing was carried out on July 20~24 at ***Cerpass Technology (Suzhou) Co.,Ltd***

Signature

Miro Chueh/ Technical director

1. Report of Measurements and Examinations

FCC CFR Title 47 Part 15 Subpart C ANSI C63.4: 2009			
Clause	Test Parameter	Test Performed	Remark
15.203	. Antenna Requirement	YES	PASS
15.225 (a)	In-band Emission	YES	PASS
15.225 (b)	In-band Emission	YES	PASS
15.225 (c)	In-band Emission	YES	PASS
15.225 (d) 15.209	Out-of –band Emission	YES	PASS
15.225 (e)	Frequency Stability Tolerance	YES	PASS
15.207	Conducted Emissions	YES	PASS

2. Test Configuration of Equipment under Test

2.1. Feature of Equipment under Test

Equipment	Biometric Contactless Smart Card Reader
Model No.	BT910X-2
Trade Mark	BQT
Frequency	13.56MHz
Number of Channel	1 channel
Modulation type	ASK
Transmit Power	67.14dBuV/m(3M)
Antenna type	Integrate Antenna (Without any antenna connector)
Power Supply	12V DC

2.2. Carrier Frequency of Channels

Channel	Frequency(MHz)	Channel	Frequency(MHz)
01	13.56	---	---
---	---	---	---
---	---	---	---

2.3. Test Mode & Test Software

A. Test Mode & Test Software
B. During testing, the interface cables and equipment positions were varied according to ANSI C63.4
C. The complete test system included EUT for RF test.
D. The following test mode was performed for conduction and radiation test:

2.4. Description of Test System

No	Device	Manufacturer	Model No.	FCC ID	Series No.	Data Cable	Power Cord
1	Notebook	Asus	W6A	N/A	N/A	RS-485 and USB Cable Unshielded1.4m	N/A
2	Battery	Zhengjiangju jiang	36B20L MF	N/A	N/A	N/A	Unshielded 0.5m
3	Mouse	DELL	OXN967	N/A	N/A	Unshielded 1.8m	N/A

2.5. General Information of Test

Test Site:	Cerpass Technology Corp.
Performand Location :	No.66,Tangzhuang Road, Suzhou Industrial Park, Jiangsu 215006, China
NVLAP LAB Code :	200814-0
FCC Registration Number :	916572, 331395
IC Registration Number :	7290A-1, 7290A-2
VCCI Registration Number :	T-343 for Telecommunication Test C-2919 for Conducted emission test R-2670 for Radiated emission test below 1GHz G-227 for Radiated emission test above 1GHz

Laboratory accreditation

2.6. Measurement Uncertainty

Measurement Item	Measurement Frequency	Polarization	Uncertainty
Conducted Emission	9 kHz ~ 30 MHz	LINE/NEUTRAL	±2.71 dB
Radiated Emission	30 MHz ~ 25GHz	Vertical	±4.11 dB
		Horizontal	±4.10 dB
Occupied Bandwidth	---	---	±7500 Hz
Maximum Peak Output Power	---	---	±1.4 dB
Band Edges	---	---	±2.2 dB
Power Spectral Density	---	---	±2.2 dB

3. Antenna Requirements

3.1. Standard Applicable

For intentional device, according to FCC 47 CFR 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.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

with the device.

3.2. Limit

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. 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 use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited.

3.3. Antenna Construction

Antenna type: Intergrate Antenna

4. Test of Conducted Emission

4.1. Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 120 VAC power and return leads of the EUT according to the methods defined in ANSI C63.4-2009 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 2.2. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

*Decreases with the logarithm of the frequency.

4.2. Test Procedures

The EUT was setup according to ANSI C63.4, 2009 and tested according to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

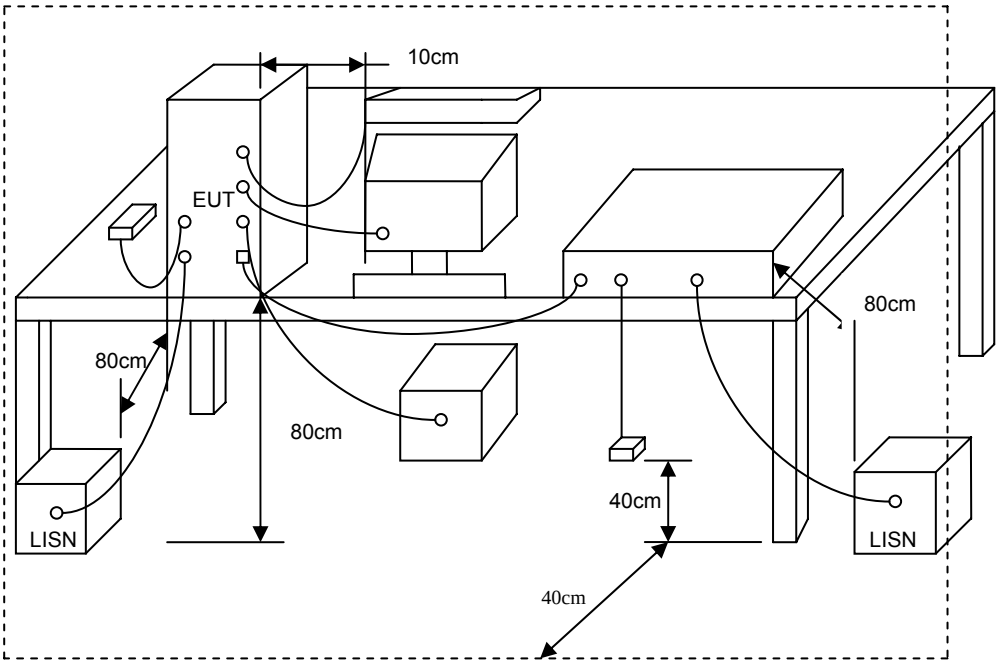
The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)

Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

4.3. Typical Test Setup

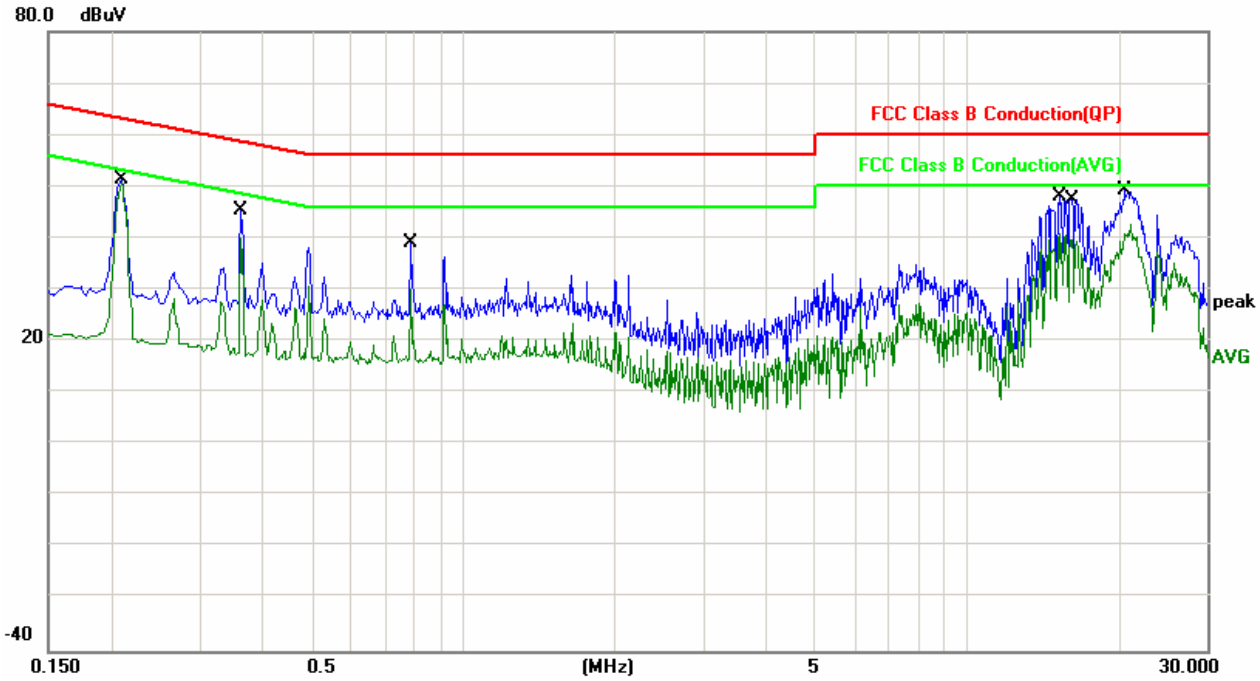


4.4. Measurement Equipment

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date.
Test Receiver	R&S	ESCI	100565	2012.11.05	2013.11.04
AMN	R&S	ESH2-Z5	100182	2012.11.05	2013.11.04
Two-Line V-Network	R&S	ENV216	100325	2013.03.10	2014.03.09
ISN	FCC	FCC-TLISN-T2-02	20379	2012.12.08	2013.12.07
ISN	FCC	FCC-TLISN-T4-02	20380	2012.12.08	2013.12.07
ISN	FCC	FCC-TLISN-T8-02	20381	2012.12.08	2013.12.07
ISN	TESEQ	ISN ST08	30175	2013.09.13	2014.09.12
Current Probe	R&S	EZ-17	100303	2013.03.10	2014.03.09
Passive Voltage Probe	R&S	ESH2-Z3	100026	2013.03.10	2014.03.09
Attenuator	R&S	ESH3-Z2	100529	2013.03.10	2014.03.09
Temperature/ Humidity Meter	Zhicheng	ZC1-11	CEP-TH-004	2013.03.10	2014.03.09

4.5. Test Result and Data

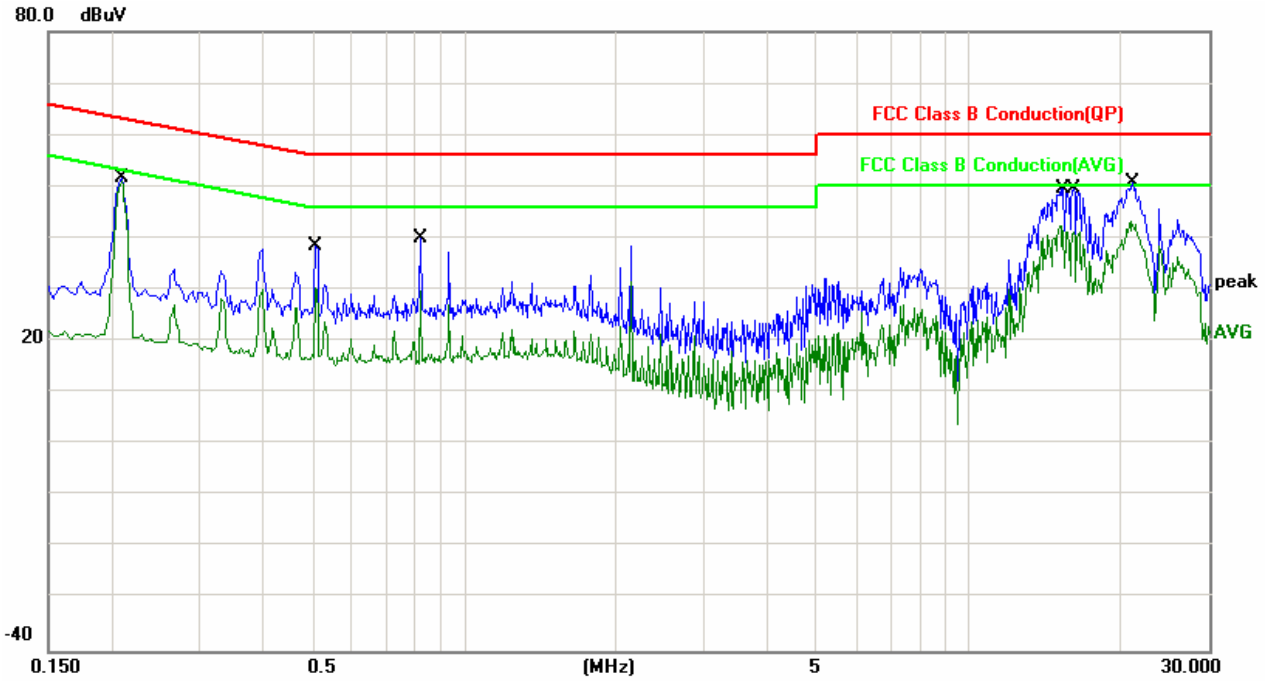
Test Mode :	Normal Link		
AC Power :	AC 120V/60Hz	Phase :	LINE
Temperature :	22°C	Humidity	50%
Pressur(mbar) :	1002	Date:	2013/09/24



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Remark
1	0.2100	0.03	50.01	50.04	63.20	-13.16	QP	PASS
2	0.2100	0.03	50.22	50.25	53.20	-2.95	AVG	PASS
3	0.3620	0.05	32.83	32.88	58.68	-25.80	QP	PASS
4	0.3620	0.05	20.58	20.63	48.68	-28.05	AVG	PASS
5	0.7900	0.09	26.20	26.29	56.00	-29.71	QP	PASS
6	0.7900	0.09	17.91	18.00	46.00	-28.00	AVG	PASS
7	15.3020	0.36	43.50	43.86	60.00	-16.14	QP	PASS
8	15.3020	0.36	35.86	36.22	50.00	-13.78	AVG	PASS
9	16.1820	0.37	43.04	43.41	60.00	-16.59	QP	PASS
10	16.1820	0.37	35.13	35.50	50.00	-14.50	AVG	PASS
11	20.6180	0.41	44.44	44.85	60.00	-15.15	QP	PASS
12	20.6180	0.41	38.75	39.16	50.00	-10.84	AVG	PASS

Note: Measurement Level = Reading Level + Correct Factor

Test Mode :	Normal Link		
AC Power :	AC 120V/60Hz	Phase :	NEUTRAL
Temperature :	22°C	Humidity	50%
Pressur(mbar) :	1002	Date:	2013/09/24



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Remark
1	0.2100	0.10	50.45	50.55	63.20	-12.65	QP	PASS
2	0.2100	0.10	50.69	50.79	53.20	-2.41	AVG	PASS
3	0.5100	0.12	25.79	25.91	56.00	-30.09	QP	PASS
4	0.5100	0.12	17.52	17.64	46.00	-28.36	AVG	PASS
5	0.8220	0.14	26.11	26.25	56.00	-29.75	QP	PASS
6	0.8220	0.14	17.32	17.46	46.00	-28.54	AVG	PASS
7	15.3980	0.38	44.57	44.95	60.00	-15.05	QP	PASS
8	15.3980	0.38	37.63	38.01	50.00	-11.99	AVG	PASS
9	16.1820	0.39	44.43	44.82	60.00	-15.18	QP	PASS
10	16.1820	0.39	37.52	37.91	50.00	-12.09	AVG	PASS
11	21.1820	0.43	45.66	46.09	60.00	-13.91	QP	PASS
12	21.1820	0.43	40.11	40.54	50.00	-9.46	AVG	PASS

Note: Measurement Level = Reading Level + Correct Factor

5. Out-of-band Emission (15.225 (d), 15.209) Test Limit

15.225 (d) The Field Strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in 15.209

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

Remark: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

In accordance with Section 15.33(a), in some cases the emissions from an intentional radiator must be measured to beyond the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator because of the incorporation of a digital device. If measurements above the tenth harmonic are so required, the radiated emissions above the tenth harmonic shall comply with the general radiated emission limits applicable to the incorporated digital device, as shown in Section 15.109 and as based on the frequency of the emission being measured, or, except for emissions contained in the restricted frequency bands shown in Section 15.205, the limit on spurious emissions specified for the intentional radiator, whichever is the higher limit. Emissions which must be measured above the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator and which fall within the restricted bands shall comply with the general radiated emission limits in Section 15.109 that are applicable to the incorporated digital device.

5.1. Test Procedures

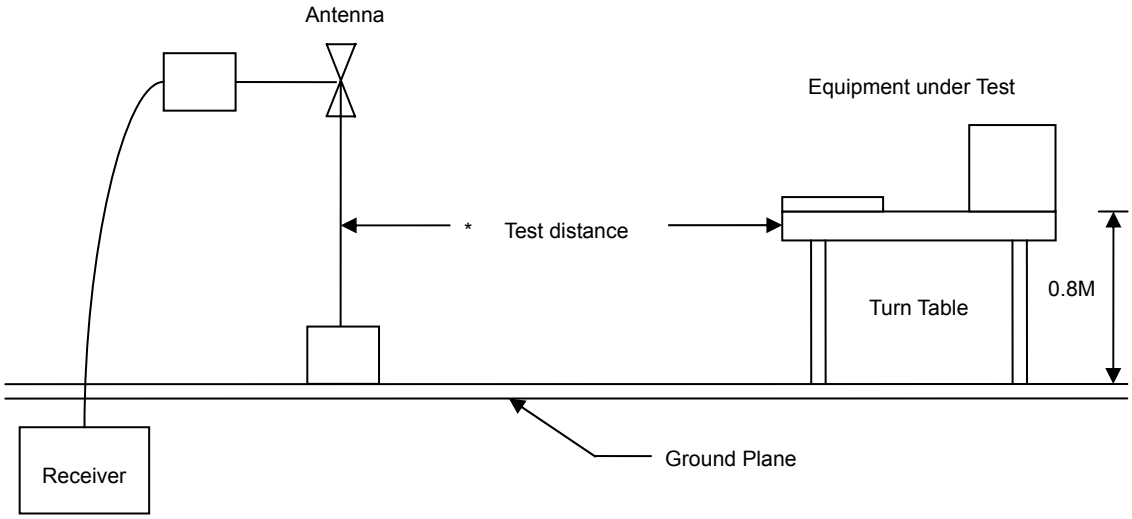
The spurious emissions from the EuT will be measured on an 10m Anechoic chamber in the frequency range of 9 kHz to 30 MHz using a tuned receiver and a shielded loop antenna.
The antenna was positioned 3, 10 or 30 meters horizontally from the EuT.
Measurements have been made in all three orthogonal axes and the shielded loop antenna was rotated to locate the maximum of the emissions.
In the case where larger measuring distances are required the results will extrapolated based on the values measured on the closer distances according to Section 15.31 (f) (2) [2].
The final measurement will be performed with an EMI Receiver set to Quasi Peak detector except for the frequency bands 9 kHz to 90 kHz and 110 to 490 kHz where an average detector will be used according to Section 15.209 (d) [2].
The final level, expressed in dBµV/m, is arrived at by taking the reading from the EMI receiver (Level dBµV) and adding the antenna correction factor and cable loss factor (Factor dB) to it. This result then has to be compared with the relevant FCC limit. The resolution
bandwidth during the measurement is as follows:

9 kHz – 150 kHz: ResBW: 200 Hz
150 kHz – 30 MHz: ResBW: 9 kHz

The preliminary radiated measurements were performed to determine the frequency producing the maximum emissions in an anechoic chamber at a distance of 3 meters.
The EUT was placed on the top of the 0.8-meter height, 1 × 1.5 meter non-metallic table. To find the maximum emission levels, the height of a measuring antenna was changed and the turntable was rotated 360°.
The antenna polarization was also changed from vertical to horizontal. The spectrum was scanned from 30 to 1000 MHz using the BILOG antenna.
To obtain the final measurement data, the EUT was arranged on a turntable situated on a 10m chamber. The EUT was tested at a distance 3 meters.
Each frequency found during preliminary measurements was re-examined and investigated. The test-receiver system was set up to average, peak, and quasi-peak

detector function with specified bandwidth.

5.2. Typical Test Setup

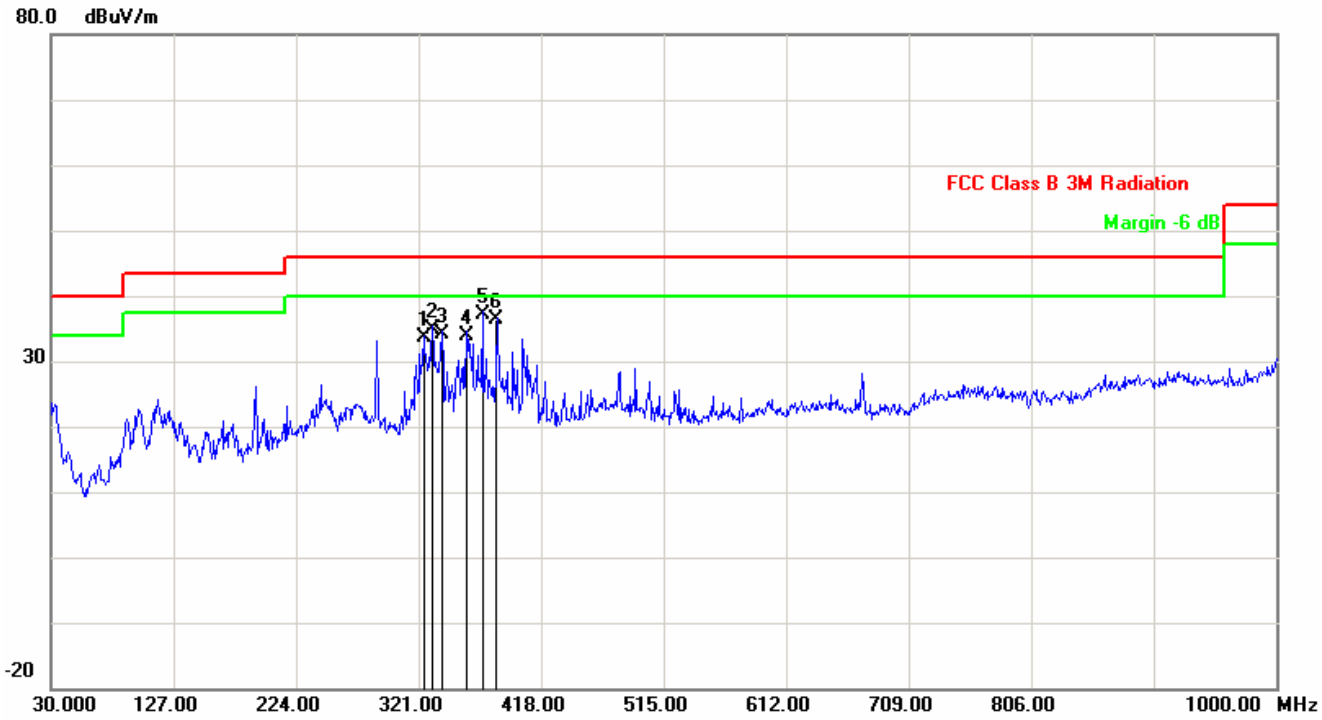


5.3. Measurement Equipment

Instrument/Ancillary	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date.
EMI Test Receiver	R&S	ESCI	101183	2013.03.10	2014.03.09
Preamplifier	Agilent	87405B	My39500554	2013.03.10	2014.03.09
Preamplifier	Agilent	8449B	3008A02342	2013.03.10	2014.03.09
Ultra Broadband Antenna	R&S	HL562	100363	2013.05.02	2014.05.01
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-618	2013.05.02	2014.05.01
Spectrum Analyzer	R&S	FSP40	100324	2013.03.10	2014.03.09
Temperature/ Humidity Meter	Zhicheng	ZC1-11	CEP-TH-001	2013.03.10	2014.03.09
EMI Test Receiver	R&S	ESCI	101183	2013.03.10	2014.03.09

5.4. Test Result and Data

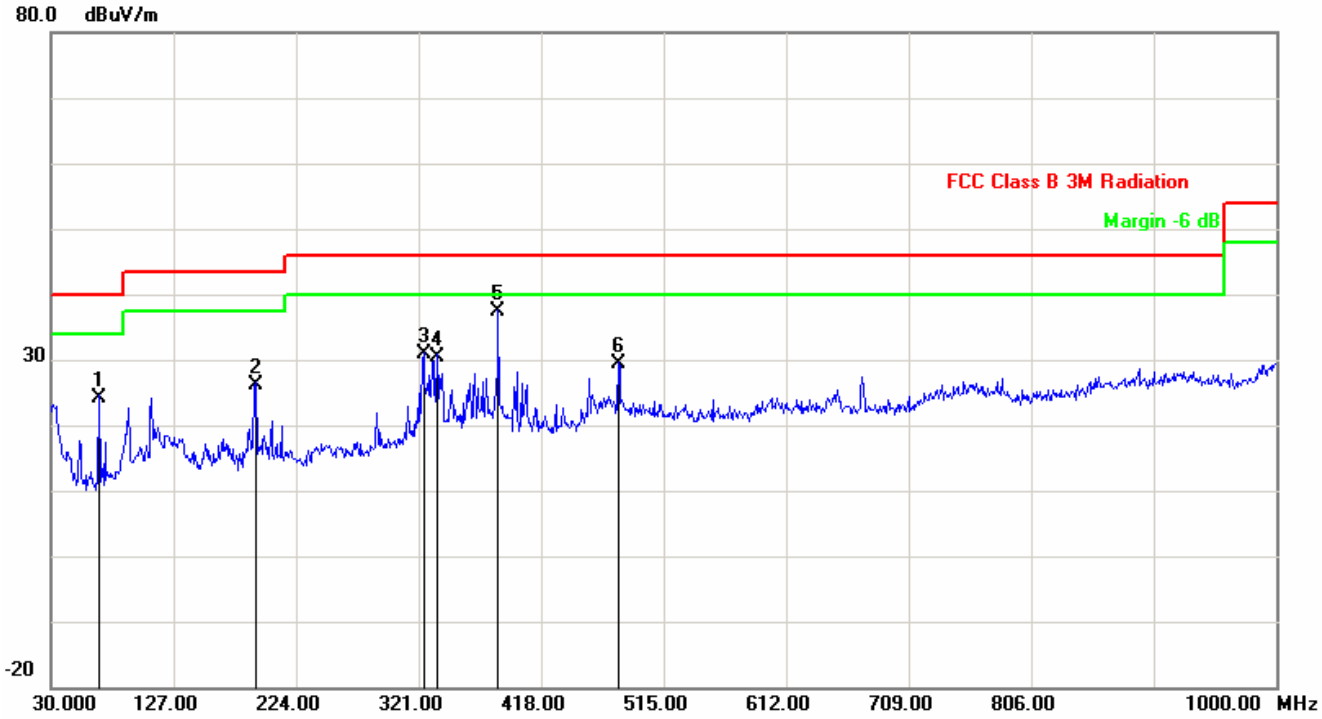
Engineer Amos	
Site : EMC Lab AC 102	**Time : 2013-09-25**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
EUT : 13.56MHz Contactless Smart Card Reader	**Probe : HORIZONTAL**
Power : AC 120V/60Hz	**Note : Normal Link**



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	324.8800	-5.45	38.97	33.52	46.00	-12.48	QP	100	357
2	331.6700	-4.11	39.02	34.91	46.00	-11.09	QP	100	357
3	339.4300	-4.32	38.51	34.19	46.00	-11.81	QP	100	349
4	358.8299	-4.39	38.34	33.95	46.00	-12.05	QP	100	151
5	371.4400	-4.76	41.92	37.16	46.00	-8.84	QP	200	139
6	383.0799	-5.26	41.65	36.39	46.00	-9.61	QP	100	144

Note: Measurement Level = Reading Level + Correct Factor

Engineer :Amos	
Site : EMC Lab AC 102	**Time : 2013-09-25**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
EUT : 13.56MHz Contactless Smart Card Reader	**Probe : VERTICAL**
Power : AC 120V/60Hz	**Note : Normal Link**



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	67.8300	-17.23	41.37	24.14	40.00	-15.86	QP	200	251
2	191.9900	-10.96	36.99	26.03	43.50	-17.47	QP	100	286
3	324.8800	-5.45	36.24	30.79	46.00	-15.21	QP	200	81
4	335.5500	-4.22	34.63	30.41	46.00	-15.59	QP	200	152
5	384.0500	-5.30	42.58	37.28	46.00	-8.72	QP	200	161
6	479.1100	-1.14	30.64	29.50	46.00	-16.50	QP	100	284

Note: Measurement Level = Reading Level + Correct Factor

6. In-band Emission (15.225 (a))

6.1. Minimum Standard

15.225 (a) The field strength of any emission within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.

6.2. Measurement Procedure

Test Procedure The Radiated Electric Field Strength intensity has been measured on semi anechoic chamber with a ground plane and at a distance of 3m.

Frequency : From 9kHz to 30MHz at distance 3m The EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity. The measurements were performed for both vertical and horizontal antenna polarization.

Frequency : From 30MHz to 1GHz at distance 3m The measuring antenna height varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity. The measurements were performed for both vertical and horizontal antenna polarization.

Measurements were performed with a QP, PK, and AV detector. The radiated emission measurements were made with the following detector function of the test receiver (below 1GHz).

Freq	9-90kHz	90-110kHz	150-490kHz	490kHz-30MHz	490kHz-30MHz
Detecter type	PK/AV	QP	PK/AV	QP	QP
IF bandwidth	200Hz	200Hz	9kHz	9kHz	120kHz

Note: Part 15 Section 15.31 (f)(2) (9kHz-30MHz)

[Limit at 3m]=[Limit at 300m]-40 x log(3[m]/300[m])

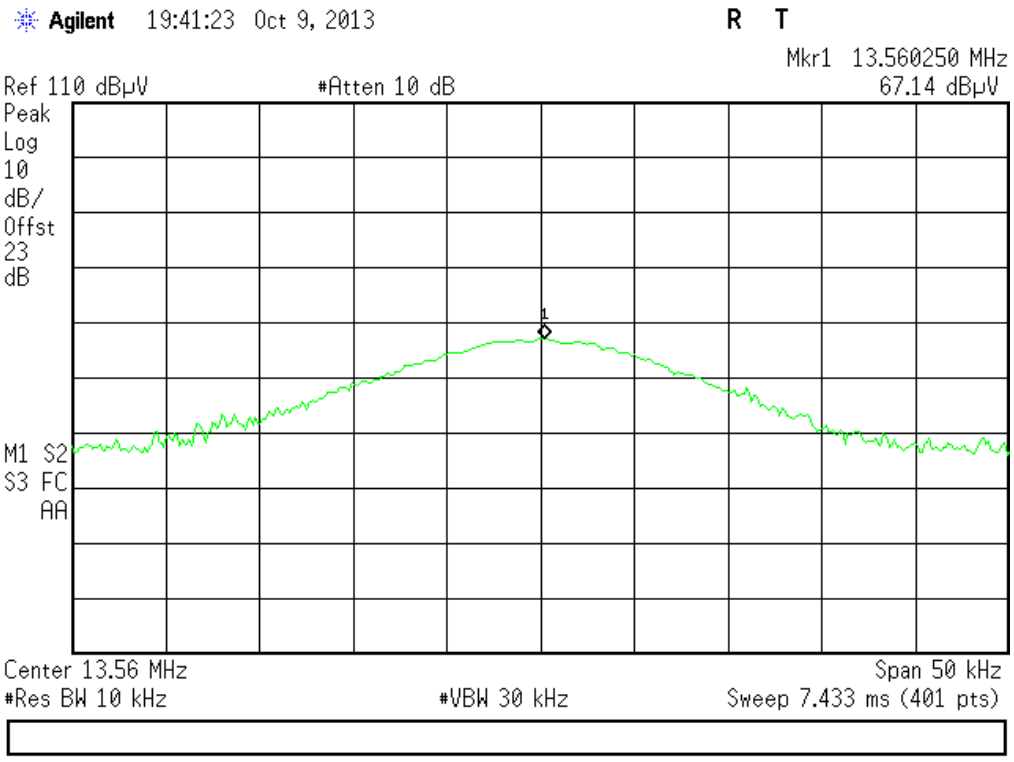
[Limit at 3m]=[Limit at 30m]-40 x log (3[m]/30[m])

6.3. Test Result

Frequency	Reading (dBuV)	Correction Factor	field strength dBμV/m at 3 m
13.56 MHz	48.58	18.56	67.14
Maximum Level(dBμV/m)			67.14
Limit(dBuV/m) at 3m			124 dBuV/m
margin			56.86

Note: Field strength limit was calculated with 40dB/dec.

Test Plot



7. In-band Emission (15.225 (b)(c))

7.1. Regulation

15.225 (b) With in the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

15.225 (c) With in the bands 13.110-13.410 MHz and 13.710-14.010 MHz, the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

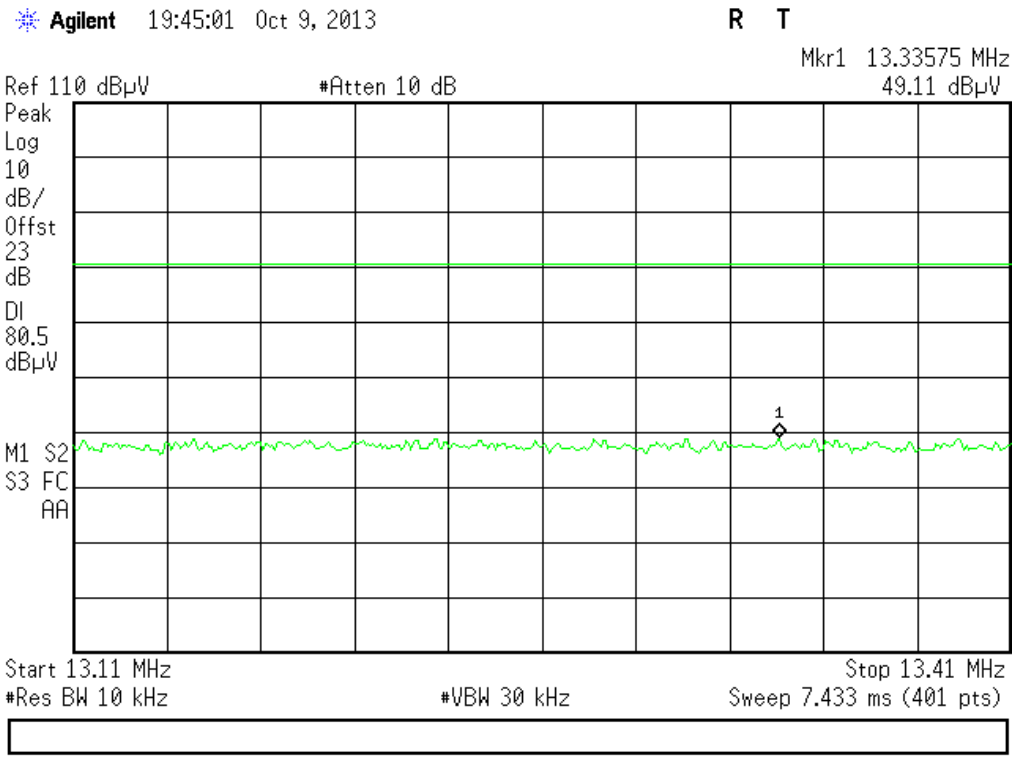
7.2. Test Result

Freq. (MHz)	Ant.Pol. H/V	Reading Level (dBuV)	Correct Factor (dB)	Measure Level (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)	Detector Mode (PK/QP)
13.33	V	60.64	-11.53	49.11	80.50	-31.39	Peak
13.55	V	66.96	-11.56	55.40	90.50	-35.1	Peak
13.57	V	66.31	-11.52	54.79	90.50	-35.71	Peak
13.73	V	60.41	-11.54	48.87	80.50	-31.63	Peak

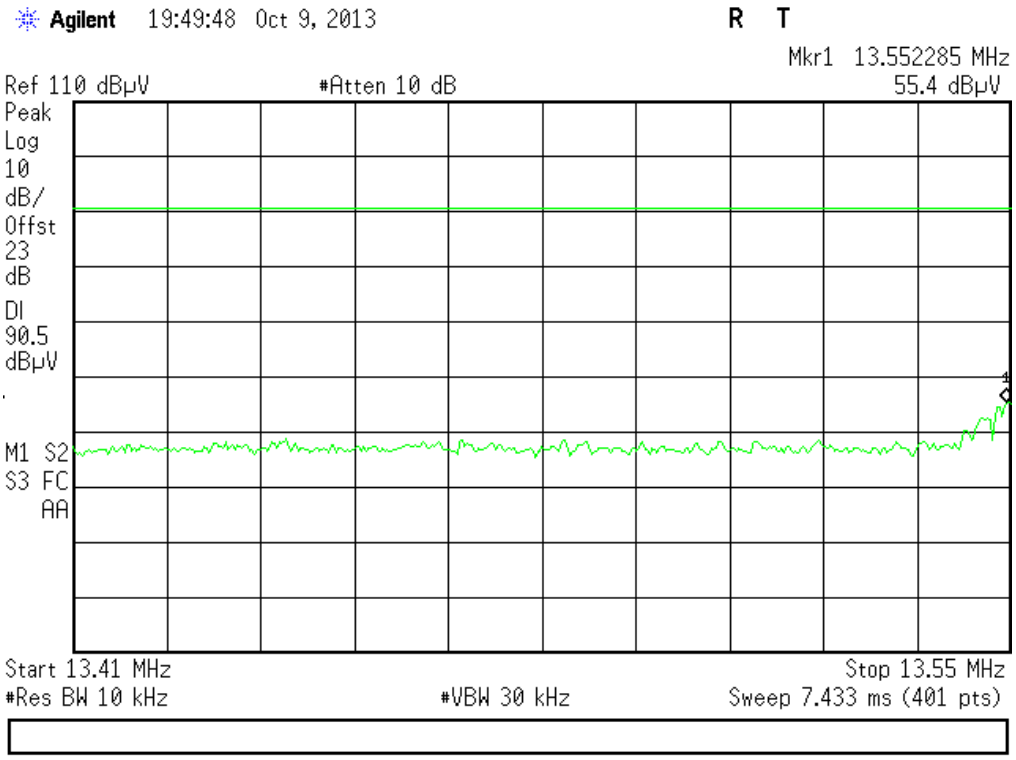
NOTE: All emissions not reported were more than 20 dB below the specified limit or in the noise floor.

Test Plot

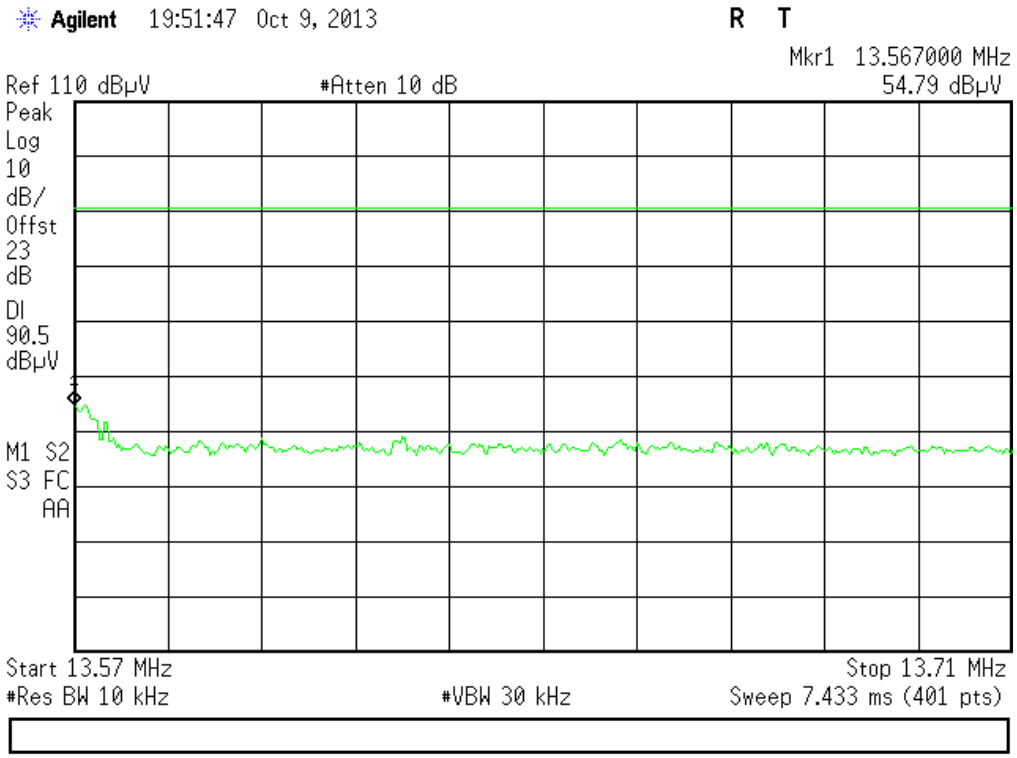
13.11-13.41MHz



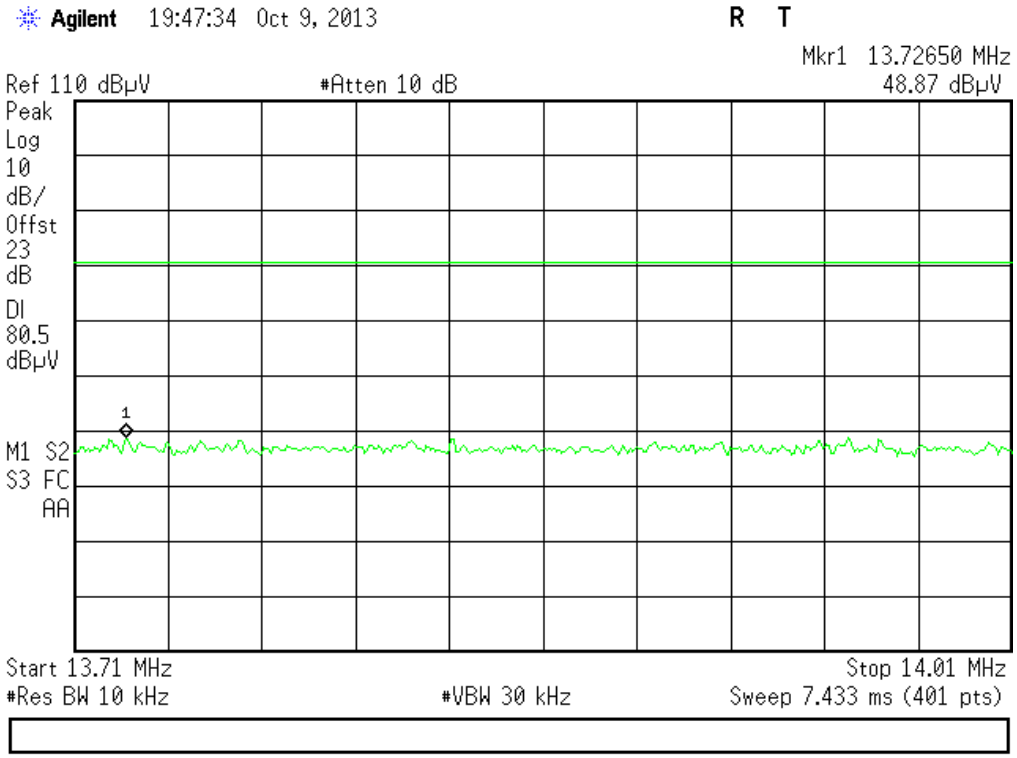
13.41-13.553MHz



13.567-13.71MHz



13.71-14.01MHz



8. Frequency tolerance (15.225 (e))

8.1. Regulation

15.225 (e) The frequency tolerance of the carrier signal shall be maintained within ±0.01% of the operating frequency over a temperature variation of −20 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. For battery operated equipment, the equipment tests shall be performed using a new battery.

8.2. Test Result

VOLTAGE (%)	POWER (V)	TEMP (°C)	FREQ (Hz)	Deviation (%)	Limit (%)
100	12	20	13560367	0.00271%	±0.01%
		-20	13560586	0.00432%	±0.01%
		-10	13560248	0.00183%	±0.01%
		0	13560543	0.00400%	±0.01%
		10	13560324	0.00239%	±0.01%
		20	13560250	0.00184%	±0.01%
		25	13560357	0.00263%	±0.01%
		30	13560481	0.00355%	±0.01%
		40	13560285	0.00210%	±0.01%
		50	13560322	0.00237%	±0.01%
85	10.2	20	13560288	0.00212%	±0.01%
115	13.8	20	13560284	0.00209%	±0.01%