TEST REPORT

Reference No.	:	WTS15S1137688E
FCC ID	:	GCD-DR6255
Applicant	:	Rosslare Enterprises Ltd
Address	:	Flat 12,9/F., Wing Fat Ind. Bldg.,12 Wang Tai Road , Kowloon Bay, Kowloon, Hong Kong
Manufacturer	:	Rosslare Electronics (Shenzhen) Ltd
Address	:	Block 2, No. A-1 Baiwangxin Industrial Park, XiLi Town, Shenzhen, China
Product Name	:	HF CSN Desktop Reader
Model No.	:	DR-6255
Standards	:	FCC CFR47 Part 15 Section 15.225: 2015
Date of Receipt sample	:	Nov. 18, 2015
Date of Test	:	Nov. 19, 2015 ～ Dec. 10, 2015
Date of Issue	:	Dec.11, 2015
Test Result	:	**Pass**

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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Compiled by:

Lake Xie / Test Engineer

Approved by:

Philo Zhong / Manager

2 Test Summary

Test Items	Test Requirement	Result
Conducted Emissions	15.207	PASS
Radiated Spurious Emissions	15.205(a) 15.209 15.225	PASS
Frequency Tolerance	15.225	PASS
20dB Bandwidth	15.215(c)	PASS
Antenna Requirement	15.203	PASS

3 Contents

4 General Information

4.1 General Description of E.U.T.

Product Name:	HF CSN Desktop Reader
Model No.:	DR-6255
Model Difference:	N/A
Type of Modulation:	FSK
Frequency Range:	13.56 MHz
The Lowest Oscillator:	12MHz
Antenna installation:	Integrated Antenna

4.2 Details of E.U.T.

Technical Data: DC 5V by USB port

4.3 Test Facility

The test facility has a test site registered with the following organizations:

- **IC – Registration No.: 7760A-1**

  Waltek Services (Shenzhen) Co., Ltd. has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration 7760A-1, October 15, 2015

- **FCC Test Site 1#– Registration No.: 880581**

  Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory `has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 880581, April 29, 2014.

- **FCC Test Site 2#– Registration No.: 328995**

  Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory `has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 328995, December 3, 2014.

5 Equipment Used during Test

5.1 Equipments List

Conducted Emissions Test Site 1#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMI Test Receiver	R&S	ESCI	100947	Sep.14,2015	Sep.13,2016
2.	LISN	R&S	ENV216	101215	Sep.14,2015	Sep.13,2016
3.	Cable	Top	TYPE16(3.5M)	-	Sep.14,2015	Sep.13,2016
Conducted Emissions Test Site 2#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMI Test Receiver	R&S	ESCI	101155	Sep.14,2015	Sep.13,2016
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	Sep.14,2015	Sep.13,2016
3.	Limiter	York	MTS-IMP-136	261115-001-0024	Sep.14,2015	Sep.13,2016
4.	Cable	LARGE	RF300	-	Sep.14,2015	Sep.13,2016
3m Semi-anechoic Chamber for Radiation Emissions Test site 1#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1	EMC Analyzer	Agilent	E7405A	MY45114943	Sep.14,2015	Sep.13,2016
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Sep.14,2015	Sep.13,2016
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Apr.18,2015	Apr.17,2016
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	Sep.14,2015	Sep.13,2016
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Apr.18,2015	Apr.17,2016
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	Apr.18,2015	Apr.17,2016
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Mar.16,2015	Mar.15,2016
8	Coaxial Cable (above 1GHz)	Top	1GHz-25GHz	EW02014-7	Apr.09,2015	Apr.08,2016
3m Semi-anechoic Chamber for Radiation Emissions Test site 2#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No**	**Last Calibration Date**	**Calibration Due Date**
1	Test Receiver	R&S	ESCI	101296	Sep.14,2015	Sep.13,2016
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	Sep.14,2015	Sep.13,2016
3	Amplifier	Compliance pirection systems inc	PAP-0203	22024	Sep.14,2015	Sep.13,2016
4	Cable	HUBER+SUHNER	CBL2	525178	Sep.14,2015	Sep.13,2016

RF Conducted Testing						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMC Analyzer (9k~26.5GHz)	Agilent	E7405A	MY45114943	Sep.14,2015	Sep.13,2016
2.	Spectrum Analyzer (9k-6GHz)	R&S	FSL6	100959	Sep.14,2015	Sep.13,2016
3.	Signal Analyzer (9k~26.5GHz)	Agilent	N9010A	MY50520207	Sep.14,2015	Sep.13,2016
4.	Humidity Chamber	GF	GTH-225-40-1P	IAA061213	Sep.14,2015	Sep.13,2016

5.2 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conducted Emissions	150kHz~30MHz	±3.64dB	(1)
Radiated Spurious Emissions	30MHz~1000MHz	±5.03dB	(1)
	1000M~5000MHz	± 5.47 dB	(1)

(1)This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

5.3 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.

6 Conducted Emission

Test Requirement:	FCC CFR 47 Part 15 Section 15.207
Test Method:	ANSI C63.4:2014
Test Result:	PASS
Frequency Range:	150kHz to 30MHz
Class/Severity:	Class B
Limit:	66-56 dBμV between 0.15MHz & 0.5MHz
	56 dBμV between 0.5MHz & 5MHz
	60 dBμV between 5MHz & 30MHz
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth)

6.1 E.U.T. Operation

Operating Environment **:**

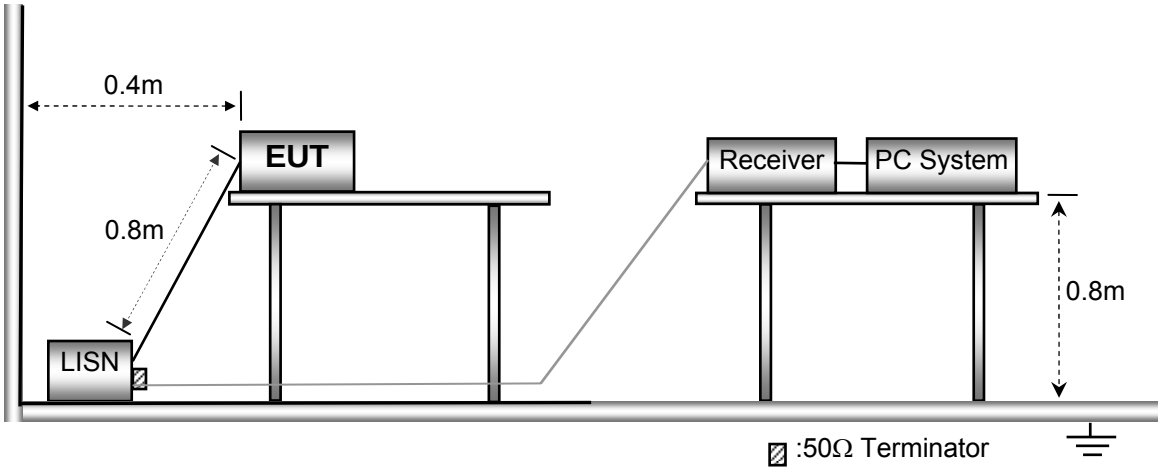
Temperature:	25.5 °C
Humidity:	51 % RH
Atmospheric Pressure:	101.2kPa

EUT Operation **:**

The test was performed in communication mode, the test data were shown in the report.

6.2 EUT Setup

The EUT was placed on the test table in shielding room.

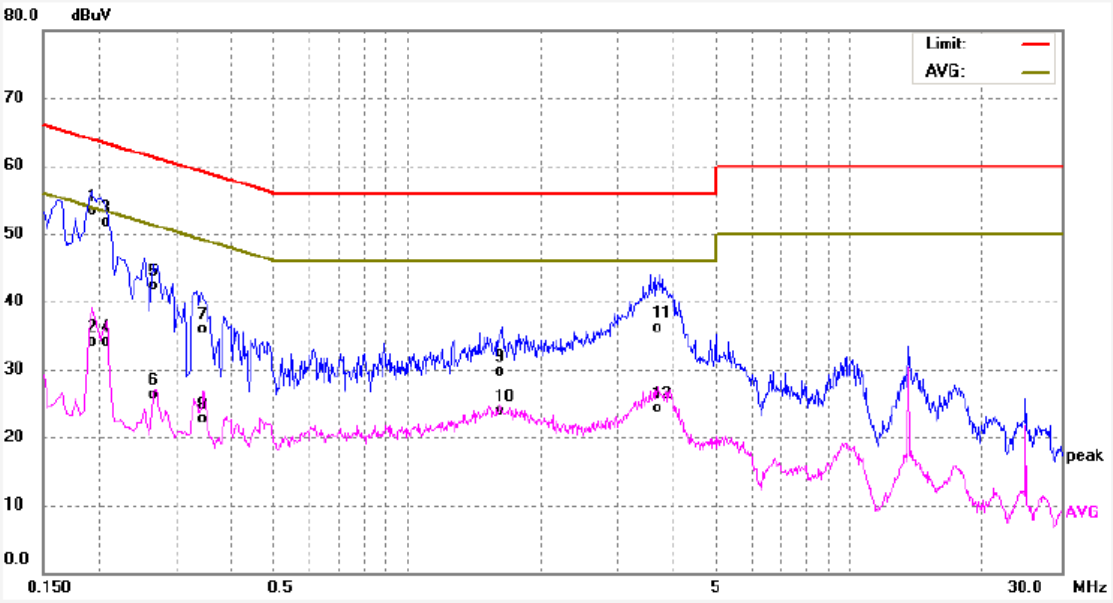


6.3 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

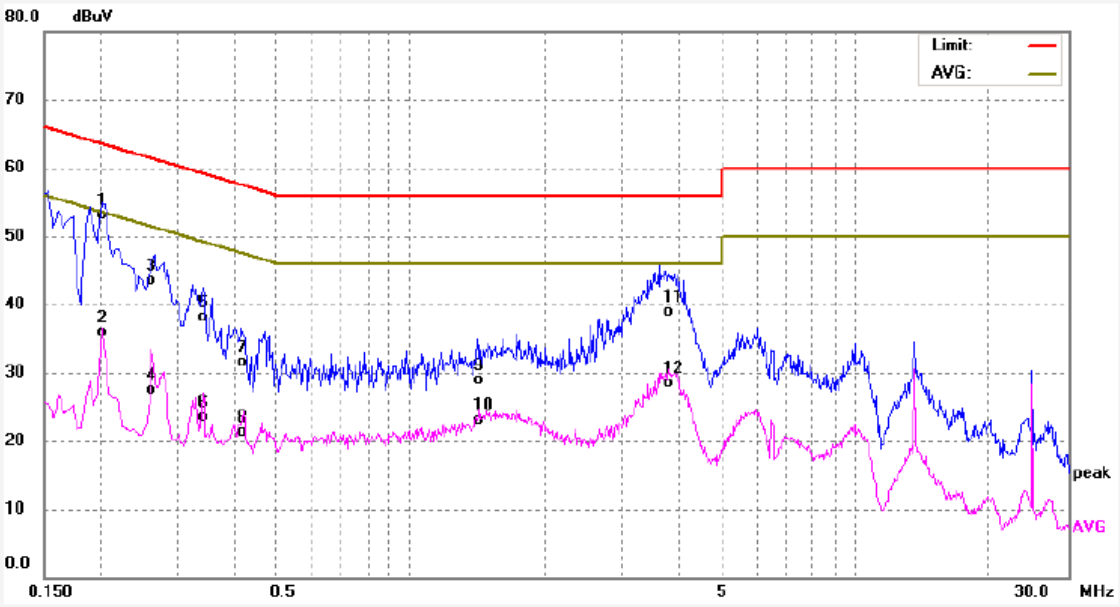
6.4 Conducted Emission Test Result

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1940	43.20	10.10	53.30	63.86	-10.56	QP	
2	0.1940	23.91	10.10	34.01	53.86	-19.85	AVG	
3	0.2100	41.53	10.10	51.63	63.20	-11.57	QP	
4	0.2100	23.92	10.10	34.02	53.20	-19.18	AVG	
5	0.2700	32.26	10.10	42.36	61.12	-18.76	QP	
6	0.2700	16.20	10.10	26.30	51.12	-24.82	AVG	
7	0.3460	25.74	10.11	35.85	59.06	-23.21	QP	
8	0.3460	12.57	10.11	22.68	49.06	-26.38	AVG	
9	1.6260	19.60	10.20	29.80	56.00	-26.20	QP	
10	1.6260	13.71	10.20	23.91	46.00	-22.09	AVG	
11	3.6780	25.86	10.22	36.08	56.00	-19.92	QP	
12	3.6780	14.03	10.22	24.25	46.00	-21.75	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.2020	43.07	10.10	53.17	63.52	-10.35	QP	
2	0.2020	25.76	10.10	35.86	53.52	-17.66	AVG	
3	0.2620	33.46	10.10	43.56	61.36	-17.80	QP	
4	0.2620	17.35	10.10	27.45	51.36	-23.91	AVG	
5	0.3420	28.08	10.11	38.19	59.15	-20.96	QP	
6	0.3420	13.32	10.11	23.43	49.15	-25.72	AVG	
7	0.4220	21.30	10.11	31.41	57.41	-26.00	QP	
8	0.4220	11.14	10.11	21.25	47.41	-26.16	AVG	
9	1.4299	18.79	10.20	28.99	56.00	-27.01	QP	
10	1.4299	12.99	10.20	23.19	46.00	-22.81	AVG	
11	3.8140	28.74	10.23	38.97	56.00	-17.03	QP	
12	3.8140	18.24	10.23	28.47	46.00	-17.53	AVG	

7 Radiated Spurious Emissions

Test Requirement: FCC Part15 Paragraph 15.225

Test Method: ANSI C63.4:2014

Test Result: PASS

Measurement Distance: 3m

Limit:

FCC Part15 Paragraph 15.209

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

FCC Part15 Paragraph 15.225

(a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters, equal to 124dBuV/m at 3 meters.

(b) Within 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, equal to 90.5dBuV/m at 3 meters..

(c) Within 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, equal to 80.5dBuV/m at 3 meters..

(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.

7.1 EUT Operation

Operating Environment **:**

Temperature: 23.5 °C

Humidity: 51.1 % RH

Atmospheric Pressure: 101.2kPa

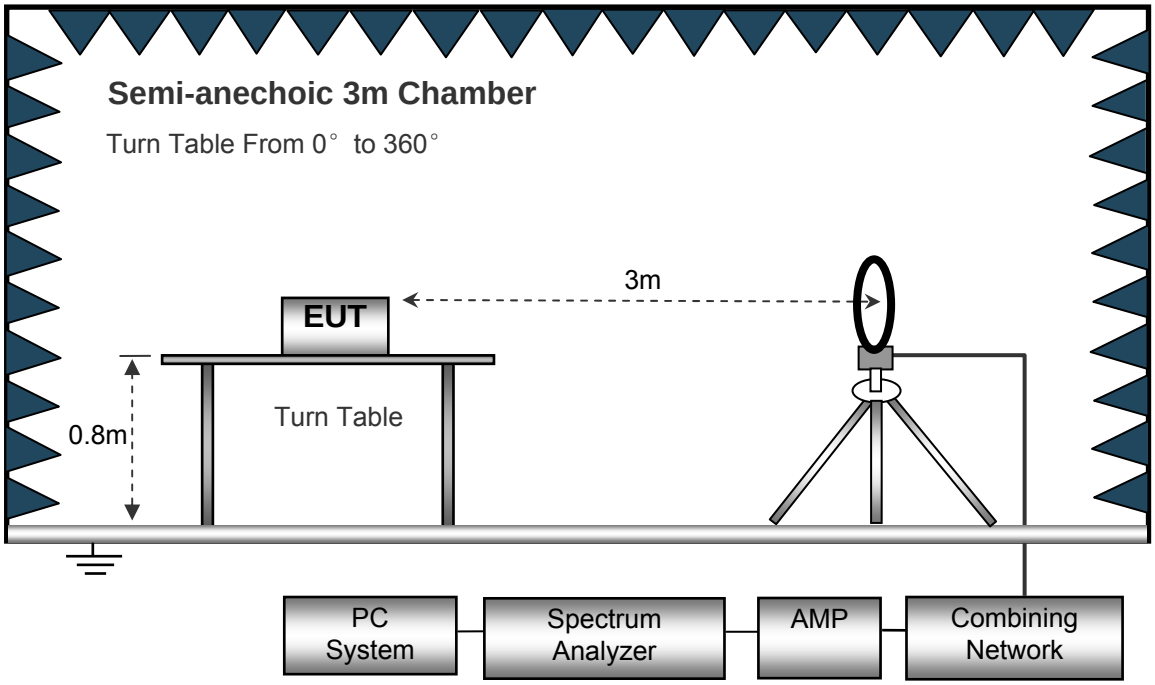
EUT Operation **:**

The test was performed in communication mode, the test data were shown in the report.

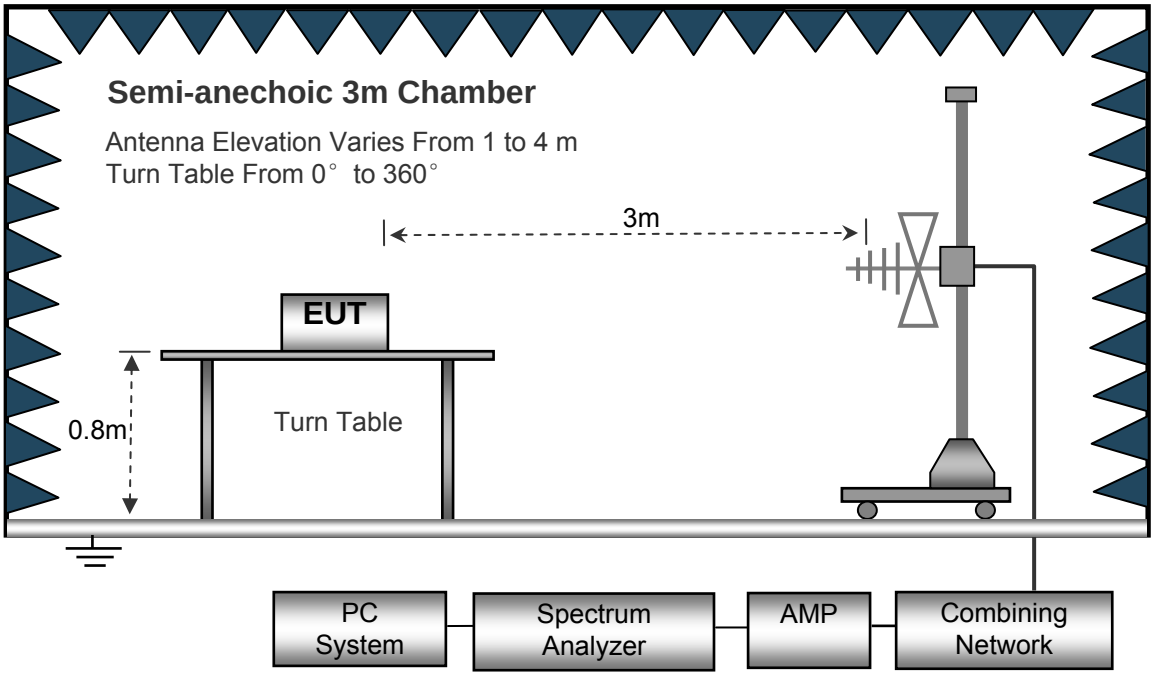
7.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4: 2014.

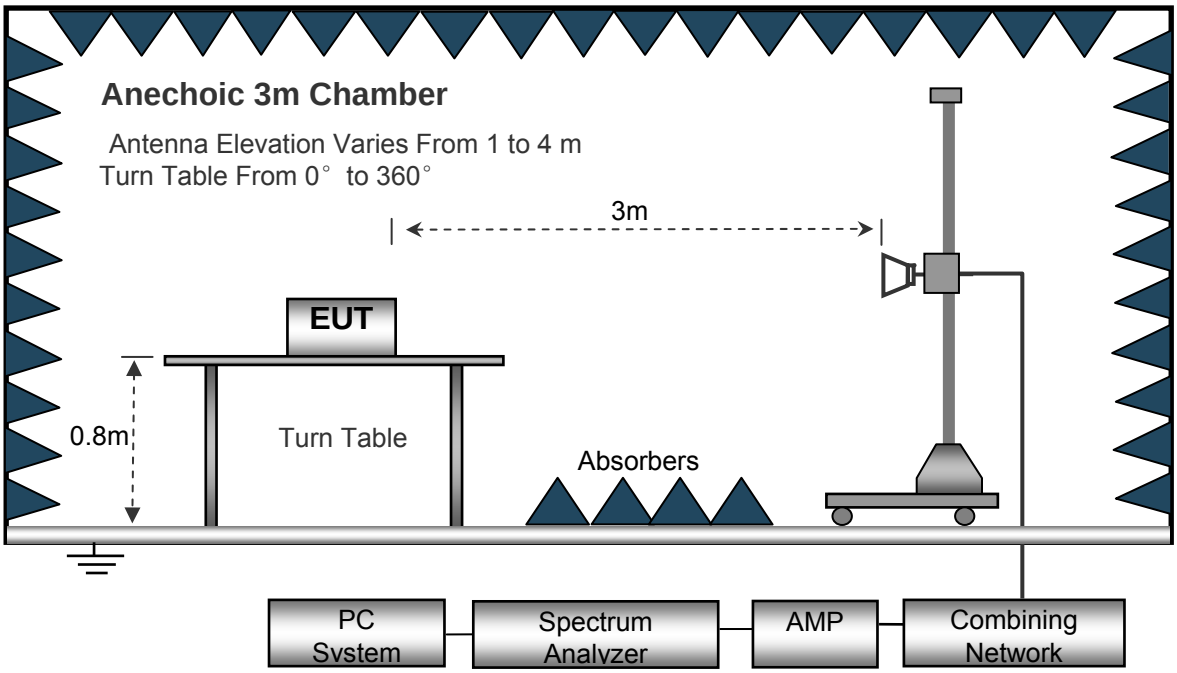
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



7.3 Spectrum Analyzer Setup

Below 30MHz

Sweep Speed ..... Auto
IF Bandwidth..... 10kHz
Video Bandwidth..... 10kHz

Resolution Bandwidth..... 10kHz

30MHz ~ 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth..... 100kHz
Video Bandwidth..... 300kHz

Above 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth..... 1MHz
Video Bandwidth..... 3MHz

7.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are tested under 3-axes(X, Y, Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand). After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

7.5 Summary of Test Results

Test Frequency :9kHz ~ 30MHz Note: Correct factor = Cable loss + Antenna factor

Frequency	Receiver Reading (PK)	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude (PK)	FCC Part 15.231/15.209/205	
			Height	Polar			Limit	Margin
(MHz)	(dBμV)	Degree	(m)	(H/V)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)
13.56	90.35	114	2	H	19.68	110.03	124	-13.97
13.56	82.18	341	1.6	V	29.71	111.89	124	-12.11

Frequency (MHz)	Receiver Reading	Detector	Correct factor	Extrapolation factor	Measurement results (calculated)	Limits	Margin
	dBμV@3m	PK/QP	dB/m	dB	dBμV/m @300m&30m	dBμV/m @300m	dB
0.120	20.53	Qp	20.60	80.00	-38.87	26.78	-65.65
2.697	18.26	Qp	20.20	40.00	-1.54	29.54	-31.08
27.682	40.19	Qp	19.90	40.00	20.09	29.54	-9.45

Frequency Range (MHz)	Frequency (MHz)	Receiver Reading	Detector	Correct factor	Extrapolation factor	Measurement results (calculated)	Limits	Margin
	dBμV @3m	dBμV/m	PK/QP	dB	dB	dBμV/m @30m	dBμV/m @30m	dBμV/m
13.110~13.41	13.362	28.32	QP	21.55	40	9.87	40.5	-30.63
13.410~13.553	13.542	38.46	QP	21.55	40	20.01	50.5	-30.49
13.553~13.567	13.536	66.69	QP	21.55	40	48.24	84.0	-35.76
13.567~13.71	13.552	39.85	QP	21.55	40	21.4	50.5	-29.10
13.710~14.01	13.818	29.27	QP	21.55	40	10.82	40.5	-29.68

Test Frequency : 30MHz ~ 1GHz

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.225/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP /Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV /m)	(dB)
54.21	20.39	QP	308	1.5	H	14.14	34.53	40	-5.47
54.21	15.27	QP	157	1.7	V	14.14	29.41	40	-10.59
213.43	19.35	QP	180	1.5	H	12.50	31.85	43.5	-11.65
213.43	14.29	QP	113	1.7	V	12.50	26.79	43.5	-16.71
493.67	11.36	QP	243	1.5	H	21.65	33.01	46	-12.99
493.67	7.68	QP	127	1.7	V	21.65	29.33	46	-16.67

8 Frequency Tolerance

Test Requirement: FCC Part15.225

Test Method: ANSI C63.4:2003

Limit 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.

8.1 Test Procedure

1.The EUT was placed on a turn table which is 0.8m above ground plane.

2.Set EUT as normal operation

3.Set SPA Center Frequency = fundamental frequency, RBW, VBW= 10kHz, Span =100kHz.

4.Set SPA Max hold. Mark peak.

8.2 Test Result

Power Supply	Temperature (℃)	Measured Frequency (MHz)	Frequency Error	Part 15.225 Limit
DC 5.0V	-20	13.53522	-0.1828%	±0.01%
	20	13.53525	-0.1825%	±0.01%
	50	13.53519	-0.1830%	±0.01%
DC 4.25V	-20	13.53524	-0.1826%	±0.01%
	20	13.53515	-0.1832%	±0.01%
	50	13.53523	-0.1827%	±0.01%
DC 5.75V	-20	13.53515	-0.1832%	±0.01%
	20	13.53518	-0.1830%	±0.01%
	50	13.53512	-0.1835%	±0.01%

9 20dB Bandwidth

Test Requirement: FCC Part15.215

Test Method: ANSI C63.4:2003

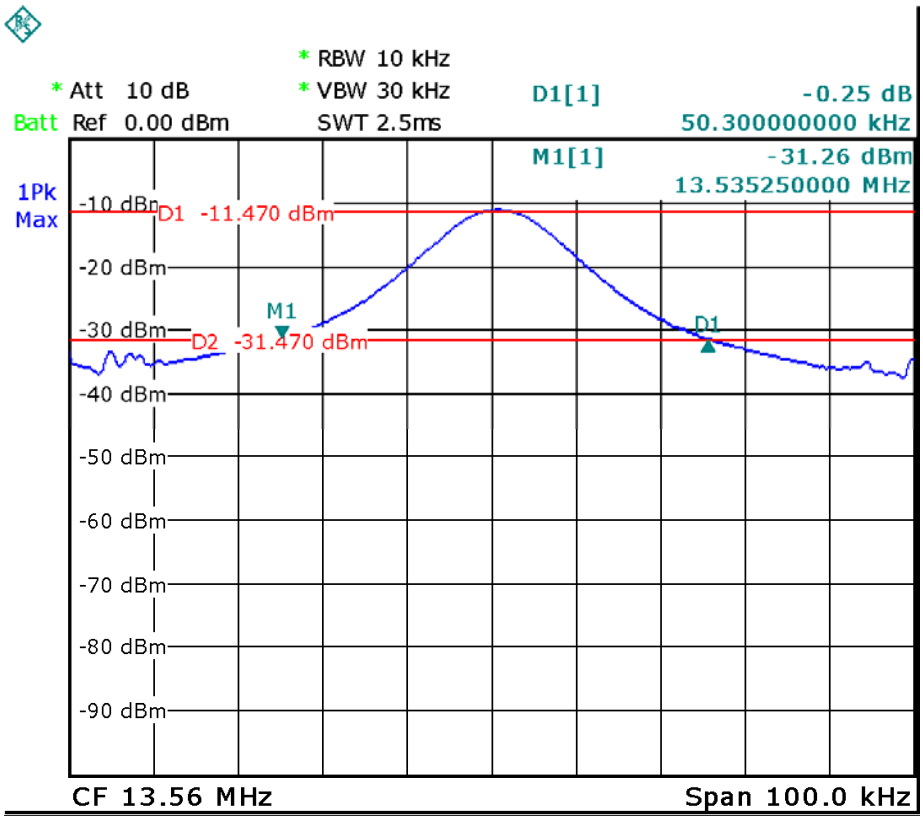
9.1 Test Procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak mode.
2. 20dB Bandwidth the resolution bandwidth of 1 kHz and the video bandwidth of 1 kHz were used.
3. Measured the spectrum width with power higher than 20dB below carrier.

9.2 Test Result

Frequency(MHz)	Bandwidth Emission(kHz)
13.56	50.30

Test Plot



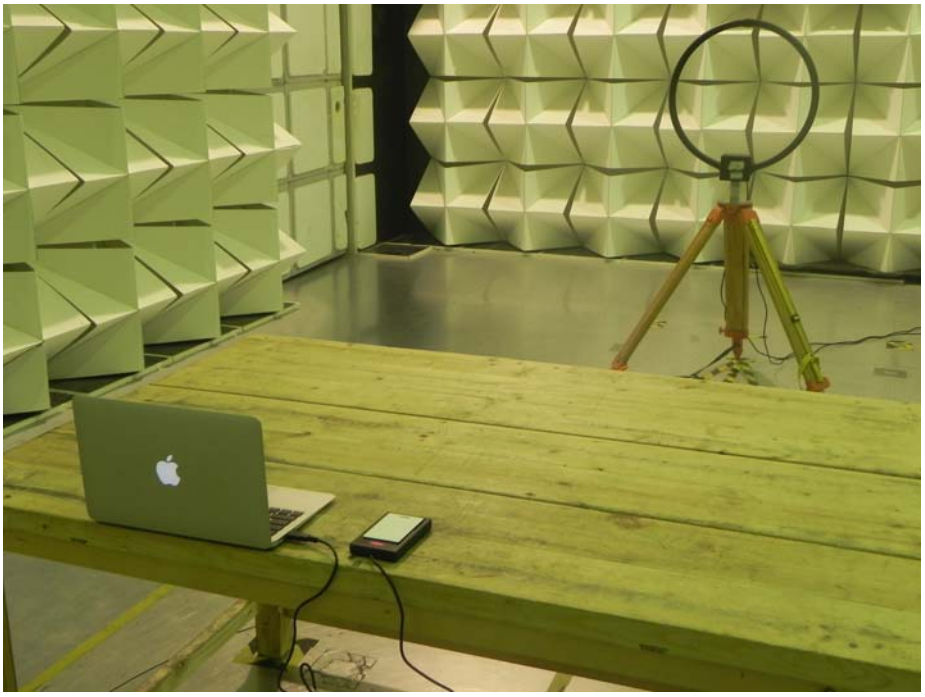
10 Antenna Requirement

According to the FCC Part 15 Paragraph 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 use of a permanently attached antenna to the intentional radiator shall be considered sufficient to comply with the provisions of this section. This product use a permanent integrated antenna, fulfill the requirement of this section

11 Model DR-6255 Photographs of Testing

11.1 Radiation Emission Test Setup

Below 30MHz at Test Site 2#



From 30MHz to 1GHz at Test Site 2#

11.2 Photograph –Conducted Disturbance at Mains Terminal Test Setup

12 Photographs - Constructional Details

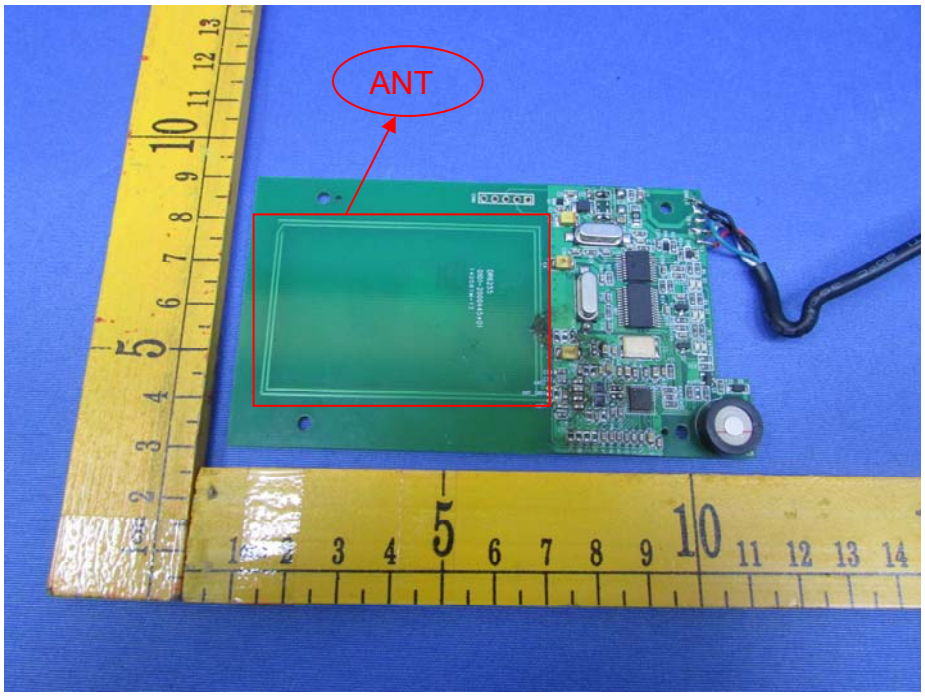
12.1 Model DR-6255- Appearance View

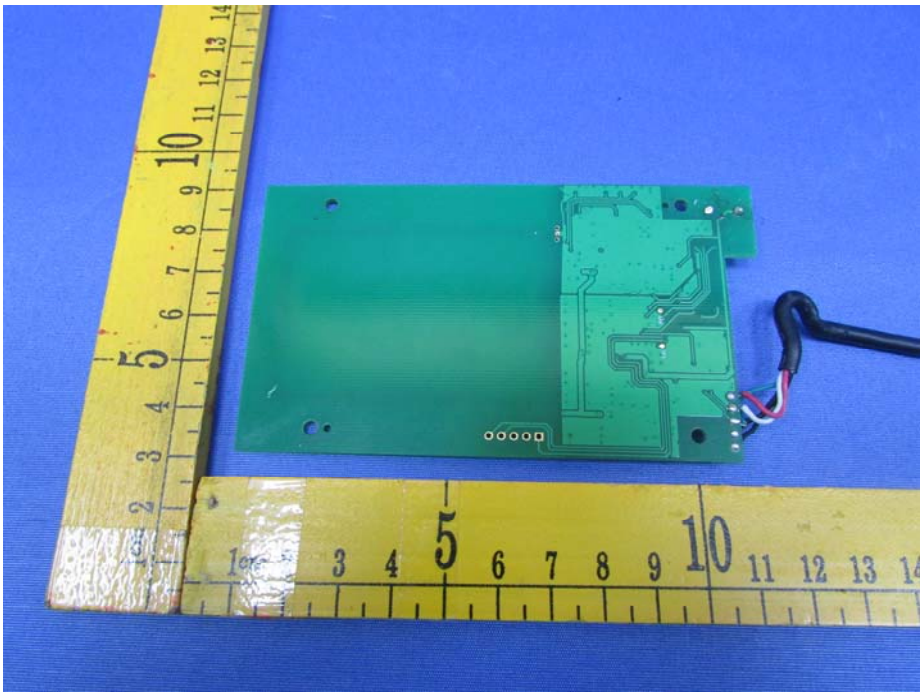

CARD


CARD


CARD

12.2 Model DR-6255- Internal View





======End of Report======