

FCC RF TEST REPORT

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Test Report Number: SKTRFC-130423-005**Date of issue: April 23, 2013****Applicant:****DUALi Inc.**

1-309 Innoplex, 552 Woncheon-dong, Youngtong-gu, Suwon, Gyeonggi-do
South Korea

Manufacturer:**DUALi Inc.**

1-309 Innoplex, 552 Woncheon-dong, Youngtong-gu, Suwon, Gyeonggi-do
South Korea

Product:**SMART CARD READER****Model:****DE-BNP**

(please see P5 for all the model numbers)

FCC ID:**SWUDE-BNP****File number:****SKTEU13-0538****EUT received:****April 16, 2013****Applied standards:****ANSI C63.10-2009 and ANSI C63.4-2009****Rule parts:****FCC Part 15 Subpart C - Intentional radiators****Equipment Class:****DXT - Part 15 Low Power Transceiver, Rx Verified****Remarks to the standards:** None

The above equipment has been tested by SK Tech Co., Ltd., and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product or system, which was tested.

**Wonsik Ham / Testing Engineer****Jongsoo Yoon / Technical Manager**

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Revision History of Report

Rev.	Revisions	Effect page	Reviewed by	Date
-	Initial issue	All	Jongsoo Yoon	April 23, 2013



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1 Summary of test results

Requirement	CFR 47 Section	Result
Antenna Requirement	15.203	Meets the requirements
Radiated Emissions Field Strength within the band 13.553-13.567 MHz	15.225(a)	Meets the requirements
Field Strength within the bands 13.410-13.553 MHz and 13.567-13.710 MHz 13.110-13.410 MHz and 13.710-14.010 MHz	15.225(b) & (c)	Meets the requirements
Radiated Harmonics and Spurious Emissions Outside of the 13.110 – 14.010 MHz	15.225(d) 15.209(a)	Meets the requirements
Frequency Tolerance of Carrier Signal	15.225(e)	Meets the requirements
AC power line Conducted emissions	15.207(a)	Meets the requirements

Note: -



2 Description of equipment under test (EUT)

Product: SMART CARD READER
Model: DE-BNP
Serial number: None (prototype)

Model differences:

Model name	Difference	Tested (checked)
DE-BNP	Original	<input checked="" type="checkbox"/>

Note: *All the differences were compared with the test sample.*

Technical data:

Power source	DC 5.0 V (from USB interface)
Local Oscillator or X-Tal	13.56 MHz
Transmit Frequency	13.56 MHz
Antenna Type	Internal PCB antenna (64 x 67 mm, 2-turns)
Type of Modulation	ASK
External Ports	USB interface for DC input and DATA communication with a host device

Note: *The equipment authorization for FCC Part 15B as a digital device was made under DoC process with a separate test report number.*

I/O port	Type	Q'ty	Remark
USB interface	For DC input and DATA communication with a PC	1	-

Equipment Modifications

none

Submitted Documents

Block diagram
Schematic diagram
Part List
User manual

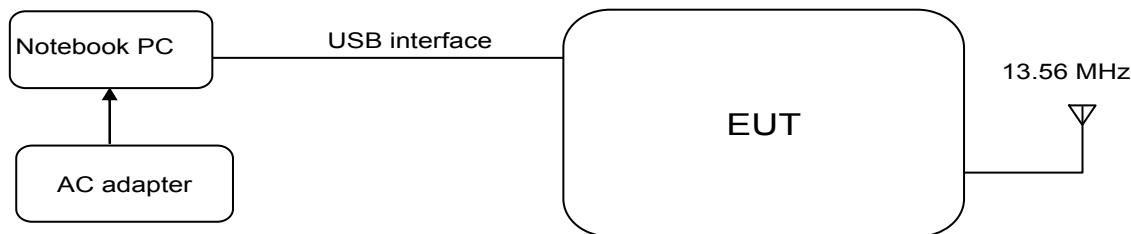


3 Test and measurement conditions

3.1. Test configuration (arrangement of EUT)

The EUT was transmitting RF signals continuously regardless of the test software if the USB cable was connected to PC.

Test software used: DNW.exe, Ver2.0 (Card Reader Test Program)



3.2. Description of support units (accessory equipment)

The following support units or accessories were used to form a representative test configuration during the tests.

#	Equipment	Manufacturer	Model No.	Serial No.
1	Notebook PC	DELL	INSPIRON	14791079949
2	AC power adapter	DELL	LA65NS0-00	CN-0MG532-70166-6BT-004G
3	RFID Cards	N/A	N/A	N/A

3.3. Interconnection and I/O cables

The following support units or accessories were used to form a representative test configuration during the tests.

#	Start		End		Cable	
	Name	I/O port	Name	I/O port	length (m)	shielded (Y/N)
1	Notebook PC	USB	EUT	7-pin connector	0.9	N
2	Notebook PC	DC IN	AC power adapter	DC OUT	1.7	N
3	AC power adapter	AC IN	AC mains	AC mains	1.7	N

Note: 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.

3.4. Measurement Uncertainty (U)

Measurement Item	Combined Standard Uncertainty U_c	Expanded Uncertainty $U = k \times U_c (k = 2)$
Conducted RF power	±1.49 dB	±2.98 dB
Radiated disturbance	±2.30 dB	±4.60 dB
Conducted disturbance	±1.96 dB	±3.92 dB

3.5. Test date

Date Tested	April 16, 2013 – April 23, 2013
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4 Facilities and accreditations

4.1. Facilities

All of the measurements described in this report were performed at SK Tech Co., Ltd

Site I: 820-2, Wolmoon-ri, Wabu-up, Namyangju-si, Kyunggi-do, Korea

Site II: 688-8, Wolmoon-ri, Wabu-up, Namyangju-si, Kyunggi-do, Korea

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-4. The sites comply with the Normalized Site Attenuation requirements given in ANSI C63.4, and site VSWR requirements specified in CISPR 16-1-4. The measuring apparatus and ancillary equipment conform to CISPR 16-1 series.

4.2. Accreditations

The laboratory has been also notified to FCC by RRA as a Conformity Assessment Body, and designated to perform compliance testing on equipment subject to Declaration of Conformity (DOC) and Certification under Parts 15 and 18 of the FCC Rules.

Designation No. KR0007

4.3. List of test and measurement instruments

No	Description	Model	Manufacturer	Serial No.	Cal. due	Use
1	Spectrum Analyzer	Agilent	E4405B	US40520856	2014.03.07	
2	Spectrum Analyzer	Agilent	E4440A	MY46186322	2014.03.18	<input checked="" type="checkbox"/>
3	EMC Spectrum Analyzer	Agilent	E7405A	US40240203	2013.07.09	
4	EMI Test Receiver	Rohde&Schwarz	ESPI7	101206	2014.07.10	<input checked="" type="checkbox"/>
5	EMI Test Receiver	Rohde&Schwarz	ESHS10	835871/002	2013.09.18	<input checked="" type="checkbox"/>
6	Artificial Mains Network	Rohde&Schwarz	ESH3-Z5	834549/011	2013.07.09	<input checked="" type="checkbox"/>
7	Pre-amplifier	HP	8447F	3113A05153	2013.07.10	<input checked="" type="checkbox"/>
8	Pre-amplifier	MITEQ	AFS44	1116321	2013.12.15	
9	Pre-amplifier	MITEQ	AFS44	1116322	2014.03.08	
10	Power Meter	Agilent	E4417A	MY45100426	2013.07.10	
11	Power Meter	Agilent	E4418B	US39402176	2013.07.10	
12	Power Sensor	Agilent	E9327A	MY44420696	2013.07.10	
13	Power Sensor	Agilent	8485A	3318A13916	2013.07.10	
14	Attenuator (10dB)	HP	8491B	38072	2013.07.09	
15	High Pass Filter	Wainwright	WHKX3.0/18G	8	2013.07.09	
16	VHF Precision Dipole Antenna (TX/RX)	Schwarzbeck	VHAP	1014 / 1015	2013.10.04	
17	UHF Precision Dipole Antenna (TX/RX)	Schwarzbeck	UHAP	989 / 990	2013.10.04	
18	Loop Antenna	Schwarzbeck	HFH2-Z2	863048/019	2013.12.22	<input checked="" type="checkbox"/>
19	TRILOG Broadband Antenna	Schwarzbeck	VULB9168	189	2013.05.31	<input checked="" type="checkbox"/>
20	Horn Antenna	AH Systems	SAS-200/571	304	N/A	
21	Horn Antenna	EMCO	3115	00040723	2014.03.26	
22	Horn Antenna	EMCO	3115	00056768	2013.08.13	
23	Horn Antenna	Schwarzbeck	BBHA9170	BBHA9170318	2013.09.28	
24	Vector Signal Generator	Agilent	E4438C	MY42080359	2013.07.10	
25	PSG analog signal generator	Agilent	E8257D-520	MY45141255	2013.07.10	
26	DC Power Supply	HP	6622A	3348A03223	2013.07.10	
27	Hygro/Thermo Graph	SATO	PC-5000TRH-II	-	2013.07.18	<input checked="" type="checkbox"/>
28	Temperature/Humidity Chamber	All Three	ATM-50M	20030425	2014.03.08	<input checked="" type="checkbox"/>



5 Test and measurements

5.1. Antenna requirement

5.1.1 Regulation

FCC 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 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 Part 15C. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31 (d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

5.1.2 Result:

PASS

The EUT has an integral PCB loop antennas, and meets the requirements of this section.



5.2. Radiated emissions

5.2.1 Regulation

FCC 47CFR15 – 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.

(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.

(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.

(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 limit (μ V/m) @ 30 m	Field strength limit (dB μ V/m) @ 30 m	Field strength limit (dB μ V/m) @ 3 m
13.110 – 13.410	106	40.5	80.5
13.410 – 13.553	334	50.5	90.5
13.553 – 13.567	15,848	84.0	124.0
13.567 – 13.710	334	50.5	90.5
13.710 – 14.010	106	40.5	80.5

FCC 47CFR15 – 15.209

(a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength limit (μ V/m)	Field strength limit (dB μ V/m)	Measurement Distance (m)
0.009 – 0.490	$2400/F$ (kHz) = 266.7 – 4.9	48.5 – 13.8	300
0.490 – 1.705	$24000/F$ (kHz) = 49.0 – 14.1	33.8 – 23.0	30
1.705 – 30.0	30	29.5	30
30 – 88	100	40.0	3
88 – 216	150	43.5	3
216 – 960	200	46.0	3
Above 960	500	54.0	3

* The emission limits shown in the above table are based on measurement instrumentation employing a CISPR quasi-peak detector. For the frequency bands 9 – 90 kHz, 110 – 490 kHz and above 1000 MHz, the radiated emission limits are based on measurements employing an average detector.

* The lower limit shall apply at the transition frequencies.



5.2.2 Measurement Procedure

Radiated Emissions Test, 9 kHz to 30 MHz (Magnetic Field Test)

1. The preliminary radiated measurements were performed to determine the frequency producing the maximum emissions at a distance of 1 meter or 3 meters according to Section 15.31(f)(2).
2. The EUT was placed on the top of the 0.8-meter height, 1 × 1.5 meter non-metallic table.
3. Emissions from the EUT are maximized by adjusting the orientation of the Loop antenna and rotating the EUT on the turntable. Manipulating the system cables also maximizes EUT emissions if applicable.
4. To obtain the final measurement data, 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.

Radiated Emissions Test, above 30 MHz

1. The preliminary radiated measurements were performed to determine the frequency producing the maximum emissions in an anechoic chamber at a distance of 3 meters.
2. 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°.
3. The antenna polarization was also changed from vertical to horizontal. The spectrum was scanned from 30 to 1000 MHz using the TRILOG broadband antenna.
4. To obtain the final measurement data, the EUT was arranged on a turntable situated on a 4 × 4 meter at the Open Area Test Site. The EUT was tested at a distance 3 meters.
5. 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.
6. The EUT is situated in three orthogonal planes (if appropriate)
7. The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT.



5.2.3 Calculation of the field strength limits below 30 MHz

1. No special calculation for obtaining the field strength in $\text{dB}\mu\text{V/m}$ is necessary, because the EMI receiver and the active loop antenna operate as a system, where the reading gives directly the field strength result ($\text{dB}\mu\text{V/m}$). The antenna factors and cable losses are already taken into consideration.
2. For test distance other than what is specified, but fulfilling the requirements of section 15.31 (f) (2) the field strength is calculated by adding additionally an extrapolation factor of 40dB/decade (inverse linear distance for field strength measurements).
3. All following emission measurements were performed using the test receiver's average, peak, and quasi-peak detector function with specified bandwidth.
4. The basic equation is as follows;

$$\text{FS} = \text{RA} + \text{DF}$$

Where

FS = Field strength in $\text{dB}\mu\text{V/m}$

RA = Receiver Amplitude in $\text{dB}\mu\text{V/m}$

DF = Distance Extrapolation Factor in dB

Where $\text{DF} = 40\log(\text{DTEST} / \text{DSPEC})$ where DTEST = Test Distance and DSPEC = Specified Distance

$\text{DF} = 40\log(3\text{m}/300\text{m}) = -80 \text{ dB}$, for frequency band: 0.009 to 0.490 MHz

$\text{DF} = 40\log(3\text{m}/30\text{m}) = -40 \text{ dB}$, for frequency band: 0.490 to 30 MHz



5.2.4 Test Results:

PASS

Table 1: Field strength below 30 MHz

Frequency [MHz]	RBW [kHz]	Reading [dB(µV/m)]	Cable Loss [dB]	Actual [dB(µV/m)]	Limit (at 3m) [dB(µV/m)]	Margin [dB]
Emissions Quasi-peak DATA under 15.225(a), (b)&(c)						
13.560 0	9	49.97	0.3	50.27	124.0	73.73
13.349 9	9	---	0.3	---	80.5	---
13.479 7	9	---	0.3	---	90.5	---
13.639 2	9	---	0.3	---	90.5	---
13.768 7	9	---	0.3	---	80.5	---
Emissions Quasi-peak DATA under 15.225(d), 15.209						
27.12	9	---	0.3	---	69.5	---

Actual (dBµV/m) = Reading + Cable Loss

Margin (dB) = Limit – Actual

NOTE: These test results were measured at the 3 m distance.

Remark: "—" means the emission level was too low to be measured or in the noise floor.

Table 2: Measured values of the Field strength (above 30 MHz)

Frequency [MHz]	RBW [kHz]	POL [V/H]	ANT [m]	Reading [dBµV]	AMP [dB]	AF [dB/m]	CL [dB]	Actual [dBµV/m]	Limit [dBµV/m]	Margin [dB]
40.69	120	H	2.25	48.14	27.64	12.66	0.78	33.94	40.00	6.06
40.69	120	V	1.00	43.05	27.64	12.66	0.78	28.85	40.00	11.15
67.80	120	H	2.92	41.02	26.76	11.59	1.00	26.85	40.00	13.15
67.80	120	V	1.00	38.00	26.76	11.59	1.00	23.83	40.00	16.17
125.10	120	H	2.53	44.61	25.64	10.87	1.38	31.22	43.50	12.28
125.10	120	V	1.00	40.54	25.64	10.87	1.38	27.15	43.50	16.35
281.99	120	H	1.00	44.50	26.80	13.30	2.07	33.07	46.00	12.93
281.99	120	V	1.00	45.12	26.80	13.30	2.07	33.69	46.00	12.31

Margin (dB) = Limit – Actual

[Actual = Reading + AF + CL]

1. H = Horizontal, V = Vertical Polarization

2. AF/CL = Antenna Factor and Cable Loss

NOTE: 1. All emissions not reported were more than 20 dB below the specified limit or in the noise floor.

2. These test results measured at the 3 m distance.



Figure 1. Plot of the Band edge (Preliminary measurement in the anechoic chamber at 3 m distance to find out the frequencies, at which the spurious emissions occur, with the peak detector function)

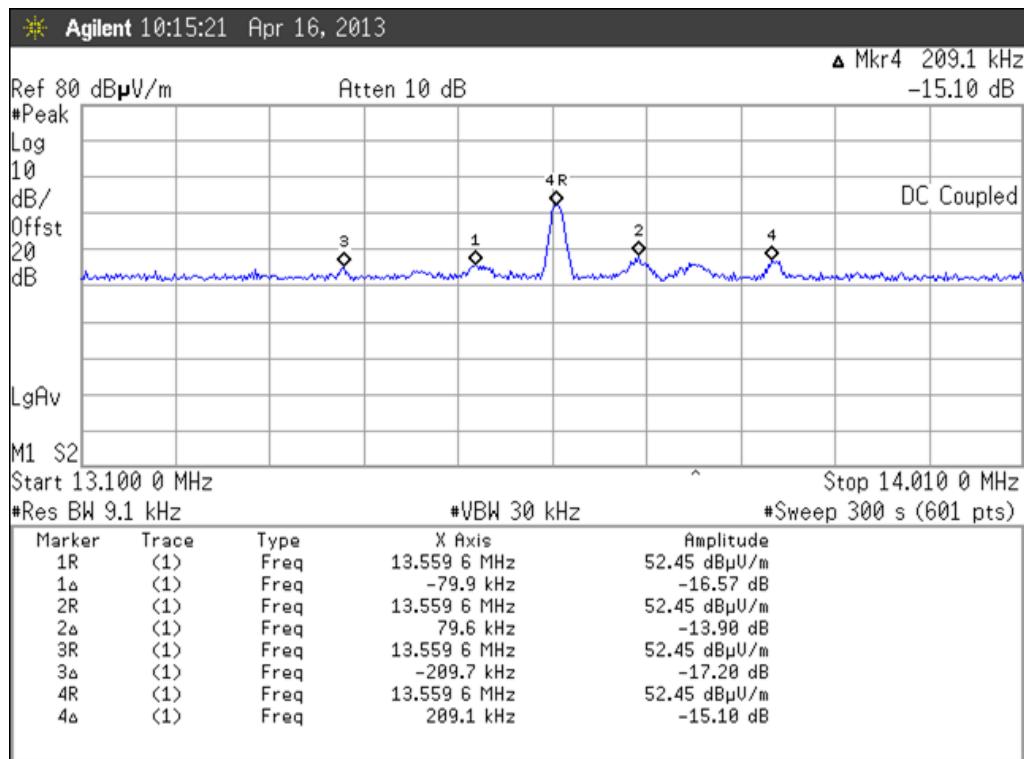
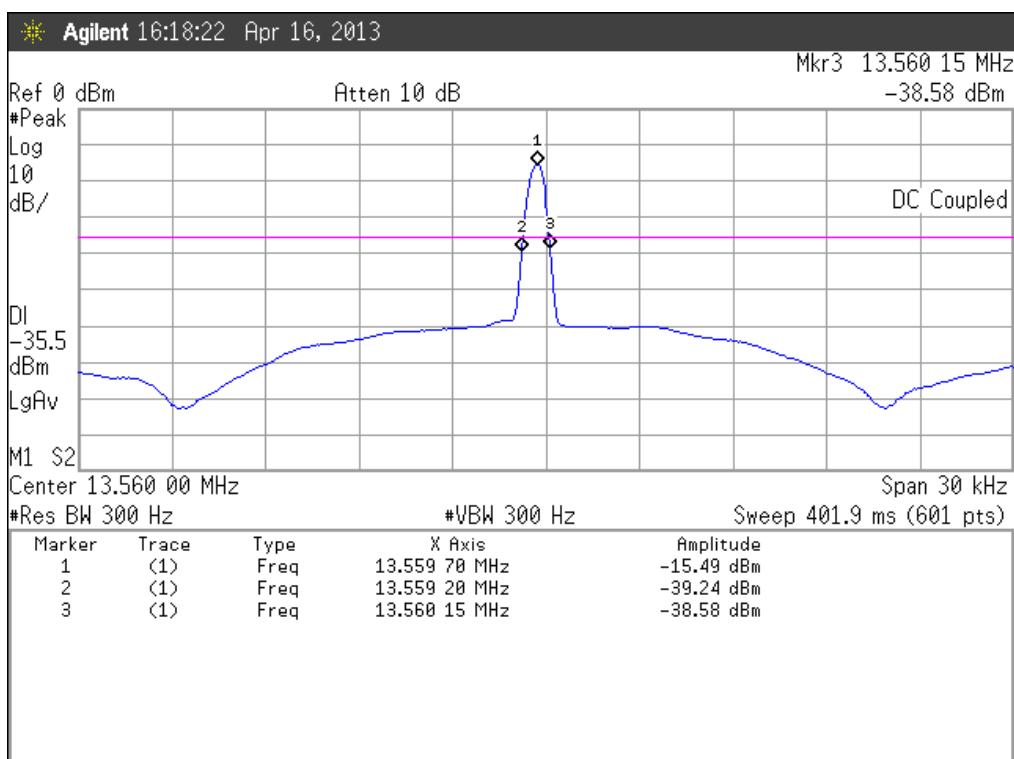


Figure 2. Plot of the 20 dB bandwidth





5.3. Frequency tolerance of carrier signal

5.3.1 Regulation

FCC 47CFR15 – 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.

5.3.2 Regulation

Frequency stability versus environmental temperature

1. Supply the EUT with nominal AC voltage.
2. Turn the EUT off, and place it inside an environmental temperature chamber. For devices that are normally operated continuously, the EUT may be energized while inside the test chamber. For devices that have oscillator heaters, energize only the heater circuit while the EUT is inside the chamber.
3. RF output was connected to a frequency counter or other frequency-measuring instrument via feed through attenuators.
4. Set the temperature control on the chamber to the highest specified EUT operating temperature, and allow the temperature inside the chamber to stabilize at the set temperature before starting frequency measurements.
5. While maintaining a constant temperature inside the environmental chamber, turn the EUT on and record the operating frequency at startup and two, five, and ten minutes after the EUT is energized.
6. After all measurements have been made at the highest specified temperature turn the EUT off.
7. Repeat the above measurement process for the EUT with the test chamber set at the appropriate temperature.

Frequency Stability versus Input Voltage

1. At room temperature (20 ± 5) °C supply the EUT with nominal AC voltage.
2. Couple RF output to a frequency counter or other frequency-measuring instrument.
3. Turn the EUT on, and measure the EUT operating frequency at startup and two, five, and ten minutes after startup.
4. Supply it with 85 % of the nominal AC voltage and repeat the above procedure.
5. Supply it with 115 % of the nominal AC voltage and repeat the above procedure.



5.3.3 Test Results:

PASS

Table 3: Frequency Tolerance

Reference Frequency: 13.5600MHz, LIMIT: within ± 1 356 Hz									
Environment Temperature [°C]	Power Supplied [V _{AC}]	Carrier Frequency Measured with Time Elapsed							
		STARUP		2 minutes		5 minutes		10 minutes	
		[MHZ]	Err [Hz]	[MHZ]	Err [Hz]	[MHZ]	Err [Hz]	[MHZ]	Err [Hz]
+50	120	13.559610	390	13.559602	398	13.559594	406	13.559588	412
+40	120	13.559665	335	13.559655	345	13.559645	355	13.559638	362
+30	120	13.559729	271	13.559717	283	13.559707	293	13.559699	301
+20	120	13.559790	210	13.559779	221	13.559771	229	13.559763	237
+10	120	13.559844	156	13.559836	164	13.559829	171	13.559822	178
0	120	13.559901	99	13.559890	110	13.559883	117	13.559877	123
-10	120	13.559931	69	13.559926	74	13.559925	75	13.559923	77
-20	120	13.559923	77	13.559930	70	13.559937	63	13.559943	57

Reference Frequency: 13.5600MHz, LIMIT: 100 PPM (within ± 1 356 Hz)									
Power Supplied [V _{AC}]	Carrier Frequency Measured with Time Elapsed								
	STARUP		2 minutes		5 minutes		10 minutes		
	[MHZ]	Err [Hz]	[MHZ]	Err [Hz]	[MHZ]	Err [Hz]	[MHZ]	Err [Hz]	
85 %	13.559789	211	13.559778	222	13.559769	231	13.559761	239	
100 %	13.559790	210	13.559779	221	13.559771	229	13.559763	237	
115 %	13.559788	212	13.559776	224	13.559767	233	13.559760	240	

Err [Hz] = Measured carrier frequency (MHz) - Reference Frequency (13.56 MHz)



5.4. AC power line Conducted emissions

5.4.1 Regulation

FCC 47CFR15 – 15.207(a)

According to §15.207(a), for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 Ω line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56 *	56 to 46 *
0.5 – 5	56	46
5 – 30	60	50

* Decreases with the logarithm of the frequency.

5.4.2 Test Procedure

1. The EUT was placed on a wooden table of size, 1 m by 1.5 m, raised 80 cm in which is located 40 cm away from the vertical wall and 1.5m away from the side wall of the shielded room.
2. Each current-carrying conductor of the EUT power cord was individually connected through a 50 Ω /50 μ H LISN, which is an input transducer to a Spectrum Analyzer or an EMI/Field Intensity Meter, to the input power source.
3. Exploratory measurements were made to identify the frequency of the emission that had the highest amplitude relative to the limit by operating the EUT in a range of typical modes of operation, cable position, and with a typical system equipment configuration and arrangement. Based on the exploratory tests of the EUT, the one EUT cable configuration and arrangement and mode of operation that had produced the emission with the highest amplitude relative to the limit was selected for the final measurement.
4. The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment is the system) was then performed over the frequency range of 0.15 MHz to 30 MHz.
5. The measurements were made with the detector set to PEAK amplitude within a bandwidth of 10 kHz or to QUASI-PEAK and AVERAGE within a bandwidth of 9 kHz. The EUT was in transmitting mode during the measurements.

**5.4.3 Test Results:****PASS****Table 4: Measured values of the Conducted Emissions**

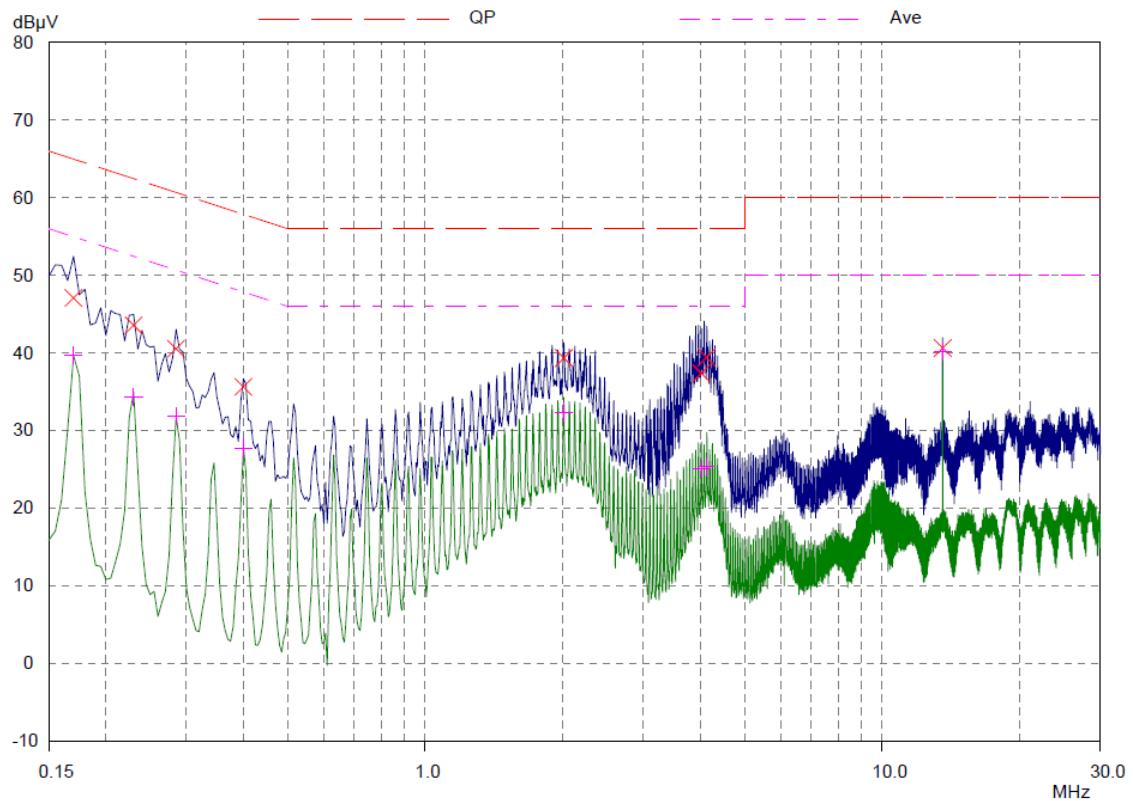
Frequency [MHz]	Reading [dB μ V]	L / N	CF [dB]	CL [dB]	Actual [dB μ V]	Limit [dB μ V]	Margin [dB]
QUASI-PEAK DATA							
0.170	52.99	N	0.10	0.01	53.1	64.96	11.86
0.230	48.71	N	0.11	0.01	48.8	62.45	13.62
0.285	41.17	N	0.12	0.01	41.3	60.67	19.37
0.345	41.53	N	0.12	0.01	41.7	59.08	17.42
0.400	35.63	L	0.12	0.01	35.8	57.85	22.09
1.835	38.54	N	0.17	0.07	38.8	56.00	17.22
2.010	39.34	L	0.17	0.08	39.6	56.00	16.41
3.965	39.19	N	0.20	0.11	39.5	56.00	16.50
4.020	37.36	L	0.20	0.11	37.7	56.00	18.33
4.080	38.68	N	0.20	0.11	39.0	56.00	17.01
4.130	39.40	L	0.20	0.11	39.7	56.00	16.29
13.560	43.37	N	0.35	0.20	43.9	60.00	16.08
AVERAGE DATA							
0.170	43.50	N	0.10	0.01	43.61	54.96	11.35
0.230	40.40	N	0.11	0.01	40.52	52.45	11.93
0.285	33.50	N	0.12	0.01	33.63	50.67	17.04
0.345	34.84	N	0.12	0.01	34.97	49.08	14.11
0.400	27.73	L	0.12	0.01	27.86	47.85	19.99
1.835	33.30	N	0.17	0.07	33.54	46.00	12.46
2.010	32.37	L	0.17	0.08	32.62	46.00	13.38
3.965	27.52	N	0.20	0.11	27.83	46.00	18.17
4.020	25.03	L	0.20	0.11	25.34	46.00	20.66
4.080	26.85	N	0.20	0.11	27.16	46.00	18.84
4.130	25.33	L	0.20	0.11	25.64	46.00	20.36
13.560	43.06	N	0.35	0.20	43.61	50.00	6.39

Margin (dB) = Limit – Actual**[Actual = Reading + CF + CL]****L/N = LINE / NEUTRAL****CF/CL = Correction Factor and Cable Loss**

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



Figure 3. Plot of the Conducted Emissions
Line – PE (Peak and Average detector used)



Neutral – PE (Peak and Average detector used)

