

Test Report

FCC Part15 Subpart C

RSS-Gen Issue 4

Product Name : Scout Hub
Model No. : SCHUB02
FCC ID : 2AC5T-SCHUB02
IC : 12325A-SCHUB02

Applicant : Scout Security, Inc.

Address : 210 N Racine Ave, Chicago IL 60607

Date of Receipt : Nov. 15, 2016

Test Date : Nov. 15, 2016~ Dec. 06, 2016

Issued Date : Dec. 14, 2016

Report No. : 16A2069R-RF-US-P06V01

Report Version : V1.0

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by CNAS, TAF or any agency of the government.

The test report shall not be reproduced without the written approval of Quietek Corporation.

Test Report Certification

Issued Date : Dec. 14, 2016

Report No. : 16A2069R-RF-US-P06V01



Product Name : Scout Hub
Applicant : Scout Security, Inc.
Address : 210 N Racine Ave, Chicago IL 60607
Manufacturer : GoerTek Inc
Address : No.8877 Yingqian Street,High-Tech Industrial Development
District,Weifang,Shandong,261031, P.R.China
Model No. : SCHUB02
FCC ID : 2AC5T-SCHUB02
IC : 12325A-SCHUB02
EUT Voltage : 5V DC 1.0A
Brand Name : Scout Alarm
Applicable Standard : FCC CFR Title 47 Part 15 Subpart C
ANSI C63.4:2014
ANSI C63.10:2013
RSS-GEN Issue 4
Test Result : Complied
Performed Location : Quietek Corporation - Suzhou EMC Laboratory
No.99 Hongye Rd., Suzhou Industrial Park, Suzhou, 215006,
Jiangsu, China
TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098
FCC Registration Number: 800392

Documented By : Kathy Feng
(Adm. Specialist: Kathy Feng)

Reviewed By : Jack Zhang
(Engineering Supervisor: Jack Zhang)

Approved By : Harry Zhao
(Engineering Manager: Harry Zhao)

Laboratory Information

We, **Quietek Corporation**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted(audited or listed) by the following related bodies in compliance with ISO 17025, EN 45001 and specified testing scope:

Taiwan R.O.C.	:	BSMI, NCC, TAF
USA	:	FCC
Japan	:	VCCI
China	:	CNAS

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation's Web Site : <http://www.quietek.com/english/about/certificates.aspx?bval=5>

The address and introduction of Quietek Corporation's laboratories can be founded in our Web site : http://www.quietek.com/index_en.aspx

If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

HsinChu Testing Laboratory :

No.75-2, 3rd Lin, Wangye Keng, Yonghxing Tsuen, Qionglin Shiang, Hsinchu County 307, Taiwan, R.O.C.
TEL:+886-3-592-8858 / FAX:+886-3-592-8859 E-Mail : service@quietek.com

LinKou Testing Laboratory :

No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451, Taiwan, R.O.C.
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789 E-Mail : service@quietek.com

Suzhou Testing Laboratory :

No.99 Hongye Rd., Suzhou Industrial Park, Suzhou, 215006, Jiangsu, China
TEL : +86-512-6251-5088 / FAX : 86-512-6251-5098 E-Mail : service@quietek.com

TABLE OF CONTENTS

Description	Page
1. General Information.....	7
1.1. EUT Description	7
1.2. Antenna information	8
1.3. Mode of Operation.....	9
1.4. Tested System Details	9
1.5. Configuration of Tested System.....	10
2. Technical Test	12
2.1. Summary of Test Result.....	12
2.2. Test Frequency configuration:.....	13
2.3. Duty Cycle	14
2.4. Test Environment.....	15
2.5. Measurement Uncertainty.....	15
3. AC Power Line Conducted Emission	16
3.1. Test Equipment.....	16
3.2. Test Setup.....	16
3.3. Limit.....	17
3.4. Test Procedure	17
3.5. Test Result.....	18
4. Emissions in restricted frequency bands	20
4.1. Test Equipment.....	20
4.2. Test Setup.....	21
4.3. Limit.....	22
4.4. Test Procedure	25
4.5. EUT test Axis definition.....	26
4.6. Test Result.....	27
5. Emissions in non-restricted frequency bands	32
5.1. Test Equipment.....	32
5.2. Test Setup.....	32
5.3. Limit.....	33
5.4. Test Procedure	34
5.5. EUT test Axis definition.....	35
5.6. Test Result.....	36
6. Occupied Bandwidth.....	37
6.1. Test Equipment.....	37
6.2. Test Setup.....	37
6.3. Limit.....	38
6.4. Test Procedure	38

6.5. EUT test definition 39
6.6. Test Result..... 40
7. Antenna Requirement..... 41
7.1. Limit..... 41
7.2. Antenna Connector Construction..... 41

History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
16A2069R-RF-US-P06V01	V1.0	Initial Issued Report	Dec. 14, 2016

1. General Information

1.1. EUT Description

Product Name	Scout Hub
Brand Name	Scout Alarm
Model No.	SCHUB02
EUT Voltage	5V DC 1.0A
Z-wave	
Frequency Range	908-916 MHz
Channel Number	3
Type of Modulation	FSK/GFSK
Data Rate	9.6/40/100kbps
Channel Control	Auto

1.2. Antenna information

Model No.	Goertek /GoerTek Honour_Zwave Antenna			
Antenna manufacturer	GoerTek			
Antenna Delivery	<input checked="" type="checkbox"/> 1*TX+1*RX	<input type="checkbox"/> 2*TX+2*RX	<input type="checkbox"/> 3*TX+3*RX	
Antenna technology	<input checked="" type="checkbox"/> SISO			
	<input type="checkbox"/> MIMO	<input type="checkbox"/> Basic		
		<input type="checkbox"/> CDD		
		<input type="checkbox"/> Sectorized		
		<input type="checkbox"/> Beam-forming		
Antenna Type	<input type="checkbox"/> External	<input type="checkbox"/> Dipole		
		<input type="checkbox"/> Sectorized		
	<input checked="" type="checkbox"/> Internal	<input type="checkbox"/> PIFA		
		<input checked="" type="checkbox"/> PCB		
		<input type="checkbox"/> helical antenna		
		<input type="checkbox"/> Ceramic Chip Antenna		
		<input type="checkbox"/> Metal plate type F antenna		
	Antenna Technology	Ant Gain (dBi)	Directional Gain (dBi)	
For Power			For PSD	
<input checked="" type="checkbox"/> SISO	2.51	2.51	2.51	

1.3. Mode of Operation

Test Modes List
Mode 1: Transmit

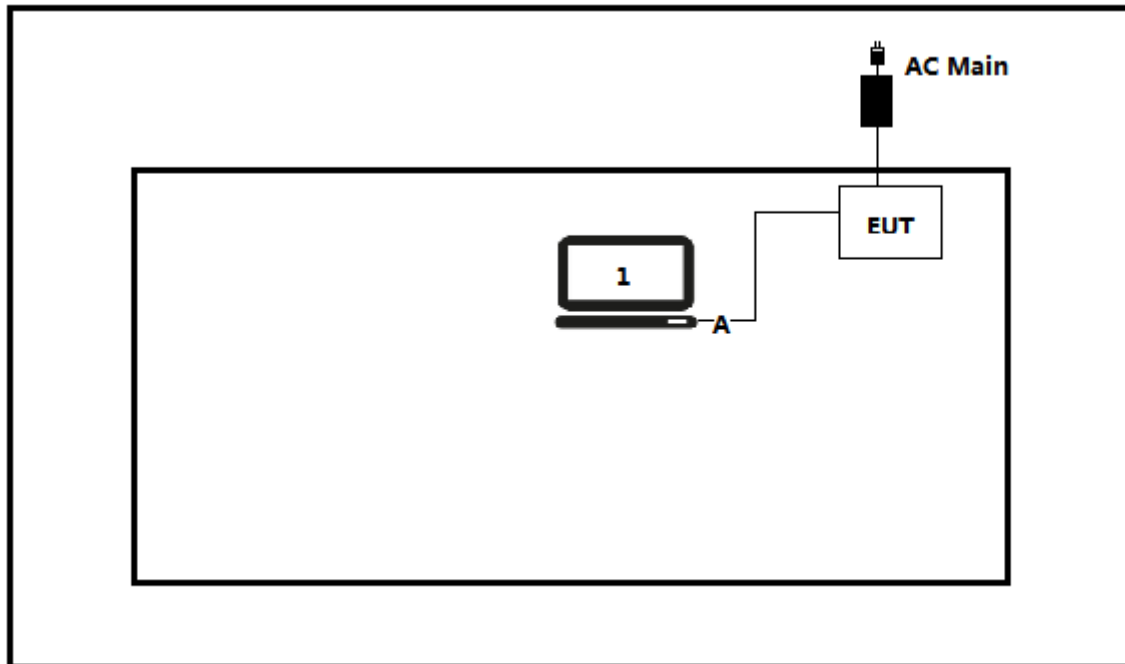
1.4. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

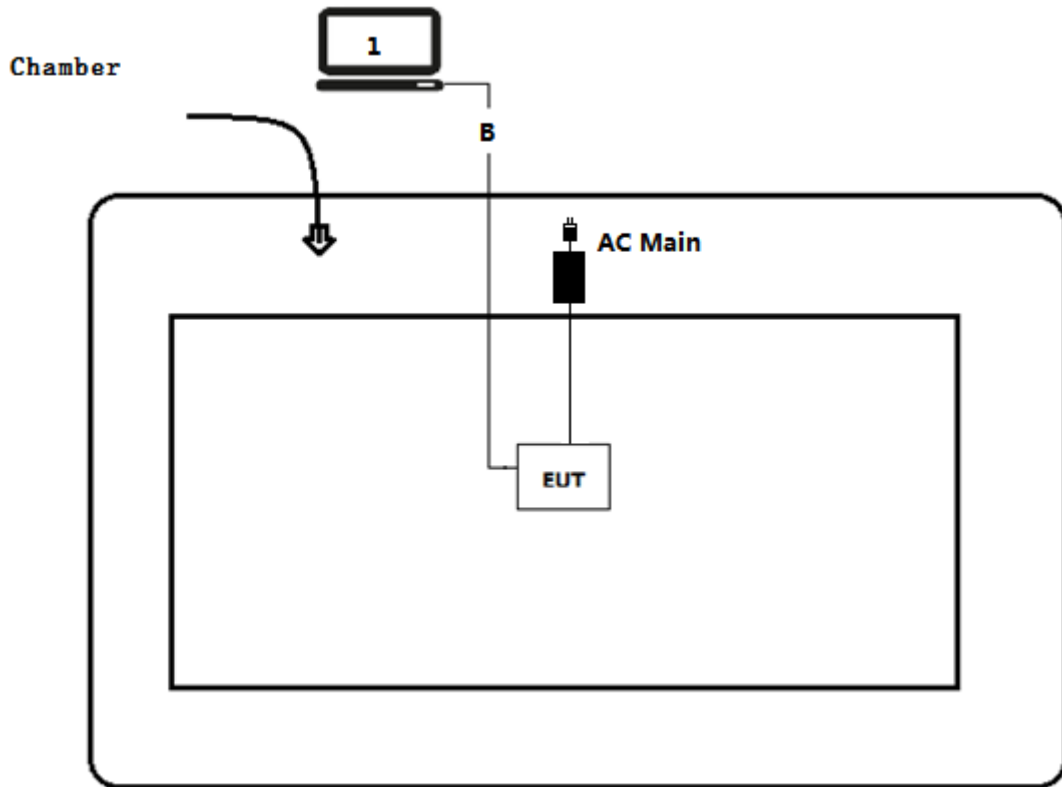
No.	Product	Manufacturer	Model No.	Serial No.	Power Cord
1	N/A	N/A	N/A	N/A	N/A

1.5. Configuration of Tested System

Test setup Diagram- AC Line Conducted Emission Test



Test setup Diagram- Radiated Emission



Signal Cable Type		Signal cable Description
A	Serial-USB Cable	Non-shielded, < 1m
B	Serial-USB Cable	Non-shielded, > 10m

2. Technical Test

2.1. Summary of Test Result

For FCC

Performed Test Item	Normative References	Limit	Result
AC Power Line Conducted Emission	FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.207	FCC 15.207	PASS
20dB&99% Bandwidth	FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.215(c)	FCC 15.215	PASS
Radiated Emission	FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.209 and 15.249	FCC 15.249	PASS
Band-edge Compliance of RF Conducted Emissions	FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.249	FCC 15.249	PASS
Antenna Requirement	FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.203	FCC 15.203	PASS

For IC

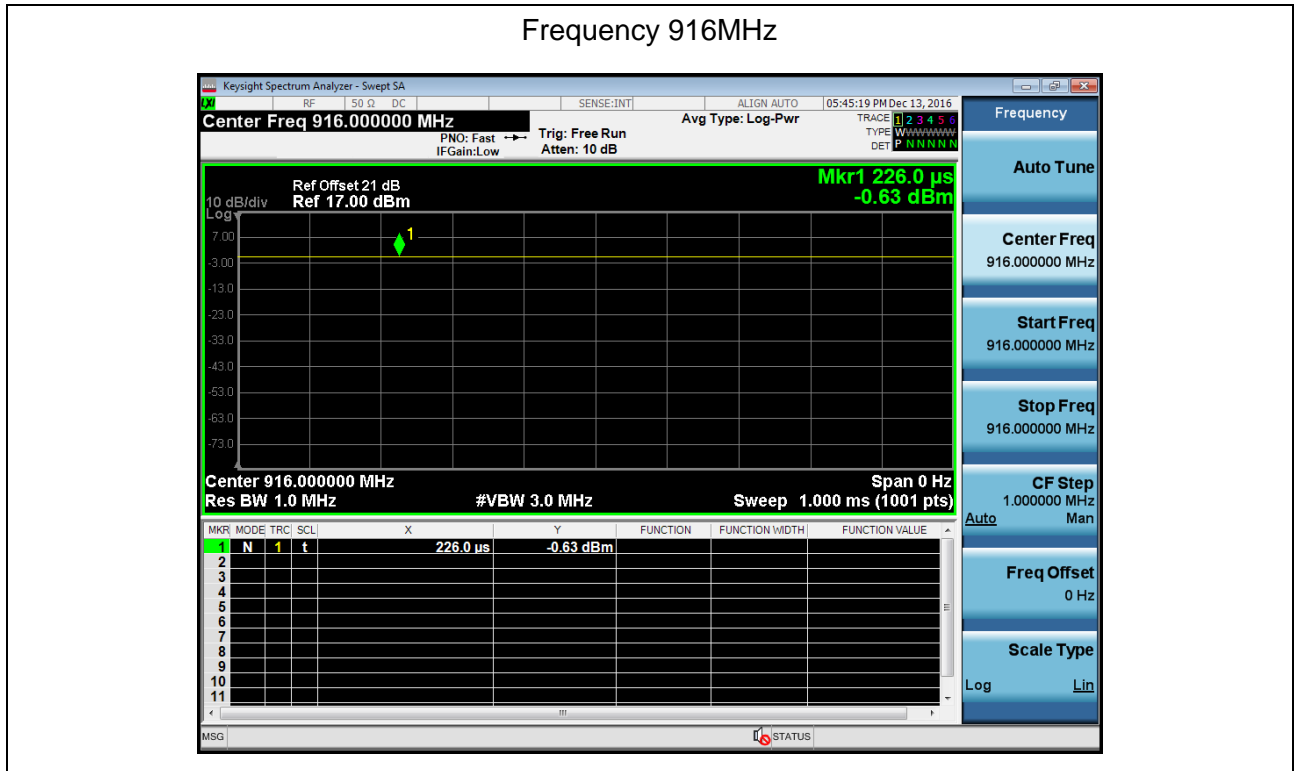
Performed Test Item	Normative References	Limit	Result
AC Power Line Conducted Emission	RSS-Gen Issue 4 November 2014 Section 8.8	RSS Gen	PASS
20dB&99% Bandwidth	RSS-Gen Issue 4 November 2014 Section 6.6	RSS Gen	PASS
Radiated Emission	RSS-210 Issue 9 August 2016 B.10 a)	RSS 210	PASS
Band-edge Compliance of RF Conducted Emissions	RSS-210 Issue 9 August 2016 B.10 b)	RSS 210	PASS
Antenna Requirement	RSS-Gen Issue 4 November 2014 Section 8.3	RSS Gen	PASS

2.2. Test Frequency configuration:

Channel	Frequency	Channel	Frequency	Channel	Frequency
Low	908.4 MHz	Mid	908.42 MHz	High	916MHz

2.3. Duty Cycle

Test Mode	Tx On (ms)	Tx Off (ms)	VBW	Tx On + Tx Off (ms)	Duty Cycle
1	--	--	10Hz	--	100%



2.4. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	21
Humidity (%RH)	25-75	50
Barometric pressure (mbar)	860-1060	950-1000

2.5. Measurement Uncertainty

Test Items	Uncertainty
AC Power Line Conducted Emission	$\pm 2.02\text{dB}$
Radiated Emission	Below 1GHz $\pm 3.8\text{ dB}$
	Above 1GHz $\pm 3.9\text{ dB}$
RF Antenna Port Conducted Emission	$\pm 1.27\text{dB}$
Radiated Emission Band Edge	$\pm 3.9\text{dB}$
Occupied Bandwidth	$\pm 1\text{kHz}$
Power Spectral Density	$\pm 1.27\text{dB}$

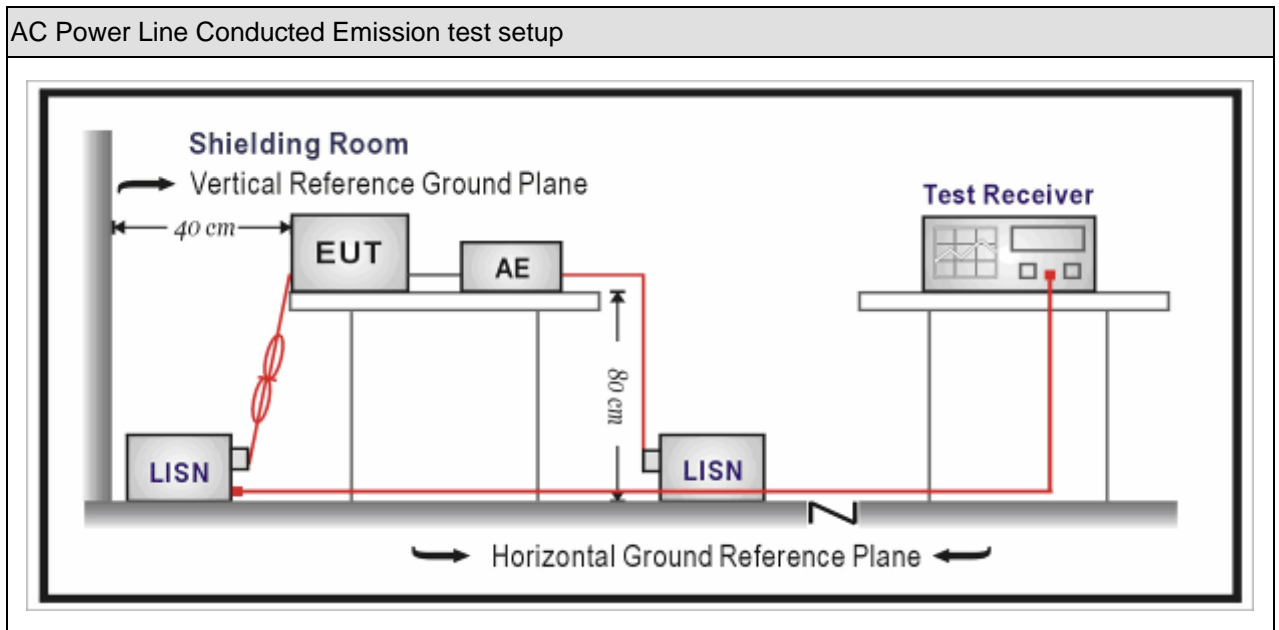
3. AC Power Line Conducted Emission

3.1. Test Equipment

AC Power Line Conducted Emission / TR-1					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100906	2016.03.05	2017.03.04
Two-Line V-Network	R&S	ENV 216	101189	2016.07.16	2017.07.15
Two-Line V-Network	R&S	ENV 216	101044	2016.09.04	2017.09.03
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	N/A	N/A
50ohm Termination	SHX	TF2	07081402	2016.09.04	2017.09.03
Temperature/Humidity Meter	Zhichen	ZC1-2	TR1-TH	2016.01.05	2017.01.04

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

3.2. Test Setup



3.3. Limit

Frequency of Emission (MHz)	Conducted Limit	
	Quasi-peak (dB μ V)	Average (dB μ V)
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

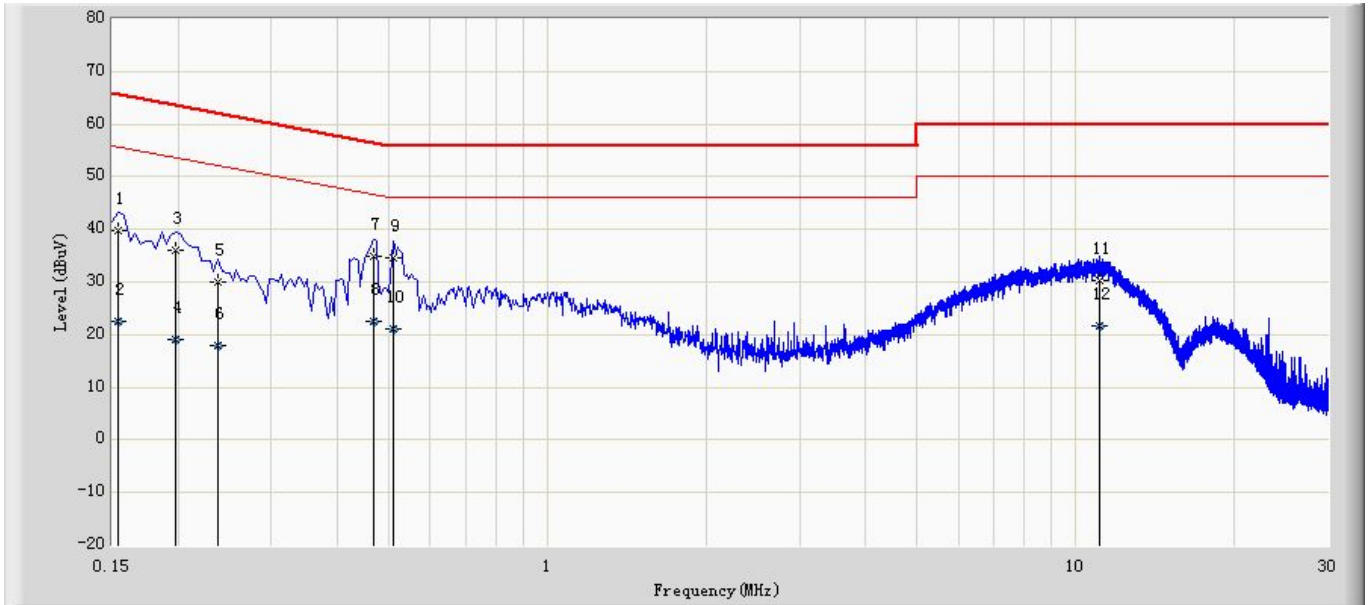
Note 1: The lower limit shall apply at the transition frequencies.
Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

3.4. Test Procedure

Test Method			
	References Rule	Chapter	Item
<input checked="" type="checkbox"/>	ANSI C63.10-2013	6.2	Standard test method for ac power-line conducted emissions from unlicensed wireless devices
<input checked="" type="checkbox"/>	ANSI C63.4-2014	7	AC power-line conducted emission measurements

3.5. Test Result

Site: TR1	Time: 2016/11/16
Limit: FCC_Part15.107_CE_AC Power_ClassB	Margin: 0
Probe: ENV216-L1	Polarity: Line
EUT: Scout Hub	Power: AC 120V/60Hz
Note: Mode 1: Transmit	

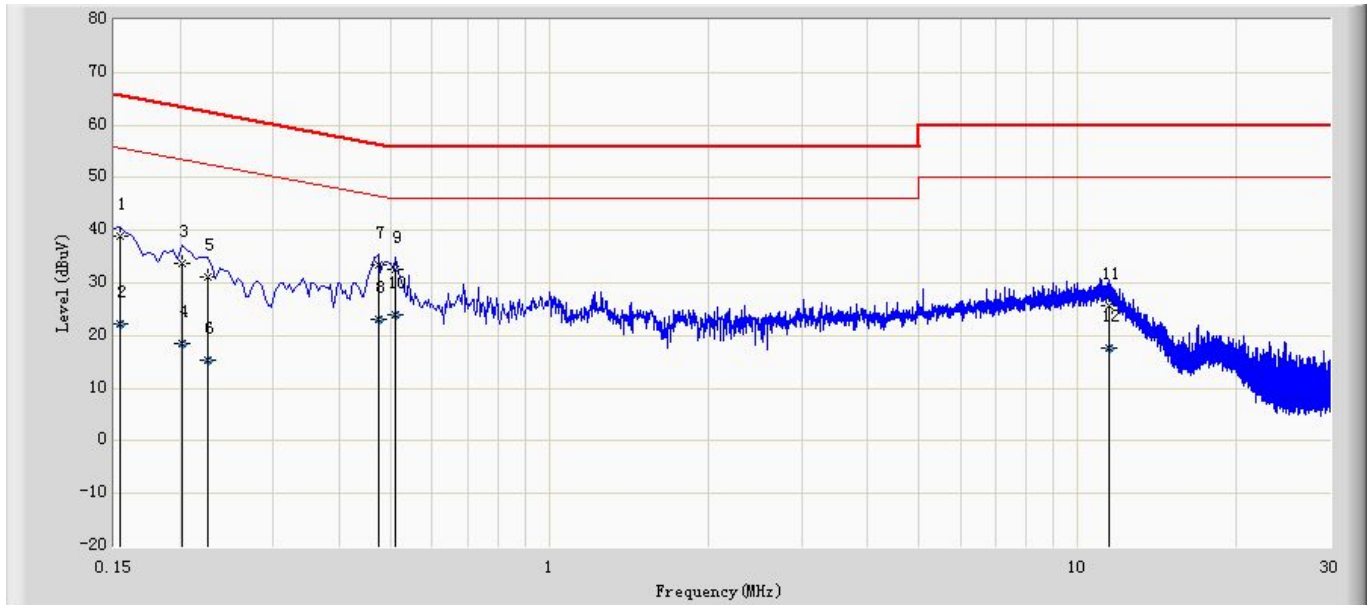


No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Probe (dB)	Cable (dB)	Amp (dB)	Type
1		0.154	39.628	29.895	-26.153	65.781	9.673	0.060	0.000	QP
2		0.154	22.513	12.780	-33.268	55.781	9.673	0.060	0.000	AV
3		0.198	36.176	26.466	-27.518	63.694	9.650	0.060	0.000	QP
4		0.198	19.205	9.495	-34.489	53.694	9.650	0.060	0.000	AV
5		0.238	30.041	20.331	-32.125	62.166	9.650	0.060	0.000	QP
6		0.238	18.036	8.326	-34.130	52.166	9.650	0.060	0.000	AV
7		0.470	34.887	25.187	-21.627	56.514	9.630	0.070	0.000	QP
8		0.470	22.536	12.836	-23.978	46.514	9.630	0.070	0.000	AV
9	*	0.510	34.709	25.009	-21.291	56.000	9.630	0.070	0.000	QP
10		0.510	21.133	11.433	-24.867	46.000	9.630	0.070	0.000	AV
11		11.110	30.388	20.358	-29.612	60.000	9.740	0.290	0.000	QP
12		11.110	21.736	11.706	-28.264	50.000	9.740	0.290	0.000	AV

Note:

1. " * ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor(Probe+Cable+Amp).

Site: TR1	Time: 2016/11/16
Limit: FCC_Part15.107_CE_AC Power_ClassB	Margin: 0
Probe: ENV216-N	Polarity: Neutral
EUT: Scout Hub	Power: AC 120V/60Hz
Note: Mode 1: Transmit	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Probe (dB)	Cable (dB)	Amp (dB)	Type
1		0.154	38.853	29.120	-26.928	65.781	9.673	0.060	0.000	QP
2		0.154	22.155	12.422	-33.626	55.781	9.673	0.060	0.000	AV
3		0.202	33.682	23.962	-29.846	63.528	9.660	0.060	0.000	QP
4		0.202	18.499	8.779	-35.029	53.528	9.660	0.060	0.000	AV
5		0.226	31.099	21.379	-31.496	62.595	9.660	0.060	0.000	QP
6		0.226	15.429	5.709	-37.166	52.595	9.660	0.060	0.000	AV
7		0.474	33.561	23.861	-22.883	56.444	9.630	0.070	0.000	QP
8		0.474	23.022	13.322	-23.422	46.444	9.630	0.070	0.000	AV
9		0.510	32.567	22.867	-23.433	56.000	9.630	0.070	0.000	QP
10	*	0.510	23.994	14.294	-22.006	46.000	9.630	0.070	0.000	AV
11		11.430	25.671	15.631	-34.329	60.000	9.750	0.290	0.000	QP
12		11.430	17.698	7.658	-32.302	50.000	9.750	0.290	0.000	AV

Note:

1. " * ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor(Probe+Cable+Amp).

4. Emissions in restricted frequency bands

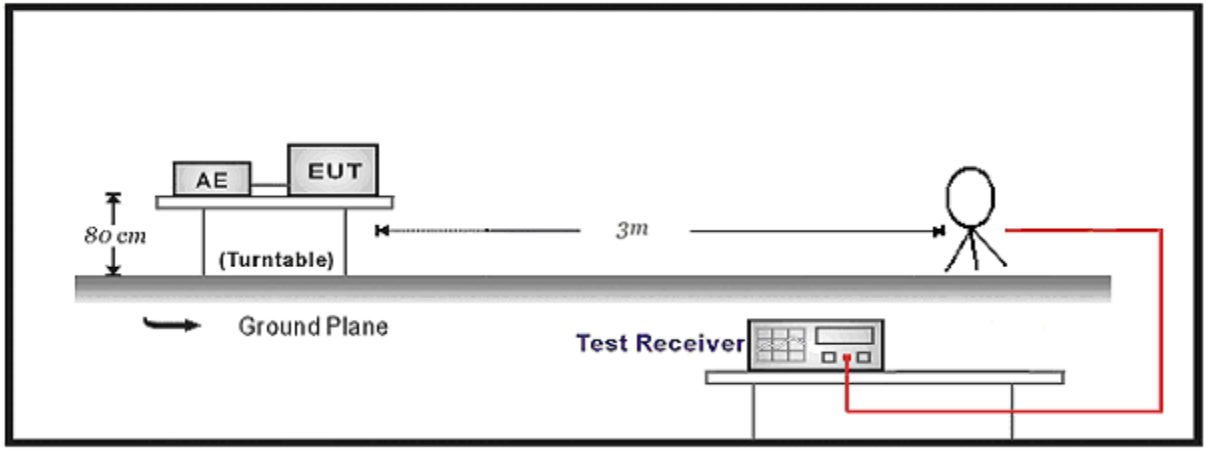
4.1. Test Equipment

Radiated Emission(Below 1GHz) / AC-2					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100573	2016.03.05	2017.03.04
Loop Antenna	R&S	HFH2-Z2	833799/003	2016.11.07	2017.11.06
Bilog Antenna	Teseq GmbH	CBL6112D	27611	2016.08.10	2017.08.09
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2016.02.28	2017.02.27
Temperature/Humidity Meter	Zhichen	ZC1-2	AC2-TH	2016.01.05	2017.01.04
Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.					

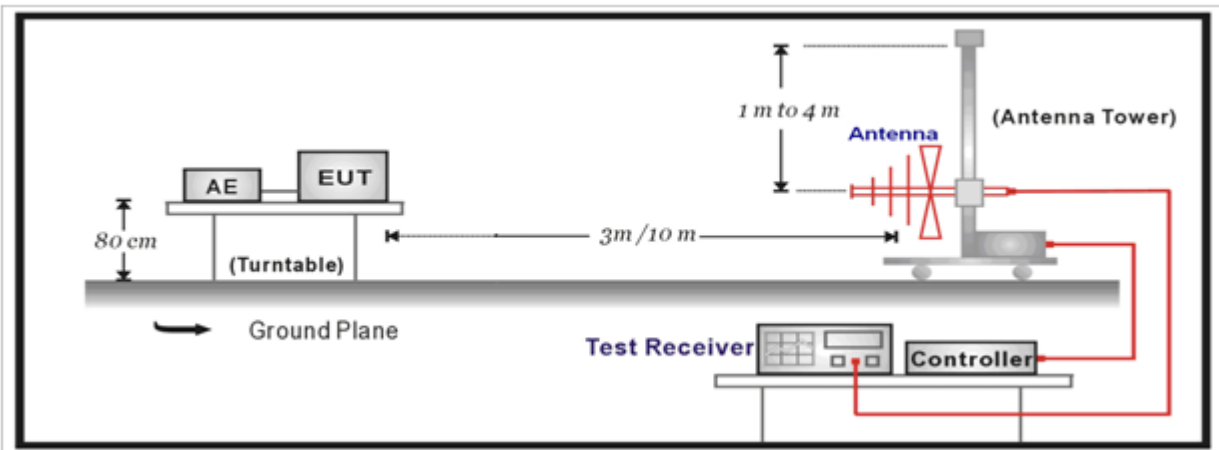
Radiated Emission(Above 1GHz) / AC-5					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2016.01.04	2017.01.03
Preamplifier	Miteq	NSP1800-25	1364185	2016.05.03	2017.05.02
Preamplifier	QuieTek	AP-040G	CHM-0906001	2016.05.06	2017.05.05
DRG Horn	ETS-Lindgren	3117	00123988	2016.01.22	2017.01.20
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2016.11.25	2017.11.23
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2016.03.02	2017.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2016.03.02	2017.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2016.03.02	2017.03.01
EMI Receiver	Agilent	N9038A	MY51210196	2016.06.10	2017.06.09
Temperature/Humidity Meter	Zhichen	ZC1-2	AC5-TH	2016.01.04	2017.01.03
Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.					

4.2. Test Setup

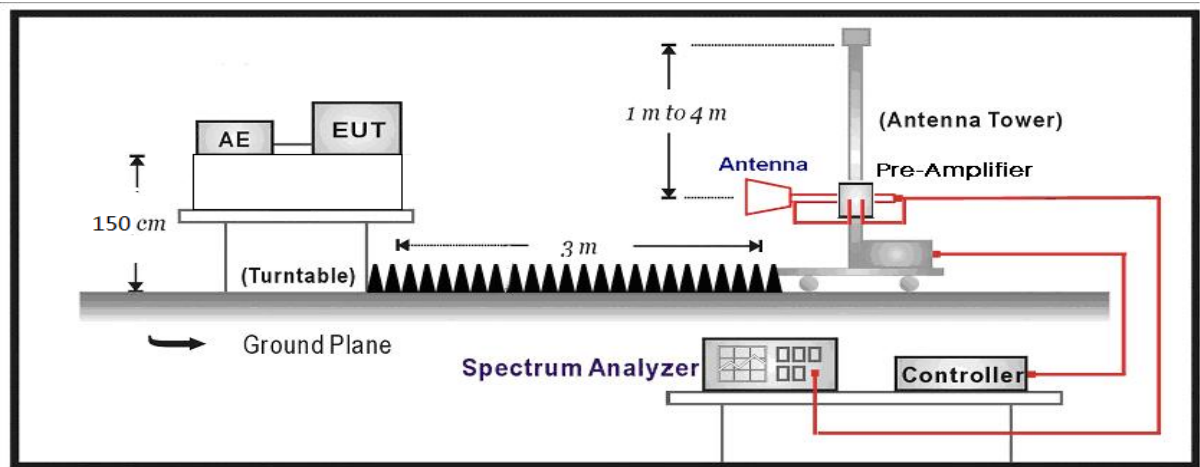
Below 30MHz Test Setup:



30MHz-1GHz Test Setup:



Above 1GHz Test Setup:



4.3. Limit

For FCC:

Restricted Bands of operation			
Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 – 0.110	16.42 – 16.423	399.9 – 410	4.5 – 5.15
0.495 – 0.505	16.69475 – 16.69525	608 – 614	5.35 – 5.46
2.1735 – 2.1905	16.80425 – 16.80475	960 – 1240	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1300 – 1427	8.025 – 8.5
4.17725 – 4.17775	37.5 – 38.25	1435 – 1626.5	9.0 – 9.2
4.20725 – 4.20775	73 – 74.6	1645.5 – 1646.5	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1660 – 1710	10.6 – 12.7
6.26775 – 6.26825	108 – 121.94	1718.8 – 1722.2	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2200 – 2300	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2310 – 2390	15.35 – 16.2
8.362 – 8.366	156.52475 – 156.52525	2483.5 – 2500	17.7 – 21.4
8.37625 – 8.38675	156.7 – 156.9	2690 – 2900	22.01 – 23.12
8.81425 – 8.81475	162.0125 – 167.17	3260 – 3267	23.6 – 24.0
12.29 – 12.293	167.72 – 173.2	3332 – 3339	31.2 – 31.8
12.51975 – 12.52025	240 – 285	3345.8 – 3358	36.43 – 36.5
12.57675 – 12.57725	322 – 335.4	3600 – 4400	
13.36 – 13.41			

For IC:

Restricted Bands of operation			
Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090-0.110	13.36-13.41	1645.5-1646.5	13.25-13.4
2.1735-2.1905	16.42-16.423	1660-1710	14.47-14.5
3.020-3.026	16.69475-16.69525	1718.8-1722.2	15.35-16.2
4.125-4.128	16.80425-16.80475	2200-2300	17.7-21.4
4.17725-4.17775	25.5-25.67	2310-2390	22.01-23.12
4.20725-4.20775	37.5-38.25	2655-2900	23.6-24.0
5.677-5.683	73-74.6	3260-3267	31.2-31.8
6.215-6.218	74.8-75.2	3332-3339	36.43-36.5
6.26775-6.26825	108-138	3345.8-3358	Above 38.6
6.31175-6.31225	156.52475-156.52525	3500-4400	
8.291-8.294	156.7-156.9	4500-5150	
8.362-8.366	240-285	5350-5460	
8.37625-8.38675	322-335.4	7250-7750	
8.41425-8.41475	399.9-410	8025-8500	
12.29-12.293	608-614	9.0-9.2	
12.51975-12.52025	960-1427	9.3-9.5	
12.57675-12.57725	1435-1626.5	10.6-12.7	

Restricted Band Emissions Limit			
Frequency (MHz)	Field strength (μ V/m)	Field strength (dB μ V/m)	Measurement distance (m)
0.009 - 0.49	2400/F(kHz)	48.5 – 13.8	300 _(Note 1)
0.49 - 1.705	24000/F(kHz)	33.8 - 23	30 _(Note 1)
1.705 - 30	30	29.5	30 _(Note 1)
30 - 88	100	40	3 _(Note 2)
88 - 216	150	43.5	3 _(Note 2)
216 - 960	200	46	3 _(Note 2)
Above 960	500	54	3 _(Note 2)

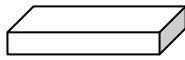
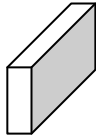
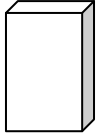



Note 1: At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade).

Note 2: At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

4.4. Test Procedure

Test Method				
	References Rule		Chapter	Description
	<input checked="" type="checkbox"/>	ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
	<input checked="" type="checkbox"/>	ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
	<input checked="" type="checkbox"/>	ANSI C63.10	6.6	Radiated emissions from unlicensed wireless devices above 1 GHz

4.5. EUT test Axis definition

Item	Emissions in restricted frequency bands			
Device Category	<input type="checkbox"/>	Fixed position use		
	<input checked="" type="checkbox"/>	Mobile position use		
Test mode	Mode 1			
Test method	<input checked="" type="checkbox"/>	Radiated		
		X Axis	Y Axis	Z Axis
				
		Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>	Worst Axis <input checked="" type="checkbox"/>
	<input type="checkbox"/>	Conducted		
	<input type="checkbox"/>	Chain 1		
				
	<input type="checkbox"/>	Chain 1	Chain 2	
				
	<input type="checkbox"/>	Chain 1	Chain 2	Chain 3
				

4.6. Test Result

Product Name	: Scout Hub	Power	: AC 120V/60HZ
Test Mode	: Mode 1	Test Site	: AC-5
Test Date	: 2016.12.08		

Frequency (MHz)	Antenna	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Type
908.4	H	51.54	31.91	83.45	114	-30.55	PK
	V	60.42	31.91	92.33	114	-21.67	PK
908.42	H	52.25	31.91	84.16	114	-29.84	PK
	V	60.51	31.91	92.42	114	-21.58	PK
916	H	50.18	31.91	82.09	114	-31.91	PK
	V	59.11	31.91	91.02	114	-22.98	PK

Note: 1. Measure Level = Reading Level + Factor.

2. Factor = Antenna factor + cable loss factor - preamp factor

Frequency (MHz)	Antenna	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Type
908.4	H	50.93	31.91	82.84	94	-11.16	QP
	V	60.67	31.91	92.58	94	-1.42	QP
908.42	H	50.23	31.91	82.14	94	-11.86	QP
	V	60.59	31.91	92.50	94	-1.5	QP
916	H	49.08	31.91	80.99	94	-13.01	QP
	V	59.46	31.91	91.37	94	-2.63	QP

Note: 1. Average Measure Level = Reading Level + Factor.

2. Factor = Antenna factor + cable loss factor - preamp factor

Frequency (MHz)	Antenna	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Type
908.4	H	50.40	31.91	82.31	94	-11.69	AV
	V	60.25	31.91	92.16	94	-1.84	AV
908.42	H	49.76	31.91	81.67	94	-12.33	AV
	V	60.21	31.91	92.12	94	-1.88	AV
916	H	48.62	31.91	80.53	94	-13.47	AV
	V	58.88	31.91	90.79	94	-3.21	AV

Note: 1. Average Measure Level = Reading Level + Factor.
 2. Factor = Antenna factor + cable loss factor - preamp factor

Harmonic Radiated Emission

CH (MHz)	Frequency (MHz)	Antenna	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Type
908.4	1816.8	H	55.5	-14.0	41.5	54(Note3)	-12.5	PK
	1816.8	V	52.8	-14.0	38.7	54(Note3)	-15.3	PK
	2725.5	H	57.8	-10.4	47.4	54(Note3)	-6.6	PK
	2725.5	V	57.2	-10.4	46.8	54(Note3)	-7.2	PK
	3635.0	H	55.1	-9.1	46.0	54(Note3)	-8.0	PK
	3635.0	V	55.5	-9.1	46.4	54(Note3)	-7.6	PK
908.42	1816.8	H	52.0	-14.0	38.0	54(Note3)	-16.0	PK
	1816.8	V	52.3	-14.0	38.3	54(Note3)	-15.7	PK
	2725.5	H	63.4	-10.4	52.9	54(Note3)	-1.1	PK
	2725.5	V	62.5	-10.4	52.0	54(Note3)	-2.0	PK
	3633.7	H	49.8	-9.1	40.6	54(Note3)	-13.4	PK
	3635.0	V	57.6	-9.1	48.6	54(Note3)	-5.4	PK
916	1832.0	H	52.3	-13.6	38.7	54(Note3)	-15.3	PK
	1832.0	V	51.2	-13.6	37.6	54(Note3)	-16.4	PK
	2751.0	H	57.2	-10.0	47.2	54(Note3)	-6.8	PK
	2751.0	V	58.4	-10.0	48.4	54(Note3)	-5.6	PK
	3660.5	H	55.0	-9.1	45.9	54(Note3)	-8.1	PK
	3660.5	V	53.8	-9.1	44.7	54(Note3)	-9.3	PK

Note: 1. Measure Level = Reading Level + Factor.

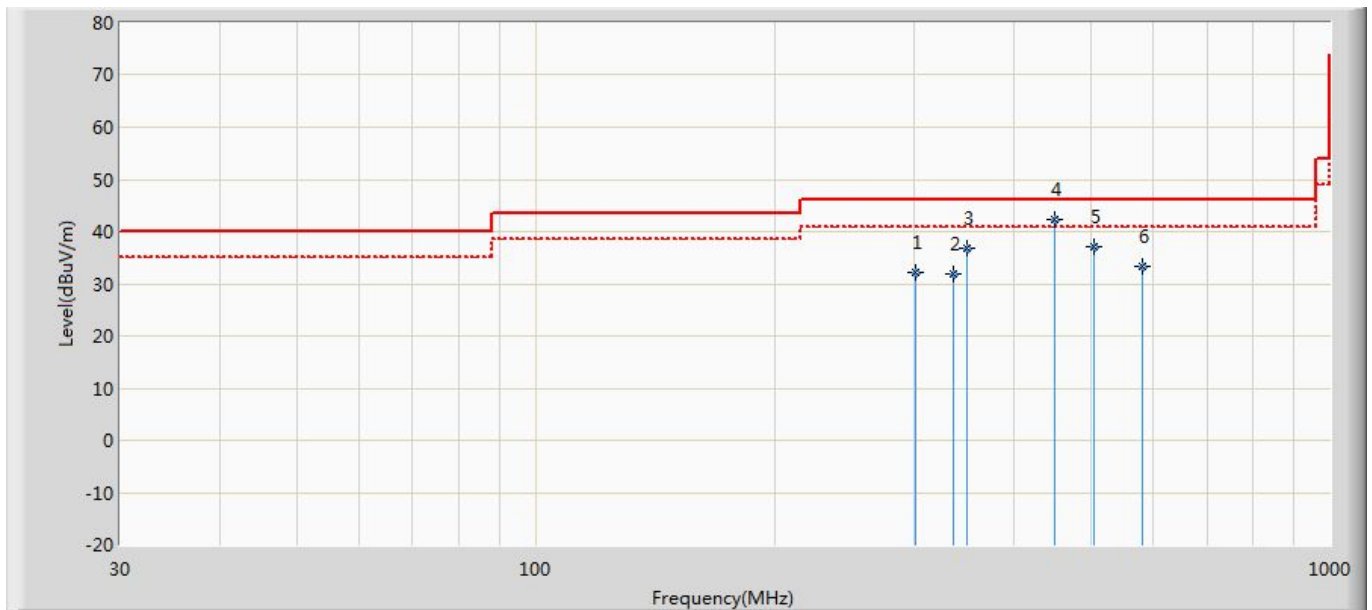
Note: 2. The test frequency range, 9kHz~30MHz, 18GHz~25GHz, both of the worst case are at least 6dB below the limits, therefore no data appear in the report.

Note: 3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

Note: 4. The RBW set up, see Clause 6.6.

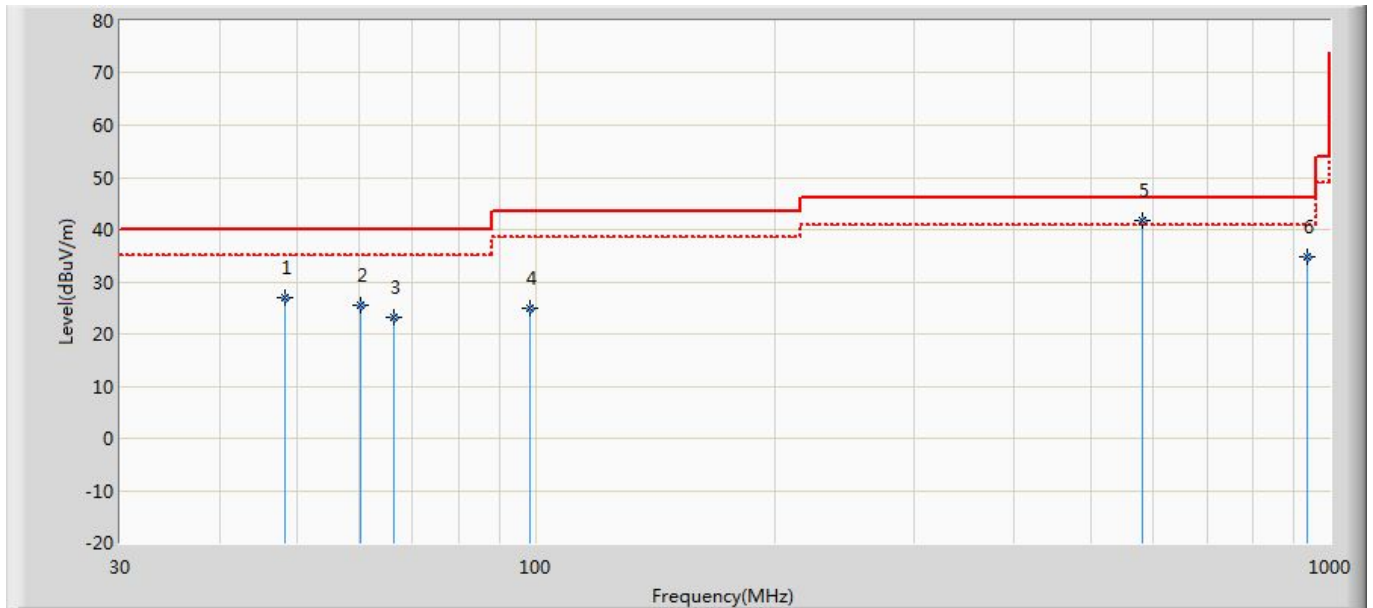
The worst case of Radiated Emission below 1GHz:

Site: AC3	Time: 2016/12/14 - 09:31
Limit: FCC_Part15.109_RE(3m)_ClassB	Margin: 5
Probe: AC3_3m (30-1000MHz)	Polarity: Horizontal
EUT: Scout Hub	Power: AC 120V/60Hz
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		300.615	32.080	11.515	-13.920	46.000	20.566	QP
2		335.514	31.759	8.645	-14.241	46.000	23.114	QP
3		349.989	36.885	14.300	-9.115	46.000	22.585	QP
4	*	449.990	42.372	15.300	-3.628	46.000	27.072	QP
5		503.941	37.073	10.100	-8.927	46.000	26.973	QP
6		580.321	33.203	5.150	-12.797	46.000	28.053	QP

Site: AC3	Time: 2016/12/14 - 09:32
Limit: FCC_Part15.109_RE(3m)_ClassB	Margin: 5
Probe: AC3_3m (30-1000MHz)	Polarity: Vertical
EUT: Scout Hub	Power: AC 120V/60Hz
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		48.461	27.025	9.300	-12.975	40.000	17.724	QP
2		60.220	25.447	9.500	-14.553	40.000	15.946	QP
3		66.292	23.166	7.700	-16.834	40.000	15.466	QP
4		98.428	24.892	3.400	-18.608	43.500	21.492	QP
5	*	579.933	41.626	14.900	-4.374	46.000	26.725	QP
6		935.497	34.834	0.600	-11.166	46.000	34.234	QP

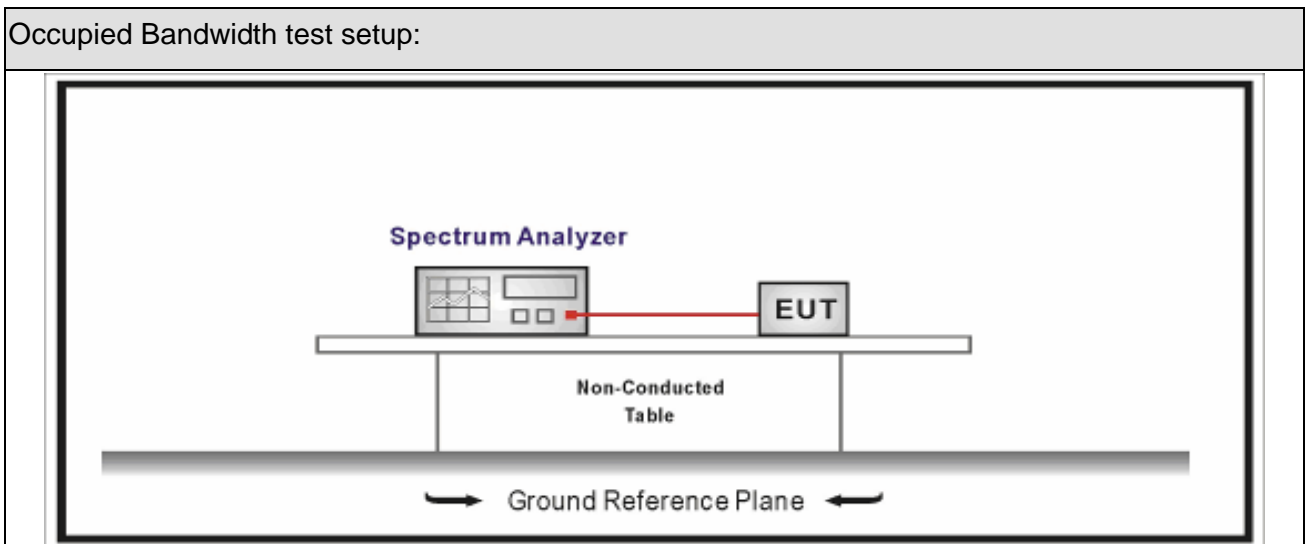
5. Emissions in non-restricted frequency bands

5.1. Test Equipment

Occupied Bandwidth / TR-8					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2016.02.04	2017.02.03
EXA Spectrum Analyzer	Keysight	N9010A	MY55370495	2016.04.09	2017.04.08
MXA Signal Analyzer	Keysight	N9020A	MY56060147	2016.04.09	2017.04.08
Temperature/Humidity Meter	zhichen	ZC1-2	TR8-TH	2016.04.10	2017.04.09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

5.2. Test Setup



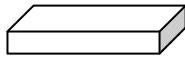
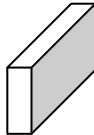
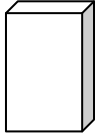
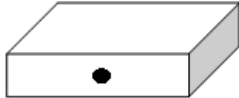


5.3. Limit

Un-Restricted Band Emissions Limit	
RF Output power (Detection methods)	Limit(dB)
RF Output power	50c(Note1)
Note 1: Emissions radiated outside of the specified frequency bands, except for harmonic emissions, shall be attenuated by at least 50 dB below the level of the fundamental emissions or to the general field strength limits listed in RSS-Gen, whichever is less stringent.	

5.4. Test Procedure

Test Method				
	References Rule		Chapter	Description
	<input checked="" type="checkbox"/>	ANSI C63.10	6.7	Antenna-port conducted measurements

5.5. EUT test Axis definition

Item	Emissions in non-restricted frequency bands			
Device Category	<input type="checkbox"/>	Fixed position use		
	<input checked="" type="checkbox"/>	Mobile position use		
Test mode	Mode 1 ~ Mode 4			
Test method	<input type="checkbox"/>	Radiated		
		X Axis	Y Axis	Z Axis
				
		Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>
	<input checked="" type="checkbox"/>	Conducted		
	<input checked="" type="checkbox"/>	Chain 0		
				
	<input type="checkbox"/>	Chain 0	Chain 1	
				
	<input type="checkbox"/>	Chain 0	Chain 1	Chain 2
				

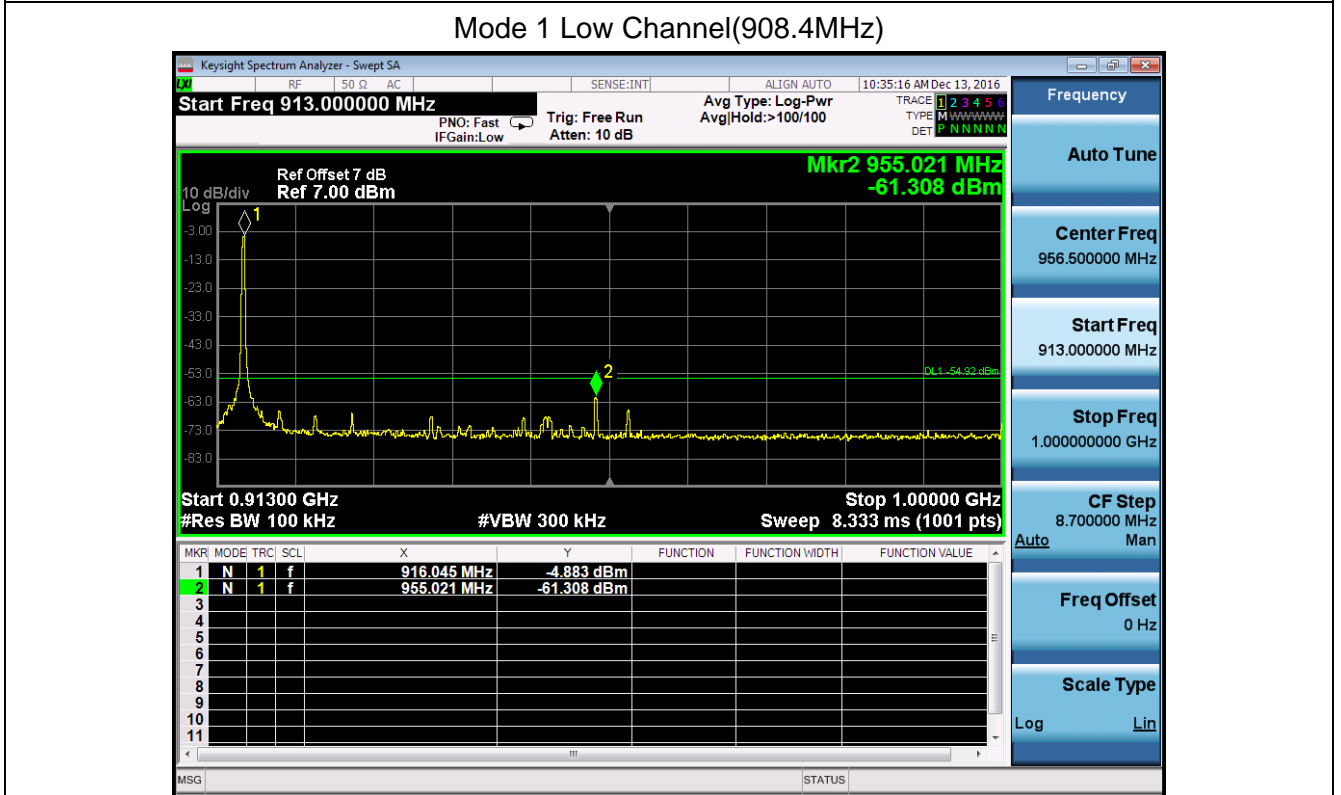
5.6. Test Result

Product Name	: Scout Hub	Power	: AC 120V/60HZ
Test Mode	: Mode1	Test Site	: TR8
Test Date	: 2016.12.08		

Mode	Channel	Test Frequency (MHz)	In-Band PSD[a] (dBm/100kHz)	Frequency (MHz)	Out-Band PSD[b] (dBm/100kHz)	[a]-[b] (dB)	Limit (dB)	Result
1	Low	908.4	-3.594	833.040	-74.308	70.714	>50	Pass
1	High	916.0	-4.883	955.021	-61.308	56.425	>50	Pass

Note: The worst case of emissions in non-restricted frequency bands as below:

Mode 1 Low Channel(908.4MHz)



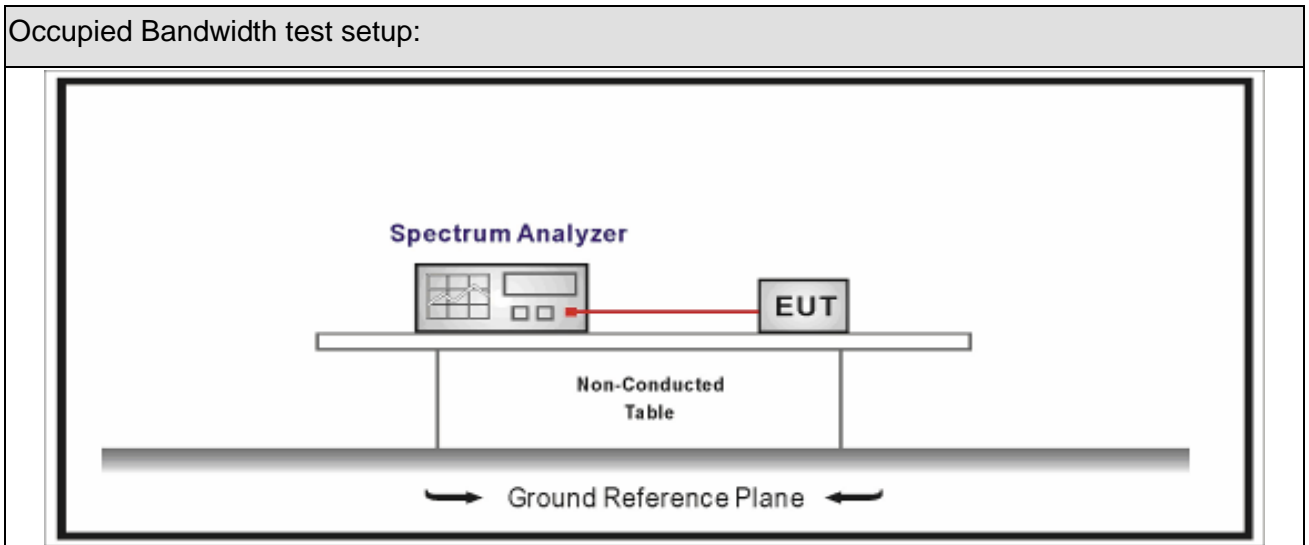
6. Occupied Bandwidth

6.1. Test Equipment

Occupied Bandwidth / TR-8					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2016.02.04	2017.02.03
EXA Spectrum Analyzer	Keysight	N9010A	MY55370495	2016.04.09	2017.04.08
MXA Signal Analyzer	Keysight	N9020A	MY56060147	2016.04.09	2017.04.08
Temperature/Humidity Meter	zhichen	ZC1-2	TR8-TH	2016.04.10	2017.04.09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

6.2. Test Setup



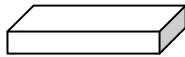
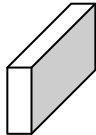
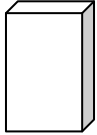
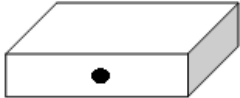


6.3. Limit

Occupied Bandwidth
<p>the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.</p>

6.4. Test Procedure

Test Method			
	Reference Rule	Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10	6.9	DTS bandwidth
<input checked="" type="checkbox"/>	ANSI C63.10	6.9.2	Occupied bandwidth—relative measurement procedure
<input checked="" type="checkbox"/>	ANSI C63.10	6.9.3	Occupied bandwidth—power bandwidth (99%) measurement procedure

6.5. EUT test definition

Item	Occupied Bandwidth			
Device Category	<input type="checkbox"/>	Fixed position use		
	<input checked="" type="checkbox"/>	Mobile position use		
Test mode	Mode 1			
Test method	<input type="checkbox"/>	Radiated		
		X Axis	Y Axis	Z Axis
				
		Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>
	<input checked="" type="checkbox"/>	Conducted		
	<input checked="" type="checkbox"/>	Chain 0		
				
	<input type="checkbox"/>	Chain 0	Chain 1	
				
	<input type="checkbox"/>	Chain 0	Chain 1	Chain 2
				

6.6. Test Result

Product Name	: Scout Hub	Power	: AC 120V/60HZ
Test Mode	: Mode1	Test Site	: TR8
Test Date	: 2016.12.08		

Mode	CH.	Test Freq. (MHz)	99% Occupied Bandwidth (KHz)	20dB Occupied Bandwidth (KHz)	Result
1	Low	908.4	85.364	87.36	Pass
1	Mid	908.42	89.075	97.84	Pass
1	High	916	109.84	124.7	Pass

Note : The worst case of Occupied Bandwidth as below in next page:

Mode 1 High Channel (916MHz)



7. Antenna Requirement

7.1. Limit

Antenna Requirement Limit
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 a broken antenna can be replaced by the user, 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 §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 §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.

7.2. Antenna Connector Construction

The EUT use permanently attached antennas and comply with FCC 15.203.



————— The End —————