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Report No.: 1601RSU00702 Report Version: V03 Issue Date: 02-05-2016

# MEASUREMENT REPORT FCC Part 15B

**APPLICANT:** Grandstream Networks, Inc.

Product:	IP Phone
Model No.:	GXP2140
Brand Name:	Grandstream
FCC Classification:	FCC Class B Digital Device (JBP)
FCC Rule Part(s):	FCC Part 15 Subpart B: 2014
Test Procedure(s):	ANSI C63.4: 2014
Test Date:	January 12 ~ 16, 2016

**Reviewed By** 

Approved By

: Robin Wu (Robin Wu) : Marlinchen

(Marlin Chen)



The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2014. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.



# **Revision History**

Report No.	Version	Description	Issue Date
1601RSU00702	Rev. 01	Initial report	01-18-2016
1601RSU00702	Rev. 02	Update the test date and delete the radiated emission data above 1GHz	01-20-2016
1601RSU00702	Rev. 03	Update the test setup diagram	02-05-2016

Note: The EUT has been got the FCC certificate (FCC ID: YZZGXP2140). The EUT adds two new adapters now and we have shown the conducted emission data and radiated emission data in this report.



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§2.1033	General	Information
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Applicant:	Grandstream Networks, Inc.			
Applicant Address:	4th Floor, Rainbow Technology Building #16 New West Rd, Nanshan			
	Science & Technology Park (North District), Shenzhen, China			
	518057			
Manufacturer:	Grandstream Networks, Inc.			
Manufacturer Address:	4th Floor, Rainbow Technology Building #16 New West Rd, Nanshan			
	Science & Technology Park (North District), Shenzhen, China			
	518057			
Test Site:	MRT Technology (Suzhou) Co., Ltd			
Test Site Address:	D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong			
	Economic Development Zone, Suzhou, China			
MRT FCC Registration No.:	809388			
Model No.:	GXP2140			
Test Device Serial No.:	N/A Production Pre-Production Engineering			

### **Test Facility / Accreditations**

Measurements were performed at MRT Laboratory located in Tian'edang Rd., Suzhou, China.

- MRT facility is a FCC registered (MRT Reg. No. 809388) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules.
- MRT facility is an IC registered (MRT Reg. No. 11384A-1) test laboratory with the site description on file at Industry Canada.
- MRT facility is a VCCI registered (R-4179, G-814, C-4664, T-2206) test laboratory with the site description on file at VCCI Council.
- MRT Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (A2LA) under the American Association for Laboratory Accreditation Program (A2LA Cert. No. 3628.01) in EMC, Telecommunications and Radio testing for FCC, Industry Canada, EU and TELEC Rules.

Accredited Laboratory ATA his number MRT TECHNOLOGY (SUZHOU) CO., LTD.
MRT TECHNOLOGY (SUZHOL) CO LTD
Suzhou, China for technical competence in the field of
Electrical Testing
This laboratory in accredited in accordance with the recognized International Standard ISO IEC 17025-2015 General requirements for the comprehence of testing and collibration distortantics. This accordination deterministic technical comprehence for a defined accept and fl operation of a laboratory quality management system (of the 1018/DE/L/C-418). Commonput data 5 January 2009).
Presented this 17th day of June 2014.
Product & CED Product & CED Confidence National Not Not Verification National Not Not Verification National Not Not
For the sum is which this accordination applies, please refer to the laboratory's Electrical Scope of Accordination.



# 1. INTRODUCTION

### 1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

## 1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taihu Lake. These measurement tests were conducted at the MRT Technology (Suzhou) Co., Ltd. Facility located at D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2009 on September 30, 2013.





# 2. PRODUCT INFORMATION

# 2.1. Equipment Description

Product Name	IP Phone	
Model No.	GXP2140	
Brand Name	Grandstream	
BT Specification	v2.1 + EDR	
Antenna Type	PIFA Antenna	
Antenna Gain	a Gain 2dBi	
Components		
Adapter #1	M/N: F12US1200100A	
Input: AC 100-240V ~ 50/60Hz, 0.5A max		
OUTPUT: 12Vdc, 1.0A		
Adapter #2 M/N: PEA-120100VA		
	Input: AC 100-240V ~ 50/60Hz, 0.3A	
	OUTPUT: 12Vdc, 1.0A	

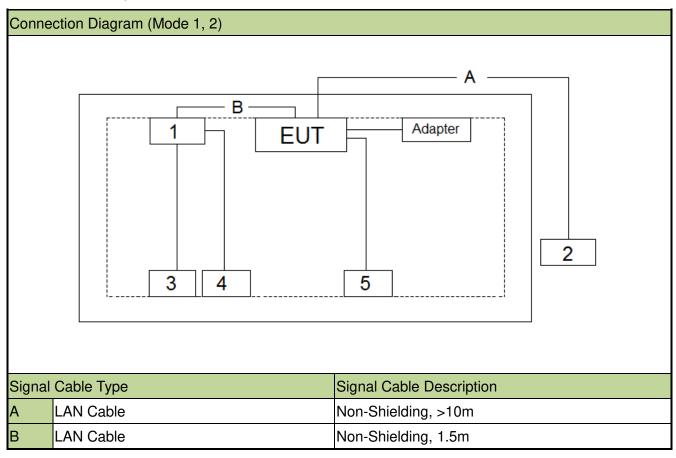
## 2.2. Test Mode

Test Mode				
EMI Mode	Mode 1: Audio Call with another IP Phone and Communicate with PC and Powered by Adapter #1 Mode 2: Audio Call with another IP Phone and Communicate with PC and Powered by Adapter #2			



## 2.3. Test Configuration

The EUT was tested per the guidance FCC Part 15 Subpart B: 2014 and ANSI C63.4: 2014 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing.



### 2.4. Test System Details

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

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook	Lenovo	X201	3626AM3	Non-Shielded, 1.8m
2	IP Phone	GRANDSTREAM	GXP2160	N/A	N/A
3	USB Keyboard	Dell	KB212	N/A	N/A
4	USB Mouse	Dell	MS111	N/A	N/A
5	USB Mouse	Dell	MS111	N/A	N/A

Remark: The auxiliary equipment notebook was authorized by FCC Declaration of Confirmation.



### 2.5. Test Software

1	Setup the EUT and simulators as shown on above.
	(1), Make the EUT set-up as shown above.
2	(2), Power on the EUT and Make a Audio Call with another IP Phone and Communicate with PC.
	(3), Start to test.

### 2.6. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.



# 3. DESCRIPTION OF TEST

### 3.1. Evaluation Procedure

The measurement procedures described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical Equipment in the Range of 9kHz to 40GHz (ANSI C63.4-2014) was used in the measurement of the **IP Phone Deviation from measurement procedure**......**None** 

### 3.2. AC Line Conducted Emissions

The line-conducted facility is located inside an 8'x4'x4' shielded enclosure. A 1m x 2m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz,  $50\Omega/50$ uH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply line(s) will be connected to the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground-plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the receiver and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The receiver was scanned from 150 kHz to 30 MHz. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 9 kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was also maximized by varying: power lines, the mode of operation or resolution, clock or data exchange speed, scrolling H pattern to the EUT and/or support equipment whichever determined the worst-case emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions are used for final measurements on the same test site.

Line conducted emissions test results are shown in Section 6.2.



### 3.3. Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. An MF Model 210SS turntable is used for radiated measurement. It is a continuously rotatable, remote controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm high PVC support structure is placed on top of the turntable. For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30 MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30 MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up was placed on top of the 0.8 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, mode of operation, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found. Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions. According to 3dB beam-width of horn antenna, the horn antenna should be always directed to the EUT when rising height.



# 4. TEST EQUIPMENT CALIBRATION DATE

#### Conducted Emissions - SR2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2016/11/03
Two-Line V-Network	R&S	ENV216	MRTSUE06002	1 year	2016/11/03
Two-Line V-Network	R&S	ENV216	MRTSUE06003	1 year	2016/11/03
Temperature/ Meter Humidity	Yuhuaze	N/A	MRTSUE06180	1 year	2016/12/20

#### Radiated Emission - AC2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	N9010A	MRTSUE06124	1 year	2016/06/23
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2016/11/03
Microwave System Amplifier	Agilent	83017A	MRTSUE06076	1 year	2016/03/29
TRILOG Antenna	Schwarzbeck	VULB9168	MRTSUE06172	1 year	2016/12/10
Temperature/ Meter Humidity	Mingao	ETH529	MRTSUE06170	1 year	2016/11/29

Software	Version	Function
e3	V8.3.5	EMI Test Software



# 5. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

AC Conducted Emission Measurement - SR2						
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)):						
150kHz~30MHz: 3.5dB						
Radiated Emission Measurement - AC2						
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)):						
Horizontal: 30MHz~1GHz: 4.07dB						
Vertical: 30MHz~1GHz: 4.18 dB						



# 6. TEST RESULT

### 6.1. Summary

Company Name:Grandstream Networks, Inc.Audio Call with another IP Phone and Communicate with PC andTest Mode:Powered by Adapter #1;<br/>Audio Call with another IP Phone and Communicate with PC and<br/>Powered by Adapter #2;

FCC Part Section(s)	Test Description	Test Result		
15.107	Conducted Emissions	Pass		
15.109	Radiated Emissions	Pass		



### 6.2. Conducted Emission Measurement

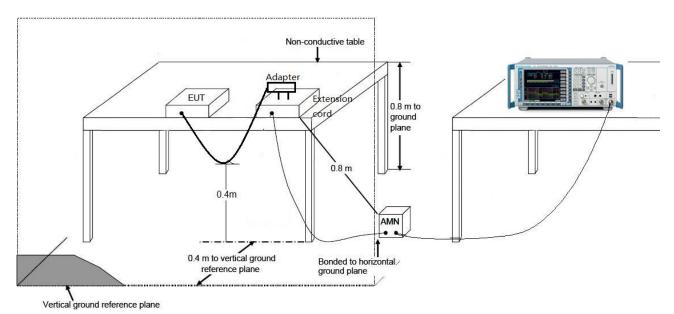
#### 6.2.1. Test Limit

FCC Part 15.107 Limits								
Frequency (MHz)	QP (dBµV)	AV (dBµV)						
0.15 - 0.50	66 - 56	56 - 46						
0.50 - 5.0	56	46						
5.0 - 30	60	50						

Note 1: The lower limit shall apply at the transition frequencies.

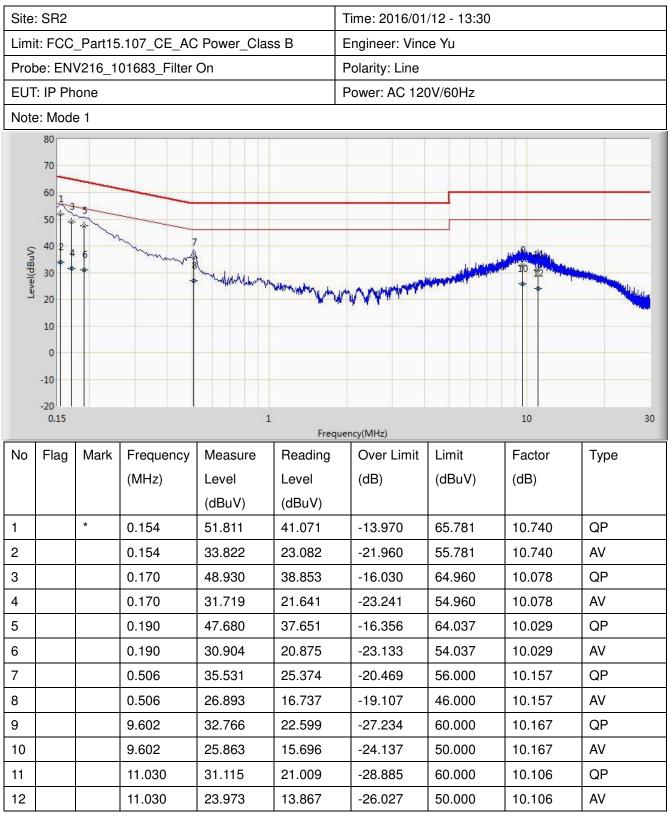
Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

#### 6.2.2. Test Setup





#### 6.2.3. Test Result of Conducted Emissions



Note: Measure Level (dB $\mu$ V) = Reading Level (dB $\mu$ V) + Factor (dB)



Sile	: SR2				Т	Time: 2016/01/12 - 13:35				
Limi	it: FCC	_Part15	.107_CE_AC	Power_Clas	s B E	Engineer: Vince Yu				
Prob	be: EN	V216_1	01683_Filter	On	F	Polarity: Neutral				
EUT	: IP Ph	ione			F	ower: AC 120	0V/60Hz			
Note	e: Mode	e 1			I					
Level(dBuV)	80 70 60 1 3 50 40 2 4 30 20 10 0		5 Multiple	h		Service and applicable				
	-10 -20 0.15			1				10	30	
NI-		Maula	<b>F</b>	Managemen		ncy(MHz)	1 inst	Fastar		
No	Flag	Mark	Frequency (MHz)	Measure Level	Reading Level	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Туре	
	Flag	Mark	(MHz)	Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	(dBuV)	(dB)		
1	Flag		(MHz) 0.150	Level (dBuV) 52.075	Reading Level (dBuV) 40.933	Over Limit (dB) -13.925	(dBuV) 66.000	(dB) 11.142	QP	
1	Flag		(MHz) 0.150 0.150	Level (dBuV) 52.075 35.352	Reading Level (dBuV) 40.933 24.210	Over Limit (dB) -13.925 -20.648	(dBuV) 66.000 56.000	(dB) 11.142 11.142	QP AV	
1 2 3	Flag		(MHz) 0.150 0.150 0.166	Level (dBuV) 52.075 35.352 50.146	Reading Level (dBuV) 40.933 24.210 40.075	Over Limit (dB) -13.925 -20.648 -15.012	(dBuV) 66.000 56.000 65.158	(dB) 11.142 11.142 10.071	QP AV QP	
1 2 3 4	Flag		(MHz) 0.150 0.150	Level (dBuV) 52.075 35.352	Reading Level (dBuV) 40.933 24.210	Over Limit (dB) -13.925 -20.648 -15.012 -21.018	(dBuV) 66.000 56.000	(dB) 11.142 11.142 10.071 10.071	QP AV	
1 2 3 4 5	Flag		(MHz) 0.150 0.150 0.166 0.166 0.494	Level (dBuV) 52.075 35.352 50.146 34.140 34.348	Reading Level (dBuV) 40.933 24.210 40.075 24.069 24.169	Over Limit (dB) -13.925 -20.648 -15.012 -21.018 -21.752	(dBuV) 66.000 56.000 65.158 55.158 56.100	(dB) 11.142 11.142 10.071 10.071 10.178	QP AV QP AV QP	
1 2 3 4	Flag		(MHz) 0.150 0.150 0.166 0.166	Level (dBuV) 52.075 35.352 50.146 34.140	Reading Level (dBuV) 40.933 24.210 40.075 24.069	Over Limit (dB) -13.925 -20.648 -15.012 -21.018	(dBuV) 66.000 56.000 65.158 55.158	(dB) 11.142 11.142 10.071 10.071	QP AV QP AV	
1 2 3 4 5 6	Flag		(MHz) 0.150 0.150 0.166 0.166 0.494 0.494	Level (dBuV) 52.075 35.352 50.146 34.140 34.348 30.011	Reading Level (dBuV) 40.933 24.210 40.075 24.069 24.169 19.832	Over Limit (dB) -13.925 -20.648 -15.012 -21.018 -21.752 -16.090	(dBuV) 66.000 56.000 65.158 55.158 56.100 46.100	(dB) 11.142 11.142 10.071 10.071 10.178 10.178	QP AV QP AV QP AV QP AV	
1 2 3 4 5 6 7	Flag		(MHz) 0.150 0.150 0.166 0.166 0.494 0.494 0.494	Level (dBuV) 52.075 35.352 50.146 34.140 34.348 30.011 32.044	Reading Level (dBuV) 40.933 24.210 40.075 24.069 24.169 19.832 22.087	Over Limit (dB) -13.925 -20.648 -15.012 -21.018 -21.752 -16.090 -23.956	(dBuV) 66.000 56.000 65.158 55.158 56.100 46.100 56.000	(dB) 11.142 11.142 10.071 10.071 10.178 10.178 9.957	QP AV QP AV QP AV QP AV QP	
1 2 3 4 5 6 7 8	Flag		(MHz) 0.150 0.150 0.166 0.166 0.494 0.494 0.494 0.914	Level (dBuV) 52.075 35.352 50.146 34.140 34.348 30.011 32.044 22.637	Reading Level (dBuV) 40.933 24.210 40.075 24.069 24.169 19.832 22.087 12.681	Over Limit (dB) -13.925 -20.648 -15.012 -21.018 -21.752 -16.090 -23.956 -23.363	(dBuV) 66.000 56.000 65.158 55.158 56.100 46.100 56.000 46.000	(dB) 11.142 11.142 10.071 10.071 10.178 10.178 9.957 9.957	QP AV QP AV QP AV QP AV QP AV	
1 2 3 4 5 6 7 8 9	Flag		(MHz) 0.150 0.150 0.166 0.166 0.494 0.494 0.914 0.914 1.350	Level (dBuV) 52.075 35.352 50.146 34.140 34.348 30.011 32.044 22.637 24.555	Reading Level (dBuV) 40.933 24.210 40.075 24.069 24.169 19.832 22.087 12.681 14.658	Over Limit (dB) -13.925 -20.648 -15.012 -21.018 -21.752 -16.090 -23.956 -23.363 -31.445	(dBuV) 66.000 56.000 65.158 55.158 56.100 46.100 56.000 46.000 56.000	(dB) 11.142 11.142 10.071 10.071 10.178 10.178 9.957 9.957 9.896	QP         AV         QP	

Note: Measure Level (dB $\mu$ V) = Reading Level (dB $\mu$ V) + Factor (dB)



Site	: SR2				Т	ïme: 2016/01	/12 - 19:29			
Limit: FCC_Part15.107_CE_AC Power_Class B						Engineer: Vince Yu				
Probe: ENV216_101683_Filter On						Polarity: Line				
EUT	Г: IP Ph	one			P	ower: AC 120	0V/60Hz			
Note	e: Mode	e 2								
Level(dBuV)	70 60 1 50 * 40 2 30 * 20 10 0 -10	4 6		han han	w www.	Mar				
	-20 0.15			1	Freque	ncy(MHz)		10	30	
No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре	
			(MHz)	Level (dBuV)	Level (dBuV)	(dB)	(dBuV)	(dB)		
1			0.158	49.828	39.517	-15.740				
2	<u> </u>					10.740	65.568	10.311	QP	
			0.158	31.752	21.441	-23.817	65.568 55.568	10.311 10.311	QP AV	
3			0.158 0.186	31.752 46.640	21.441 36.601					
						-23.817	55.568	10.311	AV	
3			0.186	46.640	36.601	-23.817 -17.574	55.568 64.213	10.311 10.039	AV QP	
3 4			0.186 0.186	46.640 29.530	36.601 19.491	-23.817 -17.574 -24.684	55.568 64.213 54.213	10.311 10.039 10.039	AV QP AV	
3 4 5			0.186 0.186 0.222	46.640 29.530 43.329	36.601 19.491 33.388	-23.817 -17.574 -24.684 -19.415	55.568 64.213 54.213 62.744	10.311 10.039 10.039 9.941	AV QP AV QP	
3 4 5 6		*	0.186 0.186 0.222 0.222	46.640 29.530 43.329 27.931	36.601 19.491 33.388 17.990	-23.817 -17.574 -24.684 -19.415 -24.813	55.568 64.213 54.213 62.744 52.744	10.311 10.039 10.039 9.941 9.941	AV QP AV QP AV	
3 4 5 6 7		*	0.186 0.186 0.222 0.222 0.486	46.640 29.530 43.329 27.931 41.665	36.601 19.491 33.388 17.990 31.510	-23.817 -17.574 -24.684 -19.415 -24.813 -14.570	55.568       64.213       54.213       62.744       52.744       56.236	10.31110.03910.0399.9419.94110.155	AV QP AV QP AV QP	
3 4 5 6 7 8		*	0.186 0.186 0.222 0.222 0.486 0.486	46.640 29.530 43.329 27.931 41.665 36.955	36.601       19.491       33.388       17.990       31.510       26.800	-23.817 -17.574 -24.684 -19.415 -24.813 -14.570 -9.281	55.568       64.213       54.213       62.744       52.744       56.236       46.236	10.31110.03910.0399.9419.94110.15510.155	AV QP AV QP AV QP AV	
3 4 5 6 7 8 9		*	0.186 0.186 0.222 0.222 0.486 0.486 5.698	46.640 29.530 43.329 27.931 41.665 36.955 33.377	36.601       19.491       33.388       17.990       31.510       26.800       23.278	-23.817 -17.574 -24.684 -19.415 -24.813 -14.570 -9.281 -26.623	55.568       64.213       54.213       62.744       52.744       56.236       46.236       60.000	10.31110.03910.0399.9419.94110.15510.15510.099	AV QP AV QP AV QP AV QP AV QP	

Note: Measure Level (dB $\mu$ V) = Reading Level (dB $\mu$ V) + Factor (dB)



Sile	: SR2				Т	ime: 2016/01	/12 - 19:34			
Lim	it: FCC	_Part15	.107_CE_AC	Power_Clas	s B E	Engineer: Vince Yu				
Prol	be: EN	V216_1	01683_Filter	On	F	Polarity: Neutral				
EUT	F: IP Ph	ione			F	ower: AC 12	0V/60Hz			
Note	e: Mod	e 2								
	80									
	70									
	60									
	50		7							
5	402	e ha	m m				2			
Level(dBuV)	30	5	mant	W. M. na	manute at a	A MANANY M	10 12	A REAL PROPERTY OF A REAL PROPER		
eve	20			when the Ar	A A A ME WANT	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	*		The second se	
	10									
	0									
	-10	<b>1</b>								
	-20 0.15									
				1				10	30	
		1		1		ncy(MHz)		10	30	
No	Flag	Mark	Frequency	Measure		over Limit	Limit	10 Factor	30	
No	Flag	Mark	Frequency (MHz)		Freque		Limit (dBuV)			
No	Flag	Mark		Measure	Freque	Over Limit		Factor		
No 1	Flag	Mark		Measure Level	Freque Reading Level	Over Limit		Factor	30 Type QP	
	Flag	Mark	(MHz)	Measure Level (dBuV)	Freque Reading Level (dBuV)	Over Limit (dB)	(dBuV)	Factor (dB)	Туре	
1	Flag	Mark	(MHz) 0.150	Measure Level (dBuV) 50.022	Frequent Reading Level (dBuV) 38.880	Over Limit (dB) -15.978	(dBuV) 66.000	Factor (dB) 11.142	Type QP	
1 2	Flag	Mark	(MHz) 0.150 0.150	Measure Level (dBuV) 50.022 33.862	Frequent Reading Level (dBuV) 38.880 22.720	Over Limit (dB) -15.978 -22.138	(dBuV) 66.000 56.000	Factor (dB) 11.142 11.142	Type   QP   AV	
1 2 3	Flag	Mark	(MHz) 0.150 0.150 0.162	Measure Level (dBuV) 50.022 33.862 47.697	Frequent         Reading         Level         (dBuV)         38.880         22.720         37.619	Over Limit (dB) -15.978 -22.138 -17.664	(dBuV) 66.000 56.000 65.361	Factor (dB) 11.142 11.142 10.078	Type   QP   AV   QP	
1 2 3 4	Flag	Mark	(MHz) 0.150 0.150 0.162 0.162	Measure Level (dBuV) 50.022 33.862 47.697 31.853	Frequent         Reading         Level         (dBuV)         38.880         22.720         37.619         21.774	Over Limit (dB) -15.978 -22.138 -17.664 -23.508	(dBuV) 66.000 56.000 65.361 55.361	Factor (dB) 11.142 11.142 10.078 10.078	Type   QP   AV   QP   AV   QP	
1 2 3 4 5	Flag	Mark	(MHz) 0.150 0.150 0.162 0.162 0.174	Measure Level (dBuV) 50.022 33.862 47.697 31.853 45.740	Freque         Reading         Level         (dBuV)         38.880         22.720         37.619         21.774         35.683	Over Limit (dB) -15.978 -22.138 -17.664 -23.508 -19.027	(dBuV) 66.000 56.000 65.361 55.361 64.767	Factor (dB) 11.142 11.142 10.078 10.078 10.057	Type   QP   AV   QP   AV   QP   QP	
1 2 3 4 5 6 7	Flag	Mark	(MHz) 0.150 0.150 0.162 0.162 0.174 0.174	Measure Level (dBuV) 50.022 33.862 47.697 31.853 45.740 29.941	Freque       Reading       Level       (dBuV)       38.880       22.720       37.619       21.774       35.683       19.884	Over Limit (dB) -15.978 -22.138 -17.664 -23.508 -19.027 -24.827	(dBuV) 66.000 56.000 65.361 55.361 64.767 54.767	Factor (dB) 11.142 11.142 10.078 10.078 10.057 10.057	TypeQPAVQPAVQPAVAVQPAVQP	
1 2 3 4 5 6 7 8	Flag		(MHz) 0.150 0.150 0.162 0.162 0.174 0.174 0.174	Measure Level (dBuV) 50.022 33.862 47.697 31.853 45.740 29.941 42.845	Freque       Reading       Level       (dBuV)       38.880       22.720       37.619       21.774       35.683       19.884       32.674	Over Limit (dB) -15.978 -22.138 -17.664 -23.508 -19.027 -24.827 -13.529	(dBuV) 66.000 56.000 65.361 55.361 64.767 54.767 56.374	Factor (dB) 11.142 11.142 10.078 10.078 10.057 10.057 10.170	Type     QP     AV     QP     AV     QP     AV     QP     AV     QP     AV     QP	
1 2 3 4 5 6	Flag		(MHz) 0.150 0.150 0.162 0.162 0.174 0.174 0.174 0.478 0.478	Measure Level (dBuV) 50.022 33.862 47.697 31.853 45.740 29.941 42.845 36.858	Freque       Reading       Level       (dBuV)       38.880       22.720       37.619       21.774       35.683       19.884       32.674       26.688	Over Limit (dB) -15.978 -22.138 -17.664 -23.508 -19.027 -24.827 -13.529 -9.516	(dBuV) 66.000 56.000 65.361 55.361 64.767 54.767 56.374 46.374	Factor (dB) 11.142 11.142 10.078 10.078 10.057 10.057 10.170 10.170	Type     QP     AV     QP     AV	
1 2 3 4 5 6 7 8 9	Flag		(MHz) 0.150 0.150 0.162 0.162 0.162 0.174 0.174 0.478 0.478 0.478 4.318	Measure Level (dBuV) 50.022 33.862 47.697 31.853 45.740 29.941 42.845 36.858 34.326	Freque       Reading       Level       (dBuV)       38.880       22.720       37.619       21.774       35.683       19.884       32.674       26.688       24.338	Over Limit (dB) -15.978 -22.138 -17.664 -23.508 -19.027 -24.827 -13.529 -9.516 -21.674	(dBuV) 66.000 56.000 65.361 55.361 64.767 54.767 56.374 46.374 56.000	Factor (dB) 11.142 11.142 10.078 10.078 10.057 10.057 10.170 10.170 9.987	TypeQPAVQPAVQPAVQPAVQP	

Note: Measure Level (dB $\mu$ V) = Reading Level (dB $\mu$ V) + Factor (dB)



### 6.3. Radiated Emission Measurement

#### 6.3.1. Test Limit

FCC Part 15.109 Limits								
Frequency (MHz)	Distance (m)	Level (dBµV/m)						
30 - 88	3	40						
88 - 216	3	43.5						
216 - 960	3	46						
Above 960	3	54						

Note 1: The lower limit shall apply at the transition frequency.

Note 2: Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

Note 3: E field strength  $(dB\mu V/m) = 20 \log E$  field strength (uV/m)

### 6.3.2. Test Frequency selected

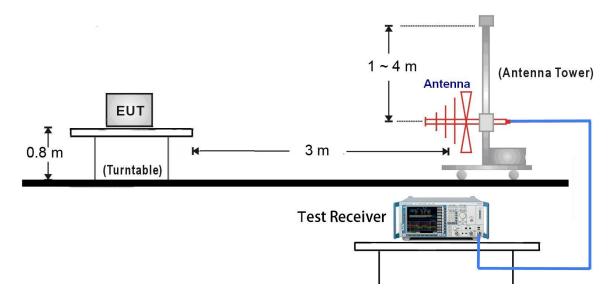
For an unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table:

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705 - 108	1000
108 - 500	2000
500 - 1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower



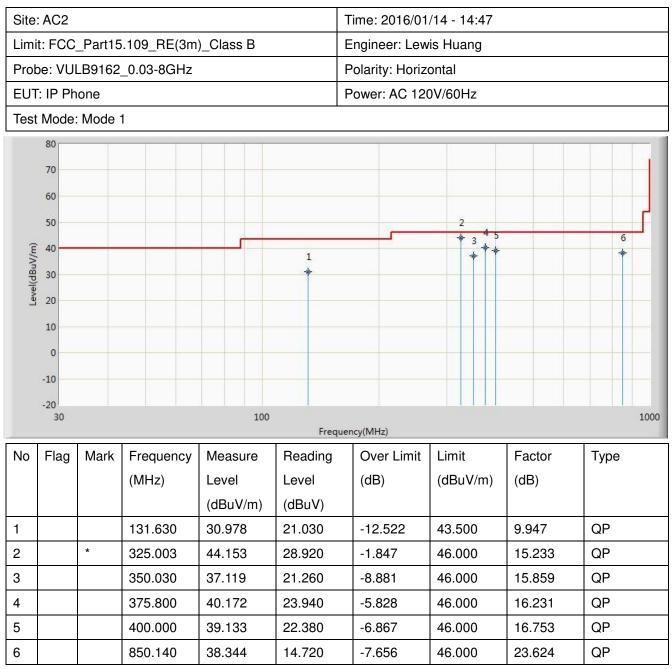
### 6.3.3. Test Setup

<u>30MHz ~ 1GHz Test Setup:</u>





#### 6.3.4. Test Result of Radiated Emissions



Note: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)



Site:	AC2					Time: 2016/01/14 - 14:49			
Limi	t: FCC	_Part15	5.109_RE(3m	)_Class B		Engineer: Lewis Huang Polarity: Vertical			
Prob	e: VU	LB9162	_0.03-8GHz						
EUT	: IP Ph	ione				Power: AC 120	0V/60Hz		
Test	Mode	: Mode	1						
	80								
	70								
	60								
	50								f
Ê	40		2		3 4		5		6
BuV/	30	*	*		* *				*
Level(dBuV/m)	20								
	10								
	0								
	-10								
	-20 30			100	Freq	uency(MHz)			1000
No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре
			(MHz)	Level	Level	(dB)	(dBuV/m)	(dB)	. )
				(dBuV/m)	(dBuV)			(- )	
1			40.230	33.207	19.300	-6.793	40.000	13.908	QP
2		*	64.900	35.122	22.530	-4.878	40.000	12.592	QP
3			117.510	36.597	24.930	-6.903	43.500	11.667	QP
4			131.969	35.731	25.810	-7.769	43.500	9.921	QP
5			325.030	38.214	22.980	-7.786	46.000	15.234	QP
6			750.290	37.793	15.530	-8.207	46.000	22.263	QP

Note: Measure Level  $(dB\mu V/m)$  = Reading Level  $(dB\mu V)$  + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)



Site	: AC2					Time: 2016/01/14 - 15:10				
Limi	t: FCC	_Part15	5.109_RE(3m	)_Class B		Engineer: Lewis Huang				
Prob	be: VU	LB9162	_0.03-8GHz			Polarity: Horizontal				
EUT	: IP Ph	ione				Power: AC 120	0V/60Hz			
Test	Mode	: Mode 2	2							
	80					1				
	70									
	60									
	50								f	
Ê	40						23	4 ⊁	5 6	
HBuV/	30				1					
Level(dBuV/m)	20				Ĩ					
	10									
	0									
	-10									
	-20 30			100	Frequ	iency(MHz)			1000	
No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре	
	Ū		(MHz)	Level	Level	(dB)	(dBuV/m)	(dB)		
				(dBuV/m)	(dBuV)					
1			131.950	28.752	18.830	-14.748	43.500	9.922	QP	
2		*	325.010	40.443	25.210	-5.557	46.000	15.233	QP	
3			375.140	39.632	23.410	-6.368	46.000	16.222	QP	
4			425.030	39.923	22.850	-6.077	46.000	17.073	QP	
5			750.020	38.212	15.950	-7.788	46.000	22.261	QP	
6			850.200	37.165	13.540	-8.835	46.000	23.625	QP	

Note: Measure Level  $(dB\mu V/m)$  = Reading Level  $(dB\mu V)$  + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).



Site: AC2 Limit: FCC_Part15.109_RE(3m)_Class B Probe: VULB9162_0.03-8GHz EUT: IP Phone						Time: 2016/01/14 - 15:15 Engineer: Lewis Huang Polarity: Vertical Power: AC 120V/60Hz													
										Test	Mode	: Mode 2	2						
											80 70 60								
											50							5	6
Level(dBuV/m)	40	1	2	*	4			*	*										
Level																			
	10 0																		
	-10 -20																		
	30	100 1000 Frequency(MHz)																	
No	Flag	Mark	Frequency	Measure	Reading	Over Limit	Limit	Factor	Туре										
			(MHz)	Level (dBuV/m)	Level (dBuV)	(dB)	(dBuV/m)	(dB)											
1			40.250	33.591	19.680	-6.409	40.000	13.911	QP										
2		*	65.520	36.013	23.630	-3.987	40.000	12.383	QP										
3			82.400	34.473	24.750	-5.527	40.000	9.723	QP										
4			131.750	35.718	25.780	-7.782	43.500	9.938	QP										
5			425.100	38.024	20.950	-7.976	46.000	17.075	QP										
6			750.010	37.002	14.740	-8.998	46.000	22.261	QP										

Note: Measure Level  $(dB\mu V/m)$  = Reading Level  $(dB\mu V)$  + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).



# 7. CONCLUSION

The data collected relate only the item(s) tested and show that the IP Phone FCC ID: YZZGXP2140

has been tested to comply with the requirements specified in §15.107 and §15.109 of the FCC

Rules.

The End

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