

Global United Technology Services Co., Ltd.

Report No.: GTS202212000172F01

TEST REPORT

X-Sense Innovations Co., Ltd. Applicant:

Address of Applicant: B4 503D, Tower B, Kexing Science Park, No15 Keyuan Road,

Technology Park Community, Yuehai Avenue, Nanshan

District, Shenzhen, China

X-Sense Innovations Co., Ltd. Manufacturer:

Address of B4 503D, Tower B, Kexing Science Park, No15 Keyuan Road,

Technology Park Community, Yuehai Avenue, Nanshan Manufacturer:

District, Shenzhen, China

X-Sense Technology Co., Ltd. **Factory:**

Room 1301, Tower A, Qiaode Technology Part, No.7 Road, Address of Factory:

Guangming District, Shenzhen, Guangdong Province, 518000,

China

Equipment Under Test (EUT)

Product Name: Base Station

Model No.: **SBS50**

Trade Mark: X-SENSE

FCC ID: 2AU4DDBQ

FCC CFR Title 47 Part 15 Subpart C Section 15.249 **Applicable standards:**

Date of sample receipt: December 19, 2022

Date of Test: December 20, 2022-January 06, 2023

Date of report issued: January 06, 2023

Test Result: PASS *

In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Robinson Luo Laboratory Manager



2 Version

Version No.	Date	Description	
00	January 06, 2023	Original	

Prepared By:	Trankly	Date:	January 06, 2023
	Project Engineer		
Check By:	Johnson Lun	Date:	January 06, 2023
	Reviewer		



3 Contents

			Page
1	cov	ER PAGE	1
2	VER	RSION	2
3	CON	NTENTS	3
4	TES	ST SUMMARY	
	4.1	MEASUREMENT UNCERTAINTY	4
5	GEN	NERAL INFORMATION	5
	5.1	GENERAL DESCRIPTION OF EUT	
	5.2	TEST MODE	
	5.3	DESCRIPTION OF SUPPORT UNITS	
	5.4	DEVIATION FROM STANDARDS	
	5.5	ABNORMALITIES FROM STANDARD CONDITIONS	6
	5.6	TEST FACILITY	6
	5.7	TEST LOCATION	
	5.8	ADDITIONAL INSTRUCTIONS	6
6	TES	ST INSTRUMENTS LIST	7
7	TES	ST RESULTS AND MEASUREMENT DATA	9
	7.1	ANTENNA REQUIREMENT	9
	7.2	CONDUCTED EMISSIONS	10
	7.3	RADIATED EMISSION METHOD	13
	7.3.	1 Field Strength of The Fundamental Signal	15
	7.3.	2 Spurious emissions and Band Edge	16
	7.4	20DB OCCUPY BANDWIDTH	20
8	TES	ST SETUP PHOTO	21
9	EUT	F CONSTRUCTIONAL DETAILS	21



4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
AC Power Line Conducted Emission	15.207	Pass
Field strength of the fundamental signal	15.249 (a)	Pass
Spurious emissions	15.249 (a) (d)/15.209	Pass
Band edge	15.249 (d)/15.205	Pass
20dB Occupied Bandwidth	15.215 (c)	Pass

Remarks:

- 1. Test according to ANSI C63.10: 2013.
- 2. Pass: The EUT complies with the essential requirements in the standard.

4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	30MHz-200MHz	3.8039dB	(1)
Radiated Emission	200MHz-1GHz	3.9679dB	(1)
Radiated Emission	1GHz-18GHz	4.29dB	(1)
Radiated Emission	18GHz-40GHz	3.30dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	3.44dB	(1)
Note (1): The measurement unce	ertainty is for coverage factor of ka	=2 and a level of confidence of 9	95%.



5 General Information

5.1 General Description of EUT

Product Name:	Base Station		
Model No.:	SBS50		
Serial No.:	SBS502XY96001		
Hardware Version:	SBS50PCB_V1.0		
Software Version:	V1.2.5		
Test sample(s) ID:	GTS202212000172-1		
Sample(s) Status	Engineered sample		
Operation Frequency:	912.375MHz		
Channel numbers:	1		
Modulation type:	FSK		
Antenna Type:	Spring antenna		
Antenna gain:	0.75dBi(Declared by applicant)		
	Power adapter		
Power supply:	Model: AS0601A-0501000USU		
i owei suppiy.	Input: AC 100-240V, 50/60Hz, 0.2A MAX		
	Output: DC 5V, 1000mA		



5.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode.
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Per-test mode.

We have verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows:

Axis	X	Υ	Z
Field Strength(dBuV/m)	90.02	90.33	89.98

5.3 Description of Support Units

None.

5.4 Deviation from Standards

None.

5.5 Abnormalities from Standard Conditions

None.

5.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC—Registration No.: 381383

Designation Number: CN5029

Global United Technology Services Co., Ltd., Shenzhen 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 files.

• IC —Registration No.: 9079A

CAB identifier: CN0091

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

NVLAP (LAB CODE:600179-0)

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

5.7 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: No. 123- 128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

Tel: 0755-27798480 Fax: 0755-27798960

5.8 Additional Instructions

Test Software	Continuously transmitter provided by manufacturer			
Power level setup	Default			

Global United Technology Services Co., Ltd.

No. 123- 128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone,

Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

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6 Test Instruments list

Rad	Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)	
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July 02, 2020	July 01, 2025	
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A	
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	April 22, 2022	April 21, 2023	
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9168	GTS640	March 21, 2022	March 20, 2023	
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June 12, 2022	June 11, 2023	
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June 23, 2022	June 22, 2023	
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A	
8	Coaxial Cable	GTS	N/A	GTS213	April 22, 2022	April 21, 2023	
9	Coaxial Cable	GTS	N/A	GTS211	April 22, 2022	April 21, 2023	
10	Coaxial cable	GTS	N/A	GTS210	April 22, 2022	April 21, 2023	
11	Coaxial Cable	GTS	N/A	GTS212	April 22, 2022	April 21, 2023	
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	April 22, 2022	April 21, 2023	
13	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 23, 2022	June 22, 2023	
14	Band filter	Amindeon	82346	GTS219	June 23, 2022	June 22, 2023	
15	Power Meter	Anritsu	ML2495A	GTS540	June 23, 2022	June 22, 2023	
16	Power Sensor	Anritsu	MA2411B	GTS541	June 23, 2022	June 22, 2023	
17	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	April 22, 2022	April 21, 2023	
18	Splitter	Agilent	11636B	GTS237	June 23, 2022	June 22, 2023	
19	Loop Antenna	ZHINAN	ZN30900A	GTS534	Nov. 29, 2022	Nov. 28, 2023	
20	Broadband Preamplifier	SCHWARZBECK	BBV9718	GTS535	April 22, 2022	April 21, 2023	
21	Breitband hornantenna	SCHWARZBECK	BBHA 9170	GTS579	Oct. 16, 2022	Oct. 15, 2023	
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 16, 2022	Oct. 15, 2023	
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 16, 2022	Oct. 15, 2023	
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	June 23, 2022	June 22, 2023	
25	Amplifier(1GHz-26.5GHz)	HP	8449B	GTS601	April 22, 2022	April 21, 2023	



Con	Conducted Emission						
Item	Test Equipment	Manufacturer	Model No. Inventory Cal.Date No. (mm-dd-yy		Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)	
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May 14, 2022	May 13, 2025	
2	EMI Test Receiver	R&S	ESCI 7	GTS552	April 24, 2022	April 23, 2023	
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June 23, 2022	June 22, 2023	
4	ENV216 2-L-V- NETZNACHB.DE	ROHDE&SCHWARZ	ENV216	GTS226	April 22, 2022	April 21, 2023	
5	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A	
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A	
7	Thermo meter	JINCHUANG	GSP-8A	GTS639	April 28, 2022	April 27, 2023	
8	Absorbing clamp	Elektronik- Feinmechanik	MDS21	GTS229	April 15, 2022	April 14, 2023	
9	ISN	SCHWARZBECK	NTFM 8158	GTS565	April 22, 2022	April 21, 2023	
10	High voltage probe	SCHWARZBECK	TK9420	GTS537	April 22, 2022	April 21, 2023	

RF C	RF Conducted Test:							
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)		
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	April 22, 2022	April 21, 2023		
2	EMI Test Receiver	R&S	ESCI 7	GTS552	April 22, 2022	April 21, 2023		
3	Spectrum Analyzer	Agilent	E4440A	GTS536	April 22, 2022	April 21, 2023		
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	April 22, 2022	April 21, 2023		
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	April 22, 2022	April 21, 2023		
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	April 22, 2022	April 21, 2023		
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	April 22, 2022	April 21, 2023		
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	April 22, 2022	April 21, 2023		

General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	April 25, 2022	April 24, 2023
2	Barometer	KUMAO	SF132	GTS647	July 26, 2022	July 25, 2023

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7 Test results and Measurement Data

7.1 Antenna requirement

Standard requirement: FCC Part15 C Section 15.203

15.203 requirement:

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, 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.

EUT Antenna:

The antenna is spring antenna, reference to the appendix II for details



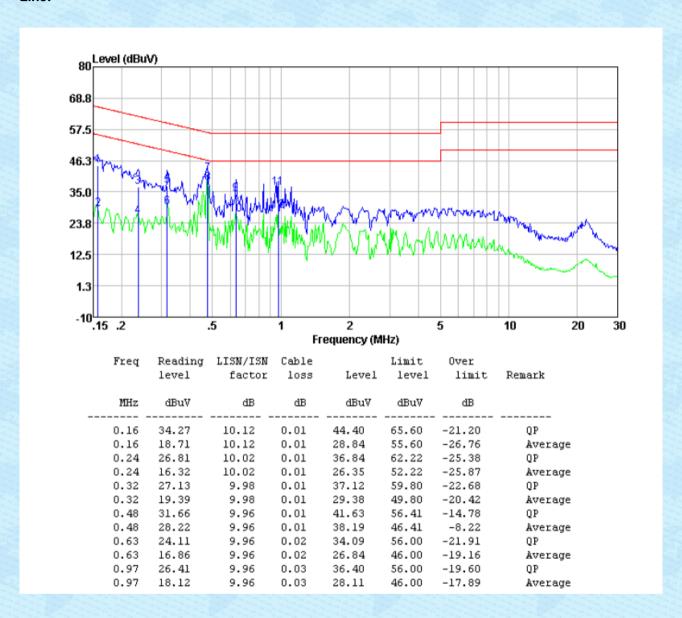
7.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207					
Test Method:	ANSI C63.10:2013					
Test Frequency Range:	150KHz to 30MHz					
Class / Severity:	Class B					
Receiver setup:	RBW=9KHz, VBW=30KHz, S	weep time=auto				
Limit:		Limit	(dBuV)			
	Frequency range (MHz)	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 logarithr					
Test setup:	Reference Plane	LISN				
	Remark E.U.T Remark EU.T Equipment Under Test LISN: Line impedence Stabilization Network Test table height=0.8m					
Test procedure:	 The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 500hm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 500hm/50uH coupling impedance with 500hm termination. (Please refer to the block diagram of the test setup and photographs). Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement. 					
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test environment:	Temp.: 25 °C Hun	nid.: 52%	Press.: 1012mbar			
Test voltage:	AC 120V 60Hz					
Test results:	Pass					



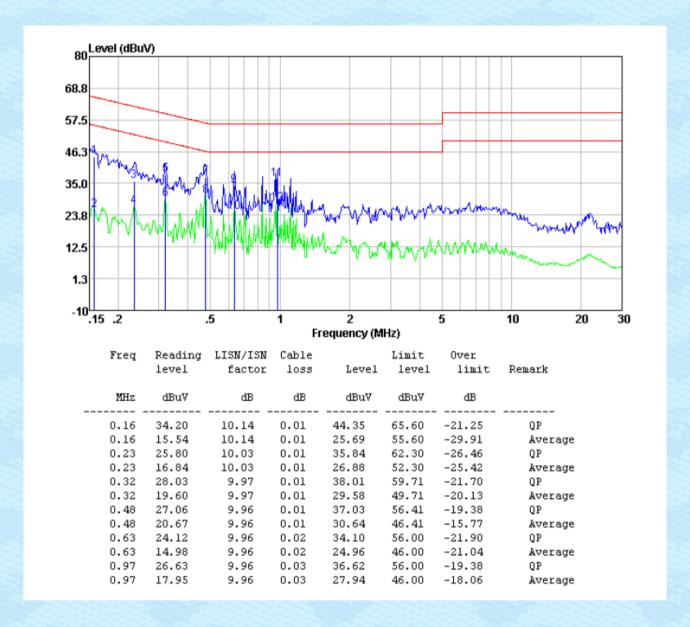
Measurement data:

Line:





Neutral:



Notes:

- 1. An initial pre-scan was performed on the line and neutral lines with peak detector.
- 2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
- 3. Final Level = Receiver Read level + LISN Factor + Cable Loss

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7.3 Radiated Emission Method

	7.3 Radiated Emission Me	thou						
	Test Requirement:	FCC Part15 C Section 15.209, 15.205						
	Test Method:	ANSI C63.10:2013						
	Test Frequency Range:	9kHz to 10GHz						
	Test site:	Measurement D	Measurement Distance: 3m					
	Receiver setup:	Frequency	Detector	RBW	VBW	Remark		
		9kHz- 150kHz	Quasi-pea	k 200Hz	300Hz	Quasi-peak Value		
		150kHz- 30MHz	Quasi-pea	k 9kHz	10kHz	Quasi-peak Value		
		30MHz- 1GHz	Quasi-pea	k 120KHz	300KHz	Quasi-peak Value		
		Above 1GHz	Peak	1MHz	3MHz	Peak Value		
		Above 1G112	Peak	1MHz	10Hz	Average Value		
	Limit:	Freque	ency	Limit (dBuV	/m @3m)	Remark		
	(Field strength of the	915.375	-LIM:	94.0	0	Quasi-peak Value		
	fundamental signal)	915.575	DIVITIZ	114.0	00	Peak Value		
	Limit:	Freque	ency	Limit (u	V/m)	Remark		
	(Spurious Emissions)	0.009MHz-0	.490MHz	2400/F(kHz)	@300m	Quasi-peak Value		
		0.490MHz-1.705MHz		24000/F(kH	z) @30m	Quasi-peak Value		
		1.705MHz-30.0MHz		30 @30m		Quasi-peak Value		
		30MHz-88MHz		100 @		Quasi-peak Value		
		88MHz-216MHz		150 @		Quasi-peak Value		
		216MHz-9		200 @		Quasi-peak Value		
		960MHz-	-1GHz	500 @		Quasi-peak Value		
		Above 1	IGHz	500 @		Average Value		
	122		1-1-1-1-1	5000 @		Peak Value		
	Limit:	Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the						
	(band edge)							
		fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.						
	Test setup:							
		For radiated emissions from 9kHz to 30MHz						
		<3m>						
		· · · · · · · · · · · · · · · · · · ·						
		Test Antenna						
		EUT						
		< 80cm > Tum Table-						
		Receiver-						
61.1.2								
7		For radiated emissions from 30MHz to1GHz						



Report No.: GTS202212000172F01 < 3m > < 1m ... 4m > EUT. Turn Table Receiver+ Preamplifier. For radiated emissions above 1GHz < 3m > < 1m ... 4m > EUT-Tum Tables <150cm> Receiver Preamplifier-1. The EUT was placed on the top of a rotating table (0.8m for below Test Procedure: 1GHz and 1.5 meters for above 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. Test Instruments: Refer to section 6.0 for details Refer to section 5.2 for details Test mode: Test environment: 52% Temp.: 25 °C Humid.: Press.: 1012mbar Test voltage: DC 3V Test results: **Pass**

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Measurement data:

7.3.1 Field Strength of The Fundamental Signal

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
912.375	86.72	24.01	4.9	32	83.63	114	-30.37	Vertical
912.375	93.42	24.01	4.9	32	90.33	114	-23.67	Horizontal

QP value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
912.375	86.23	24.01	4.9	32	83.14	94	-14.3	Vertical
912.375	92.75	24.01	4.9	32	89.66	94	-3.69	Horizontal



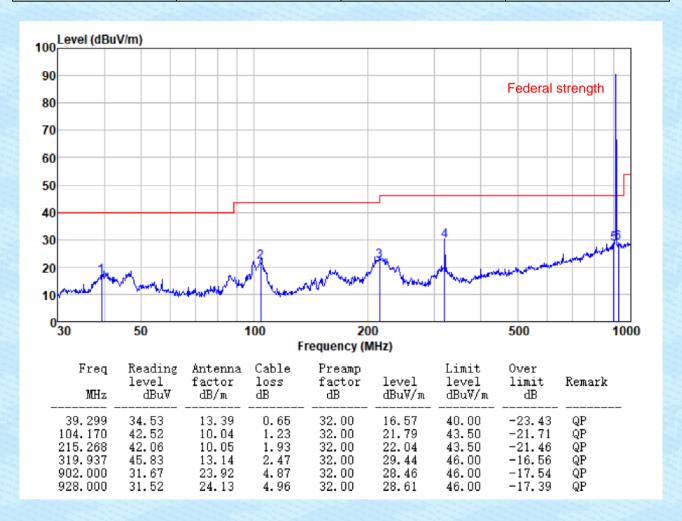
7.3.2 Spurious emissions and Band Edge

■ Below 30MHz

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o), the test result no need to reported.

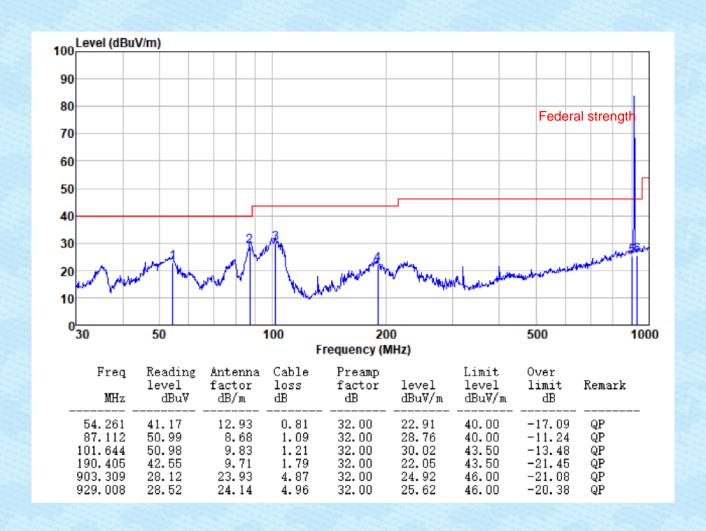
■ Below 1GHz

Test Frequency:	912.375MHz	Polarization:	Horizontal
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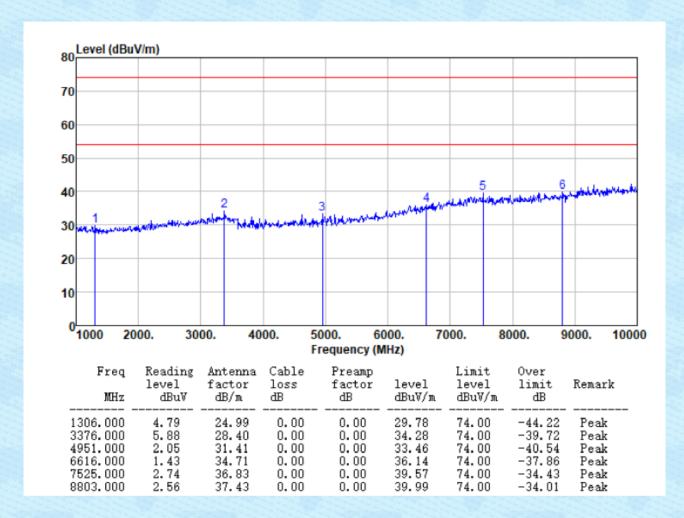
Test Frequency: 912.375MHz Polarization: Vertical





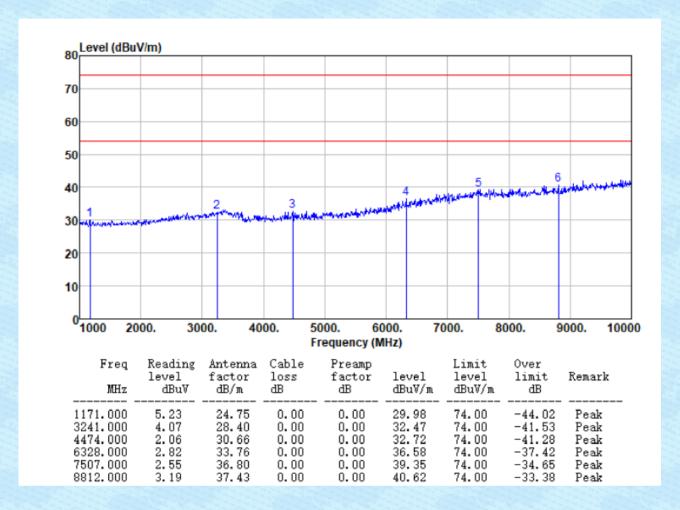
Above 1GHz

Test Frequency:	912.375MHz	Polarization:	Horizontal
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100	Test Frequency:	912.375MHz	Polarization:	Vertical
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Remarks:

1. Final Level =Receiver Read level + Antenna Factor + Cable Loss - Preamplifier Factor



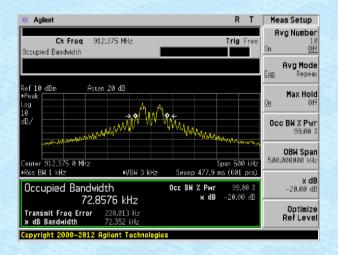
7.4 20dB Occupy Bandwidth

Test Requirement:	FCC Part15 C Section 15.249/15.215		
Test Method:	ANSI C63.10:2013		
Limit:	Operation Frequency range 902MHz~928MHz		
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane		
Test Instruments:	Refer to section 6.0 for details		
Test mode:	Refer to section 5.2 for details		
Test results:	Pass		

Measurement Data

Test Frequency	20dB bandwidth(kHz)	Result
912.375MHz	72.352	Pass

Test plot as follows:





8 Test Setup Photo

Reference to the appendix I for details.

9 EUT Constructional Details

Reference to the appendix II for details.

-----End-----