

🧲 Shenzhen Zhongjian Nanfang Testing Co., Ltd.

Report No: CCISE180916703

FCC REPORT

Applicant: Xwireless LLC

Address of Applicant: 11565 Old Georgetown Road Rockville MD 20852

Equipment Under Test (EUT)

Product Name: Smart phone

Model No.: Sync

Trade mark: Vortex

FCC ID: 2ADLJSYNC

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247

Date of sample receipt: 30 Sep., 2018

Date of Test: 08 Oct., to 29 Oct., 2018

Date of report issued: 30 Oct., 2018

Test Result: PASS *

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

Authorized Signature:



Bruce Zhang Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

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2 Version

Version No.	Date	Description
00	30 Oct., 2018	Original

Tested by: Date: 30 Oct., 2018

Test Engineer

Reviewed by: Date: 30 Oct., 2018

Project Engineer



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4 Test Summary

Test Items	Section in CFR 47	Result
Antenna requirement	15.203 & 15.247 (c)	Pass
AC Power Line Conducted Emission	15.207	Pass
Conducted Peak Output Power	15.247 (b)(3)	Pass
6dB Emission Bandwidth 99% Occupied Bandwidth	15.247 (a)(2)	Pass
Power Spectral Density	15.247 (e)	Pass
Band Edge	15.247 (d)	Pass
Spurious Emission	15.205 & 15.209	Pass

Pass: The EUT complies with the essential requirements in the standard.

N/A: Not Applicable.



5 General Information

5.1 Client Information

Applicant:	Xwireless LLC
Address:	11565 Old Georgetown Road Rockville MD 20852
Manufacturer/ Factory:	Shenzhen LEAGOO Intelligence Co., Limited
Address:	2nd Floor of Building B, HongLianYing Technology Park, No.286 of SiLi Road, DaBuXiang Community, Longhua New District, Shenzhen, China

5.2 General Description of E.U.T.

Product Name:	Smart phone
Model No.:	Sync
Operation Frequency:	2402-2480 MHz
Channel numbers:	40
Channel separation:	2 MHz
Modulation technology:	GFSK
Data speed :	1Mbps
Antenna Type:	Internal Antenna
Antenna gain:	0.5 dBi
Power supply:	Rechargeable Li-ion Battery DC3.8V 2000mAh
AC adapter:	Model: ES007-U050100X0F
	Input: AC100-240V, 50/60Hz, 0.3A
	Output: DC 5.0V, 1000mA
Test Sample Condition:	The test samples were provided in good working order with no visible defects.

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	10	2422MHz	20	2442MHz	30	2462MHz
1	2404MHz	11	2424MHz	21	2444MHz	31	2464MHz
2	2406MHz	12	2426MHz	22	2446MHz	32	2466MHz
3	2408MHz	13	2428MHz	23	2448MHz	33	2468MHz
4	2410MHz	14	2430MHz	24	2450MHz	34	2470MHz
5	2412MHz	15	2432MHz	25	2452MHz	35	2472MHz
6	2414MHz	16	2434MHz	26	2454MHz	36	2474MHz
7	2416MHz	17	2436MHz	27	2456MHz	37	2476MHz
8	2418MHz	18	2438MHz	28	2458MHz	38	2478MHz
9	2420MHz	19	2440MHz	29	2460MHz	39	2480MHz

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test. Channel No. 0, 20 & 39 were selected as Lowest, Middle and Highest channel.



5.3 Test environment and test mode

Operating Environment:	
Temperature:	24.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010 mbar
Test mode:	
Transmitting mode	Keep the EUT in continuous transmitting with modulation

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The sample was placed 0.8m (below 1GHz)/1.5m (above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. Duty cycle setting during the transmission is 100% with maximum power setting for all modulations.

5.4 Description of Support Units

The EUT has been tested as an independent unit.

5.5 Measurement Uncertainty

Parameters	Expanded Uncertainty
Conducted Emission (9kHz ~ 30MHz)	±2.22 dB (k=2)
Radiated Emission (9kHz ~ 30MHz)	±2.76 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	±4.28 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	±5.72 dB (k=2)
Radiated Emission (18GHz ~ 40GHz)	±2.88 dB (k=2)

5.6 Laboratory Facility

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

• FCC - Registration No.: 727551

Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been accredited as a testing laboratory by FCC (Federal Communications Commission). The Registration No. is 727551.

IC - Registration No.: 10106A-1

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

CNAS - Registration No.: CNAS L6048

Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

A2LA - Registration No.: 4346.01

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: https://portal.a2la.org/scopepdf/4346-01.pdf

5.7 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.

Address: No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,

Bao'an District, Shenzhen, Guangdong, China

Tel: +86-755-23118282, Fax: +86-755-23116366

Email: info@ccis-cb.com, Website: http://www.ccis-cb.com

Shenzhen Zhongjian Nanfang Testing Co., Ltd.
No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road, Bao'an District, Shenzhen, Guangdong, China
Telephone: +86 (0) 755 23118282 Fax: +86 (0) 755 23116366

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5.8 Test Instruments list

Radiated Emission:					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
3m SAC	SAEMC	9m*6m*6m	966	07-22-2017	07-21-2020
Loop Antenna	SCHWARZBECK	FMZB1519B	00044	03-16-2018	03-15-2019
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-16-2018	03-15-2019
Horn Antenna	SCHWARZBECK	BBHA9120D	916	03-16-2018	03-15-2019
Horn Antenna	SCHWARZBECK	BBHA9120D	1805	06-22-2017	06-21-2020
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170582	11-21-2017	11-20-2018
EMI Test Software	AUDIX	E3	Version: 6.110919b		b
Pre-amplifier	HP	8447D	2944A09358	03-07-2018	03-06-2019
Pre-amplifier	CD	PAP-1G18	11804	03-07-2018	03-06-2019
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-07-2018	03-06-2019
Spectrum analyzer	Rohde & Schwarz	FSP40	100363	11-21-2017	11-20-2018
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-07-2018	03-06-2019
Cable	ZDECL	Z108-NJ-NJ-81	1608458	03-07-2018	03-06-2019
Cable	MICRO-COAX	MFR64639	K10742-5	03-07-2018	03-06-2019
Cable	SUHNER	SUCOFLEX100	58193/4PE	03-07-2018	03-06-2019
RF Switch Unit	MWRFTEST	MW200	N/A	N/A	N/A
Test Software	MWRFTEST	MTS8200		Version: 2.0.0.0	·

Conducted Emission:						
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)	
EMI Test Receiver	Rohde & Schwarz	ESCI	101189	03-07-2018	03-06-2019	
Pulse Limiter	SCHWARZBECK	OSRAM 2306	9731	03-07-2018	03-06-2019	
LISN	CHASE	MN2050D	1447	03-19-2018	03-18-2019	
LISN	Rohde & Schwarz	ESH3-Z5	8438621/010	07-21-2018	07-20-2019	
Cable	HP	10503A	N/A	03-07-2018	03-06-2019	
EMI Test Software	AUDIX	E3	Version: 6.110919b			



6 Test results and Measurement Data

6.1 Antenna requirement:

Standard requirement:

FCC Part 15 C Section 15.203 /247(c)

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.

15.247(c) (1)(i) requirement:

(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

E.U.T Antenna:

The BLE antenna is an Internal antenna which cannot replace by end-user, the best-case gain of the antenna is 0.5 dBi.





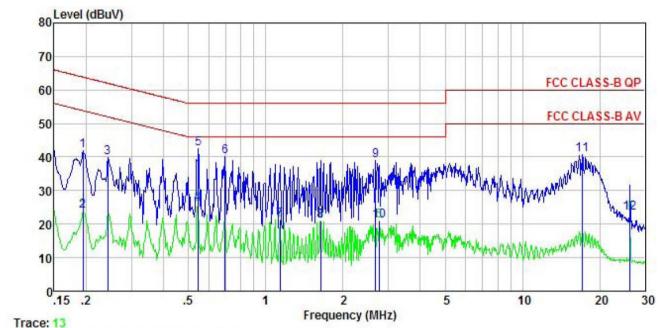
6.2 Conducted Emission

Test Requirement:	FCC Part 15 C Section 15.207			
Test Method:	ANSI C63.10: 2013			
Test Frequency Range:	150 kHz to 30 MHz			
Class / Severity:	Class B			
Receiver setup:	RBW=9kHz, VBW=30kHz			
Limit:	(NALL=)	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 logar			
Test procedure	 The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.), which provides a 50ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm 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 C63.4: 2014 on conducted measurement. 			
Test setup:	Reference Plane			
	LISN 40cm 80cm Filter AC power Equipment Test table/Insulation plane Remark E.U.T. Equipment Under Test LISN: Line Impedence Stabilization Network Test table height=0.8m			
Test Instruments:	Refer to section 5.8 for details			
Test mode:	Refer to section 5.3 for details			
Test results:	Passed			



Measurement Data:

Product name:	Smart phone	Product model:	Sync
Test by:	Yaro	Test mode:	BLE Tx mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Line
Test voltage:	AC 120 V/60 Hz	Environment:	Temp: 22.5℃ Huni: 55%



	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
-	MHz	dBu∜	<u>db</u>		dBu₹	−−dBuV	<u>ab</u>	
1	0.194	31.08	0.15	10.76	41.99	63.84	-21.85	QP
2	0.194	12.96	0.15	10.76	23.87	53.84	-29.97	Average
2 3 4	0.243	28.94	0.14	10.75	39.83	62.00	-22.17	QP
4	0.544	15.11	0.12	10.76	25.99	46.00	-20.01	Average
5	0.546	31.54	0.12	10.76	42.42	56.00	-13.58	QP
6	0.694	29.21	0.13	10.77	40.11	56.00	-15.89	QP
7 8 9	1.135	10.16	0.13	10.89	21.18	46.00	-24.82	Average
8	1.636	9.87	0.14	10.93	20.94	46.00	-25.06	Average
9	2.678	27.75	0.16	10.93	38.84	56.00	-17.16	QP
10	2.779	9.82	0.16	10.93	20.91	46.00	-25.09	Average
11	17.109	29.44	0.30	10.91	40.65	60.00	-19.35	QP
12	26.278	11.97	0.36	10.87	23.20	50.00	-26.80	Average

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.



Product name:		rt phone		ı	Product mo	del: Sy	Sync			
•		Yaro				BL	BLE Tx mode			
		kHz ~ 30) MHz	i	Phase:	Ne	eutral			
Test voltage:	AC 1	20 V/60	Hz	E	Environmen	t: Te	mp: 22.5°C	Huni: 55%		
80 Level (dBu	<i>J</i>)									
70										
60								FCC CLASS-B QP		
00		-								
50								FCC CLASS-B AV		
1 2		4 7				44		12		
40 M	. 1 1 4	7 1 1 1	111 11 10		the date of the sale of	n an and disk	A Oboration			
30	MAN	MAAAA	<u> Avyvyyyyyy</u>		MAN LITTLE BANK	Attended to the shift	************	Man		
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20	AAM				Martink	AAAAA	Janas MANANA MANANA	MANAGER SPINE		
40	1	4.						The state of the s		
10										
0.15 .2		.5	1	2		5	10	20		
				Frequen	cy (MHz)	MO CONTRACTOR OF THE SECOND	FaT()	20		
0.15 .2 Trace: 15		Read	LISN	Frequen Cable		Limit	Over			
0.15 .2 Trace: 15	req I	Read		Frequen	cy (MHz) Level	MO CONTRACTOR OF THE SECOND	Over	20 Remark		
0.15 .2 Trace: 15	req I	Read	LISN	Frequen Cable		Limit	Over Limit			
0.15 .2 Trace: 15	MHz	Read evel	LISN Factor ————————————————————————————————————	Frequen Cable Loss dB	Level ——dBuV	Limit Line ————————————————————————————————————	Over Limit ———————————————————————————————————	Remark		
0.15 .2 Trace: 15 F 1 0.	MHz 194 3	Read .evel dBuV	LISN Factor dB	Frequen Cable Loss dB	Level	Limit Line dBuV 63.84	Over Limit dB -20.51	Remark 		
0.15 .2 Trace: 15 F 1 0.	MHz 194 3 246 2	Read evel	LISN Factor ————————————————————————————————————	Frequen Cable Loss dB	Level dBuV 43.33 39.99	Limit Line dBuV 63.84 61.91	Over Limit ———————————————————————————————————	Remark QP QP		
0.15 .2 Trace: 15 F 1 0. 2 0. 3 0. 4 0.	MHz 194 3 246 2 246 2	Read .evel dBuV 31.64 28.29	LISN Factor dB 0.93 0.95	Cable Loss dB	Level	Limit Line dBuV 63.84 61.91 51.91	Over Limit ———————————————————————————————————	Remark QP QP Average		
0.15 .2 Trace: 15 F 1 0. 2 0. 3 0. 4 0.	MHz 194 3 246 2 246 2 489 2 489 2	Read .evel dBuV 31.64 28.29 20.62 27.30	LISN Factor dB 0.93 0.95 0.95 0.97	Cable Loss dB 10.76 10.75 10.75 10.76	Level dBuV 43.33 39.99 32.32 39.03 35.73	Limit Line dBuV 63.84 61.91 51.91 56.19 46.19	Over Limit 	Remark QP QP Average QP Average		
0.15 .2 Trace: 15 F 1 0. 2 0. 3 0. 4 0.	MHz 194 3 246 2 246 2 489 2 489 2 538 3	Read .evel dBuV 31.64 28.29 20.62 27.30 24.00 31.65	LISN Factor dB 0.93 0.95 0.95 0.97 0.97	Cable Loss dB 10.76 10.75 10.75 10.76 10.76	Level dBuV 43.33 39.99 32.32 39.03 35.73 43.38	Limit Line dBuV 63.84 61.91 51.91 56.19 46.19 56.00	Over Limit -20.51 -21.92 -19.59 -17.16 -10.46 -12.62	Remark QP QP Average QP Average QP Average		
0.15 .2 Trace: 15 F 1 0. 2 0. 3 0. 4 0.	MHz 194 3 246 2 489 2 489 2 538 3 538 2	Read .evel dBuV 31.64 28.29 20.62 27.30 24.00 31.65 28.38	LISN Factor 	Trequent Cable Loss dB 10.76 10.75 10.75 10.76 10.76 10.76	Level dBuV 43.33 39.99 32.32 39.03 35.73 43.38 40.11	Limit Line dBuV 63.84 61.91 51.91 56.19 46.19 56.00	Over Limit -20.51 -21.92 -19.59 -17.16 -10.46 -12.62 -5.89	Remark QP QP Average QP Average QP Average QP Average		
1 0. 2 0. 3 0. 4 0. 5 0. 6 0. 7 0. 8 0.	MHz 194 3 246 2 246 2 489 2 489 2 538 3 538 2 634 2	Read .evel dBuV 31.64 28.29 20.62 27.30 24.00 31.65 28.38 21.28	LISN Factor dB 0.93 0.95 0.95 0.97 0.97 0.97 0.97	Frequen Cable Loss dB 10.76 10.75 10.76 10.76 10.76 10.76	Level dBuV 43.33 39.99 32.32 39.03 35.73 43.38 40.11 33.02	Limit Line dBuV 63.84 61.91 56.19 46.19 56.00 46.00	Over Limit 	Remark QP QP Average QP Average QP Average Average Average		
1 0. 2 0. 3 0. 4 0. 5 0. 6 0. 7 0. 8 0. 9 1.	MHz 194 3 246 2 246 2 489 2 489 2 538 3 538 2 634 2 123 1	Read .evel dBuV 31.64 28.29 20.62 27.30 24.00 31.65 28.38 21.28	LISN Factor dB 0.93 0.95 0.95 0.97 0.97 0.97 0.97	Trequent Cable Loss	Level dBuV 43.33 39.99 32.32 39.03 35.73 43.38 40.11 33.02 31.84	Limit Line dBuV 63.84 61.91 51.91 56.19 46.19 56.00 46.00 46.00	Over Limit -20.51 -21.92 -19.59 -17.16 -10.46 -12.62 -5.89 -12.98 -14.16	Remark QP QP Average QP Average QP Average Average Average Average		
1 0. 2 0. 3 0. 4 0. 5 0. 6 0. 7 0. 8 0. 9 1. 10 1.	MHz	Read .evel dBuV 31.64 28.29 20.62 27.30 24.00 31.65 28.38 21.28 19.99	LISN Factor 	Frequen Cable Loss dB 10.76 10.75 10.76 10.76 10.76 10.76 10.77 10.88 10.94	Level dBuV 43.33 39.99 32.32 39.03 35.73 43.38 40.11 33.02 31.84 31.79	Limit Line dBuV 63.84 61.91 56.19 46.19 56.00 46.00 46.00	Over Limit 	Remark QP QP Average QP Average QP Average Average Average Average		
1 0. 2 0. 3 0. 4 0. 5 0. 6 0. 7 0. 8 0. 9 1. 10 1. 11 5.	MHz 194 3 246 2 489 2 489 538 3 538 2 634 2 123 1 654 1 447 2	Read .evel dBuV 31.64 28.29 20.62 27.30 24.00 31.65 28.38 21.28	LISN Factor dB 0.93 0.95 0.95 0.97 0.97 0.97 0.97	Trequent Cable Loss	Level dBuV 43.33 39.99 32.32 39.03 35.73 43.38 40.11 33.02 31.84	Limit Line dBuV 63.84 61.91 56.19 46.19 56.00 46.00 46.00 46.00	Over Limit -20.51 -21.92 -19.59 -17.16 -10.46 -12.62 -5.89 -12.98 -14.16	Remark QP QP Average QP Average QP Average Average Average Average Average		

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.



6.3 Conducted Output Power

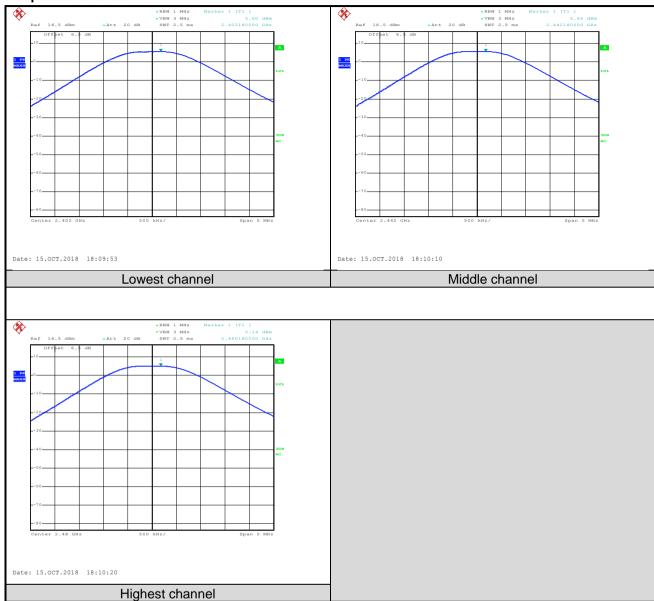
Test Requirement:	FCC Part 15 C Section 15.247 (b)(3)
Test Method:	ANSI C63.10:2013 and KDB 558074
Limit:	30dBm
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

Test CH	Maximum Conducted Output Power (dBm)	Limit(dBm)	Result
Lowest	5.60		
Middle	5.66	30.00	Pass
Highest	5.14		



Test plot as follows:





6.4 Occupy Bandwidth

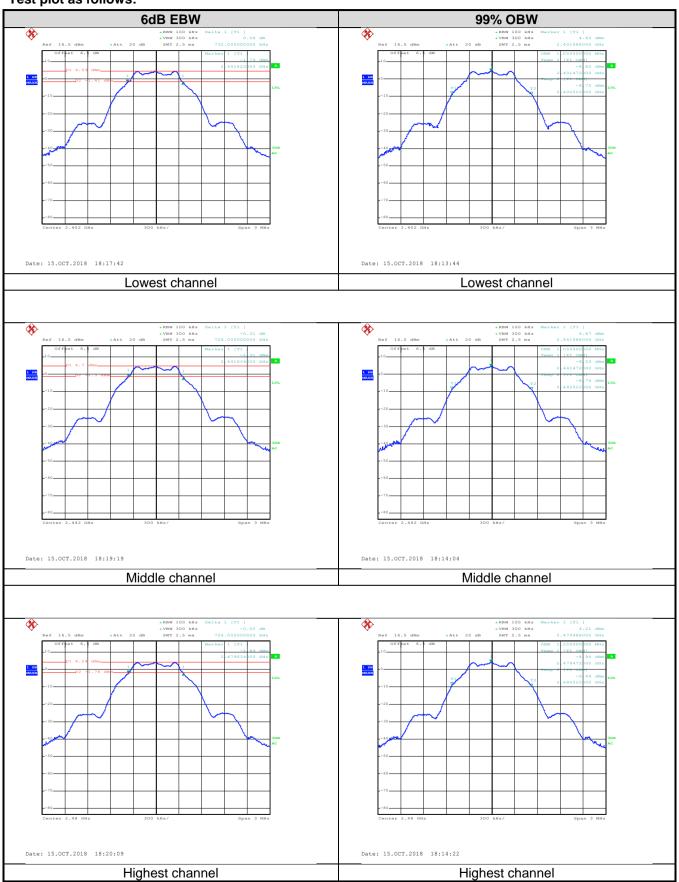
Test Requirement:	FCC Part 15 C Section 15.247 (a)(2)
Test Method:	ANSI C63.10:2013 and KDB 558074
Limit:	>500kHz
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

Test CH	6dB Emission Bandwidth (MHz)	Limit(kHz)	Result	
Lowest	0.732			
Middle	0.726	>500	Pass	
Highest	0.726			
Test CH	99% Occupy Bandwidth (MHz)	Limit(kHz)	Result	
Lowest	1.05			
Middle	Middle 1.05		N/A	
Highest	1.05			



Test plot as follows:





6.5 Power Spectral Density

Test Requirement:	FCC Part 15 C Section 15.247 (e)						
Test Method:	ANSI C63.10:2013 and KDB 558074						
Limit:	8 dBm						
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane						
Test Instruments:	Refer to section 5.8 for details						
Test mode:	Refer to section 5.3 for details						
Test results:	Passed						

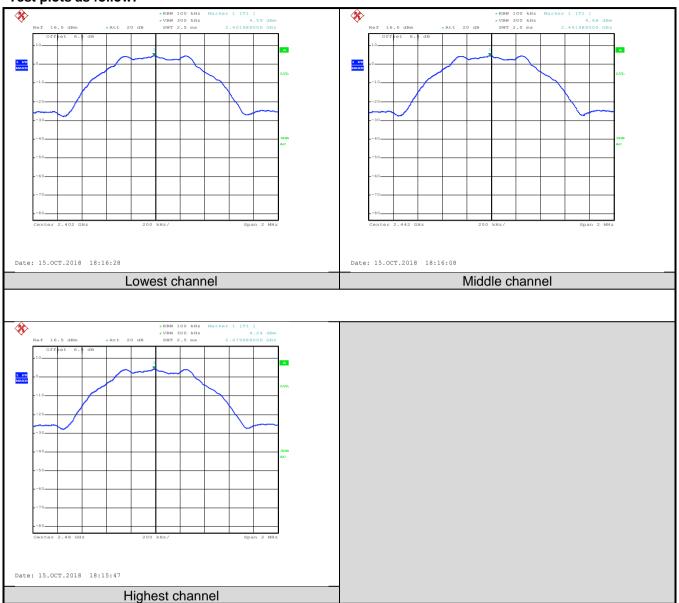
Measurement Data:

Test CH	Power Spectral Density (dBm)	Limit(dBm)	Result
Lowest	4.59		
Middle	4.68	8.00	Pass
Highest	4.24		





Test plots as follow:





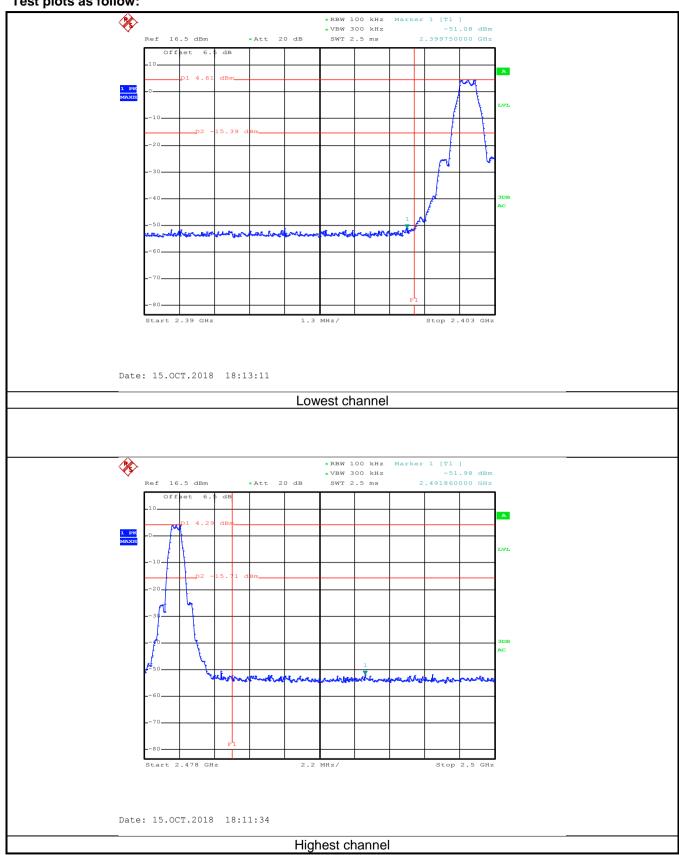
6.6 Band Edge

6.6.1 Conducted Emission Method

Test Requirement:	FCC Part 15 C Section 15.247 (d)						
Test Method:	ANSI C63.10:2013 and KDB 558074						
Limit:	In any 100 kHz bandwidth outside the frequency band in which spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 below that in the 100 kHz bandwidth within the band that contains highest level of the desired power, based on either an RF conducted radiated measurement.						
Test setup:							
	Spectrum Analyzer						
	E.U.T						
	Non-Conducted Table						
	Ground Reference Plane						
Test Instruments:	Refer to section 5.8 for details						
Test mode:	Refer to section 5.3 for details						
Test results:	Passed						



Test plots as follow:







6.6.2 Radiated Emission Method

6.6.2	Radiated Emission N	netnoa							
Т	Test Requirement:	FCC Part 15 C Section 15.205 and 15.209							
Т	Test Method:	ANSI C63.10: 2013 and KDB 558074							
Т	Test Frequency Range:	2.3GHz to 2.5GHz							
Т	Test Distance:	3m							
F	Receiver setup:	Frequency	Detecto	r	RBW		/BW	Remark	
		Above 1GHz	Peak RMS		1MHz 1MHz		MHz MHz	Peak Value Average Value	
1	_imit:	Frequen	' -	Lin	nit (dBuV/m @3		OIVII IZ	Remark	
_		Above 10			54.00		A	verage Value	
					74.00			Peak Value	
	Fest Procedure:	 The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 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. 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. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. If the emission level of the EUT in peak mode was 10 dB 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 10 dB margin would be re-tested one by one using peak, quasipeak or average method as specified and then reported in a data 						ted 360 degrees ce-receiving e-height antenna meters above ield strength. nna are set to d to its worst m 1 meter to 4 s to 360 degrees nction and 0 dB lower than d the peak values ons that did not sing peak, quasi-	
	Fest setup:	AE (T	EUT Lumtable) Test Rei	Ground I	Horn Antenna Reference Plane Pre- Amptifer Control	Antenna 1	Fower <		
Т	Test Instruments:	Refer to section	on 5.8 for d	etails	S				
Т	Test mode:	Refer to section	on 5.3 for d	etails	S				
Т	Test results:	Passed							





Product Name: Smart phone			one		Product Model:			Sync BLE Tx mode		
Test By:		Yaro			Tes	Test mode:				
Test C	hannel:	Lowest ch	nannel		Pola	rization:	Ve	ertical		
Test V	oltage:	AC 120/6	0Hz		Env	ironment:	Te	emp: 24℃	Huni: 57%	
Le	evel (dBuV/m)									
110	ver(abaviii)									
100									1000	
									Λ	
80								FCC	PART 15 (PK)	
60								FCC	PART 15 (AV)	
V	mmm	~~~	www.	-~~	~~~~	m	m		man	
40								2		
20										
3300										
0				N. C. David						
23	310 2320			2350 Freq	uency (MHz)			2404	
		ReadA	int enna		Preamp	•	Limit	Over		
	Freq	Level			Factor	Level		Limit	Remark	
	MHz	dBm	dB/m	<u>d</u> B	<u>dB</u>	dBm/m	dBm/m	<u>d</u> B		
1	2390.000	18.30	27.37 27.37	4.69	0.00	50.36	74.00	-23.64	Peak	

- 1. Final Level = Receiver Read level + Antenna Factor + Cable Loss Preamplifier Factor.
- 2. The emission levels of other frequencies are very lower than the limit and not show in test report.





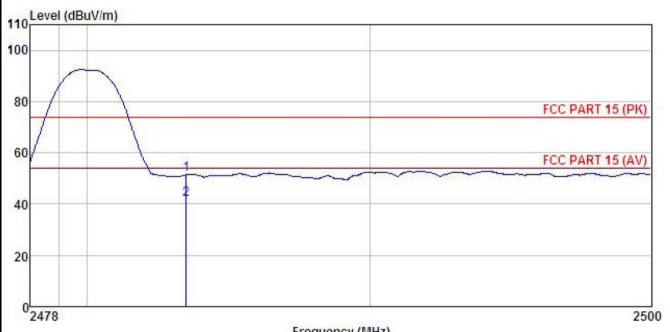
Produc	roduct Name: Smart phone			Produc	Product Model:		Sync		
Test By: Yaro			Test m	ode:	BLE Tx mode				
Test Ch	nannel:	Lowest cha	nnel		Polariz	ation:	Horizor	ntal	
Test Vo	oltage:	AC 120/60H	Нz		Enviro	nment:	Temp:	24℃	Huni: 57%
110 Lev	vel (dBuV/m)								
100									
80								FCC	PART 15 (PK)
60							_	FCÇ	PART 15 (AV)
40	m	ww	Ama	~~~	~~~	mm	Mun	n-n-n/	~~~
20									
0231	10 2320			2350 Frequ	uency (MHz)			2404
	Freq		ntenna Factor		Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBm	dB/m		<u>ab</u>	dBm/m	dBm/m		
1 2	2390.000 2390.000		27.37 27.37	4.69 4.69	0.00 0.00	50.70 41.58	74.00		Peak Average

- 1. Final Level = Receiver Read level + Antenna Factor + Cable Loss Preamplifier Factor.
- 2. The emission levels of other frequencies are very lower than the limit and not show in test report.





Product Name:	Smart phone	Product Model:	Sync
Test By:	Yaro	Test mode:	BLE Tx mode
Test Channel:	Highest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24℃ Huni: 57%



				Frequ	iency (MHz)				
	Freq		intenna Factor		Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBm	<u>dB</u> /m	<u>d</u> B	<u>d</u> B	_dBm/m	_dBm/m	<u>ab</u>	
1 2	2483.500 2483.500	18.98 9.54				51.36 41.92			

- 1. Final Level = Receiver Read level + Antenna Factor + Cable Loss Preamplifier Factor.
- 2. The emission levels of other frequencies are very lower than the limit and not show in test report.





Product Name:	Smart phone	Product Model:	Sync
Test By:	Yaro	Test mode:	BLE Tx mode
Test Channel:	Highest channel	lighest channel Polarization: Horizontal	
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24℃ Huni: 57%
110 Level (dBuV/m) 100 80 60 40	1		FCC PART 15 (PK) FCC PART 15 (AV)
02478	ReadAntenna Ca	Frequency (MHz) ble Preamp	2500 Limit Over

Loss Factor

碅

0.00

0.00

碅

4.81

4.81

Level

dBm/m

51.53

41.89

Line

dBm/m

Limit Remark

碅

74.00 -22.47 Peak

54.00 -12.11 Average

Remark:

1 2

Freq

MHz

2483.500

2483,500

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

dB/m

27.57

27.57

Level Factor

dBm

19.15

9.51

2. The emission levels of other frequencies are very lower than the limit and not show in test report.



6.7 Spurious Emission

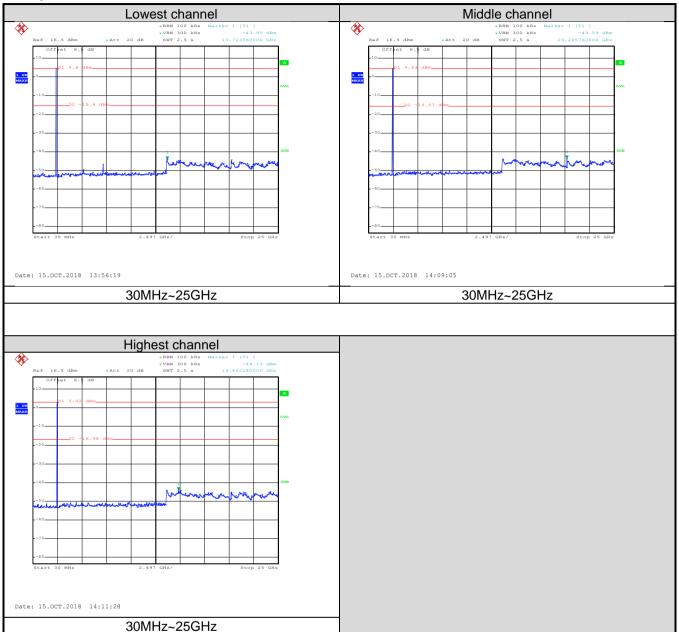
6.7.1 Conducted Emission Method

0.7.1 Conducted Linission						
Test Requirement:	FCC Part 15 C Section 15.247 (d)					
Test Method:	ANSI C63.10:2013 and KDB 558074					
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.					
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane					
Test Instruments:	Refer to section 5.8 for details					
Test mode:	Refer to section 5.3 for details					
Test results:	Passed					





Test plot as follows:





6.7.2 Radiated Emission Method

6.7.2 Radiated Emission N	vietnod								
Test Requirement:	FCC Part 15 C Section 15.205 and 15.209								
Test Method:	ANSI C63.10:2013								
Test Frequency Range:	9kHz to 25GHz								
Test Distance:	3m								
Receiver setup:	Frequency	Detector	r	RBW	VB	SW	Remark		
·	30MHz-1GHz	Quasi-pea	ak	120KHz	3001	KHz	Quasi-peak Value		
	Above 1GHz Peak 1MHz 3MHz Peak Value								
	RMS 1 1MHz 3MHz Average Value								
Limit:	Frequency Limit (dBuV/m @3m) Remark								
	30MHz-88M	1		40.0 43.5			luasi-peak Value		
	88MHz-216M 216MHz-960N			46.0			luasi-peak Value luasi-peak Value		
	960MHz-1G			54.0			luasi-peak Value		
				54.0			Average Value		
	Above 1GF	łz 📉		74.0			Peak Value		
Test Procedure:	1GHz)/1.5r The table we highest rad antenna, we tower. 3. The antenry the ground Both horizon make the meters and to find the restrict Specified E. If the emission of the EUT have 10 dE.	m(above 10 was rotated liation. was set 3 hich was man height is to determental and wheasurements and when the analytical the rota tamaximum receiver system on level of ecified, the would be margin wo	GHz) d 360 s met mount is var nine vertice ent. emis readir retem with for the en tes repo rould l	above the degrees to degrees to degrees to degrees to degrees to degrees to degree the degree	groun or deter rom th op of a ne met um valu ions of the trom 0 to Pea old Mo ak mod oe stop wise th I one b	d at a mine to the intervariate of the area degree of the was ped and e emissy one of the area of the	table 0.8m(below 3 meter camber. the position of the rference-receiving ble-height antenna our meters above the field strength. Intenna are set to anged to its worst from 1 meter to 4 es to 360 degrees ect Function and at 10 dB lower than and the peak values assions that did not using peak, quasi-reported in a data		
Test setup:	EUT	3m				Antenna Search Antenn Test eiver	ı		



	Above 1GHz
	AE EUT Horn Antenna Tower Ground Reference Plane Test Receiver Amplifer Controller
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed
Remark:	 Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis is the worst case. 9 kHz to 30MHz is too low, so only shows the data of above 30MHz in this report.

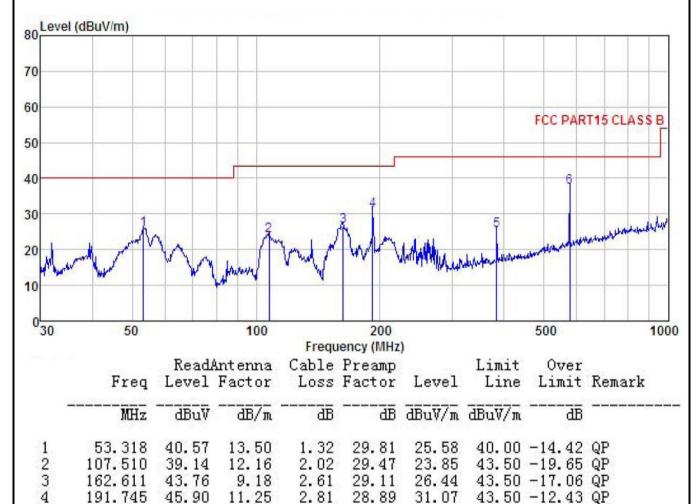




Measurement Data (worst case):

Below 1GHz:

Product Name:	Smart phone	Product Model:	Sync
Test By:	Yaro	Test mode:	BLE Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Vertical
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24℃ Huni: 57%



Remark:

5

6

383.932

576.644

15.22

18.65

35.72

43.85

3.09

3.92

28.71

29.01

25.32

37.41

46.00 -20.68 QP

-8.59 QP

46.00

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

^{2.} The emission levels of other frequencies are very lower than the limit and not show in test report.





	roduct Name:		Smart phone			Product Model:		Sync		
est By	:	Yaro			Test	Test mode: BLE)	
est Fre	equency:	30 MHz ~ 1 GHz Polar			Polarization:		Horizontal			
est Vo	Itage:	AC 120/6	60Hz		Envi	ronment:	Те	Temp: 24°C Huni: 57		i: 57%
Level	l (dBuV/m)									
30	(dDdv/III)									
70										
50								FCC PAR	T15 CL	ASSR
50								TCCFAR	1 13 CL	, , , , , , , , , , , , , , , , , , ,
			4		4		5			
10							Y	6		
								9		
20			0		3					
30			Ã	١. ،	7 Mm	Maddle				watership
20	1		Î	Van 1	M	Madelly Market	Mark Mark	and the second second	Stripmen . meligi	escapellic model of
20	herman	W	NA P	Vev	M	Make Market	ph phylosom	whom March or for	eders/mail/emiligib	and the solid state
	whereward	W	w	Vay	My	MANUAL LAND	pholips on	and and and and	a Service and Serv	water dist
10	10	W	W/\rightarrow \rightarrow \rig	Vay	√Mm	Maday Maria	gth 1/4 lann	500	and the second	
10	Lyterrane son		100	Frequ	200 iency (MHz	Madellinghet	pph/ph/	500	- Service of the Serv	100
10	50		Antenna	Cable	iency (MHz Preamp		Limit	Over		100
10	10			Cable	iency (MHz	Level	Limit Line	Over		100
10	50		Antenna	Cable	ency (MHz Preamp Factor		Line	Over Limit		100
030	50 Freq MHz	Level dBuV	Antenna Factor ——dB/m	Cable Loss dB	ency (MHz Preamp Factor dB	Level	Line dBuV/m	Over Limit dB	Rema	100
030	50 Freq MHz 55.415 105.272	Level dBuV 36.11 43.30	Antenna Factor dB/m 13.14 12.02	Cable Loss dB 1.36 2.00	Preamp Factor dB 29.80 29.49	Level dBuV/m 20.81 27.83	Line dBuV/m 40.00 43.50	Over Limit dB -19.19 -15.67		100
030	50 Freq MHz 55.415 105.272 179.386	Level dBuV 36.11 43.30 46.55	Antenna Factor —_dB/m 13.14 12.02 9.78	Cable Loss dB 1.36 2.00 2.73	Preamp Factor dB 29.80 29.49 28.98	Level dBuV/m 20.81 27.83 30.08	Line dBuV/m 40.00 43.50 43.50	Over Limit 	Rema QP QP QP	100
030	50 Freq MHz 55.415 105.272	Level dBuV 36.11 43.30	Antenna Factor dB/m 13.14 12.02	Cable Loss dB 1.36 2.00	Preamp Factor dB 29.80 29.49	Level dBuV/m 20.81 27.83	Line dBuV/m 40.00 43.50	Over Limit 	Rema QP QP QP	100

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

^{2.} The emission levels of other frequencies are very lower than the limit and not show in test report.



Above 1GHz

Above 1GHZ			T		,					
				annel: Lowe						
		1	De	tector: 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		
4804.00	48.34	35.99	6.80	41.81	49.32	74.00	-24.68	Vertical		
4804.00	47.24	35.99	6.80	41.81	48.22	74.00	-25.78	Horizontal		
Detector: Average 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		
4804.00	39.54	35.99	6.80	41.81	40.52	54.00	-13.48	Vertical		
4804.00	38.15	35.99	6.80	41.81	39.13	54.00	-14.87	Horizontal		
			Toot ob	annalı Mida	اد مادماد					
				annel: Midd						
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	tector: Peak Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization		
4884.00	47.32	36.38	6.86	41.84	48.72	74.00	-25.28	Vertical		
4884.00	47.25	36.38	6.86	41.84	48.65	74.00	-25.35	Horizontal		
			Dete	ctor: Averag	ge 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		
4884.00	38.61	36.38	6.86	41.84	40.01	54.00	-13.99	Vertical		
4884.00	38.47	36.38	6.86	41.84	39.87	54.00	-14.13	Horizontal		
			Toot ob	annel: Highe	ant abannal					
				tector: Peak						
	Read	Antenna	Cable	Preamp						
Frequency (MHz)	Level (dBuV)	Factor (dB/m)	Loss (dB)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization		
4960.00	48.52	36.71	6.91	41.87	50.27	74.00	-23.73	Vertical		
4960.00	49.34	36.71	6.91	41.87	51.09	74.00	-22.91	Horizontal		
			Dete	ctor: Averag	ge 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		
4960.00	38.29	36.71	6.91	41.87	40.04	54.00	-13.96	Vertical		
		1			1			1		

Remark:

4960.00

39.51

6.91

41.87

41.26

54.00

-12.74

36.71

Project No.: CCISE1809167

Horizontal

^{1.} Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.

^{2.} The emission levels of other frequencies are very lower than the limit and not show in test report.