

Global United Technology Services Co., Ltd.

Report No.: GTS202012000267F01

TEST REPORT

Applicant: SiMPNiC Co., Ltd.

Address of Applicant: 16F-6, No. 79, Sec 1, Xintai 5th Rd, Xizhi Dist., New Taipei

City, Taiwan

Manufacturer: Remotec Technology Ltd.

Address of 9/F., Sing Shun Centre, No. 495 Castle Peak Rd, Lai Chi Kok,

Manufacturer: Kowloon, Hong Kong

Factory: Guangdong Seneasy Intelligent Technology Co., LTD

Address of Factory: No 63, Huitai Industrial Park, Huizhou City, Guangdong, China

Equipment Under Test (EUT)

Room Keeper **Product Name:**

R1 Model No.:

SIMPNIC Trade Mark:

FCC ID: 2AX6X-R1

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

Date of sample receipt: December 23, 2020

Date of Test: December 24, 2020-January 06, 2021

Date of report issued: January 06, 2021

Test Result: PASS *

Authorized Signature:



Robinson Luo Laboratory Manager

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



2 Version

Version No.	Date	Description
00	January 06, 2021	Original

Prepared By:	Joseph Clu	Date:	January 06, 2021
	Project Engineer	_	
Check By:	Reviewer	Date:	January 06, 2021



Contents 3

			Page
1	COVE	ER PAGE	1
2	VERS	SION	2
3	CON	TENTS	3
4	TEST	SUMMARY	4
5	GENE	ERAL INFORMATION	5
		GENERAL DESCRIPTION OF EUT	
	5.2	Test mode	7
	5.3	DESCRIPTION OF SUPPORT UNITS	7
	5.4	DEVIATION FROM STANDARDS	7
	5.5	ABNORMALITIES FROM STANDARD CONDITIONS	7
	5.6	TEST FACILITY	7
	5.7	TEST LOCATION	7
	5.8	Additional Instructions	7
6	TEST	INSTRUMENTS LIST	8
7	TEST	RESULTS AND MEASUREMENT DATA	10
		ANTENNA REQUIREMENT	_
		CONDUCTED EMISSIONS	
		CONDUCTED OUTPUT POWER	
		CHANNEL BANDWIDTH	
		Power Spectral Density	
		BAND EDGES	
	7.6.1		
	7.6.2		
		Spurious Emission	
	7.7.1		
	7.7.2		
8	TEST	SETUP PHOTO	33
a	FIIT	CONSTRUCTIONAL DETAILS	33



4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203/15.247 (c)	Pass
AC Power Line Conducted Emission	15.207	Pass
Conducted Output Power	15.247 (b)(3)	Pass
Channel 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

Remarks:

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

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						
Note (1): The measurement unce	ertainty is for coverage factor of k	=2 and a level of confidence of	95%.			



5 General Information

5.1 General Description of EUT

Product Name:	Room Keeper
Model No.:	R1
Serial No.:	5259211Z0000001
Hardware version:	V1.0
Software version:	V1.0
Test sample(s) ID:	GTS202012000267-1
Sample(s) Status:	Engineer sample
Operation Frequency:	2402MHz~2480MHz
Channel Numbers:	40
Channel Separation:	2MHz
Modulation Type:	GFSK
Antenna Type:	PCB Antenna
Antenna Gain:	3.45dBi(Declare by applicant)
Power Supply:	Adapter
	Model No: JOD-S-050120A
	Input: AC 100-240V, 50/60Hz, 0.2A
	Output: DC 5.0V, 1.2A



Operation F	Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency	
1	2402 MHz	11	2422 MHz	21	2442 MHz	31	2462 MHz	
2	2404 MHz	12	2424 MHz	22	2444 MHz	32	2464 MHz	
3	2406 MHz	13	2426 MHz	23	2446 MHz	33	2466 MHz	
4	2408 MHz	14	2428 MHz	24	2448 MHz	34	2468 MHz	
5	2410 MHz	15	2430 MHz	25	2450 MHz	35	2470 MHz	
6	2412 MHz	16	2432 MHz	26	2452 MHz	36	2472 MHz	
7	2414 MHz	17	2434 MHz	27	2454 MHz	37	2474 MHz	
8	2416 MHz	18	2436 MHz	28	2456 MHz	38	2476 MHz	
9	2418 MHz	19	2438 MHz	29	2458 MHz	39	2478 MHz	
10	2420 MHz	20	2440 MHz	30	2460 MHz	40	2480 MHz	

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, and the selected channel see below:

Channel	Frequency
The lowest channel	2402MHz
The middle channel	2440MHz
The Highest channel	2480MHz



5.2 Test mode

Transmitting mode Keep the EUT in continuously transmitting mode

Remark: During the test, the dutycycle >98%, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.

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

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. Registration 381383.

• IC —Registration No.: 9079A

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 with Registration No.: 9079A.

• NVLAP (LAB CODE:600179-0)

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). LAB CODE:600179-0

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	Special test command provided by manufacturer
Power level setup	Default



6 Test Instruments list

Radi	iated 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	June. 25 2020	June. 24 2021
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 25 2020	June. 24 2021
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 25 2020	June. 24 2021
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 25 2020	June. 24 2021
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 25 2020	June. 24 2021
9	Coaxial Cable	GTS	N/A	GTS211	June. 25 2020	June. 24 2021
10	Coaxial cable	GTS	N/A	GTS210	June. 25 2020	June. 24 2021
11	Coaxial Cable	GTS	N/A	GTS212	June. 25 2020	June. 24 2021
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 25 2020	June. 24 2021
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 25 2020	June. 24 2021
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 25 2020	June. 24 2021
15	Band filter	Amindeon	82346	GTS219	June. 25 2020	June. 24 2021
16	Power Meter	Anritsu	ML2495A	GTS540	June. 25 2020	June. 24 2021
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 25 2020	June. 24 2021
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 25 2020	June. 24 2021
19	Splitter	Agilent	11636B	GTS237	June. 25 2020	June. 24 2021
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 25 2020	June. 24 2021
21	Breitband hornantenne	SCHWARZBECK	BBHA 9170	GTS579	Oct. 18 2020	Oct. 17 2021
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 18 2020	Oct. 17 2021
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 18 2020	Oct. 17 2021
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	June. 25 2020	June. 24 2021



Cond	Conducted Emission							
Item	Test Equipment	Manufacturer	Manufacturer Model No.		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.15 2019	May.14 2022		
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 25 2020	June. 24 2021		
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 25 2020	June. 24 2021		
4	ENV216 2-L-V- NETZNACHB.DE	ROHDE&SCHWARZ	ENV216	GTS226	June. 25 2020	June. 24 2021		
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	KTJ	TA328	GTS233	June. 25 2020	June. 24 2021		
8	Absorbing clamp	Elektronik- Feinmechanik	MDS21	GTS229	June. 25 2020	June. 24 2021		
9	ISN	SCHWARZBECK	NTFM 8158	GTD565	June. 25 2020	June. 24 2021		

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	June. 25 2020	June. 24 2021		
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 25 2020	June. 24 2021		
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June. 25 2020	June. 24 2021		
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	June. 25 2020	June. 24 2021		
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	June. 25 2020	June. 24 2021		
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	June. 25 2020	June. 24 2021		
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	June. 25 2020	June. 24 2021		
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	June. 25 2020	June. 24 2021		

Gene	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	June. 25 2020	June. 24 2021			
2	Barometer	ChangChun	DYM3	GTS255	June. 25 2020	June. 24 2021			



Test results and Measurement Data 7

7.1 Antenna requirement

Standard requirement: FCC Part15 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 antenna is PCB antenna, the best case gain of the antenna is 3.45dBi, reference to the appendix II for details

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



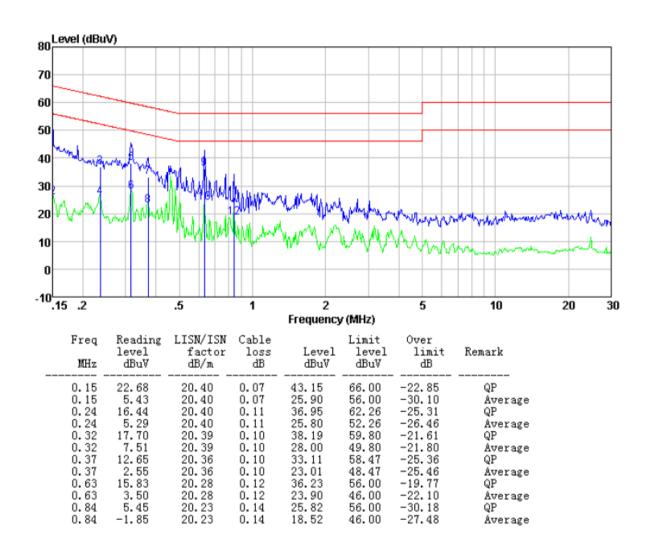
7.2 Conducted Emissions

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, Sweep time=auto						
Limit:	Eroguepov rongo (MHz)	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			J			
Test setup:	Reference Plane						
Test procedure:	Remark E.U.T Receiver Remark E.U.T Equipment Under Test LISN Line Impedence Stabilization Network Test table height=0.8m 1. 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.						
	LISN that provides a 50ohr termination. (Please refer t photographs). 3. Both sides of A.C. line are interference. In order to fine positions of equipment and according to ANSI C63.10:	o the block diagram of the checked for maximum emis all of the interface c	of the test set m conducted sion, the rela ables must b	tup and tive e changed			
Test Instruments:	Refer to section 6.0 for details	3					
Test mode:	Refer to section 5.2 for details	<u> </u>					
Test environment:	Temp.: 25 °C Hun	nid.: 52%	Press.:	1012mbar			
Test voltage:	AC 120V, 60Hz						
Test results:	Pass						

Remark: Both high and low voltages have been tested to show only the worst low voltage test data.

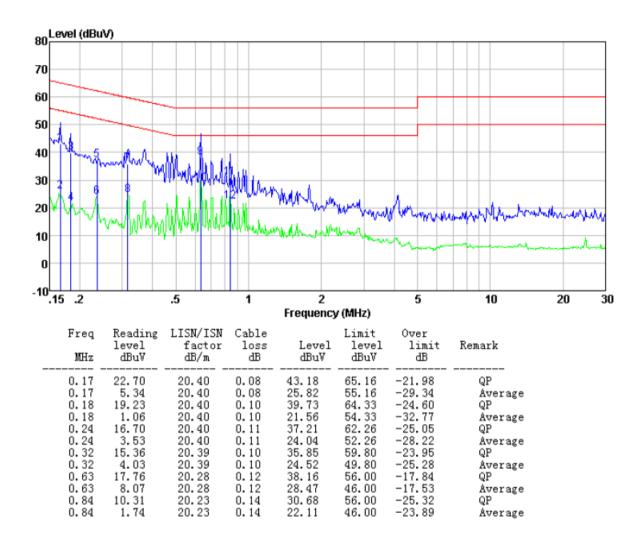


Measurement data BLE mode: Line





Neutral

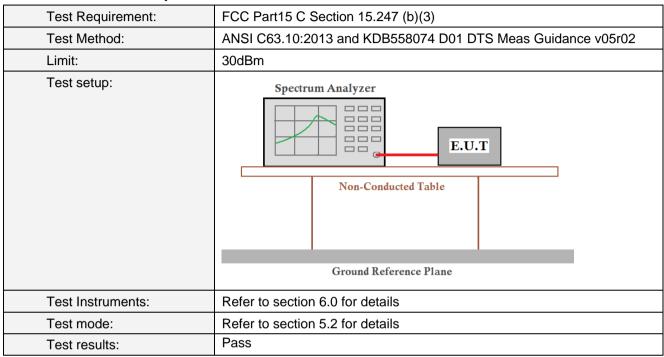


Notes:

- 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



7.3 Conducted Output Power

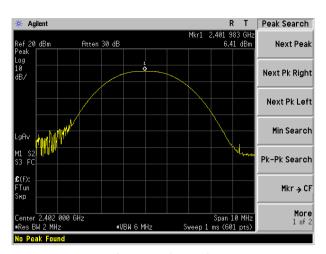


Measurement Data

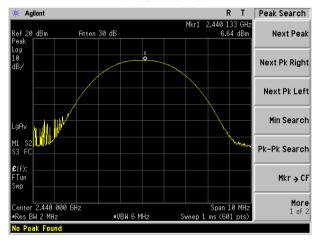
Test channel	Peak Output Power (dBm)	Limit(dBm)	Result
Lowest	6.41		
Middle	6.64	30.00	Pass
Highest	6.82		



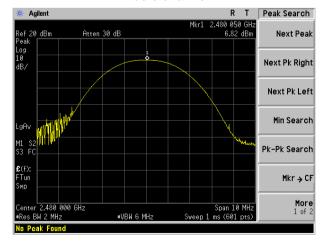
Test plot as follows:



Lowest channel



Middle channel



Highest channel



7.4 Channel Bandwidth

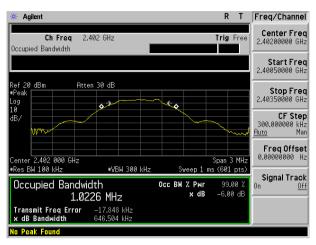
Test Requirement:	FCC Part15 C Section 15.247 (a)(2)				
Test Method:	ANSI C63.10:2013 and KDB558074 D01 15.247 Meas Guidance v05r02				
Limit:	Channel Bandwidth >500KHz				
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane				
Test Instruments:	Refer to section 6.0 for details				
Test mode:	Refer to section 5.2 for details				
Test results:	Pass				

Measurement Data

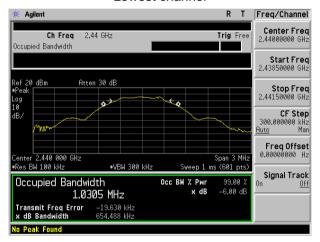
Test channel	Channel Bandwidth (MHz)	Limit(KHz)	Result
Lowest	0.647		
Middle	0.654	>500	Pass
Highest	0.651		



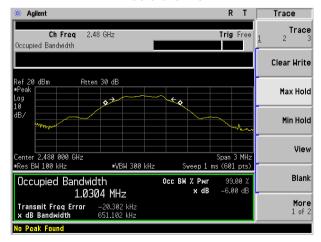
Test plot as follows:



Lowest channel



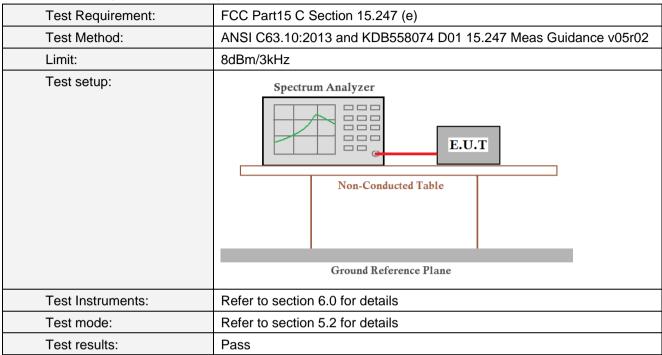
Middle channel



Highest channel



7.5 Power Spectral Density

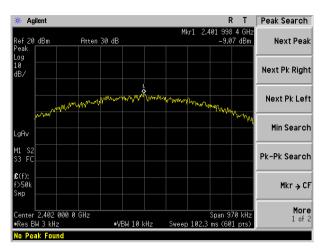


Measurement Data

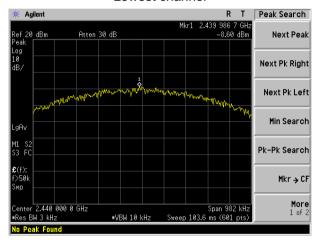
	Test channel	Power Spectral Density (dBm/3kHz)	Limit(dBm/3kHz)	Result
	Lowest	-9.07		
Ī	Middle	-8.60	8.00	Pass
	Highest	-8.31		



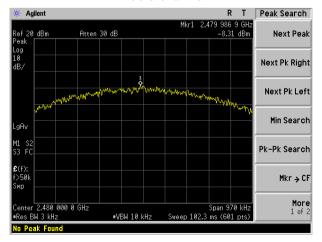
Test plot as follows:



Lowest channel



Middle channel



Highest channel

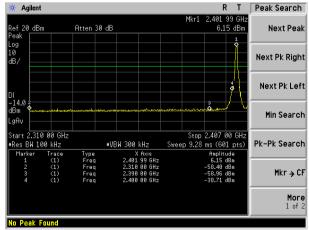


7.6 Band edges

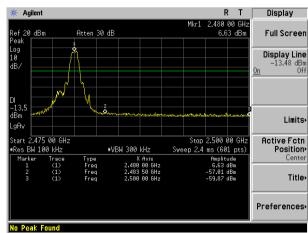
7.6.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)				
Test Method:	ANSI C63.10:2013 and KDB558074 D01 15.247 Meas Guidance v05r02				
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 6.0 for details				
Test mode:	Refer to section 5.2 for details				
Test results:	Pass				

Test plot as follows:







Highest channel



7.6.2 Radiated Emission Method

Test Requirement:	FCC Part15 C S		and 15.205				
Test Method:	ANSI C63.10:20)13					
Test Frequency Range:	All of the restrict 2500MHz) data		ested, only	the worst b	and's (2310MHz to		
Test site:	Measurement D	istance: 3m					
Receiver setup:	Frequency	Detector	RBW	VBW	Value		
		Peak	1MHz	3MHz	Peak		
	Above 1GHz	RMS	1MHz	3MHz	Average		
Limit:	Freque	Frequency Limit (dBuV/m @3m) Value					
	Above 1	CH-	54.0	0	Average		
	Above 1	GHZ	74.0	0	Peak		
	Test Antenna- Tum Table-						
Test Procedure:	1. The EUT was			ating table 1	1.5m above the		
	 The EUT was placed on the top of a rotating table 1.5m 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 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, quasipeak or average method as specified and then reported in a data sheet. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test 						
Test Instruments:	Refer to section	node is recorde 6.0 for details	- [-]				
		5.2 for details					

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



Test results:	Pass

Measurement data

Remark: The pre-test were performed on lowest, middle and highest frequencies, only the worst case's (lowest and highest frequencies) data was showed.

Test channel:	Lowest

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
2310.00	46.39	27.91	5.30	24.64	54.96	74.00	-19.04	Horizontal
2390.00	50.68	27.59	5.38	24.71	58.94	74.00	-15.06	Horizontal
2400.00	52.43	27.41	5.39	24.72	60.51	74.00	-13.49	Horizontal
2310.00	47.28	27.91	5.30	24.64	55.85	74.00	-18.15	Vertical
2390.00	52.10	27.59	5.38	24.71	60.36	74.00	-13.64	Vertical
2400.00	53.72	27.41	5.39	24.72	61.80	74.00	-12.20	Vertical

Average value:

Average va	140.							
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
2310.00	36.15	27.91	5.30	24.64	44.72	54.00	-9.28	Horizontal
2390.00	37.59	27.59	5.38	24.71	45.85	54.00	-8.15	Horizontal
2400.00	39.07	27.41	5.39	24.72	47.15	54.00	-6.85	Horizontal
2310.00	36.34	27.91	5.30	24.64	44.91	54.00	-9.09	Vertical
2390.00	38.58	27.59	5.38	24.71	46.84	54.00	-7.16	Vertical
2400.00	39.57	27.41	5.39	24.72	47.65	54.00	-6.35	Vertical



Test channel:	Highest
---------------	---------

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
2483.50	48.91	27.53	5.47	24.80	57.11	74.00	-16.89	Horizontal
2500.00	47.42	27.55	5.49	24.86	55.60	74.00	-18.40	Horizontal
2483.50	50.34	27.53	5.47	24.80	58.54	74.00	-15.46	Vertical
2500.00	48.75	27.55	5.49	24.86	56.93	74.00	-17.07	Vertical

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
2483.50	37.02	27.53	5.47	24.80	45.22	54.00	-8.78	Horizontal
2500.00	36.52	27.55	5.49	24.86	44.70	54.00	-9.30	Horizontal
2483.50	36.75	27.53	5.47	24.80	44.95	54.00	-9.05	Vertical
2500.00	36.73	27.55	5.49	24.86	44.91	54.00	-9.09	Vertical

Remark:

- 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.



7.7 Spurious Emission

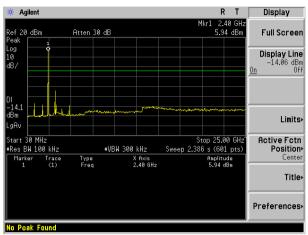
7.7.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)						
Test Method:	ANSI C63.10:2013 and KDB558074 D01 15.247 Meas Guidance v05r02						
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 6.0 for details						
Test mode:	Refer to section 5.2 for details						
Test results:	Pass						



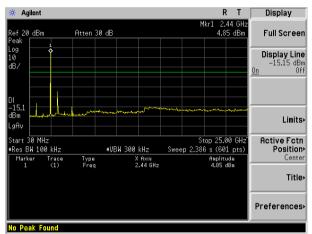
Test plot as follows:

Lowest channel



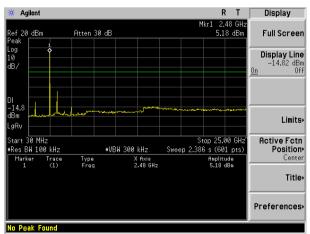
30MHz~25GHz

Middle channel



Highest channel

30MHz~25GHz



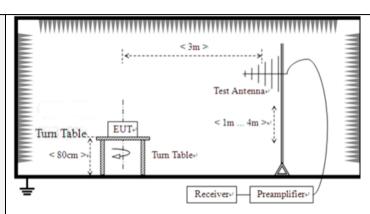
30MHz~25GHz



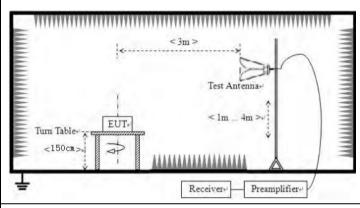
7.7.2 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209									
Test Method:	ANSI C63.10:2013									
Test Frequency Range:	9kHz to 25GHz									
Test site:	Measurement Distance: 3m									
Receiver setup:	Frequency		Detector	RB∖	RBW \		'	Value		
	9KHz-150KHz Qu		ıasi-peak	200H	Ηz	600Hz	Z	Quasi-peak		
	150KHz-30MHz	Qı	ıasi-peak	9KF	lz	30KH:	Z	Quasi-peak		
	30MHz-1GHz	Q	ıasi-peak	120K	Hz	300KH	lz	Quasi-peak		
	Above 1GHz		Peak	1MF	łz	3MHz	<u>-</u>	Peak		
	Above IGHZ		Peak	1MF	łz	10Hz		Average		
Limit: (Spurious Emissions)	Frequency		Limit (u\	//m)	٧	'alue	N	Measurement Distance		
,	0.009MHz-0.490M	lHz	2400/F(k	(Hz)		QP		300m		
	0.490MHz-1.705M	lHz	24000/F(KHz)		QP	30m			
	1.705MHz-30MH	30		QP		30m				
	30MHz-88MHz	100		QP						
	88MHz-216MHz	150		QP						
	216MHz-960MH	Z	200		QP		3m			
	960MHz-1GHz		500		QP			5111		
	Above 1GHz		500		Average					
	ABOVE TOTIZ		5000	Peak		Peak				
Test setup:	For radiated emission	ns fr	om 9kHz to	30MH	Z					
	Tum Table Som	Т	um Table-	ntenna lm Receiver						





For radiated emissions above 1GHz



Test Procedure:

- The EUT was placed on the top of a rotating table (0.8m for below 1G and 1.5m for above 1G) 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.
- 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

Test mode: Refer to section 5.2 for details

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



Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar	
Test voltage:	AC 120V, 60Hz						
Test results:	Pass						

Remark:

Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the X-axis which it is worse case.

Measurement data:

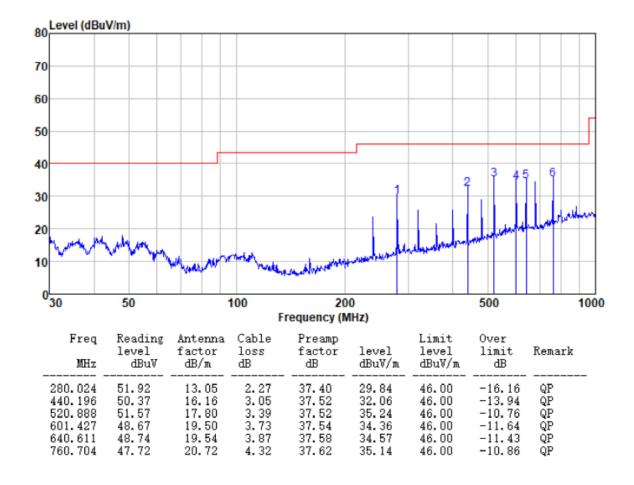
■ 9 kHz ~ 30 MHz

The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

■ Below 1GHz

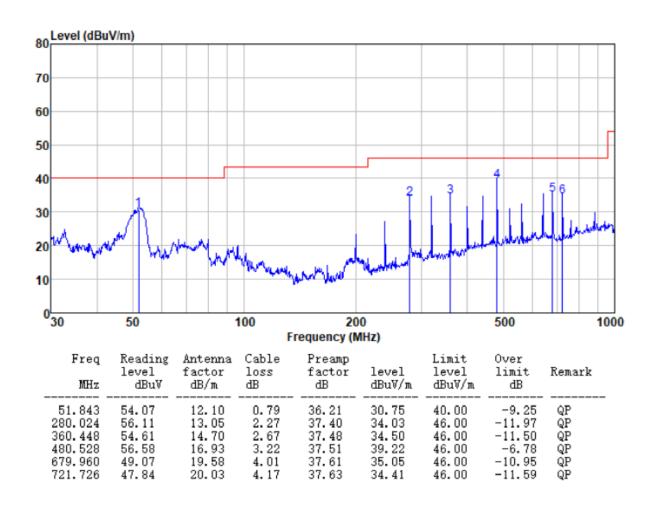
Pre-scan all test modes, found worst case at 2480MHz, and so only show the test result of 2480MHz

Horizontal





Vertical





Above 1GHz

Test channel	Test channel: Lowest									
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	35.58	31.78	8.60	32.09	43.87	74.00	-30.13	Vertical		
7206.00	30.68	36.15	11.65	32.00	46.48	74.00	-27.52	Vertical		
9608.00	30.45	37.95	14.14	31.62	50.92	74.00	-23.08	Vertical		
12010.00	*					74.00		Vertical		
14412.00	*					74.00		Vertical		
4804.00	39.51	31.78	8.60	32.09	47.80	74.00	-26.20	Horizontal		
7206.00	32.29	36.15	11.65	32.00	48.09	74.00	-25.91	Horizontal		
9608.00	29.71	37.95	14.14	31.62	50.18	74.00	-23.82	Horizontal		
12010.00	*					74.00		Horizontal		
14412.00	*					74.00		Horizontal		
Average val	ue:							•		

Average var	<u></u>							
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	24.72	31.78	8.60	32.09	33.01	54.00	-20.99	Vertical
7206.00	19.56	36.15	11.65	32.00	35.36	54.00	-18.64	Vertical
9608.00	18.75	37.95	14.14	31.62	39.22	54.00	-14.78	Vertical
12010.00	*					54.00		Vertical
14412.00	*					54.00		Vertical
4804.00	28.75	31.78	8.60	32.09	37.04	54.00	-16.96	Horizontal
7206.00	21.62	36.15	11.65	32.00	37.42	54.00	-16.58	Horizontal
9608.00	18.34	37.95	14.14	31.62	38.81	54.00	-15.19	Horizontal
12010.00	*					54.00		Horizontal
14412.00	*					54.00		Horizontal



Test channe	l:			Midd	dle			
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
4880.00	35.86	31.85	8.67	32.12	44.26	74.00	-29.74	Vertical
7320.00	30.87	36.37	11.72	31.89	47.07	74.00	-26.93	Vertical
9760.00	30.61	38.35	14.25	31.62	51.59	74.00	-22.41	Vertical
12200.00	*					74.00		Vertical
14640.00	*					74.00		Vertical
4880.00	39.85	31.85	8.67	32.12	48.25	74.00	-25.75	Horizontal
7320.00	32.50	36.37	11.72	31.89	48.70	74.00	-25.30	Horizontal
9760.00	29.90	38.35	14.25	31.62	50.88	74.00	-23.12	Horizontal
12200.00	*					74.00		Horizontal
14640.00	*					74.00		Horizontal
Average val	ue:							
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
4880.00	24.95	31.85	8.67	32.12	33.35	54.00	-20.65	Vertical
7320.00	19.73	36.37	11.72	31.89	35.93	54.00	-18.07	Vertical
9760.00	18.89	38.35	14.25	31.62	39.87	54.00	-14.13	Vertical
12200.00	*					54.00		Vertical
14640.00	*					54.00		Vertical
4880.00	29.02	31.85	8.67	32.12	37.42	54.00	-16.58	Horizontal
7320.00	21.80	36.37	11.72	31.89	38.00	54.00	-16.00	Horizontal
9760.00	18.50	38.35	14.25	31.62	39.48	54.00	-14.52	Horizontal
12200.00	*					54.00		Horizontal
14640.00	*					54.00		Horizontal



Test channel	l:			Higl	nest			
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
4960.00	35.97	31.93	8.73	32.16	44.47	74.00	-29.53	Vertical
7440.00	30.95	36.59	11.79	31.78	47.55	74.00	-26.45	Vertical
9920.00	30.68	38.81	14.38	31.88	51.99	74.00	-22.01	Vertical
12400.00	*					74.00		Vertical
14880.00	*					74.00		Vertical
4960.00	39.99	31.93	8.73	32.16	48.49	74.00	-25.51	Horizontal
7440.00	32.58	36.59	11.79	31.78	49.18	74.00	-24.82	Horizontal
9920.00	29.98	38.81	14.38	31.88	51.29	74.00	-22.71	Horizontal
12400.00	*					74.00		Horizontal
14880.00	*					74.00		Horizontal
Average val	ue:				_			
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	25.09	31.93	8.73	32.16	33.59	54.00	-20.41	Vertical
7440.00	19.82	36.59	11.79	31.78	36.42	54.00	-17.58	Vertical
9920.00	18.97	38.81	14.38	31.88	40.28	54.00	-13.72	Vertical
12400.00	*					54.00		Vertical
14880.00	*					54.00		Vertical
4960.00	29.17	31.93	8.73	32.16	37.67	54.00	-16.33	Horizontal
7440.00	21.90	36.59	11.79	31.78	38.50	54.00	-15.50	Horizontal
9920.00	18.60	38.81	14.38	31.88	39.91	54.00	-14.09	Horizontal
12400.00	*					54.00		Horizontal
14880.00	*					54.00		Horizontal

Remark:

- 1. Final Level =Receiver Read level + Antenna Factor + Cable Loss Preamplifier Factor
- 2. "*", means this data is the too weak instrument of signal is unable to test.
- 3. The emission levels of other frequencies are very lower than the limit and not show in test report.



8 Test Setup Photo

Reference to the appendix I for details.

9 EUT Constructional Details

Reference to the appendix II for details.

-----End-----