



Report No.: EA1907074F 02001

1 of 41

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT  
INTENTIONAL RADIATOR CERTIFICATION TO  
FCC PART 15 SUBPART C REQUIREMENT**

*OF*

**Noke Pad**

**Model No.: NKP01**

**Trade Mark: NOKĒ**

**FCC ID: 2AFRJNKP01**

**Report No.: EA1907074F 02001**

**Issue Date: August 05, 2019**

*Prepared for*

**Noke Inc  
2000 Ashton Blvd, Ste 375 Lehi, UT 84043, USA**

*Prepared by*

**Dong Guan Anci Electronic Technology Co., Ltd.**

**1-2 Floor, Building A, No.11, Headquarters 2 Road, Songshan, Lake Hi-tech  
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Dongguan City, Guangdong Pr., China.**

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Dong Guan Anci Electronic Technology Co., Ltd.**

**VERIFICATION OF COMPLIANCE**

Applicant:	Noke Inc 2000 Ashton Blvd, Ste 375 Lehi, UT 84043, USA
Manufacturer:	Noke Inc 2000 Ashton Blvd, Ste 375 Lehi, UT 84043, USA
Product Description:	Noke Pad
Trade Mark:	<b>NOKĒ</b>
Model Number:	NKP01

**We hereby certify that:**

The above equipment was tested by Dong Guan Anci Electronic Technology Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10-2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.249(2018).

Date of Test :

July 28, 2019 to August 05, 2019

Prepared by :

Tomas Yang/Supervisor

Reviewer &amp; Approved :

Alan He/Manager



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## Modified Information

Version	Summary	Revision Date	Report No.
Ver.1.0	Original Report	/	EA1907074F 02001

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Appendix I (Photos of EUT) (4 pages)

## 1. General Information

### 1.1 Product Description

Characteristics	Description
Product Name	Noke Pad
Model number	NKP01
Input rating	DC 24V
Test Power Supply	AC 120V/60Hz from adapter
Modulation	GFSK
Operating Frequency Range	2402-2480MHz
Number of Channels	27
Antenna Type	Internal wire antenna
Antenna Gain	3 dBi

## 1.2 Test Facility

### Site Description

EMC Lab. : Accredited by CNAS, 2017.06.26  
The certificate is valid until 2022.10.28  
The Laboratory has been assessed and proved to be in compliance with CNAS-CL01:2006 (identical to ISO/IEC 17025:2005)  
The Certificate Registration Number is L0468.

Accredited by A2LA, 2018.03.15  
The Certificate Number is 4422.01.

Name of Firm : Dong Guan Anci Electronic Technology Co., Ltd.

Site Location : 1-2 Floor, Building A, No.11, Headquarters 2 Road, Songshan, Lake Hi-tech Industrial Development Zone, Dongguan City, evelopment Zone, Dongguan City, Guangdong Pr., China.

## 2. Test Configuration

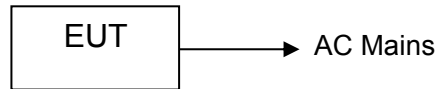


Table 2-1 Equipment Used in Tested System

Item	Equipment	Trade Mark	Model No.	FCC ID	Note
1.	Noke Pad	<b>NOKĒ</b>	CT16925	2AFRJNKP01	<i>EUT</i>
2	Adapter	N/A	Model : YSV6-2401000 Input: AC 100-240V, 50/60Hz Output: DC 24V, 1000mA	N/A	<i>Support Equipment</i>

**Note:**

- (1) Unless otherwise denoted as EUT in 『 Remark 』 column , device(s) used in tested system is a support equipment.

### 3. Summary of Test Results

FCC Rules	Description Of Test	Result
§15.207	AC Power Conducted Emission	Complies
§2.1049/15.215c	20dB Bandwidth	Complies
§15.249/15.205	Band Edge	Complies
§15.249(a)	Field Strength of Fundamental Emissions	Complies
§15.249(a)(d)	Radiated Spurious Emissions	Complies
§15.203	Antenna Requirements	Complies



## 4. Description of test modes

The EUT is used as a receiver together with dongles, but it still has the function of transmitting. More detailed feature description, please refer to the operation description or Users Manual.

The test mode is programmed on the EUT. The measurements are performed at Channel 1 (2402MHz), Channel 14 (2441MHz) and Channel 27 (2480MHz) are chosen for the final testing.

Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
<b>1</b>	<b>2402</b>	2	2405	3	2408
4	2411	5	2414	6	2417
7	2420	8	2423	9	2426
10	2429	11	2432	12	2435
13	2438	<b>14</b>	<b>2441</b>	15	2444
16	2447	17	2450	18	2453
19	2456	20	2459	21	2462
22	2465	23	2468	24	2471
25	2474	26	2477	<b>27</b>	<b>2480</b>

## 5. TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-5}$
Maximum Peak Output Power Test	$\pm 1.0\text{dB}$
Conducted Emissions Test	$\pm 2.0\text{dB}$
Radiated Emission Test	$\pm 2.0\text{dB}$
Power Density	$\pm 2.0\text{dB}$
Occupied Bandwidth Test	$\pm 1.0\text{dB}$
Band Edge Test	$\pm 3\text{dB}$
All emission, radiated	$\pm 3\text{dB}$
Antenna Port Emission	$\pm 3\text{dB}$
Temperature	$\pm 0.5^{\circ}\text{C}$
Humidity	$\pm 3\%$

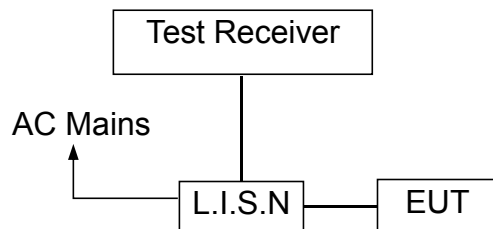
Remark: The coverage Factor ( $k=2$ ), and measurement Uncertainty for a level of Confidence of 95%.

## 6. Conducted Emissions Test

### 6.1 Measurement Procedure:

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured was complete.

### 6.2 Test SET-UP (Block Diagram of Configuration)



### 6.3 Measurement Equipment Used:

Conducted Emission Test Site				
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	Calibrated until
L.I.S.N	SCHWARZBECK	NSLK 8127	8127-669	2020-05-19
10 db attenuator	JFW	50FP-010-H4	4360846-427-1	2020-05-19
RF Cable	N/A	N/A	2#	2020-05-19
EMI Test Receiver	ROHDE&SCHWARZ	ESCI	101358	2020-05-19
Shielded Room	chengyu	8m*4m*3m	N/A	2020-05-19
Test Software	Farad	EZ-EMC Ver:ANCI-8A1	N/A	N/A

## 6.4 Conducted Emission Limit

### (7) Conducted Emission

#### Frequency(MHz)

#### Quasi-peak

#### Average

0.15-0.5

66-56

56-46

0.5-5.0

56

46

5.0-30.0

60

50

#### Note:

1. The lower limit shall apply at the transition frequencies

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

## 6.5 Measurement Result:

Operation Mode: TX

Test Date : August 02, 2019

Frequency Range: 0.15MHz~30MHz

Temperature : 24℃

Test Result: PASS

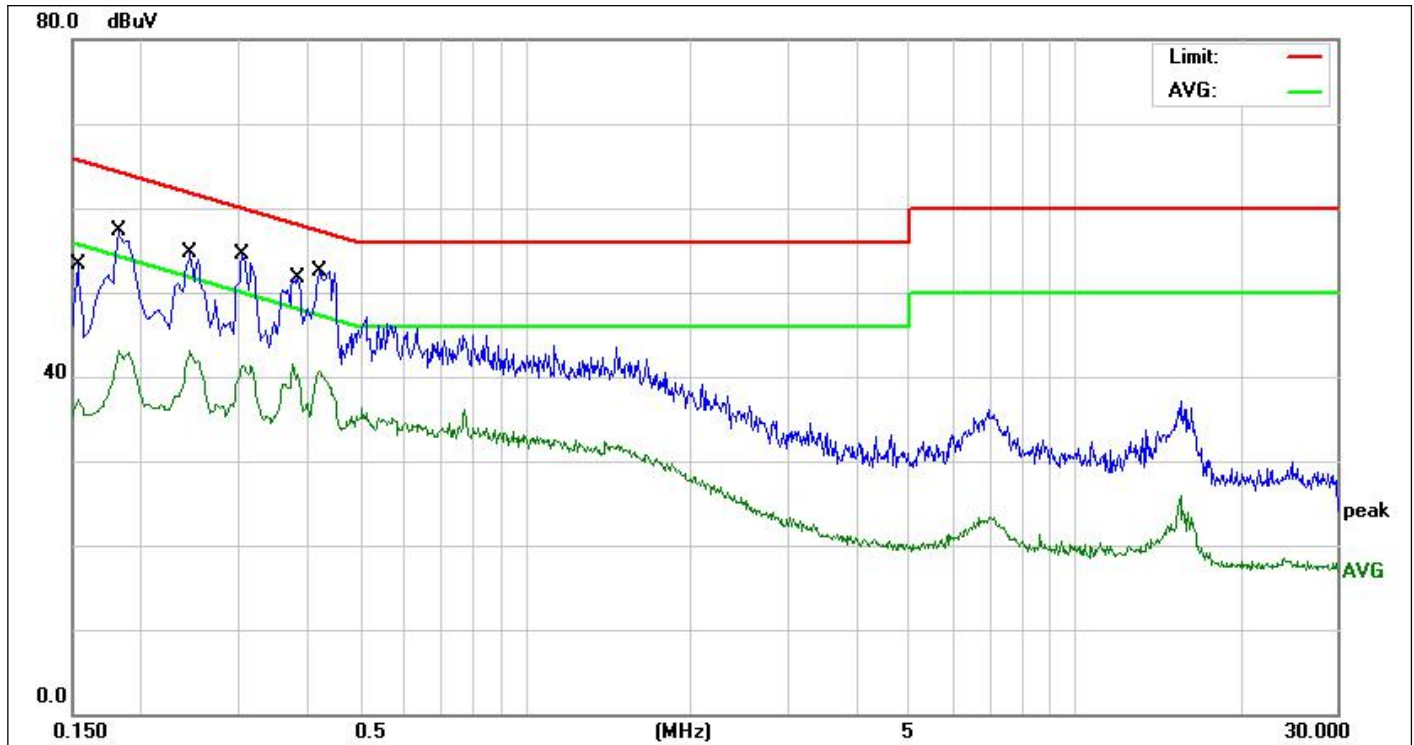
Humidity : 58 %

Test By: Best

### Pass.

The data of the worst mode ( TX 2402MHz) are recorded.

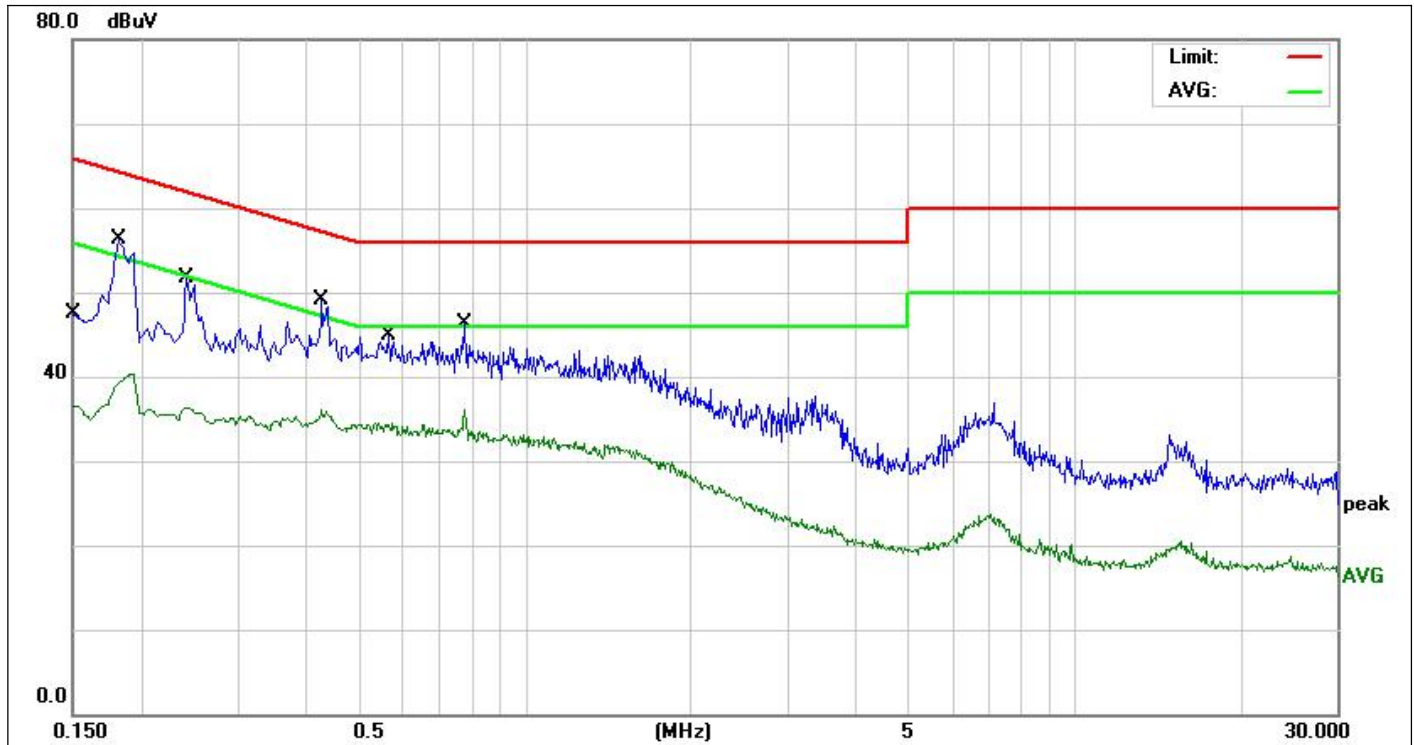
Please refer to the following data.



Site:	843	Phase:	L1	Temperature(C):	26(C)
Limit:	FCC Part 15 C Conduction(QP)	Test Time:	2019/8/2 11:32:44	Humidity(%):	60%
EUT:	Noke Pad	Power Rating:	AC 120V/60Hz		
M/N.:	NKP01	Test Engineer:	Bast		
Mode:	TX2402				
Note:					

No.	Frequency (MHz)	Reading Level(dBuV)	Factor (dB)	Measurement(dBuV)	Limit (dBuV)	Over (dB)	Detector	Comment
1	0.1539	41.36	9.63	50.99	65.78	-14.79	QP	
2	0.1539	27.77	9.63	37.40	55.78	-18.38	AVG	
3	0.1819	45.63	9.63	55.26	64.39	-9.13	QP	
4	0.1819	33.45	9.63	43.08	54.39	-11.31	AVG	
5	0.2460	43.69	9.63	53.32	61.89	-8.57	QP	
6	0.2460	33.43	9.63	43.06	51.89	-8.83	AVG	
7	0.3060	42.78	9.63	52.41	60.08	-7.67	QP	
8	0.3060	31.76	9.63	41.39	50.08	-8.69	AVG	
9	0.3860	40.03	9.62	49.65	58.15	-8.50	QP	
10	0.3860	31.79	9.62	41.41	48.15	-6.74	AVG	
11	0.4220	40.16	9.62	49.78	57.41	-7.63	QP	
12 *	0.4220	31.14	9.62	40.76	47.41	-6.65	AVG	

\*:Maximum data x:Over limit !:over margin



Site:	843	Phase:	N	Temperature(C):	26(C)
Limit:	FCC Part 15 C Conduction(QP)	Test Time:	2019/8/2 11:35:44	Humidity(%):	60%
EUT:	Noke Pad	Power Rating:	AC 120V/60Hz	Test Engineer:	Bast
M/N.:	NKP01				
Mode:	TX2402				
Note:					

No.	Frequency (MHz)	Reading Level(dBuV)	Factor (dB)	Measurement(dBuV)	Limit (dBuV)	Over (dB)	Detector	Comment
1	0.1500	35.25	9.63	44.88	65.99	-21.11	QP	
2	0.1500	26.93	9.63	36.56	55.99	-19.43	AVG	
3	0.1819	44.69	9.63	54.32	64.39	-10.07	QP	
4	0.1819	30.38	9.63	40.01	54.39	-14.38	AVG	
5	0.2420	40.32	9.63	49.95	62.02	-12.07	QP	
6	0.2420	26.74	9.63	36.37	52.02	-15.65	AVG	
7	0.4260	37.69	9.62	47.31	57.33	-10.02	QP	
8	0.4260	26.50	9.62	36.12	47.33	-11.21	AVG	
9	0.5660	33.66	9.63	43.29	56.00	-12.71	QP	
10	0.5660	24.86	9.63	34.49	46.00	-11.51	AVG	
11	0.7780	35.02	9.64	44.66	56.00	-11.34	QP	
12 *	0.7780	26.44	9.64	36.08	46.00	-9.92	AVG	

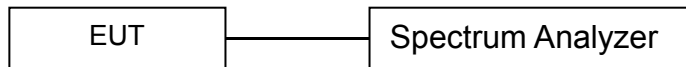
\*:Maximum data x:Over limit !:over margin

## 7. 20dB Bandwidth test

### 6.1 Measurement Procedure

The EUT was operating in hopping mode or could be controlled its channel. Printed out the test result from the spectrum by hard copy function.

### 7.2 Test SET-UP (Block Diagram of Configuration)



### 7.3 Measurement Equipment Used:

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	Calibrated until
Spectrum Analyzer	Rohde & Schwarz	FSV40	102257	2019-11-28
RF Cable	Gigalink Microwave	ZT40-2.92J-2.92J-0.3m	RF Cable	2020-03-06
Antenna Connector	ARTHUR-YANG	2244-N1TG1	N/A	N/A

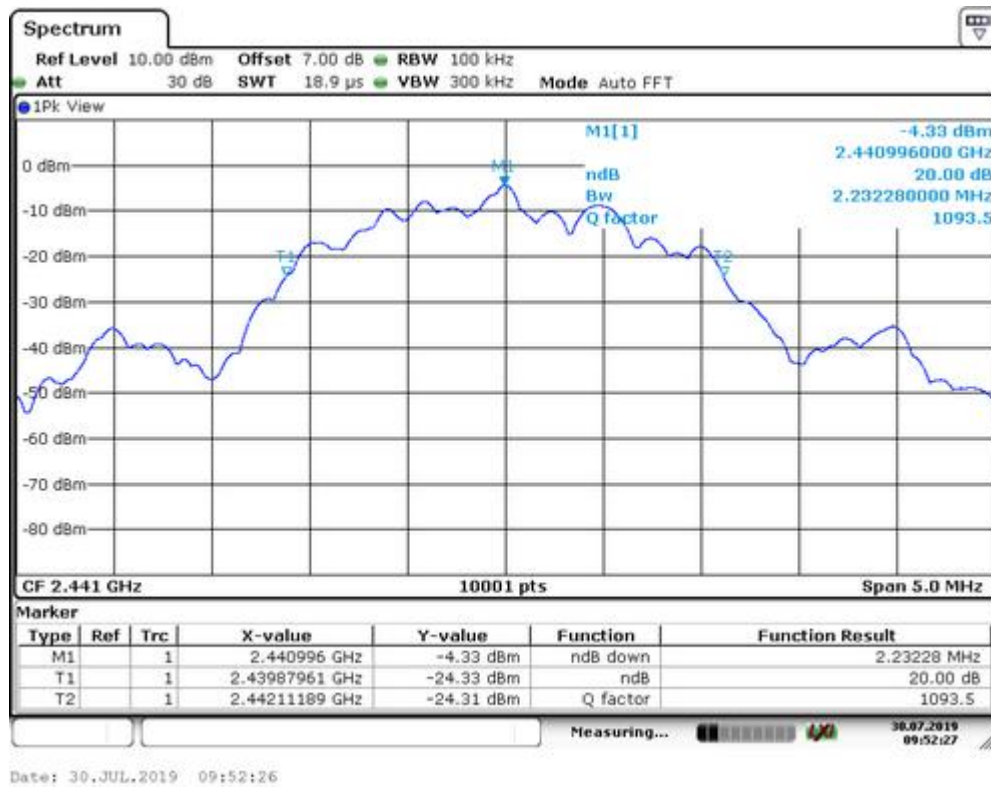
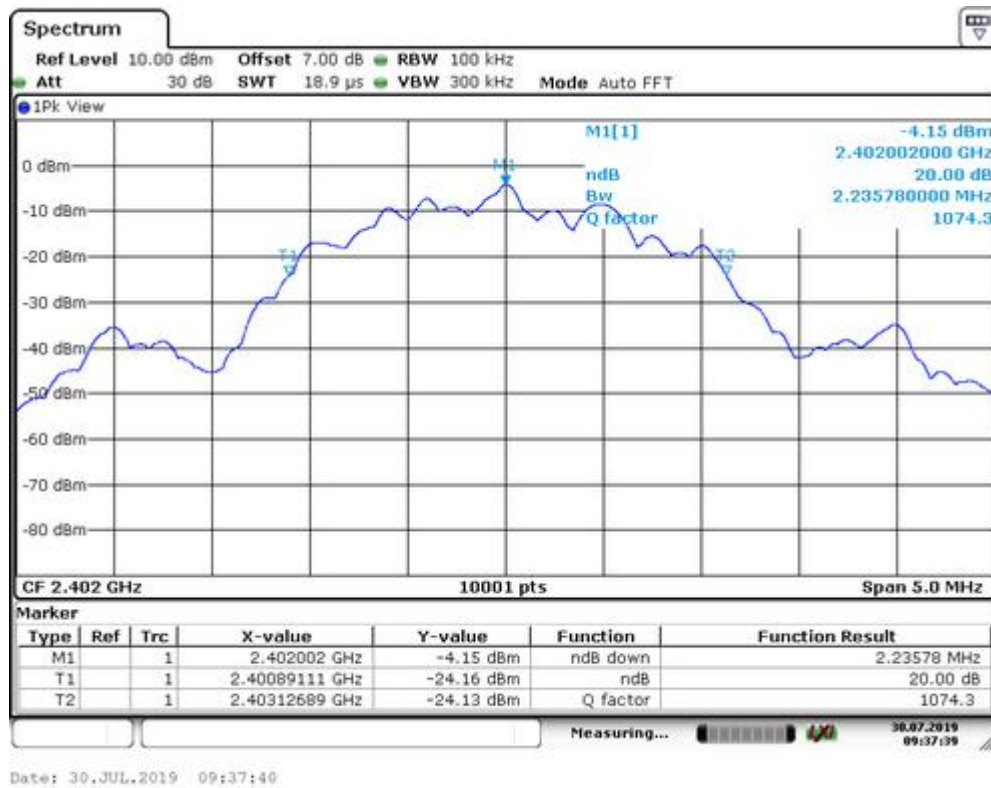
Remark: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list. The cable loss is 0.4dBm, and impedance is 50  $\Omega$  for the antenna connector.

### 7.4 Measurement Results:

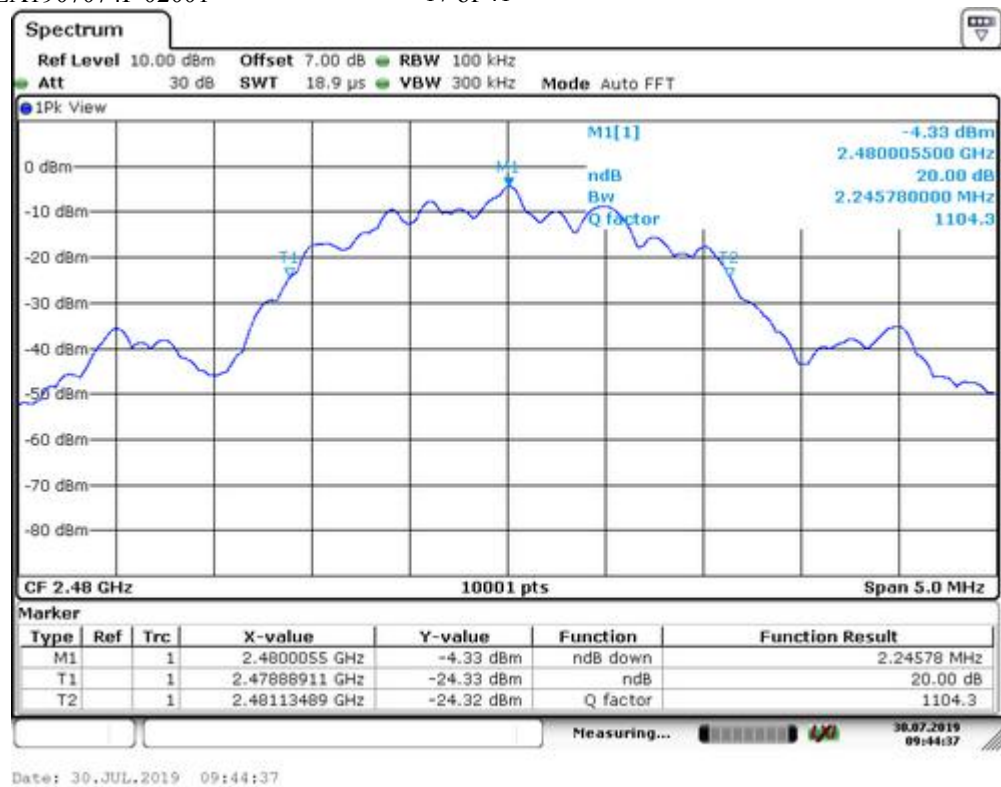
Refer to attached data chart.

Spectrum Detector:	PK	Test Date :	July 30, 2019
Test By:	Andy	Temperature :	24°C
Test Result:	PASS	Humidity :	53 %
Modulation:	FSK		

Channel frequency (MHz)	20dB Down BW(kHz)
2402	2236
2441	2232
2480	2246







## 8. Band EDGE test

### 8.1 Measurement Procedure

The EUT was placed on a styrofoam table which is 1.5m above ground plane.

The measurement procedure at the band edges was simplified by performing the measurement in just one plot. Both, the in-band-emission and the unwanted emission were encompassed by the span. After trace stabilization, the maximum peak was determined by a peak detector and the value was marked by an appropriate limit line. The second limit line, which is 20dB below the first, marks the limit for the emissions in the unrestricted band. A maximum-peak-detector marks the highest emission in the unrestricted band next to the band edge.

The measurements were performed at the lower end of the 2.4GHz band. Use the following spectrum analyzer settings:

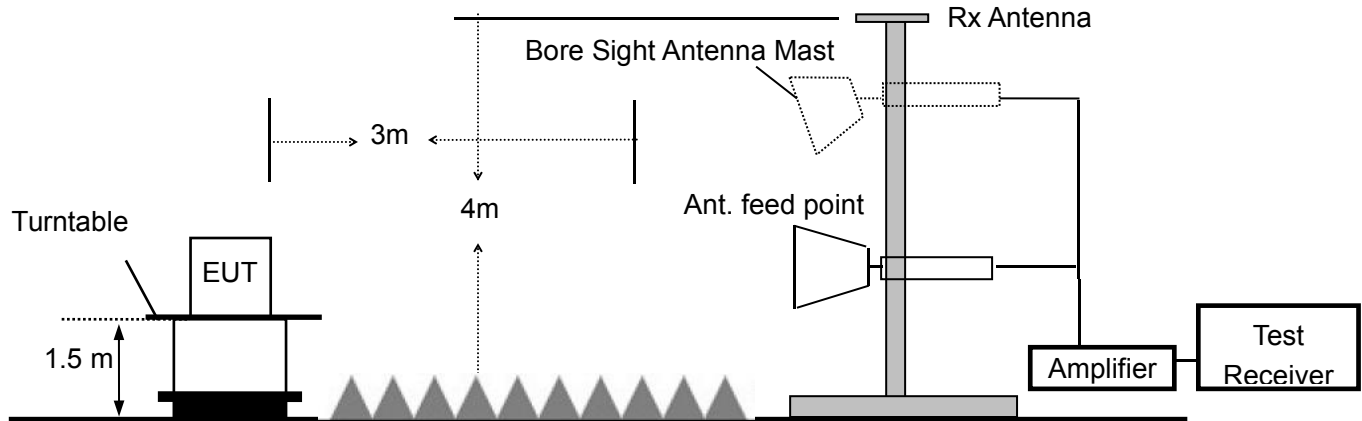
When spectrum scanned above 1GHz setting resolution bandwidth 1MHz, video bandwidth 3MHz:

EMI Test Receiver	Setting
Attenuation	Auto
RB	1MHz
VB	3MHz
Detector	Peak
Trace	Max hold

When spectrum scanned above 1GHz setting resolution bandwidth 1MHz, video bandwidth 10Hz:

EMI Test Receiver	Setting
Attenuation	Auto
RB	1MHz
VB	10Hz
Detector	Peak
Trace	Max hold

## 8.2 Test SET-UP (Block Diagram of Configuration)



## 8.3 Measurement Equipment Used:

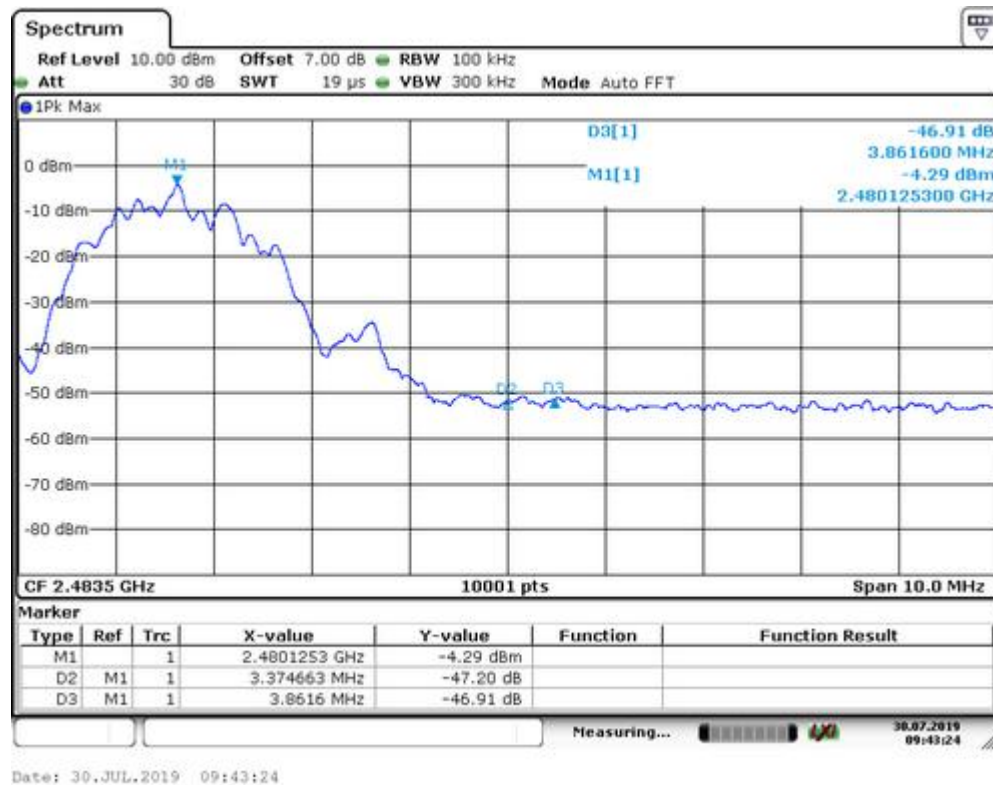
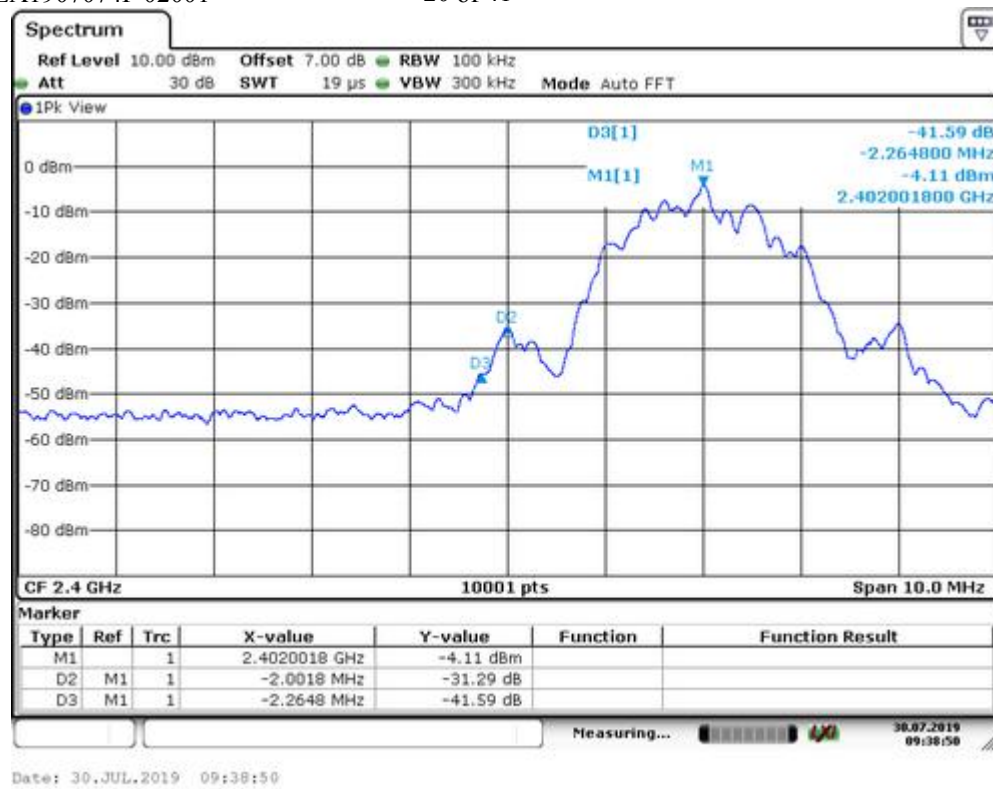
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Rohde & Schwarz	FSV40	US40240623	2019-11-28
2	Low noise Amplifiers	A-INFO	LA1018N4009	J101313052400 1	2020-05-19
3	Horn antenna	A-INFO	LB-10180-SF	J203109061212 3	2020-05-19
4	RF Cable	Gigalink Microwave	ZT40-2.92J-2.92 J-2m	N/A	2020-03-07
5	RF Cable	Gigalink Microwave	ZT40-2.92J-2.92 J-0.3m	N/A	2020-03-07

## 8.4 Measurement Results:

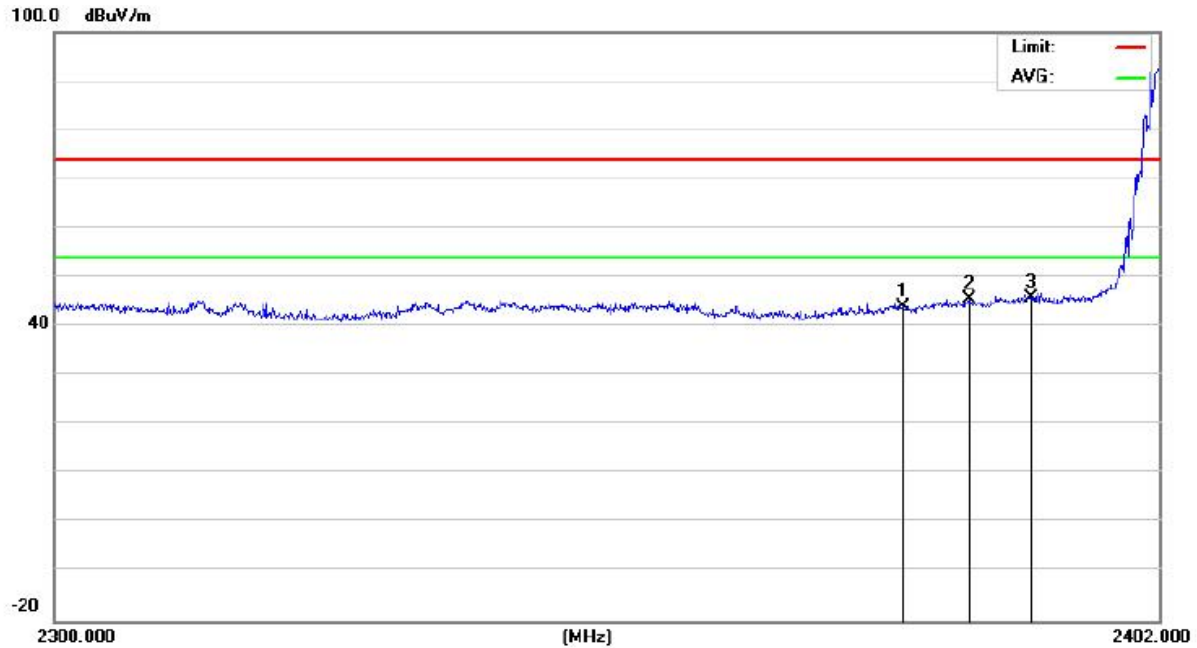
Spectrum Detector: PK      Test Date : July 30, 2019  
 Test By: Andy      Temperature : 25 °C  
 Test Result: PASS      Humidity : 50 %

### 1. Conducted Test

Frequency (MHz)	Modulation	Peak Power Output(dBm)	Result of Band edge(dBc)	Band edge Limit(dBc)
2399.74	GFSK	-4.11	41.59	>20dBc
2383.99	GFSK	-4.29	46.91	>20dBc



## 2. Radiated emission Test



Site 843

Polarization: **Horizontal**

Temperature: 26.5(C)

Limit: FCC Part 15 C 3m Above1G(Peak)

Power: DC 24V

Humidity: 60.6 %

Mode: TX2402

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	cm	degree	Comment
1		2378.043	48.97	-4.80	44.17	74.00	-29.83	peak		
2		2384.139	50.27	-4.75	45.52	74.00	-28.48	peak		
3	*	2390.000	50.44	-4.71	45.73	74.00	-28.27	peak		

\*:Maximum data x:Over limit !:over margin

<Reference Only









## **9. Radiated Emission Test**

### **9.1 Measurement Procedure**

1. Below 1000MHz, The EUT was placed on a turn table which is 0.8m above ground plane. And above 1000MHz, The EUT was placed on a styrofoam table which is 1.5m above ground plane.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (From 1m to 4m) and turntable (from 0 degree to 360 degree) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
4. Set to the maximum power setting and enable the EUT transmit continuously.
5. Final measurement (Above 1GHz): The frequency range will be divided into different sub ranges depending of the frequency range of the used horn antenna. The EMI Receiver set to peak and average mode and a resolution bandwidth of 1MHz. The measurement will be performed in horizontal and vertical polarization of the measuring antenna and while rotating the EUT in its vertical axis in the range of 0 degree to 360 degree in order to have the antenna inside the cone of radiation.
6. Test Procedure of measurement (For Above 1GHz):
  - 1) Monitor the frequency range at horizontal polarization and move the antenna over all sides of the EUT(if necessary move the EUT to another orthogonal axis).
  - 2) Change the antenna polarization and repeat 1) with vertical polarization.
  - 3) Make a hardcopy of the spectrum.
  - 4) Measure the frequency of the detected emissions with a lower span and resolution bandwidth to increase the accuracy and note the frequency value.
  - 5) Change the analyser mode to Clear/ Write and found the cone of emission.
  - 6) Rotate and move the EUT, so that the measuring distance can be enlarged to 3m and the antenna will be still inside the cone of emission.
  - 7) Measure the level of the detected frequency with the correct resolution bandwidth, with the antenna polarization and azimuth and the peak and average detector, which causes the maximum emission.
  - 8) Repeat steps 1) to 7) for the next antenna spot if the EUT is larger than the antenna beamwidth.

The following table is the setting of spectrum analyzer:

When spectrum scanned from 30MHz to 1GHz setting resolution bandwidth 120KHz and video bandwidth 300KHz:

EMI Test Receiver	Setting
Attenuation	Auto
RB	120KHz
VB	300KHz
Detector	QP
Trace	Max hold

For harmonics emission .When spectrum scanned above 1GHz setting resolution bandwidth 1MHz, video bandwidth 3MHz:

EMI Test Receiver	Setting
Attenuation	Auto
RB	1MHz
VB	3MHz
Detector	Peak
Trace	Max hold

For fundamental emission .When spectrum scanned above 1GHz setting resolution bandwidth 3MHz, video bandwidth 10MHz:

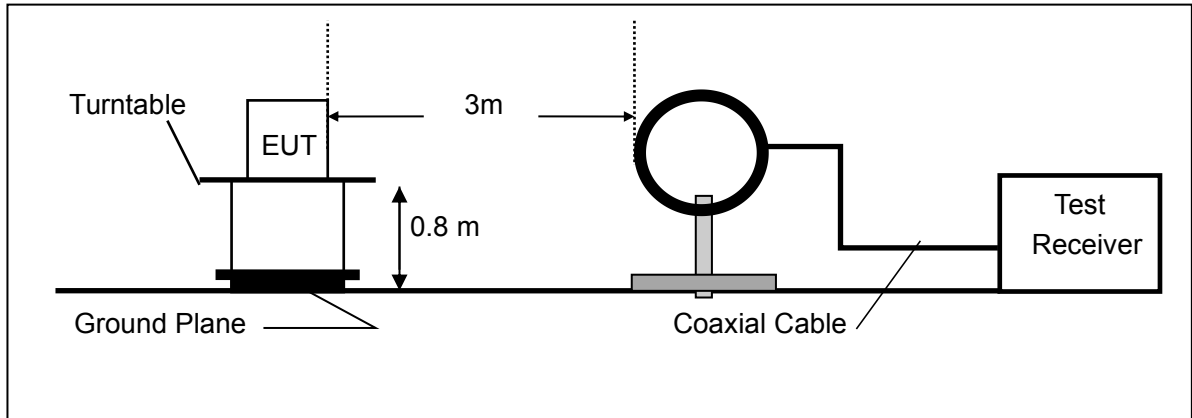
EMI Test Receiver	Setting
Attenuation	Auto
RB	3MHz
VB	10MHz
Detector	Peak
Trace	Max hold

When spectrum scanned above 1GHz setting resolution bandwidth 1MHz, video bandwidth 10Hz:

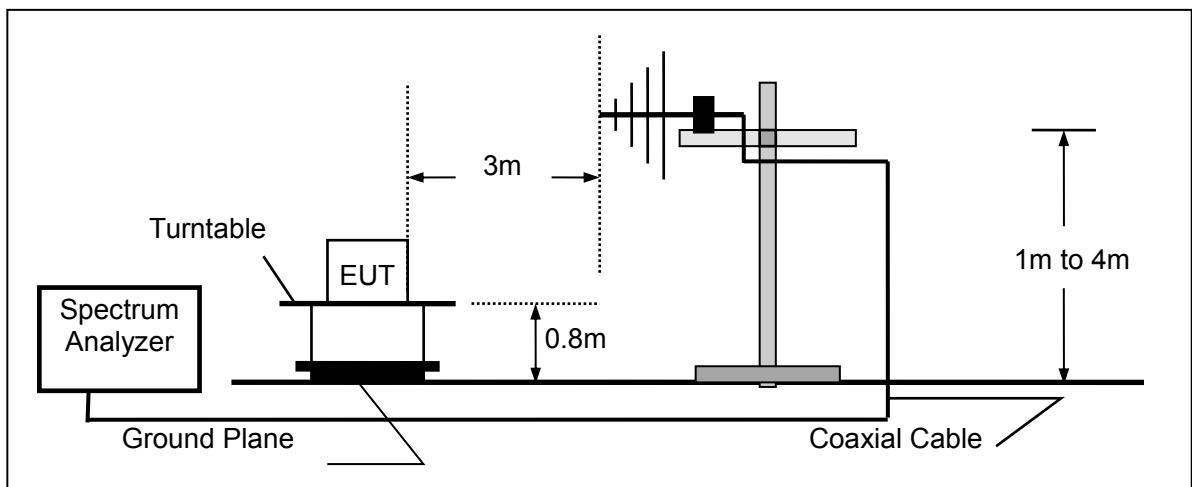
EMI Test Receiver	Setting
Attenuation	Auto
RB	1MHz
VB	10Hz
Detector	Peak
Trace	Max hold

## 9.2 Test SET-UP (Block Diagram of Configuration)

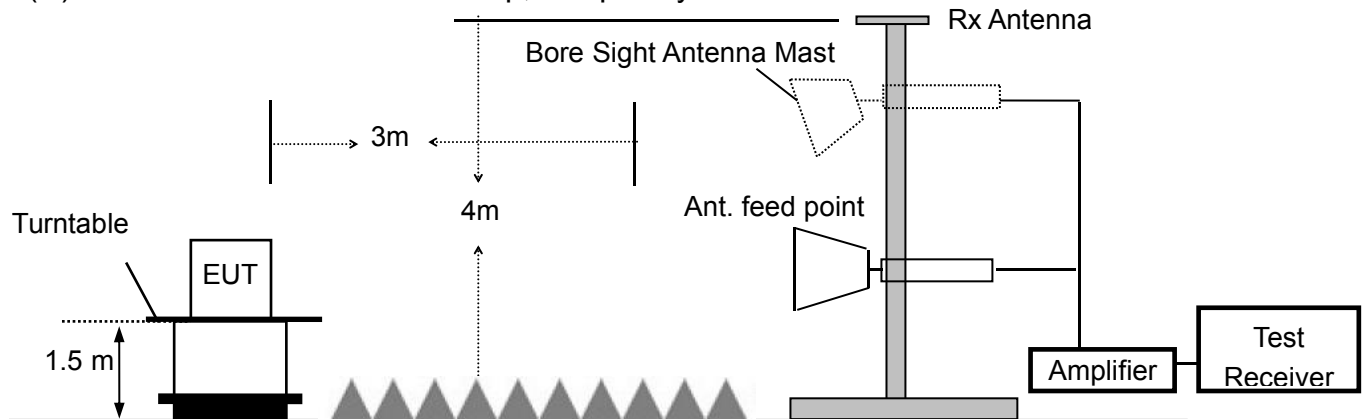
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



### 9.3 Measurement Equipment Used:

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1.	EMI Test Receiver	Rohde & Schwarz	ESPI	100502	2019-11-29
2.	Pre-Amplifier	HP	8447D	2727A06172	2020-05-19
3.	Bilog Antenna	Schwarzbeck	VULB9163	VULB9163-588	2020-05-19
4.	Loop Antenna	Schwarzbeck	FMZB 1516	1516-141	2020-01-04
5.	Spectrum Analyzer	Rohde & Schwarz	FSV40	US40240623	2019-11-28
6.	Low noise Amplifiers	A-INFO	LA1018N40 09	J101313052400 1	2020-05-19
7.	Horn antenna	A-INFO	LB-10180-S F	J203109061212 3	2020-05-19
8.	Broadband RF Power Amplifier	AEROFLEX	AEROFLEX 100KHz-40 GHz	J101313052400 1	2020-03-12
9.	DRG Horn Antenna	A.H.SYSTEMS	SAS-574	J203109061212 3	2020-03-12
10.	RF Cable	Gigalink Microwave	ZT40-2.92J- 2.92J-2m	N/A	2020-03-12
11.	RF Cable	Gigalink Microwave	ZT40-2.92J- 2.92J-0.3m	N/A	2020-03-12
12.	RF Cable	N/A	N/A	6#	2020-05-19
13.	RF Cable	N/A	N/A	1-1#	2020-05-19
14.	RF Cable	N/A	N/A	1-2#	2020-05-19
15.	RF Cable	N/A	N/A	7#	2020-05-19
16.	3m Semi-anechoic Chamber	chengyu	9m*6m*6m	N/A	2020-05-19
17.	Test Software	Farad	EZ-EMC Ver:ANCI-3 A1	N/A	N/A

## 9.4 Limit:

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table 15.209(a):

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

- Remark: 1. Emission level in dBuV/m= $20 \log (\mu\text{V/m})$   
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Frequency(MHz)	Filed Strength of Fundamental(at 3m)		Filed Strength of Harmonics(at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
902-928	114	94	74.0	54.0
2400-2483.5	114	94	74.0	54.0
5725-5875	114	94	74.0	54.0
24000-24250	128	108	88.0	68.0

## 9.5 Measurement Result

### Below 30MHz:

Operation Mode:	TX	Test Date :	August 02, 2019
Frequency Range:	9KHz~30MHz	Temperature :	28℃
Test Result:	PASS	Humidity :	65 %
Measured Distance:	3m	Test By:	Andy

Freq.	Ant.Pol.	Emission Level	Limit 3m	Over
(MHz)	H/V	(dBuV/m)	(dBuV/m)	(dB)
--	--	--	--	--

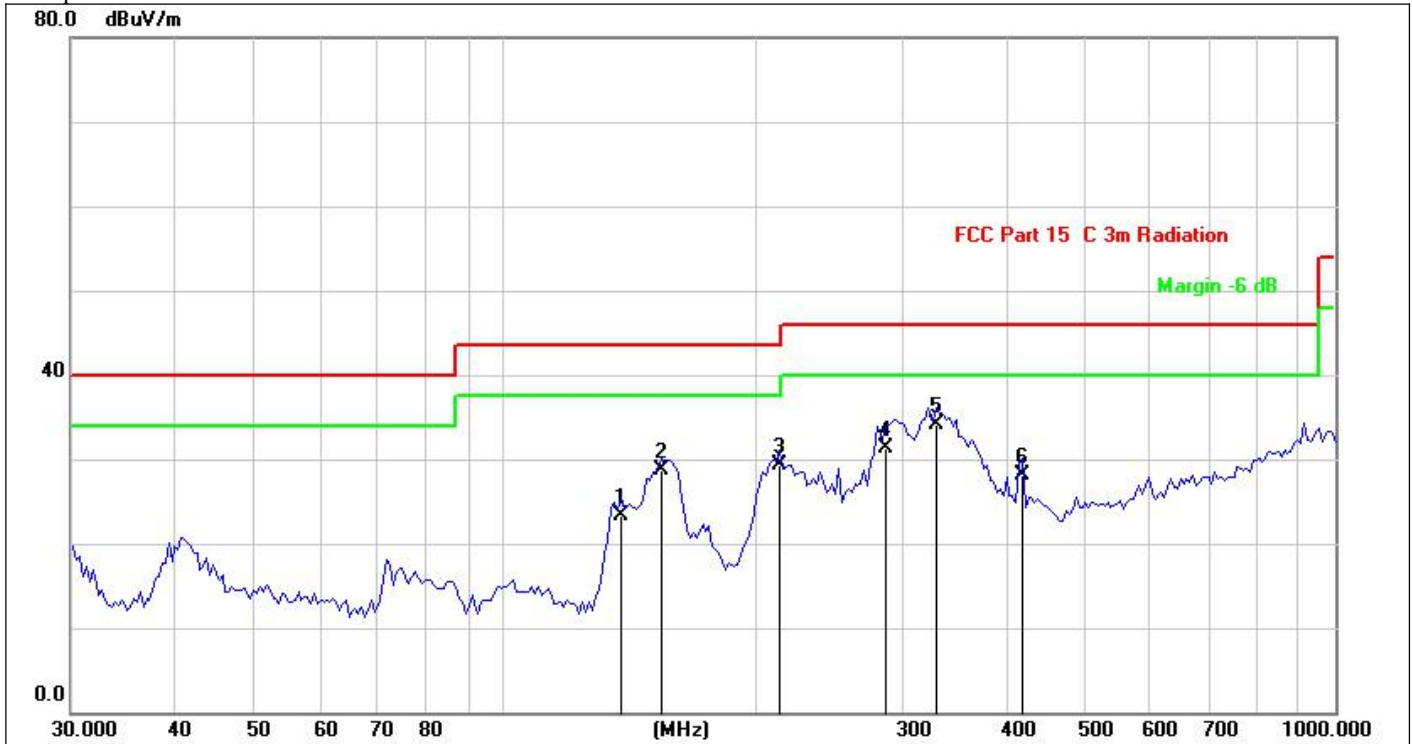
Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

### Below 1000MHz:

Pass.

All the modulation modes were tested the worst data of the mode (TX 2402MHz)are recorded in the following pages and the others modulation methods do not exceed the limits.

Please refer to the following data.



Site:	LAB	Antenna::Vertical	Temperature(C):26(C)
Limit:	FCC Part 15 C 3m Radiation		Humidity(%):60%
EUT:	Noke Pad	Test Time:	2019/08/02 14:55:08
M/N.:	NKP01	Power Rating:	AC 120V/60Hz
Mode:	TX2402	Test Engineer:	Bast
Note:			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)	Remark
1	137.9028	37.65	-14.41	23.24	43.50	-20.26	QP			
2	154.5491	43.69	-14.95	28.74	43.50	-14.76	QP			
3	213.7632	41.26	-11.97	29.29	43.50	-14.21	QP			
4	287.9904	40.25	-8.88	31.37	46.00	-14.63	QP			
5 *	331.3546	41.69	-7.67	34.02	46.00	-11.98	QP			
6	419.8435	33.58	-5.43	28.15	46.00	-17.85	QP			

\*:Maximum data x:Over limit !:over margin



Site:	LAB	Antenna::Horizontal	Temperature(C):26(C)
Limit:	FCC Part 15 C 3m Radiation		Humidity(%):60%
EUT:	Noke Pad	Test Time:	2019/08/02 14:56:32
M/N.:	NKP01	Power Rating:	AC 120V/60Hz
Mode:	TX2402	Test Engineer:	Bast
Note:			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)	Remark
1	30.2639	24.23	-7.25	16.98	40.00	-23.02	QP			
2	158.6675	34.52	-14.74	19.78	43.50	-23.72	QP			
3	210.0482	37.09	-12.17	24.92	43.50	-18.58	QP			
4 *	317.1444	48.60	-8.05	40.55	46.00	-5.45	QP			
5	371.3528	36.02	-6.64	29.38	46.00	-16.62	QP			
6	810.2653	27.55	2.43	29.98	46.00	-16.02	QP			

\*:Maximum data x:Over limit !:over margin



### Above 1000MHz~10<sup>th</sup> Harmonics:

Operation Mode: GFSK(CH1: 2402MHz) Test Date : August 05, 2019

Freq. (MHz)	Ant. Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
2402(F)	V	90.24	72.16	114	94	-23.76	-21.84
4804	V	62.31	43.02	74	54	-11.69	-10.98
7206	V	60.12	41.22	74	54	-13.88	-12.78
9608	V	56.74	37.14	74	54	-17.26	-16.86
12010	V	55.65	36.47	74	54	-18.35	-17.53
14412	V	56.3	36.02	74	54	-17.7	-17.98
16814	V	55.2	35.68	74	54	-18.8	-18.32
2402(F)	H	89.32	71.2	114	94	-24.68	-22.8
4804	H	61.99	42.69	74	54	-12.01	-11.31
7206	H	60.2	41.25	74	54	-13.8	-12.75
9608	H	56.32	37.51	74	54	-17.68	-16.49
12010	H	56.2	37.58	74	54	-17.8	-16.42
14412	H	55.21	36.25	74	54	-18.79	-17.75
16814	H	55.3	36.14	74	54	-18.7	-17.86

Operation Mode: GFSK(CH14: 2441MHz) Test Date : August 05, 2019

Freq. (MHz)	Ant. Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
2441(F)	V	85.69	68.25	114	94	-28.31	-25.75
4882	V	63.25	44.69	74	54	-10.75	-9.31
7323	V	60.14	41.15	74	54	-13.86	-12.85
9764	V	58.3	39.65	74	54	-15.7	-14.35
12205	V	56.35	37.58	74	54	-17.65	-16.42
14646	V	55.31	36.25	74	54	-18.69	-17.75
17087	V	55.47	36.25	74	54	-18.53	-17.75
2441(F)	H	86.66	71.65	114	94	-27.34	-22.35
4882	H	63.14	44.05	74	54	-10.86	-9.95
7323	H	60.25	41.25	74	54	-13.75	-12.75
9764	H	56.37	37.69	74	54	-17.63	-16.31
12205	H	56.14	37.52	74	54	-17.86	-16.48
14646	H	55.2	36.74	74	54	-18.8	-17.26
17087	H	55.39	36.44	74	54	-18.61	-17.56

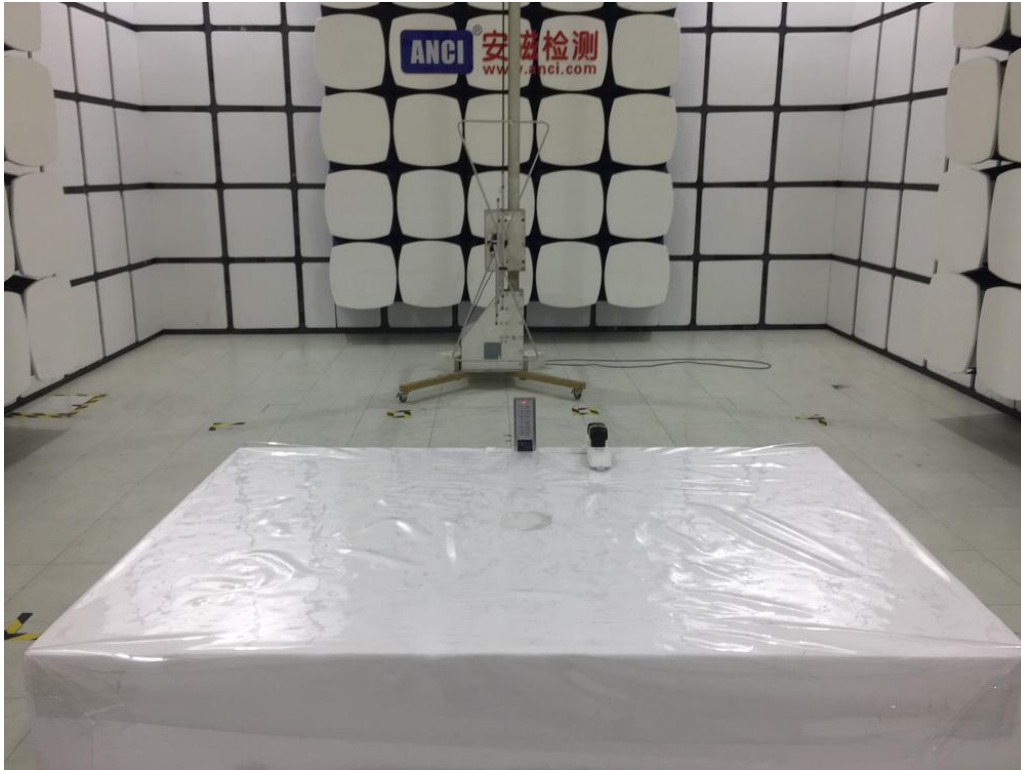
Operation Mode: GFSK(CH27: 2480MHz) Test Date : August 05, 2019

Freq. (MHz)	Ant. Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
2480(F)	V	86.32	68.63	114	94	-27.68	-25.37
4960	V	63.5	44.2	74	54	-10.5	-9.8
7440	V	60.28	41.33	74	54	-13.72	-12.67
9920	V	58.66	39.52	74	54	-15.34	-14.48
12400	V	56.32	37.45	74	54	-17.68	-16.55
14880	V	55.68	36.52	74	54	-18.32	-17.48
17360	V	55.47	36.17	74	54	-18.53	-17.83
2480(F)	H	87.35	70.26	114	94	-26.65	-23.74
4960	H	64.32	44.66	74	54	-9.68	-9.34
7440	H	60.38	41.2	74	54	-13.62	-12.8
9920	H	58.16	39.85	74	54	-15.84	-14.15
12400	H	56.5	37.69	74	54	-17.5	-16.31
14880	H	55.36	36.78	74	54	-18.64	-17.22
17360	H	55.02	36.58	74	54	-18.98	-17.42

Other harmonics emissions are lower than 20dB below the allowable limit.

- Note:**
- (1) All Readings are Peak Value and AV.
  - (2) Emission Level= Reading Level+ Probe Factor +Cable Loss.
  - (3) The average measurement was not performed when the peak measured data under the limit of average detection.
  - (4) Measuring frequencies from 1GHz to 25GHz.

### 9.5 Radiated Measurement Photos:



## **9. Antenna requirement**

### **9.1 Limit**

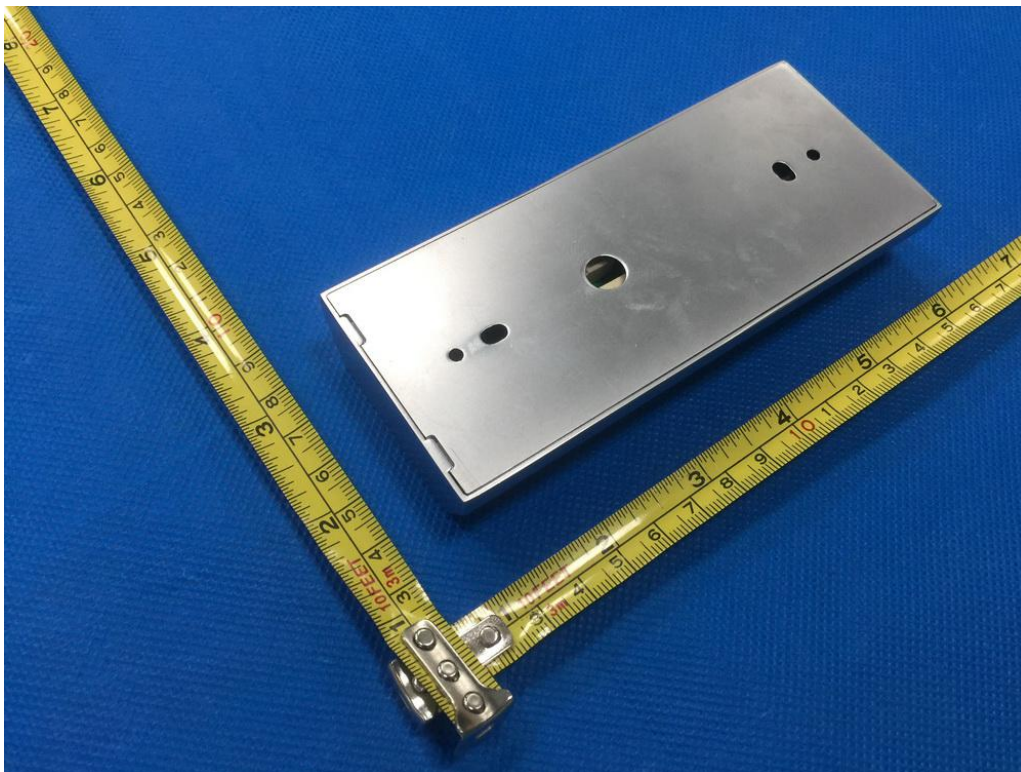
Except for special regulations, the Low-power Radio-Frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacture may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited.

### **9.2 Result**

The EUT's antenna, permanent attached antenna, used a wire antenna and soldered on PCB, The antenna's gain is 3dBi and meets the requirement.

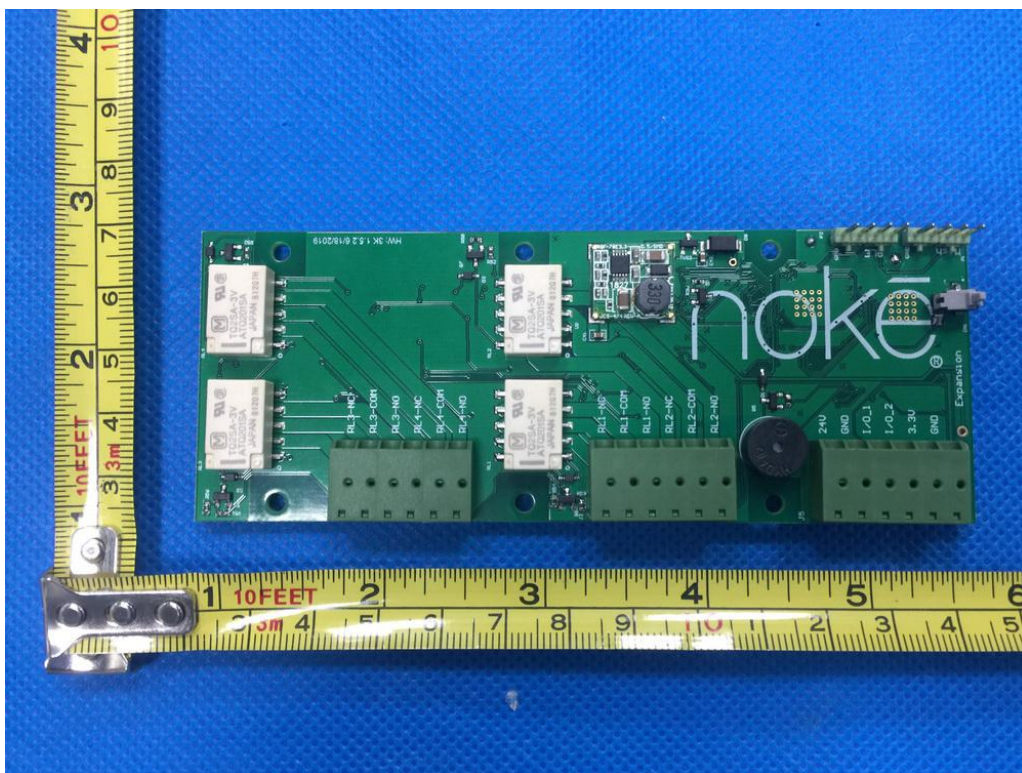
# APPENDIX I (Photos of EUT)



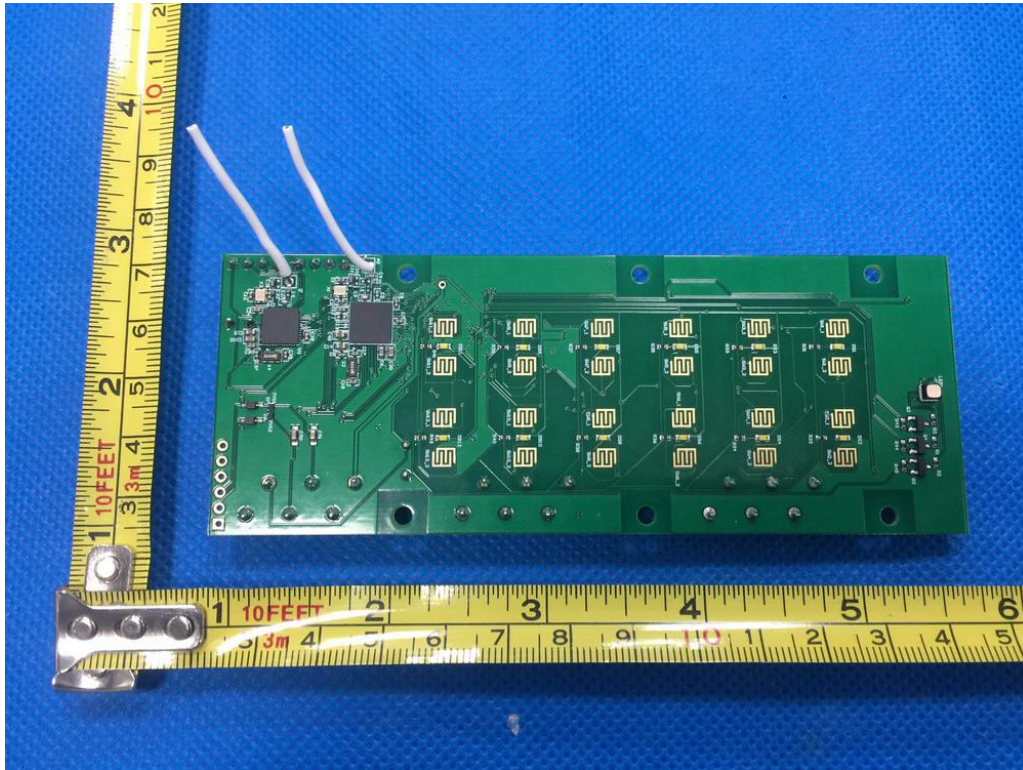












-----The end of report-----