



TEST REPORT

FCC ID: 2A7HH-NNIONGIN

Report Number.....: ZKT-220718004E-1

Date of Test..... Jun. 28, 2022 to Aug. 01, 2022

Date of issue.....: Aug. 01, 2022

Test Result.....: PASS

Testing Laboratory.....: **Shenzhen ZKT Technology Co., Ltd.**

Address: 1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China

Applicant's name: **Golden Gate Consulting Solutions FZC**

Address: 4-6-119, Al Shmookh Business Center, One UAQ, UAQ Free Trade Zone, Umm Al Quwain, U.A.E

Manufacturer's name: **Golden Gate Consulting Solutions FZC**

Address: 4-6-119, Al Shmookh Business Center, One UAQ, UAQ Free Trade Zone, Umm Al Quwain, U.A.E

Test specification:

Standard.....: FCC CFR Title 47 Part 15 Subpart C Section 15.247

Test procedure.....: /

Non-standard test method: N/A

Test Report Form No.....: TRF-EL-110_V0

Test Report Form(s) Originator.....: ZKT Testing

Master TRF: Dated: 2020-01-06

This device described above has been tested by ZKT, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Product name.....: **Nitro ION Gateway**

Trademark: NITRO

Model/Type reference.....: NNIONGIN

Ratings.....: SWITCHING ADAPTER
MODEL:HP-050200A1-VDE
INPUT:AC100-240V~50/60Hz 0.3A
OUTPUT:DC5V/2000mA



Testing procedure and testing location:

Testing Laboratory.....: Shenzhen ZKT Technology Co., Ltd.

**Address.....: 1/F, No. 101, Building B, No. 6, Tangwei Community
Industrial Avenue, Fuhai Street, Bao'an District,
Shenzhen, China**

Tested by (name + signature).....: Jim Liu

Jim Liu

Reviewer (name + signature).....: Tom Zou

Tom Zou

Approved (name + signature).....: Lake Xie





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1.Version

Report No.	Version	Description	Approved
ZKT-220718002E-1	Rev.01	Initial issue of report	Jul 18, 2022
ZKT-220718004E-1	Rev.02	Update on the original report	Aug. 01, 2022



2. 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 Peak Output Power	15.247 (b)(3)	Pass
-6dB Occupied Bandwidth	15.247 (a)(2)	Pass
Radiated Emission	15.205/15.209	Pass
Band Edge	15.247(d)	Pass
Power Spectral Density	15.247 (e)	Pass

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report



2.1 TEST FACILITY

Shenzhen ZKT Technology Co., Ltd.

Add. : 1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street,
Bao'an District, Shenzhen, China

FCC Test Firm Registration Number: 692225

Designation Number: CN1299

IC Registered No.: 27033

CAB identifier: CN0110

2.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	3m chamber Radiated spurious emission(9KHz-30MHz)	U=4.5dB
2	3m chamber Radiated spurious emission(30MHz-1GHz)	U=4.8dB
3	3m chamber Radiated spurious emission1GHz-6GHz)	U=4.9dB
4	3m chamber Radiated spurious emission(6GHz-40GHz)	U=5.0dB
5	Conducted disturbance	U=3.2dB
6	RF Band Edge	U=1.68dB
7	RF power conducted	U=1.86dB
8	RF conducted Spurious Emission	U=2.2dB
9	RF Occupied Bandwidth	U=1.8dB
10	RF Power Spectral Density	U=1.75dB
11	humidity uncertainty	U=5.3%
12	Temperature uncertainty	U=0.59℃



3. General Information

3.1 General Description of EUT

Product Name:	Nitro ION Gateway
Model No.:	NNIONGIN
Sample(s) Status:	Engineer sample
Serial No.:	N/A
Hardware Version:	N/A
Software Version:	N/A
Operation Frequency:	500kHz: 923.3MHz~927.5MHz
Channel numbers:	8
Channel separation:	0.6MHz
Modulation type:	Lora
Antenna Type:	ANT1: Stick antenna ANT2: Fiber glass antenna
Antenna gain:	ANT1: 5dBi ANT2: 3dBi
Power supply:	SWITCHING ADAPTER MODEL:HP-050200A1-VDE INPUT:AC100-240V~50/60Hz 0.3A OUTPUT:DC5V/2000mA



500kHz for DTS:

Operation Frequency each of channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	923.3	3	924.5	5	925.7	7	926.9
2	923.9	4	925.1	6	926.3	8	927.5

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(600KHz)
The lowest channel	923.30MHz
The middle channel	925.10MHz
The Highest channel	927.50MHz

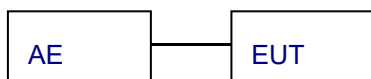


3.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode.
<i>Remark: During the test, 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.</i>	

3.3 Test Setup Configuration

Conducted Emission



Radiated Emission



Conducted Spurious



3.4 Support Equipment

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	Nitro ION Gateway	NITRO	NNIONGIN	N/A	EUT
A-1					

Item	Shielded Type	Ferrite Core	Length	Note

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.



3.5 Test Instruments list

Radiation Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	KEYSIGHT	9020A	MY45109572	Sep. 22, 2021	Sep. 21, 2022
2	Spectrum Analyzer (1GHz-40GHz)	Agilent	E4446A	100363	Sep. 22, 2021	Sep. 21, 2022
3	Test Receiver (9kHz-7GHz)	R&S	ESCI7	101169	Sep. 22, 2021	Sep. 21, 2022
4	Bilog Antenna (30MHz-1400MHz)	Schwarzbeck	VULB9168	00877	Sep. 22, 2021	Sep. 21, 2022
5	Horn Antenna (1GHz-18GHz)	SCHWARZBEC K	BBHA9120D	1541	Sep. 22, 2021	Sep. 21, 2022
6	Horn Antenna (18GHz-40GHz)	A.H. System	SAS-574	588	Sep. 22, 2021	Sep. 21, 2022
7	Amplifier (30-1000MHz)	EM Electronics	EM330 Amplifier	N/A	Sep. 22, 2021	Sep. 21, 2022
8	Amplifier (1GHz-40GHz)	QUANJUDA	DLE-161	097	Sep. 22, 2021	Sep. 21, 2022
9	Loop Antenna (9KHz-30MHz)	SCHWARZBEC K	FMZB1519B	014	Sep. 22, 2021	Sep. 21, 2022
10	RF cables1 (9kHz-30MHz)	N/A	9kHz-30MHz	N/A	Sep. 22, 2021	Sep. 21, 2022
11	RF cables2 (30MHz-1GHz)	N/A	30MHz-1GHz	N/A	Sep. 22, 2021	Sep. 21, 2022
12	RF cables3 (1GHz-40GHz)	N/A	1GHz-40GHz	N/A	Sep. 22, 2021	Sep. 21, 2022
13	CMW500 Test	R&S	CMW500	106504	Sep. 22, 2021	Sep. 21, 2022
14	ESG Signal Generator	Agilent	E4421B	GB40051203	Sep. 22, 2021	Sep. 21, 2022
15	Signal Generator	Agilent	N5182A	MY47420215	Sep. 22, 2021	Sep. 21, 2022
16	D.C. Power Supply	LongWei	TPR-6405D	\	\	\
17	Software	Frad	EZ-EMC	FA-03A2 RE	\	\

Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	LISN	R&S	ENV216	101471	Sep. 22, 2021	Sep. 21, 2022
2	LISN	CYBERTEK	EM5040A	E1850400149	Sep. 22, 2021	Sep. 21, 2022
3	Test Cable	N/A	C01	N/A	Sep. 22, 2021	Sep. 21, 2022
4	Test Cable	N/A	C02	N/A	Sep. 22, 2021	Sep. 21, 2022
5	EMI Test Receiver	R&S	ESRP3	101946	Sep. 22, 2021	Sep. 21, 2022
6	Absorbing Clamp	DZ	ZN23201	N/A	Sep. 22, 2021	Sep. 21, 2022



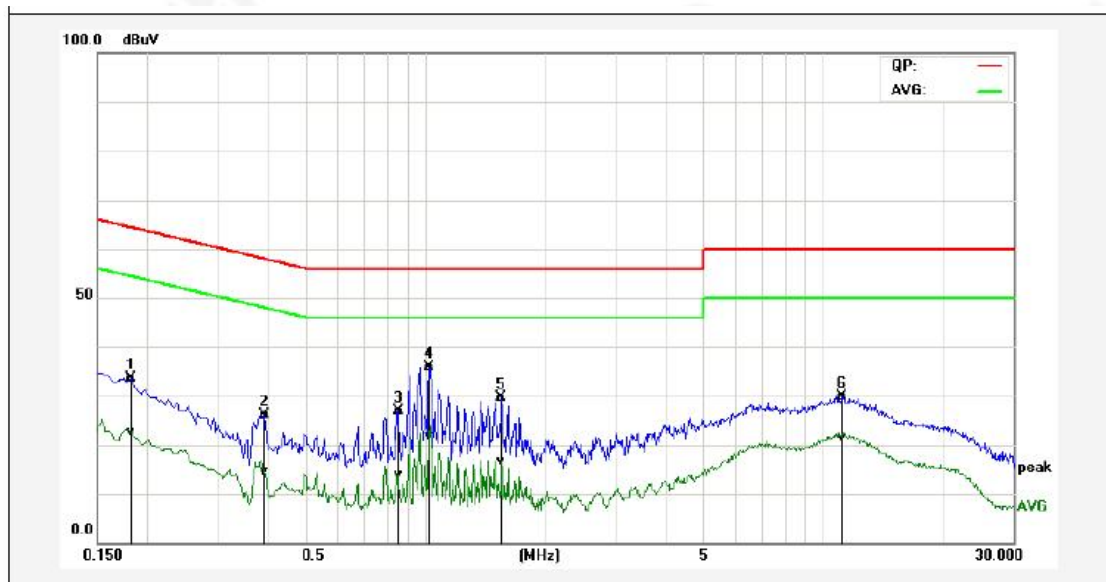
4. EMC EMISSION TEST

4.1 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:	Frequency range (MHz)		Limit (dBuV)			
			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 logarithm of the frequency.						
Test setup:	Reference Plane Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m					
	Test procedure:					
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 50ohm/50uH coupling impedance for the measuring equipment.						
2. 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).						
3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.						
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test voltage:	AC 120V/60Hz					
Test results:	Pass					



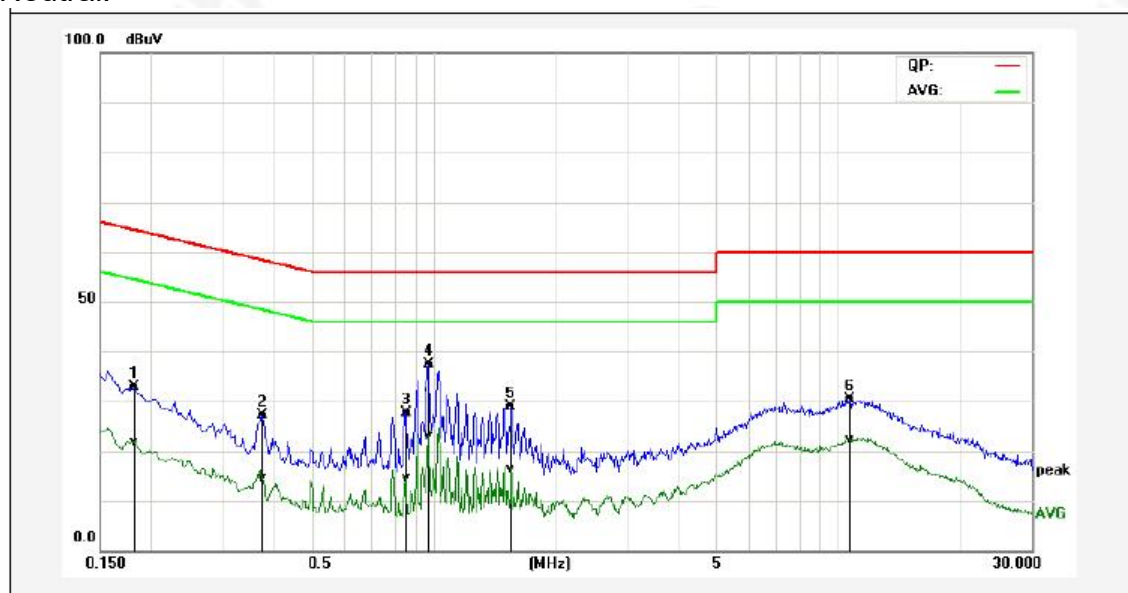
Line:



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1P	0.1819	23.50	12.59	10.02	33.52	22.61	64.39	54.40	-30.87	-31.79	Pass
2P	0.3940	16.13	4.70	10.00	26.13	14.70	57.98	47.98	-31.85	-33.28	Pass
3P	0.8540	16.90	3.96	10.02	26.92	13.98	56.00	46.00	-29.08	-32.02	Pass
4*	1.0260	25.82	11.80	10.02	35.84	21.82	56.00	46.00	-20.16	-24.18	Pass
5P	1.5580	19.62	6.52	10.01	29.63	16.53	56.00	46.00	-26.37	-29.47	Pass
6P	11.1940	19.83	11.58	10.12	29.95	21.70	60.00	50.00	-30.05	-28.30	Pass



Neutral:



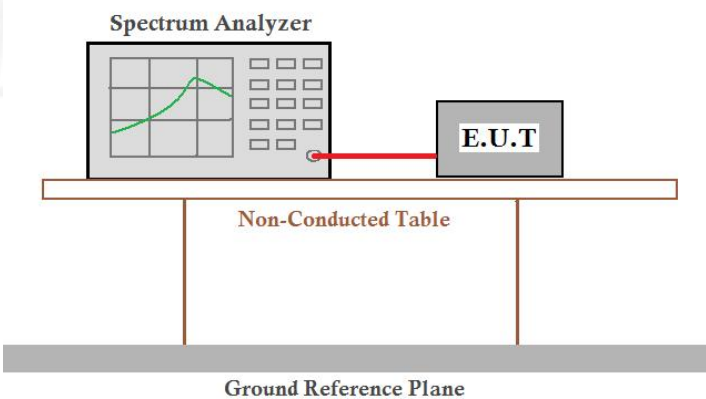
No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1P	0.1819	22.83	11.83	10.02	32.85	21.85	64.39	54.40	-31.54	-32.55	Pass
2P	0.3780	17.02	4.71	9.99	27.01	14.70	58.32	48.32	-31.31	-33.62	Pass
3P	0.8540	17.72	4.65	10.02	27.74	14.67	56.00	46.00	-28.26	-31.33	Pass
4*	0.9700	27.29	13.11	10.02	37.31	23.13	56.00	46.00	-18.69	-22.87	Pass
5P	1.5580	18.86	6.47	10.01	28.87	16.48	56.00	46.00	-27.13	-29.52	Pass
6P	10.6980	20.19	12.17	10.11	30.30	22.28	60.00	50.00	-29.70	-27.72	Pass

Remark: Factor = Insertion Loss + Cable Loss, Result=Reading + Factor, Margin=Result – Limit.



5 Test Items for DTS

5.1 Conducted Peak Output Power

Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	ANSI C63.10:2013 and KDB558074 D01 DTS Meas Guidance v05r02
Limit:	30dBm
Test setup:	
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	Peak Output Power (dBm)	Limit(dBm)	Result
Lowest	17.730	30.00	Pass
Middle	18.541		
Highest	18.326		



Keysight Spectrum Analyzer - Sweep SA

SENSE [INT]

05:54:49 PM Jul 29, 2022

TRAC 1 2 3 4 5

TYPE: RYVIEW

OFF: RYVIEW

Peak Search

Next Peak

Next Pk Right

Next Pk Left

Marker Delta

Mkr--CF

Mkr--Ref Lvl

More

1 of 2

10 dB/div

Log

Ref 30.00 dBm

Center 923.540 MHz

#Res BW 1.0 MHz

#VBW 1.0 MHz

Avg Type: Log-Pwr

Avg/Hold: >100/100

Trig: Free Run

Attenu: 40 dB

PNC: Fast

IF Gain: Low

Mkr1 923.540 MHz

17.730 dBm

Span 5.000 MHz

Sweep 1.000 ms (1001 pts)

(STATUS)

Keysight Spectrum Analyzer - Swept SA

SENSE [INT] 05:59:07 PM Jul 26, 2022

PNCh: Fast Trig: Free Run Avg Type: Log-Pwr
IF Gain: Low Attenu: 40 dB Avg Hold: >100/100

TRACE [1] 2, 4, 5
TYPE: WWWWWWWW
DEF: WWWWWW

Peak Search

Next Peak

Next Pk Right

Next Pk Left

Marker Delta

Mkr--CF

Mkr--Ref LV

More
1 of 2

Ref 30.00 dBm

10 dBm
Log

20.0
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
-6.0
-7.0
-8.0
-9.0
-10.0
-11.0
-12.0
-13.0
-14.0
-15.0
-16.0
-17.0
-18.0
-19.0
-20.0
-21.0
-22.0
-23.0
-24.0
-25.0
-26.0
-27.0
-28.0
-29.0
-30.0
-31.0
-32.0
-33.0
-34.0
-35.0
-36.0
-37.0
-38.0
-39.0
-40.0
-41.0
-42.0
-43.0
-44.0
-45.0
-46.0
-47.0
-48.0
-49.0
-50.0

Center 925.100 MHz
#Res BW 1.0 MHz

Span 5.000 MHz
Sweep 1.333 ms (20000 pts)

#VBW 1.0 MHz

1

Keysight Spectrum Analyzer - Sweep SA

SENSE:INTI

06:00:18 PM Jul 29, 2022

Trace 1: 2, 3, 4, 5

Time: 10.000000

Def: N19.000000

Peak Search

Next Peak

Next Pk Right

Next Pk Left

Marker Delta

Mkr--CF

Mkr--Ref LV

More

1 of 2

Ref 30.00 dBm

Mkr1 927.718 89 MHz
18.326 dBm

Center 927.500 MHz
#Res BW 1.0 MHz
#VBW 1.0 MHz

Span 5.000 MHz
Sweep 1.333 ms (20000 pts)

10 dBdiv

Log

20.0

16.6

13.3

10.0

6.6

3.3

0.0

-3.3

-6.6

-10.0

-13.3

-16.6

-20.0

-23.3

-26.6

-30.0

-33.3

-36.6

-40.0

-43.3

-46.6

-50.0

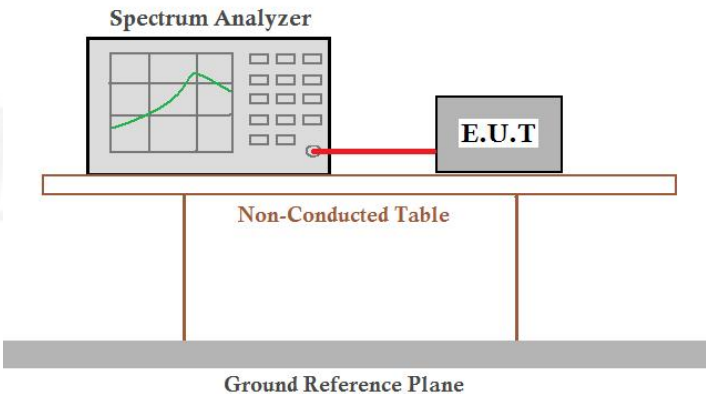
1

MSG

(STATUS)



5.2 Channel Bandwidth

Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	ANSI C63.10:2013 and KDB558074 D01 DTS Meas Guidance v05r02
Limit:	>500KHz
Test setup:	
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	-6dB Bandwidth (kHz)	99% Bandwidth (kHz)	Limit(KHz)	Result
Lowest	630.2	517.80	>500	Pass
Meddle	629.5	518.70		
Highest	629.3	516.80		



Test plot as follows:



Lowest channel



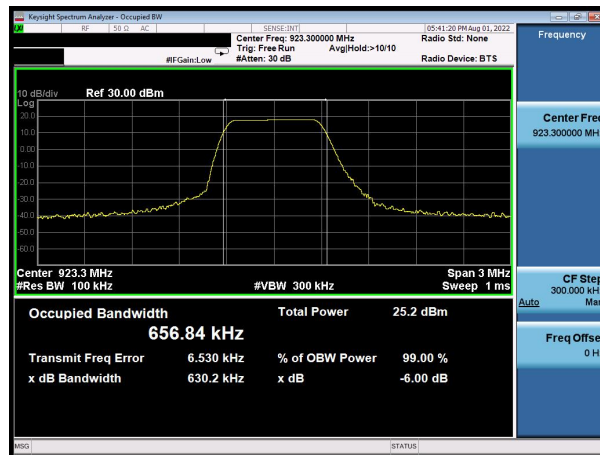
Middle channel



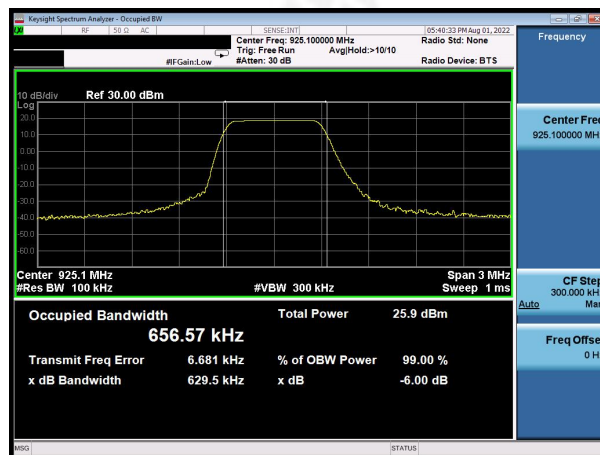
Highest channel



-6% Bandwidth
Test plot as follows:



Lowest channel



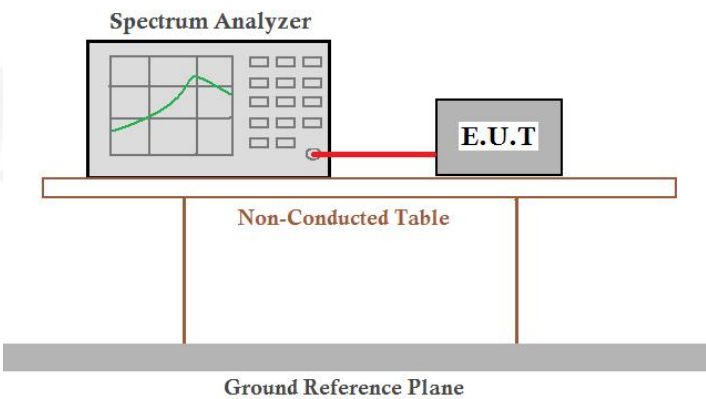
Meddle channel



Highest channel



5.3 Power Spectral Density

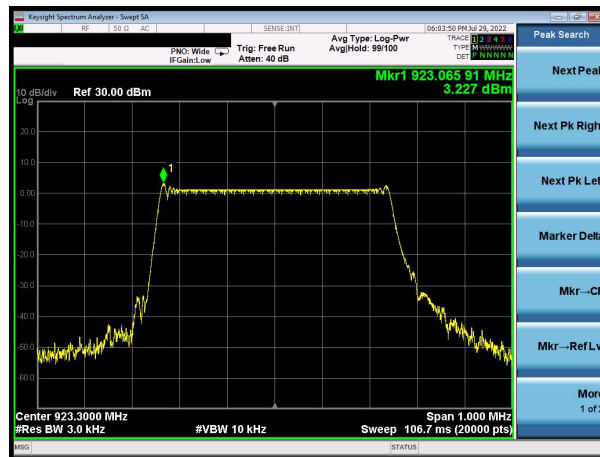
Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	ANSI C63.10:2013 and KDB558074 D01 DTS Meas Guidance v05r02
Limit:	8dBm/3kHz
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

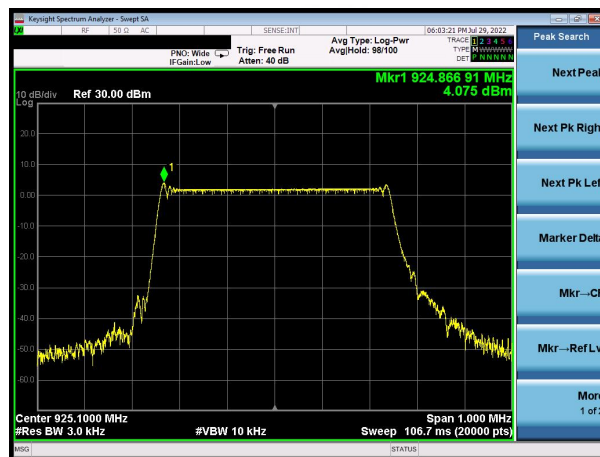
Test channel	Power Spectral Density (dBm/3kHz)	Limit(dBm/3kHz)	Result
Lowest	3.227	8.00	Pass
Middle	4.075		
Highest	5.390		



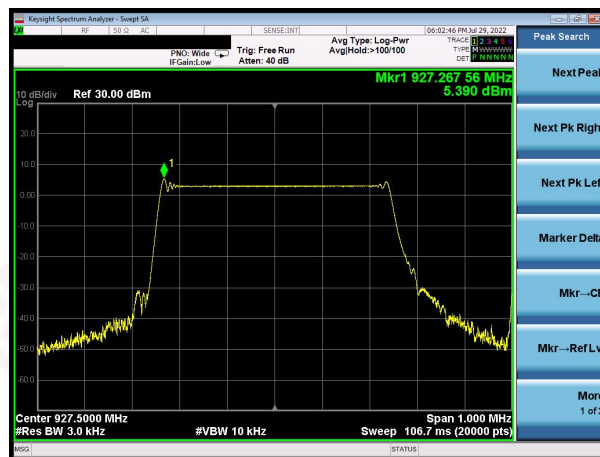
Test plot as follows:



Lowest channel



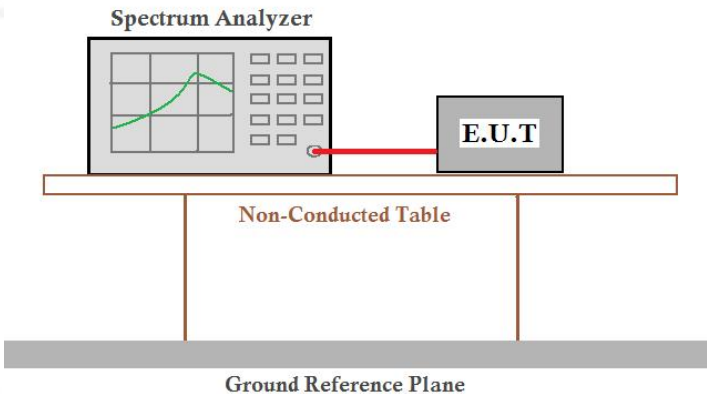
Middle channel



Highest channel

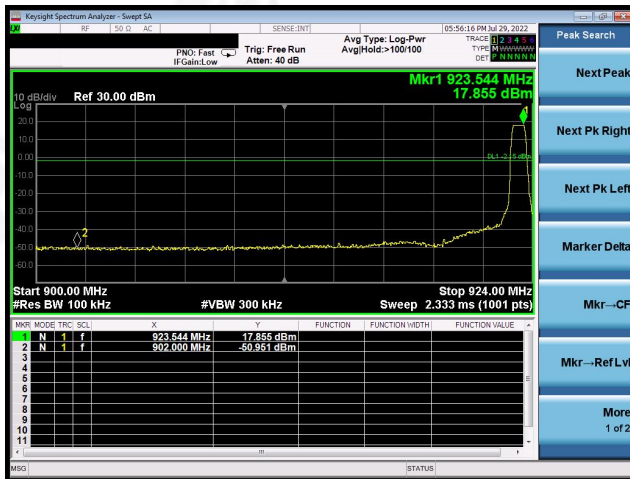


5.4 Band edges

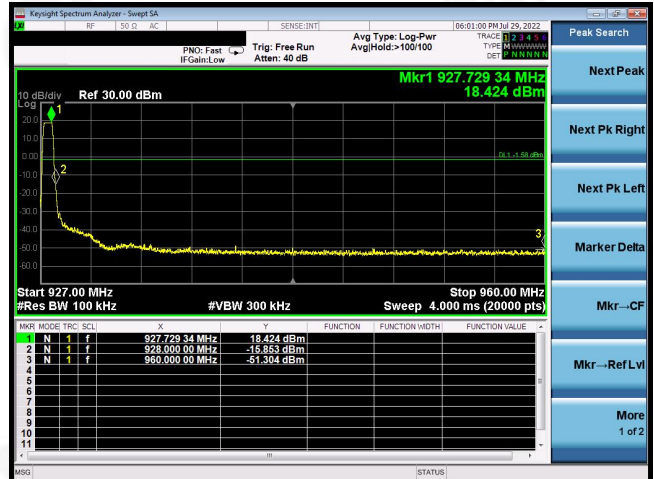
Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.10:2013 and KDB558074 D01 DTS Meas Guidance v05r02
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional 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:	
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



Highest Channel



Test channel:	Lowest channel
---------------	----------------

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
902.00	34.24	22.30	4.87	37.60	23.81	46.00	-22.19	Horizontal
902.00	35.24	22.30	4.87	37.60	24.81	46.00	-21.19	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
902.00	28.24	22.30	4.87	37.60	17.81	46.00	-28.19	Horizontal
902.00	28.76	22.30	4.87	37.60	18.33	46.00	-27.67	Vertical

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

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
928.00	37.12	22.41	4.96	37.57	26.92	46.00	-19.08	Horizontal
928.00	38.57	22.41	4.96	37.57	28.37	46.00	-17.63	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
928.00	32.01	22.41	4.96	37.57	21.81	46.00	-24.19	Horizontal
928.00	31.23	22.41	4.96	37.57	21.03	46.00	-24.97	Vertical

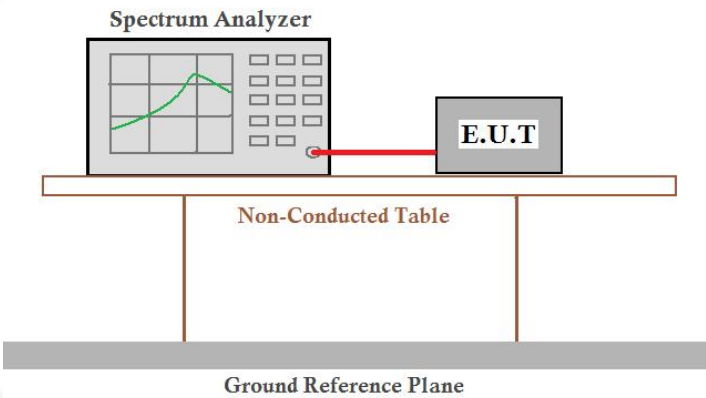
Remarks:

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



5.5 Spurious Emission

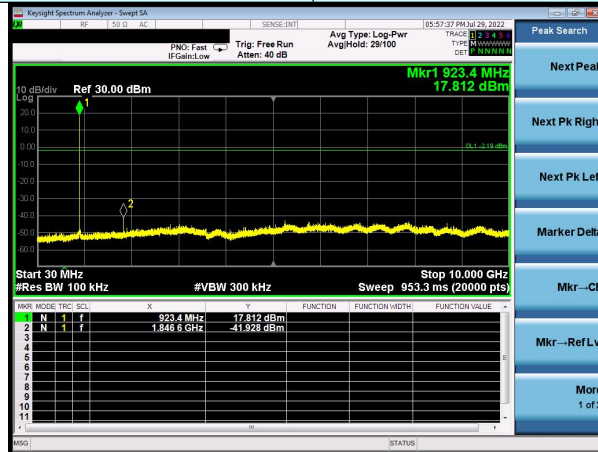
Conducted Emission Method

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



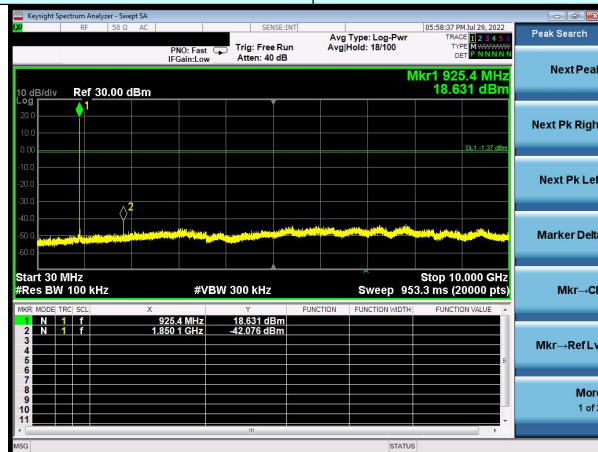
Test plot as follows:

Test channel:	Lowest channel
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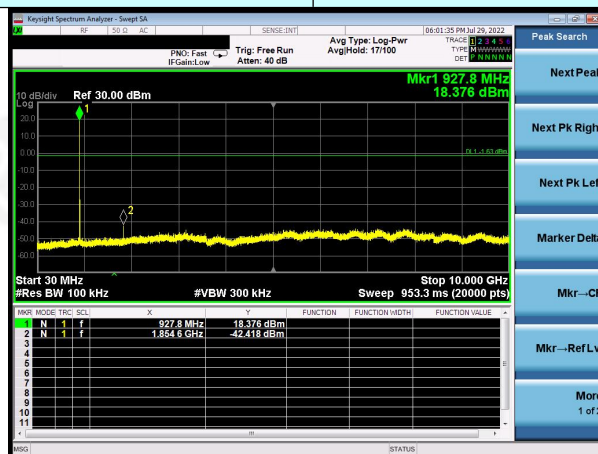
30MHz~10GHz

Test channel:	Middle channel
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30MHz~10GHz

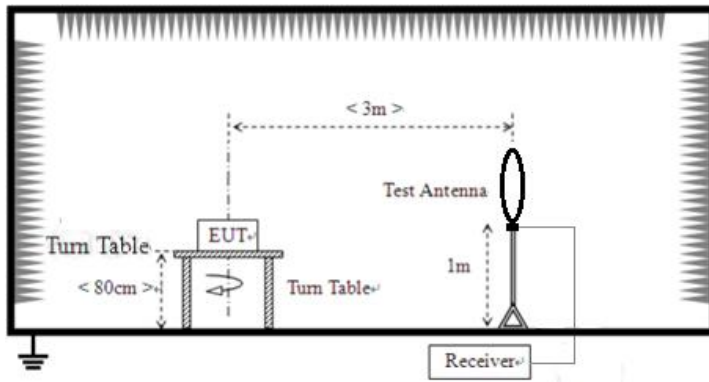
Test channel:	Highest channel
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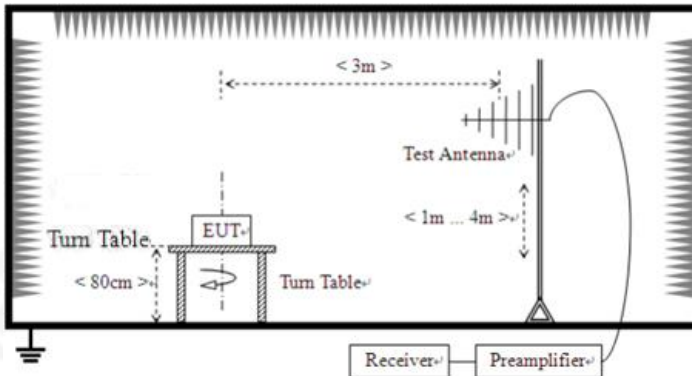
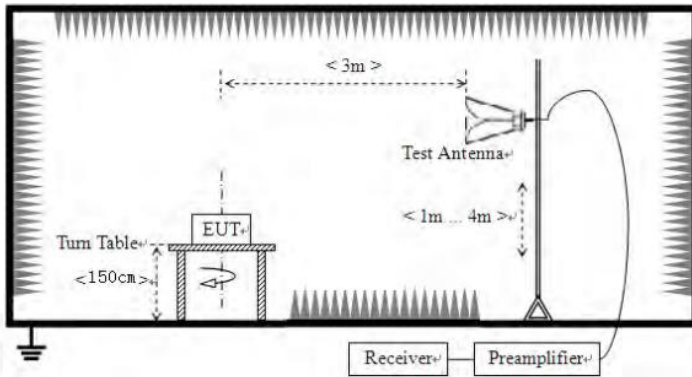
30MHz~10GHz



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	RBW	VBW	Value
	9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
	150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Limit:	Frequency	Limit (uV/m)	Value	Measurement Distance	
	0.009MHz-0.490MHz	2400/F(KHz)	QP	300m	
	0.490MHz-1.705MHz	24000/F(KHz)	QP	30m	
	1.705MHz-30MHz	30	QP	30m	
	30MHz-88MHz	100	QP	3m	
	88MHz-216MHz	150	QP		
	216MHz-960MHz	200	QP		
	960MHz-1GHz	500	QP		
	Above 1GHz	500	Average		
		5000	Peak		
Test setup:	For radiated emissions from 9kHz to 30MHz				
					



	For radiated emissions from 30MHz to1GHz					
						
	For radiated emissions above 1GHz					
						
Test Procedure:	1. 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. 1. 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. 2. 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. 3. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 4. 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					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test voltage:	AC 120V/60Hz					



Test results:	Pass
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Measurement data:

Remark:

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

■ **9kHz~30MHz**

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.



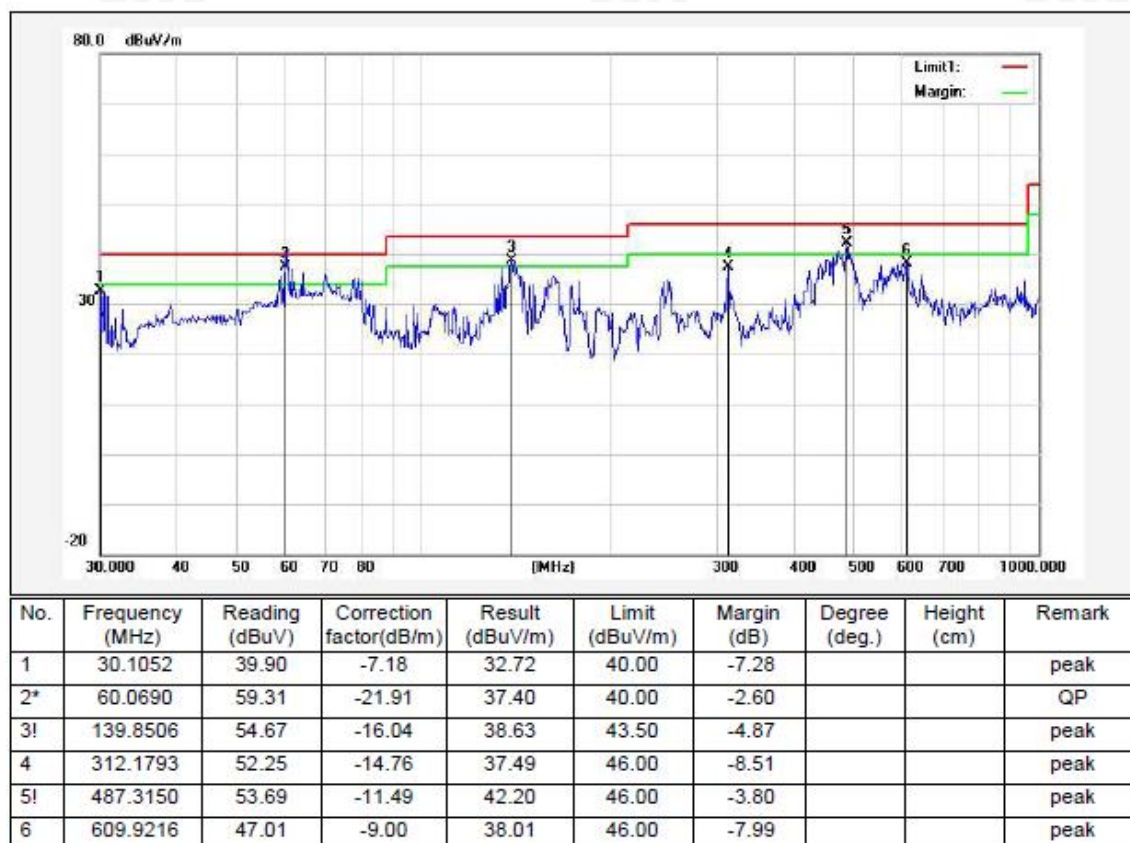
■ Below 1GHz

Horizontal:





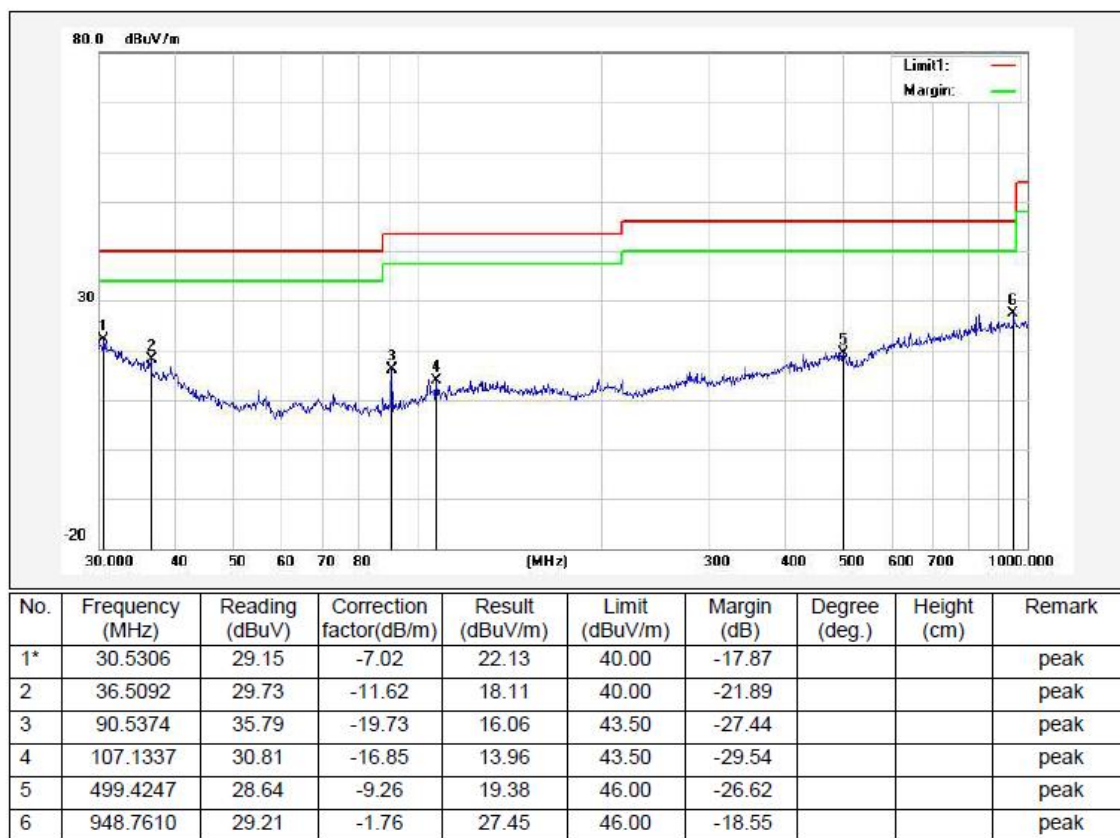
Vertical:





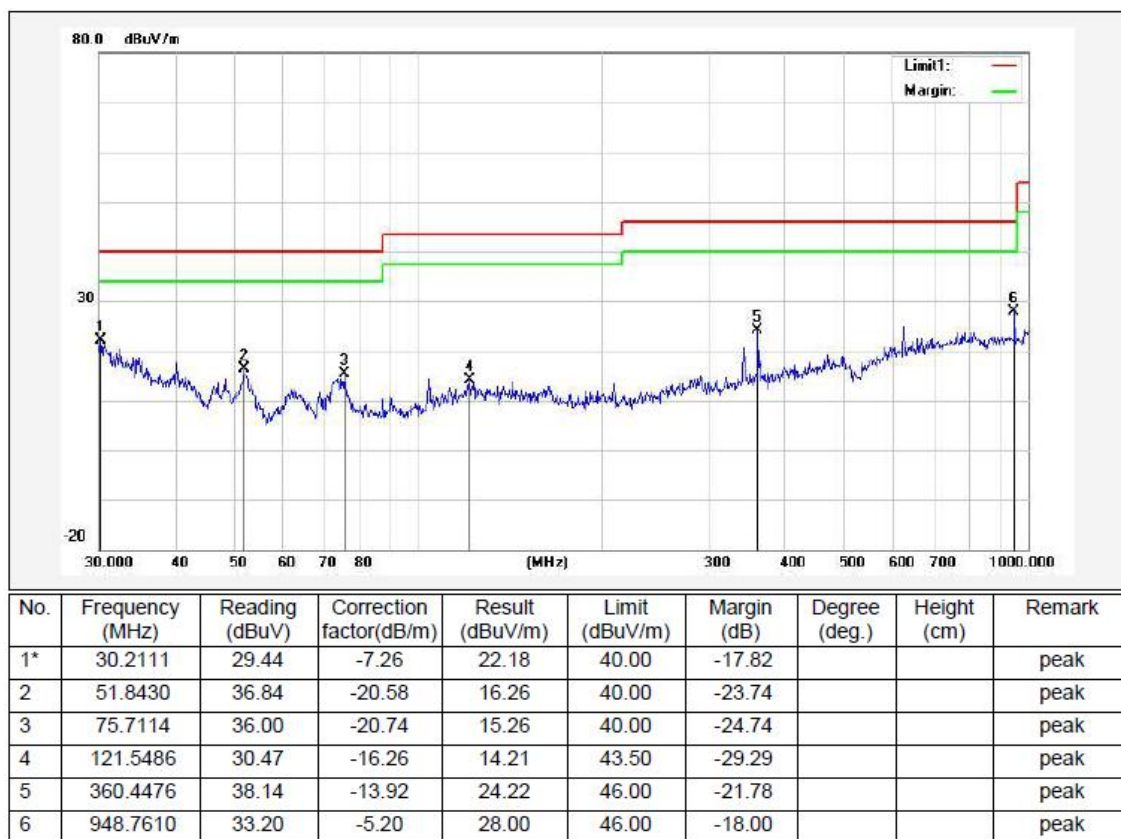
ANT2:

Horizontal:





Vertical:





■ Above 1GHz

Ant 1:

Test channel:	Lowest channel
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1815.31	41.63	25.25	4.85	34.08	37.65	74.00	-36.35	Vertical
2721.00	39.08	28.12	5.66	33.68	39.18	74.00	-34.82	Vertical
3626.00	34.31	29.19	7.25	37.37	33.38	74.00	-40.62	Vertical
4518.00	*					74.00		Vertical
5427.00	*					74.00		Vertical
6325.00	*					74.00		Vertical
1812.21	36.44	25.25	4.85	34.08	32.46	74.00	-41.54	Horizontal
2721.00	35.89	28.12	5.66	33.68	35.99	74.00	-38.01	Horizontal
3626.00	33.29	29.19	7.25	37.37	32.36	74.00	-41.64	Horizontal
4518.00	*					74.00		Horizontal
5427.00	*					74.00		Horizontal
6325.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1812.21	31.48	25.25	4.85	34.08	27.50	54.00	-26.50	Vertical
2721.00	24.72	28.12	5.66	33.68	24.82	54.00	-29.18	Vertical
3626.00	25.59	29.19	7.25	37.37	24.66	54.00	-29.34	Vertical
4518.00	*					54.00		Vertical
5427.00	*					54.00		Vertical
6325.00	*					54.00		Vertical
1812.21	29.35	25.25	4.85	34.08	25.37	54.00	-28.63	Horizontal
2721.00	25.76	28.12	5.66	33.68	25.86	54.00	-28.14	Horizontal
3626.00	25.05	29.19	7.25	37.37	24.12	54.00	-29.88	Horizontal
4518.00	*					54.00		Horizontal
5427.00	*					54.00		Horizontal
6325.00	*					54.00		Horizontal

Remarks:

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.
3. “*”, means this data is the too weak instrument of signal is unable to test.



Test channel:	Middle channel
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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
1818.80	41.70	25.43	4.89	34.12	37.90	74.00	-36.10	Vertical
2728.20	39.78	28.34	5.68	33.57	40.23	74.00	-33.77	Vertical
3637.60	36.70	29.42	7.29	37.66	35.75	74.00	-38.25	Vertical
4547.00	*					74.00		Vertical
5456.40	*					74.00		Vertical
6365.80	*					74.00		Vertical
1818.80	40.60	25.43	4.89	34.12	36.80	74.00	-37.20	Horizontal
2728.20	35.73	28.34	5.68	33.57	36.18	74.00	-37.82	Horizontal
3637.60	36.00	29.42	7.29	37.66	35.05	74.00	-38.95	Horizontal
4547.00	*					74.00		Horizontal
5456.40	*					74.00		Horizontal
6365.80	*					74.00		Horizontal

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
1818.80	27.85	25.43	4.89	34.12	24.05	54.00	-29.95	Vertical
2728.20	24.83	28.34	5.68	33.57	25.28	54.00	-28.72	Vertical
3637.60	21.13	29.42	7.29	37.66	20.18	54.00	-33.82	Vertical
4547.00	*					54.00		Vertical
5456.40	*					54.00		Vertical
6365.80	*					54.00		Vertical
1818.80	28.74	25.43	4.89	34.12	24.94	54.00	-29.06	Horizontal
2728.20	25.94	28.34	5.68	33.57	26.39	54.00	-27.61	Horizontal
3637.60	24.83	29.42	7.29	37.66	23.88	54.00	-30.12	Horizontal
4547.00	*					54.00		Horizontal
5456.40	*					54.00		Horizontal
6365.80	*					54.00		Horizontal

Remarks:

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.*
3. *“*” means this data is too weak instrument of signal is unable to test.*



Test channel:	Highest Channel
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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
1824.43	40.68	25.64	4.75	34.67	36.40	74.00	-37.60	Vertical
2753.40	37.30	28.46	5.87	33.83	37.80	74.00	-36.20	Vertical
3653.34	34.75	29.75	7.59	37.76	34.33	74.00	-39.67	Vertical
4564.14	*					74.00		Vertical
5487.67	*					74.00		Vertical
6413.58	*					74.00		Vertical
1824.43	40.00	25.64	4.75	34.67	35.72	74.00	-38.28	Horizontal
2753.40	34.24	28.46	5.87	33.83	34.74	74.00	-39.26	Horizontal
3653.34	36.06	29.75	7.59	37.76	35.64	74.00	-38.36	Horizontal
4564.14	*					74.00		Horizontal
5487.67	*					74.00		Horizontal
6413.58	*					74.00		Horizontal

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
1824.43	30.81	25.64	4.75	34.67	26.53	54.00	-27.47	Vertical
2753.40	26.65	28.46	5.87	33.83	27.15	54.00	-26.85	Vertical
3653.34	25.79	29.75	7.59	37.76	25.37	54.00	-28.63	Vertical
4564.14	*					54.00		Vertical
5487.67	*					54.00		Vertical
6413.58	*					54.00		Vertical
1824.43	32.50	25.64	4.75	34.67	28.22	54.00	-25.78	Horizontal
2753.40	24.14	28.46	5.87	33.83	24.64	54.00	-29.36	Horizontal
3653.34	25.87	29.75	7.59	37.76	25.45	54.00	-28.55	Horizontal
4564.14	*					54.00		Horizontal
5487.67	*					54.00		Horizontal
6413.58	*					54.00		Horizontal

Remarks:

4. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
5. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
6. *“*” means this data is too weak; instrument of signal is unable to test.*



Ant 2:

Test channel:	Lowest channel
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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
1815.31	41.44	25.25	4.85	34.08	37.46	74.00	-36.54	Vertical
2721.00	38.77	28.12	5.66	33.68	38.87	74.00	-35.13	Vertical
3626.00	34.35	29.19	7.25	37.37	33.42	74.00	-40.58	Vertical
4518.00	*					74.00		Vertical
5427.00	*					74.00		Vertical
6325.00	*					74.00		Vertical
1812.21	36.55	25.25	4.85	34.08	32.57	74.00	-41.43	Horizontal
2721.00	35.88	28.12	5.66	33.68	35.98	74.00	-38.02	Horizontal
3626.00	33.63	29.19	7.25	37.37	32.70	74.00	-41.30	Horizontal
4518.00	*					74.00		Horizontal
5427.00	*					74.00		Horizontal
6325.00	*					74.00		Horizontal

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
1812.21	31.40	25.25	4.85	34.08	27.42	54.00	-26.58	Vertical
2721.00	24.52	28.12	5.66	33.68	24.62	54.00	-29.38	Vertical
3626.00	25.74	29.19	7.25	37.37	24.81	54.00	-29.19	Vertical
4518.00	*					54.00		Vertical
5427.00	*					54.00		Vertical
6325.00	*					54.00		Vertical
1812.21	29.50	25.25	4.85	34.08	25.52	54.00	-28.48	Horizontal
2721.00	25.79	28.12	5.66	33.68	25.89	54.00	-28.11	Horizontal
3626.00	25.43	29.19	7.25	37.37	24.50	54.00	-29.50	Horizontal
4518.00	*					54.00		Horizontal
5427.00	*					54.00		Horizontal
6325.00	*					54.00		Horizontal

Remarks:

4. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
5. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
6. *“*” , means this data is the too weak instrument of signal is unable to test.*



Test channel:	Middle channel
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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
1818.80	40.39	25.43	4.89	34.12	36.59	74.00	-37.41	Vertical
2728.20	38.47	28.34	5.68	33.57	38.92	74.00	-35.08	Vertical
3637.60	35.39	29.42	7.29	37.66	34.44	74.00	-39.56	Vertical
4547.00	*					74.00		Vertical
5456.40	*					74.00		Vertical
6365.80	*					74.00		Vertical
1818.80	39.29	25.43	4.89	34.12	35.49	74.00	-38.51	Horizontal
2728.20	34.42	28.34	5.68	33.57	34.87	74.00	-39.13	Horizontal
3637.60	34.69	29.42	7.29	37.66	33.74	74.00	-40.26	Horizontal
4547.00	*					74.00		Horizontal
5456.40	*					74.00		Horizontal
6365.80	*					74.00		Horizontal

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
1818.80	27.93	25.43	4.89	34.12	24.13	54.00	-29.87	Vertical
2728.20	24.91	28.34	5.68	33.57	25.36	54.00	-28.64	Vertical
3637.60	21.21	29.42	7.29	37.66	20.26	54.00	-33.74	Vertical
4547.00	*					54.00		Vertical
5456.40	*					54.00		Vertical
6365.80	*					54.00		Vertical
1818.80	28.82	25.43	4.89	34.12	25.02	54.00	-28.98	Horizontal
2728.20	26.02	28.34	5.68	33.57	26.47	54.00	-27.53	Horizontal
3637.60	24.91	29.42	7.29	37.66	23.96	54.00	-30.04	Horizontal
4547.00	*					54.00		Horizontal
5456.40	*					54.00		Horizontal
6365.80	*					54.00		Horizontal

Remarks:

7. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
8. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
9. *“*” means this data is too weak instrument of signal is unable to test.*



Test channel:	Highest Channel
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1824.43	41.40	25.64	4.75	34.67	37.12	74.00	-36.88	Vertical
2753.40	37.90	28.46	5.87	33.83	38.40	74.00	-35.60	Vertical
3653.34	35.70	29.75	7.59	37.76	35.28	74.00	-38.72	Vertical
4564.14	*					74.00		Vertical
5487.67	*					74.00		Vertical
6413.58	*					74.00		Vertical
1824.43	41.02	25.64	4.75	34.67	36.74	74.00	-37.26	Horizontal
2753.40	35.14	28.46	5.87	33.83	35.64	74.00	-38.36	Horizontal
3653.34	37.31	29.75	7.59	37.76	36.89	74.00	-37.11	Horizontal
4564.14	*					74.00		Horizontal
5487.67	*					74.00		Horizontal
6413.58	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1824.43	30.88	25.64	4.75	34.67	26.60	54.00	-27.40	Vertical
2753.40	26.60	28.46	5.87	33.83	27.10	54.00	-26.90	Vertical
3653.34	26.09	29.75	7.59	37.76	25.67	54.00	-28.33	Vertical
4564.14	*					54.00		Vertical
5487.67	*					54.00		Vertical
6413.58	*					54.00		Vertical
1824.43	32.80	25.64	4.75	34.67	28.52	54.00	-25.48	Horizontal
2753.40	24.32	28.46	5.87	33.83	24.82	54.00	-29.18	Horizontal
3653.34	26.40	29.75	7.59	37.76	25.98	54.00	-28.02	Horizontal
4564.14	*					54.00		Horizontal
5487.67	*					54.00		Horizontal
6413.58	*					54.00		Horizontal

Remarks:

10. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
11. The emission levels of other frequencies are very lower than the limit and not show in test report.
12. “*”, means this data is the too weak instrument of signal is unable to test.



6. 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.	
EUT Antenna:	
The antenna is as below, reference to the EUT photos for details ANT1: Stick antenna , 5dBi ANT2: Fiber glass antenna , 3dBi	



7. Test Setup Photo

Reference to the appendix I for details.

8. EUT Constructional Details

Reference to the appendix II for details.

***** END OF REPORT *****