Shenzhen Global Test Service Co.,Ltd.
No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

FCC PART 15 SUBPART C TEST REPORT

FCC PART 15.247

Report Reference No.....:	**GTS20201016002-1-1**
FCC ID..... :	**2AYAZ-L22**
Compiled by (position+printed name+signature)..:	File administrators Peter Xiao
Supervised by (position+printed name+signature)..:	Test Engineer Moon Tan
Approved by (position+printed name+signature)..:	Manager Simon Hu
Date of issue.....:	Dec.10, 2020
Representative Laboratory Name.:	**Shenzhen Global Test Service Co.,Ltd.**
Address .....:	No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong,China
Applicant's name.....:	**Luxnpro Chengdu Electronics Co., Ltd.**
Address .....:	Floor2, Building10, District A, Tianfu Jingrong Center, Science City, Tianfu New Area, Chengdu. China
Test specification .....:	
Standard .....:	**FCC Part 15.247: Operation within the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz**
TRF Originator.....:	Shenzhen Global Test Service Co.,Ltd.
Master TRF.....:	Dated 2014-12

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Test item description .....:	**LED projector**
Trade Mark .....:	N/A
Manufacturer .....:	Luxnpro Chengdu Electronics Co., Ltd.
Model/Type reference .....:	BBQ4
List Models .....:	Please refer to page 6
Modulation Type.....:	GFSK,π/4-DQPSK,8DPSK
Operation Frequency.....:	From 2402MHz to 2480MHz
Hardware Version .....:	N/A
Software Version .....:	N/A
Rating .....:	Input: AC 100-240V,50/60Hz
Result .....:	**PASS**

TEST REPORT

Test Report No. :	GTS20201016002-1-1	Dec.10, 2020 Date of issue

Equipment under Test	:	LED projector
Model /Type	:	BBQ4
List Models	:	Please refer to page 6
Applicant	:	**Luxnpro Chengdu Electronics Co., Ltd.**
Address	:	Floor2, Building10, District A, Tianfu Jingrong Center, Science City, Tianfu New Area, Chengdu. China
Manufacturer	:	**Luxnpro Chengdu Electronics Co., Ltd.**
Address	:	Floor2, Building10, District A, Tianfu Jingrong Center, Science City, Tianfu New Area, Chengdu. China

Test Result:	**PASS**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1. TEST STANDARDS

The tests were performed according to following standards:

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.
ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices
KDB558074 D01 15.247 Meas Guidance v05r02: Digital Transmission Systems (DTS) and Frequency Hopping measurement procedures

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	Nov.21, 2020
Testing commenced on	:	Nov.21, 2020
Testing concluded on	:	Dec.10, 2020

2.2. Product Description

Product Name	LED projector
Trade Mark	N/A
Model/Type reference	BBQ4
List Models	Please refer to page 6
Model Declaration	PCB board, structure and internal of these model(s) are the same, So no additional models were tested.
Power supply:	Input: AC 100-240V,50/60Hz
Sample ID	GTS20201016002-1-1# & GTS20201016002-1-2#
Bluetooth	
Operation frequency	2402-2480MHz
Channel Number	79 channels for Bluetooth (DSS) 40 channels for Bluetooth (DTS)
Channel Spacing	1MHz for Bluetooth (DSS) 2MHz for Bluetooth (DTS)
Modulation Type	GFSK, π/4-DQPSK, 8DPSK for Bluetooth (DSS) GFSK for Bluetooth (DTS)
WIFI(2.4G Band)	
Frequency Range	2412MHz ~ 2462MHz
Channel Spacing	5MHz
Channel Number	11 Channel for 20MHz bandwidth(2412~2462MHz) 7 channels for 40MHz bandwidth(2422~2452MHz)
Modulation Type	802.11b: DSSS; 802.11g/n: OFDM
WIFI(5.2G Band)	
Frequency Range	5180MHz ~ 5240MHz
Channel Number	4 channels for 20MHz bandwidth(5180-5240MHz) 2 channels for 40MHz bandwidth(5190~5230MHz) 1 channels for 80MHz bandwidth(5210MHz)
Modulation Type	802.11a/n/ac: OFDM
WIFI (5.8G Band)	
Frequency Range	5745MHz ~ 5825MHz
Channel Number	5 channels for 20MHz bandwidth(5745-5825MHz) 2 channels for 40MHz bandwidth(5755~5795MHz) 1 channels for 80MHz bandwidth(5775MHz)
Modulation Type	802.11a/n/ac: OFDM
Antenna Description	Internal Antenna, 3.65dBi(Max.) for 2.4G Band and 2.88dBi(Max.) for 5G Band

2.3. Model list

Model list									
Z1	Z2	Z3	Z4	Z5	Z8	Z1000	Z2000	Z3000	Z4000
Z8000	ESP100	ESP200	ESP300	ESP400	ESP800	PTP100	PTP200	PTP300	PTP400
PTP800	SMART 100	SMART 200	SMART 300	SMART 400	SMART 800	CC1	CC2	CC3	CC4
CC5	CC6	CC7	CC8	CC9	Cine1	Cine2	Cine3	Cine8	S1
S2	S3	S4	S5	S6	S7	S8	S9	CM1	CM2
CM3	CM4	CM5	CM6	CM7	CM8	CM9	FHD4D 1	FHD5D 1	FHD6D 1
HQ2	HQ3	HQ4	HQ5	HQ6	HQ7	HQ8	HQ9	LX200F HD	LX300F HD
LX400F HD	LX500F HD	LX600F HD	LX700F HD	LX800F HD	LX900F HD	BBC2	BBC3	BBC4	BBC5
BBC6	BBC7	BBC8	BBC9	BBQ2	BBQ3	BBQ5	BBQ6	BBQ7	BBQ8
BBQ9	BBW2	BBW3	BBW4	BBW5	BBW6	BBW7	BBW8	V200	V201
V202	V203	V204	V205	V206	V301	V302	V303	V304	V305
V310	V320	V330	V340	V350	V500	V501	V502	V503	V504
V510	V520	V530	V540	V550	V560	L21	L22	L23	L24
L25	L26	L27	L28	A21	A22	A23	A24	Q1	Q2
Q3	Q6	Q7	Q8	EXPLO RE 3	Cinema ngo 200	Cinema ngo 200P	Cinema ngo 200W	Cinema ngo 200B	Cinema ngo 200BW
Cinema ngo 200PW	Cinema ngo 200BP W	Torch 1	Torch 2	XPE600	XPE700	XPE800	XPE900	H1	H2
H3	H6	H7	H8	BW-VP6	BW-VP7	BW-VP8	BW-VP9	BW-VP10	BW-VP6 Pro
Play	Play Lite	PlayPlus	Play 2	Play 2 Plus	Play 2 Lite	Play 3	Play 3 Plus	Play 3 Lite	AKEY6
AKEY7	AKEY8	AKEY9	AKEY10	AKEY20	AKEY30	AKEY40	AKEY50	AKEY60	X2
X3	X5	X6	X7	X8	X9	X10	D50	D60	D70
D80	D90	ET10	ET20	ET30	ET40	ET50			

2.4. Equipment Under Test

Power supply system utilised

Power supply voltage	:	○	230V / 50 Hz	●	120V / 60Hz
		○	12 V DC	○	24 V DC
		○	Other (specified in blank below)		

AC 120V

2.5. Short description of the Equipment under Test (EUT)

This is a LED projector.

For more details, refer to the user's manual of the EUT.

2.6. EUT operation mode

The Applicant provides communication tools software to control the EUT for staying in continuous transmitting (Duty Cycle more than 98%) and receiving mode for testing .There are 79 channels provided to the EUT. Channel 00/38/78 was selected to test.

Mode of Operations	Frequency Range (MHz)	Data Rate (Mbps)
(BDR/EDR)	2402	1/2/3
	2441	1/2/3
	2480	1/2/3
For Conducted Emission		
Test Mode	TX Mode	
For Radiated Emission		
Test Mode	TX Mode	

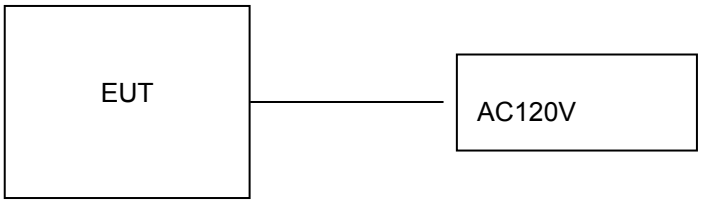
Channel	Frequency(MHz)	Channel	Frequency(MHz)
00	**2402**	40	2442
01	2403	41	2443
02	2404	42	2444
--	--	--	--
--	--	--	--
38	2440	**78**	**2480**
39	2441		

AC conducted emission pre-test at both at AC 120V/60Hz and AC 240V/50Hz modes, recorded worst case.

Worst-case mode and channel used for 150 KHz-30 MHz power line conducted emissions was the mode and channel with the highest output power that was determined to be TX (1Mbps).

Worst-case mode and channel used for 9 KHz-1000 MHz radiated emissions was the mode and channel with the highest output power, that was determined to be TX(1Mbps-MCH).

2.7. Block Diagram of Test Setup



2.8. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: 2AYAZ-L22** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

2.9. EUT Exercise Software

The system was configured for testing in a continuous transmits condition and change test channels by software (Ampak RF Test Tool) provided by application.

2.10. Special Accessories

Manufacturer	Description	Model	Serial Number	Certificate
LENOVO	PC	DESKYOP-EUIVCNR	--	SDOC

Note: The PC is only used for auxiliary testing.

2.11. External I/O Cable

I/O Port Description	Quantity	Cable
AC IN Port	1	1.0M, Unscreened Cable
USB Port	2	N/A
HDMI Port	1	N/A
AV Card	1	N/A
Headphone Port	1	N/A

2.12. Modifications

No modifications were implemented to meet testing criteria.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen Global Test Service Co.,Ltd.
No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong,China.

3.2. Test Facility

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

CNAS (No. CNAS L8169)
Shenzhen Global Test Service Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2019 General Requirements) for the Competence of Testing and Calibration Laboratories.
A2LA (Certificate No. 4758.01)
Shenzhen Global Test Service Co., Ltd. has been assessed by the American Association for Laboratory Accreditation (A2LA). Certificate No. 4758.01.
Industry Canada Registration Number. is 24189.
FCC Designation Number is CN1234.
FCC Registered Test Site Number is165725.

3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

3.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Global Test Service Co.,Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.
Hereafter the best measurement capability for Shenzhen GTS laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10 dB	(1)
Radiated Emission	1~18GHz	4.32 dB	(1)
Radiated Emission	18-40GHz	5.54 dB	(1)
Conducted Disturbance	0.15~30MHz	3.12 dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.5. Summary of measurement results

Applied Standard: FCC Part 15 Subpart C				
FCC Rules	Description of Test	Test Sample	Result	Remark
§15.247(b)(1)	Maximum Conducted Output Power	GTS20201016002-1-1#	Compliant	Note 1
§15.247(c)	Frequency Separation	GTS20201016002-1-1#	Compliant	Note 1
§15.247(c)	99% and 20 dB Bandwidth	GTS20201016002-1-1#	Compliant	Note 1
§15.247(a)(1)(ii)	Number of Hopping Frequency	GTS20201016002-1-1#	Compliant	Note 1
§15.247(a)(1)(iii)	Time Of Occupancy (Dwell Time)	GTS20201016002-1-1#	Compliant	Note 1
§15.209, §15.205	Conducted Spurious Emissions and Band Edges Test	GTS20201016002-1-1#	Compliant	Note 1
§15.209, §15.247(d)	Radiated Spurious Emissions	GTS20201016002-1-1# GTS20201016002-1-2#	Compliant	Note 1
§15.205	Emissions at Restricted Band	GTS20201016002-1-1# GTS20201016002-1-2#	Compliant	Note 1
§15.207(a)	AC Conducted Emissions	GTS20201016002-1-2#	Compliant	Note 1
§15.203	Antenna Requirements	GTS20201016002-1-1#	Compliant	Note 1
§15.247(i)§2.1091	RF Exposure	/	Compliant	Note 2

Remark:
1. The measurement uncertainty is not included in the test result.
2. NA = Not Applicable; NP = Not Performed
3. Note 1 – Test results inside test report;
4. Note 2 – Test results in other test report (SAR Report).
5. We tested all test mode and recorded worst case in report

3.6. Equipments Used during the Test

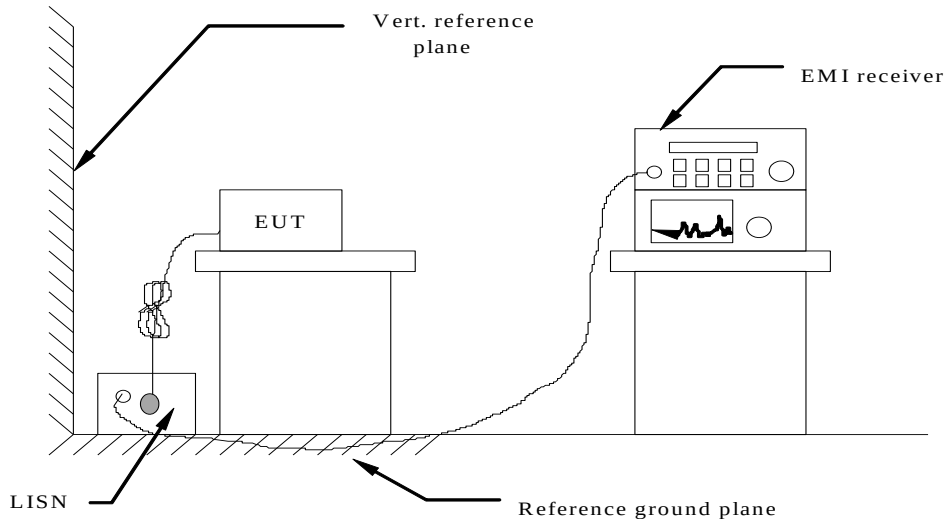
Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
LISN	R&S	ENV216	3560.6550.08	2020/09/19	2021/09/18
LISN	R&S	ESH2-Z5	893606/008	2020/09/19	2021/09/18
EMI Test Receiver	R&S	ESPI3	101841-cd	2020/09/19	2021/09/18
EMI Test Receiver	R&S	ESCI7	101102	2020/09/19	2021/09/18
Spectrum Analyzer	Agilent	N9020A	MY48010425	2020/09/19	2021/09/18
Spectrum Analyzer	R&S	FSV40	100019	2020/09/19	2021/09/18
Vector Signal generator	Agilent	N5181A	MY49060502	2020/09/19	2021/09/18
Signal generator	Agilent	E4421B	3610AO1069	2020/09/19	2021/09/18
Climate Chamber	ESPEC	EL-10KA	A20120523	2020/09/19	2021/09/18
Controller	EM Electronics	Controller EM 1000	N/A	N/A	N/A
Horn Antenna	Schwarzbeck	BBHA 9120D	01622	2020/09/22	2021/09/21
Active Loop Antenna	Beijing Da Ze Technology Co.,Ltd.	ZN30900C	15006	2020/09/19	2021/09/18
Bilog Antenna	Schwarzbeck	VULB9163	000976	2020/05/26	2021/05/25
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	791	2020/09/19	2021/09/18
Amplifier	Schwarzbeck	BBV 9743	#202	2020/09/19	2021/09/18
Amplifier	Schwarzbeck	BBV9179	9719-025	2020/09/19	2021/09/18
Amplifier	EMCI	EMC051845B	980355	2020/09/19	2021/09/18
Temperature/Humidity Meter	Gangxing	CTH-608	02	2020/09/19	2021/09/18
High-Pass Filter	K&L	9SH10-2700/X12750-O/O	KL142031	2020/09/19	2021/09/18
High-Pass Filter	K&L	41H10-1375/U12750-O/O	KL142032	2020/09/19	2021/09/18
RF Cable(below 1GHz)	HUBER+SUHNER	RG214	RE01	2020/09/19	2021/09/18
RF Cable(above 1GHz)	HUBER+SUHNER	RG214	RE02	2020/09/19	2021/09/18
Data acquisition card	Agilent	U2531A	TW53323507	2020/09/19	2021/09/18
Power Sensor	Agilent	U2021XA	MY5365004	2020/09/19	2021/09/18
Test Control Unit	Tonscend	JS0806-1	178060067	2020/06/20	2021/06/19
Automated filter bank	Tonscend	JS0806-F	19F8060177	2020/06/20	2021/06/19
EMI Test Software	Tonscend	JS1120-1	Ver 2.6.8.0518	/	/
EMI Test Software	Tonscend	JS1120-3	Ver 2.5.77.0418	/	/
EMI Test Software	Tonscend	JS32-CE	Ver 2.5	/	/
EMI Test Software	Tonscend	JS32-RE	Ver 2.5.1.8	/	/

Note: The Cal.Interval was one year.

4. TEST CONDITIONS AND RESULTS

4.1. AC Power Conducted Emission

TEST CONFIGURATION



TEST PROCEDURE

1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10-2013.
2 Support equipment, if needed, was placed as per ANSI C63.10-2013.
3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10-2013.
4 The EUT received AC 120V power, received AC120V/60Hz or AC 240V/50Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
6 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8 During the above scans, the emissions were maximized by cable manipulation.

AC Power Conducted Emission Limit

For intentional device, according to § 15.207(a) AC Power Conducted Emission Limits is as following：

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.		

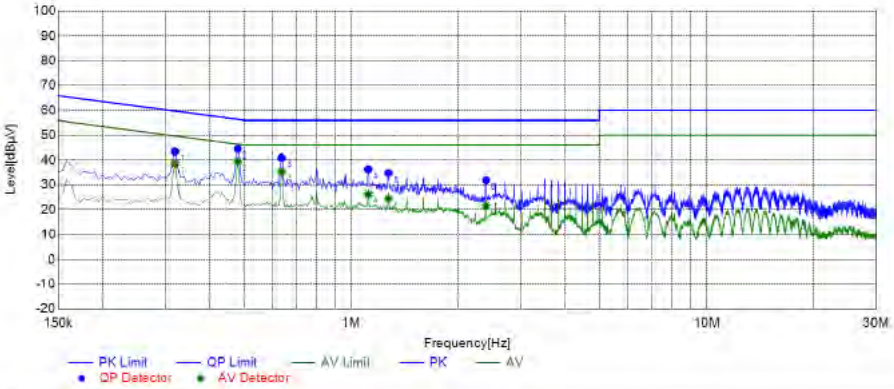
TEST RESULTS

Remark: We measured Conducted Emission at GFSK, π/4-DQPSK and 8DPSK mode in AC 120V/60Hz and AC 240V/50Hz, the worst case was recorded(GFSK 1Mbps-MCH) .

Temperature	24.2℃	Humidity	54.2%
Test Engineer	Moon Tan	Configurations	BT

Power supply:	AC 120V/60Hz	Polarization	L

Test Graph



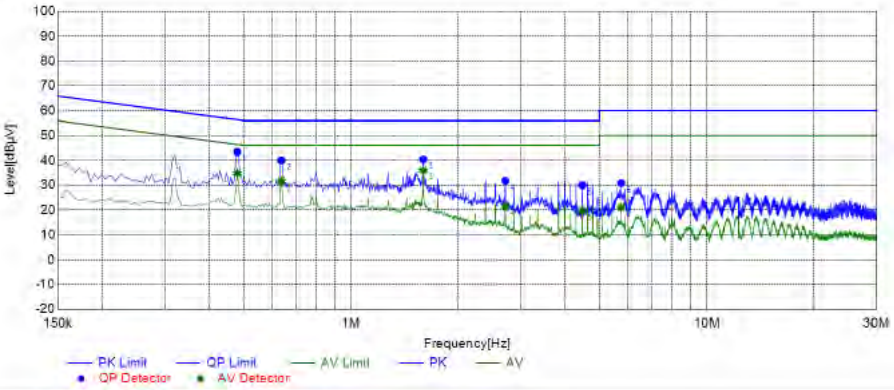
Final Data List

NO.	Frequency [MHz]	QP Reading [dBµV]	AVG. Reading [dBµV]	Factor [dB]	QP Result [dBµV]	AVG. Result [dBµV]	QP Limit [dBµV]	AVG. Limit [dBµV]	QP Margin [dB]	AVG. Margin [dB]	Line	Remark
1	0.3199	33.45	28.50	9.98	43.43	38.48	59.71	49.71	16.28	11.23	L1	PASS
2	0.4790	34.39	29.34	10.05	44.44	39.39	56.36	46.36	11.92	6.97	L1	PASS
3	0.6380	30.86	25.34	10.06	40.92	35.40	56.00	46.00	15.08	10.60	L1	PASS
4	1.1175	26.15	16.26	10.08	36.23	26.34	56.00	46.00	19.77	19.66	L1	PASS
5	1.2750	24.68	14.35	10.09	34.77	24.44	56.00	46.00	21.23	21.56	L1	PASS
6	2.3955	21.65	11.28	10.21	31.86	21.49	56.00	46.00	24.14	24.51	L1	PASS

Note: 1. Result (dBµV) = Reading (dBµV) + Factor (dB).
2. Factor (dB) = Cable loss (dB) + LISN Factor (dB).

Power supply:	AC 120V/60Hz	Polarization	N

Test Graph



Final Data List

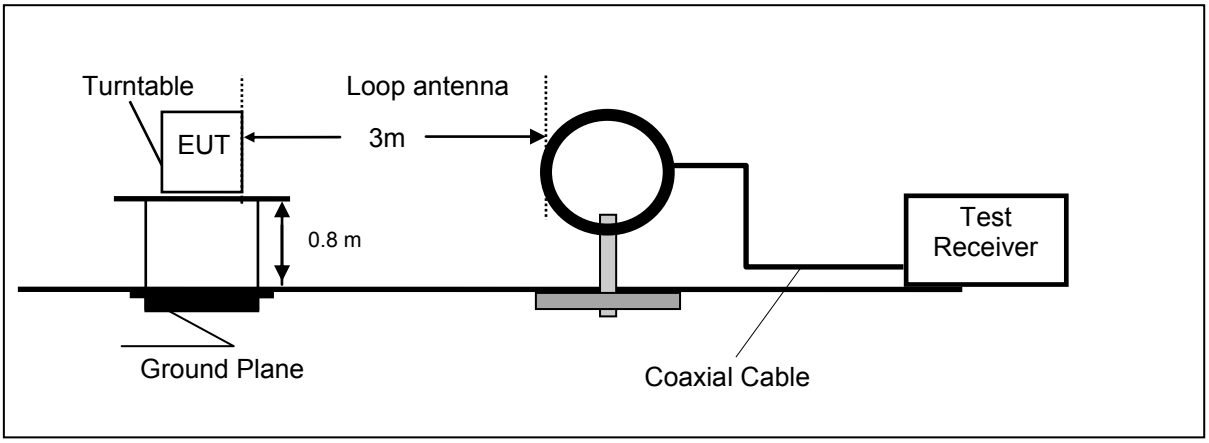
NO.	Frequency [MHz]	QP Reading [dBµV]	AVG. Reading [dBµV]	Factor [dB]	QP Result [dBµV]	AVG. Result [dBµV]	QP Limit [dBµV]	AVG. Limit [dBµV]	QP Margin [dB]	AVG. Margin [dB]	Line	Remark
1	0.4789	33.36	24.78	10.05	43.41	34.83	56.36	46.36	12.95	11.53	N	PASS
2	0.6382	30.03	21.49	10.06	40.09	31.55	56.00	46.00	15.91	14.45	N	PASS
3	1.5959	30.39	25.88	10.12	40.51	36.00	56.00	46.00	15.49	10.00	N	PASS
4	2.7150	21.45	11.26	10.25	31.70	21.51	56.00	46.00	24.30	24.49	N	PASS
5	4.4700	19.47	9.26	10.45	29.92	19.71	56.00	46.00	26.08	26.29	N	PASS
6	5.7480	20.26	10.58	10.53	30.79	21.11	60.00	50.00	29.21	28.89	N	PASS

Note: 1. Result (dBµV) = Reading (dBµV) + Factor (dB).
2. Factor (dB) = Cable loss (dB) + LISN Factor (dB).

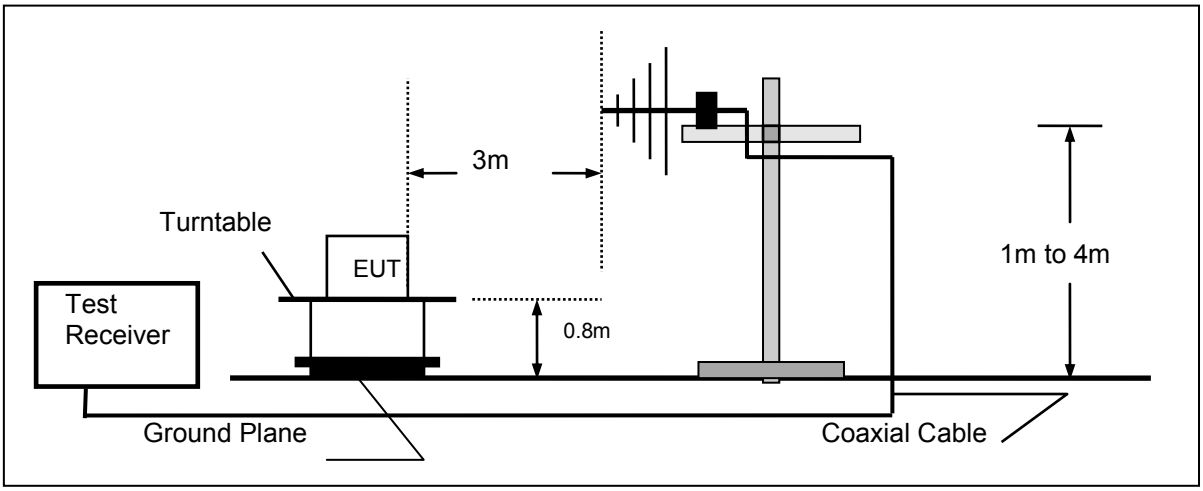
4.2. Radiated Emission

TEST CONFIGURATION

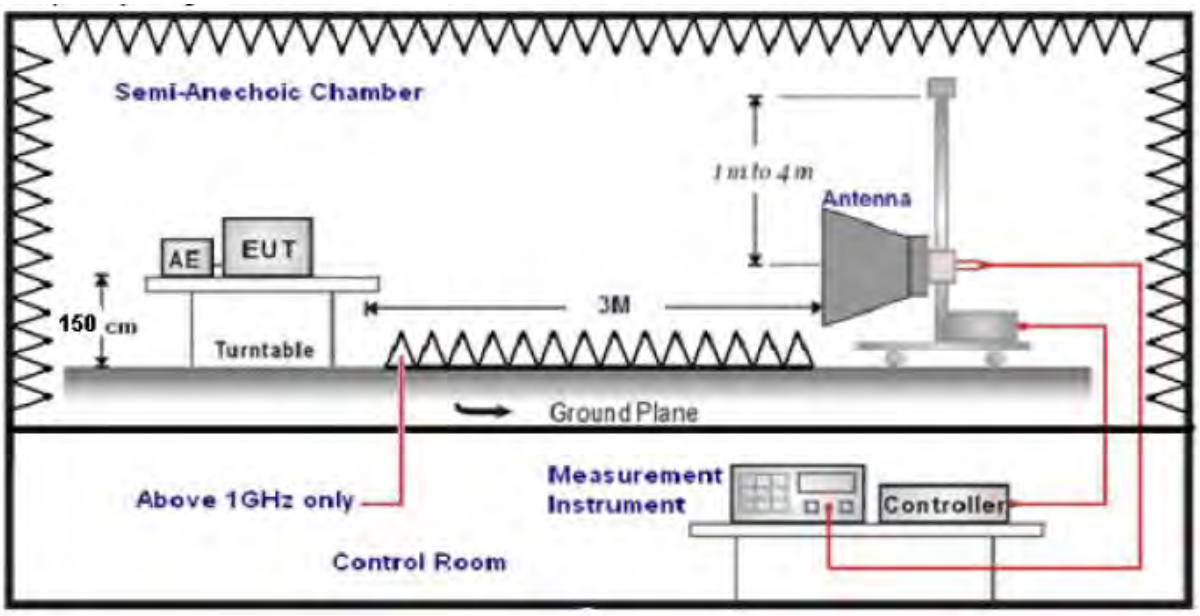
Frequency range 9 KHz – 30MHz



Frequency range 30MHz – 1000MHz



Frequency range above 1GHz-25GHz



TEST PROCEDURE

1. The EUT was placed on a turn table which is 0.8m above ground plane when testing frequency range 9 KHz –1GHz;the EUT was placed on a turn table which is 1.5m above ground plane when testing frequency range 1GHz – 25GHz.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0℃ to 360℃ to acquire the highest emissions from EUT.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.
5. The EUT minimum operation frequency was 32.768KHz and maximum operation frequency was 2480MHz.so radiated emission test frequency band from 9KHz to 25GHz.
6. The distance between test antenna and EUT as following table states:

Test Frequency range	Test Antenna Type	Test Distance
9KHz-30MHz	Active Loop Antenna	3
30MHz-1GHz	Ultra-Broadband Antenna	3
1GHz-18GHz	Double Ridged Horn Antenna	3
18GHz-25GHz	Horn Anternna	1

7. Setting test receiver/spectrum as following table states:

Test Frequency range	Test Receiver/Spectrum Setting	Detector
9KHz-150KHz	RBW=200Hz/VBW=3KHz,Sweep time=Auto	QP
150KHz-30MHz	RBW=9KHz/VBW=100KHz,Sweep time=Auto	QP
30MHz-1GHz	RBW=120KHz/VBW=1000KHz,Sweep time=Auto	QP
1GHz-40GHz	Peak Value: RBW=1MHz/VBW=3MHz, Sweep time=Auto Average Value: RBW=1MHz/VBW=10Hz, Sweep time=Auto	Peak

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

Transd=AF +CL-AG

RADIATION LIMIT

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission from intentional radiators at a distance of 3 meters shall not exceed the following table. According to § 15.247(d), in any 100kHz bandwidth outside the frequency band in which the EUT is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the100kHz bandwidth within the band that contains the highest level of desired power.
The pre-test have done for the EUT in three axes and found the worst emission at position shown in test setup photos.

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
1.705-30	3	20log(30)+ 40log(30/3)	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

TEST RESULTS

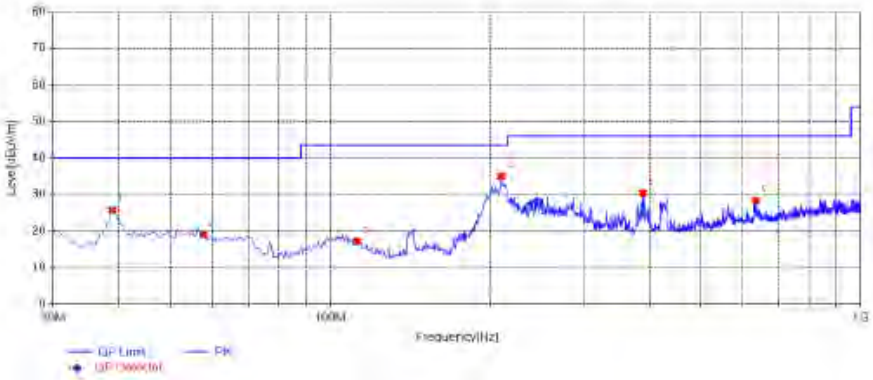
Remark: We measured Radiated Emission at GFSK, π/4-DQPSK and 8DPSK mode from 30MHz to 25GHz and recorded worst case at GFSK(1Mbps-MCH) mode.

Temperature	24.1℃	Humidity	53.8%
Test Engineer	Moon Tan	Configurations	BT

For 30MHz-1GHz

Horizontal

Test Graph



Suspected List

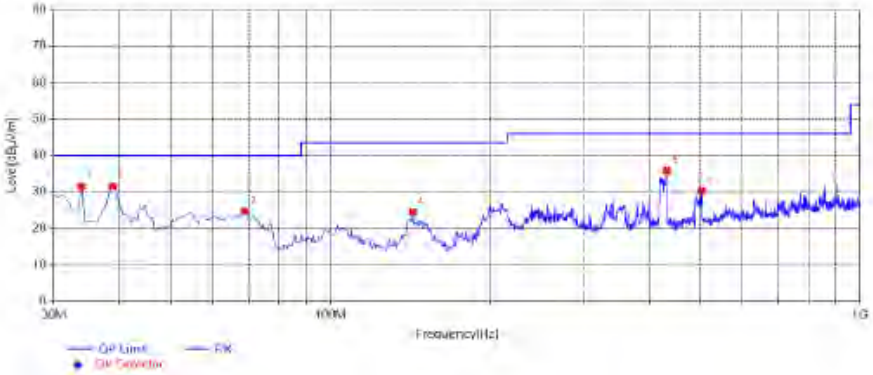
NO.	Frequency [MHz]	Reading [dBμV/m]	Factor [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity	Remark
1	38.7300	33.61	-7.79	25.82	40.00	14.18	100	218	PK	Horizonta	PASS
2	57.6450	26.58	-7.58	19.00	40.00	21.00	100	3	PK	Horizonta	PASS
3	112.4500	26.26	-8.99	17.27	43.50	26.23	100	332	PK	Horizonta	PASS
4	209.9350	44.40	-9.41	34.99	43.50	8.51	100	353	PK	Horizonta	PASS
5	388.9000	36.18	-5.77	30.41	46.00	15.59	100	358	PK	Horizonta	PASS
6	636.2500	29.52	-1.11	28.41	46.00	17.59	100	139	PK	Horizonta	PASS

Note:1. Result (dBμV/m) = Reading(dBμV/m) + Factor (dB) .

2. Factor (dB) = Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB).

Vertical

Test Graph



Suspected List

NO.	Frequency [MHz]	Reading [dBμV/m]	Factor [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity	Remark
1	33.8800	41.65	-10.07	31.58	40.00	8.42	100	68	PK	Vertical	PASS
2	38.7300	39.44	-7.79	31.65	40.00	8.35	100	242	PK	Vertical	PASS
3	68.8000	34.28	-9.56	24.72	40.00	15.28	100	189	PK	Vertical	PASS
4	143.0050	36.94	-12.38	24.56	43.50	18.94	100	53	PK	Vertical	PASS
5	431.5800	40.58	-4.72	35.86	46.00	10.14	100	154	PK	Vertical	PASS
6	502.8750	33.67	-3.43	30.24	46.00	15.76	100	360	PK	Vertical	PASS

Note:1. Result (dBμV/m) = Reading(dBμV/m) + Factor (dB) .

2. Factor (dB) = Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB).

For 1GHz to 25GHz

GFSK /Channel 0 / 2402 MHz

Freq. MHz	Reading dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
4804.00	49.60	32.44	30.25	7.95	59.74	74.00	-14.26	Peak	Horizontal
4804.00	35.97	32.44	30.25	7.95	46.11	54.00	-7.89	Average	Horizontal
4804.00	54.01	32.44	30.25	7.95	64.15	74.00	-9.85	Peak	Vertical
4804.00	36.30	32.44	30.25	7.95	46.44	54.00	-7.56	Average	Vertical

Channel 39 / 2441 MHz

Freq. MHz	Reading dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
4882.00	49.44	32.52	30.31	8.12	59.77	74.00	-14.23	Peak	Horizontal
4882.00	37.82	32.52	30.31	8.12	48.15	54.00	-5.85	Average	Horizontal
4882.00	51.42	32.52	30.31	8.12	61.75	74.00	-12.25	Peak	Vertical
4882.00	35.00	32.52	30.31	8.12	45.33	54.00	-8.67	Average	Vertical

Channel 78 / 2480 MHz

Freq. MHz	Reading dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
4960.00	50.19	32.68	30.27	7.88	60.48	74.00	-13.52	Peak	Horizontal
4960.00	36.02	32.68	30.27	7.88	46.31	54.00	-7.69	Average	Horizontal
4960.00	49.17	32.68	30.27	7.88	59.46	74.00	-14.54	Peak	Vertical
4960.00	31.97	32.68	30.27	7.88	42.26	54.00	-11.74	Average	Vertical

π/4-DQPSK /Channel 0 / 2402 MHz

Freq. MHz	Reading dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
4804.00	50.35	32.44	30.25	7.95	60.49	74.00	-13.51	Peak	Horizontal
4804.00	35.56	32.44	30.25	7.95	45.70	54.00	-8.30	Average	Horizontal
4804.00	53.01	32.44	30.25	7.95	63.15	74.00	-10.85	Peak	Vertical
4804.00	34.33	32.44	30.25	7.95	44.47	54.00	-9.53	Average	Vertical

Channel 39 / 2441 MHz

Freq. MHz	Reading dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
4882.00	50.67	32.52	30.31	8.12	61.00	74.00	-13.00	Peak	Horizontal
4882.00	37.69	32.52	30.31	8.12	48.02	54.00	-5.98	Average	Horizontal
4882.00	50.78	32.52	30.31	8.12	61.11	74.00	-12.89	Peak	Vertical
4882.00	36.10	32.52	30.31	8.12	46.43	54.00	-7.57	Average	Vertical

Channel 78 / 2480 MHz

Freq. MHz	Reading dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
4960.00	50.21	32.68	30.27	7.88	60.50	74.00	-13.50	Peak	Horizontal
4960.00	35.17	32.68	30.27	7.88	45.46	54.00	-8.54	Average	Horizontal
4960.00	50.18	32.68	30.27	7.88	60.47	74.00	-13.53	Peak	Vertical
4960.00	30.93	32.68	30.27	7.88	41.22	54.00	-12.78	Average	Vertical

8-DPSK /Channel 0 / 2402 MHz

Freq. MHz	Reading dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
4804.00	50.25	32.44	30.25	7.95	60.39	74.00	-13.61	Peak	Horizontal
4804.00	36.57	32.44	30.25	7.95	46.71	54.00	-7.29	Average	Horizontal
4804.00	54.01	32.44	30.25	7.95	64.15	74.00	-9.85	Peak	Vertical
4804.00	36.31	32.44	30.25	7.95	46.45	54.00	-7.55	Average	Vertical

Channel 39 / 2441 MHz

Freq. MHz	Reading dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
4882.00	49.82	32.52	30.31	8.12	60.15	74.00	-13.85	Peak	Horizontal
4882.00	36.35	32.52	30.31	8.12	46.68	54.00	-7.32	Average	Horizontal
4882.00	51.85	32.52	30.31	8.12	62.18	74.00	-11.82	Peak	Vertical
4882.00	35.21	32.52	30.31	8.12	45.54	54.00	-8.46	Average	Vertical

Channel 78 / 2480 MHz

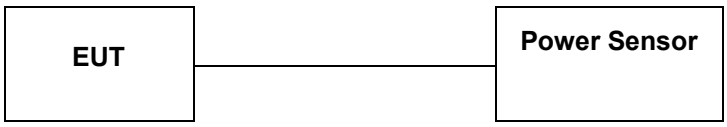
Freq. MHz	Reading dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
4960.00	51.35	32.68	30.27	7.88	61.64	74.00	-12.36	Peak	Horizontal
4960.00	35.06	32.68	30.27	7.88	45.35	54.00	-8.65	Average	Horizontal
4960.00	49.53	32.68	30.27	7.88	59.82	74.00	-14.18	Peak	Vertical
4960.00	30.68	32.68	30.27	7.88	40.97	54.00	-13.03	Average	Vertical

Notes:

1). Measuring frequencies from 9 KHz~10th harmonic or 26.5GHz (which is less), No emission found between lowest internal used/generated frequency to 30MHz.
2). Radiated emissions measured in frequency range from 9 KHz~10th harmonic or 26.5GHz (which is less) were made with an instrument using Peak detector mode.
3). Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4). Measured= Reading- Pre. Fac.+ Ant. Fac.+ Cab. Loss
5). Margin = Measured- Limit

4.3. Maximum Peak Output Power

TEST CONFIGURATION



TEST PROCEDURE

According to ANSI C63.10:2013 Maximum peak conducted output power for HFSS devices:
The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the HFSS bandwidth and shall utilize a fast-responding diode detector.
The maximum Average conducted output power may be measured using a wideband RF power meter with a thermocouple derector or equivalent. The power meter shall have a video bandwidth that is greater than or equal to the HFSS bandwidth and shall utilize a fast-responding diode detector.

LIMIT

For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

TEST RESULTS

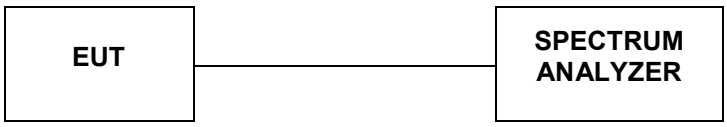
Temperature	24.2℃	Humidity	54.9%
Test Engineer	Moon Tan	Configurations	BT

Modulation	Channel	Peak Output power (dBm)	Limit (dBm)	Result
GFSK	00	8.43	21	Pass
	39	8.71		
	78	9.09		
π/4-DQPSK	00	6.62	21	Pass
	39	6.63		
	78	6.90		
8DPSK	00	6.67	21	Pass
	39	6.82		
	78	7.00		

Note: The test results including the cable lose.

4.4. 20dB Bandwidth

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with RBW=30KHz and VBW=100KHz.
The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

LIMIT

For frequency hopping systems operating in the 2400MHz-2483.5MHz no limit for 20dB bandwith.

TEST RESULTS

Temperature	24.2℃	Humidity	54.9%
Test Engineer	Moon Tan	Configurations	BT

Modulation	Frequency	20dB Bandwidth (MHz)	Result
GFSK	2402 MHz	0.888	PASS
	2441 MHz	0.891	PASS
	2480 MHz	0.897	PASS
π/4-DQPSK	2402 MHz	1.395	PASS
	2441 MHz	1.422	PASS
	2480 MHz	1.410	PASS
8-DPSK	2402 MHz	1.416	PASS
	2441 MHz	1.449	PASS
	2480 MHz	1.452	PASS

Test plot as follows:

GFSK

π/4-DQPSK

CH00

CH00

CH39

CH39

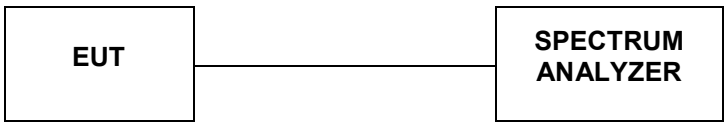
CH78

CH78

8-DPSK	
CH00	
CH39	
CH78	

4.5. Frequency Separation

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with RBW=100KHz and VBW=300KHz.

LIMIT

According to 15.247(a)(1),frequency hopping systems shall have hopping channel carrier frequencies separated by minimum of 25KHz or the 2/3*20dB bandwidth of the hopping channel, whichever is greater.

TEST RESULTS

Temperature	24.2℃	Humidity	54.9%
Test Engineer	Moon Tan	Configurations	BT

Modulation	Channel	Ch. Separation (MHz)	Limit (MHz)	Result
GFSK	Hopping	0.998	>=0.897	Complies
π/4-DQPSK	Hopping	0.984	>=0.948	Complies
8-DPSK	Hopping	0.996	>=0.968	Complies

Ch. Separation Limits: > 2/3 of 20dB bandwidth

GFSK

π/4-DQPSK

DH1

2DH1

8-DPSK

3DH1

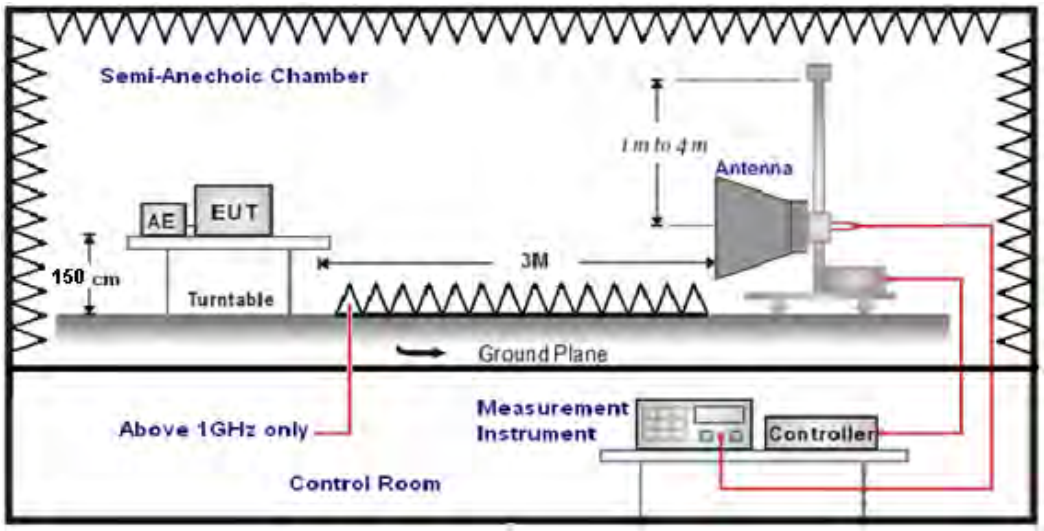
4.6. Band Edge Compliance of RF Emission

TEST REQUIREMENT

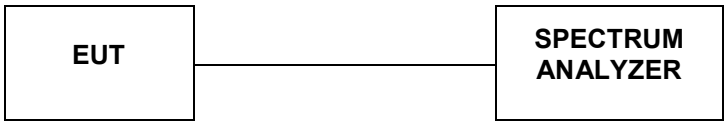
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

TEST CONFIGURATION

For Radiated



For Conducted



TEST PROCEDURE

1. The EUT was placed on a turn table which is 1.5m above ground plane.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0° to 360° to acquire the highest emissions from EUT.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed..
5. The distance between test antenna and EUT was 3 meter:
6. Setting test receiver/spectrum as following table states:

Test Frequency range	Test Receiver/Spectrum Setting	Detector
1GHz-40GHz	Peak Value: RBW=1MHz/VBW=3MHz, Sweep time=Auto Average Value: RBW=1MHz/VBW=10Hz, Sweep time=Auto	Peak

LIMIT

Below -20dB of the highest emission level in operating band.
Radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)

TEST RESULTS

Remark: we measured all conditions(DH1,DH3,DH5) and recorded worst case at DH1.

4.6.1 For Radiated Bandedge Measurement

Remark: we tested radiated bandedge at both hopping and no-hopping modes,recorded worst case at no-hopping mode

Temperature	23.8℃	Humidity	53.7%
Test Engineer	Moon Tan	Configurations	BT

GFSK

Frequency(MHz):			**2402**			**Polarity:**			**HORIZONTAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
2390.00	46.23	PK	74	-27.77	1	234	51.54	27.49	3.32	36.12	-5.31
2390.00	34.08	AV	54	-19.92	1	234	39.39	27.49	3.32	36.12	-5.31
Frequency(MHz):			**2402**			**Polarity:**			**VERTICAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
2390.00	46.44	PK	74	-27.56	1	155	51.75	27.49	3.32	36.12	-5.31
2390.00	34.92	AV	54	-19.08	1	155	40.23	27.49	3.32	36.12	-5.31
Frequency(MHz):			**2480**			**Polarity:**			**HORIZONTAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
2483.50	48.76	PK	74	-25.24	1	57	54.48	27.45	3.38	36.55	-5.72
2483.50	35.98	AV	54	-18.02	1	57	41.70	27.45	3.38	36.55	-5.72
Frequency(MHz):			**2480**			**Polarity:**			**VERTICAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
2483.50	48.25	PK	74	-25.75	1	199	53.97	27.45	3.38	36.55	-5.72
2483.50	35.49	AV	54	-18.51	1	199	41.21	27.45	3.38	36.55	-5.72

REMARKS:

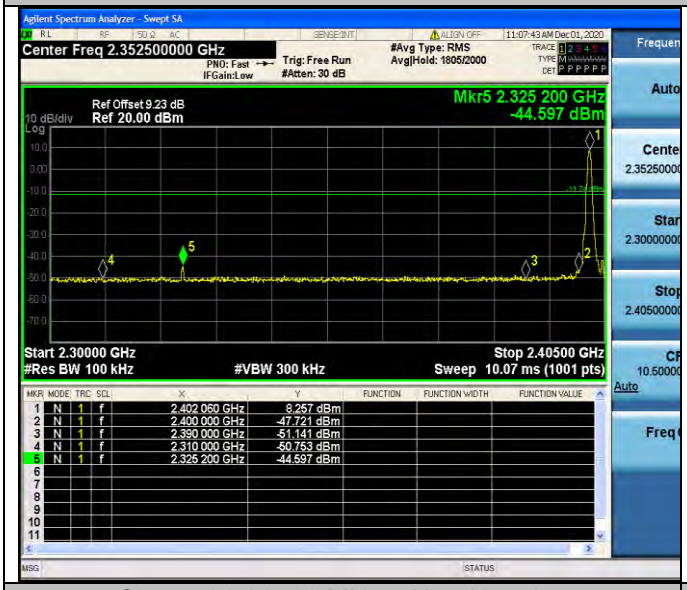
1. Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
3. Margin value = Limit value- Emission level.
4. -- Mean the PK detector measured value is below average limit.
5. The other emission levels were very low against the limit.

4.6.2 For Conducted Bandedge Measurement

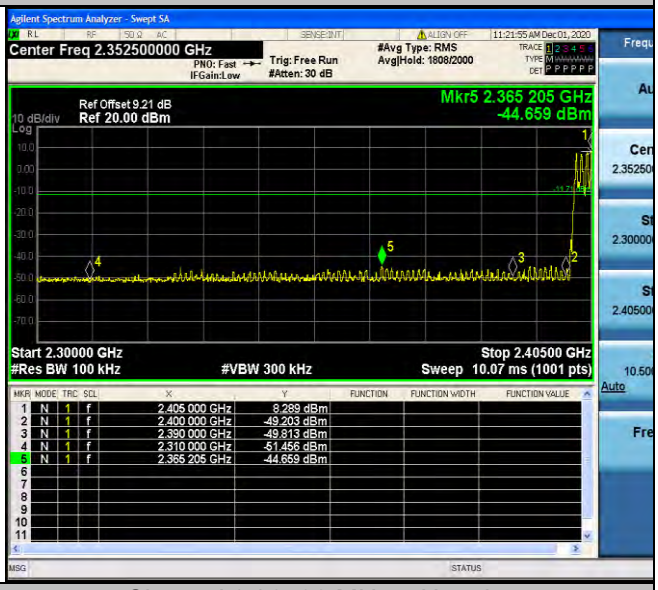
Temperature	24.2℃	Humidity	54.9%
Test Engineer	Moon Tan	Configurations	BT

Band-edge for RF conducted emissions

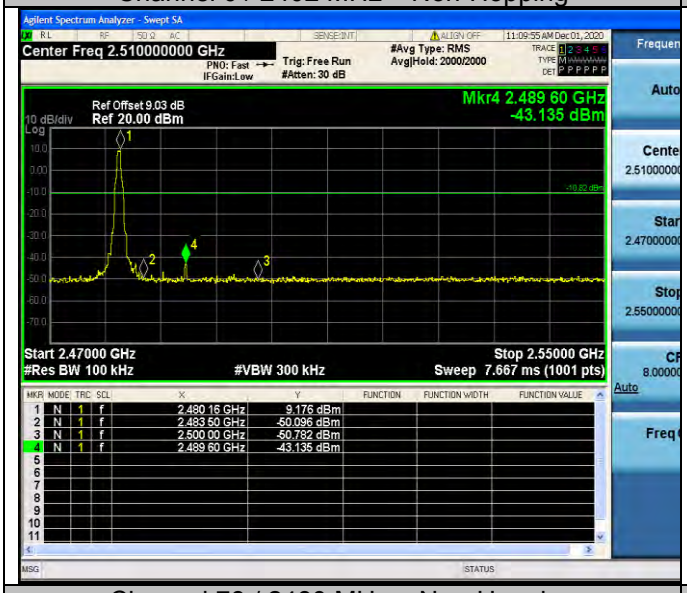
GFSK



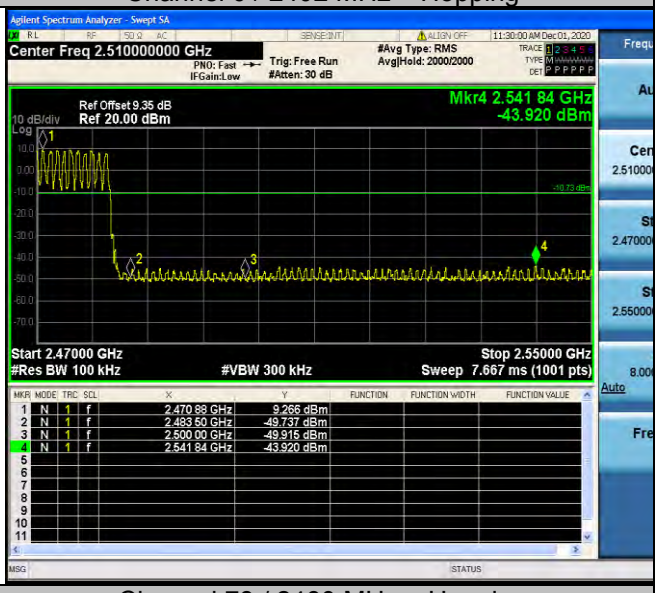
Channel 0 / 2402 MHz – Non-Hopping



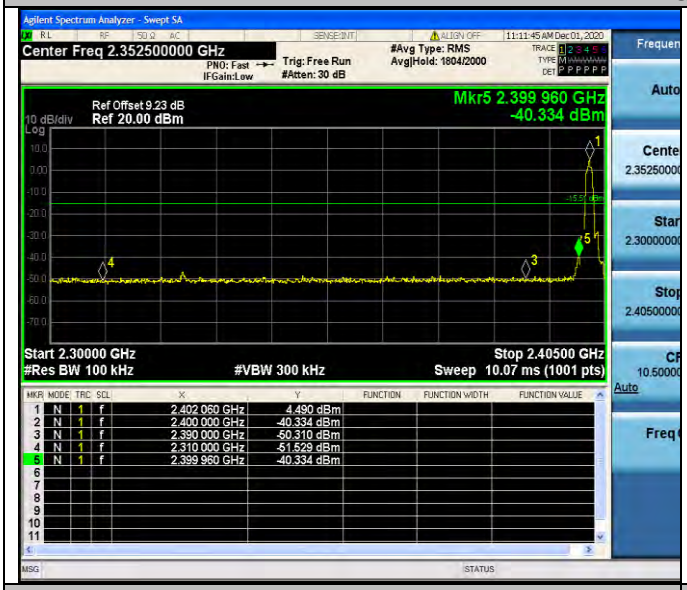
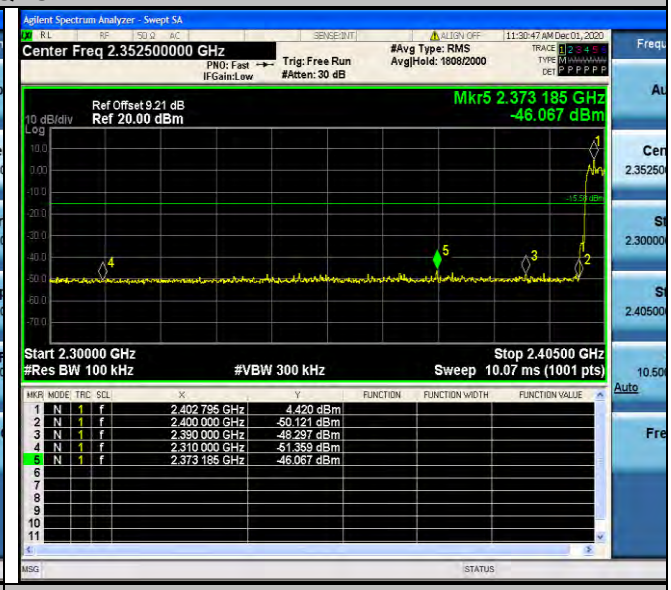
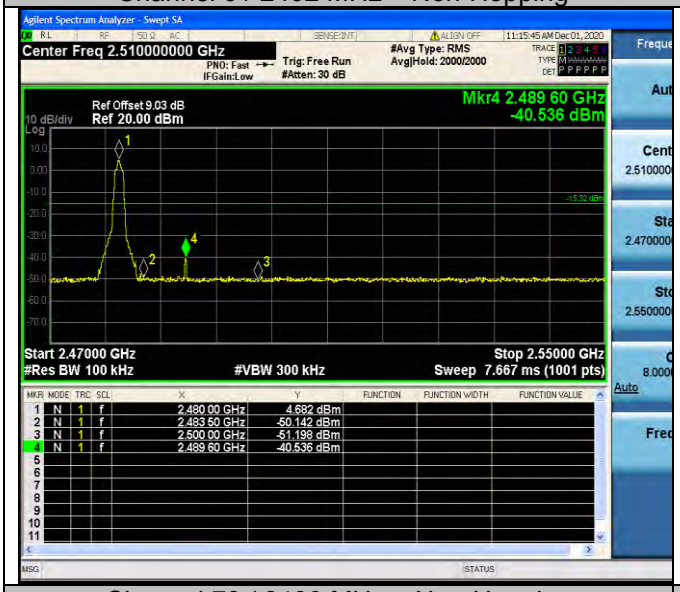
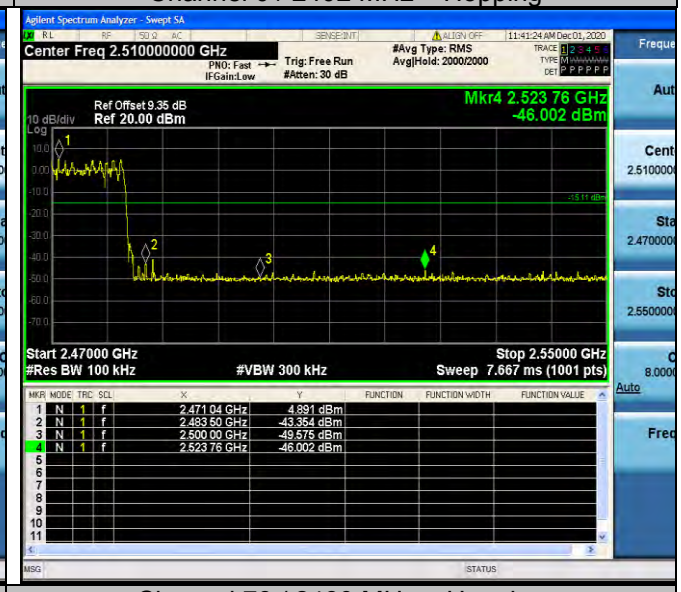
Channel 0 / 2402 MHz – Hopping

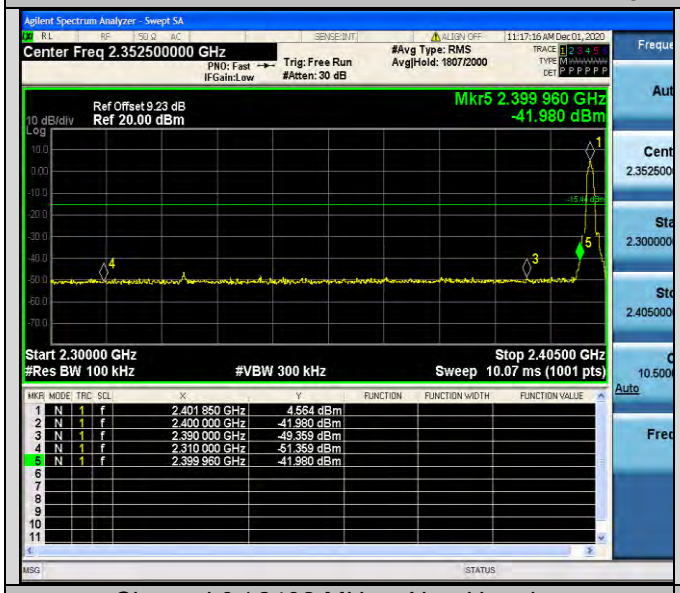
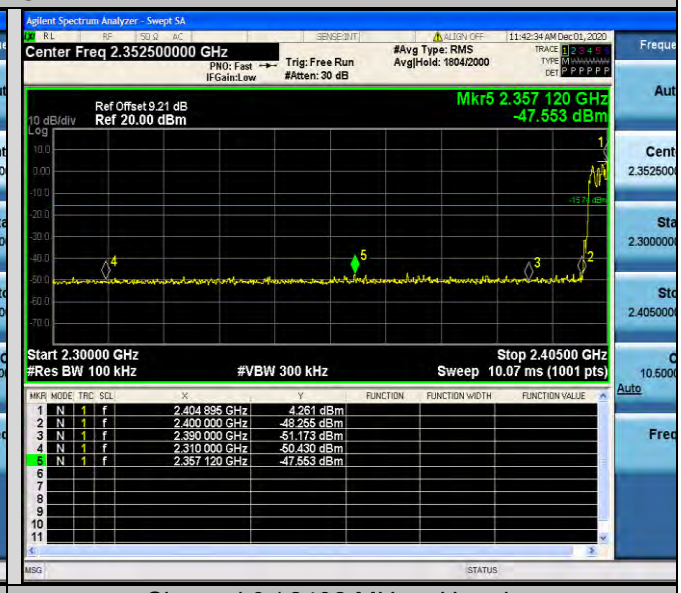
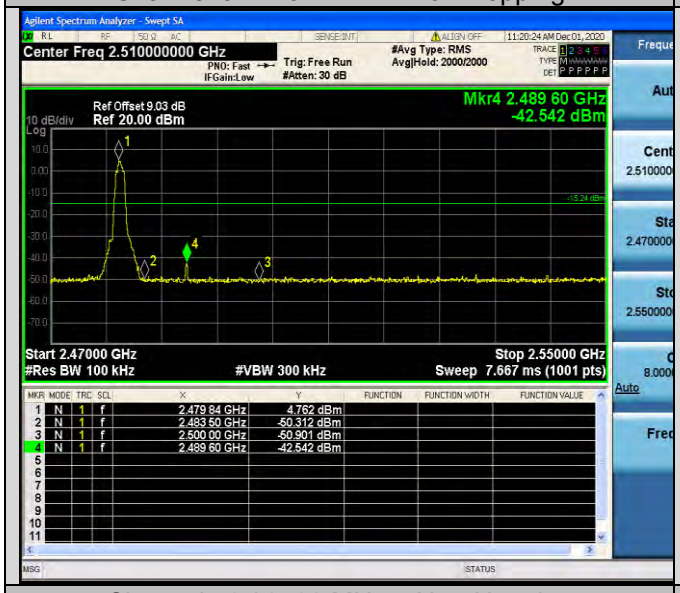
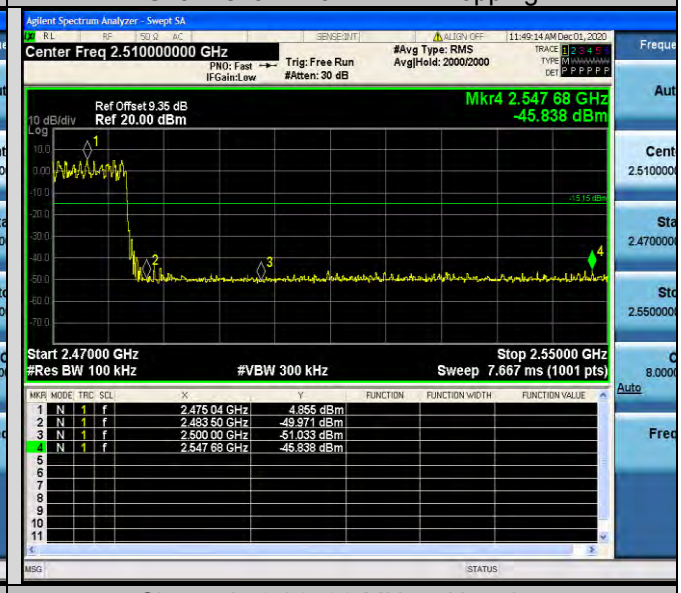


Channel 78 / 2480 MHz – Non-Hopping



Channel 78 / 2480 MHz – Hopping

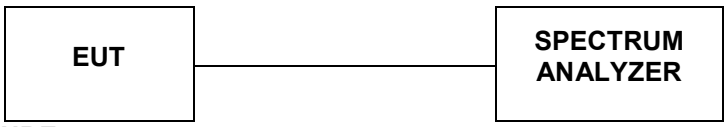
Band-edge for RF conducted emissions	
π/4-DQPSK	
	
Channel 0 / 2402 MHz – Non-Hopping	Channel 0 / 2402 MHz – Hopping
	
Channel 78 / 2480 MHz – Non-Hopping	Channel 78 / 2480 MHz – Hopping

Band-edge for RF conducted emissions	
8-DPSK	
	
Channel 0 / 2402 MHz – Non-Hopping	Channel 0 / 2402 MHz – Hopping
	
Channel 78 / 2480 MHz – Non-Hopping	Channel 78 / 2480 MHz – Hopping

NOTE: Hopping enabled and disabled have evaluated, and the worst data was reported.

4.7. Number of hopping frequency

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator.Set spectrum analyzer start 2400MHz to 2483.5MHz with RBW=100KHz and VBW=300KHz.

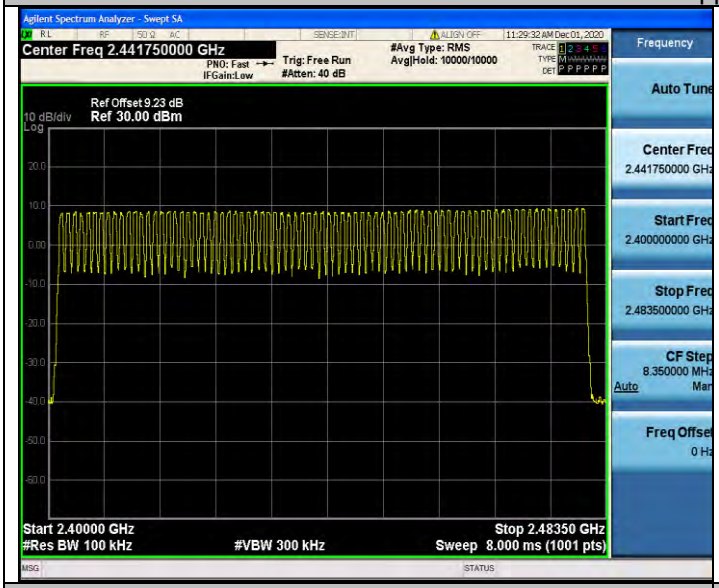
LIMIT

Frequency hopping systems in the 2400–2483.5MHz band shall use at least 15 channels.

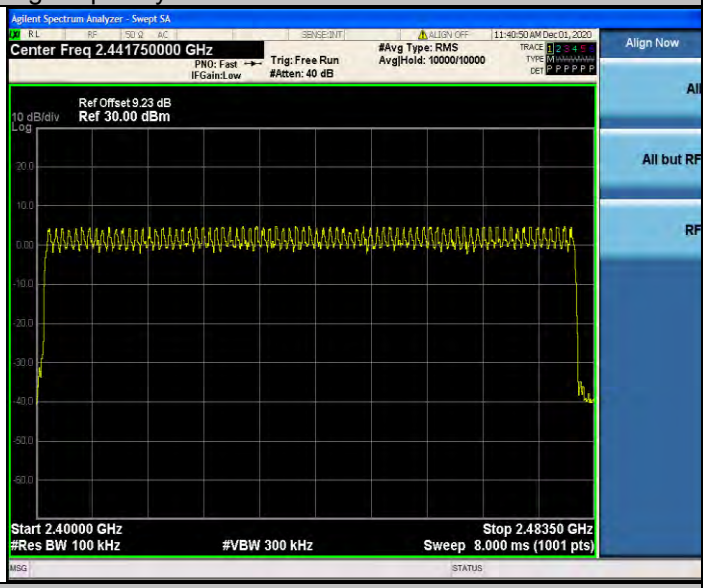
Temperature	24.2℃	Humidity	54.9%
Test Engineer	Moon Tan	Configurations	BT

Modulation	Number of Hopping Channel	Limit	Result
GFSK	79	≥15	Pass
π/4-DQPSK	79	≥15	Pass
8DPSK	79	≥15	Pass

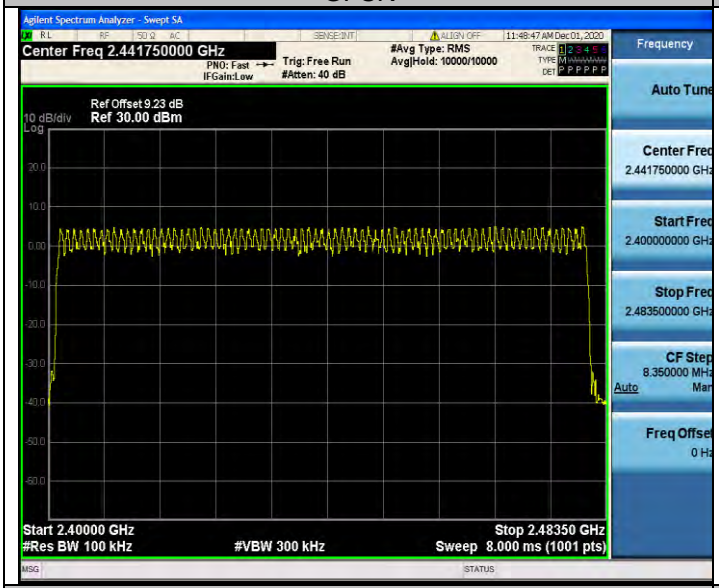
Number of hopping frequency



GFSK



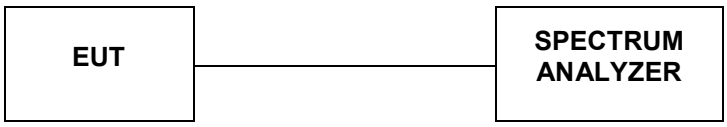
π/4-DQPSK



8DPSK

4.8. Time Of Occupancy(Dwell Time)

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. Set center frequency of spectrum analyzer=operating frequency with RBW=1MHz and VBW=3MHz,Span=0Hz.

LIMIT

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a pe-riod of 0.4 seconds multiplied by the number of hopping channels employed.

TEST RESULTS

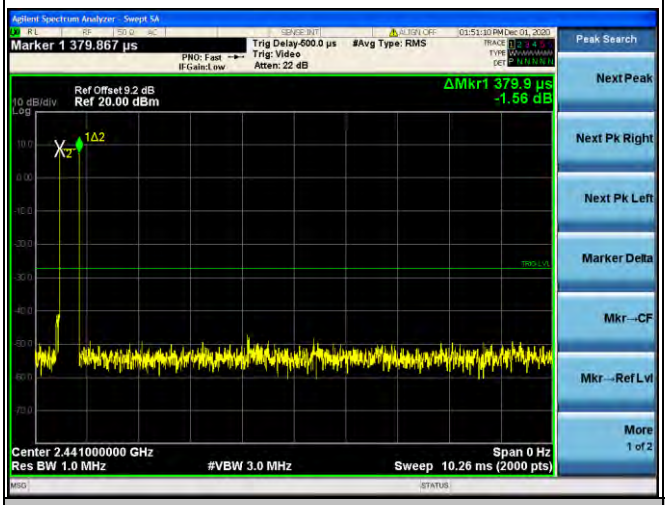
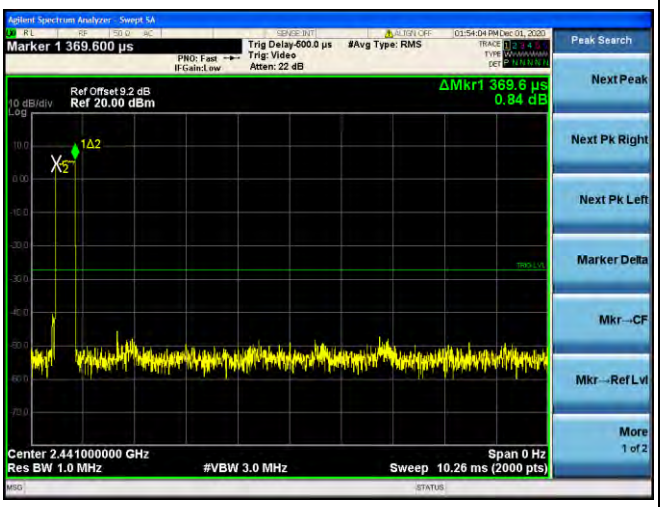
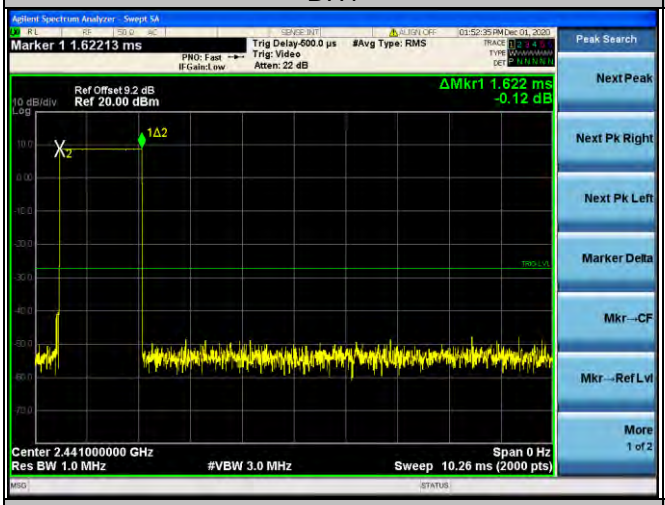
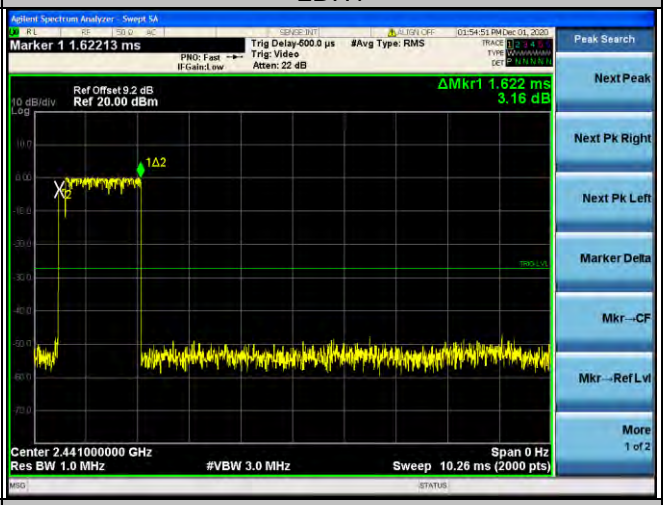
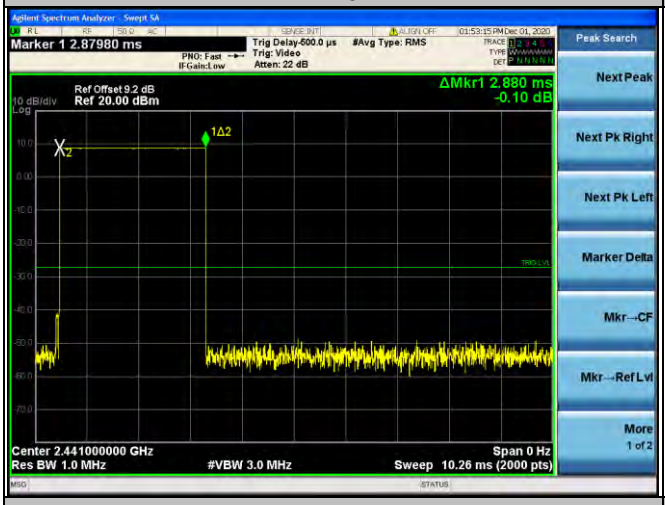
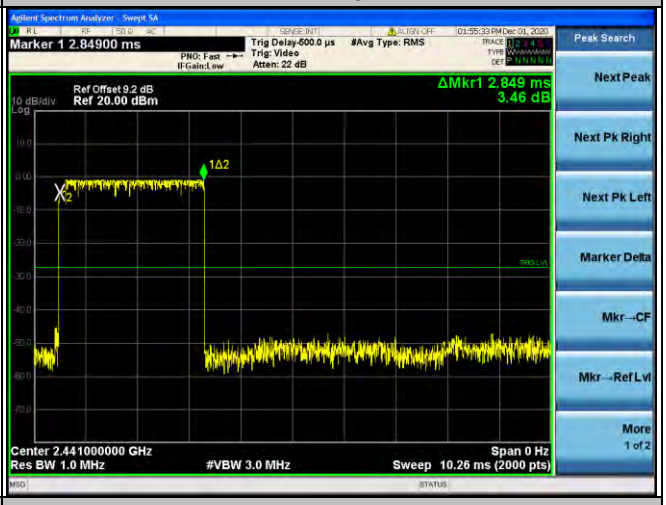
Temperature	24.2℃	Humidity	54.9%
Test Engineer	Moon Tan	Configurations	BT

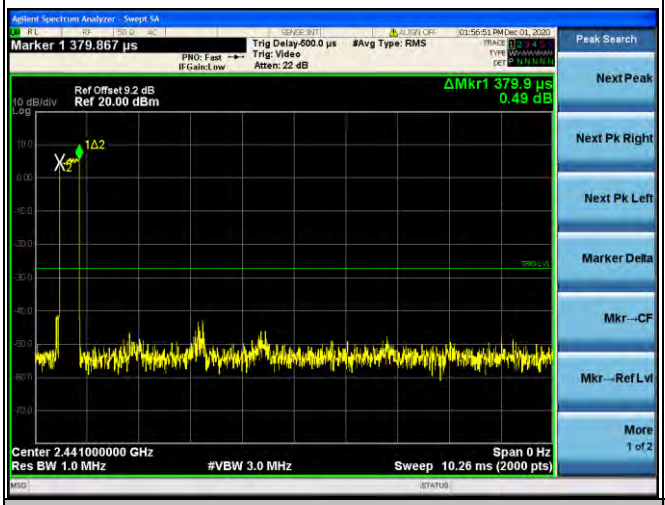
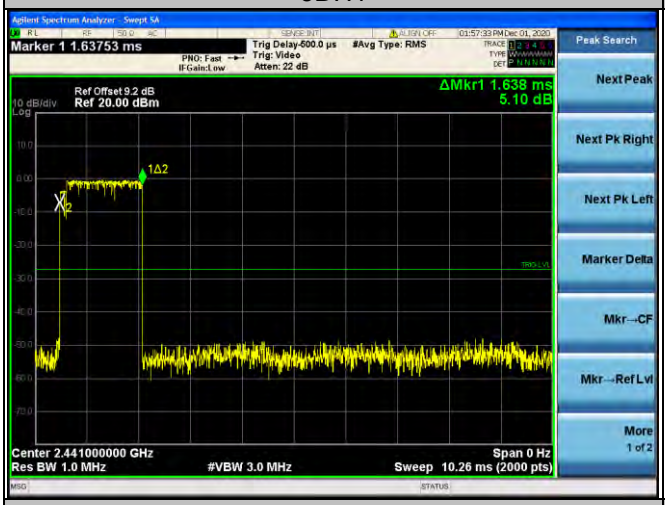
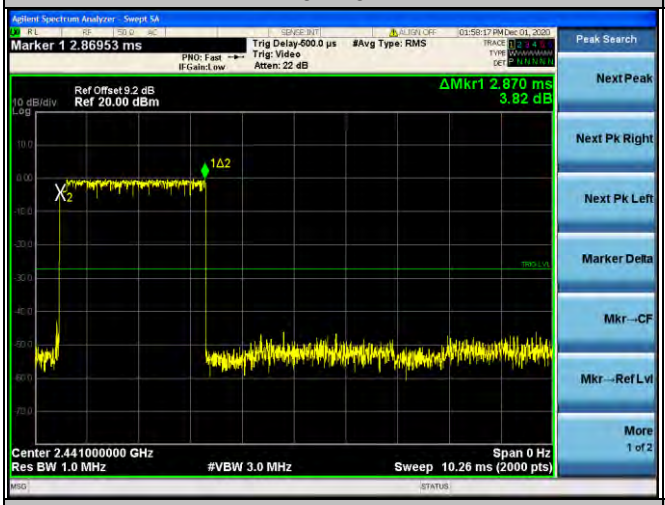
Modulation	Data Packet	Frequency	Pulse Duration	Dwell Time	Limits
			(ms)	(s)	(s)
GFSK	DH1	2441 MHz	0.38	0.12	0.40
	DH3	2441 MHz	1.62	0.26	0.40
	DH5	2441 MHz	2.88	0.31	0.40
π/4-DQPSK	2DH1	2441 MHz	0.37	0.12	0.40
	2DH3	2441 MHz	1.62	0.26	0.40
	2DH5	2441 MHz	2.85	0.30	0.40
8-DPSK	3DH1	2441 MHz	0.38	0.12	0.40
	3DH3	2441 MHz	1.64	0.26	0.40
	3DH5	2441 MHz	2.87	0.31	0.40

The Dwell Time=Burst Width*Total Hops. The detailed calculations are showed as follows:
The duration for dwell time calculation: 0.4[s]*hopping number=0.4[s]*79[ch] =31.6[s*ch];
The burst width [ms/hop/ch], which is directly measured, refers to the duration on one channel hop.
The hops per second for all channels: The selected EUT Conf uses a slot type of 5-Tx&1-Rx and a hopping rate of 1600 [ch*hop/s] for all channels. So the final hopping rate for all channels is 1600/6=266.67 [ch*hop/s]
The hops per second on one channel: 266.67 [ch*hops/s]/79 [ch] =3.38 [hop/s];
The total hops for all channels within the dwell time calculation duration: 3.38 [hop/s]*31.6[s*ch]=106.67 [hop*ch];
The dwell time for all channels hopping: 106.67 [hop*ch]*Burst Width [ms/hop/ch].

Remark:
1. Test results including cable loss;
2. Measured at difference Packet Type for each mode and recorded worst case for each mode.
3. Dwell Time Calculate formula:
   DH1: Dwell time=Pulse Time (ms) × (1600 ÷ 2 ÷ 79) ×31.6 Second
   DH3: Dwell time=Pulse Time (ms) × (1600 ÷ 4 ÷ 79) ×31.6 Second
   DH5: Dwell time=Pulse Time (ms) × (1600 ÷ 6 ÷ 79) ×31.6 Second

Test plot as follows:

GFSK	π/4-DQPSK
	
DH1	2DH1
	
DH3	2DH3
	
DH5	2DH5

8-DPSK	
	
3DH1	
	
3DH3	
	
3DH5	

4.9. Pseudorandom Frequency Hopping Sequence

TEST APPLICABLE

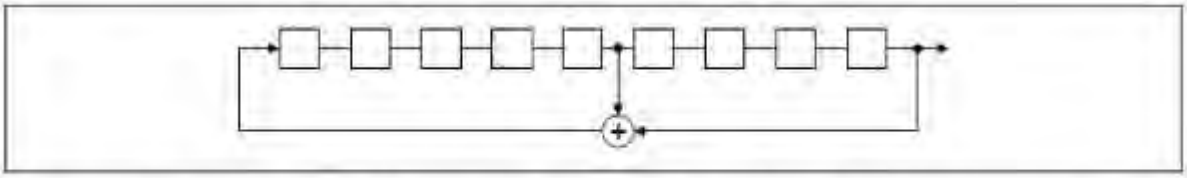
For 47 CFR Part 15C section 15.247 (a)(1) requirement:

Frequency hopping systems shall have hopping channel carrier fre-quencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hop-ping channel, whichever is greater. Al-ternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier fre-quencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to chan-nel frequencies that are selected at the system hopping rate from a pseudo ran-domly ordered list of hopping fre-quencies. Each frequency must be used equally on the average by each trans-mitter. The system receivers shall have input bandwidths that match the hop-ping channel bandwidths of their cor-responding transmitters and shall shift frequencies in synchronization with the transmitted signals.

EUT Pseudorandom Frequency Hopping Sequence Requirement

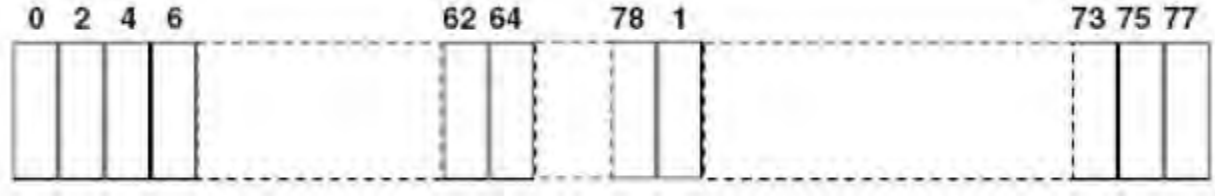
The pseudorandom frequency hopping sequence may be generated in a nice-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage.And the result is fed back to the input of the frist stage.The sequence begins with the frist one of 9 consecutive ones,for example:the shift register is initialized with nine ones.

- Number of shift register stages:9
- Length of pseudo-random sequence:29-1=511 bits
- Longest sequence of zeros:8(non-inverted signal)



Linear Feedback Shift Register for Generation of the PRBS sequence

An explame of pseudorandom frequency hopping sequence as follows:



Each frequency used equally one the average by each transmitter.
The system receiver have input bandwidths that match the hopping channel bandwidths of their corresponding transmitter and shift frequencies in synchronization with the transmitted signals.

4.10. Antenna Requirement

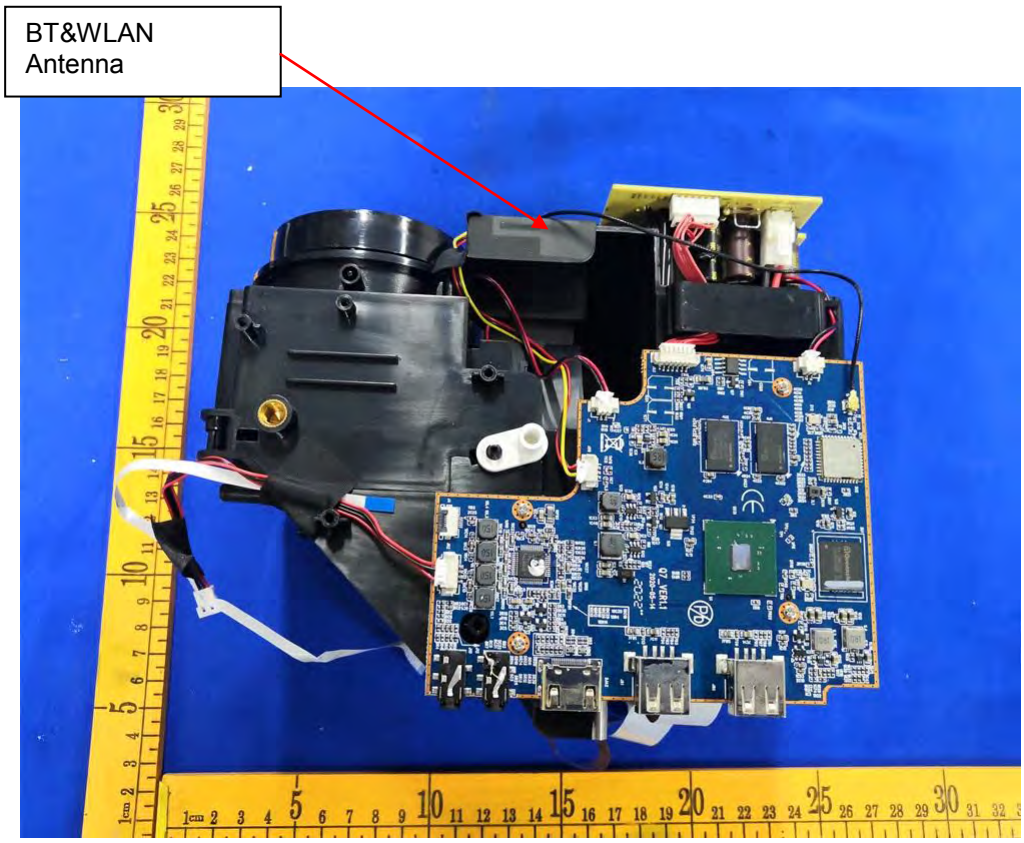
Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, 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.

And according to FCC 47 CFR Section 15.247 (c), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

Test Result

The antenna used for this product is Internal Antenna and that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is only 3.65dBi.



5. TEST SETUP PHOTOS OF THE EUT

Photo of Radiated Emissions Measurement

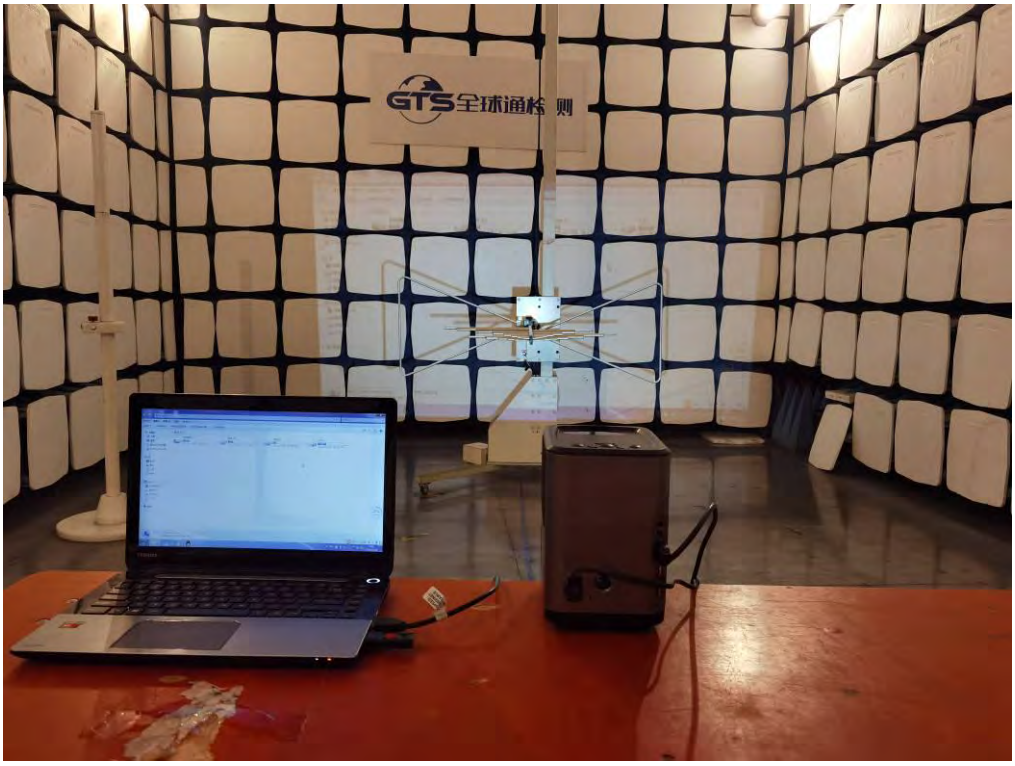


Fig. 1

Fig. 2

Photo of Conducted Emission Measurement

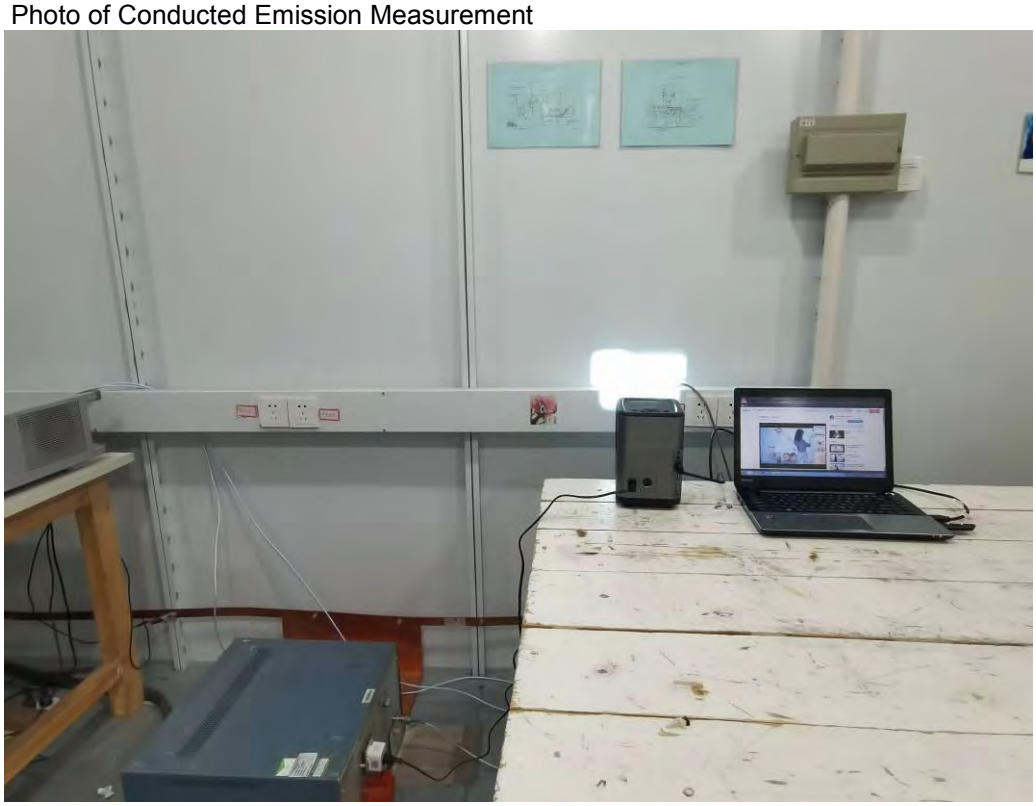


Fig. 3

6. EXTERNAL AND INTERNAL PHOTOS OF THE EUT

6.1. External photos of the EUT

Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 7

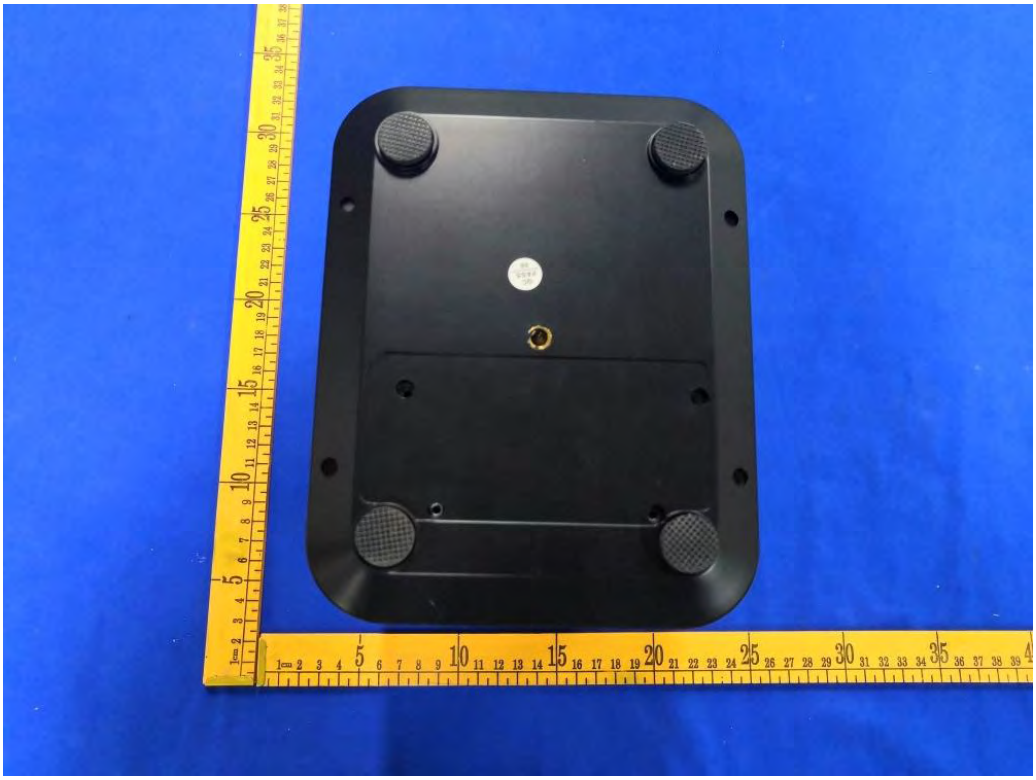


Fig. 8

6.2. Internal photos of the EUT

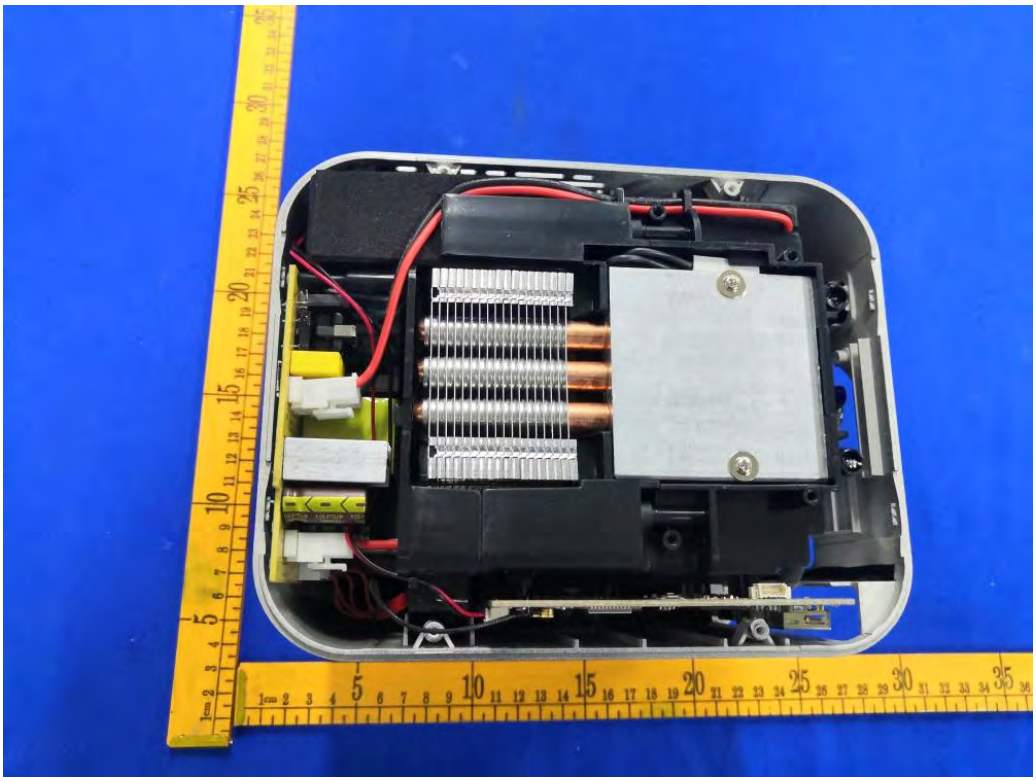


Fig. 9

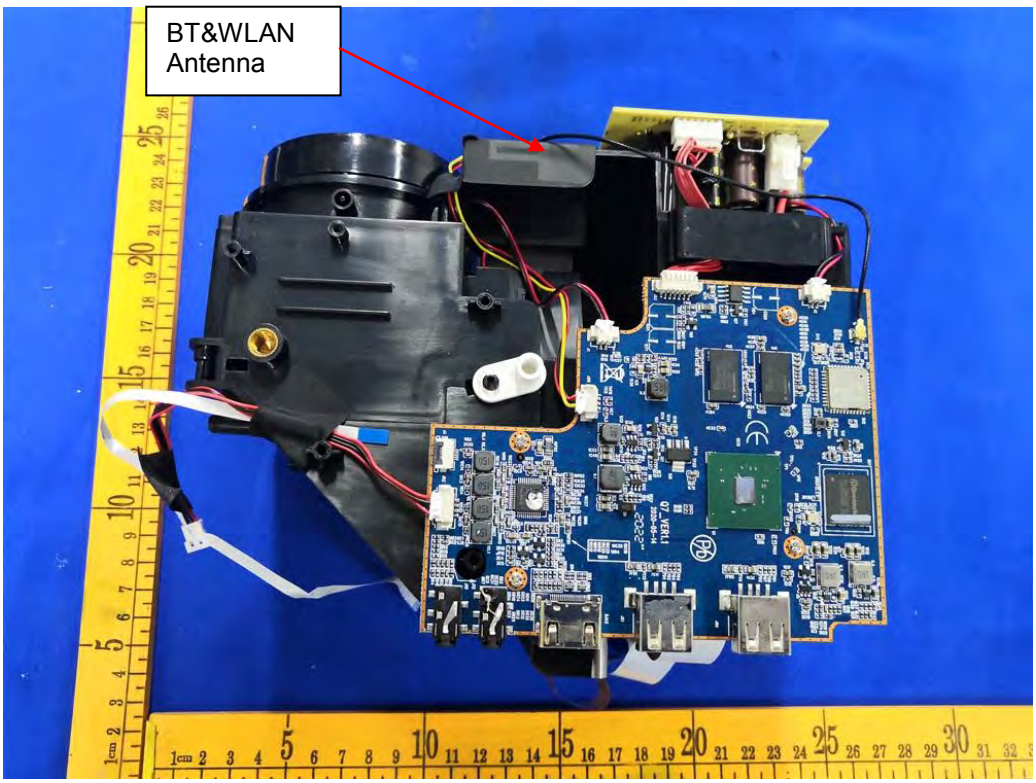


Fig. 10

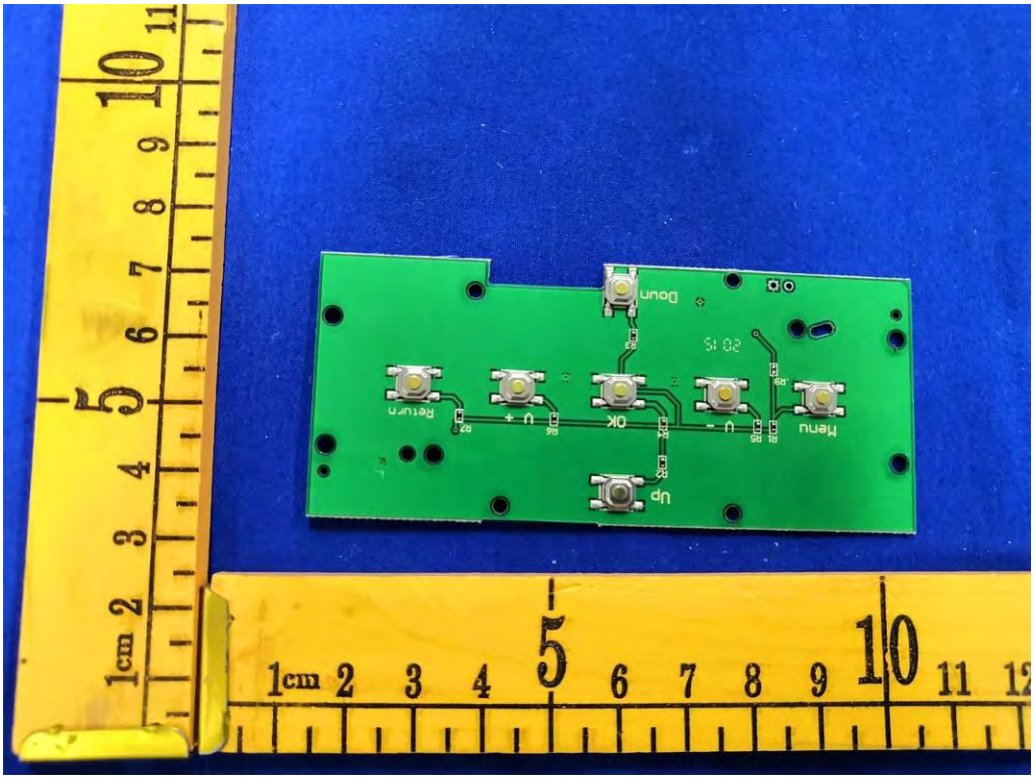


Fig. 11

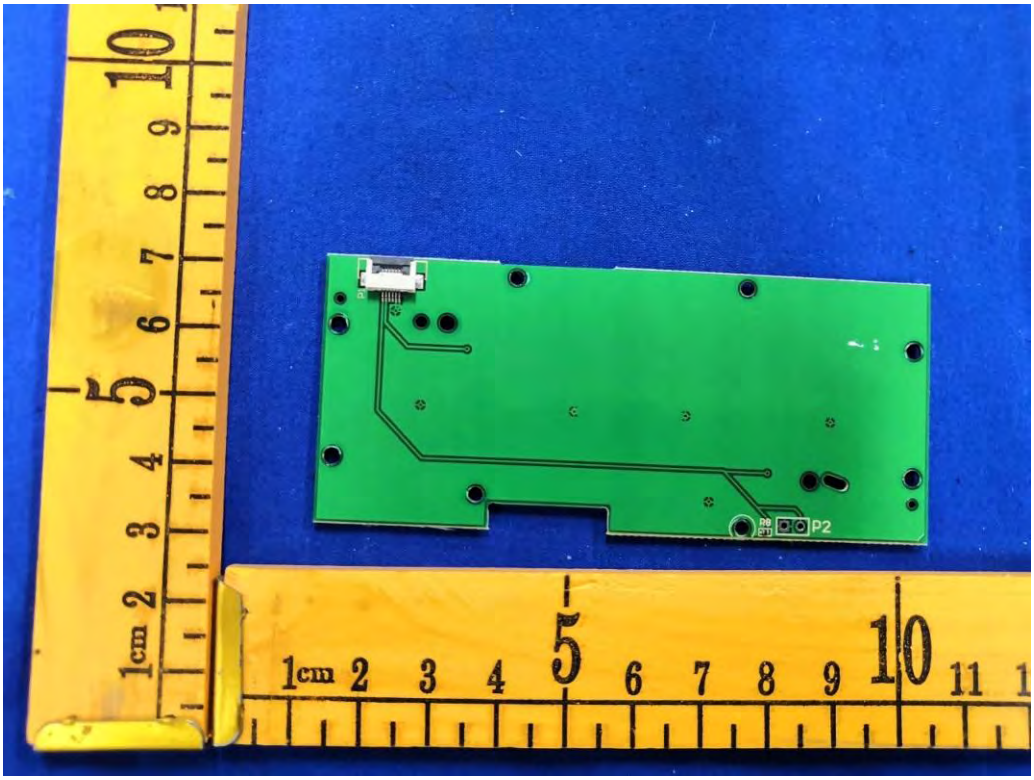


Fig. 12

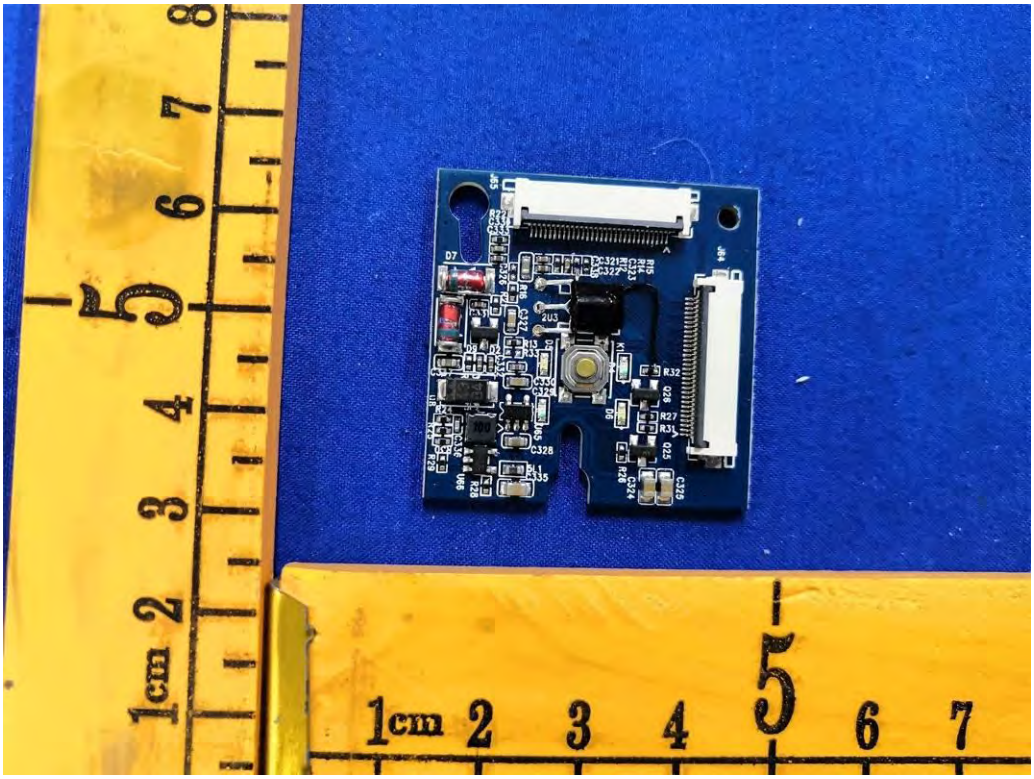


Fig. 13

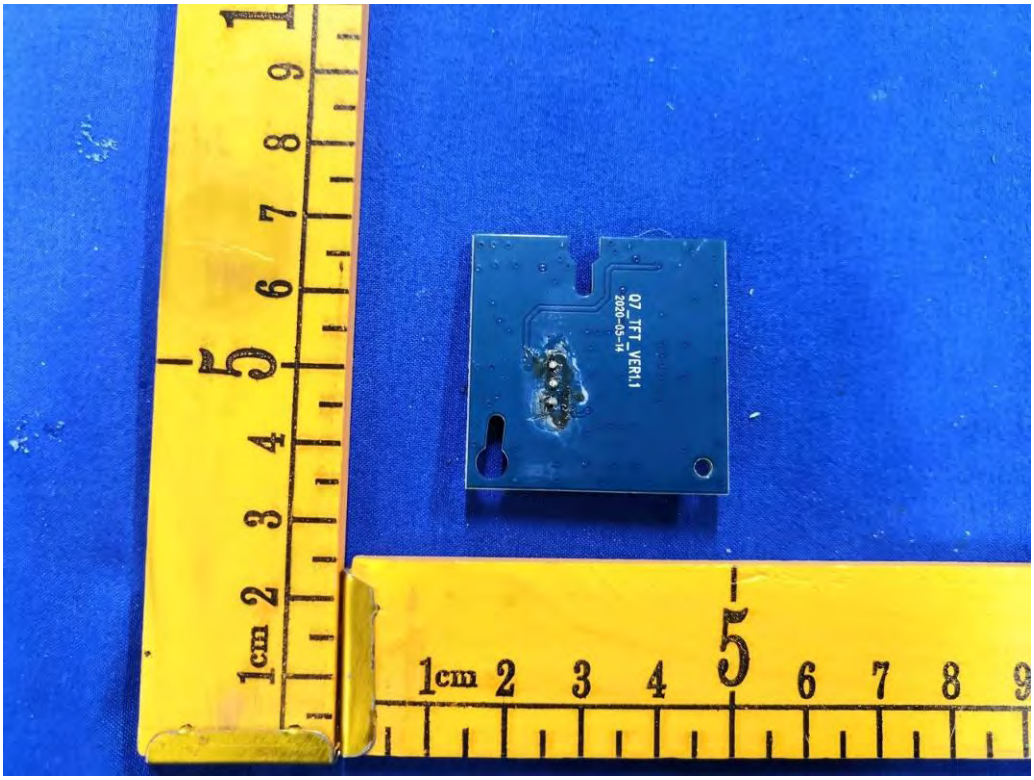


Fig. 14

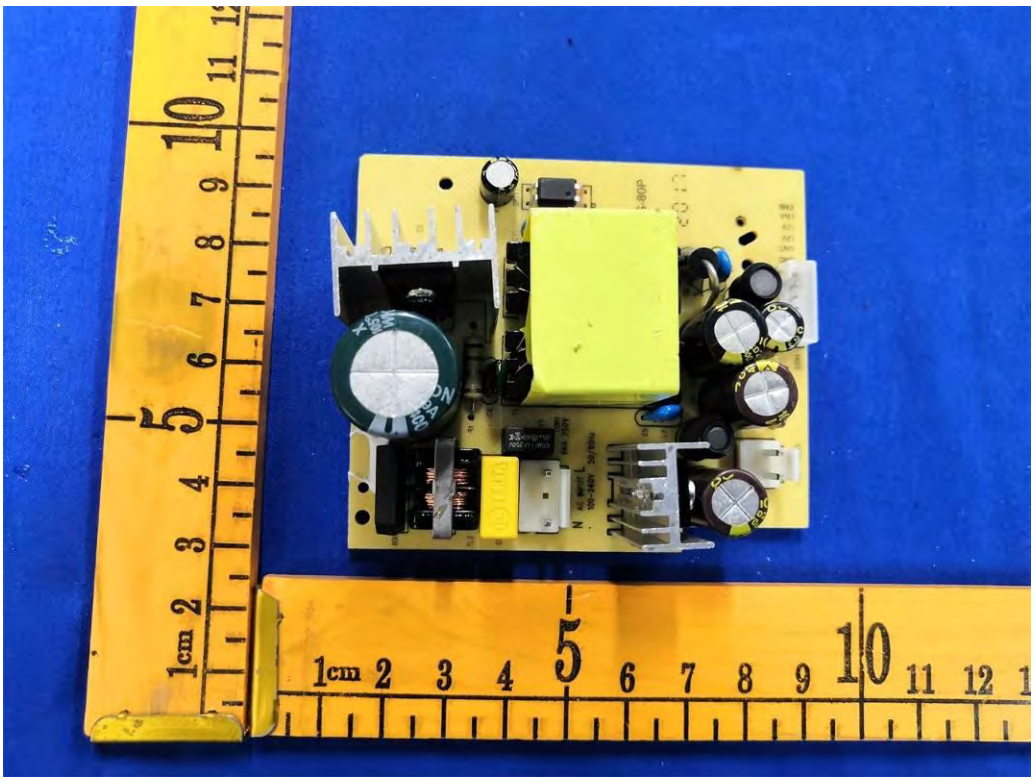


Fig. 15

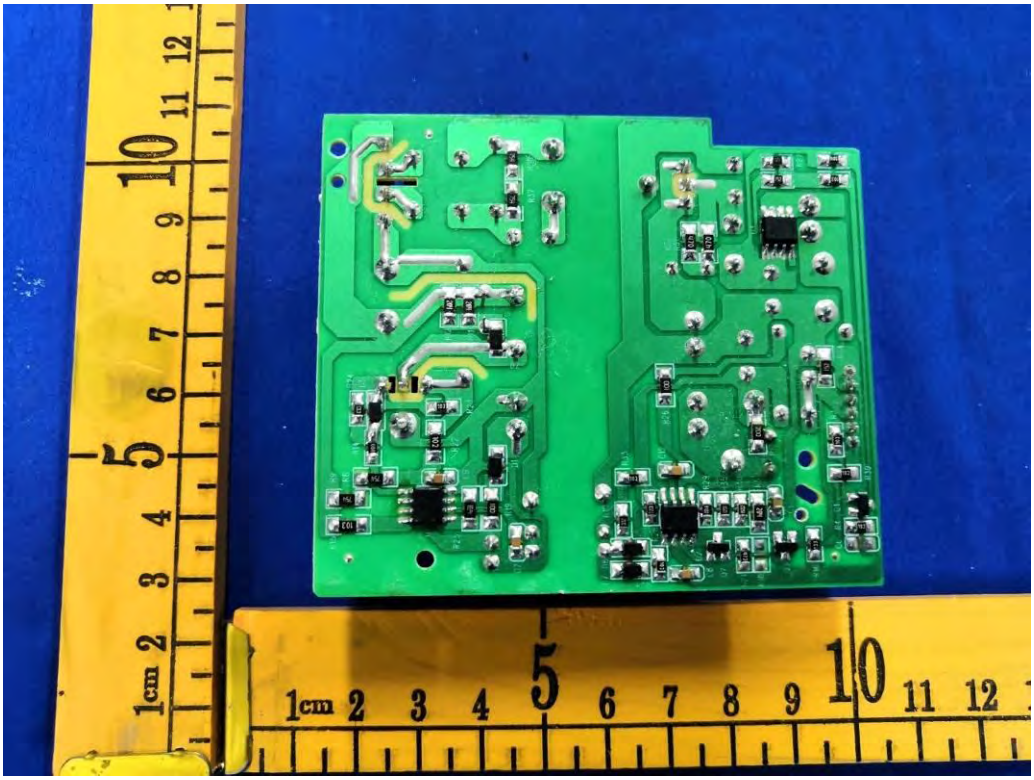


Fig. 16

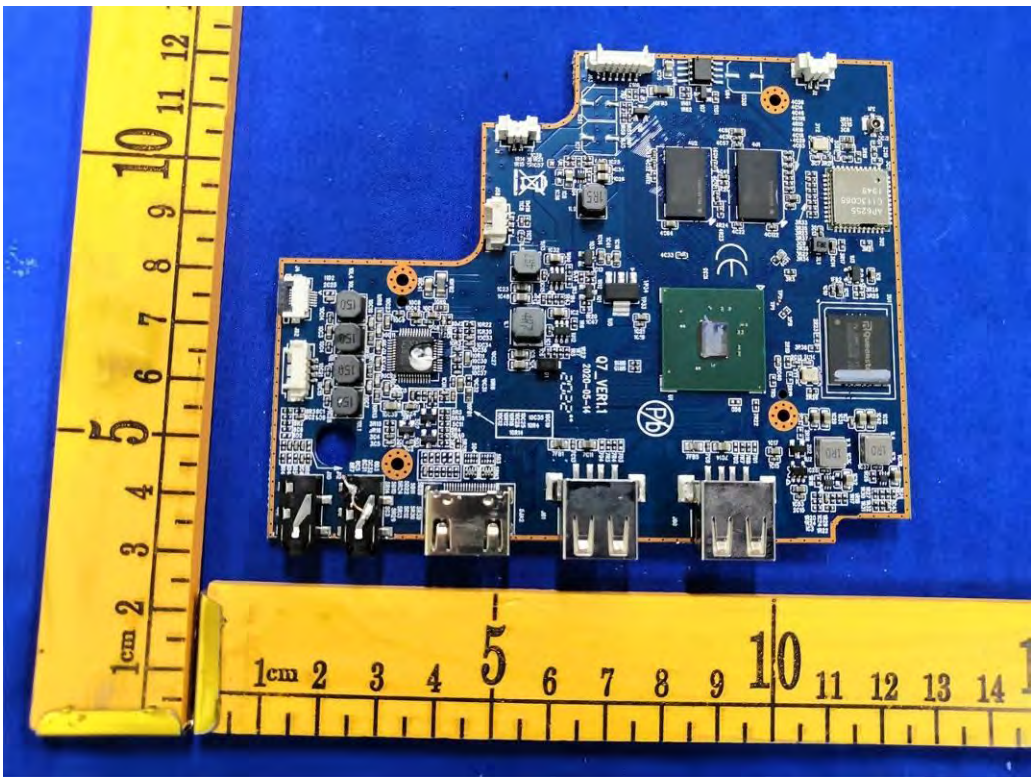


Fig. 17

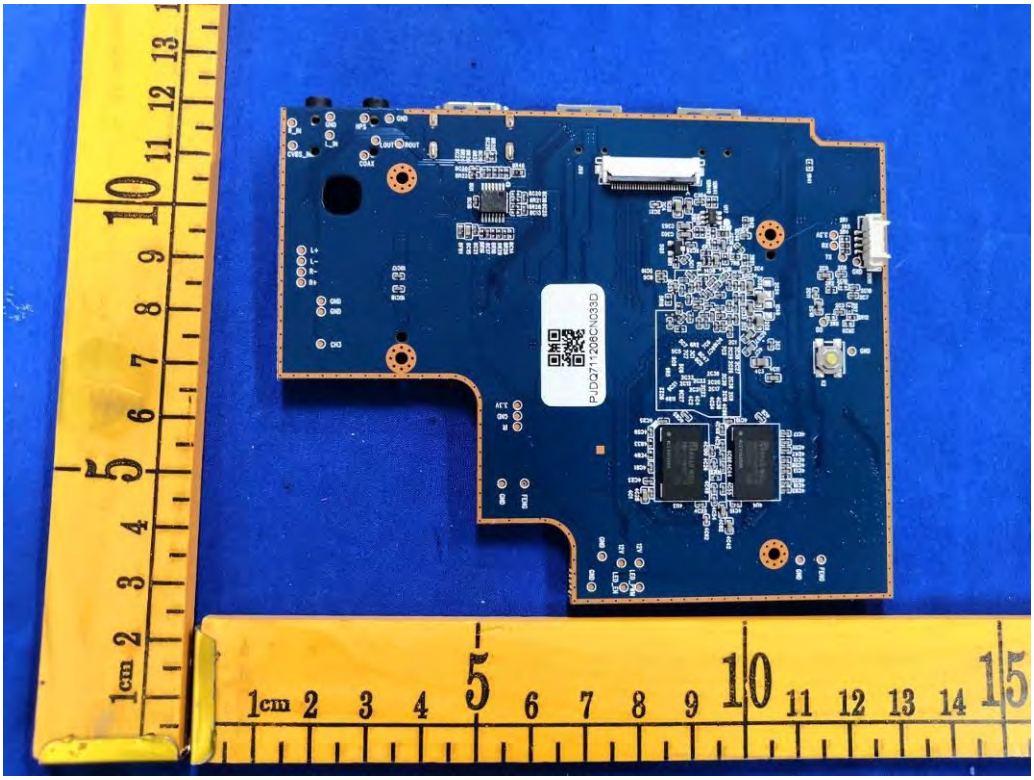


Fig. 18

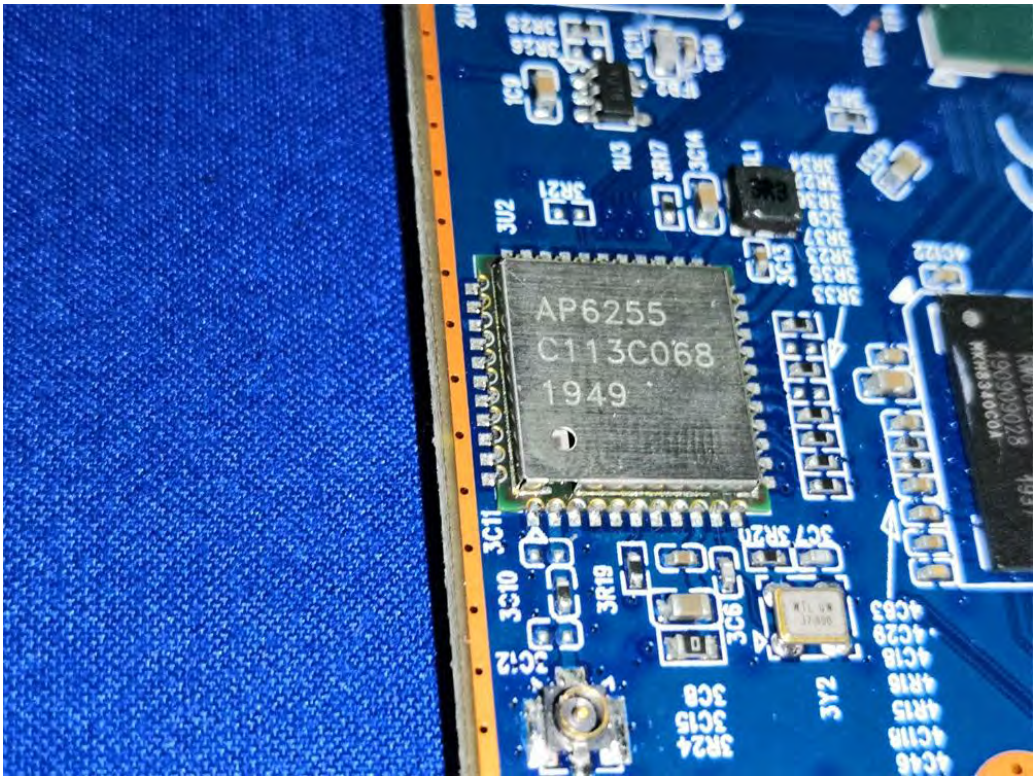


Fig. 19

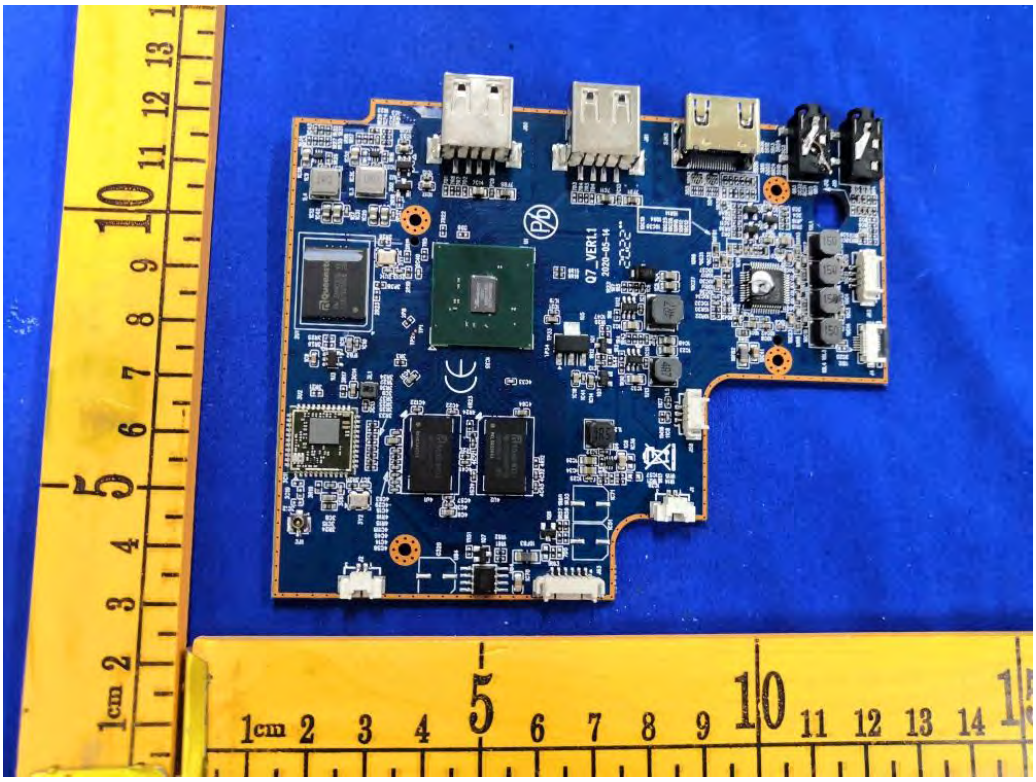


Fig. 20

Fig. 21

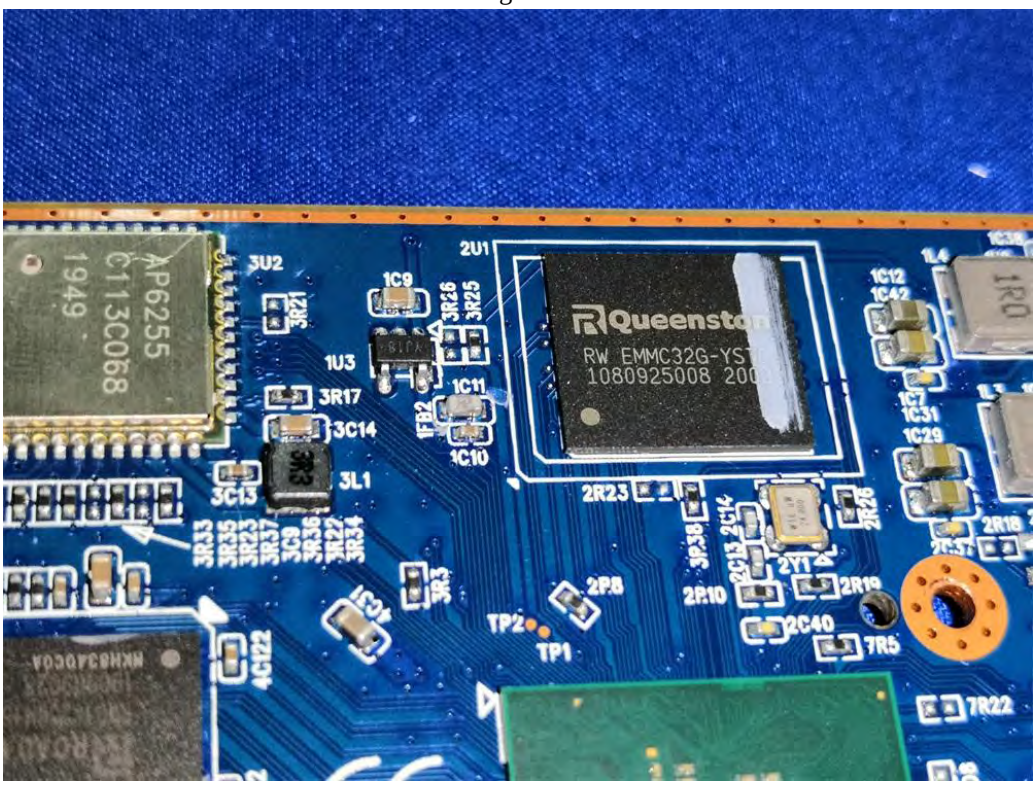


Fig. 22

.....End of Report.....