FCC TEST REPORT

Test report
On Behalf of
Guangzhou HOATOA Digital Technology Co., Ltd
For
CAR DVD
Model No.: VR-623B, PD-623B, VR-624B, NSD-623B, TI-623B

FCC ID: 2AI9D-VR623B

Prepared for :	**Guangzhou HOATOA Digital Technology Co., Ltd** **Building A,Kadanlu industrial park,Dongjing industrial ared,Xinhua street,Huadu, Guangzhou, China**
Prepared By :	**Shenzhen HUAK Testing Technology Co., Ltd.** **F1-008, Tai Yi Building, No.1, Haicheng West Road, Xixiang Street, Bao'an District, Shenzhen City, China**
Date of Test:	**Aug. 13, 2016 ~ Aug. 15, 2016**
Date of Report:	**Aug. 15, 2016**
Report Number:	**HK160812014-E**

TEST RESULT CERTIFICATION

Applicant's name	:	Guangzhou HOATOA Digital Technology Co., Ltd
Address	:	Building A,Kadanlu industrial park,Dongjing industrial ared,Xinhua street,Huadu, Guangzhou, China
Manufacture's Name	:	Guangzhou HOATOA Digital Technology Co., Ltd
Address	:	Building A,Kadanlu industrial park,Dongjing industrial ared,Xinhua street,Huadu, Guangzhou, China
Product description		
Trade Mark:		SOUNDSTREAM/POWERACOUSTIK/NESA/FARENHEIT
Product name	:	CAR DVD
Model and/or type reference	:	VR-623B, PD-623B, VR-624B, NSD-623B, TI-623B
Standards	:	FCC Rules and Regulations Part 15 Subpart C Section 15.249 ANSI C63.10: 2013

Date of Test	:	
Date (s) of performance of tests	:	**Aug. 13, 2016 ~ Aug. 15, 2016**
Date of Issue	:	**Aug. 15, 2016**
Test Result	:	**Pass**

Testing Engineer : Eric Xie

(Eric Xie)

Technical Manager : Dora Qin

(Dora Qin)

Authorized Signatory : Kait Chen

(Kait Chen)

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1.1 TEST PROCEDURES AND RESULTS

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CONDUCTED EMISSIONS TEST	N/A
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BAND EDGE	COMPLIANT
OCCUPIED BANDWIDTH MEASUREMENT	COMPLIANT
ANTENNA REQUIREMENT	COMPLIANT

1.2 TEST FACILITY

Test Firm : Dongguan Dongdian Testing Service Co., Ltd
Certificated by FCC, Registration No.: 270092

Address No.17 Zongbu road 2, Songshan Lake Sci&Tech Park, DongGuan City, Guangdong province,523808 China

1.3 MEASUREMENT UNCERTAINTY

Measurement Uncertainty

Conducted Emission Expanded Uncertainty	=	2.23dB, k=2
Radiated emission expanded uncertainty(9kHz-30MHz)	=	3.08dB, k=2
Radiated emission expanded uncertainty(30MHz-1000MHz)	=	4.42dB, k=2
Radiated emission expanded uncertainty(Above 1GHz)	=	4.06dB, k=2

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	CAR DVD
Model Name	VR-623B
Serial Model	PD-623B, VR-624B, NSD-623B, TI-623B
Model Difference	All model's the function, software and electric circuit are the same, only with a product color and model named different. Test sample model: VR-623B.
FCC ID	2AI9D-VR623B
Antenna Type	PCB Antenna
Antenna Gain	0dBi
BT Operation frequency	2402-2480MHz
Number of Channels	79CH
Modulation Type	GFSK
Power Source	DC Voltage
Power Rating	DC 12V for battery

2.1.1 Carrier Frequency of Channels

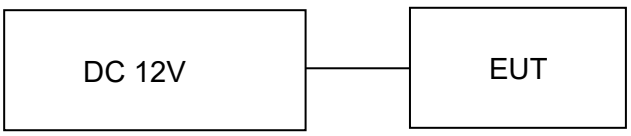
Channel List					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	27	2429	54	2456
01	2403	28	2430	55	2457
02	2404	29	2431	56	2458
03	2405	30	2432	57	2459
04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454		
26	2428	53	2455		

Operation of EUT during testing

Operating Mode
The mode is used: **Transmitting mode**
Low Channel: 2402MHz
Middle Channel: 2441MHz
High Channel: 2480MHz

2.2 DESCRIPTION OF TEST SETUP

Operation of EUT during testing



2.3 MEASUREMENT INSTRUMENTS LIST

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	Agilent	E4407B	MY45108040	May. 06, 2016	1 Year
2.	Test Receiver	R&S	ESCI	101318	May. 06, 2016	1 Year
3.	Bilog Antenna	TESEQ	CBL6111D	31216	May. 22, 2016	1 Year
4.	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	N/A	N/A
5.	Spectrum Analyzer	ADVANTEST	R3132	150900201	May. 06, 2016	1 Year
6.	Horn Antenna	EM	EM-AH-10180	2011071402	May. 22, 2016	1 Year
7.	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	May. 22, 2016	1 Year
8.	Amplifier	EM	EM-30180	060538	May. 06, 2016	N/A
9.	Loop Antenna	ARA	PLA-1030/B	1029	May. 22, 2016	1 Year
10.	Power Meter	R&S	NRVS	100696	May. 06, 2016	1 Year
11.	Power Sensor	R&S	URV5-Z4	0395.1619.05	May. 06, 2016	1 Year
12.	Cable	Resenberger	SUCOFLEX 104	314683/2	May. 06, 2016	N/A
13.	Cable	Resenberger	SUCOFLEX 104	325762/2	May. 06, 2016	1 Year
14.	Test Receiver	R&S	ESCI	101160	May. 06, 2016	1 Year
15.	LISN	R&S	ENV216	101313	May. 06, 2016	1 Year
16.	LISN	EMCO	3816/2	00042990	May. 06, 2016	1 Year
17.	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	N/A	N/A
18.	Passive Voltage Probe	R&S	ESH2-Z3	100196	May. 06, 2016	1 Year
19.	Absorbing clamp	R&S	MOS-21	100423	May. 06, 2016	1 Year
20.	Cable	Resenberger	SUCOFLEX 104	314296/2	May. 06, 2016	1 Year
21.	Spectrum analyzer	Agilent	N9020A	MY49911032	May. 06, 2016	1 Year

3. CONDUCTED EMISSIONS TEST

3.1 Conducted Power Line Emission Limit

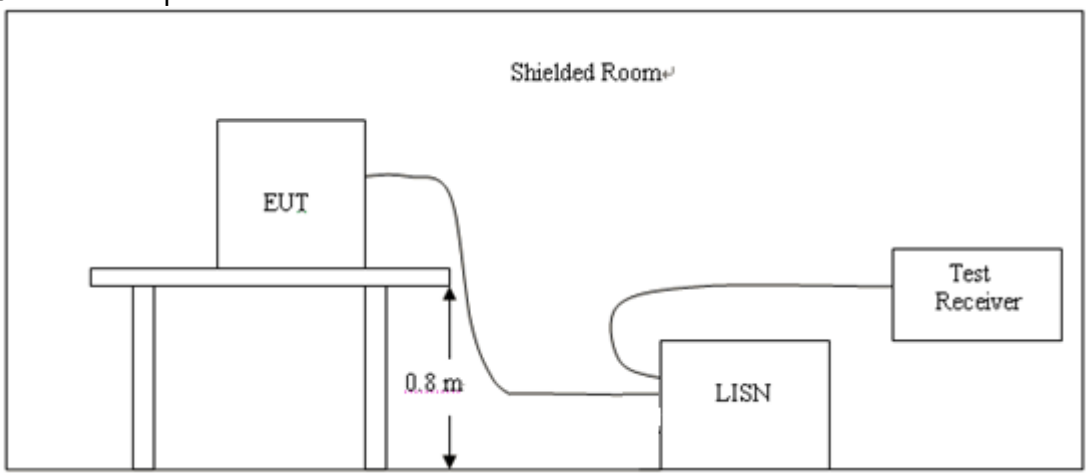
For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following

Frequency (MHz)	Maximum RF Line Voltage (dBμV)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

* Decreasing linearly with the logarithm of the frequency

For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

3.2 Test Setup



3.3 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.
2, Support equipment, if needed, was placed as per ANSI C63.10.
3, All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4, If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5, All support equipments received AC power from a second LISN, if any.
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.

3.4 Test Result

Not applicable.

Note: EUT power supply by battery, so this test not applicable.

4 RADIATED EMISSION TEST

4.1 Radiation Limit

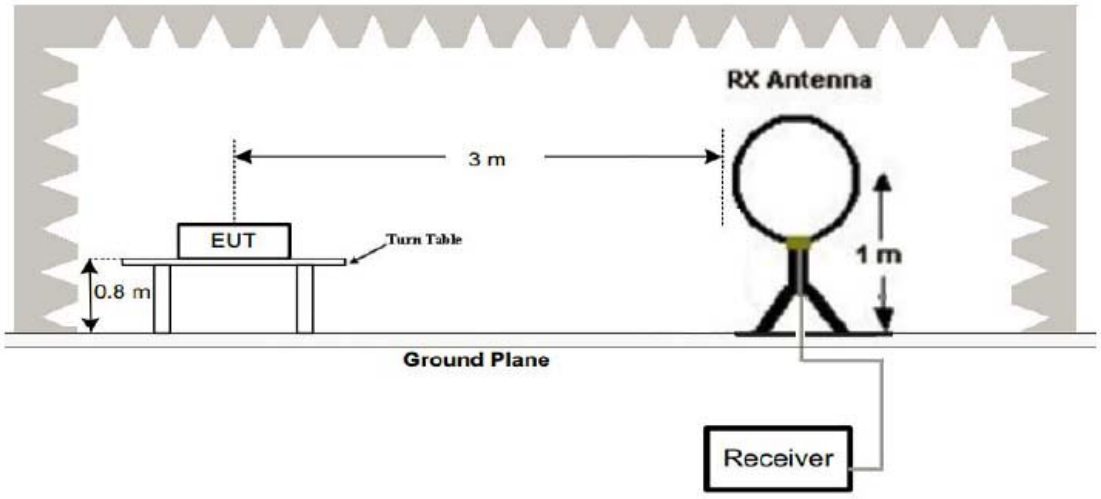
For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values：

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
30-88	3	40	100
88-216	3	43.5	150
216-960	3	46	200
Above 960	3	54	500

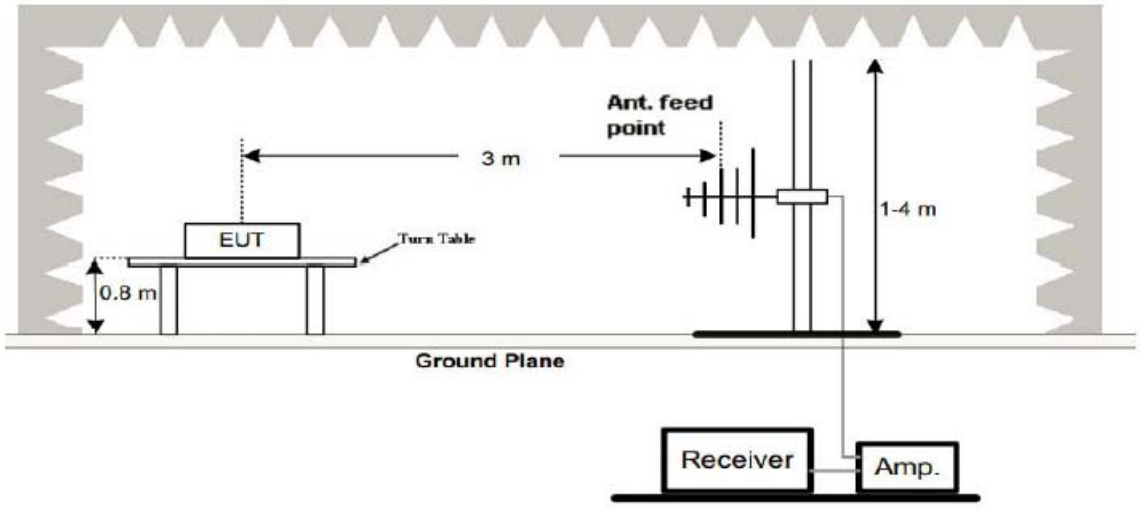
For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

4.2 Test Setup

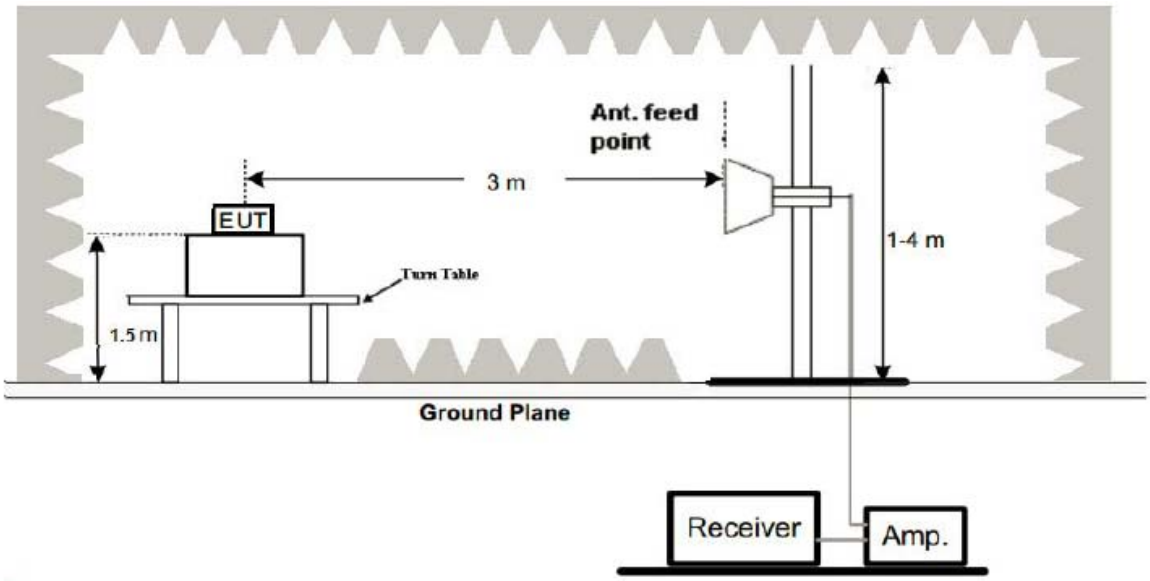
（1）Radiated Emission Test-Up Frequency Below 30MHz



（2）Radiated Emission Test-Up Frequency 30MHz~1GHz



（3）Radiated Emission Test-Up Frequency Above 1GHz



4.3 Test Procedure

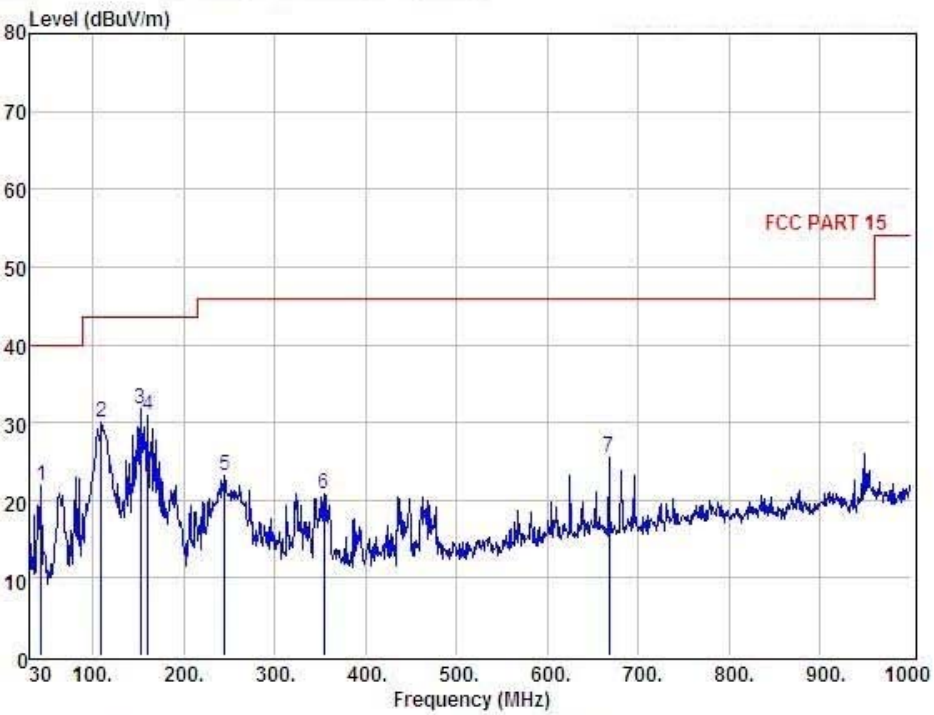
1. Below 1GHz measurement the EUT is placed on turntable which is 0.8m above ground plane. And above 1GHz measurement EUT was placed on low permittivity and low tangent turn table which is 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The test frequency range from 9KHz to 25GHz per FCC PART 15.33(a).

Note:
For battery operated equipment, the equipment tests shall be performed using a new battery.

4.4 Test Result

PASS
All the test modes completed for test. The worst case of Radiated Emission is CH 2402; the test data of this mode was reported.

Below 1GHz Test Results:
Antenna polarity: H

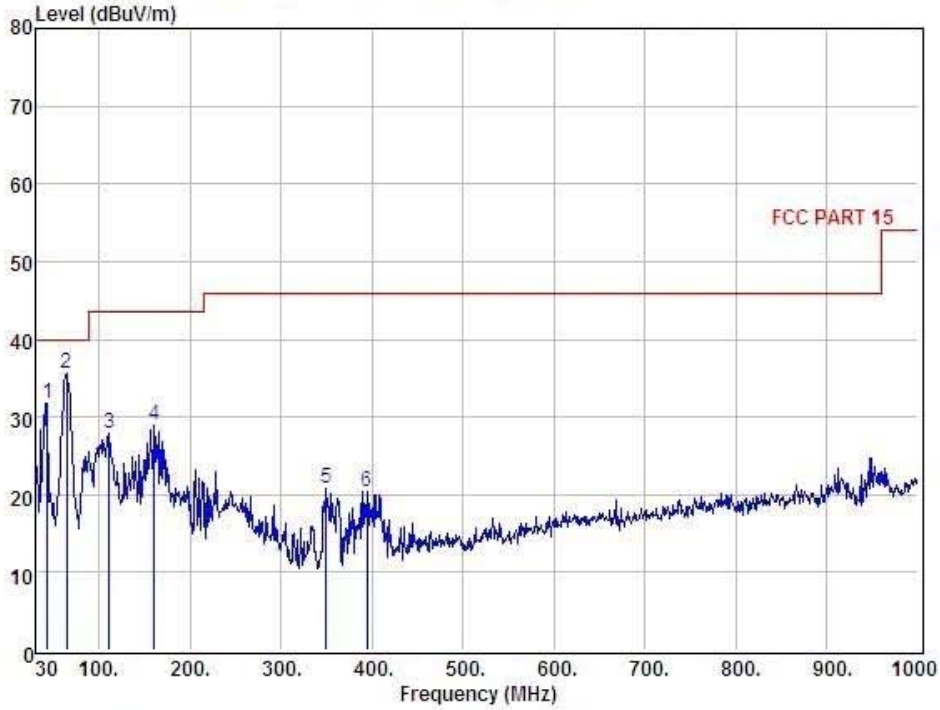


Condition : FCC PART 15 3m POL: HORIZONTAL

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	43.58	39.21	13.79	31.17	0.09	21.92	40.00	-18.08	QP
2	109.54	49.93	11.13	31.43	0.38	30.01	43.50	-13.49	QP
3	152.22	48.55	14.16	31.43	0.41	31.69	43.50	-11.81	QP
4	160.95	47.67	14.14	31.31	0.46	30.96	43.50	-12.54	QP
5	245.34	41.67	11.52	31.00	0.87	23.06	46.00	-22.94	QP
6	353.98	36.96	13.91	30.65	0.64	20.86	46.00	-25.14	QP
7	667.29	35.60	19.30	30.30	0.96	25.56	46.00	-20.44	QP

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

Antenna polarity: V



Condition : FCC PART 15 3m POL: VERTICAL

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	43.58	49.09	13.79	31.17	0.09	31.80	40.00	-8.20	QP
2	63.95	54.73	11.98	31.32	0.24	35.63	40.00	-4.37	QP
3	111.48	47.53	11.32	31.40	0.44	27.89	43.50	-15.61	QP
4	160.95	45.66	14.14	31.31	0.46	28.95	43.50	-14.55	QP
5	349.13	36.95	13.80	30.60	0.60	20.75	46.00	-25.25	QP
6	394.72	36.00	14.64	30.86	0.67	20.45	46.00	-25.55	QP

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

Remark：

(1) Measuring frequencies from 9 KHz to the 1 GHz, Radiated emission test from 9KHz to 30MHz was verified, and no any emission was found except system noise floor.

(2) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.

(3) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.

Above 1 GHz Test Results:

CH Low (2402MHz)
Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2402	111.08	-5.84	105.24	114	-8.76	peak
2402	84.48	-5.84	78.64	94	-15.36	AVG
4804	61.22	-3.64	57.58	74	-16.42	peak
4804	45.91	-3.64	42.27	54	-11.73	AVG
7206	57.00	-0.95	56.05	74	-17.95	peak
7206	42.27	-0.95	41.32	54	-12.68	AVG
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---	---	---	---	---	---	---
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2402	105.95	-5.84	100.11	114	-13.89	peak
2402	79.92	-5.84	74.08	94	-19.92	AVG
4804	60.18	-3.64	56.54	74	-17.46	peak
4804	44.80	-3.64	41.16	54	-12.84	AVG
7206	56.59	-0.95	55.64	74	-18.36	peak
7206	41.76	-0.95	40.81	54	-13.19	AVG
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

CH Middle (2441MHz)
Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2441	103.14	-5.71	97.43	114	-16.57	peak
2441	76.78	-5.71	71.07	94	-22.93	AVG
4882	60.20	-3.51	56.69	74	-17.31	peak
4882	44.83	-3.51	41.32	54	-12.68	AVG
7323	54.47	-0.82	53.65	74	-20.35	peak
7323	41.26	-0.82	40.44	54	-13.56	AVG
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Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2441	100.29	-5.71	94.58	114	-19.42	peak
2441	74.13	-5.71	68.42	94	-25.58	AVG
4882	57.45	-3.51	53.94	74	-20.06	peak
4882	43.20	-3.51	39.69	54	-14.31	AVG
7323	52.98	-0.82	52.16	74	-21.84	peak
7323	38.43	-0.82	37.61	54	-16.39	AVG
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---	---	---	---	---	---	---
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

CH High (2480MHz)
Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2480	98.19	-5.65	92.54	114	-21.46	peak
2480	72.29	-5.65	66.64	94	-27.36	AVG
4960	57.18	-3.43	53.75	74	-20.25	peak
4960	42.70	-3.43	39.27	54	-14.73	AVG
7440	55.17	-0.75	54.42	74	-19.58	peak
7440	40.93	-0.75	40.18	54	-13.82	AVG
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---	---	---	---	---	---	---
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2480	96.81	-5.65	91.16	114	-22.84	peak
2480	71.56	-5.65	65.91	94	-28.09	AVG
4960	55.90	-3.43	52.47	74	-21.53	peak
4960	41.71	-3.43	38.28	54	-15.72	AVG
7440	56.31	-0.75	55.56	74	-18.44	peak
7440	40.44	-0.75	39.69	54	-14.31	AVG
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---	---	---	---	---	---	---
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Remark：
(1) Measuring frequencies from 1 GHz to the 25 GHz。
(2) “F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency.
(3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
(4) 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.
(5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.
(6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.

5 BAND EDGE

5.1 Limits

FCC PART 15.249(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

5.2 Test Procedure

The band edge compliance of RF radiated emission should be measured by following the guidance in ANSI C63.10 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW to 100KHz and VBM to 300KHz to measure the peak field strength and set RBW to 1MHz and VBW to 10Hz to measure the average radiated field strength.The conducted RF band edge was measured by using a spectrum analyzer. Set span wide enough to capture the highest in-band emission and the emission at the band edge. Set RBW to 100 KHz and VBW to 300 KHz, to measure the conducted peak band edge.

5.3 Test Result

PASS

Radiated Band Edge Test:
Operation Mode: TX CH Low (2402MHz)
Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2390	51.89	-5.81	46.08	74	-27.92	peak
2390	/	-5.81	/	54	/	AVG
2400	60.79	-5.84	54.95	74	-19.05	peak
2400	47.01	-5.84	41.17	54	-12.83	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2390	51.00	-5.81	45.19	74	-28.81	peak
2390	/	-5.81	/	54	/	AVG
2400	59.48	-5.84	53.64	74	-20.36	peak
2400	45.11	-5.84	39.27	54	-14.73	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: TX CH High (2480MHz)

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	52.07	-5.65	46.42	74	-27.58	peak
2483.5	/	-5.65	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	50.53	-5.65	44.88	74	-29.12	peak
2483.5	/	-5.65	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						
Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit.						

6 OCCUPIED BANDWIDTH MEASUREMENT

6.1 Test Setup

Same as Radiated Emission Measurement

6.2 Test Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set EUT as normal operation.
3. Based on FCC Part15 C Section 15.239(a): RBW= 10KHz. VBW= 30 KHz, Span=1MHz.
4. The useful radiated emission from the EUT was detected by the spectrum analyser with peak detector.

6.3 Measurement Equipment Used

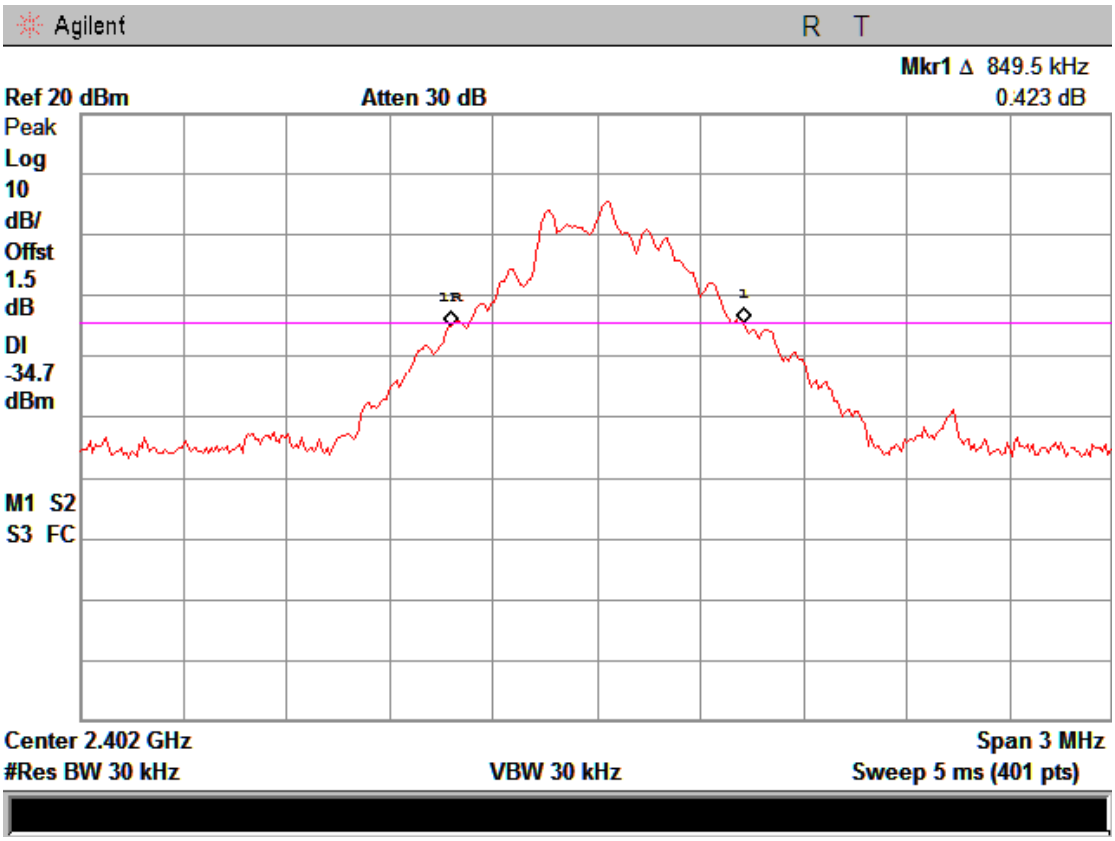
Same as Radiated Emission Measurement

6.4 Test Result

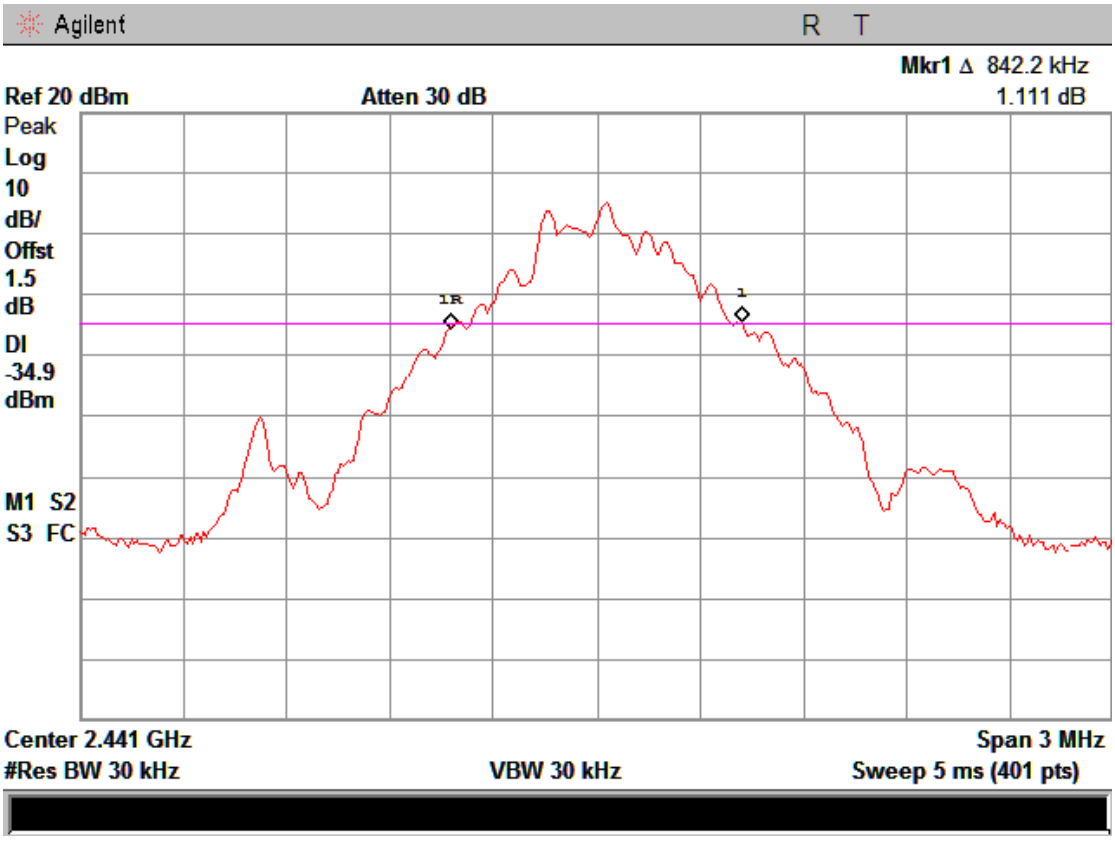
PASS

Frequency	20dB Bandwidth (kHz)	Result
2402 MHz	849.5	**PASS**
2441 MHz	842.2	**PASS**
2480 MHz	849.5	**PASS**

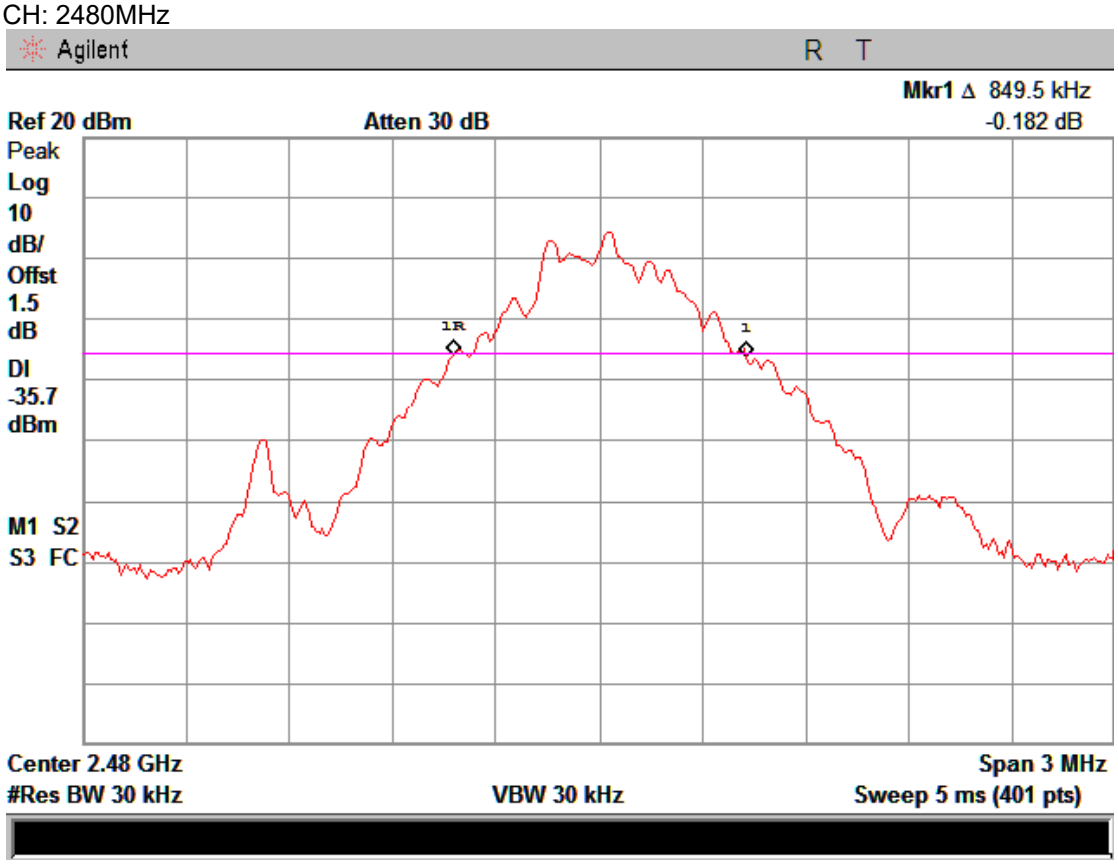
CH: 2402MHz



CH: 2441MHz



CH: 2480MHz



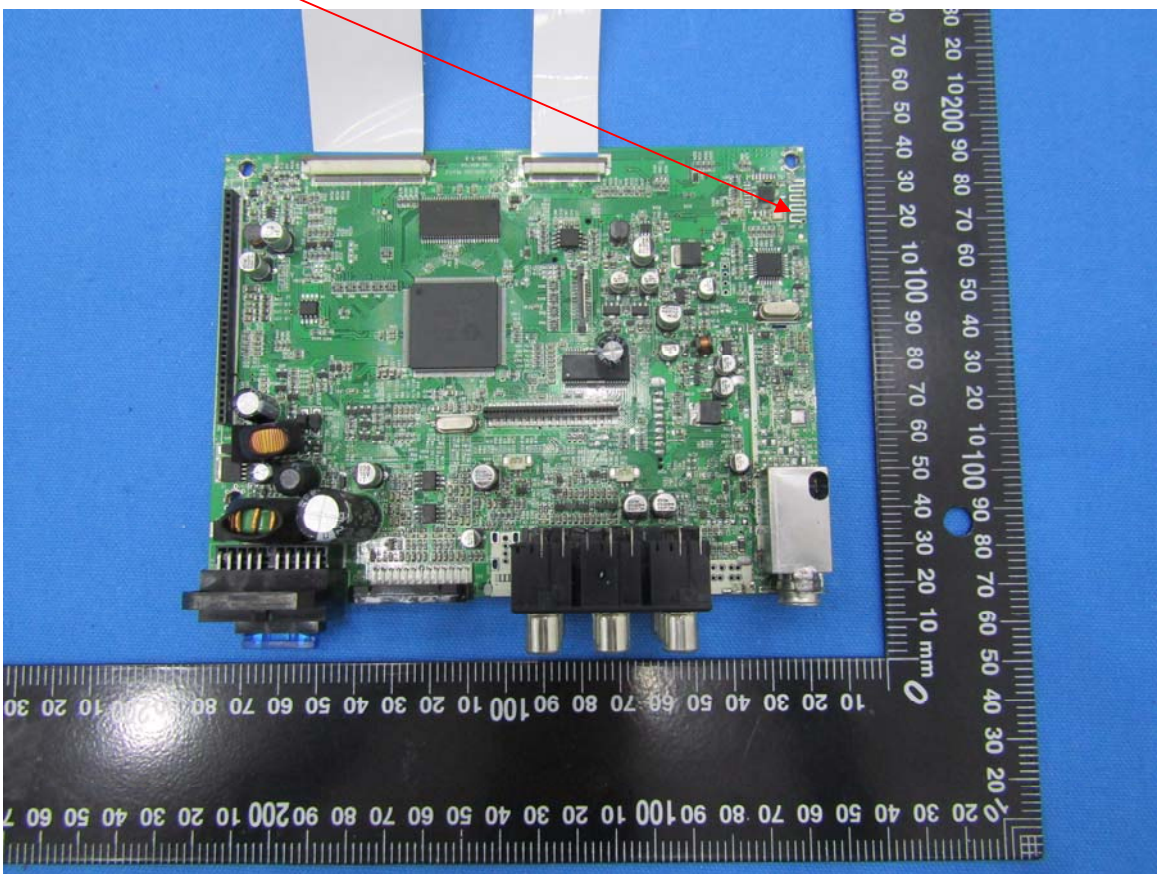
7 ANTENNA REQUIREMENT

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 15.249, 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.

Refer to statement below for compliance.
The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

Antenna Connected Construction
The antenna used in this product is a PCB Antenna, The directional gains of antenna used for transmitting is 0dBi.

ANTENNA



8 PHOTOGRAPH OF TEST

8.1 Radiated Emission