FCC TEST REPORT

REPORT NO.: FC110128N05

MODEL NO.: MIP669A, ITPW891B(See Item 3.1)

RECEIVED: Jan.28, 2011

TESTED: Mar.10~Mar.15, 2011

ISSUED: Mar.18, 2011

APPLICANT: NGAI LIK ELECTRONICS ENTERPRISES LIMITED

ADDRESS: FLAT 29-32,8/F., BLOCK B, FOCAL INDUSTRIAL CENTRE, 21 MAN LOK STREET, HUNG HOM, KOWLOON, HONG KONG

ISSUED BY: NS Technology Co., Ltd.

LAB ADDRESS: Chenwu Industrial Zone, Houjie Town, Dongguan, Guangdong, China

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ACCREDITED
Test Lab
Cert 2951.01

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1. CERTIFICATION

PRODUCT: IPhone/iPod bar speaker

MODEL: MIP669A,ITPW891B (See Item 3.1)

BRAND: iLIVE

APPLICANT: NGAI LIK ELECTRONICS ENTERPRISES LIMITED

TESTED: Mar.10~Mar.15, 2011

TEST SAMPLE: ENGINEERING SAMPLE

STANDARDS: **FCC Part 15, Subpart C (Section 15.247)**
ANSI C63.4-2003

The above equipment has been tested by **NS Technology Co., Ltd.**, and found compliance with the requirements of the above standards.

The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

REVIEWED BY : Henry Wang , **DATE:** Mar.18, 2011

Henry Wang / Supervisor

APPROVED BY : Chris Du , **DATE:** Mar.18, 2011

Chris Du / Manager

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C			
Standard Section	**Test Type and Limit**	**Result**	**Remark**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -1.90dB at 0.85703MHz.
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(d)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -3.64dB at 44.23MHz.
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Band Edge Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	No antenna connector is used.

2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	150kHz~30MHz	2.56 dB
Radiated emissions	30MHz ~ 200MHz	3.58 dB
	200MHz ~1000MHz	3.58 dB
	1GHz ~ 18GHz	3.58 dB
	18GHz ~ 40GHz	3.58 dB

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

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	IPhone/iPod bar speaker
MODEL NO.	MIP669A,ITPW891B (See Note)
FCC ID	Y8AMIP669A
POWER SUPPLY	120Vac 60Hz
MODULATION TECHNOLOGY	GFSK
OPRTAING FREQUENCY	2406MHz ~ 2472MHz
NUMBER OF CHANNEL	34 channels
MAXIMUM OUTPUT POWER	29.37mW
ANTENNA TYPE	metal antenna with 0.5dBi gain
ANTENNA CONNECTOR	NA
DATA CABLE	Audio1/2 L+R Line: Unshielded,Detachable, 1.0m Video in/out Line: Unshielded,Detachable, 1.0m Y+Pb+Pr Line: Unshielded,Detachable, 1.0m Sub out Line: Unshielded,Detachable, 1.0m AC Line: Unshielded,Detachable, 1.5m FM Antenna Line: Unshielded,Detachable, 1.2m Line in Line: Unshielded,Detachable, 1.0m

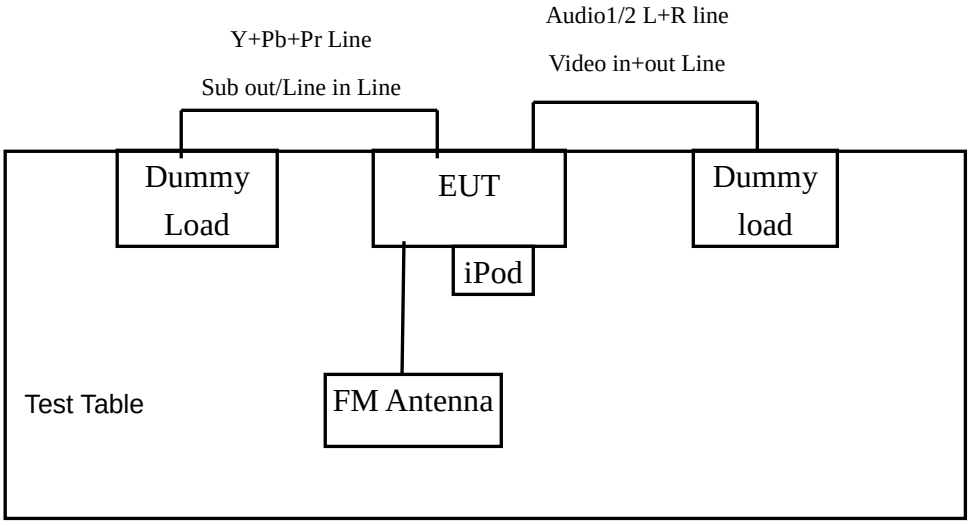
NOTE:

1. The EUT provides one completed transmitter.
2. The Model MIP669A,ITPW891B,different for model number.The other are same.
3. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 DESCRIPTION OF TEST MODES

CHANNEL	FREQ.	CHANNEL	FREQ.	CHANNEL	FREQ.	CHANNEL	FREQ.	CHANNEL	FREQ.
1	2406MHz	8	2420 MHz	15	2434 MHz	22	2448 MHz	29	2462 MHz
2	2408MHz	9	2422 MHz	16	2436 MHz	23	2450 MHz	30	2464 MHz
3	2410MHz	10	2424 MHz	17	2438 MHz	24	2452 MHz	31	2466 MHz
4	2412 MHz	11	2426 MHz	18	2440 MHz	25	2454 MHz	32	2468 MHz
5	2414 MHz	12	2428 MHz	19	2442 MHz	26	2456 MHz	33	2470 MHz
6	2416 MHz	13	2430 MHz	20	2444 MHz	27	2458 MHz	34	2472MHz
7	2418 MHz	14	2432 MHz	21	2446 MHz	28	2460 MHz		

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST



3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
TX Mode	√	√	√	√	

Where **PLC:** Power Line Conducted Emission **RE<1G:** Radiated Emission below 1GHz
RE≥1G: Radiated Emission above 1GHz **APCM:** Antenna Port Conducted Measurement

Note: The EUT had “Audio1 L+R” Mode; “audio2 L+R” Mode; “Video in” mode;”iPod Playing” mode and “Line in” Mode. We Pre-test all mode and found the **iPod playing Mode** was the worst mode. All test was based on iPod playing mode.

RADIATED EMISSION TEST (ABOVE 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	AXIS
TX Mode	1 to 34	1, 16, 34	GFSK	X

RADIATED EMISSION TEST (BELOW 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	AXIS
TX Mode	1 to 34	1	GFSK	X

POWER LINE CONDUCTED EMISSION TEST:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
TX Mode	1 to 34	1	GFSK

BANDEDGE MEASUREMENT:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
TX Mode	1 to 34	1, 16, 34	GFSK

ANTENNA PORT CONDUCTED MEASUREMENT:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY
TX Mode	1 to 34	1, 16, 34	GFSK

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
RE≥1G	25deg. C, 55%RH, 1008 hPa	120Vac, 60Hz	Jade
RE<1G	25deg. C, 55%RH, 1008 hPa	120Vac, 60Hz	Jade
PLC	25deg. C, 55%RH, 1008 hPa	120Vac, 60Hz	Jade
APCM	25deg. C, 55%RH, 1008 hPa	120Vac, 60Hz	Jade

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.247)

ANSI C63.4-2003

All test items have been performed and recorded as per the above standards.

3.4 DESCRIPTION OF SUPPORT UNITS

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.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	iPod	Apple	PP05L	25191592336	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	N/A

4. TEST TYPES AND RESULTS

4.1 RADIATED EMISSION MEASUREMENT

4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400 / F(kHz)	300
0.490 ~ 1.705	24000 / F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.1.2 TEST INSTRUMENTS

BELOW 1GHz

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
EMI Test Receiver	ESVD	847398/003	May 30,10	May 30,11
Bilog Antenna	CBL 6111D	25757	Oct.27,09	Oct.27,10
Spectrum Analyzer	8593E	3448U00806	May 30,10	May 30,11
3m Semi-anechoic Chamber	9m*6m*6m	NSEMC003	May 2,10	May 2,11
Signal Amplifier	8447D	2944A10488	May 2,10	May 2,11
RF Cable	IMRO-400	966 Cable 1#	May 2,10	May 2,11

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA and NIM/CHINA.

2. The test was performed in Chamber 966.

ABOVE 1GHz

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Horn Antenna	3117	00062558	Nov.01,10	Nov.01,11
Horn Antenna (AUX)	3117	00085519	Nov.01,10	Nov.01,11
Spectrum Analyzer	8593E	3448U00806	May 30,10	May 30,11
Signal Amplifier	PEC-38-30M18G -12-SFF	NSEMC001	Oct.16,10	Oct.16,11
RF Cable	M06/25-RG102	966 Cable 2#	May 2,10	May 2,11

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA and NIM/CHINA.

2. The test was performed in Chamber 10m.

4.1.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its 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.

d. 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 rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

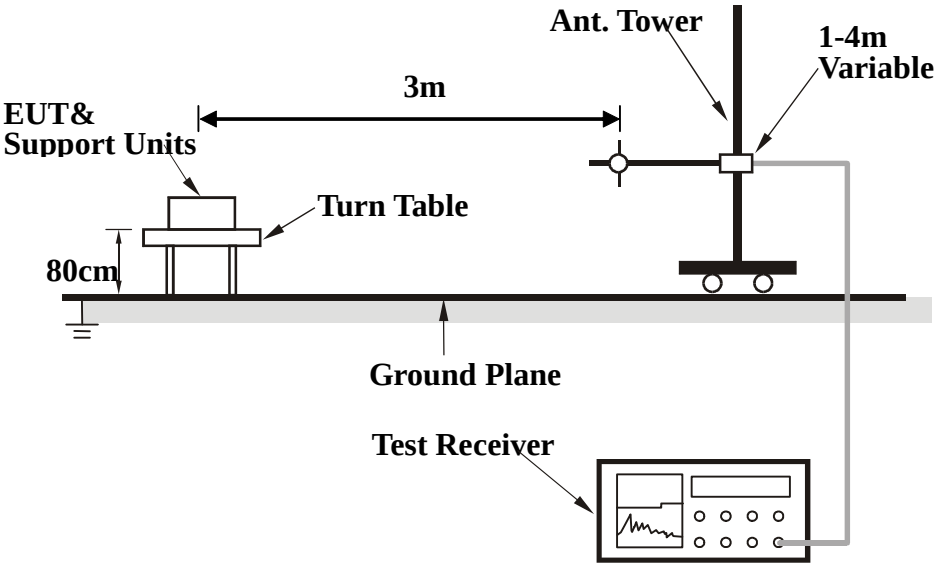
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

4.1.5 TEST SETUP



For the actual test configuration, please refer to the attached file (Test Setup Photo)

4.1.6 EUT OPERATING CONDITIONS

a. Placed the EUT on the testing table.
b. Turned on the power of all equiment.
c. iPod send the music to EUT.
d. EUT began transmit signal.

4.1.7 TEST RESULTS

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 55%RH 1008 hPa	TESTED BY	Jade

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	1210.00	51.91PK	74.00	-22.09	100	0	23.32	28.59
2	1210.00	44.27AV	54.00	-9.73	100	0	15.68	28.59
3	2406.00	118.44PK			100	0	89.85	28.59
4	2406.00	104.18AV			100	0	75.59	28.59
5	4812.00	52.98PK	74.00	-21.02	400	36	23.65	29.33
6	4812.00	45.45AV	54.00	-8.55	400	36	16.12	29.33
7	7685.50	50.15PK	74.00	-23.85	110	42	20.14	30.01
8	7685.50	44.29AV	54.00	-9.71	110	42	14.28	30.01
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2406.00	115.36PK			100	0	86.77	28.59
2	2406.00	102.98 AV			100	0	74.39	28.59
3	4812.00	63.01PK	74.00	-10.99	100	74	33.68	29.33
4	4812.00	49.94 AV	54.00	-4.06	100	74	20.61	29.33
5	7460.00	51.25 PK	74.00	-22.75	101	58	21.24	30.01
6	7460.00	43.76 AV	54.00	-10.24	101	58	13.75	30.01
7	12517.50	52.60 PK	74.00	-21.40	110	62	21.18	31.42
8	12517.50	45.60 AV	54.00	-8.40	110	62	14.18	31.42

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 16	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 55%RH 1008 hPa	TESTED BY	Jade

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2436.00	116.54PK			100	36	87.95	28.59
2	2436.00	102.85AV			100	36	74.26	28.59
3	4872.00	69.59PK	74.00	-4.41	202	100	40.26	29.33
4	4872.00	49.58AV	54.00	-4.42	202	100	20.25	29.33
5	8777.50	53.27PK	74.00	-20.73	400	68	23.26	30.01
6	8777.50	42.53AV	54.00	-11.47	400	68	12.52	30.01
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2436.00	115.95PK			101	311	87.36	28.59
2	2436.00	101.78 AV			101	311	73.19	28.59
3	4872.00	68.59 PK	74.00	-5.41	116	90	39.26	29.33
4	4872.00	49.58 AV	54.00	-4.42	116	90	20.25	29.33
5	9967.50	49.87 PK	74.00	-24.13	140	248	19.86	30.01
6	9967.50	43.87 AV	54.00	-10.13	140	248	13.86	30.01

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 34	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 55%RH 1008 hPa	TESTED BY	Jade

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2472.00	117.01PK			400	12	88.42	28.59
2	2472.00	104.75AV			400	12	76.16	28.59
3	4954.00	68.98PK	74.00	-5.02	328	0	39.65	29.33
4	4954.00	50.74 AV	54.00	-3.26	328	0	21.41	29.33
5	9925.00	50.46 PK	74.00	-23.54	200	354	20.45	30.01
6	9925.00	41.61 AV	54.00	-12.39	200	354	11.60	30.01
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2472.00	114.57PK			101	22	85.98	28.59
2	2472.00	101.65AV			101	22	73.06	28.59
3	4954.00	63.28 PK	74.00	-10.72	100	0	33.95	29.33
4	4954.00	49.39 AV	54.00	-4.61	100	0	20.06	29.33
5	7428.00	55.63PK	74.00	-18.37	100	35	25.62	30.01
6	7428.00	45.63 AV	54.00	-8.37	100	35	15.62	30.01
7	13155.00	55.68 PK	74.00	-18.32	100	0	24.26	31.42
8	13155.00	45.36 AV	54.00	-8.64	100	0	13.94	31.42

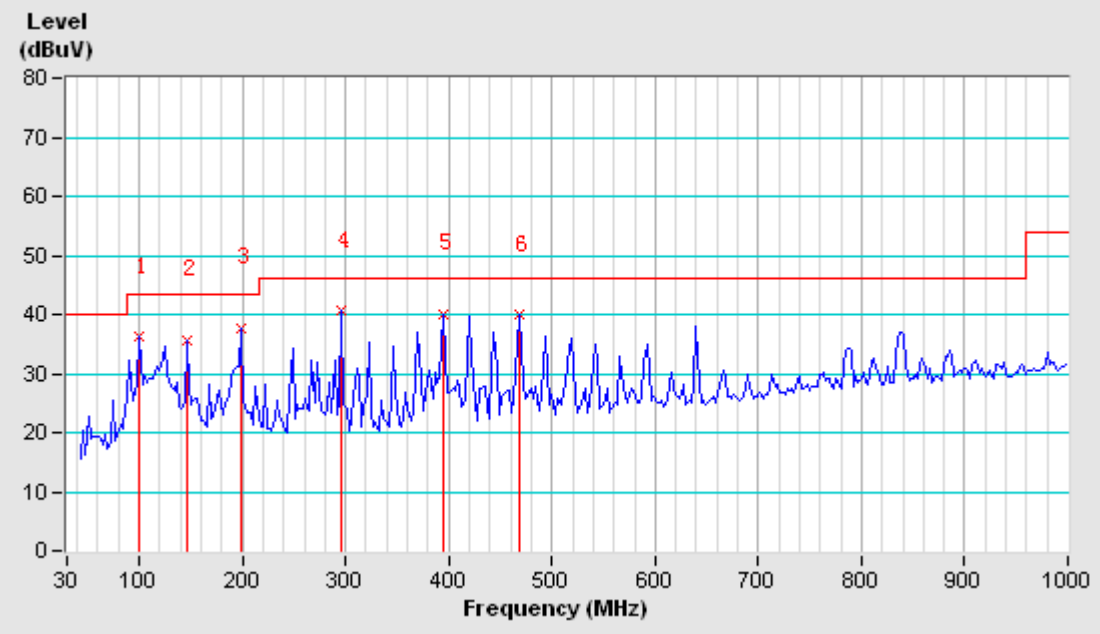
REMARKS: 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.

BELOW 1GHz

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 55%RH 1008 hPa	TESTED BY	Jade
TEST MODE	TX Mode		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	100.58	36.11	43.50	-7.39	100	25	25.55	10.56
2	145.91	35.51	43.50	-7.99	400	75	23.17	12.34
3	198.40	37.62	43.50	-5.88	400	136	27.86	9.76
4	296.21	40.54	46.00	-5.46	100	0	25.14	15.40
5	394.03	40.08	46.00	-5.92	100	359	21.64	18.44
6	467.98	39.89	46.00	-6.11	100	359	19.47	20.42

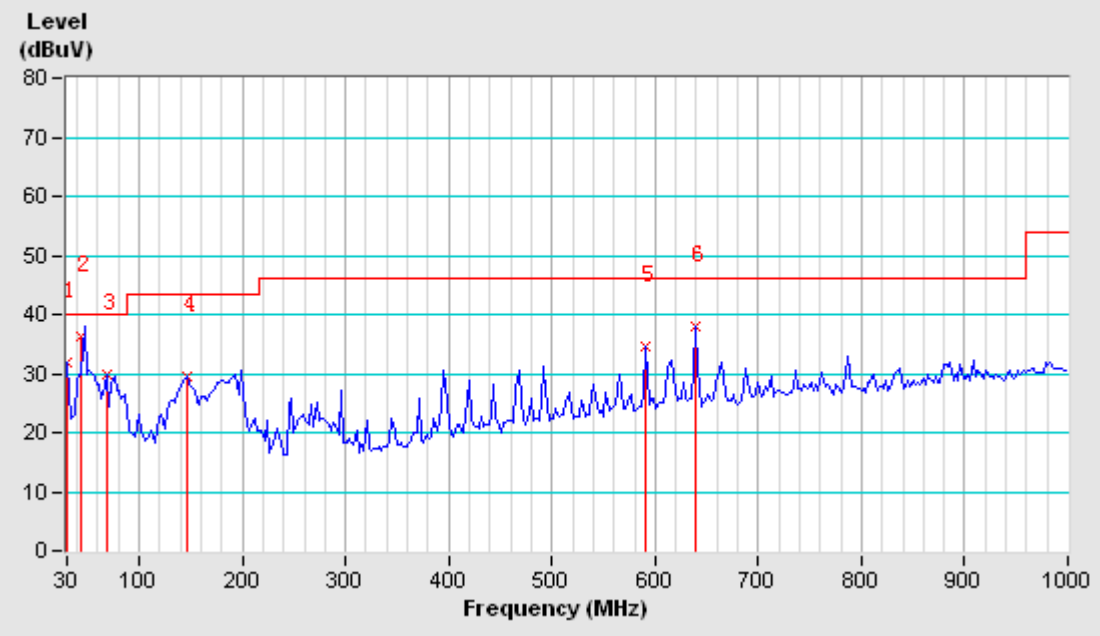
REMARKS: 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH 1008 hPa	TESTED BY	Jade
TEST MODE	B		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.00	31.89	40.00	-8.11	100	65	13.16	18.73
2	**44.23**	**36.36**	**40.00**	**-3.64**	**100**	**0**	**24.30**	**12.06**
3	68.70	29.90	40.00	-10.10	100	0	23.43	6.47
4	146.11	29.45	43.50	-14.05	150	38	17.11	12.34
5	591.20	34.54	46.00	-11.46	110	69	11.40	23.14
6	639.58	38.08	46.00	-7.92	180	100	14.39	23.69

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



4.2 CONDUCTED EMISSION MEASUREMENT

4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

NOTE: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
EMI Test Receiver	ESCS30	100340	May 30,10	May 30,11
Artificial Mains Network	ESH2-Z5	100071	May 30,10	May 30,11
Artificial Mains Network (AUX)	KNW-407	8-1579-1	May 30,10	May 30,11
Pulse Limiter	3D-2W	844 Cable	May 2,10	May 2,11

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA and NIM/CHINA.

2. The test was performed in HwaYa Shielded Room 2.

4.2.3 TEST PROCEDURES

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

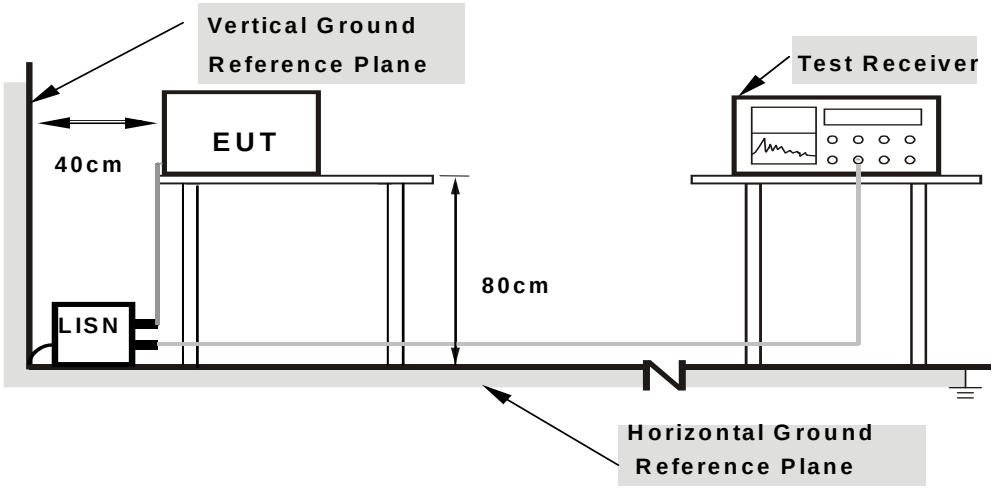
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT OPERATING CONDITIONS

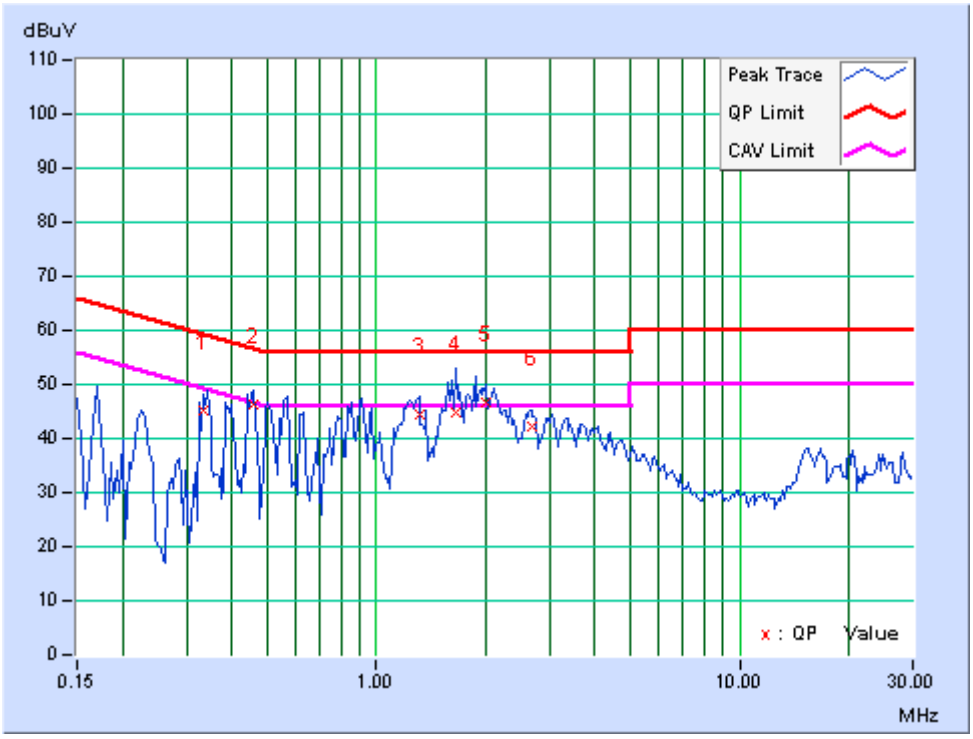
Same as 4.1.6.

4.2.7 TEST RESULTS

PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	TX Mode		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.33359	0.29	45.00	33.94	45.29	34.23	59.36	49.36	-14.07	-15.13
2	0.45859	0.28	45.94	40.12	46.22	40.40	56.72	46.72	-10.50	-6.32
3	1.31250	0.36	44.26	36.04	44.62	36.40	56.00	46.00	-11.38	-9.60
4	1.65625	0.38	44.40	36.64	44.78	37.02	56.00	46.00	-11.22	-8.98
5	2.00000	0.41	46.10	35.80	46.51	36.21	56.00	46.00	-9.49	-9.79
6	2.67969	0.44	41.80	33.14	42.24	33.58	56.00	46.00	-13.76	-12.42

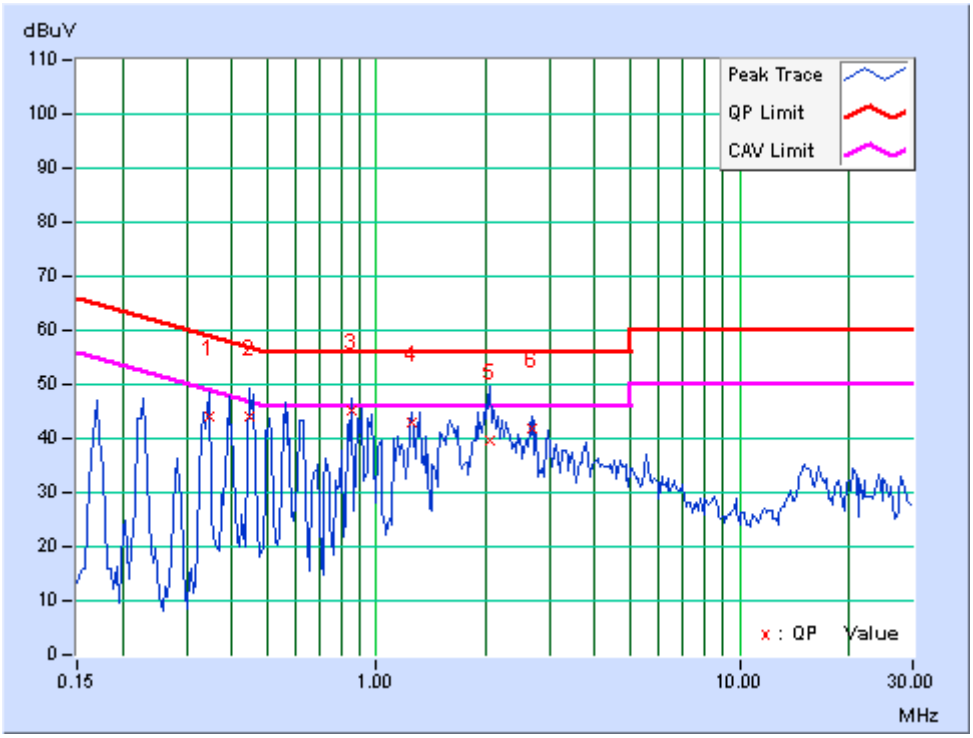
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



PHASE	N	6dB BANDWIDTH	9kHz
TEST MODE	TX Mode		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.34531	0.30	43.68	29.56	43.98	29.86	59.07	49.07	-15.10	-19.22
2	0.44688	0.31	43.90	37.32	44.21	37.63	56.93	46.93	-12.72	-9.30
3	**0.85703**	**0.35**	**44.76**	**43.75**	**45.11**	**44.10**	**56.00**	**46.00**	**-10.89**	**-1.90**
4	1.25781	0.38	42.62	32.64	43.00	33.02	56.00	46.00	-13.00	-12.98
5	2.05469	0.48	39.18	28.32	39.66	28.80	56.00	46.00	-16.34	-17.20
6	2.68359	0.54	41.16	31.22	41.70	31.76	56.00	46.00	-14.30	-14.24

REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSL3	101507	May 30,10	May 30,11

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA and NIM/CHINA.

4.3.3 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 100kHz RBW and 100kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

4.3.5 TEST SETUP

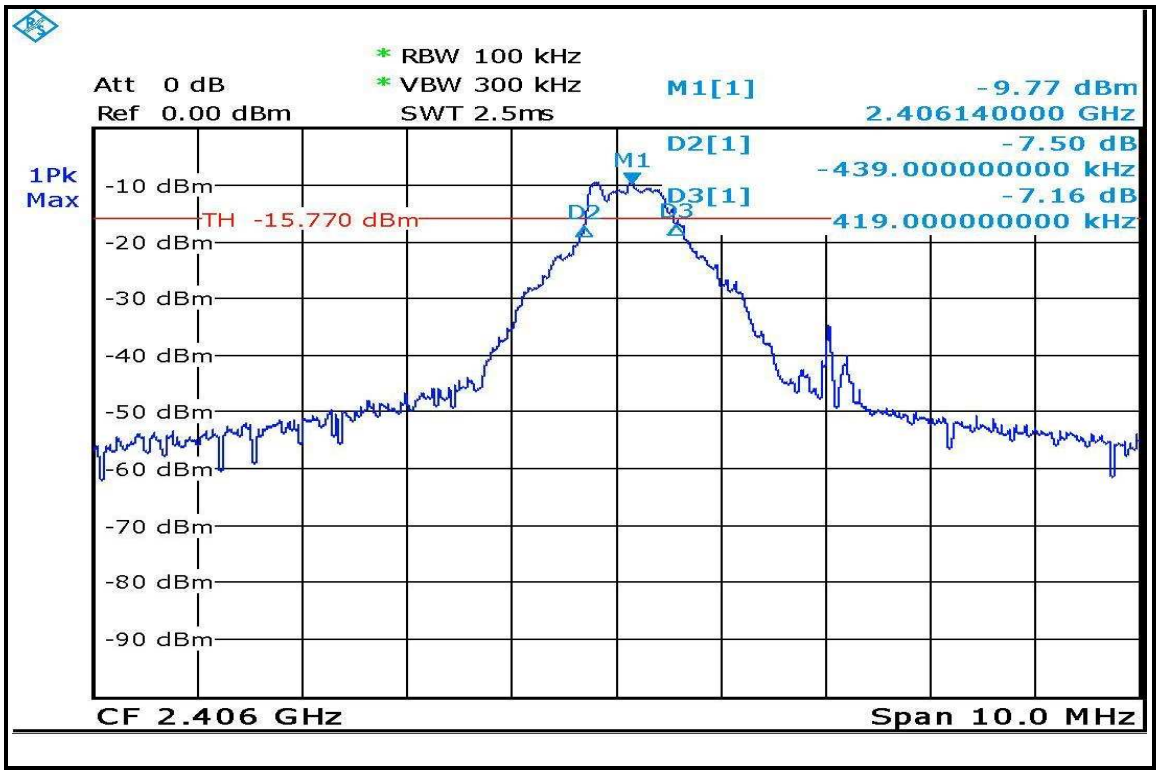
4.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

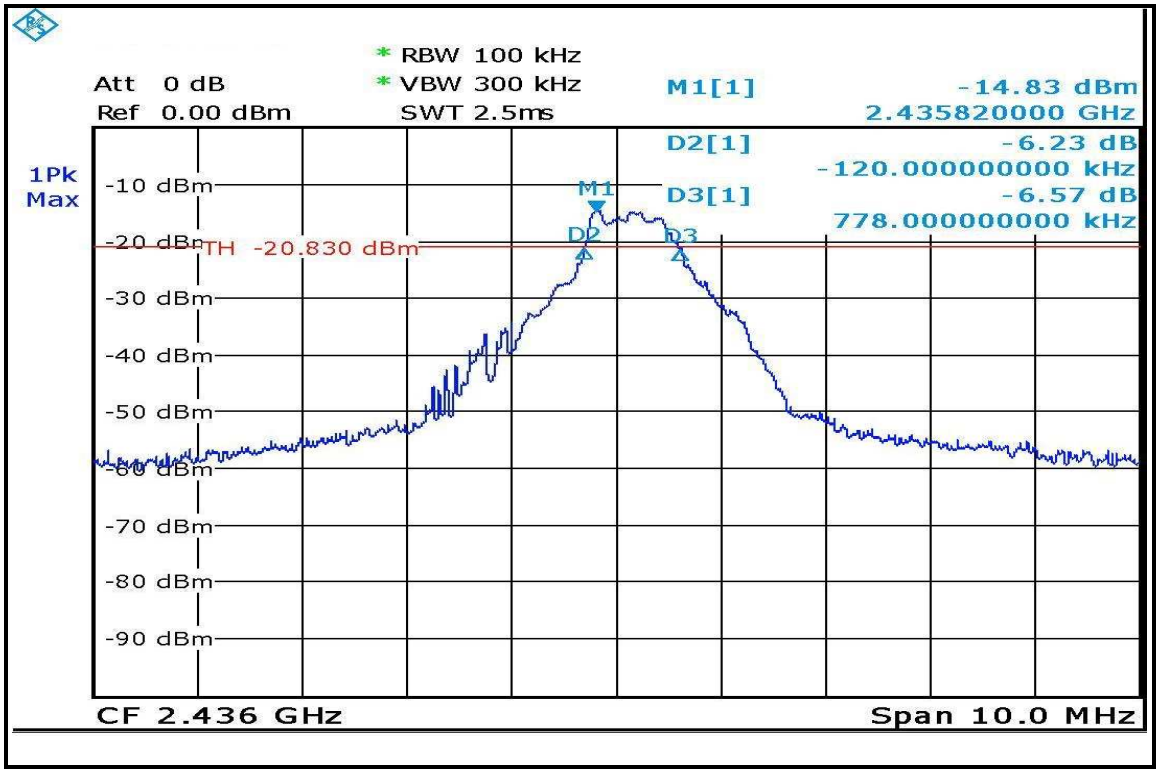
4.3.7 TEST RESULTS

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2406	0.86	0.5	PASS
16	2436	0.90	0.5	PASS
34	2472	0.89	0.5	PASS

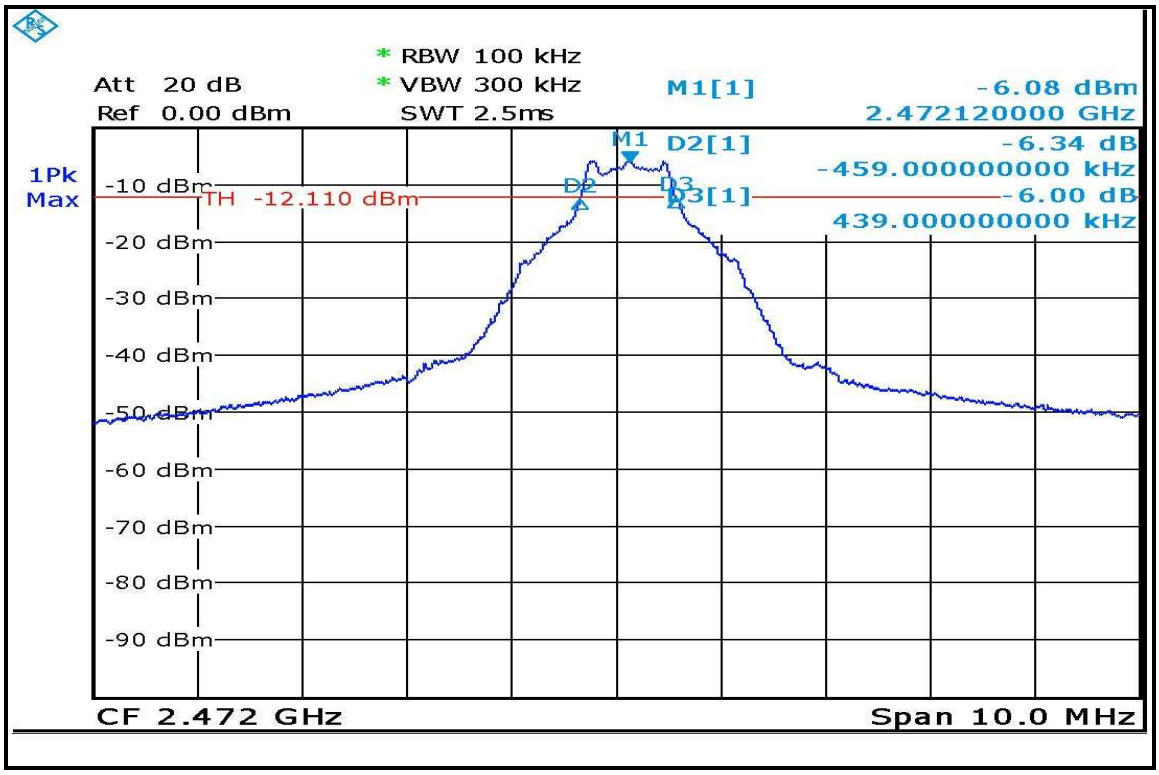
CH 1



CH 16


RBW 100 kHz
VBW 300 kHz
SWT 2.5ms
Att 0 dB
Ref 0.00 dBm
M1[1]
-14.83 dBm
2.435820000 GHz
D2[1]
-6.23 dB
-120.000000000 kHz
D3[1]
-6.57 dB
778.000000000 kHz
1Pk
Max
TH -20.830 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
CF 2.436 GHz
Span 10.0 MHz

CH 34


RBW 100 kHz
VBW 300 kHz
SWT 2.5ms
Att 20 dB
Ref 0.00 dBm
M1[1]
-6.08 dBm
2.472120000 GHz
D2[1]
-6.34 dB
-459.000000000 kHz
D3[1]
-6.00 dB
439.000000000 kHz
1Pk
Max
TH -12.110 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
CF 2.472 GHz
Span 10.0 MHz

4.4 MAXIMUM OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM OUTPUT POWER MEASUREMENT

The Maximum Output Power Measurement is 30dBm.

4.4.2 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	CALIBRATED UNTIL
Level Meter	URV35	100335	May 30,10	May 30,11
100V Insertion Unit 50Ω	URV5-Z4	100207	May 30,10	May 30,11

NOTE:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA and NIM/CHINA.
2. Measurement Bandwidth of ML2495A is 65MHz greater than 6dB bandwidth of emission.

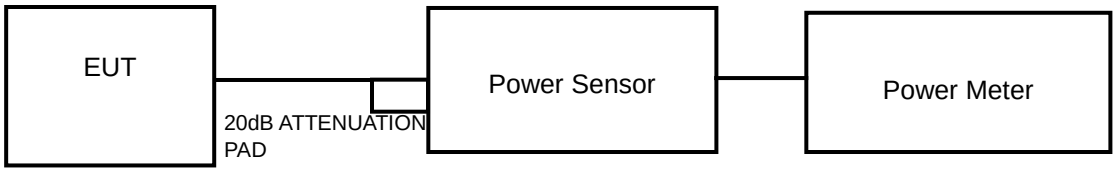
4.4.3 TEST PROCEDURES

A power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation.

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.

4.4.7 TEST RESULTS

CHAN	CHANNEL FREQUENCY (MHz)	POWER OUTPUT (mW)	POWER OUTPUT (dBm)	POWER LIMIT (dBm)	PASS/FAIL
1	2406	29.37	14.68	30	PASS
16	2436	23.66	13.74	30	PASS
34	2472	20.18	13.05	30	PASS

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSL3	101507	May 30,10	May 30,11

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA and NIM/CHINA.

4.5.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded.

The sweep time is allowed to be longer than span/3kHz for a full response of the mixer in the spectrum analyzer.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation.

4.5.5 TEST SETUP

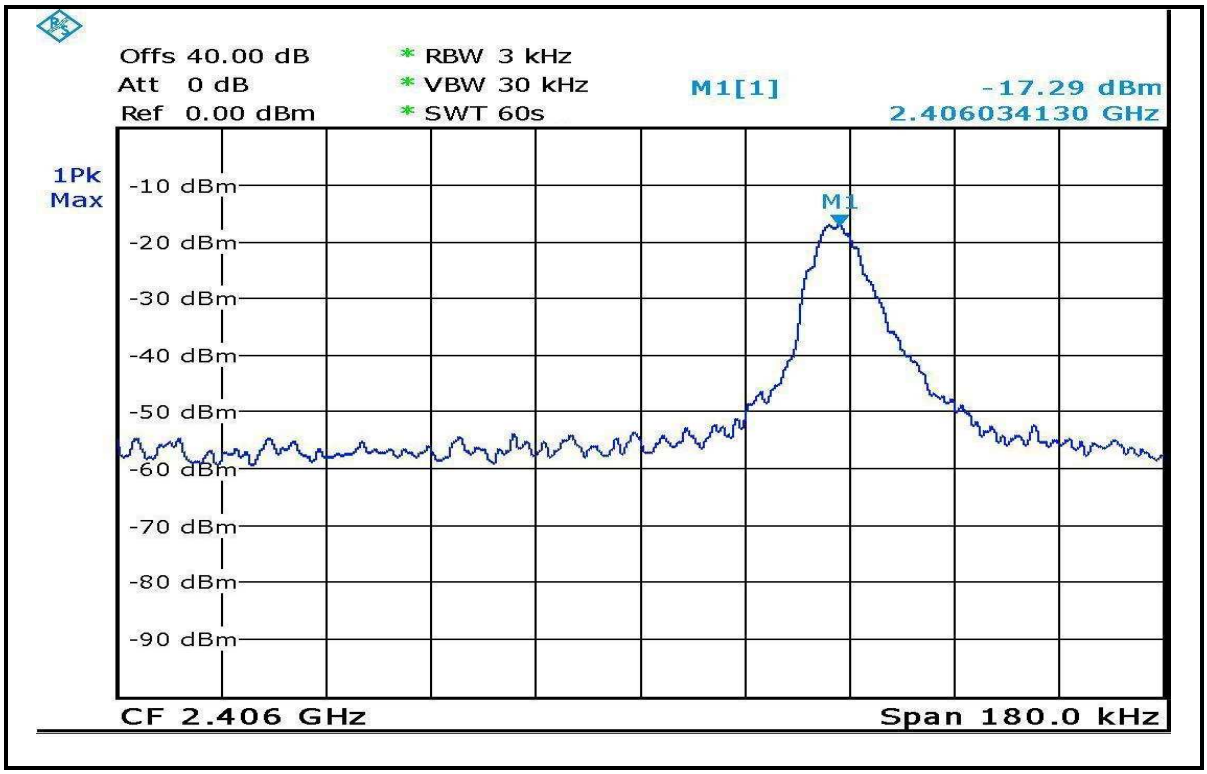
4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6.

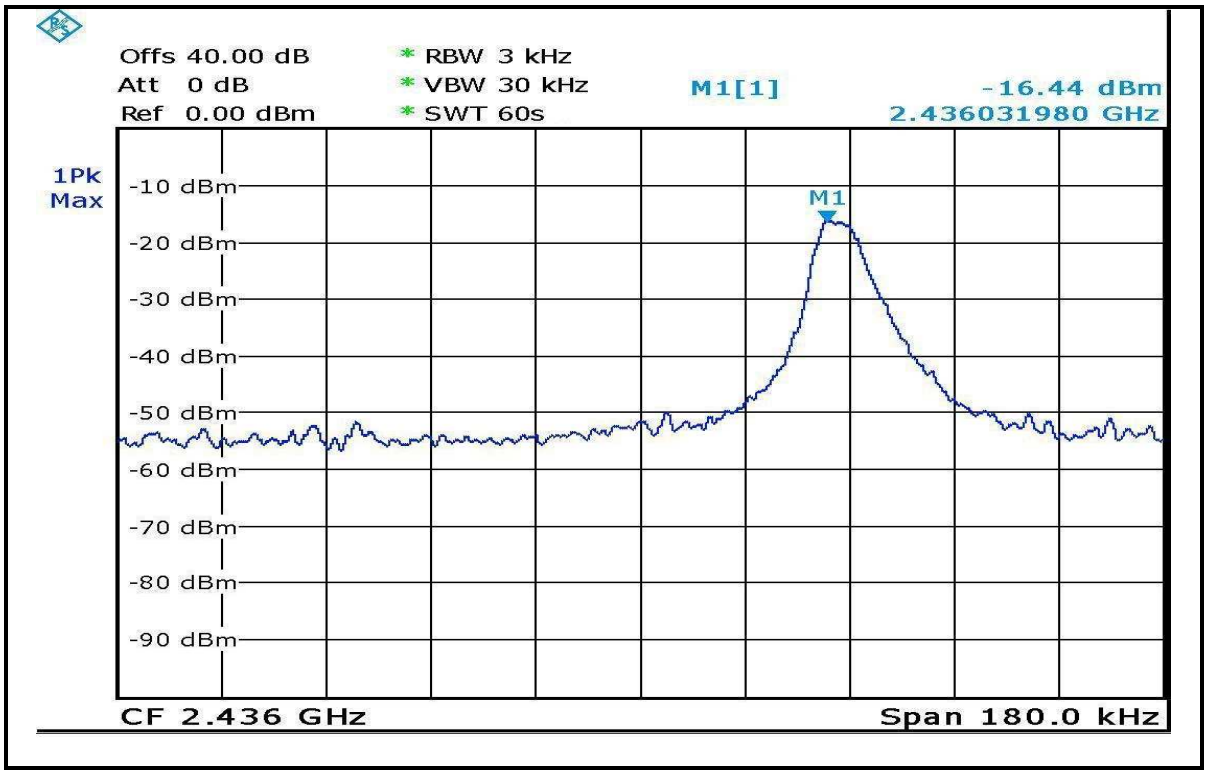
4.5.7 TEST RESULTS

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2406	-17.29	8	PASS
16	2436	-16.44	8	PASS
34	2472	-15.69	8	PASS

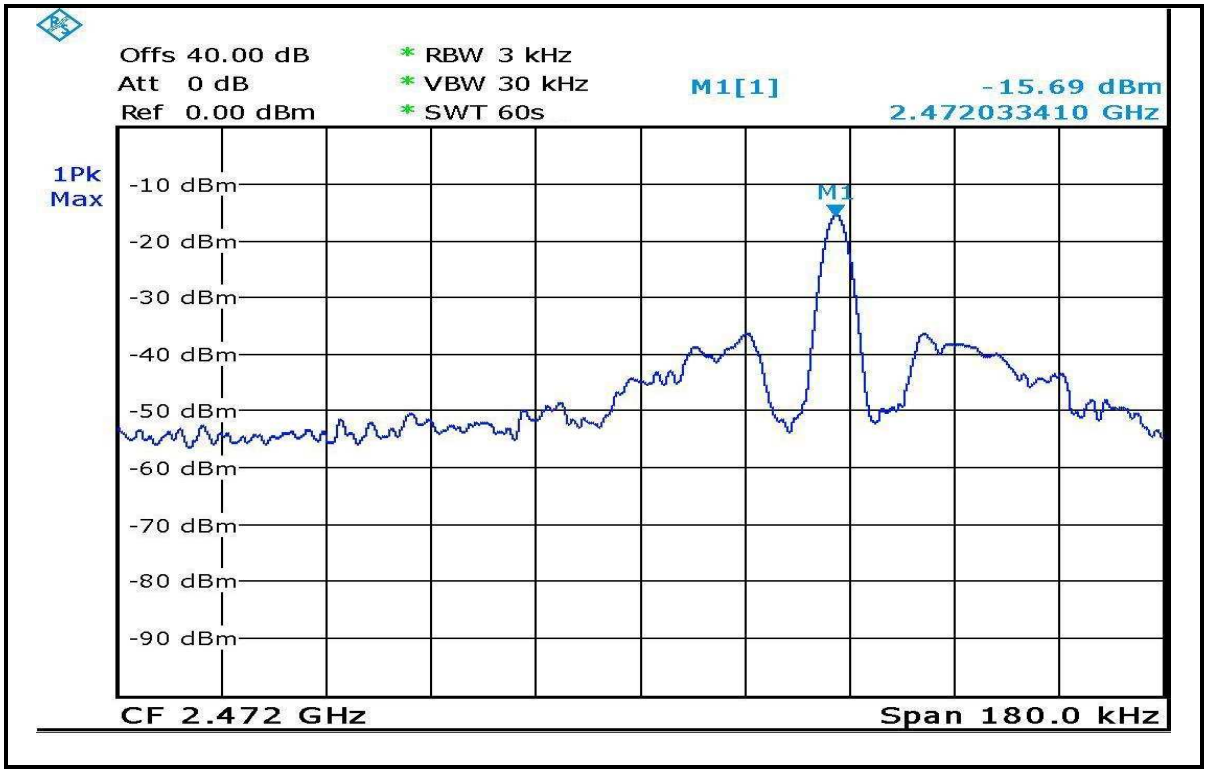
CH 1



CH 16


Offs 40.00 dB
Att 0 dB
Ref 0.00 dBm
* RBW 3 kHz
* VBW 30 kHz
* SWT 60s
M1[1]
-16.44 dBm
2.436031980 GHz
1Pk
Max
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
M1
CF 2.436 GHz
Span 180.0 kHz

CH 34


Offs 40.00 dB
Att 0 dB
Ref 0.00 dBm
* RBW 3 kHz
* VBW 30 kHz
* SWT 60s
M1[1]
-15.69 dBm
2.472033410 GHz
1Pk
Max
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
M1
CF 2.472 GHz
Span 180.0 kHz

4.6 BAND EDGES MEASUREMENT

4.6.1 LIMITS OF BAND EDGES MEASUREMENT

Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSL3	101507	May 30,10	May 30,11

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA and NIM/CHINA.

4.6.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 100kHz and 300kHz with suitable frequency span including 100MHz bandwidth from band edge. The band edges was measured and recorded.

The spectrum plots (Peak RBW = 100kHz, VBW = 300kHz; Average RBW = 1MHz, VBW = 10Hz) are attached on the following pages.

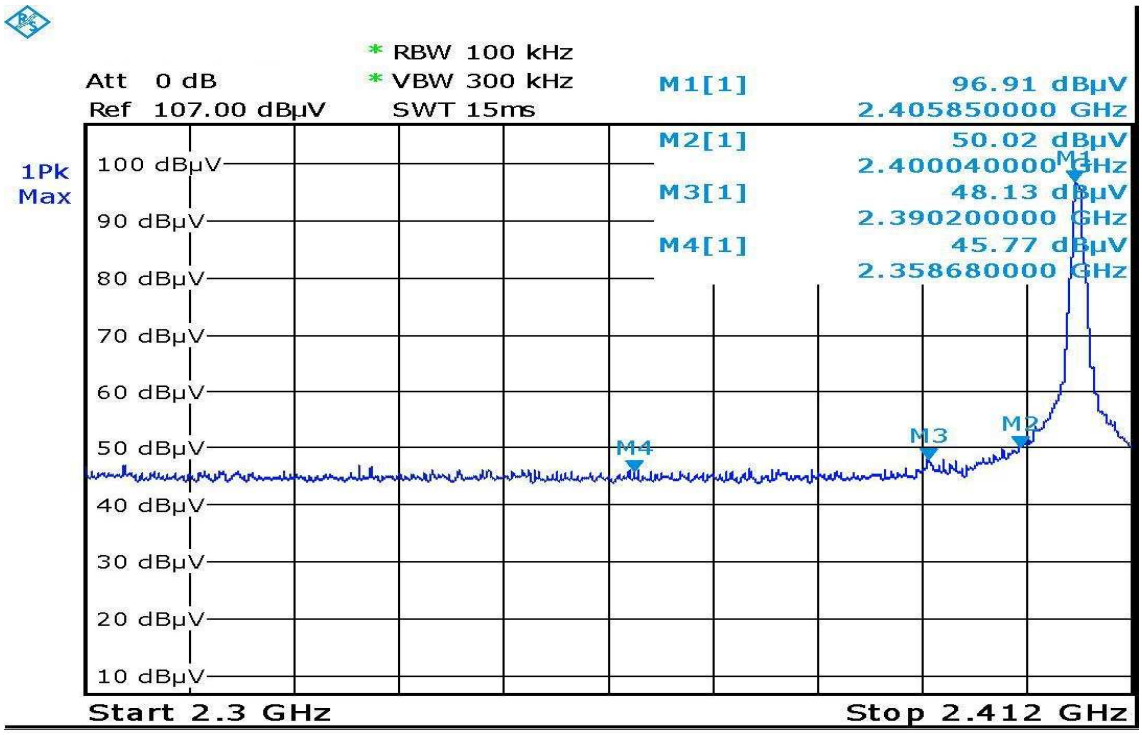
4.6.4 DEVIATION FROM TEST STANDARD

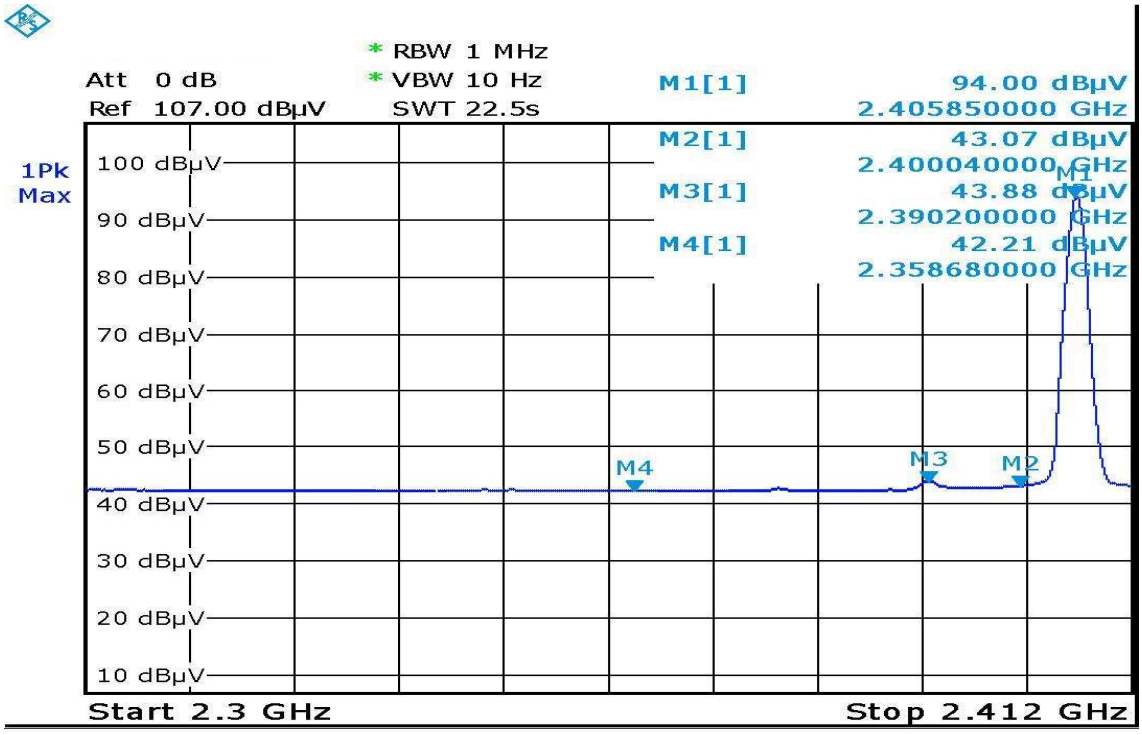
No deviation.

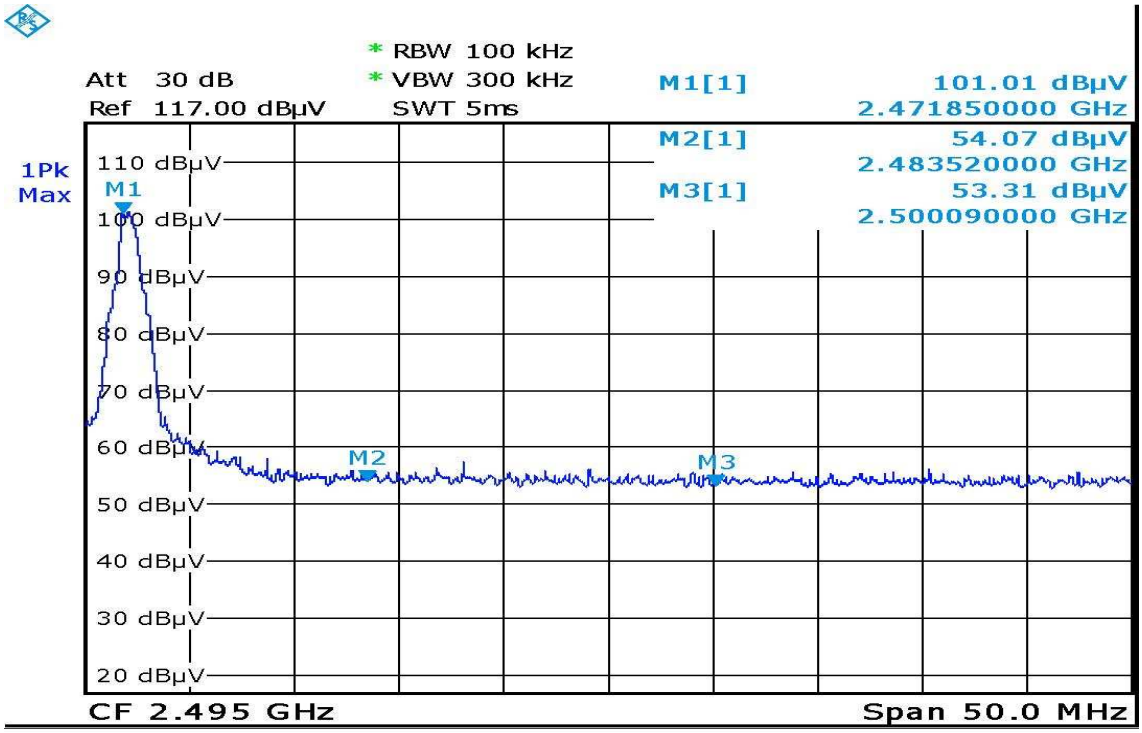
4.6.5 EUT OPERATING CONDITION

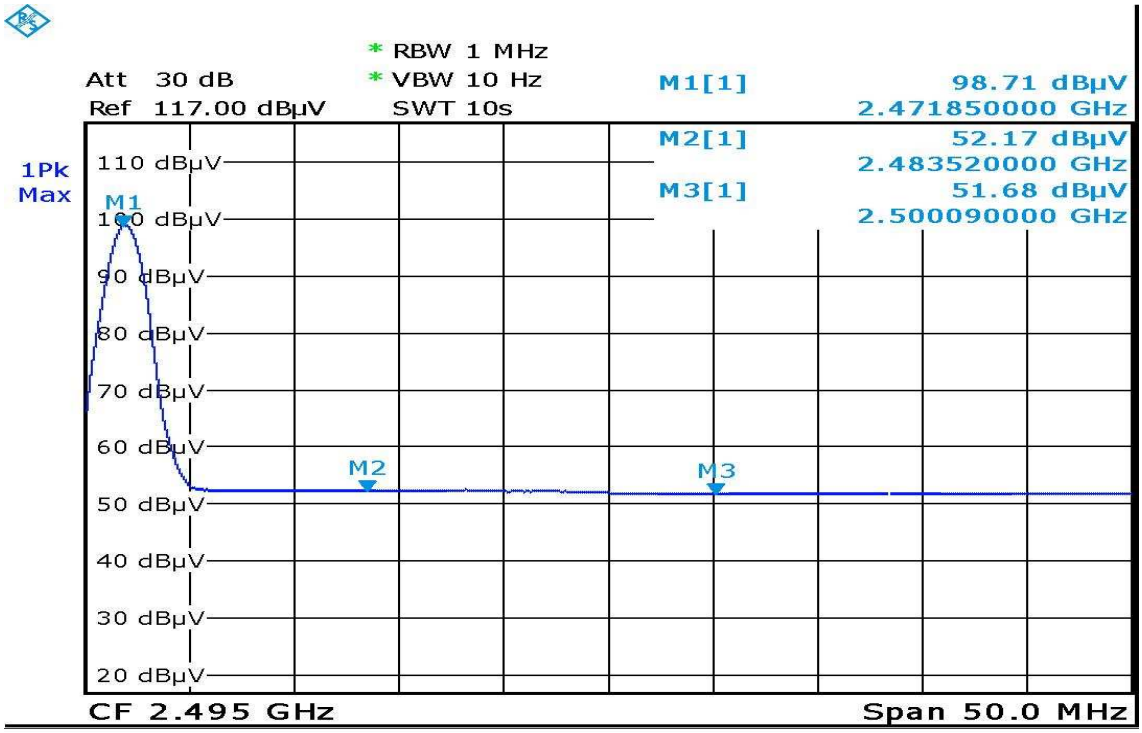
Same as Item 4.3.6.

4.6.6 TEST RESULTS






* RBW 100 kHz
Att 30 dB
* VBW 300 kHz
M1[1]
101.01 dBµV
Ref 117.00 dBµV
SWT 5ms
2.471850000 GHz
M2[1]
54.07 dBµV
2.483520000 GHz
1Pk
Max
M1
M3[1]
53.31 dBµV
2.500090000 GHz
110 dBµV
100 dBµV
90 dBµV
80 dBµV
70 dBµV
60 dBµV
M2
M3
50 dBµV
40 dBµV
30 dBµV
20 dBµV
CF 2.495 GHz
Span 50.0 MHz


* RBW 1 MHz
Att 30 dB
* VBW 10 Hz
M1[1]
98.71 dBµV
Ref 117.00 dBµV
SWT 10s
2.471850000 GHz
M2[1]
52.17 dBµV
2.483520000 GHz
1Pk
Max
M1
M3[1]
51.68 dBµV
2.500090000 GHz
110 dBµV
100 dBµV
90 dBµV
80 dBµV
70 dBµV
60 dBµV
M2
M3
50 dBµV
40 dBµV
30 dBµV
20 dBµV
CF 2.495 GHz
Span 50.0 MHz

5. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml. If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF Lab:
Tel: 886-3-5935343
Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Telecom Lab:
Tel: 886-3-3183232
Fax: 886-3-3185050

Web Site: www.adt.com.tw

The address and road map of all our labs can be found in our web site also.

6. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

--- END ---