(2) Setup EUT and simulator as shown in section 1.4 and 6.1
(3) Test antenna was located 3m from the EUT on an adjustable mast. Below pre-scan procedure was first performed in order to find prominent radiated emissions.
(a) Change work frequency or channel of device if practicable.
(b) Change modulation type of device if practicable.
(c) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions
(4) Spectrum frequency from 9KHz to 25GHz (tenth harmonic of fundamental frequency) was investigated
(5) For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4 2003 on Radiated Emission test.
(6) For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1MHz, VBW is set at 3MHz for Peak measure; RBW is set at 1MHz, VBW is set at 10Hz for Average measure.
Peak detector is used for both.

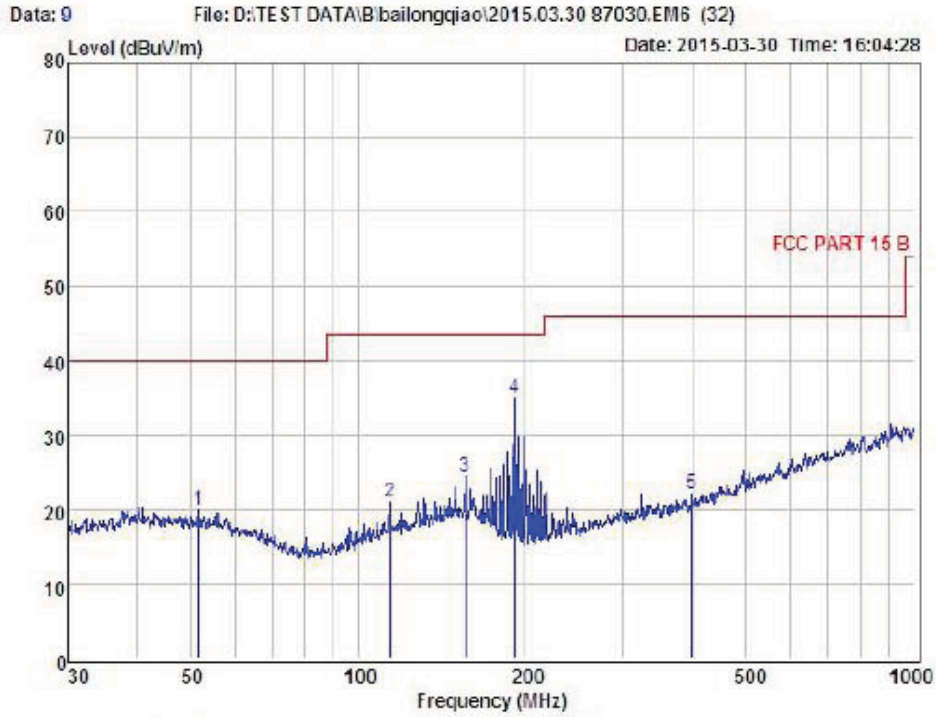
8.4. Test Result

We have scanned the 10th harmonic from 9KHz to the EUT.
Detailed information please see the following page.

From 9KHz to 30MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

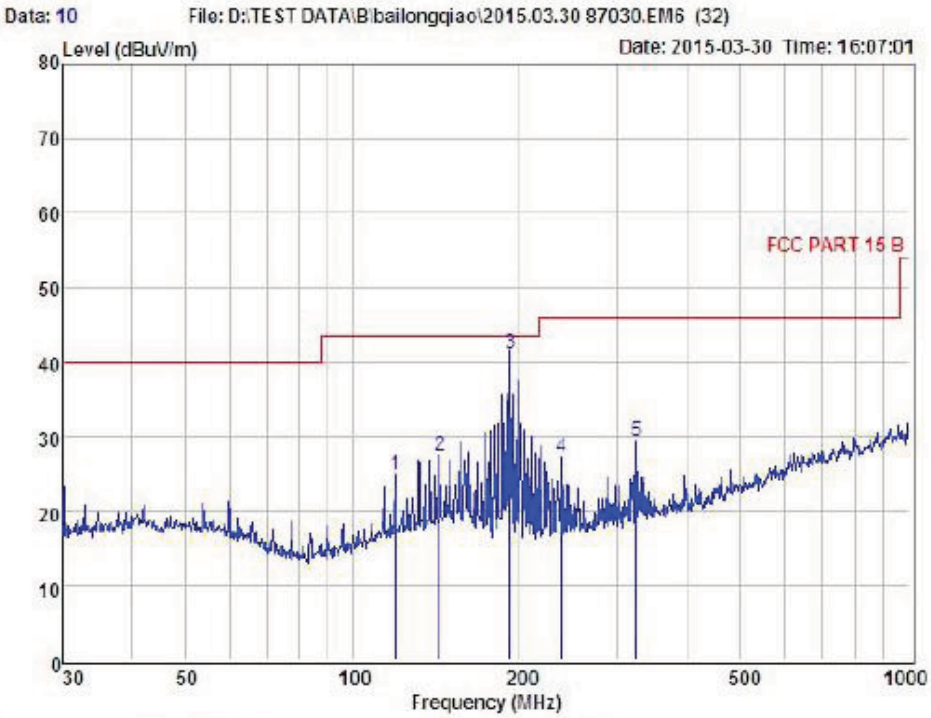
From 30MHz to 1000MHz: Conclusion: PASS



Condition : FCC PART 15 B 3m POL: HORIZONTAL
EUT :
Model No :
Test Mode :
Power : DC 6V
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq MHz	Read Level dBuV	Antenna Factor dB	Preamp Factor dB	Cable Loss dB	Level dBuV	Limit dBuV	Margin dBuV	Remark
1	51.66	38.07	13.38	31.81	0.25	19.89	40.00	-20.11	Peak
2	114.11	40.20	11.68	31.33	0.41	20.96	43.50	-22.54	Peak
3	155.91	41.02	14.15	31.16	0.38	24.39	43.50	-19.11	Peak
4	191.75	55.03	10.36	30.97	0.58	35.00	43.50	-8.50	Peak
5	399.03	37.07	14.71	30.40	0.66	22.04	46.00	-23.96	Peak

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



Condition : FCC PART 15 B 3m POL: VERTICAL
EUT :
Model No :
Test Mode :
Power : DC 6V
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq MHz	Read Level dBuV	Antenna Factor dB	Preamp Factor dB	Cable Loss dB	Level dBuV	Limit dBuV	Margin dBuV	Remark
1	119.86	43.77	12.06	31.31	0.36	24.88	43.50	-18.62	Peak
2	143.83	44.56	13.77	31.21	0.38	27.50	43.50	-16.00	Peak
3	192.01	61.29	10.36	30.97	0.58	41.26	43.50	-2.24	QP
4	237.48	46.14	11.40	30.77	0.50	27.27	46.00	-18.73	Peak
5	324.46	45.75	13.43	30.54	0.74	29.38	46.00	-16.62	Peak

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

Remark: All modes have been tested, and only worst data of Channel 2405MHz was listed in this report.

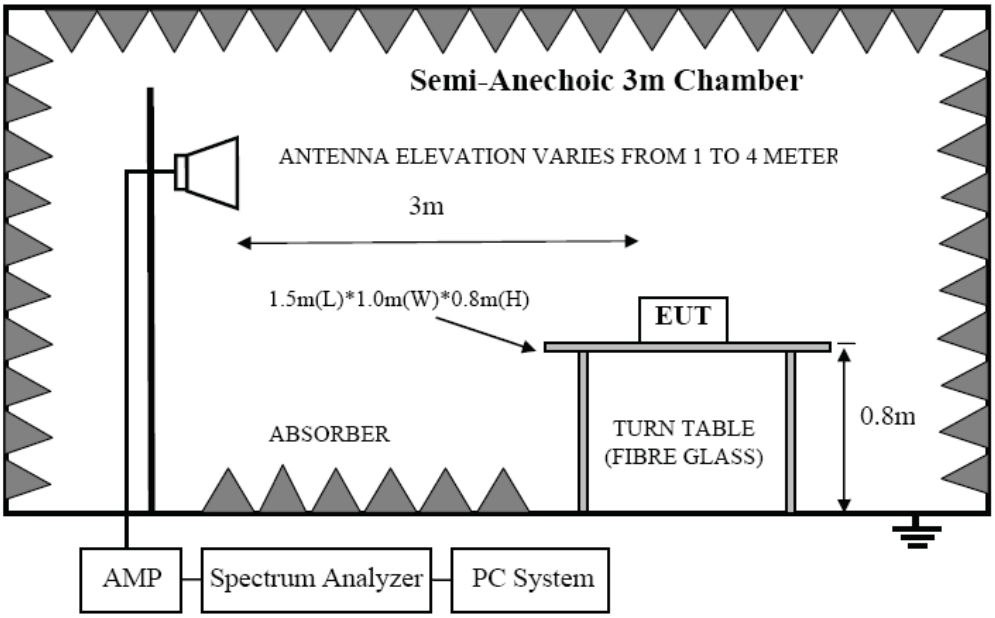
1GHz—25GHz Radiated emissison Test result									
EUT: Ikonnik HRS3.2 3Ch 2.4GHz Xenon (Xe) Transmitter M/N: KNNS0005									
Power: DC 3.7V From battery									
Test date: 2015-04-03 Test site: 3m Chamber Tested by: Peter									
Test mode: Tx CH1 2405MHz									
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4810	51.72	31.25	5.7	34.2	54.47	74	19.53	PK
2	4810	40.86	31.25	5.7	34.2	43.61	54	10.39	AV
3	7215	/							
4	/	/							
5	/	/							
Antenna Polarity: Horizontal									
1	4810	53.77	31.25	5.7	34.2	56.52	74	17.48	PK
2	4810	41.68	31.25	5.7	34.2	44.43	54	9.57	AV
3	7215	/							
4	/	/							
5	/	/							
Note: 1, Measuring frequency from 1GHz to 25GHz 2, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK 2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK 3, Result = Read level + Antenna factor + cable loss-Amp factor 4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.									

1GHz—25GHz Radiated emissison Test result									
EUT: Ikonnik HRS3.2 3Ch 2.4GHz Xenon (Xe) Transmitter M/N: KNNS0005									
Power: DC 3.7V From battery									
Test date: 2015-04-03 Test site: 3m Chamber Tested by: Peter									
Test mode: Tx CH40 2441MHz									
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4882	51.96	31.68	5.75	34.29	55.1	74	18.9	PK
2	4882	40.72	31.68	5.75	34.29	43.86	54	10.14	AV
3	7323	/							
4	9764	/							
5	12205	/							
Antenna Polarity: Horizontal									
1	4882	54.26	31.68	5.75	34.29	57.4	74	16.6	PK
2	4882	42.74	31.68	5.75	34.29	45.88	54	8.12	AV
3	7323	/							
4	9764	/							
5	12205	/							
Note: 1, Measuring frequency from 1GHz to 25GHz 2, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK 2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK 3, Result = Read level + Antenna factor + cable loss-Amp factor 4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.									

1GHz—25GHz Radiated emissison Test result									
EUT: Ikonnik HRS3.2 3Ch 2.4GHz Xenon (Xe) Transmitter M/N: KNNS0005									
Power: DC 3.7V From battery									
Test date: 2015-04-03 Test site: 3m Chamber Tested by: Peter									
Test mode: Tx CH79 2478MHz									
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4956	53.52	31.5	5.79	34.06	56.75	74	17.25	PK
2	4956	41.49	31.5	5.79	34.06	44.72	54	9.28	AV
3	7434	/							
4	/	/							
5	/	/							
Antenna Polarity: Horizontal									
1	4956	54.49	31.5	5.79	34.06	57.72	74	16.28	PK
2	4956	42.84	31.5	5.79	34.06	46.07	54	7.93	AV
3	7434	/							
4	/	/							
5	/	/							
Note: 1, Measuring frequency from 1GHz to 25GHz 2, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK 2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK 3, Result = Read level + Antenna factor + cable loss-Amp factor 4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.									

9. Band Edge Compliance

9.1. Block Diagram of Test Setup



9.2. Limit

All the lower and upper band-edges emissions appearing within restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

9.3. Test Procedure

All restriction band and non- restriction band have been tested ， only worse case is reported.

9.4. Test Result

PASS. (See below detailed test data)

Radiated Method

CH LOW :

Band Edge Test result								
EUT: Ikonnik HRS3.2 3Ch 2.4GHz Xenon (Xe) Transmitter M/N: KNNS0005								
Power: DC 6.0V From battery								
Test date: 2015-04-03 Test site: 3m Chamber Tested by: Peter								
Test mode: Tx CH1 2405MHz								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2390	53.74	27.62	3.92	34.97	50.31	74	23.69	PK
2390	/	27.62	3.92	34.97	/	54	/	AV
2400	66.24	27.62	3.94	34.97	62.83	74	11.17	PK
2400	50.78	27.62	3.94	34.97	47.37	54	6.63	AV
Antenna Polarity: Horizontal								
2390	51.89	27.62	3.92	34.97	48.46	74	25.54	PK
2390	/	27.62	3.92	34.97	/	54	/	AV
2400	63.26	27.62	3.94	34.97	59.85	74	14.15	PK
2400	48.26	27.62	3.94	34.97	44.85	54	9.15	AV
Note: 1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK 2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK 3, Result = Read level + Antenna factor + cable loss-Amp factor 4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.								

CH high :

Band Edge Test result								
EUT: Ikonnik HRS3.2 3Ch 2.4GHz Xenon (Xe) Transmitter M/N: KNNS0005								
Power: DC 6.0V From battery								
Test date: 2015-04-03 Test site: 3m Chamber Tested by: Peter								
Test mode: Tx CH74 2478MHz								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2483.5	63.75	27.59	4.00	34.97	60.37	74	13.63	PK
2483.5	50.23	27.59	4.00	34.97	46.85	54	7.15	AV
Antenna Polarity: Horizontal								
2483.5	60.99	27.59	4.00	34.97	57.61	74	16.39	PK
2483.5	47.93	27.59	4.00	34.97	44.55	54	9.45	AV
Note: 1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK 2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK 3, Result = Read level + Antenna factor + cable loss-Amp factor 4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.								

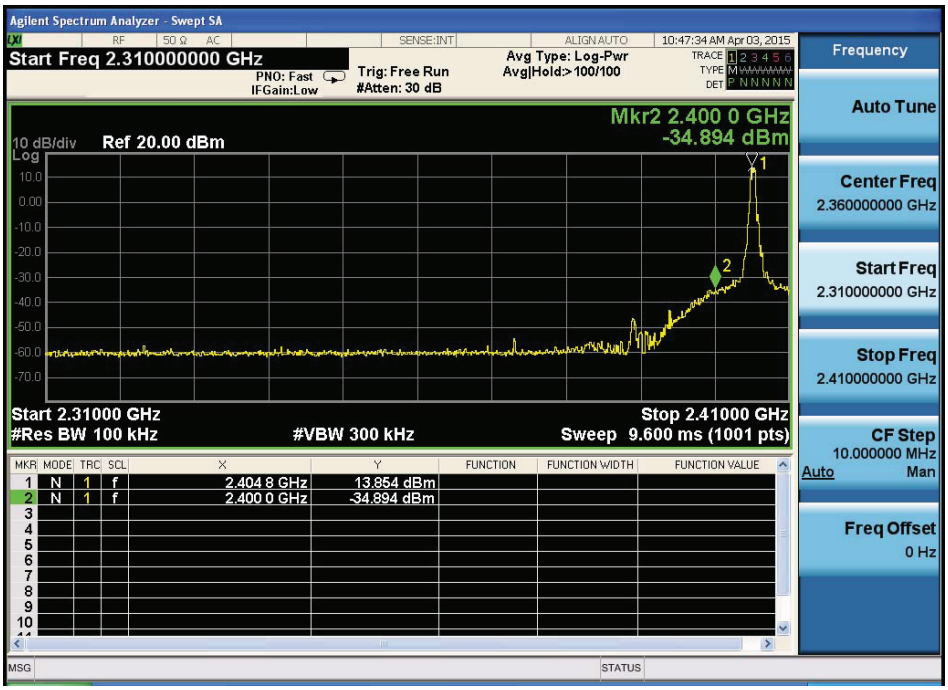
Band Edge Test result								
EUT: Ikonnik HRS3.2 3Ch 2.4GHz Xenon (Xe) Transmitter M/N: KNNS0005								
Power: DC 6.0V From battery								
Test date: 2015-04-03 Test site: 3m Chamber Tested by: Peter								
Test mode: Hopping								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2390	51.21	27.62	3.92	34.97	47.78	74	26.22	PK
2390	/	27.62	3.92	34.97	/	54	/	AV
2400	61.77	27.62	3.94	34.97	58.36	74	15.64	PK
2400	48.35	27.62	3.94	34.97	44.94	54	9.06	AV
Antenna Polarity: Horizontal								
2390	49.54	27.62	3.92	34.97	46.11	74	27.89	PK
2390	/	27.62	3.92	34.97	/	54	/	AV
2400	60.77	27.62	3.94	34.97	57.36	74	16.64	PK
2400	48.13	27.62	3.94	34.97	44.72	54	9.28	AV
Note: 1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK 2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK 3, Result = Read level + Antenna factor + cable loss-Amp factor 4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.								

Band Edge Test result								
EUT: Ikonnik HRS3.2 3Ch 2.4GHz Xenon (Xe) Transmitter M/N: KNNS0005								
Power: DC 6.0V From battery								
Test date: 2015-04-03 Test site: 3m Chamber Tested by: Peter								
Test mode: Hopping								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2483.5	62.42	27.59	4.00	34.97	59.04	74	14.96	PK
2483.5	49.89	27.59	4.00	34.97	46.51	54	7.49	AV
Antenna Polarity: Horizontal								
2483.5	60.11	27.59	4.00	34.97	56.73	74	17.27	PK
2483.5	47.65	27.59	4.00	34.97	44.27	54	9.73	AV
Note: 1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK 2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK 3, Result = Read level + Antenna factor + cable loss-Amp factor 4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.								

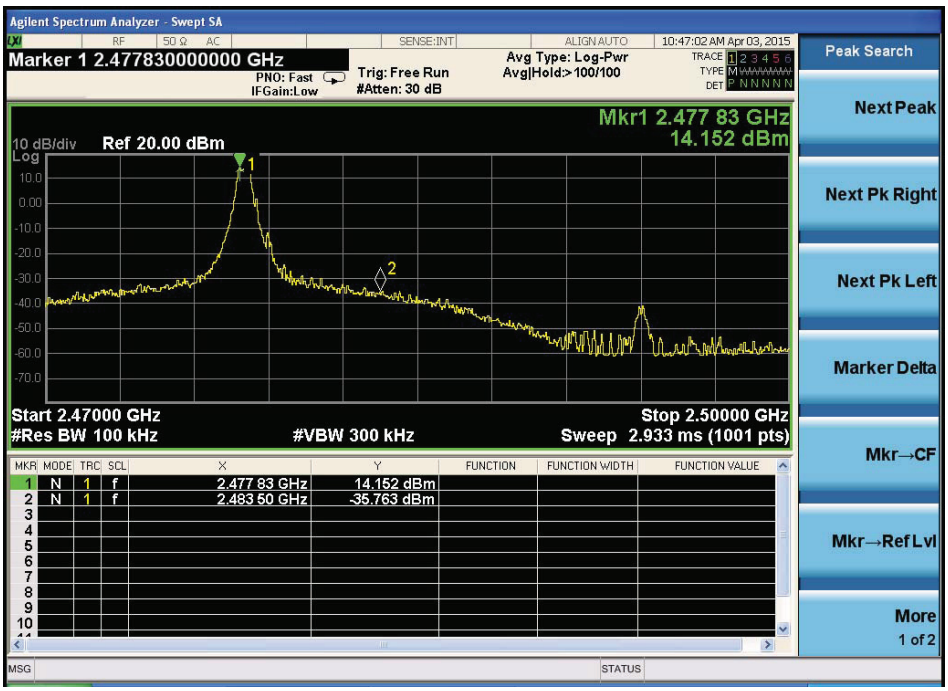
Conducted Method

FHSS(FSK)

CH LOW :



CH High :



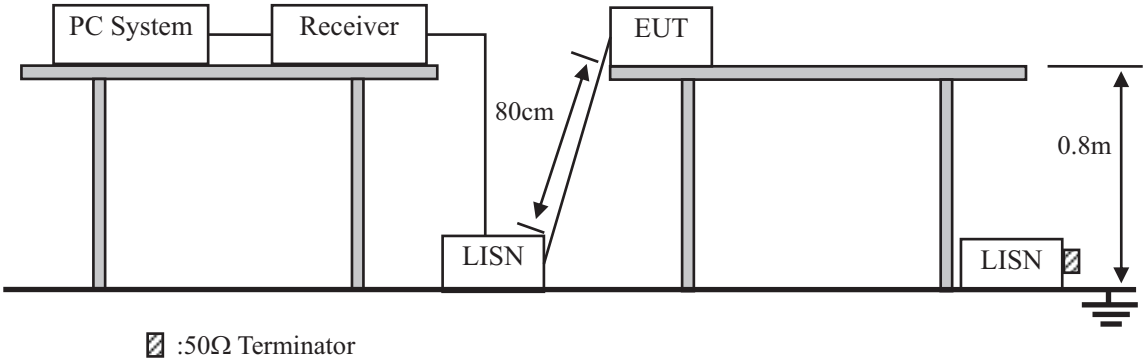
Hopping

Low

High

10. Power Line Conducted Emissions

10.1. Block Diagram of Test Setup



10.2. Limit

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. * Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

10.3. Test Procedure

(1) The EUT was placed on a non-metallic table, 80cm above the ground plane.
(2) Setup the EUT and simulator as shown in 10.1
(3) The EUT Power connected to the power mains through a power adapter and a line impedance stabilization network (L.I.S.N1). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N2), this provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4 2003 on conducted Emission test.
(4) The bandwidth of test receiver is set at 10KHz.
(5) The frequency range from 150 KHz to 30MHz is checked.

10.4. Test Result

Not Apply to battery operated product.

11. Antenna Requirements

11.1. Limit

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 (b), 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.

11.2. Result

The antenna used for this product is Antenna soldered on PCB, 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 2.5dBi .