

FCC CERTIFICATION TEST REPORT

FOR

Applicant : Dongguan Earson Audio technology Co.,Ltd

Address : Chuangye Industrial Area,guanqiaojiao Community,
Wanjiang District, dongguan City, guangdong

Equipment under Test : Wireless Transmitter

Model No : 51XXX

FCC ID : RI551XXX

Manufacturer : Dongguan Earson Audio technology Co.,Ltd

Address : Chuangye Industrial Area,guanqiaojiao Community,
Wanjiang District, dongguan City, guangdong

Issued By: Dongguan Dongdian Testing Service Co., Ltd.

Add: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City,
Guangdong Province, China, 523808

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REPORT

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TEST REPORT DECLARE

Applicant : Dongguan Earson Audio technology Co.,Ltd
Address : Chuangye Industrial Area,guanqiaojiao Community, Wanjiang District, dongguan City, guangdong
Equipment under Test : Wireless Transmitter
Model No : 51XXX
FCC ID : RI551XXX
Manufacturer : Dongguan Earson Audio technology Co.,Ltd
Address : Chuangye Industrial Area,guanqiaojiao Community, Wanjiang District, dongguan City, guangdong

Test Standard Used: FCC Rules and Regulations Part 15 Subpart C: 2012

Test procedure used: ANSI C63.10:2009

We Declare:

The equipment described above is tested by Dongguan Dongdian Testing Service Co., Ltd and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Dongguan Dongdian Testing Service Co., Ltd is assumed of full responsibility for the accuracy and completeness of these tests.

After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above FCC standards.

Report No:	DDT-RE130211		
Date of Test:	2013/08/05	Date of Report:	2013/08/19

Prepared By:



Leo Liu/Engineer

Approved By:



Jamy Yu/EMC Manager

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Dongguan Dongdian Testing Service Co., Ltd.

1. Summary of test results

EMISSION		
Description of Test Item	Standard	Results
Power Line Conducted Emission Test	FCC Part 15C: 15.207 ANSI C63.10 :2009	PASS
Radiated Emission Test	FCC Part 15C: 15.209 FCC Part 15C: 15.249 ANSI C63.10 :2009	PASS
20dB Bandwidth Test	FCC Part 15: 15.215 ANSI C63.10 :2009	PASS
N/A is an abbreviation for Not Applicable.		

2. General test information

2.1. Description of EUT

EUT* Name	:	Wireless Transmitter
Model Number	:	51XXX
Difference of Model	:	/
EUT function description	:	Please reference user manual of this device
Power supply	:	DC 3V from battery or DC 3V from external power adapter
FCC ID	:	RI551XXX
FCC Operation frequency	:	914MHz, 915MHz, 916MHz
Antenna Type	:	Integrated PCB antenna, Gain: 0dBi
Date of Receipt	:	2013/08/01
Sample Type	:	Series production

Note1: EUT is the ab. of equipment under test.

Noter2: This EUT will sold without power adapter, and a representative power adapter was provided by Manufacturer to test with EUT.

Note3: New battery was used if test with battery.

2.2. Accessories of EUT

Description of Accessories	Manufacturer	Model number or Type	Other
/	/	/	/

2.3. Assistant equipment used for test

Description of Assistant equipment	Manufacturer	Model number or Type	Other
Signal generator	GWINSTEK	GAG-810	EM862120
Adaptor	Blue Iron Holdings Limited	BI20-030150-AdU	1.5m

2.4. Block diagram of EUT configuration for test

TX Mode:



Tested mode, channel, and data rate information		
Mode	Channel	Frequency (MHz)
Tx Mode	1	914
	2	915
	3	916

2.5. Test environment conditions

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

Temperature range:	21-25°C
Humidity range:	40-75%
Pressure range:	86-106kPa

2.6. Test laboratory

Dongguan Dongdian Testing Service Co., Ltd

Add: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City, Guangdong Province, China, 523808 Tel: +86-0769-22891499

FCC Registration Number: 270092 Industry Canada site registration number: 10288A-1

2.7. Measurement uncertainty

Test Item	Uncertainty
Occupied Channel Bandwidth	±1%
Uncertainty for radio frequency	1×10^{-9}
Temperature	±0.2°C
Humidity	±1%
DC and Low frequency voltage	±0.5%
Time	±1%
Duty Cycle	±1%
Uncertainty for Radiation Emission test (30MHz-1GHz)	3.14 dB (Polarize: V)
	3.16 dB (Polarize: H)
Uncertainty for Radiation Emission test (1GHz to 25GHz)	2.08dB(Polarize: V)
	2.56dB (Polarize: H)
Uncertainty for Conduction emission test(150KHz-30MHz)	2.44dB
Uncertainty for Radiation Emission test (9KHz-150KHz)	3.89dB

Uncertainty for Radiation Emission test (150KHz-30MHz)	3.21dB
--	--------

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

3. 20dB Bandwidth

3.1. Test equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum analyzer	R&S	FSU	1166.1660.26	2012/11/26	1Y

3.2. Block diagram of test setup



3.3. Limits

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in § 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

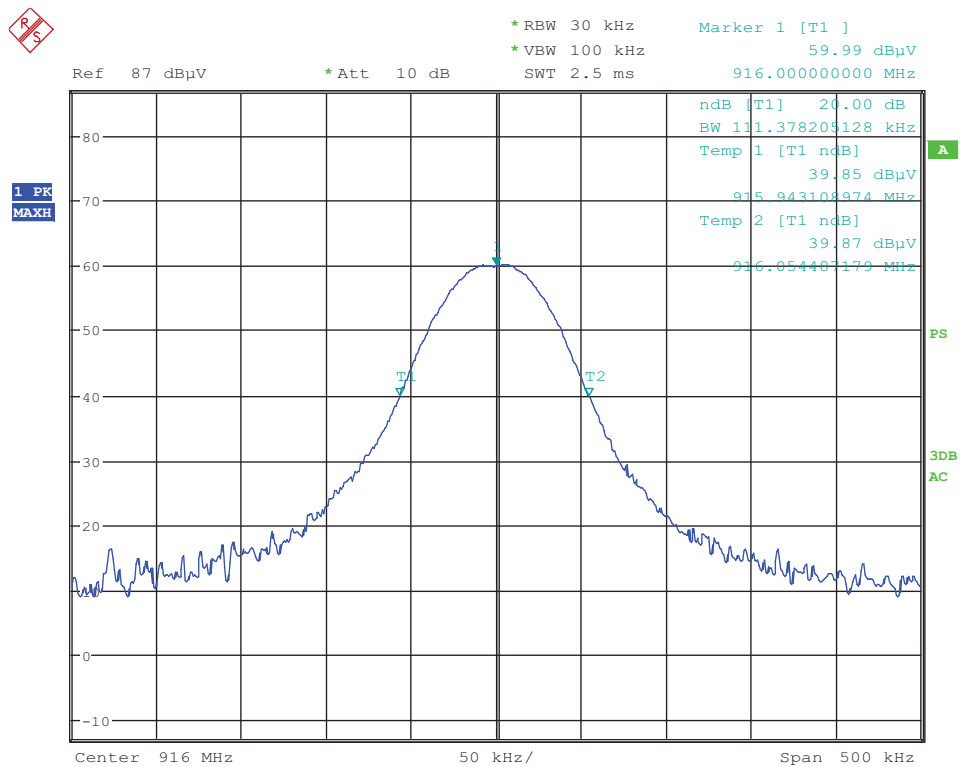
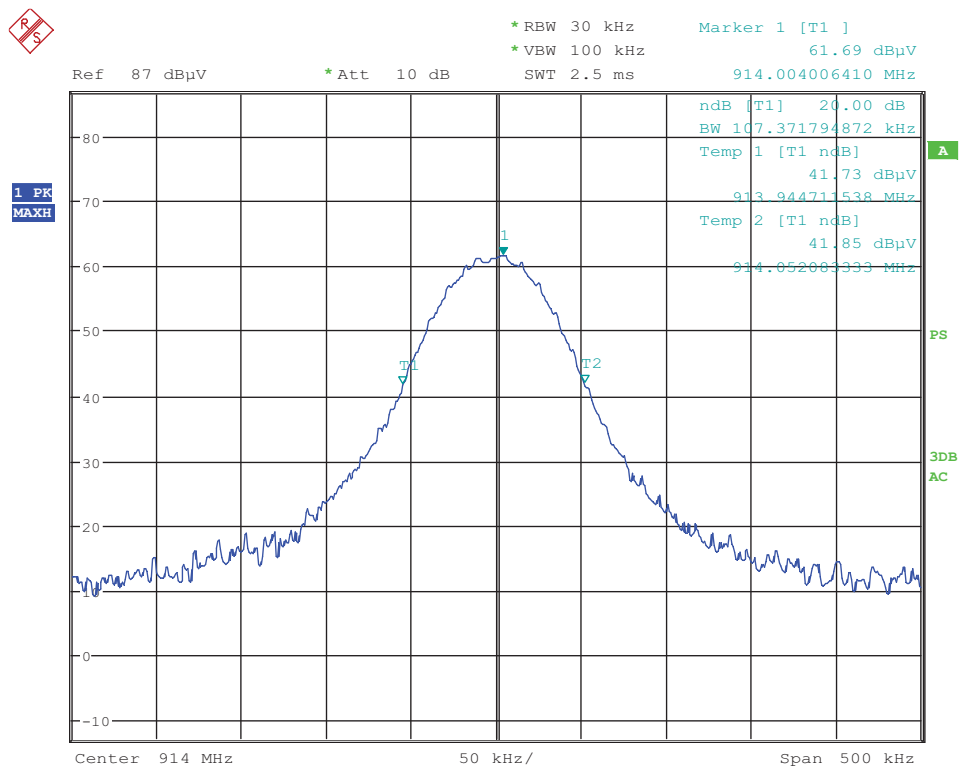
3.4. Test Procedure

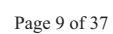
- (1) The EUT's RF signal was coupled to spectrum analyzer by a antenna connected to spectrum analyzer.
- (2) Configure EUT work in Tx mode as stated in clause 2.4.
- (3) The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30 kHz RBW and 100kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

3.5. Test Result

EUT: Wireless Transmitter M/N: 51XXX					
Mode	Freq (MHz)	Result (KHz)	Limit (MHz)	Margin (MHz)	Conclusion
Tx Mode	914	107.37	/	/	PASS
	915	106.57	/	/	PASS
	916	111.38	/	/	PASS
Test Date : 2013/08/05			Test Engineer :Leo Liu		

3.6. Original test data





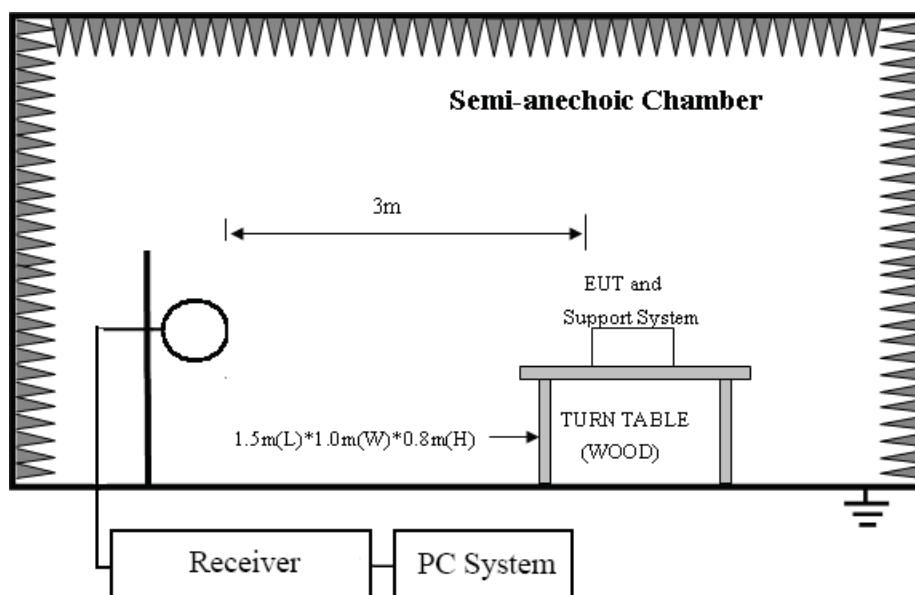
4. Radiated emission

4.1. Test equipment

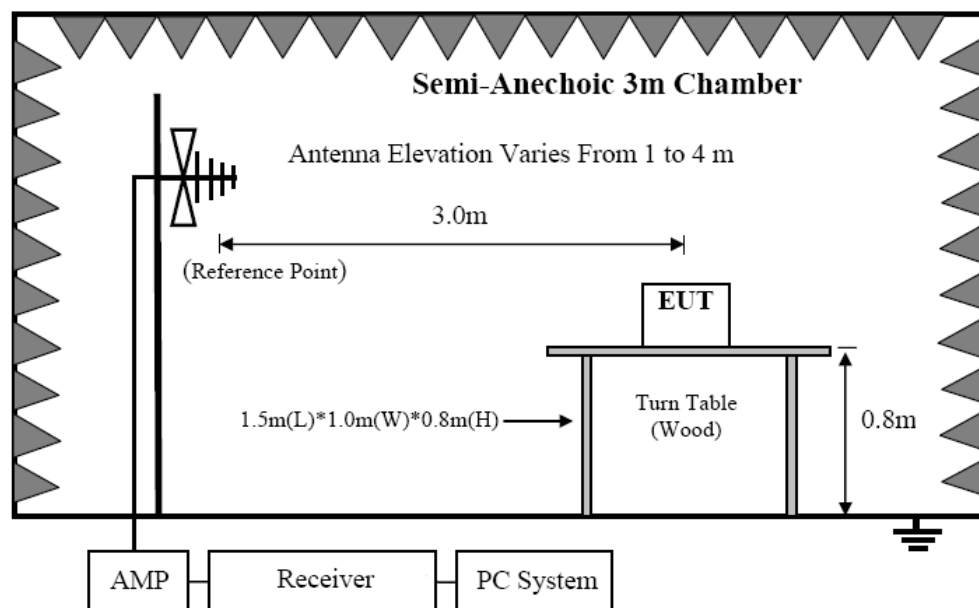
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	EMI Test Receiver	R&S	ESU8	100316	2012/11/26	1 Year
2	Spectrum analyzer	R&S	FSU	1166.1660.26	2012/11/26	1 Year
3	Active Loop antenna	Schwarzbeck	FMZB1519	1519-038	2012/11/26	1 Year
4	Trilog Broadband Antenna	Schwarzbeck	VULB9163	9163-462	2012/11/26	1 Year
5	Double Ridged Horn Antenna	R&S	HF907	100276	2012/11/26	1 Year
6	Horn Antenna	EMCO	3116	00060095	2012/11/26	1 Year
7	Pre-Amplifier	R&S	SCU-01	10049	2012/11/26	1 Year
8	Pre-amplifier	A.H.	PAM0-0118	360	2012/11/26	1 Year
9	Pre-amplifier	A.H.	PAM-1840VH	562	2012/11/26	1 Year
10	RF Cable	R&S	R01	10403	2012/11/26	1 Year
11	RF Cable	R&S	R02	10512	2012/11/26	1 Year

4.2. Block diagram of test setup

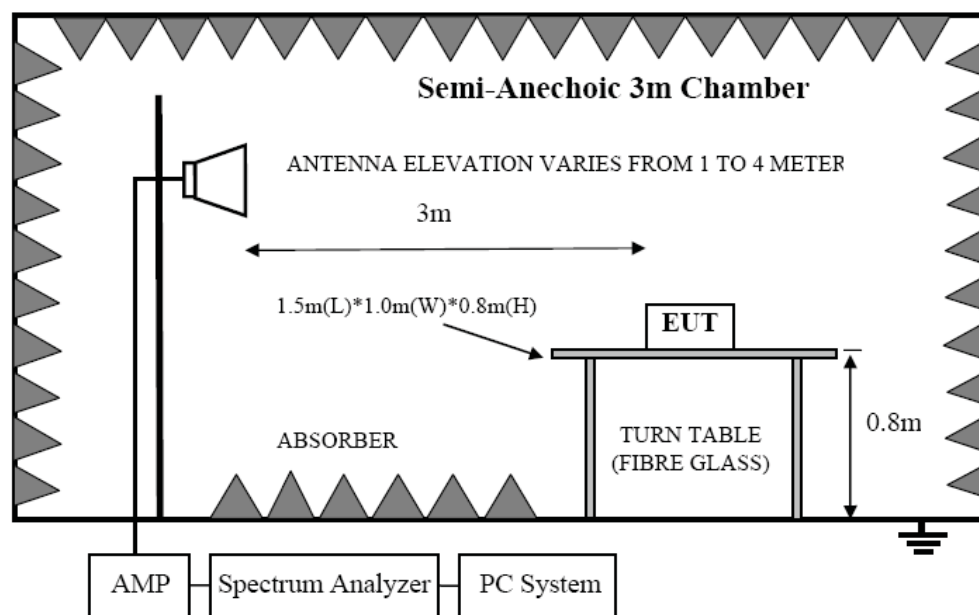
In 3m Anechoic Chamber Test Setup Diagram for 9KHz-30MHz



In 3m Anechoic Chamber Test Setup Diagram for 30MHz-1GHz



In 3m Anechoic Chamber Test Setup Diagram for frequency above 1GHz



Note: For harmonic emissions test a appropriate high pass filter was inserted in the input port of AMP.

4.3. Limit

4.3.1 FCC 15.209 limit

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V})/\text{m}$
0.009 ~ 0.490	300	$2400/\text{F}(\text{KHz})$	$67.6-20\log(\text{F})$
0.490 ~ 1.705	30	$24000/\text{F}(\text{KHz})$	$87.6-20\log(\text{F})$
1.705 ~ 30.0	30	30	29.54
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 $\text{dB}(\mu\text{V})/\text{m}$ (Peak) 54.0 $\text{dB}(\mu\text{V})/\text{m}$ (Average)	

Remark : (1) Emission level $\text{dB}\mu\text{V} = 20 \log$ Emission level $\mu\text{V/m}$

- (2) The smaller limit shall apply at the cross point between two frequency bands.
- (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.
- (4) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.
- (5) At frequencies below 30MHz, measurement may be performed at a distance closer than that specified, and the limit at closer measurement distance can be extrapolated by below formula:

$$\text{Limit}_{3\text{m}}(\text{dB}\mu\text{V/m}) = \text{Limit}_{30\text{m}}(\text{dB}\mu\text{V/m}) + 40\log(30\text{m}/3\text{m})$$

4.3.2 FCC 15.249 limit

FREQUENCY MHz	DISTANCE Meters	Limit
Field Strength of Fundamental emission for 902MHz-928MHz	3	94.0 $\text{dB}(\mu\text{V})/\text{m}$ (QP)
Field Strength of Harmonics	3	54.0 $\text{dB}(\mu\text{V})/\text{m}$ (QP)

Note: 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 Section 15.209, whichever is the lesser attenuation.

4.4. Test Procedure

- (1) EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber.
- (2) Setup EUT and assistant system according clause 2.4 and 4.2
- (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) Change power supply range from 85% to 115% of the rated supply voltage
 - (d) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions
- (4) Spectrum frequency from 9KHz to 10GHz (tenth harmonic of fundamental frequency) was investigated, and no any obvious emission were detected from 9KHz to 30MHz ,so below final test was performed with frequency range from 30MHz to 10GHz.
- (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 C63.10 2009 on Radiated Emission test.
- (6) For emissions from 30MHz to 1GHz, Quasi-Peak values were measured with EMI Receiver and the bandwidth of Receiver is 120 KHz.
- (7) For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer.
- (8) For Peak emissions above 1GHz measure, the Spectrum Analyzer was set as below:

RBW:	1MHz
VBW:	3MHz
Detector Mode:	Peak

- (9) For Average emissions above 1GHz measure, blow test procedure was used:
 - (a) Tune the Spectrum Analyzer's center frequency to the signal of interest.
 - (b) Reduce spectrum analyzer frequency span to a value of zero and peak value of the measured signal was kept in the center of the display during the reduction of the span.
 - (c) Select spectrum analyzer linear display mode.
 - (d) Set spectrum analyzer reference level such that the measured signal is positioned as close as possible to the top line of the display graticule, and other set as below:

RBW:	1MHz
VBW:	10Hz
Detector Mode:	Peak

4.5. Test result

PASS. (See below detailed test result)

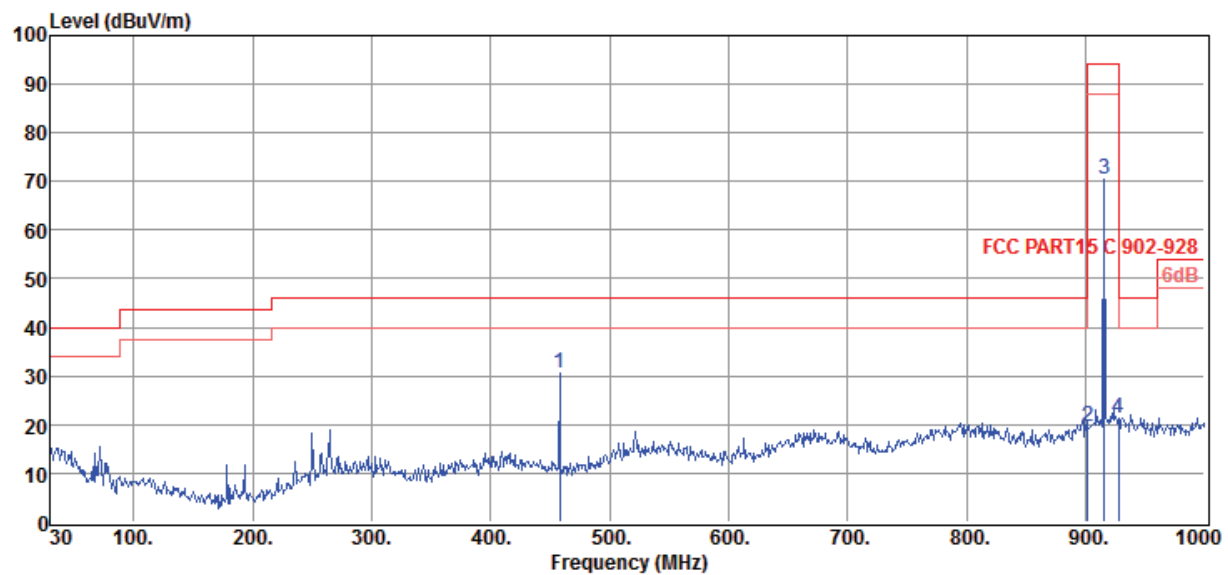
All the emissions except fundamental emission from 9 KHz to 10GHz comply with 15.209 limits.

Note: According pre-test, for emission below 1GHz when test with power adapter have worse emissions, so for emissions below 1GHz, the final test were performed with power adapter.

Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:\2013 Report data\13QE0071\Transmitter.EM6**
Test Date : 2013-08-05 **Tested By** : Damon
EUT : Transmitter **Model Number** : 51XXX
Power Supply : DC 3V from adapter 120V/60Hz **Test Mode** : Tx 915MHz
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2013 VULB9163/3m/HORIZONTAL
Memo :

Data: 16



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	457.77	56.65	13.75	43.24	3.35	30.51	46.00	-15.49	Peak	HORIZONTAL
2	902.00	36.29	21.90	43.40	4.80	19.59	46.00	-26.41	Peak	HORIZONTAL
3	915.61	86.45	22.62	43.40	4.83	70.50	94.00	-23.50	Peak	HORIZONTAL
4	928.00	37.10	22.60	43.40	4.90	21.20	46.00	-24.80	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor

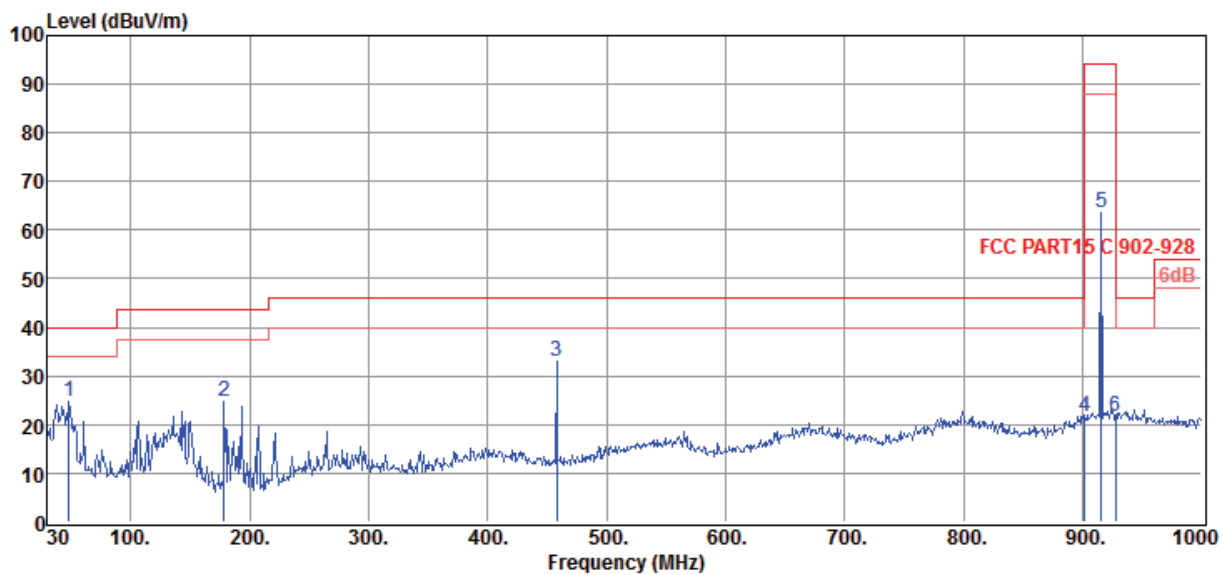
2. If Peak Result comply with QP limit, QP Result is deemed to comply with QP limit

3. Test setup: RBW: 120kHz, VBW: 300kHz, Sweep time: auto

Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:\2013 Report data\13QE0071\Transmitter.EM6**
Test Date : 2013-08-05 **Tested By** : Damon
EUT : Transmitter **Model Number** : 51XXX
Power Supply : DC 3V from adapter 120V/60Hz **Test Mode** : Tx 915MHz
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2013 VULB9163/3m/VERTICAL
Memo :

Data: 17



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	48.43	49.66	12.80	38.70	0.98	24.74	40.00	-15.26	Peak	VERTICAL
2	178.41	58.32	6.65	42.23	1.99	24.73	43.50	-18.77	Peak	VERTICAL
3	457.77	59.10	13.75	43.24	3.35	32.96	46.00	-13.04	Peak	VERTICAL
4	902.00	38.33	21.90	43.40	4.80	21.63	46.00	-24.37	Peak	VERTICAL
5	915.61	79.36	22.62	43.40	4.83	63.41	94.00	-30.59	Peak	VERTICAL
6	928.00	37.40	22.60	43.40	4.90	21.50	46.00	-24.50	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor

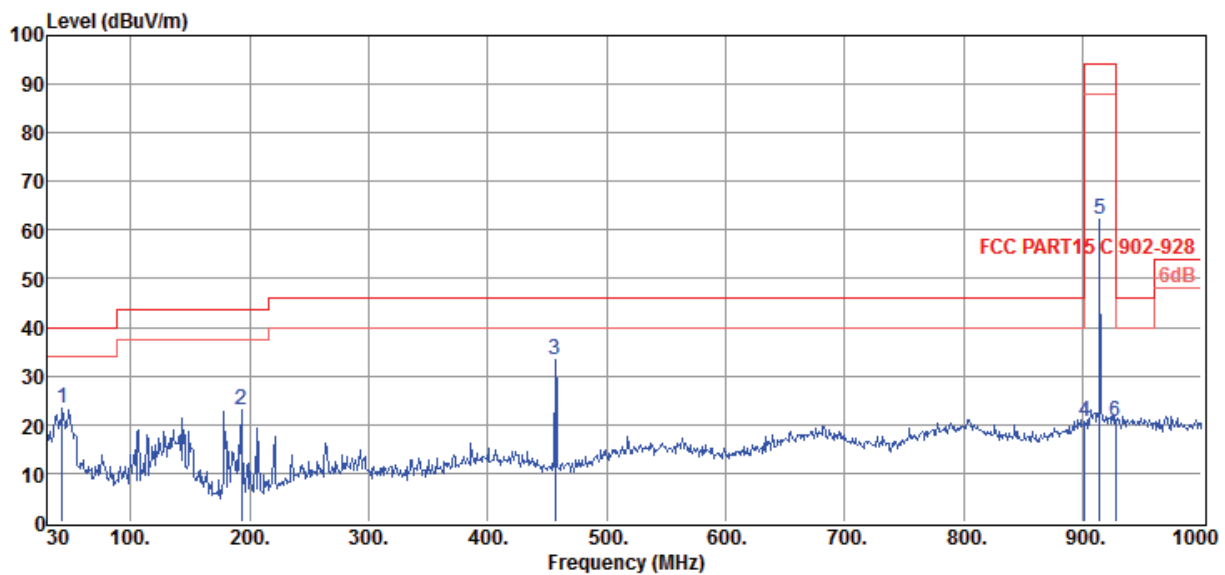
2. If Peak Result comply with QP limit, QP Result is deemed to comply with QP limit

3. Test setup: RBW: 120kHz, VBW: 300kHz, Sweep time: auto

Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:\2013 Report data\13QE0071\Transmitter.EM6**
Test Date : 2013-08-05 **Tested By** : Damon
EUT : Transmitter **Model Number** : 51XXX
Power Supply : DC 3V from adapter 120V/60Hz **Test Mode** : Tx 914MHz
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2013 VULB9163/3m/VERTICAL
Memo :

Data: 18



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	42.61	46.61	13.40	37.45	0.95	23.51	40.00	-16.49	Peak	VERTICAL
2	192.96	56.19	7.30	42.50	2.06	23.05	43.50	-20.45	Peak	VERTICAL
3	456.80	59.38	13.75	43.24	3.35	33.24	46.00	-12.76	Peak	VERTICAL
4	902.00	37.16	21.90	43.40	4.80	20.46	46.00	-25.54	Peak	VERTICAL
5	914.64	78.37	22.45	43.40	4.83	62.25	94.00	-31.75	Peak	VERTICAL
6	928.00	36.55	22.60	43.40	4.90	20.65	46.00	-25.35	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor

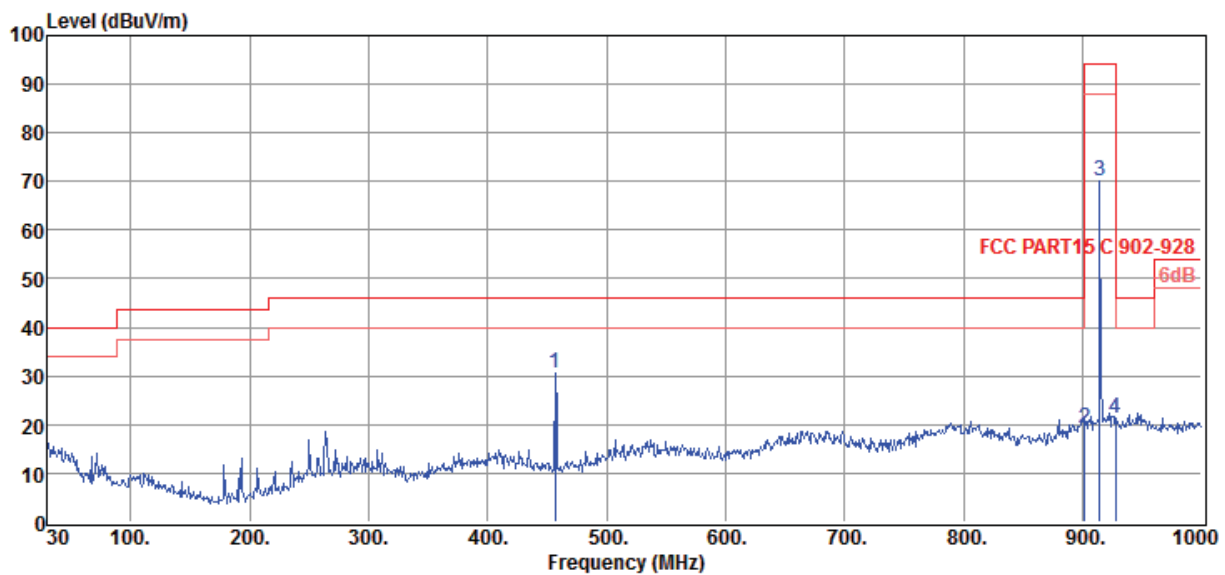
2. If Peak Result comply with QP limit, QP Result is deemed to comply with QP limit

3. Test setup: RBW: 120kHz, VBW: 300kHz, Sweep time: auto

Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:\2013 Report data\13QE0071\Transmitter.EM6**
Test Date : 2013-08-05 **Tested By** : Damon
EUT : Transmitter **Model Number** : 51XXX
Power Supply : DC 3V from adapter 120V/60Hz **Test Mode** : Tx 914MHz
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2013 VULB9163/3m/HORIZONTAL
Memo :

Data: 19



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	456.80	56.71	13.75	43.24	3.35	30.57	46.00	-15.43	Peak	HORIZONTAL
2	902.00	35.80	21.90	43.40	4.80	19.10	46.00	-26.90	Peak	HORIZONTAL
3	914.64	86.36	22.45	43.40	4.83	70.24	94.00	-23.76	Peak	HORIZONTAL
4	928.00	37.16	22.60	43.40	4.90	21.26	46.00	-24.74	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor

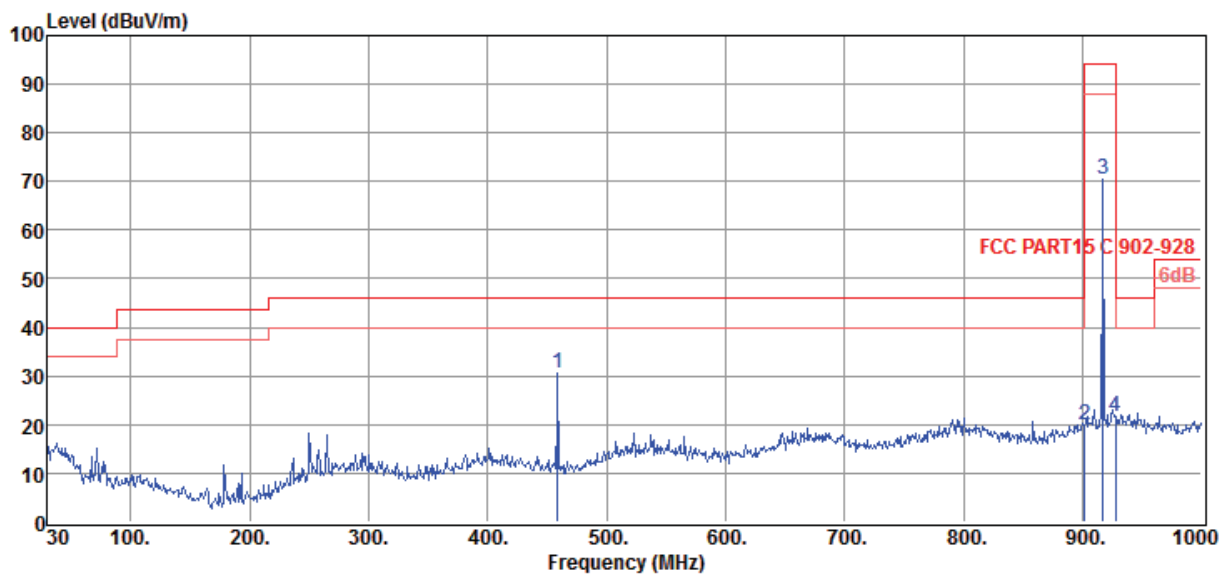
2. If Peak Result comply with QP limit, QP Result is deemed to comply with QP limit

3. Test setup: RBW: 120kHz, VBW: 300kHz, Sweep time: auto

Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:\2013 Report data\13QE0071\Transmitter.EM6**
Test Date : 2013-08-05 **Tested By** : Damon
EUT : Transmitter **Model Number** : 51XXX
Power Supply : DC 3V from adapter 120V/60Hz **Test Mode** : Tx 916MHz
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2013 VULB9163/3m/HORIZONTAL
Memo :

Data: 20



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	458.74	56.60	13.75	43.24	3.35	30.46	46.00	-15.54	Peak	HORIZONTAL
2	902.00	36.52	21.90	43.40	4.80	19.82	46.00	-26.18	Peak	HORIZONTAL
3	917.55	86.41	22.62	43.40	4.87	70.50	94.00	-23.50	Peak	HORIZONTAL
4	928.00	37.43	22.60	43.40	4.90	21.53	46.00	-24.47	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor

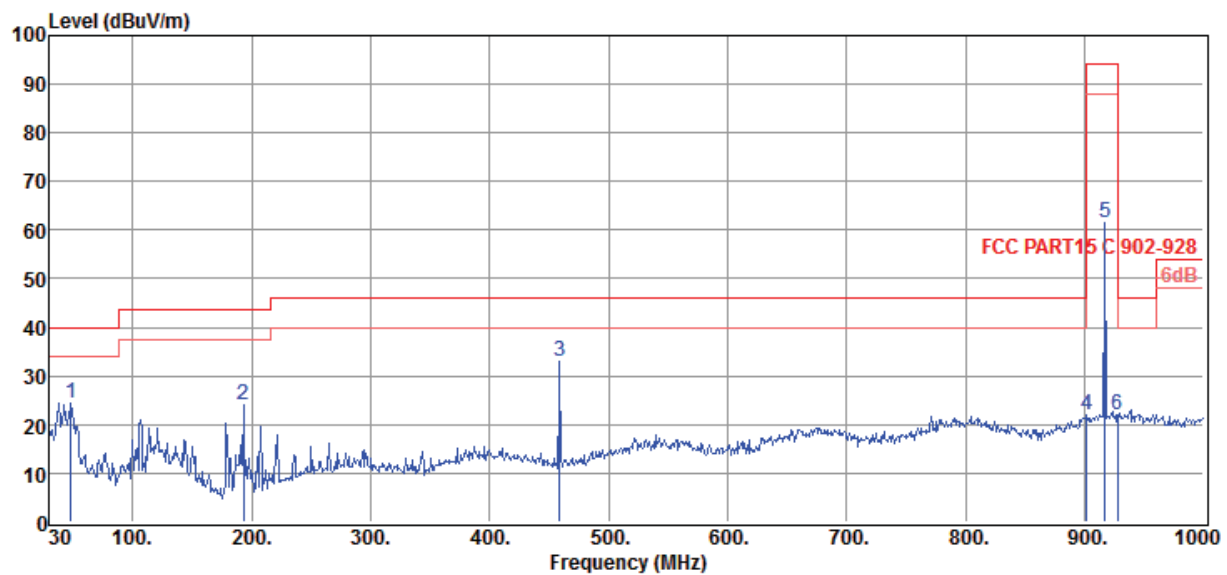
2. If Peak Result comply with QP limit, QP Result is deemed to comply with QP limit

3. Test setup: RBW: 120kHz, VBW: 300kHz, Sweep time: auto

Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:\2013 Report data\13QE0071\Transmitter.EM6**
Test Date : 2013-08-05 **Tested By** : Damon
EUT : Transmitter **Model Number** : 51XXX
Power Supply : DC 3V from adapter 120V/60Hz **Test Mode** : Tx 916MHz
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2013 VULB9163/3m/VERTICAL
Memo :

Data: 21



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	48.43	49.45	12.80	38.70	0.98	24.53	40.00	-15.47	Peak	VERTICAL
2	192.96	57.14	7.30	42.50	2.06	24.00	43.50	-19.50	Peak	VERTICAL
3	458.74	59.12	13.75	43.24	3.35	32.98	46.00	-13.02	Peak	VERTICAL
4	902.00	38.56	21.90	43.40	4.80	21.86	46.00	-24.14	Peak	VERTICAL
5	917.55	77.55	22.62	43.40	4.87	61.64	94.00	-32.36	Peak	VERTICAL
6	928.00	38.03	22.60	43.40	4.90	22.13	46.00	-23.87	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor

2. If Peak Result comply with QP limit, QP Result is deemed to comply with QP limit

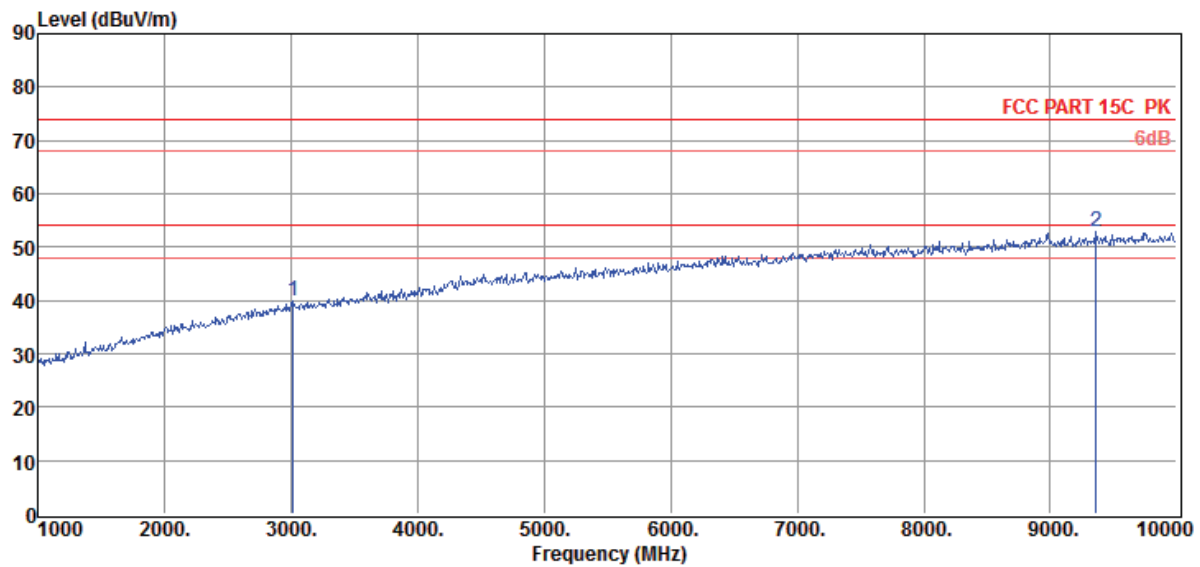
3. Test setup: RBW: 120kHz, VBW: 300kHz, Sweep time: auto

Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:** \2013 Report data\13QE0071\Transmitter.EM6
Test Date : 2013-08-05 **Tested By** : Damon
EUT : Transmitter **Model Number** : 51XXX
Power Supply : DC 3V from battery **Test Mode** : Tx 914MHz
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2013 HF907/3m/VERTICAL

Memo

Data: 1



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	3016.00	42.43	32.02	44.11	9.47	39.81	74.00	-34.19	Peak	VERTICAL
2	9361.00	41.07	37.94	43.90	17.74	52.85	74.00	-21.15	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor

2. If Peak Result comply with AV limit, AV Result is deemed to comply with AV limit

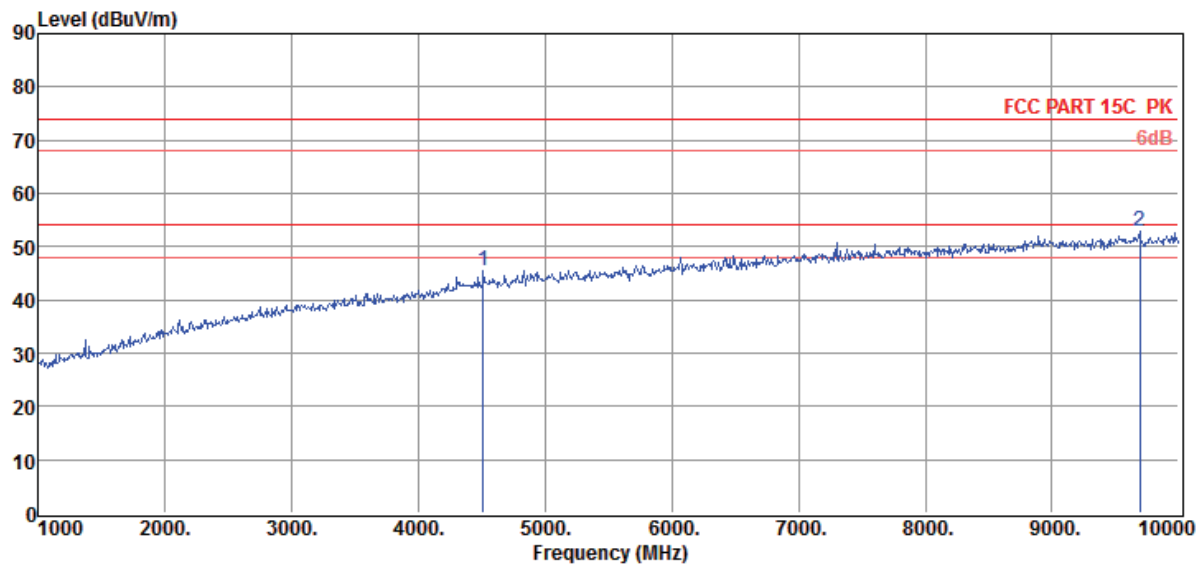
3. Test setup: RBW: 1MHz, VBW: 3MHz, Sweep time:auto

Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:** \2013 Report data\13QE0071\Transmitter.EM6
Test Date : 2013-08-05 **Tested By** : Damon
EUT : Transmitter **Model Number** : 51XXX
Power Supply : DC 3V from battery **Test Mode** : Tx 914MHz
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2013 HF907/3m/HORIZONTAL

Memo

Data: 2



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	4510.00	42.80	34.90	44.49	12.18	45.39	74.00	-28.61	Peak	HORIZONTAL
2	9694.00	40.65	38.15	43.86	18.02	52.96	74.00	-21.04	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor

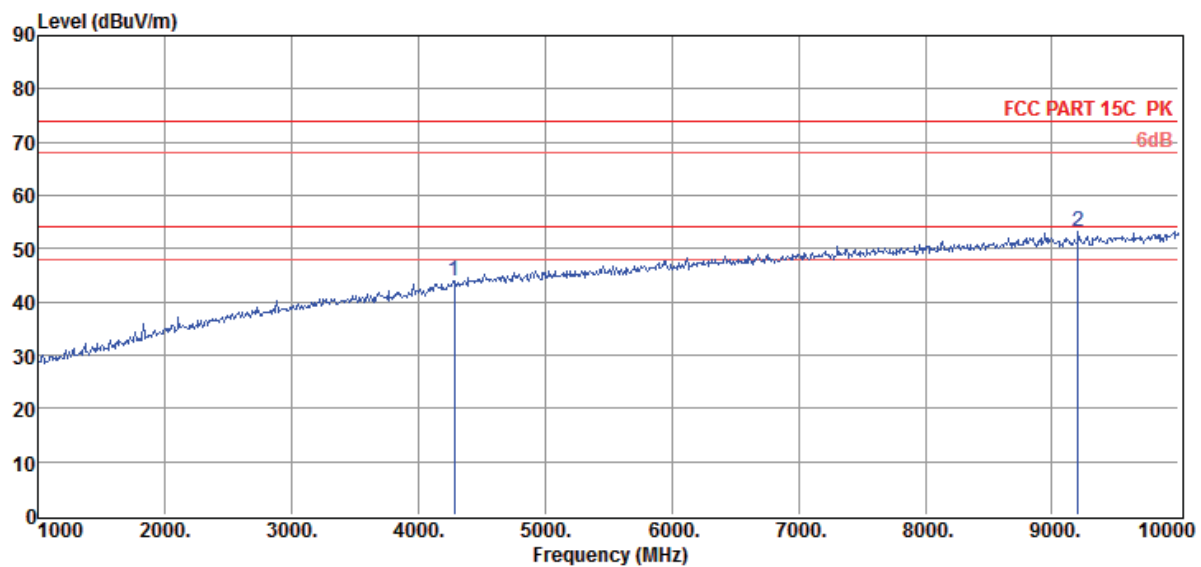
2. If Peak Result comply with AV limit, AV Result is deemed to comply with AV limit

3. Test setup: RBW: 1MHz, VBW: 3MHz, Sweep time:auto

Radiated Emission Test Result

Test Site	: DDT 3m Chamber	E:\2013 Report data\13QE0071\Transmitter.EM6
Test Date	: 2013-08-05	Tested By : Damon
EUT	: Transmitter	Model Number : 51XXX
Power Supply	: DC 3V from battery	Test Mode : Tx 915MHz
Condition	: Temp:24.5'C,Humi:55%, Press:100.1kPa	Antenna/Distance : 2013 HF907/3m/HORIZONTAL
Memo	: 915MHz	

Data: 3



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	4285.00	42.37	34.21	44.37	11.71	43.92	74.00	-30.08	Peak	HORIZONTAL
2	9208.00	41.51	37.88	43.90	17.66	53.15	74.00	-20.85	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor

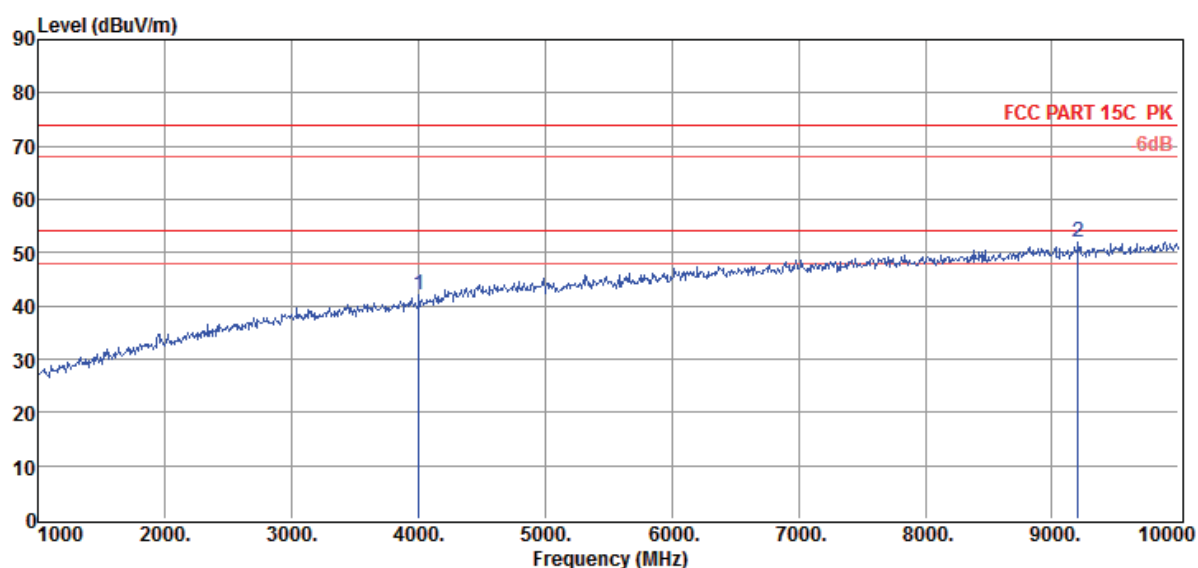
2. If Peak Result comply with AV limit, AV Result is deemed to comply with AV limit

3. Test setup: RBW: 1MHz, VBW: 3MHz, Sweep time:auto

Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:** \2013 Report data\13QE0071\Transmitter.EM6
Test Date : 2013-08-05 **Tested By** : Damon
EUT : Transmitter **Model Number** : 51XXX
Power Supply : DC 3V from battery **Test Mode** : Tx 915MHz
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2013 HF907/3m/VERTICAL
Memo : 915MHz

Data: 4



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	4006.00	41.90	33.35	44.21	11.10	42.14	74.00	-31.86	Peak	VERTICAL
2	9208.00	40.43	37.88	43.90	17.66	52.07	74.00	-21.93	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor

2. If Peak Result comply with AV limit, AV Result is deemed to comply with AV limit

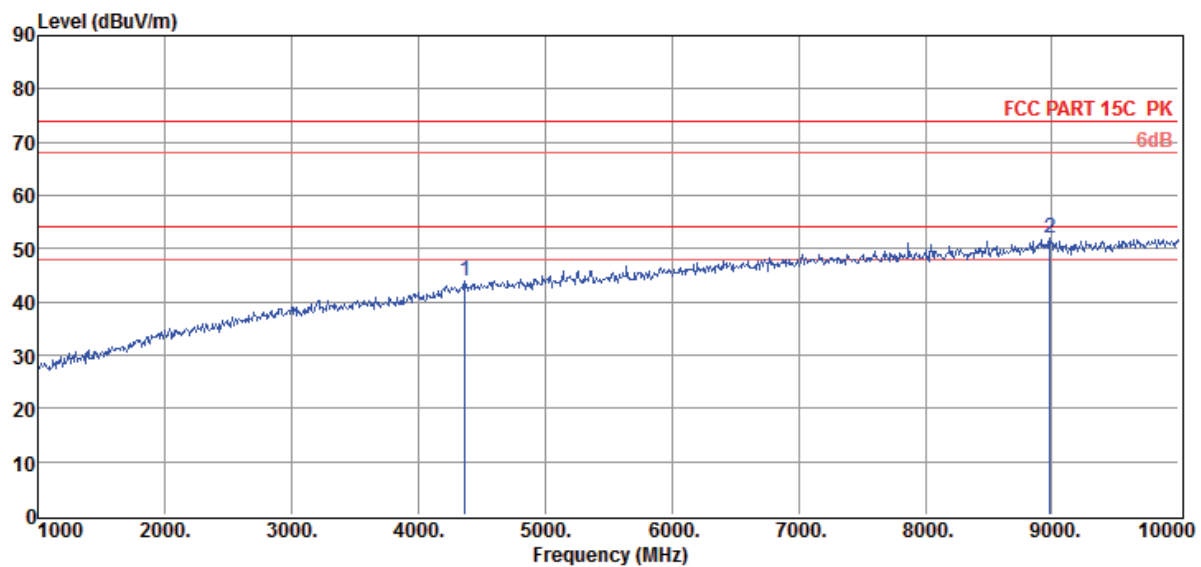
3. Test setup: RBW: 1MHz, VBW: 3MHz, Sweep time:auto

Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:\2013 Report data\13QE0071\Transmitter.EM6**
Test Date : 2013-08-05 **Tested By** : Damon
EUT : Transmitter **Model Number** : 51XXX
Power Supply : DC 3V from battery **Test Mode** : Tx 916MHz
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2013 HF907/3m/VERTICAL

Memo

Data: 5



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	4366.00	41.93	34.47	44.42	11.96	43.94	74.00	-30.06	Peak	VERTICAL
2	8983.00	40.42	37.80	43.90	17.50	51.82	74.00	-22.18	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor

2. If Peak Result comply with AV limit, AV Result is deemed to comply with AV limit

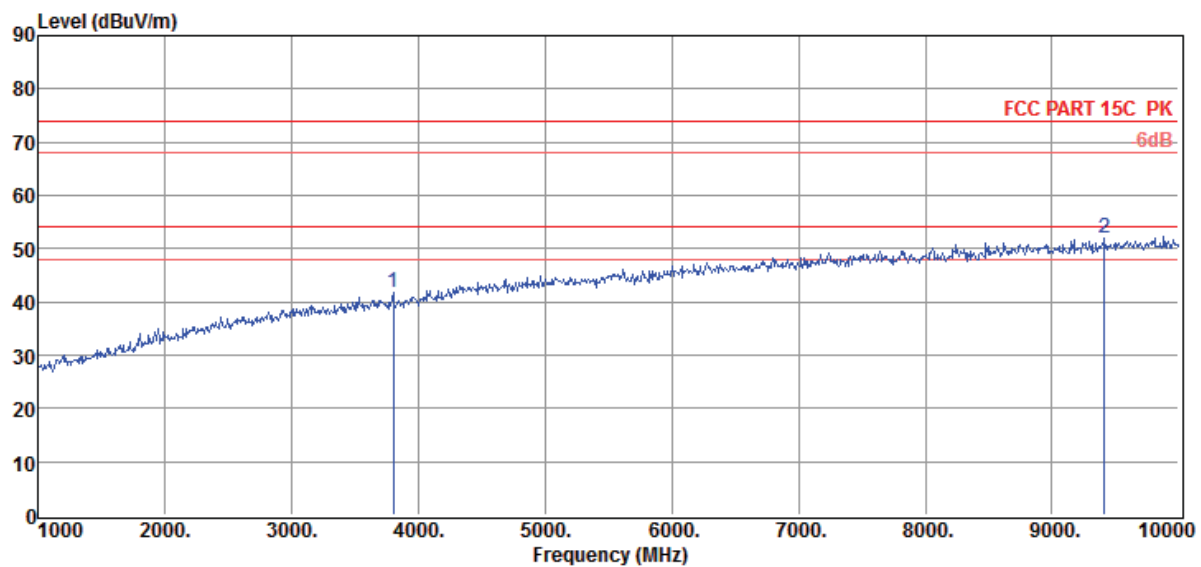
3. Test setup: RBW: 1MHz, VBW: 3MHz, Sweep time:auto

Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:** \2013 Report data\13QE0071\Transmitter.EM6
Test Date : 2013-08-05 **Tested By** : Damon
EUT : Transmitter **Model Number** : 51XXX
Power Supply : DC 3V from battery **Test Mode** : Tx 916MHz
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2013 HF907/3m/HORIZONTAL

Memo

Data: 6



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	3799.00	42.16	33.03	44.24	10.81	41.76	74.00	-32.24	Peak	HORIZONTAL
2	9415.00	40.02	37.97	43.90	17.82	51.91	74.00	-22.09	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor

2. If Peak Result comply with AV limit, AV Result is deemed to comply with AV limit

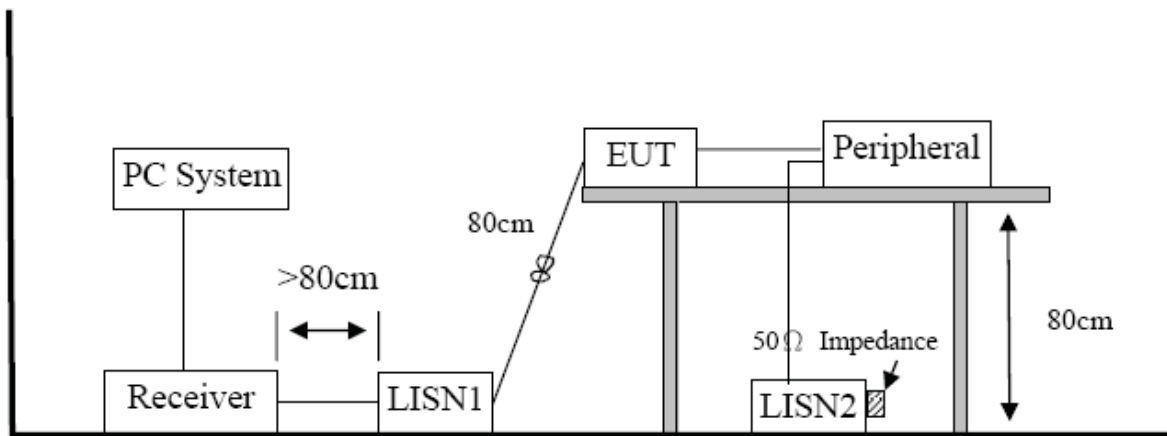
3. Test setup: RBW: 1MHz, VBW: 3MHz, Sweep time:auto

5. Power Line Conducted Emission

5.1. Test equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Test Receiver	R&S	ESU8	100316	2012/11/26	1 Year
2	LISN 1	R&S	ENV216	101109	2012/11/26	1 Year
3	LISN 2	R&S	ESH2-Z5	100309	2012/11/26	1 Year
4	Pulse Limiter	R&S	ESH3-Z2	101242	2012/11/26	1 Year

5.2. Block diagram of test setup



5.3. Power Line Conducted Emission Limits(Class B)

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

Note 1: * Decreasing linearly with logarithm of frequency.

Note 2: The lower limit shall apply at the transition frequencies.

5.4. Test Procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

Configuration EUT to simulate typical usage as described in clause 2.4 and test equipment as described in clause 10.2 of this report.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

The test mode(s) described in clause 2.4 were scanned during the preliminary test.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions.

Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

The bandwidth of test receiver is set at 9 KHz.

5.5. Test Result

PASS. (See below detailed test result)

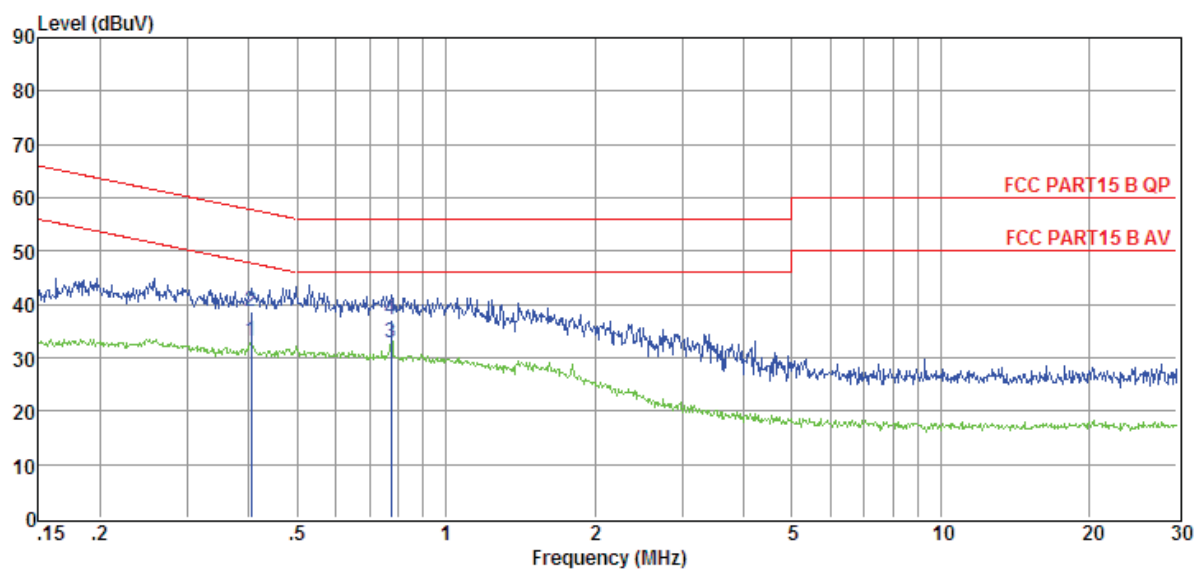
Note1: All emissions not reported below are too low against the prescribed limits.

Note2: “----” means average detection; “----” mans peak detection

Conducted Emission Test Result

Test Site : DDT 1# Shield Room **E:\2013 report data\13QE0071\transmitter.EM6**
Test Date : 2013-08-05 **Tested By** : Damon
EUT : Transmitter **Model Number** : 51XXX
Power Supply : DC 3V from adapter 120V/60Hz **Test Mode** : Tx 915MHz
Condition : Temp:24.5'C,Humi:55%,
Press:100.1kPa **LISN** : 2013 ENV216/LINE
Memo :

Data : 2



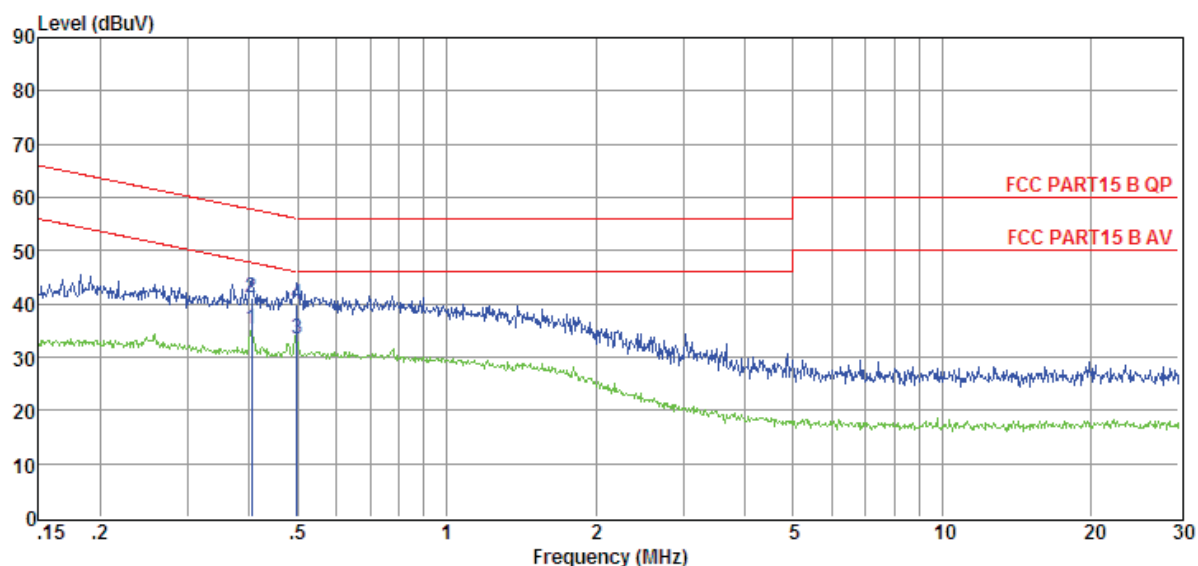
Item (Mark)	Freq (MHz)	Read Level (dBμV)	LISN Factor (dB)	Cable Loss (dB)	Pulse Limiter Factor (dB)	Result Level (dBμV)	Limit Line (dBμV)	Over Limit (dB)	Detector	Phase
1	0.40	13.63	9.63	0.03	9.86	33.15	47.77	-14.62	Average	LINE
2	0.40	19.29	9.63	0.03	9.86	38.81	57.77	-18.96	QP	LINE
3	0.78	13.24	9.62	0.08	9.86	32.80	46.00	-13.20	Average	LINE
4	0.78	17.66	9.62	0.08	9.86	37.22	56.00	-18.78	QP	LINE

Note: 1. Result Level = Read Level + LISN Factor + Pulse Limiter Factor + Cable loss
 2. If QP Result comply with AV limit, AV Result is deemed to comply with AV limit
 3. Test setup: RBW: 200Hz(9kHz—150kHz) , 9kHz(150kHz—30MHz), Step size:4kHz, Scan time: auto

Conducted Emission Test Result

Test Site : DDT 1# Shield Room **E:\2013 report data\13QE0071\transmitter.EM6**
Test Date : 2013-08-05 **Tested By** : Damon
EUT : Transmitter **Model Number** : 51XXX
Power Supply : DC 3V from adapter 120V/60Hz **Test Mode** : Tx 915MHz
Condition : Temp:24.5'C,Humi:55%,
Press:100.1kPa **LISN** : 2013 ENV216/NEUTRAL
Memo :

Data : 4



Item (Mark)	Freq (MHz)	Read Level (dBμV)	LISN Factor (dB)	Cable Loss (dB)	Pulse Limiter Factor (dB)	Result Level (dBμV)	Limit Line (dBμV)	Over Limit (dB)	Detector	Phase
1	0.40	15.65	9.61	0.03	9.86	35.15	47.77	-12.62	Average	NEUTRAL
2	0.40	21.74	9.61	0.03	9.86	41.24	57.77	-16.53	QP	NEUTRAL
3	0.50	13.90	9.61	0.03	9.87	33.41	46.01	-12.60	Average	NEUTRAL
4	0.50	20.38	9.61	0.03	9.87	39.89	56.01	-16.12	QP	NEUTRAL

Note: 1. Result Level = Read Level + LISN Factor + Pulse Limiter Factor + Cable loss

2. If QP Result comply with AV limit, AV Result is deemed to comply with AV limit

3. Test setup: RBW: 200Hz(9kHz—150kHz) , 9kHz(150kHz—30MHz), Step size:4kHz, Scan time: auto

6. Antenna Requirements

6.1. 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.

6.2. Result

The antennas used for this product are integral PCB 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 0dBi.