



STC Test Report

Date : 2010-09-27

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No. : MH184186

Applicant (HKS001):

Netop Industrial Company Limited
Dapu Industrial Zone, Gangzi Village, Changping Town,
Dongguan City, Guangdong Province, China

Manufacturer:

Netop Industrial Company Limited
Dapu Industrial Zone, Gangzi Village, Changping Town,
Dongguan City, Guangdong Province, China

Description of Sample(s):

Submitted sample(s) said to be

Product: RF Digital Microscope - USB Dongle
Brand Name: OITEZ
Model Number: DP-M03
FCC ID: YIGUSBDONGLE

Date Sample(s) Received: 2010-06-09

Date Tested: 2010-06-12, 2010-08-19

Investigation Requested:

Perform ElectroMagnetic Interference measurement in
accordance with FCC 47CFR [Codes of Federal Regulations]
Part 15: 2009 and ANSI C63.4:2003 for FCC Certification.

Conclusion(s):

The submitted product COMPLIED with the requirements of
Federal Communications Commission [FCC] Rules and
Regulations Part 15. The tests were performed in accordance
with the standards described above and on Section 2.2 in this
Test Report.

Remark(s):

Dr. LEE Kam Chuen
Authorized Signatory
ElectroMagnetic Compatibility Department
For and on behalf of
The Hong Kong Standards and Testing Centre Ltd.

The Hong Kong Standards and Testing Centre Ltd.

10 Dai Wang Street, Taipo Industrial Estate, N.T., Hong Kong

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1.0 General Details

1.1 Equipment Under Test [EUT]

Description of Sample(s)

Product: RF Digital Microscope - USB Dongle
Manufacturer: Netop Industrial Company Limited.
Dapu Industrial Zone, Gangzi Village, Changping Town, Dongguan City, Guangdong Province, China
Brand Name: OITEZ
Model Number: DP-M03
Input Voltage: The product draws power from the console (5Vd.c.)

1.2 Description of EUT Operation

The Equipment Under Test (EUT) is a Netop Industrial Company Limited, RF Digital Microscope - USB Dongle. The transmission signal is frequency hopping with channel frequency range 2407.5-2475.0MHz during normal use. The EUT was set to fixed frequency test mode by application

1.3 Date of Order

2010-06-09

1.4 Submitted Sample(s):

1 Sample

1.5 Test Duration

2010-06-12, 2010-08-19

1.6 Country of Origin

China

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2.0 Technical Details

2.1 Investigations Requested

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2009 Regulations and ANSI C63.4:2003 for FCC Certification.

2.2 Test Standards and Results Summary Tables

EMISSION Results Summary						
Test Condition	Test Requirement	Test Method	Class / Severity	Test Result		
				Pass	Fail	N/A
Field Strength of Fundamental & Harmonics Emissions	FCC 47CFR 15.249	ANSI C63.4:2003	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiated Emissions	FCC 47CFR 15.209	ANSI C63.4:2003	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conducted Emissions	FCC 47CFR 15.207	ANSI C63.4:2003	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: N/A - Not Applicable

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3.0 Test Results

3.1 Emission

3.1.1 Radiated Emissions

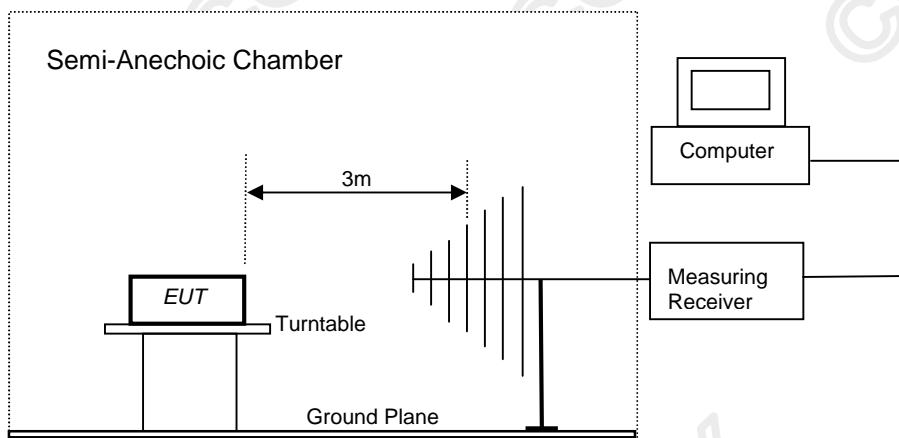
Test Requirement: FCC 47CFR 15.249
Test Method: ANSI C63.4:2003
Test Date: 2010-08-19
Mode of Operation: Tx Mode (Connected to PC) / Rx Mode

Test Method:

The sample was placed 0.8m above the ground plane of semi-anechoic Chamber*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

* Semi-anechoic chamber located on the G/F of The Hong Kong Standards and Testing Centre Ltd. with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 607756.

Test Setup:



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Limits for Field Strength of Fundamental & Harmonics Emissions [FCC 47CFR 15.249]:

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [microvolts/meter]	Field Strength of Harmonics Emission [microvolts/meter]
902-928	50,000 [Average]	500 [Average]
2400-2483.5	50,000 [Average]	500 [Average]

Results of Tx mode: Pass

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @ 3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @ 3m μ V/m	E-Field Polarity
2407.5	60.6	36.8	97.4	74,131.0	500,000	Horizontal
* 4815.0	24.4	41.9	66.3	2,065.4	5,000	Horizontal
7222.5	20.1	47.8	67.9	2,483.1	5,000	Horizontal
9630.0					500	Vertical
* 12037.5					500	Vertical
14445.0					500	Vertical
16852.5					500	Vertical
* 19260.0					500	Vertical
21667.5					500	Vertical
24075.0				No Emission Detected	500	Vertical

Field Strength of Fundamental Emissions Average Value						
Frequency MHz	Measured Level @ 3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @ 3m μ V/m	E-Field Polarity
+ 2407.5	40.6	36.8	77.4	7,413.1	50,000	Horizontal
+* 4815.0	4.4	41.9	46.3	206.5	500	Horizontal
+ 7222.5	0.1	47.8	47.9	248.3	500	Horizontal

Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

*: Denotes restricted band of operation.

Measurements were made using a peak detector. Any emission less than 1000 MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

+: Adjusted by Duty Cycle = -20.0dB

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB
1GHz to 18GHz 5.1dB

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Limits for Field Strength of Fundamental & Harmonics Emissions [FCC 47CFR 15.249]:

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [microvolts/meter]	Field Strength of Harmonics Emission [microvolts/meter]
902-928	50,000 [Average]	500 [Average]
2400-2483.5	50,000 [Average]	500 [Average]

Results of Tx mode: Pass

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
2448.0	67.9	36.9	104.8	173,780.1	500,000	Horizontal
* 4896.0	20.4	42.0	62.4	1,318.3	5,000	Horizontal
* 7344.0	19.0	48.0	67.0	2,238.7	5,000	Horizontal
9792.0					500	Vertical
* 12240.0					500	Vertical
14688.0					500	Vertical
17136.0					500	Vertical
* 19584.0					500	Vertical
* 22032.0					500	Vertical
24480.0				No Emission Detected	500	Vertical

Field Strength of Fundamental Emissions Average Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
+ 2448.0	47.9	36.9	84.8	17,378.0	50,000	Horizontal
+* 4896.0	2.4	42.0	44.4	166.0	500	Horizontal
+* 7344.0	1.0	48.0	49.0	281.8	500	Horizontal

Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

*: Denotes restricted band of operation.

Measurements were made using a peak detector. Any emission less than 1000 MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

+: Adjusted by Duty Cycle = -20.0dB

Calculated measurement uncertainty	:	30MHz to 1GHz	5.2dB
		1GHz to 18GHz	5.1dB

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Limits for Field Strength of Fundamental & Harmonics Emissions [FCC 47CFR 15.249]:

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [microvolts/meter]	Field Strength of Harmonics Emission [microvolts/meter]
902-928	50,000 [Average]	500 [Average]
2400-2483.5	50,000 [Average]	500 [Average]

Results of Tx mode: Pass

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
2475.0	66.8	37.1	103.9	156,675.1	500,000	Horizontal
* 4950.0	25.8	32.2	58.0	794.3	5,000	Horizontal
* 7425.0	24.0	48.2	72.2	4,073.8	5,000	Horizontal
9900.0					500	Vertical
* 12375.0					500	Vertical
14850.0					500	Vertical
17325.0					500	Vertical
* 19800.0					500	Vertical
* 22275.0					500	Vertical
24750.0				No Emission Detected	500	Vertical

Field Strength of Fundamental Emissions Average Value						
Frequency MHz	Measured Level @3m dB μ V/m	Correction Factor dB μ V/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
+ 2475.0	46.8	37.1	83.9	15,667.5	50,000	Horizontal
+* 4950.0	5.8	32.2	38.0	79.4	500	Horizontal
+* 7425.0	4.0	48.2	52.2	407.4	500	Horizontal

Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

*: Denotes restricted band of operation.

Measurements were made using a peak detector. Any emission less than 1000 MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

+: Adjusted by Duty Cycle = -20.0dB

Calculated measurement uncertainty	: 30MHz to 1GHz	5.2dB
	1GHz to 18GHz	5.1dB

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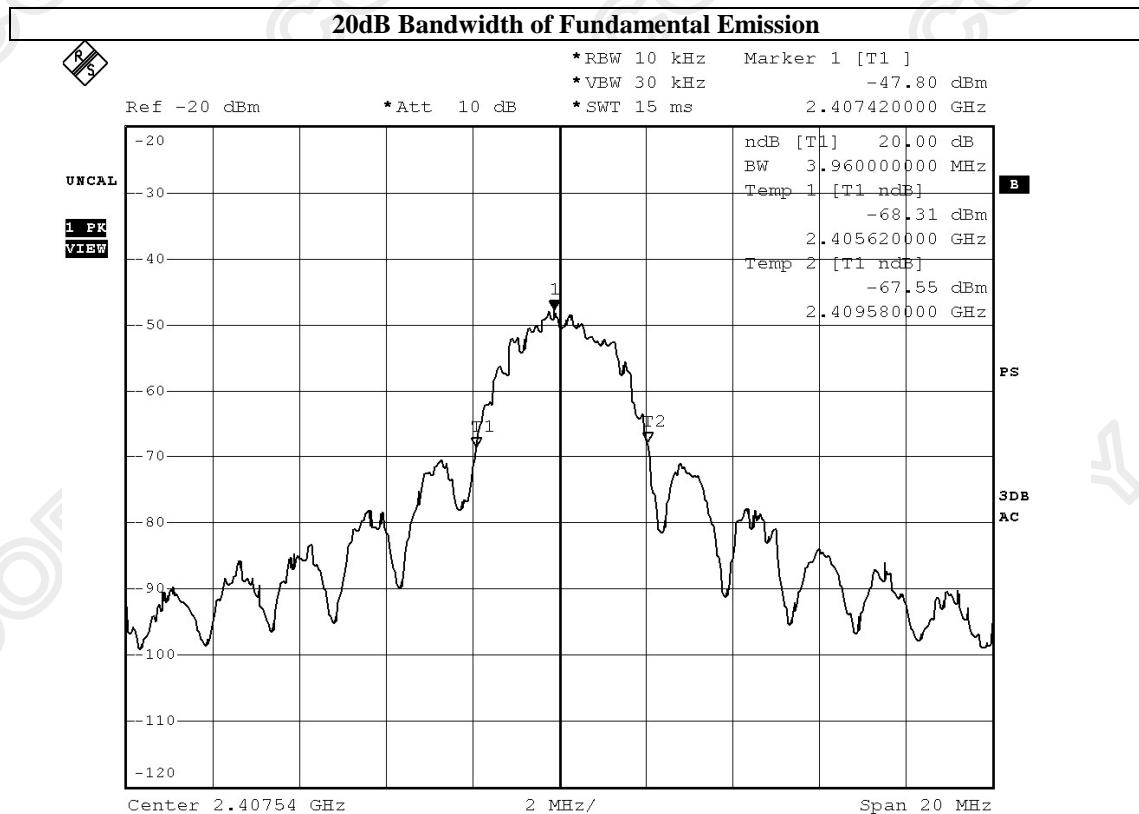
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Limits for 20dB Bandwidth of Fundamental Emission:

Frequency Range [MHz]	20dB Bandwidth [MHz]
2407.4	4.0



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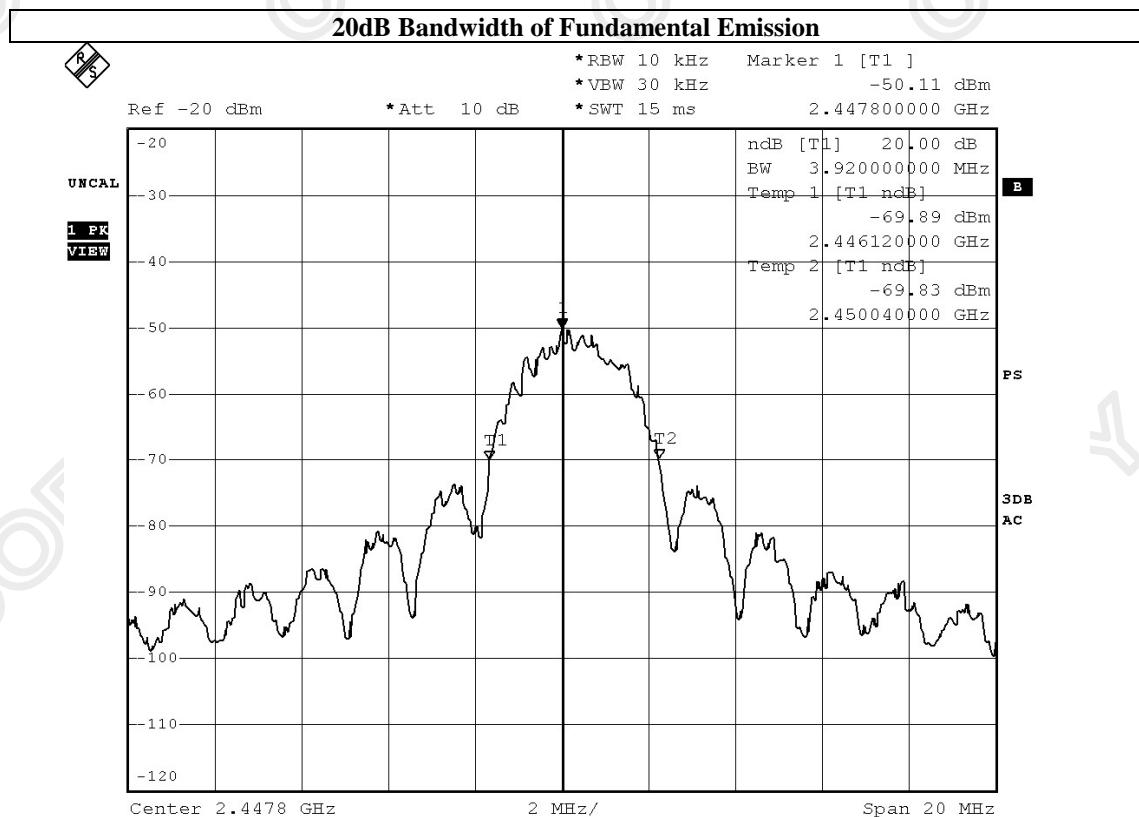
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Limits for 20dB Bandwidth of Fundamental Emission:

Frequency Range [MHz]	20dB Bandwidth [MHz]
2447.8	3.9



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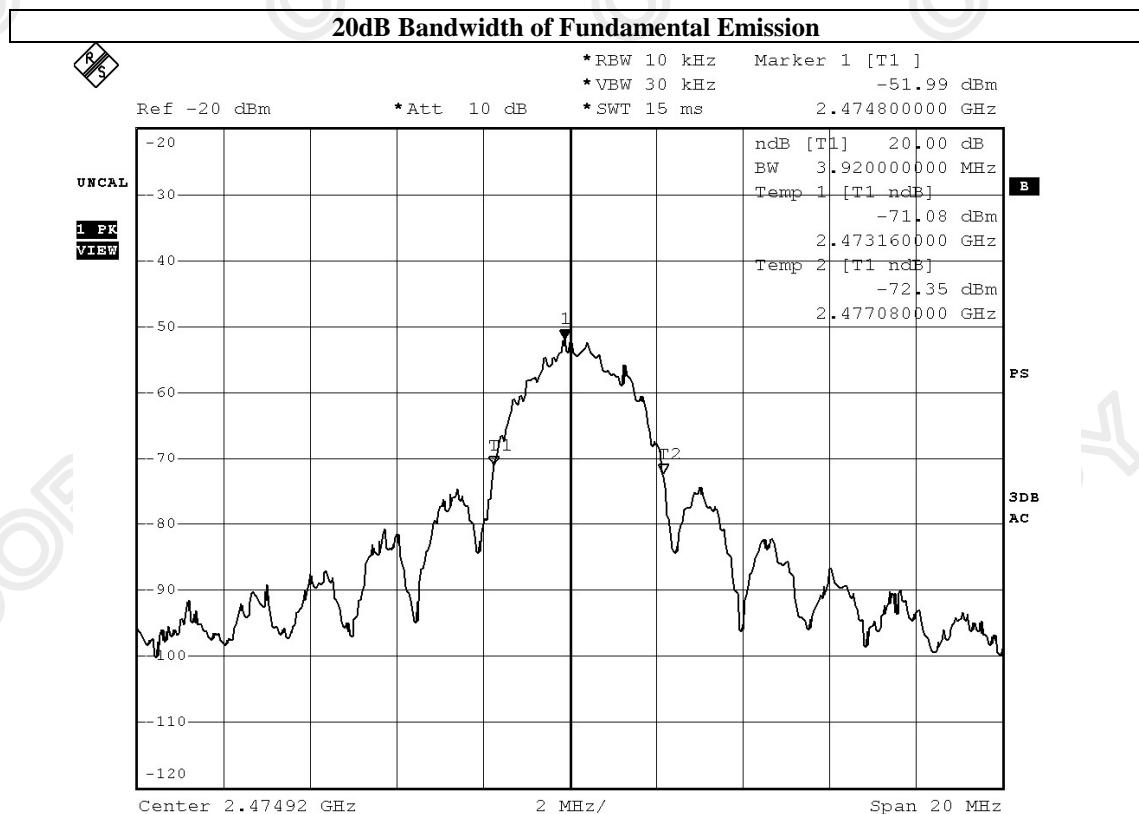
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Limits for 20dB Bandwidth of Fundamental Emission:

Frequency Range [MHz]	20dB Bandwidth [MHz]
2474.8	3.9



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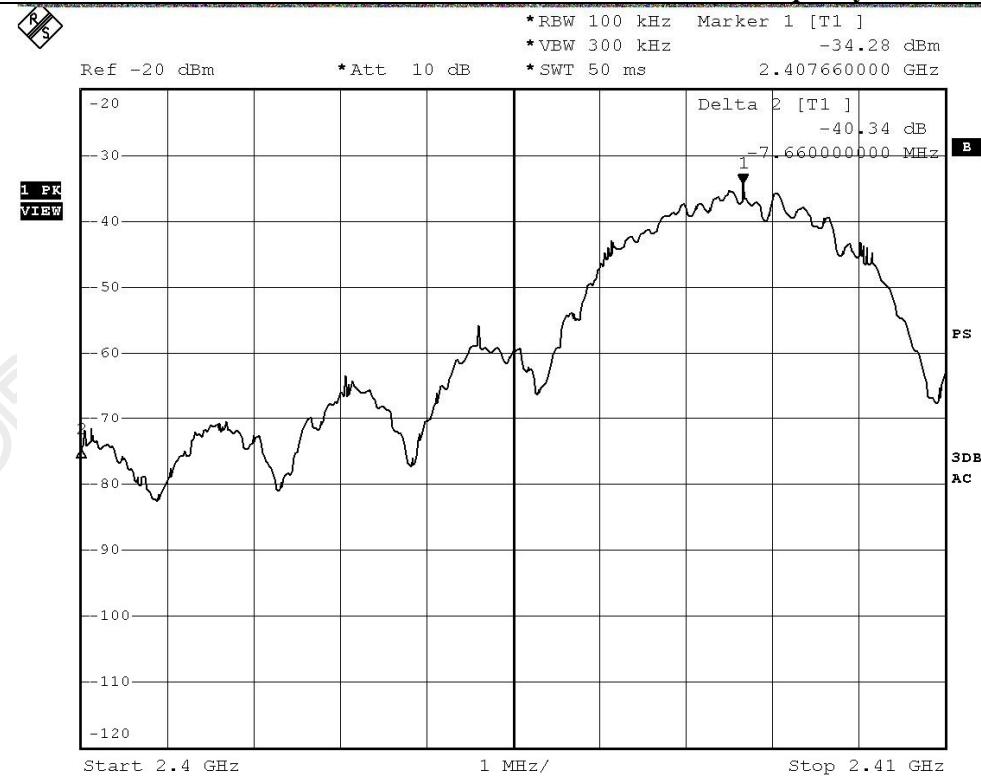
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Band Edge Measurement:

Frequency Range [MHz]	Radiated Emission Attenuated below the Fundamental [dB]
2400.0 – Lowest Fundamental	-40.34 (Actual Radiated Emission level = 32.38dB μ V/m)

Radiated Emission Attenuation From The Lowest Fundamental Frequency to 2.4000GHz



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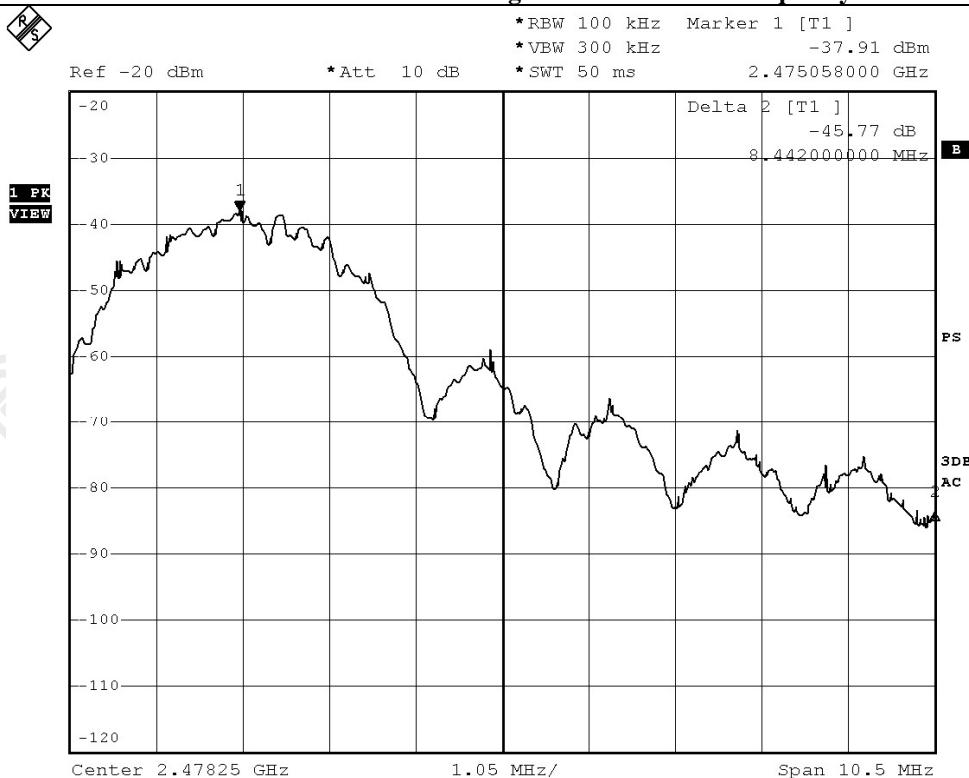
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Band Edge Measurement:

Frequency Range [MHz]	Radiated Emission Attenuated below the Fundamental [dB]
Highest Fundamental – 2483.5	-45.77 (Actual Radiated Emission level = 23.32dB μ V/m)

Radiated Emission Attenuation From The Highest Fundamental Frequency to 2.4835GHz



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Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

Frequency Range [MHz]	Quasi-Peak Limits [μ V/m]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Result of Tx Mode (Connected to PC) (9kHz – 30MHz): PASS

Emissions detected are more than 20 dB below the FCC Limits

Results of Tx mode (Connected to PC) (30MHz – 25GHz): PASS

Please refer to the following table for result details

Radiated Emissions Quasi-Peak					
Emission Frequency MHz	E-Field Polarity	Level @3m dB μ V/m	Limit @3m dB μ V/m	Level @3m μ V/m	Limit @3m μ V/m
96.0	Vertical	29.7	43.5	30.5	150
480.0	Horizontal	39.3	46.0	92.3	200
814.0	Horizontal	43.5	46.0	149.6	200
139.6	Vertical	11.9	43.5	3.9	150
225.2	Vertical	16.1	46.0	6.4	200
274.8	Horizontal	20.2	46.0	10.2	200

Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB
1GHz to 18GHz 5.1dB

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Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

Frequency Range [MHz]	Quasi-Peak Limits [μ V/m]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi -peak detector and above 1000MHz are based on measurements employing an average detector.

Result of Rx Mode (Connected to PC) (9kHz – 25GHz): PASS

Emissions detected are more than 20 dB below the FCC Limits

Remarks:

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB
1GHz to 18GHz 5.1dB

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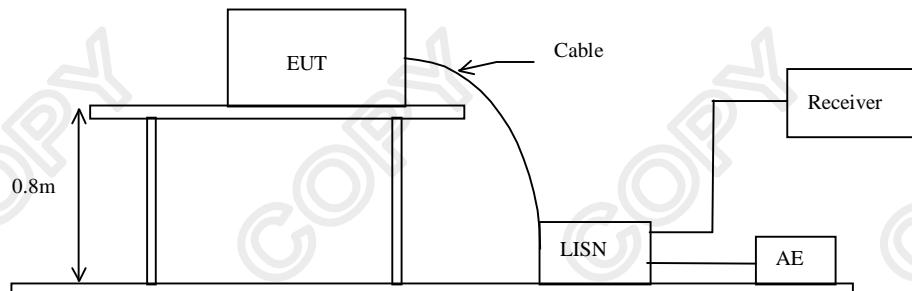
3.1.2 Conducted Emissions (0.15MHz to 30MHz)

Test Requirement: FCC 47CFR 15.207
Test Method: ANSI C63.4:2003
Test Date: 2010-06-12
Mode of Operation: Tx Mode (Connected to PC)

Test Method:

The test was performed in accordance with ANSI C63.4: 2003, with the following: an initial measurement was performed in peak and average detection mode on the live line, any emissions recorded within 30dB of the relevant limit line were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.

Test Setup:



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Limit for Conducted Emissions (FCC 47 CFR 15.207):

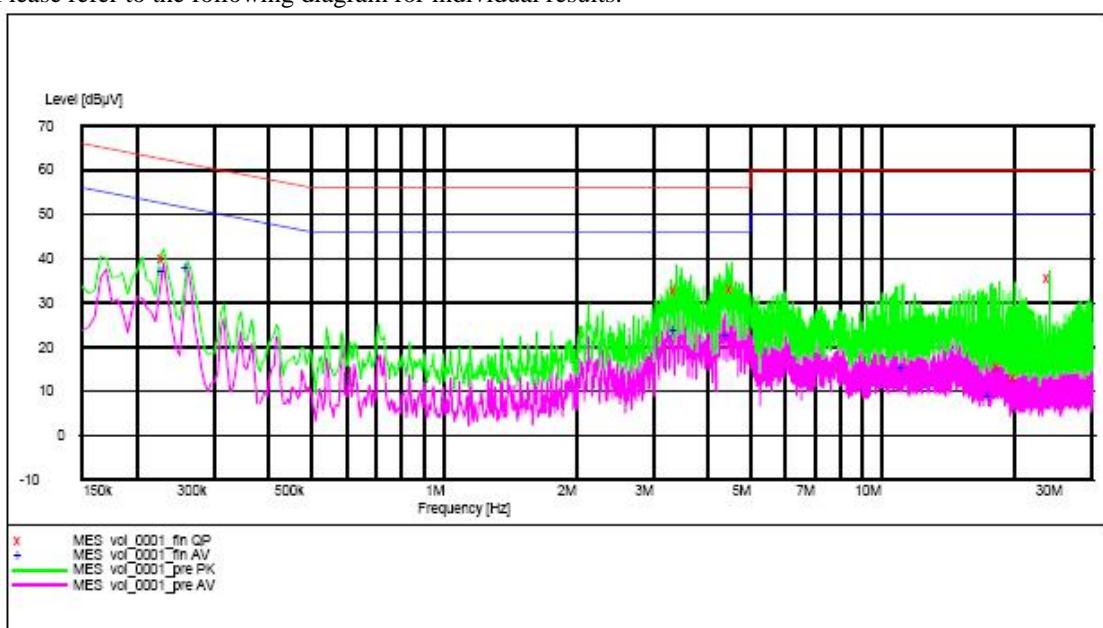
Frequency Range [MHz]	Quasi-Peak Limits [dB μ V]	Average [dB μ V]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* Decreases with the logarithm of the frequency.

Limits for Conducted Emissions Test, please refer to limit lines (Quasi-Peak and Average) in the following diagram.

Results of Tx Mode (Connected to PC) (L): PASS

Please refer to the following diagram for individual results.



Remark:

Calculated measurement uncertainty : 3.97dB

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Limit for Conducted Emissions (FCC 47 CFR 15.207):

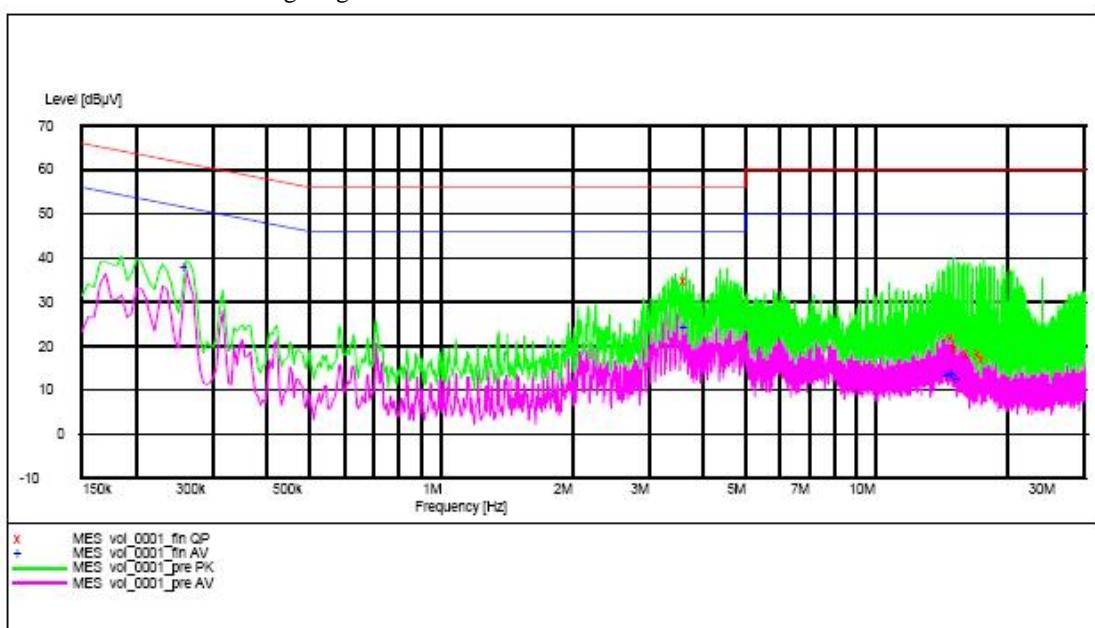
Frequency Range [MHz]	Quasi-Peak Limits [dB μ V]	Average [dB μ V]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* Decreases with the logarithm of the frequency.

Limits for Conducted Emissions Test, please refer to limit lines (Quasi-Peak and Average) in the following diagram.

Results of Tx Mode (Connected to PC) (N): PASS

Please refer to the following diagram for individual results.



Remark:

Calculated measurement uncertainty : 3.97dB

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Appendix A

List of Measurement Equipment

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM020	HORN ANTENNA	EMCO	3117	0075933	2008/11/06	2010/11/06
EM215	MULTIDEVICE CONTROLER	EMCO	2090	00024676	N/A	N/A
EM216	MINI MAST SYSTEM	EMCO	2075	00026842	N/A	N/A
EM217	ELECTRIC POWERED TURNTABLE	EMCO	2088	00029144	N/A	N/A
EM218	ANECHOIC CHAMBER	ETS-Linggren	FACT-3	--	2009/05/02	2012/05/02
EM174	BICONILOG ANTENNA	EMCO	3142B	00029071	2010/01/24	2012/01/24
EM229	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB40	100248	2010/09/27	2011/09/27
EM022	LOOP ANTENNA	EMCO	6502	1189-2424	2009/07/26	2011/07/26

Line Conducted

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM197	LISN	EMCO	4825/2	1193	2009/10/30	2011/10/30
EM181	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB7	100072	2010/06/29	2011/06/29
EM154	SHIELDING ROOM	SIEMENS MATSUSHITA COMPONENTS	N/A	803-740-057-99A	2010/01/23	2011/01/23

Remarks:-

CM Corrective Maintenance
N/A Not Applicable
TBD To Be Determined

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Appendix B

Duty Cycle Correction During 100msec

Each sample unit sends a different series of characters, but each pulse period (100msec) never exceeds a series of 3 sole (0.11msec) pulses. Assuming any combination of sole pulses may be obtained due to encoding the worst case transmit duty cycle would be considered $3 \times 0.11\text{msec} / 100\text{msec} = 0.33\%$ duty cycle. Figure A through B show the characteristics of the pulse train for one of these functions.

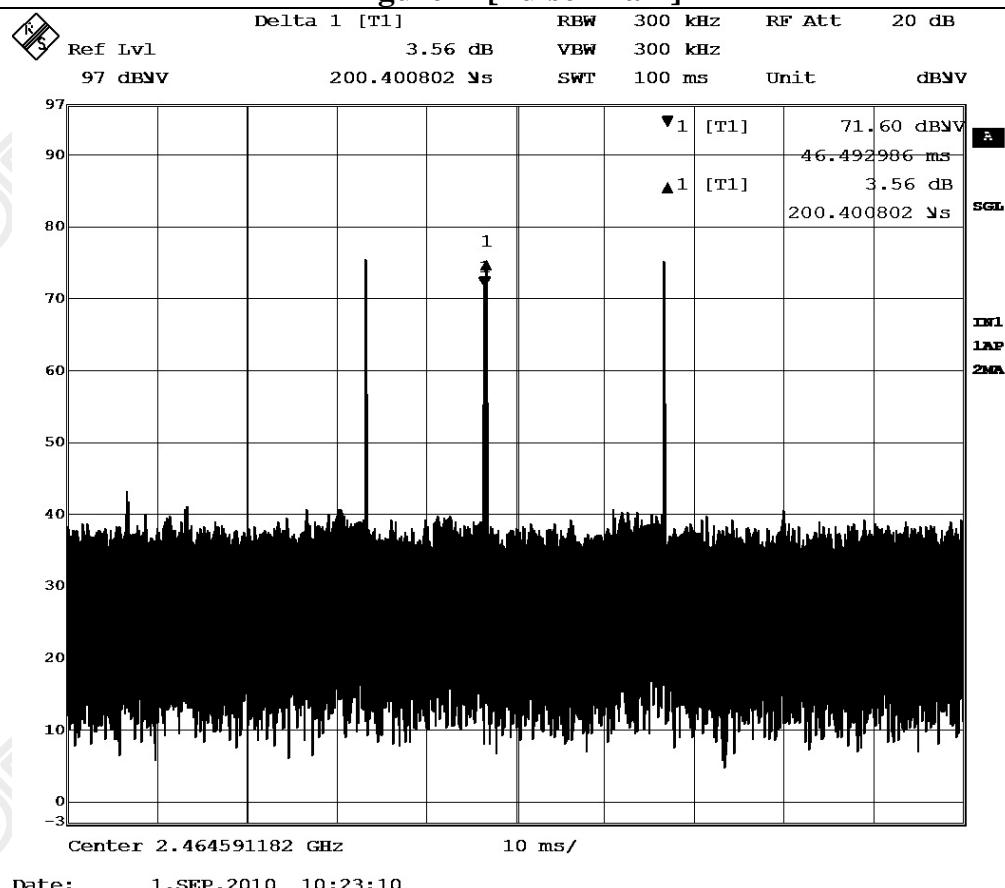
Remarks:

Duty Cycle Correction = $20\log(0.0033) = -49.6\text{ dB}$

Duty Cycle Correction = -20dB , if the calculation duty cycle correction $> -20\text{dB}$.

The following figures [Figure A to Figure B] showed the characteristics of the pulse train for one of these functions.

Figure A [Pulse Train]



Date: 1.SEP.2010 10:23:10

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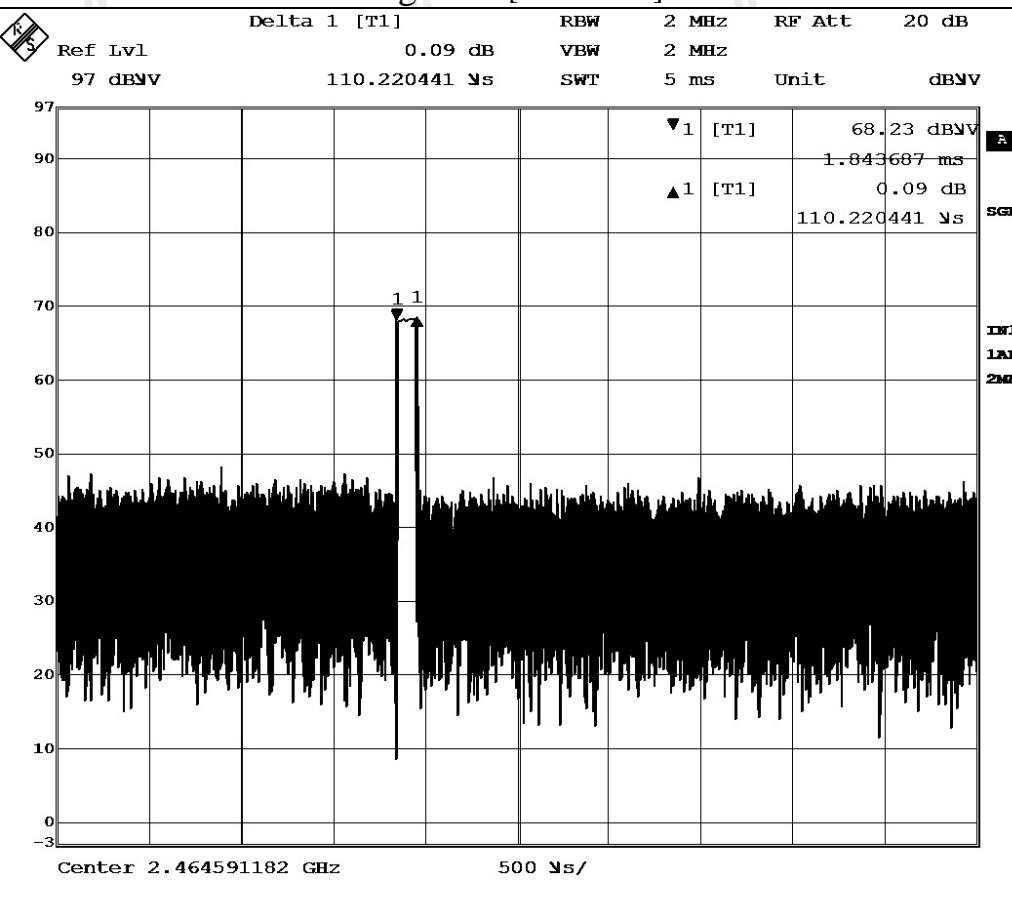
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Figure B [Sole Pulse]



Date: 1.SEP.2010 10:24:42

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Appendix C

Photographs of EUT

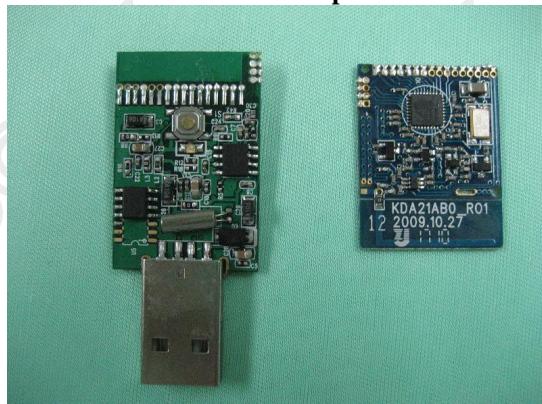
Front View of the product



Rear View of the product



Inner Circuit Top View



Inner Circuit Bottom View



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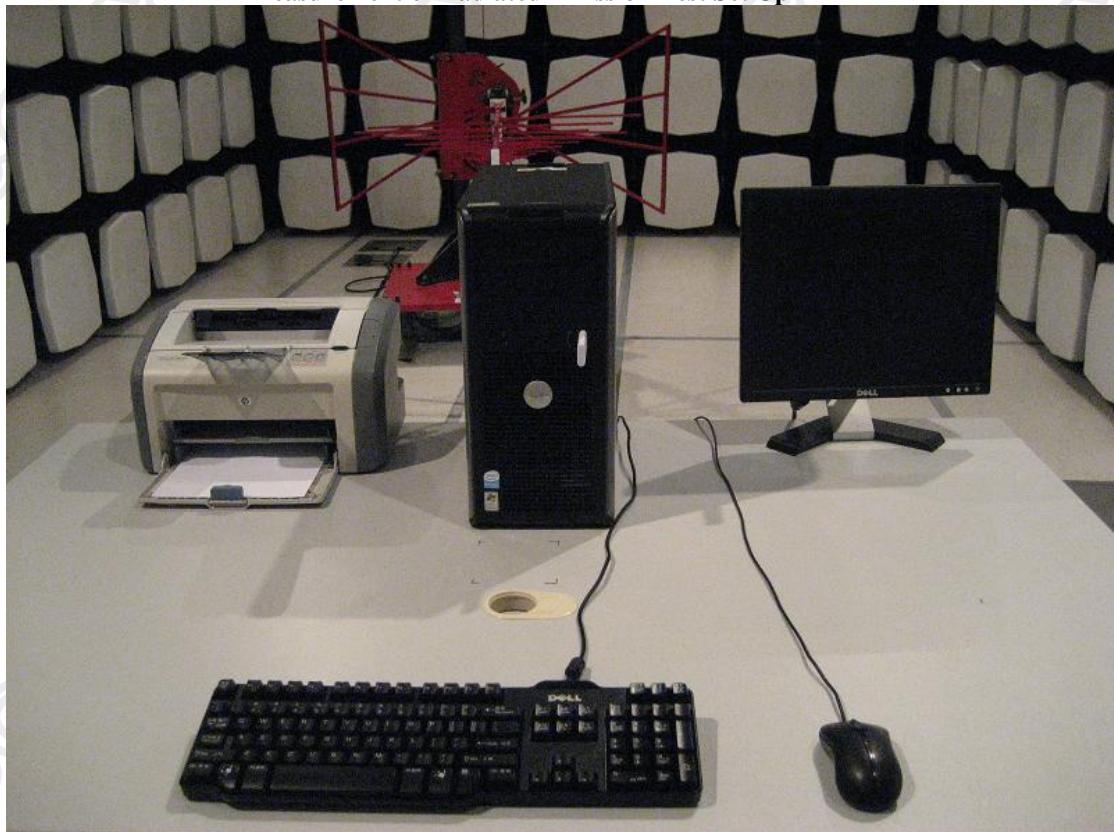
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Photographs of EUT

Measurement of Radiated Emission Test Set Up



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Photographs of EUT

Measurement of Conducted Emission Test Set Up



******* End of Test Report *******

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