STC Test Report

Date : 2012-08-07
No. : MH186690

Applicant (C01494): NINCO DESARROLLOS S.L.
Ctra.de I'Hospitalet 32, 08940 Cornella, Barcelona, Spain

Manufacturer: NINCO DESARROLLOS S.L.
Ctra.de I'Hospitalet 32, 08940 Cornella, Barcelona, Spain

Description of Sample(s): Submitted sample(s) said to be

Product:	WI.CO Wireless Controller Kit
Brand Name:	NINCO
Model Number:	10413RX
FCC ID:	HOG10413RX

Date Sample(s) Received: 2012-05-10

Date Tested: 2012-06-22 to 2012-08-06

Investigation Requested: Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2011 and ANSI C63.4:2009 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.

CONTENT:

1.0 General Details

1.1 Equipment Under Test [EUT]
Description of Sample(s)

Product:	WI.CO Wireless Controller Kit
Manufacturer:	NINCO DESARROLLOS S.L.
Brand Name:	NINCO
Model Number:	10413RX
Input Voltage:	12Vd.c. with Jack / 11.1Vd.c. (3.7V “Li-Po” rechargeable batteryx3)

The AC/DC adaptor was provided by the test lab with following details:-
Brand name: N/A; Model no.: S-500F; Input: 100-240Va.c. 50/60Hz,
Output: 12Vd.c. 500mA.

1.2 Description of EUT Operation

The Equipment Under Test (EUT) is a “Slot car track set” of NINCO DESARROLLOS S.L., WI.CO Wireless Controller Kit. The slot consist of two lanes, the power on/off of the lane(s) is controlled through the wireless communication between the slot car track set and the controller of the WI.CO Wireless Controller Kit. Tests were conducted while the EUT is communicating with the controller; Lanes were terminated with resistors to simulate the normal operation.
The EUT operates in the 2.4GHz ISM frequency band. The EUT continues to transmit while communicating with the controller. Modulation by digital data; and type of modulation is GFSK.

1.3 Date of Order

2012-05-10

1.4 Submitted Sample(s):

1 Sample

1.5 Test Duration

2012-06-22 to 2012-08-06

1.6 Country of Origin

China

2.0 Technical Details

2.1 Investigations Requested

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2011 Regulations and ANSI C63.4:2009 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 C63.4:2009	N/A	☒	☐	☐
Radiated Emissions	FCC 47CFR 15.209	ANSI C63.4:2009	N/A	☒	☐	☐
AC Mains Conducted Emissions	FCC 47CFR 15.207	ANSI C63.4:2009	N/A	☒	☐	☐

Note: N/A - Not Applicable

3.0 Test Results

3.1 Emission

3.1.1 Radiated Emissions

Test Requirement:	FCC 47CFR 15.249
Test Method:	ANSI C63.4:2009
Test Date:	2012-06-22
Mode of Operation:	Tx mode

Test Method:

The sample was placed 0.8m above the ground plane on a standard radiated emission test site. 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. In the frequency range of 9kHz to 30MHz, The center of the loop antenna shall be 1 meter above the ground and rotated loop axis for maximum reading. The emissions worst-case are shown in Test Results of the following pages.

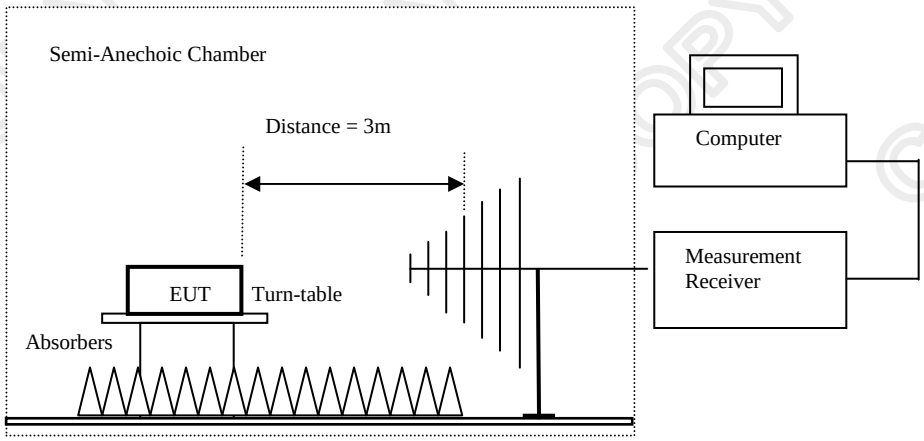
Remark: 3 orthogonal axis apply to hand-held device only.

*: 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.

Spectrum Analyzer Setting:

9KHz – 30MHz (Pk & Av)	RBW:	10kHz
	VBW:	30kHz
	Sweep:	Auto
	Span:	Fully capture the emissions being measured
	Trace:	Max. hold
30MHz – 1GHz (QP)	RBW:	120kHz
	VBW:	120kHz
	Sweep:	Auto
	Span:	Fully capture the emissions being measured
	Trace:	Max. hold
Above 1GHz (Pk & Av)	RBW:	3MHz
	VBW:	3MHz
	Sweep:	Auto
	Span:	Fully capture the emissions being measured
	Trace:	Max. hold

Test Setup:



Ground Plane

Absorbers placed on top of the ground plane are for measurements above 1000MHz only.

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 (Powered by adapter): Pass

Field Strength of Fundamental Emissions
Peak Value

Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
2401.0	47.8	35.4	83.2	14,454.4	500,000	Vertical
4802.0	9.7	41.5	51.2	363.1	5,000	Vertical
7203.0	3.1	48.8	51.9	393.6	5,000	Vertical
* 12005.0					5,000	Vertical
14406.0					5,000	Vertical
16807.0					5,000	Vertical
* 19208.0					5,000	Vertical
21609.0	**No Emission Detected**				5,000	Vertical

Field Strength of Fundamental Emissions
Average Value

Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
2401.0	31.1	35.4	66.5	2,113.5	50,000	Vertical
4802.0	-3.2	41.5	38.3	82.2	500	Vertical
7203.0	-1.1	48.8	47.7	242.7	500	Vertical

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.

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

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 (Powered by adapter): Pass

Field Strength of Fundamental Emissions
Peak Value

Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
2440.0	45.1	35.5	80.6	10,715.2	500,000	Vertical
4880.0	7.8	41.4	49.2	288.4	5,000	Vertical
7320.0	1.4	48.7	50.1	319.9	5,000	Vertical
* 12200.0					5,000	Vertical
14640.0					5,000	Vertical
17080.0					5,000	Vertical
* 19520.0					5,000	Vertical
21960.0	**No Emission Detected**				5,000	Vertical

Field Strength of Fundamental Emissions
Average Value

Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
2440.0	31.4	35.5	66.9	2,213.1	50,000	Vertical
4880.0	-4.9	41.4	36.5	66.8	500	Vertical
7320.0	-11.5	48.7	37.2	72.4	500	Vertical

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.

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

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 (Powered by adapter): Pass

Field Strength of Fundamental Emissions
Peak Value

Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
2480.0	48.5	35.8	84.3	16,405.9	500,000	Vertical
4960.0	7.4	41.4	48.8	275.4	5,000	Vertical
7440.0	0.5	48.6	49.1	285.1	5,000	Vertical
* 12400.0					5,000	Vertical
14880.0					5,000	Vertical
17360.0					5,000	Vertical
* 19840.0					5,000	Vertical
22320.0	**No Emission Detected**				5,000	Vertical

Field Strength of Fundamental Emissions
Average Value

Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
4880.0	33.4	35.8	69.2	2,884.0	50,000	Vertical
9760.0	-5.2	41.4	36.2	64.6	500	Vertical
14640.0	-11.9	48.6	36.7	68.4	500	Vertical

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.

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

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 (Powered by battery): Pass

Field Strength of Fundamental Emissions
Peak Value

Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
2401.0	47.9	35.4	83.3	14,621.8	500,000	Vertical
4802.0	9.8	41.5	51.3	367.3	5,000	Vertical
7203.0	3.0	48.8	51.8	389.0	5,000	Vertical
* 12005.0					5,000	Vertical
14406.0					5,000	Vertical
16807.0					5,000	Vertical
* 19208.0					5,000	Vertical
21609.0	**No Emission Detected**				5,000	Vertical

Field Strength of Fundamental Emissions
Average Value

Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
2401.0	31.2	35.4	66.6	2,138.0	50,000	Vertical
4802.0	-3.1	41.5	38.4	83.2	500	Vertical
7203.0	-11.0	48.8	37.8	77.6	500	Vertical

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.

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

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 (Powered by battery): Pass

Field Strength of Fundamental Emissions
Peak Value

Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
2440.0	45.0	35.5	80.5	10,592.5	500,000	Vertical
4880.0	7.9	41.4	49.3	291.7	5,000	Vertical
7320.0	1.5	48.7	50.2	323.6	5,000	Vertical
* 12200.0					5,000	Vertical
14640.0					5,000	Vertical
17080.0					5,000	Vertical
* 19520.0					5,000	Vertical
21960.0	**No Emission Detected**				5,000	Vertical

Field Strength of Fundamental Emissions
Average Value

Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
2440.0	31.3	35.5	66.8	2,187.8	50,000	Vertical
4880.0	-4.9	41.4	36.5	66.8	500	Vertical
7320.0	-11.4	48.7	37.3	73.3	500	Vertical

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.

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

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 (Powered by battery): Pass

Field Strength of Fundamental Emissions
Peak Value

Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
2480.0	48.7	35.8	84.5	16,788.0	500,000	Vertical
4960.0	7.3	41.4	48.7	272.3	5,000	Vertical
7440.0	0.6	48.6	49.2	288.4	5,000	Vertical
* 12400.0					5,000	Vertical
14880.0					5,000	Vertical
17360.0					5,000	Vertical
* 19840.0					5,000	Vertical
22320.0	**No Emission Detected**				5,000	Vertical

Field Strength of Fundamental Emissions
Average Value

Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
4880.0	33.5	35.8	69.3	2,917.4	50,000	Vertical
9760.0	-5.1	41.4	36.3	65.3	500	Vertical
14640.0	-11.9	48.6	36.7	68.4	500	Vertical

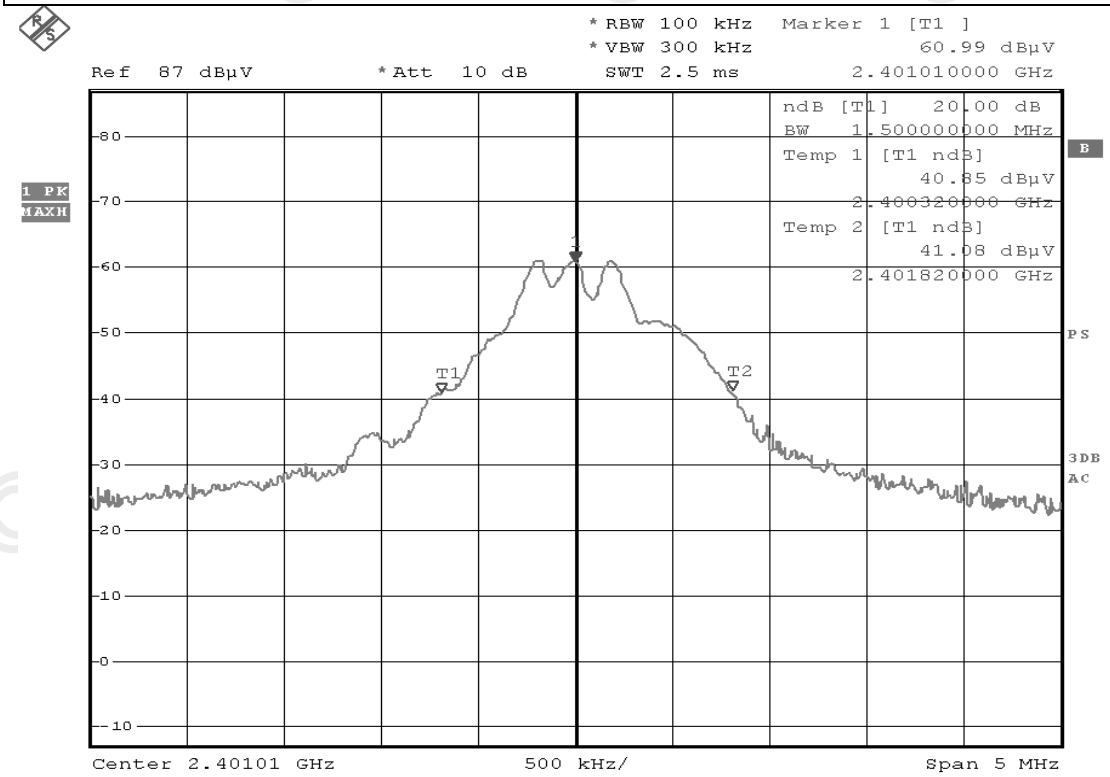
Remarks:
No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz
*: Denotes restricted band of operation.
Measurements were made using a peak detector. Any emission less than 1000 MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

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

Limits for 20dB Bandwidth of Fundamental Emission:

Frequency Range [MHz]	20dB Bandwidth [kHz]
2401.1	1500

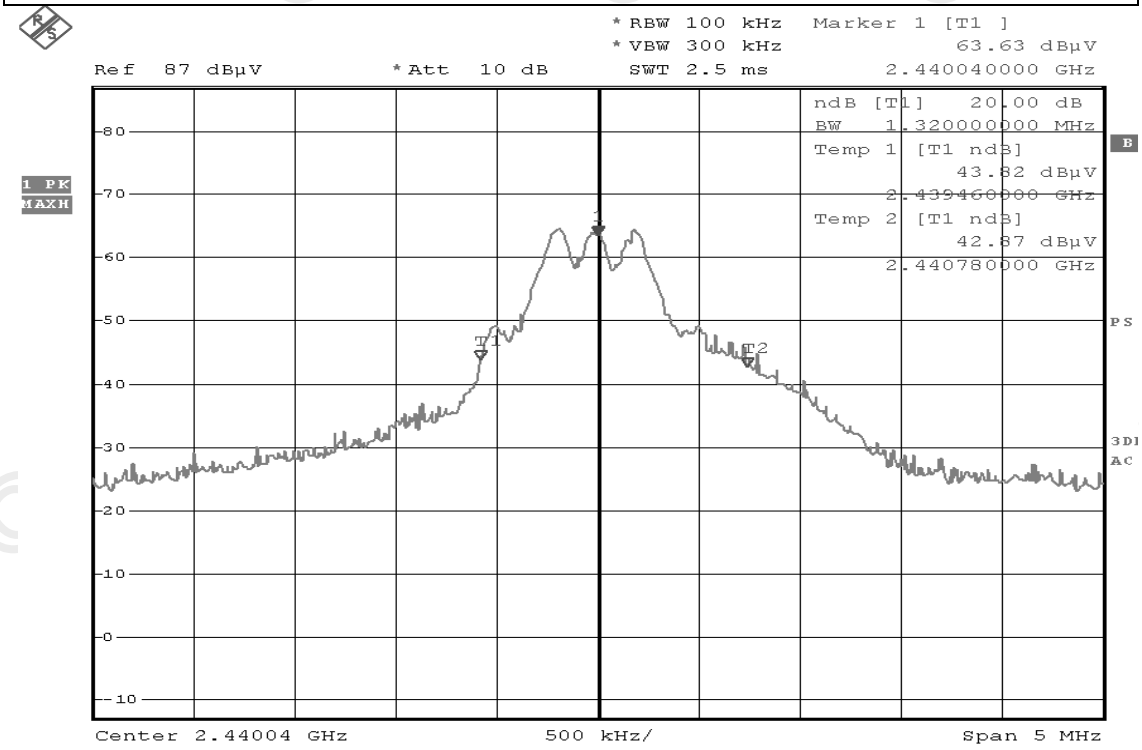
20dB Bandwidth of Fundamental Emission



Limits for 20dB Bandwidth of Fundamental Emission:

Frequency Range [MHz]	20dB Bandwidth [kHz]
2440.0	1320

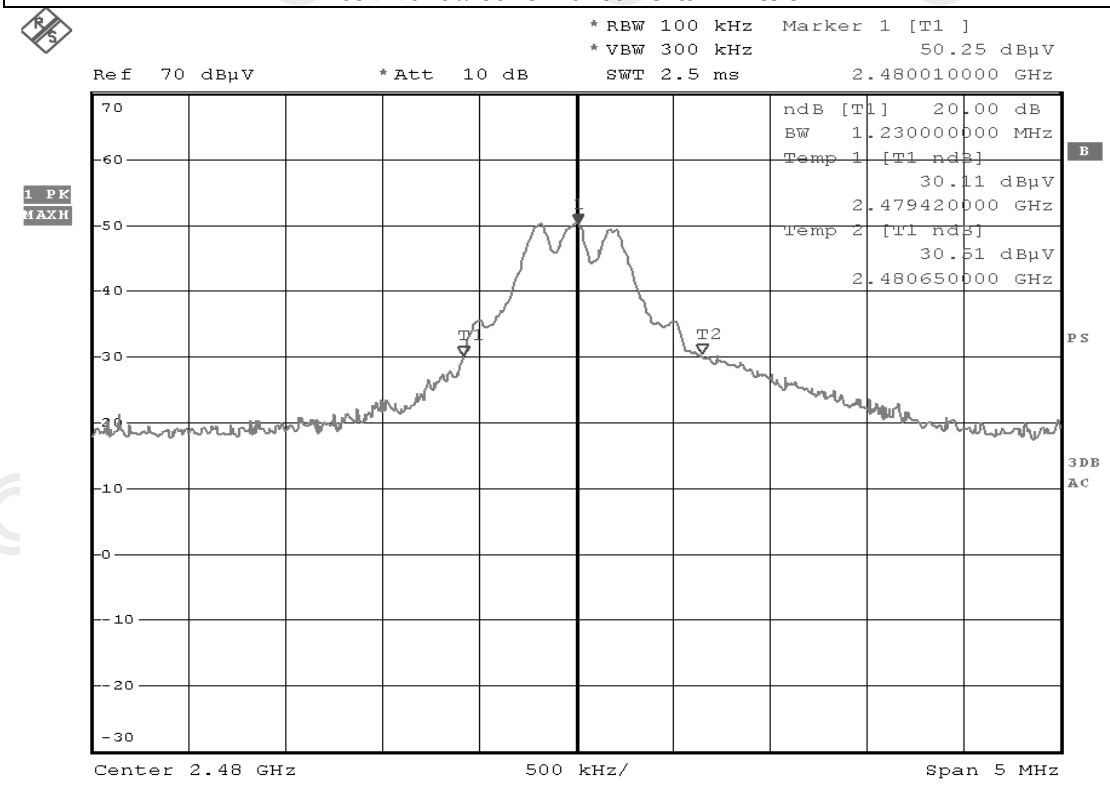
20dB Bandwidth of Fundamental Emission



Limits for 20dB Bandwidth of Fundamental Emission:

Frequency Range [MHz]	20dB Bandwidth [kHz]
2480.0	1230

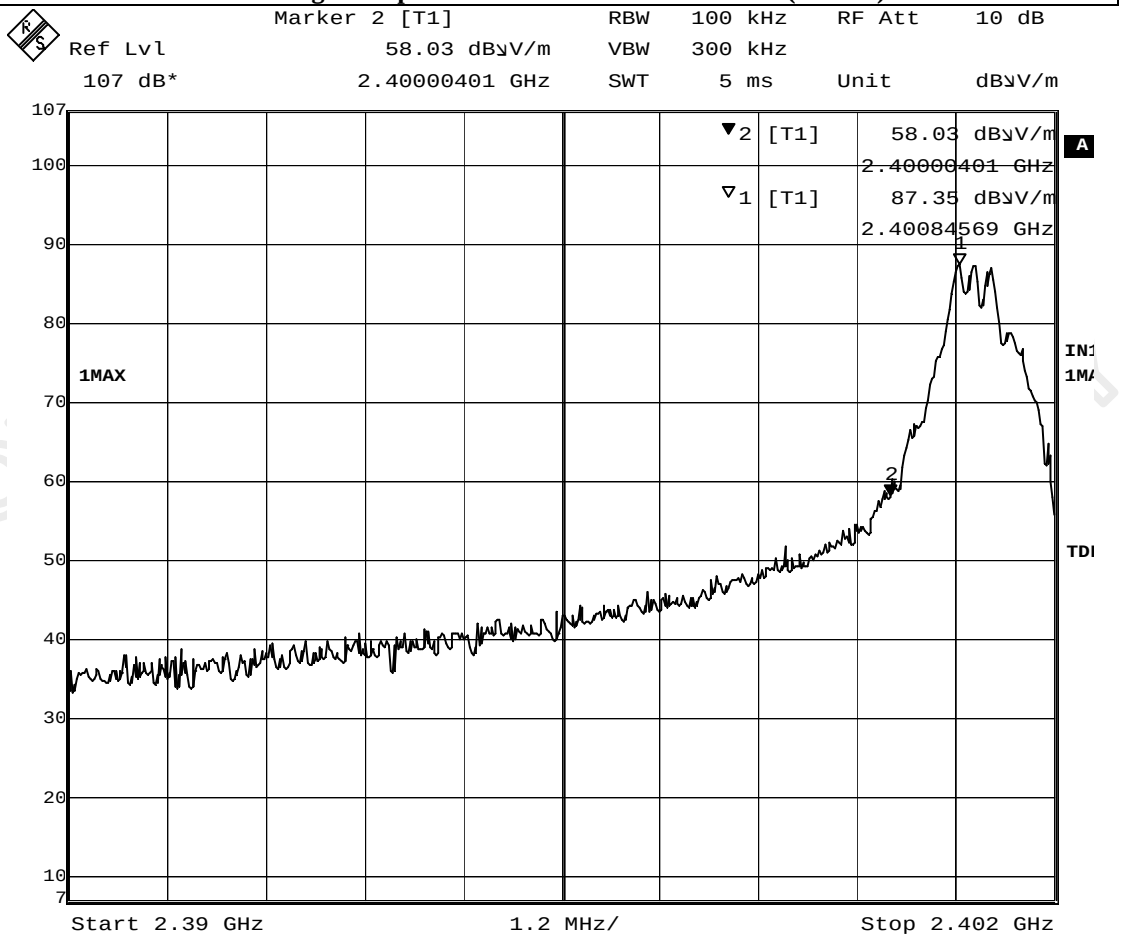
20dB Bandwidth of Fundamental Emission



Band Edge Measurement:

Frequency Range [MHz]	Radiated Emission Attenuated below the Fundamental [dB]
2400.0 – Lowest Fundamental	58.03

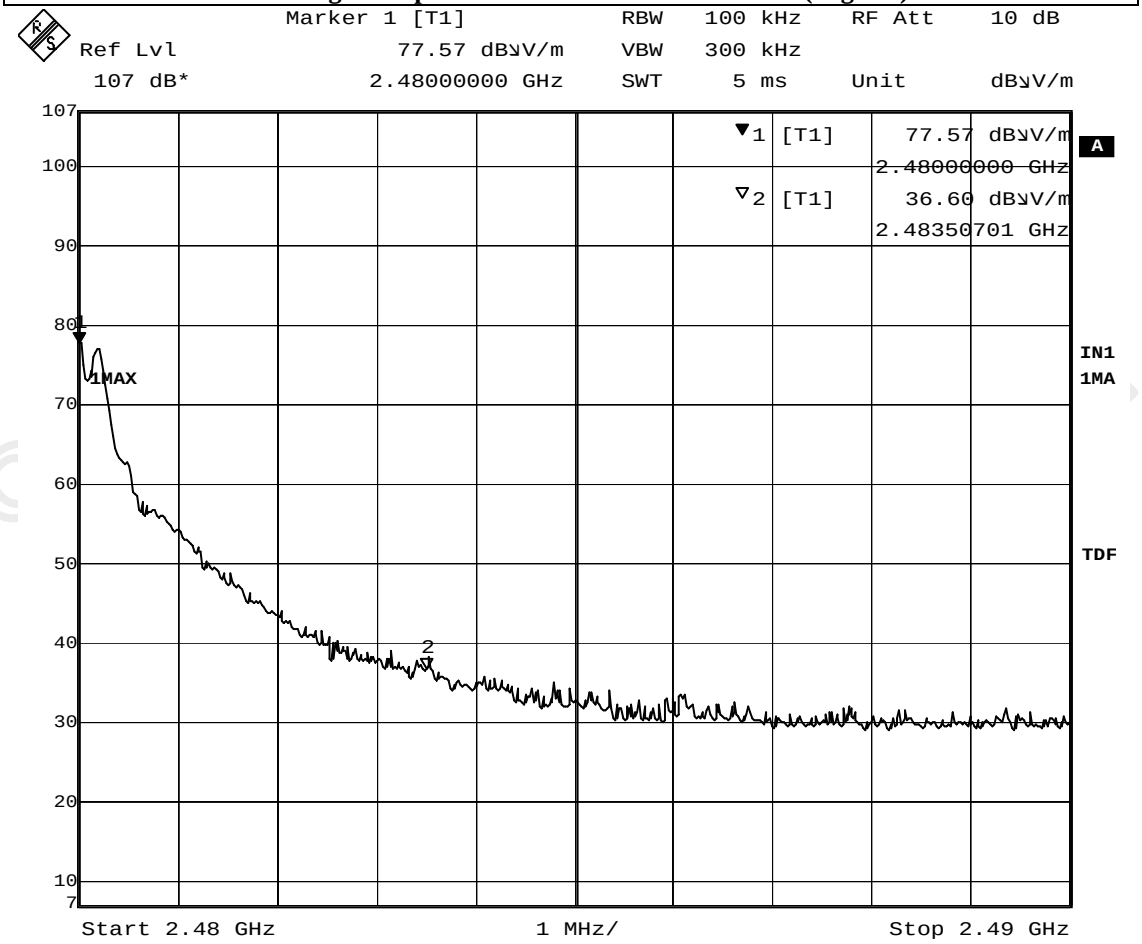
Band-edge Compliance of RF Radiated Emissions (Lowest)



Band Edge Measurement:

Frequency Range [MHz]	Radiated Emission Attenuated below the Fundamental [dB]
2480.0 - Highest Fundamental	77.57

Band-edge Compliance of RF Radiated Emissions (Highest)



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

Frequency Range [MHz]	Quasi-Peak Limits [µV/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.

Results of Communication mode (9kHz – 30MHz), (Powered by adapter): PASS
Emissions detected are more than 20 dB below the FCC Limits
Results of Communication mode (30MHz – 1GHz), (Powered by adapter): PASS

Radiated Emissions Quasi-Peak					
Emission Frequency MHz	E-Field Polarity	Level @3m dBµV/m	Limit @3m dBµV/m	Level @3m µV/m	Limit @3m µV/m
30.4	Horizontal	33.1	40.0	45.2	100
128.0	Horizontal	32.4	43.5	41.7	150
150.0	Horizontal	30.2	43.5	32.4	150
44.1	Vertical	32.3	40.0	41.2	100
192.0	Vertical	28.9	43.5	27.9	150
503.3	Vertical	38.4	46.0	83.2	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

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

Frequency Range	Quasi-Peak Limits
[MHz]	[μV/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 (30MHz – 1000MHz), (Powered by adapter): PASS

Radiated Emissions Quasi-Peak					
Emission Frequency MHz	E-Field Polarity	Level @3m dBμV/m	Limit @3m dBμV/m	Level @3m μV/m	Limit @3m μV/m
30.1	Horizontal	31.4	40.0	37.2	100
358.2	Horizontal	31.0	46.0	35.5	200
539.6	Horizontal	37.0	46.0	70.8	200
30.6	Vertical	27.9	40.0	24.8	100
378.1	Vertical	30.2	46.0	32.4	200
531.4	Vertical	35.4	46.0	58.9	200

Result of Rx Mode (1GHz – 18GHz), (Powered by adapter): PASS
Emissions detected are more than 20 dB below the FCC Limits

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

Frequency Range [MHz]	Quasi-Peak Limits [µV/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.

Results of Communication mode (9kHz – 30MHz), (Powered by battery): PASS
Emissions detected are more than 20 dB below the FCC Limits
Results of Communication mode (30MHz – 1GHz), (Powered by battery): PASS

Radiated Emissions Quasi-Peak					
Emission Frequency MHz	E-Field Polarity	Level @3m dBµV/m	Limit @3m dBµV/m	Level @3m µV/m	Limit @3m µV/m
30.4	Horizontal	33.1	40.0	45.2	100
128.0	Horizontal	32.3	43.5	41.2	150
150.0	Horizontal	30.5	43.5	33.5	150
44.3	Vertical	32.3	40.0	41.2	100
192.1	Vertical	28.9	43.5	27.9	150
503.4	Vertical	38.4	46.0	83.2	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

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

Frequency Range	Quasi-Peak Limits
[MHz]	[μV/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 (30MHz – 1000MHz), (Powered by battery): PASS

Radiated Emissions Quasi-Peak					
Emission Frequency MHz	E-Field Polarity	Level @3m dBμV/m	Limit @3m dBμV/m	Level @3m μV/m	Limit @3m μV/m
30.1	Horizontal	31.5	40.0	37.6	100
358.2	Horizontal	31.2	46.0	36.3	200
539.6	Horizontal	37.2	46.0	72.4	200
30.6	Vertical	27.8	40.0	24.5	100
378.1	Vertical	30.1	46.0	32.0	200
531.4	Vertical	35.4	46.0	58.9	200

Result of Rx Mode (1GHz – 18GHz), (Powered by battery): PASS
Emissions detected are more than 20 dB below the FCC Limits

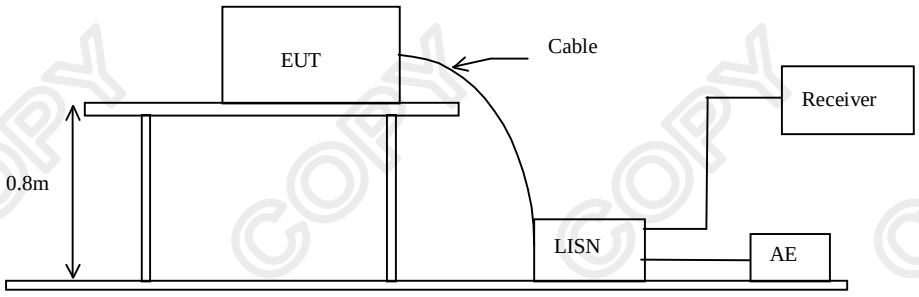
3.1.3 Conducted Emissions (0.15MHz to 30MHz)

Test Requirement:	FCC 47CFR 15.207
Test Method:	ANSI C63.4:2009
Test Date:	2012-08-06
Rating:	120Va.c. 60Hz
Mode of Operation:	Tx mode / Communication mode

Test Method:

The test was performed in accordance with ANSI C63.4: 2009, 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:



Limit for Conducted Emissions (FCC 47 CFR 15.207):

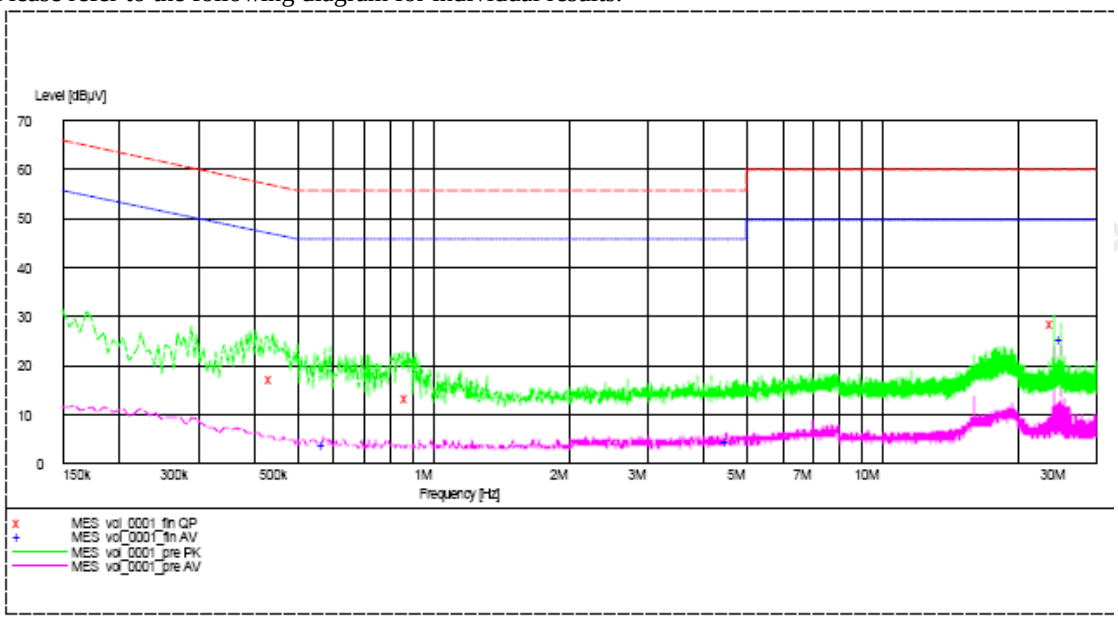
Frequency Range [MHz]	Quasi-Peak Limits [dBµV]	Average [dBµV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* 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 (L): Pass

Please refer to the following diagram for individual results.



Results of Tx mode (L): Pass

Conductor Live or Neutral	Frequency MHz	Quasi-peak		Average	
		Level dBμV	Limit dBμV	Level dBμV	Limit dBμV
Live	0.570	-*-	-*-	3.9	46.0
Live	4.540	-*-	-*-	4.7	46.0
Live	25.060	-*-	-*-	25.6	50.0
Live	0.440	17.3	57.0	-*-	-*-
Live	0.880	13.6	56.0	-*-	-*-
Live	24.090	28.5	60.0	-*-	-*-

Remarks:
Calculated measurement uncertainty : 3.97dB
-*- Emission(s) that is far below the corresponding limit line.

Limit for Conducted Emissions (FCC 47 CFR 15.207):

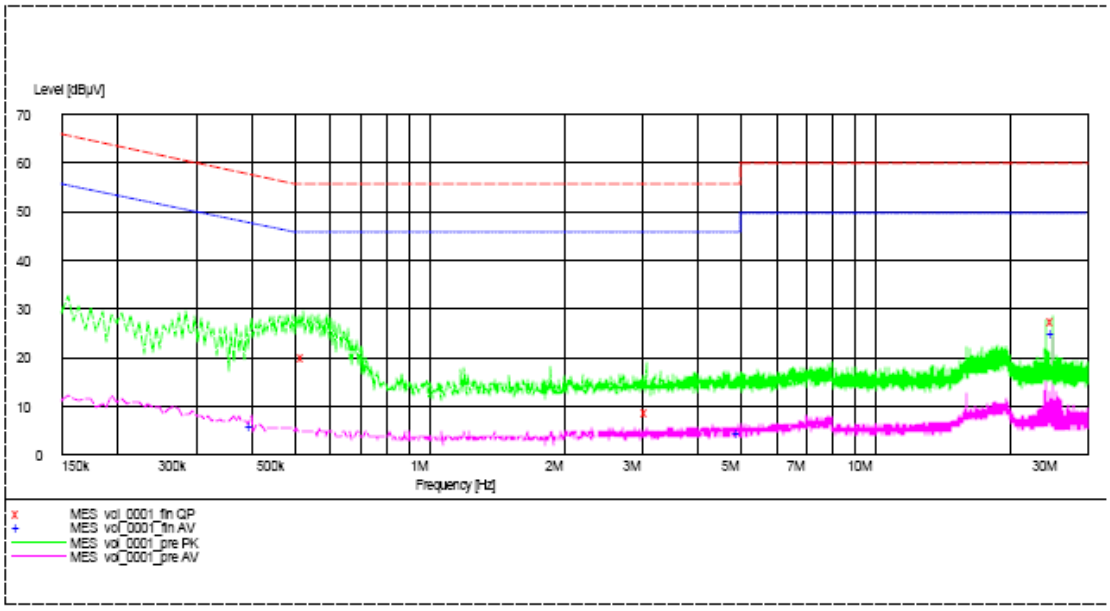
Frequency Range [MHz]	Quasi-Peak Limits [dBµV]	Average [dBµV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* 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 (N): Pass

Please refer to the following diagram for individual results.



Results of Tx mode (N): Pass

Conductor Live or Neutral	Frequency MHz	Quasi-peak		Average	
		Level dBμV	Limit dBμV	Level dBμV	Limit dBμV
Neutral	0.400	-*-	-*-	5.9	46.0
Neutral	4.940	-*-	-*-	4.7	46.0
Neutral	25.060	-*-	-*-	25.0	50.0
Neutral	0.525	20.3	56.0	-*-	-*-
Neutral	3.075	8.7	56.0	-*-	-*-
Neutral	25.060	27.5	60.0	-*-	-*-

Remarks:
Calculated measurement uncertainty : 3.97dB
-*- Emission(s) that is far below the corresponding limit line.

Limit for Conducted Emissions (FCC 47 CFR 15.207):

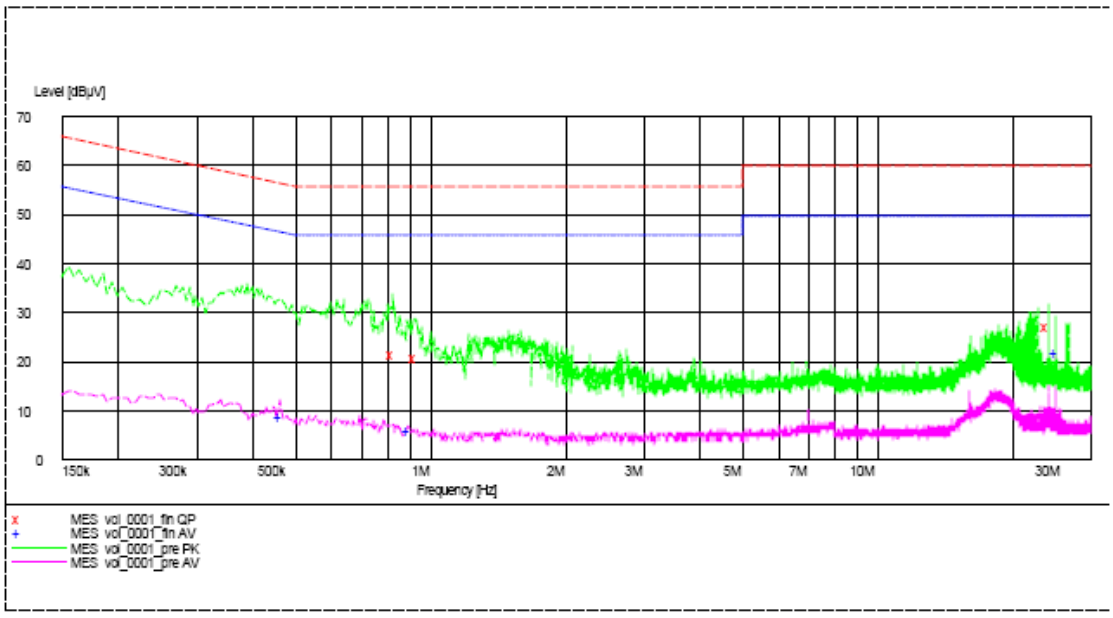
Frequency Range [MHz]	Quasi-Peak Limits [dBµV]	Average [dBµV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* 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 Communication mode (L): Pass

Please refer to the following diagram for individual results.



Results of Communication mode (L): Pass

Conductor Live or Neutral	Frequency MHz	Quasi-peak		Average	
		Level dBμV	Limit dBμV	Level dBμV	Limit dBμV
Live	0.460	-*-	-*-	8.9	47.0
Live	0.895	-*-	-*-	6.0	46.0
Live	25.060	-*-	-*-	21.8	50.0
Live	0.825	21.6	56.0	-*-	-*-
Live	0.925	21.0	56.0	-*-	-*-
Live	24.100	27.3	60.0	-*-	-*-

Remarks:
Calculated measurement uncertainty : 3.97dB
-*- Emission(s) that is far below the corresponding limit line.

Limit for Conducted Emissions (FCC 47 CFR 15.207):

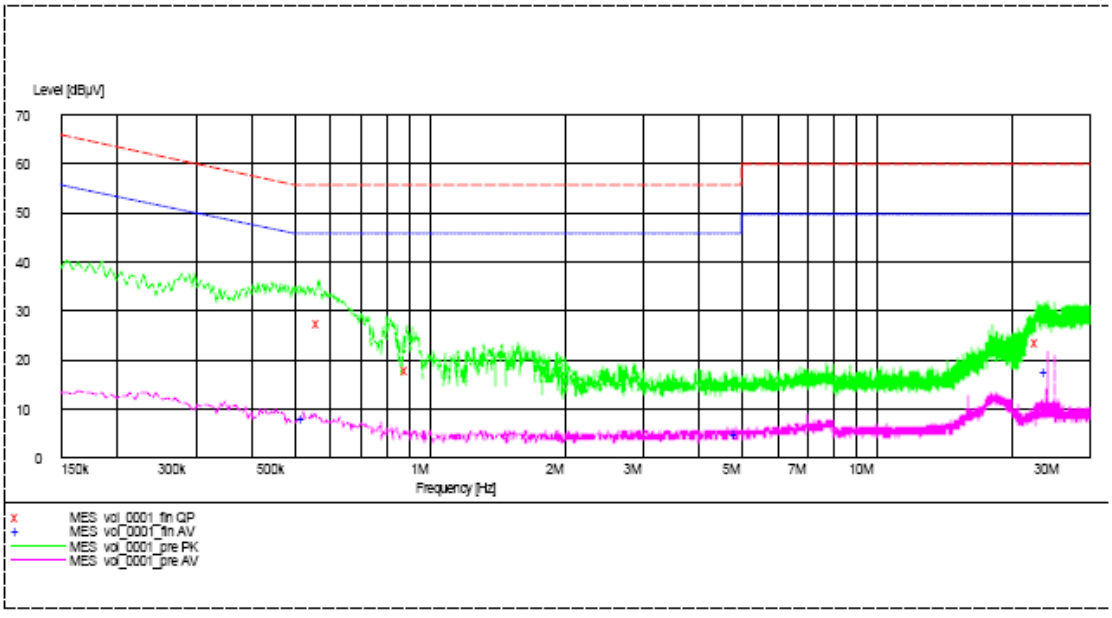
Frequency Range [MHz]	Quasi-Peak Limits [dBµV]	Average [dBµV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* 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 Communication mode (N): Pass

Please refer to the following diagram for individual results.



Results of Communication mode (N): Pass

Conductor Live or Neutral	Frequency MHz	Quasi-peak		Average	
		Level dBμV	Limit dBμV	Level dBμV	Limit dBμV
Neutral	0.525	-*-	-*-	8.2	46.0
Neutral	4.855	-*-	-*-	4.8	46.0
Neutral	24.125	-*-	-*-	17.7	50.0
Neutral	0.565	27.5	56.0	-*-	-*-
Neutral	0.895	18.2	56.0	-*-	-*-
Neutral	22.930	23.6	60.0	-*-	-*-

Remarks:
Calculated measurement uncertainty : 3.97dB
-*- Emission(s) that is far below the corresponding limit line.

Appendix A

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM276	Broadband Horn Antenna	A-INFOMW	JXTXLB-10180-SF	J2031090903007	2010/08/21	2013/08/21
EM215	MULTIDEVICE CONTROLLER	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	--	2011/10/25	2012/10/25
EM219	BICONILOG ANTENNA	EMCO	3142C	00029071	2011/03/01	2013/03/01
EM229	EMI Test Receiver	R&S	ESIB40	100248	2012/05/03	2013/05/03
EM022	LOOP ANTENNA	EMCO	6502	1189-2424	2010/09/07	2012/09/07

Line Conducted

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM197	LISN	EMCO	4825/2	1193	2012/05/16	2013/05/16
EM181	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB7	100072	2012/05/03	2013/05/03
EM179	IMPULSE LIMITER	ROHDE & SCHWARZ	ESH3-Z2	357-8810.52/54	2012/01/27	2013/01/27
EM154	SHIELDING ROOM	SIEMENS MATSUSHITA COMPONENTS	N/A	803-740-057-99A	2012/01/27	2013/01/27

Remarks:-

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

Appendix B

Ancillary Equipment

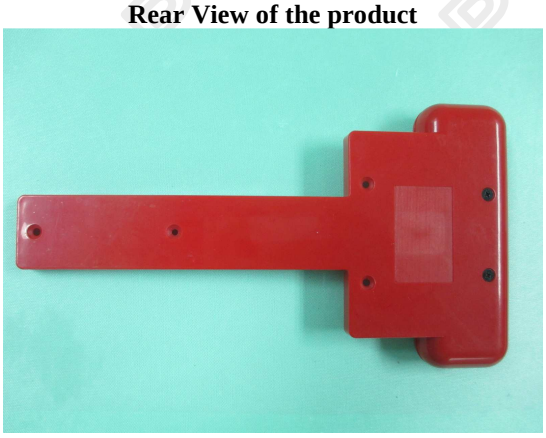
ITEM NO.	DESCRIPTION	MODEL NO.	FCC ID	REMARK
1	resistor	BX7-21	N/A	N/A
2	resistor	BX7-01	N/A	N/A

Appendix B

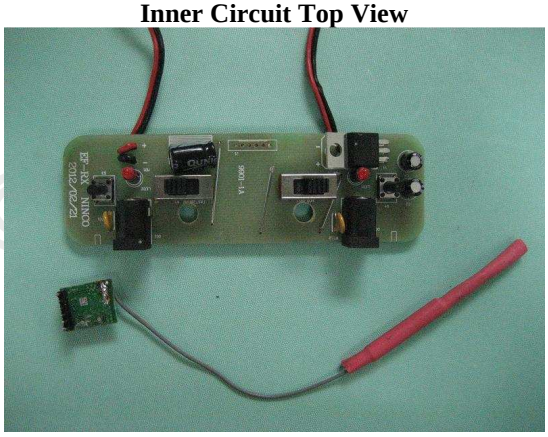
Photographs of EUT

Front View of the product

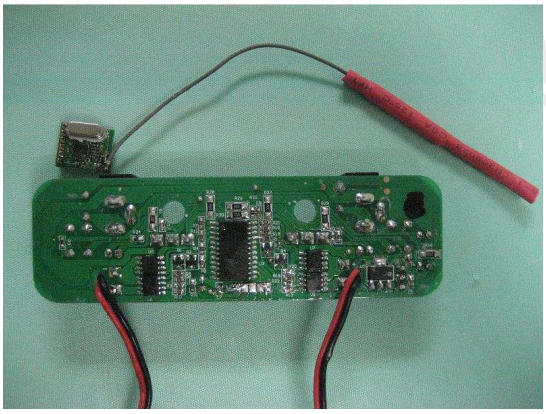
Rear View of the product



Inner Circuit Top View

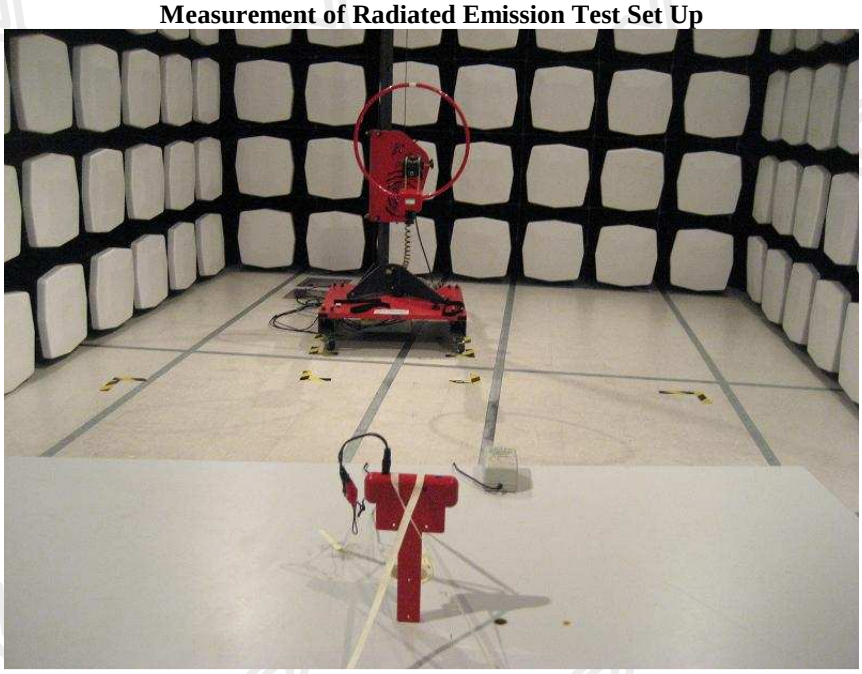


Inner Circuit Bottom View

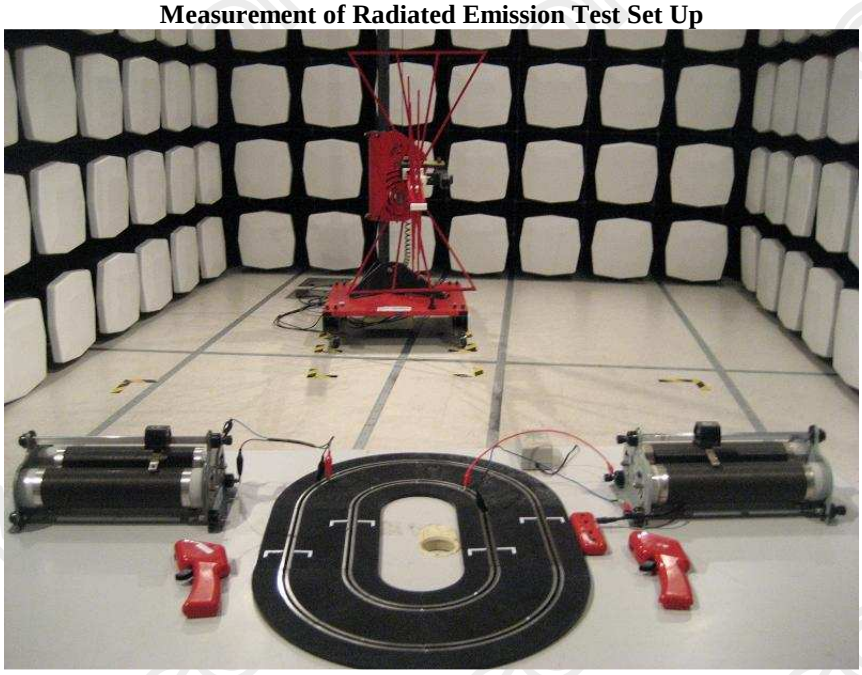


Photographs of EUT

Measurement of Radiated Emission Test Set Up

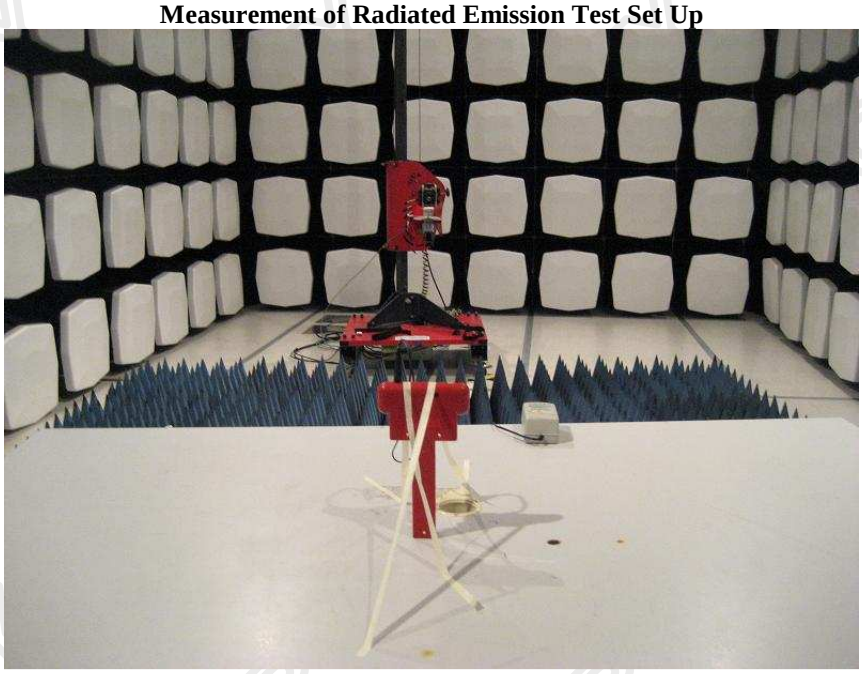


Measurement of Radiated Emission Test Set Up

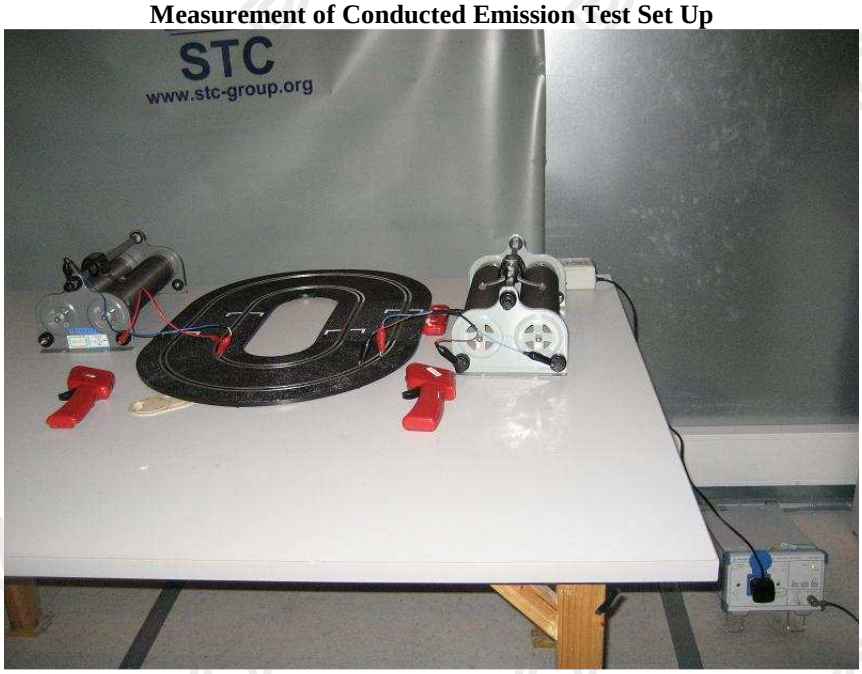


Photographs of EUT

Measurement of Radiated Emission Test Set Up



Measurement of Conducted Emission Test Set Up



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