

Date : 2007-10-08 Page 1 of 20 No. : HM159965 Belkin International INC. **Applicant (SHL012):** 501 West Wainut Street, Compton, CA90220, U.S.A. **Manufacturer:** N/A TUNECAST UNIVERSAL INLINE * **Description of Samples:** Product: CLA/3.5MM HEADPHONE JACK Brand Name: BELKIN Model Number: F8M066 FCC ID: K7SF8M066 **Date Samples Received:** 2007-09-12 **Date Tested:** 2007-09-18 to 2007-09-21 **Investigation Requested:** Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2006 and ANSI C63.4:2003 for FCC Certification. The submitted product **COMPLIED** with the requirements of **Conclusions:** 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.

Remarks:

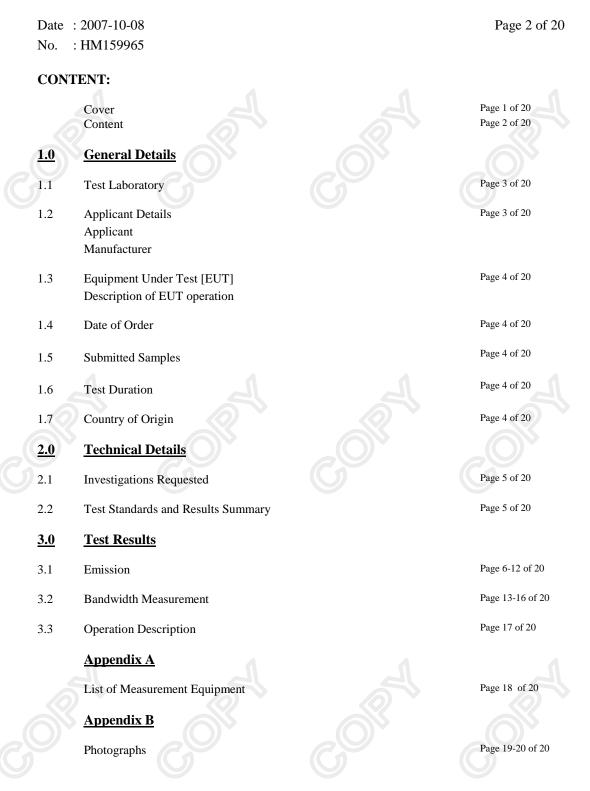
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Dr. LEE Kam Chuen, ElectroMagnetic Compatibility Department For and on behalf of The Hong Kong Standards and Testing Centre Ltd.

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No. : HM159965

1.0 General Details

1.1 Test Laboratory

The Hong Kong Standards and Testing Centre Ltd. EMC Laboratory 10 Dai Wang Street, Taipo Industrial Estate New Territories, Hong Kong

Telephone:852 2666 1888Fax:852 2664 4353

1.2 Applicant Details Applicant

Belkin International INC. 501 West Wainut Street, Compton, CA90220, U.S.A.

Manufacturer

N/A



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1.3 Equipment Under Test [EUT] Description of Sample

Model Name:TUNECAST UNIVERSAL INLINE * CLA/3.5MM HEADPHONE JACKManufacturer:N/ABrand Name:BELKINModel Number:F8M066Input Voltage:12Vd.c. ("Acid-lead" battery x 1)

1.3.1 Description of EUT Operation

The Equipment Under Test (EUT) is a Belkin International INC., TUNECAST UNIVERSAL INLINE * CLA/3.5MM HEADPHONE JACK. The transmitter is a 4 button transmitter. The EUT continues to transmit while audio input is being pressed. It is voice transmitter, Modulation by audio input and type is frequency modulation.

1.4 Date of Order

	2007-09-12	
1.5	Submitted Sample(s):	
	1 Sample	
1.6	Test Duration	
	2007-09-18 to 2007-09-21	
1.7	Country of Origin CHINA	
	A CORA	

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2.0 <u>Technical Details</u>

2.1 Investigations Requested

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2006 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 /	Г	est Result	
			Severity	Pass	Failed	N/A
Field Strength of Fundamental Emissions & Spurious Emissions	FCC 47CFR 15.239	ANSI C63.4:2003	N/A	\boxtimes		
Radiated Emissions	FCC 47CFR 15.209	ANSI C63.4:2003	N/A	\boxtimes		
Conducted Emissions on AC, 0.15MHz to 30MHz	FCC 47CFR 15.207	ANSI C63.4:2003	N/A			

Note: N/A - Not Applicable



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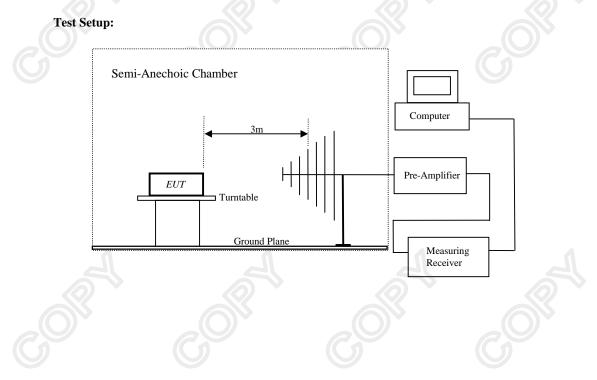


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<u>3.0</u>	<u>Test Results</u>		
3.1	Emission		
3.1.1	Radiated Emissions (3	0 – 1000MHz)	
	Test Requirement:	FCC 47CFR 15.239	
	Test Method:	ANSI C63.4:2003	
	Test Date:	2007-09-21	
	Mode of Operation:	Tx mode	

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 HKSTC with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 607756.



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Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.239]:

Frequency Range of	Peak Limits	Average Limits
Fundamental		
[MHz]	[μV/m]	[μV/m]
88-108	2,500	250

Results of Tx mode (88.1MHz): PASS

Field Strength of Fundamental Emissions						
			Peak Value			
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field
	Level @3m	Factor	Strength	Strength		Polarity
MHz	dBuV	dB/m	dBuV/m	μV/m	μV/m	-
88.10	33.00	9.8	42.8	138.0	2,500	Horizontal

Field Strength of Fundamental Emissions						
Average Value						
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field
	Level @3m	Factor	Strength	Strength		Polarity
MHz	dBuV	dB/m	dBuV/m	μV/m	μV/m	
88.10	32.70	9.8	42.5	133.4	250	Horizontal

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation. Calculated measurement uncertainty: 30MHz to 1GHz 5.2dB

According to FCC 47CFR15.35, the limit on the radio frequency emissions as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.



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

Frequency Range [MHz]	Limits [µV/m]
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 Tx mode (88.1MHz): PASS

	Radiated Emissions					
			Quasi-Peak	1		
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field
	Level @3m	Factor	Strength	Strength		Polarity
MHz	dBuV	dB/m	dBuV/m	μV/m	μV/m	
176.20	22.1	11.1	33.2	45.7	150	Horizontal
264.30	< 1.0	14.0	< 15.0	< 5.6	200	Vertical
352.40	< 1.0	17.5	< 18.5	< 8.4	200	Vertical
440.50	< 1.0	10.2	< 11.2	< 3.6	200	Vertical
528.60	< 1.0	11.9	< 12.9	< 4.4	200	Vertical
616.70	< 1.0	12.4	< 13.4	< 4.7	200	Vertical
704.80	< 1.0	13.2	< 14.2	< 5.1	200	Vertical
792.90	< 1.0	15.0	< 16.0	< 6.3	200	Vertical
881.00	< 1.0	16.1	< 17.1	< 7.2	200	Vertical

Remarks:

Correction Factor includes Antenna Factor and Cable Attenuation. Calculated measurement uncertainty: 30MHz to 1GHz 5.2dB



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Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.239]:

Frequency Range of	Peak Limits	Average Limits
Fundamental		
[MHz]	[μV/m]	[μV/m]
88-108	2,500	250

Results of Tx mode (98.1MHz): PASS

	Field Strength of Fundamental Emissions					
			Peak Value			
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field
	Level @3m	Factor	Strength	Strength		Polarity
MHz	dBuV	dB/m	dBuV/m	μV/m	μV/m	
98.10	36.00	10.2	46.2	204.2	2,500	Horizontal

	Field Strength of Fundamental Emissions					
Average Value						
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field
	Level @3m	Factor	Strength	Strength		Polarity
MHz	dBuV	dB/m	dBuV/m	μV/m	μV/m	
98.10	35.60	10.2	45.8	195.0	250	Horizontal

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation. Calculated measurement uncertainty: 30MHz to 1GHz 5.2dB

According to FCC 47CFR15.35, the limit on the radio frequency emissions as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.



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

Frequency Range [MHz]	Limits [µV/m]
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 Tx mode (98.1MHz): PASS

Radiated Emissions								
Quasi-Peak								
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field		
	Level @3m	Factor	Strength	Strength		Polarity		
MHz	dBuV	dB/m	dBuV/m	μV/m	μV/m			
196.20	< 1.0	11.0	< 12.0	< 4.0	150	Vertical		
294.30	< 1.0	14.0	< 15.0	< 5.6	200	Vertical		
392.40	< 1.0	17.5	< 18.5	< 8.4	200	Vertical		
490.50	< 1.0	10.2	< 11.2	< 3.6	200	Vertical		
588.60	< 1.0	11.9	< 12.9	< 4.4	200	Vertical		
686.70	< 1.0	12.4	< 13.4	< 4.7	200	Vertical		
784.80	< 1.0	13.2	< 14.2	< 5.1	200	Vertical		
882.90	< 1.0	15.0	< 16.0	< 6.3	200	Vertical		
981.00	< 1.0	16.1	< 17.1	< 7.2	500	Vertical		

Remarks:

Correction Factor includes Antenna Factor and Cable Attenuation. Calculated measurement uncertainty: 30MHz to 1GHz 5.2dB



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Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.239]:

Frequency Range of	Peak Limits	Average Limits
Fundamental		
[MHz]	[μV/m]	[μV/m]
88-108	2,500	250

Results of Tx mode (107.9MHz): PASS

Field Strength of Fundamental Emissions								
Peak Value								
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field		
	Level @3m	Factor	Strength	Strength		Polarity		
MHz	dBuV	dB/m	dBuV/m	μV/m	μV/m			
107.90	34.00	9.6	43.6	151.4	2,500	Horizontal		

Field Strength of Fundamental Emissions							
Average Value							
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field	
	Level @3m	Factor	Strength	Strength		Polarity	
MHz	dBuV	dB/m	dBuV/m	μV/m	μV/m		
107.90	33.70	9.6	43.3	146.2	250	Horizontal	

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation. Calculated measurement uncertainty: 30MHz to 1GHz 5.2dB

According to FCC 47CFR15.35, the limit on the radio frequency emissions as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.



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

Frequency Range [MHz]	Limits [µV/m]
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 Tx mode (107.9MHz): PASS

Radiated Emissions								
Quasi-Peak								
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field		
	Level @3m	Factor	Strength	Strength		Polarity		
MHz	dBuV	dB/m	dBuV/m	μV/m	μV/m	-		
215.80	< 1.0	11.0	< 12.0	< 4.0	150	Vertical		
323.70	< 1.0	14.0	< 15.0	< 5.6	200	Vertical		
431.60	< 1.0	17.5	< 18.5	< 8.4	200	Vertical		
539.50	< 1.0	10.2	< 11.2	< 3.6	200	Vertical		
647.40	< 1.0	11.9	< 12.9	< 4.4	200	Vertical		
755.30	< 1.0	12.4	< 13.4	< 4.7	200	Vertical		
863.20	< 1.0	13.2	< 14.2	< 5.1	200	Vertical		
971.10	< 1.0	15.0	< 16.0	< 6.3	500	Vertical		
1079.00	< 1.0	16.1	< 17.1	< 7.2	500	Vertical		

Remarks:

Correction Factor includes Antenna Factor and Cable Attenuation. Calculated measurement uncertainty: 30MHz to 1GHz 5.2dB



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3.2 20B Bandwidth of Fundamental Emission

Test Requirement: Test Method: Test Date: Mode of Operation: FCC 47 CFR 15.227 ANSI C63.4:2003 (Section 13.1.7) 2007-9-21 Tx mode

Test Method:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

Test Setup:

As Test Setup of clause 3.1.1 in this test report.



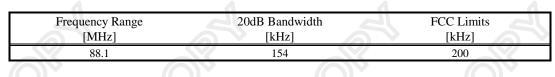
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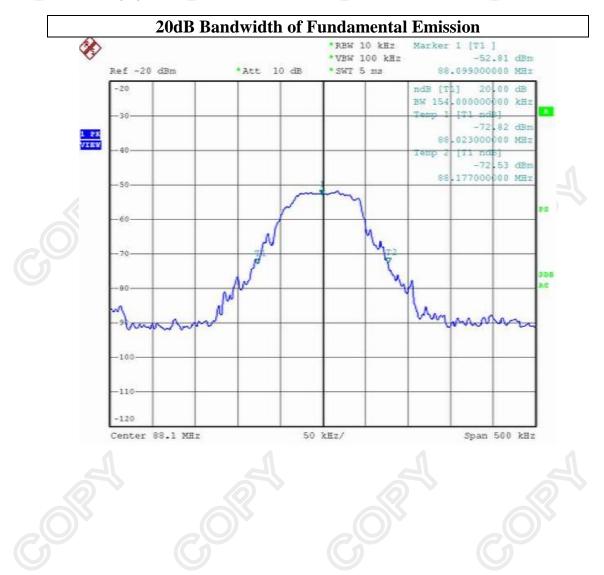
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Limits for 20dB Bandwidth of Fundamental Emission:



Result:

The following figure is the measured bandwidth of Fundamental Emission.



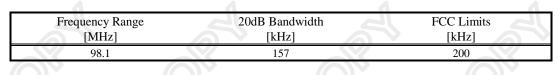
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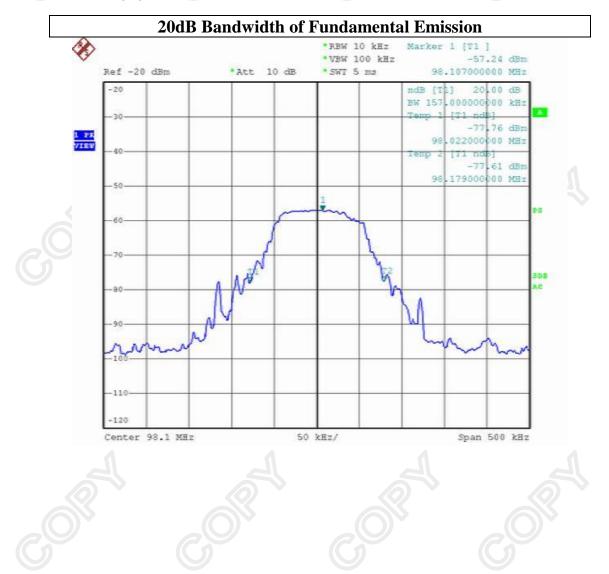
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Limits for 20dB Bandwidth of Fundamental Emission:



Result:

The following figure is the measured bandwidth of Fundamental Emission.



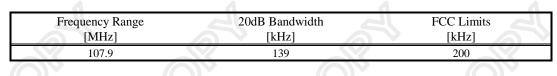
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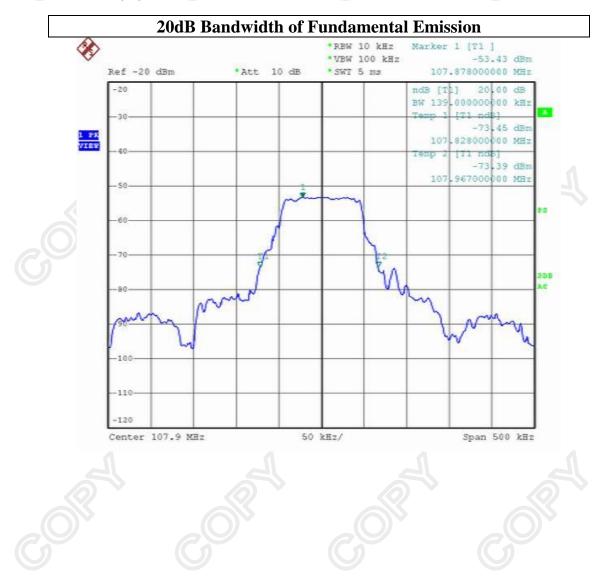
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Limits for 20dB Bandwidth of Fundamental Emission:



Result:

The following figure is the measured bandwidth of Fundamental Emission.



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Operation Description

The transmitter is a FM transmitter operating at 88.1-107.9MHz band. The transmitter is powered by 12Vd.c. and the transmitting frequency is crystal controlled. The operation is achieved by different combinations of from frequency modulation signal on the 88.1-107.9MHz carrier frequency.





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Appendix A

List of Measurement Equipment

Radiated Emission							
EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAI	
EM215	MULTIDEVICE CONTROLER	ETS-Linggren	2090	00024676	N/A	N/A	
EM216	MINI MAST SYSTEM	ETS-Linggren	2075	00026842	N/A	N/A	
EM217	ELECTRIC POWERED TURNTABLE	ETS-Linggren	2088	00029144	N/A	N/A	
EM218	ANECHOIC CHAMBER	ETS-Linggren	FACT-3		2006/05/02	2009/05/02	
EM219	BICONILOG ANTENNA	ETS-Linggren	3142C	00029071	2006/02/01	2008/02/0	
EM181	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB7	100072	2007/03/17	2008/03/1	

Line Conducted

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM119	LISN	ROHDE & SCHWARZ	ESH3-Z5	0831.5518.52	2007/07/15	2008/07/15
EM181	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB7	100072	2007/03/17	2008/03/17
EM154	SHIELDING ROOM	SIEMENA MATSUSHITA COMPONENTS	N/A	803-740-057- 99A	2006/01/12	2008/01/12

Remarks:-

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



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Appendix B

Photographs of EUT



Front View of the product

Rear View of the product

Rear View of the product



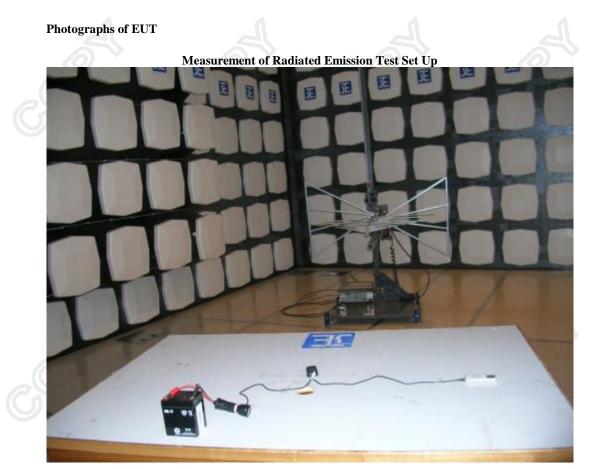




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