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16007977 001

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Auftraggeber:

Wealth Center Fiber Optic Inc.

Client:

A2, Wanan Industrial Park No. 110 Lanbei Road, Lanhe Town, Panyu,
Guangzhou, Guangdong, P.R.China

Gegenstand der Prüfung: 10/100M Ethernet Media Converter

Test item:

Bezeichnung:

MC-S100U-1A

FCC ID:

WWA-MCS100U1A

Identification:

FCC ID

Wareneingangs-Nr.:

173023546

Eingangsdatum:

06.06.2006

Receipt No.:

Date of receipt:

Prüfart:

GRG Metrology and Test Technology
(Guangzhou) Co., Ltd.

Listed test laboratory
according to FCC rules
section 2.948 for
measuring devices.

Testing location:

No.163 Pingyun Rd, West of Huangpu Ave,
Guangzhou, Guangdong, China

Prüfgrundlage:

ANSI C63.4: 2003

Test specification:

FCC Part 15: 20, Sep. 2007, Subpart B section 15.107 and 15.109

Prüfergebnis:

Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n).

Test Result:

The test item passed the test specification(s).

Prüflaboratorium:

TÜV Rheinland (Guangdong) Ltd.

Testing Laboratory:

geprüft/ tested by:

kontrolliert/ reviewed by:

2007.09.21

Ricky Liu

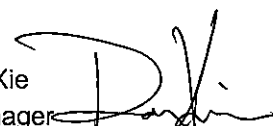
Project Manager



2007.09.21

Liangdong Xie

Project Manager



Datum
Date

Name/Stellung
Name/Position

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Name/Position

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Sonstiges/ Other Aspects:

Abkürzungen:

P(ass) = entspricht Prüfgrundlage
F(ail) = entspricht nicht Prüfgrundlage
N/A = nicht anwendbar
N/T = nicht getestet

Abbreviations:

P(ass) = passed
F(ail) = failed
N/A = not applicable
N/T = not tested

Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.

This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.

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Test Summary

FCC and IC test specification		Test items	Result
Paragraph	Released Date		
Part 15 Per Section 15.107(c)	20. Sep, 2007	Conducted Emission	Pass
Part 15 Per Section 15.109(e)	20. Sep, 2007	Radiated Emission	Pass

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1 General Remarks

1.1 Complementary Materials

None

2 Test Sites

2.1 Test Facilities

GRG Metrology and Test Technology (Guangzhou) Co., Ltd

No.163 Pingyun Rd, West of Huangpu Ave, Guangzhou, Guangdong, China

The tests at this test site have been conducted under the supervision of a TÜV Rheinland engineer.

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2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Kind of Equipment	Type	Manufacturer	S/N	Calibrated until	Calibrated Interval
EMI Receiver	ESCI	Rohde & Schwarz	100529	2010.06.18	1 year
Antenna	3142C	ETS • LINDGRE N	00075971	2009.08.03	2 year
AMN	NNBM8125	SCHWARZBECK	81251473	2010.04.21	1 year
Anechoic Chamber	RFD-F/H-100	ETS·LINDGREN	3730	2010.04.21	3 year

2.3 Traceability

All measurement equipment calibrations are traceable to NIST or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

Uncertainty for conducted emissions measurements is $\pm 3.5\text{dB}$.

Uncertainty for radiated emissions measurements is $\pm 4.5\text{dB}$

The reported expanded uncertainty is based on a standard uncertainty multiply by a coverage factor $k=2$, providing a level of confidence of approximately 95%.

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2.6 Location of original data

The original copies of test data taken during actual testing were attached at Appendix 1 of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Guangdong) file for certification follow-up purposes.

2.7 Status of facility used for testing

GRG Metrology and Test Technology (Guangzhou) Co., Ltd. No.163 Pingyun Rd, West of Huangpu Ave, Guangzhou, Guangdong, China is listed on the US Federal Communications Commission list of facilities approved to perform measurements, the register no. 688188

3 General Product Information

The EUT is Ethernet Media Converter used for converting copper media to optical media (Laser Fiber) for data transmission. The device is classified as Class B personal computers and peripherals.

The enclosure of Ethernet Media Converters is metal. The RJ-45 connector of the appliance is only considered for interconnection of indoor Ethernet network equipment such as personal computer.

Two kinds of optical transfer module are used, one is the Dual Fiber Module (DFB), and the other one is the Single Fiber Module (SFB) as an alternative component. These two modules share the same circuit design, but PCB layout of them is different. Due to the difference, bi-wire fiber is used for data transmission between DFB and single fiber is used between SFB.

For detail refer to Technical Documentation.

Based on above-mentioned information, all necessary tests are performed on EUT with DFB and SFB respectively.

3.1 Product Function and Intended Use

Refer to user manual for more information.

3.2 Ratings and System Details

Main Unit:

Type Designation	:	MC-S100U-1A
Data Rate	:	10M/100M bps
Power supply	:	DC 5V
Ports	:	DC port, RJ-45 Ethernet port
Protection Class	:	III

Accessory Power Adaptor:

Manufacturer	:	UMEC
Type Designation	:	UP0101G-05PE
Power Input	:	AC 100-240V 50/60Hz 0.4A Max.
Power Output	:	DC 5V, 1.6A Max
Ports	:	AC input, DC output
Protection Class	:	II

Refer to the Technical Documentation for further information

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3.3 Independent Operation Modes

Off/On

For further information refer to User Manual

3.4 Submitted Documents

Operation Description
Block Diagram
Schematics
FCC label and its location
User Manual
Internal Photos
External Photos
Application form

4 Test Set-up and Operation Mode

4.1 Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Refer to test set-up in chapter 5.

4.3 Special Accessories and Auxiliary Equipment

Kind of Equipment	Manufacturer	Type	Serial No.
Laptop computer	IBM	R61i 77322EC	L3-K1476 08/01
Mouse (USB)	IBM	MO32BOA	4418538
Laptop computer	HP	HP520	CND8121VDN

4.4 Countermeasures to achieve EMC Compliance

The test sample, which has been tested, contained the noise suppression parts as described in the technical document. No additional measures were employed to achieve compliance.

4.5 Test set-up

Diagram 1 of Measurement Equipment Configuration for Testing Radiated Emission below 1 GHz

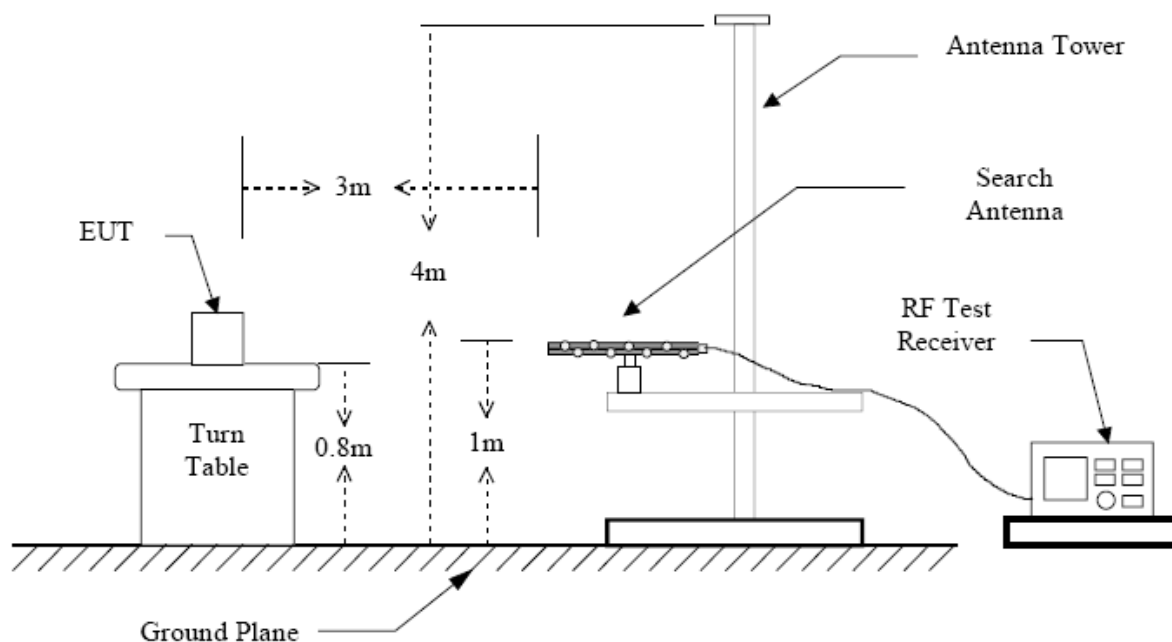
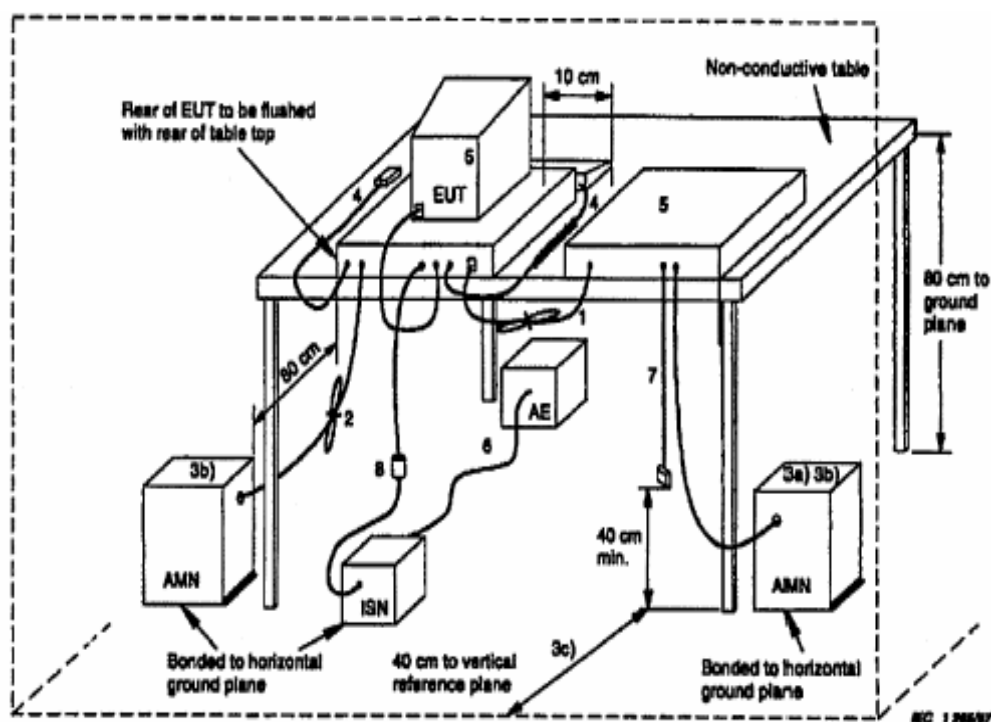


Diagram 2 of Measurement Equipment Configuration for Testing Conducted Emission



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5 Test Results EMISSION

5.1 Radiated Emission FCC Part 15 Per Section 15.109(a)

RESULT:

Pass

Date of testing	:	24.06.2009
Test specification	:	FCC Part 15 Per Section 15.109(a)
Limits	:	FCC Part 15 Per Section 15.109(a)
Test procedure	:	Procedure specified in ANSI C63.4
Deviations from Standard Test procedures	:	None
Kind of test site	:	3m Semi-anechoic chamber
Operation mode	:	On with 10M and 100M data rate respectively
Power supply	:	AC 120V input to power adaptor
Temperature	:	24°C
Humidity	:	42%

Test procedure:

1. The EUT was placed on the top of a rotatable table 0.8 meters above the ground with 3-orthogonal direction and be kept close enough to the receiving antenna. The table was rotated 360 degrees to determine the suspected emission frequency and the position of the worst radiation case with both horizontal and vertical antenna polarization.
2. The EUT was then set 3 meters away from the receiving antenna, which was mounted on a variable-height antenna tower.
3. For each suspected emission frequency recorded in step 1, the EUT was arranged to its worst case that the antenna was tuned to heights from 1 meter to 4 meters (for frequency above 30MHz) and the rotatable table was turned from 0 degree to 360 degree to read the maximum emission.

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Table 2: Radiated Emission (10Mbps data rate for SFB)

Frequency	QP	AV	PK	Polarity	Limit		
					QP	AV	PK
[MHz]	[dBμV/m]			(H/V)	[dBμV/m]		
125.02	17.6	N/A	N/A	H	43.5	N/A	N/A
189.32	24.9	N/A	N/A	H	43.5	N/A	N/A
250.00	24.2	N/A	N/A	H	46.0	N/A	N/A
312.00	29.0	N/A	N/A	H	46.0	N/A	N/A
375.06	30.9	N/A	N/A	H	46.0	N/A	N/A
625.06	41.4	N/A	N/A	H	46.0	N/A	N/A
38.43	32.7	N/A	N/A	V	43.5	N/A	N/A
106.01	34.1	N/A	N/A	V	43.5	N/A	N/A
125.00	38.4	N/A	N/A	V	43.5	N/A	N/A
149.34	34.4	N/A	N/A	V	43.5	N/A	N/A
250.00	38.7	N/A	N/A	V	46.0	N/A	N/A
625.06	32.8	N/A	N/A	V	46.0	N/A	N/A
*)---							

Table 3: Radiated Emission (100Mbps data rate for SFB)

Frequency	QP	AV	PK	Polarity	Limit		
					QP	AV	PK
[MHz]	[dBμV/m]			(H/V)	[dBμV/m]		
125.02	28.4	N/A	N/A	H	43.5	N/A	N/A
189.32	37.8	N/A	N/A	H	43.5	N/A	N/A
250.00	38.5	N/A	N/A	H	46.0	N/A	N/A
312.00	32.9	N/A	N/A	H	46.0	N/A	N/A
375.06	31.4	N/A	N/A	H	46.0	N/A	N/A
625.06	33.4	N/A	N/A	H	46.0	N/A	N/A
50.43	29.6	N/A	N/A	V	43.5	N/A	N/A
106.01	36.4	N/A	N/A	V	43.5	N/A	N/A
125.00	38.7	N/A	N/A	V	43.5	N/A	N/A
149.34	23.8	N/A	N/A	V	43.5	N/A	N/A
250.00	38.7	N/A	N/A	V	46.0	N/A	N/A
625.06	37.0	N/A	N/A	V	46.0	N/A	N/A
*)---							

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Table 4: Radiated Emission (10Mbps data rate for DFB)

Frequency	QP	AV	PK	Polarity	Limit		
					QP	AV	PK
[MHz]	[dBμV/m]			(H/V)	[dBμV/m]		
125.02	34.3	N/A	N/A	H	43.5	N/A	N/A
189.32	32.1	N/A	N/A	H	43.5	N/A	N/A
250.00	37.2	N/A	N/A	H	46.0	N/A	N/A
312.00	37.7	N/A	N/A	H	46.0	N/A	N/A
375.06	37.1	N/A	N/A	H	46.0	N/A	N/A
687.61	42.2	N/A	N/A	H	46.0	N/A	N/A
125.02	17.6	N/A	N/A	V	43.5	N/A	N/A
183.00	24.9	N/A	N/A	V	43.5	N/A	N/A
250.00	24.2	N/A	N/A	V	46.0	N/A	N/A
312.55	29.0	N/A	N/A	V	46.0	N/A	N/A
375.06	30.9	N/A	N/A	V	46.0	N/A	N/A
687.61	41.4	N/A	N/A	V	46.0	N/A	N/A
*)---							

Table 5: Radiated Emission (100Mbps data rate for DFB)

Frequency	QP	AV	PK	Polarity	Limit		
					QP	AV	PK
[MHz]	[dBμV/m]			(H/V)	[dBμV/m]		
125.02	19.3	N/A	N/A	H	43.5	N/A	N/A
181.32	22.4	N/A	N/A	H	43.5	N/A	N/A
250.00	32.7	N/A	N/A	H	46.0	N/A	N/A
312.00	36.2	N/A	N/A	H	46.0	N/A	N/A
375.06	32.8	N/A	N/A	H	46.0	N/A	N/A
687.61	41.0	N/A	N/A	H	46.0	N/A	N/A
125.02	24.6	N/A	N/A	V	43.5	N/A	N/A
183.00	28.7	N/A	N/A	V	43.5	N/A	N/A
250.00	25.4	N/A	N/A	V	46.0	N/A	N/A
312.55	26.8	N/A	N/A	V	46.0	N/A	N/A
375.06	27.6	N/A	N/A	V	46.0	N/A	N/A
687.61	39.9	N/A	N/A	V	46.0	N/A	N/A
*)---							

*) Note: Measurement is made from 30 MHz to 1 GHz. Disturbances other than those mentioned above are small or not detectable. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz at frequency below 1GHz.

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5.2 Conducted Emission for FCC Part 15 Per Section 15.107(a)

RESULT:

Pass

Date of testing	:	29.06.2009
Test specification	:	FCC Part 15 Per Section 15.107(a)
Limits	:	FCC Part 15 Per Section 15.107(a)
Test procedure	:	Procedure specified in ANSI C63.4 were followed
Deviations from Standard Test procedures	:	None
Kind of test site	:	3m Semi-anechoic chamber
Operation mode	:	On with 10M and 100M data rate respectively
Power supply	:	AC 120V input to power adaptor
Temperature	:	24°C
Humidity	:	42%

Test procedure:

1. Place the EUT as specified in ANSI C63.4 Clause 7.2.1
2. Plug the LISN to a correct power source (pay attention to: AC/DC, voltage, frequency).
4. Connect the EUT to LISN and choose N or L1 on the LISN.
5. Connect measurement receiver and LISN with a 50-ohm coaxial cable and a pulse limiter then begin exploratory measurement as specified in ANSI C63.4 Clause 7.2.3
6. Make final measurement as specified in ANSI C63.4 Clause 7.2.4
7. Switch to the other line on the LISN and repeat step 4 to 6.

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Table 6: Disturbance Voltage on AC Mains (10Mbps data rate of SFB)

Frequency [MHz]	Line L/N	QP [dBµV]	AV [dBµV]	Quasi Peak Limit [dBµV]	Average Limit [dBµV]
2.589	L	36.78	25.24	56	46
2.638	L	39.19	26.38	56	46
2.674	L	37.66	25.79	56	46
2.701	L	40.91	30.58	56	46
2.796	L	34.39	23.17	56	46
3.052	L	37.78	27.70	56	46
0.411	N	40.22	34.36	57.63	47.63
2.643	N	40.07	30.34	56	46
2.701	N	39.99	29.98	56	46
2.76	N	37.74	27.89	56	46
2.787	N	36.13	25.11	56	46
2.994	N	36.84	28.58	56	46
*)					

Table 7: Disturbance Voltage on AC Mains (100Mbps data rate SFB)

Frequency [MHz]	Line L/N	QP [dBµV]	AV [dBµV]	Quasi Peak Limit [dBµV]	Average Limit [dBµV]
0.411	L	43.2	38.13	57.63	47.63
2.584	L	39.71	29.62	56	46
2.643	L	41.78	31.72	56	46
2.706	L	38.8	27.25	56	46
2.935	L	37.44	28.79	56	46
2.998	L	36.79	27.51	56	46
2.643	N	40.07	30.53	56	46
2.701	N	39.9	30.19	56	46
2.728	N	36.21	24.9	56	46
2.764	N	35.39	25.23	56	46
2.85	N	35.78	25.51	56	46
2.994	N	36.7	28.31	56	46
*)					

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Table 8: Disturbance Voltage on AC Mains (10Mbps data rate of DFB)

Frequency [MHz]	Line L/N	QP [dBµV]	AV [dBµV]	Quasi Peak Limit [dBµV]	Average Limit [dBµV]
0.177	L	49.67	43.91	64.63	54.63
0.388	L	42.29	38.76	58.1	48.1
2.476	L	37.72	31.26	56	46
2.598	L	37.64	32.03	56	46
2.625	L	38.2	30.18	56	46
2.746	L	36.95	28.85	56	46
2.274	N	33.9	24.47	56	46
2.323	N	34.69	25.48	56	46
2.481	N	36.65	30.27	56	46
2.625	N	35.91	27.45	56	46
2.688	N	35.85	27.61	56	46
2.742	N	35.36	23.86	56	46
*)					

Table 9: Disturbance Voltage on AC Mains (100Mbps data rate DFB)

Frequency [MHz]	Line L/N	QP [dBµV]	AV [dBµV]	Quasi Peak Limit [dBµV]	Average Limit [dBµV]
1.072	L	38.15	31.13	56	46
2.269	L	41.29	33.58	56	46
2.332	L	38.85	30.42	56	46
2.683	L	41.32	34.49	56	46
2.742	L	41.27	33.58	56	46
2.854	L	34.29	23.19	56	46
2.269	N	37.00	30.48	56	46
2.328	N	37.58	30.56	56	46
2.449	N	33.67	25.29	56	46
2.535	N	36.32	29.61	56	46
2.629	N	34.54	26.42	56	46
2.661	N	36.26	29.53	56	46
*)					

*) Measurement is made from 150 kHz to 30 MHz. Disturbances other than those mentioned above are small or not detectable.

If the result of the measurement with the Quasi Peak detector is below the Average limit, the measurement with Average Detector may be omitted.

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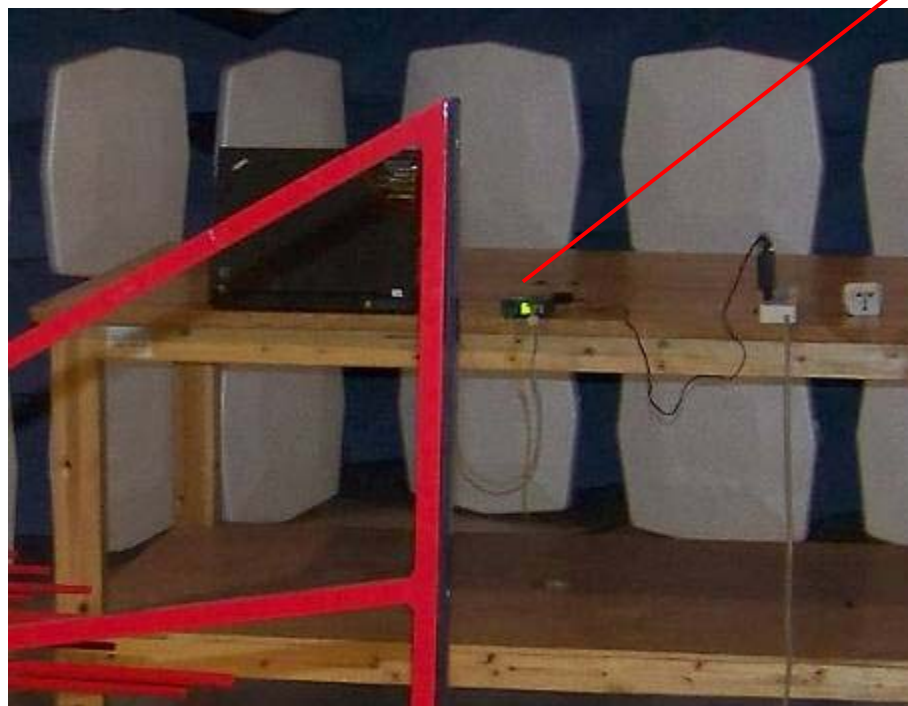
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Photographs of the Test Set-Up

Photograph 1: Set-up for Radiated Emission Measurement



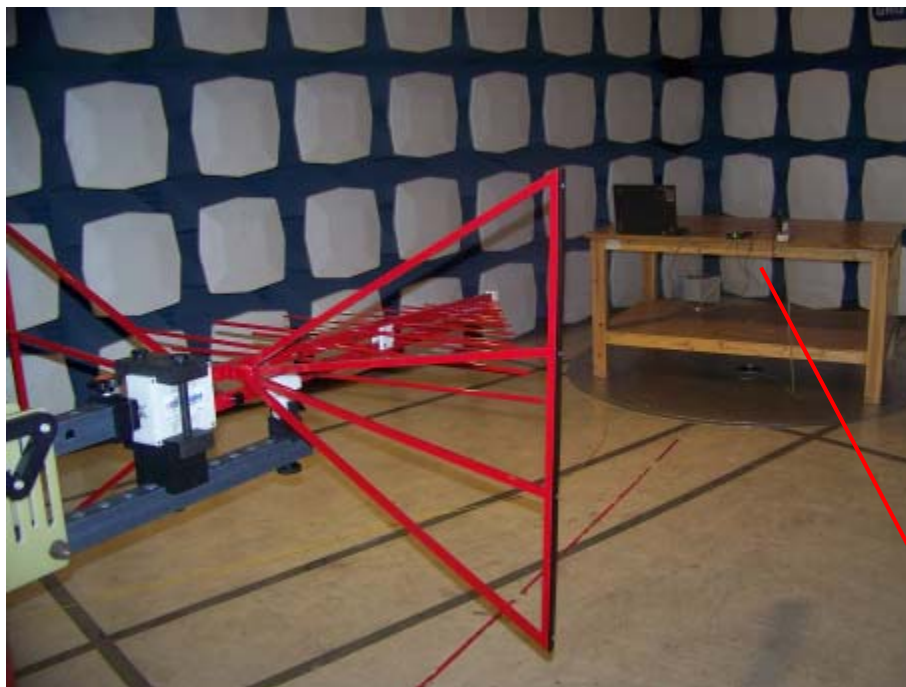
EUT with DFB



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EUT with SFB



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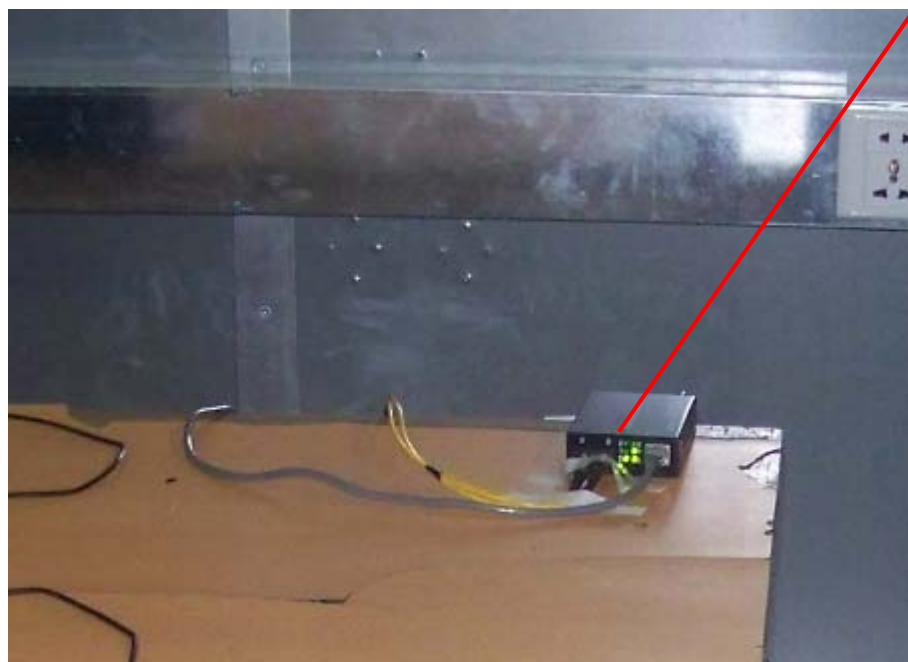
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Photograph 2: Set-up for Conducted Emission Measurement



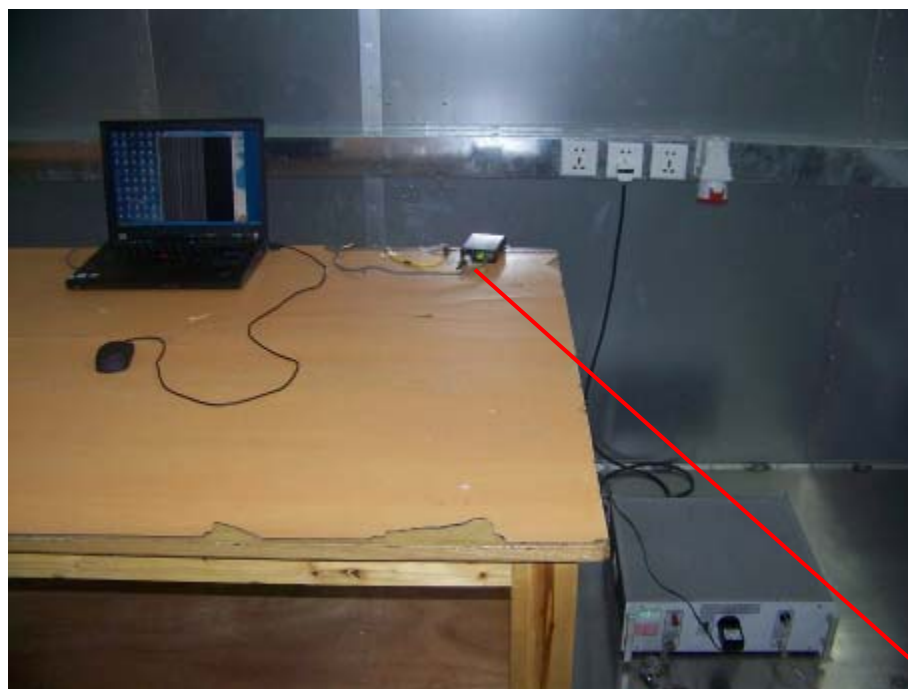
EUT with DFB



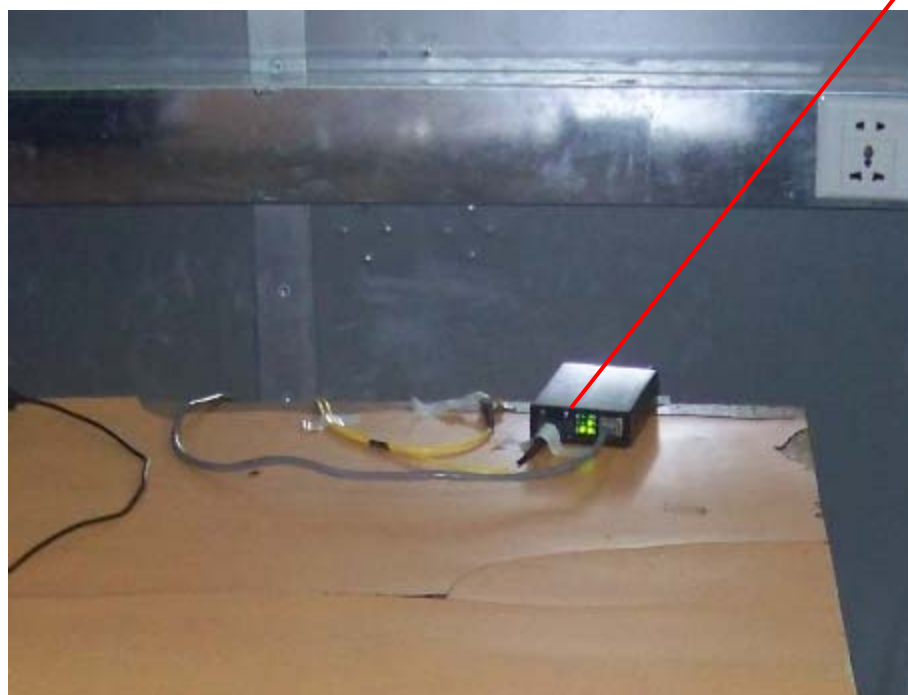
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EUT with SFB



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