

Recognized by the
Federal Communications Commission and Industry Canada
Anechoic chamber registration No.: 90462 (FCC)
Anechoic chamber registration No.: 3463 (IC)
TCB ID: DE0001



Accredited by the
German Accreditation Council
DAR–Registration Number
TTI–P–G 081/94-D0



Independent ETSI
compliance test house



Test report No. 2-3841-01-01/04
Applicant: CIAS Elettronica S.r.l.
Type: ERMO-482X-PRO
Test standard : CFR 47, FCC 15 Subpart C
IC, RSS 210 Issue 5
FCC ID: OIFERMO-482X-PRO
IC: 3325A-ERMOXPRO

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1 General information

1.1 Notes

The test results of this test report relate exclusively to the test item specified in 1.5. CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item .

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Tester :

Date	Name	Signature
2005-01-28	Manfred Paschwitz	

Technical responsibility for area of testing:

Date	Name	Signature
2005-01-28	Harro Ames	



Test Report Cover Sheet/Performance Test Data

TEST REPORT NUMBER: 2-3841-01-01/04

EQUIPMENT MODEL NUMBER: ERMO-482X-PRO

CERTIFICATION NO: 3325A-ERMOXPRO

MANUFACTURER : CIAS Elettronica S.r.l.

TESTED TO RADIO STANDARDS SPECIFICATION NO. : RSS 210 Issue 5

OPEN AREA TEST SITE INDUSTRY CANADA NUMBER: 3463

FREQUENCY RANGE (or fixed frequency): 10.525 GHz

FIELD STRENGTH (at what distance): 2089 mV/m@3m

OCCUPIED BANDWIDTH (99% BW): 7.2 MHz

TYPE OF MODULATION: Puls

EMISSION DESIGNATOR (TRC-43): 7M0P0N

ANTENNA INFORMATION: Parabol

TRANSMITTER SPURIOUS (worst case): 394,0 µV/m@ 3m

RECEIVER SPURIOUS (worst case): 442.0 µV/m@ 3m

ATTESTATION:**DECLARATION OF COMPLIANCE:**

I declare that the testing was performed or supervised by me; that the test measurements were made in accordance with the above-mentioned Industry Canada standard(s); and that the equipment identified in this application has been subjected to all the applicable test conditions specified in the Industry Canada standards and all of the requirements of the standard have been met.

Laboratory Manager :

2005-01-28 RSC 8434 M. Paschwitz

Date Section Name Signature

1.2 Testing laboratory

CETECOM ICT Services GmbH
Untertürkheimerstraße 6–10
D-66117 Saarbrücken
Germany

CETECOM ICT Services GmbH
P.O. Box 10 04 45
D-66004 Saarbrücken
Germany

Telephone : + 49 (0) 681 598–0
Fax : + 49 (0) 681 598–9075
e-mail : info@ict.cetecom.de
Internet : <http://www.cetecom.de>

Accredited testing laboratory

Accredited by : Regulierungsbehörde für Telekommunikation und Post (RegTP)
Listed by : Federal Communications Commission (FCC)
Industry Canada (IC)

Authority	Identification/Registration No.
RegTP	TTI-P-G 081/94-D0
FCC	90462
IC	3463

Testing location, if different from CETECOM ICT Services GmbH: (Not applicable)

1.3 Details of applicant

Name : CIAS Elettronica S.r.l.
Street : Via Durando 38
Town : 20158 Milano
Country : Italy
Phone : +39-02-3767161
Fax : +39-02-39311225

Contact person

Name : Mr. Vincenzo de Astis
Phone : +39-02-3767161
Fax : +39-02-39311225
E-Mail : deastis.vincenzo@cias.it

1.4 Application details

Date of receipt of application : 2005-01-10
Date of receipt of test item : 2005-01-26
Date of test : 2005-01-26 to 2005-01-27
Person(s) who have been present during the test : Carmaguani Giuseppe
Sanna Giovanni

1.5 Test item (EUT)

Description	:	Field disturbance sensor
Type designation	:	ERMO-482X-PRO
Manufacturer		
Name	:	CIAS Elettronica S.r.l.
Street	:	Via Durando 38
Town	:	20158 Milano
Country	:	Italy

1.6 Technical data

Frequency range	:	10.500 GHz to 10.550 GHz
Operational frequency	:	10.525 GHz
Field strength PEP	:	2089 mV/m
20 dB Bandwidth	:	7.2 MHz
Type of modulation	:	7M0P0N
Microwave modules	:	TX / RX – Module with integral antenna
Normal power supply (U nom)	:	115.0 V AC
Normal power supply (U nom)	:	19.0 V DC
Extreme DC power supply	:	13.8 V DC to 24.0 V DC

1.6.1 Operation conditions

Operation:	:	As soon as the equipment is powered up, TX and RX start operating
Purpose of operation	:	Field disturbance sensor

1.6.2 Equipment under test

ERMO-482X-PRO

1.7 Test standards

Code of Federal Regulations (CFR 47)
Federal Communications Commission (FCC)

FCC Part 15 Radio Frequency Devices (11/2004)

SECTION 15.245
Operation within the band 10.500 GHz to 10.550 GHz

SECTION 15.205
Restricted bands of operation.

SECTION 15.209
Radiation emission limits, general requirements

Industry Canada RSS 210 (Issue 5)
Low Power Licence-Exempt Radio communication Devices

Main Changes

TX

Section	6.2.2 (n)	Field Disturbance Sensor
	6.3	Restricted Bands and Unwanted Emission Frequencies
	6.4	Frequency Stability not applicable
	6.5	Pulse Operations not applicable
	6.6	Transmitter AC Wireline Conducted Emissions

RX

Section	7.2	Receiver Spurious Emissions (conducted) not applicable
	7.3	Receiver Spurious Emissions (radiated)
	7.4	Receiver AC Wireline Conducted Emissions

2 Technical test

2.1 Summary of test results

- ☒ No deviations from the technical specification (s) were ascertained in the course of the performed tests.
- ☐ The deviations as specified in 2.5 were ascertained in the course of the performed tests.

This test report :

- ☒ describes the first test
- ☐ describes an additional test
- ☐ is a verification of documents
- ☐ is only valid with the test report no.

2.2 Test environment

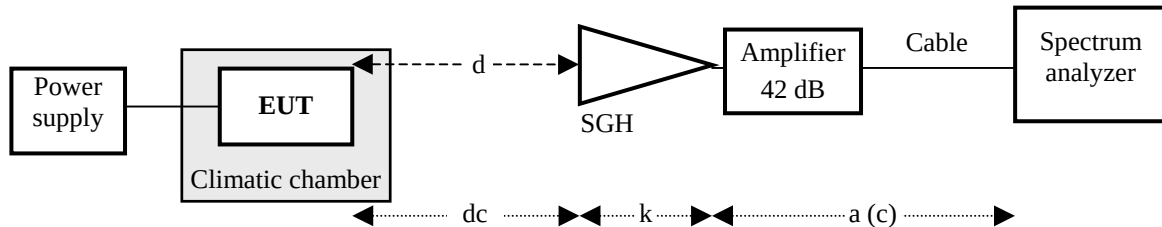
The environmental conditions are documented especially for each test.

2.3 Measurement and test set-up

The measurement and test set-up is defined in the technical specification .

2.4 Test equipment utilized and test set-up

2.4.1 Field strength and spurious radiation in the frequency range 4 GHz to 33 GHz with broadband amplifier



Frequency range [GHz]	Distance d [m]	Standard gain Horn ant. (SGH)	Antenna factor k [dB 1/m]	Amplifier gain g [dB]	Cable loss a [dB]
3.8 ... 6.0	3.0	narda 643	27.31	-42.0	1.5
5.3 ... 8.2	3.0	narda 642	30.06	-42.2	1.8
8.2 ... 12.4	3.0	narda 640	33.70	-42.0	2.0
12.4 ... 18.0	3.0	narda 639	33.97	-42.0	2.5
18 ... 26	1.0	narda 638	40.22	-42.0	3.0
26 ... 40	1.0	narda V637	44.00	-25.5	3.5

Calculation : Field strength = Analyser reading + Cable loss + Antenna factor + Ampl. gain

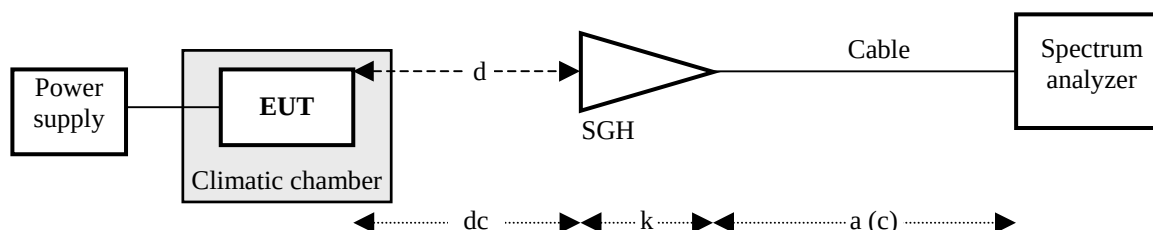
$$e = u + a + k + g$$

Test equipment	Manufacturer	Type	CETECOM reference
Spectrum Analyser	HP	HP 8565E	300001665
SGH 3.8 ... 6.0 GHz	narda	643	300002447
SGH 5.3 ... 8.2 GHz	narda	642	300000767
SGH 8.2 ... 12.4 GHz	narda	640	300002213
SGH 12.4 ... 18.0 GHz	narda	639	300000786
SGH 18 ... 27 GHz	narda	638	300002442
SGH 27 ... 40 GHz	narda	V637	300000510
SGH 27 ... 40 GHz	Thomson	COR 27_40	300000797a
Amplifier 0.5 ... 35 GHz	MITEC	U42	300003143
Notch filter	Narda	904N	300000773
Power supply DC	HP	6032A	300002115
Power supply AC	Grundig	RT 5 A	300001263
RF-cable	HP	5061-5359	300002033
Power Supply	HP	6038A	300001174

Measurement uncertainty

Test parameter	Measurement uncertainty
Power supply	±0.1 V
Temperature	±0.2 °C
Frequency	±0.01 ppm
Field strength	±1.4 dB

2.4.2 Field strength and spurious radiation in the frequency range 4 GHz to 40 GHz



Frequency range [GHz]	Distance d [m]	Standard gain Horn ant. (SGH)	Antenna factor k [dB 1/m]	Distance corr. dc (3m/Xm) [dB]	Cable loss a [dB]
3.8 ... 6.0	1.0	narda 643	27.31	-9.54	1.5
5.3 ... 8.2	0.5	narda 642	30.06	-15.56	1.8
8.2 ... 12.4	0.5	narda 640	33.70	-15.56	2.0
12.4 ... 18.0	3.0	narda 639	33.97	n.a.	2.5
18.0 ... 27.0	3.0	narda 638	40.22	n.a.	3.0
27.0 ... 40.0	3.0	narda V637	44.00	n.a.	3.5

Calculation : Field strength = Analyser reading + Cable loss + Antenna factor + distance corr.

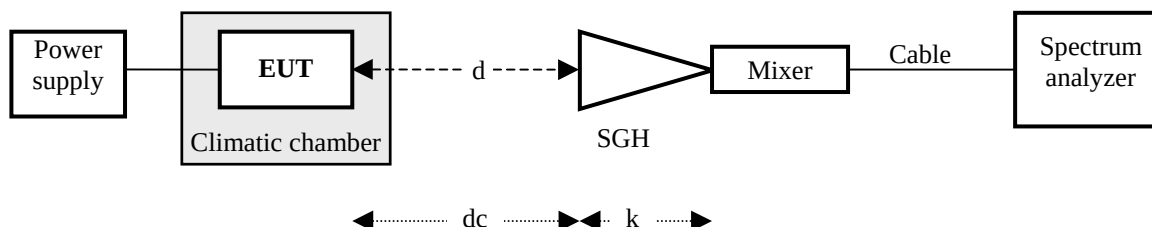
e = u + a + k + dc

Test equipment	Manufacturer	Type	CETECOM reference
Spectrum Analyser	HP	HP 8565E	300001665
SGH 3.8 ... 6.0 GHz	narda	643	300002447
SGH 5.3 ... 8.2 GHz	narda	642	300000767
SGH 8.2 ... 12.4 GHz	narda	640	300002213
SGH 12.4 ... 18.0 GHz	narda	639	300000786
SGH 18 ... 27 GHz	narda	638	300002442
SGH 27 ... 40 GHz	narda	V637	300000510
SGH 27 ... 40 GHz	Thomson	COR 27_40	300000797a
Power supply DC	HP	6032A	300002115
Power supply AC	Grundig	RT 5 A	300001263
RF-cable	HP	5061-5359	300002033
Power Supply	HP	6038A	300001174

Measurement uncertainty

Test parameter	Measurement uncertainty
Power supply	±0.1 V
Temperature	±0.2 °C
Frequency	±0.01 ppm
Field strength	±1.4 dB

2.4.3 Field strength and spurious radiation in the frequency range 33 GHz to 110 GHz



Frequency range [GHz]	Distance d [m]	Distance correction dc (3 m/Xm) [dB]	Antenna factor k [dB 1/m]
40.0 60.0	0.125	-27.60	39.10
50.0 75.0	0.125	-27.60	40.67
75.0 ... 110.0	0.125	-27.60	45.07

Calculation : Field strength = Analyser reading + Cable loss + Antenna factor + Distance correction

$$e = u + a + k + dc$$

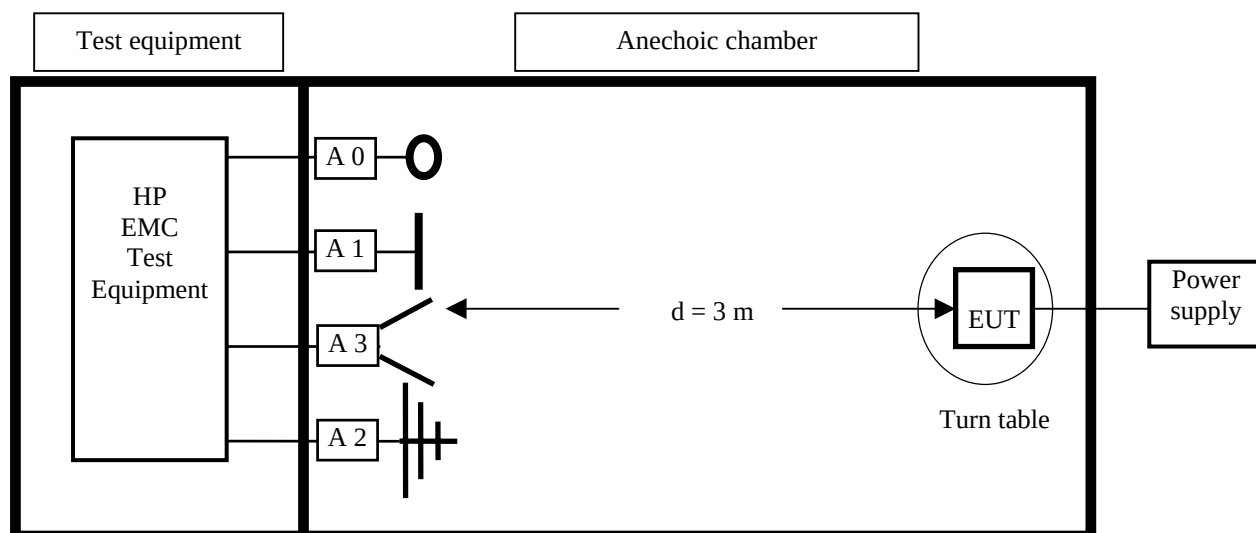
Test equipment	Manufacturer	Type	CETECOM reference
Spectrum Analyser	HP	HP 8565E	300001665
Power supply	HP	6032A	300002115
SGH 33 ... 50 GHz	Thomson	COR 33_50	300000812
Mixer 33 ... 50 GHz	HP	11970Q	300000781j
SGH 50 ... 75 GHz	Thomson	COR 50_75	300000789k
Mixer 50 ... 75 GHz	HP	11970V	300000871o
SGH 75 ... 110 GHz	Thomson	COR 75_110	300000789m
Mixer 75 ... 110 GHz	HP	11970W	300000871v
Power Supply	HP	6038A	300001174

Measurement uncertainty

Test parameter	Measurement uncertainty
Power supply	±0.1 VDC
Temperature	±0.2 °C
Frequency	±0.01 ppm
Field strength <50 GHz	±1.0 dB
Field strength >50 GHz	±3.0 dB

2.4.4 Field strength and spurious radiation in the frequency range 9 kHz to 4 GHz

Set-up for radiated measurements



Test equipment	Manufacturer	Type	Serial No.
Spectrum analyser	HP	HP 85660B	2478A05306
Analyser display	HP	HP 85662A	2816A16541
Quasi peak adapter	HP	HP 85650A	2811A01131
RF-preselector	HP	HP 85685A	2833A00768
Loop Antenna A 0	R&S	HFH 2-Z2	881 058/42
Biconical antenna A 1	Emco	3104	3758
Log.-per.-antenna A 2	Emco	3146	2304
Double ridge horn ant. A 3	Emco	3115	3007
Relay switch	R&S	RSU	375 339/002
High pass filter	FSY Microwave	HM 985955	001
Amplifier	Tron-Tech	P42-GA29	B2302
Power supply	HP	HP 6038A	2848A07027
RF-cable	HP	5061-5359	P36303

Measurement uncertainties

Performance	Measurement uncertainty
Input power (DC)	±0.1 V
Temperature	±0.2 °C
Frequency	±0.01 ppm
Field strength	±1.4 dB

2.5 Test results

2.5.1 Test results overview

This test was performed :

☐ in addition to the test report no.

Verification of EUT :

☒ EUT is in accordance with the technical description

☐ EUT is not in accordance with the technical description

☒ The equipment is compliant to FCC Part 15 and RSS 210 requirement

2.5.2 Summary of test set up

The EUT is positioned in a non-conductive test fixture and can be rotated and tilted in all angles and in all planes.

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 110 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are conform with specifications ANSI C63.2-1996 clause 15 and ANSI C63.4-2003 clause 4.1.5. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted by EUT. The measurement distances between EUT and receiving antennas are indicated in the test set-ups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received.

The wanted and unwanted emissions are received by spectrum analysers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63-4-2003 clause 4.2.

EUT : ERMO-482X-PRO
 Ambient temperature : 23 °C
 Relative humidity : 55 %

TRANSMITTER PARAMETERS

FCC PART 15 SECTION 15.209
 RSS 210 SECTION 6.3

SPURIOUS FREQUENCIES

TRANSMITTER SPURIOUS FIELD STRENGTH			
Frequency range Frequency [GHz]	Spurious frequencies [GHz]	E [μV/m] @ 3m	See plot no.:
0.009 – 30.000 MHz (h + v)	Noise	< limit	3 / 4
0.030 – 4.000 (horizontal.)	Noise	< limit	5
0.030 – 4.000 (vertical)	Noise	< limit	6
3.900 – 5.400 (h + v)	Noise	9.4	7
5.400 – 8.200 (h + v)	Noise	5.4	8
8.200 – 12.400 (h + v)	Noise + TX	27.8	9
12.400 – 18.000 (h + v)	Noise	6.8	10
18.000 – 27.000 (h + v)	Noise	25.7	11
27.000 – 40.000 (h + v)	Noise	112.2	12
40.000 - 60.000 (h + v)	Noise	394.0	13
50.000 – 75.000 (h + v)	Noise	52.4	14
75.000 – 110.000 (h + v)	Noise	70.3	15

LIMITS:

FCC PART 15 SECTION 15.209
 RSS 210 SECTION 6.3

Frequency range (MHz)	Measurement distance [m]	Field strength E [μV/m]	Field strength e [dBμV/m] @ 3 m
0.009 – 0.490	300	2400/F(kHz)	88.5 ... 53.8
0.490 – 1.705	30	24000/F(kHz)	53.8 ... 43.0
1.705 – 30.0	30	30	49.5
30.0 – 88.0	3	100	40.0
88.0 – 216.0	3	150	43.5
216.0 – 960.0	3	200	46.0
> 960.0	3	500	54.0
Harmonics	3	2,500	67.9 = 7.9 dB(mV/m)

REFERENCE OF TEST EQUIPMENT USED : see test set-up on pages 8, 9 and 10

Verdict : Spurious limits are kept

EUT : ERMO-482X-PRO
 Ambient temperature : 23 °C
 Relative humidity : 55 %

RECEIVER PARAMETERS

FCC PART 15 SECTION 15.109

RSS 210 SECTION 7.5

SPURIOUS FREQUENCIES

TRANSMITTER SPURIOUS FIELD STRENGTH			
Frequency range Frequency [GHz]	Spurious frequencies [GHz]	E [μV/m] @ 3m	See plot no.:
0.009 – 30.000 MHz (h + v)	Noise	< limit	16 / 17
0.030 – 4.000 (horizontal.)	Noise	< limit	18
0.030 – 4.000 (vertical)	Noise	< limit	19
3.900 – 5.400 (h + v)	Noise	3.2	20
5.400 – 8.200 (h + v)	Noise	6.7	21
8.200 – 12.400 (h + v)	Noise + TX	11.1	22
12.400 – 18.000 (h + v)	Noise	14.6	23
18.000 – 27.000 (h + v)	Noise	24.6	24
27.000 – 40.000 (h + v)	Noise	154.4	25
40.000 - 60.000 (h + v)	Noise	442.0	26
50.000 – 75.000 (h + v)	Noise	77.0	27
75.000 – 110.000 (h + v)	Noise	72.0	28

LIMITS:

FCC PART 15 SECTION 15.109

RSS 210 SECTION 7.5

Frequency range (MHz)	Measurement distance [m]	Field strength E [μV/m]	Field strength e [dBμV/m] @ 3 m
30.0 – 88.0	3	100	40.0
88.0 – 216.0	3	150	43.5
216.0 – 960.0	3	200	46.0
> 960.0	3	500	54.0
Harmonics	3	2,500	67.9 = 7.9 dB(mV/m)

REFERENCE OF TEST EQUIPMENT USED : see test set-up on pages 8, 9 and 10

Verdict : Spurious limits are kept

	TRANSMITTER SPURIOUS EMISSION			
	AC CONDUCTED			
Frequency range Frequency [GHz]	Spurious frequencies [GHz]	S A u [dBmV]	E [µV/m]	See plot no.:
0.150 – 30.000 MHz	Noise	< limit	< limit	29

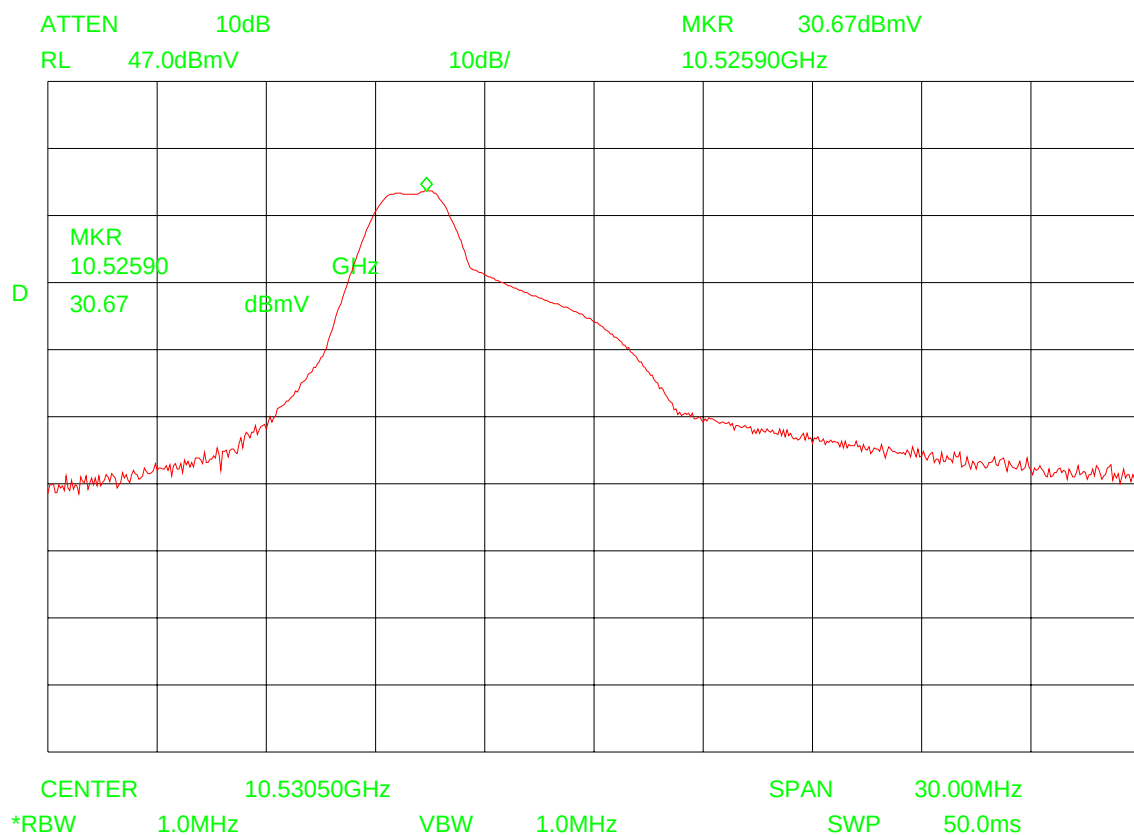
FCC:	CFR Part 15.207
IC:	RSS 210, Issue 5, Section 6.6 , 7.6

Frequency of Emission (MHz)	Conducted Limit (dBµV)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56 *	56 to 46 *
0.5 – 5	56	46
5 - 30	60	50

Verdict : Spurious limits are kept

2 Plots

Plot 01



Measurement distance d = 3.0 m

Calculation : Field strength = Analyser reading + Antenna factor + cable loss

$$e = 30.7 \text{ dB(mV)} + 33.7 \text{ dB(1/m)} + 2.0 \text{ dB}$$

$$e = 66.4 \text{ dB(mV/m)}$$

$$E = 2089.29 \text{ mV/m}$$



Measurement distance $d = 3.0 \text{ m}$

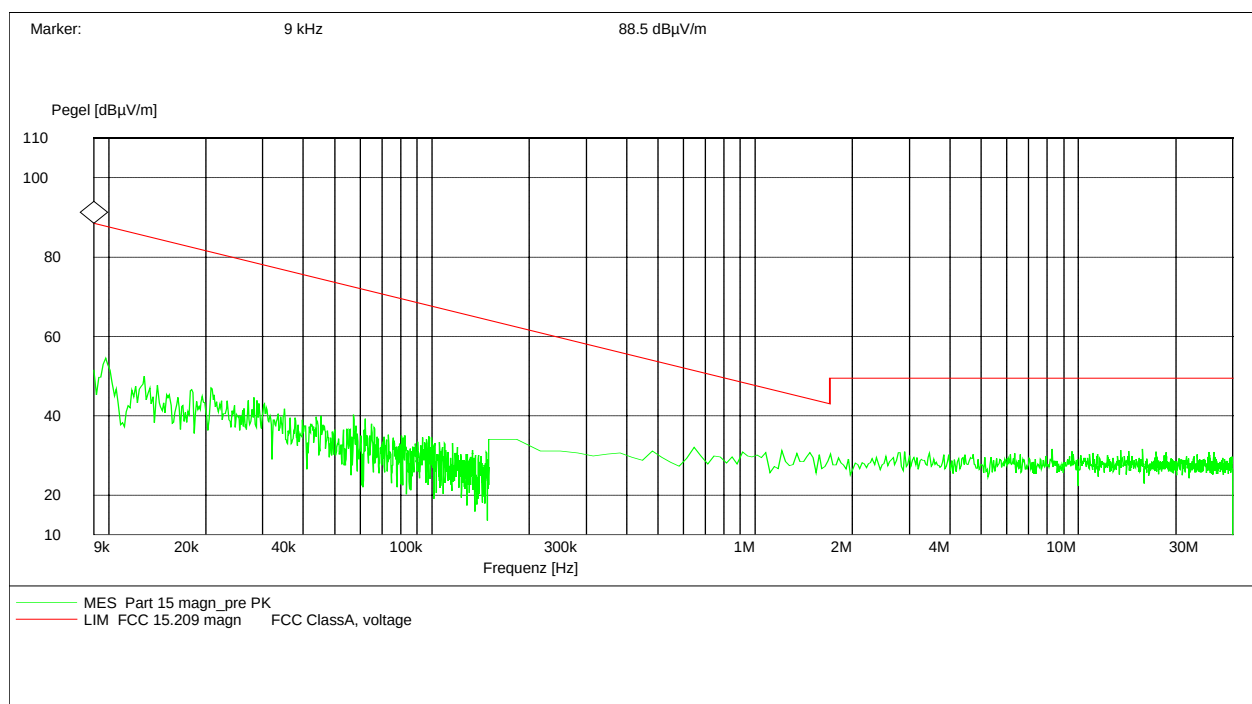
Plot 03

Part 15 Magnetics

EUT: ERMO-482X-PRO
 Manufacturer: CIAS Elettronica SRL
 Test Site: Cetecom, Room 6
 Operator: Mr. Weiden
 Comment: 115.0 V AC
 Measurement: vertical

SCAN TABLE: "FCC 15 magn"

Short Description: Magnetic 0.009 - 30 MHz
 Unit: dB μ V/m



Settings:

Peak	
9 kHz – 150 kHz	RBW / VBW 100 Hz
150 kHz – 30 MHz	RBW / VBW 9.0 kHz
QP	
9 kHz – 150 kHz	RBW / VBW 200 Hz
150 kHz – 30 MHz	RBW / VBW 9.0 kHz

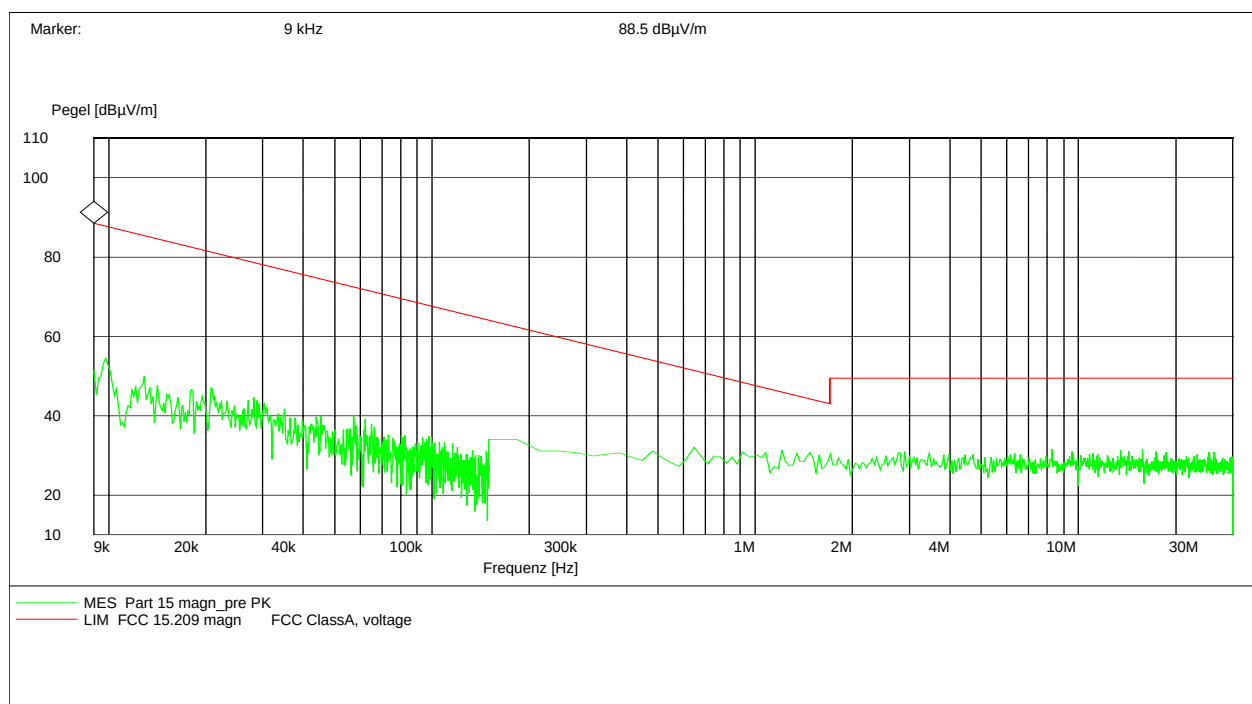
Plot 04

Part 15 Magnetics

EUT: ERMO-482X-PRO
 Manufacturer: CIAS Elettronica SRL
 Test Site: Cetecom, Room 6
 Operator: Mr. Weiden
 Comment: 115.0 V AC
 Measurement: horizontal

SCAN TABLE: "FCC 15 magn"

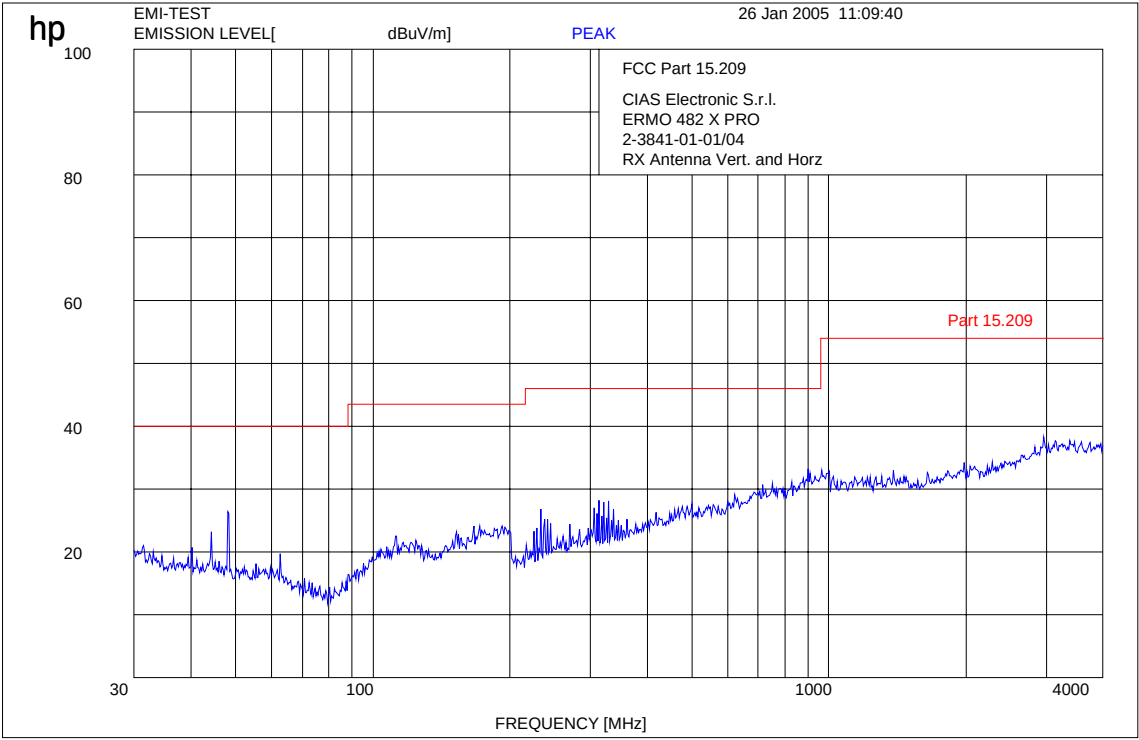
Short Description: Magnetic 0.009 - 30 MHz
 Unit: dB μ V/m



Settings:

Peak	
9 kHz – 150 kHz	RBW / VBW 100 Hz
150 kHz – 30 MHz	RBW / VBW 9.0 kHz
QP	
9 kHz – 150 kHz	RBW / VBW 200 Hz
150 kHz – 30 MHz	RBW / VBW 9.0 kHz

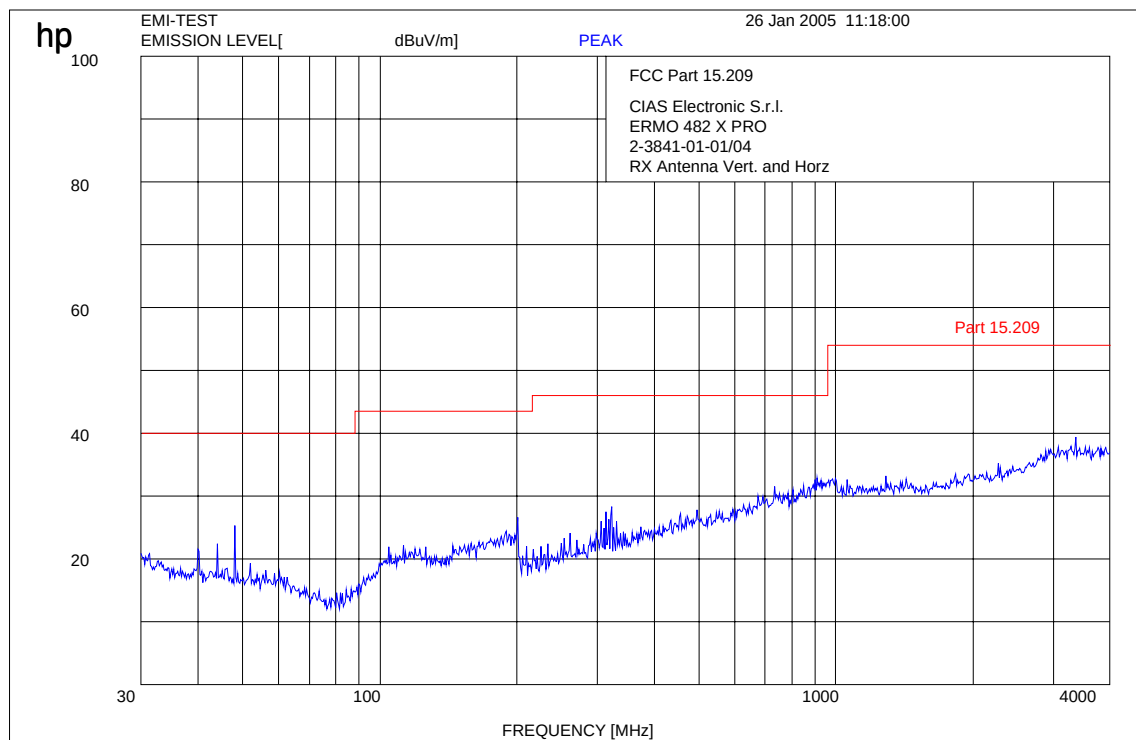
Plot 05



Settings:

Peak	
30 MHz – 1.0 GHz	RBW / VBW 100 kHz
1.0 GHz – 4.0 GHz	RBW / VBW 1.0 MHz
QP	
30 MHz – 1.0 GHz	RBW / VBW 120 kHz
1.0 GHz – 4.0 GHz	RBW / VBW 1.0 MHz

Plot 06



Settings:

Peak

30 MHz – 1.0 GHz

1.0 GHz – 4.0 GHz

QP

30 MHz – 1.0 GHz

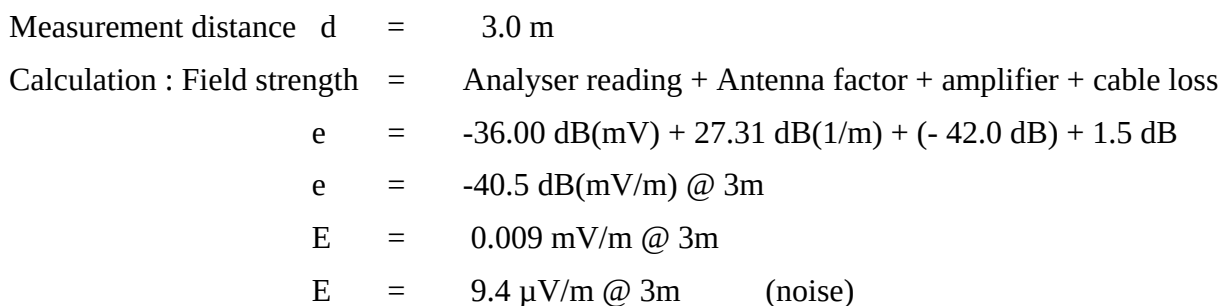
1.0 GHz – 4.0 GHz

RBW / VBW 100 kHz

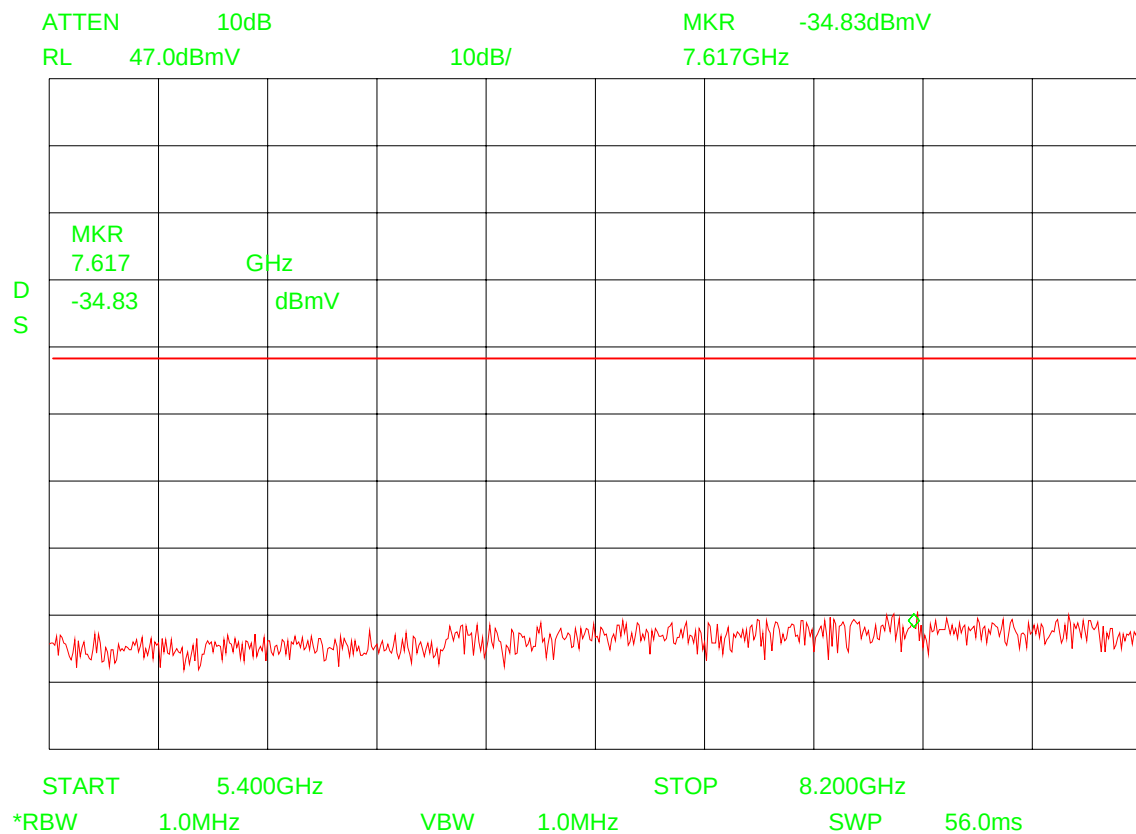
RBW / VBW 1.0 MHz

RBW / VBW 120 kHz

RBW / VBW 1.0 MHz



Plot 08



Measurement distance d = 3.0 m

Calculation : Field strength = Analyser reading + Antenna factor + amplifier + cable loss

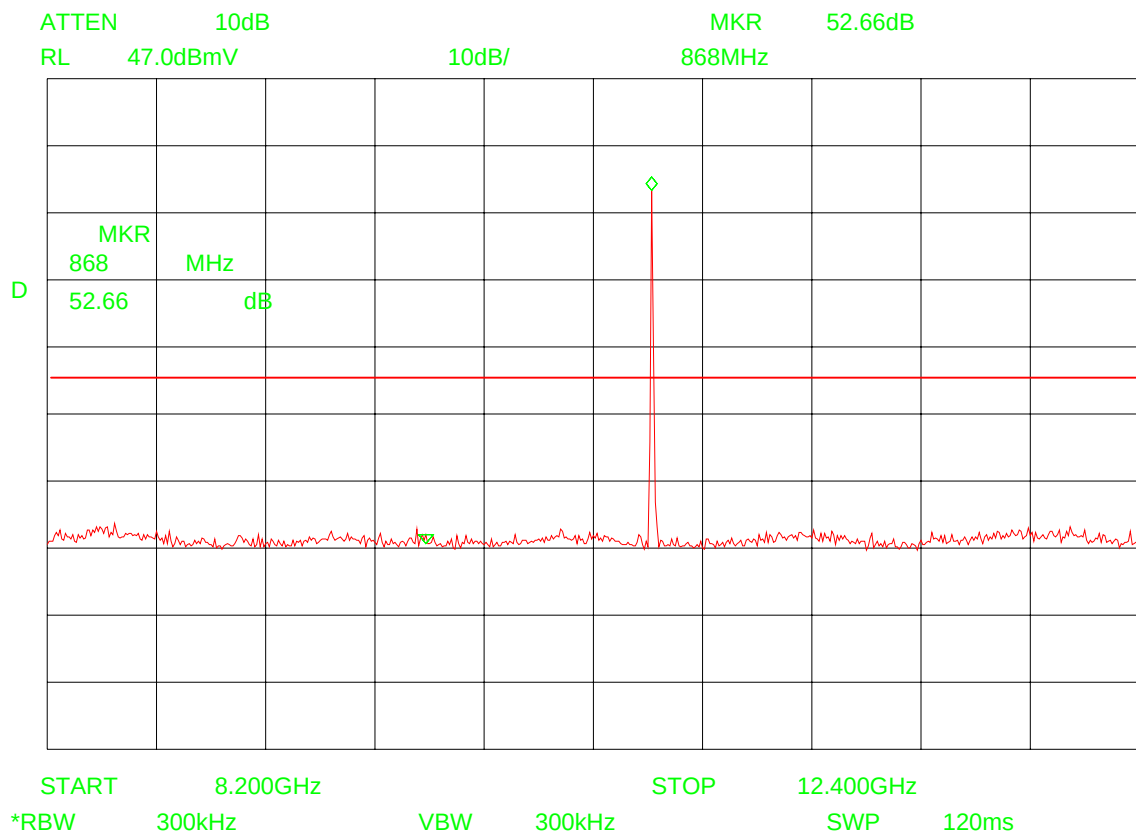
e = -34.8 dB(mV) + 30.06 dB(1/m) + (- 42.0 dB) + 1.5 dB

e = -45.24 dB(mV/m) @ 3m

E = 0.005 mV/m @ 3m

E = 5.4 μ V/m @ 3m (noise)

Plot 09



Measurement distance d = 3.0 m

Calculation : Field strength = Analyser reading + Antenna factor + amplifier + cable loss

e = -24.8 dB(mV) + 33.7 dB(1/m) + (-42.0 dB) + 2.0 dB

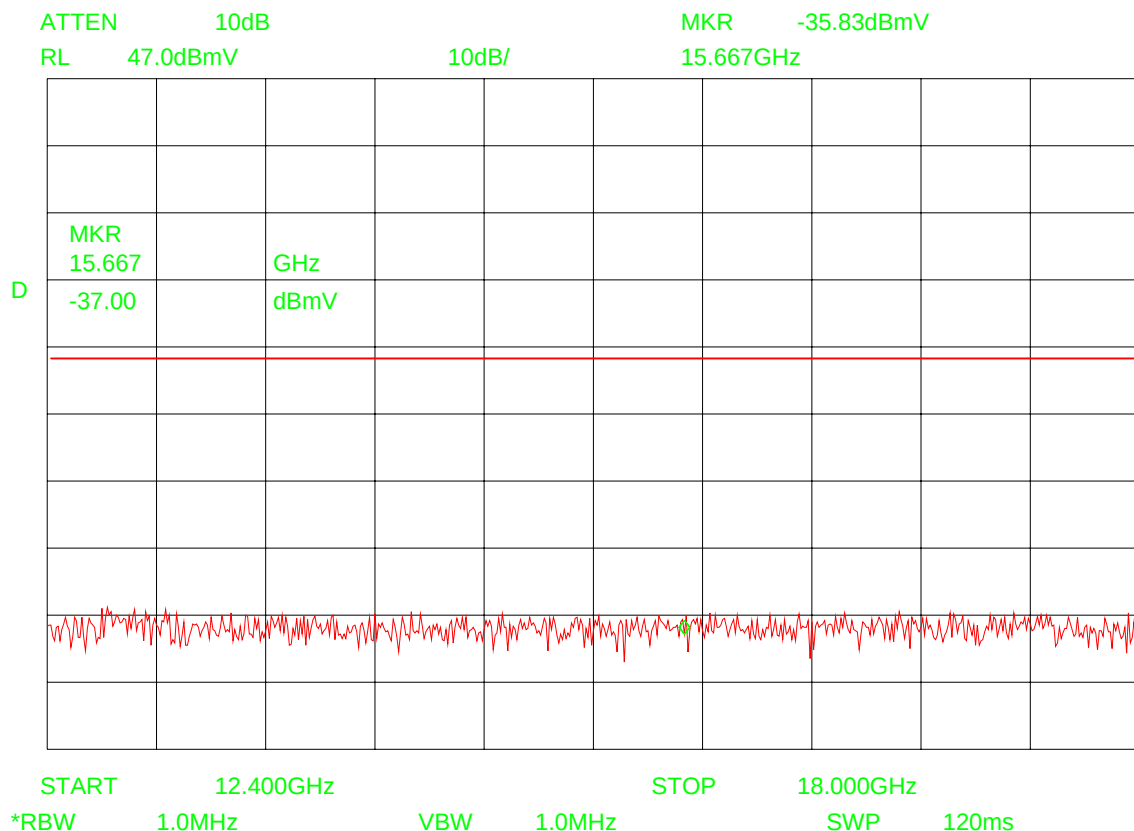
e = -31.1 dB(mV/m) @ 3m

E = 0.27 mV/m @ 3m

E = 27.8 μ V/m @ 3m (noise)

TX = 10.525 GHz is measurement with notch filter narda model 904N.

Plot 10



Measurement distance d = 3.0 m

Calculation : Field strength = Analyser reading + Antenna factor + amplifier + cable loss

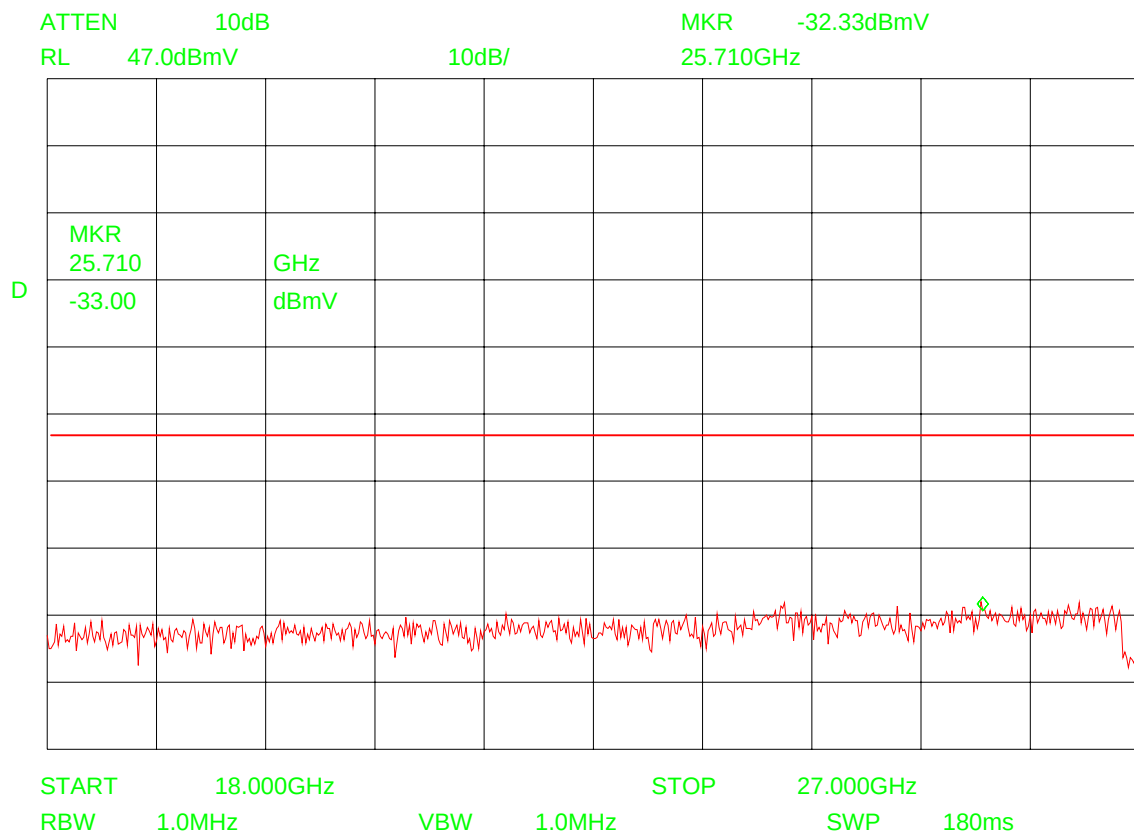
e = -37.0 dB(mV) + 33.7 dB(1/m) + (-42.0 dB) + 2.0 dB

e = -43.3 dB(mV/m) @ 3m

E = 0.06 mV/m @ 3m

E = 6.8 µV/m @ 3m (noise)

Plot 11



Measurement distance d = 3.0 m

Calculation : Field strength = Analyser reading + Antenna factor + amplifier + cable loss

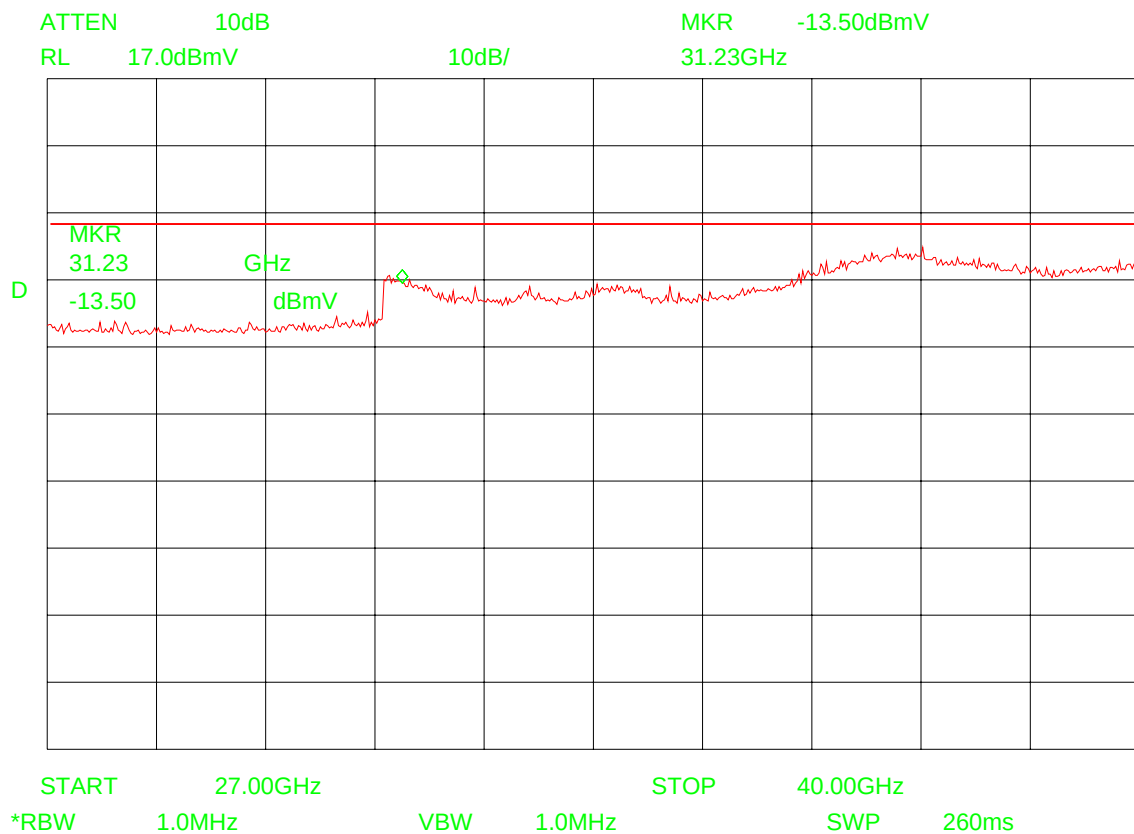
e = -33.0 dB(mV) + 40.2 dB(1/m) + (- 42.0 dB) + 3.0 dB

e = -318 dB(mV/m) @ 3m

E = 0.025 mV/m @ 3m

E = 25.7 µV/m @ 3m (noise)

Plot 12



Measurement distance $d = 0.125 \text{ m}$

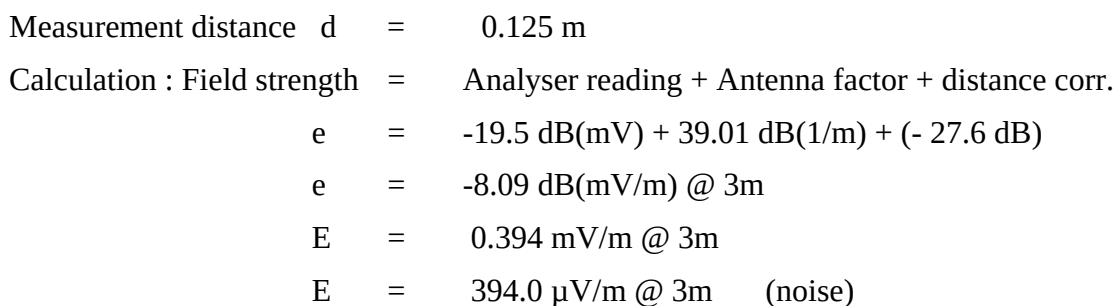
Calculation : Field strength = Analyser reading + Ant. factor + amplifier + cable + distance corr.

$e = -13.5 \text{ dB(mV)} + 44.0 \text{ dB(1/m)} + (25.5 \text{ dB}) + 3.5 \text{ dB} + (-27.6 \text{ dB})$

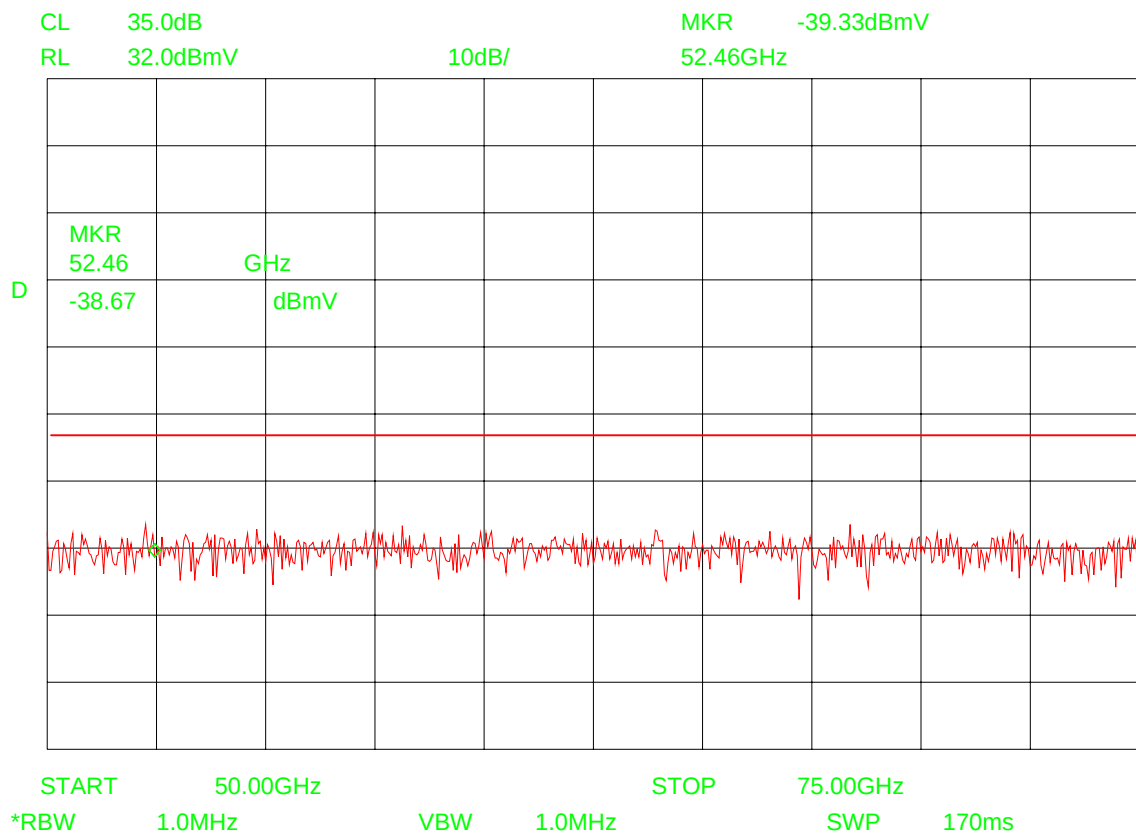
$e = -19.0 \text{ dB(mV/m)} @ 3\text{m}$

$E = 0.112 \text{ mV/m} @ 3\text{m}$

$E = 112.2 \text{ } \mu\text{V/m} @ 3\text{m} \quad (\text{noise})$



Plot 14



Measurement distance $d = 0.125 \text{ m}$

Calculation : Field strength = Analyser reading + Antenna factor + distance corr.

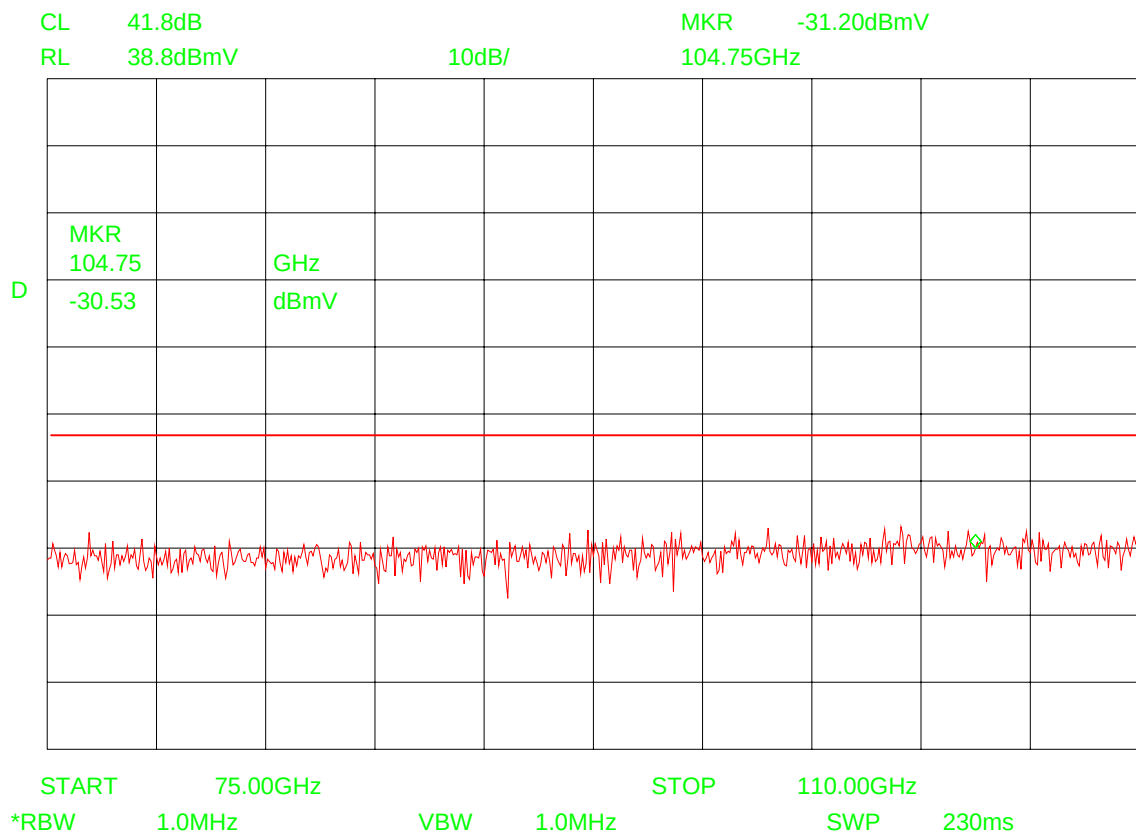
$e = -38.67 \text{ dB(mV)} + 40.67 \text{ dB(1/m)} + (-27.6 \text{ dB})$

$e = -25.6 \text{ dB(mV/m)} @ 3\text{m}$

$E = 0.052 \text{ mV/m} @ 3\text{m}$

$E = 52.4 \text{ } \mu\text{V/m} @ 3\text{m} \quad (\text{noise})$

Plot 15



Measurement distance d = 0.125 m

Calculation : Field strength = Analyser reading + Antenna factor + distance corr.

e = -30.5 dB(mV) + 35.05 dB(1/m) + (- 27.6 dB)

e = -23.05 dB(mV/m) @ 3m

E = 0.070 mV/m @ 3m

E = 70.3 μ V/m @ 3m (noise)

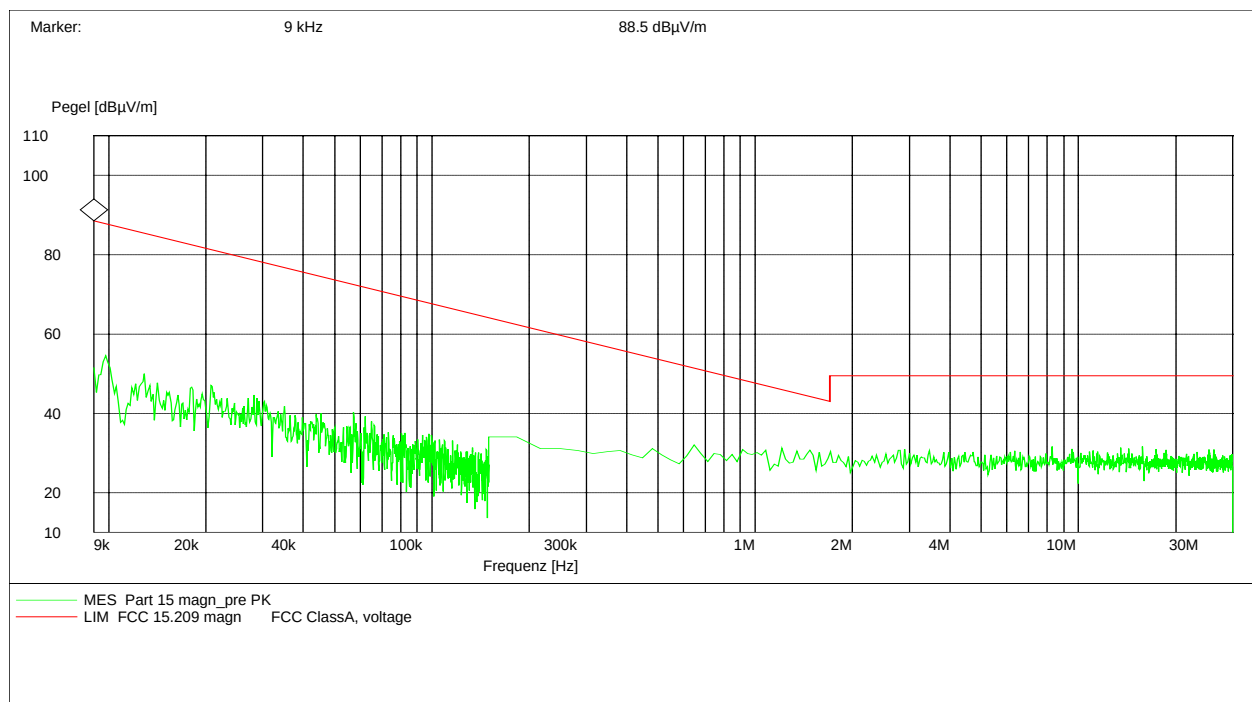
Plot 16

Part 15 Magnetics

EUT: ERMO-482X-PRO
 Manufacturer: CIAS Elettronica SRL
 Test Site: Cetecom, Room 6
 Operator: Mr. Weiden
 Test Specification: Horizontal
 Comment: 115.0 V AC

SCAN TABLE: "FCC 15 magn"

Short Description: Magnetic 0.009 - 30 MHz
 Unit: dB μ V/m



Settings:

Peak	
9 kHz – 150 kHz	RBW / VBW 100 Hz
150 kHz – 30 MHz	RBW / VBW 9.0 kHz
QP	
9 kHz – 150 kHz	RBW / VBW 200 Hz
150 kHz – 30 MHz	RBW / VBW 9.0 kHz

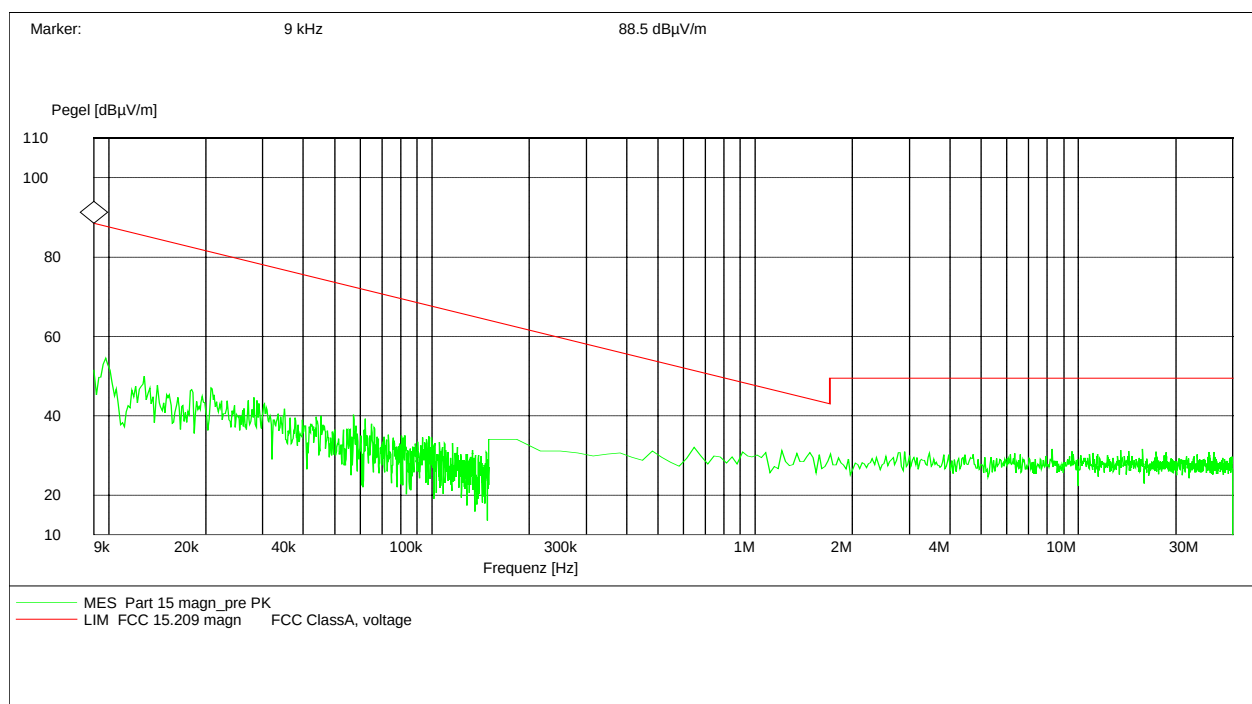
Plot 17

Part 15 Magnetics

EUT: ERMO-482X-PRO
 Manufacturer: CIAS Elettronica SRL
 Test Site: Cetecom, Room 6
 Operator: Mr. Weiden
 Test Specification: Vertikal
 Comment: 115.0 V AC

SCAN TABLE: "FCC 15 magn"

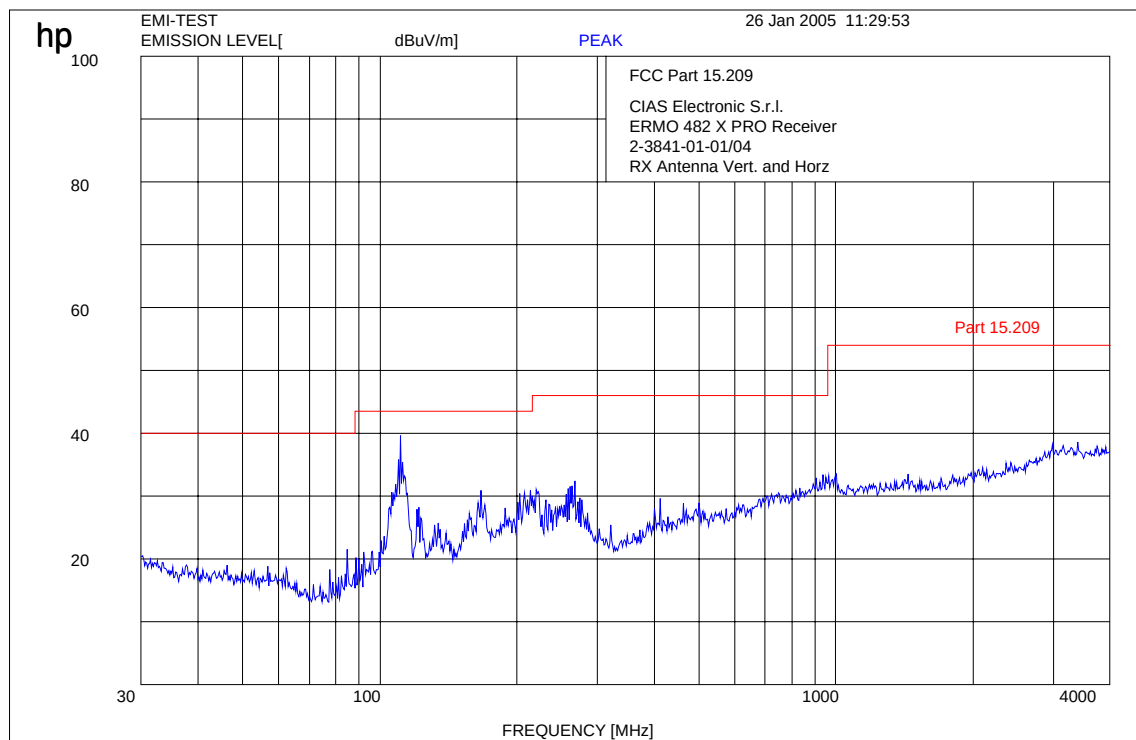
Short Description: Magnetic 0.009 - 30 MHz
 Unit: dB μ V/m



Settings:

Peak	
9 kHz – 150 kHz	RBW / VBW 100 Hz
150 kHz – 30 MHz	RBW / VBW 9.0 kHz
QP	
9 kHz – 150 kHz	RBW / VBW 200 Hz
150 kHz – 30 MHz	RBW / VBW 9.0 kHz

Plot 18



Settings:

Peak

30 MHz – 1.0 GHz

1.0 GHz – 4.0 GHz

QP

30 MHz – 1.0 GHz

1.0 GHz – 4.0 GHz

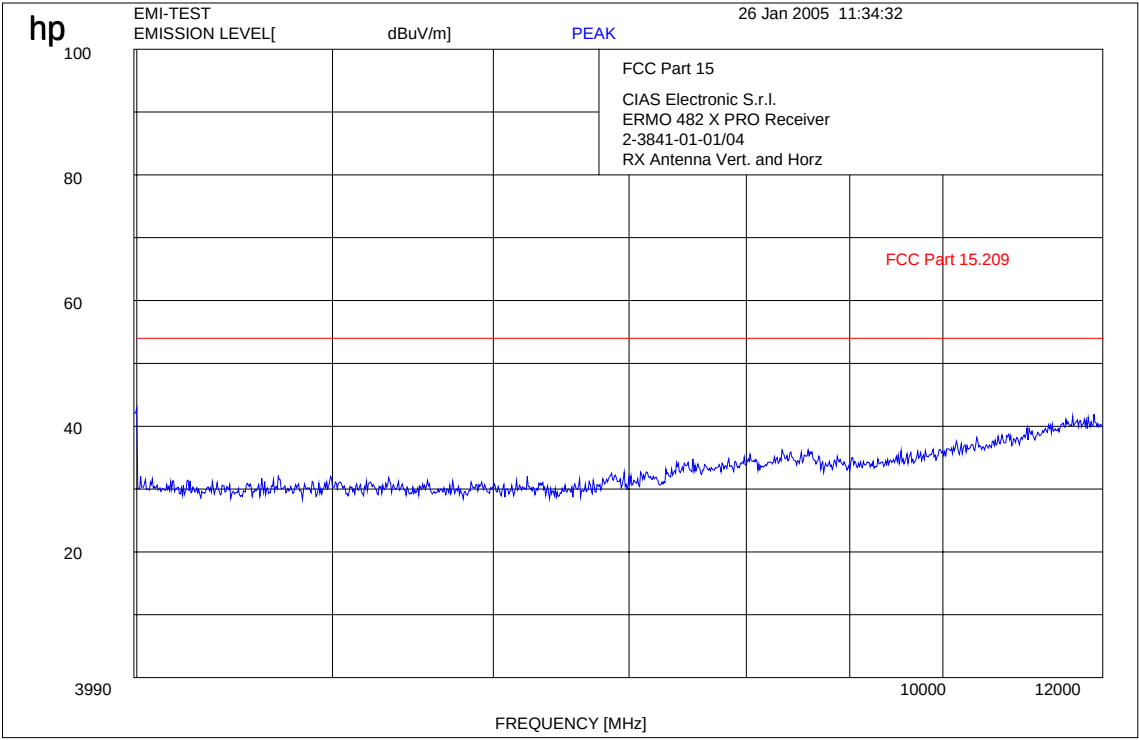
RBW / VBW 100 kHz

RBW / VBW 1.0 MHz

RBW / VBW 120 kHz

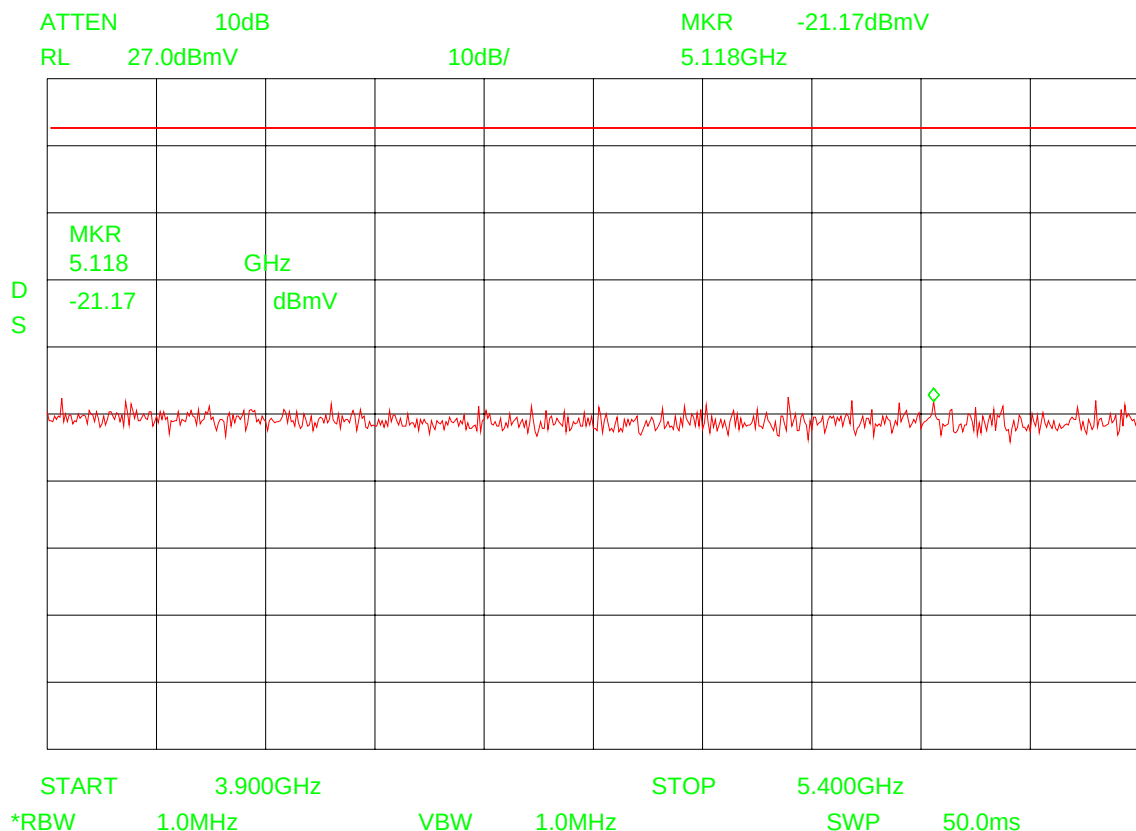
RBW / VBW 1.0 MHz

Plot 19



Settings: Peak
 4.0 GHz – 12.0 GHz RBW / VBW 1.0 MHz
 QP
 4.0 GHz – 12.0 GHz RBW / VBW 1.0 MHz

Plot 20



Measurement distance d = 0.5 m

Calculation : Field strength = Analyser reading + Ant. factor + distance corr. + cable + amplifirer

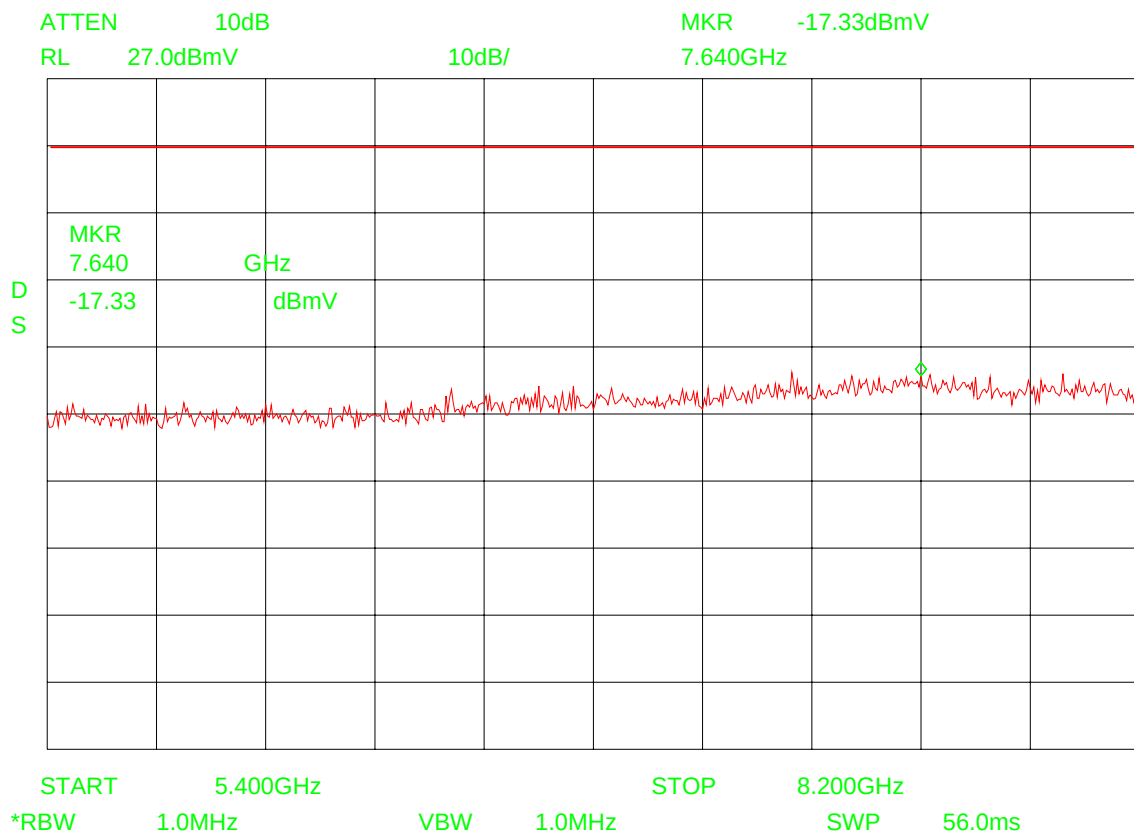
e = -21.1 dB(mV) + 27.3 dB(1/m) + (- 15.56 dB) + 1.5 dB + (-42.0 dB)

e = -49.8 dB(mV/m) @ 3m

E = 0.003 mV/m @ 3m

E = 3.2 µV/m @ 3m (noise)

Plot 21



Measurement distance $d = 0.5 \text{ m}$

Calculation : Field strength = Analyser reading + Ant. factor + distance corr. + cable + amplifirer

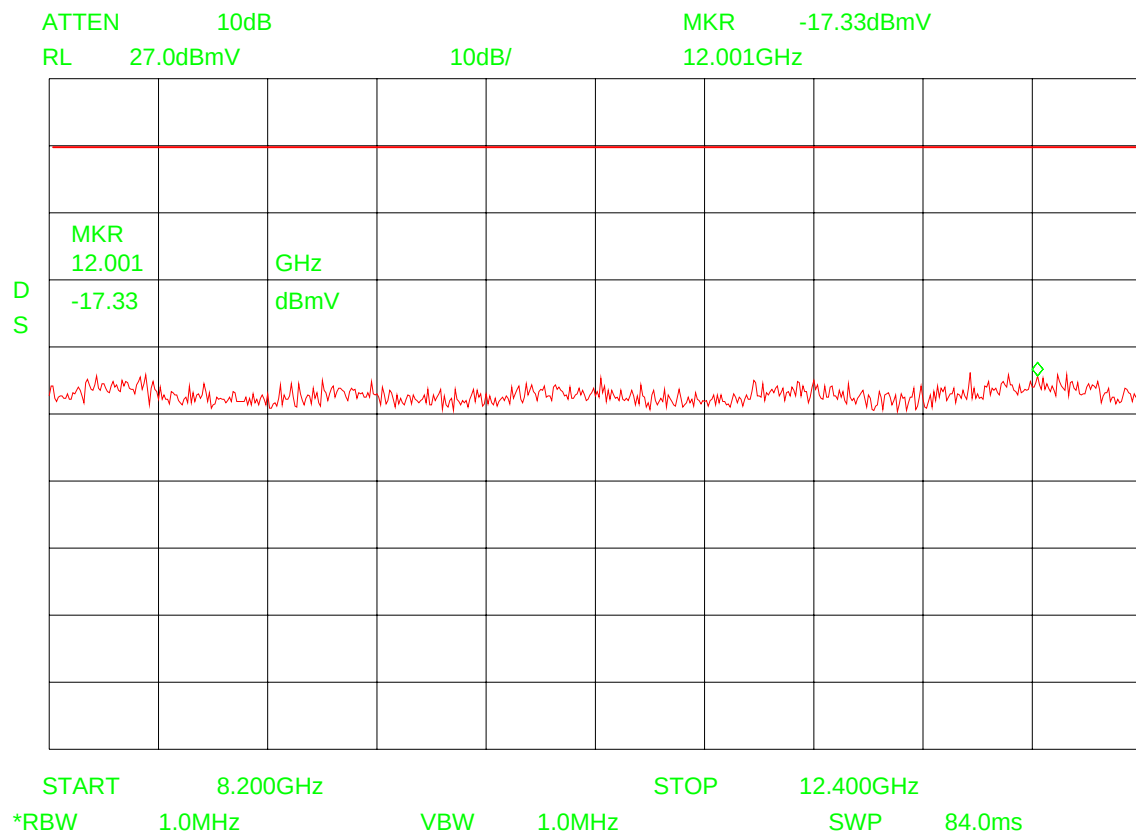
$$e = -17.3 \text{ dB(mV)} + 30.0 \text{ dB(1/m)} + (-15.56 \text{ dB}) + 1.5 \text{ dB} + (-42.0 \text{ dB})$$

$$e = -43.36 \text{ dB(mV/m) @ 3m}$$

$$E = 0.006 \text{ mV/m @ 3m}$$

$$E = 6.79 \text{ } \mu\text{V/m @ 3m} \quad (\text{noise})$$

Plot 22



Measurement distance d = 0.5 m

Calculation : Field strength = Analyser reading + Ant. factor + distance corr. + cable + amplifirer

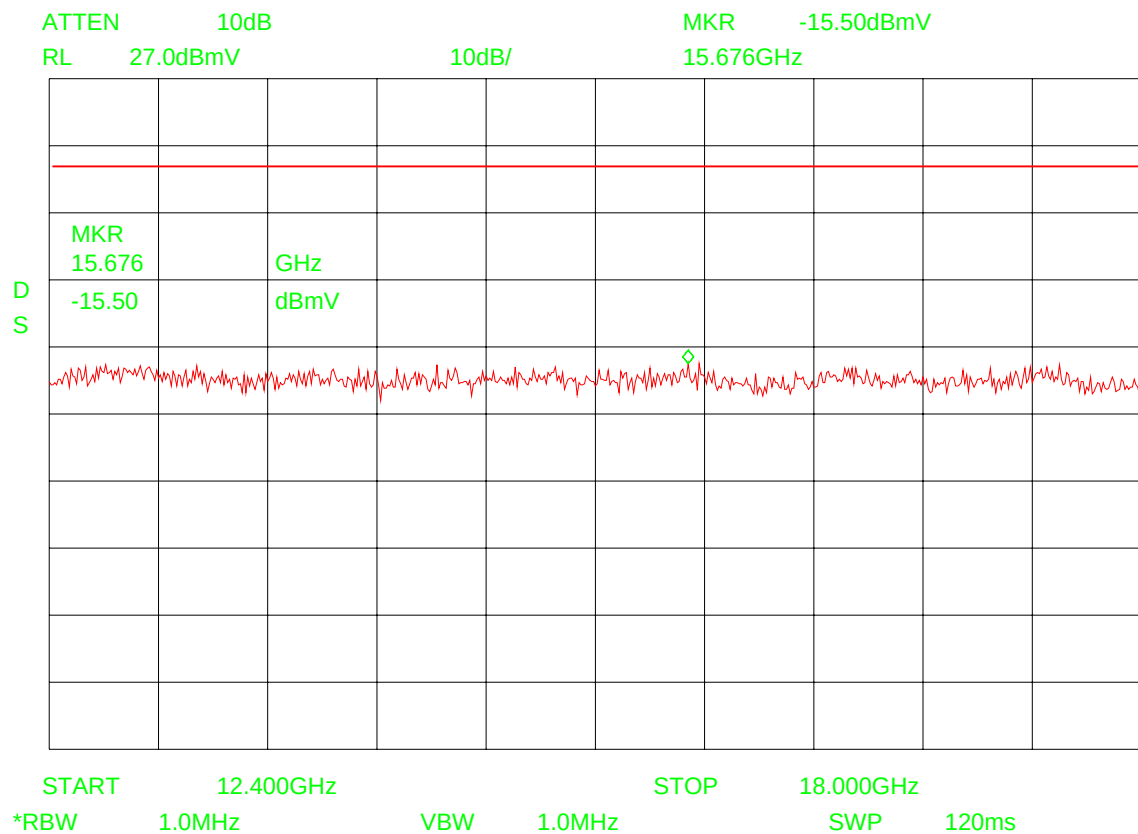
e = -17.3 dB(mV) + 33.7 dB(1/m) + (- 15.56 dB) + 2.0 dB + (-42.0 dB)

e = -39.16 dB(mV/m) @ 3m

E = 0.011mV/m @ 3m

E = 11.01 µV/m @ 3m (noise)

Plot 23



Measurement distance d = 0.5 m

Calculation : Field strength = Analyser reading + Ant. factor + distance corr. + cable + amplifirer

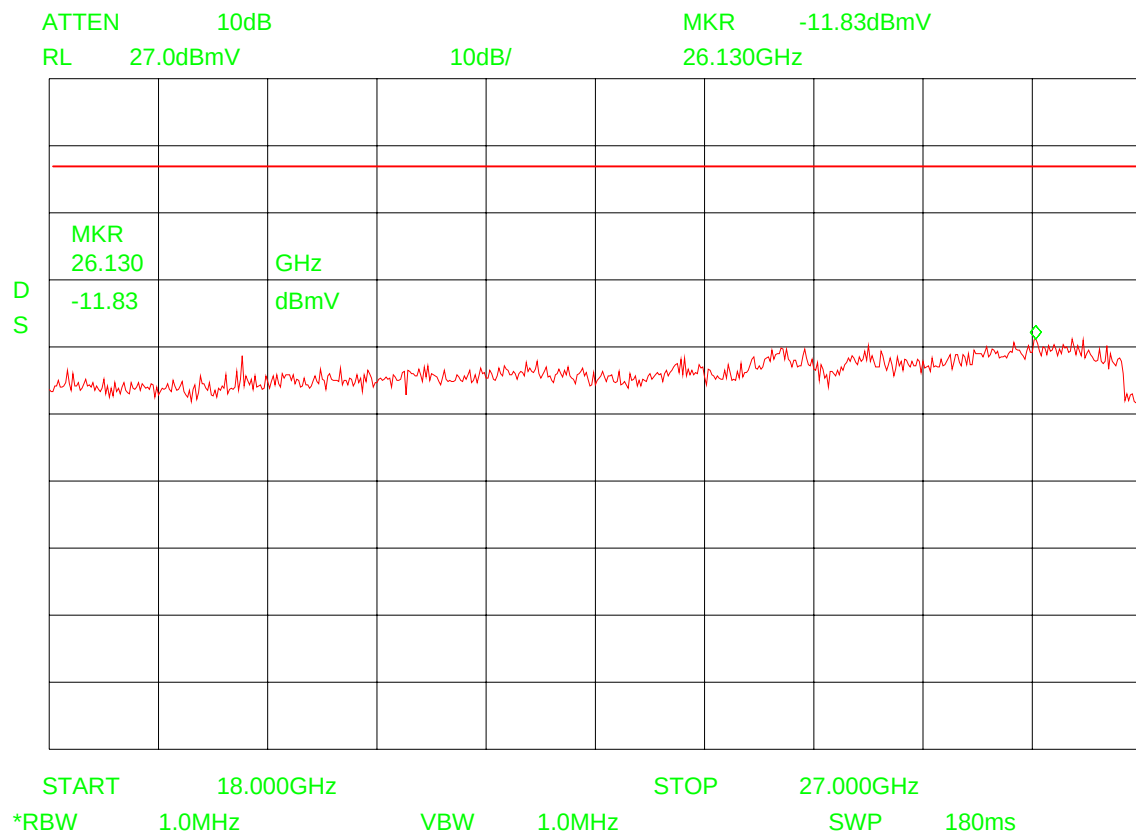
e = -15.5 dB(mV) + 33.9 dB(1/m) + (- 15.56 dB) + 2.5 dB + (-42.0 dB)

e = -36.66 dB(mV/m) @ 3m

E = 0.014 mV/m @ 3m

E = 14.6 μ V/m @ 3m (noise)

Plot 24



Measurement distance d = 0.25 m

Calculation : Field strength = Analyser reading + Ant. factor + distance corr. + cable + amplifirer

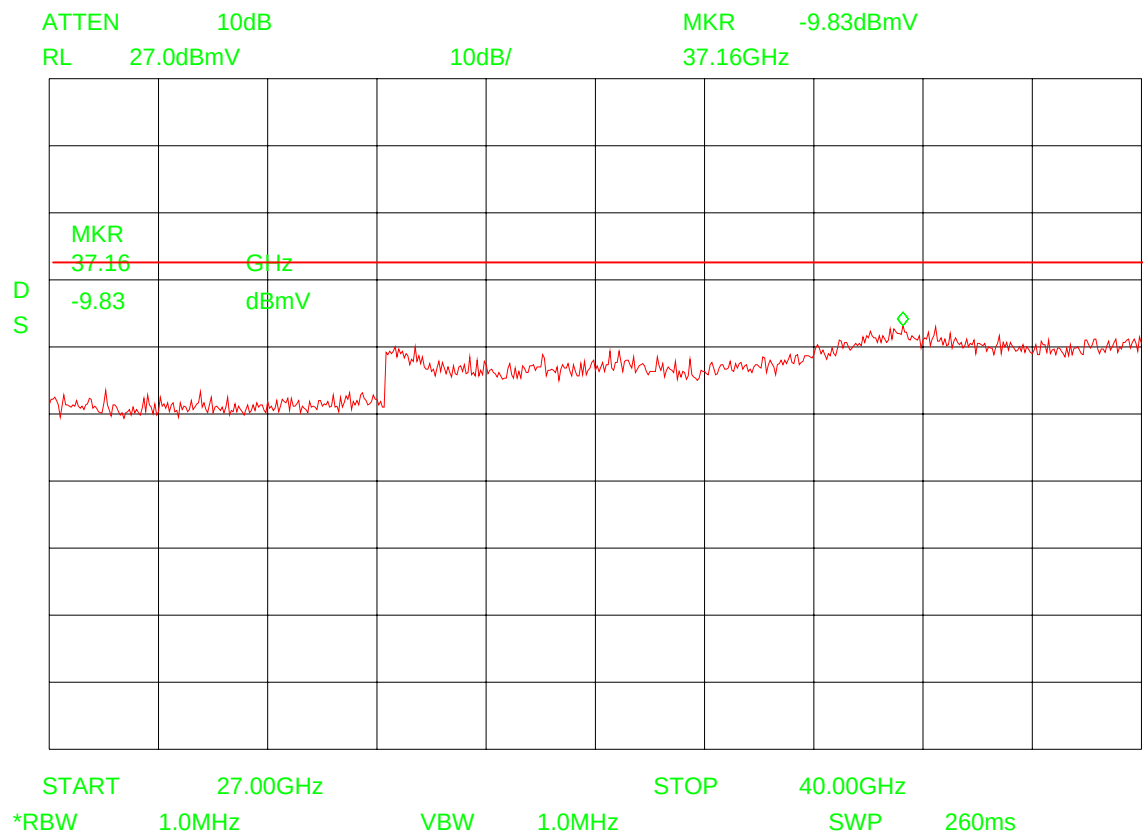
e = -11.8 dB(mV) + 40.2 dB(1/m) + (- 21.58 dB) + 3.0 dB + (-42.0 dB)

e = -32.1 dB(mV/m) @ 3m

E = 0.024 mV/m @ 3m

E = 24.6 μ V/m @ 3m (noise)

Plot 25



Measurement distance d = 0.125 m

Calculation : Field strength = Analyser reading + Ant. factor + distance corr. + cable + amplifirer

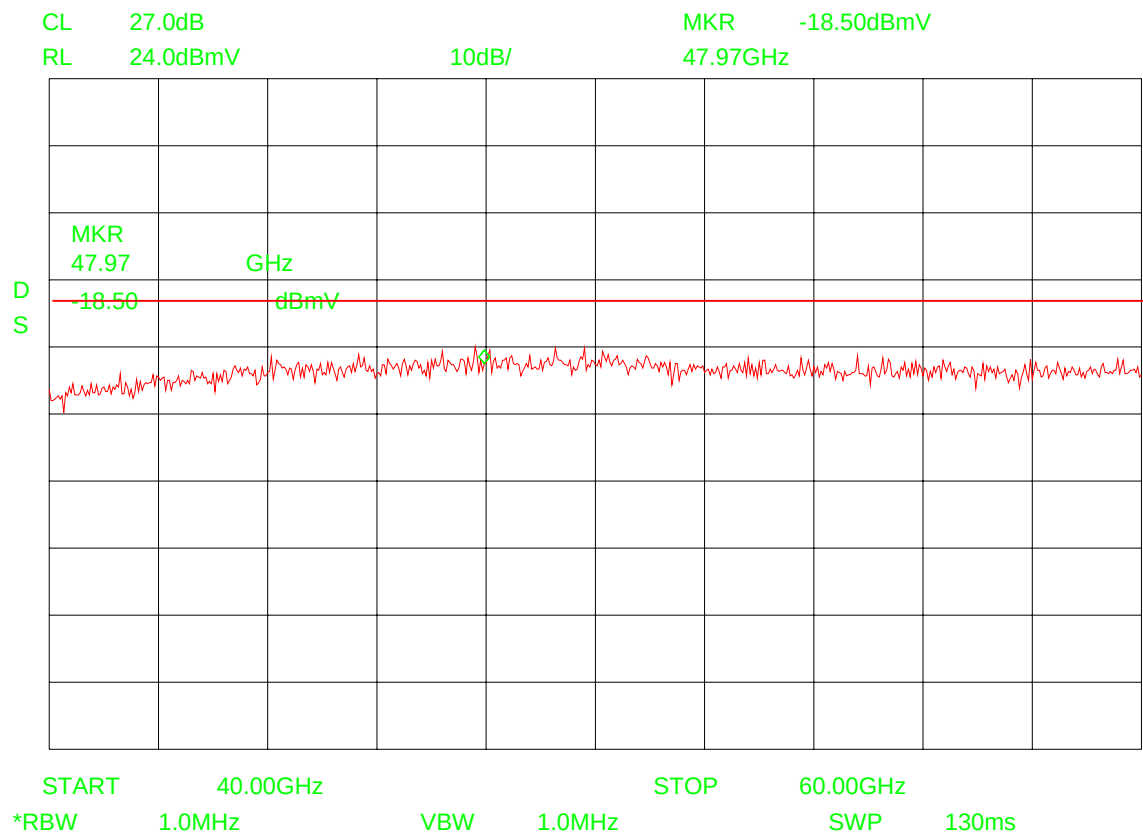
$$e = -9.8 \text{ dB(mV)} + 44.0 \text{ dB(1/m)} + (-27.6 \text{ dB}) + 3.0 \text{ dB} + (-25.5 \text{ dB})$$

$$e = -16.0 \text{ dB(mV/m) @ 3m}$$

$$E = 0.154 \text{ mV/m @ 3m}$$

$$E = 154.4 \text{ } \mu\text{V/m @ 3m} \quad (\text{noise})$$

Plot 26



Measurement distance $d = 0.125 \text{ m}$

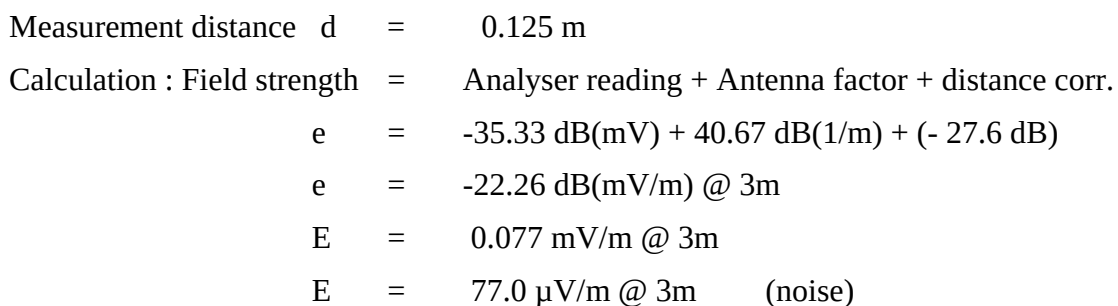
Calculation : Field strength = Analyser reading + Antenna factor + distance corr.

$$e = -18.5 \text{ dB(mV)} + 39.01 \text{ dB(1/m)} + (-27.6 \text{ dB})$$

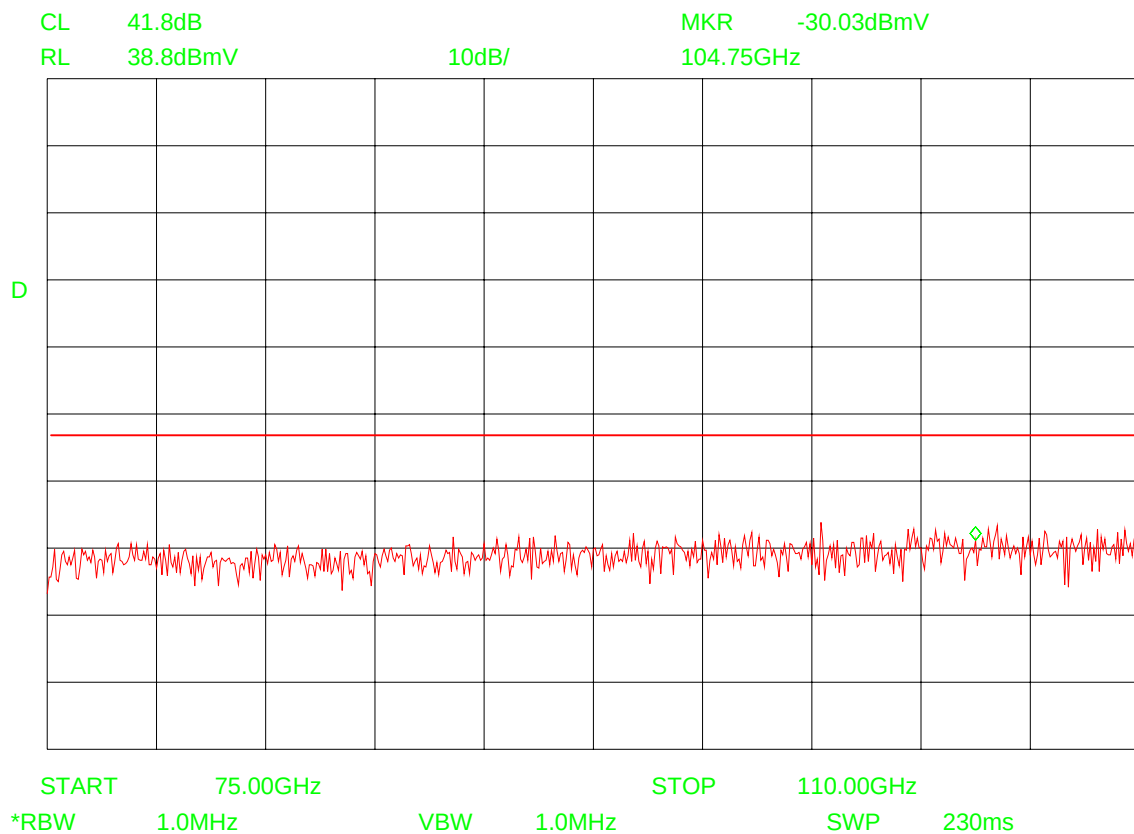
$$e = -7.09 \text{ dB(mV/m)} @ 3\text{m}$$

$$E = 0.442 \text{ mV/m} @ 3\text{m}$$

$$E = 442.0 \text{ } \mu\text{V/m} @ 3\text{m} \quad (\text{noise})$$



Plot 28



Measurement distance d = 0.125 m

Calculation : Field strength = Analyser reading + Antenna factor + distance corr.

e = -30.3 dB(mV) + 35.05 dB(1/m) + (- 27.6 dB)

e = -22.85 dB(mV/m) @ 3m

E = 0.072 mV/m @ 3m

E = 72.0 μ V/m @ 3m (noise)

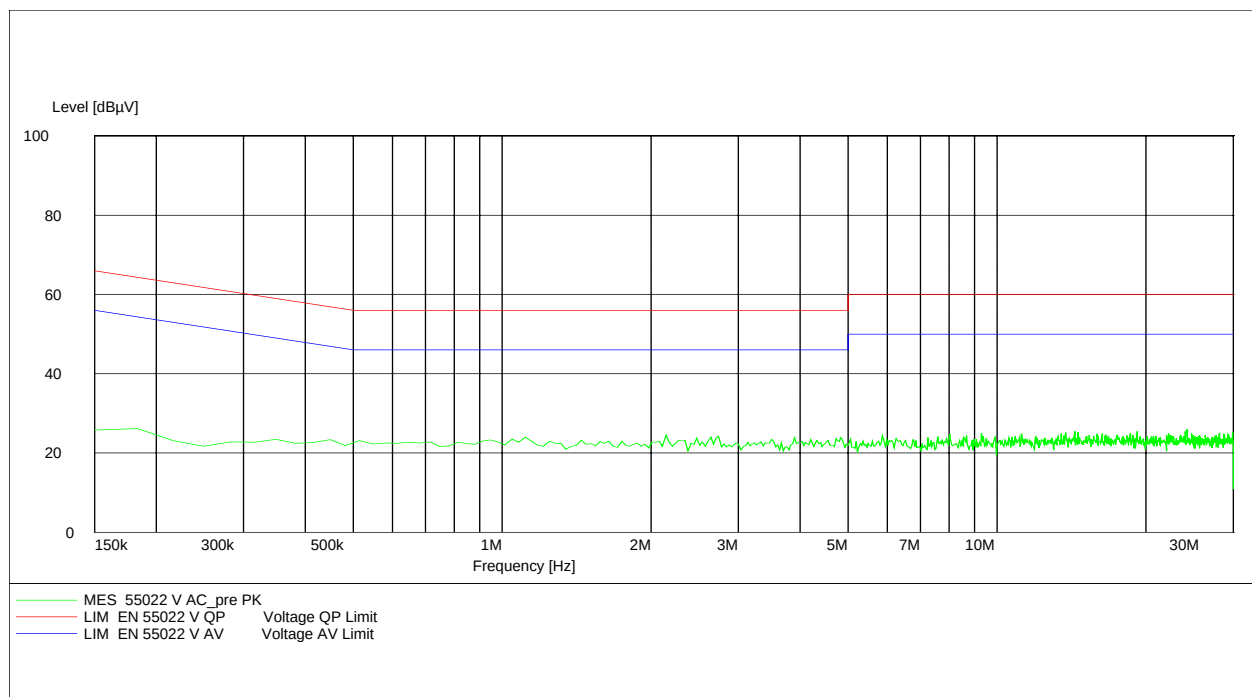
Plot 29

EN 55022 V AC Class B

EUT: ERMO-482X-PRO
 Manufacturer: CIAS Elettronica S.r.l
 Test Site: CETECOM ICT Services Room 006
 Operator: Weiden
 Power Supply: 115.0 V AC
 Start of Test: 27.01.05 / 08:38:56

SCAN TABLE: "EN 55022 V"

Short Description: Voltage Mains 1.60
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 150.0 kHz 30.0 MHz 7.5 kHz MaxPeak 100.0 ms 10 kHz ESH3-Z5 L1 1458
 Average



Settings: N₁,
 L – System,
 Grounded and
 Flooding

4 Photographs

Photo 01

Transmitter



Photo 02

Transmitter

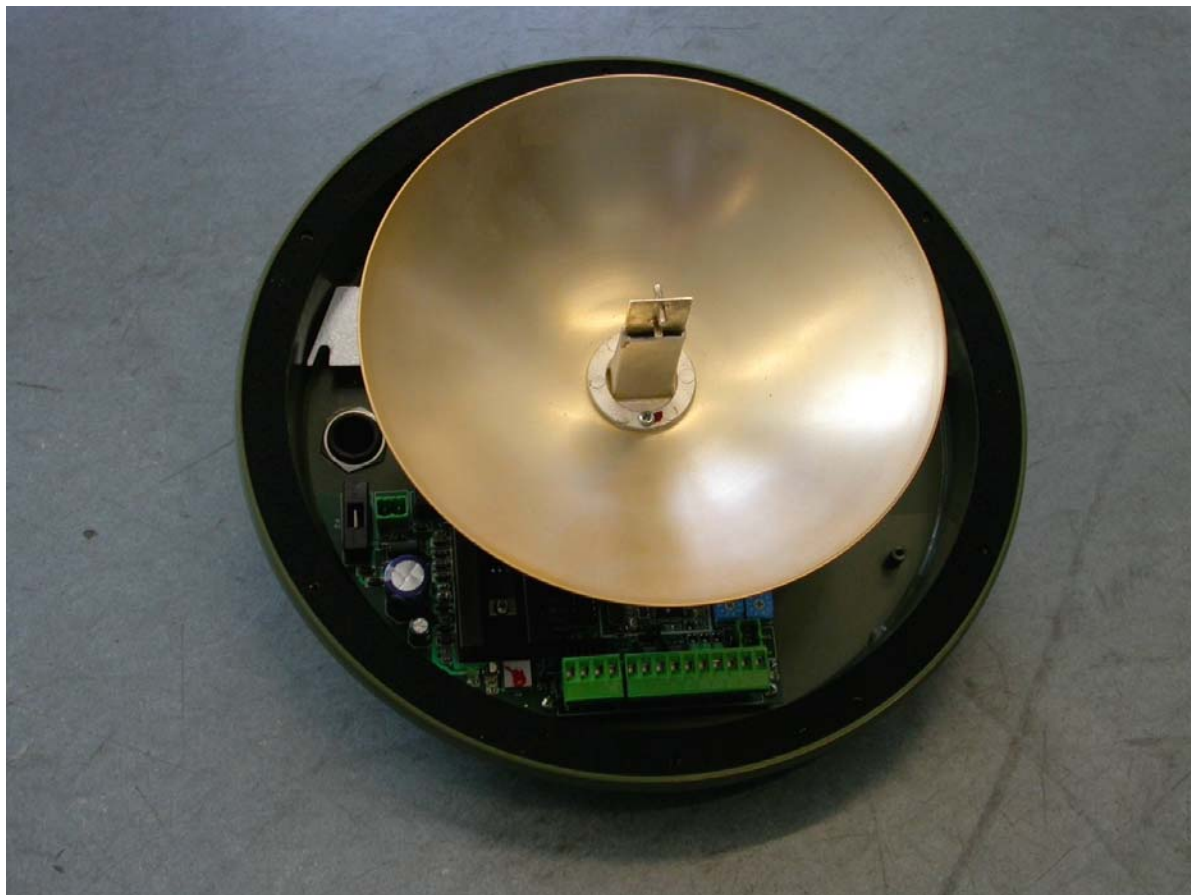


Photo 03

Transmitter

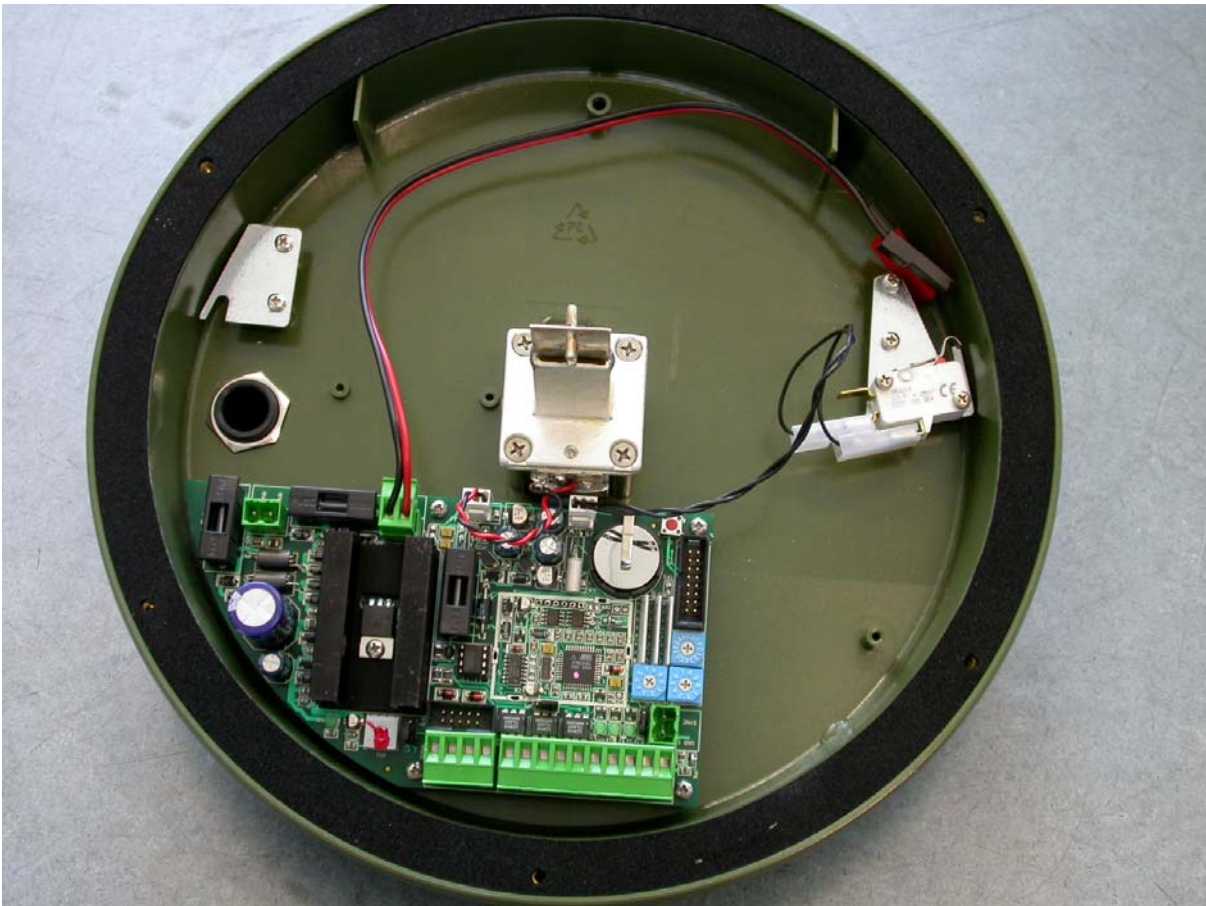


Photo 04

Transmitter

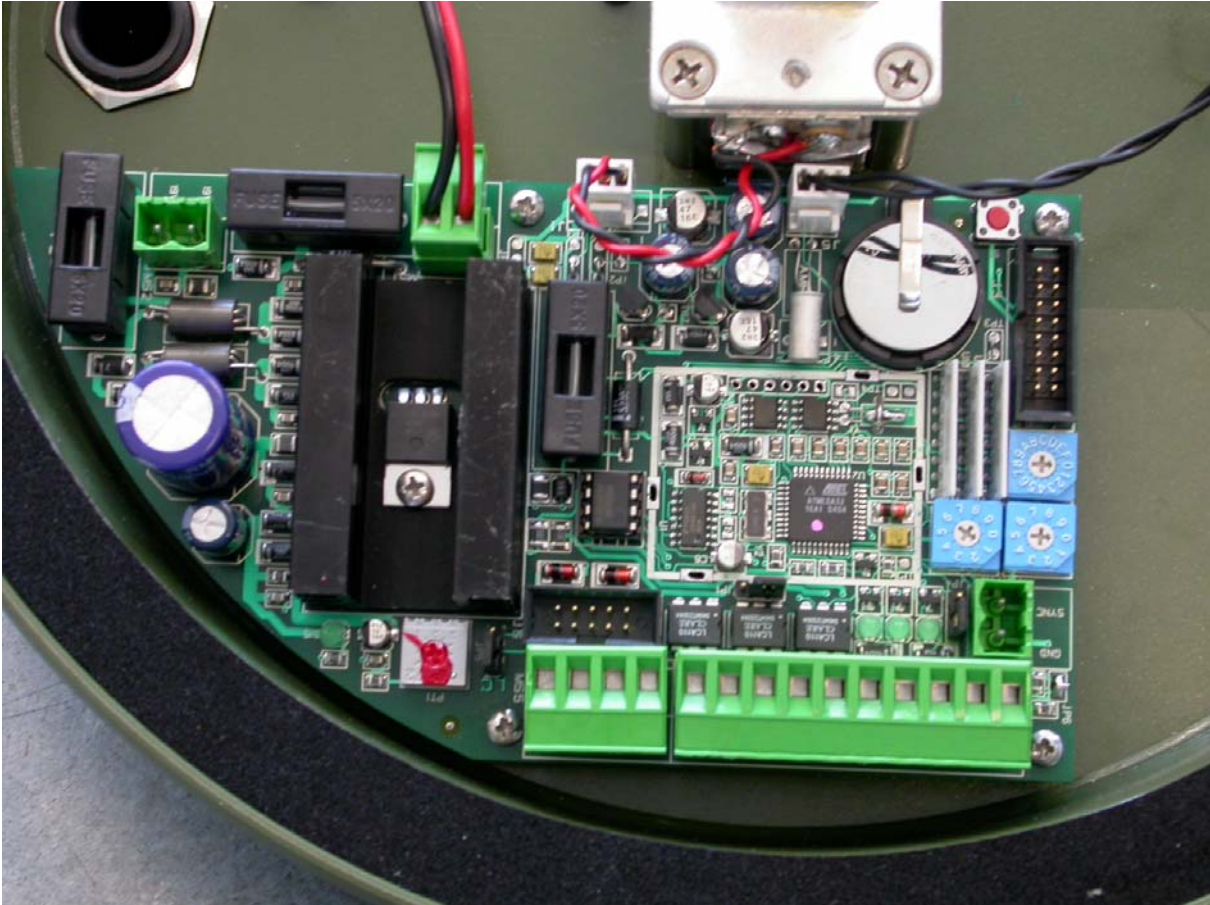


Photo 05

Transmitter

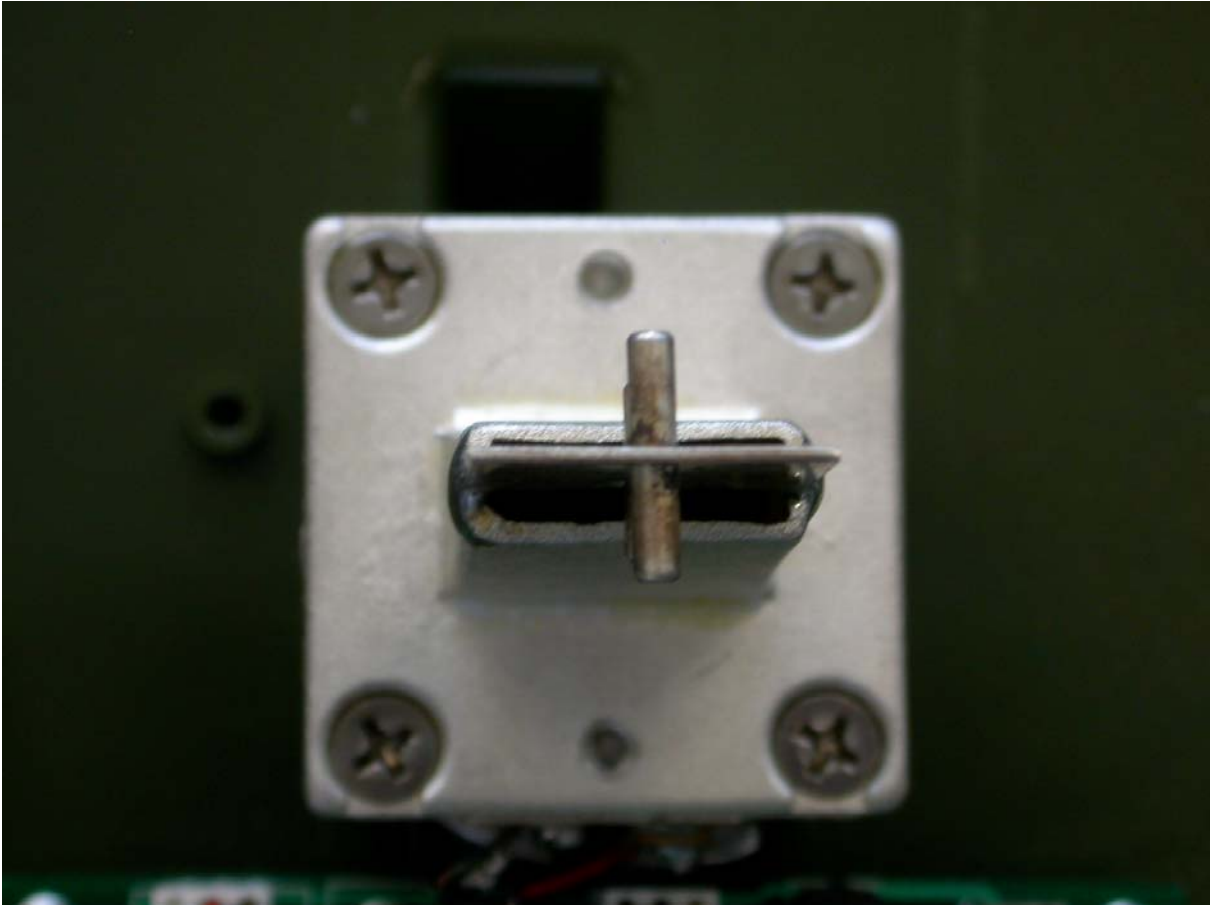


Photo 06

Transmitter

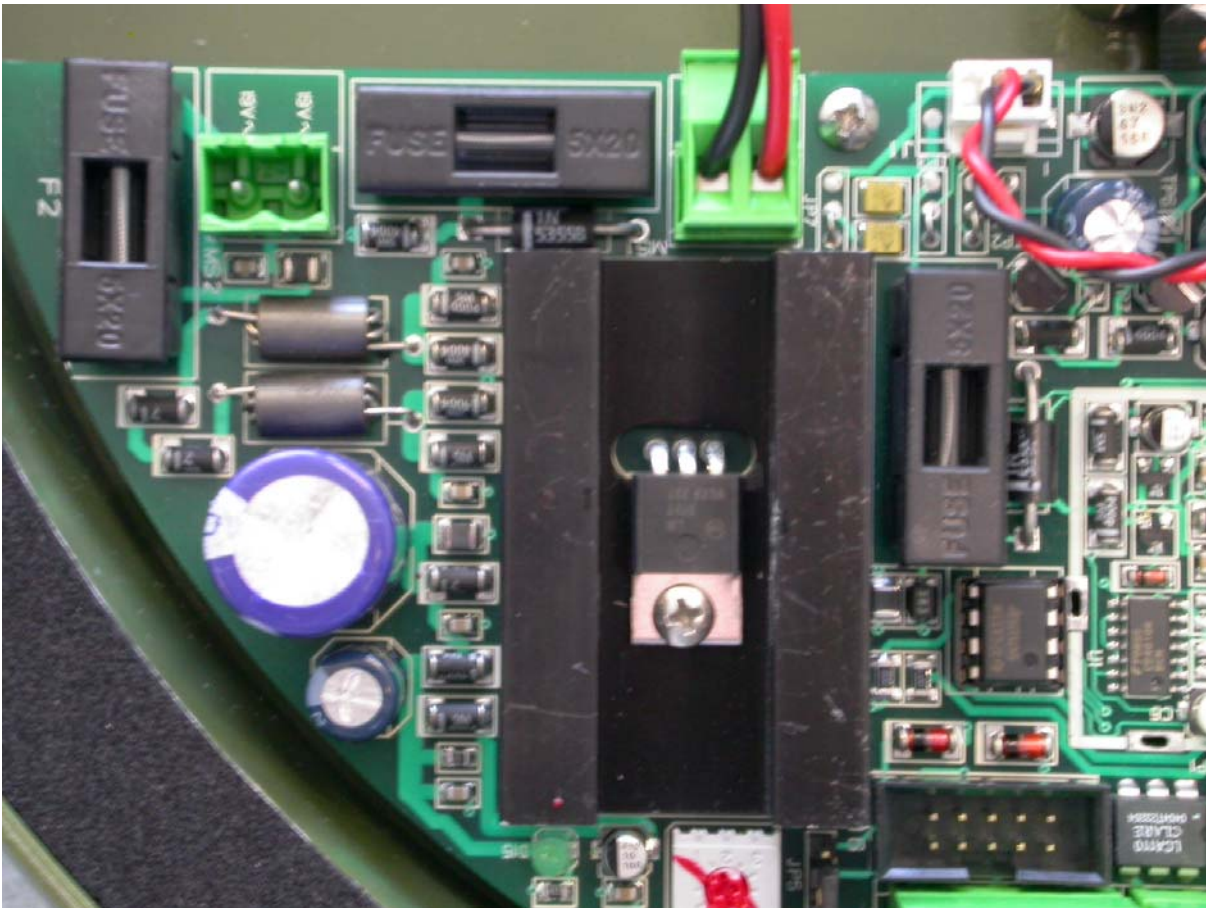


Photo 07

Transmitter

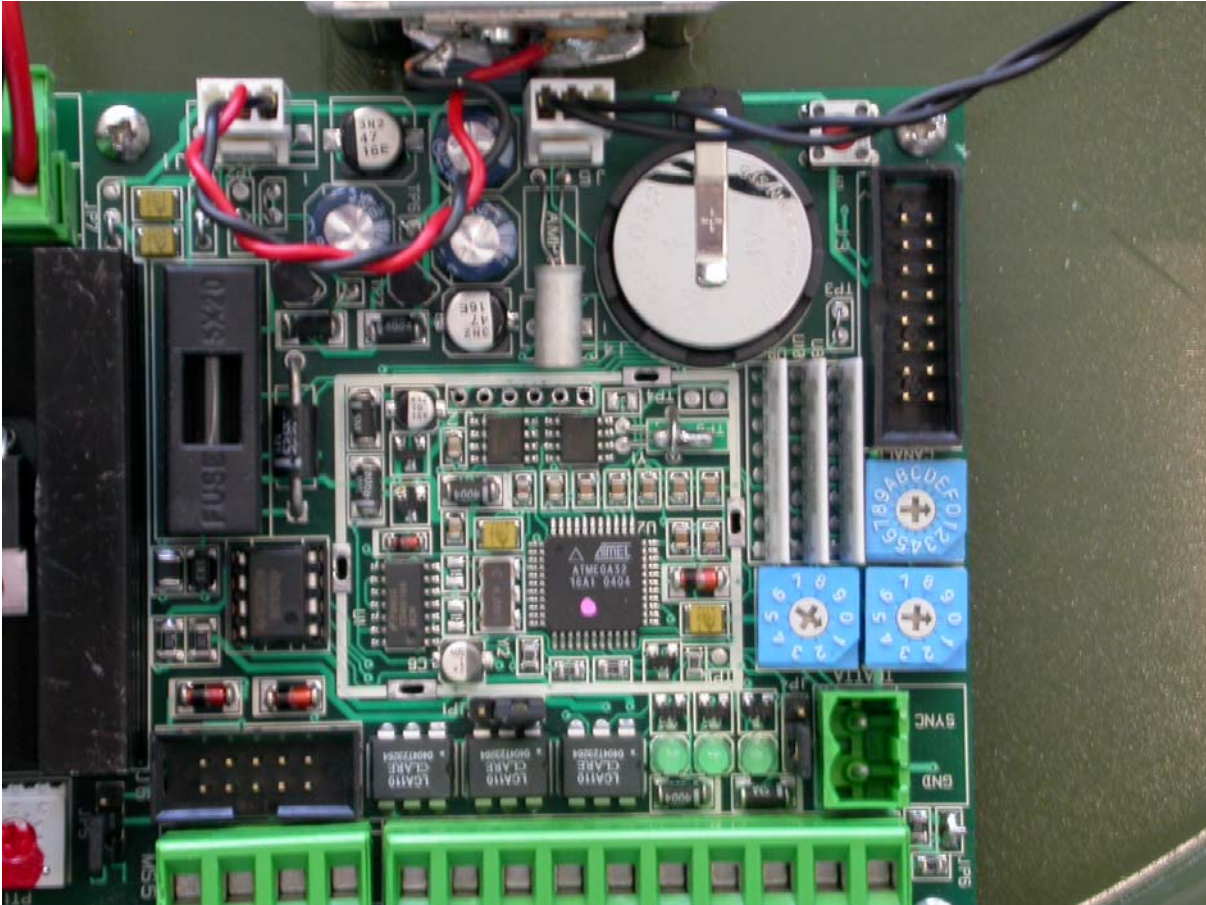


Photo 08

Receiver



Photo 09

Receiver



Photo 10

Receiver



Photo 11

Receiver

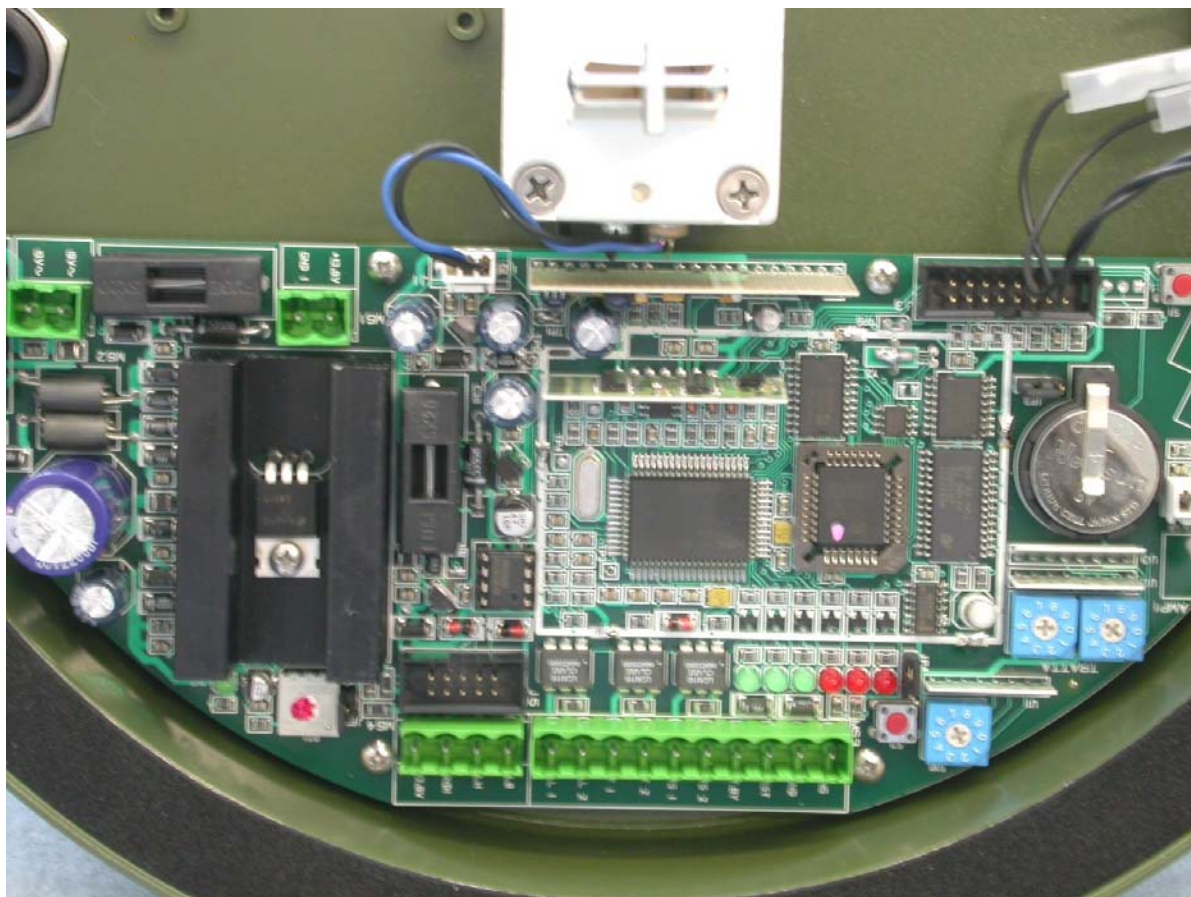


Photo 12

Receiver

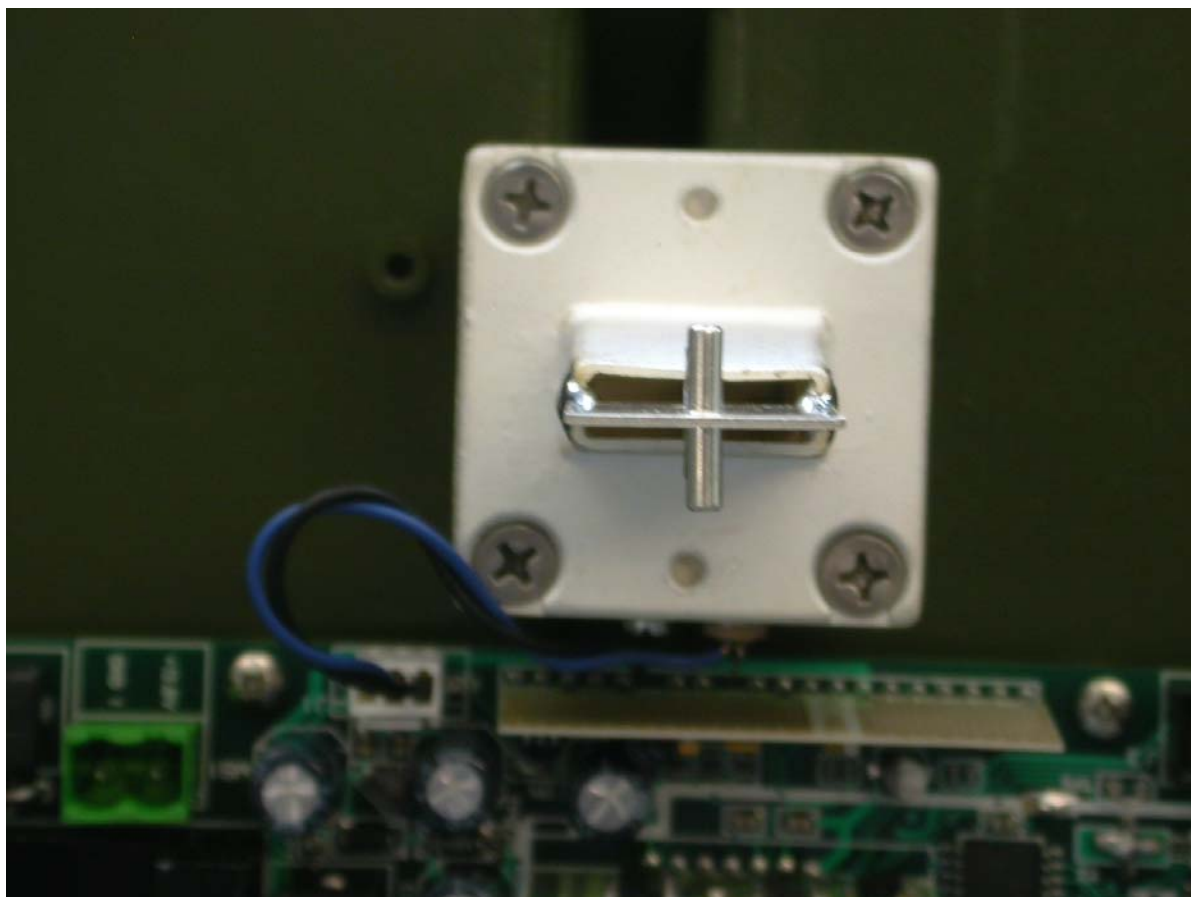


Photo 13

Receiver

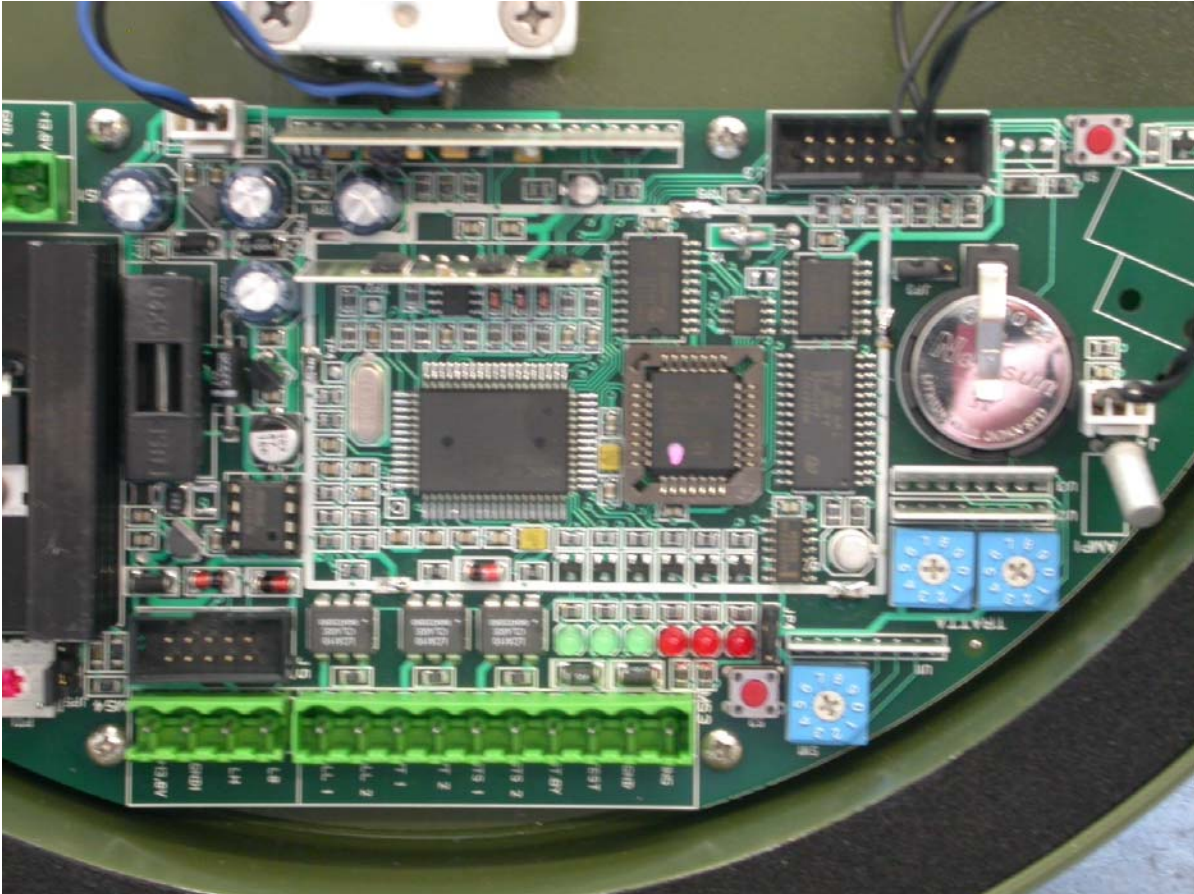


Photo 14

Receiver

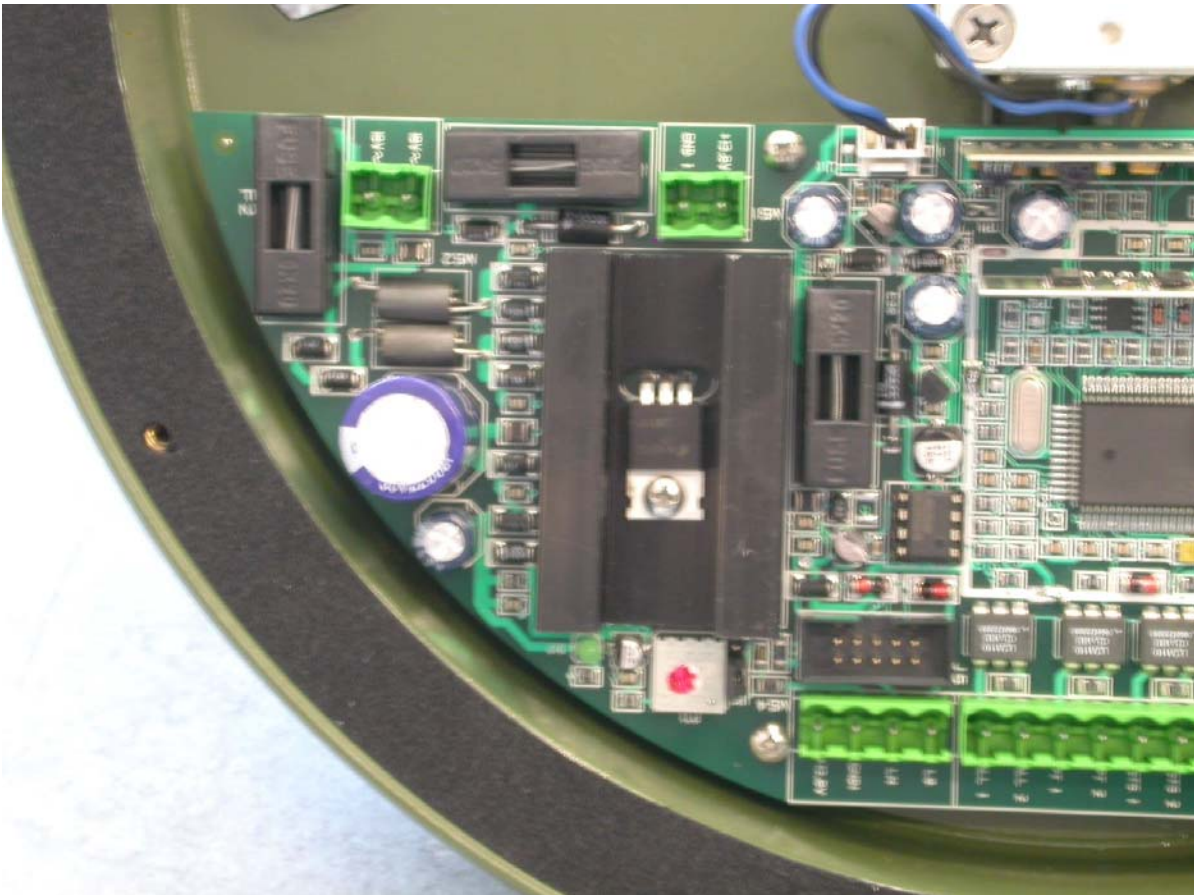


Photo 15

AC / DC

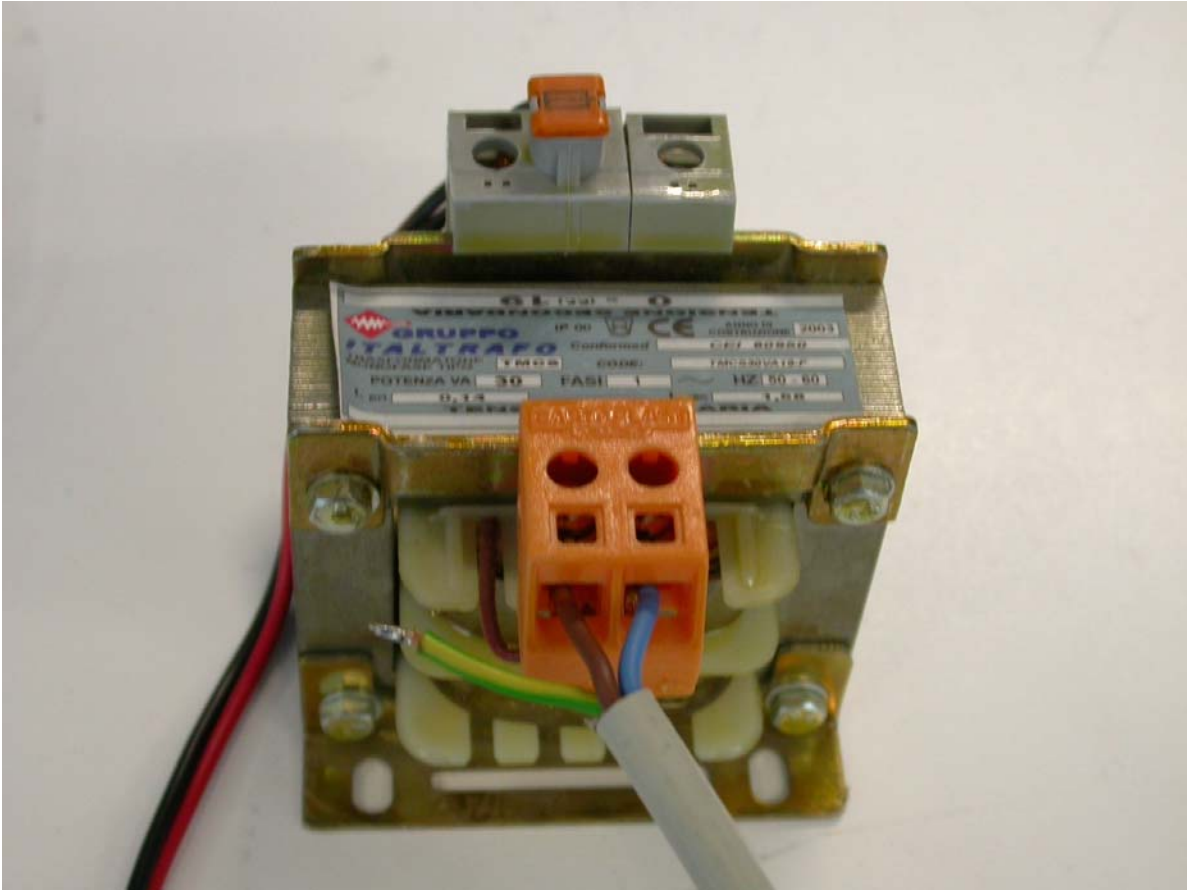


Photo 16

AC / DC

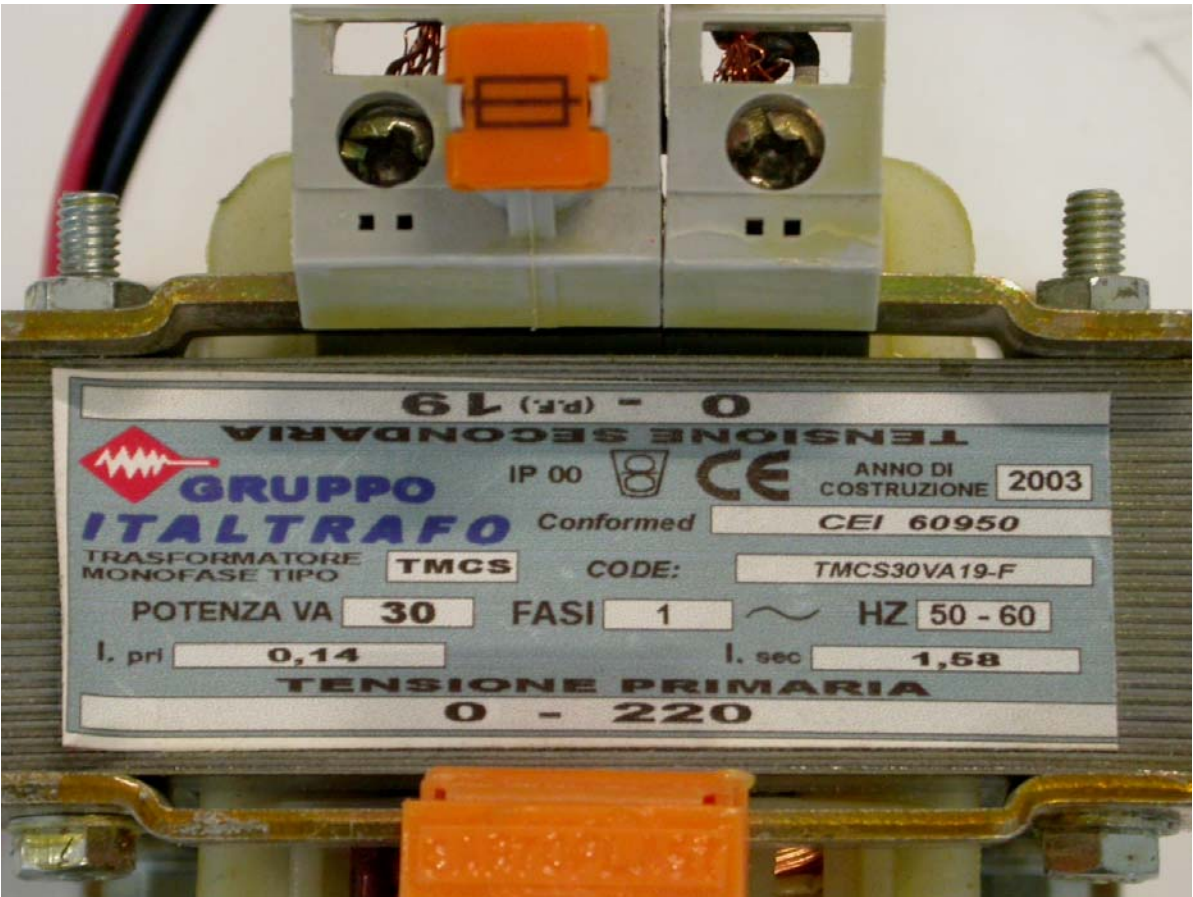


Photo 17

Test equipment

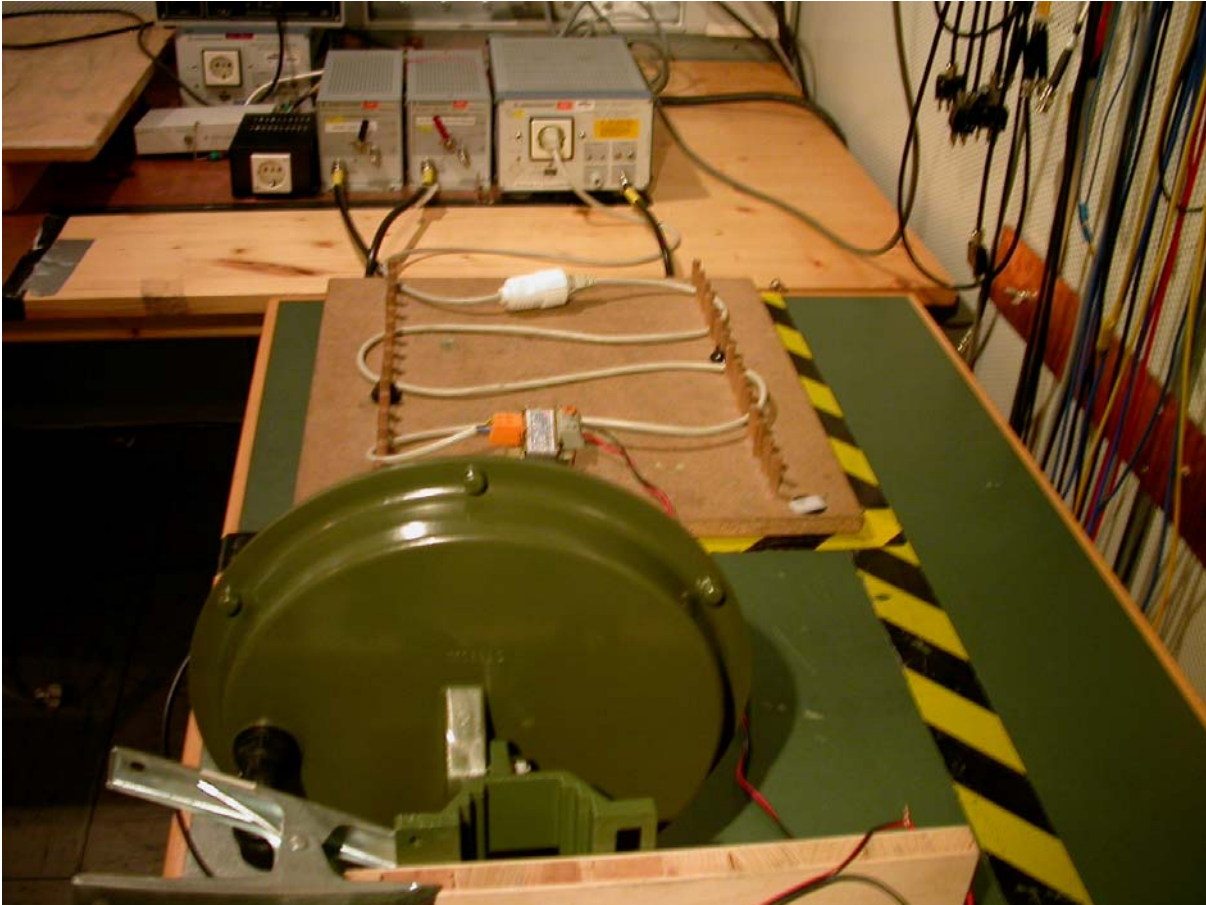


Photo 18

Test equipment



Photo 19

Test equipment

