

Recognized by the  
Federal Communications Commission  
**Anechoic chamber registration no.: 90462 (FCC)**  
**Anechoic chamber registration no.: 3463 (IC)**  
TCB ID: DE 0001



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



Independent ETSI  
compliance test house



## **Accredited Bluetooth® Test Facility (BQTF)**

**Test report no.: 2-3628-01-03/04**  
**FCC Part 15.247 / CANADA RSS-210**  
**FCC ID: PJMLRU1000**  
**/ IC:**

**ID ISC.LRU1000 / ID ISC.LRMU1000**

CETECOM – ICT Services GmbH  
Untertürkheimerstr. 6-10  
D-66117 Saarbrücken, Germany

Telephone: + 49 (0) 681 / 598-0  
Fax: + 49 (0) 681 / 9075

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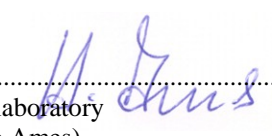
### ANNEX 1: TECHNICAL PRODUCT DESCRIPTION

## 1. Administrative data

### 1.1. Administrative data of the test facility

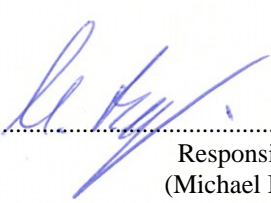
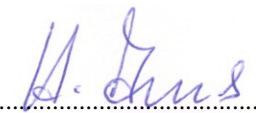
#### 1.1.1 Identification of the testing laboratory

Company name:	Cetecom ICT Services GmbH
Address:	Untertürkheimerstr. 6-10 D-66117 Saarbruecken Germany
Laboratory accreditation:	DAR-Registration No. TTI-P-G 081/94-DO Bluetooth Qualification Test Facility (BQTF)
Responsible for testing laboratory:	Michael Berg ; Harro Ames Phone: +49 681 598 0 Fax: +49 681 598 9075 email: info@ict.cetecom.de

 /   
.....  
Responsible for testing laboratory  
(Michael Berg ; Harro Ames)

#### 1.1.2 Organizational items

Reference No.:	2-3628-01-03/04
Order No.:	
Responsible for test report and project leader:	Michael Berg ; Harro Ames
Receipt of EUT:	2004-11-02
Date(s) of test:	2004-11-02 to 2004-11-04
Date of report:	2004-11-04
Number of report pages:	50
Number of diagram pages (annex):	
-----	
Version of template:	1.8

 /   
.....  
Responsible for test report  
(Michael Berg ; Harro Ames)

Note:

The test results of this test report relate exclusively to the item tested as specified in this report. The CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalizations 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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During the test no hardware and software changes are allowed to be performed at the EUT.

### 1.1.3 Applicant's details

Applicant's name:	FEIG ELECTRONIC GmbH
Address:	Lange Str. 4 D-35781 Weilburg-Waldhausen
Contact person:	Mr. Elmar Reichwein Phone: +49 (0) 6471 31 09-38 Fax: +49 (0) 6471 31 09-99 email: elmar.reichwein@feig.de

### 1.2 Administrative data of manufacturer / member

Manufacturer's name:	see applicant
Address:	

## 1.3 Description of the Equipment under test (EUT)

### 1.3.1 EUT: Type, S/N etc.

Product name	Product ID	Description	S/N serial number	HW hardware status	SW software status
ID ISC.LRU1000 / ID ISC.LRMU1000					
Frequency Band [MHz]	Type of Modulation	Number of channels	Antenna	Power Supply	Temperature Range
ISM 902 - 928	FHSS	50	external	15 – 24 V DC	-20°C to +70°C

Max. power radiated: 35.3 dBm EIRP

Max. power conducted: 29.9 dBm

FCC ID: **PJMLRU1000**

IC:

#### Product description:

The ID ISC.LR(M)U1000 RFID-Reader is a long range reader (up to 6m), operating at UHF (902-928 MHz), in a Frequency Hopping Mode. The Reader has an RF output level of 1W.

Due to its internal power converter, the ID ISC.LR(M)U1000 reader can be supplied within the range of 15 V DC to 24 V DC. The ID ISC.LR(M)U1000 contains different interfaces, for example RS232, RS485 and Ethernet, as well as digital I/O's, one relay and 5 LED for status indication.

In the extended version the ID ISC.LR(M)U1000 contains an additional µController board with LINUX operating system.

**Model ID ISC.LRU1000 represented the worst case configuration and was chosen for test.**

### 1.3.2 If RF component testing only, description of additional used HW/SW

	Product name	Product ID	Description	S/N serial number	HW hardware status	SW software status
1						
2						
3						
4						

# SRD-Testreport

CETECOM ICT Services GmbH Saarbruecken, Germany



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Date: 2004-11-04

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## 1.3.3 Additional EUT information For IC Canada (appendix 2)

Company Number:	
Model Number:	ID ISC.LRU1000 / ID ISC.LRMU1000
Product Name:	
Manufacturer:	FEIG ELECTRONIC GmbH
Tested to Radio Standards Specification (RSS) No.:	RSS-210
Open Area Test Site Industry Canada Number:	3463
Frequency Range (or fixed frequency) [MHz]:	902-928 MHz
RF: Power [W] (max):	Rad. EIRP: 3.39 W Conducted : 0.98 W
Field Strength [dB $\mu$ V/m in 3m]:	132.8
Occupied Bandwidth (99% BW) [kHz]:	20.040
Type of Modulation:	ASK
Emission Designator (TRC-43):	20K4AXD / 24M0AXD (FHSS)
Transmitter Spurious (worst case) [ $\mu$ V/m in 3m]:	431.8
Receiver Spurious (worst case) [ $\mu$ V/m in 3m]:	125.9 (noise floor)

ATTESTATION: I attest that the testing was performed or supervised by me; that the test measurements were made in accordance with the above-mentioned departmental standard(s), and that the radio equipment identified in this application has been subject to all the applicable test conditions specified in the departmental standards and all of the requirements of the standards have been met.

Signature: |

Date: 2004-11-04



Testengineer : Michael Berg

### 1.3.4 EUT operating modes

EUT operating mode no.*)	Description of operating modes	Additional information
Op. 0	Normal mode	Normal temperature and power source conditions
Op. 1		low temperature, low power source conditions
Op. 2		low temperature, high power source conditions
Op. 3		high temperature, low power source conditions
Op. 4		high temperature, high power source conditions

\*) EUT operating mode no. is used to simplify the testplan

### 1.3.5 Extreme conditions testing values

Description	Shortcut	Unit	Value
Nominal Temperature / humidity	T <sub>nom</sub>	°C / %	+23 / 50
Low Temperature	T <sub>low</sub>	°C	-20
High Temperature	T <sub>high</sub>	°C	+55
Nominal Power Source	V <sub>nom</sub>	V	24
Low Power Source	V <sub>low</sub>	V	15
High Power Source	V <sub>high</sub>	V	24

Type of powersource: V DC

Deviations from this values are reported in chapter 2

## 2. Teststandard & summary list of all performed test cases

TC identifier	Description	verdict	date	Remark
RF-Testing	FCC Part 15 §15.247 - CANADA RSS-210	PASS		

Test Specification Clause	Test Case	Pass	Fail	Not applicable	Not performed
None	Antenna Gain	Yes			
§15.247(a1)	Carrier frequency separation	Yes			
§15.247(a1)	Number of hopping channels	Yes			
§15.247(a1 iii)	Time of occupancy (dwell time)	Yes			
§15.247(d)	Power Spectral density (Hybrid system in Inquiry mode/Page scan)			X	
§15.247(a1)	Spectrum Bandwidth of a FHSS System / 20dB Bandwith	Yes			
§ 15.247 (b) (1)	Maximum output power (conducted)	Yes			
§ 15.247 (b) (1)	Max. peak output power (radiated)	Yes			
§15.247 (c)	Band-edge compliance of conducted emissions	Yes			
§15.205	Band-edge compliance of radiated emissions			X	
§ 15.247 (c) (1)	Spurious Emission - conducted (Transmitter)	Yes			
§ 15.247 (c) (1)	Spurious Emission - radiated (Transmitter)	Yes			
§ 15.109	Spurious Emissions - radiated (Receiver)	Yes			
§ 15.109	Spurious Emissions - radiated <30 MHz	Yes			
§ 15.107/207	Conducted Emissions <30 MHz	Yes			



## 3. RF measurement testing

### 3.1 Description of test set-up

#### 3.1.1 Radiated measurements

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 25 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 from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups 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.

Antennas are conform with ANSI C63.2-1996 item 15.

150 kHz - 30 MHz: Quasi Peak measurement, 9kHz Bandwidth, passive loop antenna.

30 MHz - 200 MHz: Quasi Peak measurement, 120KHz Bandwidth, biconical antenna

200MHz - 1GHz: Quasi Peak measurement, 120KHz Bandwidth, log periodic antenna

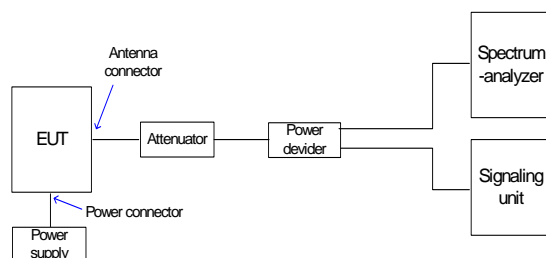
1GHz: Average, RBW 1MHz, VBW 10 MHz, waveguide horn

All measurements are done in accordance with the Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems DA 00-705 .

The EUT is powered by an external power supply with nominal voltage. The signaling is performed from outside the chamber with a signaling unit (CMU200 or other) by airlink using signaling antenna.

#### 3.1.2 Conducted measurements

The EUT's RF signal is coupled out by the antenna connector which is supplied by the manufacturer. The signal is first 10dB attenuated before it is power divided (~6dB loss per branch). One of the signal path is connected to the communication base Station (CMU200 or other), the other one is connected to the spectrum analyzer. The specific losses for both signal paths are first checked within a calibration. The measurement readings on the signaling unit/spectrum analyzer are corrected by the specific test set-up loss. The attenuator, power divider, signaling unit and the spectrum analyzer are impedance matched on 50 Ohm.



### 3.2 Referenced documents

none

### 3.3 Additional comments

Hardware / software changes during testing (only for pretesting)

Setup revision	Description of change	Change referenced to setup revision	Already perf. testcases influenced yes (reaped) / no
1.0	Start setup	-	-

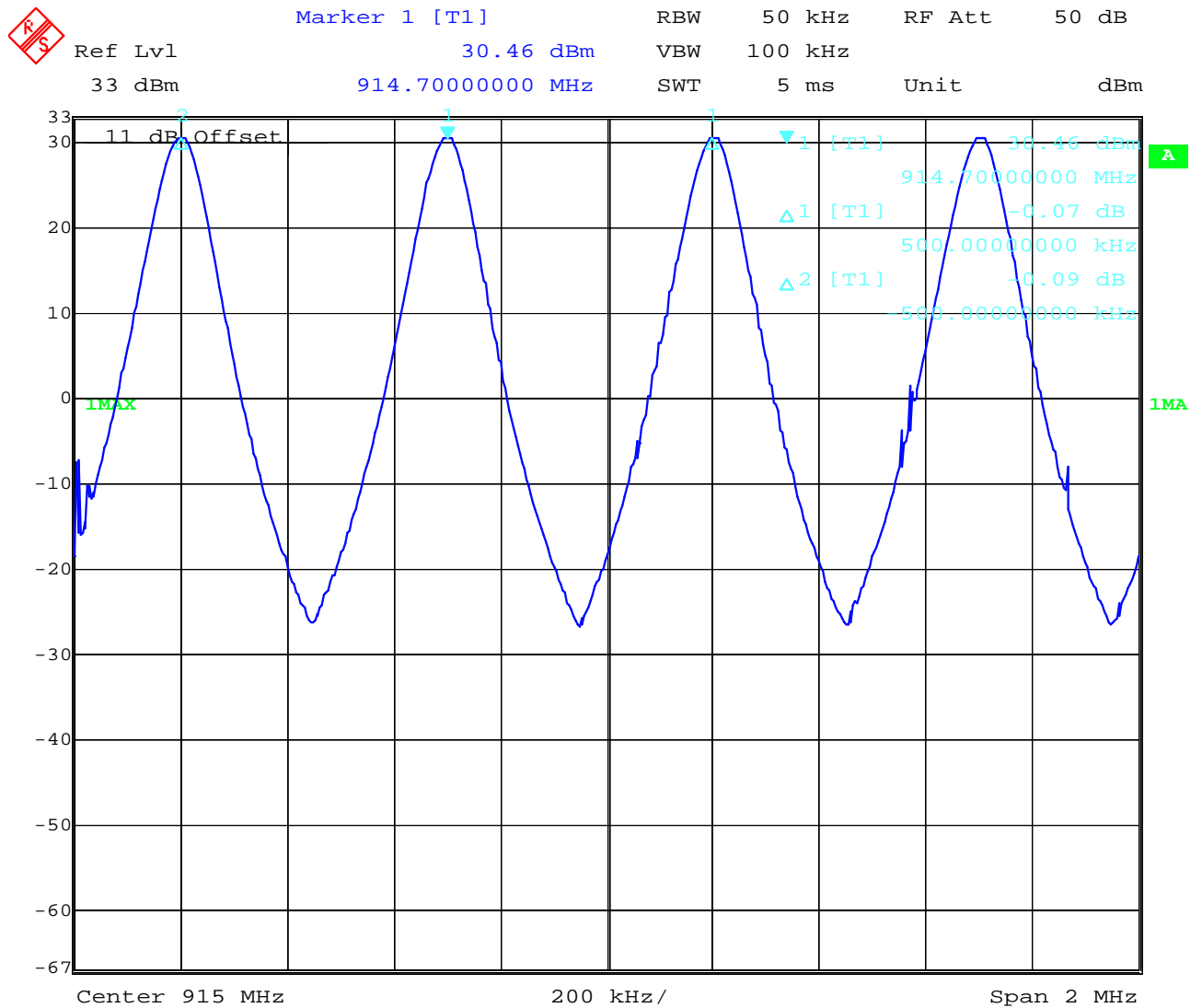
### 3.4 Antenna gain

The antenna gain of the complete system is calculated by the difference of conducted power of the module and the radiated power in EIRP.

	low channel	mid channel	high channel
Conducted power [dBm]	29.6	28.8	29.9
Radiated power [dBm]	34.4	34.8	35.3
Gain [dBi]	4.8	6.0	5,4

### 3.5 Carrier frequency separation §15.247(a1)

Plot 1 of 1:



Date: 3.NOV.2004 15:26:30

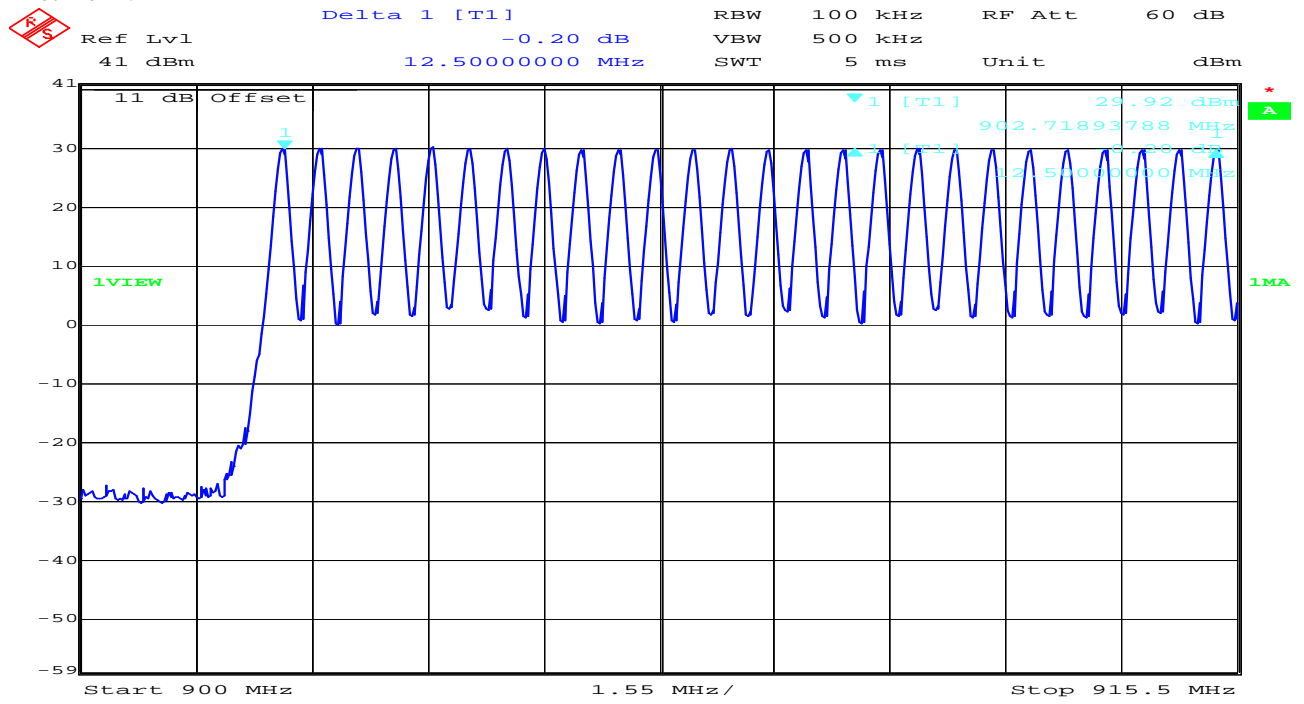
Result : Channel separation is: 500 KHz

Limits :

Under normal test conditions only	Minimum 25 kHz or 20 dB Bandwidth of the hopping system
-----------------------------------	---

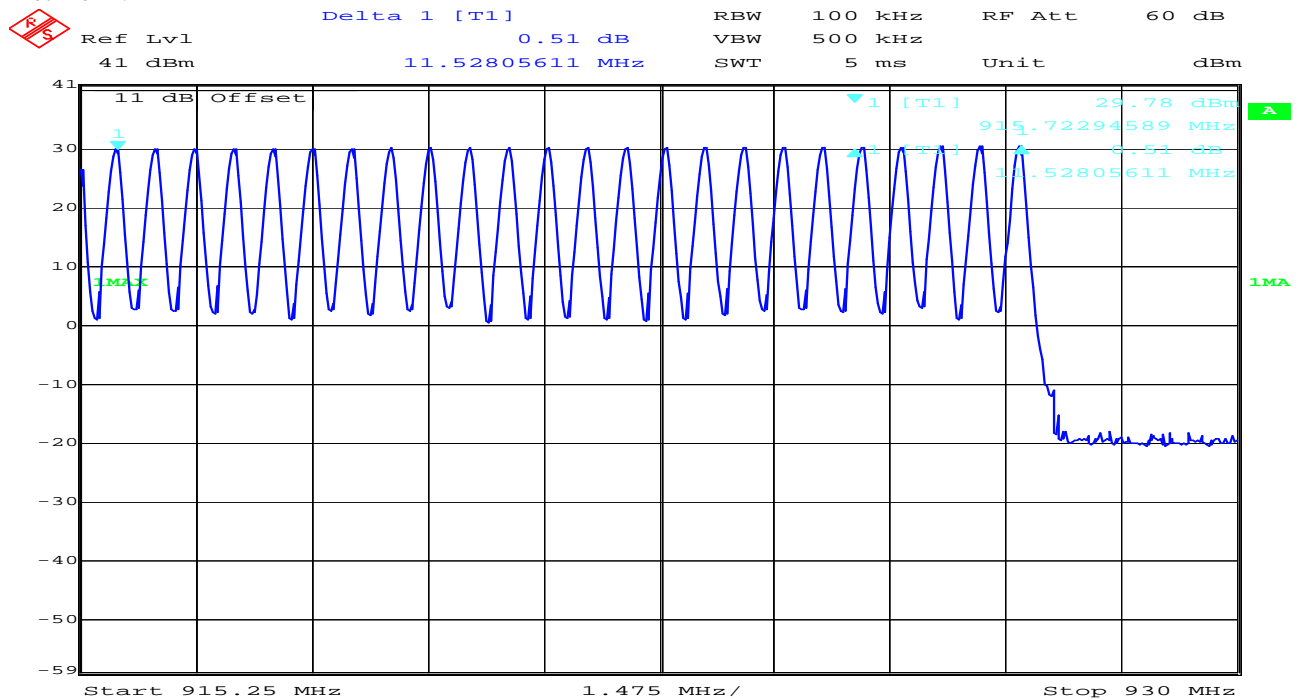
### 3.6 Number of hopping channels §15.247(a1)

Plot 1 of 2:



Date: 3.NOV.2004 15:36:18

Plot 2 of 2:



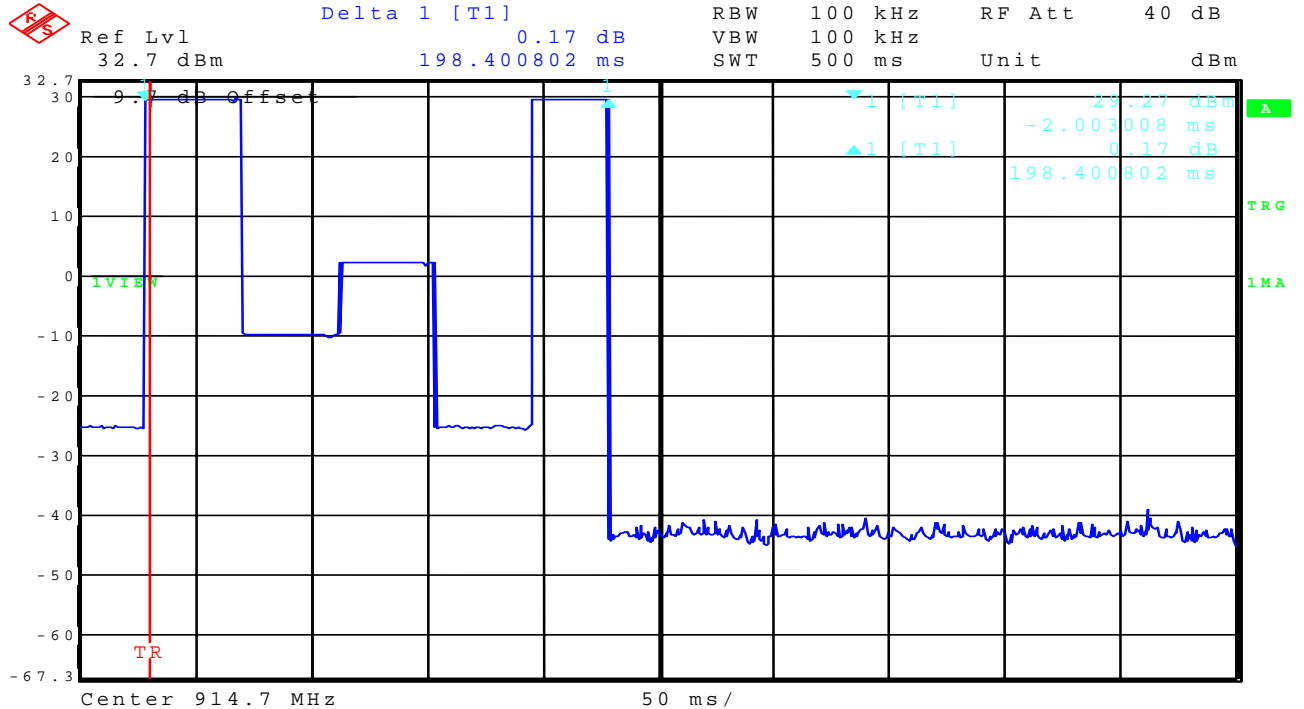
Date: 3.NOV.2004 15:38:00

Result : The number of hopping channels is: 50

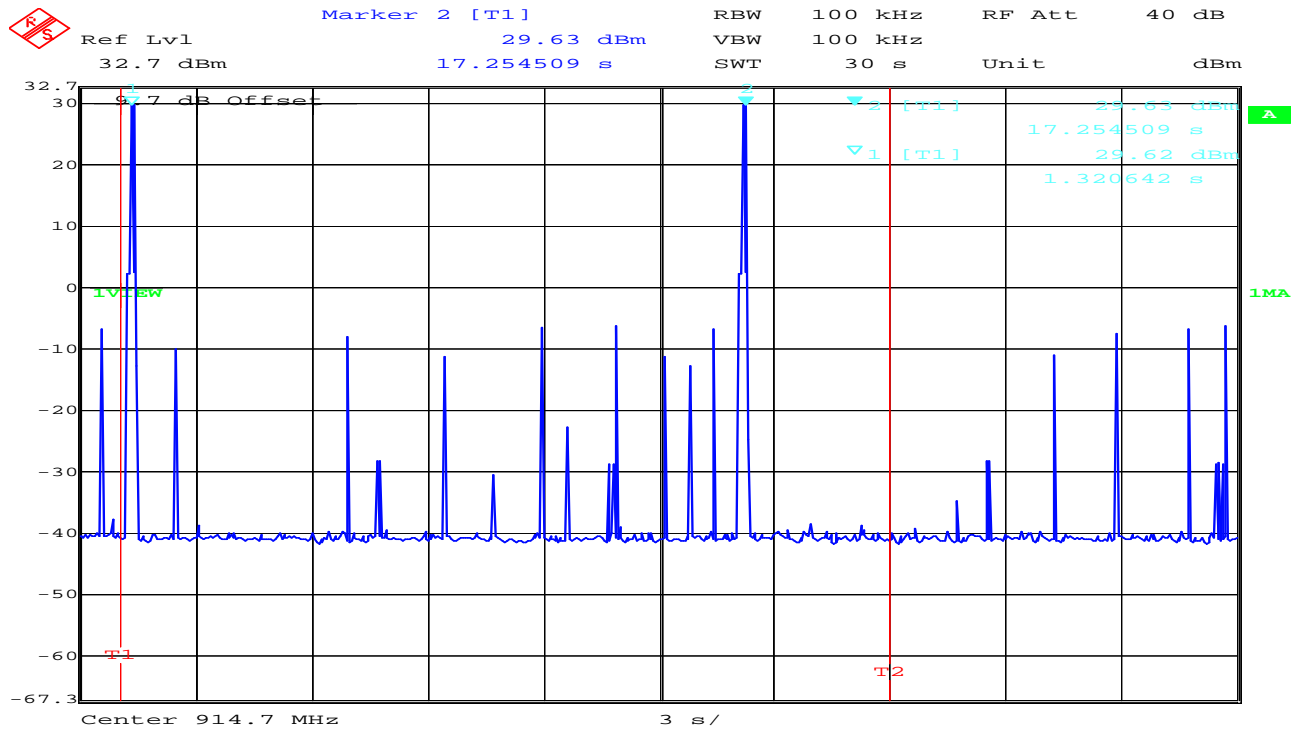
Limits :

Under normal test conditions only	at least 50 non-overlapping channels
-----------------------------------	--------------------------------------

### 3.7 Time of occupancy (dwell time) §15.247(a1 iii)



Tx on = 198.4 ms,



in 20s 2 times of occupancy (ca. all 17 s)

max. time of occupancy on any frequency :

in 20 sec 2 times Tx on 198.4 ms = 0.397 seconds within a 20 second period.

Limits :

(i) For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

### 3.8 Power Spectral density (Hybrid system in Inquiry mode/Page scan) §15.247(d)

Plot 1 of 1:

**MEASUREMENT NOT APPLICABLE (no hybrid system)**

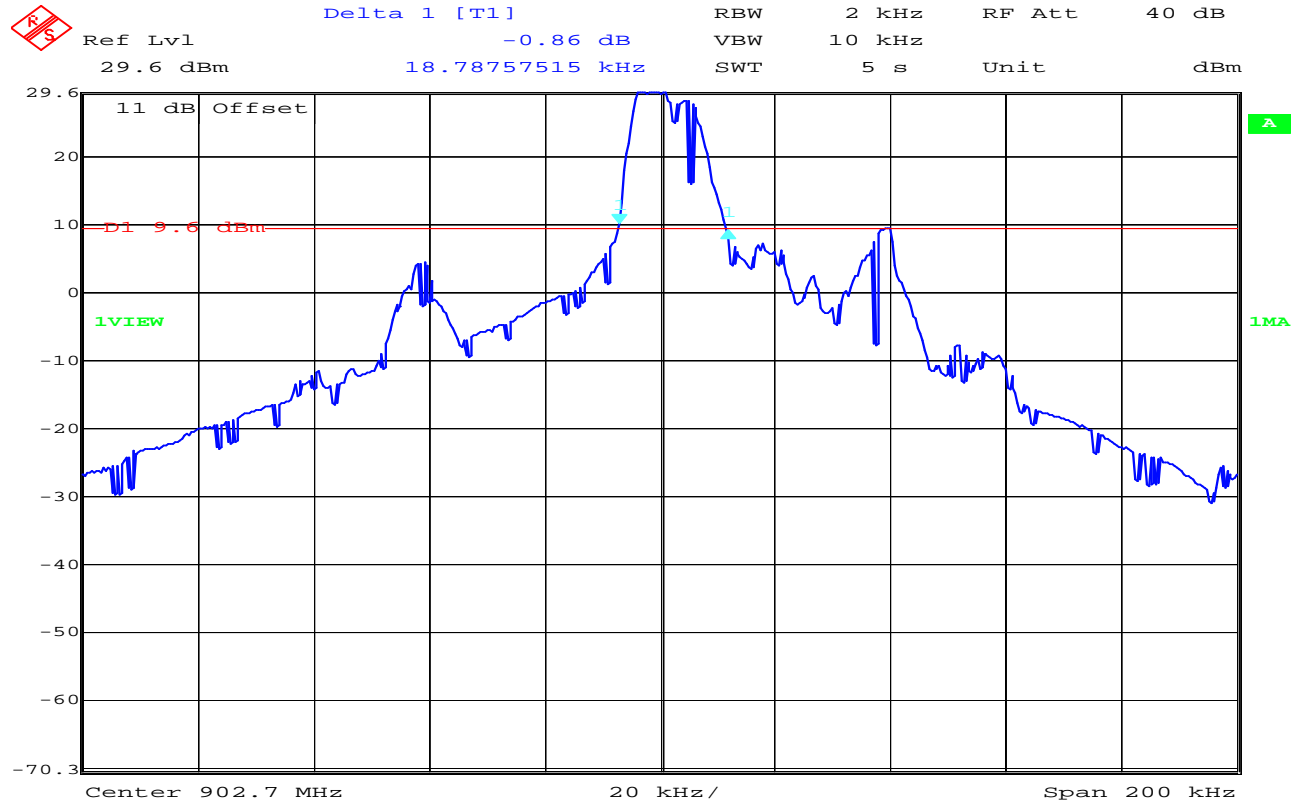
Result: Power density : - dBm/Hz = - dBm / 3 KHz  
Correction factor from dBm/Hz to dBm/3KHz is +34,8 dB

Limits :

Under normal test conditions only	For digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 KHz band during any time interval of continuous transmission
-----------------------------------	---

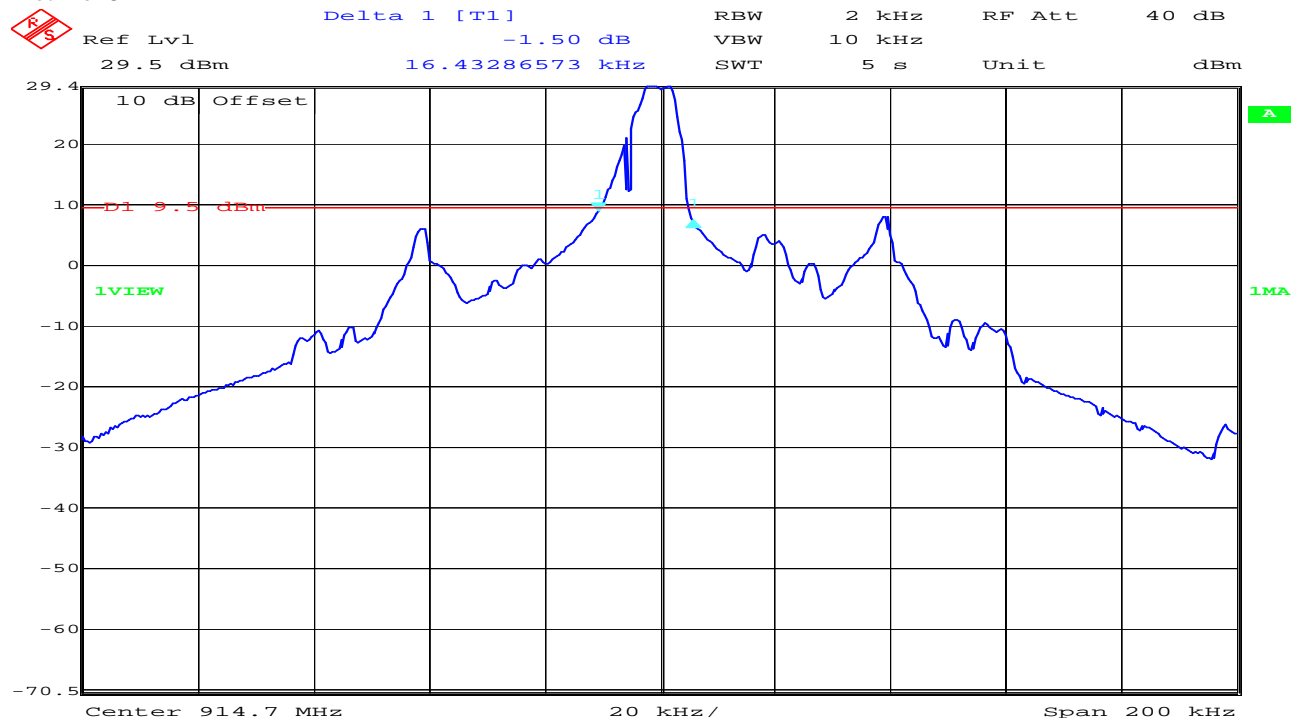
### 3.9 Spectrum Bandwidth of a FHSS System / 20dB Bandwith §15.247(a1)

Plot 1 of 3



Date: 3.NOV.2004 15:47:34

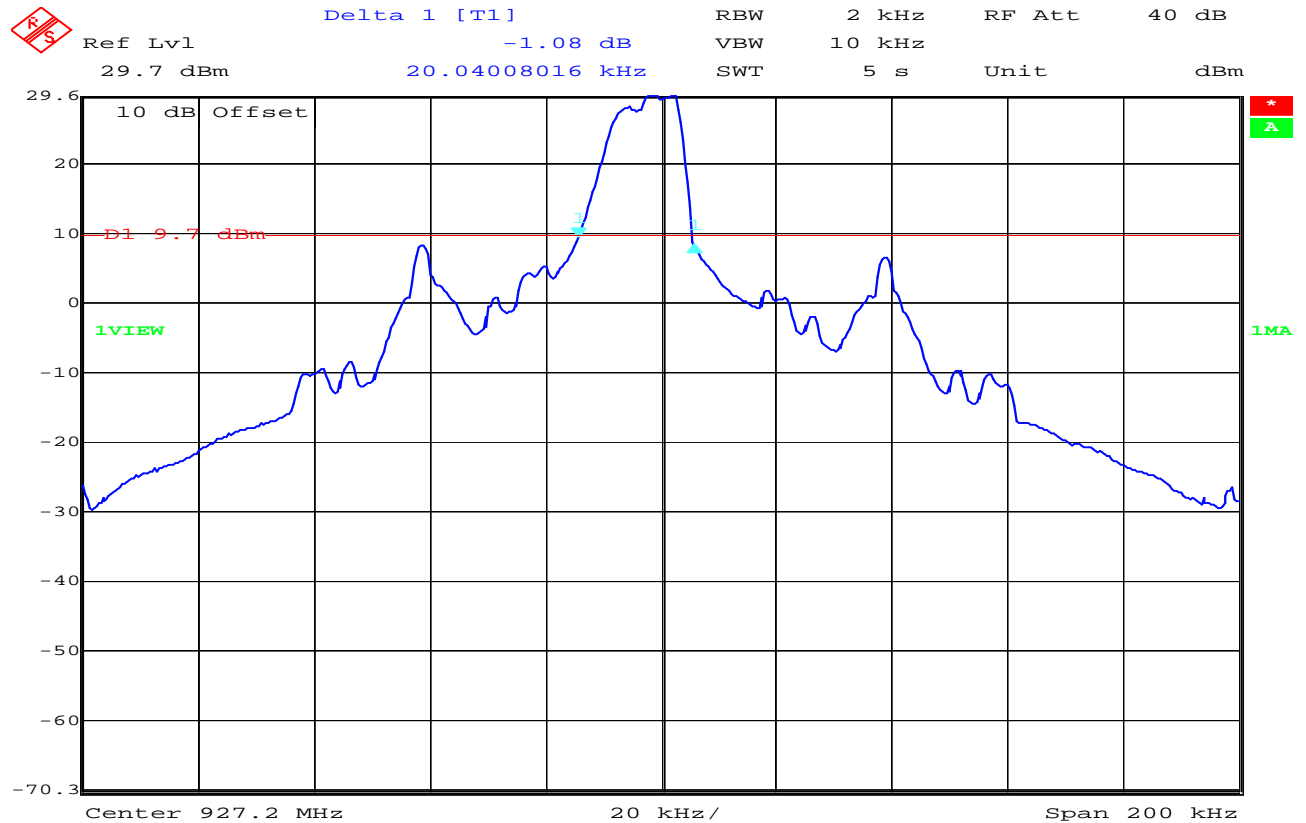
Plot 2 of 3



Date: 3.NOV.2004 15:52:16



Plot 3 of 3



Date: 3.NOV.2004 15:59:01

Results:

Test conditions		20 dB BANDWIDTH [KHz]		
Frequency [MHz]		902.7	914.7	927.2
T <sub>nom</sub>	V <sub>nom</sub>	18.788	16.433	20.040
Measurement uncertainty		±1kHz		

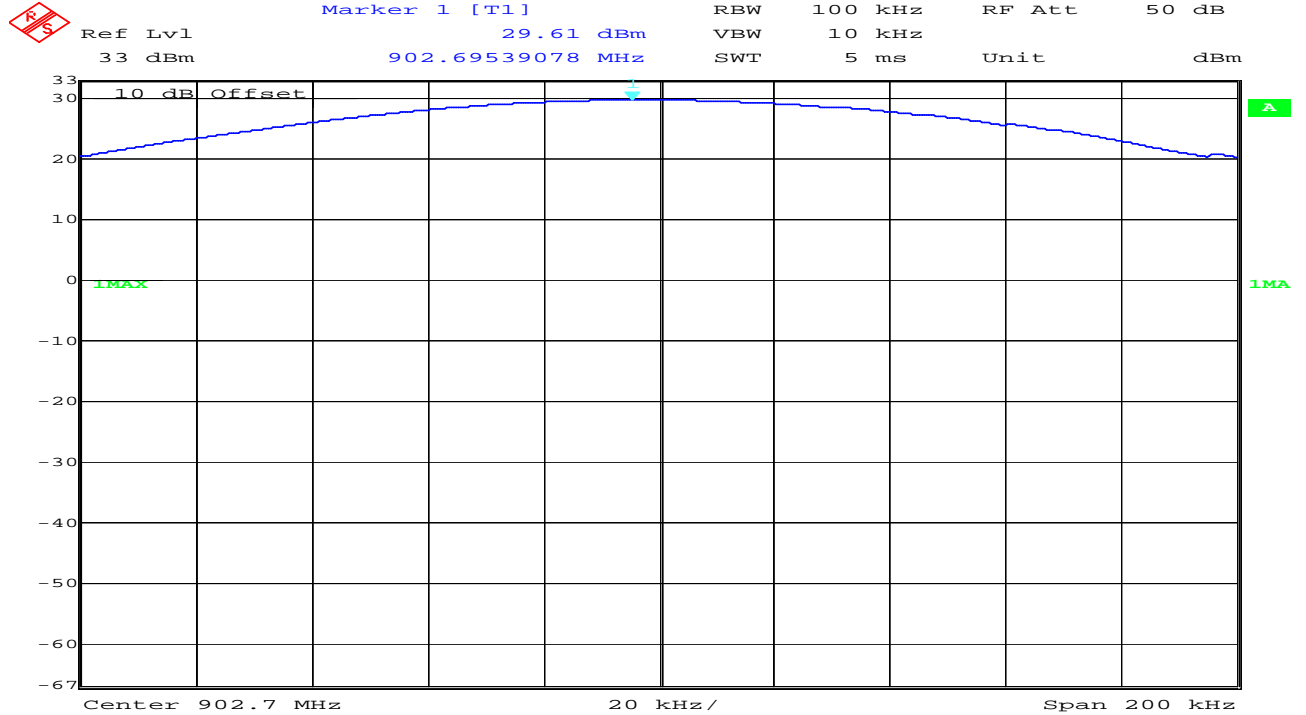
RBW / VBW as provided in the „Measurement Guidelines“ (DA 00-705, March 30, 2000)  
 RBW: 10 kHz / VBW 100 kHz

Limits :

Under normal test conditions only	< 1000 KHz
-----------------------------------	------------

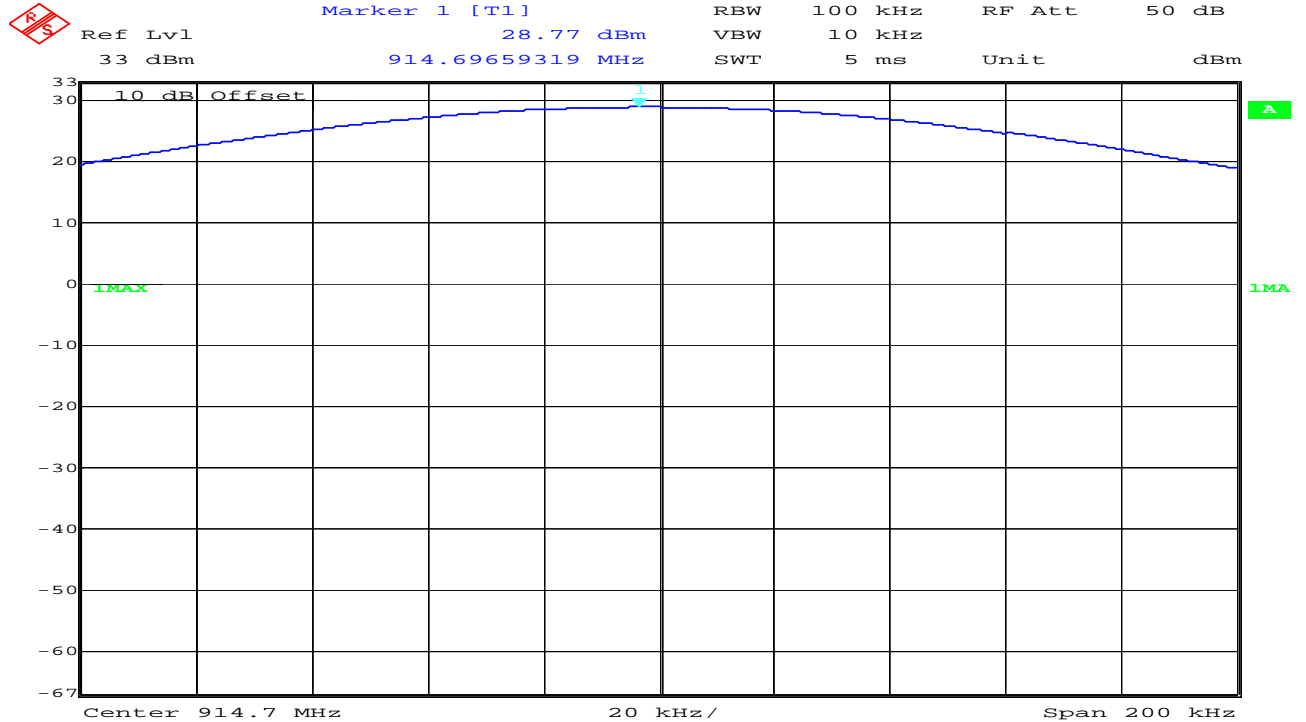
### 3.10 Maximum output power (conducted) § 15.247 (b) (1)

Plot 1 of 3



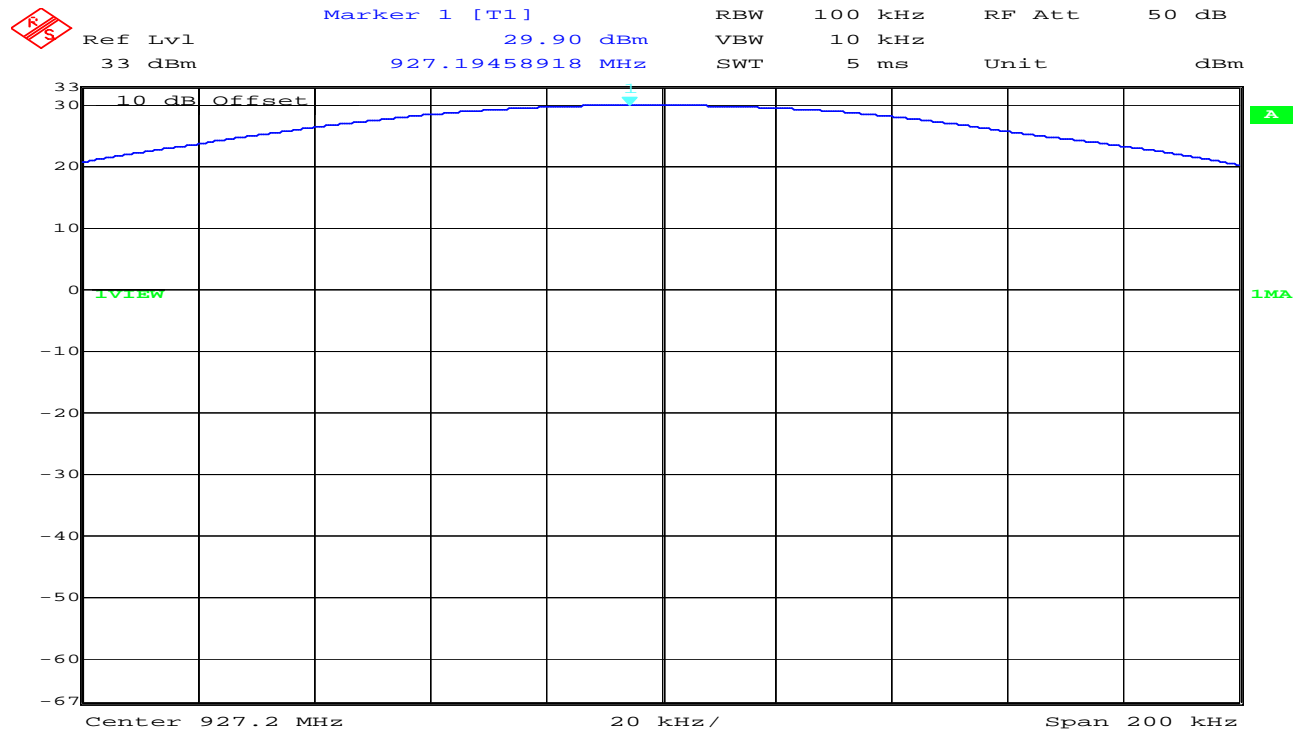
Date: 3.NOV.2004 16:04:13

Plot 2 of 3



Date: 3.NOV.2004 16:03:23

Plot 3 of 3



Date: 3.NOV.2004 16:02:00

Results:

Test conditions		Max. peak output power [dBm]		
Frequency [MHz]		902.7	914.7	927.2
T <sub>nom</sub>	V <sub>nom</sub>	PK 29.6 (0.912 W)	28.8 (0.758 W)	29.9 (0.977 W)
Measurement uncertainty		±3dB		

RBW / VBW : 100 kHz

Limits:

Under normal test conditions only, for frequency range 902 - 928 MHz	Max. 1.0 Watt / 30 dBm
--	------------------------

### 3.11 Max. peak output power (radiated) § 15.247 (b) (1)

Results:

Test conditions		Max. peak output power EIRP [dBm]		
Frequency [MHz]		902.7	914.7	927.2
T <sub>nom</sub>	V <sub>nom</sub>	34.4 (2.754 W)	34.8 (3.020 W)	35.3 (3.388 W)
Measurement uncertainty		±3dB		

RBW / VBW : 100 kHz

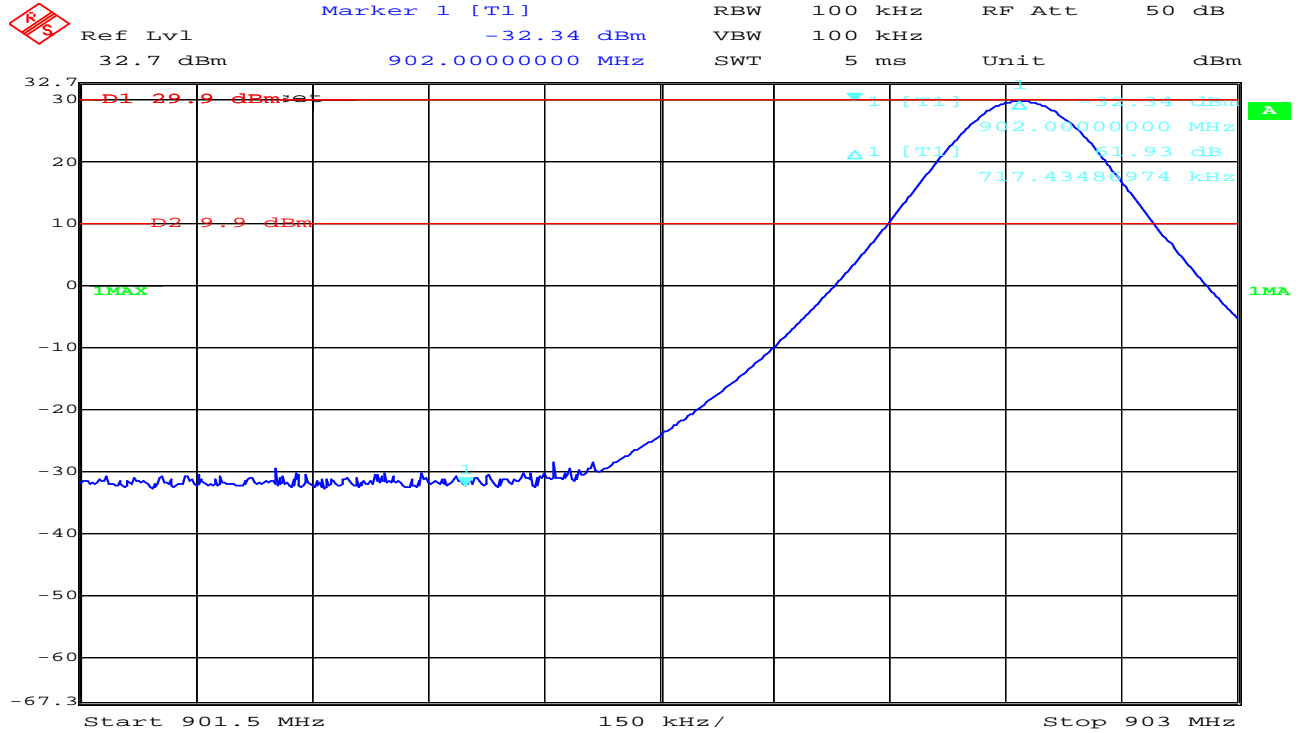
Measured at a distance of 3m

Limits:

Under normal test conditions only, for frequency range 902 - 928 MHz	Max. 4.0 Watt (1 Watt +6 dBi Antenna gain)
--	--

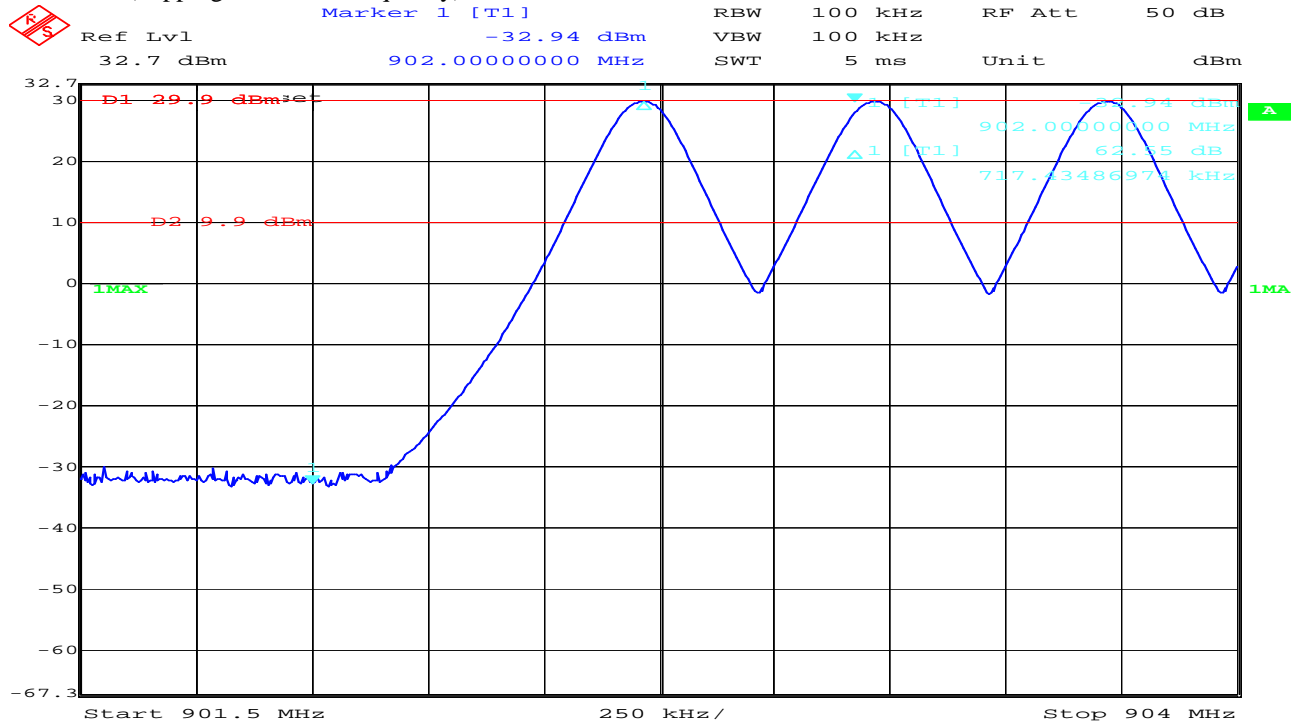
### 3.12 Band-edge compliance of conducted emissions §15.247 (c)

Plot 1 of 4 (hopping off, lowest frequency):



Date: 4.NOV.2004 06:47:23

Plot 2 of 4 (hopping on, lowest frequency):



Date: 4.NOV.2004 06:49:32

# SRD-Testreport

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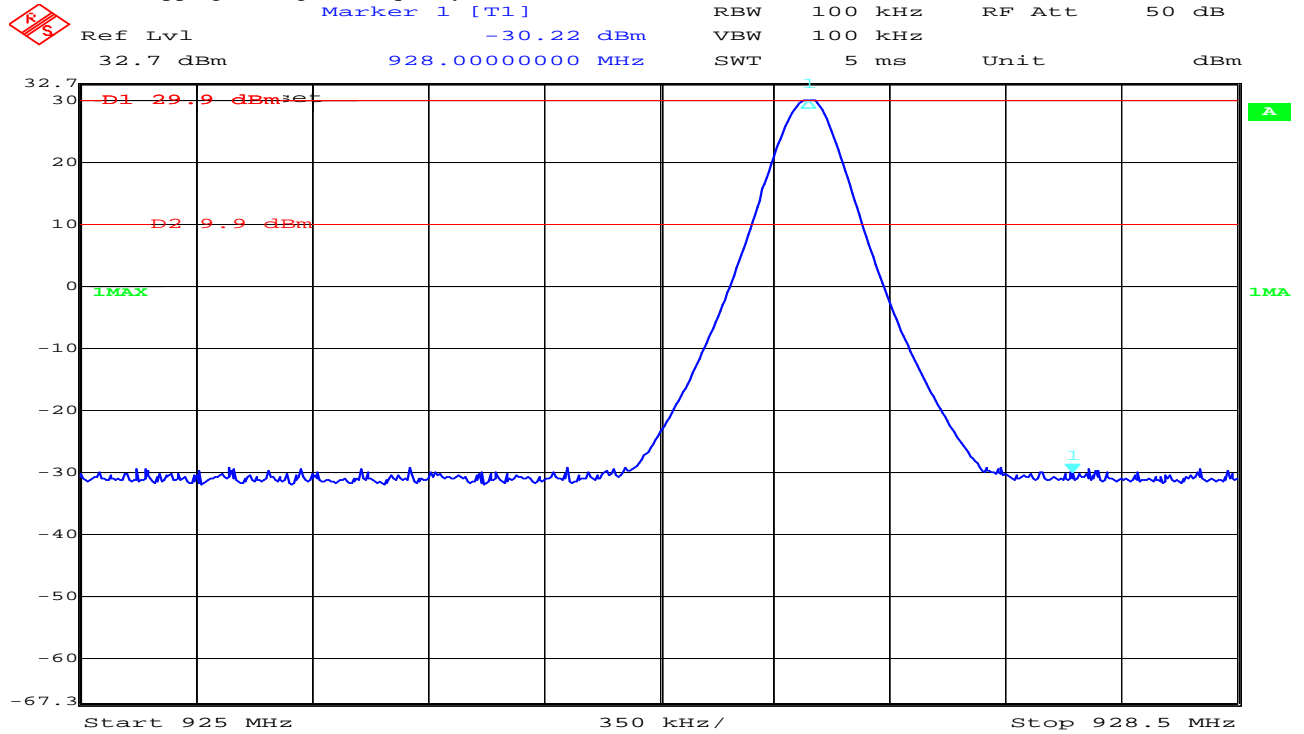


Test report No.: 2-3628-01-03/04

Date: 2004-11-04

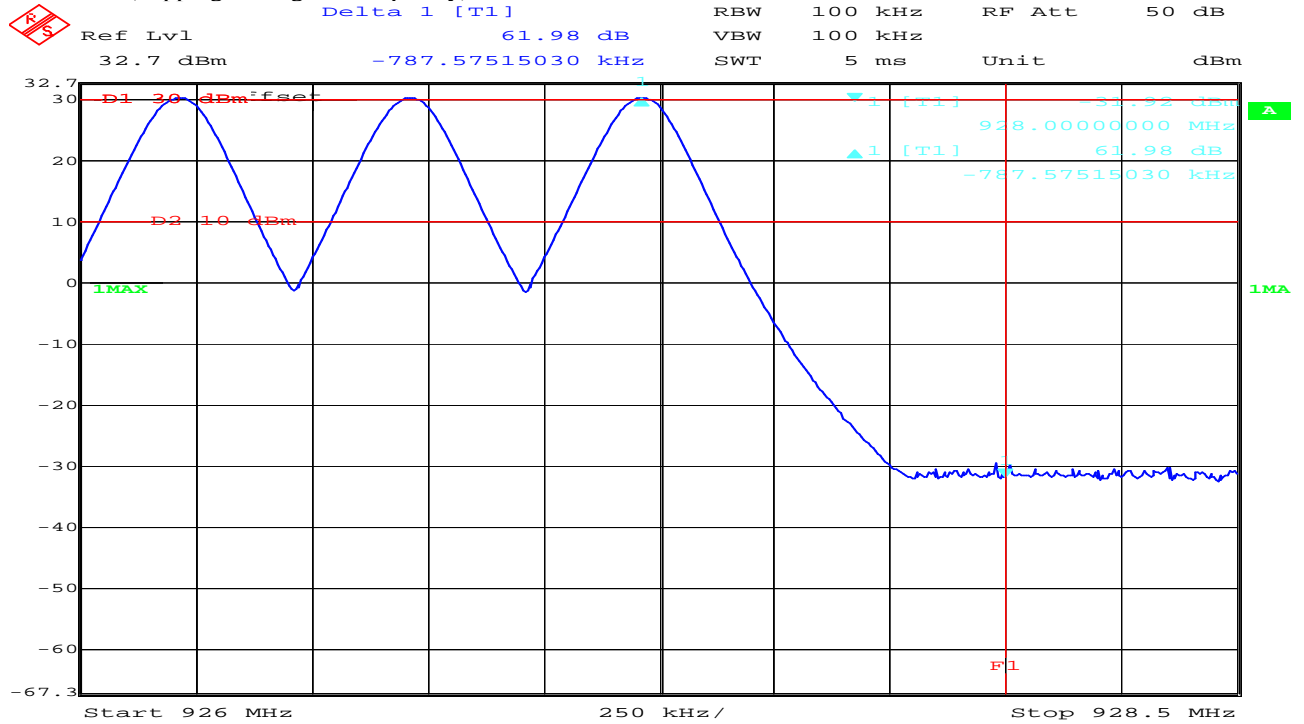
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Plot 3 of 4 (hopping off, highest frequency):



Date: 3.NOV.2004 16:15:44

Plot 4 of 4 (hopping on, highest frequency):



Date: 4.NOV.2004 06:51:30

Results:

SZENARIO	DELTA VALUE [DB]
hopping off, lowest frequency	61.93
hopping on, lowest frequency	62.55
hopping off, highest frequency	60.12
hopping on, highest frequency	61.98
Measurement uncertainty	±1,5dB

Limits:

Under normal test conditions only	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 5.205(c)).
-----------------------------------	--

### 3.13 Band-edge compliance of radiated emissions §15.205

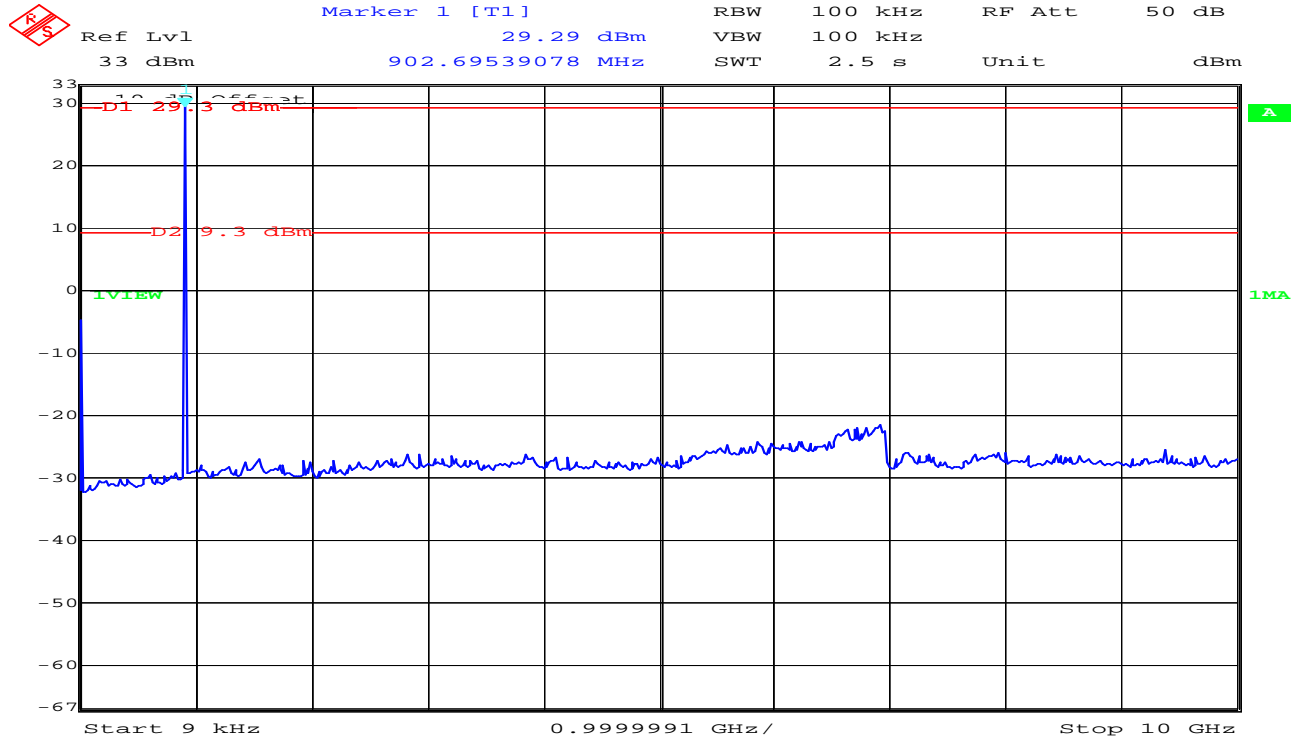
**MEASUREMENT NOT APPLICABLE (no restricted band)**

high channel	setup	measured value (3m)	correction factor (3m)	calculated value (3m)
Max. peak value	1 MHz RBW 1 MHz VBW	dB $\mu$ V/m	--	dB $\mu$ V/m
Max. average value	Calculated with duty cycle correction factor	dB $\mu$ V/m peak	-1,07dB duty cycle correction factor (worst case DH5)	dB $\mu$ V/m
Delta value	Peak 30 kHz RBW/VBW	dB (single carrier) dB (hopping mode)	-	-
Value at band edge	limit 54 dB $\mu$ V/m			dB $\mu$ V/m (single carrier) dB $\mu$ V/m (hopping mode)
Statement:				Complies



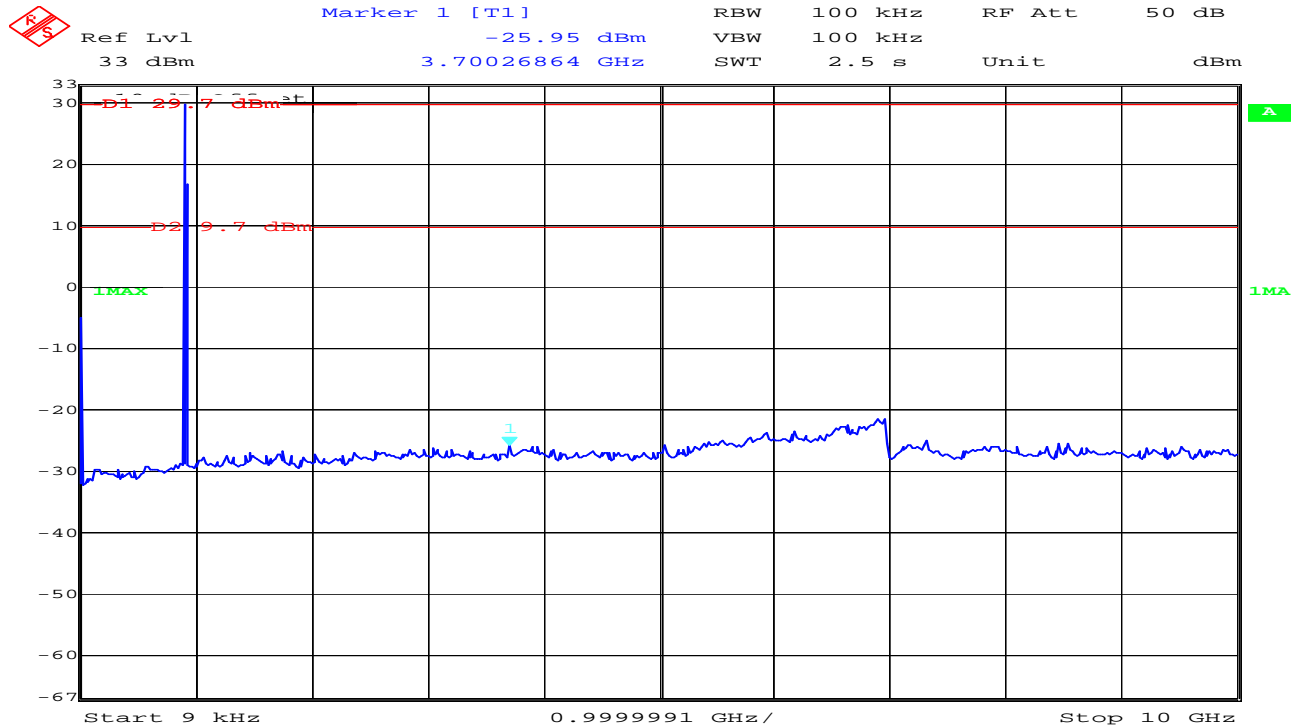
### 3.14 Spurious Emissions - conducted (Transmitter) § 15.247 (c) (1)

Plot 1 of 3: lowest channel



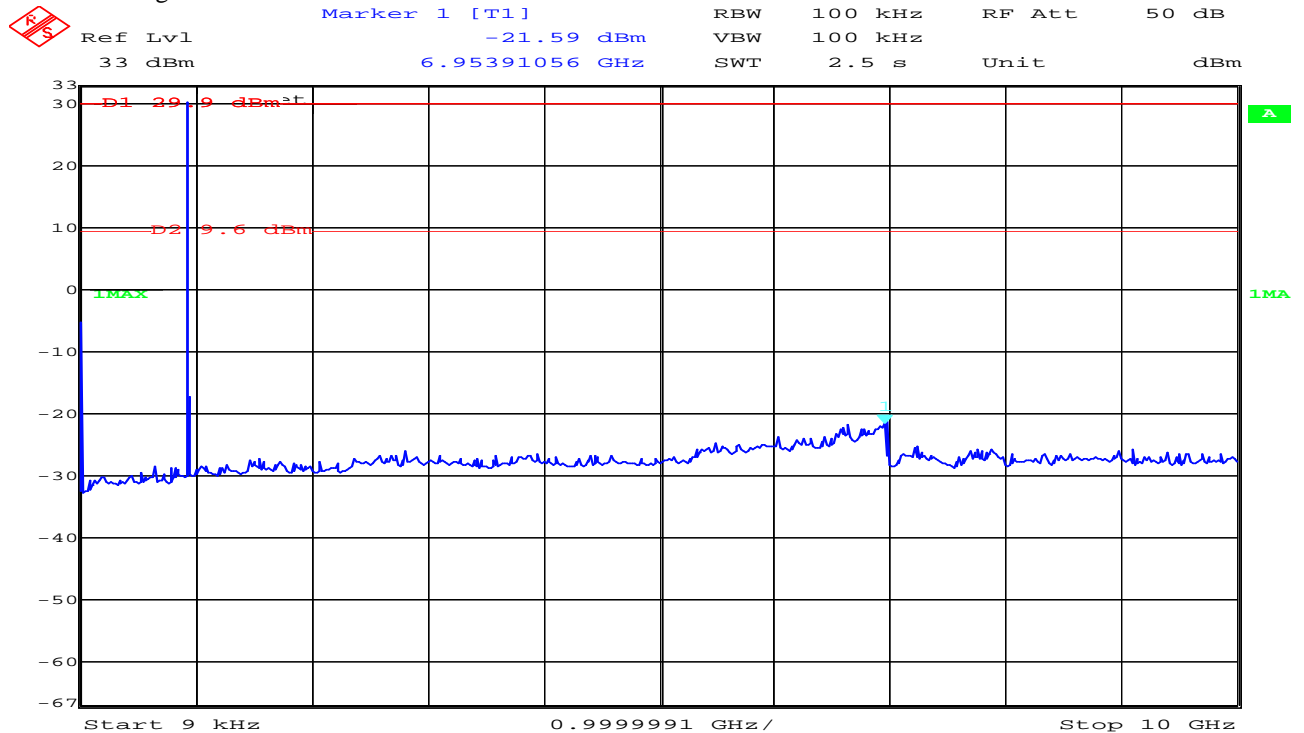
Date: 3.NOV.2004 16:08:06

Plot 2 of 3: middle channel



Date: 3.NOV.2004 16:11:49

Plot 3 of 3: highest channel



Date: 3.NOV.2004 16:13:13

Result & Limits:

Emission Limitations					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
2402			30 dBm	-	Operating frequency
	No peak	found	-20 dBc		complies
2441			30 dBm	-	Operating frequency
	No peak	found	-20 dBc		complies
2480			30 dBm		Operating frequency
	No peak	found	-20 dBc		complies
Measurement uncertainty		± 3dB			

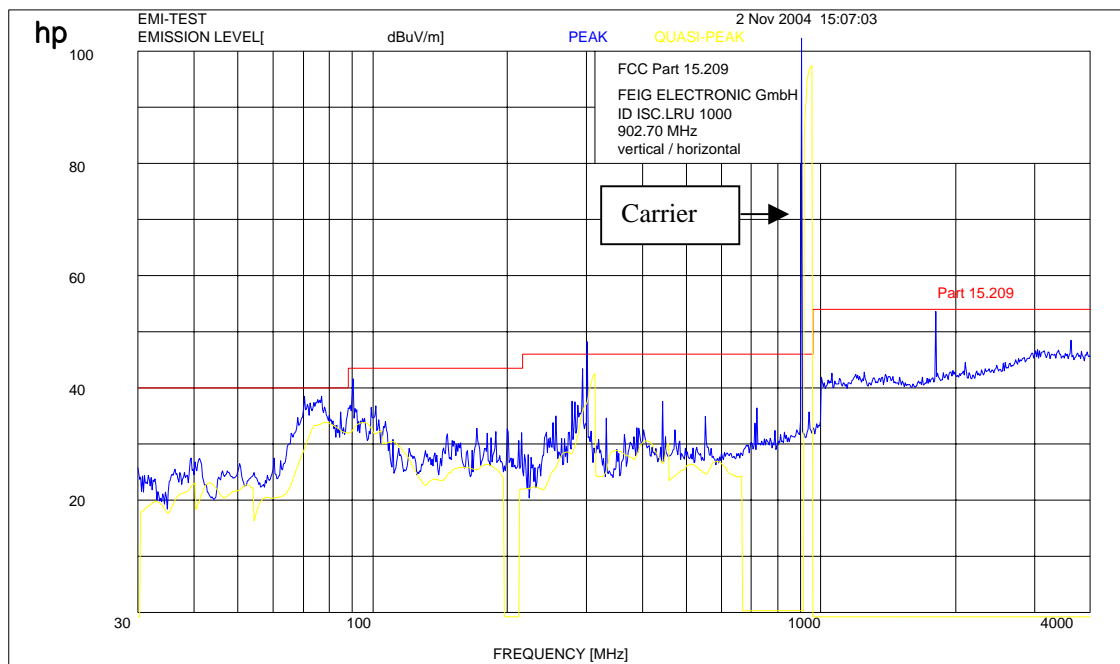
RBW : 100 kHz      VBW: 100 MHz

Under normal test conditions only	In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
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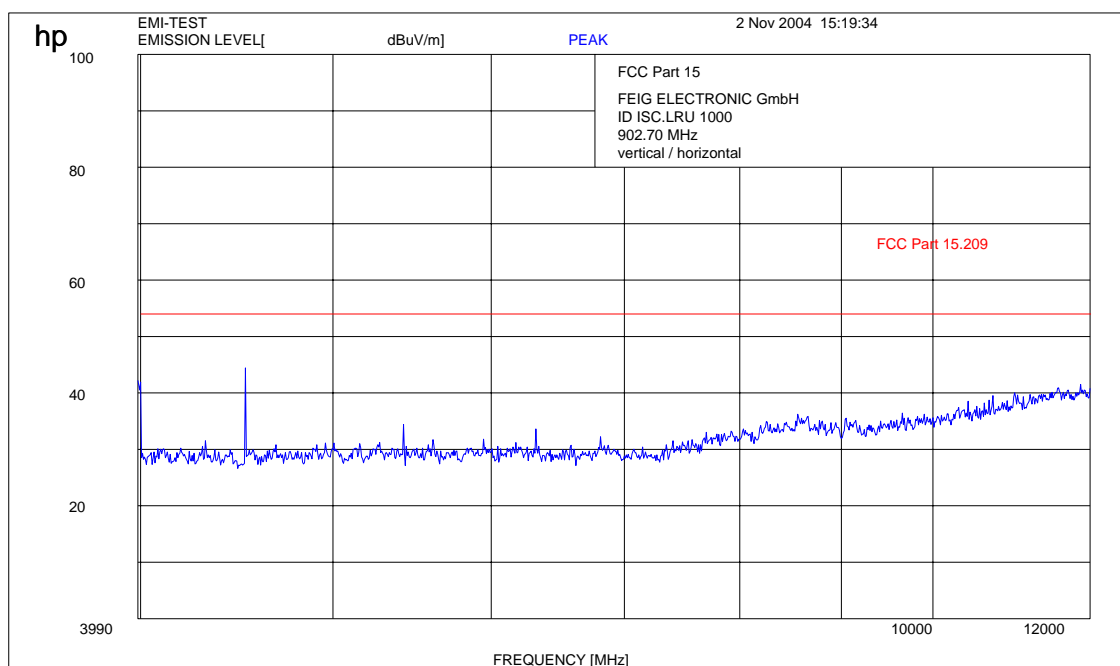
Note: For emissions that fall into restricted bands you find the radiated emissions later in the report.

### 3.15 Spurious Emissions - radiated (Transmitter) § 15.247 (c) (1)

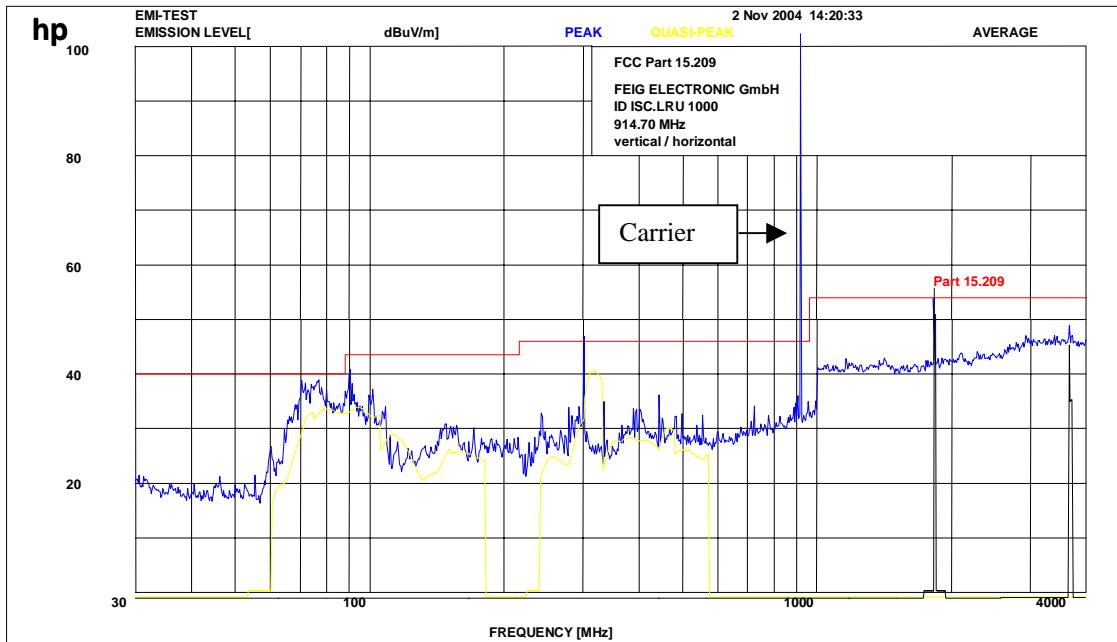
Plot : 0.03 - 4 GHz vertical/horizontal (lowest channel)



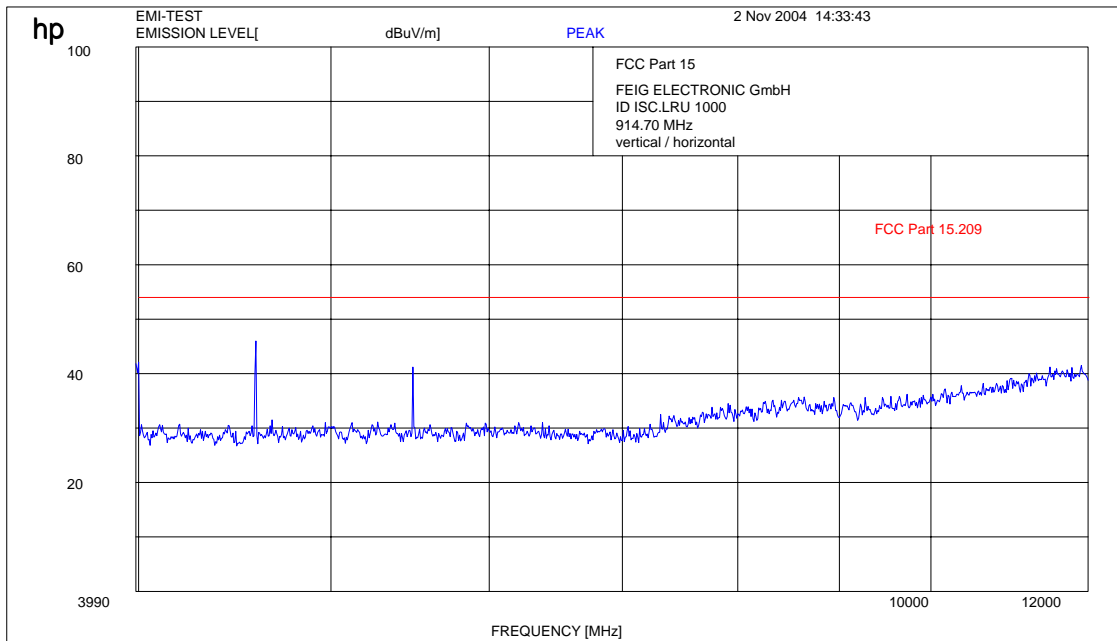
Plot : 4- 12 GHz vertical/horizontal (lowest channel)



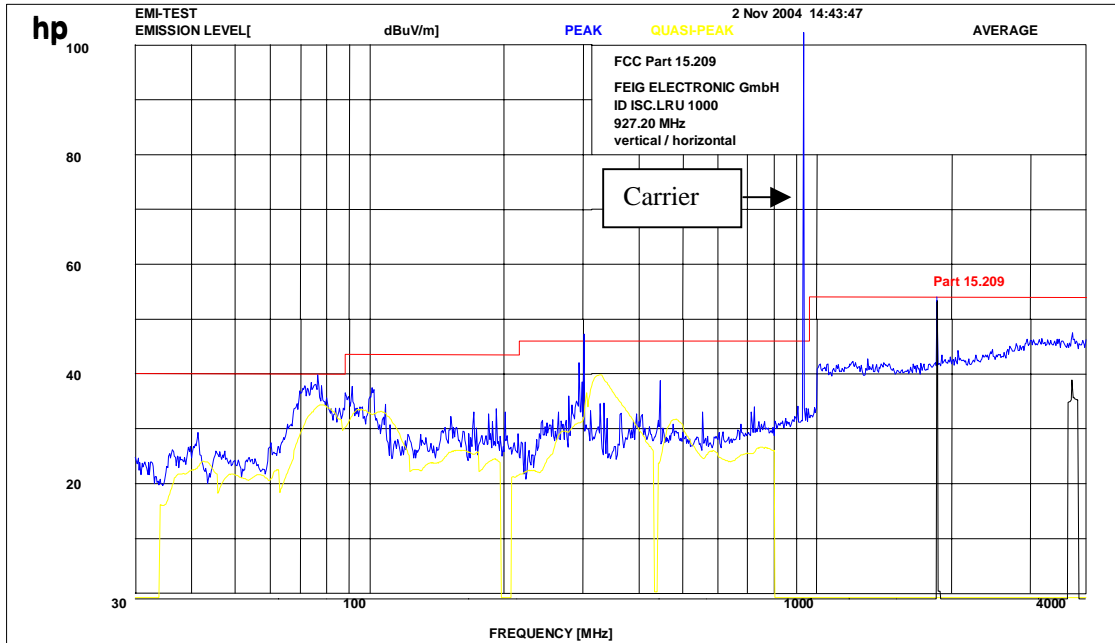
Plot : 0.03 - 4 GHz vertical/horizontal (middle channel)



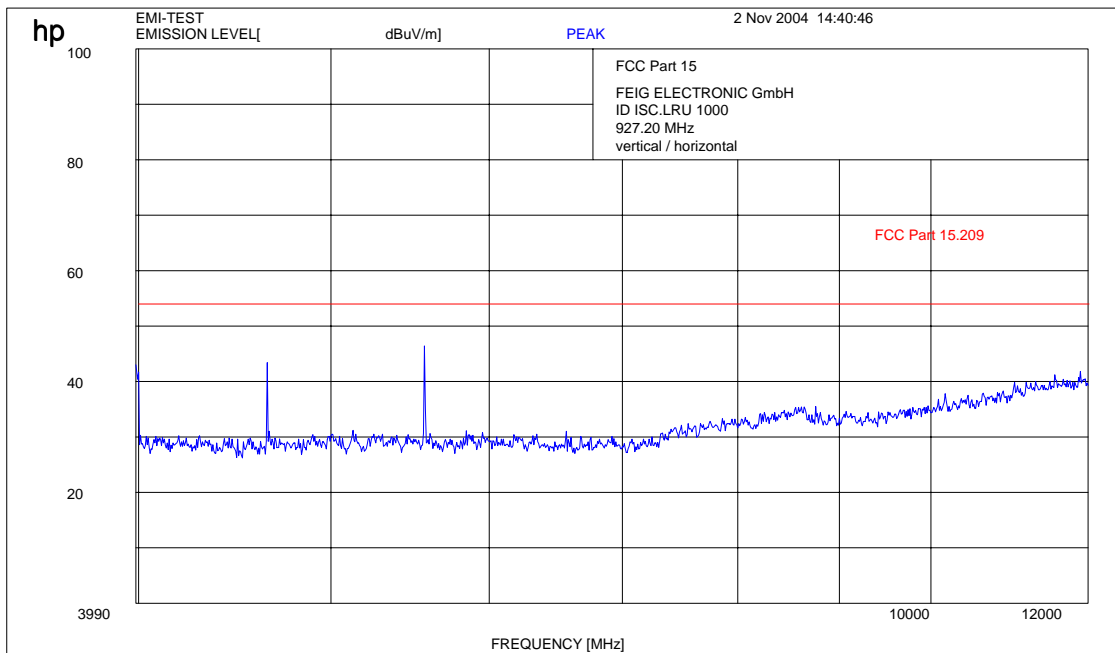
Plot : 4- 12 GHz vertical/horizontal (middle channel)



Plot : 0.03 - 4 GHz vertical/horizontal (highest channel)



Plot : 4- 12 GHz vertical/horizontal (highest channel)



Results:

SPURIOUS EMISSIONS LEVEL ( $\mu\text{V/m}$ )								
902.7 MHz			914.7 MHz			927.2 MHz		
F [MHz]	Detector	Level [ $\mu\text{V/m}$ ]	F [MHz]	Detector	Level [ $\mu\text{V/m}$ ]	F [MHz]	Detector	Level [ $\mu\text{V/m}$ ]
43.28	QP	14.3	93.7	QP	49.5	77,82	QP	52.5
78.2	QP	49.5	314.92	QP	107.2	325.88	QP	97.7
313.38	QP	133.3	465.61	QP	32,0	484.18	QP	38.9
408.04	QP	33.9	1829.4	AV	409.5	1854.4	AV	431.8
1805.4	AV	389.0	3658.8	AV	182,0	3708.8	AV	88.1
3610.8	AV	124.5	4573.5	PK	199.5	4636.0	PK	147.9
4513.5	PK	166.0	5488.2	PK	114.8	5563.2	PK	208.9
5416.2	PK	52.5						
6318.9	PK	47.9						
Measurement uncertainty			$\pm 3$ dB					

$f < 1$  GHz : RBW/VBW: 100 kHz

$f \geq 1$ GHz : RBW/VBW: 1 MHz

Limits: § 15.247 (c)

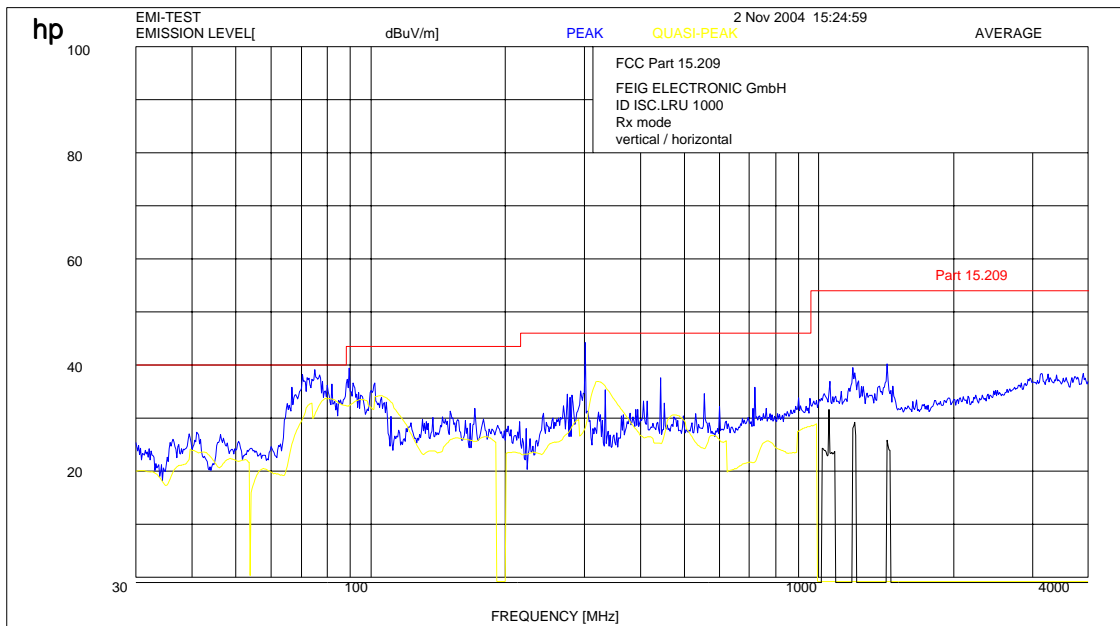
In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Limits: § 15.209

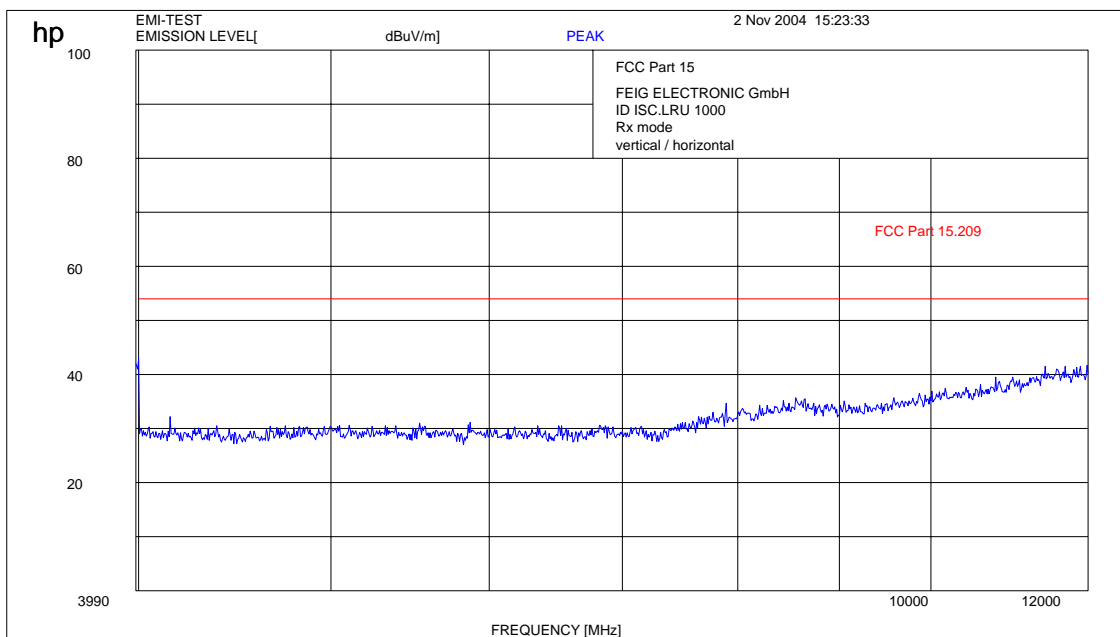
Frequency (MHz)	Field strength ( $\mu\text{V/m}$ )	Measurement distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30 / 29.5 dB $\mu\text{V/m}$	30
30 - 88	100 / 40 dB $\mu\text{V/m}$	3
88 - 216	150 / 43.5 dB $\mu\text{V/m}$	3
216 - 960	200 / 46 dB $\mu\text{V/m}$	3
above 960	500 / 54 dB $\mu\text{V/m}$	3

### 3.16 Spurious Emissions - radiated (Receiver) § 15.109

Plot : 0.03 - 4 GHz vertical/horizontal (receiver)



Plot : 4- 12 GHz vertical/horizontal (receiver)



Spurious Emissions level [ $\mu\text{V/m}$ ]								
CH 1 / 2 / 3								
f[MHz]	Detector	Level [ $\mu\text{V/m}$ ]	f[MHz]	Detector	Level [ $\mu\text{V/m}$ ]	f[MHz]	Detector	Level [ $\mu\text{V/m}$ ]
39.64	QP	16.0						
104.34	QP	51.3						
319.57	QP	70.0						
988.4	QP	27.9						
1053.2	AV	38.0						
1201.8	AV	28.8						
1419.1	AV	19.5						
Measurement uncertainty			$\pm 3 \text{ dB}$					

$f < 1 \text{ GHz}$  : RBW/VBW: 100 kHz

$f \geq 1 \text{ GHz}$  : RBW/VBW: 1 MHz

see above plots

Measurement distance see table

Limits : § 15.109

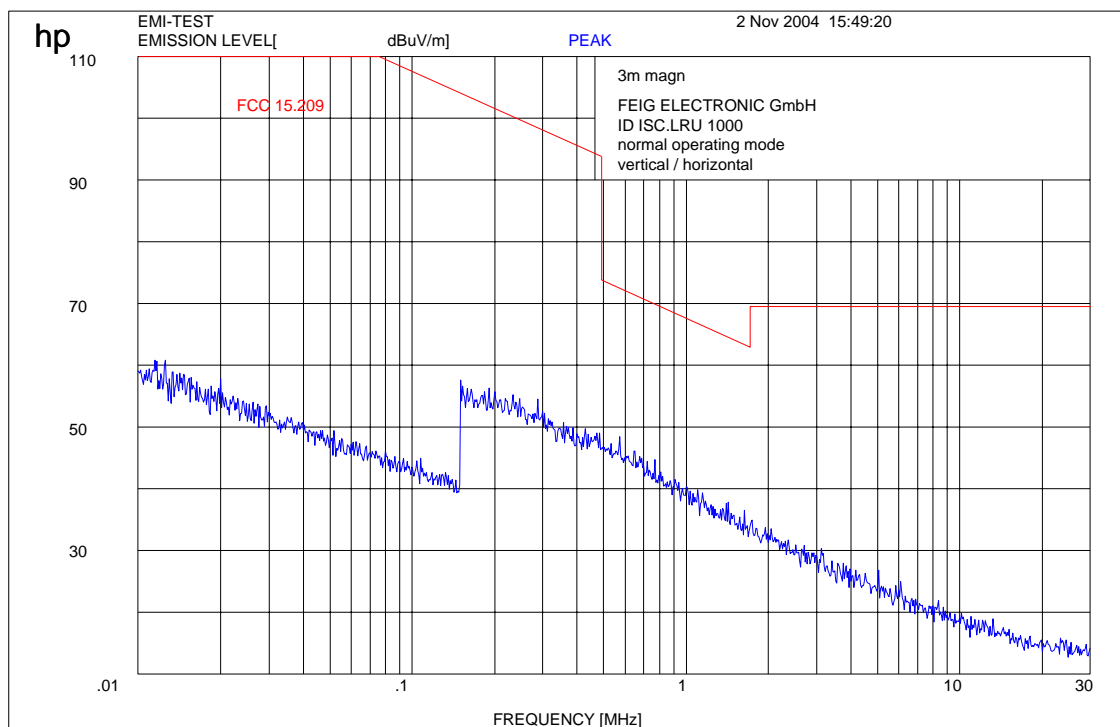
Frequency (MHz)	Field strength ( $\mu\text{V/m}$ )	Measurement distance (m)
30 - 88	100 (40 dB $\mu\text{V/m}$ )	3
88 - 216	150 (43.5 dB $\mu\text{V/m}$ )	3
216 - 960	200 (46 dB $\mu\text{V/m}$ )	3
above 960	500 (54 dB $\mu\text{V/m}$ )	3



**3.17 Spurious Emissions - radiated <30 MHz § 15.209**

Measured at 3 m distance.  
 Values recalculated with 40 dB/decade according to FCC rules.

Plot 1:



Limits:

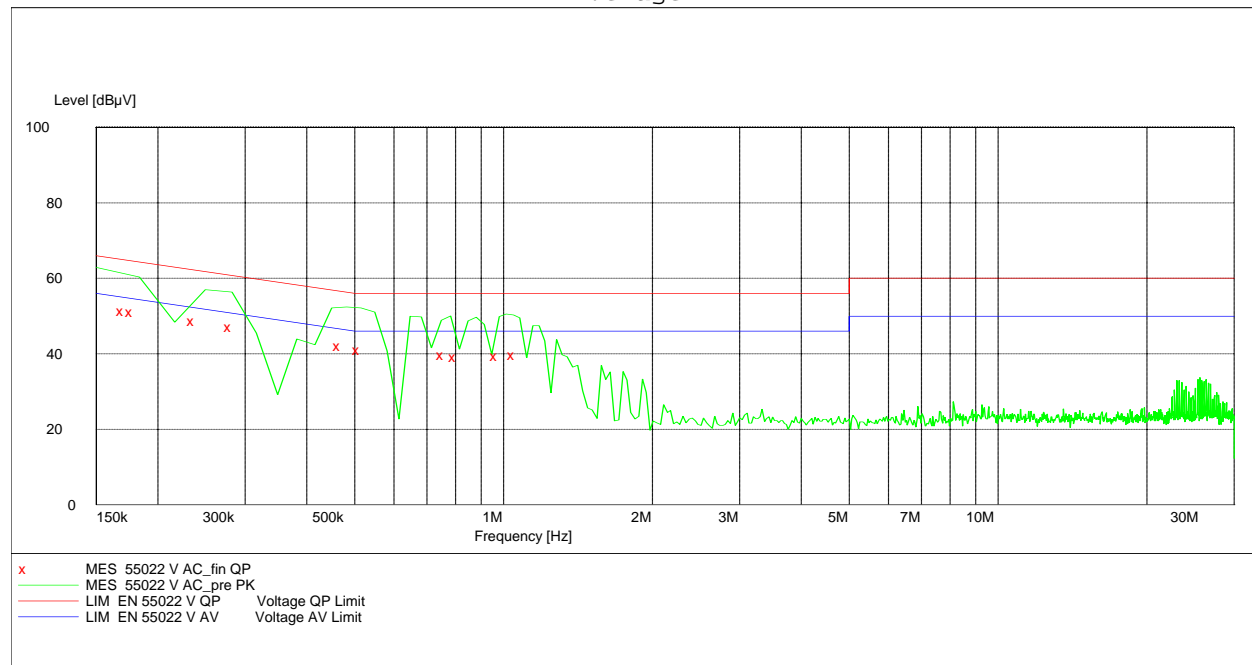
Frequency (MHz)	Field strength ( $\mu\text{V/m}$ )	Measurement distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30 / 29.5 dB $\mu\text{V/m}$	30
30 - 88	100 / 40 dB $\mu\text{V/m}$	3
88 - 216	150 / 43.5 dB $\mu\text{V/m}$	3
216 - 960	200 / 46 dB $\mu\text{V/m}$	3
above 960	500 / 54 dB $\mu\text{V/m}$	3

### 3.18 Conducted Emissions <30 MHz § 15.107/207

EUT: ID ISC.RU100  
 Manufacturer: FEIG ELECTRONIC GmbH  
 Operating Condition: normal operating mode  
 Test Site: CETECOM ICT Services Room 006  
 Operator: M. Berg  
 Test Specification: EN 55022 V / SISPR 22  
 Power Supply: 110C AC / 15 V DC Lab.-Power Supply  
 Start of Test: 19.11.04 / 07:36:50

#### 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						



#### MEASUREMENT RESULT: "55022 V AC\_fin QP"

19.11.04 07:41

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
0.172500	51.50	11.5	65	13.3	L1	FLO
0.180000	51.10	11.4	65	13.4	L1	FLO
0.240000	48.80	11.1	62	13.3	L1	FLO
0.285000	47.00	10.8	61	13.6	L1	FLO
0.472500	42.00	10.6	57	14.5	L1	GND
0.517500	41.00	10.6	56	15.0	L1	GND
0.765000	39.70	10.6	56	16.3	L1	FLO
0.810000	39.20	10.5	56	16.8	L1	FLO
0.982500	39.30	10.6	56	16.7	N	GND
1.065000	39.70	10.5	56	16.3	N	GND

Limits :

Under normal test conditions only	See plots
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## 3.19 Used Testequipment

### Anechoic chamber C:

Device	Manufacturer	Type	S/N Number	Inv. No. Cetecom
Spektrum Analyser	HP	8566B	2747A05306	300001000
Spektrum Analyser Display	HP	85662A	2816A16541	300002297
Quasi-Peak-Adapter	HP	85650A	2811A01131	300000999
Power Supply	HP	6032A	2818A03450	300001040
Power Attenuator	Byrd	8325	1530	300001595
Biconical Antenna	EMCO	3104	3758	300001602
Log. Period. Antenna	EMCO	3146	2130	300001603
Double Ridged Antenna	EMCO	HP 3115P	3088	300001032
Active Loop Antenna	EMCO	6502	2210	300001015
Antenna VDE/FCC		HP11965B		300002298
SRM-Drive	HP	9144A	2823e46556	300001044
Software	HP	EMI		300000983
Busisolator	Kontron			300001056
Absorberhalle	MWB		87400/02	300000996
Salzsäule	Kontron			300001055
Antenna	R&S	HMO20	832211/003	300002243
Indukt. Tast Antenna	R&S	HFH 2 Z4	881468/026	300001464
System-Rack	HP I.V.	85900	*	300000222
Spectrum Analyzer	HP	8566B	2747A05275	300000219
Quasi-Peak-Adapter	HP	85650A	2811A01135	300000216
RF-Preselector	HP	85685A	2837A00779	300000218
Rahmen Antenne	R&S	HFH2-Z2	891847-35	300001169
Leitungsteiler	HP	11850C		300000997
Breitband-Hornantenne EMI	HP	35155P		300002300
PC	HP	Vectra VL		300001688
VHF Meßantenne	Schwarzbeck	VHA 9103		300001778
Spectrum Analyzer Display	HP	85662A	2816A16497	300001690
VHF Meßantenna	Schwarzbeck	VHA 9103		300001780
Biconical Antenna	EMCO	3104 C	9909-4868	300002590

SRD Laboratory: (Bluetooth System)

No	Equipment/Type	Manufact.	Serial Nr.	Inv. No. Cetecom
1	System Controller PSM 12	R&S	835259/007	3000002681
2	Memory Extension PSM-K10	R&S	To 1	3000002681
3	Operating Software PSM-B2	R&S	To 1	3000002681
4	19'' Monitor		22759020-ED	3000002681
5	Mouse		LZE 0095/6639	3000002681
6	Keyboard		G00013834L461	3000002681
7	Spectrum Analyser FSIQ 26	R&S	835540/018	3000002681
8	Tracking Generator FSIQ-B10	R&S	835107/015	3000002681
10	RF-Generator SMIQ03 (B1 Signal)	R&S	835541/056	3000002681
11	Modulation Coder SMIQ-B20	R&S	To 10	3000002681
12	Data Generator SMIQ-B11	R&S	To 10	3000002681
13	RF Rear Connection SMIQ-B19	R&S	To 10	3000002681
14	Fast CPU SM-B50	R&S	To 10	3000002681

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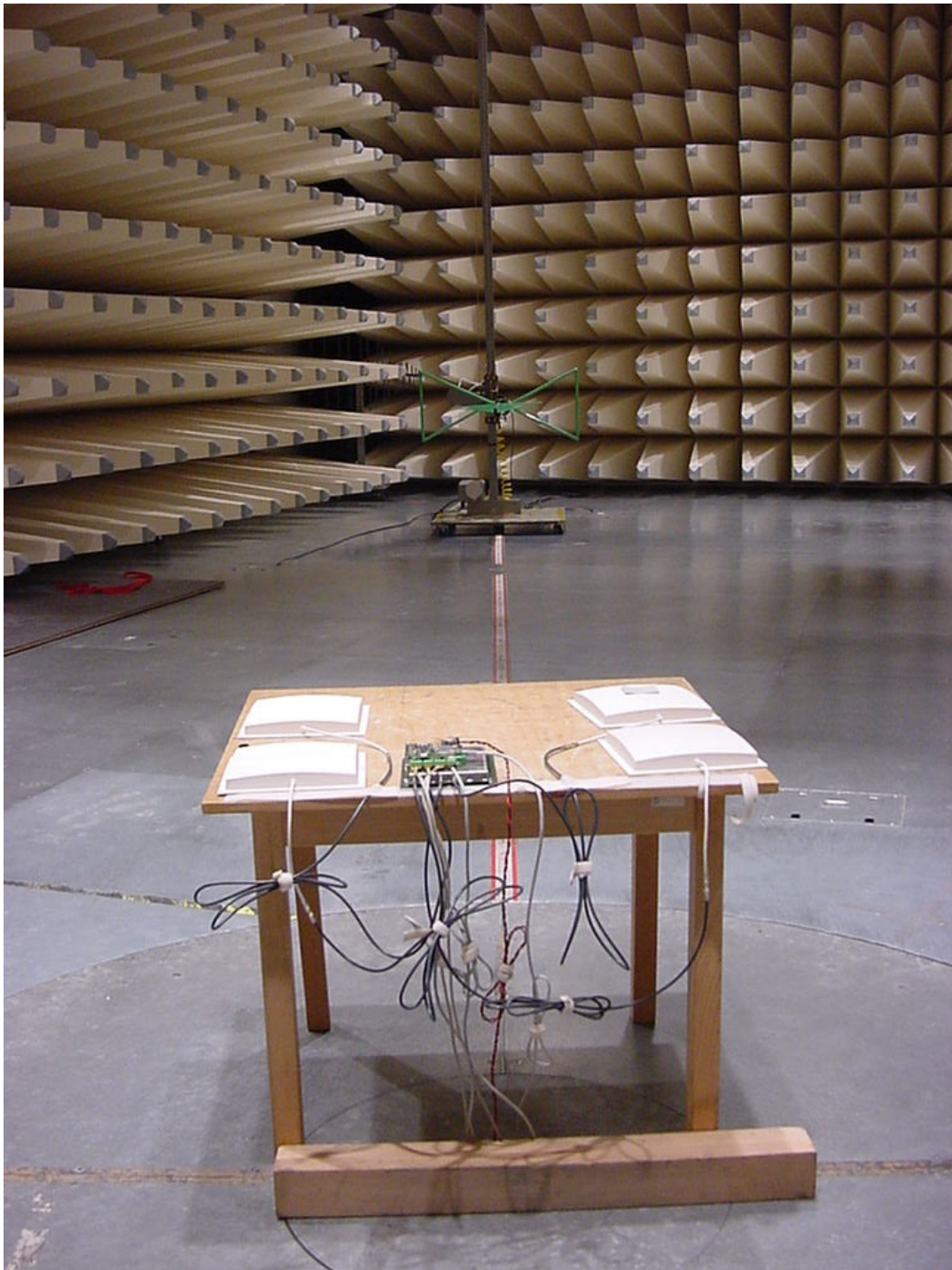
15	FM Modulator SM-B5	R&S	835676/033	3000002681
16	RF-Generator SMIQ03 (B2 Signal)	R&S	835541/055	3000002681
17	Modulation Coder SMIQ-B20	R&S	To 16	3000002681
18	Data Generator SMIQ-B11	R&S	To 16	3000002681
19	RF Rear Connection SMIQ-B19	R&S	To 16	3000002681
20	Fast CPU SM-B50	R&S	To 16	3000002681
21	FM Modulator SM-B5	R&S	836061/022	3000002681
22	RF-Generator SMP03 (B3 Signal)	R&S	835133/011	3000002681
23	Attenuator SMP-B15	R&S	835136/014	3000002681
24	RF Rear Connection SMP-B19	R&S	834745/007	3000002681
25	Power Meter NRVD	R&S	835430/044	3000002681
26	Power Sensor NRVD-Z1	R&S	833894/012	3000002681
27	Power Sensor NRVD-Z1	R&S	833894/011	3000002681
28	Rubidium Standard RUB	R&S	6197	3000002681
29	Switching and Signal Conditioning Unit SSCU	R&S	338864/003	3000002681
30	Laser Printer HP Deskjet 2100	HP	N/A	3000002681
31	19'' Rack	R&S	11138363000004	3000002681
32	RF-cable set	R&S	N/A	3000002681
33	IEEE-cables	R&S	N/A	3000002681
34	Sampling System FSIQ-B70	R&S	835355/009	3000002681
35	RSP programmable attenuator	R&S	834500/010	3000002681
36	Signalling Unit	R&S	838312/011	3000002681
37	NGPE programmable Power Supply for EUT	R&S	192.033.41	3000002681

## SRD Laboratory:

Device	Manufacturer	Type	S/N Number	Inv. No. Cetecom
Climatic box	Heraeus Vötsch	VT 4002	--	300003019
Signaling Unit	R&S	CMU200	832221/0055	300002862
Power Splitter	Inmet Corp.	6005-3	none	300002841
SMA Cables	Insulated Wire	SPS-1151-985-SPS	different	Different
Spectrum Analyser	R&S	FSIQ 26	1119.6001.27	300002678

## 4 Photographs

### 4.1 Test set-up (radiated emissions)



# SRD-Testreport

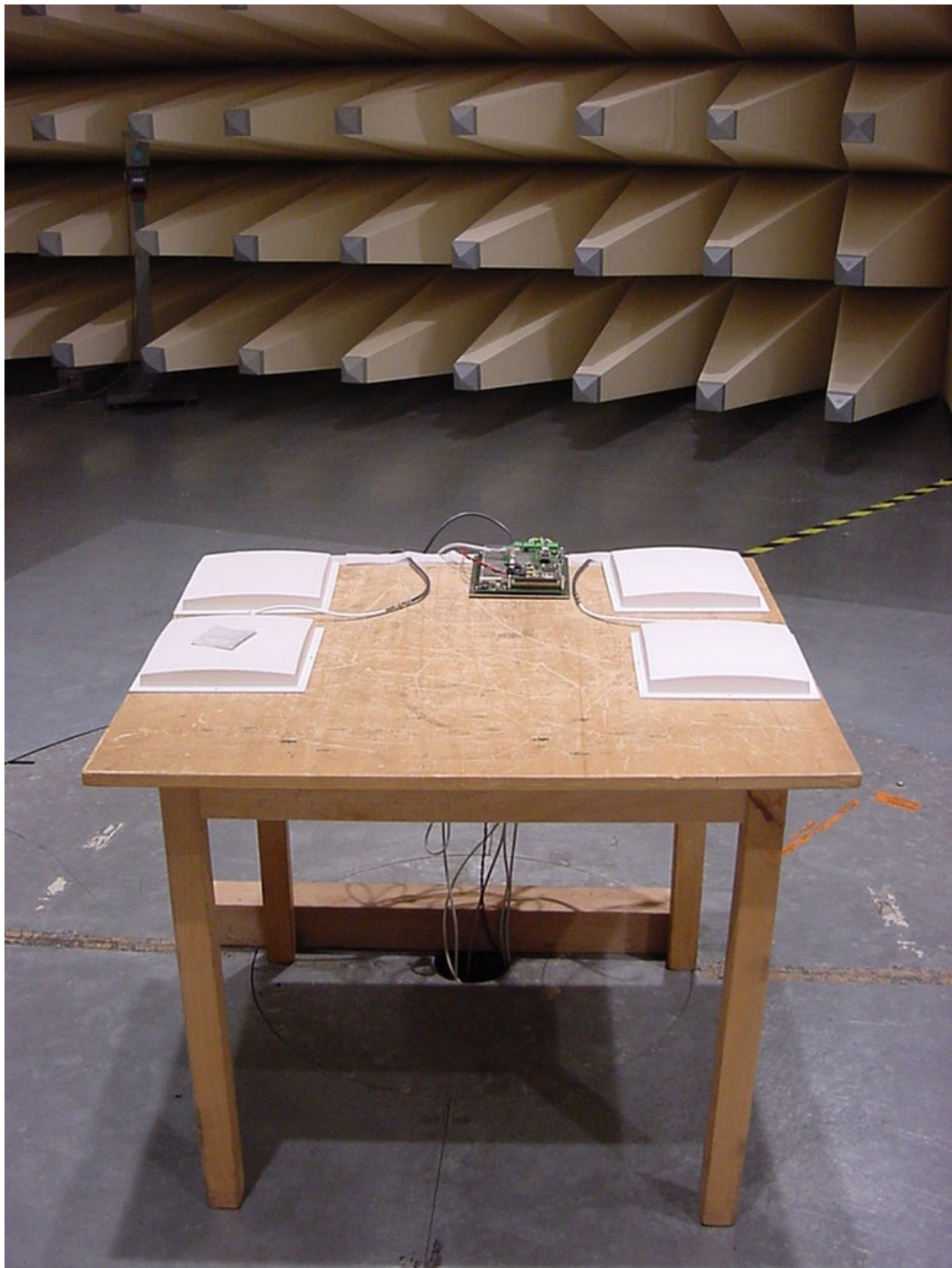
CETECOM ICT Services GmbH Saarbruecken, Germany



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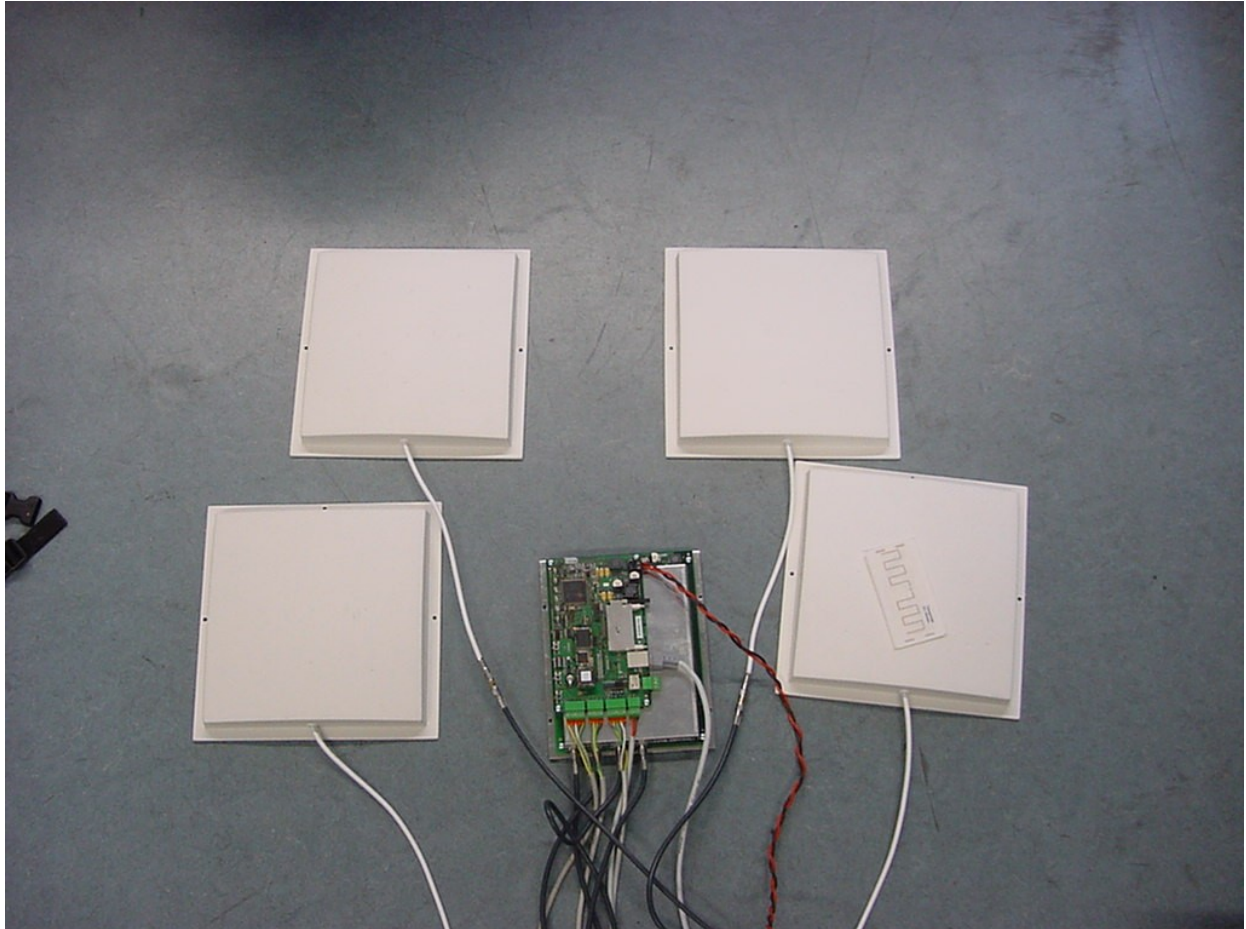
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#### 4.1 Test set-up (conducted emissions)



Photograph No.: 1





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Photograph No.: 2



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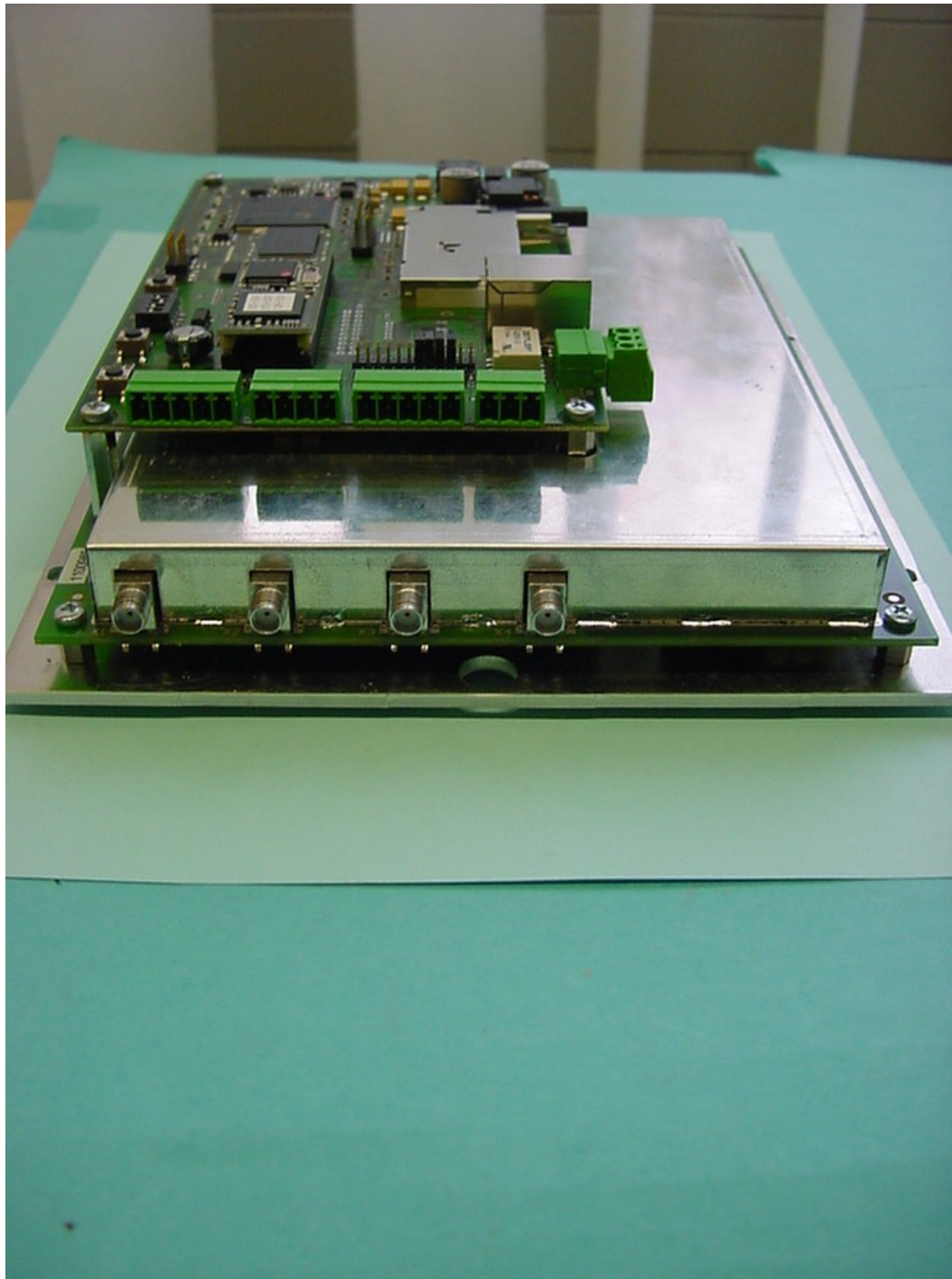


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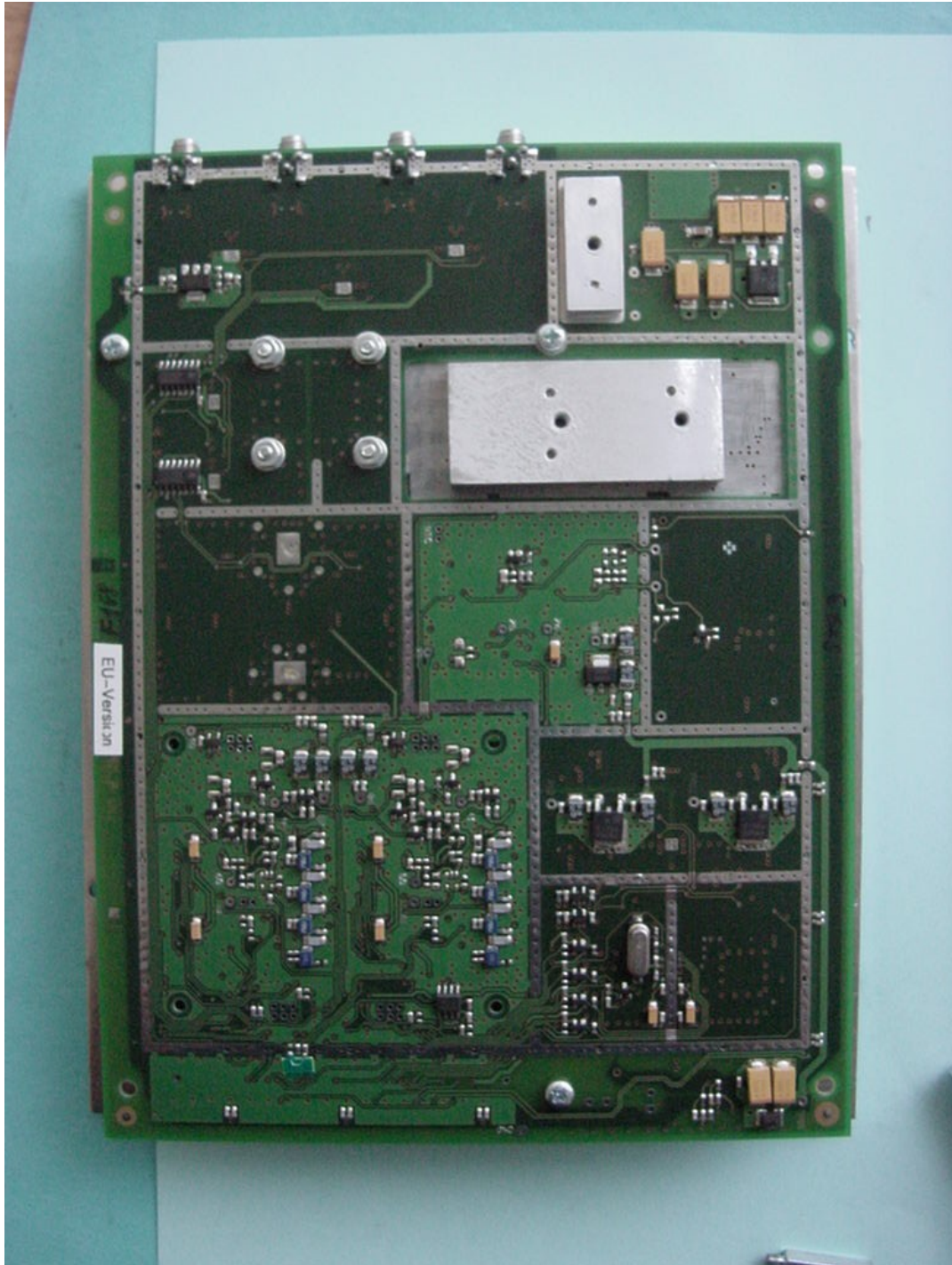


Test report No.: 2-3628-01-03/04

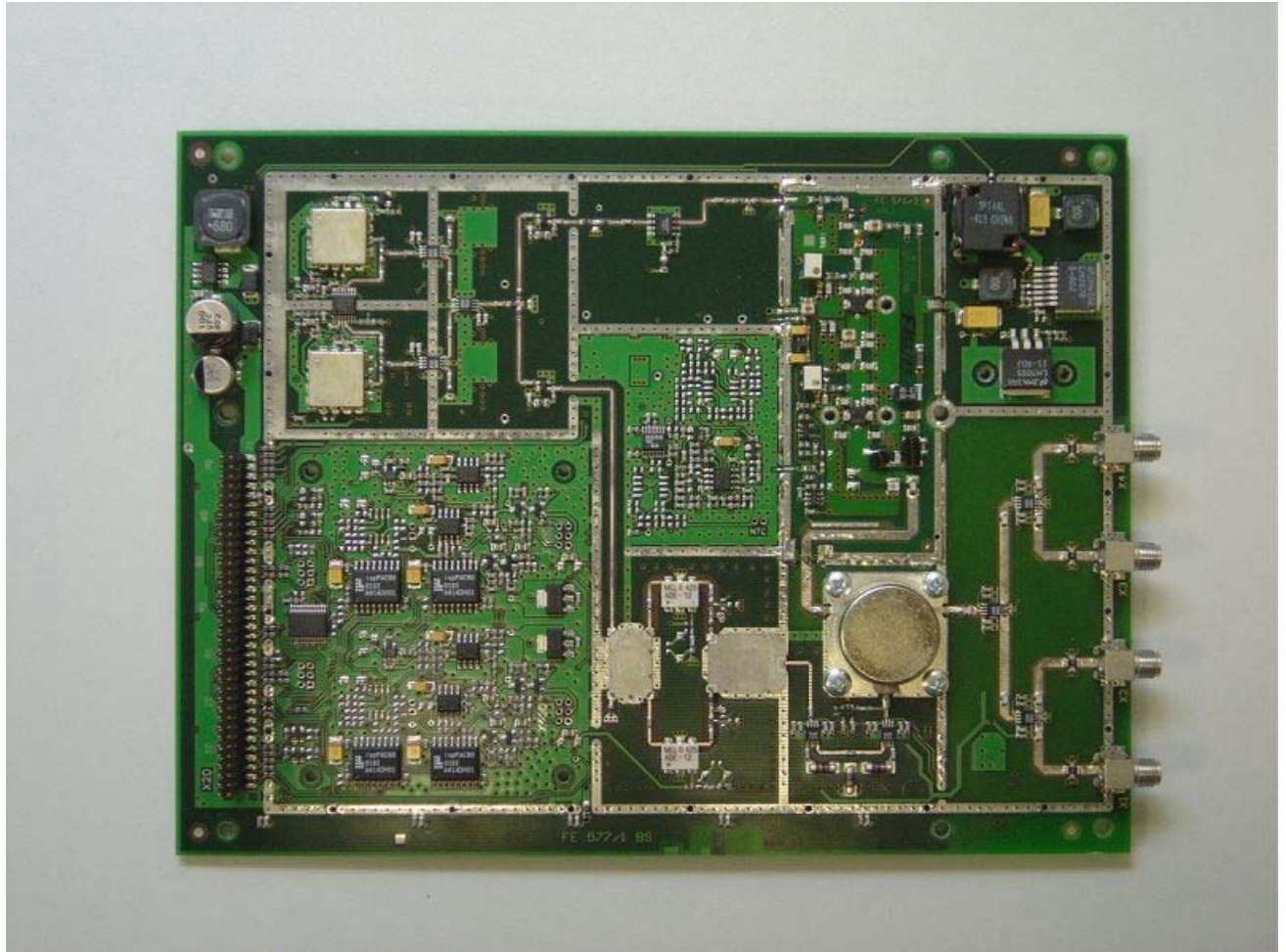
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Photograph No.: 6



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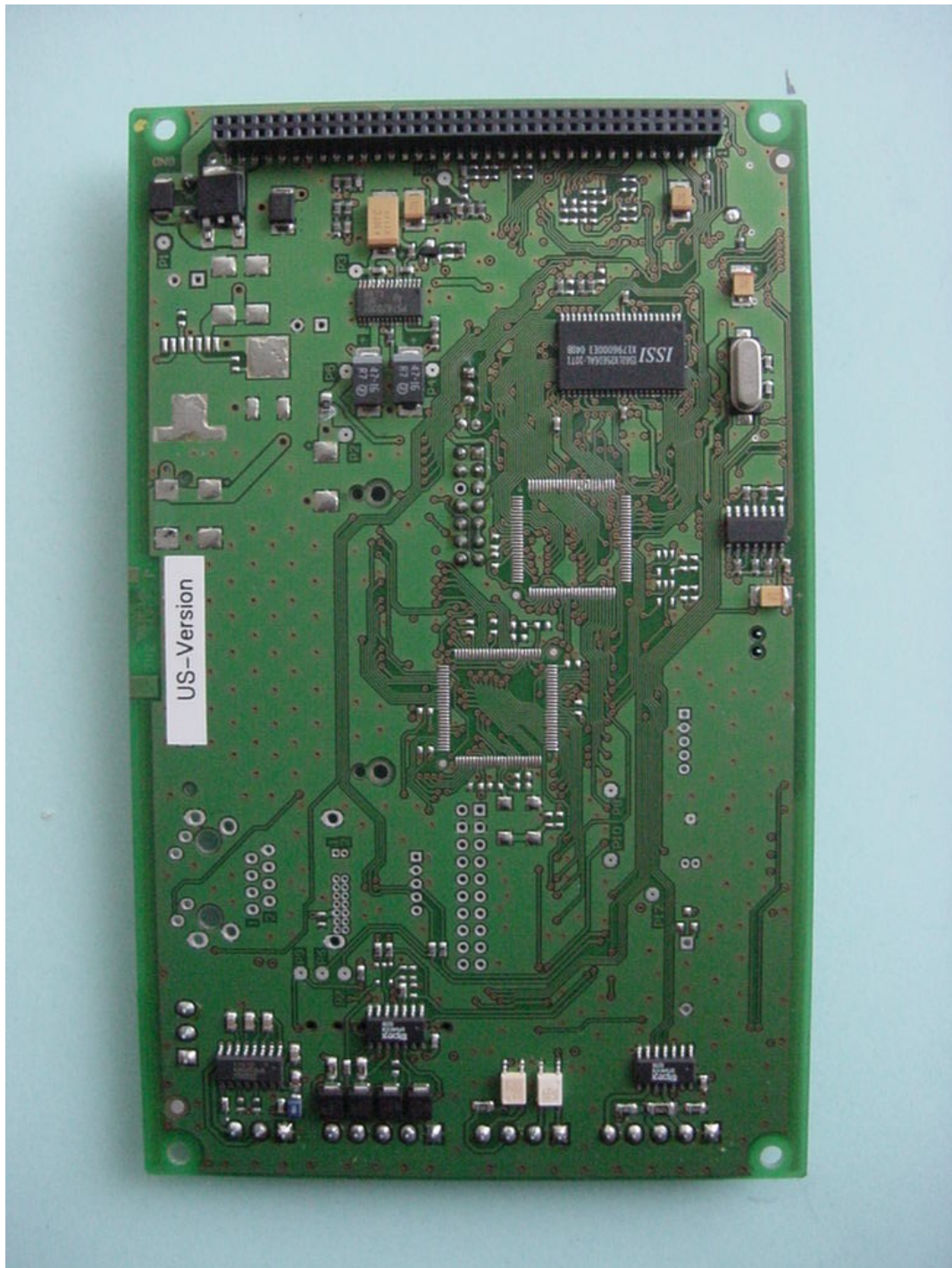


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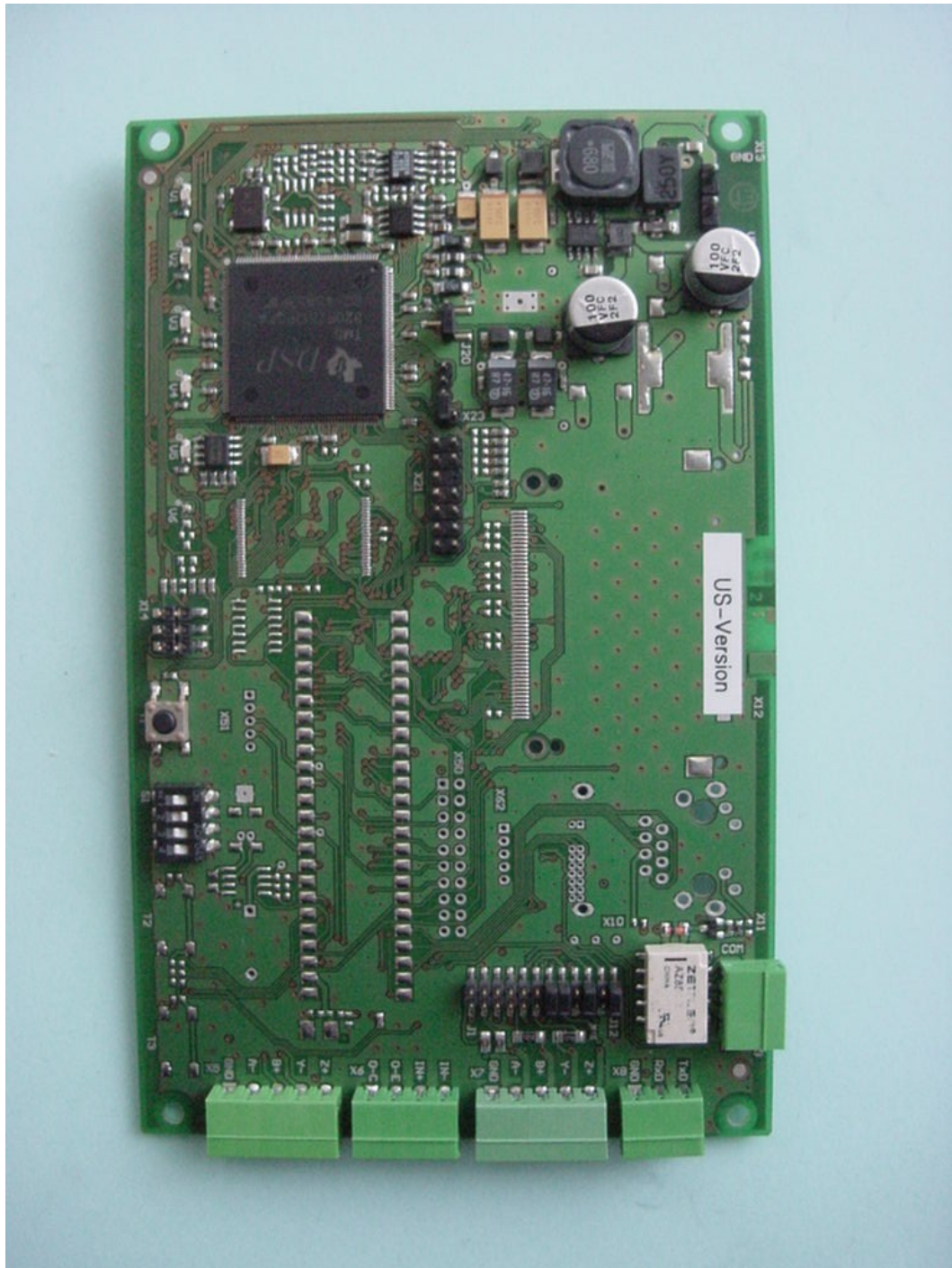


Test report No.: 2-3628-01-03/04

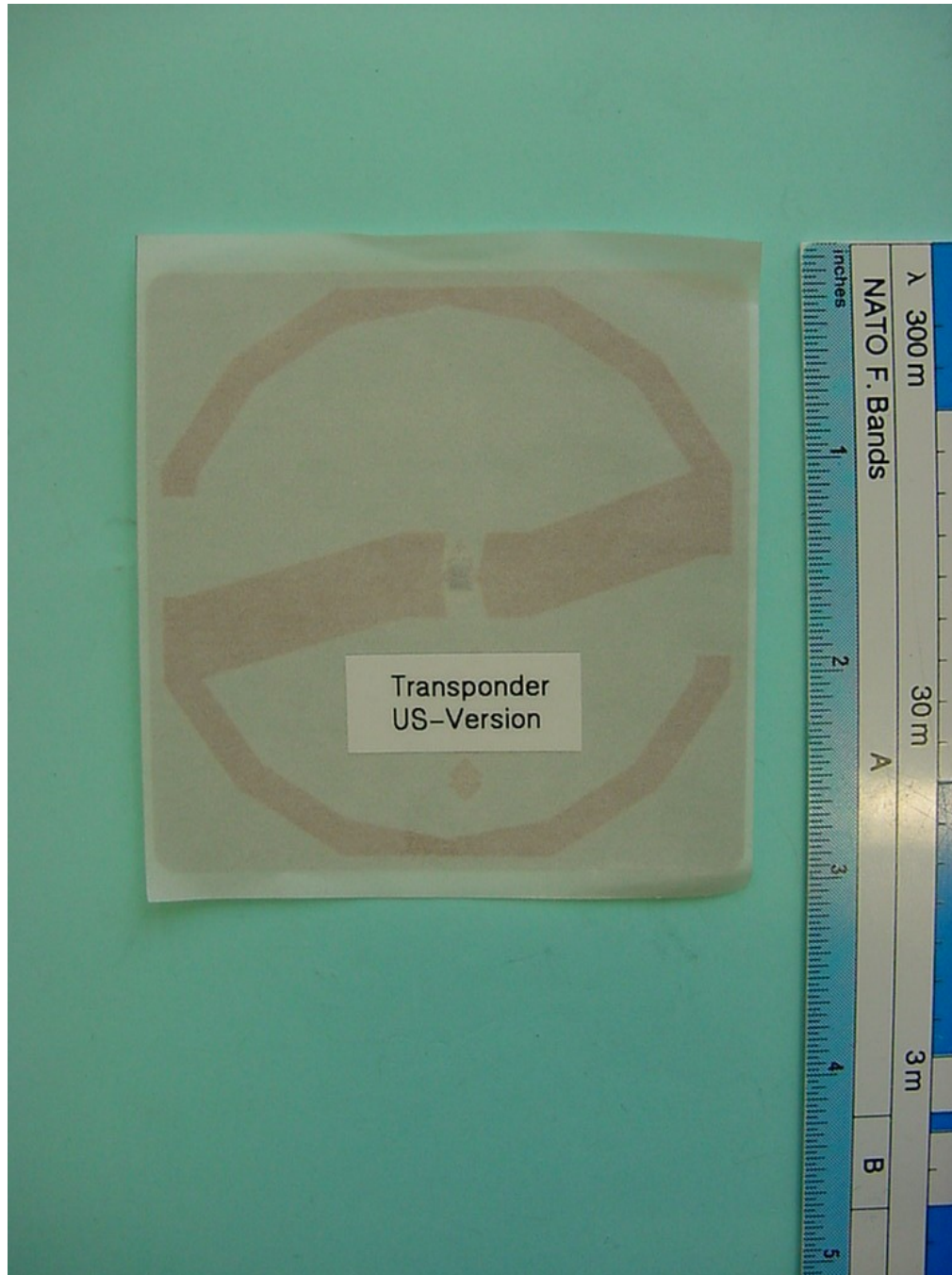
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Photograph No.: 8



Photograph No.: 9





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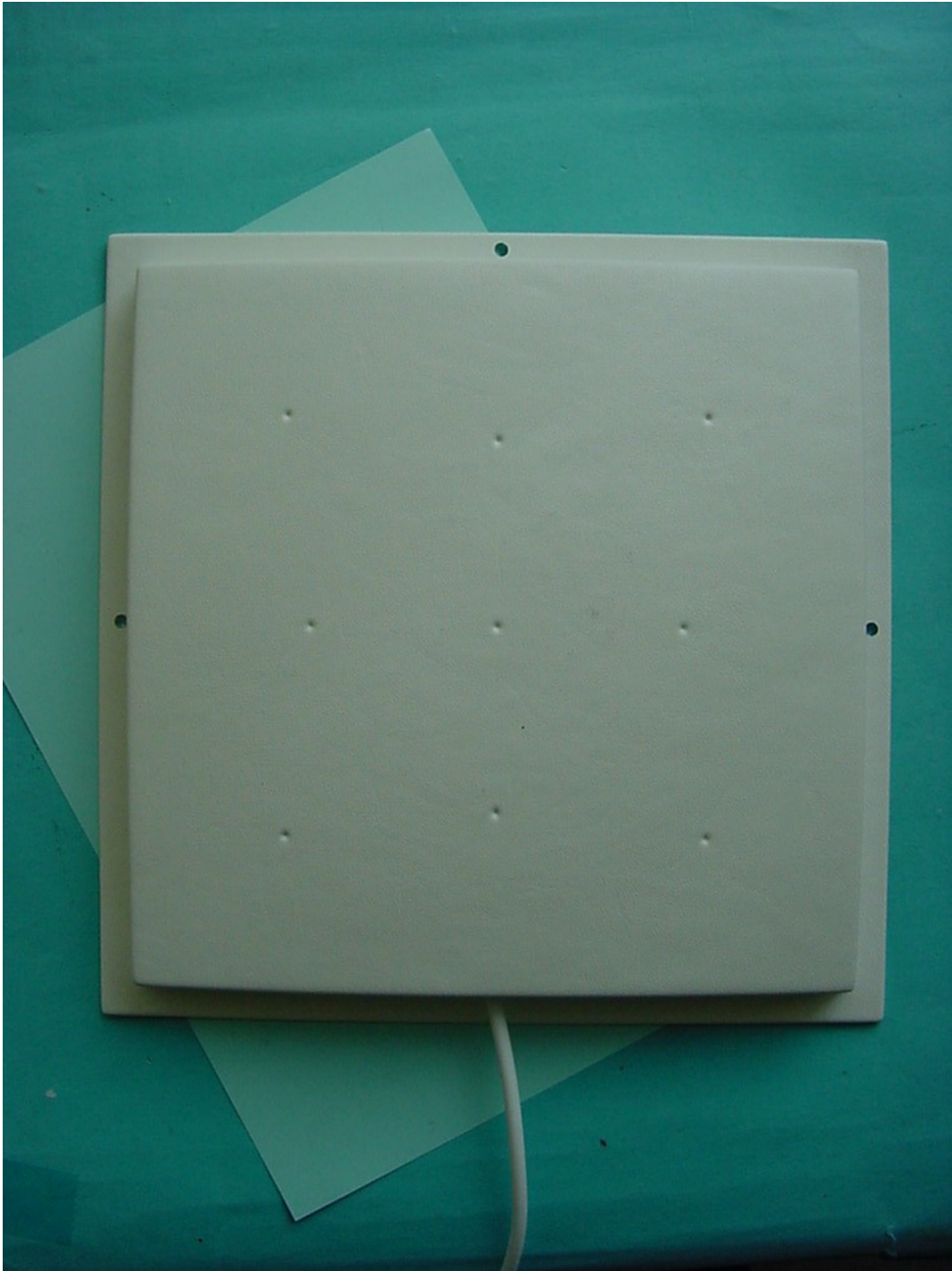


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Photograph No.: 10



Photograph No.: 11

