CETECOM

Prüfbericht
(Test Report)

Testreport no.: 2_2060-A/00
ETS 300 328
8001001
ROANA 201 132

CETECOM ICT Services GmbH
Untertürkheimer Straße 6-10
D-66117 Saarbrücken

CETECOM ICT Services GmbH

Radio Satelite Communication
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Akkreditiertes Prüflaboratorium

DAR-Registriernummer:
TTI-P-G 166/98-00 vom 19.09.98

Testreport no.: 2_2060-A/00
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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. The 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. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM ICT Services GmbH.

1.2 Testing laboratory

CETECOM ICT Services GmbH
66117 Saarbrücken
Untertürkheimer Straße 6 - 10
Deutschland
Telefone : + 49 681 598 - 9100
Telefax : + 49 681 598 - 9075
E-mail : Michael.Berg@ict.cetecom.de
Internet : info@ict.cetecom.de
Accredited testing laboratory
DAR-registration number : TTI-P-G-166/98-00 vom 18.09.98

1.3 Details of applicant

Name : Ericsson Radio Systems BV
Street : Nieuw Amsterdamsestraat 40
City : NL-7801 CA Emmen
Country : The Netherlands
Telephone : +31 591 637 777
Telefax : +31 591 632 001
Contact : Mr. Jens Lehmann
Telephone: +31 591 637 777

1.4 Application details

Date of receipt of application : 14.03.2000
Date of receipt of test item : 21.03.2000
Date of test : 21.03.2000

1.5 Test item

Type of equipment	:	**Bluetoothmodul**
Type designation	:	**8001001 (ROANA 201 132)**
Manufacturer	:	applicant
Street	:	
City	:	
Country	:	
Serial number	:	-,-
Additional informations: :		
Frequency	:	2400,0 - 2483,5
Type of modulation	:	24M0FXD (FHSS)
Number of channels	:	79
Antenna	:	+1,0 dBi antenna
Power supply	:	3,3V DC
Type of equipment	:	Temperature range : 0°C - +75°C

1.6 Test standards

ETS 300 328 (Issue : November 1996)

meets also the requirements of the ETS 300 440 (Issue : December 1995)

2 Technical test

2.1 Summary of test results

No deviations from the technical specification(s) were ascertained in the course of the tests performed.

Technical responsibility for area of testing :

22.03.00	RSC 8411	Berg M.	
Date	**Section**	**Name**	**Signature**

22.03.00	RSC 8414	Ames H.	
Date	**Section**	**Name**	**Signature**

2.2 Testreport

TEST REPORT

BAPT 211 ZV 126
I-ETS 300 328

Testreport no: 2_2060-A/009

LIST OF MEASUREMENTS.

The list of measured parameters called for in ETS 300 328 is given below.

Equipment under test : 8001001 (ROANA 201 132)
Ambient temperature : 23°C
Relative humidity : 34%

TRANSMITTER E.I.R.P. **CLAUSE 7.2.1**

Rated output power **Av : +1,0 dBm /-29,0 dBW**

Antenna assembly gain **+1 dBi (when applicable)**

Duty cycle of the equipment during the test x = 0,280 (see clause 7.2.1 step 1)

TEST CONDITIONS		TRANSMITTER POWER (dBm)		
		lowest frequency	middle frequency	highest frequency
T_{nom}(23)°C	V_{nom}(3,3)V	Av= -0,8 dBm Pk= +0,46 dBm	Av= +0,08dBm Pk= +0,72 dBm	Av= -0,35 dBm Pk= +0,42 dBm
T_{min}(± 0,0)°C	V_{min}(3,175)V	Av= -0,07 dBm Pk= -+0,33 dBm	Av= +0,40 dBm Pk= +0,92 dBm	Av= -0,17 dBm Pk= +0,88 dBm
	V_{max}(5,25)V	Av= -0,07 dBm Pk= +0,36dBm	Av= +0,40 dBm Pk= +0,92 dBm	Av= +0,15 dBm Pk= +0,85 dBm
T_{max}(+75)°C	V_{min}(3,175)V	Av= -0,55 dBm Pk= -0,06 dBm	Av= -0,90 dBm Pk= -0,28 dBm	Av= -1,30 dBm Pk= -0,47 dBm
	V_{max}(5,25)V	Av= -0,55 dBm Pk= -0,06 dBm	Av= -0,90 dBm Pk= -0,11 dBm	Av= -1,33 dBm Pk= -0,48 dBm
Measurement uncertainty		± 1,5 dB		

Note : Av is the average power as defined in clause 7.2.1 step 2 (P)
Pk is the peak power as defined in clause 7.2.1 step 4 (C+G)

LIMITS: (CLAUSE 5.2.1)

Under all test conditions	Av : 20dBm/-10dBW Pk : 23dBm/- 7dBW

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 - 24

Equipment under test : 8001001 (ROANA 201 132)
Ambient temperature : 23°C
Relative humidity : 34%

TRANSMITTER POWER DENSITY - FHSS and other types of modulation **CLAUSE 7.2.2**

Rated radiated power +0,46 / +0,72 / +0,42 dBm

TESTS	Measured Power Density		
	lowest frequency 2402 MHz	middle frequency 2440 MHz	highest frequency 2480 MHz
Measured power density	+1,18dBm /100kHz	+1,63 dBm /100kHz	+1,23 dBm /100kHz
Measurement uncertainty	± 1.5 dB		

LIMITS: **Clause 5.2.2**

Under normal test conditions only	-10dBW/100kHz 20dBm/100kHz

Is Tx on Time < 10 microseconds : no

If yes, then the test method used is that agreed between the National Regulatory Authority, the appointed test house, the accreditation authority and the applicant;
the test method reference is as follows:

.....

and the basic description of the method of measurement is as follows:

.....

see ETS 300 228

.....

.....

.....

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 - 24

Equipment under test : 8001001 (ROANA 201 132)
Ambient temperature : 23°C
Relative humidity : 34%

TRANSMITTER FREQUENCY RANGE - FHSS and other equipment **CLAUSE 7.2.3**

TEST CONDITIONS		FREQUENCY (MHz) at which -80 dBm/Hz occurs	
		lowest	highest
T_{nom}(23)°C	V_{nom}(3,3)V	2401,163	2482,788
T_{min}(± 0,0)°C	V_{min}(3,175)V	2401,306	2482,756
	V_{max}(5,25)V	2401,281	2482,756
T_{max}(+75)°C	V_{min}(3,175)V	2401,319	2482,763
	V_{max}(5,25)V	2401,319	2482,763
Measured frequencies (lowest and highest)		f_L = 2401,163 MHz	f_H = 2482,788 MHz
Measurement uncertainty		± 1 x 10^{-5}	

LIMITS: **Clause 5.2.1**

Under all test conditions	f_L > 2400 MHz	f_H < 2483.5 MHz

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 - 24

Equipment under test : 8001001 (ROANA 201 132)
Ambient temperature : 23°C
Relative humidity : 34%

TRANSMITTER SPURIOUS EMISSIONS (CONDUCTED) **CLAUSE 7.2.5**

Transmitter operating

lowest			highest		
f (MHz)	Band-width (kHz)	Level (dBm)	f (MHz)	Band-width (kHz)	Level (dBm)
4804	100	-54,29	4964	100	-52,27
Measurement uncertainty	± 6 dB				

LIMITS: Clause 5.2.4

Frequency Range	Narrowband spurious emissions		Wideband spurious emissions	
	Limit when operating	Limit when in standby	Limit when operating	Limit when in standby
30 MHz - 1 GHz	-36 dBm	-57 dBm	-86 dBm/Hz	-107 dBm/Hz
above 1 GHz - 12,75 GHz	-30 dBm	-47 dBm	-80 dBm/Hz	-97 dBm/Hz
1,8 - 1,9 GHz 5,15 - 5,3 GhZ	-47 dBm	-47 dBm	-97 dBm/Hz	-97 dBm/Hz

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 - 24

Equipment under test : 8001001 (ROANA 201 132)
Ambient temperature : 23°C
Relative humidity : 34%

TRANSMITTER SPURIOUS EMISSIONS (CONDUCTED) **CLAUSE 7.2.5**

Transmitter on standby

lowest			highest		
f (MHz)	Band-width (kHz)	Level (dBm)	f (MHz)	Band-width (kHz)	Level (dBm)
no	peak	found	no	peak	found
Measurement uncertainty	± 6 dB				

LIMITS: Clause 5.2.4

Frequency Range	Narrowband spurious emissions		Wideband spurious emissions	
	Limit when operating	Limit when in standby	Limit when operating	Limit when in standby
30 MHz - 1 GHz	-36 dBm	-57 dBm	-86 dBm/Hz	-107 dBm/Hz
above 1 GHz - 12,75 GHz	-30 dBm	-47 dBm	-80 dBm/Hz	-97 dBm/Hz
1,8 - 1,9 GHz 5,15 - 5,3 GhZ	-47 dBm	-47 dBm	-97 dBm/Hz	-97 dBm/Hz

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 - 24

Equipment under test : 8001001 (ROANA 201 132)
Ambient temperature : 23°C
Relative humidity : 34%

TRANSMITTER SPURIOUS EMISSIONS (RADIATED) **CLAUSE 7.2.5**

Transmitter operating

lowest			highest		
f (MHz)	Band-width (kHz)	Level (dBm)	f (MHz)	Band-width (kHz)	Level (dBm)
no	peaks	found	no	peaks	found
Measurement uncertainty		± 6 dB			

LIMITS: Clause 5.2.4

Frequency Range	Narrowband spurious emissions		Wideband spurious emissions	
	Limit when operating	Limit when in standby	Limit when operating	Limit when in standby
30 MHz - 1 GHz	-36 dBm	-57 dBm	-86 dBm/Hz	-107 dBm/Hz
above 1 GHz - 12,75 GHz	-30 dBm	-47 dBm	-80 dBm/Hz	-97 dBm/Hz
1,8 - 1,9 GHz 5,15 - 5,3 GhZ	-47 dBm	-47 dBm	-97 dBm/Hz	-97 dBm/Hz

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 - 24

Equipment under test : 8001001 (ROANA 201 132)
Ambient temperature : 23°C
Relative humidity : 34%

TRANSMITTER SPURIOUS EMISSIONS (RADIATED) **CLAUSE 7.2.5**

Transmitter on standby

lowest			highest		
f (MHz)	Band-width (kHz)	Level (dBm)	f (MHz)	Band-width (kHz)	Level (dBm)
no	peak	found	no	peak	found
Measurement uncertainty		± 6 dB			

LIMITS: **Clause 5.2.4**

Frequency Range	Narrowband spurious emissions		Wideband spurious emissions	
	Limit when operating	Limit when in standby	Limit when operating	Limit when in standby
30 MHz - 1 GHz	-36 dBm	-57 dBm	-86 dBm/Hz	-107 dBm/Hz
above 1 GHz - 12,75 GHz	-30 dBm	-47 dBm	-80 dBm/Hz	-97 dBm/Hz
1,8 - 1,9 GHz 5,15 - 5,3 GhZ	-47 dBm	-47 dBm	-97 dBm/Hz	-97 dBm/Hz

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 - 24

Equipment under test : 8001001 (ROANA 201 132)
Ambient temperature : 23°C
Relative humidity : 34%

RECEIVER SPURIOUS RADIATIONS (CONDUCTED) **CLAUSE 7.3.2**

lowest			highest		
f (MHz)	Band-width (kHz)	Level (dBm)	f (MHz)	Band-width (kHz)	Level (dBm)
2402	100	-62,12	2482	100	-63,41
Measurement uncertainty		± 6 dB			

LIMITS: Clause 5.2.4

Frequency range	Narrowband spurious emission	Wideband spurious emission
30 MHz - 1 GHz	-57 dBm	-107 dBm/Hz
above 1 GHz - 12,75 GHz	-47 dBm	-97 dBm/Hz

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 - 24

Equipment under test : 8001001 (ROANA 201 132)
Ambient temperature : 23°C
Relative humidity : 34%

RECEIVER SPURIOUS RADIATIONS (RADIATED) **CLAUSE 7.3.2**

lowest			highest		
f (MHz)	Band-width (kHz)	Level (dBm)	f (MHz)	Band-width (kHz)	Level (dBm)
<1000	100	<<-70,0	<1000	100	<<-70,0
> 4000	100	no peaks found	> 4000	100	no peaks found
Measurement uncertainty		± 6 dB			

LIMITS: Clause 5.2.4

Frequency range	Narrowband spurious emission	Wideband spurious emission
30 MHz - 1 GHz	-57 dBm	-107 dBm/Hz
above 1 GHz - 12,75 GHz	-47 dBm	-97 dBm/Hz

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 - 24

TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.

No	Instrument/Ancillary	Type	Manufacturer	Serial No.
01	Spectrum Analyzer	8566 A	Hewlett-Packard	1925A00257
02	Analyzer Display	8566 A	Hewlett-Packard	1925A00860
03	Oscilloscope	7633	Tektronix	230054
04	Radio Analyzer	CMTA 54	Rohde & Schwarz	894 043/010
05	System Power Supply	6038 A	Hewlett-Packard	2848A07027
06	Signal Generator	8111 A	Hewlett-Packard	2215G00867
07	Signal Generator	8662 A	Hewlett-Packard	2224A01012
08	Funktionsgenerator	AFGU	Rohde & Schwarz	862 480/032
09	Regeltrenntrafo	MPL	Erfi	91350
10	Netznachbildung	NNLA 8120	Schwarzbeck	8120331
11	Relais-Matrix	PSU	Rohde & Schwarz	893 285/020
12	Power-Meter	436 A	Hewlett-Packard	2101A12378
13	Power-Sensor	8484 A	Hewlett-Packard	2237A10156
14	Power-Sensor	8482 A	Hewlett-Packard	2237A00616
15	Modulationsmeter	9008	Racal-Dana	2647
16	Frequenzzähler	5340 A	Hewlett-Packard	1532A03899
17	Absorber Schirmkabine	---	MWB	87400/002
18	Spectrum Analyzer	85660 B	Hewlett-Packard	2747A05306
19	Analyzer Display	85662 A	Hewlett-Packard	2816A16541
20	Quasi Peak Adapter	85650 A	Hewlett-Packard	2811A01131
21	RF-Preselector	85685 A	Hewlett-Packard	2833A00768
22	Biconical Antenne	3104	Emco	3758
23	Log. Per. Antenne	3146	Emco	2130
24	Double Ridge Horn	3115	Emco	3088
25	EMI-Testreceiver	ESAI	Rohde & Schwarz	863 180/013
26	EMI-Analyzer-Display	ESAI-D	Rohde & Schwarz	862 771/008
27	Biconical Antenne	HK 116	Rohde & Schwarz	888 945/013
28	Log. Per. Antenne	HL 223	Rohde & Schwarz	825 584/002
29	Relais-Switch-Unit	RSU	Rohde & Schwarz	375 339/002
30	Highpass	HM985955	FSY Microwave	001
31	Amplifier	P42-GA29	Tron-Tech	B 23602
32	Absorber Schirmkabine		Frankonia	
33	Steuerrechner	PSM 7	Rohde & Schwarz	834 621/004
34	EMI Test Reciever	ESMI	Rohde & Schwarz	827 063/010
35	EMI Test Receiver	Display	Rohde & Schwarz	829 808/010

TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.

No	Instrument/Ancillary	Type	Manufacturer	Serial No.
36	Controler	HD 100	Deisel	100/322/93
37	Relais Matrix	PSN	Rohde & Schwarz	829 065/003
38	Control Unit	GB 016 A2	Rohde & Schwarz	344 122/008
39	Relais Switch Unit	RSU	Rohde & Schwarz	316 790/001
40	Power Supply	6032A	Hewlett Packard	2846A04063
41	Spektrum Monitor	EZM	Rohde & Schwarz	883 720/006
42	Meßempfänger	ESH 3	Rohde & Schwarz	890 174/002
43	Meßempfänger	ESVP	Rohde & Schwarz	891 752/005
44	Biconi Ant. 20-300MHz	HK 116	Rohde & Schwarz	833 162/011
45	Logper Ant. 0.3-1 GHz	HL 223	Rohde & Schwarz	832 914/010
46	Amplifier 0.1-4 GHz	AFS4	Miteq Inc.	206461
47	Logper Ant. 1-18 GHz	HL 024 A2	Rohde & Schwarz	342 662/002
48	Polarisationsnetzwerk	HL 024 Z1	Rohde & Schwarz	341 570/002
49	Double Ridge G Horn Antenne 1-26.5 GHz	3115	EMCO	9107-3696
50	Microw. Sys. Amplifier 0.5- 26.5 GHz	8317A	Hewlett Packard	3123A00105
51	Spectrum Analyzer	8562A	Hewlett Packard	2809AO2682
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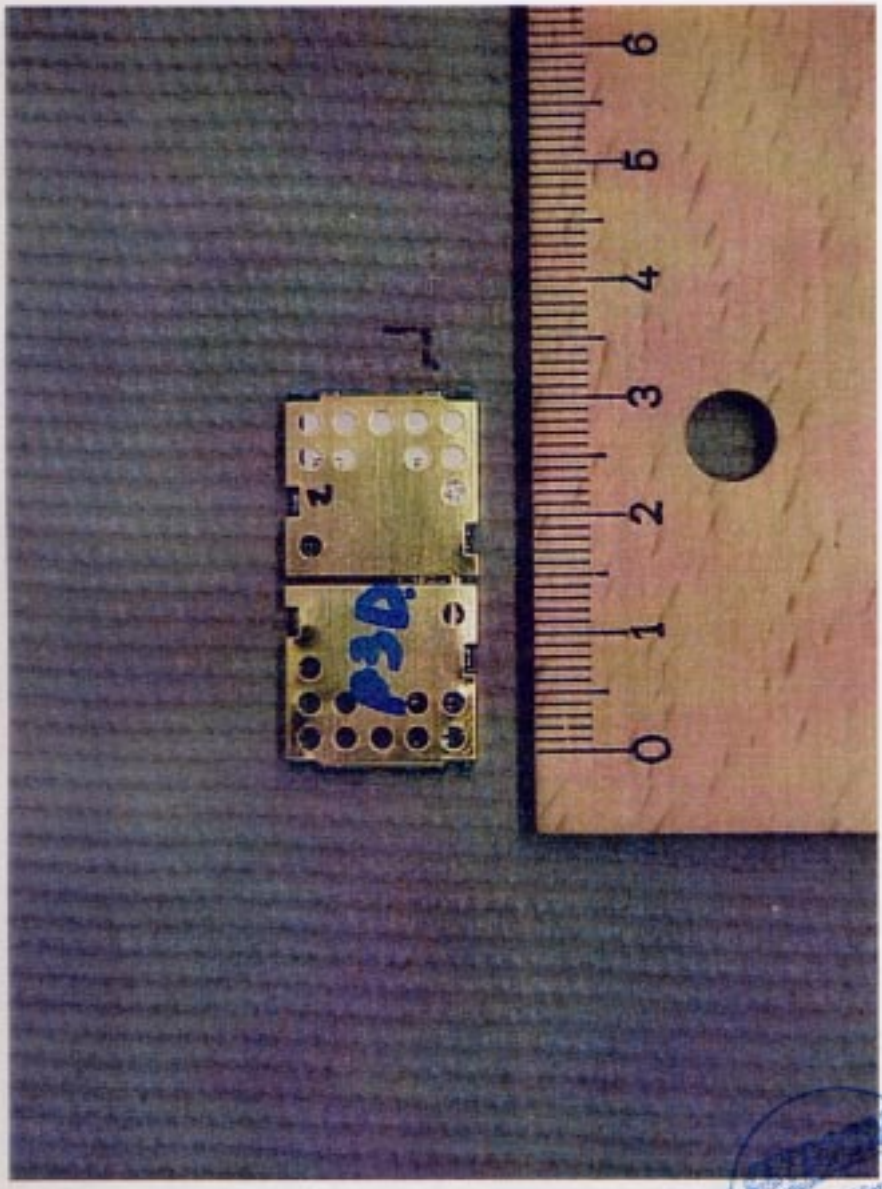
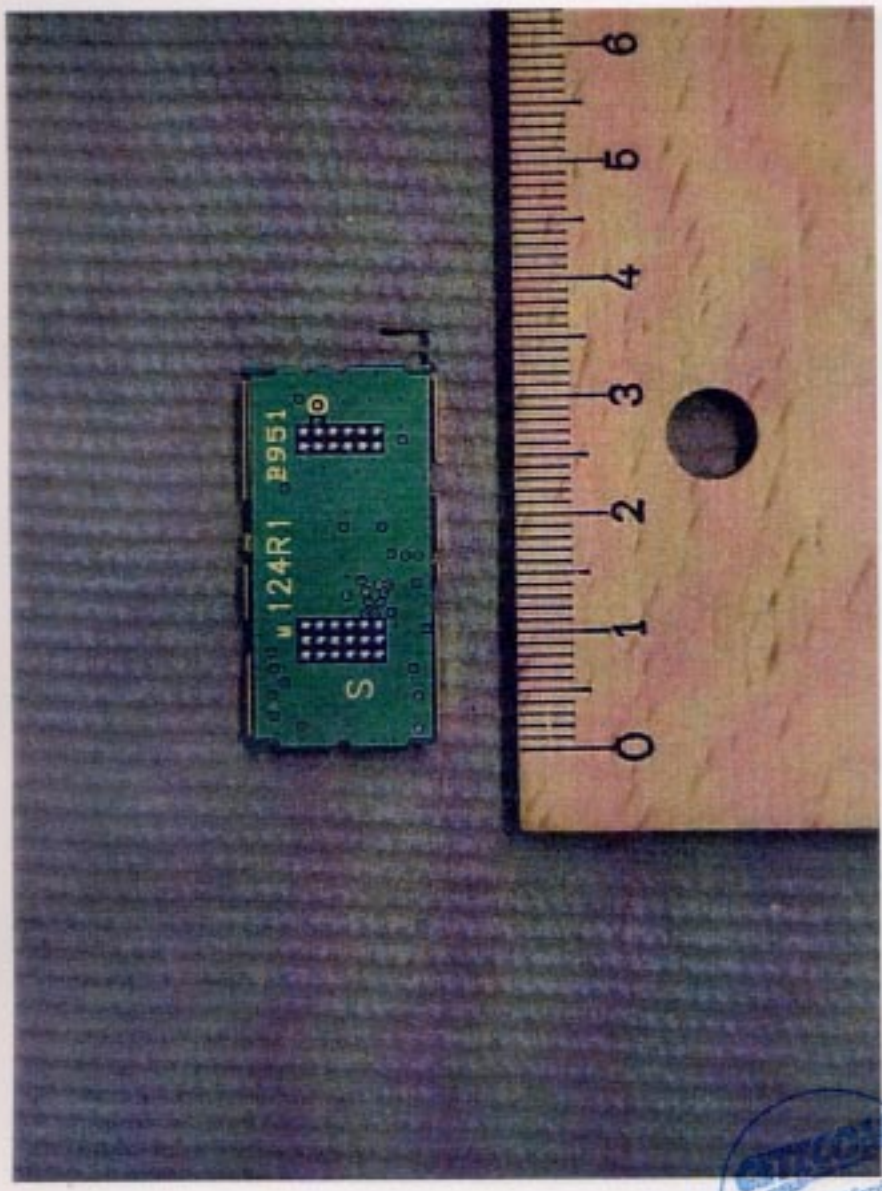
8001001 (ROANA 201 132)
PHOTOGRAPHS OF THE EQUIPMENT

Photograph no.: 1



8001001 (ROANA 201 132
PHOTOGRAPHS OF THE EQUIPMENT

Photograph no.: 2



8001001 (ROANA 201 132)
PHOTOGRAPHS OF THE EQUIPMENT

Photograph no.: 3