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Datum/Date

2003-09-12

Beteckning/Reference

F314320-F22

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1(1)

Equipment Authorization measurements on GSM Transceiver Unit with FCC ID: B5KBR1311005-2

(10 enclosures)

Test object

Transceiver Unit dTRU-8 EDGE, KRC 131 1005/2, R2C

Summary

Standard	Compliant	Enclosure	Remarks
FCC CFR 47			
2.1046 RF Power output	Yes	2	
2.1047 Modulation characteristics	Yes	3	
2.1049 Occupied bandwidth	Yes	4	
2.1049 Band Edge	Yes	5	Note 1
2.1051 Spurious emission at antenna	Yes	6	
2.1053 Field strength of spurious radiation	Yes	7	
2.1055 Frequency stability	Yes	8	

Note 1: It was not possible to reduce the transmit power enough for the channels adjacent to the frequency band edges to fulfil the requirements, thus the channels adjacent to the frequency band edges must be excluded in order to comply.

SP Swedish National Testing and Research Institute Electronics - EMC



Lasse Bergsten
Deputy Technical Manager



Jonas Bremholt
Technical Officer

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FCC ID: B5KBRKRC1311005-2

Description - Equipment Under Test (EUT)

Equipment: GSM Base station transceiver 800 MHz

Tx Frequency range: 869.2-893.8 MHz

Tested Channels:

Radiated measurements:

ARFCN	Frequency	Configuration
128	869.2 MHz	dTRU with internal combiner plus TCC
153	874.2 MHz	dTRU with internal combiner
178	879.2 MHz	dTRU with internal combiner
190	881.6 MHz	dTRU with internal combiner
201	883.8 MHz	dTRU without internal combiner
215	886.6 MHz	dTRU with internal combiner
226	888.8 MHz	dTRU without internal combiner
251	893.8 MHz	dTRU with internal combiner plus TCC

One modulation mode tested at a time: with internal combiner, without internal combiner and with internal combiner plus TCC.

Conducted measurements:

ARFCN	Frequency
128	869.2 MHz
129	869.4 MHz
153	874.2 MHz
190	881.6 MHz
226	888.8 MHz
250	893.6 MHz
251	893.8 MHz

Product number: dTRU-8 EDGE: KRC 131 1005/2

Serial number: AE50265837

All RF conducted measurements were done at the output connectors of CDU-G.
CDU-G 8: BFL 119 155/1, R2G, s/n: A4000496WM

Manufacturer's
representative: Per Helmersson, Ericsson AB

Purpose of test

The purpose of the tests is to verify compliance to the performance characteristics specified in FCC CFR47.

Reservation

The test results in this report apply only to the particular Equipment Under Test (EUT) as declared in the report.

Sign:.....

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Delivery of test object

The test object was delivered: 2003-08-01

Test engineers

Jonas Bremholt
Fredrik Isaksson

Test witnesses

Lars Hagbjörk, Ericsson AB
Mats Iregren, Ericsson AB

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FCC ID: B5KBRKRC1311005-2

RF Power output measurements according to 47CFR 2.1046

Date 2003-09-10	Temperature 22 °C ± 3 °C	Humidity 48% ± 5 %
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Test set-up and Procedure

The measurements were made per J-STD-007A Vol 1 and TIA/EIA-139-280-B. Measurements were made at CDU-G output connectors. The output was connected to a Peak power analyser via a 50 ohm attenuator. Test was performed on 24 V DC supply voltage system. The transmitter was modulated with 270.8 kbs pseudorandom data and with maximum power in all the time slots during the measurements.

Measurement equipment	Calibration Due	SP number
Boonton RF Peak power meter/analyzer	2004-01	503 144
Boonton Power sensor 56518-S/4	2004-01	503 145
Multimeter Fluke 87	2003-09	502 190
Testo 610, Temperature and humidity meter	2003-12	502 658

Results

Mode: **GMSK**

dTRU, output 1+2 (TCC).

Nominal power 24 V DC

Rated output power level after CDU-G (maximum): 49 dBm

Test conditions		Transmitter power (dBm) Peak/Average		
		Channel 128	Channel 190	Channel 251
T _{nom} 22 °C	V _{nom} 24 V DC	48.7/48.1	49.3/48.7	49.1/48.4
Measurement uncertainty		0.5 dB		

dTRU, output 1, without internal combiner:

Nominal power 24 V DC

Rated output power level after CDU-G (maximum): 46 dBm

Test conditions		Transmitter power (dBm) Peak/Average		
		Channel 128	Channel 190	Channel 251
T _{nom} 22 °C	V _{nom} 24 V DC	46.2/45.6	46.8/46.2	46.5/45.9
Measurement uncertainty		0.5 dB		

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dTRU, output 2, without internal combiner:

Nominal power 24 V DC

Rated output power level after CDU-G (maximum): 46 dBm

Test conditions		Transmitter power (dBm)		
		Peak/Average		
		Channel 128	Channel 190	Channel 251
$T_{\text{nom}} 22\text{ °C}$	$V_{\text{nom}} 24\text{ V DC}$	46.1/45.4	46.6/46.0	46.3/45.7
Measurement uncertainty		0.5 dB		

dTRU, output 1, with internal combiner:

Nominal power 24 V DC

Rated output power level after CDU-G (maximum): 43 dBm

Test conditions		Transmitter power (dBm)		
		Peak/Average		
		Channel 128	Channel 190	Channel 251
$T_{\text{nom}} 22\text{ °C}$	$V_{\text{nom}} 24\text{ V DC}$	42.7/42.0	43.3/42.7	43.0/42.4
Measurement uncertainty		0.5 dB		

dTRU, output 2, with internal combiner:

Nominal power 24 V DC

Rated output power level after CDU-G (maximum): 43 dBm

Test conditions		Transmitter power (dBm)		
		Peak/Average		
		Channel 128	Channel 190	Channel 251
$T_{\text{nom}} 22\text{ °C}$	$V_{\text{nom}} 24\text{ V DC}$	42.7/42.0	43.3/42.0	42.9/42.2
Measurement uncertainty		0.5 dB		

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Mode: **EDGE**

dTRU, output 1+2 (TCC):

Nominal power 24 V DC

Rated output power level after CDU-G (maximum): 49 dBm

Test conditions		Transmitter power (dBm)		
		Peak/Average		
		Channel 128	Channel 190	Channel 251
$T_{\text{nom}} 22\text{ °C}$	$V_{\text{nom}} 24\text{ V DC}$	48.8/45.3	49.4/45.8	49.1/45.6
Measurement uncertainty		0.5 dB		

dTRU, output 1, without internal combiner:

Nominal power 24 V DC

Rated output power level after CDU-G (maximum): 46 dBm

Test conditions		Transmitter power (dBm)		
		Peak/Average		
		Channel 128	Channel 190	Channel 251
$T_{\text{nom}} 22\text{ °C}$	$V_{\text{nom}} 24\text{ V DC}$	46.2/42.6	46.8/43.2	46.5/42.9
Measurement uncertainty		0.5 dB		

dTRU, output 2, without internal combiner:

Nominal power 24 V DC

Rated output power level after CDU-G (maximum): 46 dBm

Test conditions		Transmitter power (dBm)		
		Peak/Average		
		Channel 128	Channel 190	Channel 251
$T_{\text{nom}} 22\text{ °C}$	$V_{\text{nom}} 24\text{ V DC}$	46.0/42.5	46.5/43.0	46.2/42.7
Measurement uncertainty		0.5 dB		

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dTRU, output 1, with internal combiner:

Nominal power 24 V DC

Rated output power level after CDU-G 8 (maximum): 43 dBm

Test conditions		Transmitter power (dBm)		
		Peak Average		
		Channel 128	Channel 190	Channel 251
T _{nom} 22 °C	V _{nom} 24 V DC	42.8/39.3	43.4/39.9	43.1/39.6
Measurement uncertainty		0.5 dB		

dTRU, output 2, with internal combiner:

Nominal power 24 V DC

Rated output power level after CDU-G 8 (maximum): 43 dBm

Test conditions		Transmitter power (dBm)		
		Peak/Average		
		Channel 128	Channel 190	Channel 251
T _{nom} 22 °C	V _{nom} 24 V DC	42.7/39.1	43.3/39.7	42.9/39.4
Measurement uncertainty		0.5 dB		

Complies?	Yes
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Sign:.....

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FCC ID: B5KBRKRC1311005-2

Modulation characteristics measurements according to 47CFR 2.1047

Date 2003-08-14	Temperature 21 °C ± 3 °C	Humidity 58 % ± 5 %
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Test set-up and Procedure

The measurement was made per J-STD-007A Vol 1 and TIA/EIA-139-280-B. Measurements were made at CDU-G output connectors. The output was connected to a spectrum analyser. The spectrum analyser was connected to an external 10 MHz reference standard during measurement.

The transmitter was modulated with 270.8 kbs pseudorandom data during the measurements.

Measurement equipment	Calibration Due	SP number
R&S FSIQ	2004-03	503 738
Testo 610, Temperature and humidity meter	2003-12	502 658
Multimeter Fluke 87	2003-09	502 190

Results

Nominal Voltage 24 V DC

43 dBm output power at Channel 190 (881.6 MHz)

Mode: **GMSK**

Test conditions		Phase error (° _{RMS})	
Supply voltage DC (V)	T (°C)	TRU Output 0	TRU Output 1
24.0	+20	0.8	0.9
Maximum phase error (°)		0.9	

Mode: **EDGE**

Test conditions		EVM (% _{RMS})	
Supply voltage DC (V)	T (°C)	TRU Output 0	TRU Output 1
24.0	+20	1.5	1.5
Maximum EVM (% _{RMS})		1.5	

Test conditions		Origin offset (dBc)	
Supply voltage DC (V)	T (°C)	TRU Output 0	TRU Output 1
24.0	+20	-45.3	-48.2
Maximum origin offset (dBc)		-45.3	

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Limits

GMSK: The tolerance of the maximum output phase error shall not be greater than 5 degrees.

EDGE: The Error Vector Magnitude (EVM) shall be less than 12.5 %_{RMS}
The origin offset in any burst shall be less than -30 dBc.

Complies?	Yes
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Occupied bandwidth measurements according to 47CFR 2.1049

Date 2003-09-11	Temperature 22 °C ± 3 °C	Humidity 51 % ± 5 %
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Test set-up and Procedure

Measurements were made at CDU-G output connectors. The output was connected to a spectrum analyser. The spectrum analyser was connected to an external 10 MHz reference standard during the measurements. The transmitter was modulated with 270.8 kbs pseudorandom data during the measurements.

Measurement equipment	Calibration Due	SP number
R&S FSIQ	2004-03	503 738
Testo 610, Temperature and humidity meter	2003-12	502 658

Measurement uncertainty: 3.7 dB

Results

Mode: **GMSK**

dTRU Output 1, without internal combiner:

- Diagram 1 Ch 190 Reference level 46 dBm output power
- Diagram 2 Ch 190 26 dB points 46 dBm output power

dTRU Output 2, without internal combiner:

- Diagram 3 Ch 190 Reference level 46 dBm output power
- Diagram 4 Ch 190 26 dB points 46 dBm output power

Mode: **EDGE**

dTRU Output 1, without internal combiner:

- Diagram 5 Ch 190 Reference level 46 dBm output power
- Diagram 6 Ch 190 26 dB points 46 dBm output power

dTRU Output 2, without internal combiner:

- Diagram 7 Ch 190 Reference level 46 dBm output power
- Diagram 8 Ch 190 26 dB points 46 dBm output power

Limits

The power of any emission outside the frequency band shall be attenuated below the transmitter power (P) by at least $43 + 10 \log P$ dB.

Complies?	Yes
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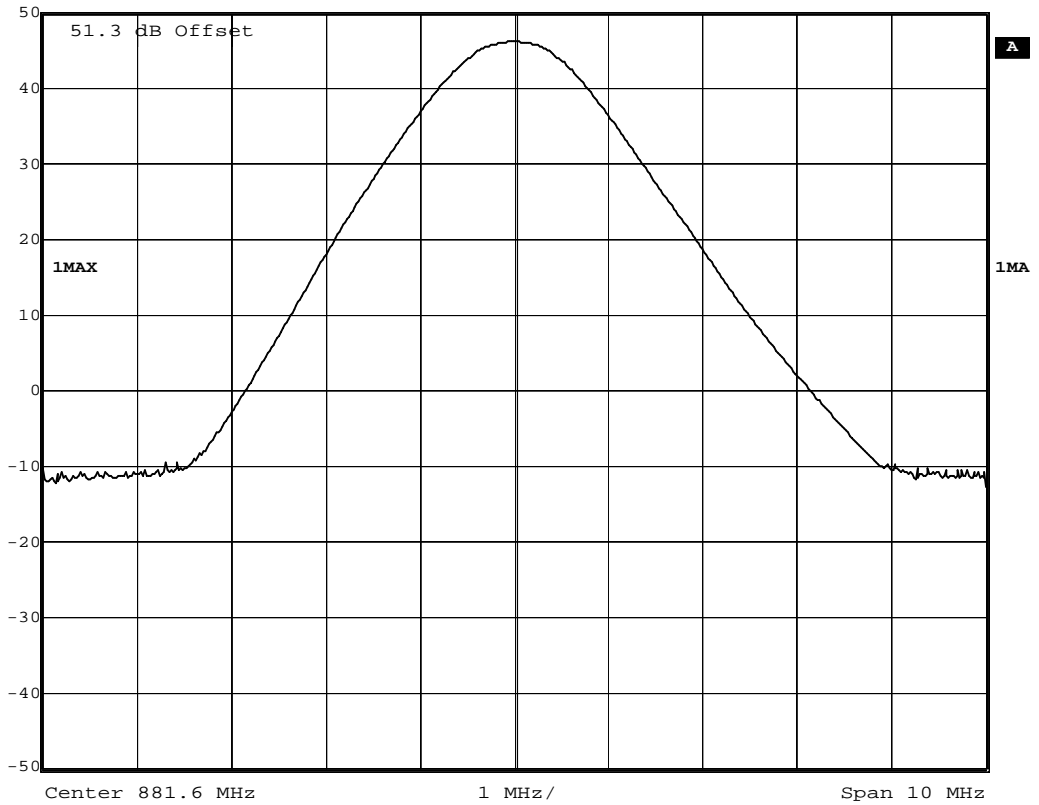
Beteckning/Reference
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Diagram 1 (8)
Encl. 4.1



Ref Lvl
50 dBm

RBW 1 MHz RF Att 20 dB
VBW 1 MHz
SWT 5 ms Unit dBm



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FCC ID: B5KBRKRC1311005-2

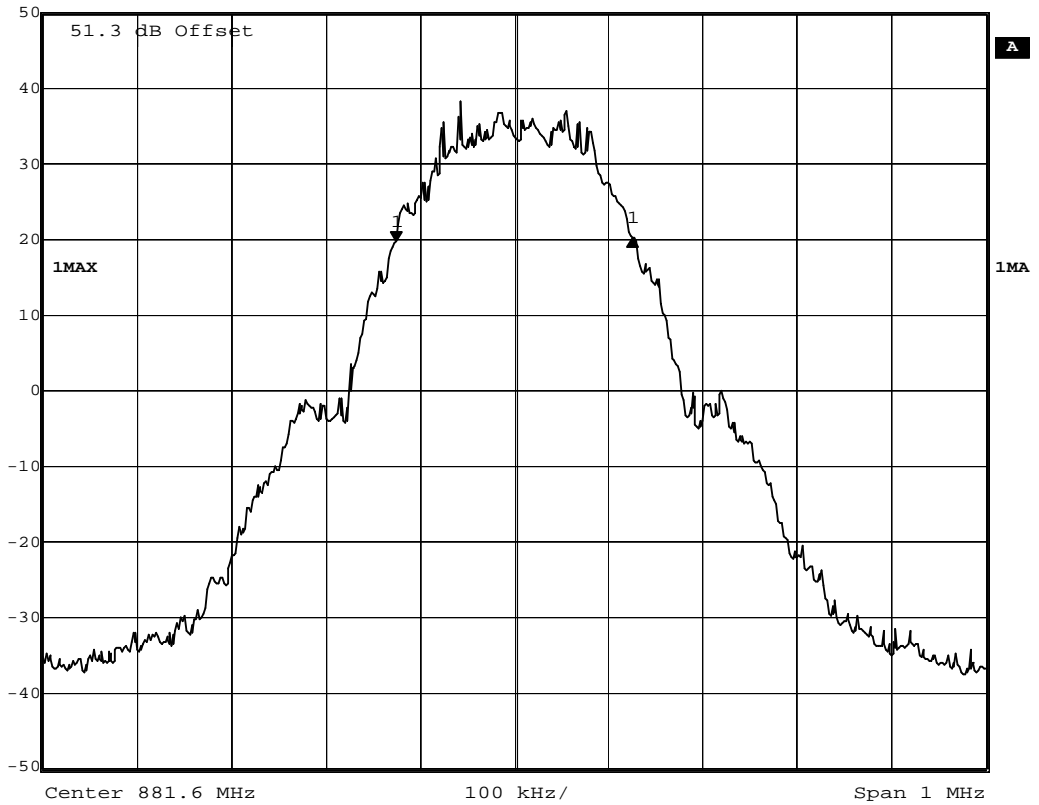
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Diagram 2 (8)
Encl. 4.1



Delta 1 [T1]	RBW	3 kHz	RF Att	20 dB
Ref Lvl	0.49 dB	VBW	3 kHz	
50 dBm	251.50300601 kHz	SWT	280 ms	Unit dBm



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FCC ID: B5KBRKRC1311005-2

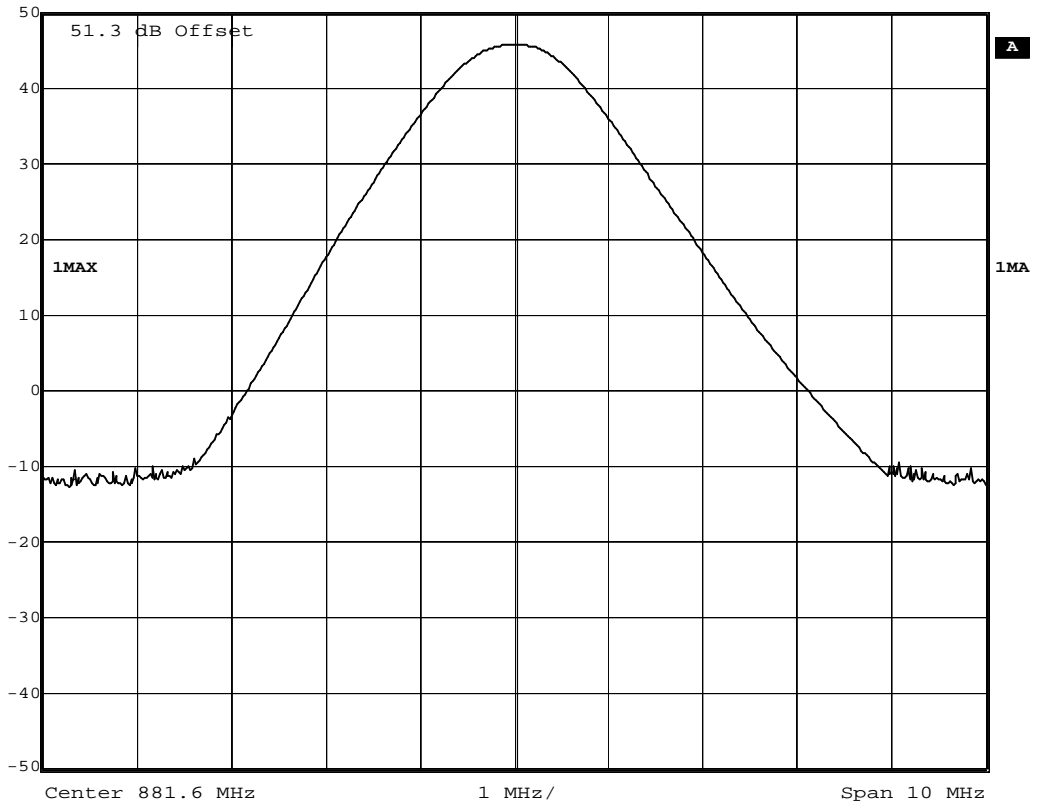
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Diagram 3 (8)
Encl. 4.1



Ref Lvl 50 dBm
RBW 1 MHz RF Att 20 dB
VBW 1 MHz
SWT 5 ms Unit dBm



Date: 11.SEP.2003 11:20:12

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2003-09-12

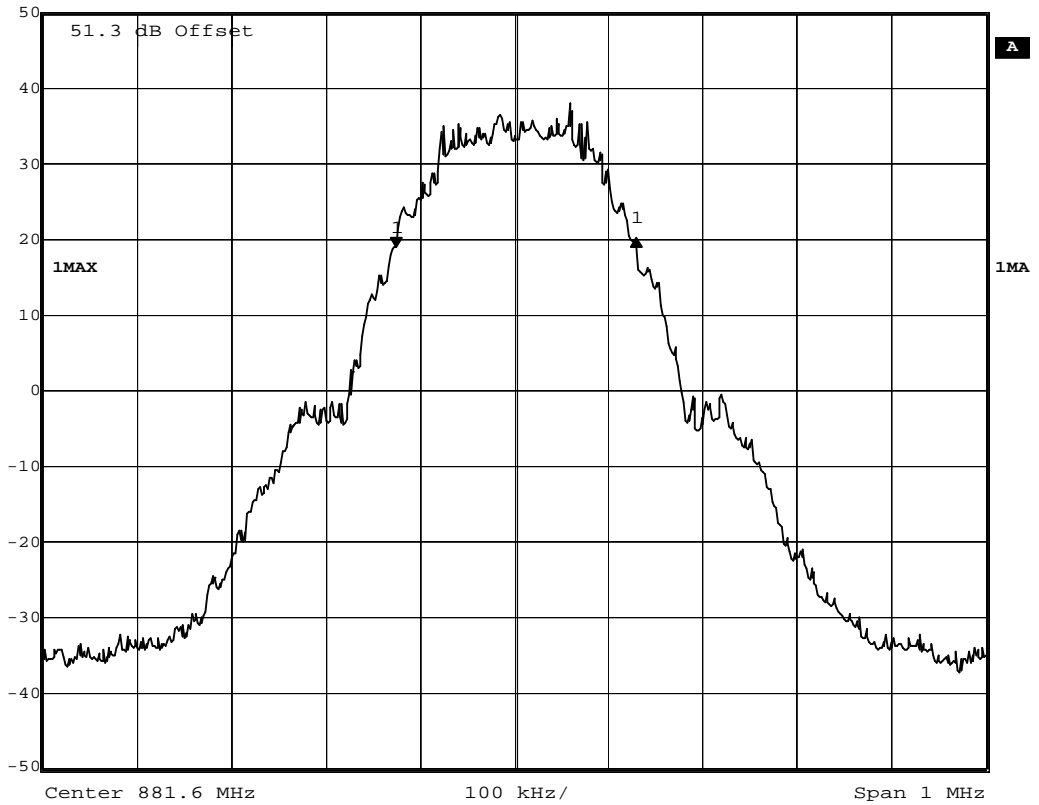
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Diagram 4 (8)
Encl. 4.1

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Delta 1 [T1]	RBW	3 kHz	RF Att	20 dB	
Ref Lvl	1.04 dB	VBW	3 kHz		
50 dBm	255.51102204 kHz	SWT	280 ms	Unit	dBm



Date: 11.SEP.2003 11:21:01

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2003-09-12

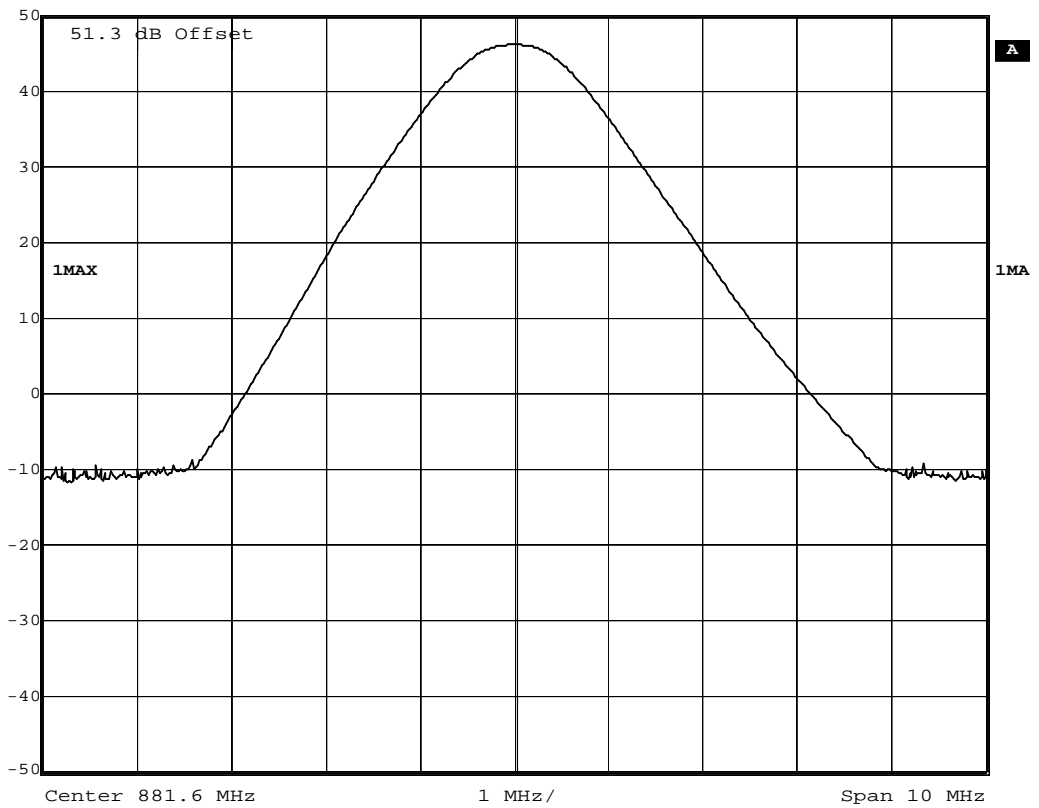
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Diagram 5 (8)
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Ref Lvl
50 dBm

RBW 1 MHz RF Att 20 dB
VBW 1 MHz
SWT 5 ms Unit dBm



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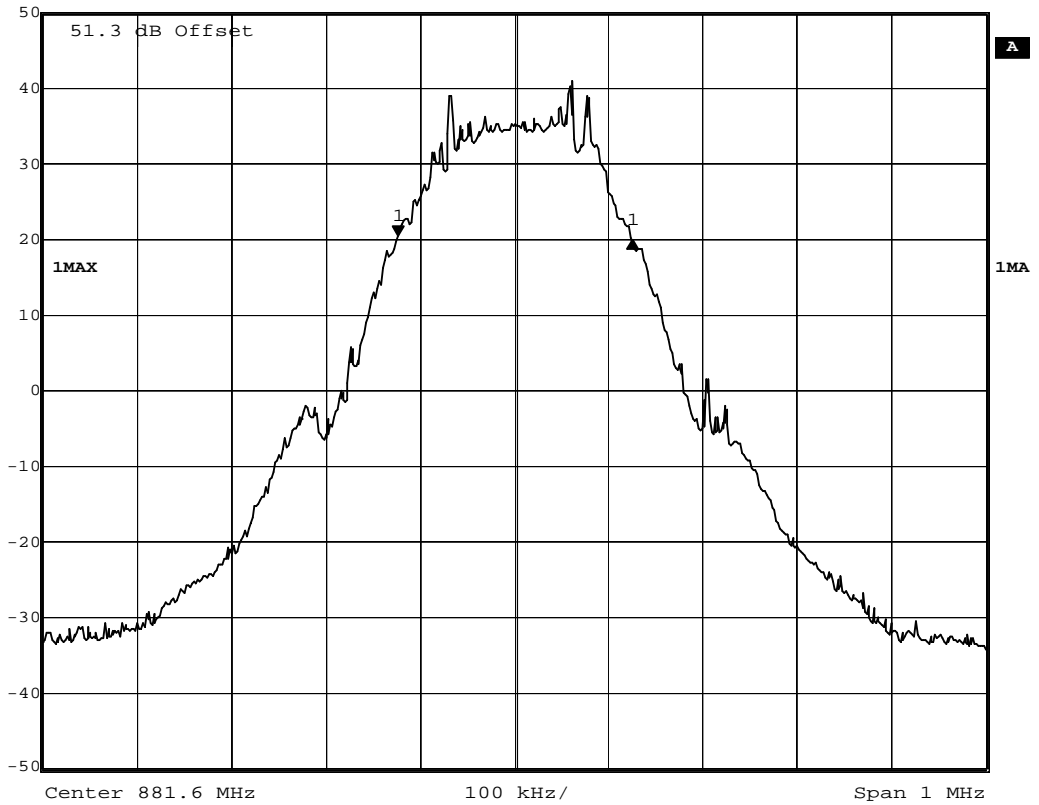
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Diagram 6 (8)
Encl. 4.1



Delta 1 [T1]	RBW	3 kHz	RF Att	20 dB	
Ref Lvl	-0.40 dB	VBW	3 kHz		
50 dBm	249.49899800 kHz	SWT	280 ms	Unit	dBm



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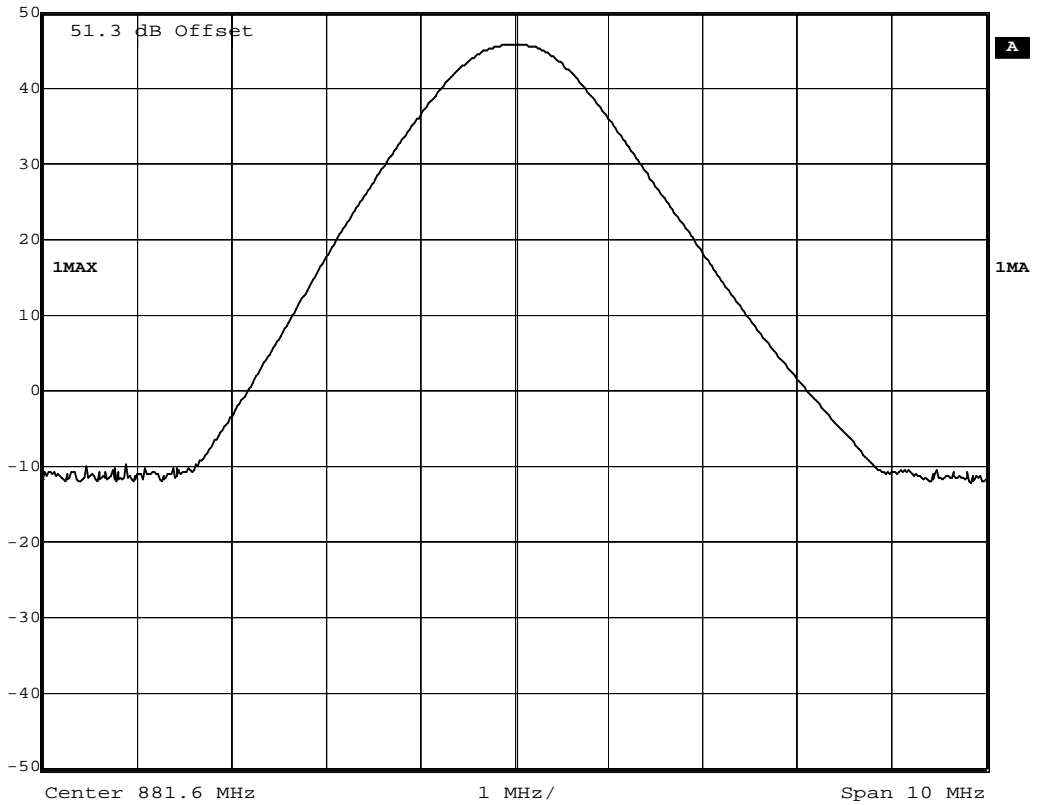
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Diagram 7 (8)
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Ref Lvl 50 dBm
RBW 1 MHz RF Att 20 dB
VBW 1 MHz
SWT 5 ms Unit dBm



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FCC ID: B5KBRKRC1311005-2

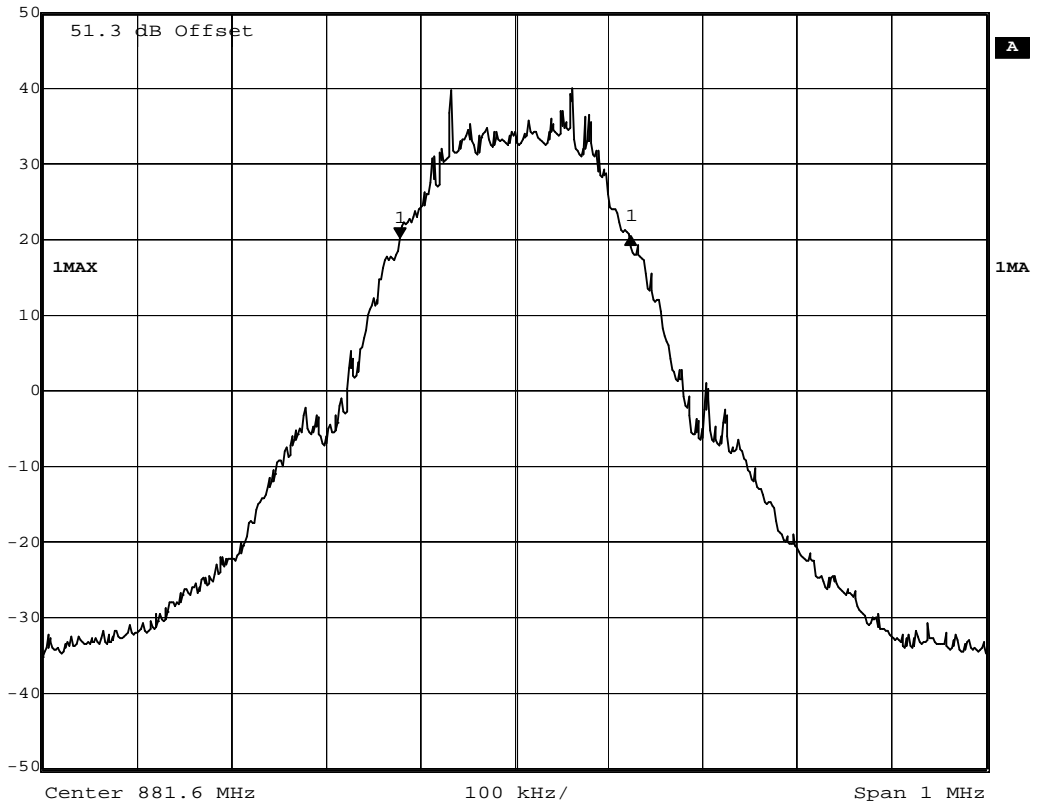
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Diagram 8 (8)
Encl. 4.1



Delta 1 [T1]	RBW	3 kHz	RF Att	20 dB	
Ref Lvl	0.24 dB	VBW	3 kHz		
50 dBm	245.49098196 kHz	SWT	280 ms	Unit	dBm



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Band edge measurements according to 47CFR 2.1049

Date	Temperature	Humidity
2003-09-10	21 °C ± 3 °C	48 % ± 5 %
2003-09-11	21 °C ± 3 °C	51 % ± 5 %

Test set-up and Procedure

The measurements were made per definition in 22.917. Measurements were made at CDU-G output connectors. The output was connected to a spectrum analyser. The spectrum analyser was connected to an external 10 MHz reference standard during the measurements. The transmitter was modulated with 270.8 kbs pseudorandom data during the measurements.

Measurement equipment	Calibration Due	SP number
R&S FSIQ	2004-03	503 738
Testo 610, Temperature and humidity meter	2003-12	502 658

Measurement uncertainty: 3.7 dB

Results

Mode: **GMSK**

(TCC), dTRU Output 1+2 (TCC):

- Diagram 1 Ch 129 (869.4 MHz) Band edge 49 dBm output power
Diagram 2 Ch 250 (893.6 MHz) Band edge 49 dBm output power

dTRU Output 1, without internal combiner:

- Diagram 3 Ch 129 (869.4 MHz) Band edge 46 dBm output power
Diagram 4 Ch 250 (893.6 MHz) Band edge 46 dBm output power

dTRU Output 2, without internal combiner:

- Diagram 5 Ch 129 (869.4 MHz) Band edge 46 dBm output power
Diagram 6 Ch 250 (893.6 MHz) Band edge 46 dBm output power

Mode: **EDGE**

dTRU Output 1+2 (TCC)

- Diagram 7 Ch 129 (869.4 MHz) Band edge 49 dBm output power
Diagram 8 Ch 250 (893.6 MHz) Band edge 49 dBm output power

dTRU Output 1, without internal combiner:

- Diagram 9 Ch 129 (869.4 MHz) Band edge 46 dBm output power
Diagram 10 Ch 250 (893.6 MHz) Band edge 46 dBm output power

dTRU Output 2, without internal combiner:

- Diagram 11 Ch 129 (869.4 MHz) Band edge 46 dBm output power
Diagram 12 Ch 250 (893.6 MHz) Band edge 46 dBm output power

Sign:.....

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Remarks

It was not possible to reduce the transmit power enough for the channels adjacent to the frequency band edges to fulfil the requirements, thus the channels adjacent to the frequency band edges must be excluded in order to comply.

Limits

The power of any emission outside the frequency band shall be attenuated below the transmitter power (P) by at least $43 + 10 \log P$ dB.

Complies?	Yes
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Sign:.....

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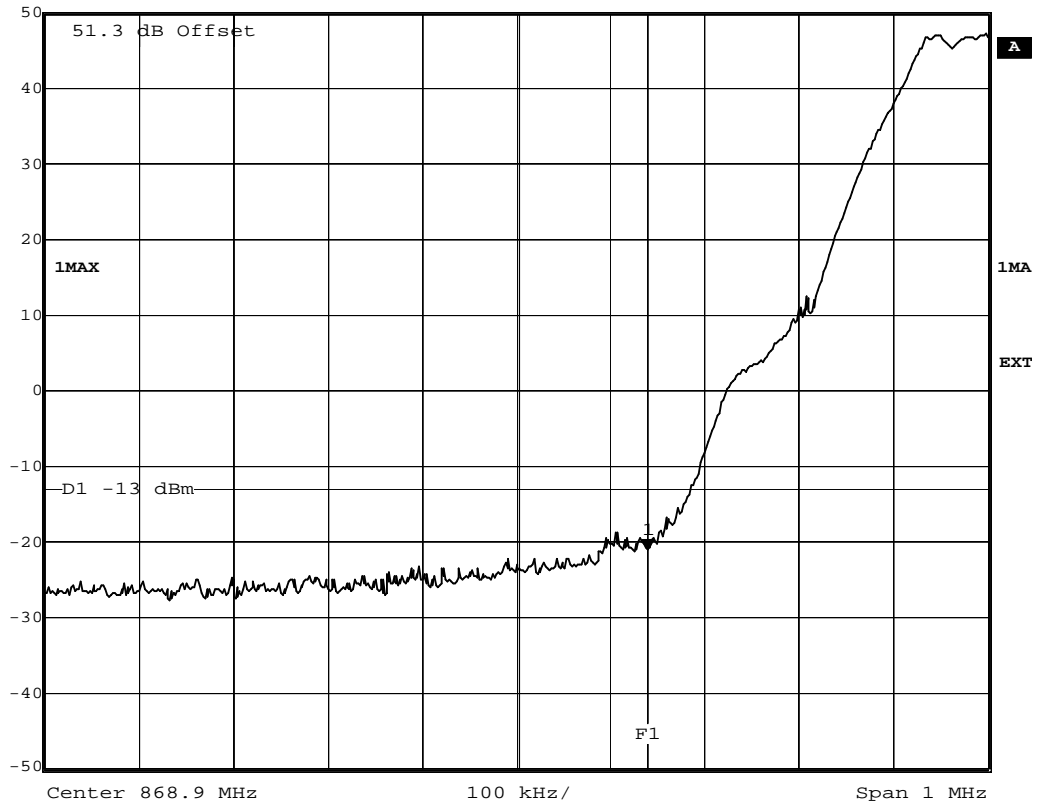
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Diagram 1 (12)
Encl. 5.1



Marker 1 [T1]	RBW	30 kHz	RF Att	20 dB
Ref Lvl	-21.19 dBm	VBW	30 kHz	
50 dBm	869.0400000 MHz	SWT	5 ms	Unit dBm



Date: 10.SEP.2003 13:59:07

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2003-09-12

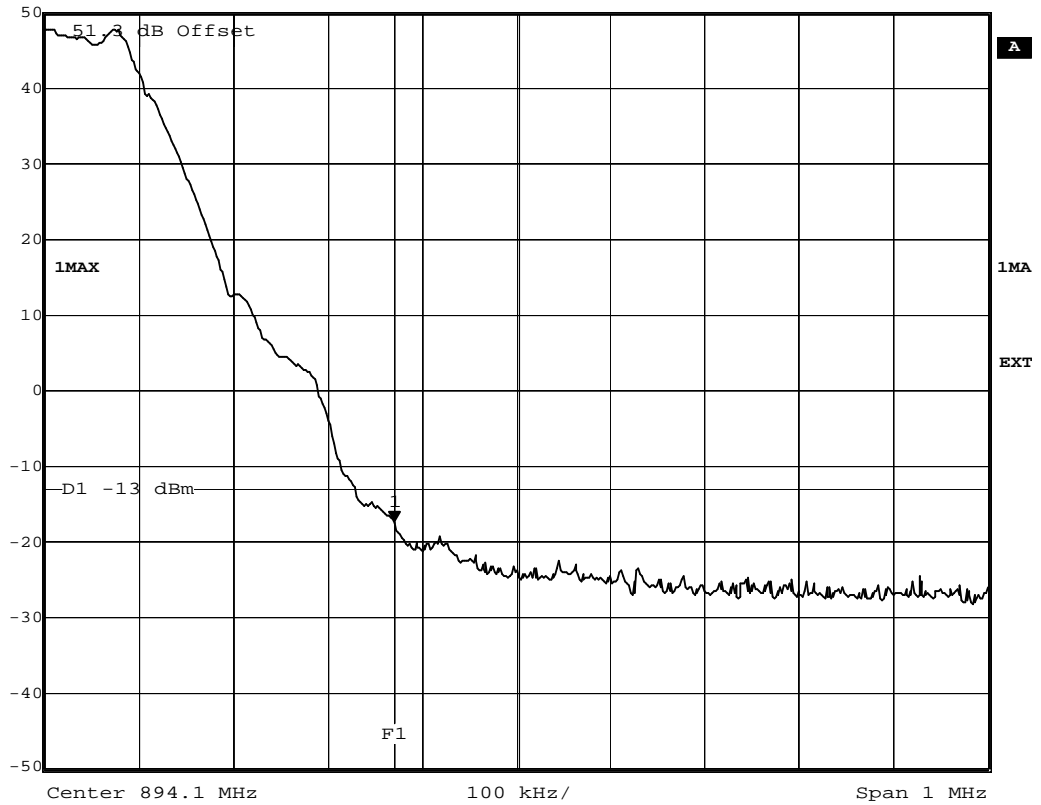
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Diagram 2 (12)
Encl. 5.1

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Marker 1 [T1]	RBW	30 kHz	RF Att	20 dB
Ref Lvl	-17.34 dBm	VBW	30 kHz	
50 dBm	893.97000000 MHz	SWT	5 ms	Unit dBm



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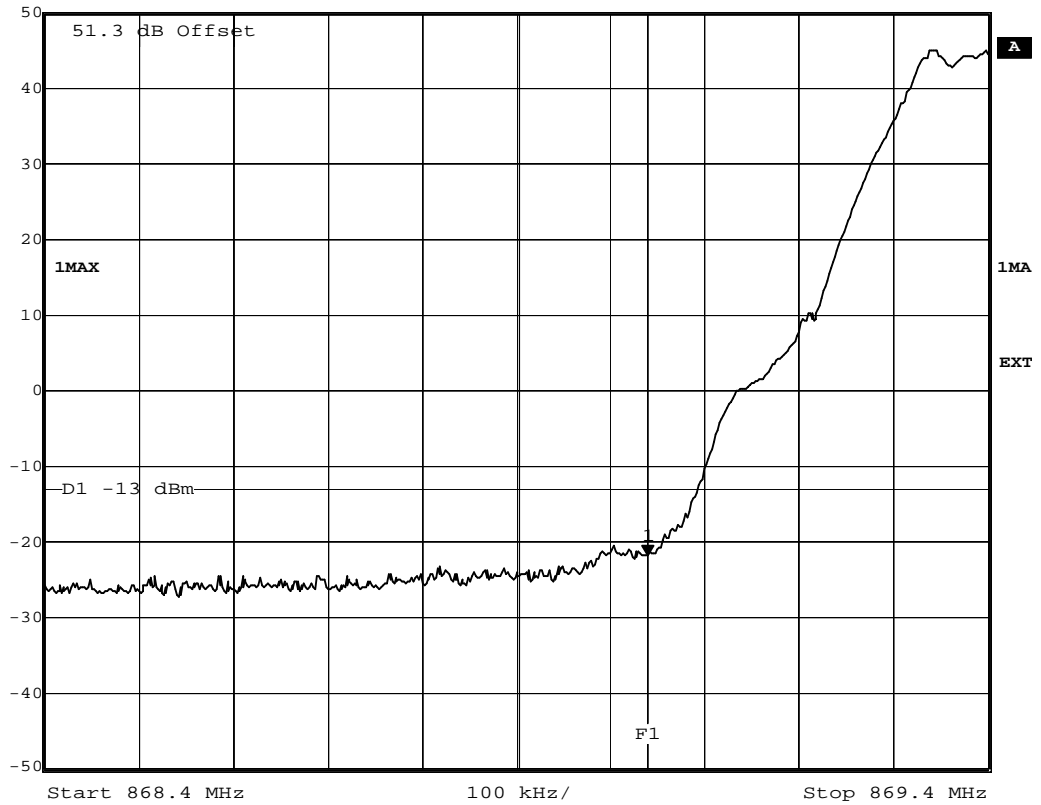
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Diagram 3 (12)
Encl. 5.1



Marker 1 [T1]	RBW	30 kHz	RF Att	20 dB	
Ref Lvl	-21.97 dBm	VBW	30 kHz		
50 dBm	869.0400000 MHz	SWT	5 ms	Unit	dBm



Date: 10.SEP.2003 15:25:27

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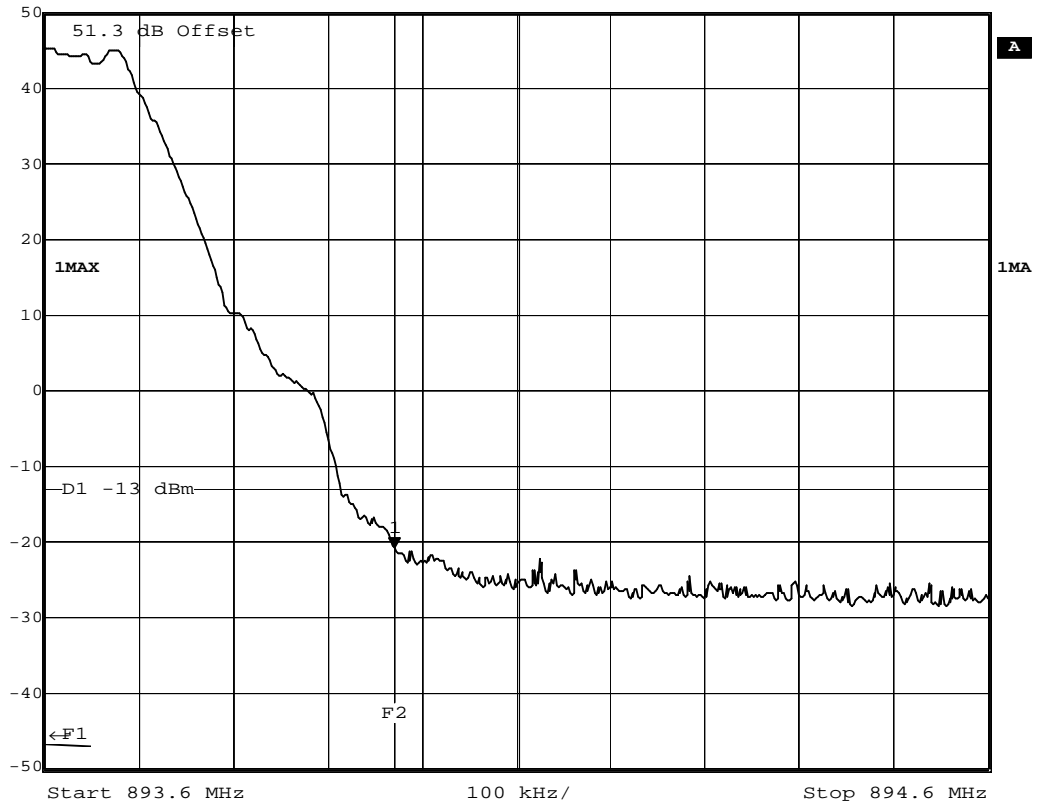
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Diagram 4 (12)
Encl. 5.1



Marker 1 [T1]	RBW	30 kHz	RF Att	20 dB
Ref Lvl	-20.84 dBm	VBW	30 kHz	
50 dBm	893.9700000 MHz	SWT	5 ms	Unit dBm



Date: 11.SEP.2003 11:09:58

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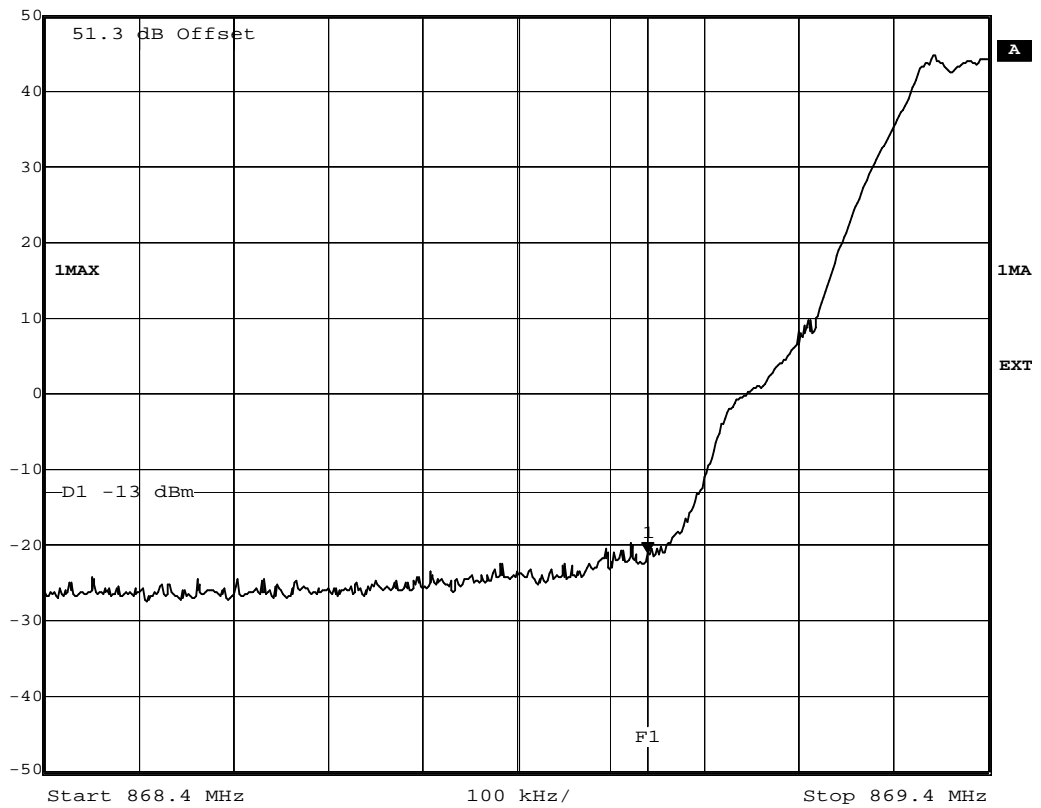
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Diagram 5 (12)
Encl. 5.1



Marker 1 [T1]	RBW	30 kHz	RF Att	20 dB	
Ref Lvl	-21.03 dBm	VBW	30 kHz		
50 dBm	869.0400000 MHz	SWT	5 ms	Unit	dBm



Date: 10.SEP.2003 14:06:33

Sign:.....

REPORT

FCC ID: B5KBRKRC1311005-2

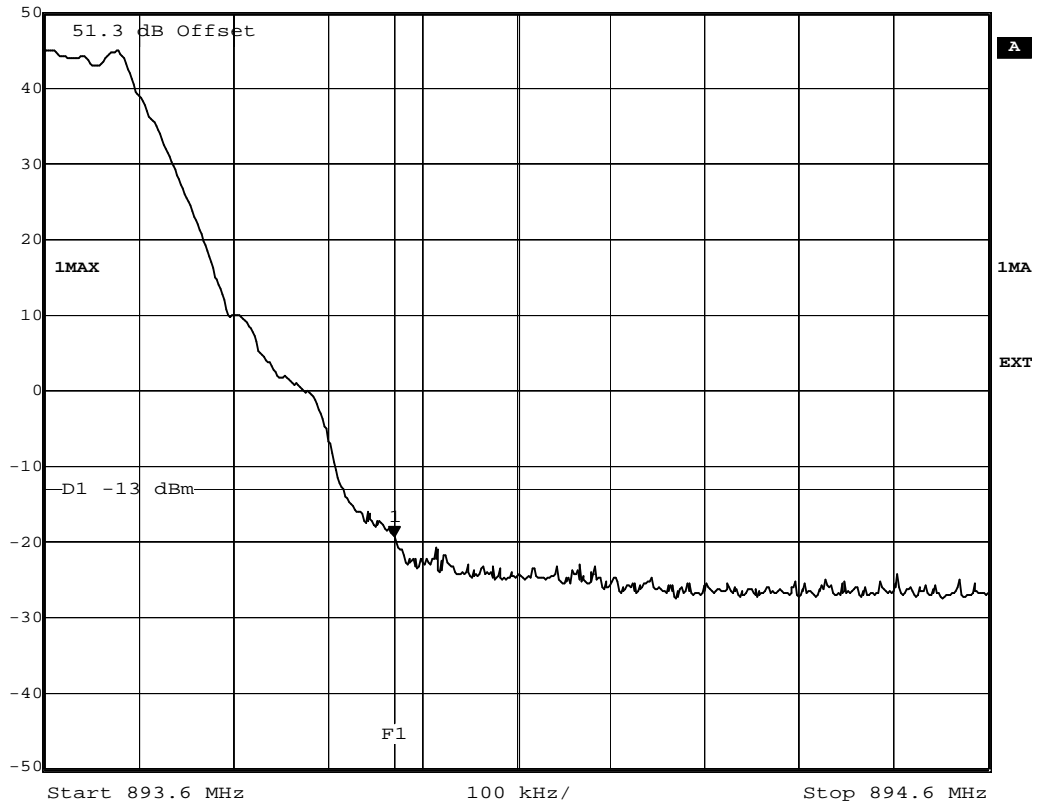
Datum/Date
2003-09-12

Beteckning/Reference
F314320-F22

Sida/Page
Diagram 6 (12)
Encl. 5.1



Marker 1 [T1]	RBW	30 kHz	RF Att	20 dB	
Ref Lvl	-19.38 dBm	VBW	30 kHz		
50 dBm	893.9700000 MHz	SWT	5 ms	Unit	dBm



Date: 10.SEP.2003 14:08:42

Sign:.....

REPORT

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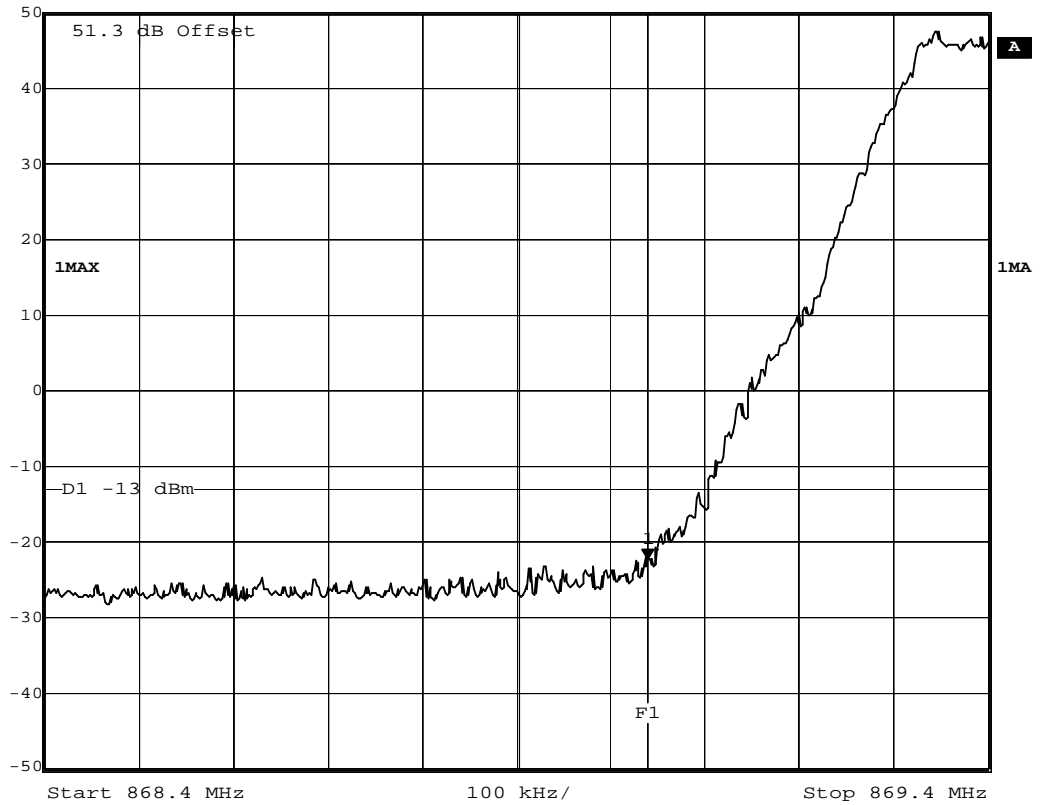
Datum/Date
2003-09-12

Betekning/Reference
F314320-F22

Sida/Page
Diagram 7 (12)
Encl. 5.1



Marker 1 [T1]	RBW	30 kHz	RF Att	20 dB	
Ref Lvl	-22.38 dBm	VBW	30 kHz		
50 dBm	869.0400000 MHz	SWT	5 ms	Unit	dBm



Date: 11.SEP.2003 11:31:29

Sign:.....

REPORT

Datum/Date
2003-09-12

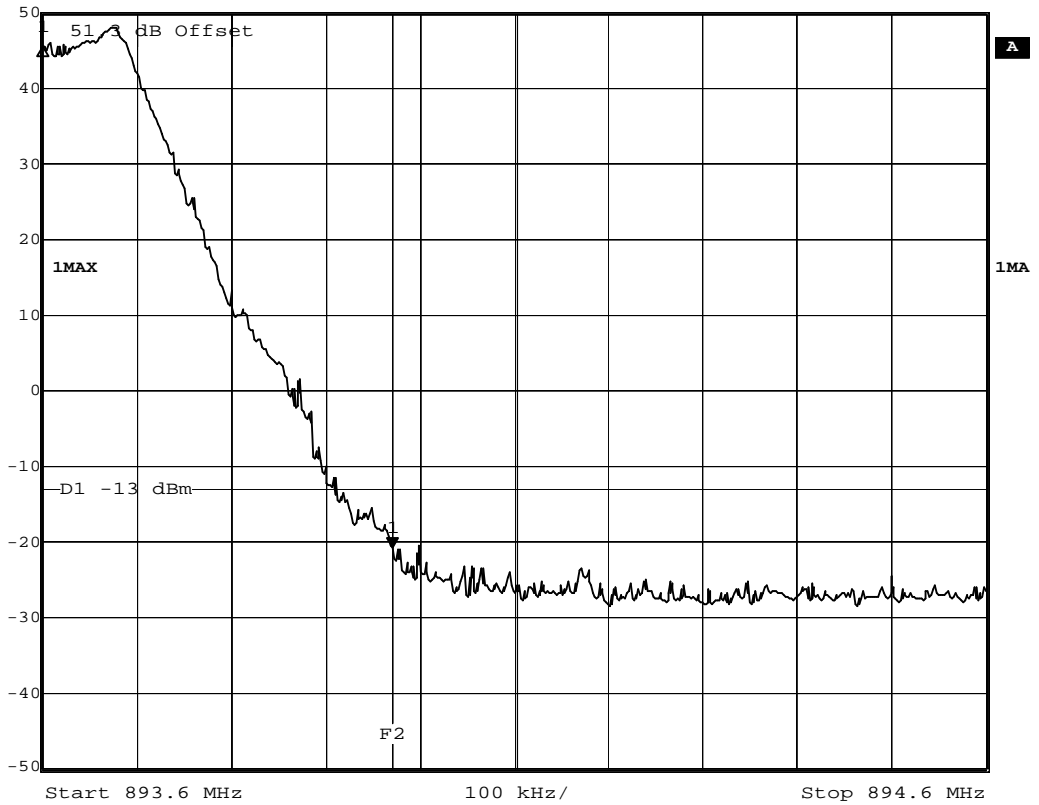
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F314320-F22

Sida/Page
Diagram 8 (12)
Encl. 5.1

FCC ID: B5KBRKRC1311005-2



Marker 1 [T1]	RBW	30 kHz	RF Att	20 dB
Ref Lvl	-20.87 dBm	VBW	30 kHz	
50 dBm	893.9700000 MHz	SWT	5 ms	Unit dBm



Date: 11.SEP.2003 11:28:57

Sign:.....

REPORT

Datum/Date
2003-09-12

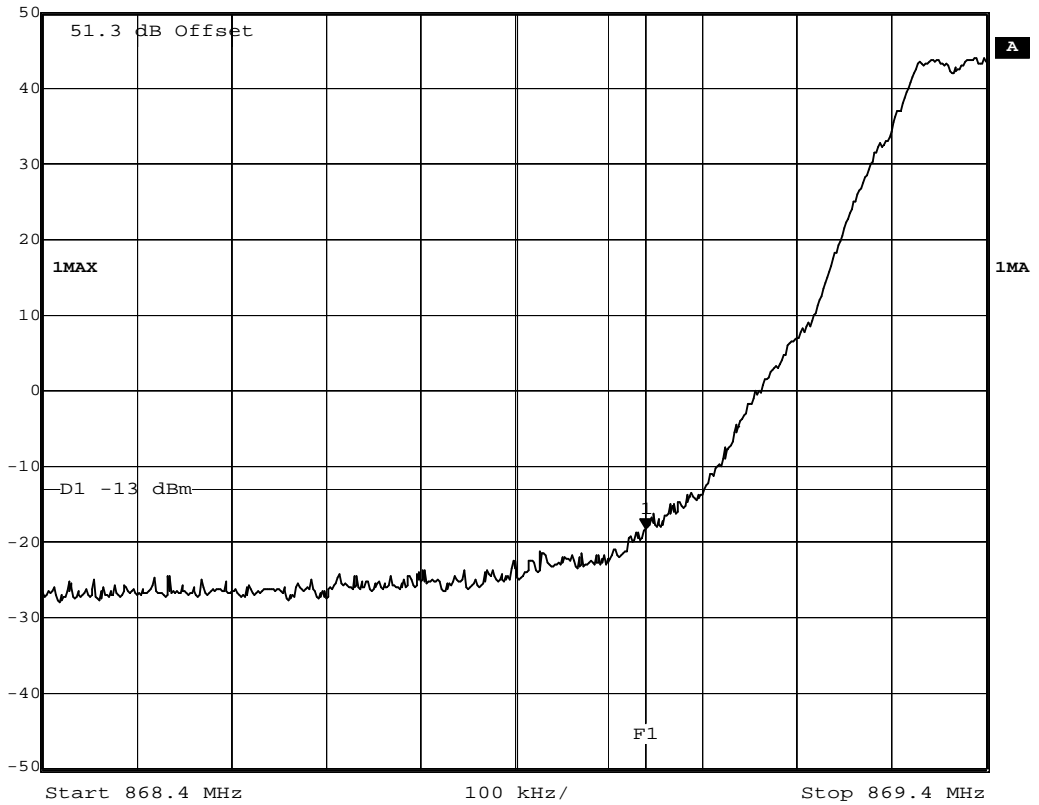
Beteckning/Reference
F314320-F22

Sida/Page
Diagram 9 (12)
Encl. 5.1

FCC ID: B5KBR1311005-2



Marker 1 [T1]	RBW	30 kHz	RF Att	20 dB
Ref Lvl	-18.29 dBm	VBW	30 kHz	
50 dBm	869.0400000 MHz	SWT	5 ms	Unit dBm



Date: 11.SEP.2003 11:04:42

Sign:.....

REPORT

Datum/Date
2003-09-12

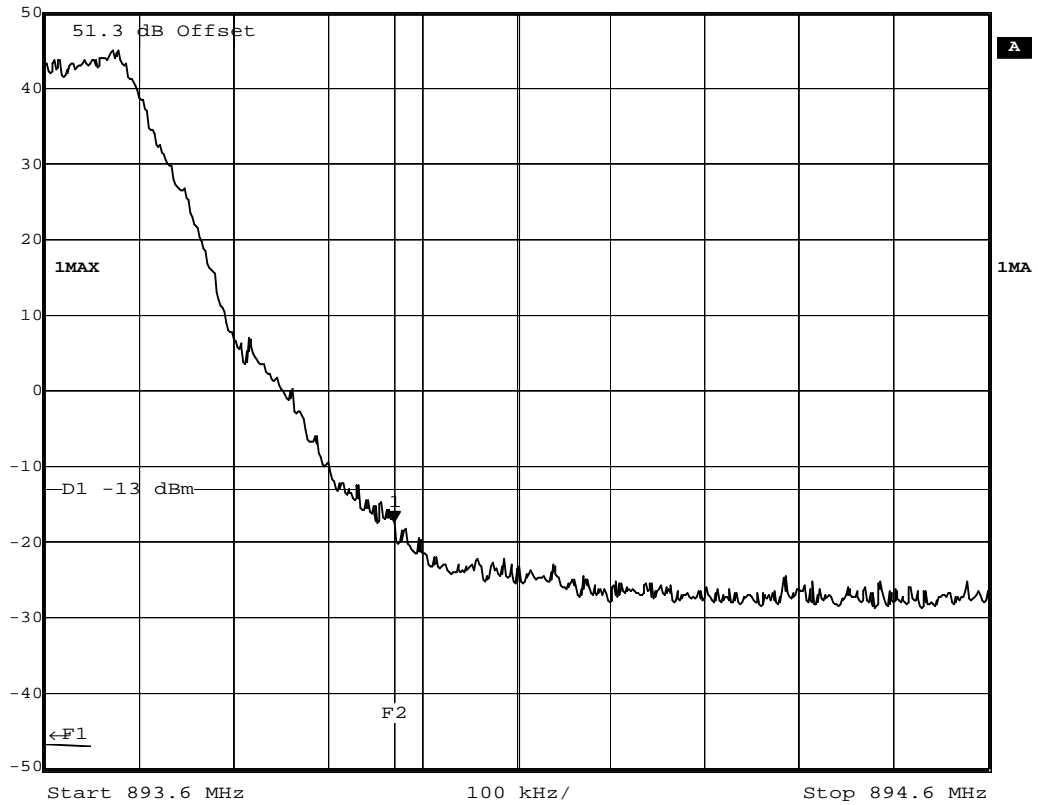
Beteckning/Reference
F314320-F22

Sida/Page
Diagram 10 (12)
Encl. 5.1

FCC ID: B5KBR1311005-2



Marker 1 [T1]	RBW	30 kHz	RF Att	20 dB
Ref Lvl	-17.44 dBm	VBW	30 kHz	
50 dBm	893.9700000 MHz	SWT	5 ms	Unit dBm



Date: 11.SEP.2003 11:10:52

Sign:.....

REPORT

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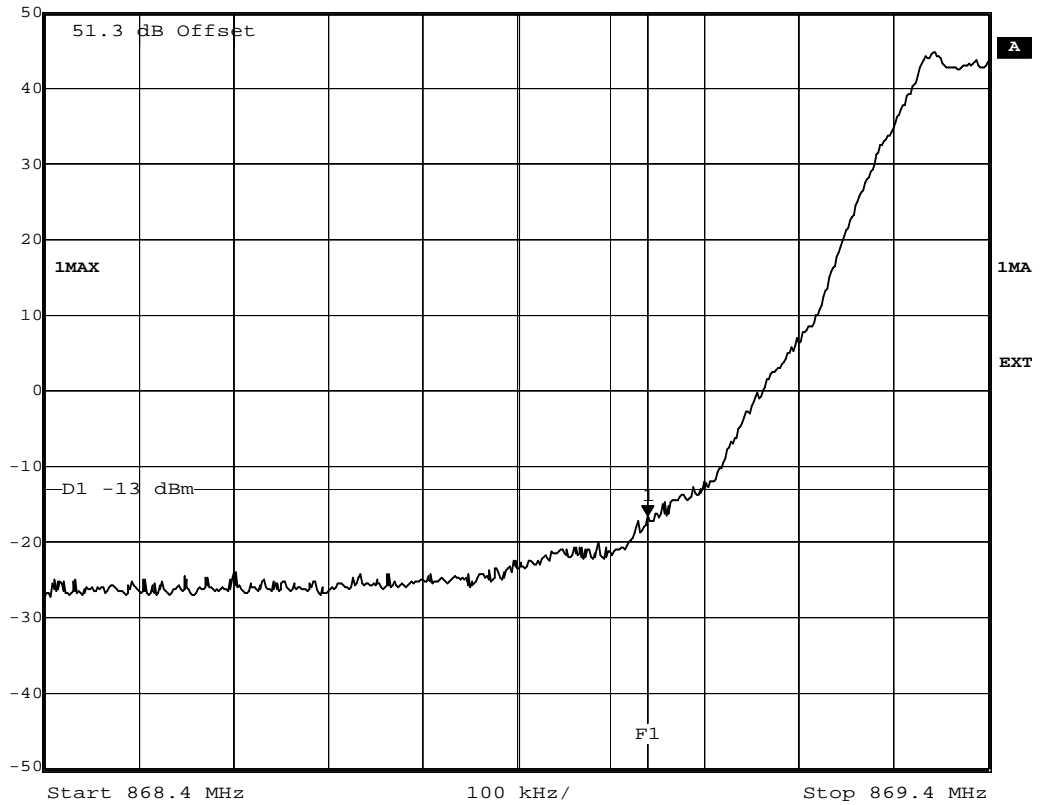
Datum/Date
2003-09-12

Betekning/Reference
F314320-F22

Sida/Page
Diagram 11 (12)
Encl. 5.1



Marker 1 [T1]	RBW	30 kHz	RF Att	20 dB
Ref Lvl	-16.61 dBm	VBW	30 kHz	
50 dBm	869.0400000 MHz	SWT	5 ms	Unit dBm



Date: 10.SEP.2003 15:19:45

Sign:.....

REPORT

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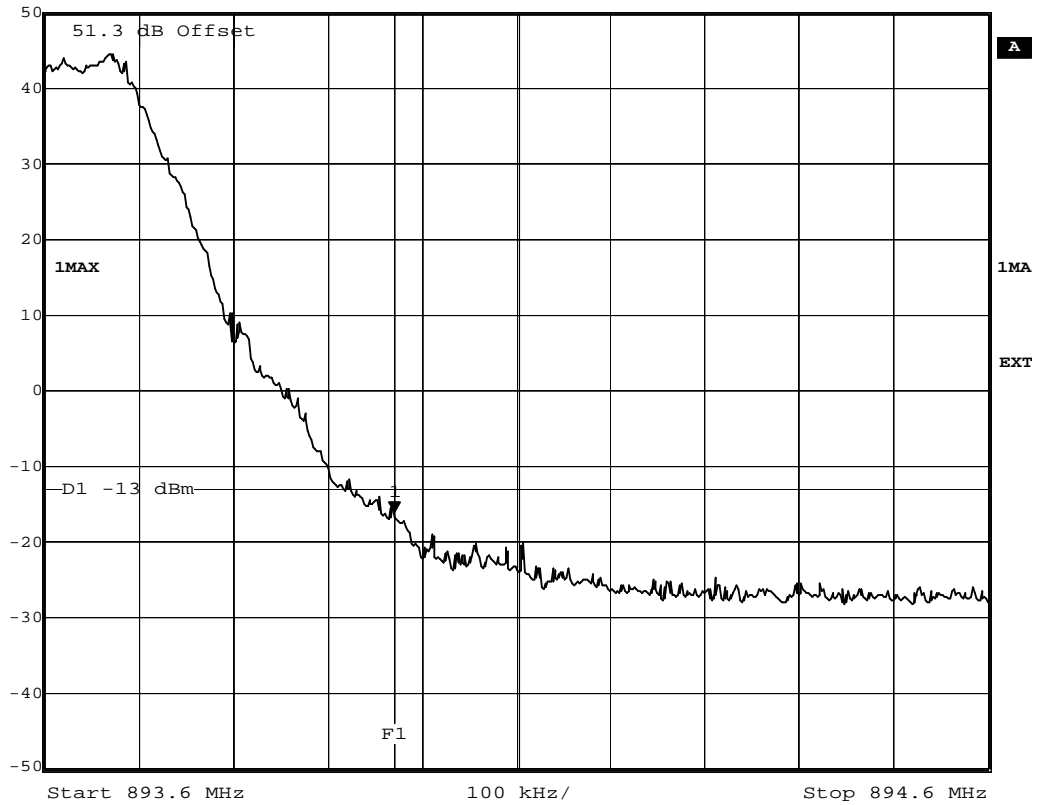
Datum/Date
2003-09-12

Beteckning/Reference
F314320-F22

Sida/Page
Diagram 12 (12)
Encl. 5.1



Marker 1 [T1]	RBW	30 kHz	RF Att	20 dB	
Ref Lvl	-16.17 dBm	VBW	30 kHz		
50 dBm	893.9700000 MHz	SWT	5 ms	Unit	dBm



Date: 10.SEP.2003 15:16:38

Sign:.....

Conducted spurious emission measurements according to 47CFR 2.1051

Date	Temperature	Humidity
2003-08-12	22 °C ± 3 °C	71 % ± 5 %
2003-08-13	23 °C ± 3 °C	70 % ± 5 %

Test set-up and Procedure

The measurements were made per definition in 22.917. Measurements were made at CDU-G output connectors. The output was connected to a spectrum analyser. The spectrum analyser was connected to an external 10 MHz reference standard during the measurements. The transmitter was modulated with 270.8 kbs pseudorandom data during the measurements.

Measurement equipment	Calibration Due	SP number
R&S FSIQ	2004-03	503 738
LP filter	2004-04	503 559
Band reject filter 800	2004-04	502 679
HP filter	2004-04	502 758
Testo 610, Temperature and humidity meter	2003-12	502 658

Measurement uncertainty: 3.7 dB

Results

Mode: **GMSK**

dTRU, output 1+2 (TCC):

Diagram 1: Ch 128, 49 dBm

Diagram 2: Ch 251, 49 dBm

dTRU, without internal combiner:

Diagram 3: TRX output 1, Ch 128, 46 dBm

Diagram 4: TRX output 1, Ch 251, 46 dBm

Diagram 5: TRX output 2, Ch 128, 46 dBm

Diagram 6: TRX output 2, Ch 251, 46 dBm

dTRU, with internal combiner:

Diagram 7: Ch 128, 43 dBm and ch 153, 43 dBm

Diagram 8: Ch 226, 43 dBm and ch 251, 43 dBm

Mode: **EDGE**

dTRU, output 1+2 (TCC):

Diagram 9: Ch 128, 49 dBm

Diagram 10: Ch 251, 49 dBm

dTRU, without internal combiner:

Diagram 11: TRX output 1, Ch 128, 46 dBm

Diagram 12: TRX output 1, Ch 251, 46 dBm

Diagram 13: TRX output 2, Ch 128, 46 dBm

Diagram 14: TRX output 2, Ch 251, 46 dBm

dTRU, with internal combiner:

Diagram 15: Ch 128, 43 dBm and ch 153, 43 dBm

Diagram 16: Ch 226, 43 dBm and ch 251, 43 dBm

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Datum/Date
2003-09-12

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F314320-F22

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2 (2)
Encl. 6

FCC ID: B5KBRKRC1311005-2

Limits

The power of any emission outside the frequency band shall be attenuated below the transmitter power (P) by at least $43 + 10 \log P$ dB.

Complies?	Yes
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Sign:.....

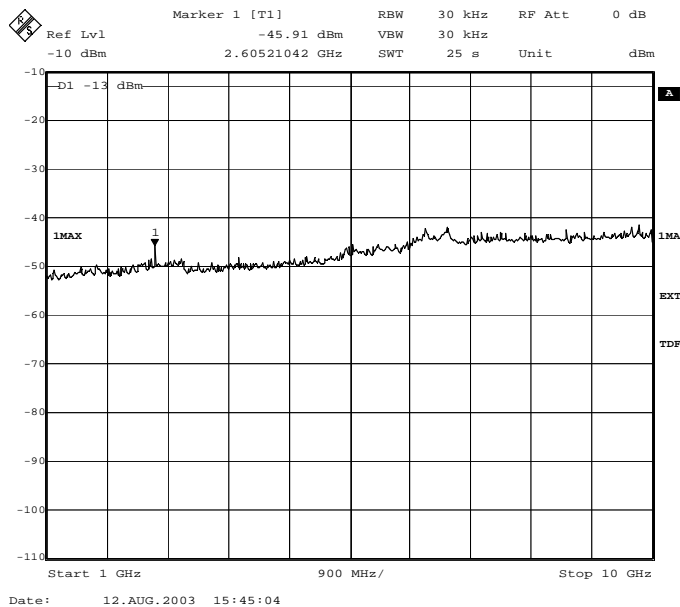
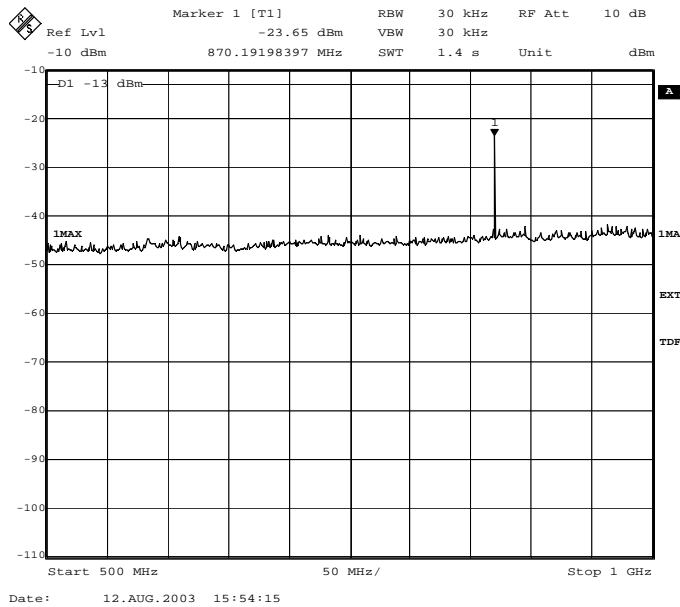
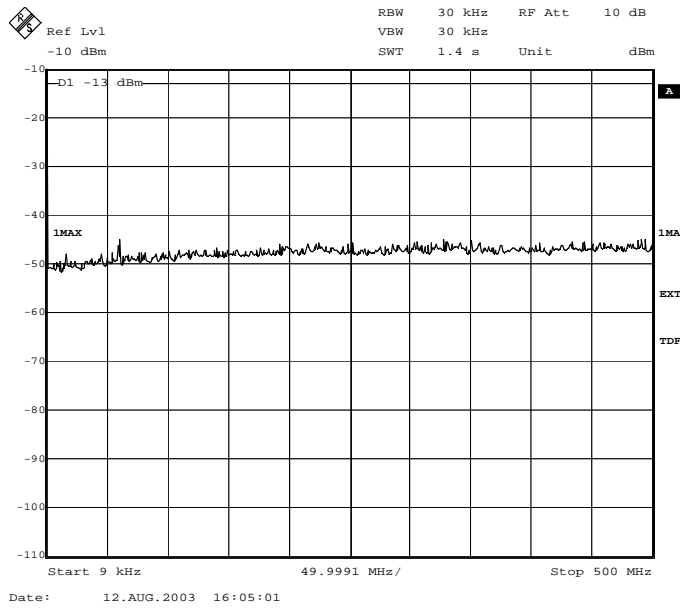
REPORT

Datum/Date
2003-09-12

Beteckning/Reference
F314320-F22

Sida/Page
Diagram 1 (16)
Encl. 6.1

FCC ID: B5KBRKRC1311005-2



Sign:.....

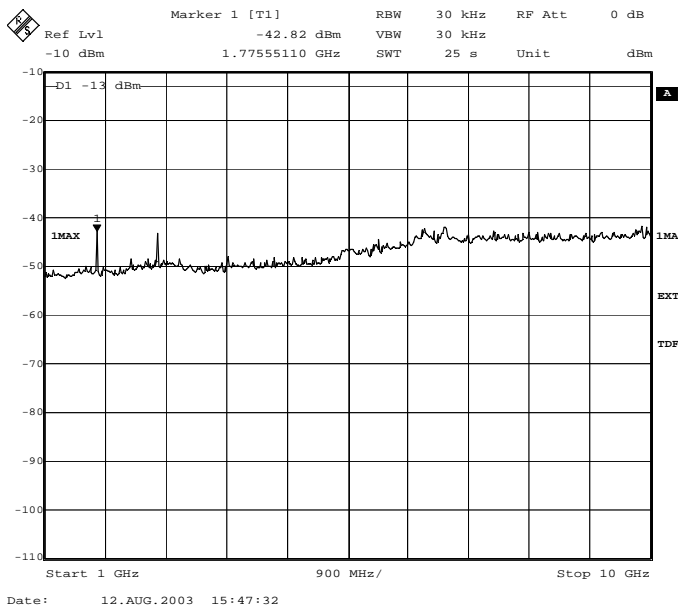
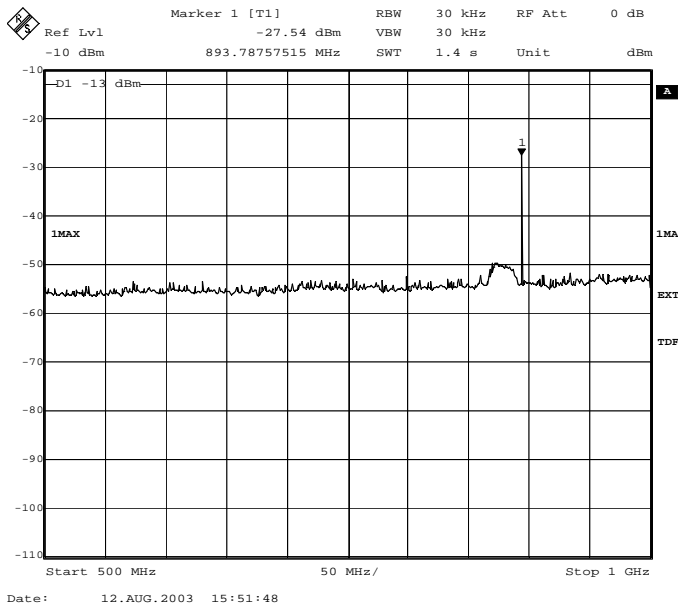
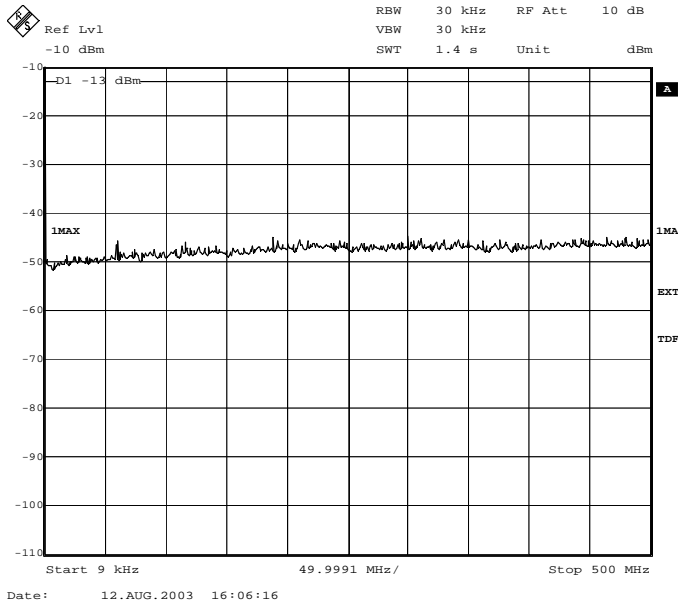
REPORT

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Datum/Date
2003-09-12

Beteckning/Reference
F314320-F22

Sida/Page
Diagram 2 (16)
Encl. 6.1



Sign:.....

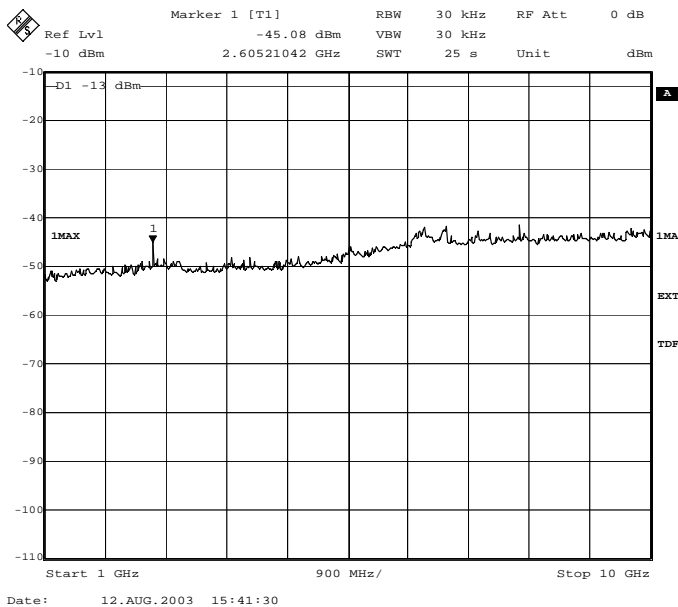
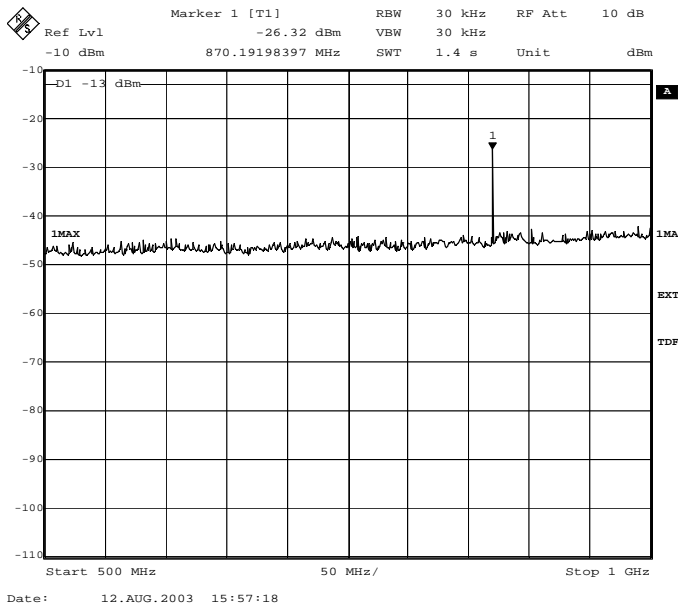
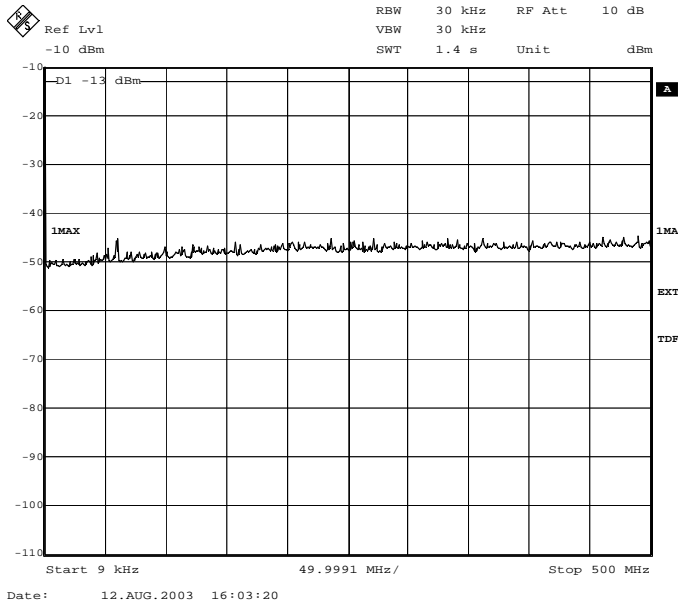
REPORT

FCC ID: B5KBRKRC1311005-2

Datum/Date
2003-09-12

Betekning/Reference
F314320-F22

Sida/Page
Diagram 3 (16)
Encl. 6.1



Sign:.....

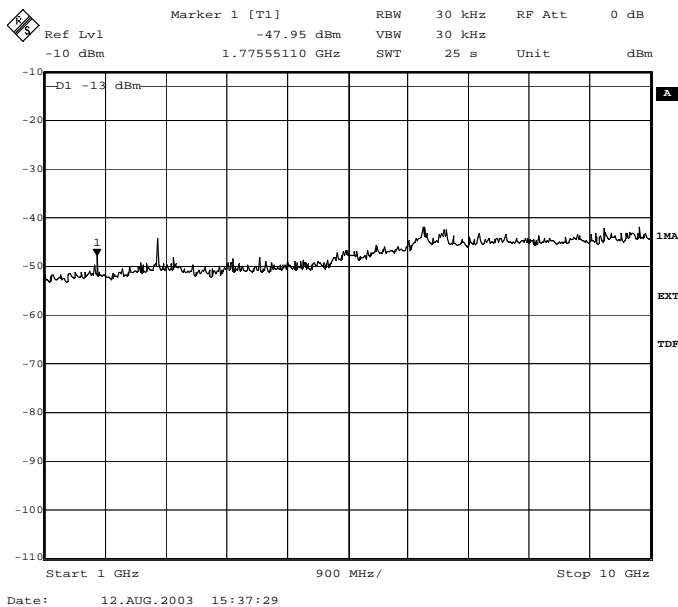
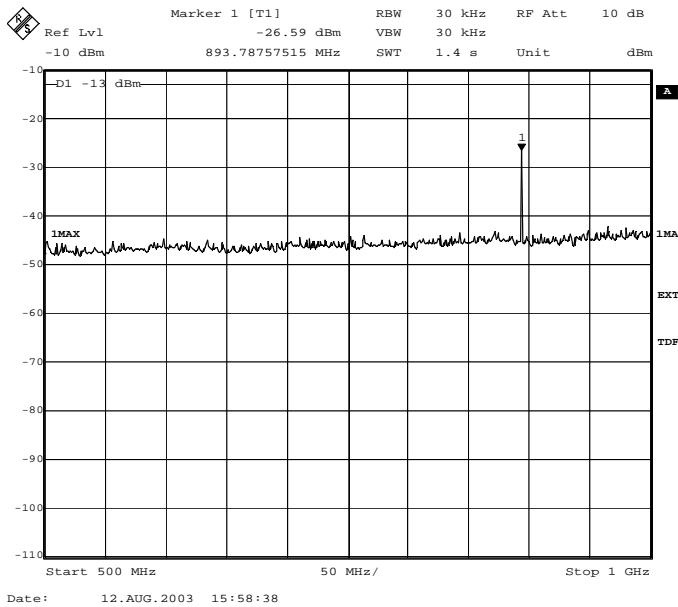
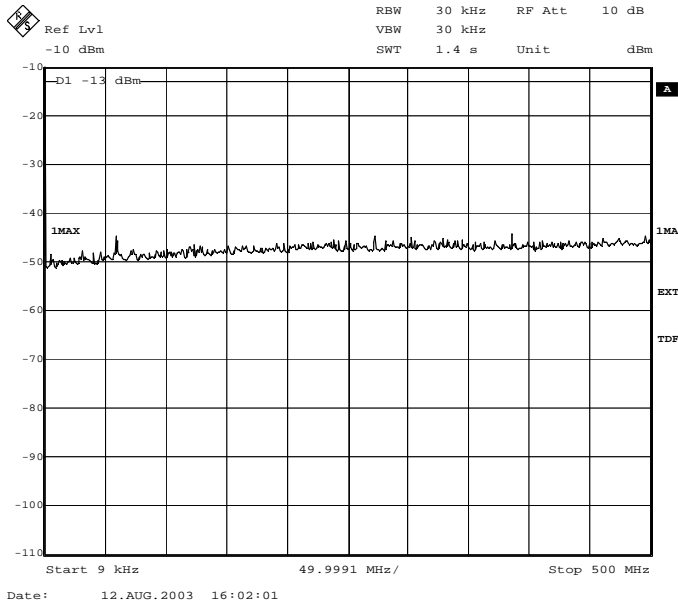
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FCC ID: B5KBRKRC1311005-2

Datum/Date
2003-09-12

Beteckning/Reference
F314320-F22

Sida/Page
Diagram 4 (16)
Encl. 6.1



Sign:.....

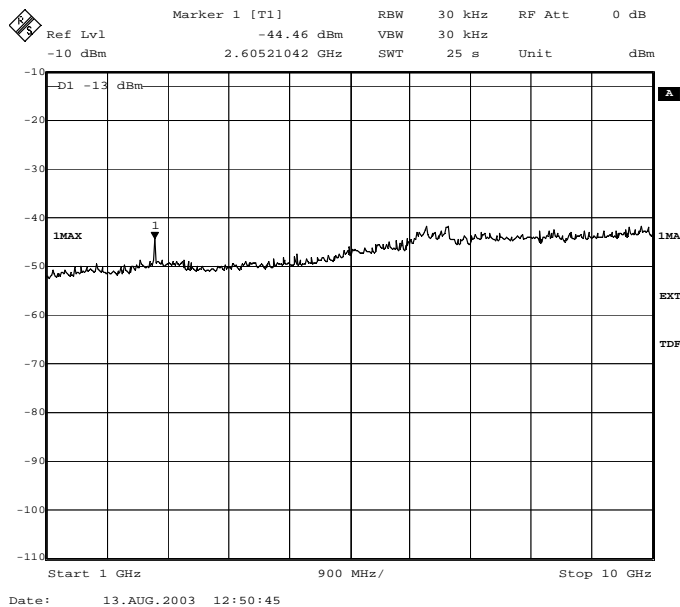
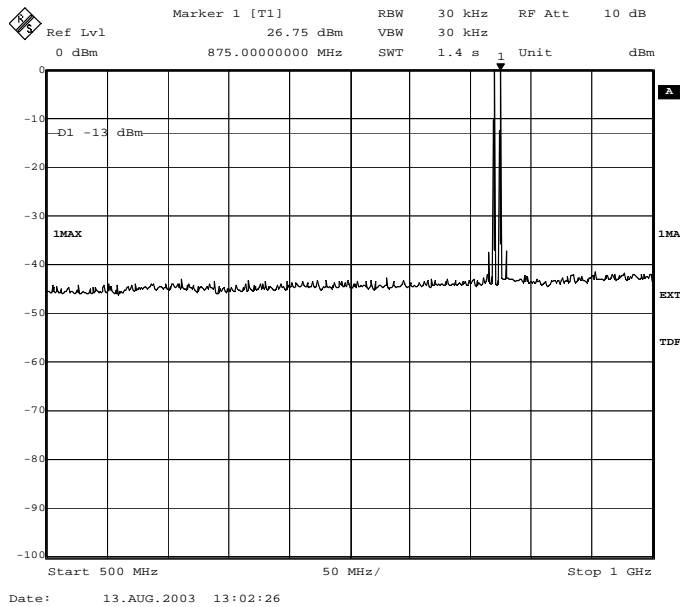
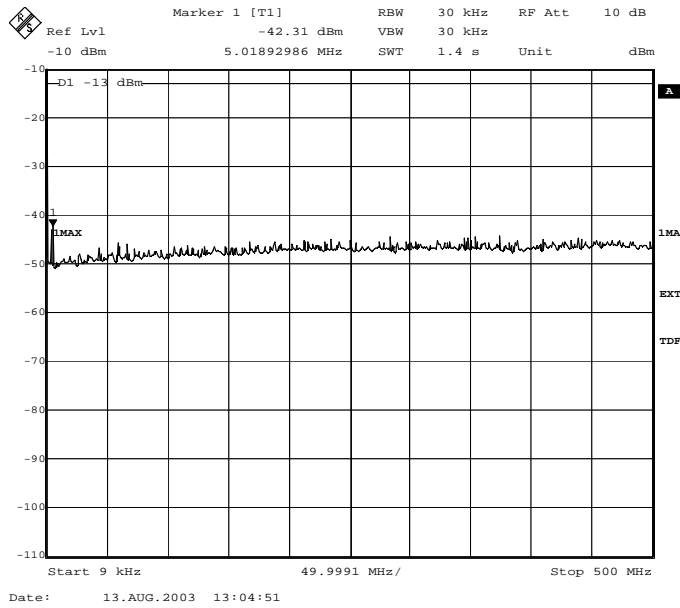
REPORT

Datum/Date
2003-09-12

Beteckning/Reference
F314320-F22

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Diagram 5 (16)
Encl. 6.1

FCC ID: B5KBRKRC1311005-2



Sign:.....

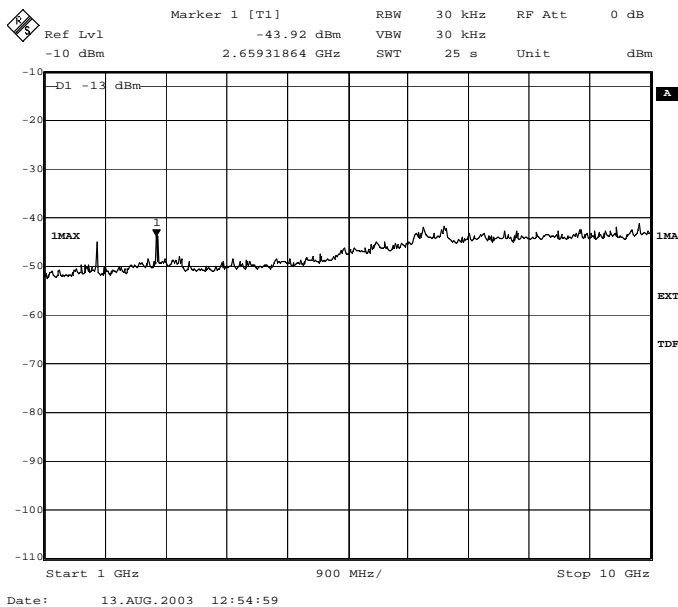
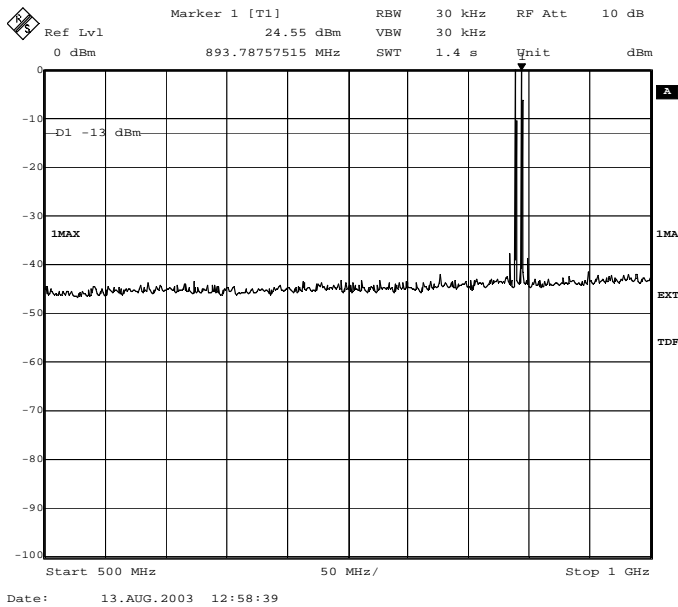
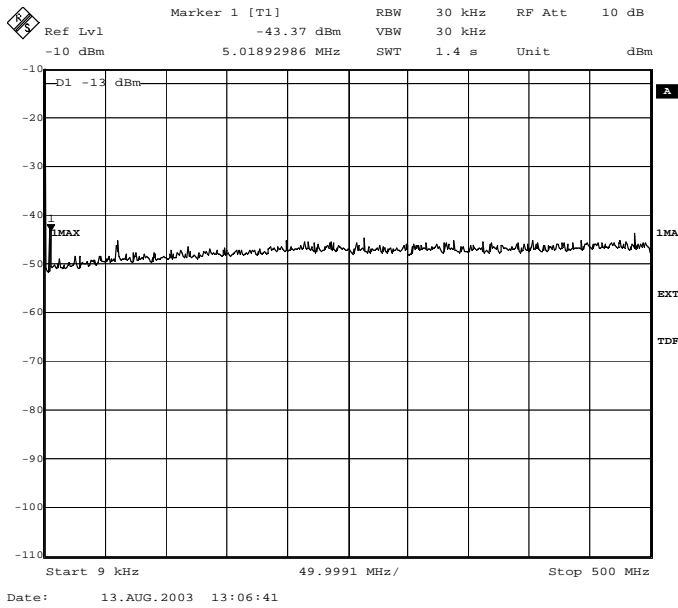
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Datum/Date
2003-09-12

Betekning/Reference
F314320-F22

Sida/Page
Diagram 6 (16)
Encl. 6.1



Sign:.....

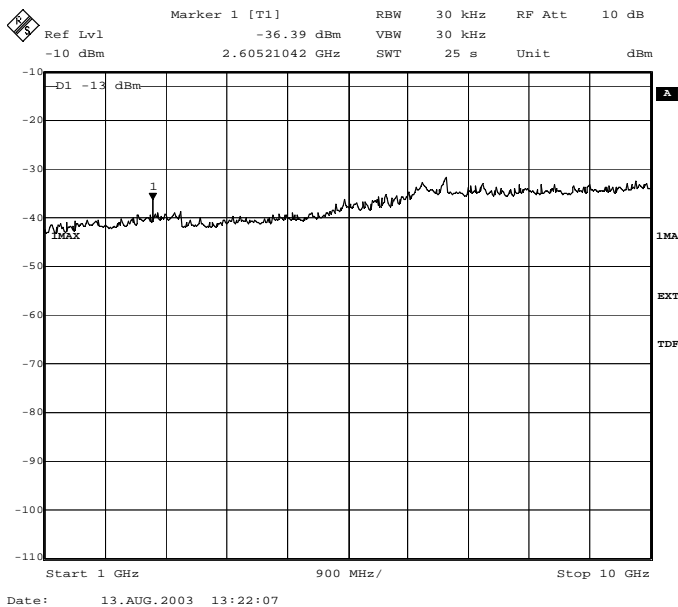
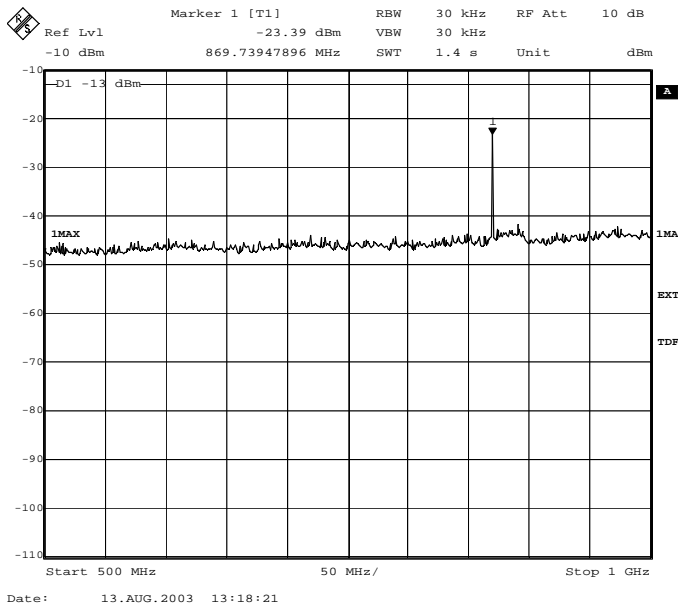
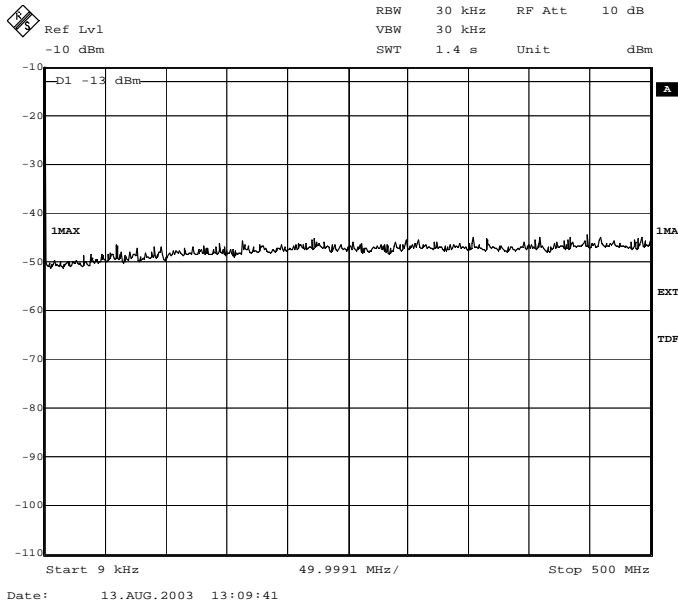
REPORT

FCC ID: B5KBRKRC1311005-2

Datum/Date
2003-09-12

Beteckning/Reference
F314320-F22

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Diagram 7 (16)
Encl. 6.1



Sign:.....

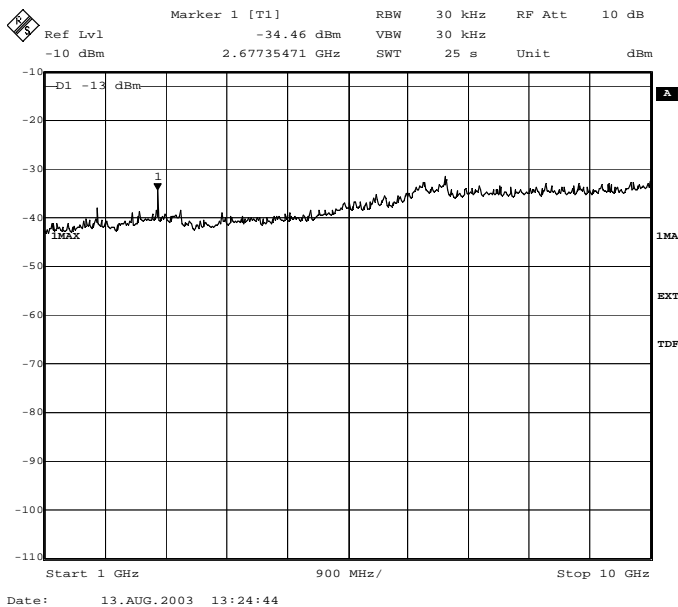
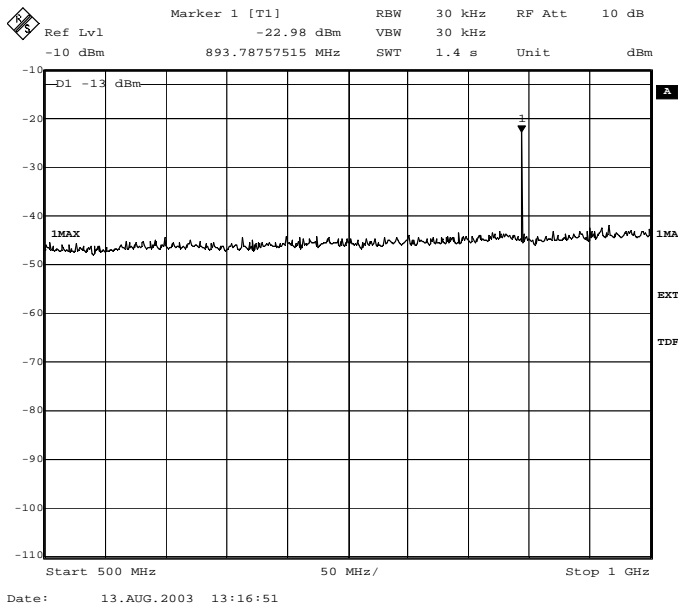
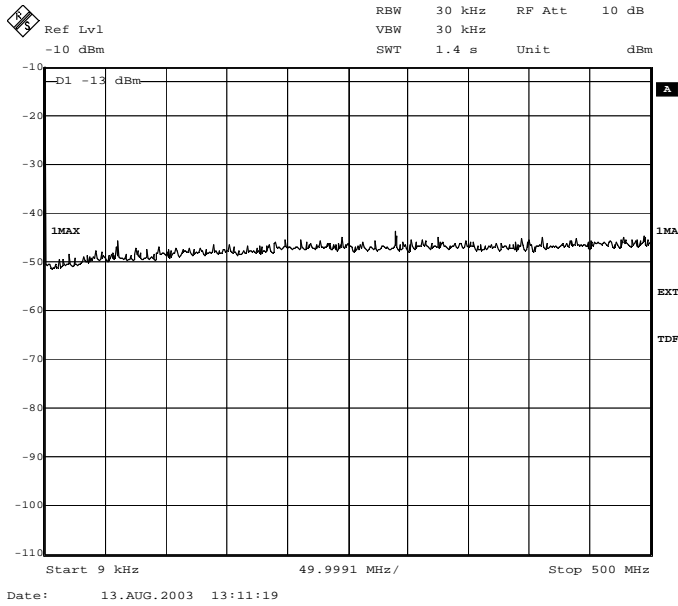
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Beteckning/Reference
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Sida/Page
Diagram 8 (16)
Encl. 6.1



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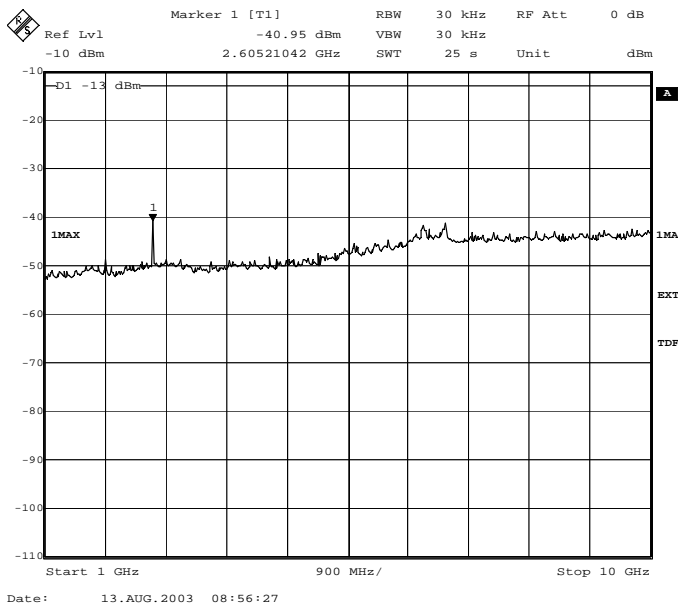
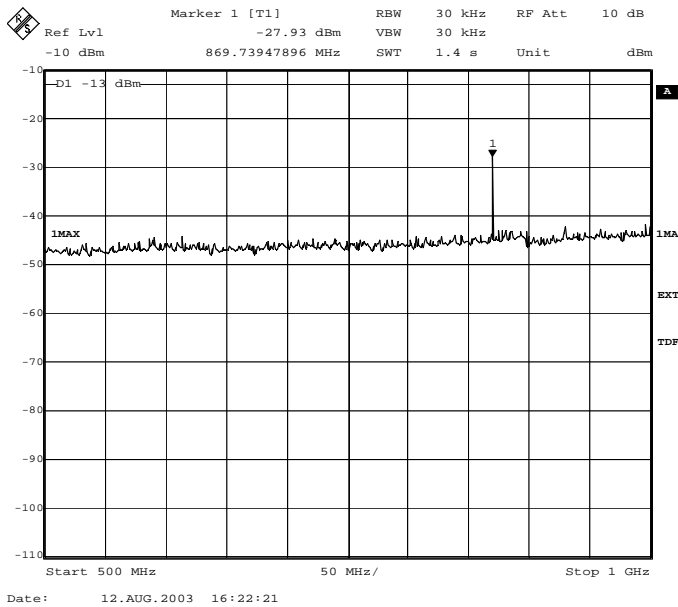
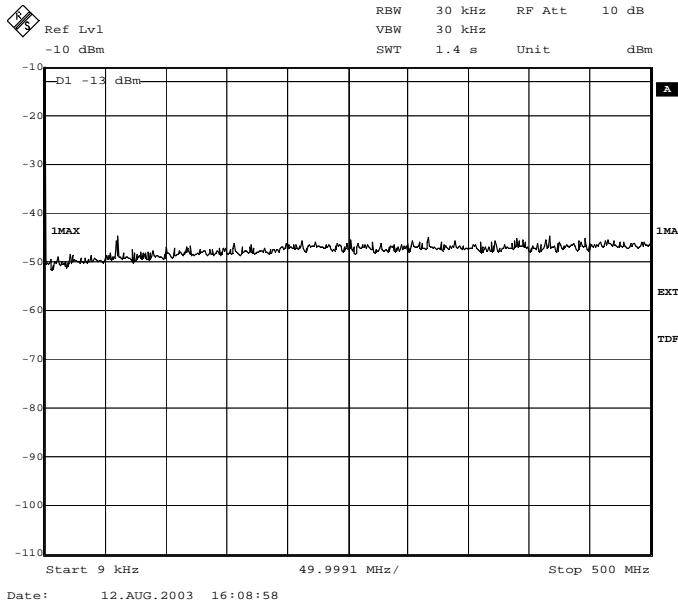
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Diagram 9 (16)
Encl. 6.1



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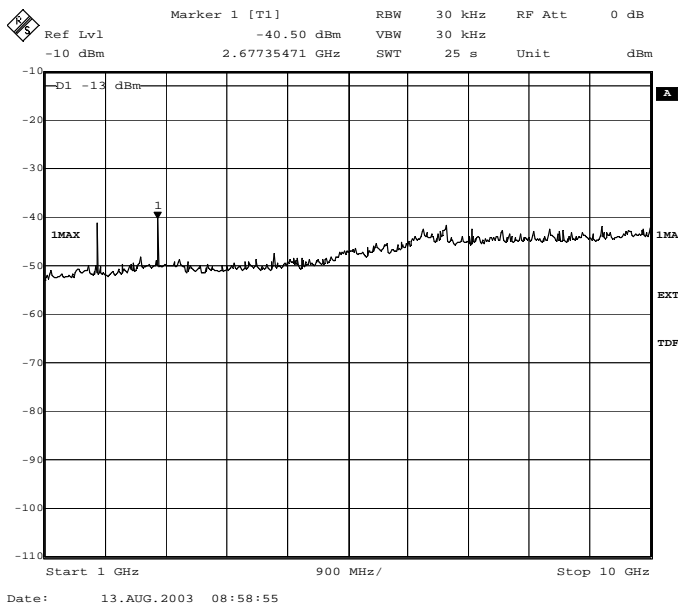
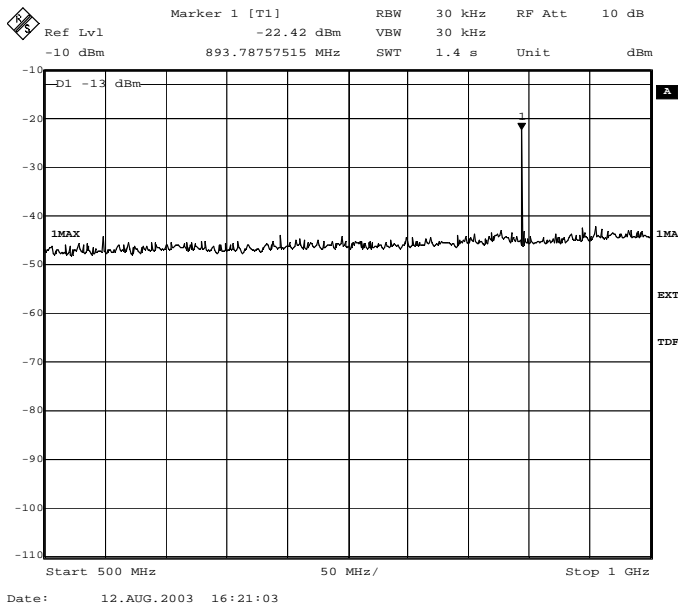
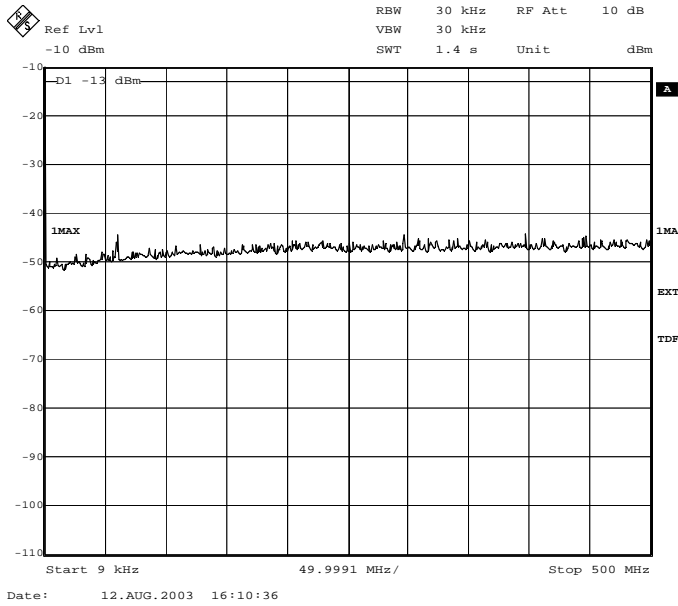
REPORT

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2003-09-12

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F314320-F22

Sida/Page
Diagram 10 (16)
Encl. 6.1



Sign:.....

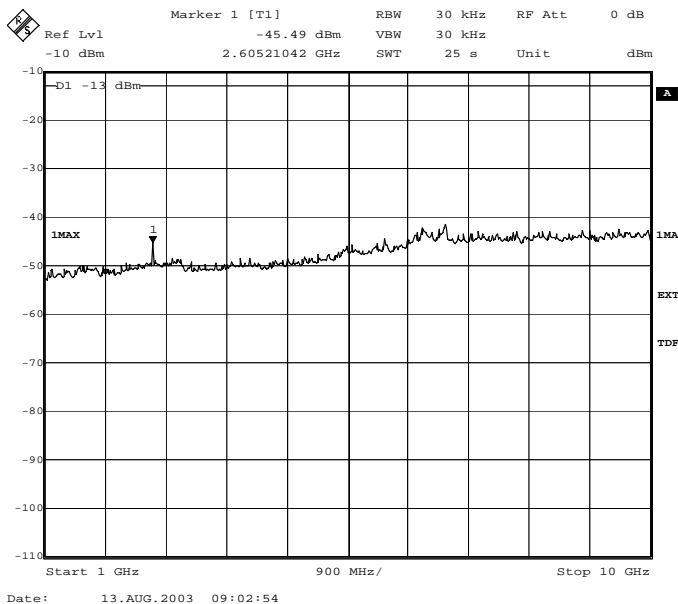
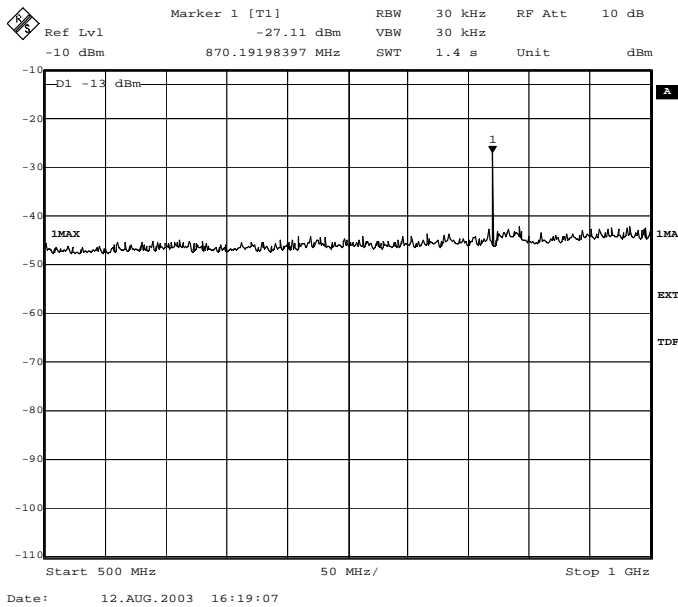
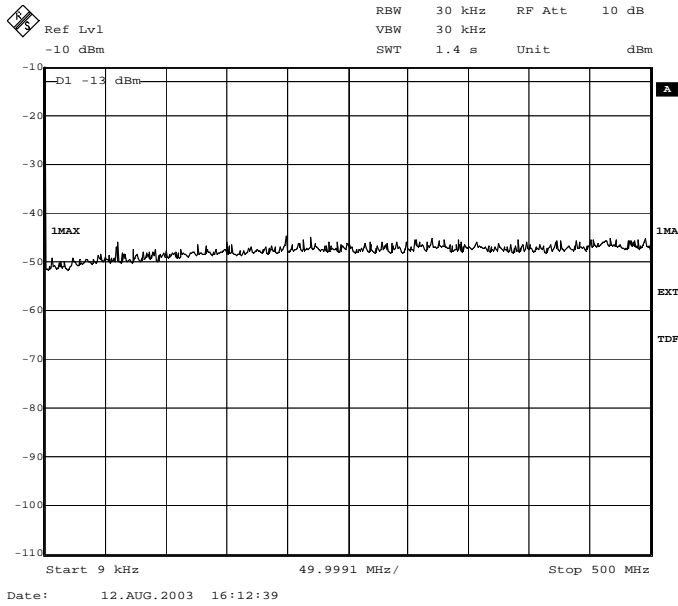
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Datum/Date
2003-09-12

Beteckning/Reference
F314320-F22

Sida/Page
Diagram 11 (16)
Encl. 6.1



Sign:.....

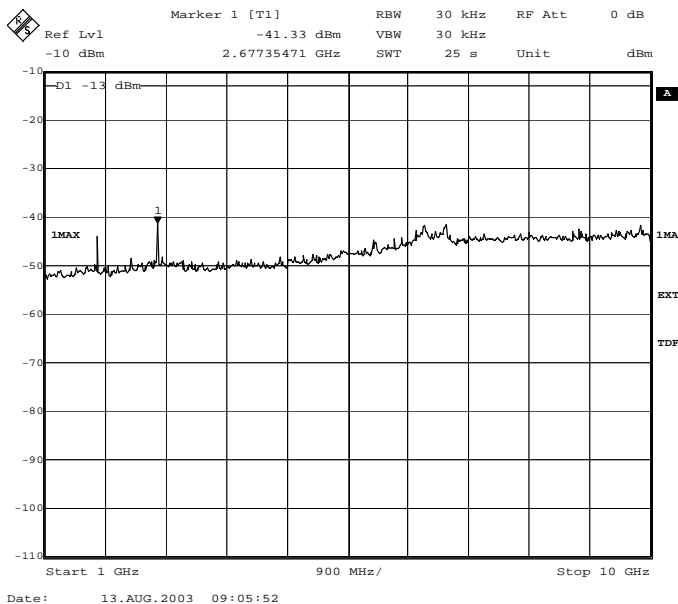
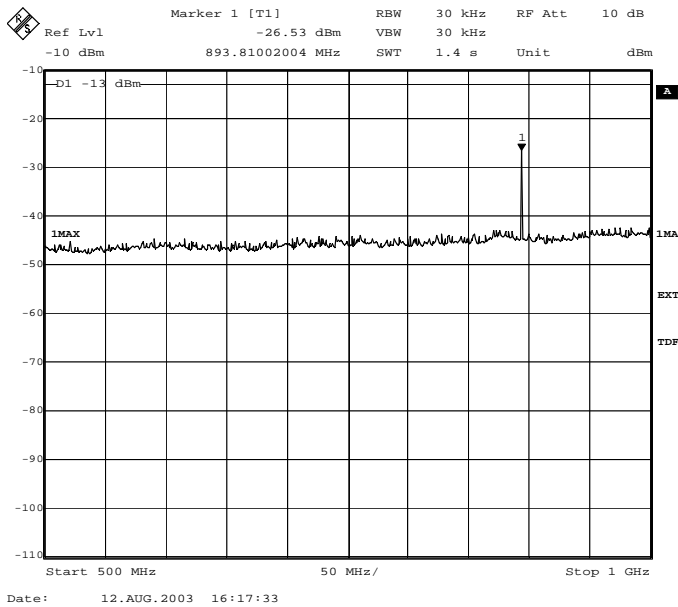
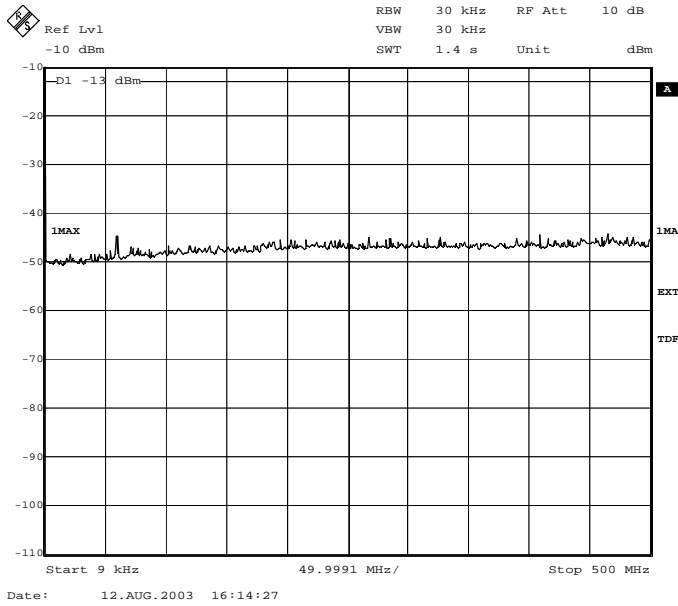
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FCC ID: B5KBRKRC1311005-2

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2003-09-12

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Diagram 12 (16)
Encl. 6.1



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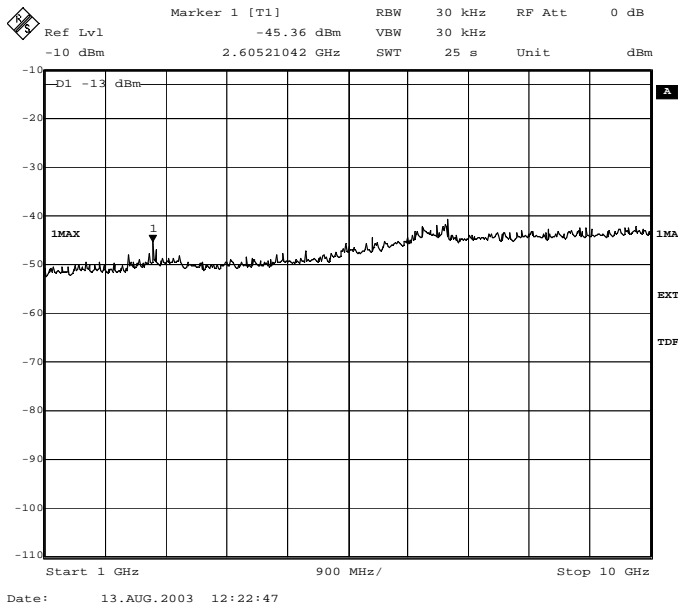
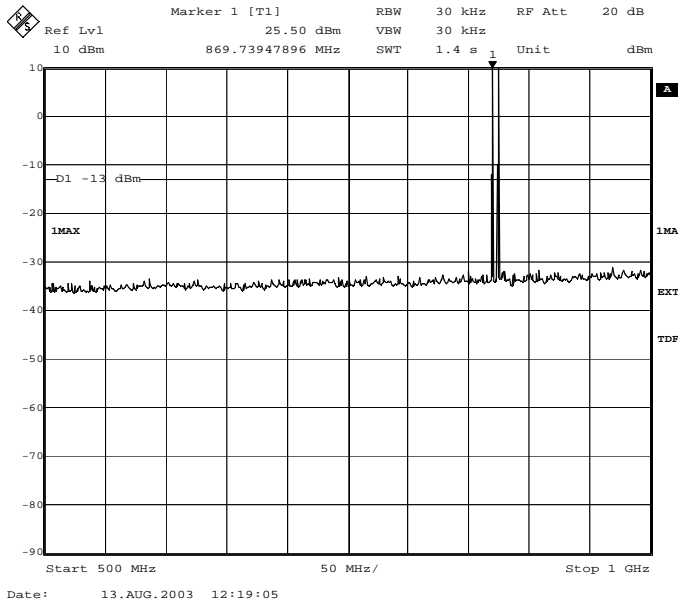
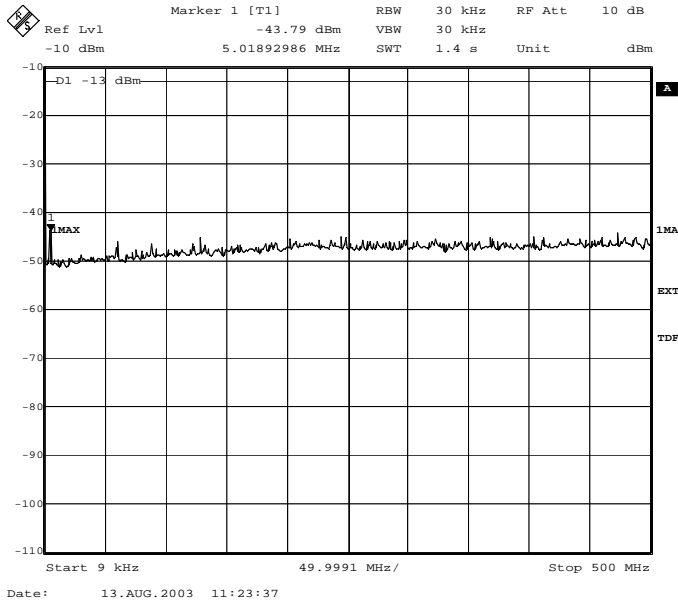
REPORT

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2003-09-12

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F314320-F22

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Diagram 13 (16)
Encl. 6.1

FCC ID: B5KBRKRC1311005-2



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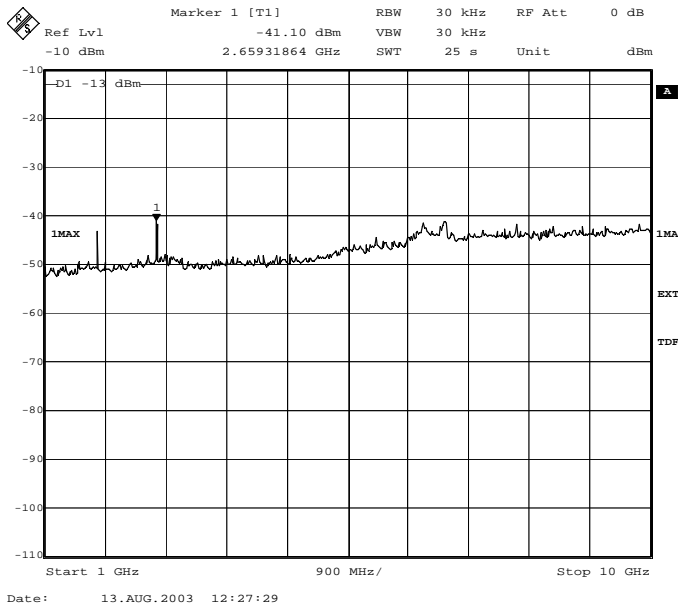
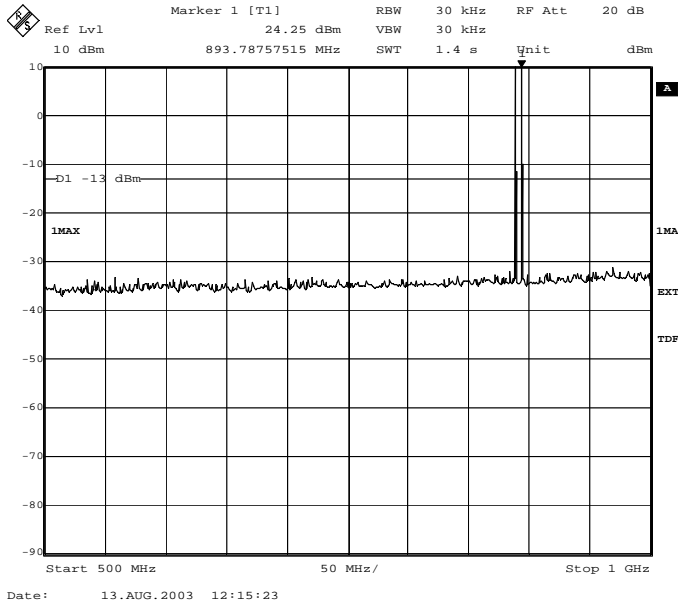
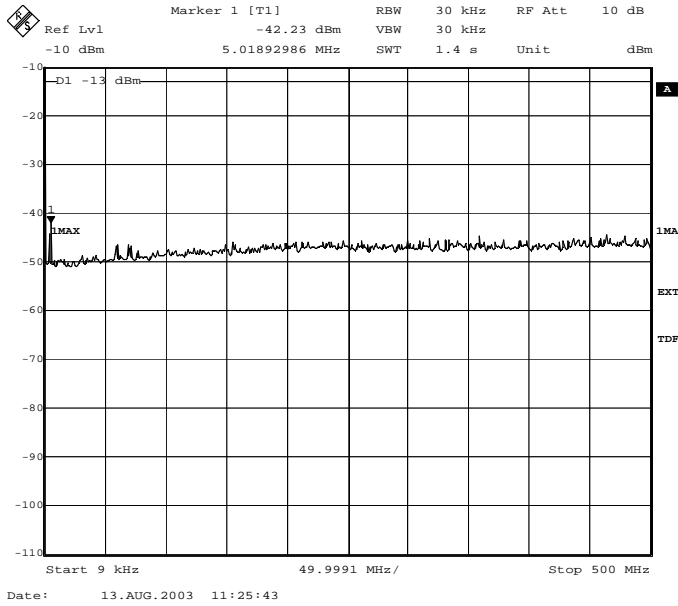
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Datum/Date
2003-09-12

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F314320-F22

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Diagram 14 (16)
Encl. 6.1



Sign:.....

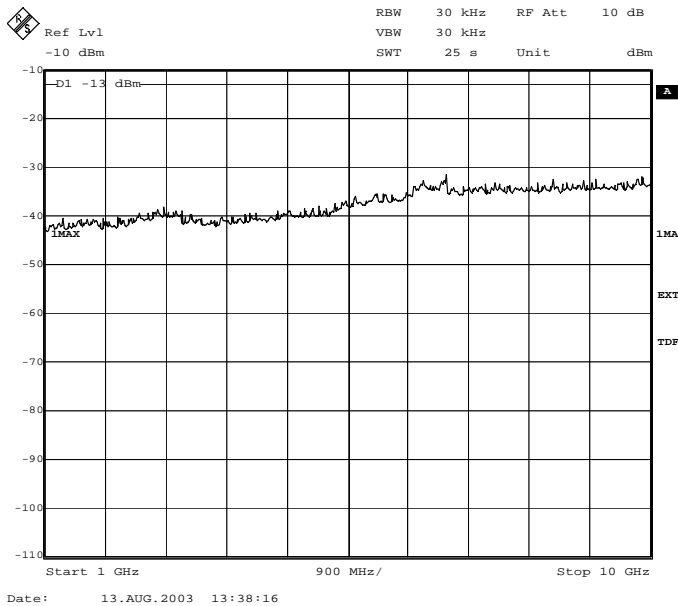
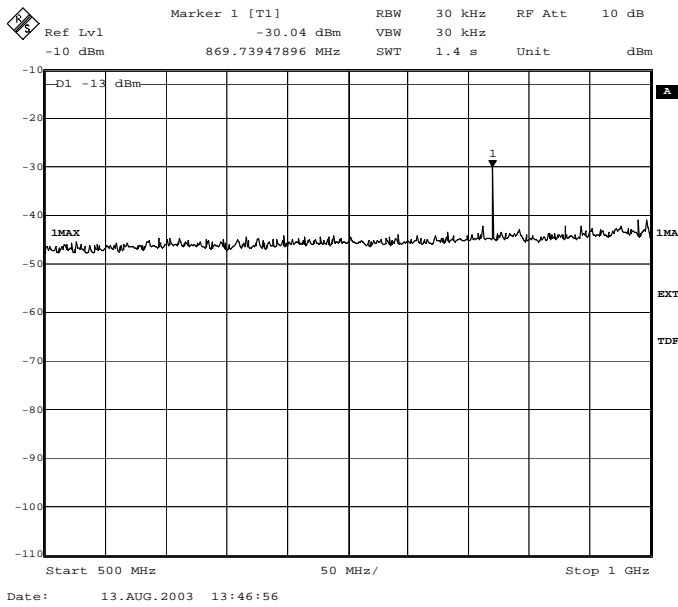
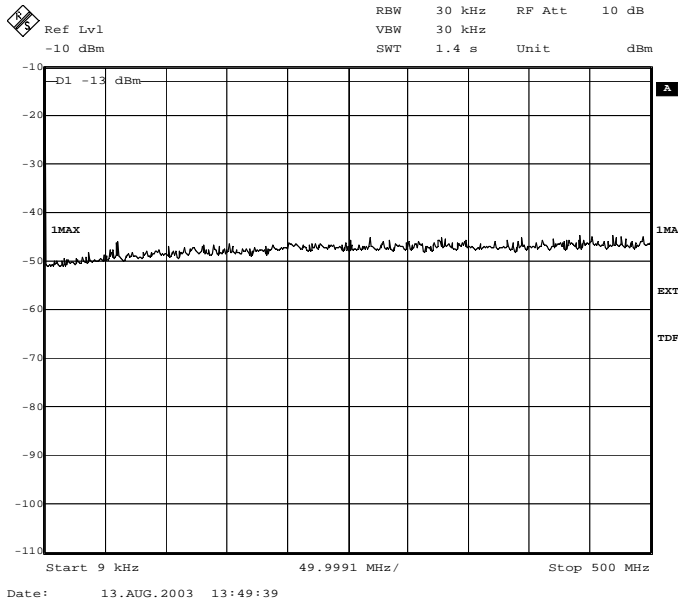
REPORT

FCC ID: B5KBRKRC1311005-2

Datum/Date
2003-09-12

Beteckning/Reference
F314320-F22

Sida/Page
Diagram 15 (16)
Encl. 6.1



Sign:.....

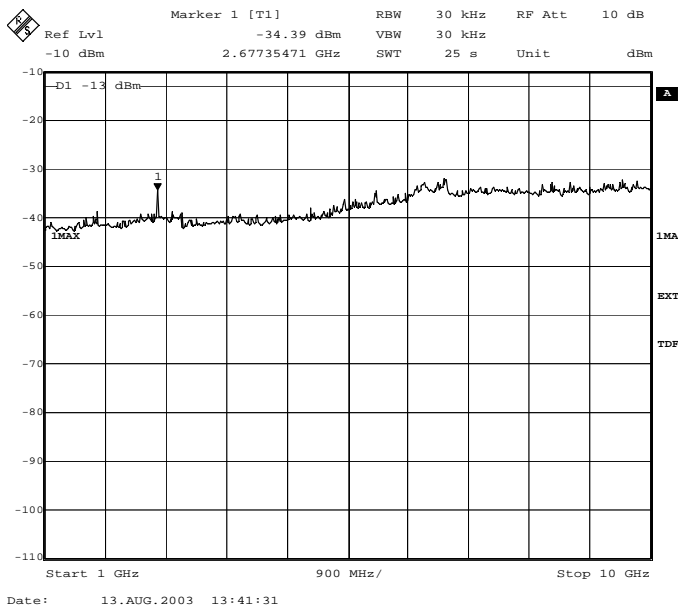
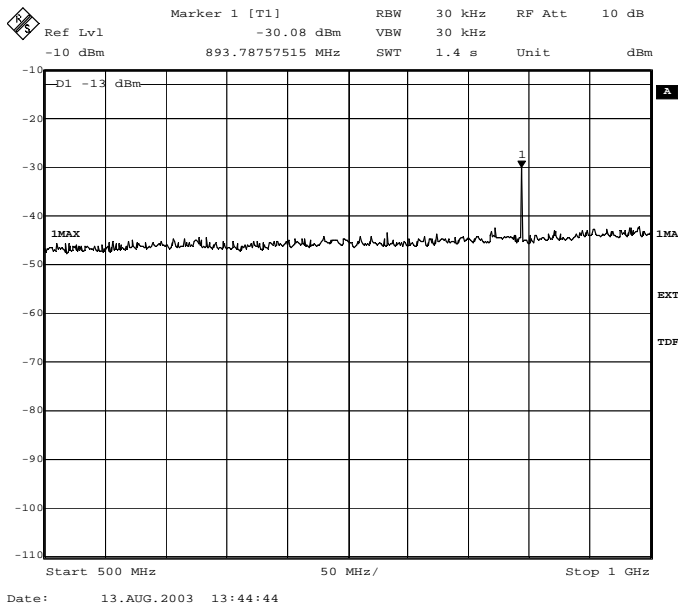
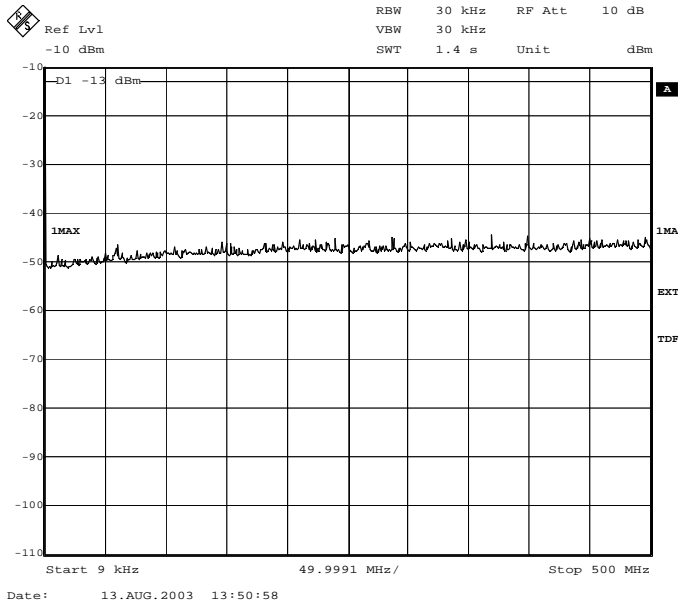
REPORT

FCC ID: B5KBRKRC1311005-2

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2003-09-12

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Diagram 16 (16)
Encl. 6.1



Sign:.....

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F314320-F22

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1 (4)
Encl. 7

FCC ID: B5KBRKRC1311005-2

Field strength of spurious radiation measurements according to 47CFR 2.1053

Date	Temperature	Humidity
2003-08-05	21 °C ± 3 °C	59 % ± 5 %
2003-08-06	22 °C ± 3 °C	40 % ± 5 %
2003-08-07	22 °C ± 3 °C	47 % ± 5 %
2003-08-08	22 °C ± 3 °C	62 % ± 5 %

Test set-up and Procedure

The measurement procedure is per ANSI/TIA/EIA-603-1992. The chamber is listed at FCC, Columbia with registration number: 93866. The test site also complies with RSS 212, Issue 1, Industry Canada file no.:IC 3482.

Measurements were done at 3 m distance. The transmitter was modulated with 270.8 kbs pseudorandom data during the measurements.

Measurement equipment	Calibration Due	SP number
Anechoic chamber	-	15:115
R&S ESI 40	2004-07	503 125
Control computer	-	503 479
Software: R&S ES-K1, ver. 1.60	-	-
Chase Bilog antenna CBL 6111A	2003-12	503 182
EMCO loop antenna 6502	2003-09	502 916
EMCO Horn Antenna 3115	2004-11	502 175
High pass filter	2004-04	502 758
MITEQ Low Noise Amplifier	2004-04	503 277
Testo 615, Temperature and humidity meter	2003-08	503 505

The test set-up during the spurious radiation measurements can be seen in the pictures on page 2.

Sign:.....

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Cabinet 2206, 24 V DC:



Cabinet 2106, three phase 208 V AC (phase-to-phase voltage):



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Results

Cabinet 2206

EDGE: the three modes tested at the same time: with internal combiner, without internal combiner and with internal combiner plus TCC

GMSK: the three modes mentioned above at the same time

Nominal Voltage: 24 V DC

Output power TCC: 49 dBm

Output power without internal combiner: 46 dBm

Output power with internal combiner: 43 dBm

Mode: **GMSK**

Frequency (MHz)	Spurious emission level (dBm)	
	Vertical	Horizontal
30-10 000	All emission > 20 dB below limit	All emission > 20 dB below limit
Measurement uncertainty		4.7 dB

Mode: **EDGE**

Frequency (MHz)	Spurious emission level (dBm)	
	Vertical	Horizontal
30-10 000	All emission > 20 dB below limit	All emission > 20 dB below limit
Measurement uncertainty		4.7 dB

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Cabinet 2106

EDGE: three mode tested at a time: with internal combiner, without internal combiner and with internal combiner plus TCC

GMSK: the three modes mentioned above at the same time

Nominal voltage: 208 V AC (phase-to-phase voltage)

Output power TCC: 49 dBm

Output power without internal combiner: 46 dBm

Output power with internal combiner: 43 dBm

Mode: **GMSK**

Frequency (MHz)	Spurious emission level (dBm)	
	Vertical	Horizontal
30-10 000	All emission > 20 dB below limit	All emission > 20 dB below limit
Measurement uncertainty		4.7 dB

Mode: **EDGE**

Frequency (MHz)	Spurious emission level (dBm)	
	Vertical	Horizontal
30-10 000	All emission > 20 dB below limit	All emission > 20 dB below limit
Measurement uncertainty		4.7 dB

Limits

The power of any emission outside the frequency band shall be attenuated below the transmitter power (P) by at least $43 + 10 \log P$ dB.

Complies?	Yes
-----------	-----

Sign:.....

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Frequency stability measurements according to 47CFR 2.1055

Date	Temperature	Humidity
2003-08-14	21 °C ± 3 °C	58 % ± 5 %
2003-08-15	23 °C ± 3 °C	49 % ± 5 %
2003-08-18	21 °C ± 3 °C	57 % ± 5 %
2003-08-19	21 °C ± 3 °C	58 % ± 5 %
2003-08-20	23 °C ± 3 °C	54 % ± 5 %

Test set-up and Procedure

The measurements were made per J-STD-007A Vol 1 (GMSK) and TIA/EIA-136-280-B (EDGE).

The test was made with the dTRU mounted in the RBS 2206 cabinet.

Measurements were made at CDU-G output connectors. The output was connected to a spectrum analyser. The spectrum analyser was connected to an external 10 MHz reference standard during measurement.

The transmitter was modulated with 270.8 kbs pseudorandom data during the measurements.

Measurement equipment	Calibration Due	SP number
Climate chamber	2004-02	503 546
R&S FSIQ	2004-03	503 738
Multimeter Fluke 87	2003-09	502 190
Testo 610, Temperature and humidity meter	2003-12	502 658

Sign:.....

Results

Nominal Voltage 24 V DC

43 dBm output power at Channel 190 (881.6 MHz)

Mode: **GMSK**

Test conditions		Frequency error (Hz)	
Supply voltage DC (V)	T (°C)	TRU Output 0	TRU Output 1
24.0	+20	-7	-7
27.6	+20	-8	-7
20.4	+20	-6	-6
24.0	+30	-6	7
24.0	+40	-10	-9
24.0	+50	-7	-10
24.0	+10	-6	-5
24.0	0	-6	-7
24.0	-10	Note 1	Note 1
24.0	-20	Note 1	Note 1
24.0	-30	Note 1	Note 1
Maximum freq. error (Hz)		-10	
Measurement uncertainty		$< \pm 1 \times 10^{-7}$	

Note 1: According to the manufacturers declaration the EUT is designed to operate in the temperature range +5 °C to +40 °C. The EUT will not transmit when the temperature is -10 °C and below. Due to the manufacturers declaration no measurements were performed at -10 °C and below.

Mode: **EDGE**

Test conditions		Frequency error (Hz)	
Supply voltage DC (V)	T (°C)	TRU Output 0	TRU Output 1
24.0	+20	-6	-6
27.6	+20	-9	-7
20.4	+20	-8	7
24.0	+30	-7	-6
24.0	+40	-7	-7
24.0	+50	-8	-8
24.0	+10	-8	-7
24.0	0	-7	-8
24.0	-10	Note 1	Note 1
24.0	-20	Note 1	Note 1
24.0	-30	Note 1	Note 1
Maximum freq. error (Hz)		-9	
Measurement uncertainty		$< \pm 1 \times 10^{-7}$	

Note 1: According to the manufacturers declaration the EUT is designed to operate in the temperature range +5 °C to +40 °C. The EUT will not transmit when the temperature is -10 °C and below. Due to the manufacturers declaration no measurements were performed at -10 °C and below.

Limits

The maximum frequency error shall not be greater than 0.05 ppm (44 Hz).

Complies?	Yes
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EUT Hardware configuration list RBS 2206

Unit	Product Number	Serial Number	Revision
Cabinet	SEB 112 1095/1	TU81362438	R5A
ACCU-01	BMG 980 07/1	S792068835	P1B
FCU-01	BGM 136 1001/2	B991030355	R3A
DC-filter	KFE 101 1145/3	TR21004032	P1B
6xBias Injector	KRY 101 1587/1	--	R2B
CDU shelf	BFL 119 406/1	--	R3A
CDU-G 8	BFL 119 155/1	A4000496WM	R2G
CDU-G 8	BFL 119 155/1	A4000496WT	R2G
CDU-G 8	BFL 119 155/1	A4000496WN	R2G
ASU-01	KRY 112 54/1	A40003DWKP	R2A
Dummy	SXK 107 5031/1	--	R1B
CXU-10	KRY 101 1856/1	S690013KNW	R3C
Dummy	SXK 107 5031/1	--	R1B
TRU shelf	BFL 119 407/1	--	R3B
dTRU-8 EDGE	KRC 131 1005/2	AE50265837	R2C
dTRU-8 EDGE	KRC 131 1005/2	AE50265840	R2C
dTRU-8 EDGE	KRC 131 1005/2	AE50265638	R2C
dTRU-8 EDGE	KRC 131 1005/2	AE50265821	R2C ¹⁾
dTRU-8 EDGE	KRC 131 1005/2	AE50265816	R2C ²⁾
dTRU-8 EDGE	KRC 131 1005/2	AE50265637	R2C ²⁾
dTRU-8	KRC 131 1005/1	AE50266989	R1E ³⁾
dTRU-8	KRC 131 1005/1	AE50266990	R1E ³⁾
Dummy	SXK 107 5031/2	--	R1B
IDM 01	BMG 980 06/1	T671080937	R3A
PSU-shelf	BFL 119 408/1	--	R2A
PSU-AC	BML 231 202/1	A082261658	R2F
PSU-AC	BML 231 202/1	A082261662	R2F
PSU-AC	BML 231 202/1	A082261624	R2F
PSU-AC	BML 231 202/1	A082261663	R2F
DXU-21A	BOE 602 14/1	X510231694	R10B
TMA-CM-01	SDK 107 881/1	SA22251364	R1B
Dummy	SXK 107 5029/1	--	R1B
Dummy	SXK 107 5030/1	--	R1C
Dummy	SXK 107 5030/1	--	R1C

- 1) This dTRU was switched off during the radiated spurious emission measurements
- 2) This dTRU was only used during the radiated spurious emission measurement in EDGE mode.
- 3) This dTRU was only used during the radiated spurious emission measurements in GMSK mode

Software	Revision
R91B	R086Z

Sign:.....

EUT Hardware configuration list RBS 2106

Unit	Product Number	Serial Number	Revision
Cabinet	SEB 112 1035/04	S773150373	R4B
Climate	BPD 104 36/1	S781146934	R8A
IDM-01	BMG 980 06/1	T671069621	R2B
PSU shelf	BFL 119 408/1	--	R2A
PSU-AC	BML 231 202/1	TL92055453	R2G
PSU-AC	BML 231 202/1	TL92024921	R2G
PSU-AC	BML 231 202/1	A083034500	R2G
PSU-AC	BML 231 202/1	TL92024372	R2G
DXU-21A	BOE 602 14/1	X510231696	R10B
TMA-CM-01	SDK 107 881/1	SA22300480	R1B
Dummy	SXX 107 5029/1	--	R1B
Dummy	SXX 107 5030/1	--	R1C
Dummy	SXX 107 5030/1	--	R1C
ACCU-02-DU	BMG 980 11/1	A441557347	R2D
FCU-01	BMG 136 1001/2	A083766414	R3A
DC/DC	BMR 960 011/1	A082515490	R2E
DC/DC	BMR 960 011/1	A082515491	R2E
ADM-01	BMG 980 12/1	T671042211	R2A
BFU-21	BMG 980 13/1	A0882538353	R1A
CDU shelf	BFL 119 406/1	--	R3A
CDU G 8	BFL 119 155/1	A4000496WY	R2G
CDU G 8	BFL 119 155/1	A4000496X4	R2G
CDU G 8	BFL 119 155/1	A4000496X2	R2G
ASU-01	KRY 112 54/1	A40003F78V	R2A
Dummy	SXX 107 5031/1	--	R1B
CXU-10	KRY 101 1856/1	S690013GJU	R3C
Dummy	SXX 107 5031/1	--	R1B
TRU shelf	BFL 119 407/1	--	R3B
dTRU 8 Edge	KRC 131 1005/2	AE50265820	R2C
dTRU 8 Edge	KRC 131 1005/2	AE50265838	R2C
dTRU 8 Edge	KRC 131 1005/2	AE50265824	R2C
dTRU 8 Edge	KRC 131 1005/2	AE50267653	R2C ¹⁾
dTRU 8 Edge	KRC 131 1005/2	AE50265819	R2C ²⁾
dTRU 8 Edge	KRC 131 1005/2	AE50265825	R2C ²⁾
dTRU 8	KRC 131 1005/1	AE50266990	R1E ³⁾
dTRU 8	KRC 131 1005/1	AE50266989	R1E ³⁾
ACCU-02-CU	--	--	--

1) This dTRU was switched off during the measurements

2) This dTRU was only used during the radiated spurious emission measurement in EDGE mode.

3) This dTRU was only used during the radiated spurious emission measurements in GMSK mode

Software	Revision
R91B	R086Z

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Description of EUT

The EUT is a dTRU that can be installed in a 800 MHz GSM Base station configured with up to 6 double transceiver units that are designed to provide mobile telephone users with a connection to a mobile network or the PSTN.

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Photos

Transceiver Unit KRC 131 1005/2, R2C

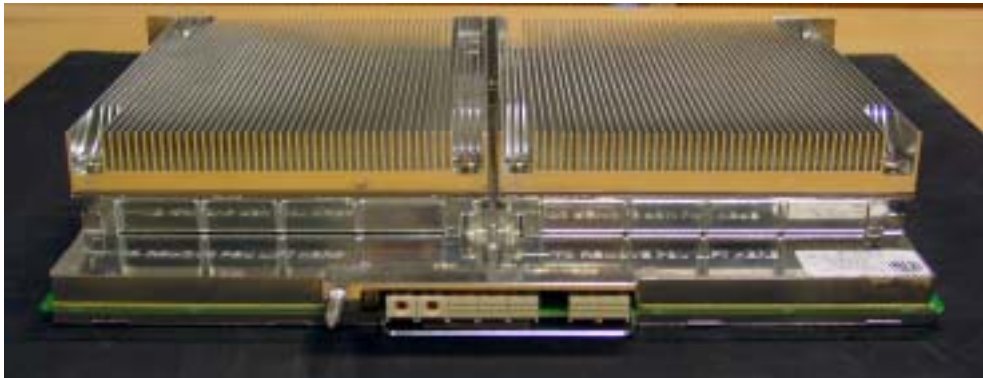
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Front side



Rear side



Sign:.....

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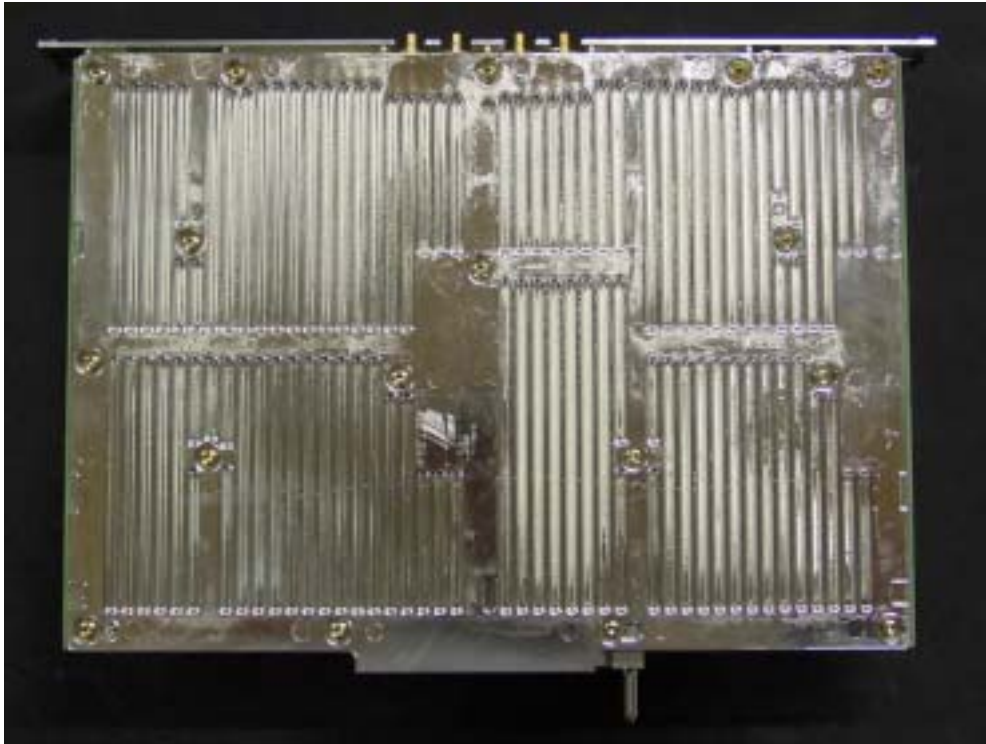
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Bottom side



Main board



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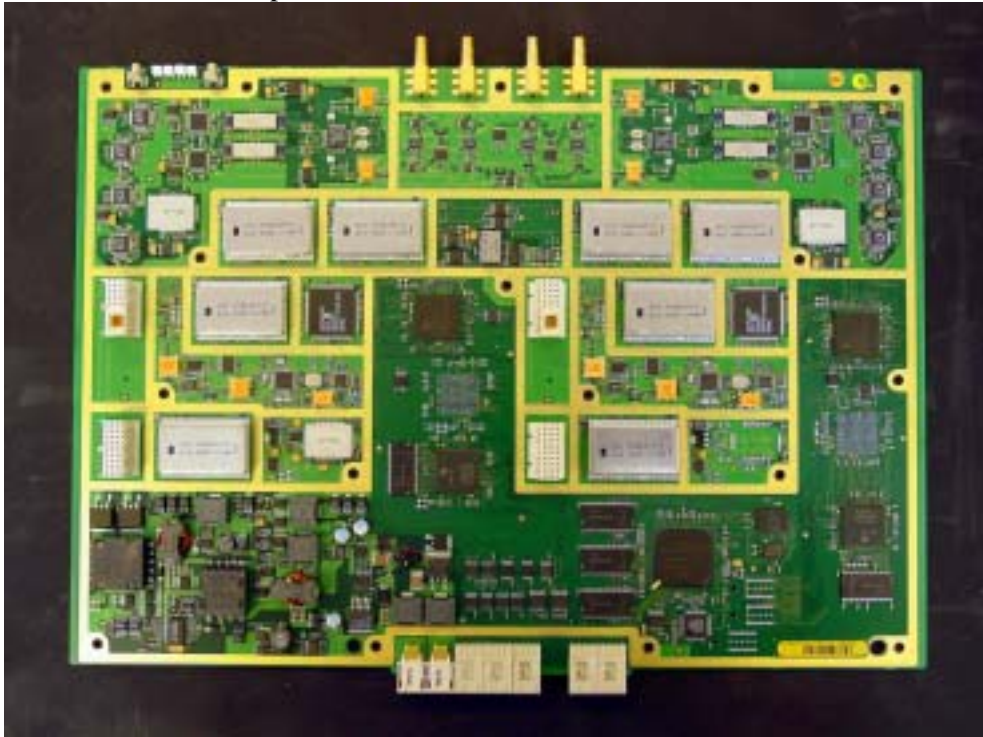
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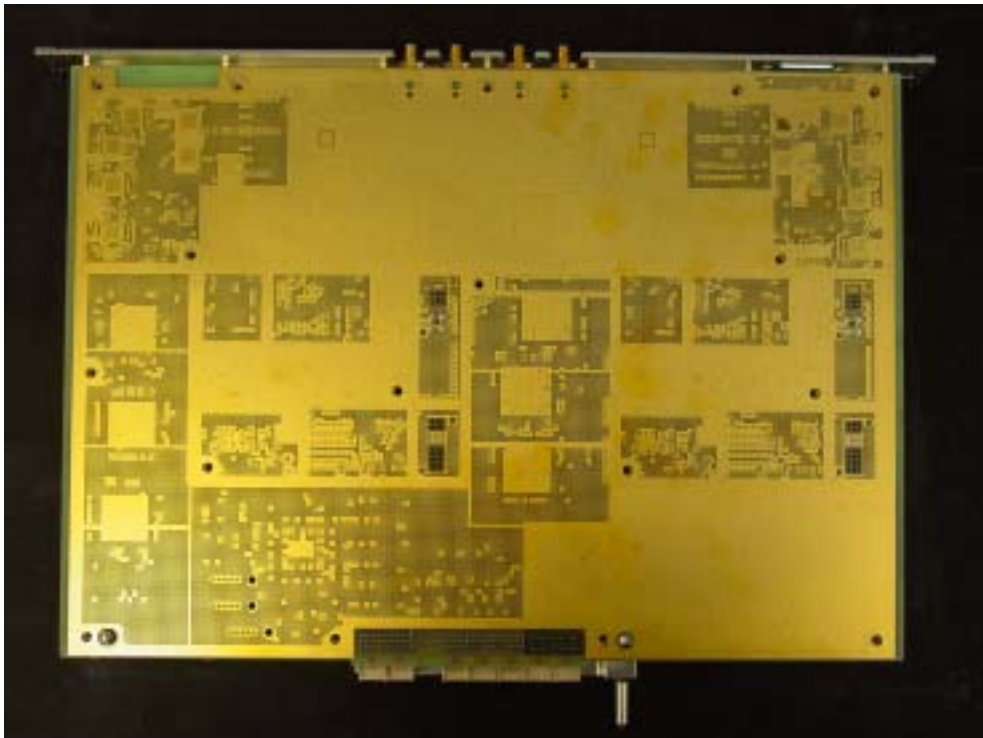
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Main board- PCB component side



Main board- PCB rear side



Sign:.....

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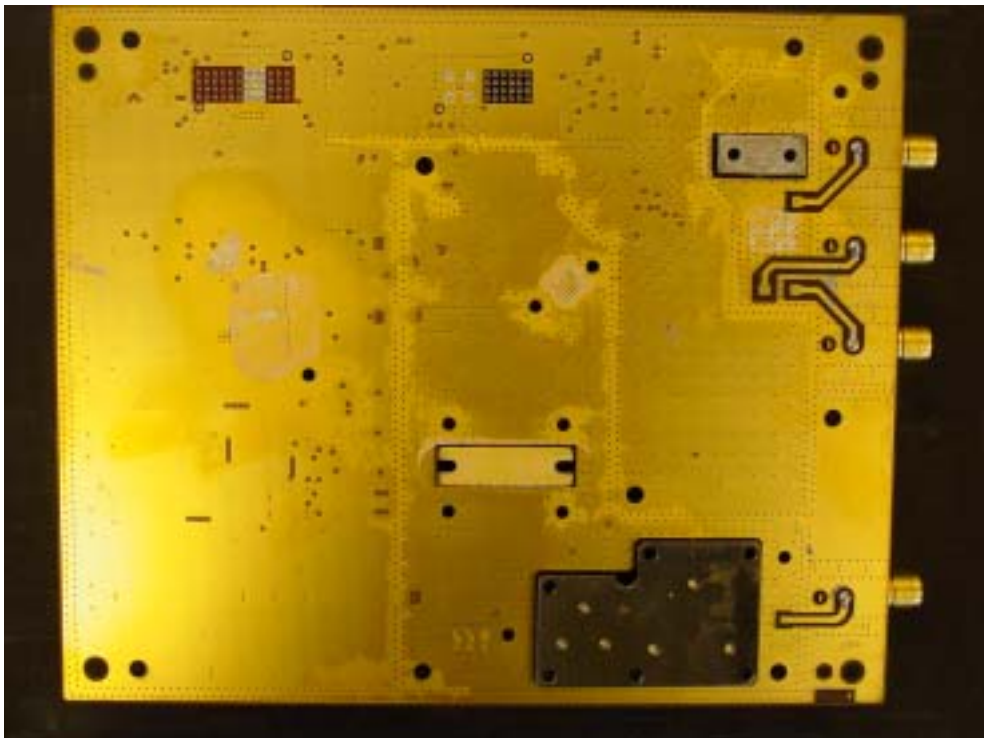
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PA1- PCB components side



PA1- PCB rear side



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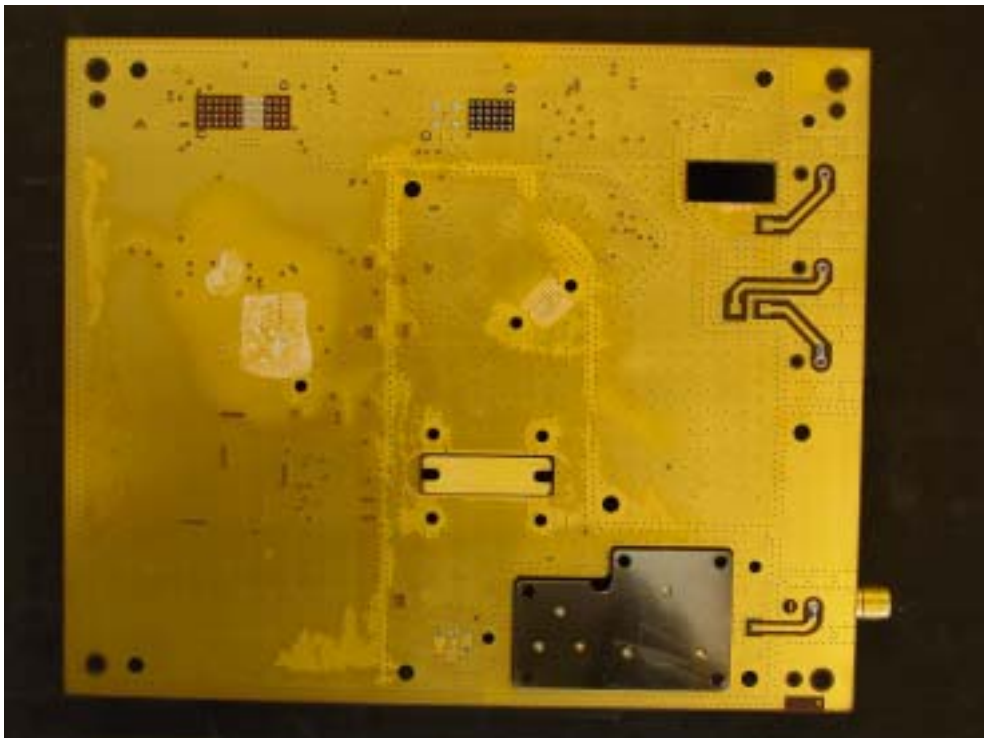
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PA2- PCB components side



PA2- PCB rear side



Sign:.....

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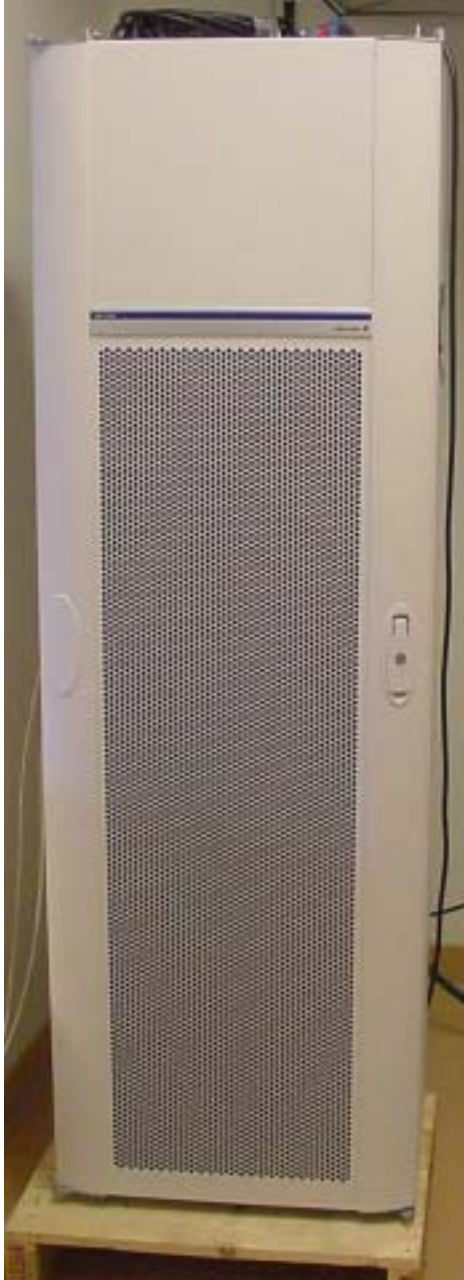
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RBS 2206 Cabinet, 24 Volt DC system

Front view



Rear view



Sign:.....

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Open door view



Sign:.....

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Top shelf view



Upper middle shelf view



Sign:.....

Lower middle shelf view



Bottom shelf view



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RBS 2106 Cabinet

Front view



Sign:.....

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Rear view



Sign:.....

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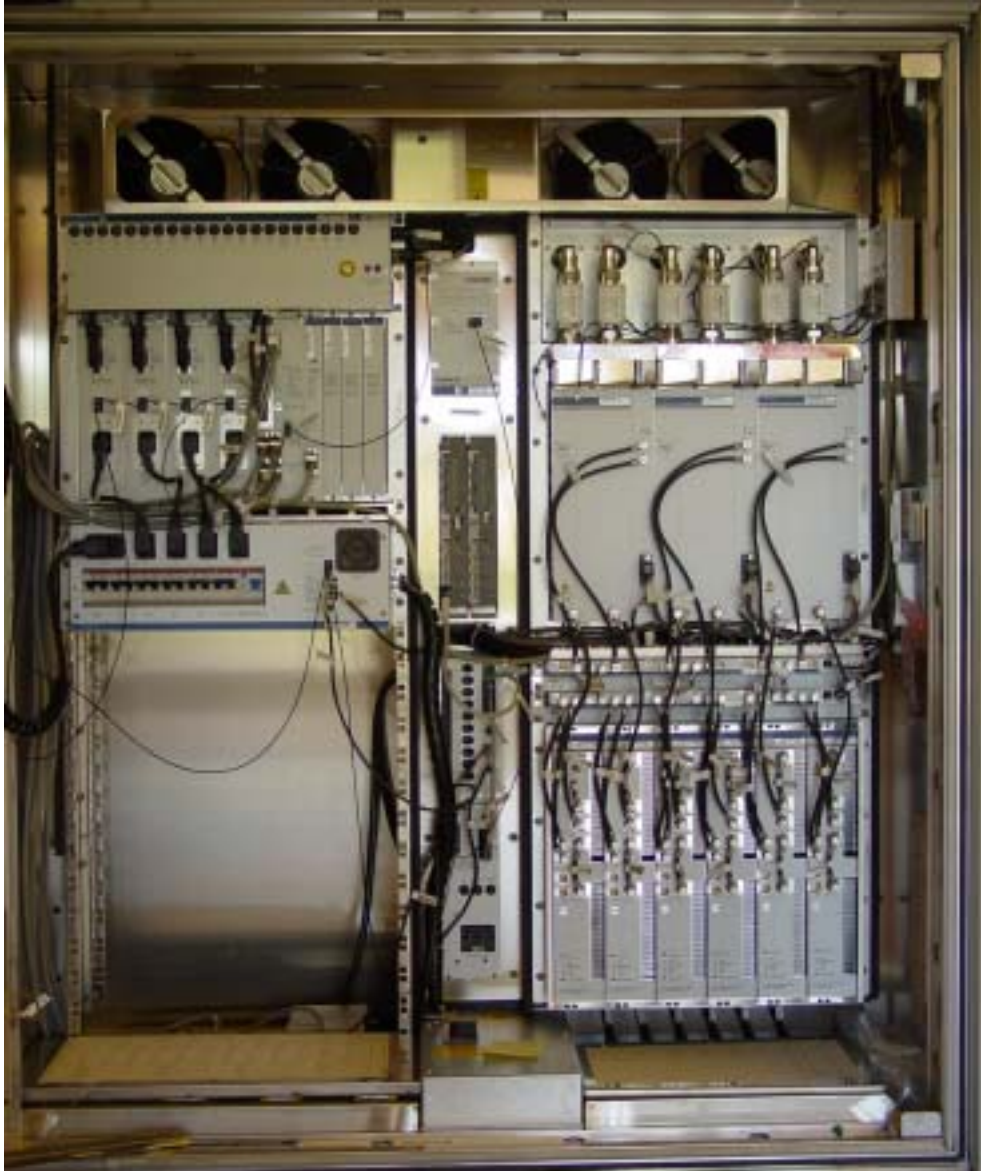
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Open door view



Sign:.....

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Top right shelf view



Sign:.....

Bottom right shelf view



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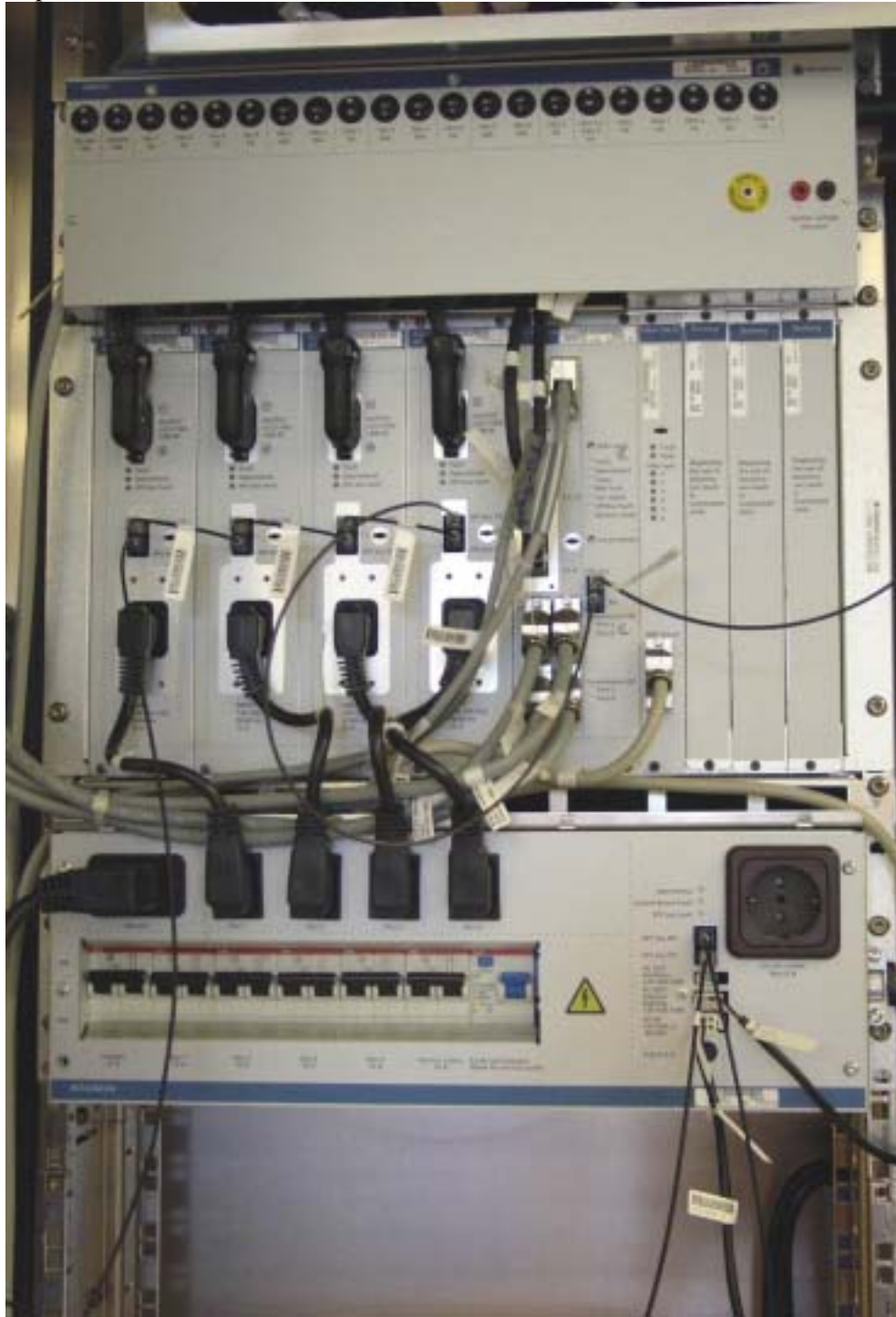
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Top left shelf view



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Bottom left shelf view



Sign:.....