REPORT

issued by an FCC listed Laboratory Reg. no. 93866.
The test site complies with RSS-Gen, IC file no: 3482A

1002
ISO/IEC 17025

Date	Reference	Page
2010-12-21	FX020450-F22	1 (2)

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Radio measurements on RRUS 01 B5 with FCC ID: TA8AKRC11864-2 and IC: 287AB-AS118642 operating in the 850 MHz cellular band

(9 appendices)

Test object

RUS 01 B5, KRC 118 64/2 Rev. R1B, S/N: C823824694

Summary

Standard		Compliant	Appendix
FCC CFR 47 / IC RSS-132 Issue 2			
2.1046 / RSS-132 4.4	RF power output	Yes	2
2.1049 / RSS-Gen 4.6.1	Occupied bandwidth	Yes	3
2.1051 / RSS-132 4.5	Band edge	Yes	4
2.1051 / RSS-132 4.5	Spurious emission at antenna terminals	Yes	5
2.1053 / RSS-132 4.5	Field strength of spurious radiation	Yes	6
2.1055 / RSS-132 4.3	Frequency stability	Yes	7
FCC CRF 47 / Industry Canada RSS-132 Issue 2			
15.111 / RSS-132 4.6	Receiver spurious emissions	Yes	8

Note: Above RSS-132 items are given as cross-reference only. Measurements were performed according to ANSI procedures referenced by FCC and covered by SP's accreditation.

SP Technical Research Institute of Sweden
Electronics - EMC

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FCC ID: TA8AKRC11864-2
IC: 287AB-AS118642

Table of contents

FCC ID: TA8AKRC11864-2 Appendix 1
IC: 287AB-AS118642

Description – Test object

Equipment:	Radio equipment RUS 01 B5 running in WCDMA mode supporting single and multi carrier.
Antenna ports:	1 TX/RX port and 1 RX port
Frequency range:	TX: 871.4 – 891.6 MHz RX: 826.4 – 846.6 MHz
Modulations:	QPSK, 16QAM and 64QAM
Nominal output power: (Maximum)	Single carrier: 1x 47.8 dBm (1x 60W) Multi carrier: 2x 44.8 dBm (2x 30W) 4x 41.8 dBm (4x 15W)
Channel bandwidth:	4.2 to 5 MHz (configurable in steps of 100/200 kHz)
Channel spacing:	4.4 to 5 MHz (configurable in steps of 100/200 kHz)
Nominal power voltage:	-48 VDC

Tested channels

	Downlink		Uplink	
Channel	Frequency*	UARFCN	Frequency*	UARFCN
B	871.4	4357	826.4	4132
B+5	876.4	4382	831.4	4157
B+10	881.4	4407	836.4	4182
B+15	886.4	4432	841.4	4207
M	881.6	4408	836.6	4183
T-15	876.6	4383	831.6	4158
T-10	881.6	4408	836.6	4183
T-5	886.6	4433	841.6	4208
T	891.6	4458	846.6	4233

* Frequency in MHz

Operation mode during measurements

Measurements were performed with the test object transmitting the Test models which are defined in 3GPP TS 25.141. Test model 1 (TM1) uses the QPSK modulation only, Test model 5 (TM5) includes the 16QAM modulation and Test model 6 (TM6) includes the 64QAM modulation.

The settings below were found to be representative for all traffic scenarios when several settings with the different modulations, channel bandwidths and the number of carriers were tested to find the worst case setting. These settings were used for all measurements if not otherwise noted.

Single carrier
TM1: 64 DPCH:s at 30 ksps (SF=128)
Multi carrier
TM1: 32 DPCH:s at 30 ksps (SF=128) in each carrier (Two carriers activated)

Channel bandwidth 5 MHz

Conducted measurements

The test object was powered with -48 VDC. All RF conducted measurements were performed with the test object configured for maximum transmit power. All TX measurements were done at the RF A connector and the RX measurements were done on the RF B connector.

Radiated measurements

The test object was powered with -48 VDC. All measurements were performed with the test object configured for maximum transmit power. The configuration represents worst case for radiated spurious emission measurements.

The RF output power port was via a RF attenuator connected to functional test equipment for supervision.

The RRUS unit was allocated to the following UARFCN:

Single Carrier: (One carrier configuration)

Cell	1	1	1
Channel	B	M	T

Multi Carrier: (Two carrier configuration)

Cell	1	2
Channel	B	B+10
Channel	T-10	T

Multi Carrier: (Four carrier configuration)

Cell	1	2	3	4
Channel	B	B+5	B+10	B+15
Channel	T	T-5	T-10	T-15

Purpose of test

The purpose of the tests is to verify compliance to the performance characteristics specified in applicable items of FCC CFR 47 and Industry Canada RSS-132.

References

Measurements were done according to relevant parts of the following standards:
ANSI 63.4-2003
ANSI/TIA/EIA-603-B-2002
CFR 47 part 2, October 1st , 2009
CFR 47 part 22, October 1st, 2009
3GPP TS 25.141, version 8.9.0
RSS-Gen Issue 3
RSS-132 Issue 2

Measurement equipment

Measurement equipment	Calibration Due	SP number
Test site Tesla	2012-10	503 881
R&S FSIQ 40	2011-07	503 738
R&S FSQ 40	2011-07	504 143
R&S ESI 26	2011-08	503 292
High pass filter	2011-07	504 199
High pass filter	2011-07	503 739
High pass filter	2011-07	503 740
RF attenuator	2011-07	504 159
RF attenuator	2011-08	900 233
RF step attenuator	2012-07	503 096
Boonton RF Peak power meter/analyzer	2011-10	503 144
Boonton Power sensor 56518-S/4	2012-10	503 145
Chase Bilog Antenna CBL 6111A	2011-10	503 182
EMCO Horn Antenna 3115	2011-01	502 175
Std.gain horn FLANN model 16240-25	-	503 939
Std.gain horn FLANN model 20240-20	-	503 674
µComp Nordic, Low Noise Amplifier	2011-07	504 160
MITEQ Low Noise Amplifier	2011-06	503 285
Temperature chamber 2	2013-11	501 031
Multimeter Fluke 87	2011-03	502 190
Testo 625, Temperature and humidity meter	2011-08	504 188
Testo 635 Temperature and humidity meter	2011-03	504 203

Uncertainties

Measurement and test instrument uncertainties are described in the quality assurance documentation ”SP-QD 10885”. The measurement uncertainties can be found in the table below. The uncertainties are calculated with a coverage factor k=2 (95% level of confidence).

Reservation

The test results in this report apply only to the particular test object as declared in the report.

Delivery of test object

The test object was delivered 2010-11-30.

Manufacturer’s representative

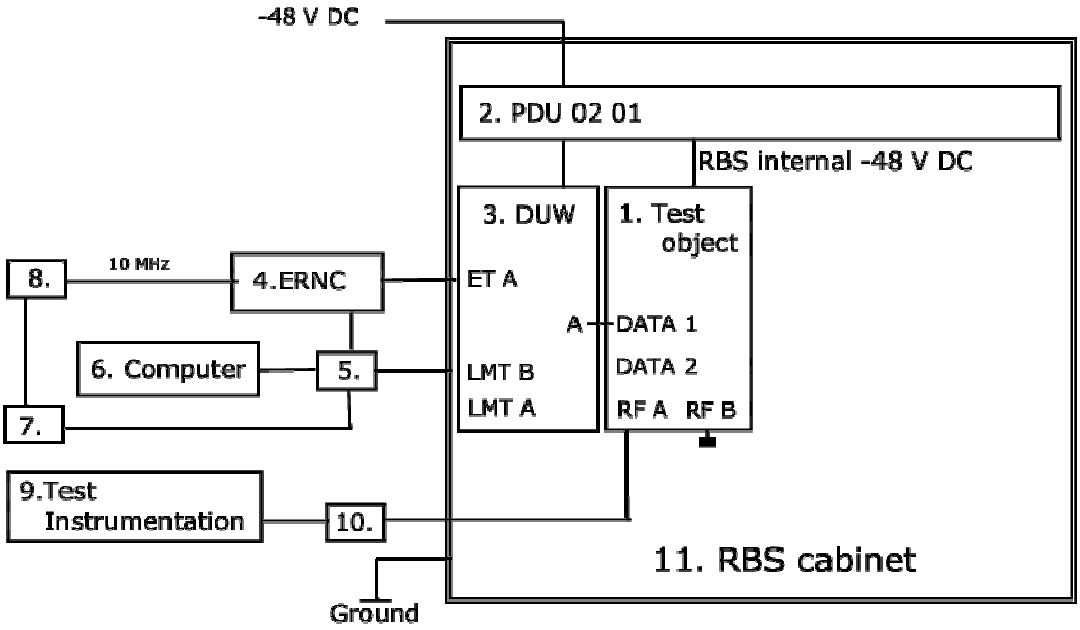
Samir Catic, Ericsson AB

Test engineers

Tomas Lennhager, Jörgen Wassholm , Reinhold Reul and Jonas Bremholt

FCC ID: TA8AKRC11864-2 Appendix 1
IC: 287AB-AS118642

Test set-up conducted measurements TX



Test object

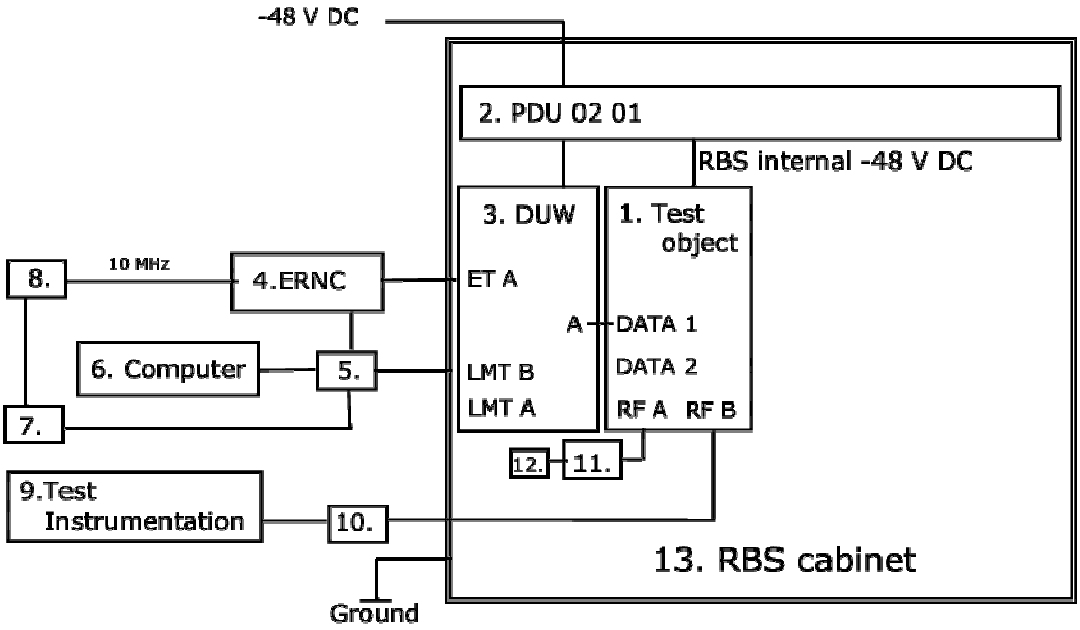
1. RUS 01 B5, KRC 118 64/2 with software Basic CXP 901 6867/3 R1E01
   Upgrade package: CXP 901 6868/1 Rev R3AF12
   (FCC ID: TA8AKRC11864-2 / IC: 287AB-AS118642)

Functional test equipment

2. PDU 02 01, BMG 980336/4, R2A, (S)BJ31528316
3. DU units with Software Basic CXP 901 6867/3 R1E01
   Upgrade package: CXP 901 6868/1 Rev R3AF12
   Configuration single carrier (1x1) and Multi carrier (1x2)
   DU: DUW 30 01 KDU 127 161/3 Rev R2B S/N (s)C823486753
   Configuration multi carrier (1x4)
   DU 1: DUW 30 01 KDU 127 161/3 Rev R2B S/N (s)C823423230 and
   DU 2: DUW 30 01 KDU 127 161/3 Rev R2B S/N (s)C823474492
4. ERNC SIM 127, BAMS – 1000660988
5. Fast Ethernet switch, Netgear FS726T
6. Computer, Sunblade 2500, BAMS – 0000015233
7. NTP server, Symmetricom SyncServer, BAMS – 1000714181
8. 10 MHz reference, Symmetricom model 8040, BAMS – 1000714186
9. SP test instrument according measurement equipment list
10. Attenuator
11. RBS 6201 cabinet, BAMS 1000778792, see below for hardware details

FCC ID: TA8AKRC11864-2 Appendix 1
IC: 287AB-AS118642

Test set-up conducted measurements RX



Test object

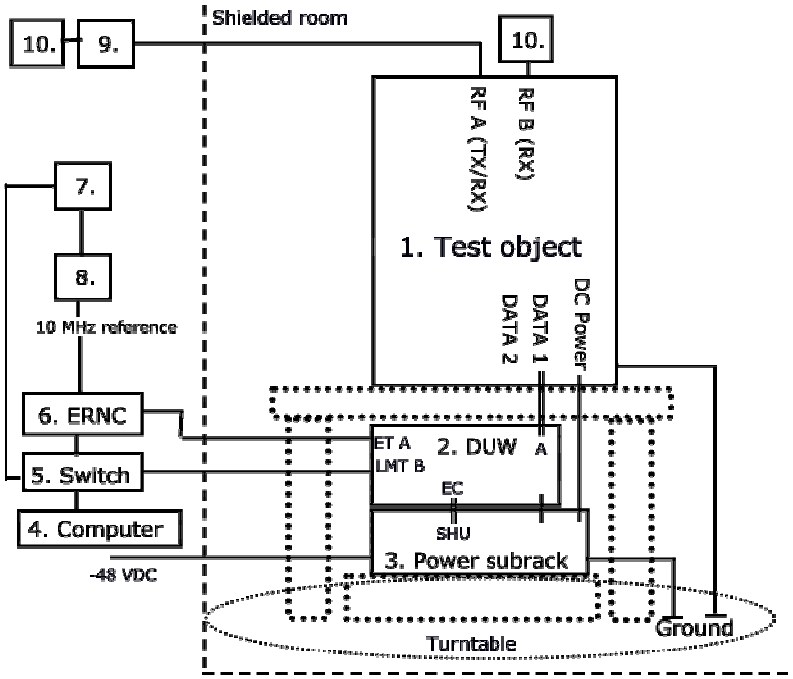
1 RUS 01 B5, KRC 118 64/2 with software Basic CXP 901 6867/3 R1E01
Upgrade package: CXP 901 6868/1 Rev R3AF12
(FCC ID: TA8AKRC11864-2 / IC: 287AB-AS118642)

Functional test equipment

2. PDU 02 01, BMG 980336/4, R2A, (S)BJ31528316
3. DU units with Software Basic CXP 901 6867/3 R1E01
Upgrade package: CXP 901 6868/1 Rev R3AF12
DUW 30 01 KDU 127 161/3 Rev R2B S/N (s)C823486753
4. ERNC SIM 127, BAMS – 1000660988
5. Fast Ethernet switch, Netgear FS726T
6. Computer, Sunblade 2500, BAMS – 0000015233
7. NTP server, Symmetricom SyncServer, BAMS – 1000714181
8. 10 MHz reference, Symmetricom model 8040, BAMS – 1000714186
9. SP test instrument according measurement equipment list
10. DC block
11. Attenuator
12 Terminator
13 RBS 6201 cabinet, BAMS 1000778792, see below for hardware details

FCC ID: TA8AKRC11864-2 Appendix 1
IC: 287AB-AS118642

Test set-up radiated measurements



Test object

1. RUS 01 B5, KRC 118 64/2 with software Basic CXP 901 6867/3 R1E01
   Upgrade package: CXP 901 6868/1 Rev R3AF12
   (FCC ID: TA8AKRC11864-2 / IC: 287AB-AS118642)

Functional test equipment

2. DU units with Software Basic CXP 901 6867/3 R1E01
   Upgrade package: CXP 901 6868/1 Rev R3AF12
   Configuration single carrier (1x1) and Multi carrier (1x2)
   DUW 30 01 KDU 127 161/3 Rev R2B S/N C823486753
   Configuration multi carrier (1x4)
   DU 1: DUW 30 01 KDU 127 161/3 Rev R2B S/N C823423230 and
   DU 2: DUW 30 01 KDU 127 161/3 Rev R2B S/N C823474492
3. Power subrack, for details see table below
4. Computer, Sunblade 2500, BAMS – 0000015233
5. Fast Ethernet switch, Netgear FS726T
6. ERNC SIM 127, BAMS – 1000660988
7. NTP server, Symmetricom SyncServer, BAMS – 1000714181
8. 10 MHz reference, Symmetricom model 8040, BAMS – 1000714186
9. Attenuator
10. Spectrum analyzer, R&S FSIQ 40, SP 503 738, for supervision purposes

FCC ID: TA8AKRC11864-2 Appendix 1
IC: 287AB-AS118642

Test object interfaces	**Type of port:**
Power configuration: -48 VDC	DC Power
Ground via RBS frame during conducted measurements, Ground via ground strap during radiated stand-alone measurements	Ground
Antenna port RF A, combined TX/RX, female 7/16 connector	Antenna
Antenna port RF B, RX only, female 7/16 connector	Antenna
Cross connect RX A, not supported, omitted in set-up drawings above	-
Cross connect RX B, not supported, omitted in set-up drawings above	-
RXA CO-site, not supported, omitted in set-up drawings above	-
Data 1, connected to DUW port RI A	Signal
Data 2, not supported	-

Hardware of power subrack used during stand-alone radiated tests

Position	Product name	Product number	R-state	Serial number
	Power subrack	SXK 109 8115/1	R2A	
1	PDU 01 01	BMG 980 336/2	R4F	BJ31532384
2	PDU 01 01	BMG 980 336/2	R4F	BJ31532382
3	SHU 01 01	BGK 901 18/1	R3C	BJ31446269
4	DUMMY	SXK 109 8257/1	R1D	-
5	DUMMY	SXK 109 8257/1	R1D	-
6	PFU 01 01	KFE 101 1162/1	R1B	BR80910495
7	DUMMY	SXK 109 8257/1	R1D	-
8	DUMMY	SXK 109 8257/1	R1D	-
9	PCF 02 01	KFE 101 1157/1	R1C	BW95301450

Hardware of RBS 6201 cabinet used during conducted measurements

Position	Product name	Product number	R-state	Serial number
	SUP RBS 6201	1/BFM 901 290/2	-	
	PCF 02 03	KFE 101 1157/4	R1C	BW96600253
	SHU 02 01	BGK 901 18/2	R1B	BJ31524373
	SCU 02 01	BGM 136 1006/2	R2A	C823109881
	PDU 02 01	BMG 980 336/4	R2A	BJ31528316
	FRU Subrack	SXK 109 8604/1	R1A	
1	Dummy 31	SXK 109 8971/1	R1E	-
	Dummy 31	SXK 109 8971/1	R1B	-
2	DUW 30 01	KDU 127 161/3	R2B	C823486753
3	DUW 30 01	KDU 127 161/3	R2B	C823423230
4	DUW 30 01	KDU 127 161/3	R2B	C823474492
5	RUS 01 B5	KRC 118 64/2	R1B	C823824694
6	Dummy	SXA 134 2193/1	-	-
7	Dummy	SXA 134 2193/1	-	-
	PFU 01 01	KFE 101 1162/1	R1B	BR80947325

FCC ID: TA8AKRC11864-2 Appendix 2
IC: 287AB-AS118642

RF power output measurements according to 47 CFR 2.1046/ RSS-132 4.4

Date	Temperature	Humidity
2010-11-30	23 °C ± 3 °C	12 % ± 5 %
2010-12-01	23 °C ± 3 °C	7 % ± 5 %
2010-12-13	23 °C ± 3 °C	12 % ± 5 %

Test set-up and procedure

The output was connected to a peak power analyzer with the CDF mode activated.

Measurement equipment	SP number
Boonton RF Peak power meter/analyzer	503 144
Boonton Power sensor 56518-S/4	503 146
Multimeter Fluke 87	502 190
Testo 635, Temperature and humidity meter	504 203

Measurement uncertainty: 0.7 dB

Results

Single carrier: Rated output power level at RF A connector (maximum): 1x 47.8 dBm

Transmitter power (dBm / dB) RMS / PAR		
B	M	T
47.4/ 6.9	47.4/ 6.8	47.4/ 7.0

Multi carrier: Rated output power level at RF A connector (maximum): 2x 44.8 dBm/ carrier

Transmitter power (dBm / dB) RMS / PAR		
B	M	T
44.6/ 9.6	44.6/ 9.6	44.6/ 9.5

Multi carrier: Rated output power level at RF A connector (maximum): 4x 41.8 dBm/ carrier

Transmitter power (dBm / dB) RMS / PAR		
B	M	T
41.3/ 11.3	41.6/ 10.9	41.6/ 10.7

Limit

According to CFR 47/ RSS there are no conducted limits at the antenna connector.

CFR § 22.913/ SRSP-503 5.1: The effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts (57 dBm).

RSS-132: The transmitter output power shall not exceed the limits given in SRSP-503

Complies?	Yes

FCC ID: TA8AKRC11864-2
IC: 287AB-AS118642

Appendix 3

Occupied bandwidth measurements according to 47 CFR 2.1049/ RSS-Gen 4.6.1

Date	Temperature	Humidity
2010-11-30	23 °C ± 3 °C	12 % ± 5 %
2010-12-01	23 °C ± 3 °C	7 % ± 5 %

Test set-up and procedure

The measurements were made as defined in §2.1049. The output was connected to a spectrum analyzer. The spectrum analyzer was connected to an external 10 MHz reference standard during the measurements.

Measurement equipment	SP number
R&S FSQ 40	504 143
Testo 635, Temperature and humidity meter	504 203

Measurement uncertainty: 3.7 dB

Results

The results are shown in appendix 3.1

Channel Bandwidth 5.0 MHz

	Channel	OBW
Diagram 1	B	4.18 MHz
Diagram 2	M	4.18 MHz
Diagram 3	T	4.17 MHz

Channel Bandwidth 4.2 MHz

	Channel	OBW
Diagram 4	B	3.85 MHz
Diagram 5	M	3.85 MHz
Diagram 6	T	3.86 MHz

FCC ID: TA8AKRC11864-2 Appendix 3.1
IC: 287AB-AS118642

Diagram 1

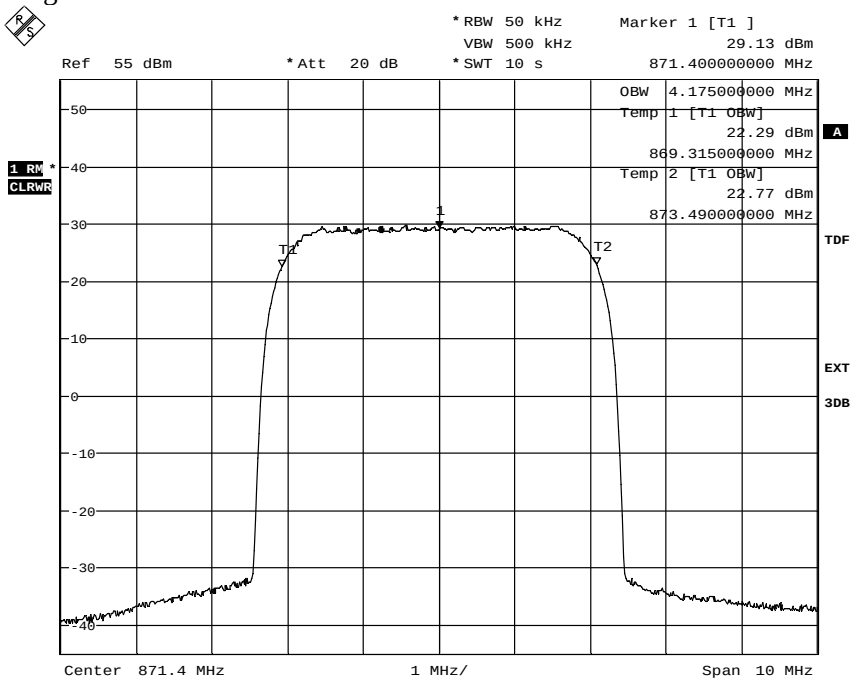


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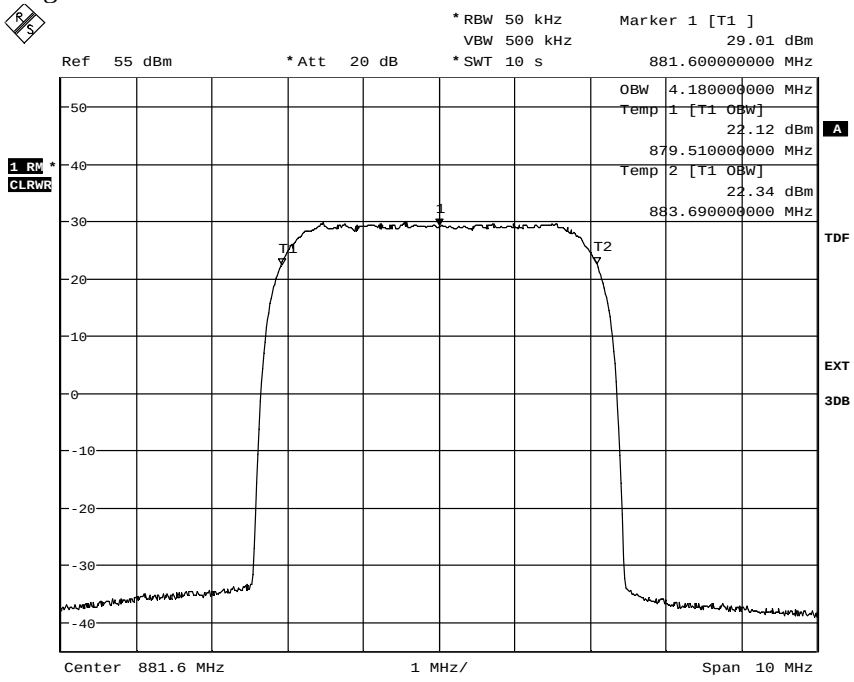
Diagram 2



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FCC ID: TA8AKRC11864-2 Appendix 3.1
IC: 287AB-AS118642

Diagram 3

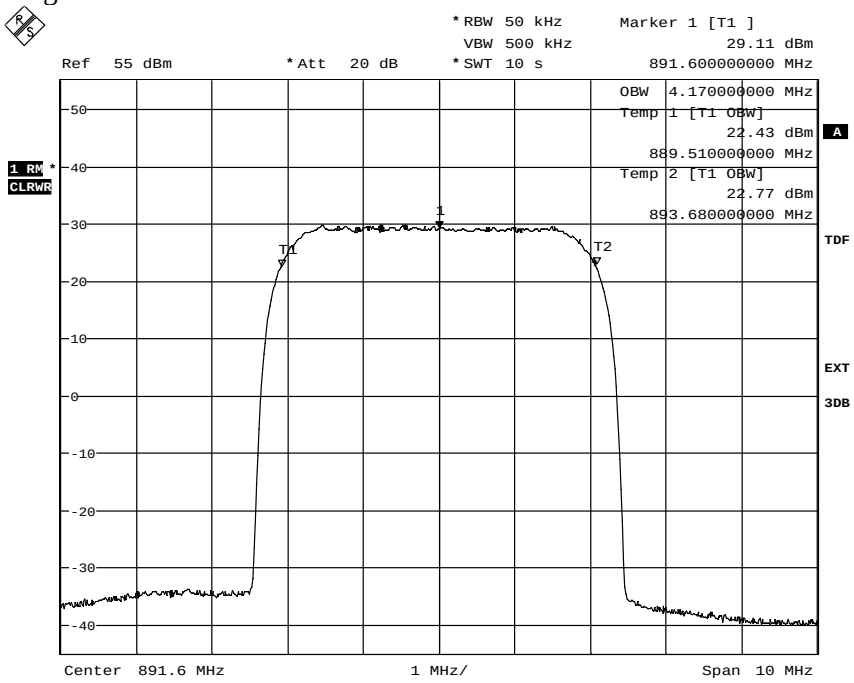

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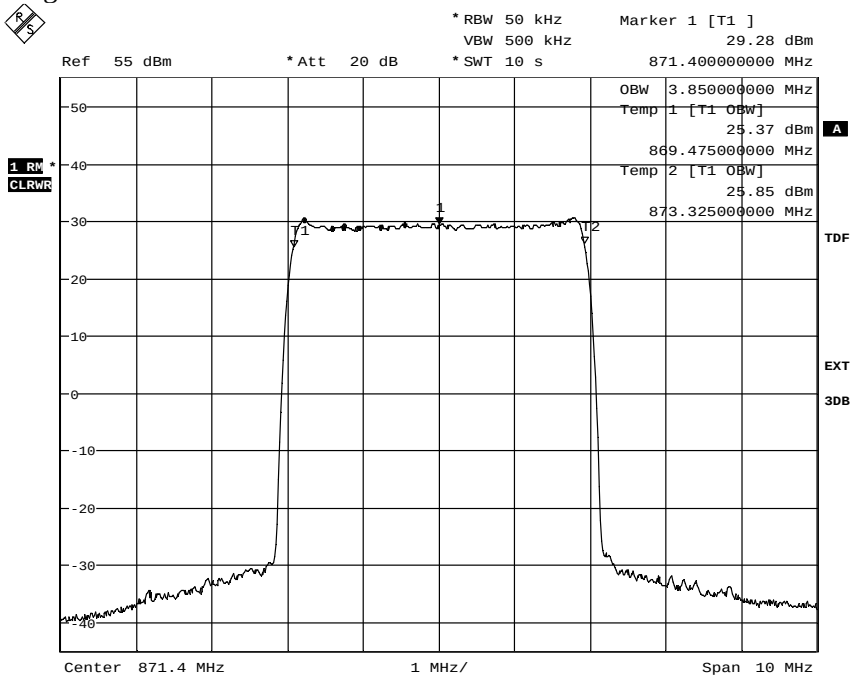
Diagram 4



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FCC ID: TA8AKRC11864-2 Appendix 3.1
IC: 287AB-AS118642

Diagram 5

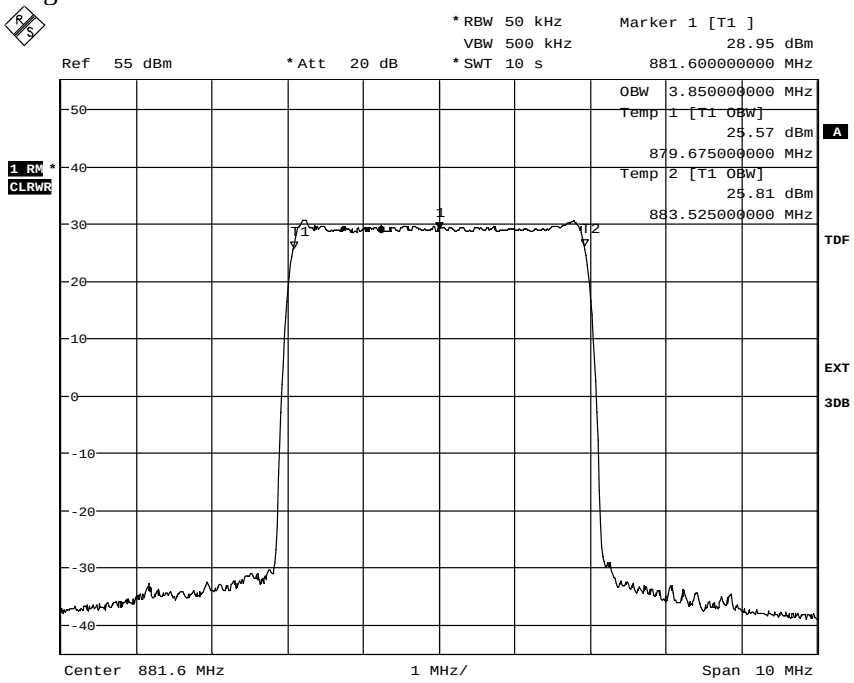

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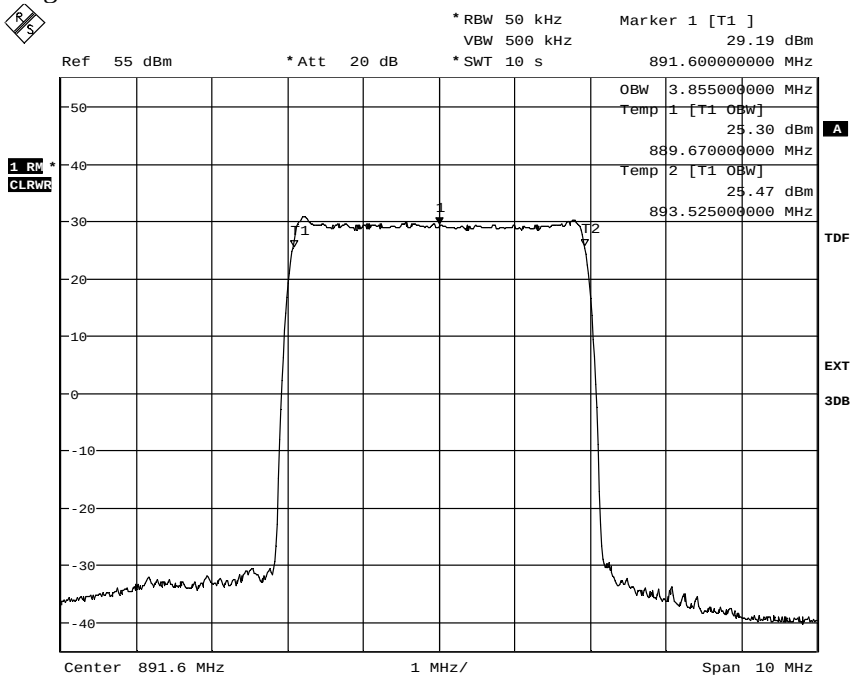
Diagram 6



Date: 30.NOV.2010 15:06:19

FCC ID: TA8AKRC11864-2 Appendix 4
IC: 287AB-AS118642

Band edge measurements according to 47 CFR 2.1051/ RSS-132 4.5

Date	Temperature	Humidity
2010-11-30	23 °C ± 3 °C	12 % ± 5 %
2010-12-01	23 °C ± 3 °C	7 % ± 5 %

Test set-up and procedure

The measurements were made as defined in §22.917. The output was connected to a spectrum analyzer with the RMS detector activated. The spectrum analyzer was connected to an external 10 MHz reference standard during the measurements. A resolution bandwidth of 30 kHz was used up to 3.25 MHz away from the band edges. 30 kHz is <1% of the Emission BW (4.25 MHz between the 26 dB points for 5 MHz nominal BW setting). To compensate for the reduced measurement bandwidth, the limit was adjusted with 1.5 dB to -14.5 dBm up to 1 MHz away from the band edges and with 15.2 dB to -28.2 dBm from 1 MHz to 5 MHz away from the band edges.

Measurement equipment	SP number
R&S FSQ 40	504 143
Testo 635, Temperature and humidity meter	504 203

Measurement uncertainty: 3.7 dB

Results

The results are shown in appendix 4.1

Single carrier:
Diagram 1: B
Diagram 2: T

Multi carrier:
Diagram 3: B+(B+5)
Diagram 4: T+(T-5)

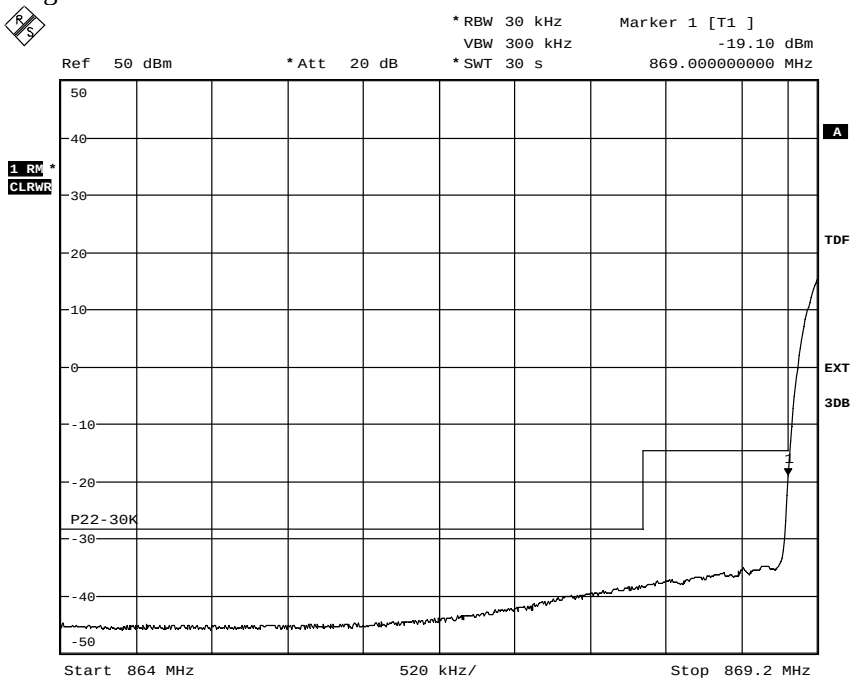
Limits

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

FCC ID: TA8AKRC11864-2 Appendix 4.1
IC: 287AB-AS118642

Diagram 1



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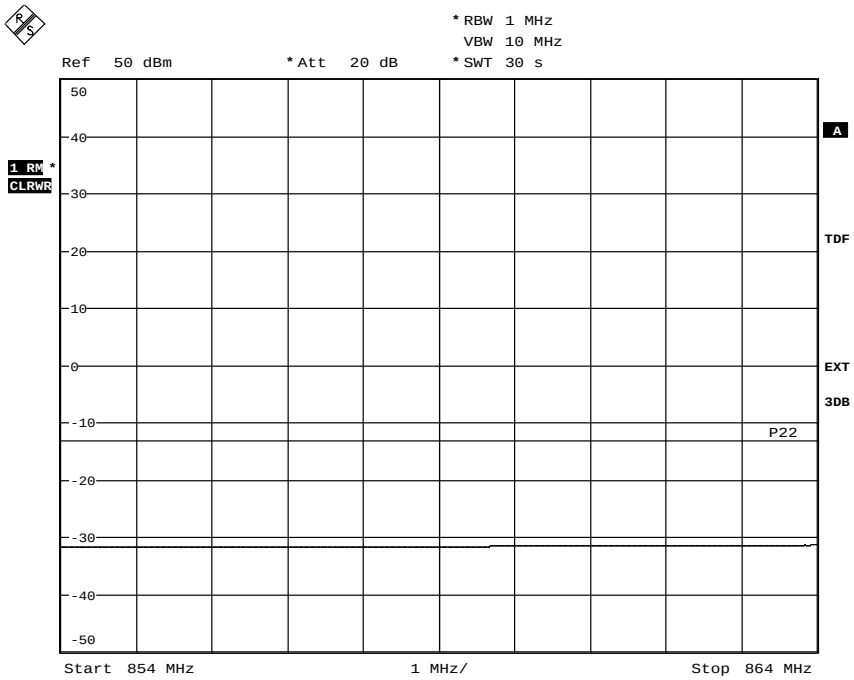

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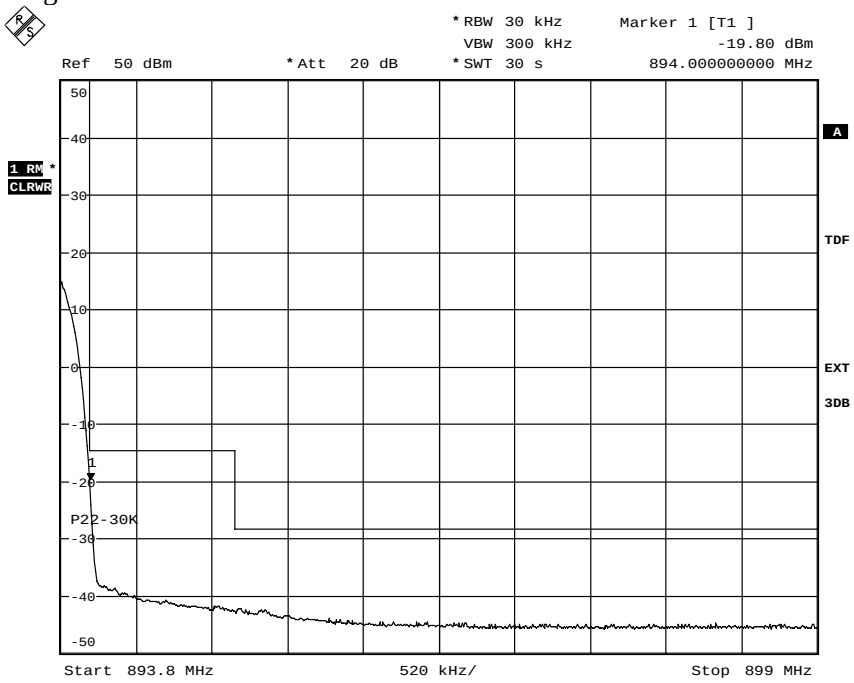
FCC ID: TA8AKRC11864-2 Appendix 4.1
IC: 287AB-AS118642

Diagram 2



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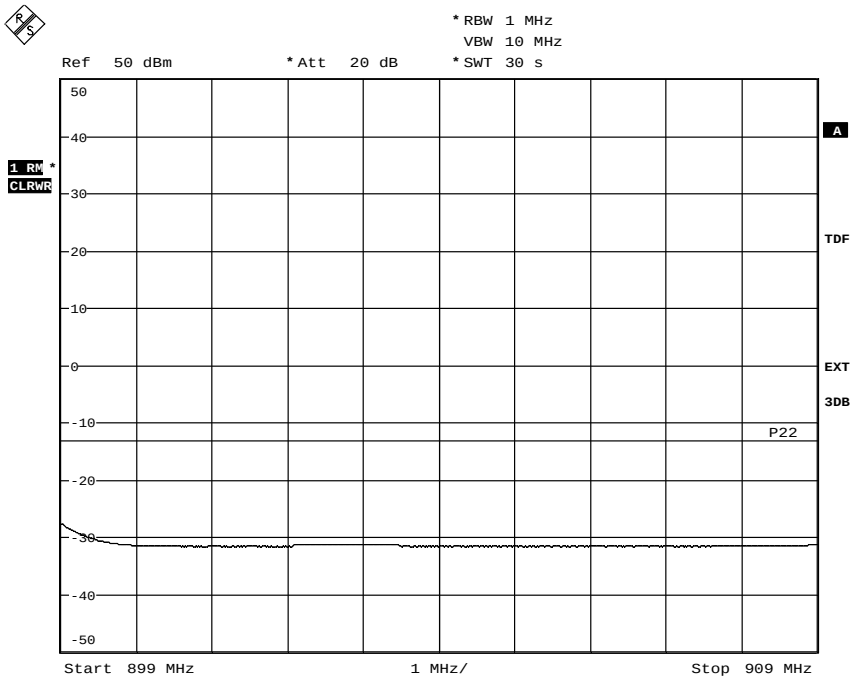

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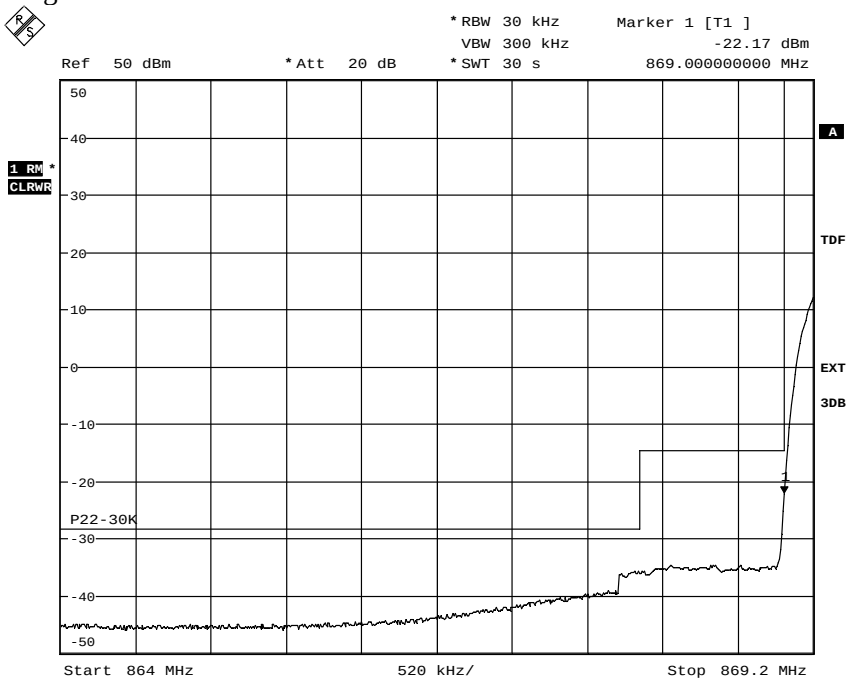
FCC ID: TA8AKRC11864-2 Appendix 4.1
IC: 287AB-AS118642

Diagram 3



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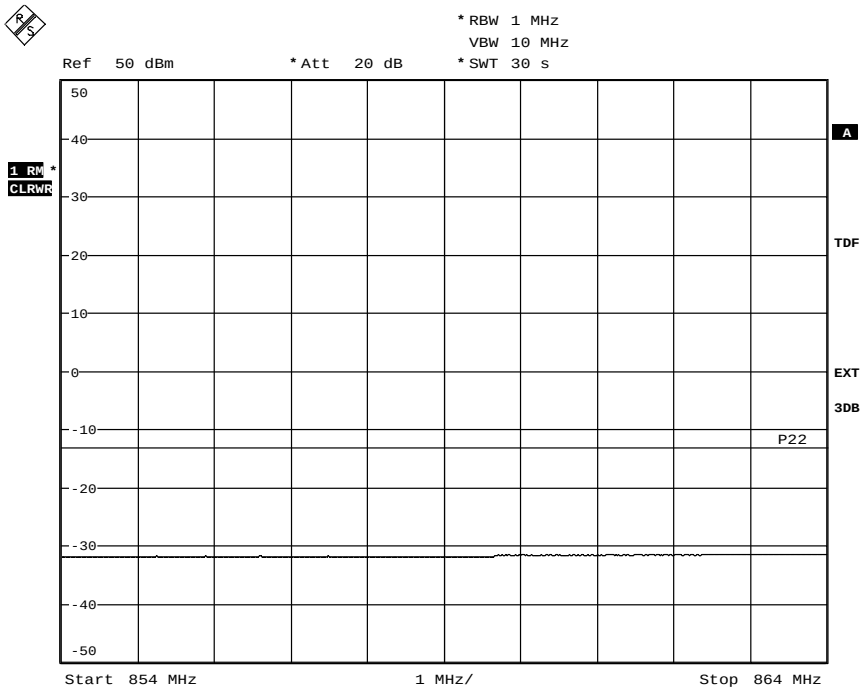

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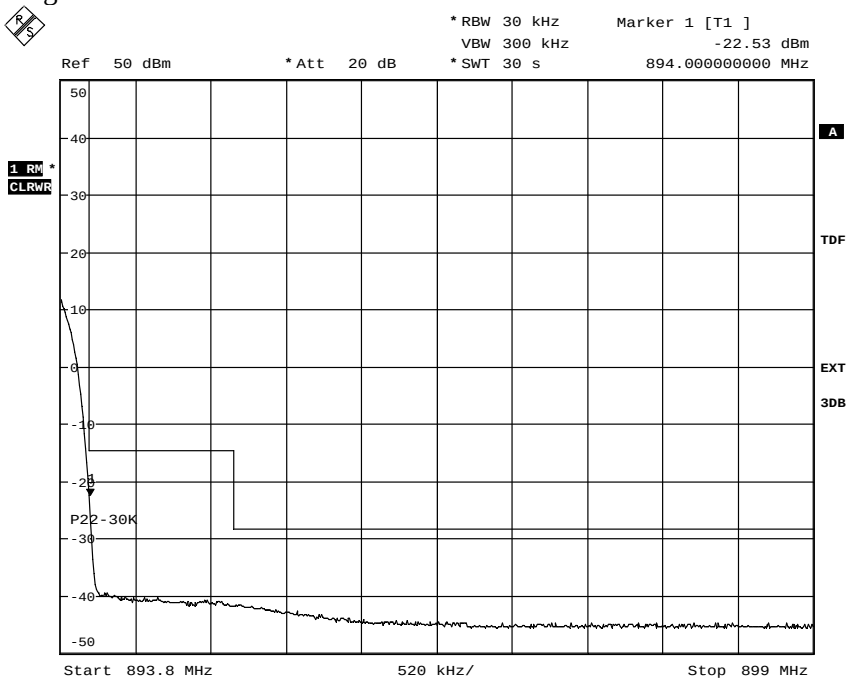
FCC ID: TA8AKRC11864-2 Appendix 4.1
IC: 287AB-AS118642

Diagram 4



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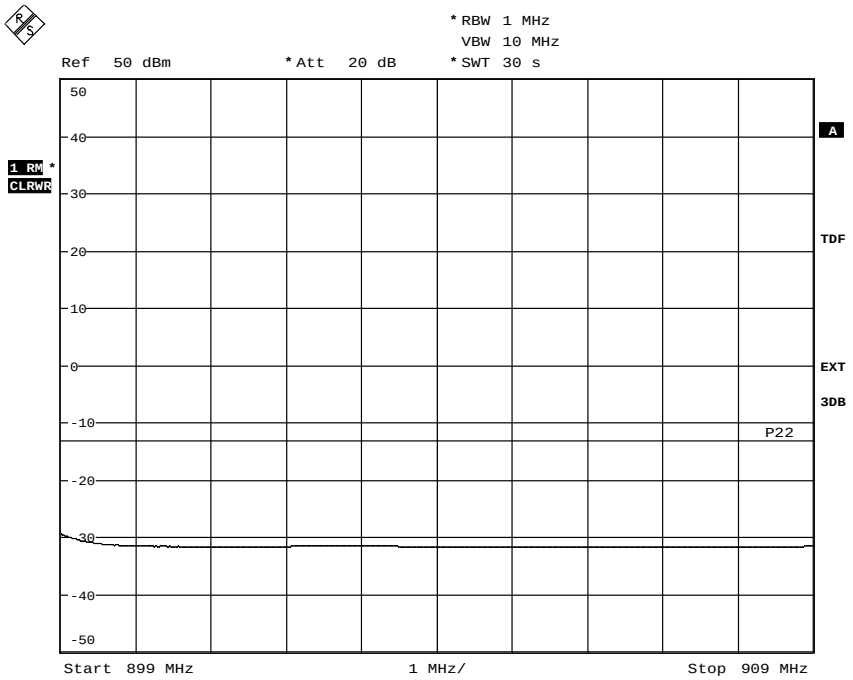

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FCC ID: TA8AKRC11864-2
IC: 287AB-AS118642

Appendix 5

Conducted spurious emission measurements according to 47 CFR 2.1051/ RSS-132 4.5

Date	Temperature	Humidity
2010-11-30	23 °C ± 3 °C	12 % ± 5 %
2010-12-01	23 °C ± 3 °C	7 % ± 5 %
2010-12-14	23 °C ± 3 °C	17 % ± 5 %

Test set-up and procedure

The measurements were made with a resolution bandwidth of 1 MHz instead of 100 kHz as RSS-132 specifies 1 MHz for equipment with an emission bandwidth of ≥4 MHz. The output was connected to a spectrum analyzer. First a pre-measurement with activated peak detector was performed. An emission close to or above the limit is measured with activated RMS detector and the RMS measurement result is noted. The spectrum analyzer was connected to an external 10 MHz reference standard during the measurements.

Measurement equipment	SP number
R&S FSQ 40	504 143
High pass filter	503 739
Testo 635, Temperature and humidity meter	504 203

Measurement uncertainty: 3.7 dB

Results

The results are shown in appendix 5.1

Single carrier:
Diagram 1: B
Diagram 2: M
Diagram 3: T

Multi carrier:
Diagram 4: B+(B+10)
Diagram 5: T+(T-10)

Remark

The emission at 9 kHz on the plots was not generated by the test object. A complementary measurement with a smaller RBW showed that it was related to the LO feed-through.

The highest internal frequency as declared by the client was 2.4576 GHz, thus the choice of the upper frequency boundary was set to 10x2.5 GHz = 25 GHz for emission measurements.

The 2.4576 GHz frequency was identified as not used in the RF chain and is not affected by the power setting of the carrier frequency, the transmitter was activated for 40 W output power during the measurements in the frequency range 15 to 25 GHz. In the frequency range 9 kHz to 15 GHz the transmitter was activated for maximum output power.

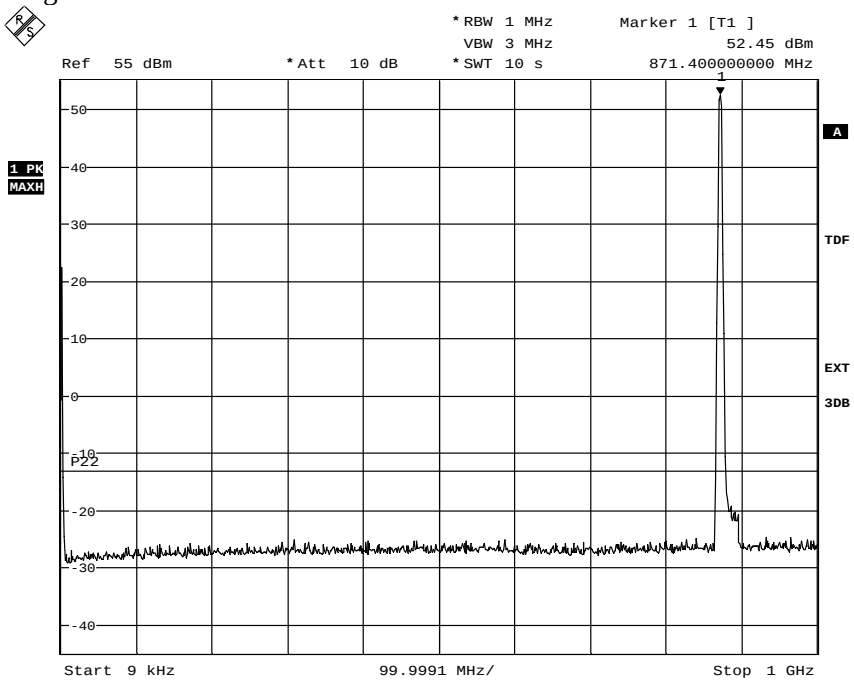
Limits

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

FCC ID: TA8AKRC11864-2 Appendix 5.1
IC: 287AB-AS118642

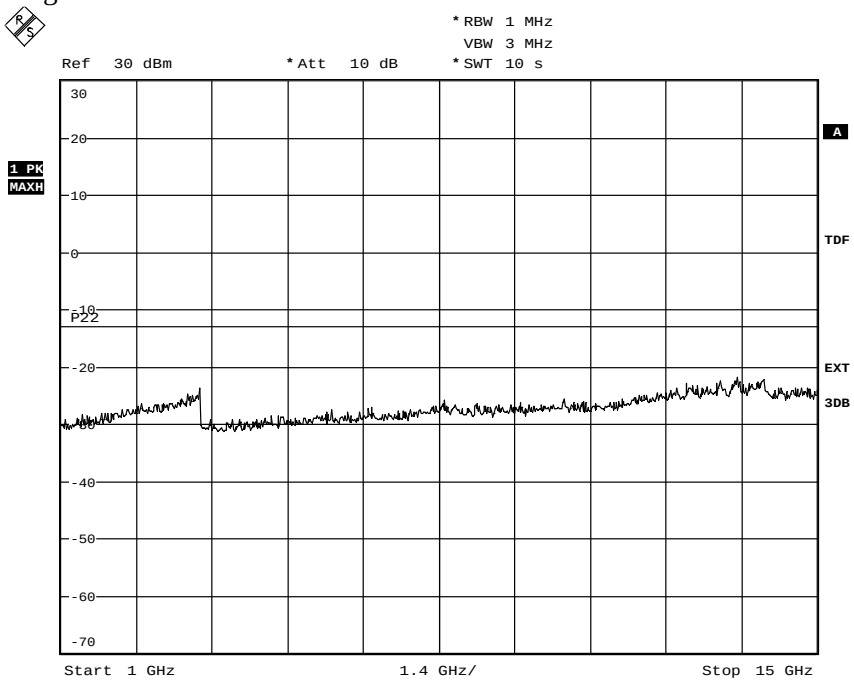
Diagram 1a



Date: 30.NOV.2010 13:53:07

The emissions around the carrier are within the operating frequency band

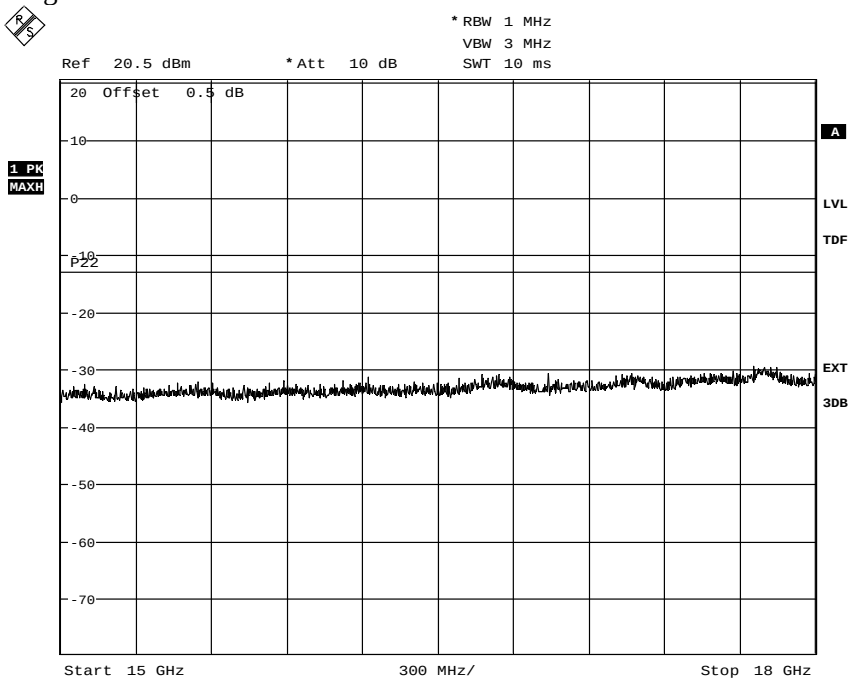
Diagram 1b



Date: 30.NOV.2010 13:51:08

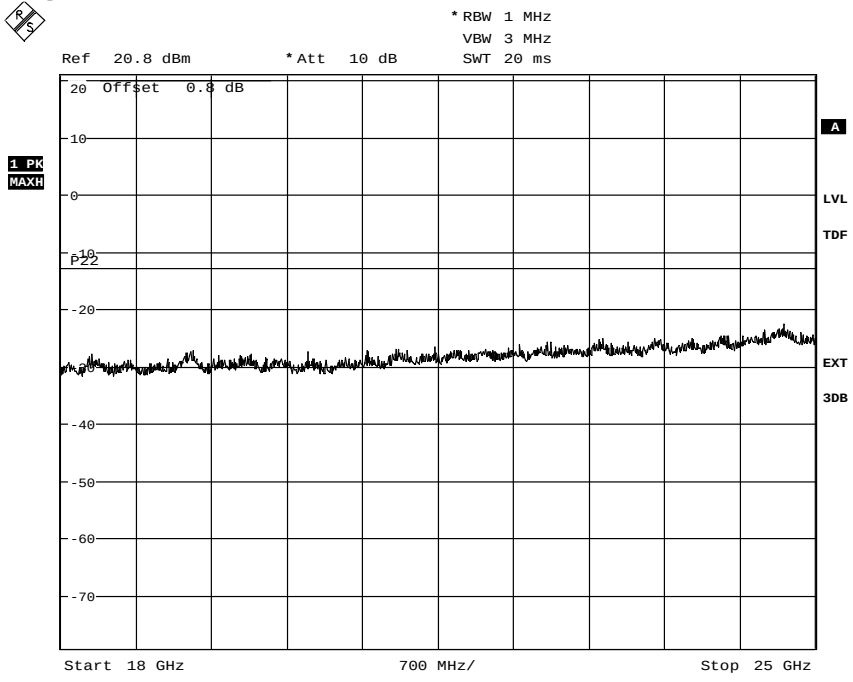
FCC ID: TA8AKRC11864-2 Appendix 5.1
IC: 287AB-AS118642

Diagram 1c



Date: 14.DEC.2010 13:15:27

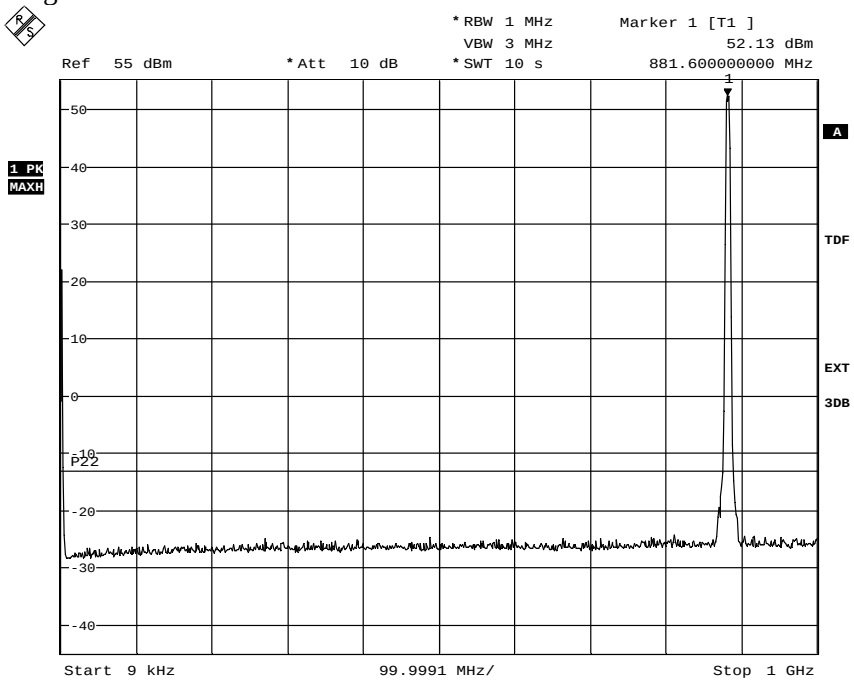
Diagram 1d



Date: 14.DEC.2010 10:28:33

FCC ID: TA8AKRC11864-2 Appendix 5.1
IC: 287AB-AS118642

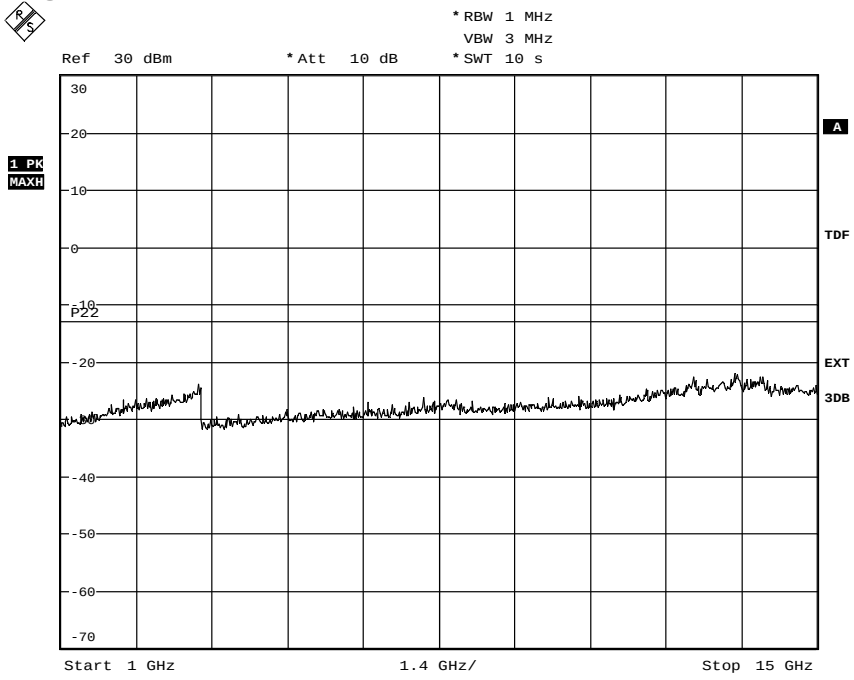
Diagram 2a



Date: 30.NOV.2010 16:23:09

The emissions around the carrier are within the operating frequency band

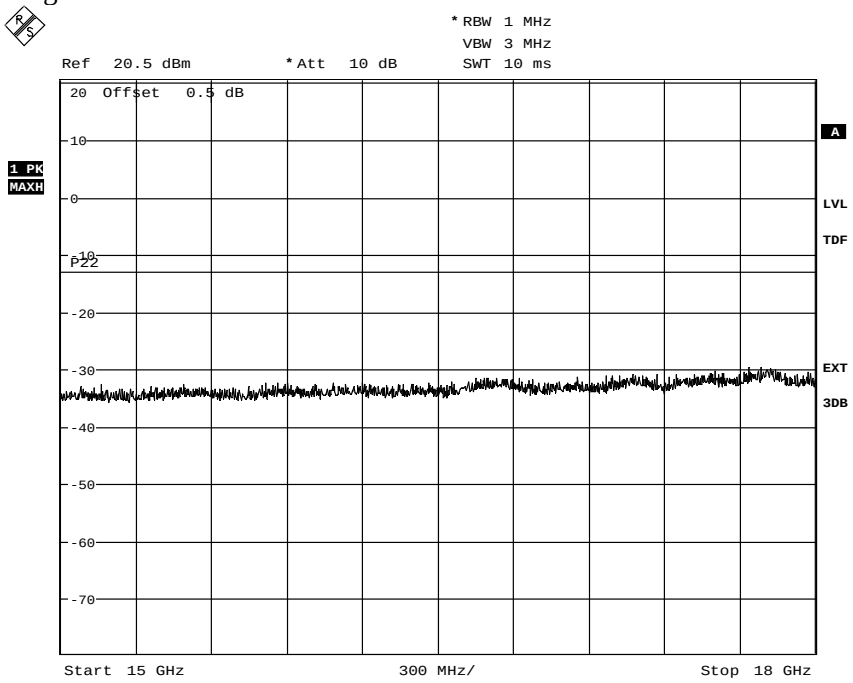
Diagram 2b



Date: 30.NOV.2010 16:27:32

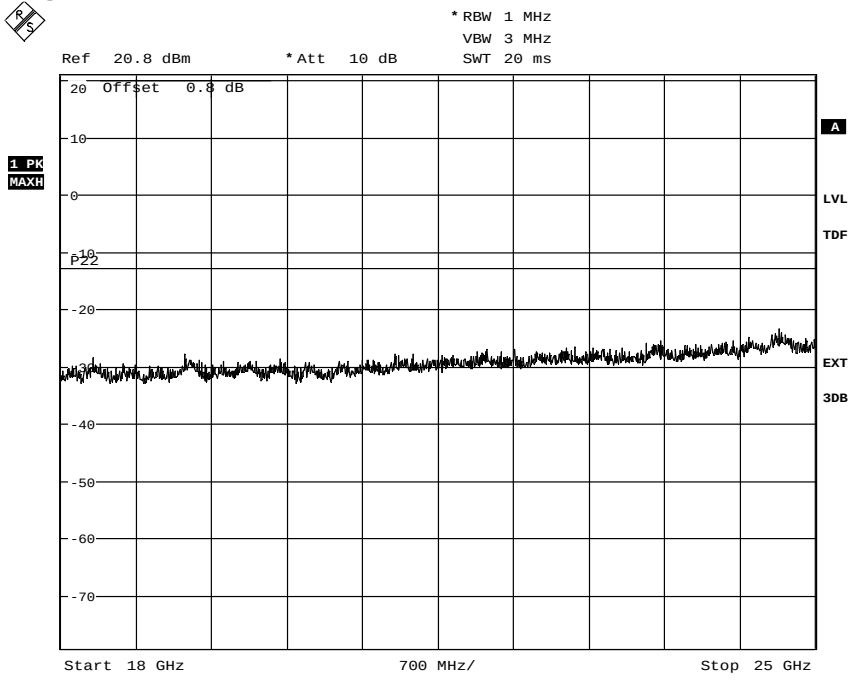
FCC ID: TA8AKRC11864-2 Appendix 5.1
IC: 287AB-AS118642

Diagram 2c



Date: 14.DEC.2010 13:45:21

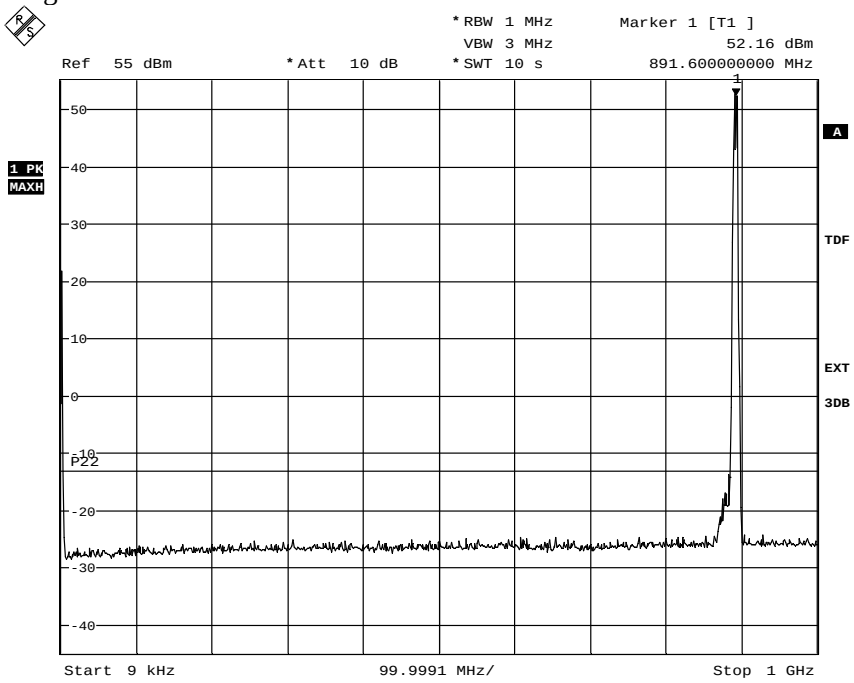
Diagram 2d



Date: 14.DEC.2010 11:09:20

FCC ID: TA8AKRC11864-2 Appendix 5.1
IC: 287AB-AS118642

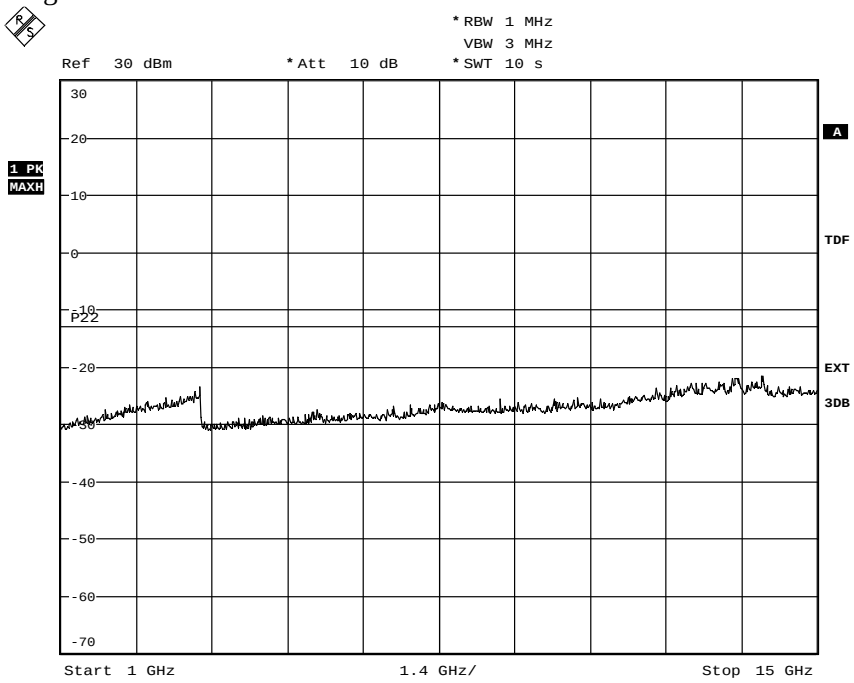
Diagram 3a



Date: 30.NOV.2010 14:35:38

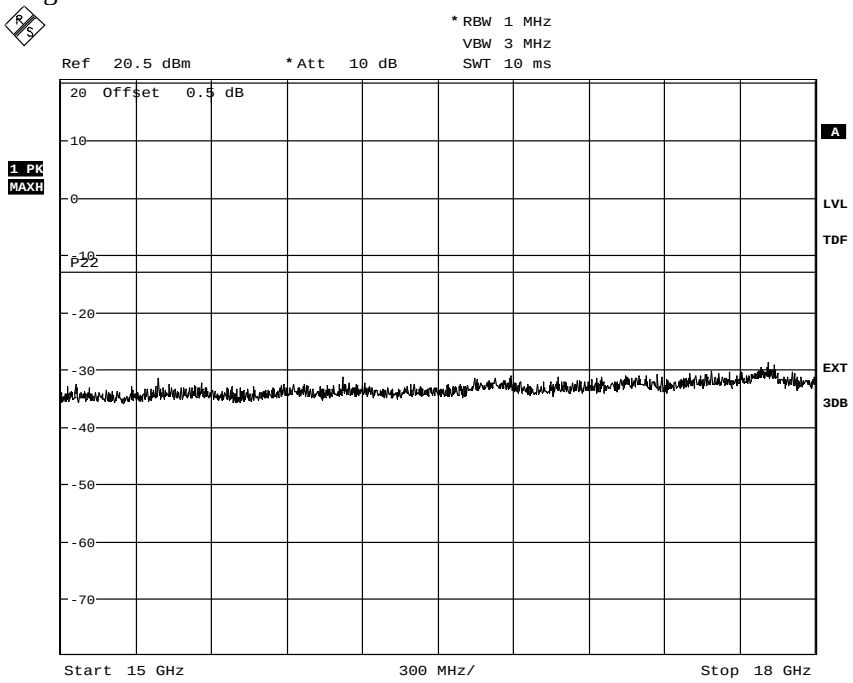
The emissions around the carrier are within the operating frequency band

Diagram 3b



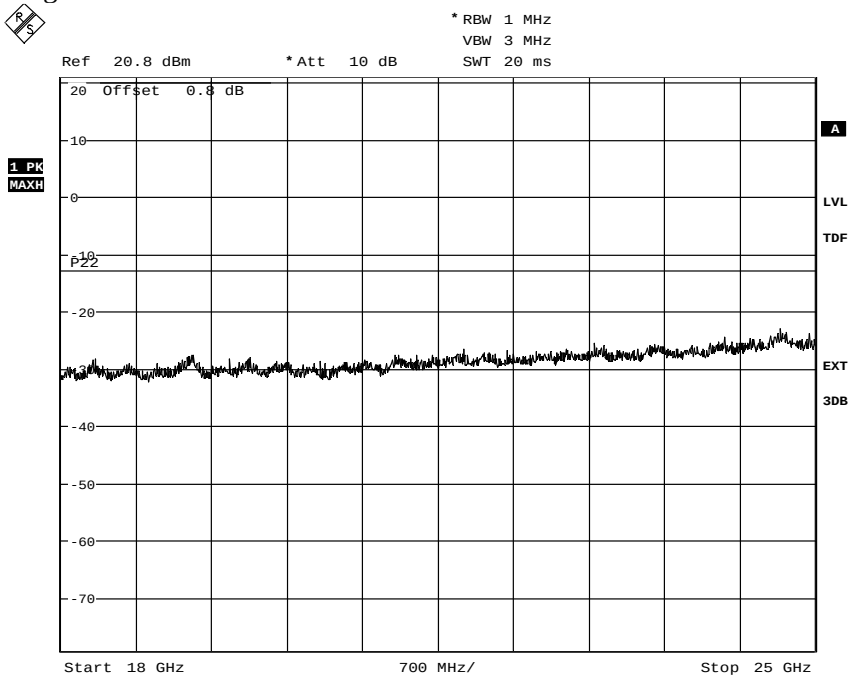
Date: 30.NOV.2010 14:49:47

Diagram 3c



Date: 14.DEC.2010 13:56:31

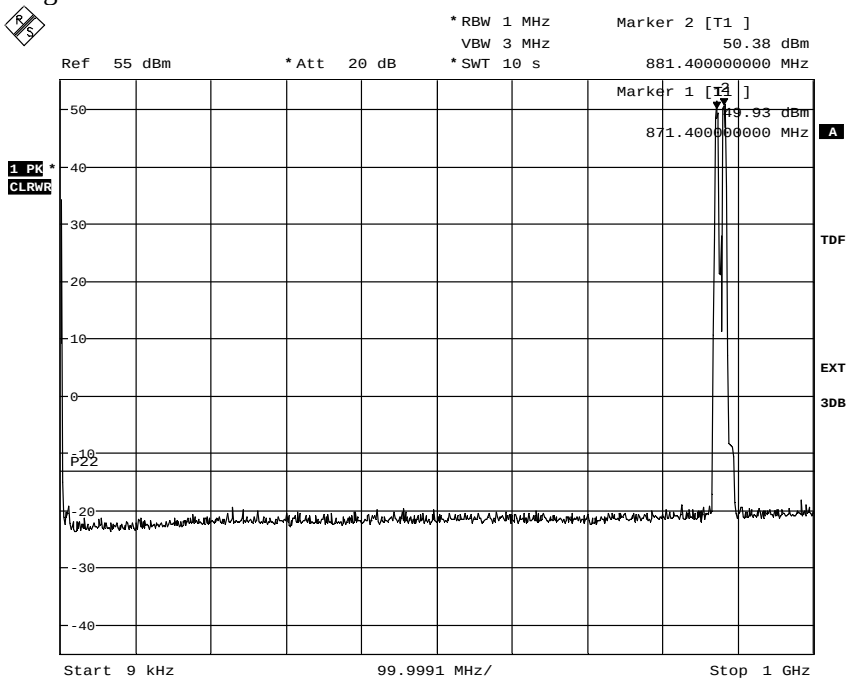
Diagram 3d



Date: 14.DEC.2010 11:20:59

FCC ID: TA8AKRC11864-2 Appendix 5.1
IC: 287AB-AS118642

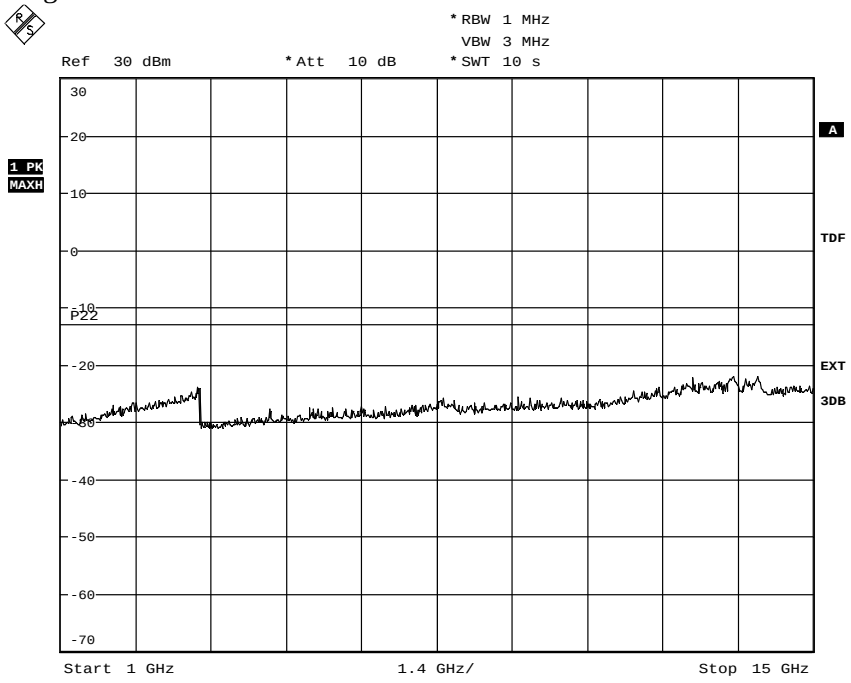
Diagram 4a



Date: 1.DEC.2010 11:16:45

The emissions around the carriers are within the operating frequency band

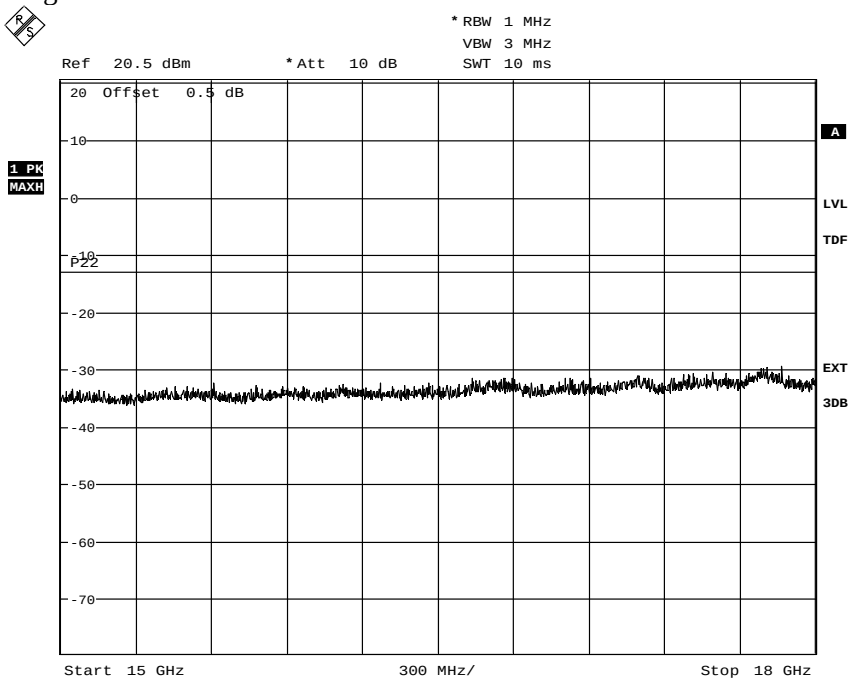
Diagram 4b



Date: 1.DEC.2010 11:19:33

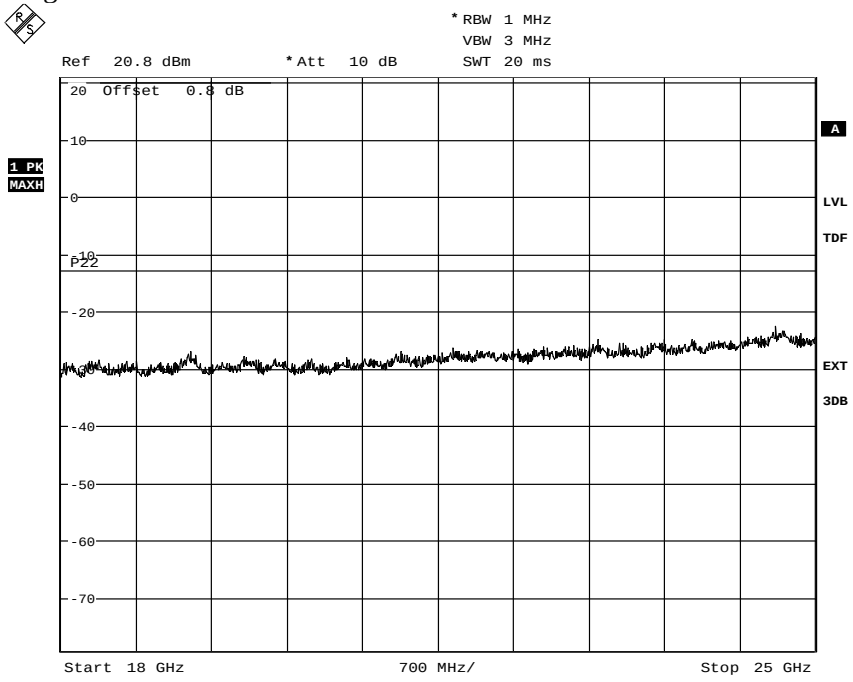
FCC ID: TA8AKRC11864-2 Appendix 5.1
IC: 287AB-AS118642

Diagram 4c



Date: 14.DEC.2010 12:58:25

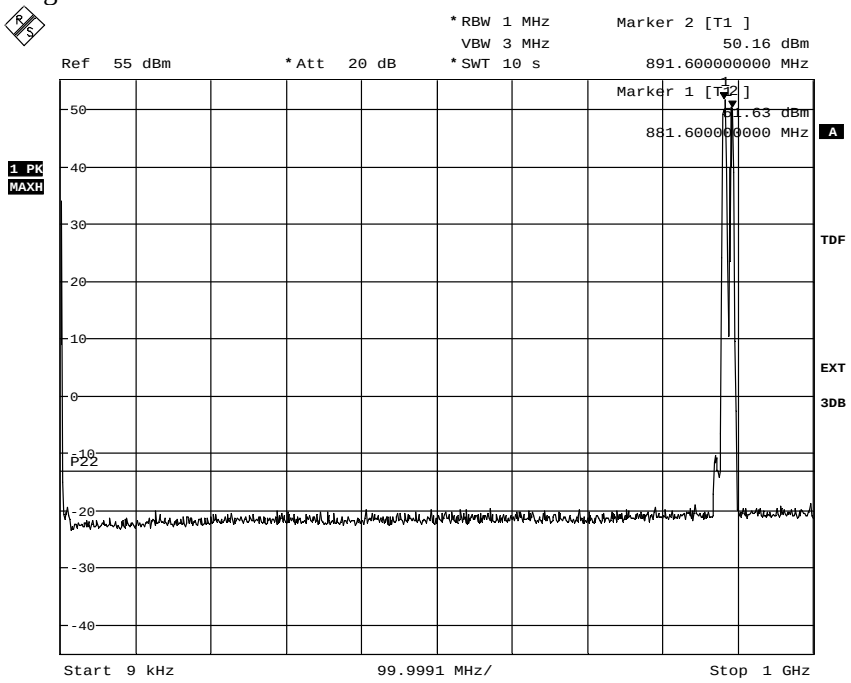
Diagram 4d



Date: 14.DEC.2010 12:15:30

FCC ID: TA8AKRC11864-2 Appendix 5.1
IC: 287AB-AS118642

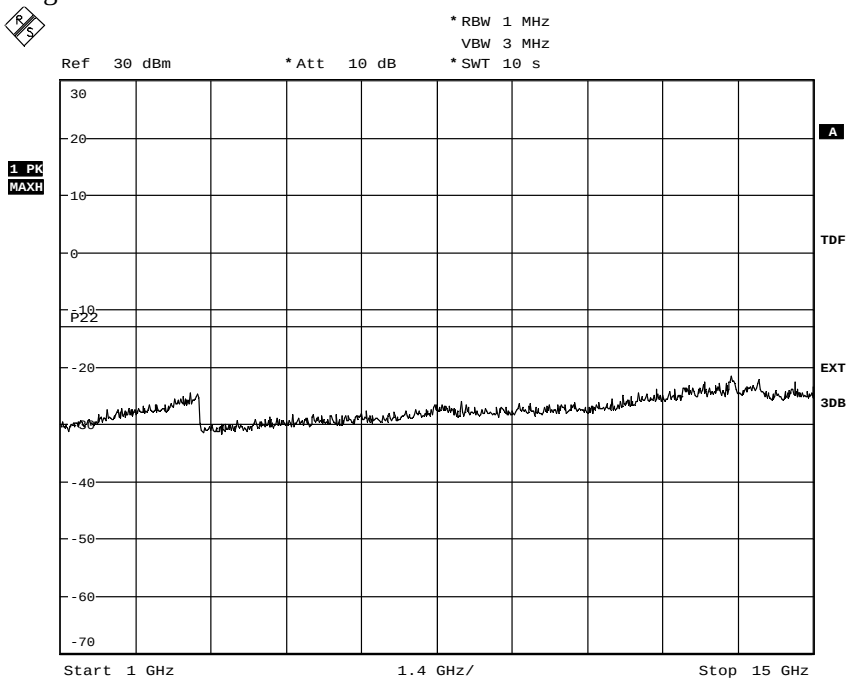
Diagram 5a



Date: 1.DEC.2010 12:13:52

The emissions around the carriers are within the operating frequency band

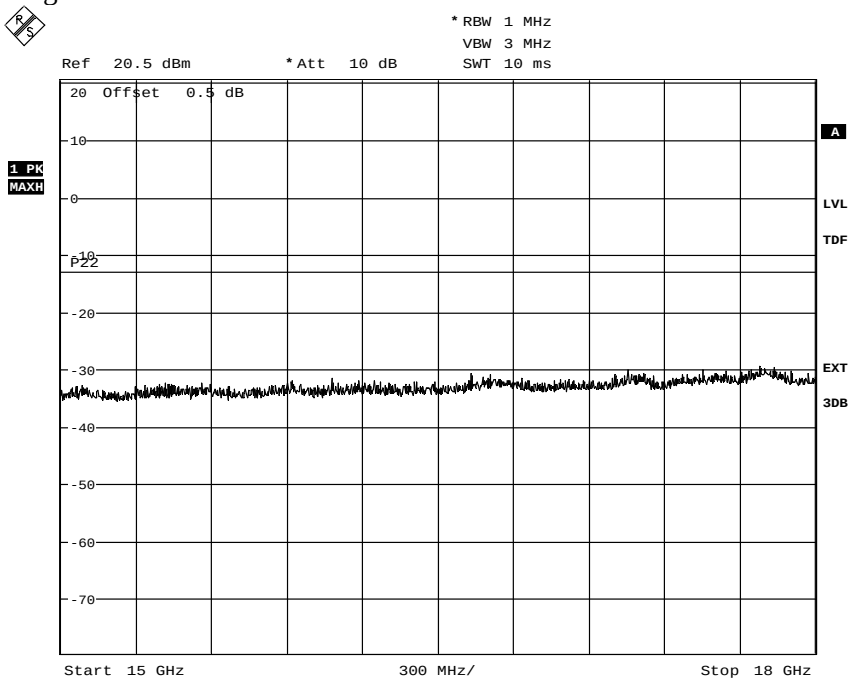
Diagram 5b



Date: 1.DEC.2010 12:16:33

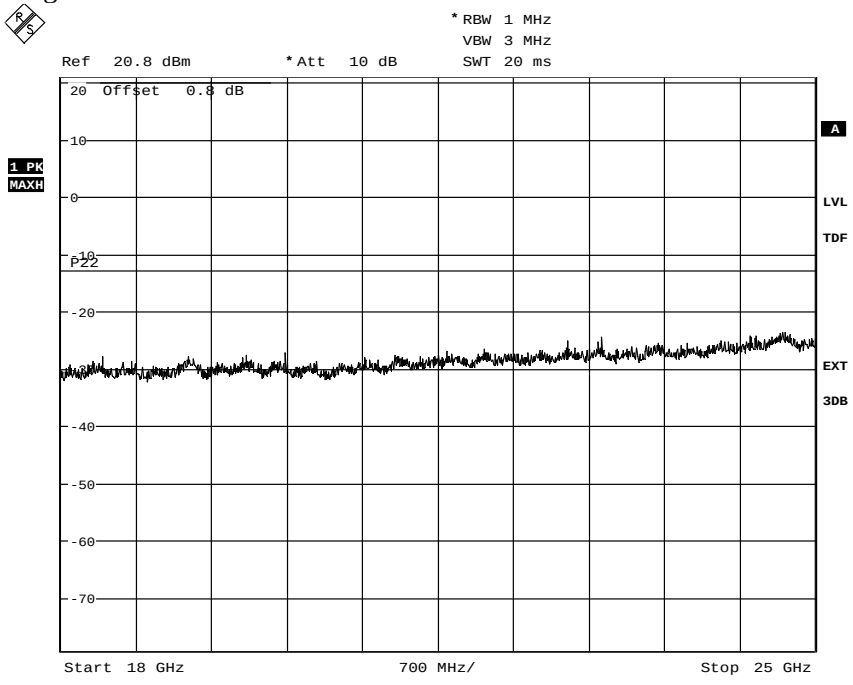
FCC ID: TA8AKRC11864-2 Appendix 5.1
IC: 287AB-AS118642

Diagram 5c



Date: 14.DEC.2010 12:44:16

Diagram 5d



Date: 14.DEC.2010 12:37:55

FCC ID: TA8AKRC11864-2 Appendix 6
IC: 287AB-AS118642

Field strength of spurious radiation measurements according to 47 CFR 2.1053/ RSS-132 4.5

Date	Temperature	Humidity
2010-12-01 to 2010-12-16	21 to 23 °C ± 3 °C	7% to 12 % ± 5 %

Test set-up and procedure

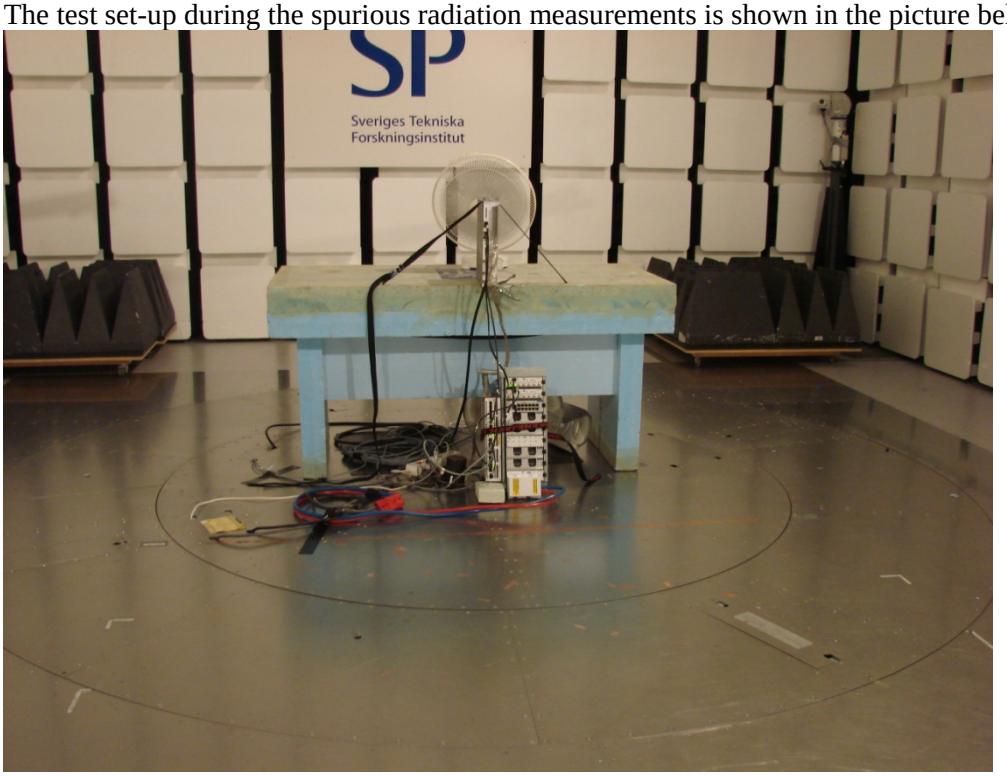
The test site is listed at FCC, Columbia with registration number: 93866. The test site also complies with RSS-Gen, Industry Canada IC file no.: 3482A-1.
The transmitter was modulated with pseudorandom data during the measurements. The antenna port “RF A” was connected to functional test equipment outside the test chamber for signal monitoring. Antenna port “RF B” was terminated with a 50 ohm load.

The measurements were performed with both horizontal and vertical polarization of the antenna. The antenna distance was 3 m in the frequency range 30 MHz to 15 GHz and 1 m in the frequency range 15 GHz to 25 GHz.

1. A pre-measurement was first performed:
2. In the frequency range 30 MHz-25 GHz the measurement was performed in power with a RBW of 1 MHz. A propagation loss in free space was calculated. The used formula was,
   $\gamma = 20\log\left(\frac{4\pi D}{\lambda}\right)$, γ is the propagation loss and D is the antenna distance.
3. The measurement procedure was as the following:
4. The pre-measurement was first performed with peak detector. The EUT was measured in eight directions and with the antenna at three heights, 1.0 m, 1.5 m and 2.0 m.
5. Spurious radiation on frequencies closer than 20 dB to the limit is scanned 0-360 degrees and the antenna is scanned 1-4 m for maximum response. The emission is then measured with the RMS detector and the RMS value is reported, frequencies closer than 10 dB to the limit measured with the RMS detector were measured with the substitution method according to the standard.

Measurement equipment	SP number
Semi anechoic chamber	503 881
R&S ESI 26	503 292
Software: R&S EMC 32, ver.8.20.1	503 745
Chase Bilog Antenna CBL 6111A	503 182
EMCO Horn Antenna 3115	502 175
Std.gain horn FLANN model 16240-25	503 939
Std.gain horn FLANN model 20240-20	503 674
µComp Nordic, Low Noise Amplifier	504 160
Miteq, Low Noise Amplifier,	503 285
HP 1-15 GHz	504 199
HP 3-18 GHz	503 739
HP 18-25 GHz	503 740
Temperature and humidity meter, Testo 625	504 188

The test set-up during the spurious radiation measurements is shown in the picture below:



Results

Frequency (MHz)	Spurious emission level (dBm)	
	Vertical	Horizontal
30-25 000	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

FCC ID: TA8AKRC11864-2
IC: 287AB-AS118642

Appendix 7

Frequency stability according to 47 CFR 2.1055/ RSS-132 4.3

Date	Temperature (test equipment)	Humidity (test equipment)
2010-12-08 to 2010-12-10	23°C ± 3 °C	7-15 % ± 5 %

Test set-up and procedure

The measurement was made per 3GPP TS 25.141. The output was connected to a spectrum analyzer. The spectrum analyzer was connected to an external 10 MHz reference standard during the measurements.

Measurement equipment	SP number
R&S FSIQ 40	503 738
Testo 635, Temperature and humidity meter	504 203
Temperature chamber 2	501 031

Results

Nominal Voltage -48 V DC
Maximum output power at mid channel (M)

Test conditions		Frequency error (Hz)
Supply voltage DC (V)	T (°C)	
-48.0	+20	+5
-55.2	+20	-4
-40.8	+20	-3
-48.0	+30	-5
-48.0	+40	+4
-48.0	+50	-3
-48.0	+10	+3
-48.0	0	N/A, Note 1
Maximum freq. error (Hz)		
Measurement uncertainty		$< \pm 1 \times 10^{-7}$

Note 1: It was not possible to activate the transmitter at this temperature.

Limits (according to 3GPP TS 25.141)

The frequency error shall be within ± 0.05 PPM ± 12 Hz (56.1 Hz).

Complies?	Yes

FCC ID: TA8AKRC11864-2 Appendix 8
IC: 287AB-AS118642

Receiver spurious emissions measurements according to 47 CFR 15.111/ IC RSS-132, section 4.6.

Date	Temperature	Humidity
2010-12-01	23 °C ± 3 °C	7 % ± 5 %
2010-12-14	23 °C ± 3 °C	17 % ± 5 %

Test set-up and procedure

The measurements were performed according to ANSI C63.4.

Measurements were performed on the receiver antenna terminal (RF B). The measurement is first performed with peak detector. Emission on frequencies close to or above the limit is re-measured with quasi-peak detector (average detector above 1000 MHz).

Measurement equipment	SP number
R&S FSQ 40	504 143
Testo 635, Temperature and humidity meter	504 203

Result

The results are shown in appendix 8.1:

	Channel
Diagram 1	B
Diagram 2	M
Diagram 3	T

Note: During the measurement on the RX port RF B the combined TX/RX port RF A was terminated into 50 ohm, the TX was active in single carrier mode transmitting TM1.

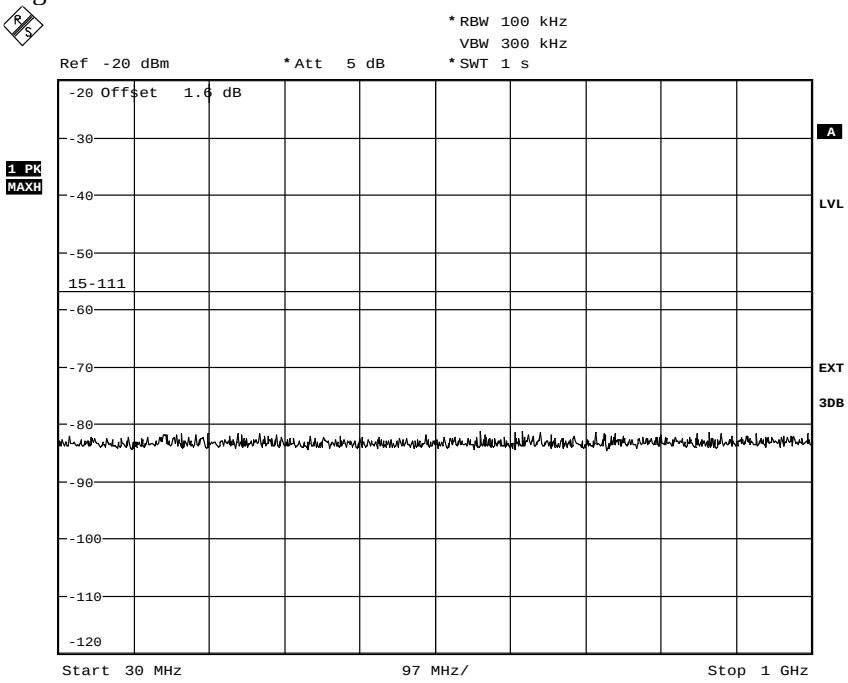
Limit

The power of any spurious output signals appearing at the antenna terminals must not exceed -57 dBm (2 nanowatt).

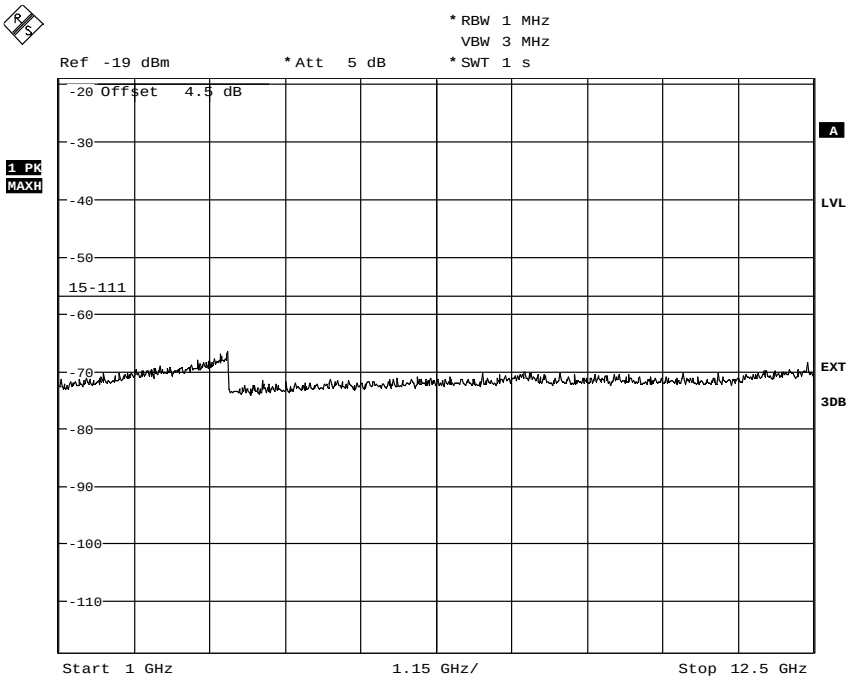
Emission below limit?	Yes

FCC ID: TA8AKRC11864-2 Appendix 8.1
IC: 287AB-AS118642

Diagram 1



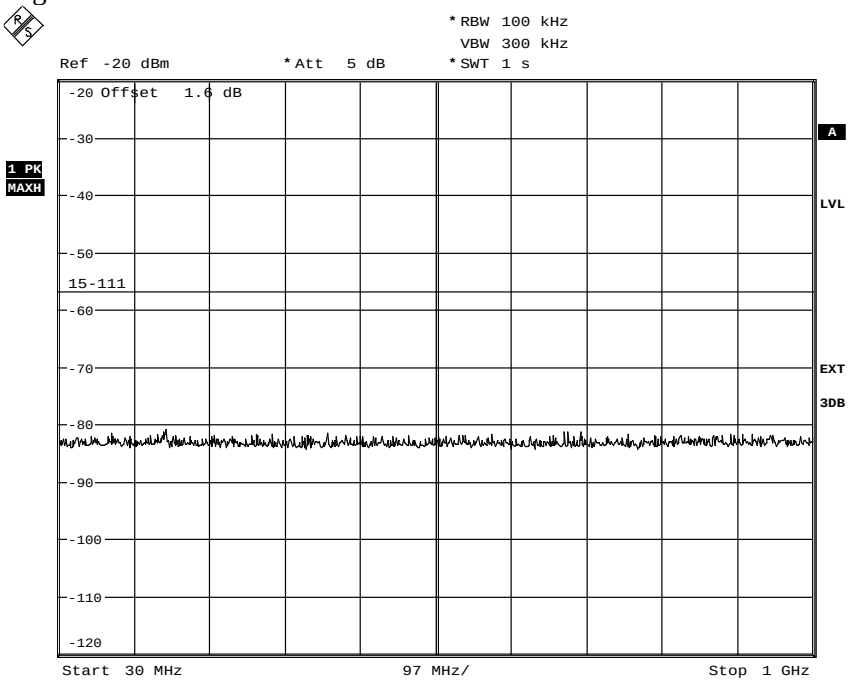
Date: 1.DEC.2010 13:02:46



Date: 14.DEC.2010 14:59:15

FCC ID: TA8AKRC11864-2 Appendix 8.1
IC: 287AB-AS118642

Diagram 2



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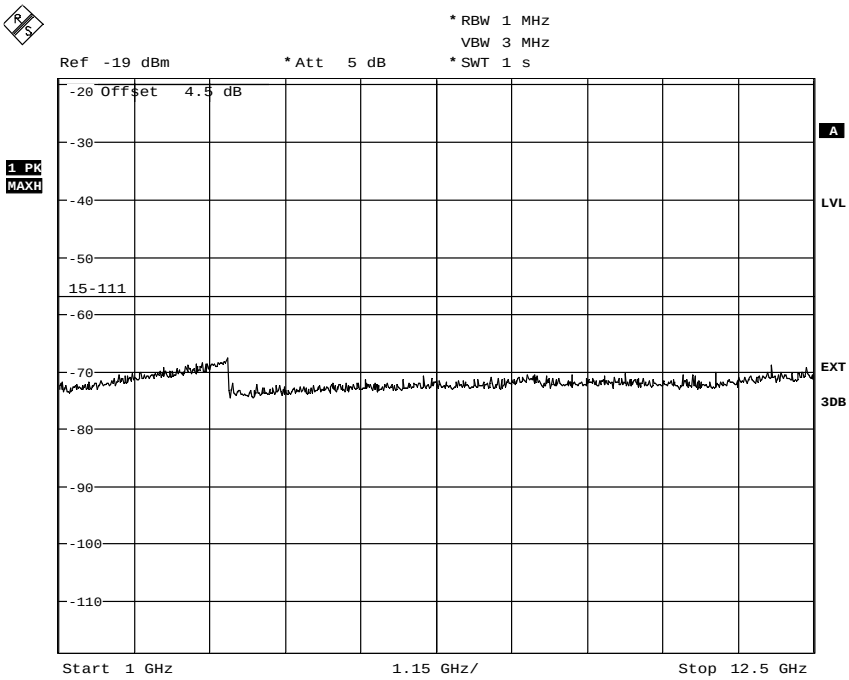
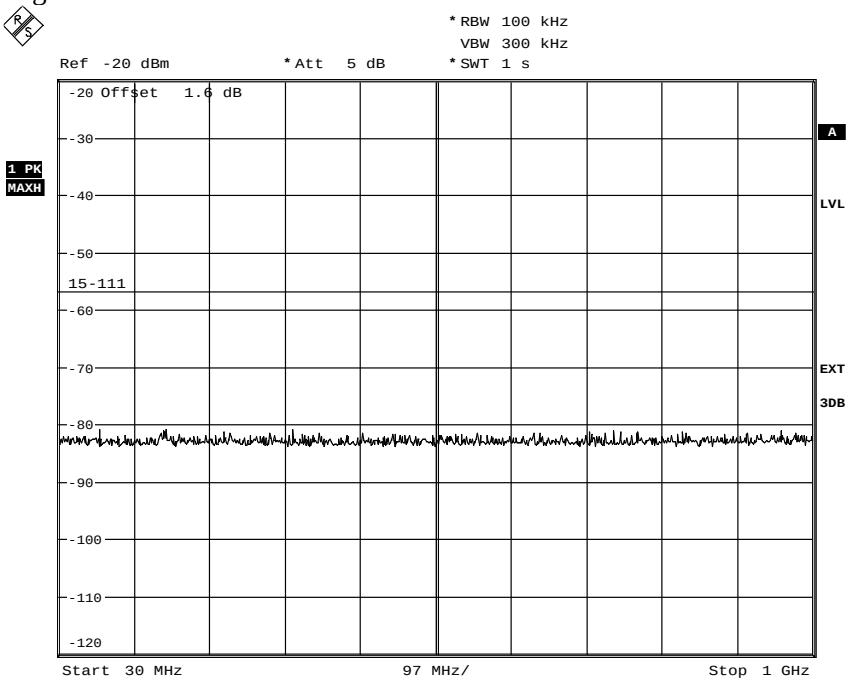


Date: 14.DEC.2010 14:44:24

FCC ID: TA8AKRC11864-2 Appendix 8.1
IC: 287AB-AS118642

Diagram 3



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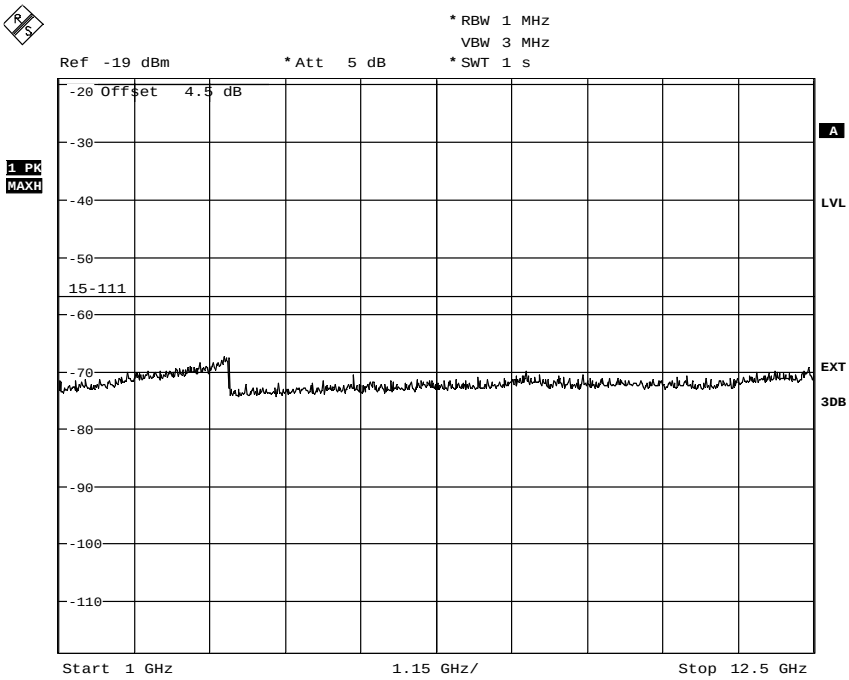

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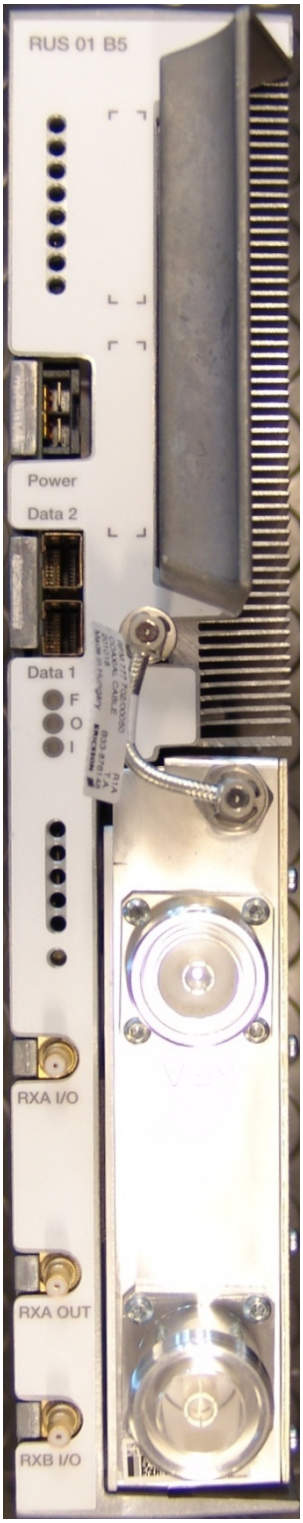
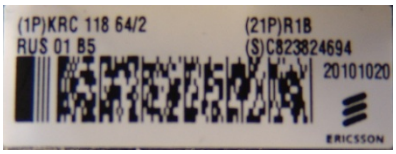
FCC ID: TA8AKRC11864-2
IC: 287AB-AS118642

Appendix 9

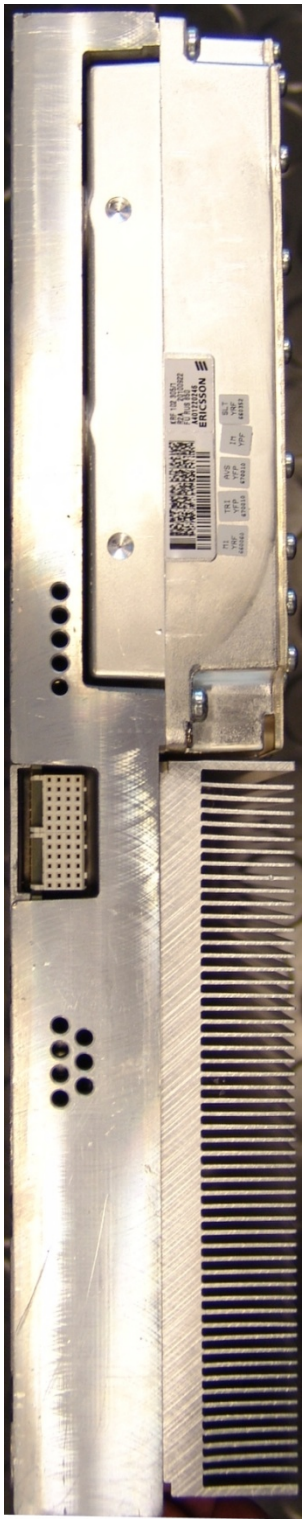
External photos of EUT

Front side





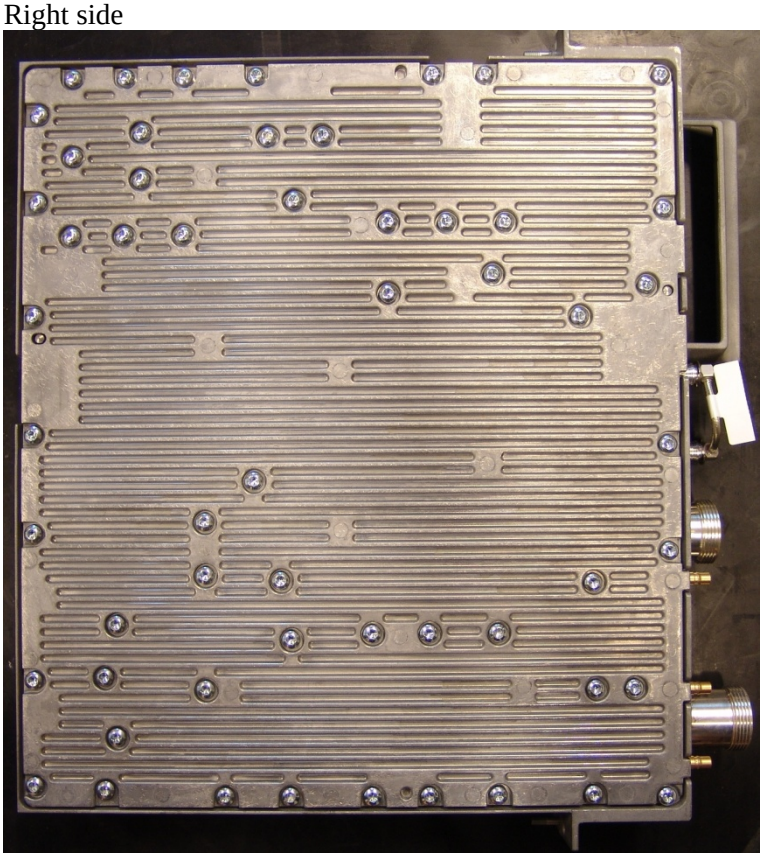
Rear side



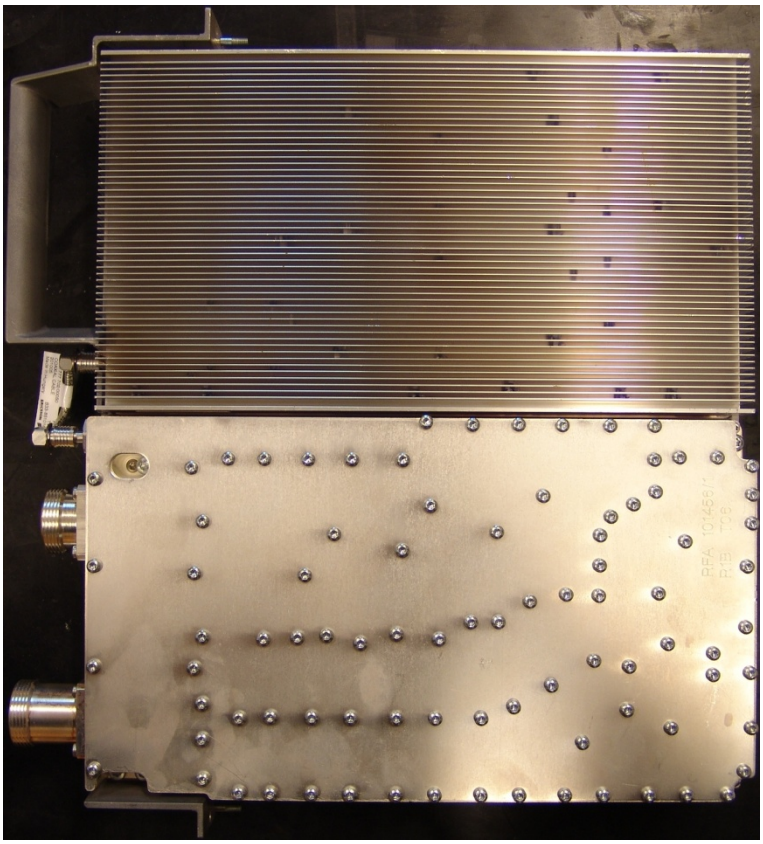
FCC ID: TA8AKRC11864-2
IC: 287AB-AS118642

Appendix 9

Right side



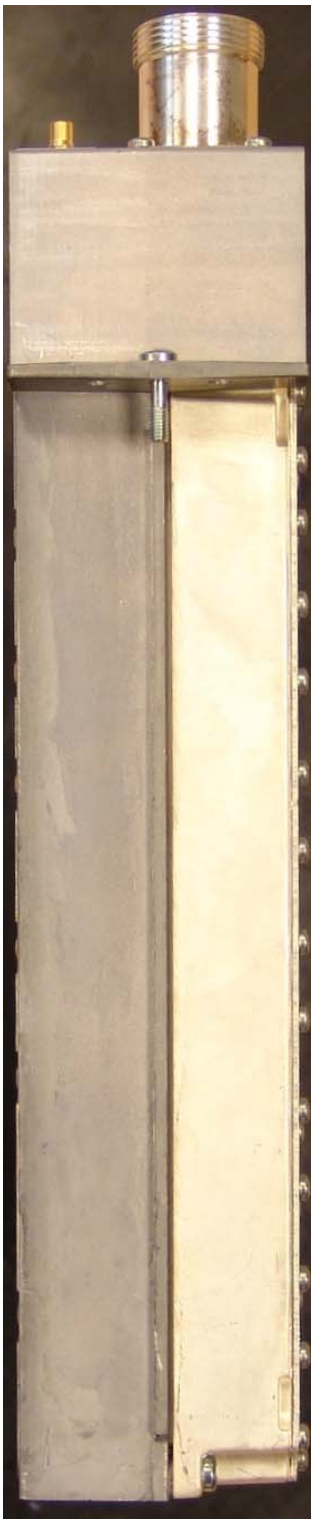
Left side



FCC ID: TA8AKRC11864-2
IC: 287AB-AS118642

Appendix 9

Bottom side



Top side