



Test Site:
 FCC Test Site No.: 96997
 IC OATS No.: IC3475A-1

ECL-EMC Test Report No.: 11-171

Equipment under test: ION-M17P/17P/17P
FCC ID: XS5-IONM171717P
IC ID: 2237E-IONM171717P
Type of test: **FCC 47 CFR Part 27 Subpart C: 2011**
 Miscellaneous Wireless Communication Services
RSS-Gen:2007, RSS-131:2005

Measurement Procedures: 47 CFR Parts 2:2011 (*Frequency Allocations and Radio Treaty Matters; General Rules and Regulations*), Part 27:2011 (*Miscellaneous Wireless Communication Services*), ANSI/TIA-603-C (2004), *Land Mobile FM or PM Communications Equipment Measurement and Performance Standards*
 IC-GEN:2007 General Requirements and Information for the Certification of Radio communication Equipment

Test result: **Passed**

Date of issue:	07.10.11			Signature:
Issue-No.:	02	Author:	T.Zahlmann Test Engineer	
Date of delivery:	19.07.2011	Checked:	M. Lehmann Head of the ECL	
Test dates:	08.05. – 19.07.2011			

Test Report No.: 11-157

FCC ID: XS5-IONM171717P

IC ID: 2237E- IONM171717P



Manufacturer: ANDREW Wireless Systems GmbH
Industriering 10

D-86675 Buchdorf

Tel.: +49 (0)9099 69 0

Fax: +49 (0)9099 69 140

Test Location: TEMPTON Service Plus GmbH
European Compliance Laboratory (ECL)

Thurn-und-Taxis-Straße 18

D-90411 Nürnberg

Tel.: +49 0911 59835 0

Fax: +49 0911 59835 90

General:

The purpose of this report is to show compliance to the FCC regulations for licensed devices operating under section 27 of the Code of Federal Regulations title 47.

This report informs about the results of the EMC tests, it only refers to the equipment under test. No part of this report may be reproduced in any form, without written permission.



Table of contents

1	TEST RESULTS SUMMARY	5
2	EQUIPMENT UNDER TEST (E.U.T.)	6
2.1	DESCRIPTION	6
2.1.1	DOWNLINK	6
2.1.2	UPLINK	6
2.1.3	DESCRIPTION OF EUT	6
2.1.4	SYSTEM DIAGRAMS	7
2.1.5	BLOCK DIAGRAM OF MEASUREMENT REFERENCE POINTS	8
3	TEST SITE (ANDREW BUCHDORF)	9
3.1	TEST ENVIRONMENT	9
3.2	TEST EQUIPMENT	9
3.3	INPUT AND OUTPUT LOSSES	9
3.4	MEASUREMENT UNCERTAINTY	9
4	TEST SITE (TEMPTON SERVICE PLUS GMBH)	10
5	RF POWER OUT: §27.50, §2.1046; RSS-131, RSS-GEN	11
5.1	LIMIT	11
5.2	TEST METHOD	11
5.3	TEST RESULTS	12
5.3.1	DOWNLINK	12
5.3.1.1	CDMA	13
5.3.2	UPLINK	13
5.4	SUMMARY TEST RESULT	13
6	OCCUPIED BANDWIDTH: §2.1049; RSS-GEN	14
6.1	LIMIT	14
6.2	TEST METHOD	14
6.3	TEST RESULTS	15
6.3.1	DOWNLINK	15
6.3.1.1	CDMA	16
6.3.2	UPLINK	17
6.4	SUMMARY TEST RESULT	17
7	SPURIOUS EMISSIONS AT ANTENNA TERMINALS: §27.53, §2.1051; RSS-131, RSS-GEN	18
7.1	LIMIT	18
7.2	TEST METHOD	18
7.3	TEST RESULTS	19
7.3.1	DOWNLINK	19
7.3.1.1	CDMA < 1MHz to band edge	20
7.3.1.2	CDMA > 1MHz to band edge	21
7.3.2	UPLINK	21
7.4	SUMMARY TEST RESULT	21

Test Report No.: 11-157

FCC ID: XS5-IONM171717P

IC ID: 2237E- IONM171717P



8	FIELD STRENGTH OF SPURIOUS EMISSIONS: §27.53, §2.1053	22
8.1	LIMIT §27.53.....	25
8.2	TEST METHOD ANSI/TIA/EA-603-C	26
8.3	CLIMATIC VALUES IN THE LAB.....	26
8.4	TEST RESULTS	27
8.4.1	30 MHZ TO 1 GHZ DOWNLINK (<u>B</u> OTTOM – <u>M</u> IDDLE – <u>T</u> OP)	27
8.4.2	1 MHZ TO 22 GHZ DOWNLINK (<u>B</u> OTTOM – <u>M</u> IDDLE – <u>T</u> OP)	28
8.5	SUMMARY TEST RESULT.....	28



1 Test Results Summary

Name of Test	FCC Para. No.	FCC Method	FCC Spec.	Result
RF Power Output	27.50(d)	2.1046	1640 Watts/MHz	Complies
Occupied Bandwidth	2.1049	2.1049	Input/Output	Complies
Spurious Emissions at Antenna Terminals	27.53(h)	2.1051	-13dBm	Complies
Field Strength of Spurious Emissions	27.53(m)	2.1053 TIA/EA-603	-13dBm E.I.R.P	Complies
Frequency Stability	27.54	2.1055	Must stay in band	NA

Name of Test	IC Para. No.	IC Method	Result
RF Power Output	RSS-131 6.4	RSS-GEN 4.8	Complies
Occupied Bandwidth	RSS-Gen 4.6	RSS-GEN 4.6.1	Complies
Spurious Emissions at Antenna Terminals	RSS-139 6.5	RSS-GEN 4.9	Complies
Field Strength of Spurious Emissions	RSS-139 6.5	RSS-GEN 4.9 SRSP-513	Complies
Frequency Stability	RSS-131 6.3	RSS-GEN 4.7	NA

Frequency stability is not applicable because the device uses a common oscillator to up convert and down convert the RF signal. The EUT does not contain modulation circuitry, or frequency generation, therefore the test was not performed.



2 Equipment under test (E.U.T.)

2.1 Description

Kind of equipment	ION-M17P/17P/17P Repeater	
Andrew Ident. Number	Id.No. 7634986-0000	
Serial no.(SN)	11	
Revision	00	
Software version and ID	V 3.9.1.4	Id.No.7164581-00
Type of modulation and Designator	CDMA (F9W)	<input checked="" type="checkbox"/>
	W-CDMA (F9W)	<input type="checkbox"/>
	LTE	<input type="checkbox"/>
Frequency Translation	F1-F1	<input checked="" type="checkbox"/>
	F1-F2	<input type="checkbox"/>
	N/A	<input type="checkbox"/>
Band Selection	Software	<input type="checkbox"/>
	Duplexer	<input checked="" type="checkbox"/>
	Fullband	<input type="checkbox"/>

2.1.1 Downlink

Pass band	2110 MHz – 2155 MHz
Max. composite output power based on one carrier per path (rated)	43 dBm = 19,953 W
Gain max.	10 dB @ Pout BTS of 33 dBm

2.1.2 Uplink

Pass band	1710 MHz – 1755 MHz
Max. composite output power based on one carrier per path (rated)	n.a.
Gain max.	n.a.

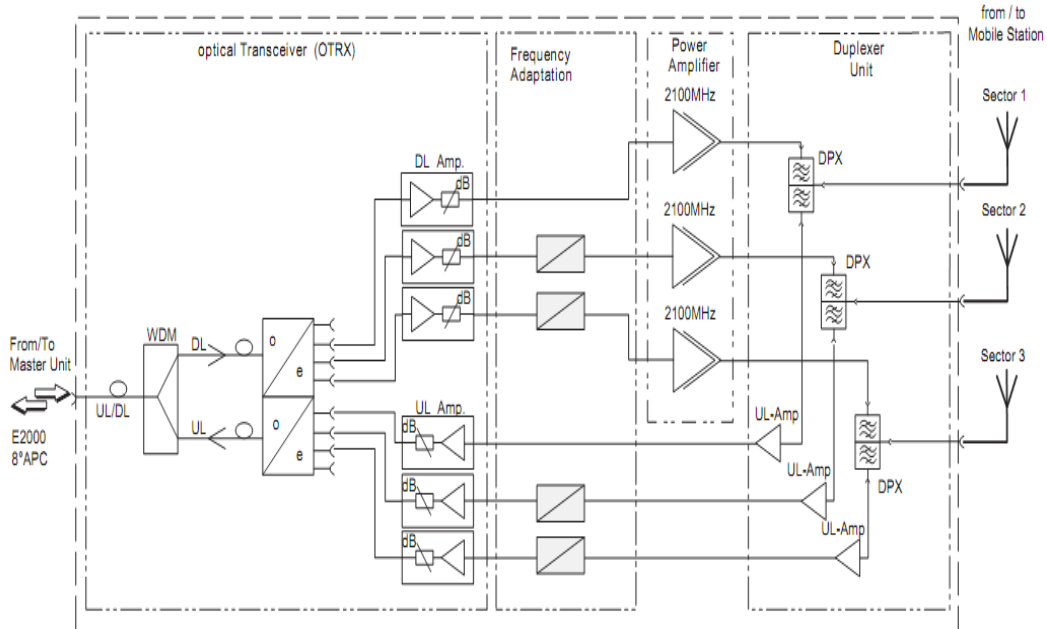
2.1.3 Description of EUT

Andrew ION-M17P/17P/17P is a multi-band, multi-operator remote unit with various extension units. It is used in conjunction with a master unit in the ION optical distribution system.

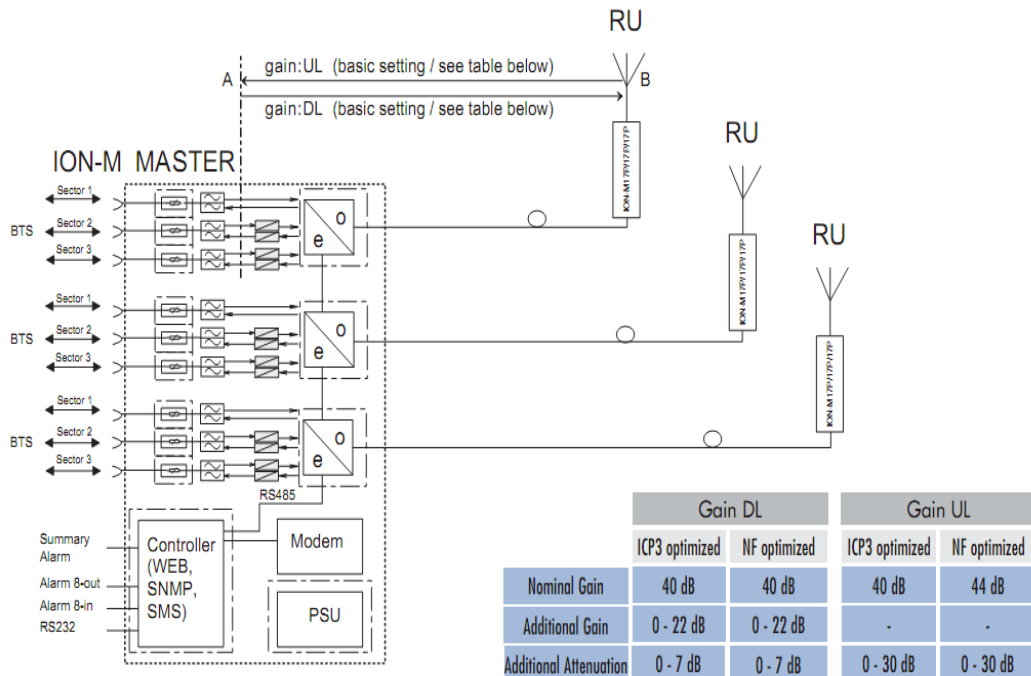
This Test Report describes only the approval of one 1700 MHz Path of the Remote Unit (EUT).

The ION-M17P/17P/17P Extension Unit consists of three 1700 MHz paths with the intended use of simultaneous transmission

2.1.4 System diagrams



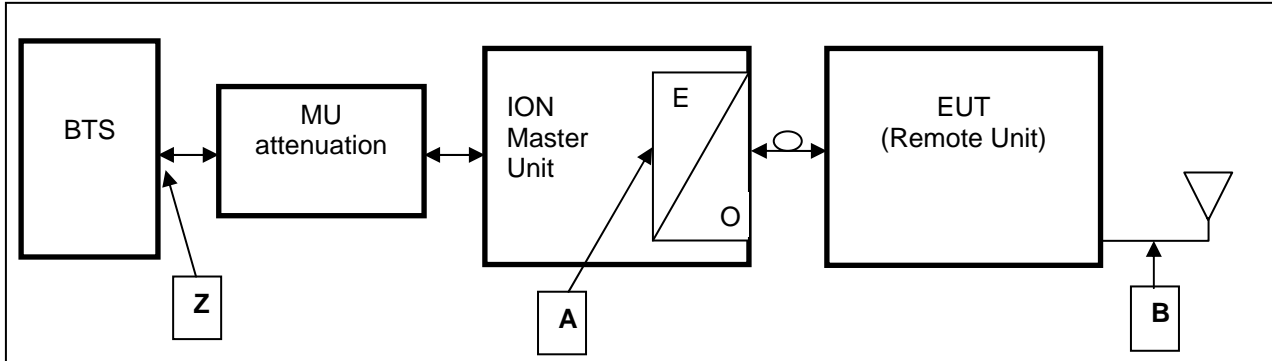
ION-M17P/17P/17P Remote Unit Design Principle



Design Principle ION System (One Subrack)

figure 2.1.4-#1 System diagrams: Application example

2.1.5 Block diagram of measurement reference points



BTS Base Station
RU is the EUT
O/E Optic/Electrical converter
SRMU Sub Rack Master Unit

Reference point B, Remote Unit DL output, UL input
Reference point A, UL output, DL input
Reference point Z, BTS DL output, UL input



3 Test site (Andrew Buchdorf)

3.1 Test environment

All tests were performed under the following environmental conditions:

Condition	Minimum value	Maximum value
Barometric pressure	86 kPa	106 kPa
Temperature	15°C	30°C
Relative Humidity	20 %	75 %
Power supply range	±5% of rated voltages	

3.2 Test equipment

ANDREW Inv. No.	Test equipment	Type	Manufacturer	Serial No.	Calibration
8741	Network Analyzer	ZVRE	R&S	100034	02/2011
8798	Spectrum Analyzer	FSIQ-26	R&S	102157	03/2011
8890	Spectrum Analyzer	FSP	R&S	100674	07/2011
9046	Generator	SMBV100A	R&S	255090	06/2011
8667	Power Meter	E4418A	Agilent	GB38273230	04/2011
8668	Power Sensor	E8481H	Agilent	US3318A19208	04/2011
7157	RF-Cable	Succoflex	Suhner	36180/4P	CIU
7158	RF-Cable	Succoflex	Suhner	36182/4P	CIU
7289	RF-Cable	Succoflex	Suhner	28443/4PE	CIU
7290	RF-Cable	Succoflex	Suhner	28444/4PE	CIU
7385	RF-Cable	Succoflex	Suhner	36267/4P	CIU
7387	RF-Cable	Succoflex	Suhner	36267/4P	CIU
7390	RF-Cable	Succoflex	Suhner	40193/4P	CIU
7381	RF-Cable	Succoflex	Suhner	40200/4P	CIU
7384	RF-Cable	Succoflex	Suhner	40448/4P	CIU
7294	RF-Cable	Succoflex	Suhner	40448/4P	CIU
7382	RF-Cable	Succoflex	Suhner	40221/4P	CIU

CIU = Calibrate in use

3.3 Input and output losses

All recorded power levels should be referenced to the input and output connectors of the repeater, unless explicitly stated otherwise.

The test equipment used in this test has to be calibrated, so that the functionality is also checked.

All cables, attenuators, splitter, isolator, circulator and combiner etc. must be measured before testing and used for compensation during testing.

3.4 Measurement uncertainty

The extended measurement uncertainty corresponds to the measurement results from the standard measurement uncertainty multiplied by the coverage factor $k=2$. The true value is located in the corresponding interval with a probability of 95 %.

Test Report No.: 11-157

FCC ID: XS5-IONM171717P

IC ID: 2237E- IONM171717P



4 Test site (TEMPTON Service Plus GmbH)

FCC Test Site No.: 96997
IC OATS No.: IC3475A-1

See relevant dates under section 8.



5 RF Power Out: §27.50, §2.1046; RSS-131, RSS-GEN

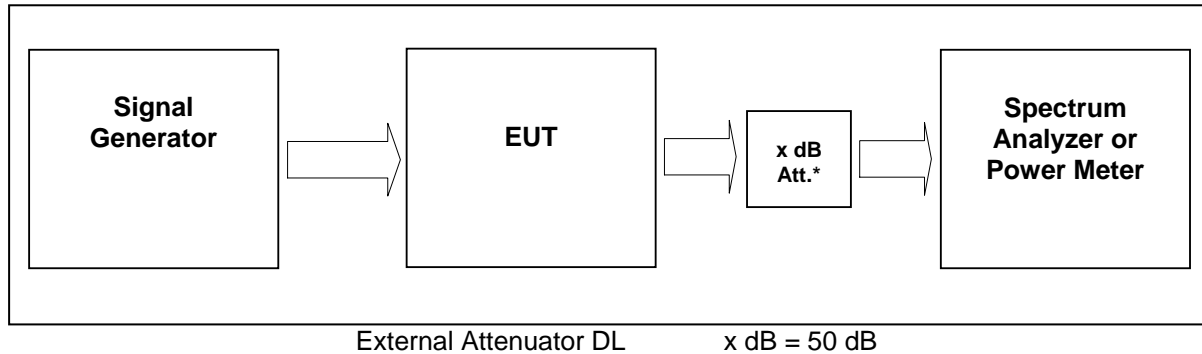


figure 3.4-#1 Test setup: RF Power Out: §27.50, §2.1046; RSS-131, RSS-GEN

Measurement uncertainty	± 0,38 dB
Test equipment used	8890; 8667; 8668; 8848

5.1 Limit

Minimum standard:

Para. No.27.50(d)(2)(B)

(d) The following power and antenna height requirements apply to stations transmitting in the 1710–1755 MHz and 2110–2155 MHz bands:

(2) The power of each fixed or base station transmitting in the 2110–2155 MHz band and situated in any geographic location other than that described in paragraph (d)(1) is limited to:

(B) an EIRP of 1640 watts/MHz when transmitting with an emission bandwidth greater than 1 MHz.

5.2 Test method

§ 2.1046 Measurements required: RF power output.

(a) For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in § 2.1033(c)(8). The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.

(c) For measurements conducted pursuant to paragraphs (a) and (b) of this section, all calculations and methods used by the applicant for determining carrier power or peak envelope power, as appropriate, on the basis of measured power in the radio frequency load attached to the transmitter output terminals shall be shown. Under the test conditions specified, no components of the emission spectrum shall exceed the limits specified in the applicable rule parts as necessary for meeting occupied bandwidth or emission limitations



5.3 Test results

Detector RMS.

Test signal CDMA2000:

Signal waveform according to table 6.2-1 of standard specification 3GPP2 C.p0051-0 v1.0 16.February 2006 pilot, sync, paging, 37 traffics, which is equal to the table 6.5.2.1 of 3GPP2 C.S0010-C v2.0 24.February 2006.

5.3.1 Downlink

Modulation	Measured at	RBW VBW Span	RF Power (dBm)	RF Power (W)	Plot -
CDMA	2132,5 MHz	3MHz 10MHz 15MHz	43	19,953	5.3.1.1 #1
Maximum output power = 43 dBm -> 19,953 W					
Limit Maximum output power = 1640 W -> 62,15 dBm					

table 5.3.1-#1 RF Power Out: §27.50, §2.1046; RSS-131, RSS-GEN Test results Downlink

The max RF Power out is 45.0 dBm, so the maximum antenna gain (x) can be calculated as follow:

Limit = 1640W (eirp) = 62.15 dBm

info: 1000W (erp) = 1640W (eirp)

$62.15 \text{ dBm} > 43 \text{ dBm} + x$

19.15 dBi > x

The antenna that will use for the complete system in the end have to has a gain lower than 19.15 dBi.

Modulation	Pin / dBm (Ref. point B)
CDMA	3,5

table 5.3.1-#2 RF Power Out: §27.50, §2.1046; RSS-131, RSS-GEN Test results Downlink Input power

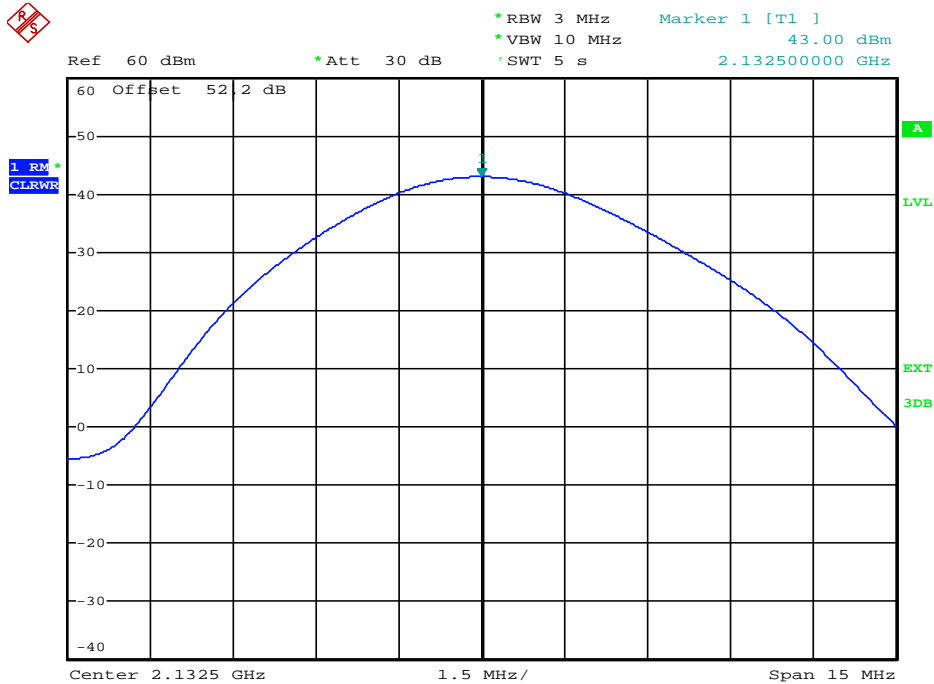
Test Report No.: 11-157

FCC ID: XS5-IONM171717P

IC ID: 2237E- IONM171717P



5.3.1.1 CDMA



Date: 9.MAY.2011 16:51:59

plot 5.3.1.1-#1 RF Power Out: §27.50, §2.1046; RSS-131, RSS-GEN; Test results; Downlink; CDMA

5.3.2 Uplink

n.a.

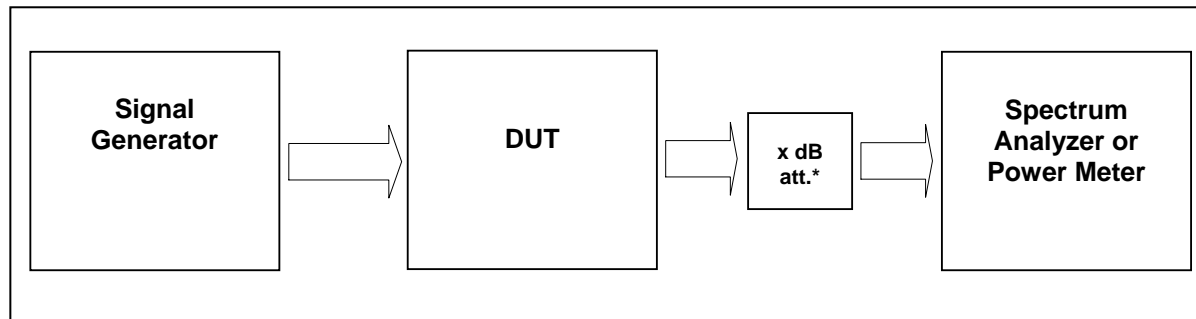
Note: The EUT does not transmit over the air in the uplink direction.

5.4 Summary test result

Test result	complies, according the plots above
Tested by:	W. Meir
Date:	9.05.2011



6 Occupied Bandwidth: §2.1049; RSS-GEN



External Attenuator DL x dB = 50 dB
figure 5.4-#1 Test setup: Occupied Bandwidth: §2.1049; RSS-GEN

Measurement uncertainty	± 0,38 dB
Test equipment used	8890; 8667; 8668; 8848

6.1 Limit

The spectral shape of the output should look similar to input for all modulations.

6.2 Test method

Para. No.2.1049

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the following conditions as applicable:

(h) Transmitters employing digital modulation techniques—when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated. The signal shall be applied through any filter networks, pseudo-random generators or other devices required in normal service. Additionally, the occupied bandwidth shall be shown for operation with any devices used for modifying the spectrum when such devices are optional at the discretion of the user.

Test Report No.: 11-157

FCC ID: XS5-IONM171717P

IC ID: 2237E- IONM171717P



6.3 Test results

6.3.1 Downlink

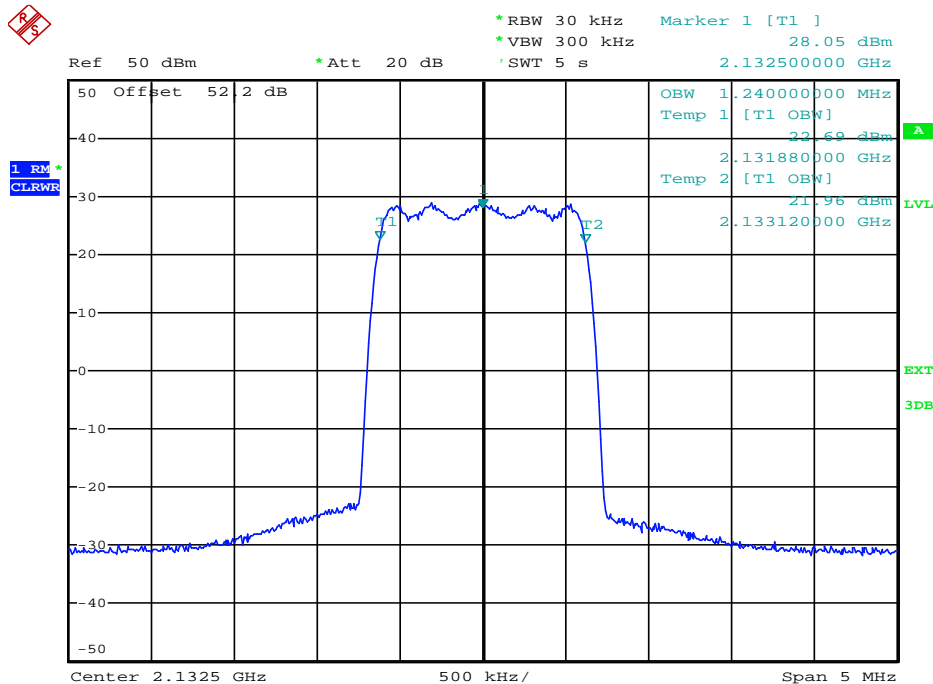
Detector RMS.

Modulation	Measured at	Center Frequency [MHz]	RBW VBW Span	Occupied Bandwidth / [MHz]	Plot #
CDMA	middle	2132,5	30kHz 300kHz 5MHz	1,24	6.3.1.1 #1, #2

table 6.3-#1 Occupied Bandwidth: §2.1049; RSS-GEN Test results Downlink

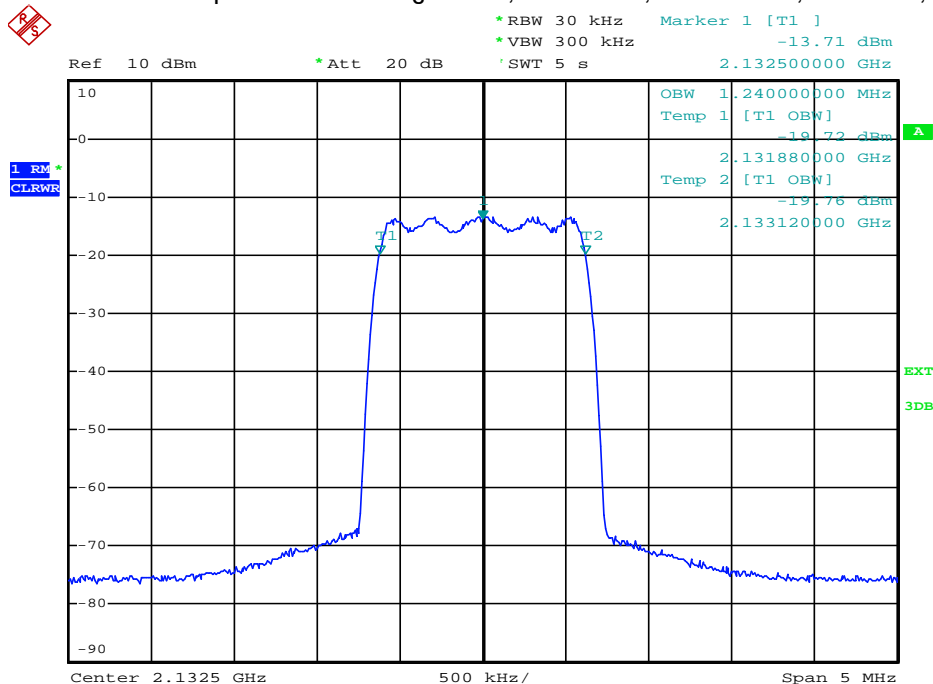


6.3.1.1 CDMA



Date: 9.MAY.2011 16:55:49

plot 6.3.1.1-#1 Occupied Bandwidth: \$2.1049; RSS-GEN; Test results; Downlink; CDMA Output



Date: 9.MAY.2011 17:04:29

plot 6.3.1.1-#2 Occupied Bandwidth: \$2.1049; RSS-GEN; Test results; Downlink; CDMA Input

Test Report No.: 11-157

FCC ID: XS5-IONM171717P

IC ID: 2237E- IONM171717P



6.3.2 Uplink

n.a.

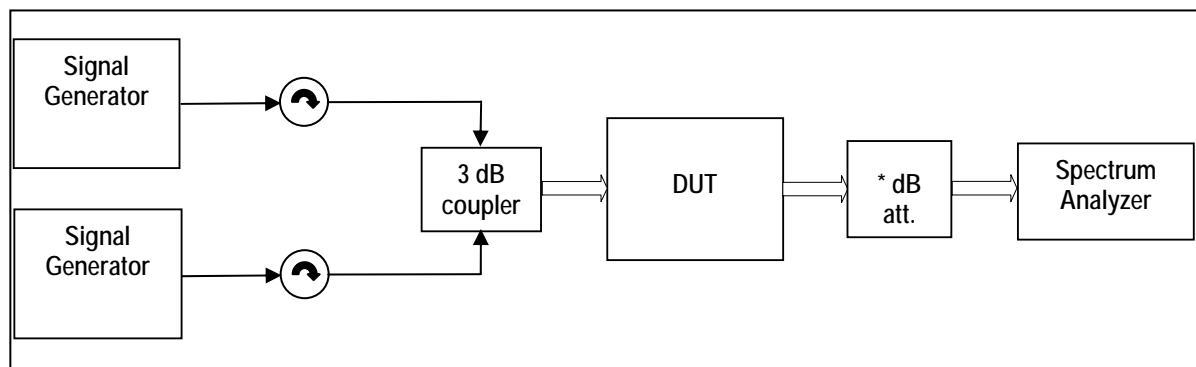
Note: The EUT does not transmit over the air in the uplink direction.

6.4 Summary test result

Test result	complies, according the plots above
Tested by:	W. Meir
Date:	9.05.2011



7 Spurious Emissions at Antenna Terminals: §27.53, §2.1051; RSS-131, RSS-GEN



Multisignal-Generator used, External Attenuator DL x dB = 50 dB

figure 7-#1 Test setup: Spurious Emissions at Antenna Terminals: §27.53, §2.1051; RSS-131, RSS-GEN

Measurement uncertainty	± 0,54 dB ± 1,2 dB ± 1,5 dB	9 kHz to 3 GHz 3 GHz to 7 GHz 7 GHz to 26 GHz
Test equipment used	8890; 8667; 8668; 8848; 8798	

7.1 Limit

Minimum standard:

Para. No.27.53(h)

(h) For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee’s frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB.

(1) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee’s frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

(2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee’s frequency block edges, both upper and lower, as the design permits.

(3) The measurements of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

7.2 Test method

Para. No 2.1051 Measurements required: Spurious emissions at antenna terminals.

The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in § 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

[39 FR 5919, Feb. 15, 1974. Redesignated and amended at 63 FR 36599, July 7, 1998]



7.3 Test results

7.3.1 Downlink

<1MHz from Band Edge

Detector: RMS.

Modulation	Measured at Band Edge	Carriers	RBW VBW Span	Max. level (dBm)	Plot -
CDMA	Lower Edge	2110,775 MHz	30kHz 300kHz 6MHz	-19,0	7.3.1.1 #1
	Upper Edge	2112,025 MHz 2152,975 MHz 2154,225 MHz		-19,9	#2

table 7.3-#1 Spurious Emissions at Antenna Terminals: §27.53, §2.1051; RSS-131, RSS-GEN Test results Downlink <1MHz from Band Edge

>1MHz from Band Edge

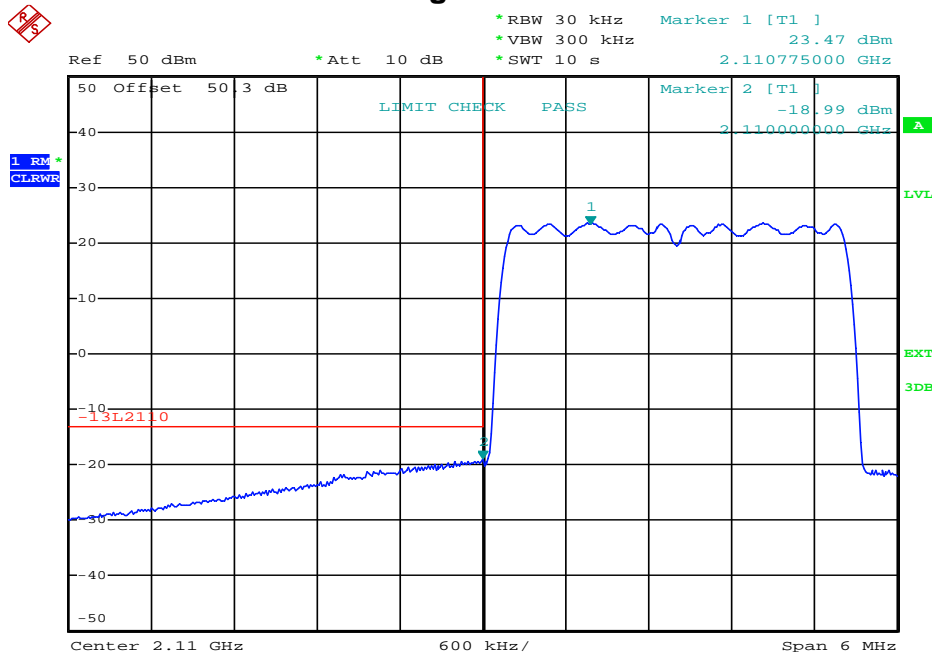
Detector: RMS.

Modulation	Carrier at	Carrier	Max. level (dBm)	RBW VBW Frequency range	Plot -
CDMA	Middle	2132,5 MHz	-21,6	1MHz 3MHz 30MHz – 22GHz	7.3.1.1 #1

table 7.3-#2 Spurious Emissions at Antenna Terminals: §27.53, §2.1051; RSS-131, RSS-GEN Test results Downlink >1MHz from Band Edge

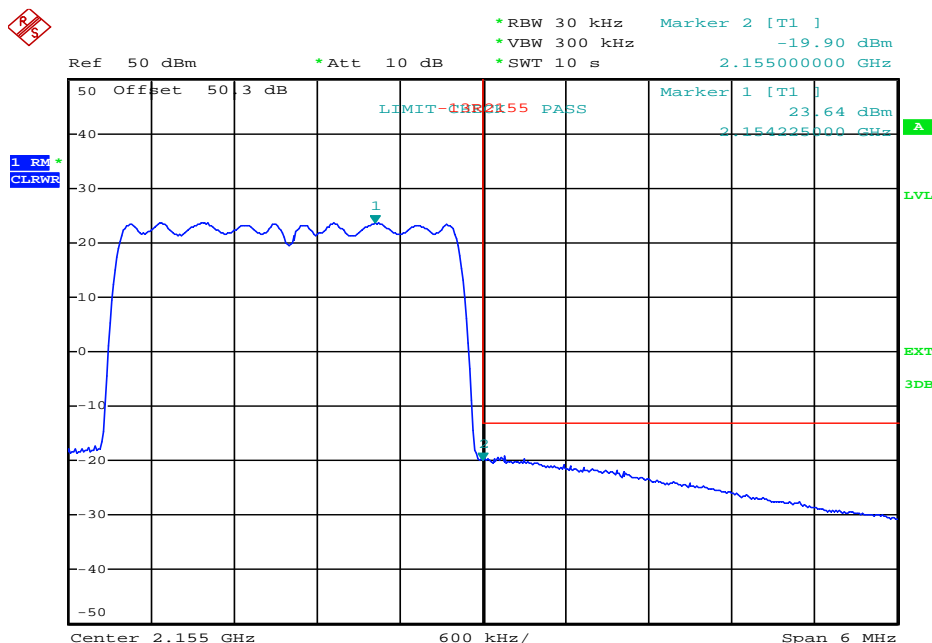


7.3.1.1 CDMA < 1MHz to band edge



Date: 9.MAY.2011 17:52:29

plot 7.3.1.1-#1 Spurious Emissions at Antenna Terminals: §27.53, §2.1051; RSS-131, RSS-GEN; Test results; Downlink; CDMA < 1MHz to band edge Lower Band Edge

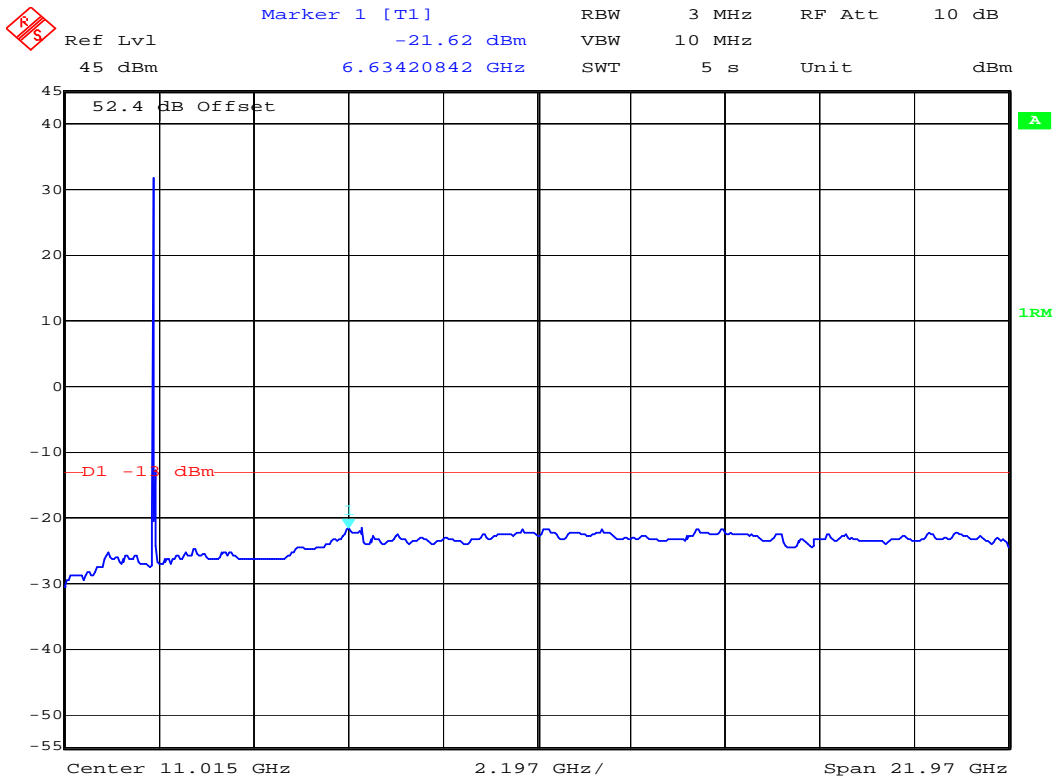


Date: 9.MAY.2011 17:57:03

plot 7.3.1.1-#2 Spurious Emissions at Antenna Terminals: §27.53, §2.1051; RSS-131, RSS-GEN; Test results; Downlink; CDMA < 1MHz to band edge Upper Band Edge



7.3.1.2 CDMA > 1MHz to band edge



Date: 25.MAY.2011 15:30:25

plot 7.3.1.2-#1 Spurious Emissions at Antenna Terminals: §27.53, §2.1051; RSS-131, RSS-GEN; Test results; Downlink; CDMA > 1MHz to band edge; carrier (2132,5MHz) notched

7.3.2 Uplink

n.a.

Note: The EUT does not transmit over the air in the uplink direction.

7.4 Summary test result

Test result	complies, according the plots above
Tested by:	W. Meir
Date:	25.05.2011

Test Report No.: 11-157

FCC ID: XS5-IONM171717P

IC ID: 2237E- IONM171717P



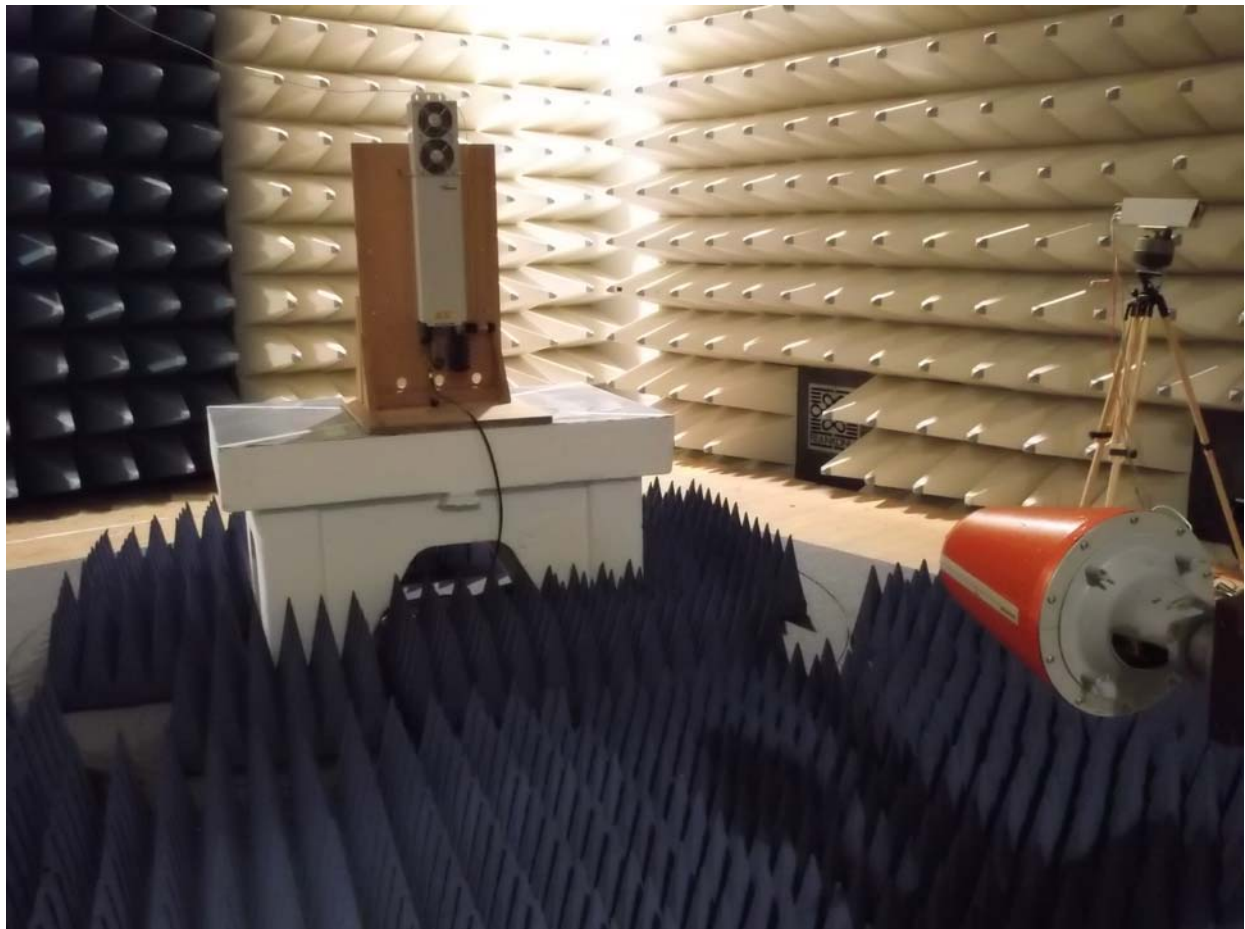
8 Field Strength of Spurious Emissions: §27.53, §2.1053



picture 8.1: EUT



picture 8.2: Test setup: Field Strength Emission <1 GHz @3m in the FAC



picture 8.3: Test setup: Field Strength Emission 1GHz to 20GHz @3m in the FAC

Test Report No.: 11-157

FCC ID: XS5-IONM171717P

IC ID: 2237E- IONM171717P



This clause specifies requirements for the measurement of radiated emission.

Frequency range	Distance: EUT <-> antenna / location	Limit	Test method
30 MHz - 1 GHz	3 metres / FAC	FCC 47 CFR Part 27.53	TIA/EIA-603-C:2004
1 GHz – 22 GHz		IC RSS-131	
		FCC 47 CFR Part 27.53	
		IC RSS-131	

Test equipment used:

Designation	Type	Manufacturer	Invent.-no.	Cal.-date	due Cal.-date	used
EMI test receiver	ESI40	Rohde & Schwarz	E1687	21.12.2010	21.12.2011	X
Antenna	CBL 6111	Chase	K1149	24.09.2010	24.09.2011	X
RF Cable		Frankonia	K1121 SET	14.07.2011	14.07.2012	X
Pre amplifier	AM1431	Miteq	K1721	14.07.2011	14.07.2012	X
Antenna	HL 025	R&S	K809	28.09.2010	28.09.2011	X
Preamplifier	AFS4-00102000	Miteq	K838	09.02.2011	09.02.2012	X
RF Cable	Sucoflex 100	Suhner	K1742	05.04.2011	05.04.2012	X

The REMI version 2.135 has been used for max search.

Test set-up:

Test location: FAC
The Fully Anechoic Chamber (FAC) fulfil the requirements of ANSI C63.4 and CISPR 16-1-4 with regards to NSA and SVSWR.

Test Voltage: 115V / 60 Hz
Type of EUT: Wall mounted

Measurement uncertainty:

Measurement uncertainty expanded (95% or K=2)	± 4,7 dB for ANSI C63.4 measurement ± 0,5 dB for TIA-603 measurement
--	---

Test Report No.: 11-157

FCC ID: XS5-IONM171717P

IC ID: 2237E- IONM171717P



8.1 Limit §27.53

Minimum standard:

Para. No.27.53(h)

(h) For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB.

(1) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

(2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.

(3) The measurements of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

The emission measurements have been made with transmission at **Bottom/Middle/Top** frequency **(2110MHz/2132MHz/2155MHz)**

The limit is -13dBm (e.i.r.p).

8.2 Test method ANSI/TIA/EA-603-C

Measurement procedure. TIA-603-C

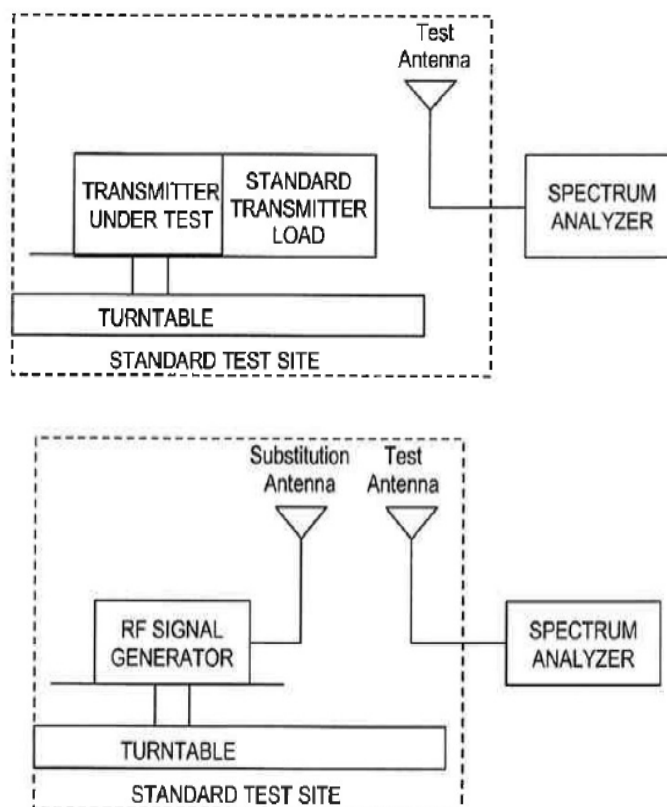
The antenna substitution method is used to determine the equivalent radiated power at spurious frequencies. The spurious emissions are measured at a distance of 3 meters. The EUT is then replaced with a reference substitution antenna with a known gain referenced to a dipole. This antenna is fed with a signal at the spurious frequency. The level of the signal is adjusted to repeat the previously measured level. The resulting eirp is the signal level fed to the reference antenna corrected for gain referenced to an isotropic dipole (see Figure 7.2).

From KDB (AMPLIFIER, BOOSTER, AND REPEATER REMINDER SHEET):

Radiated spurs (enclosure) – Use of CW signal (low, mid, and high freq.) is acceptable rather than all modulations.

The maximum RFI field strength was determined during the measurement by rotating the turntable (± 180 degrees) and varying the height of the receive antenna ($h = 1 \dots 4$ m) as like defined in ANSI C63.4. A measurement receiver has been used with a RBW 120 kHz up to 1 GHz and 1 MHz above 1 GHz. Steps with during pre measurement was half the RBW.

Both, the Fully Anechoic Chamber (FAC) and the Semi Anechoic Chamber (SAC) fulfil the requirements of ANSI C63.4 and CISPR 16-1-4 with regards to NSA and SVSWR.



picture 8.3: Substitution method

8.3 Climatic values in the lab

Temperature: 20°
 Relative Humidity: 45%
 Air-pressure: 1009hPa

Test Report No.: 11-157

FCC ID: XS5-IONM171717P

IC ID: 2237E- IONM171717P



8.4 Test results

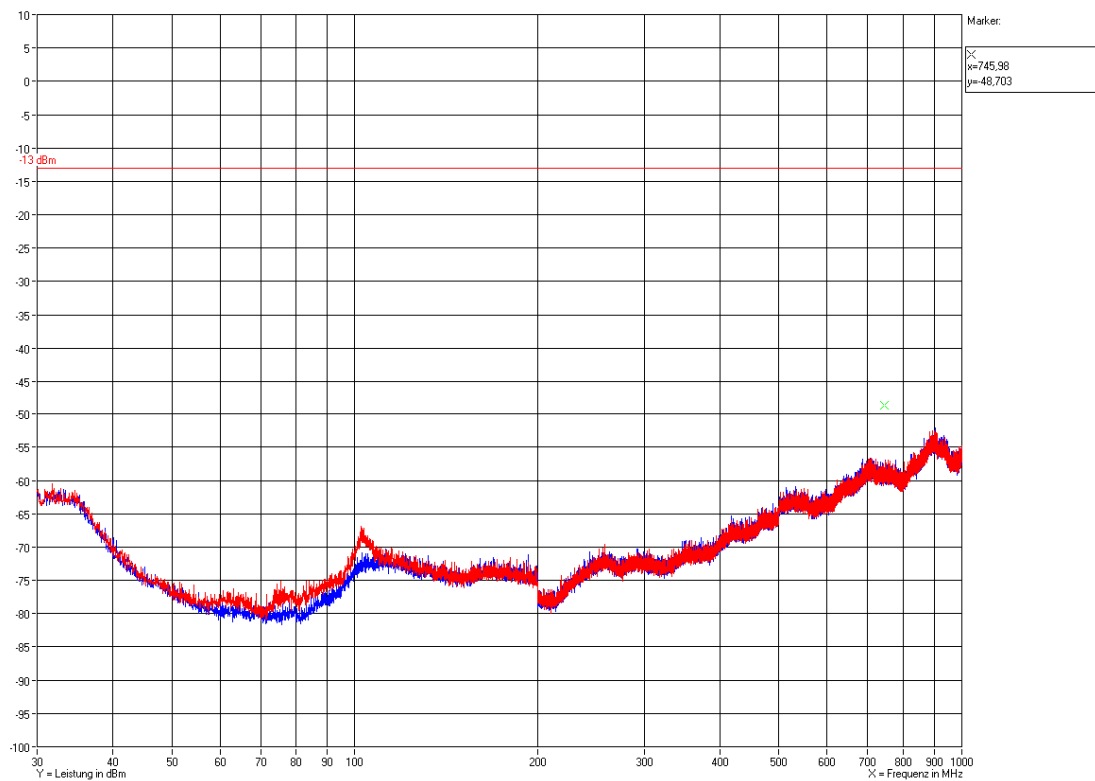
8.4.1 30 MHz to 1 GHz Downlink (Bottom – Middle – Top)

B = 2110 MHz (Sektor 2)

M = 2137 MHz (Sektor 1)

T = 2155 MHz (Sektor 3)

Horizontal / Vertikal



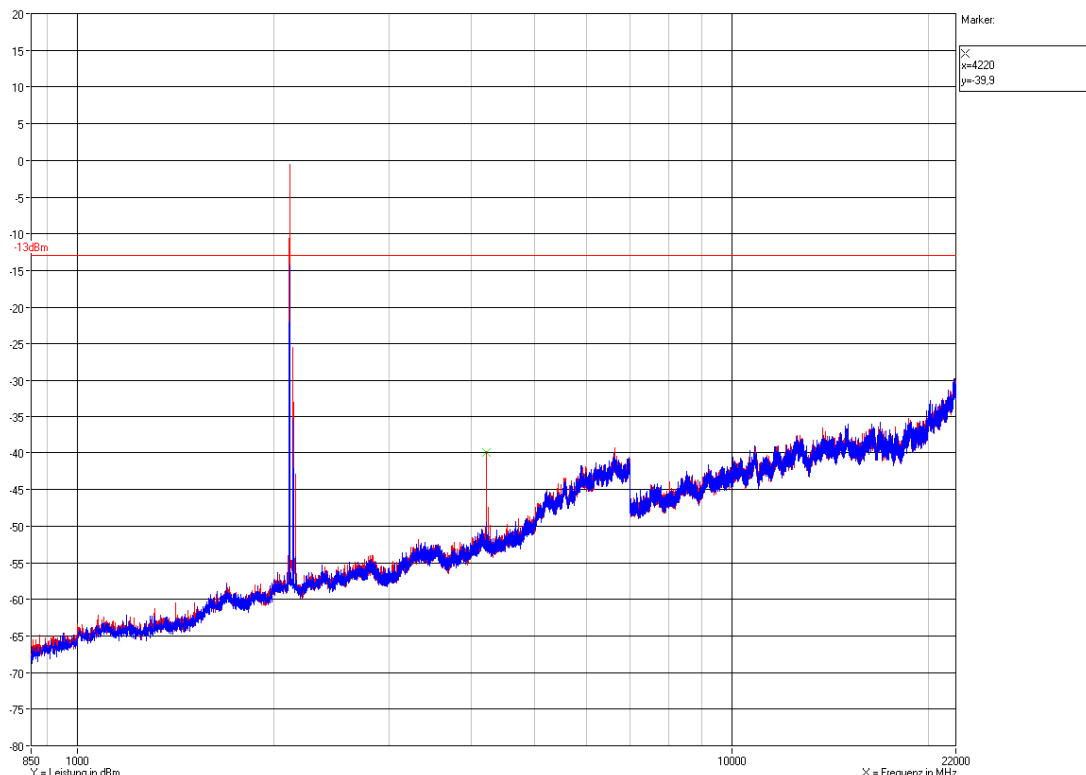
Plot 8.1: Measurement: Field Strength Emission <1 GHz @3m in the FAC max.hold



8.4.2 1 MHz to 22 GHz Downlink (Bottom – Middle – Top)

B = 2110 MHz (Sektor 2)
 M = 2137 MHz (Sektor 1)
 T = 2155 MHz (Sektor 3)

Horizontal / Vertikal



Plot 8.2: Measurement: Field Strength Emission >1 GHz to 22GHz @3m in the FAC max.hold

Frequenz [MHz]	Reading [dBuV]	Cable loss [dB]	Measurement [dBm]	Limit [dBm]	Margin [dB]
2110	-22.0	21.4	-0.6	-13.0	-12.4*
2137.2	-46.7	21.2	-25.5	-13.0	12.5*
2154.8	-64.1	21.2	-42.9	-13.0	29.9*
4220.4	-68.9	29.1	-39.8	-13.0	26.8

*these are the fundamentals

8.5 Summary test result

Test result	complies, according to the plots above
Tested by:	Tom Zahlmann
Date:	25.07.2011

Test Report No.: 11-157

FCC ID: XS5-IONM171717P

IC ID: 2237E- IONM171717P



Version manager:

Version	Change	Date
V01.00	Initial report	25.07.2011
V02.00	5.2 Test method: The paragraph C was repeated twice. The titles of section 5 and 7 are inappropriate. Therefore, the references 24.232 and 24.238 were changed to the counterparts of the Part 27. 5.3.1: insert the calculation of the maximum antenna gain	07.10.2011

******* End of test report *******