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The Netherlands
Chamber of Commerce
51565536
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telefication

Radio test report
20114000300

based on:

- FCC part 15; subpart C; section 15.249 & 15.209 & 15.207 (10-1-10 edition)
- FCC part 15, subpart B: section 15.109 & 15.107 (11-1-10 edition)

Wireless rollerblind shutter motor
Coulisse
ABC-05
ABC-17
ABC-18

Contents

This report comprises of three modules. The total number of pages is: 39

Main module

1 Introduction

This report contains the result of tests performed by:

Telefication B.V.
Edisonstraat 12a
6902 PK Zevenaar
The Netherlands

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Ordering party:

Company name	:	Coulisse B.V.
Address	:	Vonderweg 48
Zipcode	:	7468 DC
City/town	:	Enter
Country	:	The Netherlands
Date of order	:	30 August 2011

2 Product

A sample of the following product was submitted for testing:

Product description	:	Wireless rollerblind shutter motor
Manufacturer	:	Coulisse B.V.
Trade mark	:	Coulisse
Type designation	:	ABC-05
FCC ID	:	ZY4ABC05
Hardware version	:	--
Serial number	:	--
Software release	:	--

Variant 1

Product description	:	Wireless rollerblind shutter motor
Manufacturer	:	Coulisse B.V.
Trade mark	:	Coulisse
Type designation	:	ABC-17
FCC ID	:	ZY4ABC05
Hardware version	:	--
Serial number	:	--
Software release	:	--

Variant 2

Product description	:	Wireless rollerblind shutter motor
Manufacturer	:	Coulisse B.V.
Trade mark	:	Coulisse
Type designation	:	ABC-18
FCC ID	:	ZY4ABC05
Hardware version	:	--
Serial number	:	--
Software release	:	--

3 Test schedule

Tests are carried out in accordance with the specification detailed in chapter 7 “Summary” of this report.

Tests are carried out at the following location:

- Telefication, Zevenaar

The samples of the product were received on:

- 12 January 2012

Tests are carried out between:

- 12 January and 4 May 2012

4 Product documentation

For production of this report the following product documentation was used:

Identification	**Date**
ABC05+ABC17+ABC18.pdf	2012 04 05
ABC-05-17-18 block.pdf	2012 04 05

The above-mentioned documentation will be filed at Telefication for a period of 10 years following the issue of this test report.

5 Observations and comments

The ABC-05 is a wireless operated roller blind shutter motor.
There are two variants, the ABC-17 and ABC-18.

ABC-05, and the variants ABC-17 and ABC-18 are equal in circuit diagram and PCB layout, except for the following parts:

1 different buttons on PCB
2 common mode filter at input is sunken in PCB on the ABC-17
3 capacitor after common-mode filter connecting to motor is not mounted with ABC-18, this capacitor is mounted onto the PCB behind the motor

Full testing has been carried out on the ABC-05 and additional spurious emissions measurements have been carried out on the ABC-17 and ABC-18.

No AC - mains adaptor was included in the testing.

Conducted spurious emissions have been measured on the DC power input port.

6 Modifications to the sample

All modifications are included in chapter 4 "*Product documentation"*

7 Summary

The product is intended for use in the following application area:

INTENTIONAL RADIATOR OPERATING IN THE FREQUENCY BAND 2400 - 2483.5 MHz

The sample is tested according to the following specifications:

FCC part 15; subpart C; section 15.249 & 15.209 & 15.207 (10-1-10 edition)

FCC part 15, subpart B, section 15.109 & 15.107 (10-1-10 edition)

8 Conclusions

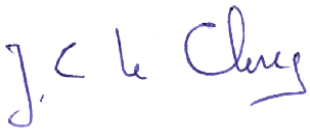
The samples of the product showed **NO NON-COMPLIANCES** to the specification stated in chapter 7 of this report.

The results of the tests as stated in this report are exclusively applicable to the product item as identified in this report. Telefication accepts no responsibility for any stated properties of product items in this test report, which are not supported by the tests as specified in chapter 7 "*Summary"*

All tests are performed by:

name : ing. J.C. le Clercq

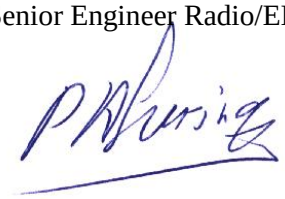
function : Test Engineer

signature : 

Review of test report by:

name : ing. P.A. Suringa

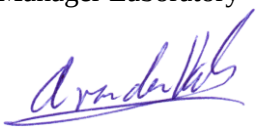
function : Senior Engineer Radio/EMC

signature : 

The above conclusions have been verified by the following signatory:

Date : 14 may 2012
name : ing. A. van der Valk

function : Manager Laboratory

signature : 

Test results module

1 General information

1.1 Equipment information

Rated RF output power	n.a., integral antenna
Rated radiated RF power	1 mW
Operating frequency range	2402 MHz to 2480 MHz (24 channels)
Modulation	GFSK
Modulation bit rate	250 kbit/s
ITU emission class	--
Duty cycle (during testing)	44 %
FCC ID	ZY4ABC05

2 Emission tests ABC-05

2.1 Field strength of intentional signal

Compliance standard : FCC part 15, subpart C, section 15.249 (a) & (e)
Method of test : FCC part 15, subpart A, section 15.31(m), 15.33, 15.35, ANSI C63.10-2009, section 6.6
Test results :

Note: only peak power was measured. The formula for conversion from power to field strength is:
FS (dBµV/m) = EIRP (dBm) + 95.2 dB.
Only the higher of the two polarizations is stated.

Peak field strength:

Frequency (MHz)	Test result @ 3 m distance (dBµV/m)	Polarisation	Limit (dBµV/m)
2402	89,9	H	114
2441	91,0	H	114
2480	91,0	H	114

The average field strength has been calculated by the following formula:

$FS_{average}$ (dBµV/m) = FS_{peak} (dBµV/m) + ACF (Average Correction Factor)

ACF = 20 log (1/x), where x is the duty cycle
x = τ / T = 1258 µs / 2833 µs = 44.4 %
ACF: 20 log (44.4 / 100) = -7.0 dB

Average field strength*:

Frequency (MHz)	Calculated field strength @ 3 m distance (dBµV/m)	Polarisation	Limit (dBµV/m)
2402	82.9	H	94
2441	84.0	H	94
2480	84.0	H	94

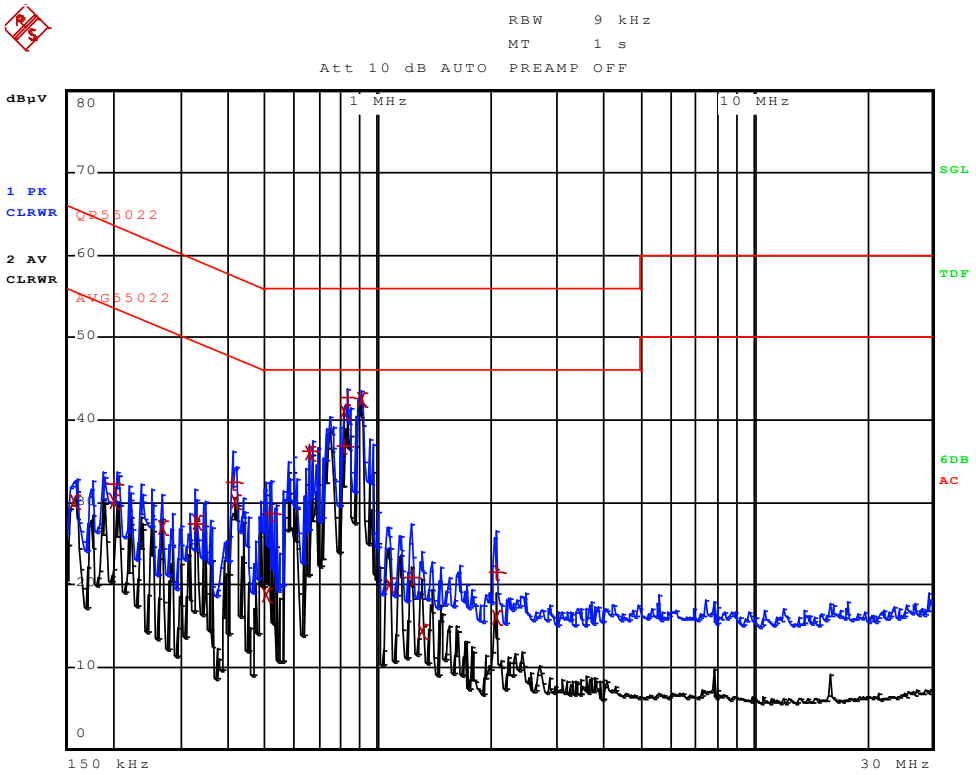
Measurement uncertainty	+4.5 dB / -6.1 dB.

Measurement equipment used (item numbers refer to section “used test equipment”)	2, 16, 24, 35, 37, 39, 47, 48, 49.

2.2 Conducted Disturbance Measurements

Compliance standard	:	FCC part 15, subpart C, section 15.207(a).
Method of test	:	ANSI C63.10: 2009, section 6.2
Port	:	DC power input, 12 Volt
Mode	:	transmitting (installation mode)
Configuration	:	The sample was continuously activated
Atmospheric pressure	:	Between 86 kPa and 106 kPa
Temperature	:	23 °C
Relative humidity	:	40 %
Test results	:	Plots and tables

Type ABC-05, plus wire, plot



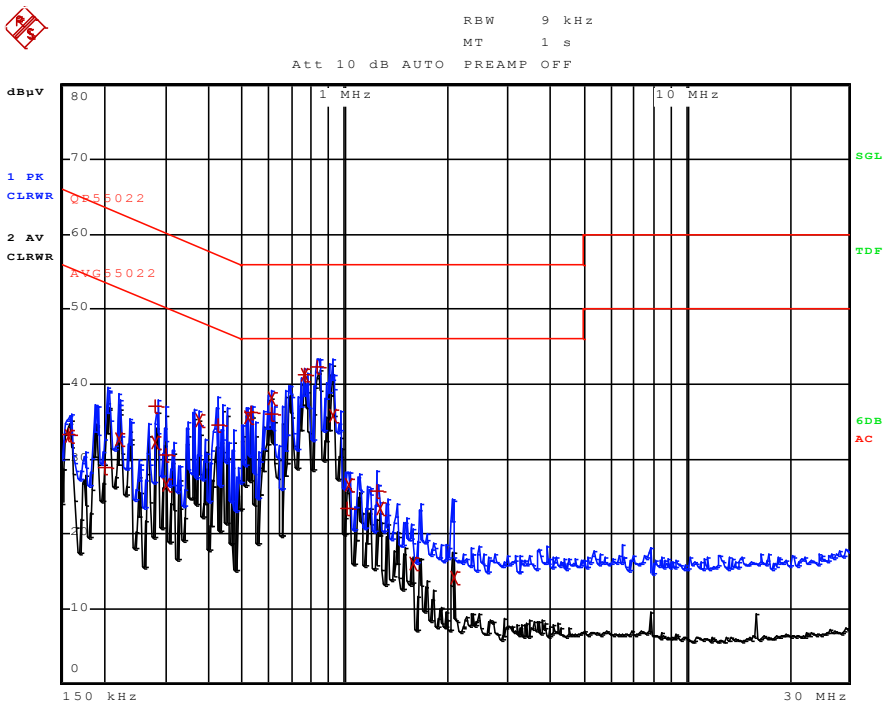
Type ABC-05, plus wire, table

EDIT PEAK LIST (Final Measurement Results)

Trace1: QP55022
Trace2: AVG55022
Trace3: ---

TRACE		FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2	Average	906 kHz	42.60	-3.39
2	Average	814 kHz	40.94	-5.05
2	Average	658 kHz	36.06	-9.93
1	Quasi Peak	830 kHz	42.71	-13.28
2	Average	414 kHz	30.14	-17.42
1	Quasi Peak	814 kHz	36.81	-19.18
1	Quasi Peak	658 kHz	36.13	-19.86
2	Average	330 kHz	27.65	-21.79
2	Average	202 kHz	30.04	-23.48
2	Average	266 kHz	27.03	-24.20
1	Quasi Peak	410 kHz	32.39	-25.25
2	Average	158 kHz	30.03	-25.53
2	Average	1.078 MHz	20.04	-25.95
2	Average	502 kHz	18.76	-27.23
1	Quasi Peak	518 kHz	28.68	-27.31
2	Average	2.074 MHz	16.11	-29.88
1	Quasi Peak	202 kHz	32.13	-31.39
2	Average	1.314 MHz	14.39	-31.60
1	Quasi Peak	326 kHz	27.43	-32.11
1	Quasi Peak	2.074 MHz	21.62	-34.37

Type ABC-05, minus wire, plot



Type ABC-05, minus wire, table

EDIT PEAK LIST (Final Measurement Results)

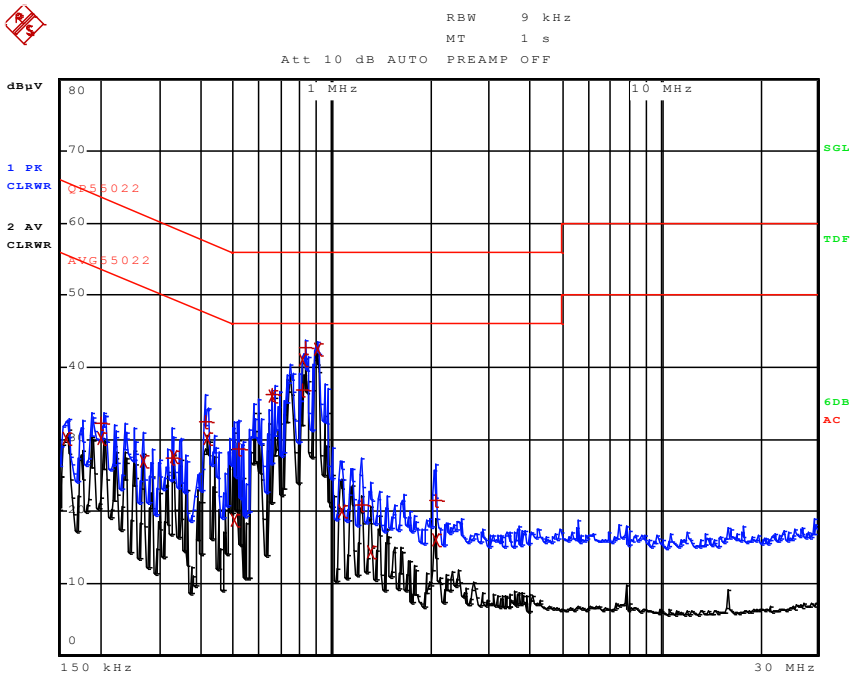
Trace1: QP55022
Trace2: AVG55022
Trace3: ---

TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2 Average	766 kHz	41.16	-4.84
2 Average	610 kHz	38.13	-7.86
2 Average	922 kHz	35.87	-10.12
2 Average	518 kHz	35.55	-10.44
2 Average	374 kHz	35.16	-13.25
1 Quasi Peak	830 kHz	42.34	-13.65
1 Quasi Peak	766 kHz	41.35	-14.64
2 Average	282 kHz	32.27	-18.48
2 Average	1.03 MHz	26.48	-19.51
1 Quasi Peak	530 kHz	36.17	-19.83
1 Quasi Peak	610 kHz	35.93	-20.06
2 Average	218 kHz	32.63	-20.25
2 Average	158 kHz	33.05	-22.51
2 Average	1.266 MHz	23.33	-22.66
1 Quasi Peak	422 kHz	34.64	-22.76
2 Average	298 kHz	26.65	-23.64
1 Quasi Peak	282 kHz	37.04	-23.71
1 Quasi Peak	298 kHz	30.61	-29.68
2 Average	1.594 MHz	15.96	-30.03
1 Quasi Peak	1.25 MHz	25.71	-30.28

Result : Pass
Measurement uncertainty : +/- 3.6 dB. The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approx. 95%, but excluding the effect of measurement system repeatability.
Measurement equipment : 35, 43, 55, 56. (the numbers listed refer to the module 'Used test equipment').

Compliance standard	:	FCC part 15, subpart B, section 15.107(a).
Method of test	:	ANSI C63.10: 2009, section 6.2
Port	:	DC power input, 12 Volt
Mode	:	receiving (normal usage mode)
Configuration	:	The sample was continuously activated
Atmospheric pressure	:	Between 86 kPa and 106 kPa
Temperature	:	23 °C
Relative humidity	:	40 %
Test results	:	Plots and tables

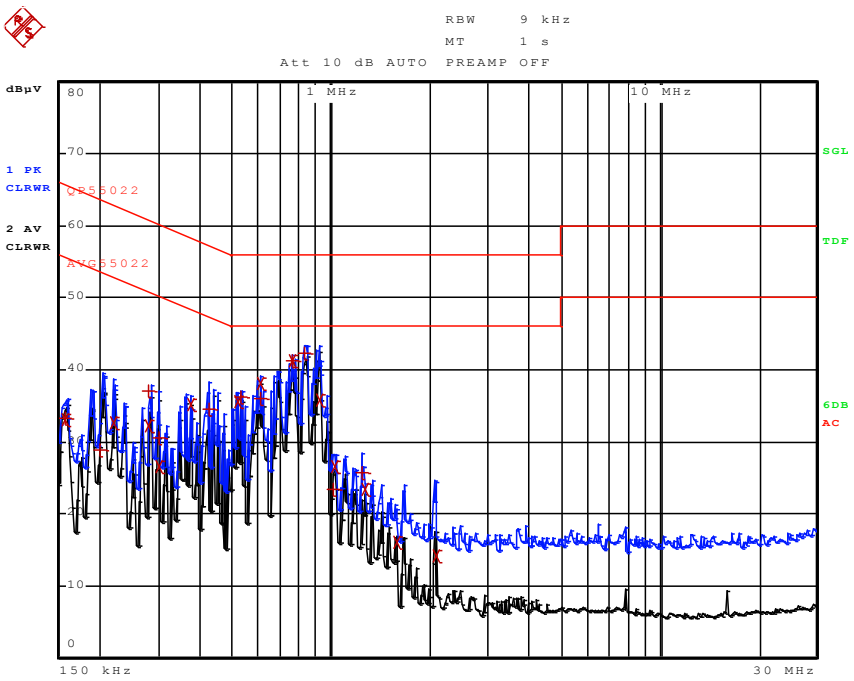
Type ABC-05, plus wire, plot



Type ABC-05, plus wire, table

EDIT PEAK LIST (Final Measurement Results)			
Trace1:	QP55022		
Trace2:	AVG55022		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2 Average	906 kHz	42.60	-3.39
2 Average	814 kHz	40.94	-5.05
2 Average	658 kHz	36.06	-9.93
1 Quasi Peak	830 kHz	42.71	-13.28
2 Average	414 kHz	30.14	-17.42
1 Quasi Peak	814 kHz	36.81	-19.18
1 Quasi Peak	658 kHz	36.13	-19.86
2 Average	330 kHz	27.65	-21.79
2 Average	202 kHz	30.04	-23.48
2 Average	266 kHz	27.03	-24.20
1 Quasi Peak	410 kHz	32.39	-25.25
2 Average	158 kHz	30.03	-25.53
2 Average	1.078 MHz	20.04	-25.95
2 Average	502 kHz	18.76	-27.23
1 Quasi Peak	518 kHz	28.68	-27.31
2 Average	2.074 MHz	16.11	-29.88
1 Quasi Peak	202 kHz	32.13	-31.39
2 Average	1.314 MHz	14.39	-31.60
1 Quasi Peak	326 kHz	27.43	-32.11
1 Quasi Peak	2.074 MHz	21.62	-34.37

Type ABC-05, minus wire, plot



Type ABC-05, minus wire, table

EDIT PEAK LIST (Final Measurement Results)

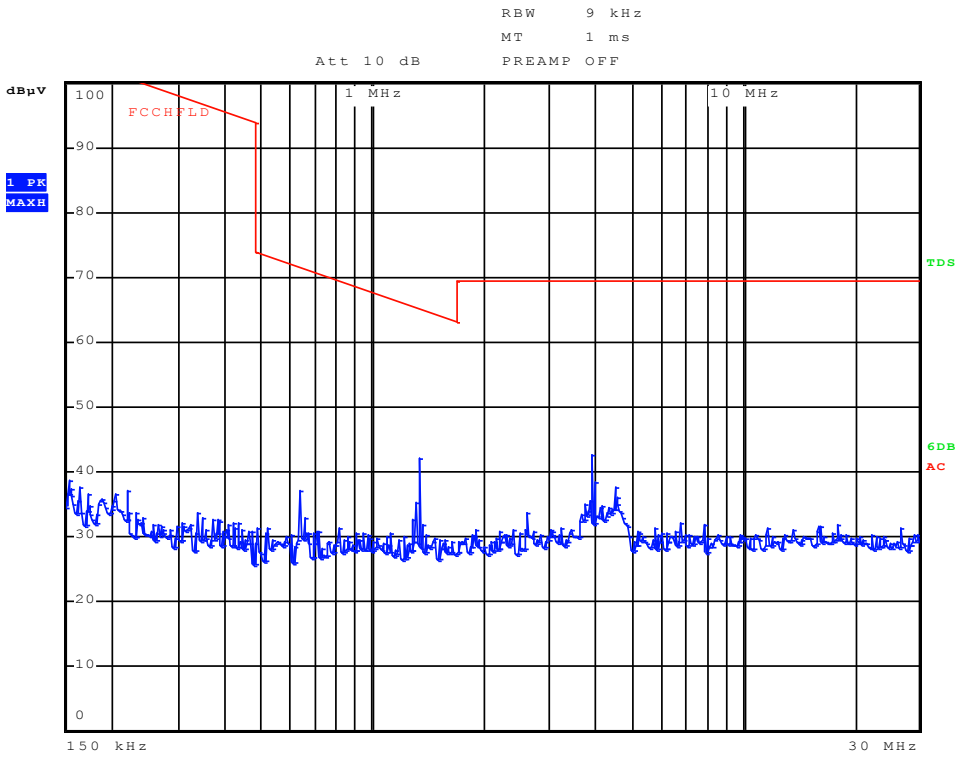
Trace1: QP55022
Trace2: AVG55022
Trace3: ---

TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2 Average	766 kHz	41.16	-4.84
2 Average	610 kHz	38.13	-7.86
2 Average	922 kHz	35.87	-10.12
2 Average	518 kHz	35.55	-10.44
2 Average	374 kHz	35.16	-13.25
1 Quasi Peak	830 kHz	42.34	-13.65
1 Quasi Peak	766 kHz	41.35	-14.64
2 Average	282 kHz	32.27	-18.48
2 Average	1.03 MHz	26.48	-19.51
1 Quasi Peak	530 kHz	36.17	-19.83
1 Quasi Peak	610 kHz	35.93	-20.06
2 Average	218 kHz	32.63	-20.25
2 Average	158 kHz	33.05	-22.51
2 Average	1.266 MHz	23.33	-22.66
1 Quasi Peak	422 kHz	34.64	-22.76
2 Average	298 kHz	26.65	-23.64
1 Quasi Peak	282 kHz	37.04	-23.71
1 Quasi Peak	298 kHz	30.61	-29.68
2 Average	1.594 MHz	15.96	-30.03
1 Quasi Peak	1.25 MHz	25.71	-30.28

Test results : Pass
Measurement uncertainty : +/- 3.6 dB. The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approx. 95%, but excluding the effect of measurement system repeatability.
Measurement equipment : 35, 43, 55, 56 (the numbers listed refer to the module 'Used test equipment').

2.3 Field strength of unwanted emissions 0.15 - 30 MHz

Compliance standard	:	FCC part 15, subpart C, section 15.209 (a) & 15.249 (d)
Method of test	:	ANSI C63.10-2009, sections 6.4 FCC part 15, subpart A, section 15.31(m), 15.33, 15.35.
EUT condition	:	transmitting (installation mode)
Test results	:	



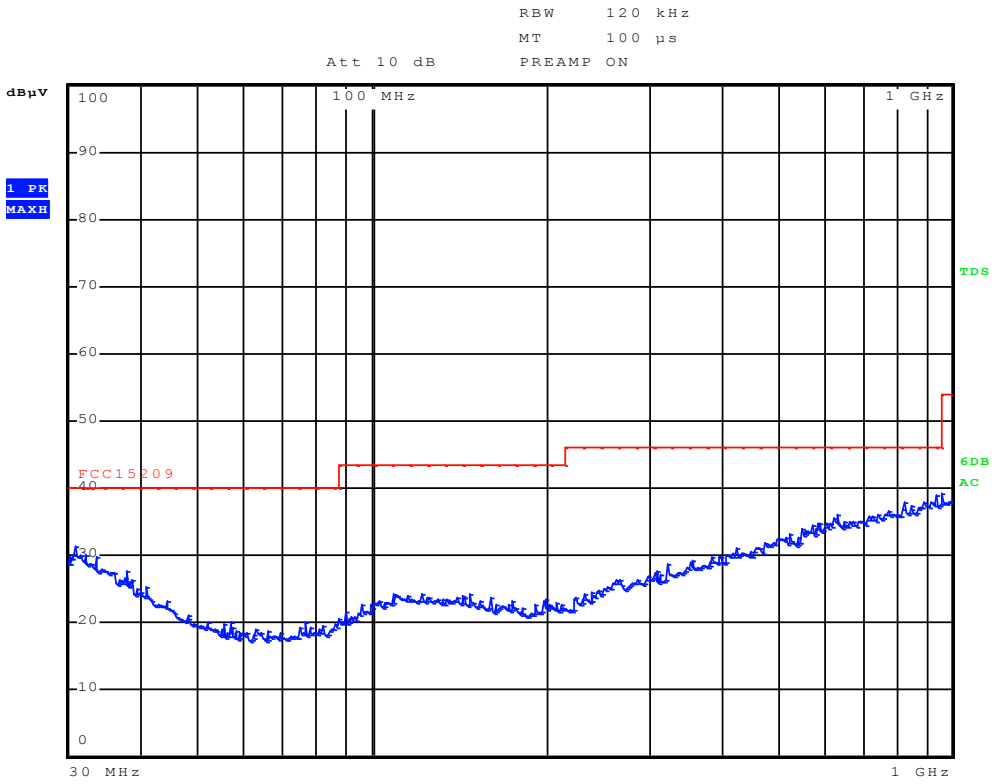
Measurement uncertainty	+3.0 dB / -2.5 dB.

Measurement equipment used (item numbers refer to section “used test equipment”)	28, 34, 35, 43.

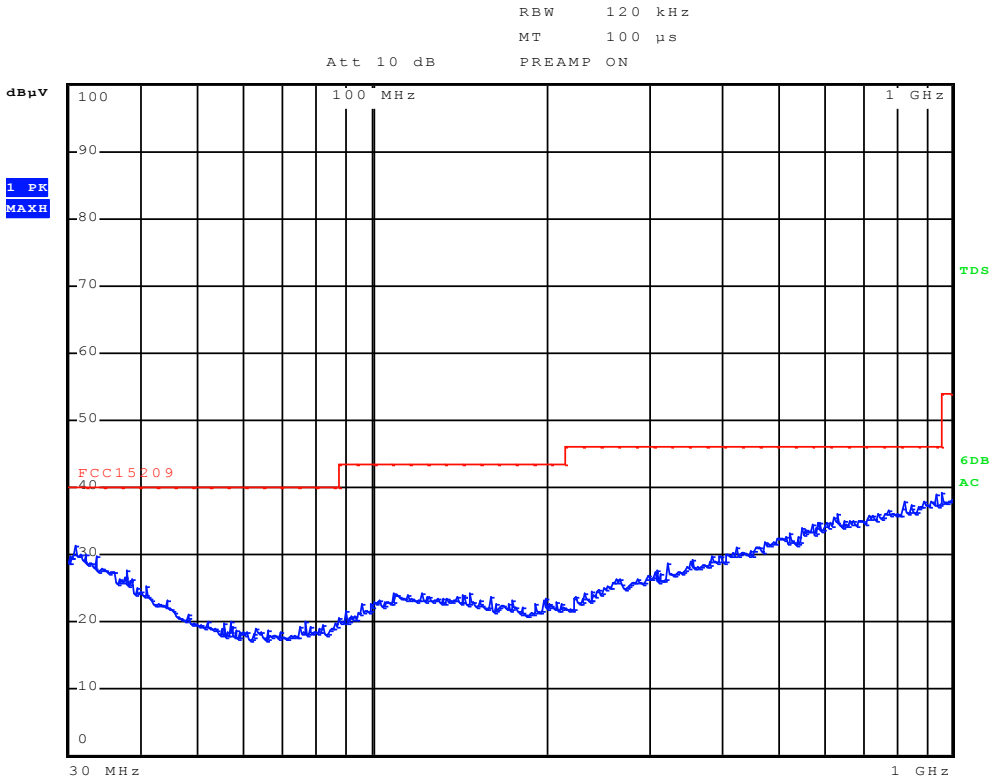
2.4 Field strength of unwanted emissions 30 - 1000 MHz

Compliance standard	:	FCC part 15, subpart C, section 15.209 (a) & 15.249 (d)
Method of test	:	ANSI C63.10-2009, section 6.5 FCC part 15, subpart A, section 15.31(m), 15.33, 15.35.
EUT condition	:	transmitting (installation mode)
Test results	:	

Polarization horizontal (max. hold)



Polarization vertical (max. hold)

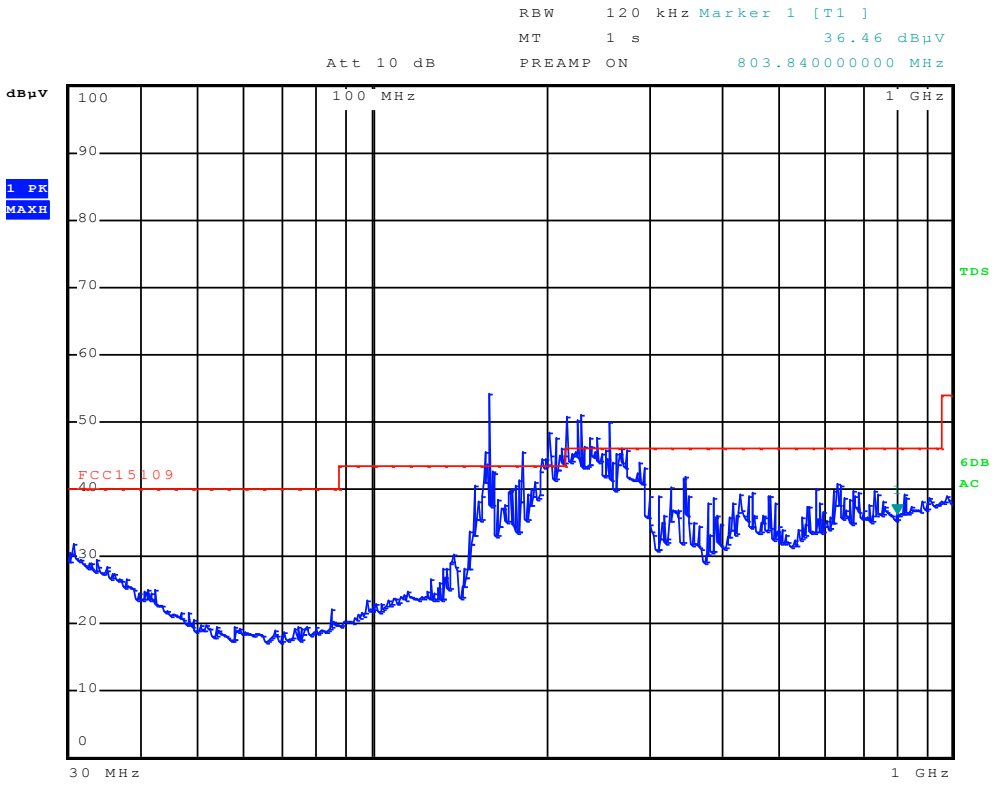


Measurement uncertainty	Vertical polarisation:	
	30 – 200 MHz	5.4 dB
	200 -1000 MHz	4.6 dB
	Horizontal polarisation:	
	30 – 200 MHz	4.5 dB
	200 -1000 MHz	3.6 dB

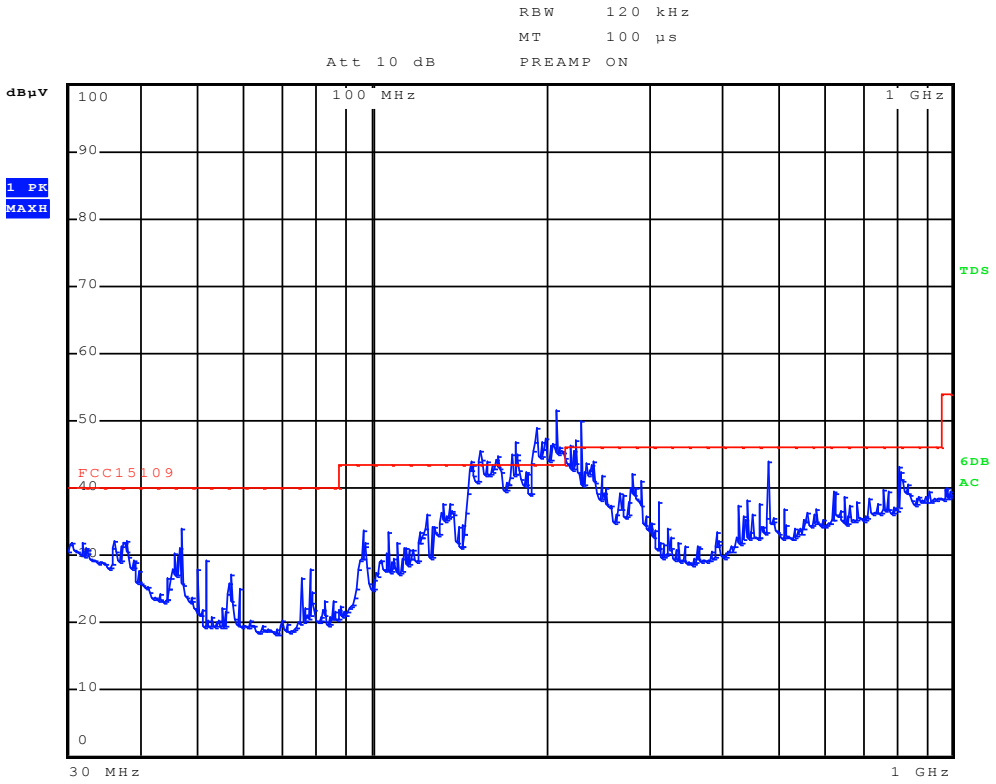
Measurement equipment used (item numbers refer to section “used test equipment”	34, 35, 36, 43, 50, 51.

Compliance standard	:	FCC part 15, subpart B, section 15.109
Method of test	:	ANSI C63.10-2009, section 6.5 FCC part 15, subpart A, section 15.31(m), 15.33, 15.35.
EUT condition	:	receiving (normal usage mode)
Test results	:	

Polarization horizontal (max. hold)



Polarization vertical (max. hold)



Frequency	Polarisation	Level (QP)	Limit
(MHz)	H/V	(dBµV/m)	(dBµV/m)
153.22	V	33.53	43.5
159.68	H	29.57	43.5
202.20	V	35.47	43.5
229.44	H	38.40	46
274.44	H	39.18	46
808.20	V	31.15	46

Measurement uncertainty	+4.5 dB / -6.1 dB.

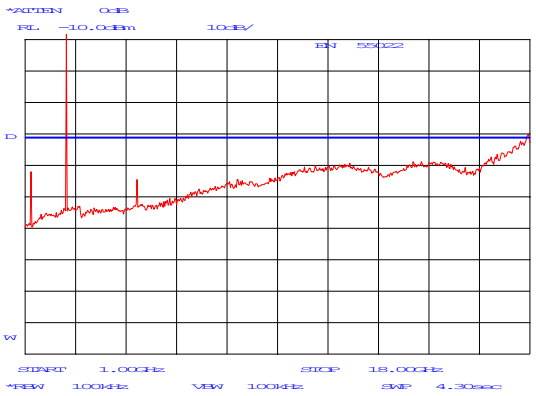
Measurement equipment used (item numbers refer to section “used test equipment”)	34, 35, 36, 43, 50, 51.

2.5 Field strength of unwanted emissions > 1000 MHz

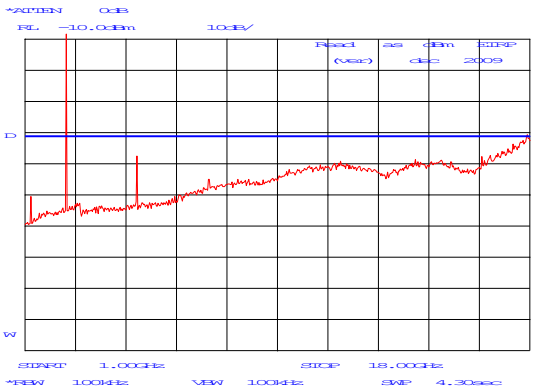
Compliance standard	:	FCC part 15, subpart C, section 15.209 (a)& 15.249 (a) & (e)
Method of test	:	ANSI C63.10-2009, section 6.6 FCC part 15, subpart A, section 15.31(m), 15.33, 15.35;
Measuring distance	:	3 m
EUT condition	:	transmitting (installation mode)
Test results	:	

Unwanted emissions transmitter (peak values):

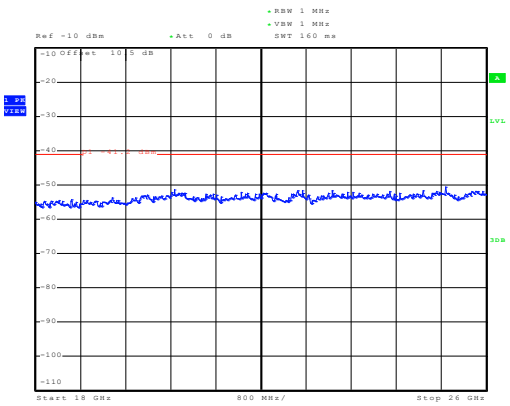
Low channel (2402 MHz)



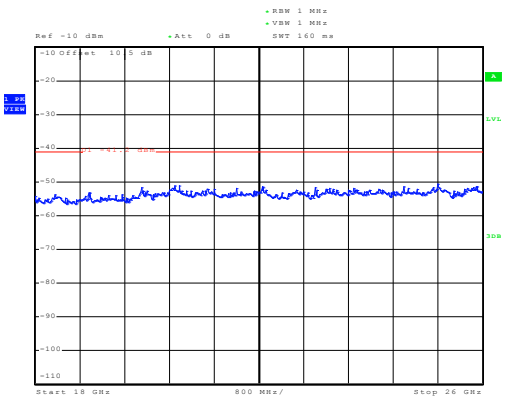
1000 - 18000 MHz
polarization horizontal, (max. hold)



1000 - 18000 MHz
polarization vertical, (max. hold)

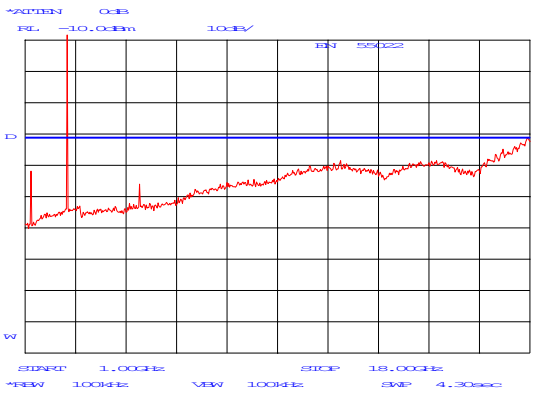


18000 - 26000 MHz
polarization horizontal, (max. hold)

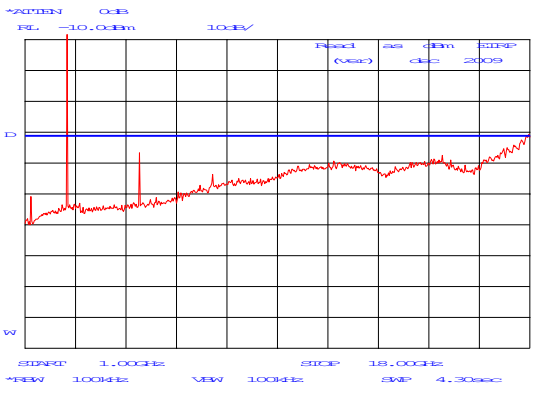


18000 - 26000 MHz
polarization vertical, (max. hold)

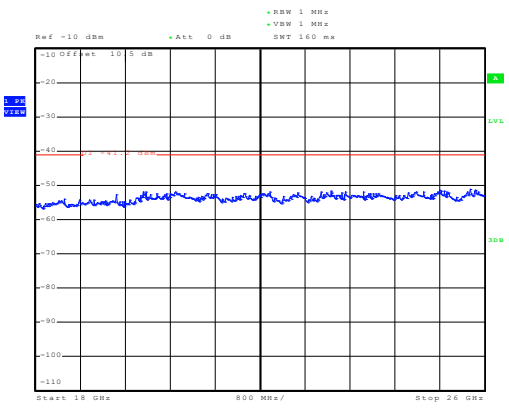
Mid channel (2441 MHz)



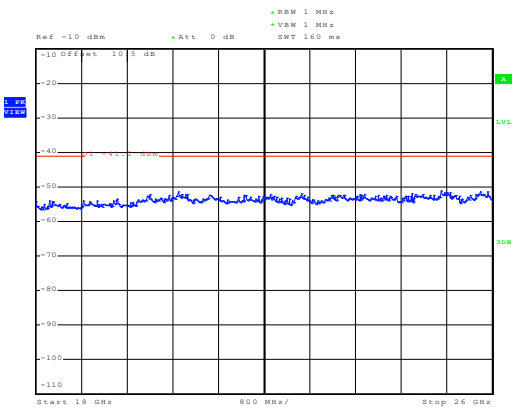
1000 - 18000 MHz
polarization horizontal, (max. hold)



1000 - 18000 MHz
polarization vertical, (max. hold)

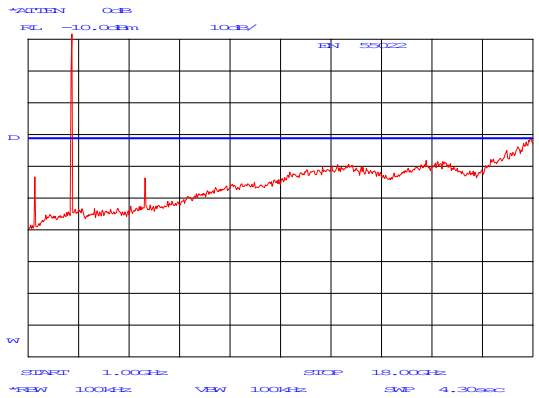


18000 - 26000 MHz
polarization horizontal, (max. hold)

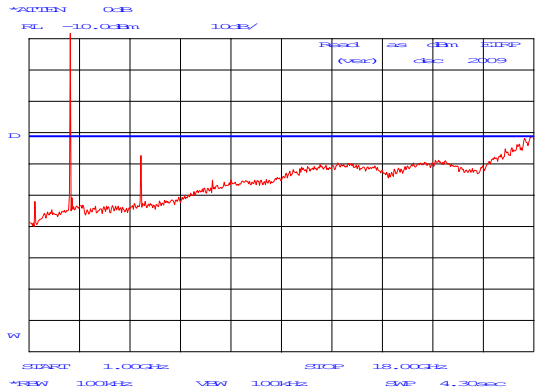


18000 - 26000 MHz
polarization vertical, (max. hold)

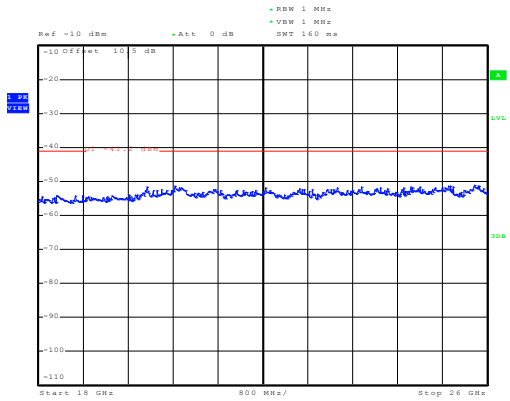
High channel (2480 MHz)



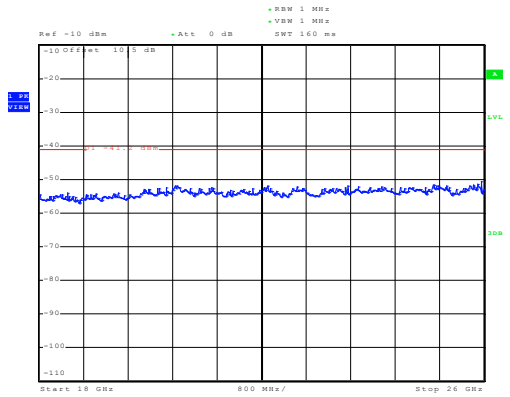
1000 - 18000 MHz
polarization horizontal, (max. hold)



1000 - 18000 MHz
polarization vertical, (max. hold)



18000 - 26000 MHz
polarization horizontal, (max. hold)



18000 - 26000 MHz
polarization vertical, (max. hold)

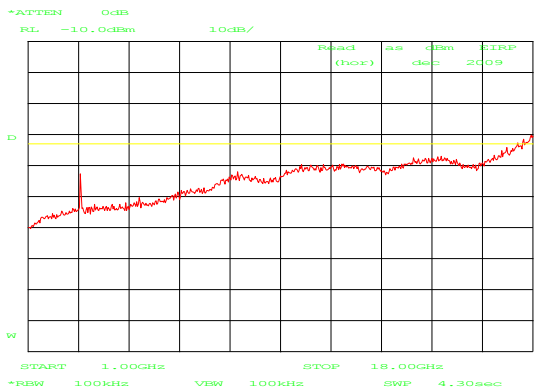
Measurement uncertainty	+4.5 dB / -6.1 dB.

Measurement equipment used (item numbers refer to section “used test equipment”)	2, 16, 24, 31, 35, 42, 46, 47, 48, 49.

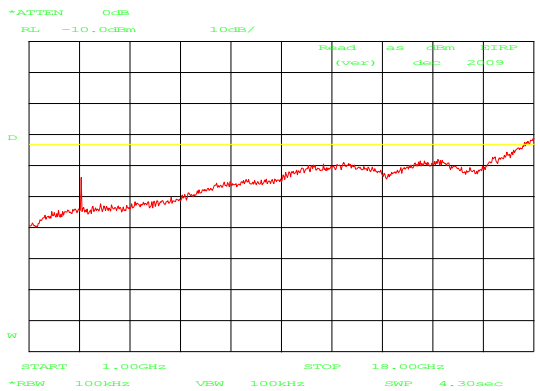
Compliance standard	:	FCC part 15, subpart B, section 15.109 (a)
Method of test	:	ANSI C63.10-2009, sections 6.6; FCC part 15, subpart A, section 15.31(m), 15.33, 15.35;
EUT condition	:	receiving (normal usage mode)
Measuring distance	:	3 m
Test results	:	

Unwanted emissions receiver (peak values):

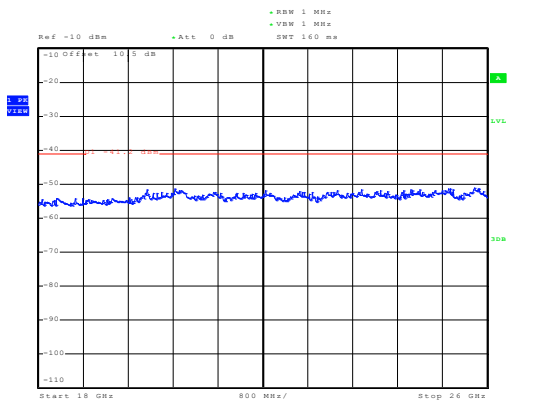
Low channel (2402 MHz)



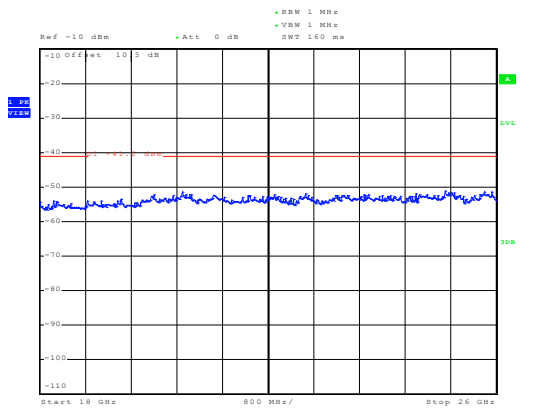
1000 - 18000 MHz
polarization horizontal, (max. hold)



1000 - 18000 MHz
polarization vertical, (max. hold)

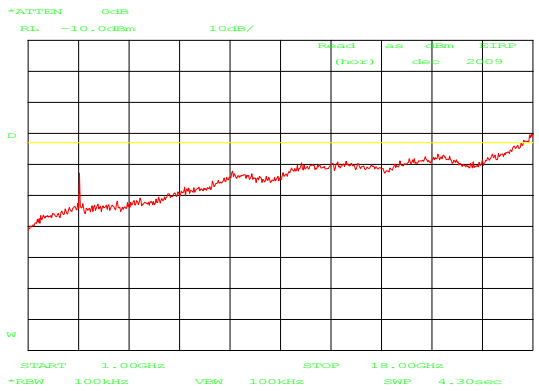


18000 - 26000 MHz
polarization horizontal, (max. hold)

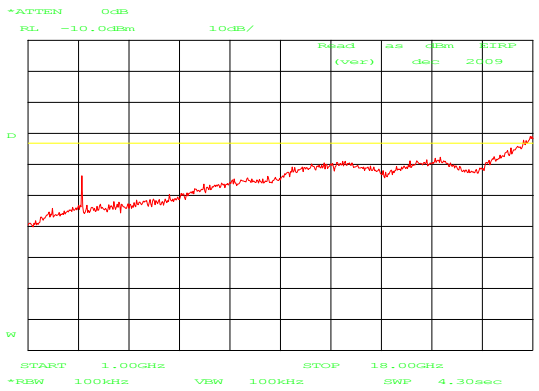


18000 - 26000 MHz
polarization vertical, (max. hold)

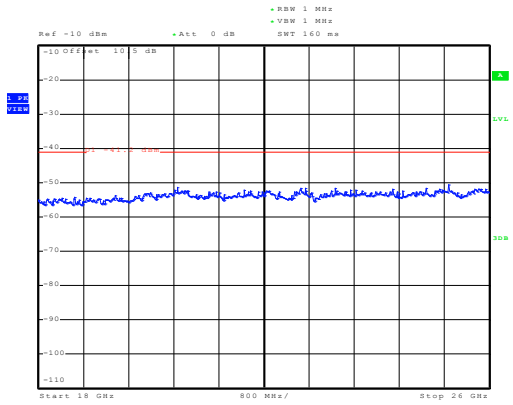
Mid channel (2441 MHz)



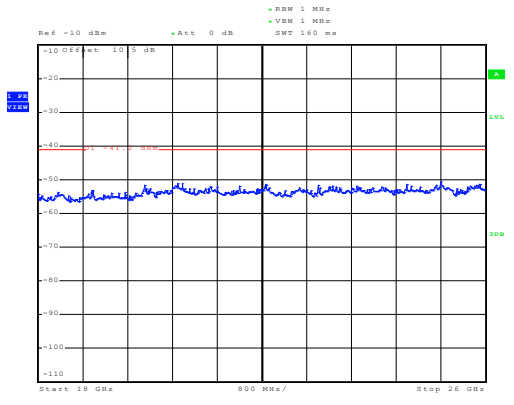
1000 - 18000 MHz
polarization horizontal, (max. hold)



1000 - 18000 MHz
polarization vertical, (max. hold)

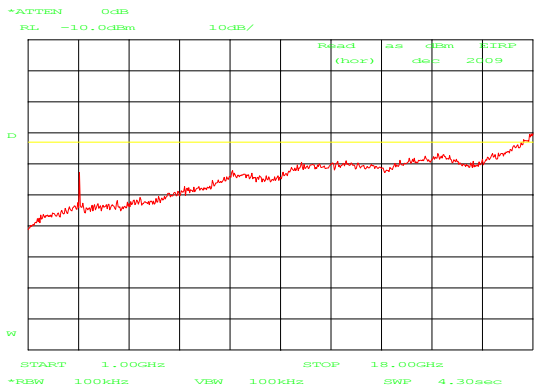


18000 - 26000 MHz
polarization horizontal, (max. hold)

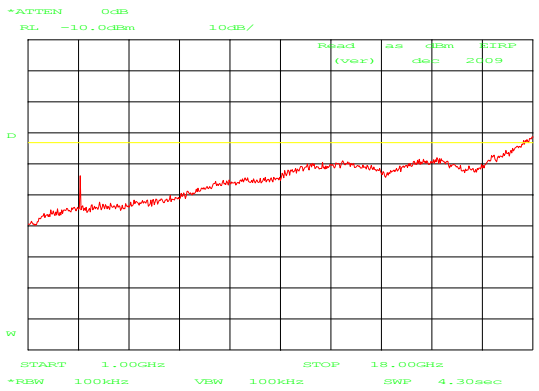


18000 - 26000 MHz
polarization vertical, (max. hold)

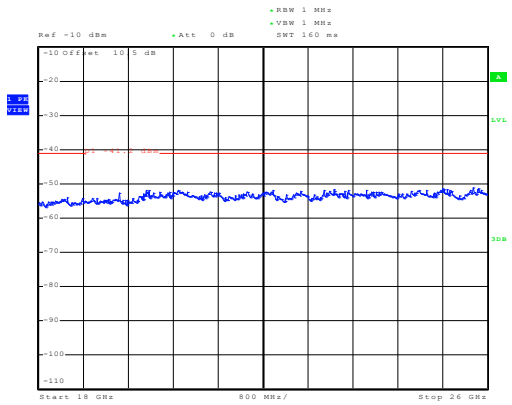
High channel (2480 MHz)



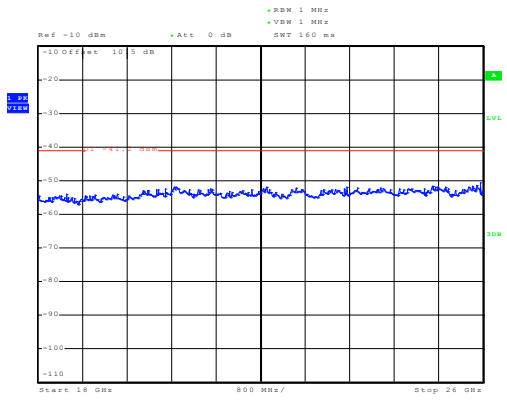
1000 - 18000 MHz
polarization horizontal, (max. hold)



1000 - 18000 MHz
polarization vertical, (max. hold)



18000 - 26000 MHz
polarization horizontal, (max. hold)



18000 - 26000 MHz
polarization vertical, (max. hold)

Measurement uncertainty	+4.5 dB / -6.1 dB.

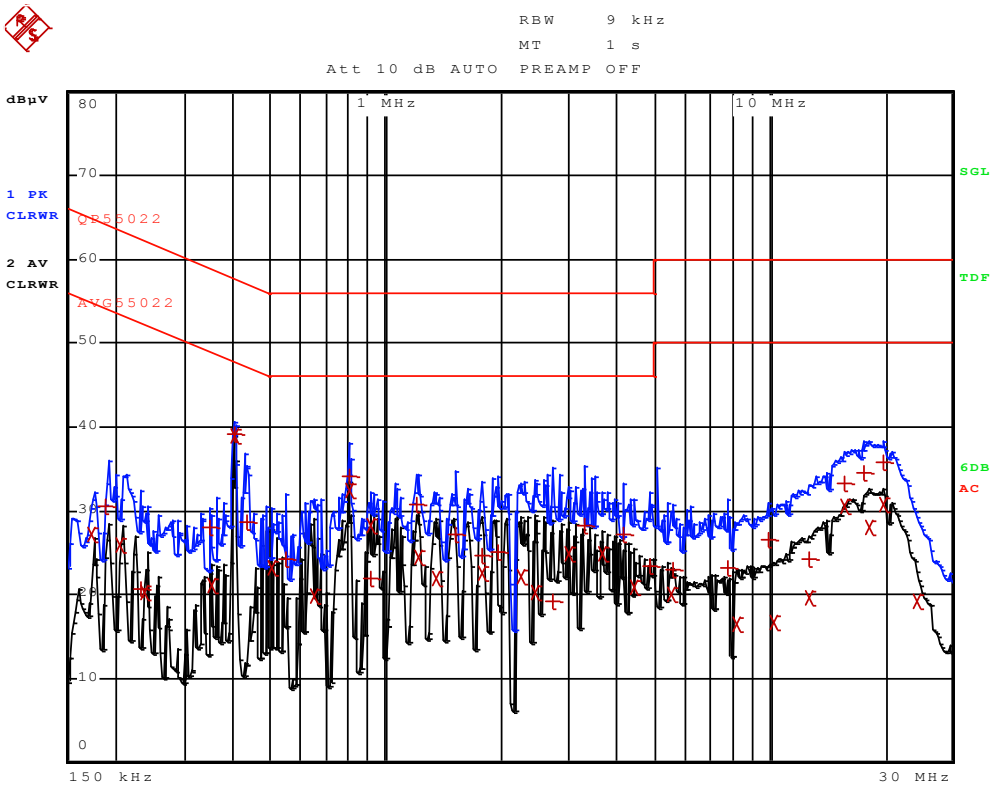
Measurement equipment used (item numbers refer to section “used test equipment”)	2, 16, 24, 31, 35, 42, 46, 47, 48, 49.

3 Emission tests ABC-17

3.1 Conducted Disturbance Measurements

Compliance standard	:	FCC part 15, subpart B, section 15.107(a).
Method of test	:	ANSI C63.10: 2009, section 6.2
Port	:	DC power input, 12 Volt
Mode	:	receiving (normal usage mode)
Configuration	:	The sample was continuously activated
Atmospheric pressure	:	Between 86 kPa and 106 kPa
Temperature	:	23 °C
Relative humidity	:	40 %
Test results	:	Plots and tables

Type ABC-17, plus wire, plot



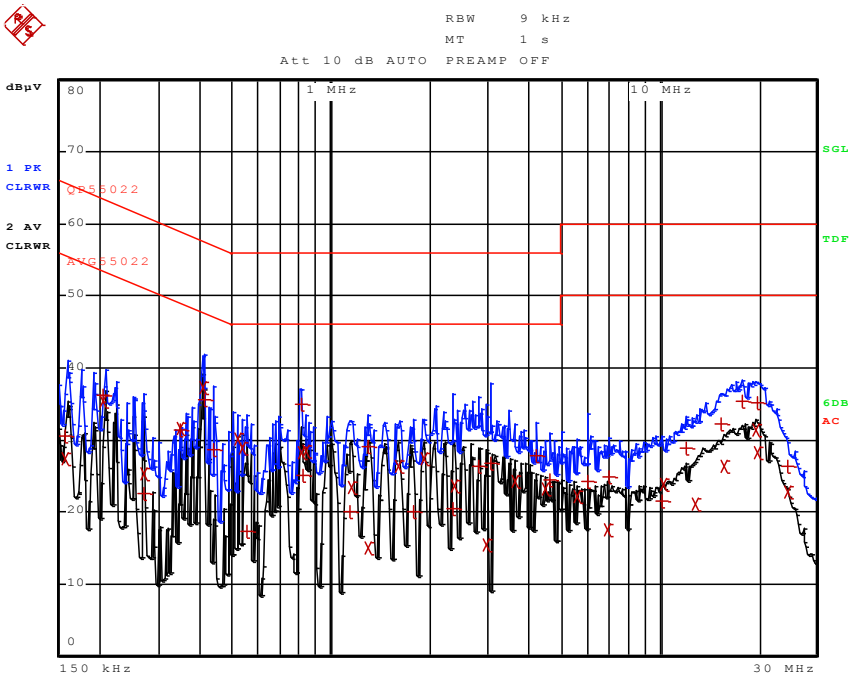
Type ABC-17, plus wire, table

EDIT PEAK LIST (Final Measurement Results)

Trace1: QP55022
Trace2: AVG55022
Trace3: ---

TRACE		FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2	Average	402 kHz	38.95	-8.85
2	Average	806 kHz	32.52	-13.47
2	Average	918 kHz	28.26	-17.73
1	Quasi Peak	402 kHz	39.13	-18.67
2	Average	19.934 MHz	30.67	-19.32
2	Average	15.794 MHz	30.45	-19.54
2	Average	3.67 MHz	24.98	-21.01
2	Average	3.002 MHz	24.92	-21.07
2	Average	1.218 MHz	24.41	-21.58
1	Quasi Peak	806 kHz	34.12	-21.87
2	Average	18.286 MHz	28.12	-21.87
2	Average	506 kHz	23.22	-22.77
2	Average	1.786 MHz	22.54	-23.45
2	Average	2.246 MHz	22.12	-23.87
2	Average	1.362 MHz	21.90	-24.09
1	Quasi Peak	19.818 MHz	35.82	-24.17
2	Average	4.47 MHz	20.94	-25.05
1	Quasi Peak	1.202 MHz	30.81	-25.18
1	Quasi Peak	17.706 MHz	34.56	-25.43
2	Average	2.466 MHz	20.21	-25.78

Type ABC-17, minus wire, plot



Type ABC-17, minus wire, table

EDIT PEAK LIST (Final Measurement Results)

Trace1:	QP55022
Trace2:	AVG55022
Trace3:	---

TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2 Average	406 kHz	37.30	-10.42
2 Average	522 kHz	30.09	-15.90
2 Average	538 kHz	28.92	-17.07
2 Average	346 kHz	31.70	-17.35
2 Average	838 kHz	28.48	-17.51
2 Average	814 kHz	28.15	-17.84
2 Average	206 kHz	35.46	-17.90
2 Average	19.618 MHz	31.37	-18.62
2 Average	1.926 MHz	27.35	-18.64
2 Average	1.61 MHz	26.27	-19.72
1 Quasi Peak	810 kHz	35.02	-20.97
2 Average	3.65 MHz	24.31	-21.68
2 Average	19.734 MHz	28.18	-21.81
1 Quasi Peak	410 kHz	35.67	-21.97
2 Average	2.382 MHz	23.64	-22.35
2 Average	1.154 MHz	23.47	-22.52
2 Average	4.498 MHz	23.29	-22.70
2 Average	15.75 MHz	26.33	-23.66
1 Quasi Peak	17.894 MHz	35.42	-24.57
1 Quasi Peak	19.926 MHz	35.08	-24.92

Result : Pass

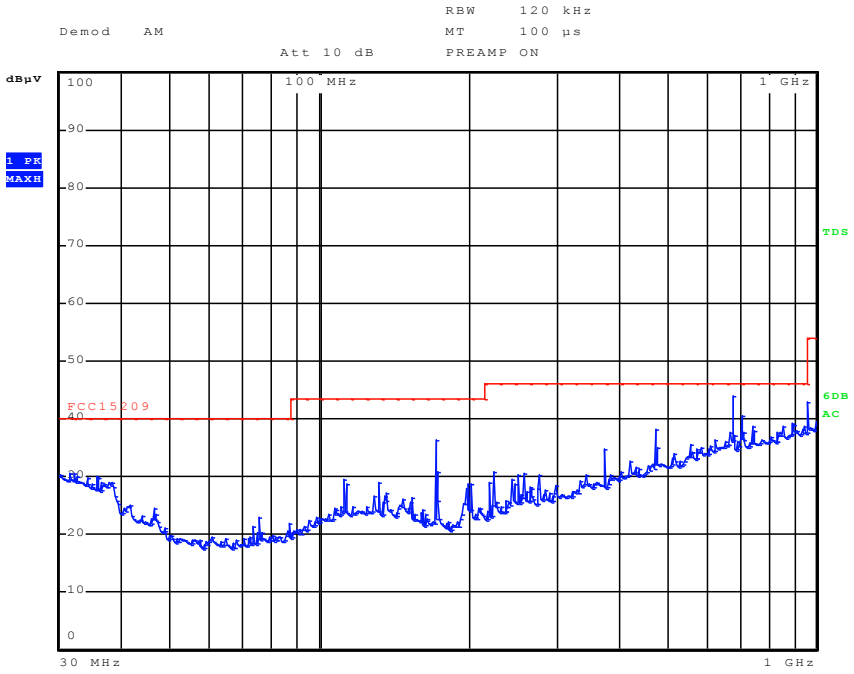
Measurement uncertainty : +/- 3.6 dB. The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approx. 95%, but excluding the effect of measurement system repeatability.

Measurement equipment : 35, 43, 55, 56 (the numbers listed refer to the module 'Used test equipment').

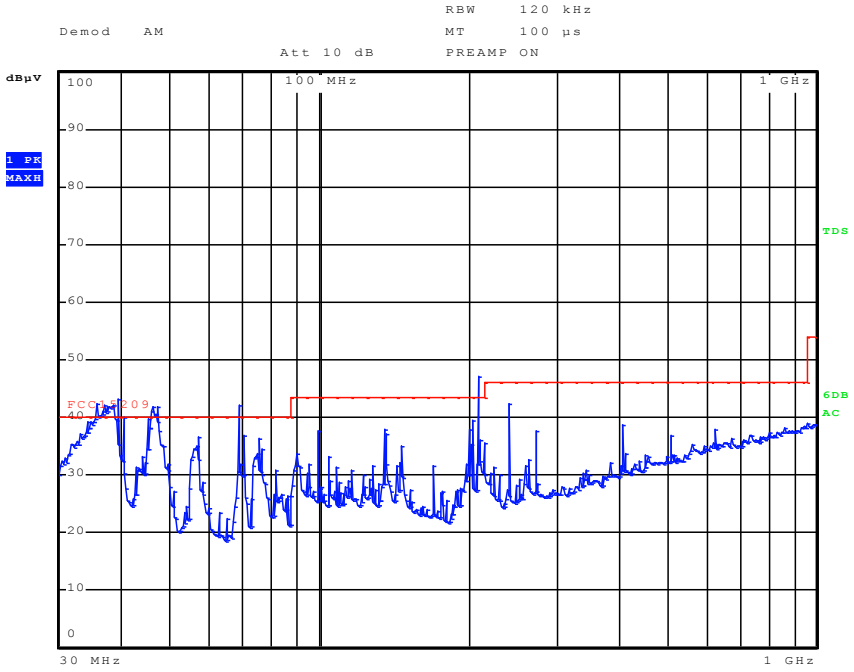
3.2 Field strength of unwanted emissions 30 - 1000 MHz

Compliance standard	:	FCC part 15, subpart B, section 15.109 (a)
Method of test	:	ANSI C63.10-2009, section 6.5; FCC part 15, subpart A, section 15.31(m), 15.33, 15.35.
EUT condition	:	receiving (normal usage mode)
Test results	:	

Polarization horizontal (max.hold)



Polarization vertical (max.hold)



Frequency	Polarisation	Level (QP)	Limit
(MHz)	H/V	(dBµV/m)	(dBµV/m)
46.88	V	32.58	40
56.36	V	26.46	40
69.92	V	22.17	40
76.64	V	23.11	40
682.16	H	29.75	46

Measurement uncertainty	Vertical polarisation:	
	30 – 200 MHz	5.4 dB
	200 -1000 MHz	4.6 dB
	Horizontal polarisation:	
	30 – 200 MHz	4.5 dB
	200 -1000 MHz	3.6 dB

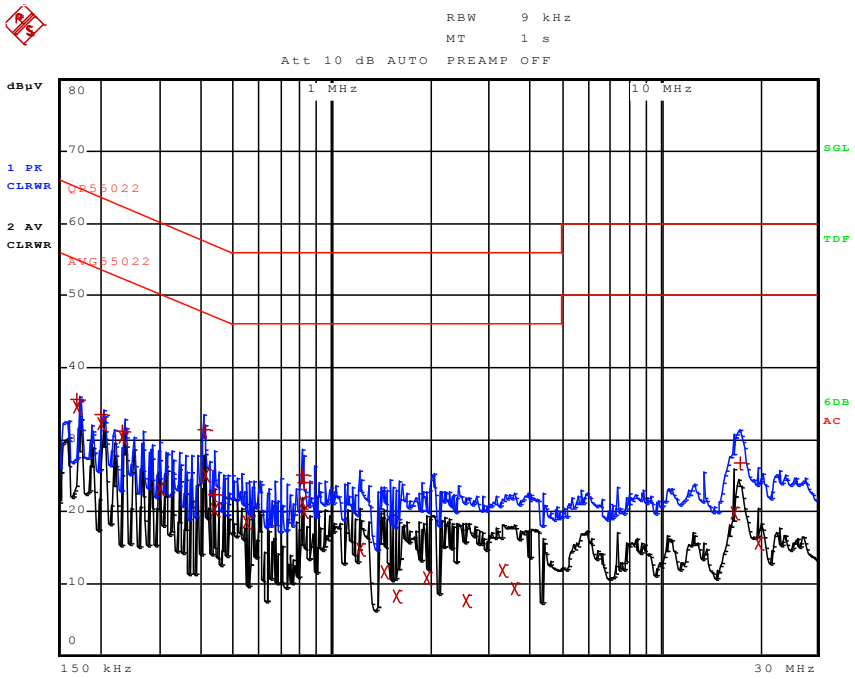
Measurement equipment used (item numbers refer to section “used test equipment”	34, 35, 36, 43, 50, 51.

4 Emission tests ABC-18

4.1 Conducted Disturbance Measurements

Compliance standard	:	FCC part 15, subpart B, section 15.107(a).
Method of test	:	ANSI C63.10: 2009, section 5.2.
Port	:	DC power input, 12 Volt
Mode	:	receiving (normal usage mode)
Configuration	:	the sample was continuously activated
Atmospheric pressure	:	between 86 kPa and 106 kPa
Temperature	:	22 °C
Relative humidity	:	40 %
Test results	:	plots and tables

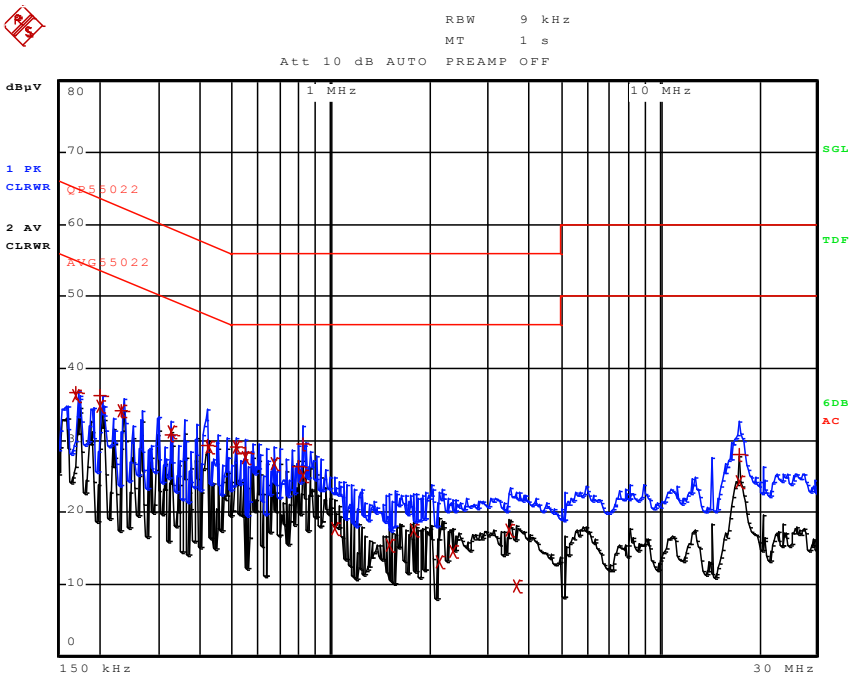
Type ABC-18, plus wire, plot



Type ABC-18, plus wire, table

EDIT PEAK LIST (Final Measurement Results)			
Trace1:	QP55022		
Trace2:	AVG55022		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2 Average	170 kHz	34.44	-20.51
2 Average	202 kHz	32.22	-21.29
2 Average	234 kHz	30.41	-21.88
2 Average	410 kHz	25.14	-22.50
2 Average	814 kHz	21.38	-24.61
2 Average	818 kHz	20.01	-25.98
1 Quasi Peak	406 kHz	31.38	-26.34
2 Average	438 kHz	20.27	-26.82
2 Average	298 kHz	23.16	-27.13
2 Average	546 kHz	18.48	-27.51
1 Quasi Peak	170 kHz	35.64	-29.31
1 Quasi Peak	202 kHz	33.40	-30.12
2 Average	16.738 MHz	19.84	-30.15
1 Quasi Peak	810 kHz	25.04	-30.95
1 Quasi Peak	234 kHz	31.07	-31.22
2 Average	1.214 MHz	14.71	-31.28
1 Quasi Peak	818 kHz	23.96	-32.03
1 Quasi Peak	17.386 MHz	26.75	-33.24
2 Average	3.302 MHz	11.91	-34.08
2 Average	1.446 MHz	11.67	-34.33

Type ABC-18, minus wire, plot



Type ABC-18, minus wire, table

EDIT PEAK LIST (Final Measurement Results)

Trace1: QP55022
Trace2: AVG55022
Trace3: ---

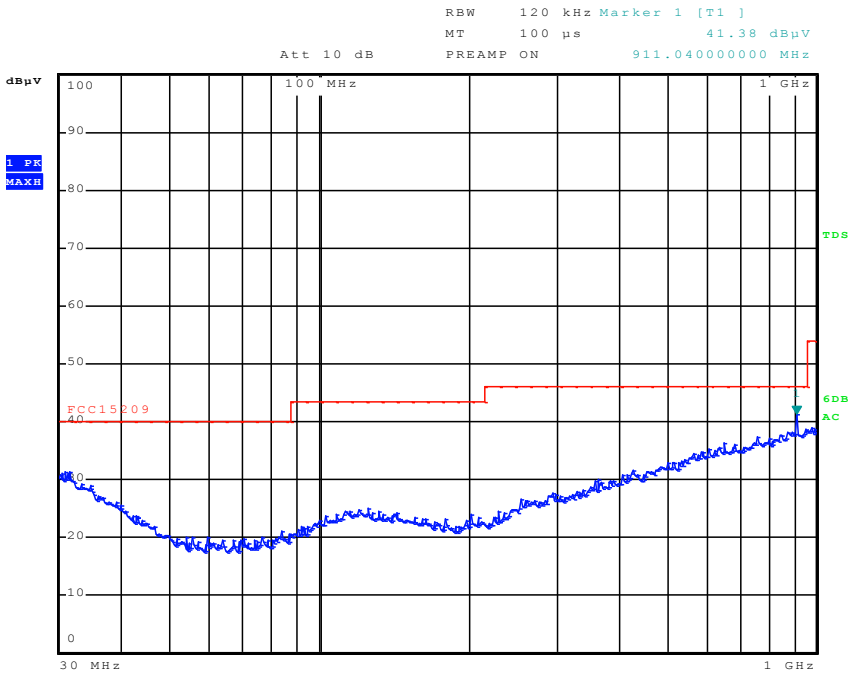
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2 Average	514 kHz	29.11	-16.88
2 Average	234 kHz	34.09	-18.21
2 Average	422 kHz	29.08	-18.32
2 Average	326 kHz	31.21	-18.33
2 Average	546 kHz	27.66	-18.33
2 Average	170 kHz	36.20	-18.75
2 Average	202 kHz	34.75	-18.77
2 Average	670 kHz	26.79	-19.20
2 Average	826 kHz	24.99	-21.00
2 Average	17.518 MHz	24.22	-25.77
1 Quasi Peak	826 kHz	29.45	-26.55
1 Quasi Peak	514 kHz	29.17	-26.82
1 Quasi Peak	202 kHz	36.23	-27.29
1 Quasi Peak	546 kHz	28.24	-27.75
1 Quasi Peak	234 kHz	34.17	-28.13
2 Average	1.026 MHz	17.74	-28.25
1 Quasi Peak	418 kHz	29.22	-28.26
1 Quasi Peak	170 kHz	36.59	-28.36
2 Average	3.502 MHz	17.57	-28.42
2 Average	1.79 MHz	17.49	-28.50

Result	:	Pass
Remark	:	Spurious signals originate from 60 Hz power source, number 85 in the module 'Used test equipment')
Measurement uncertainty	:	+/- 3.6 dB. The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approx. 95%, but excluding the effect of measurement system repeatability.
Measurement equipment	:	35, 43, 55, 56 (the numbers listed refer to the module 'Used test equipment').

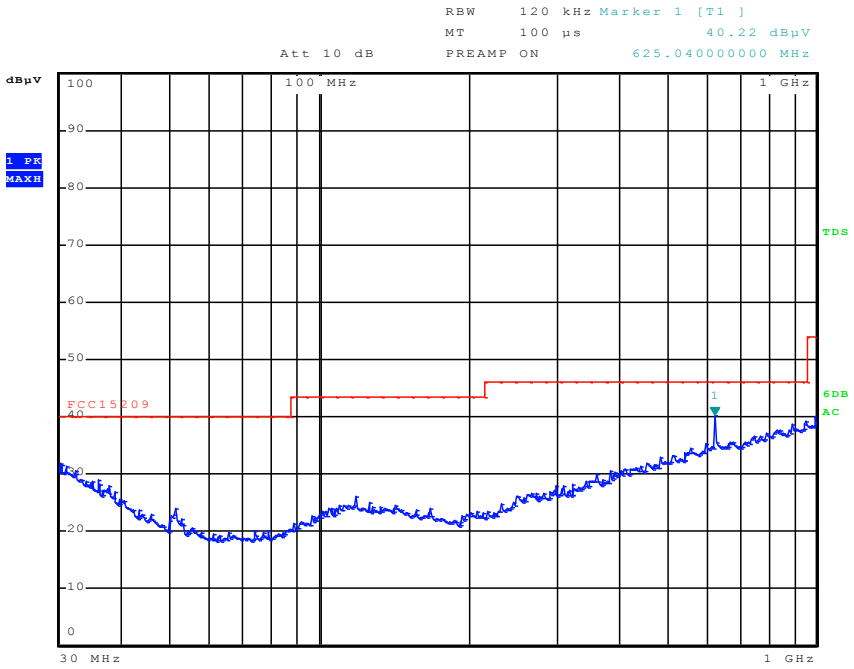
4.2 Field strength of unwanted emissions 30 - 1000 MHz

Compliance standard	:	FCC part 15, subpart B, section 15.109 (a)
Method of test	:	ANSI C63.10-2009, section 6.5; FCC part 15, subpart A, section 15.31(m), 15.33, 15.35.
EUT condition	:	receiving (normal usage mode)
Test results	:	

Polarization horizontal (max hold)



Polarization vertical (max. hold)



Frequency	Polarisation	Level (QP)	Limit
(MHz)	H/V	(dBµV/m)	(dBµV/m)
514.20	V	38.68	46.0
625.04	V	41.07	46.0
788.44	H	39.59	46.0

Measurement uncertainty	Vertical polarisation:	
	30 – 200 MHz	5.4 dB
	200 -1000 MHz	4.6 dB
	Horizontal polarisation:	
	30 – 200 MHz	4.5 dB
	200 -1000 MHz	3.6 dB

Measurement equipment used (item numbers refer to section “used test equipment”	34, 35, 36, 43, 50, 51.

Used test equipment module

Item	Description	Manufacturer	Type	ID
1	Signal generator	Marconi	2042	TE 00030
2	Preamplifier 1 – 26.5 GHz	HP	8449B	TE 00092
3	Preamplifier 1 – 26.5 GHz	HP	8449B	TE 00093
4	Pre-amplifier 10 dB	R & S	ESV-Z3	TE 00097
5	Pre-amplifier 10 dB	R & S	ESV-Z3	TE 00098
6	Spectrum analyser	HP	8562E	TE 00099
7	Microwave amplifier	HP	HP8349A	TE 00124
8	Digital multimeter	HP	34401A	TE 00143
9	Digital multimeter	HP	3438A	TE 00215
10	Step attenuator	HP	8494A	TE 00233
11	Step attenuator	HP	8496A	TE 00234
12	Power sensor	HP	8484A	TE 00245
13	Power meter	HP	435B	TE 00249
14	Power meter	HP	437B	TE 00354
15	Power sensor	HP	8481A	TE 00355
16	Spectrum analyser	HP	8563E	TE 00359
17	Audio analyzer	HP	8903A	TE 00373
18	Signal generator	Marconi	2042	TE 00379
19	Digital thermometer	Fluke	51	TE 00388
20	Step attenuator	HP	8491A	TE 00403
21	Signal generator	HP	8642B	TE 00424
22	Signal generator	Marconi	2042	TE 00427
23	Spectrum analyser	HP	8563E	TE 00481
24	Horn antenna	EMCO	3115	TE 00531
25	Horn antenna	EMCO	3116	TE 00533
26	Biconilog antenna	EMCO	3143	TE 00700
27	Climate chamber	CTS	C-40/350	TE 00741
28	Active loop antenna	R & S	HFH2-Z2	TE 00746
29	Horn antenna	Quinstar	QWH-1900-AA	TE 00747

Item	Description	Manufacturer	Type	ID
30	Step attenuator	HP	8491A	TE 00787
31	Standard gain horn	Flann	20240-25	TE 00818
32	Power supply for amplifier	R & S	HZ-9	TE 00830
33	Power supply	Delta Elektronika	E030-1	TE 00851
34	Semi Anechoic Room	Comtest	--	TE 00861
35	Power supply	Delta Elektronika	MST030-10	TE 00886
36	Biconilog antenna	Chase	CBL6112A	TE 00967
37	Anechoic chamber	Euroshield	RFB-F-100	TE 01064
38	Triple loop antenna	Telefication	--	TE 01066
39	Temp / RH logger	MicroLog	EC 650	TE 01114
40	Broadband resistive power divider	Weinschel	1506A	TE 01120
41	Broadband resistive power divider	Weinschel	1506A	TE 01122
42	Spectrum analyser	R & S	FSP 40	TE 11125
43	EMI test receiver	R & S	ESCI	TE 11128
44	Radio Communication Service Monitor	R & S	CMS54	TE 11129
45	Pre-amplifier	Miteq	JS4-18004000	TE 11131
46	Low noise amplifier	Miteq	AFS42-041001800	TE 11132
47	Antenna tower	Heinrich Deisel	AS 620P	ANEC
48	Turntable	Heinrich Deisel	DS-412	ANEC
49	Turntable controller	Heinrich Deisel	HD-050	ANEC
50	Antenna mast	EMCO	1070	SAR
51	Turn table	EMCO	1060-2M	SAR
52	Near field probe	--	--	--
53	Digital multimeter	Fluke	87	TE 00257
54	Variable transformer	KSL	RU8	TE 00904
55	Two line V-network	R & S	ESH3-Z5	TE 00208
56	Pulse limiter	R & S	ESH3-Z2	TE 00756

Revision history

REVISION	DATE	REMARKS	REVISED BY
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