	Report No: R3055 Issue No: 1	FCC ID: XL8EXTPIR1501	
	Test No: T4200		Test Report



dB Technology
|----- (Cambridge Ltd.) -----|

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REPORT ON ELECTROMAGNETIC COMPATIBILITY TESTS

**Performed at:
TWENTY PENCE TEST SITE**

**Twenty Pence Road,
Cottenham,
Cambridge
U.K.
CB24 8PS**

on

Quatro Electronics Ltd

External PIR

dated


2nd March 2012

Document History

Issue	Date	Affected page(s)	Description of modifications	Revised by	Approved by
1	02/03/12		Initial release		

Based on report template:
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	Report No: R3055	FCC ID: XL8EXTPIR1501	
	Issue No: 1		
Test No: T4200	Test Report		Page: 2 of 45

Equipment Under Test (EUT):

External PIR

Test Commissioned by:

Quatro Electronics Ltd
Quatro House
School Lane
Lytham
Lancashire
FY8 5NL

Representative:

Dave Smith

Test Started:

31st January 2012

Test Completed:

21st February 2012

Test Engineer:

Peter Barlow, Dave Smith

Date of Report:

2nd March 2012

Written by: Dave Smith

Checked by: Derek Barlow

Signature:

D. A. Smith

Signature:

D. Barlow

Date: 21st February 2012

Date: 2nd March 2012


dB Technology can only report on the specific unit(s) tested at its site. The responsibility for extrapolating this data to a product line lies solely with the manufacturer.

Test Standards Applied

CFR 47

Code of Federal Regulations: Pt 15 Subpart C - Radio Frequency Devices - Intentional Radiators

In particular, the rules of CFR 47 part 15.231 were applied.


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Emissions Test Results Summary

CFR 47					PASS
Test	Port	Method	Limit	PASS/FAIL	Notes
Conducted Emissions	ac power	ANSI C63.4:2003	15.207	N/A	#1
Periodic Operation			15.231(a)	PASS	
Radiated Emissions		ANSI C63.4:2003	15.231(b)	PASS	
Bandwidth		ANSI C63.4:2003	15.231(c)	PASS	


specs_fccv090511

#1 Test not required because EUT is battery operated and does not have any connection to the mains.

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1 EUT Details

1.1 General

The EUT was an External PIR with a 434.475MHz intentional transmitter. The transmitter is intended for periodic operation and was therefore tested to FCC part 15.231. This report covers four versions of the product that all contain the same transmitter board but are housed in different enclosures with different PIR detectors.

Details of the EUT and associated peripherals used during the tests are listed below. Figure 1 shows the arrangement of the EUT.

Item	Manufacturer	Model	Description	Serial No:	Notes
1	Quatro	External PIR - BX	EUT sample 1	2003322	
1	Quatro	External PIR - VX	EUT sample 2	2003321	
1	Quatro	External PIR - HX40	EUT sample 3	2003318	
1	Quatro	External PIR - HX80	EUT sample 4	2003320	

1.2 Modifications to EUT

Details of any modifications that were required to achieve compliance are listed below. The modification numbers are referred to in the results sections as appropriate.

Mod No:	Details	Implemented for
0	Original unit.	
1	5dB Attenuator fitted to all units.	Radiated_Emissions

1.3 EUT Operating Modes

The EUT was tested in the following operating mode or modes. Generally, operating modes are chosen that will exercise the functions of the EUT as fully as possible and in a manner likely to produce maximum emission levels. Individual test result sheets reference the operating mode of the EUT.

Operating Mode	Details
1	<p>Pulsed transmission at 434.475MHz.</p> <p>For the purposes of the test the transmitter was operated with a high duty cycle. In normal operation the transmitter is continuously on for a duration of more than 100msec and so no additional reduction in levels could be made by calculating an average based on duty cycle.</p>


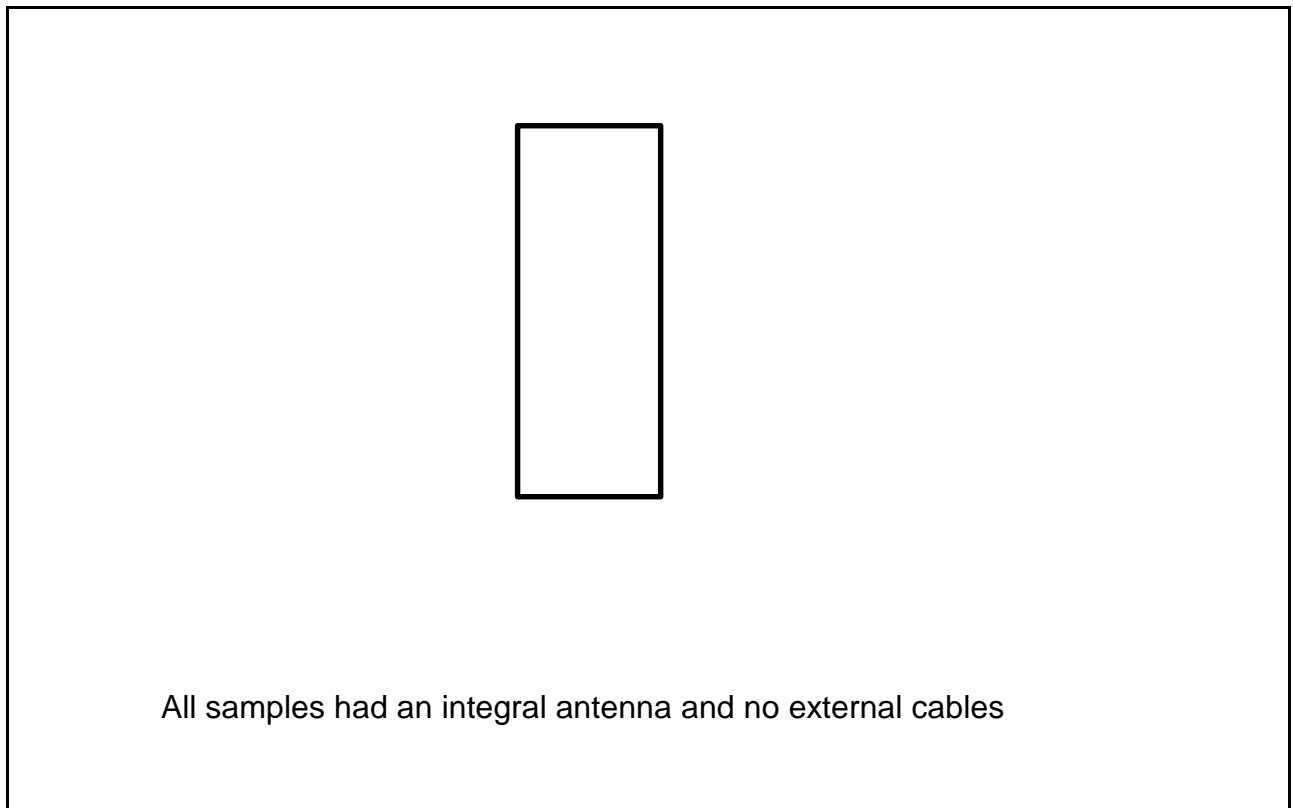

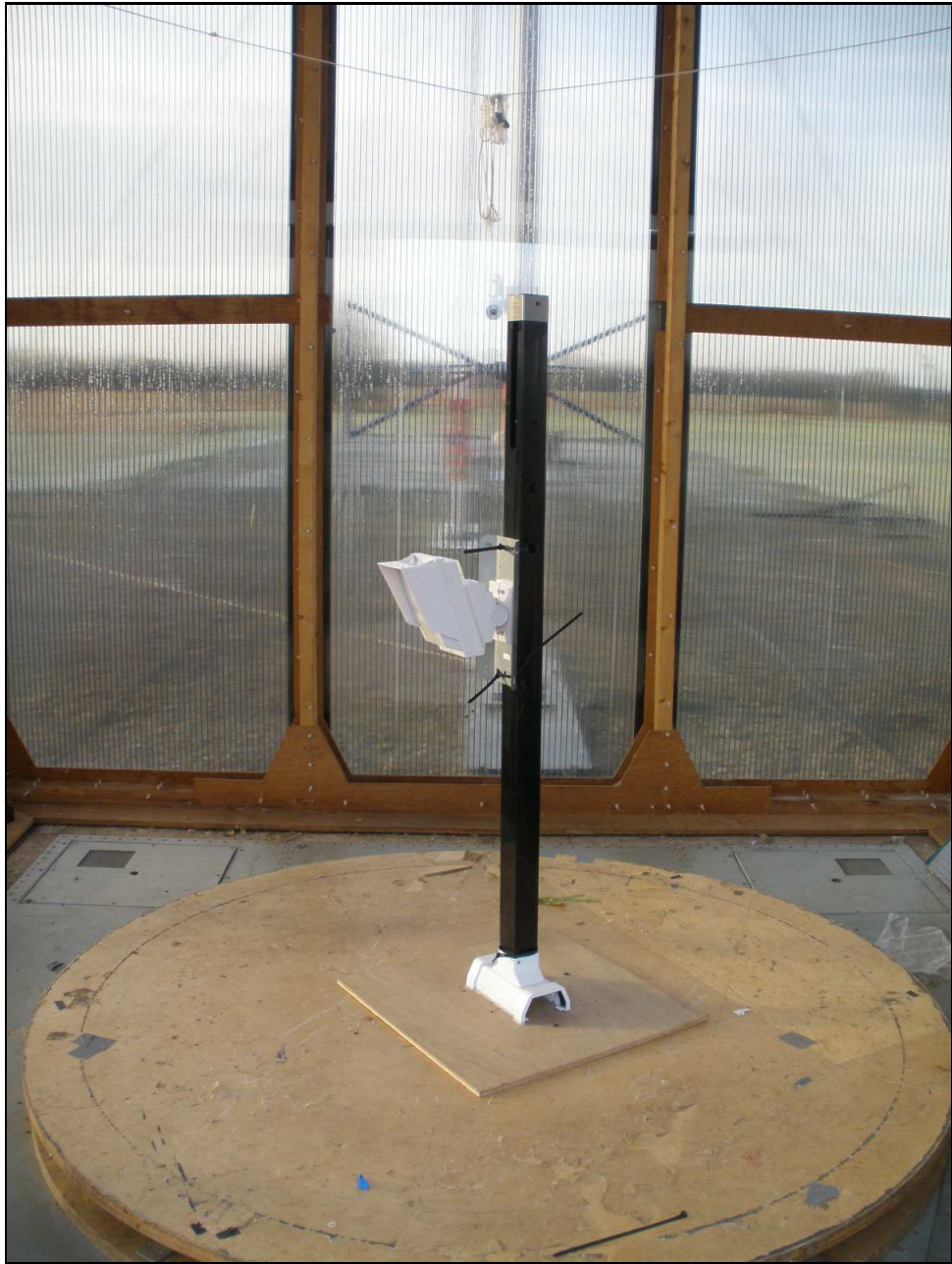
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Figure 1 General Arrangement of EUT and Peripherals



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Photograph 1 HX80

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Photograph 2 HX40

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Photograph 3 VX

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Photograph 4 BX

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2 Test Equipment

The test equipment used during the tests was one or more of the items listed below. Individual test result sheets indicate which items were used.

Ref No:	Details	Serial Number	Cal Date	Cal interval
A12	Chase Bilog CBL6111A	1012	18/11/2011	1 year
A23	EMCO 3115 DR Guide (1-18GHz)	9507-4525	31/01/2012	1 year
A24	Chase X-wing Bilog CBL6144 26MHz-3GHz	27590	18/11/2011	1 year
PRE7	LUCIX 0.1GHz to 20GHz	24485	08/01/2012	1 year
R4	R&S ESVS10	843744/002	16/12/2011	1 year
R8	Agilent E7405A Spectrum Analyser	MY44212494	19/09/2011	1 year
RFF11	High Pass RF Filter 890MHz to 22GHz	11	20/12/2011	1 year

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3 Test Methods

3.1 Intermittent Operation - 15.231(a)

The output of the unit is coupled into a spectrum analyser which is set to the carrier frequency with zero span and a suitable timebase to capture one whole transmit burst. The unit is put into operation and the output captured for a single transmit burst. The plot of the transmitter output is used to measure the total duration of the transmission. Manufacturer statements are used to provide information on frequency of operation and supervisory signals.

3.2 Radiated Emissions - 15.231(b)

This section describes the general method of performing this test. The specific method used and any deviations from this general method are listed in the appropriate results section.

Initial scans are performed in a semi-anechoic screened room at a distance of 3m. Scans are performed over the frequency range specified in the test standard with the antenna both horizontally and vertically polarised. During these scans the EUT and peripherals are rotated through 360°. Bench top EUTs are placed on a non-conducting bench at a height of 0.8m above the ground plane. Floor standing EUTs are placed 0.1m above the ground plane. The results of the scans are shown in the plots included at the end of the report.

Significant emissions identified by the scans are measured on an open area test site at the appropriate test distance using a CISPR16 quasi-peak receiver. Maximised readings are obtained by rotating the EUT through 360° and adjusting the height of the antenna from 1m to 4m. Measurements are made with the antenna both horizontally and vertically polarised and the results tabulated.

Tabulated results show levels based on the following calculation:

Field Strength (dBuV) = receiver reading (dBuV) + CF (dB/m)

CF is the correction factor for the antenna and cable.

For example:

If at 434.478MHz the receiver reading was 58.8dBuV and combined correction factor = 20.4 (dB/m).


Total field strength = 58.8 + 20.4 = 79.2dBuV/m.

3.3 Bandwidth - 15.231(c)

The output of the unit is coupled into a spectrum analyser on which the centre frequency is set to the carrier frequency of the transmission. The analyser is set to a narrow bandwidth (10kHz) and the span is adjusted such that the points at each side of the centre frequency which are 20dB down from the peak level can be displayed. The marker is used to identify the frequencies at which the level is 20dB below the maximum level both above and below the carrier frequency. The difference between these frequencies is the bandwidth of the transmission.

4 Test Results

The following sections contain tabulated test results. Plots of various scans are included at the back of this section.

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4.1 Intermittent Operation Information - 15.231(a)

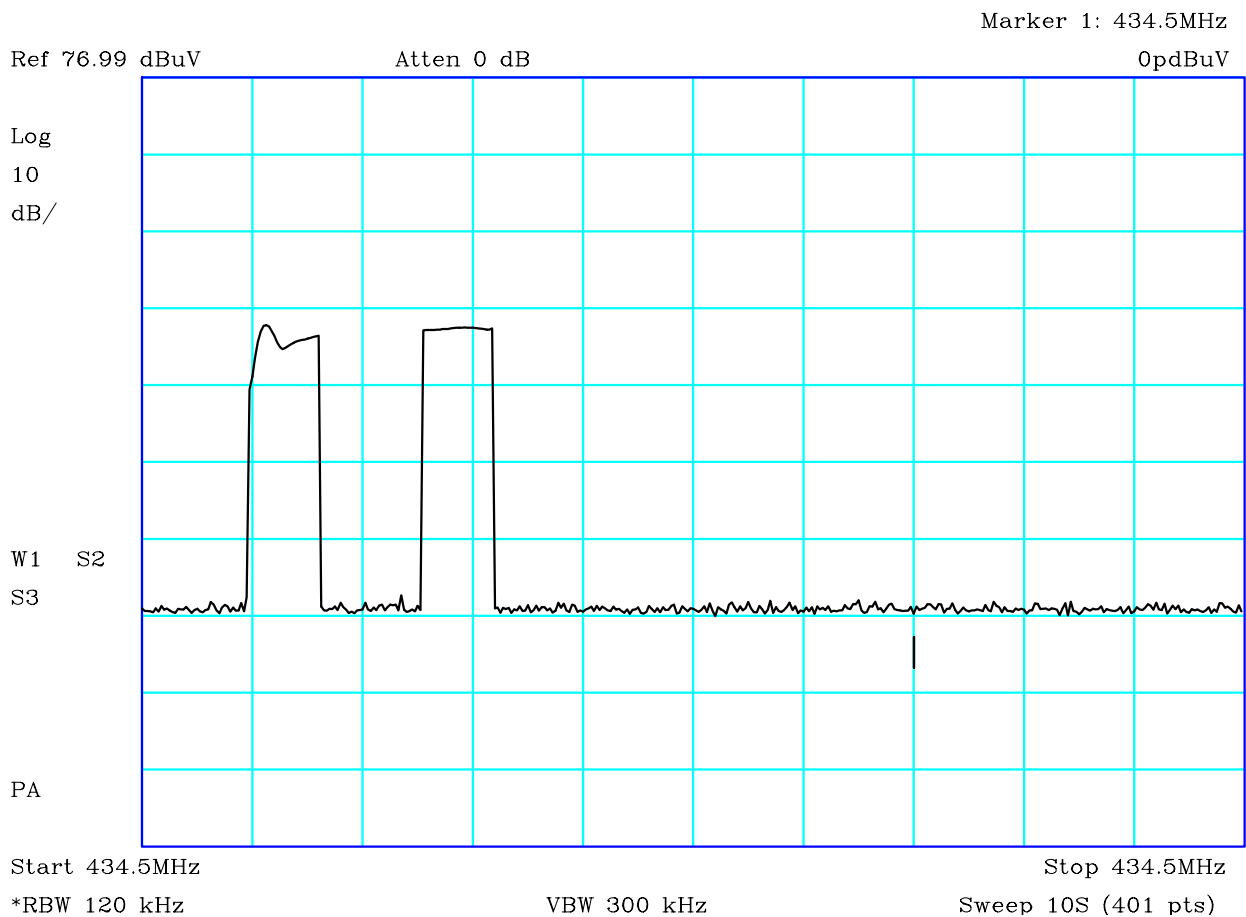
The operation of the transmitter is controlled by a microprocessor. The transmitter is activated by movement detection.

When activated the transmitter sends a single sequence of pulses which lasts for less than 5 seconds - see plot below. No other sequence of pulses is transmitted until a new warning condition is detected. In any case, no retransmission occurs within 3 minutes of a previous transmission, regardless of whether a new warning condition occurs.


In addition, this same sequence of pulses is sent out once every 18 hours for supervisory purposes.

This is considered to meet the rules of 15.231 as:

- o it is an automatically operated device which transmits for a period of less than 5 seconds.
- o transmissions at regular predetermined intervals are limited to supervision transmissions to determine system integrity in a security or safety application and does not exceed a rate of 2 seconds per hour.



Plot shows total transmitter activation time as less than 2 seconds.


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4.2 Radiated Emissions Results - Carrier - 15.231(b)

Factor Set 1:	A12_FS_11A - - CBL015_11A	1 m cable
Factor Set 2:	- - -	
Factor Set 3:	- - -	
Test Equipment:	R4 A12 CSET005	

Radiated Emissions

Company: Quatro Electronics Ltd					Product: External PIR									
Date: 31/01/2012					Test Eng: Peter Barlow									
Ports:														
Test: ANSI C63.4:2003					using limits of 15.231(b)									
Ports:														
Test:					using limits of									
Plot	Op Mode	Mod State	Dist m	Fact Set	Freq. MHz	Ant Pol	Rec. Level dBuV	Corr'n Factor dB/m	Corr'n Factor dB	Total Level dBuV/m	Limit FCC dBuV/m	Margin FCC dB	Notes	
10	1	1	3	1	434.476	V	52.0	20.6		72.6	80.8	8.2	HX80	
10	1	1	3	1	434.476	H	53.4	20.6		74.0	80.8	6.8	HX80	
6	1	1	3	1	434.476	V	52.6	20.6		73.2	80.8	7.6	HX40	
6	1	1	3	1	434.476	H	51.2	20.6		71.8	80.8	9.0	HX40	
14	1	1	3	1	434.476	V	56.7	20.6		77.3	80.8	3.5	VX	
14	1	1	3	1	434.476	H	49.9	20.6		70.5	80.8	10.3	VX	
2	1	1	3	1	434.476	V	55.5	20.6		76.1	80.8	4.7	BX	
2	1	1	3	1	434.476	H	49.8	20.6		70.4	80.8	10.4	BX	
Results											Minimum Margin PASS/FAIL		3.5 dB PASS	
Notes	Comments and Observations													
	<p>Results of scans shown in plots 2, 6, 10 and 14.</p> <p>All measurements made with a quasi-peak detector.</p> <p>The EUT is NOT hand held and is always installed in the same orientation. The tests were performed in this orientation.</p>													


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4.3 Radiated Emissions - Spurious below 1GHz - 15.231(b)

Factor Set 1:	A12_FS_11A - - CBL015_11A	1 m cable
Factor Set 2:	- - -	
Factor Set 3:	- - -	
Test Equipment:	R4 A12 CSET005	

Radiated Emissions

Company: Quatro Electronics Ltd					Product: External PIR								
Date: 31/01/2012					Test Eng: Peter Barlow								
Ports:													
Test: ANSI C63.4:2003					using limits of 15.231(b)								
Ports:													
Test:					using limits of								
Plot	Op Mode	Mod State	Dist m	Fact Set	Freq. MHz	Ant Pol	Rec. Level dBuV	Corr'n Factor dB/m	Corr'n Factor dB	Total Level dBuV/m	Limit FCC dBuV/m	Margin FCC dB	Notes
10	1	1	3	1	868.957	V	15.2	29.2		44.4	60.8	16.4	HX80
10	1	1	3	1	868.957	H	12.1	29.2		41.3	60.8	19.5	HX80
6	1	1	3	1	868.957	V	14.4	29.2		43.6	60.8	17.2	HX40
6	1	1	3	1	868.957	H	10.1	29.2		39.3	60.8	21.5	HX40
14	1	1	3	1	868.957	V	14.5	29.2		43.7	60.8	17.1	VX
14	1	1	3	1	868.957	H	14.5	29.2		43.7	60.8	17.1	VX
2	1	1	3	1	868.957	V	11.2	29.2		40.4	60.8	20.4	BX
2	1	1	3	1	868.957	H	7.5	29.2		36.7	60.8	24.1	BX
Results											Minimum Margin		
											PASS/FAIL		
											16.4 dB		
											PASS		
Notes													
Comments and Observations													
Results of scans shown in plots 1, 2, 5, 6, 9, 10, 13 and 14.													
All measurements made with a quasi-peak detector.													
The EUT is NOT hand held and is always installed in the same orientation.													
The tests were performed in this orientation.													


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4.4 Radiated Emissions - Spurious at Band Edges- 15.231(b)

Factor Set 1:	A12_FS_11A - - CBL015_11A	1 m cable
Factor Set 2:	- - - -	
Factor Set 3:	- - - -	
Test Equipment:	R4 A12 CSET005	

Radiated Emissions

Company: Quatro Electronics Ltd					Product: External PIR								
Date: 31/01/2012					Test Eng: Peter Barlow								
Ports:													
Test: ANSI C63.4:2003					using limits of 15.231(b)								
Ports:													
Test:					using limits of								
Plot	Op Mode	Mod State	Dist m	Fact Set	Freq. MHz	Ant Pol	Rec. Level dBuV	Corr'n Factor dB/m	Corr'n Factor dB	Total Level dBuV/m	Limit FCC dBuV/m	Margin FCC dB	Notes
17	1	1	3	1	433.932	V	3.5	20.6		24.1	60.8	36.7	BX
17	1	1	3	1	435.018	V	6.0	20.6		26.6	60.8	34.2	BX
17	1	1	3	1	433.932	H	3.5	20.6		24.1	60.8	36.7	BX
17	1	1	3	1	435.018	H	4.2	20.6		24.8	60.8	36.0	BX
19	1	1	3	1	433.932	V	1.7	20.6		22.3	60.8	38.5	HX80
19	1	1	3	1	435.018	V	2.4	20.6		23.0	60.8	37.8	HX80
19	1	1	3	1	433.932	H	2.3	20.6		22.9	60.8	37.9	HX80
19	1	1	3	1	435.018	H	4.7	20.6		25.3	60.8	35.5	HX80
18	1	1	3	1	433.932	V	0.8	20.6		21.4	60.8	39.4	HX40
18	1	1	3	1	435.018	V	2.0	20.6		22.6	60.8	38.2	HX40
18	1	1	3	1	433.932	H	1.4	20.6		22.0	60.8	38.8	HX40
18	1	1	3	1	435.018	H	0.9	20.6		21.5	60.8	39.3	HX40
20	1	1	3	1	433.932	V	4.7	20.6		25.3	60.8	35.5	VX
20	1	1	3	1	435.018	V	7.6	20.6		28.2	60.8	32.6	VX
20	1	1	3	1	433.932	H	3.5	20.6		24.1	60.8	36.7	VX
20	1	1	3	1	435.018	H	3.1	20.6		23.7	60.8	37.1	VX
Results											Minimum Margin		
											PASS/FAIL		
											32.6 dB		
											PASS		
Notes		Comments and Observations											
		<p>Plots 17 to 20.</p> <p>The band edges were assumed to be at the maximum permitted occupied band limits i.e. +/- 0.125% above and below the operating frequency.</p> <p>Plots show transient emissions produced when the transmitter turned on. These emissions were captured because a peak detector was employed along with a "maximum hold" on the spectrum analyser. The plot is a maximum hold of a large number of sweeps.</p> <p>To establish that these transients were not an issue, quasi peak measurements were made at the nominal band edge points as shown above.</p>											


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4.5 Radiated Emissions Results - Spurious above 1GHz - 15.231(b) - BX Unit

Factor Set 1: A23_3m_10A PRE7_CBL052_CBL093_11A RFF11_10A -
Factor Set 2: - - - -
Factor Set 3: - - - -
Test Equipment: R8 A23 PRE7

Radiated Emissions

Company: Quatro Electronics Ltd					Product: External PIR								
Date: 10/02/2012					Test Eng: Dave Smith								
Ports:													
Test: ANSI C63.4:2003					using limits of				15.231(b)				
Ports:													
Test:					using limits of								
Plot	Op Mode	Mod State	Dist m	Fact Set	Freq. MHz	Ant Pol	Rec. Level dBuV	Corr'n Factor dB/m	Corr'n Factor dB	Total Level dBuV/m	Limit FCC dBuV/m	Margin FCC dB	Notes
4	1	1	1.5	1	3475.855	V	58.3	-8.3		50.0	60.0	10.0	
4	1	1	1.5	1	3475.855	H	57.8	-8.3		49.5	60.0	10.6	
4	1	1	1.5	1	3910.305	V	53.9	-6.6		47.3	60.0	12.7	
4	1	1	1.5	1	3910.305	H	52.7	-6.6		46.1	60.0	13.9	
4	1	1	1.5	1	4344.760	V	59.7	-6.9		52.8	60.0	7.3	
4	1	1	1.5	1	4344.760	H	54.7	-6.9		47.7	60.0	12.3	
Results											Minimum Margin		
											PASS/FAIL		
											7.3 dB		
											PASS		
Notes	Comments and Observations												
	Results of scans shown in plots 3 and 4.												
	BX												
	Measurements made with 1MHz BW peak detector.												


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4.6 Radiated Emissions Results - Spurious above 1GHz - 15.231(b) - HX40 Unit

Factor Set 1: A23_3m_10A PRE7_CBL052_CBL093_11A RFF11_10A -
Factor Set 2: - - - -
Factor Set 3: - - - -
Test Equipment: R8 A23 PRE7

Radiated Emissions

Company: Quatro Electronics Ltd					Product: External PIR								
Date: 10/02/2012					Test Eng: Dave Smith								
Ports:													
Test: ANSI C63.4:2003					using limits of 15.231(b)								
Ports:													
Test:					using limits of								
Plot	Op Mode	Mod State	Dist m	Fact Set	Freq. MHz	Ant Pol	Rec. Level dBuV	Corr'n Factor dB/m	Corr'n Factor dB	Total Level dBuV/m	Limit FCC dBuV/m	Margin FCC dB	Notes
8	1	1	1.5	1	3475.855	V	56.3	-8.3		48.0	60.0	12.0	
8	1	1	1.5	1	3475.855	H	55.5	-8.3		47.2	60.0	12.8	
8	1	1	1.5	1	3910.360	V	53.4	-6.6		46.8	60.0	13.2	
8	1	1	1.5	1	3910.360	H	54.1	-6.6		47.6	60.0	12.5	
8	1	1	1.5	1	4344.760	V	54.6	-6.9		47.7	60.0	12.3	
8	1	1	1.5	1	4344.760	H	54.1	-6.9		47.2	60.0	12.9	
Results											Minimum Margin		
											PASS/FAIL		
											12.0 dB		
											PASS		
Notes	Comments and Observations												
	Results of scans shown in plots 7 and 8.												
	HX40												
	Measurements made with 1MHz BW peak detector.												


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4.7 Radiated Emissions Results - Spurious above 1GHz - 15.231(b) - HX80 Unit

Factor Set 1: A23_3m_10A PRE7_CBL052_CBL093_11A RFF11_10A -
Factor Set 2: - - - -
Factor Set 3: - - - -
Test Equipment: R8 A23 PRE7

Radiated Emissions

Company: Quatro Electronics Ltd					Product: External PIR								
Date: 10/02/2012					Test Eng: Dave Smith								
Ports:													
Test: ANSI C63.4:2003					using limits of				15.231(b)				
Ports:													
Test:					using limits of								
Plot	Op Mode	Mod State	Dist m	Fact Set	Freq. MHz	Ant Pol	Rec. Level dBuV	Corr'n Factor dB/m	Corr'n Factor dB	Total Level dBuV/m	Limit FCC dBuV/m	Margin FCC dB	Notes
12	1	1	1.5	1	3475.855	V	53.0	-8.3		44.7	60.0	15.4	
12	1	1	1.5	1	3475.855	H	55.1	-8.3		46.8	60.0	13.3	
12	1	1	1.5	1	3910.360	V	55.6	-6.6		49.0	60.0	11.0	
12	1	1	1.5	1	3910.360	H	52.3	-6.6		45.8	60.0	14.2	
12	1	1	1.5	1	4344.000	V	55.6	-7.0		48.7	60.0	11.3	
12	1	1	1.5	1	4344.000	H	57.1	-7.0		50.2	60.0	9.9	
Results											Minimum Margin		
											PASS/FAIL		
											9.9 dB		
											PASS		
Notes	Comments and Observations												
	Results of scans shown in plots 11 and 12.												
	HX80												
	Measurements made with 1MHz BW peak detector.												


	Report No: R3055 Issue No: 1	FCC ID: XL8EXTPIR1501	
	Test No: T4200		
Test Report			Page: 20 of 45

4.8 Radiated Emissions Results - Spurious above 1GHz - 15.231(b) - VX Unit

Factor Set 1: A23_3m_10A PRE7_CBL052_CBL093_11A RFF11_10A -
Factor Set 2: - - - -
Factor Set 3: - - - -
Test Equipment: R8 A23 PRE7

Radiated Emissions

Company: Quatro Electronics Ltd					Product: External PIR								
Date: 10/02/2012					Test Eng: Dave Smith								
Ports:													
Test: ANSI C63.4:2003					using limits of				15.231(b)				
Ports:													
Test:					using limits of								
Plot	Op Mode	Mod State	Dist m	Fact Set	Freq. MHz	Ant Pol	Rec. Level dBuV	Corr'n Factor dB/m	Corr'n Factor dB	Total Level dBuV/m	Limit FCC dBuV/m	Margin FCC dB	Notes
16	1	1	1.5	1	3475.830	V	56.4	-8.3		48.1	60.0	11.9	
16	1	1	1.5	1	3475.830	H	58.1	-8.3		49.8	60.0	10.2	
16	1	1	1.5	1	3910.401	V	54.1	-6.6		47.6	60.0	12.5	
16	1	1	1.5	1	3910.401	H	52.6	-6.6		-6.6	60.0	66.6	
16	1	1	1.5	1	4344.785	V	55.5	-6.9		48.5	60.0	11.5	
16	1	1	1.5	1	4344.785	H	55.9	-6.9		48.9	60.0	11.1	
Results											Minimum Margin		
											PASS/FAIL		
											10.2 dB		
											PASS		
Notes	Comments and Observations												
	Results of scans shown in plots 15 and 16. VX Measurements made with 1MHz BW peak detector.												


	Report No: R3055 Issue No: 1	FCC ID: XL8EXTPIR1501	
	Test No: T4200		Test Report

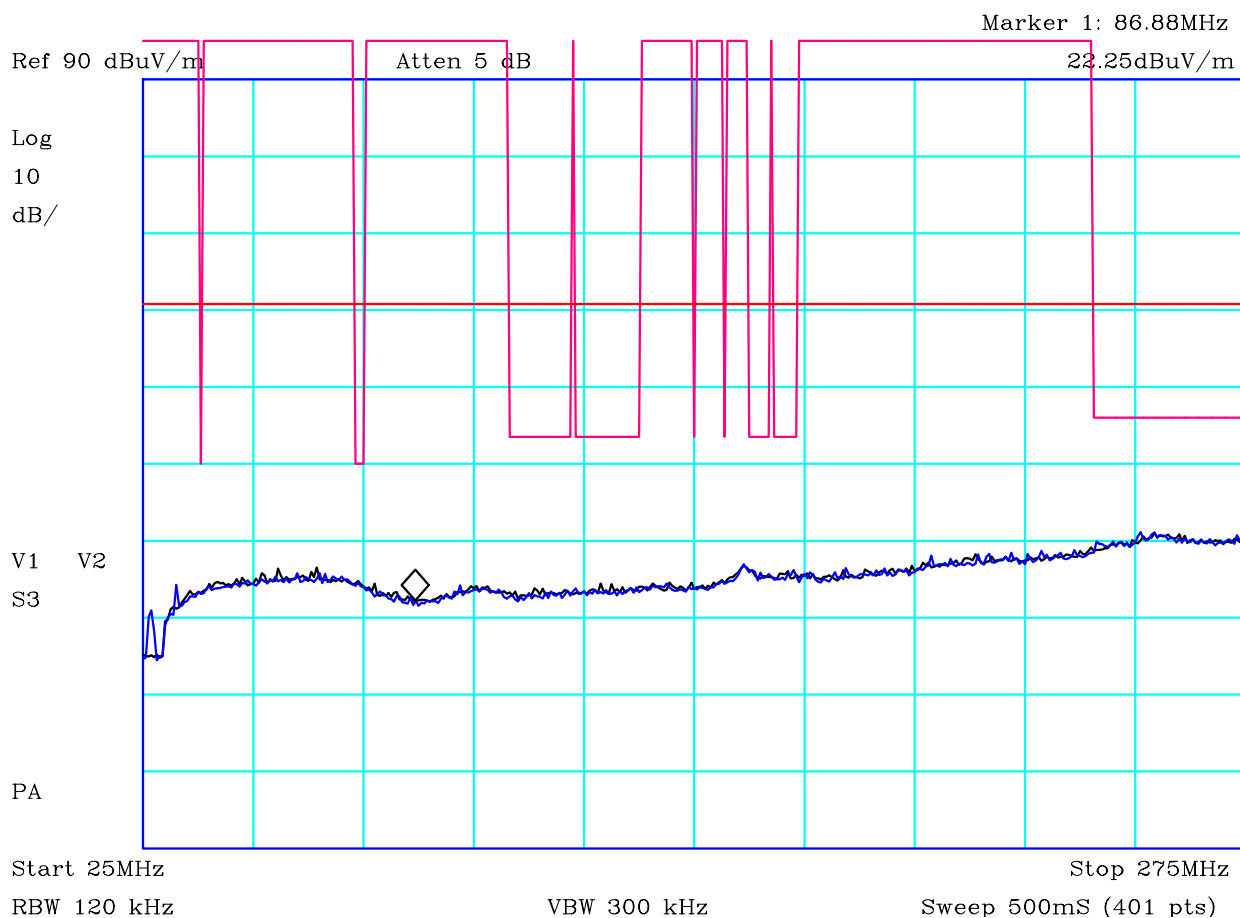
4.9 Bandwidth - 15.231(c)

Factor Set 1: A23_3m_10A PRE7_CBL052_CBL093_11A RFF11_10A -
Factor Set 2: - - - -
Factor Set 3: - - - -
Test Equipment: R8 A23 PRE7

Radiated Emissions

Company: Quatro Electronics Ltd		Product: External PIR	
Date: 10/02/2012		Test Eng: Dave Smith	
Ports:			
Test: ANSI C63.4:2003		using limits of 15.231(c)	
Ports:			
Test:		using limits of	
Notes	Comments and Observations		
	<p>The bandwidth must not exceed 0.25% of operating frequency.</p> <p>In this case, as the operating frequency is 434.475MHz, the maximum allowable bandwidth is 1.09MHz Plots 21 to 24 show emissions measurements over this band.</p> <p>The bandwidth is defined at points 20dB down from the carrier.</p> <p>The following bandwidths were measured:</p> <p>BX unit: 41kHz</p> <p>HX40 unit: 41kHz</p> <p>HX80 unit: 41kHz</p> <p>VX unit: 41kHz</p> <p>This is significantly below the maximum permitted bandwidth of 1.09MHz.</p> <p>PASS</p>		


	Report No: R3055	FCC ID: XL8EXTPIR1501	
	Issue No: 1		
	Test No: T4200	Test Report	Page: 22 of 45

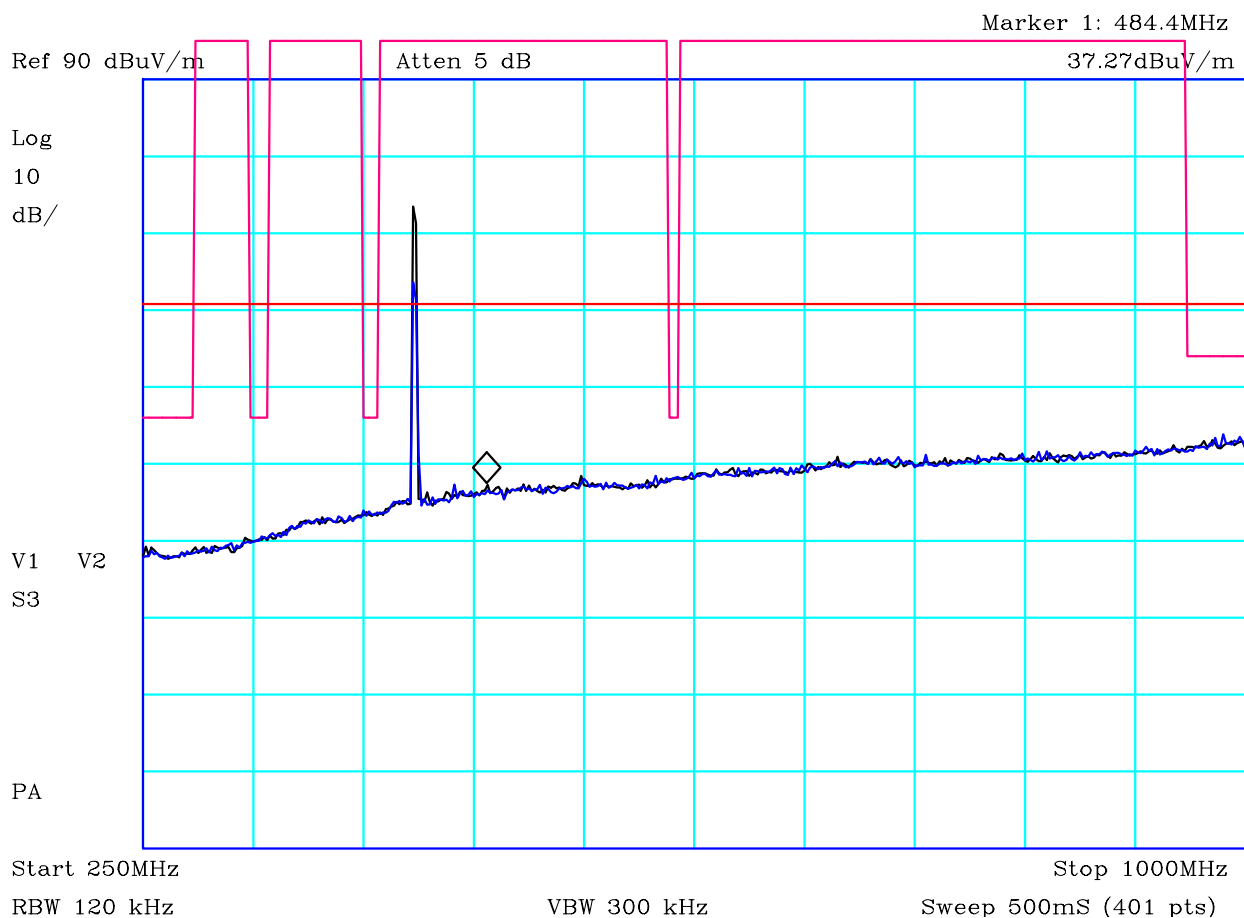


CF1:A24_3m_101116 CF4:CBL059_CBL018_CBL065_CBL060_100806

PLOT 1 Radiated Emissions - BX Unit - 25MHz to 275MHz

Company:	Quatro Electronics Ltd	Product:	BX
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	FCC Section 15.231	Method:	
Limit1:(VIO)	FCC Restricted Bands	Limit2:(RED)	15.231 @3m
Limit3:		Limit4:	
Op.Mode: Transmit Mode 434MHz. Setup: Max hold on both vertical and horizontal and with EUT mounted vertically Vertical Antenna Polarisation = Black Trace, Horizontal = Blue Trace.			
Facility:	Anech_2	Height	1.5m
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H211054F
		Mode:	1
		Modification State:	0


	Report No: R3055	FCC ID: XL8EXTPIR1501	
	Issue No: 1		
	Test No: T4200	Test Report	Page: 23 of 45

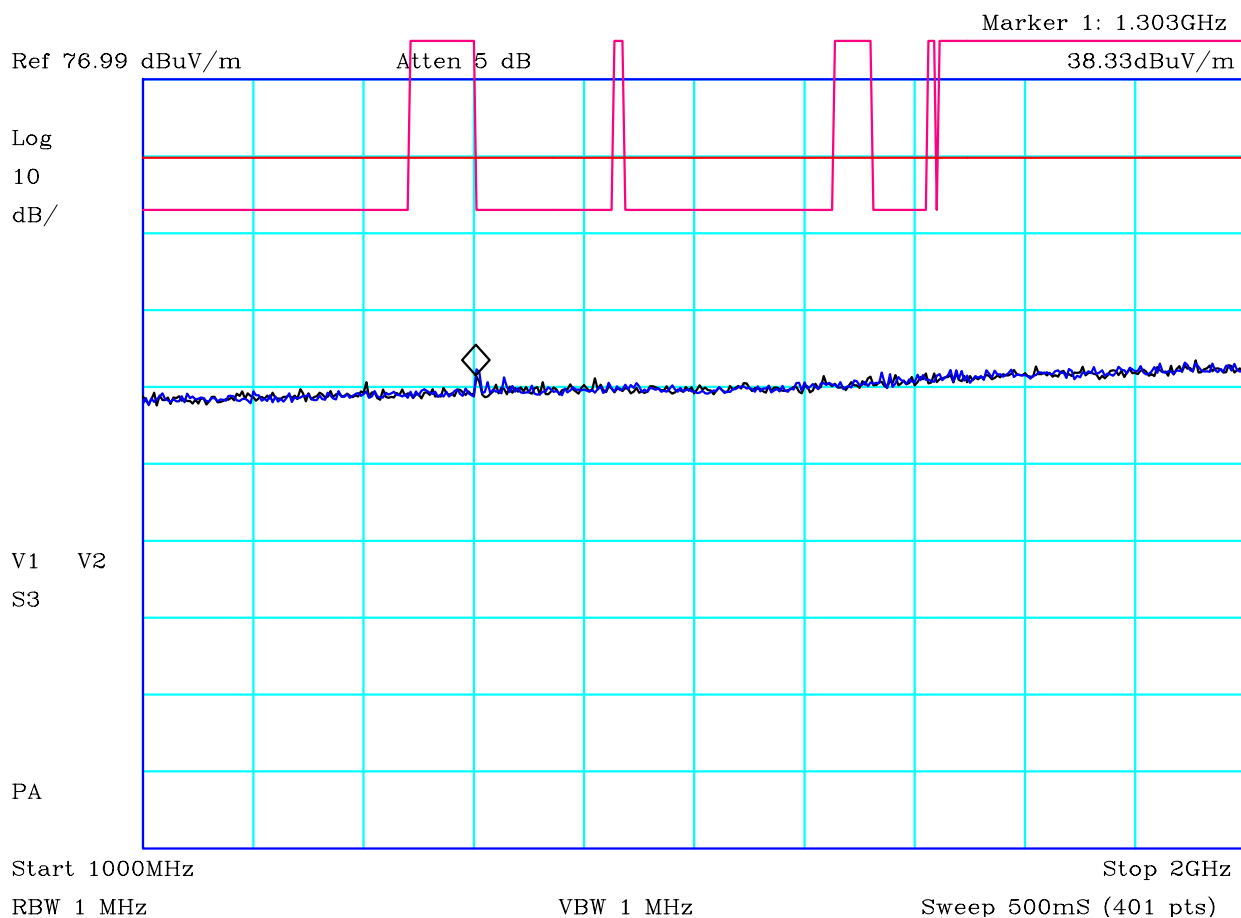


CF1:A24_3m_101116 CF4:CBL059_CBL018_CBL065_CBL060_100806

PLOT 2 Radiated Emissions - BX Unit - 250MHz to 1GHz

Company:	Quatro Electronics Ltd	Product:	BX
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	FCC Section 15.231	Method:	
Limit1:(VIO)	FCC Restricted Bands	Limit2:(RED)	15.231 @3m
Limit3:		Limit4:	
Op.Mode: Transmit Mode 434MHz. Setup: Max hold on both vertical and horizontal and with EUT mounted vertically Vertical Antenna Polarisation = Black Trace, Horizontal = Blue Trace.			
Facility:	Anech_2	Height	1.5m
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H2110565
		Mode:	1
		Modification State:	0

	Report No: R3055	FCC ID: XL8EXTPIR1501	
	Issue No: 1		
	Test No: T4200	Test Report	Page: 24 of 45



CF1:A23_3m_100806 CF2:PRE7_CBL052_CBL093_110112 CF3:RFF11_100806
CF4:CBL059_CBL018_CBL065_CBL060_100806


PLOT 3 Radiated Emissions - BX Unit - 1GHz to 2GHz

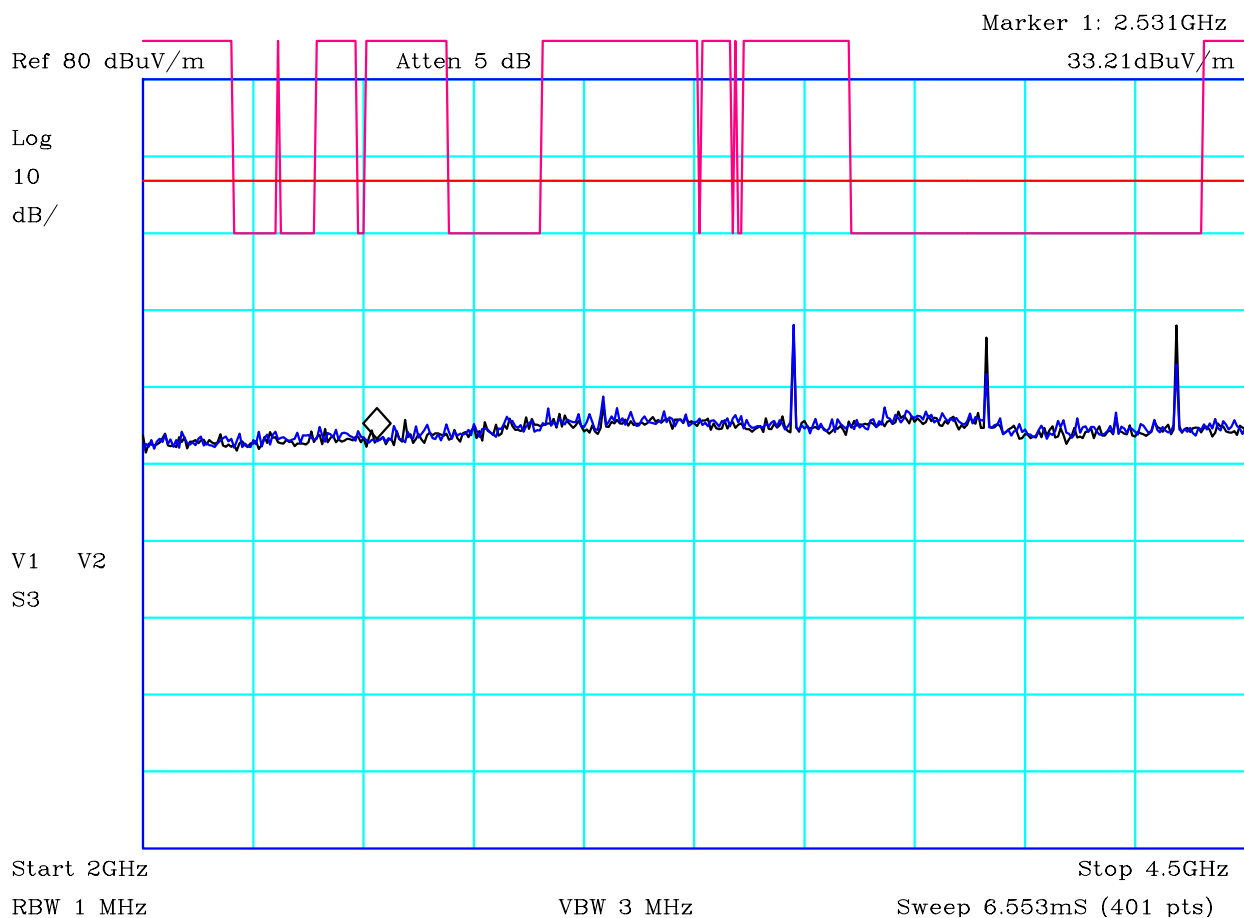
Company:	Quatro Electronics Ltd	Product:	BX
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	FCC Section 15.231	Method:	
Limit1:(VIO)	FCC Restricted Bands@1.5m	Limit2:(RED)	15.231@1.5m
Limit3:		Limit4:	

Op.Mode: Transmit Mode 434MHz.

Vertical Antenna Polarisation = Black Trace, Horizontal = Blue Trace.

Facility:	Anech_2	Height	1.4m	Mode:	1
Distance	1.5m	Polarisation	V+H	Modification State:	0
Angle	0-360	File:	H2110698		

	Report No: R3055	FCC ID: XL8EXTPIR1501	
	Issue No: 1		
	Test No: T4200	Test Report	Page: 25 of 45



CF1:A23_3m_100806 CF2:PRE7_CBL052_CBL093_110112 CF3:RFF11_100806


PLOT 4 Radiated Emissions - BX Unit - 2GHz to 4.5GHz

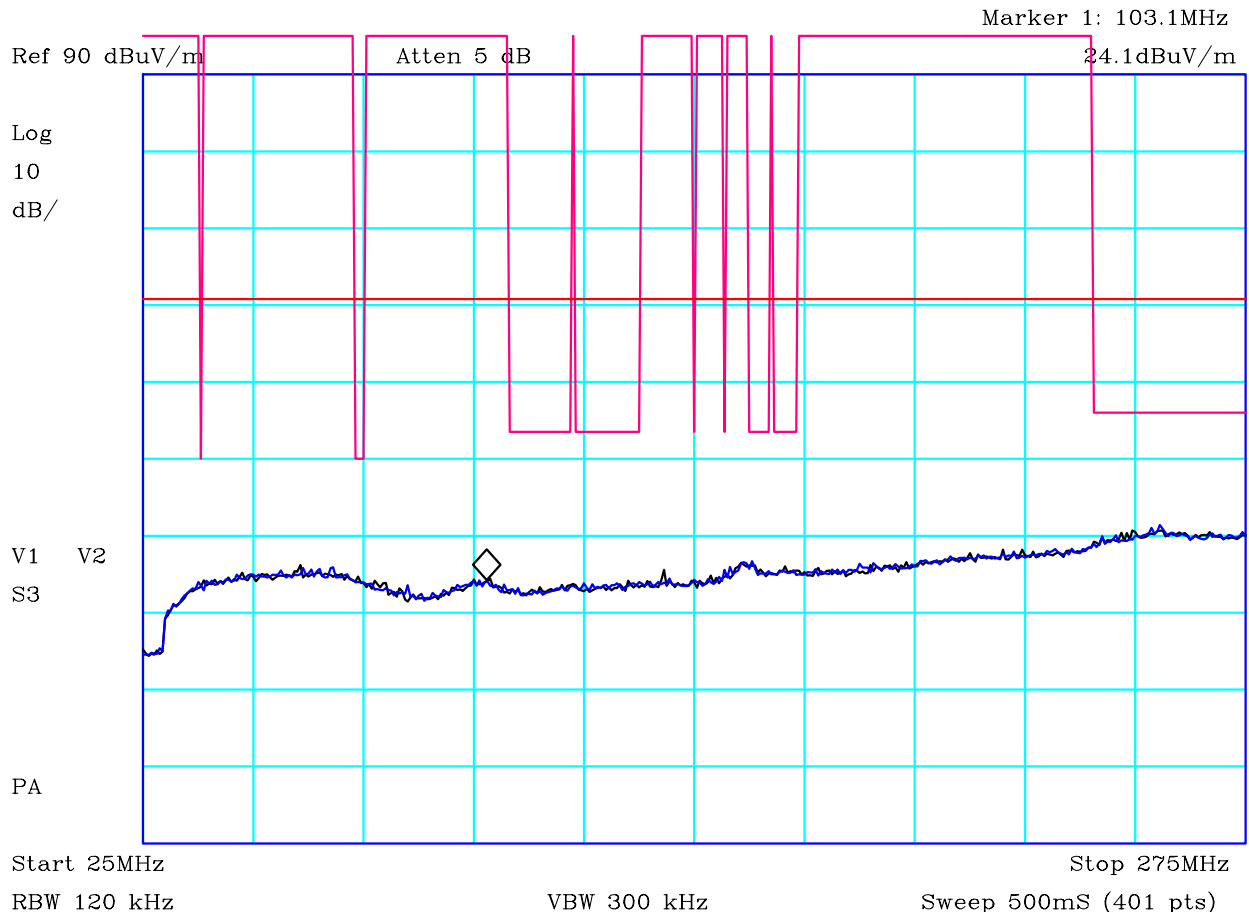
Company:	Quatro Electronics Ltd	Product:	BX
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	FCC Section 15.231	Method:	
Limit1:(VIO)	FCC Restricted Bands@1.5m	Limit2:(RED)	15.231@1.5m
Limit3:		Limit4:	

Op.Mode: Transmit Mode 434MHz.

Vertical Antenna Polarisation = Black Trace, Horizontal = Blue Trace.

Facility:	Anech_2	Height	1.4m	Mode:	1
Distance	1.5m	Polarisation	V+H	Modification State:	0
Angle	0-360	File:	H2110752		


	Report No: R3055	FCC ID: XL8EXTPIR1501	
	Issue No: 1		
	Test No: T4200	Test Report	Page: 26 of 45

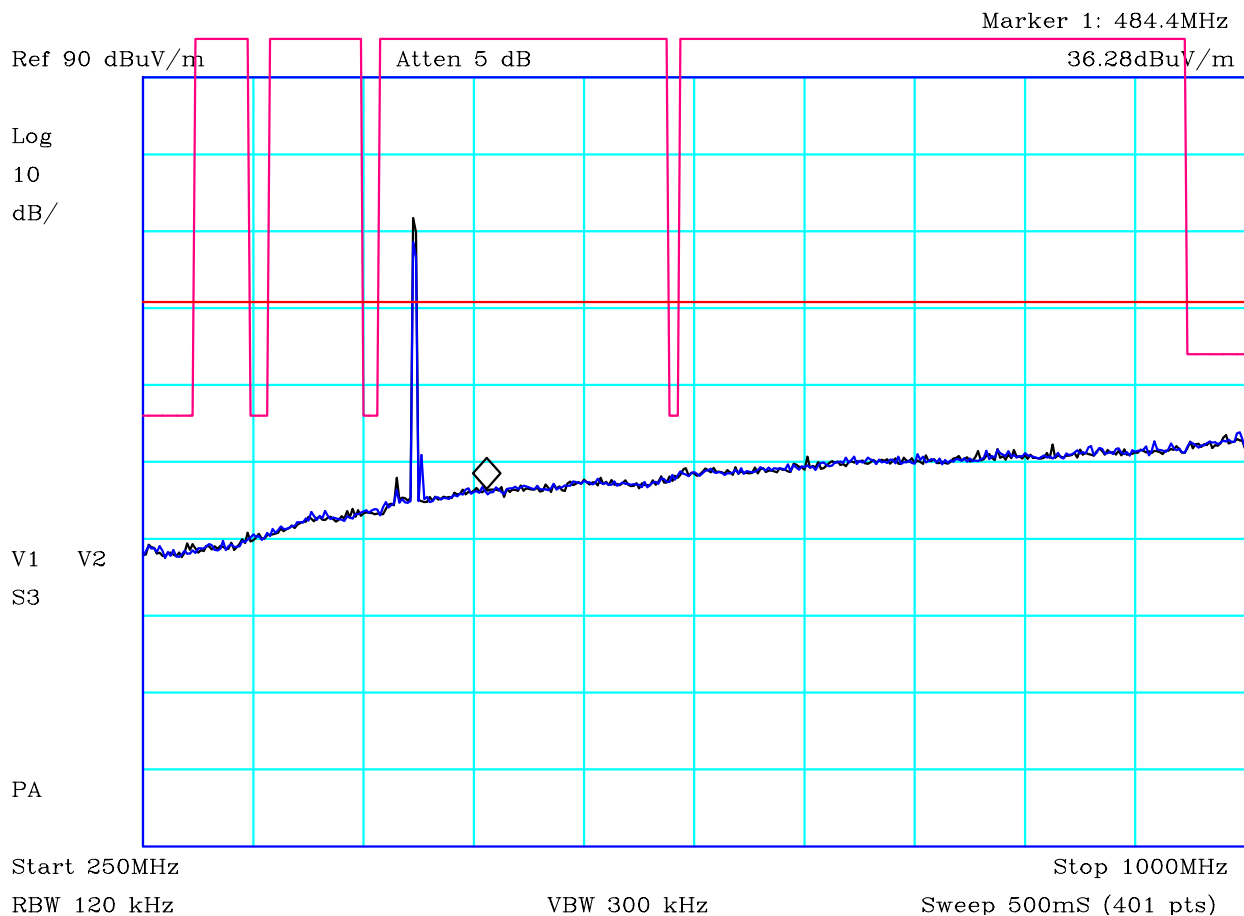


CF1:A24_3m_101116 CF4:CBL059_CBL018_CBL065_CBL060_100806

PLOT 5 Radiated Emissions - HX40 Unit - 25MHz to 275MHz

Company:	Quatro Electronics Ltd	Product:	Hx40
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	FCC Section 15.231	Method:	
Limit1:(VIO)	FCC Restricted Bands	Limit2:(RED)	15.231 @3m
Limit3:		Limit4:	
Op.Mode: Transmit Mode 434MHz. Setup: Max hold on both vertical and horizontal and with EUT mounted vertically Vertical Antenna Polarisation = Black Trace, Horizontal = Blue Trace.			
Facility:	Anech_2	Height	1.5m
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H211057A
		Mode:	1
		Modification State:	0


	Report No: R3055	FCC ID: XL8EXTPIR1501	
	Issue No: 1		
	Test No: T4200	Test Report	Page: 27 of 45

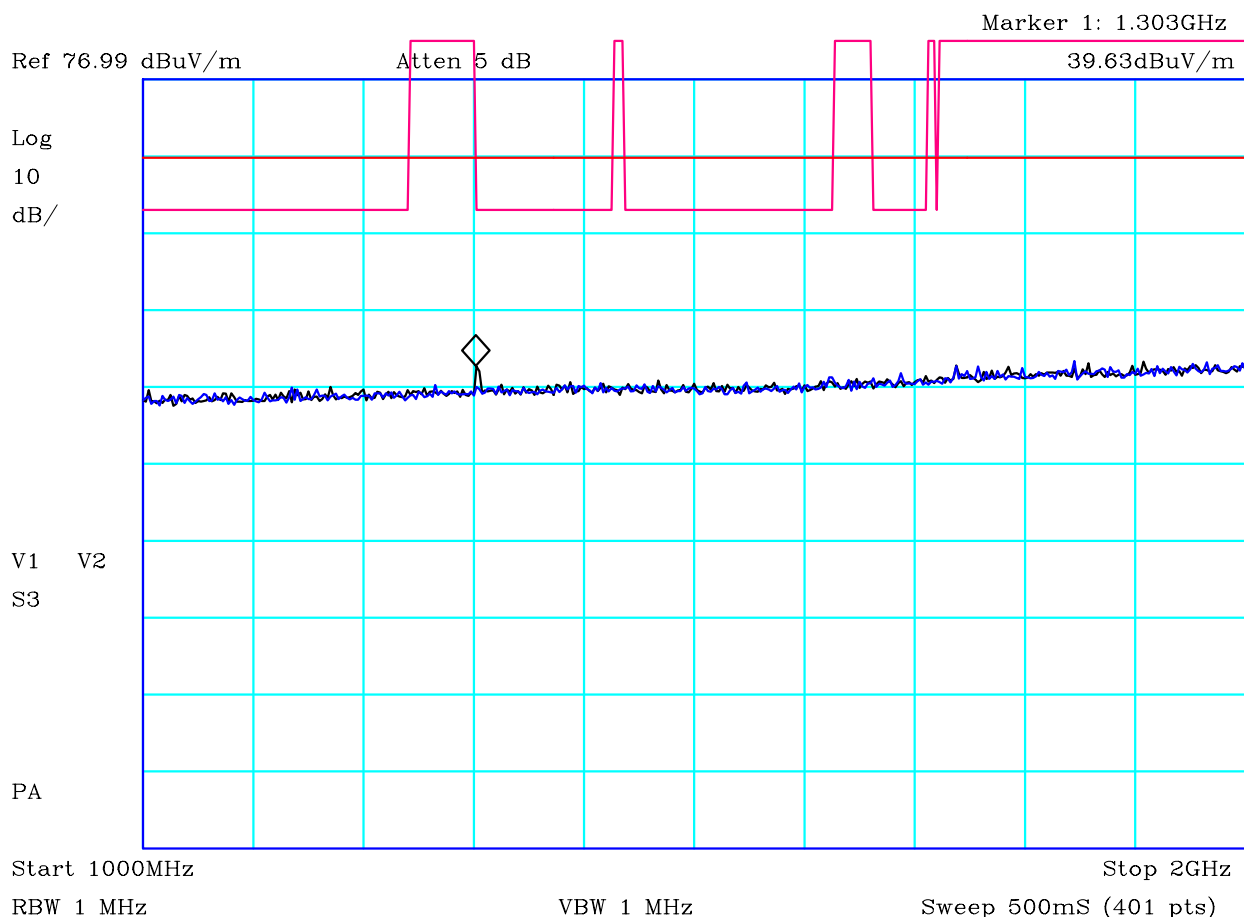


CF1:A24_3m_101116 CF4:CBL059_CBL018_CBL065_CBL060_100806

PLOT 6 Radiated Emissions - HX40 Unit - 250MHz to 1GHz

Company:	Quatro Electronics Ltd	Product:	Hx40
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	FCC Section 15.231	Method:	
Limit1:(VIO)	FCC Restricted Bands	Limit2:(RED)	15.231 @3m
Limit3:		Limit4:	
Op.Mode: Transmit Mode 434MHz.			
Setup: Max hold on both vertical and horizontal and with EUT mounted vertically			
Vertical Antenna Polarisation = Black Trace, Horizontal = Blue Trace.			
Facility:	Anech_2	Height	1.5m
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H2110571
		Mode:	1
		Modification State:	0


	Report No: R3055	FCC ID: XL8EXTPIR1501	
	Issue No: 1		
	Test No: T4200	Test Report	Page: 28 of 45

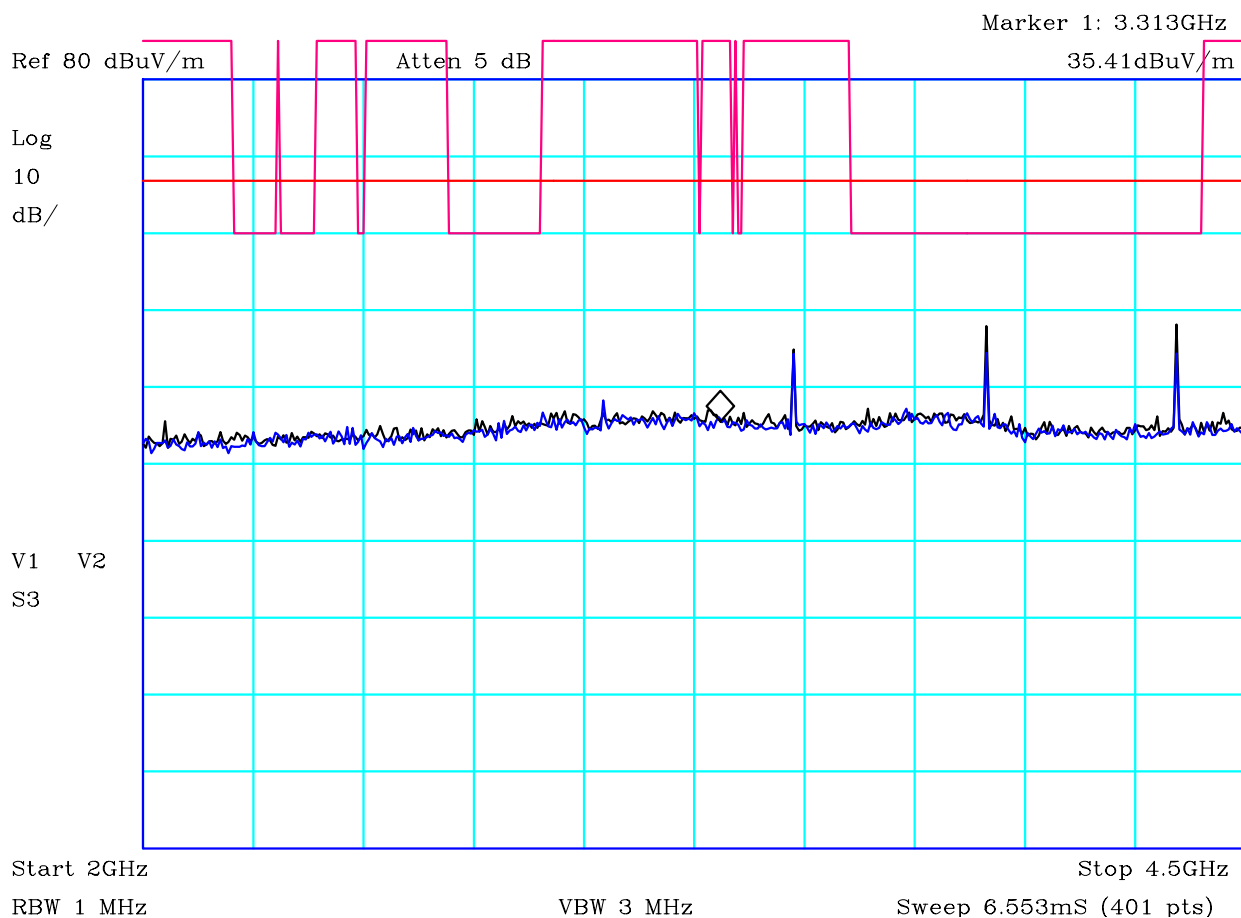


CF1:A23_3m_100806 CF2:PRE7_CBL052_CBL093_110112 CF3:RFF11_100806
CF4:CBL059_CBL018_CBL065_CBL060_100806

PLOT 7 Radiated Emissions - HX40 Unit - 1GHz to 2GHz

Company:	Quatro Electronics Ltd	Product:	HX40
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	FCC Section 15.231	Method:	
Limit1:(VIO)	FCC Restricted Bands@1.5m	Limit2:(RED)	15.231@1.5m
Limit3:		Limit4:	
Op.Mode: Transmit Mode 434MHz.			
Vertical Antenna Polarisation = Black Trace, Horizontal = Blue Trace.			
Facility:	Anech_2	Height	1.4m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H21106A0
		Mode:	1
		Modification State:	0


	Report No: R3055	FCC ID: XL8EXTPIR1501	
	Issue No: 1		
	Test No: T4200	Test Report	Page: 29 of 45

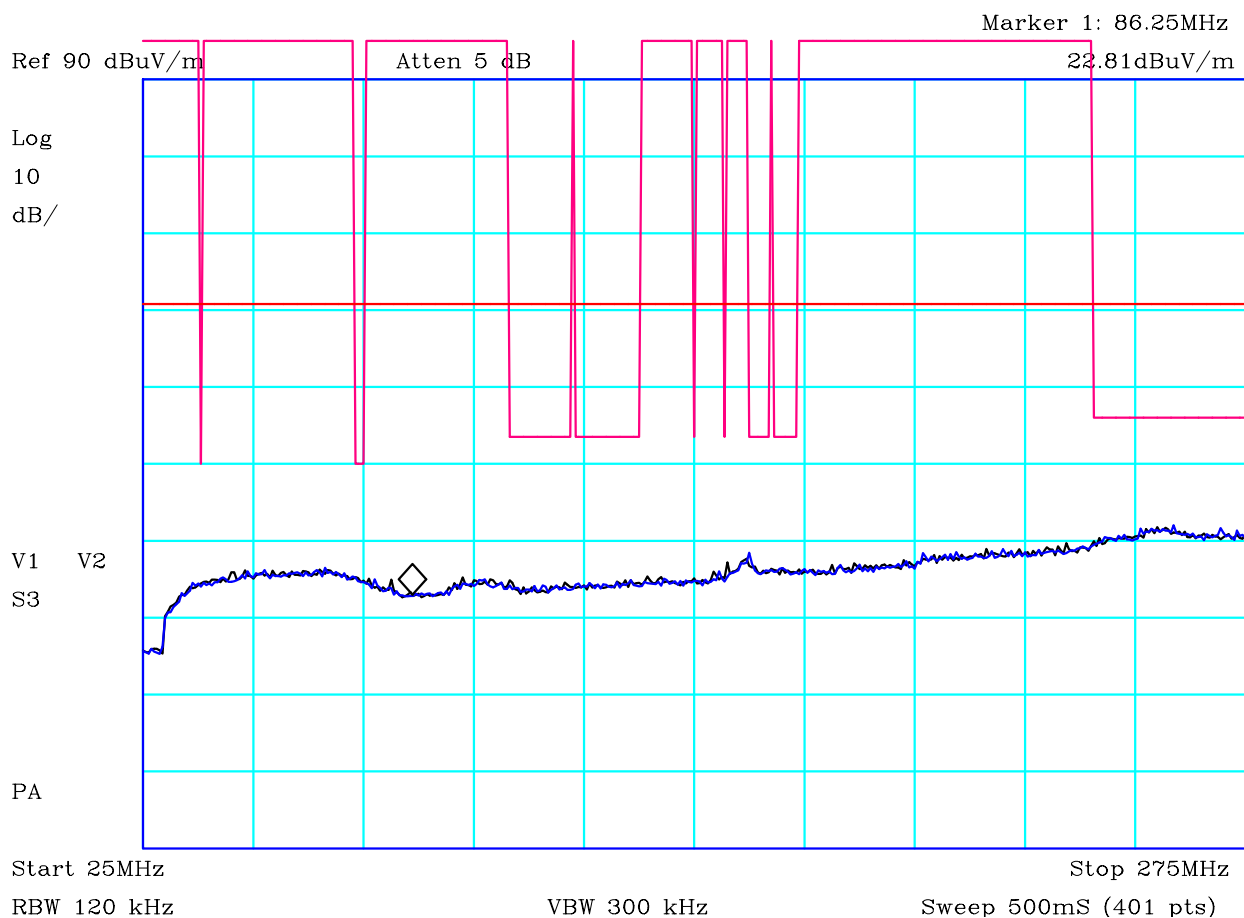


CF1:A23_3m_100806 CF2:PRE7_CBL052_CBL093_110112 CF3:RFF11_100806

PLOT 8 Radiated Emissions - HX40 Unit - 2GHz to 4.5GHz

Company:	Quatro Electronics Ltd	Product:	HX40
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	FCC Section 15.231	Method:	
Limit1:(VIO)	FCC Restricted Bands@1.5m	Limit2:(RED)	15.231@1.5m
Limit3:		Limit4:	
Op.Mode: Transmit Mode 434MHz.			
Vertical Antenna Polarisation = Black Trace, Horizontal = Blue Trace.			
Facility:	Anech_2	Height	1.4m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H21106FC
		Mode:	1
		Modification State:	0

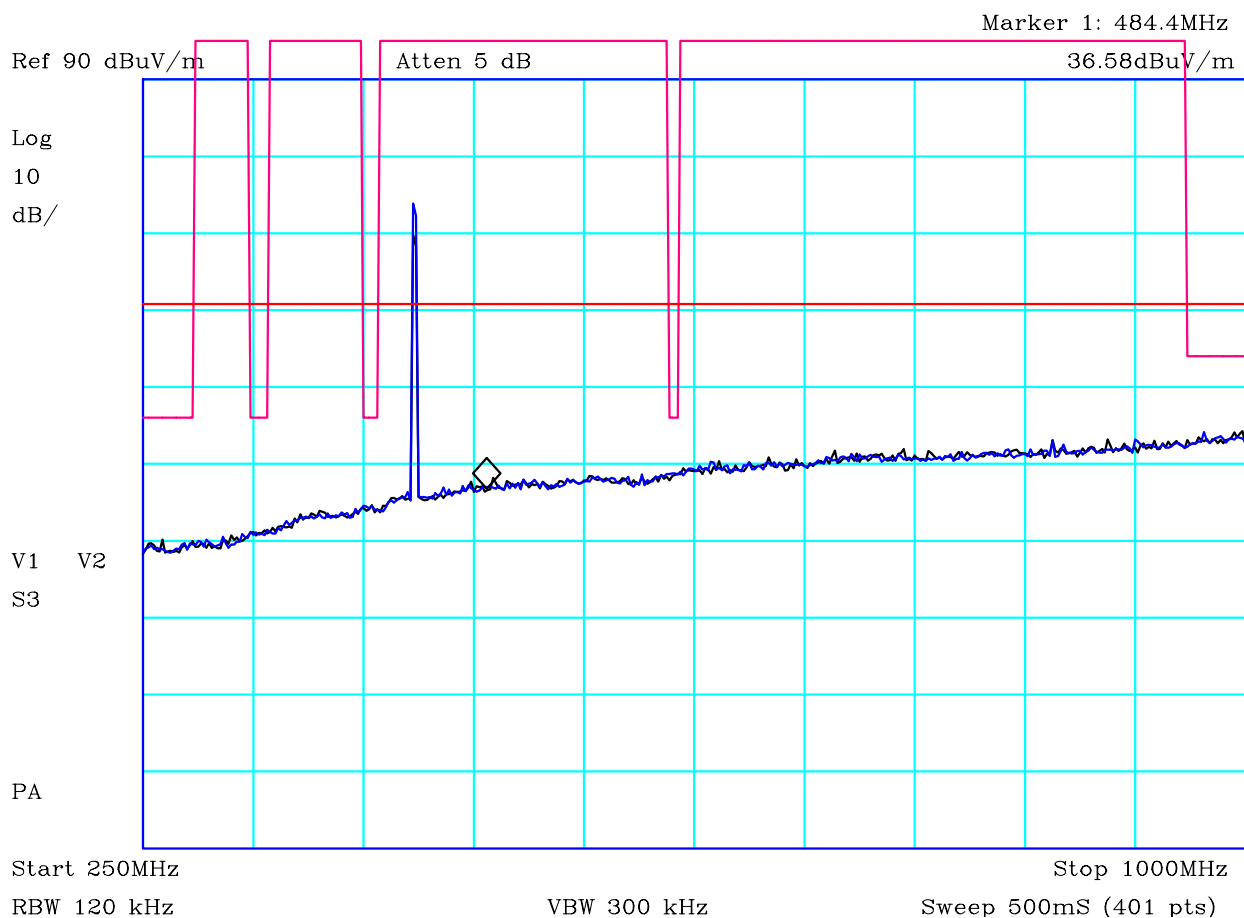
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	Issue No: 1		
	Test No: T4200	Test Report	Page: 30 of 45



CF1:A24_3m_101116 CF4:CBL059_CBL018_CBL065_CBL060_100806

PLOT 9 Radiated Emissions - HX80 Unit - 25MHz to 275MHz


Company:	Quatro Electronics Ltd	Product:	Hx80
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	FCC Section 15.231	Method:	
Limit1:(VIO)	FCC Restricted Bands	Limit2:(RED)	15.231 @3m
Limit3:		Limit4:	
Op.Mode: Transmit Mode 434MHz. Setup: Max hold on both vertical and horizontal and with EUT mounted vertically Vertical Antenna Polarisation = Black Trace, Horizontal = Blue Trace.			
Facility:	Anech_2	Height	1.5m
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H211058F
		Mode:	1
		Modification State:	0

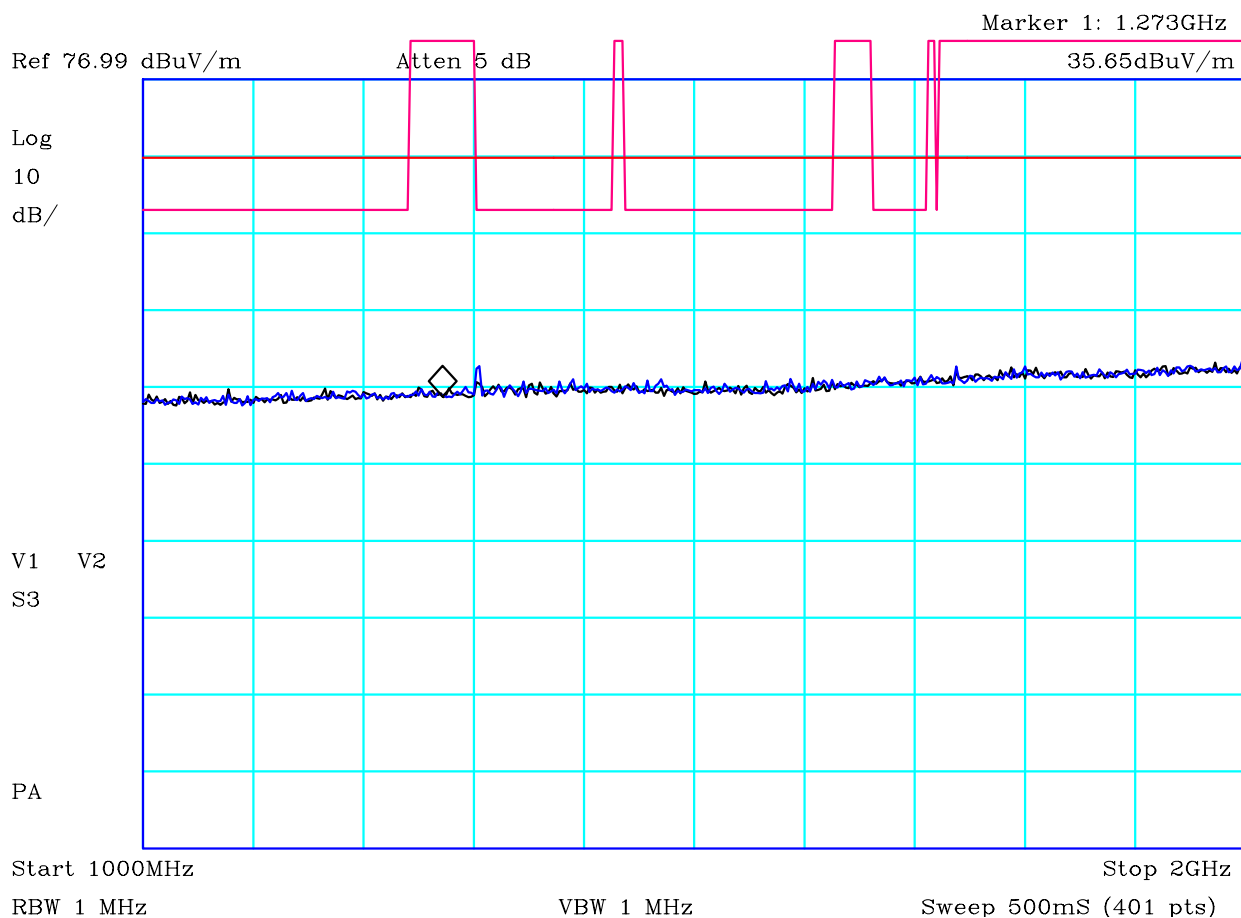


CF1:A24_3m_101116 CF4:CBL059_CBL018_CBL065_CBL060_100806

PLOT 10 Radiated Emissions - HX80 Unit - 250MHz to 1GHz

Company:	Quatro Electronics Ltd	Product:	Hx80
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	FCC Section 15.231	Method:	
Limit1:(VIO)	FCC Restricted Bands	Limit2:(RED)	15.231 @3m
Limit3:		Limit4:	
Op.Mode: Transmit Mode 434MHz.			
Setup: Max hold on both vertical and horizontal and with EUT mounted vertically			
Vertical Antenna Polarisation = Black Trace, Horizontal = Blue Trace.			
Facility:	Anech_2	Height	1.5m
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H211058A
		Mode:	1
		Modification State:	0


	Report No: R3055	FCC ID: XL8EXTPIR1501	
	Issue No: 1		
	Test No: T4200	Test Report	Page: 32 of 45

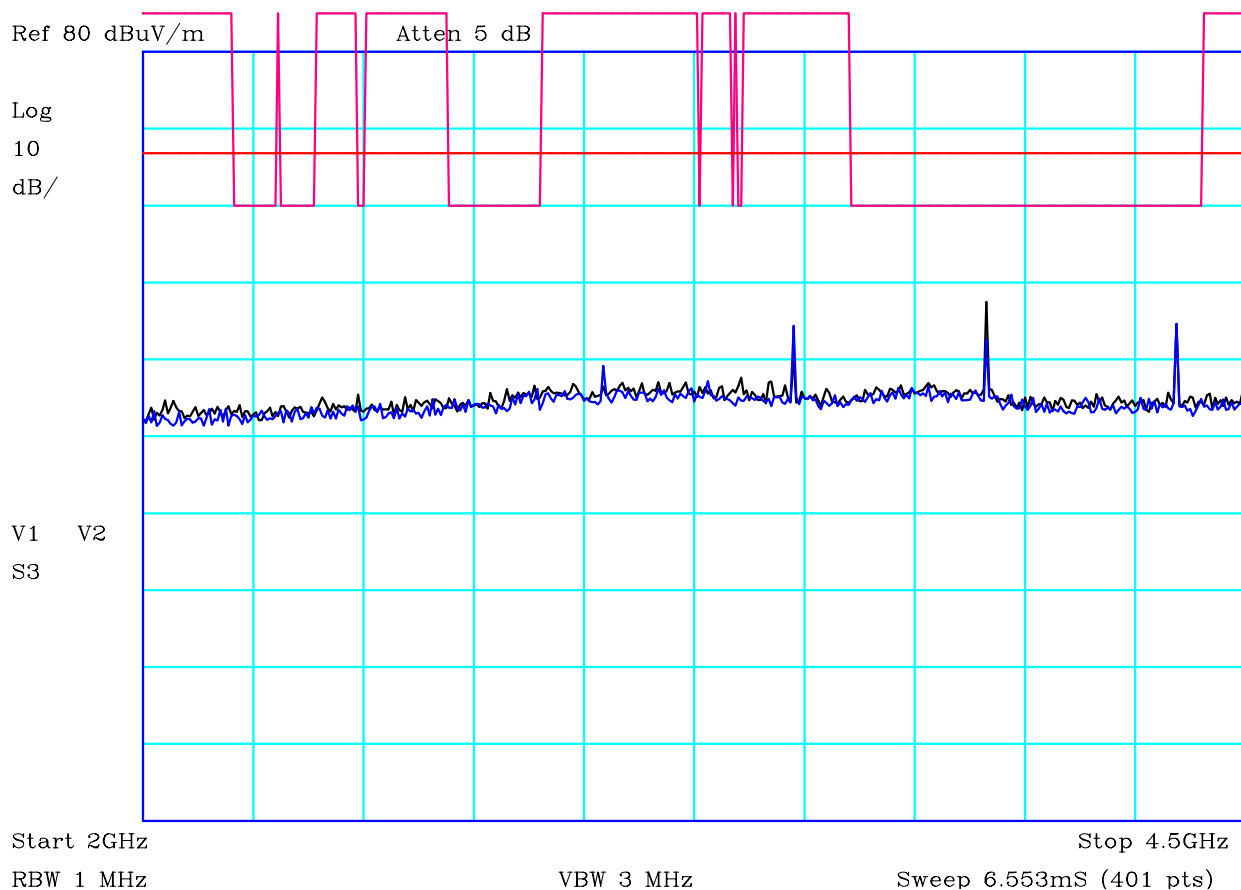


CF1:A23_3m_100806 CF2:PRE7_CBL052_CBL093_110112 CF3:RFF11_100806
CF4:CBL059_CBL018_CBL065_CBL060_100806

PLOT 11 Radiated Emissions - HX80 Unit - 1GHz to 2GHz

Company:	Quatro Electronics Ltd	Product:	HX80
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	FCC Section 15.231	Method:	
Limit1:(VIO)	FCC Restricted Bands@1.5m	Limit2:(RED)	15.231@1.5m
Limit3:		Limit4:	
Op.Mode: Transmit Mode 434MHz.			
Vertical Antenna Polarisation = Black Trace, Horizontal = Blue Trace.			
Facility:	Anech_2	Height	1.4m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H21106A9
		Mode:	1
		Modification State:	0


	Report No: R3055	FCC ID: XL8EXTPIR1501	
	Issue No: 1		
	Test No: T4200	Test Report	Page: 33 of 45

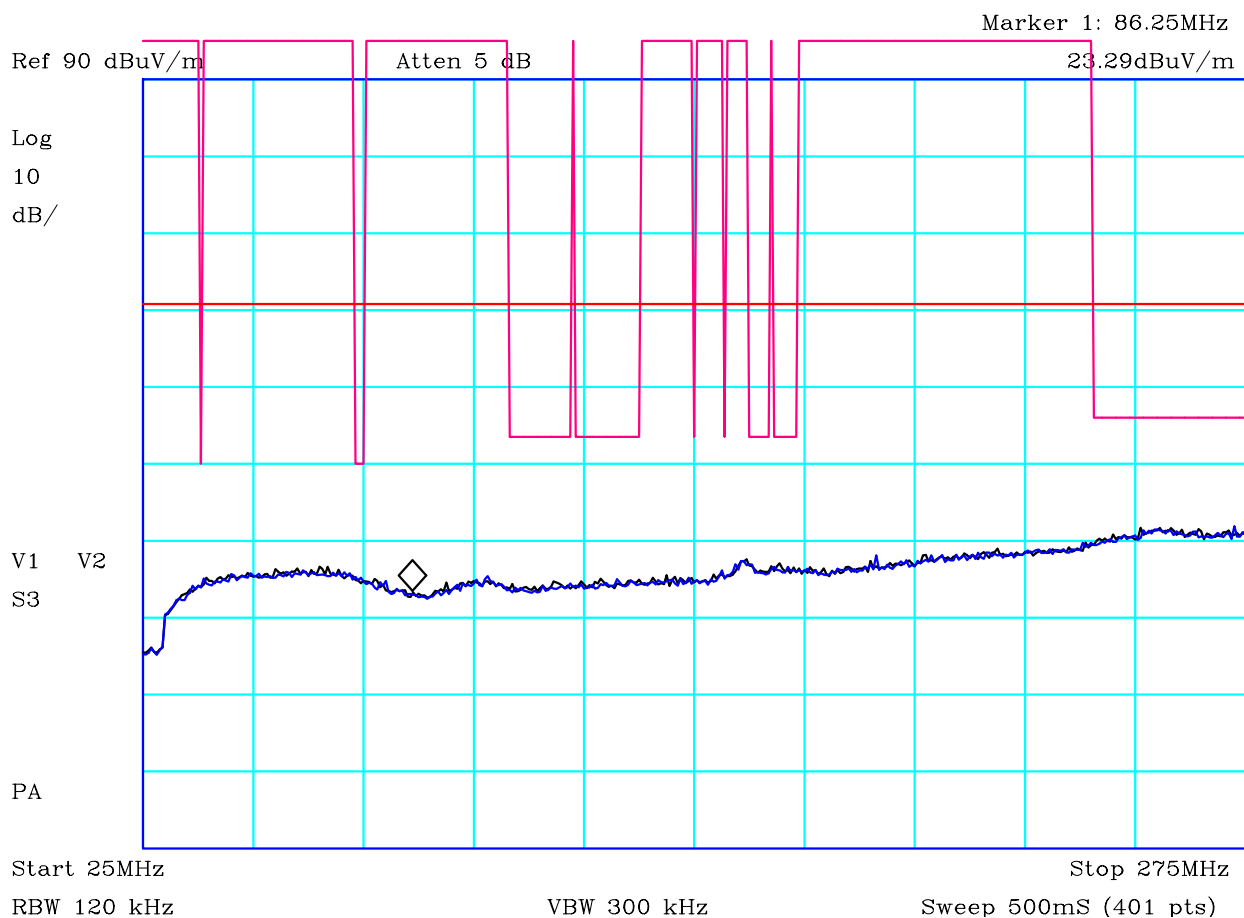


CF1:A23_3m_100806 CF2:PRE7_CBL052_CBL093_110112 CF3:RFF11_100806

PLOT 12 Radiated Emissions - HX80 Unit - 2GHz to 4.5GHz

Company:	Quatro Electronics Ltd	Product:	HX80
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	FCC Section 15.231	Method:	
Limit1:(VIO)	FCC Restricted Bands@1.5m	Limit2:(RED)	15.231@1.5m
Limit3:		Limit4:	
Op.Mode: Transmit Mode 434MHz.			
Vertical Antenna Polarisation = Black Trace, Horizontal = Blue Trace.			
Facility:	Anech_2	Height	1.4m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H21106D0
		Mode:	1
		Modification State:	0

	Report No: R3055	FCC ID: XL8EXTPIR1501	
	Issue No: 1		
	Test No: T4200	Test Report	Page: 34 of 45



CF1:A24_3m_101116 CF4:CBL059_CBL018_CBL065_CBL060_100806

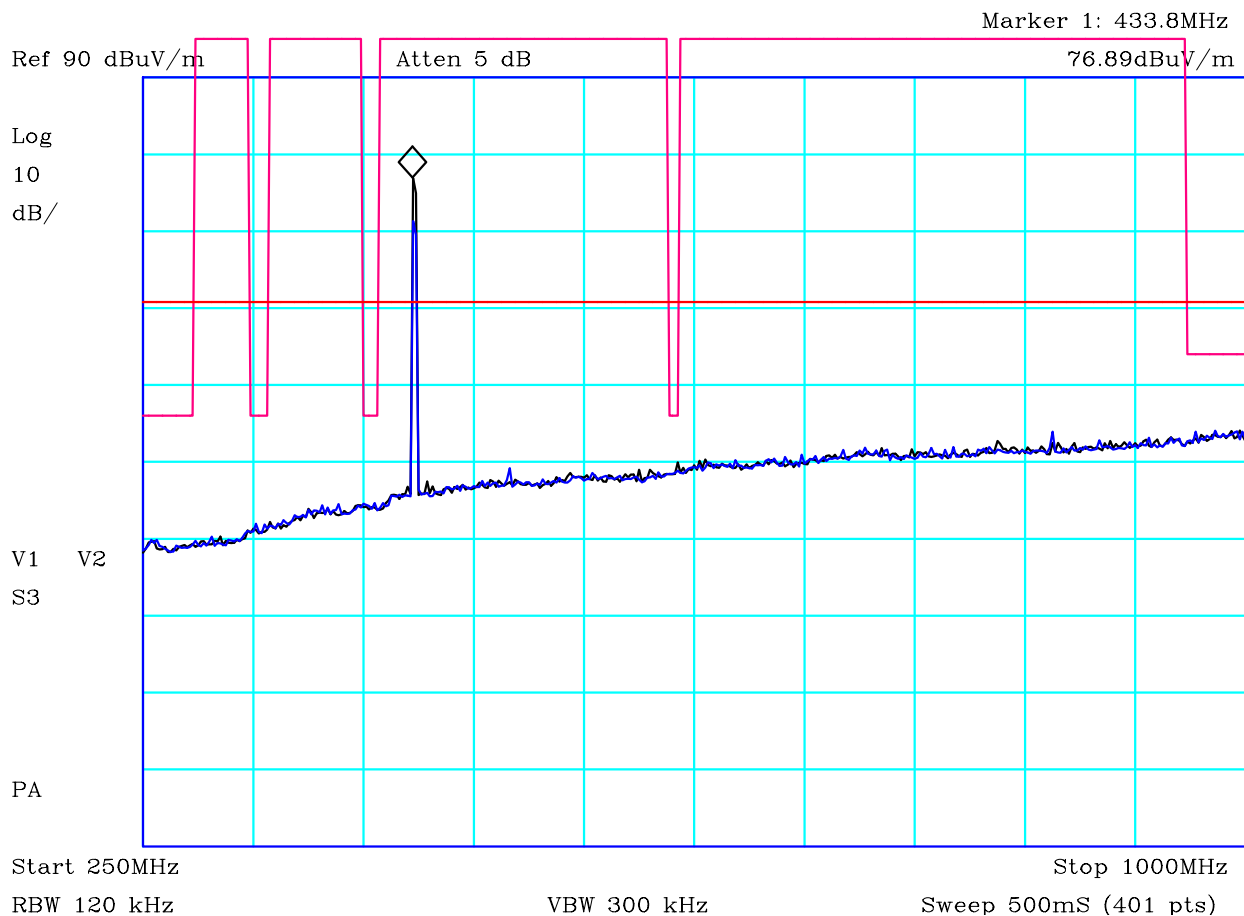
PLOT 13 Radiated Emissions - VX Unit - 25MHz to 275MHz

Company:	Quatro Electronics Ltd	Product:	VX
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	FCC Section 15.231	Method:	
Limit1:(VIO)	FCC Restricted Bands	Limit2:(RED)	15.231 @3m
Limit3:		Limit4:	

Op.Mode: Transmit Mode 434MHz.
Setup: Max hold on both vertical and horizontal and with EUT mounted vertically

Vertical Antenna Polarisation = Black Trace, Horizontal = Blue Trace.


Facility:	Anech_2	Height	1.5m	Mode:	1
Distance	3m	Polarisation	V+H	Modification State:	0
Angle	0-360	File:	H211059E		

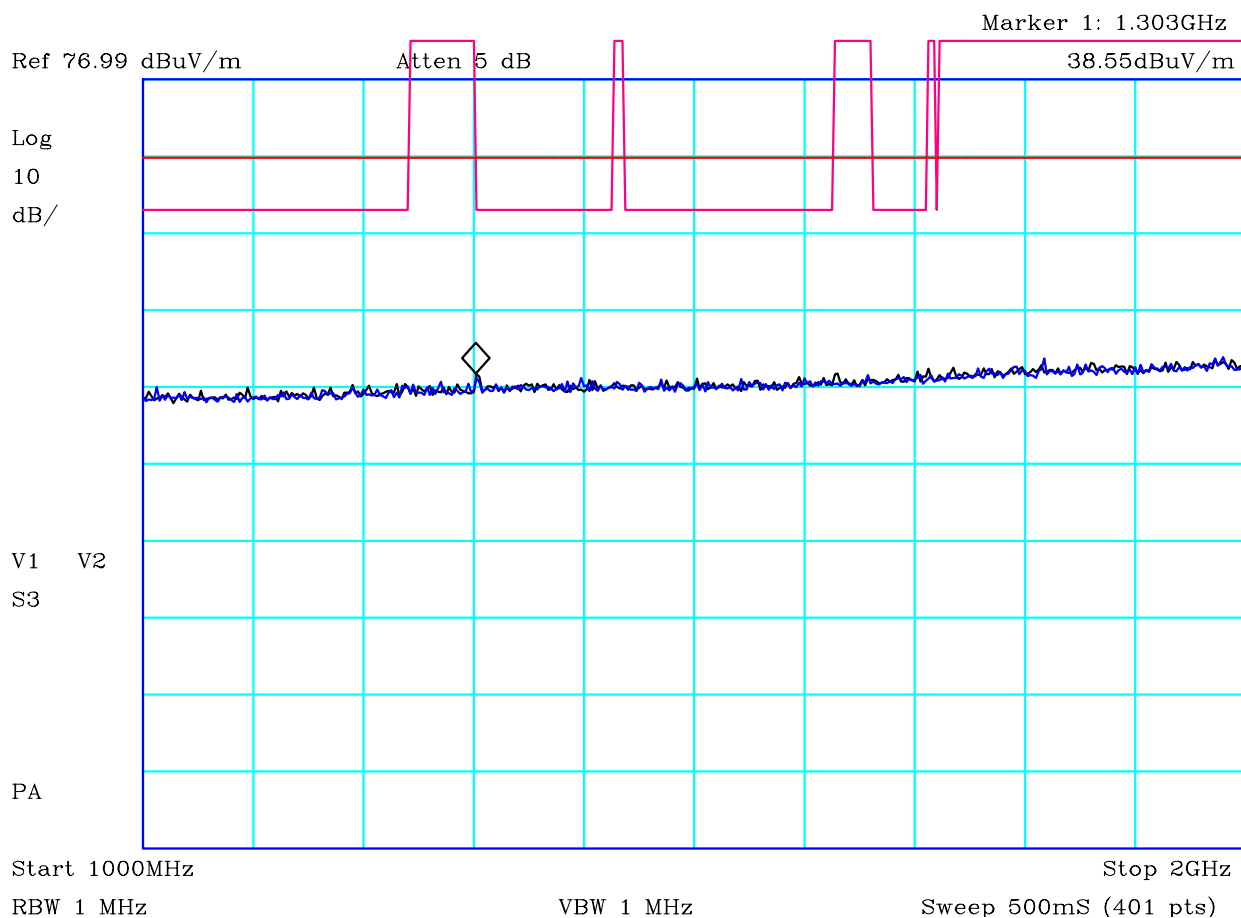


CF1:A24_3m_101116 CF4:CBL059_CBL018_CBL065_CBL060_100806

PLOT 14 Radiated Emissions - VX Unit - 250MHz to 1GHz

Company:	Quatro Electronics Ltd	Product:	VX
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	FCC Section 15.231	Method:	
Limit1:(VIO)	FCC Restricted Bands	Limit2:(RED)	15.231 @3m
Limit3:		Limit4:	
Op.Mode: Transmit Mode 434MHz.			
Setup: Max hold on both vertical and horizontal and with EUT mounted vertically			
Vertical Antenna Polarisation = Black Trace, Horizontal = Blue Trace.			
Facility:	Anech_2	Height	1.5m
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H2110598
		Mode:	1
		Modification State:	0


	Report No: R3055	FCC ID: XL8EXTPIR1501	
	Issue No: 1		
	Test No: T4200	Test Report	Page: 36 of 45



CF1:A23_3m_100806 CF2:PRE7_CBL052_CBL093_110112 CF3:RFF11_100806
CF4:CBL059_CBL018_CBL065_CBL060_100806

PLOT 15 Radiated Emissions - VX Unit - 1GHz to 2GHz

Company:	Quatro Electronics Ltd	Product:	VX
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	FCC Section 15.231	Method:	
Limit1:(VIO)	FCC Restricted Bands@1.5m	Limit2:(RED)	15.231@1.5m
Limit3:		Limit4:	
Op.Mode: Transmit Mode 434MHz.			
Vertical Antenna Polarisation = Black Trace, Horizontal = Blue Trace.			
Facility:	Anech_2	Height	1.4m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H2110691
		Mode:	1
		Modification State:	0


	Report No: R3055	FCC ID: XL8EXTPIR1501	
	Issue No: 1		
	Test No: T4200	Test Report	Page: 37 of 45

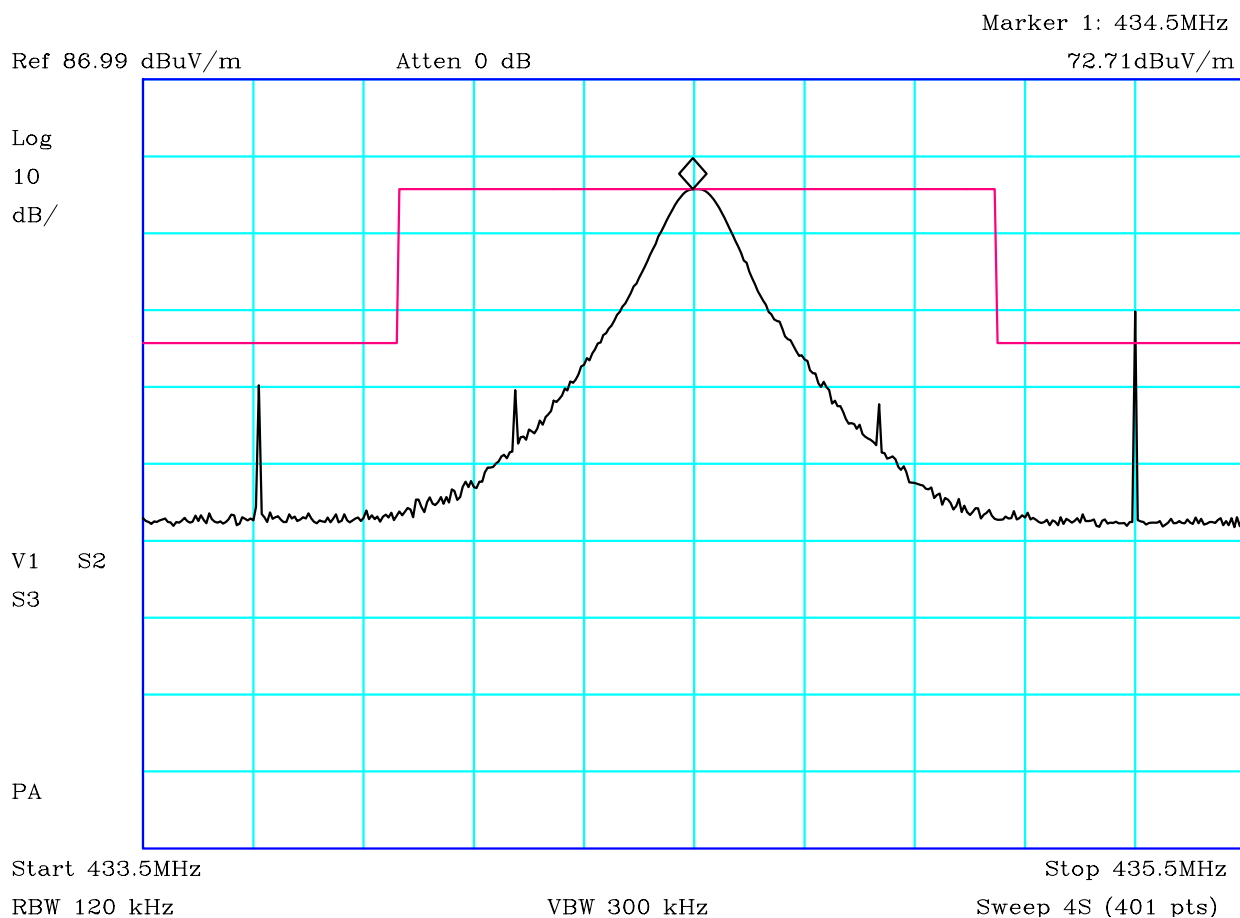


CF1:A23_3m_100806 CF2:PRE7_CBL052_CBL093_110112 CF3:RFF11_100806

PLOT 16 Radiated Emissions - VX Unit - 2GHz to 4.5GHz

Company:	Quatro Electronics Ltd	Product:	VX
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	FCC Section 15.231	Method:	
Limit1:(VIO)	FCC Restricted Bands@1.5m	Limit2:(RED)	15.231@1.5m
Limit3:		Limit4:	
Op.Mode: Transmit Mode 434MHz.			
Vertical Antenna Polarisation = Black Trace, Horizontal = Blue Trace.			
Facility:	Anech_2	Height	1.4m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H2110762
		Mode:	1
		Modification State:	0

	Report No: R3055	FCC ID: XL8EXTPIR1501	
	Issue No: 1		
	Test No: T4200	Test Report	Page: 38 of 45




CF1:A24_3m_101116 CF2:CBL059_CBL062_CBL065_CBL060_090306

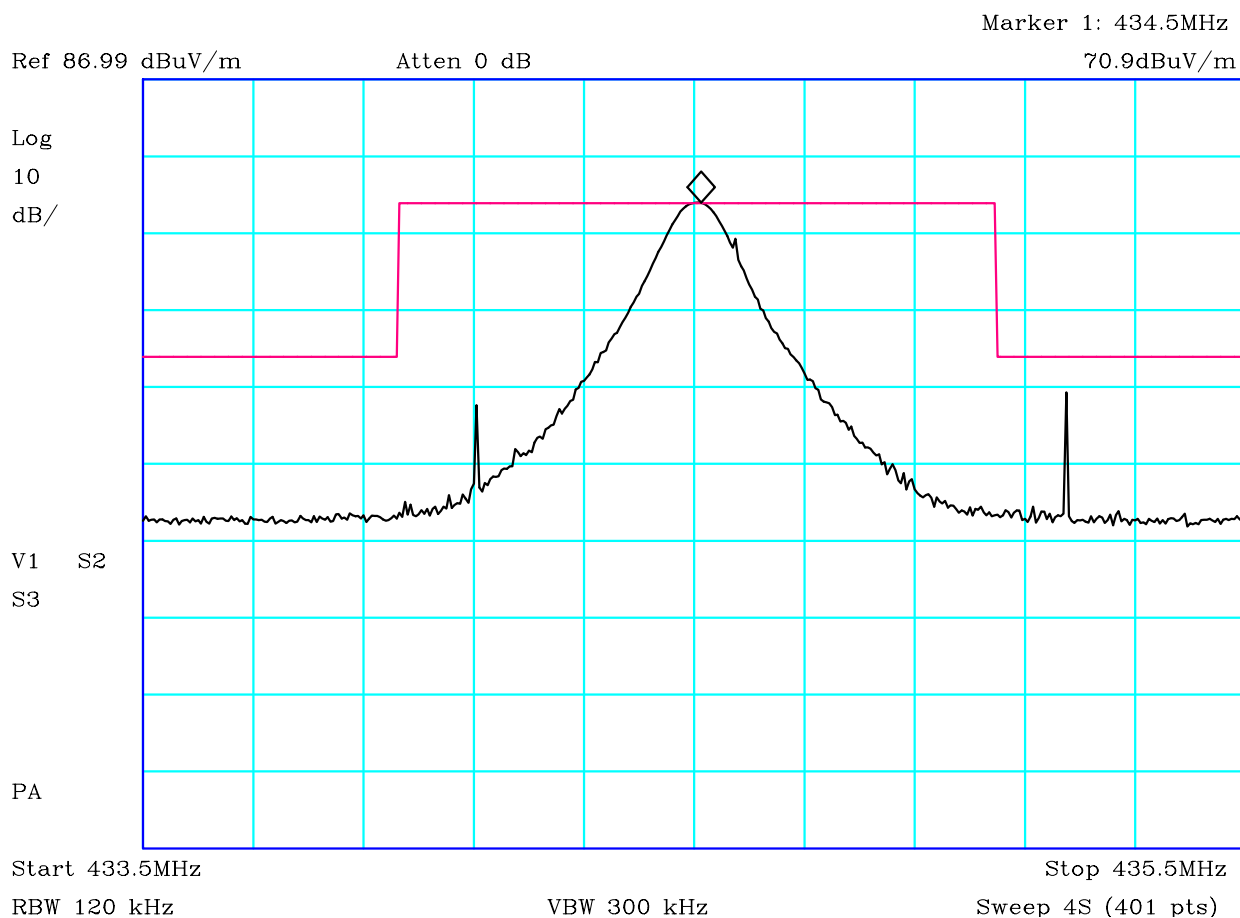
PLOT 17 Radiated Emissions - Band Edges - BX Unit

Company:	Quatro	Product:	BX
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	-20dBc ($\pm 0.125\%$ carrier)	Limit2:	
Limit3:		Limit4:	
Facility:	Anech_2	Height	1.5m
Distance	3m	Polarisation	V
Angle		File:	H21105FB
Mode:	1	Modification State:	1

The band edges were assumed to be the maximum occupied band limits i.e. width = 0.25% of operating frequency. The limit shown is the carrier limit within the allowed occupied band (carrier $\pm 0.125\%$) and the spurious limit outside of this band.

"Spikes" were transients when transmitter turns on. The quasi peaks levels of these transients were very low - see tabulated results for "Radiated Emissions at Band Edges".

	Report No: R3055	FCC ID: XL8EXTPIR1501	
	Issue No: 1		
Test No: T4200	Test Report		Page: 39 of 45



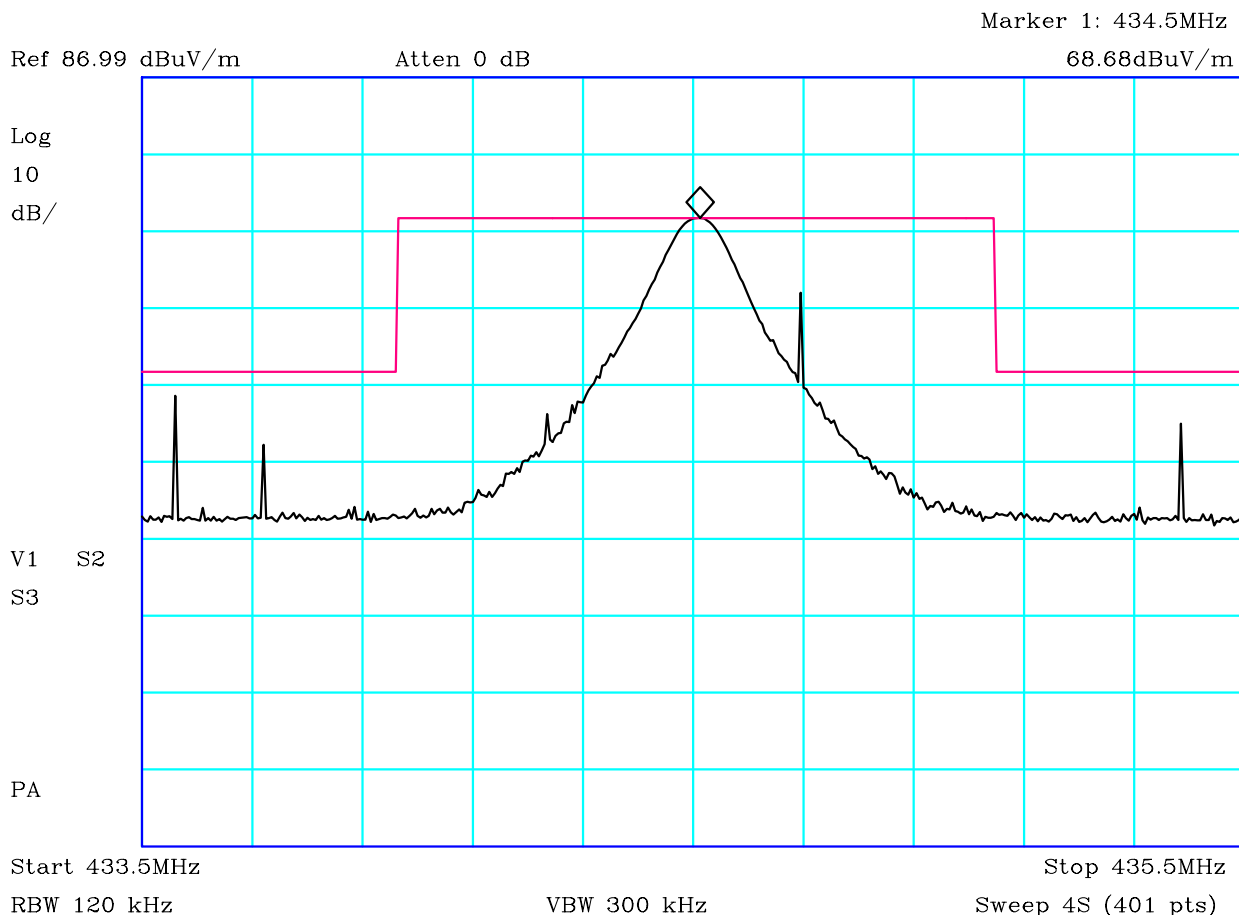
CF1:A24_3m_101116 CF2:CBL059_CBL062_CBL065_CBL060_090306

PLOT 18 Radiated Emissions - Band Edges - HX40 Unit

Company:	Quatro		Product:	HX40	
Date:	10/02/2012		Test Eng:	Dave Smith	
Method:	ANSI C63.4		Method:		
Limit1:(VIO)	-20dBc ($\pm 0.125\%$ carrier)		Limit2:		
Limit3:			Limit4:		
Facility:	Anech_2	Height	1.5m	Mode:	1
Distance	3m	Polarisation	V	Modification State:	1
Angle		File:	H21105F7		

The band edges were assumed to be the maximum occupied band limits i.e. width = 0.25% of operating frequency. The limit shown is the carrier limit within the allowed occupied band (carrier $\pm 0.125\%$) and the spurious limit outside of this band.

"Spikes" were transients when transmitter turns on. The quasi peaks levels of these transients were very low - see tabulated results for "Radiated Emissions at Band Edges".



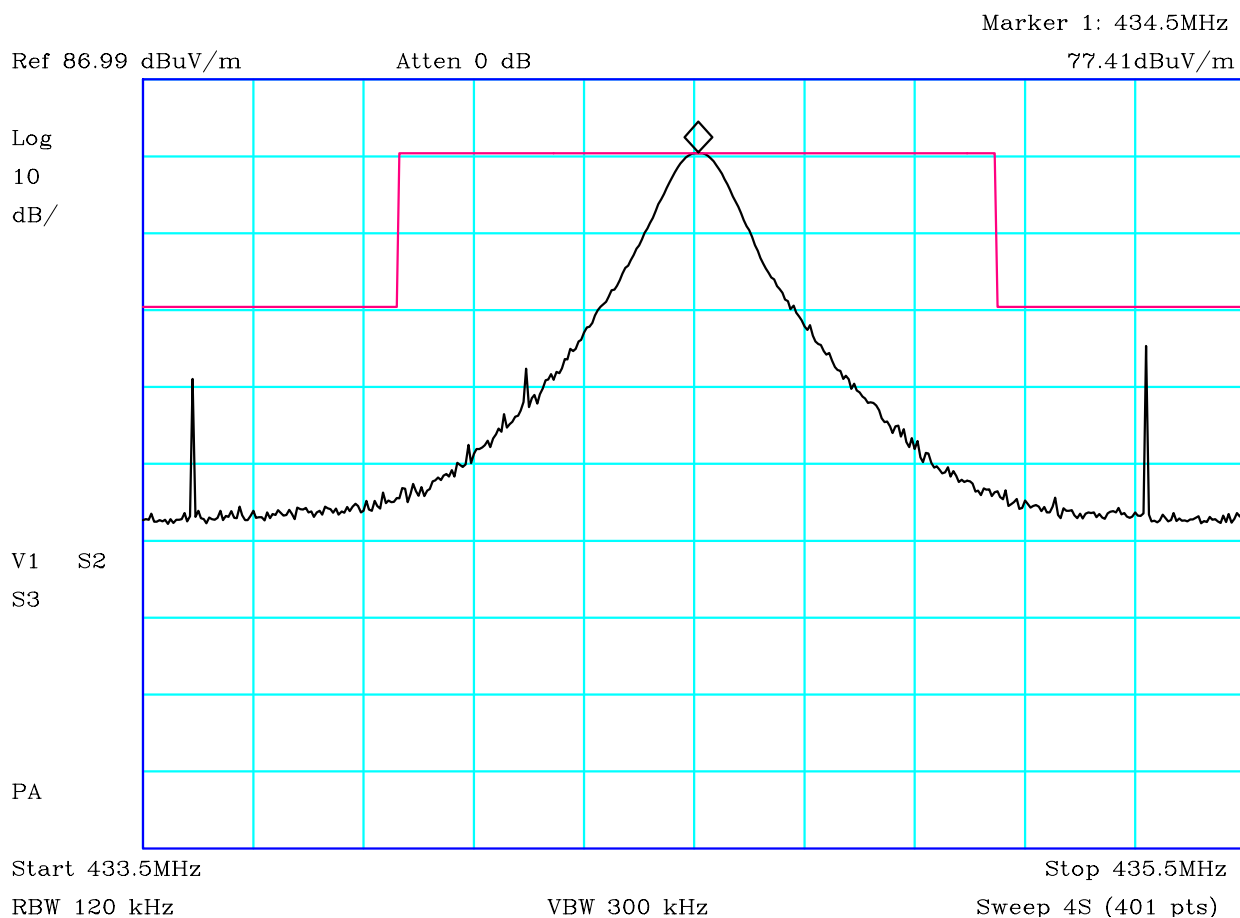
CF1:A24_3m_101116 CF2:CBL059_CBL062_CBL065_CBL060_090306

PLOT 19 Radiated Emissions - Band Edges - HX80 Unit

Company:	Quatro	Product:	HX80
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	-20dBc ($\pm 0.125\%$ carrier)	Limit2:	
Limit3:		Limit4:	
Facility:	Anech_2	Height	1.5m
Distance	3m	Polarisation	V
Angle		File:	H21105F0
Mode:	1	Modification State:	1

The band edges were assumed to be the maximum occupied band limits i.e. width = 0.25% of operating frequency. The limit shown is the carrier limit within the allowed occupied band (carrier $\pm 0.125\%$) and the spurious limit outside of this band.

"Spikes" were transients when transmitter turns on. The quasi peaks levels of these transients were very low - see tabulated results for "Radiated Emissions at Band Edges".




CF1:A24_3m_101116 CF2:CBL059_CBL062_CBL065_CBL060_090306

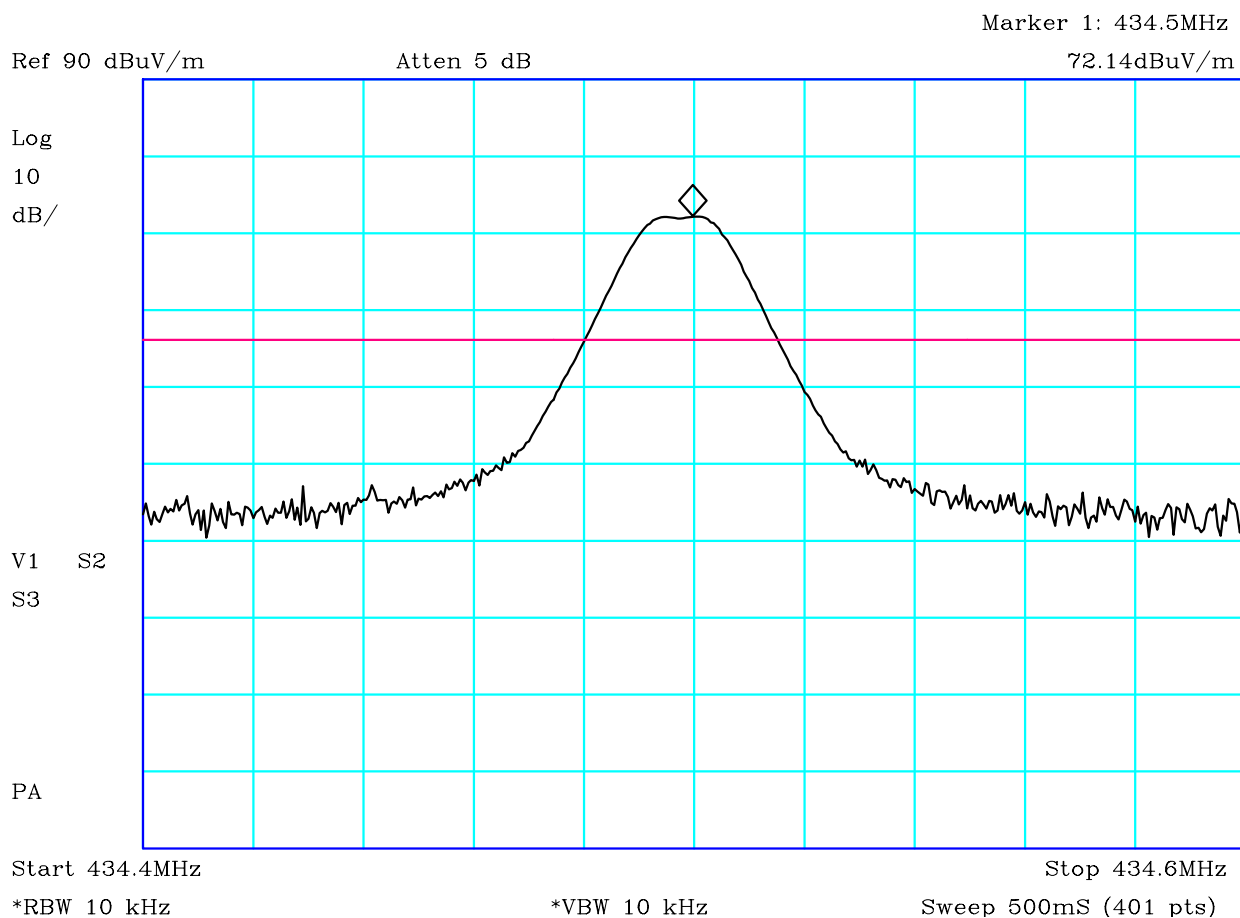
PLOT 20 Radiated Emissions - Band Edges - VX Unit

Company:	Quatro	Product:	VX
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	-20dBc ($\pm 0.125\%$ carrier)	Limit2:	
Limit3:		Limit4:	
Facility:	Anech_2	Height	1.5m
Distance	3m	Polarisation	V
Angle		File:	H2110601
Mode:	1	Modification State:	1

The band edges were assumed to be the maximum occupied band limits i.e. width = 0.25% of operating frequency. The limit shown is the carrier limit within the allowed occupied band (carrier $\pm 0.125\%$) and the spurious limit outside of this band.

"Spikes" were transients when transmitter turns on. The quasi peaks levels of these transients were very low - see tabulated results for "Radiated Emissions at Band Edges".

	Report No: R3055	FCC ID: XL8EXTPIR1501	
	Issue No: 1		
	Test No: T4200	Test Report	Page: 42 of 45




CF1:A24_3m_101116 CF4:CBL059_CBL018_CBL065_CBL060_100806

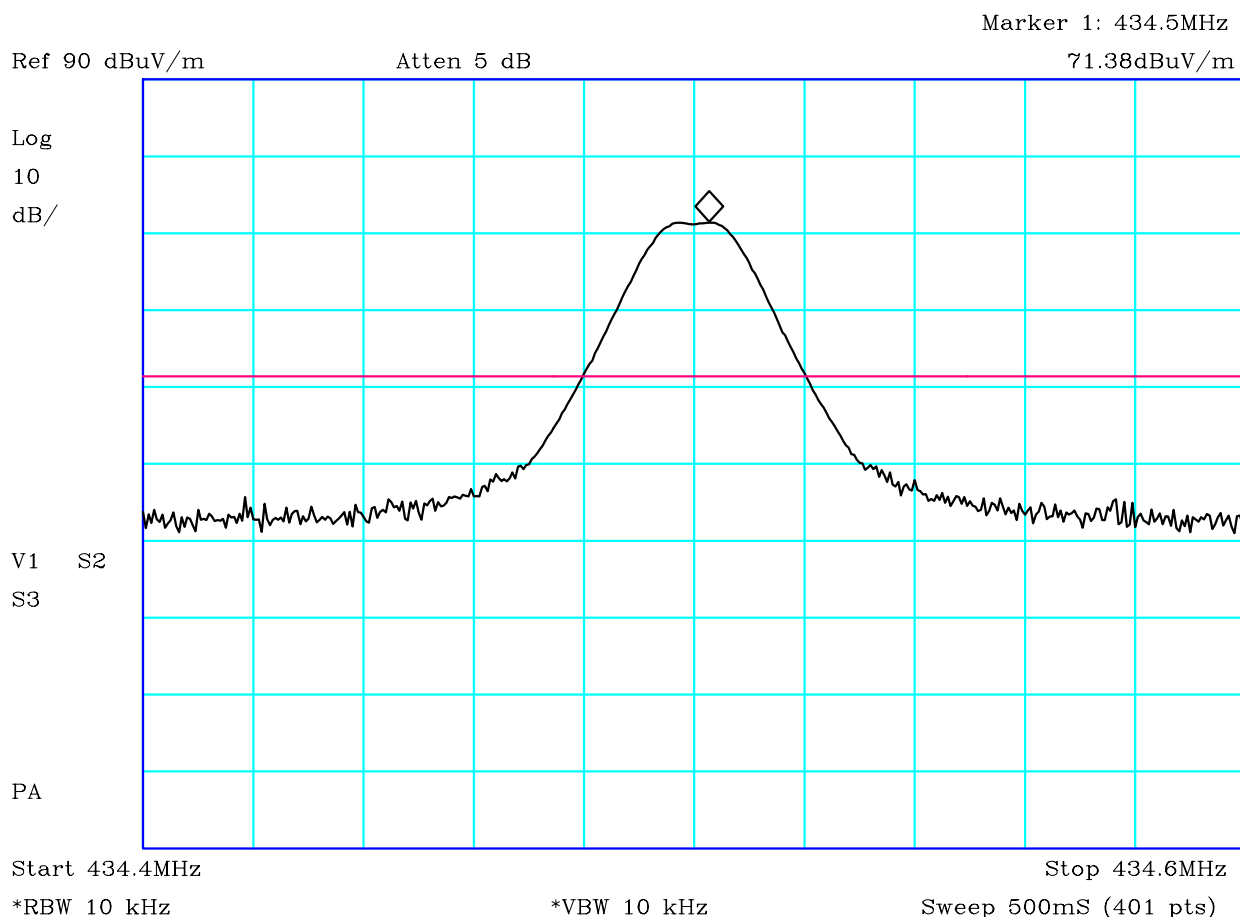
PLOT 21 Occupied Bandwidth - BX Unit

Company:	Quatro Electronics Ltd	Product:	BX
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	FCC Section 15.231	Method:	
Limit1:(VIO)	-20dBc	Limit2:	
Limit3:		Limit4:	

-20dBc to left of peak: 434.454MHz
-20dBc to right of peak: 434.495MHz
Occupied bandwidth = 41kHz
Limit = 1.09MHz

Facility:	Anech_2	Height	1.5m	Mode:	1
Distance	3m	Polarisation	V+H	Modification State:	0
Angle	0-360	File:	H21105C4		

	Report No: R3055	FCC ID: XL8EXTPIR1501	
	Issue No: 1		
	Test No: T4200	Test Report	Page: 43 of 45




CF1:A24_3m_101116 CF4:CBL059_CBL018_CBL065_CBL060_100806

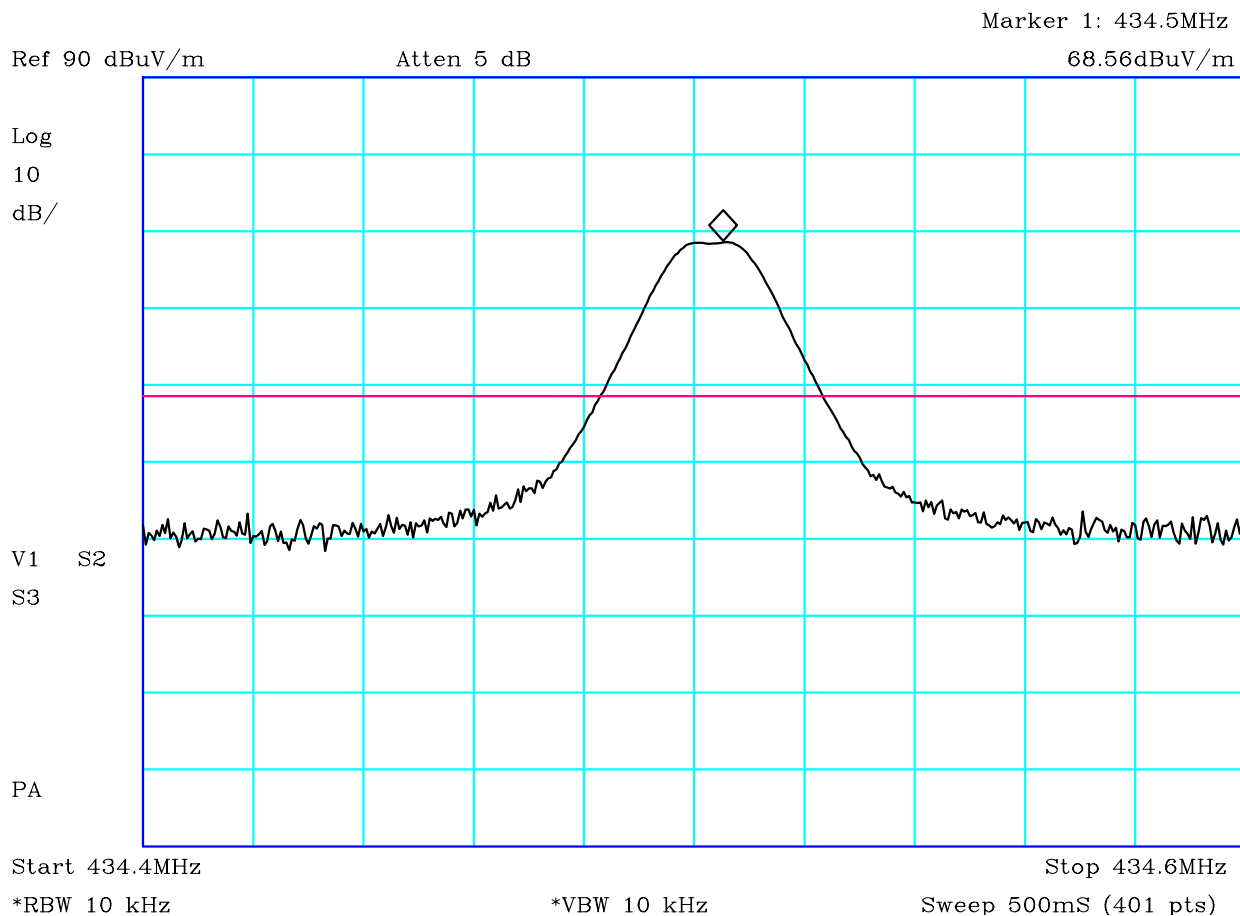
PLOT 22 Occupied Bandwidth - HX40 Unit

Company:	Quatro Electronics Ltd	Product:	HX40
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	FCC Section 15.231	Method:	
Limit1:(VIO)	-20dBc	Limit2:	
Limit3:		Limit4:	

-20dBc to left of peak: 434.4565MHz
-20dBc to right of peak: 434.4975MHz
Occupied bandwidth = 41kHz
Limit = 1.09MHz

Facility:	Anech_2	Height	1.5m	Mode:	1
Distance	3m	Polarisation	V+H	Modification State:	0
Angle	0-360	File:	H21105D3		

	Report No: R3055	FCC ID: XL8EXTPIR1501	
	Issue No: 1		
	Test No: T4200	Test Report	Page: 44 of 45




CF1:A24_3m_101116 CF4:CBL059_CBL018_CBL065_CBL060_100806

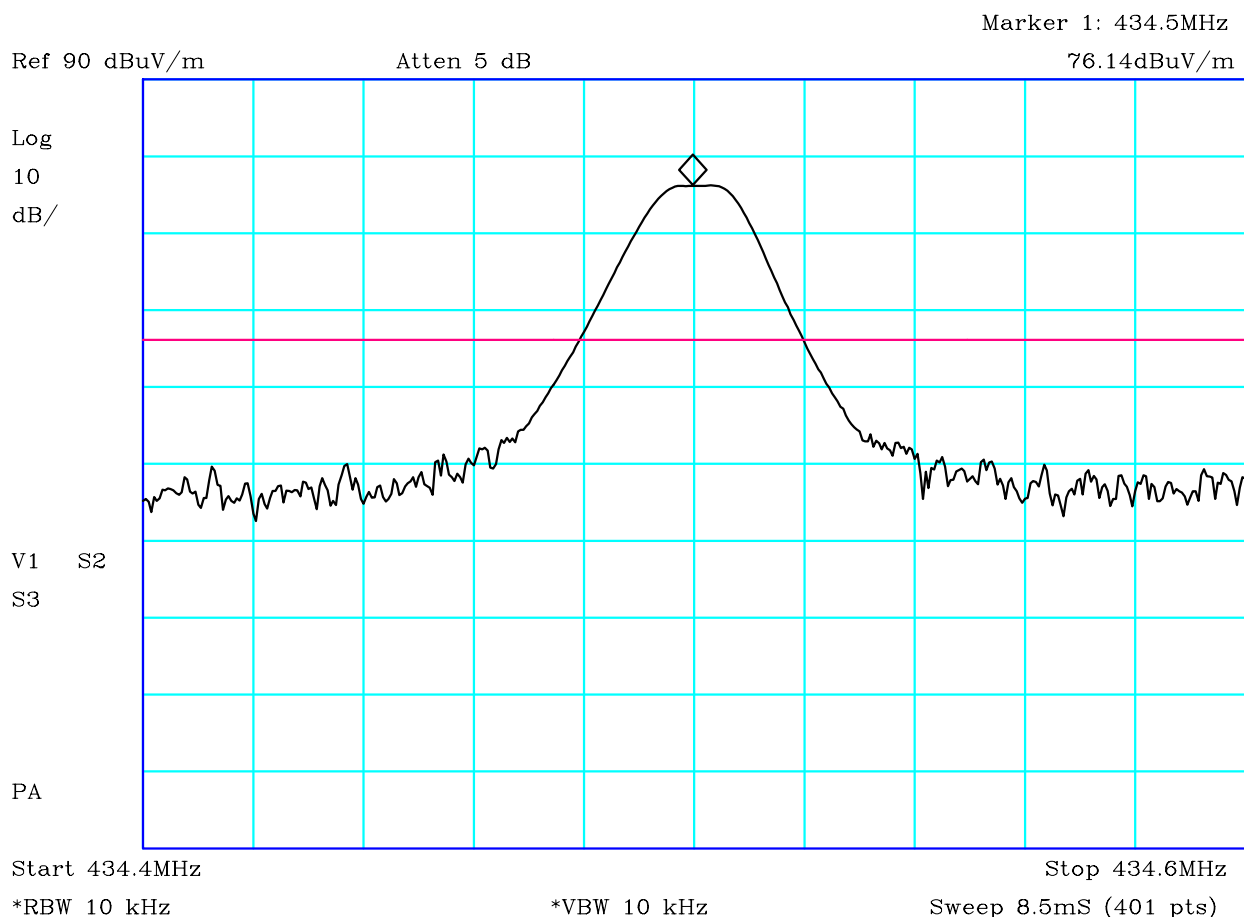
PLOT 23 Occupied Bandwidth - HX80 Unit

Company:	Quatro Electronics Ltd	Product:	HX80
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	FCC Section 15.231	Method:	
Limit1:(VIO)	-20dBc	Limit2:	
Limit3:		Limit4:	

-20dBc to left of peak: 434.4595MHz
-20dBc to right of peak: 434.5005MHz
Occupied bandwidth = 41kHz
Limit = 1.09MHz

Facility:	Anech_2	Height	1.5m	Mode:	1
Distance	3m	Polarisation	V+H	Modification State:	0
Angle	0-360	File:	H21105E2		

	Report No: R3055	FCC ID: XL8EXTPIR1501	
	Issue No: 1		
Test No: T4200	Test Report		Page: 45 of 45



CF1:A24_3m_101116 CF4:CBL059_CBL018_CBL065_CBL060_100806

PLOT 24 Occupied Bandwidth - VX Unit

Company:	Quatro Electronics Ltd	Product:	VX
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	FCC Section 15.231	Method:	
Limit1:(VIO)	-20dBc	Limit2:	
Limit3:		Limit4:	

-20dBc to left of peak: 434.456MHz
-20dBc to right of peak: 434.497MHz
Occupied bandwidth = 41kHz
Limit = 1.09MHz

Facility:	Anech_2	Height	1.5m	Mode:	1
Distance	3m	Polarisation	V+H	Modification State:	0
Angle	0-360	File:	H21105B8		