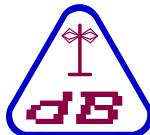


	Report No: R3055 Issue No: 1	FCC ID: XL8EXTPIR1501	
	Test No: T4200	Test Report	Page: 1 of 45



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:
v090319

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

Signature: 

Checked by: Derek Barlow

Signature: 

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.

	Report No: R3055 Issue No: 1	FCC ID: XL8EXTPIR1501	
	Test No: T4200	Test Report	Page: 3 of 45

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.

	Report No: R3055	FCC ID: XL8EXTPIR1501	
	Issue No: 1		
	Test No: T4200	Test Report	Page: 4 of 45

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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

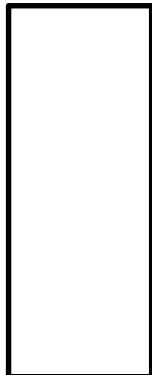
1.3 EUT Operating Modes

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>

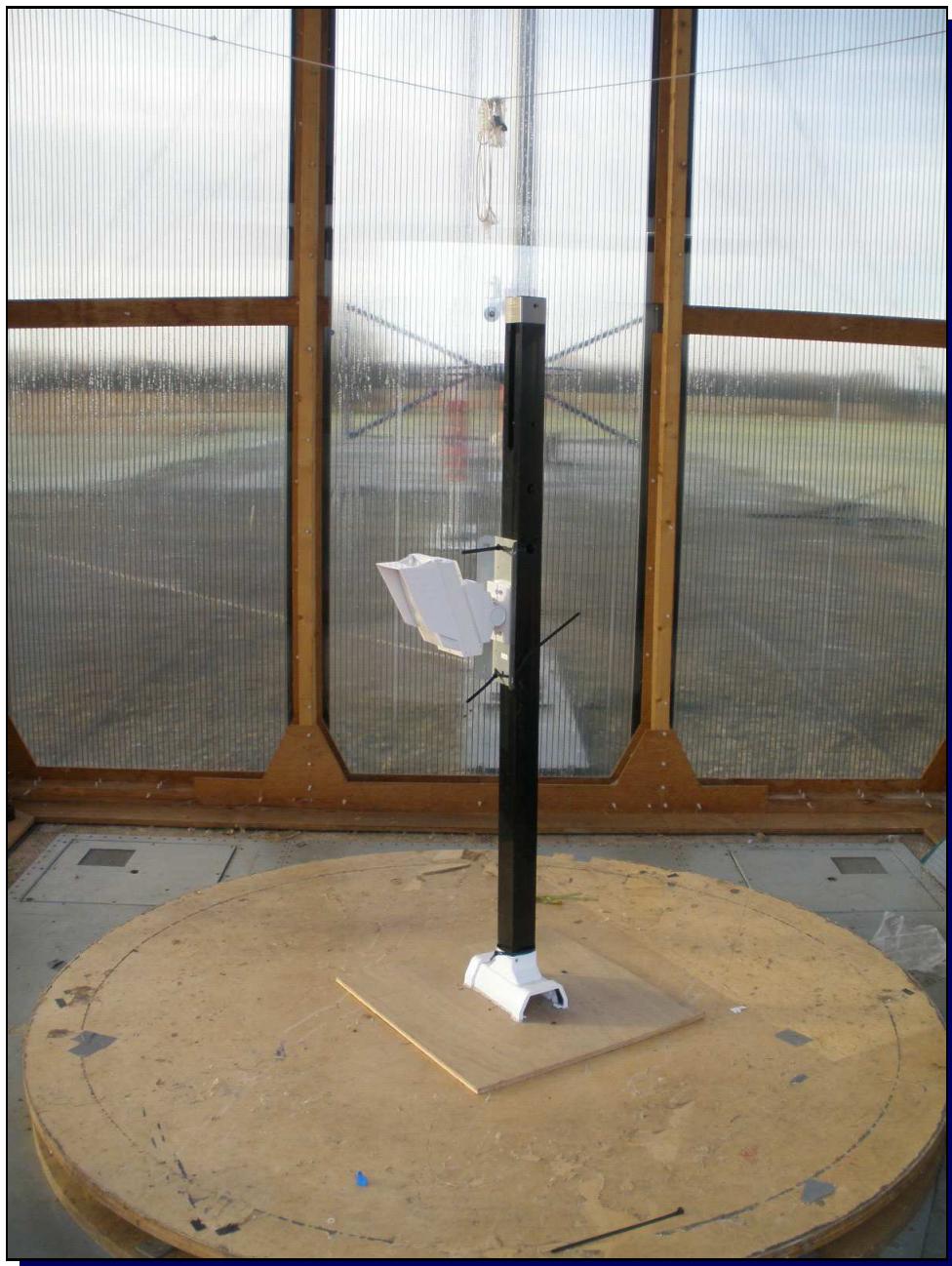
	Report No: R3055 Issue No: 1	FCC ID: XL8EXTPIR1501	
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Figure 1 General Arrangement of EUT and Peripherals



All samples had an integral antenna and no external cables

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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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	Issue No: 1		
	Test No: T4200	Test Report	Page: 12 of 45

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 = 57.8 + 20.4 = 78.2dBuV/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.

	Report No: R3055	FCC ID: XL8EXTPIR1501	
	Issue No: 1		
Test No: T4200		Test Report	Page: 13 of 45

4.1 Intermittent Operation Information - 15.231(a)

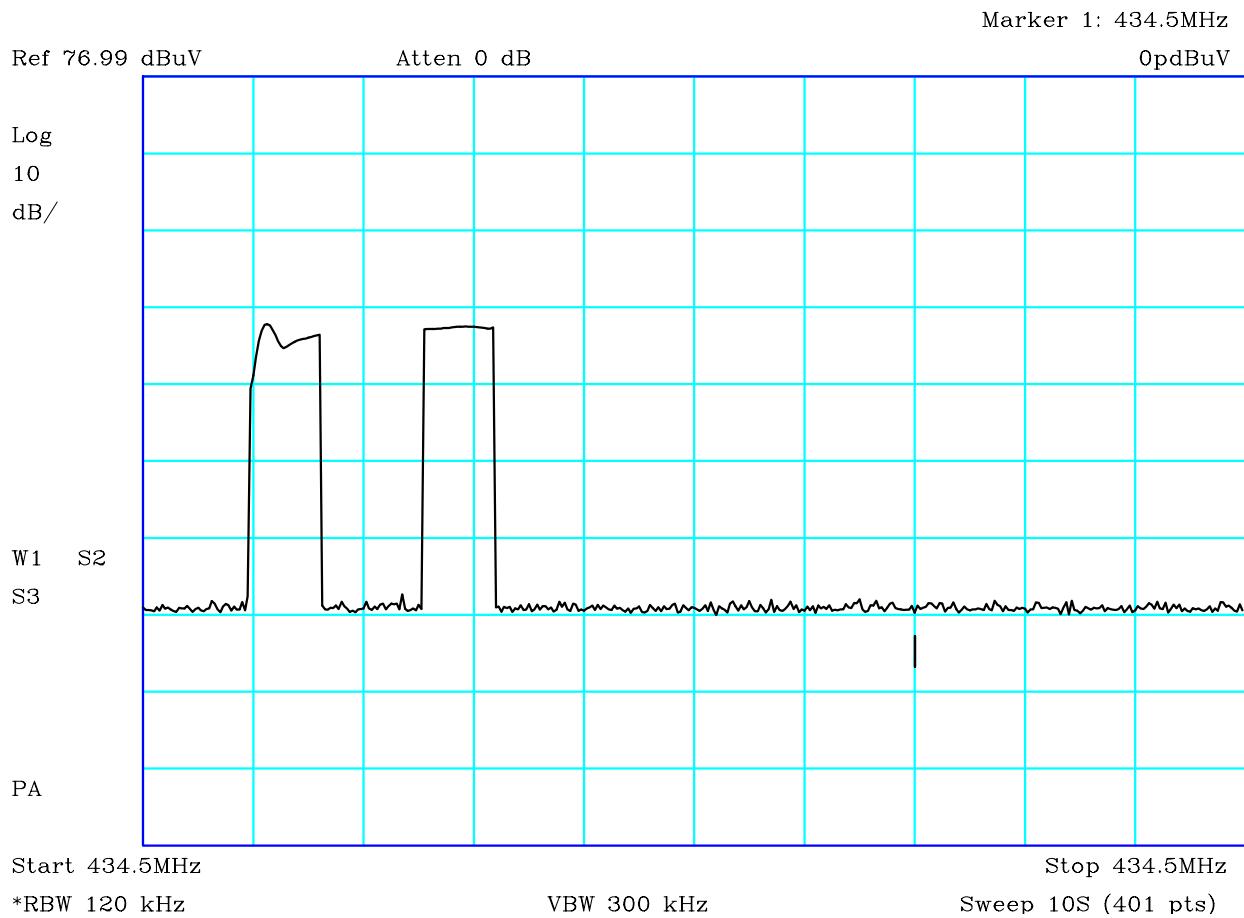
The operation of the transmitter is controlled by a microprocessor. The transmitter is activated by movement detection.

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.

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

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:													
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			
Notes	Comments and Observations												
	Results of scans shown in plots 2, 6, 10 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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	Issue No: 1	Test Report						

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					
Notes		Comments and Observations													
		<p>Results of scans shown in plots 1, 2, 5, 6, 9, 10, 13 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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	Issue No: 1	Test Report						
	Test No: T4200							Page: 16 of 45

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:													
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			
Notes	Comments and Observations												
	Plots 17 to 20. The band edges were assumed to be at the maximum permitted occupied band limits i.e. +/- 0.125% above and below the operating frequency. 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. To establish that these transients were not an issue, quasi peak measurements were made at the nominal band edge points as shown above.												

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

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 PASS	dB					
Notes	Comments and Observations															
	Results of scans shown in plots 3 and 4. BX Measurements made with 1MHz BW peak detector.															

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

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.															

	Report No: R3055	FCC ID: XL8EXTPIR1501						
	Issue No: 1	Test Report						
	Test No: T4200							Page: 19 of 45

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	FCC ID: XL8EXTPIR1501						
	Issue No: 1	Test Report						

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																
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	Page: 21 of 45

4.9 Bandwidth - 15.231(c)

Factor Set 1: A23_3m_10A PRE7_CBL052_CBL093_11A RFF11_10A -

Factor Set 2: - - -

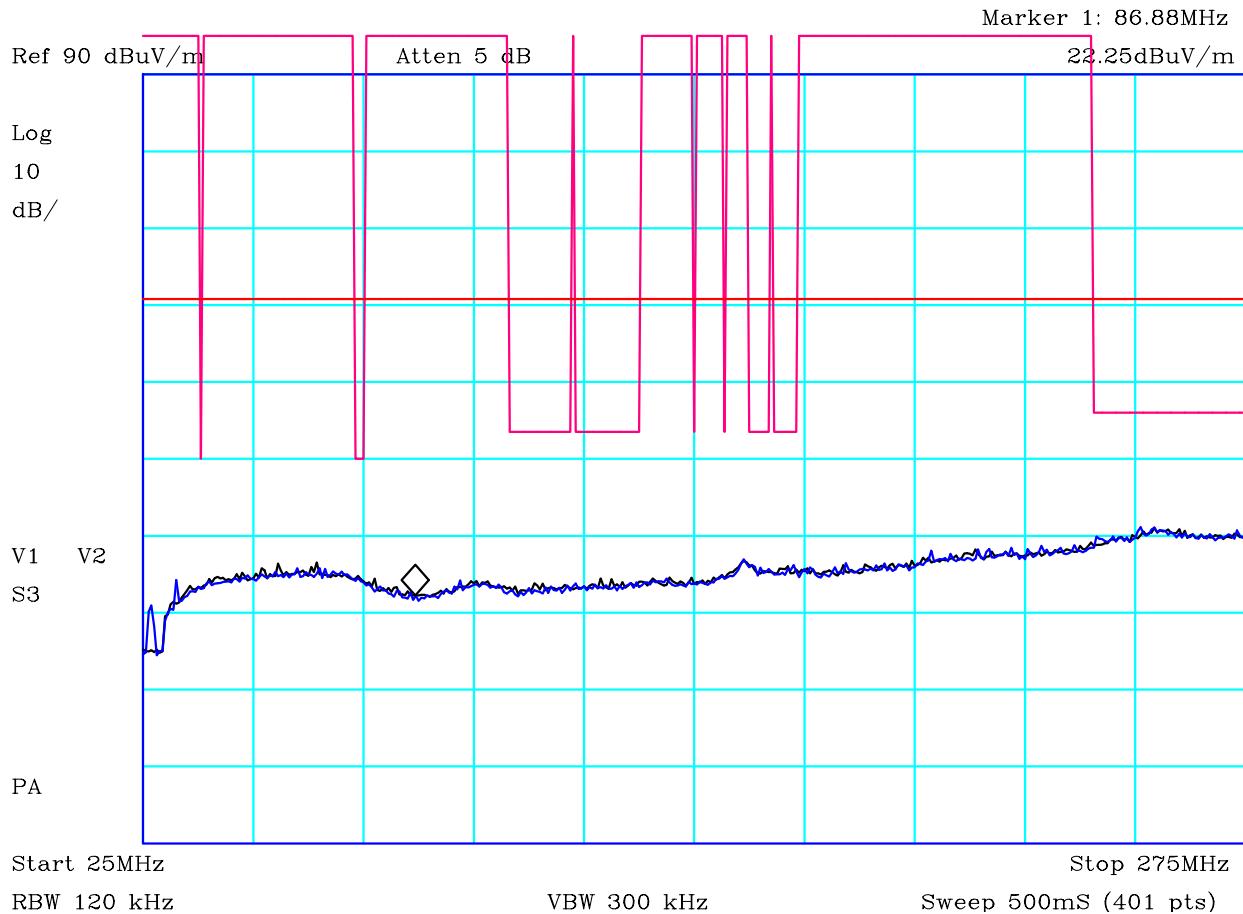
Factor Set 3: - - -

Test Equipment: R8 A23 PRE7

Radiated Emissions

<i>Company:</i>	Quatro Electronics Ltd	<i>Product:</i>	External PIR								
<i>Date:</i>	10/02/2012	<i>Test Eng:</i>	Dave Smith								
<i>Ports:</i>											
<i>Test:</i>	ANSI C63.4:2003	using limits of	15.231(c)								
<i>Ports:</i>											
<i>Test:</i>	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</p> <p>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> <table> <tr> <td>BX unit:</td> <td>41kHz</td> </tr> <tr> <td>HX40 unit:</td> <td>41kHz</td> </tr> <tr> <td>HX80 unit:</td> <td>41kHz</td> </tr> <tr> <td>VX unit:</td> <td>41kHz</td> </tr> </table> <p>This is significantly below the maximum permitted bandwidth of 1.09MHz.</p> <p>PASS</p>			BX unit:	41kHz	HX40 unit:	41kHz	HX80 unit:	41kHz	VX unit:	41kHz
BX unit:	41kHz										
HX40 unit:	41kHz										
HX80 unit:	41kHz										
VX unit:	41kHz										

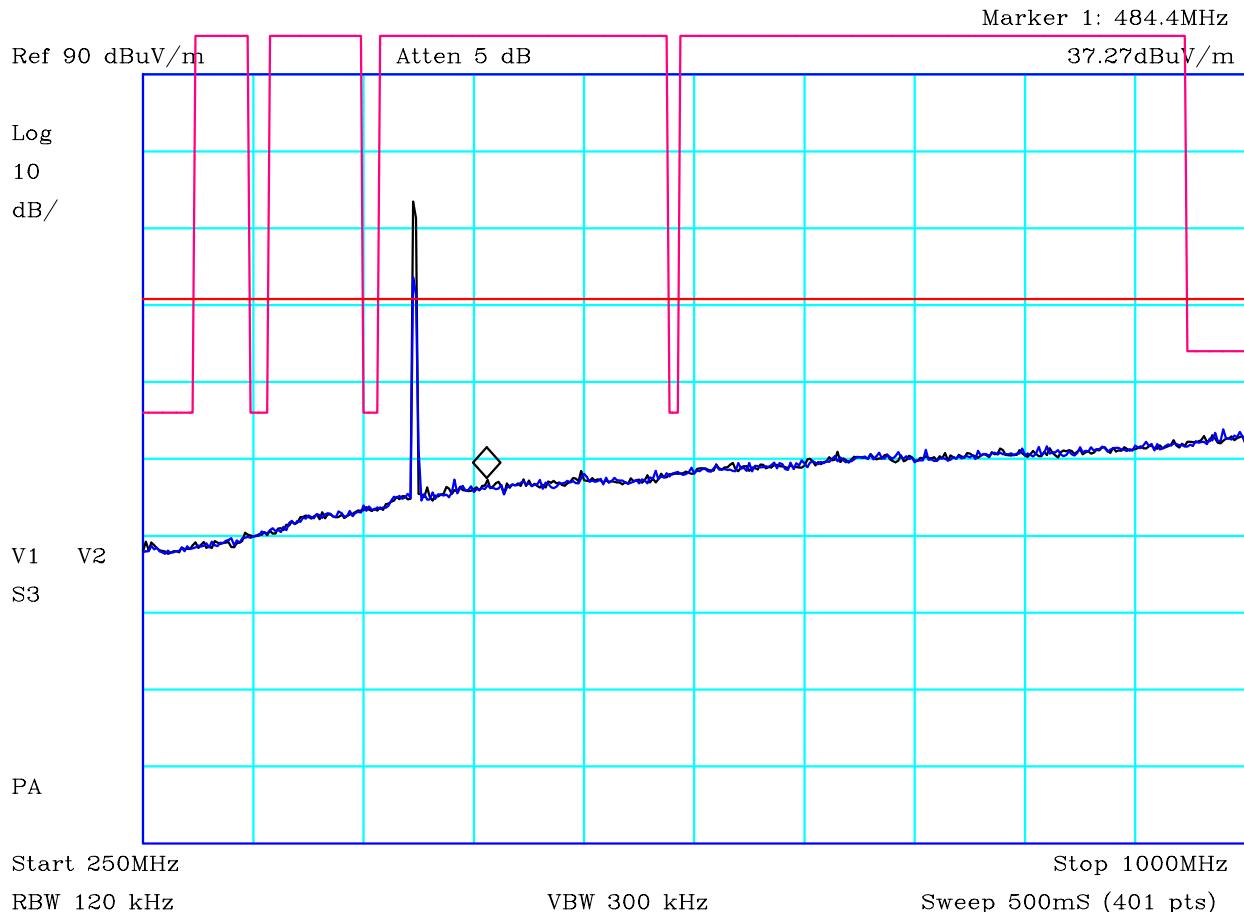
	Report No: R3055 Issue No: 1	FCC ID: XL8EXTPIR1501	
Test No: T4200	Test Report		Page: 22 of 45



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

Company:	Quattro 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

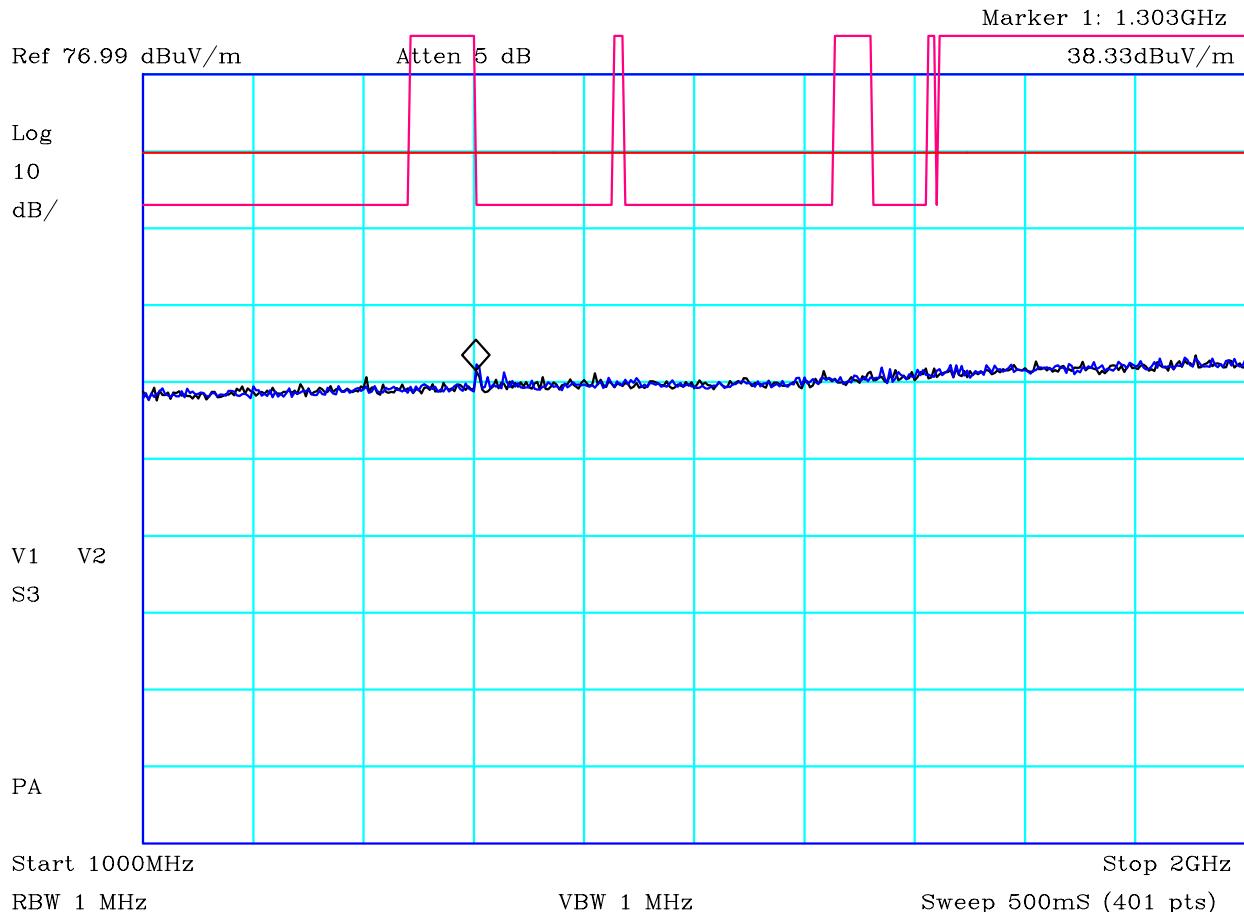
	Report No: R3055 Issue No: 1	FCC ID: XL8EXTPIR1501	
Test No: T4200	Test Report		Page: 23 of 45



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

Company:	Quattro 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

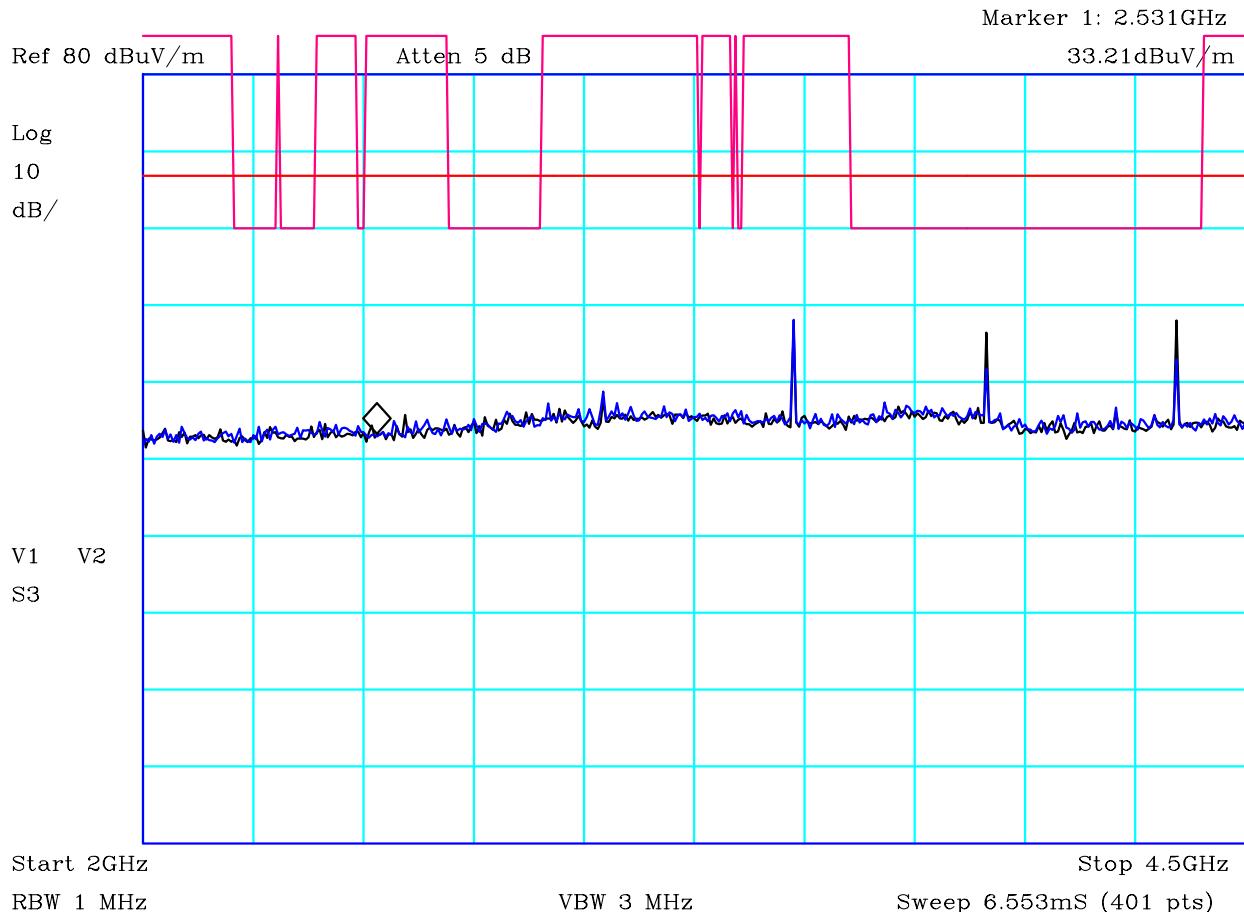
	Report No: R3055 Issue No: 1	FCC ID: XL8EXTPIR1501	
Test No: T4200	Test Report		Page: 24 of 45



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

Company:	Quattro 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
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H2110698
Mode:	1	Modification State:	0

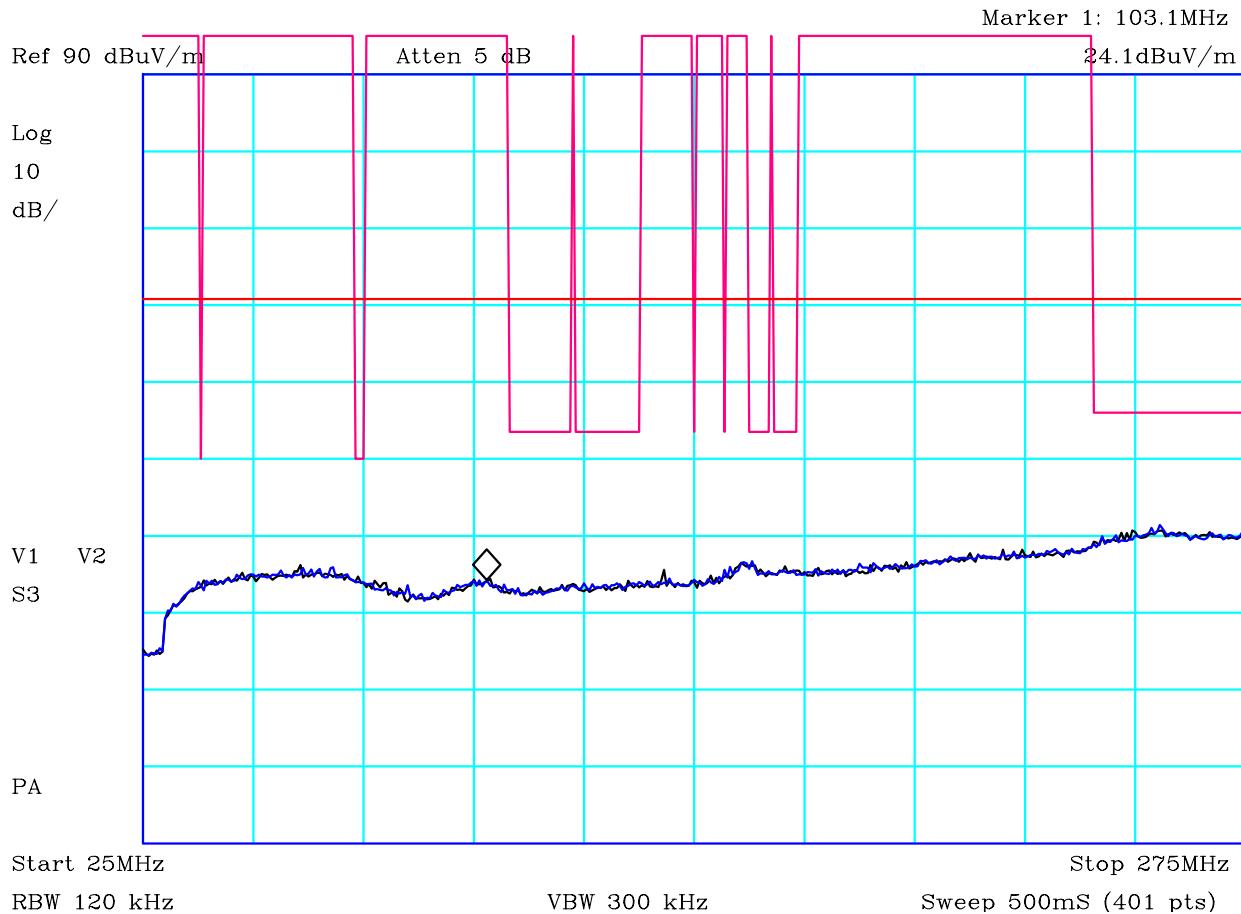
	Report No: R3055 Issue No: 1	FCC ID: XL8EXTPIR1501	
Test No: T4200	Test Report		Page: 25 of 45



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

Company:	Quattro 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
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H2110752
Mode:	1	Modification State:	0

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

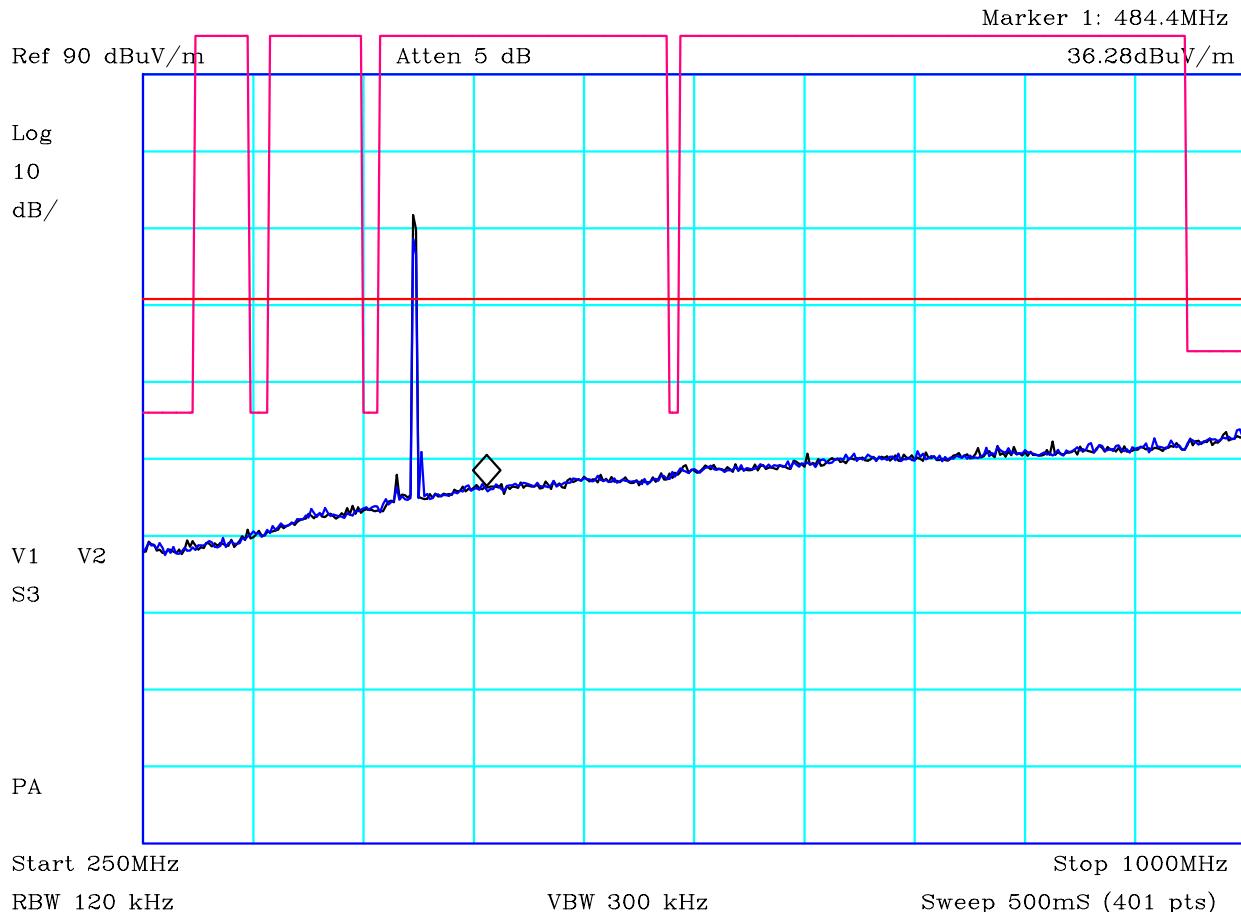


CF1:A24_3m_101116 CF4:CBL059_CBL018_CBL065_CBL060_100806

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

Company:	Quattro 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

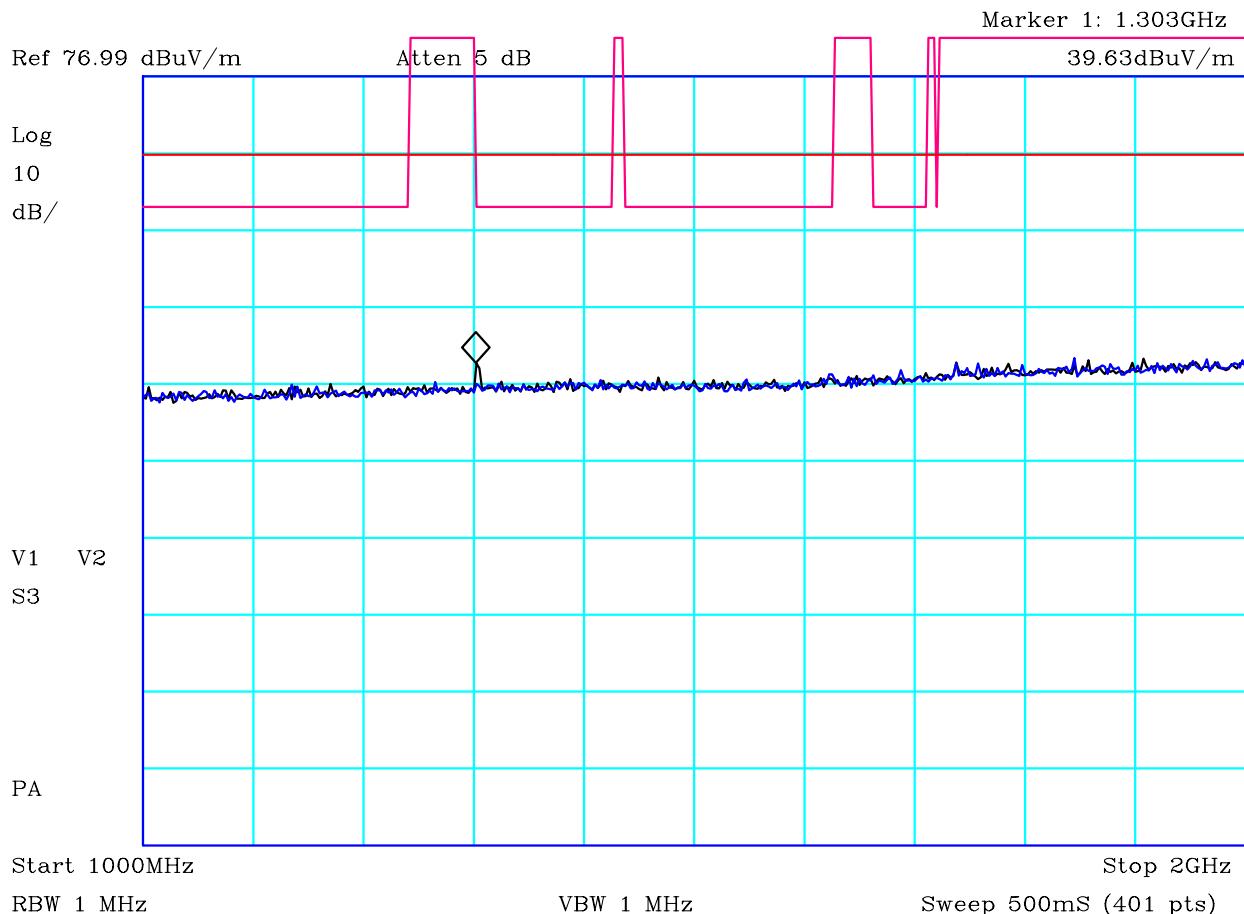
	Report No: R3055 Issue No: 1	FCC ID: XL8EXTPIR1501	
Test No: T4200	Test Report		Page: 27 of 45



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

Company:	Quattro 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

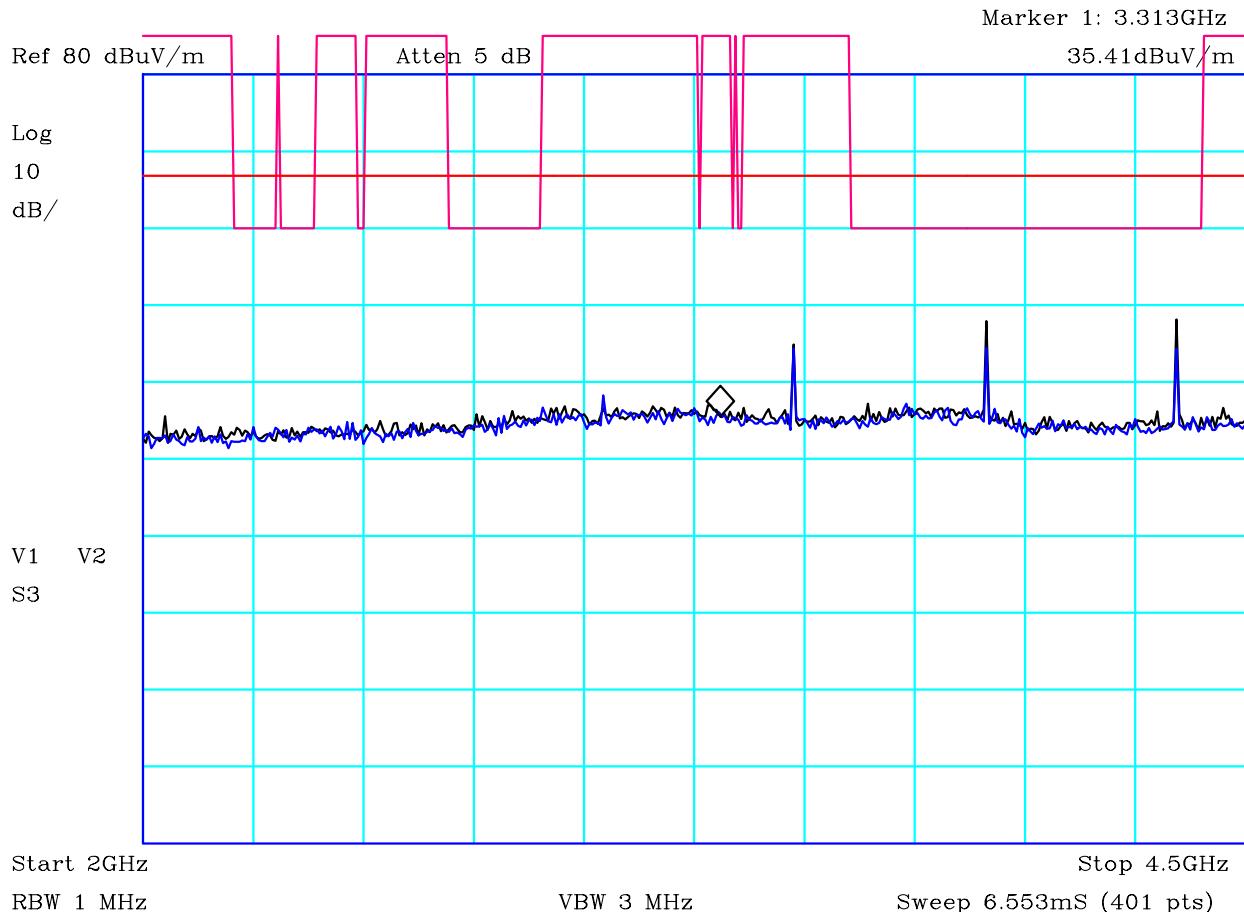
	Report No: R3055 Issue No: 1	FCC ID: XL8EXTPIR1501	
Test No: T4200	Test Report		Page: 28 of 45



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

Company:	Quattro 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

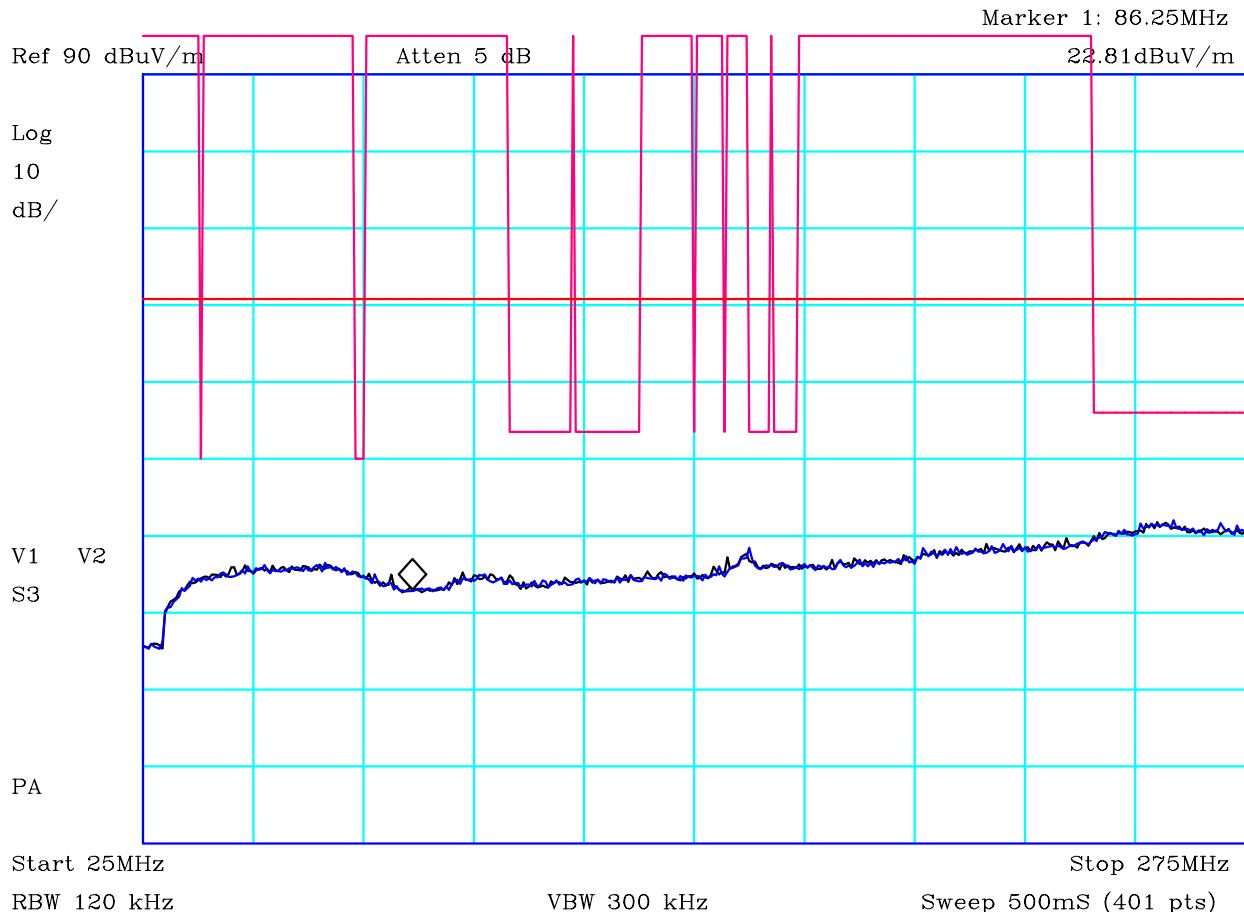
	Report No: R3055 Issue No: 1	FCC ID: XL8EXTPIR1501	
Test No: T4200	Test Report		Page: 29 of 45



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

Company:	Quattro 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

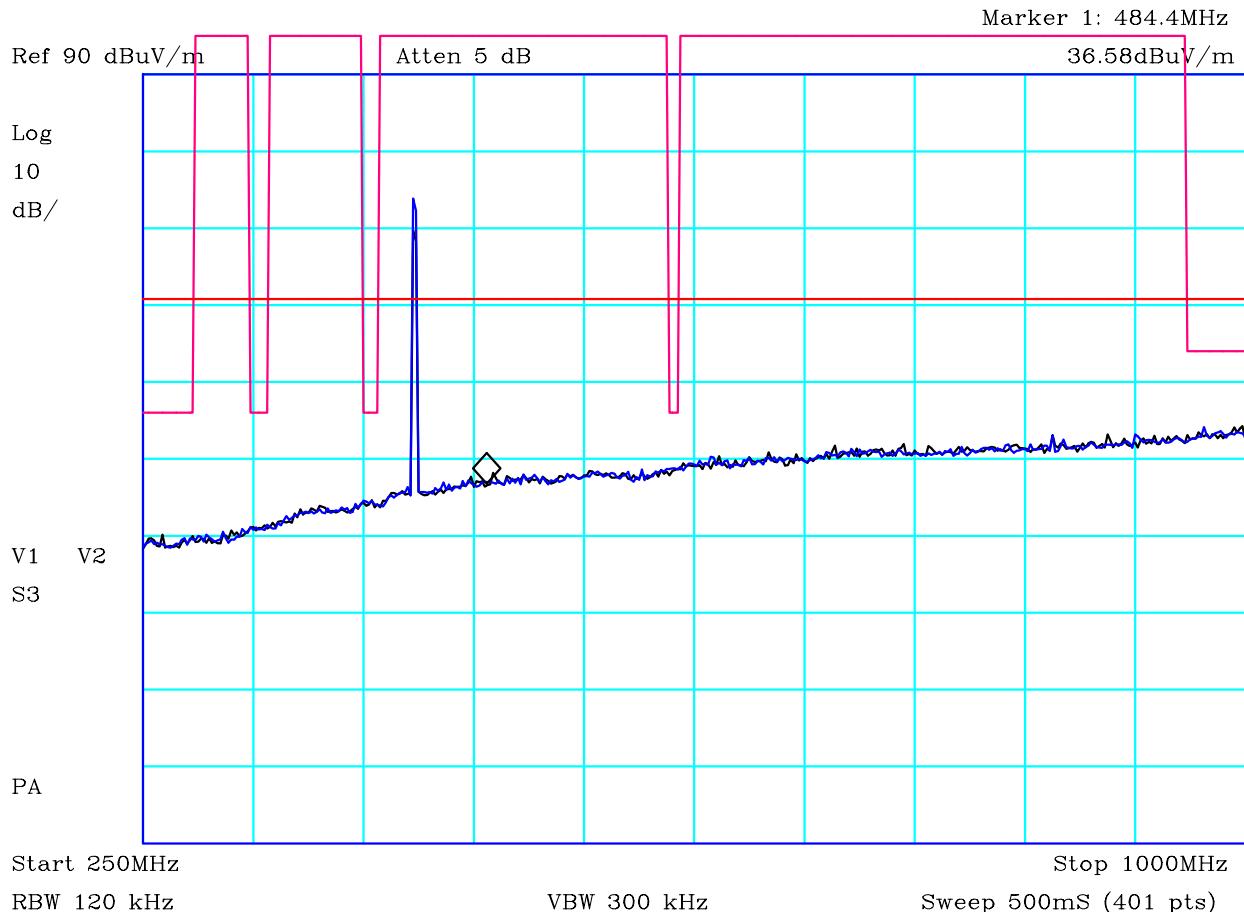
	Report No: R3055 Issue No: 1	FCC ID: XL8EXTPIR1501	
Test No: T4200	Test Report		Page: 30 of 45



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

Company:	Quattro 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
Modification State:	1	Mode:	0

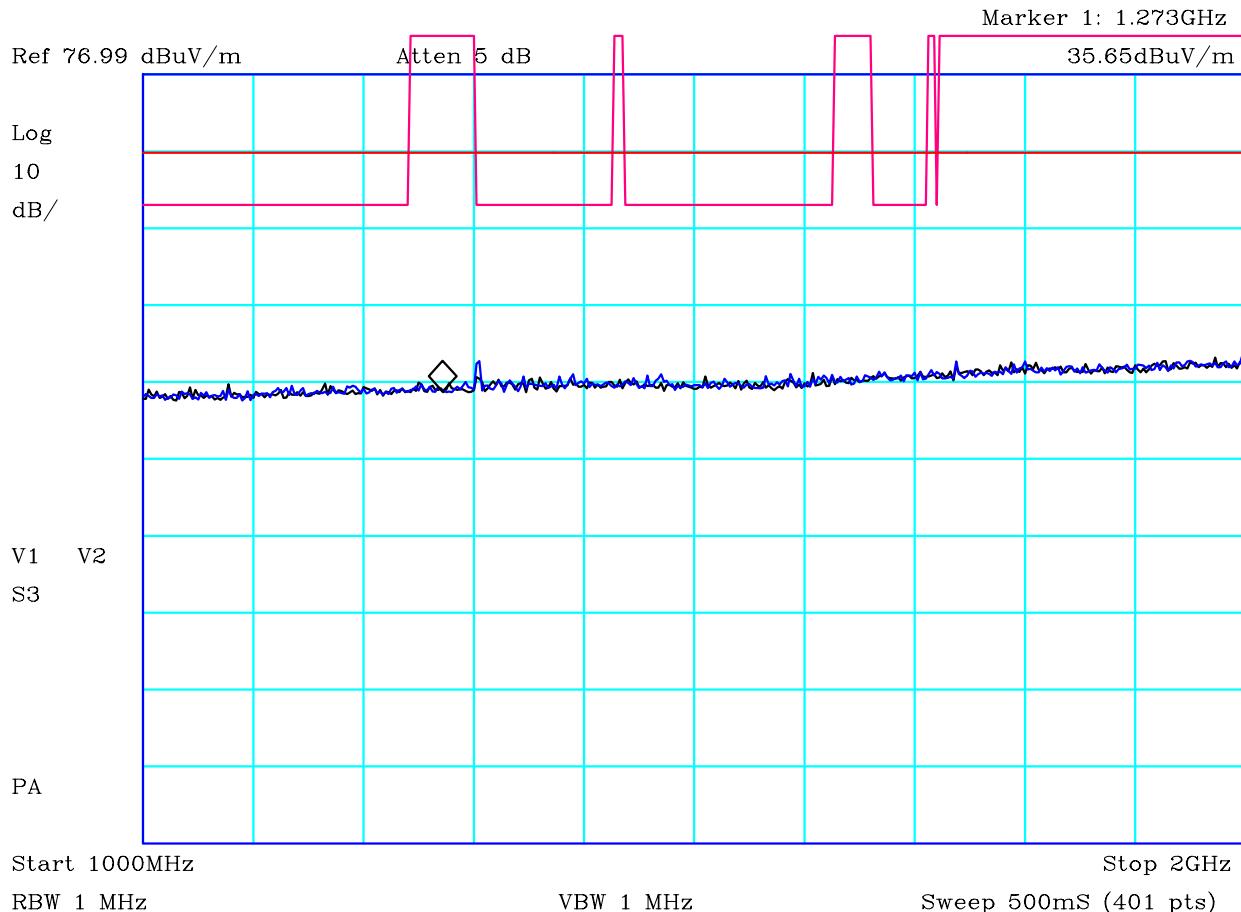
	Report No: R3055 Issue No: 1	FCC ID: XL8EXTPIR1501	
Test No: T4200	Test Report		Page: 31 of 45



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

Company:	Quattro 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

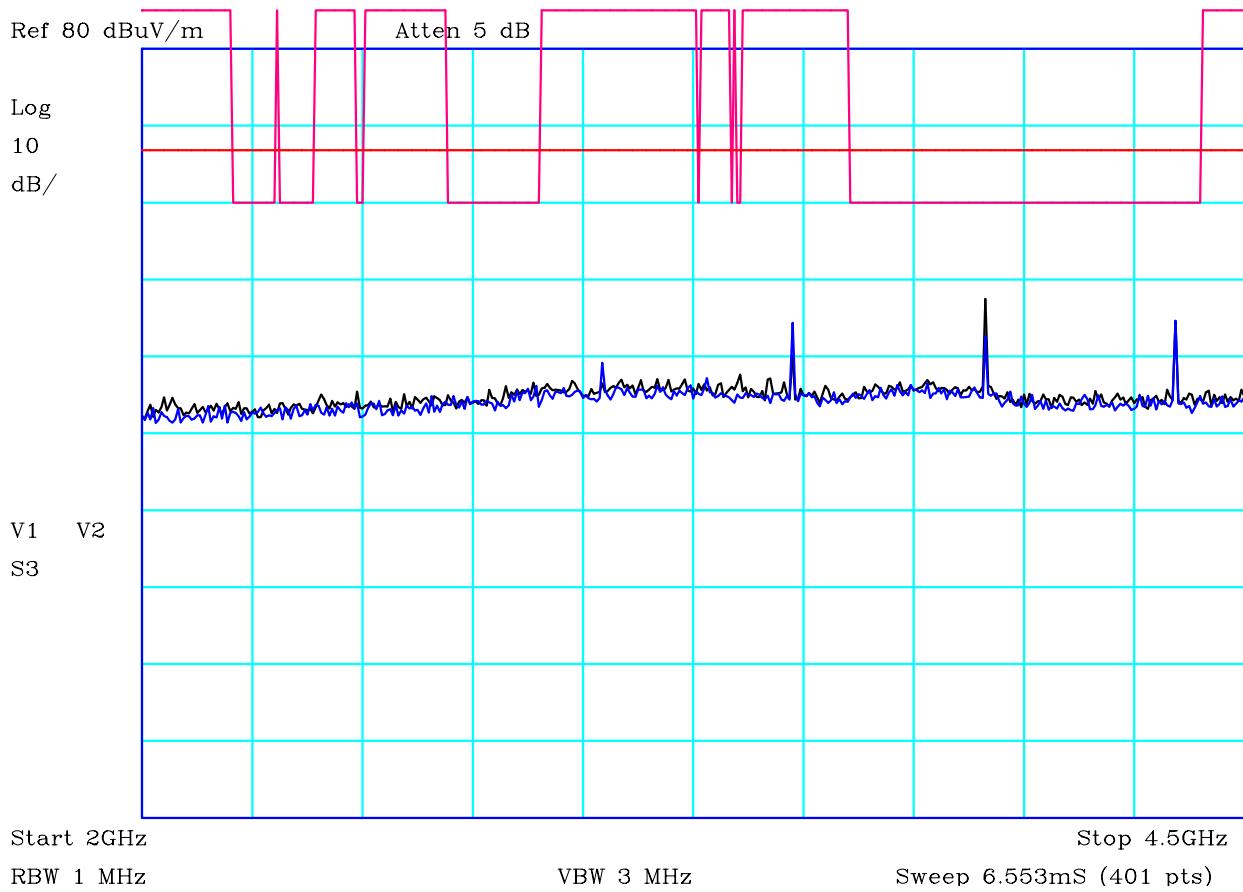
	Report No: R3055 Issue No: 1	FCC ID: XL8EXTPIR1501	
Test No: T4200		Test Report	Page: 32 of 45



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

Company:	Quattro 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

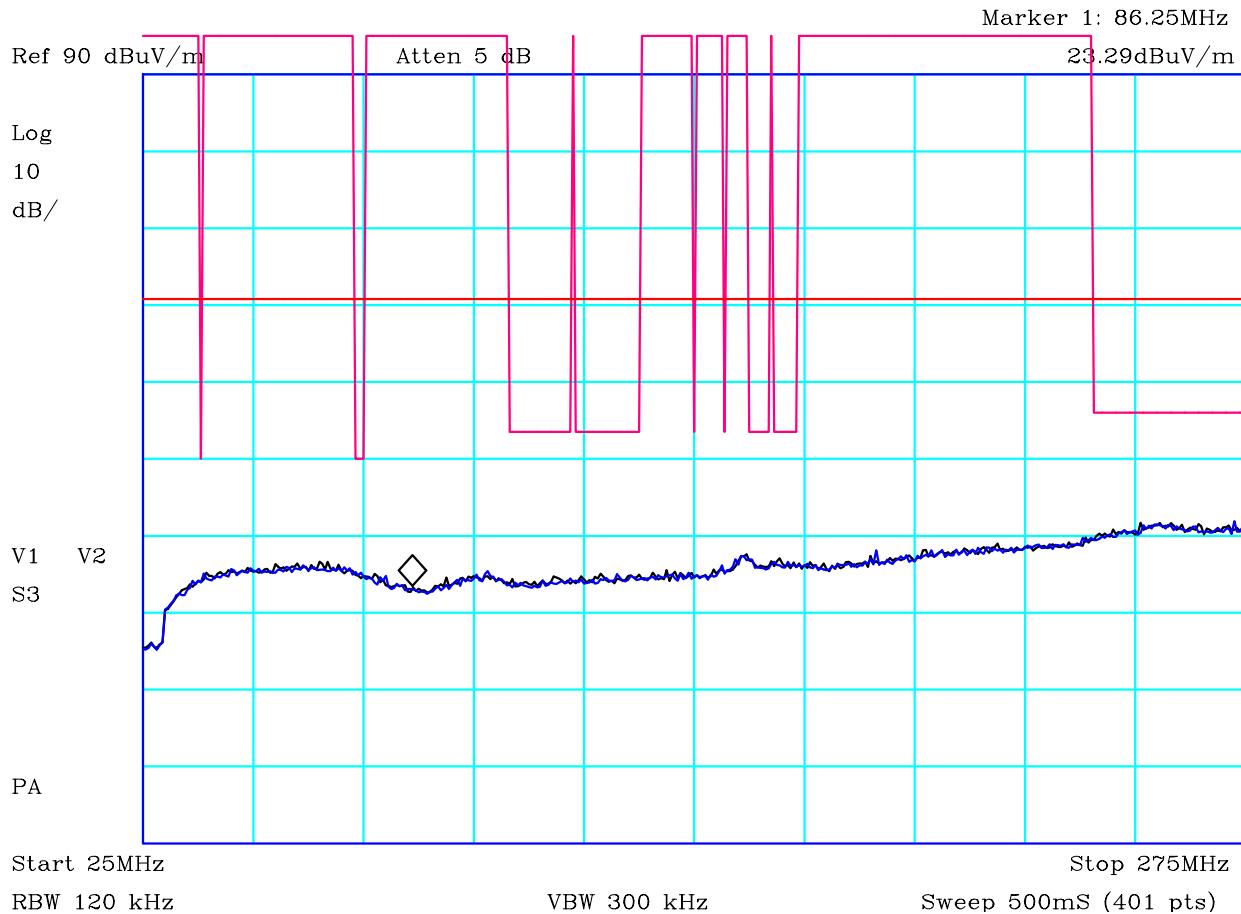
	Report No: R3055 Issue No: 1	FCC ID: XL8EXTPIR1501	
	Test No: T4200	Test Report	Page: 33 of 45



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

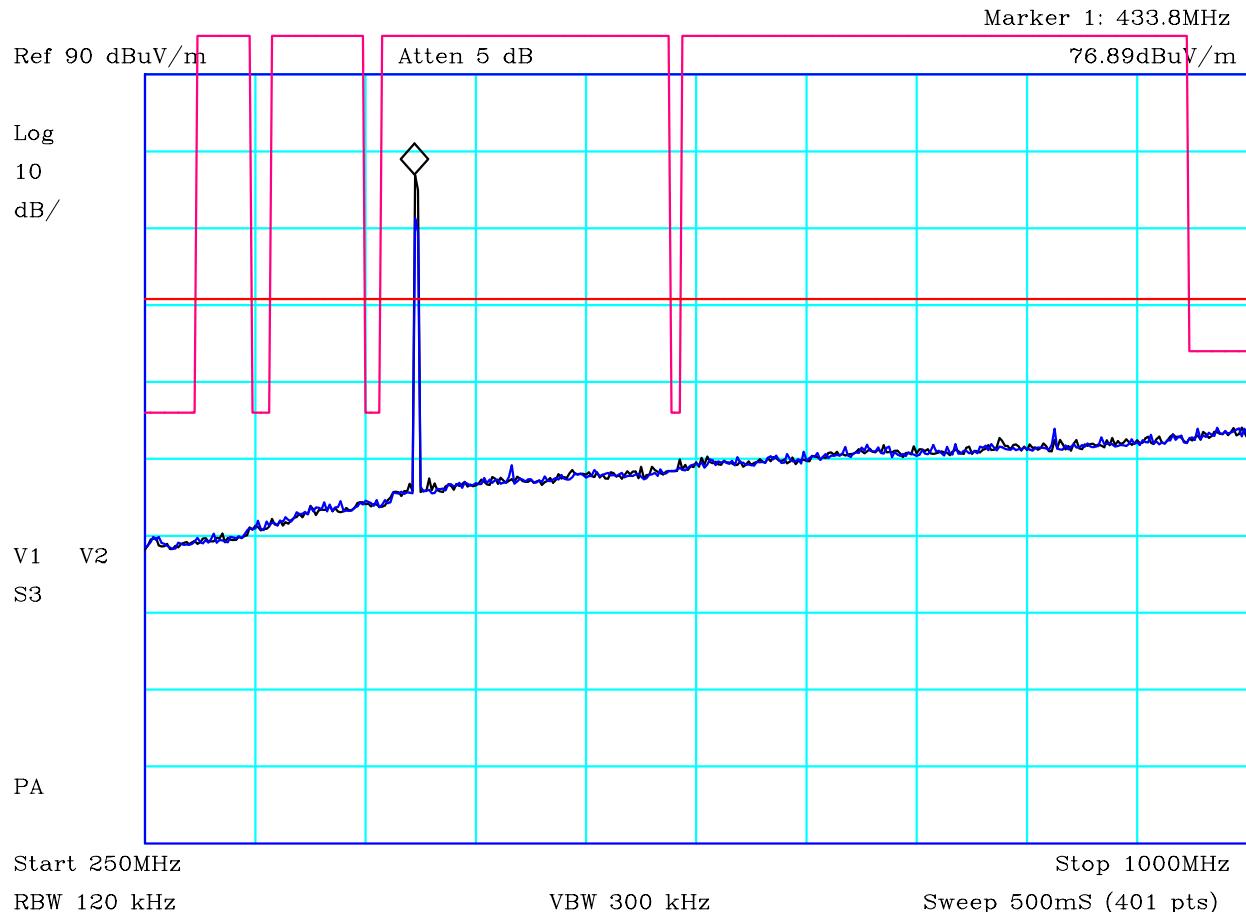
	Report No: R3055 Issue No: 1	FCC ID: XL8EXTPIR1501	
Test No: T4200	Test Report		Page: 34 of 45



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

Company:	Quattro 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:	H211059E
Modification State:	1	Mode:	0

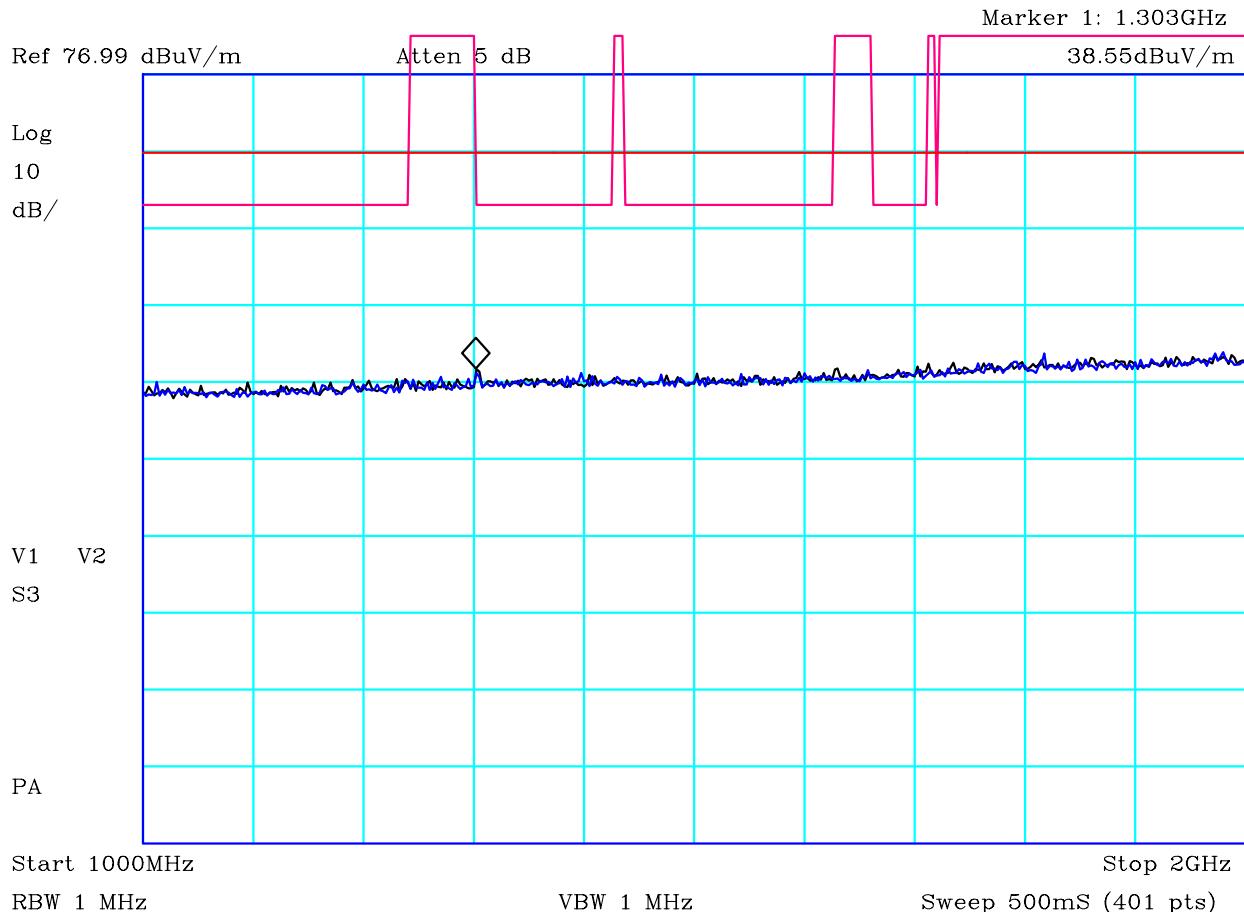
	Report No: R3055 Issue No: 1	FCC ID: XL8EXTPIR1501		
Test No: T4200	Test Report		Page: 35 of 45	



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

Company:	Quattro 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
Modification State:	1	Mode:	0

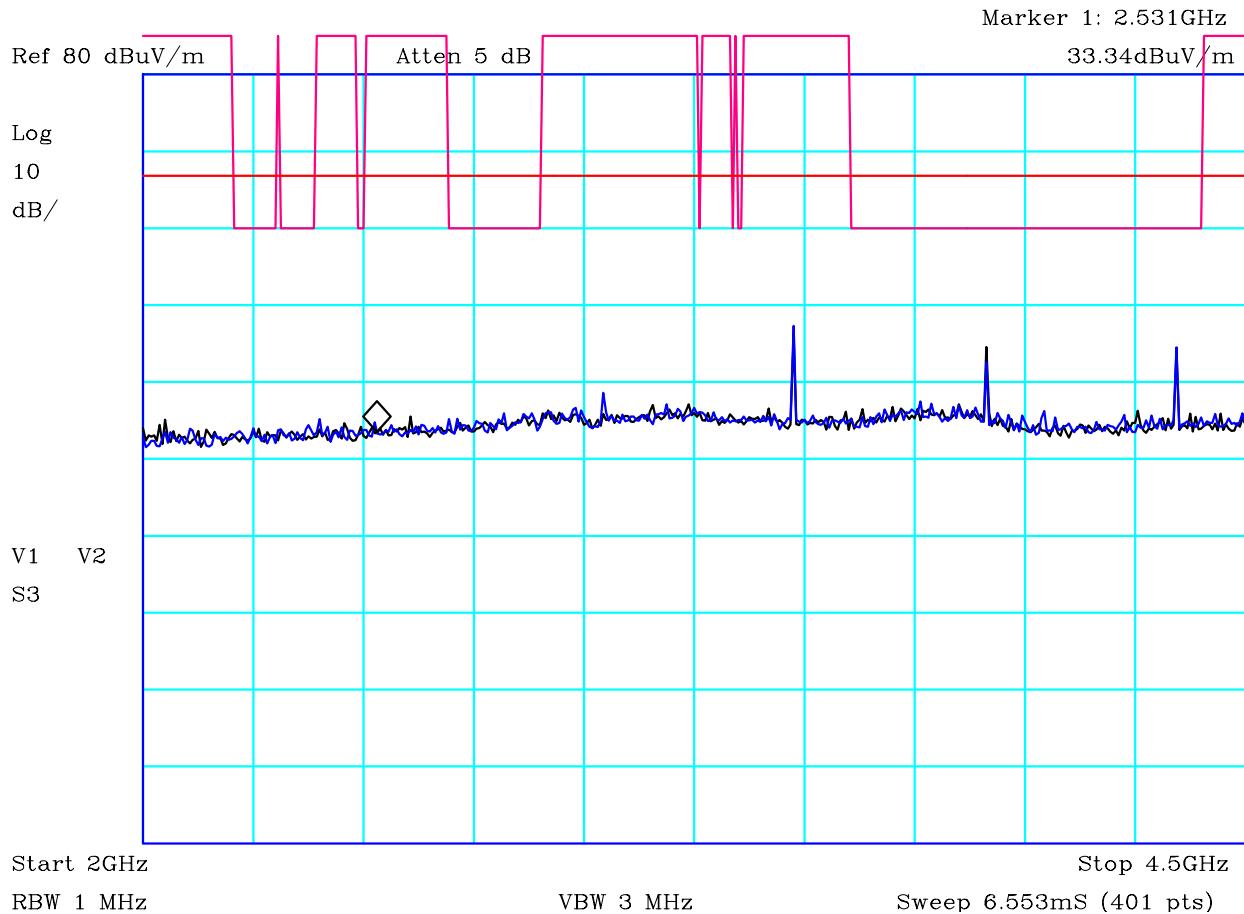
	Report No: R3055 Issue No: 1	FCC ID: XL8EXTPIR1501	
Test No: T4200		Test Report	Page: 36 of 45



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

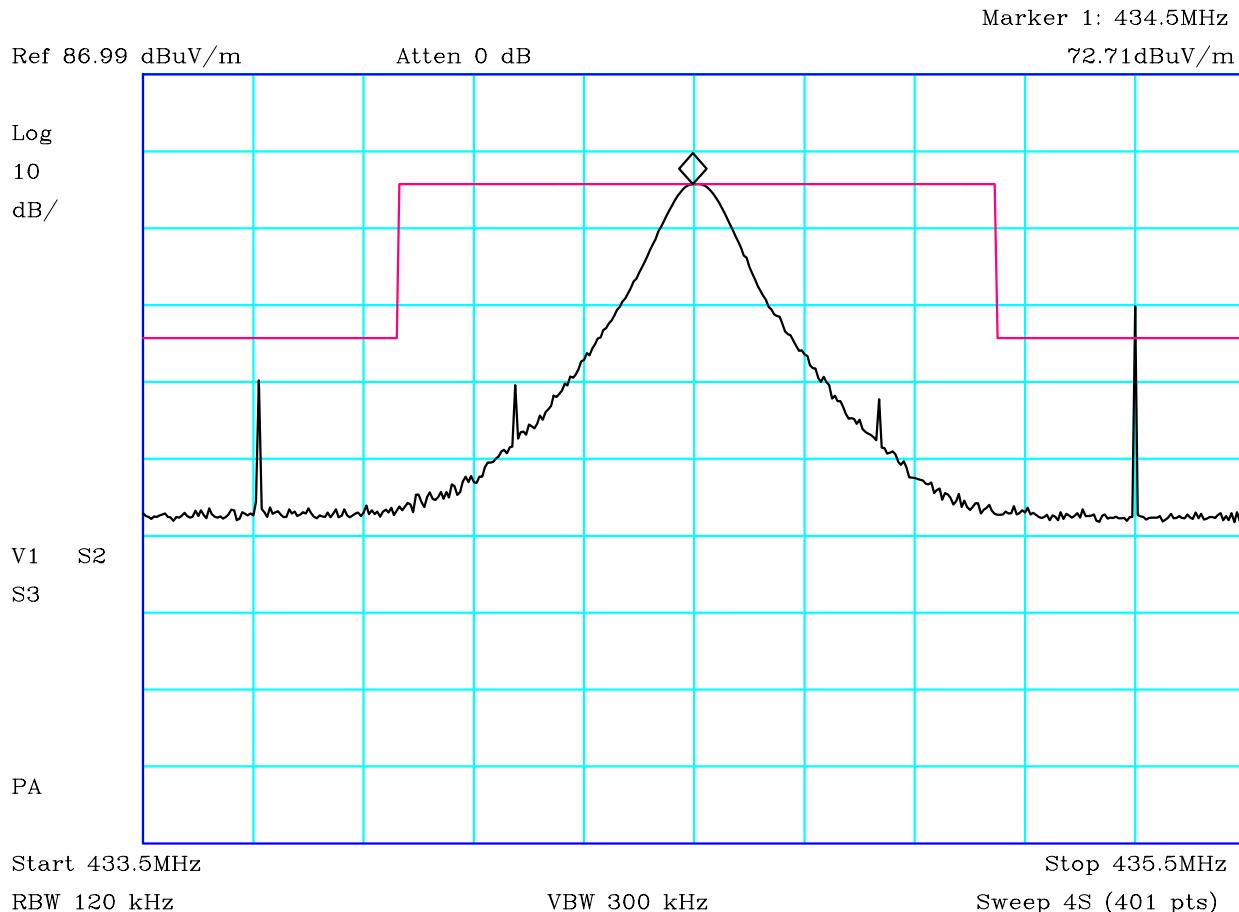
Company:	Quattro Electronics Ltd	Product:	VX
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	FCC Section 15.231	Method:	
Limit1:(VIO)	FCC Restricted Bands@1.5m	Limit2:(RED)	15.231@1.5m
Limit3:		Limit4:	
Op.Mode: Transmit Mode 434MHz.			
Vertical Antenna Polarisation = Black Trace, Horizontal = Blue Trace.			
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 Issue No: 1	FCC ID: XL8EXTPIR1501	
Test No: T4200	Test Report		Page: 37 of 45



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

Company:	Quattro 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



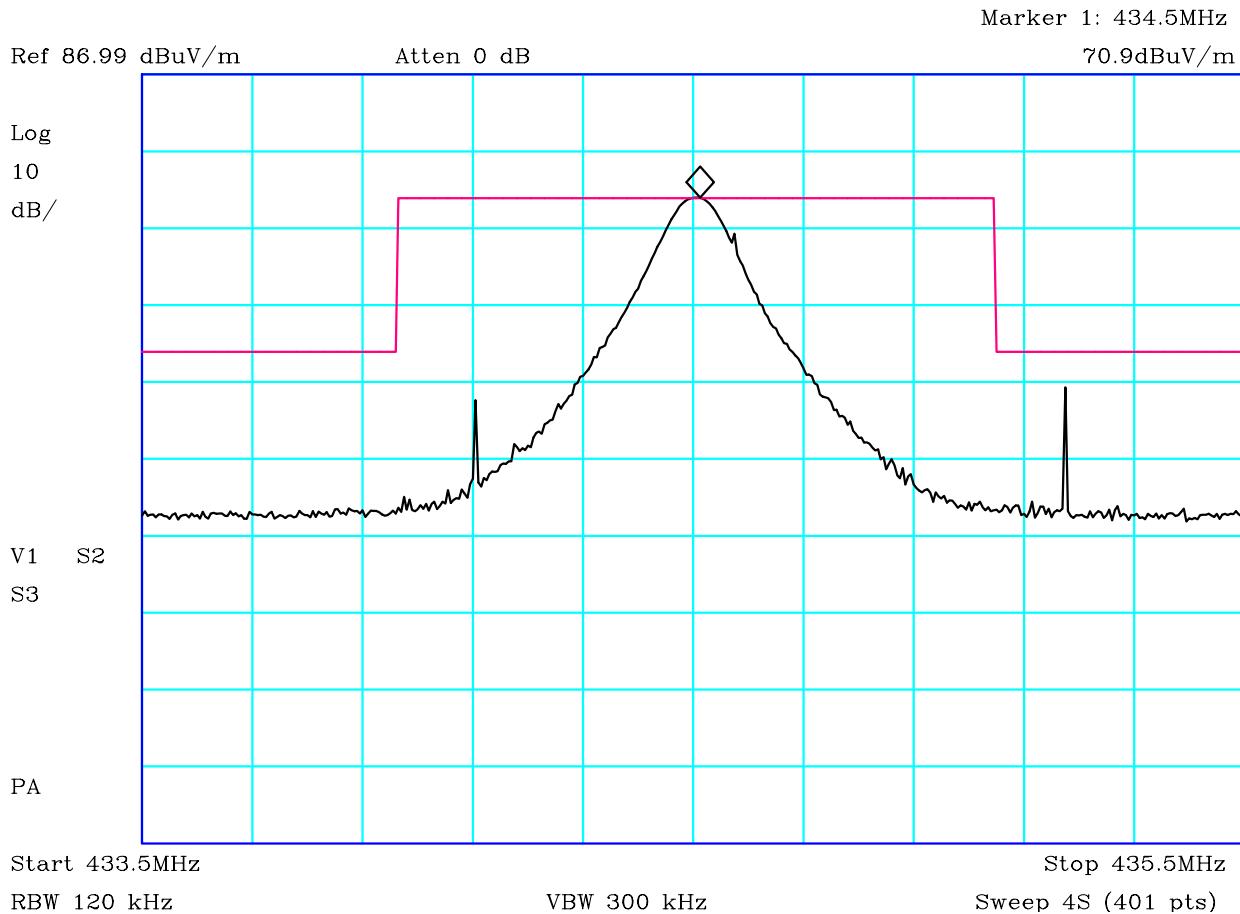
CF1:A24_3m_101116 CF2:CBL059_CBL062_CBL065_CBL060_090306

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

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".



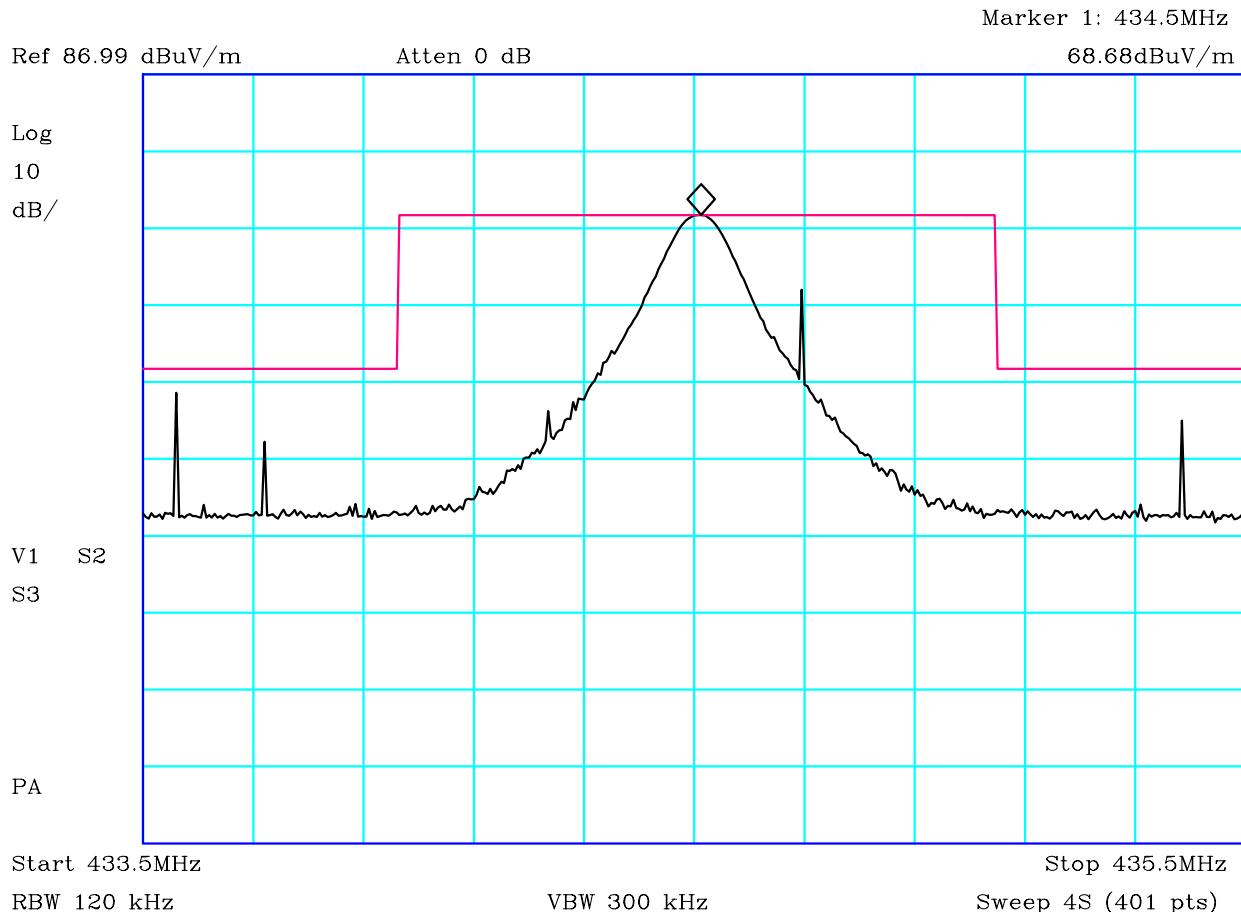
CF1:A24_3m_101116 CF2:CBL059_CBL062_CBL065_CBL060_090306

PLOT 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
Distance	3m	Polarisation	V
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".

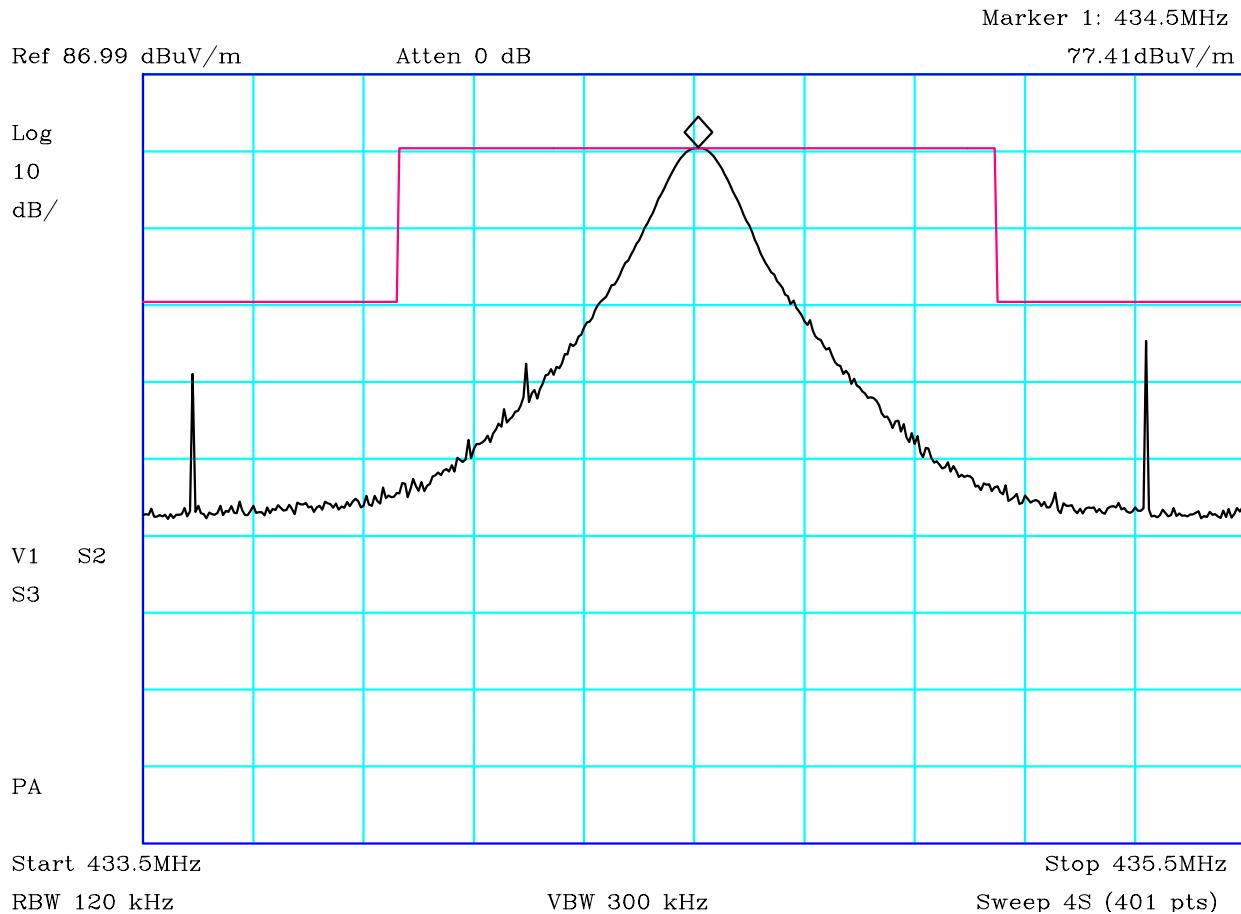


PLOT 19 Radiated Emissions - Band Edges - HX80 Unit

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

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:	Quattro	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

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.

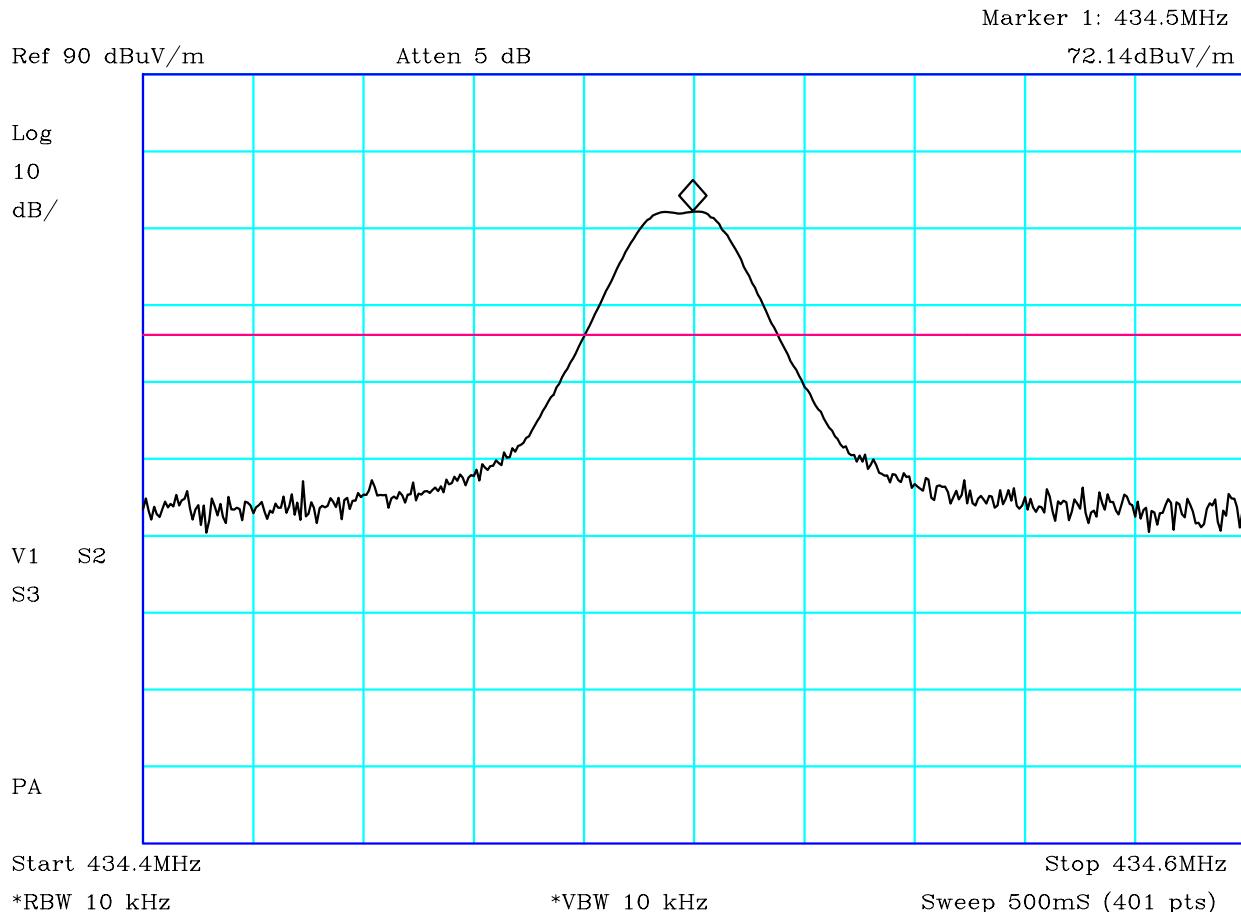
"Spikes" were transients when transmitter turns on. The quasi peaks levels of these transients were very low - see tabulated results for "Radiated Emissions at Band Edges".

	Report No: R3055 Issue No: 1
Test No: T4200	

FCC ID: XL8EXTPIR1501

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PLOT 21 Occupied Bandwidth - BX Unit

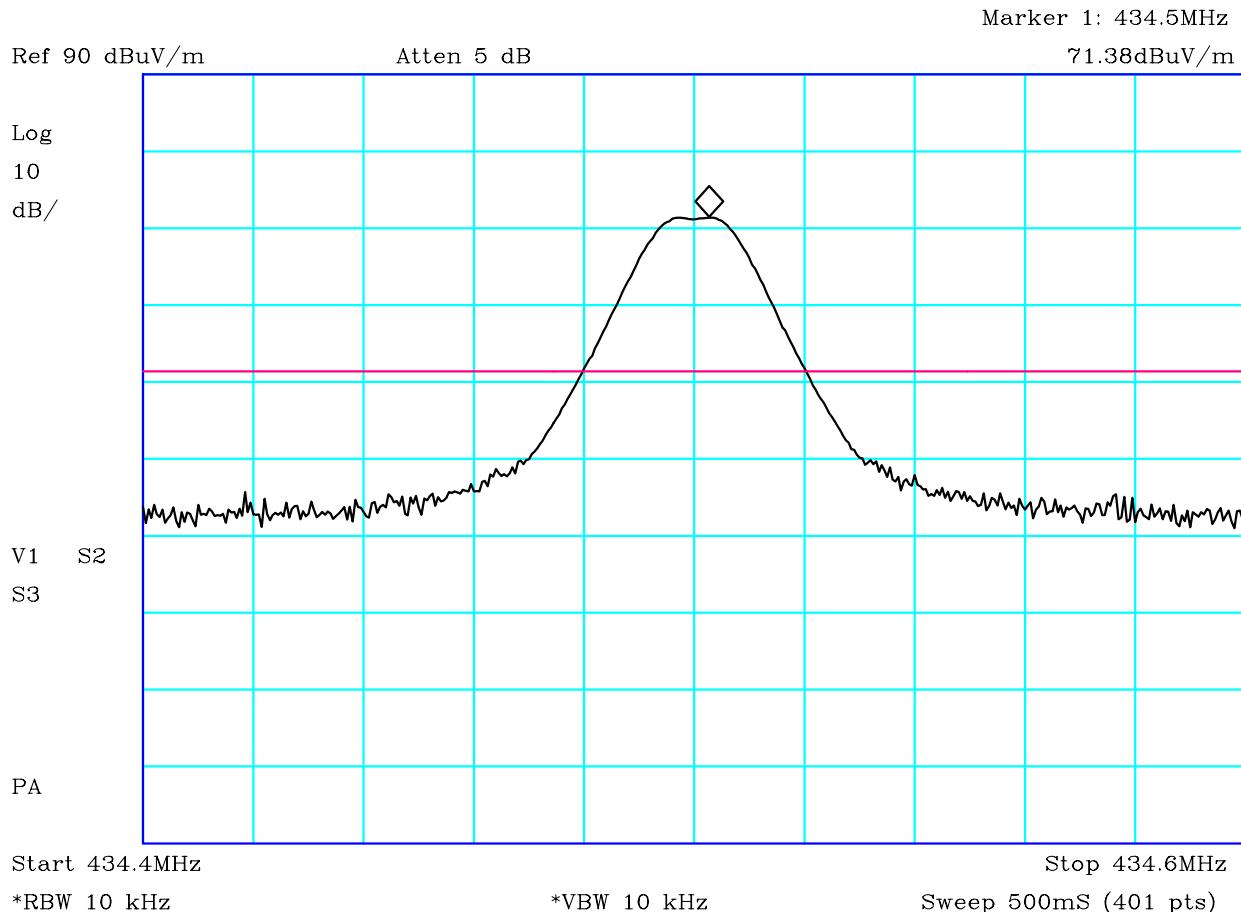
Company:	Quattro Electronics Ltd	Product:	BX
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	FCC Section 15.231	Method:	
Limit1:(VIO)	-20dBc	Limit2:	
Limit3:		Limit4:	
<p>-20dBc to left of peak: 434.454MHz -20dBc to right of peak: 434.495MHz Occupied bandwidth = 41kHz Limit = 1.09MHz</p>			
Facility:	Anech_2	Height	1.5m
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H21105C4
Mode:	1	Modification State:	0

	Report No: R3055 Issue No: 1
Test No: T4200	

FCC ID: XL8EXTPIR1501

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PLOT 22 Occupied Bandwidth - HX40 Unit

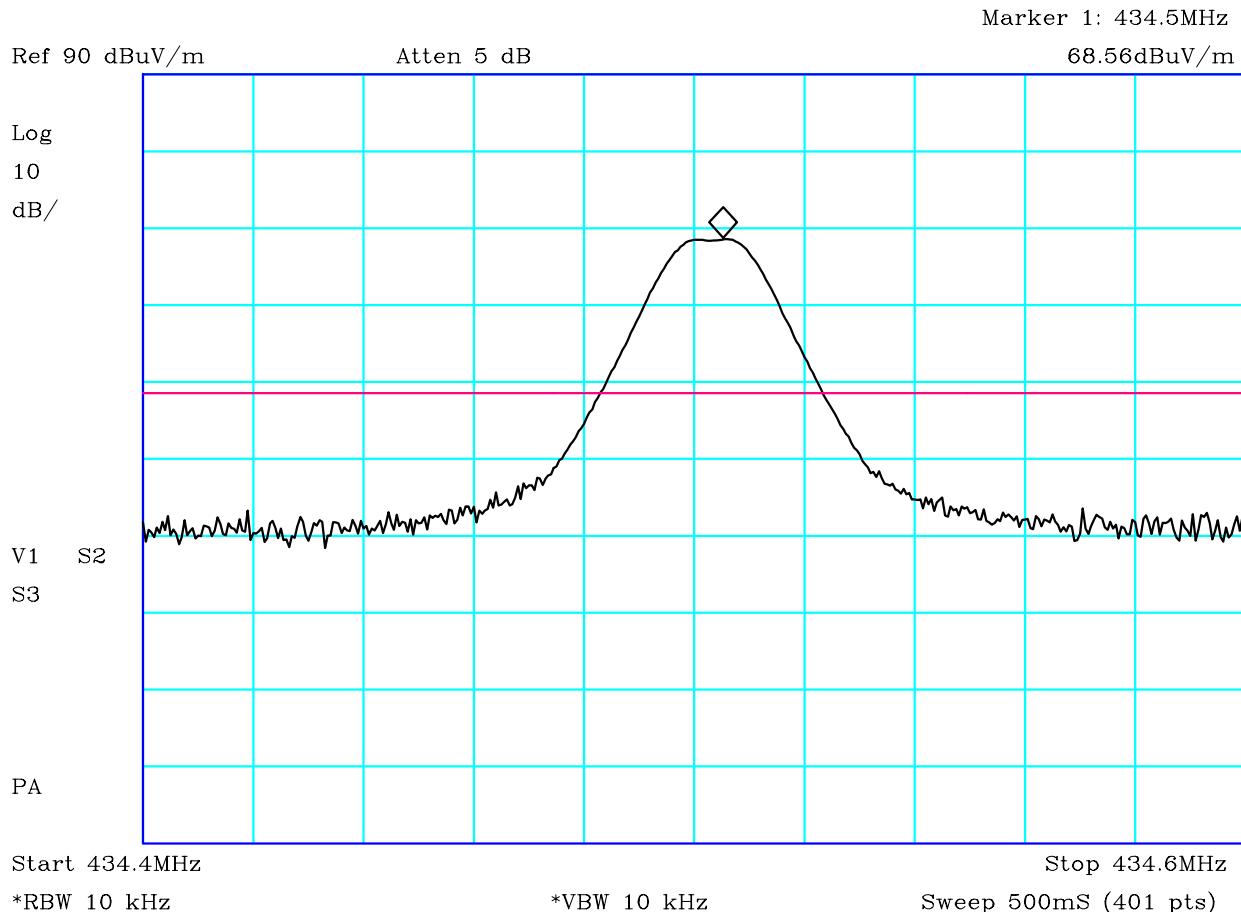
Company:	Quattro Electronics Ltd	Product:	HX40
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	FCC Section 15.231	Method:	
Limit1:(VIO)	-20dBc	Limit2:	
Limit3:		Limit4:	
<p>-20dBc to left of peak: 434.4565MHz -20dBc to right of peak: 434.4975MHz Occupied bandwidth = 41kHz Limit = 1.09MHz</p>			
Facility:	Anech_2	Height	1.5m
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H21105D3
Mode:	1	Modification State:	0

	Report No: R3055 Issue No: 1
Test No: T4200	

FCC ID: XL8EXTPIR1501

Test Report

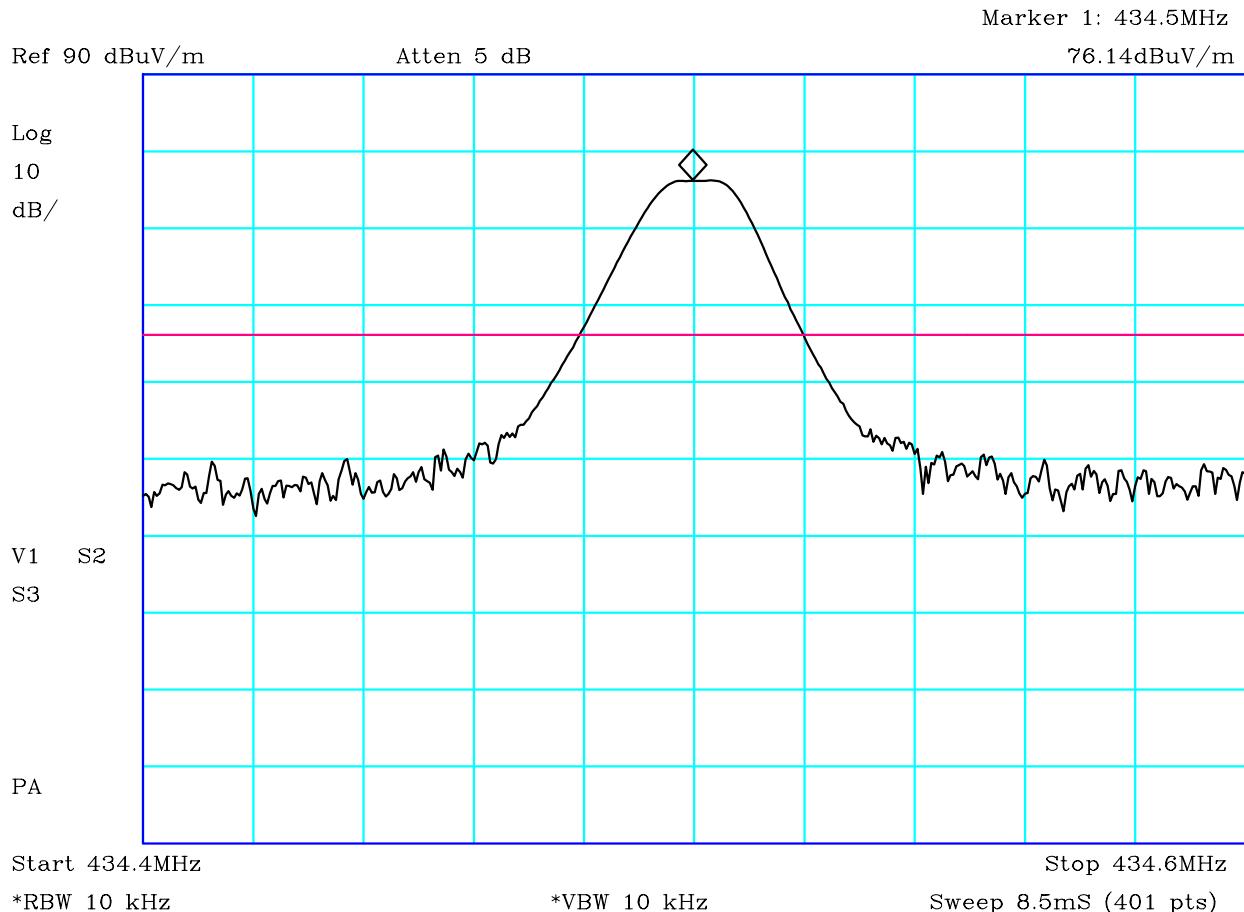
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PLOT 23 Occupied Bandwidth - HX80 Unit

Company:	Quattro Electronics Ltd	Product:	HX80
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	FCC Section 15.231	Method:	
Limit1:(VIO)	-20dBc	Limit2:	
Limit3:		Limit4:	
<p>-20dBc to left of peak: 434.4595MHz -20dBc to right of peak: 434.5005MHz Occupied bandwidth = 41kHz Limit = 1.09MHz</p>			
Facility:	Anech_2	Height	1.5m
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H21105E2
Mode:	1	Modification State:	0

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



PLOT 24 Occupied Bandwidth - VX Unit

Company:	Quattro Electronics Ltd	Product:	VX
Date:	10/02/2012	Test Eng:	Dave Smith
Method:	FCC Section 15.231	Method:	
Limit1:(VIO)	-20dBc	Limit2:	
Limit3:		Limit4:	
<p>-20dBc to left of peak: 434.456MHz -20dBc to right of peak: 434.497MHz Occupied bandwidth = 41kHz Limit = 1.09MHz</p>			
Facility:	Anech_2	Height	1.5m
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H21105B8
Mode:	1	Modification State:	0