	Report No: R3095A	FCC ID: WJHMH11	
	Issue No: 2		
	Test No: T4309	Test Report	Page: 1 of 57



dB Technology

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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

AlertMe.com Ltd

Hub520/Hub504

(FCC Part 15.247 measurements only)

dated


19th May 2012

Document History

Issue	Date	Affected page(s)	Description of modifications	Revised by	Approved by
1	19/05/12		Initial release		
2	31/05/12	1 and 16	AC Power conducted emissions 9kHz RBW clarified.	PB	DB

Based on report template:
v090319

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dB Technology (Cambridge) Ltd.*

	Report No: R3095A	FCC ID: WJHMH11	
	Issue No: 2		
	Test No: T4309	Test Report	Page: 2 of 57


Equipment Under Test (EUT):	Hub520/Hub504
Test Commissioned by:	AlertMe.com Ltd Compass House 80 Newmarket Road Cambridge CB5 8DZ
Representative:	Bruce Benson
Test Started:	3rd April 2012
Test Completed:	17th May 2012
Test Engineer:	Dave Smith
Date of Report:	19th May 2012
Written by: <u> Dave Smith </u>	Checked by: <u> Derek Barlow </u>
Signature: 	Signature: 
Date: <u> 19th May 2012 </u>	Date: <u> 22nd May 2012 </u>

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	<i>Code of Federal Regulations: Pt 15 Subpart C - Radio Frequency Devices - Intentional Radiators</i>
---------------	---

In particular, the rules of part 15.247 were applied.

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Device operating in the 2400-2483.5 MHz band (part 15.247)

FCC Part	Parameter	
15.207	Conducted Emissions	PASS
15.209	Radiated Emissions	PASS (for frequencies in the Restricted Bands list of 15.205 only - all other parts of 15.209 are not applicable - 15.247 takes precedence.)
15.247(a)(2)	Minimum 6dB bandwidth (must be > 500kHz)	PASS
15.247(b)(3)	Peak power (must be < 1W)	PASS
15.247(b)(4)	Antenna gain (must be < 6dBi)	Manufacturer data states a gain of 1dBi. Only integral antenna.
15.247(b)(5)	Exposure to RF	See separate declaration based on calculation.
15.247(d)	Conducted Antenna Spurious (Must be at least 20dB below carrier in - 100kHz bw)	PASS
15.247(e)	Spectral Density (must not exceed 8dBm in any 3kHz band)	PASS


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1 EUT Details

1.1 General

The EUT was an AlertMe Hub520/Hub504. The device incorporates two intentional radiators:

- (a) Zigbee: operating in the 2.4GHz to 2.4835GHz band. Operates on 15 equally spaced channels starting at 2.405GHz (channel 11) and ending at 2.475GHz (channel 25). O-QPSK (digital) modulation. Integral antenna. Gain of the antenna declared to be 1dBi.
- (b) Z-wave: operating in the 902MHz to 928MHz band. The device operates on 908.42 MHz. GFSK modulation. Integral antenna.

This report only covers the operation of the device as an intentional radiator in the 2.4GHz to 2.4835GHz band.


For Zigbee transmit mode tests were performed on:

Ch 11: 2.405 GHz, Ch 18: 2.440 GHz, Ch 25: 2.475 GHz

The device has an ethernet port and is powered from an external ac/dc adaptor or internal battery. Details of the EUT and associated peripherals used during the tests are listed below. Figure 1 shows the interconnections between the EUT and peripherals.

Item	Manufacturer	Model	Description	Serial No:	Notes
1	Alertme	Hub520/Hub504.	Sample 1 with wired co-axial connection to Zigbee transmitter		
2	Alertme	Hub520/Hub504.	Sample 2 with integral antennas. Z-wave transmitting constant unmodulated carrier Zigbee programmable.		
3	Alertme	Hub520/Hub504.	Sample 3 - with integral antennas. Z-wave constantly transmitting modulated signal		#1
4	Alertme	Hub520/Hub504.	Sample 4 with integral antennas. Z-wave in receive mode. Zigbee programmable.		
5	Ten Pao	S0006MU0520115	ac to dc power adaptor		
6	D-Link	DES-1008D	ethernet switch	DR90157001347	#2
7	D-Link	AD-071AD	ethernet switch PSU		#2

- #1 Sample not used for tests covered by this report.
#2 FCC Declaration of Conformity
#3 Power supply so only FCC Verification required.

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1.2 Modifications to EUT and Peripherals

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	
1	Internal screening can over part of pcb.	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 or susceptibility. Individual test result sheets reference the operating mode of the EUT.

Operating Mode	Details
1	Zigbee transmit. Continuously transmitting constant packet stream. The transmit channel was set to either Channel 11, 18 or 25. Individual test results show the actual operating channel. Output set to 0dBm and amplifier switched on.
2	As mode 1 but with Z-wave also continuously transmitting.

1.4 Zigbee Duty Cycle

All Zigbee transmit measurements were made with the device sending continuous packet streams. In the intended application transmissions only occur in short bursts. The manufacturer has stated that in any one 100msec period transmissions are limited to a burst of approximately 2 msec. This is backed up by the traces provided by the manufacturer (see Figure 2 and Figure 3).

This allows an additional duty cycle correction factor to be applied where average limits are specified. This duty cycle correction factor has been calculated as -20dB ($=20 \cdot \log_{10} 10/100$ - assuming a transmit time of no more than 10msec in a 100msec period). This additional correction factor has only been applied where necessary and it is clearly indicated in the results tables.

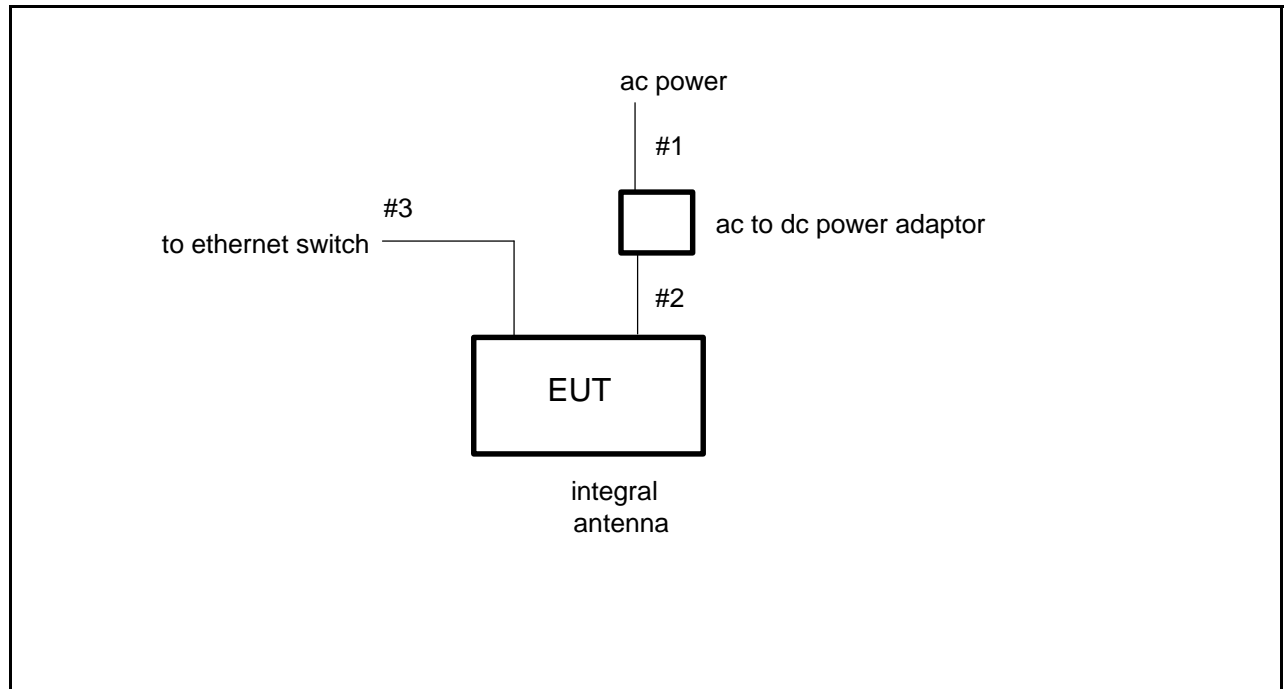


Figure 1 EUT and Peripherals

	Description	Type	Length	Notes
#1	Mains extension lead	Unscreened	1.5m	
#2	DC power lead	Unscreened	2m	
#3	Ethernet cable	Screened	2m	

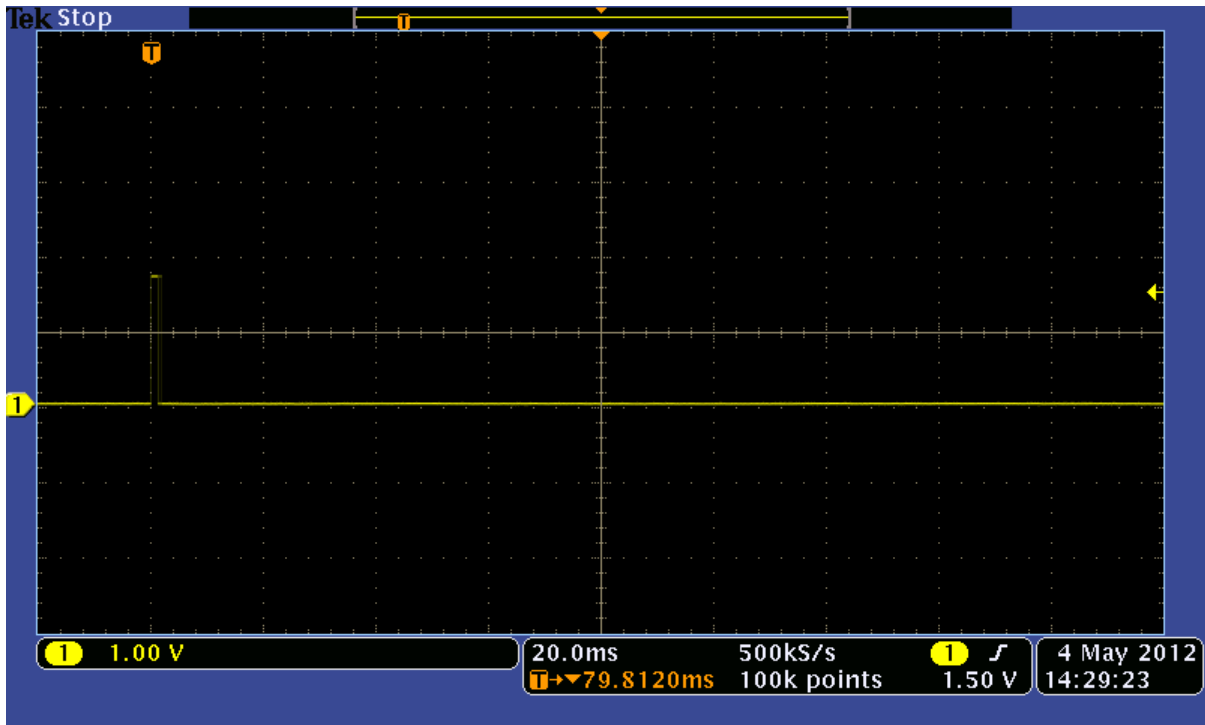


Figure 2 Manufacturer's trace showing Zigbee 2msec burst in 100msec period

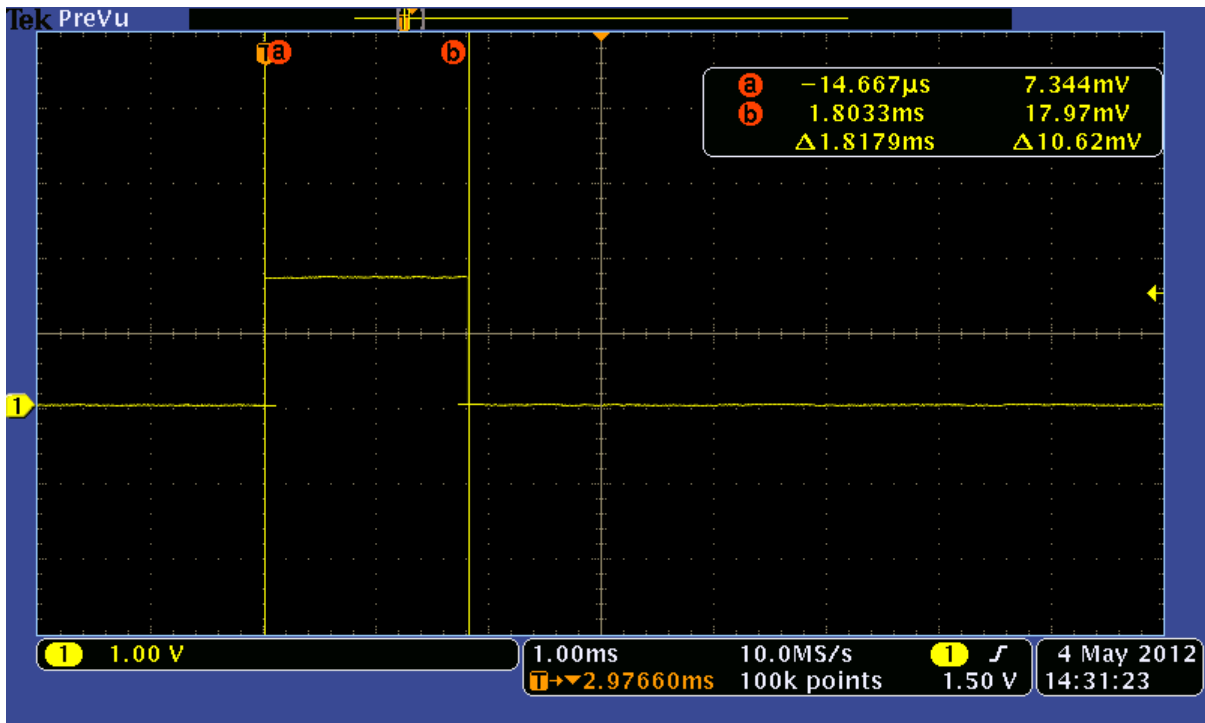



Figure 3 Manufacturer's trace showing duration of Zigbee 2msec

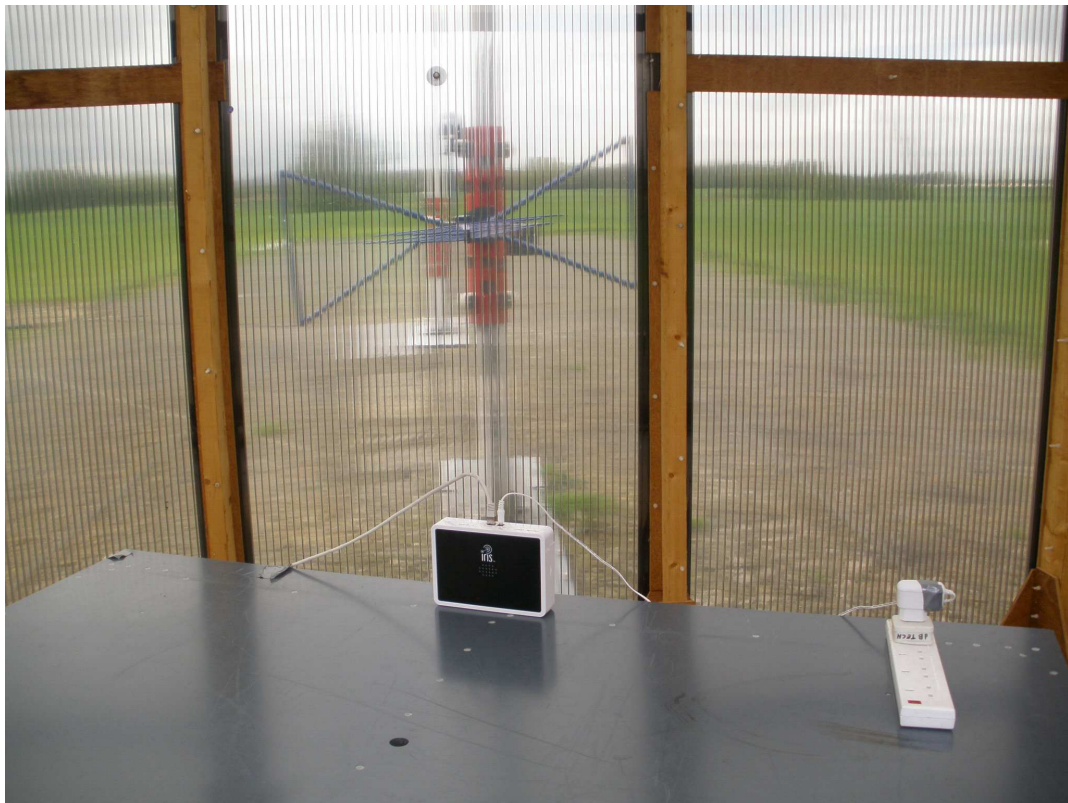
	Report No: R3095A	FCC ID: WJHMH11	
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Photograph 1 Conducted Emissions - Front




Photograph 2 Conducted Emissions - Back



Photograph 3 Radiated Emissions - Upright - Front




Photograph 4 Radiated Emissions - Flat - Back

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Photograph 5 Conducted Antenna


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	Test No: T4309	Test Report	

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 Dat	Cal Interval
A15	Chase X-wing Bilog CBL6140 20MHz-2GHz	1047	18/11/2011	1 year
A20	Alpha 61932500 Horn Antenna (18-26GHz)	50	#1	
A22	Alpha 61932400 Horn Antenna (12.4-18GHz)	55	#1	
A23	EMCO 3115 DR Guide (1-18GHz)	4982	31/01/2012	1 year
A24	Chase X-wing Bilog CBL6144 26MHz-3GHz	27590	18/11/2011	1 year
A5	Chase Bilog CBL6111A	1760	31/01/2012	1 year
L1	EMCO 3825/2 LISN	1358	16/02/2012	1 year
L2	R&S ESH3-Z5 LISN	93762.444444	16/02/2012	1 year
PRE7	LUCIX 0.1GHz to 20GHz	24485	08/01/2012	1 year
PRE8	LUCIX 18GHz to 26.5GHz	24486	08/01/2012	1 year
R1	CHASE LHR 7000	1056	31/01/2012	1 year
R4	R&S ESVS10	421872	16/10/2011	1 year
R8	Agilent E7405A Spectrum Analyser	MY44212494	19/09/2011	1 year
R9	Agilent E7405A Spectrum Analyser	MY45110758	21/11/2011	1 year
RFF01	High Pass RF Filter 3GHz to 12.75GHz	1	08/02/2012	1 year
RFF04	Low Pass RF Filter 0MHz to 2GHz	4	08/02/2012	1 year
RFF15	Band Pass Filter 1GHz to 2GHz	15	08/02/2012	1 year
RFF22	Hi Pass Filter - 1.35GHz (to 10GHz) HPM13017	33	08/02/2012	1 year

#1 Standard Gain Horns - Factors derived by calculation from dimensions.

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3 Test Methods

3.1 Conducted Emissions - ac power

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.

Bench top EUTs and peripheral equipment are normally placed on a 0.8m high non-conducting bench, positioned 0.4m from one of the metallic walls of a screened room. Floor standing EUTs are normally placed 0.1m above the metallic floor of the screened room. Mains leads are bundled so as not to exceed 1m.

The EUT is powered using a 50ohm/50uH Line Impedance Stabilisation Network (LISN). Peripherals are powered using a second a 50ohm/50uH LISN. These LISNs are bonded to the screened room floor.

With the correct supply voltage applied to the EUT scans are performed on both the live and neutral line outputs of the LISN using quasi-peak detection over the specified frequency range. The results of these scans are shown in the plots section at the end of the report.

Significant emissions identified by the scans are measured and the results tabulated. The table of results is shown in the conducted emissions results section.

Final Level (dBuV) = Receiver Reading (dBuV) + Combined Cable & Attenuator Correction Factor (dB)

Example:

@ 191kHz Final Level = 45.8 + 10.0 = 55.8 dBuV

3.2 Radiated Emissions

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 up to 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. Attempts are made to identify the layout of cables that give highest readings.

Significant emissions identified by the scans are measured on an open area test site at the appropriate test distance using the specified detector function. Maximised readings are obtained by rotating the EUT through 360° and adjusting the height of the antenna from 1 m 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 receiver reading was 57.8dBuV and combined correction factor = 20.4 (dB/m).

Total field strength = 57.8 + 20.4 = 78.2dBuV/m.

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3.3 Conducted Antenna Emissions

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.

The antenna port of the EUT was connected directly to the input of a spectrum analyser. Sweeps were made over the required frequency ranges with the specified detectors applied.

4 Test Results


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

4.1 Conducted Emissions (Power) - Results

Factor Set 1:	L1_11A AB002_CBL005_CBL039_11A - -
Factor Set 2:	- - - -
Factor Set 3:	- - - -
Test Equipment:	R1 L1 L2

Conducted Emissions (Power)

<i>Company:</i> AlertMe.com Ltd					<i>Product:</i> Hub520/Hub504							
<i>Date:</i> 04/05/12					<i>Test Eng:</i> Dave Smith							
<i>Ports:</i> ac power												
<i>Test:</i> ANSI C63.4:2003 using limits of FCC(B)												
<i>Ports:</i>												
<i>Test:</i> using limits of												
Plot	Op Mode	Mod State	Line (L/N)	Fact Set	Freq. MHz	Det qp/av	Rec. Level dBuV	Corr'n Factor dB	Total Level dBuV	Limit FCC(B) dBuV	Margin FCC(B) dB	Notes
32	2	1	N	1	0.150	qp	37.7	10.0	47.7	66.0	18.3	
32	2	1	N	1	0.150	av	23.8	10.0	33.8	56.0	22.2	
32	2	1	N	1	0.267	qp	26.4	10.0	36.4	61.2	24.8	
32	2	1	N	1	0.267	av	18.0	10.0	28.0	51.2	23.2	
32	2	1	N	1	9.240	qp	23.7	10.2	33.9	60.0	26.1	
32	2	1	N	1	9.240	av	13.8	10.2	24.0	50.0	26.0	
33	2	1	L	1	0.150	qp	36.3	10.0	46.3	66.0	19.7	
33	2	1	L	1	0.150	av	23.8	10.0	33.8	56.0	22.2	
33	2	1	L	1	0.370	qp	29.8	10.0	39.8	58.5	18.7	
33	2	1	L	1	0.370	av	20.0	10.0	30.0	48.5	18.5	
33	2	1	L	1	9.079	qp	25.8	10.2	36.0	60.0	24.0	
33	2	1	L	1	9.079	av	16.3	10.2	26.5	50.0	23.5	
Results										Minimum Margin		
										PASS/FAIL		
										18.3 dB		
										PASS		
Notes	Comments and Observations											
	<p>Results of scans shown in plots 32 and 33. Measurements made with both Z-wave and Zigbee transmitting which was considered to be the "worse case" mode (Sample 2).</p> <p>All AC power conducted emissions measurements were made using a 9kHz resolution bandwidth.</p> <p>Limits for 15.207 are shown.</p>											

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4.2 Zigbee Peak Power - 15.247(b)(3)

Test Equipment: R8

Peak Power

<i>Company:</i> AlertMe.com Ltd	<i>Product:</i> Hub520/Hub504
<i>Date:</i> 16/05/2012	<i>Test Eng:</i> Dave Smith
<i>Ports:</i> Antenna	
<i>Test:</i> 15.247(b)(3)	
<i>Ports:</i>	
<i>Test:</i>	

Notes	Comments and Observations																
	<p>This was performed as a conducted measurement on sample 1.</p> <p>Results of scans are shown in plots 1 to 3.</p> <p>The method of 558074 D01 DTS Meas Guidance v01 section 5.2.1.2 was applied. The spectrum analyser's "band power" measurement was used with a peak detector selected.</p> <p>Results were as follows:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Channel</th> <th>Level (dBm)</th> <th>Limit (dBm)</th> <th></th> </tr> </thead> <tbody> <tr> <td>11</td> <td>21.94</td> <td>30</td> <td>PASS</td> </tr> <tr> <td>18</td> <td>22.08</td> <td>30</td> <td>PASS</td> </tr> <tr> <td>25</td> <td>21.94</td> <td>30</td> <td>PASS</td> </tr> </tbody> </table>	Channel	Level (dBm)	Limit (dBm)		11	21.94	30	PASS	18	22.08	30	PASS	25	21.94	30	PASS
Channel	Level (dBm)	Limit (dBm)															
11	21.94	30	PASS														
18	22.08	30	PASS														
25	21.94	30	PASS														

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4.3 Zigbee Bandwidth - 15.247(a)(2)

Test Equipment: R8

Bandwidth

<i>Company:</i> AlertMe.com Ltd	<i>Product:</i> Hub520/Hub504
<i>Date:</i> 16/05/2012	<i>Test Eng:</i> Dave Smith
<i>Ports:</i> Antenna	
<i>Test:</i> 15.247(a)(2)	
<i>Ports:</i>	
<i>Test:</i>	

Notes	Comments and Observations																
	<p>This was performed as a conducted measurement on sample 1.</p> <p>Results of scans are shown in plots 4 to 6.</p> <p>The method of 558074 D01 DTS Meas Guidance v01 section 5.1.1 was applied.</p> <p>The results are as follows:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Channel</th> <th>Measured Bandwidth (MHz)</th> <th>Limit</th> <th></th> </tr> </thead> <tbody> <tr> <td>11</td> <td>1.600</td> <td>> 500kHz</td> <td>PASS</td> </tr> <tr> <td>18</td> <td>1.560</td> <td>> 500kHz</td> <td>PASS</td> </tr> <tr> <td>25</td> <td>1.610</td> <td>> 500kHz</td> <td>PASS</td> </tr> </tbody> </table> <p>PASS</p>	Channel	Measured Bandwidth (MHz)	Limit		11	1.600	> 500kHz	PASS	18	1.560	> 500kHz	PASS	25	1.610	> 500kHz	PASS
Channel	Measured Bandwidth (MHz)	Limit															
11	1.600	> 500kHz	PASS														
18	1.560	> 500kHz	PASS														
25	1.610	> 500kHz	PASS														

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4.4 Zigbee Power Spectral Density in 3kHz bw - 15.247(e)

Test Equipment: R8

Spectral Density

<i>Company:</i> AlertMe.com Ltd	<i>Product:</i> Hub520/Hub504
<i>Date:</i> 16/05/2012	<i>Test Eng:</i> Dave Smith
<i>Ports:</i> Antenna	
<i>Test:</i> 15.247(e)	
<i>Ports:</i>	
<i>Test:</i>	

Notes	Comments and Observations
	<p>This was performed as a conducted measurement on sample 1.</p> <p>The method of 558074 D01 DTS Meas Guidance v01 section 5.3.1 was applied. As specified, measurements were made with a RBW of 100kHz and an additional CF of -15.2dB applied to convert to dBm/3kHz.</p> <p>Results of scans are shown in plots 7 to 9.</p> <p>In all cases the spectral density is below 8dBm/3kHz.</p> <p>PASS</p>

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4.5 Zigbee Antenna Conducted Spurious Emissions (100kHz bw) - 15.247(d)

Test Equipment: R8

Conducted Emissions (Signal)

<i>Company:</i> AlertMe.com Ltd	<i>Product:</i> Hub520/Hub504
<i>Date:</i> 10/04/2012	<i>Test Eng:</i> Dave Smith
<i>Ports:</i> Antenna	
<i>Test:</i> 15.247(d)	
<i>Ports:</i>	
<i>Test:</i>	

Notes	Comments and Observations																																																																				
	<p>This was performed as a conducted measurement on sample 1.</p> <p>The method of 558074 D01 DTS Meas Guidance v01 section 5.4.1 was applied.</p> <p>Results of scans shown in plots 10 to 14.</p> <table border="1"> <thead> <tr> <th>Frequency <i>MHz</i></th> <th>Tx Ch</th> <th>Level <i>dBm</i></th> <th>Level w.r.t Fundamental <i>dB</i></th> <th>Limit <i>dB</i></th> <th>Margin <i>dB</i></th> <th></th> </tr> </thead> <tbody> <tr> <td><i>2.4050</i></td> <td><i>Ch 11</i></td> <td><i>15.8</i></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2.4000</td> <td>Ch 11</td> <td>-30.2</td> <td>-46.0</td> <td>-20</td> <td>26.0</td> <td>PASS</td> </tr> <tr> <td>4.8094</td> <td>Ch 11</td> <td>-38.5</td> <td>-54.3</td> <td>-20</td> <td>34.3</td> <td>N/A *</td> </tr> <tr> <td><i>2.4400</i></td> <td><i>Ch 18</i></td> <td><i>16.2</i></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4.8794</td> <td>Ch 18</td> <td>-36.7</td> <td>-52.9</td> <td>-20</td> <td>32.9</td> <td>N/A *</td> </tr> <tr> <td><i>2.4750</i></td> <td><i>Ch 25</i></td> <td><i>15.9</i></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2.4835</td> <td>Ch 25</td> <td>-37.2</td> <td>-37.2</td> <td>-20</td> <td>17.2</td> <td>PASS</td> </tr> <tr> <td>4.9494</td> <td>Ch 25</td> <td>-37.0</td> <td>-52.9</td> <td>-20</td> <td>32.9</td> <td>N/A *</td> </tr> </tbody> </table> <p>* This emission falls within a restricted band and was therefore also measured as a radiated test using the limits of 15.209. Providing an emission meets the radiated limits of 15.209 there is no requirement to additionally meet -20dBc conducted limit.</p> <p>PASS</p>						Frequency <i>MHz</i>	Tx Ch	Level <i>dBm</i>	Level w.r.t Fundamental <i>dB</i>	Limit <i>dB</i>	Margin <i>dB</i>		<i>2.4050</i>	<i>Ch 11</i>	<i>15.8</i>					2.4000	Ch 11	-30.2	-46.0	-20	26.0	PASS	4.8094	Ch 11	-38.5	-54.3	-20	34.3	N/A *	<i>2.4400</i>	<i>Ch 18</i>	<i>16.2</i>					4.8794	Ch 18	-36.7	-52.9	-20	32.9	N/A *	<i>2.4750</i>	<i>Ch 25</i>	<i>15.9</i>					2.4835	Ch 25	-37.2	-37.2	-20	17.2	PASS	4.9494	Ch 25	-37.0	-52.9	-20	32.9	N/A *
Frequency <i>MHz</i>	Tx Ch	Level <i>dBm</i>	Level w.r.t Fundamental <i>dB</i>	Limit <i>dB</i>	Margin <i>dB</i>																																																																
<i>2.4050</i>	<i>Ch 11</i>	<i>15.8</i>																																																																			
2.4000	Ch 11	-30.2	-46.0	-20	26.0	PASS																																																															
4.8094	Ch 11	-38.5	-54.3	-20	34.3	N/A *																																																															
<i>2.4400</i>	<i>Ch 18</i>	<i>16.2</i>																																																																			
4.8794	Ch 18	-36.7	-52.9	-20	32.9	N/A *																																																															
<i>2.4750</i>	<i>Ch 25</i>	<i>15.9</i>																																																																			
2.4835	Ch 25	-37.2	-37.2	-20	17.2	PASS																																																															
4.9494	Ch 25	-37.0	-52.9	-20	32.9	N/A *																																																															

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	Test No: T4309	Test Report	

4.6 Zigbee Radiated Emissions - Channel 11 - 15.209

Factor Set 1:	A23_3m_10A PRE7_CBL052_CBL093_11A RFF01_11A -
Factor Set 2:	A20_3m_10B PRE8_CBL052_CBL092_11A - -
Factor Set 3:	- - - -
Test Equipment:	R8 A23 A15 PRE7 RFF01 A20 PRE8 A22 RFF04

Radiated Emissions


<i>Company:</i> AlertMe.com Ltd					<i>Product:</i> Hub520/Hub504								
<i>Date:</i> 05/04/2012					<i>Test Eng:</i> Dave Smith								
<i>Ports:</i>													
<i>Test:</i> ANSI C63.4:2003					using limits of 15.209								
<i>Ports:</i>													
<i>Test:</i>					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 15.209 dBuV/m	Margin 15.209 dB	Notes
Channel 11													
25	1	0	1.5	1	4809.395	V	59.2	-5.3		53.9	80.0	26.1	Pk
25	1	0	1.5	1	4809.395	V	50.1	-5.3		44.7	60.0	15.3	Av
25	1	0	1.5	1	4809.395	H	65.7	-5.3		60.4	80.0	19.6	Pk
25	1	0	1.5	1	4809.395	H	56.8	-5.3		51.4	60.0	8.6	Av
27	1	0	1.5	1	12028.487	V	54.4	3.6		57.9	80.0	22.1	Pk
27	1	0	1.5	1	12028.487	V	43.8	3.6		47.4	60.0	12.6	Av
27	1	0	1.5	1	12028.487	H	56.0	3.6		59.6	80.0	20.5	Pk
27	1	0	1.5	1	12028.487	H	45.7	3.6		49.2	60.0	10.8	Av
30	1	0	3	2	19237.775	V	50.0	1.6		51.6	74.0	22.4	Pk
30	1	0	3	2	19237.775	V	41.3	1.6		42.9	54.0	11.1	Av
30	1	0	3	2	19237.775	H	53.8	1.6		55.5	74.0	18.5	Pk
30	1	0	3	2	19237.775	H	46.2	1.6		47.9	54.0	6.1	Av
Results											Minimum Margin		
											PASS/FAIL		
											6.1 dB		
											PASS		
Notes	Comments and Observations												
	Results of scans shown in plots 20 to 31.												
	All average measurements could be reduced by a further 20dB if the "Duty Cycle Correction" were applied.												
Key:	qp - quasi-peak, av - average, pk - peak												

4.7 Zigbee Radiated Emissions - Channel 18 - 15.209

Factor Set 1:	A23_3m_10A PRE7_CBL052_CBL093_11A RFF01_11A -
Factor Set 2:	A20_3m_10B PRE8_CBL052_CBL092_11A - -
Factor Set 3:	- - - -
Test Equipment:	R8 A23 A15 PRE7 RFF01 A20 PRE8 A22 RFF04

Radiated Emissions

<i>Company:</i> AlertMe.com Ltd					<i>Product:</i> Hub520/Hub504								
<i>Date:</i> 05/04/2012					<i>Test Eng:</i> Dave Smith								
<i>Ports:</i>													
<i>Test:</i> ANSI C63.4:2003 using limits of 15.209													
<i>Ports:</i>													
<i>Test:</i> 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 15.209 dBuV/m	Margin 15.209 dB	Notes
Channel 18													
25	1	0	1.5	1	4879.400	V	62.4	-5.0		57.4	80.0	22.7	Pk
25	1	0	1.5	1	4879.400	V	53.5	-5.0		48.5	60.0	11.6	Av
25	1	0	1.5	1	4879.400	H	67.5	-5.0		62.5	80.0	17.6	Pk
25	1	0	1.5	1	4879.400	H	58.5	-5.0		53.5	60.0	6.5	Av
26	1	0	1.5	1	7319.063	V	60.8	-0.7		60.1	80.0	19.9	Pk
26	1	0	1.5	1	7319.063	V	50.7	-0.7		50.0	60.0	10.0	Av
26	1	0	1.5	1	7319.063	H	65.7	-0.7		65.0	80.0	15.0	Pk
26	1	0	1.5	1	7319.063	H	55.8	-0.7		55.1	60.0	4.9	Av
27	1	0	1.5	1	12198.420	V	53.9	3.4		57.2	80.0	22.8	Pk
27	1	0	1.5	1	12198.420	V	44.0	3.4		47.4	60.0	12.6	Av
27	1	0	1.5	1	12198.420	H	56.1	3.4		59.5	80.0	20.6	Pk
27	1	0	1.5	1	12198.420	H	46.0	3.4		49.4	60.0	10.6	Av
30	1	0	3	2	19517.700	V	48.7	1.6		50.3	74.0	23.7	Pk
30	1	0	3	2	19517.700	V	40.3	1.6		41.9	54.0	12.1	Av
30	1	0	3	2	19517.700	H	49.6	1.6		51.2	74.0	22.8	Pk
30	1	0	3	2	19517.700	H	41.2	1.6		42.8	54.0	11.2	Av
Results											Minimum Margin		
											PASS/FAIL		
											4.9 dB		
											PASS		
Notes	Comments and Observations												
	<p>Results of scans shown in plots 20 to 31.</p> <p>All average measurements could be reduced by a further 20dB if the "Duty Cycle Correction" were applied.</p> <p>Key: qp - quasi-peak, av - average, pk - peak</p>												


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	Test No: T4309	Test Report	

4.8 Zigbee Radiated Emissions - Channel 25 - 15.209

Factor Set 1:	A23_3m_10A PRE7_CBL052_CBL093_11A RFF01_11A -
Factor Set 2:	A20_3m_10B PRE8_CBL052_CBL092_11A - -
Factor Set 3:	- - - -
Test Equipment:	R8 A23 A15 PRE7 RFF01 A20 PRE8 A22 RFF04

Radiated Emissions

<i>Company:</i> AlertMe.com Ltd					<i>Product:</i> Hub520/Hub504								
<i>Date:</i> 05/04/2012					<i>Test Eng:</i> Dave Smith								
<i>Ports:</i>													
<i>Test:</i> ANSI C63.4:2003 using limits of 15.209													
<i>Ports:</i>													
<i>Test:</i> 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 15.209 dBuV/m	Margin 15.209 dB	Notes
Channel 25													
25	1	0	1.5	1	4949.400	V	62.9	-5.0		57.9	80.0	22.1	Pk
25	1	0	1.5	1	4949.400	V	53.8	-5.0		48.8	60.0	11.2	Av
25	1	0	1.5	1	4949.400	H	66.2	-5.0		61.2	80.0	18.8	Pk
25	1	0	1.5	1	4949.400	H	57.1	-5.0		52.1	60.0	7.9	Av
26	1	0	1.5	1	7423.625	V	62.4	-0.1		62.3	80.0	17.7	Pk
26	1	0	1.5	1	7423.625	V	52.8	-0.1		52.7	60.0	7.3	Av
26	1	0	1.5	1	7423.625	H	64.7	-0.1		64.6	80.0	15.4	Pk
26	1	0	1.5	1	7423.625	H	55.1	-0.1		55.0	60.0	5.0	Av
27	1	0	1.5	1	12373.500	V	53.4	3.4		56.8	80.0	23.2	Pk
27	1	0	1.5	1	12373.500	V	43.3	3.4		46.7	60.0	13.4	Av
27	1	0	1.5	1	12373.500	H	53.5	3.4		56.9	80.0	23.1	Pk
27	1	0	1.5	1	12373.500	H	43.1	3.4		46.5	60.0	13.6	Av
30	1	0	3	2	19797.400	V	47.8	0.3		48.1	74.0	25.9	Pk
30	1	0	3	2	19797.400	V	38.7	0.3		38.9	54.0	15.1	Av
30	1	0	3	2	19797.400	H	50.3	0.3		50.5	74.0	23.5	Pk
30	1	0	3	2	19797.400	H	42.0	0.3		42.3	54.0	11.7	Av
Results											Minimum Margin		
											PASS/FAIL		
											5.0 dB		
											PASS		
Notes	Comments and Observations												
	<p>Results of scans shown in plots 20 to 31.</p> <p>All average measurements could be reduced by a further 20dB if the "Duty Cycle Correction" were applied.</p> <p>Key: qp - quasi-peak, av - average, pk - peak</p>												

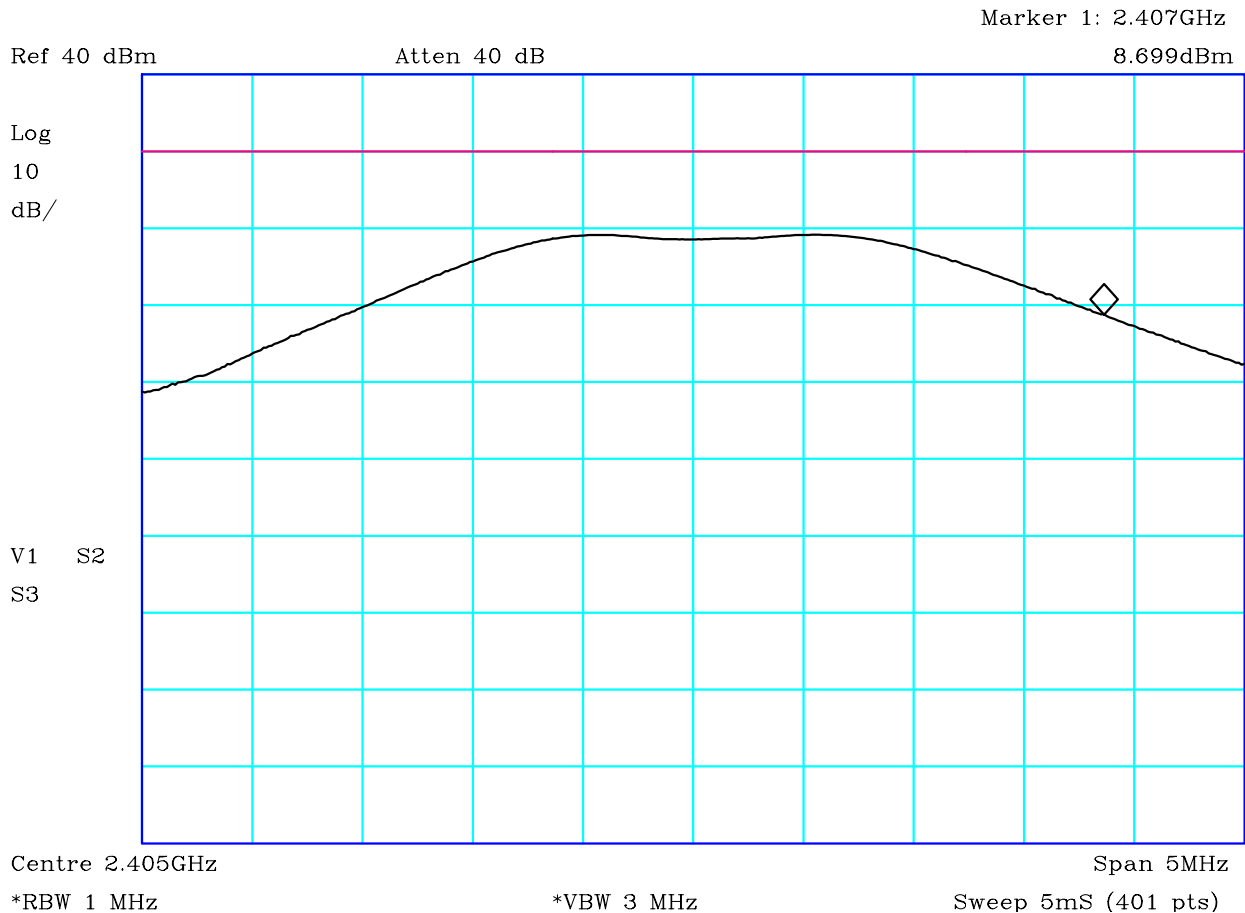
	Report No: R3095A	FCC ID: WJHMH11	Page: 24 of 57
	Issue No: 2		
	Test No: T4309	Test Report	

4.9 Zigbee Radiated Emissions - Band Edges - 15.209

Factor Set 1:	A23_3m_10A CBL059_CBL018_CBL065_CBL060_10A - -
Factor Set 2:	A23_3m_10A CBL049_11A - -
Factor Set 3:	- - - -
Test Equipment:	R8 A23

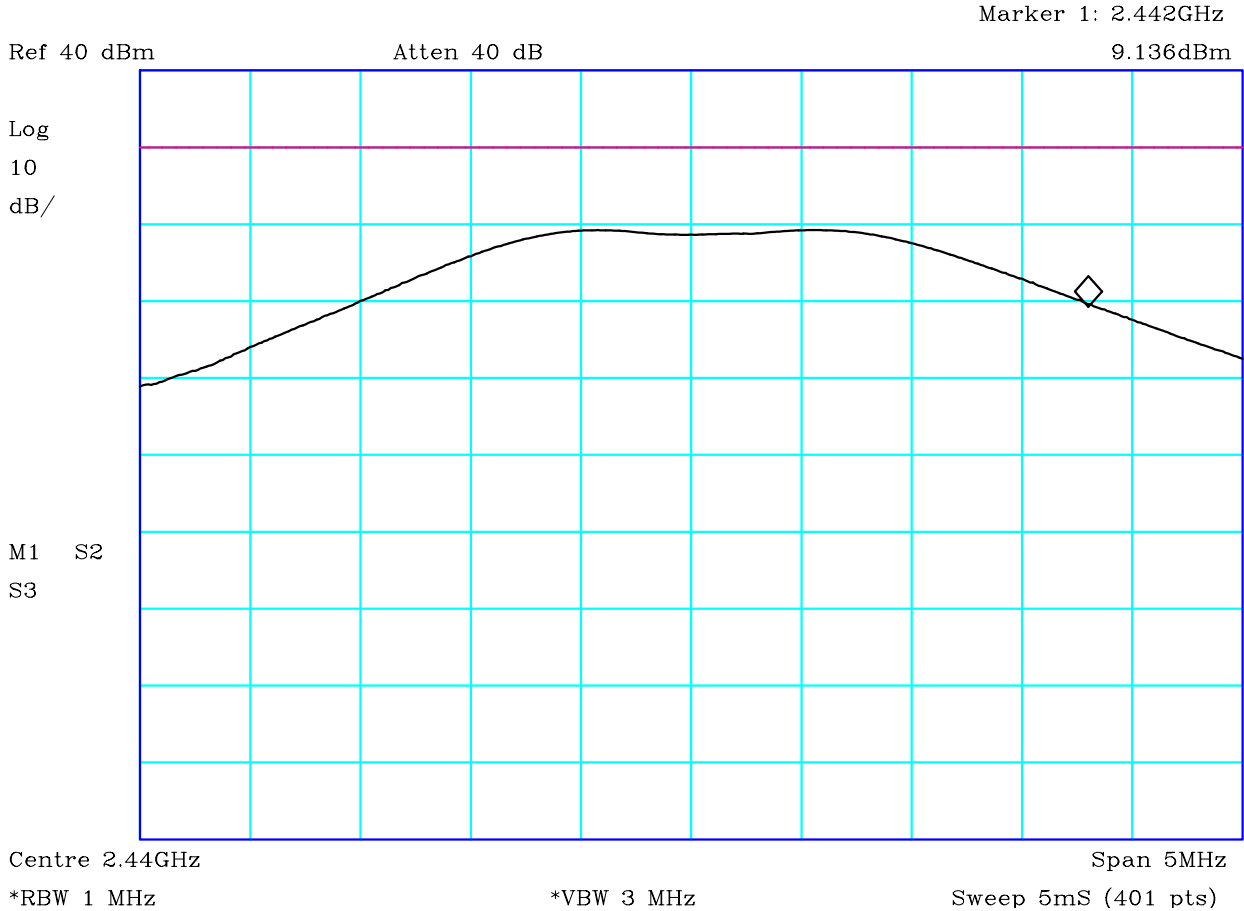
Radiated Emissions

<i>Company:</i> AlertMe.com Ltd					<i>Product:</i> Hub520/Hub504								
<i>Date:</i> 03/04/2012					<i>Test Eng:</i> Dave Smith								
<i>Ports:</i>													
<i>Test:</i> ANSI C63.4:2003 using limits of 15.209													
<i>Ports:</i>													
<i>Test:</i> 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
Channel 11													
15	1	0	3	2	2390.000	V	29.3	29.7		59.0	74.0	15.0	Pk
15	1	0	3	2	2390.000	V	15.0	29.7	-20.0	24.7	54.0	29.3	Av
16	1	0	3	2	2390.000	H	28.1	29.7		57.8	74.0	16.2	Pk
16	1	0	3	2	2390.000	H	17.0	29.7	-20.0	26.7	54.0	27.3	Av
Channel 25													
17	1	0	3	1	2483.500	V	29.2	32.7		62.0	74.0	12.0	Pk
17	1	0	3	1	2483.500	V	19.4	32.7	-20.0	32.2	54.0	21.8	Av
18	1	0	3	1	2483.500	H	34.6	32.7		67.3	74.0	6.7	Pk
18	1	0	3	1	2483.500	H	25.0	32.7	-20.0	37.8	54.0	16.2	Av
Results											Minimum Margin		
											PASS/FAIL		
											6.7 dB		
											PASS		
Notes	Comments and Observations												
	<p>Results of scans shown in plots 15 to 19</p> <p>Measurements were made with a continuous data stream transmission. As described in the "Duty Cycle" section of this report, average measurements can be reduced by an additional 20dB because transmissions occur for no more than 10msec in any 100msec period. This -20dB factor is included in the above table as the "second" correction factor.</p> <p>Key: qp - quasi-peak, av - average, pk - peak</p>												



PLOT 1 Peak Power - Channel 11

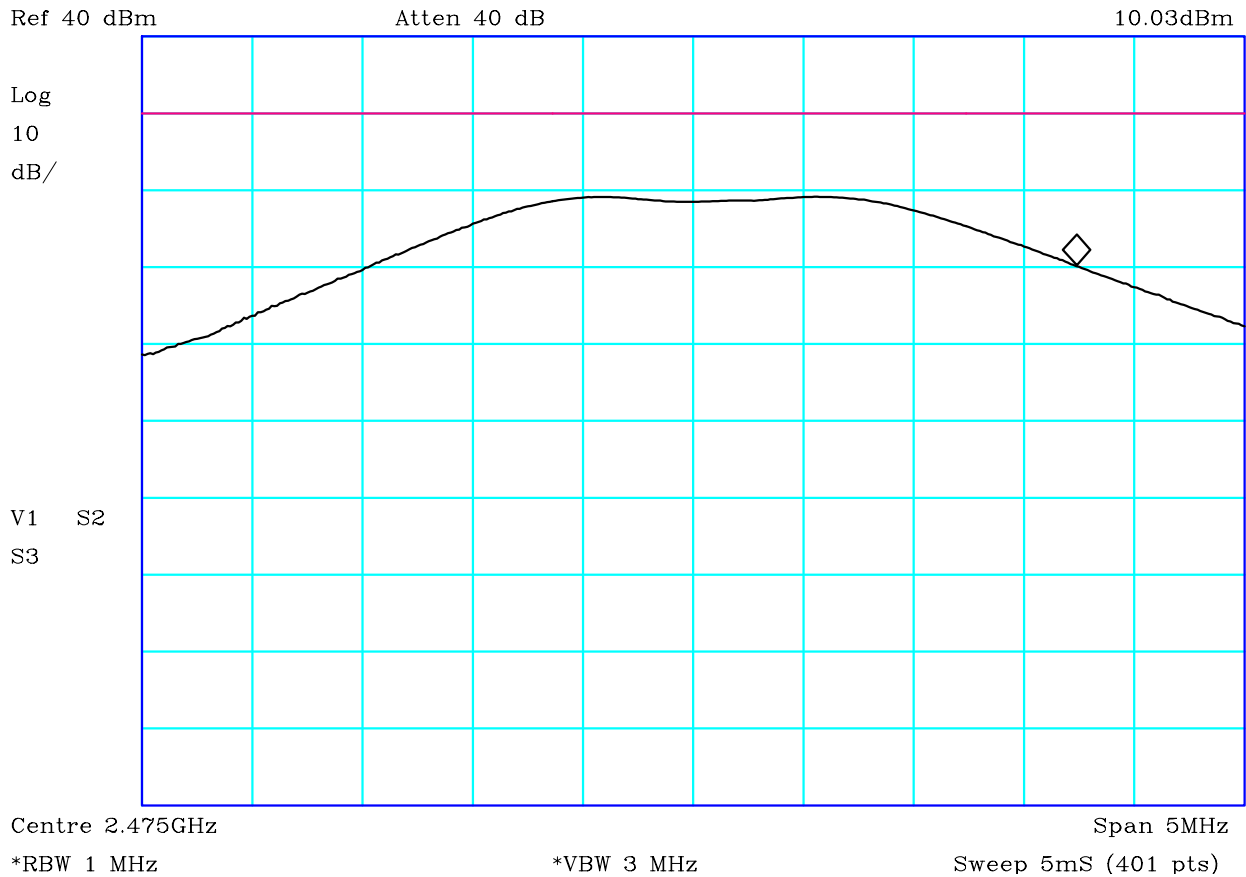
Company:	Alertme	Product:	miniHub
Date:	16/05/2012	Test Eng:	Dave Smith
Method:	D01 DTS Meas Guidance v01	Method:	
Limit1:(VIO)	30dBm	Limit2:	
Limit3:		Limit4:	
<p>Channel 11 Band power measured over EBW (-26dB points) using peak detector. Level = 21.94 dBm which therefore complies with the upper limit of Part 15.247(b)(3) of 30dBm (1W).</p>			
Facility:	GTEM_1	Mode:	1
		Modification State:	0
	File:		H24168B3



PLOT 2 Peak Power - Channel 18

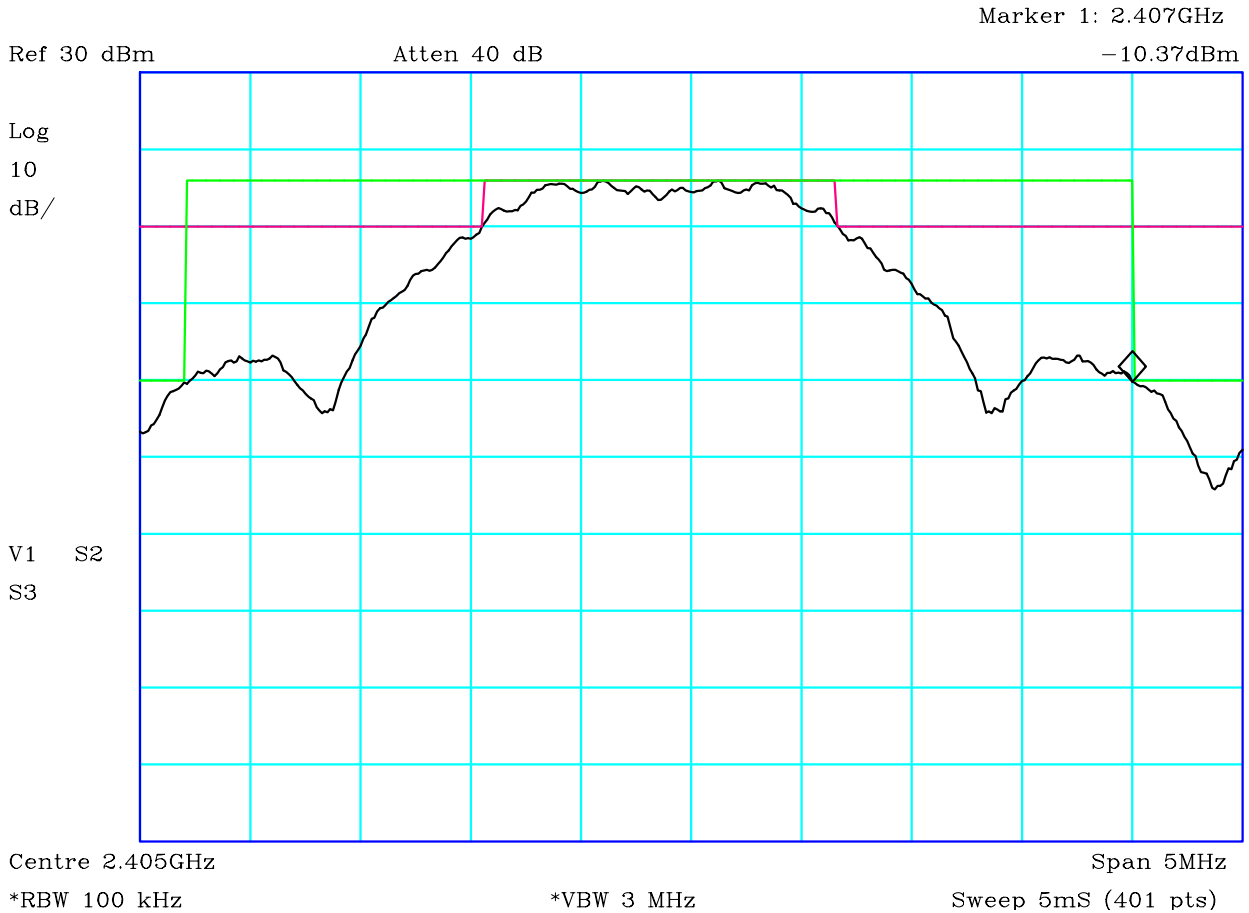
Company:	Alertme	Product:	miniHub
Date:	16/05/2012	Test Eng:	Dave Smith
Method:	D01 DTS Meas Guidance v01	Method:	
Limit1:(VIO)	30dBm	Limit2:	
Limit3:		Limit4:	
<p>Channel 18 Band power measured over EBW (-26dB points) using peak detector. Level = 22.08 dBm which therefore complies with the upper limit of Part 15.247(b)(3) of 30dBm (1W).</p>			
Facility:	GTEM_1	Mode:	1
		Modification State:	0
	File:	H24168B7	

Marker 1: 2.477GHz



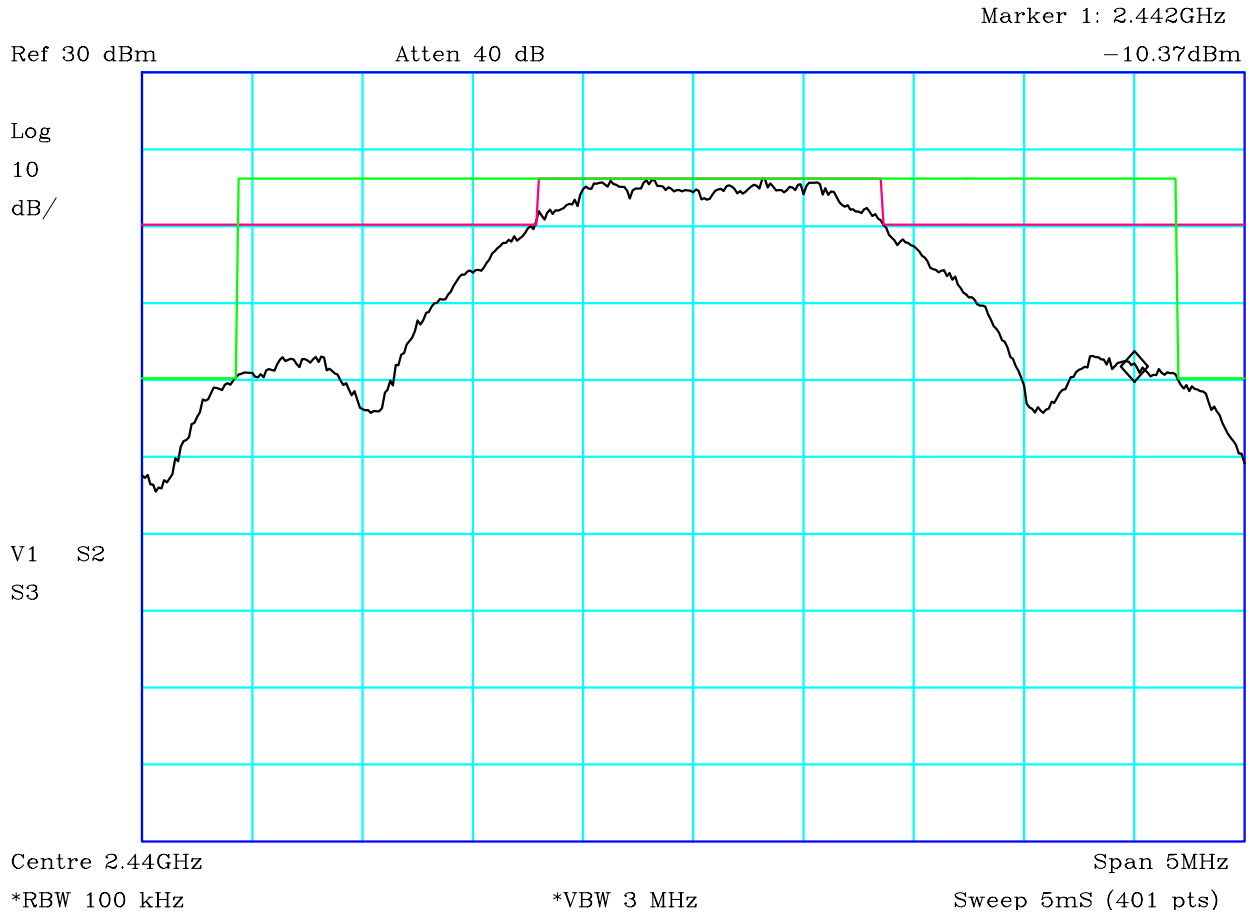
PLOT 3 Peak Power - Channel 25

Company:	Alertme	Product:	miniHub
Date:	16/05/2012	Test Eng:	Dave Smith
Method:	D01 DTS Meas Guidance v01	Method:	
Limit1:(VIO)	30dBm	Limit2:	
Limit3:		Limit4:	
<p>Channel 25 Band power measured over EBW (-26dB points) using peak detector. Level = 21.94 dBm which therefore complies with the upper limit of Part 15.247(b)(3) of 30dBm (1W).</p>			
Facility:	GTEM_1	Mode:	1
		Modification State:	0
	File:	H24168AF	



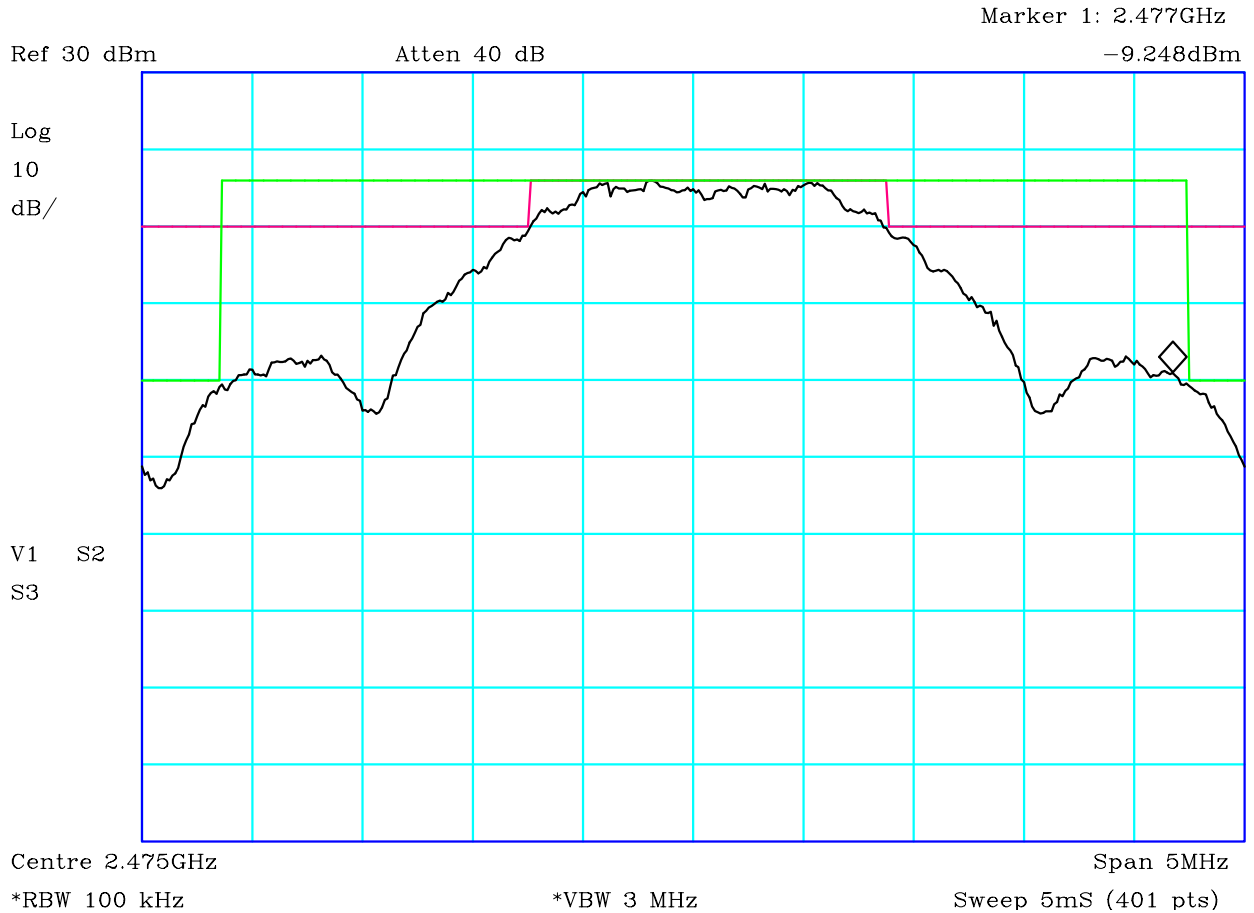
PLOT 4 6dB Bandwidth - Channel 11

Company:	Alertme	Product:	miniHub
Date:	16/05/2012	Test Eng:	Dave Smith
Method:	D01 DTS Meas Guidance v01	Method:	
Limit1:(VIO)	-6dB	Limit2:(GRN)	-26dB
Limit3:		Limit4:	
Channel 11			
6dB Bandwidth lies between 2.4042625 GHz and 2.4058625GHz. 6dB Bandwidth = 1.60MHz. 26dB Bandwidth = 4.31MHz. Part 15.247(a)(2) requires the 6dB bandwidth to be more than 500kHz.			
Facility:	GTEM_1	Mode:	1
		Modification State:	0
File:	H241683C		



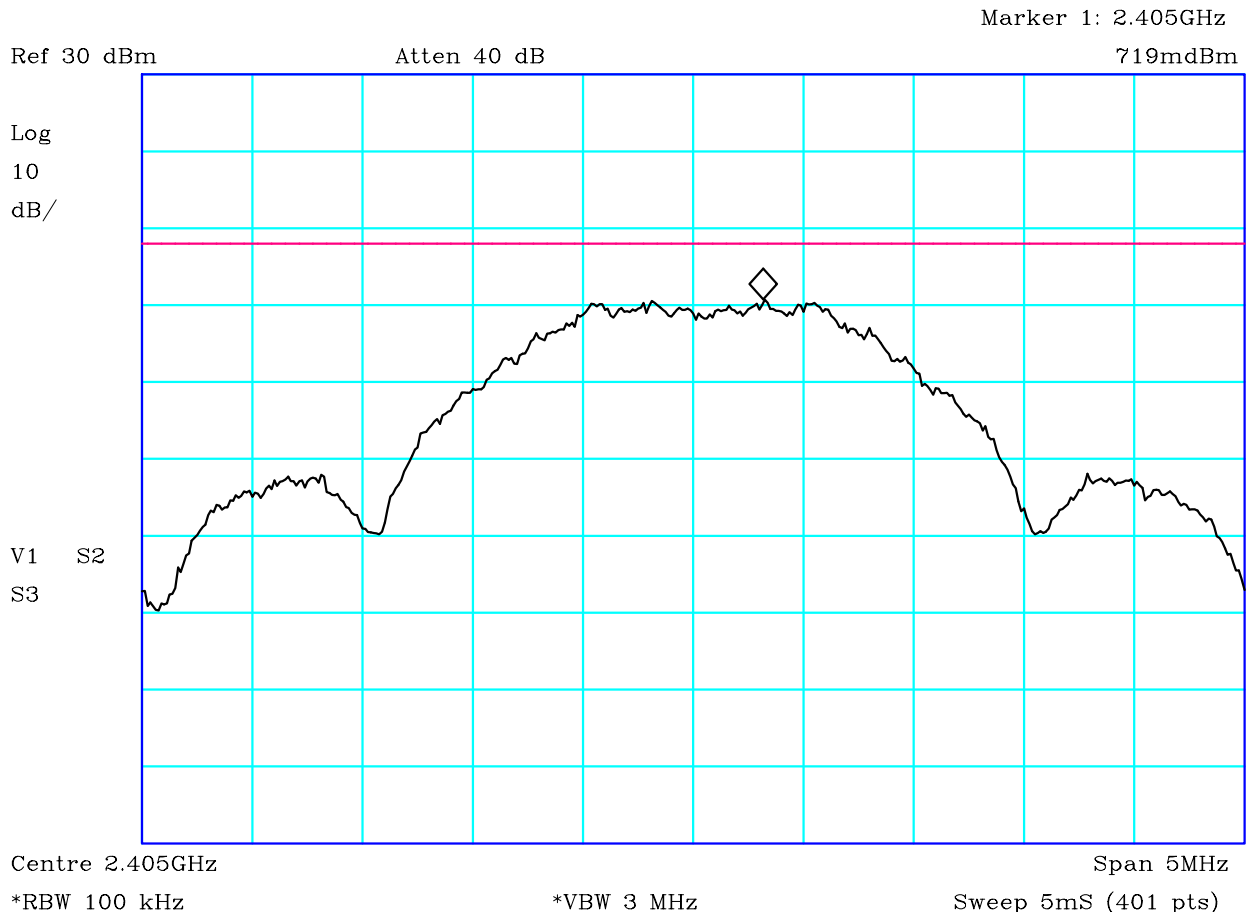
PLOT 5 6dB Bandwidth - Channel 18

Company:	Alertme	Product:	miniHub
Date:	16/05/2012	Test Eng:	Dave Smith
Method:	D01 DTS Meas Guidance v01	Method:	
Limit1:(VIO)	-6dB	Limit2:(GRN)	-26dB
Limit3:		Limit4:	
Channel 18			
<p>6dB Bandwidth lies between 2.4392875 GHz and 2.4408500GHz. 6dB Bandwidth = 1.56MHz. 26dB Bandwidth = 4.26MHz. Part 15.247(a)(2) requires the 6dB bandwidth to be more than 500kHz.</p>			
Facility:	GTEM_1	Mode:	1
		Modification State:	0
File:	H241684B		



PLOT 6 6dB Bandwidth - Channel 25

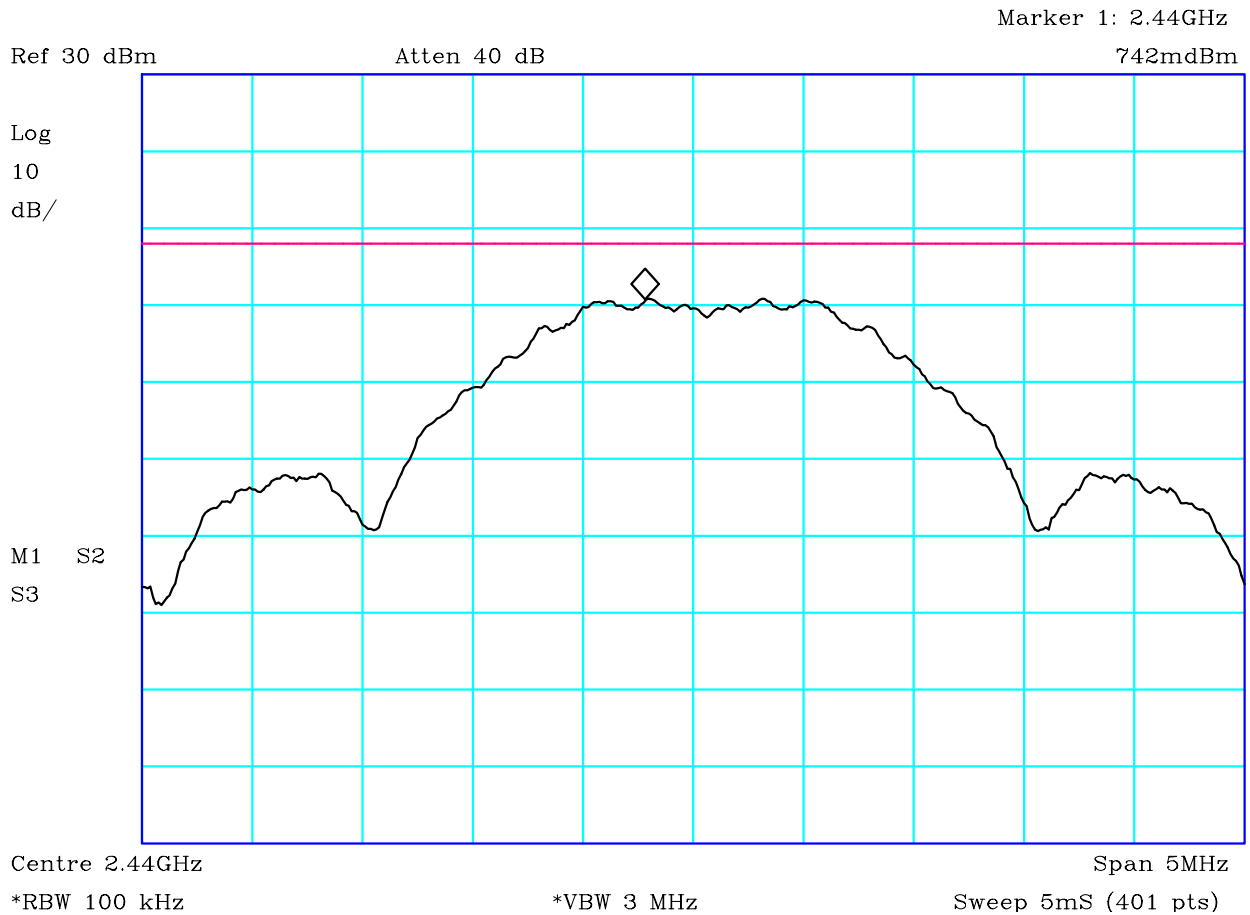
Company:	Alertme	Product:	miniHub
Date:	16/05/2012	Test Eng:	Dave Smith
Method:	D01 DTS Meas Guidance v01	Method:	
Limit1:(VIO)	-6dB	Limit2:(GRN)	-26dB
Limit3:		Limit4:	
Channel 25			
6dB Bandwidth lies between 2.4742625 GHz and 2.4758750GHz. 6dB Bandwidth = 1.61MHz. 26dB Bandwidth = 4.38MHz. Part 15.247(a)(2) requires the 6dB bandwidth to be more than 500kHz			
Facility:	GTEM_1	Mode:	1
		Modification State:	0
File:	H2416854		



CF1:-15.2

PLOT 7 Spectral Density - Channel 11

Company:	Alertme	Product:	miniHub
Date:	16/05/2012	Test Eng:	Dave Smith
Method:	D01 DTS Meas Guidance v01	Method:	
Limit1:(VIO)	8dBm/3kHz	Limit2:	
Limit3:		Limit4:	
<p>Channel 11 Maximum spectral density = 0.719 dBm/3kHz Includes correction factor to convert from 100kHz to 3kHz bandwidth (-15.2dB) Part 15 Subpart (c) 15.247(e) requires the spectral density to be below 8dBm/3kHz</p>			
Facility:	GTEM_1	Mode:	1
		Modification State:	0
File:	H24168C4		



CF1:-15.2

PLOT 8 Spectral Density - Channel 18

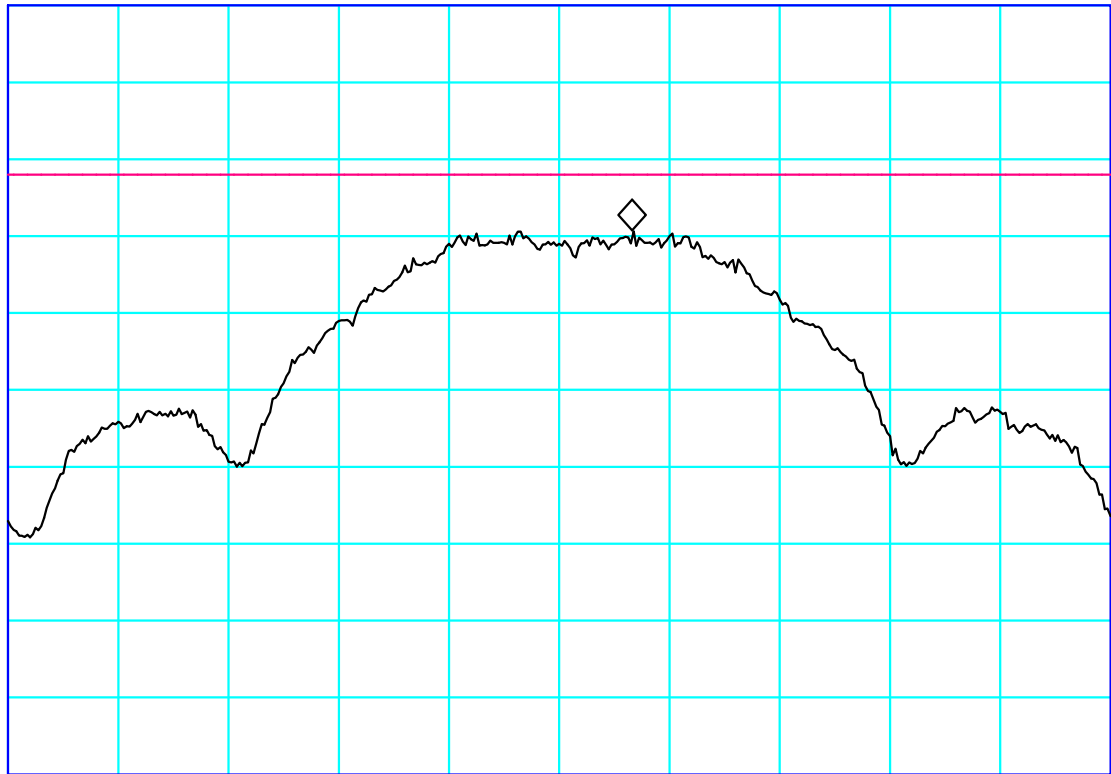
Company:	Alertme	Product:	miniHub
Date:	16/05/2012	Test Eng:	Dave Smith
Method:	D01 DTS Meas Guidance v01	Method:	
Limit1:(VIO)	8dBm/3kHz	Limit2:	
Limit3:		Limit4:	
<p>Channel 18 Maximum spectral density = 0.724 dBm/3kHz Includes correction factor to convert from 100kHz to 3kHz bandwidth (-15.2dB) Part 15 Subpart (c) 15.247(e) requires the spectral density to be below 8dBm/3kHz</p>			
Facility:	GTEM_1	Mode:	1
		Modification State:	0
File:	H24168BE		

Marker 1: 2.475GHz

Ref 30 dBm Atten 40 dB 615m dBm

Log
10
dB/

V1 S2
S3



Centre 2.475GHz

Span 5MHz

*RBW 100 kHz

*VBW 3 MHz

Sweep 5mS (401 pts)

CF1:-15.2

PLOT 9 Spectral Density - Channel 25

Company:	Alertme	Product:	miniHub
Date:	16/05/2012	Test Eng:	Dave Smith
Method:	D01 DTS Meas Guidance v01	Method:	
Limit1:(VIO)	8dBm/3kHz	Limit2:	
Limit3:		Limit4:	
<p>Channel 25 Maximum spectral density = 0.615 dBm/3kHz Includes correction factor to convert from 100kHz to 3kHz bandwidth (-15.2dB) Part 15 Subpart (c) 15.247(e) requires the spectral density to be below 8dBm/3kHz</p>			
Facility:	GTEM_1	Mode:	1
		Modification State:	0
File:	H24168C1		

Marker 1: 952.5MHz

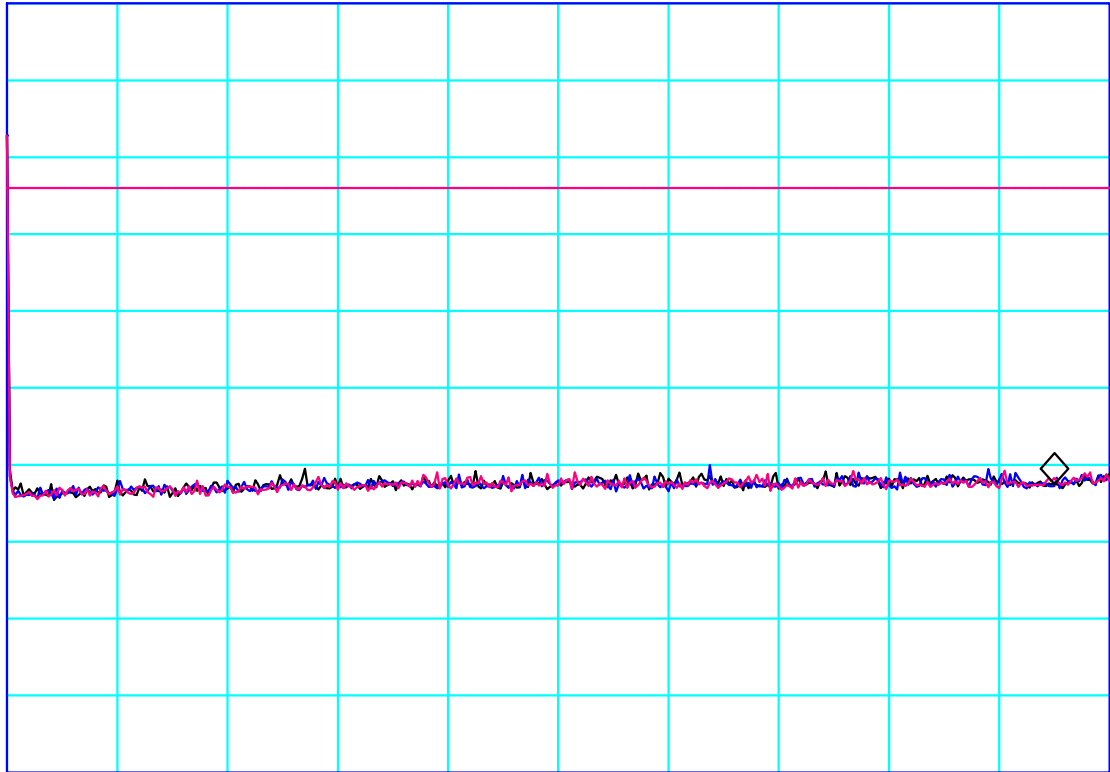
Ref 20 dBm

Atten 30 dB

-42.53dBm

Log
10
dB/

V1 V2
V3



Start 9kHz

Stop 1000MHz

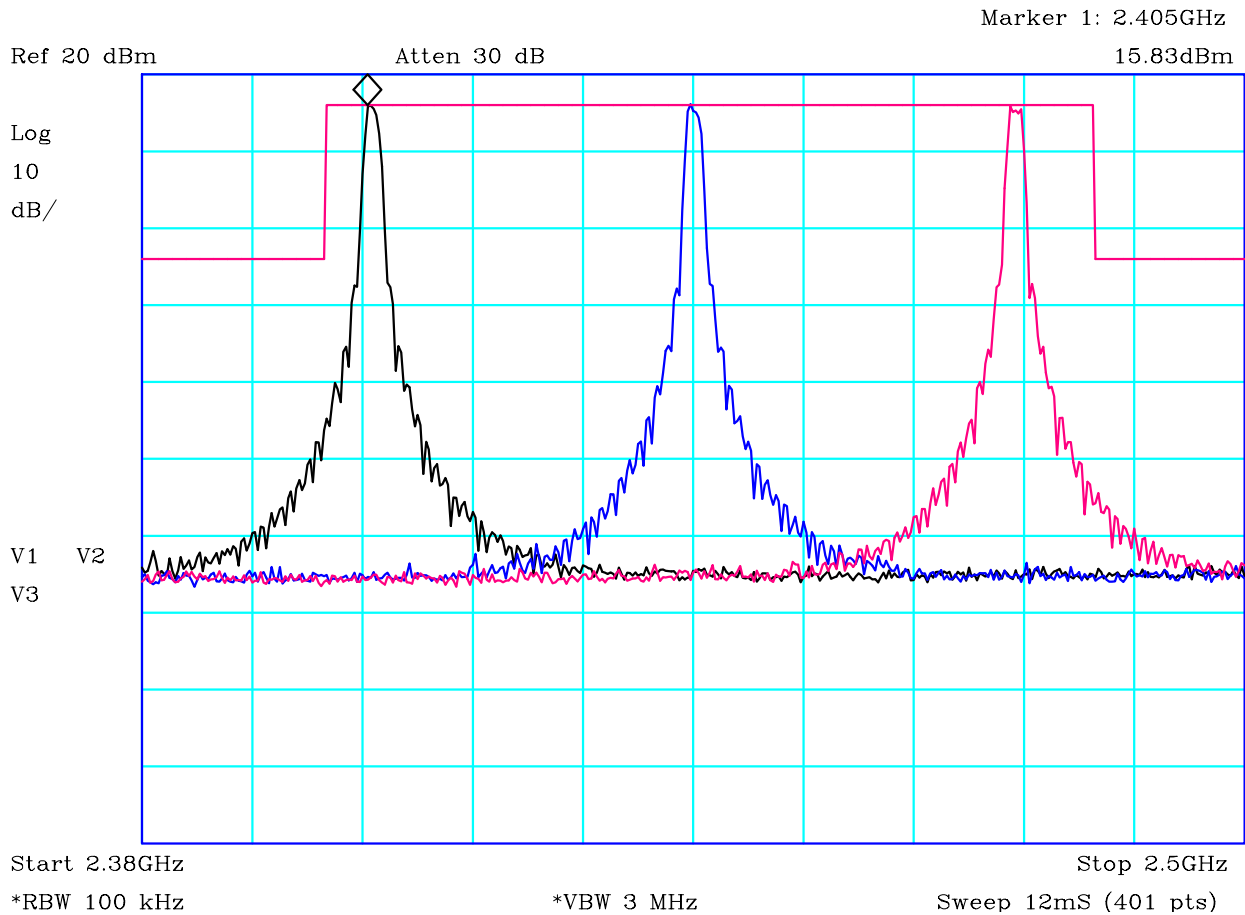
*RBW 100 kHz

*VBW 3 MHz

Sweep 100mS (401 pts)

PLOT 10 Antenna Conducted Spurious - 9kHz to 1GHz

Company:	Alertme	Product:	miniHub
Date:	10/04/2012	Test Eng:	Dave Smith
Method:	D01 DTS Meas Guidance v01	Method:	
Limit1:(VIO)	-20dBc	Limit2:	
Limit3:		Limit4:	
<p>Sample 1. Black = Channel 11 Blue = Channel 18 Red = Channel 25 Part 15 Subpart (c) 15.247(d) requires spurious conducted emissions to be at least 20dB below carrier. Carrier level of 16dBm used to set limit. (With 100kHz RBW all channel measured with 0.5dB of 16dBm)</p>			
Facility:	Anech_2	Height	Mode: 1
Distance		Polarisation	Modification State: 0
Angle		File: H231075F	



PLOT 11 Antenna Conducted Spurious - near band edges

Company:	Alertme	Product:	miniHub
Date:	10/04/2012	Test Eng:	Dave Smith
Method:	D01 DTS Meas Guidance v01	Method:	
Limit1:(VIO)	-20dBc	Limit2:	
Limit3:		Limit4:	
<p>Sample 1. Black = Channel 11 Blue = Channel 18 Red = Channel 25 Part 15 Subpart (c) 15.247(d) requires spurious conducted emissions to be at least 20dB below carrier. Carrier level of 16dBm used to set limit. (With 100kHz RBW all channel measured with 0.5dB of 16dBm)</p>			
Facility:	Anech_2	Height	Mode: 1
Distance		Polarisation	Modification State: 0
Angle		File: H2409705	

Marker 1: 14.53GHz

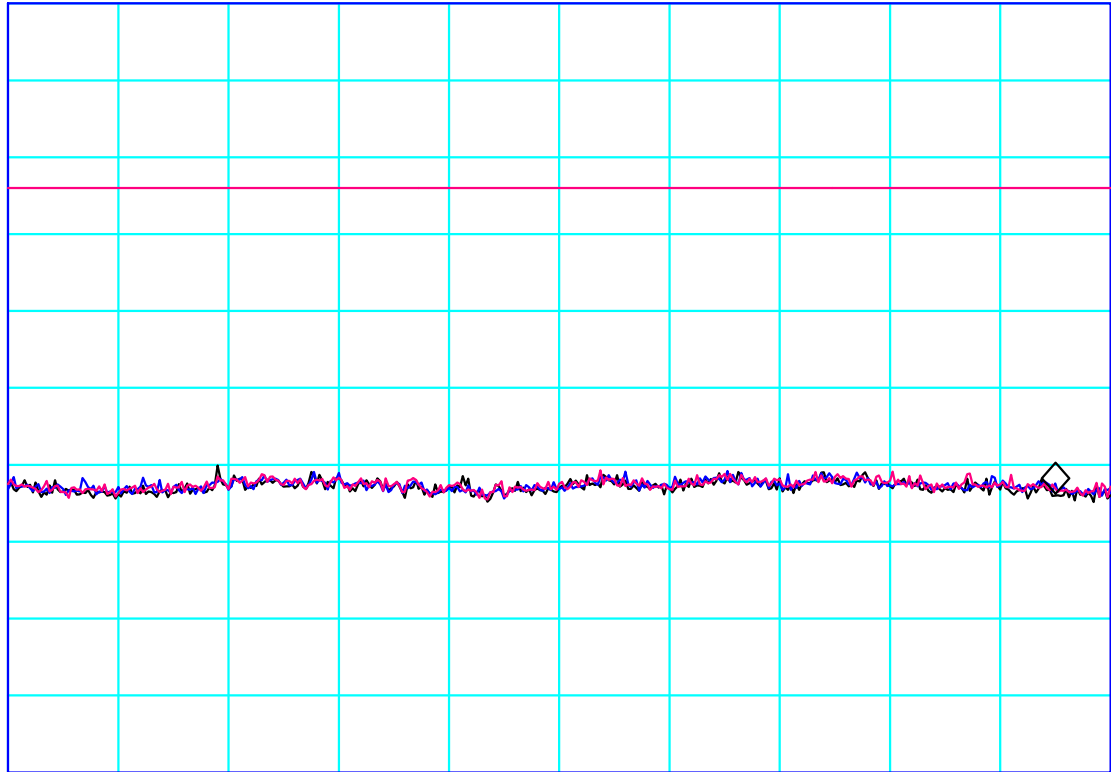
Ref 20 dBm

Atten 30 dB

-43.95dBm

Log
10
dB/

V1 V2
V3



Start 5GHz

Stop 15GHz

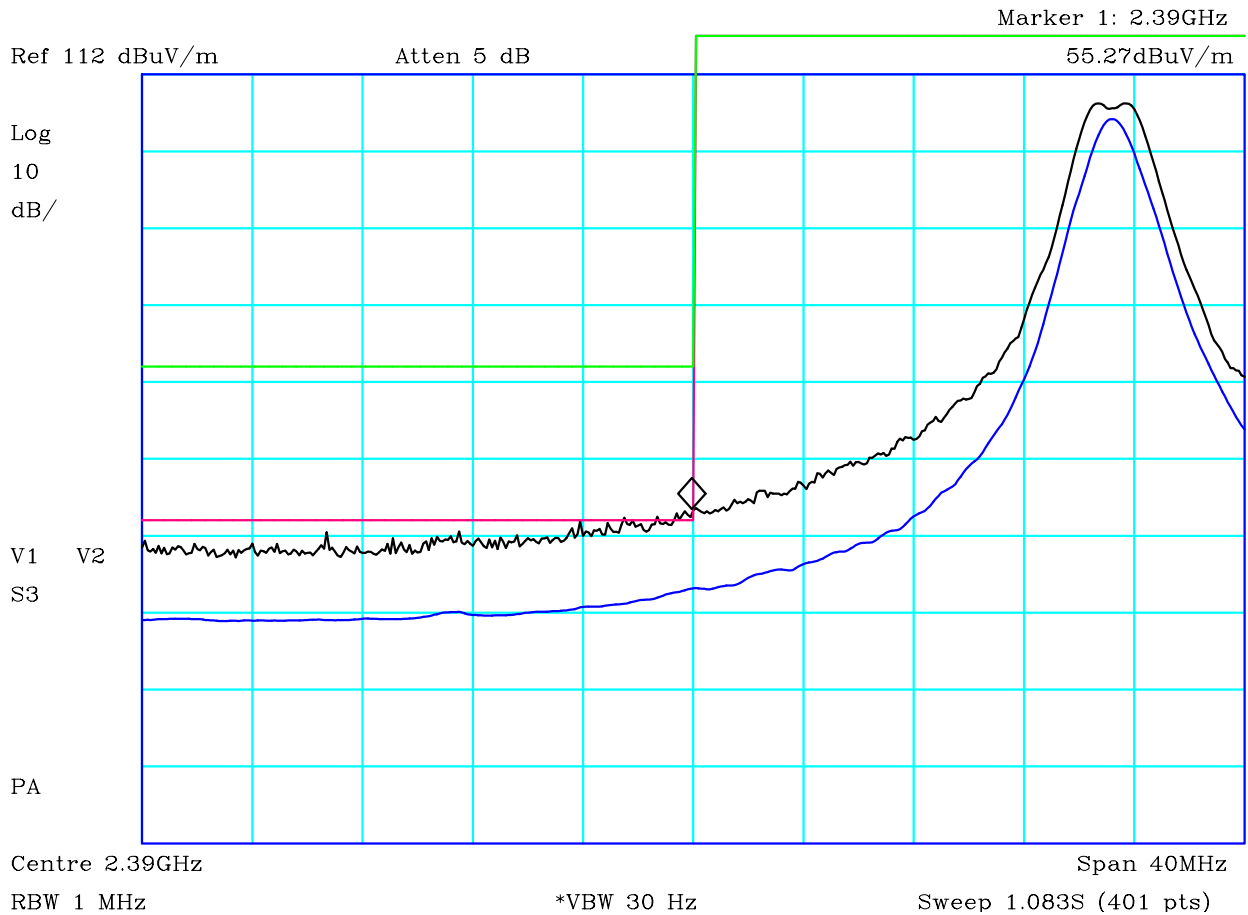
*RBW 100 kHz

*VBW 3 MHz

Sweep 1S (401 pts)

PLOT 13 Antenna Conducted Spurious - 5GHz to 15GHz

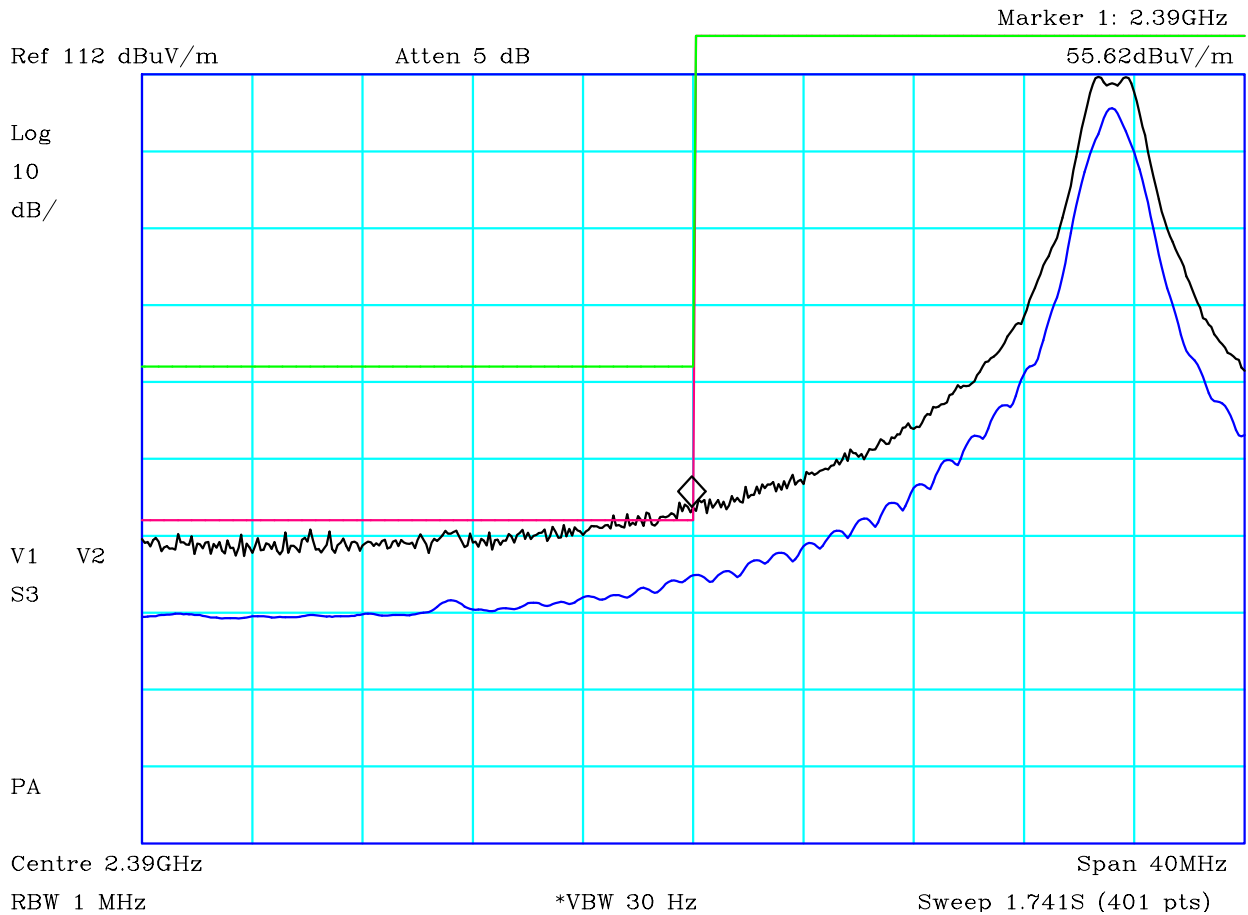
Company:	Alertme	Product:	miniHub
Date:	10/04/2012	Test Eng:	Dave Smith
Method:	D01 DTS Meas Guidance v01	Method:	
Limit1:(VIO)	-20dBc	Limit2:	
Limit3:		Limit4:	
<p>Sample 1. Black = Channel 11 Blue = Channel 18 Red = Channel 25 Part 15 Subpart (c) 15.247(d) requires spurious conducted emissions to be at least 20dB below carrier. Carrier level of 16dBm used to set limit. (With 100kHz RBW all channel measured with 0.5dB of 16dBm)</p>			
Facility:	Anech_2	Height	Mode: 1
Distance		Polarisation	Modification State: 0
Angle		File: H2310759	



CF1:A23_3m_100806 CF2:CBL049_110107

PLOT 15 Radiated Emissions - Zigbee Tx - Ch 11 - Band Edge - Vertical

Company:	Alertme	Product:	minHub
Date:	03/04/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands@3m Av	Limit2:(GRN)	FCC Restricted Bands@3m Pk
Limit3:		Limit4:	
<p>Sample 4. Black: 3MHz VBW (green limit), Blue: 30Hz VBW (red limit) Transmitting on channel 11. Maximum of EUT upright and flat.</p>			
Facility:	Anech_2	Height	1.5m
Distance	3m	Polarisation	V
Angle	0-360	File:	H2303782
		Mode:	1
		Modification State:	0



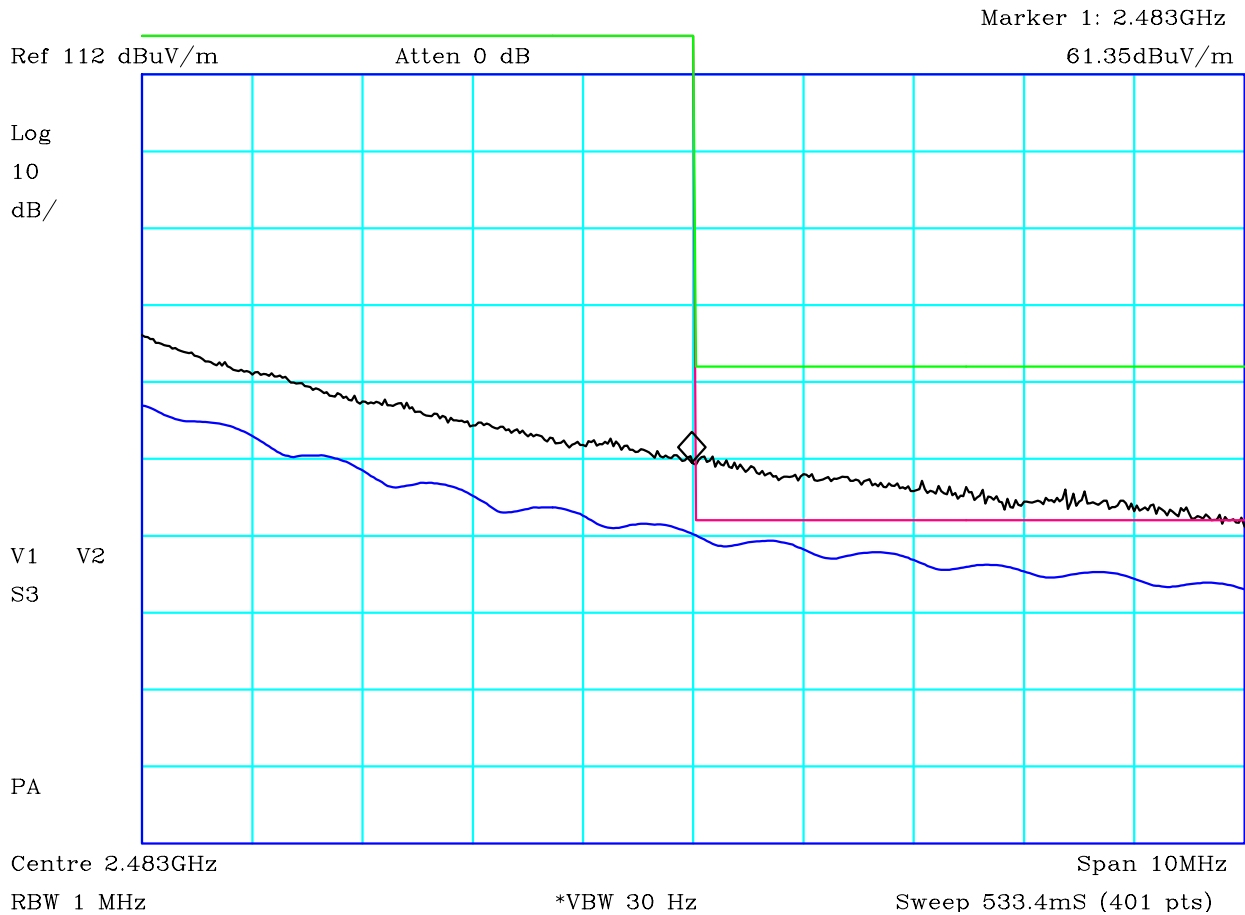
CF1:A23_3m_100806 CF2:CBL059_CBL018_CBL065_CBL060_100806

PLOT 16 Radiated Emissions - Zigbee Tx - Ch 11 - Band Edge - Horizontal

Company:	Alertme	Product:	minHub
Date:	03/04/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands@3m Av	Limit2:(GRN)	FCC Restricted Bands@3m Pk
Limit3:		Limit4:	

Sample 4.
 Black: 3MHz VBW (green limit), Blue: 30Hz VBW (red limit)
 Transmitting on channel 11.
 Maximum of EUT upright and flat.

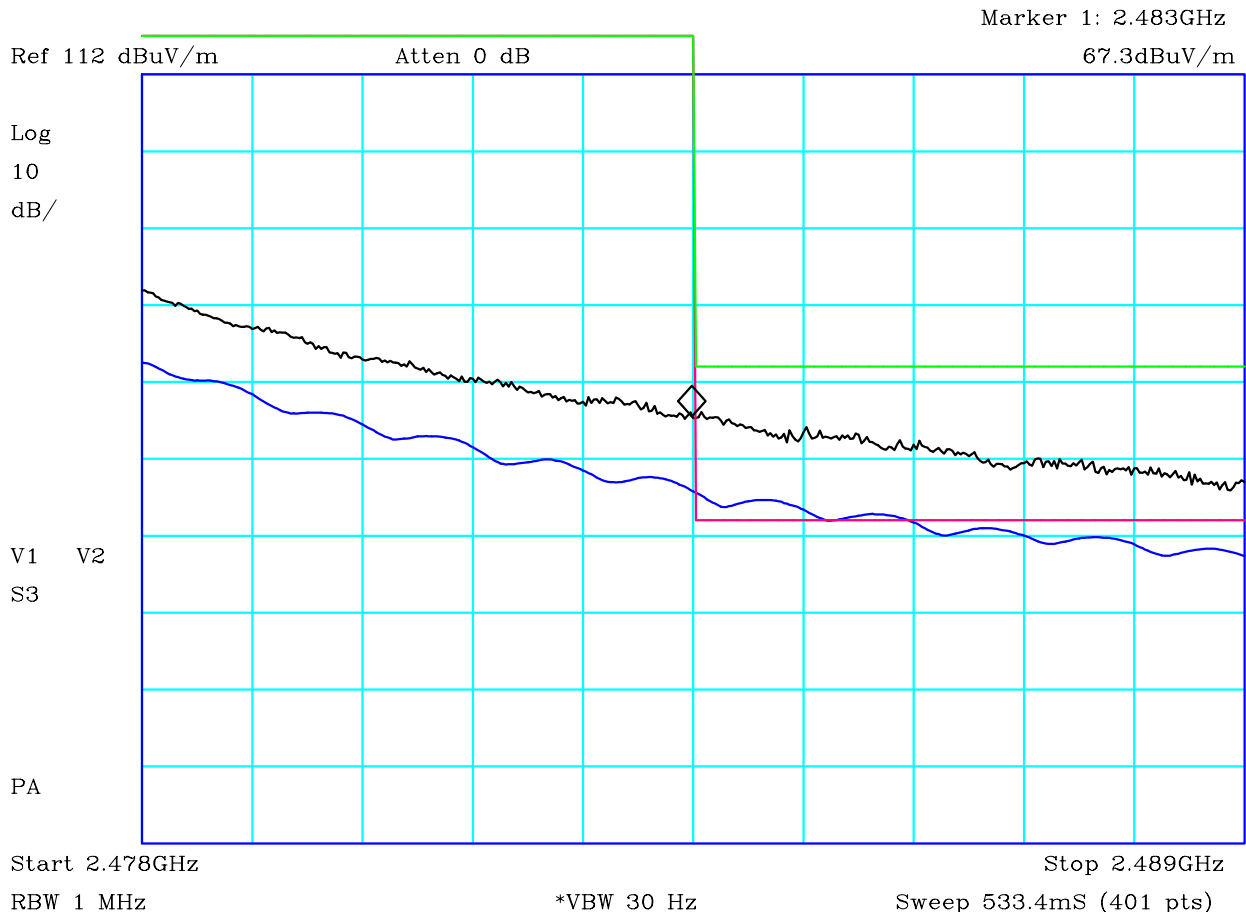
Facility:	Anech_2	Height	1.5m	Mode:	1
Distance	3m	Polarisation	H	Modification State:	0
Angle	0-360	File:	H2303756		



CF1:A23_3m_100806 CF2:CBL059_CBL018_CBL065_CBL060_100806

PLOT 17 Radiated Emissions - Zigbee Tx - Ch 25 - Band Edge - Vertical

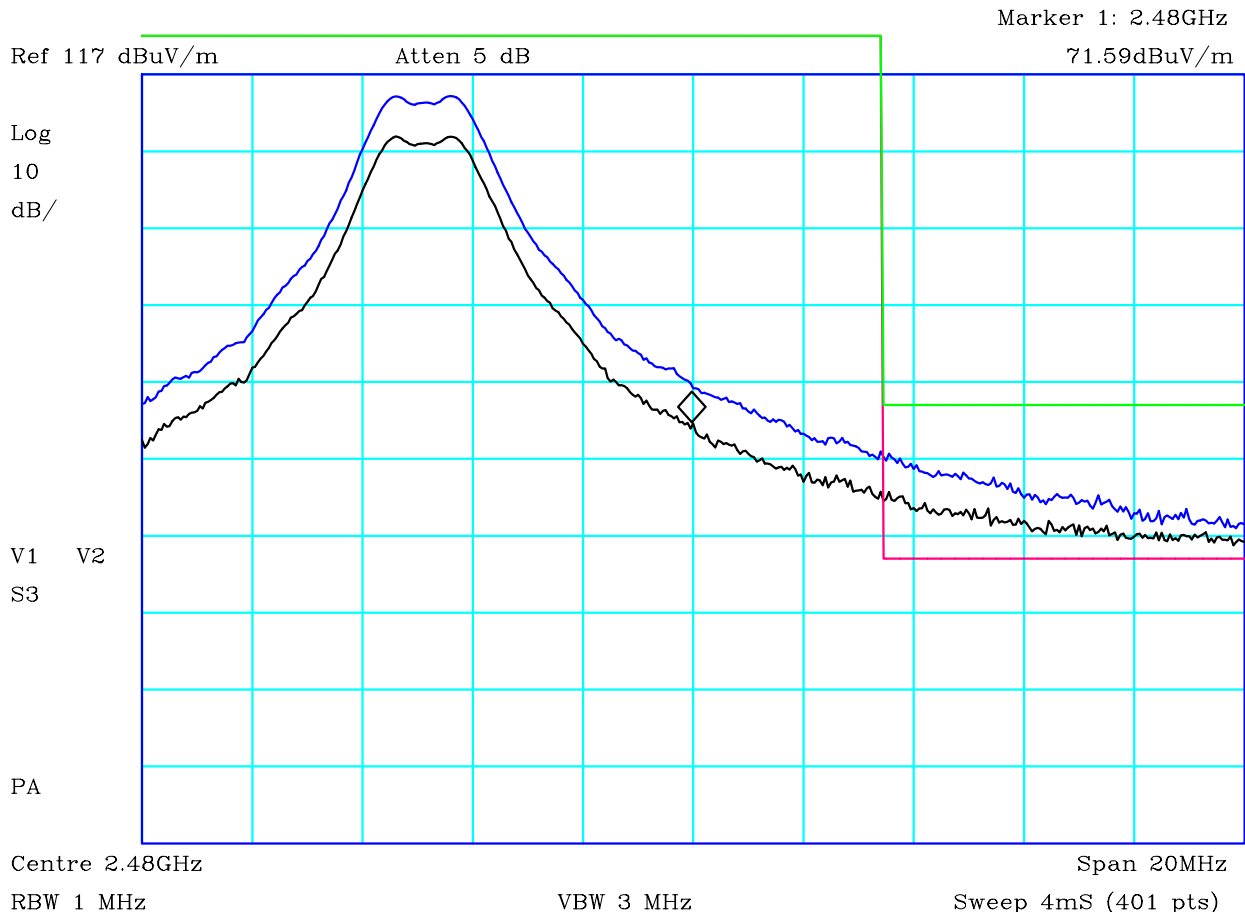
Company:	Alertme	Product:	minHub
Date:	03/04/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands@3m Av	Limit2:(GRN)	FCC Restricted Bands@3m Pk
Limit3:		Limit4:	
<p>Sample 4. Black: 3MHz VBW (green limit), Blue: 30Hz VBW (red limit) Transmitting on channel 25. Maximised position of EUT upright and flat.</p>			
Facility:	Anech_2	Height	1.5m
Distance	3m	Polarisation	V
Angle	0-360	File:	H2303612
Mode:		Mode:	1
Modification State:		Modification State:	0



CF1:A23_3m_100806 CF2:CBL059_CBL018_CBL065_CBL060_100806

PLOT 18 Radiated Emissions - Zigbee Tx - Ch 25 - Band Edge - Horizontal

Company:	Alertme	Product:	minHub
Date:	03/04/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands@3m Av	Limit2:(GRN)	FCC Restricted Bands@3m Pk
Limit3:		Limit4:	
<p>Sample 4. Black: 3MHz VBW (green limit), Blue: 30Hz VBW (red limit) Transmitting on channel 25. Maximised position of EUT upright and flat.</p>			
Facility:	Anech_2	Height	1.5m
Distance	3m	Polarisation	H
Angle	0-360	File:	H230367D
Mode:		Mode:	1
Modification State:		Modification State:	0



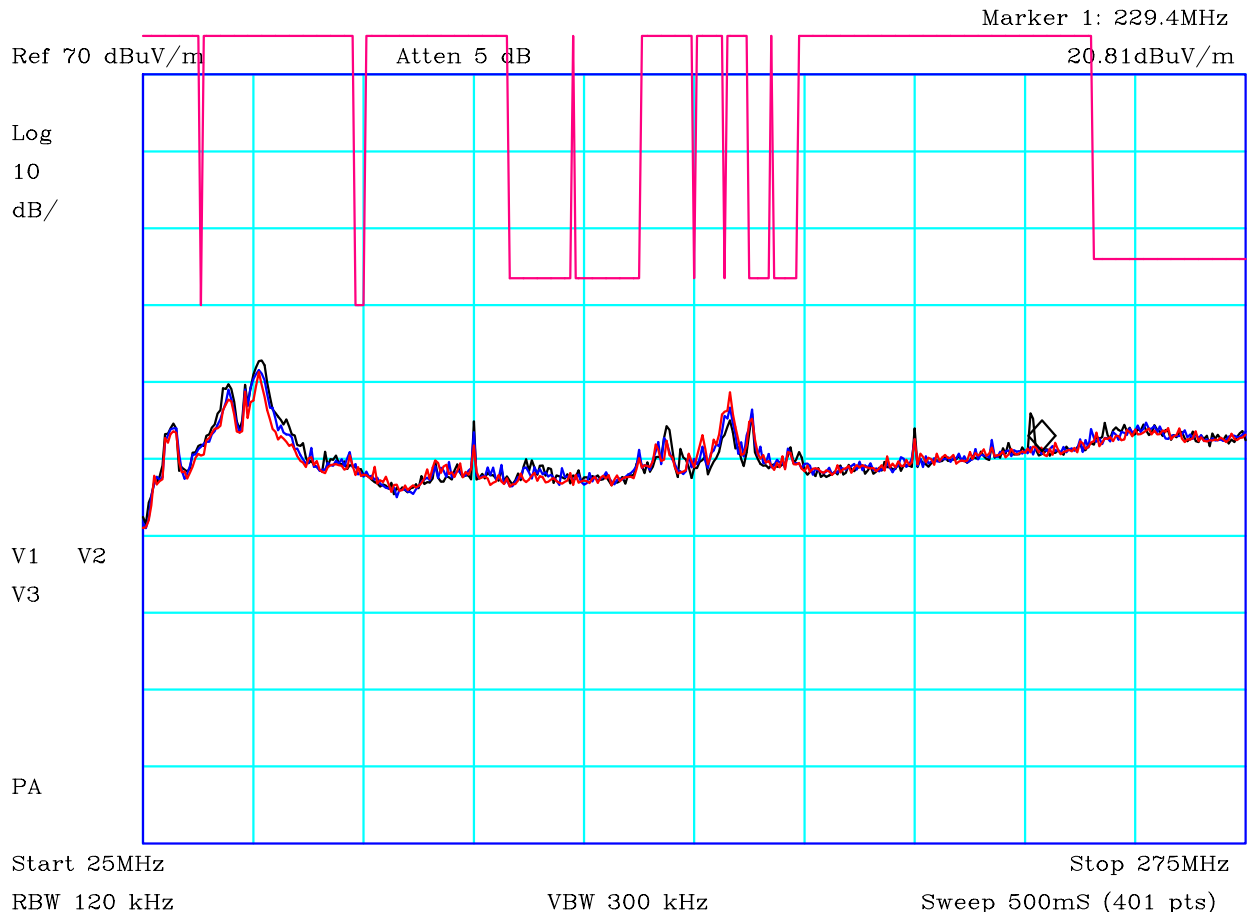
CF1:A23_3m_100806 CF2:CBL059_CBL018_CBL065_CBL060_100806

PLOT 19 Radiated Emissions - Zigbee Tx - Ch 25 - Band Edge

Company:	Alertme	Product:	minHub
Date:	03/04/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands@3m Av	Limit2:(GRN)	FCC Restricted Bands@3m Pk
Limit3:		Limit4:	

Sample 4.
 Black: vertical, Blue: Horizontal
 Transmitting on channel 25.
 Peak measurement (Green limit line is peak limit).
 Maximum of EUT upright and flat.

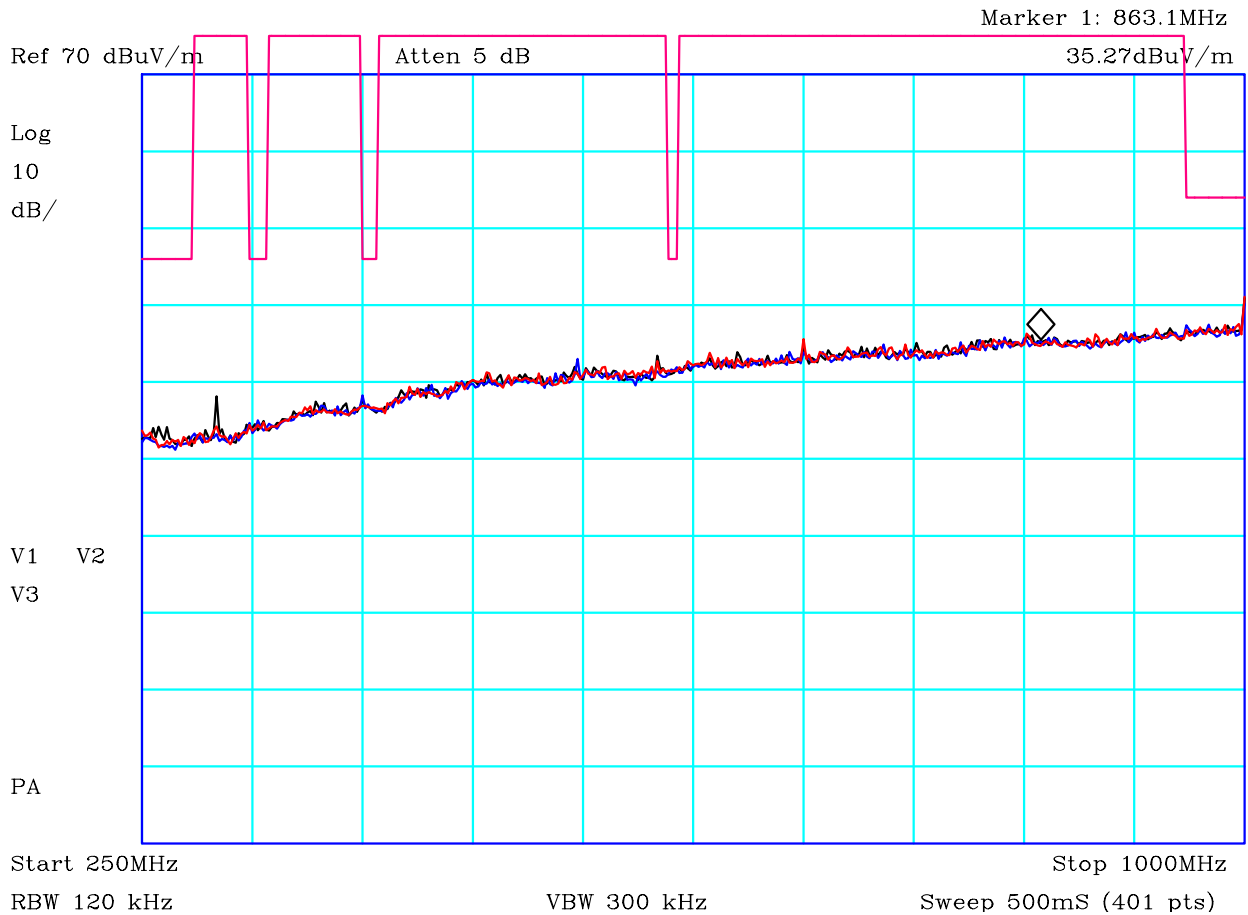
Facility:	Anech_2	Height	1.5m	Mode:	1
Distance	3m	Polarisation	V+H	Modification State:	0
Angle	0-360	File:	H230369F		



CF1:A15_100811 CF2:CBL002_CBL069_100809 CF4:RFF04_110112

PLOT 20 Radiated Emissions - Zigbee Tx - 25MHz to 275MHz

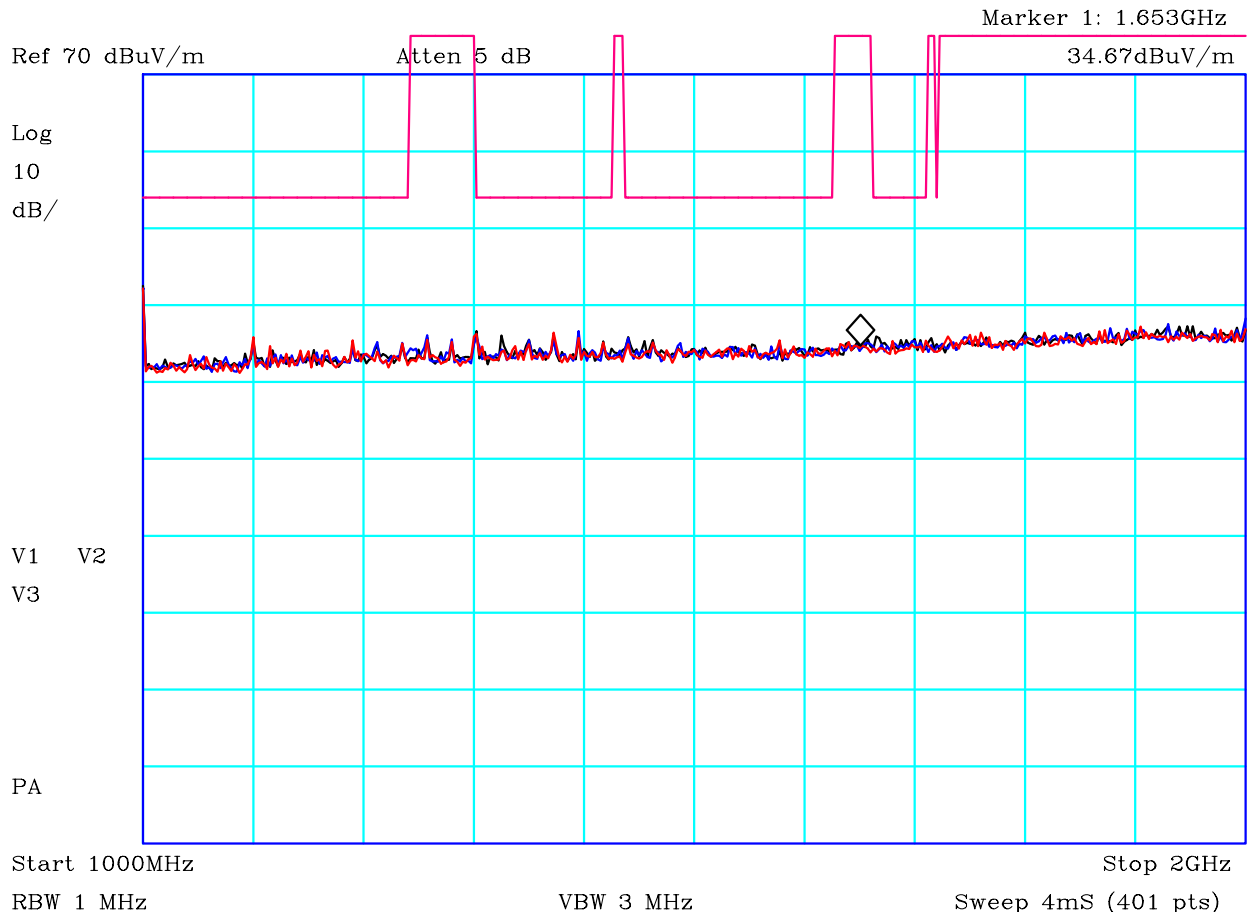
Company:	Alertme	Product:	miniHub
Date:	02/05/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands	Limit2:	
Limit3:		Limit4:	
<p>Sample 4. Black: Ch11, Blue: Ch18, Red: Ch25 Peak measurement Maximum of EUT upright and flat.</p>			
Facility:	Anech_1	Height	1m,1.5m,2m
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H24026D1
		Mode:	1
		Modification State:	1



CF1:A15_100811 CF2:CBL002_CBL069_100809 CF4:RFF04_110112

PLOT 21 Radiated Emissions - Zigbee Tx - 250MHz to 1GHz

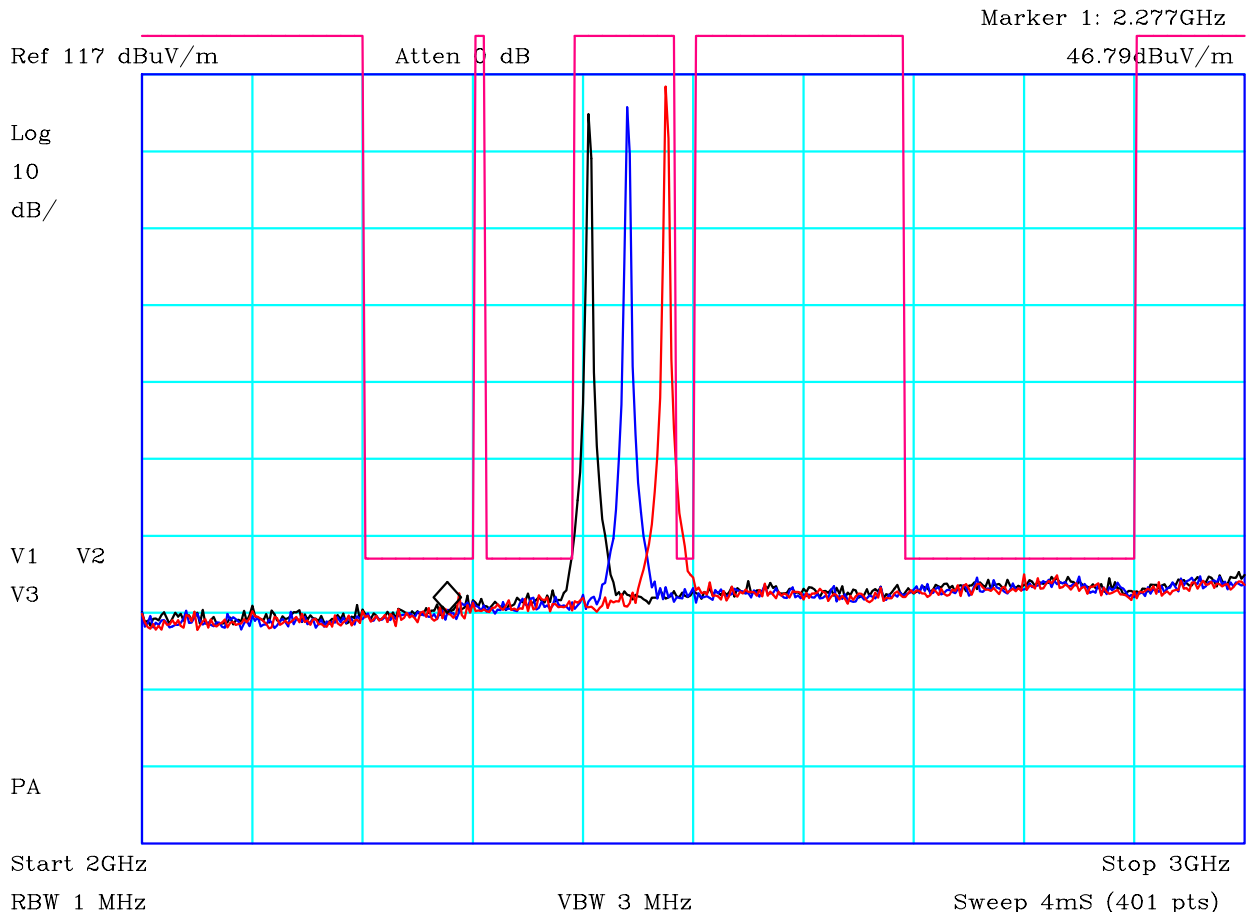
Company:	Alertme	Product:	miniHub
Date:	02/05/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands	Limit2:	
Limit3:		Limit4:	
<p>Sample 4. Black: Ch11, Blue: Ch18, Red: Ch25 Peak measurement Maximum of EUT upright and flat.</p>			
Facility:	Anech_1	Height	1m,1.5m,2m
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H24026DD
		Mode:	1
		Modification State:	1



CF1:A23_3m_100806 CF2:CBL002_CBL069_100809 CF3:PRE7_110112 CF4:RFF04_110112

PLOT 22 Radiated Emissions - Zigbee Tx - 1GHz to 2GHz

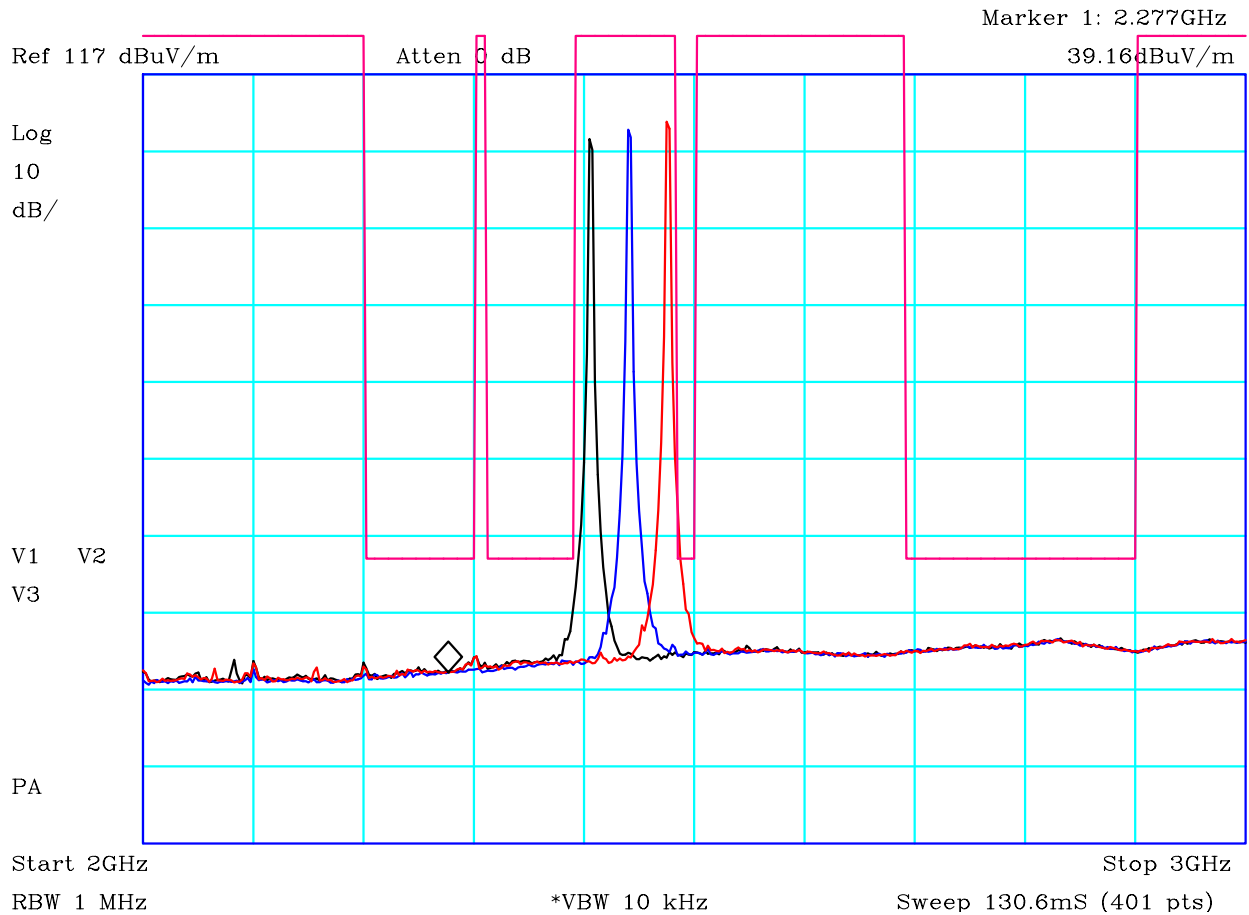
Company:	Alertme	Product:	miniHub
Date:	02/05/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands	Limit2:	
Limit3:		Limit4:	
<p>Sample 4. Black: Ch11, Blue: Ch18, Red: Ch25 Peak measurement Maximum of EUT upright and flat.</p>			
Facility:	Anech_1	Height	1m
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H24025B9
		Mode:	1
		Modification State:	1



CF1:A23_3m_100806 CF2:CBL049_110107

PLOT 23 Radiated Emissions - Zigbee Tx - 2GHz to 3GHz

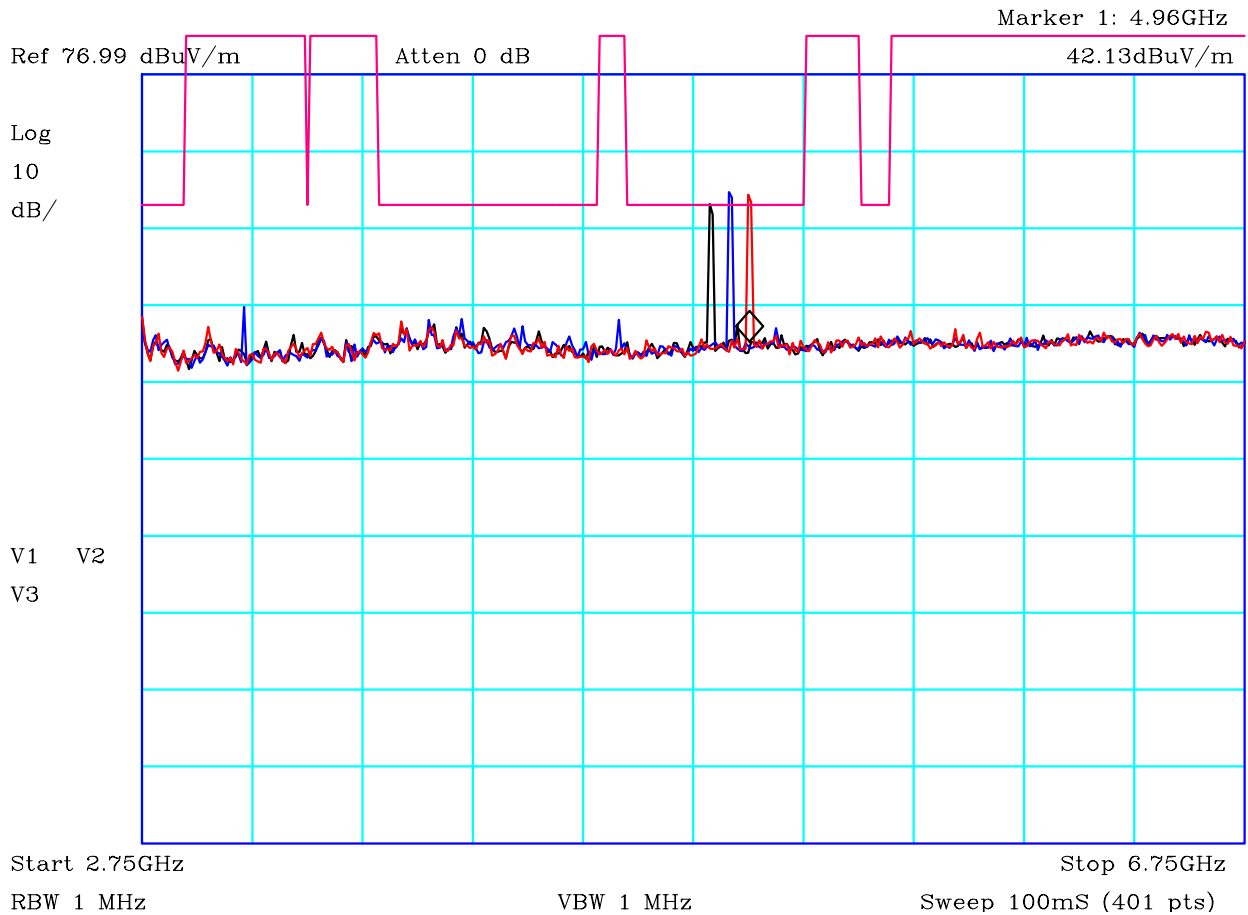
Company:	Alertme	Product:	minHub
Date:	03/04/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands@3m Av	Limit2:	
Limit3:		Limit4:	
<p>Sample 4. Black: Ch11, Blue: Ch18, Red: Ch25 Peak measurement Maximum of EUT upright and flat.</p>			
Facility:	Anech_2	Height	1.5m
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H2303723
		Mode:	1
		Modification State:	0



CF1:A23_3m_100806 CF2:CBL049_110107

PLOT 24 Radiated Emissions - Zigbee Tx - 2GHz to 3GHz - 10kHz VBW

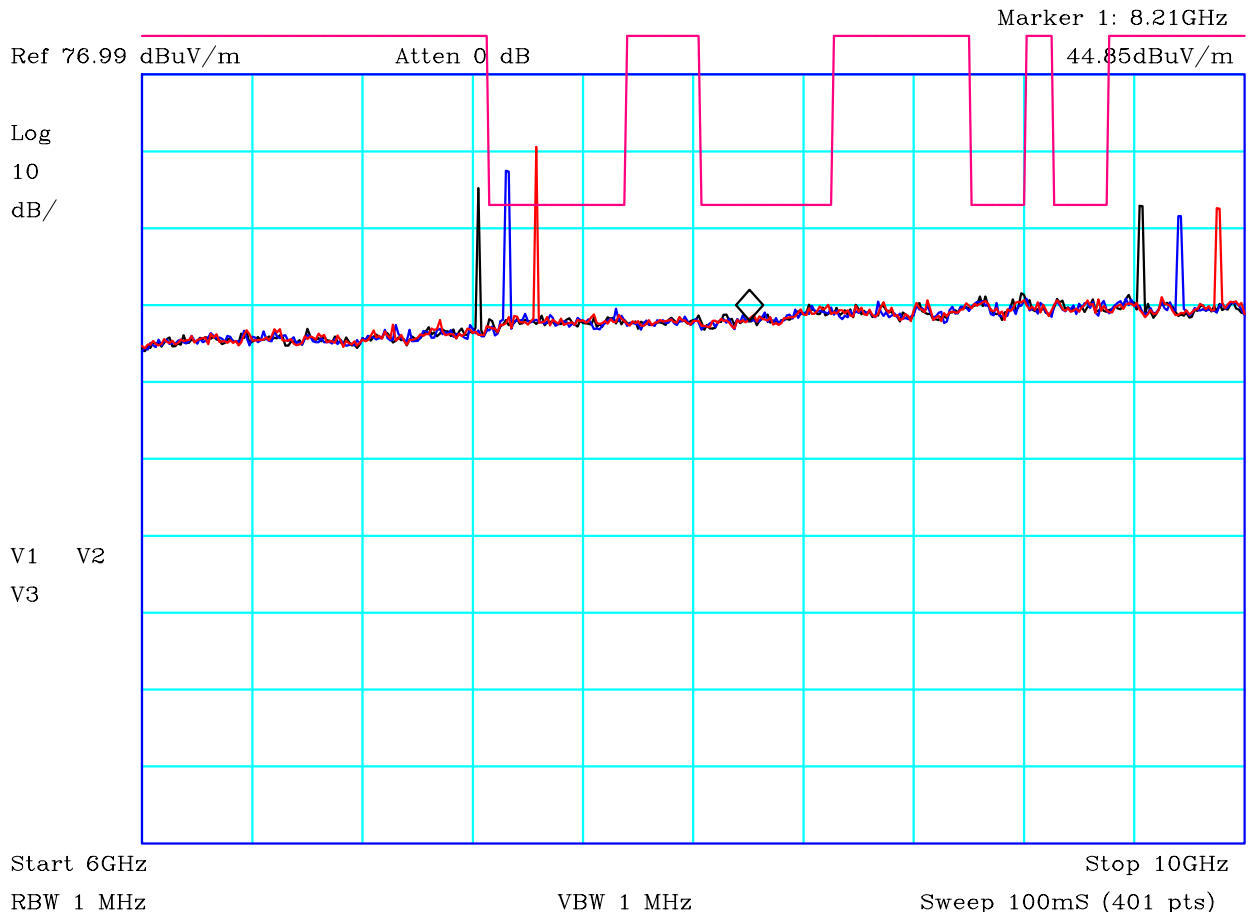
Company:	Alertme	Product:	minHub
Date:	03/04/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands@3m Av	Limit2:	
Limit3:		Limit4:	
<p>Sample 4. Black: Ch11, Blue: Ch18, Red: Ch25 Peak measurement Maximum of EUT upright and flat. Video bandwidth reduced to 10khz for average indication.</p>			
Facility:	Anech_2	Height	1.5m
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H2303732
		Mode:	1
		Modification State:	0



CF1:A23_3m_100806 CF2:PRE7_CBL052_CBL093_110112 CF3:RFF01_110112

PLOT 25 Radiated Emissions - Zigbee Tx - 2.75GHz to 6.75GHz

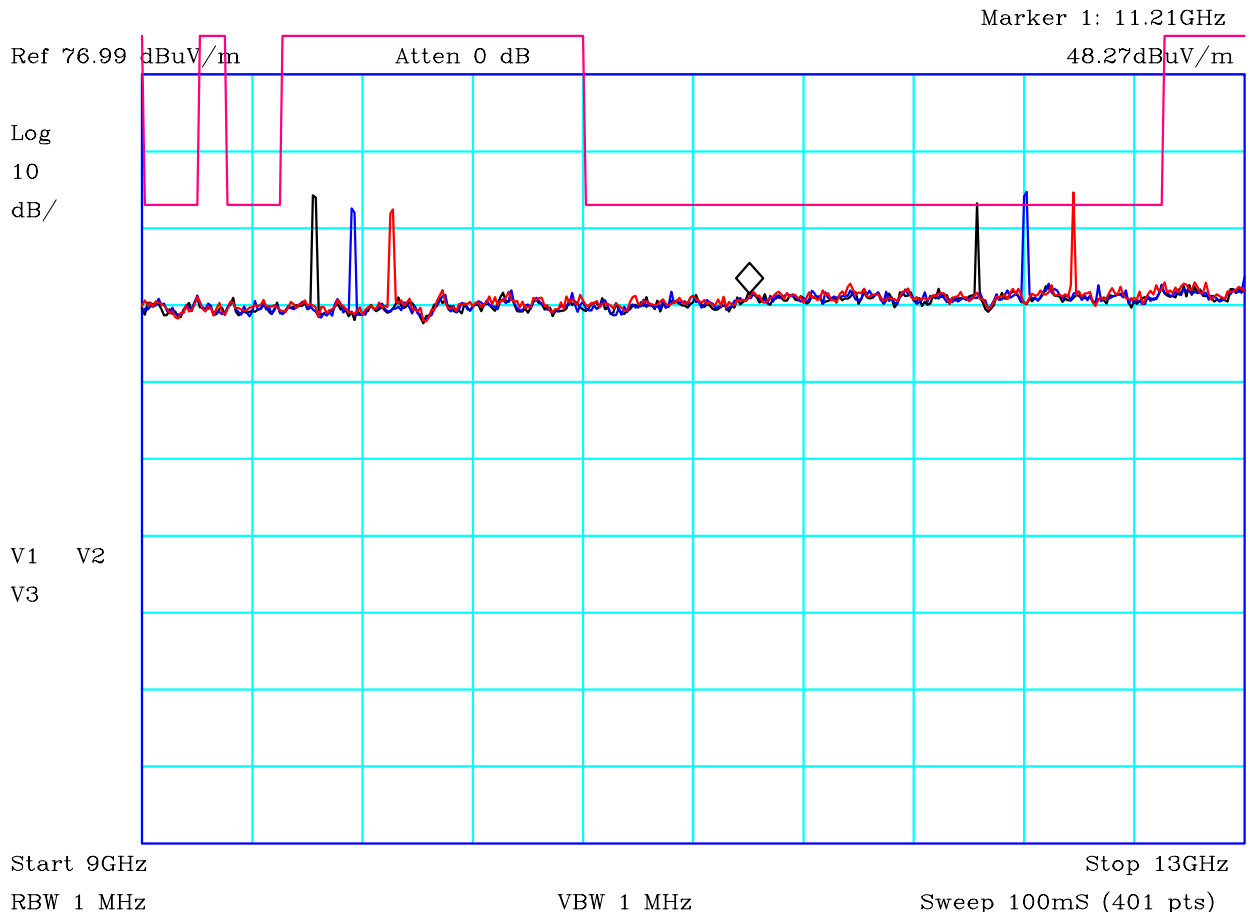
Company:	Alertme	Product:	minHub
Date:	03/04/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands@1.5m	Limit2:	
Limit3:		Limit4:	
<p>Sample 4. Black: Ch11, Blue: Ch18, Red: Ch25 Peak measurement Maximum of EUT upright and flat.</p>			
Facility:	Anech_2	Height	1.5m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H23037E5
		Mode:	1
		Modification State:	0



CF1:A23_3m_100806 CF2:PRE7_CBL052_CBL093_110112 CF3:RFF01_110112

PLOT 26 Radiated Emissions - Zigbee Tx - 6GHz to 10GHz

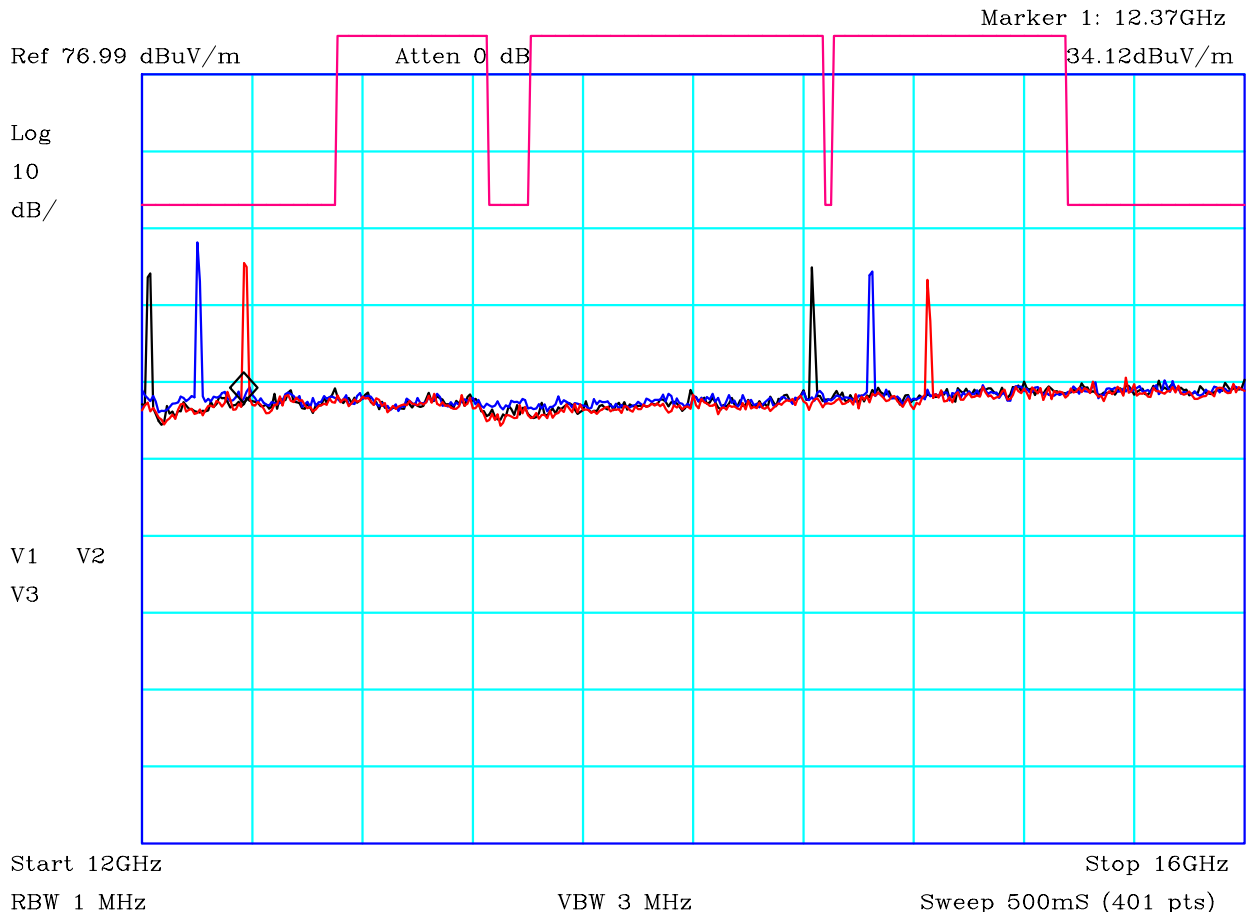
Company:	Alertme	Product:	minHub
Date:	03/04/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands@1.5m	Limit2:	
Limit3:		Limit4:	
<p>Sample 4. Black: Vertical, Blue: Horizontal Black: Ch11, Blue: Ch18, Red: Ch25 Peak measurement Maximum of EUT upright and flat.</p>			
Facility:	Anech_2	Height	1.5m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H2303816
Mode:		Mode:	1
Modification State:		Modification State:	0



CF1:A23_3m_100806 CF2:PRE7_CBL052_CBL093_110112 CF3:RFF01_110112

PLOT 27 Radiated Emissions - Zigbee Tx - 9GHz to 13GHz

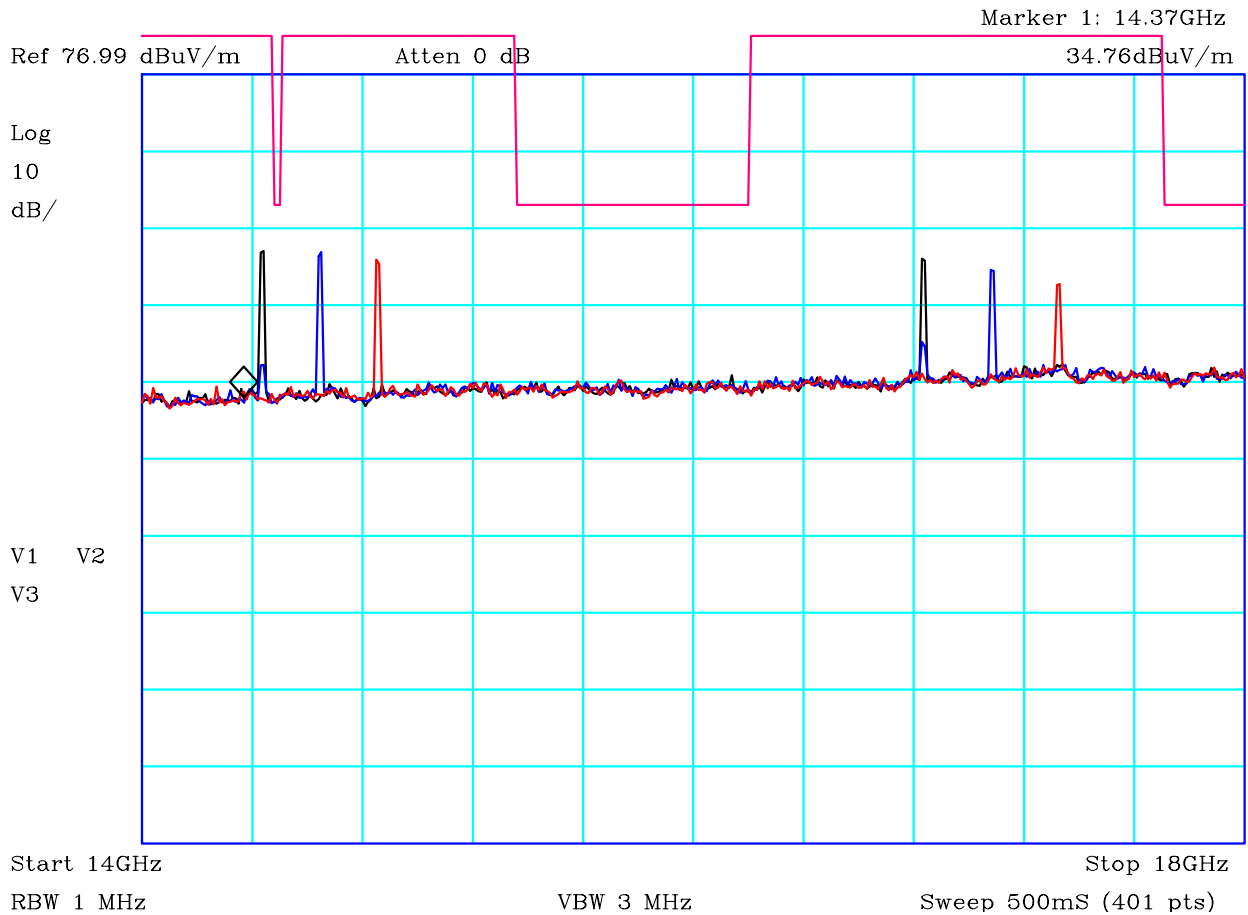
Company:	Alertme	Product:	minHub
Date:	03/04/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands@1.5m	Limit2:	
Limit3:		Limit4:	
<p>Sample 4. Black: Vertical, Blue: Horizontal Black: Ch11, Blue: Ch18, Red: Ch25 Peak measurement Maximum of EUT upright and flat.</p>			
Facility:	Anech_2	Height	1.5m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H230383F
		Mode:	1
		Modification State:	0



CF1:A22_3m_100201 CF2:PRE7_CBL052_CBL093_110112

PLOT 28 Radiated Emissions - Zigbee Tx - 12GHz to 16GHz

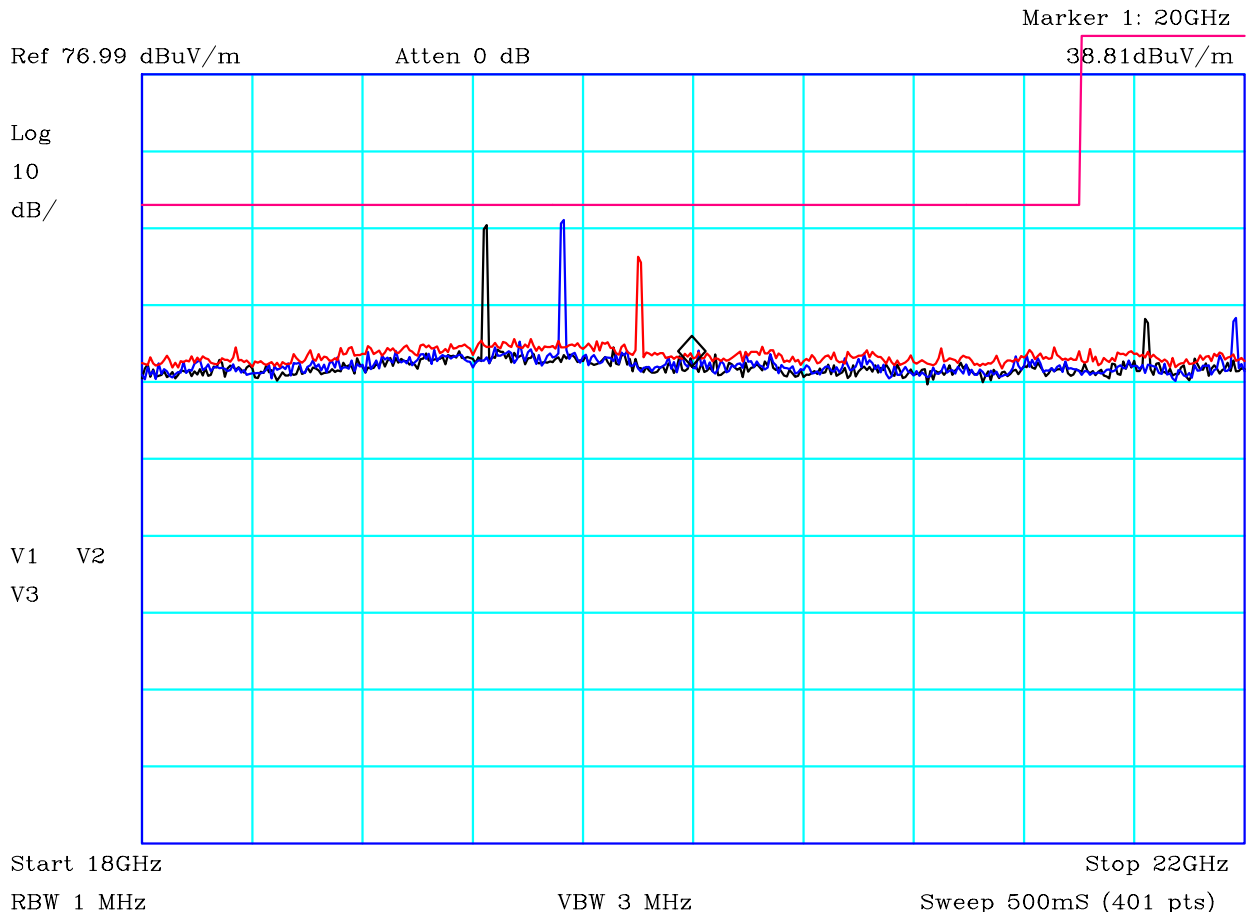
Company:	Alertme	Product:	minHub
Date:	05/04/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands@1.5m	Limit2:	
Limit3:		Limit4:	
<p>Sample 4. Black: Vertical, Blue: Horizontal Black: Ch11, Blue: Ch18, Red: Ch25 Peak measurement Maximum of EUT upright and flat.</p>			
Facility:	Anech_2	Height	1.5m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H23056E1
		Mode:	1
		Modification State:	0



CF1:A22_3m_100201 CF2:PRE7_CBL052_CBL093_110112

PLOT 29 Radiated Emissions - Zigbee Tx - 14GHz to 18GHz

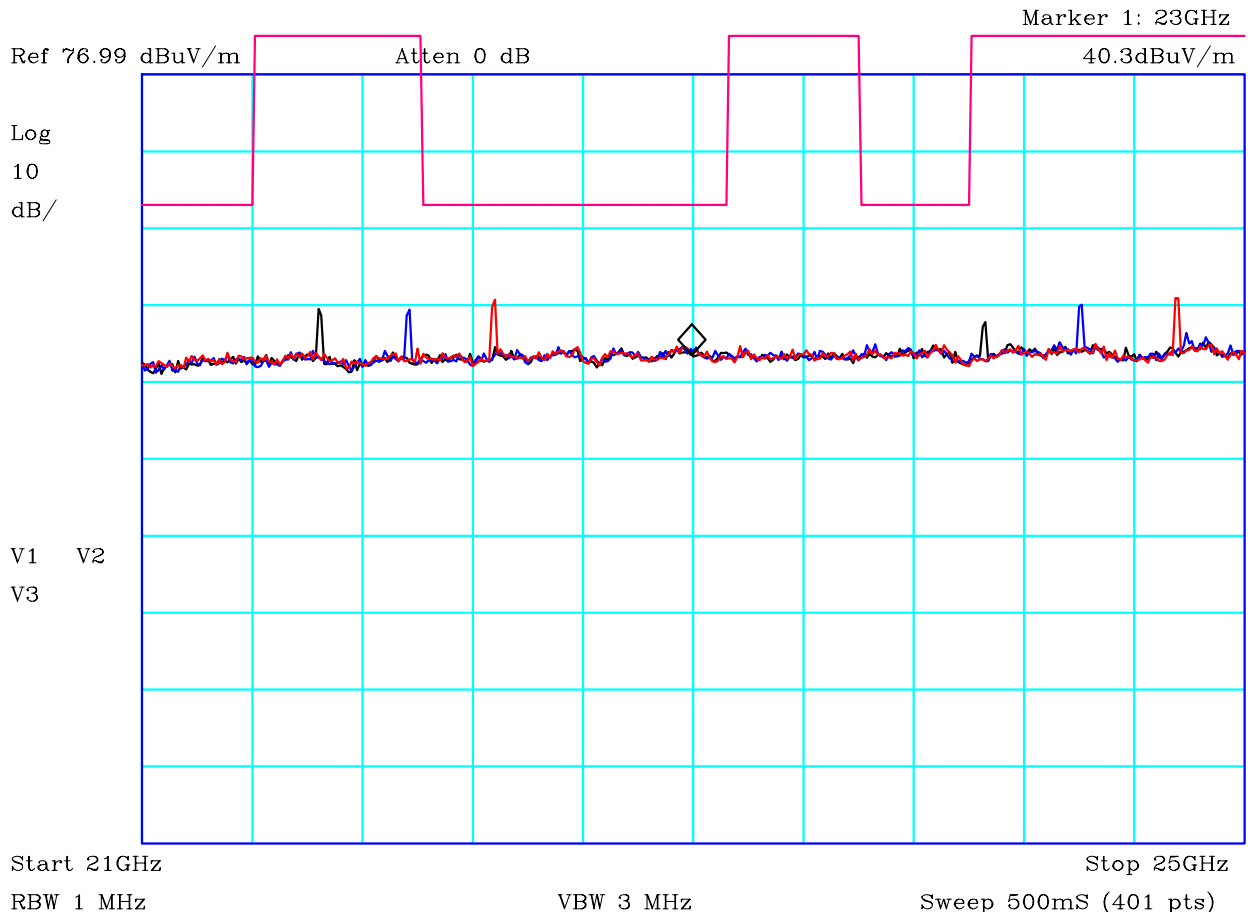
Company:	Alertme	Product:	minHub
Date:	05/04/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands@1.5m	Limit2:	
Limit3:		Limit4:	
<p>Sample 4. Black: Vertical, Blue: Horizontal Black: Ch11, Blue: Ch18, Red: Ch25 Peak measurement Maximum of EUT upright and flat.</p>			
Facility:	Anech_2	Height	1.5m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H2305724
Mode:		Mode:	1
Modification State:		Modification State:	0



CF1:A20_3m_100201 CF2:PRE8_CBL052_CBL092_110112

PLOT 30 Radiated Emissions - Zigbee Tx - 18GHz to 22GHz

Company:	Alertme	Product:	mini Hub
Date:	01/05/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands@1.5m	Limit2:	
Limit3:		Limit4:	
<p>Sample 4. Black: Vertical, Blue: Horizontal Black: Ch11, Blue: Ch18, Red: Ch25 Peak measurement Maximum of EUT upright and flat.</p>			
Facility:	Anech_2	Height	1.5m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H24024BB
Mode:		Mode:	1
Modification State:		Modification State:	0



CF1:A20_3m_100201 CF2:PRE8_CBL052_CBL092_110112

PLOT 31 Radiated Emissions - Zigbee Tx - 21GHz to 25GHz

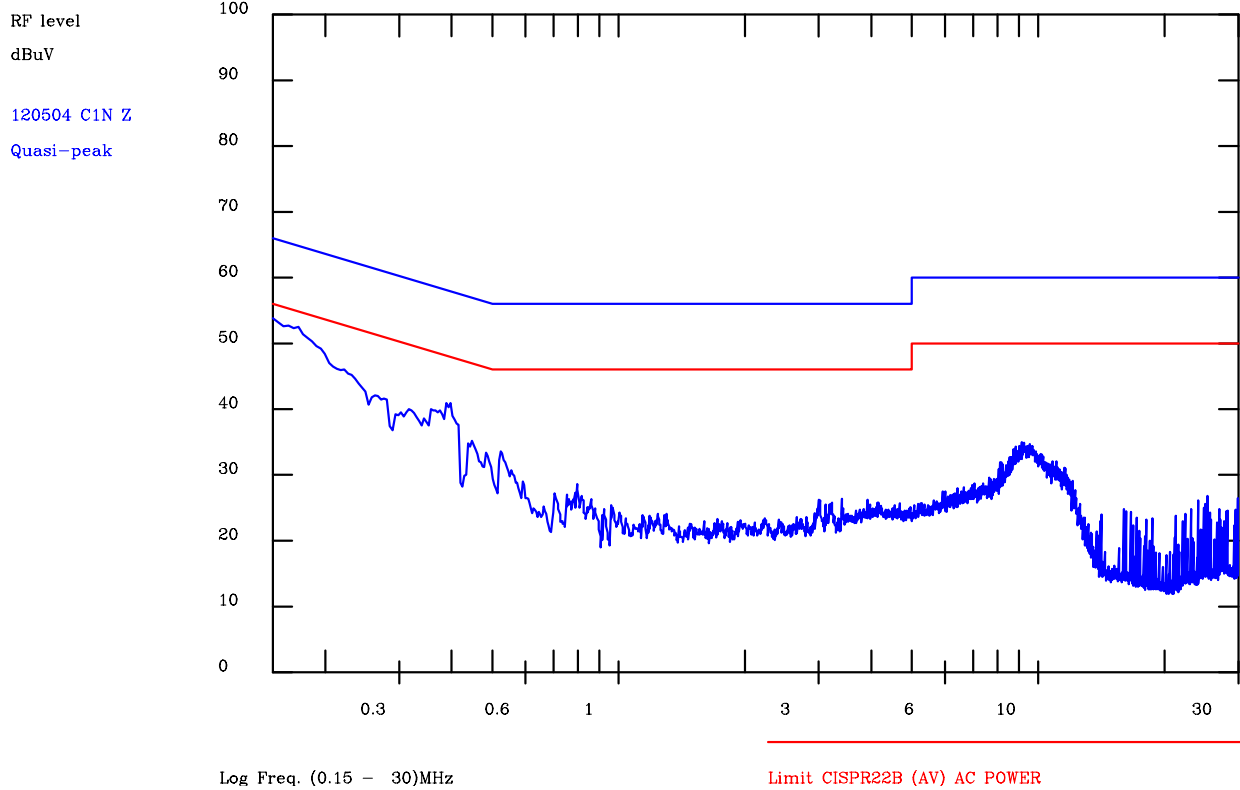
Company:	Alertme	Product:	miniHub
Date:	01/05/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands@1.5m	Limit2:	
Limit3:		Limit4:	
<p>Sample 4. Black: Vertical, Blue: Horizontal Black: Ch11, Blue: Ch18, Red: Ch25 Peak measurement Maximum of EUT upright and flat.</p>			
Facility:	Anech_2	Height	1.5m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H24024E2
Mode:		Mode:	1
Modification State:		Modification State:	0

Chase EMS 6.21

Notes

Analyse 120504 C1N Z-wave Tx. Ch 18 Tx

Test: 150kHz-30MHz (L1+CSET001) dBuV



PLOT 32 Conducted Emissions - Neutral Line - Z-wave & Zigbee Tx

Company:	Alertme	Product:	miniHub
Date:	04 May 12	Test Engineer:	Dave Smith
Test:	FCC Part 15	Limit:	15.21
Notes:			
Z-wave Transmitting. Zigbee transmitting on Ch 18.			
Equip:R1,L1,AB002,CBL005,CBL039			
Line:	Neutral	Attenuator:	10dB PAD
Detector:	QuasiPeak	Operating Mode:	2
LISN:	EMCO	Mod. State:	1
		Filename:	C25047BB.plt

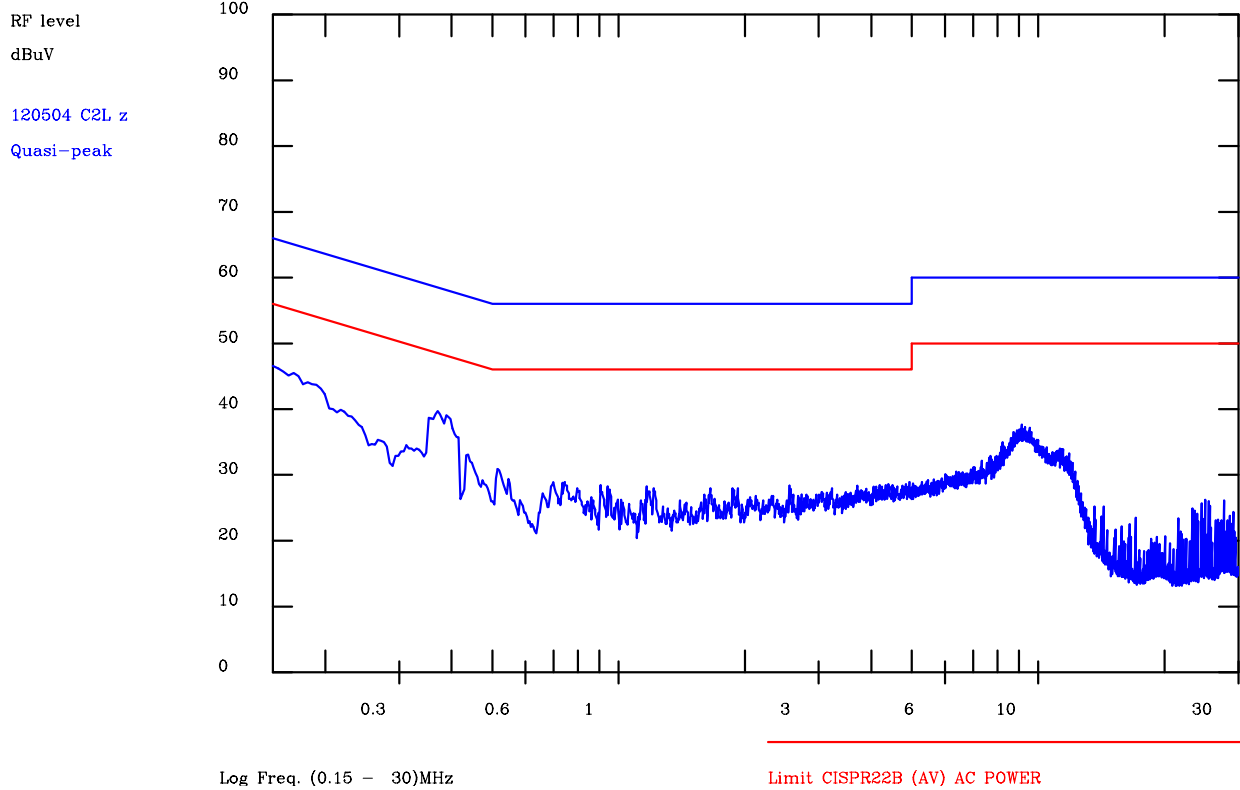
Frequency List (MHz)

Chase EMS 6.21

Notes

Analyse 120504 C2L z-wave tx, ch 18 tx

Test: 150kHz-30MHz (L1+CSET001) dBuV



PLOT 33 Conducted Emissions - Live Line - Z-wave & Zigbee Tx

Company:	Alertme	Product:	miniHub
Date:	04 May 12	Test Engineer:	Dave Smith
Test:	FCC Part 15	Limit:	15.21
Notes:			
Z-wave Transmitting. Zigbee transmitting on Ch 18.			
Equip:R1,L1,AB002,CBL005,CBL039			
Line:	Live	Attenuator:	10dB PAD
Detector:	QuasiPeak	Operating Mode:	2
LISN:	EMCO	Mod. State:	1
		Filename:	C25047CE.plt

Frequency List (MHz)
