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	Test No: <b>T4189</b>	<b>Test Report</b>	



**dB Technology**

( Cambridge Ltd. )

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Testing

EMC  
Consultancy

EMC  
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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**

**PIR**

dated


**9th May 2012**

### Document History

Issue	Date	Affected page(s)	Description of modifications	Revised by	Approved by
1	07/02/12		Initial release		
2	09/05/12	New version	Application of 558074 DOS DTS Meas Guidance V01	DS	DB
3	11/05/12	All	FCC ID corrected	DS	DB
4	15/05/12	12-14,20-28	Conducted antenna measurements repeated with EBW interpreted as -26dB points	DS	DB

Based on report template:  
v090319

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dB Technology (Cambridge) Ltd.*

	Report No: <b>R3027</b>	FCC ID: WJHMD12	
	Issue No: <b>4</b>		
	Test No: <b>T4189</b>	<b>Test Report</b>	Page: 2 of 44

Equipment Under Test (EUT): PIR

Test Commissioned by: AlertMe.com Ltd  
Compass House  
80 Newmarket Road  
Cambridge  
CB5 8DZ

Representative: Bruce Benson


Test Started: 4th January 2012

Test Completed: 9th May 2012

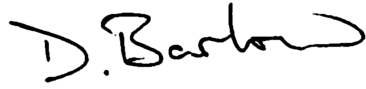
Test Engineer: Dave Smith

Date of Report: 9th May 2012

Written by: Dave Smith      Checked by: Derek Barlow

Signature: 

Date: 9th May 2012

Signature: 


Date: 9th May 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

<b>CFR 47</b>	<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


FCC Part	Parameter	
15.207	Conducted Emissions	N/A #1
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

#1 Test not applicable because EUT is powered by internal battery - there is no ac power supply.

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## 1 EUT Details

### 1.1 General

The EUT was an AlertMe.com PIR. The PIR incorporates an intentional radiator operating in the 2.4GHz to 2.4835GHz band. The device operates on 15 equally spaced channels starting at 2.405GHz (channel 11) and ending at 2.475GHz (channel 25).

The device is powered from an internal battery and has an integral antenna.

For some tests a modified version of the device was used which provided a direct SMA connection to the radio module RF port and a short data cable that could be connected to a PC for the purposes of setting the required test modes.

The device can operate on 15 channels (channels 11 to 25) in the range 2.405GHz to 2.480GHz. Tests were performed on:

Ch 11: 2.405 GHz

Ch 18: 2.440 GHz

Ch 25: 2.475 GHz


The modulation is O-QPSK which is considered a digital modulation technique.

The gain of the antenna was declared to be 1dBi.

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.com	PIR	EUT with integral antenna	sample 1	
2	AlertMe.com	PIR	EUT with temporary sma connection instead of antenna to allow conducted measurements	sample 2	

#1 Only used to power the device during antenna conducted measurements.

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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.

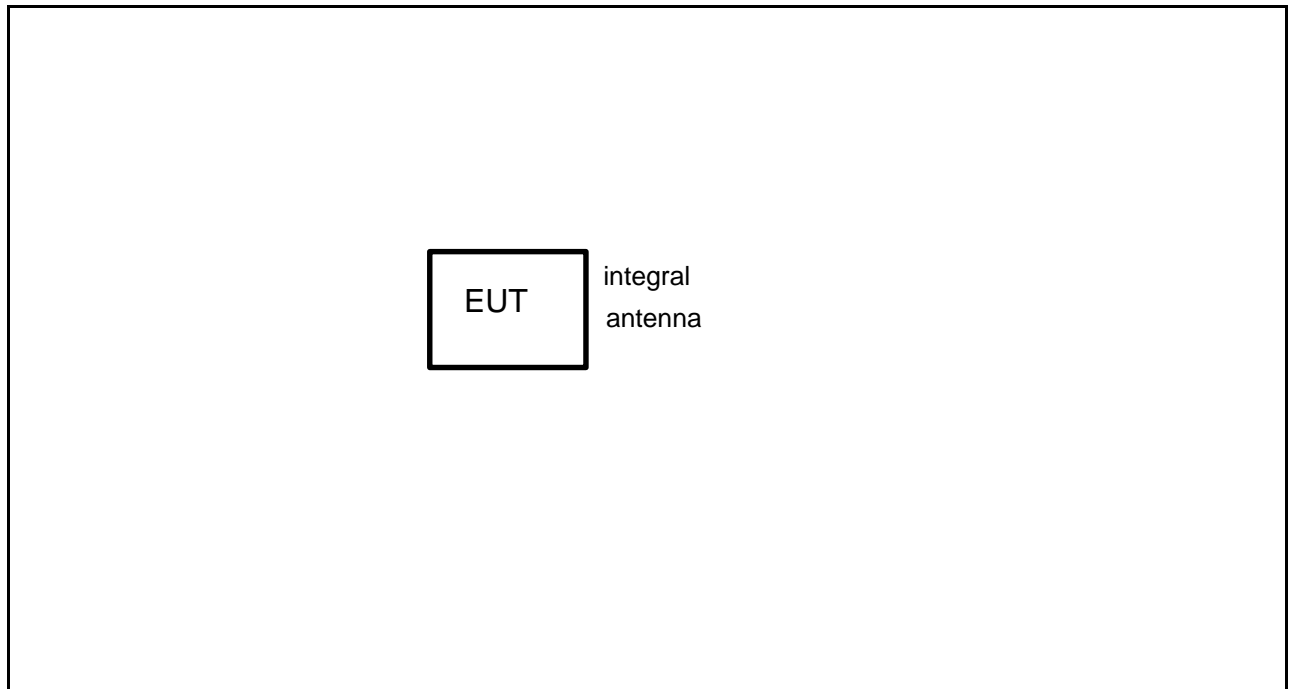
Mod No:	Details	Implemented for
0	Original unit No modifications were made during the course of testing.	

## 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	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.  In normal usage packets are intermittently sent in short pulses with no more than 10 msec ON duration in any 100msec period.

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	Test No: <b>T4189</b>	<b>Test Report</b>	Page: 7 of 44

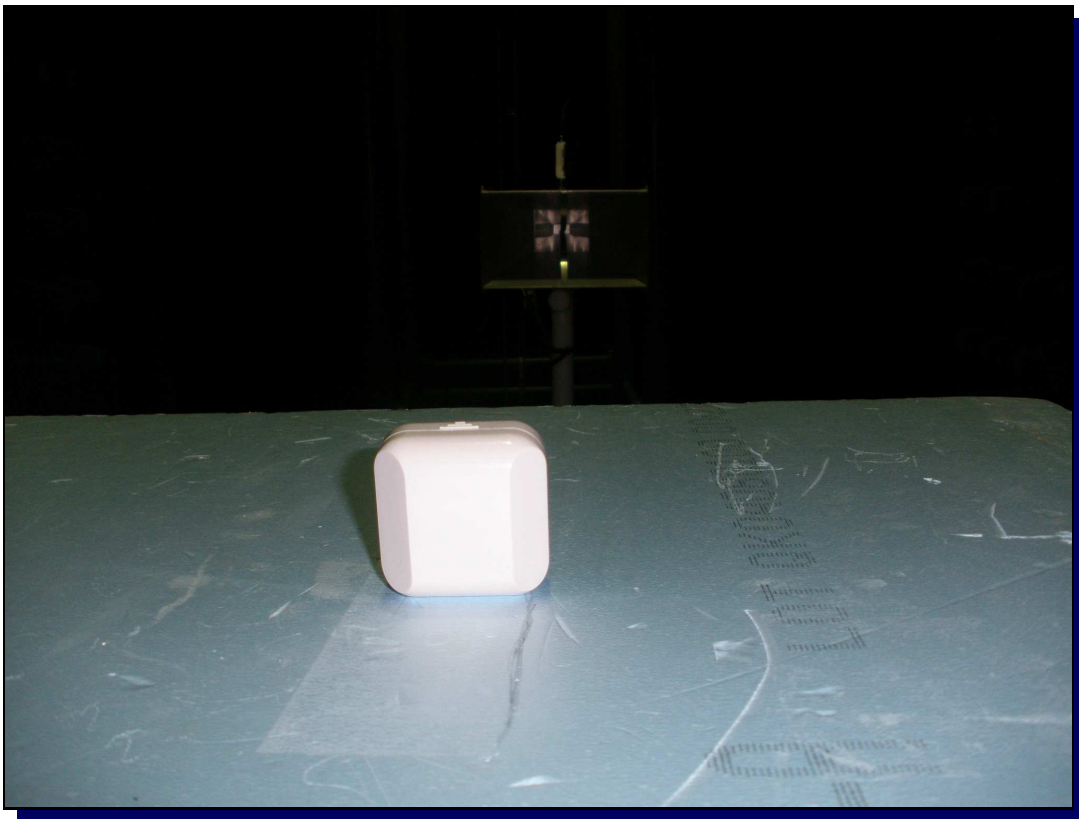


**Figure 1 EUT and Peripherals: Emissions Measurements**

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**Photograph 1 Radiated Emissions - Upright - Front**

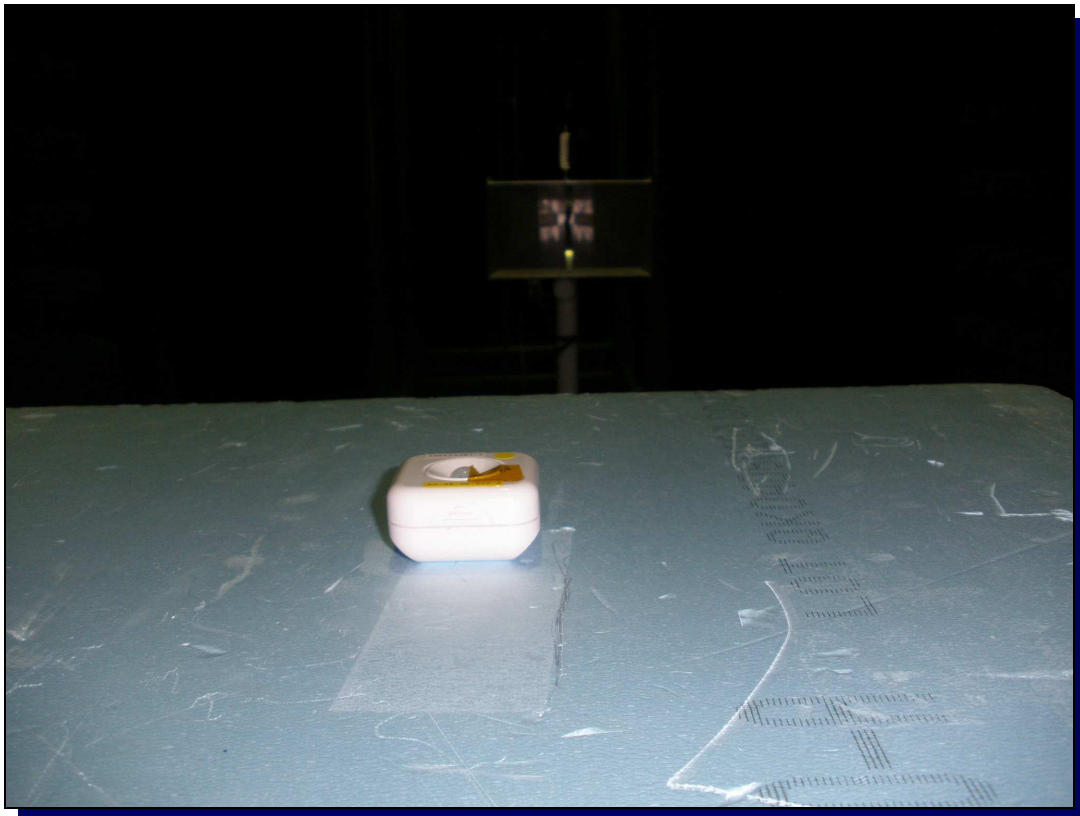


**Photograph 2 Radiated Emissions - Upright - Back**

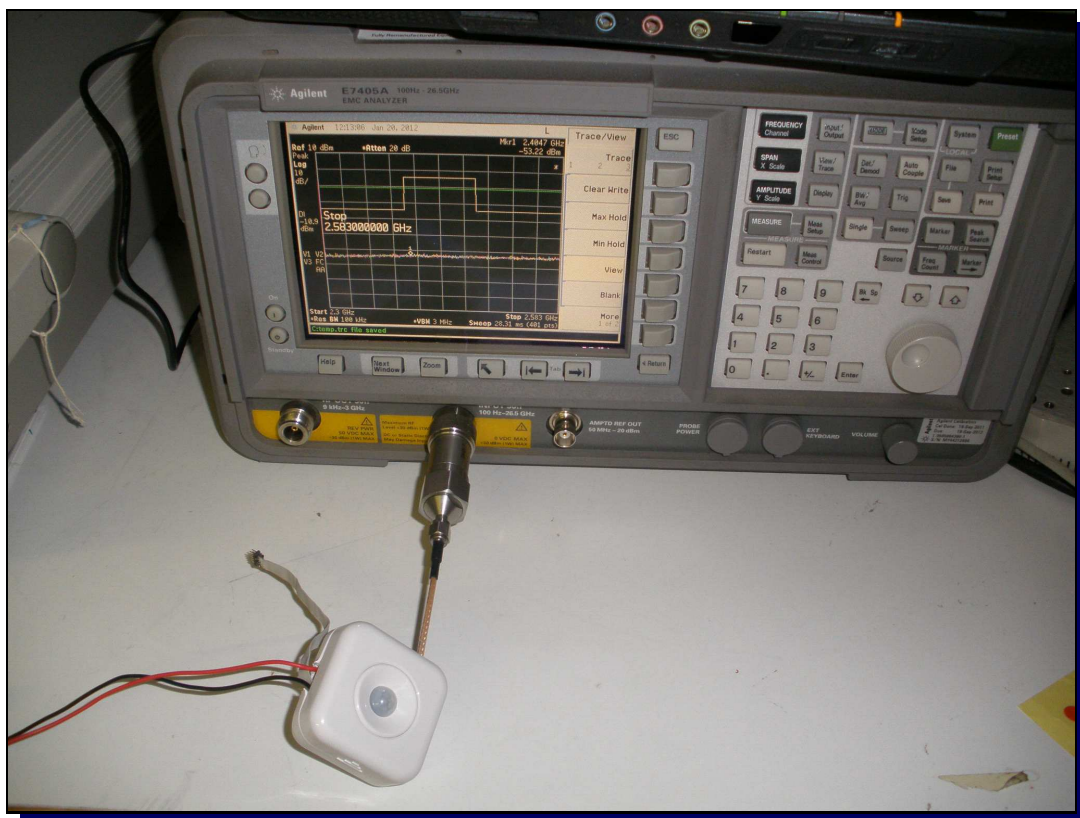
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	Issue No: <b>4</b>		
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**Photograph 3 Radiated Emissions - Flat**



**Photograph 4 Conducted Antenna**

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	Issue No: <b>4</b>		
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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
A19	EMCO 3115 DR Guide (1-18GHz)	2431	25/01/2011	1 year
A20	Alpha 61932500 Horn Antenna (18-26GHz)	50	#1	
A22	Alpha 61932400 Horn Antenna (12.4-18GHz)	55	#1	
A24	Chase X-wing Bilog CBL6144 26MHz-3GHz	27590	18/11/2011	1 year
PRE7	LUCIX 0.1GHz to 20GHz	24485	11/01/2011	1 year
PRE8	LUCIX 18GHz to 26.5GHz	24486	11/01/2011	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	11/01/2011	1 year
RFF04	Low Pass RF Filter 0MHz to 2GHz	4	11/01/2011	1 year

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

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### 3 Test Methods

#### 3.1 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 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/m) = 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 58.8dBuV and combined correction factor = 20.4 (dB/m).

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


#### 3.2 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.

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#### 4.1 Peak Power - 15.247(b)(3)

Test Equipment: R8
--------------------

*Peak Power*

<i>Company:</i> AlertMe.com Ltd	<i>Product:</i> PIR
<i>Date:</i> 15/05/2012	<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 2.</p> <p>Results of scans 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 analysers "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>-0.15</td> <td>30</td> <td>PASS</td> </tr> <tr> <td>18</td> <td>0.26</td> <td>30</td> <td>PASS</td> </tr> <tr> <td>25</td> <td>0.76</td> <td>30</td> <td>PASS</td> </tr> </tbody> </table> <p>The plots show no significant deviation when the dc power supply is varied between 2.55V and 3.45V.</p> <p><b>PASS</b></p>	Channel	Level (dBm)	Limit (dBm)		11	-0.15	30	PASS	18	0.26	30	PASS	25	0.76	30	PASS
Channel	Level (dBm)	Limit (dBm)															
11	-0.15	30	PASS														
18	0.26	30	PASS														
25	0.76	30	PASS														


	Report No: <b>R3027</b>	FCC ID: WJHMD12	
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	Test No: <b>T4189</b>	<b>Test Report</b>	Page: 13 of 44

## 4.2 Bandwidth - 15.247(a)(2)

Test Equipment: R8
--------------------

### Bandwidth

<i>Company:</i> AlertMe.com Ltd	<i>Product:</i> PIR																
<i>Date:</i> 15/05/2012	<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 2.</p> <p>The method of 558074 D01 DTS Meas Guidance v01 section 5.1.1 was applied.</p> <p>Results of scans shown in plots 4 to 6.</p> <p>The results are as follows:</p> <table border="1"> <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>&gt; 500kHz</td> <td>PASS</td> </tr> <tr> <td>18</td> <td>1.590</td> <td>&gt; 500kHz</td> <td>PASS</td> </tr> <tr> <td>25</td> <td>1.560</td> <td>&gt; 500kHz</td> <td>PASS</td> </tr> </tbody> </table> <p><b>PASS</b></p>	Channel	Measured Bandwidth (MHz)	Limit		11	1.600	> 500kHz	PASS	18	1.590	> 500kHz	PASS	25	1.560	> 500kHz	PASS
Channel	Measured Bandwidth (MHz)	Limit															
11	1.600	> 500kHz	PASS														
18	1.590	> 500kHz	PASS														
25	1.560	> 500kHz	PASS														

	Report No: <b>R3027</b>	FCC ID: WJHMD12	
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### 4.3 Power Spectral Density in 3kHz bw - 15.247(e)

Test Equipment: R8
--------------------

*Spectral Density*

<i>Company:</i> AlertMe.com Ltd	<i>Product:</i> PIR
<i>Date:</i> 15/05/2012	<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 2.</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 shown in plots 7 to 9.</p> <p>In all cases the spectral density is below 8dBm/3kHz.</p> <p><b>PASS</b></p>

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	Test No: <b>T4189</b>	<b>Test Report</b>	Page: 15 of 44


#### 4.4 Antenna Conducted Spurious Emissions using 100kHz bw - 15.247(d)

Test Equipment: R8
--------------------

##### Conducted Emissions (Signal)

<i>Company:</i> AlertMe.com Ltd	<i>Product:</i> PIR
<i>Date:</i> 19/01/2012	<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 2. 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>-6.9</i></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2.4000</td> <td>Ch 11</td> <td>-45.6</td> <td>-38.7</td> <td>-20</td> <td>18.7</td> <td>PASS</td> </tr> <tr> <td>4.8094</td> <td>Ch 11</td> <td>-24.2</td> <td>-17.2</td> <td>-20</td> <td>-2.8</td> <td>N/A *</td> </tr> <tr> <td><i>2.4400</i></td> <td><i>Ch 18</i></td> <td><i>-5.9</i></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4.8796</td> <td>Ch 18</td> <td>-24.7</td> <td>-18.8</td> <td>-20</td> <td>-1.2</td> <td>N/A *</td> </tr> <tr> <td><i>2.4750</i></td> <td><i>Ch 25</i></td> <td><i>-3.9</i></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2.4835</td> <td>Ch 25</td> <td>-50.2</td> <td>-46.2</td> <td>-20</td> <td>26.2</td> <td>PASS</td> </tr> <tr> <td>4.9494</td> <td>Ch 25</td> <td>-26.6</td> <td>-22.7</td> <td>-20</td> <td>2.7</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><b>PASS</b></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>-6.9</i>					2.4000	Ch 11	-45.6	-38.7	-20	18.7	PASS	4.8094	Ch 11	-24.2	-17.2	-20	-2.8	N/A *	<i>2.4400</i>	<i>Ch 18</i>	<i>-5.9</i>					4.8796	Ch 18	-24.7	-18.8	-20	-1.2	N/A *	<i>2.4750</i>	<i>Ch 25</i>	<i>-3.9</i>					2.4835	Ch 25	-50.2	-46.2	-20	26.2	PASS	4.9494	Ch 25	-26.6	-22.7	-20	2.7	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>-6.9</i>																																																														
2.4000	Ch 11	-45.6	-38.7	-20	18.7	PASS																																																										
4.8094	Ch 11	-24.2	-17.2	-20	-2.8	N/A *																																																										
<i>2.4400</i>	<i>Ch 18</i>	<i>-5.9</i>																																																														
4.8796	Ch 18	-24.7	-18.8	-20	-1.2	N/A *																																																										
<i>2.4750</i>	<i>Ch 25</i>	<i>-3.9</i>																																																														
2.4835	Ch 25	-50.2	-46.2	-20	26.2	PASS																																																										
4.9494	Ch 25	-26.6	-22.7	-20	2.7	N/A *																																																										

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#### 4.5 Radiated Emissions - Channel 11 - 15.209

Factor Set 1: A19_3m_11A PRE7_CBL052_CBL093_11A RFF01_11A -
Factor Set 2: - - - -
Factor Set 3: - - - -
Test Equipment: R8 A19 PRE8 PRE7 RFF01 RFF04 A20 A22 A24

*Radiated Emissions*

<i>Company:</i> AlertMe.com Ltd		<i>Product:</i> PIR											
<i>Date:</i> 05/01/2012		<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
18	1	0	1.5	1	4809.375	V	70.8	-5.4		65.5	80.0	14.5	pk
18	1	0	1.5	1	4809.375	V	62.3	-5.4		57.0	60.0	3.0	avg
18	1	0	1.5	1	4809.375	H	69.1	-5.4		63.8	80.0	16.2	pk
18	1	0	1.5	1	4809.375	H	60.6	-5.4		55.2	60.0	4.8	avg
19	1	0	1.5	1	7214.200	V	55.8	-1.4		54.4	80.0	25.6	pk
19	1	0	1.5	1	7214.200	V	46.4	-1.4		45.0	60.0	15.0	avg
19	1	0	1.5	1	7214.200	H	55.3	-1.4		53.9	80.0	26.1	pk
19	1	0	1.5	1	7214.200	H	45.5	-1.4		44.1	60.0	15.9	avg
<b>Results</b>											<b>3.0 dB</b>		
											<b>PASS</b>		
<b>Minimum Margin</b>													
<b>PASS/FAIL</b>													
Notes	Comments and Observations												
	<p>Results of scans shown in plots 15 to 25.</p> <p>Measurements made using 1MHz RBW. VBW set to 3MHz for peak measurements and 30Hz for average measurements.</p> <p>Because in normal use the transmission is pulsed, with a total on period of no more than 10msec in a 100msec period, the average measurements could be reduced further by a factor of 20dB (<math>20 \cdot \log(0.1)</math>) to give an increased margin against the average limits.</p>												




	Report No: <b>R3027</b>	FCC ID: WJHMD12	Page: 17 of 44
	Issue No: <b>4</b>		
	Test No: <b>T4189</b>	<b>Test Report</b>	

#### 4.6 Radiated Emissions - Channel 18 - 15.209

Factor Set 1: A19_3m_11A PRE7_CBL052_CBL093_11A RFF01_11A -
Factor Set 2: - - - -
Factor Set 3: - - - -
Test Equipment: R8 A19 PRE8 PRE7 RFF01 RFF04 A20 A22 A24

*Radiated Emissions*

<i>Company:</i> AlertMe.com Ltd					<i>Product:</i> PIR								
<i>Date:</i> 05/01/2012					<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
18	1	0	1.5	1	4879.439	V	70.9	-5.1		65.8	80.0	14.2	pk
18	1	0	1.5	1	4879.439	V	62.1	-5.1		56.9	60.0	3.1	avg
18	1	0	1.5	1	4879.439	H	71.2	-5.1		66.0	80.0	14.0	pk
18	1	0	1.5	1	4879.439	H	62.1	-5.1		56.9	60.0	3.1	avg
19	1	0	1.5	1	7319.125	V	57.2	-0.6		56.7	80.0	23.3	pk
19	1	0	1.5	1	7319.125	V	47.9	-0.6		47.3	60.0	12.7	avg
19	1	0	1.5	1	7319.125	H	56.6	-0.6		56.0	80.0	24.0	pk
19	1	0	1.5	1	7319.125	H	47.3	-0.6		46.7	60.0	13.4	avg
<b>Results</b>											<b>3.1 dB</b>		
											<b>PASS</b>		
<b>Minimum Margin PASS/FAIL</b>													
<b>Notes</b>													
<b>Comments and Observations</b>													
<p>Results of scans shown in plots 15 to 25.</p> <p>Measurements made using 1MHz RBW. VBW set to 3MHz for peak measurements and 30Hz for average measurements.</p> <p>Because in normal use the transmission is pulsed, with a total on period of no more than 10msec in a 100msec period, the average measurements could be reduced further by a factor of 20dB (20*log(0.1)) to give an increased margin against the average limits.</p>													


	Report No: <b>R3027</b>	FCC ID: WJHMD12	Page: 18 of 44
	Issue No: <b>4</b>		
	Test No: <b>T4189</b>	<b>Test Report</b>	

#### 4.7 Radiated Emissions - Channel 25 - 15.209

Factor Set 1: A19_3m_11A PRE7_CBL052_CBL093_11A RFF01_11A -
Factor Set 2: - - - -
Factor Set 3: - - - -
Test Equipment: R8 A19 PRE8 PRE7 RFF01 RFF04 A20 A22 A24

*Radiated Emissions*

<i>Company:</i> AlertMe.com Ltd					<i>Product:</i> PIR								
<i>Date:</i> 05/01/2012					<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
18	1	0	1.5	1	4949.410	V	70.7	-5.1		65.6	80.0	14.4	pk
18	1	0	1.5	1	4949.410	V	61.9	-5.1		56.7	60.0	3.3	avg
18	1	0	1.5	1	4949.410	H	69.4	-5.1		64.2	80.0	15.8	pk
18	1	0	1.5	1	4949.410	H	60.5	-5.1		55.4	60.0	4.6	avg
19	1	0	1.5	1	7427.142	V	57.6	0.0		57.6	80.0	22.4	pk
19	1	0	1.5	1	7427.142	V	47.7	0.0		47.7	60.0	12.3	avg
19	1	0	1.5	1	7427.142	H	57.7	0.0		57.8	80.0	22.2	pk
19	1	0	1.5	1	7427.142	H	47.6	0.0		47.7	60.0	12.4	avg
<b>Results</b>											<b>Minimum Margin</b>		
											<b>PASS/FAIL</b>		
											<b>3.3 dB</b>		
											<b>PASS</b>		
Notes	Comments and Observations												
	<p>Results of scans shown in plots 15 to 25.</p> <p>Measurements made using 1MHz RBW. VBW set to 3MHz for peak measurements and 30Hz for average measurements.</p> <p>Because in normal use the transmission is pulsed, with a total on period of no more than 10msec in a 100msec period, the average measurements could be reduced further by a factor of 20dB (<math>20 \cdot \log(0.1)</math>) to give an increased margin against the average limits.</p>												

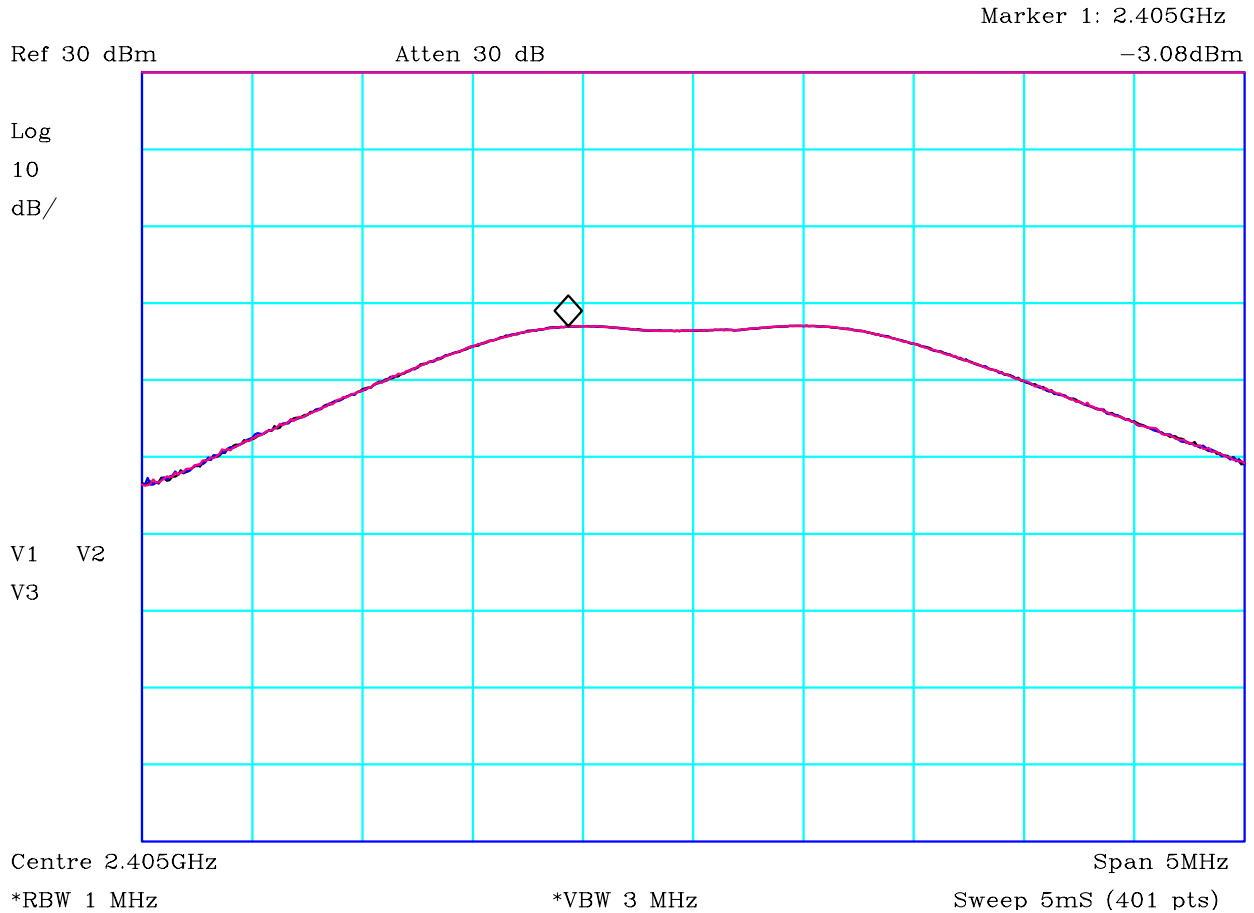
	Report No: <b>R3027</b>	FCC ID: WJHMD12	
	Issue No: <b>4</b>		
	Test No: <b>T4189</b>	<b>Test Report</b>	Page: 19 of 44

#### 4.8 Radiated Emissions - Band Edge - Channel 25 - 15.209

Factor Set 1:	A19_3m_11A_CBL059_CBL018_CBL065_CBL060_10A --
Factor Set 2:	---
Factor Set 3:	---
Test Equipment:	R8 A19

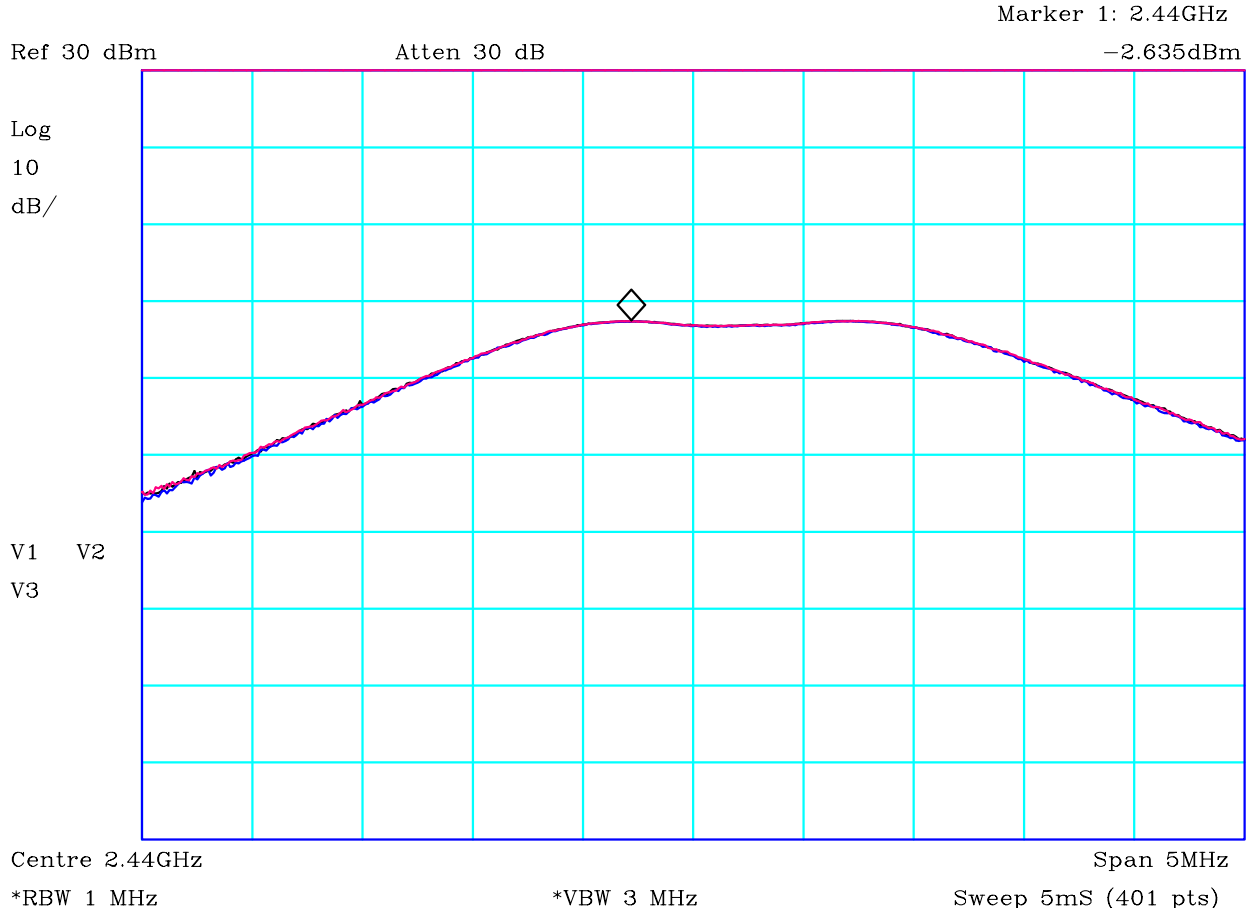
*Radiated Emissions*

<i>Company:</i> AlertMe.com Ltd		<i>Product:</i> PIR											
<i>Date:</i> 05/01/2012		<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
Fundamental - channel 18													
17	1	0	1.5	1	2440.225	V	58.4	32.4		90.8	-		
17	1	0	1.5	1	2440.225	H	63.4	32.4		95.8	-		
Spurious at band edge - channel 25													
25	1	0	1.5	1	2483.500	V	19.4	32.6		52.0	80.0	28.0	
25	1	0	1.5	1	2483.500	V	10.3	32.6		42.8	60.0	17.2	
25	1	0	1.5	1	2483.500	H	22.7	32.6		55.3	80.0	24.7	
25	1	0	1.5	1	2483.500	H	12.3	32.6		44.9	60.0	15.1	
<b>Results</b>											<b>Minimum Margin</b>		
											<b>PASS/FAIL</b>		
											<b>15.1 dB</b>		
											<b>PASS</b>		
Notes	Comments and Observations												
	<p>Results of scans shown in plots 17 and 25</p> <p>There is no radiated emissions requirement for the fundamental because a conducted antenna measurement was made. The measurement above is for information only.</p> <p>The lower band edge is not at a restricted band and so was measured as a conducted antenna test.</p> <p>Measurements made using 1MHz RBW. VBW set to 3MHz for peak measurements and 30Hz for average measurements.</p> <p>Because in normal use the transmission is pulsed, with a total on period of no more than 10msec in a 100msec period, the average measurements could be reduced further by a factor of 20dB (<math>20 \cdot \log(0.1)</math>) to give an increased margin against the average limits.</p>												



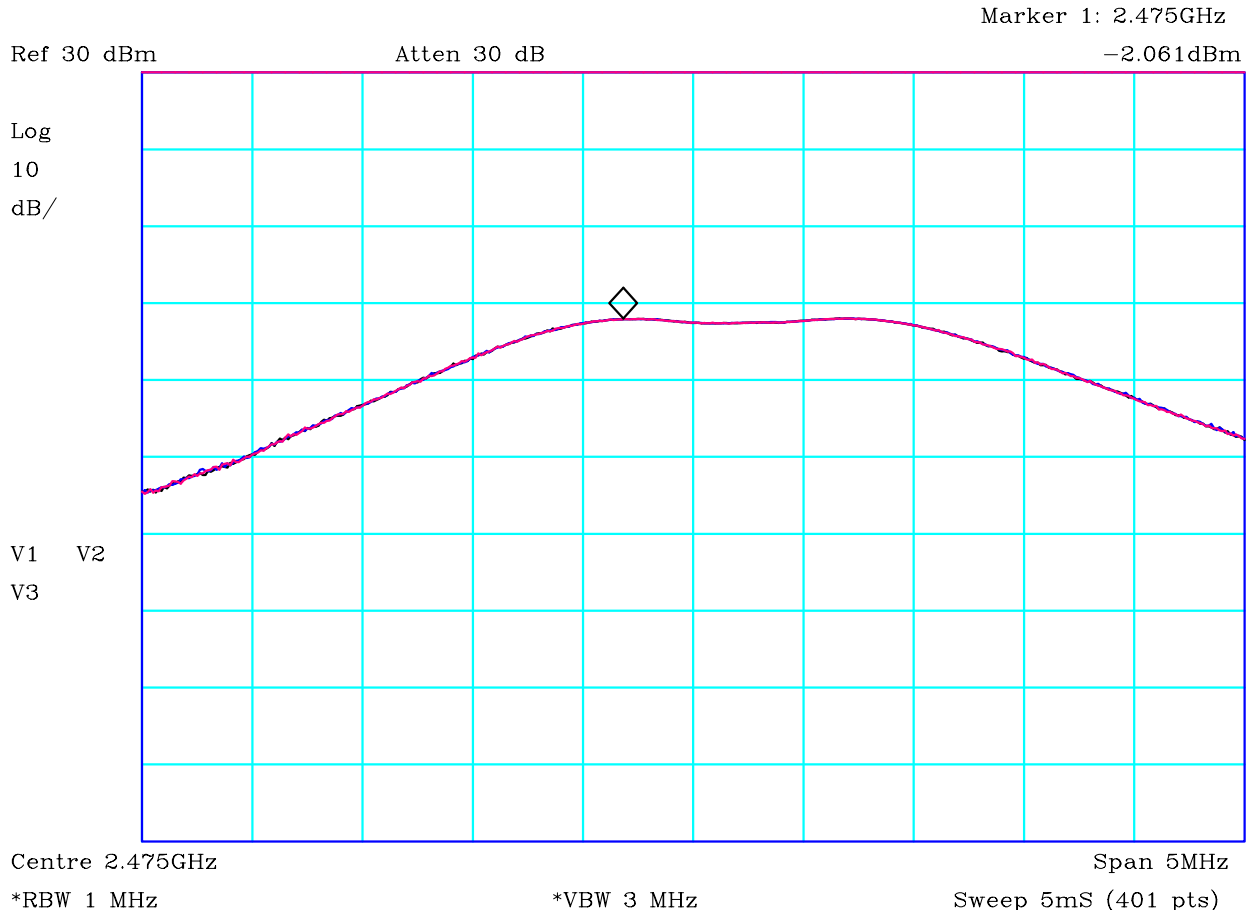
### PLOT 1 Peak Power - Channel 11

Company:	Alertme	Product:	PIR
Date:	15/05/2012	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 point) using peak detector.  Level = -0.145 dBm which therefore complies with the upper limit of  Part 15.247(b)(3) of 30dBm (1W).  Black: 2.55V, Blue: 3.0V, Red: 3.45V</p>			
Facility:	GTEM_1	Mode:	1
		Modification State:	0
File:	H241670A		



## PLOT 2 Peak Power - Channel 18

Company:	Alertme	Product:	PIR
Date:	15/05/2012	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 point) using peak detector.  Level = 0.26 dBm which therefore complies with the upper limit of  Part 15.247(b)(3) of 30dBm (1W).  Black: 2.55V, Blue: 3.0V, Red: 3.45V</p>			
Facility:	GTEM_1	Mode:	1
		Modification State:	0
File:	H241670F		



### PLOT 3 Peak Power - Channel 25

Company:	Alertme	Product:	PIR
Date:	15/05/2012	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 point) using peak detector.  Level = 0.757 dBm which therefore complies with the upper limit of  Part 15.247(b)(3) of 30dBm (1W).  Black: 2.55V, Blue: 3.0V, Red: 3.45V</p>			
Facility:	GTEM_1	Mode:	1
		Modification State:	0
File:	H2416715		

Marker 1: 2.407GHz

Ref 10 dBm

Atten 30 dB

-32.49dBm

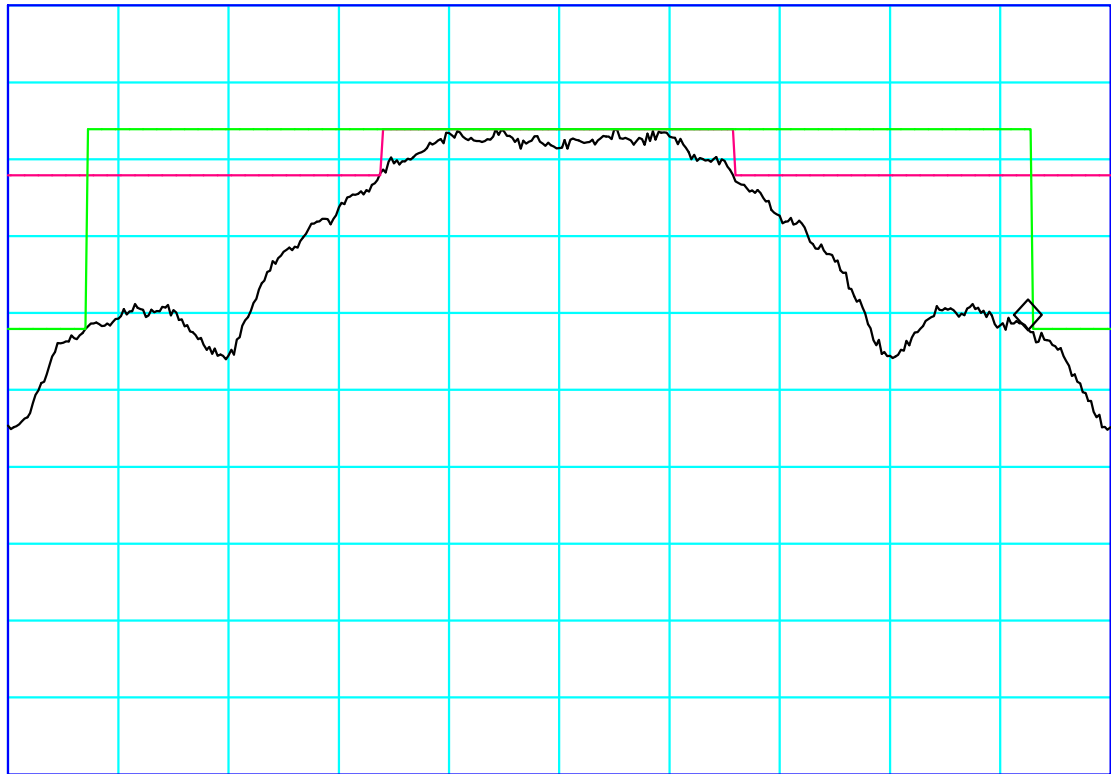
Log

10

dB/

V1 S2

S3



Centre 2.405GHz

Span 5MHz

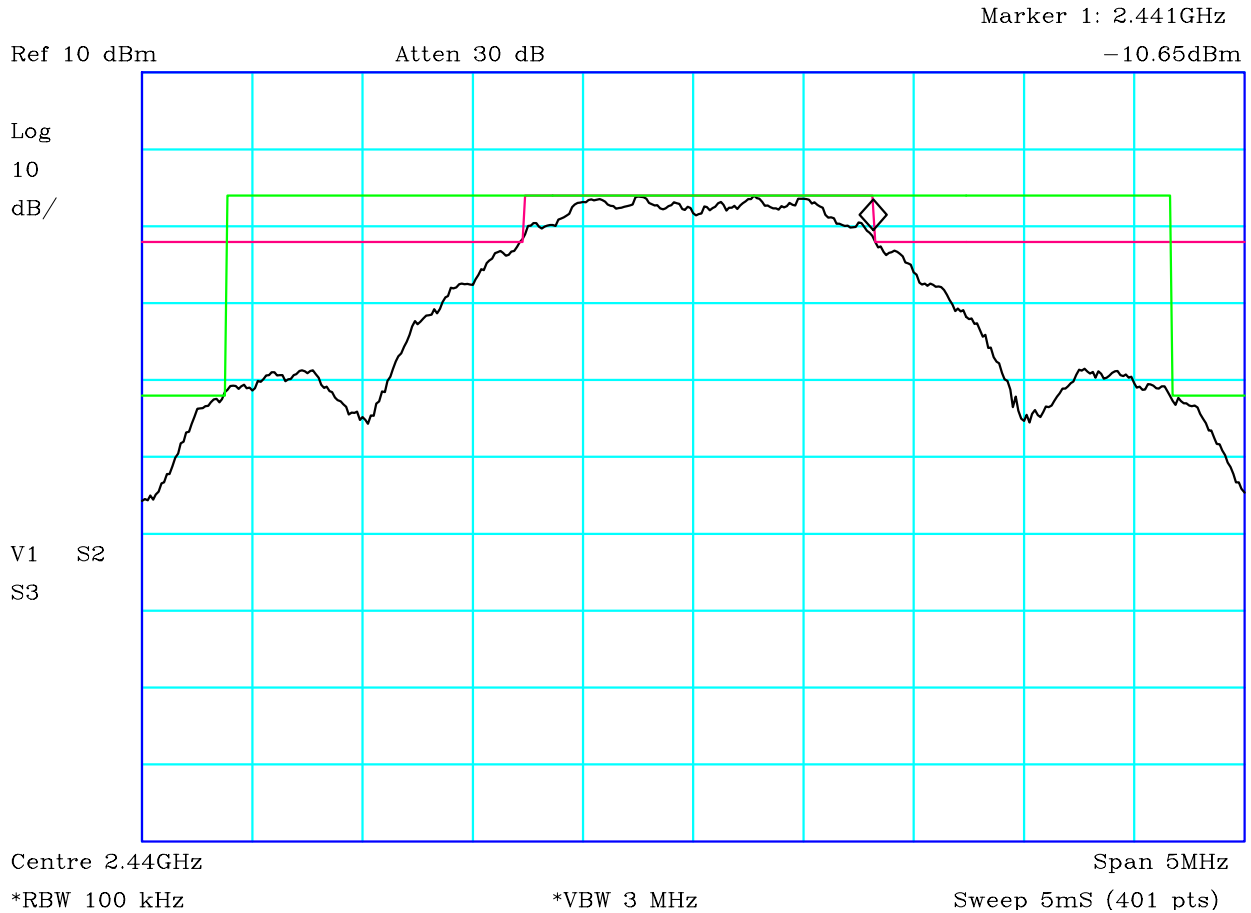
\*RBW 100 kHz

\*VBW 3 MHz

Sweep 5mS (401 pts)

#### PLOT 4 6dB Bandwidth - Channel 11

Company:	Alertme	Product:	PIR
Date:	15/05/2012	Test Eng:	Dave Smith
Method:	D01 DTS Meas Guidance v01	Method:	
Limit1:(VIO)	>500kHz	Limit2:(GRN)	-26dB
Limit3:		Limit4:	
Channel 11			
6dB Bandwidth lies between 2.4043875 GHz and 2.4059875GHz.			
6dB Bandwidth = 1.60MHz.			
Part 15.247(a)(2) requires the 6dB bandwidth to be more than 500kHz.			
Facility:	GTEM_1	Mode:	1
		Modification State:	0
File:	H24165F8		

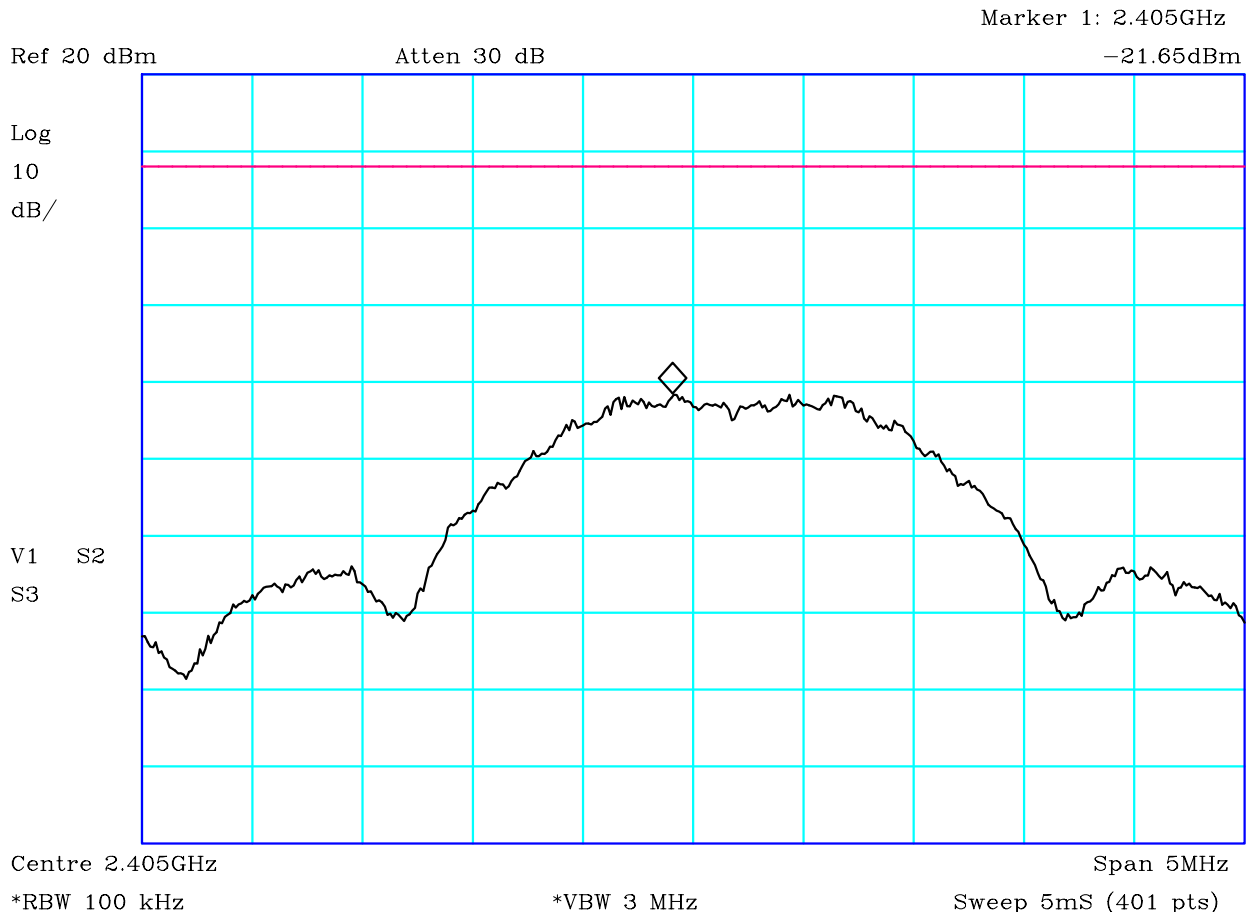


### PLOT 5 6dB Bandwidth - Channel 18

Company:	Alertme	Product:	PIR
Date:	15/05/2012	Test Eng:	Dave Smith
Method:	D01 DTS Meas Guidance v01	Method:	
Limit1:(VIO)	>500kHz	Limit2:(GRN)	-26dB
Limit3:		Limit4:	
Channel 18			
6dB Bandwidth lies between 2.4394000 GHz and 2.4409875GHz.			
6dB Bandwidth = 1.59MHz.			
26dB Bandwidth = 4.29MHz.			
Part 15.247(a)(2) requires the 6dB bandwidth to be more than 500kHz.			
Facility:	GTEM_1	Mode:	1
		Modification State:	0
File:	H24166E7		







CF1:-15.2

### PLOT 7 Spectral Density - Channel 11

Company:	Alertme	Product:	PIR
Date:	15/05/2012	Test Eng:	Dave Smith
Method:	D01 DTS Meas Guidance v01	Method:	
Limit1:(VIO)	8dBm/3kHz	Limit2:	
Limit3:		Limit4:	
<p>Channel 11  Maximum spectral density = -21.65 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:	H2416758		







Marker 1: 2.48GHz

Ref 10 dBm

Atten 20 dB

-6.695dBm

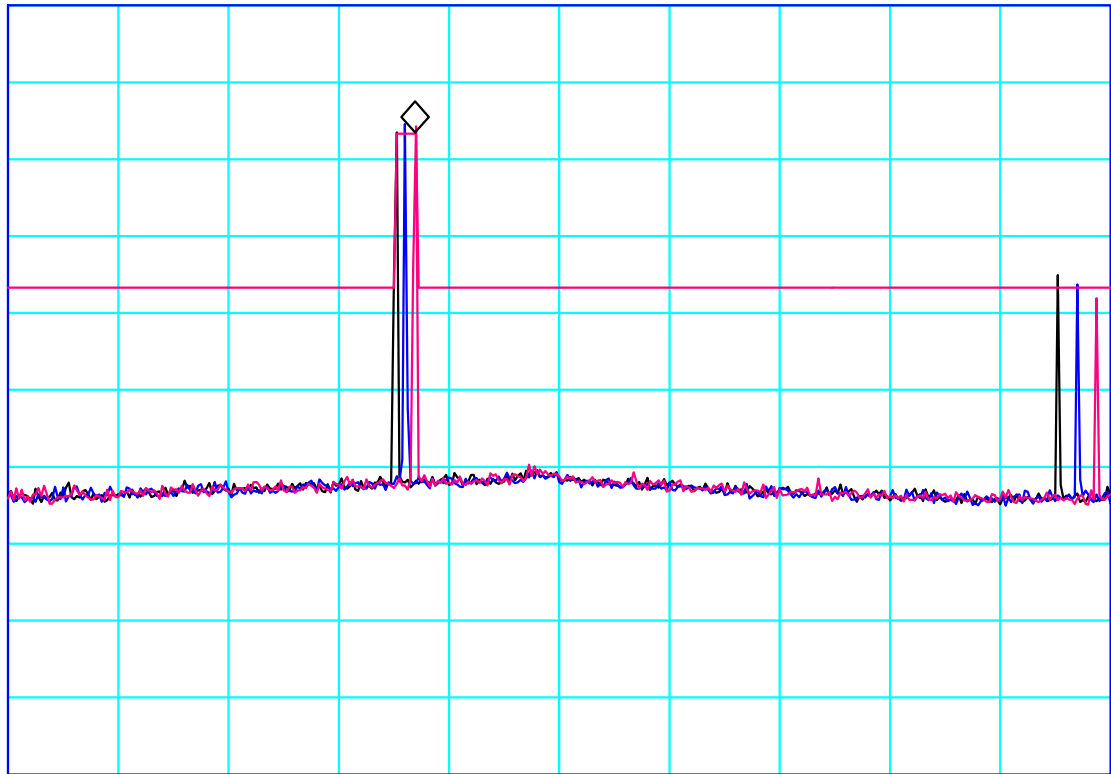
Log

10

dB/

V1 V2

V3



Start 1000MHz

Stop 5GHz

\*RBW 100 kHz

\*VBW 3 MHz

Sweep 400.1mS (401 pts)

CF2:Antenna\_dBI

### PLOT 11 Antenna Conducted Spurious - 1GHz to 5GHz

Company:	Alertme	Product:	PIR
Date:	20/01/2012	Test Eng:	Dave Smith
Method:	D01 DTS Meas Guidance v01	Method:	
Limit1:(VIO)	-20dBc	Limit2:	
Limit3:		Limit4:	

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.

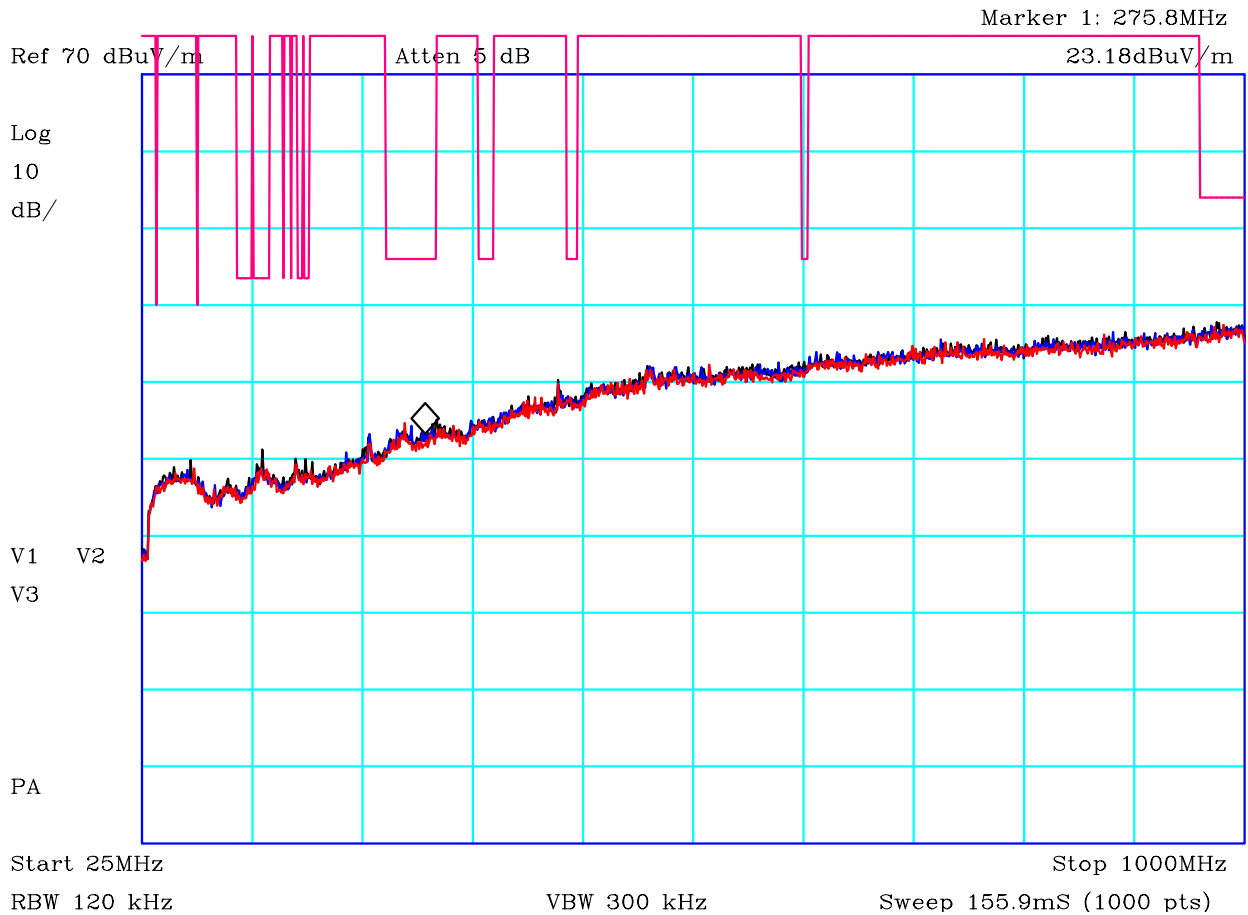
Facility:	ENVIR	Mode:	1
		Modification State:	0
File:	H2020562		







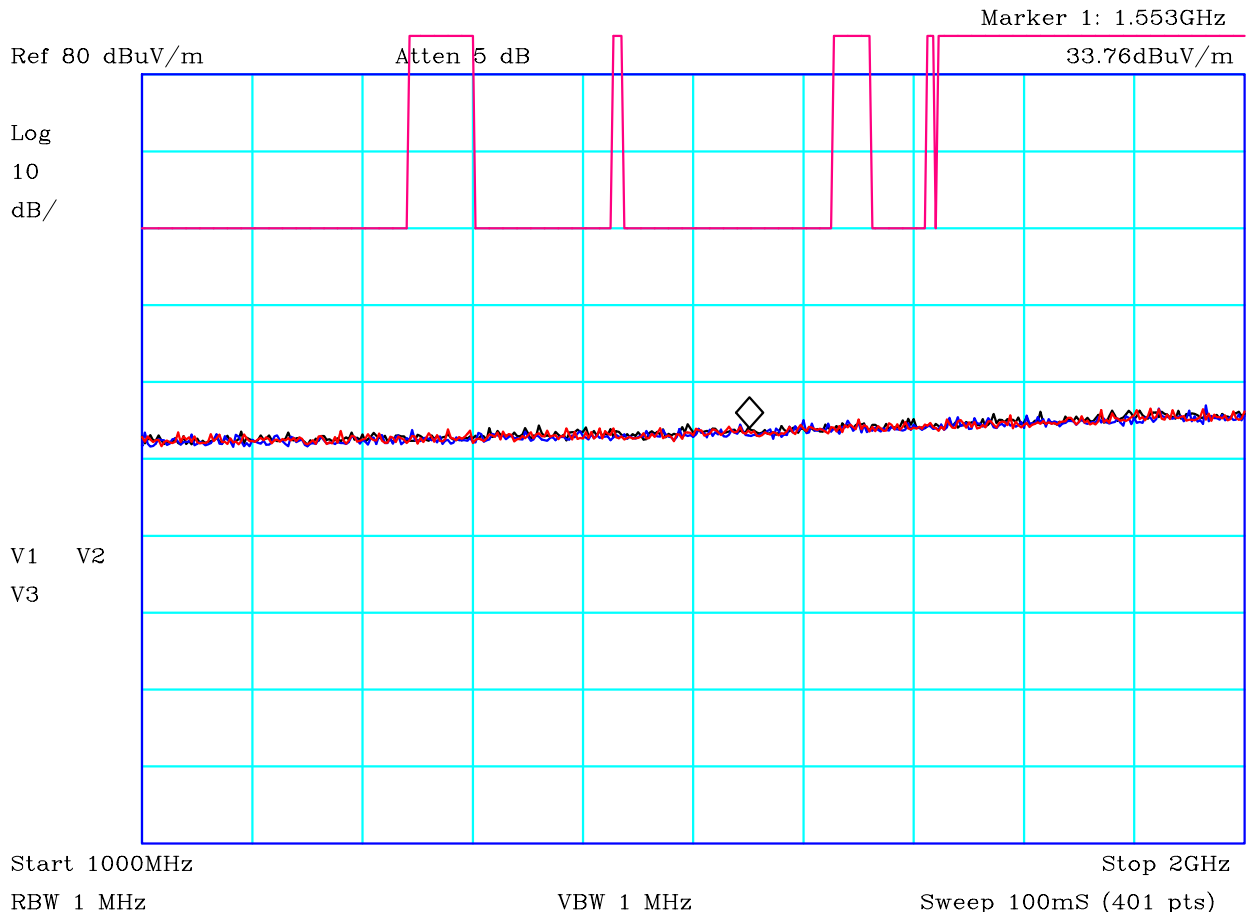




CF1:A24\_3m\_101116    CF2:CBL059\_CBL018\_CBL065\_CBL060\_100806    CF3:RFF01\_110112

### PLOT 15 Radiated Emissions - 25MHz to 1GHz

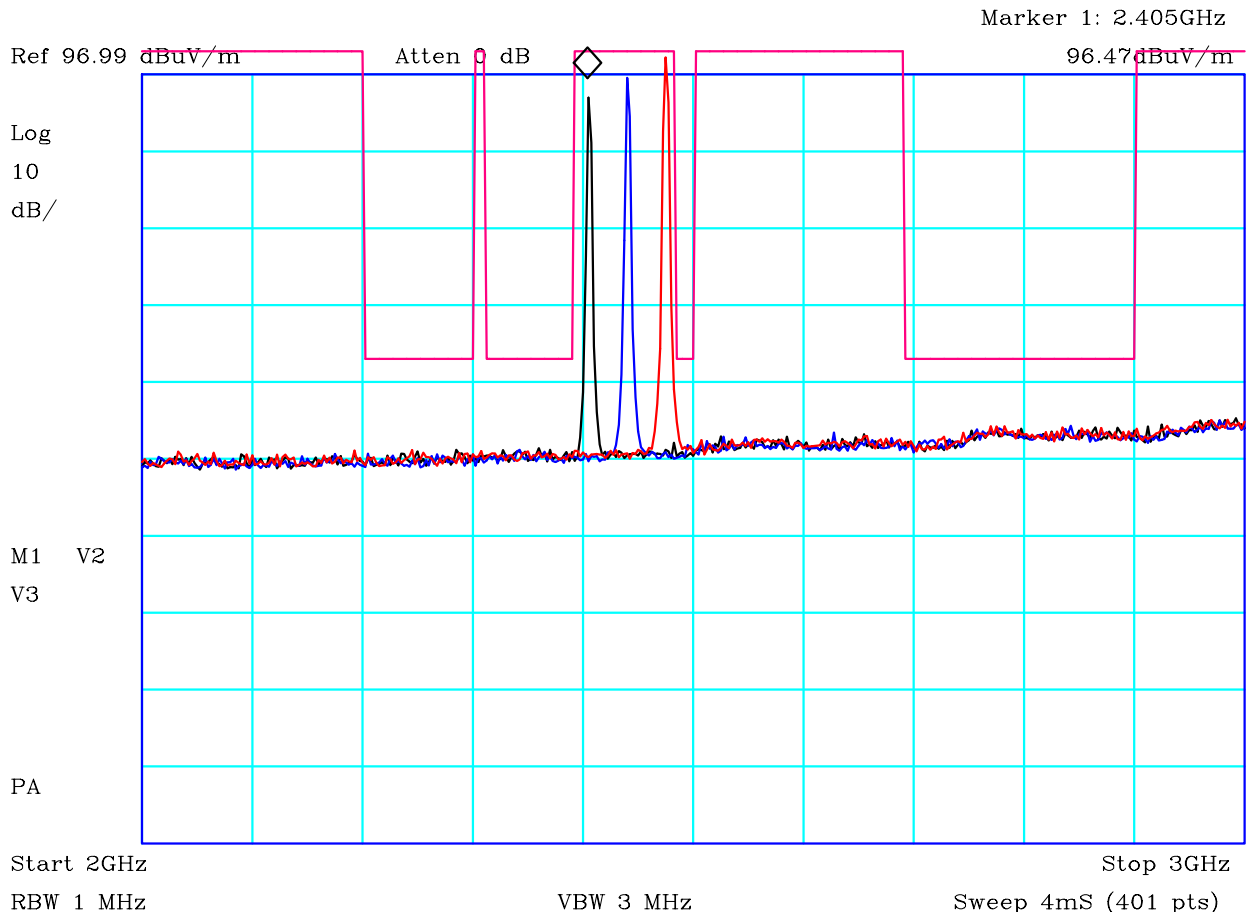
Company:	Alertme	Product:	PIR
Date:	13/01/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands	Limit2:	
Limit3:		Limit4:	
Transmit Mode Black: Channel 11 Blue: Channel 18 Red: Channel 25 Max hold on both vertical and horizontal and with EUT upright and flat			
Facility:	Anech_2	Height	1m
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H2013665
Mode:		Mode:	1
Modification State:		Modification State:	0



CF1:A19\_3m\_090306   CF2:PRE7\_CBL052\_CBL093\_110112   CF3:RFF04\_110112

### PLOT 16 Radiated Emissions - 1GHz to 2GHz

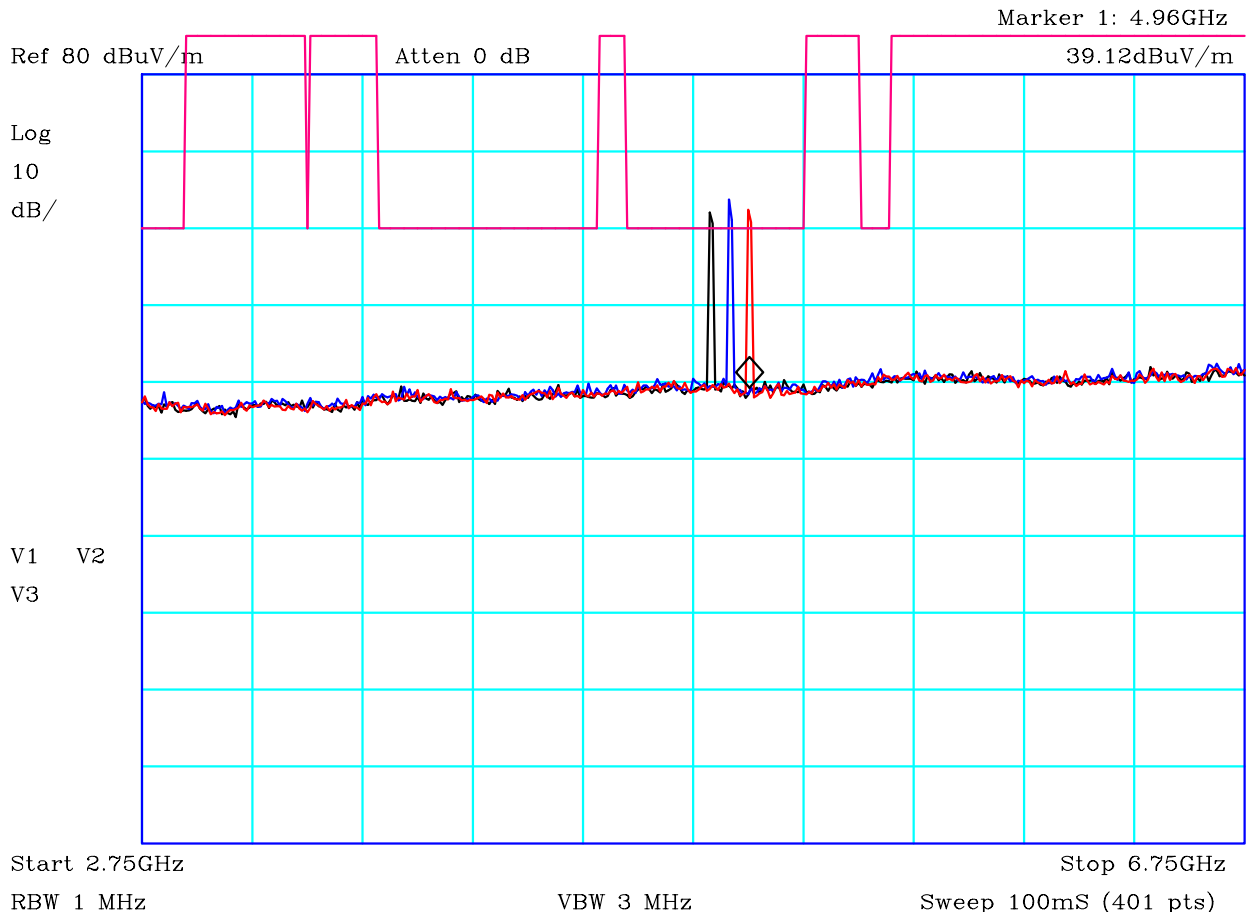
Company:	Alertme	Product:	PIR
Date:	13/01/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands@1.5m	Limit2:	
Limit3:		Limit4:	
Transmit Mode Black: Channel 11 Blue: Channel 18 Red: Channel 25 Max hold on both vertical and horizontal and with EUT upright and flat.			
Facility:	Anech_2	Height	1m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H20135D8
Mode:		Mode:	1
Modification State:		Modification State:	0



CF1:A19\_3m\_090306    CF2:CBL050\_110107

### PLOT 17 Radiated Emissions - 2GHz to 3GHz

Company:	Alertme	Product:	PIR
Date:	04/01/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands@1.5m	Limit2:	
Limit3:		Limit4:	
Transmit Mode Black: Channel 11 Blue: Channel 18 Red: Channel 25 Max hold on both vertical and horizontal and with EUT upright and flat.			
Facility:	Anech_2	Height	1m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H200463A
Mode:		Mode:	1
Modification State:		Modification State:	0



CF1:A19\_3m\_090306   CF2:PRE7\_CBL052\_CBL093\_110112   CF3:RFF01\_110112

**PLOT 18 Radiated Emissions - 2.75GHz to 6.75GHz**

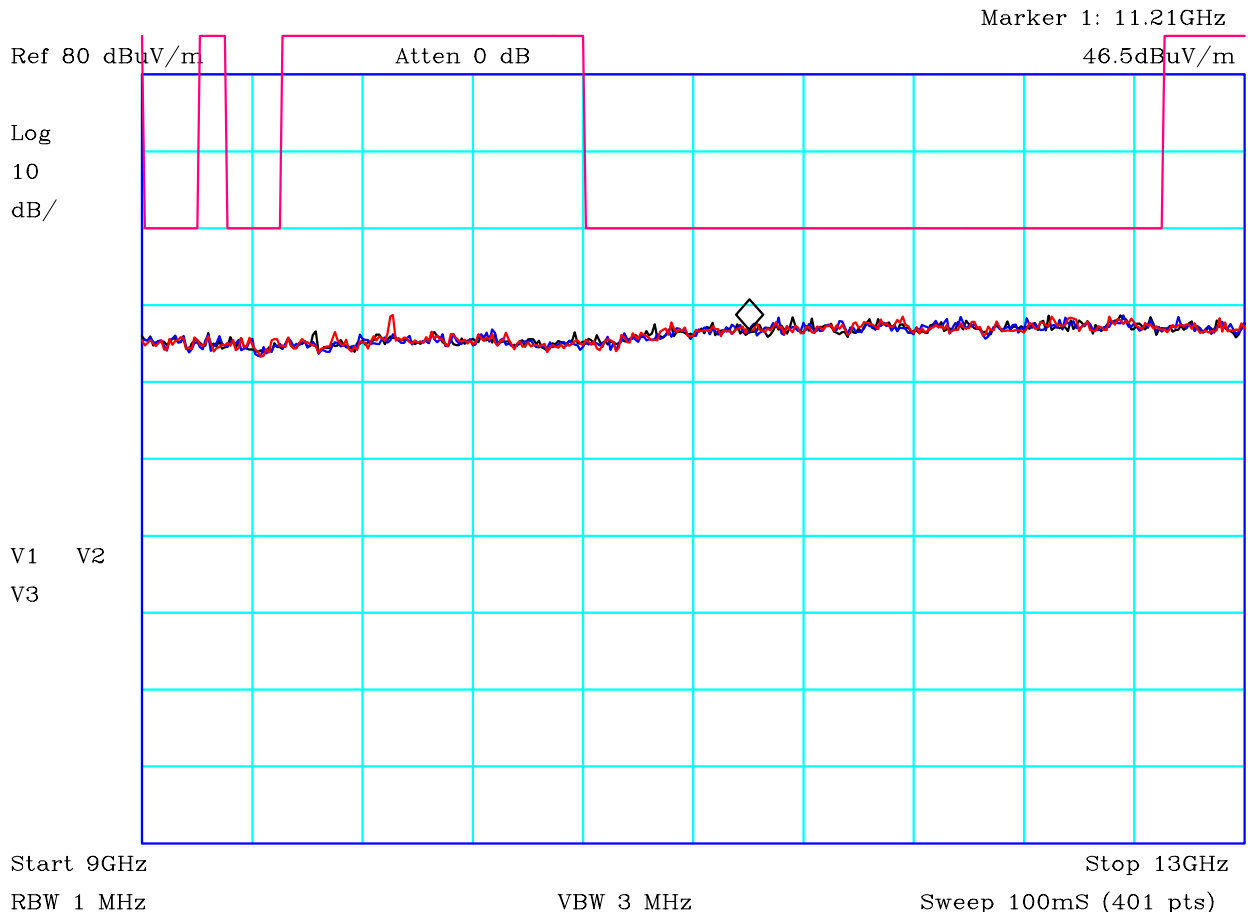
Company:	Alertme	Product:	PIR
Date:	04/01/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands@1.5m	Limit2:	
Limit3:		Limit4:	
Transmit Mode Black: Channel 11 Blue: Channel 18 Red: Channel 25 Max hold on both vertical and horizontal and with EUT upright and flat.			
Facility:	Anech_2	Height	1m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H20046F5
Mode:		Mode:	1
Modification State:		Modification State:	0



CF1:A19\_3m\_090306   CF2:PRE7\_CBL052\_CBL093\_110112   CF3:RFF01\_110112

**PLOT 19 Radiated Emissions - 6GHz to 10GHz**

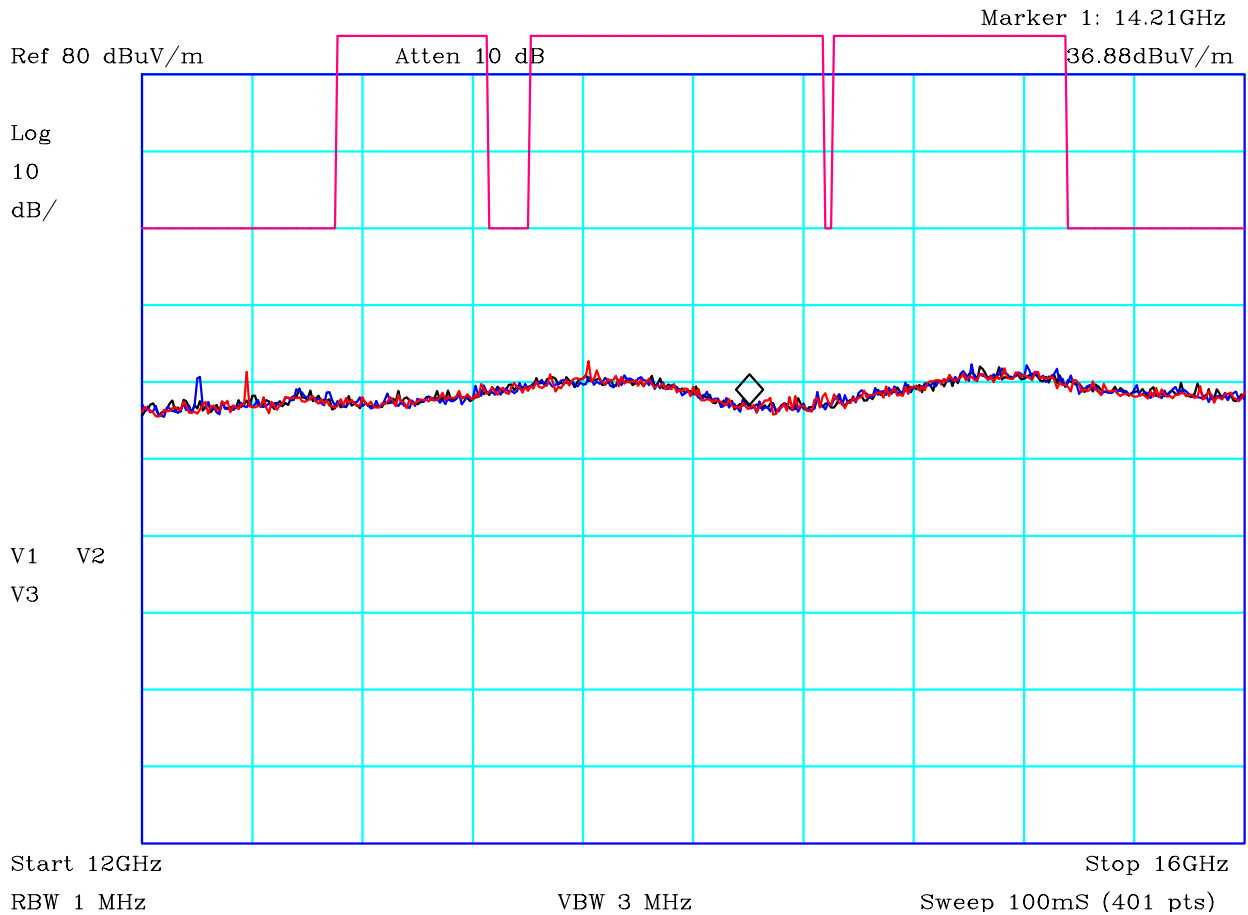
Company:	Alertme	Product:	PIR
Date:	05/01/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands@1.5m	Limit2:	
Limit3:		Limit4:	
Transmit Mode Black: Channel 11 Blue: Channel 18 Red: Channel 25 Max hold on both vertical and horizontal and with EUT upright and flat.			
Facility:	Anech_2	Height	1m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H20054B3
Mode:		Mode:	1
Modification State:		Modification State:	0



CF1:A19\_3m\_090306    CF2:PRE7\_CBL052\_CBL093\_110112    CF3:RFF01\_110112

**PLOT 20 Radiated Emissions - 9GHz to 13GHz**

Company:	Alertme	Product:	PIR
Date:	05/01/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands@1.5m	Limit2:	
Limit3:		Limit4:	
Transmit Mode Black: Channel 11 Blue: Channel 18 Red: Channel 25 Max hold on both vertical and horizontal and with EUT upright and flat.			
Facility:	Anech_2	Height	1m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H20054D2
Mode:		Mode:	1
Modification State:		Modification State:	0

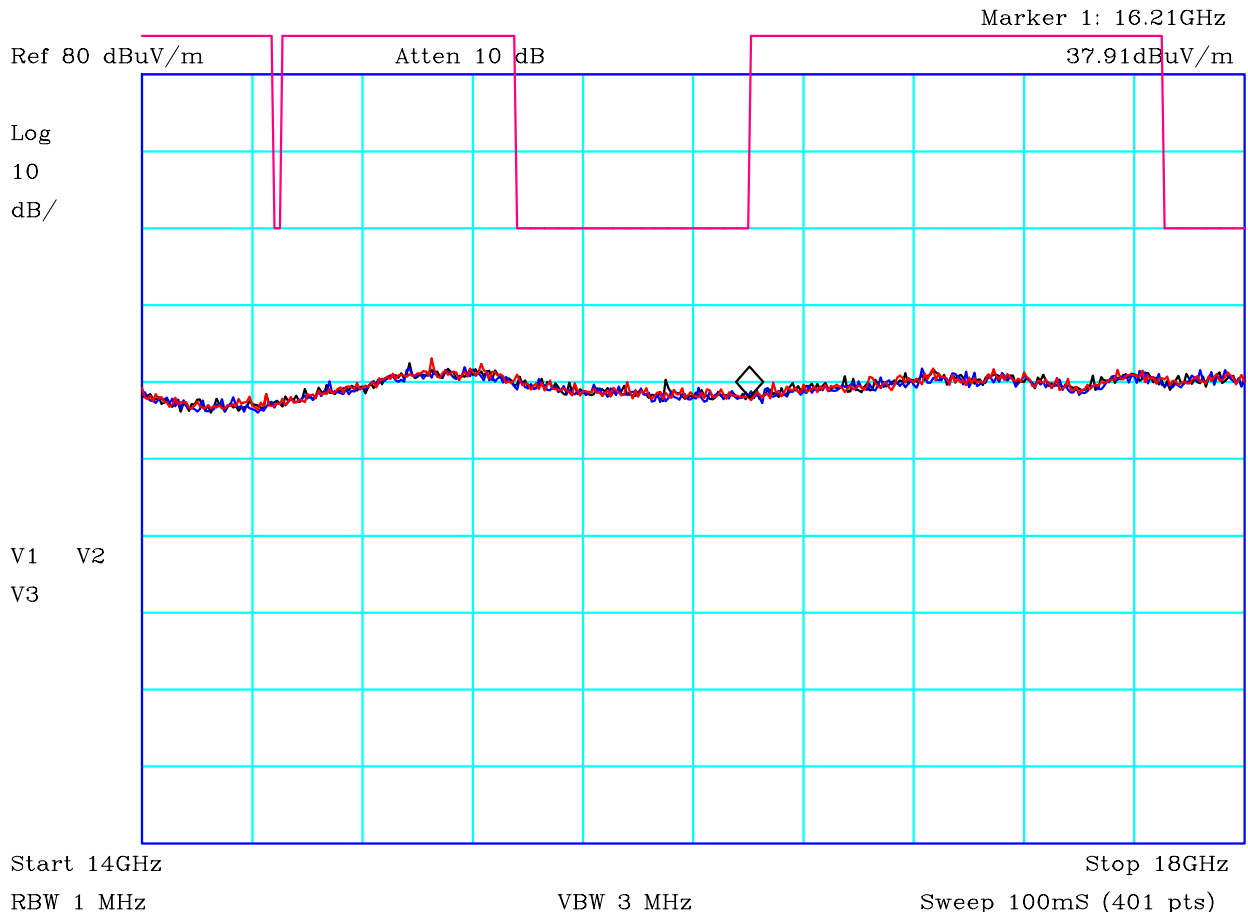


CF1:A22\_3m\_100201 CF2:PRE7\_CBL052\_CBL093\_110112

### PLOT 21 Radiated Emissions - 12GHz to 16GHz

Company:	Alertme	Product:	PIR
Date:	05/01/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands@1.5m	Limit2:	
Limit3:		Limit4:	
Transmit Mode Black: Channel 11 Blue: Channel 18 Red: Channel 25 Max hold on both vertical and horizontal and with EUT upright and flat.			
Facility:	Anech_2	Height	1m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H2005598
Mode:		Mode:	1
Modification State:		Modification State:	0

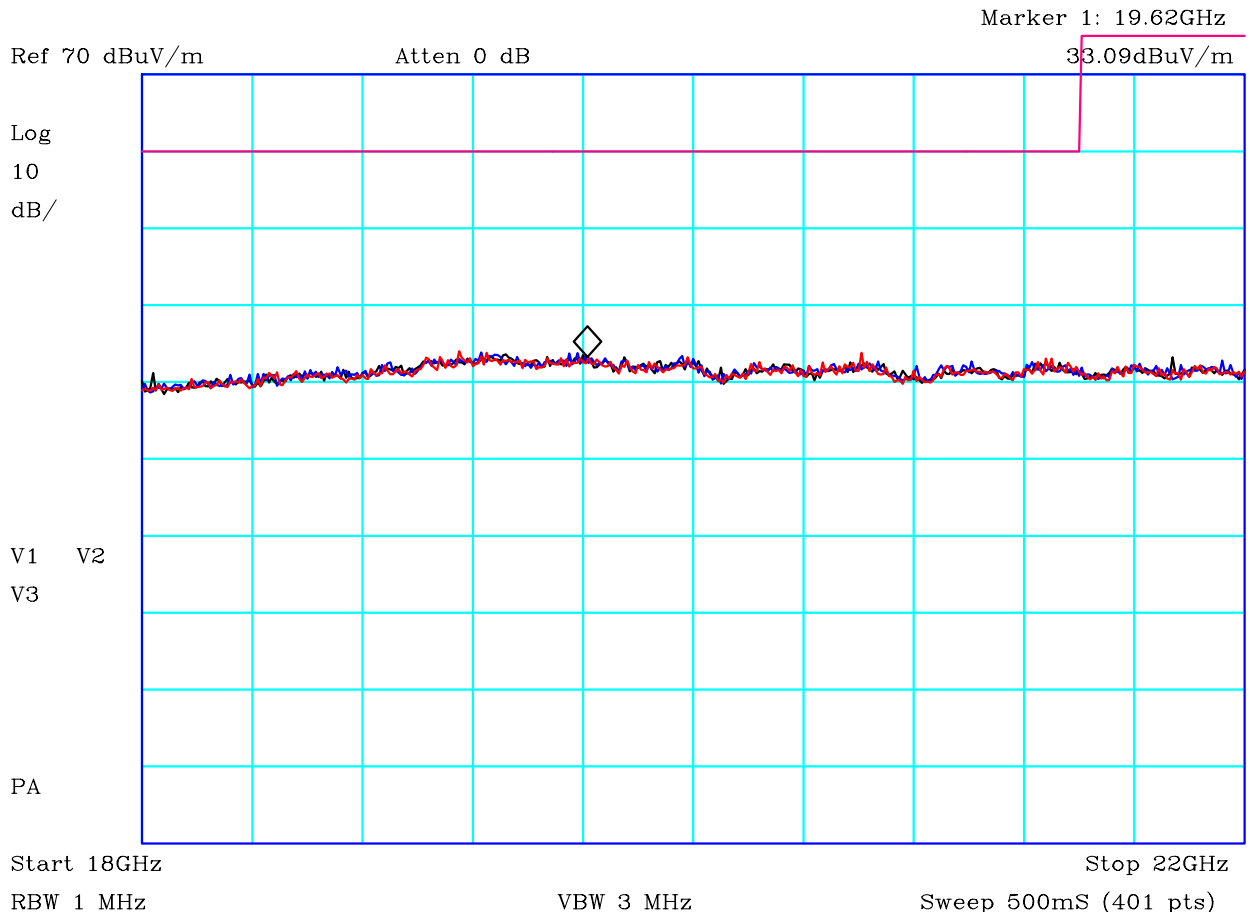




CF1:A22\_3m\_100201    CF2:PRE7\_CBL052\_CBL093\_110112

### PLOT 22 Radiated Emissions - 14GHz to 18GHz

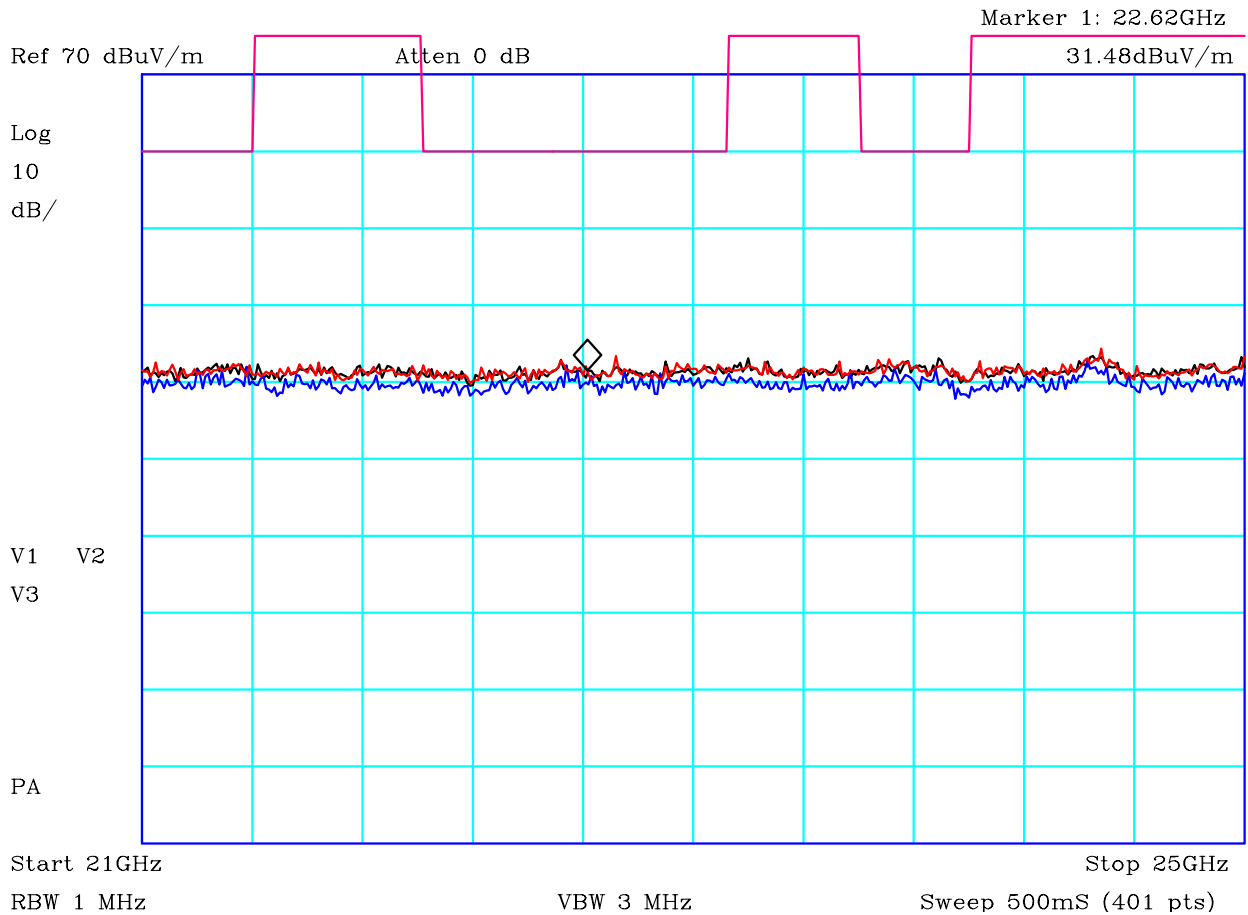
Company:	Alertme	Product:	PIR
Date:	05/01/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands@1.5m	Limit2:	
Limit3:		Limit4:	
Transmit Mode Black: Channel 11 Blue: Channel 18 Red: Channel 25 Max hold on both vertical and horizontal and with EUT upright and flat.			
Facility:	Anech_2	Height	1m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H20055A1
Mode:		Mode:	1
Modification State:		Modification State:	0



CF1:A20\_3m\_100201 CF2:PRE8\_CBL052\_CBL092\_110112

**PLOT 23 Radiated Emissions - 18GHz to 22GHz**

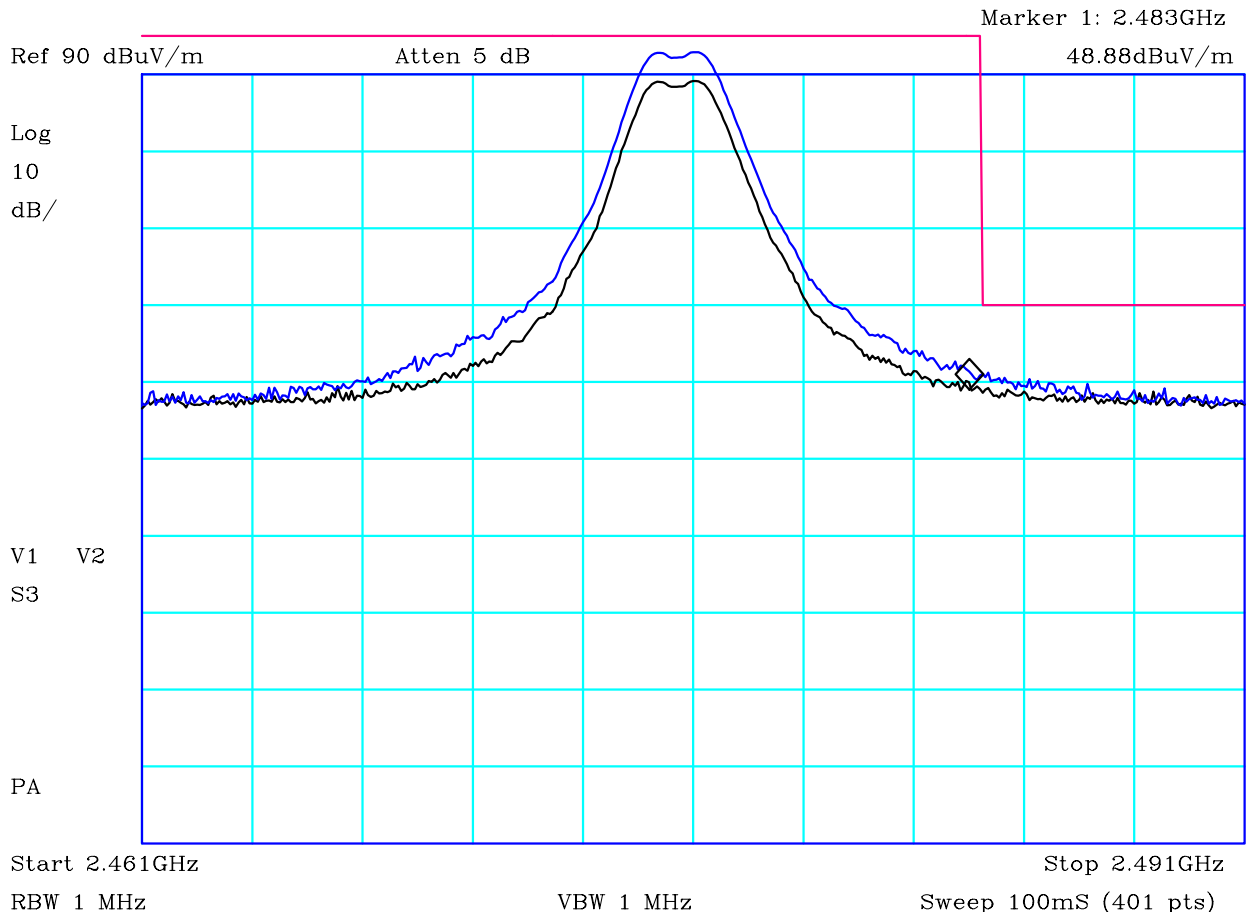
Company:	Alertme	Product:	PIR
Date:	12/01/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands@1.5m	Limit2:	
Limit3:		Limit4:	
Transmit Mode Black: Channel 11 Blue: Channel 18 Red: Channel 25 Max hold on both vertical and horizontal and with EUT upright and flat.			
Facility:	Anech_2	Height	1m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H20125DE
Mode:		Mode:	1
Modification State:		Modification State:	0



CF1:A20\_3m\_100201    CF2:PRE8\_CBL052\_CBL092\_110112

### PLOT 24 Radiated Emissions - 21GHz to 25GHz

Company:	Alertme	Product:	PIR
Date:	12/01/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands@1.5m	Limit2:	
Limit3:		Limit4:	
Transmit Mode Black: Channel 11 Blue: Channel 18 Red: Channel 25 Max hold on both vertical and horizontal and with EUT upright and flat.			
Facility:	Anech_2	Height	1m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H20125D8
Mode:		Mode:	1
Modification State:		Modification State:	0



CF1:A19\_3m\_090306

### PLOT 25 Radiated Emissions - Band Edge - Channel 25

Company:	Alertme	Product:	PIR
Date:	13/01/2012	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC Restricted Bands@1.5m	Limit2:	
Limit3:		Limit4:	
Transmit Mode Channel 25 Black: Vertical Blue: Horizontal Max hold with EUT upright and flat.			
Facility:	Anech_2	Height	1m
Distance	1.5m	Polarisation	V+H
Angle	0-360	File:	H20135E4
Mode:		Mode:	1
Modification State:		Modification State:	0