



TEST REPORT

According to CFR 47 Part 15

Vigilcast

FCC ID: UJETCPVIG01400

N°247001-CC-1-b

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FCC CERTIFICATION TEST REPORT

EQUIPMENT FCC ID : UJETCPVIG01400

The 21 pages of this report are not sharable

Identification : 247001-CC-1-b

FCC registration # 90469

2

This report concerns : Original grant ☒ Class II change ☐

Equipment tested : **Vigilcast**

Equipment FCC ID : **UJETCPVIG01400**

Designed by : **TEAMCAST**
Centre Espace Performance
Batiment P
35769 Saint Grégoire

Manufactured by : **TEAMCAST**
Centre Espace Performance
Batiment P
35769 Saint Grégoire

Deferred grant requested per 47 CFR 0.457 (d)(1)(ii) YES ☐ NO ☒

if yes, defer until :

Company Named agrees to notify the Commission by :

of the intended date of announcement of the product so that the grant can be issued on the date

Transition rules requested per 15.37? YES ☐ NO ☒


If no, assumed Part 15, Subpart B for intentional or
unintentional radiator

The new 47 CFR [10-1-96 edition] provision


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1 Reference and record of revisions of the test report:

Test report number :	Revision :	Number of pages	Modification reasons :
247001-CC-1-a	a	21	Creation, August 14, 2007
247001-CC-1-b	b	21	Addition of peak results
Redactor : O.ROY			Date of writing : October 8, 2007
<p align="center">Technical control: O. ROY</p> 			<p align="center">Quality Control: F. NOURRY</p>

2 Interpretation and remarks :

2.1 RESULTS :

This equipment complies with the rules of the FCC section 15.247 and related sections.

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3 GENERAL INFORMATION :

3.1 APPLICANT :

TEAMCAST
Centre Espace Performance
Batiment P
35769 Saint Grégoire

3.2 MANUFACTURER :


TEAMCAST
Centre Espace Performance
Batiment P
35769 Saint Grégoire

3.3 TEST DATE :

December 2005 and August 2006.

3.4 TEST SITE :

GYL Technologies
Parc d'activités de Lanserre
49610 Juigné sur Loire – France
FCC registration Number : 90469

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4 INTRODUCTION :

The following test report for Wireless Video Surveillance Unit (2.4 GHz radio link) is written in accordance with Part 15 of the Federal Communications Commissions. The Equipment Under Test (EUT) was Vigilcast. The test results reported in this document relate only to the item that was tested.

All measurements contained in this Application were conducted in accordance with ANSI C63.4 Methods of Measurement of Radio Noise Emissions of 2001. The instrumentation utilized for the measurements conforms to the ANSI C63.4 standard for EMI and Field Strength Instrumentation. Some accessories are used to increase sensitivity and prevent overloading of the measuring instrument. These are explained in this report. Calibration checks are performed regularly on the instruments, and all accessories including the high pass filter, preamplifier and cables.

All radiated and conducted emissions measurements were performed manually at GYL TECHNOLOGIES. The radiated emissions measurements required by the rules were performed on the three to ten meters, open field, test site maintained by GYL Technologies Parc d'activités de Lanserre, 49610 Juigné sur Loire , France. Complete description and site attenuation measurement data have been placed on file with the Federal Communications Commission.

The power line conducted emission measurements were performed in a shielded enclosure also located at the Parc d'activités de Lanserre, 49610 Juigné sur Loire, France facility

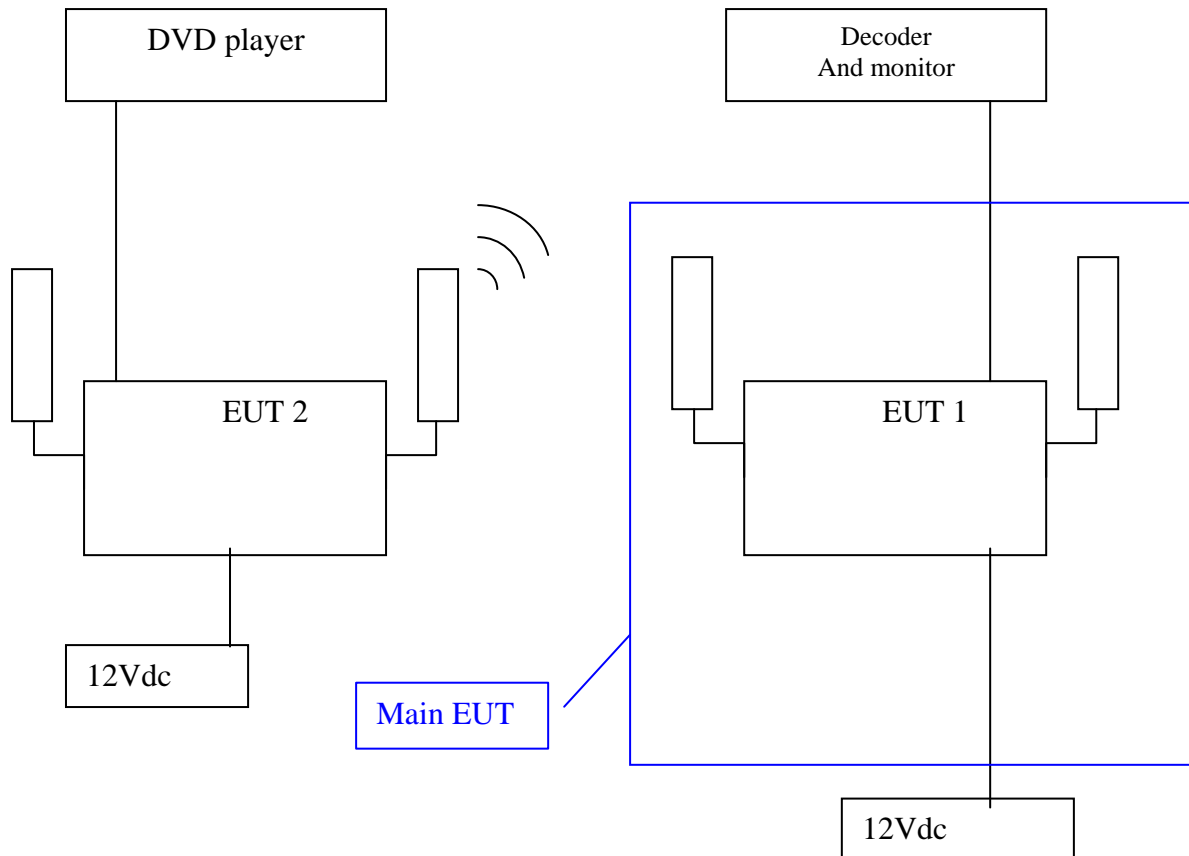
5 MEASUREMENT EQUIPMENT LIST :

PART TYPE	MANUFACTURER	MODEL	GYL TECHNOLOGIES NUMBER	CALIBRATION DATE
RECEIVERS				
Receiver	Rohde & Schwarz	ESI 7	M02020	April-05, April-06
Spectrum analyzer	Rohde & Schwarz	FSEM 30	M02021	April-05, April-06
Filter 150 kHz	Rohde & Schwarz	EZ25	M02040	July-04, July-05, July-06
ARTIFICIAL MAINS NETWORKS				
LISN (50μH / 5/50Ω)	Rohde & Schwarz	ESH3-Z5	M02027	Nov-04, Nov-05, Nov-06
ANTENNAS				
Bilog (30-2000MHz)	CHASE	CBL-6112	M02031	Aug-04, Aug-05, Aug-06
Bilog (30-2000MHz)	CHASE	CBL-6112	M02032	Aug-04, Aug-05, Aug-06
Horn antenna	EMCO	3115	M02045	None
Horn antenna	EMCO	3160-09	M04002	None

6 CONFIGURATION OF TESTED SYSTEM :

Working mode for spurious emission measurements:

Video transmission from DVD player to monitor via RF link (VIGILCAST) and video channel decoder (VIGIPAL).




7 EXERCISING TEST CONDITIONS :

7.1 Measurements according to §15.209 and §15.247 of FCC CFR 47

Video transmission from DVD player to monitor via RF link (VIGILCAST) and video channel decoder (VIGIPAL).

For conducted measurement on antenna ports, the configuration was chosen to transmit on one channel with modulation.

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8 CONFORMANCE STATEMENT :

8.1 STANDARDS REFERENCED FOR THIS REPORT :

PART 2: 2004	Frequency allocations and Radio Treaty Matters General Rules and Regulations
PART 15: 2006	Radio frequency devices
ANSI C63.4-2003	Standard format measurements/technical report personal computer and peripherals

8.2 JUSTIFICATION :

Note the EUT is 12V dc powered thus 15.207 is not applicable.

- Part 15.209 (subpart C) for radiated emission for intentional radiator.
- Part 15.247 for intentional radiator in ISM band 2.400-2.4835 GHz.

9 TEST ACCORDING TO CFR 47 Part 15

Tests performed by Olivier ROY at GYL Technologies laboratories in December 13th, 2005 and August 22nd, 2006.

9.1 REFERENCE DOCUMENTATION :

FCC part 15 (Sub part B) §15.209 and 15.247 of 2005

9.2 RADIATED EMISSIONS MEASUREMENTS:

9.2.1 Measurements below 1GHz

Before final measurements of radiated emissions were made on the open-field three/ten meter range; the EUT was pre-scanned in the semi anechoic at one meter distance. This was done in order to determine its emissions spectrum signature. The physical arrangement of the test system and associated cabling was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. This process was repeated during final radiated emissions measurements on the open-field range, at each frequency, in order to insure that maximum emission amplitudes were attained.

Final radiated emissions measurements were made on the three/ten-meter, open-field test site. The EUT was placed on a conductive turntable on isolated support, table, 0.8 meter above the ground plane. At each frequency, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters in order to determine the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarizations. The spectrum analyzer's 6 dB bandwidth was set to 120 kHz, and the analyzer was operated in the CISPR quasi-peak detection mode. No video filter less than 10 times the resolution bandwidth was used. The range of the frequency spectrum to be investigated is specified in FCC Part 15. The highest emission amplitudes relative to the appropriate limit were measured and recorded in this report.

Summary of settings

ESI 7 EMI TEST RECEIVER IN RECEIVER MODE	
Peak measurement time	5 ms
step size	40 kHz
Preamplifier	ON
Preselector	ON
Resolution, Band With	120 kHz
Final Quasi Peak measurement time	1 s minimum
Final average measurement time	1 s minimum

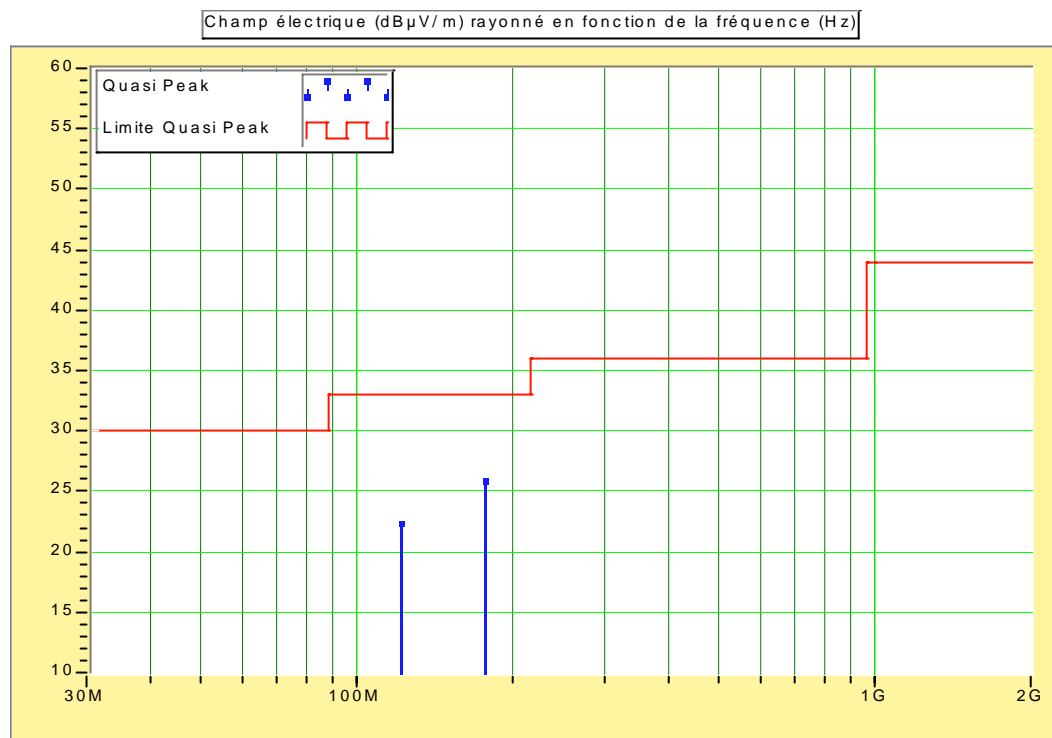
All readings are quasi-peak unless stated otherwise.

9.2.2 RESULTS:

The following data table lists the most significant emission frequencies, measured level, correction factor (includes cable and antenna corrections), corrected reading and the limit. The highest peaks are measured in quasi-peak detection mode at 10 meters distance.

Frequency (MHz)	Peak (dBμV/m)	Quasi peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Polar.	Height (cm)	Angle (°)	Factor Corr. (dB)	Comments
121,503	20,09	22,37	33.5	-11.13	V	105	29	14,40	
175,486	31,29	25,93	33.5	-7.57	V	210	128	13,33	

No other radiation detected over noise floor.



9.2.3 Spurious emissions measurement from 1GHz to 25GHz:

A pre-scan measurement is done very close to the product (less than 10cm) with 100kHz RBW and a max peak detector. Then measurements are performed according to DA00705 at 1 m with 1MHz RBW, a peak detector and a video averaging (10Hz).

Spurious emissions are made with a permanent emission on channel 1, 5 and 10.

Average limit at 3 m is 54 dB μ V/m in restricted bands of §15.205.

Peak limit is 20 dB above (74 dB μ V/m at 3 m) according to 15.35 in restricted bands of §15.205.

All harmonics except H2 are noise floor.

Max spurious channel 1

Freq. (GHz)	Harm.	Peak (dB μ V/m) At 1m	Peak corrected for 3 m distance (dB μ V/m)	Peak Limit (dB μ V/m)	Avg (dB μ V/m) At 1m	Avg corrected for 3 m distance (dB μ V/m)	Avg Limit (dB μ V/m)	Minimum Margin (dB)
1.197		58.7	48.7	74	55.3	45.3	54	-8.7
1.200		58.1	48.1	74	55.9	45.9	54	-8.1
1.2435		58.4	48.4	74	55.6	45.6	54	-8.4
4.804	2	59.0	49	74	55.0	45.0	54	-9.0
	3	NF			NF			
	4	NF			NF			
	5	NF			NF			
	6	NF			NF			
	7	NF			NF			
	8	NF			NF			
	9	NF			NF			
	10	NF			NF			

Max spurious channel 5

Freq. (GHz)	Harm.	Peak (dBμV/m) At 1m	Peak corrected for 3 m distance (dBμV/m)	Peak Limit (dBμV/m)	Avg (dBμV/m) At 1m	Avg corrected for 3 m distance (dBμV/m)	Limit (dBμV/m)	Minimum Margin (dB)
1.200		58.4	48.4	74	55.6	45.6	54	-8.4
4.8712	2	59.8	49.8	74	53.8	43.8	54	-10.2
	3	NF			NF			
	4	NF			NF			
	5	NF			NF			
	6	NF			NF			
	7	NF			NF			
	8	NF			NF			
	9	NF			NF			
	10	NF			NF			

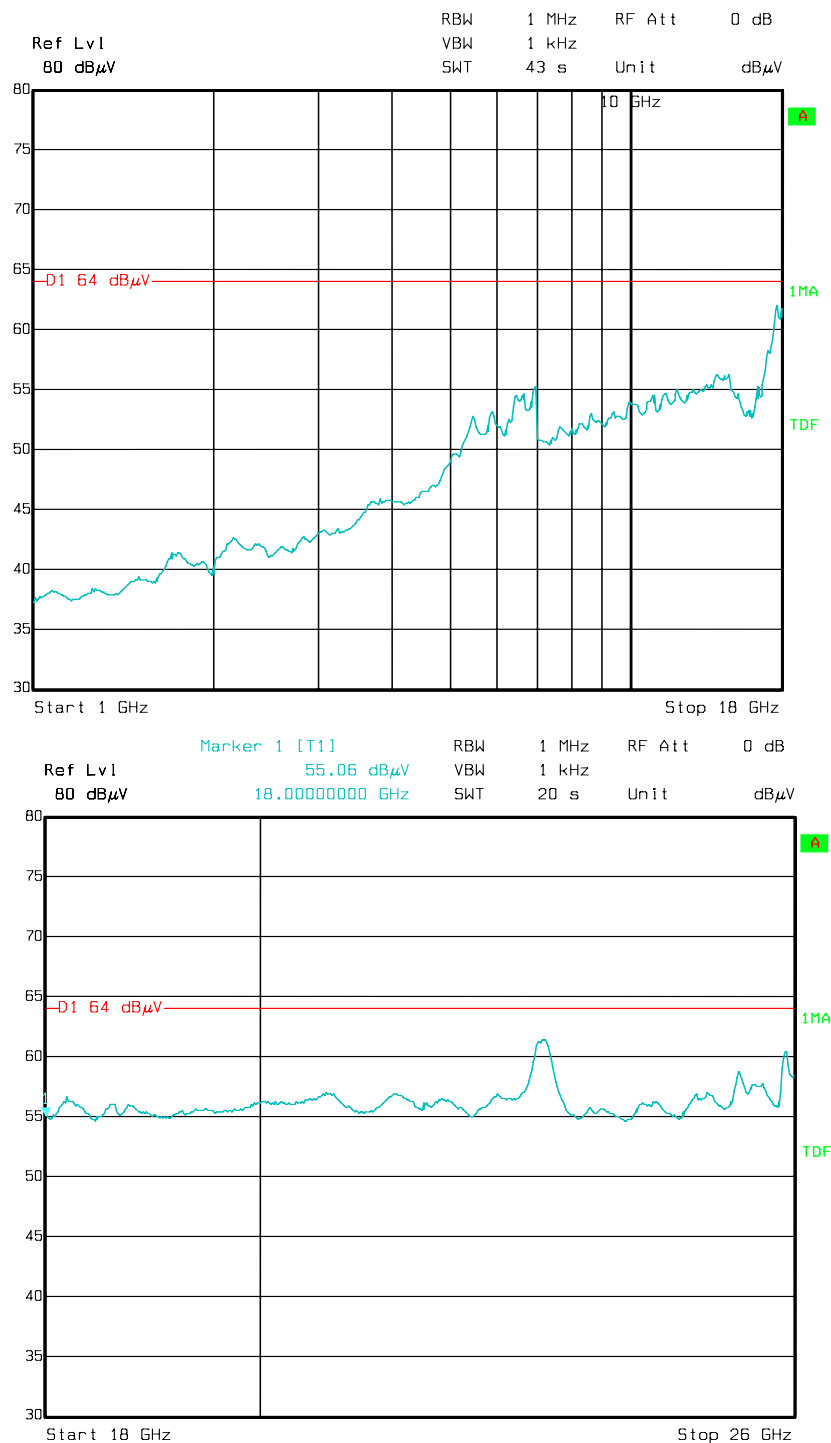
Max spurious channel 10

Freq. (GHz)	Harm.	Peak (dBμV/m) At 1m	Peak corrected for 3 m distance (dBμV/m)	Peak Limit (dBμV/m)	Avg (dBμV/m) At 1m	Avg corrected for 3 m distance (dBμV/m)	Limit (dBμV/m)	Minimum Margin (dB)
1.197		58.5	48.5	74	54.5	44.5	54	-9.5
1.200		58.0	48.0	74	54.0	44.0	54	-10.0
1.2435		58.6	48.6	74	54.5	44.5	54	-9.5
4.949	2	62.2	52.2	74	53.4	43.4	54	-10.6
	3	NF			NF			
	4	NF			NF			
	5	NF			NF			
	6	NF			NF			
	7	NF			NF			
	8	NF			NF			
	9	NF			NF			
	10	NF			NF			

For the restricted band 2483.5-2500.0 MHz see measurements at band edge §9.8.4.

* NF means Noise Floor

These plots are noise floor plot (without equipment) to show the margin between noise floor and 1m limit in restricted bands. The detector is a peak detector. The averaging is done by a reduction of the VBW (down to 10Hz as described in DA00705 is not used because a reduction of the VBW to 1kHz is sufficient to show that the noise floor is below the limit).



9.3 INTERPRETATION AND REMARKS:

The equipment complies with the §15.209 in restricted bands of §15.205.

9.4 Intentional radiator operation within the band 2400 – 2483.5 MHz §15.247 :

The system uses COFDM modulation which is a digitally spread spectrum modulation.

The system can be programmed on 10 channels.

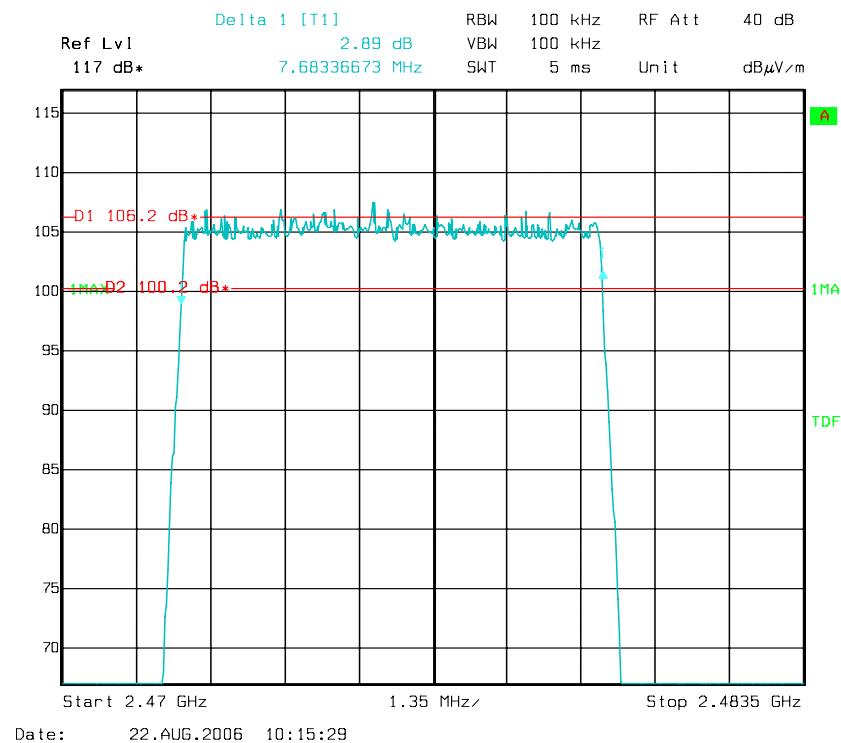
To make easier measurements a special test mode allows selecting one channel with its modulation.

9.4.1 Frequency channel separation (15.247 (a) (2))

The minimum 6dB bandwidth shall be at least 500kHz.

The measurement gives **7.683 MHz** (compliant)

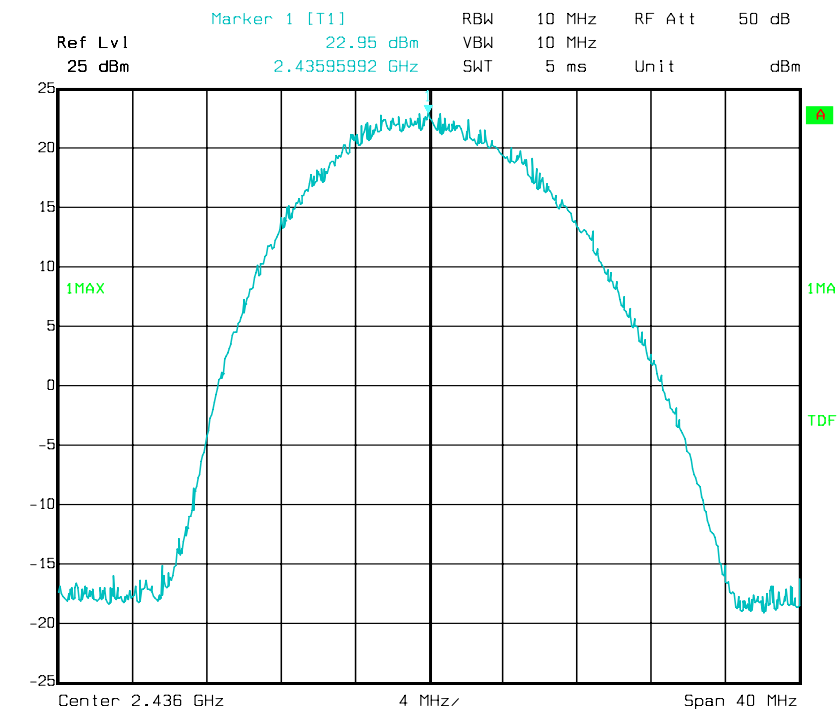
Graph provided for channel 10.



9.4.2 Maximum peak conducted output power (15.247§ (b) (3), (c)(1)(i))

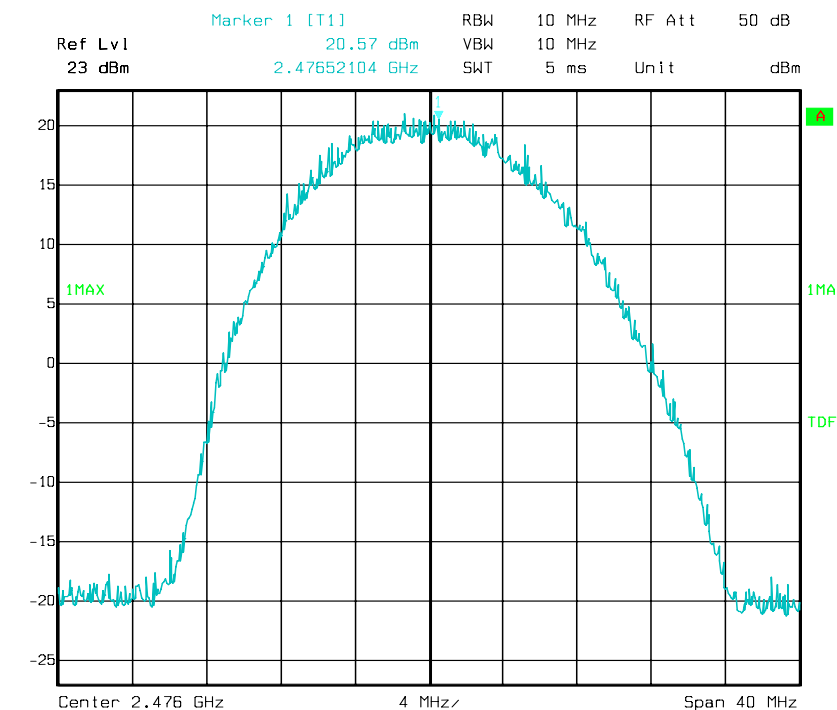
The maximum peak conducted power is measured at **22.95 dBm** for channel 5

Channel 5



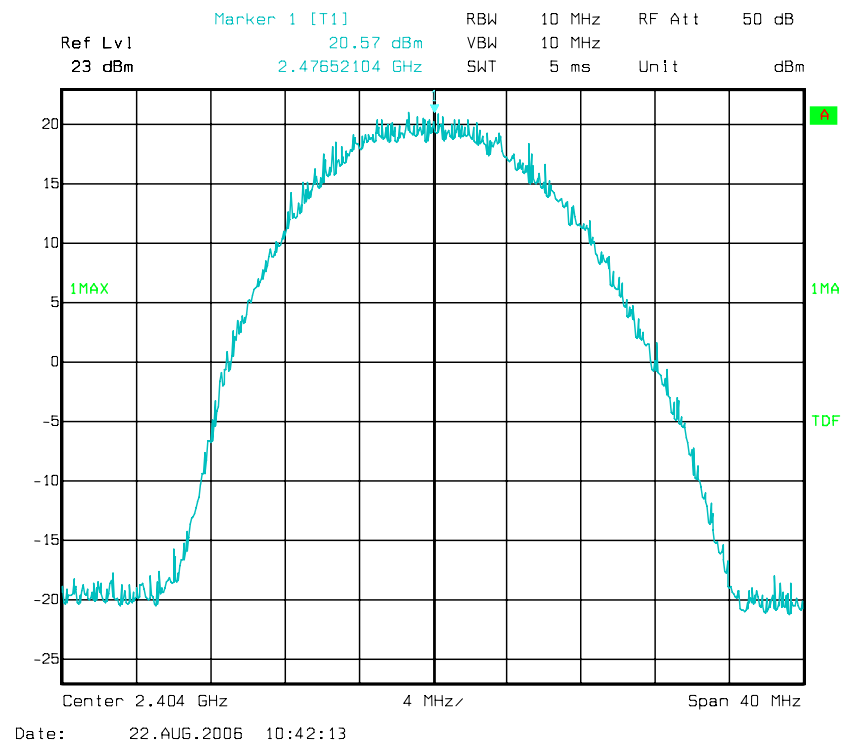
Date: 22.AUG.2006 10:47:24

Channel 10



Date: 22.AUG.2006 10:32:14

Channel 1



9.4.2.1 Antenna gain

The product is designed for fixed point to point operation.

User notice gives:

“The antenna has to be chosen so that the value “Antenna Gain - Feeder Loss” does not exceed 8 dB (at ambient temperature of 25°C). For instance, if the attenuation the cable used between the VigilCast Unit and the antenna is 2dB, the gain of the antenna must be less than 10 dB”.

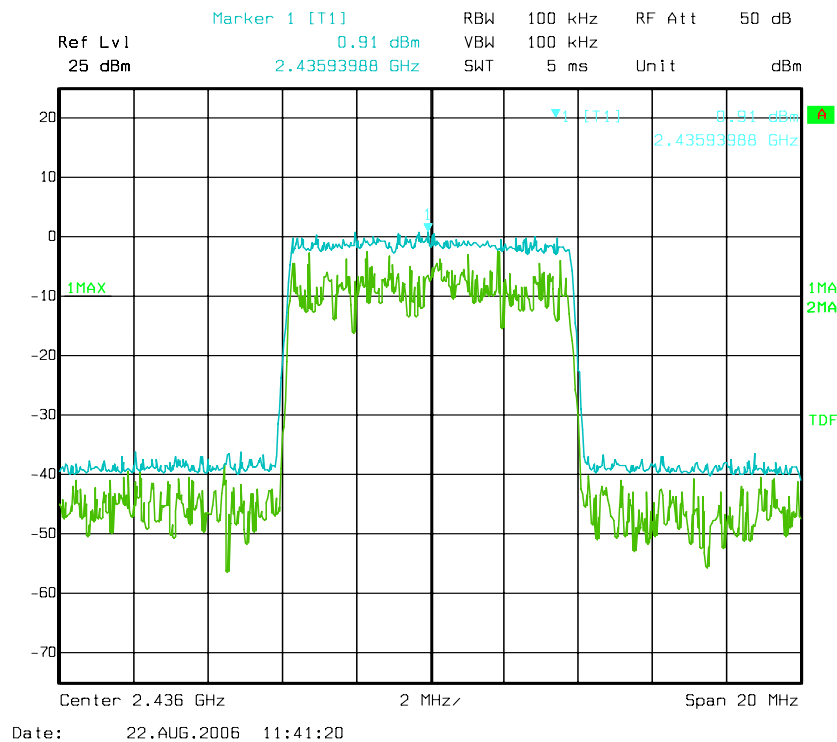
That gives a limitation to 30dBm (1W) – 0.67 dB (2dB over 6dB).

The limit of conducted output power is **29.33 dBm**. Thus the margin is **6.38 dB**

9.4.3 Spurious emission (15.247 § (d))

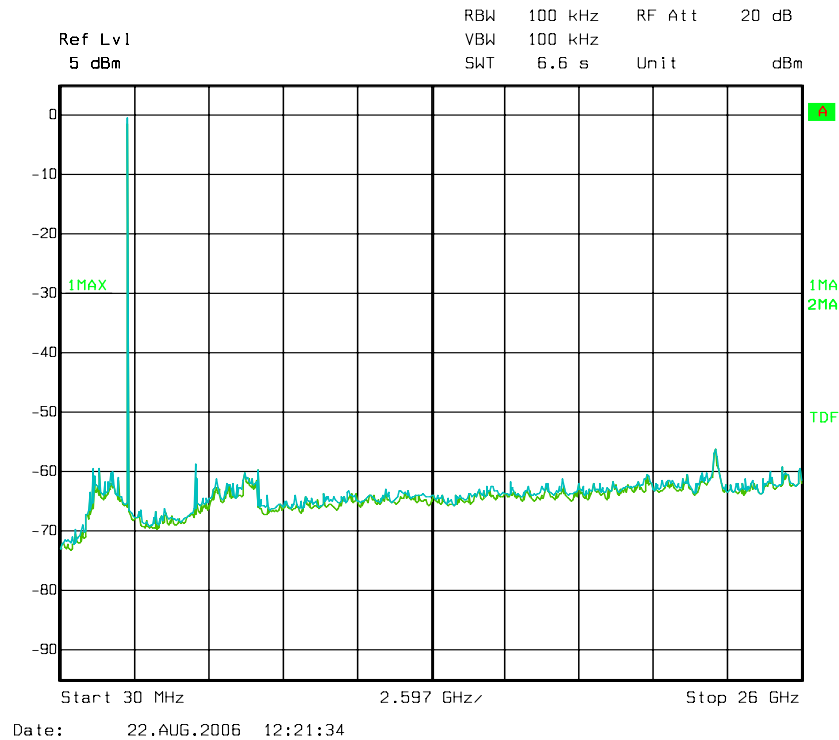
In any 100 kHz bandwidth outside the frequency band, the level is at least 20 dB below that in the 100kHz bandwidth within the band contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

The maximum power in 100kHz bandwidth is for channel 5: **0.91dBm**



For conducted emission: tests are done on channels 1, 5 and 10, no spurious over -55dBm.
Measurement is done band by band

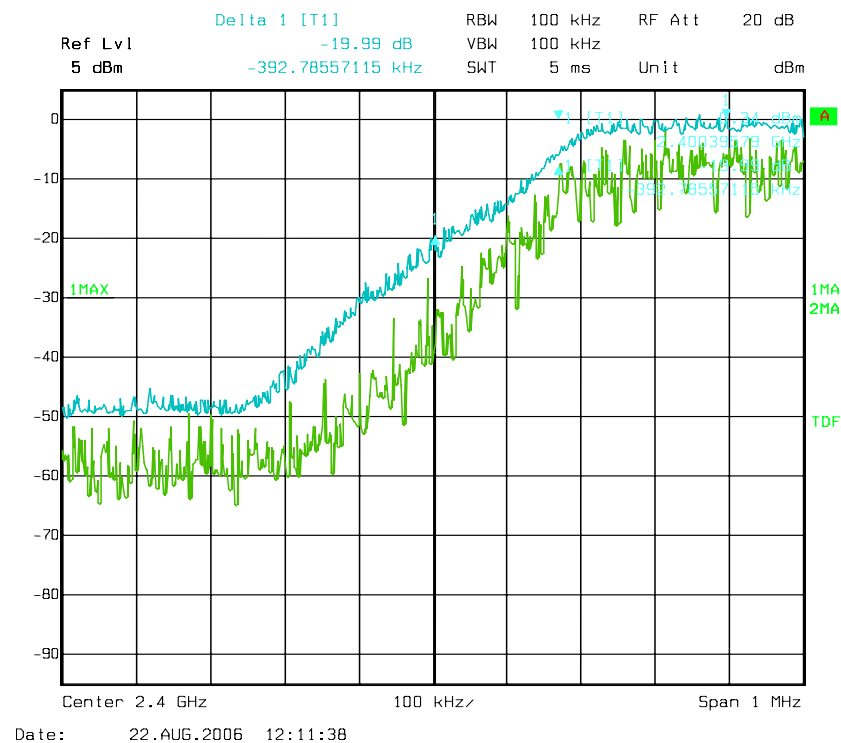
Sample scan from 30MHz to 25 GHz for channel 1:



Band edges:

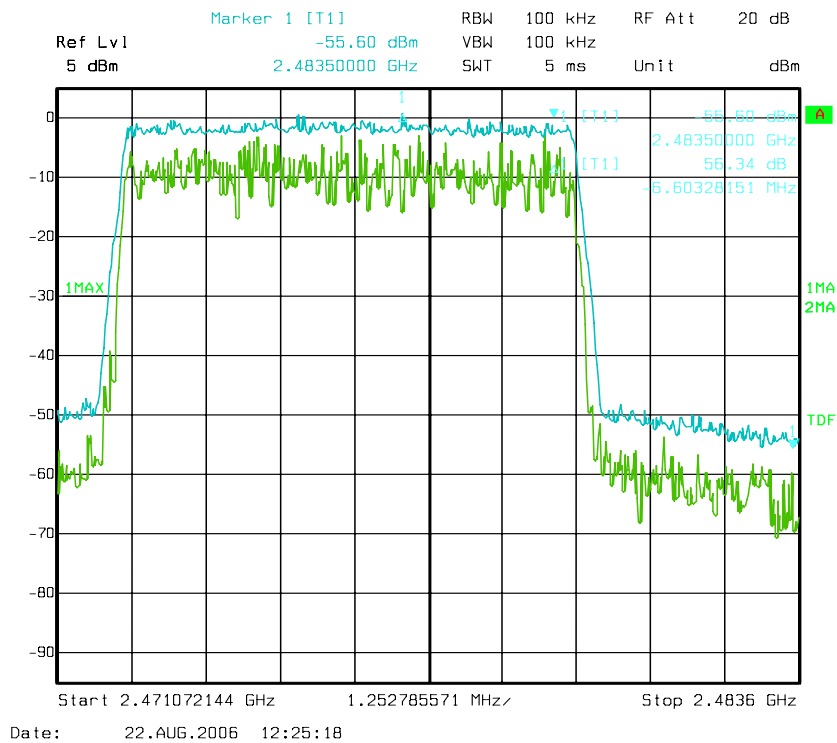
Channel 1: The 20dB limit is over 2400 MHz

The level at 2400 MHz (-19.65dBm) is lower than -19.1 dBm (0.91-20)



Channel 10

The absolute level is -55.6 dBm at 2483.5MHz



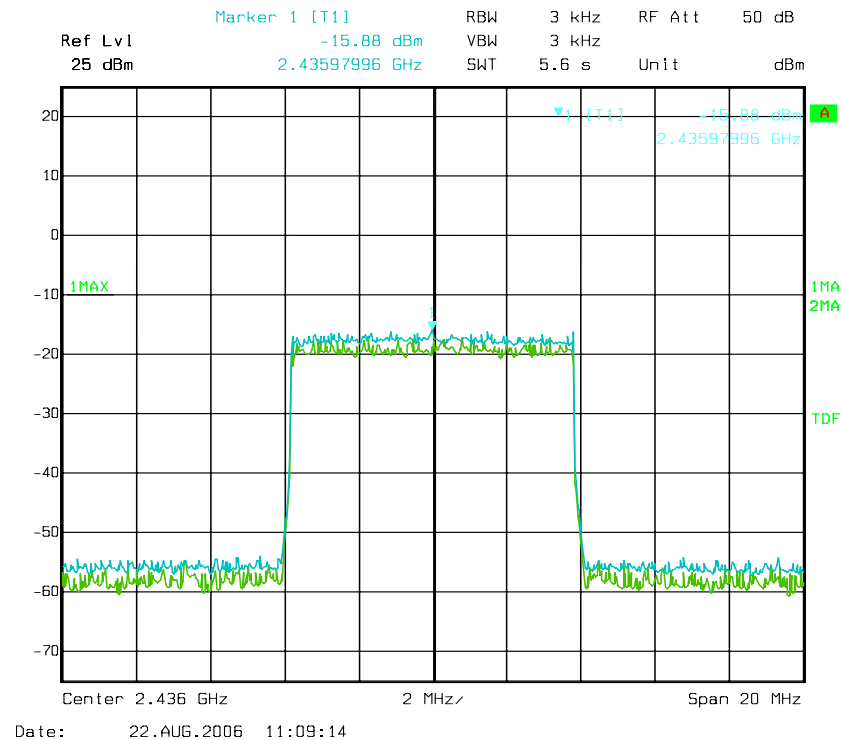
For spurious radiated emissions see §9.2

Supposing the maximum antenna gain (8dBi) stated in user manual, -55.6 dBm gives a radiated field of **47.6 dBμV/m at 3 m (margin of 6.4 dB).**

9.4.4 Spectral density (15.247 § (e))

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than **8 dBm in any 3 kHz** band during any time interval of continuous transmission.

Worst case : channel 5 gives **-15.88 dBm (margin 23.88 dB)**



9.4.5 Exposition of public to radio frequency energy.

In the frequency range of this product, the limit of S is $1\text{mW}/\text{cm}^2$.

With the formula given in OET 65 and the measurement done for the power and antenna gain, we can compute that the minimum distance between a body and the antenna is:

P = 22.95 dBm that gives 200mW

Max antenna gain is 8dBi : 6.3

$$R = \text{square root} (200 \cdot 6.3 / (4 \cdot \pi \cdot 1))$$

$$R = 10 \text{ cm}$$

The normal use of this product is with the antenna at a distance greater than 20cm as stated in user guide page 2.

In accordance with bulletin OET 65 C, there is no need to make SAR evaluation for such device.

9.5 Antenna requirements (§15.203)

User notice gives:

“The antenna has to be chosen so that the value “Antenna Gain - Feeder Loss” does not exceed 8 dB (at ambient temperature of 25°C). For instance, if the attenuation the cable used between the VigilCast Unit and the antenna is 2dB, the gain of the antenna must be less than 10 dB”.

9.6 Measurement of frequency stability §15.215 (c)

The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

Measurements were conducted according to the operating temperature range given in the installation guide

Frequencies (GHz)

Temperature Voltage	50°C 12V	50°C 10,8V	-10°C 12V	-10°C 10,8V	20°C 12V
Upper channel (10) 2,476GHz					
Fl (in 100kHz) GHz	2,47204375	2,4720441	2,472033	2,47203	2,4720452
Fh (in 100kHz) GHz	2,47994375	2,4799405	2,479964	2,479967	2,4799427
Middle channel (5) 2,436GHz					
Fl (in 100kHz) GHz	2,4320375	2,43203	2,432025	2,432022	2,4320397
Fh (in 100kHz) GHz	2,43995	2,439952	2,43997	2,439976	2,4399577
Lower channel (1) 2,404GHz					
Fl (in 100kHz) GHz	2,40003	2,40003	2,400025	2,400132	2,4000269
Fh (in 100kHz) GHz	2,40796	2,40796	2,407975	2,407877	2,4079588

f_H is the highest frequency of the power envelope: it is the frequency furthest above the frequency of maximum power where the output power drops below the level of -80 dBm/Hz e.i.r.p. spectral power density (-30 dBm if measured in a 100 kHz bandwidth).

f_L is the lowest frequency of the power envelope; it is the frequency furthest below the frequency of maximum power where the output power drops below the level equivalent to -80 dBm/Hz e.i.r.p. spectral power density (or -30 dBm if measured in a 100 kHz bandwidth).

Neither voltage nor temperature variations affect the frequency stability that is better than **±35 ppm**.