2.2 – Frequency hopping system: Channel separation

- NOT APPLICABLE -

2.3 – Digital modulation system : 6dB bandwidth and Occupied bandwidth at 99%

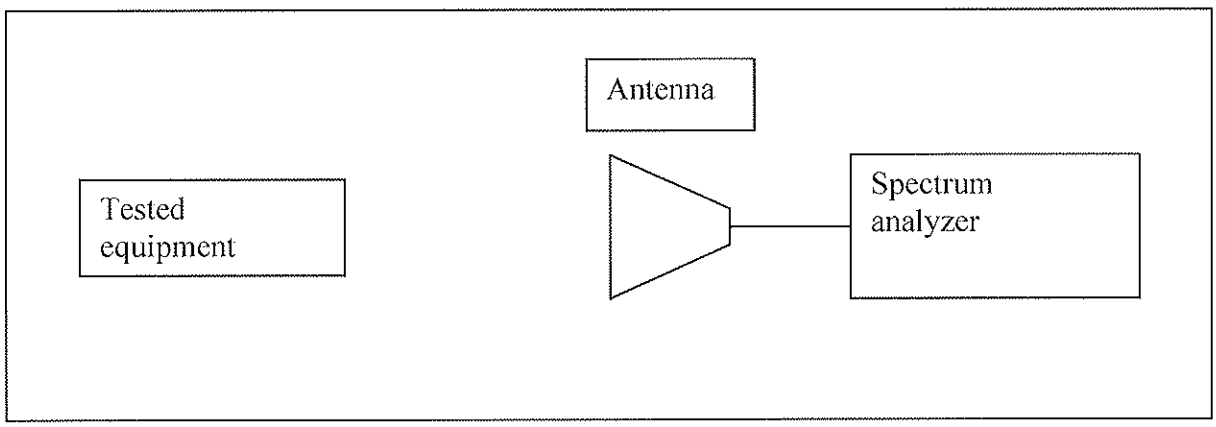
2.3.1 – General

The product has been tested with 110V/60Hz power line voltage. The results has been compared to the FCC part 15 subpart C §15.247 (a) (2) and the RSS-210 §A8.2 (a).

2.3.2 – Test setup

A first test is performed on the open area test site to evaluate the radiated output level (EIRP see §1.7 in this report). The equipment is fixed on a table and the antenna never moves during the measure. This measured level is compared to the open area test site result for an offset calculation.

The Spectrum analyzer setting is:
RBW = 100kHz VBW = 100kHz
Sweep = 5ms Span = 20MHz
Unit = dBm Detector = peak (with max hold)



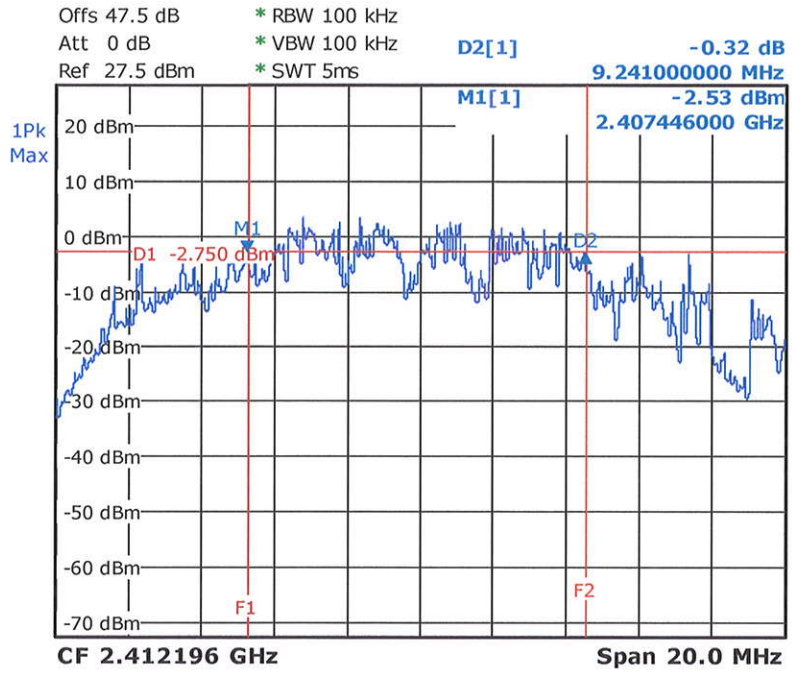
2.3.3 – Equipment list

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum analyseur	HEWLETT PACKARD	8566B	A4060004	12/2009	12/2010
Preselector	HEWLETT PACKARD	85685A	A4069001	12/2009	12/2010
Horn antenna	EMCO	3115	C2042016	01/2010	01/2011
Horn antenna	ETS	3115	C2040023	01/2010	01/2011
Preamplifier	HEWLETT PACKARD	8449B	A4069002	03/2010	03/2011

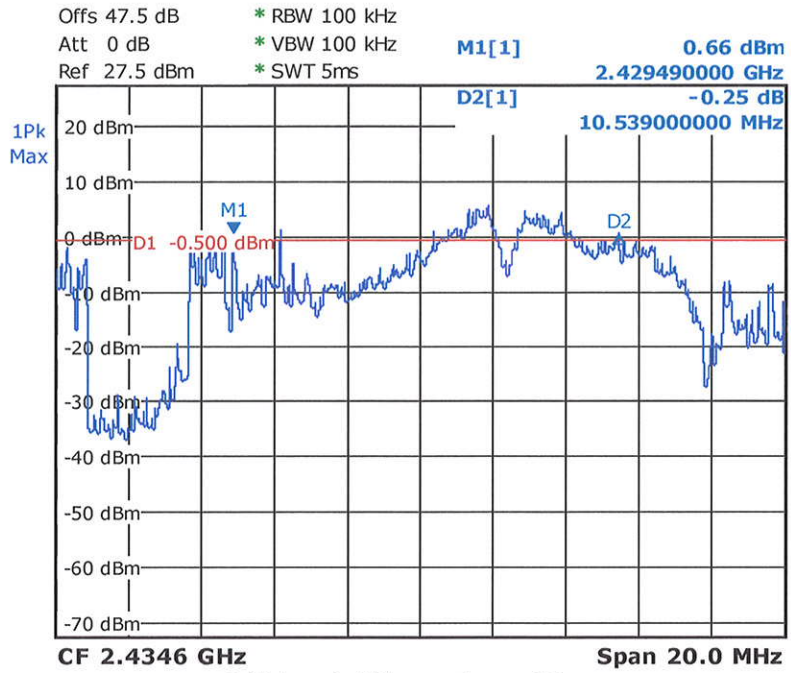
2.3.4 – Test results

The 6dB bandwidth shall be at least 500kHz

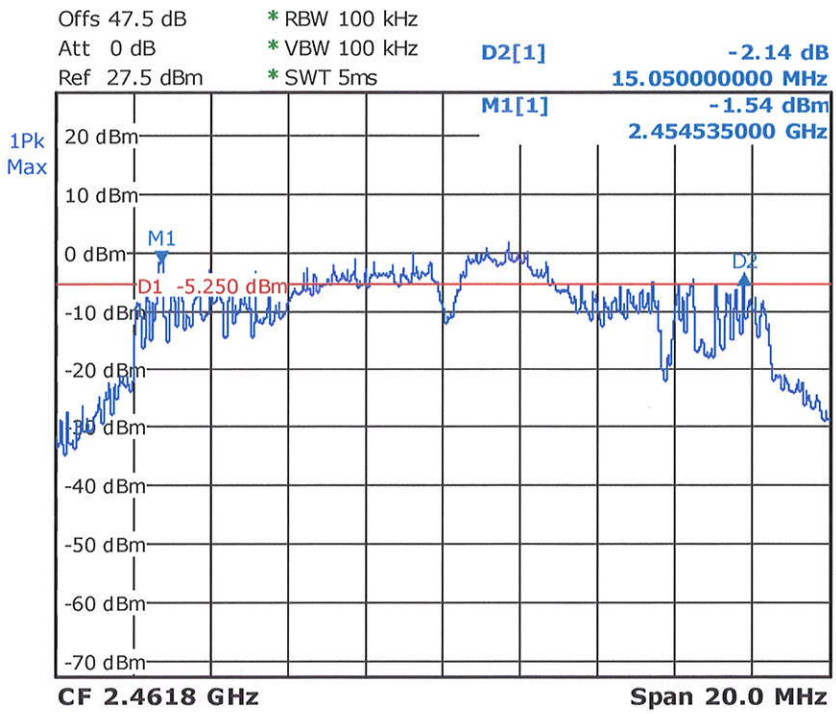
Channel	Measured 6dB bandwidth (kHz)	Pass / Fail		Channel	99 % Occupied bandwidth (kHz)
1	9241.0	Pass		1	15528.0
6	10539.0	Pass		6	16886.0
11	15050.0	Pass		11	16041.0



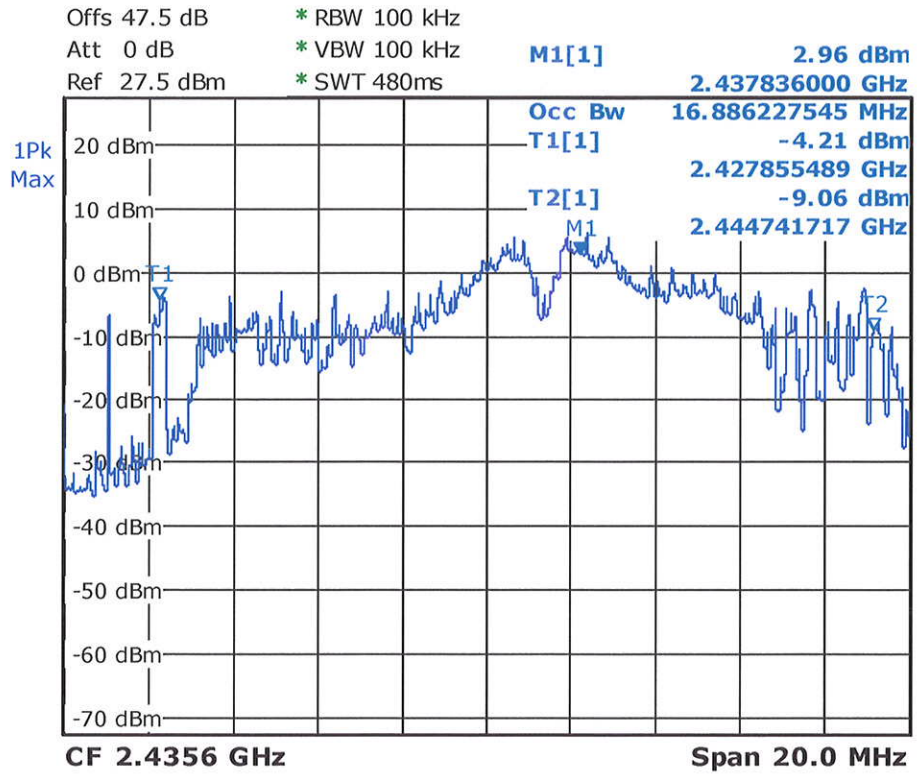
6dB bandwidth on channel 1



6dB bandwidth on channel 6



6dB bandwidth on channel 11



99% occupied bandwidth on channel 6

2.4 – Maximum peak conducted output power

2.4.1 – General

The product has been tested with 110V/60Hz power line voltage. The results has been compared to the FCC part 15 subpart C §15.247 (b) and the RSS-210 §A8.4.
The product has not an antenna port; the maximum power has been measured in radiated mode, with substitution method.

2.4.2 – Test setup

The EUT is placed on a table at 0.8 m height. Measurements have been made with antenna at 10m distance on the open area test site. Pre scans were performed on the EUT put on its three axes to determine the position with maximum radiation. The value has been maximised by rotating the equipment, move the antenna height and antenna polarization.

2.4.3 – Test configuration

Test is carried out in average method with a spectrum analyzer.
Test method is in accordance with Power output option 2 – Method 1 as described in document "Measurement of Digital Transmission Systems Operating under Section 15.247: March 23, 2005"

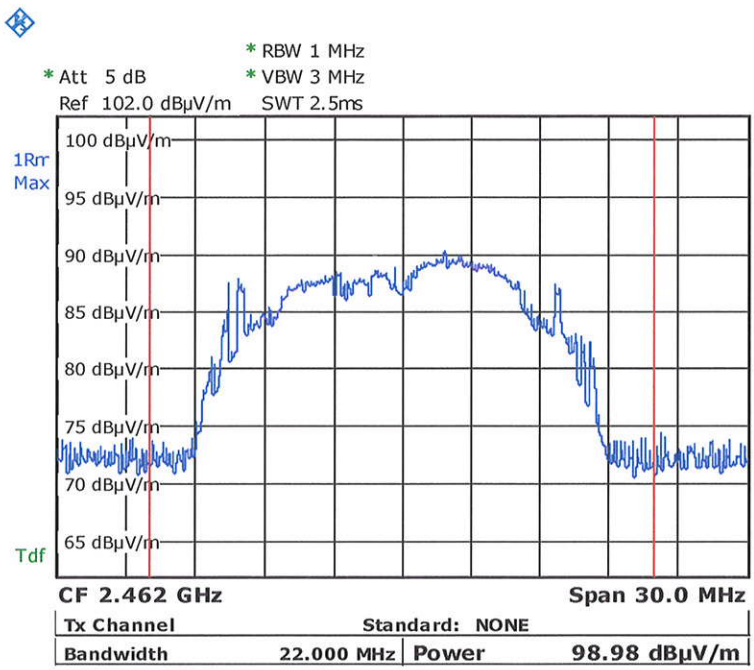
- Span = 30 MHz (> EBW)
- RBW = 1 MHz, VBW = 3 MHz
- Sample mode with channel power function on 22 MHz bandwidth.

2.4.4 – Equipment list

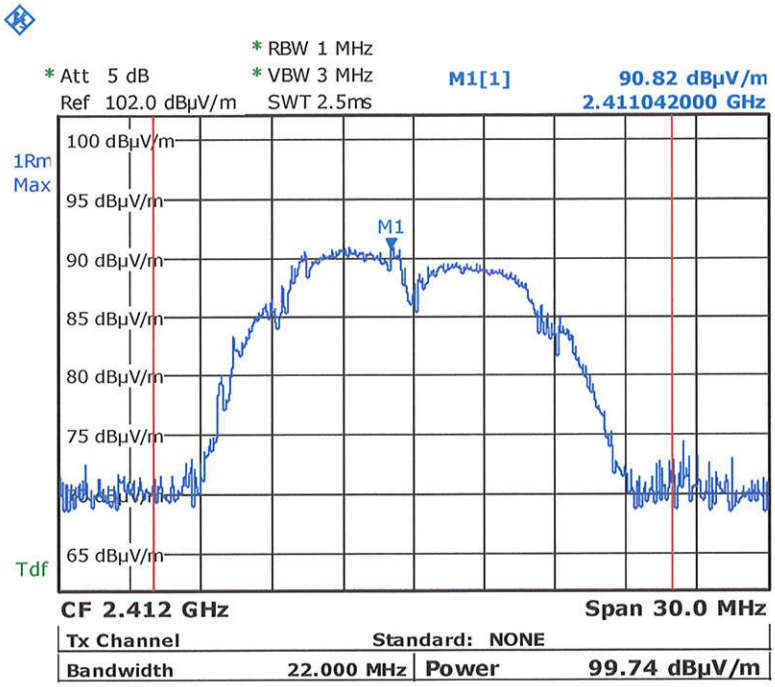
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum analyseur	HEWLETT PACKARD	8566B	A4060004	12/2009	12/2010
Spectrum analyseur	ROHDE & SCHWARZ	FSL	A4060032	08/2009	08/2010
Preselector	HEWLETT PACKARD	85685A	A4069001	12/2009	12/2010
Horn antenna	EMCO	3115	C2042016	01/2010	01/2011
Horn antenna	ETS	3115	C2040023	01/2010	01/2011
Signal Generator	ROHDE & SCHWARZ	SMP02	B2163019	07/2009	07/2010
Preamplifier	HEWLETT PACKARD	8449B	A4069002	03/2010	03/2011
Diode detector	ODS0004A	OMNIYIG	-	NA	NA
Wattmeter	GIGATRONICS	8542C	A1503009	01/2009	01/2011
probe	GIGATRONICS	80401A	A1509027	01/2009	01/2011
Oscilloscope	LECROY	64Xi	A4081040	10/2009	10/2010
Filter	BL MICROWAVE	B2440-120	A7120006	12/2009	12/2010

2.4.5 –Test results

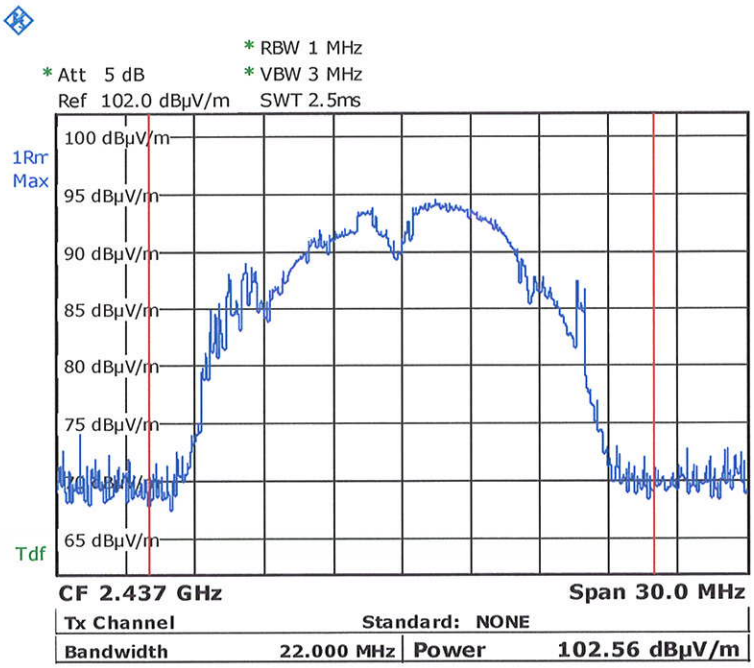
Channel	E (dBµV/m) (Included correction factor)	Antenna gain	P (W)	Limit (W)
1 (2412 MHz)	99.74	1,41	0.0223	1
6 (2437 MHz)	102.56	1,41	0.0426	1
11 (2462 MHz)	98.98	1,41	0.0187	1



Channel power on channel 11



Channel power on channel 1



Channel power on channel 6

2.5 – Operation with directional antenna gains greater than 6dBi

- NOT APPLICABLE -

2.6 – Emission radiated outside the specified frequency band

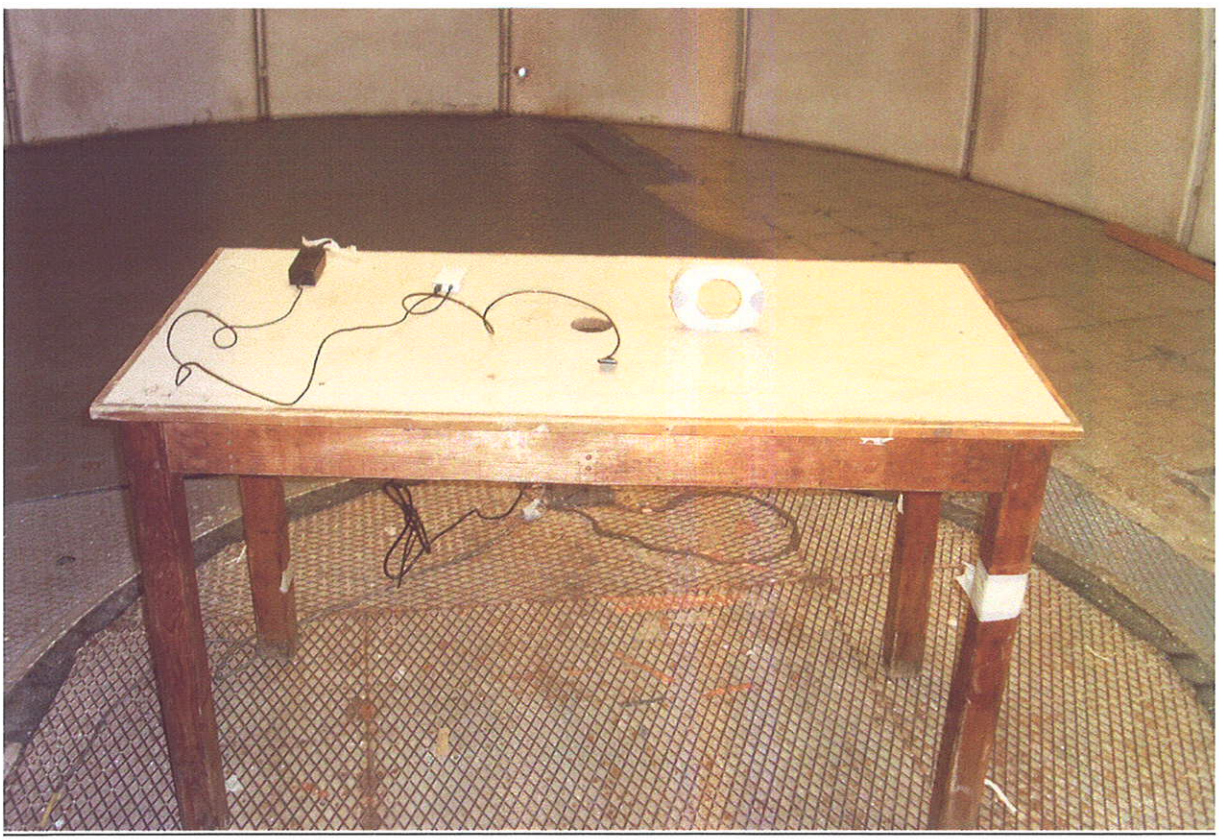
2.6.1 – General

The product has been tested with 110V/60Hz power line voltage and compared to the FCC part 15 subpart C §15.209 limits and the RSS-GEN §6 (a) Table 1

The 6dB resolution bandwidth was 120 kHz from 30MHz to 1GHz, and 1MHz from 1GHz to 18GHz.

2.6.2 – Test setup

The EUT is placed on a table at 0.8 m height. Measurements have been made with antenna at 10m distance on the open area test site. The values have been maximised by rotating the equipment, move the antenna height and antenna polarization.



2.6.3 – Equipment list

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum analyseur	HEWLETT PACKARD	8566B	A4060004	12/2009	12/2010
Preselector	HEWLETT PACKARD	85685A	A4069001	12/2009	12/2010
Horn antenna	EMCO	3115	C2042016	01/2010	01/2011
Quasi-Peak adaptator	HEWLETT PACKARD	85650A	A4069003	12/2009	12/2010
Bilog antenna	CHASE	CBL 6112A	C2040040	08/2009	08/2010
Preamplifier	HEWLETT PACKARD	8449B	A4069002	12/2009	12/2010

2.6.4 – Uncertainty

The uncertainty values calculated by the laboratory are lower than limit uncertainty values defined by the CISPR 16-4-2. The conformity of the sample is directly established by the applicable limits values.

Kind of measurement	Wide uncertainty laboratory (k=2) ±x	CISPR uncertainty limit ±y
Measurement of radiated electric field on the open area test site	5.07 dB	5.2 dB

2.6.5 – Test results

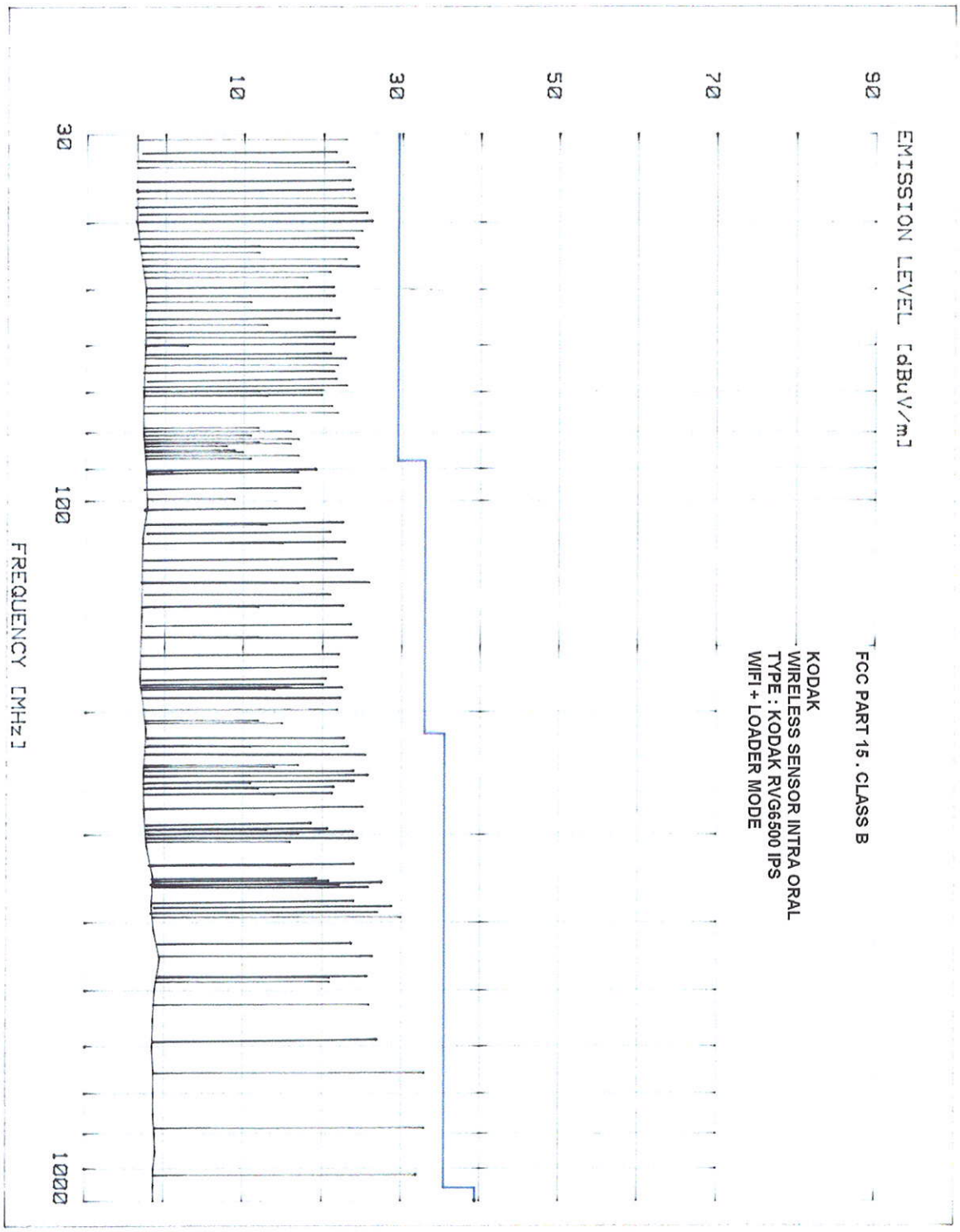
10 m radiated measurements from 30 to 1000 MHz

Frequency (MHz)	Quasi-peak measurements @ 10m (dBµV/m)	Limits Quasi peak @ 10m (dBµV/m)
38.7	26.5	29.5
40.0	27.1	29.5
392.7	30.1	35.5
656.2	33.1	35.5
784.4	32.7	35.5
918.6	32.0	35.5

10 m radiated measurements from 1000 to 24835 MHz

No spurious emission measured in this frequency range.

Channel	Frequency (MHz)	Peak measurements @ 10m (dBµV/m)	Limits average @ 10m (dBµV/m)
1	2399.9 MHz	37	43.5
11	2483.9 MHz	41.2	43.5


EMISSION LEVEL [dBuV/m]
90
70
50
30
10
30
100
1000
FREQUENCY [MHz]
FCC PART 15 . CLASS B
KODAK
WIRELESS SENSOR INTRA ORAL
TYPE : KODAK RVG6500 IPS
WIFI + LOADER MODE

2.7 – Digital modulation system: power spectral density

2.7.1 – General

The product has been tested with 110V/60Hz power line voltage. The results has been compared to the FCC part 15 subpart C §15.247 (e) and the RSS-210 §A8.2 (b).

2.7.2 – Test setup

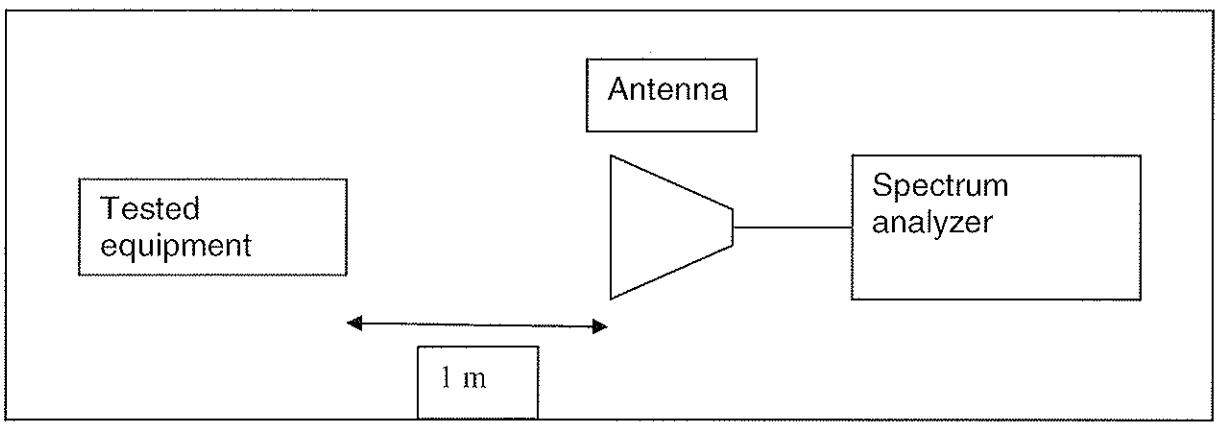
The antenna cannot be removed from the device, a radiated alternative test procedure is performed.

In a first time the equipment is moved around its three axes to find the maximum fundamental emission level.
Then the Spectrum analyzer is set as follows:
RBW = 3kHz VBW = 10kHz
Sweep = 100s Span = 300kHz
Unit = dBµV/m Detector = peak (with max hold)
The field strength E is measured with this settings.

A correction factor of antenna and cable for measurements is applied to the E level.

The power density level is calculated with the formula:
$P = (E \times d)^2 / (30 \times G)$

G = 1.41 linear gain of the antenna (1.5 dBi)
d = 1m (distance between measurement antenna and the equipment under test)
E = measured field strength in V/m
P = power in W



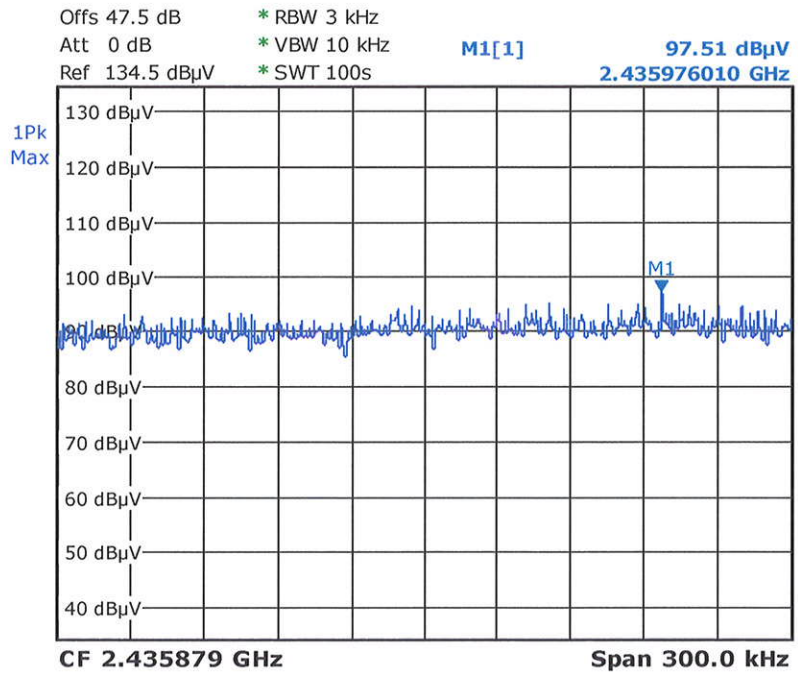
2.7.3 – Equipment list

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum analyseur	HEWLETT PACKARD	8566B	A4060004	12/2009	12/2010
Preselector	HEWLETT PACKARD	85685A	A4069001	12/2009	12/2010
Horn antenna	EMCO	3115	C2042016	01/2010	01/2011
Horn antenna	ETS	3115	C2040023	01/2010	01/2011
Preamplifier	HEWLETT PACKARD	8449B	A4069002	03/2010	03/2011
Wattmeter	GIGATRONICS	8542C	A1503009	01/2009	01/2011
probe	GIGATRONICS	80401A	A1509027	01/2009	01/2011
Oscilloscope	LECROY	64Xi	A4081040	10/2009	10/2010
Filter	BL MICROWAVE	B2440-120	A7120006	12/2009	12/2010

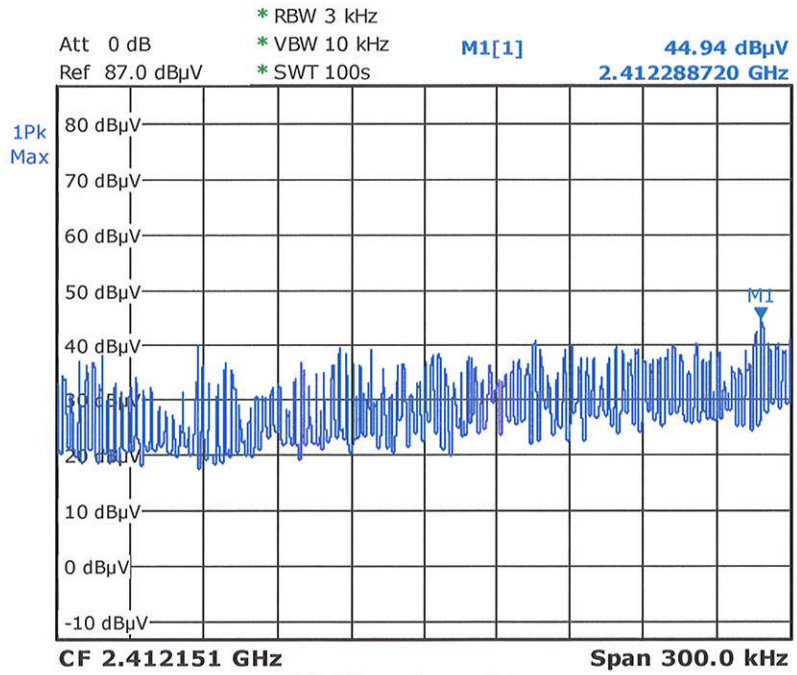
2.7.4 – Test results

The calculated power level must be no greater than +8 dBm.

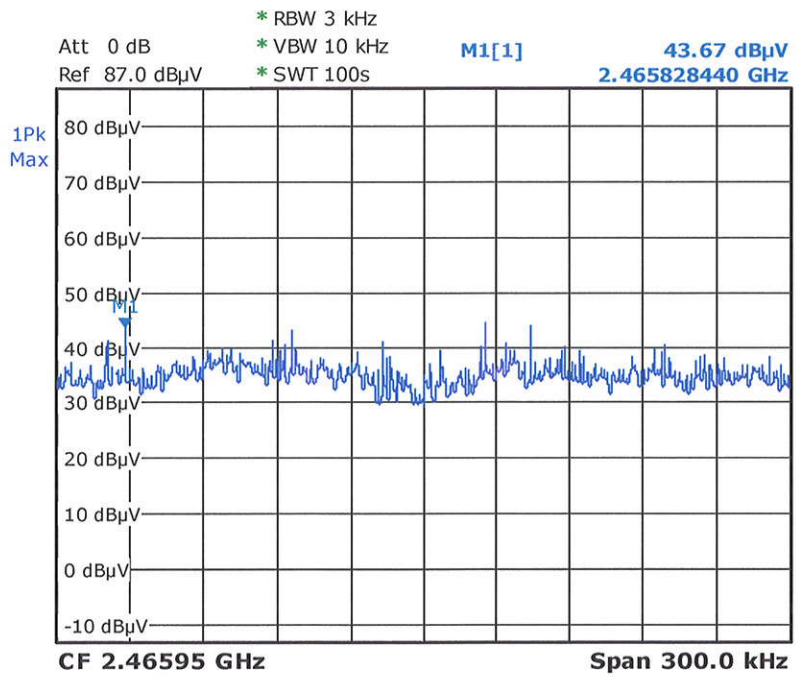
Channel	E field measured (dBµV/m)	Measurement correction factor (dB)	Calculated power (dBm)	Result Pass / Fail
1	44.94	24.1	-37.23	Pass
6	50.01	24.1	-32.16	Pass
11	43.67	24.1	-38.5	Pass



E field on channel 6 (with offset)



E field on channel 1



E field on channel 11

2.8 – Hybrid system: time of occupancy

- NOT APPLICABLE -

2.9 – Frequency hopping system : individual hopping frequency management

- NOT APPLICABLE -

2.10 – Public exposure to RF energy

- NOT APPLICABLE -

2.11 – Bandedge emission measurement

2.11.1 – General

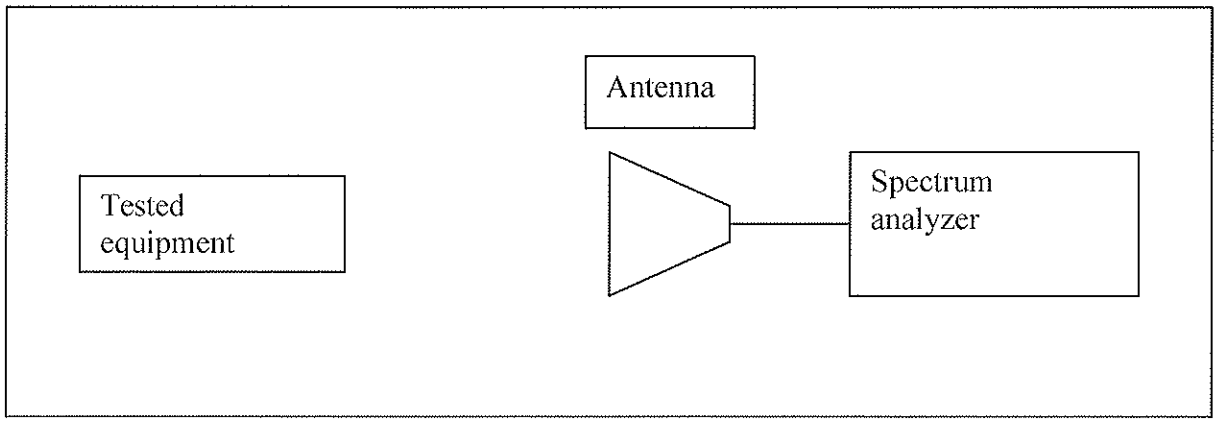
The product has been tested with 110V/60Hz power line voltage. The results has been compared to the FCC part 15 subpart C §15.247 (d) and the RSS-210 §A8.5.

2.11.2 – Test setup

A first test is performed on the open area test site to evaluate the radiated output level (EIRP see §1.7 in this report). The equipment is fixed on a table and the antenna never moves during the measure. This measured level is compared to the open area test site result for an offset calculation.

The Spectrum analyzer setting is:

RBW = 100kHz	VBW = 100kHz
Sweep = 5ms	Span = 50MHz
Unit = dBm	Detector = peak (with max hold)



2.11.3 – Equipment list

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum analyseur	HEWLETT PACKARD	8566B	A4060004	12/2009	12/2010
Preselector	HEWLETT PACKARD	85685A	A4069001	12/2009	12/2010
Horn antenna	EMCO	3115	C2042016	01/2010	01/2011
Horn antenna	ETS	3115	C2040023	01/2010	01/2011
Preamplifier	HEWLETT PACKARD	8449B	A4069002	03/2010	03/2011

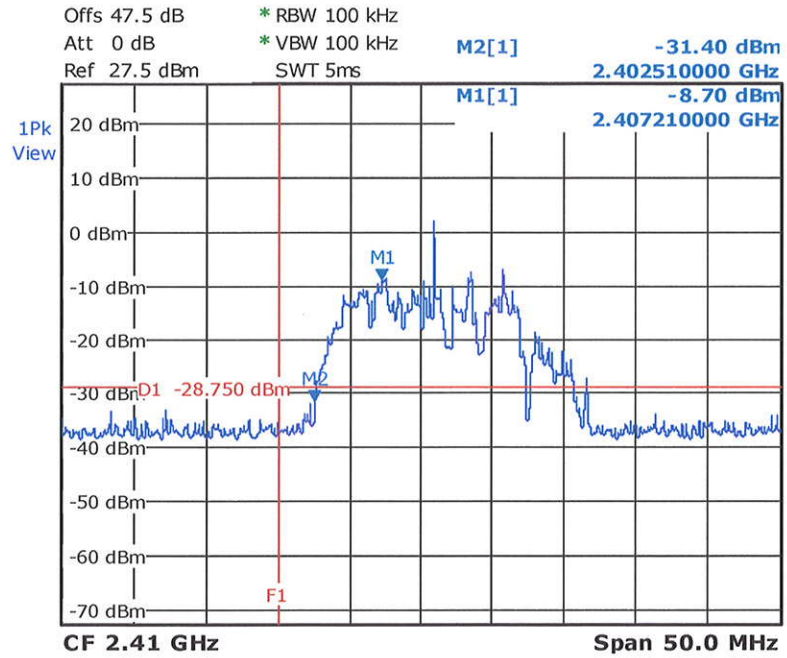
2.11.4 – Test results

In any 100 kHz bandwidth outside the frequency band in witch the equipment internal radiator is operating, the radio power produced by the internal radiator shall be at least 20 dB below the highest level (100 kHz bandwidth) of emission within the operating frequency band.

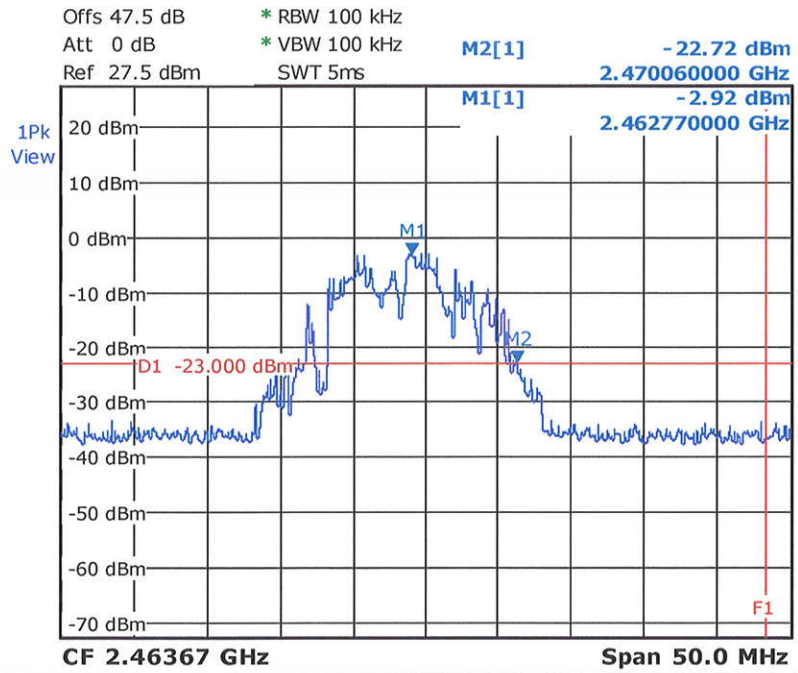
Fl is the lowest frequency with 20 dB below the highest level.
Fh is the highest frequency with 20 dB below the highest level.

Fl shall be > 2400MHz
Fh shall be < 2483.5MHz

Channel	Frequency at level max -20dB (MHz)	Pass / Fail
1	Fl= 2402.5	Pass
11	Fh= 2470.0	Pass



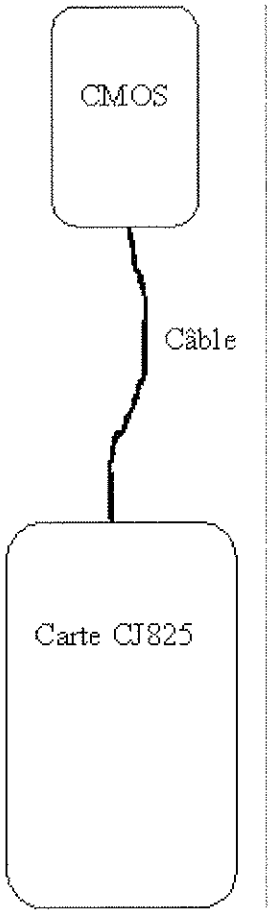
Lowest frequency band edge: Fl



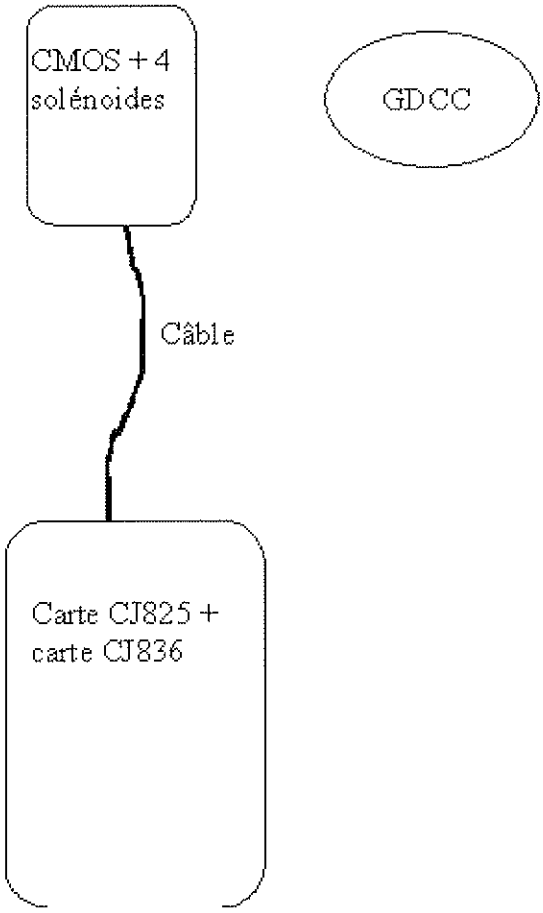
Highest frequency band edge: Fh

Related document

Kodak RVG6500
Ultimate



RVG6500 IPS
Ultimate + IPS



End of test report