

TRaC Wireless Test Report : TTR-000557WUS1

Applicant : COMARK Ltd

Apparatus : RF500

Specification(s) : CFR47 Part 15.247 July 2008

FCCID : TVHRF500

Purpose of Test : Class II Permissive Change

Authorised by



: Radio Product Manager

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Section 1:**Introduction****1.1 General**

This report contains an assessment of an apparatus against Electromagnetic Compatibility Standards based upon tests carried out on samples submitted to the Laboratory.

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1.2 Tests Requested By

This testing in this report was requested by :

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1.3 Manufacturer

As Above

1.4 Apparatus Assessed

The following apparatus was assessed between 11th November to 19th November 2010:

Comark RF500 Gateway

The Class II Permissive change covered in this report concerns the change of External power supply as follows

The original external PSU Stontronics LAD6019AB5 has been made obsolete, and is now replaced by a Friwo DT60 Power supply.

Results contained in this report were all obtained during testing with the Friwo DT60 Power Supply.

1.5 Test Result Summary

Full details of test results are contained within Appendix A. The following table summarises the results of the assessment.

The statements relating to compliance with the standards below apply ONLY as qualified in the notes and deviations stated in sections 1.6 to 1.7 of this test report.

Full details of test results are contained within Appendix A. The following table summarises the results of the assessment.

Test Type	Regulation	Measurement standard	Result
Conducted Carrier Power	Title 47 of the CFR : Part 15 Subpart C; 15.247(b)	ANSI C63.10	Pass
Radiated spurious emissions	Title 47 of the CFR: Part 15 Subpart C; 15.247 & 15.109	ANSI C63.10	Pass
AC Power conducted emissions	Title 47 of the CFR: Part 15 Subpart C; 15.207	ANSI C63.10	Pass

Abbreviations used in the above table:

Mod	: Modification	ANSI	: American National Standards Institution
CFR	: Code of Federal Regulations	PLCE	: Power Line Conducted Emissions
REFE	: Radiated Electric Field Emissions		

1.6 Notes Relating To The Assessment

With regard to this assessment, the following points should be noted:

The results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

The apparatus was set up and exercised using the configurations, modes of operation and arrangements defined in this report only.

Particular operating modes, apparatus monitoring methods and performance criteria required by the standards tested to have been performed except where identified in Section 1.7 of this test report (Deviations from Test Standards).

For emissions testing, throughout this test report, "Pass" indicates that the results for the sample as tested were below the specified limit (refer also to Section 2, Measurement Uncertainty).

Where relevant, the apparatus was only assessed using the monitoring methods and susceptibility criteria defined in this report.

All testing with the exception of testing at the Open Area Test Site was performed under the following environmental conditions:

Temperature	: 17 to 23 °C
Humidity	: 45 to 75 %
Barometric Pressure	: 86 to 106 kPa

All dates used in this report are in the format dd/mm/yy.

This assessment has been performed in accordance with the requirements of ISO/IEC 17025.

1.7 Deviations from Test Standards

There were no deviations from the standards tested to.

Section 2:**Measurement Uncertainty****2.1 Measurement Uncertainty Values**

For the test data recorded in accordance with note (iii) of Section 2.1 the following measurement uncertainty was calculated:

Radio Testing – General Uncertainty Schedule

All statements of uncertainty are expanded standard uncertainty using a coverage factor of 1.96 to give a 95% confidence where no required test level exists.

[1] Adjacent Channel Power

Uncertainty in test result = **1.86dB**

[2] Carrier Power

Uncertainty in test result (Equipment - TRLUH120) = **2.18dB**

Uncertainty in test result (Equipment – TRL05) = **1.08dB**

Uncertainty in test result (Equipment – TRL479) = **2.48dB**

[3] Effective Radiated Power

Uncertainty in test result = **4.71dB**

[4] Spurious Emissions

Uncertainty in test result = **4.75dB**

[5] Maximum frequency error

Uncertainty in test result (Equipment - TRLUH120) = **119ppm**

Uncertainty in test result (Equipment – TRL05) = **0.113ppm**

Uncertainty in test result (Equipment – TRL479) = **0.265ppm**

[6] Radiated Emissions, field strength OATS 14kHz-18GHz Electric Field

Uncertainty in test result (14kHz – 30MHz) = **4.8dB**, Uncertainty in test result (30MHz – 1GHz) = **4.6dB**, Uncertainty in test result (1GHz-18GHz) = **4.7dB**

[7] Frequency deviation

Uncertainty in test result = **3.2%**

[8] Magnetic Field Emissions

Uncertainty in test result = **2.3dB**

[9] Conducted Spurious

Uncertainty in test result (Equipment TRL479) Up to 8.1GHz = **3.31dB**

Uncertainty in test result (Equipment TRL479) 8.1GHz – 15.3GHz = **4.43dB**

Uncertainty in test result (Equipment TRL479) 15.3GHz – 21GHz = **5.34dB**

Uncertainty in test result (Equipment TRLUH120) Up to 26GHz = **3.14dB**

[10] Channel Bandwidth

Uncertainty in test result = **15.5%**

[11] Amplitude and Time Measurement – Oscilloscope

Uncertainty in overall test level = **2.1dB**, Uncertainty in time measurement = **0.59%**, Uncertainty in Amplitude measurement = **0.82%**

[11] Power Line Conduction

Uncertainty in test result = **3.4dB**

[12] Spectrum Mask Measurements

Uncertainty in test result = **2.59% (frequency)**
Uncertainty in test result = **1.32dB (amplitude)**

[13] Adjacent Sub Band Selectivity

Uncertainty in test result = **1.24dB**

[14] Receiver Blocking – Listen Mode, Radiated

Uncertainty in test result = **3.42dB**

[15] Receiver Blocking – Talk Mode, Radiated

Uncertainty in test result = **3.36dB**

[16] Receiver Blocking – Talk Mode, Conducted

Uncertainty in test result = **1.24dB**

[17] Receiver Threshold

Uncertainty in test result = **3.23dB**

[18] Transmission Time Measurement

Uncertainty in test result = **7.98%**

Section 3:

Modifications

3.1 Modifications Performed During Assessment

None

Appendix A:**Formal Emission Test Results**

Abbreviations used in the tables in this appendix:

Spec	: Specification	ALSR	: Absorber Lined Screened Room
Mod	: Modification	OATS	: Open Area Test Site
		ATS	: Alternative Test Site
EUT	: Equipment Under Test		
SE	: Support Equipment	Ref	: Reference
		Freq	: Frequency
L	: Live Power Line		
N	: Neutral Power Line	MD	: Measurement Distance
E	: Earth Power Line	SD	: Spec Distance
Pk	: Peak Detector	Pol	: Polarisation
QP	: Quasi-Peak Detector	H	: Horizontal Polarisation
Av	: Average Detector	V	: Vertical Polarisation
CDN	: Coupling & decoupling network		

A1 Transmitter Peak Output Power

Carrier power was verified with the EUT transmitting on its lowest, centre and highest carrier frequency in turn.

Test Details:	
Regulation	Title 47 of the CFR: Part15 Subpart (c) 15.247(b)(3)
Measurement standard	ANSI C63.10
EUT sample number	S01
Modification state	01
SE in test environment	None
SE isolated from EUT	None
EUT set up	Refer to Appendix C
Temperature	18°C

Channel Frequency (MHz)	Peak Carrier Power (W)	Antenna Gain dBi	Average Power (W)	Limit (W)	Result
2405.0	0.00105	7	0.00528	1	Pass

Notes:

Conducted Measurement

Highest Gain of any antenna to be used = 7 dBi

Conducted measurements were performed on unique antenna connector provided by the client.

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A2 Radiated Electric Field Emissions

Preliminary scans were performed using a peak detector with the RBW = 100kHz. The radiated electric field emission in this report related only to emissions that were affected by the class II change. All other emissions, found to be unaffected by the change, are contained in report RU1538/8938. All emissions contained in this report were found to be unrelated to the radio section of the device.

The following test site was used for final measurements as specified by the standard tested to:

3m open area test site : ☐

3m alternative test site : ☒

The effect of the EUT set-up on the measurements is summarised in note (c) below.

Test Details: 2405.0 MHz	
Regulation	Title 47 of the CFR: Part 15 Subpart (b) Clause 15.109
Measurement standard	ANSI C63.10
Frequency range	30MHz to 25 GHz
EUT sample number	S01 & S03
Modification state	01
SE in test environment	None
SE isolated from EUT	None
EUT set up	Refer to Appendix C
Photographs (Appendix F)	1 & 2

Ref No.	FREQ. (MHz)	MEAS Rx (dBμV)	CABLE LOSS (dB)	ANT FACT. (dB/m)	PRE AMP (dB)	FIELD ST'GH (dBμV/m)	EXTRAP FACT (dB)	FIELD ST'GH (μV/m)	LIMIT (μV/m)
1.	66.95	15.0	1.0	8.1	-	24.1	-	16.03	100
2.	85.45	15.4	1.1	9.2	-	25.7	-	19.30	100
3.	89.7	19.9	1.1	9.4	-	30.4	-	33.15	150
4.	117.1	18.0	1.3	10.3	-	29.6	-	30.23	150
5.	123.15	17.5	1.3	10.6	-	29.5	-	29.72	150
6.	133.25	25.3	1.4	11.3	-	38.0	-	79.43	150
7.	144.05	17.6	1.5	11.8	-	30.9	-	34.91	150
8.	173.2	17.8	1.6	13.3	-	32.8	-	43.45	150
9.	184.35	14.2	1.7	13.8	-	29.7	-	30.58	150
10	192	12.9	1.8	14.4	-	29.1	-	28.35	150
11	208.9	12.8	1.8	15.3	-	29.9	-	31.41	150
12	214.8	10.8	1.9	15.5	-	28.1	-	25.53	150
13	240.05	11.4	2.0	17.2	-	30.6	-	33.73	200
14	266.95	14.5	2.1	17.9	-	34.5	-	52.91	200
15	272	5.8	2.1	18.1	-	26.0	-	19.93	200
16	288.05	6.5	2.2	19.7	-	28.4	-	26.15	200
17	304	17.8	2.2	14.2	-	34.2	-	51.35	200
18	320	13.9	2.3	14.2	-	30.4	-	32.96	200
19	329.95	13.7	2.3	14.4	-	30.4	-	33.08	200
20	528.1	16.3	3.0	18.6	-	37.9	-	78.34	200
21	576.15	7.5	3.1	19.7	-	30.3	-	32.62	200

Ref No.	FREQ. (MHz)	MEAS Rx (dBμV)	CABLE LOSS (dB)	ANT FACT. (dB/m)	PRE AMP (dB)	FIELD ST'GH (dBμV/m)	EXTRAP FACT (dB)	FIELD ST'GH (μV/m)	LIMIT (μV/m)
22	624.15	8.7	3.2	20.2	-	32.1	-	40.32	200
23	720.15	11.8	3.4	21.1	-	36.3	-	65.61	200
24	768.15	13.9	3.5	21.5	-	39.0		88.72	200

Notes:

- Any testing performed below 30 MHz was performed using a magnetic loop antenna in accordance with ANSI C63.10: section 4.5, Table 1
- In accordance with 15.35(b), above 1 GHz, emissions measured using a peak detector shall not exceed a level 20 dB above the average limit.
- Measurements at 2400 & 2483.5 MHz were made to ensure band edge compliance.
- Testing was performed with the EUT orientated in three orthogonal planes and the maximum emissions level recorded. In addition, the EUT antenna was varied within its range of motion in order to maximise emissions.
- For Frequencies below 1 GHz, RBW= 100 kHz, testing was performed with CISPR16 compliant test receiver with QP detector. Above 1 GHz tests were performed using a spectrum analyser using the following settings:
 Peak RBW=VBW= 1MHz
 Average RBW=VBW= 1MHz

These settings as per ANSI C63.10

The upper and lower frequency of the measurement range was decided according to 47 CFR 15:2008 Clause 15.33(a) and 15.33(a)(1).

Radiated emission limits (47 CFR 15: Clause 15.209) for emissions falling within the restricted bands defined in 15.205(a):

Frequency of emission (MHz)	Field strength μV/m	Measurement Distance m	Field strength dBμV/m
0.009-0.490	2400/F(kHz)	300	67.6/F (kHz)
0.490-1.705	24000/F(kHz)	30	87.6/F (kHz)
1.705-30	30	30	29.5
30-88	100	3	40.0
88-216	150	3	43.5
216-960	200	3	46.0
Above 960	500	3	54.0

Notes:

- (a) Where results have been measured at one distance, and a signal level displayed at another, the results have been extrapolated using the following formula:

$$\text{Extrapolation (dB)} = 20 \log_{10} \left(\frac{\text{measurement distance}}{\text{specification distance}} \right)$$

The results displayed take into account applicable antenna factors and cable losses.

- (b) The levels may have been rounded for display purposes.
- (c) The following table summarises the effect of the EUT operating mode, internal configuration and arrangement of cables / samples on the measured emission levels :

	See (i)	See (ii)	See (iii)	See (iv)
Effect of EUT operating mode on emission levels		✓		
Effect of EUT internal configuration on emission levels		✓		
Effect of Position of EUT cables & samples on emission levels				✓
(i) Parameter defined by standard and / or single possible, refer to Appendix D (ii) Parameter defined by client and / or single possible, refer to Appendix D (iii) Parameter had a negligible effect on emission levels, refer to Appendix D (iv) Worst case determined by initial measurement, refer to Appendix D				

A3 Power Line Conducted Emissions

Preview power line conducted emission measurements were performed with a peak detector in a screened room. The effect of the EUT set-up on the measurements is summarised in note (b). Where applicable formal measurements of the emissions were performed with a peak, average and/or quasi peak detector. The EUT was set to transmit on its lowest, centre and highest carrier frequency in turn. The formal measurements are detailed below:

Test Details:	
Regulation	Title 47 of the CFR: Part 15 Subpart (c) Clause 15.207
Measurement standard	ANSI C63.10
Frequency range	150kHz to 30MHz
EUT sample number	S01 & S03
Modification state	01
SE in test environment	Laptop
SE isolated from EUT	None
EUT set up	Refer to Appendix C
Photographs (Appendix F)	Photograph 3

The worst-case power line conducted emission measurements are listed below:

Results measured using the average detector compared to the average limit

Ref No.	Freq (MHz)	Conductor	Result (dBuV)	Spec Limit (dBuV)	Margin (dB)	Result Summary
1	0.35	Neutral	33.36	48.96	15.6	Pass
2	0.385	Neutral	31.69	48.17	16.48	Pass
3	0.525	Neutral	26.3	46	19.7	Pass
4	0.585	Live	27.69	46	18.31	Pass
5	0.7	Neutral	28.9	46	17.1	Pass
6	0.925	Live	26.97	46	19.03	Pass
7	1.19	Neutral	28.84	46	17.16	Pass
8	1.275	Live	26.72	46	19.28	Pass
9	1.505	Neutral	27.49	46	18.51	Pass
10	1.85	Live	28.93	46	17.07	Pass
11	1.91	Live	27.2	46	18.8	Pass
12	3.39	Neutral	26.26	46	19.74	Pass
13	4.5	Neutral	26.69	46	19.31	Pass
14	4.995	Live	26.09	46	19.91	Pass
15	10.35	Live	31.42	50	18.58	Pass
16	12.61	Live	36.29	50	13.71	Pass
17	13.16	Live	36.47	50	13.53	Pass
18	19.45	Live	35.53	50	14.47	Pass
19	21.525	Live	36.78	50	13.22	Pass
20	24.64	Live	32.58	50	17.42	Pass

Results measured using the quasi-peak detector compared to the quasi-peak limit

Ref No.	Freq (MHz)	Conductor	Result (dBuV)	Spec Limit (dBuV)	Margin (dB)	Result Summary
1	0.18	Neutral	47.39	64.49	17.1	Pass
2	0.24	Neutral	43.81	62.1	18.29	Pass
3	0.35	Neutral	39.67	58.96	19.29	Pass
4	0.43	Live	40.1	57.25	17.15	Pass
5	0.455	Neutral	39.74	56.78	17.04	Pass
6	0.635	Neutral	38.24	56	17.76	Pass
7	0.765	Neutral	39.67	56	16.33	Pass
8	0.705	Neutral	36.94	56	19.06	Pass
9	0.74	Live	40.16	56	15.84	Pass
10	0.83	Neutral	37.88	56	18.12	Pass
11	0.97	Live	38.16	56	17.84	Pass
12	1.19	Live	39.26	56	16.74	Pass
13	1.34	Neutral	38.04	56	17.96	Pass
14	1.72	Live	37.8	56	18.2	Pass
15	1.85	Neutral	37.45	56	18.55	Pass

Specification limits :

Conducted emission limits (47 CFR 15: Clause 15.207):

Conducted disturbance at the mains ports.

Frequency range MHz	Limits dBuV	
	Quasi-peak	Average
0.15 to 0.5	66 to 56 ²	56 to 46 ²
0.5 to 5	56	46
5 to 30	60	50

Notes:

- The lower limit shall apply at the transition frequency.
- The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

Notes:

- (a) The levels may have been rounded for display purposes.
- (b) The following table summarises the effect of the EUT operating mode and internal configuration on the measured emission levels :

	See (i)	See (ii)	See (iii)	See (iv)
Effect of EUT operating mode on emission levels	✓			
Effect of EUT internal configuration on emission levels		✓		

(i) Parameter defined by standard and / or single possible, refer to Appendix C
(ii) Parameter defined by client and / or single possible, refer to Appendix C
(iii) Parameter had a negligible effect on emission levels, refer to Appendix C
(iv) Worst case determined by initial measurement, refer to Appendix C

A4 Antenna Gain

The maximum antenna gain for the antenna types to be used with the EUT, as declared by the client, is 7 dBi.

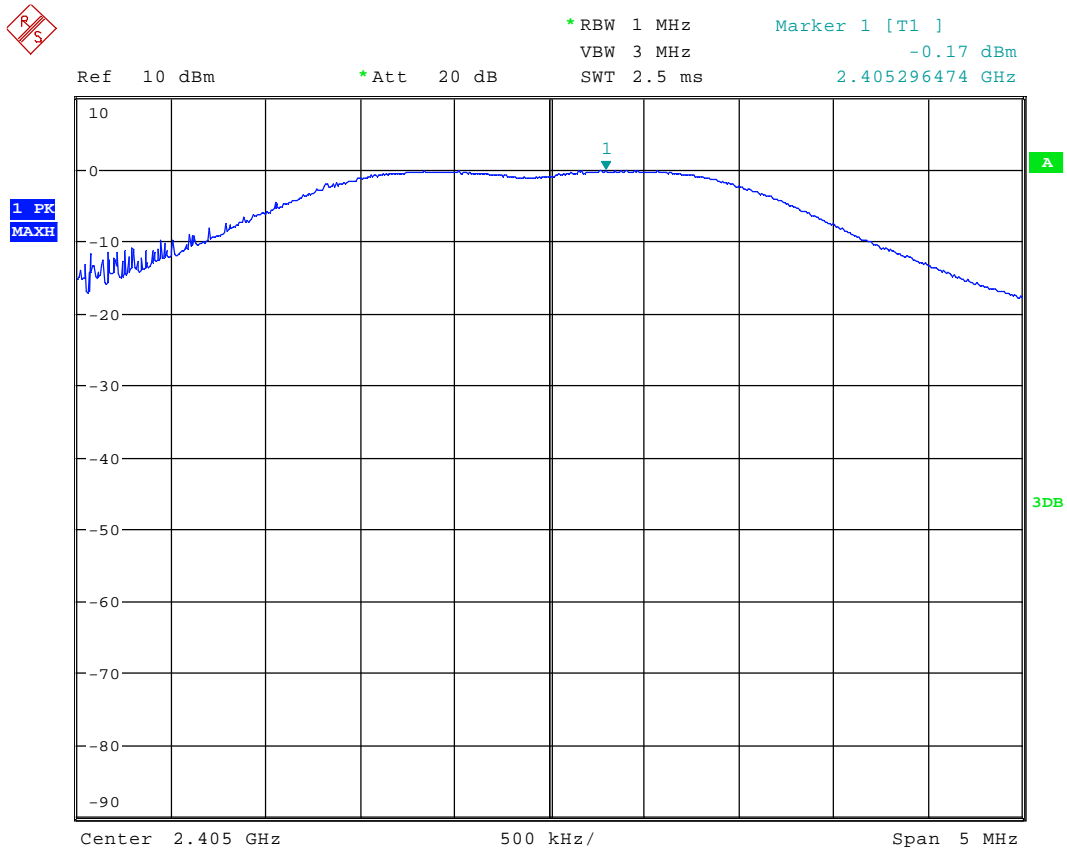
Appendix B:

Supporting Graphical Data

This appendix contains graphical data obtained during testing.

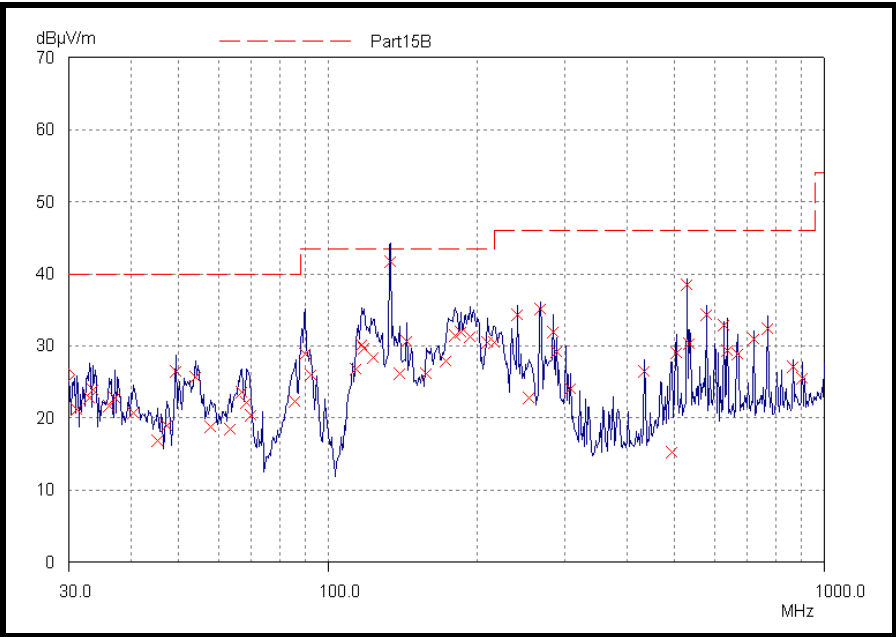
Notes:

- (a) The radiated electric field emissions and conducted emissions graphical data in this appendix is preview data. For details of formal results, refer to Appendix A and Appendix B.
- (b) The time and date on the plots do not necessarily equate to the time of the test.
- (c) Where relevant, on power line conducted emission plots, the limit displayed is the average limit, which is stricter than the quasi peak limit.
- (d) Appendix C details the numbering system used to identify the sample and its modification state.
- (e) The plots presented in this appendix may not be a complete record of the measurements performed, but are a representative sample, relative to the final assessment.

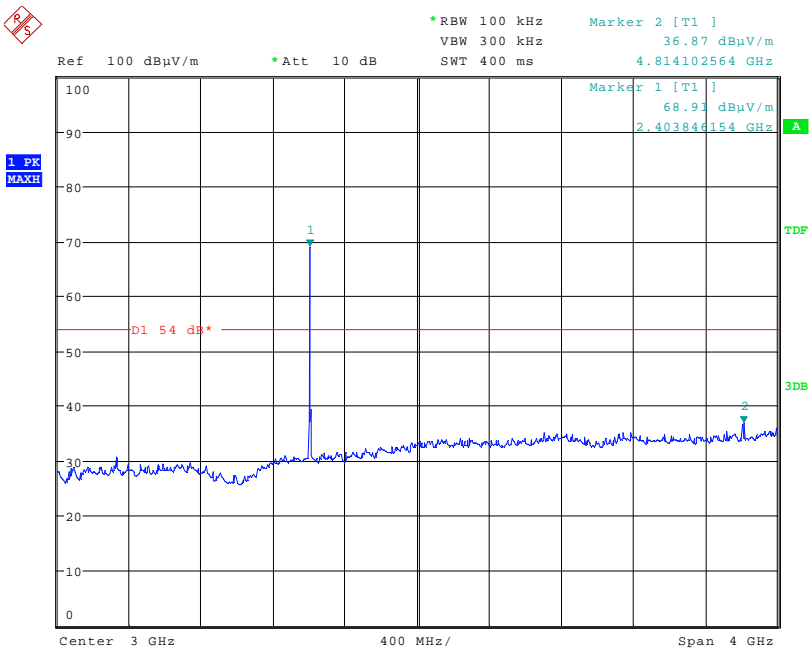


Date: 17.NOV.2010 09:33:21

Conducted carrier power 2405.0MHz

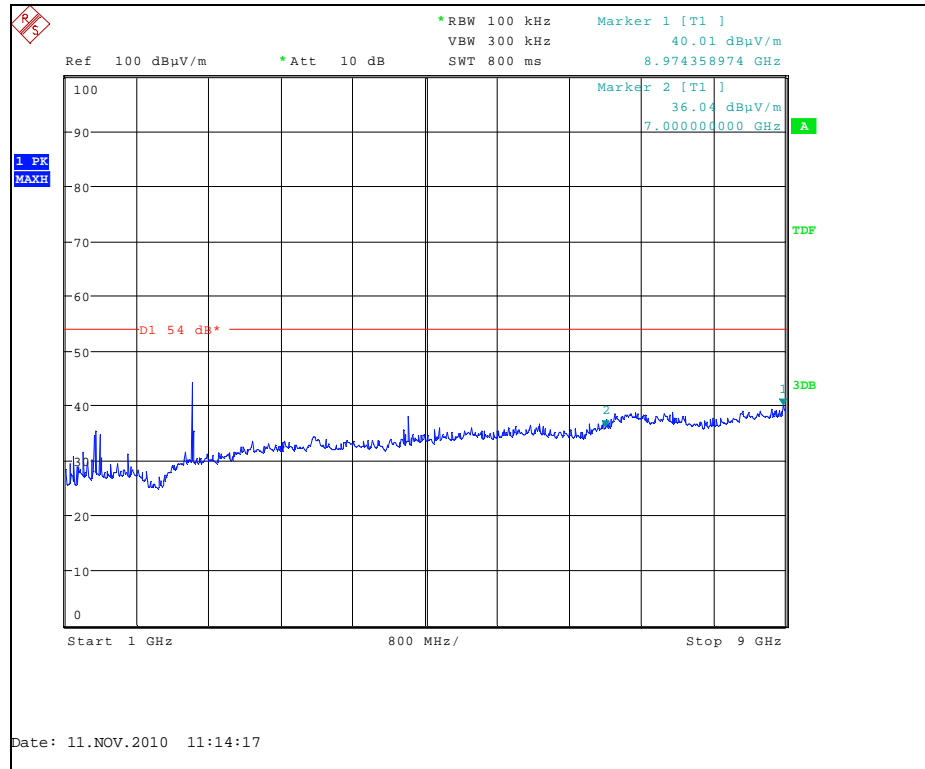


Transmitter Radiated Spurious Emissions 30 MHz to 1 GHz – 2405.0MHz

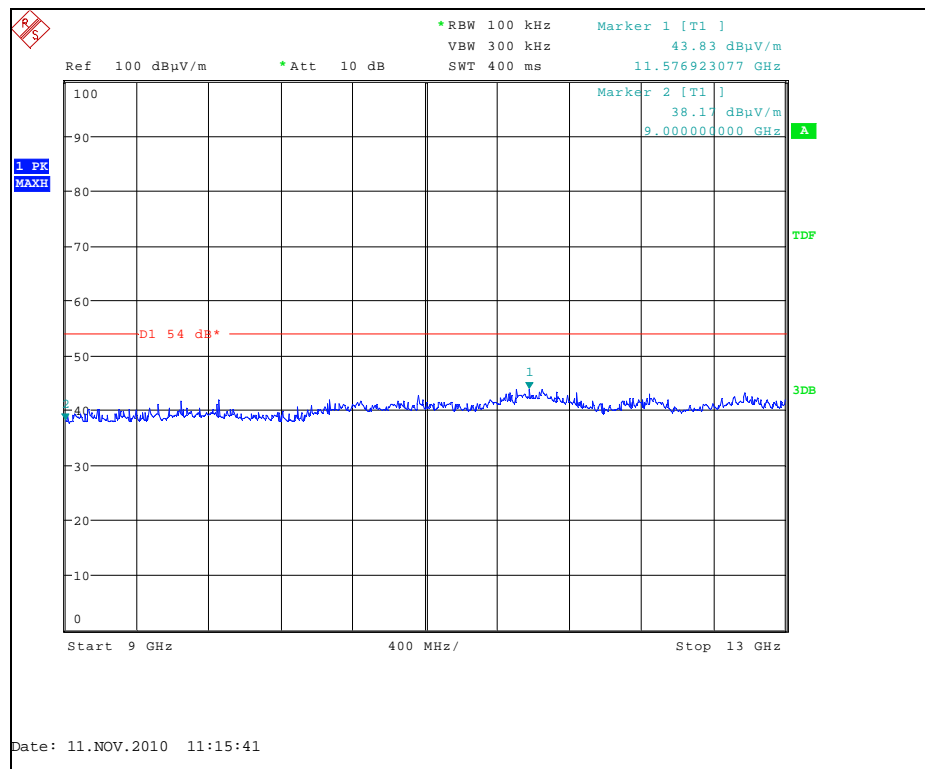


Date: 11.NOV.2010 10:45:44

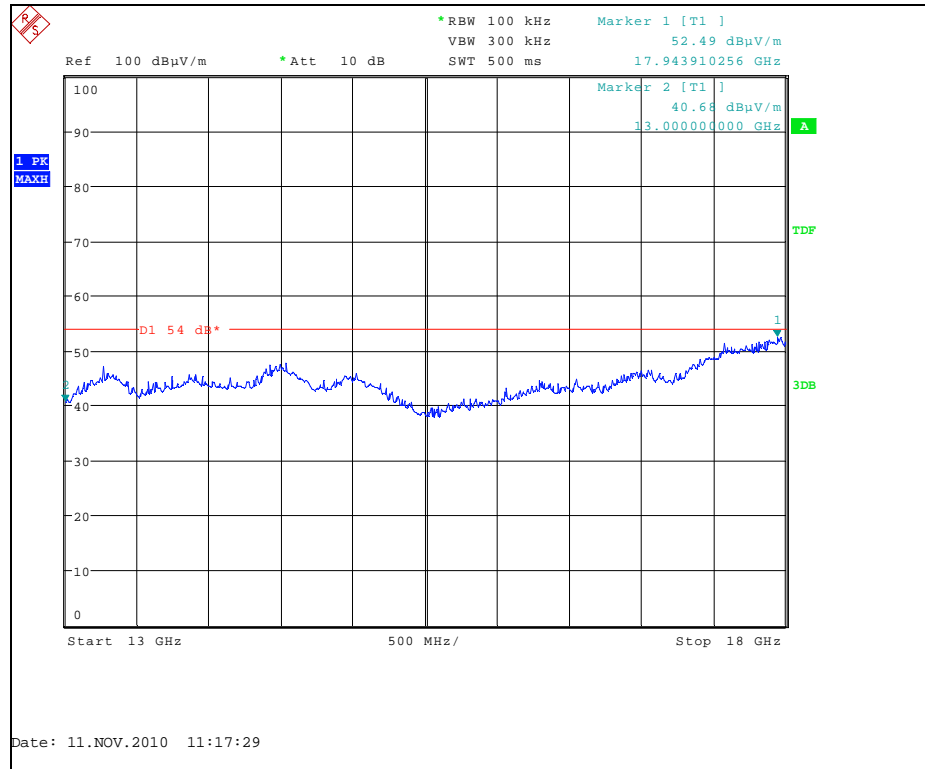
Transmitter Radiated Spurious Emissions 1 GHz to 5 GHz – 2405.0MHz



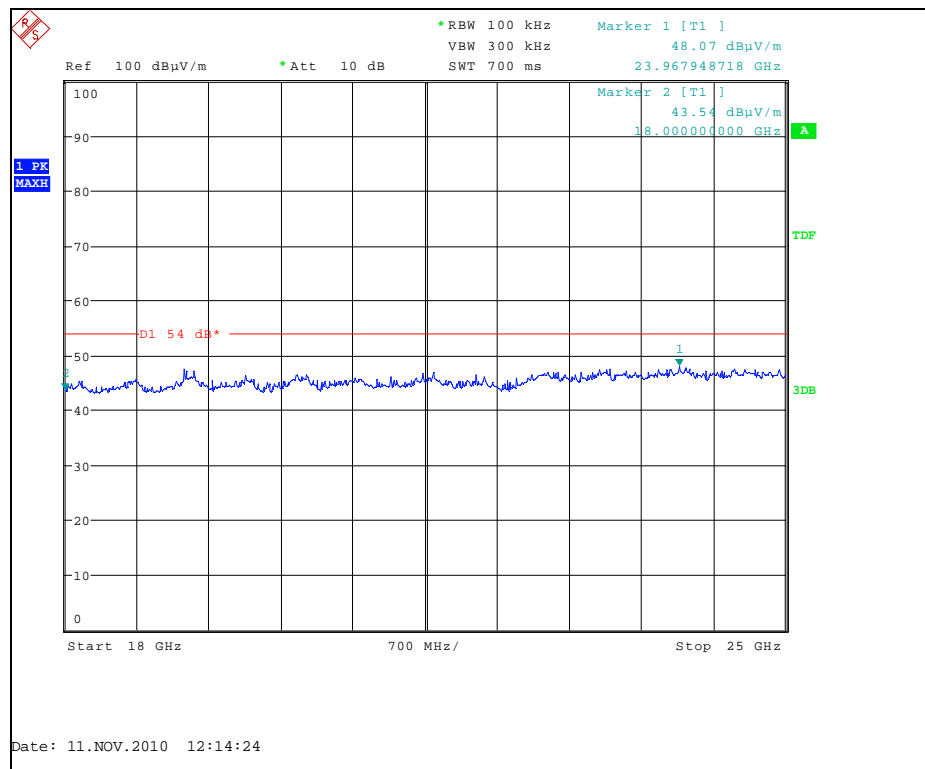
Transmitter Radiated Spurious Emissions 5 GHz to 9 GHz – 2405.0MHz



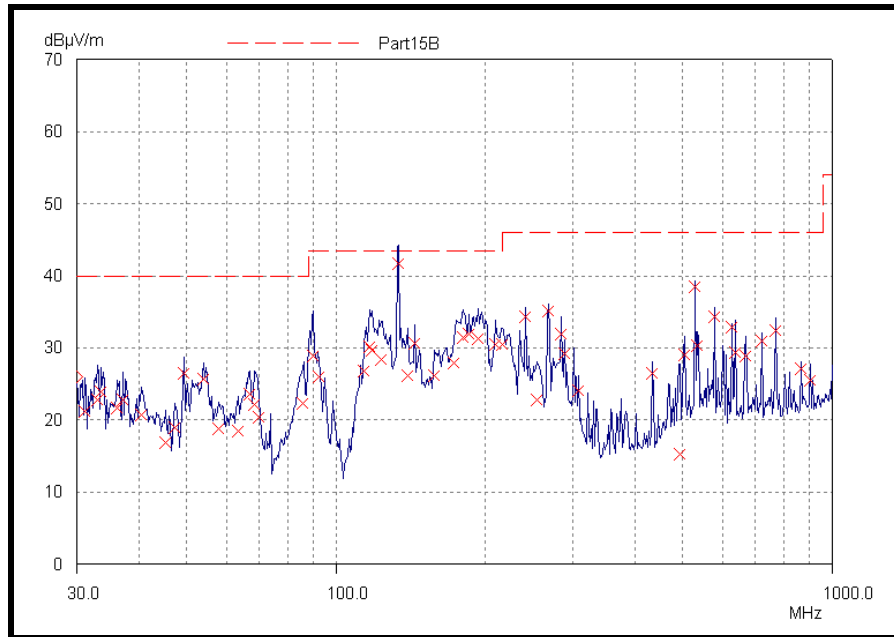
Transmitter Radiated Spurious Emissions 9 GHz to 13 GHz – 2405.0MHz



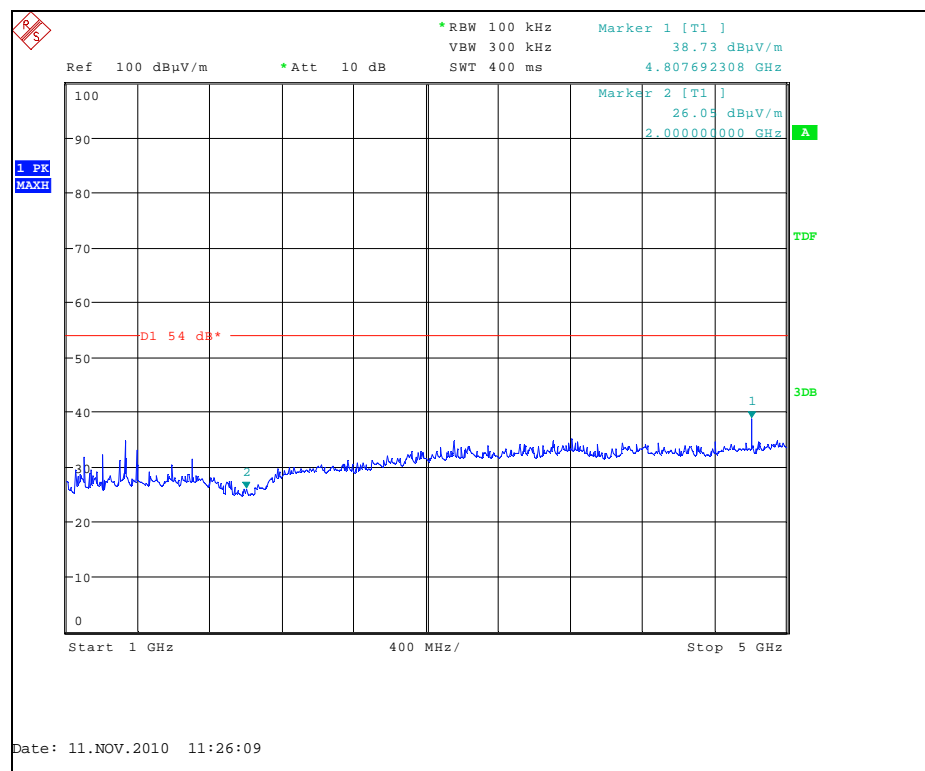
Transmitter Radiated Spurious Emissions 13 GHz to 18GHz – 2405.0MHz



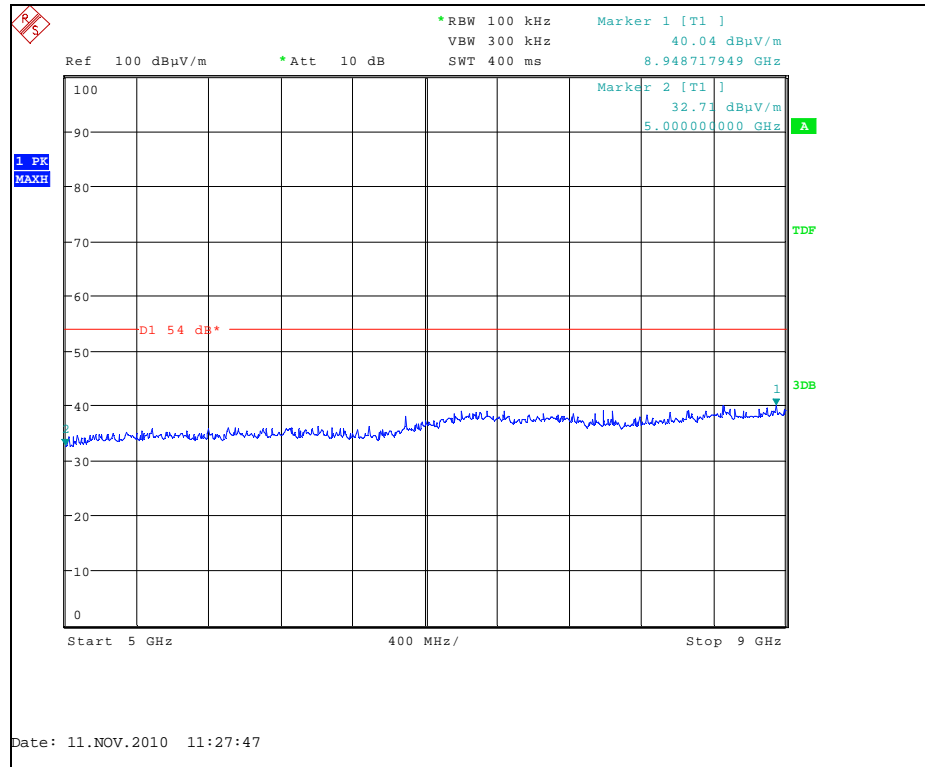
Transmitter Radiated Spurious Emissions 18 GHz to 25 GHz – 2405.0MHz



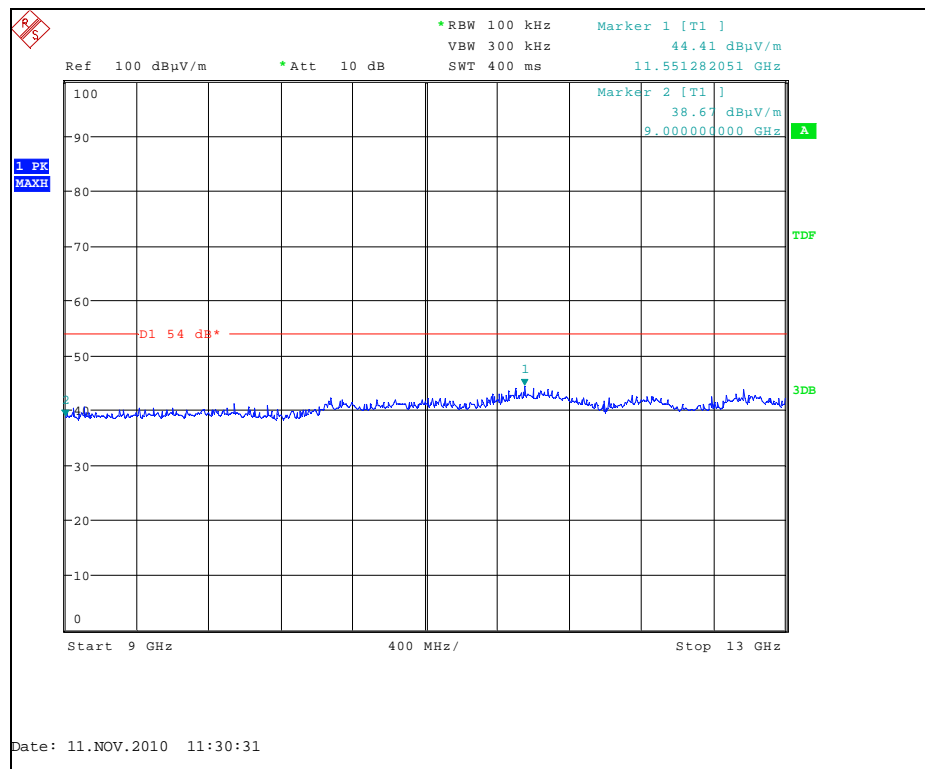
Receiver Radiated Spurious Emissions 30 MHz to 1 GHz – 2405.0MHz



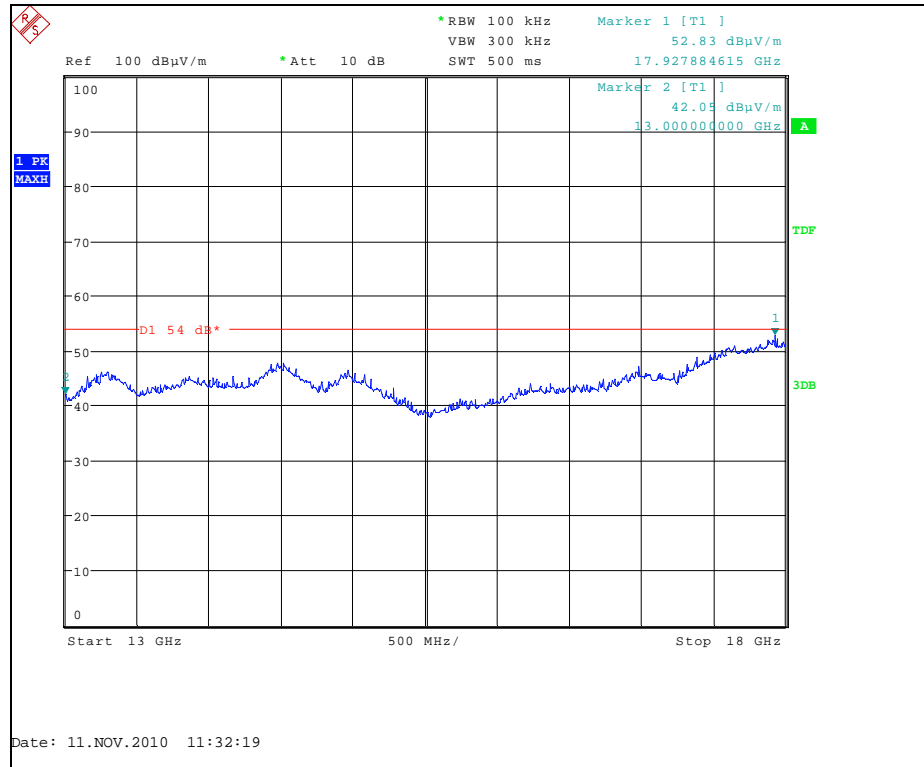
Receiver Radiated Spurious Emissions 1 GHz to 5 GHz – 2405.0MHz



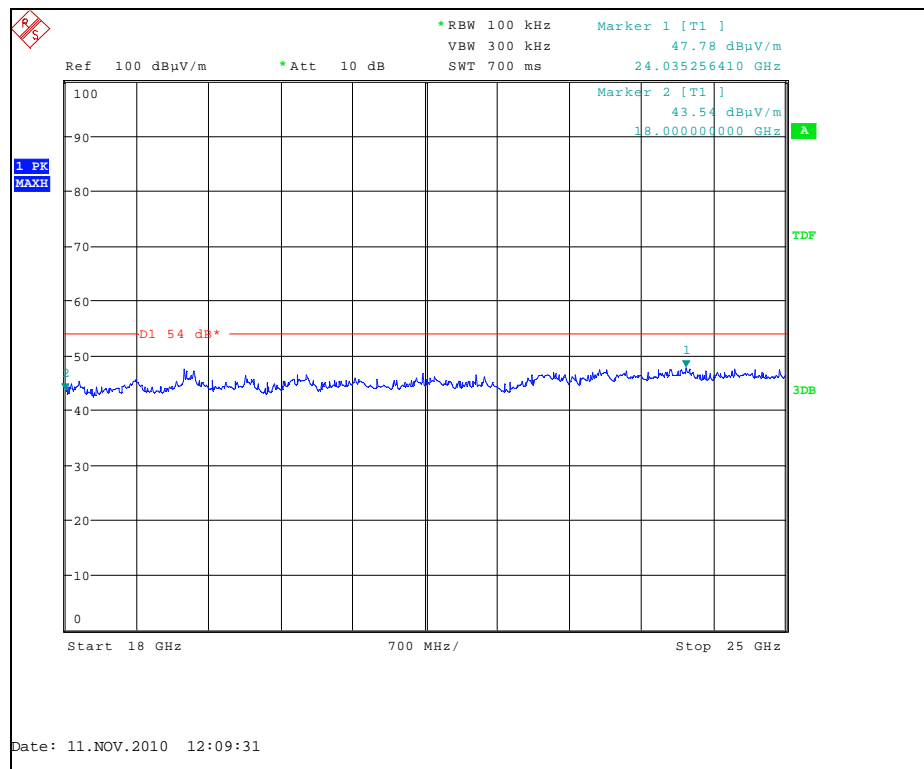
Receiver Radiated Spurious Emissions 5 GHz to 9 GHz – 2405.0MHz



Receiver Radiated Spurious Emissions 9 GHz to 13 GHz – 2405.0MHz



Receiver Radiated Spurious Emissions 13 GHz to 18GHz – 2405.0MHz



Receiver Radiated Spurious Emissions 18 GHz to 25 GHz – 2405.0MHz

Appendix C: Additional Test and Sample Details

This appendix contains details of:

1. The samples submitted for testing.
2. Details of EUT operating mode(s)
3. Details of EUT configuration(s) (see below).
4. EUT arrangement (see below).

Throughout testing, the following numbering system is used to identify the sample and its modification state:

Sample No: Sxx Mod w

where:

xx	= sample number	eg. S01
w	= modification number	eg. Mod 2

The following terminology is used throughout the test report:

Support Equipment (SE) is any additional equipment required to exercise the EUT in the applicable operating mode. Where relevant SE is divided into two categories:

SE in test environment: The SE is positioned in the test environment and is not isolated from the EUT (e.g. on the table top during REFE testing).

SE isolated from the EUT: The SE is isolated via filtering from the EUT. (e.g. equipment placed externally to the ALSR during REFE testing).

EUT configuration refers to the internal set-up of the EUT. It may include for example:

- Positioning of cards in a chassis.
- Setting of any internal switches.
- Circuit board jumper settings.
- Alternative internal power supplies.

Where no change in EUT configuration is **possible**, the configuration is described as "single possible configuration".

EUT arrangement refers to the termination of EUT ports / connection of support equipment, and where relevant, the relative positioning of samples (EUT and SE) in the test environment.

For further details of the test procedures and general test set ups used during testing please refer to the related document "EMC Test Methods - An Overview", which can be supplied by TRaC Telecoms & Radio upon request.

C1) Test samples

The following samples of the apparatus were submitted by the client for testing :

Sample No.	Description	Identification
01	RF500	6805302
03	Power Supply	DT6012

The following samples of apparatus were submitted by the client as host, support or drive equipment (auxiliary equipment):

Sample No.	Description	Identification

The following samples of apparatus were supplied by TRaC Telecoms & Radio as support or drive equipment (auxiliary equipment):

Identification	Description
None	Network Port Connection

C2) EUT Operating Mode During Testing.

During testing, the EUT was exercised as described in the following tables :

Test	Description of Operating Mode:
Transmitter radiated spurious emissions	EUT active & transmitting.

Test	Description of Operating Mode:
Receiver radiated spurious emissions	EUT active but non-transmitting.

Test	Description of Operating Mode:
PLCE	EUT active & transmitting. EUT active but non-transmitting.

C3) EUT Configuration Information.

The EUT was submitted for testing in one single possible configuration.

C4) List of EUT Ports

The tables below describe the termination of EUT ports:

Sample : 01
Tests : Radiated Emissions

Port	Description of Cable Attached	Cable length	Equipment Connected
Antenna	No Cable	-	7dBi Antenna
Power	2 Core	2m	AC Adaptor DT6012
Network	CAT-5 Cable	2m	Network port

C5 Details of Equipment Used

For Radiated Measurements:

TRAC Ref	Type	Description	Manufacturer	Date Calibrated.
TRLUH281	FSU46	Spectrum Analyser	Rhode & Schwarz	29/01/2009
TRL138	3115	1-18GHz Horn Antenna	EMCO	10/09/2009
TRL139	3115	1-18GHz Horn Antenna	EMCO	17/08/2009
TRL572	8499B	1 – 26.5 GHz Pre Amplifier	Agilent	04/07/2008
TRLUH186	ESHS10	Receiver	Rhode & Schwarz	10/12/2009
TRLUH191	CBL611/A	BiLog Periodic Antenna	York	27/01/2010
TRLUH372	6201-69	30MHz – 1 GHz Pre Amplifier	Watkins Johnson	14/04/2010

For Conducted Measurements

TRAC Ref	Type	Description	Manufacturer	Date Calibrated.
TRLUH281	FSU46	Spectrum Analyser	Rhode & Schwarz	29/01/2009

For Power Line Conducted Emissions

TRAC Ref	Type	Description	Manufacturer	Date Calibrated
TRLUH195	ESH3-Z5	Single-phase LISN	Rhode & Schwarz	10/12/2009
TRLUH187	ESVS10	Receiver	Rhode & Schwarz	10/12/2009

Appendix D:

Additional Information

No additional information is included within this test report.

Appendix E:**Calculation of the duty cycle correction factor**

Using a spectrum analyser in zero span mode, centred on the fundamental carrier frequency with a RBW of 1MHz and a video Bandwidth of 1MHz the sweep time was set accordingly to capture the pulse train. The transmit pulsewidths and period was measured. A plots of the pulse train is contained in Appendix B of this test report.

If the pulse train was less than 100 ms, including blanking intervals, the duty cycle was calculated by averaging the sum of the pulsewidths over one complete pulse train. However if the pulse train exceeds 100ms then the duty cycle was calculated by averaging the sum of the pulsewidths over the 100ms width with the highest average value. (The duty cycle is the value of the sum of the pulse widths in one period (or 100ms), divided by the length of the period (or 100ms). The duty cycle correction factor was then expressed in dB and the peak emissions adjusted accordingly to give an average value of the emission.

Correction factor dB = $20 \times (\text{Log}_{10} \text{ Calculated Duty Cycle})$

Therefore the calculated duty cycle was determined:

The pulse train period was greater than >100ms and in as shown from the plots in contained in appendix B of this test report.

Duty cycle = $\frac{\text{the sum of the highest average value pulsewidths over 100ms}}{100\text{ms}}$

e.g

$$= \frac{7.459\text{ms}}{100\text{ms}} = 0.07459$$

0.07459 or 7.459%

Correction factor (dB) = $20 \times (\text{Log}_{10} 0.07459) = -22.54\text{dB}$

Appendix F:

Photographs and Figures

The following photographs were taken of the test samples:

1. Radiated electric field emissions arrangement: RF500 front view.
2. Radiated electric field emissions arrangement: RF500 close up.



Photograph 1



Photograph 2

