REPORT ON THE CERTIFICATION TESTING OF A
COMARK Ltd
RF500LITE
WITH RESPECT TO
THE FCC RULES CFR 47, PART 15.247 September 2007
INTENTIONAL RADIATOR SPECIFICATION

TEST REPORT NO: RU1437/8458

COPY NO: 2

ISSUE NO: 1

FCC ID: TVHRF500LITE

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COMARK Ltd
RF500LITE
WITH RESPECT TO
THE FCC RULES CFR 47, PART 15.247 September 2007
INTENTIONAL RADIATOR SPECIFICATION

TEST DATE: 3rd – 5th March 2008

TESTED BY: Daniel Winstanley — Digitally signed by Daniel Winstanley DN: CN = Daniel Winstanley, C = <n Reason: I am the author of this document Date: 2008.04.01 14:48:31 +01'00' — D WINSTANLEY

APPROVED BY: John Charters — Digitally signed by John Charters DN: CN = John Charters, C = GB, O = TRL Compliance Ltd Reason: I am approving this document Date: 2008.04.01 14:52:31 +01'00' — J CHARTERS RADIO SECTION LEADER

DATE: 1st April 2008

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CONTENTS

Notes:

1. Component failure during test — YES [ ] NO [X]
2. If Yes, details of failure:
3. The facilities used for the testing of the product contain in this report are FCC Listed.
4. The contents of the attached applicants declarations and other supplied information are not covered by the scope of this laboratory's UKAS or FCC accreditations' and is provided in good faith.

TRL Compliance
part of TRAC global

CERTIFICATE OF CONFORMITY & COMPLIANCE

FCC IDENTITY:	TVHRF500LITE					
PURPOSE OF TEST:	Certification					
TEST SPECIFICATION:	FCC RULES CFR 47, Part 15.247 September 2007					
TEST RESULT:	Compliant to Specification					
EQUIPMENT UNDER TEST:	RF500LITE					
EQUIPMENT SERIAL No:	ENG01					
ITU: EMISSION CODE:	1M6F1D					
EQUIPMENT TYPE:	Temperature Monitor					
CARRIER EMISSION:	0.00611 W					
ANTENNA TYPE:	Unique Antenna Connector					
GAIN ANTENNA:	7dBi Maximum Gain antenna					
FREQUENCY OF OPERATION:	2405MHz					
CHANNEL SPACING:	N/A Wideband channel					
NUMBER OF CHANNELS:	1					
FREQUENCY GENERATION:	SAW Resonator	[ ]	Crystal	[ ]	Synthesiser	[X]
MODULATION METHOD:	FHSS	[ ]	DSSS	[X]	Other	[ ]
POWER SOURCE(s):	+110Vac					
TEST DATE(s):	3rd – 5th March 2008					
ORDER No(s):	SO6309					
APPLICANT:	Comark Ltd.					
ADDRESS:	Comark House Gunnels Wood Park Gunnelswood Road Stevenage Heartforshire SG1 2TS United Kingdom					

TESTED BY: Daniel Winstanley — Digitally signed by Daniel Winstanley DN: CN = Daniel Winstanley, C = <n Reason: I am the author of this document Date: 2008.04.01 14:47:53 +01'00' — D WINSTANLEY

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TRAC testing regulatory and compliance

APPLICANT'S SUMMARY

EQUIPMENT UNDER TEST (EUT):	RF500LITE
EQUIPMENT TYPE:	Temperature Monitor
SERIAL NUMBER OF EUT:	ENG01
PURPOSE OF TEST:	Certification
TEST SPECIFICATION(s):	FCC RULES CFR 47, Part 15.247 September 2007
TEST RESULT:	COMPLIANT Yes [X] No [ ]
APPLICANT'S CATEGORY:	MANUFACTURER [X] IMPORTER [ ] DISTRIBUTOR [ ] TEST HOUSE [ ] AGENT [ ]
APPLICANT'S ORDER No(s):	SO6309
APPLICANT'S CONTACT PERSON(s):	Mr P Morrison
E-mail address:	paulmorrison@comarkltd.com
APPLICANT:	Comark Ltd
ADDRESS:	Comark House Gunnels Wood Park Gunnelswood Road Stevenage Heartforshire SG1 2TS United Kingdom
TEL:	+44 1483 367367
FAX:	+44 1483 367400
EUT(s) COUNTRY OF ORIGIN:	United Kingdom
TEST LABORATORY:	TRL Compliance Ltd
UKAS ACCREDITATION No:	0728
TEST DATE(s):	3rd – 5th March 2008
TEST REPORT No:	RU1437/8458

EQUIPMENT TEST / EXAMINATIONS REQUIRED

1.

TEST/EXAMINATION	RULE PART	DETECTOR	APPLICABILITY
Intentional Emission Frequency:	15.247	Peak	Yes
Intentional Emission Field Strength:	-	-	No
Intentional Emission Band Occupancy:	15.247(a)1	Peak	Yes
Intentional Emission EIRP (mW):	15.247(b)1	Peak	Yes
Spurious Emissions – Conducted:	15.207	Quasi Peak Average	Yes
Spurious Emissions – Conducted:	15.247	Peak	Yes
Spurious Emissions – Radiated <1000MHz:	15.209 ,15.247	Quasi Peak	Yes
Spurious Emissions – Radiated >1000MHz:	15.247 15.209	Peak average	Yes
Transmitter Carrier Frequency Separation:	15.247(a)(1)	Peak	Yes
Transmitter Maximum Peak Power Output Power:	15.247(b)(1)	Peak	Yes
Transmitter Band Edge Conducted Emissions:	15.247(c)	Peak	Yes
Transmitter Band Edge Radiated Emission:	15.247(c)	Peak	Yes
Extrapolation Factor:	15.31(f)	-	Yes
Maximum Frequency of Search:	15.33	-	Yes
Antenna Arrangements Integral:	15.203	-	Yes
Antenna Arrangements External Connector:	15.204	-	Yes
Restricted Bands:	15.205	-	Yes

2. Product Description : 1M6F1D

3. Temperatures: Ambient (Tnom) 16^{o}C

4. Supply Voltages: Vnom +110Vac

Note: Vnom voltages are as stated above unless otherwise shown on the test report page

5. Equipment Category: Single channel [X]
Multi-channel [ ]

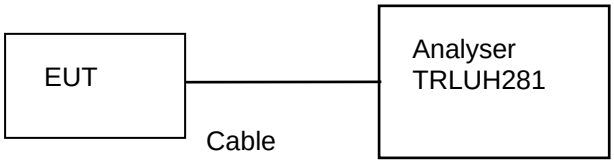
6. Channel spacing: Narrowband [ ]
Wideband [X]

TRANSMITTER TESTS

TRANSMITTER 6dB BANDWIDTH – CONDUCTED - PART 15.247(A)(2)

Ambient temperature = 16^{o}C
Relative humidity = 54%
Conditions = Radio Lab
Supply voltage = +110Vac

Diagram



Frequency	Channel	F_{lower}	F_{Higher}	Measured Bandwidth	Limit
2.405MHz	1	2404.186795 MHz	2405.789359 MHz	1.602 MHz	>500kHz

Notes: 1 For analyser plots see annex G.

Test Method: 1 The EUT was connected to the analyser via the unique antenna connector & a cable.
2 The 6dB bandwidth was recorded with the EUT activity transmitting data.

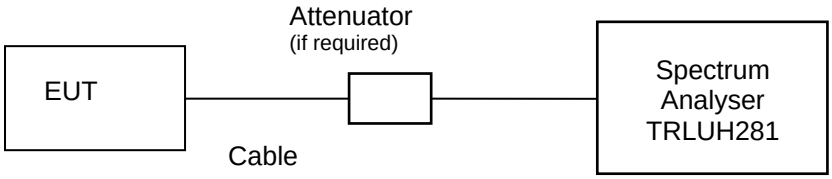
TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	RHODE & SCHWARZ	FSU46	200034	UH281	**X**

TRANSMITTER TESTS

TRANSMITTER - MAXIMUM PEAK POWER - CONDUCTED - PART 15.247(B)(3)

Ambient temperature = 16^{o}C
Relative humidity = 54%
Conditions = Radio Lab
Supply voltage = +110Vac

Diagram



Frequency MHz	Channel	Peak Power dBm	Peak Power Watts	Antenna Gain dBi	Average Power Watts	Limit Watts
2.405	1	0.86	0.00122	7	0.00611	1

Notes:
1 Gain of antenna 7dBi, maximum gain antenna supplied by manufacturer.
2 For analyser plots see annex H.

Test Method:
1 The EUT was connected to the spectrum analyser via the unique antenna connector a cable and attenuator - if applicable.
2 The EUT was operated in transmit mode with modulation.
3 The level on the analyser was recorded.
4 The resolution bandwidth of the analyser was set to > than the 6dB bandwidth

Test equipment used for Peak Power measurement:

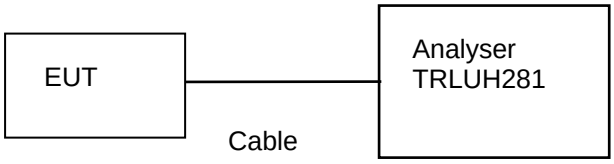
TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	RHODE & SCHWARZ	FSU46	200034	UH281	**X**

TRANSMITTER TESTS

TRANSMITTER POWER SPECTRAL DENSITY – CONDUCTED - PART 15.247(E)

Ambient temperature = 17^{o}C
Relative humidity = 53%
Conditions = Radio Lab
Supply voltage = +110Vac

Diagram



Frequency	Channel	Measured Power Spectral Density	Limit
2.405MHz	1	-5.37 dBm	+8 dBm

Notes: 1 For analyser plots see annex E.

Test Method:
1 The EUT was connected to the analyser via the unique antenna connector & a cable
2 The resolution bandwidth on the analyser was set to 3kHz and trace set to max hold.
3 The span is set to 3MHz
4 The sweep time is 1000 seconds (Span/3kHz).
5 The analyser level is offset to take the antenna gain (7dBi) into account.

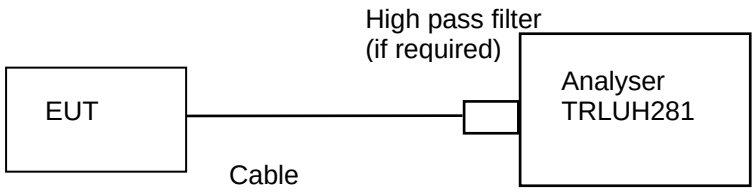
TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	RHODE & SCHWARZ	FSU46	200034	UH281	**X**

TRANSMITTER TESTS

TRANSMITTER SPURIOUS EMISSIONS – CONDUCTED – Part 15.247(D)

Ambient temperature	=	16^{o}C
Relative humidity	=	53%
Conditions	=	Conducted –Radio Lab
Supply voltage	=	+110Vac

Diagram



Spurious Emissions

Range Frequency (MHz)	Emission Frequency (GHz)	Level (dBm)	Limit (dBm)
30 – 25000	4810.256 7216.602	-45.89 -42.95	-24.25 -24.25

See spectrum analyser scan plots – Annex J

Bandedge Compliance

Bandedge	Result
Lower	Measured As Compliant
Upper	Measured As Compliant

Notes:
1 Section 15.247(c) states that all spurious emissions measured within a 100kHz bandwidth shall be attenuated by at least 20dB below the level of the highest fundamental level measured within a 100kHz bandwidth.
2 Emissions with levels 20dB less than the limit are not necessarily recorded.
3 For analyser plots see annex J.

Test Method:
1 The EUT was connected to the analyzer using a cable and high pass filter (if required).
2 Frequency sweeps were performed to check for spurious emissions.
3 Any emissions discovered were checked for compliance against the limit.
4 A marker was set on the peak emission of the lowest channel. The delta marker function was then used to measure the highest out of band emissions. (If no peaks exist outside the band the level is taken at the band edge).
5 The delta marker function was then used to measure the highest out of band emissions. (If no peaks exist outside the band the level is taken at the band edge).

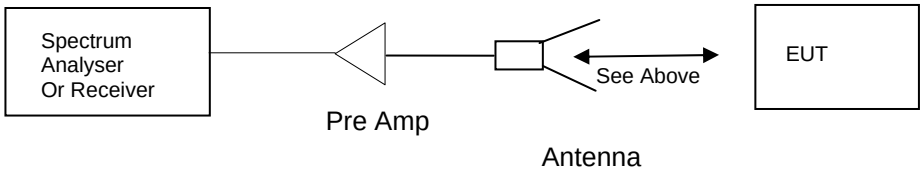
The test equipment used for the tests is shown below:

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	ROHDE & SCHWARZ	FSU	200034	UH281	**X**

TRANSMITTER TESTS

TRANSMITTER SPURIOUS EMISSIONS – RADIATED – Part 15.247(c) and 15.209

Ambient temperature	=	21°C	3m measurements <1GHz	[X]
Relative humidity	=	30%	3m measurements >1GHz	[X]
Conditions	=	Open Area Test Site (OATS)		
Supply voltage	=	+110Vac		



	Emission Frequency (MHz)	Meas. Rx. (dBuV)	Cable loss & Pre Amp Gain (dB)	Ant. Factor (dB/m)	Field Strength (dBµV/m)	Extrap. Factor (dB)	Result (µV/m)	Limit (µV/m)
30MHz – 88MHz Restricted bands	Note 5/6							100
88MHz – 216MHz Restricted bands	Note 5/6							150
216MHz – 960MHz Restricted bands	Note 5/6							200
960MHz – 1GHz Restricted bands	Note 5/6							500
1GHz – 26GHz Restricted bands	Note 5/6							500
30MHz -26GHz	Note 5/6							-20dBc

See annex E for initial pre scan results.

Notes:

1 Initial pre scans were performed see Annex E for plots.
2 See annex F for radiated bandedge compliance plots.
3 Emissions above 1GHz were measured with both a peak and average detectors.
4 Measurements were performed at 3 meters.
5 Only emissions with in 20dB of limit are recorded.
6 Emissions not directly related to the transmitter are reported under receiver tests.

Test Method:

1 As per section 15.247.
2 Measuring distances as Note 4 above.
3 EUT 0.8 metre above ground plane.
4 Emissions maximised by rotation of EUT, on an automatic turntable.
Raising and lowering the receiver antenna between 1m & 4m >30MHz.
Horizontal and vertical polarisations, of the receive antenna.
EUT orientation in three orthagonal planes. Maximum results recorded.

The test equipment used for the tests is shown overleaf:

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
AE, LOOP, Z2, 9kHz - 30MHz	ROHDE & SCHWARZ	HFH2	881058 - 53	07	
HORN ANTENNA	EMCO	3115	9010-3580	138	**X**
HORN ANTENNA	EMCO	3115	9010-3581	139	
RECEIVER	ROHDE & SCHWARZ	ESHS 10	830051/001	UH03	
RECEIVER	ROHDE & SCHWARZ	ESVS 10	825892/003	UH04	**X**
RANGE 1	TRL	3 METRE	N/A	UH06	**X**
AE, LOOP, Z2, 9kHz - 30MHz	ROHDE & SCHWARZ	HFH2	881058 - 53	07	
BILOG ANTENNA	CHASE	CBL6112	2129	UH93	**X**
SPECTRUM ANALYSER	ROHDE & SCHWARZ	FSU	200034	UH281	**X**
PRE AMPLIFIER	AGILENT	8449B	3008A01610	572	**X**

TRANSMITTER and RECEIVER TESTS

TRANSMITTER CONDUCTED EMISSIONS – AC POWER LINE Parts 15.207 & 15.107

SIGNIFICANT EMISSIONS

FREQUENCY (MHz)	MEASUREMENT RECEIVER READING (dBµV)	DETECTOR	CONDUCTOR (L or N)	LIMIT (dBµV)
0.165	49.23	Quasi Peak	Live	65.21
2.165	31.14	Average	Neutral	46.00
10.725	34.84	Average	Neutral	50.00
13.410	30.15	Average	Neutral	50.00
15.555	37.12	Average	Neutral	50.00
18.245	35.80	Average	Neutral	50.00
19.845	40.45	Average	Live	50.00
20.920	41.42	Quasi Peak	Neutral	60.00
23.070	46.05	Quasi Peak	Live	60.00
23.130	40.98	Average	Live	50.00
24.675	35.91	Average	Live	50.00
25.205	42.80	Quasi Peak	Neutral	60.00
25.255	31.06	Average	Live	50.00
26.285	39.91	Average	Neutral	50.00

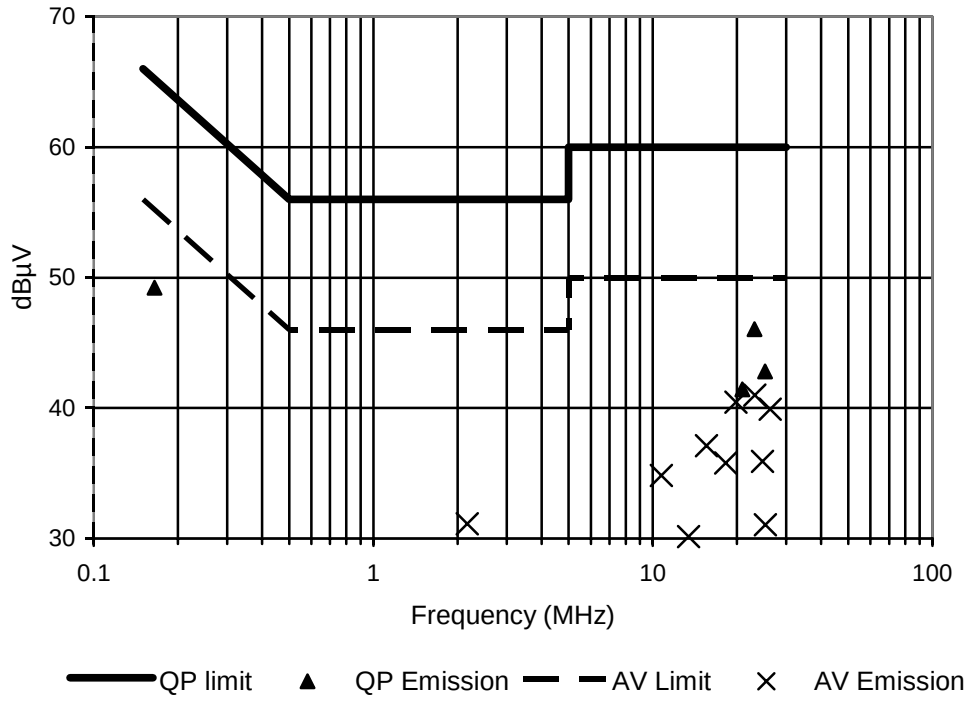
Notes: 1 See attached plot annex D
2 EUT in normal operation mode connected to PC and transmitting permanent carrier.
3 Worst case result recorded.

Test Method: 1 As per Radio – Noise Emissions, ANSI C63.4: 2003

The test equipment used for the Transmitter Conducted Emissions – AC Power Line Part 15.207 test was:

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
RECEIVER	ROHDE & SCHWARZ	ESHS 10	830051/001	UH03	
LISN/AMN	ROHDE & SCHWARZ	ESH3-Z5	863906/018	UH05	
RECEIVER	ROHDE & SCHWARZ	ESHS 10	841429/012	UH187	**X**
LISN/AMN	ROHDE & SCHWARZ	ESH3-Z5	8407 31/015	UH195	**X**

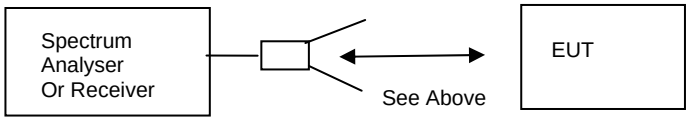
POWER LINE CONDUCTION EMISSIONS



RECEIVER TESTS

RECEIVER SPURIOUS EMISSIONS – RADIATED – PART 15.109

Ambient temperature	=	14^{o}C	3m measurements <1GHz	[X]
Relative humidity	=	43%	3m measurements >1GHz	[X]
Conditions	=	Open Area Test Site (OATS)		
Supply voltage	=	+110Vac		



Antenna

	FREQ. (MHz)	MEAS. Rx. (dBµV)	CABLE LOSS (dB)	ANT FACT. (dB/m)	PRE AMP (dB)	FIELD ST'GH (dBµV/m)	FIELD ST'GH (µV/m)	LIMIT (µV/m)
30MHz – 88MHz	30.55	15.88	0.42	17.7	-	34.0	50.11	100
	31.05	16.08	0.42	17.5	-	34.0	50.11	100
	32.60	18.97	0.43	16.6	-	36.0	63.09	100
	33.35	15.16	0.44	16.2	-	31.8	38.90	100
	34.95	15.22	0.48	15.3	-	31.0	35.48	100
	36.70	15.50	0.50	14.2	-	30.2	32.35	100
	37.15	16.65	0.55	13.9	-	31.1	35.89	100
	39.05	17.92	0.58	13.0	-	31.5	37.58	100
	42.30	19.51	0.59	11.4	-	31.5	37.58	100
	43.95	19.12	0.58	10.5	-	30.2	32.35	100
	44.15	21.52	0.58	10.4	-	32.5	42.17	100
	44.95	23.22	0.58	10.0	-	33.8	48.97	100
	48.45	29.91	0.59	8.3	-	38.8	87.09	100
	51.15	28.57	0.63	7.3	-	36.5	66.83	100
	52.45	26.85	0.65	6.9	-	34.4	52.48	100
	54.10	26.91	0.69	6.4	-	34.0	50.11	100
	54.60	25.59	0.71	6.2	-	32.5	42.17	100
	55.15	25.19	0.71	6.1	-	32.0	39.81	100
	56.70	32.40	0.70	5.8	-	38.9	88.10	100
	66.65	21.48	0.72	5.0	-	27.2	22.90	100
	73.75	20.59	0.81	5.6	-	27.0	22.38	100
	86.05	30.45	0.85	7.9	-	39.2	91.20	100
88MHz – 216MHz	144.00	20.01	1.19	10.4	-	31.6	38.01	150
	147.45	23.80	1.20	10.1	-	35.1	56.88	150
	157.55	20.73	1.27	9.5	-	31.5	37.58	150
	159.75	21.53	1.27	9.4	-	32.2	40.73	150
	168.85	25.60	1.30	9.1	-	36.0	63.09	150
	178.65	26.24	1.36	8.4	-	36.0	63.09	150
	184.35	24.30	1.40	8.3	-	34.0	50.11	150
	186.10	19.28	1.42	8.3	-	29.0	28.18	150
	187.05	20.66	1.44	8.3	-	30.4	33.11	150

Limits	30MHz to 88MHz	100µV/m @ 3m
	88MHz to 216MHz	150µV/m @ 3m
	216MHz to 960MHz	200µV/m @ 3m
	960MHz to 1GHz	500µV/m @ 3m
	1GHz to 5GHz	500µV/m @ 3m

	FREQ. (MHz)	MEAS. Rx. (dBµV)	CABLE LOSS (dB)	ANT FACT. (dB/m)	PRE AMP (dB)	FIELD ST'GH (dBµV/m)	FIELD ST'GH (µV/m)	LIMIT (µV/m)
216MHz – 960MHz	229.05	27.56	1.64	9.7	-	38.9	88.10	200
	236.10	28.64	1.66	10.3	-	40.6	107.15	200
	243.45	28.41	1.69	11.2	-	41.3	116.14	200
	246.05	20.10	1.70	11.5	-	33.3	46.23	200
	258.05	23.87	1.73	12.9	-	38.5	84.14	200
	265.95	26.52	1.78	12.9	-	41.2	114.81	200
	272.05	26.25	1.85	12.5	-	40.6	107.15	200
	276.25	19.33	1.87	12.5	-	33.7	48.41	200
	288.10	25.80	1.90	12.7	-	40.4	104.71	200
	299.70	22.26	1.94	12.9	-	37.1	71.61	200
	307.20	21.32	1.98	13.3	-	36.6	67.60	200
	336.10	24.41	2.09	14.0	-	40.5	105.92	200
	356.35	21.36	2.14	14.5	-	38.0	79.43	200
	366.60	10.50	2.20	16.8	-	29.5	29.85	200
	399.95	26.42	2.28	15.9	-	44.6	169.82	200
	400.35	26.25	2.35	15.9	-	44.5	167.88	200
	432.10	23.87	2.43	16.4	-	42.7	136.45	200
	528.15	18.20	2.80	17.6	-	38.6	85.11	200
	531.80	12.97	2.83	17.6	-	33.4	46.77	200
	533.75	14.10	2.80	17.8	-	34.7	54.32	200
	576.10	18.55	2.95	18.5	-	40.0	100.00	200
	634.80	9.45	3.15	18.8	-	31.4	37.15	200
	672.15	17.15	3.35	19.1	-	39.6	95.49	200
	720.20	12.94	3.66	19.3	-	35.9	62.37	200
	768.15	12.92	3.78	20.0	-	36.7	68.39	200
960MHz – 1.0GHz	Note 5							
1GHz – 25.0GHz	1008.221	49.15	0.9	24.69	37.5	37.24	72.77	500
	1152.237	46.76	0.9	24.75	37.5	34.85	55.27	500
	1200.262	49.57	0.9	24.98	37.5	37.66	76.38	500
	1332.561	59.49	0.9	24.99	37.5	47.58	239.33	500

Limits	30MHz to 88MHz	100µV/m @ 3m
	88MHz to 216MHz	150µV/m @ 3m
	216MHz to 960MHz	200µV/m @ 3m
	960MHz to 1GHz	500µV/m @ 3m
	1GHz to 5GHz	500µV/m @ 3m

Notes:
1 Initial pre scans were performed see Annex E for plots <1GHz.
2 Emissions above 1GHz were measured with both a peak and average detectors.
3 Measurements <1GHz were performed at 3 meters.
4 Measurements >1GHz were performed at 3 meters
5 Only emissions with in 20dB of limit are recorded.

Test Method:
1 As per Radio – Noise Emissions, ANSI C63.4: 2003.
2 Measuring distances as Notes 1 to 4 above.
3 EUT 0.8 metre above ground plane.
4 Emissions maximised by rotation of EUT, on an automatic turntable.
Raising and lowering the receiver antenna between 1m & 4m.
Horizontal and vertical polarisations, of the receive antenna.
EUT orientation in three orthagonal planes.
Maximum results recorded.

The test equipment used for the Transmitter Spurious Emissions – Radiated – Part 15.209 tests is shown below:

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
AE, LOOP, Z2, 9kHz - 30MHz	ROHDE & SCHWARZ	HFH2	881058 - 53	07	
HORN ANTENNA	EMCO	3115	9010-3580	138	**X**
HORN ANTENNA	EMCO	3115	9010-3581	139	
RECEIVER	ROHDE & SCHWARZ	ESHS 10	830051/001	UH03	
RECEIVER	ROHDE & SCHWARZ	ESVS 10	825892/003	UH04	**X**
RANGE 1	TRL	3 METRE	N/A	UH06	**X**
AE, LOOP, Z2, 9kHz - 30MHz	ROHDE & SCHWARZ	HFH2	881058 - 53	07	
BILOG ANTENNA	CHASE	CBL6112	2129	UH93	**X**
SPECTRUM ANALYSER	ROHDE & SCHWARZ	FSU	200034	UH281	**X**
PRE AMPLIFIER	AGILENT	8449B	3008A01610	572	**X**

ANNEX A

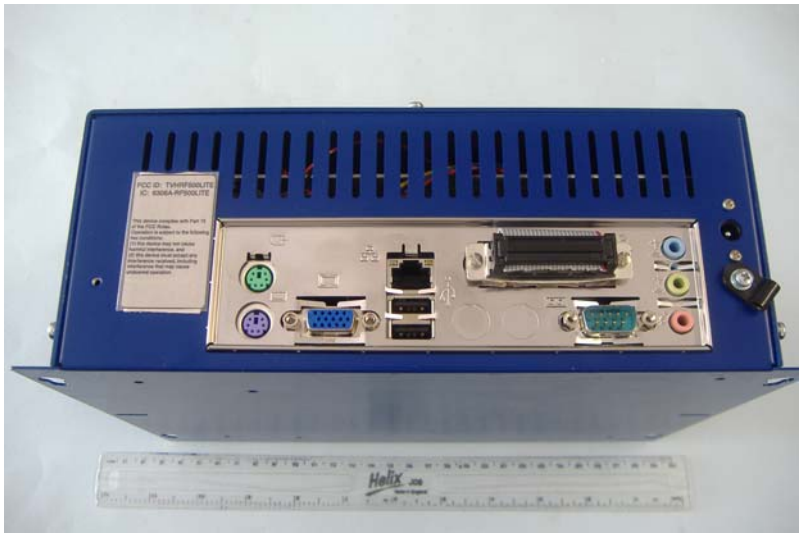
PHOTOGRAPHS

PHOTOGRAPH No. 1 **TEST SETUP**

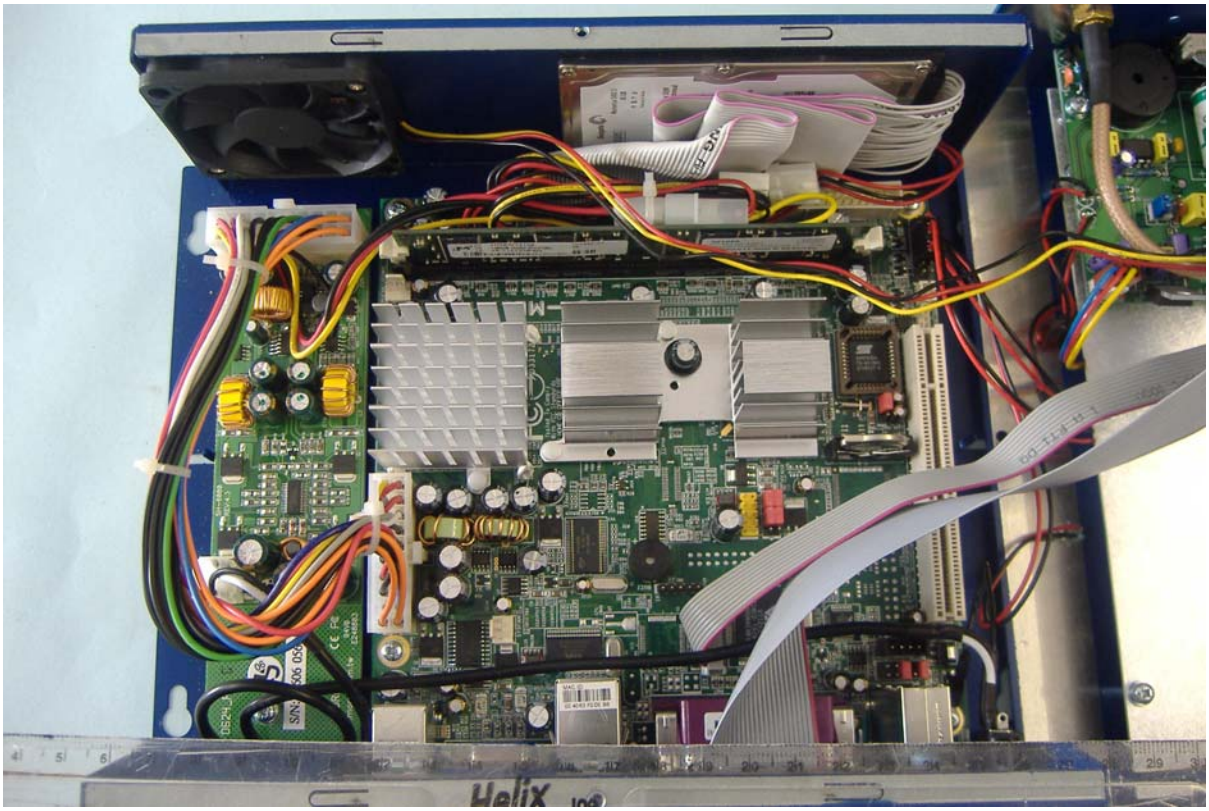
PHOTOGRAPH No. 2 **POWERLINE TEST SETUP**

PHOTOGRAPH No. 3 **OVERVIEW**

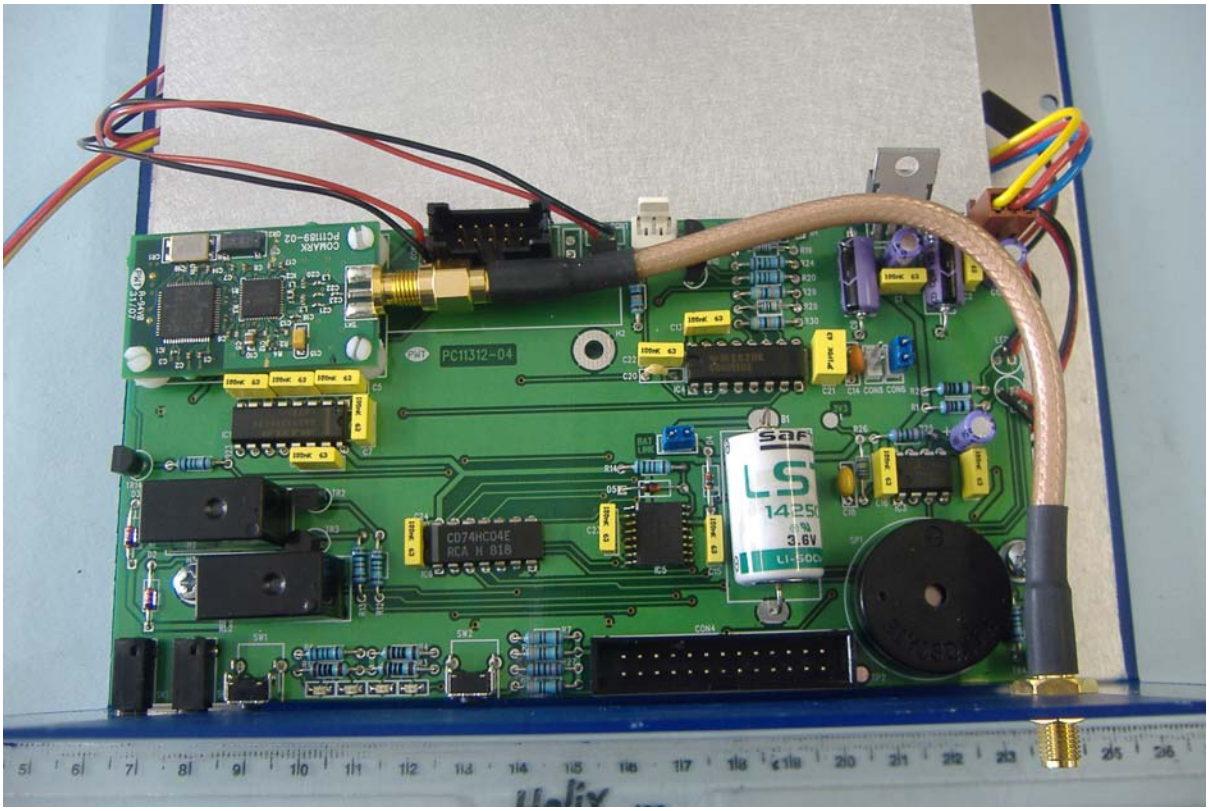
PHOTOGRAPH No. 4 **CONNECTOR OVERVIEW**



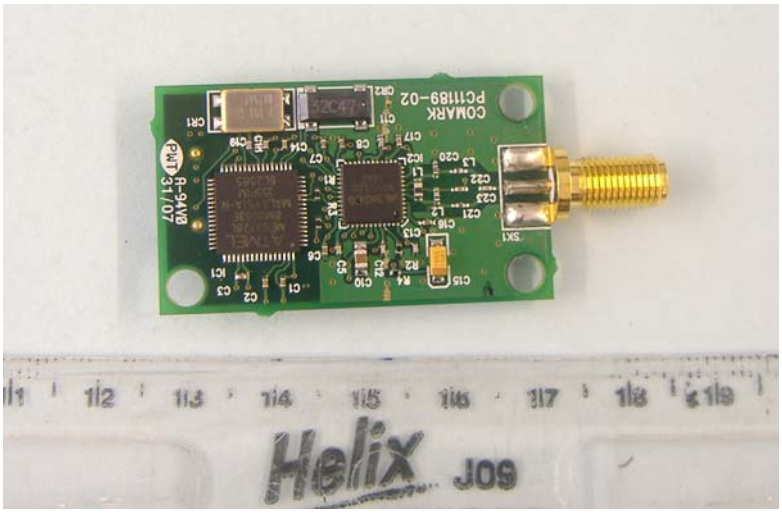
PHOTOGRAPH No. 5 **PC PCB OVERVIEW**



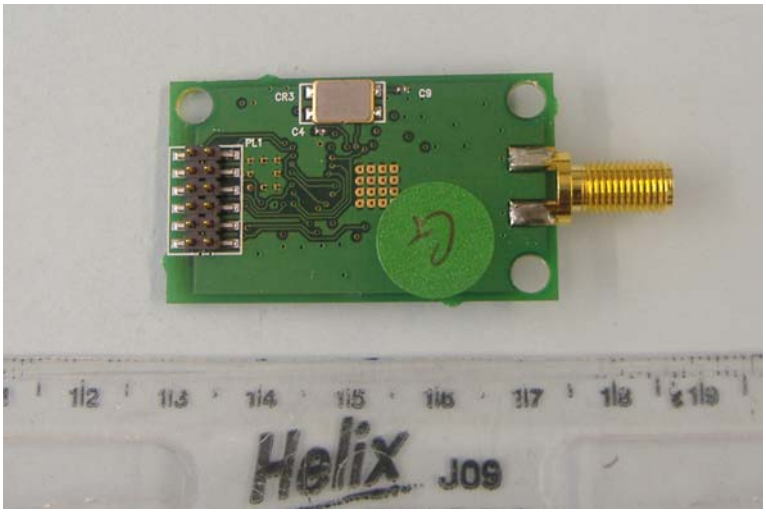
PHOTOGRAPH No. 6 **RF INTERFACEC PCB OVERVIEW**



PHOTOGRAPH No. 7 **RF PCB TOP**



PHOTOGRAPH No. 7 **RF PCB BOTTOM**



ANNEX B

APPLICANT'S SUBMISSION OF DOCUMENTATION LIST

APPLICANT'S SUBMISSION OF DOCUMENTATION LIST

a.	TCB	-	APPLICATION	[X]
		-	FEE	[X]
b.	AGENT'S LETTER OF AUTHORISATION	-		[X]
c.	MODEL(s) vs IDENTITY	-		[ ]
d.	ALTERNATIVE TRADE NAME DECLARATION(s)	-		[X]
e.	LABELLING	-	PHOTOGRAPHS	[X]
		-	DECLARATION	[ ]
		-	DRAWINGS	[X]
f.	TECHNICAL DESCRIPTION	-		[X]
g.	BLOCK DIAGRAMS	-	Tx	[X]
		-	Rx	[ ]
		-	PSU	[ ]
		-	AUX	[ ]
h.	CIRCUIT DIAGRAMS	-	Tx	[X]
		-	Rx	[ ]
		-	PSU	[ ]
		-	AUX	[ ]
i.	COMPONENT LOCATION	-	Tx	[X]
		-	Rx	[ ]
		-	PSU	[ ]
		-	AUX	[ ]
j.	PCB TRACK LAYOUT	-	Tx	[X]
		-	Rx	[ ]
		-	PSU	[ ]
		-	AUX	[ ]
k.	BILL OF MATERIALS	-	Tx	[X]
		-	Rx	[ ]
		-	PSU	[ ]
		-	AUX	[ ]
l.	USER INSTALLATION / OPERATING INSTRUCTIONS	-		[X]

ANNEX C

EQUIPMENT CALIBRATION DETAILS

TRL Number	Equipment Type	Manufacturer	Last Cal Calibration	Calibration Period	Due For Calibration
UH004	Receiver	R&S	06/11/2007	12	06/11/2008
UH06/07	IC OATS Submission	TRL	01/06/2007	24	01/06/2009
UH06/07	NSA Calibration	TRL	17/12/2007	12	17/12/2008
UH028	Log Periodic Ant	Schwarbeck	30/05/2007	24	30/05/2009
UH029	Bicone Antenna	Schwarbeck	22/05/2007	24	22/05/2009
UH041	Multimeter	AVOmeter	15/01/2008	12	15/01/2009
UH093	Bilog Antenna	Chase	21/05/2007	24	21/05/2009
UH122	Oscilloscope	Tektronix	10/12/2007	24	10/12/2009
UH132	Power meter	Marconi	15/01/2008	12	15/01/2009
UH162	ERP Cable Cal	TRL	21/12/2007	12	21/12/2008
UH187	Receiver	R&S	12/12/2007	12	12/12/2008
UH195	LISN	R&S	04/01/2008	12	04/01/2009
UH228	Power Sensor	Marconi	16/01/2008	12	16/01/2009
UH253	1m Cable N type	TRL	30/01/2008	12	30/01/2009
UH254	1m Cable N type	TRL	30/01/2008	12	30/01/2009
UH269	1m Cable N type	TRL	30/01/2008	12	30/01/2009
UH270	1m Cable N type	TRL	30/01/2008	12	30/01/2009
UH271	1.5m Cable N type	TRL	30/01/2008	12	30/01/2009
UH272	1.5m Cable N type	TRL	30/01/2008	12	30/01/2009
UH273	2m Cable N type	TRL	30/01/2008	12	30/01/2009
UH274	2m Cable N type	TRL	30/01/2008	12	30/01/2009
UH281	Spectrum Analyser	R&S	24/10/2007	12	24/10/2008
UH340	Signal Generator	HP	29/06/2006	12	29/06/2007
L005	CMTA	R&S	30/10/2007	12	30/10/2008
L007	Loop Antenna	R&S	22/05/2007	24	22/05/2009
L138	Horn Antenna	EMCO	23/05/2007	24	23/05/2009
L139	Horn Antenna	EMCO	23/05/2007	24	23/05/2009
L572	Pre Amplifier	Agilent	01/06/2007	12	01/06/2008

ANNEX D

POWER LINE CONDUCTION

Powerline Conduction

04 Mar 2008 13:05

150kHz - 30MHz

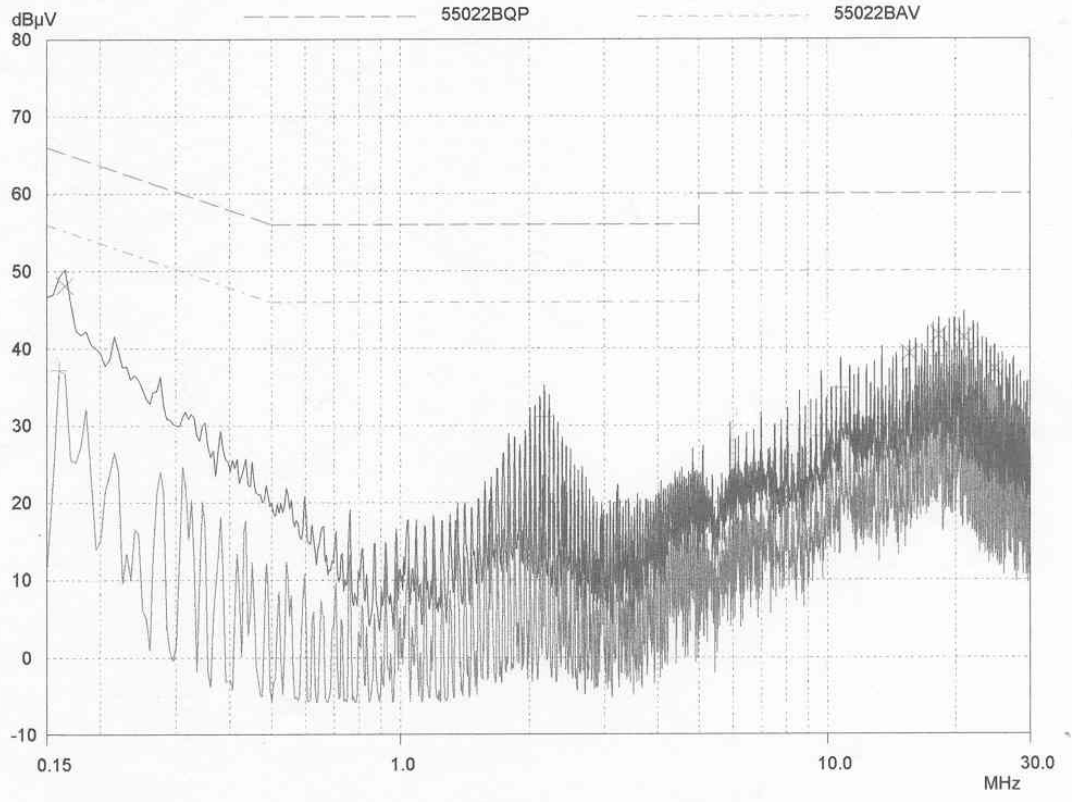
EUT:	RF500 Lite
Manuf:	Comark
Op Cond:	LISN UH195, cable UH21 & Receiver UH187
Operator:	S Hodgkinson
Test Spec:	EN55022 Class B (or Variant)
Comment:	Neutral Line, 110V, 60Hz
	Unit TX Once Per Second . network port connected to PC.
Result File:	txn.dat : New Measurement

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	5kHz	10kHz	PK+AV	50msec	Auto	OFF	60dB

Transducer	No.	Start	Stop	Name
1	1	10kHz	30MHz	UH21
	2	150kHz	30MHz	UH195

Final Measurement:		
	Detectors:	X QP / + AV
	Meas Time:	2sec
	Subranges:	25
	Acc Margin:	20 dB



PAGE 1

Powerline Conduction

04 Mar 2008 12:48

150kHz - 30MHz

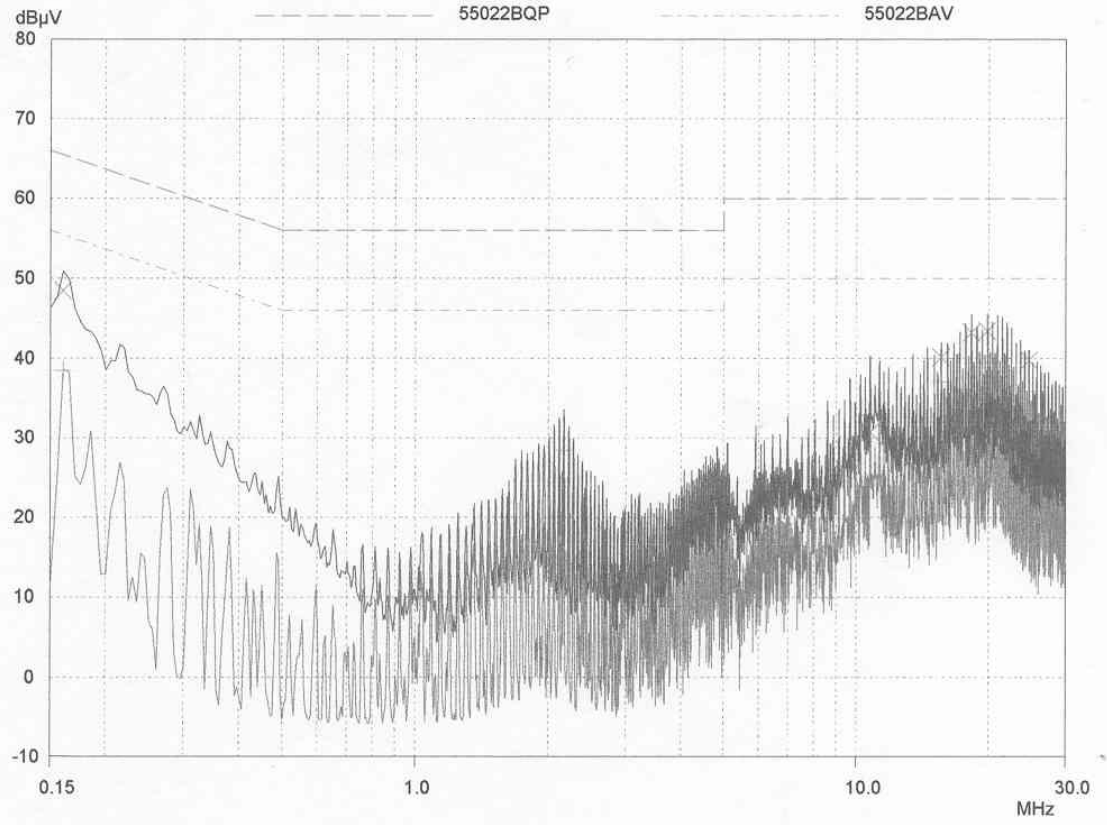
EUT:	RF500 Lite
Manuf:	Comark
Op Cond:	LISN UH195, cable UH21 & Receiver UH187
Operator:	S Hodgkinson
Test Spec:	EN55022 Class B (or Variant)
Comment:	Live Line, 110V, 60Hz
	Unit TX Once Per Second . network port connected to PC.
Result File:	Txlive.dat : New Measurement

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	5kHz	10kHz	PK+AV	50msec	Auto	OFF	60dB

Transducer	No.	Start	Stop	Name
1	1	10kHz	30MHz	UH21
	2	150kHz	30MHz	UH195

Final Measurement:		
	Detectors:	X QP / + AV
	Meas Time:	2sec
	Subranges:	25
	Acc Margin:	20 dB



PAGE 1

ANNEX E

RADIATED EMISSIONS

TRL Compliance Ltd

03 Mar 2008 14:46

E-Field Radiation (30MHz-1GHz)

EUT:	RF500 Lite
Manuf:	Comark
Op Cond:	3m Indoor Prescan
Operator:	S Hodgkinson
Test Spec:	FCC CFR47 Part 15.109
Comment:	Unit in TX Mode Once Per Second .Antenna terminated in 50 ohms, PSU on table.network port populated, PC outside chambe Rx antenna Vertical. Cable Layout Corrected
Result File:	TxVertC.dat : New Measurement

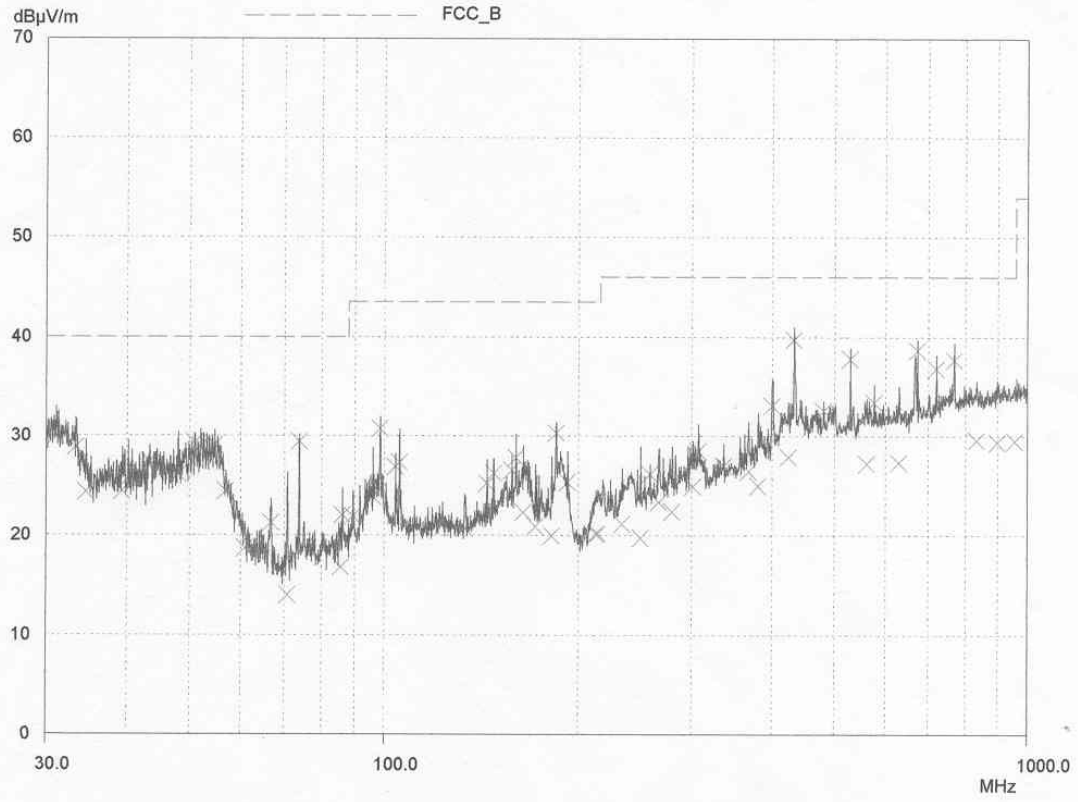
Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
30MHz	1000MHz	50kHz	120kHz	PK	1msec	Auto	ON	60dB

Transducer	No.	Start	Stop	Name
1	21	30MHz	1000MHz	UH72
	22	30MHz	1000MHz	UH93

Final Measurement:

Detector:	X QP
Meas Time:	2sec
Subranges:	50
Acc Margin:	20 dB



PAGE 1

TRL Compliance Ltd

03 Mar 2008 15:04

E-Field Radiation (30MHz-1GHz)

EUT:	RF500 Lite
Manuf:	Comark
Op Cond:	3m Indoor Prescan
Operator:	S Hodgkinson
Test Spec:	FCC CFR47 Part 15.109
Comment:	Unit in TX Mode Once Per Second .Antenna terminated in 50 ohms, PSU on table.network port populated, PC outside chamb
	Rx antenna Horizontal. Cable Layout Corrected
Result File:	TxHorizC.dat : New Measurement

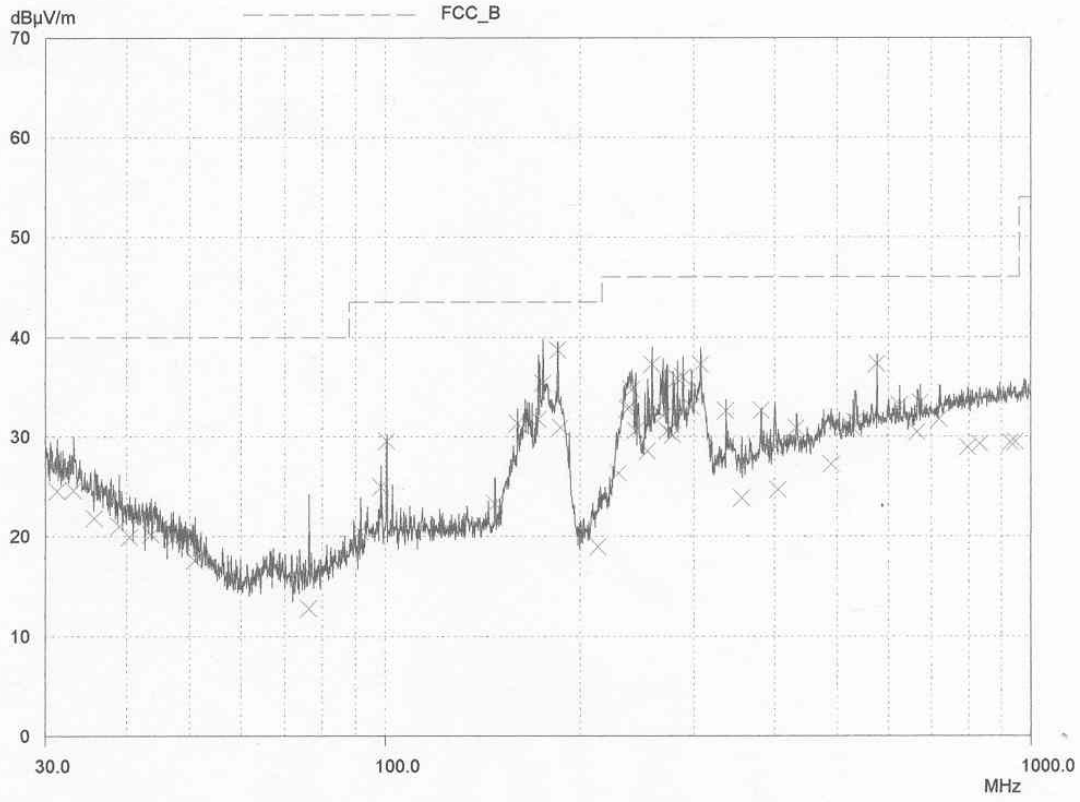
Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
30MHz	1000MHz	50kHz	120kHz	PK	1msec	Auto	ON	60dB

Transducer	No.	Start	Stop	Name
1	21	30MHz	1000MHz	UH72
	22	30MHz	1000MHz	UH93

Final Measurement:

Detector:	X QP
Meas Time:	2sec
Subranges:	50
Acc Margin:	20 dB



PAGE 1

TRL Compliance Ltd

03 Mar 2008 13:30

E-Field Radiation (30MHz-1GHz)

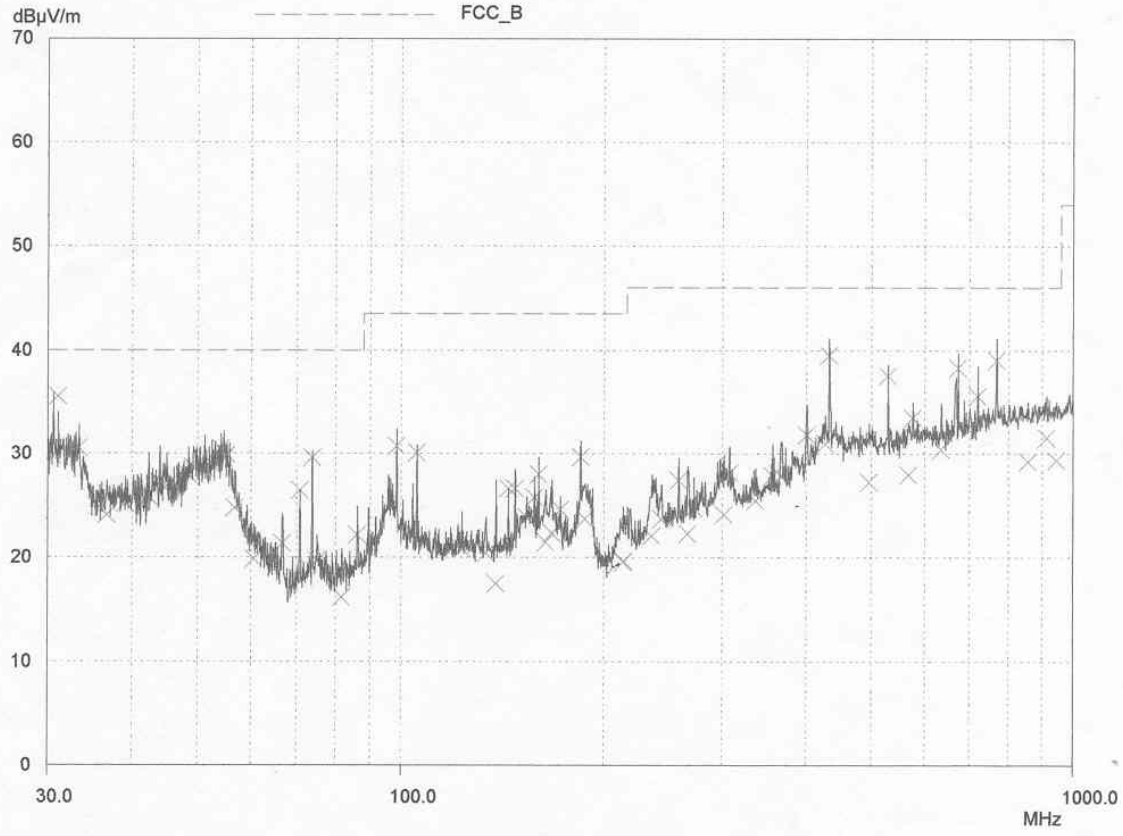
EUT:	RF500 Lite
Manuf:	Comark
Op Cond:	3m Indoor Prescan
Operator:	S Hodgkinson
Test Spec:	FCC CFR47 Part 15.109
Comment:	Unit in Rx Mode only.Antenna terminated in 50 ohms, PSU on table.network port populated, PC outside chamber. Rx antenna Vertical. Cable Layout Corrected
Result File:	RxVertC.dat : New Measurement

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
30MHz	1000MHz	50kHz	120kHz	PK	1msec	Auto	ON	60dB

Transducer	No.	Start	Stop	Name
1	21	30MHz	1000MHz	UH72
	22	30MHz	1000MHz	UH93

Final Measurement: Detector: X QP
Meas Time: 2sec
Subranges: 50
Acc Margin: 20 dB



PAGE 1

TRL Compliance Ltd

03 Mar 2008 13:09

E-Field Radiation (30MHz-1GHz)

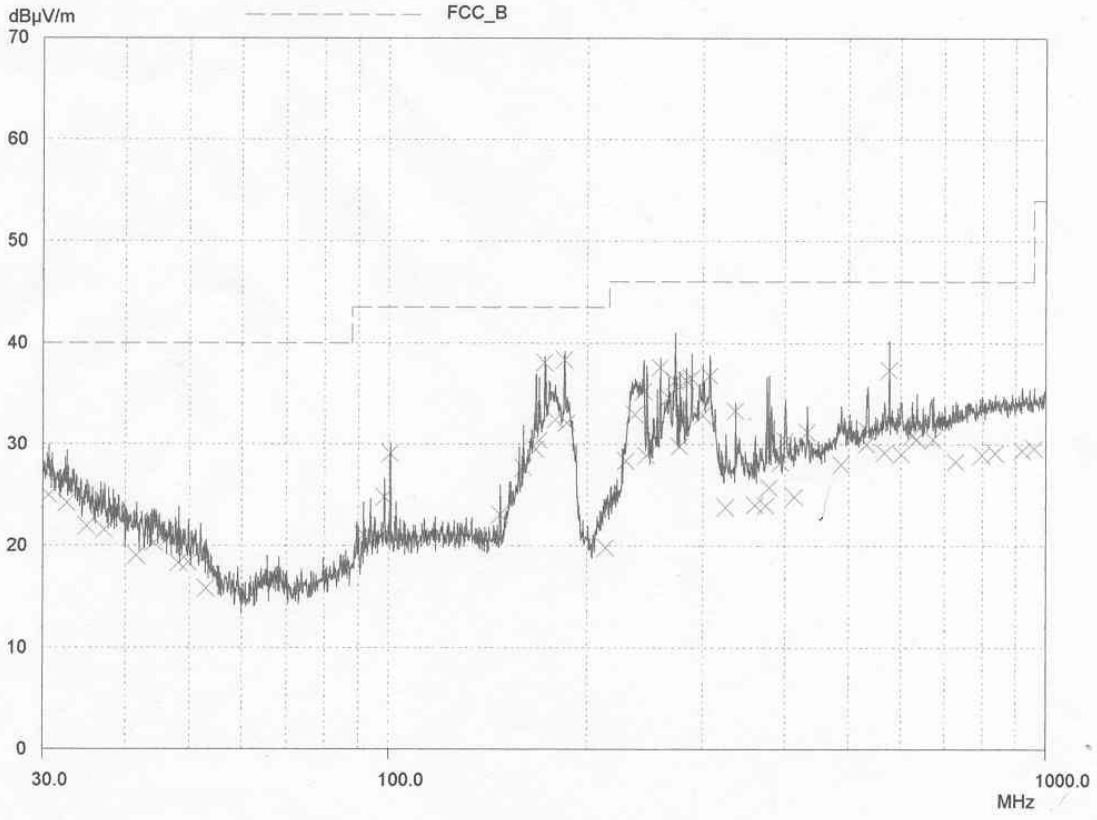
EUT:	RF500 Lite
Manuf:	Comark
Op Cond:	3m Indoor Prescan
Operator:	S Hodgkinson
Test Spec:	FCC CFR47 Part 15.109
Comment:	Unit in Rx Mode only.Antenna terminated in 50 ohms, PSU on table.network port populated, PC outside chambre. Rx antenna Horizontal. Cable Layout Corrected
Result File:	RxHorizC.dat : New Measurement

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
30MHz	1000MHz	50kHz	120kHz	PK	1msec	Auto	ON	60dB

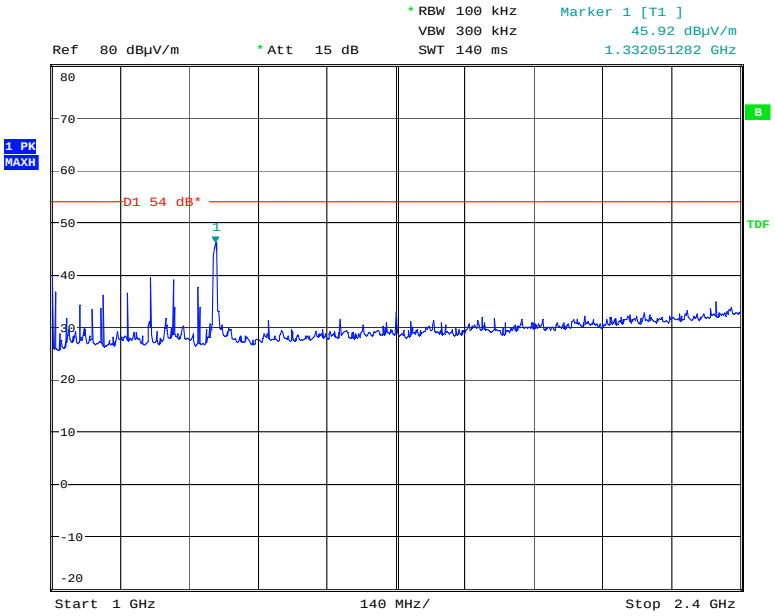
Transducer	No.	Start	Stop	Name
1	21	30MHz	1000MHz	UH72
	22	30MHz	1000MHz	UH93

Final Measurement: Detector: X QP
Meas Time: 2sec
Subranges: 50
Acc Margin: 20 dB



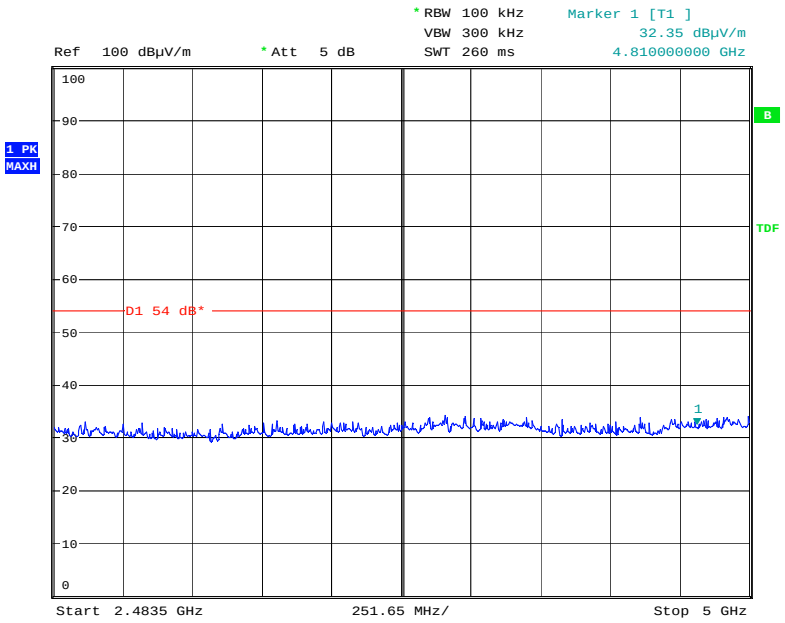
PAGE 1

RADIATED EMISSIONS 1GHz – 2.5 GHz



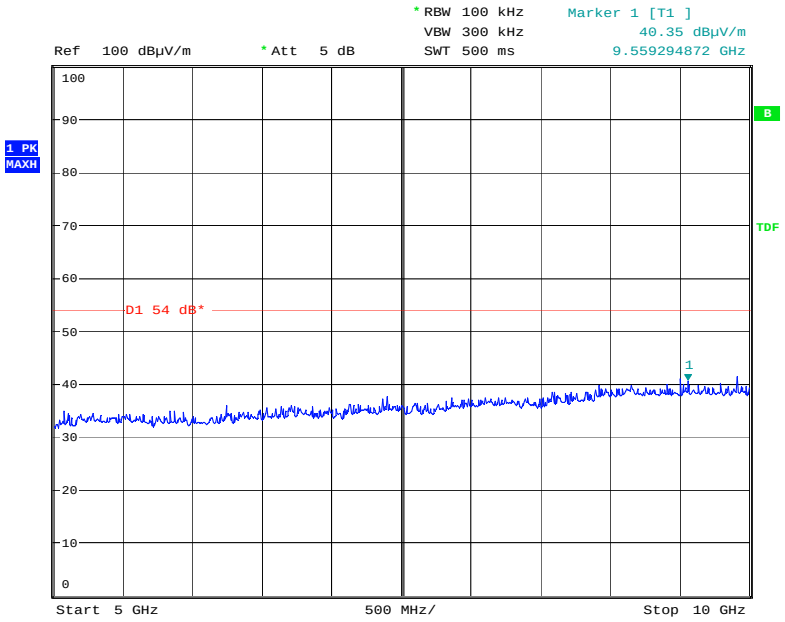
Date: 4.MAR.2008 14:23:41

RADIATED EMISSIONS 2.5GHz –5GHz



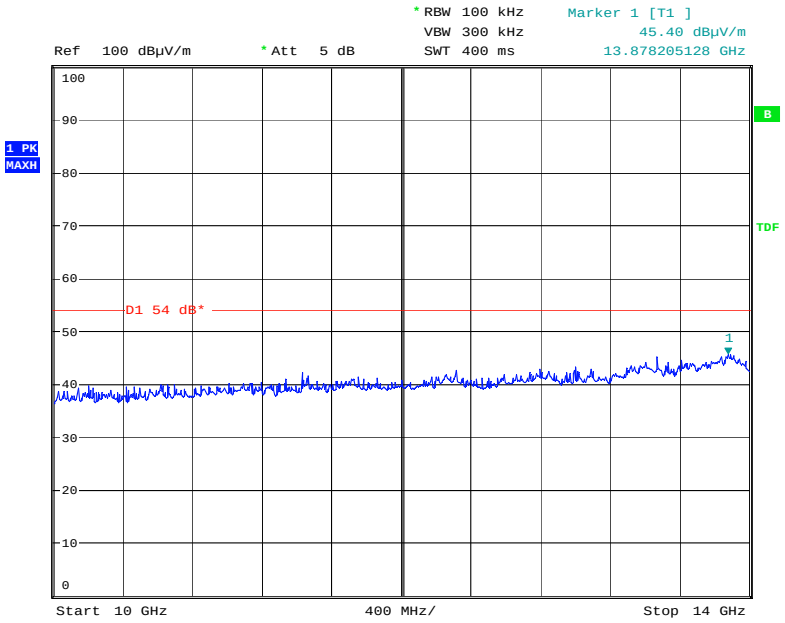
Date: 4.MAR.2008 14:30:27

RADIATED EMISSIONS 5GHz – 10GHz



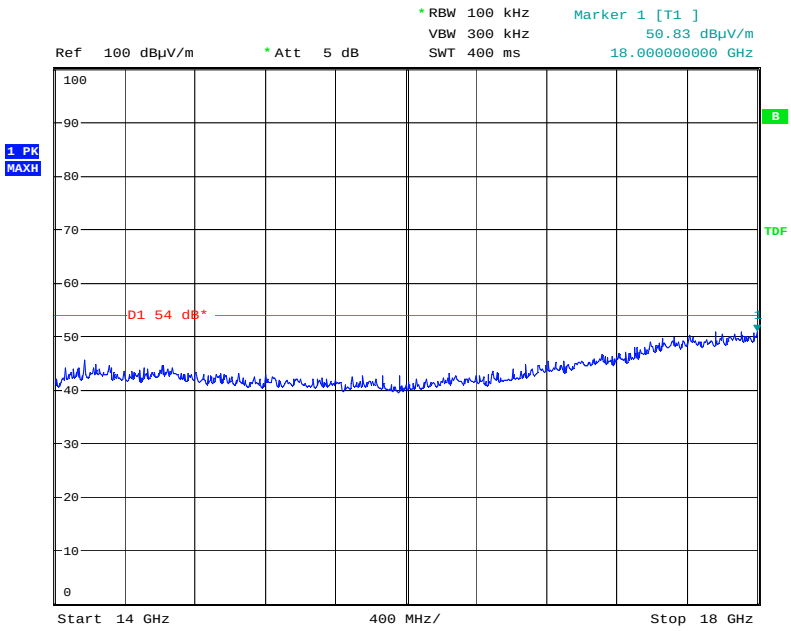
Date: 4.MAR.2008 14:25:41

RADIATED EMISSIONS 10GHz – 14GHz



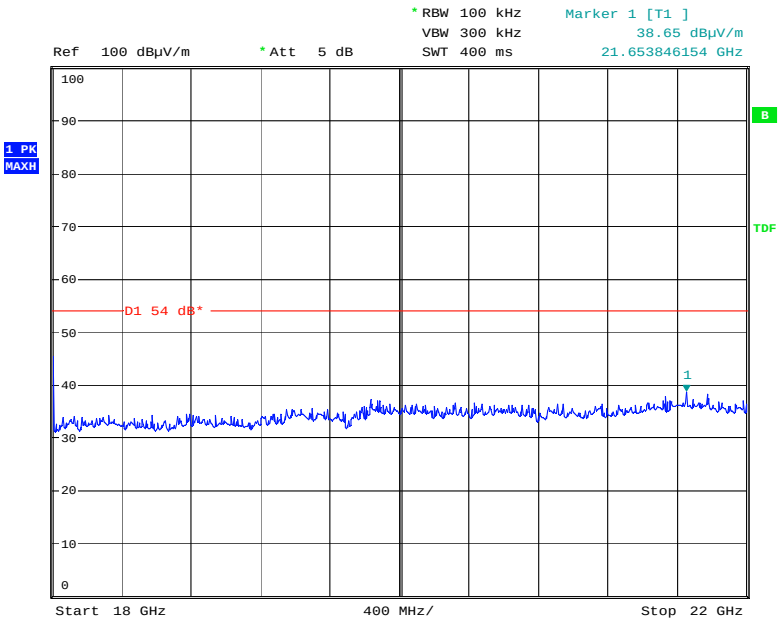
Date: 4.MAR.2008 14:26:26

RADIATED EMISSIONS 14GHz – 18GHz



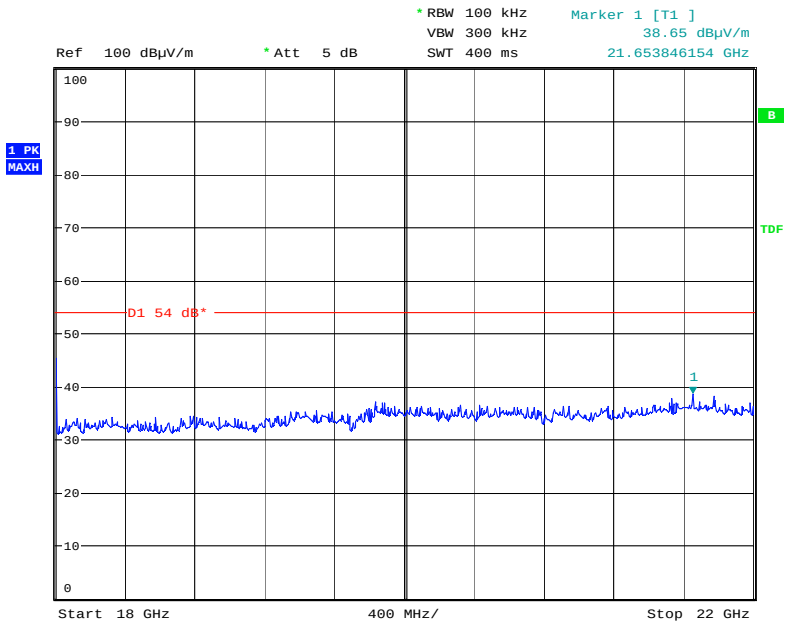
Date: 4.MAR.2008 14:26:57

RADIATED EMISSIONS 14GHz – 18GHz



Date: 4.MAR.2008 14:27:31

RADIATED EMISSIONS 18GHz – 22GHz



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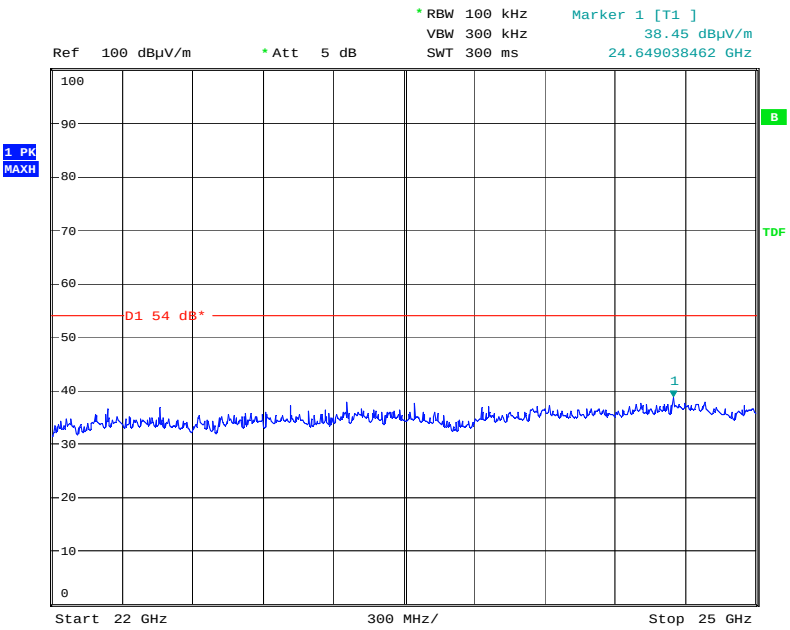
RADIATED EMISSIONS 18GHz – 22GHz

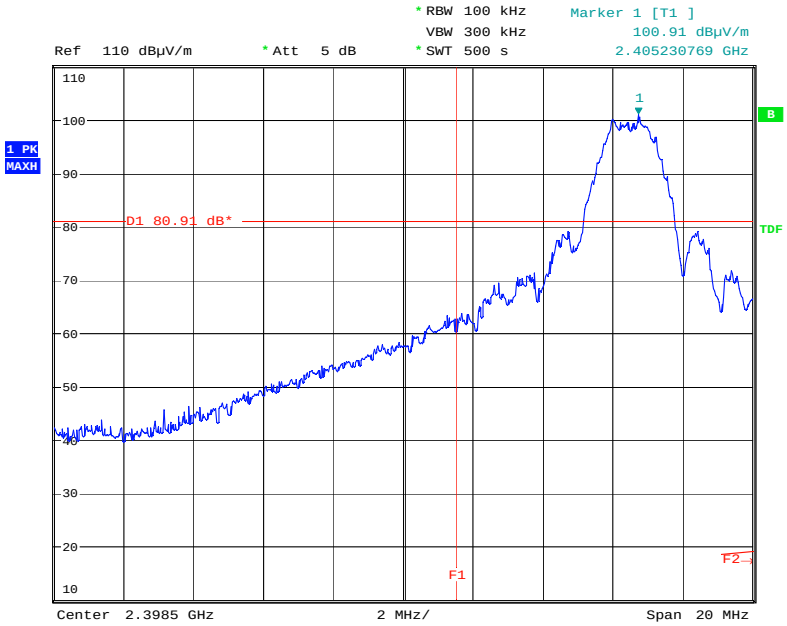


Date: 4.MAR.2008 14:27:50

ANNEX F

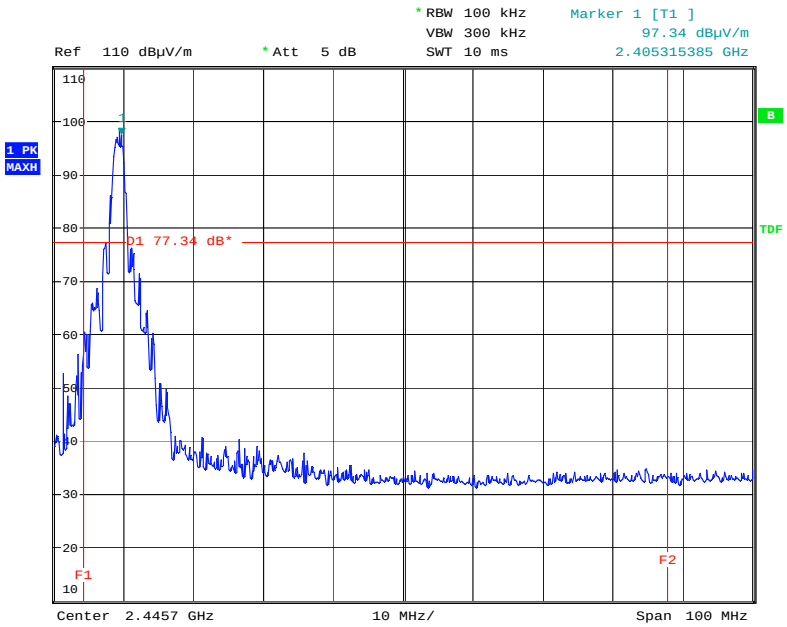
RADIATED BANDEDGE COMPLIANCE

RADIATED LOWER BAND EDGE



Date: 4.MAR.2008 15:20:39

RADIATED UPPER BAND EDGE

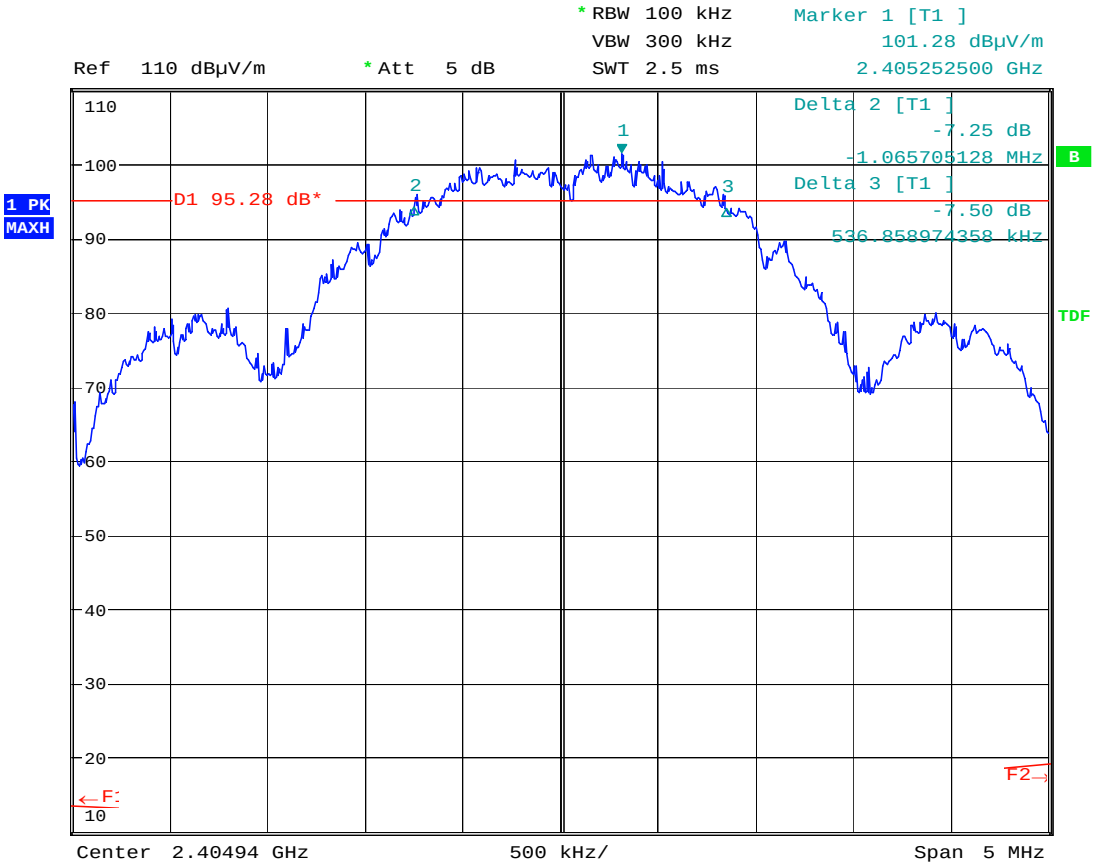


Date: 4.MAR.2008 15:23:48

ANNEX G

6dB BANDWIDTH

6dB BANDWIDTH

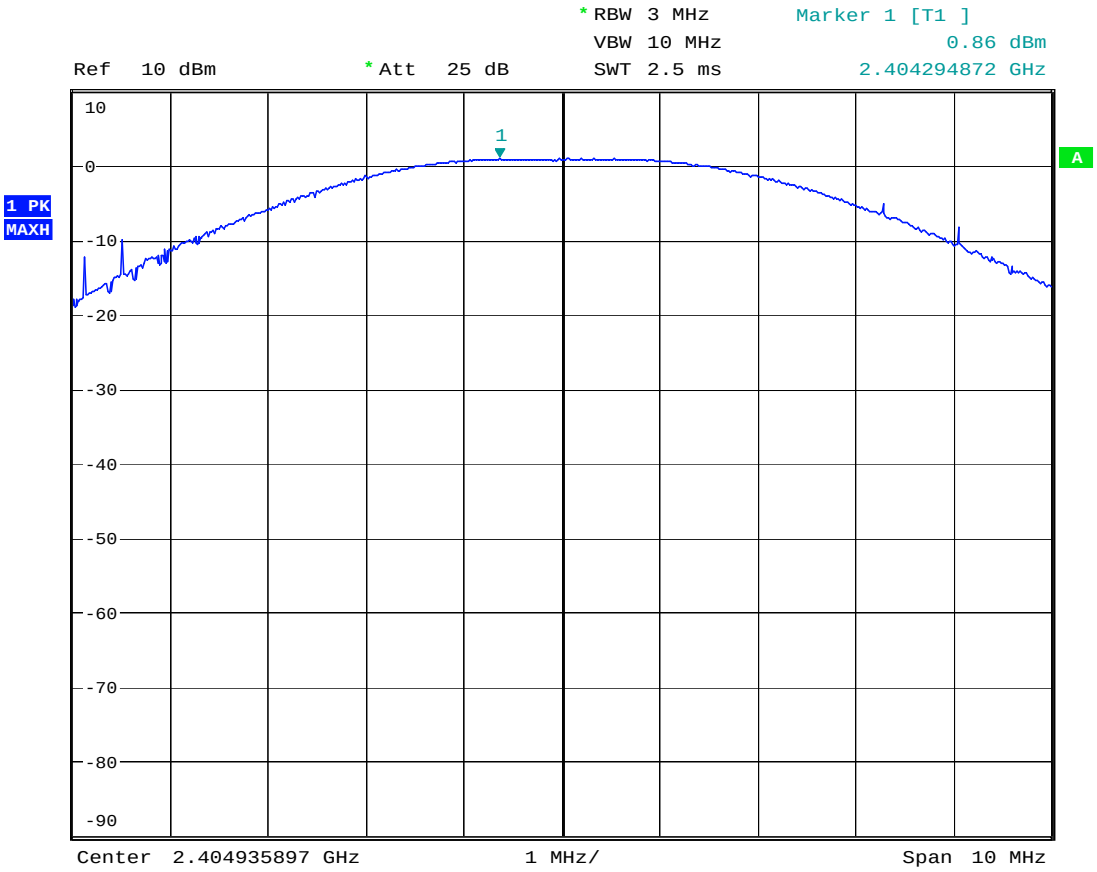


Date: 4.MAR.2008 15:32:11

ANNEX H

PEAK OUTPUT POWER

OUTPUT POWER



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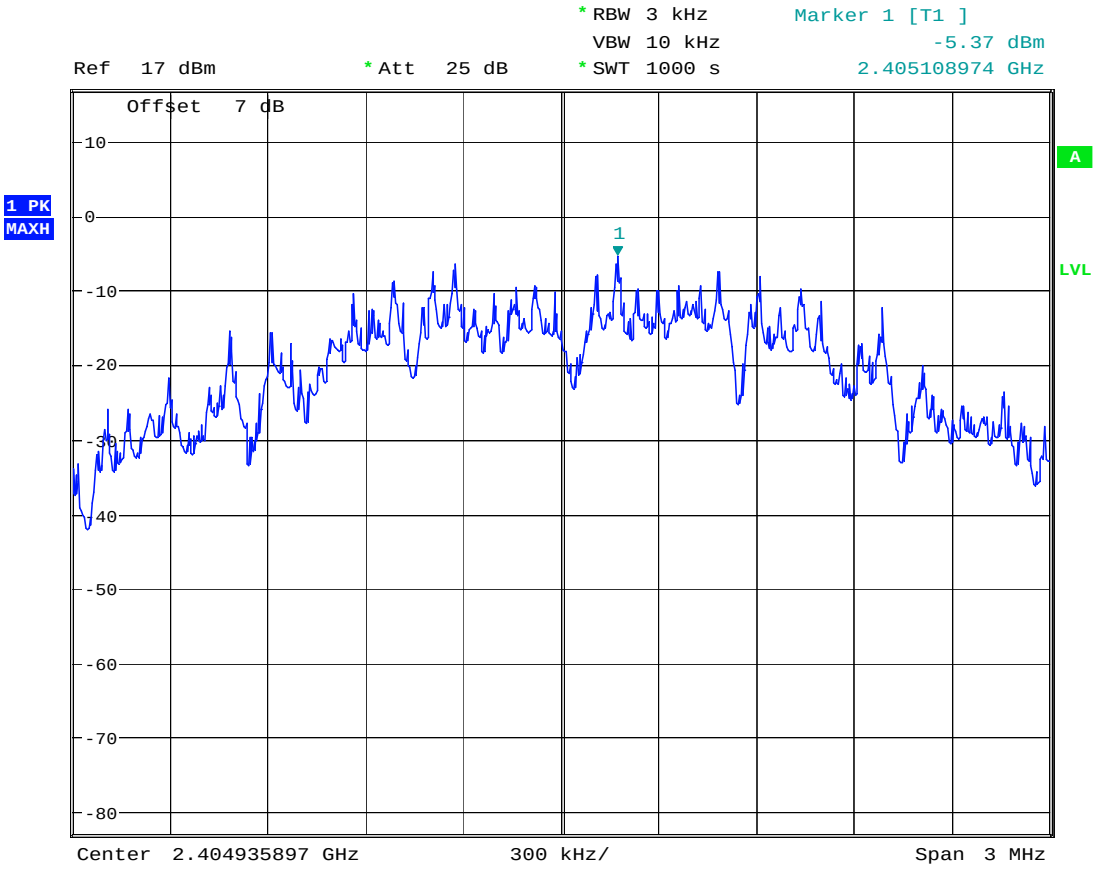
ANNEX I

POWER SPECTRAL DENSITY

POWER SPECTRAL DENSITY

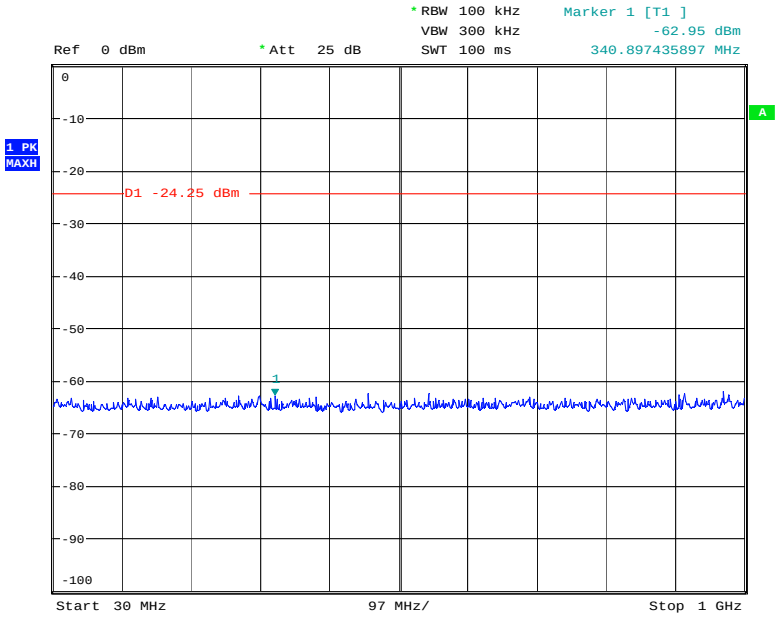


Date: 4.MAR.2008 16:47:47

ANNEX J

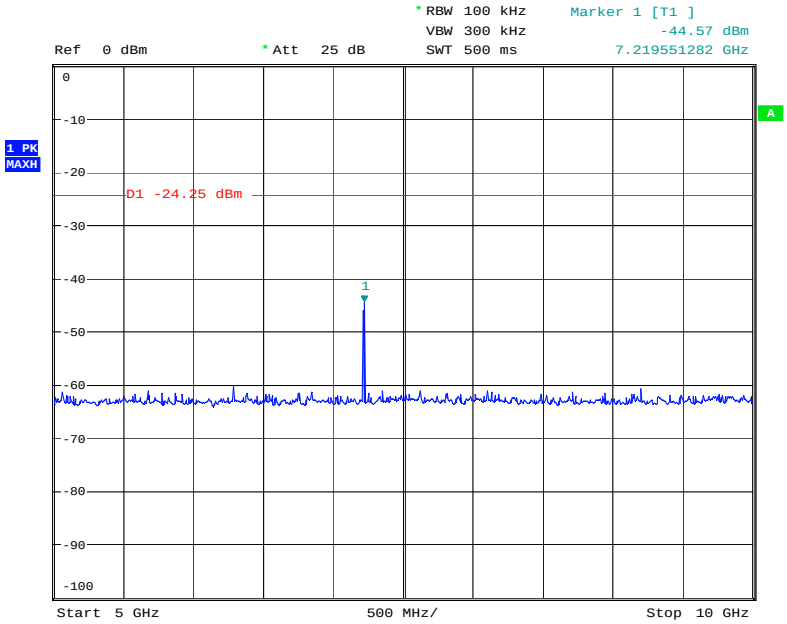
CONDUCTED SPURIOUS EMISSIONS

CONDUCTED EMISSIONS 30MHz-1GHz



Date: 4.MAR.2008 15:57:55

CONDUCTED EMISSIONS 1GHz - 5GHz



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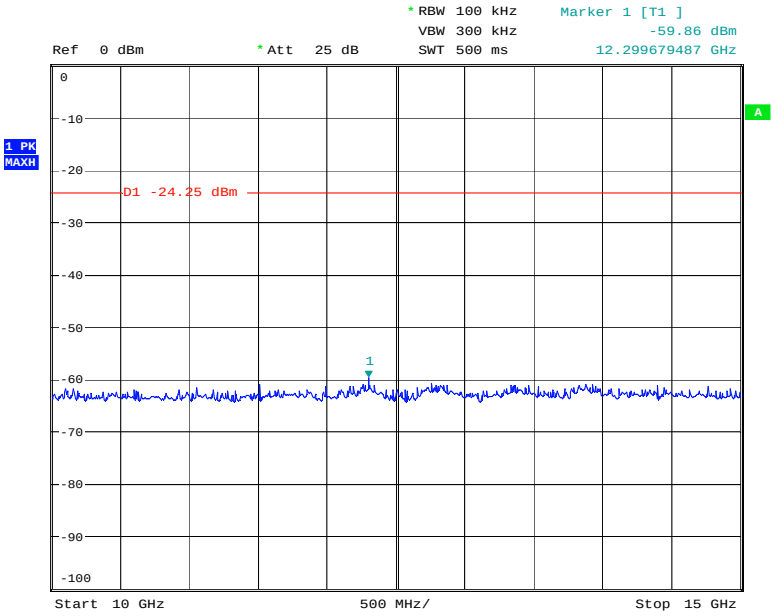
CONDUCTED EMISSIONS 5GHz - 10GHz



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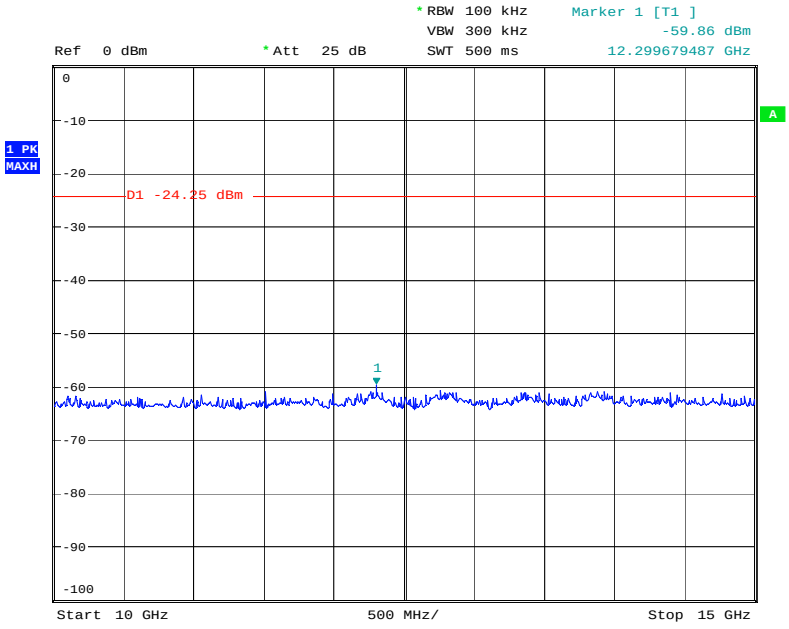
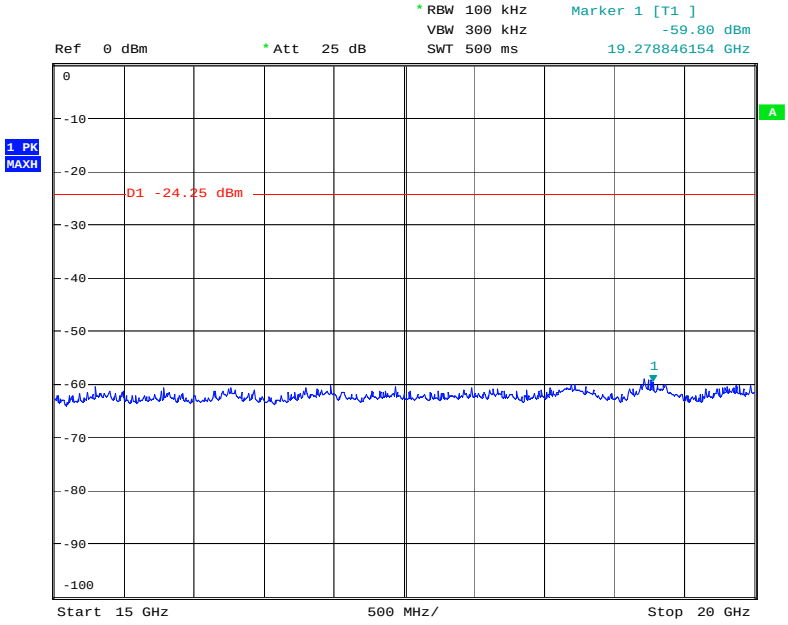
CONDUCTED EMISSIONS 10GHz - 15GHz



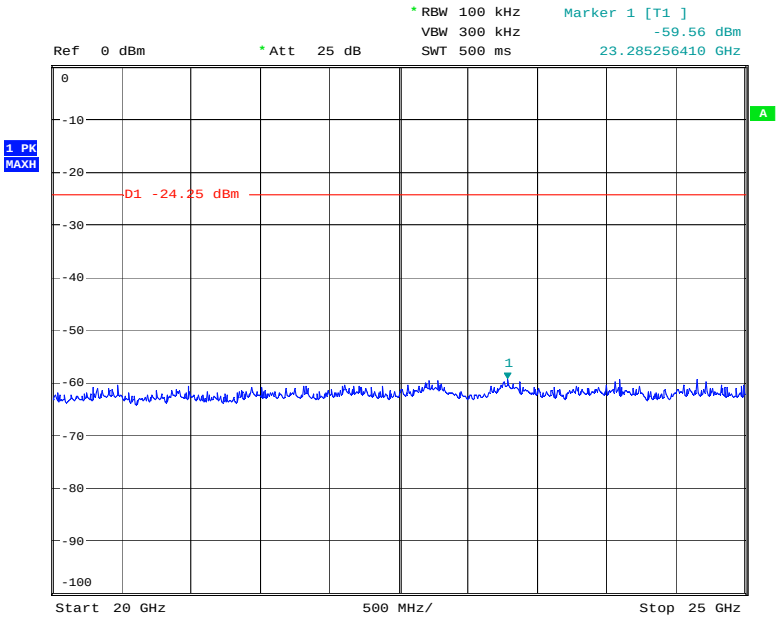
Date: 4.MAR.2008 15:52:59

CONDUCTED EMISSIONS 15GHz - 20GHz



Date: 4.MAR.2008 15:53:47

CONDUCTED EMISSIONS 20GHz - 25GHz



Date: 4.MAR.2008 15:54:04

ANNEX K

MEASUREMENT UNCERTAINTY

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%**