TEST REPORT NO: RU1228/6970

COPY NO: 2

ISSUE NO: 1

FCC ID: TVHRF500

REPORT ON THE CERTIFICATION TESTING OF A
COMARK Ltd.
RF500 GATEWAY
WITH RESPECT TO
THE FCC RULES CFR 47, PART 15.247 February 2006
INTENTIONAL RADIATOR SPECIFICATION

TEST DATE: 27th February – 7th June 2006

TESTED BY: Daniel Winstanley Digitally signed by Daniel Winstanley DN: CN = Daniel Winstanley, C = <n Reason: I am the author of this document Date: 2006.06.23 15:38:39 +01'00' D Winstanley

APPROVED BY: Peter Green I am approving this document 2006.06.26 12:57:57 +01'00' P Green Product Manager

DATE: 23rd June 2006

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UKAS TESTING
0728

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.

CERTIFICATE OF CONFORMITY & COMPLIANCE

FCC IDENTITY:	TVHRF500					
PURPOSE OF TEST:	Certification					
TEST SPECIFICATION:	FCC RULES CFR 47, Part 15.247 February 2006					
TEST RESULT:	Compliant to Specification					
EQUIPMENT UNDER TEST:	RF500 Gateway					
EQUIPMENT SERIAL No:	Engineering sample					
EQUIPMENT TYPE:	Temperature Monitor System Control Unit					
CARRIER EMISSION:	0.00467 W e.i.r.p.					
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:	Amplitude	[ ]	Digital	[X]	Angle	[ ]
POWER SOURCE(s):	+110Vac					
TEST DATE(s):	27th February – 7th June 2006					
ORDER No(s):	S05059					
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: 2006.06.23 15:38:29 +01'00' — D Winstanley

APPROVED BY: Peter Green I am approving this document 2006.06.26 12:58:08 +01'00' — P Green Product Manager

APPLICANT'S SUMMARY

EQUIPMENT UNDER TEST (EUT):	RF500 Gateway
EQUIPMENT TYPE:	Temperature Monitor System Control Unit
SERIAL NUMBER OF EUT:	Engineering Sample
PURPOSE OF TEST:	Certification
TEST SPECIFICATION(s):	FCC RULES CFR 47, Part 15.247 February 2006
TEST RESULT:	COMPLIANT Yes [X] No [ ]
APPLICANT'S CATEGORY:	MANUFACTURER [X] IMPORTER [ ] DISTRIBUTOR [ ] TEST HOUSE [ ] AGENT [ ]
APPLICANT'S ORDER No(s):	S05059
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
MANUFACTURER:	Comark Ltd.
EUT(s) COUNTRY OF ORIGIN:	United Kingdom
TEST LABORATORY:	TRL Compliance Ltd
UKAS ACCREDITATION No:	0728
TEST DATE(s):	16th February – 7th June 2006
TEST REPORT No:	RU1228/6970

EQUIPMENT TEST / EXAMINATIONS REQUIRED

1.

TEST/EXAMINATION	RULE PART	DETECTOR	APPLICABILITY
Intentional Emission Frequency:	15.247(b)	Peak	Yes
Intentional Emission Field Strength:	-	-	No
Intentional Emission Band Occupancy 6dB:	15.247 (a)	Peak	Yes
Intentional Emission ERP (mW):	15.247 (b)	Peak	Yes
Spurious Emissions – Conducted:	15.247 (c)	Peak	Yes
Spurious Emissions – Radiated <1000MHz:	15.209	Quasi Peak	Yes (note 1)
Spurious Emissions – Radiated >1000MHz:	15.209	Average	Yes (note 1)
Spectral Power Density	15.247 (e)	Peak	Yes
Spurious Emissions – Power Line TX	15.207	Quasi Peak Average	Yes
Spurious Emissions – Power Line RX	15.107	Quasi Peak Average	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
Extrapolation Factor	15.31(f)	-	Yes

Note 1: The manufacturer has stated that this unit is not intended to be operated within 20cm of the body.

2. Emission Designator: 1M59F1D

3. Duty Cycle: <100%

4. Transmitter bit or pulse rate and level: 250kBps

5. Temperatures: Ambient (Tnom) 20°C

6. Supply Voltages: Vnom +110Vac

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

7. Equipment Category:
   Single channel [X]
   Two channel [ ]
   Multi-channel [ ]

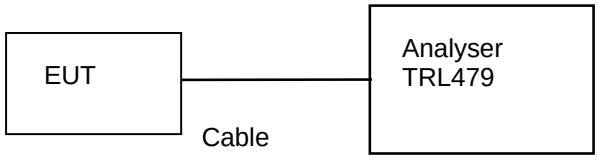
8. Channel Allocation:
   Narrowband [ ]
   Wideband [X]

TRANSMITTER TESTS

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

Ambient temperature = 24°C(<1GHz)
Relative humidity = 48% (<1GHz)
Conditions = Radio Lab
Supply voltage = +110Vac

Diagram



Frequency	Channel	Measured Bandwidth	Limit
2.405MHz	1	1.62 MHz	>500kHz

Notes: 1 For analyser plots see annex C.

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.

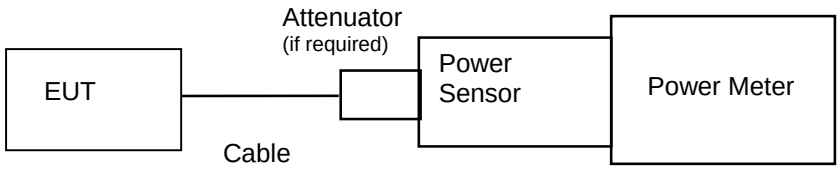
TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	ANRITSU	MS2665C	MT26089	479	**X**
SPECTRUM ANALYSER	MARCONI	2386/2380	152076/004	UH120	

TRANSMITTER TESTS

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

Ambient temperature = 24°C(<1GHz)
Relative humidity = 48% (<1GHz)
Conditions = Radio Lab
Supply voltage = +110Vac

Diagram



Frequency MHz	Channel	Peak Power on Meter dBm	Attenuator & Cable loss dB	Peak Power Watts	EUT Antenna Gain dBi	Average Power Watts	Limit Watts
2.405	1	-31.2	31.2	0.000933	7	0.00467	1

Notes: 1 Gain of antenna 7dBi, maximum gain antenna supplied by manufacturer.

Test Method:
1 The EUT was connected to the power sensor 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 power meter was recorded.
4 The power meter was adjusted to take the EUTs duty cycle into account.

Test equipment used for Peak Power measurement:

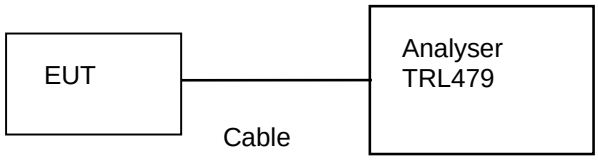
TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
POWER METER	MARCONI	6960B	237034/019	UH132	**X**
POWER SENSOR	MARCONI	6920	1564	UH228	**X**
ATTENUATOR	JFW	50PF-030	N/A	N/A	**X**

TRANSMITTER TESTS

TRANSMITTER BAND EDGE EMISSIONS – CONDUCTED – Part 15.247(D)

Ambient temperature	=	17°C
Relative humidity	=	53%
Conditions	=	Conducted – Radio Lab
Supply voltage	=	+110Vac

Diagram



Test Result

Measured as compliant, see analyser plots

Notes:

1 The EUT was set into a transmit mode with modulation.
2 The EUT was connected to the analyser via the unique antenna connector & a cable.
3 See Annex D for analysers plots.

Test Method:

1 A plot covering transmission and lower band edge was taken. 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).
2 A plot covering transmission and upper band edge was taken. A marker was set on the peak emission of the highest 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).

The test equipment used for the tests is shown below:

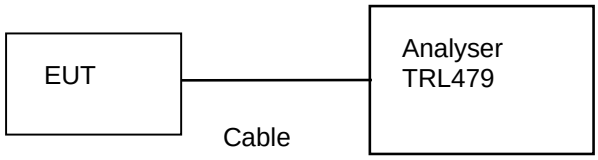
TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	ANRITSU	MS2665C	MT26089	479	**X**
RECEIVER	ROHDE & SCHWARZ	ESVS 10	825892/003	UH04	
SPECTRUM ANALYSER	MARCONI	2386/2380	152076/004	UH120	

TRANSMITTER TESTS

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

Ambient temperature = 17°C(<1GHz)
Relative humidity = 53% (<1GHz)
Conditions = Radio Lab
Supply voltage = +110Vac

Diagram



Frequency	Channel	Measured Power Spectral Density	Limit
2.405MHz	1	-13.44 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 with a sweep time of 1000 seconds
2 The resolution bandwidth on the analyser was set to 3kHz and trace set to max hold.

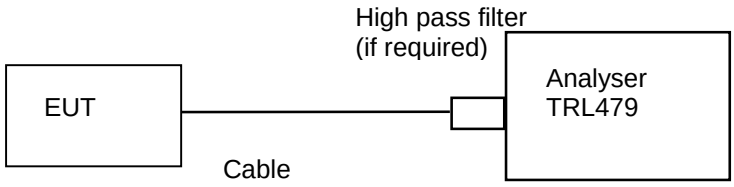
TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	ANRITSU	MS2665C	MT26089	479	**X**
SPECTRUM ANALYSER	MARCONI	2386/2380	152076/004	UH120	

TRANSMITTER TESTS

TRANSMITTER SPURIOUS EMISSIONS – CONDUCTED – Part 15.247(D)

Ambient temperature = 22°C
Relative humidity = 34%
Conditions = Conducted –Radio Lab
Supply voltage = +110Vac

Diagram



Range Frequency (MHz)	Emission Frequency (GHz)	Emission Level (dBm)	Cable loss (dB)	Level (dBm)	Limit (dBm)
30 – 26000	No Significant Emissions within 20 dBs of the Limit				-25.71 dBm

See spectrum analyser scan plots – Annex F

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.

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.

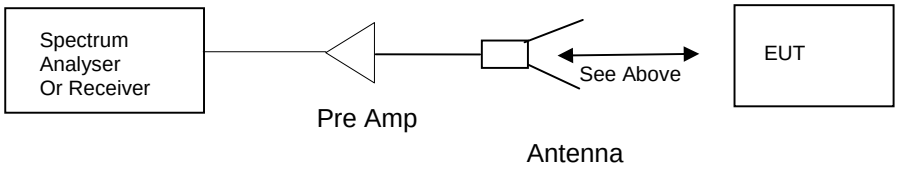
The test equipment used for the tests is shown below:

TYPE OF EQUIPMENT	MAKER/ SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
RECEIVER	ROHDE & SCHWARZ	ESVS 10	825892/003	UH04	
RANGE 1	TRL	3 METRE	N/A	UH06	
SPECTRUM ANALYSER	ROHDE & SCHWARZ	FSU	200034	281	**X**

TRANSMITTER TESTS

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

Ambient temperature	=	21°C(>1GHz)	3m measurements <1GHz	[X]
Relative humidity	=	30% (>1GHz)	1m measurements >1GHz	[X]
Conditions	=	Open Area Test Site (OATS)	3m extrapolated from 1m	[X]
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 7							100
88MHz – 216MHz Restricted bands	Note 7							150
216MHz – 960MHz Restricted bands	Note 7							200
960MHz – 1GHz Restricted bands	Note 7							500
1GHz – 26GHz Restricted bands	4810.000	42.26	-28	34.00	48.62	-9.54	86.3	500
30MHz -26GHz	Note 7							-20dBc
See annex G for initial pre scan results.								

Notes:

1 Initial pre scans were performed see Annex G for plots <1GHz.
2 See annex H for radiated bandedge compliance plots.
3 Emissions above 1GHz were measured with both a peak and average detectors.
4 Measurements <1GHz were performed at 3 meters.
5 Measurements >1GHz were initial performed at 1 metres. This distance was increased if sensitivity of analyser allowed.
6 1m to 3m extrapolated as per part 15.31
7 Only emissions with in 20dB of limit are recorded.
8 Emissions not directly related to the transmitter are reported under receiver tests.

Test Method:

1 As per section 15.247.
2 Measuring distances as Notes 5 to 6 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	
HORN ANTENNA	EMCO	3115	9010-3581	139	**X**
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	281	**X**
PRE AMPLIFIER	AGILENT	8449B	3008A01610	572	**X**

TRANSMITTER and RECEIVER TESTS

TRANSMITTER CONDUCTED EMISSIONS – AC POWER LINE Parts 15.207 & 15.107

Ambient temperature = 20°C(<1GHz)
Relative humidity = 47%(<1GHz)
Conditions = Power Line Laboratory
Supply voltage = +110V AC
Supply Frequency = 60Hz

SIGNIFICANT EMISSIONS

Transmitting Part 15.207

FREQUENCY (MHz)	MEASUREMENT RECEIVER READING (dBµV)	DETECTOR	CONDUCTOR (L or N)	LIMIT (dBµV)
0.405	39.99	Average	Live	46.00
0.465	40.94	Average	Live	46.00
0.520	41.83	Average	Live	46.00
0.580	43.10	Average	Live	46.00
0.640	44.26	Average	Live	46.00
0.695	44.15	Average	Live	46.00
0.755	45.61	Average	Live	46.00
0.815	44.56	Average	Live	46.00
0.870	45.52	Average	Neutral	46.00
0.925	43.72	Average	Live	46.00
0.985	45.77	Average	Neutral	46.00
1.04	45.59	Average	Live	46.00
1.10	45.54	Average	Live	46.00
1.16	44.77	Average	Live	46.00
1.22	44.66	Average	Live	46.00
1.275	44.56	Average	Neutral	46.00
1.335	43.34	Average	Neutral	46.00
1.39	43.77	Average	Neutral	46.00
1.45	43.03	Average	Neutral	46.00
1.565	42.42	Average	Neutral	46.00
1.915	39.17	Average	Live	46.00
2.375	37.07	Average	Live	46.00

The test equipment used for the Transmitter Conducted Emissions – AC Power Line Part 15.207 test are shown on page 15:

SIGNIFICANT EMISSIONS

Receiving Part 15.107

FREQUENCY (MHz)	MEASUREMENT RECEIVER READING (dBµV)	DETECTOR	CONDUCTOR (L or N)	LIMIT (dBµV)
0.405	39.99	Average	Live	46.00
0.465	40.94	Average	Live	46.00
0.520	41.83	Average	Live	46.00
0.580	43.10	Average	Live	46.00
0.640	44.26	Average	Live	46.00
0.695	44.15	Average	Live	46.00
0.755	45.61	Average	Live	46.00
0.815	44.56	Average	Live	46.00
0.870	45.52	Average	Neutral	46.00
0.925	43.72	Average	Live	46.00
0.985	45.77	Average	Neutral	46.00
1.04	45.59	Average	Live	46.00
1.10	45.54	Average	Neutral	46.00
1.16	44.77	Average	Live	46.00
1.22	44.66	Average	Live	46.00
1.275	44.56	Average	Neutral	46.00
1.335	43.34	Average	Neutral	46.00
1.39	43.77	Average	Neutral	46.00
1.45	43.03	Average	Neutral	46.00
1.51	42.75	Average	Live	46.00
1.565	42.42	Average	Neutral	46.00
1.915	39.17	Average	Neutral	46.00
2.375	37.07	Average	Neutral	46.00
2.435	36.11	Average	Live	46.00

The test equipment used for the Transmitter Conducted Emissions – AC Power Line Part 15.207 test are shown on page 15:

Notes: 1 See attached plots annex I (Worst Case Scan for TX and RX).
2 Only emissions within 10 dB of the limit are recorded.

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

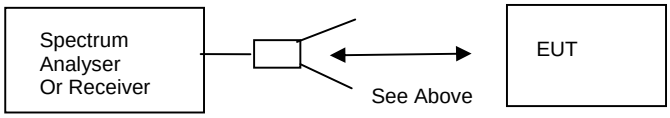
The test equipment used for the Transmitter Conducted Emissions – AC Power Line Part 15.207 test was:

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

RECEIVER TESTS

RECEIVER SPURIOUS EMISSIONS – RADIATED – PART 15.109

Ambient temperature	=	7.5°C(<1GHz)	10m measurements <1GHz	[X]
Relative humidity	=	30% (<1GHz)	0.3m measurements >1GHz	[X]
Conditions	=	Open Area Test Site (OATS)	3m extrapolated from 0.3m	[X]
Supply voltage	=	+110Vac		



Antenna

	FREQ. (MHz)	MEAS. Rx. (dBµV)	CABLE LOSS (dB)	ANT FACTOR	FIELD STRENGTH (dBµV/m)	EXTRAP. FACTOR (dB)	FIELD STRENGTH (µV/m)	LIMIT (µV/m)
30MHz – 88MHz	30.25	12.70	0.60	17.90	31.2	-	36.31	90
	32.85	14.30	0.65	16.35	31.3	-	36.73	90
	35.30	14.35	0.70	15.25	30.3	-	32.73	90
	86.05	14.26	1.04	7.70	23.0	-	14.13	90
88MHz – 216MHz	Note 6							
216MHz – 960MHz	399.05	11.20	2.40	15.80	29.4	-	29.51	210
	432.10	15.03	2.60	16.37	34.0	-	50.12	210
	528.10	13.60	2.80	17.80	34.2	-	51.28	210
	576.15	16.42	3.05	18.63	38.1	-	80.53	210
	768.15	11.98	3.58	19.84	35.4	-	58.88	210
	912.20	8.98	3.90	20.92	33.8	-	48.97	210
960MHz – 1.0GHz	Note 6							
1GHz – 5.0GHz	1056.280	27.85	1.09	26.1	55.04	20	56.4	500
	1148.890	34.61	1.22	26.0	61.83	20	123.4	500
	1822.260	32.37	1.47	26.2	60.04	20	100.0	500
	1830.480	36.20	1.47	26.0	63.67	20	152.5	500
	1862.720	32.35	1.47	26.0	59.82	20	97.9	500
	1862.680	34.42	1.47	26.0	61.89	20	124.3	500
	1865.260	30.35	1.47	26.0	57.82	20	77.8	500
	1871.340	34.72	1.46	26.0	62.18	20	128.5	500

Limits	30MHz to 88MHz	90µV/m @ 10m
	88MHz to 216MHz	150µV/m @ 10m
	216MHz to 960MHz	210µV/m @ 10m
	960MHz to 1GHz	300µV/m @ 10m
	1GHz to 5GHz	300µV/m @ 10m 500µV/m @ 3m

Notes:

1 R indicates frequency with a restricted band.
2 Initial pre scans were performed see Annex J for plots <1GHz.
3 Emissions above 1GHz were measured with both a peak and average detectors.
4 Measurements <1GHz were performed at 3 meters.
5 Measurements >1GHz were initial performed at 0.3metres. This distance was increased if sensitivity of analyser allowed.
6 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	
HORN ANTENNA	EMCO	3115	9010-3581	139	**X**
RECEIVER	ROHDE & SCHWARZ	ESHS 10	830051/001	UH03	
RECEIVER	ROHDE & SCHWARZ	ESVS 10	825892/003	UH04	**X**
RANGE 1	TRL	10 METRE	N/A	UH07	**X**
AE, LOOP, Z2, 9kHz - 30MHz	ROHDE & SCHWARZ	HFH2	881058 - 53	07	
BILOG ANTENNA	CHASE	CBL6112	2129	UH93	**X**
SPECTRUM ANALYSER	ANRITSU	MS2665C	MT26089	479	**X**

ANNEX A

PHOTOGRAPHS

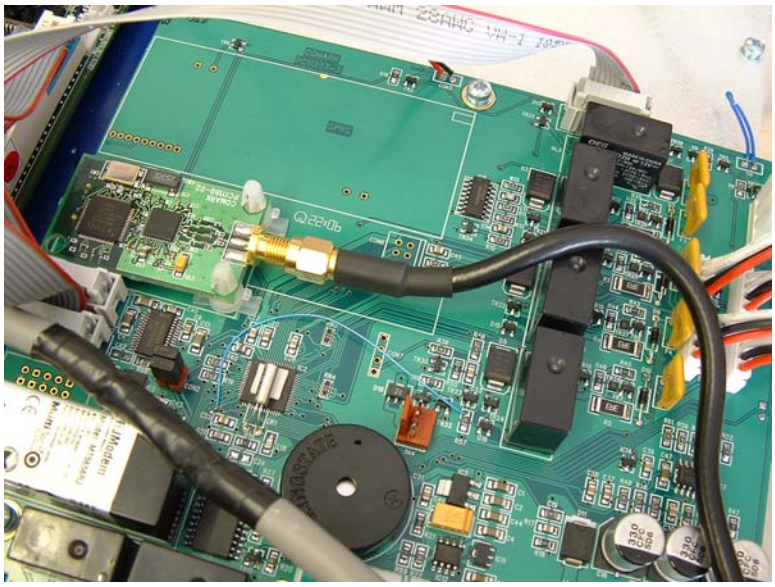
PHOTOGRAPH No. 1 **TEST SETUP**

PHOTOGRAPH No. 2 **TRANSMITTER TOP VIEW**

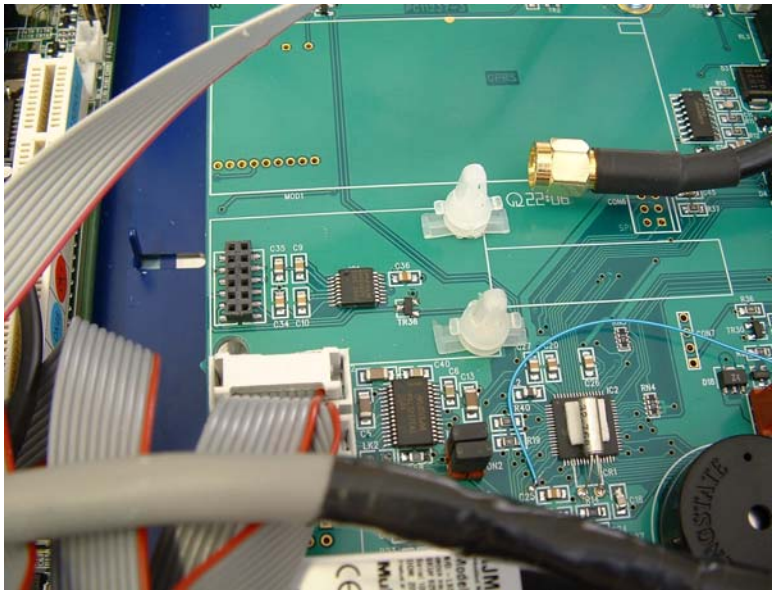
PHOTOGRAPH No. 3 **TRANSMITTER SIDE VIEW**

PHOTOGRAPH No. 4 **UNIT OPEN**

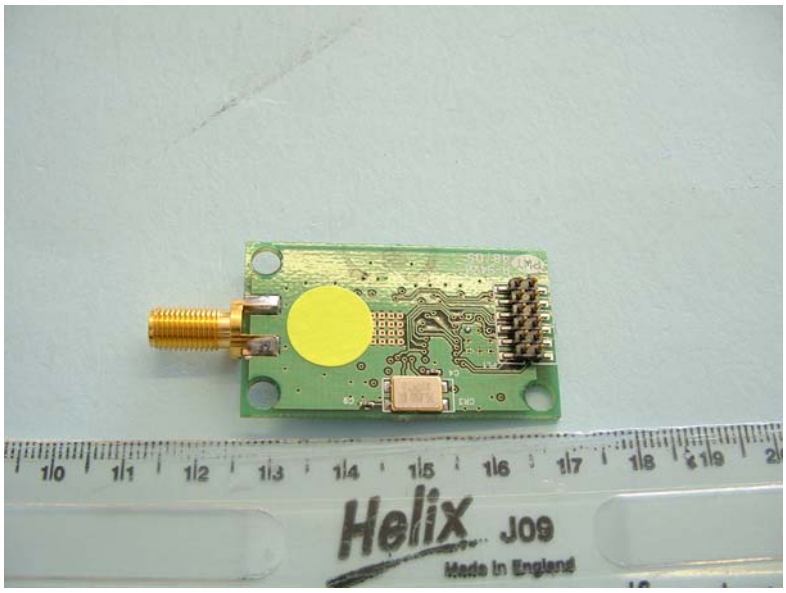
PHOTOGRAPH No. 5 **CONTROL PCB RF MODULE MOUNTED**



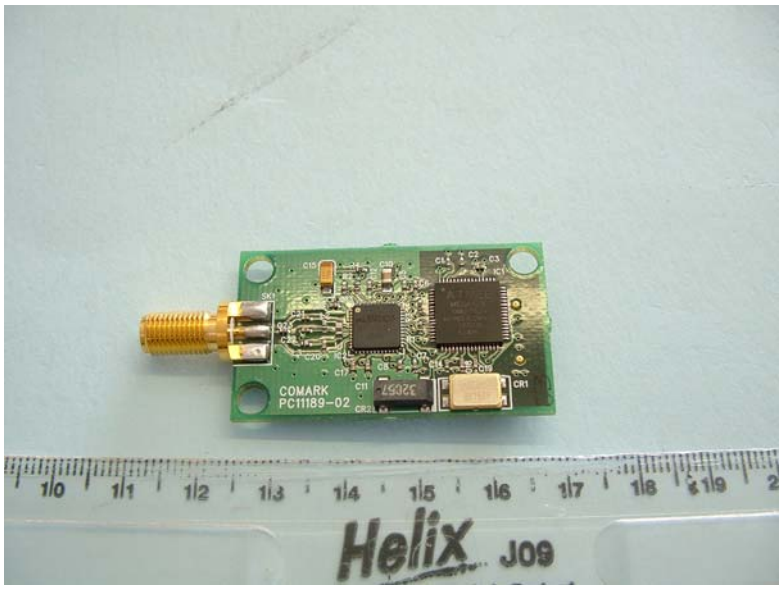
PHOTOGRAPH No. 6 **CONTROL PCB RF MODULE UNMOUNTED**



PHOTOGRAPH No. 7 **RF PCB TRACK SIDE**



PHOTOGRAPH No. 8 **RF PCB COMPONENT SIDE**



ANNEX B

APPLICANT'S SUBMISSION OF DOCUMENTATION LIST

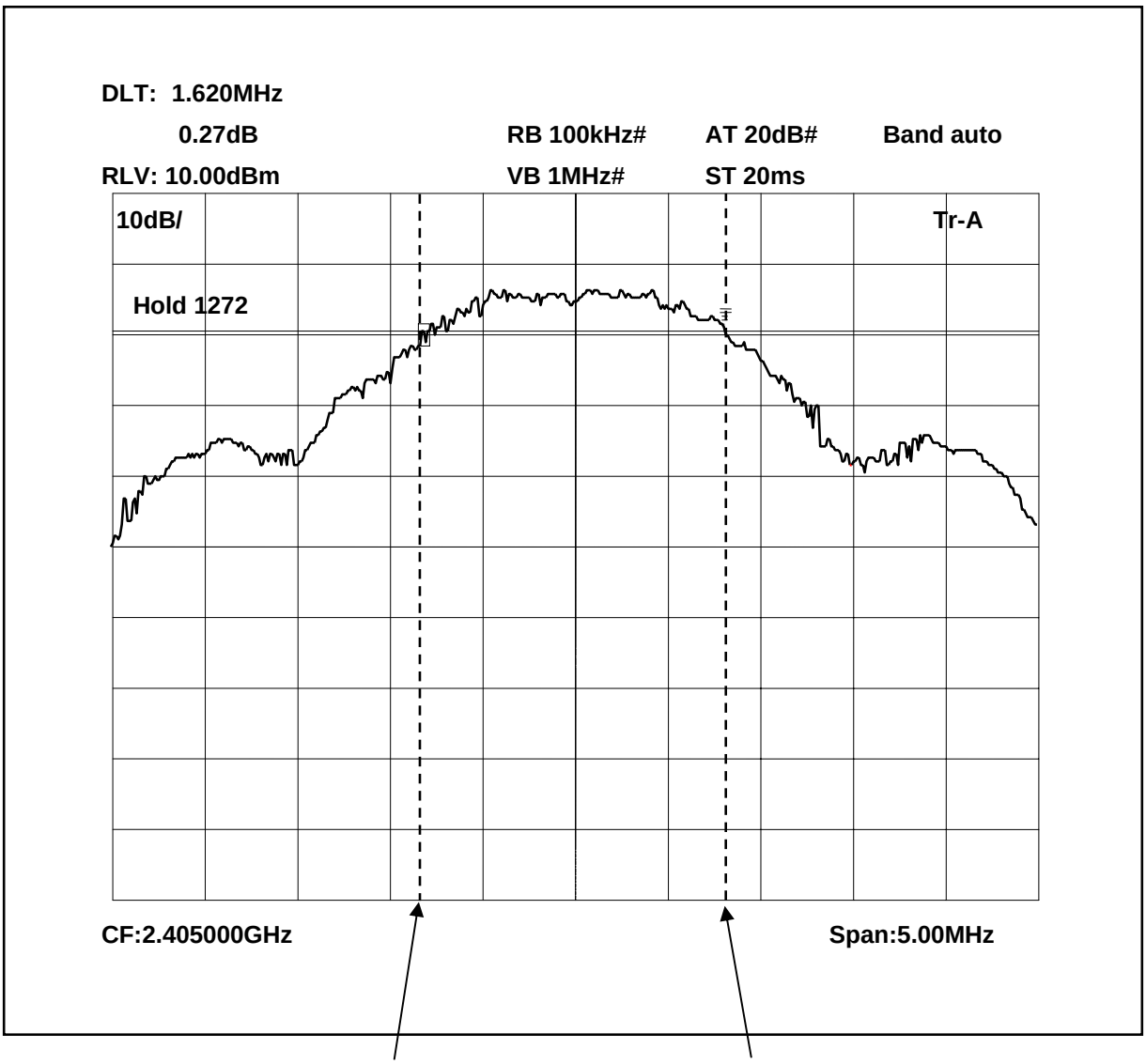
APPLICANT'S SUBMISSION OF DOCUMENTATION LIST

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

ANNEX C

6 dB BANDWIDTH

6dB Bandwidth



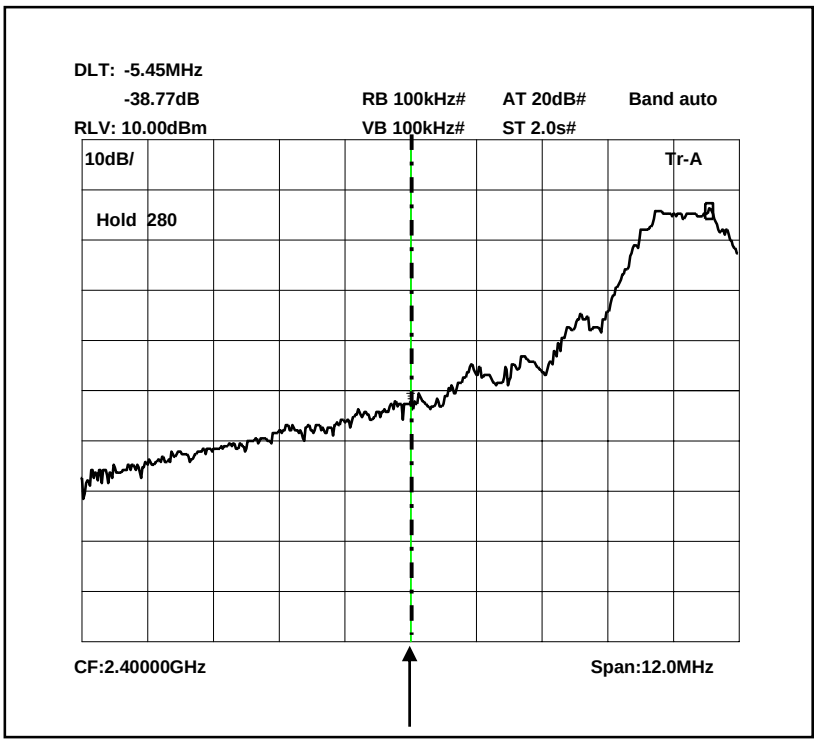
f lower f higher

Occupied bandwidth = 1.620 MHz

ANNEX D

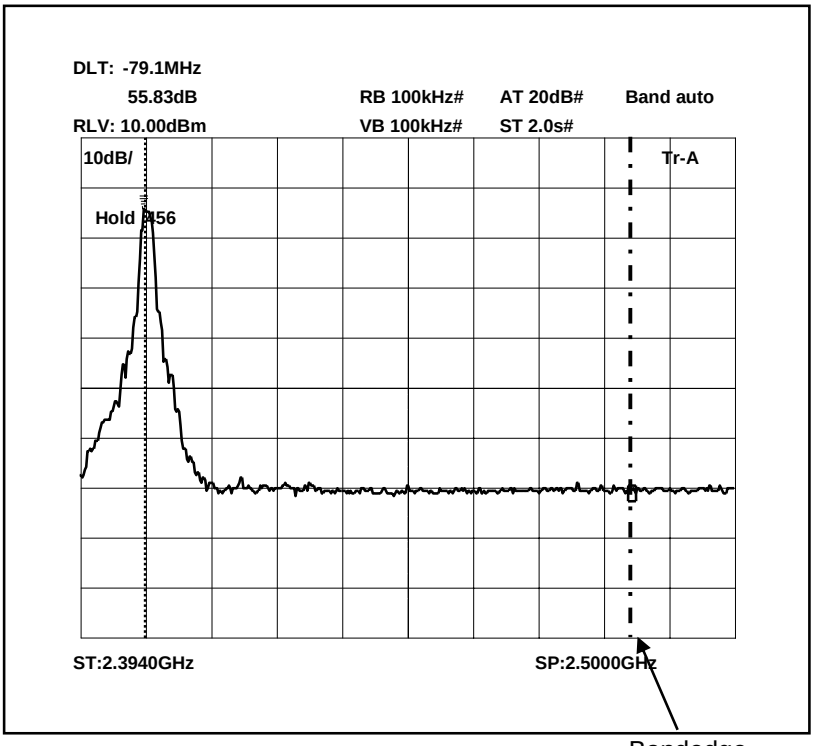
BAND EDGE COMPLIANCE (Conducted)

Lower Band Edge



Bandedge

Upper Band Edge

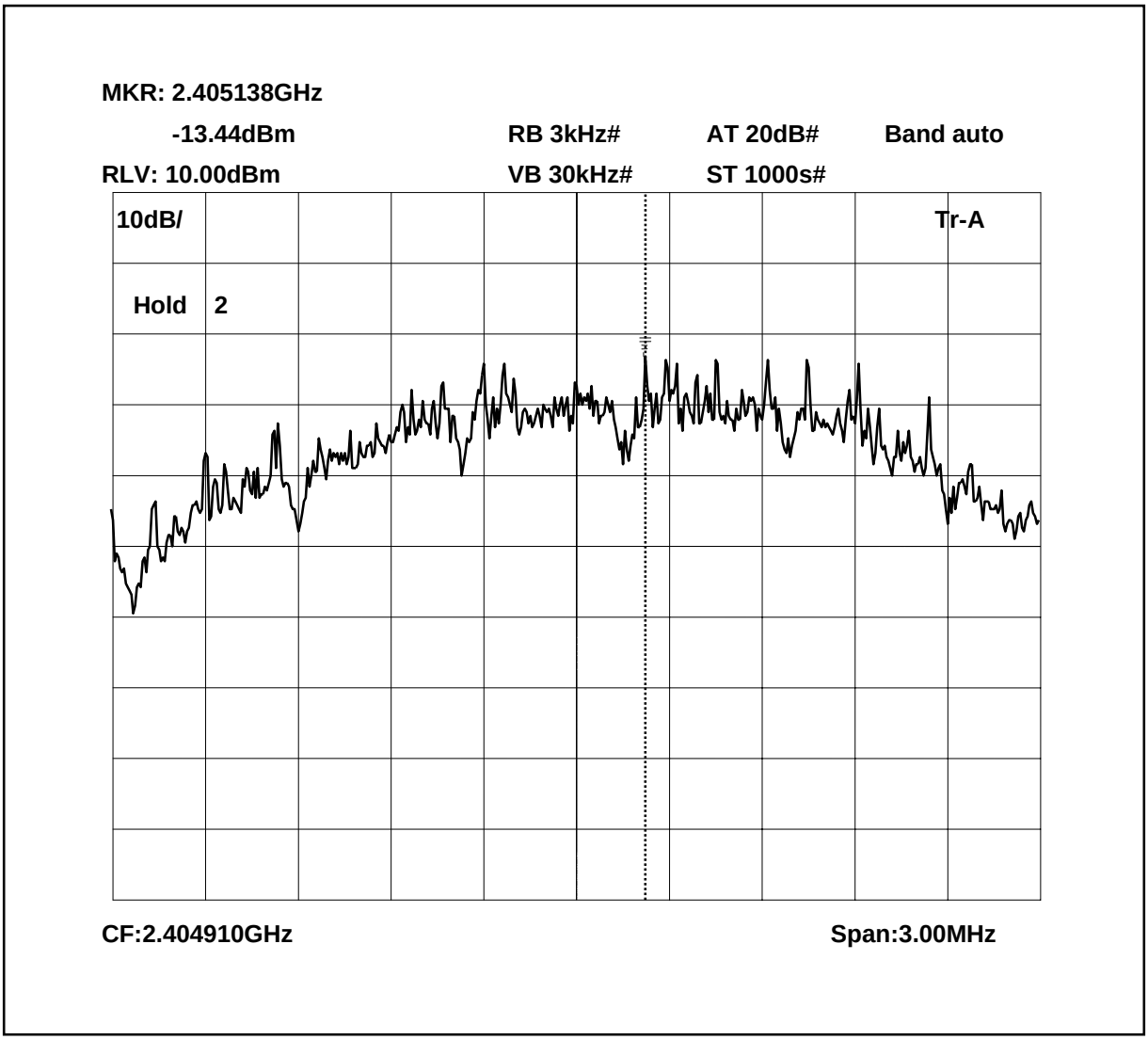


Bandedge

ANNEX E

POWER SPECTRAL DENSITY

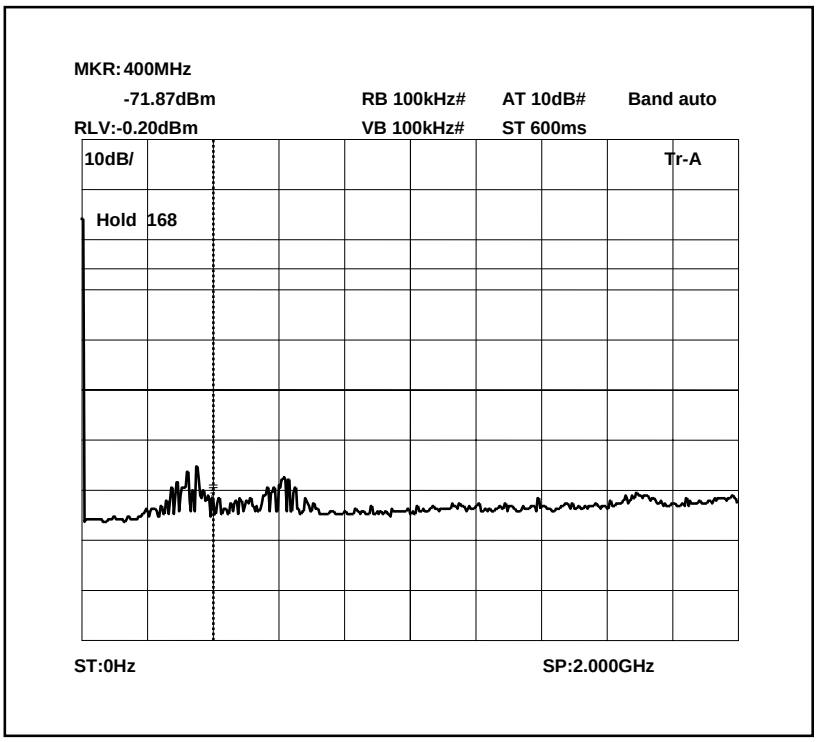
Power Spectral Density



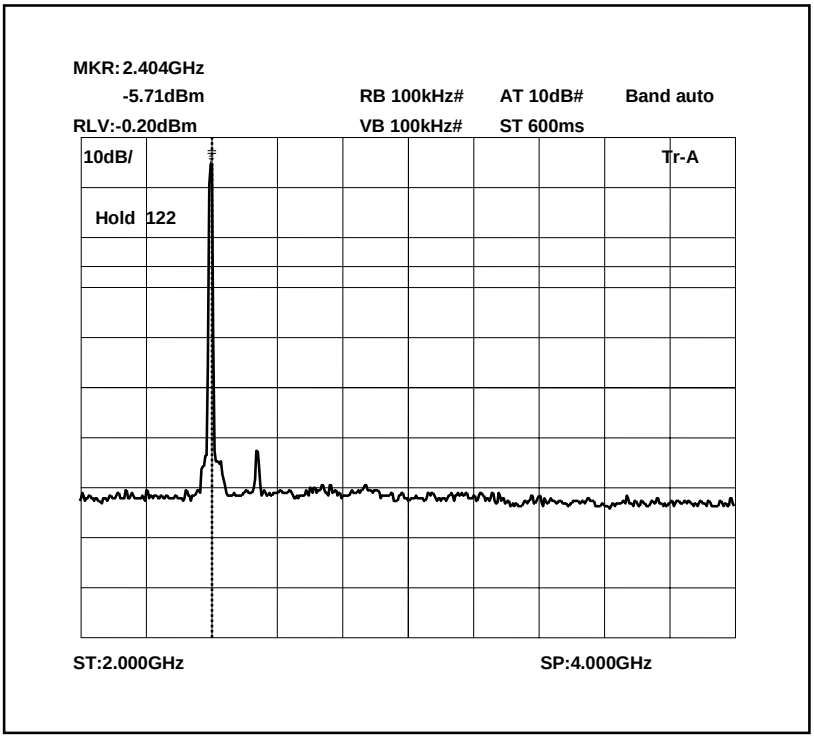
ANNEX F

TRANSMITTER SPURIOUS EMISSIONS CONDUCTED

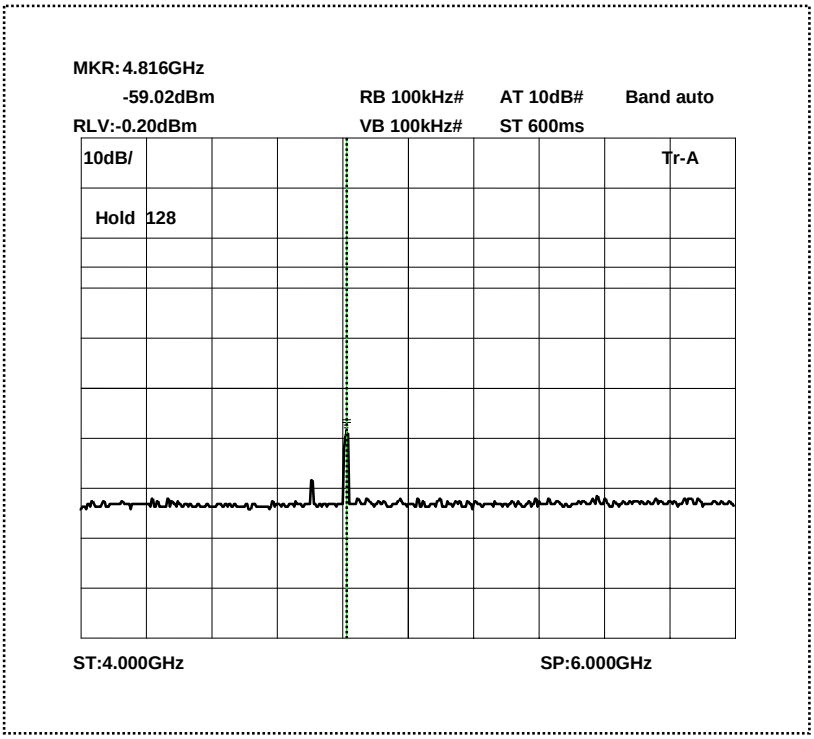
0 – 2GHz


MKR: 400MHz
-71.87dBm
RB 100kHz#
AT 10dB#
Band auto
RLV:-0.20dBm
VB 100kHz#
ST 600ms
10dB/
Tr-A
Hold 168
ST:0Hz
SP:2.000GHz

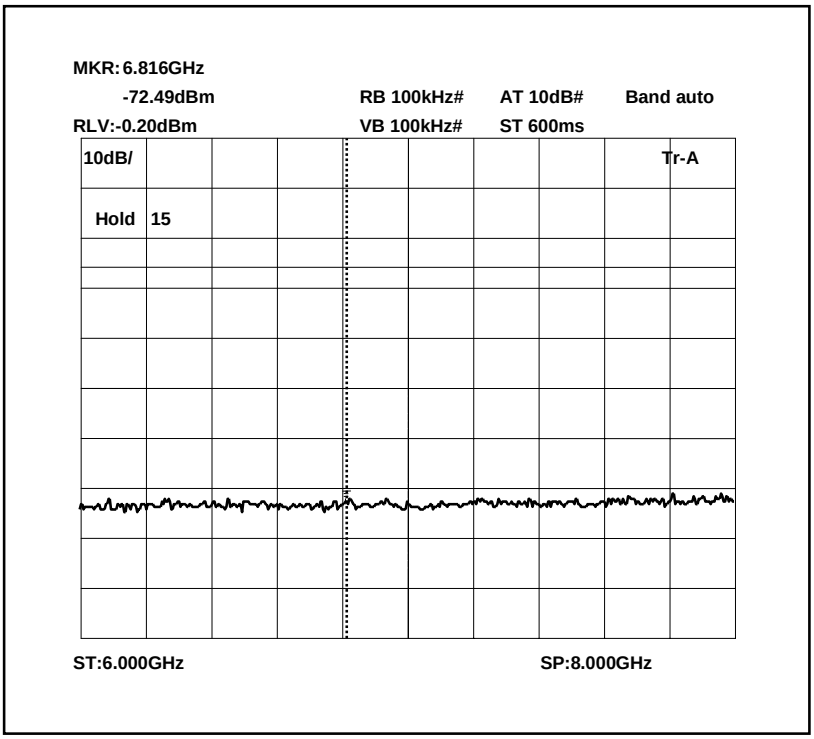
2-4 GHz


MKR: 2.404GHz
-5.71dBm
RB 100kHz#
AT 10dB#
Band auto
RLV:-0.20dBm
VB 100kHz#
ST 600ms
10dB/
Tr-A
Hold 122
ST:2.000GHz
SP:4.000GHz

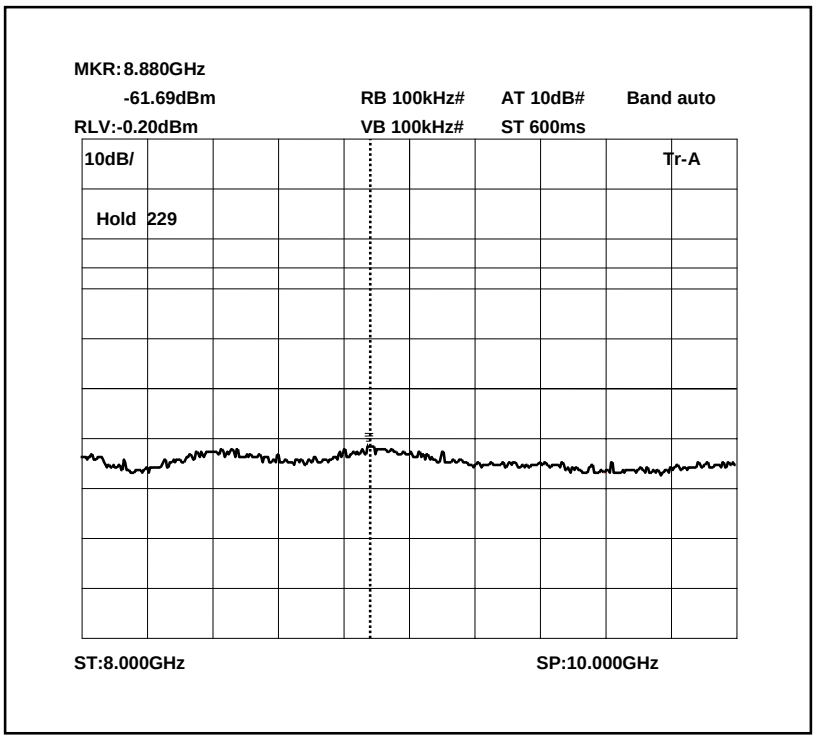
4-6GHz


MKR: 4.816GHz
-59.02dBm
RB 100kHz#
AT 10dB#
Band auto
RLV:-0.20dBm
VB 100kHz#
ST 600ms
10dB/
Tr-A
Hold 128
ST:4.000GHz
SP:6.000GHz

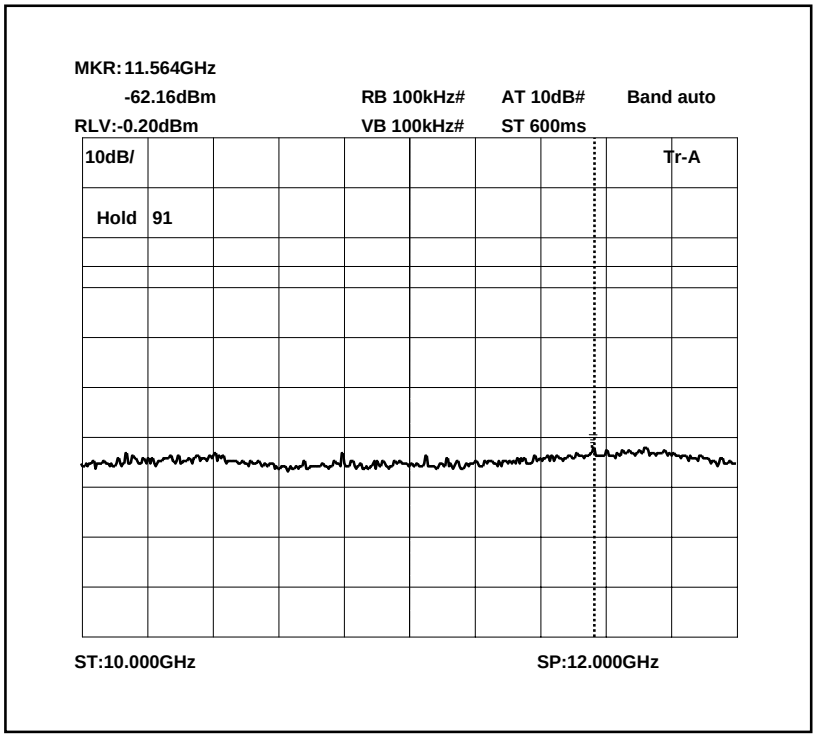
6-8GHz


MKR: 6.816GHz
-72.49dBm
RB 100kHz#
AT 10dB#
Band auto
RLV:-0.20dBm
VB 100kHz#
ST 600ms
10dB/
Tr-A
Hold 15
ST:6.000GHz
SP:8.000GHz

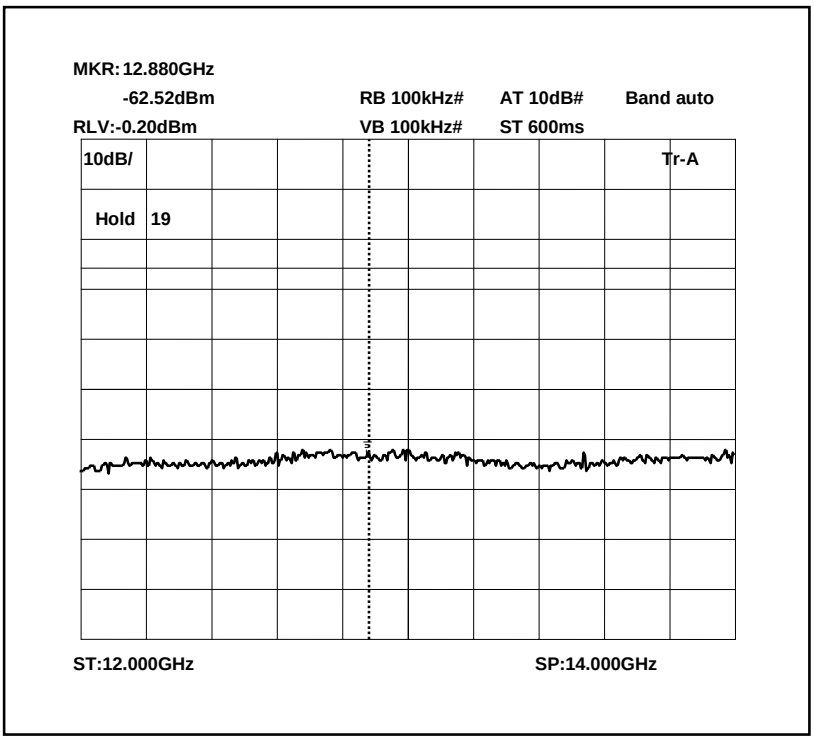
8-10 GHz



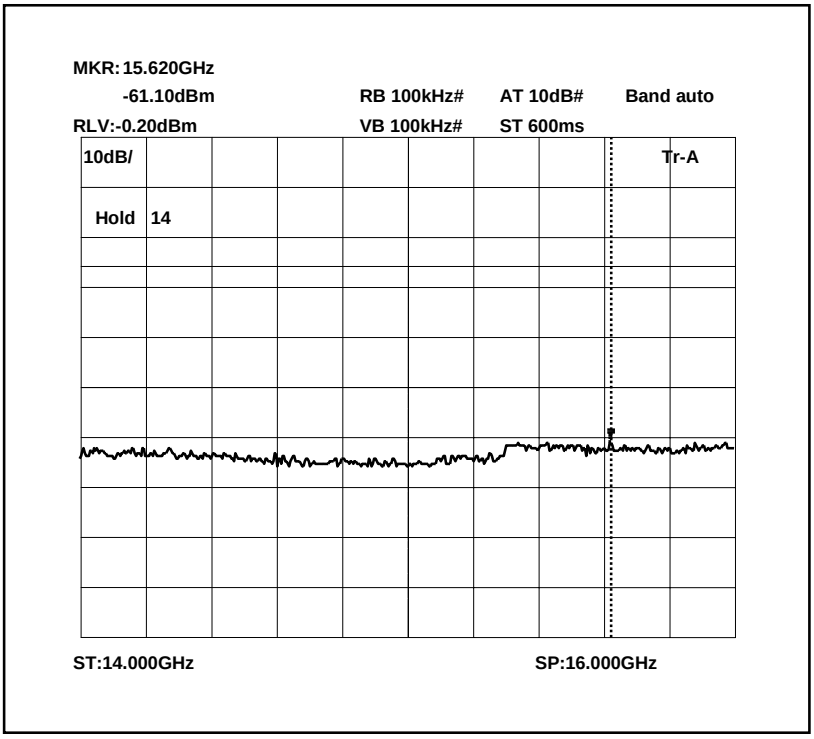
10-12 GHz



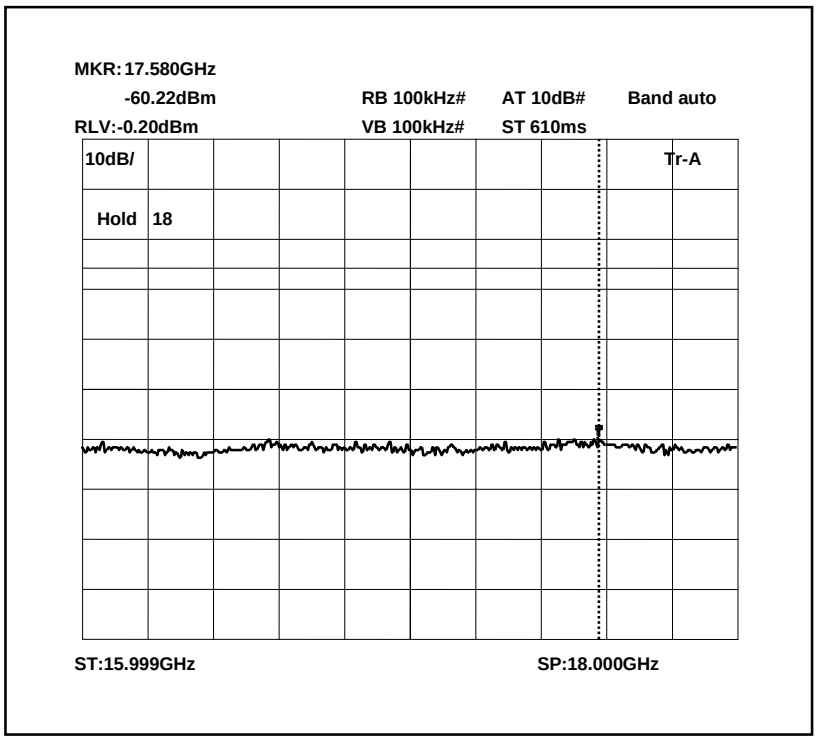
12-14GHz



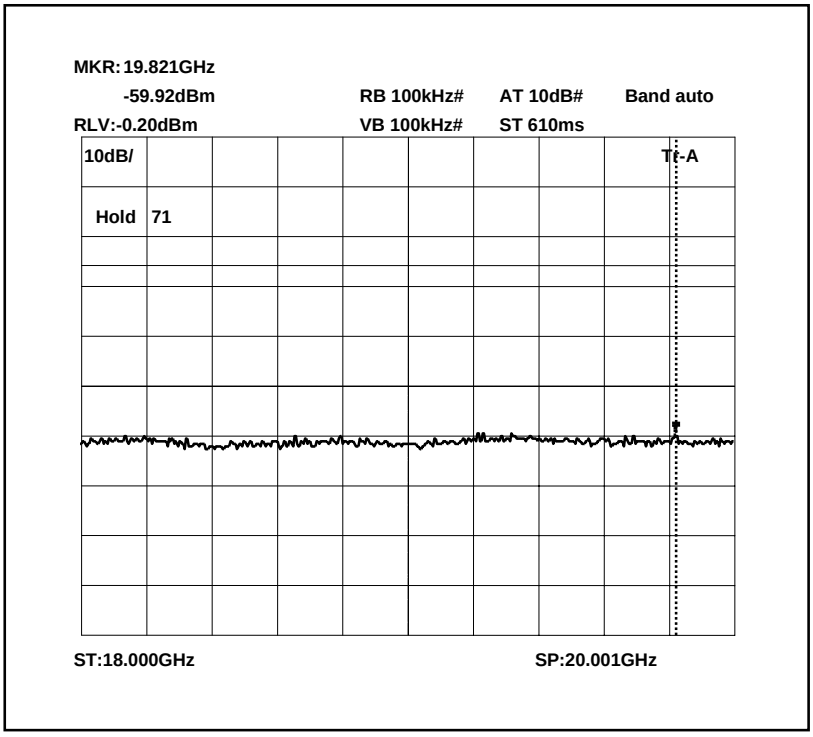
14-16GHz



16-18GHz



18-20GHz



ANNEX G

TRANSMITTER SPURIOUS EMISSIONS RADIATED

TRL Compliance Services Ltd

05 Jun 2006 13:59

E-Field Radiation (30MHz-1GHz)

EUT:	RF500
Manuf:	Comark
Op Cond:	Prescan 30MHz - 1000MHz
Operator:	D Winstanley
Test Spec:	Part15
Comment:	Unit on TX 1 per Second. Monitor, Keyboard, network & Modem cables connected. Antenna port terminated. RX Antenna Vertical

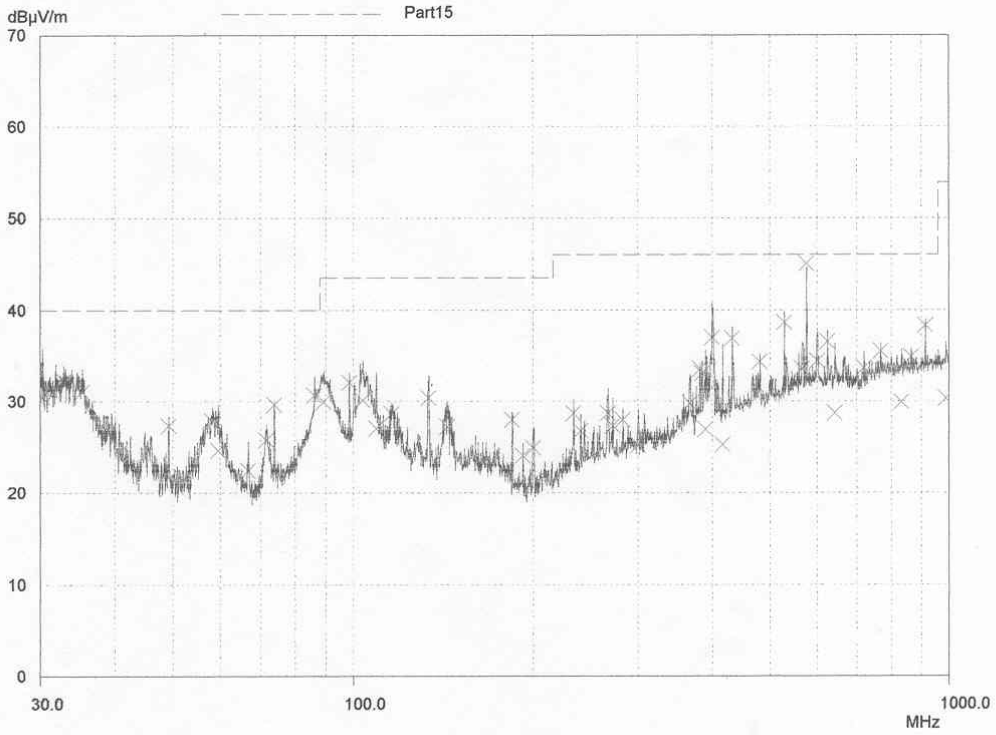
Scan Settings (1 Range)

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:	10 dB



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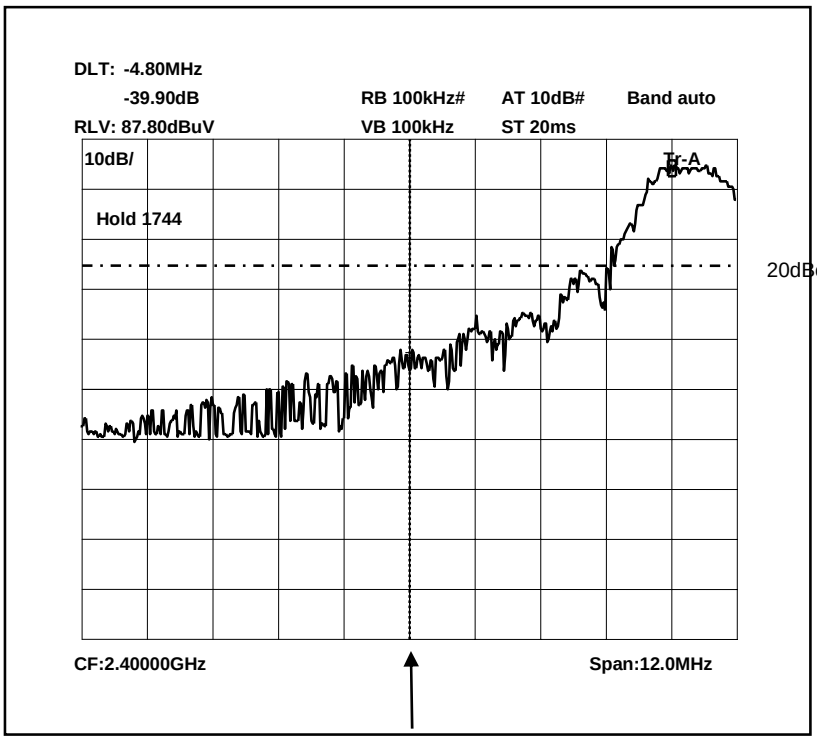
ANNEX H

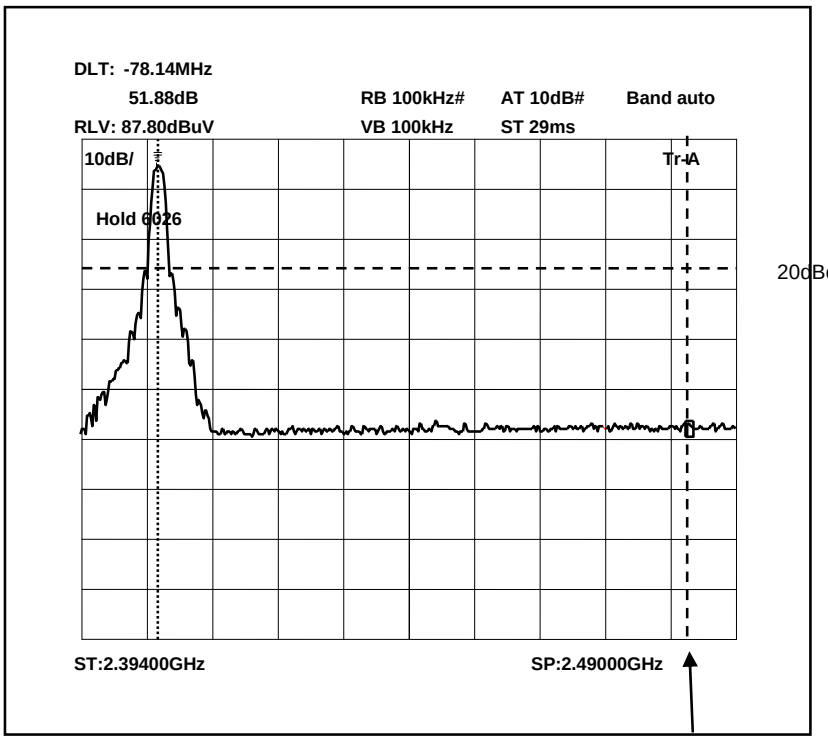
BAND EDGE COMPLIANCE (Radiated)

Lower Band Edge



Bandedge

Upper Band Edge



ANNEX I

AC POWER LINE CONDUCTION

Powerline Conduction

06 Jun 2006 10:57

150kHz - 30MHz

EUT:	RF500
Manuf:	Comark
Op Cond:	LISN UH05, cable UH21 & Receiver UH187
Operator:	S Hodgkinson
Test Spec:	EN55022 Class B (or Variant)
Comment:	Neutral Line, 110V, 60Hz
	Unit in Tx mode,monitor,keyboard,network cables connected.

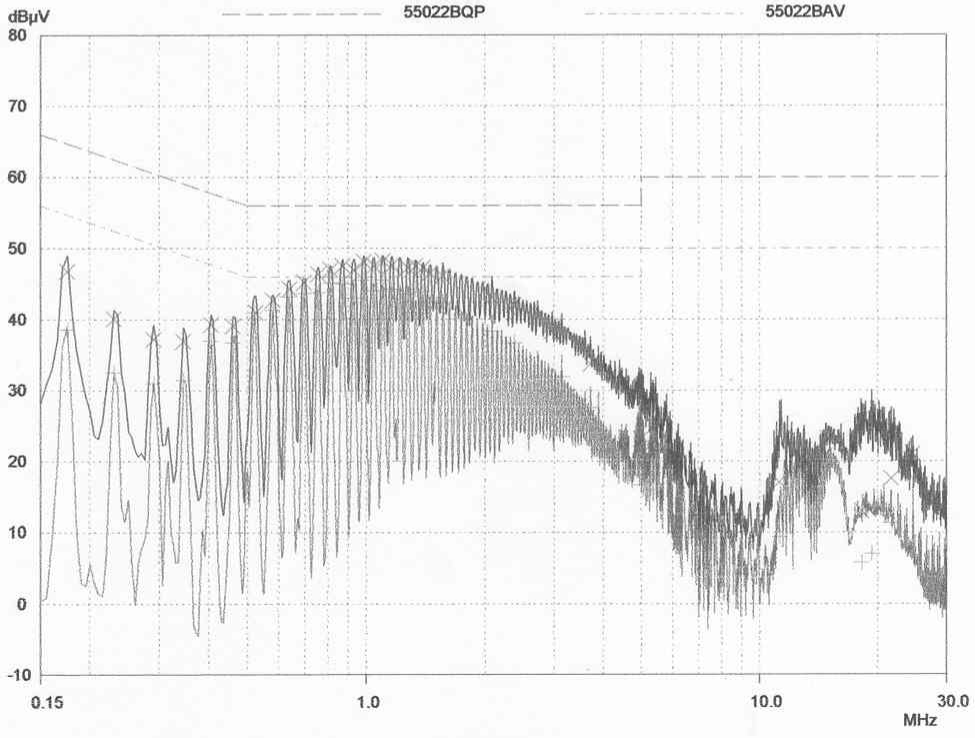
Scan Settings (1 Range)

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	150kHz	30MHz	UH21

Final Measurement:

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



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ANNEX J

RECEIVER SPURIOUS EMISSIONS RADIATED

TRL Compliance Services Ltd

05 Jun 2006 15:28

E-Field Radiation (30MHz-1GHz)

EUT:	RF500
Manuf:	Comark
Op Cond:	Prescan 30MHz - 1000MHz
Operator:	D Winstanley
Test Spec:	Part15
Comment:	Unit in Rx mode,monitor,keyboard,modem cables connected.Antenna port terminated.
	Rx antenna Vertical

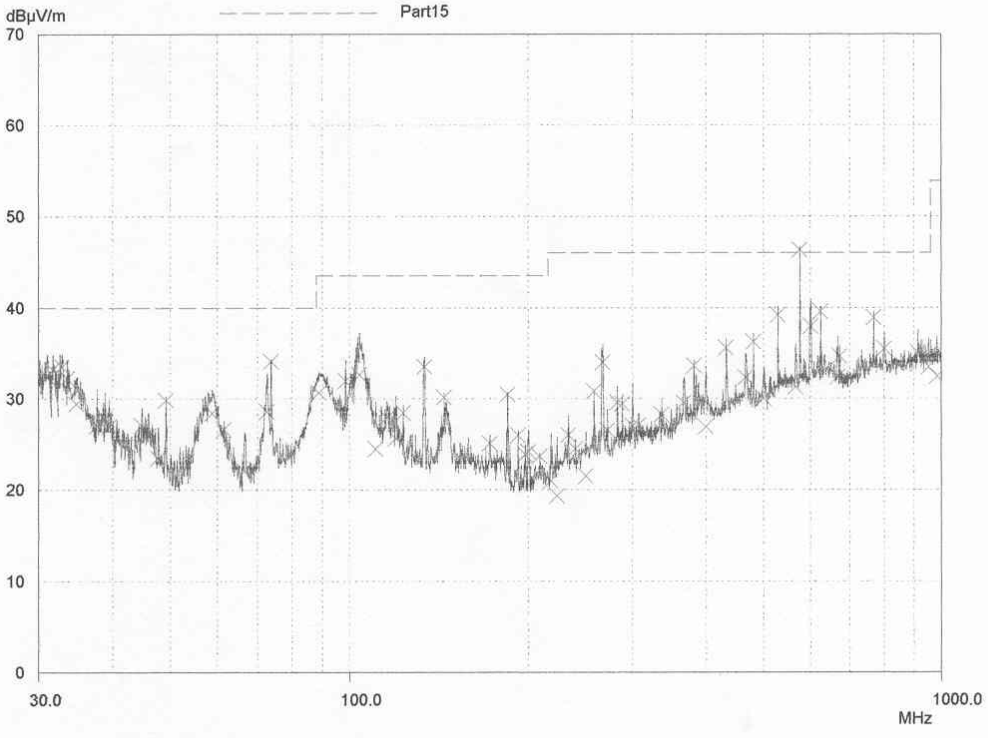
Scan Settings (1 Range)

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:	10 dB



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ANNEX K

TEST EQUIPMENT CALIBRATION DETAILS

TRL Number	Equipment Type	Manufacturer	Last Cal Calibration	Calibration Period	Due For Calibration
UH006	3m Range ERP CAL	TRL	06/01/2006	12	06/01/2007
UH028	Log Periodic Ant	Schwarbeck	28/04/2005	24	28/04/2007
UH029	Bicone Antenna	Schwarbeck	27/04/2005	24	27/04/2007
UH041	Multimeter	AVOmeter	20/12/2005	12	20/12/2006
UH093	Bilog Antenna	Chase	19/08/2005	12	19/08/2006
UH120	Spectrum Analyser	Marconi	15/03/2005	12	15/03/2006
UH122	Oscilloscope	Tektronix	07/06/2005	24	07/06/2007
UH132	Power meter	Marconi	03/01/2006	12	03/01/2007
UH162	ERP Cable Cal	TRL	06/01/2006	12	06/01/2007
UH179	Power Sensor	Marconi	14/12/2004	12	14/12/2005
UH228	Power Sensor	Marconi	03/01/2006	12	03/01/2007
UH253	1m Cable N type	TRL	23/02/2006	12	23/02/2007
UH254	1m Cable N type	TRL	05/01/2006	12	05/01/2007
UH265	Notch filer	Telonic	24/06/2005	12	24/06/2006
UH271	1m Cable N type	TRL	23/02/2006	12	23/02/2007
UH273	1m Cable N type	TRL	23/02/2006	12	23/02/2007
L005	CMTA	R&S	05/12/2005	12	05/12/2006
L007	Loop Antenna	R&S	29/03/2005	24	29/03/2007
L138	1-18GHz Horn	EMCO	15/04/2005	24	15/04/2007
L139	1-18GHz Horn	EMCO	03/05/2005	24	03/05/2007
L176	Signal Generator	Marconi	31/01/2005	12	31/01/2006
L193	Bicone Antenna	Chase	12/10/2003	24	12/10/2005
L203	Log Periodic Ant	Chase	21/10/2003	24	21/10/2005
L280	18GHz Cable	Rosenberger	05/01/2006	12	05/01/2007
L343	CCIR Noise Filter	TRL	07/06/2005	12	07/06/2006
L426	Temperature Indicator	Fluke	04/01/2006	12	04/01/2007
L479	Analyser	Anritsu	18/11/2005	12	18/11/2006
L552	Signal Generator	Agilent	25/04/2005	12	25/04/2006
N/A	High Pass Filter	AFL	23/02/2006	12	23/02/2007

ANNEX L

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**