TEST REPORT NO: RU1231/7352

COPY NO: 2

ISSUE NO: 1

FCC ID: OE5PENDTUUSB

REPORT ON THE CERTIFICATION TESTING OF A
GROUP 4 TECHNOLOGY Ltd
PROXISHOE WITH RESPECT TO
THE FCC RULES CFR 47, PART 15.209
AUGUST 2006
INTENTIONAL RADIATOR SPECIFICATION

TEST DATE: 31st October – 14th November 2006

TESTED BY: S HODGKINSON — Digitally signed by S HODGKINSON DN: CN = S HODGKINSON, C = GB, O = TRL COMPLIANCE LTD Reason: I am the author of this document Date: 2006.12.20 15:45:44 Z — S HODGKINSON

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: 2006.12.20 15:46:50 Z — J CHARTERS RADIO SECTION LEADER

DATE: 20th December 2006

Distribution:

Copy Nos:
1. Group 4 Technology Limited
2. TCB: TRL Compliance Limited
3. TRL Compliance Limited

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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:	OE5PENDTUUSB					
PURPOSE OF TEST:	Certification					
TEST SPECIFICATION:	FCC RULES CFR 47, Part 15.209					
TEST RESULT:	Compliant to Specification					
EQUIPMENT UNDER TEST:	Proxishoe					
EQUIPMENT SERIAL No:	001					
ITU: EMISSION CODE:	10k7K1N					
EQUIPMENT TYPE:	Inductive Tag Reader					
PRODUCT USE:	Time and Location Verification					
CARRIER EMISSION:	0.001µV/m @ 300m					
ANTENNA TYPE:	Integral					
ALTERNATIVE ANTENNA:	Not applicable					
FREQUENCY OF OPERATION:	125.95 kHz					
CHANNEL SPACING:	Not applicable					
NUMBER OF CHANNELS:	1					
FREQUENCY GENERATION:	SAW Resonator	[X]	Crystal	[ ]	Synthesiser	[ ]
MODULATION METHOD:	Amplitude	[ ]	Digital	[X]	Angle	[ ]
POWER SOURCE(s):	10Vdc via ext supply or 5Vdc via the USB lead					
TEST DATE(s):	31st October – 14th November 2006					
ORDER No(s):	PUR71540					
APPLICANT:	Group 4 Technology Limited					
ADDRESS:	Building 2 Challenge House International Drive Tewkesbury Gloucestershire GL20 8UQ					

TESTED BY: S HODGKINSON

Digitally signed by S HODGKINSON
DN: CN = S HODGKINSON, C = GB, O = TRL COMPLIANCE LTD
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Reason: I am approving this document
Date: 2006.12.20 15:46:59 Z

J CHARTERS
RADIO SECTION LEADER

APPLICANT'S SUMMARY

EQUIPMENT UNDER TEST (EUT):	Proxishoe
EQUIPMENT TYPE:	Inductive Tag Reader
SERIAL NUMBER OF EUT:	001
PURPOSE OF TEST:	Certification
TEST SPECIFICATION(s):	FCC RULES CFR 47, Part 15.209
TEST RESULT:	COMPLIANT Yes [X] No [ ]
APPLICANT'S CATEGORY:	MANUFACTURER [X] IMPORTER [ ] DISTRIBUTOR [ ] TEST HOUSE [ ] AGENT [ ]
APPLICANT'S ORDER No(s):	PUR71540
APPLICANT'S CONTACT PERSON(s):	Mr E Porter
E-mail address:	eric.porter@g4tec.com
APPLICANT:	Group 4 Technology Limited
ADDRESS:	Building 2 Challenge House International Drive Tewkesbury Gloucestershire GL20 8UQ
TEL:	+44 (0) 1684 850977
FAX:	+44 (0) 1684 277500
MANUFACTURER:	Group 4 Technology Limited
EUT(s) COUNTRY OF ORIGIN:	United Kingdom
TEST LABORATORY:	TRL Compliance
UKAS ACCREDITATION No:	0728
TEST DATE(s):	31st October – 14th November 2006
TEST REPORT No:	RU1231/7352

EQUIPMENT TEST / EXAMINATIONS REQUIRED

1.

TEST/EXAMINATION	RULE PART	DETECTOR	APPLICABILITY
Intentional Emission Frequency:	15.209(a)	Average	Yes
Intentional Emission Field Strength:	15.209(a)	Average	Yes
Intentional Emission Band Occupancy:	15.215(c)	Peak	Yes
Intentional Emission ERP (mW):	-	-	No
Spurious Emissions – Conducted:	15.207	Quasi Peak Average	Yes
Spurious Emissions – Radiated <1000MHz:	15.209	Quasi Peak Average	Yes
Spurious Emissions – Radiated >1000MHz:	-	-	No
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

2. Product Use: Time and Location Verification

3. Emission Designator: 10k7K1N

4. Duty Cycle: <100%

5. Transmitter bit or pulse rate and level: 19200bps

6. Temperatures: Ambient (Tnom) 15^{o}C

7. Supply Voltages: Vnom +10Vdc

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

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

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

TRANSMITTER TESTS

TRANSMITTER SPURIOUS EMISSIONS – RADIATED – PART 15.209

Ambient temperature	=	13°C(<1GHz)	3m measurements <30MHz	[X]
Relative humidity	=	42% (<1GHz),	3m measurements <1GHz	[X]
Conditions	=	Open Area Test Site (OATS)	300m extrapolated from 3m	[X]
Supply voltage	=	+1.2Vdc		
Channel number	=	1		

	FREQ (MHz)	MEAS. Rx. (dBµV)	CABLE LOSS (dB)	ANT FACT (dB)	FIELD STRENGTH (dBµV/m)	EXTRAP FACTOR (dB)	FIELD STRENGTH (µV/m)
0.009MHz - 0.49MHz	No Significant Emissions Detected						
0.4MHz - 1.705MHz	No Significant Emissions Detected						
1.705MHz - 30MHz	No Significant Emissions Detected						
30MHz - 88MHz	No Significant Emissions Detected						
88MHz - 216MHz	144.00MHz 192.00MHz	17.40 21.30	1.4 1.6	10.40 8.30	29.2 31.2	- -	28.84 36.30
216MHz - 960MHz	228.65MHz 240.00MHz 252.00MHz 299.75MHz 360.05MHz 384.05MHz 399.80MHz 480.05MHz	21.46 32.30 19.61 20.88 19.19 20.32 24.60 20.40	1.74 1.80 1.89 2.02 2.21 2.38 2.40 2.60	9.10 10.80 12.20 13.00 14.60 15.20 15.80 17.00	32.3 44.9 33.7 35.9 36.0 37.9 42.8 40.0	- - - - - - - -	41.21 175.79 48.41 62.37 63.10 78.52 138.04 100.00
960MHz - 1GHz	No Significant Emissions Detected						
1GHz - 5GHz	No Significant Emissions Detected						

Limits	0.009MHz to 0.49MHz	2400/F(kHz)@ 300m
	0.49MHz to 1.705MHz	24000/F(kHz)@ 30m
	1.705MHz to 30MHz	30µV/m@ 30m
	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

TRANSMITTER TESTS

TRANSMITTER SPURIOUS EMISSIONS – RADIATED – PART 15.209

Notes:
1 Results quoted are extrapolated as indicated.
2 Emissions were searched to: (**x**) 1000MHz inclusive, as per Part 15.33a.
3 Extrapolation factor 9.5dB from 1m to 3m, as per Part 15.31f.
4 Extrapolation factor 80dB from 3m to 300m as per Part 15.31f.
5 Extrapolation factor 40dB from 3m to 30m as per Part 15.31f.
6 Measurements >1GHz @ 1m as per Part 15.31f(1).
7 Receiver detector 9kHz – 30MHz CISPR, Quasi-Peak,10kHz bandwidth.
Apart from the bands 9kHz-90kHz and 110kHz-490kHz where an Average detector is used.
8 Receiver detector 30MHz – 1GHz = CISPR, Quasi-Peak, 120kHz bandwidth.
9 Receiver detector >1GHz = Peak Hold, 1MHz resolution bandwidth.
10 New batteries used for battery powered products.
11 Emissions 20dB's below the limit are not recorded.
12 For emissions below 30MHz, the measuring receiver automatically compensates for the loss due to the antenna factor of the loop antenna. This loss is 20dB's across the measurement range 9kHz to 30MHz.
13 For emissions below 30MHz the cable losses are assumed to be negligible.
14 F(kHz) is the frequency of operation or spurious emission.

Test
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 >30MHz.
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 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	**X**
HORN ANTENNA	EMCO	3115	9010-3580	138	
HORN ANTENNA	EMCO	3115	9010-3581	139	
SPECTRUM ANALYSER	TEKTRONIX	2756P	B010109	164	
BICONE ANTENNA	CHASE	BBA9106	N/A	193	
ANTENNA, LOG PERIODIC 300MHz – 1GHz	CHASE	UPA6108	1061	203	
RECEIVER	ROHDE & SCHWARZ	ESHS20	837960/003	237	
ANTENNA, BICONE 20MHz - 300MHz	CHASE	VBA6106A	1193	251	
BILOG ANTENNA	CHASE	CBL6112	2098	274	
RECEIVER	ROHDE & SCHWARZ	ESVS10	837948/003	317	
RECEIVER	ROHDE & SCHWARZ	ESVS10	844594/003	352	
RECEIVER	ROHDE & SCHWARZ	ESHS10	844077/019	353	
V / UHF RECEIVER 20MHz - 1GHz	ROHDE & SCHWARZ	ESVS 20	838804 / 005	415	
BILOG ANTENNA	SCHAFFNER	CBL6112B	2761	431	
RECEIVER	ROHDE & SCHWARZ	ESHS 10	830051/001	UH03	**X**
RECEIVER	ROHDE & SCHWARZ	ESVS 10	825892/003	UH04	**X**
RANGE 1	TRL	3 METRE	N/A	UH06	**X**
BILOG ANTENNA	CHASE	CBL6112	2129	UH93	**X**
SPECTRUM ANALYSER	MARCONI	2386/2380	152076/004	UH120	

TRANSMITTER TESTS

TRANSMITTER INTENTIONAL EMISSION – RADIATED – Part 15.209

DTU CONNECTED TO THE LAPTOP VIA DATA LEAD AND POWERED VIA THE 12V EXTERNAL SUPPLY.

Ambient temperature	=	13°C(<1GHz),	1m measurements @ fc	[X]
Relative humidity	=	48%(<1GHz),	3m measurements @ fc	[X]
Conditions	=	Open Area Test Site (OATS)	10m measurements @ fc	[ ]
Supply voltage	=	+10Vdc	30m measurements @ fc	[ ]
Channel number	=	1	300m extrapolated from1& 3m	[X]
			30m extrapolated from 10m	[ ]

FREQ. (kHz)	MEASUREMENT DISTANCE (Metres)	MEASUREMENT Rx. READING (dBµV/m)	EXTRAP. FACTOR (dB)	FIELD STRENGTH (µV/m)
125.92	1	36.5	99	0.001
125.92	3	17.1	80	0.001

Limit value @ fc	**19.05(µV/m) @ 300m**	
Band occupancy @ -20dBc	**f lower**	**f higher**
	119.679 kHz	129.839 kHz

See spectrum analyser plot – Annex C

Notes:

1 The results quoted are for the worse case configuration.
Results quoted are extrapolated as indicated.
2 Receiver detector @ fc = Average, 200Hz bandwidth, measurement time 1s.
3 The EUT was powered with new batteries.
4 For emissions below 30MHz the measuring receiver automatically compensates for the loss due to the antenna factor of the loop antenna. This loss is 20dB's across the measurement range 9kHz to 30MHz.
5 For emissions below 30MHz the cable losses are assumed to be negligible.
6 Peak emissions were found to be less than or equal to the average limit therefore deemed to comply with 15.35(b).
7 The test results quoted are the maximum seen after the supply voltage was varied between 85% and 115% of Vnom.
8 Results for measurements @ 10m are not quoted as the EUT field strength was so low that only noise floor was seen @ 10m.

Test Method:

1 As per Radio – Noise Emissions, ANSI C63.4: 2003.
2 Measuring distances 1 & 3m.
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 at frequencies >30MHz.
Horizontal and vertical polarisations, of the receive antenna.
EUT orientation in three orthagonal planes.
Maximum results recorded.

The test equipment used for the Transmitter Intentional Emission – Radiated – Part 15.209 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	
SPECTRUM ANALYSER	TEKTRONIX	2756P	B010109	164	
BICONE ANTENNA	CHASE	BBA9106	N/A	193	
ANTENNA, LOG PERIODIC 300MHz – 1GHz	CHASE	UPA6108	1061	203	
RECEIVER	ROHDE & SCHWARZ	ESHS20	837960/003	237	
ANTENNA, BICONE 20MHz - 300MHz	CHASE	VBA6106A	1193	251	
BILOG ANTENNA	CHASE	CBL6112	2098	274	
RECEIVER	ROHDE & SCHWARZ	ESVS10	837948/003	317	
RECEIVER	ROHDE & SCHWARZ	ESVS10	844594/003	352	
RECEIVER	ROHDE & SCHWARZ	ESHS10	844077/019	353	
V / UHF RECEIVER 20MHz - 1GHz	ROHDE & SCHWARZ	ESVS 20	838804 / 005	415	
BILOG ANTENNA	SCHAFFNER	CBL6112B	2761	431	
RECEIVER	ROHDE & SCHWARZ	ESHS 10	830051/001	UH03	**X**
RECEIVER	ROHDE & SCHWARZ	ESVS 10	825892/003	UH04	
RANGE 1	TRL	3 METRE	N/A	UH06	**X**
AE, LOOP, Z2, 9kHz - 30MHz	ROHDE & SCHWARZ	HFH2	881058 - 53	07	**X**
BILOG ANTENNA	CHASE	CBL6112	2129	UH93	
SPECTRUM ANALYSER	ANRITSU	MS2665C	MT26089	479	**X**

TRANSMITTER TESTS

TRANSMITTER CONDUCTED EMISSIONS – AC POWER LINE Part 15.207

DTU CONNECTED TO THE LAPTOP VIA THE DATA LEAD AND POWERED VIA THE 12V EXTERNAL SUPPLY.

Ambient temperature = 20 °C (<1GHz),
Relative humidity = 42% (<1GHz),
Conditions = Power Line Laboratory
Supply voltage = 110V AC
Supply Frequency = 60Hz

FREQUENCY (MHz)	MEASUREMENT RECEIVER READING (dBµV)	DETECTOR	CONDUCTOR (L or N)	EMISSION LIMIT (dBµV)
24.0MHz	40.58	QUASI PEAK	NEUTRAL	60.0
28.0MHz	44.84	AVERAGE	NEUTRAL	50.0

Notes:
1 See Annex D for plot
2 Measurements were taken on both live & neutral lines; levels are recorded in the table.
The proxipen was seated in the DTU ,the DTU was powered via the mains.The DTU and
3 Proxipen were continuously transferring data via the RF link.

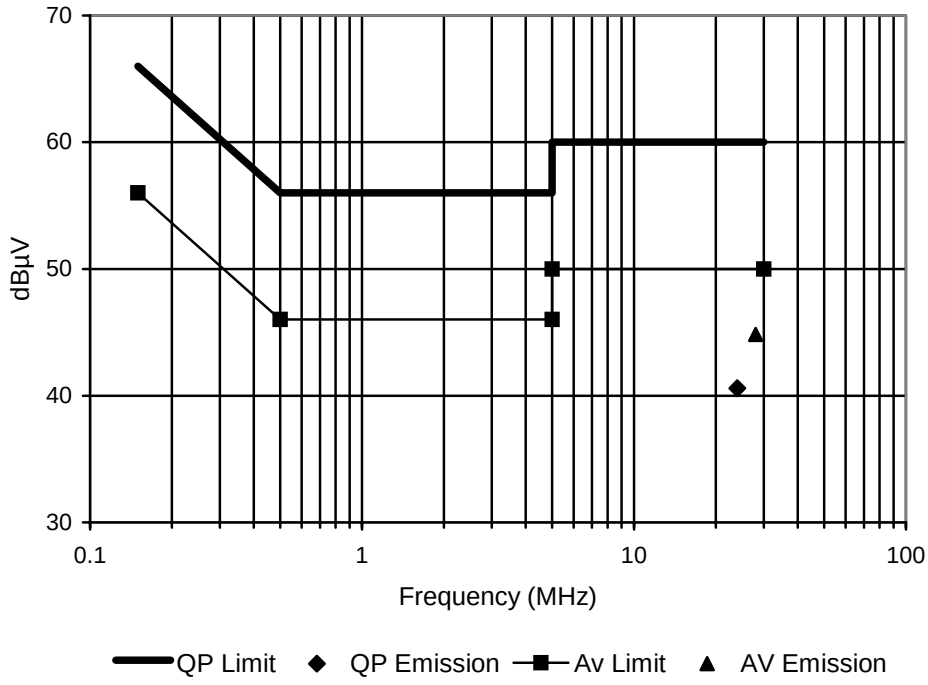
Test Method: 1 As per Radio – Noise Emissions, ANSI C63.4: 2003.

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	ESHS20	837960/003	237	
LISN / AMN	ROHDE & SCHWARZ	ESH3-Z5	83746/010	289	
RECEIVER	ROHDE & SCHWARZ	ESHS10	844077/019	353	
RECEIVER	ROHDE & SCHWARZ	ESHS 10	830051/001	UH03	**X**
LISN/AMN	ROHDE & SCHWARZ	ESH3-Z5	8470 31/015	UH195	**x**
SPECTRUM ANALYSER	MARCONI	2386/2380	152076/004	UH120	

POWER LINE CONDUCTION EMISSIONS

Limits Part 15.207
(Levels below the limit are only displayed if
within 20dB of the limit)



TRANSMITTER TESTS

TRANSMITTER CONDUCTED EMISSIONS – AC POWER LINE Part 15.207

PROXIPEN SEATED IN DTU CONNECTED TO THE PC VIA THE USB CABLE.

Ambient temperature = 20 °C (<1GHz),
Relative humidity = 42% (<1GHz),
Conditions = Power Line Laboratory
Supply voltage = 110V AC
Supply Frequency = 60Hz

FREQUENCY (MHz)	MEASUREMENT RECEIVER READING (dBµV)	DETECTOR	CONDUCTOR (L or N)	EMISSION LIMIT (dBµV)
0.205MHz	37.30	AVERAGE	LIVE	53.41
0.275MHz	32.66	AVERAGE	NEUTRAL	50.97
0.415MHz	30.97	AVERAGE	LIVE	47.55
0.485MHz	29.87	AVERAGE	NEUTRAL	46.34
0.55MHz	32.05	AVERAGE	NEUTRAL	46.00
0.62MHz	30.30	AVERAGE	LIVE	46.00
0.895MHz	28.62	AVERAGE	LIVE	46.00
0.965MHz	28.95	AVERAGE	NEUTRAL	46.00
1.03MHz	29.27	AVERAGE	NEUTRAL	46.00
1.24MHz	27.25	AVERAGE	LIVE	46.00
1.31MHz	29.87	AVERAGE	LIVE	46.00
1.38MHz	29.11	AVERAGE	NEUTRAL	46.00
1.725MHz	27.20	AVERAGE	NEUTRAL	46.00
1.73MHz	28.70	AVERAGE	NEUTRAL	46.00
2.14MHz	27.11	AVERAGE	NEUTRAL	46.00
2.55MHz	26.70	AVERAGE	NEUTRAL	46.00
3.38MHz	26.43	AVERAGE	NEUTRAL	46.00

Notes:
1 See Annex D for plot
2 Measurements were taken on both live & neutral lines; levels are recorded in the table.
3 The proxipen was seated in the DTU, the DTU was powered via USB lead via the PC.The DTU and Proxipen were continuously transferring data via the RF link.

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

TRANSMITTER TESTS

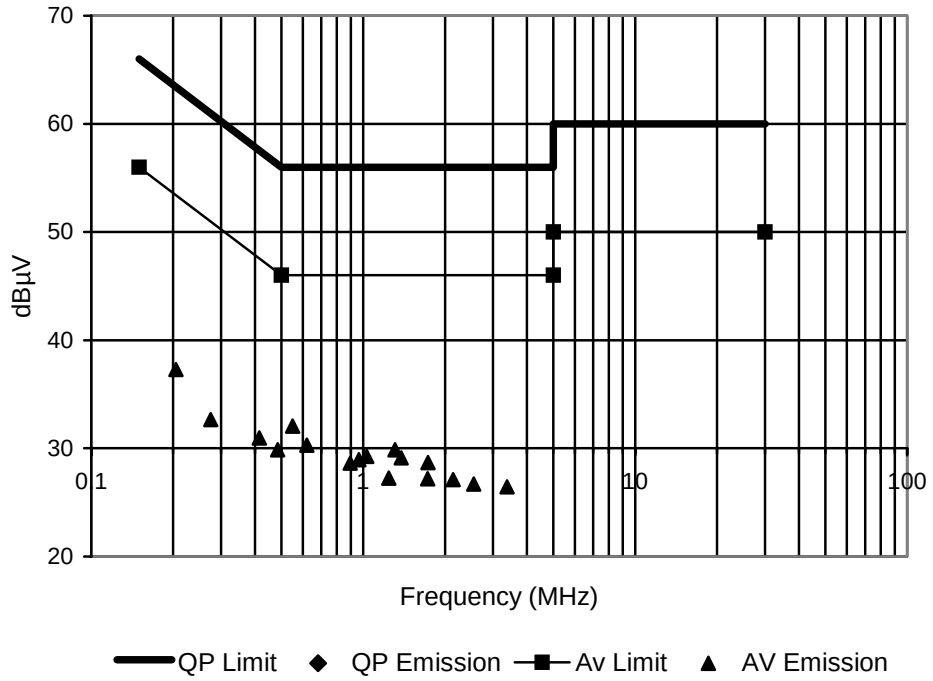
TRANSMITTER CONDUCTED EMISSIONS – AC POWER LINE Part 15.207

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	ESHS20	837960/003	237	
LISN / AMN	ROHDE & SCHWARZ	ESH3-Z5	83746/010	289	
RECEIVER	ROHDE & SCHWARZ	ESHS10	844077/019	353	
RECEIVER	ROHDE & SCHWARZ	ESHS 10	830051/001	UH03	**X**
LISN/AMN	ROHDE & SCHWARZ	ESH3-Z5	8470 31/015	UH195	**X**
SPECTRUM ANALYSER	MARCONI	2386/2380	152076/004	UH120	

POWER LINE CONDUCTION EMISSIONS

Limits Part 15.207
(Levels below the limit are only displayed if
within 20dB of the limit)



ANNEX A

PHOTOGRAPHS

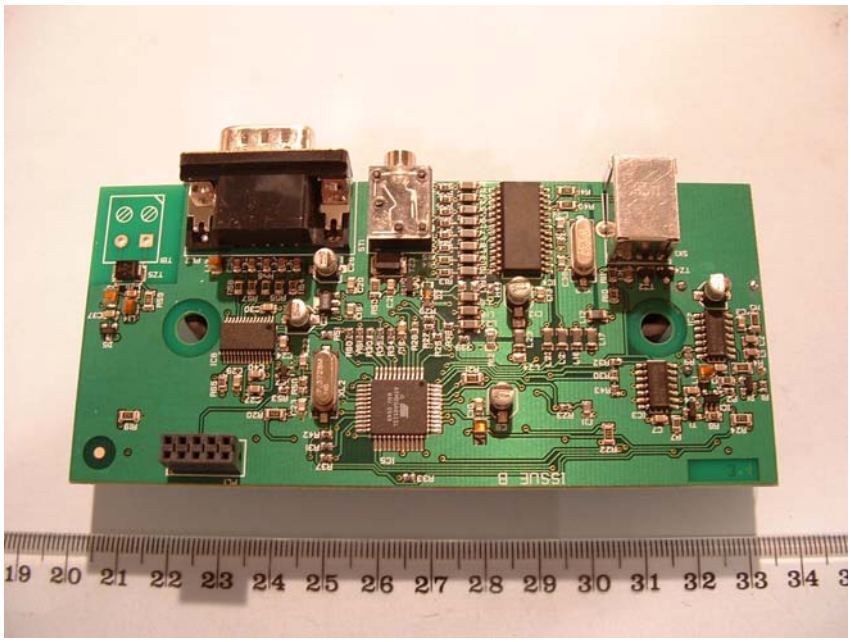
PHOTOGRAPH No. 1 **TEST SETUP**

PHOTOGRAPH No. 2 **TEST SETUP**

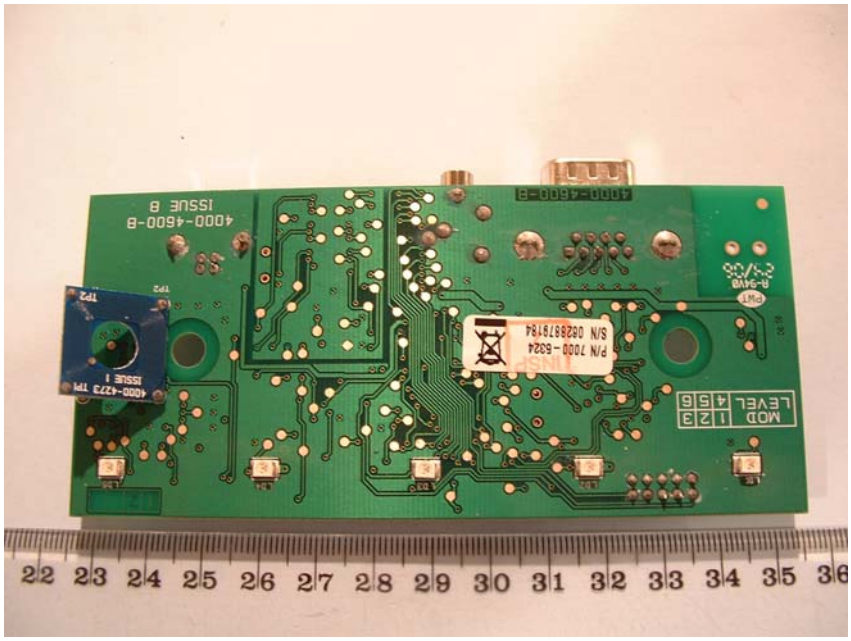
PHOTOGRAPH No. 3 **DTU EXTERNAL TOP VIEW**

PHOTOGRAPH No. 4 **DTU REAR VIEW**

PHOTOGRAPH No. 5 **DTU PCB TOP SIDE**



PHOTOGRAPH No. 6 **DTU PCB BOTTOM SIDE**



ANNEX B

APPLICANT'S SUBMISSION OF DOCUMENTATION LIST

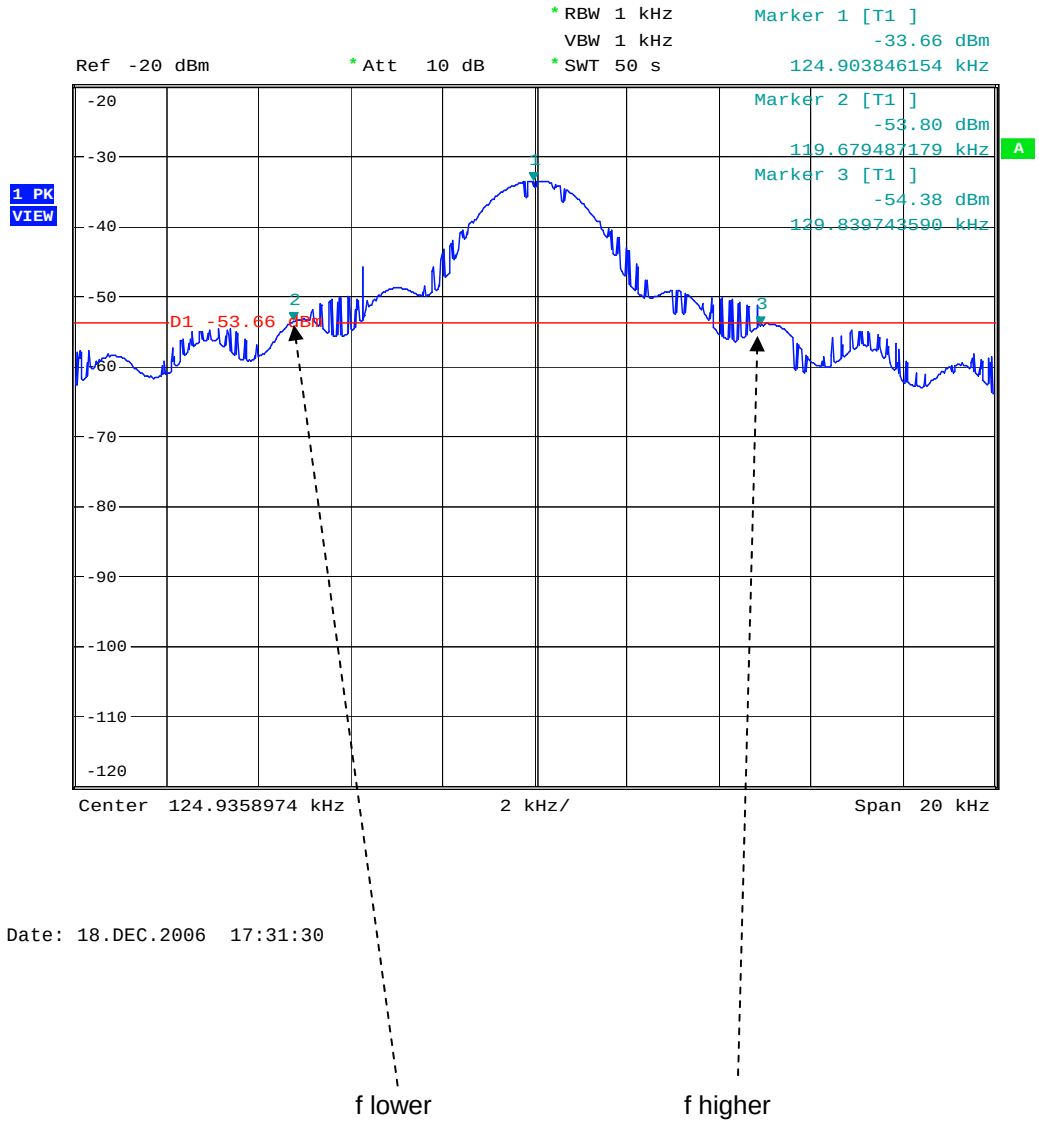
APPLICANT'S SUBMISSION OF DOCUMENTATION LIST

a.	TCB	-	APPLICATION	[X]
		-	FEE	[X]
b.	AGENT'S LETTER OF AUTHORISATION	-		[X]
c.	MODEL(s) vs IDENTITY	-		[X]
d.	ALTERNATIVE TRADE P GREEN DECLARATION(s)	-		[ ]
e.	LABELLING	-	PHOTOGRAPHS	[ ]
		-	DECLARATION	[X]
		-	DRAWINGS	[ ]
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

BANDWIDTH PLOT

BANDWIDTH PLOT



Occupied Bandwidth	=	10.16 kHz
f lower	=	119.679 kHz
f higher	=	129.839 kHz

ANNEX D

30MHz – 1000MHz SCAN PLOT

TRL Compliance Services Ltd

09 Nov 2006 13:57

E-Field Radiation (30MHz-1GHz)

EUT:	Proxi Pen DTU
Manuf:	Group 4
Op Cond:	Prescan 30MHz - 1000MHz
Operator:	S Hodgkinson
Test Spec:	Part15
Comment:	DTU pen fitted .connected to Pc via USB lead.
	Rx antenna Vertical.

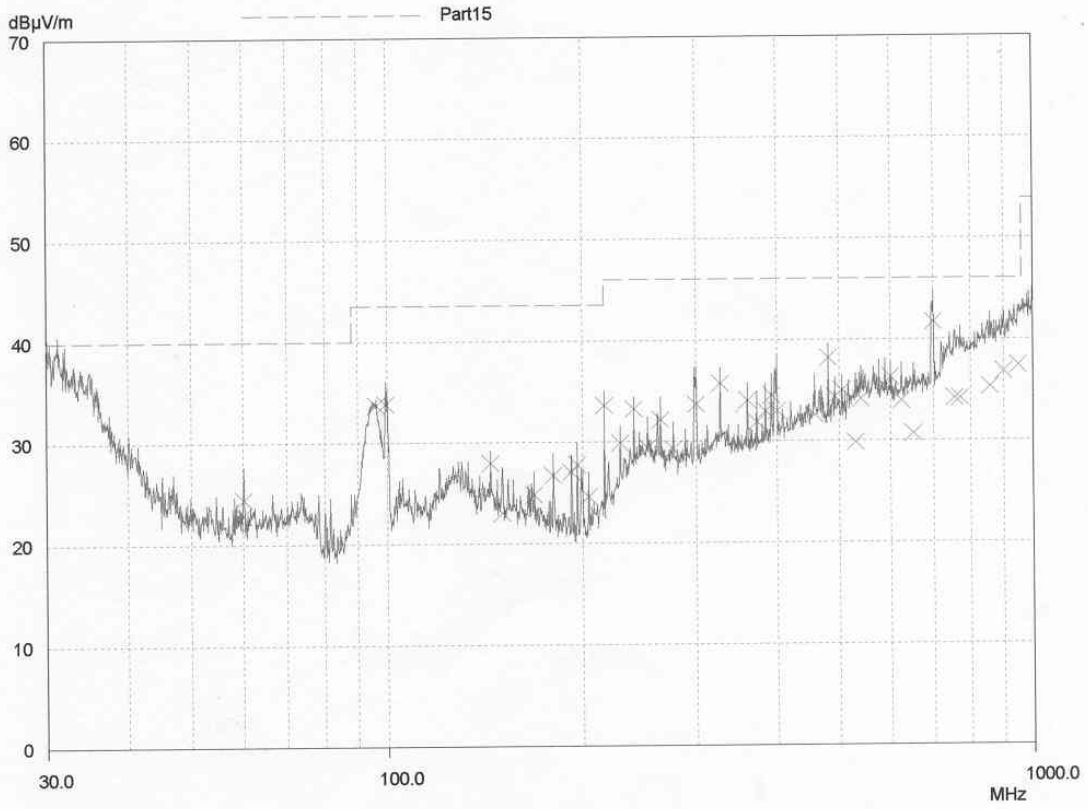
Scan Settings (1 Range)

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	UH191

Final Measurement:

Detector:	X QP
Meas Time:	2sec
Subranges:	50
Acc Margin:	10 dB



PAGE 1

ANNEX E

TEST EQUIPMENT CALIBRATION

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	Schaffner	19/08/2005	24	19/08/2007
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
UH177	Power Supply	Manson	Use Calibrated Multimeter		
UH187	Receiver	R&S	22/06/2005	12	22/06/2006
UH191	Bilog	York	16/04/2004	24	16/04/2006
UH195	LISN/AMN	R&S	22/12/2005	12	22/12/2006
UH226	Bidirectional Coupler	Narda	Calibrate in use		
UH228	Power Sensor	Marconi	03/01/2006	12	03/01/2007
UH253	1m Cable N type	TRL	05/01/2006	12	05/01/2007
UH254	1m Cable N type	TRL	05/01/2006	12	05/01/2007
UH265	Notch filer	Telonic	24/06/2005	12	24/06/2006
L005	CMTA	R&S	05/12/2005	12	05/12/2006
L007	Loop Antenna	R&S	29/03/2005	24	29/03/2007
L011	Temperature Chamber	Shartree	Use Calibrated Temperature Indicator		
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
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

ANNEX F

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%**