

REPORT ON THE CERTIFICATION TESTING OF A
TUNSTALL ELECTRONICS Ltd
PR275 FALL DETECTOR
WITH RESPECT TO
THE FCC RULES CFR 47, PART 15.231 September 2007
INTENTIONAL RADIATOR SPECIFICATION





TEST REPORT NO: RU1374/8333

COPY NO: 2

ISSUE NO: 1

FCC ID: G2X66004

REPORT ON THE CERTIFICATION TESTING OF A TUNSTALL ELECTRONICS Ltd PR275 FALL DETECTOR WITH RESPECT TO THE FCC RULES CFR 47, PART 15.231 September 2007 INTENTIONAL RADIATOR SPECIFICATION

TEST DATE: 1st – 10th January 2008

TESTED BY:		D WINSTANLEY
APPROVED BY:		 J CHARTERS
		RADIO SECTION LEADER
DATE:	29 th January 2008	

Distribution:

Copy Nos: 1. Tunstall Electronics Ltd

2. FCC EVALUATION LABORATORIES

3. TRL Compliance Ltd

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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.



TEST SPECIFICATION:	FCC RULES CFR 47, Part 15.231 September 2007				
TEST RESULT:	Compliant to Specification				
EQUIPMENT UNDER TEST:	PR275 Fall Detector				
EQUIPMENT MODEL No ^s :	66004/07 Grey Case 66004/08 Black Case				
ITU: EMISSION CODE:	89k0F1D				
EQUIPMENT TYPE:	Periodic Transmitter				
PRODUCT USE:	Personal Care Monitoring & Alarm System				
CARRIER EMISSION:	5559.04 μV/m @ 3m				
ANTENNA TYPE:	Integral				
ALTERNATIVE ANTENNA:	Not applicable				
BAND OF OPERATION:	312 MHz				
CHANNEL SPACING:	Not applicable, wideband				
NUMBER OF CHANNELS:	1				
FREQUENCY GENERATION:	SAW Resonator [] Crystal [X]	Synthesiser []			
MODULATION METHOD:	Amplitude [] Digital [X]	Angle []			
POWER SOURCE(s):	+6Vdc				
TEST DATE(s):	1 st – 10 th January 2008				
ORDER No(s):	102738				
APPLICANT:	Tunstall Electronics Ltd				
ADDRESS:	Whitley Lodge Whitley Bridge Yorkshire DN14 0HR				
TESTED BY:		D WINSTANLEY			
APPROVED BY:		J CHARTERS RADIO SECTION LEADER			

G2X66004

Certification

FCC IDENTITY:

PURPOSE OF TEST:

RF335U iss03B RU1374/8333

APPLICANT'S SUMMARY

EQUIPMENT UNDER TEST (EUT): PR275 Fall Detector **EQUIPMENT TYPE:** Periodic Transmitter PURPOSE OF TEST: Certification TEST SPECIFICATION(s): FCC RULES CFR 47, Part 15.231 September 2007 TEST RESULT: Yes COMPLIANT No APPLICANT'S CATEGORY: MANUFACTURER [X] **IMPORTER** DISTRIBUTOR TEST HOUSE **AGENT** 102738 APPLICANT'S ORDER No(s): APPLICANT'S CONTACT PERSON(s): Mr Colin Cassidy E-mail address: Colin.Cassidy@tunstall.co.uk APPLICANT: Tunstall Electronics Ltd ADDRESS: Whitley Lodge Whitley Bridge Yorkshire **DN14 0HR** TEL: +44 (0) 1977 661234 FAX: +44 (0) 1977 662452 EUT(s) COUNTRY OF ORIGIN: United Kingdom TEST LABORATORY: TRL Compliance Ltd UKAS ACCREDITATION No: 0728 1st – 10th January 2008 TEST DATE(s) TEST REPORT No: RU1374/8333

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EQUIPMENT TEST / EXAMINATIONS REQUIRED

1.	TEST/EXAMINATION	RULE PART	DETECTOR	APPLICABILITY
	Intentional Emission Frequency:	15.231(b)	Quasi Peak	Yes
	Intentional Emission Field Strength:	15.231(b)	Quasi Peak	Yes
	Intentional Emission Band Occupancy:	15.231(c)	Peak	Yes
	Intentional Emission ERP (mW):	-	-	No
	Spurious Emissions – Conducted:	15.207	-	No
	Spurious Emissions – Radiated <1000MHz:	15.231(b) 15.209	Quasi Peak	Yes
	Spurious Emissions – Radiated >1000MHz:	15.231(b) 15.209	Quasi Peak Average	Yes
	Maximum Frequency of Search:	15.33	-	Yes
	Antenna Arrangements Integral:	15.203	-	Yes
	Antenna Arrangements External Connector:	15.204	-	N/A
	Restricted Bands	15.205	-	Yes
	Extrapolation Factor	15.31(f)	-	Yes

2.	Product Use:	Personal Care Monito	ring & Alarm System
3.	Emission Designator:	89k0F1D	
4.	Duty Cycle:		<100%
5.	Transmitter bit or pulse rate and level:		1000bps
6.	Temperatures:	Ambient (Tnom)	4.6°C
7.	Supply Voltages:	Vnom	+6Vdc
	Note: Vnom voltages are as stated above unless othe	rwise shown on the test	report page
В.	Equipment Category:	Single channel Two channel Multi-channel	[X] [] []
9.	Channel spacing:	Narrowband Wideband	[] [X]

TRANSMITTER TESTS

TRANSMITTER SPURIOUS EMISSIONS - RADIATED - PART 15.209

Ambient temperature = 16° C(<1GHz) 3m measurements <1GHz [X] Relative humidity = 63% (<1GHz), 3m measurements >1GHz [X] Conditions = Open Area Test Site (OATS) 3m extrapolated from 1m []

Supply voltage = +6Vdc Channel number = 1

Bottom Channel	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							note 12	
88MHz - 216MHz							note 12	
216MHz - 960MHz							note 12	
960MHz - 1GHz							note 12	
1GHz - 4GHz	1247.995 1560.025(r) 2187.971 2496.014(r) 2808.054(r)	43.7 43.7	0.9 1.0 1.2 2.5 1.9	24.9 25.1 27.9 28.8 29.5	36.4 35.3 35.0 35.0 35.3	36.9 37.7 37.8 40.0 35.0	69.9 76.7 77.6 100.0 56.2	555 500 555 500 500
	30MH	lz to 88MHz	<u>z</u>		100μ	V/m @ 3m		
88MHz to 216MHz		z	150μV/m @ 3m					
Limits	216MH	z to 960MH	Hz		200µ	V/m @ 3m		
	960M	Hz to 1GHz	<u>z</u>		500µ	V/m @ 3m		
	1GH	lz to 4GHz			500µ	V/m @ 3m	1	

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 Measurements >1GHz @ 1m as per Part 15.31f(1)
- 5 Receiver detector >1GHz = CISPR, Quasi-Peak, 120kHz bandwidth
- 6 Receiver detector >1GHz = Peak Hold, 1MHz resolution bandwidth
- 7 New batteries used for battery powered products.
- 8 See Annex F for Emissions Graph(s)
- 9 Due to the transmitted signal lasting only 1.80 seconds a modified unit, which allowed continuous transmission, was used during spurious emissions testing.
- 10 (r) Denotes restricted band.
- 11 Spurious limit level of 555μV/m was calculated by reducing the fundamental limit level by 20 dB, as per 15.231(b).
- 12 Only emissions within 20 dB's of the 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 overleaf:

TYPE OF EQUIPMENT MAKER/SUPPLIER MODEL NO SERIAL NO NO SUSED RADIO COMMUNICATIONS ANALYSER R & S CMTA 52 894715/ 003 05 05 LOOP ANTENNA R & S CMTA 52 894715/ 003 05 05 ENVIRONMENTAL CHAMBER (temp) SHARETREE TCC125- 815P CS 203 11 HORN ANTENNA EMCO 3115 9010-3581 139 HORN ANTENNA EMCO 3115 9010-3581 139 RF SIGNAL GEN MARCONI 2042 119388 / 080 176 TEMPERATURE INDICATOR FLUKE 52 Series II 74700044 426 SPECTERUM ANALYSER ANRITSU MS2665C MT26089 479 RF SIGNAL GEN AGILENT 8341B 2819A02239 552 PRE AMPLIFIER AGILENT 8449B 3008A016 572 X RECEIVER R & S ESVS 10 826892/003 UH04 RECEIVER R & S ESVS 10 826892/003 UH04					TRL	EQUIPMENT
ANALYSER	TYPE OF EQUIPMENT	MAKER/SUPPLIER	MODEL No	SERIAL No		
ENVIRONMENTAL CHAMBER (temp) SHARETREE TCC125 - 815P CS 203 11		R & S	CMTA 52		05	
CHAMBER (temp)	LOOP ANTENNA	R&S	HFH2	881058-53	07	
HORN ANTENNA		SHARETREE		CS 203	11	
RF SIGNAL GEN MARCONI 2042 119388 / 080 176 TEMPERATURE INDICATOR FLUKE 52 Series II 74700044 426 SPECTRUM ANALYSER ANRITSU MS2665C MT26089 479 RF SIGNAL GEN AGILENT 8341B 2819A02239 552 PRE AMPLIFIER AGILENT 8449B 3008A016 572 X RECEIVER R & S ESHS 10 830051/001 UH03 RECEIVER R & S ESVS 10 825892/003 UH04 RANGE 1 TRL 3 METRE N/A UH06 X MULTIMETER AVOmeter M3004 M3270006 UH41 BILOG ANTENNA CHASE CBL6112 2129 UH93 X POWER SUPPLY THANDOR PL320QMD 044749 UH100 OSCILLOSCOPE TEKTRONIX TDS520B B020491 UH122 POWER METER MARCONI 6960B 237036/001 UH132 RECEIVER R & S ESHS 10	HORN ANTENNA	N ANTENNA EMCO 3115 9010 - 3580		138	X	
RESIGNAL GEN MARCONI 2042 080 176 TEMPERATURE INDICATOR FLUKE 52 Series II 74700044 426 SPECTRUM ANALYSER ANRITSU MS2665C MT26089 479 RF SIGNAL GEN AGILENT 8341B 2819A02239 552 PRE AMPLIFIER AGILENT 8449B 3008A016 572 X RECEIVER R & S ESHS 10 830051/001 UH03 RECEIVER R & S ESVS 10 825892/003 UH04 RANGE 1 TRL 3 METRE N/A UH06 X MULTIMETER AVOmeter M3004 M3270006 UH41 BILOG ANTENNA CHASE CBL6112 2129 UH93 X POWER SUPPLY THANDOR PL320QMD 044749 UH100 OSCILLOSCOPE TEKTRONIX TDS520B B020491 UH122 POWER METER MARCONI 6960B 237036/001 UH132 RECEIVER R & S ESHS 10 841429	HORN ANTENNA	EMCO	3115	9010 - 3581	139	
INDICATOR FLURE 52 Series 1	RF SIGNAL GEN	MARCONI	2042		176	
ANALYSER ANKITSU MS2665C MT26089 4/9 RF SIGNAL GEN AGILENT 8341B 2819A02239 552 PRE AMPLIFIER AGILENT 8449B 3008A016 572 X RECEIVER R & S ESHS 10 830051/001 UH03 RECEIVER R & S ESVS 10 825892/003 UH04 RANGE 1 TRL 3 METRE N/A UH06 X MULTIMETER AVOmeter M3004 M3270006 UH41 BILOG ANTENNA CHASE CBL6112 2129 UH93 X POWER SUPPLY THANDOR PL320QMD 044749 UH100 OSCILLOSCOPE TEKTRONIX TDS520B B020491 UH122 POWER METER MARCONI 6960B 237036/001 UH132 RECEIVER R & S ESVS 10 841431/014 UH186 X RECEIVER R & S ESHS 10 841429/012 UH187 BILOG ANTENNA YORK CBL611/A 1618 UH191 500W AUDIO AMPLIFIER PRO POWER STA-162 688200474 UH196 POWER SENSOR MARCONI 6920 1564 UH228 SPECTRUM ANALYSER R & S FSU 200034 UH281 X	_	FLUKE	52 Series II	74700044	426	
PRE AMPLIFIER AGILENT 8449B 3008A016 572 X RECEIVER R & S ESHS 10 830051/001 UH03 RECEIVER R & S ESVS 10 825892/003 UH04 RANGE 1 TRL 3 METRE N/A UH06 X MULTIMETER AVOmeter M3004 M3270006 UH41 BILOG ANTENNA CHASE CBL6112 2129 UH93 X POWER SUPPLY THANDOR PL320QMD 044749 UH100 OSCILLOSCOPE TEKTRONIX TDS520B B020491 UH122 POWER METER MARCONI 6960B 237036/001 UH132 RECEIVER R & S ESVS 10 841431/014 UH186 X RECEIVER R & S ESHS 10 841429/012 UH187 BILOG ANTENNA YORK CBL611/A 1618 UH191 500W AUDIO AMPLIFIER PRO POWER STA-162 688200474 UH196 POWER SENSOR MARCONI 6920		ANRITSU	MS2665C	MT26089	479	
RECEIVER R & S ESHS 10 830051/001 UH03 RECEIVER R & S ESVS 10 825892/003 UH04 RANGE 1 TRL 3 METRE N/A UH06 X MULTIMETER AVOmeter M3004 M3270006 UH41 BILOG ANTENNA CHASE CBL6112 2129 UH93 X POWER SUPPLY THANDOR PL320QMD 044749 UH100 OSCILLOSCOPE TEKTRONIX TDS520B B020491 UH122 POWER METER MARCONI 6960B 237036/001 UH132 RECEIVER R & S ESVS 10 841431/014 UH186 X RECEIVER R & S ESHS 10 841429/012 UH187 BILOG ANTENNA YORK CBL611/A 1618 UH191 500W AUDIO AMPLIFIER PRO POWER STA-162 688200474 UH196 POWER SENSOR MARCONI 6920 1564 UH228 SPECTRUM ANALYSER R & S FSU 200034 </td <td>RF SIGNAL GEN</td> <td>AGILENT</td> <td>8341B</td> <td>2819A02239</td> <td>552</td> <td></td>	RF SIGNAL GEN	AGILENT	8341B	2819A02239	552	
RECEIVER R & S ESVS 10 825892/003 UH04 RANGE 1 TRL 3 METRE N/A UH06 X MULTIMETER AVOmeter M3004 M3270006 UH41 BILOG ANTENNA CHASE CBL6112 2129 UH93 X POWER SUPPLY THANDOR PL320QMD 044749 UH100 OSCILLOSCOPE TEKTRONIX TDS520B B020491 UH122 POWER METER MARCONI 6960B 237036/001 UH132 RECEIVER R & S ESVS 10 841431/014 UH186 X RECEIVER R & S ESHS 10 841429/012 UH187 BILOG ANTENNA YORK CBL611/A 1618 UH191 500W AUDIO AMPLIFIER PRO POWER STA-162 688200474 UH196 POWER SENSOR MARCONI 6920 1564 UH228 SPECTRUM ANALYSER R & S FSU 200034 UH281 X	PRE AMPLIFIER	AGILENT	8449B	3008A016	572	х
RANGE 1 TRL 3 METRE N/A UH06 X MULTIMETER AVOmeter M3004 M3270006 UH41 BILOG ANTENNA CHASE CBL6112 2129 UH93 X POWER SUPPLY THANDOR PL320QMD 044749 UH100 OSCILLOSCOPE TEKTRONIX TDS520B B020491 UH122 POWER METER MARCONI 6960B 237036/001 UH132 RECEIVER R & S ESVS 10 841431/014 UH186 X RECEIVER R & S ESHS 10 841429/012 UH187 BILOG ANTENNA YORK CBL611/A 1618 UH191 500W AUDIO AMPLIFIER PRO POWER STA-162 688200474 UH196 POWER SENSOR MARCONI 6920 1564 UH228 SPECTRUM ANALYSER R & S FSU 200034 UH281 X	RECEIVER	R&S	ESHS 10	830051/001	UH03	
MULTIMETER AVOmeter M3004 M3270006 UH41 BILOG ANTENNA CHASE CBL6112 2129 UH93 X POWER SUPPLY THANDOR PL320QMD 044749 UH100 OSCILLOSCOPE TEKTRONIX TDS520B B020491 UH122 POWER METER MARCONI 6960B 237036/001 UH132 RECEIVER R & S ESVS 10 841431/014 UH186 X RECEIVER R & S ESHS 10 841429/012 UH187 BILOG ANTENNA YORK CBL611/A 1618 UH191 500W AUDIO AMPLIFIER PRO POWER STA-162 688200474 UH196 POWER SENSOR MARCONI 6920 1564 UH228 SPECTRUM ANALYSER R & S FSU 200034 UH281 X	RECEIVER	R&S	ESVS 10	825892/003	UH04	
BILOG ANTENNA CHASE CBL6112 2129 UH93 X POWER SUPPLY THANDOR PL320QMD 044749 UH100 OSCILLOSCOPE TEKTRONIX TDS520B B020491 UH122 POWER METER MARCONI 6960B 237036/001 UH132 RECEIVER R & S ESVS 10 841431/014 UH186 X RECEIVER R & S ESHS 10 841429/012 UH187 BILOG ANTENNA YORK CBL611/A 1618 UH191 500W AUDIO AMPLIFIER PRO POWER STA-162 688200474 UH196 POWER SENSOR MARCONI 6920 1564 UH228 SPECTRUM ANALYSER R & S FSU 200034 UH281 X	RANGE 1	TRL	3 METRE	N/A	UH06	х
POWER SUPPLY THANDOR PL320QMD 044749 UH100 OSCILLOSCOPE TEKTRONIX TDS520B B020491 UH122 POWER METER MARCONI 6960B 237036/001 UH132 RECEIVER R & S ESVS 10 841431/014 UH186 X RECEIVER R & S ESHS 10 841429/012 UH187 BILOG ANTENNA YORK CBL611/A 1618 UH191 500W AUDIO AMPLIFIER PRO POWER STA-162 688200474 UH196 POWER SENSOR MARCONI 6920 1564 UH228 SPECTRUM ANALYSER R & S FSU 200034 UH281 X	MULTIMETER	AVOmeter	M3004	M3270006	UH41	
OSCILLOSCOPE TEKTRONIX TDS520B B020491 UH122 POWER METER MARCONI 6960B 237036/001 UH132 RECEIVER R & S ESVS 10 841431/014 UH186 X RECEIVER R & S ESHS 10 841429/012 UH187 BILOG ANTENNA YORK CBL611/A 1618 UH191 500W AUDIO AMPLIFIER PRO POWER STA-162 688200474 UH196 POWER SENSOR MARCONI 6920 1564 UH228 SPECTRUM ANALYSER R & S FSU 200034 UH281 X	BILOG ANTENNA	CHASE	CBL6112	2129	UH93	х
POWER METER MARCONI 6960B 237036/001 UH132 RECEIVER R & S ESVS 10 841431/014 UH186 X RECEIVER R & S ESHS 10 841429/012 UH187 BILOG ANTENNA YORK CBL611/A 1618 UH191 500W AUDIO AMPLIFIER PRO POWER STA-162 688200474 UH196 POWER SENSOR MARCONI 6920 1564 UH228 SPECTRUM ANALYSER R & S FSU 200034 UH281 X	POWER SUPPLY	THANDOR	PL320QMD	044749	UH100	
RECEIVER R & S ESVS 10 841431/014 UH186 X RECEIVER R & S ESHS 10 841429/012 UH187 BILOG ANTENNA YORK CBL611/A 1618 UH191 500W AUDIO AMPLIFIER PRO POWER STA-162 688200474 UH196 POWER SENSOR MARCONI 6920 1564 UH228 SPECTRUM ANALYSER R & S FSU 200034 UH281 X	OSCILLOSCOPE	TEKTRONIX	TDS520B	B020491	UH122	
RECEIVER R & S ESHS 10 841429/012 UH187 BILOG ANTENNA YORK CBL611/A 1618 UH191 500W AUDIO AMPLIFIER PRO POWER STA-162 688200474 UH196 POWER SENSOR MARCONI 6920 1564 UH228 SPECTRUM ANALYSER R & S FSU 200034 UH281 X	POWER METER	MARCONI	6960B	237036/001	UH132	
BILOG ANTENNA YORK CBL611/A 1618 UH191 500W AUDIO AMPLIFIER PRO POWER STA-162 688200474 UH196 POWER SENSOR MARCONI 6920 1564 UH228 SPECTRUM ANALYSER R & S FSU 200034 UH281 X	RECEIVER	R&S	ESVS 10	841431/014	UH186	х
500W AUDIO AMPLIFIER PRO POWER STA-162 688200474 UH196 POWER SENSOR MARCONI 6920 1564 UH228 SPECTRUM ANALYSER R & S FSU 200034 UH281 X	RECEIVER	R&S	ESHS 10	841429/012	UH187	
AMPLIFIER PRO POWER STA-162 688200474 0H196 POWER SENSOR MARCONI 6920 1564 UH228 SPECTRUM ANALYSER R & S FSU 200034 UH281 X	BILOG ANTENNA	YORK	CBL611/A	1618	UH191	
SPECTRUM ANALYSER R&S FSU 200034 UH281 X		PRO POWER	STA-162	688200474	UH196	
ANALYSER R&S FSU 200034 UH281 X	POWER SENSOR	MARCONI	6920	1564	UH228	
RF SIGNAL GEN HP 83630B 3722A00588 UH340		R & S	FSU	200034	UH281	х
	RF SIGNAL GEN	HP	83630B	3722A00588	UH340	

TRANSMITTER TESTS

TRANSMITTER INTENTIONAL EMISSION - RADIATED - Part 15.231 September 2007

4.6°C(<1GHz), Ambient temperature 3m measurements @ fc Relative humidity 64%(<1GHz), 10m measurements @ fc Conditions Open Area Test Site (OATS) 30m measurements @ fc Supply voltage +6Vdc 30m extrapolated from 3m = Channel number 1 30m extrapolated from 10m

FREQ. (MHz)	MEASUREMENT Rx. READING (dBµV)	CABLE LOSS (dB)	ANT FACTOR (dB/m)	FIELD STRENGTH (dBµV/m)	FIELD STRENGTH (µV/m)
312.0	59.2	2.3	13.4	74.9	5559.043
Limit va	llue @ fc		5916.6	(μV/m)	
		f lo	wer	f higher	
		311.9719551 MHz		312.0608974 MHz	
Band occupancy @ -20dBc		Occupied Bandwidth		Limit	
		88.9423 kHz		780 kHz	
	ime during Alarm dition	1.80 Seconds Removal of the alarm		1.80 Seconds Removal of the alarm cond	
	me during manual nsmission.	1.80 Seconds Deactivation within 5 seco manual trigger releas			
Supervision	Transmission	960ms 2 seconds per hour			s per hour

For band occupancy see spectrum analyser plots – Annex E For transmitter timing pulses see oscilloscope plots – Annex G

Notes: 1 Results quoted are extrapolated as indicated

2 Receiver detector @ fc = Quasi Peak 120kHz bandwidth.

- 3 When battery powered the EUT was powered with new batteries
- 4 Supervision transmission repeated every 4 hours.

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

- 2 Measuring distances 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. Horizontal and vertical polarisations, of the receive antenna.

EUT orientation in three orthagonal planes.

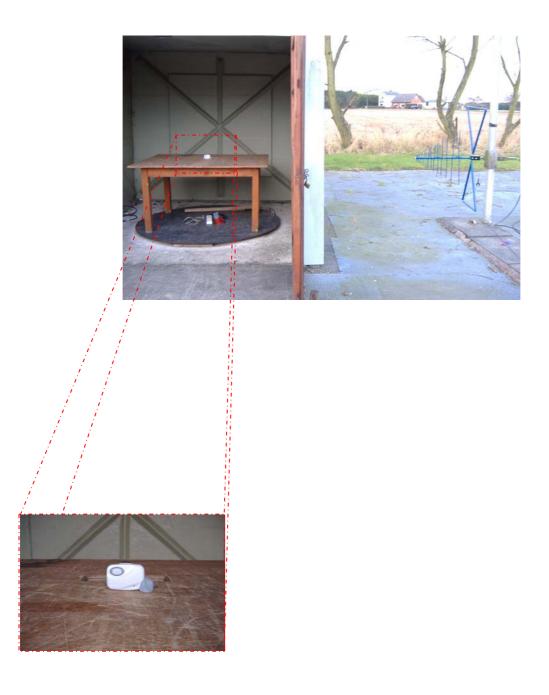
Maximum results recorded

The test equipment used for the Transmitter Intentional Emission – Radiated – Part 15.231 September 2007 tests is shown overleaf:

TYPE OF EQUIPMENT	MAKER/SUPPLIER	MODEL No	SERIAL No	TRL No	EQUIPMENT USED
RADIO COMMUNICATIONS ANALYSER	R & S	CMTA 52	894715 / 003	05	
LOOP ANTENNA	R&S	HFH2	881058-53	07	
ENVIRONMENTAL CHAMBER (temp)	SHARETREE	TCC125 - 815P	CS 203	11	
AE, DRG HORN, 1GHz - 18GHz	EMCO	3115	9010 - 3580	138	
AE, DRG HORN, 1GHz - 18GHz	EMCO	3115	9010 - 3581	139	
RF SIGNAL GEN	MARCONI	2042	119388 / 080	176	
TEMPERATURE INDICATOR	FLUKE	52 Series II	74700044	426	
SPECTRUM ANALYSER	ANRITSU	MS2665C	MT26089	479	
RF SIGNAL GEN	AGILENT	8341B	2819A02239	552	
PRE AMPLIFIER	AGILENT	8449B	3008A016	572	
RECEIVER	R&S	ESHS 10	830051/001	UH03	
RECEIVER	R&S	ESVS 10	825892/003	UH04	
RANGE 1	TRL	3 METRE	N/A	UH06	Х
MULTIMETER	AVOmeter	M3004	M3270006	UH41	
BILOG ANTENNA	CHASE	CBL6112	2129	UH93	Х
POWER SUPPLY	THANDOR	PL320QMD	044749	UH100	
OSCILLOSCOPE	TEKTRONIX	TDS520B	B020491	UH122	Х
POWER METER	MARCONI	6960B	237036/001	UH132	
RECEIVER	R&S	ESVS 10	841431/014	UH186	x
RECEIVER	R&S	ESHS 10	841429/012	UH187	
BILOG ANTENNA	YORK	CBL611/A	1618	UH191	
500W AUDIO AMPLIFIER	PRO POWER	STA-162	688200474	UH196	
POWER SENSOR	MARCONI	6920	1564	UH228	
SPECTRUM ANALYSER	R&S	FSU	200034	UH281	
RF SIGNAL GEN	HP	83630B	3722A00588	UH340	

ANNEX A PHOTOGRAPHS

TEST SETUP



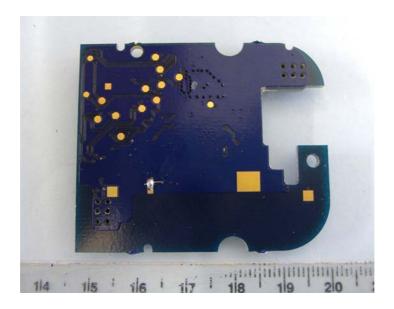
TRANSMITTER FRONT VIEW



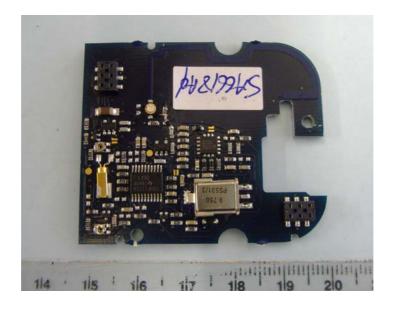
TRANSMITTER REAR VIEW



RF PCB TRACK SIDE



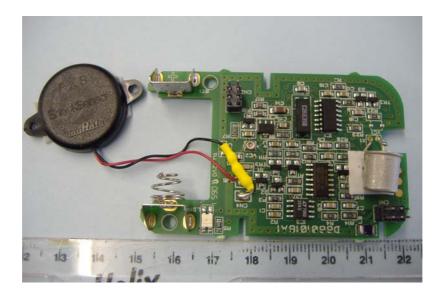
RF PCB COMPONENT SIDE



CONTROL PCB TRACK SIDE



PHOTOGRAPH No. 7 CONTROL PCB COMPONENT SIDE



ANNEX B APPLICANT'S SUBMISSION OF DOCUMENTATION LIST

APPLICANT'S SUBMISSION OF DOCUMENTATION LIST

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

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ANNEX C 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 8.1 \text{GHz} = 3.31 \text{dB} Uncertainty in test result (Equipment TRL479) 8.1 \text{GHz} - 15.3 \text{GHz} = 4.43 \text{dB} Uncertainty in test result (Equipment TRL479) 15.3 \text{GHz} - 21 \text{GHz} = 5.34 \text{dB} Uncertainty in test result (Equipment TRLUH120) Up to 26 \text{GHz} = 3.14 \text{dB}
```

[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

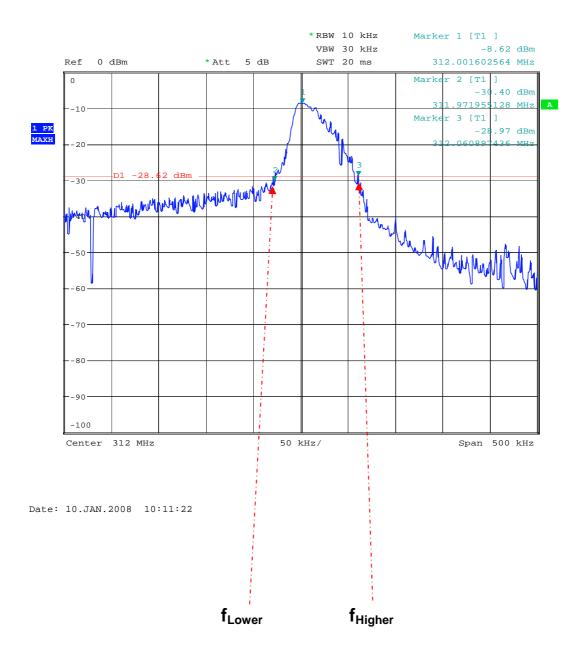
Uncertainty in test result = 7.98%

ANNEX D TEST EQUIPMENT CALIBRATION

TRL	Equipment	Mary factors	Last Cal	Calibration	Due For
Number	Туре	Manufacturer	Calibration	Period	Calibration
UH004	Receiver	R&S	06/11/2007	12	06/11/2008
UH06/07	NSA Cal	TRL	17/12/2007	12	17/12/2008
UH06/07	IC OATS Submission	TRL	01/06/2007	24	01/06/2009
UH006	3m Range ERP CAL	TRL	08/12/2006	12	08/12/2007
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	04/01/2007	12	04/01/2008
UH093	Antenna	Chase	21/05/2007	24	21/05/2009
UH122	Oscilloscope	Tektronix	07/06/2005	24	07/06/2007
UH132	Power meter	Marconi	10/01/2007	12	10/01/2008
UH162	ERP Cable Cal	TRL	02/01/2007	12	02/01/2008
UH186	Receiver	R&S	12/12/2007	12	12/12/2008
UH187	Receiver	R&S	12/12/2007	12	12/12/2008
UH191	Bilog Antenna	York	11/08/2006	24	11/08/2008
UH195	LISN	R&S	09/01/2007	12	09/01/2008
UH228	Power Sensor	Marconi	15/01/2007	12	15/01/2008
UH253	1m Cable N type	TRL	07/12/2006	12	07/12/2007
UH254	1m Cable N type	TRL	07/12/2006	12	07/12/2007
UH265	Notch filer	Telonic	11/01/2006	24	11/01/2008
UH269	1m Cable N type	TRL	07/12/2006	12	07/12/2007
UH270	1m Cable N type	TRL	07/12/2006	12	07/12/2007
UH271	1.5m Cable N type	TRL	07/12/2006	12	07/12/2007
UH272	1.5m Cable N type	TRL	07/12/2006	12	07/12/2007
UH273	2m Cable N type	TRL	07/12/2006	12	07/12/2007
UH274	2m Cable N type	TRL	07/12/2006	12	07/12/2007
UH281	Spectrum Analyser	R&S	25/10/2007	12	25/10/2008
UH340	Signal Generator	HP	29/06/2006	12	29/06/2007
L005	CMTA	R&S	10/01/2007	12	10/01/2008
L007	Loop Antenna	R&S	22/05/2007	24	22/05/2009
L138	1-18GHz Horn	EMCO	23/05/2007	24	23/05/2009
L139	1-18GHz Horn	EMCO	23/05/2007	24	23/05/2009
L176	Signal Generator	Marconi	01/03/2007	12	01/03/2008
L193	Bicone Antenna	Chase	12/10/2003	24	12/10/2005
L203	Log Periodic Ant	Chase	21/10/2003	24	21/10/2005
L343	CCIR Noise Filter	TRL	20/09/2006	12	20/09/2007
L426	Temperature Indicator	Fluke	09/01/2007	12	09/01/2008
L479	Analyser	Anritsu	09/01/2007	12	09/01/2008
L552	Signal Generator	Agilent	24/07/2006	12	24/07/2007
L572	Pre Amplifier	Agilent	C	Calibrate in use	

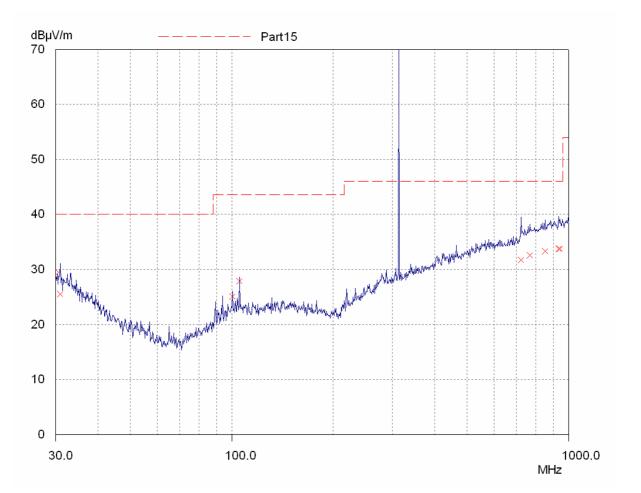
ANNEX E BANDWIDTH PLOT

BANDWIDTH PLOT



 $\begin{array}{ll} f_{Lower} & = 311.9719551 \; \text{MHz} \\ f_{Higher} & = 312.0608974 \; \text{MHz} \\ \text{Occupied Bandwidth} & = 88.9423 \; \text{kHz} \end{array}$

ANNEX F EMISSIONS GRAPH(s)



ANNEX G TRANSMITTER TIMING PULSES

