

TEST REPORT NO: RU1272/7258
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FCC ID: TMW-TC910

**REPORT ON THE CERTIFICATION TESTING OF A
TRANSMIT TECHNOLOGY Ltd
TC910
WITH RESPECT TO
THE FCC RULES CFR 47, PART 15.249 August 2006
INTENTIONAL RADIATOR SPECIFICATION**

TEST DATE: 29th September – 16th October 2006

TESTED BY: _____ S HODGKINSON

APPROVED BY: _____ J CHARTERS
RADIO SECTION
LEADER

DATE: 29th November 2006

Distribution:

- Copy Nos:
1. TRANSMIT TECHNOLOGY Ltd
 2. TRL COMPLIANCE

THIS DOCUMENT MAY BE REPRODUCED ONLY IN ITS ENTIRETY AND WITHOUT CHANGE

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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.		

CERTIFICATE OF CONFORMITY & COMPLIANCE

FCC IDENTITY: TMW-TC910

PURPOSE OF TEST: Certification

TEST SPECIFICATION: FCC RULES CFR 47, Part 15.249 August 2006

TEST RESULT: Compliant to Specification

EQUIPMENT UNDER TEST: TC910

EQUIPMENT SERIAL No: Not supplied

ITU: EMISSION CODE: 308kF1D

EQUIPMENT TYPE: Data transmitter

PRODUCT USE: Utilities meter data transmitter

CARRIER EMISSION: 42.46mV/m @3m (Plastic lid)

ANTENNA TYPE: Integral

ALTERNATIVE ANTENNA: Not applicable

FREQUENCY OF OPERATION: 919.9 MHz

CHANNEL SPACING: Not applicable, wideband

NUMBER OF CHANNELS: 1

FREQUENCY GENERATION: SAW Resonator ☐ Crystal ☐ Synthesiser ☒

MODULATION METHOD: Amplitude ☐ Digital ☒ Angle ☐

POWER SOURCE(s): +3.6 Vdc

TEST DATE(s): 29th September– 16th October 2006

ORDER No(s): 68

APPLICANT: Transmit Technology Ltd

ADDRESS: 49 Newlands Avenue
Radlett
Hertfordshire
WD7 8EJ

TESTED BY: _____ S HODGKINSON

APPROVED BY: _____ J CHARTERS
RADIO SECTION
LEADER

APPLICANT'S SUMMARY

EQUIPMENT UNDER TEST (EUT):	TC910
EQUIPMENT TYPE:	Data transmitter
SERIAL NUMBER OF EUT:	Not supplied
PURPOSE OF TEST:	Certification
TEST SPECIFICATION(s):	FCC RULES CFR 47, Part 15.249 August 2006
TEST RESULT:	COMPLIANT Yes ☒ No ☐
APPLICANT'S CATEGORY:	MANUFACTURER ☒ IMPORTER ☐ DISTRIBUTOR ☐ TEST HOUSE ☐ AGENT ☐
APPLICANT'S ORDER No(s):	68
APPLICANT'S CONTACT PERSON(s):	Mr D Want
E-mail address:	davewant@tclarity.com
APPLICANT:	Transmit Technology Ltd
ADDRESS:	49 Newlands Avenue Radlett Hertfordshire WD7 8EJ
TEL:	+44 (0) 1788 541790
FAX:	+44 (0) 1788 541790
MANUFACTURER:	Transmit Technology Ltd
EUT(s) COUNTRY OF ORIGIN:	United Kingdom
TEST LABORATORY:	TRL Compliance Ltd
UKAS ACCREDITATION No:	0728
TEST DATE(s) :	29 th September– 16 th October 2006
TEST REPORT No:	RU1272/7258

EQUIPMENT TEST / EXAMINATIONS REQUIRED

1.	TEST/EXAMINATION	RULE PART	DETECTOR	APPLICABILITY
	Intentional Emission Frequency:	15.249(a)	Quasi Peak	YES
	Intentional Emission Field Strength:	15.249(a)	Quasi Peak	YES
	Intentional Emission Band Occupancy:	15.215	Peak	YES
	Intentional Emission ERP (mW):	N/A	-	NO
	Spurious Emissions – Conducted:	15.207	-	NO
	Spurious Emissions – Radiated <1000MHz:	15.209	Quasi Peak	YES
	Spurious Emissions – Radiated >1000MHz:	15.209 15.249(a)	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

2. Product Use: Water meter data transmitter
3. Emission Designator: 308kF1D
4. Duty Cycle: 0.04 %
5. Transmitter bit or pulse rate and level: 100 kbps
6. Temperatures: Ambient (Tnom) 18°C
7. Supply Voltages: Vnom +3.6Vdc
- 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]

10. Product description:

The TC910 water meter is used for automatic meter reading, the TC910 is the 'pit' version of the TC900 and as such was tested within a 'pit' with both types of supplied lids (plastic & metal). The plastic lid has a thickness of half an inch. The 'pit' was contained within a large wooden box, H 80cm x L 106cm x D 76cm and a metal liner placed into the centre of the box before the box was filled with sand. The TC910 was then placed within the metal liner for testing and the plastic and metal lids fitted, refer to photographs 1& 2. in Annex A.

The 'pit' was placed upon the turntable and rotated at 22.5° intervals and the antenna raised and lowered from 1m - 4m and the measurement taken. The transmitter is on for 2ms in every 5 seconds see Annex C for the Duty cycle.

See FCC OET Knowledge base publication number 139720 22/09/2005 for further information on equipment setup.

TRANSMITTER TESTS

TRANSMITTER SPURIOUS EMISSIONS – RADIATED – PART 15.209

UNIT TESTED WITHIN A 'PIT' USING A PLASTIC LID.

Ambient temperature = 18°C(<1GHz) 3m measurements <1GHz [X]
 Relative humidity = 42% (<1GHz), 1.0m measurements >1GHz [X]
 Conditions = Open Area Test Site (OATS) 3m extrapolated from 1.0m [X]
 Supply voltage = +3.6Vdc
 Channel number = 1

	FREQ. (MHz)	MEAS RX (dBµV)	CABLE & PRE AMP (dB)	ANT FACT.	FIELD STRENGTH (dBµV/m)	EXTRAP FACTOR (dB)	DUTY CYCLE CORRECTION	FIELD STRENGTH (µV/m)	LIMIT (µV/m)
1.705MHz - 30MHz									
30MHz - 88MHz									
88MHz - 216MHz									
216MHz - 960MHz	288.0	16.0	2.68	19.30	37.98	-	-	79.25	200
960MHz - 1GHz									
1GHz - 5GHz	1839.82	77.99	-35.70	27.0	69.29	9.54	-20	97.16	500
	2759.72(r)	69.10	-34.80	29.5	63.80	9.54	-20	51.64	500
	4599.69(r)	64.68	-33.78	32.8	63.70	9.54	-20	51.05	500
Limits	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				

Notes:

- Results quoted are extrapolated as indicated
- Emissions were searched to: (x) 1000MHz inclusive, as per Part 15.33a
- Extrapolation factor 9.54dB from 1m to 3m, as per Part 15.31f
- Measurements >1GHz @ 1m as per Part 15.31f(1)
- Receiver detector <1GHz = CISPR, Quasi-Peak, 120kHz bandwidth
- Receiver detector >1GHz = Peak Hold, 1MHz resolution bandwidth
- New batteries used for battery powered products.
- (r) Indicates restricted bands, as per Part 15.205
- Results not within 10 dB's of limit are not necessarily recorded
- See annex E for scan data. This scan was taken with the unit outside of the pit
In a shielded room to ensure that no frequencies were missed
- Unit transmitting pulsed carrier wave.
- For emissions > 1GHz all emission measured with peak detector meet average limit

TRANSMITTER TESTS

TRANSMITTER SPURIOUS EMISSIONS – RADIATED – PART 15.209

- 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 orthogonal planes.
Maximum results recorded.
 - 5 The turntable was rotated from 0° - 360° in 22.5° increments and that the worse case is only Shown.

The test equipment used for the Transmitter Spurious Emissions – Radiated – Part 15.209 tests is shown on page 11.

TRANSMITTER TESTS

TRANSMITTER SPURIOUS EMISSIONS – RADIATED – PART 15.209

UNIT TESTED WITHIN A 'PIT' USING A METAL LID.

Ambient temperature = 18°C(<1GHz) 3m measurements <1GHz [X]
 Relative humidity = 42% (<1GHz), 1.0m measurements >1GHz [X]
 Conditions = Open Area Test Site (OATS) 3m extrapolated from 1.0m [X]
 Supply voltage = +3.6Vdc
 Channel number = 1

	FREQ. (MHz)	MEAS RX (dBμV)	CABLE & PRE AMP (dB)	ANT FACT.	FIELD STRENGTH (dBμV/m)	EXTRAP FACTOR (dB)	DUTY CYCLE CORRECTION	FIELD STRENGTH (μV/m)	LIMIT (μV/m)
1.705MHz - 30MHz									
30MHz - 88MHz									
88MHz - 216MHz									
216MHz - 960MHz	288.0	16.0	2.68	19.30	37.98	-	-	79.25	200
960MHz - 1GHz									
1GHz - 5GHz									
Limits	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					

Notes:

- 1 Results quoted are extrapolated as indicated
- 2 Emissions were searched to: (x) 1000MHz inclusive, as per Part 15.33a
- 3 Extrapolation factor 9.54dB 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 (r) Indicates restricted bands, as per Part 15.205
- 9 Results not within 10 dB's of limit are not necessarily recorded
- 10 See annex E for scan data. This scan was taken with the unit outside of the pit
In a shielded room to ensure that no frequencies were missed
- 11 Unit transmitting pulsed carrier wave.
- 12 For emissions > 1GHz all emission measured with peak detector meet average limit

TRANSMITTER TESTS

TRANSMITTER SPURIOUS EMISSIONS – RADIATED – PART 15.209

- 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 orthogonal planes.
Maximum results recorded.
 - 5 The turntable was rotated from 0° - 360° in 22.5° increments and that the worse case only Shown.

The test equipment used for the Transmitter Spurious Emissions – Radiated – Part 15.209 tests is shown on page 11.

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	
SPECTRUM ANALYSER	ROHDE & SCHWARZ	FSU	200034	281	X
PRE-AMPLIFIER	AGILENT	8449B	3008A016	572	X
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	841431/014	186	X
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	
RECEIVER	ROHDE & SCHWARZ	ESVS 10	841431/014	UH186	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	ANRITSU	MS2665C	MT26089	479	

TRANSMITTER TESTS

TRANSMITTER INTENTIONAL EMISSION – RADIATED – Part 15.249 August 2006

Ambient temperature	=	18°C(<1GHz),	3m measurements @ fc	[X]
Relative humidity	=	42%(<1GHz),	10m measurements @ fc	[]
Conditions	=	Open Area Test Site	30m measurements @ fc	[]
Supply voltage	=	+3.6Vdc	30m extrapolated from 3m	[]
Channel number	=	1	30m extrapolated from 10m	[]
Frequency	=	919.92MHz		

PLASTIC LID FITTED OVER THE PIT

POSITION OF TURNABLE DEG °	MEAS RX dBµV	CABLE LOSS (dB)	ANT FACTORS (dB)	FIELD STRENGTH (dBµV/m)	FIELD STRENGTH (mV/m)	ANTENNA POLARIZATION	LIMIT (mV/m)
0/360	63.0	6.07	22.49	91.56	37.84	H	50
22.5	61.0	6.07	22.49	89.56	30.06	H	50
45	63.0	6.07	22.49	91.56	37.84	V	50
67.5	62.0	6.07	22.49	90.56	33.72	V	50
90	61.0	6.07	22.49	89.56	30.06	V	50
112.5	62.5	6.07	22.49	91.06	35.72	V	50
135	62.0	6.07	22.49	90.56	33.72	V	50
157.5	59.0	6.07	22.49	87.56	23.87	H	50
180	61.0	6.07	22.49	89.56	30.06	V & H	50
202.5	60.0	6.07	22.49	88.56	26.79	H	50
225	61.5	6.07	22.49	90.06	31.84	V	50
247.5	62.0	6.07	22.49	90.56	33.72	V	50
270	64.0	6.07	22.49	92.56	42.46	V	50
292.5	63.0	6.07	22.49	91.56	37.84	V	50
315	56.0	6.07	22.49	84.56	16.90	V	50
337.5	52.0	6.07	22.49	80.56	10.66	H	50

The results are the worst case from both vertical and horizontal polarization.

TRANSMITTER TESTS

TRANSMITTER INTENTIONAL EMISSION – RADIATED – Part 15.249 August 2006

Ambient temperature	=	18°C(<1GHz),	3m measurements @ fc	[X]
Relative humidity	=	42%(<1GHz),	10m measurements @ fc	[]
Conditions	=	Open Area Test Site	30m measurements @ fc	[]
Supply voltage	=	+3.6Vdc	30m extrapolated from 3m	[]
Channel number	=	1	30m extrapolated from 10m	[]
Frequency	=	919.92MHz		

METAL LID FITTED OVER THE PIT

POSITION OF TURNABLE DEG °	MEAS RX dBµV	CABLE LOSS (dB)	ANT FACTORS (dB)	FIELD STRENGTH (dBµV/m)	FIELD STRENGTH (mV/m)	ANTENNA POLARIZATION	LIMIT (mV/m)
0/360	54.0	6.07	22.49	82.56	13.42	H	50
22.5	57.0	6.07	22.49	85.56	18.96	H	50
45	60.0	6.07	22.49	88.56	26.79	H	50
67.5	58.0	6.07	22.49	86.56	21.28	V	50
90	57.0	6.07	22.49	85.56	18.96	H	50
112.5	55.0	6.07	22.49	83.56	15.06	H	50
135	57.0	6.07	22.49	85.56	18.96	H	50
157.5	55.0	6.07	22.49	83.56	15.06	H	50
180	62.0	6.07	22.49	90.56	33.72	H	50
202.5	60.0	6.07	22.49	88.56	26.79	H	50
225	56.0	6.07	22.49	84.56	16.90	V & H	50
247.5	62.0	6.07	22.49	90.56	33.72	V	50
270	61.0	6.07	22.49	89.56	30.06	V	50
292.5	53.0	6.07	22.49	81.56	11.96	H	50
315	56.0	6.07	22.49	84.56	16.90	H	50
337.5	56.0	6.07	22.49	84.56	16.90	H	50

The results are the worst case from both vertical and horizontal polarization.

TRANSMITTER TESTS

TRANSMITTER INTENTIONAL EMISSION – RADIATED WORSE CASE RESULTS – Part 15.249 August 2006

Ambient temperature	=	18°C(<1GHz),	3m measurements @ fc	[X]
Relative humidity	=	42%(<1GHz),	10m measurements @ fc	[]
Conditions	=	Open Area Test Site (OATS)	30m measurements @ fc	[]
Supply voltage	=	+3.6Vdc	30m extrapolated from 3m	[]
Channel number	=	1	30m extrapolated from 10m	[]

FREQ. (MHz) 919.9	FIELD STRENGTH (dBµV)	FIELD STRENGTH (mV/m)
PLASTIC LID	92.56	42.46
METAL LID	90.56	33.72
Limit value @ fc	50 (mV/m)	
Band occupancy @ -20dBc	f lower	f higher
	919.7393718 MHz	920.0473718 MHz

See spectrum analyser plot – Annex D

- 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 Unit transmitting a 2ms burst once ever 5 seconds (normal operation)
 - 5 See Annex C for band occupancy plot
 - 6 See Annex D for duty cycle plots
 - 7 The -20dBc Band Occupancy plot was taken with the unit outside of the pit

- 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 every 22.5° as per FCC Knowledge base publication number 139720
Raising and lowering the receiver antenna between 1m & 4m.
Horizontal and vertical polarisations, of the receive antenna.
EUT orientation in three orthogonal planes.
Maximum results recorded

The test equipment used for the Transmitter Intentional Emission – Radiated – Part 15.249 August 2006 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	ROHDE & SCHWARZ	FSU	200034	281	X
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	
RECEIVER	ROHDE & SCHWARZ	ESVS 10	841431/014	UH186	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	ANRITSU	MS2665C	MT26089	479	

ANNEX A
PHOTOGRAPHS

PHOTOGRAPH No. 1

TEST SETUP



PHOTOGRAPH No. 2 **TRANSMITTER TOP VIEW WITHIN THE ' PIT '**



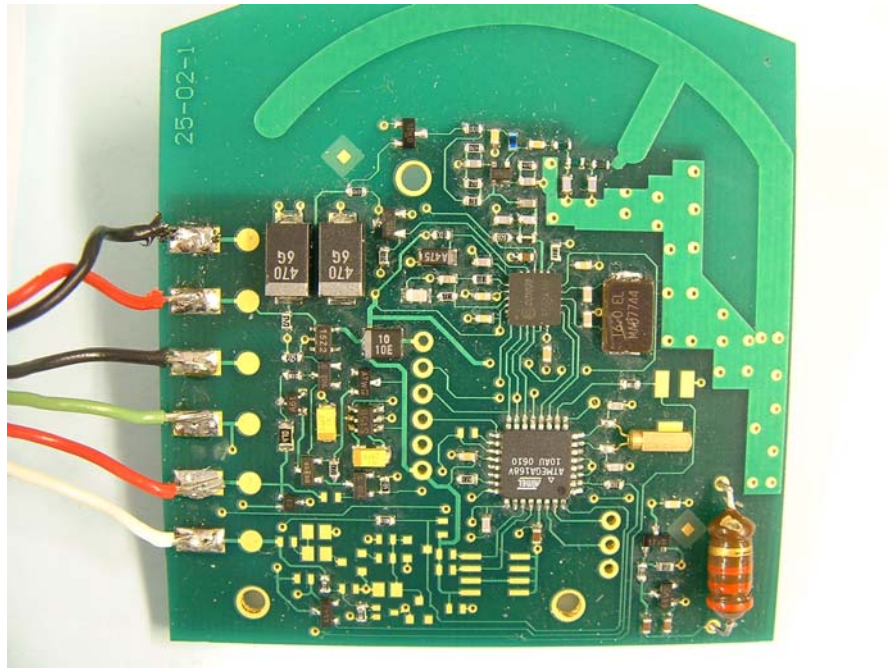
PHOTOGRAPH No. 3

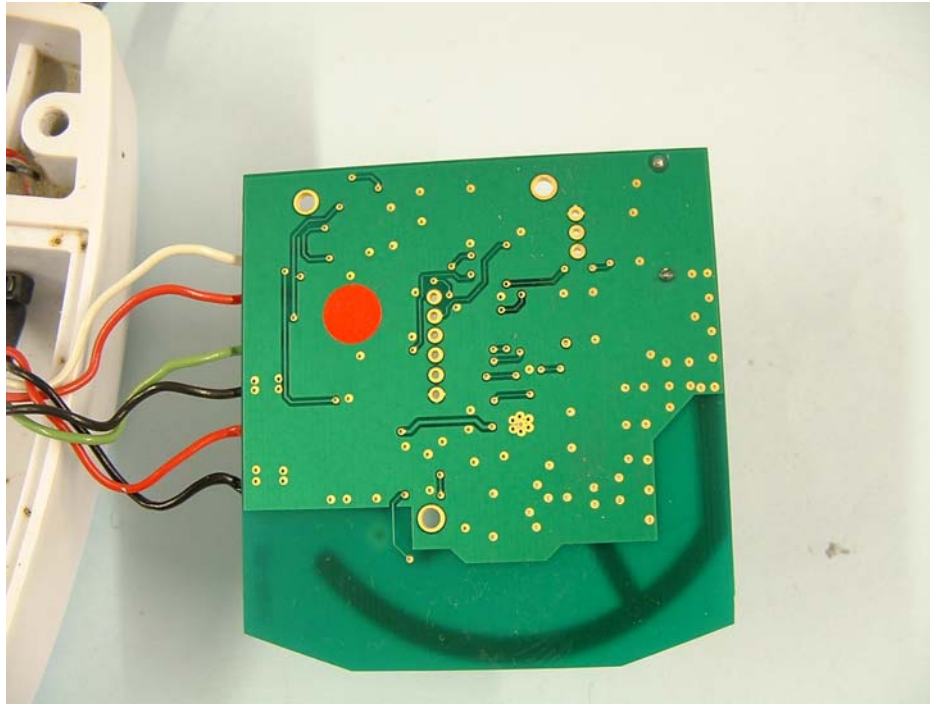
TRANSMITTER REAR VIEW



PHOTOGRAPH No.4 **TRANSMITTER FRONT VIEW COVERS REMOVED**







ANNEX B

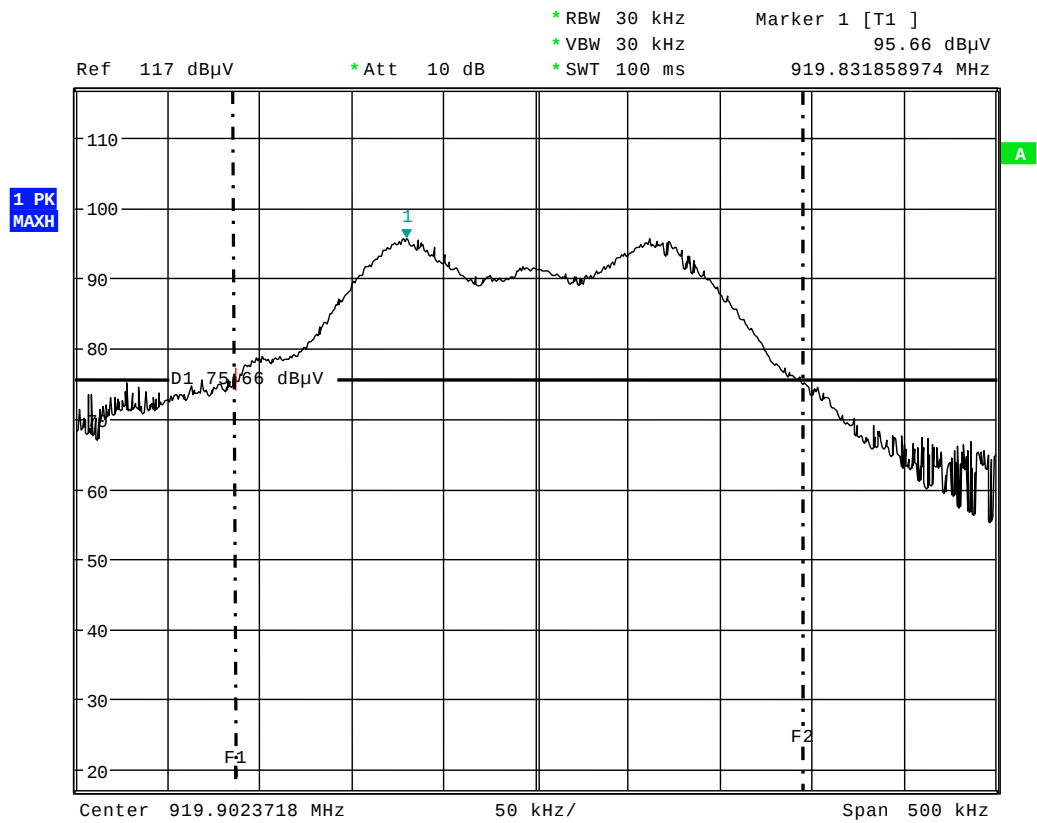
APPLICANT'S SUBMISSION OF DOCUMENTATION LIST

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 P GREEN DECLARATION(s)	-		[]
e.	LABELLING	-	PHOTOGRAPHS	[]
		-	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
BAND OCCUPANCY PLOT

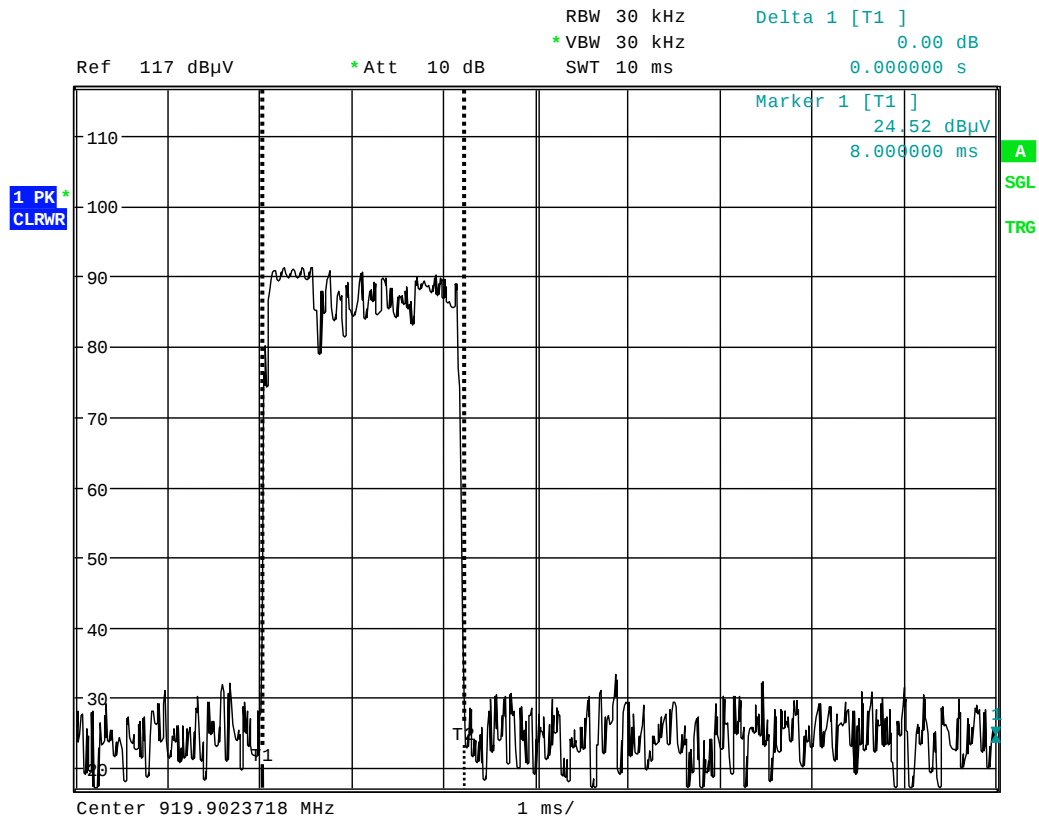
BAND OCCUPANCY PLOT



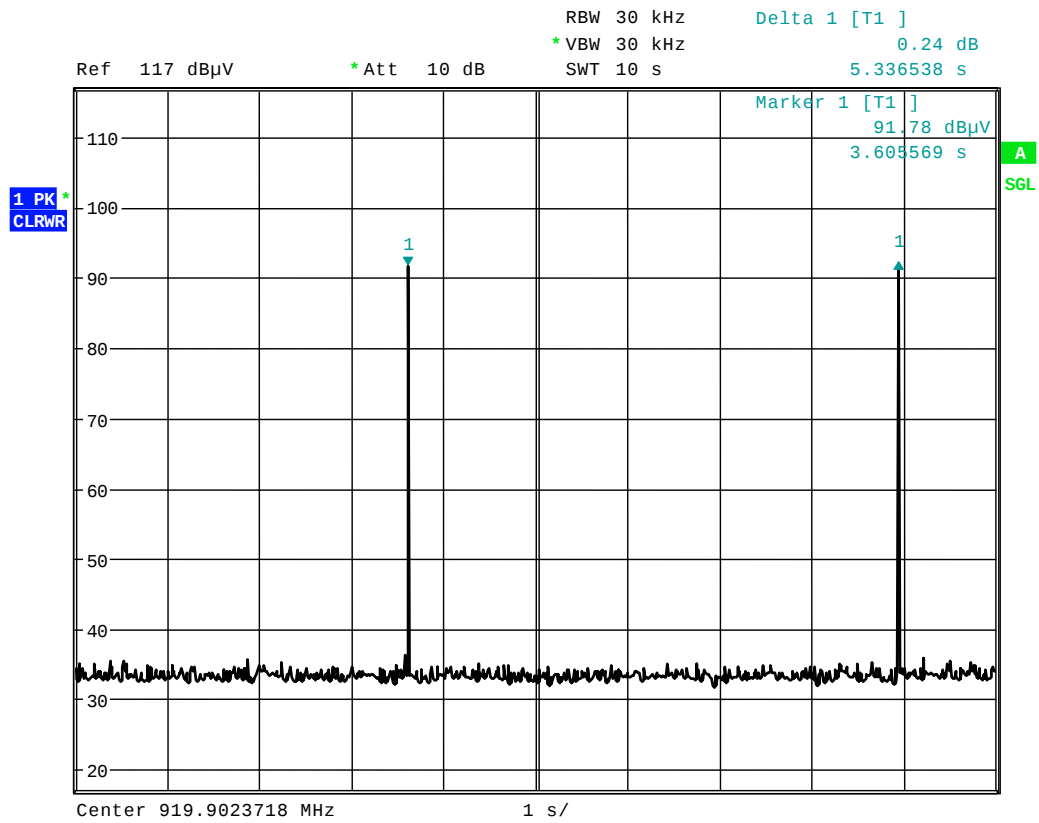
fl = 919.7393718 MHz
 fh = 920.0473718 MHz
 occupied bandwidth = 308.0 kHz

ANNEX D
DUTY CYCLE

DUTY CYCLE



Ton = 2.219ms



Tframe = 5.33s

ANNEX E
EMISSIONS GRAPH(s)

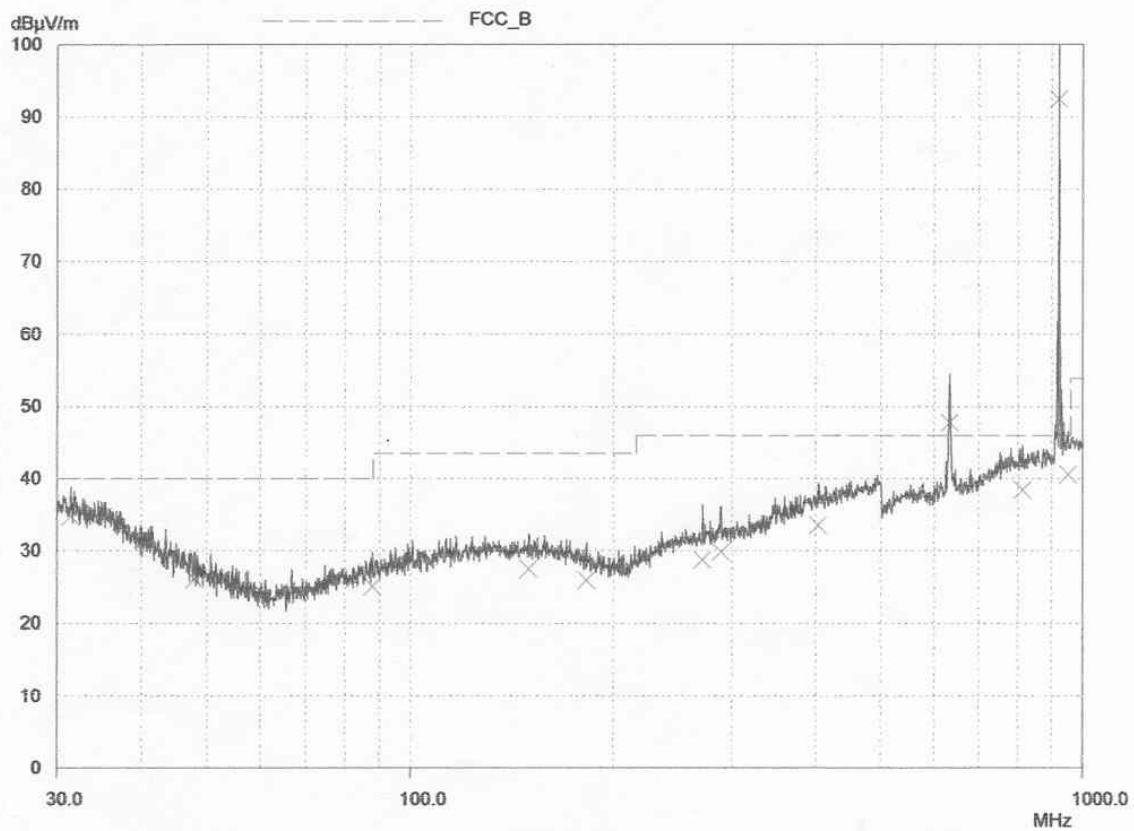
E-Field Radiation (30MHz-1GHz)

EUT: TC900 pit
Manuf: RF insight
Op Cond: 3m Indoor Prescan
Operator: J Charters
Test Spec: FCC CFR47 Part 15.109
Comment: Unit TX on CW. Cable 30cm Bunched
RX ant vertical

This plot was taken with the unit operating on a table inside a screened room.

Scan Settings			(1 Range)			Receiver Settings		
Frequencies								
Start	Stop	Step	IF BW	Detector	M-Time	Atten	OpRge	
30MHz	1000MHz	50kHz	120kHz	PK	1msec	Auto	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: 20 dB



ANNEX F
EQUIPMENT CALIBRATION

TRL Number	Equipment Type	Manufacturer	Last Cal Calibration	Calibration Period	Due For Calibration
UH006	3m Range ERP CAL	TRL	01/03/05	12	01/03/06
UH028	Log Periodic Ant	Schwarbeck	28/04/05	24	28/04/07
UH029	Bicone Antenna	Schwarbeck	27/04/05	24	27/04/07
UH093	Bilog	Schafner	19/08/05	12	19/08/06
UH120	Spectrum Analyser	Marconi	15/03/05	12	15/03/06
UH122	Oscilloscope	Tektronix	07/06/05	24	07/06/07
UH162	ERP Cable Cal	TRL	23/05/05	12	23/05/06
UH186	Receiver >30MHz	R&S	22/03/05	12	22/03/06
UH253	1m Cable N type	TRL	10/01/05	12	10/01/06
UH254	1m Cable N type	TRL	10/01/05	12	10/01/06
UH265	Notch filer	Telonic	24/06/05	12	24/06/06
L005	CMTA	R&S	05/12/05	12	05/12/06
L007	Loop Antenna	R&S	29/03/05	24	29/03/07
L138	1-18GHz Horn	EMCO	15/04/05	24	15/04/07
L139	1-18GHz Horn	EMCO	03/05/05	24	03/05/07
L176	Signal Generator	Marconi	31/01/05	12	31/01/06
L280	18GHz Cable	Rosenberger	10/01/05	12	10/01/06
L343	CCIR Noise Filter	TRL	07/06/05	12	07/06/06

ANNEX G
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%**