



TEST REPORT NO: RU1051/4303
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FCC ID: G2X 63004A

**REPORT ON THE CERTIFICATION TESTING OF A
TUNSTALL TELECOM Ltd.
AMIE RADIO TRANSMITTER
WITH RESPECT TO
THE FCC RULES CFR 47, PART 15.231
INTENTIONAL RADIATOR SPECIFICATION**

TEST DATE: 15th – 22nd April 2003

TESTED BY:  **JOHN CHARTERS** Digitally signed by JOHN CHARTERS
DN: cn=JOHN CHARTERS, o=TRL COMPLIANCE SERVICES, c=US
Date: 2003.05.06 12:50:26 Z J CHARTERS

APPROVED BY:  **Peter Green** Digitally signed by Peter Green
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PRODUCT MANAGER

DATE: 2nd May 2003

Distribution:

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0728

CONTENTS

	PAGE
CERTIFICATE OF CONFORMITY & COMPLIANCE	3
APPLICANT'S SUMMARY	4
EQUIPMENT TEST CONDITIONS	5
TESTS REQUIRED	5
SAMPLE CALCULATIONS	6
TEST RESULTS	6-9

ANNEX

PHOTOGRAPHS	A
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PHOTOGRAPH No. 1: Test setup

PHOTOGRAPH No. 2: Transmitter front view

PHOTOGRAPH No. 3: Transmitter rear view

PHOTOGRAPH No. 4: Transmitter PCB track side

PHOTOGRAPH No. 5: Transmitter PCB component side

PHOTOGRAPH No. 6: Transmitter PCB track side with battery

APPLICANT'S SUBMISSION OF DOCUMENTATION LIST	B
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BAND OCCUPANCY PLOT	C
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TRANSMITTER ON TIME	D
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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: G2X 63004A

PURPOSE OF TEST: Certification

TEST SPECIFICATION: FCC RULES CFR 47, Part 15.231

TEST RESULT: Compliant to Specification

EQUIPMENT UNDER TEST: AMIE RADIO TRANSMITTER

EQUIPMENT SERIAL No: Engineering sample

ITU: EMISSION CODE: 3k00F1DAN

EQUIPMENT TYPE: 63004

PRODUCT USE: Fall Alarm

CARRIER EMISSION: 1678.8 μ V/m @3m

ANTENNA TYPE: Integral

ALTERNATIVE ANTENNA: N/A

BAND OF OPERATION: 260MHz-470MHz

CHANNEL SPACING: N/A

NUMBER OF CHANNELS: 1

FREQUENCY GENERATION: SAW Resonator [] Crystal [X] Synthesiser []

MODULATION METHOD: Amplitude [] Digital [X] Angle []

POWER SOURCE(s): 6Vdc

TEST DATE(s): 15th – 22nd April 2003

ORDER No(s): 10543

APPLICANT: TUNSTALL TELECOM Ltd.

ADDRESS: Whitley Lodge
Whitley Bridge
Yorkshire
United Kingdom
DN14 0HR

TESTED BY:

 **JOHN CHARTERS**

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P GREEN
PRODUCT
MANAGER

APPLICANT'S SUMMARY

EQUIPMENT UNDER TEST (EUT):	AMIE RADIO TRANSMITTER
EQUIPMENT TYPE:	63004
SERIAL NUMBER OF EUT:	Engineering sample
PURPOSE OF TEST:	Certification
TEST SPECIFICATION(s):	FCC RULES CFR 47, Part 15.231
TEST RESULT:	COMPLIANT Yes ☒ No ☐
APPLICANT'S CATEGORY:	MANUFACTURER ☒ IMPORTER ☐ DISTRIBUTOR ☐ TEST HOUSE ☐ AGENT ☐
APPLICANT'S ORDER No(s):	10543
APPLICANT'S CONTACT PERSON(s):	Mr Richard Nadin
E-mail address:	R_nadin@tunstall.co.uk
APPLICANT:	TUNSTALL TELECOM Ltd.
ADDRESS:	Whitley Lodge Whitley Bridge Doncaster DN14 0HR United Kingdom
TEL:	01977 661234
FAX:	01977 662570
MANUFACTURER:	TUNSTALL TELECOM Ltd.
EUT(s) COUNTRY OF ORIGIN:	United Kingdom
TEST LABORATORY:	TRL EMC
UKAS ACCREDITATION No:	0728
TEST DATE(s)	15 th – 22 nd April 2003
TEST REPORT No:	RU1051/4303

EQUIPMENT TEST / EXAMINATIONS REQUIRED

1.	TEST/EXAMINATION	RULE PART	DETECTOR	APPLICABILITY
	Intentional Emission Frequency:	15.231	Quasi Peak	Yes
	Intentional Emission Field Strength:	15.231(b)	Quasi Peak	Yes
	Intentional Emission Band Occupancy:	15.231(c)	Quasi Peak	Yes
	Intentional Emission ERP (mW):	-	-	No
	Spurious Emissions – Conducted:	15.207	-	No
	Spurious Emissions – Radiated <1000MHz:	15.209 15.231(b)	Quasi Peak Average	Yes
	Spurious Emissions – Radiated >1000MHz:	15.209 15.231(b)	Average 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:	Fall Alarm		
3.	Emission Designator:	3K00F1DAN		
4.	Duty Cycle:	<1%		
5.	Transmitter bit or pulse rate and level:	20 Bps		
6.	Temperatures:	Ambient (Tnom)	20°C	
7.	Supply Voltages:	Vnom	2x3V lithium cells	
	Note: Vnom voltages are as stated above unless otherwise shown on the test report page			
8.	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	=	20°C(<1GHz)	3m measurements <1GHz	[X]
Relative humidity	=	54% (<1GHz),	0.3m measurements >1GHz	[X]
Conditions	=	Open Area Test Site (OATS)	3m extrapolated from 0.3m	[X]
Supply voltage	=	6Vdc		
Channel number	=	1		

	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								
88MHz - 216MHz	104.0	14.61	0.6	11.0	26.21	-	20.4	500
216MHz - 960MHz								
960MHz - 1GHz								
1GHz - 5GHz	1560.0(R)	30.6	0.2	25.7	56.5	20	66.8	500
	1872.0	41.6	0.2	26.8	68.6	20	269.1	588
	2184.0	36.9	0.3	28.0	65.2	20	181.9	588
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 9.5dB 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) indicated frequency within restricted band from 15.205
- Due to the transmitted signal lasting only 1.1 second. A unit with modified software which allowed continuous transmission was used during spurious emissions testing.

Test Method:

- As per Radio – Noise Emissions, ANSI C63.4: 1992
- Measuring distances as Notes 1 to 4 above
- EUT 0.8 metre above ground plane
- 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.

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	
HORN ANTENNA	EMCO	3115	9010-3580	138	
HORN ANTENNA	EMCO	3115	9010-3581	139	X
SPECTRUM ANALYSER	TEKTRONIX	2756P	B010109	164	
BICONE ANTENNA	CHASE	BBA9106	N/A	193	X
ANTENNA, LOG PERIODIC 300MHz – 1GHz	CHASE	UPA6108	1061	203	X
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	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	
SPECTRUM ANALYSER	MARCONI	2386/2380	152076/004	UH120	X

TRANSMITTER TESTS

TRANSMITTER INTENTIONAL EMISSION – RADIATED – Part 15.231

Ambient temperature	=	20°C(<1GHz),	3m measurements @ fc	[X]
Relative humidity	=	40%(<1GHz),	10m measurements @ fc	[]
Conditions	=	Open Area Test Site (OATS)	30m measurements @ fc	[]
Supply voltage	=	6V	30m extrapolated from 3m	[]
Channel number	=	1	30m extrapolated from 10m	[]

FREQ. (MHz)	MEASUREMENT Rx. READING (dBµV)	CABLE LOSS (dB)	ANT FACTOR	FIELD STRENGTH (dBµV/m)	EXTRAP. FACTOR (dB)	FIELD STRENGTH (µV/m)
312.0	49.2	1.8	13.5	64.5	-	1678.8
Limit value @ fc			5916.6µV/m			
Band occupancy @ -20dBc			f lower		f higher	
During button press			311.812MHz		312.168MHz	
During pole signal			311.816MHz		312.176MHz	
Transmitter on time during button press			1.16 seconds			
Transmitter on time during pole signal			1.02 seconds			

See spectrum analyser plot – Annex C

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 For transmitter shut down time see annex D
- 5 The transmitter sends a pole signal once every 4 hours for 1 second duration
- 6 Due to the transmitted signal lasting only 1.1 second. A unit with modified software which allowed continuous transmission was used during the carrier power testing.

Test Method:

- 1 As per Radio – Noise Emissions, ANSI C63.4: 1992
- 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 orthogonal planes.
Maximum results recorded

The test equipment used for the Transmitter Intentional Emission – Radiated – Part 15.231 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	X
RECEIVER	ROHDE & SCHWARZ	ESHS20	837960/003	237	
ANTENNA, BICONE 20MHz - 300MHz	CHASE	VBA6106A	1193	251	
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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	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	
SPECTRUM ANALYSER	MARCONI	2386/2380	152076/004	UH120	

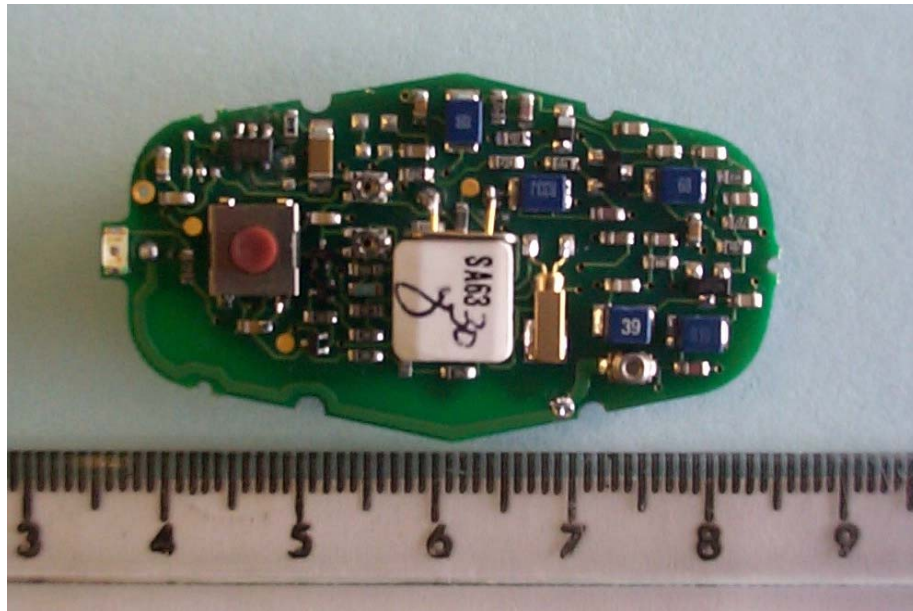
ANNEX A
PHOTOGRAPHS



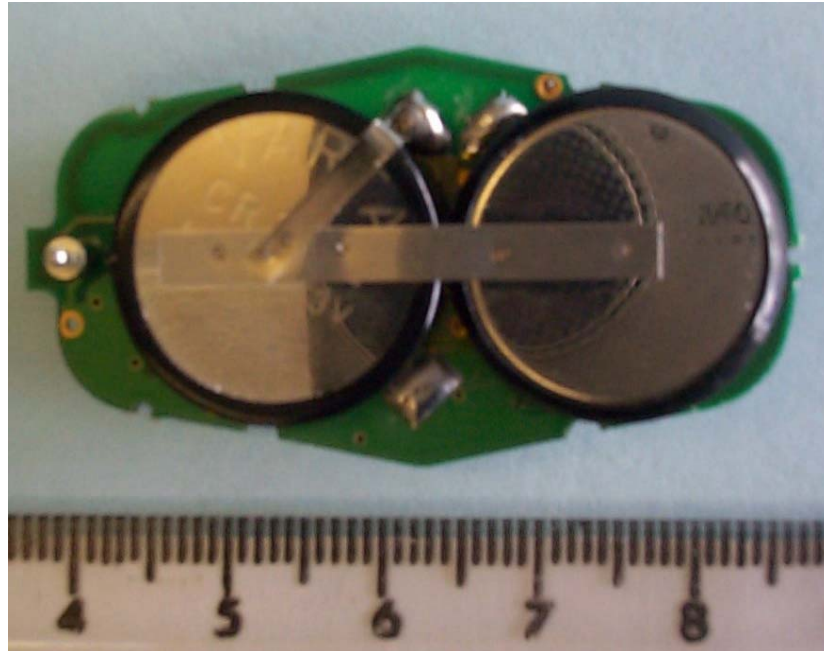








PHOTOGRAPH No. 6 TRANSMITTER TRACK SIDE WITH BATTERY



ANNEX B

APPLICANT'S SUBMISSION OF DOCUMENTATION LIST

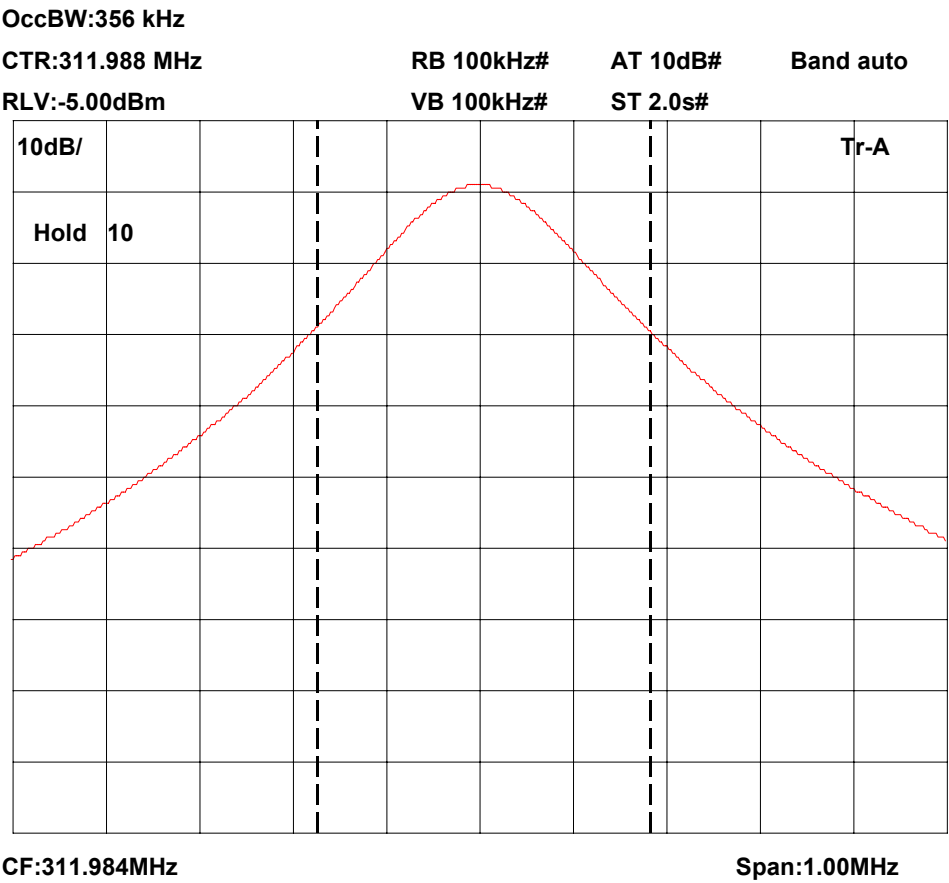
APPLICANT'S SUBMISSION OF DOCUMENTATION LIST

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

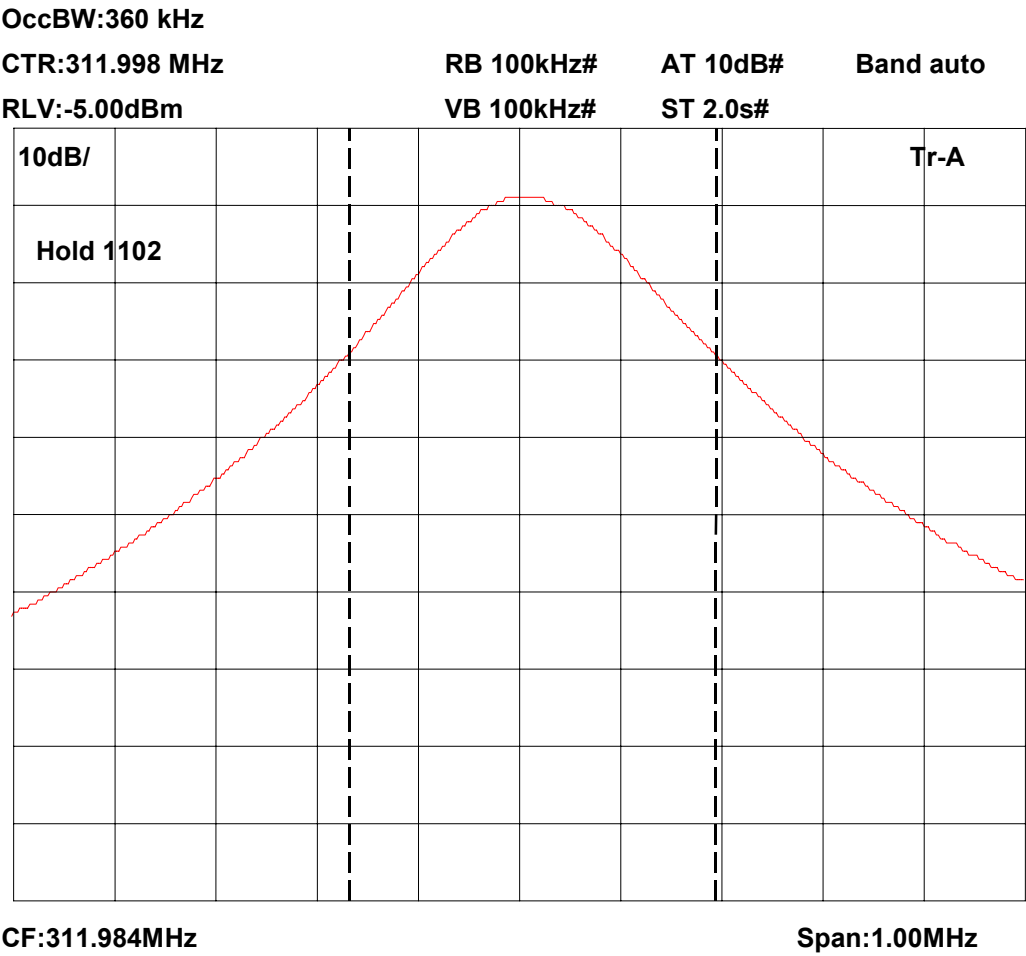
BANDWIDTH PLOT DURING BUTTON PRESS

Lower Frequency 311.812MHz
Upper Frequency 312.168MHz
Occupied Bandwidth @-20dBc = 356kHz



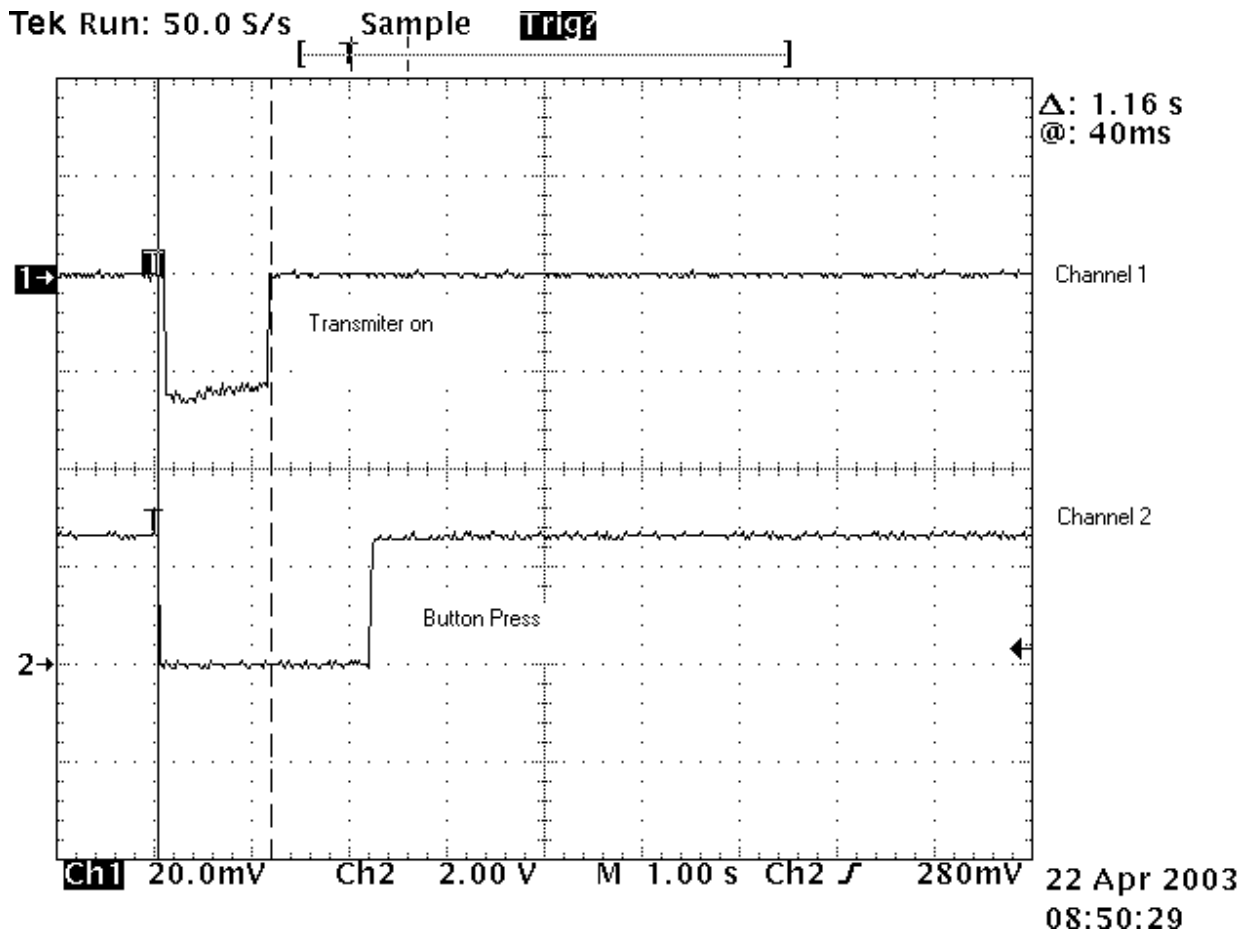
BANDWIDTH PLOT DURING POLE

Lower Frequency 311.816MHz
Upper Frequency 312.176MHz
Occupied Bandwidth @-20dBc = 360kHz



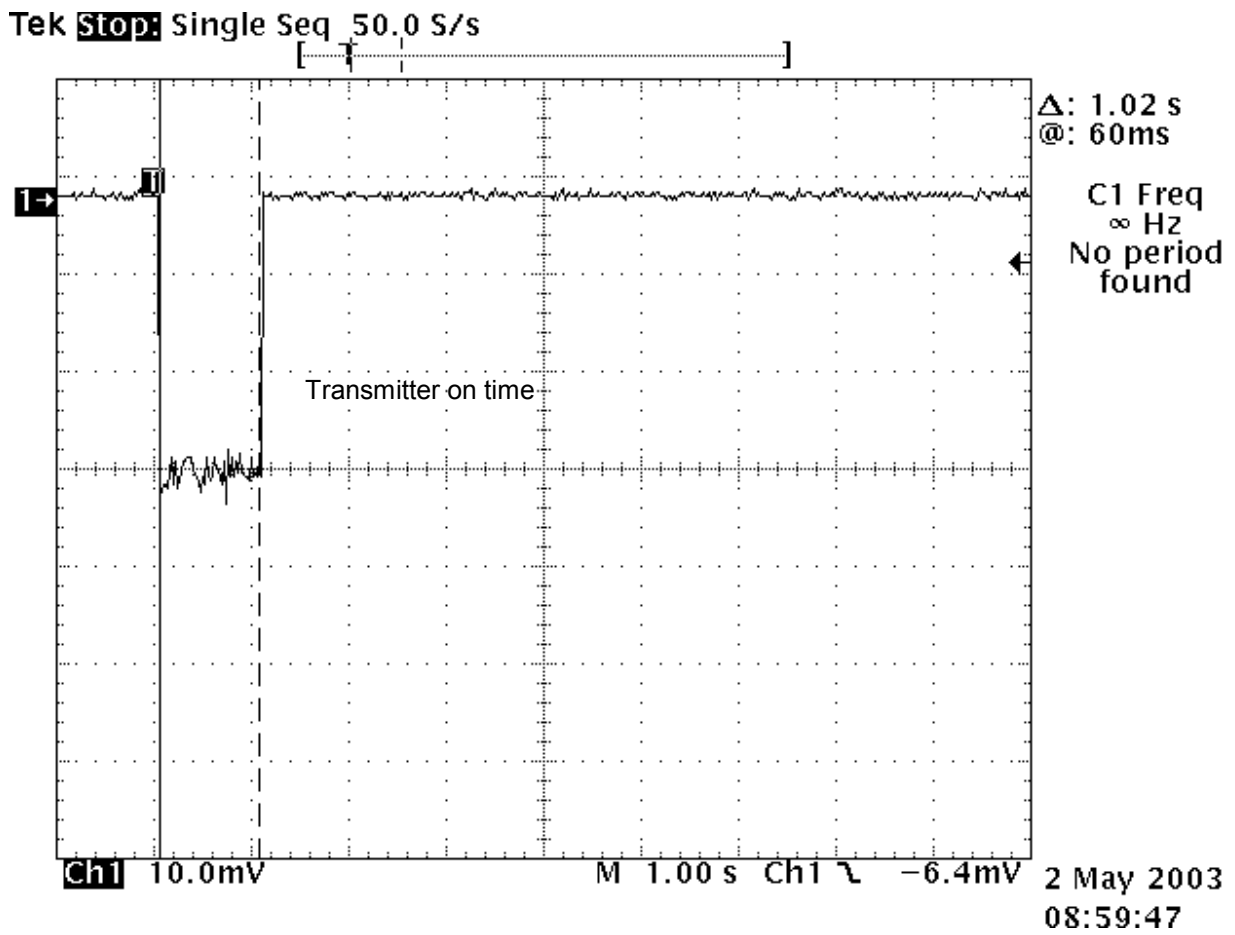
ANNEX D
TANSMITTER ON TIME PLOT

Transmitter on time during button press



1. The transmitter on time is 1.16seconds.
2. The length of time the button is pressed does not affect the transmit time.

Transmitter on time during pole signal.



Transmitter on time during polling signal is 1.02 seconds.