



TEST REPORT NO: RU1180/6213
COPY NO: 2
ISSUE NO: 1
FCC ID: S6T-377A

**REPORT ON THE CERTIFICATION TESTING OF A
TEKELEK EUROPE Ltd
TEK 377A TANK MONITORING EQUIPMENT
WITH RESPECT TO
THE FCC RULES CFR 47, PART 15.249 January 2005
INTENTIONAL RADIATOR SPECIFICATION**

TEST DATE: 20th March 2005 – 21st March 2005

TESTED BY: _____ D WINSTANLEY

APPROVED BY: _____ P GREEN
EMC PRODUCT
MANAGER

DATE: 6th May 2005

Distribution:

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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: S6T-377A

PURPOSE OF TEST: Certification

TEST SPECIFICATION: FCC RULES CFR 47, Part 15.249 January 2005

TEST RESULT: Compliant to Specification

EQUIPMENT UNDER TEST: TEK 377A Tank Monitoring Equipment

EQUIPMENT SERIAL No: Engineering Sample

ITU: EMISSION CODE: 150kF1D

EQUIPMENT TYPE: Ultrasonic Level Monitoring Equipment

PRODUCT USE: Level Indication

CARRIER EMISSION: 19952.62 μ V/m @ 3m

ANTENNA TYPE: Integral

ALTERNATIVE ANTENNA: Not applicable

FREQUENCY OF OPERATION: 914.4445MHz

CHANNEL SPACING: Not applicable, Wideband

NUMBER OF CHANNELS: Not applicable

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

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

POWER SOURCE(s): +3Vdc

TEST DATE(s): 20th march 2005 – 21st March 2005

ORDER No(s): TE-6624

APPLICANT: Tekelek Europe Ltd

ADDRESS: Bay 118
Shannon Free Zone
Shannon
County Clare
Ireland

TESTED BY: _____ D WINSTANLEY

APPROVED BY: _____ P GREEN
EMC PRODUCT
MANAGER

APPLICANT'S SUMMARY

EQUIPMENT UNDER TEST (EUT):	TEK 377A Tank Monitoring Equipment
EQUIPMENT TYPE:	Ultrasonic Level Monitoring Equipment
SERIAL NUMBER OF EUT:	Engineering Sample
PURPOSE OF TEST:	Certification
TEST SPECIFICATION(s):	FCC RULES CFR 47, Part 15.249 January 2005
TEST RESULT:	COMPLIANT Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
APPLICANT'S CATEGORY:	MANUFACTURER <input checked="" type="checkbox"/> IMPORTER <input type="checkbox"/> DISTRIBUTOR <input type="checkbox"/> TEST HOUSE <input type="checkbox"/> AGENT <input type="checkbox"/>
APPLICANT'S ORDER No(s):	TE-6624
APPLICANT'S CONTACT PERSON(s):	Mr M Lintzgy
E-mail address:	martin.lintzgy@tekelek.ie
APPLICANT:	Tekelek Europe Ltd
ADDRESS:	Bay 118 Shannon Free Zone Shannon County Clare Ireland
TEL:	+353-61-471511
FAX:	+353-61-471685
MANUFACTURER:	Tekelek Europe Ltd
EUT(s) COUNTRY OF ORIGIN:	Eire
TEST LABORATORY:	TRL EMC
UKAS ACCREDITATION No:	0728
TEST DATE(s)	20 th March 2005 – 21 st March 2005
TEST REPORT No:	RU1180/6213

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:	Level Indication		
3.	Emission Designator:	150kF1D		
4.	Duty Cycle:	<100%		
5.	Transmitter bit or pulse rate and level:	1000bps		
6.	Temperatures:	Ambient (Tnom)	8°C	
7.	Supply Voltages:	Vnom	+3Vdc	
	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	=	8°C(<1GHz)	3m measurements <1GHz	[X]
Relative humidity	=	36% (<1GHz),	0.3m measurements >1GHz	[X]
Conditions	=	Open Area Test Site (OATS)	3m extrapolated from 0.3m	[X]
Supply voltage	=	+3Vdc		
Channel number	=	1		

	FREQ. (MHz)	MEAS. Rx. (dBµV)	CABLE LOSS (dB)	ANT FACT	FIELD STRENGTH (dBµV/m)	EXTRAP. FACTOR (dB)	FIELD STRENGTH (µV/m)	LIMIT (µV/m)
30MHz - 88MHz								
88MHz - 216MHz								
216MHz - 960MHz								
960MHz - 1GHz								
1GHz - 5GHz	2743.29(R)	26.64	1.85	29.9	58.39	-20	83.01	500
	3657.72(R)	29.91	2.15	32.0	64.06	-20	159.58	500
	4572.50(R)	28.12	2.36	32.8	63.28	-20	145.88	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 20dB from 0.3m to 3m, as per Part 15.31f
- Measurements >1GHz @ 0.3m as per Part 15.31f(1)
- Receiver detector <1GHz = CISPR, Quasi-Peak, 120kHz bandwidth
- Receiver detector >1GHz = Average, 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 D for scan data
- Unit transmitting at a rate of once per 300ms. Measurement times adjusted accordingly.

Test Method:

- As per Radio – Noise Emissions, ANSI C63.4: 2003
- 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	X
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	
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	MARCONI	2386/2380	152076/004	UH120	X

TRANSMITTER TESTS

TRANSMITTER INTENTIONAL EMISSION – RADIATED – Part 15.249 January 2005

Ambient temperature	=	8°C(<1GHz),	3m measurements @ fc	[X]
Relative humidity	=	36%(<1GHz),	10m measurements @ fc	[]
Conditions	=	Open Area Test Site (OATS)	30m measurements @ fc	[]
Supply voltage	=	+3Vdc	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 (mV/m)
914.4445	58.0	3.6	24.4	86.0	-	19.95
Limit value @ fc			50 (mV/m)			
Band occupancy @ -20dBc			f lower		f higher	
			914.4330MHz		914.5820MHz	

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 at a rate of once per 300ms. Measurement times adjusted accordingly.

- 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 15.249 January 2005 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	
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	ANRITSU	MS2665C	MT26089	479	X

ANNEX A
PHOTOGRAPHS

PHOTOGRAPH No. 1

TEST SETUP



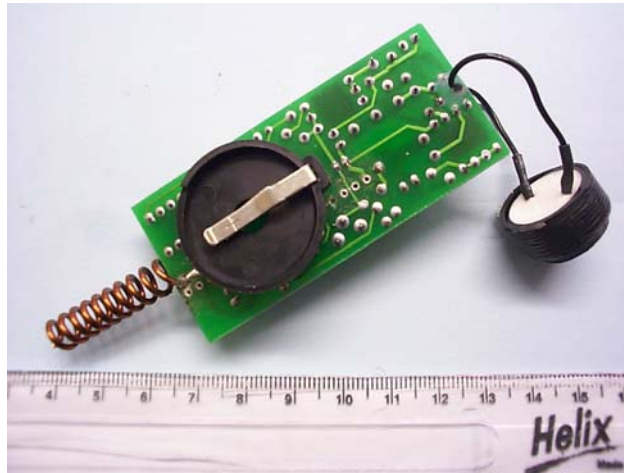
PHOTOGRAPH No. 2

TRANSMITTER OVERVIEW



PHOTOGRAPH No. 3

CONTROL PCB TRACK SIDE



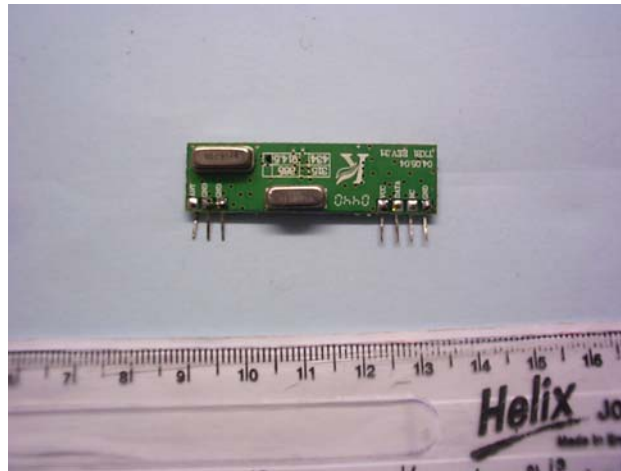
PHOTOGRAPH No. 4

CONTROL PCB COMPONENT SIDE



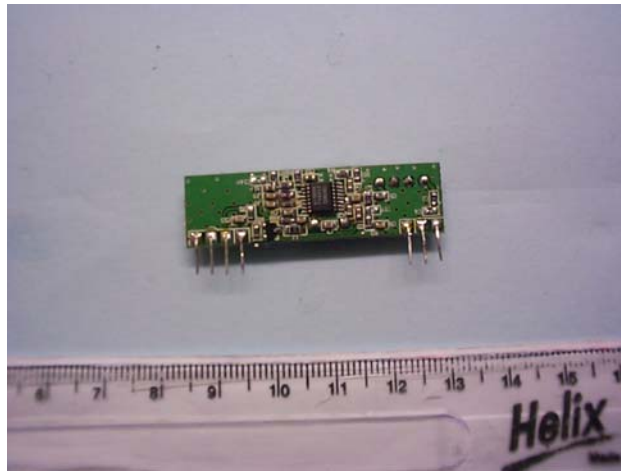
PHOTOGRAPH No. 5

RF MODULE PCB TRACK SIDE



PHOTOGRAPH No. 6

RF MODULE PCB COMPONENT SIDE



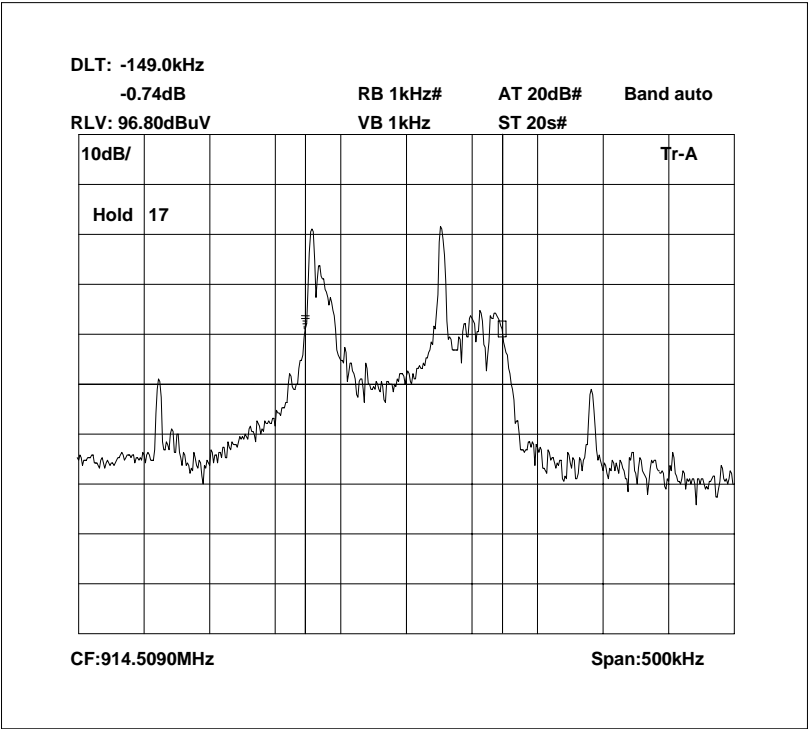
ANNEX B
APPLICANT'S SUBMISSION OF DOCUMENTATION LIST

APPLICANT'S SUBMISSION OF DOCUMENTATION LIST

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

BANDWIDTH PLOT



fl = 914.4330MHz
fh = 914.5820MHz
Occupied Bandwidth = 149kHz

ANNEX C
SCAN PLOT(s)

SCAN PLOT(s)

TRL Compliance Services Ltd

20 Apr 2005 16:17

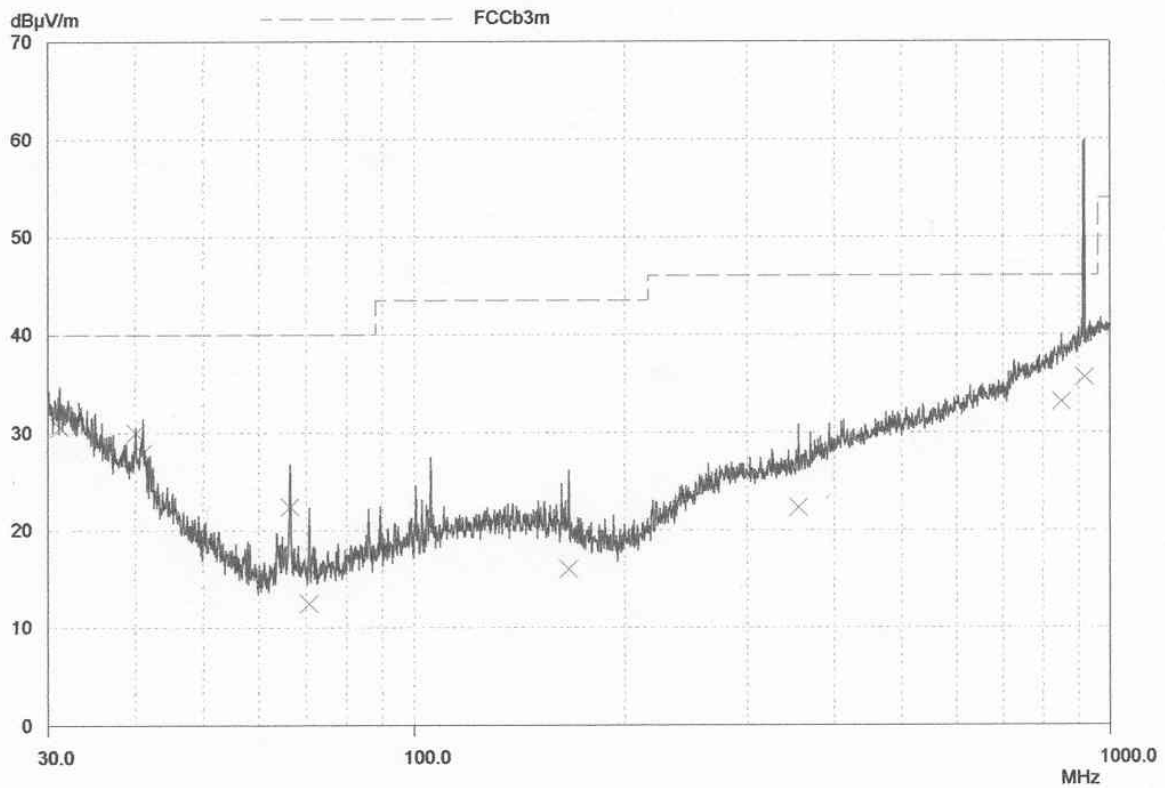
E-Field Radiation

EUT: TEK Tank Monitor
 Manuf: Tekelek
 Op Cond: 3m Indoor Prescan
 Operator: D Winstanley
 Test Spec: CFR47 FCC part 15.109 (Class B)
 Comment: Unit On. Modulated Carrier. Plused once every 300ms.
 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	15	30MHz	1000MHz	TRLUH72
	20	30MHz	1000MHz	UH191

Final Measurement: Detector: X QP
 Meas Time: 5sec
 Subranges: 50
 Acc Margin: 10 dB



PAGE 1