SGS

Test Report

INTENTIONAL RADIATOR TESTS ACCORDING TO FCC PART 15 C and INDUSTRY CANADA REQUIREMENTS

Equipment Under Test:	Electronic compass
Model:	R50
Type:	-
Manufacturer:	Tracker Oy Kauppiaantie 30 FI-90460 OULUNSALO FINLAND
Customer:	Tracker Oy Kauppiaantie 30 FI-90460 OULUNSALO FINLAND
FCC Rule Part: IC Rule Part	15.249: 2008 RSS-210, Issue 7, 2007

FINAS
Finnish Accreditation Service
T004 (EN ISO/IEC 17025)

Date:	30.04.2010	Date:	30.04.2010
Issued by:	Niko Tolonen RF Testing Engineer	Checked by:	Jari Merikari Technical Manager

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Equipment Under Test (EUT)

Electronic Compass	
Brand:	Tracker Stealth
Model:	R50
Type:	-
Serial no:	-
HW version:	V1
SW version:	Feb 19 2010
FCC ID number:	YBW-R50
Industry Canada number:	8932A-R50

Description of the EUT

The EUT is an electronic compass which receives radio signal from the transmitter collar designed for hunting dogs. The collar transmits a location signal to the compass and the hunter can indentify the location of the dog.

Before the EUT is set into receiving mode it has to be paired with the transmit collar T60. This pairing process is the only time when the EUT transmits a radio signal. The pairing takes only few seconds.

Classification of the device

Fixed device	☐
Mobile Device (Human body distance > 20cm)	☐
Portable Device (Human body distance < 20cm)	☒

Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing

Ratings and declarations

Operating Frequency TX mode:	902.0125 MHz
Tx Channels:	1
Operating Frequency Range (OFR) RX mode:	902 – 916 MHz
RX Channels	560
RX Channel separation:	25 kHz
Channel bandwidth:	16.43 kHz
Effective radiated power:	25.8 mW (-15.88 dBm)
Transmission technique:	One channel
Modulation:	2FSK
Antenna type and gain:	6dBi

Power Supply

Rated voltage:	1 x 3 VDC battery (CR123)
Operating voltage:	2.7 – 3.1VDC

Mechanical Size of the EUT

Length:	135 mm	Width:	103 mm	Height:	63 mm

Peripherals

No peripherals were used during the tests.

Samples

Sample No. 1: EUT uses its own internal antenna.

Sample No. 2: Measurement cable was connected to the EUT by using temporary antenna connector.

Disclaimer

SUMMARY OF TESTING

Test Specification	Description of Test	Result
§15.249 (a) / RSS-210, A2.9	Field Strength of Fundamental	PASS
§15.249 (a) (d) / RSS-210, 2.6	Spurious Radiated Emissions	PASS
§15.215(c)	20 dB Bandwidth	PASS
RSS-GEN 4.6.1	99% Bandwidth	PASS
§15.109 / RSS-GEN 7.2.3 ICES-003	Receiver Radiated Emissions	PASS

EUT Test Conditions During Testing

The EUT was in continuous transmit mode during all the tests.

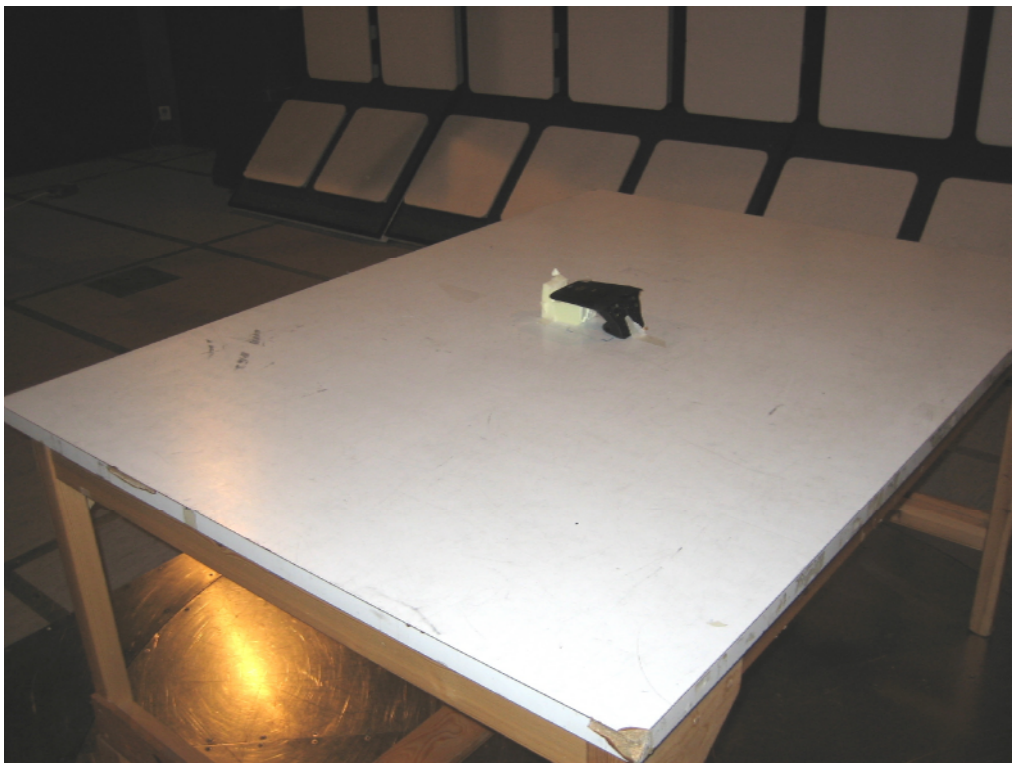
In the radiated emission test the EUT was tested in three different orthogonal axes (X, Y and Z) in order to find out the worst direction. The worst direction result was reported.

Test Facility

☐ Testing Location / address: FCC registration number: **90598**	SGS Fimko Ltd Särkiniementie 3 FI-00210, HELSINKI FINLAND
☒ Testing Location / address: FCC registration number: **178986** Industry Canada registration number: **8708A-2**	SGS Fimko Ltd Karakaarenkuja 4 FI-02610, ESPOO FINLAND

Photographs of the EUT

Picture 1. The EUT equipped with the temporary antenna and control connector.



Picture 2. The EUT and test set-up for radiated emission test

Field Strength of Fundamental

Standard:	ANSI C63.4	(2003)
Tested by:	NTO	
Date:	26.2.2010	
Humidity:	41%	
Temperature:	22°C	
Barometric pressure	1006mbar	
Measurement uncertainty	± 4.51 dB	Level of confidence 95 % (k = 2)

FCC Rule: 15.249(a)

Level (dBµV/m)	Polarization	Azimuth (deg)	Height (cm)	Margin (dB)	Limit (dBµV/m)	Comment
81.5	H	11.0	100.0	8.5	94.0	PASS

Transmitter Radiated Emissions 30 – 10 000 MHz

Standard:	ANSI C63.4	(2003)
Tested by:	NTO	
Date:	26.2.2010	
Humidity:	41%	
Temperature:	22.0°C	
Barometric pressure	1006mbar	
Measurement uncertainty	± 4.51 dB	Level of confidence 95 % (k = 2)

FCC Rule: 15.249(a) (d) (e), 15.209(a)

Measured Peak Values In The Frequency Range 30 MHz - 1000 MHz.

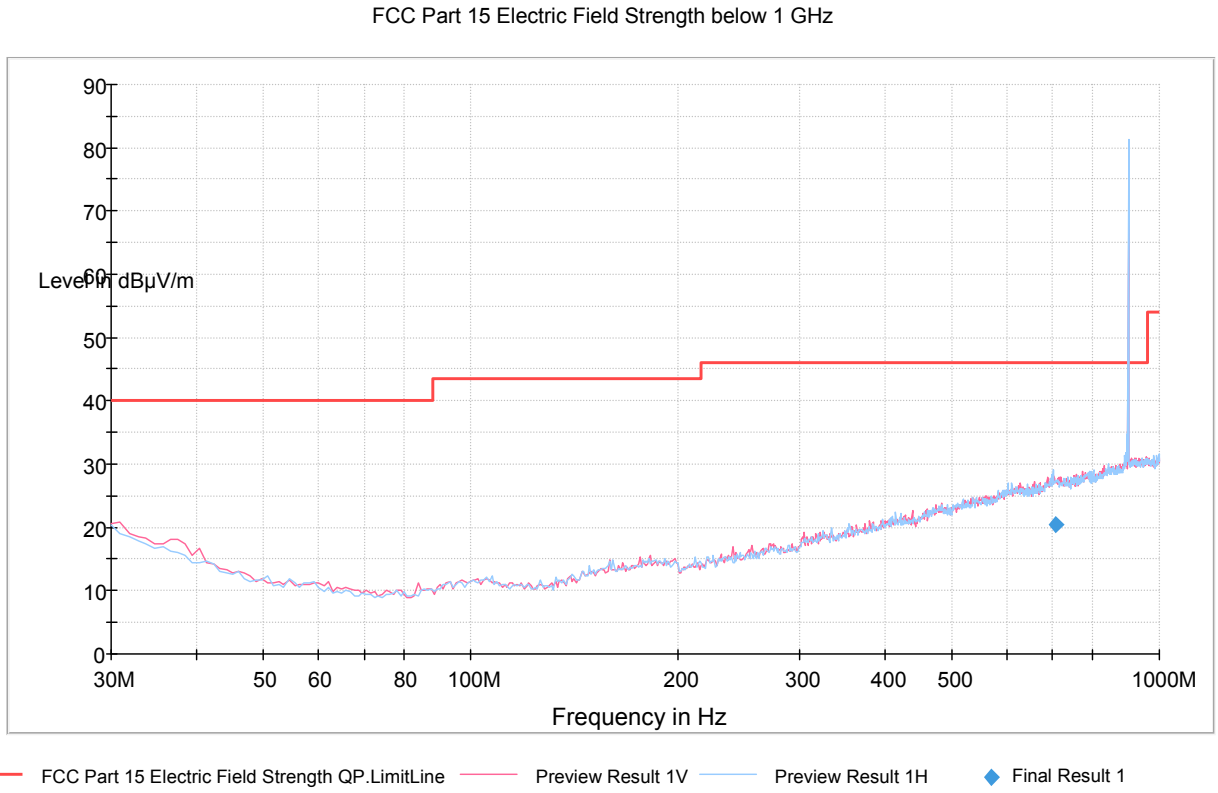


Figure 1. Measured curve with peak-detector

Final measurements from the worst frequencies

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
701.182403	20.9	1000.0	100.000	177.0	H	31.0	24.6	25.1	46.0

Table 1. Final results.

Note: Peak in the frequency 902 MHz is the carrier.

Measured Peak and Average Values In The Frequency Range 1 000 MHz – 10 000 MHz.

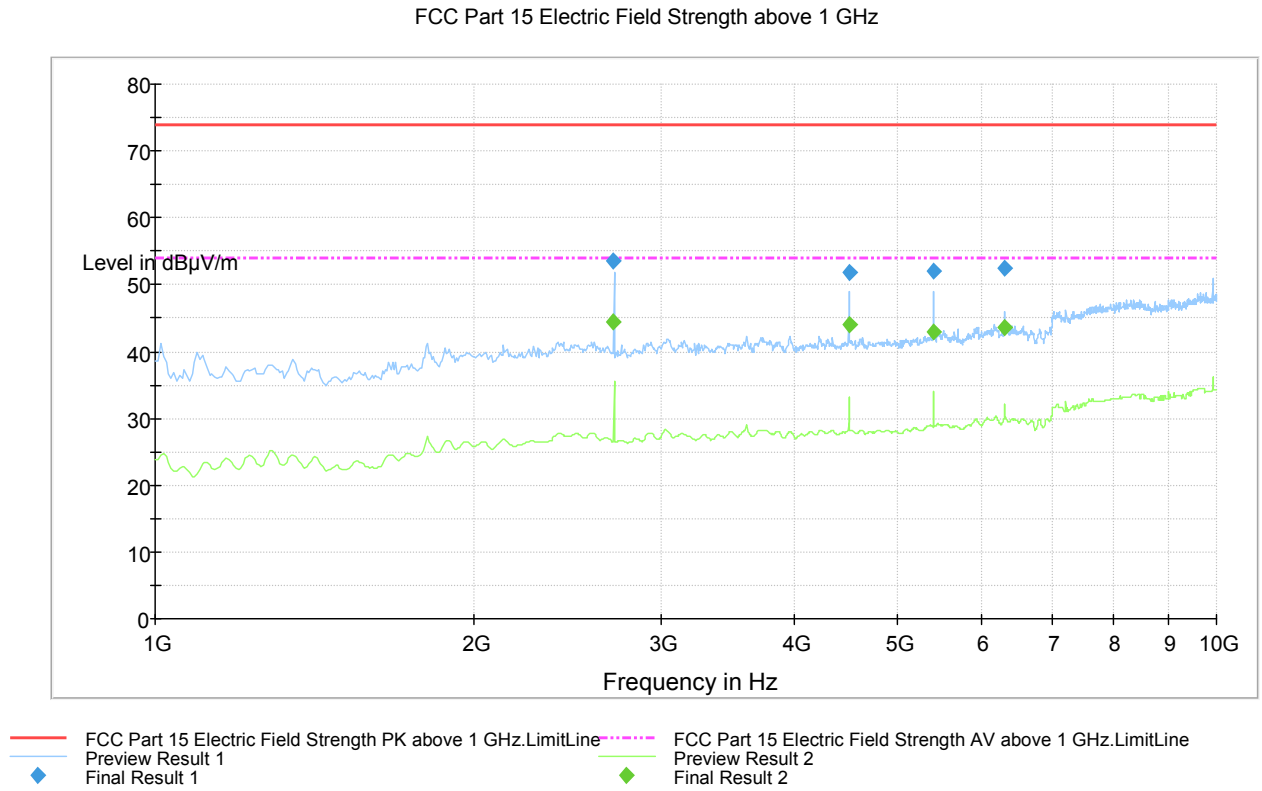


Figure 2. Measured curves with peak and average detector.

Final measurements from the worst frequencies

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2706.014830	53.5	1000.0	1000.000	149.0	H	63.0	5.2	20.5	74.0
4510.022044	51.8	1000.0	1000.000	139.0	V	120.0	9.5	22.2	74.0
5412.025651	51.9	1000.0	1000.000	100.0	V	332.0	11.1	22.1	74.0
6314.029259	52.4	1000.0	1000.000	172.0	H	342.0	12.5	21.6	74.0

Table 2. Final results with Peak detector.

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2706.014830	44.5	1000.0	1000.000	100.0	V	329.0	5.2	9.5	54.0
4510.022044	44.1	1000.0	1000.000	100.0	V	131.0	9.5	9.9	54.0
5412.025651	43.0	1000.0	1000.000	100.0	V	93.0	11.1	11.0	54.0
6314.029259	43.7	1000.0	1000.000	174.0	H	341.0	12.5	10.3	54.0

Table 3. Final results with Average detector.

Receiver Radiated Emissions 30 – 10 000 MHz

Standard:	ANSI C63.4	(2003)
Tested by:	NTO	
Date:	26.2.2010	
Humidity:	41%	
Temperature:	22.0°C	
Barometric pressure	1006mbar	
Measurement uncertainty	± 4.51 dB	Level of confidence 95 % (k = 2)

FCC Rule: 15.109

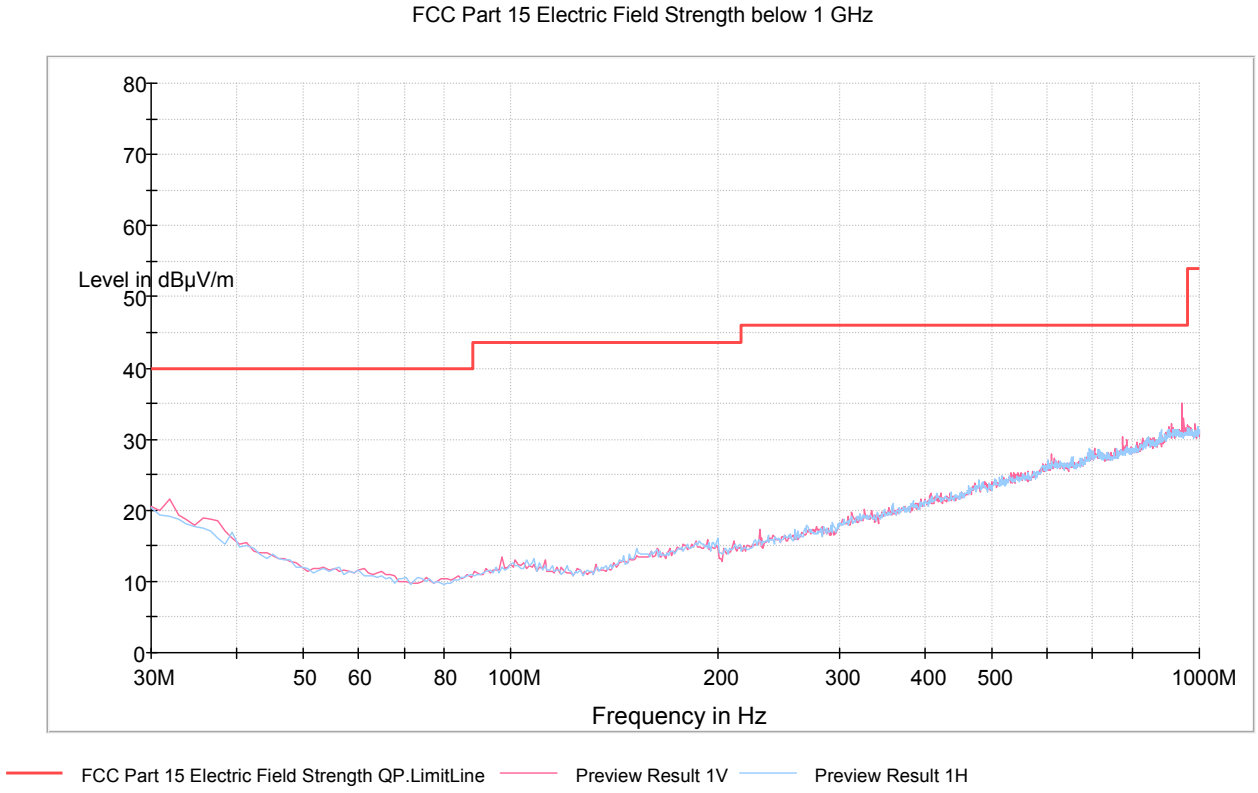


Figure 3. Receiver radiated emissions measured with Peak detector.

No final measurements were made due to the margin over 10 dB below the limit line.

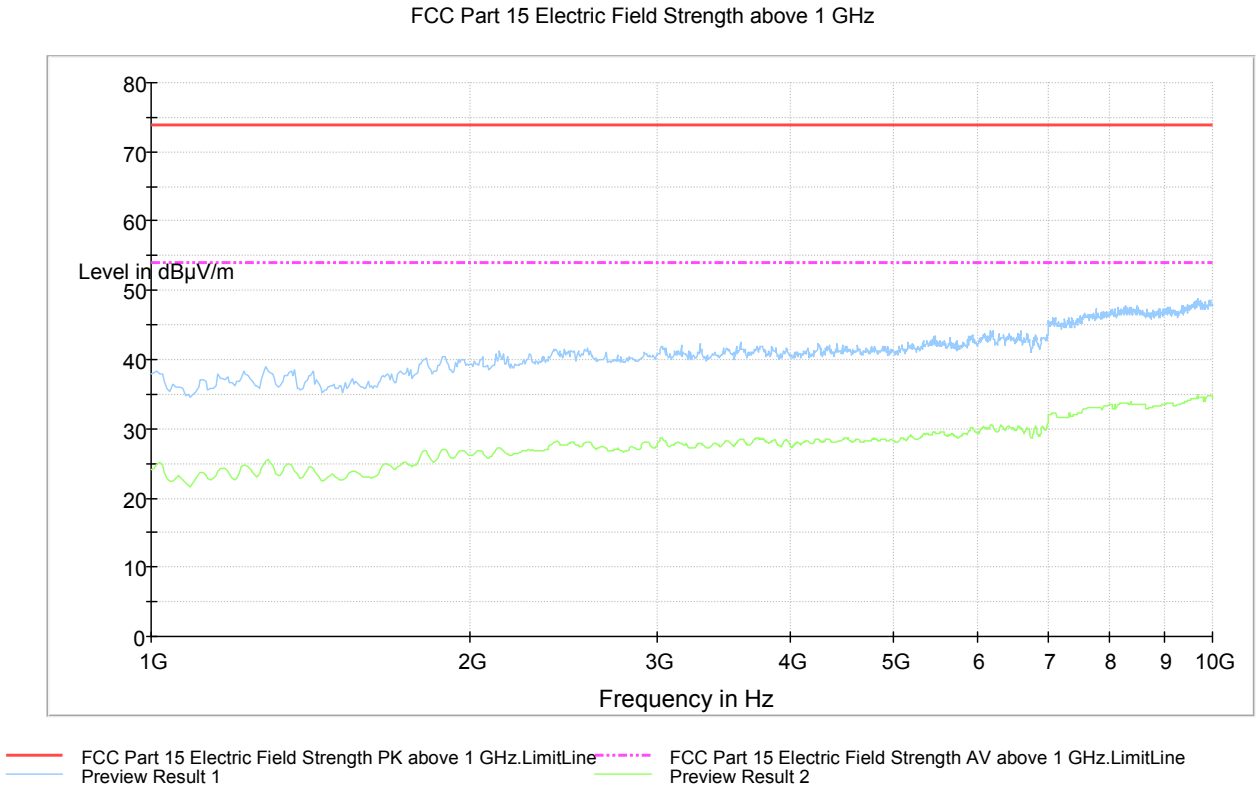


Figure 4. Receiver radiated emissions measured with Peak and Average detector.

No final measurements were made because the Peak detector measurement level was below the Average limit line.

20 dB Bandwidth

Standard:	ANSI C63.4	(2003)
Tested by:	NTO	
Date:	2.3.2010	
Humidity:	42 %	
Temperature:	21.8 °C	
Barometric pressure	989 mbar	

FCC Rule: 15.215(c)

EUT frequency [MHz]	Limit [kHz]	20 dB BW [kHz]	Result
902.0125	-	16.633	PASS

Table 4. 20 dB bandwidth test results.

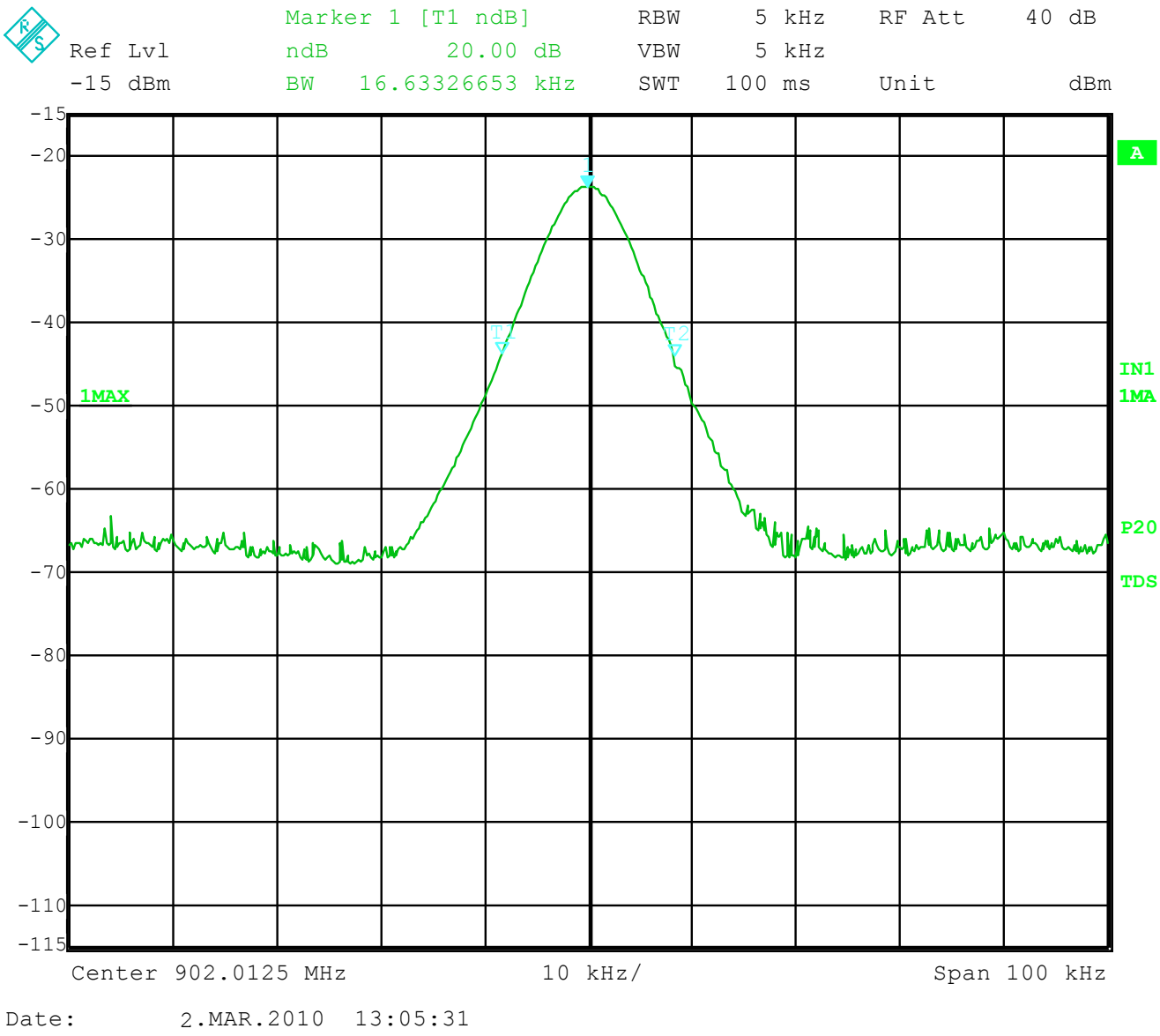


Figure 5. 20dB bandwidth.

99% Occupied Bandwidth

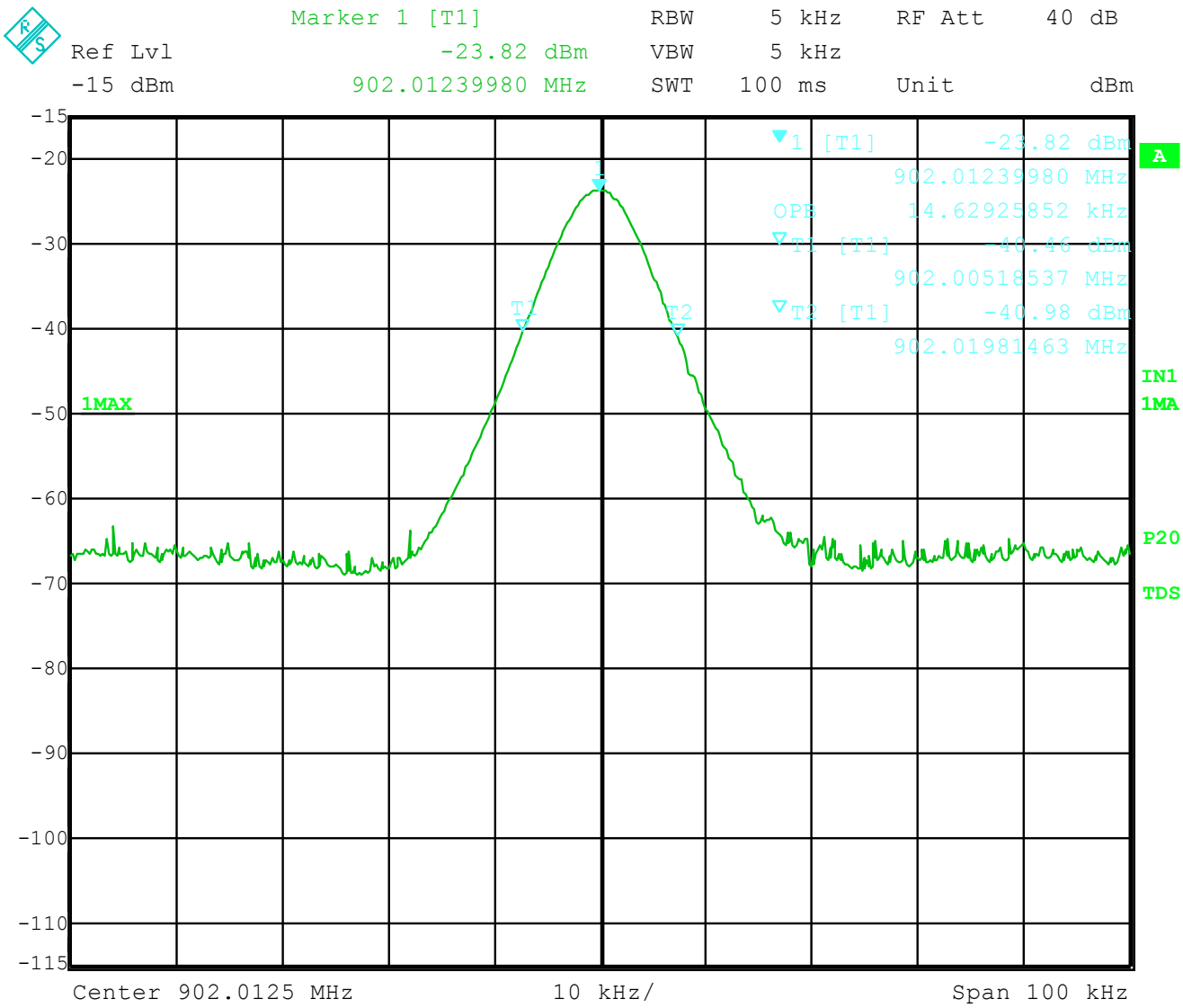
Standard:	ANSI C63.4	(2003)
Tested by:	NTO	
Date:	2.3.2010	
Humidity:	42 %	
Temperature:	21.8 °C	
Barometric pressure	989 mbar	

RSS-GEN 4.7

EUT frequency [MHz]	Limit [kHz]	99% BW [kHz]	Result
902.0125	-	14.629	PASS

Table 5. 99% occupied bandwidth test results.

99% Occupied Bandwidth



List of test equipments

Manufacturer	Type	Serial no	Inv. no
ROHDE & SCHWARZ			
EMI Test receiver	ESIB 26	10093	5358
Test software	EMC32	Ver. 8.30.0	-
DAVIS			
Weather station	Vantage Pro	-	5297
EMCO			
Antenna (30 MHz - 3 GHz)	3142C	00079895	7788
Antenna (1 - 18 GHz)	3117	29617	7293
HEWLETT- PACKARD			
Microwave amplifier	83017A	-	5226
HUBER-+ SUHNER			
Attenuator 6dB	6806.17B	-	-
DEISEL			
Antenna mast	MA 240 T	240/394/96	5017
Tilt option	KE 220	220/307/96	-
Controller	HD 100	100/413/96	5018
Turntable	DS 420	420/420/96	5015
WAINWRIGHT			
High Pass Filter	WHKX	10	8267