



FCC ID: T4YH42TBTWMGBS

Registration No. DAT-P-207/05

## EMI -- TEST REPORT

- FCC Part 15B -

<b>Test Report No. :</b> <b>T33064-00-00HS</b>	05. March 2010 <hr/> Date of issue
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**Type / Model Name** : H42

**Product Description** : Communicator with Barcode reader, GSM, Bluetooth, GPS, WLAN and Card reader

**Applicant** : GOTIVE a.s.

**Address** : Bajkalká 21/A

82101 BRATISLAVA, SLOVAKIA

**Manufacturer** : GOTIVE a.s.

**Address** : Bajkalká 21/A

82101 BRATISLAVA, SLOVAKIA

**Licence holder** : GOTIVE a.s.

**Address** : Bajkalká 21/A

82101 BRATISLAVA, SLOVAKIA

<b>Test Result</b> according to the standards listed in clause 1 test standards:	<b>POSITIVE</b>
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DAT-P-207/05-00

The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test results without the written permission of the test laboratory.

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# 1 TEST STANDARDS

The tests were performed according to following standards:

## **FCC Rules and Regulations Part 15 Subpart A - General (October 1, 2008)**

Part 15, Subpart A, Section 15.31	Measurement standards
Part 15, Subpart A, Section 15.33	Frequency range of radiated measurements
Part 15, Subpart A, Section 15.35	Measurement detector functions and bandwidths

## **FCC Rules and Regulations Part 15 Subpart B - Unintentional Radiators (October 1, 2008)**

Part 15, Subpart B, Section 15.107	AC Line conducted emissions <input type="checkbox"/> Class A device <input checked="" type="checkbox"/> Class B device
Part 15, Subpart B, Section 15.109	Radiated emissions, general requirements
Part 15, Subpart B, Section 15.111	Antenna power conduction

ANSI C63.4: 2003	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
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ANSI C95.1:1992	IEEE Standard for Safety Levels with respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz
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CISPR 16-4-2: 2003	Uncertainty in EMC measurement
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CISPR 22: 2005 EN 55022: 2006	Information technology equipment
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## 2 SUMMARY

### GENERAL REMARKS:

The EUT consists of a GPS-Module, a Smart Card Reader and a Bar Code Reader. The EUT showed its compliance to the FCC requirements was fully equipped with all options. The listed variants are subsets of the EUT.

Product Code	Product name - short	Product Name
H42TBTWB	H42T.BTW.B	H42 - BCR - Traffic Red
H42TBTWB1	H42T.BTW.B.1	H42 - BCR - Blue Sky
H42TBTWB2	H42T.BTW.B.2	H42 - BCR - Industrial Grey
H42TBTWMG	H42T.BTW.MG	H42 - GSM&GPS - Traffic Red
H42TBTWMG1	H42T.BTW.MG.1	H42 - GSM&GPS - Blue Sky
H42TBTWMG2	H42T.BTW.MG.2	H42 - GSM&GPS - Industrial Grey
H42TBTWMGB	H42T.BTW.MG.B	H42 - GSM&GPS&BCR - Traffic Red
H42TBTWMGB1	H42T.BTW.MG.B.1	H42 - GSM&GPS&BCR - Blue Sky
H42TBTWMGB2	H42T.BTW.MG.B.2	H42 - GSM&GPS&BCR - Industrial Grey
H42TBTWBS	H42T.BTW.B.S	H42 - BCR&SCR - Traffic Red
H42TBTWBS1	H42T.BTW.B.S.1	H42 - BCR&SCR - Blue Sky
H42TBTWBS2	H42T.BTW.B.S.2	H42 - BCR&SCR - Industrial Grey
H42TBTWMGS	H42T.BTW.MG.S	H42 - GSM&GPS&SCR - Traffic Red
H42TBTWMGS1	H42T.BTW.MG.S.1	H42 - GSM&GPS&SCR - Blue Sky
H42TBTWMGS2	H42T.BTW.MG.S.2	H42 - GSM&GPS&SCR - Industrial Grey
H42TBTWMGBS	H42T.BTW.MG.B.S	H42 - GSM&GPS&BCR&SCR - Traffic Red
H42TBTWMGBS1	H42T.BTW.MG.B.S.1	H42 - GSM&GPS&BCR&SCR - Blue Sky
H42TBTWMGBS2	H42T.BTW.MG.B.S.2	H42 - GSM&GPS&BCR&SCR - Industrial Grey
H42TBTWBA	H42T.BTW.B.A	H42 - BCR&SCRI - Traffic Red
H42TBTWBA1	H42T.BTW.B.A.1	H42 - BCR&SCRI - Blue Sky
H42TBTWBA2	H42T.BTW.B.A.2	H42 - BCR&SCRI - Industrial Grey
H42TBTWMGA	H42T.BTW.MG.A	H42 - GSM&GPS&SCRI - Traffic Red
H42TBTWMGA1	H42T.BTW.MG.A.1	H42 - GSM&GPS&SCRI - Blue Sky
H42TBTWMGA2	H42T.BTW.MG.A.2	H42 - GSM&GPS&SCRI - Industrial Grey
H42TBTWMGBA	H42T.BTW.MG.B.A	H42 - GSM&GPS&BCR&SCRI - Traffic Red
H42TBTWMGBA1	H42T.BTW.MG.B.A.1	H42 - GSM&GPS&BCR&SCRI - Blue Sky
H42TBTWMGBA2	H42T.BTW.MG.B.A.2	H42 - GSM&GPS&BCR&SCRI - Industrial Grey

### FINAL ASSESSMENT:

The equipment under test **fulfills** the EMI requirements cited in clause 1 test standards.

Date of receipt of test sample : acc. to storage records

Testing commenced on : 16 November 2009

Testing concluded on : 19 November 2009

Checked by:

Tested by:

Klaus Gegenfurtner  
Dipl.-Ing.(FH)  
Manager: Radio Group

Hermann Smetana  
Dipl.-Ing.(FH)  
Radio Expert

### 3 EQUIPMENT UNDER TEST

#### 3.1 Photo documentation of the EUT – Detailed photos see attachment A

#### 3.2 Power supply system utilised

Power supply voltage : Lithium-ion battery 3.7 VDC, AC mains adapter (100 V - 240 V / 50/60 Hz / 1 $\phi$ )

#### 3.3 Short description of the equipment under test (EUT)

The EUT is a hand held communicator supports the user with following mobile features for the logistic management:

##### **Communication**

- GSM data only
- GPRS data only
- WLAN 802.11b/g
- Bluetooth

##### **Capture**

- Bar Code Reader
- Smart Card Reader
- Imager
- Fingerprint Reader

##### **Navigation**

- Global Positioning System (GPS)

Number of tested samples: 1  
Serial number: Prototype

#### **EUT operation mode:**

The equipment under test was operated during the measurement under the following conditions:

- RX-Mode (While measure the GPS, BCR and SCR was active.)

#### **EUT configuration:**

(The CDF filled by the applicant can be viewed at the test laboratory.)

#### **The following peripheral devices and interface cables were connected during the measurements:**

- AC mains adapter, (100V - 240V 50/60 Hz)	Model : Fairway, Model: WN20U-050
- _____	Model : _____
- _____	Model : _____

## **4 TEST ENVIRONMENT**

### **4.1 Address of the test laboratory**

**mikes-testingpartners gmbh**  
**Ohmstrasse 2-4**  
**94342 STRASSKIRCHEN**  
**GERMANY**

### **4.2 Environmental conditions**

During the measurement the environmental conditions were within the listed ranges:

Temperature: 15-35 ° C

Humidity: 30-60 %

Atmospheric pressure: 86-106 kPa

### **4.3 Statement of the measurement uncertainty**

The data and results referenced in this document are true and accurate. The reader may notice that tolerances within the calibration of the equipment and facilities may cause additional uncertainty. The measurement uncertainty is calculated for all measurements listed in this test report acc. to CISPR 16-4-2 „Uncertainties, statistics and limit modelling – Uncertainty in EMC measurement“ and documented in the mikes-testingpartners gmbh quality system acc. to DIN EN ISO/IEC 17025. For all measurements shown in this report, the measurement uncertainty of the test laboratory, mikes-testingpartners gmbh, is below the measurement uncertainty as defined by CISPR. Therefore, no special measures must be taken into consideration with regard to the limits according to CISPR. Furthermore, component diversity and modifications in production processes may result in additional deviation. If necessary, refer to the test lab for the actual measurement uncertainty for specific tests. The manufacturer has the sole responsibility of continued compliance of the EUT.

### **4.4 Measurement protocol for FCC, VCCI and AUSTEL**

#### **4.4.1 GENERAL INFORMATION**

#### 4.4.1.1 Test Methodology

Conducted and radiated disturbance testing is performed according to the procedures set out by the International Special Committee on Radio Interference (CISPR) Publication 22, European Standard EN 55022 as shown under section 1 of this report.

The test methods used comply with CISPR Publication 22, EN 55022 - "Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement" and with ANSI C63.4 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz."

In compliance with 47 CFR Part 15 Subpart A, Section 15.38 testing for FCC compliance may be achieved by following the procedures set out in ANSI C63.4 and applying the CISPR 22 limits.

#### 4.4.1.2 Justification

The Equipment under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral using the appropriate impedance characteristic or left unterminated. Where appropriate, cables are manually manipulated with respect to each in order to obtain maximum disturbances from the unit.

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## 5 TEST CONDITIONS AND RESULTS

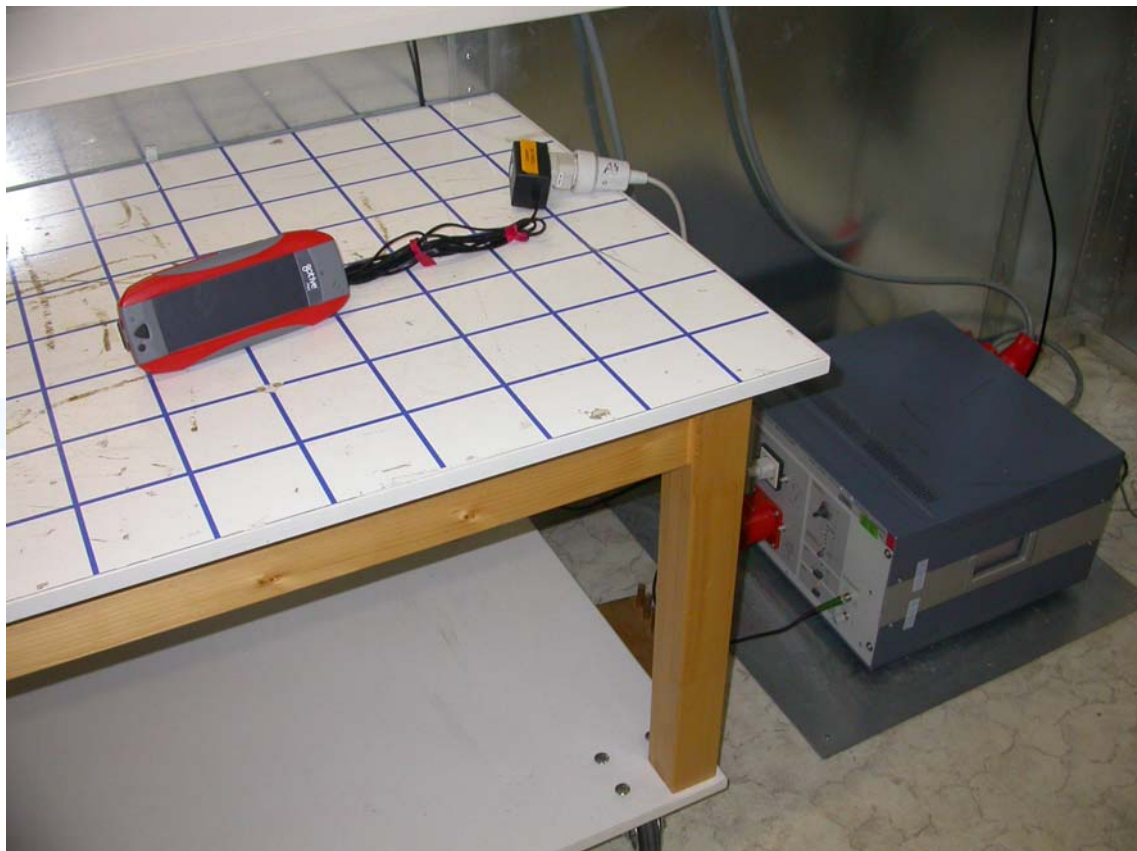
### 5.1 Conducted emissions

For test instruments and accessories used see section 6 Part A 4.

#### 5.1.1 Description of the test location

Test location:                      Shielded Room S2

#### 5.1.2 Photo documentation of the test set-up



#### 5.1.3 Applicable standard

According to FCC Part 15, Section 15.107 (a):

Except as shown in paragraphs (b) and (c) of this Section, for an unintentional radiator that is designed to be connected to the public utility AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

\* Decreases with the logarithm of the frequency

#### 5.1.4 Description of Measurement

The correction factors for cable loss is stored in the memory of the EMI receiver used for the measurement and therefore the final level (dB $\mu$ V) appears directly in the reading of the EMI receiver. This level is compared to the FCC limit.

To convert between dB $\mu$ V and  $\mu$ V, the following conversions apply:

$$\begin{aligned} \text{dB}\mu\text{V} &= 20(\log \mu\text{V}) \\ \mu\text{V} &= 10^{(\text{dB}\mu\text{V}/20)} \end{aligned}$$

The measurements are performed using an EMI receiver, which has CISPR characteristic bandwidth and quasi-peak detection and a line impedance stabilization network (LISN) with 50 $\Omega$ /50  $\mu$ H (CISPR 16) characteristics. Table top equipment is placed on a non-conducting table 80 cm above the floor and is positioned 40 cm from the vertical ground plane (wall) of the screen room. If the minimum limit margin appears to be less than 20 dB with a peak mode measurement, the emissions are remeasured using a tuned receiver with quasi-peak and average detection and recorded on the data sheets.

#### 5.1.5 Test result

Frequency range:	0.15 MHz - 30 MHz
Min. limit margin	3.5 dB at 0.815 MHz

The requirements are **FULFILLED**.

Remarks:

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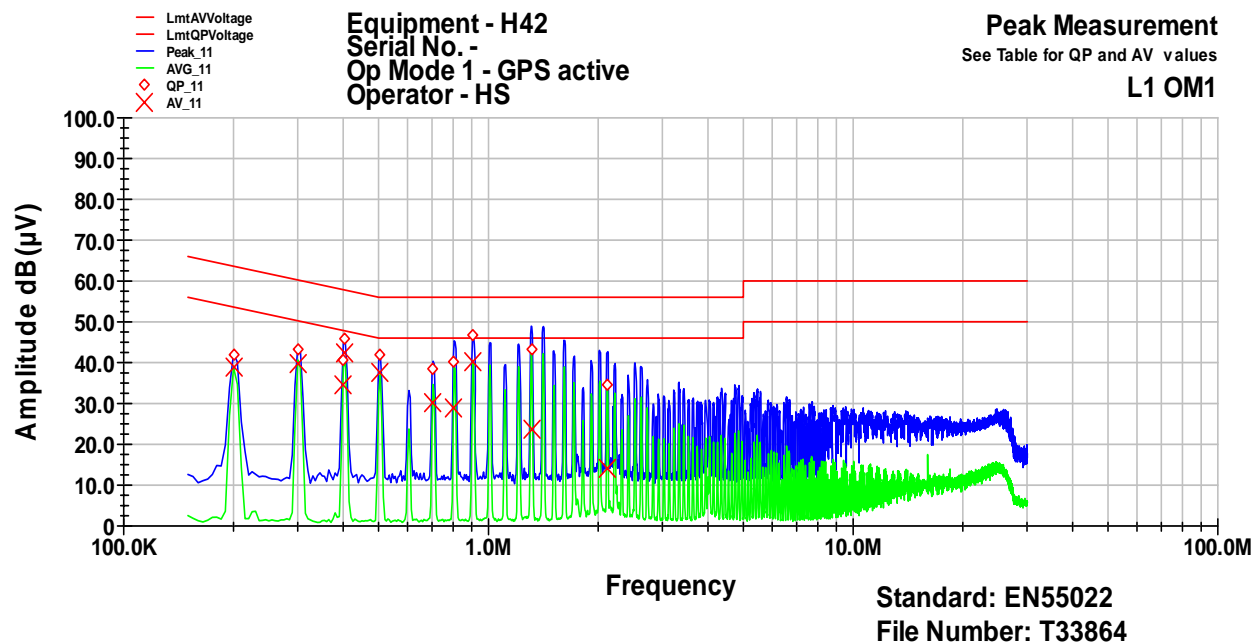
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### 5.1.6 Test protocol

Test point L1  
Operation mode: **RX-Mode**  
Remarks: While measure the GPS, BCR and SCR was active.

Result: passed

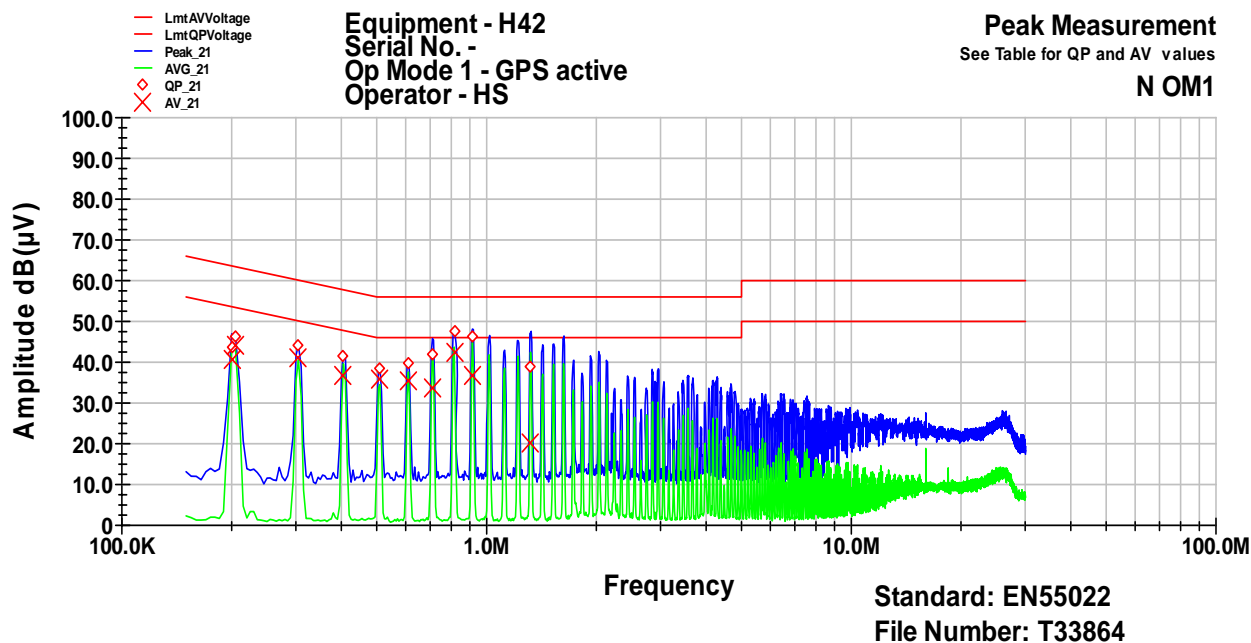


Frequency MHz	QP Level dB(μV)	QP Delta dB	QP Limit dB	AV Level dB(μV)	AV Delta dB	AV Limit dB
0.2	41.8	-21.8	63.6	39.0	-14.6	53.6
0.3	43.2	-17.0	60.2	39.7	-10.6	50.2
0.4	40.7	-17.2	57.9	34.7	-13.1	47.9
0.405	45.8	-12.0	57.8	42.5	-5.2	47.8
0.505	41.9	-14.1	56.0	37.6	-8.4	46.0
0.705	38.6	-17.4	56.0	30.1	-15.9	46.0
0.805	40.3	-15.7	56.0	29.1	-16.9	46.0
0.91	46.7	-9.3	56.0	40.4	-5.6	46.0
1.31	43.2	-12.8	56.0	23.8	-22.2	46.0
2.12	34.5	-21.5	56.0	14.0	-32.0	46.0

FCC ID: T4YH42TBTWMGBS

Test point: N  
Operation mode: RX-Mode  
Remarks: While measure the GPS, BCR and SCR was active.

Result: passed



Frequency MHz	QP Level dB(μV)	QP Delta dB	QP Limit dB	AV Level dB(μV)	AV Delta dB	AV Limit dB
0.2	43.6	-20.1	63.6	40.6	-13.0	53.6
0.205	46.2	-17.2	63.4	44.0	-9.4	53.4
0.305	44.2	-15.9	60.1	41.2	-8.9	50.1
0.405	41.3	-16.5	57.8	36.8	-11.0	47.8
0.51	38.5	-17.5	56.0	36.0	-10.0	46.0
0.61	39.8	-16.2	56.0	35.5	-10.5	46.0
0.71	41.8	-14.2	56.0	33.6	-12.4	46.0
0.815	47.7	-8.3	56.0	42.5	-3.5	46.0
0.915	46.2	-9.8	56.0	36.6	-9.4	46.0
1.32	39.1	-16.9	56.0	20.0	-26.0	46.0

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## 5.2 Radiated emissions

For test instruments and accessories used see section 6 Part **SER 2**, **SER 3**.

### 5.2.1 Description of the test location

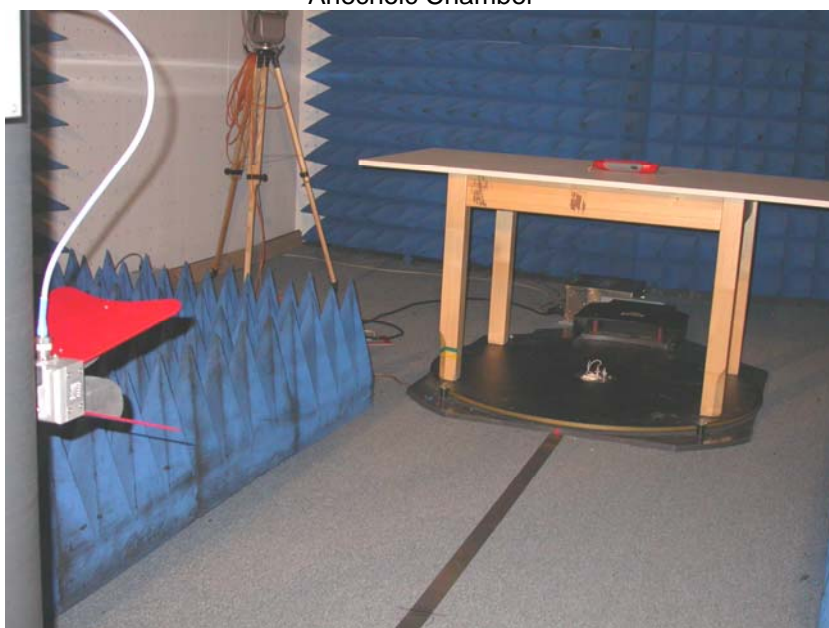
Test location: OATS1  
Test location: Anechoic Chamber A2  
Test distance: 3 metres

### 5.2.2 Photo documentation of the test set-up

Open area test site



Anechoic Chamber



### 5.2.3 Applicable standard

According to FCC Part 15, Section 15.109 (a):

Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 m shall not exceed the given limit.

### 5.2.4 Description of Measurement

Radiated emissions from the EUT are measured in the frequency range of 30 MHz to 1000 MHz using a tuned receiver and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. The set up of the equipment under test will be in accordance to ANSI C63.4. The interface cables that are closer than 40 cm to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 cm from the ground plane. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 m, measurement scans are made with horizontal and vertical antenna polarization and the EUT is rotated 360 degrees. The delta is calculated by substitution the displayed result from the effective FCC or CISPR limit.

The radiated emissions from the EUT are measured in the frequency range up 1 GHz to maximum frequency as specified in section 15.33, using a spectrum analyser and appropriate linearly polarized antennas. Table top equipment is placed on a 1.0 X 1.5 m non-conducting table 80 cm above the ground plane. The set up of the equipment under test will be in accordance to ANSI C63.4. Measurements are made in horizontal and vertical polarization in a fully anechoic chamber. Hand-held or body-worn devices are rotated through three orthogonal axes to determine the attitude of the highest emission shall be used for final testing. During the tests the EUT is rotated 360° and the cables and equipment are placed and moved in position in such a way to find the maximum emission level.

The resolution bandwidth during the measurement is as following:

30 MHz – 1000 MHz: RBW: 120 kHz

Above 1000 MHz: RBW: 1 MHz

### 5.2.5 Test result, $f < 1$ GHz

Frequency (MHz)	L: QP (dBµV)	L: AV (dBµV)	Bandwidth (kHz)	Correct. (dB)	L: QP (dBµV/m)	L: AV (dBµV/m)	Limit (dBµV/m)	Delta (dB)
-	-							

### 5.2.6 Test result, $f > 1$ GHz

Frequency (MHz)	L: PK (dBµV)	L: AV (dBµV)	Bandwidth (kHz)	Correct. (dB)	L: PK (dBµV/m)	L: AV (dBµV/m)	Limit AV (dBµV/m)	Delta (dB)
-		-						

**FCC ID: T4YH42TBTWMGBS**

Limit according to FCC Subpart 15.109(a) at distance 3m:

Frequency (MHz)	Limit ( $\mu\text{V/m}$ )	Limit (dB $\mu\text{V/m}$ )
30-88	100	40
88-216	150	43,5
216-960	200	46
Above 960	500	54

The requirements are **FULFILLED**.

**Remarks:** The measurement was performed according to FCC Part 15.33(b), up to 7875 GHz. No emission is detected within 10 dB to the limit and therefore not recorded. While measure the GPS, BCR and SCR was active.

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**FCC ID: T4YH42TBTWMGBS**

## **6 USED TEST EQUIPMENT AND ACCESSORIES**

All test instruments used are calibrated and verified regularly. The calibration history is available on request.

<b>Test ID</b>	<b>Model Type</b>	<b>Equipment No.</b>	<b>Next Calib.</b>	<b>Last Calib.</b>	<b>Next Verif.</b>	<b>Next Verif.</b>
<b>A 4</b>	ESHS 30	02-02/03-05-002	05/06/2010	05/06/2009		
	NNLK 8129	02-02/20-05-001			12/30/2009	06/30/2009
	ESH 2 - Z 5	02-02/20-05-004	03/13/2011	03/13/2008	05/17/2010	11/17/2009
	N-4000-BNC	02-02/50-05-138				
	N-1500-N	02-02/50-05-140				
	ESH 3 - Z 2	02-02/50-05-155			04/06/2010	10/06/2009
<b>SER 2</b>	ESVS 30	02-02/03-05-006	08/05/2010	08/05/2009		
	VULB 9168	02-02/24-05-005	05/06/2011	05/06/2008	04/08/2010	10/08/2009
	S10162-B	02-02/50-05-031				
	KK-EF393-21N-16	02-02/50-05-033				
	NW-2000-NB	02-02/50-05-113				
<b>SER 3</b>	FSP 30	02-02/11-05-001	04/20/2010	04/20/2009		
	AFS4-01000400-10-10P-4	02-02/17-05-003				
	AMF-4F-04001200-15-10P	02-02/17-05-004				
	AFS5-12001800-18-10P-6	02-02/17-06-002				
	3117	02-02/24-05-009	02/04/2010	02/04/2009		
	Sucoflex N-1600-SMA	02-02/50-05-073				
	Sucoflex N-2000-SMA	02-02/50-05-075				