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# DELTA Test Report



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## FCC Part 15 C test of Trackman III (TMA3A)

### Performed for Trackman A/S

DANAK-1911673 Rev. C

Project no.: T200869

Page 1 of 51

Including 4 annexes

07 February 2012

#### DELTA

Venlighedsvej 4

2970 Hørsholm

Denmark

Tlf. +45 72 19 40 00

Fax +45 72 19 40 01

[www.delta.dk](http://www.delta.dk)

VAT No. 12275110

**Title** FCC Part 15 C test of Trackman III (TMA3A)

**Test object** Trackman III (TMA3A)

**Report no.** DANAK-1911673 Rev. C

**Project no.** T200869

**Test period** 6 October - 8 November 2011

**Client** Trackman A/S  
Stubbeled 2  
2950 Vedbæk  
Denmark  
Tel.: +45 45 57 08 50

**Contact person** Mr. Morten Didriksen  
E-mail: md@trackman.dk

**Manufacturer** Trackman A/S

**Specifications** See chapter 1 “Summary of tests”

**Results** The test object was found to be in compliance with the specifications, as listed in Section 1

**Test personnel** Henrik Egeberg Nielsen  
Claus Momme Thomsen

**Date** 07 February 2012

**Project Manager**



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Jakob Steensen  
Consultant, Centre of Compliance Engineering  
DELTA

**Responsible**



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Claus Rømer Andersen  
Manager, Centre of Compliance Engineering  
DELTA



This report replaces previously issued report DANAK-1911673 Rev. B dated 09 January 2012.

The changes in this report are:

Page 13: 8.5 kHz and 8.6 kHz have been corrected to 8.5 MHz and 8.6 MHz

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<b>Table of contents</b>		<b>Page</b>
<b>1.</b>	<b>Summary of tests</b>	<b>5</b>
1.1	Technical report summary	5
1.1.1	Applicable FCC rules for test	5
1.2	Summary of tests	6
<b>2.</b>	<b>Test object</b>	<b>7</b>
2.1	Test object - Trackman III	7
2.2	AUX equipment - Power adapter for Trackman III	8
2.3	AUX equipment - PC	8
2.4	AUX equipment - Power adapter for PC	8
<b>3.</b>	<b>General test conditions</b>	<b>9</b>
3.1	Test setup	9
<b>4.</b>	<b>Test and results</b>	<b>10</b>
4.1	Conducted emission, AC mains (FCC Part 15, Subpart C)	10
4.2	Radiated electromagnetic field emission (FCC Part 15, Subpart C)	11
4.3	Occupied bandwidth	13
4.4	Peak output field strength	14
<b>5.</b>	<b>National registrations and accreditations</b>	<b>15</b>
5.1	DANAK Accreditation	15
5.2	FCC Registrations	15
5.3	VCCI Registrations	15
5.4	IC Registrations	16
<b>6.</b>	<b>List of instruments</b>	<b>17</b>
	Annex 1 Photos	18
	Annex 2 Test record sheets regarding conducted emission	23
	Annex 3 Test record sheets regarding radiated emission / occupied bandwidth	26
	Annex 4 Peak output field strength / occupied bandwidth	45

## 1. Summary of tests

### 1.1 Technical report summary

The tests reported in this document have been performed to demonstrate compliance with the requirements of:

FCC Part 15, Section 15.245 Operation within the bands 902 - 928 MHz, 2435 - 2465 MHz, 5785 - 5815 MHz, 10500 - 10550 MHz, and 24075 - 24175 MHz.

This report contains measurement data from tests performed at DELTA, Hørsholm, Denmark, a FCC listed and DANAK accredited test laboratory.

#### 1.1.1 Applicable FCC rules for test

CFR 47 FCC Part 15, Subpart C - Intentional Radiators

- §15.205 Restricted bands of operation
- §15.207 Conducted limits
- §15.209 Radiated emission limits, general requirements
- §15.215 Additional provisions to the general radiated emission limitations
- §15.245 Operation within the bands 902 - 928 MHz, 2435 - 2465 MHz, 5785 - 5815 MHz, 10500 - 10550 MHz, and 24075 - 24175 MHz.

The methods and procedures have been applied as specified in:

- §15.31 Measurements standards.

This point to the following procedure, used during the measurements in this report:

- ANSI C63.10:2009 "American National Standard for Testing Unlicensed Wireless Devices".

Furthermore, the requirements of the following have been applied:

- § 15.33 Frequency range of radiated measurements
- § 15.35 Measurement detector functions and bandwidths.



## 1.2 Summary of tests

The results of the emission tests can be summarised as follows:

<b>Tests of Intentional Radiator</b>	<b>Key references to requirement</b>	<b>FCC Part 15 Subpart C</b>
Conducted emission, AC mains	§ 15.207	Passed
Radiated electromagnetic field emission	§15.209	Passed
Radiated emission limits, additional provisions	§15.215 and §15.245	Passed
Restricted bands of operation	§15.205	Passed

### Abbreviations

Passed	:	The requirements are met.
Failed	:	The requirements are not met.
Not done	:	No test was performed.
N/A	:	Not applicable.
Not relevant	:	The test was not relevant for the test object.

The test results relate only to the object tested.



## 2. Test object

The test object is a Field Disturbance Sensor installed in a cabinet. Information from the field disturbance sensor is transmitted to a PC using an USB2 connection.

The field disturbance sensor is designed for the purpose of measuring properties of golf balls and will only be used on golf fields or in golf ball manufacturers test facilities.

The test object will transmit two continuous carriers, both contained in the frequency band of 10.5 to 10.55 GHz. There is no traditional receiver with down converter etc. in the product. The down conversion is direct as the Doppler signal produced as the frequency difference between the radiated field and the received (reflected) signal.



Photo 2.1 Test object and power adaptor.

### 2.1 Test object - Trackman III

Name of test object	TMA3A
Model / type	TrackMan Field Disturbance Sensor
Part no	-
Serial no.	1100 0004
FCC ID	SFX-TMANIII
Manufacturer	Trackman A/S
Supply voltage	24 VDC
Software version	Normal continuous wave operation
Cycle time	< 0.5 ms
Comments	-



## 2.2 AUX equipment - Power adapter for Trackman III

Name of test object	AC/DC Converter
Model / type	LFZVC65SG24E
Part no	-
Serial no.	E01-A-L419-1383
FCC ID	-
Manufacturer	-
Supply voltage	100-240 VAC primary, 24 VDC secondary
Software version	-
Cycle time	-
Comments	-

## 2.3 AUX equipment - PC

Name of test object	Laptop PC with controller software
Model / type	-
Part no	-
Serial no.	CN-0C4708-48643-614-0255
FCC ID	-
Manufacturer	Dell
Supply voltage	20 VDC
Software version	-
Cycle time	-
Comments	-

## 2.4 AUX equipment - Power adapter for PC

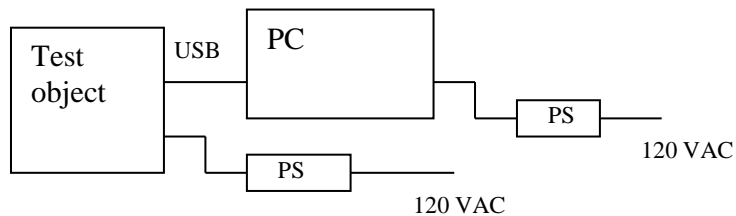
Name of test object	Power supply for Dell Laptop PC
Model / type	-
Part no	-
Serial no.	CN-0DF315-71615-78G-2625
FCC ID	-
Manufacturer	Dell
Supply voltage	20 VDC
Software version	-
Cycle time	-
Comments	-





### 3. General test conditions

#### 3.1 Test setup



The antenna of the test object is an internal structure mounted behind a cover.

The test object will transmit two unmodulated carriers. Reflected signals will produce a Doppler signal that is converted and transmitted to the PC for calculation. In the test object is also installed a camera. Pictures are constantly captured and transmitted to the PC, where they are displayed.

During tests, the PC and PC power adaptor were stored under the shielding floor in the test chamber.



## 4. Test and results

### 4.1 Conducted emission, AC mains (FCC Part 15, Subpart C)

	<b>Requirements</b>	
Specification	CFR 47 FCC Part 15, Subpart C	
Method	ANSI C63.10:2009	
Date of test	7 October 2011	
Temperature	21 °C	
Humidity	40 %	
Personnel	HEN	
Frequency range	0.15 - 30 MHz	
Limit: (quasi-peak)	0.15-0.50 MHz: (decreasing lin. with the logarithm of freq.)	66-56 dB $\mu$ V
	0.50-5 MHz:	56 dB $\mu$ V
	5-30 MHz:	60 dB $\mu$ V
Limit: (average)	0.15-0.50 MHz: (decreasing lin. with the logarithm of freq.)	56-46 dB $\mu$ V
	0.50-5 MHz:	46 dB $\mu$ V
	5-30 MHz:	50 dB $\mu$ V
Photos	Annex 2	
Test record sheets	Annex 3	

#### Results

The test result is in compliance with the requirements.

#### Comments

None.



## 4.2 Radiated electromagnetic field emission (FCC Part 15, Subpart C)

	<b>Requirements</b>	
Specification	CFR 47 FCC Part 15, Subpart C	
Method	ANSI C63.10:2009	
Date of test	7 October – 7 November 2011	
Temperature	21-23 °C	
Humidity	40-45 %	
Personnel	HEN / CMT	
Measuring distance	30-1000 MHz: 3 m 1-40 GHz: 0.10 m (handheld prescan) Calibrated investigation of fundamentals and 2. harmonics performed at 3 m distance	
Frequency range	30-40.000 MHz	
Limits: As specified in 15.209(a)	30-88 MHz: 88-216 MHz: 216-960 MHz: Above 960 MHz:	40 dB $\mu$ V/m 43.5 dB $\mu$ V/m 46 dB $\mu$ V/m 54 dB $\mu$ V/m
Measurement uncertainty (2 $\sigma$ ) <1 GHz		2.6 dB
Measurement uncertainty (2 $\sigma$ ) >1 GHz		4.9 dB
Below 1 GHz, the limits apply to measurements performed using a quasi-peak detector. Above 1 GHz, the limits apply to measurements of spurious emission performed with an average detector. Furthermore, the peak level must be no higher than 20 dB above the average limit.		
In the band 1-12.75 GHz, RBW is set at 1 MHz. In the band 12.75-18 GHz, RBW is set at 1 MHz. In the band 18-26.5 GHz, RBW is set at 100 kHz. In the band 18-26.5 GHz, RBW is set at 100 kHz.		
Test setup		Annex 1
Test record sheets		Annex 3



All measurements above 1 GHz are performed as peak detector measurements. Peak-to-Average Factor is established to be 0 dB, because only unmodulated carriers are transmitted.

Measurements 1 - 40 GHz are performed as handheld prescans @ 10 centimetres distance in order to obtain the required S/N ratio. Investigations are performed in calibrated environment (semi-anechoic chamber) in case any emission is found to be closer to limit than a specified 20 dB.

Only one set of emission frequencies is investigated according to the 20 dB criteria, being the second harmonics of the two fundamental frequencies. These were measured at medium channel setting.

### **Results**

No spurious emissions are above the general emission limit as specified in Part 15.209(a).

The second harmonics are investigated in details in Section 4.4.

For spectral plots and emissions in tabular form, refer to Annex 3.

The measured field strength was within the specified limits.

### **Comments, general**

None.



### 4.3 Occupied bandwidth

	<b>Requirements</b>
Specification	CFR 47 FCC Part 15, Subpart C
Method	ANSI C63.10:2009
Date of test	8 November 2011
Temperature	21 °C
Humidity	40 %
Personnel	HEN
Resolution Bandwidth	1 MHz

With reference to §15.215(c), the 20 dB bandwidth of the emission shall be contained within the designated frequency band with the lower band limit at 10.5 GHz and the upper band limit at 10.55 GHz.

In Annex 4 the occupied bandwidth was measured using 1000 kHz resolution bandwidth. The fundamental frequencies are set in non-adjustable firmware, so that any eventual intermodulation products are contained within the band.

The fundamental signal consists of two CW carrier frequencies, and as such, the OBW is measured as 20 dBc, left slope of the lowest fundamental frequency to 20 dBc, right slope of the highest fundamental frequency. The procedure is repeated for each of the three channels setting; low, mid, high.

Measured from the plots (sheets 45-47) in Annex 4:

The largest 20 dB OBW equals 8.6 MHz.

**Occupied bandwidth:**

8.5 MHz measured in 1000 kHz bandwidth or from 10.5037 to 10.5122 GHz.

8.6 MHz measured in 1000 kHz bandwidth or from 10.5206 to 10.5292 GHz.

8.5 MHz measured in 1000 kHz bandwidth or from 10.5377 to 10.5462 GHz.

The test object is in compliance with the requirements.



#### 4.4 Peak output field strength

	<b>Requirements</b>	
Specification	CFR 47 FCC Part 15, Subpart C	
Method	ANSI C63.10:2009	
Date of test	31 October – 8 November 2011	
Temperature	21 °C	
Humidity	40 %	
Personnel	HEN / CMT	
Measuring distance	3 m	
Frequency range	30-40.000 MHz	
Limits: As specified in 15.245(b)	10.5 – 10.55 GHz: Harmonic:	128 dB $\mu$ V/m 77.5 dB $\mu$ V/m
Measurement uncertainty (2 $\sigma$ ) >1 GHz	4.9 dB	
Resolution bandwidth	1 MHz	

The peak output field strength of the intentional radiator is limited to 2500 mV/m or 128 dB $\mu$ V/m at a distance of 3 m following §15.245(b), and to 7.5 mV/m or 77.5 dB $\mu$ V/m at the harmonics. Measurements show:

**Peak output field strength:** 660 mV/m or 116.4 dB $\mu$ V/m,  
at the frequency 10.51 GHz.

2.755 mV/m or 68.795 dB $\mu$ V/m,  
at the frequency 21.045 GHz  
(which is the highest of the harmonics)

See plot in Annex 4.

The test object is in compliance with the requirement.

## 5. National registrations and accreditations

### 5.1 DANAK Accreditation

**Organization:** Danish Accreditation and Metrology Fund - DANAK, see [www.danak.dk](http://www.danak.dk) and [www.ilac.org](http://www.ilac.org)

**Registration Number:** 19

**Area Number:** C

DANAK is part of ILAC (International Laboratory Accreditation Cooperation) including its MRA (Mutual Recognition Arrangement). The MRA includes the Australian NATA and Canadian SCC.

CISPR 22 is equivalent to AS/NZS CISPR 22, and therefore this report can be used for applying the **Australian C-Tick mark** for IT equipment, when this test has been passed.

CISPR 22:2002 is equivalent to ICES-003:2004, and therefore this report can be used for approval in Canada for IT equipment, when this test has been passed.

### 5.2 FCC Registrations

**Organization:** Federal Communications Commission, USA

**Registration Number:** 90529

**Facilities:** EMC room 2 Hørsholm (EMC-2)  
EMC room 3 Hørsholm (EMC-3)  
EMC room 4 Hørsholm (EMC-4)  
EMI room Hørsholm (EMC-5)

### 5.3 VCCI Registrations

**Organization:** Voluntary Control Council for Interference by Information Technology, Japan

**Member Number:** 910

**Facilities:** EMC room 2 Hørsholm (EMC-2): C-707, T-246 and T-1547  
EMC room 3 Hørsholm (EMC-3): C-2532, T-247 and T-1548  
EMC room 4 Hørsholm (EMC-4): C-2533, T-248 and T1549  
EMI room Hørsholm (EMC-5): R-1180, C-706, T-249 and T-1550, G-470



## 5.4 IC Registrations

**Organization:** Industry Canada, Certification and Engineering Bureau

**Registration Number:** IC4187A-5

**Facilities:** EMI room Hørsholm (EMC-5)





## 6. List of instruments

No.	Description	Manufacturer	Type No.
29301	ARTIFICIAL MAINS NETWORK	ROHDE & SCHWARZ	ESH2-Z5
29449	HORN ANTENNA, 12.4-18 GHz w. SUHNER ADAPTOR 3101.19.A	FLANN MICROWAVE	1824-20
29680	IMPULSE VOLTAGE LIMITER	ROHDE & SCHWARZ	ESH3/Z2
29797	BILOG ANTENNA, 30-2000 MHz	CHASE ELECTRICS LTD	CBL 6111A
29837	BROADBAND POWER AMPLIFIER, 8-18 GHz, 1 W	MITEQ	AMF-9B-080180-30P
29861	EMI-SOFTWARE VER. 1.60	ROHDE & SCHWARZ	ES-K1, PART: 1026.6790.02
29876	RIDGED GUIDE HORN ANTENNA, 1-12.75 (18) GHz	EMCO	3115
49086	REMI EMISSION SOFTWARE PACKAGE v. 2.133, ROOM 5	NeWeTec	REMI
49327	STANDARD GAIN HORN, 26.5-40.0 GHz	NARDA	V637
49328	STANDARD GAIN HORN, 18-26.5 GHz	NARDA	638
49555	SPECTRUM ANALYZER / MEASUREMENT RECEIVER	ROHDE & SCHWARZ	ESU26
49613	CABLE 5 M SMA	HUBER+SUHNER	SUCOTEST 106
49615	CABLE 5 M SMA	HUBER+SUHNER	SUCOTEST 106



Annex 1

**Photos**





Photo A1.1 Conducted emission 0.15 - 30 MHz.



Photo A1.2 Radiated emission 30 - 1000 MHz.





Photo A1.3 Radiated emission 1 - 12.75 GHz.

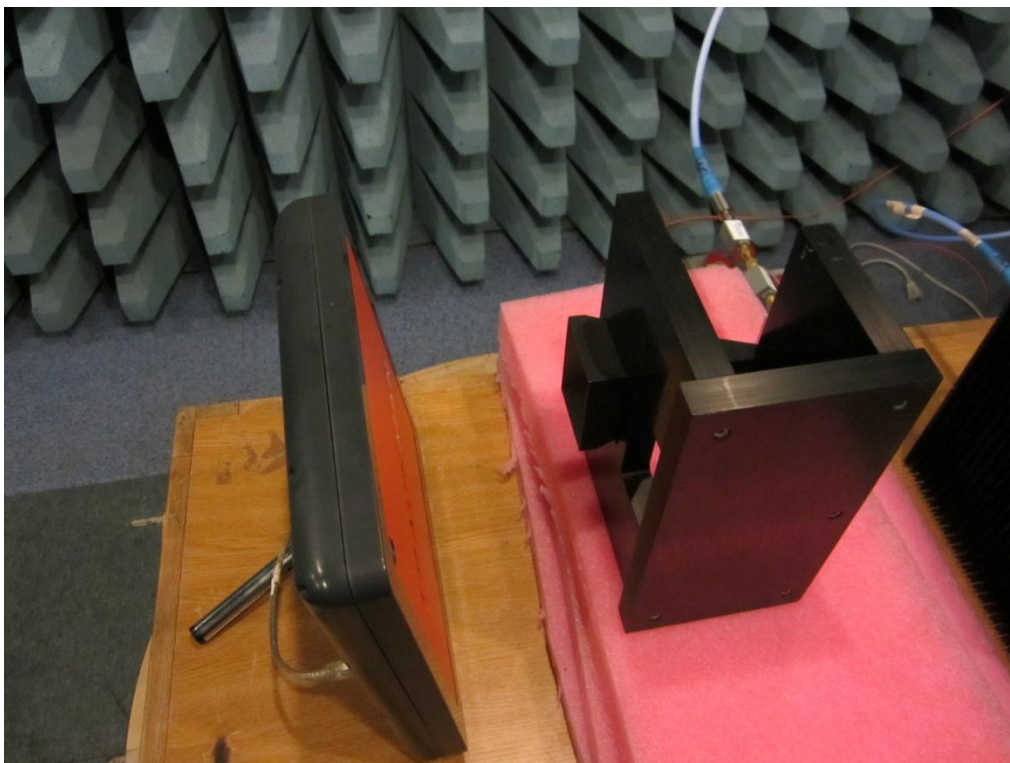


Photo A1.4 Radiated emission 12.75 -18 GHz.





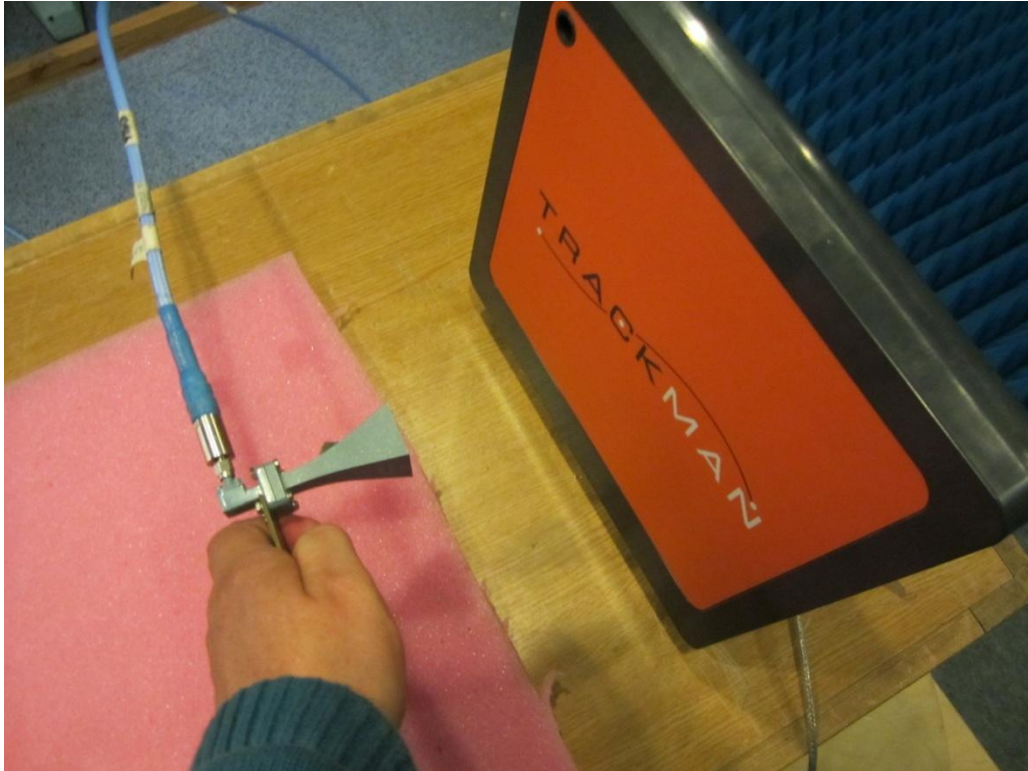


Photo A1.5 Radiated emission 18 – 26.5 GHz.

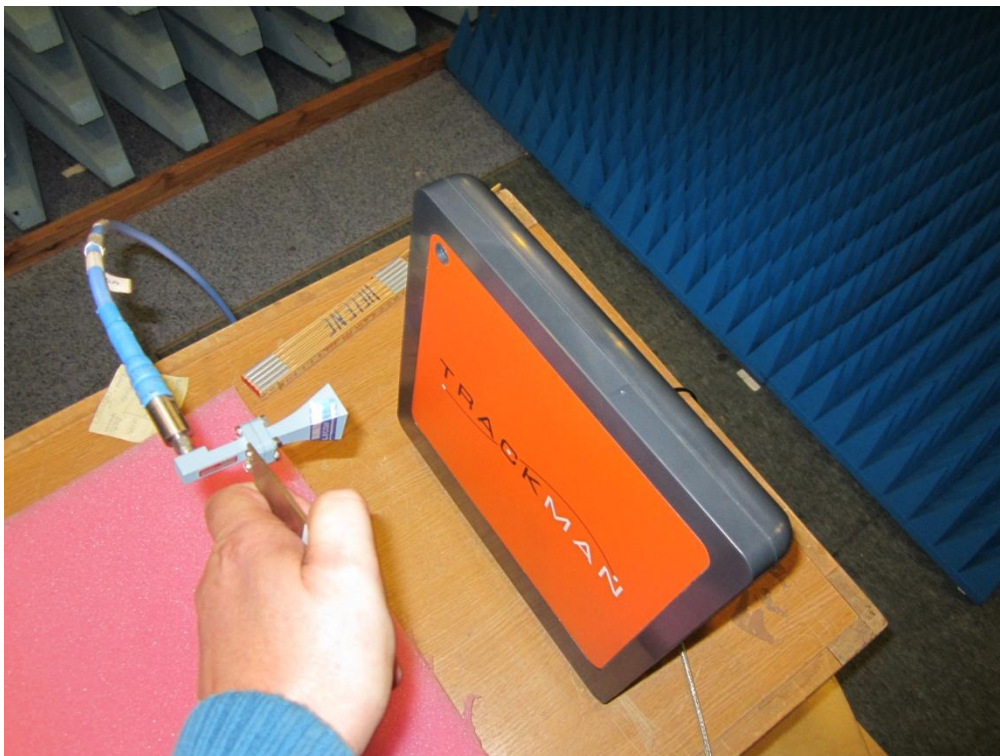


Photo A1.6 Radiated emission 26.5 - 40 GHz.





Photo A1.7 Field strength of the fundamental ( $\sim 10.5$  GHz).

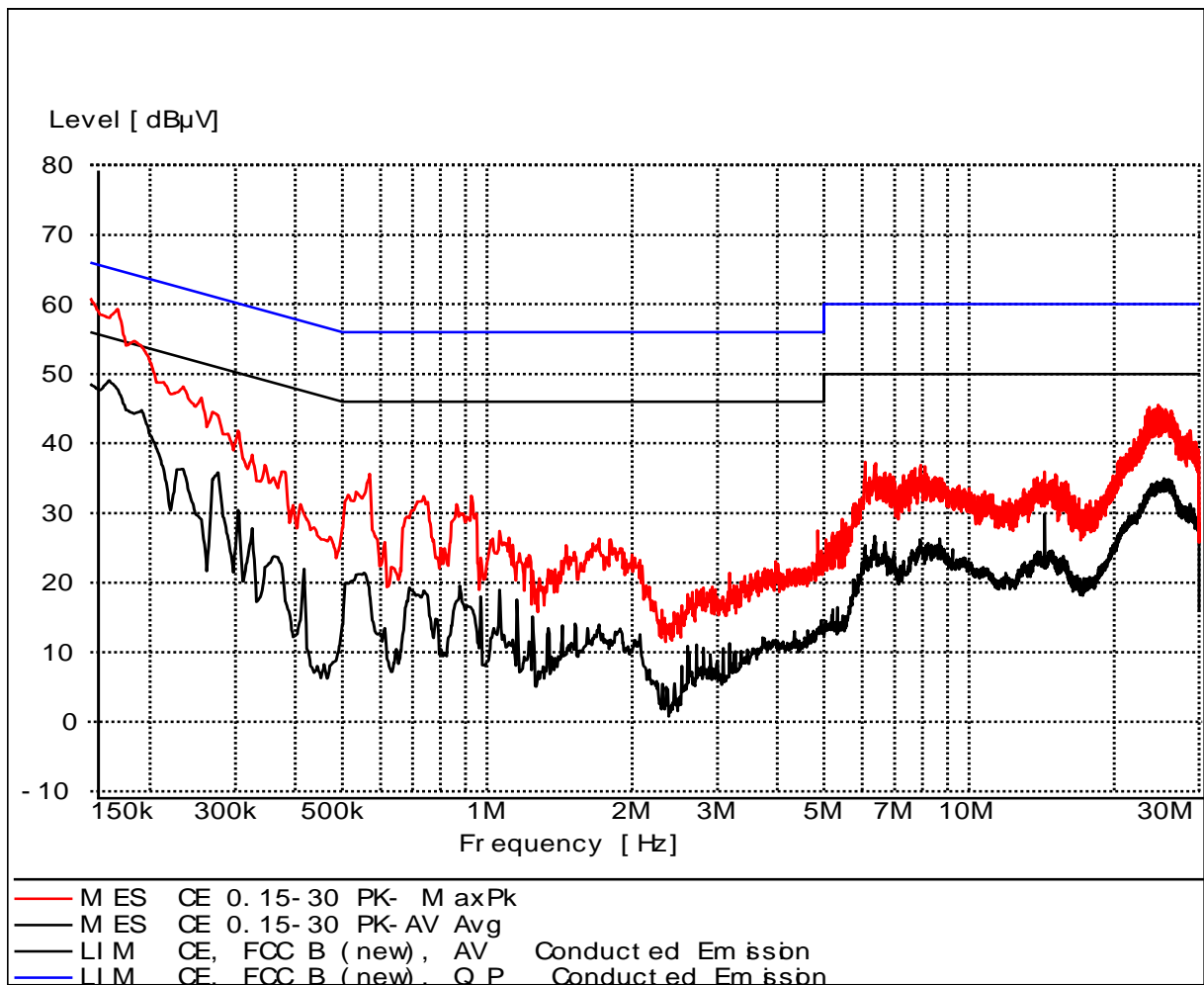


Photo A1.8 Field strength of the second harmonic of the fundamentals ( $\sim 21$  GHz).

## **Annex 2**

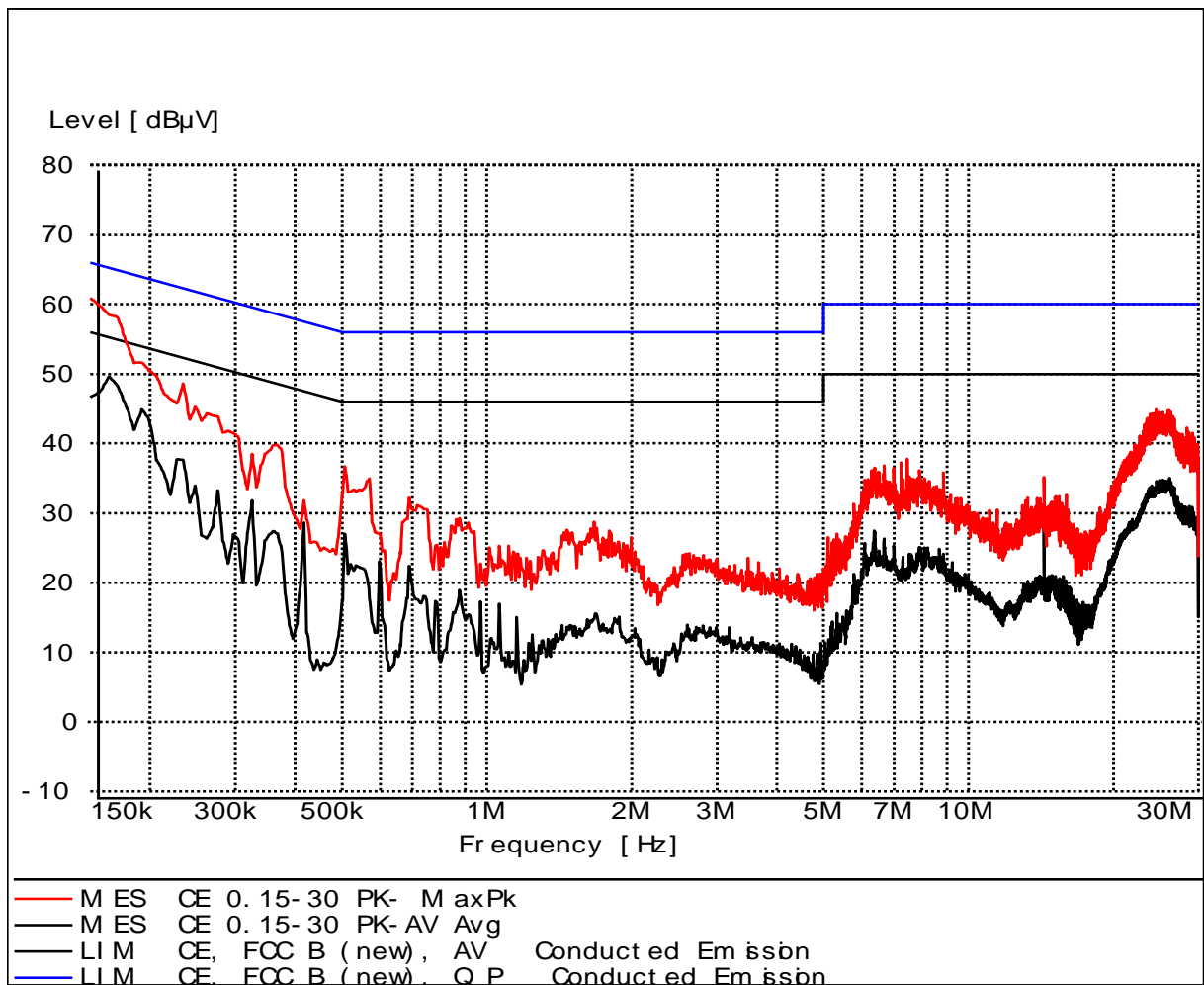
### **Test record sheets regarding conducted emission**

Test object: TMA3A  
 Manufacturer: Trackman A/S  
 Operating Condition: Line no.: Neutral. 120 VAC  
 Test Site: EMC - 5  
 Operator: HEN - T200869-1  
 Test Specification: FCC Part 15 C  
 Comment: Sheet 27





Test object: TMA3A  
Manufacturer: Trackman A/S  
Operating Condition: Line no.: Line 1. 120 VAC  
Test Site: EMC - 5  
Operator: HEN - T200869-1  
Test Specification: FCC Part 15 C  
Comment: Sheet 28

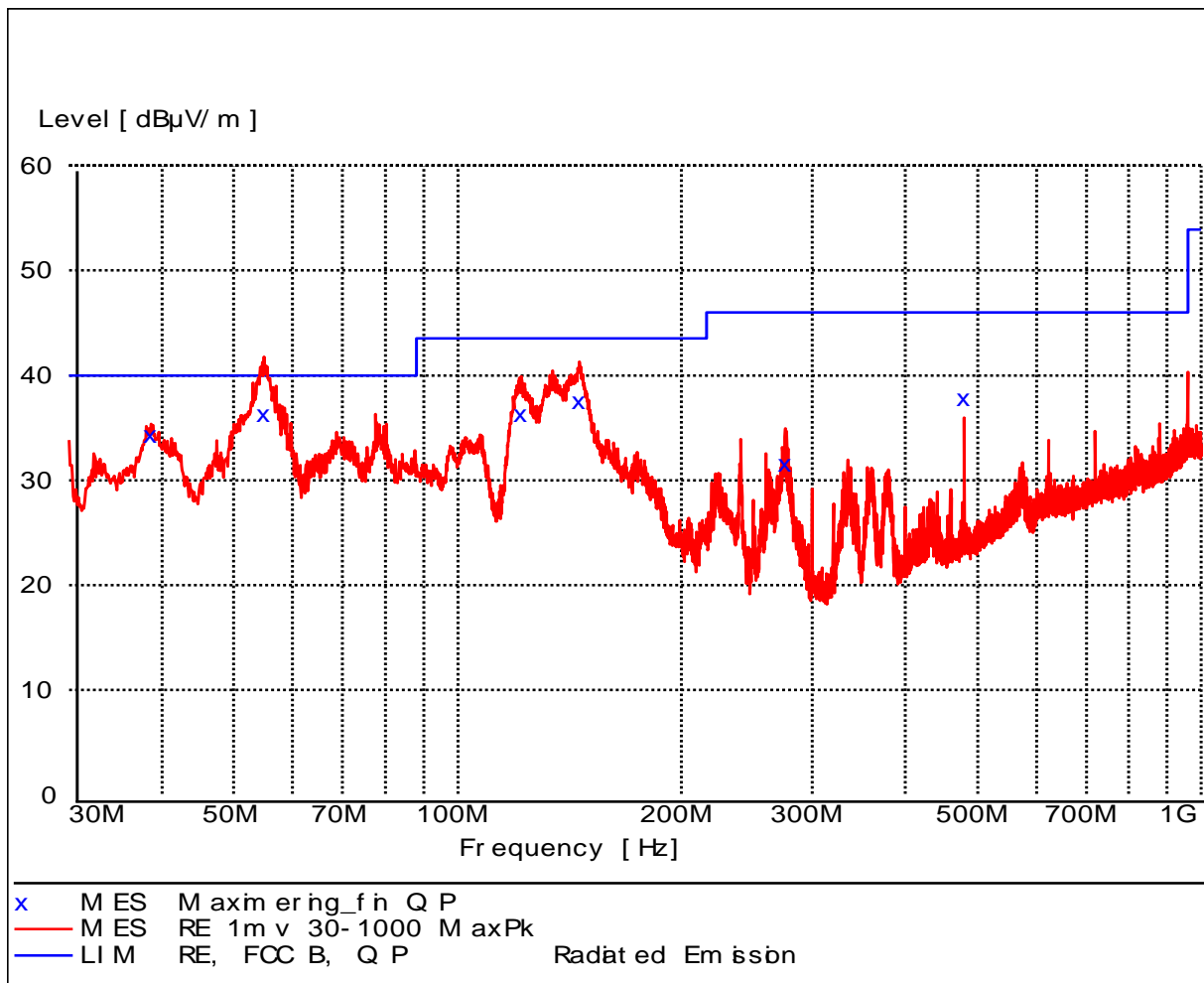


### **Annex 3**

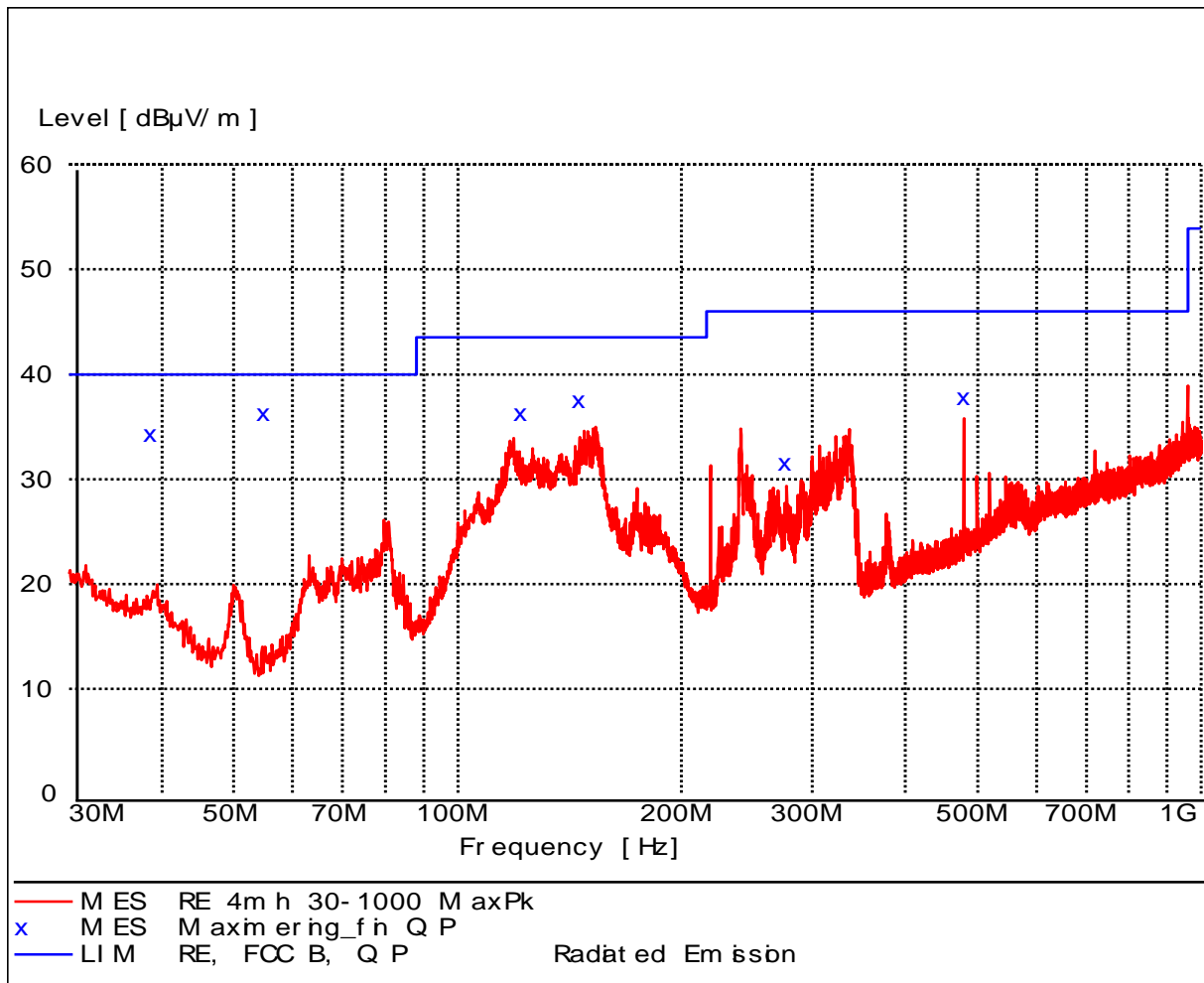
**Test record sheets regarding radiated emission / occupied bandwidth**

### Test plots, radiated emission 30-1000 MHz

Test object: TMA3A  
 Manufacturer: Trackman A/S  
 Operating Condition: Low ch setting (10.5005 and 10,5055 GHz), Ant 1 m vertical  
 Test Site: EMC - 5  
 Operator: HEN - T200869-1  
 Test Specification: FCC Part 15 C  
 Comment: Sheet 17



Test object: TMA3A  
 Manufacturer: Trackman A/S  
 Operating Condition: Low ch setting (10.5005 and 10,5055 GHz), Ant 3 m horizontal  
 Test Site: EMC - 5  
 Operator: HEN - T200869-1  
 Test Specification: FCC Part 15 C  
 Comment: Sheet 18

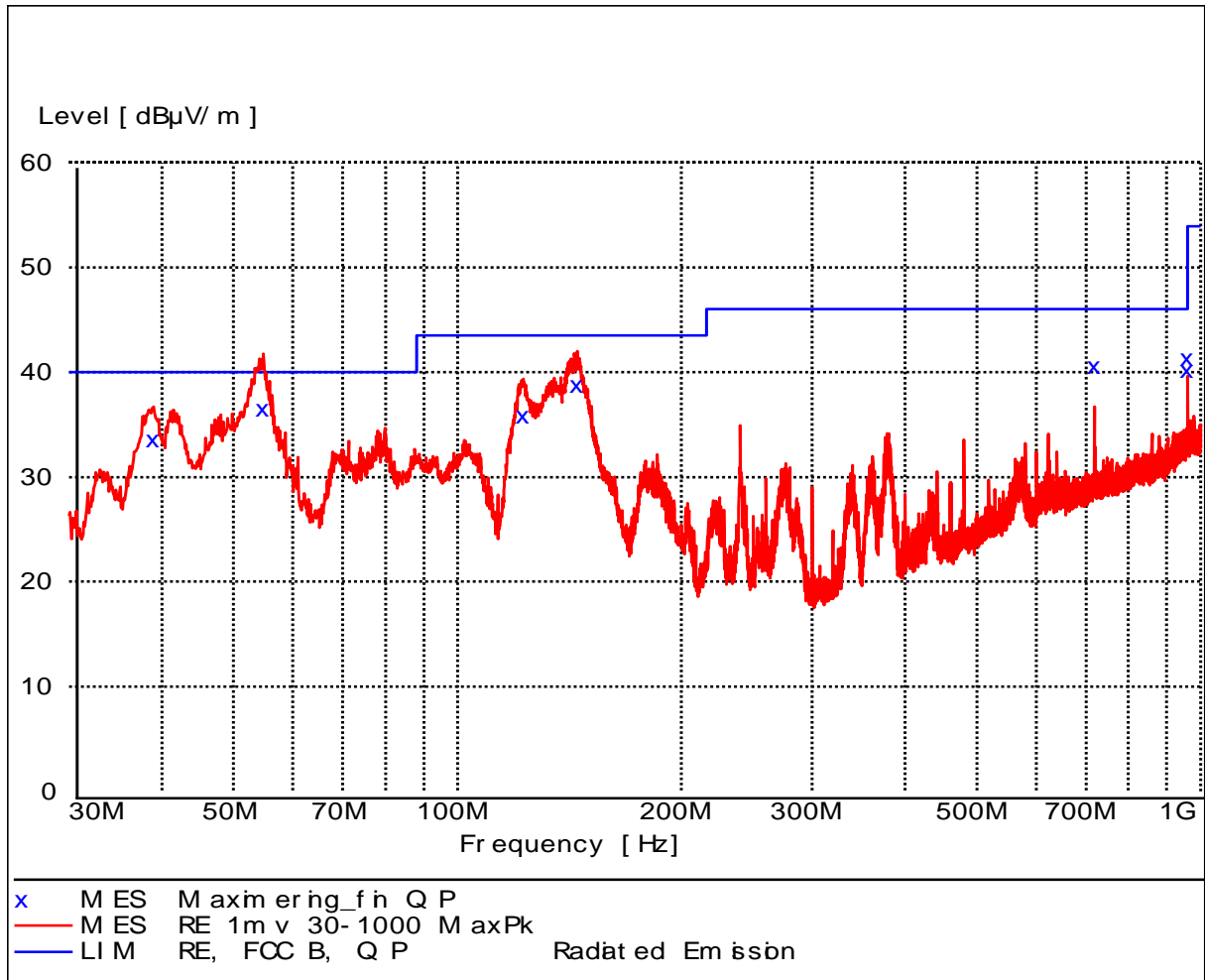


**MEASUREMENT RESULT: "Maximerring\_fin QP"**

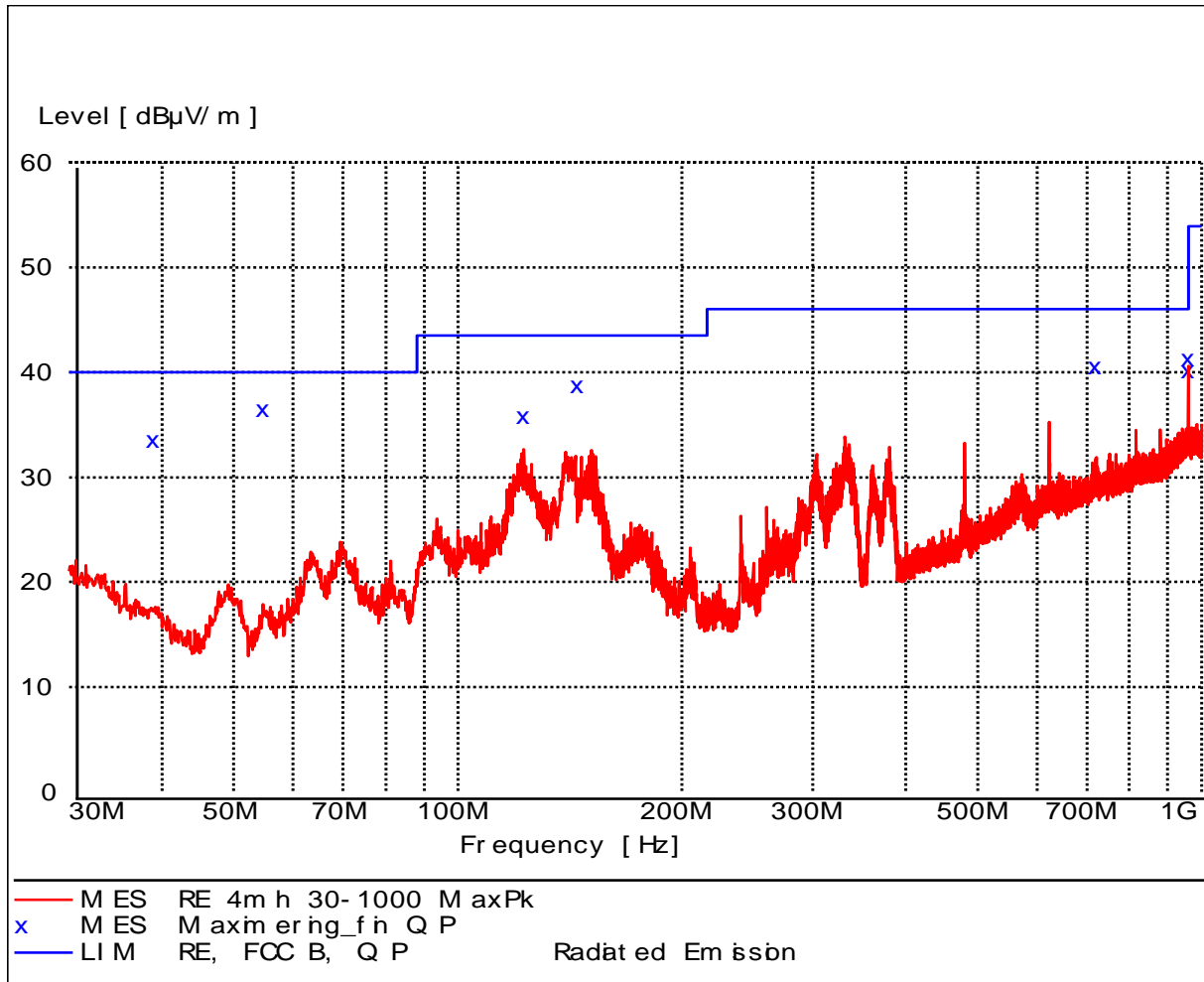
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
38.700000	34.30	14.4	40.0	5.7	101.0	46.00	VERTICAL
54.900000	36.30	8.7	40.0	3.7	104.0	1.00	VERTICAL
121.700000	36.30	13.1	43.5	7.2	101.0	358.00	VERTICAL
145.800000	37.50	12.8	43.5	6.0	101.0	12.00	VERTICAL
276.200000	31.60	15.6	46.0	14.4	101.0	133.00	HORIZONTAL
480.000000	37.80	20.9	46.0	8.2	143.0	156.00	HORIZONTAL



Test object: TMA3A  
 Manufacturer: Trackman A/S  
 Operating Condition: Mid ch setting (10.5225 and 10.5275 GHz), Ant 1 m vertical  
 Test Site: EMC - 5  
 Operator: HEN - T200869-1  
 Test Specification: FCC Part 15 C  
 Comment: Sheet 19



Test object: TMA3A  
 Manufacturer: Trackman A/S  
 Operating Condition: Mid ch setting (10.5225 and 10.5275 GHz), Ant 3 m horizontal  
 Test Site: EMC - 5  
 Operator: HEN - T200869-1  
 Test Specification: FCC Part 15 C  
 Comment: Sheet 20

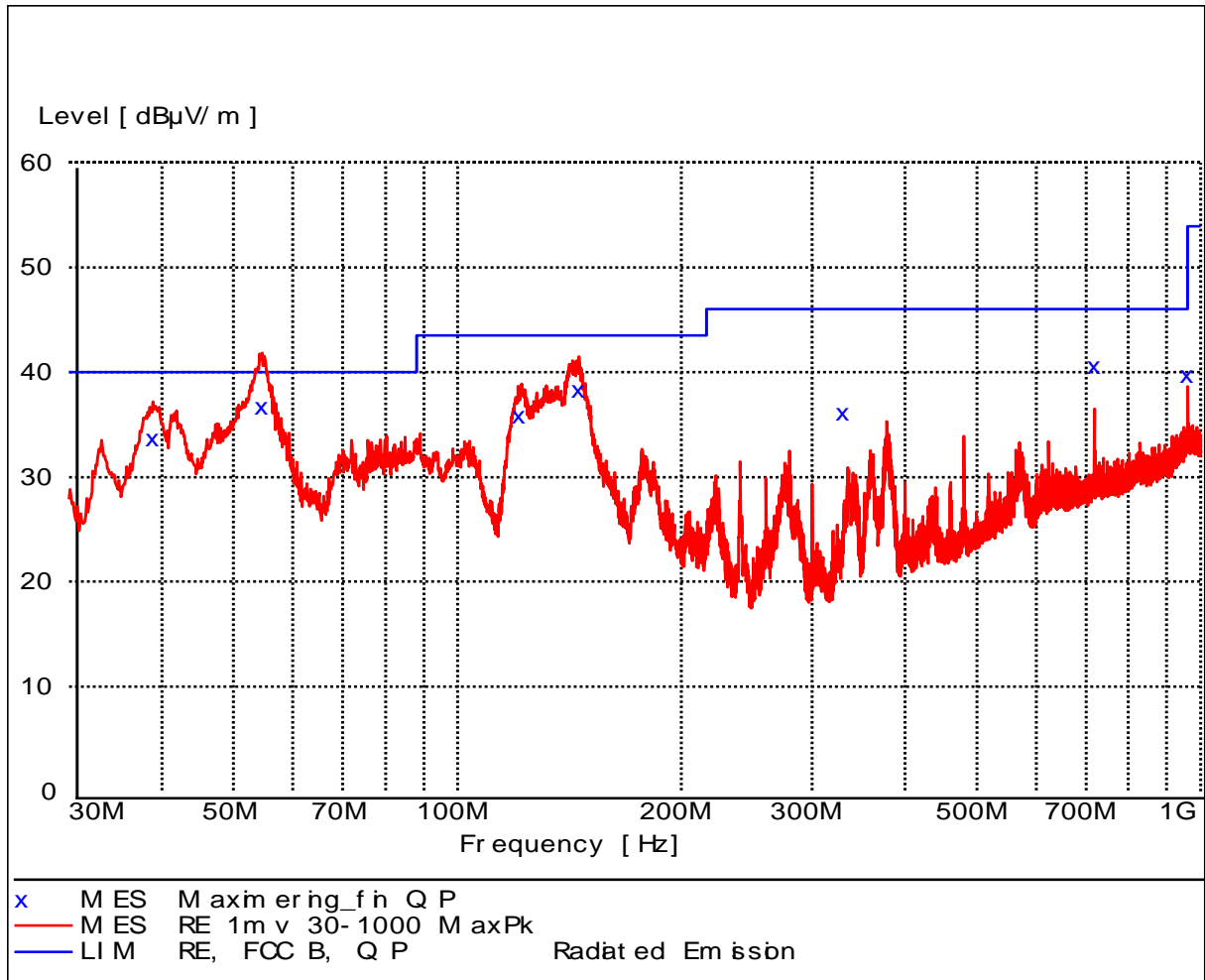


**MEASUREMENT RESULT: "Maximizing\_fin\_QP"**

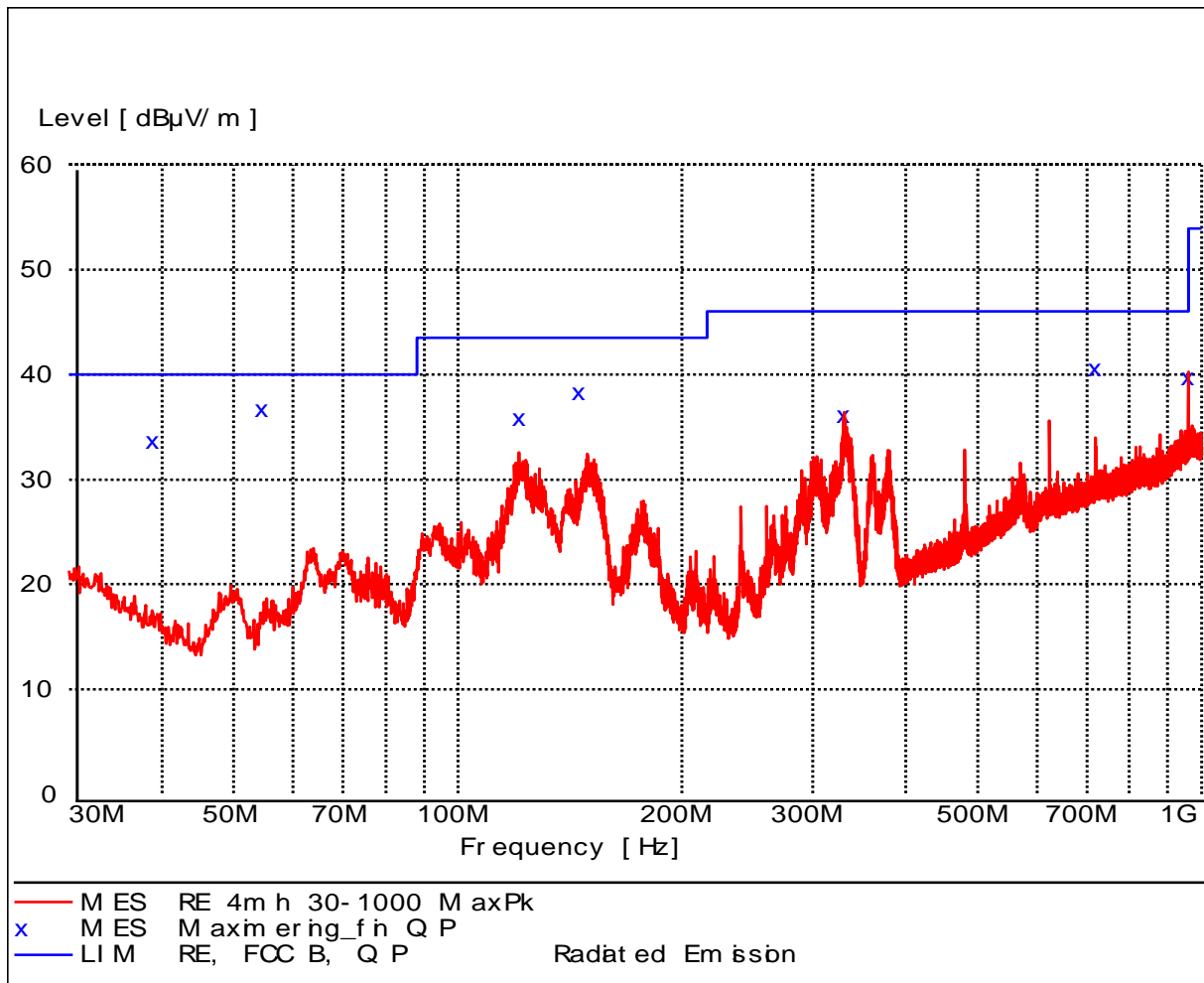
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
39.000000	33.60	14.3	40.0	6.4	101.0	45.00	VERTICAL
54.800000	36.50	8.7	40.0	3.5	101.0	1.00	VERTICAL
122.700000	35.80	13.2	43.5	7.7	101.0	359.00	VERTICAL
144.900000	38.80	12.9	43.5	4.7	101.0	358.00	VERTICAL
720.030000	40.60	25.4	46.0	5.4	101.0	23.00	HORIZONTAL
960.000000	40.20	29.4	46.0	5.8	200.0	239.00	HORIZONTAL
960.040000	41.30	29.4	53.9	12.6	213.0	357.00	HORIZONTAL



Test object: TMA3A  
 Manufacturer: Trackman A/S  
 Operating Condition: High ch setting (10.5445 and 10.5495 GHz), Ant 1 m vertical  
 Test Site: EMC - 5  
 Operator: HEN - T200869-1  
 Test Specification: FCC Part 15 C  
 Comment: Sheet 21



Test object: TMA3A  
 Manufacturer: Trackman A/S  
 Operating Condition: High ch setting (10.5445 and 10.5495 GHz), Ant 3 m horizontal  
 Test Site: EMC - 5  
 Operator: HEN - T200869-1  
 Test Specification: FCC Part 15 C  
 Comment: Sheet 22



**MEASUREMENT RESULT: "Maximerring\_fin QP"**

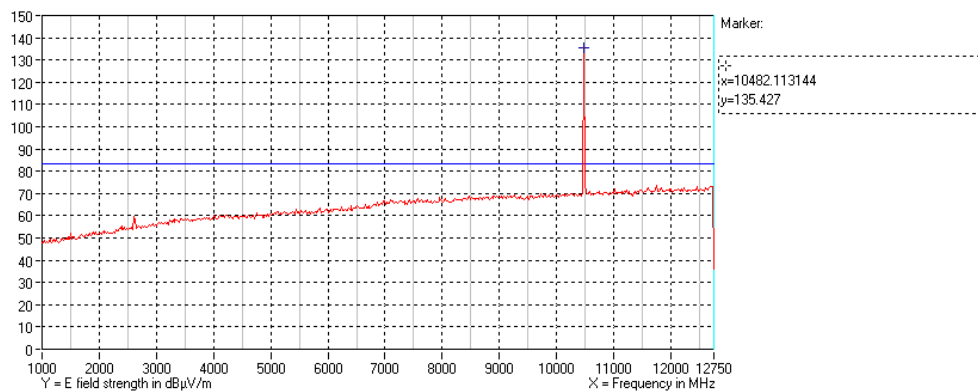
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
38.900000	33.70	14.3	40.0	6.3	101.0	76.00	VERTICAL
54.600000	36.70	8.7	40.0	3.3	105.0	1.00	VERTICAL
121.200000	35.90	13.1	43.5	7.6	104.0	358.00	VERTICAL
145.600000	38.30	12.8	43.5	5.2	104.0	358.00	VERTICAL
330.500000	36.10	17.1	46.0	9.9	132.0	193.00	VERTICAL
720.030000	40.60	25.4	46.0	5.4	101.0	25.00	HORIZONTAL
960.000000	39.70	29.4	46.0	6.3	143.0	329.00	HORIZONTAL



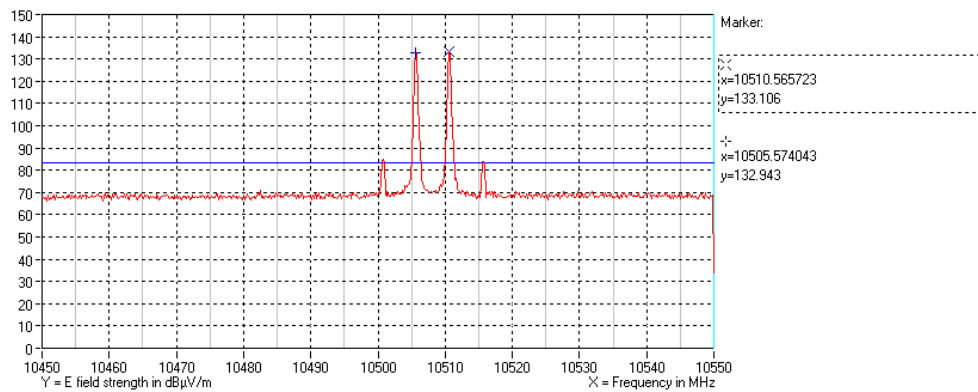


## Test plots, radiated emission 1-12.75 GHz

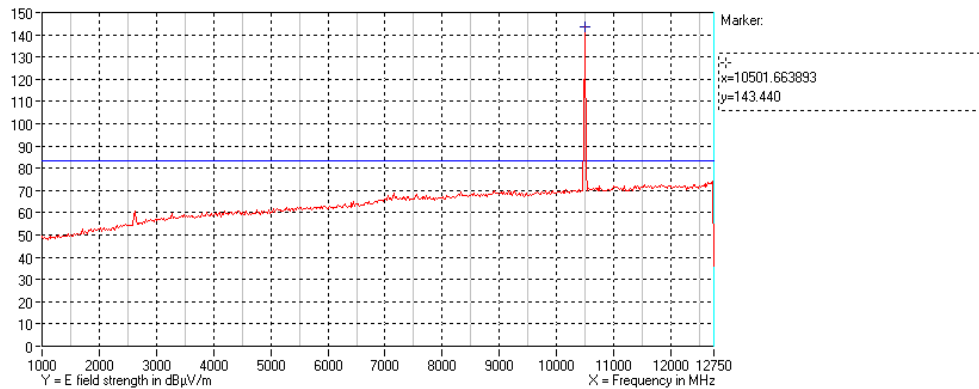
Test object: TMA3A  
Manufacturer: Trackman A/S  
Operating Condition: Low ch setting (10.5055 and 10.5105 GHz), Ant 0.1 m, handheld prescan  
Limit corrected according to measurement distance.  
Test Site: EMC – Room B  
Operator: HEN - T200869-1  
Test Specification: FCC Part 15 C  
Comment: Sheet 29 & 30



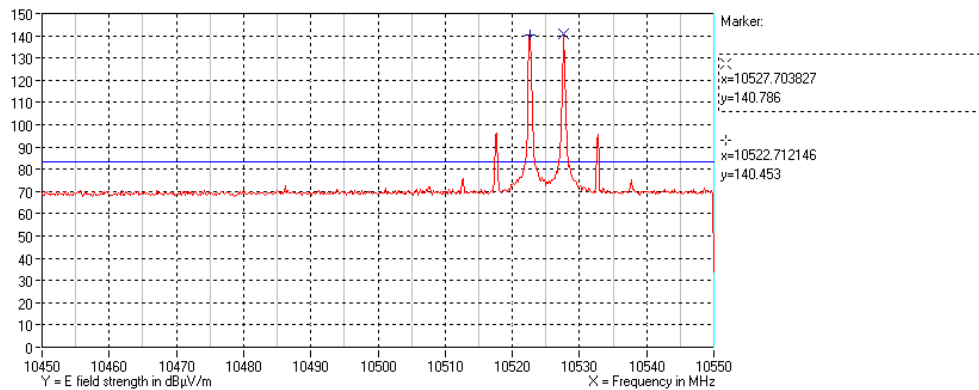
Zoom to view fundamentals:



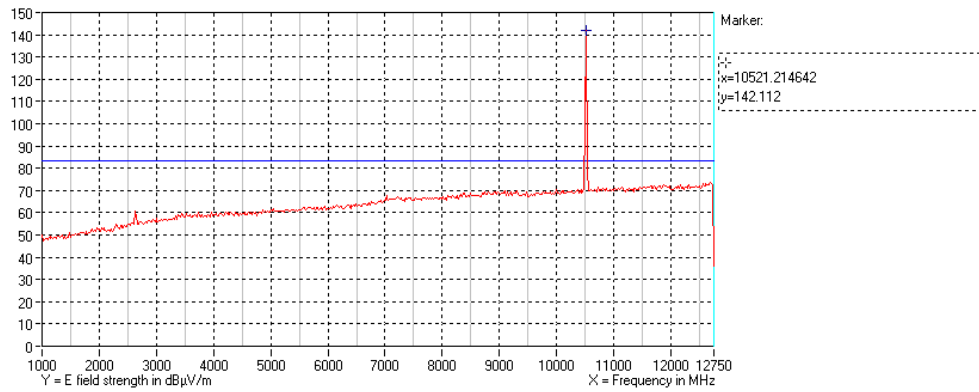
Test object: TMA3A  
Manufacturer: Trackman A/S  
Operating Condition: Mid ch setting (10.5225 and 10.5275 GHz), Ant 0.1 m, handheld prescan  
Limit corrected according to measurement distance.  
Test Site: EMC – Room B  
Operator: HEN - T200869-1  
Test Specification: FCC Part 15 C  
Comment: Sheet 31 & 32



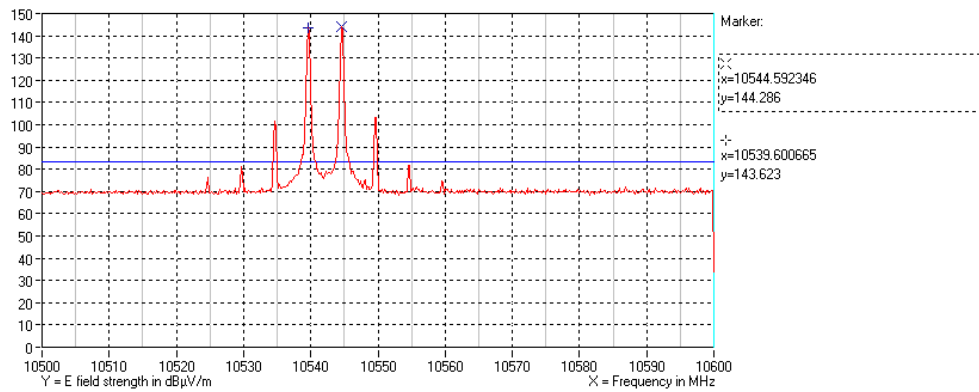
Zoom to view fundamentals:



Test object: TMA3A  
Manufacturer: Trackman A/S  
Operating Condition: High ch setting (10.5395 and 10.5445 GHz), Ant 0.1 m, handheld prescan  
Limit corrected according to measurement distance.  
Test Site: EMC – Room B  
Operator: HEN - T200869-1  
Test Specification: FCC Part 15 C  
Comment: Sheet 33 & 34

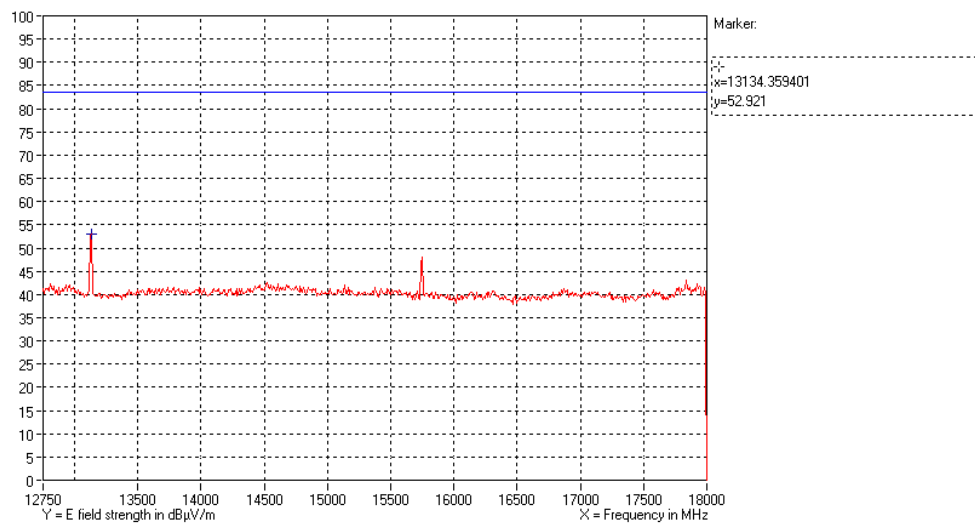


Zoom to view fundamentals:

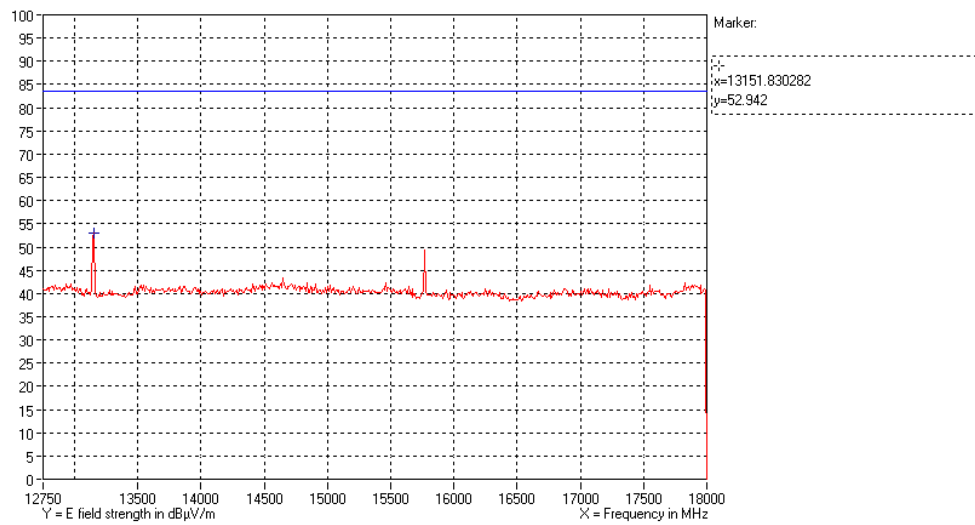


## Test plots, radiated emission 12.75-18 GHz

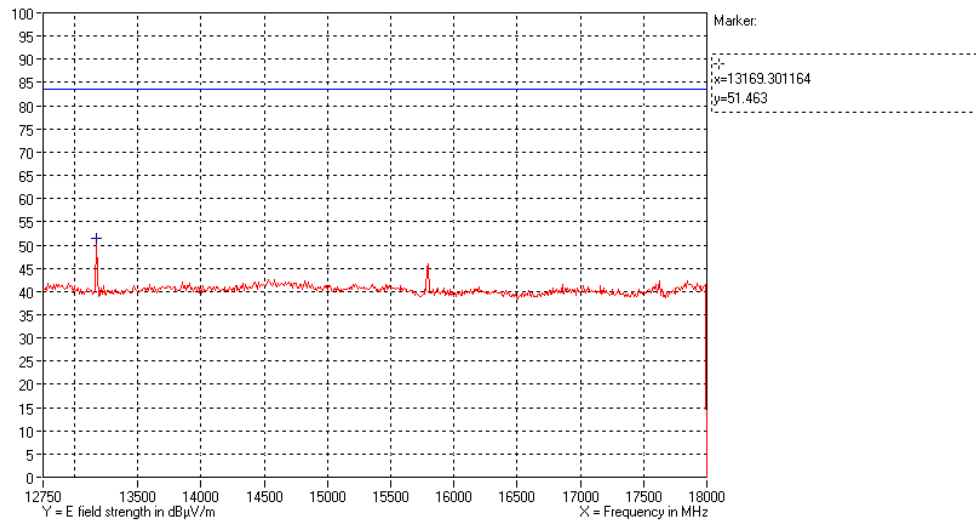
Test object: TMA3A  
Manufacturer: Trackman A/S  
Operating Condition: Low ch setting (10.5055 and 10.5105 GHz), Ant 0.1 m, handheld prescan  
Limit corrected according to measurement distance.  
Test Site: EMC – Room B  
Operator: HEN - T200869-1  
Test Specification: FCC Part 15 C  
Comment: Sheet 35



Test object: TMA3A  
Manufacturer: Trackman A/S  
Operating Condition: Mid ch setting (10.5225 and 10.5275 GHz), Ant 0.1 m, handheld prescan  
Limit corrected according to measurement distance.  
Test Site: EMC – Room B  
Operator: HEN - T200869-1  
Test Specification: FCC Part 15 C  
Comment: Sheet 36

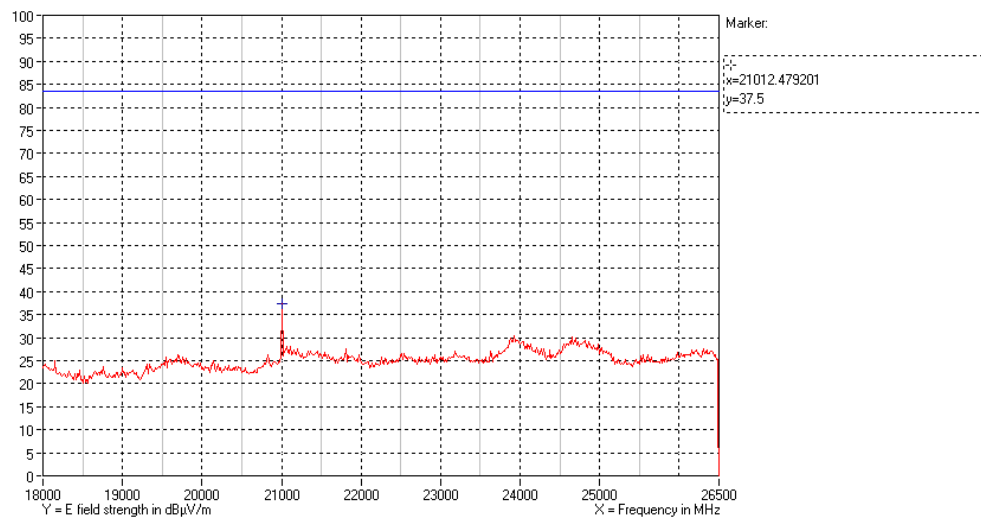


Test object: TMA3A  
Manufacturer: Trackman A/S  
Operating Condition: High ch setting (10.5395 and 10.5445 GHz), Ant 0.1 m, handheld prescan  
Limit corrected according to measurement distance.  
Test Site: EMC – Room B  
Operator: HEN - T200869-1  
Test Specification: FCC Part 15 C  
Comment: Sheet 37

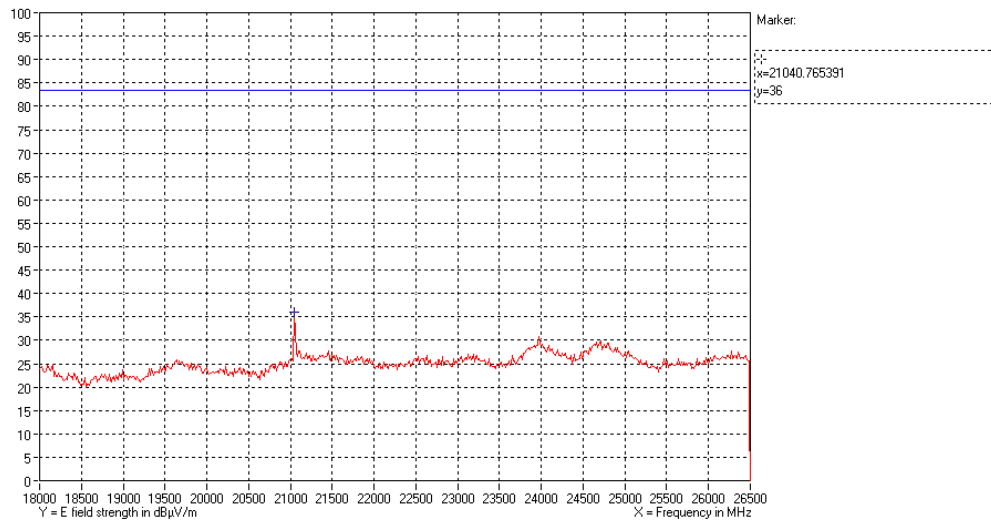


## Test plots, radiated emission 18-26.5 GHz

Test object: TMA3A  
Manufacturer: Trackman A/S  
Operating Condition: Low ch setting (10.5055 and 10.5105 GHz), Ant 0.1 m, handheld prescan  
Limit corrected according to measurement distance.  
Test Site: EMC – Room B  
Operator: HEN - T200869-1  
Test Specification: FCC Part 15 C  
Comment: Sheet 38A

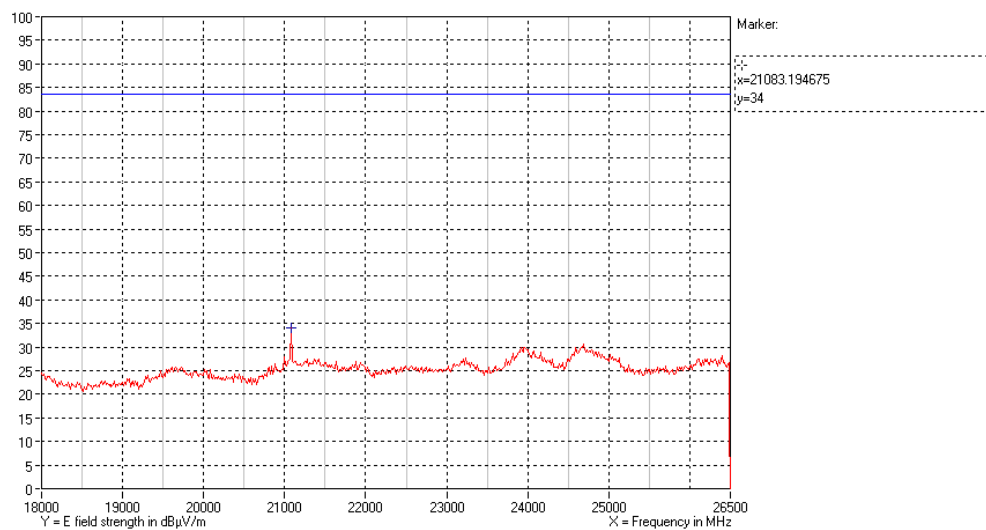


Test object: TMA3A  
Manufacturer: Trackman A/S  
Operating Condition: Mid ch setting (10.5225 and 10.5275 GHz), Ant 0.1 m, handheld prescan  
Limit corrected according to measurement distance.  
Test Site: EMC – Room B  
Operator: HEN - T200869-1  
Test Specification: FCC Part 15 C  
Comment: Sheet 39A



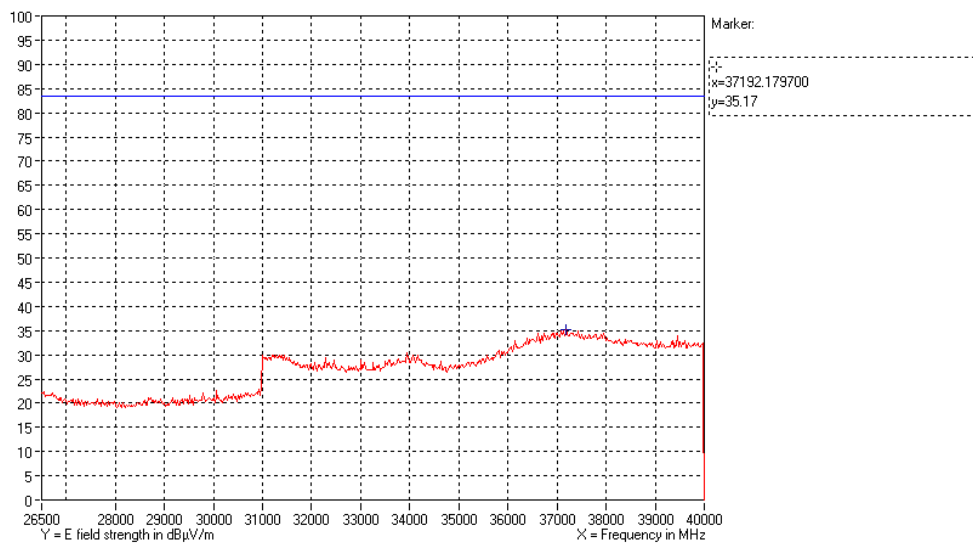


Test object: TMA3A  
Manufacturer: Trackman A/S  
Operating Condition: High ch setting (10.5395 and 10.5445 GHz), Ant 0.1 m, handheld prescan  
Limit corrected according to measurement distance.  
Test Site: EMC – Room B  
Operator: HEN - T200869-1  
Test Specification: FCC Part 15 C  
Comment: Sheet 40A

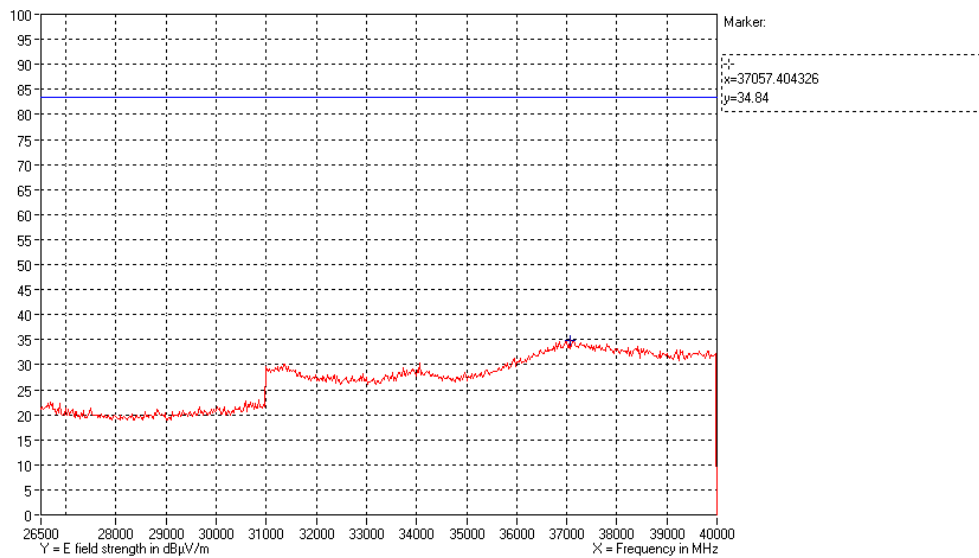


## Test plots, radiated emission 26.5-40 GHz

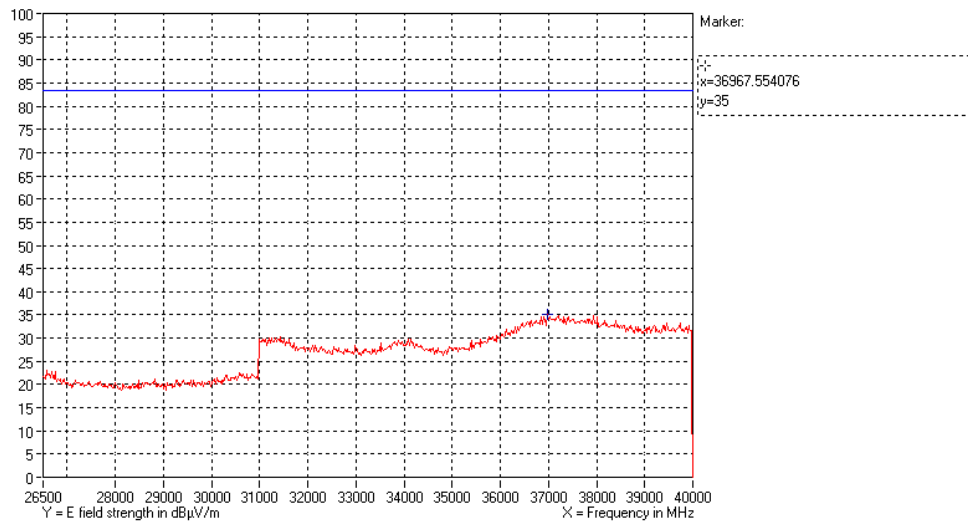
Test object: TMA3A  
Manufacturer: Trackman A/S  
Operating Condition: Low ch setting (10.5055 and 10.5105 GHz), Ant 0.1 m, handheld prescan  
Limit corrected according to measurement distance.  
Test Site: EMC – Room B  
Operator: HEN - T200869-1  
Test Specification: FCC Part 15 C  
Comment: Sheet 41



Test object: TMA3A  
Manufacturer: Trackman A/S  
Operating Condition: Mid ch setting (10.5225 and 10.5275 GHz), Ant 0.1 m, handheld prescan  
Limit corrected according to measurement distance.  
Test Site: EMC – Room B  
Operator: HEN - T200869-1  
Test Specification: FCC Part 15 C  
Comment: Sheet 42



Test object: TMA3A  
Manufacturer: Trackman A/S  
Operating Condition: High ch setting (10.5395 and 10.5445 GHz), Ant 0.1 m, handheld prescan  
Limit corrected according to measurement distance.  
Test Site: EMC – Room B  
Operator: HEN - T200869-1  
Test Specification: FCC Part 15 C  
Comment: Sheet 43

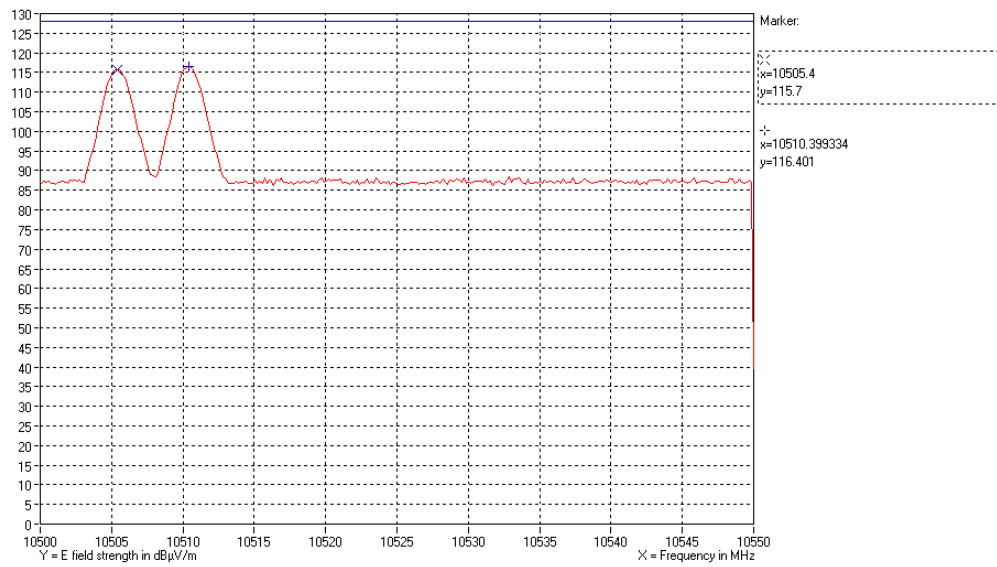


## **Annex 4**

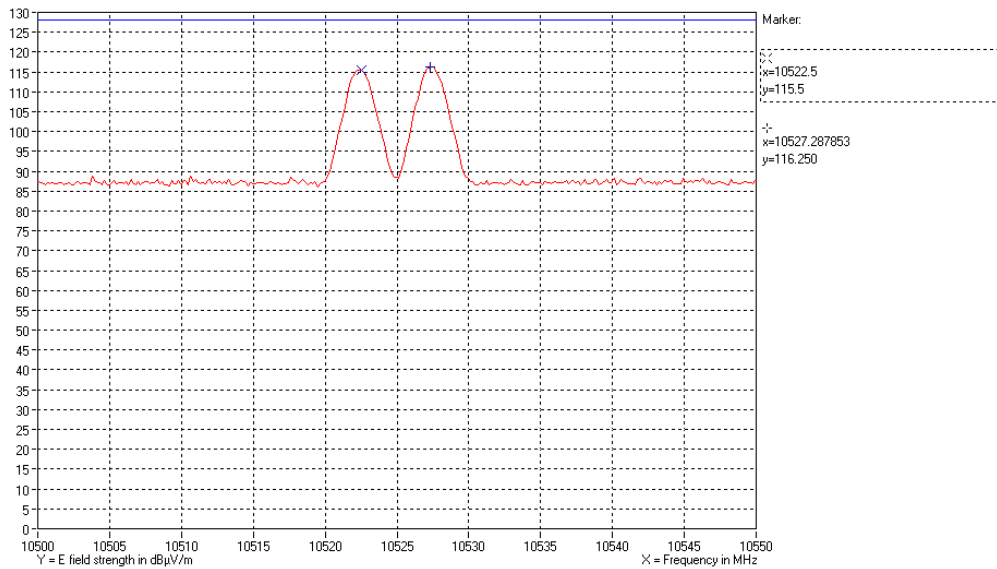
### **Peak output field strength / occupied bandwidth**

## Test plots, peak output field strength

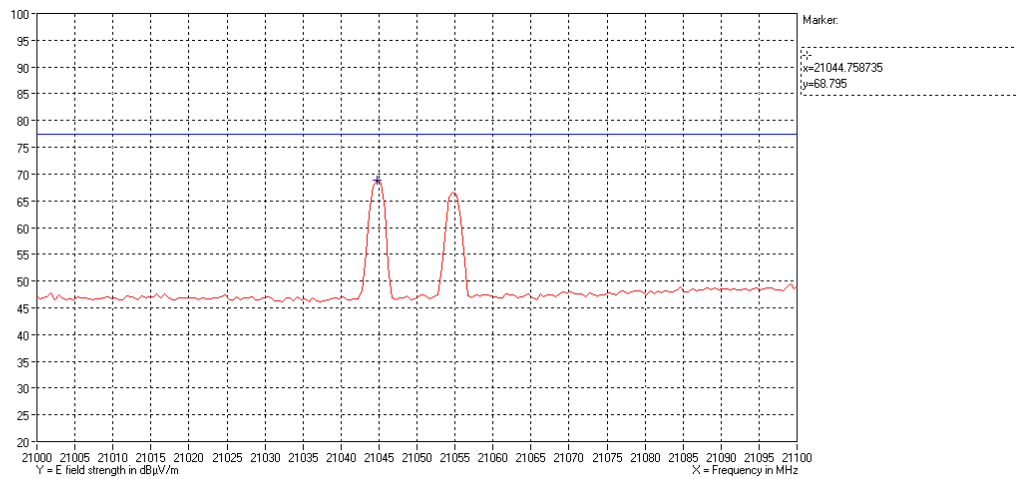
Test object: TMA3A  
Manufacturer: Trackman A/S  
Operating Condition: Low ch setting (10.5055 and 10.5105 GHz), Ant 3 m, 1-3 m H + V  
Limit corrected according to measurement distance.  
Test Site: EMC – Room B  
Operator: HEN - T200869-1  
Test Specification: FCC Part 15 C  
Comment: Sheet 47



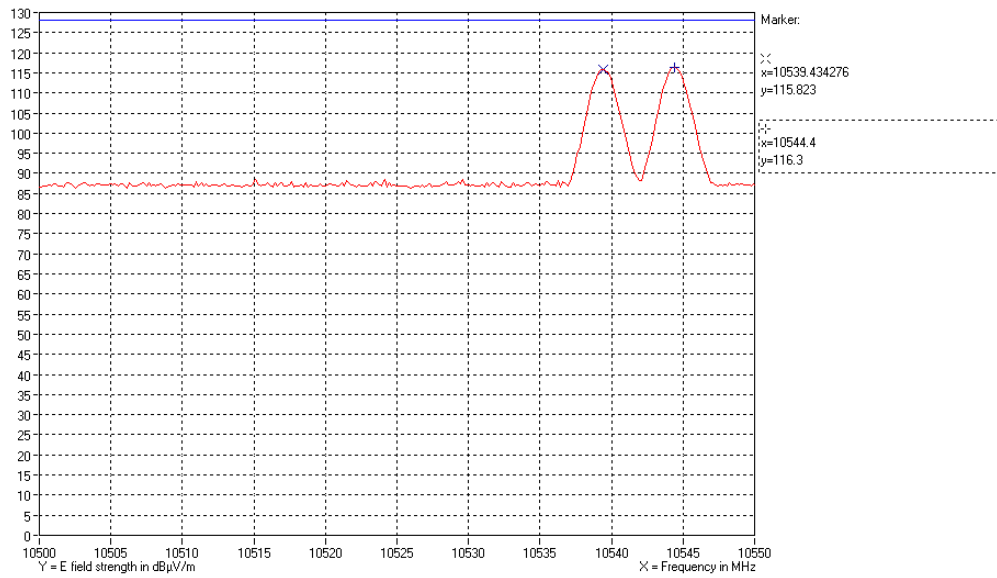
Test object: TMA3A  
Manufacturer: Trackman A/S  
Operating Condition: Mid ch setting (10.5225 and 10.5275 GHz), Ant 3 m, 1-3 m H + V  
Limit corrected according to measurement distance.  
Test Site: EMC – Room B  
Operator: HEN - T200869-1  
Test Specification: FCC Part 15 C  
Comment: Sheet 46 & 44



Second harmonic:



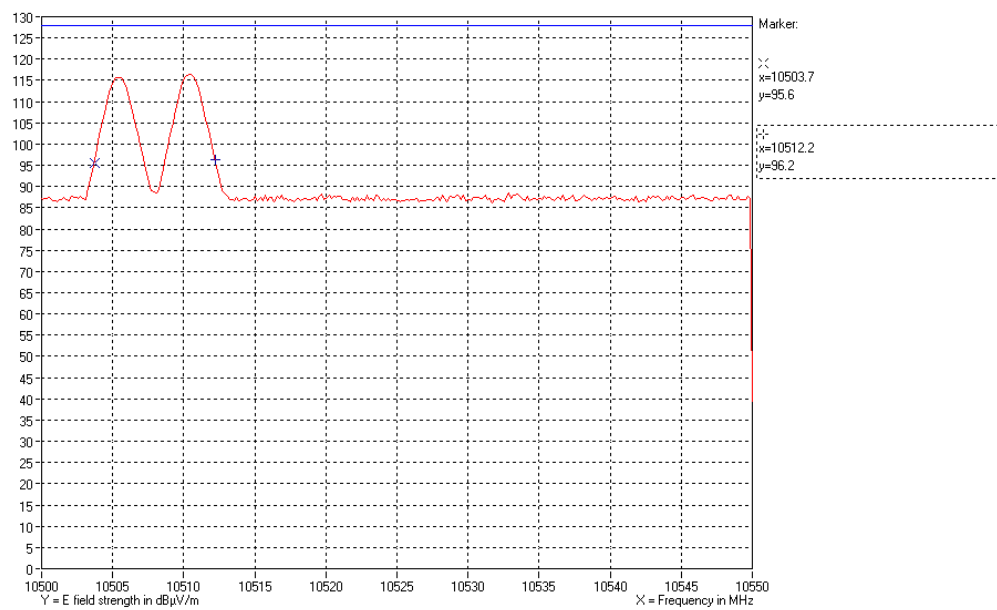
Test object: TMA3A  
Manufacturer: Trackman A/S  
Operating Condition: High ch setting (10.5395 and 10.5445 GHz), Ant 3 m, 1-3 m H + V  
Limit corrected according to measurement distance.  
Test Site: EMC – Room B  
Operator: HEN - T200869-1  
Test Specification: FCC Part 15 C  
Comment: Sheet 45



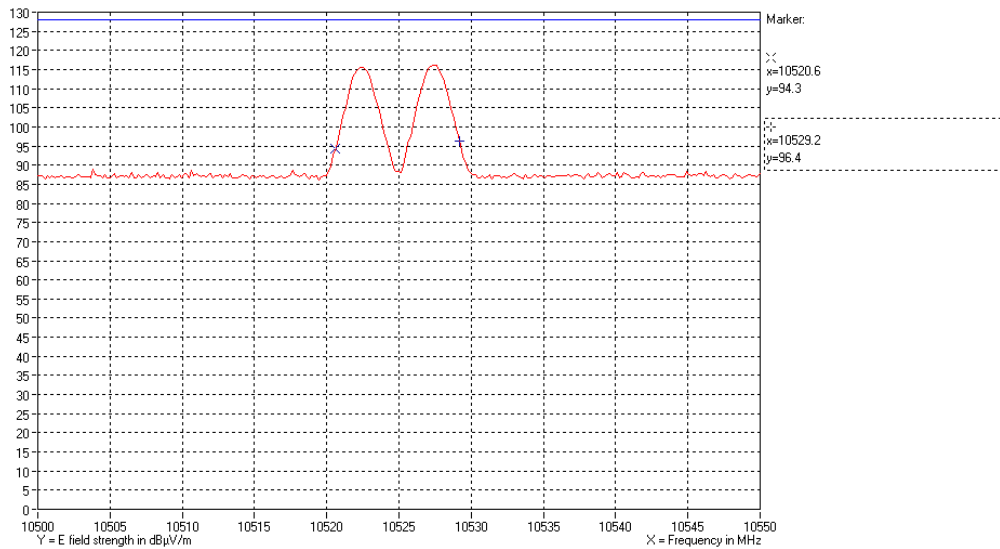


## Test plots, occupied bandwidth

Test object: TMA3A  
Manufacturer: Trackman A/S  
Operating Condition: Low ch setting (10.5055 and 10.5105 GHz), Ant 3 m, 1-3 m H + V  
Limit corrected according to measurement distance.  
Test Site: EMC – Room B  
Operator: HEN - T200869-1  
Test Specification: FCC Part 15 C  
Comment: Sheet 47



Test object: TMA3A  
Manufacturer: Trackman A/S  
Operating Condition: Mid ch setting (10.5225 and 10.5275 GHz), Ant 3 m, 1-3 m H + V  
Limit corrected according to measurement distance.  
Test Site: EMC – Room B  
Operator: HEN - T200869-1  
Test Specification: FCC Part 15 C  
Comment: Sheet 46



Test object: TMA3A  
Manufacturer: Trackman A/S  
Operating Condition: High ch setting (10.5395 and 10.5445 GHz), Ant 3 m, 1-3 m H + V  
Limit corrected according to measurement distance.  
Test Site: EMC – Room B  
Operator: HEN - T200869-1  
Test Specification: FCC Part 15 C  
Comment: Sheet 45

