



# **TEST REPORT**

## **No. 98.30.35.384 – Rev. 0**

### **E.U.T.: FIELD TESTER FOR HIGH PERFORMANCE PREMISE CABLING**

Prepared: A. Zani .....

Verified: G. Sartori .....

Date of issue: 1998-10-07

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This test report refers only to the tested sample(s).

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<b><u>1 - General</u></b>	

## **1.1 Inspection Body**

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Via G. Gozzi, 1/A  
20129 MILANO  
ITALY

Phone: +39 027393.1  
Fax: +39 0270125067

## **1.2 Date of testing**

The tests were performed on 25<sup>th</sup> September 1998

## **1.3 Location of testing**

Tests laboratory address: Via Alessandro Gherardesca, 5 – 56014 Ospedaletto (PI)

## **1.4 Execution of testing**

The tests were performed by Mr Jim Sciacero, Microtest Inc. and Mr Andrea Zani, SGS Servizi Tecnici Industriali.

## **1.5 Persons witnessing the testing**

- Mr Thomas Hüsch, Microtest GmbH
- Mr Massimo Landriscina, Microtest Italia
- Mr. Roberto Franza, SGS ICS srl

## **2 - Customer**

### **2.1 Address**

MICROTEST GmbH  
AM Söldermoos 17  
D-85399 München-Hallbergmoos  
Germany

Phone: +49 89 607 6861-6

Fax: +49 89 607 6861-1

### **2.2 Reference person**

- Mr Sören Schanpka, Microtest GmbH
- Mr Massimo Landriscina, Microtest Italia

### **3 - Equipment under test (EUT)**

#### **3.1 Description**

No.1 field tester for high performance premise cabling

- Manufacturer : Microtest Inc.
- Model : OMNIScanner (main unit) – OMNIRemote (remote unit)
- P/N : 2950-4000-02 (main unit) – 2950-4001-01 (remote unit)
- Power supply : 15 Vdc – 1 A
- AC adapter : switching power supply SCEPTRE – P/N PS-1512APL6 –  
Model UP01811150 – 100-250 Vac, 50-60 Hz, 0.5 A/15 Vdc, 1.2 A

## **4 - Reference Documents**

- Microtest Specification – OMNIScanner RF Measurement Verification Test Plan – September 8, 1998.

## **5 - Tests performed**

The following tests were performed:

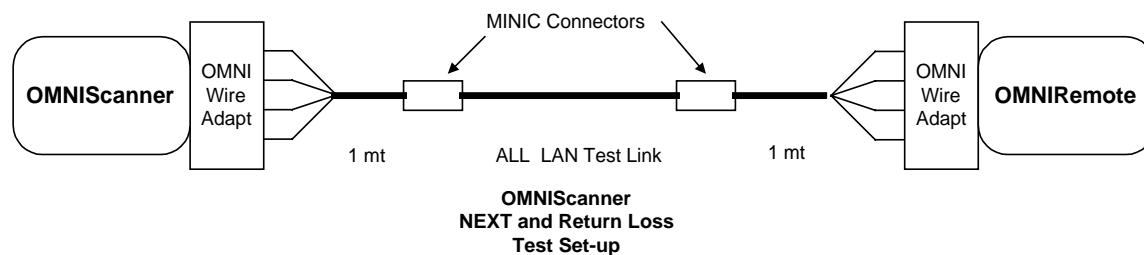
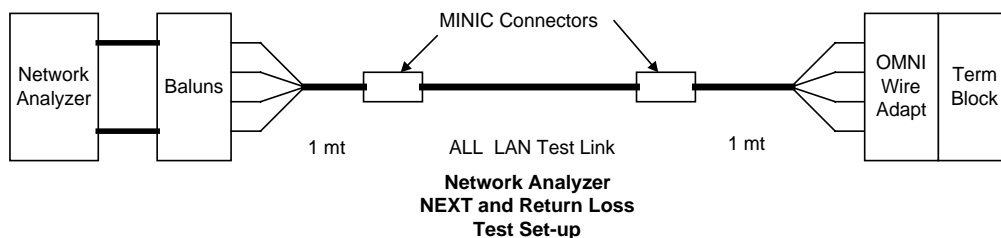
### **5.1 Field Tester Intrinsic Parameter Verification**

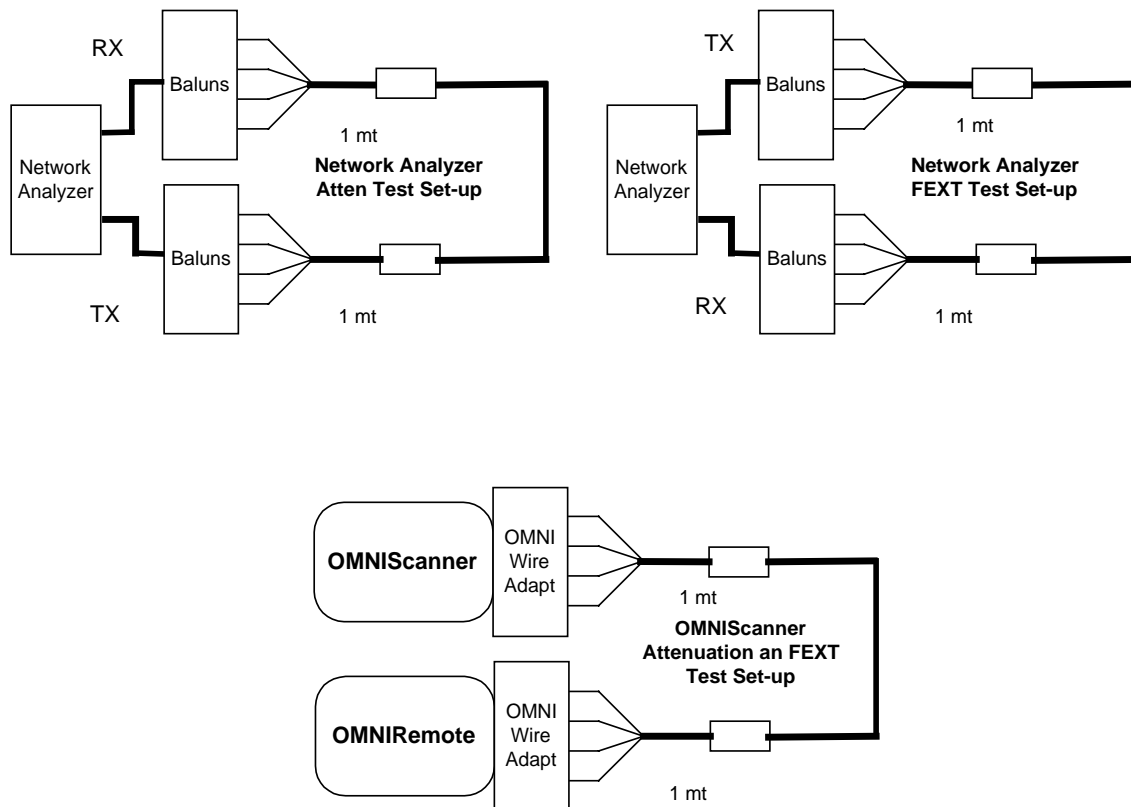
- 5.1.1 NEXT Dynamic Range (Residual NEXT and Noise)
- 5.1.2 Return Loss Directivity

### **5.2 Field Tester and Network Analyser Measurement Performance Comparison**

- 5.2.1 Near End Crosstalk (NEXT)
- 5.2.2 Return Loss (RL)
- 5.2.3 Attenuation
- 5.2.4 Far End Crosstalk (FEXT)

## **6 – Test configurations**





To perform the comparison measurements the following links were used:

- **Shielded Link** – it was used to measure NEXT, Return Loss and FEXT. It was composed by: n°2 IBM 100  $\Omega$  cat.6 jacks type ACS MINI C and 90 m IBM ACS cat.7, S-STP, 100  $\Omega$ , 4x2xAWG22 horizontal cable code 7890.
- **Unshielded Link** – it was used to measure NEXT, FEXT and Attenuation. It was composed by: n°2 IBM 100  $\Omega$  cat.5 jacks type G and 90 m BICC BRAND-REX cat.5, UTP, 100  $\Omega$  4x2xAWG24 horizontal cable type C5U

The measurements were performed over the frequency range of 1-300 MHz.

Verification of OMNIremote measurement function, as it also makes NEXT and RL measurements at the far end of the link, was made swapping the position of OMNIScanner and OMNIremote so to measure the same end of the link characterised by the network analyser. Measurement results were compared to the relevant network analyser measurements.

In order to verify repeatability of measurements carried out by OMNIScanner, NEXT and RL measurements were repeated after measurements with network analyser and compared with the ones carried out before.

All the measurements, both with the field tester and with the network analyser, were performed using Microtest patch cords 1 m long, two of them terminated with a cat.6 IBM MINI C connector and two terminated with a cat.5 RJ45 connector. The other side of the patch cords was terminated with the PCB mounted in the adapter for the field tester.

## **7 - Test Equipment list**

<b>Equipment</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Serial Number</b>
NETWORK ANALYSER	HP	8753	JP38160908
BALUN	BH Electronics	040-0055	--

## **8 - Comments**

The tests performed highlighted the high dynamic measurement range of the field tester (95 dB @ 300 MHz).

It was noticed the physical position of the test set-up has a great influence for the possibility of comparison of the measurements; this means any movement of the set-up causes differences in the results.

The results of the measurements carried out with the field tester are generally comparable with those taken with the network analyser (in most case they are coincident). Some differences can be noticed in the range 150÷300 MHz for NEXT measurement; it is , anyway, to be said the overall behaviour of the curves is comparable.

Repeatability of the measurements with the OMNIScanner is excellent: no difference can be noticed in measurements taken on the same link in different moments.



# **ANNEX n° 1**

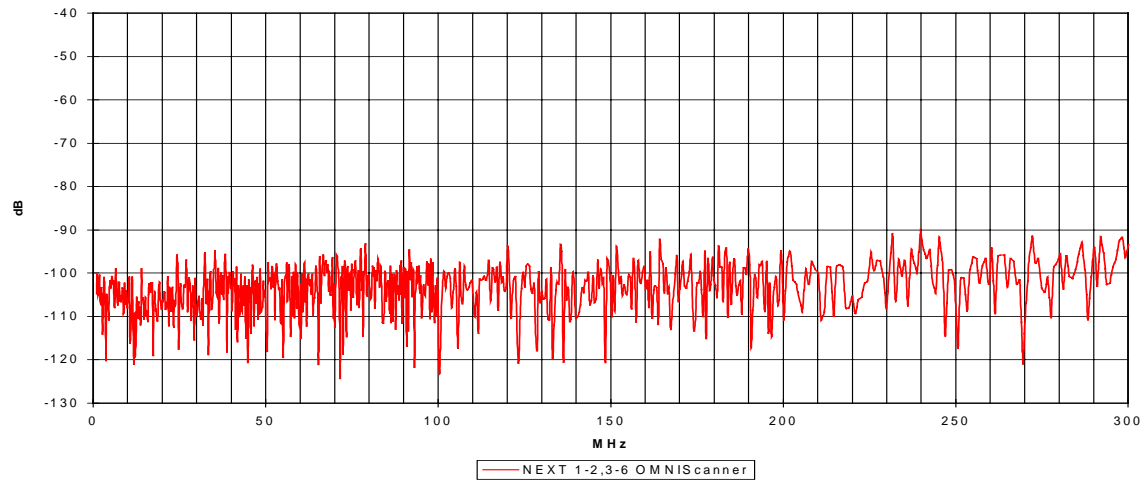
**Contents : OMNIScanner Residual NEXT**

**EUT : Field Tester OMNIScanner**

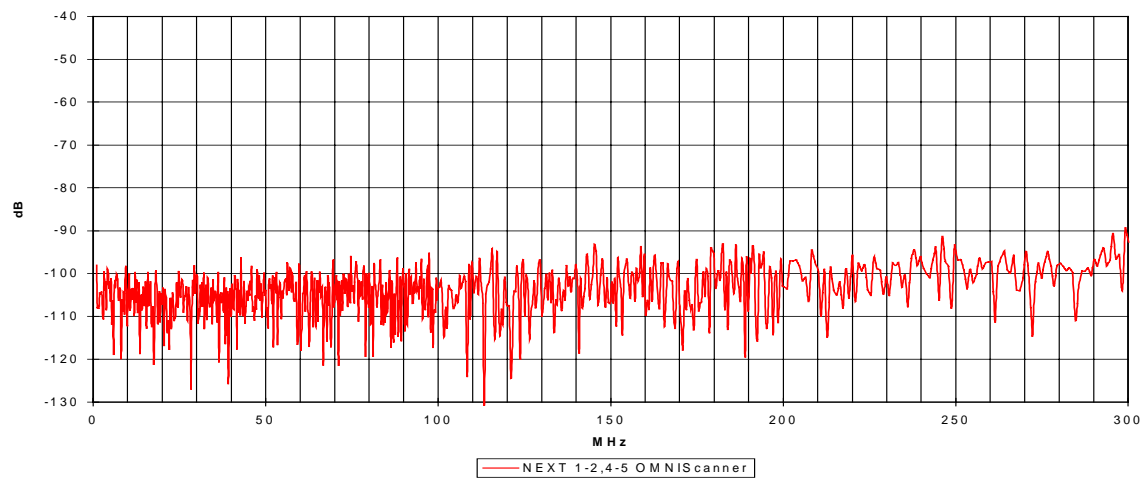
**Test Report no. : 98.30.35.384 - Rev.0**

**Date of issue : 1998 October 07<sup>th</sup>**

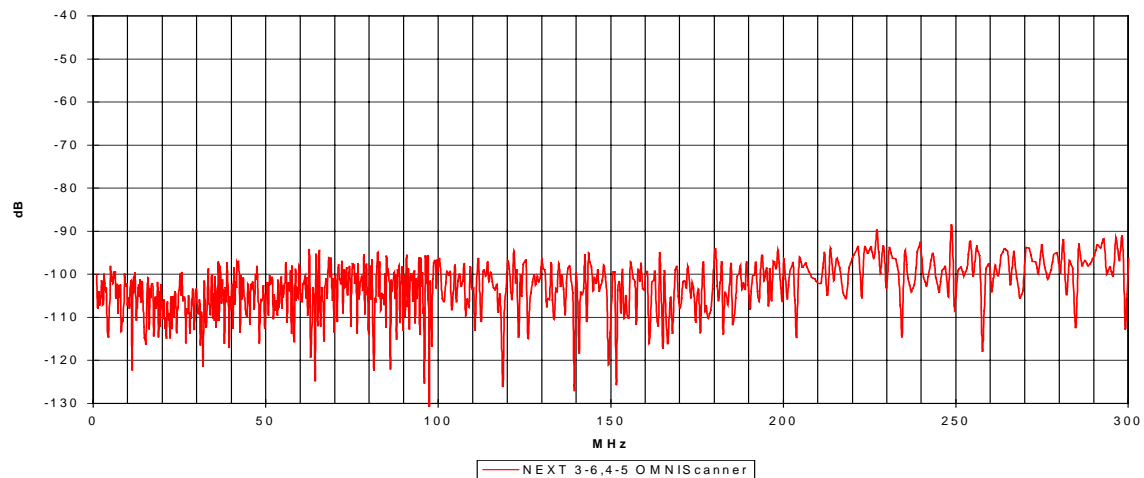
OMNIScanner Residual NEXT 1-2,3-6



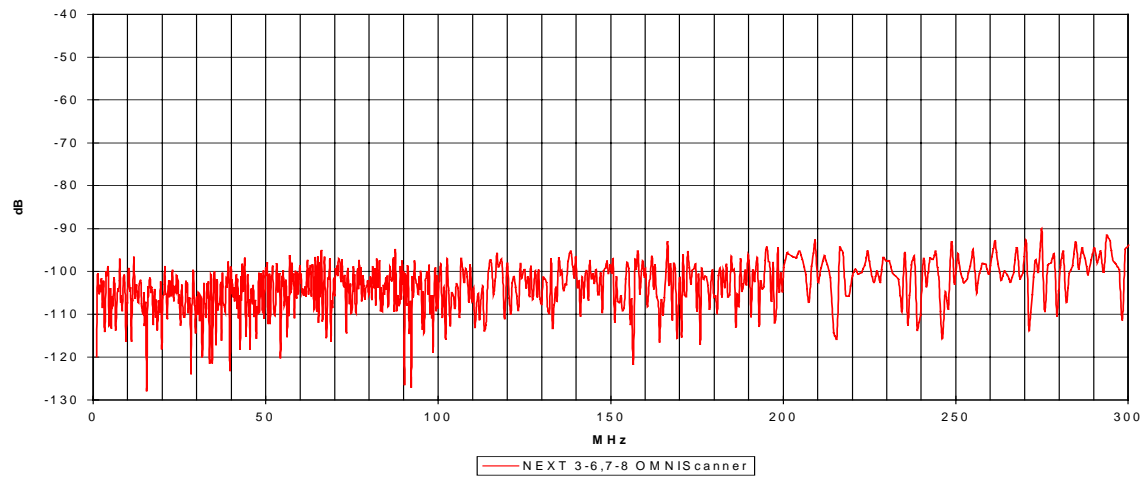
OMNIScanner Residual NEXT 1-2,4-5



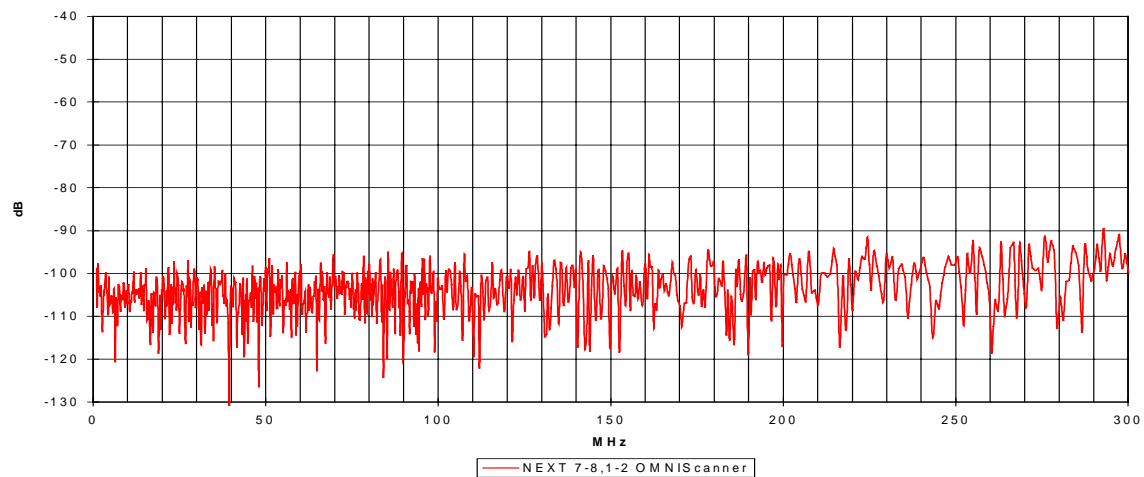
OMNIScanner Residual NEXT 3-6,4-5



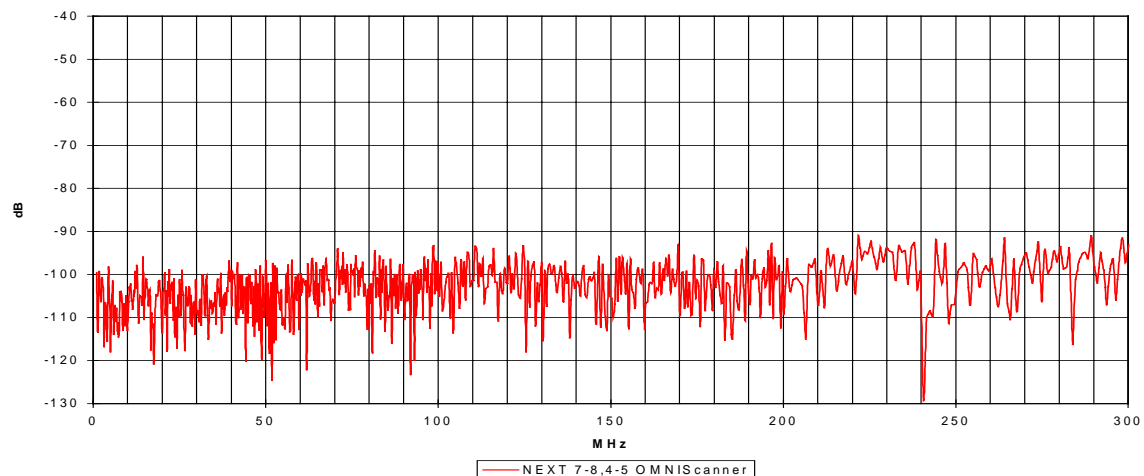
OMNIScanner Residual NEXT 3-6,7-8



OMNIScanner Residual NEXT 7-8,1-2



OMNIScanner Residual NEXT 7-8,4-5



## **ANNEX n° 2**

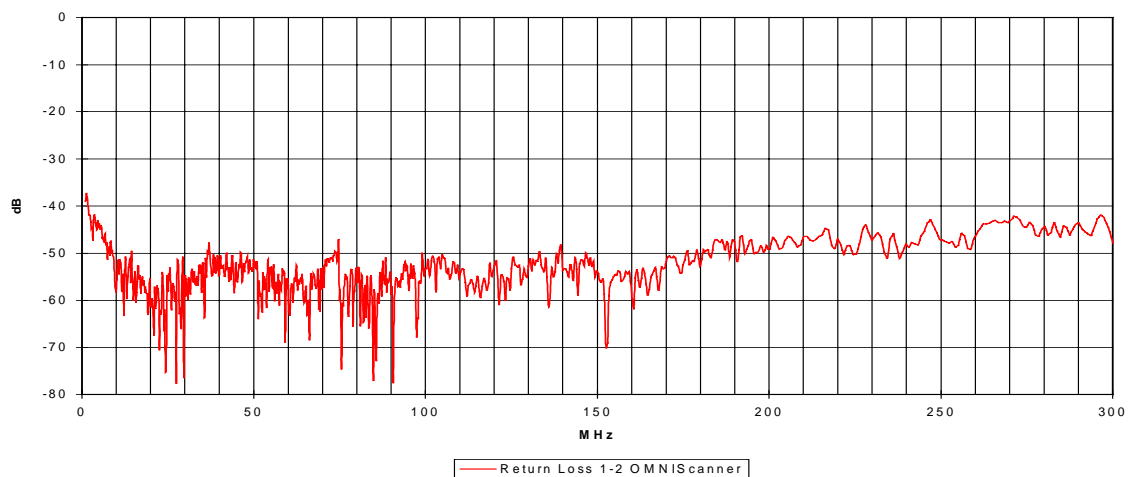
**Contents : Return Loss Directivity**

**CUT : Field Tester OMNIScanner**

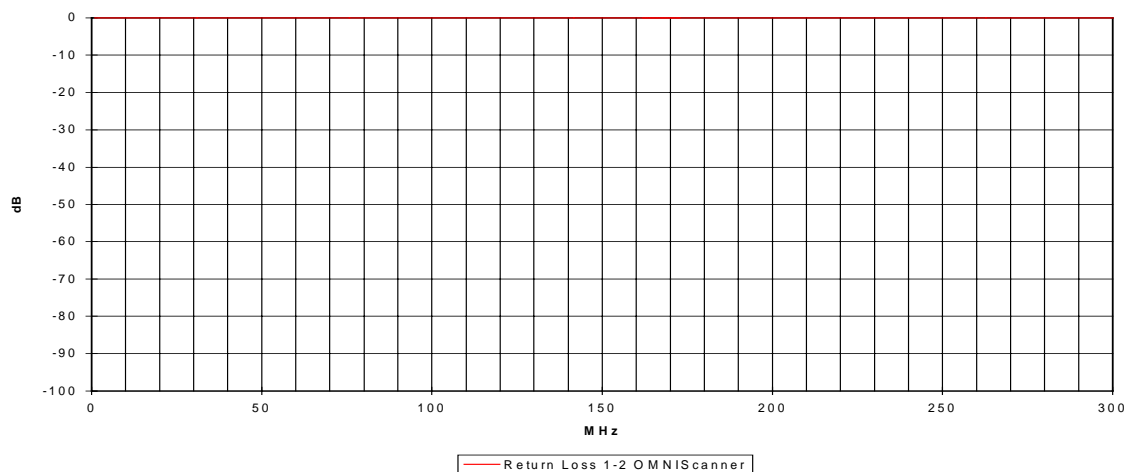
**Test Report no. : 98.30.35.384 - Rev.0**

**Date of issue : 1998 October 07<sup>th</sup>**

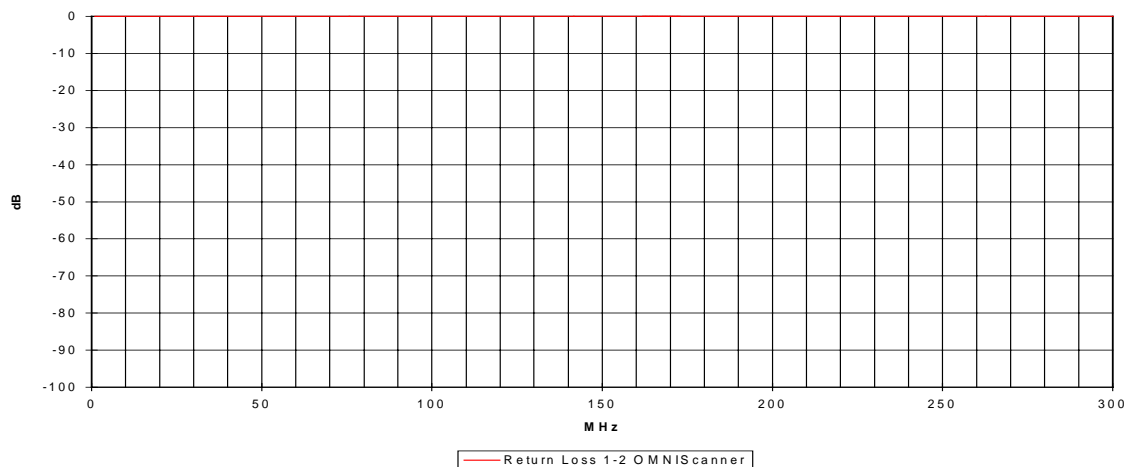
OMNIScanner Accuracy Return Loss 1-2 (LOAD)



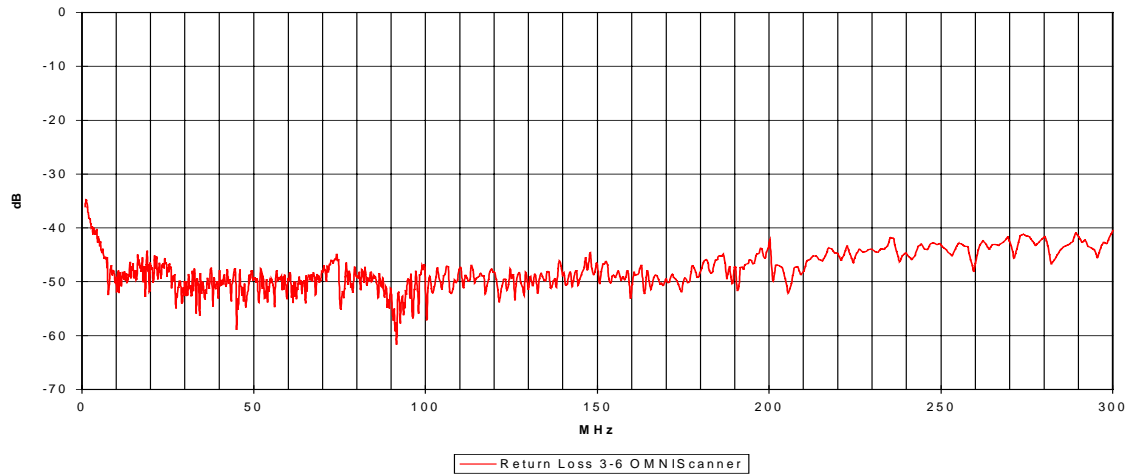
OMNIScanner Accuracy Return Loss 1-2 (OPEN)



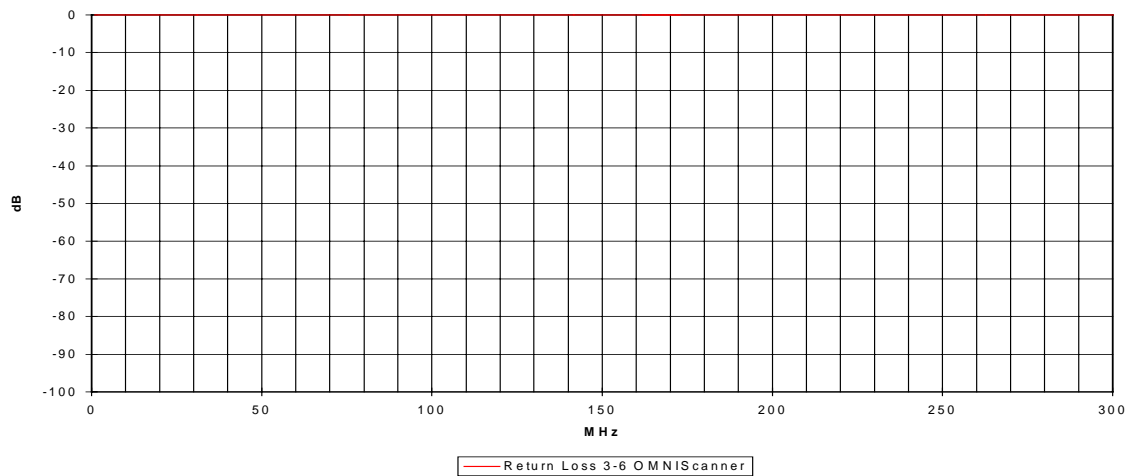
OMNIScanner Accuracy Return Loss 1-2 (SHORT)



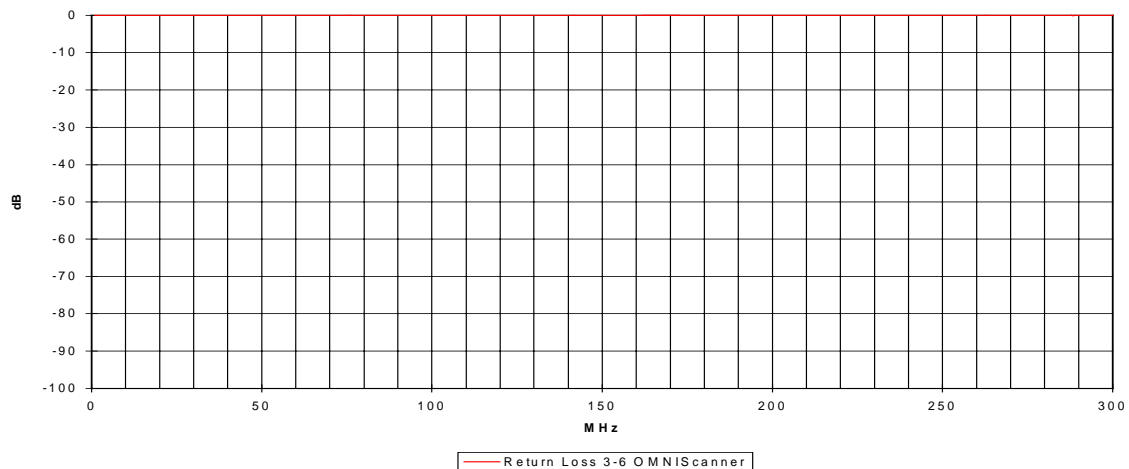
OMNIScanner Accuracy Return Loss 3-6 (LOAD)



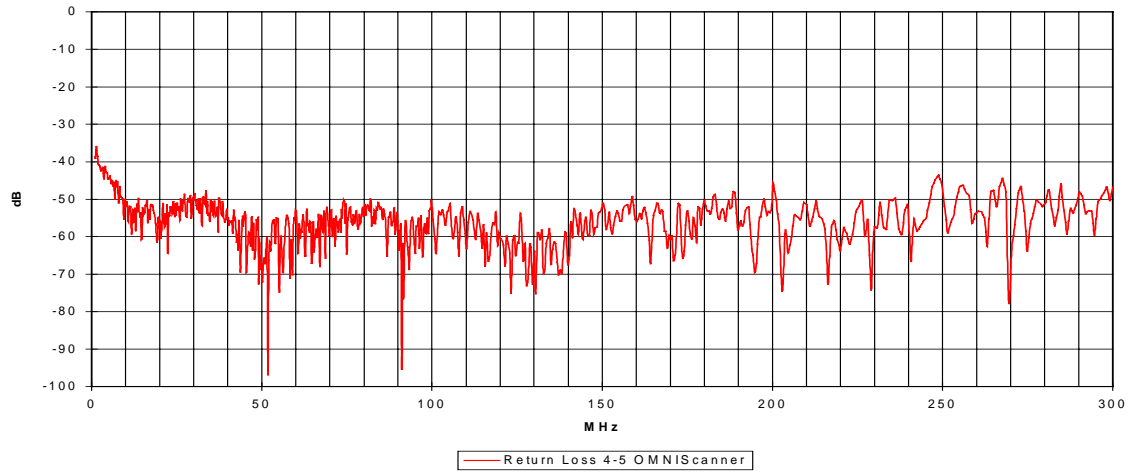
OMNIScanner Accuracy Return Loss 3-6 (OPEN)



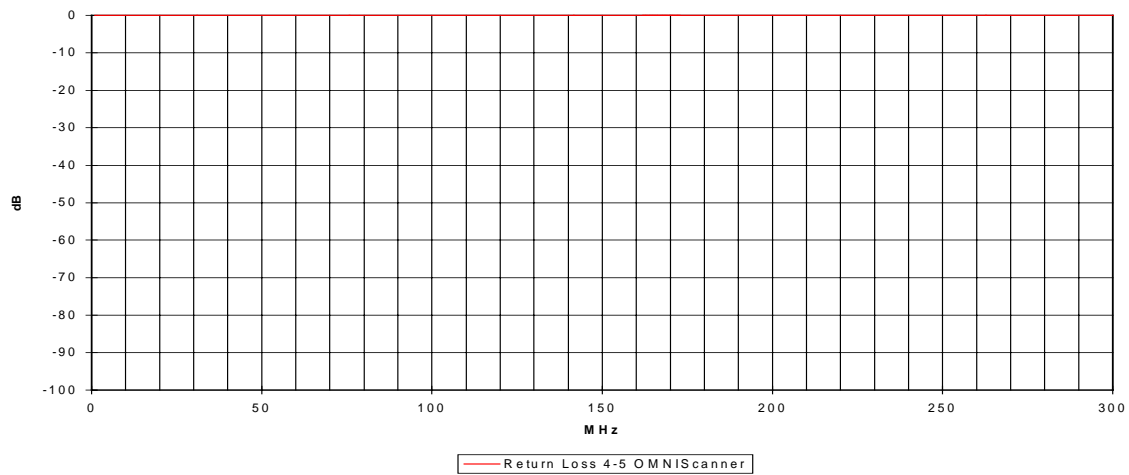
OMNIScanner Accuracy Return Loss 3-6 (SHORT)



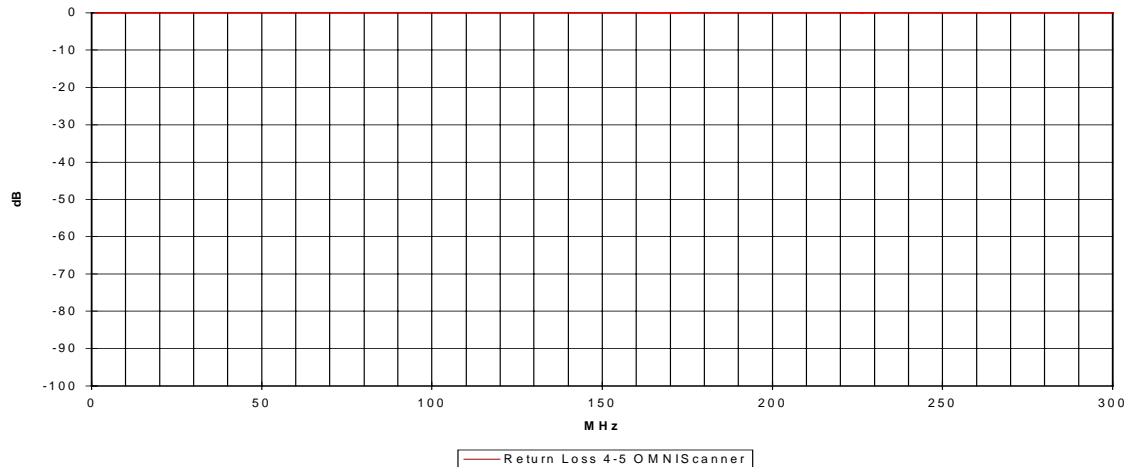
OMNIScanner Accuracy Return Loss 4-5 (LOAD)



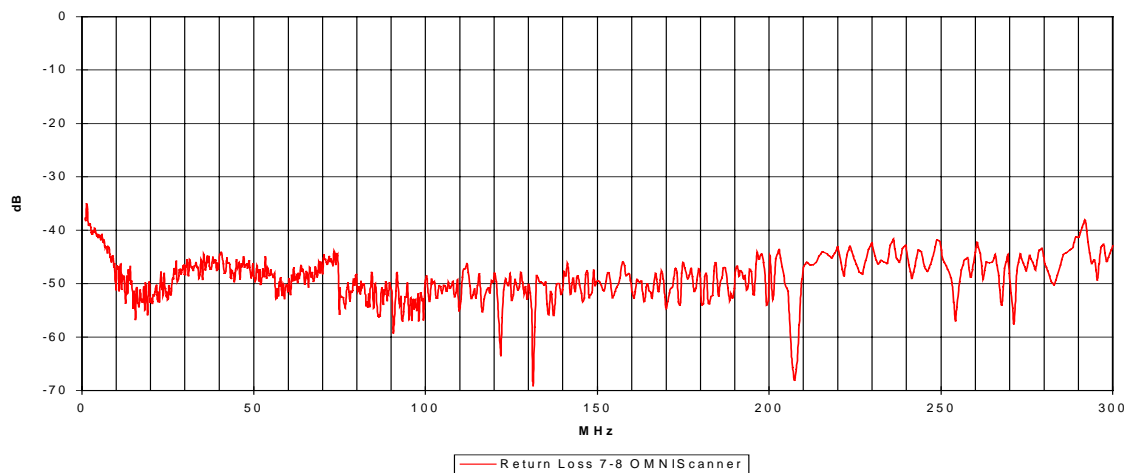
OMNIScanner Accuracy Return Loss 4-5 (OPEN)



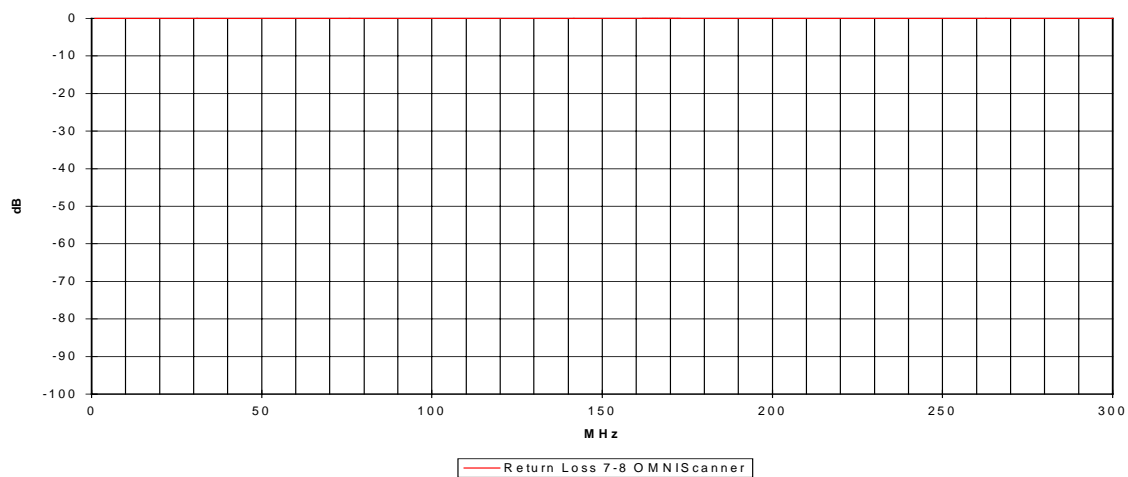
OMNIScanner Accuracy Return Loss 4-5 (SHORT)



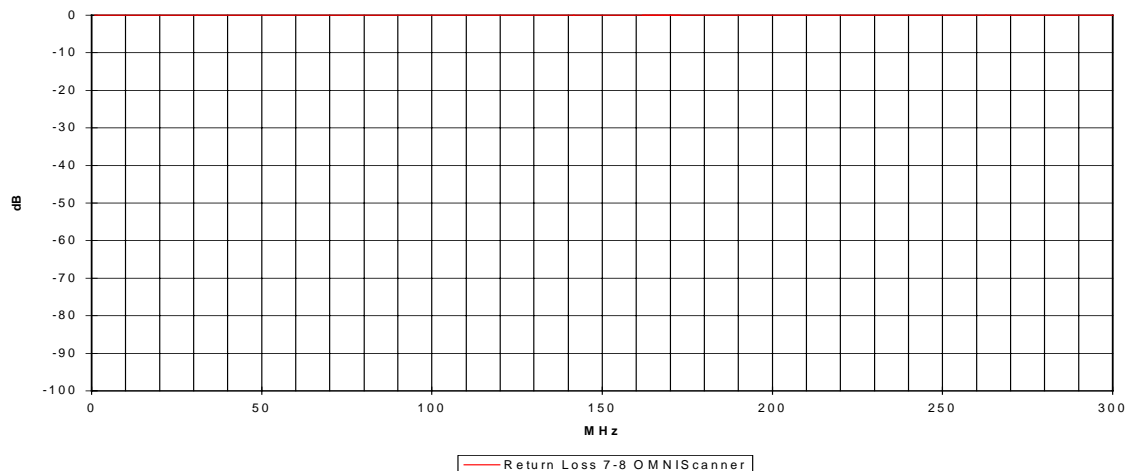
OMNIScanner Accuracy Return Loss 7-8 (LOAD)



OMNIScanner Accuracy Return Loss 7-8 (OPEN)



OMNIScanner Accuracy Return Loss 7-8 (SHORT)





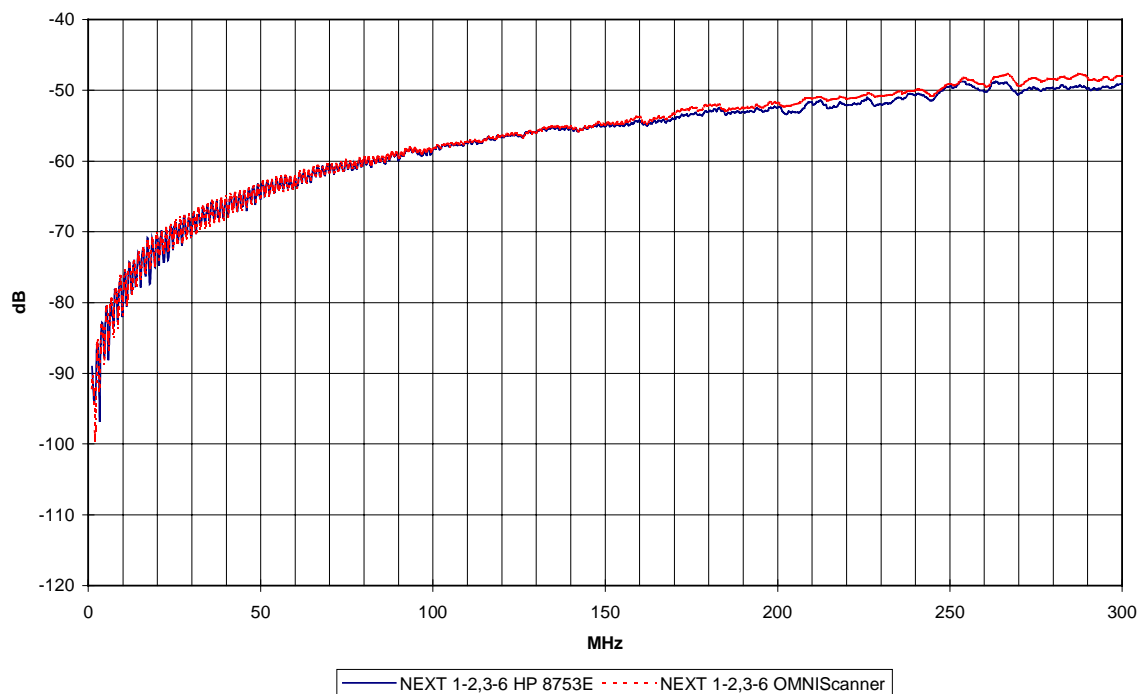
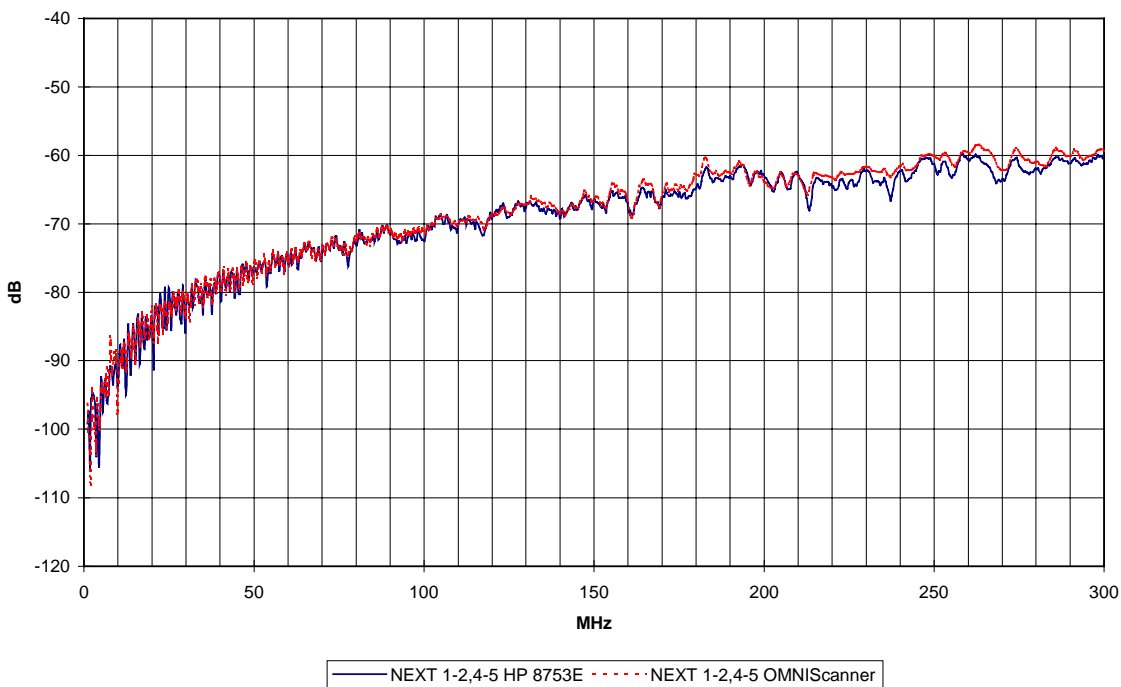
## **ANNEX n° 3**

**Contents : Comparison of NEXT**

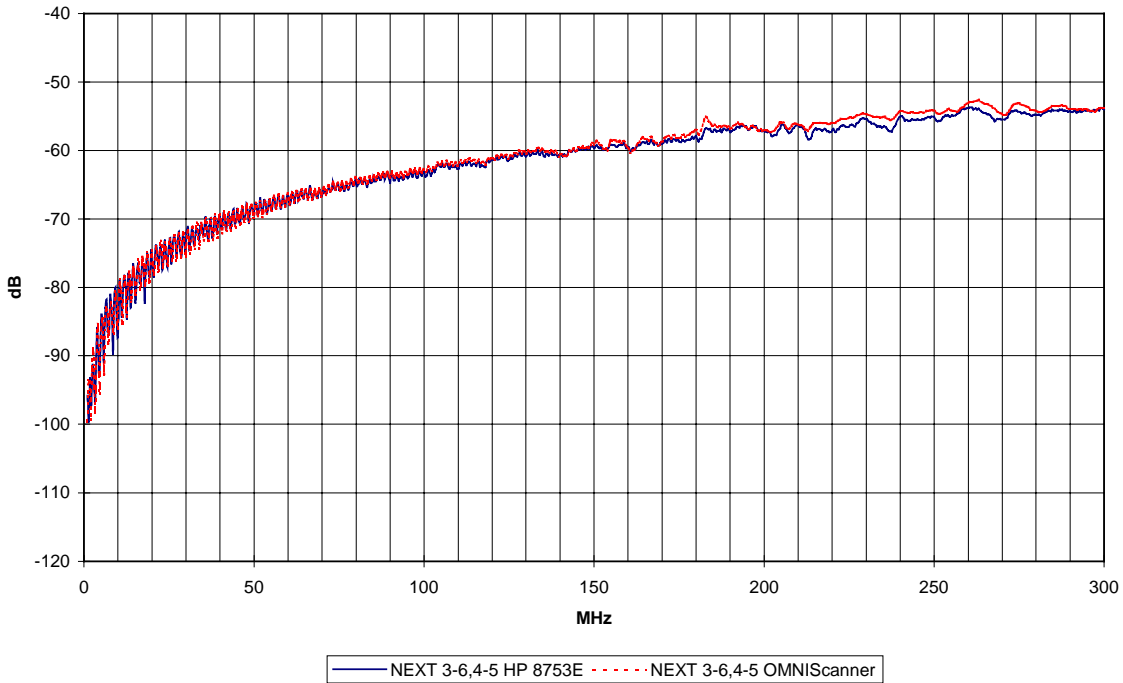
**EUT : Field Tester OMNIScanner**

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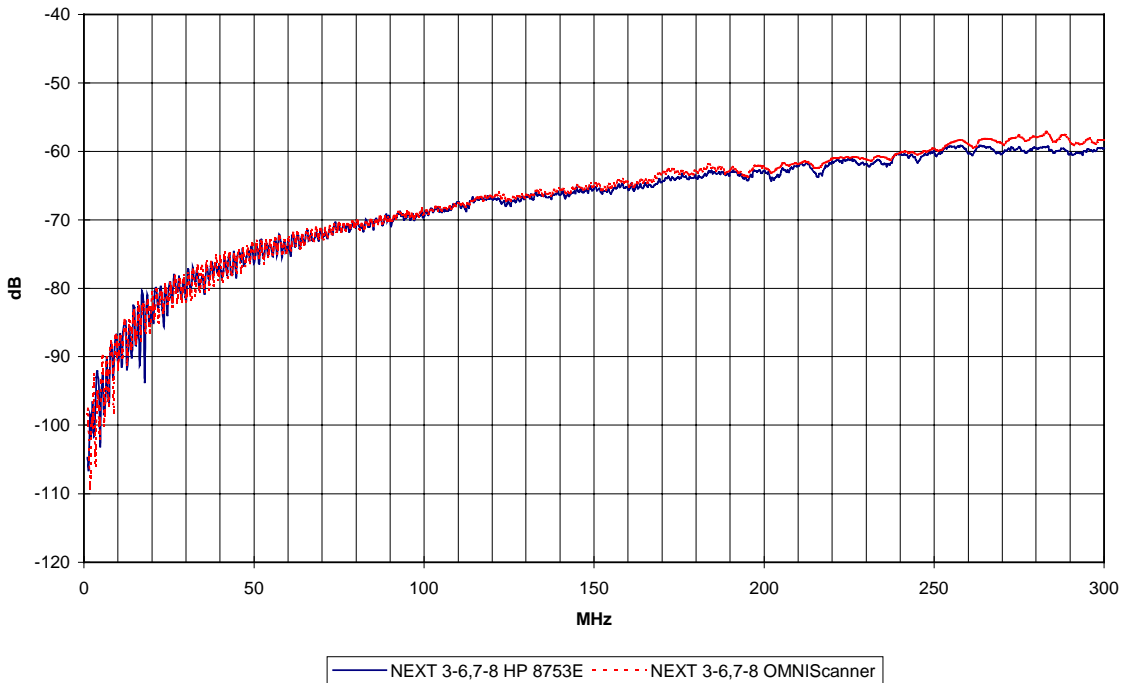
**Date of issue : 1998 October 07<sup>th</sup>**

**Comparison of NEXT 1-2,3-6**

**Comparison of NEXT 1-2,4-5**


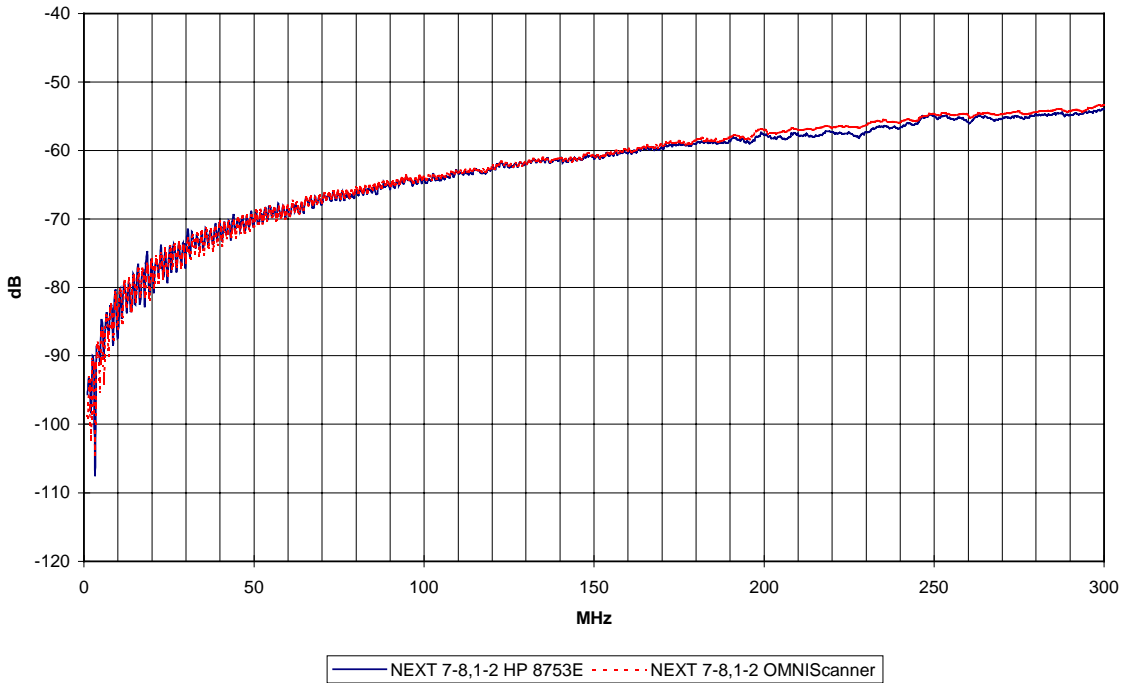
Comparison of NEXT 3-6,4-5



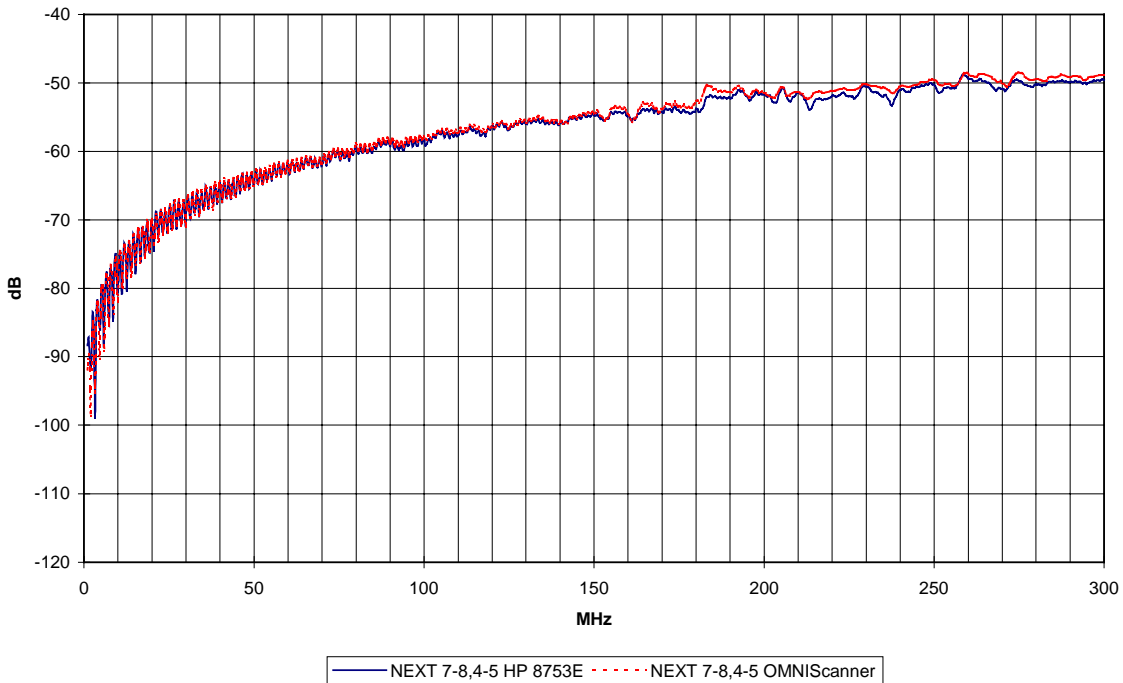
Comparison of NEXT 3-6,7-8



Comparison of NEXT 7-8,1-2



Comparison of NEXT 7-8,4-5



## **ANNEX n° 4**

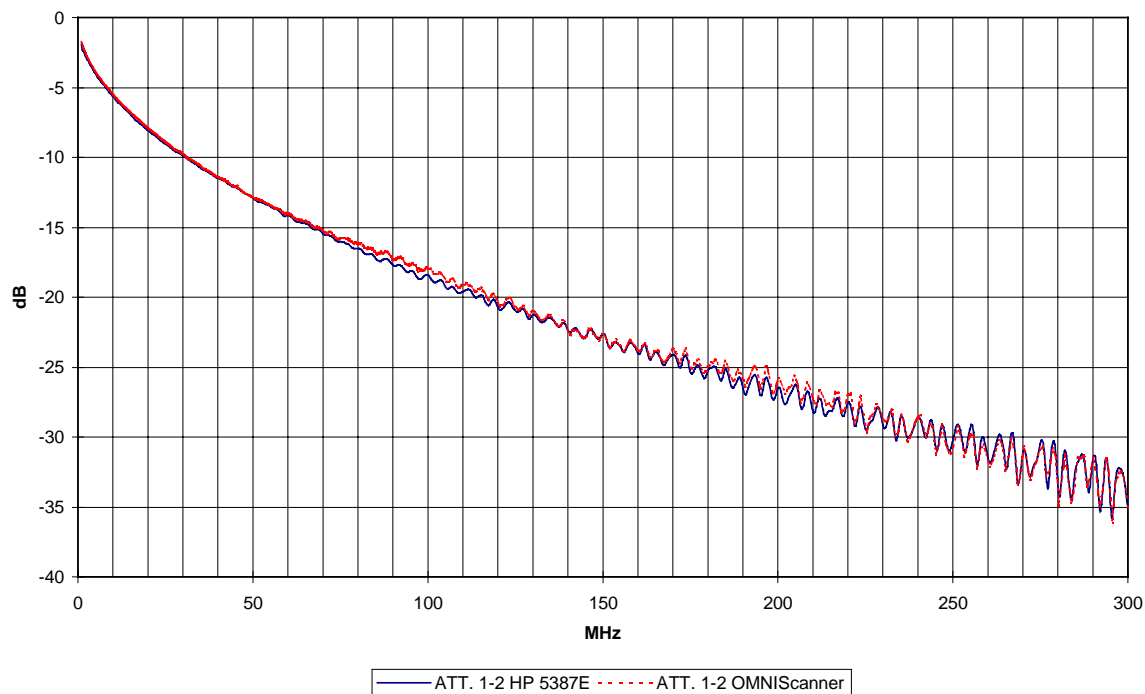
**Contents : Comparison of ATTENUATION**

**EUT : Field Tester OMNIScanner**

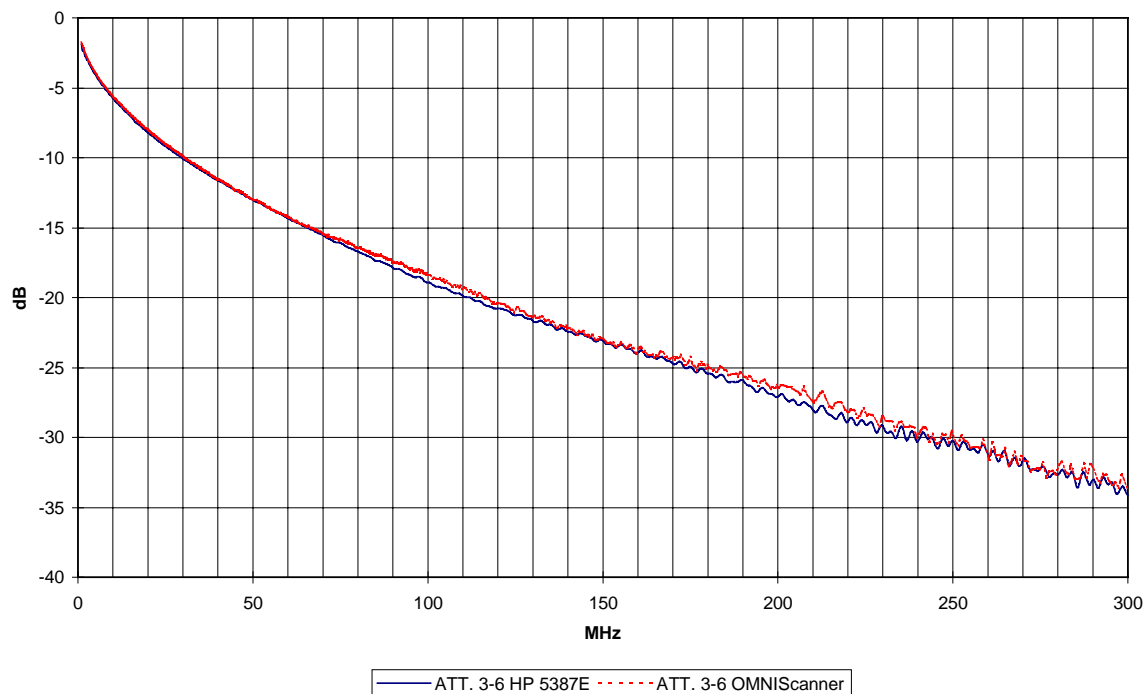
**Test Report no. : 98.30.35.384 - Rev.0**

**Date of issue : 1998 October 07<sup>th</sup>**

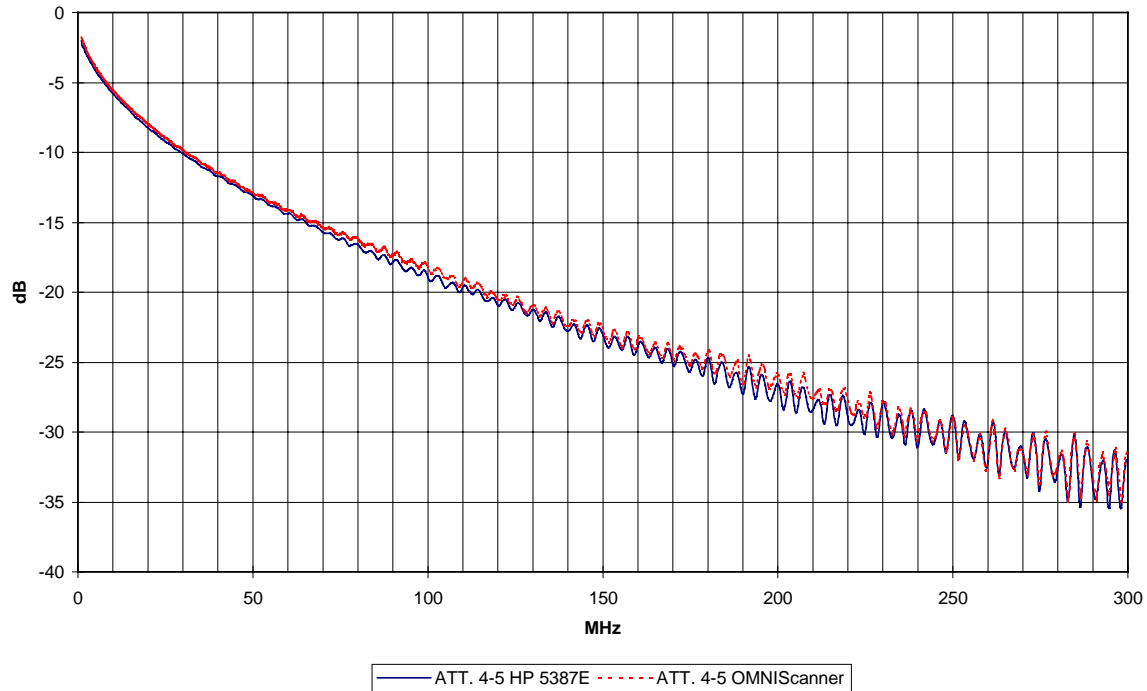
**Comparison ATTENUATION 1-2**



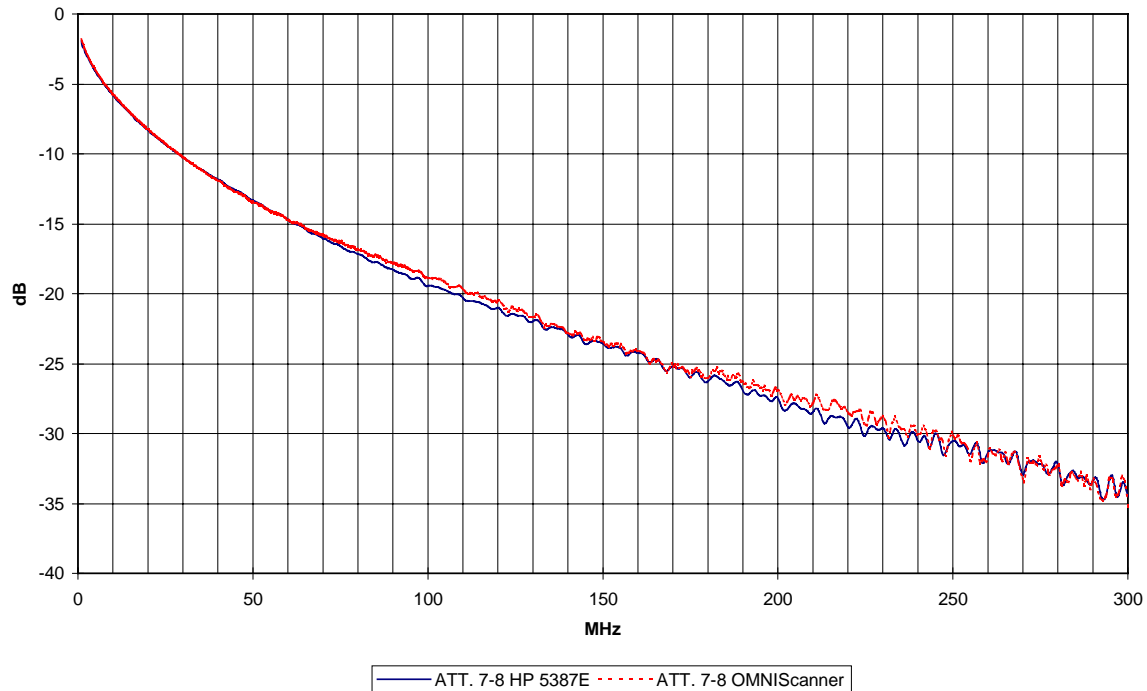
**Comparison ATTENUATION 3-6**



**Comparison ATTENUATION 4-5**



**Comparison ATTENUATION 7-8**



## **ANNEX n° 5**

**Contents : Comparison of FEXT**

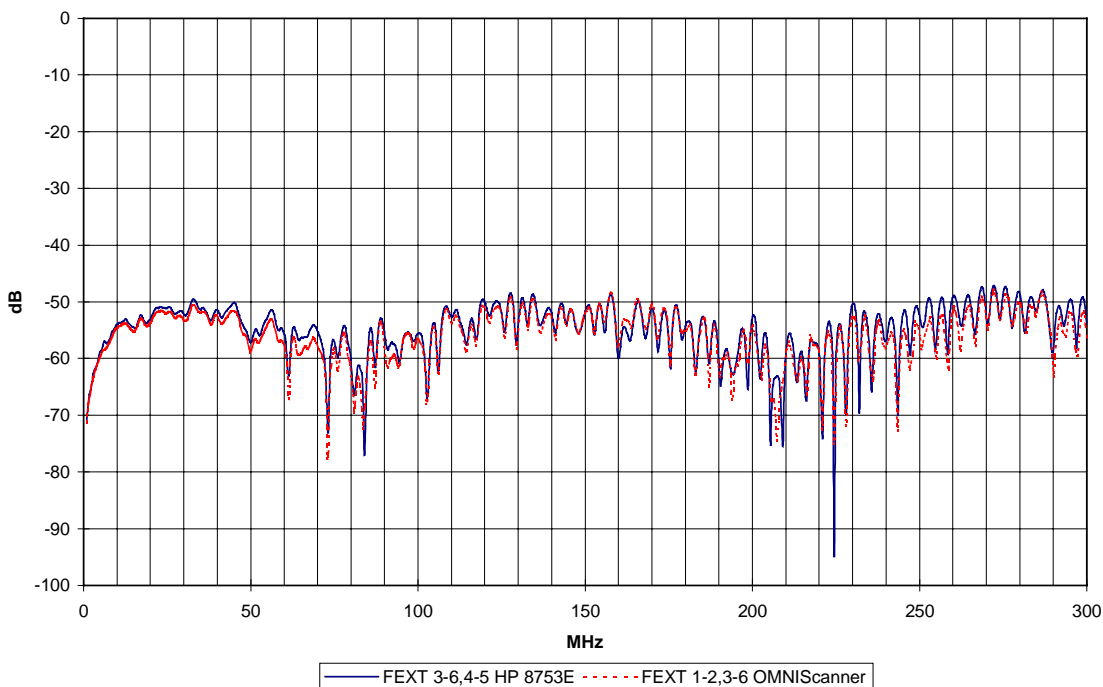
**EUT : Field Tester OMNIScanner**

**Test Report no. : 98.30.35.384 - Rev.0**

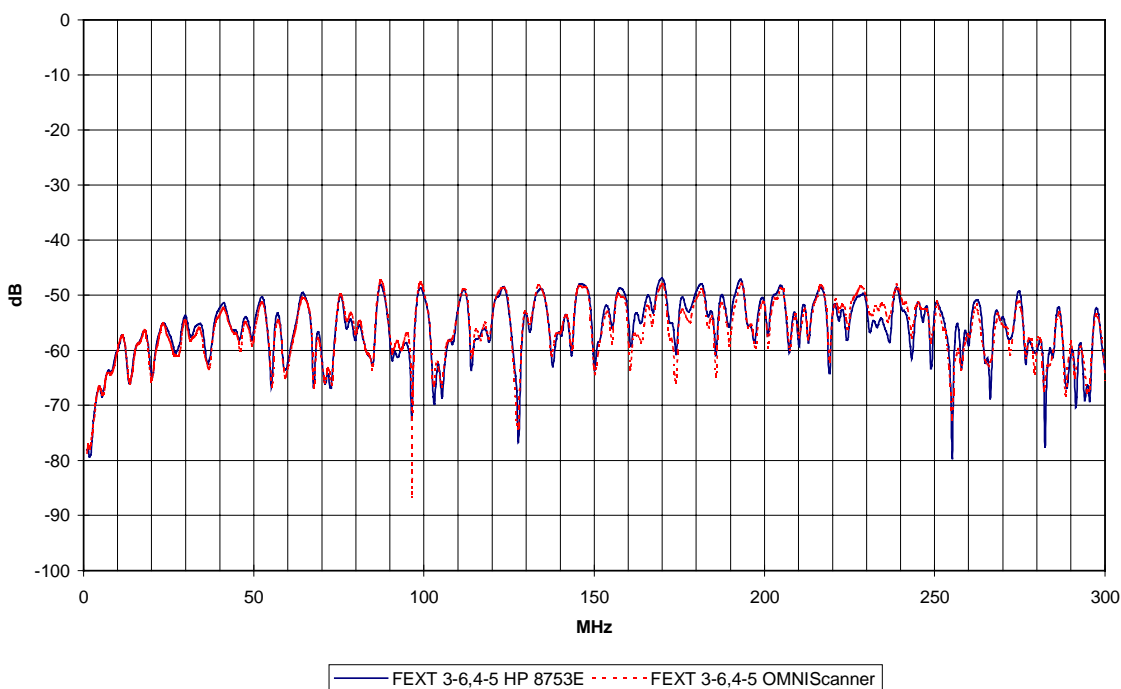
**Date of issue : 1998 October 07<sup>th</sup>**



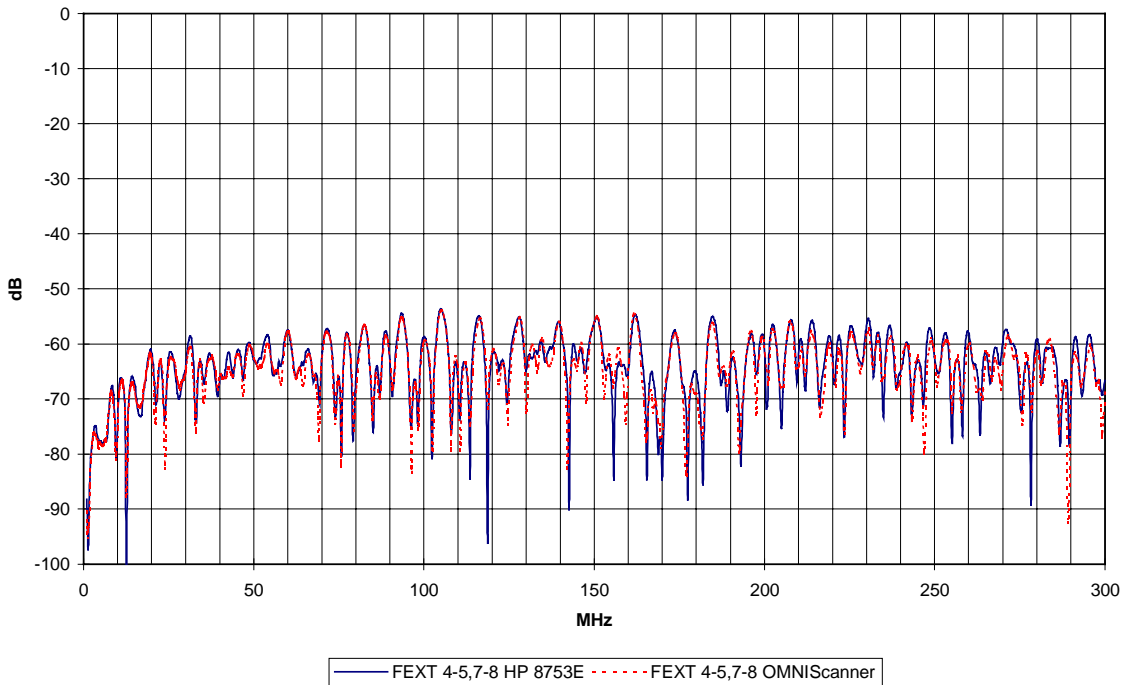
**Comparison of FEXT 1-2 , 3-6**



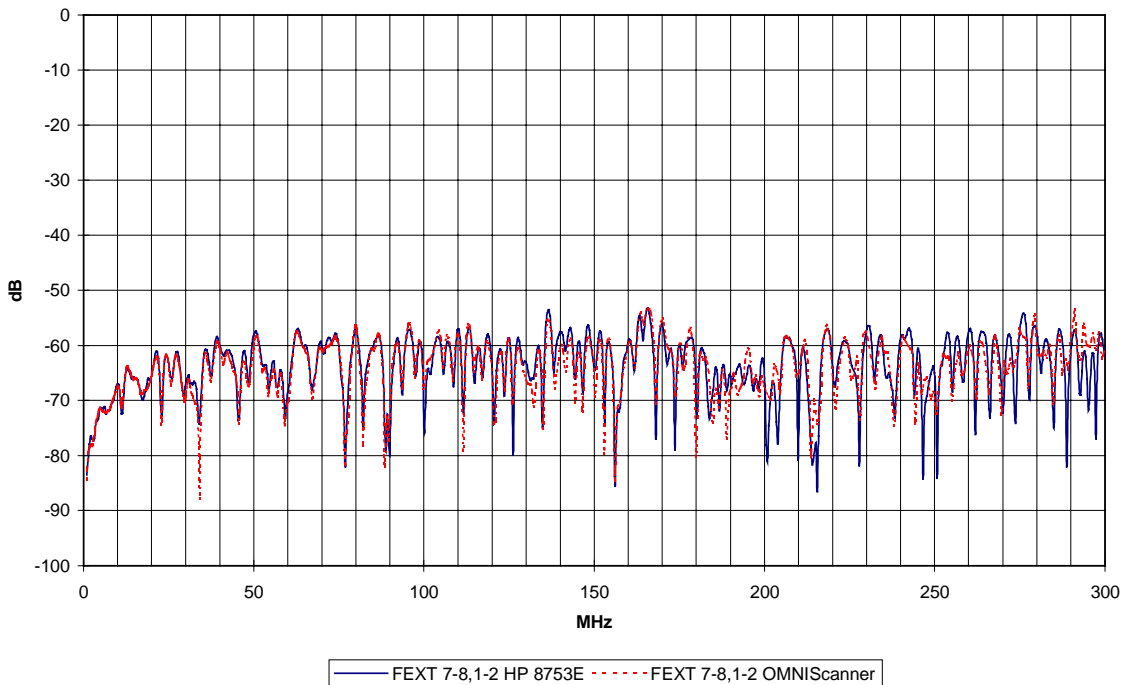
**Comparison of FEXT 3-6, 4-5**



**Comparison of FEXT 4-5,7-8**



**Comparison of FEXT 7-8,1-2**



## **ANNEX n° 6**

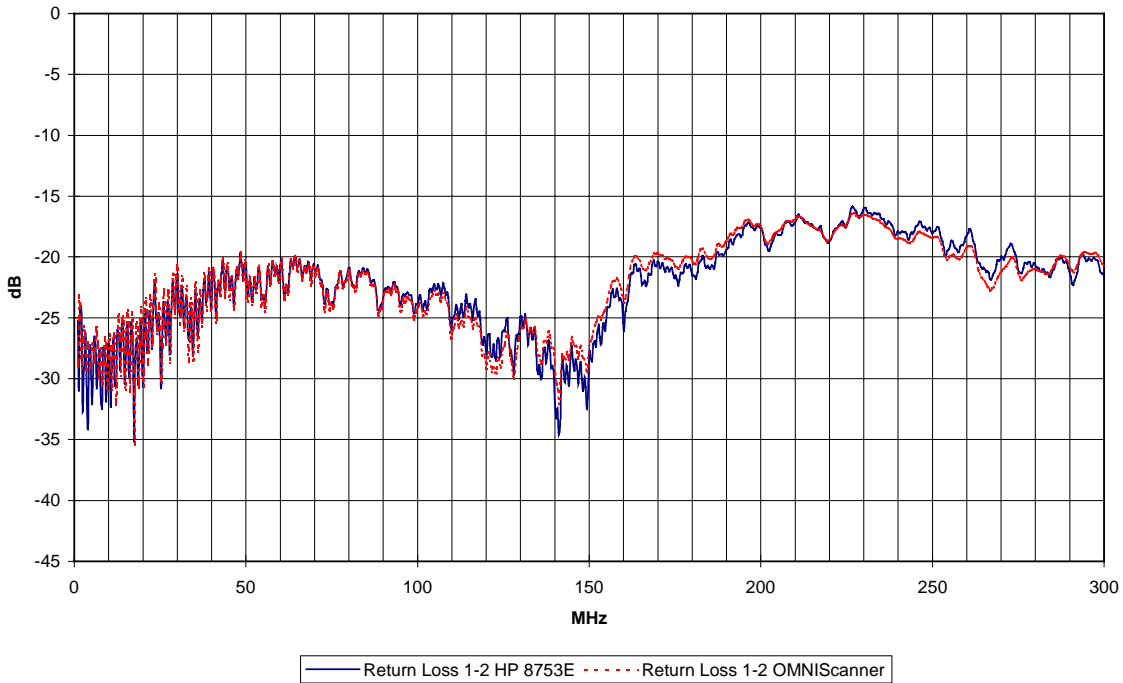
**Contents : Comparison of Return Loss**

**EUT : Field Tester OMNIScanner**

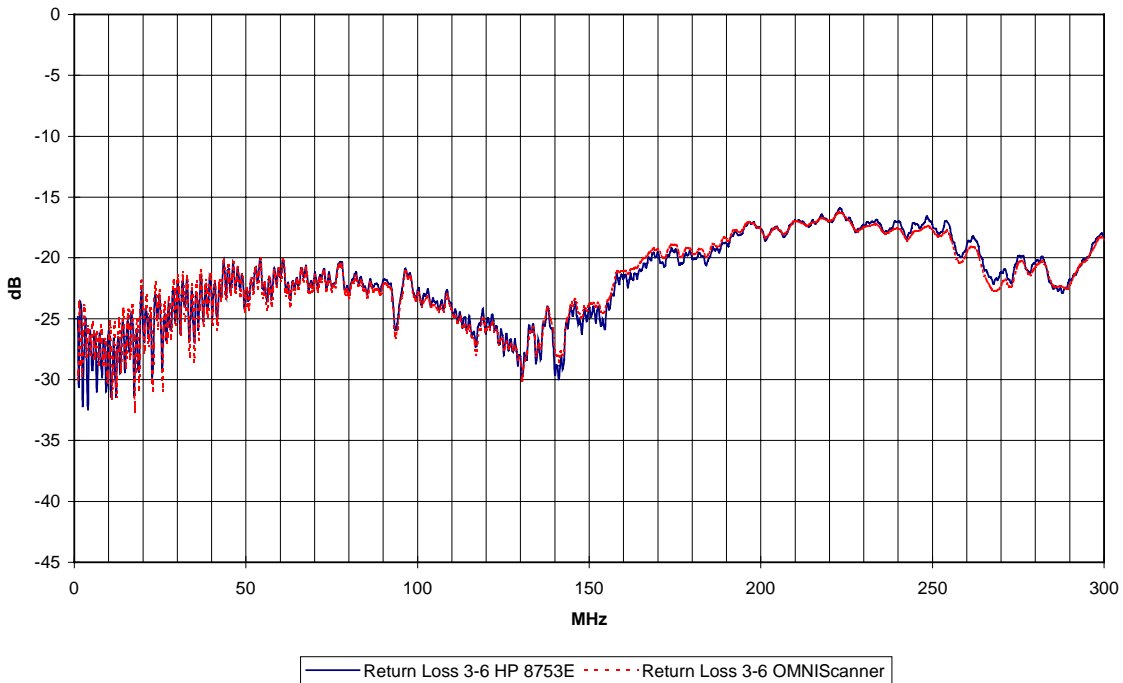
**Test Report no. : 98.30.35.384 - Rev.0**

**Date of issue : 1998 October 07<sup>th</sup>**

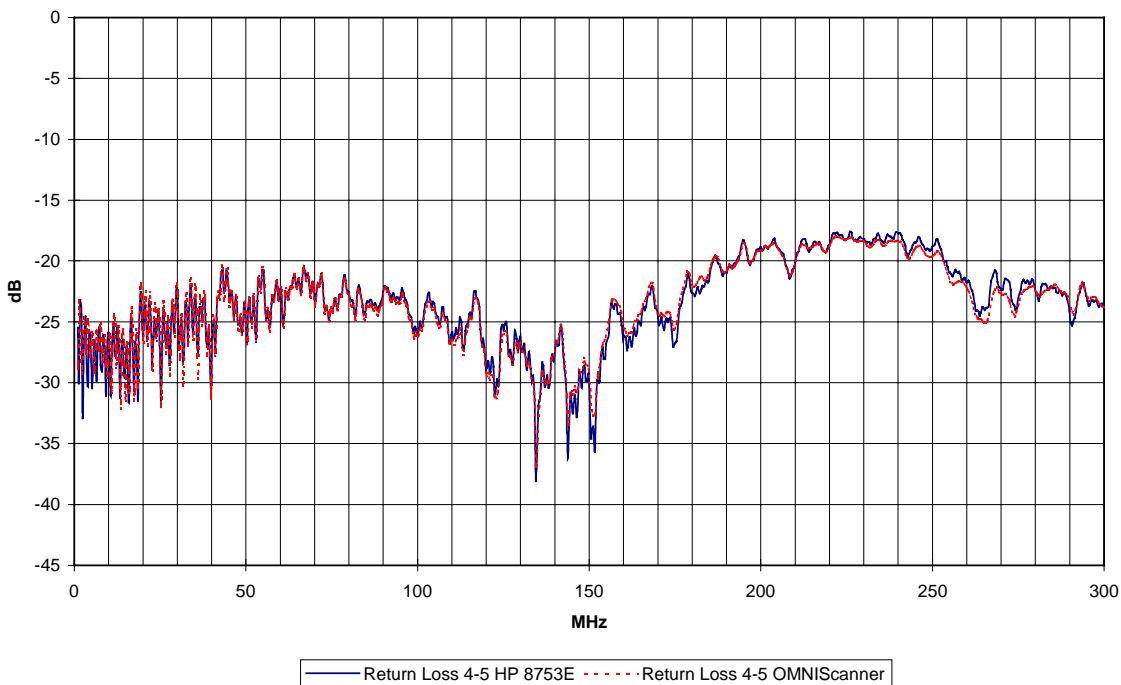
**Comparison of Return Loss 1-2**



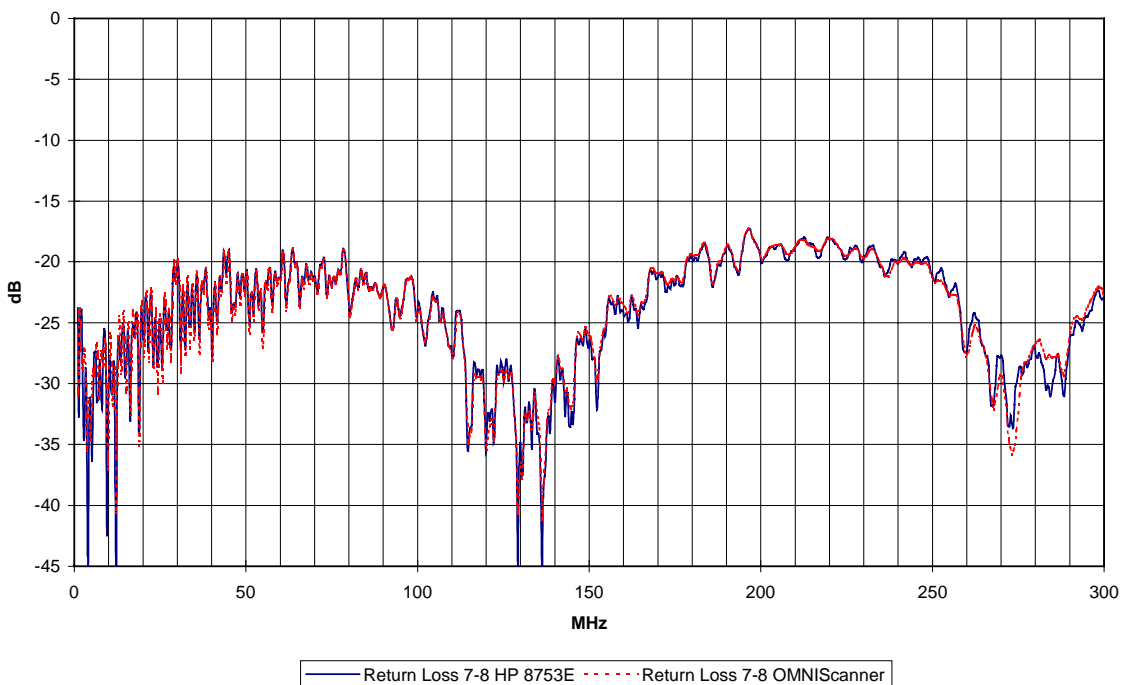
**Comparison of Return Loss 3-6**



**Comparison of Return Loss 4-5**



**Comparison of Return Loss 7-8**



## **ANNEX n° 7**

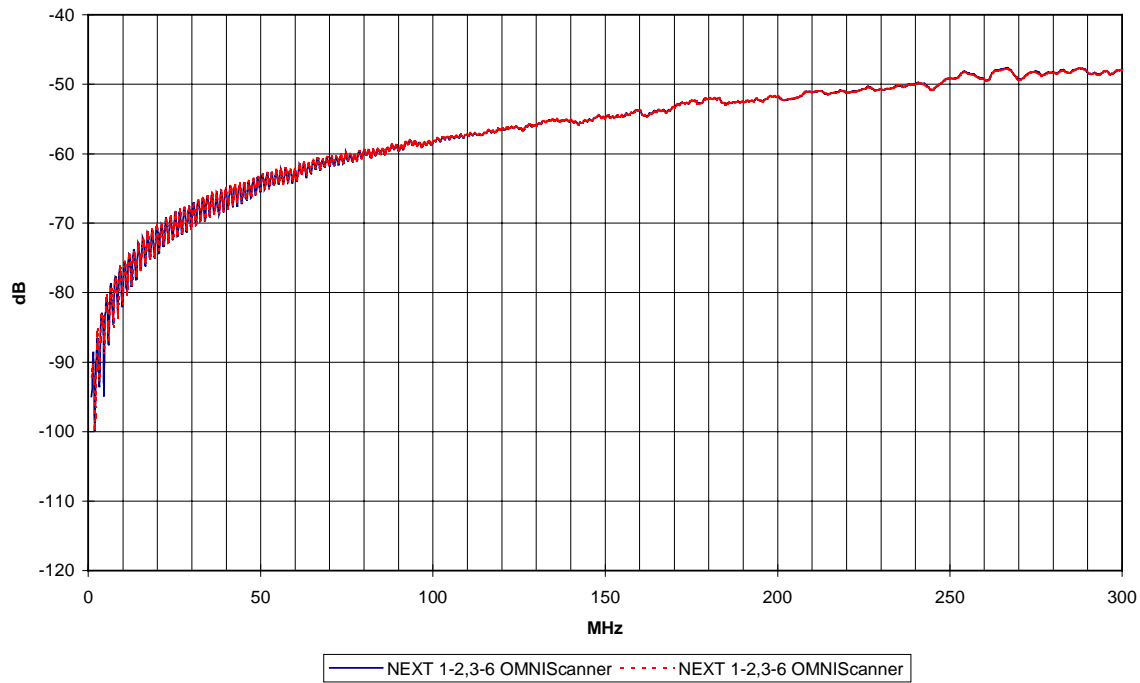
**Contents : OMNIScanner repeatability of NEXT**

**EUT : Field Tester OMNIScanner**

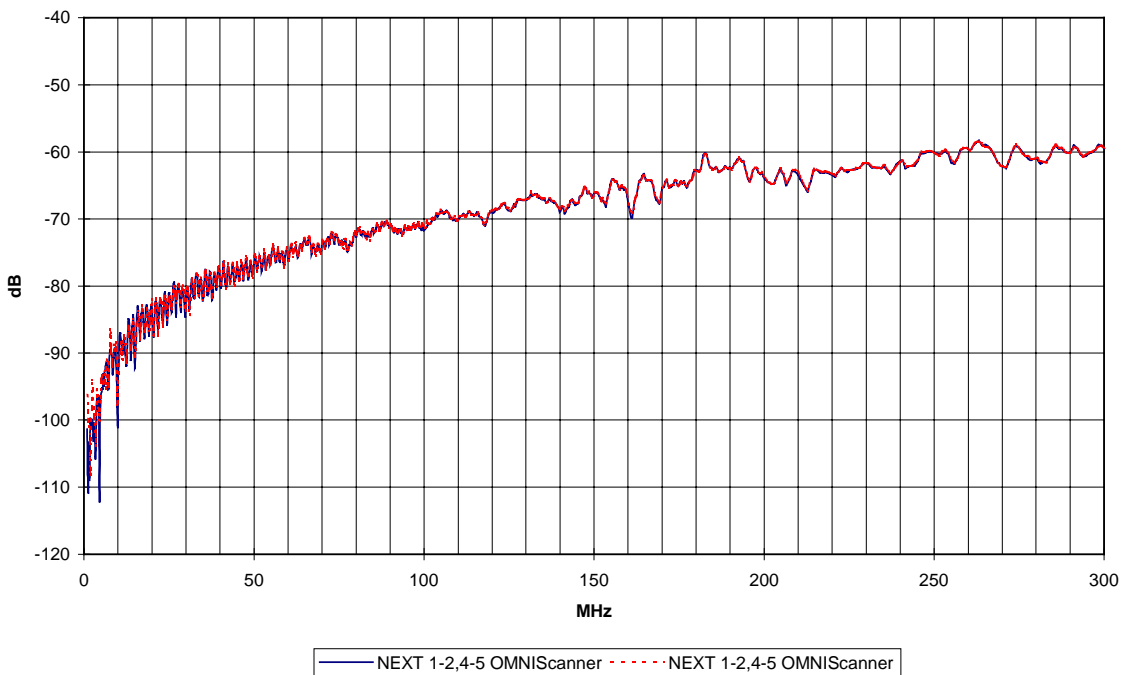
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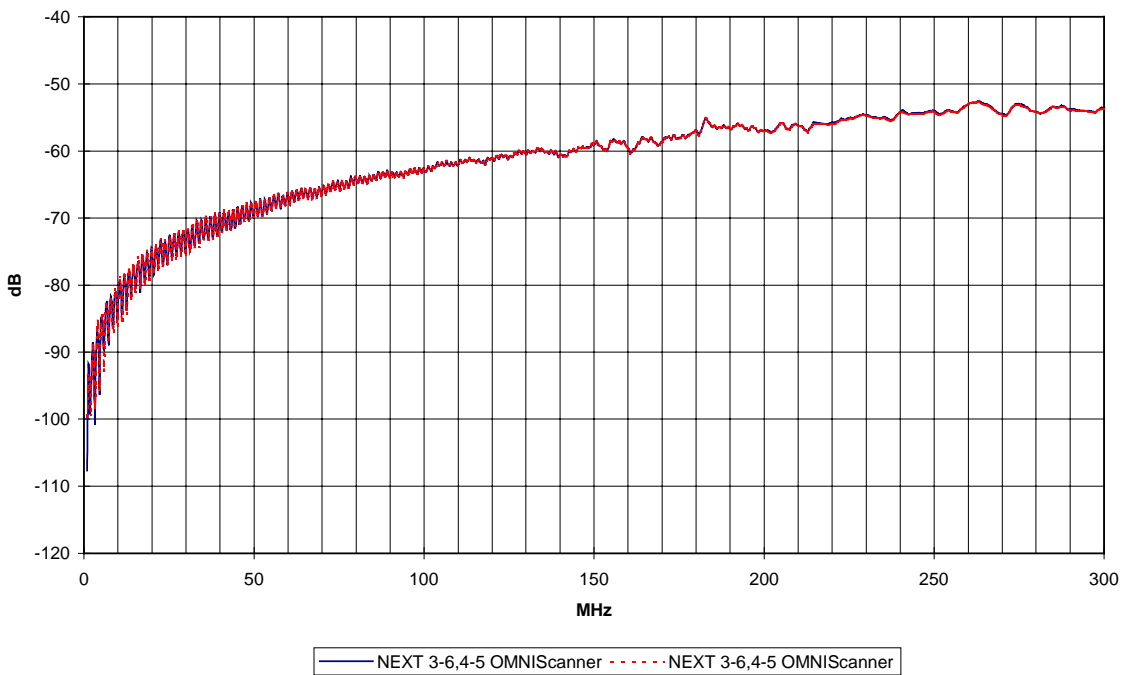
**OMNIScanner Repeatability**  
**NEXT 1-2,3-6**



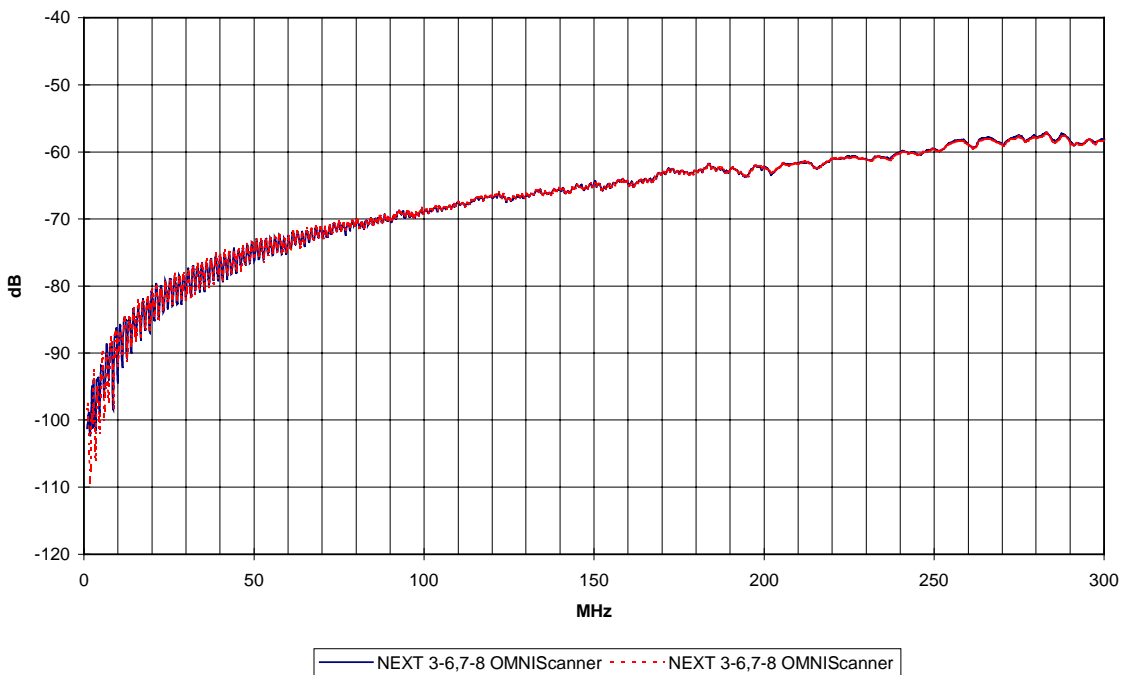
**OMNIScanner Repeatability**  
**NEXT 1-2,4-5**



**OMNIScanner Repeatability**  
**NEXT 3-6,4-5**

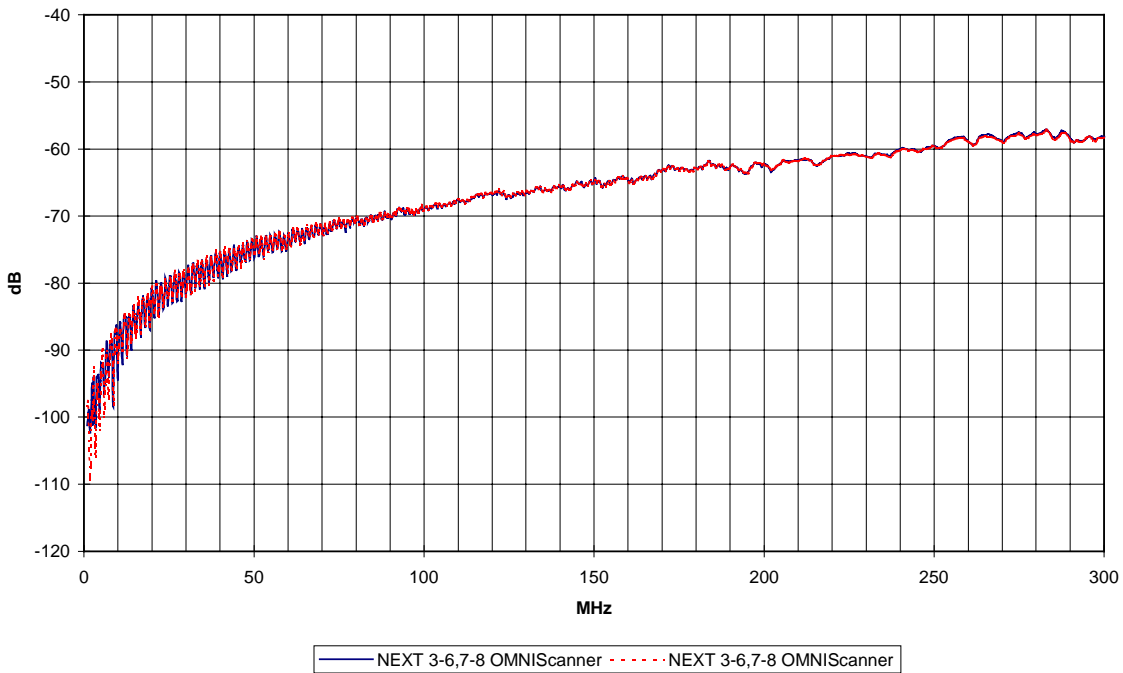


**OMNIScanner Repeatability**  
**NEXT 3-6,7-8**

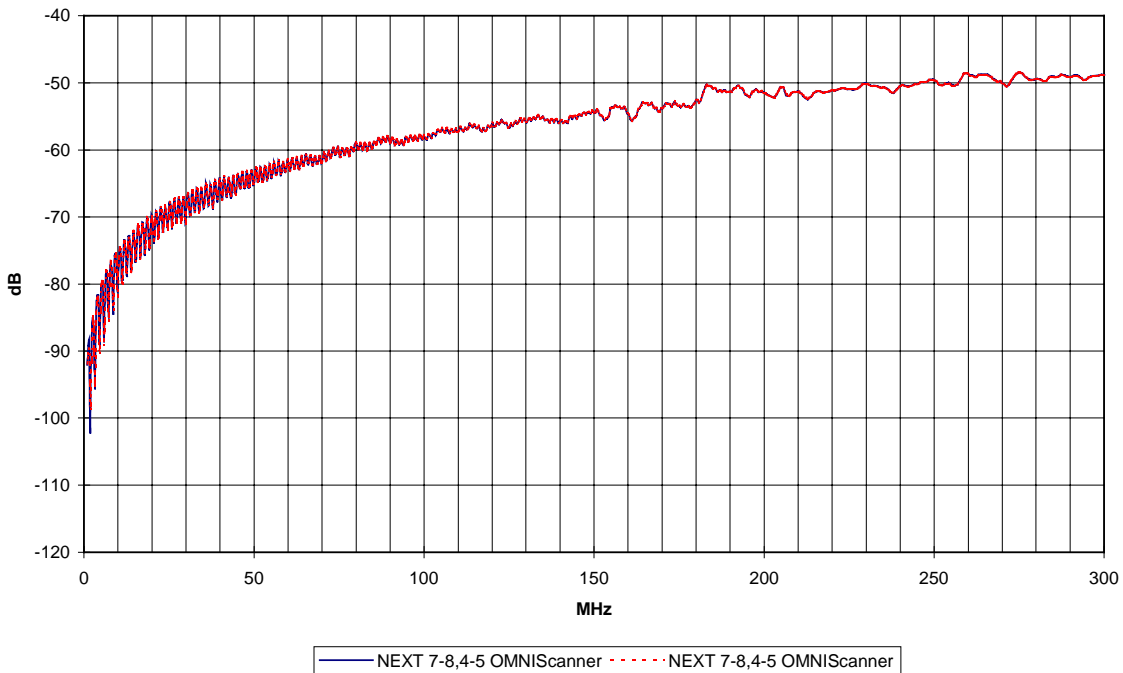




**OMNIScanner Repeatability**  
**NEXT 3-6,7-8**



**OMNIScanner Repeatability**  
**NEXT 7-8,4-5**





## **ANNEX n° 8**

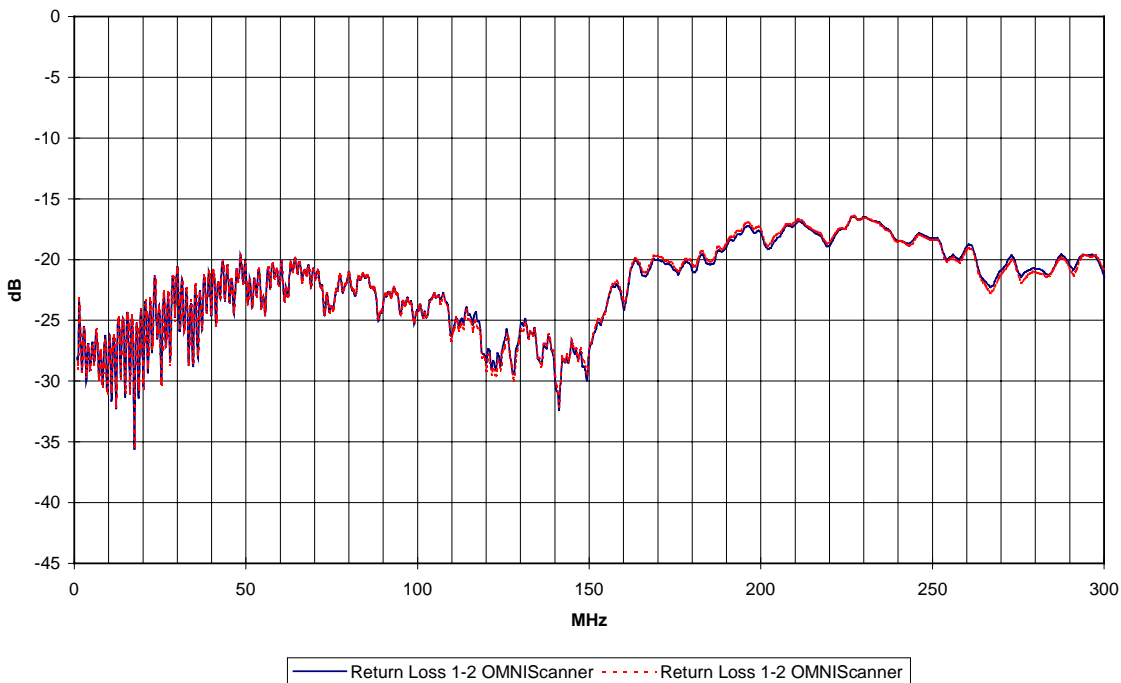
**Contents : OMNIScanner Repeatability of Return Loss**

**EUT : Field Tester OMNIScanner**

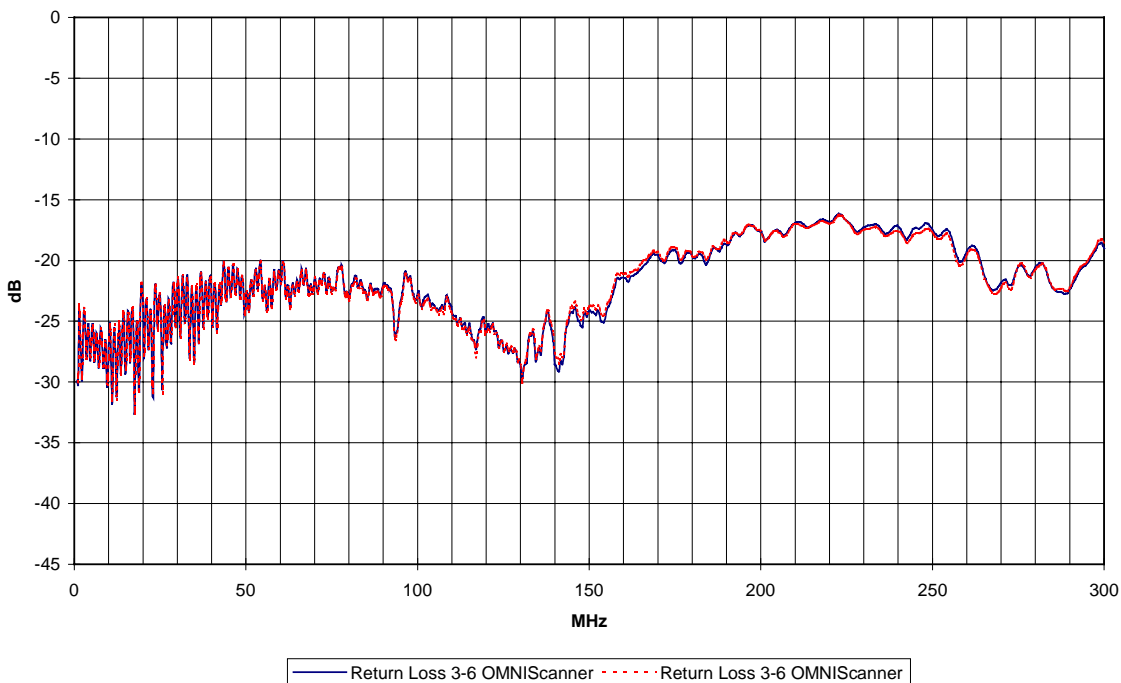
**Test Report no. : 98.30.35.384 - Rev.0**

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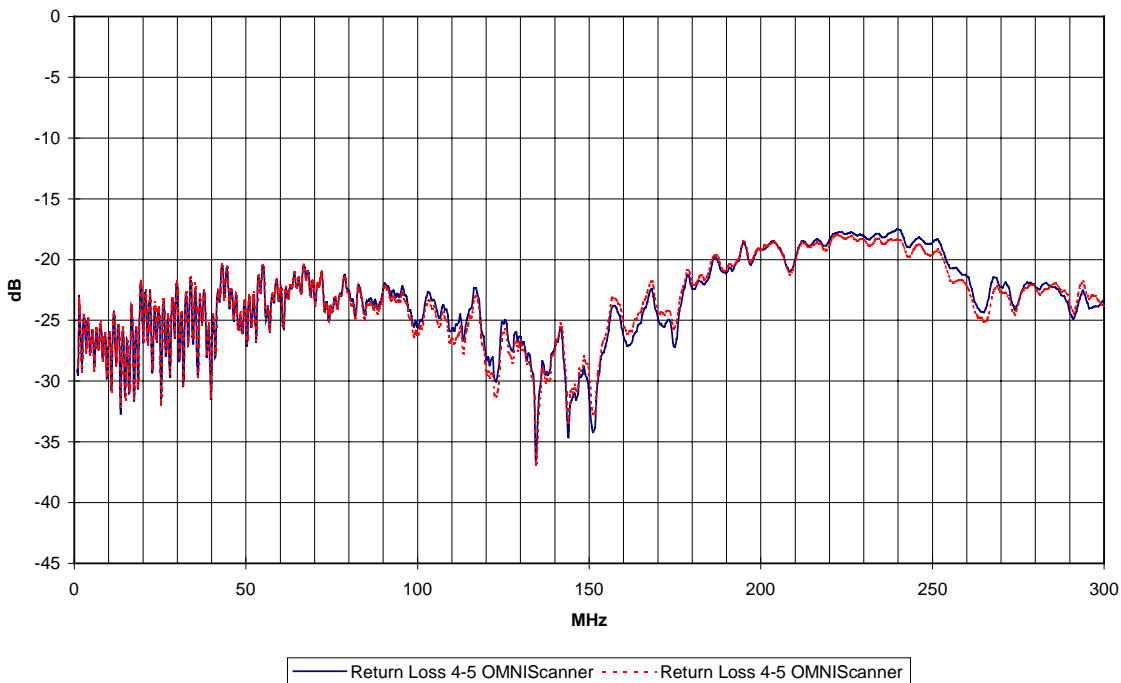
**OMNIScanner Repeatability**  
**Return Loss 1-2**



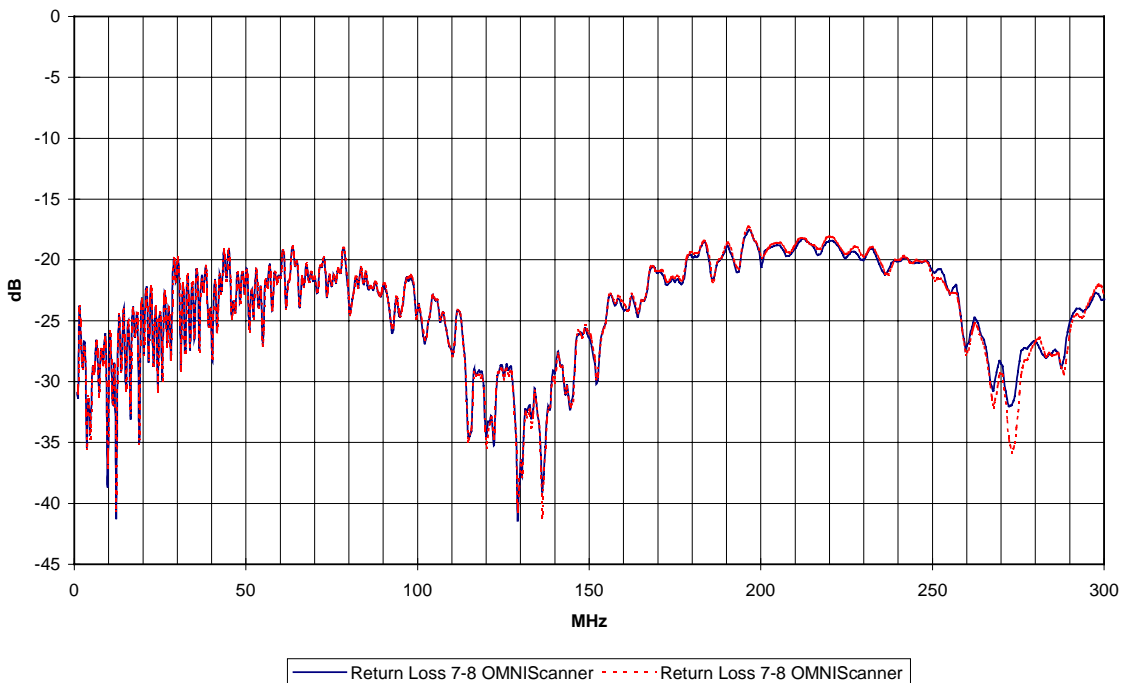
**OMNIScanner Repeatability**  
**Return Loss 3-6**



**OMNIScanner Repeatability**  
**Return Loss 4-5**



**OMNIScanner Repeatability**  
**Return Loss 7-8**



## **ANNEX n° 9**

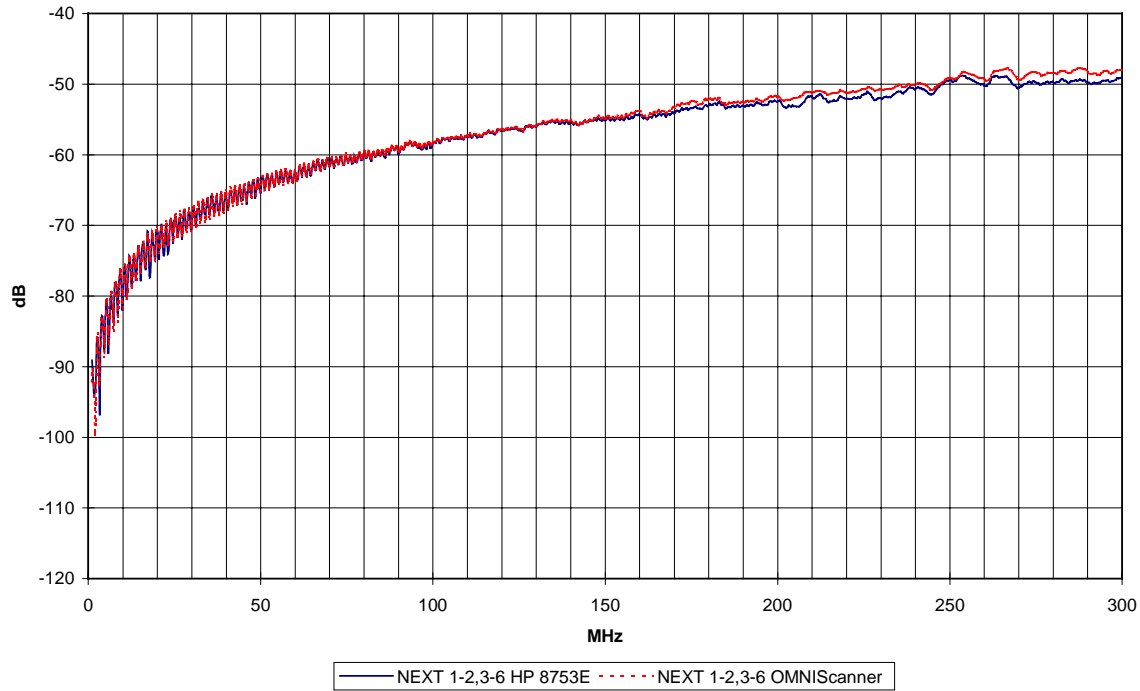
**Contents** : **Comparison of curves inverting position of OMNIScanner and OMNIRemote (NEXT)**

**EUT** : **Field Tester OMNIScanner**

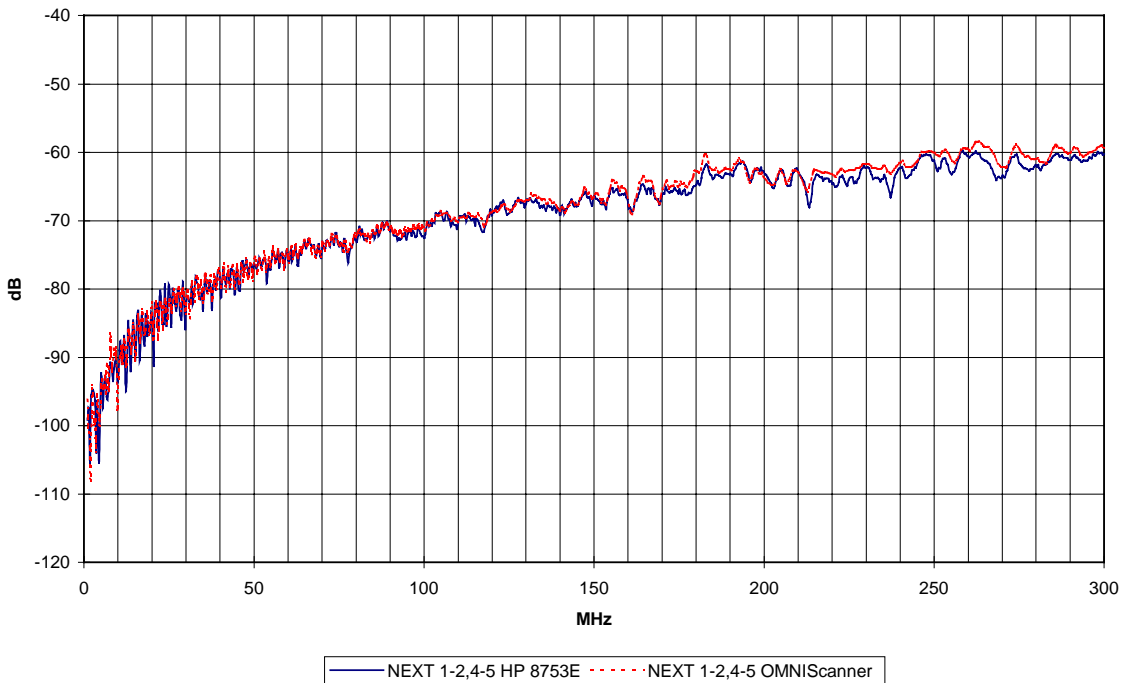
**Test Report no.** : **98.30.35.384 - Rev.0**

**Date of issue** : **1998 October 07<sup>th</sup>**

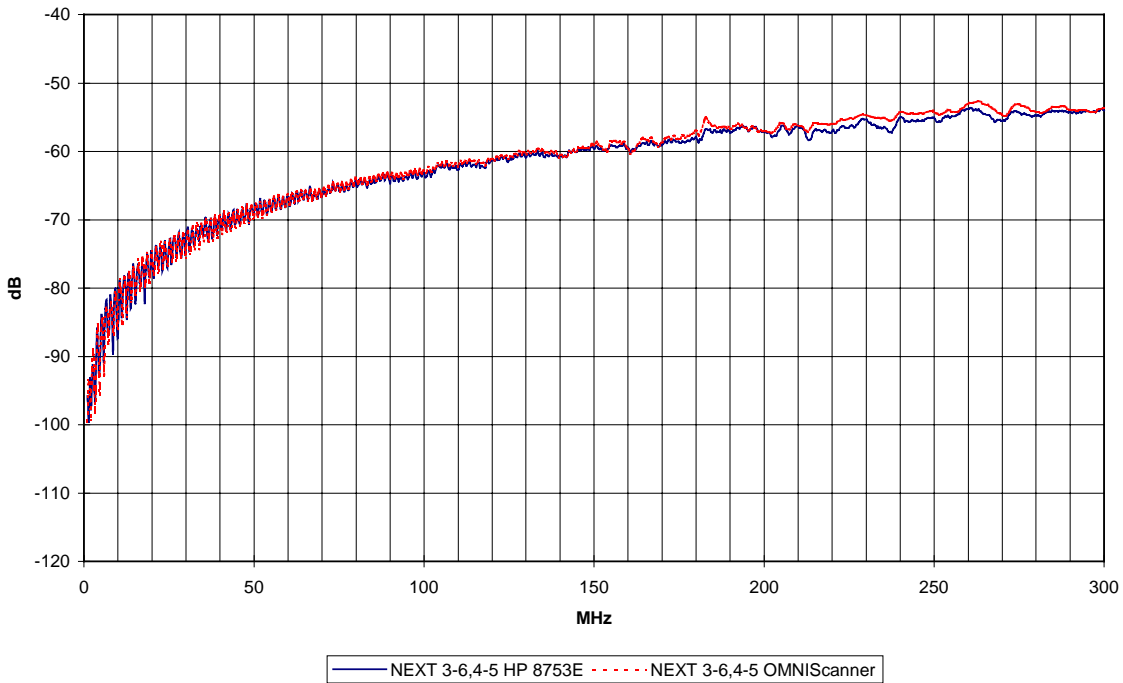
Comparison of curves inverting of OMNIScanner and OMNIRemote  
NEXT 1-2,3-6



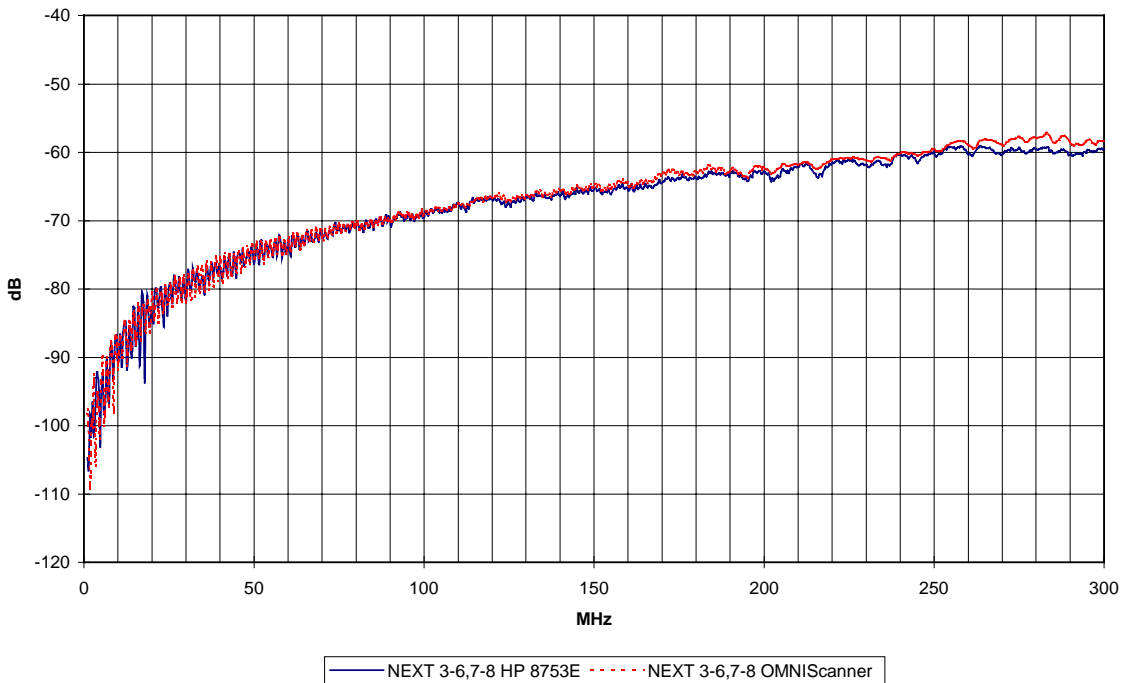
Comparison of curves inverting of OMNIScanner and OMNIRemote  
NEXT 1-2,4-5



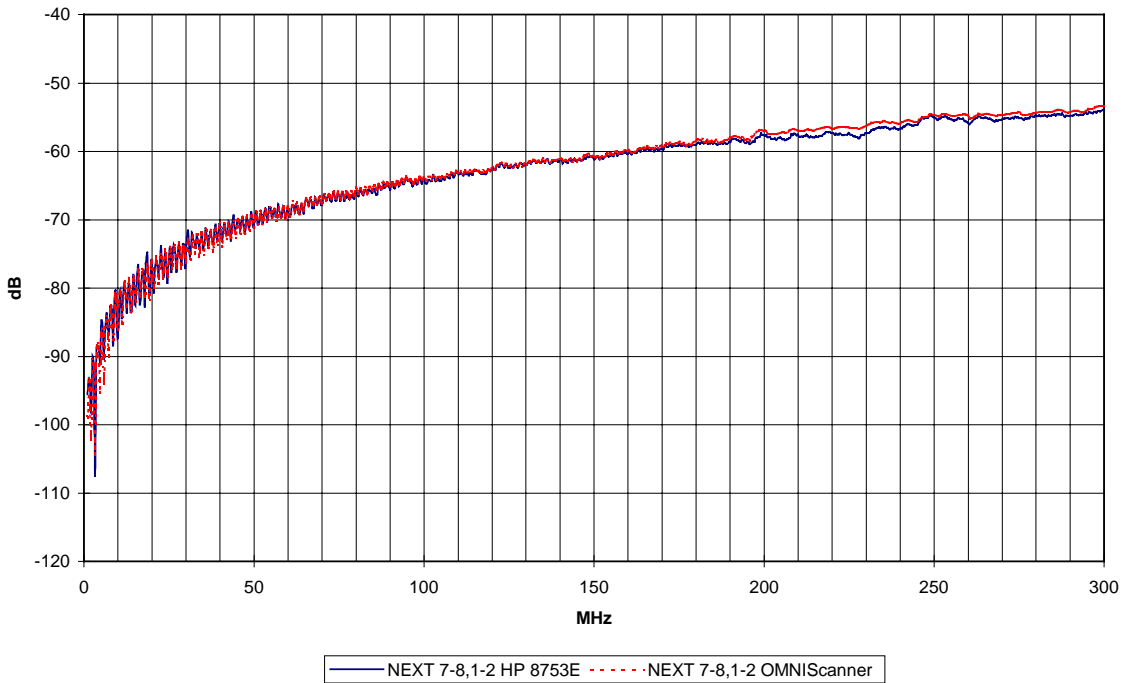
**Comparison of curves inverting of OMNIScanner and OMNIRemote  
NEXT 3-6,4-5**



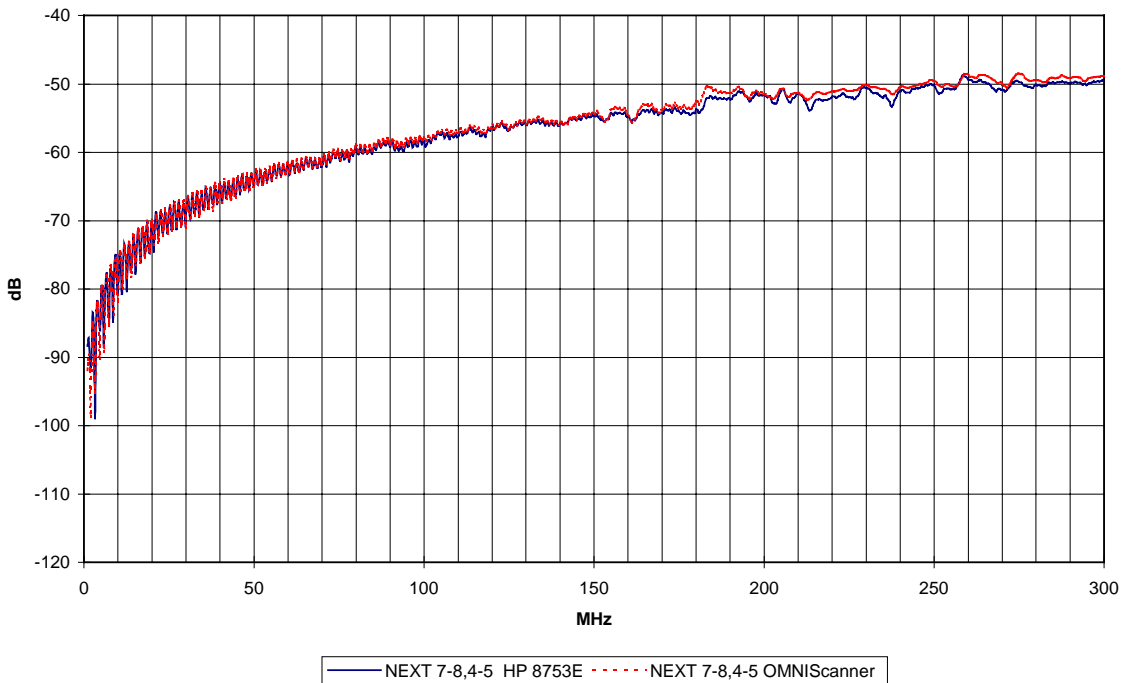
**Comparison of curves inverting of OMNIScanner and OMNIRemote  
NEXT 3-6,7-8**



Comparison of curves inverting of OMNIScanner and OMNIRemote  
NEXT 7-8,1-2



Comparison of curves inverting of OMNIScanner and OMNIRemote  
NEXT 7-8,4-5





## **ANNEX n° 10**

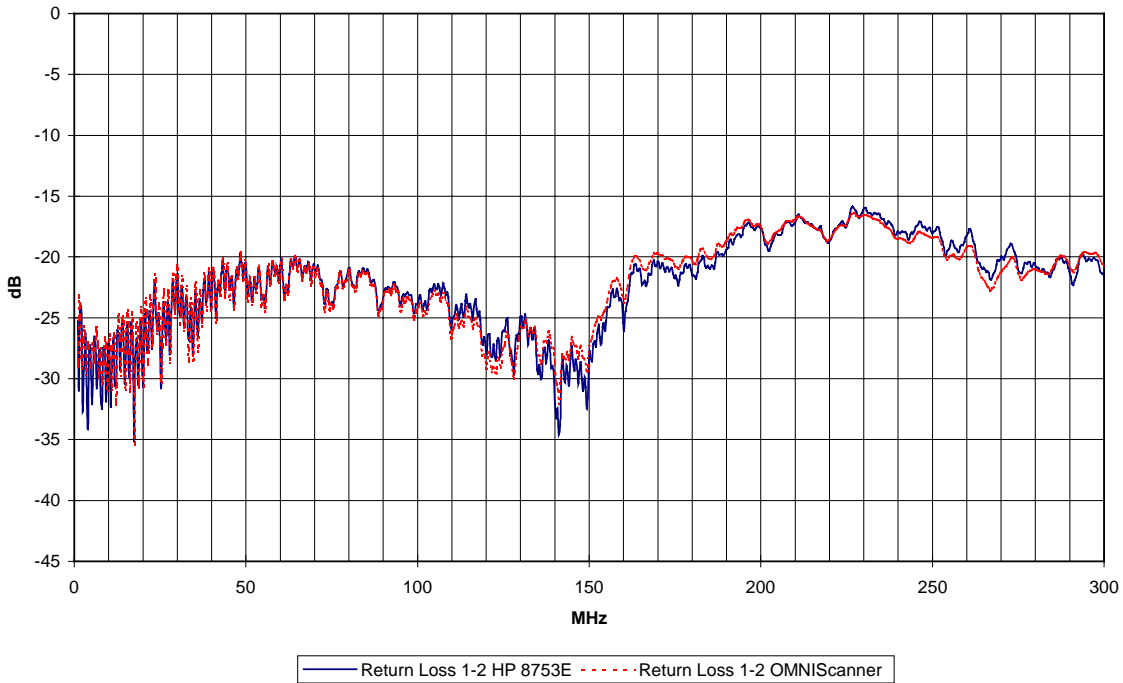
**Contents** : **Comparison of curves inverting position of  
OMNIScanner and OMNIRemote (RETURN LOSS)**

**EUT** : **Field Tester OMNIScanner**

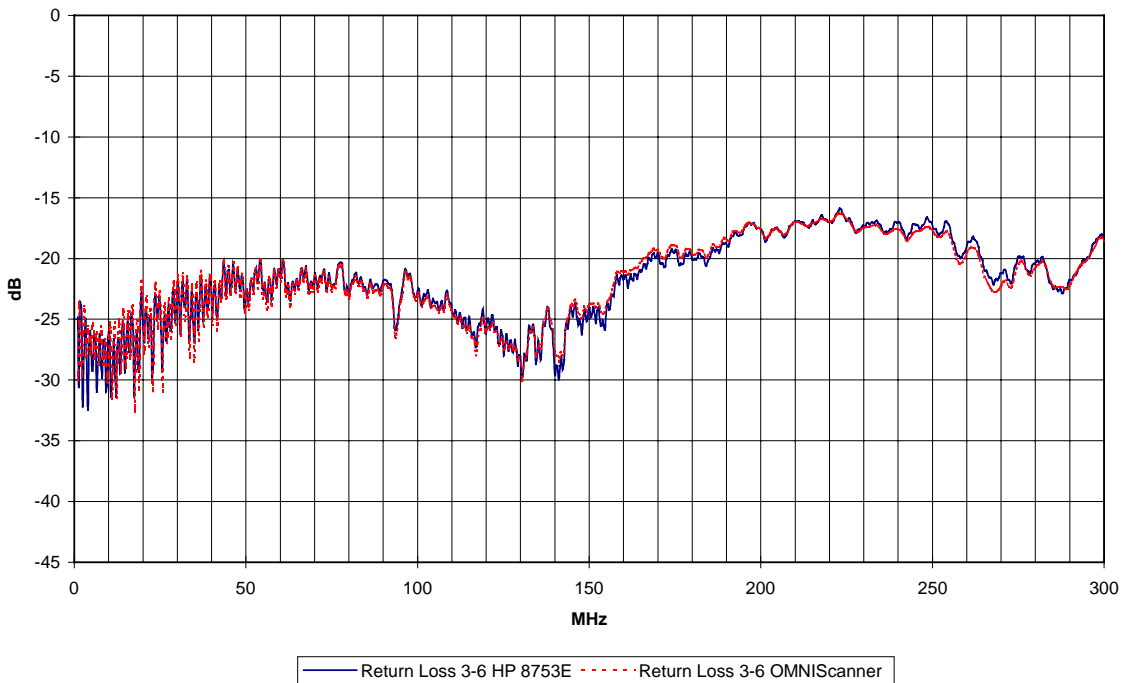
**Test Report no.** : **98.30.35.384 - Rev.0**

**Date of issue** : **1998 October 07<sup>th</sup>**

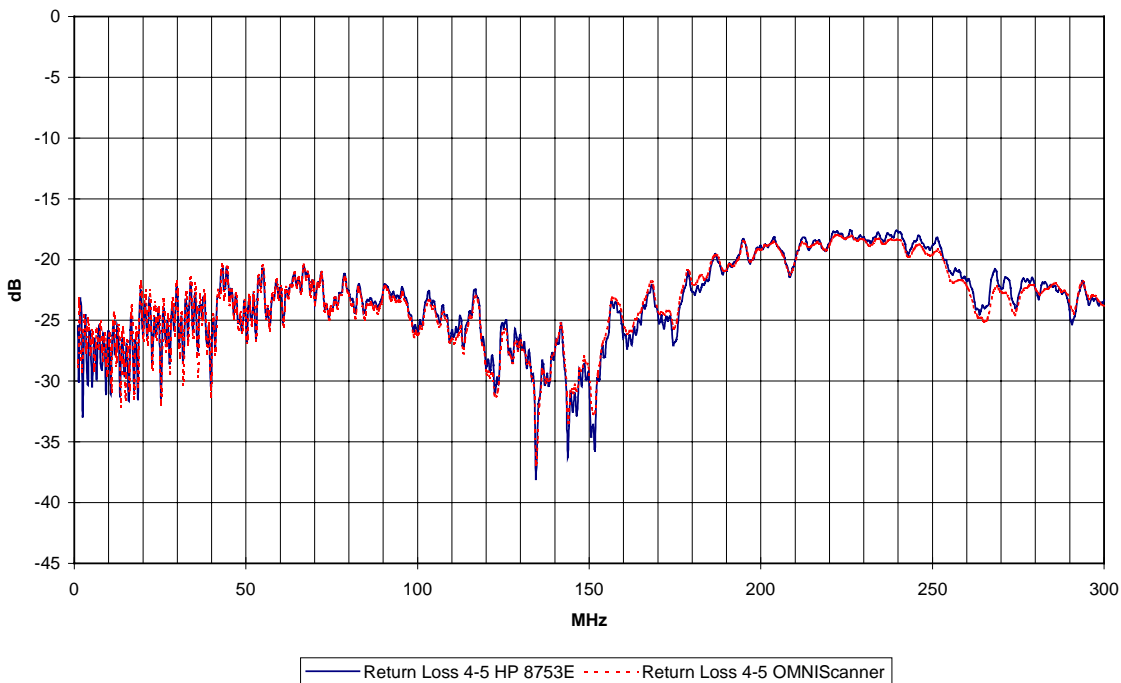
**Comparison of curves inverting position of OMNIScanner and OMNIRemote Return Loss 1-2**



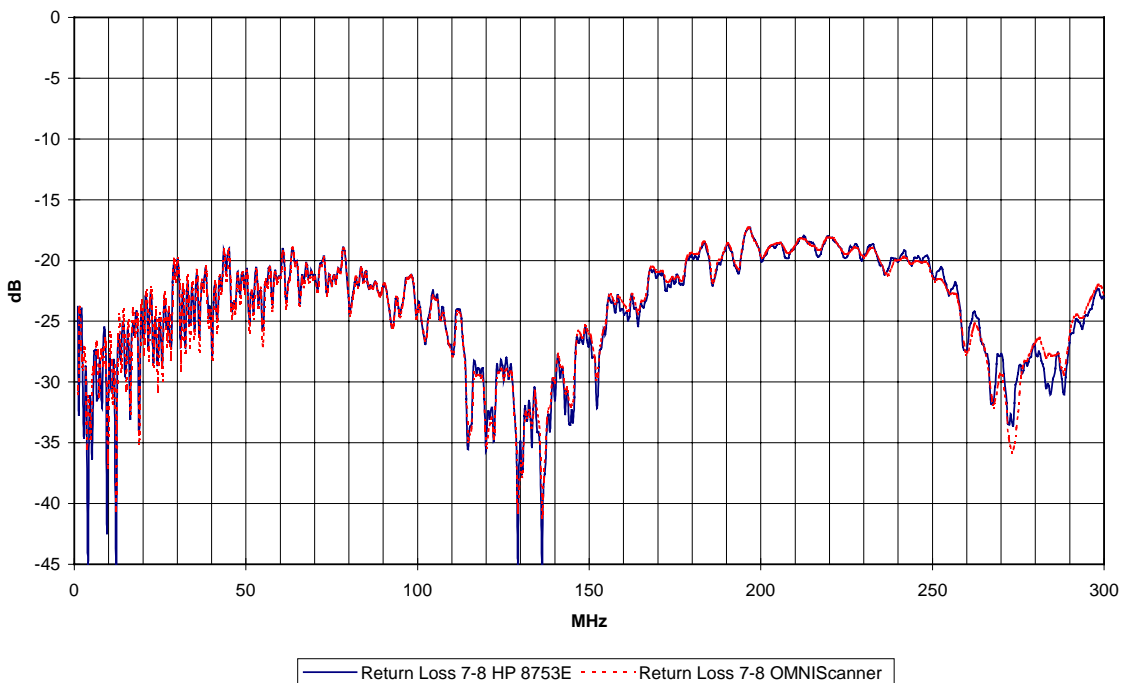
**Comparison of curves inverting position of OMNIScanner and OMNIRemote Return Loss 3-6**



**Comparison of curves inverting position of OMNIScanner and OMNIRemote**  
**Return Loss 4-5**



**Comparison of curves inverting position of OMNIScanner and OMNIRemote**  
**Return Loss 7-8**



# **ANNEX n° 11**

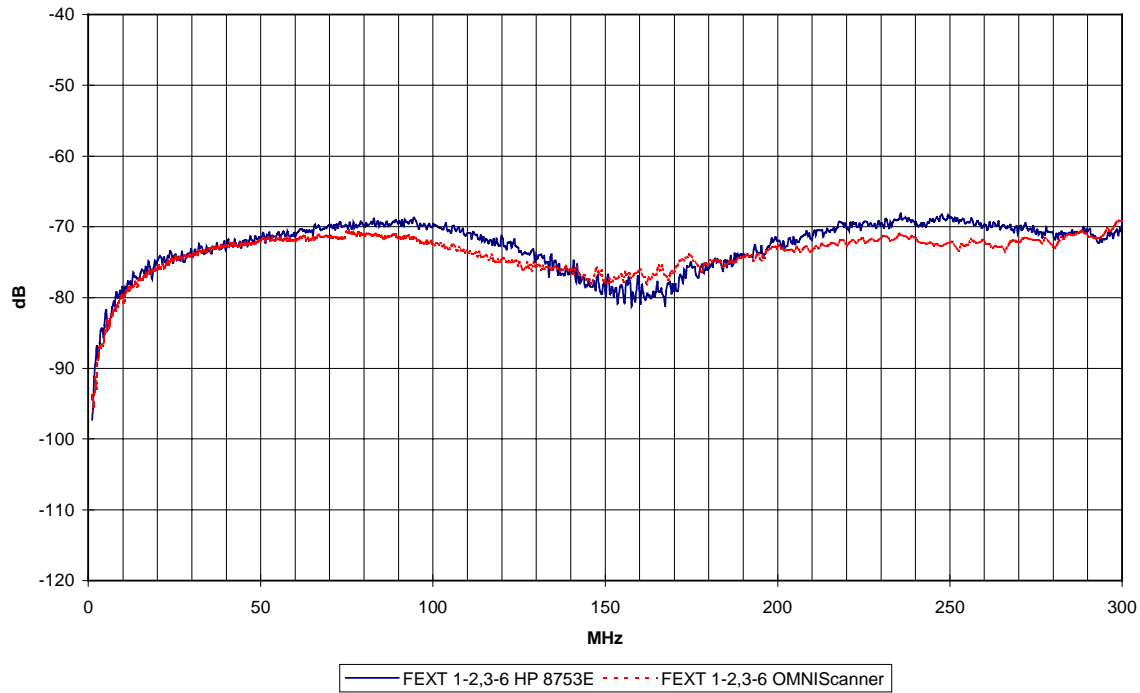
**Contents : Comparison of FEXT S-STP**

**EUT : Field Tester OMNIScanner**

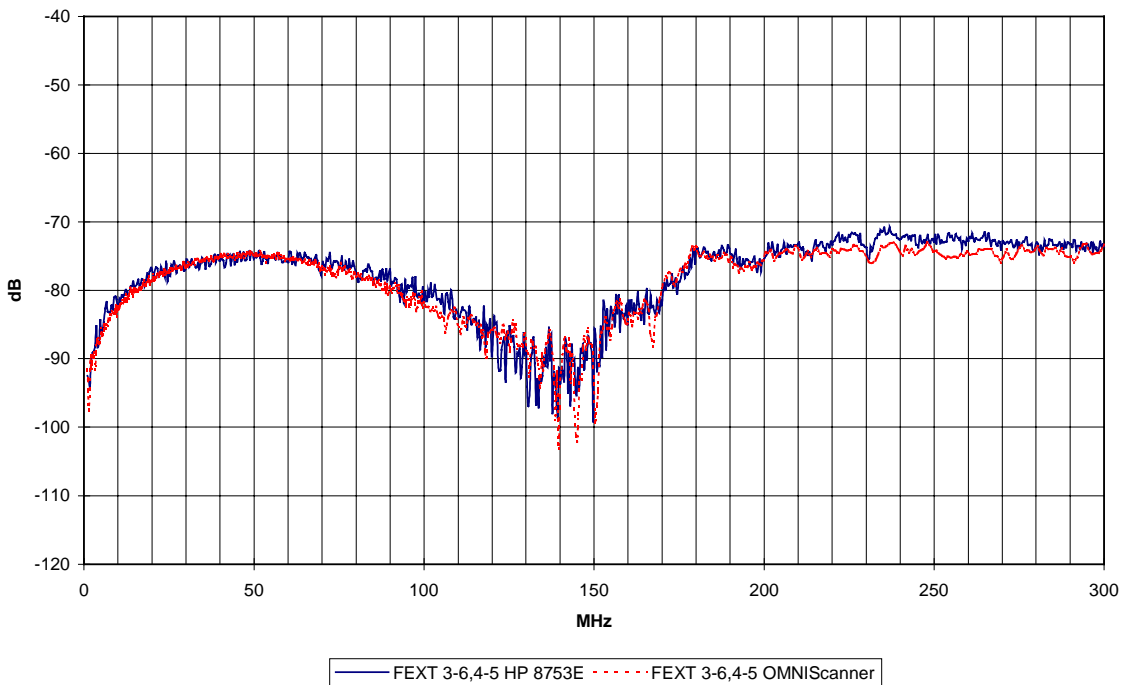
**Test Report no. : 98.30.35.384 - Rev.0**

**Date of issue : 1998 October 07<sup>th</sup>**

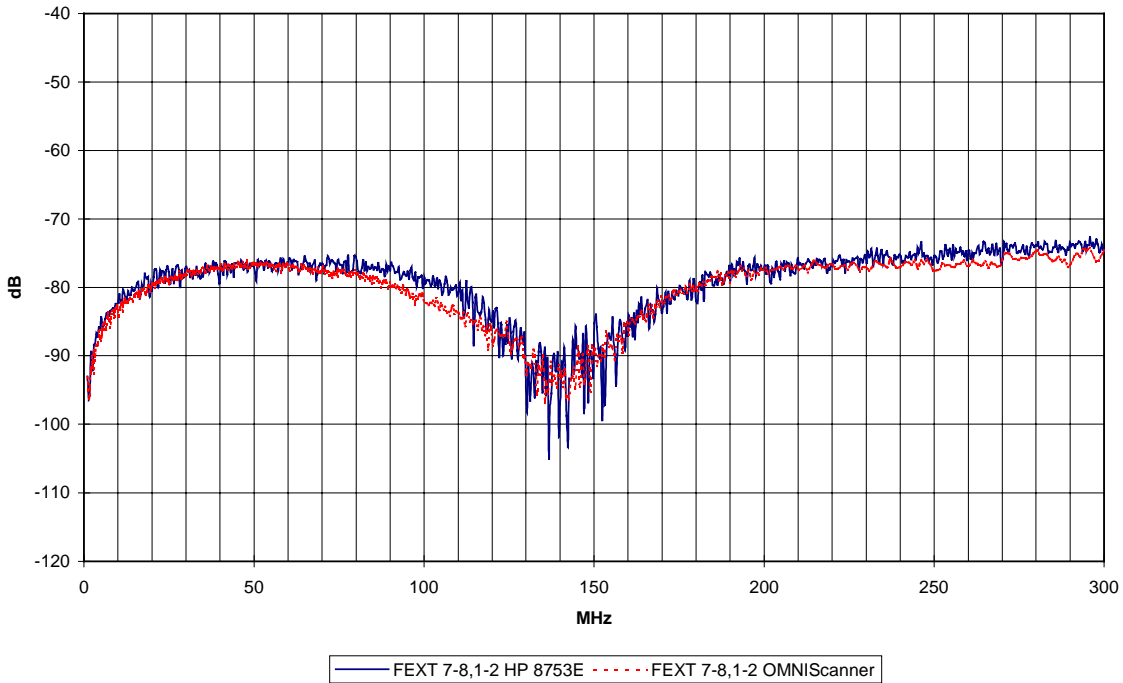
Comparison of FEXT 1-2,3-6



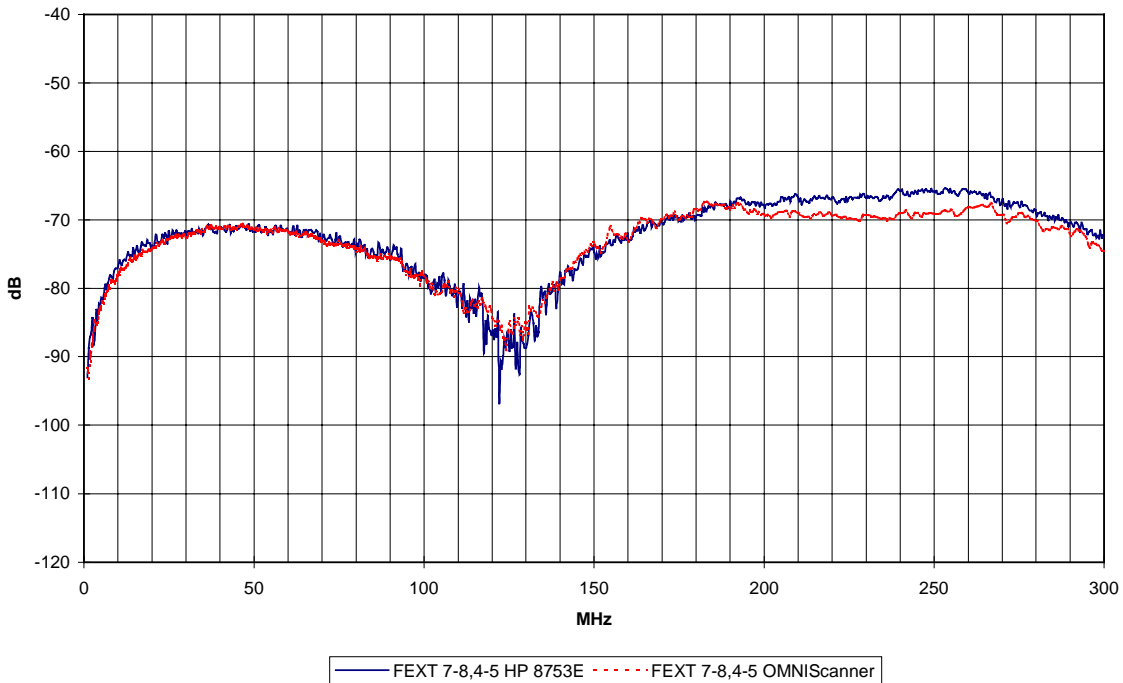
Comparison of FEXT 3-6,4-5



Comparison of FEXT 7-8,1-2



Comparison of FEXT 7-8,4-5



## **ANNEX n° 12**

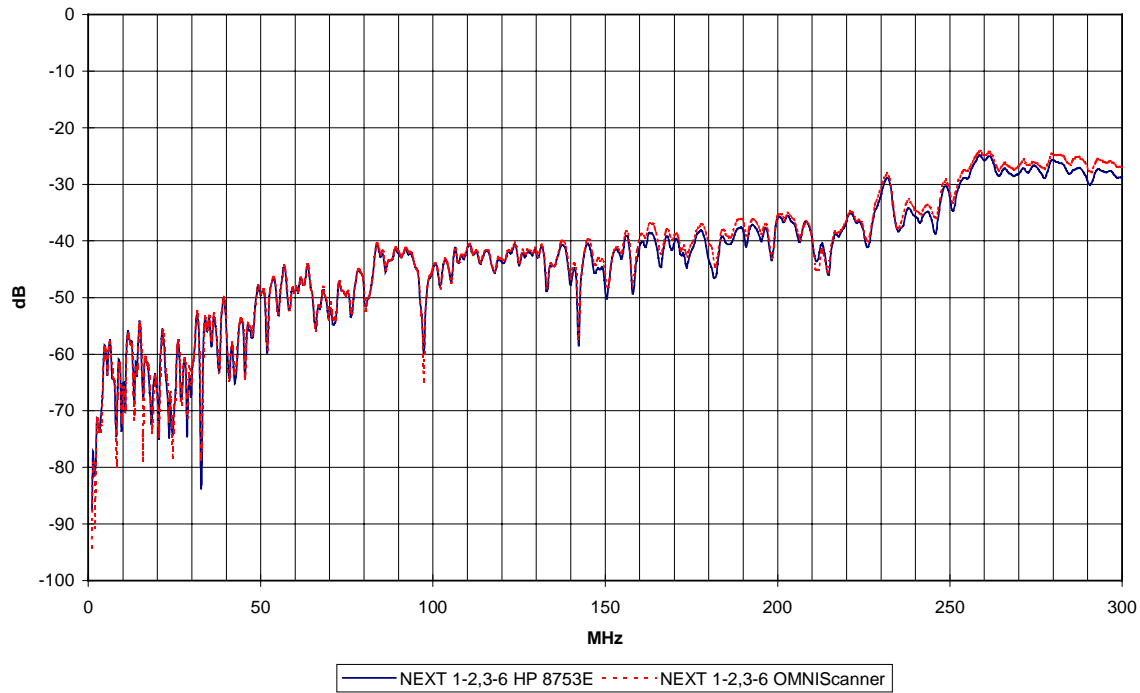
**Contents : Comparison of NEXT UTP CAT 5**

**EUT : Field Tester OMNIScanner**

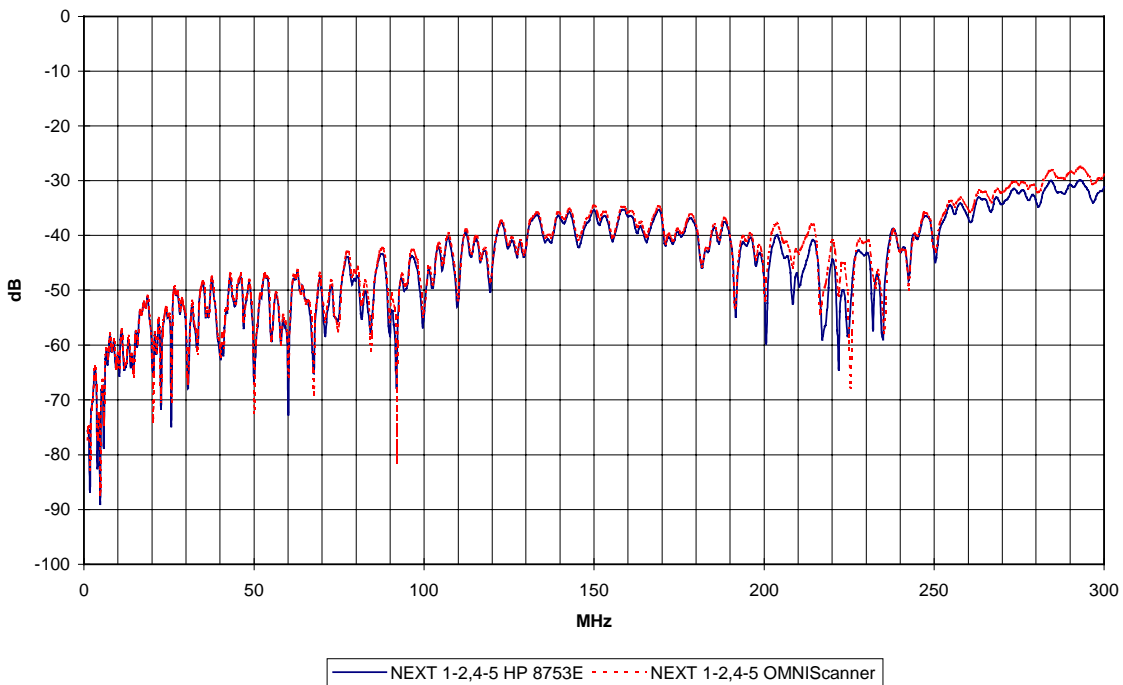
**Test Report no. : 98.30.35.384 - Rev.0**

**Date of issue : 1998 October 07<sup>th</sup>**

Comparison of NEXT 1-2,3-6

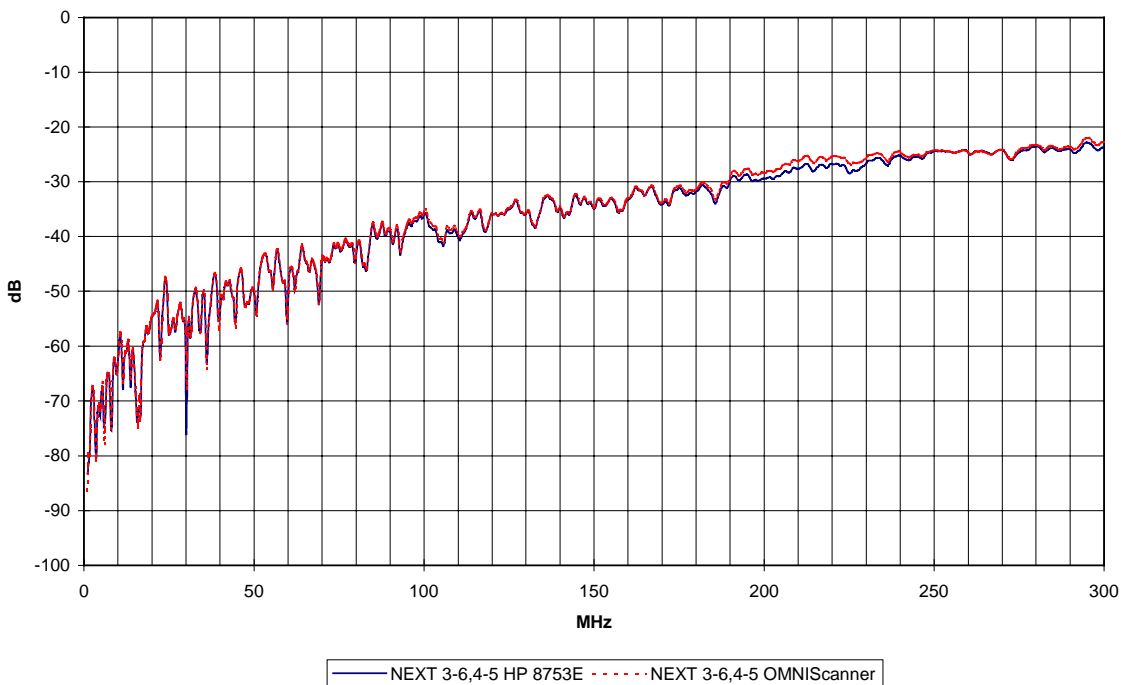


Comparison of NEXT 1-2,4-5

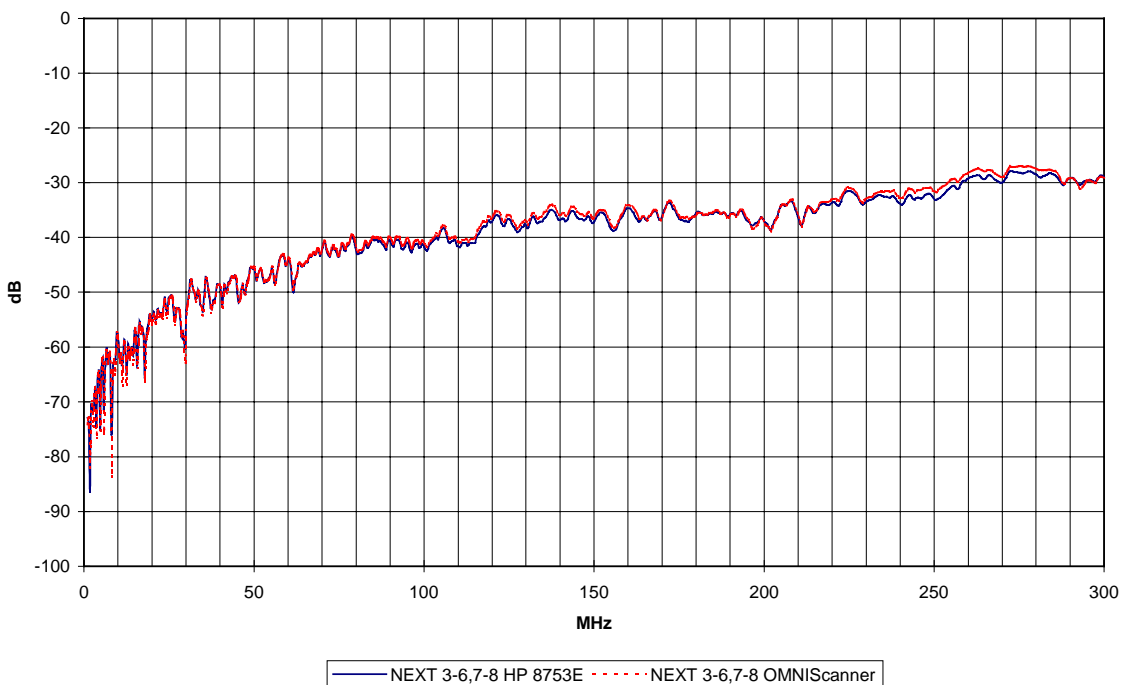




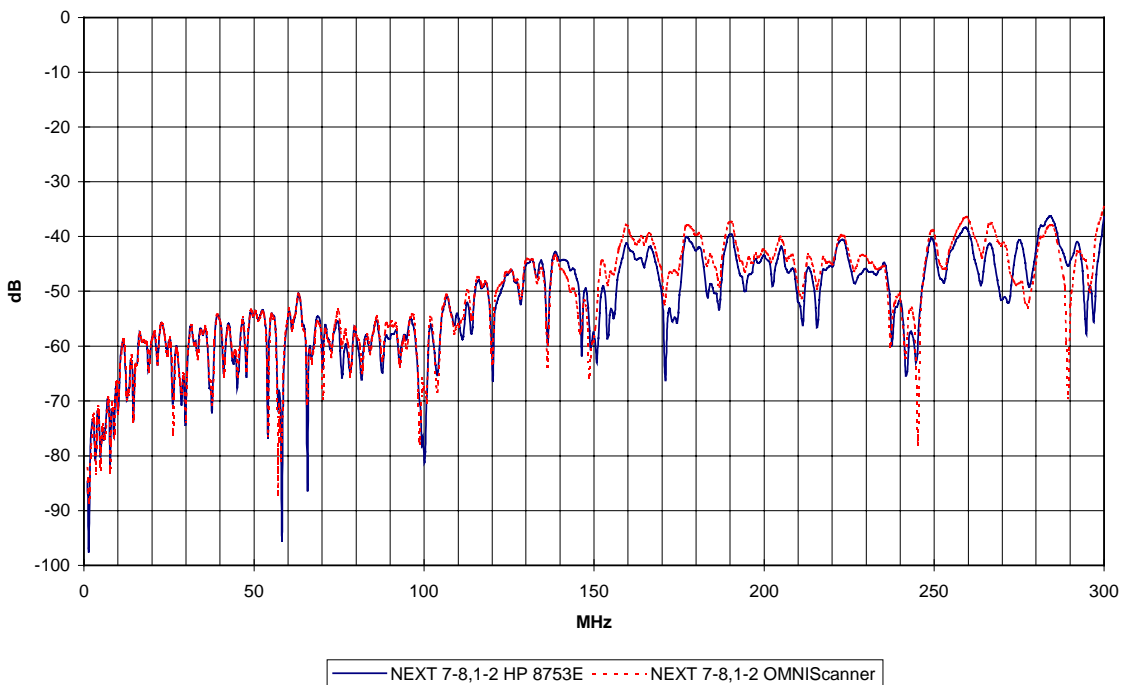
Comparison of NEXT 3-6,4-5



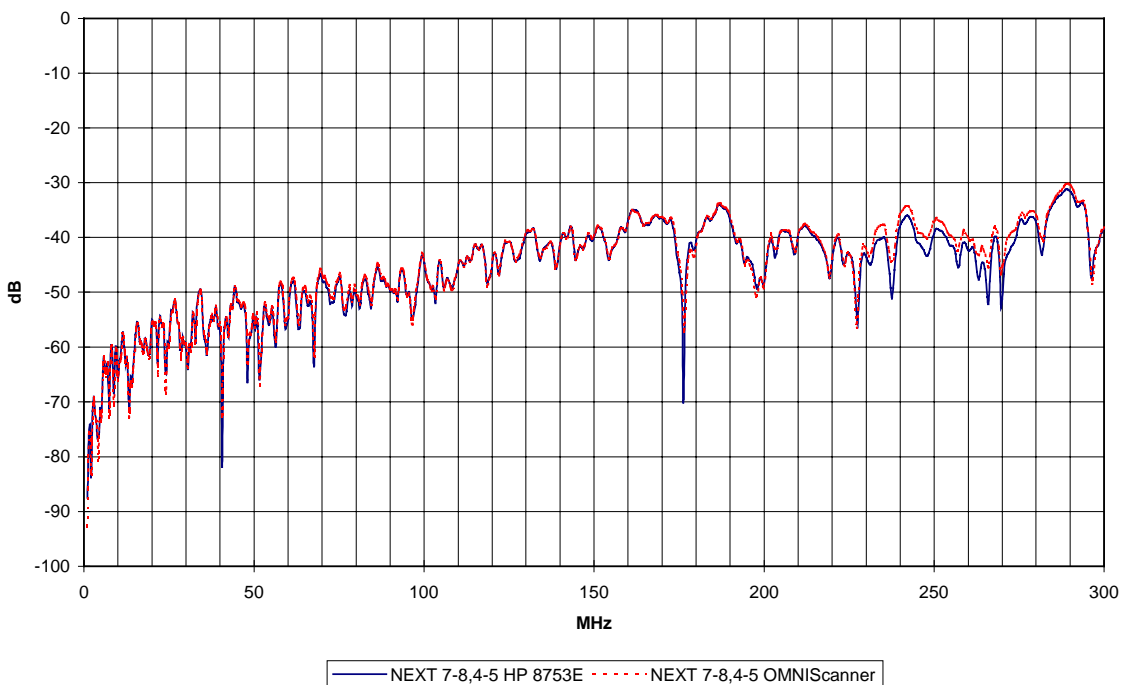
Comparison of NEXT 3-6,7-8



Comparison of NEXT 7-8,1-2



Comparison of NEXT 7-8,4-5





**SGS Servizi Tecnici Industriali S.r.l.**

**Divisione Industriale e Beni di Consumo**

Test Report 98.30.35.384 – Rev. 0 dated 1998 October 07