Test Report No. EWB40192-03-TR2

Neutrik RJ45 Module NE8FDX-Y6 / NE8FDX-Y6-B

Initial Sample Testing

Return Loss and NEXT

Tested according to ISO/IEC 11801 Ed. 2.2 Cat. 6_A

Tested for

Neutrik AG

Im alten Riet 143

9494 Schaan

Liechtenstein

REAL-TIME RE-EMBEDDED

REAL-TIME DIRECT-FIXTURE

Contents

1 Test Description

1.1 General/Overview

With initial sample testing, the Telegärtner Labs evaluate whether an infrastructure component complies with national or international standards. With this sort of testing, selected samples are usually tested before the production of a series starts.

To ensure superior product quality, the Telegärtner Labs test passive components and devices according to the most demanding national and international standards.

With Telegärtner's Real-time Re-embedded testing procedure, components and devices are tested according to the demanding category 6_A specifications. However, these specifications are not relevant for all kinds of components. Depending on the very type, they have to be tested as individual components or as part of an assembly or a link.

Telegärtner is one of the very few companies who are able to test components without the need for baluns to be used as an adapter between the tester and the device to be tested. Telegärtner's direct fixture test procedure allows the fixture of the device under test to be connected directly to the tester. This leads to more precise and more reliable test results than usual test procedures.

For a detailed description of the component to be tested, please refer to chapter *1.2 Device under Test (DUT)*.
The standards against the component is tested are listed in chapter *1.4 Applicable Standards*.

1.2 Device under Test (DUT)

The following component was tested in the Telegärtner Lab:

Neutrik RJ45 Module NE8FDX-Y6

The test applies also for the following module type as the printed circuit board and contacts are the same as in the type above:

Neutrik RJ45 Module NE8FDX-Y6-B

Technical data of the DUT according to supplying company:

Product	
Title	NE8FDX-Y6
Gender	female
Electrical	
Dielectric strength	1 kVdc
Insulation resistance	> 0.5 GΩ
Rated current per contact	1.5 A
Transmission performance	CAT6A, acc. TIA/EIA rating CAT6A, acc. IEC/ISO/EN rating
Power over Ethernet	PoE+ acc. IEEE 802.3at
Mechanical	
Lifetime	> 1000 mating cycles
Wiresize	solid: AWG 26/1 - AWG 22/1 stranded: AWG 26/7 - AWG 22/7
Locking device	Latch lock
Insulation diameter	0.85 - 1.6 mm
Material	
Contact plating	Au
Shell	Zinc diecast (ZnAl4Cu1)
Shell plating	Nickel
Environmental	
Flammability	UL 94 V-0
Temperature range	-40 °C to + 70 °C

1.3 Parameters to be tested

The following parameters of the DUT were tested:

a) Return Loss
When an electrical signal travels along a link, any disturbances that might occur (e.g. transition from a cable to a connector, transition from a connector to a module ("plug to jack")) or any changes whatsoever cause a part of the signal to be reflected at the very point the disturbance appears. The return loss indicates how much of the signal is being reflected. As the return loss is by convention expressed as a logarithmic ratio of the signal power returned to the incident signal power, a high return loss value is desirable and means that only very few power is reflected.

b) NEXT
The acronym NEXT stands for "near end crosstalk attenuation". Crosstalk means that the signal travelling along one pair of a cable can be detected on an adjacent pair as well, which is unwanted. NEXT is the attenuation ("suppression") of the unwanted crosstalk at the near end of a link. Similar to the return loss, a high dB value of NEXT is desirable because it indicates that only very little of signal energy leaks into adjacent signal lines.

1.4 Applicable Standards

The device was tested according to the following standard:

ISO/IEC 11801 Ed. 2.2 Cat. 6_A

2 Test Setup

2.1 General/Overview

The test was conducted in the Telegärtner Lab in Steinenbronn, Germany, as described in chapter 2.2 Test Setup, in a standard lab environment.

2.2 Test Setup

The device under test was connected to the test fixture.
The fixture was connected to an 8-port network analyzer using coaxial cables.
Baluns as adaptors were NOT used.

2.3 Tester

8-port network vector analyzer Rohde & Schwarz ZVT 8
with calibration unit ZV-Z58, 300 kHz to 8 GHz.

2.4 Test Adapter

Telegärtner Re-Embedded fixture.
The advanced probe fixture design eliminates the need for baluns, leading to more accurate test results.

3 Testing

3.1 General/Overview

The test was conducted in the Telegärtner Lab in Steinenbronn, Germany.
It was conducted in a standard lab environment. No special EMC cabin was used.

3.2 Date

Date of the test: 08.12.2014

3.3 Tester/Test Device Numbers

Rohde & Schwarz vector network analyzer ZVT8
with calibration unit ZV-Z58, 300 kHz to 8 GHz.
Serial number 100159
TG number 06457300

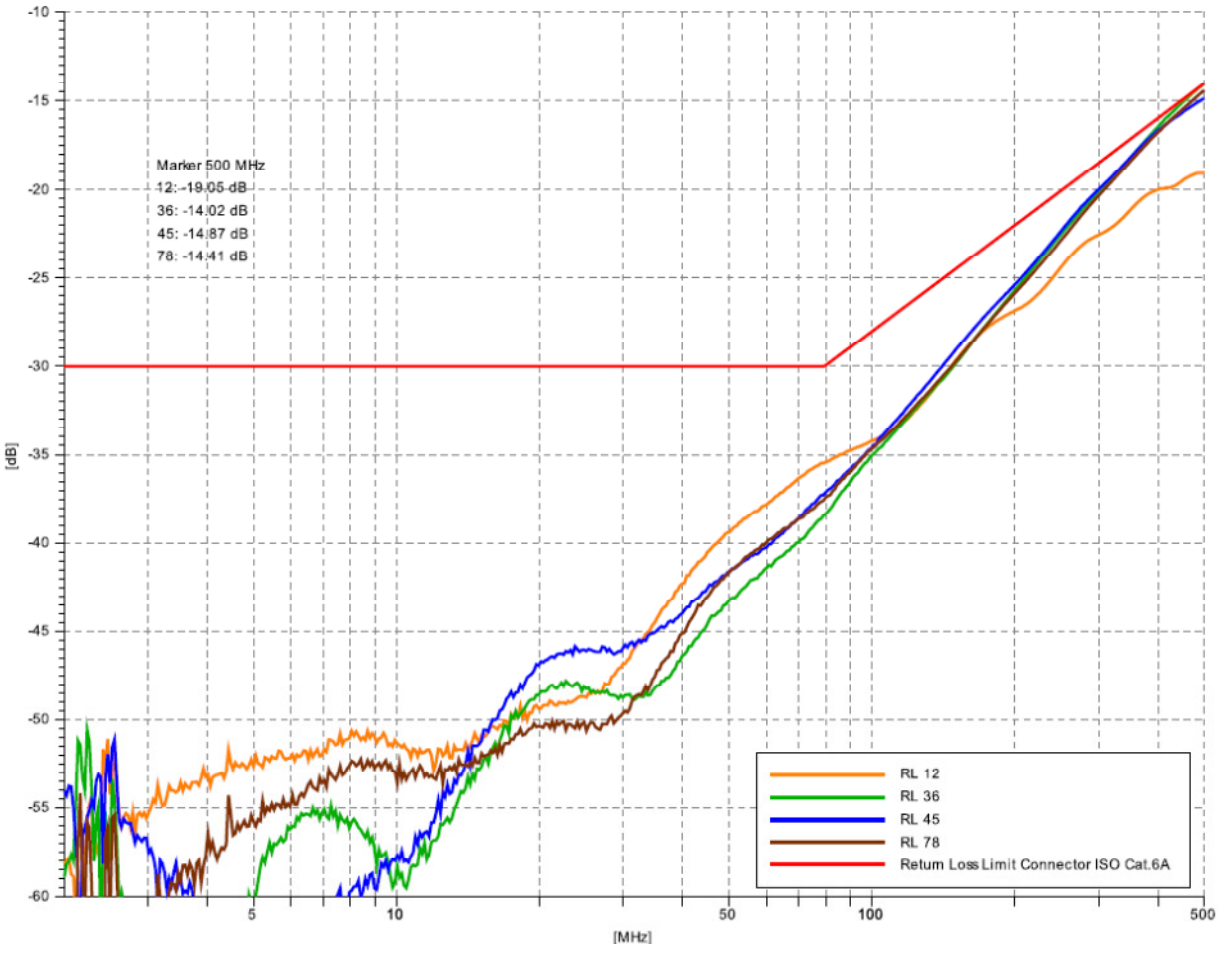
3.4 Technician

Test technician:
Frank Albert
Lab Technician

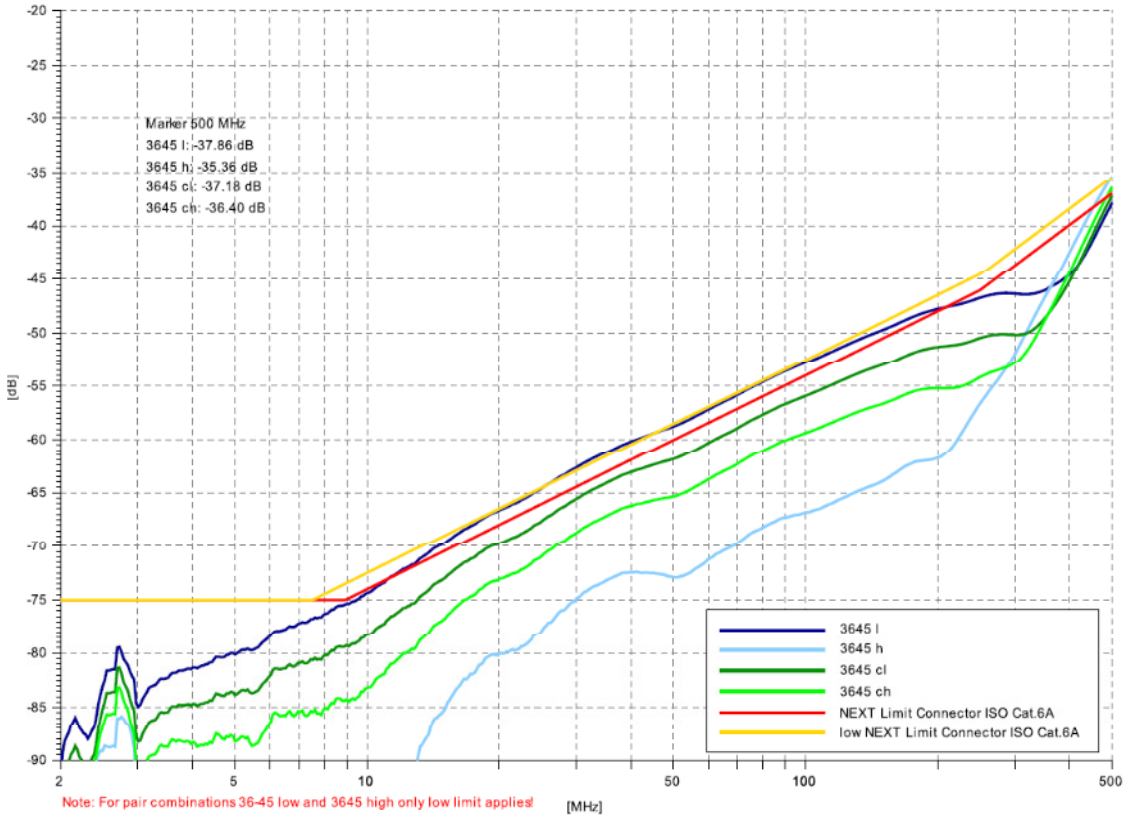
3.5 Test Data

The following graphical data was obtained during the tests:

a) Return Loss

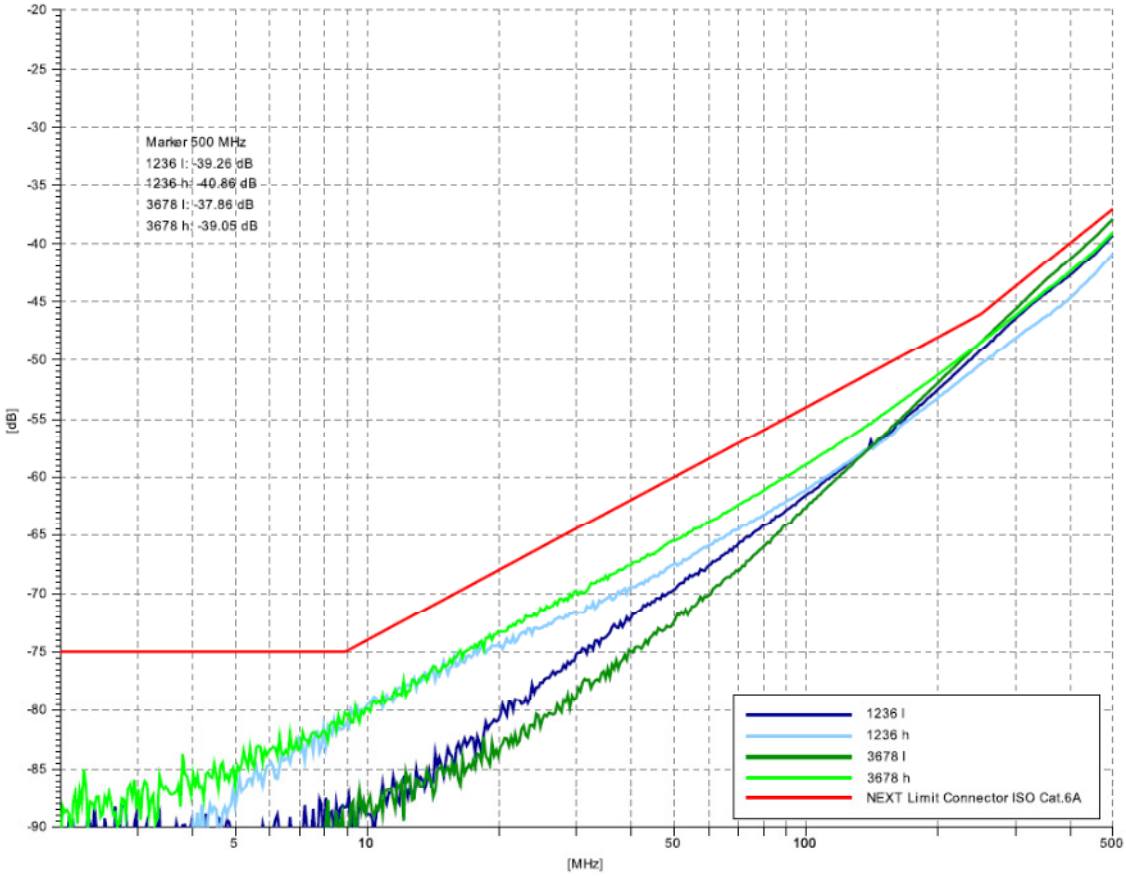


b) NEXT

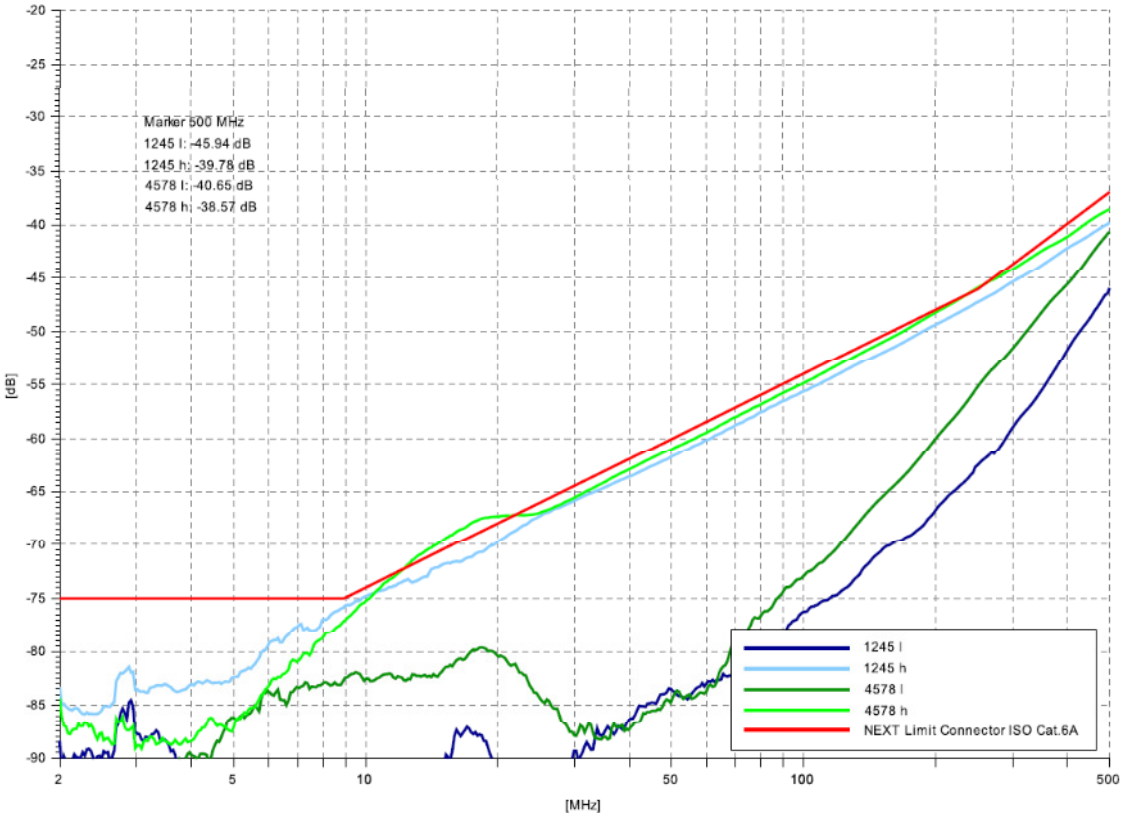


For pair combinations 3645 high and 3645 low, only the low NEXT limits apply.
The combination 3645 low meets the standard values within the accuracy of the test equipment.

NEXT, continued



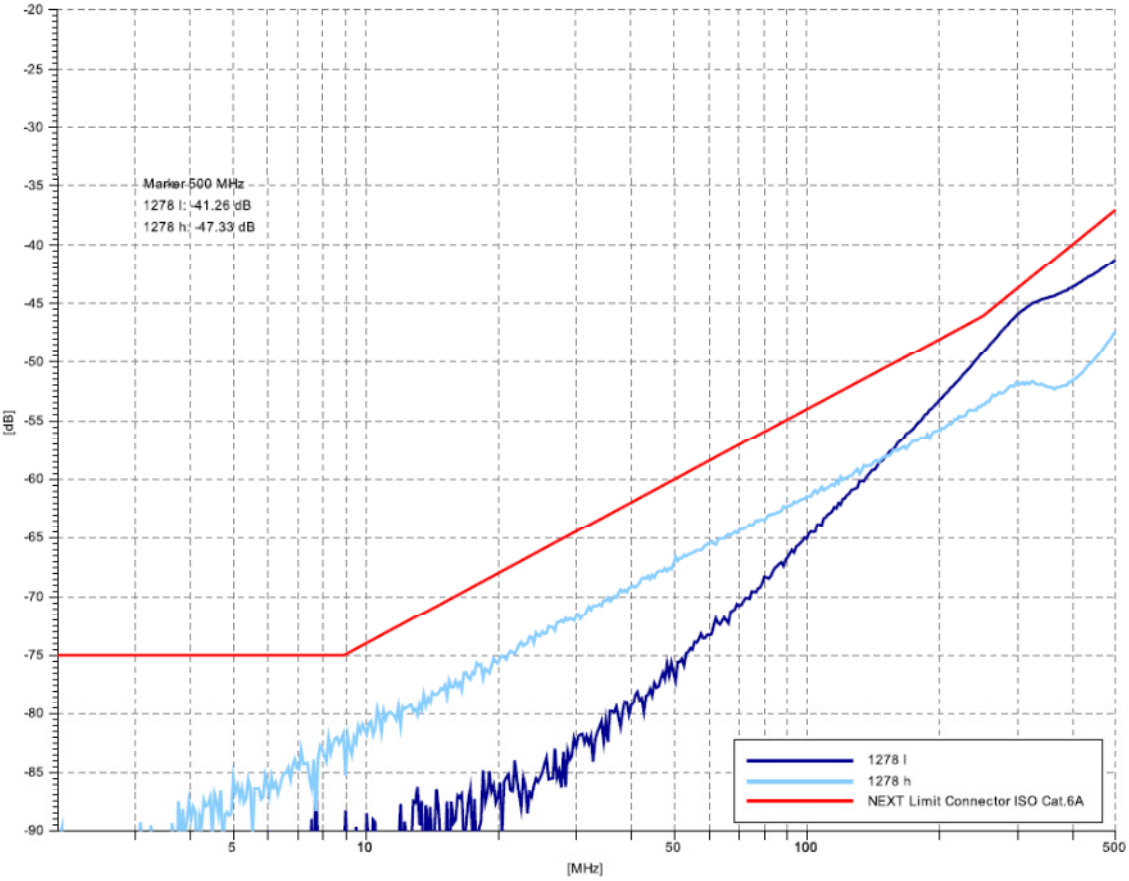
NEXT, continued



The results of the pairs 4578 seem to be below the limits in the frequency range of 10 to 20 MHz. However, this is a snapshot of an instantaneous signal trace frozen in time. Very low signal levels below 65 dB are susceptible to small changes in the physical arrangement of DUT and fixture. In this sense the limit line is not really violated. Furthermore, in this very low frequency range there is ample headroom to the channel specifications.

Please note that most critical is NEXT above 250 MHz.

NEXT, continued



4 Test Results

4.1 Summary of the Test Data

The **return loss test result** of all pairs is better than the specified values.

The **NEXT test result** of all pair combinations, including the innermost pair combination 3645 is in line with the specified values.

4.2 Conclusion/Recommendations

As a result of the test, the parameters NEXT and Return Loss tests can be regarded as

PASS

The DUT is a fully compliant Cat. 6_A component according to ISO/IEC 11801 Ed. 2.2 standard.

Dr. Habbo Heinze
Technical Managing Director R&D

Margret Hirsch
Distinguished Expert

Mouser Electronics

Authorized Distributor

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Neutrik:
NE8FDX-Y6-B