TX6A™ UTP Field-Term RJ45 Plug
## Testing Procedures (PN614)

Introduction

Copper cabling transmission performance depends on cable characteristics, connecting hardware, patch cords and cross-connect wiring, the total number of connections, and the care with which they are installed and maintained. To qualify for a *PANDUIT* System Warranty, post-installation performance testing must be done using Panduit approved field test instruments to verify that the installed cabling will meet or exceed the performance requirements of the designated classification defined in the Commercial Building Telecommunication Standards. These standards based test results should then be submitted to the *PANDUIT* Warranty Department for review.

PANDUIT offers warranties on the *TX6A™* Copper Cabling System for the current standards including ANSI/TIA-568D.2 to channel, ANSI/TIA-568D.2 to permanent link for direct connection or ISO 11801 Class E_A Ch AMD1.

Test Configuration – Standards Model – Modular Plug Terminated Link (MPTL)

The MPTL field terminable plug Standards Model is to be used by system designers and users of data communications systems to verify the performance of the permanent link used in a direct-connect designed infrastructure. Permanent link performance is most critical to the end user, as this is how their network will perform. The permanent link tested in this model includes up to 90m (295.2 feet) of horizontal cable with a maximum of two (2) field terminable plugs. The connection to the equipment at either end of a permanent link is only included in the permanent link definition if measured via the Standards Model. Schematic representations of the permanent link testing via the Standards Model can be found below.
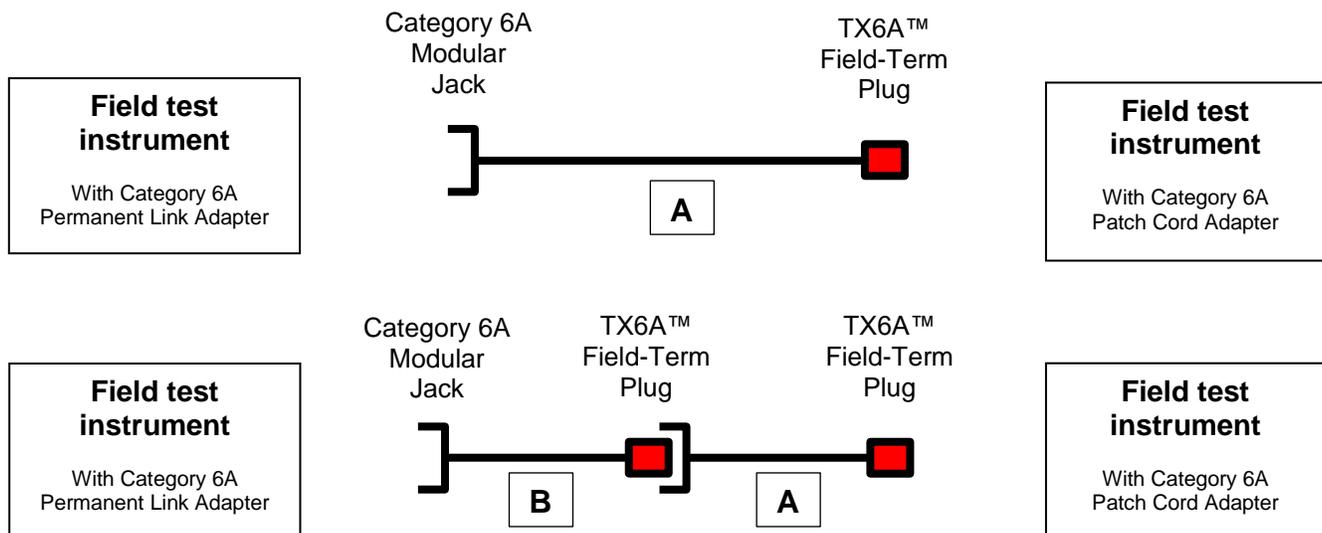
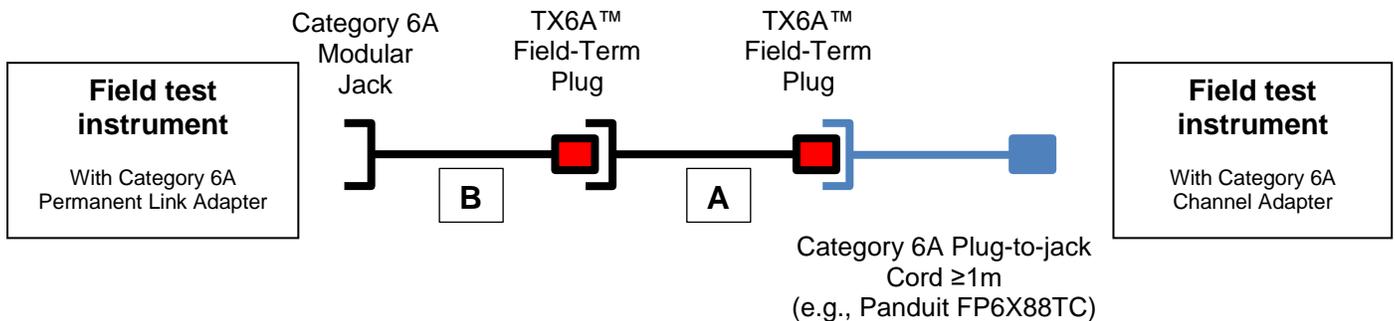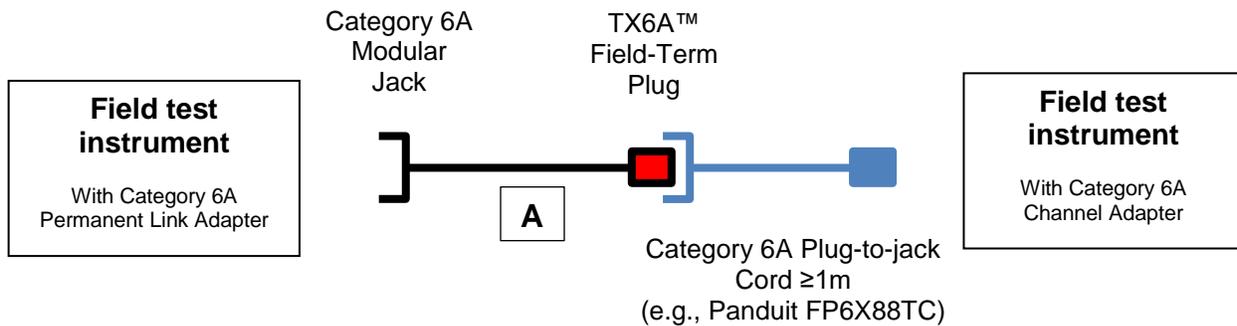**Minimum** segment **"A"** length = 1m (3.28 ft)

Minimum segment **"B"** length = 9m (29.53 ft)

Maximum PL length = 90m (295.2 ft)

For Technical Support: **www.panduit.com/resources/install_maintain.asp**

Test Configuration – Alternate Model

The Alternate Model field terminable plug test configuration is to be used by system designers and users of data communications systems to verify the performance of the permanent link used in a direct-connect designed infrastructure where the Standards Model is not possible. In the Alternate Model, the permanent link continues to have a maximum total horizontal cable length of 90m (295 feet) and a maximum of two (2) field terminable plugs. The connection to the equipment at either end of a permanent link is not included in the Alternate Model testing method and therefore requires a ≥1m plug-to-jack cord to properly test the TX6A™ as part of the permanent link performance. Schematic representations of this permanent link test configuration can be found below.

Category 6A
Modular
Jack

TX6A™
Field-Term
Plug

**Field test
instrument**

With Category 6A
Permanent Link Adapter

A

**Field test
instrument**

With Category 6A
Channel Adapter

Category 6A Plug-to-jack
Cord ≥1m
(e.g., Panduit FP6X88TC)

Category 6A
Modular
Jack

TX6A™
Field-Term
Plug

TX6A™
Field-Term
Plug

**Field test
instrument**

With Category 6A
Permanent Link Adapter

B

A

**Field test
instrument**

With Category 6A
Channel Adapter

Category 6A Plug-to-jack
Cord ≥1m
(e.g., Panduit FP6X88TC)

> **Minimum** segment **"A"** length = 1m (3.28 ft)
> **Minimum** segment **"B"** length = 9m (29.53 ft)
> **Maximum** PL length = 90m (295.2 ft)

PANDUIT System Warranty

PANDUIT will typically provide a system warranty in the following way:

The warranty of the Field Terminable Plug offered by *PANDUIT* is based on passing permanent link test results.

Passing test results must be obtained using an approved field test instrument. *PANDUIT* Corp. evaluates each type of handheld test instrument before approving it for use in the field. This ensures the integrity of the test data submitted for warranty.

Current field testers approved for Category 6A:

- Fluke DTX-1500 / DTX-1800 / DSX – 5000 / DSX-8000
- Ideal LanTEK II / LanTEK III
- Viavi Solutions Certifier 40G
- Softing WireXpert 4500 / WireXpert 4500FA

Testing Required for ANSI/TIA Category 6A Direct Connection Permanent Link Warranty

PANDUIT requires that internal permanent link performance be verified for each link to obtain the warranty. *PANDUIT* does not require that field alien crosstalk testing be performed, as the *TX6A™* Copper Cabling System has been thoroughly lab tested and verified to meet alien crosstalk requirements under worse case conditions of 6-around-1 tightly bundled configuration.

Fluke DSX-5000 Series Digital Cable Analyzer

PANDUIT has evaluated the Fluke DSX-5000 Series Digital Cable Analyzer and approves the use of this tester for the certification of installed Category 6A direct connection cabling permanent links. To verify that the installed cabling will meet or exceed the performance requirements of the designated classification defined in the ANSI/TIA Category 6A standard, it is important that the following steps are followed.

Permanent Link Testing (Standards MPTL Method)

1) Verify that your DSX-5000 Series tester has the most up-to-date software. The latest software updates can be found on the Fluke website at: http://www.flukenetworks.com/support/downloads/58119/DSX%2BCableAnalyzer%25E2%2584%25A2%2BSeries
2) Perform a Set Reference procedure in the special functions prior to testing. Fluke Networks recommends that a Set Reference procedure be performed every 30 days to ensure the maximum accuracy of the test results. DSX Reference Module part# DSX-REFMOD, is recommended for Category 6A testing.
   For detailed instructions on Set Reference procedure, refer to Fluke Network's *DSX-5000 Series Users Manual* page 36, on "Set the Reference". The link for the User's Manual is: http://www.flukenetworks.com/support/manuals/58119/DSX%2BCableAnalyzer%25E2%2584%25A2%2BSeries
   Note: Fluke Networks also recommends factory calibration once a year to ensure that the test tool meets or exceeds the published accuracy specifications.
3) Select the Fluke Permanent Link Adapter (DSX‑PLA001) and attach it to the DSX-5000 Series Main unit.
4) Select the Fluke Ca6A Patch Cord Adapter (# DSX-PC6A) and attach it to the DSX-5000 Series Remote unit.

For Technical Support: www.panduit.com/resources/install_maintain.asp

5) Select from the following Fluke Test Limits, for which warranty is desired:
   - **TIA Cat 6A Permanent Link**
   - **ISO Class E$_A$ Permanent Link**
6) Begin testing your installed permanent link with the Fluke DSX-5000 Series Digital Cable Analyzer and save all test results.
7) Troubleshoot and repair any <u>failing</u> permanent links. Permanent links resulting in a PASS* are considered a PASS and will be acceptable for warranty.
   Note: The Fluke HDTDX analyzer and HDTDR test are very helpful when troubleshooting failing channels. Both can be found on the SINGLE TEST menu and will also run automatically when a failure occurs. Also make sure that Store Plot Data is set to Extended under Setup/Instrument settings.
8) Submit electronic permanent link test reports to the *PANDUIT* Warranty Department with all required warranty paperwork. A warranty will then be given based on passing test results.

Note: *PANDUIT* <u>recommends that installers install and test multiple permanent links before completing the entire system.</u>

Permanent Link Testing (Alternate Method)

1) Verify that your DSX-5000 Series tester has the most up-to-date software. The latest software updates can be found on the Fluke website at:
   http://www.flukenetworks.com/support/downloads/58119/DSX%2BCableAnalyzer%25E2%2584%25A2%2BSeries
2) Perform a Set Reference procedure in the special functions prior to testing. Fluke Networks recommends that a Set Reference procedure be performed every 30 days to ensure the maximum accuracy of the test results. DSX Reference Module part# DSX-REFMOD, is recommended for Category 6A testing.
   For detailed instructions on Set Reference procedure, refer to Fluke Network's *DSX-5000 Series Users Manual* page 36, on "Set the Reference". The link for the User's Manual is:
   http://www.flukenetworks.com/support/manuals/58119/DSX%2BCableAnalyzer%25E2%2584%25A2%2BSeries
   Note: Fluke Networks also recommends factory calibration once a year to ensure that the test tool meets or exceeds the published accuracy specifications.
3) Select the Fluke Permanent Link Adapter (DSX‑PLA001) and attach it to the DSX-5000 Series Main unit.
4) Select the Fluke Channel Adapter (# DSX-CHA004S) and attach it to the DSX-5000 Series Remote unit.
5) Select from the following Fluke Test Limits, for which warranty is desired:
   - **TIA Cat 6A Permanent Link**
   - **ISO ClassE$_A$ Permanent Link**
6) Begin testing your installed permanent link with the Fluke DSX-5000 Series Digital Cable Analyzer. You will receive a warning for an adapter/test limit compatibility. Press YES to continue. Save all test results.
7) Troubleshoot and repair any <u>failing</u> permanent links. Permanent links resulting in a PASS* are considered a PASS and will be acceptable for warranty.
   Note: The Fluke HDTDX analyzer and HDTDR test are very helpful when troubleshooting failing channels. Both can be found on the SINGLE TEST menu and will also run automatically when a failure occurs. Also make sure that Store Plot Data is set to Extended under Setup/Instrument settings.
8) Submit electronic permanent link test reports to the *PANDUIT* Warranty Department with all required warranty paperwork. A warranty will then be given based on passing test results.

Note: *PANDUIT* <u>recommends that installers install and test multiple permanent links before completing the entire system.</u>

For Technical Support: www.panduit.com/resources/install_maintain.asp

Panduit Approved Testers

Tester	Reporting Software	Channel Adapter	PL Adapter	Comments	Cat5e		Cat6		Cat6A	
					PL	Channel	PL	Channel	PL	Channel
DTX1500	Linkware	CHA002	PLA002		✓	✓	✓	✓	✓	✓
DTX1800	Linkware	CHA002	PLA002	Supported thru June 2018	✓	✓	✓	✓	✓	✓
DSX5000	Linkware	DSX-CHA001	DSX-PLA001		✓	✓	✓	✓	✓	✓
DSX8000	Linkware	DSX-CHA801	DSX-PLA801	Approved 4/18/2017	✓	✓	✓	✓	✓	✓
LanTEK III	IDC	R1611051	R161053	Approved 4/18/2017	✓	✓	✓	✓	✓	✓
LanTEK II	IDC	0012-00-0656	0012-00-0656P		✓	✓	✓	✓		
Certifier40G	J-Reporter	NGC-4500-6ACH2	NGC-4500-6AL2		✓	✓	✓	✓	✓	✓
WireXpert 4500	eXport	WX-AD-GGARJCH1	WX-AD-6ALINK1		✓	✓	✓	✓	✓	✓
WireXpert 4500FA		WX-AD-GGARJCH1	WX-AD-6ALINK1	Approved 4/18/2017	✓	✓	✓	✓	✓	✓

For Technical Support: **www.panduit.com/resources/install_maintain.asp**