
**CATEGORY 6 DIN TELECOMMUNICATIONS OUTLET:
AMP-TWIST-6S**

1. SCOPE

1.1 Content

This specification covers performance, tests and quality requirements for CATEGORY 6 DIN TELECOMMUNICATIONS OUTLET AMP NETCONNECT* (AMP-TWIST*-6S) used to connect building wiring for data and voice networking systems.

1.2 Qualification

When tests are performed on subject product line, procedures specified in Figure 1 shall be used. All inspections shall be performed using applicable inspection plan and product drawing.

2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the latest edition of the document applies. In the event of conflict between the requirements of this specification and the customer drawing or any Tyco Electronics (TE) documents listed below, the customer drawing and TE documents shall take precedence. In the event of conflict between the requirements of this specification and the industrial standards, this specification shall take precedence.

2.1 Tyco Electronics Documents

A. Documents specified in the following tables:

	Cat. 6 DIN Telecommunications Outlet: AMP-TWIST-6S		
	Floor 2 Ports	Planar 2 Ports	Planar 1 Port
Instruction sheet	411-22046	411-93005	411-93006
Product Spec.	108-22140	108-22140	108-22140
Customer drawing	C-336539	C-336675	C-1711088
Qualification Test report	501-93003	501-93015	501-93014

	Components	
	110 Connect Block for Cat. 6 applications.	PCB Angle Jack for Cat. 6 applications.
Product Spec.	108-22145	108-22142
Application Spec.	114-22022	114-22021
Customer drawing	C-336505 / C-336507	C-336545
Qualification Test report	501-93002	501-93004

B. 230-702: Design for environment standard – ‘Supplier Requirements for the Elimination of Hazardous Substances’

C. 109-197: AMP Test Specification vs. EIA and IEC Test Methods.

2.2 Industrial Standards:

A. ISO/IEC 11801 2nd Edition Sep. 2002: Generic cabling for customer premises.

B. ANSI/TIA/EIA 568-B.2-1 Jun. 2002: Commercial building telecommunications cabling standard.

C. DIN IEC 60512: Basic testing procedures and measuring methods for electromechanical components for electronic equipment.

D. DIN IEC 60068: Basic environmental testing procedures.

- E. ISO/IEC 60603-7-1 1st Edition 2002: Detail Specification for 8-way, shielded free and fixed connectors with common mating features, with assessed quality.
- F. ISO/IEC 60603-7-5 Ed.1.0 (2003): Detail Specification for 8-way, shielded free and fixed connectors for data transmissions with frequencies up to 250 MHz.

3. REQUIREMENTS

3.1 Design and Construction

Product shall be of design, construction and physical dimensions specified on applicable product drawing.

3.2 Materials

Materials shall be as specified on applicable product drawing and in accordance to Tyco Electronics requirements about environmental-related substances as per Tyco Electronics specification 230-702.

3.3 Wire range

- A. Conductor range (mm): 0.5 - 0.65
 B. Conductor range (solid): 24 – 22 (AWG)
 C. Insulation range (mm): 0.8 - 1.6

3.4 Ratings

- A. Voltage: 150 Vac max.
 B. Current: 0.75 A
 C. Temperature: -40 to 70°C

3.5 Performance Requirements and Test Procedures

Product is designed to meet electrical, mechanical and environmental performance requirements specified in Figure 1. Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

3.6 Test Requirements and Procedures summary

Test Description	Requirement	Test Procedure
VISUAL		
Examination of product.	Meets requirements of product drawing	Visual, dimensional and functional per applicable quality inspection plan
ELECTRICAL		
Input-output Resistance	200 mΩ maximum initial and final. (See figure 2).	ISO / IEC 11801. IEC 60512-2-1 Test 2a. Measure Jacks mated to a Patch Cord
Shield Resistance	100 mΩ maximum initial and final. (See figure 2)	ISO / IEC 11801. IEC 60512-2-1 Test 2a. Measure Jacks mated to a Patch Cord
Voltage Proof	1 000 Vdc or ac peak. 1 500 Vdc or ac peak.	Contact / contact. Mated connectors. Method A. All contacts to Shield. Mated connectors. Method A. IEC 60512-4-1.
Transfer Impedance	ISO/IEC 11801. 2nd Edition	Mated connectors, terminated with each cable construction intended to be allowed for these connectors. IEC 60603-7-1

TRANSMISSION (See Figure 3 for transmission tests in Permanent link configuration)		
Return Loss	Class E Permanent Link Return Loss requirements according to ISO/IEC 11801	IEC 61935-1, Paragraph 4.9
Insertion Loss	Class E Permanent Link Insertion Loss requirements according to ISO/IEC 11801	IEC 61935-1, Paragraph 4.1
NEXT Loss	Class E Permanent Link NEXT Loss requirements according to ISO/IEC 11801	IEC 61935-1, Paragraph 4.6
PS NEXT Loss	Class E Permanent Link PS NEXT Loss requirements according to ISO/IEC 11801	(PS NEXT is computed from NEXT loss values)
ACR	Class E Permanent Link ACR Loss requirements according to ISO/IEC 11801	(ACR is computed from NEXT and Insertion loss values)
PS ACR	Class E Permanent Link PS ACR Loss requirements according to ISO/IEC 11801	(PS ACR is computed from ACR values)
FEXT Loss	(There are no requirements for FEXT Loss)	IEC 61935-1, Paragraph 4.7
ELFEXT	Class E Permanent Link ELFEXT requirements according to ISO/IEC 11801	(ELFEXT is computed from FEXT and Insertion loss values)
PS ELFEXT	Class E Permanent Link PS ELFEXT requirements according to ISO/IEC 11801	(PS ELFEXT is computed from ELFEXT loss values)
Propagation delay	Class E Permanent Link Prop Delay requirements according to ISO/IEC 11801	IEC 61935-1, Paragraph 4.5
Delay Skew	Class E Permanent Link Delay Skew requirements according to ISO/IEC 11801	IEC 61935-1, Paragraph 4.5
ENVIRONMENTAL		
Corrosion Testing	See Note(1) below	IEC 60068-2-60 Test Method C. Test Conditions: SO ₂ 0,5 ppm (Volume) H ₂ S 0,1 ppm (Volume) T= (25 ± 2)°C HR= (75 ± 3) % Test time: 4 days.
NOTE (1)	<i>Shall meet visual requirements, show no physical damage and shall meet requirements of additional tests as specified in Test Sequence in Figure 4.</i>	
NOTE (2)	<i>See Test Sequence in paragraph 4.2 Figure 4.</i>	

Figure 1: Category 6 DIN Telecommunications Outlet AMP-TWIST-6S

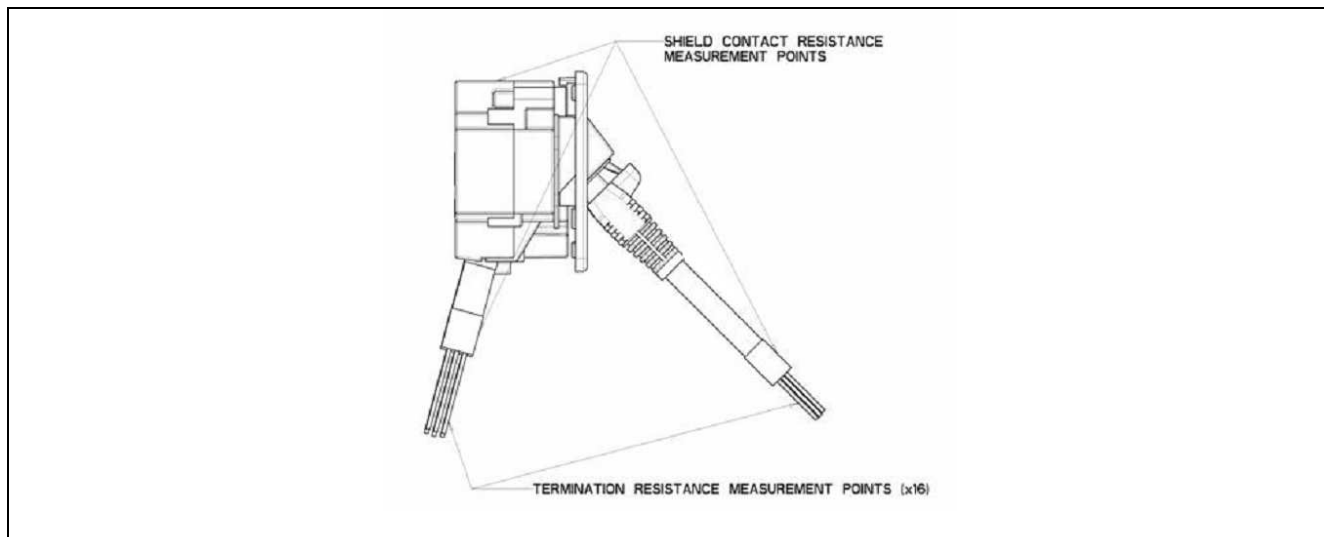


Figure 2: Termination and shield resistance measurement points

Measure termination resistance between points shown. Figure is for reference only. Use the adequate DIN Outlet: AMP-TWIST-6S Planar or Floor. (Subtract bulk resistance due to wire lengths).

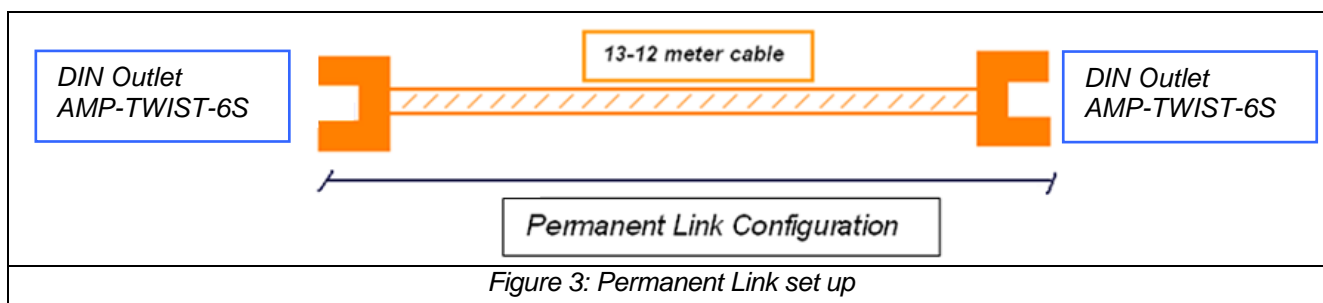


Figure 3: Permanent Link set up

4. PRODUCT QUALIFICATION AND REQUALIFICATION

4.1 Sample Selection

Samples shall be selected at random from current production and prepared in accordance with applicable Instruction Sheets (refer to Tyco Electronics documents). For qualification purpose, all test groups shall consist of a minimum of 10 samples per relevant length per product family.

Shielded patch cords PN 959385-1 or equivalent shall be delivered with the samples to be tested.

4.2 Test sequence

	Test Group			
	1	2	3	4
	Test Sequence			
Examination of product	1,7	1,3	1,14	1,3
Input-output Resistance	2,6			
Shield resistance	3,5			
Voltage proof		2		
Corrosion Testing	4			
NEXT (Near End Cross Talk)			2	
Power Sum NEXT			3	
Attenuation (Insertion Loss)			4	
ACR			5	
PS ACR			6	
FEXT (Far End Cross Talk)			7	
Power Sum FEXT			8	
ELFEXT			9	
Power Sum ELFEXT			10	
Return Loss			11	
Propagation Delay			12	
Delay Skew			13	
Transfer Impedance				2

Figure 4: Test sequence

NOTE Numbers indicate sequence in which tests are performed divided in test groups.

4.3 Requalification Testing

If changes significantly affecting form, fit or function are made to the product or manufacturing process, requalification testing shall be initiated, consisting of all or part of the original testing sequence as determined by Tyco Electronics.

5. QUALITY ASSURANCE PROVISIONS

Quality provisions are based upon the philosophy of TQM (Total Quality Management) with a system approved to EN ISO 9001 by Lloyds Register Quality Assurance.

5.1 Responsibility for quality

Unless otherwise stated in the purchase order, it shall be the supplier's responsibility to assure qualification and lot conformance to this specification. The supplier may utilize his own or other testing and inspection facilities acceptable to the buyer.

5.2 Qualification conformance

For the purposes of internal qualification, the program shall consist of examinations and tests to determine conformance with the requirements of this specification. It shall be performed once, on introduction of the product. Subsequent design changes shall be partially or fully re-qualified depending upon their area of impact in the context of product functionality. Regular requalification testing shall be performed as defined by the Quality Department.

5.3 Manufacturing follow-up

Tyco Electronics products target Six Sigma levels of performance by the integration of capable processes from the development throughout the entire supply chain. The goal is to reduce variability to achieve zero defects for products and services. Systems used are based on preventive and statistical techniques during development and manufacturing. This also includes suppliers of materials, components or systems. Dedicated procedures for supplier selection, development and follow-up are implemented to ensure conformance to TQM and specification requirements.

Best demonstrated practices are identified and implemented throughout the company, with a continuing challenge to identify opportunities for innovation and improvement