

zQSFP+ connector with cage
Signal integrity requirements

DESIGN OBJECTIVES

The product described in this document has not been fully tested to ensure conformance to the requirements outlined below. Therefore, TE Connectivity makes no representation or warranty, express or implied, that the product will comply with these requirements. Further, TE Connectivity may change these requirements based on the results of additional testing and evaluation. Contact TE Connectivity Engineering for further details, if necessary.

1. SCOPE.

1.1 Content.

This specification covers performance, test and quality requirements for the zQSFP+ Fixed connector with cage. The connector is designed to make a connection between a PCB & cable connector to feature a signal data rate up to 25 Gb/s. It is aimed to support 100G Ethernet and 100G infiniband EDR (25.78Gbps) applications.

When tests are performed on subject product, procedures specified in this specification shall be used.

2. APPLICABLE DOCUMENTS.

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, latest edition of the document applies. In the event of conflict between requirements of this specification and referenced documents, this specification shall take precedence.

2.1 TE Connectivity Documents.

108-19437 Signal integrity specification zQSFP+ connector
SFF 8682 Draft QSFP+ 32 Gb/s 4x connector

2.2 Other relevant documents.

GR-1217-CORE Telcordia Generic Requirements for Separable Electrical Connectors Used in Telecommunications Hardware.
OIF CEI-25 25 Gb/s Electrical signalling
SFF-8672 QSFP+ for 25 Gb/s applications

3. REQUIREMENTS.

3.1 Design and Construction:

Products shall be of design, construction and physical dimensions as specified on the applicable product drawing.

3.2 Material and Finish:

Materials used in this connector system are next to the mechanical and environmental requirements also selected for their electrical performance. The relative Permittivity and dissipation factor are part of them

3.3 Ratings:

- | | |
|-----------------------------|--|
| A. Data-rate | Supports 100G Ethernet and 100G infiniband EDR (25.78Gbps) |
| B. Characteristic Impedance | 100 Ohm +/-10 Ohm at 25ps (20-80%) |
| C. Insertion loss | Max. 1.20 dB @ 14 GHz |

3.4 Performance and Test Description:

ELECTRICAL			
Para	Test Title	Requirements	Procedure/ severity
3.4.1	Differential Insertion loss	1.2 dB maximum (Frequencies up to 14 GHz)	EIA 364-101 50 MHz to 16 GHz
3.4.2	Differential Return Loss	-12 dB maximum (Frequencies up to 14 GHz)	EIA 364-108 10 MHz to 25 GHz
3.4.3	Differential Impedance	100 Ohm +/- 10 Ohm	EIA 364-108 TDR 25ps (20-80%)
3.4.4	Skew	Inner Pair skew 1 ps max	By Design
3.4.5	Common Mode Through Conversion (SCD21)	-24.0 dB maximum (Frequencies up to 14 GHz)	10 MHz to 14GHz
3.4.6	Crosstalk Integrated Crosstalk Noise (ICN)	Total ICN: 3 mV rms (all aggressors active) Near End Worst Aggressor: 1 mV rms Far End Worst Aggressor: 2.8 mV rms	Range of Integration: 10 MHz to 28 GHz Aggressors' peak amplitude: 600mV Aggressors' 20%-80% risetime: 9.6ps 3dB reference receiver bandwidth: 18.75 GHz

3.5 Product Qualification and Requalification Test Sequence.

Test or examination	TEST-GROUP (a)	
	1	2
	TEST-SEQUENCE (b)	
	Time domain TDR mated connector	Freq. domain Network analysis
Examination of connectors and mounting on PCB	1	1
Differential Impedance (all pairs)	2	2
Integrated Crosstalk Noise	2	2
Common mode trough conversion	2	2
Differential Return Loss	2	2
Differential Insertion loss	2	2
Number of samples	3	3

4. **QUALITY ASSURANCE PROVISIONS.**

4.1 **Qualification testing.**

A. Sample selection

Samples shall be prepared in accordance with applicable instructions and shall be selected at random from current production.

The test-group shall consist of a minimum of 3 connectors. Connectors shall be terminated to the PC-Board as specified in application specification 114-13282.

B. Test sequence

Qualification inspection shall be verified by testing samples as specified in paragraph 3.6.

4.2 **Requalification testing.**

If changes significantly affecting form, fit or function are made to product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of original testing sequence as determined by product, quality and reliability engineering.

4.3 **Acceptance.**

Acceptance is based upon verification that product meets requirements of paragraph 3.4. Failures attributed to equipment, test set-up, applied customer components or operator deficiencies shall not disqualify the product. When product failure occurs, corrective action shall be taken and samples resubmitted for requalification. Testing to confirm corrective action is required before resubmitted.