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NXS Connector Series

September 2021 | Product Introduction

BEYOND
CONNECTIVITY

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1. Product Summary
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Product Summary

1

NXS Series | Ultra High Density, Space Qualified Interconnect



NXS Series | Value Proposition



The solderless PCB mount **reduces customer risk and cost of ownership**. The connector is mounted after reflow and has no impact on nearby components

Ultra high contact density and compact form factor allows the customer to make a 90° transition within a very small footprint

Gold plated, **low mass composite** shell minimises cost of launch

Signal integrity through a 90° transition qualified up to **10Gbps per channel**

Qualified to space standards with heritage in GEO applications. Withstands shock up to 2100G

Manufactured to the **highest space standards** in our site, Dundee UK

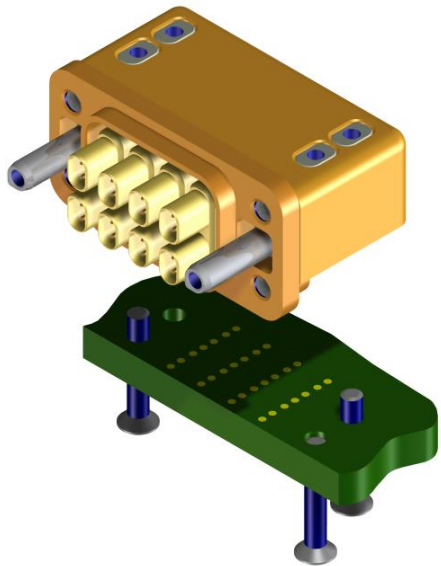
Future modularity built in. Additional NXS modules on the technology roadmap will complement the Quadrax module



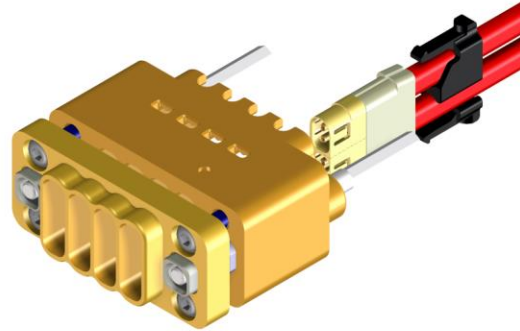
Technical Overview

2

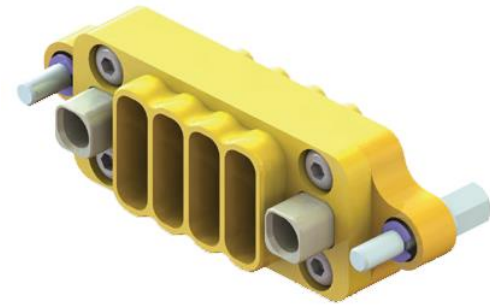
Receptacle



Plug, cable assembly



Saver



Saver receptacle

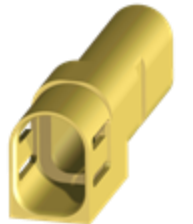


Saver plug

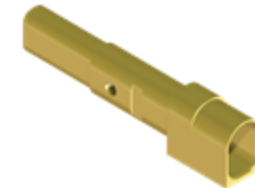
Accessories



Socket contact



Contact outer shell



Cavity filler



Clip retention



Insulator



Spacer

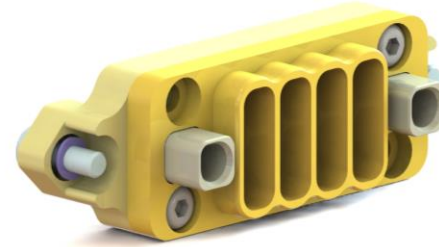
NXS Series | 4-bay and 12-bay configurations



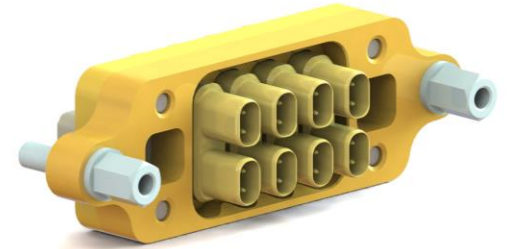
4-bay, receptacle



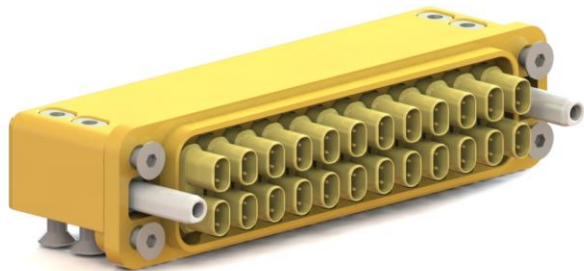
4-bay, plug



4-bay, saver plug



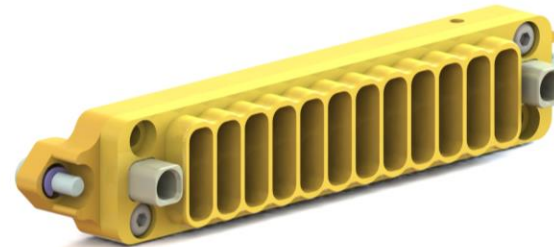
4-bay, saver receptacle



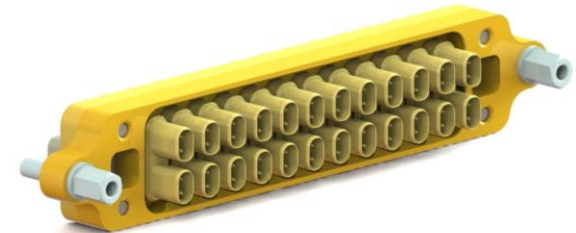
12-bay, receptacle



12-bay, plug



12-bay, saver plug

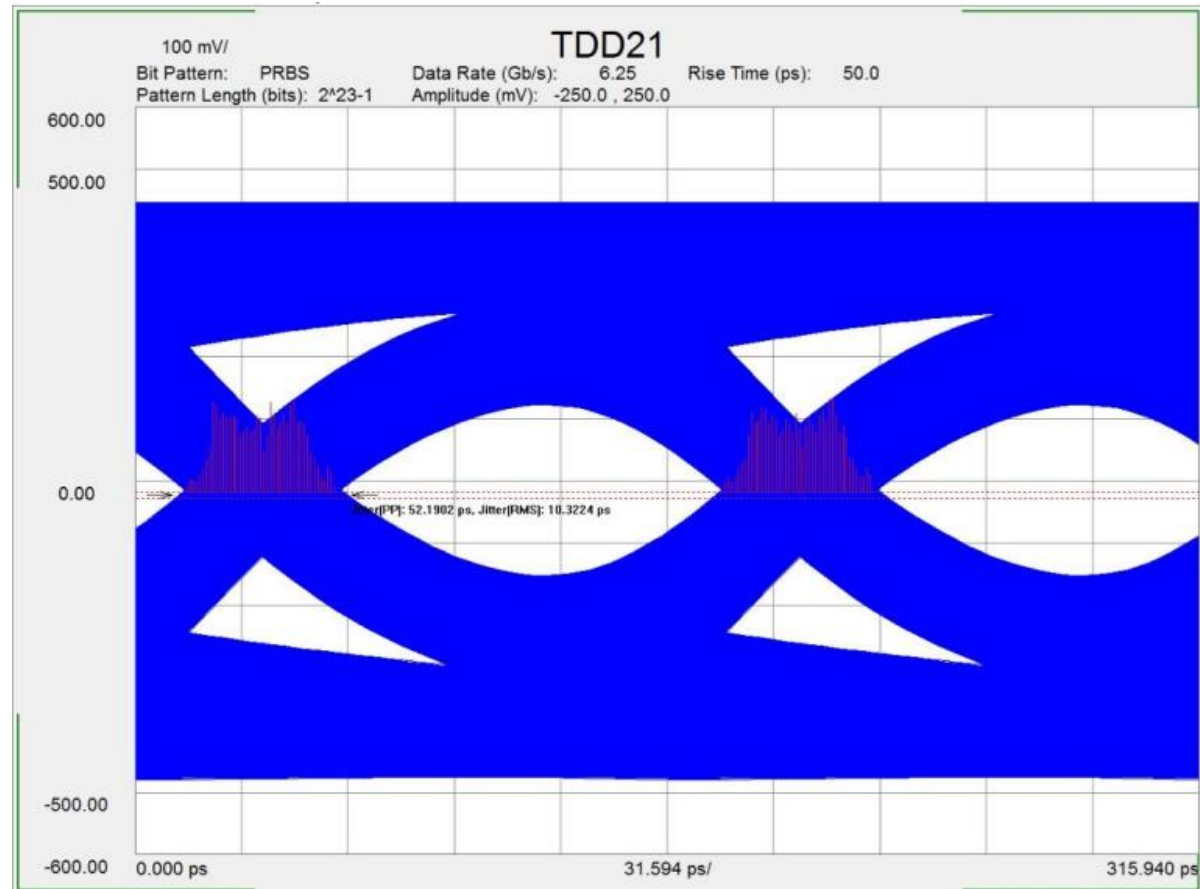


12-bay, saver receptacle

Mechanical & Environmental		Electrical	
Insulation Resistance	1 GΩ	Current Rating	1A
Contact Resistant	150 mΩ	Withstanding Voltage	10V RMS
Temperature Rating	-40°C to 125°C	Data Transmission Rate	Up to 10Gbps per channel
Durability (mate/unmate with saver fitted)	500 cycles	Impedance	100 Ω ±10%

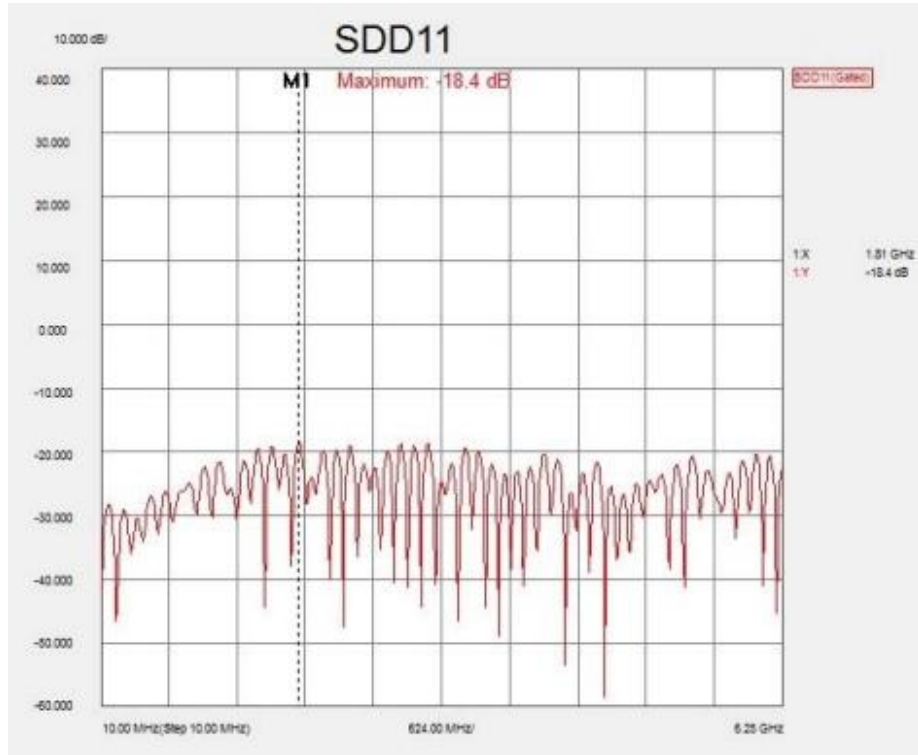
Materials & Finishes

Connector Plug/Receptacle Shells	Composite - (base material: PEEK 30% carbon filled) Finish: Gold over nickel
Inner Shell (Quad module)	Aluminium alloy Finish: Gold over nickel
Saver Shells	Aluminium alloy Finish: Gold over nickel
Contacts	Copper alloy Finish: Gold over nickel
Insulators/Dielectric	PEEK
Guide Hardware	Stainless steel and titanium alloy
Fasteners	Stainless steel

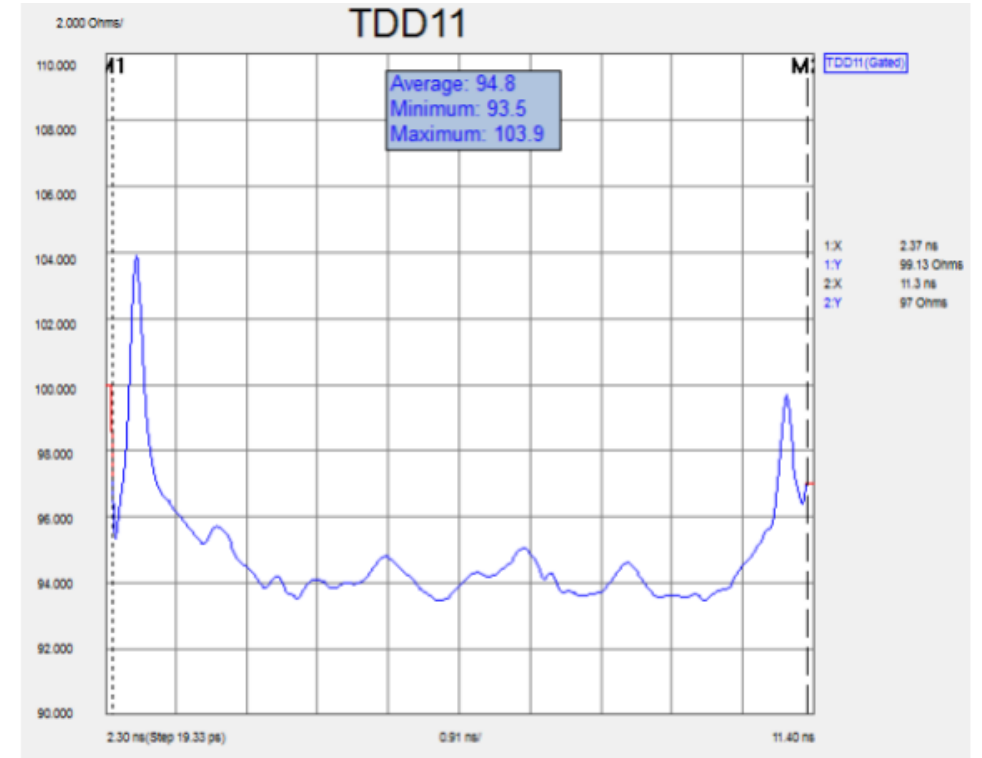


Eye jitter (PP) = 53.5ps
Post high temp' storage, connected to 1.0m length of cable (with bend)

NXS Series | Return Loss & Impedance



NXS: Typical Return Loss, frequency range up to 6.25GHz



NXS: Typical Impedance measurement (rise time 100ps),

Image shows TDR trace (TDD11) of the signal entering the connector, going through the cable, and exiting from a different part of the connector

NXS Series | Qualified to ESCC Standards

Test Activity	Affected Samples	Related Specification(s)	Section	Date Tested	Qual Result
SCREENING					
First Article Inspection	All	-	8.1.1	-	Pass
Mating / <u>Un</u> mating Forces	All	ESCC 3401 par 9.20	8.1.2	18-Mar 21	Pass
Low Level Contact Resistance	All	ESCC 3401 par 9.1.3	8.1.3	19-Mar	Pass
Insulation Resistance	All	EIA 363-21E	8.1.4	22-Mar	Pass
Dielectric Withstand Voltage	All	EIA 364-20E	8.1.5	22-Mar	Pass
Mated Shell Conductivity	All	ESCC 3401 Par 9.1.1.4	8.1.6	23-Mar	Pass
Voltage Standing Wave Ratio	All	ESCC 3402 Par 9.16	8.1.7	25-Mar	Pass
Insertion Loss	All	ESCC 3401 Par 9.1.1.6	8.1.8	26-Mar	Pass
Test Group I					
Screw Torque Force	Sample #1	-	8.2.1	29-Mar	Pass
Low Level Sine Sweep (Con Monitor)	Sample #1	ESCC 3401 9.11.1(b)	8.2.2	01-Apr to 07-Apr	Pass
Sine Vibration (Con Monitor)	Sample #1	ESCC 3401 Par 9.11.2	8.2.3	06-Apr to 07-Apr	Pass
Random Vibration (Con Monitor)	Sample #1	ESCC 3401 Par 9.11.3	8.2.4	06-Apr to 07-Apr	Pass
Low Level Sine Sweep (Con Monitor)	Sample #1	ESCC 3401 9.11.1(b)	8.2.5	06-Apr to 07-Apr	Pass
External Visual Inspection	Sample #1	IEC512-2 Test 1a	8.2.6	07-Apr	Pass
Low Level Contact Resistance	Sample #1	ESCC 3401 par 9.1.3	8.2.7	08-Apr	Pass
Screw Torque Force Drift	Sample #1	-	8.2.8	08-Apr	Pass
1/2 Sine Mechanical Shock (Con Monitor)	Sample #1	ESCC 3401 Par 9.12.1	8.2.9	08-Apr	Pass
External Visual Inspection	Sample #1	IEC512-2 Test 1a	8.2.10	08-Apr	Pass
Low Level Contact Resistance	Sample #1	ESCC 3401 par 9.1.3	8.2.11	09-Apr	Pass
Screw Torque Force Drift	Sample #1	-	8.2.12	09-Apr	Pass
Dry Heat (with Insulation Resistance)	Sample #1	ESCC 3401 9.13.2 IEC 60068-2-2	8.2.13	13-Apr	Pass
Damp Heat (Cycle 1)	Sample #1	ESCC 3401 9.13.3 IEC 60068-2-30	8.2.14	14-Apr to 15-Apr	Pass
Cold Test	Sample #1	ESCC 3401 9.13.4 IEC 60068-2-1	8.2.15	15-Apr	Pass
Low Air Pressure (with DWV)	Sample #1	ESCC 3401 9.13.5 IEC 60068-2-13	8.2.16	16-Apr	Pass
Damp Heat (Remaining Cycles)	Sample #1	ESCC 3401 9.13.6 IEC 60068-2-30	8.2.17	16-Apr to 21-Apr	Pass
Insulation Resistance	Sample #1	EIA 363-21E	8.2.18	21-Apr	Pass
Recovery & Visual Inspection	Sample #1	ESCC 3401 Par 9.13.7 IEC 512-2 Test 1a	8.2.19	22-Apr	Pass
Insulation Resistance	Sample #1	EIA 363-21E	8.2.20	26-Apr	Pass
Dielectric Withstand Voltage	Sample #1	EIA 364-20E	8.2.21	26-Apr	Pass

Test Activity	Affected Samples	Related Specification(s)	Section	Date Tested	Qual Result
Test Group II					
Rapid Change of Temperature (5 Cycles - 55C, +125C)	Sample #2	ESCC 3401 Par 9.16	8.3.1	26-Mar	Pass
External Visual Inspection	Sample #2	IEC 512-2 Test 1a	8.3.2	29-Mar	Pass
Low Level Contact Resistance	Sample #2	ESCC 3401 par 9.1.3	8.3.3	29-Mar	Pass
Mated Shell Conductivity	Sample #2	ESCC 3401 Par 9.1.1.4	8.3.4	29-Mar	Pass
Insulation Resistance	Sample #2	EIA 363-21E	8.3.5	29-Mar	Pass
Dielectric Withstand Voltage	Sample #2	EIA 364-20E	8.3.6	29-Mar	Pass
Voltage Standing Wave Ratio	Sample #2	ESCC 3402 Par 9.16	8.3.7	30-Mar	Pass
Insertion Loss	Sample #2	ESCC 3401 Par 9.1.1.6	8.3.8	31-Mar	Pass
Contact Retention	Sample #2	ESCC 3401 Par 9.17	8.3.9	09-Apr to 13-Apr	Pass
Mated Shell Conductivity	Sample #2	ESCC 3401 Par 9.1.1.4	8.3.10	13-Apr	Pass
Low Level Contact Resistance	Sample #2	ESCC 3401 par 9.1.3	8.3.11	14-Apr	Pass
Mating / <u>Un</u> mating Forces	Sample #2	ESCC 3401 par 9.20	8.3.12	14-Apr	Pass
Endurance (500 Cycles)	Sample #2	ESCC 3401 Par 9.18	8.3.13	14-Apr	Pass
Mating / <u>Un</u> mating Forces	Sample #2	ESCC 3401 par 9.20	8.3.14	15 Apr	Pass
Low Level Contact Resistance	Sample #2	ESCC 3401 par 9.1.3	8.3.15	15-Apr	Pass
Mated Shell Conductivity	Sample #2	ESCC 3401 Par 9.1.1.4	8.3.16	15-Apr	Pass
Insulation Resistance	Sample #2	EIA 363-21E	8.3.17	16-Apr	Pass
Dielectric Withstand Voltage	Sample #2	EIA 364-20E	8.3.18	16-Apr	Pass
Voltage Standing Wave Ratio	Sample #2	ESCC 3402 Par 9.16	8.3.19	19-Apr	Pass
Insertion Loss	Sample #2	ESCC 3401 Par 9.1.1.6	8.3.20	19-Apr	Pass
Destructive Physical Analysis	Sample #2	-	8.3.21	27.05.21	Pass

NXS Series | How to Order



1	Series	N X S (Series -fixed)
2	No. of ways	0 0 4 4-Bay high speed quadrax (dual twinax) 0 1 2 12-Bay high speed quadrax (dual twinax)
3	Shell gender	R 0 Receptacle R S Saver (Receptacle mount) P 0 Plug P S Saver (Plug mount)
4	Termination style	R A Right angle solderless PC (Receptacle only) 0 0 Supplied without contacts (Plug) 1 1 Connector Saver's
5	Shell material/Finish	C Composite shell (PEEK 30% carbon filled / gold over nickel) M Aluminium alloy / gold over nickel (std for savers)
6	Polarising/Guides	A Guide position A 1 Guide position 1 B Guide position B 2 Guide position 2 C Guide position C 3 Guide position 3 D Guide position D 4 Guide position 4
7	Custom variations	0 Standard



Collateral

3

NXS Series | Website Product Page and Landing Page

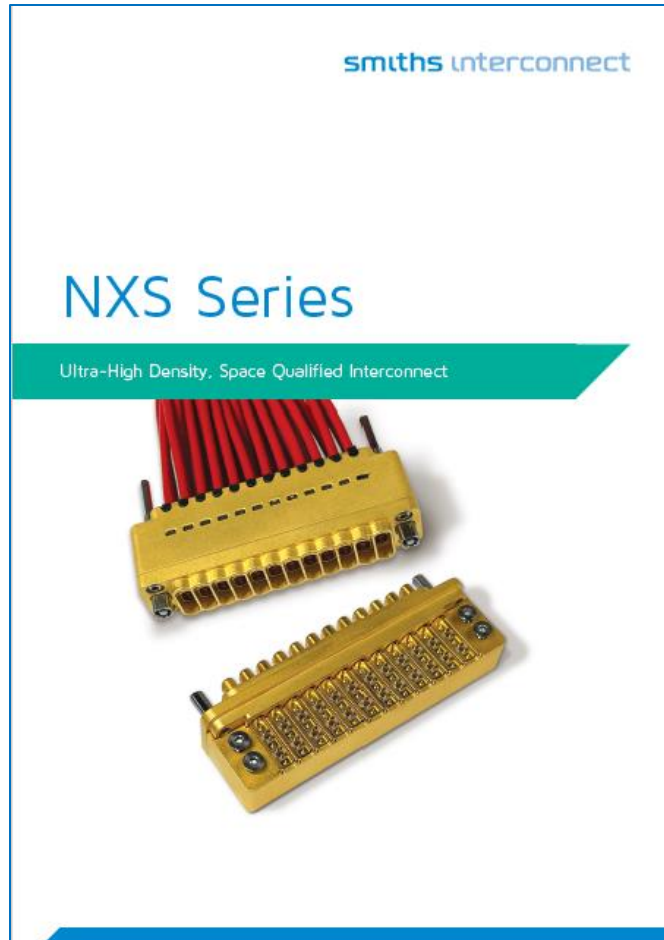
The screenshot shows the product page for the NXS Series on the Smiths Interconnect website. The page includes a navigation bar with links for Products, Markets, News, Library, Company, Careers, and Contact. The breadcrumb trail is Home > Products > Connectors > High Speed Data > NXS Series. The main heading is "NXS Series" with the sub-heading "Ultra-High Density, Space Qualified Interconnect". A descriptive paragraph states: "Equipped with the micro-boloid contact technology the NXS system has proven to withstand data rate application up to 10 Gbps requirements, including extreme levels of vibration, shock and climatic testing. The NXS Series is designed in a robust construction with 4 or 12 high speed quadrx (dualtwinx) modules." A prominent green "Request a Quote" button is visible. Below the main image is a carousel of three smaller images. At the bottom, there are tabs for "Features & Benefits", "Overview", "Documents & Literature", "Related Products", and "Related News". The "Features & Benefits" section lists "Low outgassing materials" and "Solderless PCB Termination". Two buttons, "Request a Quote" and "Request More Info", are located at the bottom right of the page.



3D animation, exploded view, in the webpage

[Smiths Interconnect - NXS Series – Ultra high density, space qualified interconnect](#)

Brochure



smiths interconnect

NXS Series

Ultra-High Density, Space Qualified Interconnect



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NXS Series

Ultra-High Density, Space Qualified Interconnect

Specifically designed and tested for High Speed Space applications up to

Today, space satellites are moving away from RF Analog based payloads providing low speed telecommunication signaling, to a new Digital Transparent Processor architecture for high throughput satellites. Those architectures increase the demand for rugged and higher speed connectivity.

To meet these industry needs, Smiths Interconnect has developed the NXS Series, the advanced high speed, high density system interconnect offering best generation data on demand.

Equipped with the micro-biased contact technology the NXS system has proven to withstand data rate application up to 10 Gbps requirements, including extreme levels of vibration, shock and climatic testing. The NXS Series is designed in a robust construction with 4 or 12 high speed signal (bi-terminal) modules.

Each ultra-high density quarter module contains, 2 Dual Termax at 100 Ω each pair. It is blind mated, hot pluggable, with ultra-low mating forces and low outgassing materials.

Features

- Low outgassing materials
- Micro - Hyperboloid contacts
- Solderless PCB Termination
- 4 and 12 bay configurations

Benefits

- Weight savings
- Ultra High Density
- Ultra low mating forces
- Withstands high shock and environments

Designed to exceed requirements of:

- ESCC 2401
- ESCC 2402
- ECSS-Q-ST-70C
- ECSS-Q-ST-70-D2
- ECSS-Q-ST-70-D8C
- ECSS-Q-ST-70-S8C
- ECSS-Q-70-71

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Accessories

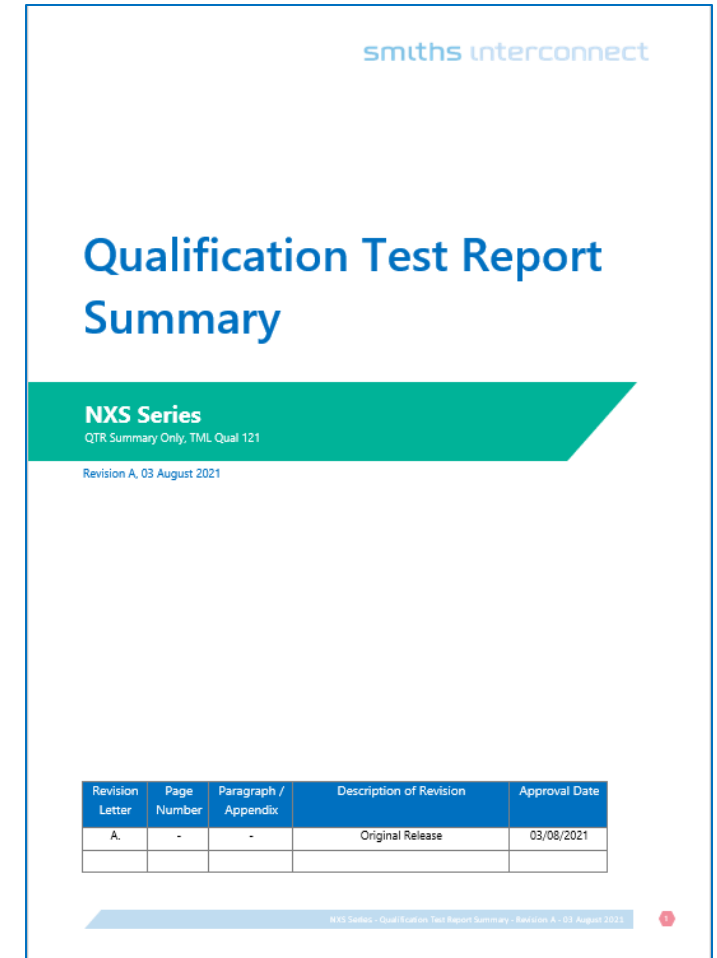
Description	Smiths Interconnect Part Number	
Cavity Filter	HIS-0360-107	
Clip, cable retention	HIS-0023-M	
Termination Kit	HIS-7009 <small>Each kit includes 1000 individual bi-axial cables to suit customer stock and test process. See table for impedance list.</small>	
Contact outer Shell	HIS-7049-14-107 1-2 if supplied in kit	
Socket Contact	HIS-056-100 1-4 if supplied in kit	
Insulator / Dielectric	HIS-6044-M 1-2 if supplied in kit	
Spacer	HIS-0365 1-4 if supplied in kit	

Plug Cable Termination (Twinax - as detailed above)



Note: Please refer to Application guide for stripping details.

Test Report



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Qualification Test Report Summary

NXS Series

QTR Summary Only, TML Qual 121

Revision A, 03 August 2021

Revision Letter	Page Number	Paragraph / Appendix	Description of Revision	Approval Date
A.	-	-	Original Release	03/08/2021

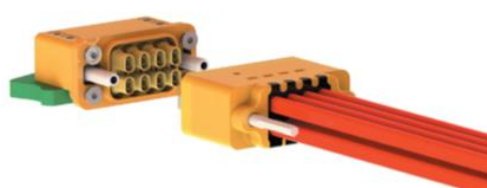
NXS Series - Qualification Test Report Summary - Revision A - 03 August 2021

Cable Fitting Guide

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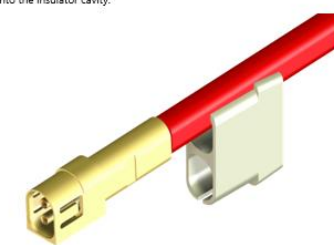
Cable Fitting Guide

NXS Series
 Preparation of Cable Assemblies and Fitting to Plugs

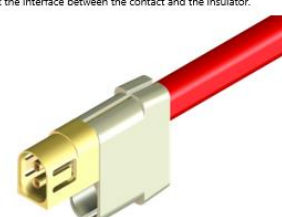


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- **STEP 1: FIT CABLE TO INSULATOR**
 Take an insulator and carefully open one of the slots in the insulator to allow the jacket of the first cable to pass into the insulator cavity.



- **STEP 2: SLIDE CABLE INTO ITS HOME POSITION**
 Use gentle finger pressure to slide the cable and contact into the position illustrated below; there should be no gap at the interface between the contact and the insulator.




NXS Series - Cable Fitting Guide - 27 September 2022

Application Guide

smiths interconnect




Application Guide

NXS Series
 Revision A



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Tooling

Part Number	Description	Image
H611571	Hex Driver 1.27 A/F	
HTA-661	Contact Release tool	
HTA-662	Contact Extract tool	

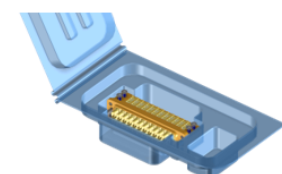
Product

NXS Receptacle

The NXS Receptacle utilizes solderless termination for connection to the parent PCB, any cleaning or conformal coating required on the parent board must be carried out prior to the fitment of the NXS Receptacle.

(Note: cleaning product & conformal coating product may cause contamination of inner contact and affect performance)

- Receptacle supplied individually packed within dedicated ESD clam-shell packing tray:



NXS Series - Application Guide - 27 September 2022

more > smithsinterconnect.com



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