ORBIX: THE CUTTING-EDGE SOLUTION FOR MODERN SPACE CHALLENGES

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INTRODUCTION

With over 50 years of experience in the space industry, dating back to our first satellite program in 1974, Radiall has built a legacy of trusted expertise supporting some of the world's most demanding space missions. As a long-standing partner to the space industry, Radiall has established close relationships with leading space agencies. Notably, the company became the first ESA-qualified manufacturer of coaxial connectors, terminations, and attenuators, demonstrating its commitment to the highest standards of quality and reliability.

Radiall interconnect solutions are built on the foundation of its qualified space products, designed specifically to meet the extreme demands of the space environment, including radiations, wide temperature fluctuations as well as intense shocks and vibrations. Beyond space, Radiall is a trusted supplier to the aerospace and defense industries. Combined with a global manufacturing footprint, this cross-sector expertise enables regional customer support, resilient supply chains, and industrial capabilities that meet the evolving needs of both traditional and New Space programs.

Over the past years, the space market has transformed significantly. Launches have surged, driven by the rapid rise of low-orbit constellation projects. As these programs involve the deployment of hundreds or even thousands of satellites, overall equipment needs have increased dramatically, creating unprecedented pressure on manufacturers to reduce costs without compromising reliability. In response to this fast-paced, transformative space race, Radiall has developed a competitive alternative to traditional space-grade products, dedicated to satellite and launcher manufacturers.

Radiall is thrilled to introduce the Orbix range (cable assemblies and connectors), a pioneering RF interconnection product line tailored for the new era of space. The Orbix range is engineered specifically for LEO constellations, Small/MEO Satellites, Launchers and Ground Segments, delivering exceptional Space Grade Qualified performances with an emphasis on cost-effectiveness and scalability.

ORBIX KEY FEATURES AND BENEFITS

- **Designed for space environments**
- **Cost-Effective and Scalable :** Ideal for high-volume satellite programs
- **Fast and Competitive Lead Times :** Supports dynamic deployment schedules
- **Customization:** Available through Radiall's dedicated space engineering team
- **High-Frequency Performance :** Operates up to 65 GHz, covering key frequency bands including C, X, Ku, K, Ka, and V
- **Compact and Lightweight :** Designed for easy integration into compact and densely packed architectures

- **Comprehensive Offering :** The Orbix range encompasses a vast selection of connectors, cable assemblies, board-to-board solutions, and equipment interfaces, ensuring compatibility with various frequency bands and applications. The solutions are built leveraging Radiall's robust manufacturing infrastructure, ensuring global availability and efficient supply chains.

THE ORBIX NEW SPACE RANGE INCLUDES SOLUTION THAT COVER TYPICAL NEEDS FOR NEW SPACE APPLICATIONS

With these product configurations, we include solutions for :

- Quick, easy and secure integration into final systems (Lock?)
- Ultra compact size for highly constrained and densely packed architectures (SMPM interface)
- Lightweight solutions for the new generation of satellites where every gram counts

Our RF engineering teams are available to support any product development or customization that are not part of the original launch scope, in order to support new launches.

PRODUCT	TYPE		MAX FREQUENCY [2]								CONNECTORS					
			8 GHz	12 GHz	18 GHz	20 GHz	26 GHz	32 GHz	40 GHz	65 GHz	SMA	SMA 2.9	SMP	SMPM	SMP [2]	SMPM [2]
			C	X	Ku	Ku	K	Ka	Ka	V						
Cable Assemblies	0.047		■	■	■	■	■	■	■					■		■
	SHF 2.4M		■	■							■					
					■	■	■	■	■				■		■	
	SHF 3M		■	■							■					
					■	■	■	■	■				■		■	
	SHF 4.6M		■	■	■	■	■	■				■				
	SHF 5M		■	■	■	■	■				■					
Connectors	Board-to-Board	SMP	■	■	■	■	■	■	■							
		SMPM	■	■	■	■	■	■	■	■						
	Connectors for Equipment	SMA	■	■												
		SMA 2.9	■	■	■	■	■	■	■							
		SMP [3]	■	■	■	■	■	■	■							
		SMPM [3]	■	■	■	■	■	■	■	■						
	Adapters	SMP to SMA	■	■												

Notes

1. Contact us for details
2. Coaxial transmission line frequency
3. SMP & SMPM connectors are also available with Radiall robust locking mechanism option: SMP-LOCK® & SMPM-LOCK®







ORBIX RANGE BRIDGES SPACE-PROVEN RELIABILITY AND COST-EFFECTIVE DESIGN, WITHOUT COMPROMISING PERFORMANCE

A systematic design-to-cost methodology was applied across the entire product lifecycle. Product architecture, material selection, manufacturing and assembly processes, inspection plans, qualification and acceptance testing, as well as marking and packaging strategies were carefully reassessed to eliminate non-value-added operations while preserving the level of robustness required to withstand the mechanical, thermal and environmental constraints encountered throughout the mission lifecycle.

The resulting qualification philosophy delivers space-proven and industrialized solutions, specifically engineered for today's commercial satellite platforms, enabling reduced production costs and shorter lead times without compromising mission-critical performance.

A simplified table shows below the results of Radiall approach:

RF CONNECTORS

	SPACE GRADE	ORBIX NEW SPACE
Qualification	ESA-ESCC Qualification	
Design	Space Design	
Assembly Workshop	ISO 9 Room	Standard Workshop
Assembly Process	Same Assembly Process	
Assembly Controls	100% Testing with Cleaning after each Mounting Operation	Controls via Sampling, after each Mounting Operation
Final Screening Test	Yes	N/A
Packaging	Individually Packaged (Anti-Static Bags)	
Marking	On Connector or on Packaging	

RF CABLE ASSEMBLIES

	SPACE GRADE	ORBIX NEW SPACE
Qualification	ESA-ESCC for TNC-VHP ESA-ESCC as a Guideline for others [1]	ESA-ESCC as a Guideline [1]
Design	Space Design	Space & Enhanced MIL Design
Assembly Workshop	ISO 8 Room	Standard Workshop
Assembly Process	Same Assembly Process (Soldering)	
Assembly Controls	100% Testing (X-Ray, Mating Records, etc...)	Lightened Test Procedure [1]
Final Screening Test	Yes	Yes

1. Contact us for details

CONCLUSION

Radiall Orbix range complements the existing space and military quality grades. It is a new type of space-proven product, answering the needs of the new space age, born with the rise of LEO constellations.

Radiall’s Orbix New Space range delivers high-performance RF cable assemblies and connectors built to thrive in the extreme conditions of space, combining reliability, cost efficiency and scalable production to meet the needs of today’s rapidly growing satellite and space programs.

If you’re interested in knowing more, technical information (TDS, qualification reports, etc..) are available online or through local Radiall Sales contact.

Find out more on Radiall website and on Radiall Orbix dedicated webpage :

www.radiall.com/orbix-space

AUTHORS

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Past experiences :

- International Product Manger
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- R&D Product Engineer, LED, Lighting, and Avionics
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