GORE[®] Spaceflight Microwave/RF Assemblies

For Traditional Space Applications

PROVEN NOW AND OVER TIME



Together, improving life

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Proven Performance in Critical Systems Now & Over Time

Spacecraft are routinely exposed to severe conditions while traveling millions of miles to explore the galaxy. From challenging launches in space to extreme temperatures with multiple thermal cycles over time in outer space. There are no quick repairs in space, so microwave cable assemblies must reliably transmit signals from the spacecraft back to Earth without failure for the duration of the mission.

Reliable Signals with Integrity

With approved materials, GORE[®] Spaceflight Microwave/RF Assemblies for traditional space applications are specifically engineered to maintain electrical and mechanical integrity in the harshest environments. They withstand exposure to shock, vibration, extreme temperatures, and radiation while transmitting uninterrupted signals with low insertion/ return loss and excellent phase stability.

Our rugged cable assemblies can operate at frequencies ranging from DC to 40 GHz. The small, low-mass and flexible construction of these cable assemblies also make rigorous routing easier and faster without breaking or failing.

We offer cable assemblies in diameters ranging from 1.2 mm (0.047 in) to 8.1 mm (0.320 in) to meet massdriven or insertion loss application requirements. We also offer a variety of robust, low-profile connector solutions — including, but not limited to SMA, SSMA, MSSS, SMP, SMPM, 2.92 mm, TNCA and TNC engineered to complement cable assembly performance.

Unique Materials Technology

We bring uniqueness to the industry by utilizing our extensive knowledge and unparalleled expertise in manipulating fluoropolymer to manufacturer solutions that have been proven in critical systems now and over time. Our core technology is a proprietary material expanded polytetrafluoroethylene (ePTFE). This patented technology enables us to design and wrap our ePTFE dielectric around our cable cores, producing high-performance solutions for targeted spaceflight applications (Figure 1).

Program Heritage

For decades, we have provided reliable solutions in hundreds of global spaceflight programs with a 100% failure-free flight record. We work closely with major space organizations such as the ESA (European Space Agency) and NASA (National Aeronautics and Space Administration) to deliver valued reliability from an ESA-qualified and ISO 9001:2000-certified manufacturing facility.

Our products have been used in many missions including the historic Apollo 11 mission to the moon. Also, other iconic programs such as the International Space Station, Envisat, Space Shuttle Program, Sentinel, Hubble Space Telescope, and more.

With approved materials, Gore offers small, low-mass, flexible solutions in rugged designs for targeted spaceflight applications that have been proven now and over time.

For Traditional Space Applications



Figure 1: Rugged Construction

Benefits

- Reliable signal integrity with low loss and excellent phase stability
- Outstanding shielding effectiveness across wide operating frequencies
- Superior radiation protection due to specialized, high-performance materials
- Increased flexibility in design layout with robust, low-profile connector solutions
- Small, low-mass, flexible designs tolerate rigorous routing and meet mass-driven requirements
- Proven performance through qualification testing replicating integration, launch, in-orbit phases
- Decades of 100% failure-free flight record in hundreds of global spaceflight programs

High-Performance Solutions

We offer a selection of GORE[®] Spaceflight Microwave/RF Assemblies to meet the needs and requirements of your specific traditional space application — from high power and high frequency to high flex and high density (Figure 2).

Our high-performance solutions have been thoroughly tested and qualified using our replication of integration, launch, and in-orbit phases to ensure mission-critical success every time over the life of the spacecraft.

High Power

Power handling, multipaction, and PIM (Passive Intermodulation) are all considered during the design phase for our high-power connector solutions. Manufactured on our Advanced PIM Processing Line, we offer TNC, SMA, and multipaction-free wedge TNC connectors to meet your critical power needs. With significant 3D RF field simulation capabilities, our highpower Types 28, 42, and 41 are the perfect low-risk solutions for mission-critical success.

High Frequency

Types 5D, 5G, and 56 are optimized for Ka, Q and V band to meet your specific high-frequency application needs. We also offer cable assemblies in small diameters to meet mass-driven applications or larger diameters to meet insertion loss-driven applications.

High Flex

With greater flexibility, Types 21, 2T and 26 with stranded center conductors provide excellent phase stability in high-flex applications. Please contact a Gore representative to discuss your specific requirements for flexure and to provide the best assembly type for your application.

High Density

With a small footprint, Types 27, 8S and 5U are the premier solutions for inside-the-box or box-to-box applications where the installation path is challenging, and spacecraft mass is critical. Our push-on connector solutions facilitate fast and easy integration without the need for a torque wrench.

Figure 2: GORE[®] Spaceflight Microwave/RF Assemblies



Hig	h Flex	
21 [3.0 mm / 0.120 in]	2T [3.0 mm / 0.120 in]	26 [3.0 mm / 0.120 in]

High Density			
27 [3.0 mm / 0.120 in]	85 [2.2 mm / 0.085 in]	5U [1.2 mm / 0.047 in]	

Advanced Capabilities

Thermal Extremes

Based on our extensive testing and long program heritage in real-world applications, our products are qualified for thermal extremes to meet the critical needs of your spacecraft. We offer products that withstand extreme temperatures ranging from -155°C to +150°C, utilizing high-temperature solders and unique termination techniques.

Multipaction

Our high-power connector solutions are specifically designed to reduce the risk of multipactor breakdown on SMA and TNC interface designs. Our wedge TNC interface provides the lowest risk, multipactor-resistant solution in extreme power applications.



Low PIM

We are deeply committed to understanding the causes of PIM. Our Advanced PIM Processing Line precisely manufactures low PIM interconnects that meet the complex, mission-critical needs of your spacecraft application.

Radiation Resistance

We have worked extensively with radiation experts for an in-depth understanding of mission profiles and the potential impact on cable performance. We offer best-in-class, radiation-resistant solutions aligned with your mission requirements.



For Traditional Space Applications

Type 5U (1.2 mm /0.047 in)



Program Heritage

- Griffon
- Intelsat 35
- Scout
- ViaSat

Typical Applications

- High-density interconnects
- Low-mass payload
- Quick connect
- T/R modules

Built precisely for high-density applications, Type 5U provides high-quality signal transmission at frequencies ranging from DC to 18 GHz (Table 1). The construction of our coaxial cable assembly has a very small diameter and is super low mass with more flexibility.

Table 1: Cable Assembly Properties

Electrical

Property	Value
Maximum Frequency (GHz)	18
Insertion Loss dB/m (ft) 1 GHz 18 GHz	0.97 (0.29) 3.74 (1.14)

Property	Value
Jacket Material	Tefzel [®] ETFE
Braided Shield	Silver-Plated Copper
Conductor Outer Center	Helically Wrapped Foil/Silver-Plated Copper Solid / Silver-Plated Copper
Dielectric Material	Gore ePTFE
Overall Diameter mm (in)	1.2 (0.047)
Mass g/m (g/ft)	5.6 (1.7)
Minimum Bend Radius mm (in) Single Multiple	3.2 (0.125) 6.4 (0.25)
Radiation Resistance (MRad)	100
Operating Temperature Range (°C) Standard Qualified	-55 to +150 -120 to +150

GORE[®] Spaceflight Microwave/RF Assemblies, Type 5U for high-density applications is available with connector variants engineered to complement assembly performance, minimizing loss and reflection (Table 2). For more information, please contact a Gore representative.

Туре	Code	Form	Maximum Frequency (GHz)
SMA	S01	Straight Pin	18
SMPM	ZNQ ZVY ZST	Straight Bulkhead Pin 90° Box Socket Straight Socket	18 18 18 18

Table 2: Connector Variants

For Traditional Space Applications

Type 85 (2.2 mm / 0.085)



Table 3: Cable Assembly Properties

Electrical

Property	Value
Maximum Frequency (GHz)	32
Standard Impedance (Ohms)	50 ± 1
Insertion Loss dB/m (ft) 1 GHz 18 GHz	0.63 (0.19) 2.83 (0.89)

Mechanical / Environmental

Property	Value
Jacket Material	Tefzel [®] ETFE
Braided Shield	Silver-Plated Copper
Conductor Outer Center	Helically Wrapped Foil/Silver-Plated Copper Solid / Silver-Plated Copper
Dielectric Material	Gore ePTFE
Overall Diameter mm (in)	2.2 (0.085)
Mass g/m (g/ft)	13.1 (4.0)
Minimum Bend Radius mm (in) Single Multiple	6.4 (0.25) 12.7 (0.50)
Radiation Resistance (MRad)	700
Operating Temperature Range (°C) Standard Qualified	-55 to +150 -110 to +150

Program Heritage

- Amos 4
- Galileo IOV
- MSG
- SBIRS
- Sentinel 1

Typical Applications

- General payload
- High-density interconnects
- Inside-the-box connections
- Low-mass payload
- Multiplexor
- Quick connect

GORE[®] Spaceflight Microwave/RF Assemblies, Type 8S for high-density applications is available with connector variants engineered to complement assembly performance, minimizing loss and reflection (Table 4). For more information, please contact a Gore representative.

Туре	Code	Form	Maximum Frequency (GHz)
	S 01	Straight Pin	22
	S71	90° Box Pin	22
	ZF8	90° Swept Pin	22
SMA	Y04	90° Clip Pin	22
	502	Straight Socket	22
	R42	Bulkhead Socket	22
	S 52	Flange Socket	22
CCMA	301	Straight Pin	18
SSIMA	371	90° Box Pin	18
	ZEM	Straight Socket	18
	ZF6	90° Box Socket	18
	ZWC	90° Truncated Box Pin Interface	18
SMP	ZWK	90° Box Socket	18
	ZKR	90° Extended Box Socket	18
	ZT4	Bulkhead Pin	18
	ZS5	Bulkhead Pin	18
CMDM	ZVY	90° Box Socket	18
SMPM	ZST	Straight Socket	18
2.02	ZMQ	Straight Pin	32
2.92 mm	ZQA	90° Box Pin	32
МСХ	7K2	Straight Pin	18
			.0
MSSS	ZNF	Straight Pin	20.5

Table 4: Connector Variants

For Traditional Space Applications

Type 26 (3.0 mm / 0.120 in)



Table 5: Cable Assembly Properties

Electrical

Value
22
0.52 (0.16)
2.33 (0.71)

Typical Applications

Program Heritage

COSMOKOMPSAT

- Box-to-box connections
- Limited flex applications
- Low-mass payload

Property	Value
Jacket Material	Tefzel [®] ETFE
Braided Shield	Silver-Plated Copper
Conductor Outer Center	Helically Wrapped Foil/Silver-Plated Copper Stranded / Silver-Plated Copper
Dielectric Material	Gore ePTFE
Overall Diameter mm (in)	3.0 (0.120)
Mass g/m (g/ft)	29.5 (9.0)
Minimum Bend Radius mm (in) Single Multiple	6.4 (0.25) 12.7 (0.50)
Radiation Resistance (MRad)	100
Operating Temperature Range (°C) Standard/Qualified	-55 to +150

GORE[®] Spaceflight Microwave/RF Assemblies, Type 26 for limited flex applications is available with connector variants engineered to complement assembly performance, minimizing loss and reflection (Table 6). For more information, please contact a Gore representative.

Туре	Code	Form	Maximum Frequency (GHz)
	S01	Straight Pin	22
	S71	90° Box Pin	22
CMA	ZF8	90° Swept Pin	22
SMA	Y04	90° Clip Pin	22
	502	Straight Socket	22
	R42	Bulkhead Socket	22
SSMA	ZBW	90° Clip Pin	18
SMP	ZEM ZF6	Straight Socket 90° Box Socket	18 18
	ZT3	Limited Detent Bulkhead Pin	18

Table 6: Connector Variants

For Traditional Space Applications

Type 27 (3.0 mm / 0.120 in Diameter)



Table 7: Cable Assembly Properties

Electrical

Property	Value
Maximum Frequency (GHz)	32
Insertion Loss dB/m (ft)	
1 GHz	0.47 (0.14)
18 GHz	2.08 (0.64)

Mechanical / Environmental

Property	Value
Jacket Material	Tefzel [®] ETFE
Braided Shield	Silver-Plated Copper
Conductor Outer Center	Helically Wrapped Foil/Silver-Plated Copper Solid / Silver-Plated Copper
Dielectric Material	Gore ePTFE
Overall Diameter mm (in)	3.0 (0.120)
Mass g/m (g/ft)	29.5 (9.0)
Minimum Bend Radius mm (in) Single Multiple	6.4 (0.25) 12.7 (0.50)
Radiation Resistance (MRad)	100
Operating Temperature Range (°C) Standard Qualified	-55 to +150 -110 to +150

Program Heritage

- Amos 2
- Intelsat 35
- Quasi-Zenith
- ViaSat

Typical Applications

- Box-to-box connections
- General payload
- High-density interconnects
- Inside-the-box connections
- Low-mass payload
- Multiplexer
- Quick connect

GORE[®] Spaceflight Microwave/RF Assemblies, Type 27 for high-density applications is available with connector variants engineered to complement assembly performance, minimizing loss and reflection (Table 8). For more information, please contact a Gore representative.

Туре	Code	Form	Maximum Frequency (GHz)
	S01	Straight Pin	22
	S71	90° Box Pin	22
SMA	ZF8	90° Swept Pin	22
	Y04	90° Clip Pin	22
	R42	Bulkhead Socket	22
CCMA	301	Straight Pin	18
AIVICC	ZBW	90° Clip Pin	18
SMP	ZEM ZF6	Straight Socket 90° Box Socket	18 18
2.92 mm	ZMQ ZQA	Straight Pin Straight Pin	32 32

Table 8: Connector Variants

For Traditional Space Applications

Type 2T (3.2 mm / 0.125 in)



For applications requiring more than 100,000 flexes, our Type 2T is the proven solution. This highly flexible coaxial cable assembly provides outstanding signal transmission in dynamic operation at frequencies ranging from DC to 22 GHz (Table 9).

Table 9: Cable Assembly Properties

Electrical

Property	Value	
Maximum Frequency (GHz)	22	
Insertion Loss dB/m (ft)		
1 GHz	0.59 (0.16)	
18 GHz	2.33 (0.71)	

Program Heritage

Euclid

Typical Applications

- Deployable antennas
- High-flex applications
- Mechanical arms

Property	Value
Jacket Material	PFA
Braided Shield	Silver-Plated Copper
Binder Material	Gore ePTFE
Conductor Outer Center	Helically Wrapped Foil/Silver-Plated Copper Stranded / Silver-Plated Copper
Dielectric Material	Gore ePTFE
Overall Diameter mm (in)	3.2 (0.125)
Mass g/m (g/ft)	26.2 (8.0)
Minimum Bend Radius mm (in) Single Multiple	6.4 (0.25) 12.7 (0.50)
Radiation Resistance (MRad)	100
Operating Temperature Range (°C) Standard/Qualified	-55 to +150

GORE[®] Spaceflight Microwave/RF Assemblies, Type 2T for high-flex applications is available with connector variants engineered to complement assembly performance, minimizing loss and reflection (Table 10). For more information, please contact a Gore representative.

Table 10: Connector Variants

Туре	Code	Form	Maximum Frequency (GHz)
2.92 mm	ZMQ	Straight Pin Vented	22



With proven high flexure, Gore's Type 2T ensures reliable signal transmission in dynamic operation ideal for spacecraft such as the Euclid.

For Traditional Space Applications

Type 56 (3.6 mm / 0.140 in)



Program Heritage

- HYLAS
- Intelsat 35
- Satmex
- SES-15
- TDRS

Typical Applications

- Antennas
- Box-to-box connections
- General payload
- High-frequency equipment

Engineered for high-frequency applications, our coaxial cable assembly operates reliably with superior signals ranging from DC to 40 GHz (Table 11). We build Type 56 in a flexible, low-mass package and offer a 2.92 mm connector solution.

Table 11: Cable Assembly Properties

Electrical

Property	Value
Maximum Frequency (GHz)	40
Insertion Loss dB/m (ft)	
1 GHz	0.38 (0.11)
18 GHz	1.67 (0.52)

Property	Value
Jacket Material	Tefzel [®] ETFE
Braided Shield	Silver-Plated Copper
Conductor Outer Center	Helically Wrapped Foil/Silver-Plated Copper Solid / Silver-Plated Copper
Dielectric Material	Gore ePTFE
Overall Diameter mm (in)	3.6 (0.140)
Mass g/m (g/ft)	36.1 (11.0)
Minimum Bend Radius mm (in) Single Multiple	12.7 (0.50) 25.4 (1.0)
Radiation Resistance (MRad)	100
Operating Temperature Range (°C) Standard Qualified	-55 to +150 160 to +160

GORE[®] Spaceflight Microwave/RF Assemblies, Type 56 for high-frequency applications is available with connector variants engineered to complement assembly performance, minimizing loss and reflection (Table 12). For more information, please contact a Gore representative.

Table 12: Connector Variants

Туре	Code	Form	Maximum Frequency (GHz)
	ZMQ	Straight Pin Vented	40
2 02 mm	ZMR	Swept Pin Vented	40
2.92 11111	ZMP	Straight Socket Vented	40
	ZMN	Bulkhead Socket Vented	40



Optimized for Ka-Band uplinks and downlinks, Type 5G from Gore delivers high-quality signal transmission in applications such as the TDRS.

© NASA/Kim Shiflett

For Traditional Space Applications

Type 5G (4.3 mm / 0.170 in)



Optimized for Ka-Band uplink and downlink applications, Type 5G delivers superior radio frequency performance for high-quality signal transmission ranging from DC to 32 GHz (Table 13). This coaxial cable assembly is designed in a small, flexible format and offers a 2.92 mm connector solution.

Table 13: Cable Assembly Properties

Electrical

Property	Value
Maximum Frequency (GHz)	32
Insertion Loss dB/m (ft) 1 GHz 18 GHz	0.26 (0.08) 1.14 (0.36)

Program HeritageAmos 6

- AR6
- HS-4

Typical Applications

- Antennas
- Box-to-box connections
- General payload
- High-frequency equipment

Property	Value
Jacket Material	Tefzel [®] ETFE
Braided Shield	Silver-Plated Copper
Conductor Outer Center	Helically Wrapped Foil/Silver-Plated Copper Solid / Silver-Plated Copper
Dielectric Material	Gore ePTFE
Overall Diameter mm (in)	4.3 (0.170)
Mass g/m (g/ft)	42.1 (13.0)
Minimum Bend Radius mm (in) Single Multiple	12.7 (0.50) 25.4 (1.0)
Radiation Resistance (MRad)	100
Operating Temperature Range (ºC) Standard Qualified	-55 to +150 -90 to +150

GORE[®] Spaceflight Microwave/RF Assemblies, Type 5G for high-frequency applications is available with connector variants engineered to complement assembly performance, minimizing loss and reflection (Table 14). For more information, please contact a Gore representative.

Table 14: Connector Variants

Туре	Code	Form	Maximum Frequency (GHz)
2.02	ZMQ	Straight Bulkhead Pin Vented	32
2.92 mm	Y04	Clip Pin Vented	32

For Traditional Space Applications

Type 21 (4.8 mm / 0.190 in)



Program Heritage

- Centaur
- CRS
- ORB-8
- SES-8

Typical Applications

- Box-to-box connections
- Limited flex applications
- Satellite panel-to-panel equipment

This flexible coaxial cable assembly is an alternative solution for applications requiring flexing limited to less than 100. Our Type 21 transfers consistently reliable signals with excellent phase stability at frequencies ranging from DC to 18 GHz (Table 15).

Table 15: Cable Assembly Properties

Electrical

Property	Value	
Maximum Frequency (GHz)	18	
Insertion Loss dB/m (ft) 1 GHz 18 GHz	0.31 (0.09) 1.39 (0.42)	

Property	Value
Jacket Material	Tefzel [®] ETFE
Braided Shield	Silver-Plated Copper
Conductor Outer Center	Helically Wrapped Foil/Silver-Plated Copper Stranded / Silver-Plated Copper
Dielectric Material	Gore ePTFE
Overall Diameter mm (in)	4.8 (0.190)
Mass g/m (g/ft)	55.8 (17.0)
Minimum Bend Radius mm (in) Single Multiple	12.7 (0.50) 25.4 (1.0)
Radiation Resistance (MRad)	100
Operating Temperature Range (°C) Standard/Qualified	-55 to +150

GORE[®] Spaceflight Microwave/RF Assemblies, Type 21 for high-flex applications is available with connector variants engineered to complement assembly performance, minimizing loss and reflection (Table 16). For more information, please contact a Gore representative.

Туре	Code	Form	Maximum Frequency (GHz)
	ZN1	Straight Pin Vented	18
SMA	ZSK	90º Box Pin Vented	18
	ZL7	Bulkhead Socket Vented	18
TNCA	ZL5 ZSY	Straight Pin Vented Straight Socket Vented	18 18



Gore's Type 21 with greater flexibility and consistently reliable signals is an alternative solution for robotic space vehicles requiring limited cable flexing such as the Centaur Rover.

For Traditional Space Applications

Type 41 (4.8 mm / 0.190 in)



Program Heritage

- Amos 2
- GOES-16
- HYLAS
- Juno
- Quasi-Zenith
- SES-14
- Vega

Typical Applications

- Box-to-box connections
- Extreme temperatures
- General payload
- Satellite panel-to-panel equipment

Designed for general payload applications, Type 41 delivers dependable signals while maintaining low insertion loss at frequencies ranging from DC to 18 GHz (Table 17). Our coaxial cable assembly is engineered in a flexible, robust construction for high-power systems operating in extreme temperatures.

Table 17: Cable Assembly Properties

Electrical

Property	Value
Maximum Frequency (GHz)	18
Insertion Loss dB/m (ft)	
1 GHz	0.24 (0.07)
18 GHz	1.07 (0.34)

Property	Value
Jacket Material	Tefzel [®] ETFE
Braided Shield	Silver-Plated Copper
Conductor Outer Center	Helically Wrapped Foil/Silver-Plated Copper Solid / Silver-Plated Copper
Dielectric Material	Gore ePTFE
Overall Diameter mm (in)	4.8 (0.190)
Mass g/m (g/ft)	55.8 (17.0)
Minimum Bend Radius mm (in) Single Multiple	12.7 (0.50) 25.4 (1.0)
Radiation Resistance (MRad)	100
Operating Temperature Range (°C) Standard Qualified	-55 to +150 -155 to +150

GORE[®] Spaceflight Microwave/RF Assemblies, Type 41 for high-power applications is available with connector variants engineered to complement assembly performance, minimizing loss and reflection (Table 18). For more information, please contact a Gore representative.

Туре	Code	Form	Maximum Frequency (GHz)
SMA	ZN1	Straight Pin Vented	18
	ZN2	90° Swept Pin Vented	18
	ZJP	90° Elbow Pin Vented	18
	ZSK	90° Box Pin Vented	18
	ZL7	Bulkhead Socket Vented	18
	ZP5	Straight Socket Vented	18
SMA (High Power)	ZW9	Straight Pin Vented	18
	ZWB	90° Elbow Pin Vented	18
TNCA	ZL5	Straight Pin Vented	18
	ZL6	90° Swept Pin Vented	18
	ZS2	90° Elbow Pin Vented	18
	ZSD	Bulkhead Socket Vented	18
	ZLU	Flange Socket Vented	18
TNCA (High Power)	ZLK	Straight Pin Vented	5
	Y06	90° Clip Pin Vented	5
Size 8 BMB	ZR2	Socket Contact (Pin Interface)	18
	ZR3	Pin Contact (Socket Interface)	18
Type N	N01	Straight Pin Vented	12.4

Table 18: Connector Variants

For Traditional Space Applications

Type 5D (4.8 mm / 0.190 in)



Table 19: Cable Assembly Properties

Electrical

Property	Value	
Maximum Frequency (GHz)	29.5	
Insertion Loss dB/m (ft) 1 GHz	0.24 (0.07)	
18 GHz	1.07 (0.34)	

Mechanical / Environmental

Property	Value
Jacket Material	Tefzel [®] ETFE
Braided Shield	Silver-Plated Copper
Conductor Outer Center	Helically Wrapped Foil/Silver-Plated Copper Solid / Silver-Plated Copper
Dielectric Material	Gore ePTFE
Overall Diameter mm (in)	4.8 (0.190)
Mass g/m (g/ft)	55.8 (17.0)
Minimum Bend Radius mm (in) Single Multiple	12.7 (0.50) 25.4 (1.0)
Radiation Resistance (MRad)	100
Operating Temperature Range (°C) Standard Qualified	-55 to +150 -155 to +150

Program Heritage

- AMU-1
- DirecTV 15
- HYLAS
- SES-14
- ViaSat

Typical Applications

- General payload
- High-frequency equipment
- Satellite panel-to-panel equipment

GORE[®] Spaceflight Microwave/RF Assemblies, Type 5D for high-frequency applications is available with connector variants engineered to complement assembly performance, minimizing loss and reflection (Table 20). For more information, please contact a Gore representative.

Table 20: Connector Variants

Туре	Code	Form	Maximum Frequency (GHz)
	ZUF	Straight Pin Vented	29.5
	ZXL	90° Clip Pin Vented	29.5
2.92 mm	ZMQ	Straight Pin Vented	29.5
	ZMR	90° Swept Pin Vented	29.5
	ZMP	Straight Socket Vented	29.5

Durable, flexible Type 5D from Gore enables high-frequency signal transmission with low loss in applications such as panel-to-panel equipment in the HYLAS satellite.



For Traditional Space Applications

Type 42 (7.4 mm / 0.290 in)



Program Heritage

- Amos 2
- Atlantic Bird 7
- COSMO
- Galileo IOV
- GOES-16
- SES-14

Typical Applications

- Antennas
- Extreme temperatures
- General payload
- High-power/low PIM/ multipaction applications
- Satellite panel-to-panel equipment

With low insertion loss, Type 42 transmits accurate signals at frequencies ranging from DC to 18 GHz (Table 21). Our flexible coaxial cable assembly is ideally suited for applications operating in extreme temperatures such as antennas, high power, and general payload.

Table 21: Cable Assembly Properties

Electrical

Property	Value
Maximum Frequency (GHz)	18
Insertion Loss dB/m (ft)	
1 GHz	0.16 (0.05)
18 GHz	0.69 (0.22)

Property	Value
Jacket Material	Tefzel [®] ETFE
Braided Shield	Silver-Plated Copper
Conductor Outer Center	Helically Wrapped Foil/Silver-Plated Copper Solid / Silver-Plated Copper
Dielectric Material	Gore ePTFE
Overall Diameter mm (in)	7.4 (0.290)
Mass g/m (g/ft)	131.2 (40.0)
Minimum Bend Radius mm (in) Single Multiple	19.0 (0.75) 39.1 (1.5)
Radiation Resistance (MRad)	100
Operating Temperature Range (°C) Standard Qualified	-55 to +150 -155 to +150

GORE[®] Spaceflight Microwave/RF Assemblies, Type 42 for high-power applications is available with connector variants engineered to complement assembly performance, minimizing loss and reflection (Table 22). For more information, please contact a Gore representative.

Туре	Code	Form	Maximum Frequency (GHz)
SMA	ZN1 ZN2 ZJP ZSK ZL7 ZP5	Straight Pin Vented 90° Swept Pin Vented 90° Elbow Pin Vented 90° Box Pin Vented Bulkhead Socket Vented Straight Socket Vented	18 18 18 18 18 18
TNCA	ZL5 ZL6 ZS2 ZMB ZSD	Straight Pin Vented 90° Swept Pin Vented 90° Elbow Pin Vented 90° Box Pin Vented Bulkhead Socket Vented	18 18 18 18 18
TNC (High Power)	ZV8 ZV9 ZLK Y06 ZLV ZPC ZWA	Straight Pin Vented 90° Elbow Pin Vented Straight Pin Vented 90° Clip Pin Vented 90° Swept Pin Vented Bulkhead Socket Vented Flange Socket Vented	5 5 5 5 5 5 5 5 5
TNC Wedge (High Power)	ZVX ZWS ZVZ	Straight Pin Vented 90° Swept Pin Vented Straight Socket Vented	5 5 5
Type N	ZMW	Straight Pin Vented	12.4

Table 22: Connector Variants

For Traditional Space Applications

Type 28 (8.1 mm / 0.320 in)



Program Heritage

- Alphasat
- Astra 58
- Express AM7
- Globalstar 2
- SES-15
- TDRS

Typical Applications

- Antennas
- Extreme temperatures
- High-power/low PIM/ multipaction applications

Our coaxial cable assembly maintains exceptional signal quality and low insertion loss at frequencies ranging from DC to 18 GHz (Table 23). With a flexible format, Type 28 operates reliably and consistently in high-power and antenna applications.

Table 23: Cable Assembly Properties

Electrical

Property	Value	
Maximum Frequency (GHz)	18	
Insertion Loss dB/m (ft)		
1 GHz	0.15 (0.04)	
18 GHz	0.64 (0.02	

Property	Value
Jacket Material	Tefzel [®] ETFE
Braided Shield	Silver-Plated Copper
Conductor Outer Center	Helically Wrapped Foil/Silver-Plated Copper Solid / Silver-Plated Copper
Dielectric Material	Gore ePTFE
Overall Diameter mm (in)	8.1 (0.320)
Mass g/m (g/ft)	144.3 (44.0)
Minimum Bend Radius mm (in) Single Multiple	25.4 (1.0) 50.8 (2.0)
Radiation Resistance (MRad)	100
Operating Temperature Range (°C) Standard Qualified	-55 to +150 -155 to +150

GORE[®] Spaceflight Microwave/RF Assemblies, Type 28 for high-power applications is available with connector variants engineered to complement assembly performance, minimizing loss and reflection (Table 24). For more information, please contact a Gore representative.

Туре	Code	Form	Maximum Frequency (GHz)
SMA	ZN1	Straight Pin Vented	18
	ZSK	90° Box Pin Vented	18
TNCA	ZL5	Straight Pin Vented	18
	ZSY	Straight Socket Vented	18
	ZSD	Bulkhead Socket Vented	18
TNC (High Power)	ZLK Y06 ZLW ZPC	Straight Pin Vented 90° Clip Pin Vented 90° Box Pin Vented Bulkhead Socket Vented	5 5 5 5
TNC Wedge	ZVX	Straight Pin Vented	5
(High Power)	ZVZ	Straight Socket Vented	5
Type N	ZMW	Straight Pin Vented	12.4

Table 24: Connector Variants

For Traditional Space Applications

Ordering Information

GORE[®] Spaceflight Microwave/RF Assemblies are identified by a 16-character part number that designates the cable type, connector type, assembly length, and connector form (Table 25). For more information or to discuss your application needs and request a quote, please contact a Gore representative. Alternatively, use our online tools to calculate parameters, build your assembly, and request a quote.



Positions 1–2: The two-character identifier of the cable type.

Positions 3–5 and 6–8: Connector codes A and B in alphanumeric order.

Positions 9–11: The length of the assembly expressed in inches, including zeros to fill positions if the length is less than two or three digits. For example, fill in "006" for 6 inches or "024" for 24 inches.

Position 12: Identifier to further define the length of the assembly not in whole increments (e.g., 24.5). Do not use a two-place decimal; instead, round to the desirable tenth of an inch for your application. For whole-inch increments, fill in a zero in this position (e.g., 0060 or 0240).

Positions 13–15: Use only when an assembly has two angled or "D" mount connectors or a combination of both. Angles less than 100° must be preceded by a zero in position 13. If any of these positions are NOT specified, Gore will supply the assembly with an angular displacement of 0°. These positions are required for ordering purposes only and are not printed on the actual assembly.

Positions 16: Identifier for desired temperature range. Include "S" for operating temperatures between -55°C to +150°C or "X" for extreme operating temperatures.

Table 25: Examples of Gore's Part Numbering System

	Ordering Identifier (Part Number Positions)					
Gore Part Number	Cable Diameter Type (Pos 1–2)	Connector A (Pos 3–5)	Connector B (Pos 6–8)	Assembly Length (Pos 9–12)	Angular Disp. (Pos 13–15)	Temp Range (Pos 16)
27S71S710 120/270-S	27 3.0 mm (0.120 in)	SMA, 90° Box, Pin	SMA, 90° Box, Pin	12.0 in	270°	-55°C to +150
42ZN2ZN21 200-S	42 7.4 mm (0.290 in)	SMA, 90° Swept, Pin, Vented	SMA, 90° Swept, Pin, Vented	120.0 in	0°	-55°C to +150°C
42ZL5ZL50 245-X	42ET 7.4 mm (0.290 in)	TNCA, Straight, Pin, Vented	TNCA, Straight, Pin, Vented	24.5 in	N/A	-155°C to +150°C

The **GORE™ Microwave/RF Assembly Builder** is a step-by-step tool that allows you to configure and request a quote for an assembly with different connector options, assembly lengths, and frequencies. For more information, visit **gore.com/rfcablebuilder**.

The **GORE™ Microwave/RF Assembly Calculator** is an online tool that calculates and compares the insertion loss, VSWR, and other parameters for various cable types. For more information, visit **tools.gore.com/gmcacalc.**

GORE® Spaceflight Microwave/RF Assemblies For Traditional Space Applications

Notes



Information in this publication corresponds to W. L. Gore & Associates' current knowledge on the subject. It is offered solely to provide possible suggestions for user experimentations. It is NOT intended, however, to substitute for any testing the user may need to conduct to determine the suitability of the product for the user's particular purposes. Due to the unlimited variety of potential applications for the product, the user must BEFORE production use, determine that the product is suitable for the intended application and is compatible with other component materials. The user is solely responsible for determining the proper amount and placement of the product. Information in this publication may be subject to revision as new knowledge and experience become available. W. L. Gore & Associates cannot anticipate all variations in actual end user conditions, and therefore, makes no warranties and assumes no liability in connection with any use of this information. No information in this publication is to be considered as a license to operate under or a recommendation to infringe any patent right.

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