



Micro-Coaxial

Interconnects for High Density and High Frequency Applications

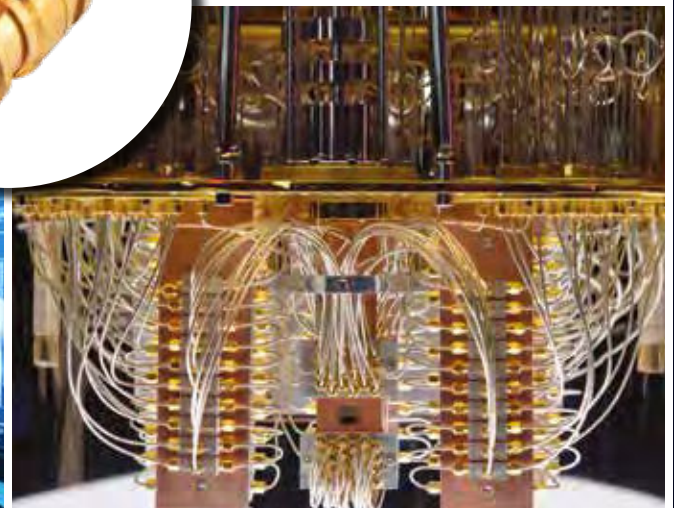
• PhaseTrack® 047

• StripFlex® 047

• InstaBend® 047

• TF-047

• XtendedFlex™ 045



Micro-Coaxial Overview

Interconnects for High Density and High Frequency Applications

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Micro-Coaxial Applications

Where we focus our resources to develop differentiated solutions for many applications such as:

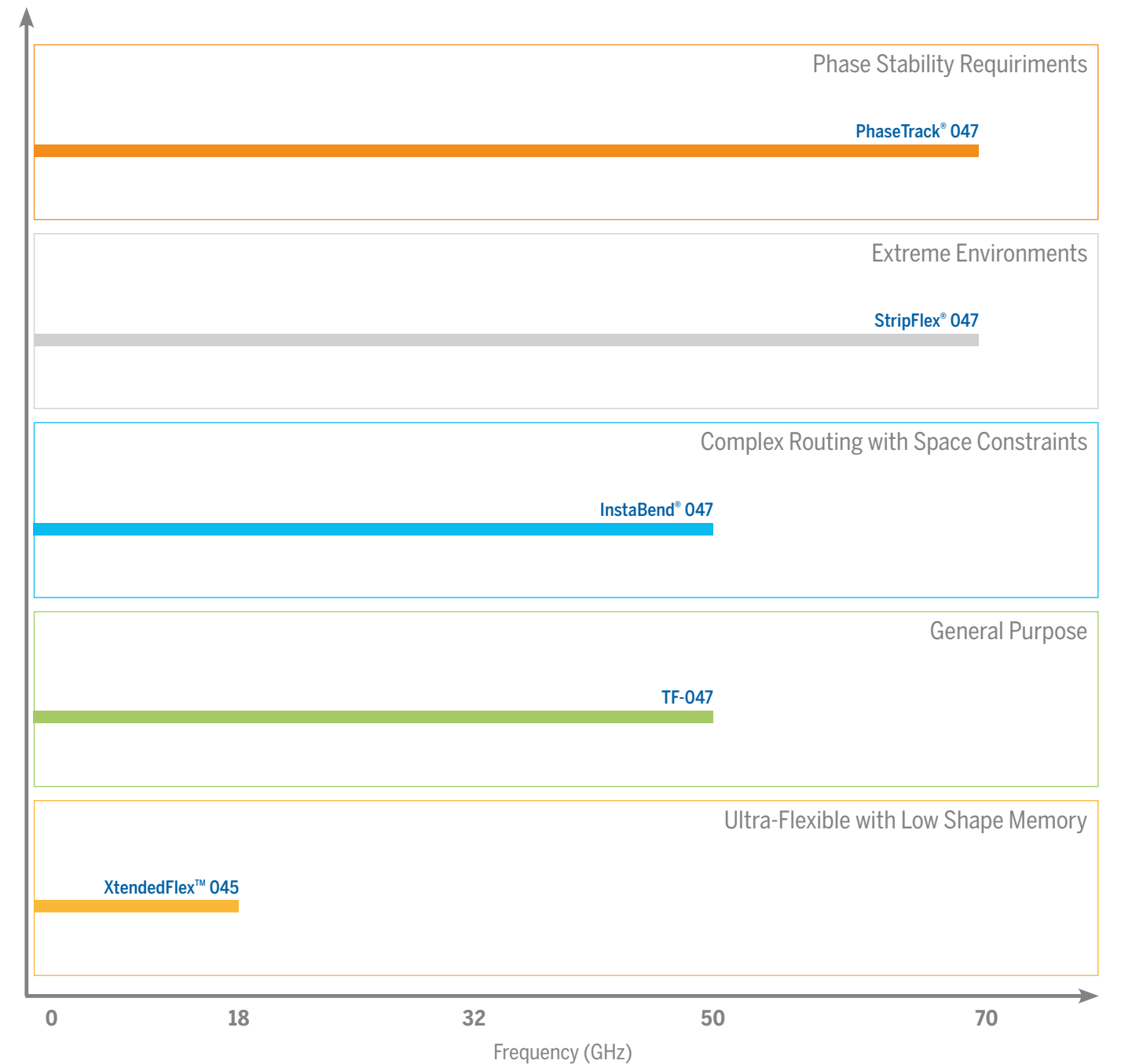
Medical Devices	Inside-the-Box Connectivity	Test and Measurement	Industrial
<ul style="list-style-type: none"> Flexible catheter Medical imaging Patient monitoring 	<ul style="list-style-type: none"> Board-to-board Module-to-module Backplane Crossover 	<ul style="list-style-type: none"> Bench / production test Signal fanout ATE 	<ul style="list-style-type: none"> Sensor Automation High speed data GPS

Cable Assembly Comparison Chart

Cable	Max.Frequency	Cable Diameter	Flexure	Loss	Power Handling	Temperature Range
PhaseTrack® 047	70 GHz	0.065 in (1.65 mm)	Good	Excellent	Excellent	Excellent
StripFlex® 047	70 GHz	0.057 in (1.45 mm)	Good	Good	Excellent	Superior
InstaBend® 047	50 GHz	0.061 in (1.55 mm)	Superior	Excellent	Excellent	Good
TF-047	50 GHz	0.055 in (1.40 mm)	Excellent	Excellent	Excellent	Excellent
XtendedFlex™ 045	18 GHz	0.045 in (1.14 mm)	Excellent	Superior	Excellent	Good

Cable Assembly Guide

Selecting the correct assembly for the right application is not always an easy task. Below are some considerations when selecting High Performance Microwave Assemblies.



PhaseTrack® 047

Low-Loss Micro Coaxial



PT-047 is a low-loss, highly flexible, foam-core micro coaxial cable. Originally designed for space satellite programs, this high-performance cable has many applications across multiple markets. It has a broad frequency range and strong durability making it ideal for medical, test equipment, and many other RF applications.

Features:

- High performance in a compact size
- Extremely rugged and low loss
- Broad frequency range up to 70 GHz
- Flex tested to over a million cycles
- In-the-box flexible alternative to 047 Semi-Rigid

Specifications

Impedance
50 Ohms

Op Temp
-85 to 302°F
-65 to 150°C

Units

Parameter	Units	Value
Maximum Outer Diameter	in (mm)	0.065 (1.651)
Weight	lb/ft (g/m)	0.006 (8.33)
Static Bend Radius	in (mm)	0.25 (6.35)
Dynamic Bend Radius	in (mm)	0.75 (19.05)
Velocity of Propagation	%	77
Max. Frequency	GHz	70
Capacitance	pF/ft (pF/m)	26.9 (88.25)

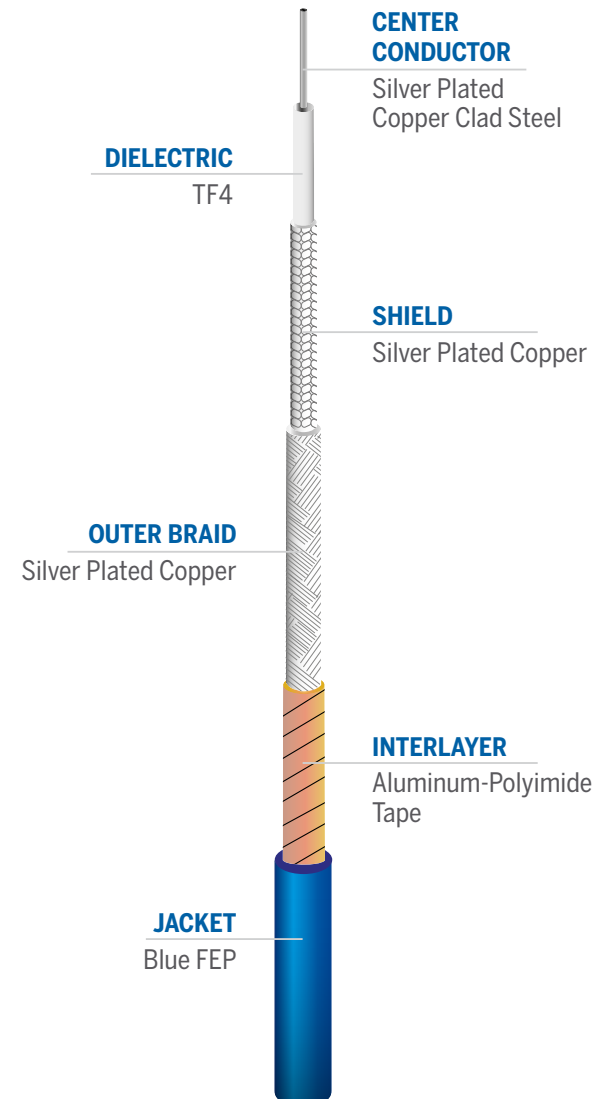
Calculation

$$IL = (K1 \times \sqrt{f}) + K2 \times f \times \text{Cable Length}$$

Cable Insertion Loss
f = Frequency (MHz)

Use K values with matching length unit

K values	dB/ft	dB/m
K1	0.011767	0.038607
K2	0.000008	0.00025



Ordering Guide

PT047 -XXX XXX- XX.X CM
- Connector A Connector B - Length / 3 dig in / cm

Connectors	Code	Part-Number	Stock Code	Description
	MSMPFR	EZ-047-MSMPF-RA-DS	3190-6817	Mini SMP, female, right angle
	MSMPF	EZ-PT047-MSMPF-DS	3190-6880	SMPM, female, straight
	185M	EZ-PT047-185M-SS	3190-6875	1.85, male, straight
	24M	EZ-PT047-24M-SS	3190-6876	2.4, male, straight
	KM	EZ-PT047-KM-SS	3190-6877	2.92, male, straight
	SM	EZ-PT047-SM-SS	3190-6878	SMA, male, straight
	SMPF	EZ-PT047-SMPF-DS	3190-6879	SMP, female, straight
	SMPSF	EZ-PT047-SMPSF-DS	3190-6898	SMPS, female, straight
	SMPSFR	EZ-PT047-SMPSF-RA-DS	3190-6906	SMPS, female, right angle

Ideal for:



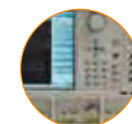
Space



Radar



EW Systems



Test and measurements



SF-047 is a ruggedized, small-diameter cable developed to operate in harsh environments. Its durable construction provides the high performance and reliability required in a wide variety of applications, ranging from high-precision device test to spaceflight. The SF-047 is an ideal solution when there can be no compromise in low SWaP, high density, and high reliability.

Features:

- Ruggedized construction
- Wide operating temperature range
- Versatile solution for all applications

Specifications

Impedance 50 Ohms
Op Temp -85 to 392°F
-65 to 200°C

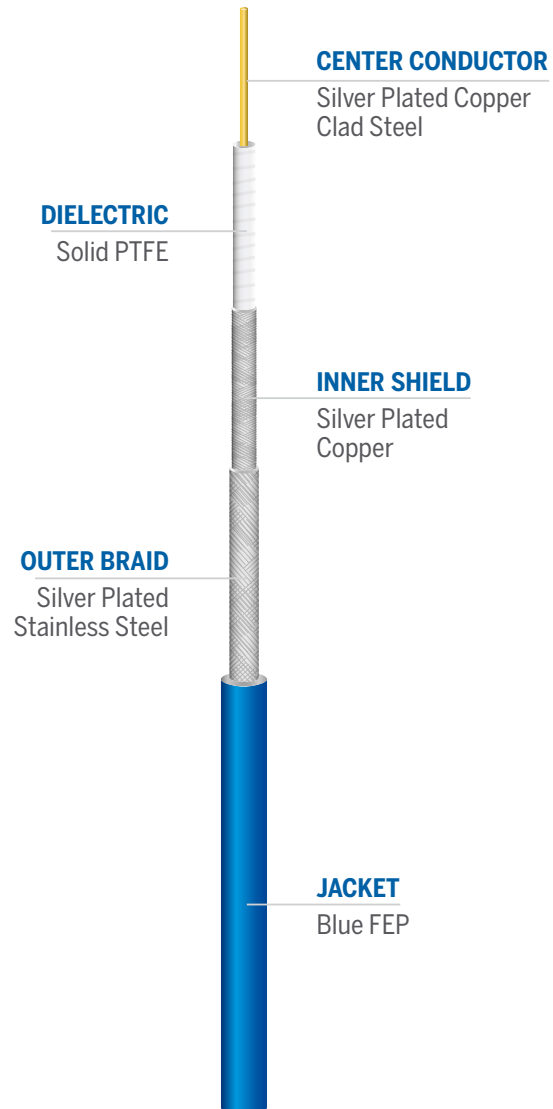
	Units	
Maximum Outer Diameter	in (mm)	0.057 (1.45)
Weight	lb/ft (g/m)	0.004 (5.66)
Bend Radius	in (mm)	0.500 (12.70)
Velocity of Propagation	%	70
Max. Frequency	GHz	70
Capacitance	pF/ft (pF/m)	29.1 (95.5)
Delay	ns/ft (ns/m)	1.45 (4.76)
Minimum Shielding Effectiveness	dB	-85
Power Handling @18 GHz, 25°C, Sea Level	W (CW)	13.4

Calculation

$$IL = (K1 \times v(f) + K2 \times f) \times \text{Cable Length}$$

Cable Insertion Loss
f = Frequency (MHz)
Use K values with matching length unit

K values	dB/ft	dB/m
K1	1.379692	4.526549
K2	0.001279	0.004196



Ordering Guide

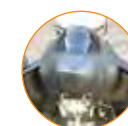
SF047 -XXX XXX- XX.X CM
- Connector A Connector B - Length / 3 dig in / cm

Connectors	Code	Part-Number	Stock Code	Description
	MSMPFR	EZ-047-MSMPF-RA-DS	3190-6817	Mini SMP, female, right angle
	MSMPF	EZ-PT047-MSMPF-DS	3190-6880	SMPM, female, straight
	185M	EZ-PT047-185M-SS	3190-6875	1.85, male, straight
	24M	EZ-PT047-24M-SS	3190-6876	2.4, male, straight
	KM	EZ-PT047-KM-SS	3190-6877	2.92, male, straight
	SM	EZ-PT047-SM-SS	3190-6878	SMA, male, straight
	SMPF	EZ-PT047-SMPF-DS	3190-6879	SMP, female, straight
	SMPSF	EZ-PT047-SMPSF-DS	3190-6898	SMPS, female, straight
	SMPSFR	EZ-PT047-SMPSF-RA-DS	3190-6906	SMPS, female, right angle

Ideal for:



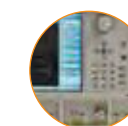
Space



Ground and airborne systems



Quantum computer



Test and measurements

InstaBend® 047

High Performance Microwave Assemblies



InstaBend® are flexible, coaxial microwave assemblies designed for interconnects between RF circuit cards, modules and enclosure panels. The cable can be bent very closely behind the connector, simplifying cable routing.

Features:

- Readily Available
- Low-profile bending close to the connector back-end for minimal footprint
- Lightweight

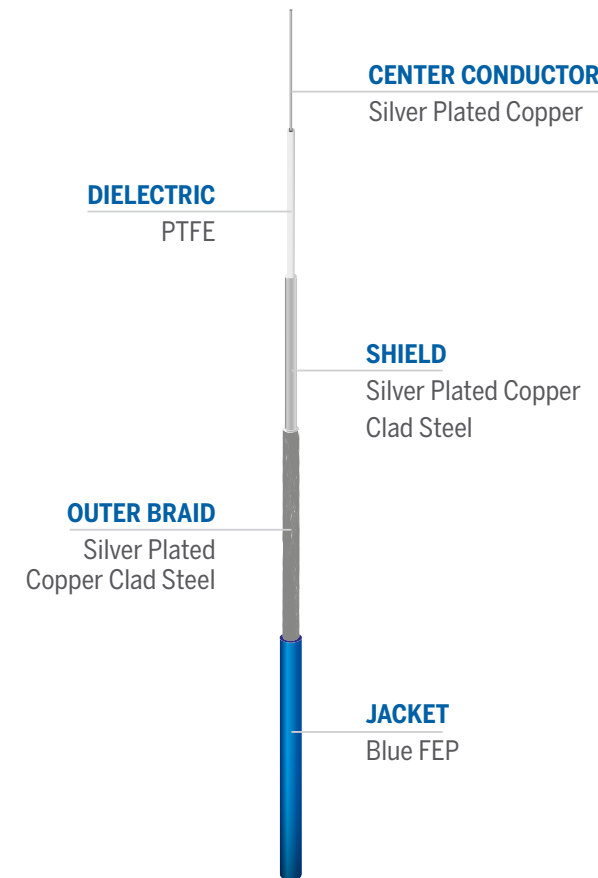
Specifications

Impedance
50 Ohms

Op Temp
-85 to 257°F
-65 to 125°C

Units

Diameter	in (mm)	0.061 (1.55)
Weight	lb/ft (g/m)	0.004 (5.95)
Minimum Bend Radius	in (mm)	0.130 (3.30)
Maximum Frequency	GHz	50
Maximum Operating Voltage	VACrms	100
Capacitance	pF/ft (pF/m)	29.9 (98.1)
Delay	ns/ft (ns/m)	1.45 (4.76)
Shielding	dBc	-90



Ordering Guide

IB047 -XX XX- XX.X XX
- Connector A Connector B - Length in / ft / cm / m

Connectors	Code	Part-Number	Stock Code	Description	VSWR max
	KM	IB-047-KM	47425	2.92 mm, male, straight	1.35 @ DC-12.4 GHz 1.50 @ 12.4- 18 GHz
	SM	IB-047-SM	47396	SMA, male, straight	1.20 @ DC-6.0 GHz 1.35 @ 6.0-26.5 GHz
	SMPF	IB-047-SMPF	47432	SMP, female, straight	1.20 @ DC-6.0 GHz 1.35 @ 6.0-26.5 GHz 1.40 @ 26.5-40.0 GHz

Calculation

$$IL = (K1 \times v(f) + K2 \times f) \times \text{Cable Length} + \text{Connector Loss}$$

Cable Insertion Loss
f = Frequency (MHz)

Use K values with
matching length unit

K values	dB/ft	dB/m
K1	0,01195	0,03920795
K2	0,000013	0,000042653

Typical Connector Loss

Frequency (MHz)	dB/pr	Frequency (MHz)	dB/pr
500	0.04	10000	0.19
1000	0.06	12000	0.21
2000	0.08	14000	0.22
4000	0.12	16000	0.24
6000	0.15	18000	0.25
8000	0.17		

Ideal for:



Space



Radar



EW Systems



Test and measurements

TF-047

Micro-Coaxial Cable



TF-047 is a versatile micro-coaxial cable ideal for high-density applications. Available in bulk or cable assembly with a wide selection of interfaces, TF-047 offers high performance and reliability in a compact footprint.

Features:

- Optimal SWAP-C cable solution
- Compatible with a large selection of connectors
- Flexible and compact for easy routing

Specifications

Impedance
50 Ohms

Op Temp
-85 to 302°F
-65 to 150°C

Units

Parameter	Unit	Value
Maximum Outer Diameter	in (mm)	0.0550 (1.397)
Weight	lb/ft (g/m)	0.004 (5.66)
Static Bend Radius	in (mm)	0.20 (5.08)
Dynamic Bend Radius	in (mm)	0.40 (10.16)
Velocity of Propagation	%	70
Max. Frequency	GHz	50
Capacitance	pF/ft (pF/m)	28.83 (94.59)

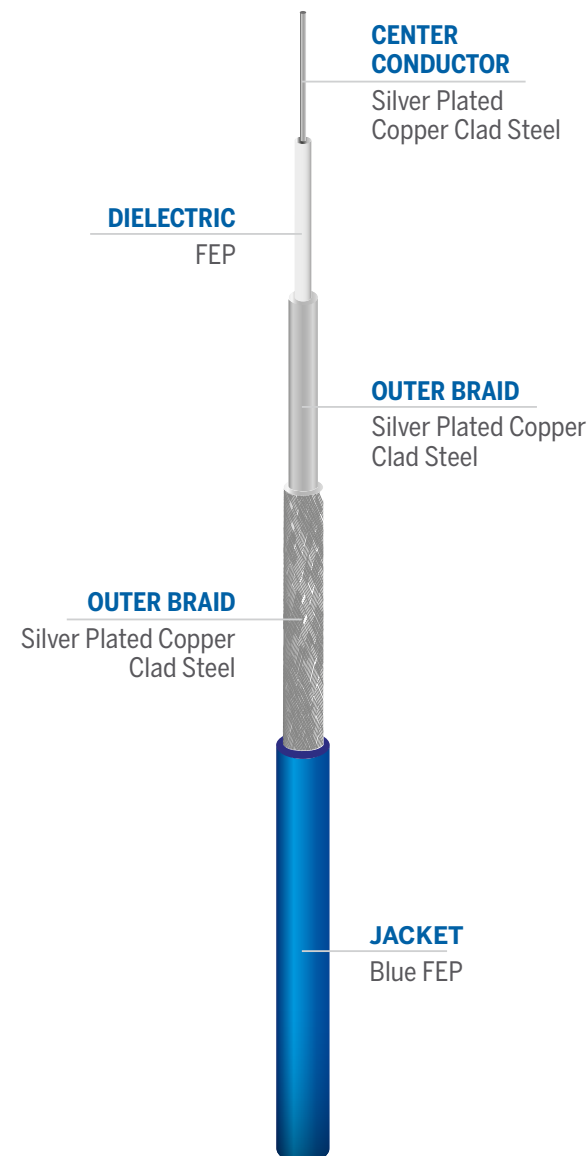
Calculation

$$IL = (K1 \times v(f) + K2 \times f) \times \text{Cable Length} + \text{Connector Loss}$$

Cable Insertion Loss
f = Frequency (MHz)

Use K values with
matching length unit

K values	dB/ft	dB/m
K1	.012253	.040202
K2	.000018	000060



Ordering Guide

TF047 -XXX XXX- XX.X CM
- Connector A Connector B - Length / 3 dig in / cm

Connectors	Code	Part-Number	Stock Code	Description
	MSMPFR	EZ-047-MSMPF-RA-DS	3190-6817	Mini SMP, female, right angle
	MSMPF	EZ-PT047-MSMPF-DS	3190-6880	SMPM, female, straight
	185M	EZ-PT047-185M-SS	3190-6875	1.85, male, straight
	24M	EZ-PT047-24M-SS	3190-6876	2.4, male, straight
	KM	EZ-PT047-KM-SS	3190-6877	2.92, male, straight
	SM	EZ-PT047-SM-SS	3190-6878	SMA, male, straight
	SMPF	EZ-PT047-SMPF-DS	3190-6879	SMP, female, straight
	SMPSF	EZ-PT047-SMPSF-DS	3190-6898	SMPS, female, straight
	SMPSFR	EZ-PT047-SMPSF-RA-DS	3190-6906	SMPS, female, right angle

Ideal for:



Ground and airborne systems



Data network



Quantum computer



Test and measurements

XtendedFlex™ 045



XtendedFlex™ 045 is the most compact cable in the XtendedFlex product family. Developed with the latest medical devices and minimally invasive procedures in mind, XF 045 is a versatile solution combining ultra-flexibility with low attenuation.

Features:

- Ultra-flexible
- High power transfer efficiency
- Lightweight

Specifications

Impedance
50 Ohms

Op Temp
-67 to 302°F
-55 to 150°C

	Units	
Maximum Diameter	in (mm)	0.045 (1.14)
Weight	lb/ft (g/m)	0.002 (3.27)
Minimum Bend Radius	in (mm)	0.2 (5.08)
Maximum Frequency	GHz	18
Velocity of Propagation	%	80
Capacitance	pF/ft (pF/m)	25.4 (83.3)
Delay	ns/ft (ns/m)	1.27 (4.17)

Calculation

$$IL = (K1 \times v(f) + K2 \times f) \times \text{Cable Length}$$

Cable Insertion Loss
f = Frequency (MHz)

Use K values with matching length unit

K values	dB/ft	dB/m
K1	0.010832	0.035540
K2	0.000001	0.000005

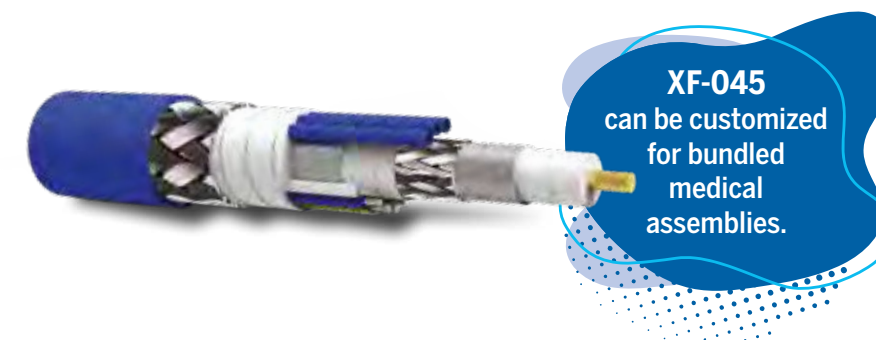


Ordering Guide

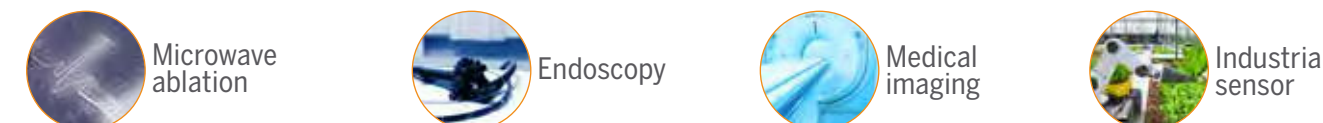
XF045 - CODE CODE - XX.X XX

- Connector A Connector B - Length Units of measure
IN - Inches
CM -Centimeters

Connectors	Code	Part-Number	Stock Code	Description
	MCXM	TC-XF045-MCXM	3190-7039	MCX, male, straight



Ideal for:





T **TIMES**
MICROWAVE SYSTEMS
AN AMPHENOL COMPANY

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