

# TFlex<sup>®</sup>



**TT** **TIMES**  
MICROWAVE SYSTEMS  
AN AMPHENOL COMPANY

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**TFlex®** is a high-performance microwave cable that offers low loss, excellent shielding, and low PIM (Passive Intermodulation) characteristics. With its unique design, it provides an alternative to semi-rigid cables while maintaining comparable electrical performance. The cable consists of a silver-plated copper center conductor, which is surrounded by a dielectric material made of a solid PTFE (Polytetrafluoroethylene) compound.

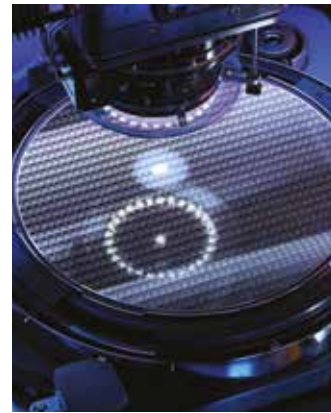
This dielectric material is then covered by a double-layer of silver-plated copper braid shields for superior EMI (Electromagnetic Interference) protection. The outer jacket is made of FEP (Fluorinated Ethylene Propylene) material, which is UV-resistant, flame-retardant, and provides excellent chemical resistance. TFlex® is suitable for a wide range of applications, including aerospace, defense, and telecommunications.

## Applications

Ground and Airborne Systems



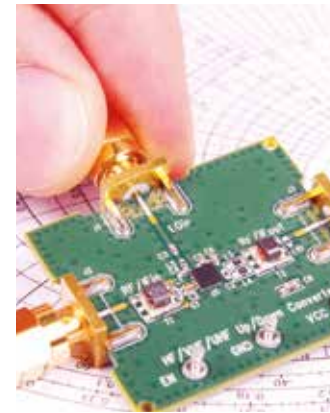
Test and Measurement



Satellites



Integrated Microwave Assemblies



For further information, pricing and delivery, please contact our Sales Department.

## Benefits

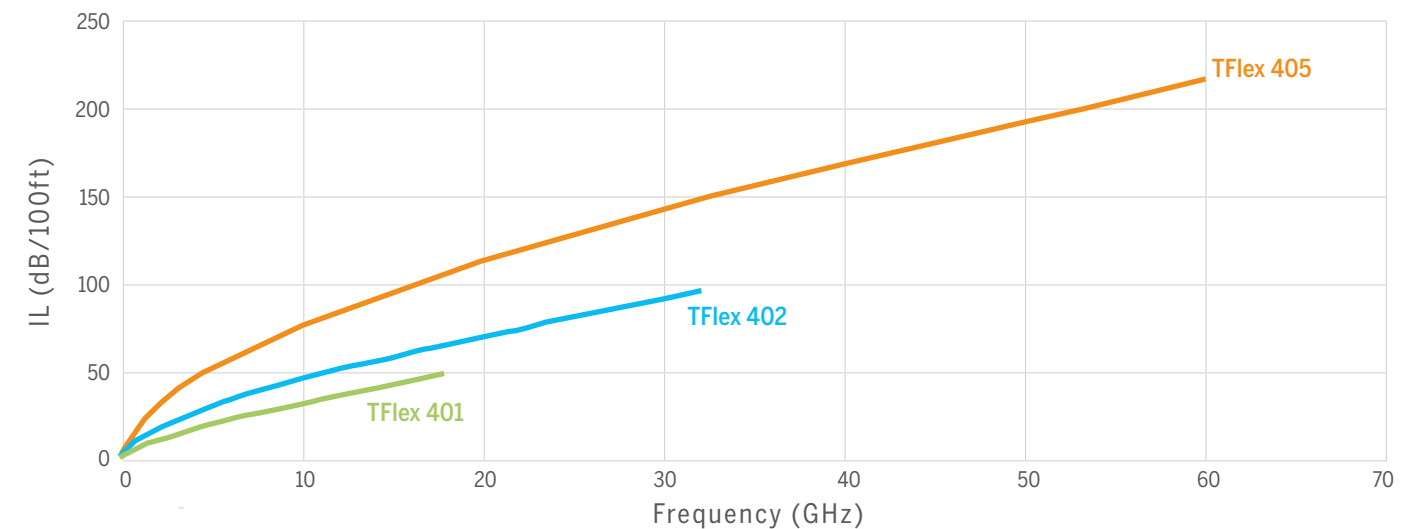
TFlex® enables designers and installers to make simple Drop-In replacement cable runs without the need for complex 3D bend configurations required for semirigid coaxial cable.

- Meets all MIL-C-17 Requirements
- Excellent Shielding Effectiveness
- Low Passive Intermod (PIM)
- Stable Loss, Phase and VSWR vs. Flexing
- Uses Standard Solder-on Semirigid Connectors

## Maximum CW Power Handling (Watts, +40°C, Sea Level 1:1 VSWR)

Frequency (GHz)	401	402	405
0.1	2119	999	401
0.4	1002	480	195
1.0	595	290	119
2.0	394	195	81
3.0	306	154	65
10.0	136	72	31
12.0	120	63	28
13.5	110	58	26
16.0	97	52	23
18.0	88	48	21

## Insertion loss vs frequency





## Specifications

Impedance 50 Ohms
 Op Temp -40 to +194°F -65 to +125°C

	Units	
Maximum Diameter	in (mm)	0.105 (2.67)
Weight	lb/ft (kg/m)	0.015 (0.02)
Minimum Bend Radius	in (mm)	0.25 (6.4)
Velocity of Propagation	%	69.5
Capacitance	pF/ft (pF/m)	29.30 (96.1)
Shielding Effectiveness	dB	> 100
Cutoff Frequency	GHz	60
Time Delay	ns/ft (ns/m)	1.45 (4.76)

## Attenuation (max)

Frequency GHz	dB/ft	dB/m
4	0.46	1.51
8	0.68	2.23
12	0.85	2.79
18	1.06	3.48
26	1.31	4.30
32	1.50	4.92
40	1.70	5.58
60	2.17	7.12

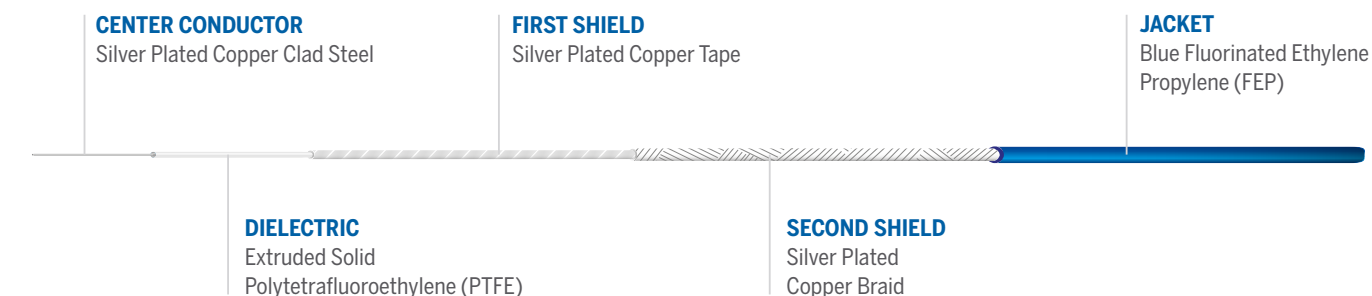
## Calculation

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

Cable Insertion Loss  
 $f = \text{Frequency (MHz)}$   
 Use K values with matching length unit

K values	dB/ft	dB/m
K1	0.006746	0.022132
K2	0.000009	0.000028

## Cable Details



## Connectors\*

Type	Gender	Description	Part Number	Stock Code	Connector Code	Max. Frequency	Connector Loss
2.4mm	Male	Straight Plug	EZ-405-24M-SS	3190-6317	24M	40	0.1 x $\sqrt{f}$ (GHz)
2.92mm	Female	Straight Jacket	EZ-405-KF-SS	3190-6309	KF	40	0.1 x $\sqrt{f}$ (GHz)
		Bulkhead Jack	EZ-405-KF-BH-SS	3190-6810	KFBH	40	0.1 x $\sqrt{f}$ (GHz)
	Male	Straight Plug	EZ-405-KM-SS	3190-6225	KM	40	0.05 x $\sqrt{f}$ (GHz)
		Right Angle Plug	EZ-405-KM-RA-SS	3190-6834	KMR	40	0.1 x $\sqrt{f}$ (GHz)
SMA	Female	Straight Jack	TC-405-SF	3190-2838	SF	18	0.1 x $\sqrt{f}$ (GHz)
		Bulkhead Jack	SC-405-SF-BH	3190-6327	SFBH	18	0.1 x $\sqrt{f}$ (GHz)
	Male	Straight Plug	SC-405-SM	3190-6236	SM	18	0.1 x $\sqrt{f}$ (GHz)
		Right Angle Plug	TC-405-SM-RA	3190-2901	SMR	18	0.1 x $\sqrt{f}$ (GHz)
SMP	Female	Straight Female Plug	TC-405-SMPF	3190-6329	SMPF	40	0.05 x $\sqrt{f}$ (GHz)
		Right Angle Female Plug	SC-405-SMPF-RA	3190-6045	SMPFR	14	0.1 x $\sqrt{f}$ (GHz)
Mini SMP	Female	Straight Female Plug	EZ-405-MSMPF	3190-6314	SMPMF	40	0.1 x $\sqrt{f}$ (GHz)
		Right Angle Female Plug	EZ-405-MSMPF-RA	3190-6840	SMPMFR	40	0.1 x $\sqrt{f}$ (GHz)
TNC	Female	Bulkhead Jack	TC-405-TF-BH-SSL	3190-7063	TFBH	18	0.1 x $\sqrt{f}$ (GHz)
	Male	Straight Plug	TC-405-TM-LW-SS	3190-6733	TM	18	0.1 x $\sqrt{f}$ (GHz)

\* More connector options available upon request

## Ordering Guide

**TFLEX405**    -XXX    XXX-    XX.X    X  
 Cable Code    Connector A    Connector B    Length    Units of measure: I = Inches, F = Feet, M = Meters



## Specifications

Ω Impedance  
50 Ohms

Op Temp  
-40 to +194°F  
-65 to +125°C

	Units	
Maximum Diameter	in (mm)	0.165 (4.19)
Weight	lb/ft (kg/m)	0.033 (0.05)
Minimum Bend Radius	in (mm)	0.50 (12.7)
Velocity of Propagation	%	69.5
Capacitance	pF/ft (pF/m)	29.30 (96.1)
Shielding Effectiveness	dB	> 100
Cutoff Frequency	GHz	34
Time Delay	ns/ft (ns/m)	1.45 (4.76)

## Attenuation (max)

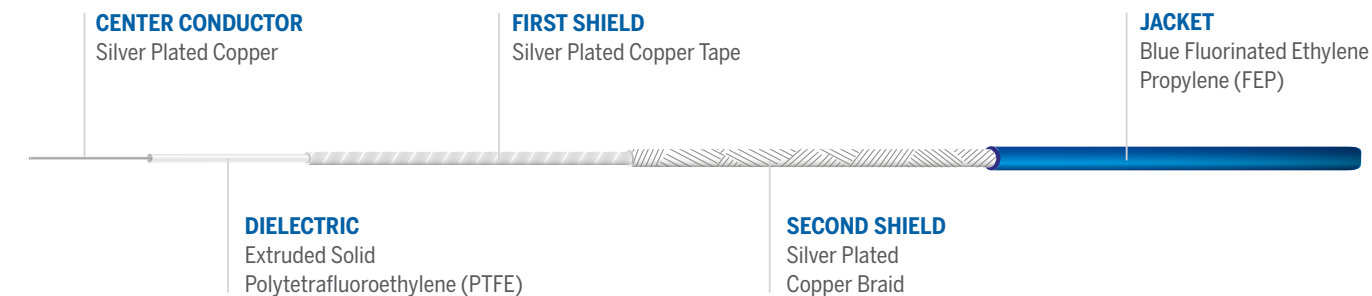
Frequency GHz	dB/ft	dB/m
1	0.13	0.43
4	0.27	0.89
8	0.41	1.35
12	0.52	1.71
18	0.67	2.20
26	0.85	2.79
32	0.97	3.18

## Calculation

$$IL = \underbrace{(K1 \times v(f) + K2 \times f)}_{\substack{\text{Cable Insertion Loss} \\ f = \text{Frequency (MHz)}}} \times \underbrace{\text{Cable Length}}_{\substack{\text{Use K values with} \\ \text{matching length unit}}} + \text{Connector Loss}$$

K values	dB/ft	dB/m
K1	0.003610	0.011844
K2	0.000010	0.000033

## Cable Details



## Connectors\*

Type	Gender	Description	Part Number	Stock Code	Connector Code	Max. Frequency	Connector Loss
2.92mm	Male	Straight Plug	TC-402-KM-SS	3190-2842	KM	26.5	0.1 x v <sub>f</sub> (GHz)
SMA	Male	Straight Plug	SC-402-SM	3190-6181	SM	18	0.05 x v <sub>f</sub> (GHz)
		Right Angle Plug	EZ-402-SM-RA	3190-2902	SMR	18	0.1 x v <sub>f</sub> (GHz)
TNC	Male	Straight Plug	TC-402-TM-LW-SSL	3190-6745	TM	18	0.1 x v <sub>f</sub> (GHz)
N	Male	Straight Plug	TC-402-NMH	3190-2921	NM	18	0.1 x v <sub>f</sub> (GHz)
SMP	Female	Straight Female Plug	TC-402-SMPF	3190-6046	SMPF	10	0.05 x v <sub>f</sub> (GHz)
		Right Angle Female Plug	SC-402-SMPF-RA	3190-6073	SMPFR	10	0.06 x v <sub>f</sub> (GHz)

\* More connector options available upon request

## Ordering Guide

TFLEX402 - XXX XXX - XX.X X  
 Cable Code Connector A Connector B Length Units of measure: I = Inches, F = Feet, M = Meters



## Specifications

Impedance  
50 Ohms
 Op Temp  
-40 to +194°F  
-65 to +125°C

	Units	
Maximum Diameter	in (mm)	0.273 (6.93)
Weight	lb/ft (kg/m)	0.095 (0.14)
Minimum Bend Radius	in (mm)	1.13 (28.6)
Velocity of Propagation	%	69.5
Capacitance	pF/ft (pF/m)	29.30 (96.1)
Shielding Effectiveness	dB	> 100
Cutoff Frequency	GHz	19
Time Delay	ns/ft (ns/m)	1.45 (4.76)

## Attenuation (max)

Frequency GHz	dB/ft	dB/m
0.5	0.06	0.20
1	0.07	0.23
2	0.12	0.39
4	0.18	0.59
8	0.29	0.95
12	0.38	1.25
18	0.50	1.64

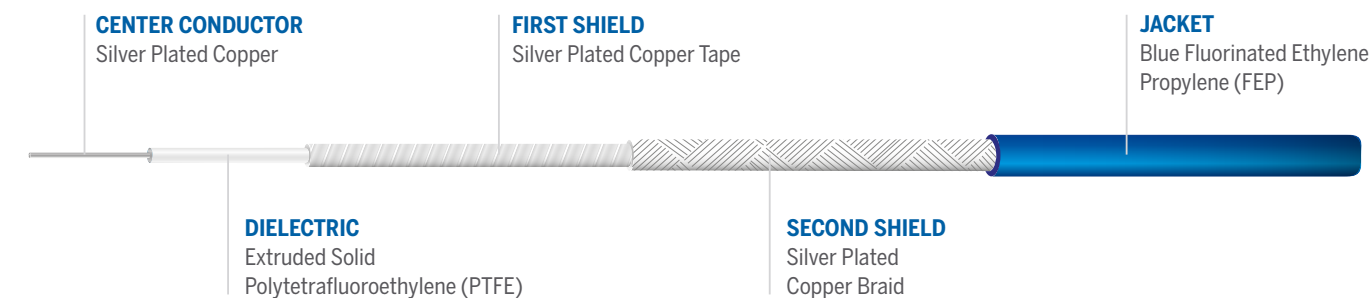
## Calculation

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

Cable Insertion Loss  
 $f = \text{Frequency (MHz)}$   
 Use K values with  
 matching length unit

K values	dB/ft	dB/m
K1	0.002066	0.006779
K2	0.000012	0.000040

## Cable Details



## Connectors\*

Type	Gender	Description	Part Number	Stock Code	Connector Code	Max. Frequency	Connector Loss
N	Male	Straight Plug	TC-401-NM-NG	3190-6300	NM	6	0.1 x $\sqrt{f}$ (GHz)
		Right Angle Plug	TC-401-NM-RA-NG	3190-6188	NMR	6	0.1 x $\sqrt{f}$ (GHz)
	Female	Bulkhead Jack	TC-CLL250-NF-BH	3190-2120	NFBH	6	0.1 x $\sqrt{f}$ (GHz)

\* More connector options available upon request

## Ordering Guide

**TFLEX401**    **-XXX**    **XXX-**    **XX.X**    **X**  
 Cable Code    Connector A    Connector B    Length    Units of measure: I = Inches, F = Feet, M = Meters



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