

TRUtest™ Series



a division of WINCHESTER
ELECTRONICS



General Purpose Test Cable Assemblies

- Matched performance to 18 GHz
- Repeatable, stable performance
- Low insertion loss and VSWR
- 100% RF tested
- MIL-STD-348 test interfaces
- Stainless steel connectors
- Excellent cable-connector retention
- Ideally suited for production test stations and engineering labs



TRUtest™ Series cable assemblies combine MIL-standard test-grade interfaces with flexible and durable cable construction to provide repeatable, reliable performance and long service life. Three standard connector configurations are available for rapid delivery to your test application—SMA, Type N and 3.5 mm. TRUtest™ assemblies utilize a low density, PTFE tape-wrapped core to provide excellent loss and phase stability over a broad temperature rating.

The TRUtest™ Series combines robust design and material construction. Stainless steel connectors provide durable mating interfaces that will not degrade over multiple mating and torque. Our unique cable-connector attachment technology has been designed to eliminate the cable junction as a point of mechanical stress failure.

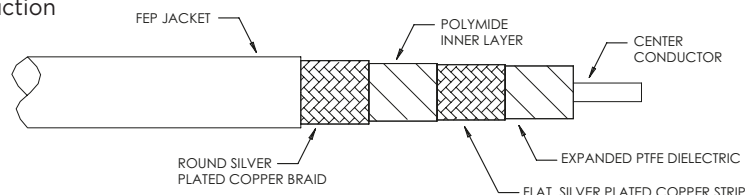
TRUtest™ Series cable assemblies are engineered to provide excellent reliability and performance in all your test applications. In addition to our general purpose cable assemblies, TRU also offers a wide variety of associated test solutions that include precision and millimeter-wave adapters.

In addition to our standard catalog products, TRU can engineer a wide range of custom design solutions to meet your challenge.

Visit our website to find additional support and product information:
trucorporation.com

Requirement	Detail
Electrical	
Frequency	0.05 to 18 GHz
Impedance	50 Ohms nominal
Velocity of Propagation	80% nominal
VSWR	1.35:1 maximum
Attenuation	0.4 dB/ft + 0.4 dB @ 18 GHz
Shielding Effectiveness	> -95 dB
Mechanical	
Cable/Connector Retention	50 pound minimum (tested IAW MIL-C-87104) Positive shoulder mechanical captivation
Torque	IAW MIL-C-87104
Flexure	100,000 cycles minimum (IAW MIL-C-87104)
Phase vs Flexure	+/- 0.15 degrees per GHz typical, see graph
Minimum Bend Radius	1.0 inch (25,4 mm)
Cable Outer Diameter	0.20 inch (5,08 mm)
Connector Outer Diameter (IAW-STD-348 test)	Type N: 0.8 inch (20,3 mm) nominal SMA: 0.35 inch (8,9 mm) nominal 3.5 mm: 0.35 inch (8,9 mm) nominal
Mating Durability	500 cycles minimum
Cable Materials	Silver plated, copper center conductor Expanded PTFE dielectric Silver plated, copper shielded layers Extruded FEP jacket
Connector Materials	Stainless steel outer bodies Gold plated beryllium copper contacts TPX, fluoroloy, PTFE insulators
Environmental	
Temperature	-55 to +120°C
Phase vs Temperature	< 1800 PPM typical (-40 to +120°C), see graph

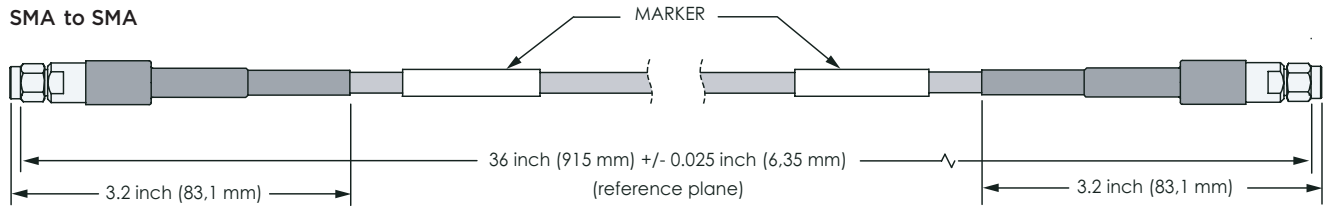
Cable Construction



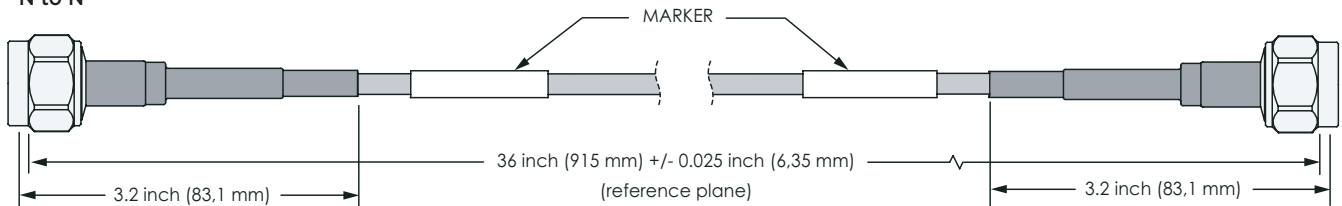
TRUtest™ 18 Series General Purpose Test Cables



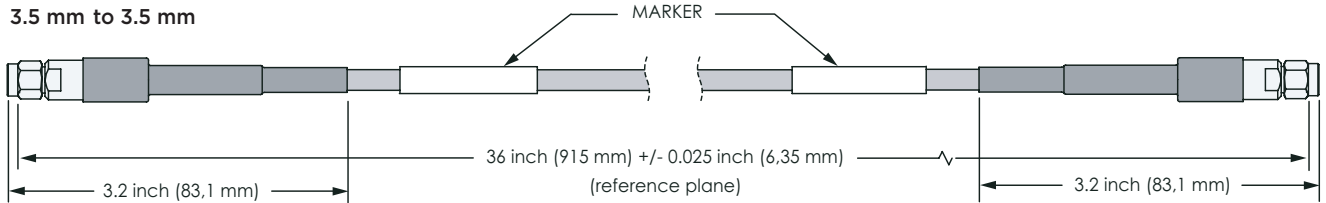
SMA to SMA



N to N



3.5 mm to 3.5 mm



Ordering Specifications

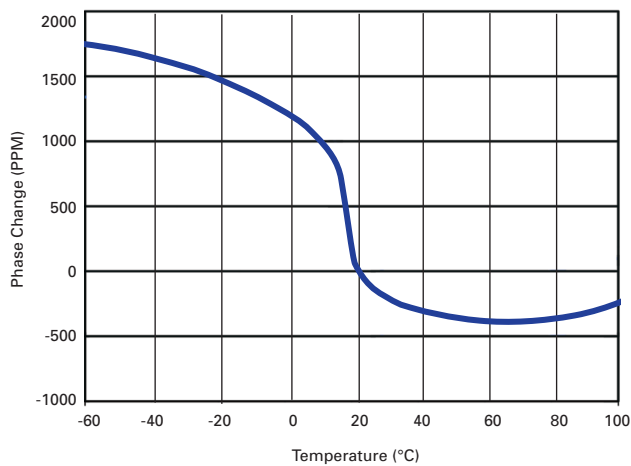
Figure	Part Number	RoHS Compliant Part Number	Description
1	TRU-16002-03	TRU-16501-03	TRUtest 18 - SMA straight plug to SMA straight
2	TRU-16003-03	TRU-16502-03	TRUtest 18 - N straight plug to N straight plug
3	TRU-16001-03	TRU-16503-03	TRUtest 18 - 3.5 mm straight plug to 3.5 mm straight plug

Custom Requirements

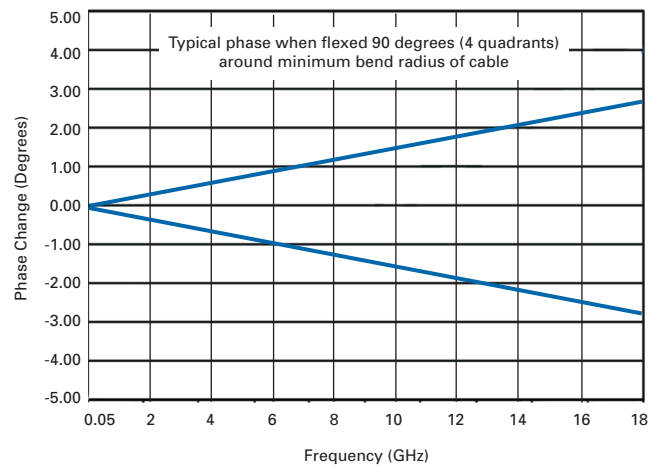
TRUtest™ cable assemblies are also available in custom lengths, configurations or with alternate connector interfaces to meet your specific application requirements. Contact your local sales representative or distribution sales office to discuss your requirement or request a quote. Our sales offices can be conveniently found on our web site at trucorporation.com.

Performance Specifications

Phase vs Temperature



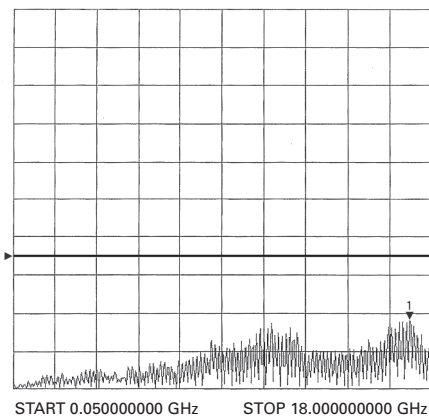
Phase vs. Flexure



Typical VSWR

3.5 mm male to 3.5 mm male
30 inches (762 mm) long

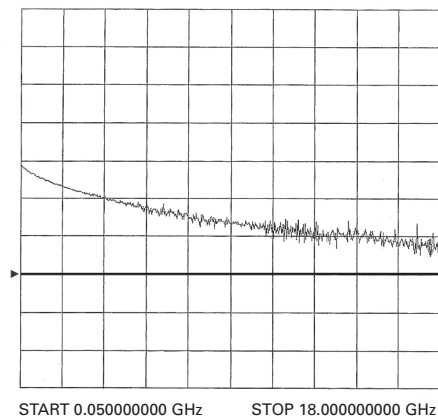
S11 SWR 100 m/REF 1.35 1:1.1848 17.057 625000 GHz



Typical Insertion Loss

3.5 mm male to 3.5 mm male
30 inches (762 mm) long

S21 LOG .5 dB/REF-1.5 dB 1:-1.2540 dB 17.596 125 000 GHz



Precision Test Adapters

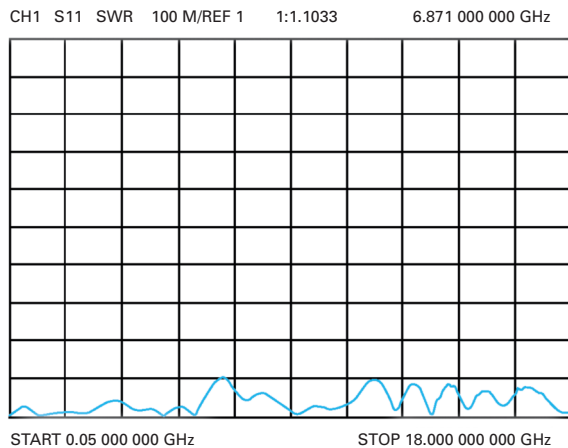
TRU offers a broad range of precision adapters in a variety of interface configurations. Our modular design approach provides flexibility in selecting the best adaptive combination without sacrificing VSWR and phase matched performance. Gold plated, six-slot center contacts on the 7 mm and type N interfaces ensure precise mated connections. Electrically-matched Noryl insulators are designed to mechanically capture the center contacts and operate over temperatures ranging from 0° to 85° C. The gold plated, durable stainless steel body and coupling nut construction will provide long-lasting and reliable performance life.

The table below illustrates the range of interface combinations available as an in-series or between series adapter.

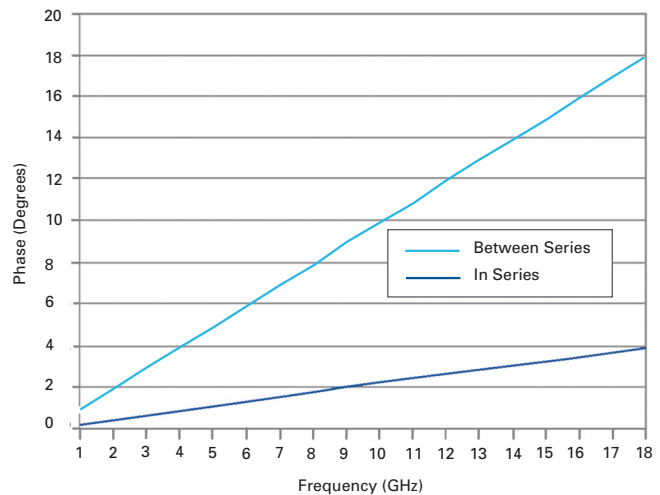


18 GHz		Interface	3.5 mm (male)	3.5 mm (female)	SC (female)	SC (male)	ATNC (male)	ATNC (female)	SMA (male)	SMA (female)	N (male)	N (female)
Interface	Description	3.5m	3.5f	SCf	SCm	ATNCm	ATNCf	SMAm	SMAf	Nm	Nf	
7 mm	7 mm	•	•	•	•	•	•	•	•	•	•	
N (female)	Nf	•	•	•	•	•	•	•	•	•	•	
N (male)	Nm	•	•	•	•	•	•	•	•	•	•	
SMA (female)	SMAf	•	•	•	•	•	•	•	•	•	•	
SMA (male)	SMAm	•	•	•	•	•	•	•	•	•	•	
ATNC (female)	ATNCf	•	•	•	•	•	•	•	•	•	•	
ATNC (male)	ATNCm	•	•	•	•	•	•	•	•	•	•	
SC (male)	SCm	•	•	•	•	•	•	•	•	•	•	
SC (female)	SCf	•	•	•	•	•	•	•	•	•	•	
3.5 mm (female)	3.5f	•	•	•	•	•	•	•	•	•	•	
3.5 mm (male)	3.5m	•	•	•	•	•	•	•	•	•	•	

Typical VSWR Performance (mated pair)



Typical Phase Match

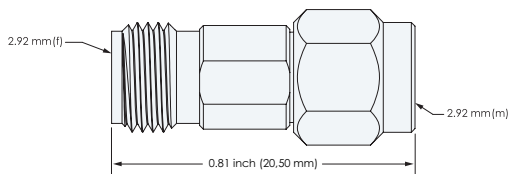


Precision Millimeter-wave Test Adapters

TRU precision adapters feature MIL-STD-348 test grade interfaces and robust stainless steel and BeCu construction to ensure optimal electrical performance, measurement accuracy and repeatability in your test application.

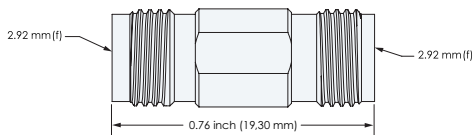
Our broad range of millimeter-wave, precision adapters are ideal for use with today's sophisticated (PNA) precision network analyzers.

Precision adapters are available in 2.92 mm (DC - 40 GHz), 3.5 mm (DC - 33 GHz) and 2.4 mm (DC - 50 GHz) interface combinations.



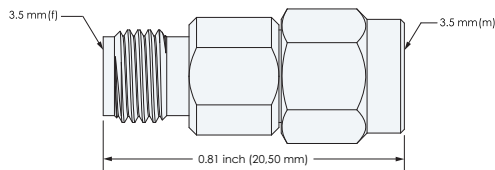
2.92 mm (female) to 2.92 mm (male) Adapter

Part Number	Frequency	VSWR	Finish
TRU-11223	DC-40 GHz	1.15:1 Max	Passivated Stainless Steel



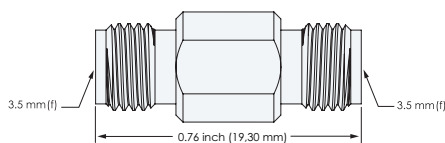
2.92 mm (female) to 2.92 mm (female) Adapter

Part Number	Frequency	VSWR	Finish
TRU-11222	DC-40 GHz	1.20:1 Max	Passivated Stainless Steel



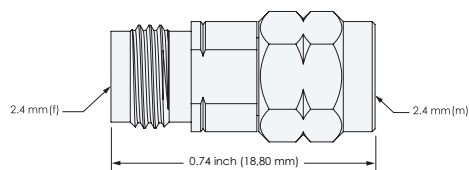
3.5 mm (female) to 3.5 mm (male) Adapter

Part Number	Frequency	VSWR	Finish
TRU-11201	DC-33 GHz	1.15:1 Max	Passivated Stainless Steel



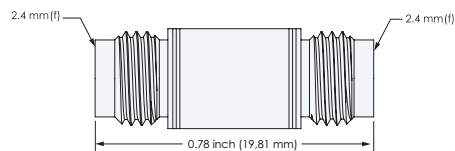
3.5 mm (female) to 3.5 mm (female) Adapter

Part Number	Frequency	VSWR	Finish
TRU-11200	DC-33 GHz	1.15:1 Max	Passivated Stainless Steel



2.4 mm (female) to 2.4 mm (male) Adapter

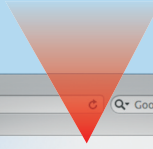
Part Number	Frequency	VSWR	Finish
TRU-11245	DC-50 GHz	1.15:1 Max	Passivated Stainless Steel



2.4 mm (female) to 2.4 mm (female) Adapter

Part Number	Frequency	VSWR	Finish
TRU-11244	DC-50 GHz	1.20:1 Max	Passivated Stainless Steel

Find your cable assembly solution everywhere you are



Environment
Application: Industrial equipment
Frequency: DC - 250 MHz
Length of Cable: 3 feet

Connector A
7-16 Male (Straight)

Cable
Cable: TRU RG-217

Connector B
QRMm R/A Male (Right Angle)

Performance Review and Quote

Details

Connector A	7-16 Male
Cable	TRU RG-217
Connector B	QRMm R/A Male
Length	3 feet
Operating Temperature	Room Temperature
Operating Altitude	Sea Level
Mechanical Conditions	None Specified
Environmental Conditions	None Specified
Minimum Bend Radius	2.75" (static)

Performance Analysis

Frequency Range of Assembly	DC - 250 MHz	DC - 250 MHz	
Max Return Loss (or VSWR)	TRU Standard	VSWR 1.25 : 1 @ 250 MHz	VSWR
Min Shielding Effectiveness (dB)	TRU Standard	-60 dB	
Power Handling (watts)	TRU Standard	850 watts @ 250 MHz	280
Total Attenuation/Insertion Loss (dB)	TRU Standard	0.20 dB @ 250 MHz	0.

Please Specify any Additional Requirements

Start Over **Save this Assembly** **Request Assistance** **Request Quote**

SIMPLE NAVIGATION

With the new TRU online **Cable Configurator** you can build the right cable assembly for your specific requirements.

The **Cable Configurator** takes you through a series of filtered fields where you specify your **Primary Application, Length and Frequency**.

Choose either **TRU Standard** specs or specify your own **electrical, mechanical or environmental** specs.

From there you specify **connector** and **cable** types.

It's an easy to follow, prompted process that results in a completed review from which you can **Request Assistance** from an applications engineer or **Request a Quote**.

ADAPTS FOR USE ON LAPTOPS AND MOBILE DEVICES



Build cables to your specifications

trucorporation.com/cable_configurator

Winchester Electronics, established in 1941, is a leader in the design, development, and deployment of interconnect technologies globally.

Why we do it: We like to make things better TODAY

How we do it: We solve problems in real time

*What we do: We make connectors and cable assemblies—
we transmit light and energy*

- | | | |
|---------------------|--|---|
| Markets | - Data Infrastructure
- Medical
- Semiconductor
- Military /Aerospace | - Test & Measurement
- Broadcast
- Marine-Oil-Gas
- Rail Mass Transit |
| Products | - RF cable assemblies and connectors
- Industrial cable assemblies and connectors | - Hermetic interconnects
- Multi-pin connectors
- Engineered cable assemblies
- Fiber optic solutions |
| Capabilities | - Engineering design and development
- Flexible manufacturing—high mix/low volume
- 3-D modeling
- Field technical services | - Electrical, environmental, and mechanical qualification testing
- Field technical services
- Supply chain solutions
- ANSYS simulation packages: electrical, structural, thermal |

Headquarters | Collaboration Center
Norwalk, Connecticut

Winchester Electronics
Middlebury, Connecticut
Franklin, Massachusetts
Nogales, Sonora, Mexico
Suzhou, China
Penang, Malaysia
winchesterelectronics.com

Clements National Company
Broadview, Illinois
clementsnational.com

Electrical Specialty Products
Spartanburg, South Carolina
esp-sc.com

Source Technology
Houston, Texas
sourcetechnology.net

SRC Haverhill
Santa Rosa, California
src-cables.com

SRI Hermetics
Melbourne, Florida
srihermetics.com

TRU Corporation
Peabody, Massachusetts
trucorporation.com

