

# Microwave Site Master™

## Cable & Antenna Analyzer

Featuring Classic and Advanced Modes

### S820E

1 MHz to 8 GHz, 14 GHz, 20 GHz, 30 GHz, 40 GHz

#### Introduction

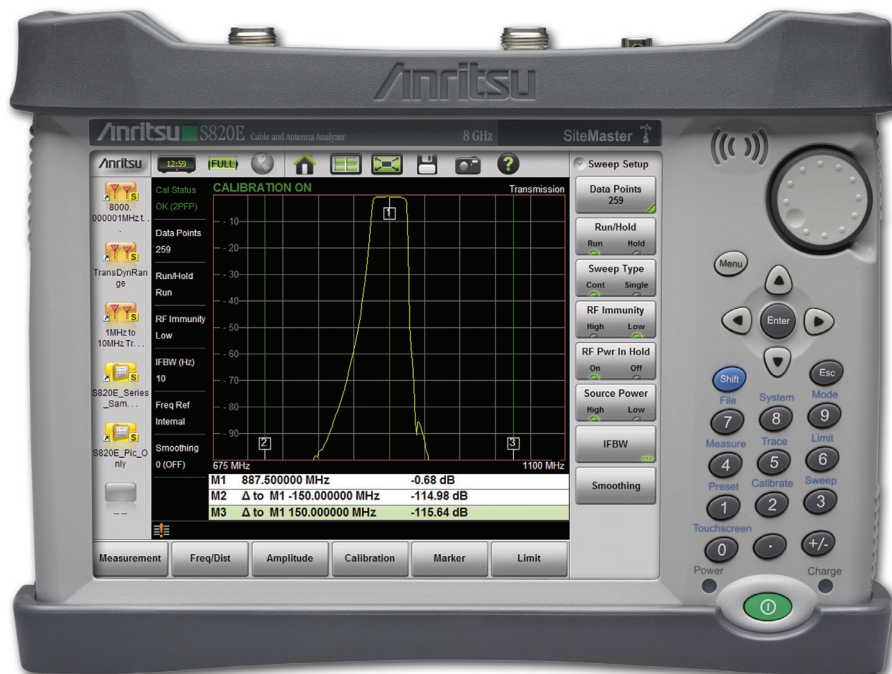
Anritsu is proud to introduce the world's most advanced Site Master. With microwave frequency coverage up to 40 GHz, the new S820E completely redefines the standards for portable handheld analyzers, setting another new industry benchmark for performance and accuracy. The new S820E is the culmination of over 50 years of microwave development, utilizing the very latest technologies to deliver accuracy and performance previously reserved only for benchtop instruments. Based on a true 4 channel receiver design, the S820E offers true VNA performance in a portable package.

#### Cable and Antenna Analyzer Highlights

- 1-Port Measurements: RL, VSWR, Cable Loss, DTF, Phase, Smith Chart
- 2-Port Measurements: Transmission, Cable Loss
- Display: Single or Dual Measurement Touchscreen
- Calibration: Coaxial (OSL, TOSL), Waveguide (SSL, SSLT)
- Dynamic Range: 110 dB (20 MHz to 40 GHz)
- Frequency Resolution: 1 Hz (1 MHz to 40 GHz)
- Sweep Speed: 650  $\mu$ s/data point
- Calibration Temperature Window:  $\pm 10$  °C
- Full Temperature Calibration Kits: -10 °C to +55 °C

#### Capabilities and Functional Highlights

- Benchtop VNA Performance
- Intuitive GUI + Classic Mode
- 2-Port Cable Loss
- Std High Accuracy Power Meter
- USB Transmission Sensors up to 40 GHz
- Built-in Help Menu
- Ethernet/USB Connectivity
- USB Peripheral Support
- Touchscreen Popup Keyboard
- easyTest™ Automated Scripts
- Certified Training



Microwave Site Master™ S820E Cable and Antenna Analyzer Featuring 8.4 in Daylight Viewable Touchscreen  
 Compact Size: 273 mm x 199 mm x 91 mm (10.7 in x 7.8 in x 3.6 in), Lightweight: 3.0 kg (6.6 lb)

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**Definitions**

	All specifications and characteristics apply under the following conditions, unless otherwise stated:
Warm-Up Time	After 10 minutes of warm-up time, where the instrument is left in the ON state.
Temperature Range	Over the 23 °C ± 5 °C temperature range.
Reference Signal	When using internal reference signal.
Typical Performance	Typical specifications that are not in parenthesis are not tested and not warranted. They are generally representative of characteristic performance. Typical specifications in parenthesis ( ) represent the mean value of measured units and do not include any guard-bands or uncertainties. They are not warranted.
Uncertainty	A coverage factor of x1 is applied to the measurement uncertainties to facilitate comparison with other industry handheld analyzers.
Calibration Cycle	Calibration is within the recommended 12 month period (residual specifications also require calibration kit calibration cycle adherence.) All specifications subject to change without notice. For the most current data sheet, please visit the Anritsu web site: <a href="http://www.anritsu.com">www.anritsu.com</a>



## Cable and Antenna Analyzer

### Measurements

1-Port Measurements	Return Loss Distance-to-Fault (DTF) Return Loss Cable Loss VSWR Distance-to-Fault (DTF) VSWR Smith Chart 50 Ω/75 Ω (Advanced Mode Only) Phase (Advanced Mode Only)
2-Port Measurements	Transmission (Advanced Mode Only) Transmission with External Sensor (Advanced Mode Only) Cable Loss (2-Port) with External Sensor (Classic Mode Only)

### Setup Parameters Classic Mode

Measurement Display	Single Display with independent markers
Frequency	F1/F2
DTF	D1/D2, Units m/ft, DTF Aid, Cable List, Cable Loss, Propagation Velocity
Windowing	Rectangular, Nominal Side Lobe, Low Side Lobe, Minimum Side Lobe
Amplitude	Top, Bottom Auto Scale, Full Scale, Scale Preset
Sweep	Data Points (130, 259, 517, 1033, 2065), Run/Hold, Sweep Type (Single/Continuous), RF Immunity (High/Low), RF Power in Hold (On/Off), Smoothing, Trace
Marker	Markers 1 to 6 (On/Off), Delta Makers 2 to 4 (Ref Mk1), Marker to Peak/Valley, Marker Table, Marker 5 (Peak/Valley between M1 & M2), Marker 6 (Peak/Valley between M3 & M4)
Trace	Copy Trace To Memory, Trace Display, Trace Math
Limit	On/Off, Edit Value, Limit Alarm (On/ Off), Pass/Fail (On/Off), Limit Preset
Calibration	Start Calibration, Calibration Info, Calibration Correction (On/ Off)
Calibration Setup	Coax, Waveguide
Save/Recall/File Management	Setups, Measurements, Screen Shots (PNG)

### Setup Parameters Advanced Mode

Measurement Display	Single/Dual Display with independent markers
Frequency	Start Frequency (F1), Stop Frequency (F2)
Distance	Start Distance (D1), Stop Distance (D2), Units (meters/feet), DTF Aid
DTF Setup	DTF Line Type (Coax/Waveguide), Cable List, Cable Loss, Propagation Velocity, Windowing (Rectangular, Nominal Side Lobe, Low Side Lobe, Minimum Side Lobe)
Amplitude	Top, Bottom, Auto Scale, Full Scale, Scale Preset
Sweep	Data Points (130, 259, 517, 1033, 2065), Run/Hold, Sweep Type (Single/Continuous), RF Immunity (High/Low), RF Power in Hold (On/Off), Source Power (High/Low), IFBW (10 Hz, 100 Hz, 1 kHz, 100 kHz), Smoothing
Markers	Markers 1 to 8 (On/Off), Delta Makers 2 to 8 (Ref Mk1), Marker to Peak/Valley, Marker Table, Marker 5 & 7 (Peak/Valley between M1 & M2), Marker 6 & 8 (Peak/Valley between M3 & M4)
Trace	Copy Trace to Memory, Trace Display, Trace Math
Limit	On/Off, Edit Value, Limit Alarm (On/Off), Pass/Fail (On/Off), Limit Preset
Calibration	Start Calibration, Calibration Info, Calibration Correction (On/Off)
Save/Recall/File Management	Setups, Measurements, Screen Shots (PNG)

### Frequency

Frequency Range	1 MHz to 8 GHz, 14 GHz, 20 GHz, 30 GHz, 40 GHz (frequency option dependent)
Frequency Accuracy	± 1.0 ppm at 23 °C
Stability	± 1.0 ppm from -10 °C to +55 °C, typical
Aging	± 1.0 ppm/yr, typical
Frequency Resolution	1 Hz

### IFBW

Advanced Mode Only	10 Hz, 100 Hz, 1 kHz, 100 kHz
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### Output Power

High	-3 dBm, typical
Low	-20 dBm, typical

### RF Immunity<sup>1</sup>

+17 dBm, typical

1. +13 dBm for interfering signals landing in-band



## Cable and Antenna Analyzer (continued)

### Measurement Speed<sup>1</sup>

Reflection/Transmission Measurements	≤ 650 μs/data point, RF immunity low, typical
Transmission Ext. Sensor (2-port Cable Loss)	Determined by USB sensor and may vary with model used, not specified.

### Dynamic Range<sup>2,3</sup> (High Power, 10 Hz IFBW, 10 averages Port 1 to Port 2)

1 MHz to 20 MHz	≥ 85 dB (105 dB, typical)
>20 MHz to 8 GHz	≥ 100 dB (115 dB, typical)
>8 GHz to 40 GHz	≥ 100 dB (110 dB, typical)

### Receiver Compression Port 1 or Port 2

1 MHz to 40 GHz	+5 dBm (0.1 dB compression), typical
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### High Level Noise<sup>4</sup> (High Power, 100 Hz IFBW, 20 MHz to 40 GHz)

Magnitude	± 0.006 dB (± 0.001 dB, typical) rms
Phase	± 0.040° (± 0.007°, typical)

### Smoothing

Range	0 % to 20 %
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### System Impedance

Port 1 or Port 2	50 Ω standard, 75 Ω with 50 Ω to 75 Ω adapter
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### Return Loss

Measurement Display Range	0 to 1000 dB
Resolution	0.01 dB

### VSWR

Measurement Display Range	1 to 1000
Resolution	0.01

### Cable Loss

Measurement Display Range	0 to 500 dB
Resolution	0.01 dB

### Distance-to-Fault

Vertical Range Return Loss	0 to 1000 dB
Vertical Range VSWR	1 to 1000
Fault Resolution (meters)	$(1.5 \times 10^8 \times vp) / \Delta F$ (vp = propagation velocity constant, ΔF is F2-F1 in Hz)
Horizontal Range (meters)	0 to (Data Points - 1) x Fault Resolution, to a maximum of 1500 m (4921 ft)

### 1-Port Phase

Measurement Display Range	-450° to +450°
Resolution	0.01°

### Smith Chart

Impedance	50 Ω, 75 Ω
Resolution	0.01

### Cable Loss 2-Port (Classic Mode Only)

Measurement Display Range	-1000 to +1000 dB
Resolution	0.01 dB

### Transmission (Advanced Mode Only)

Measurement Display Range	-1000 to +1000 dB
Resolution	0.01 dB

### Transmission Ext Sensor (Advanced Mode Only)

Measurement Display Range	-1000 to +1000 dB
Resolution	0.01 dB

1. 1 ms/point, 1 MHz to 10 MHz, typical.

2. Dynamic range is defined as the difference between output power and receiver noise floor.

3. Decrease specification by 20 dB below 10 MHz. Decrease specification by 5 dB between 8 GHz and 14 GHz.

4. High Level Noise below 20 MHz is increased by a factor of 5.0.

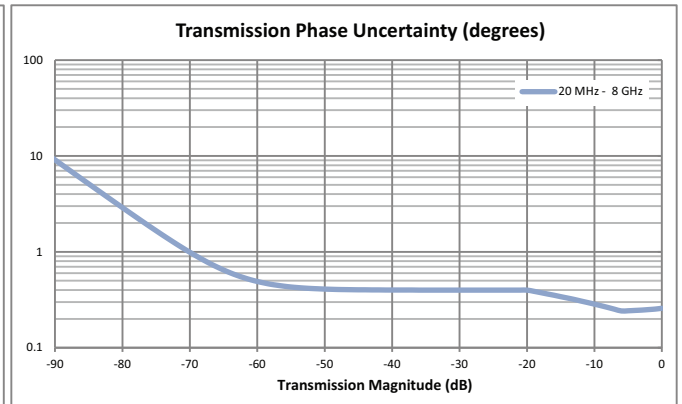
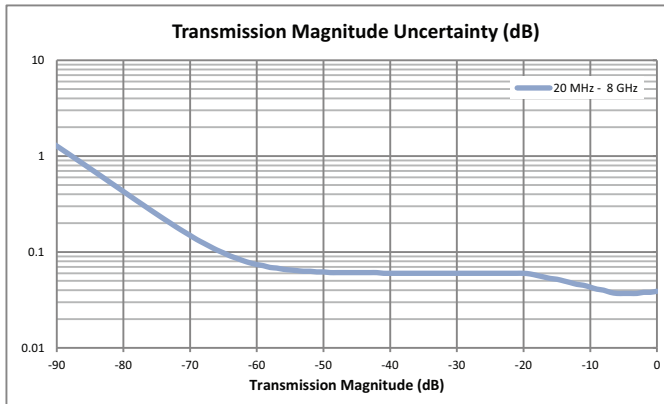
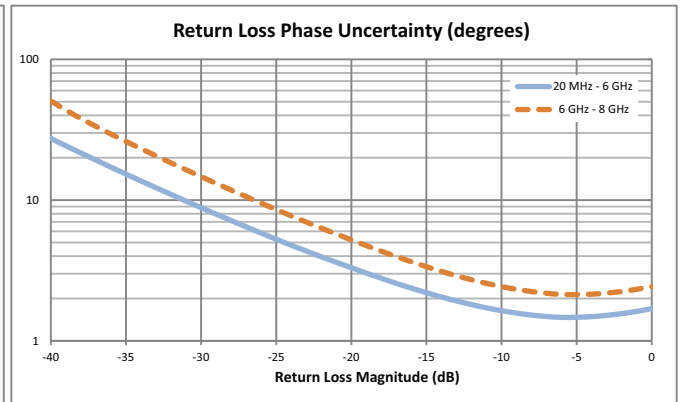
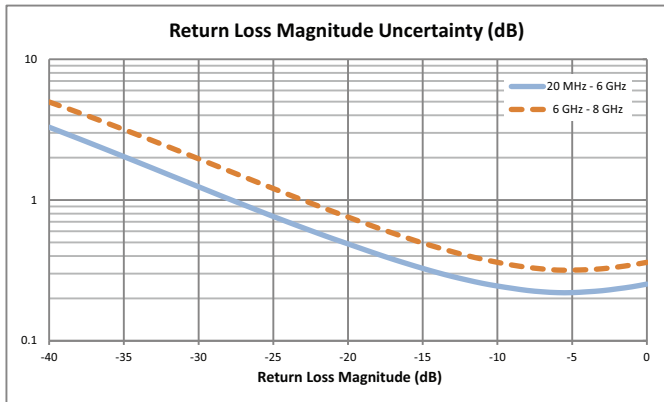


**Cable and Antenna Analyzer** (continued)

**Measurement Accuracy<sup>1</sup>** (OSLN50A-8 or OSLNF50A-8, TOSLN50A-8 or TOSLNF50A-8)

Frequency Range	Directivity (dB)	Source Match (dB)	Load Match (dB)	Reflection Tracking (dB)	Transmission Tracking (dB)
1 MHz to 6 GHz	≥ 42	≥ 33	≥ 42	± 0.15	± 0.06
> 6 GHz to 8 GHz	≥ 37	≥ 33	≥ 37	± 0.15	± 0.06

**Corrected Measurement Uncertainty** (Transmission from Port 1 to Port 2)



1. Full 2-Port calibration, Default Power, 10 Hz IFBW, No averaging, 10 minute warm-up. OSLN50A-8, OSLNF50A-8, TOSLN50A-8, or TOSLNF50A-8 calibration kit. Load match specification applicable directly at corrected port only. De-rate by approximately 8 dB if using a 3670 series test port cable. Reflection and Transmission Tracking are typical.

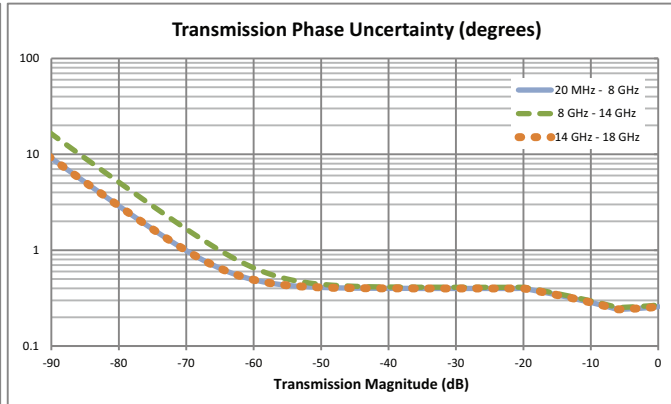
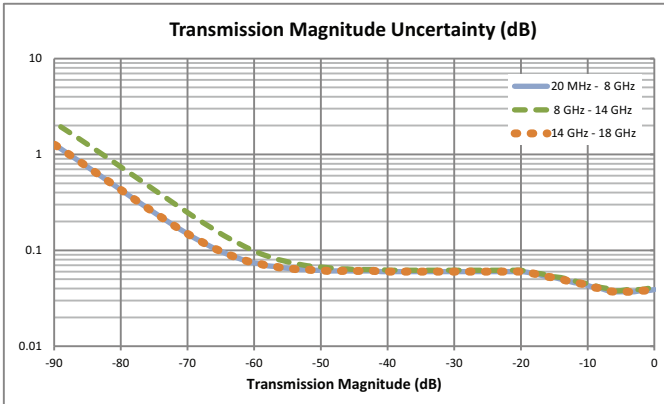
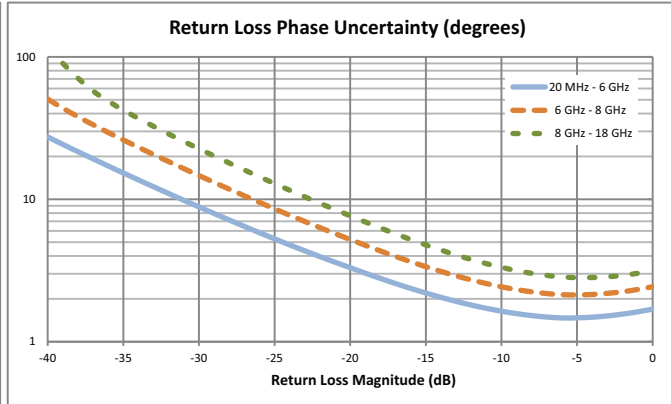
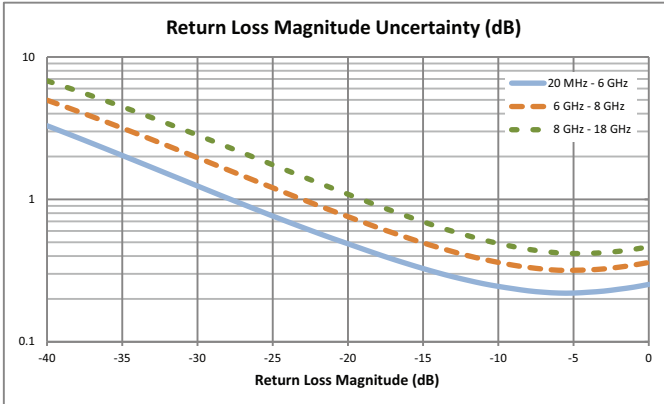


**Cable and Antenna Analyzer** (continued)

**Measurement Accuracy<sup>1</sup>** (OSLN50A-18 or OSLNF50A-18, TOSLN50A-18 or TOSLNF50A-18)

Frequency Range	Directivity (dB)	Source Match (dB)	Load Match (dB)	Reflection Tracking (dB)	Transmission Tracking (dB)
1 MHz to 6 GHz	≥ 42	≥ 33	≥ 42	± 0.15	± 0.06
> 6 GHz to 9 GHz	≥ 37	≥ 33	≥ 37	± 0.15	± 0.06
> 9 GHz to 18 GHz	≥ 33	≥ 26	≥ 33	± 0.15	± 0.06

**Corrected Measurement Uncertainty** (Transmission from Port 1 to Port 2)



1. Full 2-Port calibration, Default Power, 10 Hz IFBW, No averaging, 10 minute warm-up. OSLN50A-18, OSLNF50A-18, TOSLN50A-18, or TOSLNF50A-18 calibration kit. Load match specification applicable directly at corrected port only. De-rate by approximately 8 dB if using a 3670 series test port cable. Reflection and Transmission Tracking are typical.

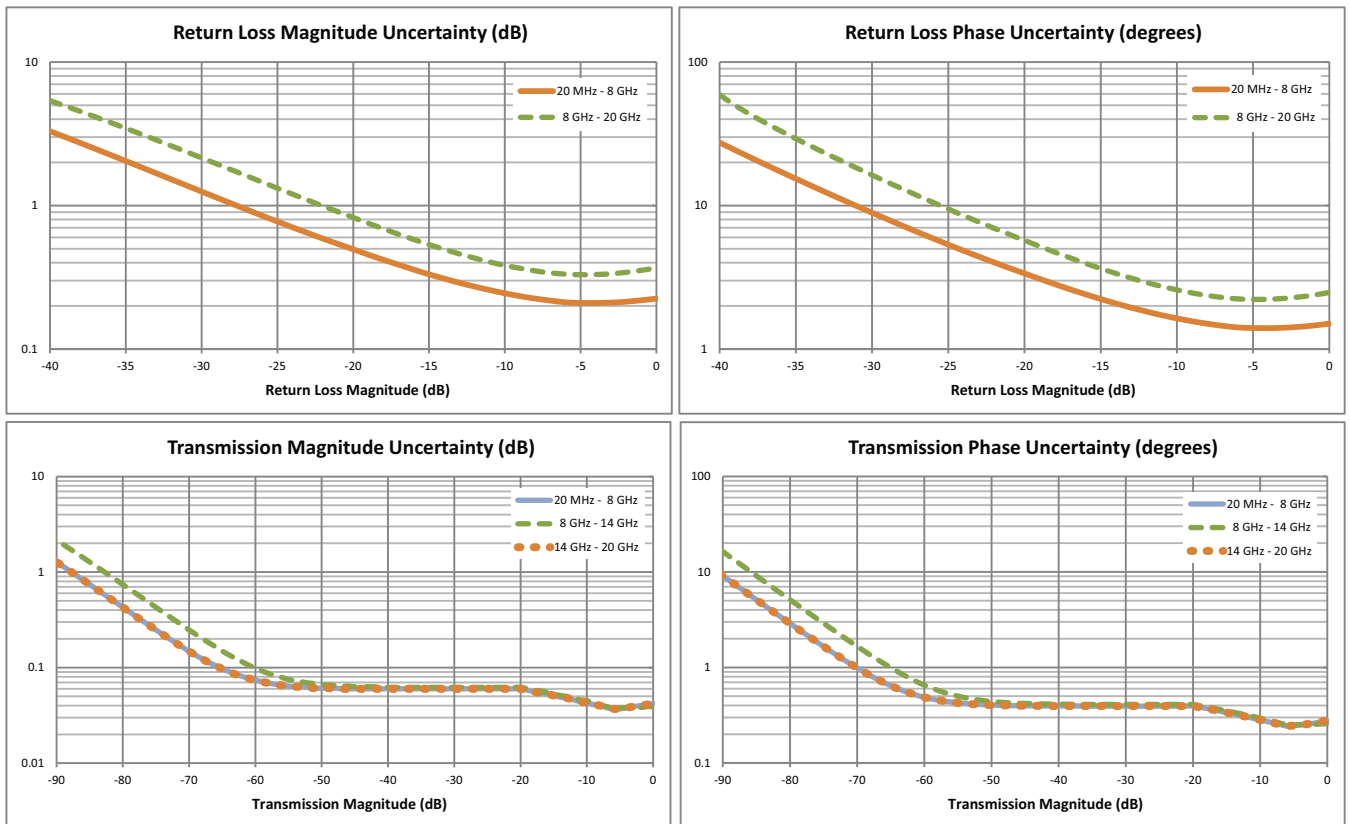


**Cable and Antenna Analyzer** (continued)

**Measurement Accuracy<sup>1</sup>** (TOSLK50A-20 or TOSLKF50A-20)

Frequency Range	Directivity (dB)	Source Match (dB)	Load Match (dB)	Reflection Tracking (dB)	Transmission Tracking (dB)
1 MHz to 10 GHz	≥ 42	≥ 33	≥ 42	± 0.15	± 0.06
> 10 GHz to 20 GHz	≥ 36	≥ 26	≥ 36	± 0.15	± 0.05

**Corrected Measurement Uncertainty** (Transmission from Port 1 to Port 2)



1. Full 2-Port calibration, Default Power, 10 Hz IFBW, No averaging, 10 minute warm-up. TOSLK50A-20 or TOSLKF50A-20 calibration kit. Load match specification applicable directly at corrected port only. De-rate by approximately 8 dB if using a 3670 series test port cable. Reflection and Transmission Tracking are typical.

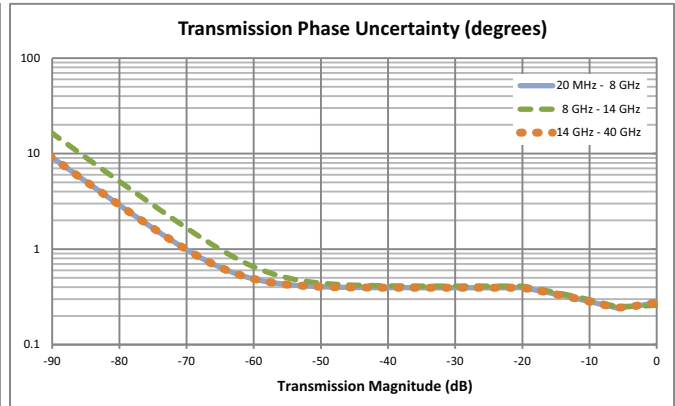
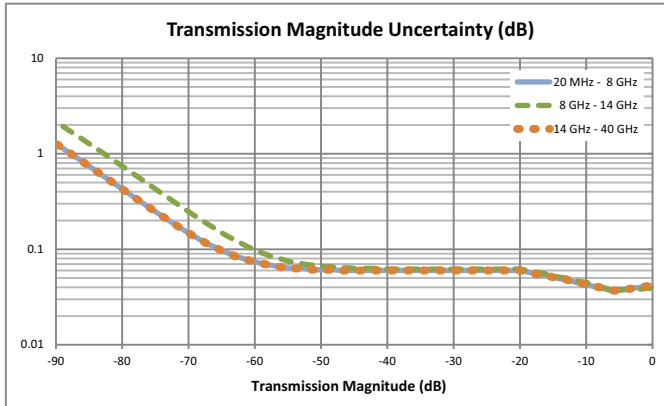
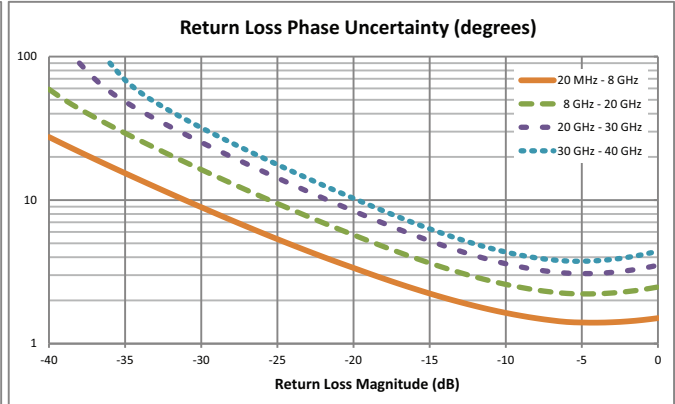
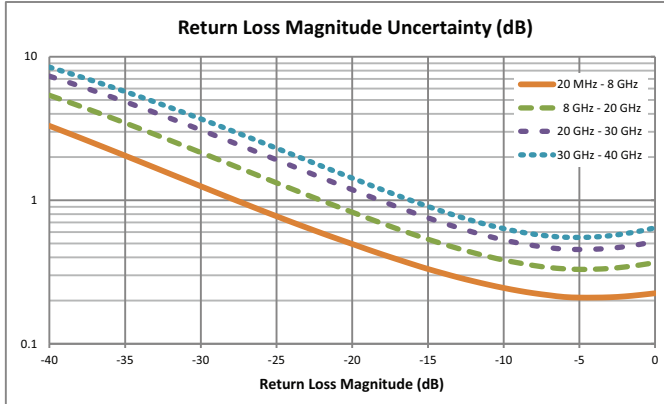


**Cable and Antenna Analyzer** (continued)

**Measurement Accuracy<sup>1</sup>** (TOSLK50A-40 or TOSLKF50A-40)

Frequency Range	Directivity (dB)	Source Match (dB)	Load Match (dB)	Reflection Tracking (dB)	Transmission Tracking (dB)
1 MHz to 10 GHz	≥ 42	≥ 33	≥ 42	± 0.15	± 0.06
> 10 GHz to 20 GHz	≥ 36	≥ 26	≥ 36	± 0.15	± 0.05
> 20 GHz to 30 GHz	≥ 32	≥ 22	≥ 32	± 0.10	± 0.05
> 30 GHz to 40 GHz	≥ 30	≥ 20	≥ 30	± 0.10	± 0.05

**Corrected Measurement Uncertainty** (Transmission from Port 1 to Port 2)



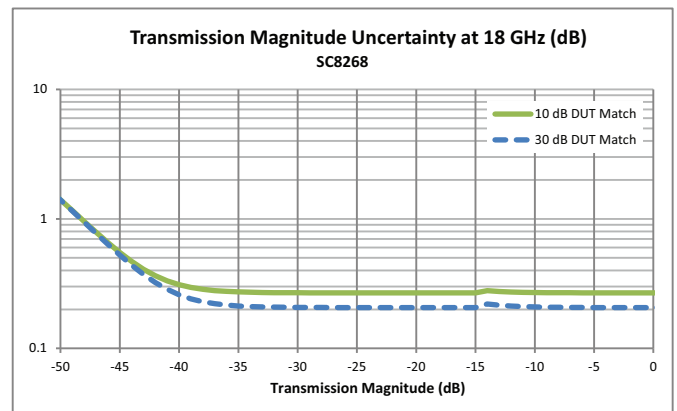
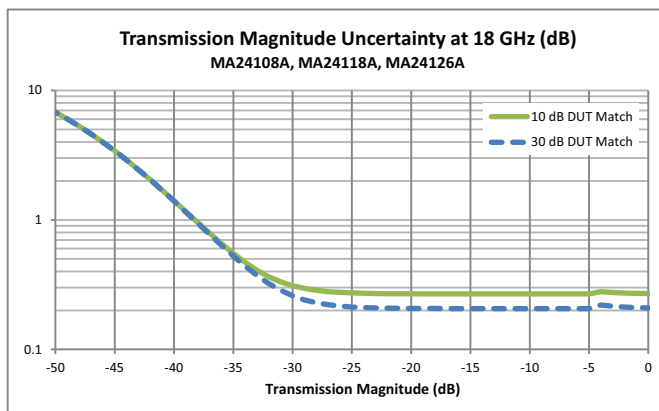
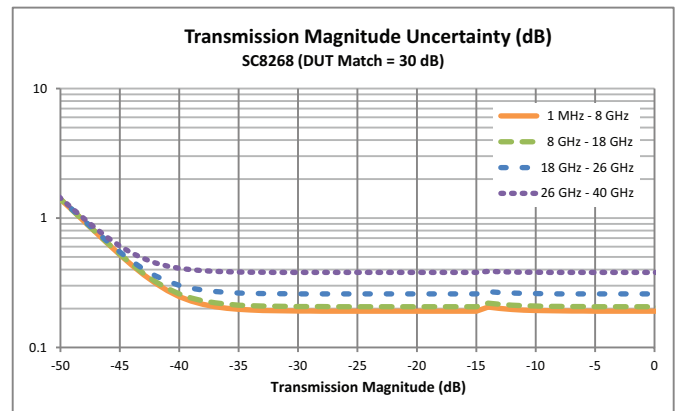
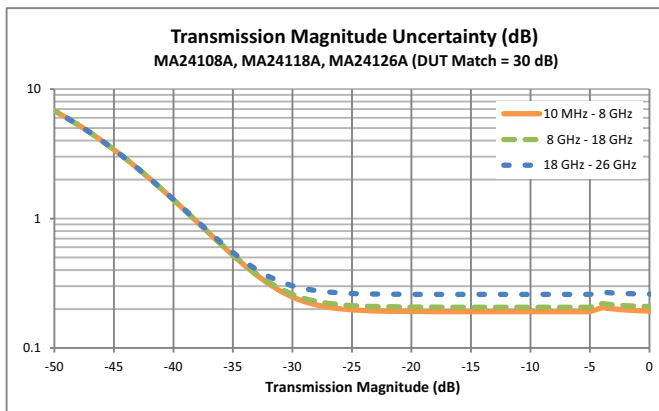
1. Full 2-Port calibration, Default Power, 10 Hz IFBW, No averaging, 10 minute warm-up. TOSLK50A-40 or TOSLKF50A-40 calibration kit. Load match specification applicable directly at corrected port only. De-rate by approximately 8 dB if using a 3670 series test port cable. Reflection and Transmission Tracking are typical.





**Cable and Antenna Analyzer** (continued)

**External Sensor Transmission Measurement Accuracy<sup>1</sup>** (Corrected Transmission Uncertainty, Magnitude Only)



**High Accuracy Power Meter – Standard** (Requires external USB Power Sensor, sold separately)

Amplitude Maximum, Minimum, Offset, Relative On/Off, Units, Auto Scale  
 Average # of Running Averages, Max Hold  
 Zero/Cal Zero On/Off, Cal Factor (Center Frequency, Signal Standard)  
 Limits Limit On/Off, Limit Upper/Lower

Power Sensor Model	MA24105A	MA24106A	MA24108A/18A/26A
Description	Inline High Power Sensor	High Accuracy RF Power Sensor	Microwave USB Power Sensor
Frequency Range	350 MHz to 4 GHz	50 MHz to 6 GHz	10 MHz to 8/18/26 GHz
Connector	Type N(f), 50 Ω	Type N(m), 50 Ω	Type N(m), 50 Ω (8/18 GHz) Type K(m), 50 Ω (26 GHz)
Dynamic Range	+3 dBm to +51.76 dBm (2 mW to 150 W)	-40 dBm to +23 dBm (0.1 μW to 200 mW)	-40 dBm to +20 dBm (0.1 μW to 100 mW)
VBW	100 Hz	100 Hz	50 kHz
Measurand	True-RMS	True-RMS	True-RMS, Slot Power, Burst Average Power
Measurement Uncertainty	± 0.17 dB <sup>a</sup>	± 0.16 dB <sup>b</sup>	± 0.18 dB <sup>c</sup>
Data sheet (for complete specifications)	11410-00621	11410-00424	11410-00504

- Notes:
- a. Expanded uncertainty with K=2 for power measurements of a CW signal greater than +20 dBm with a matched load. Measurement results referenced to the input side of the sensor.
  - b. Total RSS measurement uncertainty (0 °C to 50 °C) for power measurements of a CW signal greater than -20 dBm with zero mismatch errors.
  - c. Expanded uncertainty with K=2 for power measurements of a CW signal greater than -20 dBm with zero mismatch errors.

1. Sensor Transmission Calibration from Port 1 to Sensor, default power, 10 Hz bandwidth. SC8268 specifications below 10 MHz are typical.



## General Specifications

### Setup Parameters

System Info	Status, Battery
System Setups	Date/Time, Language, Display/Audio
Date/Time	Day, Month, Year, Time
Language	English, French, German, Italian, Spanish, Russian, Portuguese, Japanese, Korean, Chinese
Display/Audio	Brightness, Color Schemes, Screen Shot Settings, Volume
Connectivity	GPS
Diagnostics	Self Test
Preset	Preset, Reset
Reset	Factory Reset, Delete All User or Custom Files, Master Reset, Update Firmware
File	Save, Recall, File Management
File Management	Rename, Create Folder, Copy, Paste, Delete, Navigation
Navigation	Top, Bottom, Page Up, Page Down
Save	Measurement (*.dat), Setup (*.stp), Screen Shot (*.png)
Internal Trace/Setup Memory	>2000 files, files may be traces, setups, screenshots, or any combination
External Trace/Setup Memory	Limited only by size of USB Flash drive

### Connectors

Port 1 (models up to 14 GHz)	Type N, female, 50 Ω, Maximum Input +23 dBm, ±50 VDC
Port 2 (models up to 14 GHz)	Type N, female, 50 Ω, Maximum Input +23 dBm, ±50 VDC
Port 1 (models > 14 GHz)	Type Ruggedized K, male, 50 Ω, Maximum Input +23 dBm, ±50 VDC
Port 2 (models > 14 GHz)	Type Ruggedized K, male, 50 Ω, Maximum Input +23 dBm, ±50 VDC
External Reference In	Type BNC female, 50 Ω, 10 MHz, Maximum +10 dBm
External Trigger In	Type BNC female, 50 Ω, Maximum +5 VDC
Headset Jack	3.5 mm mini-jack
External Power	5.5 mm barrel connector, +11 to +14 VDC, ≤ 4.0 A
USB Interface (2)	Type A, Connect USB Flash Drive, GPS Module, Power Sensor, other
USB Interface	5-pin mini-B, Connect to PC for data transfer and/or control
Ethernet	RJ-45, Category 5, 10/100 MB/s. Connect to PC for data transfer and/or control

### Display

Type	High Resolution Resistive Touchscreen
Size	8.4 in daylight viewable color LCD
Resolution	800 x 600

### Battery

Type	Li-Ion
Battery Operation	4.0 hr, typical

### Electromagnetic Compatibility

European Union	CE Mark EMC Directive: 2004/108/EC Standards: • Emissions: EN 55011:2009 +A1:2010 Group 1 Class A • Immunity: EN 61000-4-2/-4-3/-4-4/-4-5/-4-6/-4-11
Australia and New Zealand	C-tick N274

### Safety

European Union	CE Mark Low Voltage Directive: 2006/95/EC Standard: EN 61010-1:2010 (when used with Anritsu Company supplied Power Supply meeting IEC 60950-1)
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### Environmental

Operating Temperature	-10 °C to +55 °C
Storage Temperature	-51 °C to +71 °C
Maximum Relative Humidity	95 %, non-condensing
Mechanical Shock	MIL-PRF-28800F Class 2
Explosive Atmosphere	MIL-PRF-28800F Section 4.5.6.3
Altitude	4600 m (15092 ft), operating and non-operating

### Size and Weight

Size	273 mm x 199 mm x 91 mm (10.7 in x 7.8 in x 3.6 in)
Weight	3.0 kg (6.6 lb), including battery



## Line Sweep Tools™ (for your PC)

### Trace Capture

Browse to Instrument	View and copy traces from the test equipment to your PC using Windows Explorer
Open Legacy Files	Open DAT files captured with Handheld Software Tools v6.61
Open Current Files	Open VNA or DAT files
Capture Plots To	The Line Sweep Tools screen, DAT files, Database, or JPEG

### Traces

Trace Types	Return Loss, VSWR, DTF-RL, DTF-VSWR, Cable Loss, Smith Chart, and PIM
Trace Formats	DAT, VNA, CSV, PNG, BMP, JPG, HTML, Data Base, and PDF

### Report Generation

Report Generator	Includes GPS location along with measurements
Report Format	Create reports in HTML or PDF format
Report Setup	Report Title, Company, Prepared for, Location, Date and Time, Filename, Company logo
Trace Setup	1 Trace Portrait Mode, 2 Trace Portrait Mode, 1 Trace Landscape Mode

### Trace Validation

Presets	7 presets allow "one click" setting of up to 6 markers and one limit line
Marker Controls	6 regular Markers, Marker Peak, Marker Valley, Marker between, and frequency entry
Delta Markers	6 Delta markers
Limit Line	Enable and drag or value entry. Also works with presets
Next Trace Button	Next Trace and Previous Trace arrow keys allow quick switching between traces

### Tools

Cable Editor	Allows creation of custom cable parameters
Distance to Fault	Converts a Return Loss trace to a Distance to Fault trace
Measurement Calculator	Converts Real, Imaginary, Magnitude, Phase, RL, VSWR, Rho, and Transmit power
Signal Standard Editor	Creates new band and channel tables
Renaming Grid	36 user definable phrases for creation of file names, trace titles, and trace subtitles

### Connectivity

Connections	Connect to PC using Serial, USB, or Ethernet
Download	Download measurements and live traces to PC for storage and analysis
Upload	Upload measurements from PC to instrument

**Ordering Information – Standard Configuration**

<b>S820E</b>	<b>Description</b>
1 MHz to 8, 14, 20, 30, 40 GHz	Microwave Cable & Antenna Analyzer Transmission/Reflection High Accuracy Power Meter (requires external USB sensor) GPS Location/System Time Sync (requires external GPS module 2000-1723-R) Three Year Warranty (One year on battery)
<b>Options</b>	
S820E-0098	Standard Calibration to ISO/IEC 17025:2005
S820E-0099	Premium Calibration to ISO/IEC 17025:2005 plus Test Data

**Frequency Options** (Select one frequency option only)

<b>Option Number</b>	<b>Description</b>
S820E-0708	1 MHz to 8 GHz, type N(f) ports
S820E-0714	1 MHz to 14 GHz, type N(f) ports
S820E-0720	1 MHz to 20 GHz, type Ruggedized K(m) ports (compatible with 3.5 mm and SMA connectors)
S820E-0730	1 MHz to 30 GHz, type Ruggedized K(m) ports (compatible with 3.5 mm and SMA connectors)
S820E-0740	1 MHz to 40 GHz, type Ruggedized K(m) ports (compatible with 3.5 mm and SMA connectors)

**Measurement Options** (available later in 2014 by software upgrade, contact your local Anritsu sales representative for details.)

<b>Option Number</b>	<b>Description</b>
S820E-0002	VNA Time Domain with Gating (Requires S820E-0440)
S820E-0440	VNA Full Reversing 2 Port S Parameters
S820E-0441	Vector voltmeter and A/B Ratio (Requires S820E-0440)

**USB Power Sensors** (For complete ordering information see the respective data sheets of each sensor)

<b>Model Number</b>	<b>Description</b>
MA24105A	Inline Dual Directional High Power Sensor, 350 MHz to 4 GHz, +3 dBm to +51.76 dBm
MA24106A	High Accuracy RF Power Sensor, 50 MHz to 6 GHz, +23 dBm to -40 dBm
MA24108A	Microwave USB Power Sensor, 10 MHz to 8 GHz, +20 dBm to -40 dBm
MA24118A	Microwave USB Power Sensor, 10 MHz to 18 GHz, +20 dBm to -40 dBm
MA24126A	Microwave USB Power Sensor, 10 MHz to 26 GHz, +20 dBm to -40 dBm

**USB Transmission Sensors and USB Extender Kit** (For 2-Port Cable Loss/Transmission (Ext. Sensor) Measurements)

<b>Model Number</b>	<b>Description</b>
MA24108A	Microwave USB Power Sensor, N(m), 10 MHz to 8 GHz, +20 dBm to -40 dBm
MA24118A	Microwave USB Power Sensor, N(m), 10 MHz to 18 GHz, +20 dBm to -40 dBm
MA24126A	Microwave USB Power Sensor, K(m), 10 MHz to 26 GHz, +20 dBm to -40 dBm
SC8268	USB Transmission Sensor, K(m), 1 MHz to 40 GHz, 0 dBm to -50 dBm
2000-1717-R	USB Extender, Requires Cat 5e extension cable (sold separately)
2100-28-R	Cat 5e extension cable for use with USB Extender (22.5 m)

**Documentation** (soft copy included on disc and at [www.anritsu.com](http://www.anritsu.com))

<b>Part Number</b>	<b>Description</b>
11410-00749	Technical Data Sheet
10580-00343	User Guide
10580-00344	Programming Manual
10580-00345	Maintenance Manual

**Standard Accessories** (included with instrument)



Part Number	Description
3-68736	Soft Carrying Case
10920-00060	Anritsu Handheld Instruments Documentation Disc
2300-577	Anritsu RF Handheld Instruments Software Tools Disc
71693-R	Ruggedized K(f) to N(f), 2 pcs (included only with S820E-0720)
633-75	Rechargeable Li-Ion Battery
40-187-R	AC-DC Adapter
806-141-R	Automotive Power Adapter, 12 VDC, 60 W
2000-1691-R	Stylus with Coiled Tether
3-2000-1498	USB A/5-pin Mini-B Cable, 3.05 m (10 ft)
2000-1371-R	Ethernet Cable, 2.13 m (7 ft)
	Certificate of Calibration and Conformance

**Optional Accessories**

**Miscellaneous Accessories**

Part Number	Description
71693-R	Ruggedized K(f) to N(f), DC to 18 GHz, 50 Ω
2000-1723-R	High Performance USB Mag-Mount GPS Module
633-75	Rechargeable Li-Ion Battery
2000-1374	External Charger for Li-Ion Batteries
2000-1691-R	Stylus with Coiled Tether
2000-1371-R	Ethernet Cable, 2.13 m (7 ft)
2000-1653	Anti-glare Screen Cover (package of 2)
67135	Anritsu Backpack (For Handheld Instrument and PC)
760-243-R	Large Transit Case with Wheels and Handle

**Full Temperature Coaxial Calibration Kits**

K Type is compatible with 3.5 mm and SMA connectors. -10 °C to +55 °C (see individual data sheets on [www.anritsu.com](http://www.anritsu.com))



Part Number	Description
OSLN50A-8	Type N(m), DC to 8 GHz, 50 Ω
OSLNF50A-8	Type N(f), DC to 8 GHz, 50 Ω
TOSLN50A-8	Type N(m), DC to 8 GHz, 50 Ω
TOSLNF50A-8	Type N(f), DC to 8 GHz, 50 Ω
OSLN50A-18	Type N(m), DC to 18 GHz, 50 Ω
OSLNF50A-18	Type N(f), DC to 18 GHz, 50 Ω
TOSLN50A-18	Type N(m), DC to 18 GHz, 50 Ω
TOSLNF50A-18	Type N(f), DC to 18 GHz, 50 Ω
TOSLK50A-20	Type K(m), DC to 20 GHz, 50 Ω
TOSLKF50A-20	Type K(f), DC to 20 GHz, 50 Ω
TOSLK50A-40	Type K(m), DC to 40 GHz, 50 Ω
TOSLKF50A-40	Type K(f), DC to 40 GHz, 50 Ω

**Coaxial Calibration Components, N Type 50 Ω, K Type 50 Ω** (K Type is compatible with 3.5 mm and SMA connectors)



Part Number	Description
22N50	Precision Open/Short, N(m), DC to 18 GHz, 50 Ω
22NF50	Precision Open/Short, N(f), DC to 18 GHz, 50 Ω
28N50-2	Precision Load, N(m), DC to 18 GHz, 50 Ω
28NF50-2	Precision Load, N(f), DC to 18 GHz, 50 Ω
22K50	Precision Open/Short, K(m), DC to 40 GHz, 50 Ω
22KF50	Precision Open/Short, K(f), DC to 40 GHz, 50 Ω
28K50	Precision Load, K(m), DC to 40 GHz, 50 Ω
28KF50	Precision Load, K(f), DC to 40 GHz, 50 Ω

## Coaxial Calibration Components, Other 50 Ω, 75 Ω



Part Number	Description
2000-1618-R	Precision Open/Short/Load, 7/16 DIN(m), DC to 6.0 GHz 50 Ω
2000-1619-R	Precision Open/Short/Load, 7/16 DIN(f), DC to 6.0 GHz 50 Ω
12N50-75B	Matching Pad, DC to 3 GHz, 50 Ω to 75 Ω
22N75	Open/Short, N(m), DC to 3 GHz, 75 Ω
22NF75	Open/Short, N(f), DC to 3 GHz, 75 Ω
26N75A	Precision Termination, N(m), DC to 3 GHz, 75 Ω
26NF75A	Precision Termination, N(f), DC to 3 GHz, 75 Ω
1091-55	Open, TNC(f), DC to 18 GHz
1091-53	Open, TNC(m), DC to 18 GHz
1091-56	Short, TNC(f), DC to 18 GHz
1091-54	Short, TNC(m), DC to 18 GHz
1015-54	Termination, TNC(f), DC to 18 GHz
1015-55	Termination, TNC(m), DC to 18 GHz

## Waveguide Calibration Kits, Rectangular Type 50 Ω

Frequency Range (GHz)	1/8 Offset	3/8 Offset	Termination	Coax to Waveguide Adapter	Compatible Flanges
3.30 to 4.90	23UA229	24UA229	26UA229	35UA229N	PDR40
3.95 to 5.85	23UA187	24UA187	26UA187	35UA187N	CPR187F, CPR187G, UG-1352/U, UG-1353/U, UG-1728/U, UG-1729/U, UG-148/U, UG-149A/U
5.85 to 8.20	23UA137	24UA137	26UA137	35UA137N	CPR137F, CPR137G, UG-1356/U, UG-1357/U, UG-1732/U, UG-1733/U, UG-343B/U, UG-344/U, UG-440B/U, UG-441/U
7.05 to 10.00	23UA112	24UA112	26UA112	35UA112N	CPR112F, CPR112G, UG-1358/U, UG-1359/U, UG-1734/U, UG-1735/U, UG-52B/U, UG-51/U, UG-137B/U, UG-138/U
8.20 to 12.40	23UA90	24UA90	26UA90	35UA90N	CPR90F, CPR90G, UG-1360/U, UG-1361/U, UG-1736/U, UG-1737/U, UG-40B/U, UG-39/U, UG-135/U, UG-136B/U
10.00 to 15.00	23UA75	24UA75	26UA75	35UA75N	UDR120
12.40 to 18.00	23UA62	24UA62	26UA62	35UA62N	UG-541A/U, UG-419/U, UG-1665/U, UG1666/U
17.00 to 26.50	23UA42	24UA42	26UA42	35UA42K	UG-596A/U, UG-595/U, UG-597/U, UG-598A/U
26.50 to 40.00	23UA28	24UA28	26UA28	35UA28K	UG-599/U
3.30 to 4.90	23UM40	24UM40	26UM40	35UM40N	PDR40
3.95 to 5.85	23UM48	24UM48	26UM48	35UM48N	CAR48, PAR48, UAR48, PDR48
5.85 to 8.20	23UM70	24UM70	26UM70	35UM70N	CAR70, PAR70, UAR 70, PDR70
7.05 to 10.00	23UM84	24UM84	26UM84	35UM84N	CBR84, UBR84, PBR84, PDR84
8.20 to 12.40	23UM100	24UM100	26UM100	35UM100N	CBR100, UBR100, PBR100, PDR100
10.00 to 15.00	23UM120	24UM120	26UM120	35UM120N	CBR120, UBR120, PBR120, PDR120
12.40 to 18.00	23UM140	24UM140	26UM140	35UM140N	CBR140, UBR140, PBR140, PDR140
17.00 to 26.50	23UM220	24UM220	26UM220	35UM220K	CBR220, UBR220, PBR220, PDR220
26.50 to 40.00	23UM320	24UM320	26UM320	35UM320K	UBR320

## Phase-Stable Test Port Extension Cables (Armored and Flexible)

Part Number	Description
14RKFKF50-0.6	0.6 m (24"), DC to 40 GHz, Ruggedized K(f) to K(f), 50 Ω
14RKFKF50-1.0	1.0 m (39"), DC to 40 GHz, Ruggedized K(f) to K(f), 50 Ω
14RKFK50-0.6	0.6 m (24"), DC to 40 GHz, Ruggedized K(f) to K(m), 50 Ω
14RKFK50-1.0	1.0 m (39"), DC to 40 GHz, Ruggedized K(f) to K(m), 50 Ω
14KFKF50-0.6	0.6 m (24"), DC to 40 GHz, K(f) to K(f), 50 Ω
14KFKF50-1.0	1.0 m (39"), DC to 40 GHz, K(f) to K(f), 50 Ω
14KFK50-0.6	0.6 m (24"), DC to 40 GHz, K(f) to K(m), 50 Ω
14KFK50-1.0	1.0 m (39"), DC to 40 GHz, K(f) to K(m), 50 Ω
15NN50-1.0B	1.0 m (39"), DC to 18 GHz, N(m) to N(m), 50 Ω
15NNF50-1.0B	1.0 m (39"), DC to 18 GHz, N(m) to N(f), 50 Ω
15LL50-1.0A	1.0 m (39"), DC to 20 GHz, 3.5 mm (m) to 3.5 mm(m), 50 Ω
15LLF50-1.0A	1.0 m (39"), DC to 20 GHz, 3.5 mm (m) to 3.5 mm(f), 50 Ω
15KK50-1.0A	1.0 m (39"), DC to 26.5 GHz, K(m) to K(m), 50 Ω
15KKF50-1.0A	1.0 m (39"), DC to 26.5 GHz, K(m) to K(f), 50 Ω

**Phase-Stable 18 GHz and 40 GHz Semi-Rigid Cables (Armored)**

3670K50-1	0.3 m (12"), DC to 40 GHz, K(f) to K(m), 50 Ω
3670K50-2	0.6 m (24"), DC to 40 GHz, K(f) to K(m), 50 Ω
3670N50-1	0.3 m (12"), DC to 18 GHz, N(f) to N(m), 50 Ω
3670NN50-1	0.3 m (12"), DC to 18 GHz, N(m) to N(m), 50 Ω
3670N50-2	0.6 m (24"), DC to 18 GHz, N(f) to N(m), 50 Ω
3670NN50-2	0.6 m (24"), DC to 18 GHz, N(m) to N(m), 50 Ω

**Adapters**

71693-R	Ruggedized K(f) to N(f), DC to 18 GHz, 50 Ω
1091-26-R	SMA(m) to N(m), DC to 18 GHz, 50 Ω
1091-27-R	SMA(f) to N(m), DC to 18 GHz, 50 Ω
1091-80-R	SMA(m) to N(f), DC to 18 GHz, 50 Ω
1091-81-R	SMA(f) to N(f), DC to 18 GHz, 50 Ω
1091-172	BNC(f) to N(m), DC to 1.3 GHz, 50 Ω
510-90-R	7/16 DIN(f) to N(m), DC to 7.5 GHz, 50 Ω
510-91-R	7/16 DIN(f) to N(f), DC to 7.5 GHz, 50 Ω
510-92-R	7/16 DIN(m) to N(m), DC to 7.5 GHz, 50 Ω
510-93-R	7/16 DIN(m) to N(f), DC to 7.5 GHz, 50 Ω
510-96-R	7/16 DIN(m) to 7/16 DIN (m), DC to 7.5 GHz, 50 Ω
510-97-R	7/16 DIN(f) to 7/16 DIN (f), DC to 7.5 GHz, 50 Ω
513-62	Adapter, DC to 18 GHz, TNC(f) to N(f), 50 Ω
1091-315	Adapter, DC to 18 GHz, TNC(m) to N(f), 50 Ω
1091-324	Adapter, DC to 18 GHz, TNC(f) to N(m), 50 Ω
1091-325	Adapter, DC to 18 GHz, TNC(m) to N(m), 50 Ω
1091-317	Adapter, DC to 18 GHz, TNC(m) to SMA(f), 50 Ω
1091-318	Adapter, DC to 18 GHz, TNC(m) to SMA(m), 50 Ω
1091-323	Adapter, DC to 18 GHz, TNC(m) to TNC(f), 50 Ω
1091-326	Adapter, DC to 18 GHz, TNC(m) to TNC(m), 50 Ω
1091-379-R	7/16 DIN(f) to 7/16 DIN(f), DC to 6 GHz, 50 Ω, with Reinforced Grip
510-102-R	N(m) to N(m), DC to 11 GHz, 50 Ω, 90 degrees right angle

**Precision Adapters**

34NN50A	Precision Adapter, N(m) to N(m), DC to 18 GHz, 50 Ω
34NFN50	Precision Adapter, N(f) to N(f), DC to 18 GHz, 50 Ω
K220B	Precision Adapter, DC to 40 GHz, K(m) to K(m), 50 Ω
K222B	Precision Adapter, DC to 40 GHz, K(f) to K(f), 50 Ω
K224B	Precision Adapter, DC to 40 GHz, K(m) to K(f), 50 Ω

**Attenuators N Type (Up to 18 GHz)**

3-1010-122	20 dB, 5 W, DC to 12.4 GHz, N(m) to N(f)
42N50-20	20 dB, 5 W, DC to 18 GHz, N(m) to N(f)
42N50A-30	30 dB, 5 W, DC to 18 GHz, N(m) to N(f)
3-1010-123	30 dB, 50 W, DC to 8.5 GHz, N(m) to N(f)
1010-127-R	30 dB, 150 W, DC to 3 GHz, N(m) to N(f)
3-1010-124	40 dB, 100 W, DC to 8.5 GHz, N(f) to N(m), Uni-directional
1010-121	40 dB, 100 W, DC to 18 GHz, N(f) to N(m), Uni-directional
1010-128-R	40 dB, 150 W, DC to 3 GHz, N(m) to N(f)

**Attenuators K Type (Up to 40 GHz)**

41KB-3	Precision Fixed Attenuator, K(m) to K(f), 3 dB, DC to 26.5 GHz, 50 Ω
41KB-6	Precision Fixed Attenuator, K(m) to K(f), 6 dB, DC to 26.5 GHz, 50 Ω
41KB-10	Precision Fixed Attenuator, K(m) to K(f), 10 dB, DC to 26.5 GHz, 50 Ω
41KB-20	Precision Fixed Attenuator, K(m) to K(f), 20 dB, DC to 26.5 GHz, 50 Ω
41KC-3	Precision Fixed Attenuator, K(m) to K(f), 3 dB, DC to 40 GHz, 50 Ω
41KC-6	Precision Fixed Attenuator, K(m) to K(f), 6 dB, DC to 40 GHz, 50 Ω
41KC-10	Precision Fixed Attenuator, K(m) to K(f), 10 dB, DC to 40 GHz, 50 Ω
41KC-20	Precision Fixed Attenuator, K(m) to K(f), 20 dB, DC to 40 GHz, 50 Ω





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