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# **Anritsu** envision : ensure

# Site Master™

Handheld Cable & Antenna Analyzer Featuring Classic and Advanced Modes

## S331L

2.0 MHz to 4.0 GHz Cable & Antenna Analyzer 50 MHz to 4.0 GHz Power Meter



## S331L

## **Specifications**

## Introduction

Anritsu introduces its ninth generation, compact handheld Cable & Antenna Analyzer for installation and maintenance of antenna systems.

## **Optimized for Field Use**

- > 8 Hour Battery Life
- Rugged and Reliable
- Instant On from Standby Mode
- Highest RF Immunity
- Built-in InstaCal<sup>™</sup> Module
   Fact. One connection Calibration
- Fast, One-connection Calibration • FlexCal<sup>™</sup> Calibration
  - One Calibration for All Frequencies

## Easy to Use

- Integrated Help Function
- S331D-like Classic Mode
- S331E-like Advanced Mode
  - Additional Markers
  - Customizable Shortcuts
  - Full-screen View

## **Efficient Sweep Management**

- Internally Store >1000 Files
   Sweeps, Setups, Screen Shots
- Line Sweep Tools (LST) Software
  - Edit Sweeps, Rename, Archive
  - Generate PDF or HTML Reports

- Optical connector inspection with IEC 61300-3-35 based Pass/Fail standard (Requires USB Video Inspection Probe, sold separately)
- Built-in Power Meter
- High Accuracy USB Power Meter (Requires USB Sensor, sold separately)
- Impact, Dust, and Splash Resistant
- Smallest, Lightest Site Master™
- Multiple USB Ports
- 800 x 480 7" TFT Touch Screen - Alphanumeric Keyboard - EZ Name Quick Matrix
- Backlit Keypad
- easyTest<sup>™</sup>
- Fast Preview of Stored Sweeps
- Standard \*.dat Sweep File Format
- Compatible with HHST
  - Widely Accepted by Operators
- Location Data with Compatible USB GPS Module



Site Master<sup>™</sup> S331L Cable & Antenna Analyzer Featuring 7.0 in Daylight Viewable Touch Screen Compact Size: 250 mm x 177 mm x 61 mm (10.0 in x 7.1 in x 2.4 in), Lightweight: < 2.0 kg (4.4 lb)

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## Definitions

	All specifications and characteristics apply to Revision 2 instruments under the following conditions, unless otherwise stated:
Warm-Up Time	After 5 minutes of warm-up time, where the instrument has completely stabilized to the ambient temperature.
Frequency Reference	Internal frequency reference is used.
Calibration	Instrument is within the recommended calibration cycle of 12 months. Cable and Antenna Analyzer measurements applicable after standard OSL calibration is performed using Anritsu calibration components.
Typical Performance	Typical specifications in parenthesis () describe performance that will be met by a minimum of 80% of all products. They do not include guard bands and are not warranted.
	Typical specifications that are not in parenthesis are not tested and not warranted. They are generally representative of the nominal characteristic performance.
Uncertainty	A coverage factor of k = 2 is applied to the measurement uncertainties to facilitate comparison with other industry monitors.
	All specifications subject to change without notice. For the most current data sheet, please visit the Anritsu web site: www.anritsu.com

S331L

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Measurements       VSWR Return Loss Cable Loss (One Port) Distance-to-Fault (DTF) Return Loss Distance-to-Fault (DTF) SWR Smith Chart 50 rJ/ 75 Ω (Advanced Mode Only) 1-Port Phase (Advanced Mode Only) Transmission with External Sensor (Advanced Mode Only)         Setup Parameters-Classic Mode       Single Display with independent markers         Frequency       F1/F2         DTF       D1/D2, DTF Aid, Cable Loss, Propagation Velocity, Cable type         Windowing       Retangular, Normal Side Lobe, Low Side Lobe, Minimum Side Lobe         Amplitude       Top, Bottom Auto Scale, Full Scale         Sweep       Data Points, Run/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off), Trace         Data Points       130, 259, 517, 1033, 2065         Markers       Karkers to G (On/Off, Delta Markers 2 to 4 (Ref M1), Marker to Peak/Valley, Marker Table, Markers 5 (Peak/Valley between M1 & M2), Marker 6 (Peak/Valley between M3 & M4), Independent Markers for Frequency and Distance Measurements         Traces       Copy Trace To Memory, Trace Display, Trace Math [Trace - Memory, Trace + Memory, Calibration         Satur?Recall       Setup Parameters-Advanced Mode         Measurement Display       Single/Dual Display with independent markers         Frequenty       Start Cellbration, Cal Info, Cal Correction (On/Off), Cal Method (OSL, InstaCal <sup>™</sup> ), Cal Type (Standard, FlexCal <sup>™</sup> )         Satur Cellbration, Cal Info, Cal Correction (On/Off), Cal Method (OSL, InstaCal <sup>™</sup> ), Cal Type (Standard, FlexCal <sup>™</sup> )	Maaguramanta	
Return Loss       Return Loss         Cable Loss (One Port)       Distance-to-fault (DT) Plenui         Distance-to-fault (DT) Plenui       Distance-to-fault (DT) Plenui         Settup Parameters-Classic Mode       Smith Charty Sig / 751 (Manned Mode Only)         Transmission with External Sensor (Akonced Mode Only)       Transmission, Normal Side Lobe, Low Side Lobe, Minimum Side Lobe         Massurement Display       Fingle Display, Normal Side Lobe, Minimum Side Lobe         Amplitude       Top, Dation Auto Scale, Full Scale         Data Points, Markers       Markers         Markers       Markers         Markers       Markers         Traces       Copy Trace 1 Memory, Trace Display, Trace Marking Trace - Memory, Trace 1 Memory, Trace Display, Trace Marking Trace - Memory, Trace - Memory, Trace - Memory, Trace - Memory, Trace Display, Trace Marking Trace - Memory, Trace - M	Measurements	VCM/D
Cobie Loss (One Port)         Distance to Fault (CTP) Feature Loss Distance to Fault (CTP) Feature Loss Frequency         Setup Parameters-Classic Mode Masurement Dispat       Single Display with independent markers Frequency       FI/72         DTD       DTD2. DTFAIC Cable Loss, Propagation Velocity, Cable Uspe Windowing       Retactinguitar, Normal Side Lobe, Low Side Lobe, Minimum Side Lobe Sweep       Data Points, Run/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Oft), Trace Data Points, Run/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Oft), Trace Data Points, Run/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Oft), Trace Data Points, Run/Hold (Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Oft), Trace + Memory, Trace Science Copy Trace To Memory, Trace Deplay, Trace Math (Trace - Memory, Trace + Memory	Measurements	
bistance-to-Fault (DTP) Return Loss Distance-to-Fault (DTP) Return Loss Distance-to-Fault (DTP) Return Loss Distance-to-Fault (DTP) Setting Settup Parameters-Classic Mode Measurement Display Frequency FU/2 TOT D1/02, DTF Add Cable Loss, Propagation Velocity, Cable type Mindowing Rectangular, Normal Side Lobe, Low Side Lobe, Minimum Side Lobe Amplitude Markers Top, Bottom Auto Sciel, Full Scale Data Points, Murridus Single/Continuous, RF Immunity (High/Low), RF Power in Hold (DrvOft), Trace Data Points, Murridus Single/Continuous, RF Immunity (High/Low), RF Power in Hold (DrvOft), Trace Data Points, Control Top, 1000, Trace Mathematican Markers Top Scale Sc		
Bistance-to-Fault (DTP YSWR Smith Charlos Out 75 (LeWanneed Mode Only) 1-Part Fibae (Advanced Mode Only) 1-Tarismibians with Esternal Sensor (Advanced Mode Only) Transmissions with Esternal Sensor (Advanced Mode Only) DET 01/02.0 TF Air, Cable Loss, Propagation Velocity, Cable type Windowing Rectangular, Normal Side Lobe, Low Side Lobe, Minitum Side Lobe Amplitude 70p, Bottom Auto Scale, Full Scale Sweep Data Points, Run/Hold, Single/Continuous, RF Limmunity (High/Low), RF Power in Hold (On/Off), Trace Data Points, Run/Hold, Single/Continuous, RF Limmunity (High/Low), RF Power in Hold (On/Off), Trace Data Points, Run/Hold, Single/Continuous, RF Limmunity (High/Low), RF Power in Hold (On/Off), Trace Data Points, Run/Hold, Single/Continuous, RF Limmunity (High/Low), RF Power in Hold (On/Off), Trace Data Points, Run/Hold, Single/Continuous, RF Limmunity (High/Low), RF Power in Hold (On/Off), Trace Data Points, Run/Hold, Single/Continuous, RF Limmunity (High/Low), RF Power in Hold (On/Off), Trace Cogli Trace To Memory, Trace Math (Trace - Memory, Trace + Memory, (Trace - Memory Limit Line On/Off, Edit Value, Limit Alarm, Pass/Fail On/Off, Limit Preset Calibration, Cali Info, Cal Correction (OrOff), SwerRecall Setup, Neasurement, Screet Shots Setup Parameters-Advanced Mode Amplitude Top, Bottom, Aux, Narker (Telexcal) <sup>m</sup> SwerRecall Setup, Neasurement, Screet Shots Setup Parameters - Advanced Mode Amplitude Top, Bottom, Aux, Narkar (Telexcal) <sup>m</sup> SwerRecall Setup, Neasurement, Screet Shots Setup Parameters - Advanced Mode Amplitude Top, Bottom, Aux, Narkar (Telexcal) <sup>m</sup> SwerRecall Setup, Measurement, Screet Shots Setup Parameters - Advanced Mode Amplitude Top, Bottom, Aux, Narkar (Telexcal) <sup>m</sup> SwerRecall Setup, Measurements, Screet Shots Frequency Recars & Markers To 16 (On/Off), More Active Limit, Edit Segments (42 upper and 42 lot segments Nate) Rest To 18 (On/Off), Libeta Markers 2 to 8 (Ref M1), Marker TraceMary (Marker TraceMary) SwerRecall Setup, Measurement, Screen Shots Frequency Recars & Shots Setup, Measurem		
1-Port Phase (Advanced Mode Only)       Setup Parameters-Classic Mode       Measurement Display     Single Display with independent markers       Frequency     FUZ       DTF     D1/02, DTF Ad, Cable Loss, Propagation Velocity, Cable type       Minitum     Top, Bottom Auto Scale, Full Scale       Save Data Points     302, 259, 317, 1033, 2065       Markers     Markers to G(On/Off), Deta Markers 2 to 4 (Ref M1), Marker to Peak/Valley, Marker Table, Marker 5 for Peak/Valley Detween M1 & M2), Marker to Peak/Valley, Marker Table, Marker 5 for Peak/Valley Detween M1 & M2), Marker to Peak/Valley, Marker Table, Marker 5 for Peak/Valley Detween M1 & M2), Marker to Peak/Valley, Marker Table, Marker 5 for Peak/Valley Detween M1 & M2), Marker to Peak/Valley, Marker Table, Marker 5 for Peak/Valley Detween M1 & M2), Marker to Peak/Valley, Marker Table, Marker 5 for Peak/Valley Detween M1 & M2), Marker to Peak/Valley, Marker Table, Marker 5 for Peak/Valley Detween M1 & M2), Marker to Peak/Valley, Marker Table, Marker 5 for Peak/Valley Detween M1 & M2), Marker to Peak/Valley, Marker Table, Marker 5 for Peak/Valley Detween M1 & M2), Marker Top, Stop Forequency (F), Call Weind Mold (SC), InstCall <sup>M1</sup> , Call Yee (Standard, HexCall <sup>M2</sup> )       Setup Parameters-Advanced Mode       Measurement Display     Single/Dual Display with independent markers       Setup Parameters-Advanced Mode     Single/Dual Display with independent markers       Setup Parameters-Advanced Mode     Markers 10 Biologic (Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off)       Data Points, Run/Hold, Single/Dual Display with Independent markers     Single/Dual Display Nith Independent Ma		
Transmission with External Sensor (Advanced Mode Only)         Setup Parameters-Classic Mode         Measurement Display       Single Display with independent markers         Frequency       F1/72         DTF       D1/10.2 DTF Aid, Cable Loss, Propagation Velocity, Cable type         Amplitude       Top, Bottom Auto Scale, Full Scale         Seveep       Data Points, Run/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off), Trace Data Points, Run/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off), Trace Data Points, Run/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off), Trace To Memory, Trace Math (Trace - Memory, Trace + Memory, (Trace + Memory, ITrace - Memory, Cable type)         Call Trace       Copy Trace To Memory, Trace Math (Trace Math, Trace Math, Trace - Memory, ITrace + Memory, (Trace + Memory, ITrace + Memory, ITrace + Memory, ITrace - Memory, ITrace + Memory, ITrace - Memory, ITrace + Memory,		
Setup Parameters-Classic Mode     Messurement Display     Single Display with Independent markers       Frequency     FI/Z       DTF     D1/D2. DTF Add, Cable Loss, Propagation Velocity, Cable type       Windowing     Restangular, Normal Side Lobe, Low Side Lobe, Minimum Side Lobe       Amplitude     Top, Bottom Auto Scale, Full Scale       Sevep     Data Poins, Runzhold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (Or/Off), Trace Data Poins, Runzhold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (Or/Off), Trace Data Poins, Runzhold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (Or/Off), Trace Scale, Full Scale       Data Poins, Runzhold, Single/Data Markers 2 to 4 (Ref M1), Marker to Peak/Valley, Marker Able, Markers 5 or (Peak/Valley) between M1 & Sul, Marker G ForkAlley Detween M1 & Sul, Marker G Sulpak/Valley Detween M1 &		
Messurement Display     Single Display with independent markers       Frequency     FI/2       OTTO     D1/02, DTF Add, Cable Loss, Propagation Velocity, Cable type       Data Points, Pauly All, Cable Loss, Propagation Velocity, Cable type     Data Points, Pauly All, Cable Lose, Low Side Lobe, Minimum Side Lobe       Amplitude     Top, Bottom Auto Scale, Full Scale     Data Points, Pauly All, Markers 2 to 4 (Ref M1), Marker to Peak/Valley, Marker Table, Markers 7 (Peak/Valley between M1 & Markers 1 (Peak/Valley between M3 & Markers 1 (Peak/Valley Be		
Frequeincy       F1/2         DT       D1/20, DTF Aid, Cable Loss, Propagation Velocity, Cable type         Mindowing       Rectangular, Normal Side Lobe, Low Side Lobe, Minimum Side Lobe         Amplitude       Top, Bottom Auto Scale, Full Scale         Date Points       130, 259, 517, 1033, 2065         Markers       To (BO/OTR), Delta Markers 2 to 4 (Ref M1), Marker to Peak/Valley, Marker Table, Markers 5 or Frequency and Distance Measurements         Calibration       Save Peak         Calibration       Calibration, Cal Info, Cal Correction (MO/OTR), Calibration Autor Peak         Setup Parameters-Advanced Molos       Start Calibration, Cal Info, Cal Correction (MO/OTR), Calibration Start (Calibration Start (Calibration, Cal Info, Cal Correction (MO/OTR), Calibration Start (Calibration, Calibrate (D1), Stop Frequency (F2)         Setup Parameters-Advanced Molos       Start Frequency (F1), Stop Frequency (F1), Stop Frequency (F2)         Data Points, Run/Hold, Single/Coul Display with independent markers       Start Frequency (F1), Stop Frequency (F2)         Start Frequency       Start Frequency (F1), Stop Frequency (F2)       Start Frequency (F1), Stop Frequency (F1), Stop Frequency (F2)         Data Points, Run/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off)       Data Points, Run/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off)         Data Points, Run/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off)       Data Points, Run/Hold, Sin	-	
DT/EQ_DTF Add, Cable Loss, Propagation Velocity, Cable Upp       Windowing     Rectangular, Normal Side Lobe, Low Side Lobe, Minimum Side Lobe       Top, Bottom Auto Scale, Full Scale     Data Points, Rum/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off), Trace Data Points, Rum/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off), Trace Data Point, Rum Yest State (On/Off), Deta Markers 1 to 6 (On/Off), Deta Marker 5 (Peak/Valley between M3 & Ma), Independent Markers for (Calibration, Cali Info, Cali Carettoni (On/Off), Calibration, Cali Info, Cali Carettoni (On/Off), Calibration, Cali Info, Cali Carettoni (On/Off), Calibration, Cali Info, Calibration, Calin (Calibration, Calin (Calibration, Calin (Calibration, Calino, Calibration), Calibration (Calibration, Calibration), Calibration (Calibration, Calibration, Strengeunsy (H), Socy Prequency (H), Marker Tracible, Marker S & (Peak/Valley between M1 & Marker Hemory, Trace + Memory, Trace + Memory, Trace Hemory, Trace		
Windowing     Rectangular, Normal Side Lobe, Kwi Side Lobe, Minimum Side Lobe       Amplitude     Top, BBottom Auto Scale, Hull Scale       Data Points, Run/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off), Trace       Data Points     Top, 255, 917, 1033, 2065       Markers     Markers       Traces     Copy Trace To Memory, Trace Display, Trace Memory, Trace + Memory, Trace		
Amplitude       Top, Bartom Auto Scale, Full Scale         Seveep       Data Points, RurrHolds, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (Dn/Off), Trace Data Points         130, 259, 517, 1033, 2065       Markers 1 to 6 (On/Off), Delta Markers 2 to 4 (Ref M1), Marker to Peak/Valley, Marker Table, Markers 5 to Frequency and Distance Measurements         Traces       Copy Trace To Memory, Trace Display, Trace Math [Trace - Memory, Trace + Memory, ITrace + Memory, Clarker + Memory, ITrace + Memory, Trace Display, Trace Display, Trace Math [Trace - Memory, Trace + Memory, Clarker + Memory, Limit Line         Setup Parameters-Advanced Mode       Single/Dual Display with independent markers         Setup Parameters-Advanced Mode       Frequency Start Frequency (FI), Stop Frequency (F2)         DTF       Start Distance (D1), Stop Distance (D2), Units mft, DTF Aid, Cable List, Cable Loss, Propagation Velocit Windowing         Weindowing       Retarnalysin, Vond Stale Lobe, Minimum Side Lobe         Amplitude       Top, Bortom, Auto Scale, Full Scale         Sovepp Data Points, RurrHold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off)         Data Points, RurrHold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off)         Data Points, RurrHold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off)         Data Points, RurrHold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off)         Data Points, RurrHold, Single/Co	DTF	D1/D2, DTF Aid, Cable Loss, Propagation Velocity, Cable type
Sweep     Data Points     Run/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off), Trace Data Points       Markers     130, 259, 517, 1033, 2065       Markers     Traces     Copy Trace To Memory, Trace Display, Trace Memory, Trace Memory, Trace + Memory, Carace + Memory, Merce 5, Single/Oual Display with independent markers       Setup Parameters-Advanced Mode     Single/Oual Display with independent markers       Frequency     Single/Oual Display, Single/Onitinuous, RF Immunity (High/Low), RF Power in Hold (On/Off)       Diff     Start Calibration, Cali Info, Cal Correction (On/Off),       Windowing     Retangular, Normal Side Lobe, Low Side Lobe, Minimum Side Lobe       Markers     Markers 1 to 8 (Cn/Off), Obeta Markers 2 to 8 (Ref M1), Marker 1 Trace, Memory, Trace Memory, Trace + Memory, Marker 6 & 8 (Peak/Valley between M3 & Independent Markers 5 re 1 (Peak/Valley between M1 & M2), Marker 6 & 8	Windowing	Rectangular, Normal Side Lobe, Low Side Lobe, Minimum Side Lobe
Data Points     130, 229, 517, 1033, 2065       Markers     Markers       Markers	Amplitude	Top, Bottom Auto Scale, Full Scale
Data Points     130, 229, 517, 1033, 2065       Markers     Markers       Markers	Sweep	Data Points. Run/Hold. Single/Continuous. RF Immunity (High/Low). RF Power in Hold (On/Off). Trace
Markers' 10 6 (On/Off), Delta Markers 21 0 4 (Ref M1), Marker 10 Adv. Marker 50 (Peak/Valley between M3 & M4), Independent Markers for Frequency and Distance Measurements         Traces Copy Trace To Memory, Trace Display, Trace Math (Trace - Memory, Trace + Memory, Link arker + Table, Marker 5 & 7 (Peak/Valley between M1 & M2), Marker + 6 & 8 (Peak/Valley between M1 & M2), Marker + 6 & 8 (Peak/Valley between M1 & M2), Marker + 6 & 8 (Peak/Valley between M1 & M2), Marker + 6 & 8 (Peak/Valley between M1 & M2), Marker + 6 & 8 (Peak/Valley between M1 & M2), Marker + 6 & 8 (Peak/Valley between M1 & M2), Marker + 6 & 8 (Peak/Valley between M1 & M2), Marker + 6 & 8 (Peak/Valley between M1 & M2), Marker + 6 & 8 (Peak/Valley between M1 & M2), Marker + 6 & 8 (Peak/Valley between M1 & M2), Marker + 6 & 8 (Peak/Valley between M1 & M2), Marker + 6 & 8 (Peak/Valley between M1 & M2), Marker + 6 & 8 (Peak/Valley between M1 & M2), Marker + 6 & 8 (Peak/Valley between M1 & M2), Marker + 6 & 8 (Peak/Valley between M1 & M2), Marker + 6 & 8 (Peak/Valley between M1 & M2), Marker + 6 & 8 (Peak/Valley between M1 & M2), Marker + 6 &		
(Peak/Xalley between M1 & M2), Marker 5 (Peak/Xalley between M3 & M4), Independent Markers for Frequency and Distance Measurements         Traces       Copy Trace To Memory, Trace Display, Trace Math [Trace - Memory, Trace + Memory, Call Method (OSL, Instaca <sup>IM</sup> ), Call Type (Standard, FiexCa <sup>IM</sup> ) Save/Recall         Setup Parameters-Advanced Mode       Measurement, Screen Shots         Measurement Display       Single/Dual Display with independent markers Strene Shots         Setup Parameters-Advanced Mode       Measurement, Display         Measurement Display       Single/Dual Display with independent markers Strene (O2), Units mrft, DTF Aid, Cable List, Cable Loss, Propagation Velocit Windowing Rectangular, Normal Side Lobe, Low Side Lobe, Minimum Side Lobe Amplitude Top, Bottom, Auto Scale, Full Scale Sweep         Data Points, Run/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off) Data Points, Run/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off) Data Points, Run/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off) Marker Table, Marker 5 & 7 (PaaK/Valley between M1 & M2), Marker 6 (PaaKValley between M1 & M2), Marker Table, Marker 5 & 7 (PaaKValley between M1 & M2), Marker Table, Marker Table, Marker 5 & 7 (PaaKValley between M1 & M2), Marker Table, Marker Table, Marker 5 & 7 (PaaKValley between M1 & M2), Marker Table, Marker Table, Marker 5 & 7 (PaaKValley between M1 & M2), Marker Table, Marker Table, Marker 5 & 7 (PaaKValley between M1 & M2), Marker Table, Marker Table, Marker 5 & 7 (PaaKValley between M1 & M2), Marker 5 & 7 (PaaKValley between M1 & M2), Marker 5 & 7 (PaaKValley between M1 & M2), Marker 5 & 7 (PaaKValley		
Limit Line Ori/Off, Edit Value, Limit Alarm, Pass/Fail On/Off, Limit Preset Calibration Start Calibration, Cal Info, Cal Correction (On/Off) Measurement Display Single/Dual Display with independent markers Start Frequency (FL), Stop Frequency (F2) Measurement Display Single/Dual Display with independent markers Frequency Start Frequency (FL), Stop Frequency (F2) Measurement Display Single/Dual Display with independent markers Start Frequency (FL), Stop Frequency (F2) Measurement Display Single/Dual Display with independent markers Frequency To Bistance (D1), Stop Distance (D2), Units mft, DTF Aid, Cable List, Cable Loss, Propagation Velocit Rectangular, Normal Side Lobe, Low Side Lobe, Minimum Side Lobe Amplitude Top, Bottom, Auto Scale, Full Scale Sweep Data Points, Rurl Mold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off) Data Points 130, 259, 517, 1033, 2065 Markers Ta 8 (On/Off), Deta Markers 2 to 8 (Ref M1), Marker Tacking (On/Off), Marker to Peak/Valle Markers Ta 18 (On/Off), Deta Markers 2 to 8 (Ref M1), Marker F & 8 (Peak/Valley between M3 & Independent Markers for Frequency and Distance Measurements Traces Copy Trace to Memory, Trace Display, Trace Math [Trace - Memory, Trace + Memory, Limit Line Segments maximum), Limit Marry, Bass/Fail On/Off), Limit Preset Calibration Cal Info. Cal Correction (On/Off), More Active Limit, Edit Segments (42 upper and 42 lo sequents maximum), Limit Alarry, Bass/Fail On/Off, Limit Preset Calibration Start Calibration, Cal Info, Cal Correction (On/Off), Save/Recall Setups, Measurements, Screen Shots Frequency Resolution 1 kHz 20 On-Channel 117 dBm outside calibrated sweep range On-Frequency Resolution 0.0-Frequency 4: 5 ppm @ 23 °C ± 3 °C Frequency Resolution 1 kHz 20 Setups Adata point, RF immunity low, typical Distance-to-Fault 1.75 ms/data point, RF immunity low, typical Return Loss Measurement Range Note 60 dB Not 60 dB Not 60 dB	ividi kei s	(Peak/Valley between M1 & M2), Marker 6 (Peak/Valley between M3 & M4), Independent Markers for
Calibration       Start Calibration, Cal Info, Cal Correction (On/Off), Cal Method (OSL, InstaCal <sup>m</sup> ), Cal Type (Standard, FlexCal <sup>m</sup> )         Setup Parameters-Advanced Mode       Measurements, Screen Shots         Setup Parameters-Advanced Mode       Measurement Display         Measurement Display       Single/Dual Display with independent markers         Frequency       Start Frequency (F2)         DTF       Start Trequency (F1), Stop Prequency (F2)         DTF       Start Daiton (Coling)         Parameters-Mode Doc       Minimum Side Lobe         Windowing       Rectangular, Normal Side Lobe, Low Side Lobe, Minimum Side Lobe         Data Points, Run/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off)         Data Points, Run/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off)         Data Points, Run/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off)         Data Points, Run/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off)         Markers 1 to 8 (On/Off), Delta Markers 2 to 8 (Ref M1), Marker Tracking (On/Off), Marker to Peak/Valle         Markers 1 to 8 (On/Off), Delta Markers 2 to 8 (Ref M1), Marker Tracking (On/Off), Marker to Peak/Valle         Marker 1 to 8 (Don/Off), Cal Info, Cal Correction (On/Off),         Calibration       Start Calibration         Start Calibration       Start Calibratio         Start Calibration <td>Traces</td> <td>Copy Trace To Memory, Trace Display, Trace Math [Trace - Memory, Trace + Memory, (Trace + Memory)/</td>	Traces	Copy Trace To Memory, Trace Display, Trace Math [Trace - Memory, Trace + Memory, (Trace + Memory)/
Calibration       Start Calibration (Cal Info; Cal Correction (On/Off); Save/Recall         Setup Parameters-Advanced Mode         Measurement Display       Single/Dual Display with independent markers         Frequency       Start Frequency (F1), Stop Frequency (F2)         DTF       Start Trequency (F1), Stop Prequency (F2)         DTF       Start Distance (D1), Stop Distance (D2), Units m/ft, DTF Aid, Cable List, Cable Loss, Propagation Velocit         Windowing       Rectangular, Normal Side Lobe, Low Side Lobe, Minimum Side Lobe         DTF       Start Distance (D1), Stop Pistance (D2), Units m/ft, DTF Aid, Cable List, Cable Loss, Propagation Velocit         Windowing       Rectangular, Normal Side Lobe, Low Side Lobe, Minimum Side Lobe         DTF       Start Dailtont to Kon/Off). Delta Markers 2 to 8 (Ref M1), Marker Tracking On/Off), Marker to Peak/Nalle         Data Points       Suo, 259, 571, 7033, 2065         Markers 1 to 8 (On/Off). Delta Markers 2 to 8 (Ref M1), Marker Tracking On/Off), Marker to Peak/Nalle         Markers 1 to 8 (On/Off). Delta Markers 2 to 8 (Ref M1), Marker Tracking On/Off), Marker to e Memory, Trace + Memory, Trace + Memory, Trace to Memory. Trace Display, Trace Math (Trace - Memory, Trace + Memory, Crace + Memory, Caliberato         Calibration       Start Calibration         Start Calibration       Start Calibration         Start Calibration       Start Calibration <td>Limit Line</td> <td>On/Off, Edit Value, Limit Alarm, Pass/Fail On/Off, Limit Preset</td>	Limit Line	On/Off, Edit Value, Limit Alarm, Pass/Fail On/Off, Limit Preset
Cal Method (QSL, InstaCa <sup>IM</sup> ), Cal Type (Standard, FlexCa <sup>IM</sup> ) Save/Recall Setups, Measurements, Screen Shots Setup Parameters-Advanced Mode Measurement Display Frequency Start Frequency (F1), Stop Distance (D2), Units m/ft, DTF Aid, Cable List, Cable Loss, Propagation Velocit Windowing Rectangular, Normal Side Lobe, Low Side Lobe, Minimum Side Lobe Amplitude Top, Bottom, Auto Scale, Full Scale Sweep Data Points, Run/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off) Data Points 130, 259, 517, 1033, 2065 Markers To 8 (Marker 5 & 7 (Peak/Valley between M 1 & M2), Marker 6 & 8 (Peak/Valley between M 2 & M2), Marker 7 6 & M2 (Paak/Valley between M 2 & M2), Marker 6 & 8 (Peak/Valley between M 2 & M2 (Paak/Valley between M 2 & M2 (P	Calibration	Start Calibration, Cal Info, Cal Correction (On/Off),
Setup Parameters-Advanced Mode       Single/Dual Display with independent markers         Frequency       Start Frequency (F1), Stop Distance (D2), Units m/rt, DTF Aid, Cable List, Cable Loss, Propagation Velocit         Windowing       Rectangular, Normal Side Lobe, Low Side Lobe, Minimum Side Lobe         Amplitude       Top, Bottom, Auto Scale, Full Scale         Sweep       Data Points, Run/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off)         Data Points       130, 259, 517, 1033, 2065         Markers       Markers 1 to 8 (On/Off). Delta Markers 2 to 8 (Ref M1), Marker Tracking (On/Off), Marker to Peak/Valle         Markers       Narkers 1 to 8 (On/Off). Delta Markers 2 to 8 (Ref M1), Marker Tracking (On/Off), Marker to Peak/Valle         Markers       Markers 5 & 7 (Peak/Valley between M1 & M2), Marker 1 Tacking (On/Off), Marker to Peak/Valle         Markers       Satt Frequency         Limit Line       Active Limit (Upper/Lower), Limit State (On/Off), Morker Uniti, Edit Segments (42 upper and 42 lo segments maximum). Limit Alarn, Pass/Fall On/Off, Limit Preset         Calibration       Sater Calibration, Cal Info, Cal Correction (On/Off)         Save/Recall       Setups, Measurements, Streen Shots         Frequency Range       2 MHz to 4 GHz         Frequency Range       2 MHz to 4 GHz         Yange       2 J DB outside calibrated sweep range         On-Channel       +17 dBm outside cali		
Measurement Display       Single/Dual Display with independent markers         Frequency       Start Distance (D1), Stop Distance (D2), Units m/H, DTF Aid, Cable List, Cable Loss, Propagation Velocit         Windowing       Rectangular, Normal Side Lobe, Low Side Lobe, Minimum Side Lobe         Amplitude       Top, Bottom, Auto Scale, Full Scale         Sweep       Data Points, Run/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off)         Data Points       Sugs 517, 1033, 2065         Markers       Stor Rectangular, Normal Side Lobe, Low Side Lobe, Marker Tracking (On/Off), Marker to Peak/Valle Markers 7 & 7 (Peak/Valley between M1 & M2), Marker 6 & 8 (Peak/Valley between M3 & Independent Markers 5 to Fequency and Distance Measurements         Traces       Copy Trace to Memory, Trace Display, Trace Math [Trace - Memory, Trace + Memory, Crace + Memory, Call Method (OsL), Instaca <sup>IM</sup> , Haarn, Pass/Fail On/Off, Limit Preset         Start Calibration       Start to 4 GHz         Starter Prequency Range       2 MHz to 4 GHz         Yerequency Resolution       * 5 gpm @ 23 °C ± 3 °C         Frequency Resolution       * 11 dBm outside calibrated sweep range         On-Channel       * 117 dBm outside calibrated sweep range         On-Channel       * 1.50 ms/data point, RF immunity low, typical         Return Loss <td< td=""><td>Save/Recall</td><td>Setups, Measurements, Screen Shots</td></td<>	Save/Recall	Setups, Measurements, Screen Shots
Measurement Display       Single/Dual Display with independent markers         Frequency       Start Distance (D1), Stop Distance (D2), Units m/H, DTF Aid, Cable List, Cable Loss, Propagation Velocit         Windowing       Rectangular, Normal Side Lobe, Low Side Lobe, Minimum Side Lobe         Amplitude       Top, Bottom, Auto Scale, Full Scale         Sweep       Data Points, Run/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off)         Data Points       Sugs 517, 1033, 2065         Markers       Stor Rectangular, Normal Side Lobe, Low Side Lobe, Marker Tracking (On/Off), Marker to Peak/Valle Markers 7 & 7 (Peak/Valley between M1 & M2), Marker 6 & 8 (Peak/Valley between M3 & Independent Markers 5 to Fequency and Distance Measurements         Traces       Copy Trace to Memory, Trace Display, Trace Math [Trace - Memory, Trace + Memory, Crace + Memory, Call Method (OsL), Instaca <sup>IM</sup> , Haarn, Pass/Fail On/Off, Limit Preset         Start Calibration       Start to 4 GHz         Starter Prequency Range       2 MHz to 4 GHz         Yerequency Resolution       * 5 gpm @ 23 °C ± 3 °C         Frequency Resolution       * 11 dBm outside calibrated sweep range         On-Channel       * 117 dBm outside calibrated sweep range         On-Channel       * 1.50 ms/data point, RF immunity low, typical         Return Loss <td< td=""><td>Setup Parameters-Advanced Mod</td><td>le</td></td<>	Setup Parameters-Advanced Mod	le
Frequency       Start Frequency (F1), Stop Prequency (F2)         DTF       Start Distance (D1), Stop Distance (D2), Units m/ft, DTF Aid, Cable List, Cable Loss, Propagation Velocit         Windowing       Rectangular, Normal Side Lobe, Low Side Lobe, Minimum Side Lobe         Amplitude       Top, Bottom, Auto Scale, Full Scale         Data Points, Run/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off)         Data Points       Tao, 259, 517, 1033, 2065         Markers 1 to 8 (On/Off), Delta Markers 2 to 8 (Ref M1), Marker Tacking (On/Off), Marker to Peak/Valley         Markers 1 to 8 (On/Off), Delta Markers 2 to 8 (Ref M1), Marker Tacking (On/Off), Marker to 24 log         Marker Table, Marker 5 & Power on Marker 5 & Start Calibration         Traces       Copy Trace to Memory, Trace Display, Trace Math [Trace - Memory, Trace + Memory, Limit Line         Calibration       Start Calibration, Cal Info, Cal Correction (On/Off), More Active Limit, Edit Segments (42 upper and 42 log         Sequerkee       Setups, Measurements, Screen Shots         Frequency       Setups, Measurements, Screen Shots         Frequency Range       2 MHz to 4 GHz         Yrequency Resolution       1 KHz         Power       0utput Power       -3 dBm,		
DTF       Start Distance (D1). Stop Distance (D2). Units m/ft, DTF Aid, Cable List, Cable Loss, Propagation Velocit         Windowing       Rectangular, Normal Side Lobe, Low Side Lobe, Minimum Side Lobe         Amplitude       Sweep       Data Points, Run/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off)         Data Points       130, 259, 517, 1033, 2065       Markers 1 to 8 (On/Off), Delta Markers 2 to 8 (Ref M1), Marker Tracking (On/Off), Marker to Peak/Valle         Markers       Traces       Copy Trace to Memory, Trace Display, Trace Math [Trace - Memory, Trace + Memory, Charker to Peak/Valle         Markers       Traces       Copy Trace to Memory, Trace Display, Trace Math [Trace - Memory, Trace + Memory, Charker to Peak/Valle         Segments       Calibration, Cal Ibro, Cal Correction (On/Off), Marker to Peak/Valle         Save/Recall       Start Calibration, Cal Iofo, Cal Correction (On/Off), Limit Preset         Save/Recall       Statuse (On/Off), Diak Jam, Pass/Fasil On/Off, Limit Preset         Save/Recall       Setups, Measurements, Screen Shots         Frequency       Prequency Range       2 MHz to 4 GHz         * 5 pp m@ 23 °C ± 3 °C       1 kHz         Power       Output Power       -3 dBm, typical         Interference Immunity       On-Channel       +17 dBm outside calibrated sweep range         On-Frequency       \$ 1.50 ms/data point, RF immunity low, typical       \$ 1.50 ms/da		
Windowing Amplitude       Rectangular, Normal Side Lobe, Low Side Lobe, Minimum Side Lobe         Sweep       Data Points         Sweep       Data Points         Data Points       Markers         Markers       Narkers 1 to 8 (On/Off), Delta Markers 2 to 8 (Ref M1), Marker Tracking (On/Off), Marker to Peak/Valle Markers 1 to 8 (On/Off), Delta Markers 2 to 8 (Ref M1), Marker 4 (Ref M		
Amplitude       Top, Bottom, Auto Scale, Full Scale         Sweep       Data Points, Run/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off)         Data Points       Markers 1 to 8 (On/Off), Delta Markers 2 to 8 (Ref M1), Marker Tracking (On/Off), Marker to Peak/Valle         Markers       Markers 1 to 8 (On/Off), Delta Markers 2 to 8 (Ref M1), Marker Tacking (On/Off), Marker to Peak/Valle         Markers       Markers 2 to 8 (On/Off), Delta Markers 2 to 8 (Ref M1), Marker 6 & 8 (Peak/Valley between M3 & Independent Warkers for Frequency and Distance Measurements         Traces       Copy Trace to Memory, Trace Display, Trace Math N & M2, Marker 5 & 8 (Peak/Valley between M3 & Independent Warkers for Frequency and Distance Measurements         Calibration       Start Calibration, Cal Tofo, Cal Correction (On/Off), Move Active Limit, Edit Segments (42 upper and 42 lo segments maximum), Limit Marm, Pass/Fail On/Off, Imit Preset         Save/Recall       Setups, Measurements, Screen Shots         Frequency Resolution       Setups, Measurements, Screen Shots         Frequency Resolution       1 kHz         Power       Output Power       -3 dBm, typical         Interference Immunity       +17 dBm outside calibrated sweep range         Measurement Speed       ≤ 1.50 ms/data point, RF immunity low, typical         Return Loss       ≤ 1.50 ms/data point, RF immunity low, typical         Measurement Range       0 to 60 dB       0.01 dB <td></td> <td></td>		
Sweep Data Points, Run/Hold, Single/Continuous, RF Immunity (High/Low), RF Power in Hold (On/Off) 130, 259, 517, 1033, 2065       Markers     Markers 1 to 8 (On/Off). Delta Markers 2 to 8 (Ref M1), Marker Tracking (On/Off), Marker to Peak/Valle Marker Table, Marker 5 & 7 (Peak/Valley between M1 & M2), Marker 6 & 8 (Peak/Marker 6 & 8 (Pe	5	5
Data Points       130, 259, 517, 1033, 2065         Markers       Markers         Markers       130, 259, 517, 1033, 2065         Markers       100,70ff), Delta Markers 2 to 8 (Ref M1), Marker Tracking (Qn/Off), Marker 6 & 8 (Peak/Valley between M3 & Independent Markers for Frequency and Distance Measurements         Copy Trace to Memory, Trace Display, Trace Math [Trace - Memory, Trace + Memory, (Trace + Memory, Limit Limit Limit Cyper/Lower), Limit State (On/Off), Move Active Limit, Edit Segments (42 upper and 42 to segments maximum), Limit Alarm, Pass/Fail On/Off, Limit Preset         Calibration       Start Calibration, Cal Info, Cal Correction (On/Off), Move Active Limit, Edit Segments (42 upper and 42 to segments maximum), Limit Alarm, Pass/Fail On/Off, Limit Preset         Save/Recal       Setups, Measurements, Screen Shots         Frequency Range       2 MHz to 4 GHz         Frequency Resolution       1 kHz         Power       Output Power         Output Power       -3 dBm, typical         Interference Immunity       +17 dBm outside calibrated sweep range         On-Channel       +17 dBm outside calibrated sweep range         Measurement Speed       s 1.50 ms/data point, RF immunity low, typical         Return Loss       6 to 60 dB         Measurement Range       0 to 60 dB         0.01 dB       0.01 dB		
Markers       Markers 1 to 8 (On/Off), Delta Markers 2 to 8 (Ref M1), Marker Tacking (On/Off), Marker to Peak/Valley Detween M3 & M2), Marker 6 & 8 (Peak/Valley Detween M3 & M2), Marker 6 & 8 (Peak/Valley Detween M3 & M2), Marker 6 & 8 (Peak/Valley Detween M3 & M2), Marker 6 & 8 (Peak/Valley Detween M3 & M2), Marker 6 & 8 (Peak/Valley Detween M3 & M2), Marker 6 & 8 (Peak/Valley Detween M3 & Marker 5 & 7 (Peak/Valley Detween M3 & M2), Marker 6 & 8 (Peak/Valley Detween M3 & Marker 5 & 7 (Paak/Marker) Paaker & S (Paak/Marker) Paaker & S (Paaker) &	•	
Marker Table, Marker 5 & 7 (Peak/Valley between M1 & M2), Marker 6 & 8 (Peak/Valley between M3 & Independent Markers for Frequency and Distance Measurements         Traces       Copy Trace to Memory, Trace Display, Trace Math [Trace - Memory, Trace + Memory, (Trace + Memory, Calibration calibration, Calibration, Calibration, Calibration, Calibration, Calibration, Calibration, Cal Method (OSL, InstaCal <sup>™</sup> , Transmission, OSL + Transmission), Cal Type (Standard, FlexCal <sup>™</sup> )         Frequency       Frequency Range       2 MHz to 4 GHz         Frequency Resolution       ± 5 ppm @ 23 °C ± 3 °C         Frequency Resolution       -3 dBm, typical         Interference Immunity       On-Channel         On-Frequency       +17 dBm outside calibrated sweep range         Measurement Speed       < 1.50 ms/data point, RF immunity low, typical	Data Points	130, 259, 517, 1033, 2065
Traces       Copy Trace to Memory, Trace Display, Trace Math [Trace - Memory, Trace + Memory, Active Limit Limit         Limit Line       Active Limit (Upper/Lower), Limit State (On/Off), Move Active Limit, Edit Segments (42 upper and 42 los segments maximum), Limit Alarm, Pass/Fail On/Off, Limit Preset         Calibration       Start Calibration, Cal Info, Cal Correction (On/Off), Cal Method (OSL, InstaCal <sup>TM</sup> , Transmission, OSL + Transmission), Cal Type (Standard, FlexCal <sup>TM</sup> )         Save/Recal       Setups, Measurements, Screen Shots         Frequency Range       2 MHz to 4 GHz         Frequency Resolution       ± 5 ppm @ 23 °C ± 3 °C         Interference Immunity       -3 dBm, typical         On-Frequency       +17 dBm outside calibrated sweep range         On-Frequency       ± 1.50 ms/data point, RF immunity low, typical         Measurement Speed       ≤ 1.50 ms/data point, RF immunity low, typical         Return Loss       Measurement Range       0 to 60 dB         Network       0.01 dB       0.01 dB	Markers	Markers 1 to 8 (On/Off), Delta Markers 2 to 8 (Ref M1), Marker Tracking (On/Off), Marker to Peak/Valley, Marker Table, Marker 5 & 7 (Peak/Valley between M1 & M2), Marker 6 & 8 (Peak/Valley between M3 & M Ladopadent Markers for Forguency, and Distance Massurgments
Limit Line       Active Limit (Upper/Lower), Limit State (On/Off), Move Active Limit, Edit Segments (42 upper and 42 log segments maximum), Limit Alarm, Pass/Fall On/Off, Limit Preset         Calibration       Start Calibration, Cal Info, Cal Correction (On/Off), Cal Method (OSL, InstaCal <sup>™</sup> , Transmission, OSL + Transmission), Cal Type (Standard, FlexCal <sup>™</sup> )         Save/Recall       Setups, Measurements, Screen Shots         Frequency       Frequency Accuracy       ± 5 ppm @ 23 °C ± 3 °C         Frequency Resolution       1 kHz         Power       Output Power       -3 dBm, typical         Interference Immunity       +17 dBm outside calibrated sweep range         On-Frequency       ± 1.50 ms/data point, RF immunity low, typical         Distance-to-Fault       ≤ 1.50 ms/data point, RF immunity low, typical         Return Loss       0 to 60 dB         Measurement Range       0 to 60 dB         0.01 dB       0 to 60 dB         VSWR       VSWR	Traces	
segments maximum), Limit Alarm, Pass/Fail On/Off, Limit Preset       Start Calibration, Cal Info, Cal Correction (On/Off), Cal Type (Standard, FlexCal <sup>m</sup> )         Save/Recall       Setups, Measurements, Screen Shots         Frequency       Frequency Range         Frequency       2 MHz to 4 GHz         Frequency Recall       2 MHz to 4 GHz         * 5 ppm @ 23 °C ± 3 °C         1 kHz         Power       Output Power         On-Channel       +17 dBm outside calibrated sweep range         On-Frequency       +13 dBm within calibrated sweep range         On-Frequency       ≤ 1.50 ms/data point, RF immunity low, typical         Measurement Speed       ≤ 1.50 ms/data point, RF immunity low, typical         Keturn Loss       ≤ 0 to 60 dB         Neasurement Range       0 to 60 dB         0.01 dB       0.01 dB		
Cal Method (OSL, InstaCal™, Transmission), OSL + Transmission), Cal Type (Standard, FlexCal™)         Save/Recall       Setups, Measurements, Screen Shots         Frequency       Frequency Range       2 MHz to 4 GHz         Frequency Accuracy       ± 5 ppm @ 23 °C ± 3 °C         Frequency Resolution       1 kHz         Power       Output Power       -3 dBm, typical         Interference Immunity       On-Channel       +17 dBm outside calibrated sweep range         On-Frequency       exist a point, RF immunity low, typical       ≤ 1.50 ms/data point, RF immunity low, typical         Measurement Speed       ≤ 1.50 ms/data point, RF immunity low, typical       ≤ 1.75 ms/data point, RF immunity low, typical         Return Loss       Measurement Range       0 to 60 dB       0.01 dB         VSWR       VSWR       VSWR       VSWR	Limit Line	
Save/Recall       Setups, Measurements, Screen Shots         Frequency       2 MHz to 4 GHz         Frequency Accuracy       ± 5 ppm @ 23 °C ± 3 °C         Frequency Resolution       1 kHz         Power       Output Power         Output Power       -3 dBm, typical         Interference Immunity       +17 dBm outside calibrated sweep range         On-Frequency       +13 dBm within calibrated sweep range         On-Frequency       ± 1.50 ms/data point, RF immunity low, typical         Beasurement Speed       ≤ 1.50 ms/data point, RF immunity low, typical         Return Loss       ≤ 1.75 ms/data point, RF immunity low, typical         Measurement Range       0 to 60 dB         0.01 dB       0.01 dB	Calibration	
Frequency       Frequency Range       2 MHz to 4 GHz         Frequency Accuracy       ± 5 ppm @ 23 °C ± 3 °C         Frequency Resolution       1 kHz         Power       Output Power         Output Power       -3 dBm, typical         Interference Immunity       +17 dBm outside calibrated sweep range         On-Frequency       +13 dBm within calibrated sweep range         Measurement Speed       < 1.50 ms/data point, RF immunity low, typical	Save/Decall	
Frequency Range       2 MHz to 4 GHz         Frequency Accuracy       ± 5 ppm @ 23 °C ± 3 °C         1 kHz       1 kHz         Power       Output Power         On-Channel       -3 dBm, typical         Interference Immunity       +17 dBm outside calibrated sweep range         On-Frequency       +13 dBm within calibrated sweep range         1 3 dBm.       ± 1.50 ms/data point, RF immunity low, typical         Return Loss       ≤ 1.50 ms/data point, RF immunity low, typical         Measurement Range       0 to 60 dB         0.01 dB       0.01 dB		שנעףא, ואפאטרפווופוונא, אנו פרו שווטנא
Frequency Accuracy Frequency Resolution       ± 5 ppm @ 23 °C ± 3 °C 1 kHz         Power       Output Power         Output Power       -3 dBm, typical         Interference Immunity On-Channel On-Frequency       +17 dBm outside calibrated sweep range +13 dBm within calibrated sweep range         Measurement Speed Return Loss Distance-to-Fault       ≤ 1.50 ms/data point, RF immunity low, typical ≤ 1.75 ms/data point, RF immunity low, typical         Return Loss Measurement Range Resolution       0 to 60 dB 0.01 dB         VSWR       VSWR		
Frequency Resolution       1 kHz         Power       Output Power       -3 dBm, typical         Interference Immunity       On-Channel       +17 dBm outside calibrated sweep range         On-Frequency       +13 dBm within calibrated sweep range         On-Frequency       +13 dBm outside calibrated sweep range         Measurement Speed       \$ 1.50 ms/data point, RF immunity low, typical         Sistance-to-Fault       \$ 1.50 ms/data point, RF immunity low, typical         Measurement Range       0 to 60 dB         0.01 dB       0.01 dB		
Power       Output Power       -3 dBm, typical         Interference Immunity       On-Channel       +17 dBm outside calibrated sweep range         On-Frequency       +13 dBm within calibrated sweep range         Measurement Speed       ≤ 1.50 ms/data point, RF immunity low, typical         Distance-to-Fault       ≤ 1.50 ms/data point, RF immunity low, typical         Return Loss       ≤ 1.75 ms/data point, RF immunity low, typical         Measurement Range       0 to 60 dB         0.01 dB       0.01 dB	1 1 1	
Output Power       -3 dBm, typical         Interference Immunity       +17 dBm outside calibrated sweep range         On-Channel       +13 dBm within calibrated sweep range         On-Frequency       +13 dBm within calibrated sweep range         Measurement Speed       ≤ 1.50 ms/data point, RF immunity low, typical         Distance-to-Fault       ≤ 1.75 ms/data point, RF immunity low, typical         Return Loss       0 to 60 dB         Measurement Range       0 to 60 dB         0.01 dB       0.01 dB	Frequency Resolution	1 kHz
Interference Immunity       On-Channel       +17 dBm outside calibrated sweep range         On-Frequency       +13 dBm within calibrated sweep range         Measurement Speed       ≤ 1.50 ms/data point, RF immunity low, typical         Distance-to-Fault       ≤ 1.75 ms/data point, RF immunity low, typical         Return Loss       0 to 60 dB         Resolution       0.01 dB         VSWR       VSWR	Power	
On-Channel       +17 dBm outside calibrated sweep range         On-Frequency       +13 dBm within calibrated sweep range         Measurement Speed       ≤ 1.50 ms/data point, RF immunity low, typical         Distance-to-Fault       ≤ 1.75 ms/data point, RF immunity low, typical         Return Loss       Measurement Range         Measurement Range       0 to 60 dB         0.01 dB       0.01 dB         VSWR       VSWR	Output Power	–3 dBm, typical
On-Frequency       +13 dBm within calibrated sweep range         Measurement Speed       ≤ 1.50 ms/data point, RF immunity low, typical         Distance-to-Fault       ≤ 1.75 ms/data point, RF immunity low, typical         Return Loss       Measurement Range         Measurement Range       0 to 60 dB         0.01 dB       0.01 dB	Interference Immunity	
Measurement Speed       ≤ 1.50 ms/data point, RF immunity low, typical         Distance-to-Fault       ≤ 1.75 ms/data point, RF immunity low, typical         Return Loss       Measurement Range         Measurement Range       0 to 60 dB         Resolution       0.01 dB	On-Channel	+17 dBm outside calibrated sweep range
Return Loss       ≤ 1.50 ms/data point, RF immunity low, typical         Distance-to-Fault       ≤ 1.75 ms/data point, RF immunity low, typical         Return Loss       Measurement Range Resolution         0 to 60 dB       0.01 dB         VSWR       VSWR	On-Frequency	+13 dBm within calibrated sweep range
Return Loss       ≤ 1.50 ms/data point, RF immunity low, typical         Distance-to-Fault       ≤ 1.75 ms/data point, RF immunity low, typical         Return Loss       Measurement Range Resolution         0 to 60 dB       0.01 dB         VSWR       VSWR	Measurement Speed	
Distance-to-Fault       ≤ 1.75 ms/data point, RF immunity low, typical         Return Loss       Measurement Range Resolution       0 to 60 dB         VSWR       VSWR	•	≤ 1.50 ms/data point, RF immunity low. typical
Measurement Range Resolution     0 to 60 dB 0.01 dB       VSWR     VSWR		
Measurement Range Resolution     0 to 60 dB 0.01 dB       VSWR     VSWR	Return Loss	
Resolution 0.01 dB		0 to 60 dB
	-	
	VSWP	
		1 to 65
Resolution 0.01	-	

ecifications		S331
🍟 Cable and Antenna Anal	yzer (continued)	
Cable Loss		
Measurement Range	0 to 30 dB	
Resolution	0.01 dB	
Distance-to-Fault		
Vertical Range Return Loss	0 to 60 dB	
Vertical Range VSWR	1 to 65	
Fault Resolution (meters)	(1.5 x $10^8$ x vp)/ $\Delta$ F (vp = propagation velocity, $\Delta$ F is F2 – F1 in Hz)	
Horizontal Range (meters)	0 to (Data Points – 1) x Fault Resolution, to maximum of 1500 meters (4921 ft)	
1-Port Phase (Advanced Mode Only)		
Measurement Display Range	–450 ° to +450 °	
Resolution	0.01 °	
Smith Chart (Advanced Mode Only)		
Impedance	50 Ω, 75 Ω	
Resolution	0.01	
Transmission Ext Sensor (Advanced	Mode Only)	
Measurement Display Range	–100 dB to +100 dB	
Resolution	0.01 dB	
Measurement Accuracy (at 23 °C ±	3 °C)	
Corrected Directivity	≥ 38 dB, InstaCal <sup>™</sup> calibration	
	≥ 42 dB, OSL calibration (OSLN50A-8, OSLNF50A-8, OSLN50-1, OSLNF50-1)	

Return Loss Measurement Uncertainty (Standard OSL calibration. OSLN50-1 Precision Open/Short/Load calibration component.)



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## **Internal Power Meter**

internal Fower Meter	
Frequency	Measurement Frequency (for Cal Factor)
Amplitude	Max Value, Min Value, Offset Value, Relative On/Off, Units dBm/Watts, Auto Scale, Fullscale
Calibration	Zero On/Off
Average	Running Average, Max Hold (On/Off), Run/Hold, Average Mode (Continuous/Single)
Limits	Limit (On/Off), Upper Value, Lower Value
Frequency Range	50 MHz to 4 GHz
Display Range	–100 dBm to +100 dBm
Offset Range	Max ± 100 dB, user settable value
Measurement Range	-33 dBm to +20 dBm
VSWR	1.5:1 typical
Maximum Power	+27 dBm, ± 45 VDC (damage level)
Connector	Type N(m), 50 Ω
Accuracy	± 0.7 dB (0 dBm, 1 GHz CW, @ 23 °C ± 3 °C)
Frequency Response and Linearity	Additional ± 0.8 dB (± 0.5 dB typical)
Temperature Effect	Additional ± 0.02 dB per 1 °C change (typical)

#### High Accuracy Power Meter (requires external USB Power Sensor)

Amplitude Average Zero/Cal Limits	# of Running Averag	tor (Center Frequency			
Power Sensor Model	MA24105A	MA24106A	MA24108A/18A/26A	MA24208A/18A	MA24330A/40A/50A
Description	Inline High Power Sensor	High Accuracy RF Power Sensor	Microwave USB Power Sensor	Microwave Universal USB Power Sensor	Microwave CW USB Power Sensor
Frequency Range	350 MHz to 4 GHz	50 MHz to 6 GHz	10 MHz to 8/18/26 GHz	10 MHz to 8/18 GHz	10 MHz to 33/40/50 GHz
Connector	Type N(f), 50 Ω	Type N(m), 50 Ω	Type N(m), 50 Ω (8/18 GHz)	Type N(m), 50 Ω	Type K(m), 50 Ω (33/40 GHz)
			Type K(m), 50 Ω (26 GHz)		Type V(m), 50 Ω (50 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)	–60 dBm to +20 dBm (1 nW to 100 mW)	–70 dBm to +20 dBm (0.1 nW to 100 mW)
Measurand	True-RMS	True-RMS	True-RMS, Slot Power, Burst Average Power	True-RMS, Slot Power, Burst Average Power	Average Power
Measurement Uncertainty	± 0.17 dB <sup>a</sup>	± 0.16 dB <sup>b</sup>	± 0.18 dB <sup>c</sup>	± 0.17 dB <sup>d</sup>	± 0.17 dB <sup>e</sup>
Data sheet (for complete specifications)	11410-00621	11410-00424	11410-00504	11410-00841	11410-00906

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. d. Power uncertainty expressed with two sigma confidence level for CW measurement after zero operation. Includes

calibration factor and linearity over temperature uncertainties, but not the effects of mismatch, zero set and drift, or noise. e. Includes linearity over temperature uncertainties, but not the effects of calibration factor, mismatch, zero set and drift, and noise.

**Specifications** 

ecifications		S331I
🤰 Video Inspection Probe (	Requires external USB Video Inspection Probe, sold separately)	
Setup Parameters		
Probe Models	G0306A or G0306B 400X USB Visual Inspection Probe	
Tip Type (included with G0306A)	SC_APC_F:, SC_PC_F:, LC_PC_F:, FC_PC_F:, 2.5APC_M:, 2.5PC_M:, 1.25PC_M:	
Test Profile (IEC 61300-3-35)	SM PC >45:, SM APC:, SM PC >25:, MM PC 62.5:, MM PC 50.0:	
Auto Analyze	On/Off	
Auto Filename	On/Off	
Auto Filename Settings	Location, File Prefix, Start Number, Include Date	
Measurement Parameters		
Live	View Live Image	
Captured	Capture Image for Analysis	
Analyze	Analyze Image	
Results Table	Auto/Off	
Overlay	On/Off	
Zoom Control Help	Displays instruction for image Zoom feature	
Save/Recall Parameters		
Save	Measurement (*.vipi), VIP Image (*.png), Screen Shot (.png)	
Recall	Measurement (*.vipi), VIP Image (*.png), Screen Shot (.png)	
File Management	Rename, Create Folder, Copy, Paste, Delete	
Report Parameters		
Header Settings	Customer, Project, Operator, Notes, Include Logo	
Generate Report	Generates pdf report with options to include multiple *.vipi files	

**Instrument Displays** 







After proper cleaning, fiber passes 100%

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## **General Specifications**

Setup Parameters	
System Info	Status, Battery
System Setups	Date/Time, Language, Display/Audio
Date/Time	Time and Date Settings, Time Zone Settings
Language	English, French, German, Italian, Spanish, Russian, Portuguese, Japanese, Korean, Chinese
Display/Audio	Brightness, Color Schemes, Screen Shot Settings, Volume
Connectivity	GPS, Ethernet Configuration (DHCP/Static)
Diagnostics	Self Test
Preset	Preset, Reset, Update Firmware
Reset	Factory Reset, Delete All User Files, Delete Custom Files, Master Reset
File	Save, Recall, File Management
Save	Measurement (*.dat), Setup (*.stp), Screen Shot (*.png)
Recall	Recall, Create Folder, Copy, Paste, Delete
File Management	Rename, Create Folder, Copy, Paste, Delete
Navigation	Top, Bottom, Page Up, Page Down
Help Menu	System Info, FAQ, User Guide
Internal Trace/Setup Memory	> 1000 files (files may be traces, setups, screen shots, or any combination)
External Trace/Setup Memory	Limited only by size of USB Flash drive
Connectors	
RF Out/Reflect In	Type N, female, 50 $\Omega$ , Maximum Input +42 dBm, ± 50 VDC
InstaCal <sup>™</sup> /Power Meter	Type N, male, 50 $\Omega$ , Maximum Input +27 dBm, ± 45 VDC (Damage Level)
External Power	5.5 mm barrel connector, 11 to 14 VDC, < 3.0 A
USB Ports	USB 2.0 Type A (two ports)
USB Interface	Type mini-B, Connect to PC for data transfer
Display	
Туре	TFT Resistive Touch Screen
Size	7.0 in daylight viewable color LCD
Resolution	800 x 480
Pixel Defects	No more than five defective pixels (99.9986% good pixels)
GPS Connectivity (external GPS USB n	
GPS Time/Location Indicator	Time, Latitude, Longitude and Altitude in GPS dialog (current or last known location)
Catura	Time, Latitude, Longitude and Altitude with trace storage (current or last known location)
Setup	Clear Data, Synchronize system time to GPS
Battery	
Туре	Li-Ion
Battery Operation	> 8.0 Hours typical (70 % brightness setting, continuous usage)
Standby	7 days typical (With fully charged battery. Actual time will vary depending on battery charge level)
Regulatory Compliance	
European Union	EMC 2014/30/EU, EN 61326:2013, CISPR 11/EN 55011, IEC/EN 61000-4-2/3/4/5/6/8/11
	Low Voltage Directive 2014/35/EU
	Safety EN 61010-1:2010 RoHS Directive 2011/65/EU applies to instruments with CE marking placed on the market after July 22, 201
Australia and New Zealand	RCM AS/NZS 4417:2012
South Korea	KCC-REM-A21-0004
Environmental	MIL-PRF-28800F Class 2
Operating Temperature Range	-10 °C to 55 °C
Storage Temperature Range	-51 °C to 71 °C
Maximum Relative Humidity	95 % RH at 30 °C, non-condensing
Vibration, Sinusoidal	5 Hz to 55 Hz
Vibration, Random	10 Hz to 500 Hz
Half Sine Shock	30 g <sub>n</sub>
Altitude	4600 meters, operating and non-operating
Explosive Atmosphere	MIL-PRF-28800F Section 4.5.6.3 MIL-STD-810G, Method 511.5, Procedure 1
	אוב איז איזע אופווטע אוו.א, דוטכבעעוב ד
Size and Weight	
Size	250 mm x 177 mm x 61 mm (10.0 in x 7.1 in x 2.4 in)
Weight	< 2.0 kg (4.4 lb), including battery

#### ų. Anritsu Tool Box and Line Sweep Tools (for your PC)

Line Sweep Tools (LST) is a free PC based program that increases productivity for people who deal with numerous Cable and Antenna traces every day. LST is the next generation of Anritsu's familiar Handheld Software Tools (HHST) and shares its uncomplicated user interface, giving a new face to the term "ease of use."

Cable Editor <sup>1</sup>	Instrument Cable Lists may be retrieved from the instrument, modified as required, and uploaded back into instrument.
Distance to Fault <sup>2</sup> (DTF)	Easily convert Return Loss or VSWR traces to Distance to Fault traces with one button press.
Measurement Calculator	Provides quick conversion between commonly used measurement units such as VSWR, RL, and others.
Signal Standard Editor <sup>1</sup>	Signal Standard Lists may be retrieved from the instrument, modified as required, and uploaded back into instrument.
Naming Grid	A naming grid function makes changing file names, trace titles, and trace subtitles from field values to those required by contract simple and quick. Once the naming grid is populated with user defined file name segments, a few simple button presses will then fill out the file, title, and sub-title names. Quickly applied to multiple traces, the naming grid can save time, increase efficiency and accuracy.
Presets	Presets make applying markers and a limit line to similar traces quick and easy. They only need to be set once, and recorded. After this, applying them to a similar trace requires only one button push. This speeds up trace processing and makes providing consistent marker and limit line settings easy.
Report Generator	The report generator creates a professional PDF or HTML based report. Reports may include GPS <sup>3</sup> location, power level <sup>3</sup> , company logo <sup>4</sup> , instrument and calibration status along with a display of all open traces. It also may contain additional information such as addresses and phone numbers.
Capture	Plots to Screen, Database, *.dat, *.jpg
Connect	To PC using USB, Ethernet, Serial
Download/Upload <sup>1</sup>	Lists/measurements and live traces to PC for storage and analysis.
Supported File Types	Input: *.dat, *.vna, *.mna, *.pim, *.tm
	Output: *.dat, *.vna, *.pim, *.tm, *.csv, *.bmp, *.jpg, *.png

## easyTest Tools (for your PC)

#### **Instrument Mode**

instrument moue		
		Cable & Antenna Analyzer Mode
Commands		
	Display Image	Allows putting a custom image on the instrument screen
	Recall Setup	Places the instrument into a known state
	Prompt	Displays instructional messages on the instrument screen
	Save	Allows automatic or manual saving of traces

#### Connectivity

USB cable or USB memory stick Connections

Instrument type/model must match original
 Only \*.dat and \*.vna file types supported
 Model dependent
 Optionally set by user

S331L			Specificati	ion
Ordering Information [ [ 한 ] [ 문화 문화]	<b>Model Number</b> S331L (Includes all items listed in the d	escription)	<b>Description</b> Cable and Antenna Analyzer - 2 MHz to 4 GHz Internal InstaCal <sup>™</sup> - 2 MHz to 4 GHz Internal Power Meter - 50 MHz to 4 GHz	
			High Accuracy Power Meter (requires External USB Power Sensor, sold separately) GPS Location/System Time Sync (requires External GPS Module 2000-1723-R, sold separat Optical connector inspection with IEC 61300-3-35 based Pass/Fail standard (requires USB Video Inspection Probe, sold separately)	ely)
alibration and Extended	Warranty Options Warranty with			
Warranty	Z540 Calibration		Description	
S331L-ES510	S331L-ES513		Warranty Extension to 5 Years, Return to Anritsu	
alibration Only Options				
<b>3</b> 1	Option		Description	
	S331L-0098		Standard Calibration to ISO17025 and ANSI/NCSL Z540-1. Includes calibration certificate.	•
	S331L-0099		Premium Calibration to ISO17025 and ANSI/NCSL Z540-1 Includes calibration certificate, test report, and uncertain data.	
	2000-1687-R 40-187-R 806-141-R 3-2000-1498	AC-DC Ada Automotiv USB A/5-pi Standard T	ultiplier N(m) apter ve Power Adapter, 12 VDC, 60 W in mini-B Cable, 305 cm (120 in) Three-Year Warranty (battery one-year warranty) of Calibration and Conformance	
ocumentation (available at ww	w.anritsu.com) Part Number	Descriptio	on.	
	10100-00065	•	on Iformation, Compliance, and Safety	
	11410-00616		r <sup>™</sup> S331L Technical Data Sheet	
	10580-00321		rr <sup>™</sup> S331L User Guide r S331L Product Brochure	
	11410-00640	(Includes i	nformation about additional Site Master models)	
	11410-00662 11410-00674 10580-00253	Cable and	er S331L Quick Fact Sheet Antenna Analysis Troubleshooting Guide r <sup>™</sup> S331L Maintenance Manual	
Optional Accessories				
Backpack and Transit Case				
-	Part Number 67135	Description Anritsu Ba	<b>on</b> ickpack (For Handheld Instrument and PC)	
	760-286-R	Compact T	Fransit Case with Wheels and Handle	
	1	55.6 cm x 3	35.5 cm x 22.9 cm (21.89" x 13.98" x 9.01")	

S331L

## Optional Accessories (continued)

USB Power Sensors and Transmission Sens	sors (for complete or Model Number	dering information, see the respective data sheets of each sensor)
		Inline Peak Power Sensor, 350 MHz to 4 GHz, +3 dBm to +51.76 dBm
		RF USB Power Sensor and 2-Port Loss/Transmission Sensor, 50 MHz to 6 GHz, +23 dBm to –40 dBm
	MA24108A	Microwave USB Power Sensor and 2-Port Loss/Transmission Sensor, 10 MHz to 8 GHz, +20 dBm to –40 dBm
		Microwave USB Power Sensor and 2-Port Loss/Transmission Sensor, 10 MHz to 18 GHz, +20 dBm to –40 dBm
		Microwave USB Power Sensor and 2-Port Loss/Transmission Sensor, 10 MHz to 26 GHz, +20 dBm to -40 dBm
		Microwave Universal USB Power Sensor and 2-Port Loss/Transmission Sensor, 10 MHz to 8 GHz, +20 dBm to -60 dBm
		Microwave Universal USB Power Sensor and 2-Port Loss/Transmission Sensor, 10 MHz to 18 GHz, +20 dBm to -60 dBm
		Microwave CW USB Power Sensor and 2-Port Loss/Transmission Sensor, 10 MHz to 33 GHz, +20 dBm to -70 dBm
		Microwave CW USB Power Sensor and 2-Port Loss/Transmission Sensor, 10 MHz to 40 GHz, +20 dBm to –70 dBm Microwave CW USB Power Sensor and 2-Port Loss/Transmission Sensor,
		10 MHz to 50 GHz, +20 dBm to -70 dBm USB Transmission Sensor, K(m), 1 MHz to 40 GHz, +10 dBm to -50 dBm
		RF Power Indicator
USB Extender Kit (for use with external 2-port cal		sensors; requires Cat 5e extension cable, sold separately)
	Model Number	•
A CANANA AND AND AND AND AND AND AND AND AN		USB 1.1 Passive 40 m Extender USB 2.0 Active 100 meter Extender (with Type A power cord for USA,
		Japan, North America, Central America and Caribbean) USB 2.0 Active 100 meter Extender (with Type C power cord for use in
( Ist	2000-1902-R	Europe, India, South Korea, and many countries in Middle East and Afric USB 2.0 Active 100 meter Extender (with Type I power cord for use in
	2000-1903-R	Australia, New Zealand, Argentina, and the South Pacific) USB 2.0 Active 100 meter Extender (with Type G power cord for use in th UK, and several other countries in Asia, the Middle East, and Africa)
	2100-28-R	Cat 5e extension cable for use with USB Extender (22.5 m)
Not compatible with sensors MA24208A, MA24218A, MA24330A,	MA24340A, MA24350A; m	nust use active extenders with these sensors.
Replacement Accessories		
	Part Number	•
	2000-1691-R 2000-1687-R	Replacement Stylus with coiled tether Replacement Torque Multiplier N(m)
GPS Module	Part Number	Description
	2000-1723-R	High Performance USB Mag-Mount GPS Module
Ethernet Adapter	Part Number	Description
AND	2000-1810-R	•

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## **Optional Accessories** (continued)

Part Number	Description
G0306B	Video Inspection Probe (400x), including the following standard connector tips:
Universal Tips	H0361A 1.25PC-M, H0360A 2.5PC-M, H0362A 2.5APC-M
Bulkhead Tips	H0363A LC-PC-F, H0364A FC-PC-F, H0375A ST-PC-F, H0366A SC-APC-F
Additional Tips Available	H0372A E2000-PC-F, H0373A FC-APC-F, H0374A MU-PC-F, H0365A SC-PC-F, H0376A 1.25APC-M
Accessories	
971-14-R	Ferrule Cleaner, 2.5 mm SC
971-15-R	Ferrule Cleaner, 1.25 mm LC
971-16	Fiber Ferrule Cleaner
	G0306B Universal Tips Bulkhead Tips Additional Tips Available

Phase-Stable Test Port Cables, Armored w/ Reinforced Grip (recommended for cable & antenna line sweep applications)

keintorcea Grip	(recommended for cable & antenna line sweep
Part Number	Description
15RNFN50-1.5-R	1.5 m, DC to 6 GHz, N(m) to N(f), 50 $\Omega$
15RDFN50-1.5-R	1.5 m, DC to 6 GHz, N(m) to 7/16 DIN(f), 50 $\Omega$
15RDN50-1.5-R	1.5 m, DC to 6 GHz, N(m) to 7/16 DIN(m), 50 $\Omega$
15RNFN50-3.0-R	3.0 m, DC to 6 GHz, N(m) to N(f), 50 $\Omega$
15RDFN50-3.0-R	3.0 m, DC to 6 GHz, N(m) to 7/16 DIN(f), 50 $\Omega$
15RDN50-3.0-R	3.0 m, DC to 6 GHz, N(m) to 7/16 DIN(m), 50 $\Omega$

## Interchangeable Adapter Phase Stable Test Port Cables, Armored w/Reinforced Grip

(recommended for cable and antenna line sweep applications. It uses the same ruggedized grip as the reinforced grip series cables.

Now you can also change the adapter interface on the grip to four different connector types)
Part Number Description



 Part Number
 Description

 15RCN50-1.5-R
 1.5 m, DC to 6 GHz, N(m), N(f), 7/16 DIN(m), 7/16 DIN(f), 50 Ω

 15RCN50-3.0-R
 3.0 m, DC to 6 GHz, N(m), N(f), 7/16 DIN(m), 7/16 DIN(f), 50 Ω

Phase-Stable Test Port Cables, Armored (ideal for use with tightly spaced connectors and other general use applications)



Part Number	Description
15NNF50-1.5C	1.5 m, DC to 6 GHz, N(m) to N(f), 50 Ω
15NN50-1.5C	1.5 m, DC to 6 GHz, N(m) to N(m), 50 Ω
15NDF50-1.5C	1.5 m, DC to 6 GHz, N(m) to 7/16 DIN(f), 50 $\Omega$
15ND50-1.5C	1.5 m, DC to 6 GHz, N(m) to 7/16 DIN(m), 50 $\Omega$
15NNF50-3.0C	3.0 m, DC to 6 GHz, N(m) to N(f), 50 $\Omega$
15NN50-3.0C	3.0 m, DC to 6 GHz, N(m) to N(m), 50 $\Omega$
15NNF50-5.0C	5.0 m, DC to 6 GHz, N(m) to N(f), 50 Ω
15NN50-5.0C	5.0 m, DC to 6 GHz, N(m) to N(m), 50 Ω
15N43M50-1.5C	Test Port Extension Cable, Armored, 1.5 meters, DC to 6GHz, N(m) to 4.3-10(m)
15N43F50-1.5C	Test Port Extension Cable, Armored, 1.5 meter, DC to 6GHz, N(m) to 4.3-10(f)
15N43M50-3.0C	Test Port Extension Cable, Armored, 3 meters, DC to 6 GHz, N(m) to 4.3-10(m)
15N43F50-3.0C	Test Port Extension Cable, Armored, 3 meters, DC to 6 GHz, N(m) to 4.3-10(f)
15NF43M50-1.5C	Test Port Extension Cable, Armored, 1.5 meters, DC to 6 GHz, N(f) to 4.3-10(m)
15NF43F50-1.5C	Test Port Extension Cable, Armored, 1.5 meters, DC to 6 GHz, N(f) to 4.3-10(f)
15NF43M50-3.0C	Test Port Extension Cable, Armored, 3 meters, DC to 6 GHz, N(f) to 4.3-10(m)
15NF43F50-3.0C	Test Port Extension Cable, Armored, 3 meters, DC to 6 GHz, N(f) to 4.3-10(f)

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lumber LN50A-8 NF50A-8 )-1618-R )-1619-R )-1914-R )-1915-R 22N50 22NF50 22NF50 SM/PL-1 /PLNF-1 VPLNF-1 Jumber N50-75B 22N75 22N75 22N75 26N75A	DescriptionPrecision Open/Short/Load, N(m), 42 dB, DC to 8.0 GHz, 50 ΩPrecision Open/Short/Load, N(f), 42 dB, DC to 8.0 GHz, 50 ΩPrecision Open/Short/Load, 7/16 DIN(m), DC to 6.0 GHz 50 ΩPrecision Open/Short/Load, 7/16 DIN(f), DC to 6.0 GHz 50 ΩPrecision Open/Short/Load, 4.3-10(f), DC to 6 GHz, 50 ΩPrecision Open/Short/Load, 4.3-10(f), DC to 6 GHz, 50 ΩOpen/Short, N(m), DC to 18 GHz, 50 ΩOpen/Short, N(m), DC to 18 GHz, 50 ΩPrecision Load, N(m), 42 dB, DC to 6.0 GHzPrecision Load, N(f), DC to 3 GHz, 50 Ω to 75 ΩOpen/Short, N(m), DC to 3 GHz, 75 ΩPrecision Termination, N(m), DC to 3 GHz, 75 Ω
NF50A-8 )-1618-R )-1619-R )-1914-R )-1915-R 22N50 22NF50 SM/PL-1 //PLNF-1 /VENF-1 /VENF-1 /VENF-1 22N75 22N75 22NF75 26N75A	Precision Open/Short/Load, N(ħ), 42 dB, DC to 8.0 GHz, 50 Ω Precision Open/Short/Load, 7/16 DIN(m), DC to 6.0 GHz 50 Ω Precision Open/Short/Load, 7/16 DIN(ħ), DC to 6.0 GHz 50 Ω Precision Open/Short/Load, 4.3-10(ħ), DC to 6 GHz, 50 Ω Precision Open/Short/Load, 4.3-10(m), DC to 6 GHz, 50 Ω Open/Short, N(m), DC to 18 GHz, 50 Ω Open/Short, N(ħ), DC to 18 GHz, 50 Ω Precision Load, N(m), 42 dB, DC to 6.0 GHz Precision Load, N(ħ), 20 to 3 GHz, 50 Ω Open/Short, N(m), DC to 3 GHz, 75 Ω Open/Short, N(ħ), DC to 3 GHz, 75 Ω
)-1618-R )-1619-R )-1914-R )-1915-R 22N50 22NF50 SM/PL-1 //PLNF-1 /VENF-1 <b>Jumber</b> N50-75B 22NF75 22NF75 26N75A	Precision Open/Short/Load, 7/16 DIN(m), DC to 6.0 GHz 50 $\Omega$ Precision Open/Short/Load, 7/16 DIN(f), DC to 6.0 GHz 50 $\Omega$ Precision Open/Short/Load, 4.3-10(f), DC to 6 GHz, 50 $\Omega$ Precision Open/Short/Load, 4.3-10(m), DC to 6 GHz, 50 $\Omega$ Open/Short, N(m), DC to 18 GHz, 50 $\Omega$ Open/Short, N(f), DC to 18 GHz, 50 $\Omega$ Precision Load, N(m), 42 dB, DC to 6.0 GHz Precision Load, N(f), 42 dB, DC to 6.0 GHz Precision Load, N(f), 42 dB, DC to 6.0 GHz Precision Load, N(f), 2 dB, DC to 6.0 GHz
)-1619-R )-1914-R )-1915-R 22N50 22NF50 SM/PL-1 //PLNF-1 /VENF-1 /VENF-1 /VENF-1 22N75 22NF75 26N75A	Precision Open/Short/Load, 7/16 DIN(f), DC to 6.0 GHz 50 ΩPrecision Open/Short/Load, 4.3-10(f), DC to 6 GHz, 50 ΩPrecision Open/Short/Load, 4.3-10(m), DC to 6 GHz, 50 ΩOpen/Short, N(m), DC to 18 GHz, 50 ΩOpen/Short, N(f), DC to 18 GHz, 50 ΩPrecision Load, N(m), 42 dB, DC to 6.0 GHzPrecision Load, N(f), 42 dB, DC to 6.0 GHzPrecision Load, N(f), 42 dB, DC to 6.0 GHzDescriptionMatching Pad, DC to 3 GHz, 50 Ω to 75 ΩOpen/Short, N(f), DC to 3 GHz, 75 ΩOpen/Short, N(f), DC to 3 GHz, 75 Ω
)-1914-R )-1915-R 22N50 22NF50 SM/PL-1 //PLNF-1 /VENF-1 /VENF-1 /VENF-1 22N75 22NF75 26N75A	Precision Open/Short/Load, 4.3-10(f), DC to 6 GHz, 50 $\Omega$ Precision Open/Short/Load, 4.3-10(m), DC to 6 GHz, 50 $\Omega$ Open/Short, N(m), DC to 18 GHz, 50 $\Omega$ Open/Short, N(f), DC to 18 GHz, 50 $\Omega$ Precision Load, N(m), 42 dB, DC to 6.0 GHz Precision Load, N(f), 42 dB, DC to 6.0 GHz <b>Description</b> Matching Pad, DC to 3 GHz, 50 $\Omega$ to 75 $\Omega$ Open/Short, N(m), DC to 3 GHz, 75 $\Omega$ Open/Short, N(f), DC to 3 GHz, 75 $\Omega$
)-1915-R 22N50 22NF50 SM/PL-1 //PLNF-1 Jumber N50-75B 22N75 22NF75 26N75A	Precision Open/Short/Load, 4.3-10(m), DC to 6 GHz, 50 $\Omega$ Open/Short, N(m), DC to 18 GHz, 50 $\Omega$ Open/Short, N(f), DC to 18 GHz, 50 $\Omega$ Precision Load, N(m), 42 dB, DC to 6.0 GHz Precision Load, N(f), 42 dB, DC to 6.0 GHz <b>Description</b> Matching Pad, DC to 3 GHz, 50 $\Omega$ to 75 $\Omega$ Open/Short, N(m), DC to 3 GHz, 75 $\Omega$ Open/Short, N(f), DC to 3 GHz, 75 $\Omega$
22N50 22NF50 SM/PL-1 //PLNF-1 Jumber N50-75B 22N75 22NF75 26N75A	Open/Short, N(m), DC to 18 GHz, 50 $\Omega$ Open/Short, N(f), DC to 18 GHz, 50 $\Omega$ Precision Load, N(m), 42 dB, DC to 6.0 GHz Precision Load, N(f), 42 dB, DC to 6.0 GHz <b>Description</b> Matching Pad, DC to 3 GHz, 50 $\Omega$ to 75 $\Omega$ Open/Short, N(m), DC to 3 GHz, 75 $\Omega$ Open/Short, N(f), DC to 3 GHz, 75 $\Omega$
22NF50 SM/PL-1 //PLNF-1 Jumber N50-75B 22N75 22NF75 26N75A	Open/Short, N(f), DC to 18 GHz, 50 $\Omega$ Precision Load, N(m), 42 dB, DC to 6.0 GHz Precision Load, N(f), 42 dB, DC to 6.0 GHz Description Matching Pad, DC to 3 GHz, 50 $\Omega$ to 75 $\Omega$ Open/Short, N(m), DC to 3 GHz, 75 $\Omega$ Open/Short, N(f), DC to 3 GHz, 75 $\Omega$
SM/PL-1 //PLNF-1 Jumber N50-75B 22N75 22NF75 26N75A	Precision Load, N(m), 42 dB, DC to 6.0 GHz Precision Load, N(f), 42 dB, DC to 6.0 GHz <b>Description</b> Matching Pad, DC to 3 GHz, 50 Ω to 75 Ω Open/Short, N(m), DC to 3 GHz, 75 Ω Open/Short, N(f), DC to 3 GHz, 75 Ω
/PLNF-1 lumber N50-75B 22N75 22NF75 26N75A	Precision Load, N(f), 42 dB, DC to 6.0 GHz Description Matching Pad, DC to 3 GHz, 50 Ω to 75 Ω Open/Short, N(m), DC to 3 GHz, 75 Ω Open/Short, N(f), DC to 3 GHz, 75 Ω
<b>lumber</b> N50-75B 22N75 22NF75 26N75A	<b>Description</b> Matching Pad, DC to 3 GHz, 50 Ω to 75 Ω Open/Short, N(m), DC to 3 GHz, 75 Ω Open/Short, N(f), DC to 3 GHz, 75 Ω
N50-75B 22N75 22NF75 26N75A	Matching Pad, DC to 3 GHz, 50 $\Omega$ to 75 $\Omega$ Open/Short, N(m), DC to 3 GHz, 75 $\Omega$ Open/Short, N(f), DC to 3 GHz, 75 $\Omega$
N50-75B 22N75 22NF75 26N75A	Matching Pad, DC to 3 GHz, 50 $\Omega$ to 75 $\Omega$ Open/Short, N(m), DC to 3 GHz, 75 $\Omega$ Open/Short, N(f), DC to 3 GHz, 75 $\Omega$
22N75 22NF75 26N75A	Open/Short, N(m), DC to 3 GHz, 75 $\Omega$ Open/Short, N(f), DC to 3 GHz, 75 $\Omega$
22NF75 26N75A	Open/Short, N(f), DC to 3 GHz, 75 $\Omega$
26N75A	• • • • • • • • • • • • • • • • • • • •
	Precision Termination, N(m), DC to 3 GHz, $75 \Omega$
6NF75A	
	Precision Termination, N(f), DC to 3 GHz, 75 $\Omega$
	Description
	7/16 DIN(f) to N(m), DC to 7.5 GHz, 50 Ω
	7/16 DIN(f) to N(f), DC to 7.5 GHz, 50 $\Omega$
	7/16 DIN(m) to N(m), DC to 7.5 GHz, 50 Ω
	7/16 DIN(m) to N(f), DC to 7.5 GHz, 50 Ω
	7/16 DIN(m) to 7/16 DIN(m), DC to 7.5 GHz, 50 Ω
	7/16 DIN(f) to 7/16 DIN(f), DC to 7.5 GHz, 50 Ω
	N(m) to N(m), DC to 11 GHz, 50 $\Omega$ , 90 degrees right angle
	SMA(m) to N(m), DC to 18 GHz, 50 Ω
	SMA(f) to N(m), DC to 18 GHz, 50 $\Omega$
	BNC(f) to N(m), DC to 1.3 GHz, 50 $\Omega$
	Low PIM Adapter, 4.1-9.5(f) to 7/16 DIN(f), DC to 3.0 GHz, 50 $\Omega$
	Low PIM Adapter, 4.1-9.5(m) to 7/16 DIN(f), DC to 3.0 GHz, 50 $\Omega$
	Low PIM Adapter, 4.1-9.5(m) to N(m), DC to 3.0 GHz, 50 $\Omega$
	Low PIM Adapter, 4.3-10(f) to 7/16 DIN(f), DC to 3.0 GHz, 50 $\Omega$ Low PIM Adapter, 4.3-10(m) to 7/16 DIN(f), DC to 3.0 GHz, 50 $\Omega$
	Low PIM Adapter, 4.3-10(f) to N(m), DC to 3.0 GHz, 50 $\Omega$
	Low PIM Adapter, 4.3-10(m) to N(m), DC to 3.0 GHz, 50 Ω Adapter, DC to 6 GHz, 4.3-10(f) to N(f), 50 Ω
	• • • • • • • •
lumber	Description
4NN50A	Precision Adapter, N(m) to N(m), DC to 18 GHz, 50 $\Omega$
NFNF50	Precision Adapter, N(f) to N(f), DC to 18 GHz, 50 $\Omega$
lumber	Description
010-122	20 dB, 5 W, DC to 12.4 GHz, N(m) to N(f)
	20 dB, 5 W, DC to 18 GHz, N(m) to N(f)
	, , , , , , , , , , , , , , , , , , , ,
	30 dB, 50 W, DC to 8.5 GHz, N(m) to N(f)
	30 dB, 150 W, DC to 3 GHz, N(m) to N(f)
	40 dB, 100 W, DC to 8.5 GHz, N(f) to N(m), Unidirectional
	40 dB, 100 W, DC to 18 GHz, N(f) to N(m), Unidirectional
10-128-R	40 dB, 150 W, DC to 3 GHz, N(m) to N(f)
	umber           10-90-R           10-91-R           10-92-R           10-93-R           10-97-R           0-102-R           91-26-R           91-27-R           91-81-R           1-172-R           1-433-R           1-433-R           1-440-R           1-442-R           1-442-R           1-442-R           1-445-R           1-465-R           1-465-R           1-465-R           1-452-R           100-122           2N50-20           V50A-30           010-123           0-127-R           010-124           010-121

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