Agilent
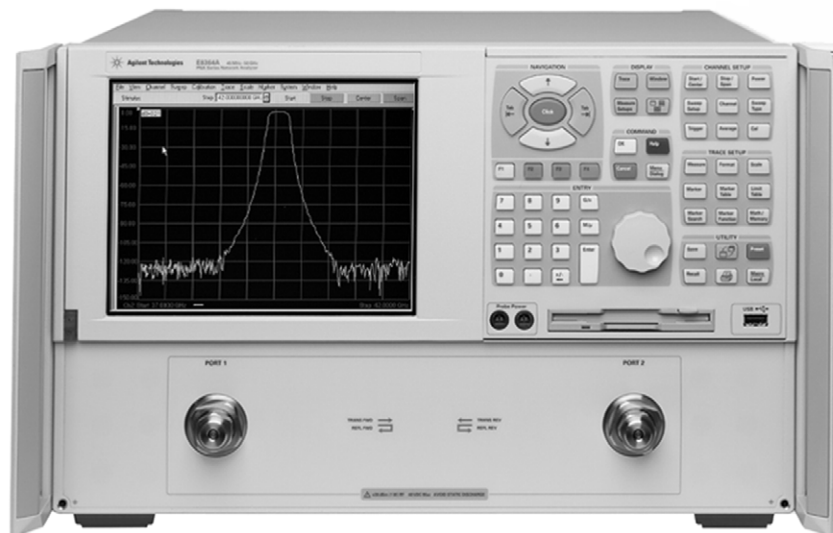# PNA Series
Microwave Network Analyzer

Configuration Guide

E8364A 45 MHz to 50 GHz

System configuration summary

This summary lists the main components required to form a basic measurement system. Options or peripherals may be added to provide enhanced measurement and data storage capability.

Full S-parameter measurements

❑ **Agilent PNA Series microwave network analyzer**
❑ **Test port cables, 50 ohms**
❑ **Calibration kit for applicable connector type**

This configuration guide describes standard configurations, options, accessories, upgrade kits and compatible peripherals for the PNA Series microwave network analyzer. This guide should be used with the Agilent PNA Series microwave network analyzer, Technical Specifications for a complete description of this analyzer.

Agilent Technologies

Ordering guide for PNA Series network analyzers

This guide is intended to assist you in the ordering process. Additional information and products (such as calibration kits and cables) are described throughout this document.

❏ *Choose ONE and ONLY one*
(Options are mutually exclusive)

❍ *Choose any combination*

Step 1: Choose a frequency range and number of ports
(Must choose one and only one)

❏ 300 kHz – 9 GHz, please refer to the RF PNA
   Series Configuration Guide
   (literature number 5980-1235E)
❏ 45 MHz – 50 GHz, continue to Step 2

Step 2: Would you like extended power range?

❏ Yes (Option UNL)

❏ No (Standard power range)

Step 3: Would you like a configurable test set?

❏ Yes (Option 014)

❏ No (Standard test set)

Step 4: Would you like time domain analysis?

❏ Yes (Option 010)

❏ No

Step 5: Would you like any accessories for your network analyzer?

❍ Rack mount kit with handles (Option 1CP)
❍ Rack mount kit without handles (Option 1CM)

Step 6: Would you like a commercial calibration certificate with test data?

❏ Yes (Option UK6)

❏ No

Step 7: Would you like an additional warranty for a total of 5 years?

❏ Yes (Option W50)

❏ No

Step 8: Would you like any additional documentation for your network analyzer?

English CD-ROM comes standard
   ❍ Service documentation, assembly level
      (Option 0BW)
   ❍ United States - English documentation set
      (Option AVK)
   ❍ Germany - German localization (Option ABD)
   ❍ Spain - Spanish localization (Option ABE)
   ❍ France - French localization (Option ABF)
   ❍ Japan - Japanese localization (Option ABJ)

Agilent Microwave PNA Series

The microwave PNA Series is an integrated vector network analyzer with frequency coverage from 45 MHz to 50 GHz. It is equipped with a built-in LCD display, hard and floppy disk drives, S-parameter test set and synthesized source. The analyzer has two 50-ohm, 2.4-mm (f) test ports. Included with each instrument is a mouse, keyboard, CD-ROM containing a copy of online help and programming documentation, a mini parallel-to-parallel adapter, and a three-year return-to-Agilent service warranty.

❏ **E8364A** network analyzer, 45 MHz to 50 GHz

Options

❏ **Option 010** time-domain capability
For viewing reflection and transmission responses in time or distance domain.

❏ **Option 014** configurable test set
With the configurable test set option, six front panel access loops are provided. Three access loops are for port one and three for port two. The loops provide access to the signal path between (a) the source output and the reference receiver, (b) the source output and directional coupler thru and (c) the coupled arm of the directional coupler and the port receiver. This option provides the capability to improve measurement sensitivity for measuring low-level signals, to reverse the directional coupler to achieve even more dynamic range or to add components and other peripheral instruments for a variety of measurement applications.

❏ **Option 1CM** rack mount kit
Adds a rack mount and rail kit for use without handles

❏ **Option 1CP** rack mount kit
Adds a rack mount and rail kit for use with previously supplied handles

❏ **Option UNL** Extended power range and bias tees
Adds two step attenuators and two bias tees. A step attenuator and bias tee set is inserted between the source and test port one and another set between the source and test port two.

Documentation
- ❏ **Option AVK** adds printed copy of Online Help and programming documentation
- ❏ **Option 0BW** adds printed copy of assembly level service manual

Localization
The following options provide a translated, printed copy of Online Help and an English printed copy of programming documentation.
- ❏ **Option ABD** German manual
- ❏ **Option ABE** Spanish manual
- ❏ **Option ABF** French manual
- ❏ **Option ABJ** Japanese manual

Certification options
- ❏ **Option UK6** Commercial calibration certificate with test data

Service and support options
- ❏ **Option W01** Converts 3-year return-to-Agilent service warranty to 1-year on-site service (check with your local Agilent sales or service office for availability in your area)
- ❏ **Option W31** Converts 3-year return-to-Agilent service warranty to 3-year on-site service (check with your local Agilent sales or service office for availability in your area)
- ❏ **Option W32** 3-year return-to-Agilent commercial calibration agreement
- ❏ **Option W34** 3-year return-to-Agilent standards-compliant calibration agreement
- ❏ **Option W50** Extends return-to-Agilent service warranty to 5 years
- ❏ **Option W51** Converts 3-year return-to-Agilent service warranty to 5-year on-site service (check with your local Agilent sales or service office for availability in your area)
- ❏ **Option W52** 5-year return-to-Agilent commercial calibration agreement
- ❏ **Option W54** 5-year return-to-Agilent standards-compliant calibration agreement

Measurement accessories

A complete line of RF and microwave test accessories can be found in the Agilent RF and Microwave Test Accessories Catalog (literature number 5968-4314EN) or by visiting **www.agilent.com/find/mta**

Accessories are available in these connector types: 50 ohm Type-N, 3.5 mm, 7 mm, 2.4 mm, 2.92 mm, and waveguide. Test port cables and a calibration kit should be added for a complete measurement system. A verification kit is used to verify corrected system performance.

Test-port cables

Test port cables are used to connect the network analyzer to the device under test.

- ❏ **85133C** single semi-rigid: 2.4 mm cable, dc to 50 GHz
  Includes one 81 cm (32 in) cable with female connector
- ❏ **85133D** semi-rigid: 2.4 mm cable set, dc to 50 GHz
  Includes two 53 cm (21 in) cables with male and female connectors
- ❏ **85133E** single flexible 2.4 mm cable, dc to 50 GHz
  Includes one 113 cm (44 in) cable with a female connector
- ❏ **85133F** flexible 2.4 mm cable set, dc to 50 GHz
  Includes two 72 cm (28 in) cables with male and female connectors

Calibration kits

Mechanical calibration kits include standards, such as open/short circuits and loads, which are measured by the network analyzer for increased measurement accuracy.

Choose a calibration kit for each connector type to be used.

Economy, includes:
- open standards (male and female)
- short standards (male and female)
- fixed-termination standards (male and female)
- in-series adapters

Standard, includes the devices in the economy kit and adds:
- sliding load standards (male and female)

Precision, includes the devices in the economy kit and adds:
- 50 ohm airline(s) for TRL calibration
  TRL adapters

For devices with 2.4 mm connectors

(see **Adapters** section for information about Agilent 2.4 mm adapters)

Mechanical calibration kits

❏ **85056D** economy: 45 MHz to 50 GHz. Includes:
  00901-60003 2.4 mm (m) fixed broadband load
  00902-60004 2.4 mm (f) fixed broadband load
  85056-60005 2.4 mm (m) to 2.4 mm (m) adapter
  85056-60006 2.4 mm (f) to 2.4 mm (f) adapter
  85056-60007 2.4 mm (m) to 2.4 mm (f) adapter
  85056-60020 2.4 mm (m) short
  85056-60021 2.4 mm (f) short
  85056-60022 2.4 mm (m) open
  85056-60023 2.4 mm (f) open

❏ **85056A** standard: 45 MHz to 50 GHz. Includes:
  00901-60003 2.4 mm (m) fixed broadband load
  00902-60004 2.4 mm (f) fixed broadband load
  00915-60003 2.4 mm (m) sliding load
  00915-60004 2.4 mm (f) sliding load
  85056-60005 2.4 mm (m) to 2.4 mm (m) adapter
  85056-60006 2.4 mm (f) to 2.4 mm (f) adapter
  85056-60007 2.4 mm (m) to 2.4 mm (f) adapter
  85056-60020 2.4 mm (m) short
  85056-60021 2.4 mm (f) short
  85056-60022 2.4 mm (m) open
  85056-60023 2.4 mm (f) open

For devices with K connectors (2.92mm)

(see **Adapters** section for information about Agilent 2.92 mm adapters)

Mechanical calibration kits

❏ **85056K** 2.92/2.4 economy: 45 MHz to 50 GHz. Includes:
  00901-60003 2.4 mm (m) fixed broadband load
  00902-60004 2.4 mm (f) fixed broadband load
  00915-60003 2.4 mm (m) sliding load (Option 001)
  00915-60004 2.4 mm (f) sliding load (Option 001)
  11904-60001 2.4 mm (m) to 2.92 mm (m) adapter
  11904-60002 2.4 mm (f) to 2.92 mm (f) adapter
  11904-60003 2.4 mm (m) to 2.92 mm (m) adapter
  11904-60004 2.4 mm (f) to 2.92 mm (f) adapter
  85056-60005 2.4 mm (m) to 2.4 mm (m) adapter
  85056-60006 2.4 mm (f) to 2.4 mm (f) adapter
  85056-60007 2.4 mm (m) to 2.4 mm (f) adapter
  85056-60020 2.4 mm (m) short
  85056-60021 2.4 mm (f) short
  85056-60022 2.4 mm (m) open
  85056-60023 2.4 mm (f) open

For devices with 3.5 mm or SMA connectors

(see **Adapters** section for information about the Agilent 3.5 mm adapters)

Mechanical calibration kits

❑ **85052D** economy: 45 MHz to 26.5 GHz. Includes:
00902-60003 3.5 mm (m) fixed load
00902-60004 3.5 mm (f) fixed load
85052-60006 3.5 mm (m) short
85052-60007 3.5 mm (f) short
85052-60008 3.5 mm (m) open
85052-60009 3.5 mm (f) open
85052-60012 3.5 mm (f) to 3.5 mm (f) adapter
85052-60013 3.5 mm (f) to 3.5 mm (m) adapter
85052-60014 3.5 mm (m) to 3.5 mm (m) adapter

❑ **85052B** standard: 45 MHz to 26.5 GHz. Includes:
00902-60003 3.5 mm (m) fixed load
00902-60004 3.5 mm (f) fixed load
00911-60019 3.5 mm (m) sliding load
00911-60020 3.5 mm (f) sliding load
85052-60006 3.5 mm (m) short
85052-60007 3.5 mm (f) short
85052-60008 3.5 mm (m) open
85052-60009 3.5 mm (f) open
85052-60012 3.5 mm (f) to 3.5 mm (f) adapter
85052-60013 3.5 mm (f) to 3.5 mm (m) adapter
85052-60014 3.5 mm (m) to 3.5 mm (m) adapter
   ❑ **Option K11** PSC-3.5 slotless female center
      contact repair kit

❑ **85052C** precision TRL: 45 MHz to 26.5 GHz.
Includes:
00902-60003 3.5 mm (m) fixed load
00902-60004 3.5 mm (f) fixed load
85052-60006 3.5 mm (m) short
85052-60007 3.5 mm (f) short
85052-60008 3.5 mm (m) open
85052-60009 3.5 mm (f) open
85052-60032 3.5 mm (f) to 3.5 mm (f) adapter
85052-60033 3.5 mm (m) to 3.5 mm (m) adapter
85052-60034 3.5 mm (f) to 3.5 mm (m) adapter
85052-60035 3.5 mm short TRL line
85052-60036 3.5 mm long TRL line

For devices with Type-N connectors

(see **Adapters** section for information about Agilent Type-N adapters)

Mechanical calibration kits

❑ **85054D** economy: 45 MHz to 18 GHz. Includes:
85054-60025 Type-N (m) short
85054-60026 Type-N (f) short
85054-60027 Type-N (m) open
85054-60028 Type-N (f) open
85054-60031 Type-N (f) to 7mm adapter
85054-60032 Type-N (m) to 7mm adapter
85054-60037 Type-N (f) to Type-N (f) adapter
85054-60038 Type-N (m) to Type-N (m) adapter
85054-60046 Type-N (m) fixed load
85054-60047 Type-N (f) fixed load

❑ **85054B** standard: 45 MHz to 18 GHz. Includes:
00909-60011 Type-N (m) fixed lowband load
00909-60012 Type-N (f) fixed lowband load
85054-60025 Type-N (m) short
85054-60026 Type-N (f) short
85054-60027 Type-N (m) open
85054-60028 Type-N (f) open
85054-60031 Type-N (f) to 7mm adapter
85054-60032 Type-N (m) to 7mm adapter
85054-60037 Type-N (f) to Type-N (f) adapter
85054-60038 Type-N (m) to Type-N (m) adapter
85054-80010 Type-N (f) sliding load
85054-80009 Type-N (m) sliding load
85054-60050 Type-N (f) connector gage
85054-60052 Type-N (f) gage master
85054-60051 Type-N (m) connector gage
85054-60053 Type-N (m) gage master
   ❑ **Option K11** PSC-N slotless contact repair kit

For devices with 7 mm connectors

(see **Adapters** section for information about Agilent 7 mm adapters)

Mechanical calibration kits

❏ **85050D** economy: 45 MHz to 18 GHz. Includes:
   85050-60006 7 mm fixed broadband load
   85050-80007 7 mm short
   85050-80010 7 mm open

❏ **85050B** standard: 45 MHz to 18 GHz. Includes:
   00909-60008 7 mm coax termination
   85050-60006 7 mm fixed broadband load
   85050-80007 7 mm short
   85050-80010 7 mm open
   85050-80011 7 mm sliding load

❏ **85050C** precision TRL: 45 MHz to 18 GHz.
   Includes:
   00909-60008 7 mm coax termination
   85050-60003 7 mm to 7 mm airline
   85050-60005 7 mm to 7 mm TRL adapter
   85050-60006 7 mm fixed broadband load
   85050-80008 7 mm short
   85050-80009 7 mm short collet
   85050-80010 7 mm open

For devices with waveguide

(see **Adapters** section for information about Agilent coax to waveguide adapters)

Mechanical calibration kits

X Band

❏ **X11644A** standard, WR-90: 8.2 to 12.4 GHz.
   Includes:
   00896-60008 X-band standard section
   00910-60003 X-band termination
   11644-20018 X-band short
   11644-20021 X-band shim

P Band

❏ **P11644A** standard, WR-62: 12.4 to 18 GHz.
   Includes:
   00896-60007 P-band standard section
   00910-60002 P-band termination
   11644-20017 P-band short
   11644-20020 P-band shim

K Band

❏ **K11644A** standard, WR-42: 18 to 26.5 GHz.
   Includes:
   00896-60006 K-band standard section
   00910-60001 K-band termination
   11644-20016 K-band short
   11644-20019 K-band shim

R Band

❏ **R11644A** standard, WR-28: 26.5 to 40 GHz.
   Includes:
   00914-20028 R-band termination
   11644-20005 R-band short
   11644-20003 R-band shim
   11644-60001 R-band 10 cm straight waveguide
   11644-60016 R-band 5 cm straight waveguide

Q Band

❏ **Q11644A** standard, WR-28: 26.5 to 40 GHz.
   Includes:
   11644-60005 Q-band termination
   11644-20004 Q-band short
   11644-20001 Q-band shim
   11644-60002 Q-band 10 cm straight waveguide
   11644-60017 Q-band 5 cm straight waveguide

Verification kits

All Agilent verification kits include:
- precision Z_o airline
- mismatched airline
- fixed attenuators
- traceable measured data and uncertainties

❑ **85057B** 45 MHz to 50 GHz 2.4 mm kit
Includes attenuators, airline and mismatch airline with data on a 3.5-inch disk for use in confirming accuracy enhanced system measurement performance, traceable to national standards. Test procedure is provided in the service manual.

❑ **85055A** 300 kHz to 18 GHz Type-N kit
Includes attenuators, airline and mismatch airline with data on a 3.5-inch disk for use in confirming accuracy enhanced system measurement performance, traceable to national standards. Test procedure is provided in the service manual.

❑ **85053B** 300 kHz to 26.5 GHz 3.5 mm kit
Includes attenuators, airline and mismatch airline with data on a 3.5-inch disk for use in confirming accuracy enhanced system measurement performance, traceable to national standards. Test procedure is provided in the service manual.

❑ **85051B** 300 kHz to 18 GHz 7 mm kit
Includes attenuators, airline and mismatch airline with data on a 3.5-inch disk for use in confirming accuracy enhanced system measurement performance, traceable to national standards. Test procedure is provided in the service manual.

❑ **R11645A** 26.5 to 40 GHz R-Band W-28 kit
Includes attenuators and mismatch attenuator with data on a 3.5-inch disk for use in confirming accuracy enhanced system measurement performance, traceable to national standards. Test procedure is provided in the service manual.

❑ **Q11645A** 33 to 50 GHz Q-Band W-22 kit
Includes attenuators and mismatch attenuator with data on a 3.5-inch disk for use in confirming accuracy enhanced system measurement performance, traceable to national standards. Test procedure is provided in the service manual.

Adapters
❑ **11900A/B/C/D** 2.4 mm adapters
❑ **11904A/B/C/D** 2.4 mm to 2.92 mm adapters
❑ **11902A/B** 2.4 mm to 3.5 mm adapters
❑ **11903A/B/C/D** 2.4 mm to Type-N 50 ohm adapters

General accessories

USB Periferals

❏ N4688A CD-ROM drive
  Provides an external read/write CD-ROM drive with a USB cable.

❏ N4689A USB hub
  Provides a USB hub for connecting additional USB peripherals.

Probe

❏ **85024A** high-frequency probe
  Provides high-impedance in-circuit test capability from 300 kHz to 3 GHz.

Power meters and sensors

Recommended for self support, adjustments and performance tests to verify proper instrument operation.

❏ **E4418B** single-channel power meter
❏ **E4419B** dual-channel power meter
❏ **8481B** power sensor, 10 MHz to 18 GHz, Type-N (m),25 W
❏ **8481A** power sensor, 10 MHz to 18 GHz, Type-N (m),100 mW
❏ **8485A** power sensor, 50 MHz to 26.5 GHz, APC-3.5 mm (m),100 mW
❏ **8487A** power sensor, 50 MHz to 50 GHz, 2.4 mm,300 mW
❏ **8487D** power sensor, 50 MHz to 50 GHz, 2.4 mm,100 mW
❏ **R8486A** power sensor, 26 GHz to 40 GHz, waveguide flange UG-599/U,100 mW
❏ **Q8486A** power sensor, 33 GHz to 50 GHz, waveguide flange UG-383/U,100 mW
❏ **E4412A** CW power sensor, 10 MHz to 18 GHz, Type-N (m), 200 mW

Amplifiers

❏ **83006A** power amplifier, 10 MHz to 26.5 GHz, 20 dB gain, power out: +18 dBm to 10 GHz or +16 dBm to 20 GHz or +14 dBm to 26.5 GHz
❏ **83017A** power amplifier, 50 MHz to 26.5 GHz, 25 dB gain, power out: +20 dBm to 20 GHz, or +15 dBm to 26.5 GHz
❏ **83018A** power amplifier, 2 to 26.5 GHz, 27 dB gain to 20 GHz or 23 dB to 26.5 GHz, power out: +24 dBm to 20 GHz or +21 dBm to 26.5 GHz
❏ **83020A** power amplifier, 2 to 26.5 GHz, 30 dB gain to 20 GHz or 27 dB to 26.5 GHz, power out: +30 dBm to 20 GHz or +26 dBm to 26.5 GHz
❏ **83050A** power amplifier, 2 to 50 GHz, 23 dB gain, power out: +20 dBm to 40 GHz or +17 dBm to 50 GHz
❏ **83051A** power amplifier, 45 MHz to 50 GHz, 23 dB gain power out: +12 dBm to 45 GHz or +10 dBm to 50 GHz

Couplers

❏ **87300B** coaxial coupler, 1 to 20 GHz, SMA (f), 10 dB coupling
❏ **87300C** coaxial coupler, 1 to 26.5 GHz, 3.5 mm (f), 10 dB coupling
❏ **87301D** coaxial coupler, 1 to 40 GHz, 2.4 mm (f) or optional 2.92 mm (f), 13 dB coupling
❏ **87310B** 90° coaxial coupler, 1 to 18 GHz, SMA (f), 3 dB coupling
❏ **87301E** coaxial coupler, 2 to 50 GHz, 2.4 mm (f), 10 dB coupling

Equipment racks and case

❏ Rack mount flange kit, for use with handles; includes handles[1]
❏ Rack mount kit, for use without handles; may be ordered as option 1CM
❏ Rack mount kit, for use with previously supplied handles; may be ordered as option 1CP
❏ Rail kit, included with option 1CM and 1CP

---

1. The PNA Series analyzer is supplied with handles.

Applications

Material measurement

❑ **85070D** High-Temperature Dielectric Probe Kit
The 85070D allows the measurement of the dielectric properties of materials quickly and conveniently. Measurements made with this probe are nondestructive and require no sample preparation. The dielectric probe is well suited for measurements of liquid, semisolid and flat solid materials. Measurement results can be viewed in a variety of formats (er', e r ", tan d or Cole-Cole). The supplied software can be run in the PNA analyzer or on a PC.

❑ **85071D** Materials Measurement Software
The material software calculates the permittivity and permeability of material samples placed in a coaxial airline or a rectangular waveguide.   The measurement technique works well for solid materials that can be machined to fit precisely inside a transmission line. Measurement results can be viewed in a variety of formats (er', e r ", tan d, mr', m r ", tan dm or Cole-Cole). The software can be run in the PNA analyzer or on a PC.

Filter tuning

❑ **N4261A** Filter Tuning Software
This software will significantly reduce filter tuning training times and increase manufacturing throughput. Through the graphical user interface, visual training indicators show when the individual resonators and couplers in a filter have been tuned within specifications. The indicators also show the user when and how to tune each filter element, reducing the number of times each element has to be retuned before the filter meets specifications.

Peripherals

The following peripherals may be used with the E8364A. Other peripherals not listed here may also be compatible with these instruments.

CD-ROM drive

USB-compatible CD-ROM drive

Monitors

VGA-compatible monitor

Printers

USB, LAN, parallel or serial printers with Microsoft ® Windows ® 2000 printer driver

Interface cables

Choose the appropriate cables to connect each peripheral to the network analyzer.
10833A GPIB cable, 1.0 m (3.3 ft)
10833B GPIB cable, 2.0 m (6.6 ft)
10833D GPIB cable, 0.5 m (1.6 ft)

Upgrade kits

Upgrade kits for the E8364A

Upgrade kits are available to add options after initial purchase. To order an upgrade kit for an E8364A, order the analyzer's model number followed by a "U", then indicate the option to be added:

❑ **Option 010** time-domain upgrade kit
The serial number of the E8364A to be retrofitted must be specified when ordering this kit. Installation is not included.

❑ **Option 014** configurable test set upgrade kit

❑ **Option 099** firmware upgrade
Provides the latest revision of firmware for the PNA Series on CD-ROM. Firmware is user-installable. Installation requires USB CD-ROM drive or external computer connected via LAN. The latest firmware is also available from our web site. Visit our web page at: **www.agilent.com/find/pna**

❑ **Option UNL** Extended power range
Adds a step attenuators and a bias tee between source and each test port.

Upgrades requiring model number changes are addressed on a special handling quotation basis. Contact your local Agilent sales or service office for further information.

Additional services

The ease-of-use and performance of the PNA Series vector network analyzers is only a small part of what is available from Agilent. Contact your local Agilent Sales or Support Desk regarding additional service and support products available:

- **Calibration services**
- **Repair services**
- **Technical consulting**
- **Process consulting**
- **Education and training**

❑ **W50** 5-Year Extended Repair Coverage
Provides warranty-like repair coverage with return-to-Agilent logistics for an additional 2-years over the standard 3-year warranty that comes with the hardware.

❑ **W01** 1-year on-site warranty conversion
Upfront option that converts 3-year return-to-Agilent service warranty to 1-year on-site

❑ **W31** 3-year on-site warranty conversion
Upfront option that converts 3-year return-to-Agilent service warranty to 3 years on-site.

❑ **W51** 5-year on-site warranty conversion
Upfront option that converts 3-year return-to-Agilent service warranty to 5-years on-site.

❑ **W32** 3-Year Calibration Service
Upfront option that provides (return-to-Agilent) standard calibrations based on manufacturer calibration cycles for the hardware over 3-year period.

❑ **W34** 3-Year Accredited Calibration Service
Upfront option that provides (return-to-Agilent) accredited calibrations (premium documentation and adjustment recording) based on manufacturer calibration cycles for the hardware over 3-year period.

❑ **W52** 5-Year Calibration Service
Upfront option that provides (return-to-Agilent) standard calibrations based on manufacturer calibration cycles for the hardware over 5-year period.

❑ **W54** 5-Year Accredited Calibration Service
Upfront option that provides (return-to-Agilent) accredited calibrations (premium documentation and adjustment recording) based on manufacturer calibration cycles for the hardware over 5-year period.

For on-line information about Agilent's service and support products visit:
www.agilent.com/find/tm_services

Literature and information

PNA Series Brochure, literature number 5968-8472E

Microwave PNA Series Data Sheet, literature number 5988-3992EN

Application and product notes

Application Development with the Agilent PNA Series of Network Analyzers
literature number 5980-2666ENUS

Understanding and Improving Network Analyzer Dynamic Range Application Note 1363-1
literature number 5980-2778EN

The "Need for Speed" in Component Manufacturing Test
literature number 5980-2783EN

Connectivity Advances in a LAN-enabled Instrument
literature number 5980-2782EN

De-embedding and Embedding S-parameter Networks Using the PNA Series Network Analyzer Application Note 1364-1
literature number 5980-2784EN

Advanced Filter Tuning Using Time Domain Application Note 1287-10
literature number 5980-2785EN

Understanding the Fundamental Principles of Vector Network Analysis Application Note 1287-1
literature number 5965-7707E

Exploring the Architectures of Network Analyzers Application Note 1287-2
literature number 5965-7708E

Applying Error Correction to Network Analyzer Measurements Application Note 1287-3
literature number 5965-7709E

Network Analyzer Measurements: Filter and Amplifier Examples Application Note 1287-4
literature number 5965-7710E

Improving Throughput in Network Analyzer Applications Application Note 1287-5
literature number 5966-3317E

Using a Network Analyzer to Characterize High-Power Components Application Note 1287-6
literature number 5966-3319E

Simplified Filter Tuning Using Time-Domain Analysis Application Note 1287-8
literature number 5968-5328E

In-Fixture Measurements Using Vector Network Analyzers Application Note 1287-9
literature number 5968-5329E

10 Hints for Making Better Network Analyzer Measurements Application Note 1291-1
literature number 5965-8166E

Key web resources

Visit our component manufacturer industry area at:
www.agilent.com/find/component_test

Visit the PNA Series home page at:
www.agilent.com/find/pna

Most application and product notes may be downloaded from our web site at:
www.agilent.com/find/tmappnotes/apps

Agilent Technologies' Test and Measurement Support, Services, and Assistance
Agilent Technologies aims to maximize the value you receive, while minimizing your risk and problems. We strive to ensure that you get the test and measurement capabilities you paid for and obtain the support you need. Our extensive support resources and services can help you choose the right Agilent products for your applications and apply them successfully. Every instrument and system we sell has a global warranty. Support is available for at least five years beyond the production life of the product. Two concepts underlie Agilent's overall support policy: "Our Promise" and "Your Advantage."

Our Promise
Our Promise means your Agilent test and measurement equipment will meet its advertised performance and functionality. When you are choosing new equipment, we will help you with product information, including realistic performance specifications and practical recommendations from experienced test engineers. When you use Agilent equipment, we can verify that it works properly, help with product operation, and provide basic measurement assistance for the use of specified capabilities, at no extra cost upon request. Many self-help tools are available.

Your Advantage
Your Advantage means that Agilent offers a wide range of additional expert test and measurement services, which you can purchase according to your unique technical and business needs. Solve problems efficiently and gain a competitive edge by contracting with us for calibration, extra-cost upgrades, out-of-warranty repairs, and on-site education and training, as well as design, system integration, project management, and other professional engineering services. Experienced Agilent engineers and technicians worldwide can help you maximize your productivity, optimize the return on investment of your Agilent instruments and systems, and obtain dependable measurement accuracy for the life of those products.

Microsft ® and Windows ® are U.S. registered trademarks of Microsoft Corporation.

By internet, phone, or fax, get assistance with all your test and measurement needs.

Online assistance:

www.agilent.com/find/assist

Phone or Fax
United States:
(tel) 1 800 452 4844

Canada:
(tel) 1 877 894 4414
(fax) (905) 282-6495

China:
(tel) 800-810-0189
(fax) 1-0800-650-0121

Europe:
(tel) (31 20) 547 2323
(fax) (31 20) 547 2390

Japan:
(tel) (81) 426 56 7832
(fax) (81) 426 56 7840

Korea:
(tel) (82-2) 2004-5004
(fax) (82-2) 2004-5115

Latin America:
(tel) (305) 269 7500
(fax) (305) 269 7599

Taiwan:
(tel) 080-004-7866
(fax) (886-2) 2545-6723

Other Asia Pacific Countries:
(tel) (65) 375-8100
(fax) (65) 836-0252
Email: tm_asia@agilent.com

Product specifications and descriptions in this document subject to change without notice.

Agilent Technologies