# Microwave PNA Series
## General information

| Description | Supplemental information |
|---|---|
| **System IF bandwidth range** | 1 Hz to 40 kHz, nominal |
| **RF connectors** | |
| E8362B | 3.5 mm (male), 50 Ω, (nominal), center pin recession flush to .002 in. (characteristic) |
| E8363/4B | 2.4 mm (male), 50 Ω, (nominal), center pin recession flush to .002 in. (characteristic) |
| E8361A | 1.85 mm (male), 50 Ω, (nominal), center pin recession flush to .002 in. (characteristic) |
| **Display** | 8.4 in diagonal color active matrix LCD; 640 (horizontal) x 480 (vertical) resolution; 59.83 Hz vertical refresh rate; 31.41 Hz horizontal refresh rate |
| **Display range** | |
| Magnitude | ±200 dB (at 20 dB/div), max |
| Phase | ±500°, max |
| Polar | 10 pico units, min; 1000 units, max |
| **Display resolution** | |
| Magnitude | 0.001 dB/div, min |
| Phase | 0.01°/div, min |
| **Marker resolution** | |
| Magnitude | 0.001 dB, min |
| Phase | 0.01°, min |
| Polar | 0.01 mUnit, min; 0.01°, min |
| **CPU** | Intel® 1.1 GHz Pentium® M with 1 GByte RAM |
| **Line power** (single phase) | |
| Frequency | 50/60/400 Hz for 100 to 120 V, 50/60 Hz for 220 to 240 V (Power supply is auto switching.) |
| Max | 350 Watts |
| **General environmental** | |
| EMC | Complies with European EMC directive 89/336/EEC, amended by 93/68/EEC<br>• IEC/EN 61326<br>• CISPR Pub 11 Group 1, class A<br>• AS/NZS CISPR II:2002<br>• ICES/NMB-001 |
| Safety | Complies with European Low Voltage Directive 73/23/EEC, amended by 93/68/EEC<br>• IEC/EN 61010-1:2001<br>• Canada: CSA C22.2 No. 61010-1:2001<br>• USA: UL 61010-1 |
| **Operating environment** | |
| Temperature | 0 to +40 °C; Instrument powers up, phase locks, and displays no error messages within this temperature range. (Except for 'source unleveled' error message that may occur at temperature outside the specified performance temperature range of 25 °C, ± 5 °C.) |
| Error-corrected temperature range | System specifications valid from 23 °C, ± 3 °C, with less than 1 °C deviation from the calibration temperature |
| Relative humidity | Type-tested, 0 to 95% at 40 °C, non condensing |
| Altitude | 0 to 4600 m (15,000 ft) |

# Microwave PNA Series
## General information *continued*

| Description | Supplemental information | | | |
|---|---|---|---|---|
| **Non-operating storage environment** | | | | |
| Temperature | -40 to +70 °C | | | |
| **Cabinet dimensions** | | **Height** | **Width** | **Depth** |
| | Excluding front and rear panel hardware and feet | 267 mm<br>10.50 in | 426 mm<br>16.75 in | 427 mm<br>16.80 in |
| | As shipped - includes front panel connectors, rear panel bumpers, and feet. | 280 mm<br>11.00 in | 435 mm<br>17.10 in | 470 mm<br>18.50 in |
| | As shipped plus handles | 280 mm<br>11.00 in | 458 mm<br>18.00 in | 501 mm<br>19.70 in |
| | As shipped plus rack mount flanges | 280 mm<br>11.00 in | 483 mm<br>19.00 in | 470 mm<br>18.50 in |
| | As shipped plus handles and rack mount flanges | 280 mm<br>11.00 in | 483 mm<br>19.00 in | 501 mm<br>19.70 in |
| **Weight** | | | | |
| Net | 29 kg (64 lb), nom. | | | |
| Shipping | 36 kg (80 lb), nom. | | | |

# Microwave PNA Series
## Rear panel

| Description | Supplemental information |
|---|---|
| **External trigger rear panel I/O (typical)** | |
| **Trigger input** | |
| Function | Measurement of next point, next channel, or next group of channels |
| Source | Aux I/O (pin 19) or I/O 1 (BNC (f) connector) |
| Signal levels | TTL-compatible |
| Input impedance | 5 kΩ nominal |
| Minimum trigger width | 1 µs |
| Trigger modes | High or low level; positive or negative edge |
| Trigger delay range | 0 to 1 sec |
| Trigger delay resolution | 6 µs (IF bandwidth ≥ 15 kHz) or 6.2 us (IF bandwidth <15 kHz) |
| **Trigger output** | |
| Function | Generate pulse before or after measurement (only active when trigger type is external) |
| Source | I/O 2 (BNC (f) connector) |
| Signal levels | TTL-compatible |
| Trigger polarity | Positive or negative edge |
| Pulse width | 1 µs |
| **Option H11 rear panel I/O (typical)** | |
| **External IF inputs** | |
| Function | Allows use of external IF signals from remote mixers, bypassing the PNA's first converters |
| Connectors | BNC (f), for B, R2, R1, A receivers |
| Input frequency | $8.3\overline{3}$ MHz |
| Input impedance | 50 Ω nominal |
| RF damage level | –20 dBm |
| DC damage level | 25 Volts |
| 0.1 dB compression point | –27 dBm |
| **Test Set Drivers** | |
| Function | Used for driving remote mixers |
| Connectors | SMA (f) for RF and LO outputs |
| RF, LO output frequency range | 1.7 to 20 GHz |
| RF output power levels | +5 to –16 dBm, depending on frequency[1] |
| LO output power levels | –7 to –16 dBm, depending on frequency |
| **Pulse inputs (IF gates)[2]** | |
| Function | Internal receiver gates used for point-in-pulse and pulse-profile measurements |
| Connectors | BNC (f), for B, R2, R1, A receivers |
| Input impedance | 1 kΩ nominal |
| Minimum pulse width | 20 ns for less than 1 dB deviation from theoretical performance[3] |
| DC damage level | 5.5 Volts |
| Signal levels | TTL; 0 V (off), +5 V (on) nominal |

1. Measured at –5 dBm test port power.
2. Pulse input connectors are operational only with Option H08 (Pulsed Measurement Capability) enabled.
3. Based on deviation from signal reduction equation:
   Signal Reduction (dB) = $20\log_{10}$(Duty_cycle) = $20\log_{10}$(pulse_width/pulse_repetition_interval).
   Measured at pulse repetition frequency of 1 MHz.

# Microwave PNA Series

## Rear panel *continued*

| Description | Supplemental information |
|---|---|
| **10 MHz reference in** | |
| Input frequency | 10 MHz ±10 ppm, typ. |
| Input power | –15 to +20 dBm, typ. |
| Input impedance | 200 Ω, nom. |
| **10 MHz reference out** | |
| Output frequency | 10 MHz ±10 ppm, typ. |
| Signal type | Sine wave, typ. |
| Output power | 10 dB ± 4 dB into 50 Ω, typ. |
| Output impedance | 50 Ω, nom. |
| Harmonics | < -40 dBc, typ. |
| **Test set I/O** | 25-pin D-sub; available for external test set control |
| **Handler I/O** | 36-pin, parallel I/O port; all input/output signals are default set to negative logic; can be reset to positive logic via GPIB command |
| **Auxiliary I/O** | 25-pin D-sub male connector; analog and digital I/O |
| **Bias tee inputs** | |
| Connectors | BNC (f), for port 1 and port 2 |
| Maximum voltage | ±40 V DC |
| Maximum current | ±200 mA with no degradation of RF specifications |
| Fuse | 500 mA, bi-pin style |

The following connectors/connections are located on the Intel® 1.1 GHz Pentium® M CPU

| | |
|---|---|
| **VGA video output** | 15-pin mini D-Sub; Drives VGA compatible monitors |
| **GPIB** | Two ports: dedicated controller and dedicated talker/listener 24-pin D-sub (Type D-24), female; compatible with IEEE-488 |
| **USB port** | 1 port on front panel and 4 ports on rear panel. |
| **LAN** | 10/100 BaseT Ethernet; 8-pin configuration auto selects between the two data rates |