



# PRECISION CALIBRATION KITS

## WR28 WAVEGUIDE, 26.5 TO 40.0 GHz

### For Calibrating

- Agilent 8510A/B/C
- Agilent 8719/20/22
- Agilent PNA Series
- Anritsu 360/37000
- Rohde & Schwarz ZVA/B Series
- 2.92mm and 2.4mm Connector Test Ports/Cables



Model U7005E34

### Description

The U7005E calibration kits are designed to provide accurate calibration of the above mentioned Agilent and Anritsu Vector Network Analyzers (VNAs) as well as the Rohde & Schwarz ZVA/B series. These kits are available for use with VNA test sets and test cables utilizing 3.5mm, 2.92mm (K connector) and 2.4mm. The chart on page 2 shows the adapter options available.

### Kit Composition

The U7005E calibration kits include all the necessary devices for accurately calibrating Agilent and Anritsu VNAs in WR28 waveguide from 26.5 to 40.0 GHz. A precision sliding load provides an impedance standard with a typical return loss greater than 50 dB. All component flanges have precision indexing holes, greatly improving measurement repeatability (indexing pins are included with each kit).

Quantity	Description
3	Adapters (see chart on page 2)
1	Sliding termination, high precision, model 314
1	Precision fixed termination
1	Straight section
1	Offset short, $1/8\lambda$
1	Offset short, $3/8\lambda$
1	Fixed (reference plane) short
1	Flange hardware including indexing pins (set) <sup>1</sup>
1	Data medium containing the calibration constants <sup>2</sup>
1	Instrument case
1	Operating instructions

### Specifications

#### General:

Frequency Range ..... 26.5 to 40.0 GHz  
 Waveguide Size ..... WR28 (0.280 x 0.140 I.D.)  
 Cutoff Frequency ..... 21.070 GHz  
 Flange ..... MPF28 (with precision indexing holes) mates with UG599U<sup>3</sup> or UG600/U

#### Sliding Termination: Model U314

Housing VSWR ..... 1.015 maximum  
 Element VSWR ..... 1.015 maximum  
 Element Travel ..... Greater than 1/2 waveguide wavelength at lowest frequency

<sup>1</sup> Consists of four (4) each long and short indexing pins, and eight (8) each 4-40 screws and nuts.

<sup>2</sup> Calibration constants software is included with each kit. See adapter set and VNA options table on page 2 to select the software corresponding to your network analyzer (VNA code).



## Specifications Continued

### Fixed Termination: Model U301

VSWR ..... 1.025 maximum (<1.01 typical)  
Power Rating ..... 0.5 W average, 0.2 kW peak

### Offset Shorts:

Electrical Length ..... See table below  
Reflection Coefficient..... >0.998  
Quarterwave ..... 0.118 nominal (0.300cm)  
Offset Length Accuracy ..... ±0.0005 inches

### Fixed Short: Model U344A

Reflection Coefficient..... >0.999

### Precision Straight Section: Model U103A4

VSWR ..... 1.025 maximum (<1.015 typical)  
Length ..... 4.00 inches

### Adapters:

Three waveguide to coaxial adapters are included with each kit. The standard adapter set options and adapter specifications are listed below. Other adapter options are available on special order.

Model	Offset Length		Wavelength
	Inches	(cm)	
U340B	0.059	0.150	1/8
U340C	0.177	0.450	3/8

## Adapter Set and VNA Options

Insert the appropriate single-digit numbers from the chart below to designate the adapter set and VNA options needed.

**EXAMPLE:** to order a U7005E kit for the Agilent PNA with adapter set option 5, the correct model number is U7005E57.

Adapter Set Option  $\swarrow$   $\nwarrow$  VNA Code

Adapter Set Option	Description	VNA Code
4	1 each 2.92mm (f) RAL; 1 each 2.92mm (m) RAL; 1 each 2.92mm (f) EL	1 — Rohde & Schwarz ZVA/B Series
5	1 each 2.4mm (f) RAL; 1 each 2.4mm (m) RAL; 1 each 2.4mm (f) EL	3 — Agilent 8510A/B 4 — Agilent 8510C 5 — Agilent 8719/20/22 7 — Agilent PNA 8 — Anritsu 360 9 — Anritsu 37000

NMD mates with the ruggedized test ports on most popular VNAs. 2.92mm is also known as the "K" connector.

## Adapter Specifications

Model	Description	Maximum VSWR
U210C6	2.92mm (female) right angle launch to WR28 waveguide	1.15
U211C6	2.92mm (male) right angle launch to WR28 waveguide	1.15
U233A1	2.92mm (female) end launch to WR28 waveguide	1.10
U236A6	2.4mm (female) right angle launch to WR28 waveguide	1.15
U236B6	2.4mm (male) right angle launch to WR28 waveguide	1.15
U237A1	2.4mm (female) end launch to WR28 waveguide	1.10

<sup>3</sup> This flange is described in Maury data sheet 5E-010.