



# OPTIMIZED CALIBRATION KITS

## WR10 WAVEGUIDE

### Description

The Z7005 series calibration kits are measured and optimized to provide optimal source match and directivity in calibrating network analyzers in WR10 waveguide from 75 to 110 GHz. The kits provide all the necessary calibration hardware and software required supplied in an attractive foam-lined wooden instrument case with operating instructions. Two types of kits are offered; (1) **high precision** for optimum measurement results and a full complement of calibration and verification standards, and (2) **precision** which is a more economical version with slightly reduced performance.



Model Z7005G

Kit Model	For Use With VNA	Description	Directivity Minimum (dB) <sup>1</sup>	Source Match Minimum (dB) <sup>1</sup>
Z7005G13	Agilent 8510A/B	<b>High precision kits:</b> provided with a high precision sliding termination, calibrated precision offset shorts, test port adapters (2), precision air line for use as verification standards, a fixed termination and a fixed short.	50	40
Z7005G14	Agilent 8510C			
Z7005G18	Anritsu 360			
Z7005G19	Anritsu 37000 series			
Z7005M13	Agilent 8510A/B	<b>Precision kits:</b> utilizes a $\lambda/4$ shim and fixed short instead of offset shorts and a fixed or sliding termination, plus test port adapters (2) and a precision air line to use as a verification standard.	46	36
Z7005M14	Agilent 8510C			
Z7005N18	Anritsu 360			
Z7005N19	Anritsu 37000 series			

### Specifications

#### a. General:

Frequency Range ..... 75 to 110 GHz  
 Waveguide Size ..... WR10 (0.100 x 0.050 I.D.)  
 Cut Off Frequency ..... 58.995 GHz (air)  
 Flange ..... MPF10 (equivalent to UG387/U with precision indexing holes)<sup>2</sup>

#### b. Sliding termination: model Z314B<sup>3</sup>

Housing VSWR ..... 1.008 maximum, (48 dB minimum R. L.)  
 Element VSWR..... 1.025 maximum, <1.015 typical  
 Element Travel ..... Greater than 1/2 waveguide wavelength at lowest frequency

#### c. Fixed termination: model Z301

VSWR ..... 1.03 maximum  
 Power Rating ..... 0.25 W average, 0.1 KW peak

#### d. Offset shorts<sup>4</sup>:

Electrical Length ..... See table below  
 Reflection Coefficient ..... >0.998  
 Quarterwave ..... 0.0424 inches nominal (0.108 cm)  
 Offset Length Accuracy .....  $\pm 0.0005$  inches

Model	Offset Length		Wavelength
	inches	(cm)	
Z340A1	0.0212	0.054	1/8
Z340A3	0.0636	0.162	3/8



## Specifications Continued

### e. Fixed short: models V344E<sup>5</sup> and V344D<sup>6</sup>

Reflection Coefficient ..... >0.999

### f. Precision straight section: model Z106B

VSWR ..... 1.016 maximum (42 dB minimum R. L.)

Length ..... 1.968 inches (5.0cm)

### g. Precision $\lambda/4$ shim: model Z322A1.00

VSWR ..... 1.010 maximum (46 dB minimum RL)

Length ..... 0.0424  $\pm$  0.0005 inches (0.108cm)

### h. Test port adapters: model Z115B

VSWR ..... 1.02 maximum (40.1 dB minimum RL)

Length ..... 1.375 inches

## Components Provided

Item	Description	Kit Number			
		Z7005G13/14	Z7005G18/19	Z7005M( )	Z7005N( )
1	Sliding termination, Z314B	1 each	1 each	—	1 each
2	Fixed termination, Z301	1 each	1 each	1 each	—
3	1/8 wavelength offset short, Z340A1	1 each	1 each	—	—
4	3/8 wavelength offset short, Z340A3	1 each	1 each	—	—
5	Fixed short, V344E and/or V344D	1 each	1 each	1 each	2 each <sup>6</sup>
6	Precision straight section (5cm), Z106B	1 each	1 each	1 each	1 each
7	Shim ( $\lambda/4$ ), Z322A1.00	—	—	1 each	1 each
8	Test port adapters, Z115B	2 each	2 each	2 each	2 each
9	Configuration software	1 each <sup>7</sup>	1 each <sup>8</sup>	1 each <sup>7</sup>	1 each <sup>8</sup>
10	Flange hardware and indexing pins <sup>2, 9</sup>	1 set	1 set	1 set	1 set
11	Flange hardware tools <sup>2</sup>	1 set	1 set	1 set	1 set
12	Operating instructions	1 each	1 each	1 each	1 each
13	Instrument case (with nameplate)	1 each	1 each	1 each	1 each

## Accessories and Complementary Equipment Available

### a. Precision two port standard set: model Z322A.

### b. Standard mismatches: Z320 series.

## Footnotes

<sup>1</sup> Performance specifications are based on VNA's performing within their rated specifications, utilizing the calibration kits in accordance with their instruction, using the 12-term error model and the temperature held to 23°  $\pm$  3°C.

<sup>2</sup> Refer to Maury data sheet 5E-031 for flange and flange hardware information.

<sup>3</sup> This is a high precision impedance standard utilizing a machined waveguide housing.

<sup>4</sup> Utilizing two shorts reduces errors associated with flange losses and their differences produce a 1/4 wave at midband.

<sup>5</sup> The model V344E precision fixed short has indexing holes and its flange face has a relief in order to properly align and mate with flat faced shim model Z322A1.00.

<sup>6</sup> The Z7005N kit is provided with 1 each V344E and 1 each V344D; a second short is required for full 12-term calibration. The model V344D is a flat faced short.

<sup>7</sup> Supplied with configuration software cartridge or disk for use on the Agilent 8510A/B or C. Provides the Short-Short-Load-Thru (SSLT) or the Short-Short-Load-Load-Thru (SSLT) calibration methods with provisions to use (a) shim/fixed short or two offset shorts and (b) a sliding load or an offset fixed load. Software is customized for use with kit provided only.

<sup>8</sup> Supplied with configuration software disk for use on the Anritsu 360 or 37000 series VNA's. Provides the Short-Short-Load-Thru (SSLT) calibration method with a sliding load and provision for either a shim/fixed short or two offset shorts. Software is customized for use with kit provided only.

<sup>9</sup> Consists of 2 each long (for use with shim) and 10 each short indexing pins plus 4 each long captive screws (for use with shim). Each flange is provided with 2 each short captive screws and 2 each removable threaded pins.