

MICROWAVE TEST EQUIPMENT



VARIABLE COAXIAL ATTENUATOR

Versatile application to 2 GHz

Models 355C,D, 393A, 394A

355C,D VHF Attenuators

Unique design provides accurate attenuation from dc to 1 GHz with the HP 355C (0 to 12 dB in 1-dB steps) and HP 355D (0 to 120 dB in 10-dB steps). Attenuator sections are inserted and removed by cam-driven microswitches. These sections are adjusted by a time-domain reflectometry system to minimize reflections and ensure high accuracy. Insertion loss is low, and using both instruments provides attenuation in 1-dB steps to 132 dB. The units can be connected with either terminal as input or output, and their small size and mounting versatility permit several installation schemes—even within other equipment.

393A, 394A Coaxial Attenuators

Each of these coaxial variable attenuators uses the principle of a directional coupler (see Figure 1) to achieve a wide range of attenuation over a full octave. The HP 393A covers 5 to 120 dB from 500 to 1000 MHz; HP 394A covers 6 to 120 dB from 1 to 2 GHz. With special high-power terminations, they will handle up to 200 watts average.

Since these instruments are variable directional couplers, they are particularly useful for mixing signals while maintaining isolation.

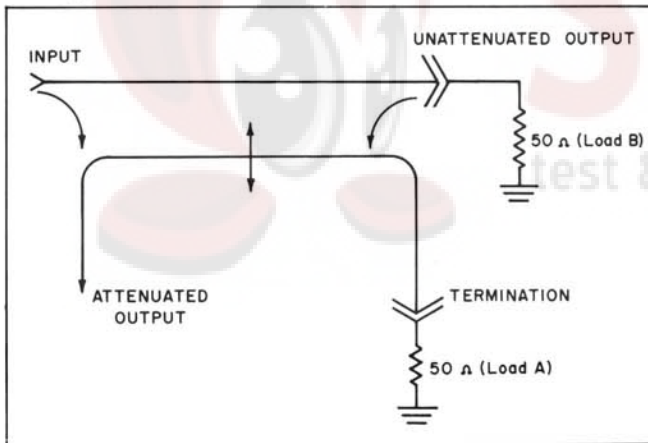
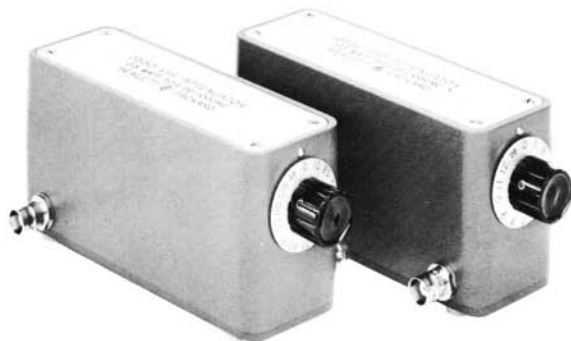


Figure 1. With loads A and B in place the instrument is an attenuator. With load A only, the instrument is a variable directional coupler.

Specifications	355C	355D
Attenuation:	12 dB in 1-dB steps	120 dB in 10-dB steps
Frequency range:	dc to 1 GHz	
Overall accuracy:	± 0.1 dB at 1000 Hz; ± 0.25 dB dc to 500 MHz; ± 0.35 dB dc to 1 GHz	± 0.3 dB to 120 dB at 1000 Hz; ± 1.5 dB to 90 dB below 1 GHz; ± 3 dB to 120 dB below 1 GHz
Impedance:	50 ohms nominal	
Power dissipation:	0.5 watt average, 350 volts peak	
Maximum SWR (input and output):	1.2 below 250 MHz; 1.3 below 500 MHz; 1.5 below 1 GHz	
Maximum insertion loss:	0.25 dB at 100 MHz; 0.75 dB to 500 MHz; 1.5 dB to 1 GHz	
Dimensions (in.):	6 long, 2 $\frac{3}{4}$ wide, 2 $\frac{1}{2}$ high (152 x 70 x 67 mm)	
Weight:	net 1 $\frac{1}{2}$ lb (0,7 kg); shipping 3 lb (1,4 kg)	
Price:	HP 355C, \$160	HP 355D, \$160
Option 01, HP 355C, 355D (Type N connectors). Add \$33		
Specifications	393A	394A
Frequency range:	500 MHz to 1 GHz	1 to 2 GHz
Attenuation or coupling:	5 to 120 dB, variable	6 to 120 dB, variable
Directivity (with loads less than 1.05 SWR):	typically > 10 dB, 10 to 40 dB attenuation	
Absolute accuracy (between matched generator and load):	± 1.25 dB or $\pm 1.75\%$ of dial reading, whichever is greater	± 1.25 dB or $\pm 2.5\%$ of dial reading, which- ever is greater
SWR input:	< 2.5, 5 to 15 dB attenuation < 1.5, 15 to 30 dB attenuation < 1.2, 30 to 120 dB attenuation	< 2.5, 6 to 10 dB attenuation < 1.8, 10 to 15 dB attenuation < 1.6, 15 to 120 dB attenuation
SWR output:	< 2.5, 5 to 15 dB attenuation < 1.5, 15 to 30 dB attenuation < 1.4, 30 to 120 dB attenuation	< 2.5, 6 to 10 dB attenuation < 1.8, 10 to 15 dB attenuation < 1.6, 15 to 120 dB attenuation
Impedance:	50 ohms nominal	
Maximum voltage:	500 volts peak	
Average power:	approx. 200 watts maximum; power rating of terminations must be observed (908A, 0.5 watt terminations furnished)	
Dimensions (in.):	5 $\frac{1}{2}$ wide, 12 long, 2 $\frac{3}{4}$ deep (140 x 305 x 70 mm)	
Weight:	net 6 lb (2,7 kg); shipping 13 lb (5,8 kg)	
Price:	HP 393A, \$525	HP 394A, \$550
Option 01.	supplied without 908A coaxial terminations, less \$70	



355C,D



393A