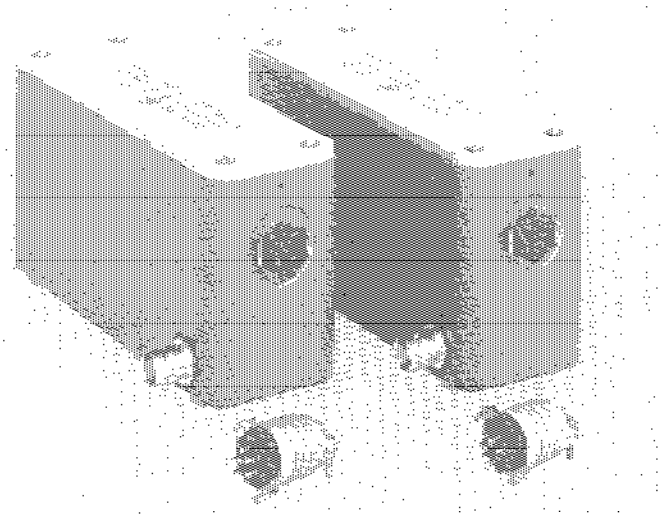
HEWLETT hp PACKARD

DC-1 GHz PROGRAMMABLE ATTENUATORS

models 355E 355F

TECHNICAL DATA 15 SEP 70



FEATURES

- **PRECISION ATTENUATION**
- **SIMPLE PROGRAMMING**
- **BROAD FREQUENCY COVERAGE**
- **LOW SWR AND NEGLIGIBLE LEAKAGE**
- **SAVES SPACE, VOLUME LESS THAN 30 CUBIC INCHES**
- **BROADENS USEFULNESS OF PRESENT EQUIPMENT**

DESCRIPTION

Precision programmable attenuation from DC to 1000 MHz is available with these Hewlett-Packard attenuators. These units feature programmability in a small, lightweight, reliable version of the 355C/D Precision Attenuator for inclusion in any test equipment. The 355E provides 0 - 12 dB attenuation in 1 dB steps while the 355F provides 0 - 120 dB in 10 dB steps. Access to highly accurate, fixed increments of attenuation is provided through a 7-pin connector which allows switching control from a remote position. The simplicity of programming, rapid switching time, and the broadband operation make these step attenuators particularly useful for applications in new automatic or remotely controlled test equipment. The standard programmable attenuators have BNC female connectors with other connectors available—Type N female connectors (Option 001) being ideally suited for applications such as receiver testing where minimum leakage is important. Also, to insure protection of the user's transistor drivers against any possible transients associated with the switching process, a protective diode is placed between each solenoid and the driver (Option 007).

BASIC DESIGN

A precision, compact unit which has low insertion loss and low SWR is the result of the unusual design of these attenuators. Designed for long life and high accuracy under all operating conditions, the special solenoid actuated switching arrangement has been precisely adjusted to reduce the attenuation error on all steps. π type attenuation sections are inserted and removed by this switching arrangement which is designed to keep all lead lengths short. This design reduces all stray capacities and inductances to an absolute minimum—thus allowing the upper frequency limit of 1000 MHz to be easily attained. All component parts are rigidly positioned and well shielded so that neither stray pickup nor leakage is a problem. Also, both attenuators may be connected with either terminal as input or output.

Also available on special order is the 355D, Option E46 which combines both a 355E and a 355F along with a power supply into one unit to provide 0 - 132 dB of programmable attenuation in 1 dB steps.

SPECIFICATIONS

355E

Attenuation: 0 - 12 dB in 1 dB steps.

Frequency Range: DC to 1000 MHz.

Overall Accuracy: ±0.1 dB @ 1 kHz; ±0.25 dB, DC to 500 MHz; ±0.35 dB, DC to 1000 MHz.

355F

Attenuation: 0 - 120 dB in 10 dB steps.

Frequency Range: DC to 1000 MHz.

Overall Accuracy: ±0.3 dB to 120 dB @ 1 kHz; ±1.5 dB to 90 dB below 1000 MHz; ±3 dB to 120 dB below 1000 MHz.

BOTH MODELS

Impedance: 50 ohms nominal.

Internal Power Dissipation: 0.5 W average, 350 V peak.

Maximum Insertion Loss: 0.25 dB to 100 MHz; 0.75 dB to 500 MHz; 1.5 dB to 1000 MHz.

Maximum SWR

(Input and Output): 1.2 below 250 MHz;
1.3 below 500 MHz;
1.5 below 1000 MHz.

RF Connectors: Type BNC female.

Control Connectors: 7-pin connector for external control of solenoids (4 control lines, one ground, 2 spares) for desired attenuation. Mating connector supplied.

Switching Speed: 50 msec.

Required Solenoid Power: +18 to +24 V DC, 1/6 amp.

Operating Temperature: 0°C to +55°C.

Dimensions: 5-7/16 in. long, 2-13/16 in. wide, 2-13/16 in. high (139 x 97 x 97 mm).

Weight: Net, 1½ lb (0,7 kg). Shipping, 3 lb (1,4 kg).

Option 001: Type N female connectors

Option 005: TNC female connectors

Option 007: Transistor driver protection circuitry installed

HEWLETT hp PACKARD