Weinschel Subsystems

High Power Step Attenuator

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INTELLECTUAL PROPERTY NOTICE

1 INTRODUCTION

Weinschel is pleased to present this technical paper describing a rack mountable high power microwave step attenuator. Designs of this type are intended for use in cellular telephone base station sites, high power amplifier testing and general engineering laboratory high power testing. The high power step attenuator can be configured in three different power handling configurations; 100 Watt, 50 Watt and 25 Watt. The step attenuator can also be configured for a 0-15 dB system (1 dB steps) and a 0-31 dB (1dB steps).

Weinschel develops and manufactures high-quality, high-reliability microwave and RF components and Subsystems. Weinschel has over 25 years of product development experience in satellite and communications systems, test, measurement and simulation of wireless systems, including 3G, WCDMA, PCS, and GSM; cable modem test sets and precision microwave and RF instrumentation.

Features:

- DC –18 GHz operation
- 0-15 dB or 0-31 dB configuration
- 25 Watt, 50 Watt or 100 Watt configuration
- Latching Relay design
- IEEE-488, RS-232 or Ethernet control

2 SCOPE

Weinschel's design approach uses a highly adaptable platform to configure the step attenuator to specific customers requirements. When the controller requests a new attenuation level the input switch terminates the input signal into a 50 Ohm load. This input switch is hot switchable at an input power of 100 Watts. This will remove the high power signal from the main signal path. With no signal connected to the attenuator path the controller then commands the series of relays to configure the attenuator for the requested attenuation value. Then the input switch re-connects the input signal to the attenuator path. The system can be operated with either a remote controller, (IEEE-488, RS-232 or Ethernet 10 base T) or through front panel control.

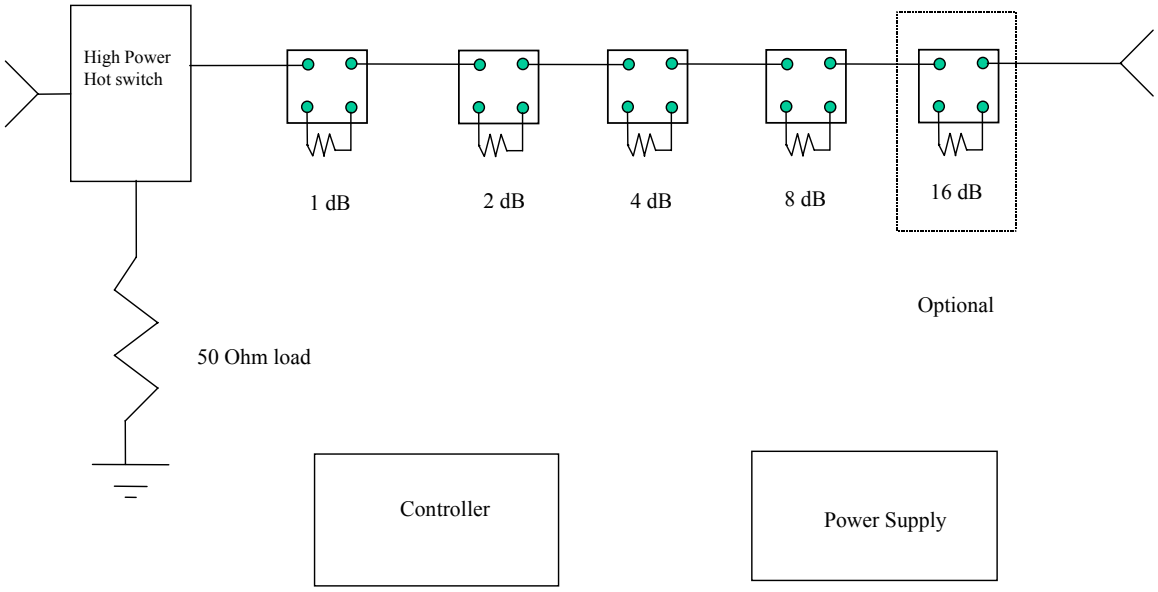

Figure 1
High Power Step Attenuator

3 GENERAL SPECIFICATIONS

3.1 RF Specifications

The design uses a unique approach allowing Hot Switch capability for the step attenuator. When the controller requests a new attenuation level the input switch terminates the input signal into a 50 Ohm load. (**See Figure 1**) This input switch is hot switchable at an input power of 100 Watts. This will remove the high power signal from the main signal path. With no signal connected to the attenuator path the controller then commands the series of relays to configure the attenuator for the requested attenuation value. Then the input switch re-connects the input signal to the attenuator path.

3.1.1 Attenuator Specifications

Specifications:

Switch	Electromechanical latching
Frequency:	DC – 18 GHz
Attenuation Selection	0-15 dB or 0-31 dB
Impedance:	50 ohm
Insertion Loss , 0 dB selection:	4 dB @ 18 GHz for a 31 dB design, or 3.5 dB at 18 GHz for a 15 dB design
RF Input Power:	25 W, 50 W or 100 W
RF connector:	N*
Size:	5.25 h x 19 w x 14 d
VSWR:	1.7:1 (target)
Life: Input switch:	50,000 cycles min, 75,000 target
All others:	1 million cycles
Control:	Ethernet, RS232, IEEE-488

* Alternate RF connectors available.

3.2 Design

The Step Attenuator Subsystem will be delivered in a chassis with a power supply and a controller. The Power Supply, Controller electromechanical relays and the attenuators will be assembled and factory tested.

3.2.1 Controller

The controller is a user communication interface to control the chassis hardware. The communication protocols are Ethernet 10BaseT, IEEE-488 or RS232.

4 CERTIFICATION

The Step Attenuator can have a CE certification if required.

5 QUALITY ASSURANCE

Weinschel will implement its standard quality assurance program for development, fabrication, assembly, alignment and test of the deliverable items. This program supports compliance with the inspection requirements of ISO 9001.

6 DESIGN RIGHTS

Weinschel will retain all proprietary rights to the High Power Step Attenuator. Weinschel will assign special model number to this item at the time of order.