The Digital Attenuator Specification Sheet

Number of Sections

Equal to the number of bits.

Bandwidth (Hz)

This device, like all other devices, can effectively operate only within a finite bandwidth (e.g., 2-5 GHz or 300-400 MHz).

Port Impedance (Γ, return loss, VSWR)

Insertion Loss (dB)

This is defined as the attenuation of the device in its minimum attenuation state (i.e., no attenuators are selected). Ideally, this would be 0 dB. However, the insertion loss of the switches makes this ideal value unachievable.

Typically, insertion loss will be equal to approximately 1 dB per bit. In other words a 6-bit attenuator will have an insertion loss of 6 dB.
Maximum Attenuation (dB)

The attenuation of the device with all fixed attenuators selected. This value is therefore the sum (in dB) of every fixed attenuator, plus the insertion loss discussed above. Remember, the insertion loss of the switches is prevalent regardless of the attenuator state.

Attenuation Step Size (dB)

The vast majority of digital attenuators have attenuation states that are separated by a fixed value (e.g., 0.5, 1.0, or 2 dB).

Maximum Input power (dBm)

Digital attenuators have a maximum input power.

Switching Speed (seconds)

The state of a microwave switch cannot change instantaneously. It takes some small but non-zero amount of time to change from one attenuation state to another. Typical values range from 0.1 to 20.0 $\mu$s.

Switch Logic

See microwave switch spec sheet.

DC Power
See microwave switch spec sheet.