

Coaxial open-circuits are often used as measurement reference standards and can be found in most commercially available vector network analyzer (VNA) calibration kits. The capacitance characteristics of these devices are usually summarized in terms of the coefficients of a polynomial used to describe their frequency dependence. The resulting measurement method enables these standards to be 'calibrated' with known uncertainty and with traceability to national measurement standards.

When you measure reflections in transmissions at RF and microwave frequencies with a network analyzer, you can reduce measurement uncertainty if you calibrate your measurement setup using known standards. Manufacturers of network analyzers typically sell known standards in calibration kits. Each kit contains a combination of calibration standards that include precision-machined shorts, opens, and load impedances (50 W or 75 W).

Calibration kit manufacturers machine their parts for specific electrical characteristics. Shorts and opens, for example, have specified characteristics such as offset delay (the time required for a signal to traverse the length of the standard relative to the calibration plane). Offset delay results from the actual mechanical offset between the short or open circuit and the mating plane of the standard's connector. Each standard doesn't have a unique set of calibration constants. Instead, each type of standard has typical characteristics that the network analyzer uses to compute correction factors.