S46 Microwave Switch System's "Just what you need" Philosophy:

Excellent Performance, High Reliability, and Fast Delivery

Adequate product testing always requires a level of sensitivity, resolution, and accuracy *beyond* the limits of the product being tested. The testing of high frequency and microwave RF devices is even more demanding, where the quality of measurement depends not only on instrumentation, but also on the characteristics of the signal path itself. The insertion of connectors, switches, extra cabling, and other devices into an RF circuit can introduce mismatch conditions that result in reflections, signal loss, and degraded measurements. Add the usual concerns over instrumentation size and footprint, reliability, expansion potential, connectivity, and programming, and it quickly becomes obvious that RF testing is among the most challenging of all tests.

Keithley's S46 Microwave Switch System is a high performance switching array for design evaluation, production testing, and environmental testing of broadband devices:

- Cellular phones, pagers, and base stations
- Personal Digital Assistants (PDAs) and web-enabled handsets
- Cordless phones
- Wireless computing (Bluetooth) peripherals
- Broadband wireless communication transceivers
- RFICs and other RF components
- Wideband circuits, sub-systems, and instruments
- High speed digital circuits

The S46 maintains exceptional signal integrity from DC to microwave frequencies. The standard system is specified for a bandwidth of 18GHz, while custom S46 systems can support bandwidths up to 40GHz. Typical performance data, including voltage standing wave ratio (VSWR) and insertion loss, are shown in Figures 1 and 2.

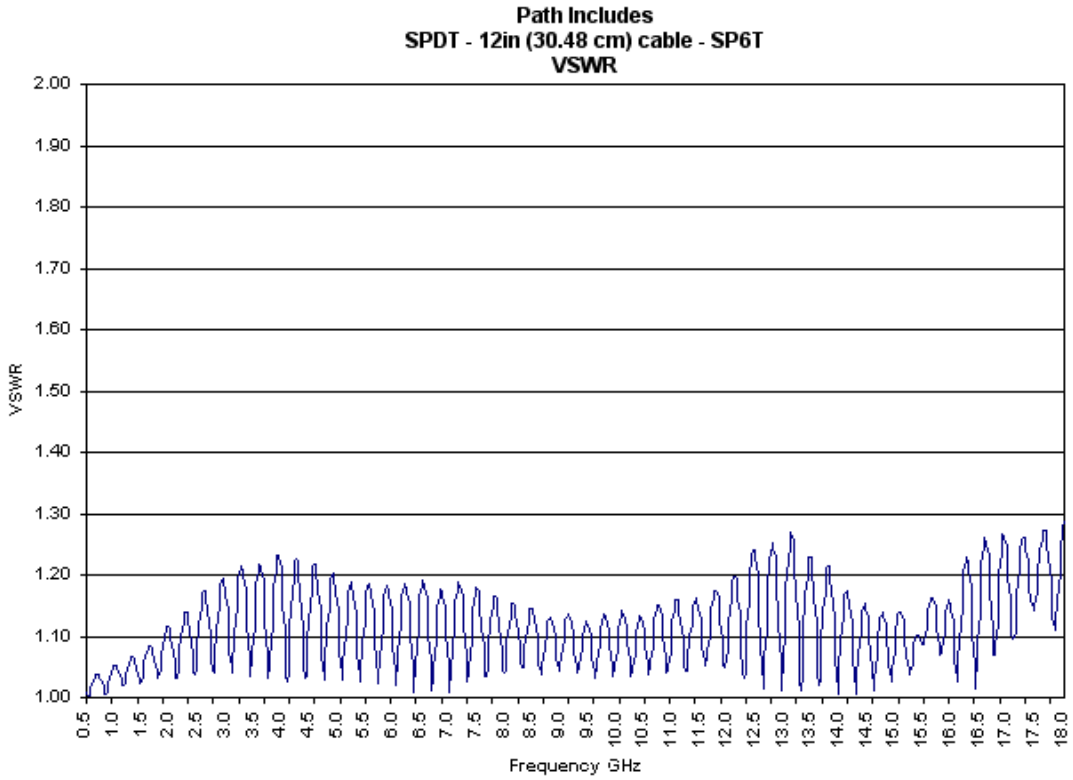

Figure 1. Typical S46 VSWR Performance

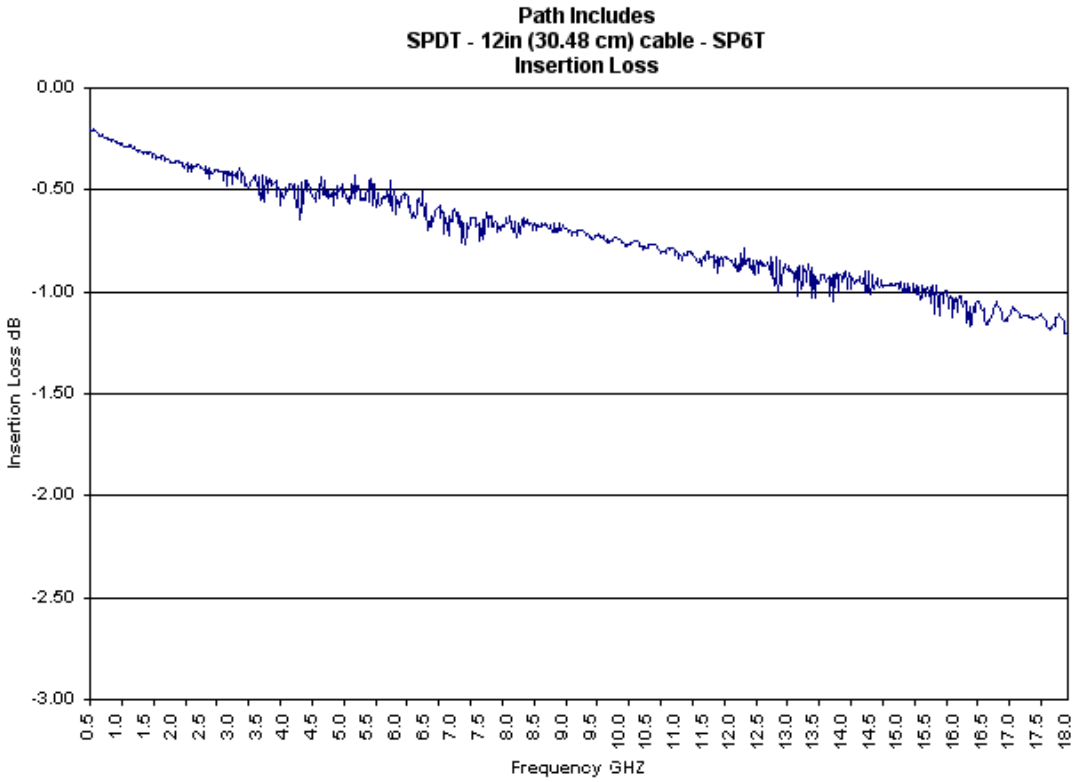

Figure 2., Typical S46 Insertion Loss Performance

The S46 adheres to a "just what you need and no more" philosophy that helps keep costs down without sacrificing capabilities or performance. Up to 32 channels facilitate the configuration of numerous standard or fully custom systems for controlling microwave relays, programmable attenuators, and other types of active and passive RF components. The S46's actual complement of relays (or other controllable channel devices) is specified by the user at the time of order, permitting the basic S46 mainframe to be in a variety of multiplexers, matrices, independent relays, or combinations of configurations. Matrix configurations can be as large as a 2×6 non-blocking matrix, or a 12×12 blocking matrix. The use of an IEEE-488 interface in the S46 simplifies the creation of programmable systems with other IEEE-488 instruments, while its compact 2U (3.5") high form factor conserves rack space. The physical layout of the front and/or rear panel can also be designed to customer specifications. Standard versions of the S46 can accommodate up to eight SPDT coaxial microwave relays and four multipole coaxial microwave relays. Any of the four multi-pole coaxial relays can be SP3T, SP4T, SP5T, or SP6T. Thus, the number of possible standard systems is extensive. Relays can be added to the system easily as test requirements evolve. Furthermore, the modular nature of the S46 minimizes the number of subassemblies in the system, resulting in easier system specification at the time of order. Keithley stocks many standard components for the S46 to provide quick delivery.

A contact closure counter in the S46 enables users to monitor the remaining service life of relays. Relays are rated for a minimum of 2 million cycles, and the system counts and stores the number of contact closures for each relay in non-volatile memory. This data enables maintenance to be scheduled proactively when relays are nearing the end of their mechanical life, rather than in response to unexpected failures that can result in lost production time. In addition to counter data, the S46's non-volatile memory can store up to 68 bytes of parameter information for each relay contact or pathway. If a specific performance parameter, such as VSWR or insertion loss, is critical, the parameter can be stored in memory for trend analysis between scheduled maintenance shutdowns.

Another advantage of the S46 over similar instruments comes from the easy integration of the S46 with Keithley's wide range of sourcing, switching, and measurement instruments. These enable the user to specify and obtain complete test solutions in which instruments share common programming requirements, and can be supported by a single, comprehensive product service and support organization. For system requirements that standard configurations cannot accommodate, Keithley has a team of Applications Engineering experts who will assist with custom system design. This applications support is provided at no charge. Contact your local Keithley representative to discuss the custom system design process.