PIN diode switches are often used to control the path of RF signals. Depending on the performance requirements, the switch can consist of all series diodes, all shunt diodes or a combination of series and shunt diodes. The impedance of the diode is determined by its DC bias. When forward biased, the diode impedance is very low. When reverse biased, the diode impedance is high.

**SWITCH TYPES**
There are two types of PIN diode switches, reflective or absorptive. With reflective switches, the RF signal at the "off" port is reflected back to the source due to the poor match. In general, these switches are simple in design, slightly lower in cost and can handle higher power than absorptive switches.

Absorptive switches provide a matched termination to the inactive ports. Because they absorb the RF signal, they are limited by the power handling capability of the terminations. These switches are slightly more complex in their design.

**INSERTION LOSS**
The maximum loss a signal experiences in dB when sent in through the common port and out the port in the “on” state.

**ISOLATION**
The suppression of a signal in excess of the insertion loss by an “off” port. It is the ratio of the power level when the switch is “on” to the power level when the switch is “off”.

**VSWR**
A measure of the relationship between the switch impedance (Z) and the source or load impedance (Z₀). MITEQ’s switches are typically designed to perform in a 50 ohm system.

**SWITCHING SPEED**
The time to change the state of a switch arm from “on” to “off” or “off” to “on”. It is characterized in two ways: rise/fall time and on/off time.

Rise time is the time period from the 10% to the 90% of the square law detected RF output as a switch arm is changed from an “off” state (isolation) to an “on” state (insertion loss).

Fall time is the time period from the 90% to the 10% of the square law detected RF output as a switch arm is changed from an “on” state (insertion loss) to an “off” state (isolation).

Rise and fall times do not include the switch driver delay time.

On time is the time period from the 50% of the transition of the input command to 90% of the square law detected RF output as the switch arm is changed from an “off” state (isolation) to an “on” state (insertion loss).

Off time is the time period from the 50% of the transition of the input command to 10% of the square law detected RF output as the switch arm is changed from an “on” state (insertion loss) to an “off” state (isolation).

The “on” and “off” times include the driver propagation delay.
**VIDEO LEAKAGE**
Video leakage refers to the spurious signals present at the RF ports of the switch when it is switched without an RF signal present.

**POWER HANDLING (FULL PERFORMANCE)**
Defined as the maximum input power the switch can handle without degradation of performance.

**POWER HANDLING (NO DAMAGE)**
Defined as the maximum input power the switch can handle without damaging the device but with degradation in performance.