Introduction

RAMSES CONCEPT

A NEW ACTUATOR CONFIGURATION

To eliminate this problem of increased insertion loss in the contacts, RAMSES devices incorporate a patented system. This system, compresses two parallel blades suspended from a bearer, which enables the guiding and positioning of the commutation blades to be accomplished entirely outside the RF cavity. These blades impose a rectilinear motion on the switching pusher, suppressing both friction and the production of particles inside the RF cavity. The unique system is extremely small and can be used in all of RAMSES series switches.

FIG. 2: CUTAWAY VIEW

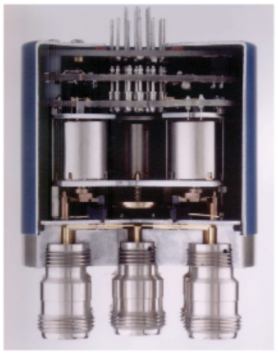
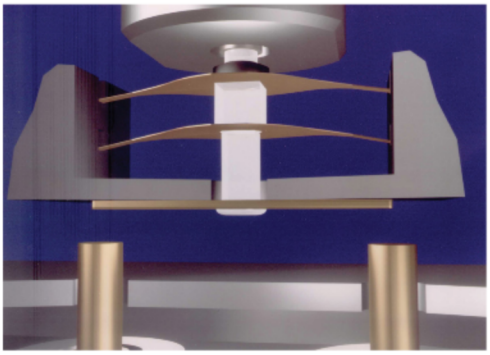
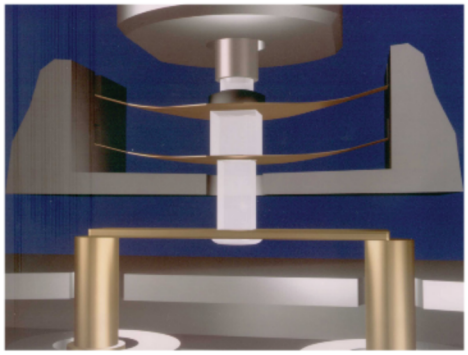


FIG. 3: A RAMSES SET OF CONTACTS



(a) RF line open



(b) RF line closed

Figure 2 shows a cutaway view of a RAMSES coaxial switch displaying the actuator mechanism. A second improvement involves a new rectilinear actuator design using high energy magnets and a switching performance in relation to its size.

The system is used in the production of both failsafe and latching actuators, depending on how it is applied in the switch. These actuators are either 500 g locking forces or 300 to 800 g current forces for a power consumption of 100 mA at 28 V.

The new actuator has the added advantage of very low magnetic leakage, allowing actuators to be used in close proximity to one another without performance degradation. The use of a dry, solid lubricant and the control of friction areas provide an actuator life expectancy of over 50 million operations without defect when temperature range exceeds -40 ° to +85 °C.

SWITCH PERFORMANCE

RAMSES series switches have successfully survived tests of 10 million switching temperature cycles from -55 ° to + 85 °C while demonstrating good contact resistance stability. Visual inspection of these switches after testing has indicated that the RF lines were free of much of the contamination found during similar tests on traditional switches. A comparison of the actual measured contact resistance obtained from monitoring both conventional and RAMSES switches using several parts that have already been actuated one million cycles is shown in figure 4. Although the conventional switch may not be considered failure, its contact resistance has become unstable, thus degrading its reliability.

FIG. 4: A COMPARISON OF (A) CONVENTIONAL & (B) RAMSES SWITCH DESIGN CONTACT RESISTANCE DURING ONE MILLION CYCLES