

# ***Focus Microwaves Inc.***

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## ***Product Note No 10***

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### **6 to 40 GHz Coaxial Programmable Tuner Model 4006**

The coaxial programmable tuners, model 4006 operate from 6 to 40 GHz using K®-connectors. They are using the robust and proven chassis of the 1816 tuners (figure 1) and a precisely machined aluminium slabline with a cutoff frequency beyond 42 GHz. A single slotted and polished Beryllium Copper RF slug is permanently fixed on the Teflon stabilized vertical axis for minimum loss and high phase tuning stability.

The BeCu slug is moved in, out and along the slabline to generate controllable  $\Gamma$  and phase. The probe's horizontal play during vertical movement is less than  $\pm 1\mu\text{m}$  in total. The slug is sliding on the walls of the slabline for perfect ground contact and negligible microphonics (sensitivity of the RF parameters to mechanical vibrations).

The 4006 tuners are fully compatible with the IBM®-PC based CCMT control and measurement software for Calibration, Noise and Load Pull measurements. Obtainable VSWR exceeds 10:1, and reaches up to 15:1 in most parts of the band ( figures 2,3). The 4006 tuners represent wide band  $50\Omega$  at the lower frequencies keeping this way most devices from spurious oscillations.

#### **4006 Tuner Characteristics**

|                       |  |
|-----------------------|--|
| Frequency Range       | 6 - 40 GHz using a single RF slug  |
| VSWR min              | 1.2:1  |
| VSWR max              | 10:1 (15:1)  |
| Insertion Loss        | 0.7 dB max @ VSWR min  |
| RF resetability       | 40 dB min  |
| Calibration           | 181 or 361 impedances per frequency (figure 2).                          |
| Tuning Resolution     | 0.21°/step @ 40 GHz  |
| Max Tunable points    | >2,200,000 @ 40 GHz  |
| Mechanical - Accuracy | $\pm 1$ step   |
| Step Size             | Vertical 1.5 $\mu\text{m}$ , Horizontal 2.95 $\mu\text{m}$               |
| RF Connectors         | 2.92mm (K®)  |
| Overall Size          | 7.8 x 6 x 5 inches   |
| Weight                | 4.3 kg   |
| Power Handling        | 15 W CW (connector limitation)   |
| Operation             | Automatic - Manual - Mouse Tuning for test fixture or 'on wafer' setups. |