High-Permittivity Ceramic (DK36) For R F Applications

Dielectric ceramics with high permittivity (r>10) and low dielectric loss (tan <10 3) have a number of applications in microwave devices. The process technology for realizing DK36 ceramics with dielectric constant r 36-39 has been established. This is similar to imported ceramics like TE36, MDR36, SB350 and 8300 and useful for microwave filters, oscillators etc. The process technology adopted is advanced solid state ceramic route. The ceramics can be fired to full density below 1350°C. DK36 ceramics can find use in devices like filters, oscillators, diplexers, patch antennas etc. The nominal properties of DK36 ceramic are given below.

Bulk density (g/cc)	4.35 – 4.55
Coeff. of thermal expansion (10^{-6}/K)	8.8 – 9.2
Dielectric constant (εr)	36 – 38
Unloaded Quality factor (Qu @ 4 GHz)	6,000 – 8,000
Loss factor ($\tan\delta$, 10^{-4}) @ 4 GHz	1.25 – 1.5
Temp. coeff. of frequency (τf, ppm/K)	2 – 7

DK36 ceramics can find use as resonators in filters, oscillators etc. and substrates for patch antennas.

Technology Transfer from ISRO

ISRO is willing to offer the knowhow of this technology to suitable entrepreneurs / industries in India. Capable manufacturing industries interested in acquiring this knowhow may write with details of their present activities, requirements and plans for implementation, infrastructure and technical expertise available with them, their own market assessment, if any, and plans for diversification to the address given below: