DK 18- Ceramics

DK-18 is a MgTiO3 based ceramic, which is widely used as Patch Antenna substrates in Satellite and GPS communication systems. This dielectric, coming in the medium permittivity materials, possesses extremely low dielectric loss (tanδ~10-5) in microwave frequency ranges.

Electronic ceramics with high permittivity (□r>20) and low dielectric loss (tan□<10±3) have a number of applications in microwave devices like filters, oscillators, multiplexers etc in terrestrial as well as Space communications systems ranging from UHF to mm- band frequencies. In such devices, it is desirable that the ceramics have high □r to confine the electromagnetic waves near them. However, when applications like antennas and substrates are considered, 10<□r<20 is desirable for better radiation field outside the ceramic and size reduction. Their advantages are small size, light weight, temperature stability etc. Globally, a few materials have been manufactured for use in specific range of microwave spectrum. This indigenously developed DK18 is equivalent to Kyocera SM200 and P series of Murata that are used as substrates for GPS antennas.

Since the process temperatures are much lower than the tantalates and raw material cost is also low, the production cost of this ceramics is much lower compared to other similar products in the market. This ceramic also has the added advantage of having a low ρ, only about a half that of tantalates.

Typical properties:

Appe arance	Light cream
Bulk density (g/cc)	3.7±0.15
Open Porosity	Nil
Closed Porosity	<2%
Resistivity (Ω.cm)	10 13
Coeff. of Thermal Expansion (10−6/K)	9.2
Dielectric constant (εr)	19±1.5
Quality factor (Qu @ GHz)	12,000 (6.5)
Loss factor (tanδ, 10−5)	8.4
Temp. coeff. of frequency (τf, ppm/K)	0 ± 5
TE01□ resonator size at 5 GHz (D=2L, mm)	14

VSSC is willing to offer the technology of DK18 ceramics to eligible interested parties who are in the field of manufacturing similar items

Interested entrepreneurs are requested to contact the address given below with all relevant particulars regarding their line of current activity, infrastructure available, market assessment of the product, financial arrangements made, turn over and sales of their products for the past years and a copy of their latest annual report.