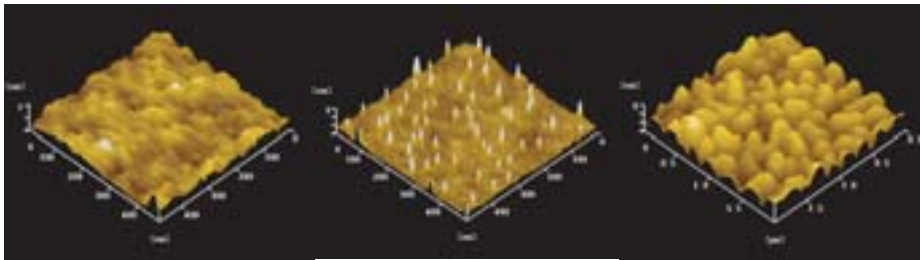


Planarized Ceramic Substrates 平坦化陶瓷基板

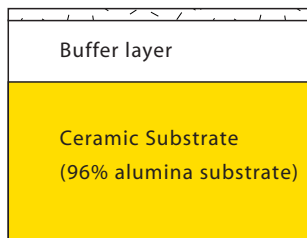
ITRI has succeeded in growing a nanostructured layer on 96 percent low-grade aluminum oxide substrates, resulting in a surface roughness less than 5 nm, thus making the substitution of much costlier substrate materials possible. These planarized substrates also exhibit adhesion properties sufficient to support metallic films ~6 μm thick, thus enabling the easy fabrication of electrical, optical and magnetic thin film devices.

在百分之九十六低價位氧化鋁基板表面被覆自組裝奈米結構，可使基板表面粗糙度小於5奈米，大幅降低原高價位之基板成本；在此平坦化陶瓷基板上可鍍厚達6微米之金屬鍍膜，具有足夠之附著力，可為電子、光學及磁性等薄膜元件的基材。

Current Results



Surface structure manipulation
2003/03



Nano structure layer

1. Surface Roughness < 5 nm
2. Resistivity > 10¹¹ Ω-cm
3. Adhesion > 20 MPa
4. Post Process Temp. Compatability > 600°C
5. Dielectric Loss tan δ < 0.001, @5 GHz
6. Thermal Conductivity > 10 W/mK



SEM Image

2002/10

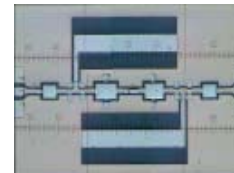
Verifications

Integrated Passive Device



2002/10

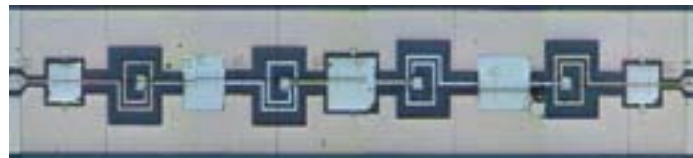
High Frequency Band Pass Filter



2003/01

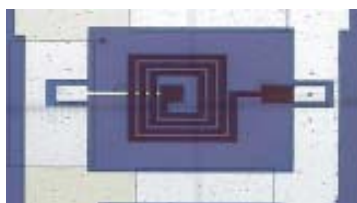
BPF Prototype
Dimension
2.7 mm x 2.0 mm

High Frequency Low Pass Filter



2003/01

High Frequency Inductor



	99.6% alumina substrate		planarized ceramic substrate	
	L (nH)	Qmax	L (nH)	Qmax
2.5turns	3.12	14.03	3.35	16.3
4.5turns	9.72	13.94	10.55	15.32

Applications: Substrates suitable for High Frequency electronic industry

2002/10
Materials Research Laboratories