

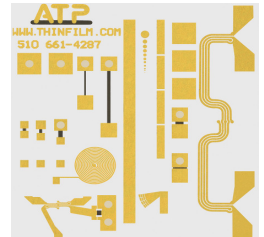
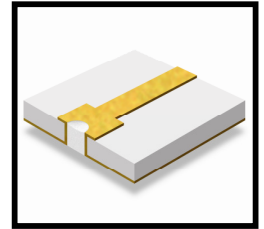


# ATP1009 Samples

## As-Fired Aluminum Oxide Circuit with Polyimide Filled Via Holes

Applied Thin-Film Products (ATP) is pleased to provide ceramic thin-film samples for your evaluation.

TaN/TiW/Au metalization with polyimide filled, conductive, plated- thru-CO<sub>2</sub> laser drilled via holes in Aluminum Oxide (Al<sub>2</sub>O<sub>3</sub>). Polyimide is used as a non-conductive plug for via hole assemblies. Will prevent epoxy and eutectic solders from reaching the surface of the circuit while keeping continuity between back side and front side surfaces.



### Material Specifications:

| Properties                             | Units                  | Asfired High Density 996 Aluminum Oxide |
|--|------------------------|---|
| Chemical Composition                   |                        | Al <sub>2</sub> O <sub>3</sub>          |
| Purity                                 | %                      | 99.6                                    |
| Color                                  |                        | White                                   |
| Nominal Density                        | g/cm                   | 3.88                                    |
| Surface Finish As-Fired                | u-inches / (nm)        | 3u" (76.2nm)                            |
| Coefficient of Thermal Expansion (CTE) | 10 (-6)                | 7.0-8.3 (25-1000°C)                     |
| Camber                                 | inches / um(microns)   | 0.002/(.508um)                          |
| Thickness                              | inches / um(microns)   | .015/(.381mm)                           |
| Thickness Tolerance                    | inches / um(microns)   | 0.001/(25.4um)                          |
| Thermal Conductivity 100 °C            | Watts/m K              | 26.9                                    |
| Dielectric Constant                    | 1 MHz                  | 9.9 +/- .1                              |
|  | 10 GHZ                 | 9.7 +/- .1                              |
| Dissipation Factor (Loss Tangent)      | 1 MHz                  | 0.0001                                  |
| Hardness                               | Rockwell               | 87                                      |
| Flexural Strength                      | K(10-3) lbs/sq.in(Mpa) | 90(620)                                 |
| Compressive Strength                   | M(10-3) lbs/sq.in.     | 54                                      |
| Grain Size                             | um (microns)           | <1.0                                    |

Material Specifications provided by Coors Ceramic Company

ATP offers build-to-print service for a wide range of materials and metalization schemes. ATP fabricates circuits on substrates from As-Fired Alumina to Beryllium Oxide to Fused Silica, even Silicon. Metalizations range from the standard TaN/TiW/Au to films including Nickel, Palladium, or Titanium.

At ATP, we constantly evolve our processing and material capabilities to reflect our customer's changing needs. If you have a circuit requirement that is out of the "normal" thin-film type, please contact ATP at (510) 661-4287 or visit our web site [www.thinfilm.com](http://www.thinfilm.com). ATP would enjoy discussing your application with you and working to develop a solution.

### Sample Provided:

#### Physical Properties of Polyimide:

|                      |                           |
|----------------------|---------------------------|
| Max. Use Temp.       | 2800F(1500 degree C)      |
| Base                 | Alumina Oxide             |
| Compressive Strenght | 4200 psi                  |
| Flexural Strenght    | 1900 psi                  |
| Dielectric Strenght  | 125 volts/mil             |
| Volume Resistance    | 10 8 ohm cm               |
| Thermal              |                           |
| Conductivity         | 15 BTU in/hr/degreeF ft 2 |
| Exapnsion            | 4.0 x 10 -6/ degree F     |
| Consistency          | Paste                     |

Manufactured according to Mil Spec Mil-I-45208

#### ATP1009, Material is 15 mil As-Fired Al<sub>2</sub>O<sub>3</sub>

TaN Resistors = 50 Ohms per Square

TiW = 400 to 800 Angstroms

Au = 120 u" minimum

web site: [www.thinfilm.com](http://www.thinfilm.com)

