

## Direct Copper Bonded (DCB) Ceramic Substrates

### Features

- Fine Mechanical strength
- Fine Adhesion and Corrosion Resistant
- Excellent Electrical Insulation and Thermal Conductive Properties
- High Reliability
- Lower Thermal Expansion Coefficient
- Etchable to Various Graphs

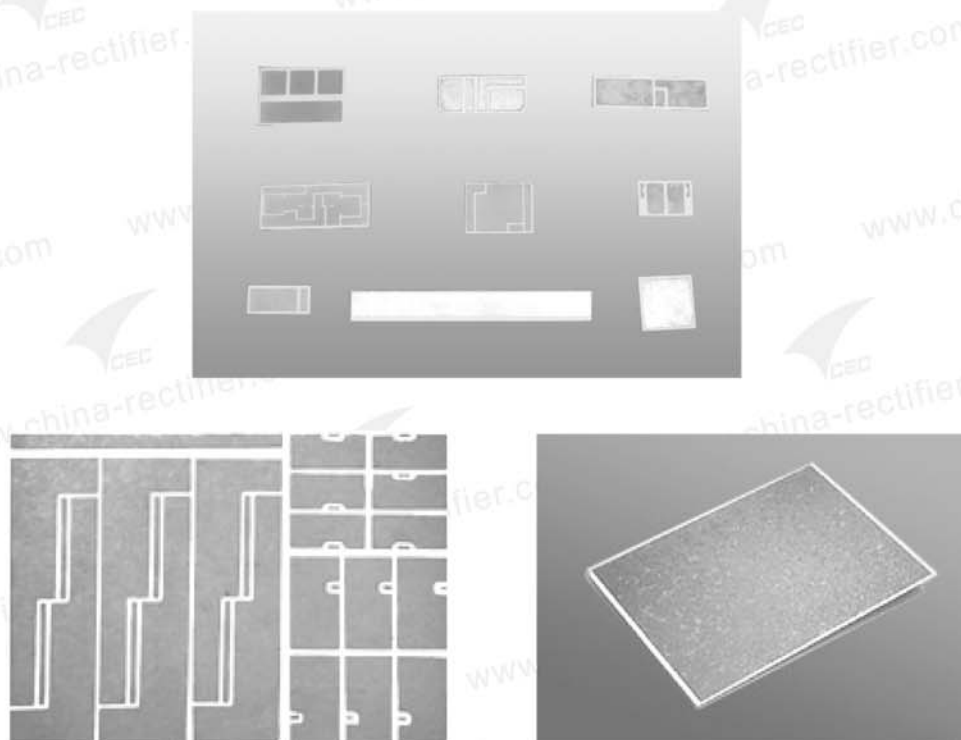
### Applications

- Power Semiconductor Modules
- Power Hybrids
- Power Control Circuits
- Solid-state Relays
- Semiconductor Refrigerators
- Electronic Devices for Automobile
- Intelligent Power Assemblies
- Solar Cell Board

### Characteristics of Material

| Item         |                                          | Unit                 | Value                                  |             |
|--------------|------------------------------------------|----------------------|----------------------------------------|-------------|
| Ceramic      | Content                                  | %                    | 96Al <sub>2</sub> O <sub>3</sub>       | 96AlN       |
|              | Thickness                                | mm                   | 0.25, 0.38, 0.5, 0.63(std.), 0.76, 1.0 |             |
|              | Dielectric Constant (at 25°C, 1MHz)      |                      | 9.4                                    | 8.9         |
|              | Dielectric Loss Angle (at 25°C, 1MHz)    | × 10 <sup>-4</sup>   | 3                                      | 3           |
|              | Dielectric Strength                      | kV/mm                | > 14                                   | > 14        |
|              | Thermal Conductivity (at 25°C)           | W/m.K                | 24~28                                  | 150         |
| Copper layer | Thickness                                | mm                   | 0.3                                    |             |
|              | Thermal Conductivity                     | W/m.K                | 385                                    |             |
| DCB          | Dimension (max.)                         | mm×mm                | 127×198                                | 75×57       |
|              | Thermal Expansion Coefficient            | 10 <sup>-6</sup> /°C | 7.4(25~200°C)                          | 5(50~500°C) |
|              | Bonding Force                            | N/mm                 | >6                                     | >3          |
|              | Bending                                  | μ m/mm               | <150/50                                |             |
|              | Operating Temperature (inert atmosphere) | °C                   | -55~+850                               |             |
|              | Plating                                  |                      | Au or Ni plated or bare Cu             |             |

Note: Dimension and etching graph of DCB substrate can be produced according to customers' requirements.



Various DCB ceramic substrates