

All technical data presented represent typical results, unless stated otherwise as min/max values. No guarantee is made that material will meet exactly the values shown.

## Substrates, Al<sub>2</sub>O<sub>3</sub> and AlN

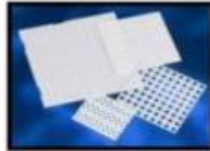
### Substrate Products



LED substrate



Pressure sensor Component



Automobile HIC Substrate



Chip Resistor / Chip Array



- Ceramic Core W/W Inductor
- Automobile Ceramic Insulator



#### Ceramic Substrates Specifications

Material		Unit	AlN		Al <sub>2</sub> O <sub>3</sub>				Reference
			ZP-ANS47	ZP-ZTAS	ZP-ALS96	ZP-ALS98	ZP-ALS985A	ZP-ALS985B	
Item No.	Thickness 0.5mm	%	30	N/A	88	N/A	N/A	N/A	
	Thickness 1.0mm	%	N/A	N/A	94	N/A	N/A	N/A	ASTM E903
Bulk Density		g/cm <sup>3</sup>	≥3.26	≥4	≥3.72	≥3.74	≥3.74	≥3.75	ASTMC 373-88
Thermal Conductivity (25°C)		W/mK	≥170	≥24	≥24	≥25	≥25	≥24	ISO/DIS 22007-2.2
Coefficient of Thermal Expansion RT ~300°C		x10 <sup>-6</sup> /°C	3.16	6.12	5.8	6.37	6.34	5.96	ASTM C372-94
Coefficient of Thermal Expansion RT ~500°C		x10 <sup>-6</sup> /°C	4.02	7.04	6.82	7.12	7.11	6.81	
Dielectric Strength		V/mm	≥15	≥15	≥15	≥15	≥15	≥15	ASTM D149
Dielectric Constant at 1MHz			10	12.4	9.8	10	10	10	ASTM D150
Dielectric Loss at 1MHz		x10 <sup>-3</sup>	3	8	3	3	3	3	ASTM D150
Volume Resistant		Ω-cm	≥10 <sup>14</sup>	≥10 <sup>14</sup>	≥10 <sup>14</sup>	≥10 <sup>14</sup>	≥10 <sup>14</sup>	≥10 <sup>14</sup>	ASTM D257
3-Point Flexural Strength		Mpa	≥350	≥800*	≥350	≥450	≥350	≥400	ASTMC1161-02c ASTM D790*
Surface Roughness in Ra		µm	≤0.6						
Color			Grey	White	White	White	White	White	
Dimensions	Standard		4.5" x 4.5" 4.7" x 4.7"	7.5" x 5.4" 4.5" x 4.5"	4" x 4" 4.5" x 4.5" 4.7" x 4.7" 5" x 5" 7.5" x 5.4" 7" x 7"				
	Thickness		0.38-1.00mm	0.32mm	0.38-1.0mm				
Applications			Heat Dissipation Substrates, High Power LED Packaging	Heat Dissipation Substrates, High Power LED Packaging, Automotive IGBT cooling substrate	Heat Dissipation Substrates, Resistors Substrates	Thin Film Resistors Substrates	Heat Dissipation Substrates, High Power LED Packaging, Easy to Cut Substrates	Heat Dissipation Substrates, High Power LED Packaging, Thin Film Substrates, Automotive IGBT cooling substrate, 5G Wireless Technology	

Application: [Advanced energy](#), [Advanced ceramics](#), [Specialty materials](#)

Product type: [Consumables](#), [Components](#)

Production scale: [Lab](#), [Pilot](#), [Commercial](#)

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