

List of Characteristic Values

Characteristic Values

Item / Unit				Single Layer					HTCC			Microwave Dielectric Ceramics*
				Al ₂ O ₃		AlN			Al ₂ O ₃		AlN	
				HA-96-2	HA-996	AN-170	AN-200	AN-230	-	-	-	
Color		-	White	White	Gray	Gray	Baige	White	Brown	Gray	-	
Composition			96	99.6	-	-	-	92	92	-	-	
Reflectivity		%	70	-	-	-	-	-	-	-	-	
Bulk Density		g/cm ³	3.75	3.85	3.30	3.28	3.25	3.60	3.80	3.30	3.0~5.7	
Surface Roughness		μm	0.4	0.1	0.3	0.5	-	-	-	0.3	-	
Mechanical Characteristics	3-Point Bending Strength		MPa	450	450	450	250	200	350	350	400	-
	Young's Modulus		GPa	340	370	320	320	-	-	-	-	-
	Vickers Hardness		GPa	14	16	11	11	-	-	-	-	-
Thermal Characteristics	Coefficient of Thermal Expansion	40-400℃	×10 ⁻⁶ /K	6.9	7.1	4.8	4.8	4.8	7.0	7.3	4.8	9.6~12.3
		40-800℃	×10 ⁻⁶ /K	7.8	8.1	5.4	5.4	5.4	-	-	5.4	
	Thermal Conductivity	25℃	W/(m・K)	24	29	180	200	230	16	15	180	-
		300℃	W/(m・K)	12	13	120	130	145	-	-	90	-
	Specific Heat		J/(kg・K)	750	780	720	720	720	-	-	720	-
Electrical Characteristics	Dielectric Constant	1MHz	-	9.8	9.9	9.0	9.0	9.0	9.0	9.5	8.9	7~200
		1MHz	×10 ⁻⁴	3	2	3	3	3	-	-	2	-
	Volume Resistivity	25℃	Ω・cm	>10 ¹⁴	>10 ¹⁴	>10 ¹⁴	>10 ¹³	>10 ¹³	>10 ¹⁴	>10 ¹⁴	>10 ¹⁴	-
		300℃	Ω・cm	10 ¹⁰	10 ¹³	10 ¹⁰	10 ⁹	10 ⁹	-	-	10 ¹⁰	-
		500℃	Ω・cm	10 ⁸	10 ¹⁰	10 ⁸	10 ⁷	10 ⁷	-	-	10 ⁸	-
Dielectric Breakdown Voltage		kV/mm	>15	>15	>15	>15	>15	>10	>10	>15	-	

*Please refer to the category of Microwave Dielectric Ceramics for more details.