NaF3000 Series of products

Features of NaF3000 Series

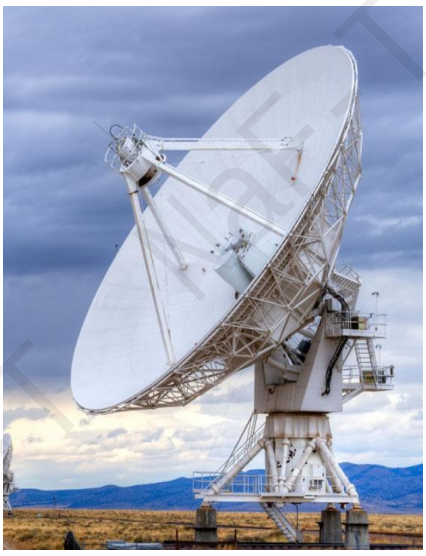
- NaF3000 series are ceramic-filled PTFE high-frequency copper clad laminates (CCLs) independently developed and produced by NaF-T.
- The dielectric constant is very stable and the dielectric loss is ultra low (D_k: 3.0~10.2; D_f: 0.00098~0.0023).

- **Consistent and stable**
- **High peel strength**
- **Low dielectric loss**
- **Excellent cost performance**

Application Fields of NaF3000 Series

- The Products are used in antenna, millimeter wave, military radar, military electronics, missile antenna, etc.
- NaF-T not only produces high-frequency copper clad laminates (CCLs) with ultra low loss, but also can customize the thickness and thermal conductivity of CCLs according to customer's needs.

- **Space wideband antenna**
- **Missile antenna**
- **Microstrip and strip-line circuits**
- **Base station antenna**
- **Millimeter wave equipment**
- **Phase shifter**
- **Military radar**
- **High-frequency power divider**
- **Phased array radar**
- **IoT devices**



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NaF3035Gth: A highly-thermal conductive, glass-reinforced and ceramic-filled PTFE high-frequency circuit material

GENERAL PROPERTIES

Property	Typical Value	Direction	Unit	Condition	Test Method
Dielectric Constant, D_k	3.45±0.03	Z	-	10 GHz 23℃	IPC-TM-650 2.5.5.5 SPDR
Dissipation Factor, D_f	0.0018	Z	-	10 GHz 23℃	IPC-TM-650 2.5.5.5
Thermal Coefficient of ε_r	-9	Z	ppm/℃	10 GHz 0-100℃	IPC-TM-650 2.5.5.5
Dimensional Stability	-0.08,-0.09	X, Y	mm/m	COND A	IPC-TM-650 2.2.4
Volume Resistivity	10^7		MΩ•cm	COND A	IPC 2.5.17.1
Surface Resistivity	10^7		MΩ	COND A	IPC 2.5.17.1
Tensile Modulus	1500 1580	MD CMD	MPa	23℃	ASTM D638
Water Absorption	0.04	-	%	D48/50	IPC-TM-650 2.6.2.1
Thermal Conductivity	1.7	-	W/(m·K)	50℃	ASTM D5470
Coefficient of Thermal Expansion	7,8,23	X, Y, Z	ppm/℃	23℃/50% RH (23 ~ 288 ℃)	IPC-TM-650 2.4.24
T_d	500		℃	TGA	ASTM D3850
Density	2.3		mg/cm^3		
Copper Peel Strength	8.0		pli	1 oz. EDC After floating tin	IPC-TM-2.4.8
Flammability	V-0				UL 94
Lead Free Process Compatible	YES				

PRODUCT SPECIFICATION

Standard Thickness	Standard Panel Size	Standard Copper Cladding
0.020" (0.508mm) +/- 0.0020" 0.030" (0.762mm) +/- 0.0030" 0.060" (1.016mm) +/- 0.0030" * Other thicknesses are available	12" X 18" (305 X 457mm) 24" X 18" (610 X 457mm)	Electrolytic copper foil:LP/VLP/RTF/HVLP ½ oz.(18μm) H/H 1 oz.(35μm) 1/1 * Additional cladding weights are available

Note: All typical values listed above are for reference only and not for specification.