Microwave dielectric copper-clad substrate TP-1/2

The advantage of design for microwave circuit using TP-1/2 here:

- The dielectric constant is stable and can be optional within the range of 3~22 according to the design of circuit requirement. The operating temperature is -100℃～+150℃;
- The peel strength between the copper and the substrate is more reliable than the vacuum film coating of ceramic substrate. This substrate is created to offer customers easy for circuit processing, higher pass-rate of production, and the manufacturing cost is much lower than the ceramic substrate.
- Dissipation factor tg δ ≤1×10-3, and the loss has a slight variation with the rise of the frequency.
- It is easy for mechanical manufacturing, including drill, punch, grind, cut, etching, etc.. For these, the ceramic substrate cannot be compared.Technical Specifications:

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Appearance	Smooth and neat on both sides: no stain, scratch and dent.			
Dimension and tolerance （mm）	Dimensions A×B（mm）			Tolerance
	120×100, 150×150, 160×160, 180×180, 200×200, 170×240			-2
	Thickness and Tolerance			
	0.8±0.05, 1.0±0.05, 1.2±0.05, 1.5±0.06, 2.0±0.075, 3.0±0.10, 4.0±0.10, 5.0±0.12, 6.0±0.12, 10.0±0.2			
	For special dimensions, customized lamination is available.			
Mechanical Strength	Peel strength	In normal state: ≥6N/cm; In the environment of alternating humidity and temperature: ≥4 N/cm .		
	Chemical Property	According to the properties of laminate, the chemical etching method for PCB can be used. The dielectric properties of materials are not changed.		
Electrical property	Name	Test condition	Unit	Value
	Density	Normal state	g/cm^3	1.0~2. 9
	Moisture Absorption	Dip in distilled water of 20±2℃ for 24 hours	%	≤0.02
	Operating Temperature	High-low temperature chamber	℃	-100～+150（Processing temperature should not exceed 200℃）
	Thermal Conductivity	-55~288℃	W /m /k	0.6
	CTE	Temperature rise of 96℃ per hour		$< 6\times10^{-5}$
	Shrinkage Factor	2 hours in boiling water	%	0.0004

	Surface Resistivity	500V DC	Normal state	M.Ω	≥1×10^{7}
			Constant humidity and temperature		≥1×10^{5}
	Volume Resistivity	Normal state		MΩ.cm	≥1×109
		Constant humidity and temperature			≥1×106
	Pin Resistance	500V DC	Normal state	MΩ	≥1×106
			Constant humidity and temperature		≥1×104
	Surface dielectric strength	Normal state		Kv/mm	≥1.5
		Constant humidity and temperature			≥1.2
	Dielectric Constant	10GHZ		ε r	3, 6, 9.6, 10.2, 10.5, 11, 16, 20, 22（±2%）(dielectric constant canbe customized）
	Dissipation Factor	10GHZ		Tg δ （ε r 3-11)	⩽1×10^{-3}
				Tg δ (ε r 12-22)	⩽1.5×10^{-3}