

# mmWAVE

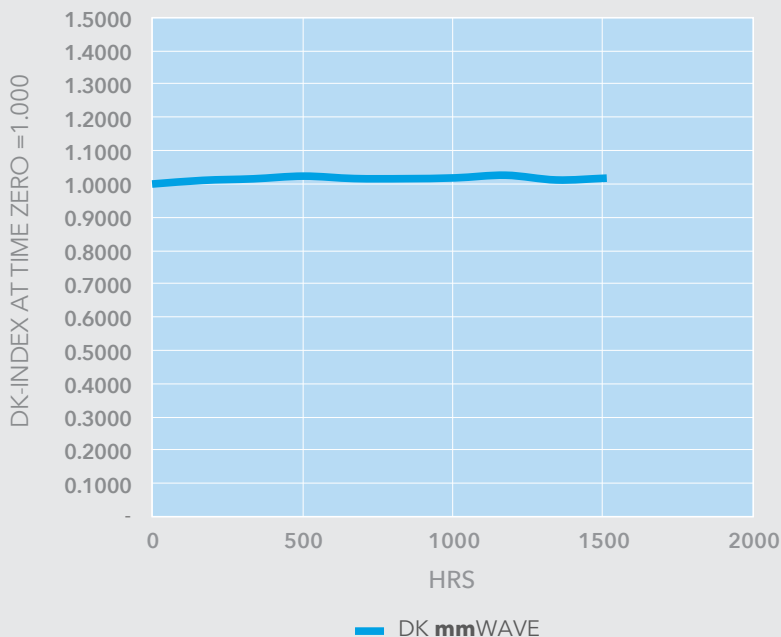
## mmWAVE

### ULTRA LOW LOSS WOVEN GLASS PPE MATERIALS

mmWave is designed for use in many of today's demanding and highly challenging RF/Microwave design platforms that extend into the millimeter range. mmWave is a PPE Woven Glass Controlled Dielectric Material with excellent electrical and mechanical properties with a consistent and stable dielectric constant and dissipation factor over a wide range of frequencies and temperatures. mmWave exhibits excellent dimensional stability, chemical resistance and low moisture absorption.

## mmWAVE LAMINATE

AGING DATA-DK AT 85 C/85 RH FOR SHENGYI



## APPLICATIONS

- Automotive Radar
- Base Station Antenna
- GPS Systems
- Point to Point Antenna
- Telemetry
- Avionics & Aerospace
- DAS & CPE Antenna
- mmWave Applications

## FEATURES

- Low CTE
- Stable Dk over Frequency and Temperature
- Ultra Low Loss
- Low Moisture Absorption
- Passive Inter-modulation -158 dBc
- Excellent Copper Peel Strength
- UL 94 V-0 Flame Rating

## PRODUCT CONTACTS

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## GENERAL PROPERTIES

PROPERTY	TYPICAL VALUE	DIRECTION	UNITS	CONDITION	TEST METHOD
Dielectric Constant, $\epsilon_r$ (Process specification)	3.00±0.05	Z		10GHz/23°C	IPC-TM-650 2.5.5.5 ( <sup>1</sup> )Clamped Stripline
Dielectric Constant, $\epsilon_r$ (Design specification)	3.064	Z		6GHz/23°C	Differential Phase Length Method
Dissipation Factor tan, $\delta$	0.002	Z		10GHz/23°C	IPC-TM-650 2.5.5.5 ( <sup>1</sup> )Clamped Stripline
Thermal Coefficient of $\epsilon_r$	60	Z	ppm/°C	-40C to +150°C	IPC-TM-650 2.5.5.5
Volume Resistivity	2.0×10 <sup>7</sup>		<u>MΩ-cm</u>	COND A	IPC-TM-650 2.5.17.1
Surface Resistivity	2.0X10 <sup>7</sup>		MΩ	COND A	IPC-TM-650 2.5.17.1
Electrical Strength	85	Z	KV/mm	0.51mm (0.020")	IPC-TM-650 2.5.6.2
Coefficient of Thermal Expansion	17 19 50	X Y Z	ppm/°C	-55 to 260°C	IPC-TM-650 2.4.41
Tg	190		°C TMA	A	IPC-TM-650 2.4.24
Td	400		°C TGA		ASTM D3850
Thermal Conductivity	0.5		W/m <sup>2</sup> K	100°C	ASTM D5470
Moisture Absorption	0.09		%		IPC-TM-650 2.6.2.1
Copper Peel Strength	0.85 (4.85)		N/mm (lb/in.)	after solder float 1 oz. HVLP Foil	IPC-TM-650 2.4.8
PIM (Typical)	-158		dBc	Reflected 43 dBm swept tones	Summitek 1900b PIM Analyzer
Flammability	94V-0				UL

## PRODUCT SPECIFICATION

PRODUCT	STANDARD THICKNESS	STANDARD PANEL SIZE	COPPER FOIL
mmWave	0.005"(0.127mm) 0.010"(0.254mm) 0.020"(0.508mm) 0.030"(0.762mm) 0.060"(1.524mm)	18"×12"(457*305mm) 18"×24"(457*610mm) 36"×48"(915*1220mm) 42"×48"(1067*1220mm)	½ oz. (18µm) HVLP copper foil. 1 oz. (35µm) HVLP copper foil. 2 oz. (70µm) RTF copper foil. Other claddings may be available. Contact customer service.

<sup>(1)</sup>Clamped strip line method can potentially lower the actual dielectric constant due to presence of air gap. Dielectric constant in practice may be higher than the values listed.

<sup>(2)</sup>Typical values are a representation of an average value for the population of the property. For specification values contact SYTECH Corporation. The information in this data sheet is intended to assist you in designing with SYTECH's circuit materials. It is not intended to and does not create any warranties, express or implied, including any warranty of merchantability or fitness for a particular purpose or that any results shown in this data sheet will be achieved by a user for a particular purpose. The user is responsible for determining the suitability of SYTECH's circuit materials for each application.