

ITEQ
Your Partner of Advanced Materials & Mass Lam Service

IT-170GRA2

CCL : IT-170GRA2TC
Prepreg: IT-170GRA2BS

High Tg / Halogen Free / Low-Loss Laminate & Prepreg

- ANSI Type : **FR-4.1**
- Appliceable IPC-4101 /127/128/130；IPC-4103 /240/540
- Halogen free, High-Tg (175oC) / Lower Dk (3.8 @ 10GHz) and low Df (0.008 @ 10GHz)
- Compatible with High Tg standard FR-4 processes
- High CAF resistance reliability /Super High thermal resistance reliability

Laminate properties

Items	IPC TM-650	Typical Value	Unit
Peel Strength, minimum A. Low profile copper foil	2.4.8	4.0~5.0	lb/inch
Volume Resistivity	2.5.17.1	$1x10^{10}$	MΩ-cm
Surface Resistivity	2.5.17.1	$1x10^{10}$	MΩ
Moisture Absorption, maximum	2.6.2.1	0.10	%
Permittivity (Dk, 50% resin content) A. 1GHz B. 2GHz C. 5GHz D. 10GHz	 2.5.5.9 2.5.5.13 2.5.5.13 2.5.5.13	 4.0 3.9 3.9 3.8	--
Loss Tangent (Df, 50% resin content) A. 1GHz B. 2GHz C. 5GHz D. 10GHz	 2.5.5.9 2.5.5.13 2.5.5.13 2.5.5.13	 0.0060 0.0063 0.0075 0.0080	--
Flexural Strength, minimum A. Length direction B. Cross direction	2.4.4	 450-480 380-410	N/mm^2
Young's Modulus A.Warp direction B.Fill direction	ASTM D3039	 20 19	Gpa
Thermal Stress 10 s at 288°C A. Unetched B. Etched	2.4.13.1	 Pass Pass	Rating
Flammability	UL94	V-0	Rating
Comparative Tracking Index (CTI)	ASTM D3638/ UL 746	CTI 2 (250-399)	Class (Volts)
Maximum Operating Temperature(MOT)	UL 746	130	°C
Glass Transition Temperature(DSC) Glass Transition Temperature(TMA)	2.4.25 2.4.24	175 170	°C
Decomposition Temperature(5% W.L)	2.4.24.6	390	°C
X/Y Axis CTE (40℃ to 125℃)	2.4.41	13/16	ppm/°C
	2.4.24.5	11/12	ppm/°C
Z-Axis CTE A. Alpha 1 B. Alpha 2 C. 50 to 260 Degrees C	2.4.24	 40 215 2.4	 ppm/°C ppm/°C %
Thermal Resistance A. T260 B. T288	2.4.24.1	 >60 >60	 Minutes Minutes