

VT-901

UL Approval: E214381 Version: Rev. B7

PROCESS GUIDE

VT-901 CCL/Laminate VT-901 PP / Prepreg (Polyimide)

Precautions in Handling

Storage Condition & Shelf Life

		Prepreg		Laminate
Storage Condition	Temperature	Below 23°C (73°F)	Below 5°C (41°F)	Room
	Relative Humidity	Below 55%	/	/
Shelf Time		3 Months	6 Months	24 Months

- The prepreg exceeding shelf life should be retested.
- Take care in handling thin core laminates as they are easily damaged.
- If the prepreg is not consumed within 48hrs after opening the vacuum package, it is recommended that the bags be resealed.
- Material is available in both long and short grain. The grain direction is indicated on the label with an arrow.

Designing & Inner layer Process

- Please be careful when single ply of 1080, 1086, 1078 or 106 prepreg is designed to the dielectric layer.
- Dimension stability is the same with Standard FR4 material.
- Please check with your oxide vendor to make sure that our material is suitable with your oxide process. We recommend to control the peel strength with brown oxide copper over 2 Lb/in.
- For unclad or single sided laminates to be used in multilayer, please brush unclad sides before use.

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Prepreg Availability

E-Glass styles : 7628, 1506, 1500, 2113, 2313, 3313, 2116, 1080, 1086, 1078, 106, 1067 etc.

Type	Resin Content	Press Thickness (mil)	DK				DF				Remark
			@ 1GHz	@ 2GHz	@ 5GHz	@ 10GHz	@ 1GHz	@ 2GHz	@ 5GHz	@ 10GHz	
7628	40%	7.30	4.40	4.35	4.35	4.30	0.010	0.010	0.011	0.011	Standard
	44%	8.00	4.30	4.25	4.25	4.20	0.011	0.011	0.012	0.012	Standard
1506	46%	6.80	4.25	4.20	4.20	4.15	0.011	0.011	0.012	0.012	Standard
2116	50%	4.70	4.15	4.10	4.10	4.05	0.011	0.011	0.012	0.012	Standard
	53%	5.10	4.10	4.05	4.02	3.97	0.011	0.011	0.012	0.012	Standard
	56%	5.40	3.98	3.93	3.93	3.88	0.012	0.012	0.013	0.013	Standard
2113	57%	4.30	3.98	3.93	3.93	3.88	0.012	0.012	0.013	0.013	Standard
1080	60%	2.80	3.80	3.75	3.75	3.70	0.012	0.012	0.013	0.013	Standard
	63%	3.10	3.72	3.67	3.67	3.62	0.012	0.012	0.013	0.013	Standard
106	70%	2.00	3.55	3.50	3.50	3.45	0.013	0.013	0.014	0.014	Standard

Remark:

- ① Press thickness test condition---Prepreg lamination size 18"*24", Copper Foil---1oz/1oz, Flow---about 5%;
- ② Make laminated prepreg to micro-section and measure the thickness with microscope; this thickness is used for resistance design calculation.
- ③ The thickness measured with micrometer is 0.2~0.4 mil larger than that measured with micro-section; and mainly used for total thickness design calculation.

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Laminates Availability

- Thickness: 0.002" (0.05mm) to 0.200" (5mm), available in sheet or panel form
- Copper Foil: 1/4 to 12oz, HTE or RTF or DST
- Dk values are for impedance design.

Core thk. (inches)	Stack-up	Resin Content	DK				DF				Remark
			@ 1GHz	@ 2GHz	@ 5GHz	@ 10GHz	@ 1GHz	@ 2GHz	@ 5GHz	@ 10GHz	
0.002	1-106	70%	3.55	3.50	3.50	3.45	0.013	0.013	0.014	0.014	Standard
0.003	1-1080	63%	3.72	3.67	3.67	3.62	0.012	0.012	0.013	0.013	Standard
0.0035	1-1080	68%	3.59	3.54	3.54	3.39	0.013	0.013	0.014	0.014	Standard
0.0035	2-1067	58%	3.98	3.93	3.93	3.88	0.012	0.012	0.013	0.013	2ply
0.004	1-2116	44%	4.30	4.25	4.25	4.20	0.011	0.011	0.012	0.012	Standard
0.004	2-1078	45%	4.30	4.25	4.25	4.20	0.011	0.011	0.012	0.012	2ply
0.005	1-2116	53%	4.10	4.05	4.02	3.97	0.012	0.012	0.013	0.013	Standard
0.005	2-1078	54%	4.10	4.05	4.02	3.97	0.012	0.012	0.013	0.013	2ply
0.006	1-1506	42%	4.35	4.30	4.30	4.25	0.010	0.010	0.011	0.011	Standard
0.006	2-1080	63%	3.72	3.67	3.67	3.62	0.012	0.012	0.013	0.013	2ply
0.007	1-7628	40%	4.40	4.35	4.35	4.30	0.010	0.010	0.011	0.011	Standard
0.007	2-2113	48%	4.22	4.17	4.17	4.12	0.011	0.011	0.012	0.012	2ply
0.008	1-7628	44%	4.30	4.25	4.25	4.20	0.011	0.011	0.012	0.012	Standard
0.008	2-2116	44%	4.30	4.25	4.25	4.20	0.011	0.011	0.012	0.012	2ply
0.010	2-2116	53%	4.10	4.05	4.02	3.97	0.011	0.011	0.012	0.012	Standard
0.012	2-1506	42%	4.35	4.30	4.30	4.25	0.010	0.010	0.011	0.011	Standard
0.014	2-7628	40%	4.40	4.35	4.35	4.30	0.010	0.010	0.011	0.011	Standard
0.014	3-2116	53%	4.10	4.05	4.02	3.97	0.011	0.011	0.012	0.012	Non-7628
0.016	2-7628	44%	4.30	4.25	4.25	4.20	0.011	0.011	0.012	0.012	Standard
0.018	2-7628+1-2116	40%	4.40	4.35	4.35	4.30	0.010	0.010	0.011	0.011	Standard
0.020	2-7628+1-2116	41%	4.40	4.35	4.35	4.30	0.010	0.010	0.011	0.011	Standard
0.024	3-7628	44%	4.30	4.25	4.25	4.20	0.011	0.011	0.012	0.012	Standard
0.028	4-7628	40%	4.40	4.35	4.35	4.30	0.010	0.010	0.011	0.011	Standard
0.029	4-7628	41%	4.40	4.35	4.35	4.30	0.010	0.010	0.011	0.011	Standard
0.031	4-7628	43%	4.33	4.28	4.28	4.23	0.010	0.010	0.011	0.011	Standard
0.036	5-7628	40%	4.40	4.35	4.35	4.30	0.010	0.010	0.011	0.011	Standard
0.039	5-7628	43%	4.33	4.28	4.28	4.23	0.010	0.010	0.011	0.011	Standard
0.042	6-7628	40%	4.40	4.35	4.35	4.30	0.010	0.010	0.011	0.011	Standard
0.045	6-7628	41%	4.38	4.33	4.33	4.28	0.010	0.010	0.011	0.011	Standard
0.049	7-7628	40%	4.40	4.35	4.35	4.30	0.010	0.010	0.011	0.011	Standard
0.059	8-7628	42%	4.35	4.30	4.30	4.25	0.010	0.010	0.011	0.011	Standard

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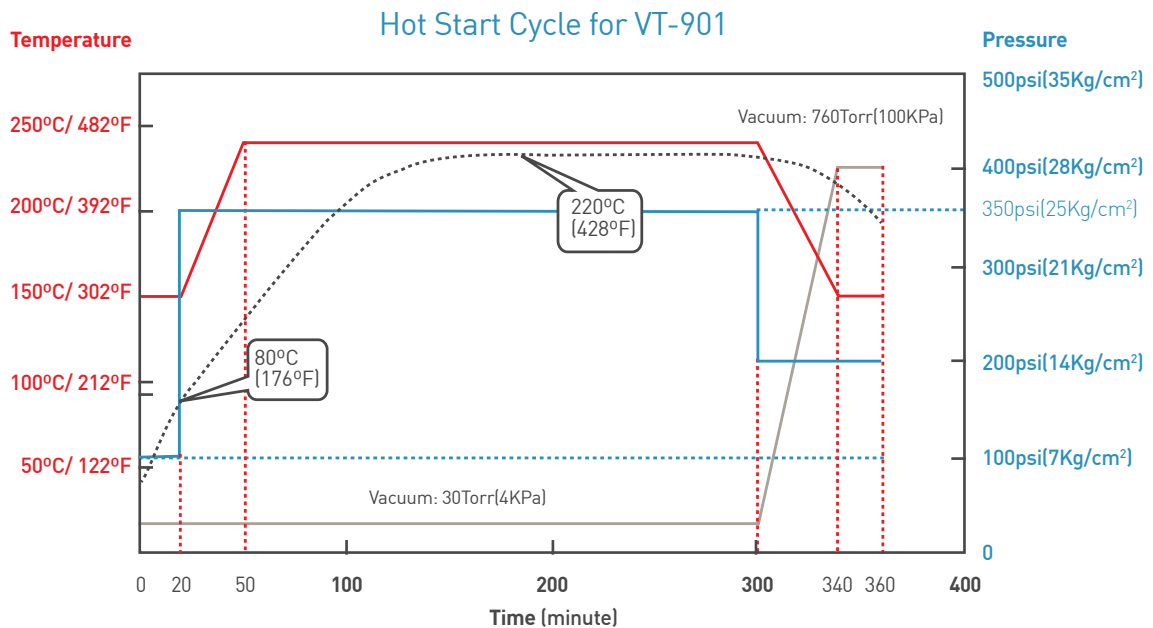
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Press Condition

1. Heating rate (Rise of Rate) of material:
Programmable Press: 1.5-3.0°C/min (3~5°F/min). Manual Press: 3~6°C /min (5~10°F/min)
2. Curing Temperature & Time:
 - 1) 120~150min at more than 218°C (424°F) [Material Temperature] depending on total thickness.
Boards thicker than 3 mm may need longer curing time.
 - 2) For sequential lamination use 120 minutes for the first lamination and 150 minutes for the final.
After pressing, T_g should be performed for further verification.
3. Full Pressure: ≥320psi
4. Vacuuming should be continued until over 200°C (392°F) [Material Temperature]
5. Cold Press condition: Keep Plate @ Room Temperature by water; Pressure: 100psi; Keep Time: 60minutes



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Typical Drilling Parameters (ϕ 0.3-1.0 mm)

1. Spindle Speed	120-180	KRPM
2. Feed Rate	100-200	inch / min
3. Retract Rate	550-1000	inch / min
4. Chip Load	0.6~1.8	mil / Rev.
5. Entry board	0.15mm Al	-

Desmear Process

1. Adjustments to the desmear process are necessary for the polyimide materials;
2. Check with your chemical supplier for recommendations.

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