RF-35A2

General Processing Guidelines

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ADVANCED DIELECTRIC DIVISION

Taconic RF-35A2 PTFE laminate Characteristics					
	Dielectric Constant (Dk)		Dielectric Loss (Df)		Thickness Range
	10 GHz	40 GHz	10 GHz	40 GHz	
RF-35A2	3.50±0.05	3.55	0.0015	0.0018	0.0050" – 0.0600"

Attention to Handling：

1. Most applications of RF-35A2 are in microwave frequency that dielectric thicknesses of substrates are usually thin, such as 5mil or 10mil. Extreme care should be paid during handling to prevent edge damage and folding.
2. RF-35A2 is a PTFE laminate that is a relatively soft texture comparing to FR4. No mechanical scrabbling (brushing or pumicing) is allowed.

Drilling：

1. Use all new drill bits （Standard 130°）. One panel one stack；pressure foot at 40 psi；
2. Use Al entry material，then underneath with ~1mm Melamine board or LE/LCOA；
3. When drilling RF-35A2 FR4 hybrid boards，RF-35A2 side should face up；
4. Blow debris of drilling with high pressure air gun；
5. Use the most stable drilling machines with drilling parameters as table below：

Drill Size (inch)	**Chipload** (mil)	**Spindle speed** (krpm)	**Feed rate** (ipm)	**Retract Rate** (in/min)
0.010	0.4 -.6	80-125	55-60	1000
0.012	0.4 -.6	80-125	55-60	1000
0.0200	.64	70	45	1000
0.0280	1.0	32	32	1000
0.0380	1.3	24	31	1000
0.0400	1.8	22	40	1000
0.0420	1.8	21	38	1000
0.0440	1.8	20	37	1000
0.0460	1.8	19	35	1000
0.0480	1.8	19	34	1000
0.0500	2.0	18	36	1000

Plasma

Clean copper surface with chemical cleaning line only with RF-35A2 side facing down.

Plasma Parameters（1）for RF-35A2 double side boards：

Step	O2 (%)	N2 (%)	CF4 (%)	H2 (%)	Pressure (Torr)	RF (W)	Seg time （min）	Flow (LT/min)
1	80	10	10	0	250	4200	15	2.50
2	0	20	0	80	250	4200	45	2.50

Plasma Parameters（2）for RF-35A2 FR4 hybrid boards：

Step	O_2 (%)	N_2 (%)	CF4 (%)	H_2 (%)	Pressure (Torr)	RF (W)	Seg Time (min)	Flow （LT/min）
1	80	20	0	0	250	8000	99	2.50
2	80	10	10	0	250	4000	10	2.50
3	100	0	0	0	250	4000	10	2.50
4	0	20	0	80	250	4200	20	2.50

Wetibility check after Plasma process：

Use surface tension testing pen to test wetibility of plasma action by using a small testing coupon (1″×3″) of etched PTFE laminate. Plasma action can only last ~ 8 hours.

PTH

1. Skip Desmear; start PTH at microetch (microetch rate at 20 micro inch).
2. Check for "black holes" carefully; second PTH (starting from pre-dip) may be needed.

Panel Plating, D/F Imaging, Pattern Plating

1. When panels are thin, plating frame might be needed for thin panel protection.
2. Check open and short in circuit pattern carefully before etching.

AOI Inspection

1. Impedance check（some customers might require ±1 ohm）;
2. Holding time at inspection should not be more than 4 hours.

W/F Solder mask

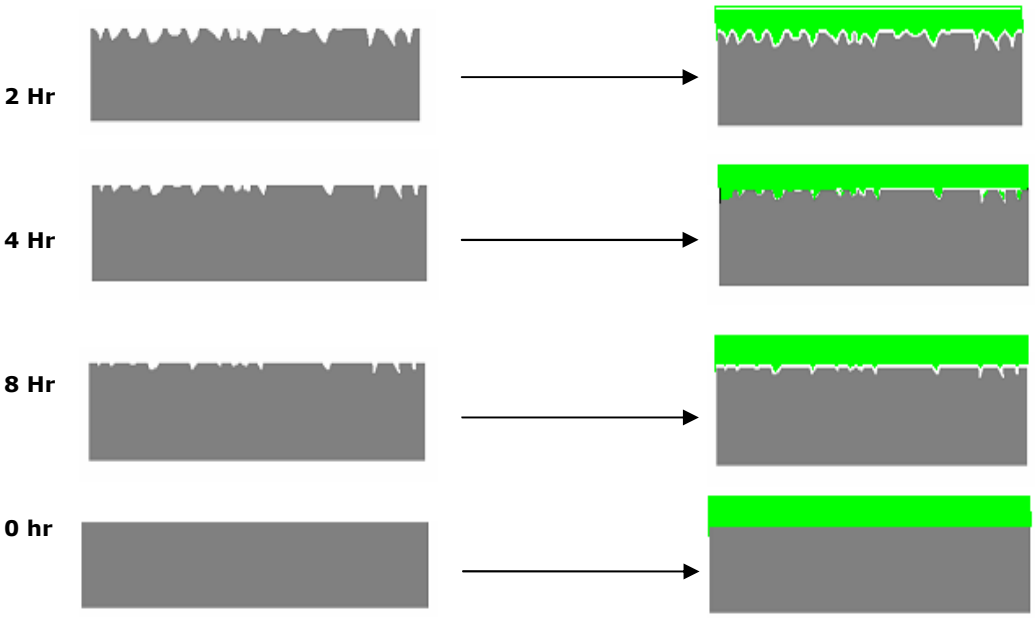
Chemical clean → baking to dry（90℃，30min） → Ink screening → Pre-bake (70℃，36min) → Image Exposure → Developing → Final cure

（To increase solder mask adhesion to PTFE, final cure with：80℃、100℃、150℃，30min each section）。

If solder mask peel off, strip old solder mask and then reactivate RF-35A2 PTFE surface with Plasma.

Solder mask screening should be done within 8 hours (or the sooner the better) after etching.

Etched PTFE surface topography change over time.



HASL

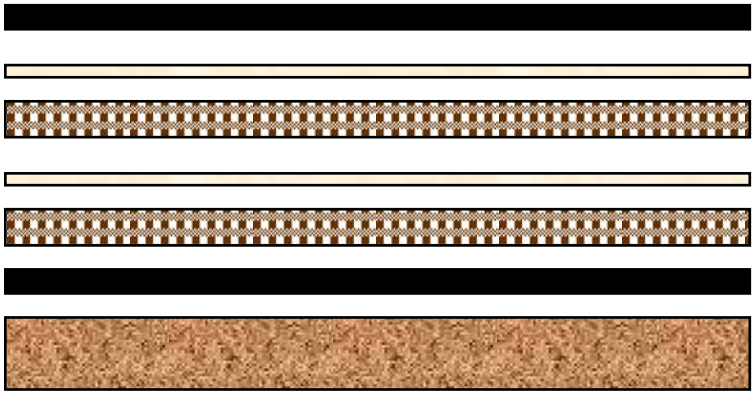
Pre-baking （150℃，2-3 hrs） → Chemical Clean → Hot air blow dry → Rosin →

Solder pot temperature < 250℃ → Heating up and cooling down slowly to minimize thermal shock.

Routing Profiling

Place interlay paper on PTFE (signal) side of the board.

Routing stacks are sandwiched with ~1.0 mm etched FR-4 or phenolic boards as shown below：



Use chip-breaker, under-cut routing bits and the best routing machines with below parameters：

	Diameter (mm)	Speed (kRPM)	Comp (inch)	Table Speed (IPM)	Routing bits
Etched pre-rout	2.4	22	0.050	15	Chip-breaker
Etched re-rout	0.8	50	0.0185	15	Chip-breaker
Pre-rout	2.4	35	0.0520	15	Chip-breaker
Re-rout	2.4	45	0.0492	15	Chip-breaker

After routing，some burr might still need to be cleaned manually.

Good vacuum action will generally reduce burr.