



# High Speed/Low Loss & Green

## EM-828 / EM-828B

- Low Dk and Df
- Low moisture absorption
- Excellent CAF resistance
- Halogen, antimony and red phosphorus free
- For high speed sever, network and telecom application

### Basic Laminate Property

Item	Test method	Test condition	Unit	Core thickness		
				≥ 0.031" ( 0.78mm)		
				*IPC Spec.	Typical Value	
Glass transition temp.	2.4.25	DSC	°C	min. 170	175	
CTE, X-, Y-axis	2.4.24	Pre-Tg, TMA	ppm/°C	—	12/15	
CTE, Z-axis	2.4.24	Alpha 1, TMA	ppm/°C	max. 60	50	
		Alpha 2, TMA	ppm/°C	max. 300	250	
Z-axis Expansion	2.4.24	50~260°C, TMA	%	max. 3.0	2.6	
Decomposition temp.	2.4.24.26	TGA	°C	min. 340	380	
Thermal stress 10sec 288°C	2.4.13.1	A. Clad	—	Pass Visual	Pass Visual	
		B. Etched	—	Pass Visual	Pass Visual	
Water absorption	2.6.2.1	E-1/105+D-24/23	%	max. 0.8	0.07	
Peel strength	0.5 oz	2.4.8	as received	lb/in	—	5.5
			after thermal stress	lb/in	—	5.5
	1.0 oz	2.4.8	as received	lb/in	min. 6	7.0
			after thermal stress	lb/in	min. 6	7.0
Permittivity (RC 50%)	1 GHz	2.5.5.9	C-24/23/50	—	—	3.9
	6 GHz	Cavity Resonator		—	—	3.8
Loss tangent (RC 50%)	1 GHz	2.5.5.9	C-24/23/50	—	—	0.008
	6 GHz	Cavity Resonator		—	—	0.011
Volume resistivity	2.5.17.1	C-96/35/90	MΩ-cm	min. 1*10 <sup>6</sup>	>10 <sup>10</sup>	
Surface resistivity	2.5.17.1	C-96/35/90	MΩ	min. 1*10 <sup>4</sup>	>10 <sup>9</sup>	
Flexural strength	Warp	2.4.4	as received	MPa	min. 415	420~450
	Fill		as received	MPa	min. 345	360~390
Flame resistance	UL-94	A&E-24/125	—	min. V-0	V-0	

Specification Sheet : IPC-4101C / 130



## High Speed/Low Loss & Green EM-828 / EM-828B

### Basic Available Prepreg

Type	Resin Content (%)	Resin Flow (%)	Gel Time (sec)	Volatile Content (%)	Scale Flow (mil/ply)	Unclad Laminate Thickness (mil)
7629	43.0±3.0	22.0±7.0	165±25	≤ 2.0	8.5±0.7	8.1±0.7
	47.0±3.0	26.0±7.0	160±25	≤ 2.0	8.8±0.7	8.8 ±0.7
1501	47.0±3.0	25.0±7.0	170±25	≤ 2.0	7.0±0.7	7.1±0.7
	51.0±3.0	32.0±7.0	170±25	≤ 2.0	7.5±0.7	7.8±0.7
2116	52.0±3.0	28.0±7.0	170±25	≤ 2.0	5.0±0.7	5.0±0.5
	56.0±3.0	34.0±7.0	170±25	≤ 2.0	5.5±0.7	5.5±0.5
2113	55.0±3.0	30.0±7.0	170±25	≤ 2.0	4.0±0.7	4.1±0.4
1080	63.0±3.0	34.0±7.0	170±25	≤ 2.0	3.0±0.7	3.2±0.4
	66.0±3.0	40.0±7.0	170±25	≤ 2.0	3.2±0.7	3.6±0.4
	70.0±3.0	45.0±7.0	170±25	≤ 2.0	3.5±0.7	4.0±0.4
106	71.0±3.0	32.0±7.0	170±25	≤ 2.0	2.0±0.7	2.3±0.4
	74.0±3.0	38.0±7.0	170±25	≤ 2.0	2.2±0.7	2.5±0.4

**Notice:**

1. Table listed as above is basic property for reference only.
2. Lower resin content might be insufficient resin for lower copper residual or heavy copper of inner layer.
3. If you have any other requirement, please contact our sales or customer service representatives.



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### Basic Available CCL

Thickness inch (mm)	Tolerance inch (mm)	Construction
0.002" (0.051)	± 0.0005" (0.013)	106×1
0.0023" (0.058)	± 0.0005" (0.013)	106×1
0.003" (0.076)	± 0.0005" (0.013)	1080×1
0.0035" (0.089)	± 0.0005" (0.013)	2113×1
0.004" (0.102)	± 0.0005" (0.013)	2113×1
0.004" (0.102)	± 0.0005" (0.013)	106×2
0.0042" (0.107)	± 0.0005" (0.013)	2116×1
0.005" (0.127)	± 0.0007" (0.018)	2116×1
0.005" (0.127)	± 0.0007" (0.018)	1080×2
0.006" (0.152)	± 0.0007" (0.018)	1080×2
0.0064" (0.163)	± 0.0007" (0.018)	1501×1
0.007" (0.178)	± 0.0010" (0.025)	7628×1
0.008" (0.203)	± 0.0010" (0.025)	7629×1
0.010" (0.254)	± 0.0010" (0.025)	2116×2
0.0125" (0.318)	± 0.0015" (0.038)	1501×2
0.014" (0.355)	± 0.0015" (0.038)	7628×2
0.015" (0.355)	± 0.0015" (0.038)	7629×2
0.021" (0.533)	± 0.0020" (0.051)	7628×3
0.028" (0.711)	± 0.0020" (0.051)	7628×4
0.031" (0.787)	± 0.0030" (0.076)	7629×4

\* Notice: Above thickness does not include copper

Thickness inch (mm)	Tolerance inch (mm)	Construction
0.039" (0.991)	± 0.0030" (0.076)	7628×2+7629×3 (for 1oz copper)
0.047" (1.194)	± 0.0030" (0.076)	7629×6
0.059" (1.500)	± 0.0030" (0.076)	7628×8 (for 1 oz copper)
0.059" (1.500)	± 0.0030" (0.076)	7629×4+7628×4 (for H oz copper)
0.062" (1.575)	± 0.0030" (0.076)	7629×8

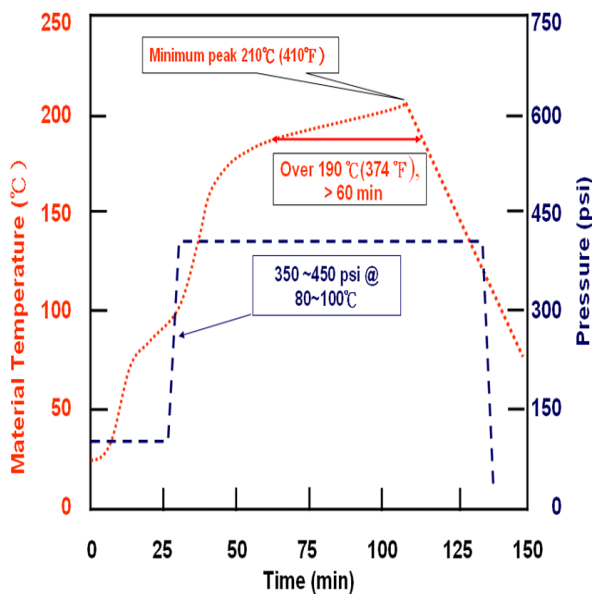
\* Notice: Above thickness include copper.



## High Speed/Low Loss & Green EM-828 / EM-828B

### Press Cycle

Basic press cycle for normal construction of multilayer PWB:



Kiss pressure: 5 ~ 7 kgf / cm<sup>2</sup>( 70 ~ 100 psi )

Heat rate: 1.8 ~ 2.2 °C / min

Full pressure : 25 ~ 32 kgf / cm<sup>2</sup>  
( 350 ~ 450 psi )

Apply full pressure at: 80 ~ 100 °C

Curing condition: > 190 °C / 60 min

( Minimum peak temperature should reach :  
210 °C )

The higher heating rate gives the better peel strength and inner layer pattern filling. The lower heating rate provides lower press flow for better thickness uniformity. Please contact our customer service for setting suitable press cycle if necessary.

### Prepreg storage (Shelf life)

EM-828B should be stored under 23°C , RH 60% for 3 month shelf life.