

Standardized Information for Process/Product Change Notification (PCN)

Based on the JEDEC Standard JESD46 standard (latest release)

Not for publication unless permission is granted by LEM			1. PCN basic data		
1.1 Company			LEM International SA Route du Nant d'Avril 152 1217 Meyrin Switzerland		
1.2 PCN No.	PCN-049_2026_0-OMTS26xxxxx				
1.3 Title of PCN	PCB material change				
1.4 Product Category	Electronic module - Current sensor				
1.5 Issue date	2026/07/08				
1.6 PCN revision history (optional)	1.7 Issue date of previous revision (optional)		1.8 Delta to previous revision (optional)		

Form provided by ZVEI - Revision 5.0

2. PCN Team		
2.1 Contact supplier		
2.1.1 Name	Saravanakkumar Arumugam - Product Life Cycle Coordinator	
2.1.2 Phone		
2.1.3 Email	Srm@lem.com	
2.2 Team supplier (optional)		
2.2.1 Name (optional)	2.2.2 Phone (optional)	2.2.3 Email (optional)
Stéphane Rollier - Product Life Cycle	0041227061449	sro@lem.com

3. Changes			
No.	3.0 Ident	3.1 Category	3.2 Type of change
#1	SEM-PA-16	PROCESS - ASSEMBLY	Change of direct material supplier

4. Description of change		
	Old	New
Change #1	PCB material: EM825	PCB material: EM825 or S1000H
4.1 Anticipated impact on form, fit, function, reliability or processability?	Comparison between current and second source PCB materials as enclosed as well as their respective data sheets. No impact on form, fit, function, reliability, data sheet, process, quality and product safety.	
4.2 Reference parts with customer number (optional)		

5. Reason / motivation for change	
5.1 Motivation	To secure supply chain, avoid shortages on deliveries.
5.2 Additional explanation (optional)	

6. Marking of parts / traceability of change	
6.1 Description	No change in the marking of the parts. Traceability ensured by datecode.

7. Timing / schedule		
7.1 Date of qualification results		
7.2 Last order date (optional)		
7.3 Last delivery date (optional)		
7.4 Intended start of delivery	2026/08/31	Short notice due to sudden shortage for the current PCB material, "Force majeure" case.
7.5 Qualification samples available?		
7.6 Customer feedback required until	2026/08/17	

8. Qualification / validation			
8.1 Description (e.g. qual. plan/report, AEC-Q...)			
8.2 Qualification report and qualification results	not applicable	▼	issue date

9. Input to customer for risk assessment process

10. Attachments (e.g. new datasheet, additional documentation, pictures, process flow, sample plan, ...)

11. Affected parts									
11.1 Current						11.2 New (if applicable)			
11.1.1 Customer Part No.	11.1.2 Supplier Part Name	11.1.3 Supplier Part No. (optional)	11.1.4 Package Name	11.1.5 Part Description (optional)	11.1.6 Additional Part Information (optional)	11.2.2 Supplier Part Name	11.2.3 Supplier Part No. (optional)	11.2.4 Package Name	11.2.6 Additional Part Information (optional)
	LES 15-NP								
	LES 25-NP								
	LES 50-NP								
	LES 6-NP								
	LESR 15-NP								
	LESR 15-NP KIT 3P								
	LESR 15-NP/SP1								

	LESR 15-NP/SP2							
	LESR 25-NP							
	LESR 25-NP KIT 3P							
	LESR 25-NP/SP1							
	LESR 50-NP							
	LESR 50-NP KIT 3P							
	LESR 50-NP/SP1							
	LESR 6-NP							
	LESR 6-NP KIT 3P							
	LESR 6-NP/SP1							
	LKSR 15-NP							
	LKSR 15-NP KIT 3P							
	LKSR 15-NP/SP1							
	LKSR 25-NP							
	LKSR 25-NP/SP1							
	LKSR 50-NP							
	LKSR 50-NP KIT 3P							
	LKSR 50-NP/SP1							
	LKSR 6-NP							
	LKSR 6-NP KIT 3P							
	LKSR 6-NP/SP1							
	LKSR 75-NP							
	LPSR 15-NP							
	LPSR 15-NP KIT 3P							
	LPSR 15- NP/SP1							
	LPSR 25-NP							
	LPSR 25-NP KIT 3P							
	LPSR 25- NP/SP1							
	LPSR 50-NP							
	LPSR 50-NP KIT 3P							
	LPSR 50- NP/SP2							
	LPSR 6-NP							
	LPSR 6-NP KIT 3P							
	LPSR 6- NP/SP1							
	LXS 15-NPS							
	LXS 25-NPS							
	LXS 6-NPS							
	LXSR 15-NPS							
	LXSR 15-NPS KIT 3P							
	LXSR 25-NPS							
	LXSR 25-NPS KIT 3P							
	LXSR 6-NPS							
	LXSR 6-NPS KIT 3P							

Customer Feedback/Approval Form

Form provided by ZVEI - Revision 5.0

Title of PCN:			
PCB material change			
Customer PCN No.		Supplier PCN No.	PCN-049_2026_0-OMTS26xxxxx
Please check the appropriate box below:			

1. feedback to be provided within 3 weeks after the reception of the PCN.

☐	1. Feedback	date:	
☐	We agree with this proposed change for the parts as listed in chapter '11. Affected parts'. Approval letter will be sent in written form.		
☐	We agree with this proposed change schedule and will start with the PCN process. Approval letter will be sent in written form after evaluation.		
☐	We disapprove because:		
☐	Remark:		

2. feedback to be provided within 6 weeks after the reception of the PCN.

☐	2. Feedback	date:	
☐	We acknowledge qualification / validation as assigned in chapter 8 of the PCN.		
☐	We need more information:		
☐	We need the following samples:		
☐	Estimated closing date for PCN:		

☐	Final Feedback/Approval	date:	

Sender:	
Company:	
Name:	
Address/Location:	
Signature:	
Date:	

Please return to: [your Sales partner]	
Name:	Saravanakkumar Arumugam - Product Life Cycle Coordinator
Address/Location:	
Phone:	
Fax:	
Email:	Srm@lem.com

In case LEM does not receive any feedback within 6 weeks at the latest after PCN notification, LEM will assume:

- Customer acceptance to the change
- No need for samples
- No additional need

1. feedback to be provided within 3 weeks after the reception of the PCN.
2. feedback to be provided within 6 weeks after the reception of the PCN.

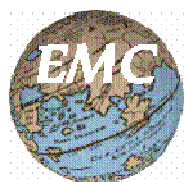
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Based on the JEDEC Standard JESD46 standard (latest release)

				EM-825(I)	S1000H
Thermal property	Test Method	Test Condition	Unit	Typical Value	Typical Value
Tg	IPC-TM-650 2.4.25D	DSC	°C	150	160
Td	IPC-TM-650 2.4.24.6	TGA	°C	340	348
Z-axis CTE	IPC-TM-650 2.4.24	Before Tg	ppm/°C	40-45	37
	IPC-TM-650 2.4.24	After Tg	ppm/°C	240-250	230
	IPC-TM-650 2.4.24	Expansion 50~260°C	%	3.2	2.8
T260	IPC-TM-650 2.4.24.1	TMA	min	> 60	> 60
T288	IPC-TM-650 2.4.24.1		min	> 20	20
Flammability	UL94		Rating	94V-0	94V-0
Electrical property					
Permittivity	IPC-TM-650 2.5.5.5	C-24/23/50 @1GHz		4.4	4.6
Loss Tangent	IPC-TM-650 2.5.5.5	C-24/23/50 @1GHz		0.016	0.011
Dielectric Breakdown	IPC-TM-650 2.5.6		KV	> 45	>45
Comparative Tracking Index	IEC60112	A	Rating	PLC3	PLC3
Arc Resistance	IPC-TM-650 2.5.1		Sec	> 120	150
Volume Resistivity	IPC-TM-650 2.5.17.1	After Moisture Resistance	MΩ/cm	>1.0x10 ¹⁰	1.5x10 ⁸
Surface Resistivity	IPC-TM-650 2.5.17.1	After Moisture Resistance	MΩ	>1.0x10 ⁹	3.5x10 ⁷
Mechanical property					
Flexural Strength	IPC-TM-650 2.4.4	Lengthwise	Mpa	510-570	530
	IPC-TM-650 2.4.4	Crosswise	Mpa	450-500	440
Peel Strength - 1oz	IPC-TM-650 2.4.8	288°C/10s	lb/in & N/mm	8.5lb/in	1.3N/mm
Water absorption	IPC-TM-650 2.6.2.1	D-24/23	%	0.11	0.09



Low CTE Middle Tg Material

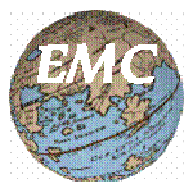
EM-825 / EM-825B

- Low Z-axis CTE < 3.5% (50~260 °C)
- Low moisture absorption
- Excellent thermal stability for lead-free processing
- For mobile device and server application

Basic Laminate Property

Item		IPC-TM-650	Test condition	Unit	Typical Value
Glass transition temp.		2.4.25	DSC		150
CTE, X-, Y-axis		2.4.24	Pre-Tg, TMA	ppm/	12/15
CTE, Z-axis		2.4.24	Alpha 1, TMA	ppm/	50
			Alpha 2, TMA	ppm/	260
Z-axis Expansion		2.4.24	50~260 , TMA	%	3.2
Decomposition temp.		2.4.24.26	TGA		340
Thermal stress 10sec 288		2.4.13.1	Clad	—	Pass Visual
			Etched	—	Pass Visual
Water absorption		2.6.2.1	E-1/105+D-24/23	%	0.10
Peel strength	0.5 oz	2.4.8	as received	lb/in	6.5
			after thermal stress	lb/in	6.5
	1.0 oz	2.4.8	as received	lb/in	8.5
			after thermal stress	lb/in	8.5
Permittivity (RC 50%)	1 MHz	2.5.5.9	C-24/23/50	—	4.9
	1 GHz			—	4.3
Loss tangent (RC 50%)	1 MHz	2.5.5.9	C-24/23/50	—	0.015
	1 GHz			—	0.016
Electric strength		2.5.6.2	as received	KV/mm	45
Volume resistivity		2.5.17.1	C-96/35/90	MΩ-cm	>10 ¹⁰
Surface resistivity		2.5.17.1	C-96/35/90	MΩ	>10 ⁹
Flexural strength	Warp	2.4.4	as received	MPa	510~540
	Fill		as received	MPa	410~460
Flame resistance		UL-94	A&E-24/125	—	V-0

Specification Sheet : IPC-4101C / 99



Low CTE Middle Tg Material

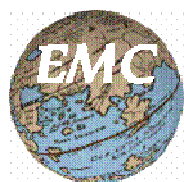
EM-825 / EM-825B

Basic Available Prepreg

Type	Resin Content (%)	Gel Time (sec)	Volatile Content(%)	Unclad Laminate Thickness (mil)
7628	52.5±3.0	100±25	0.7	8.8
	47.0±3.0	100±25	0.7	7.8
1506	55.0±3.0	105±25	0.7	7.3
	51.0±3.0	105±25	0.7	6.7
2116	59.0±3.0	105±25	1.0	5.3
	56.0±3.0	105±25	1.0	4.8
	51.0±3.0	105±25	1.0	4.2
2313	58.0±3.0	105±25	1.0	4.0
2113	58.0±3.0	105±25	1.0	4.0
3313	58.0±3.0	105±25	1.0	4.0
1080	69.0±3.0	105±25	1.5	3.2
	66.0±3.0	105±25	1.5	3.0
	63.0±3.0	105±25	1.5	2.8
1086	69.0±3.0	105±25	1.5	3.6
	66.0±3.0	105±25	1.5	3.3
	63.0±3.0	105±25	1.5	3.1
106	76.0±3.0	105±25	1.5	2.2
	72.0±3.0	105±25	1.5	2.0
1067	76.0±3.0	105±25	1.5	2.9
	72.0±3.0	105±25	1.5	2.4

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.



Low CTE Middle Tg Material

EM-825 / EM-825B

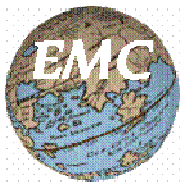
Basic Available CCL

Thickness inch (mm)	Tolerance inch (mm)	Construction
0.0023" (0.058)	±0.0005" (0.013)	106×1
0.0025" (0.064)	±0.0005" (0.013)	1067×1
0.003" (0.076)	±0.0005" (0.013)	1086×1
0.0042" (0.107)	±0.0005" (0.013)	2116×1
0.005" (0.127)	±0.0007" (0.018)	2116×1
0.0064" (0.163)	±0.0007" (0.018)	1506×1
0.007" (0.178)	±0.0010" (0.025)	7628×1
0.008" (0.203)	±0.0010" (0.025)	7628×1
0.010" (0.254)	±0.0010" (0.025)	2116×2
0.0125" (0.318)	±0.0015" (0.038)	1506×2
0.014" (0.356)	±0.0015" (0.038)	7628×2
0.015" (0.381)	±0.0015" (0.038)	7628×2
0.020" (0.508)	±0.0020" (0.051)	7628×2+2116×1
0.021" (0.533)	±0.0020" (0.051)	7628×3
0.024" (0.610)	±0.0020" (0.051)	7628×3
0.028" (0.711)	±0.0020" (0.051)	7628×4
0.031" (0.787)	±0.0030" (0.076)	7628×4

* Notice: Above thickness does not include copper

Thickness inch (mm)	Tolerance inch (mm)	Construction
0.039" (0.991)	± 0.0030" (0.076)	7628×5 (Hoz / 1oz)
0.047" (1.194)	± 0.0030" (0.076)	7628×6 (Hoz / 1oz)
0.059" (1.499)	± 0.0030" (0.076)	7628×8 (Hoz / 1oz)
0.062" (1.575)	± 0.0030" (0.076)	7628×8 (Hoz / 1oz)

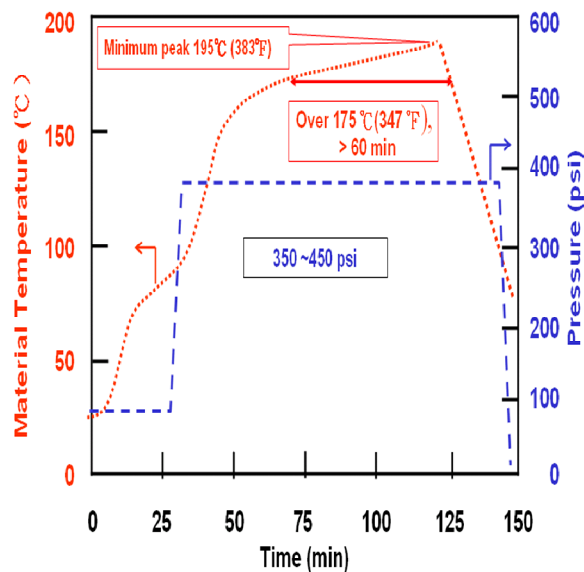
* Notice: Above thickness include copper.



Low CTE Middle Tg Material EM-825 / EM-825B

Press Cycle

Basic press cycle for normal construction of multilayer PWB:



Kiss pressure: 5 ~ 7 kgf / cm² (70 ~ 100 psi)

Heat rate: 1.8 ~ 2.5 / min

Full pressure : 25 ~ 32 kgf / cm²
(350 ~ 450 psi)

Apply full pressure at: 80 ~ 100

Curing condition: > 175 / 60 min

(Minimum peak temperature should reach :
195)

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-825B should be stored under 23 °C, RH 55% for 3 month shelf life.



S1000H

FR-4.0

FEATURES

- Lead-free compatible FR-4
- Excellent thermal reliability
- Z-CTE 3.0%
- Good in anti-CAF performance and IST
- Low water absorption

APPLICATIONS

Computer and NB
Instruments
Consumable Digit
Automotives Electronics
and Industrial

GENERAL PROPERTIES

Items		Condition	Unit	Property Data	
				Spec.	Typical Value
Tg		DMA	℃	≥150	160
Flammability		C-48/23/50 and E-24/125	-	V-0	V-0
Volume Resistivity		After moisture resistance	MΩ-cm	≥10 ⁶	1.5E+08
		E-24/125		≥10 ³	3.2E+06
Surface Resistivity		After moisture resistance	MΩ	≥10 ⁴	3.5E+07
		E-24/125		≥10 ³	2.3E+06
Arc Resistance		D-48/50+D-0.5/23	S	≥60	150
Dielectric Breakdown		D-48/50+D-0.5/23	KV	≥40	45KV+NB
Dielectric Constant	(1GHz)	C-24/23/50	-	-	4.6
	(1MHz)	C-24/23/50	-	≤5.4	4.9
Dissipation Factor	(1GHz)	C-24/23/50	-	-	0.011
	(1MHz)	C-24/23/50	-	≤0.035	0.009
Thermal Stress		288℃, solder dip	-	>10s No Delamination	>100s No Delamination
Peel Strength (1 Oz)		288℃/10s	N/mm	≥1.05	1.3
Flexural Strength		LW	Mpa	≥415	530
		CW		≥345	440
Water Absorption		D-24/23	%	≤0.5	0.09
CTE(Z-axis)		Before Tg	PPM/℃	≤60	37
		After Tg	PPM/℃	≤300	230
		50-260℃	%	≤3.5	2.8
Td		Wt5%loss	℃	≥325	348
T260		TMA	min	≥30	60
T288		TMA	min	≥5	20
CTI		IEC60112Method	V	PLC3 (175~249)	PLC3

Specimen thickness: 1.6mm. Test method is according to IPC-TM-650.

Remarks: 1.All the typical value is based on the 1.6mm specimen,while the Tg is for specimen ≥0.50mm.
2.All the typical val only/ple

Explanations: C = Humidity conditioning; D = Immersion conditioning in distilled water; E = Temperature conditioning.

The figures following the letter symbols indicate with the first digit the duration of the preconditioning in hours, with the second digit the preconditioning temperature in °C and with the third digit the relative humidity.

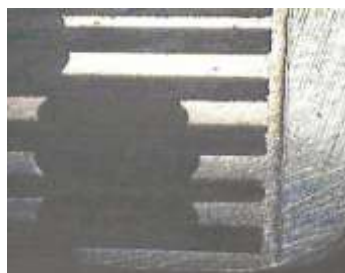


S1000H

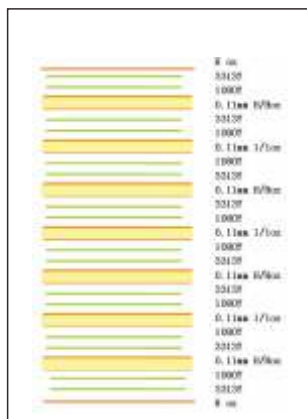
(UL ANSI:FR-4.0) High Performance, Mid-Tg Lead-free

Heavy Copper Board application

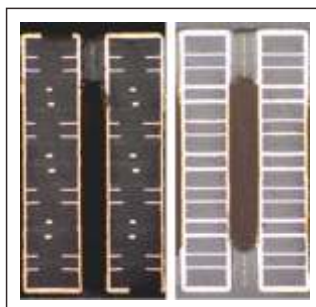
Test Sample: S1000H, inner copper 4Oz
Test Method: Solder dip 288°C, 10s, 3X



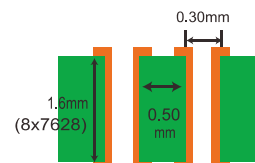
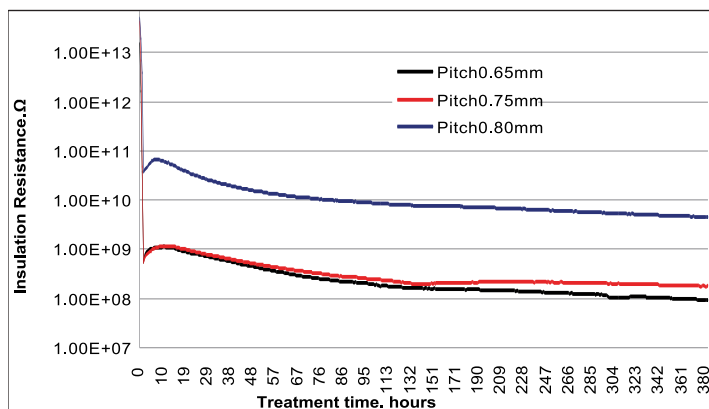
High layer count application evaluation



Structure : 16-Layer, 0.30mm/0.8Pitch
Overall thickness : 2.4mm
Test : 260°C reflow 5times



Hast Test



Pretreatment condition:

125°C/4hrs->85°C/85%RH/96hrs->260°C

Lead free reflow 1X

HAST condition:

121°C/85%RH/50VDC



S1000HB PREPREG

(UL ANSI:FR-4.0) High Performance, Mid-Tg Lead-free

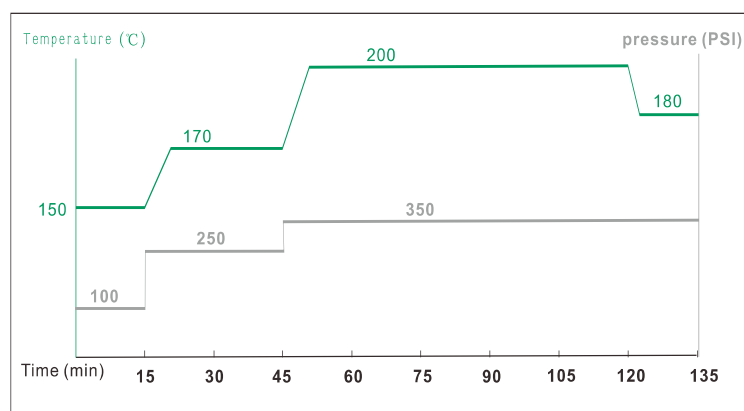
PREPREG PARAMETERS

Glass fabric type	Resin content (%)	Cured thickness (mm)	DK(1GHz)	Df(1GHz)	Standard size (Roll type)
106/1037	73	0.050	3.9	0.021	1.260m X150m
	78	0.060	3.8	0.021	
1080/1078	65	0.072	4.1	0.020	1.260m X300m
	68	0.078	4.1	0.020	
	70	0.085	4.0	0.020	
2313	57	0.100	4.3	0.018	1.260m X250m
2116	55	0.120	4.3	0.017	
	58	0.130	4.3	0.018	
1506	48	0.160	4.4	0.016	1.260m X150m
7628	46	0.195	4.4	0.016	
	48	0.205	4.3	0.016	
	50	0.215	4.3	0.016	

Remark: DK and Df are tested according to IPC TM-650 2.5.5.9

Prepreg type, resin content and size could be available upon request.

HOT PRESSING CYCLE



- Heat up rate: 1.0-2.5°C/min (80-140°C)
- Curing time: >45min (>180°C)
- The hot pressing parameter is for your reference only; please turn to Shengyi Technology Co., Ltd. for detailed information.

STORAGE CONDITION

- 3 months when stored at < 23°C and <50% RH.
- 6 months when stored at <5°C. Normalize in room temperature for at least 4h before using.
- Beware of moisture, always keeping wrapped in damp-proof material. Were kept in normal condition, prepreg might absorb moisture and its bonding strength would be weakened.
- Avoid UV-rays and strong light.