



Doosan Corporation
Electro-Materials

DS-7209

(ANSI : CEM-3)

COPPER CLAD LAMINATES

Features

- Process similar to FR-4 including PTH
- Punching process applicable
- Excellent mechanical & electrical properties
- Lower thermal expansion

Applications

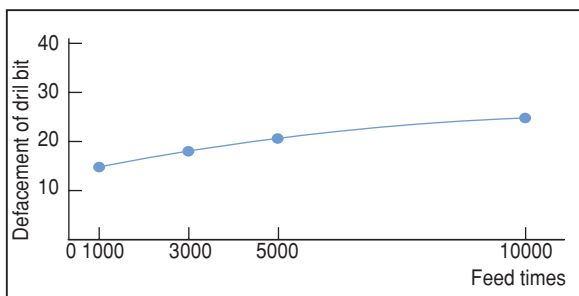
Test & Measurement equipment, Tuner, Car electronics, Power supply, etc.

International Standard Recognition

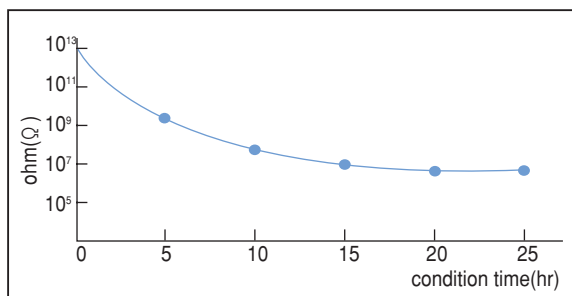
- UL : E103670
- CSA : LS-93237
- BSI : 6741
- VDE : VDE-Reg-Nr. 4945

Drilling processability

Drill defacement (Round direction) (60,000rpm, 50 μ m/ rev ,3 sheets)

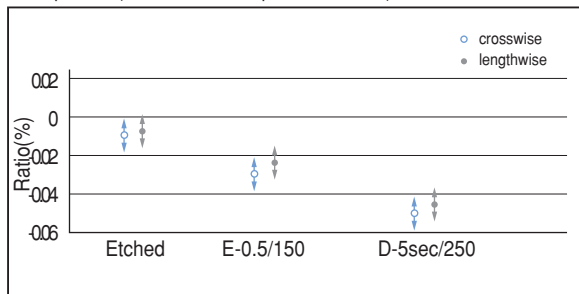


Insulation resistance at pressure cooker



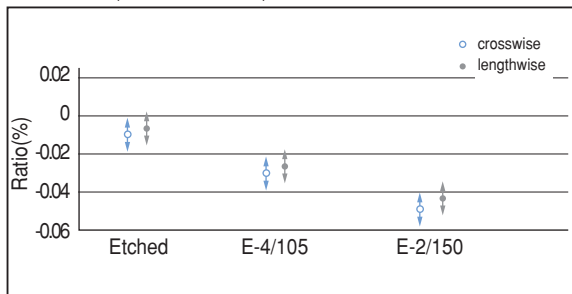
Dimensional stability

PCB process (size360X310mm span310X254mm)

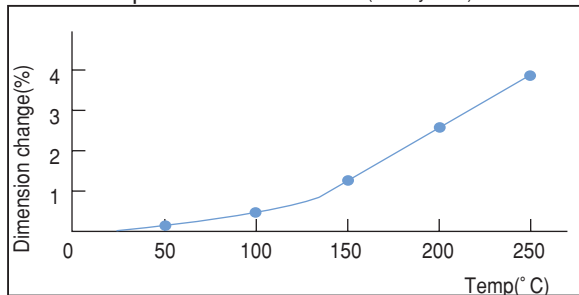


Dimensional stability

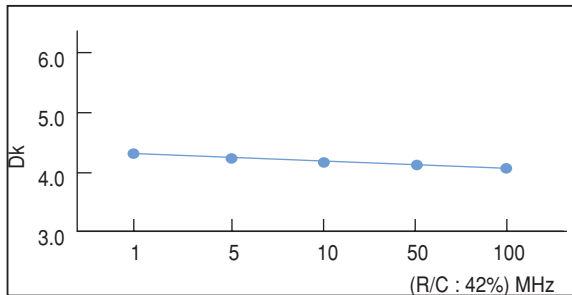
Test method (IPC-TM-650 2.4.39)



Thermal expansion of Z-direction (Test by TMA)



Dielectric constant



COPPER CLAD LAMINATES

General Properties

Test Item	Unit	Treatment Condition	Designation	DS-7209
			ANSI Grade	CEM-3
			Property Data	
			Standard Value	Guaranteed Value
Tg	°C	DSC TMA	135	above 130
			130	above 125
CTE x-axis y-axis z-axis	ppm/°C	Ambient to Tg	28	less than 30
			24	less than 26
			55	less than 60
Flammability	-	UL-94	V-0	V-0
Insulation Resistance	ohm	C-96/20/65	$1 \times 10^{12} - 1 \times 10^{13}$	above 5×10^{11}
		C-96/20/65+D-2/100	$1 \times 10^{10} - 1 \times 10^{11}$	above 1×10^9
Volume Resistivity	ohm-cm	C-96/20/65	$1 \times 10^{14} - 1 \times 10^{15}$	above 1×10^{13}
		C-96/20/65+C-96/40/90	$5 \times 10^{13} - 5 \times 10^{14}$	above 5×10^{12}
Surface Resistance	ohm	C-96/20/65	$5 \times 10^{13} - 5 \times 10^{14}$	above 1×10^{12}
		C-96/20/65+C-96/40/90	$1 \times 10^{12} - 1 \times 10^{13}$	above 1×10^{11}
Arc Resistance	min. sec		110	above 60
Dielectric Constant (1 MHz)	-	C-96/20/65	4.2 - 4.5	less than 5.5
		C-96/20/65+D-48/50	4.3 - 4.8	less than 5.8
Dissipation Factor (1 MHz)	-	C-96/20/65	0.015 - 0.020	less than 0.035
		C-96/20/65+D-48/50	0.018 - 0.023	less than 0.045
Comparative Tracking Index	volt	IEC Method	-	-
Solder Float(260°C)	sec	A	above 120	above 60
Peel Strength	Cu.foil1 oz (0.035mm) kgf/cm	A	1.6 - 1.8	above 1.43
Flexural Strength	kgf/mm ²	A	30 - 40	above 22.4
Water Absorption	%	E-24/50+D-24/23	0.10 - 0.15	less than 0.25

Specimen Thickness : 1.6mm

Purchasing Information

- Copper foil : 0.5 oz/ft²(0.018 mm), 1 oz/ft²(0.035 mm), 2 oz/ft²(0.070 mm) available
- Thickness : 0.8mm to 1.6mm
- 7209(S) : Pauching property improved, yellowish color in layer

Standard Size		Tolerance(mm)
1,020 X 1,220mm (40" X 48")	915 X 1,220mm (36" X 48")	+3
1,070 X 1,220mm (42" X 48")	970 X 1,220mm (38" X 48")	-0
1,020 X 1,020mm (40" X 40")		

※ Other sheet size and thickness could be available upon request.

※ UV Block & Yellow color available (DS-7209, DS-7209S, DS-7209P)