SPACER & HEAT-SINK COMPOSITES

S-CMC (Super - Copper Molybdenum Clad)

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powered by

FJ Composite

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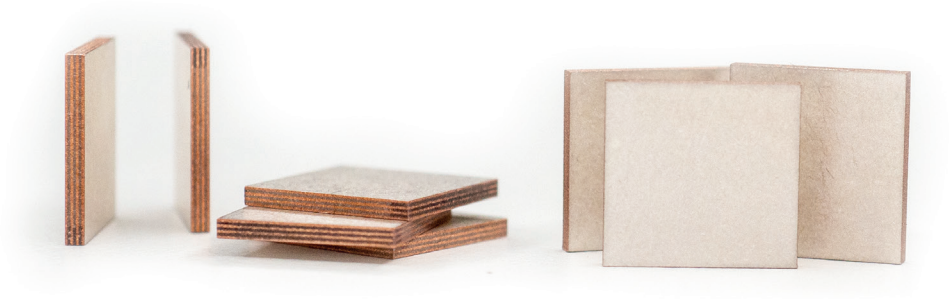
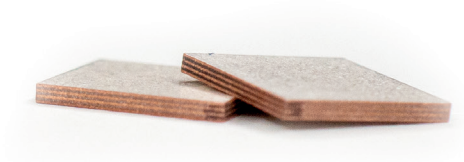
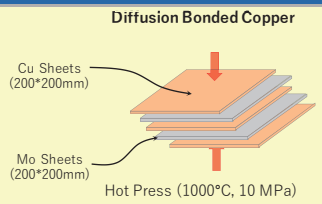
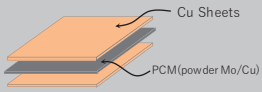
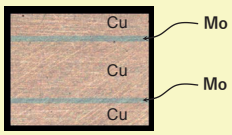
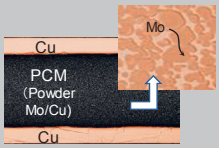
PHYSICAL PROPERTIES TABLE

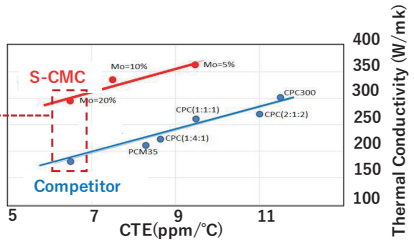
Typical Properties		Super - CMC				Reference	
Mo Content (%)		Mo=5%	Mo=10%	Mo=20%	Mo=40%	Cu	Mo
Thermal Conductivity (W / mK)	Z-direction	362	335	291	230	394	137
	XY-direction	381	369	344	290		
Thermal Expansion (x 10^{-6}/°C	RT - 250°C	14.8	11.8	7.4	6.6	17	5.2
	RT - 400°C	13.5	9.3	6.8	6.2	18	5.6
	RT - 800°C	9.5	7.5	6.5	6.1	19	5.7



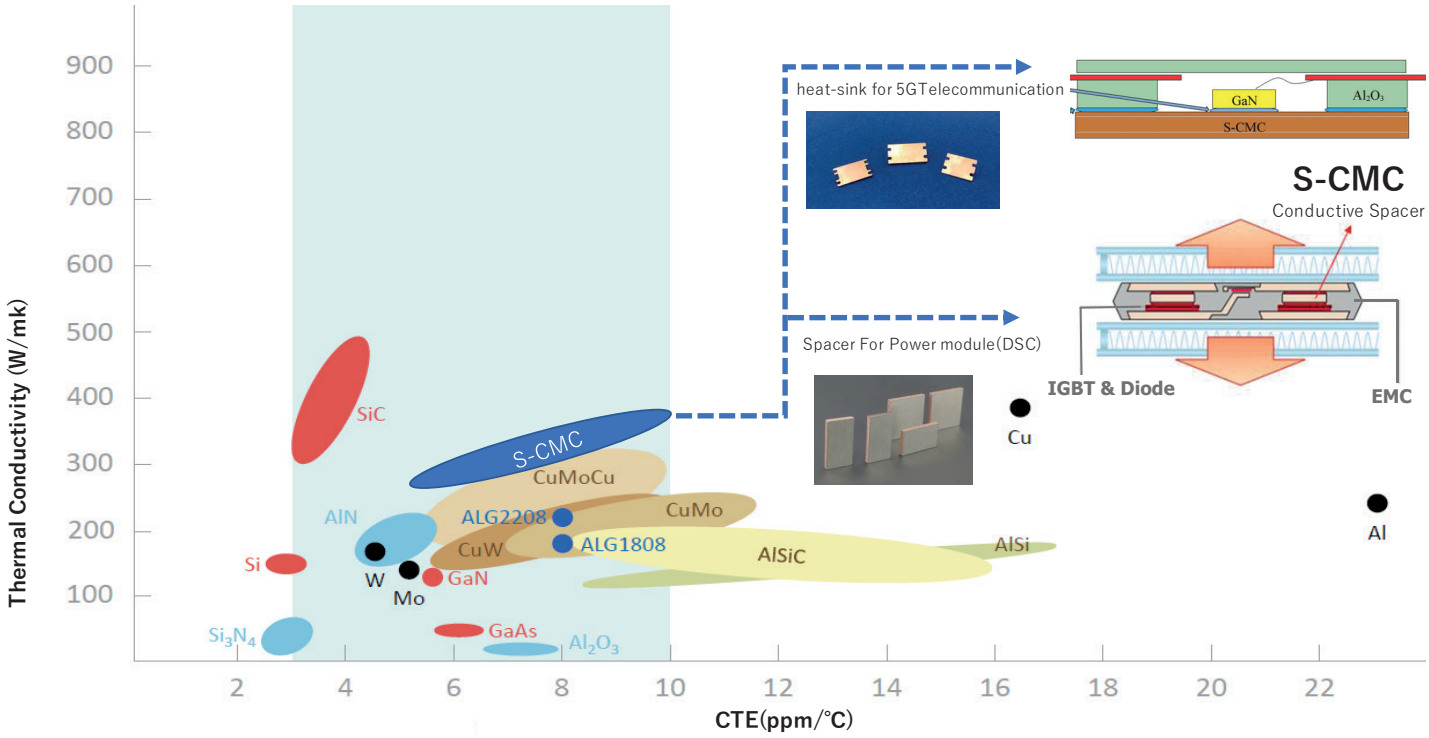


		S-CMC	Competitor (CPC)
Process Description	Metalizing Method		
Features	Cross section structure	 *Various layer structure available according to customer request	
	Properties		

		S-CMC	Competitor
C.T.E	ppm/°C	6~7	
Thermal Conductivity	Z-dir.	291	180
	XY-dir.	344	230

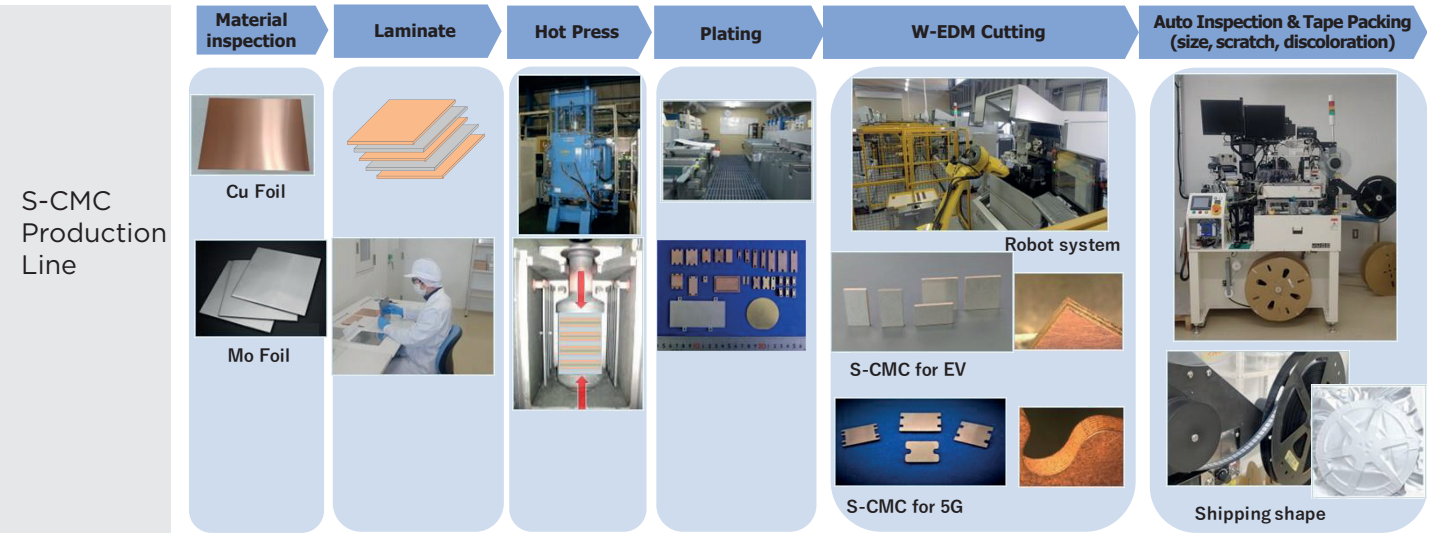


MATERIAL CHARACTERISTICS OF S-CMC AND OTHER MATERIALS



Our original „S-CMS® (Super CMC)“ is composed of multiple layers of Mo foil and Cu foil.
Mo foil is effective more than Mo powder in order to control the CTE.
As a result, S-CMC is high termal conductivity because of less Mo using.

S-CMC PROCESS CHART



•Mo content (CTE) can be easily adjusted according to customer needs (low thermal expansion, high thermal conductivity)
•Diffusion bonding of various materials such as tungsten, diamond, AlN, aluminum, and carbon are possible.
•A wide variety of plating is possible. (Ni, Ag, Au, Au/Sn, Pt, etc)

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CONDUCTIVE SPACER DESIGN RULES

Spacer Spec			
Items		Unit	Value
Size		mm	1m~200mm
Dimension		mm	±0.05
Thickness		mm	±0.0075
Fillet		mm	≤ R0.1
Roughness		µm	≤ Ra 1
Burr	X,Y	mm	MAX 0.01
	Z	mm	MAX 0.01

Plating Spec			
Items		Unit	Value
			Electro Plating Non-Electro Plating
Specifications	1st (Ni)	µm	1~3
	2st (Ag)	µm	1~3
* Other plating is also available			

Properties		
Items		Value
CTE (DIL) *In case of Mo=20%	RT - 250°C	7.4 ppm/°C
	RT - 300°C	7.1 ppm/°C
Thermal conducitivity *In case of Mo=20%	25°C	Z-dir. = 291W/mK
		X=Y-dir. = 344 W/mK
	100°C	Z-dir. = 290W/mK
		X=Y-dir. = 343 W/mK
Specific Heat [kJ/(kg•K)]	kJ/kgK	0.34
Specific Gravity		9.3
Hardness [Hv]	Hv	120
Transverse Rapture Strength	MPa	100
Tensile Strenght	MPa	120
Young's Moduls	Gpa	120
Poisson's Tatio		0.3
Electric Resistivity	Ωm	0.0003

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