SANTIER
Engineered Microelectronic Housings & Assemblies

Heat Sinks - Tungsten/Copper Composites

Reference Physical and Mechanical Properties	Density at 20°C [g/cm^3]	Coefficient of thermal expansion at 20°C [10^{-6}/K]	Thermal Conductivity at 25°C/100°C [W/mk]	Specific heat at 100°C [J/kgK]	Electrical resistance at 20°C [µΩm]	Young's modulus at 20°C [GPa]	Vickers hardness [HV 10]
WCu 90:10	17.1	6.4	174	160	0.045	330	300
WCu 87:13	16.8	6.7	183	168	0.043	320	290
WCu 85:15	16.4	7.3	188	174	0.040	310	280
WCu 80:20	15.5	8.3	206	195	0.034	280	260

Heat Sinks - Molybdenum/Copper Composites

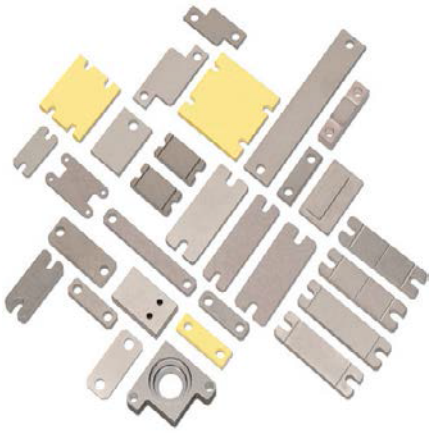
Reference Physical and Mechanical Properties	Density at 20°C [g/cm^3]	Coefficient of thermal expansion at 20°C [10^{-6}/K]	Thermal Conductivity at 20°C/100°C [W/mk]	Specific heat at 100°C [J/kgK]	Electrical resistance at 20°C [µΩm]	Young's modulus at 20°C [GPa]	Vickers hardness [HV 10]
MoCu 70:30	9.7	7.5	174	301	0.037	225	170
MoCu 50:50	9.5	9.9	220	323	0.028	172	150

Other Materials

Material	Density [g/cm^3]	Coefficient of Thermal Expansion [10^{-6}/K]	Thermal Conductivity [W/mk] xy	Thermal Conductivity [W/mk] z	Electrical Resistance u-ohm-cm	Young's Modulus (msi)	Rockwell E Hardness
Cu-Cu/Mo-Cu	9.3	7.0-8.5	300	250	9.300		
S-CMC	9.1	11.7/7.6	345	290			
Silvar Kovar	8.8	7	110				
Al Gr 4-230	2.4	4	230	120			
Al Gr 7-200	2.46	7	200	125	6.890		
CuGr 4-280	5.5	4	280	200	4.360		
CuGr 7-300	6.07	7	300	210			

Heat Sinks - Various Materials

Material	Density [g/cm^3]	Thermal Conductivity [W/mk] 20°C	100°C	Thermal Expansion
AlN	3.3	180	150	4.5
Al_2O_3	3.8	25	17	6.7
BeO	2.9	240	180	7.6
Al-SiC°	2.7-3.2	80-200	-	6.8-12.0
Fe-Ni-Co	2.4	17	17	5.3
Si	2.3	151	-	4.8
GaAs	5.3	54	34	5.8
Mo	10.2	142	135	5.5
W	19.3	165	152	4.5
Cu	8.9	398	393	17.1



Our Mission

To be your partner of choice, always trying to understand and deliver what will make you successful.

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