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Data Sheet: 100 Tin

Physical Property Information:

Solder Alloy Composition	min.99.8 % Sn (weight per cent)
Melting point	231.9°C
Density	7.29 Mg.m ⁻³
Coefficient of Thermal Expansion (CTE)	23.5 ppm/K
Electrical Conductivity	15.6% IACS
Thermal Conductivity	73.2 W m ⁻¹ .K ⁻¹
Electrical Resistivity	12.6 μΩ.cm
Hardness	3.9 HB (10 kg/5mm/180S)
Poisson's Ratio	0.33

Mechanical Properties:

Young's Modulus:	41.6 GNm ⁻²
Yield strain:	6.1 %

Typical impurity levels for electronic grade are less then:

Pb: 0.05,	Ni: 0.01,	Al: 0.005,	Bi: 0.10,	Fe: 0.02,
Zn: 0.003,	As: 0.03,	Cd: 0.002	In: 0.05	

Application: Soldering temperature for reflow should be minimal at or above 260°C for 20 seconds. This assumes either very clean, soldering surfaces or the presence of a reducing agent or atmosphere during the soldering cycle. If and when the components are slightly oxidized, a combination with flux and higher temperatures and/or longer soldering temperatures is required. Alternatively, the alloy can be reflowed below 260°C when special conditions for substrates (i.e. Au-plating over Ni-) and longer temperatures above melting point are being met. The alloy can be used for flux-less soldering, when the soldering substrates materials are free of oxides and/or oily residues. Common practice for flux-free soldering is: Nickel-plated substrates (1.5-2.5μm) protected with an Au-flash (0.2-0.5μm) and soldering in vacuum or inert atmosphere.

General information:

Pure tin (100%) has a (gray) α↔(silvery) β phase transformation temperature of 13.2°C. The impurities in commercial tin inhibit the phase transformation into α Sn, which has no structure but is a powdery substance. Furthermore, the impurities suppress also the tendency of whisker formation of pure tin.

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