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ELECTRONIC COMPONENTS
AND PACKAGING

DATA SHEET: 80 Gold-20 Tin

Physical Property Information:

Solder Alloy Composition	80Au-20Sn (weight per cent)
Eutectic melting point	280°C
Density	14.52 Mg m ⁻³
Coefficient of Thermal Expansion (CTE)	15.9 ppm/°C
Thermal Conductivity	57.3 W m ⁻¹ K ⁻¹
Electrical Resistivity	16.4 μΩ cm

Mechanical Properties:

Ultimate Tensile Strength:	MPA (ksi)
23°C	275 (39.9)
100°C	217 (31.5)
150°C	165 (23.9)
Young's Modulus:	GPA (10 ⁶ psi)
23°C	68 (9.8)
Poisson Ratio:	0.405

Typical impurity levels for the min. 99.99%-purity electronic grade alloy are less than:
Sb: 0.005, Pb: 0.005, Ni: 0.003, Al: 0.005, Bi: 0.005, Fe: 0.005, Zn: 0.005, As: 0.002, Cd: 0.001 and
In: 0.005

Application information:

The alloy is generally used for flux-less soldering, for which 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, inert or N₂/H₂ atmosphere.

Soldering temperature for reflow (measured in the joint), should be minimal at or above 305-320°C for 20 seconds, depending the mass of the assembly and the type of furnace used. This assumes either very clean, soldering surfaces or the presence of a reducing agent (flux) or reducing atmosphere during the soldering cycle. If and when the components are slightly oxidized, a combination with flux or reducing atmosphere and higher temperatures and/or longer soldering temperatures is required.

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