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ELECTRONIC COMPONENTS
AND PACKAGING

DATA SHEET: 96.85Gold-3.15 Silicon

Physical Property Information:

Solder Alloy Composition	96.85Au-3.15Si (weight per cent)
Eutectic melting point	363°C
Density	15.70 Mg m ⁻³
Coefficient of Thermal Expansion (CTE)	12.3 ppm/°C
Thermal Conductivity	27.2 W m ⁻¹ K ⁻¹
Electrical Resistivity	15-20 μΩ cm

Mechanical Properties:

Ultimate Tensile Strength:	MPa
23°C	255
150°C	225
Yield Strength:	MPa
23°C	220
100°C	207
150°C	195

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, high-temperature, die-attach 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 390-400°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 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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