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ELECTRONIC COMPONENTS
AND PACKAGING

DATA SHEET: 63 Lead-37 Tin

Physical Properties of Bulk Solder

Solder Alloy Composition	63Pb-37Sn (weight per cent)
Solidus	183°C
Liquidus	249°C
Density	9.20 Mg/m ³
Coefficient of Thermal Expansion	24.58 x 10 ⁻⁶ K ⁻¹
Young's Modulus	23.03 Nmm ⁻²
Hardness	12 HV
Thermal Conductivity	43.6 W m ⁻¹ K ⁻¹
Electrical Conductivity	10.5% IACS
Electrical Resistivity	17.07 μΩ cm

Mechanical Properties: Tensile Strength (Stress, Nmm⁻²)

Test speed	50 mm min ⁻¹	20°C	100°C
	20	42.7	22.5
	5.0	40.1	20.6
	1.0	36.3	16.6
	0.2	28.5	12.7
	0.05	21.8	8.5
		16.9	5.7

Typical impurity levels for electronic grade are less than:

Au: 0.05	Cu: 0.08	Ni: 0.01	Al: 0.005
Bi: 0.10	Fe: 0.02	Zn: 0.003	As: 0.03
Cd: 0.002	In: 0.10		

Soldering temperature for reflow should be minimal at or above 285°C for a minimal time of 20 seconds. This assumes either very clean, soldering surfaces and an inert or reducing atmosphere or the presence of a deoxidizing agent/flux during the soldering cycle. If and when the components are slightly oxidized, a combination with higher temperatures and/or longer soldering temperatures is required. For more oxidized surfaces, an appropriate flux must be used.

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