Heraeus

Electronics

PowerCu SOFT

Thick Copper Bonding Wire of Extreme Softness

PowerCu SOFT Benefits

- Copper bonding wire of extreme softness
- Softest deformation resistance and best bondability
- Uniform fine grain structure
- Best thermal stability
- Lowest electrical resistance

PowerCu Soft bonding wire is Heraeus' preferred material for the next generation of power devices – targeting 200 °C operation temperature. PowerCu Soft bonding wire, when compared to standard aluminum bonding wire, shows up with superior electrical conductivity and increased fusing current values. It is the material of choice for advanced packaging of modules dedicated for high temperature and high robustness challenges.

In lifetime tests, Heraeus PowerCu Soft bonding wire for wedge/wedge applications can provide 10–30 x higher cycle numbers compared to conventional Al technology. The bonding machine parameter settings require higher bonding forces and cutting tool concepts, applicable for the use of copper bonding wire. The semiconductor metallization usually contains Cu layers with 5–50 µm thickness.

PowerCu Soft bonding wire undergoes special processing steps – thus Heraeus is able to generate extreme soft copper material. The excellent bondability of PowerCu Soft bonding wire is based in the material's low deformation resistance. PowerCu Soft bonding wire can be used the sensible surfaces of IGBT devices.

Next generation technologies in silicon carbide (SiC) and gallium nitride (GaN) are connected to large currents and high temperatures. Copper enables larger currents under higher temperatures in electronic system modules. The future of copper wire starts now, with the implementation in IGBTs for hybrid car and electronic vehicle technology.

Recommended Technical Data of PowerCu SOFT

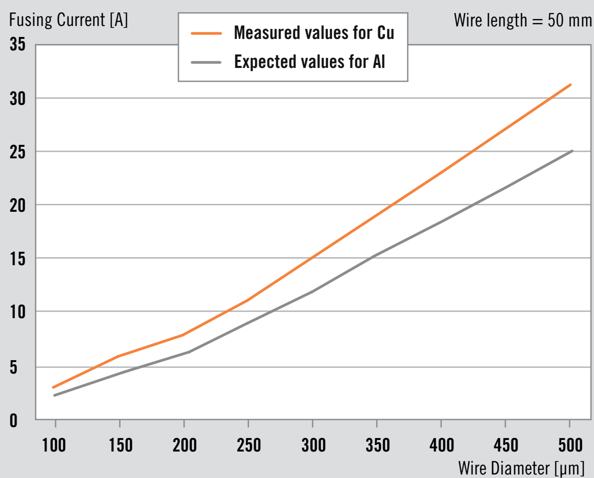
Diameter	**Microns [µm]**	200	250	300	380	400	500
	Mils	8	10	12	15	16	20
Elongation	**[%]**	> 15	> 15	> 15	> 15	> 15	> 15
Breaking Load	**[cN]**	500 – 750	780 – 1200	1100 – 1700	1700 – 2700	2000 – 3100	3100 – 4800
Deformation Resistance Index	**Standard Cu Wire**	1	1	1	1	1	1
	PowerCu Soft	0,9	0,8	0,8	0,7	0,8	0,9

For other diameters, please contact Heraeus Electronics Product Management.

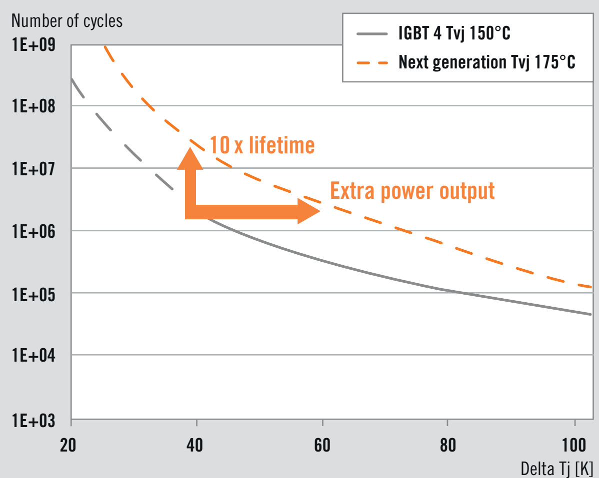
Characteristics of PowerCu SOFT

Property	Value	Unit
Melting Point	1083	°C
Modulus of rigidity	48	GPa
Thermal conductivity at 20°C	399	W/(m * K)
Linear expansion coefficient (0°C – 100°C)	16.8	$10^{-6} * K^{-1}$
Electrical Resistivity at 20°C	1.8	µΩ * cm
Temperature coefficient of electrical resistance (0°C – 100°C)	3.9	$10^{-3} * K^{-1}$
Meter resistance at Ø 500 µm (20°C)	91.7	Ω/m
Density	8.933	Kg/dm^3
Other Guidelines		
Floor Life	14	days
Shelf Life Time	6	months

PowerCu SOFT Fusing Current



PowerCu SOFT Increased Lifetime during Power Cycling



The data given here is valid. We reserve the right to make technical alterations.

Americas
Phone +1 610 825 6050
electronics.americas@heraeus.com

Asia Pacific
Phone +65 6571 7649
electronics.apac@heraeus.com

China
Phone +86 53 5815 9601
electronics.china@heraeus.com

Europe, Middle East and Africa
Phone +49 6181 35 4370
electronics.emea@heraeus.com

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Heraeus Electronics GmbH & Co.KG, 63450 Hanau, Germany
Web: www.heraeus-electronics.com

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