Heraeus

AW-29

Gold Bonding Wire for Universal Use in Discrete and IC (Larger Dia) Applications

AW-29 Benefits

- Permits ease of looping for high loop applications
- Robust 2nd bond with wide application range for low temperature bonding, such as on soft substrate e. g. COB and Hybrids packages
- Established for use on sensitive IC die metallizations with wire diameter ≥ 30 µm
- Compatible with high speed automatic ball bonding equipment

Ideal for discrete devices such as LEDs, Optos etc, AW-29 is typically found in 25 µm to 35 µm diameters. This alloy displays salient characteristics via its long HAZ which facilitates ease of looping for both medium (~170 µm)* and high loop (~230 µm)* applications, thereby minimizing requirements on machine looping capability. In addition, AW-29's large process 2nd bond window makes it an excellent choice for low temperature bonding on soft substrates. AW-29 is also commonly used on sensitive die metallization, even in diameters > 30 µm.

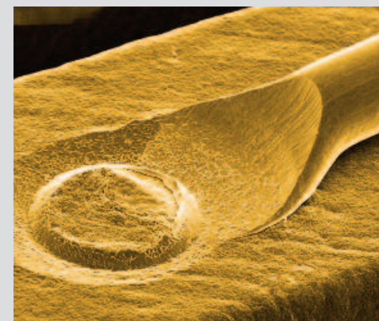
* Reference to 25 µm wire dia.

Application Data*

First bond results on optimum setting

	Ball Diameter (µm)	Squash Height (µm)	Shear Force (g)	Shear Strength (g/mil²)
Mean	88	16	71.1	7.5
Std Dev	0.35	0.63	2.7	0.3
Min	84	13	66.0	6.5
Max	93	20	76.2	7.9

*Results may vary with package and die configuration, as well as bond process.



Bonding Conditions: Wire diameter: 33 µm · Wire bonder: K&S 1488 turbo
Package type: PLCC 68 leads · Die metallization: AlSi (1%) Cu (0.5%)
Leadframe: Ag: Plated Cu · Wire span: 3.2 – 4 mm · Loop height range: 230 µm +/- 25 µm
Bonding temperature: 240°C · Capillary: 41413-0013-335 · T=3.7 mil, FA 8°

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AW-29 Mechanical Properties

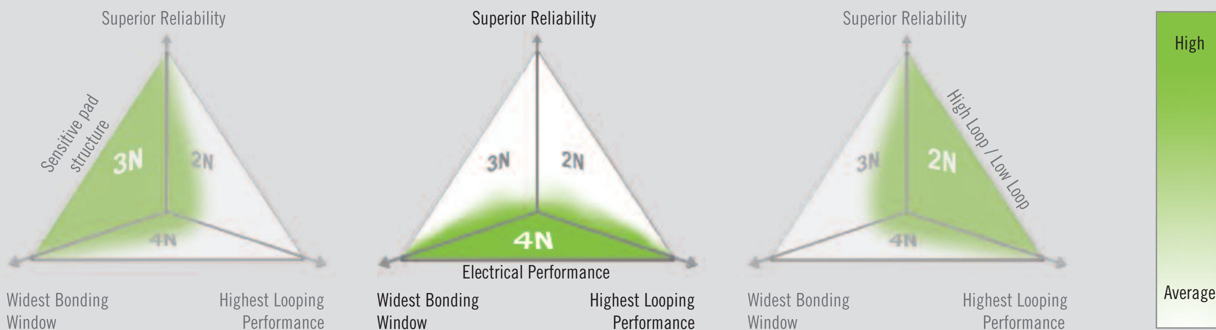
Diameter	Microns	20	23	25	28	30	32	33	38	50
	Mils	0.8	0.9	1.0	1.1	1.2	1.25	1.3	1.5	2.0
Recommended Specs for Ball Bonding										
Elongation (%)		2 – 6	2 – 6	2 – 6	2 – 6	2 – 7	2 – 7	2 – 7	2 – 7	4 – 12
Breaking Load (g)		3 – 8	4 – 9	7 – 11	8 – 14	9 – 16	12 – 19	13 – 20	19 – 25	30 – 45
Typical Breaking Load (g)										
Room Temp @ 4% EL		5.4	6.5	9.3	11.9	13.8	16.9	22.7	23.6	35.1*
High Temp (250°C/20s)		5.0	6.0	8.6	10.9	12.8	14.4	15.5	20.9	32.3

* @ 8% EL

AW-29 Characteristics (for 30 µm diameter wire)

Non-Gold Elements	< 100 ppm
Breaking Load @ Room Temperature	> 13 g at 4% EL
Breaking Load @ 250°C / 20 sec.	> 12 g
Elastic Modulus	> 65 GPa
Heat Affected Zone (HAZ)	~ 200 µm (for 70 µm ball diameter)
Neck Strength	~ 11 g (at 70 µm ball diameter)
Melting Point	1063°C
Density	19.32 g/cm^3
Heat Conductivity	3.17 W/cm·K
Electrical Resistivity	2.3 µOhm-cm
Coeff. of Linear Expansion (0 – 100°C)	14.2 ppm / K
Fusing Current for 30 µm, dia 10 mm length (in air)	0.6 A

Gold Wire Segmentation by Properties



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The data given here is correct as of April 2009. We reserve the right to make technical alterations as necessary.