



GBC/GBE

Au Alloy & Au Bumping Wire

Au合金 & Au バンピングワイヤ

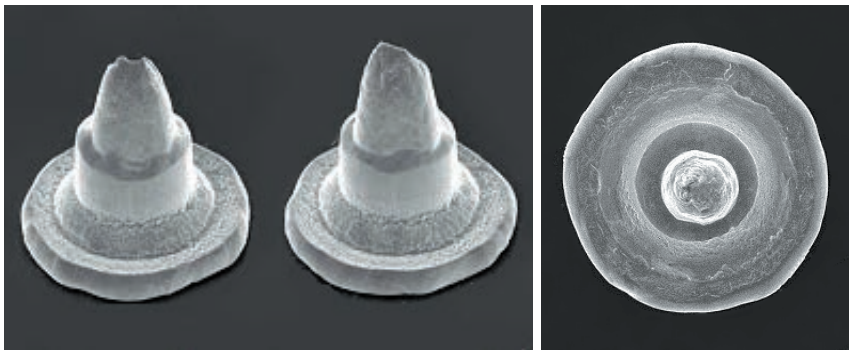
Characteristics

- Small deviation of ball neck height after bumping.
- Steady bump shape.
- No bond pad damage after bonding.(GBE)
- Low deterioration of shear strength in aging test at 200°C(GBC)

特徴

- バンプ形成後のネック高さバラツキが小さい。
- バンプ形状が安定している。
- ボンディング後のチップダメージがない。(GBE)
- バンプ形成後の高温放置試験（200°C）において経時に対するシヤ強度の低下が少ない。(GBC)

Bump Shape



Bonding condition

Type : GBE
 Bonder : Shinkawa SBB-1
 US Power: 0.45W
 US Time : 10ms
 Force : 471mN

Chip Damage

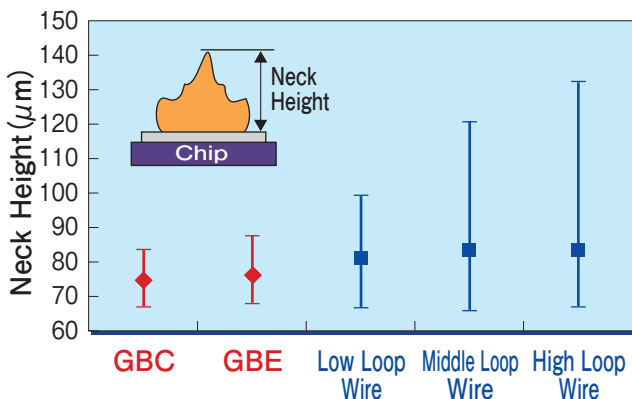
Unit:%, N=400

US Power	← High →			
	Low			High
4N-Au	0	0	0	0
GBE	0	0	0	0
GBC	0	0.3	1.3	2.3

Bonding Condition

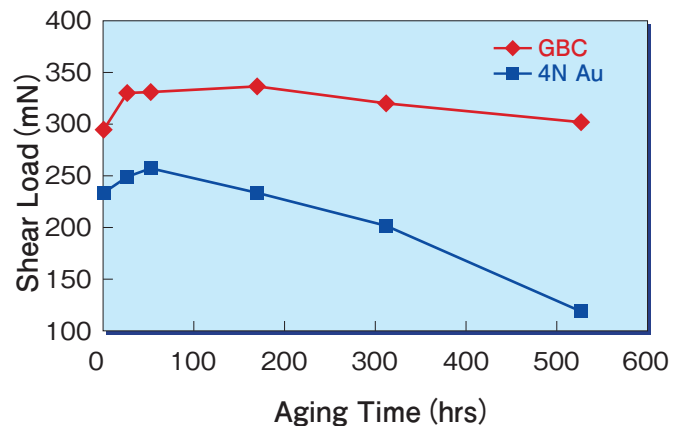
Wire Diameter : 30μm
 Bonder : Shinkawa SBB-1
 Ball Diameter : 90μm
 Bonding Temp.: 150C
 Chip : Non-silicon oxide film
 Al film thickness: 0.1μm

Neck Height



Bonder : Shinkawa SBB-1
 Wire Diameter : 25μm
 Squashed Ball Diameter : 63μm

Bond Reliability



Aging Time (hrs)

Aging temp. : 200°C
 Wire Diameter: 25μm

GBC Data Sheet
General Properties

Wire Diameter (um)	15	18	20	23	25	28	30	32	35	38	ASTM F205-94
Tolerance (um)	+/- 1.0										
Weight (mg/200mm)	0.591-0.772	0.872-1.089	1.089-1.330	1.460-1.737	1.737-2.039	2.199-2.536	2.536-2.898	2.898-3.284	3.486-3.909	4.129-4.587	
Breaking Load (gf)	≥ 5.2 ≥ 8.2 ≥ 9.3 ≥ 12.3 ≥ 14.5 ≥ 18.2 ≥ 20.9 ≥ 23.8 ≥ 28.4 ≥ 33.5										Tensile Tester Jaw Length = 100mm Production Guide 2012-3 10H
Elongation (%)	1.5 - 4.0				1.5 - 5.0				1.5 - 6.0		

Physical Property

Hardness (HV)	Free Air Ball	35 - 55										Vickers tester
	HAZ	45 - 110										
	Wire	100 - 120										
Density (g/cm ³)	19.20										Calculated Value	
Resistivity (uΩcm) @ 20°C	3.0										4 terminal method	
Fusing Current (A, Length=3mm,10sec)	0.3*	0.4	0.5	0.6	0.7	0.9	1.1	1.2	1.5	1.8	Theoretical Value (*Out of applicable W.D.)	
Electrical resistance (Ω, Length 10mm, Room Temp.)	1.49 - 1.95	1.06 - 1.32	0.87 - 1.06	0.66 - 0.79	0.57 - 0.66	0.45 - 0.52	0.40 - 0.45	0.35 - 0.40	0.30 - 0.33	0.25 - 0.28	Calculated Value	
Thermal Conductivity @ 20°C (W/m/K)	240										Theoretical Value	
Linear Expansion Coefficient (0-100°C) (ppm/K)	14.4										TMA	
Elastic Modulus (GPa)	95 - 115										Tensile Tester	
Melting Point (°C)	1,070										Phase Diagram	

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GBE Data Sheet
General Properties

Wire Diameter (um)	15	18	20	23	25	28	30	32	35	38	ASTM F205-94
Tolerance (um)	+/- 1.0										
Weight (mg/200mm)	0.595-0.777	0.877-1.096	1.096-1.338	1.469-1.748	1.748-2.052	2.212-2.552	2.552-2.916	2.916-3.305	3.508-3.933	4.155-4.616	
Breaking Load (gf)	≥ 4.5 ≥ 6.5 ≥ 8.0 ≥ 10.6 ≥ 12.6 ≥ 15.8 ≥ 18.1 ≥ 20.6 ≥ 24.6 ≥ 29.0										Tensile Tester Jaw Length = 100mm Production Guide 2012-3 10H
Elongation (%)	1.0 - 4.0				1.0 - 5.0				1.0 - 6.0		

Physical Property

Hardness (HV)	Free Air Ball	35 - 55										Vickers tester
	HAZ	45 - 80										
	Wire	70 - 90										
Density (g/cm ³)	19.32										ASTM	
Resistivity (uΩcm) @ 20°C	2.3										4 terminal method	
Fusing Current (A, Length=3mm,10sec)	0.3*	0.4	0.5	0.7	0.8	1.1	1.2	1.4	1.7	2.0	Theoretical Value (*Out of applicable W.D.)	
Electrical resistance (Ω, Length 10mm, Room Temp.)	1.14 - 1.49	0.81 - 1.01	0.66 - 0.81	0.51 - 0.61	0.43 - 0.51	0.35 - 0.40	0.30 - 0.35	0.27 - 0.30	0.23 - 0.25	0.19 - 0.21	Calculated Value	
Thermal Conductivity @ 20°C (W/m/K)	315.5										Metals Data Book	
Linear Expansion Coefficient (0-100°C) (ppm/K)	14.1										Metals Data Book	
Elastic Modulus (GPa)	70 - 90										Tensile Tester	
Melting Point (°C)	1,063										Metals Data Book	

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