

TECHNICAL INFORMATION

SMT Adhesive

JU-100-5

KOKI COMPANY LIMITED

1. Features

- Ensures excellent dispensability from slow to high speed dispensing.
- Negligible slump, smear and stringing.
- Ensures high bonding strength regardless of kind of components and prevent losing components at solder waves.
- Offers extremely high electrical and chemical reliability.

2. Specifications

• Before curing

No	Item	Treatment	Value	Remarks
1	Appearance • color	--	Paste, red	--
2	Specific gravity	20°C	1.20 ± 0.05	Cup method
3	Viscosity	20°C, Pa.S	50 ± 5	E-type viscometer
4	Thixotropy	20°C	5.5 ± 0.5	E-type viscometer
5	Non volatile	105°C × 3hr	> 99%	--
6	Viscosity variation rate	40°C × 2hr	< 5%	--
7	Shelf life	Room temp. (20°C)	2 months	--
		0 ~ 10°C	6 months	--

• After curing (cured at 150°C × 1 min.)

No	Item	Treatment	Value	Remarks
1	Appearance • color	--	Polymerized solid, dark red	--
2	Bonding strength	2125 chip condenser	> 3 kgf	Push gauge
3	Copper plate corrosion	40°C×95%RH×96hr	No discoloration, corrosion	--
4	Solder resistivity	250°C × 10sec.	No abnormality	--
5	Surface insulation resistance	Room temp., humidity	> 1 × 10 ¹¹ Ω	JIS specified comb electrode type II
		40°C×95%RH×96hrs	> 1 × 10 ¹⁰ Ω	
6	Dielectric constant	20°C	3.5	1MHz
		40°C×90%RH×250hrs	3.6	
7	Dielectric tangent	20°C	0.015	1MHz
		40°C 90%RH 250hours	0.017	
8	Linear expansion coefficient	cm/cm, °C (20~100°C)	8 × 10 ⁻⁵	--
9	Boiled water absorption	Boiled water, 1hr	< 0.5%	--
10	Solvent resistivity	Room temp. 1 hr dip	No abnormality	IPA, toluene

3. Curing condition

Curing condition of JU-100-5, Substrate surface temperature (130°C~150°C) and the following curing time are required.

Bonding strength tends to become higher as the curing temperature increases.

- Recommended curing condition

Curing temperature (°C)	Curing time (sec.)
150	> 60
140	> 60
130	> 90

4. Electrical & chemical reliability data

1) Copper plate corrosion test

- Test condition : 40°C × 95%RH × 336/hour

Curing condition	Corrosiveness
150°C × 60 sec.	No corrosion
140°C × 60 sec.	No corrosion
130°C × 60 sec.	No corrosion
130°C × 10 min.	No corrosion

2) Surface insulation resistance

- Test conditions

Substrate : J I S comb type electrode type-II

Thickness of adhesive applied : approx. 200µm

Measurement voltage : DC 100V

- Curing condition : 150°C × 60sec.

Climate condition \ Time (hour)	Initial value	192h	672h	1008h	1008h
	Out of oven	In oven	In oven	In oven	Out of oven
40°C × 95%RH	3.2×10^{13}	5.6×10^{12}	4.3×10^{12}	5.6×10^{12}	5.2×10^{13}
60°C × 90%RH	3.4×10^{13}	4.3×10^{11}	4.0×10^{11}	3.8×10^{11}	5.0×10^{13}
85°C × 85%RH	3.5×10^{13}	5.2×10^{11}	3.5×10^{11}	4.5×10^{11}	4.2×10^{13}

- Curing condition : 140°C × 60sec.

Climate condition \ Time (hour)	Initial value	192h	672h	1008h	1008h
	Out of oven	In oven	In oven	In oven	Out of oven
40°C × 95%RH	3.8×10^{13}	4.6×10^{12}	4.3×10^{12}	5.0×10^{12}	5.0×10^{13}
60°C × 90%RH	3.3×10^{13}	4.0×10^{11}	4.0×10^{11}	3.8×10^{11}	4.0×10^{13}
85°C × 85%RH	3.7×10^{13}	3.2×10^{11}	3.0×10^{11}	3.5×10^{11}	3.2×10^{13}

- Curing condition : 130°C × 60sec.

Climate condition \ Time (hour)	Initial value	192h	672h	1008h	1008h
	Out of oven	In oven	In oven	In oven	Out of oven
40°C × 95%RH	3.2×10^{13}	2.6×10^{12}	3.3×10^{12}	4.5×10^{12}	4.6×10^{13}
60°C × 90%RH	4.3×10^{13}	2.0×10^{11}	4.2×10^{11}	4.8×10^{11}	3.9×10^{13}
85°C × 85%RH	5.7×10^{13}	4.2×10^{11}	3.3×10^{11}	4.5×10^{11}	5.3×10^{13}

3) Voltage applied SIR test

- Test conditions

Substrate : J I S comb type electrode type-II
 Thickness of adhesive applied : approx. 200μm
 Voltage applied : DC16V, DC100V
 Measurement voltage : DC 100V

- Curing condition : 150°C × 60sec.

Climate condition \ Time (hour)	Initial value	192h	672h	1008h	
	Out of oven	In oven	In oven	In oven	
40°C × 95%RH	16V	3.2×10^{13}	2.6×10^{11}	2.3×10^{11}	2.1×10^{11}
	100V	3.9×10^{13}	2.5×10^{11}	1.8×10^{11}	2.0×10^{11}
60°C × 90%RH	16V	3.4×10^{13}	1.9×10^{11}	2.0×10^{11}	2.8×10^{11}
	100V	3.8×10^{13}	2.3×10^{11}	1.9×10^{11}	2.2×10^{11}
85°C × 85%RH	16V	3.5×10^{13}	2.2×10^{11}	1.5×10^{11}	1.5×10^{11}
	100V	3.8×10^{13}	2.0×10^{11}	1.7×10^{11}	1.2×10^{11}

- Curing condition : 140°C × 60sec.

Climate condition \ Time (hour)	Initial value	192h	672h	1008h	
	Out of oven	In oven	In oven	In oven	
40°C × 95%RH	16V	4.3×10^{13}	1.8×10^{11}	2.0×10^{11}	2.0×10^{11}
	100V	3.8×10^{13}	2.3×10^{11}	1.9×10^{11}	2.1×10^{11}
60°C × 90%RH	16V	3.7×10^{13}	1.7×10^{11}	1.8×10^{11}	2.3×10^{11}
	100V	4.1×10^{13}	2.2×10^{11}	1.9×10^{11}	2.0×10^{11}
85°C × 85%RH	16V	3.4×10^{13}	1.9×10^{11}	1.7×10^{11}	1.8×10^{11}
	100V	4.4×10^{13}	2.0×10^{11}	1.8×10^{11}	1.7×10^{11}

- Curing condition : 130°C × 60sec.

Climate condition \ Time (hour)		Initial value	192h	672h	1008h
		Out of oven	In oven	In oven	In oven
40°C × 95%RH	16V	3.4×10 ¹³	1.6×10 ¹¹	2.0×10 ¹¹	1.7×10 ¹¹
	100V	3.5×10 ¹³	2.0×10 ¹¹	1.9×10 ¹¹	1.8×10 ¹¹
60°C × 90%RH	16V	3.7×10 ¹³	1.6×10 ¹¹	1.6×10 ¹¹	2.0×10 ¹¹
	100V	4.5×10 ¹³	2.0×10 ¹¹	1.8×10 ¹¹	2.1×10 ¹¹
85°C × 85%RH	16V	3.7×10 ¹³	2.3×10 ¹¹	1.9×10 ¹¹	1.6×10 ¹¹
	100V	4.2×10 ¹³	2.0×10 ¹¹	1.9×10 ¹¹	1.6×10 ¹¹

5. Bonding strength

- Test conditions

PC board : Paper phenol (prefluxed)

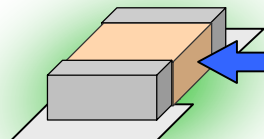
Component : Condenser, resistor, mini-mold transistor

Amount applied : 1.0mm diameter single dot

Curing oven : Far infra-red oven (Koki)

Measurement method : Adhere the components with the adhesive with the below indicated curing conditions to obtain test pieces.

Push the component to a right angle with a push gauge and measure the shear strength at the occurrence of breakage.



Push with push gauge.

n = 20

- Square shape condenser curing at 150°C bonding strength (room temp.)

Curing condition	Average strength (kgf)	Maximum (kgf)	Minimum (kgf)
150°C × 60 sec.	4.9	5.9	4.1
150°C × 90 sec.	4.8	6.6	4.3

- Square shape condenser curing at 140°C bonding strength (room temp.)

Curing condition	Average strength (kgf)	Maximum (kgf)	Minimum (kgf)
140°C × 60 sec.	4.6	5.7	3.9
140°C × 90 sec.	5.1	6.2	4.4

- Square shape condenser curing at 130°C bonding strength (room temp.)

Curing condition	Average strength (kgf)	Maximum (kgf)	Minimum (kgf)
130°C × 60 sec.	3.7	4.7	3.1
130°C × 90 sec.	4.4	5.3	3.6

- Square shape resistor curing at 150°C bonding strength (room temp.)

Curing condition	Average strength (kgf)	Maximum (kgf)	Minimum (kgf)
150°C × 60 sec.	5.1	6.8	4.3
150°C × 90 sec.	5.1	6.5	4.5

- Square shape resistor curing at 140°C bonding strength (room temp.)

Curing condition	Average strength (kgf)	Maximum (kgf)	Minimum (kgf)
140°C × 60 sec.	4.8	6.1	3.9
140°C × 90 sec.	5.0	6.3	4.1

- Square shape resistor curing at 130°C bonding strength (room temp.)

Curing condition	Average strength (kgf)	Maximum (kgf)	Minimum (kgf)
130°C × 60 sec.	3.5	4.8	2.8
130°C × 90 sec.	4.5	5.2	3.3

- Square shape mini-mold transistor curing at 150°C bonding strength (room temp.)

Curing condition	Average strength (kgf)	Maximum (kgf)	Minimum (kgf)
150°C × 60 sec.	5.0	6.7	4.4
150°C × 90 sec.	5.2	6.9	4.8

- Square shape mini-mold transistor curing at 140°C bonding strength (room temp.)

Curing condition	Average strength (kgf)	Maximum (kgf)	Minimum (kgf)
140°C × 60 sec.	4.5	5.8	3.7
140°C × 90 sec.	4.9	5.9	4.0

- Square shape mini-mold transistor curing at 130°C bonding strength (room temp.)

Curing condition	Average strength (kgf)	Maximum (kgf)	Minimum (kgf)
130°C × 60 sec.	3.8	4.6	3.0
130°C × 90 sec.	4.4	5.3	3.5

6. High temperature bonding strength

- Test conditions

PC board : Paper phenol (prefluxed)

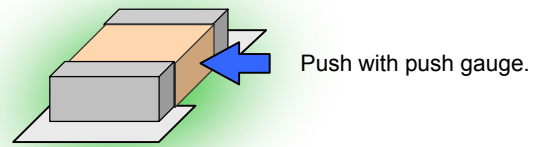
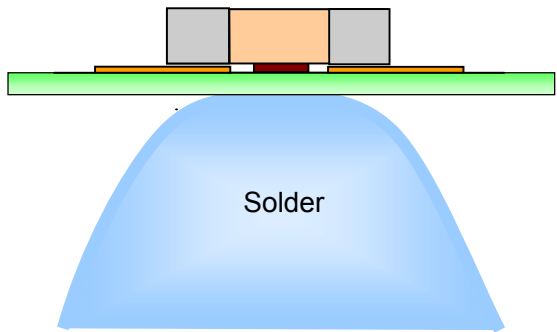
Component : Condenser, resistor, mini-mold transistor

Amount applied : 1.0mm diameter single dot

Curing oven : Far infra-red oven (Koki)

Measurement method : Adhere the components with the adhesive with the below indicated curing conditions to obtain test pieces.

Leave the test piece on the surface of the flowing solder and, when the surface temperature of the test piece becomes intended temperature, measure the shear strength at the occurrence of breakage by pushing the component with the push gauge.



n = 10

Result :

- Chip condenser (2125) 150°C × 60 sec. with isopropyl alcohol application

Curing condition	Temperature of test piece (top side: °C)	Bonding strength (kgf)		
		Average	Maximum	Minimum
150°C × 60 sec.	25	4.9	5.9	4.1
	100	2.8	3.1	2.2
	150	1.0	1.2	0.6
	200	0.1	0.2	0.1

- Chip resistor (2125) 150°C × 60 sec. with IPA application

Curing condition	Temperature of test piece (top side: °C)	Bonding strength (kgf)		
		Average	Maximum	Minimum
150°C × 60 sec.	25	5.1	6.8	4.3
	100	3.0	3.5	2.2
	150	1.1	1.4	0.7
	200	0.1	0.2	0.1

7. Solder heat resistance

- Test conditions

PC board : Paper phenol (prefluxed)
 Component : Condenser, resistor, mini-mold transistor
 Amount applied : 1.0mm diameter single dot
 Curing oven : Far infra-red oven (Koki)

Measurement method : Adhere the components with the adhesive with the below indicated curing conditions to obtain test pieces.

Prepare the test pieces with and with out application of isopropyl alcohol, and dip each piece into static molten solder (250°C) for 10 sec. Number of dipping timed is 1 to 3 times.

Cool it down to room temperature and measure the shear strength by the push gauge at the occurrence of breakage.

n = 10

- Chip condenser (2125) 150°C × 60 sec. with IPA application

Dipping	Bonding strength (kgf)		
	Average	Maximum	Minimum
No dipping	4.9	5.9	4.1
1 time	4.7	6.0	3.8
2 times	3.6	4.4	2.2
3 times	2.5	3.0	1.2

- Chip condenser (2125) 130°C × 60 sec. with IPA application

Dipping	Bonding strength (kgf)		
	Average	Maximum	Minimum
No dipping	3.7	4.7	3.1
1 time	3.9	5.1	2.9
2 times	2.7	3.6	2.0
3 times	2.0	2.7	1.2

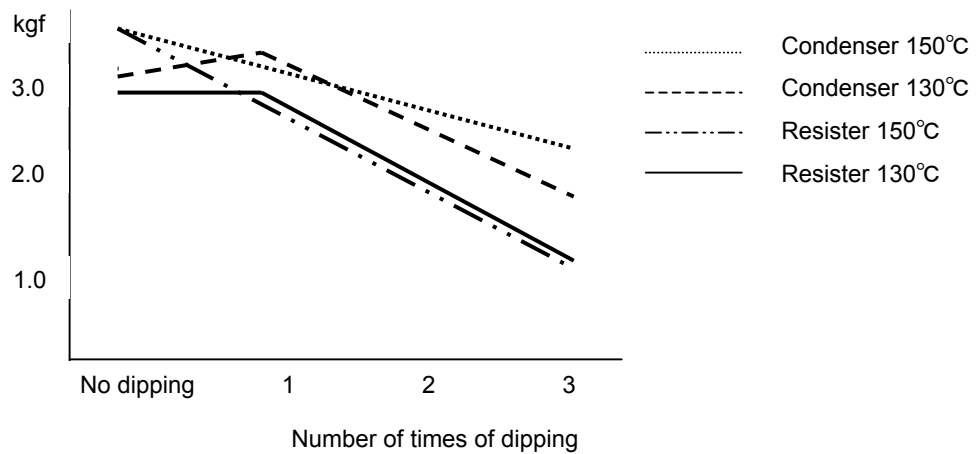
- Chip resistor (2125) 150°C × 60 sec. with IPA application

Dipping	Bonding strength (kgf)		
	Average	Maximum	Minimum
No dipping	5.1	6.8	4.3
1 time	4.9	6.5	4.4
2 times	3.4	4.2	2.1
3 times	2.2	3.1	1.6

- Chip condenser (2125) 130°C × 60 sec. with IPA application

Dipping	Bonding strength (kgf)		
	Average	Maximum	Minimum
No dipping	3.5	4.8	2.8
1 time	3.8	5.1	3.0
2 times	2.5	3.3	1.9
3 times	1.9	2.7	1.3

Result : No major difference in heat resistance among the test pieces with or without isopropyl alcohol.



8. Packaging

Package	Content	Remarks
Syringe	5 cc	EFD
	10 cc	EFD, Iwashita, Siemens
	20 cc	Panasonic
	25 cc	Panasonic
	30 cc	EFD, Fuji, Iwashita
Tube	300 gs	
Cartridge	360 gs	Semco

* Specify manufacturer of syringe or dispenser when ordering.

9. Storage

Store in a refrigerator below 10°C. (Refer to 1. Specifications for 'Shelf life'.)

10. Handling instruction

- 1) Warm to a room temperature before setting up in a dispensing machine.
- 2) For the storage of the product at the halfway use, put it back to the refrigerator for a long term storage, and keep it at room temperature off the dispenser for the short term storage.
- 3) In case of repairing, heat the adhesive to some 100~150°C for removal.
- 4) As the cured adhesive cannot be removed by an organic solvent, shave it off while keeping it warm.
The adhesive before curing shall be removed by ketone based solvent (methyl ethyl ketone, acetone).
- 5) In case of skin contact, wash with soap and water.
- 6) Use in well-ventilated area and keep away from source of fire.
- 7) Others
 - (1) All of chemical components formulated in this product are registered in the existing chemical substances.
 - (2) This product is not inflammable.
 - (3) Used containers shall be disposed of as waste plastic. Request an industrial waste disposal company according to local regulation and law.
 - (4) Read the MSDS very carefully before use.