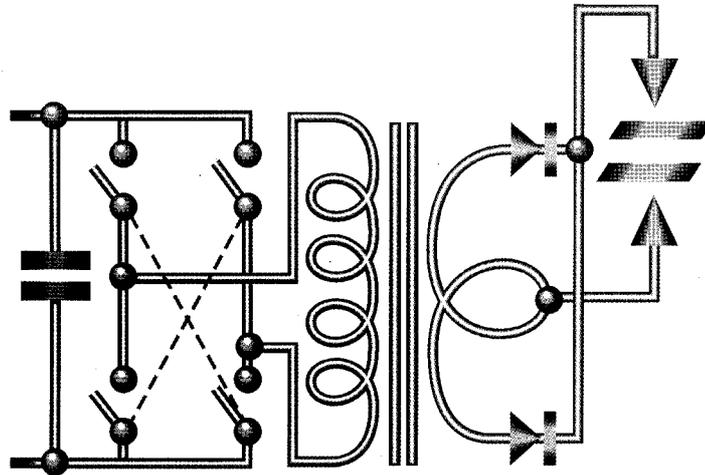


Vol:5(Rev.0)



KCE

Korea Coil Engineering Co.,Ltd

Tel: +82 -2 -974 -7034

Fax: +82 -2 -974 -7345

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- 1.
- 2.
3.
 - 3-1.
 - 3-2.
 - 3-3. Flux
 - 3-4. (鉛)Free
 - 3-5.
4. Impulse Heating
 - 4-1.
 - 4-2.
 - 4-3.
5. Micro Arc Welding
 - 5-1.
 - 5-2.
6. Spot Welding
 - 6-1.
 - 6-2.
7. Laser Welding
 - 7-1.
 - 7-2.
8. Ultra Sonic
 - 8-1.
 - 8-2.
- 9.



1.

1-1 (Solder Dip)

(1) Swing Dip()

(2) Vibro Dip()

(3) Flow Dip()

1-2 (Point Soldering)

1-3 Impulse Heating

1-4 Micro Arc Welding

1-5 Spot Welding

1-6 Laser Welding

1-7 Ultra Sonic Welding

2.

2-1. Soldering

A,B (低融点)
C(Solder) A B



2-2. Welding

A,B가



2-3.

(組織相) 가 ,가 ,
A,B 가



3. (Solder Dip)

3-1. (Solder)

(融点)

Pb-Sn

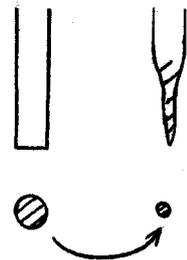
(共晶点) 가

Sn63, Sn60, Sn50

Sn5(315) SMD

가 (PCB

Reflow) 가 (220~250) , 가



가

가 Pb-Sn Ag 1~3%

Pb-Sn Cu, In, Bi, Ag 가

Dip Soldering
417도~424도
2sec
그림3-1

(315) (183)

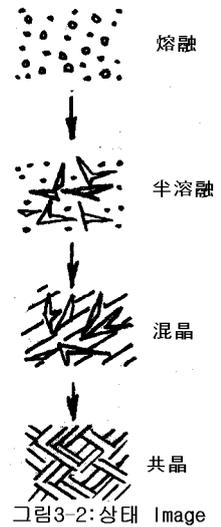
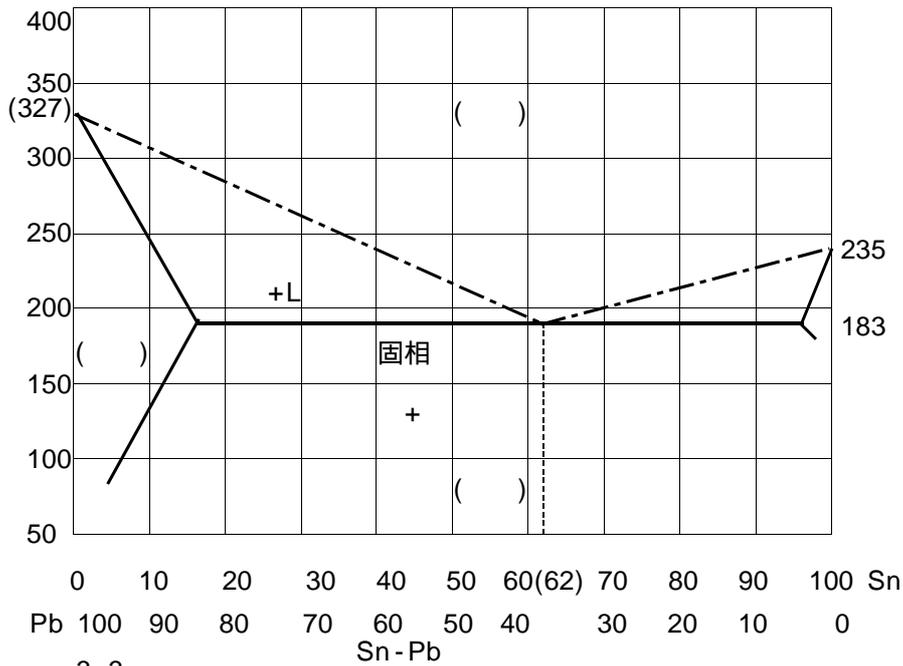
3-1



| | | | | |
|------|--------|--------|------------------|------------------|
| | (:mm) | (:mm) | (315) (:mm) | (183) (:mm) |
| 2UEW | 0.06 | 0.062 | 0.054 | 0.038 |
| 2UEW | 0.08 | 0.082 | 0.074 | 0.062 |
| 2UEW | 0.10 | 0.102 | 0.089 | 0.078 |

3-1. ,

3-3 Sn-Pb , 3-2 Image , 3-2



| % / % | | | | | | |
|-------|-----|-----|-------------------|---------|--------------------|----|
| Sn | Pb | | g/cm ³ | Cu=100% | kg/mm ² | % |
| 100 | 0 | 235 | 7.29 | 13.0 | 1.49 | 55 |
| 95 | 5 | 222 | 4.40 | 13.6 | 3.15 | 47 |
| 60 | 40 | 188 | 8.45 | 11.6 | 5.35 | 30 |
| 50 | 50 | 214 | 8.86 | 10.7 | 4.73 | 40 |
| 42 | 58 | 243 | 9.15 | 10.2 | 4.41 | 38 |
| 35 | 65 | 247 | 9.45 | 9.70 | 4.57 | 25 |
| 30 | 70 | 252 | 9.73 | 9.30 | 4.73 | 22 |
| 0 | 100 | 327 | 11.35 | 7.91 | 1.42 | 39 |

3-2



3-2.

Sn-Pb

Sn

Sn

Cu 가 가 Fe(),Ni

3-3

| | | | |
|----|-------|---------|-------|
| | | | |
| Bi | | | Crack |
| Zr | | , | |
| Fe | | | |
| Al | | | |
| Cu | | | (粒狀) |
| Ag | Void가 | Ceramic | |
| Ni | | | |

3-3

3-3.Flux

Flux

Flux (油脂),

Flux

(1) ,(2) ,(3) ,(4) Gas가 ,(5) (非洗淨)

, Flux (炭化)

(高重合)

(氣化)

Flux 가

1)Rosin(松脂)

가 White Rosin

Rosin (Abietin Acid) 가

가 가 Rosin

Alchole

2) (Activated Rosin)

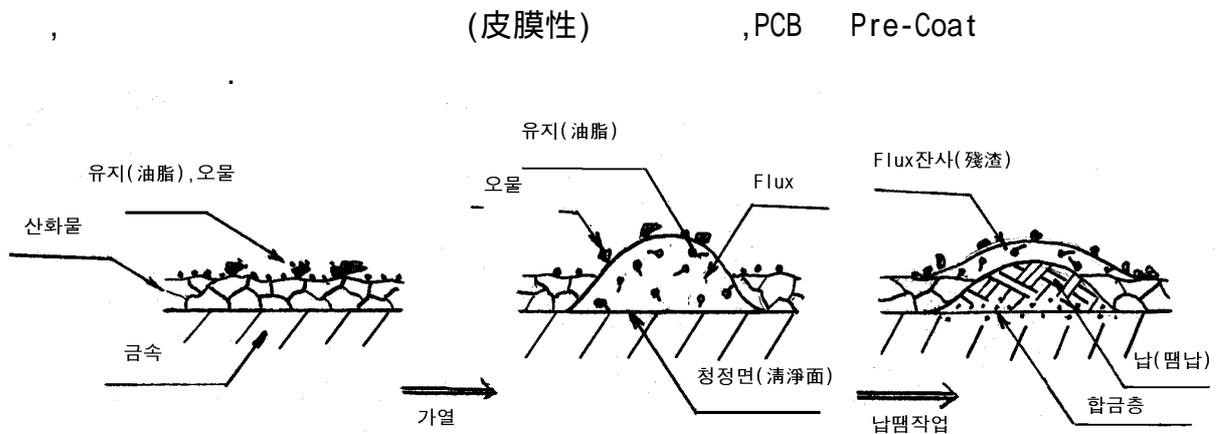
Amin , Halogen

(Cl,Br) 가 (吸濕)

가 가



3) Flux



3-3: Flux

3-4: (鉛)Free

Pb-Free(Lead Free)

3-4

| () | () | () |
|---------|--------------|---------|
| 120 180 | 48Sn-52In | 117 |
| | 43Sn-57Bi | 139 |
| | 97In-3Ag | 143 |
| | 58Sn-42In | 117 145 |
| | 95In-5Bi | 125 150 |
| | 60Sn-40Bi | 139 170 |
| 180 200 | 91Sn-9Zn | 190 |
| 220 250 | 96.5Sn-3.5Ag | 221 |
| | 99.3Sn-0.7Cu | 227 |
| | 95Sn-5Sb | 235 240 |
| 280 300 | 20Sn-80Au | 280 |
| | 90Sn-10Ag | 221 295 |
| | 97Sn-3Cu | 227 300 |
| | 99Sn-1Ge | 232 345 |

3-4:

가 , (擴張性), (耐久强度),

Recycle ,

Sn-Ag-X, Sn-Cu-X가

3-5

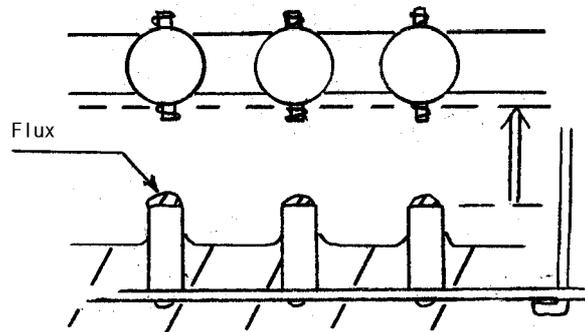
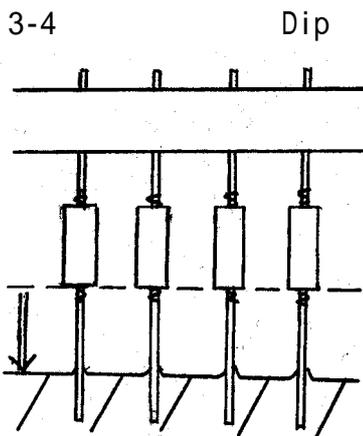


| | | | | |
|----------------|--------------------------|----------------------------------|--------------------------------|------------------------------|
| | Sn-Ag(3.645) - I(1.0) | Sn-Cu(2.0) - Sb(0.8) -Ag(0.2) | Sn-Bi(7.5) - Ag(2) -Cu(0.5) | Sn-Zn(8) - In(5) -Ag(0.1) |
| | 221 | 210 215 | 186 218 | 185 199 |
| | | | | × × |
| | | | | |
| Flow | | | | |
| Reflow | | | | |
| | | | | |
| N ₂ | | | | |
| 가 | | | | |

3-5:

3-5:

1) Flux



3-4: Flux Dip

Flux Pot

Dip

가 3-4)

가

Dip

(Point Flux
Flux가

Roller

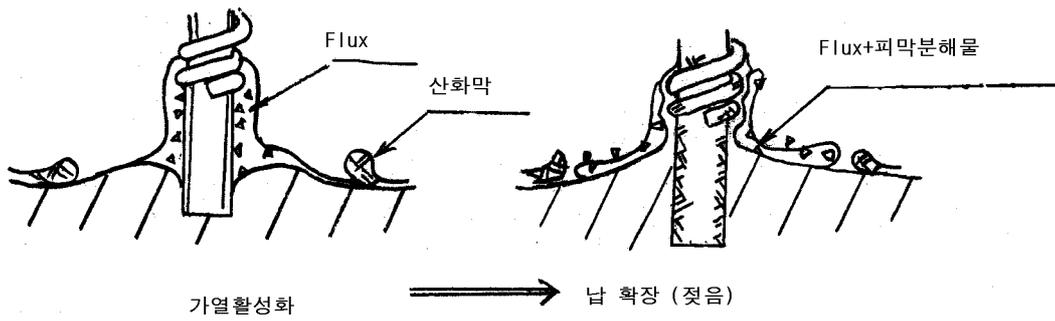
2) Dip

Dip

Flux가

Flux





3-5: Flux

가

가

Dip

가

가

3-6

3) (Point Soldering)

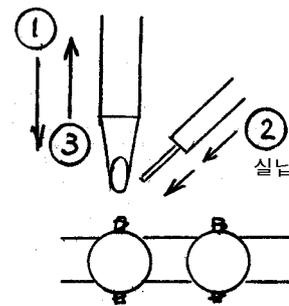
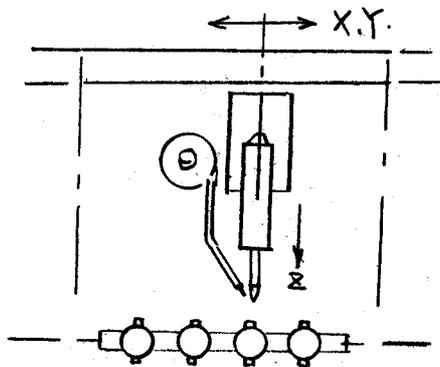
Dip

NC

FBT Diode FBT RC-Block
(精度), Chip

Chip

가



3-7: (Point Soldering)

4. Impulse Heating

4-1.

(壓接)

(合金相)

가

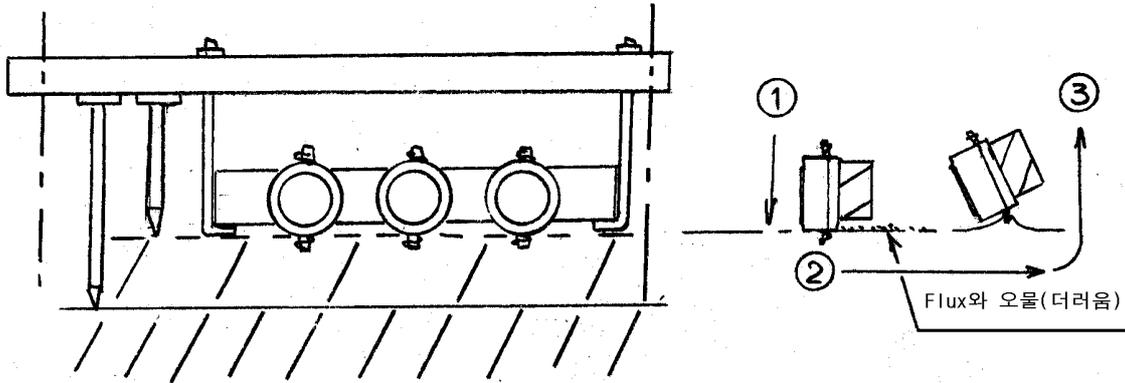
(Sn)

600 800

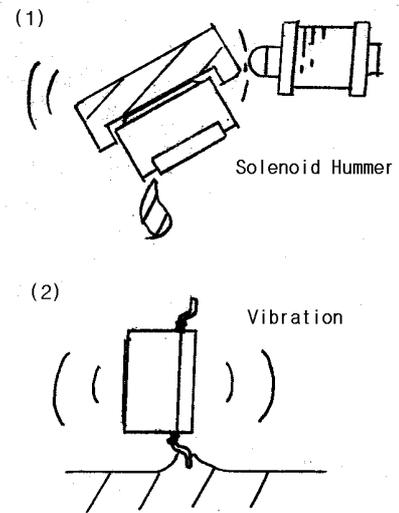
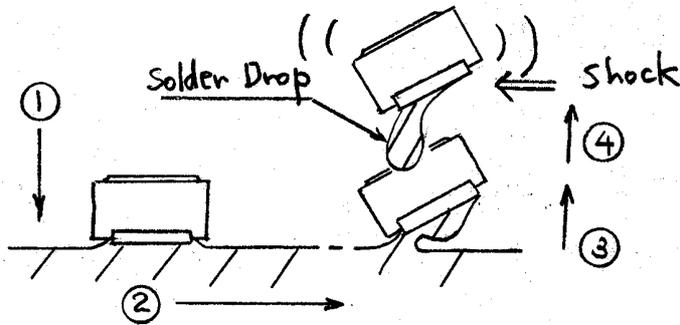
g



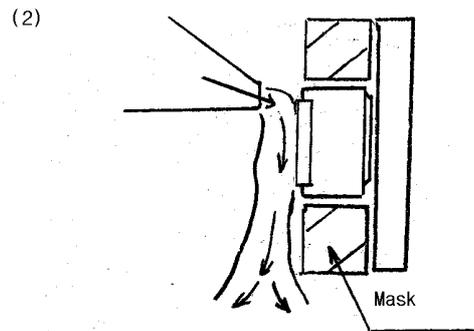
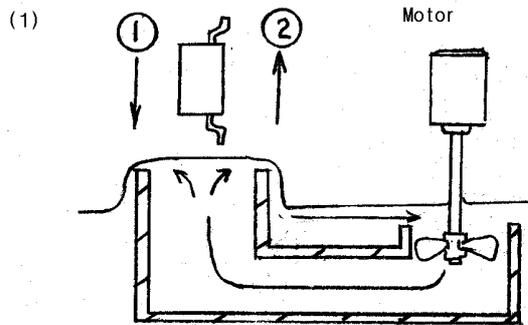
a) Swing Solder Dip



b) Vibro Solder Dip



c) Flow Solder Dip



3-6: 가

4-2:

Inverter

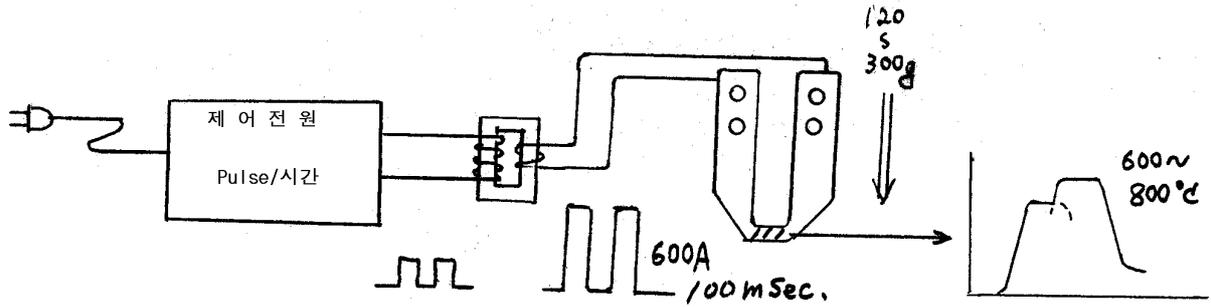
Condenser

(適性精度)

Feedback



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4-1: Impulse Heating

Trans Heater Chip Pulse
.(4-)

Pulse

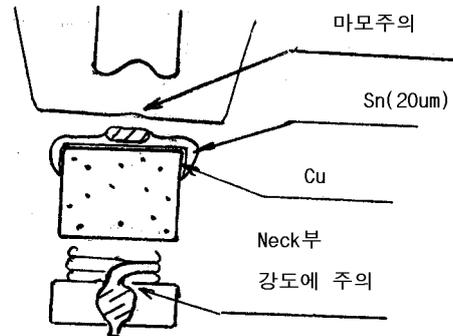
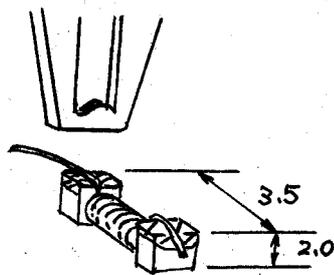
4-3.

(1) 1

가 Spot Ceramic Core CMC
가 .(4-2)
Ceramic Cu+Sn , Impulse 600 700A
100msec x 2 3
가 Spring Balance 120 300g,

Feed-Back

Heat Chip (W) 가 .Chip
5 Shot 가 가 20 Shot 가



(2) 2

4-2: 1

IC Card Coil IC Chip
.(4-3)

가 1 가 1.75 Heat Chip

Coating

Heat Chip



Feedback Heat 가

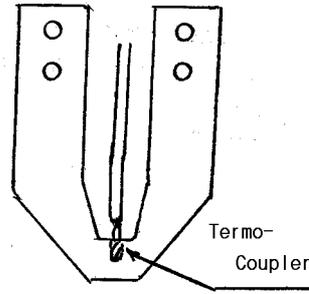
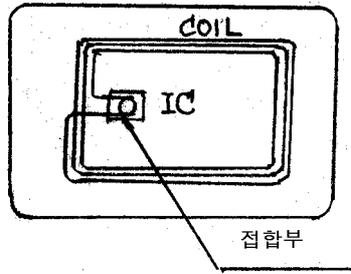
Inverter 가

EIW 0.045mm가 IC Card

Cu+Pb-Sn, Sn, Ni, Ag

,AIW

Pb-Sn Chip



4-3: 2

5. Micro Arc Welding

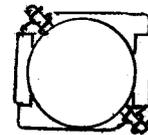
가

5-1.

Arc

2

가



UEW 가

AIW, EIW

S-Type(Solderable) 가

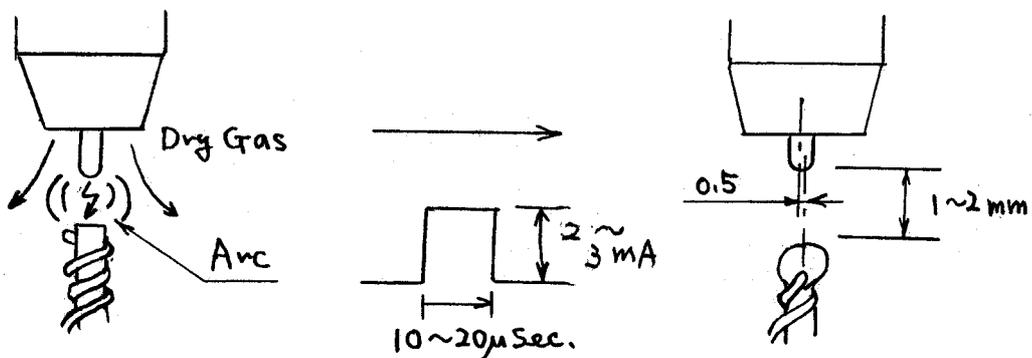
5-1:

(1.5 2mA, 10 20usec)

Arc가

(± 0.5mm),

Dry-Ar N₂ Gas



5-2:Micro Arc



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가 (球狀)

5-2.

SMD Coil

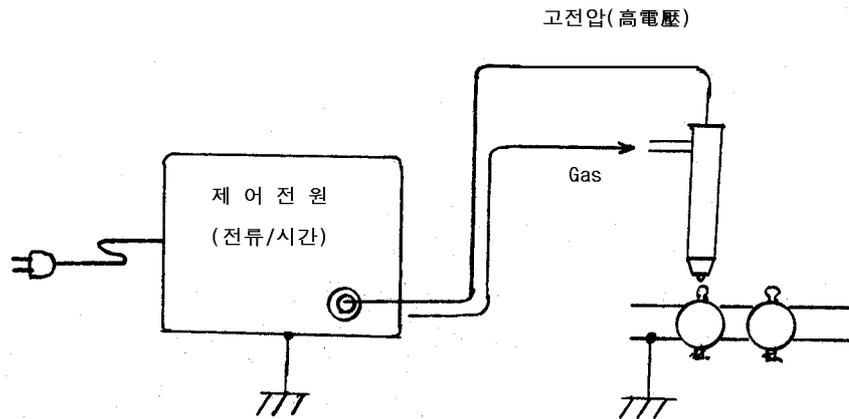
Relay

(0.1 × 300mm / : Shot)

Gas



5-3: (球)



5-4:

Jig

가

Tact Time 0.5 1.0usec 가

6. Spot Welding

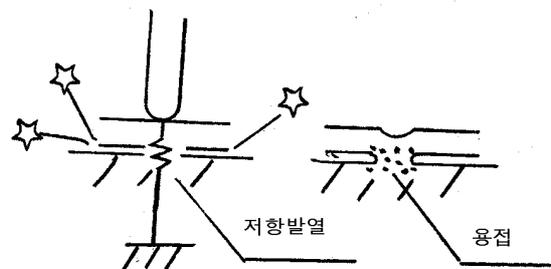
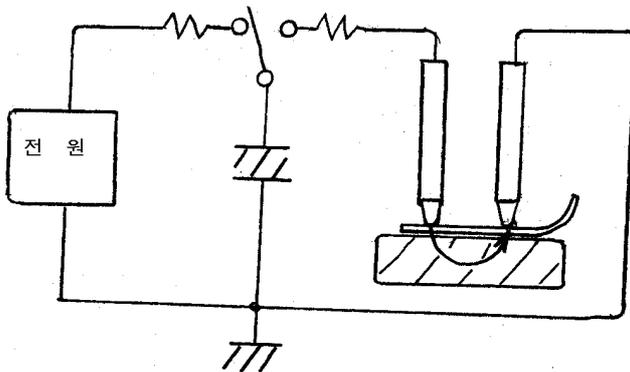
6-1.

2

(界面)

2

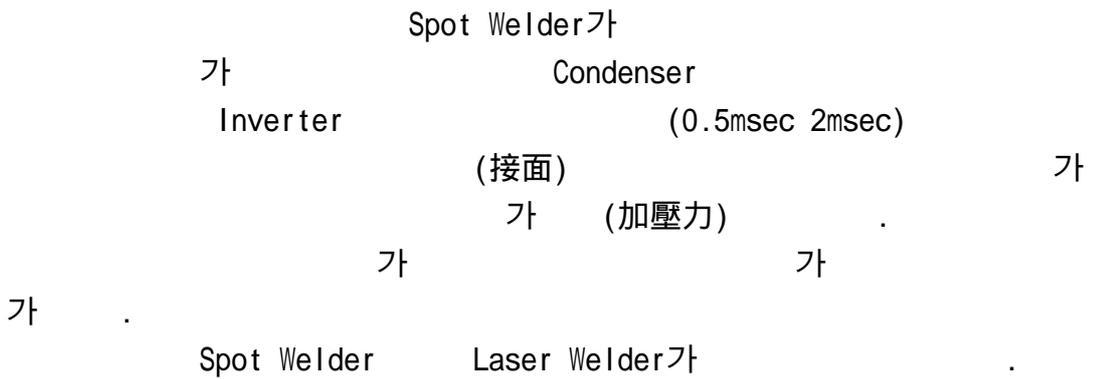
CRT



6-1: Spot



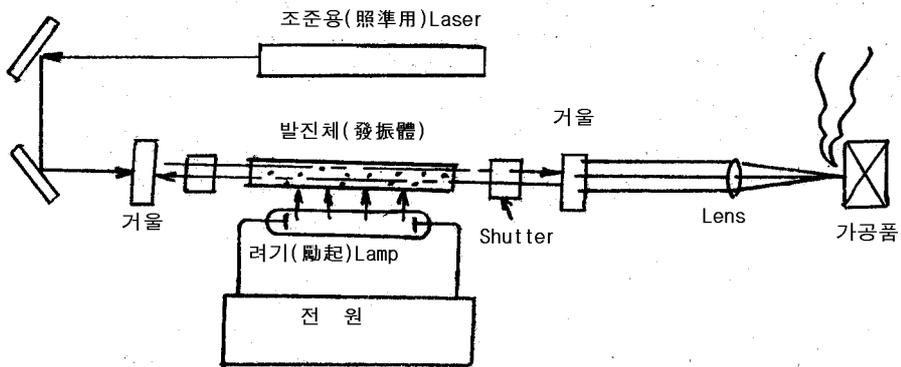
6-2.



7. Laser Welding

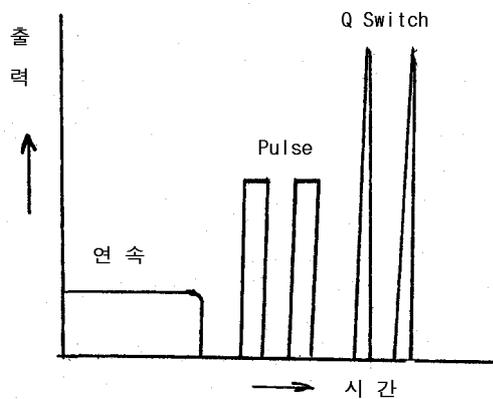
7-1.

가 Laser (集光精度) Energy
 CO₂, YAG, He-Ne
 CO₂, YAG 가 Energy , He-Ne
 CO₂ 가 가
 YAG가 가



7-1:Laser Welding

Laser , Pulse
 (Q-Switch) 가 Peak
 가
 Xenon, Crip-ton Lamp Laser Diode
 가

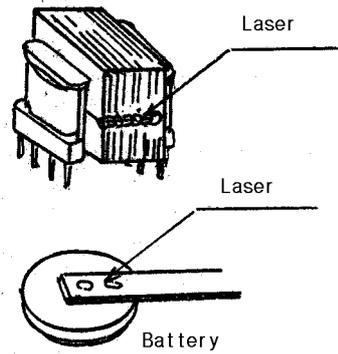


7-2:

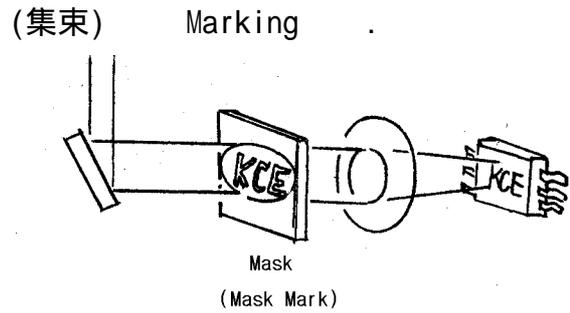
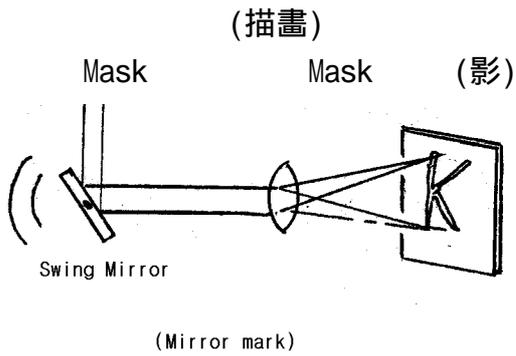


7-2.

가
 30 50W Pulse Laser가
 Coil, Trans
 가 가 Wire가
 Laser Marking Mirror Mask
 Mirror Pattern



7-3:Laser Welding

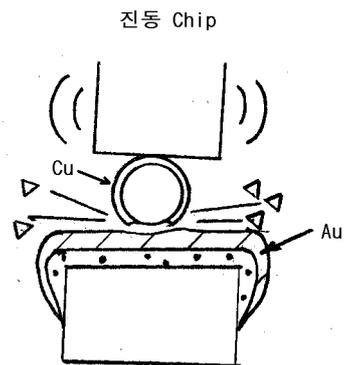
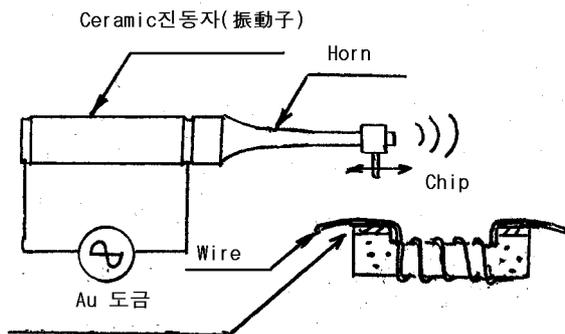


8. Ultra Sonic()

8-1.

(銅:Cu) (:Au)

(固相反應)



Cu Au가

가 (結晶)

가 가

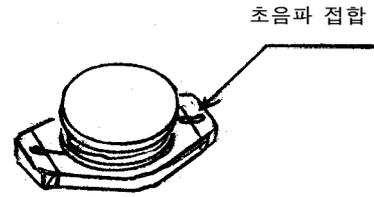


8-2.

Coil-Craft

가 Wire

가



9.

Coil Trans

Core

Wire

가 Cost

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:
: ,Ishikawa Michio
: ()

139-865
1 601
Tel: +82-2-974-7034
Fax: +82-2-974-7345

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