July 01, 2004

# BGA Adapter-CSPACK/CSICE

# Instruction for use

(1) Soldering CSPACK on a target board:

4 non-through holes for guide pins have to be provided on a target board for positioning CSPACK precisely on soldering pads. Details on guide pin please see the drawing.

A. Soldering procedure:

-1. Cream solder is applied on soldering pads of a target board. The solder thickness should be from 100 to 150 micro meter.

-2. CSPACK is packed in vacuum to prevent the solder balls from oxidation.
We recommend CSPACK should be soldered on a target board within the same day after opening the package. If CSPACK has to be soldered on a target board on the following day, please keep it in desiccators.

Please do not touch solder balls by fingers before soldering. It will cause poor soldering.

A plastic protection cover is placed over the pogo pins to protect the pins from damages. The cover is fixed with screws onto the adapter base. The cover should not be removed before soldering to prevent CSPACK from splashing flux during soldering process.

-3. The guide pins of CSPACK should be carefully inserted into non-through holes of a target board. Then please check whether CSPACK is placed at the exact position.

-4. The recommending reflow temperature profile is shown under :

i) Outer dimensions of CSPACK are bigger than those of BGA package, so please refer to the foot print drawing on the space available for mounting other piece parts.

ii) A big volume part around CSPACK will interfere reflow soldering heat circulation. Please pay attention for positioning a big part around CSPACK.

iii) Soldering temperature profile of CSPACK should be finalized after checking the reflow temperature with a CSPACK test sample since CSPACK is bigger than BGA package. Temperature on the bottom of the sample should be checked with sensor.

iv) The maximum soldering temperature should be 210°C or higher for 30 to 60 seconds.

v) Reflow temperature testing samples are available with charges. Please make it sure whether or not the testing sample is firmly soldered on a PCB before setting up the soldering temperature profile of CSPACK. Recommending temperature profile is shown under;

Preheating : 160 to 180 °C for 180 seconds approximately
Soldering temperature : 210 °C or higher for 30 to 60 seconds approximately.

Note : Do not clean CSPACK with a flux.

-5. Unscrew the four corners from CSPACK, and remove the protection cover.

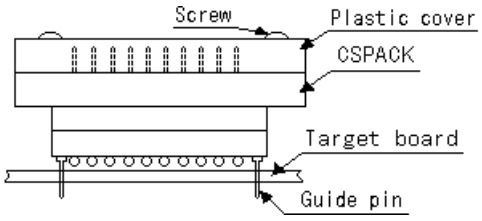


**Fig. 1 Mounting CSPACK on a target board**

(2) Installing BGA package :

CSPACK and CSCOVER (top cover and spacer) are assembled after soldering CSPACK on a target board;

-1. Place a spacer on CSPACK. Holes at four corners of CSPACK and the spacer should be drawn up in line.

-2. BGA package is installed into the spacer, paying attention to the location of pin # 1. Solder bumps of BGA package will touch the flexible contact pins of CSPACK.

-3. Place the top cover over the spacer. Holes at four corners should be drawn up in line. CSPACK and the top cover are assembled together with screws enclosed.
Screw the top cover with equal force on each corner. The screw driver attached should be used to fix the top cover with optimum torque. Screw fixing torque is 0.55kg f cm (0.054Nm) max.

-4. When disassemble CSCOVER and CSPACK, unscrew CSCOVER from CSPACK. During disassembly, hold CSCOVER with fingers to protect CSPACK from unscrewing stress. Then remove the top cover, and withdraw BGA package with tweezers. As illustrated under, semicircle spaces for a tweezers are provided for easy withdrawal of BGA package.

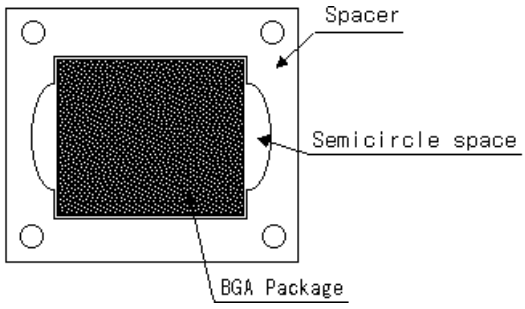


**Fig. 2 Spacer and BGA package**

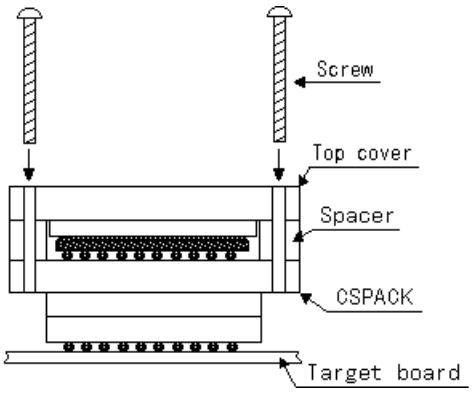


**Fig. 3 Installing BGA package**

(3) ICE cable connection :

ICE cable can be connected to CSPACK soldered on a target board.

-1. Connection pads have to be provided at the end of the cable for connecting CSPACK flexible pins. Connection pads should be plated with hard gold over nickel. Please do not make through holes in the pads, as the flexible pins touch the pads. This will damage both the pads and the flexible pins. Fig 4 illustrates the explosion view of ICE cable and CSPACK assembly.

-2. Contact force of 30 grams/flexible pin will be applied to the connection pads. So we recommend that a stiffener should be placed at on the cable for protecting pad area as shown in the Fig. 4.

-3. CSPACK and the cable are assembled together with screws, M-1.6 for pin count up to 199, or M-2.0 for pin count 200 or more. Screw at the four corners of the stiffener and the cable with equal force. Please hold the stiffener and CSPACK with fingers to protect CSPACK from unscrewing stress while screwing, when disassemble the cable, unscrew the cable from CSPACK. A stiffener should be used to protect a rigid PCB of its thickness less than 1.2mm.

-4. Flexible pins are so designed that the optimum contact force will be realized with pin stroke of 0.8 mm. So 0.2 mm spacers as stand off have to be provided at the bottom side of the cable as shown in the Fig 4.

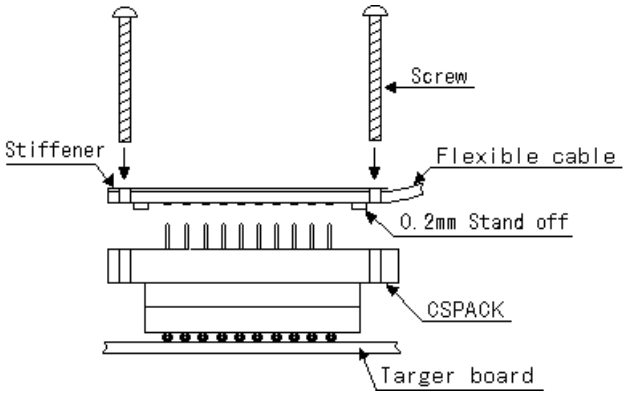


**Fig. 4 Explosion view of ICE cable connection**

(4) ICE connection with CSICE :

Stacking CSICE connector on CSPACK ;

-1. After soldering CSPACK on a target board, draw up through holes of CSICE and CSPACK in line.

-2. Fixe CSICE on CSPACK with the guide screws attached. During fixing CSICE, hold CSPACK with fingers to protect CSPACK from screwing stress. The fixing torque should be equal to each screw.

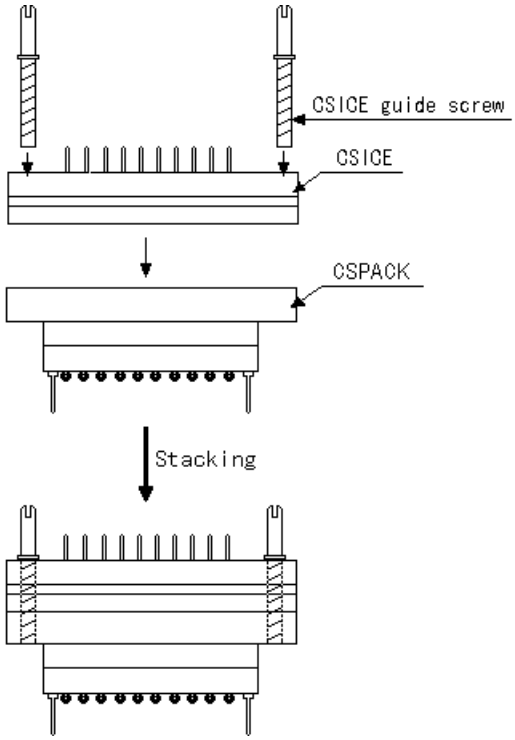


**Fig. 5 CSICE stacking on CSPACK**

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# Important Notes in Handling BGA adapters, CSPACK

1. Check the BGA package sizes whether the package is fit with CSPACK. For details, please refer to our home page at PDF file, in which you can find CSPACK product drawings and the recommended foot patterns.

2. When CSPACK are taken out of a packing box, please hold CSPACK by fingers, then remove the packing material first.

3. When packing boxes are kept under ambient temperature of 50 °C for long time, the boxes might be deformed. The storage place should be free from sun light, and the room temperature should be 40 °C or lower.

4. CSPACK are encapsulated in vacuum plastic bags to prevent the solder bumps from oxidation. CSPACK must be soldered on PC boards within the day when the packing box is opened. If CSPACK are not soldered on PC boards for more than 24 hours after opened the bags, CSPACK should be kept in a desiccator.

5. A CSPACK is encapsulated in a vacuum plastic bag. A plastic protection cover is placed over the pogo pins to protect the pins from damages. The cover is fixed with screws onto the adapter base. The cover should not be removed before soldering to protect CSPACK from splashing flux during soldering process.

6. Recommend soldering temperature profile on the surface of CSPACK:
   Preheat : 150 to 180 °C for 180 seconds
   Reflow : 210 °C for 30 seconds max.
   Peak temperature : 240 °C for 10 seconds

7. CSPACK should not be cleansed. Cleaning materials will contaminate in the CSPACK due to its construction.

8. When fixing CSPACK with a screw driver, the precision driver (+ type) #0 or 1, or a torque driver should be used. Screw fixing torque is 0.55 kg f cm (0.54Nm) Max. Four screws at the corners should loosely fasten first, then tightly fasten the screws. If only one screw is tightly fastened more than others, open contact problem might be caused.

9. Guide pins come out about 1.4 mm from the bottom surface of PCB of 1.6 mm thickness, when a guide pin type CSPACK is soldered. If any force is applied to the pins come out, the force is transferred to solder bumps of the bottom of CSPACK. This may cause open contact problems, or may damage CSPACK. So please protect the pins come out from any force. Guide pins should be soldered at the rear side of PCB after soldering CSPACK. Or, Soldered balls potions should be tightened with a glue to protect solder balls from stress.

10. CSPACK with guide pins should be used because stress will damages the solder balls of CSPACK if the guide pins are not provided. Guides pins are attached to the standard CSPACK.

11. Vibration or shock environments are not be allowed for CSPACK. CSPACK should be used for

test or emulation applications only.

12. CSPACK is developed for test or emulation applications only as mentioned item 11. So CSPACK are not approved by any Electric Appliances Safety Rules or EMI Regulations.