August 1, 2000

BGA Emulation Adapter
DSPACK
Technical Information

I. Notes for PCB Design :

1. **Pads for DSPACK pogo pins must be plated with gold. Plating with other than gold will cause open contact problem.**

2. **The DSPACK has guide posts for proper alignment and mounting. So provide non-plated through holes. For dimensional details, please refer to the technical darwings.**

3. **The DSPACK is attached with nuts on the rear side. The area around the nuts should be clear of wiring traces. For details, please refer to the technical darwings.**

II. Notes for assembling DSPACK on a taregt board :

1. **Place the DSPACK adapter on a target board using the guide posts for proper alignment; The posts will help for positioning the adapter properly.**

2. **Hold DSPACK down to a target board while you tighten the nuts on the rear side of a target board. Tightening torque is 0.55kg.f.cm. (0.054N.m) Maximum. Excessive tightening torque will cause open contact between pogo pins and pads due to warp of the target board.**

III. Loading and unloading the BGA package into the DSPACK:

1. **The guide plate, called DSCOVER, is provided for positioning BGA package at the exact mating position.**

2. **The spacer shown in Fig 1 and 2 on the following page is placed on DSPACK base. Four fixing holes of the spacer and the base should be aligned before tightening screws.**

3. **Pin# 1 location of BGA package should be confirmed visualy pin #1 of DSPACK before loading the package. Place the package into the spacer from the top. Solder balls of the package can be aligned with the pogo pins of DSPACK. The surfaces of solder ball should be clean and free from oxidation, otherwise you might experience open circuit problem.**

4. **Place the top cover on the spacer. The screw holes of the top cover are located at the same positions as those of the spacer. Attach the top cover and the spacer to DSPACK base by tightening the screws in diagonal fashion with the provided driver. Tightening torque should be 0.55kg.f.cm (0.054N.m) Maximum.**

5. **When the top cover is removed from DSPACK adapter, hold the adapter base by fingers to protect the base from unscrewing force. To remove BGA package from the adapter, use tweezers by inseting its end into the space provided at the edges of the spacer, then take it away from the adapter. For more details, plesase refer to Fig 1 and 2.**

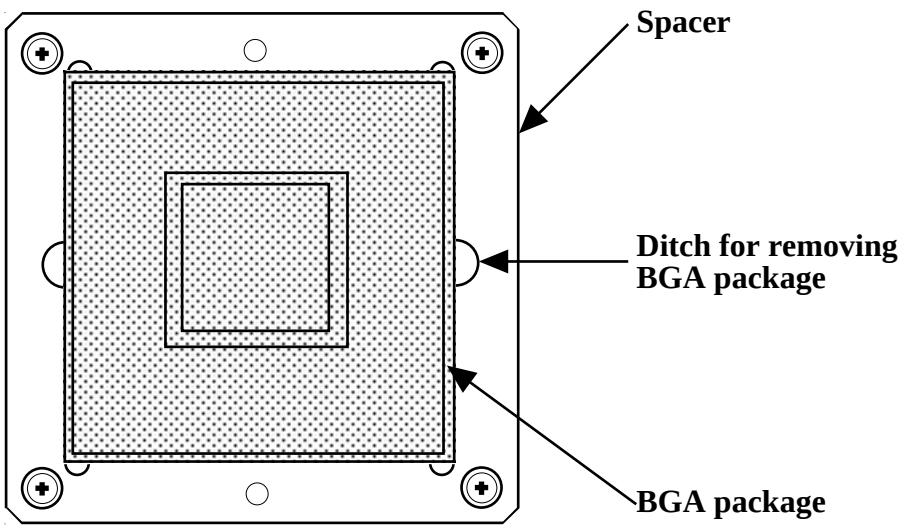

Fig 1. Top view of BGA package and spacer.

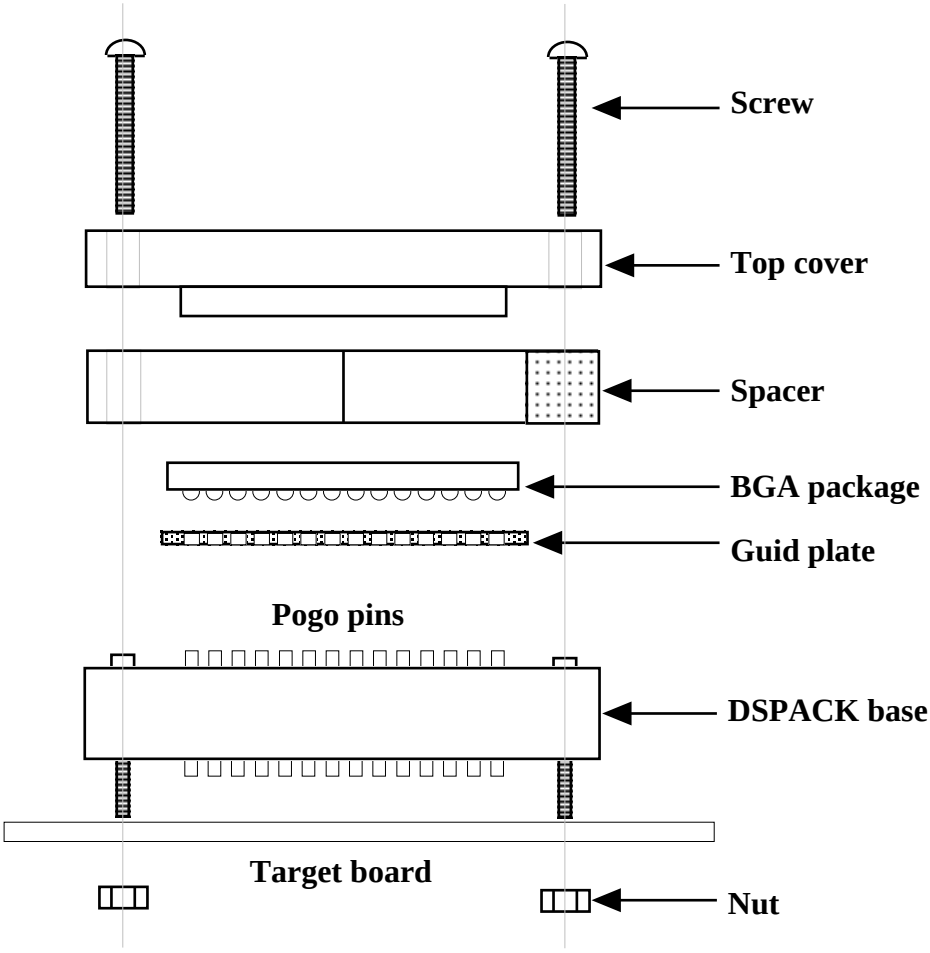

Fig 2. Explosion view of DSPACK and BGA package.

IV. ICE cable direct connection to DSPACK:

1. **Extension cables can be connected directly to DSPACK assembled on a target board.**

2. **Pads on the cable have to have the same phsycal layout as the pogo pins of DSPACK. Recommendable plating on the pads is gold over nickel since the pogo pins will push against the pads. Do not use through holes on the pads. Pogo pins can damage the holes. For details, please refer to Fig 3.**

3. **Contact force between pogo pins and the pads is 30 grams approx.. Therefore, the flexible cable's end must be protected with a stiffener (rigid plastic plate) which has thickness 1.2mm or more. The stiffener less than 1.2 mm thickness may be damaged from the contact force.**

4. **As illustrated in Fig 4 , cable can be attached to DSPACK with screws that can be either M1.6 or 2.0 in size. The holes at each corner of DSPACK base are for this purpose. The screws should be tighten with the provided driver. When a cable is removed from DSPACK base, hold the adapter base to protect the base from unscrewing torque.**

5. **The optimum contact force can be achieved at 0.4 mm pogo pin displacement. Therefore, please put a stand off at each corner on the cable end as illustrated in Fig. 3.**

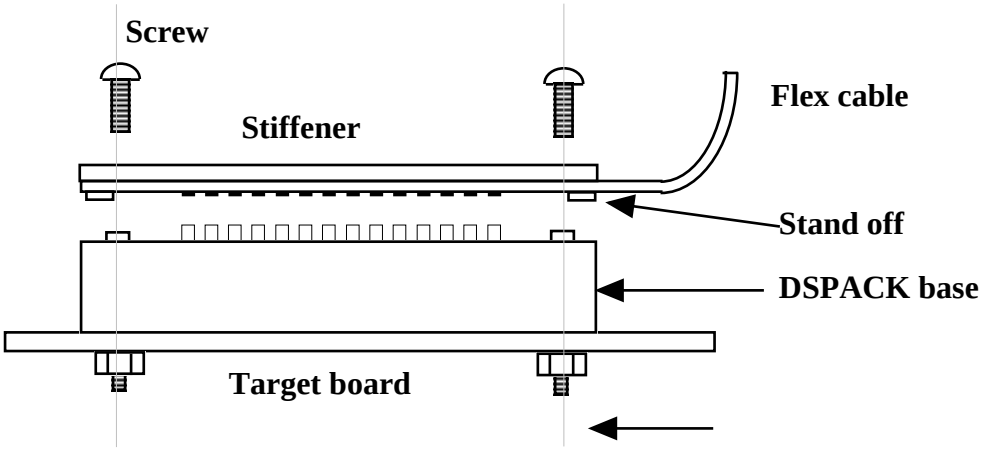

Fig 3 Connection to ICE cables

V. ICE cables connection to DSPACK using CSICE :

1. **CSICE is a conversion adapter; It converts BGA foot pattern to QFP socket pin layout. This allows existing NQ/TQPACK tools to be connected to DSPACK base using CSICE as illustrated Fig 4 .**

2. **Place CSICE on DSPACK base with pad side down. Align the fixing screw holes of both CSICE and DSPACK.**

3. **Attach CSICE and DSPACK base using CSICE guide screws. Hold DSPACK base by your fingers to protect the base from screw tightening torque. Tighten the screws in diagonal order with equal torque.**

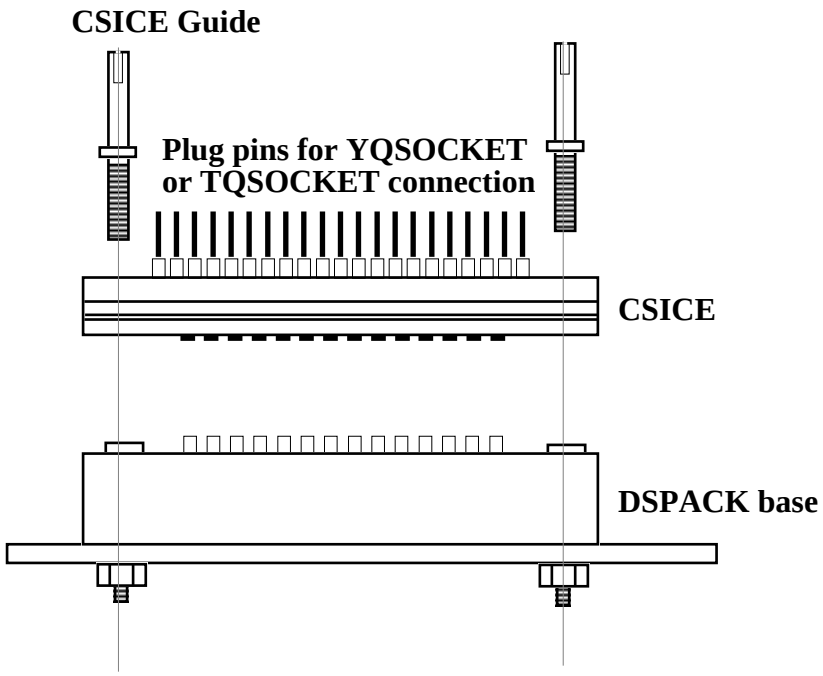

Fig 4. Explosion view of DSPACK and CSICE

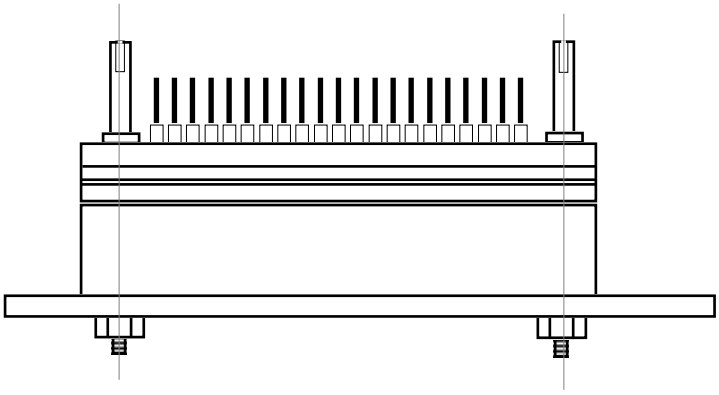

Fig 5. DSPACK and CSICE are assembled

VI. ICE cables connection to DSPACK base with CSPLUG :

1. **ICE cables can be connected to DSPACK base using CSPLUG as shown Fig 6.**

2. **Plug pins are soldered to FLEX cable end. Assemble CSPLUG onto DSPACK base with its pad side down.**

3. **CSPLUG and DSPACK base are attached together with the screws of whcih size is M1.6 or M2 . Hold DSPACK base by your fingers to prevent the base from screw tightening force. Screws should be tightened in diagonal order with equal torque.**

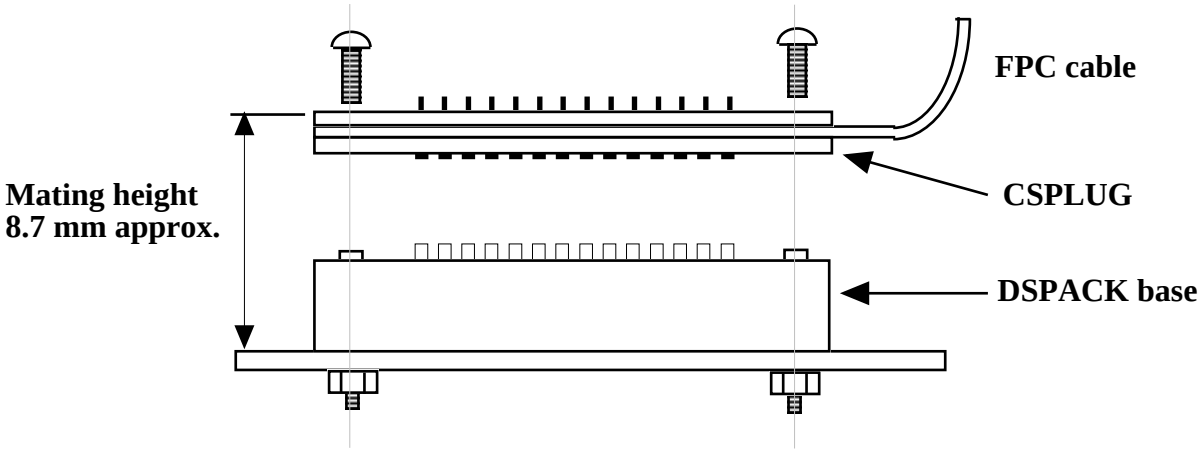

Fig 6. ICE cable connection to DSPACK with CSPLUG

VII. ICE cable connection to DSPACK with CSPLUG and CSSOCKET:

1. **As shown Fig 7, CSPLUG is assmbled onto DSPACK. During tightening CSPLUG-Guide, hold DSPACK base by fingers to protect DSPACKbase from tightening force. CSGUIDE should be tightened in diagonal order with equal torque.**

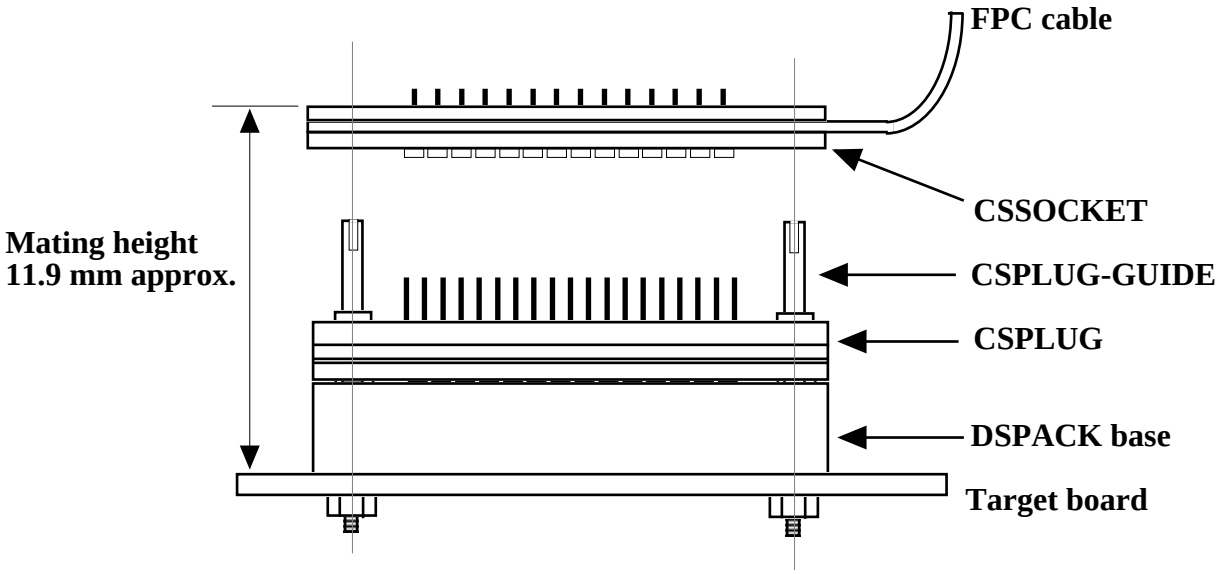

Fig 7. ICE cable connection with CSPLUG and CSSOCKET

2. **CSSOCKET soldered to the cable's end can be stuck on CSPLUG which is assembled on DSPACK base. CSSOCKET can be placed on the exact mating position by using CSPLUG-GUIDE. Provide non-through holes for the guide posts at each corner of CSSOCKET. In case of a single CSSOCKET only at the cable end.**
   As CSPLUG-GUIDE is not long enough, it can not be fixed to DSPACK from the top of CSSOCKET.