Q&A of Bonding & Soldering of SE105 Flip-Chip Pressure Sensor Dies

Model SE105 Flip-Chip Pressure Sensor Dies (or chips) feature a unique flip-chip structure so that they can be bonded/soldered through surface mounting process. Listed below are general Q&A's about bonding & soldering of SE105 chips, which are based on experience of BCM SENSOR. One can refer to such the Q&A's to setup and/or adjust facilities to conduct the bonding and soldering.

Q-1
Regarding the bonding and soldering of SE105 chips, is it recommended to use an ordinary reflow soldering furnace or a nitrogen-filled soldering furnace (or similar equipment)?
A-1
The solder paste used to implant the solder balls on SE105 chips is SCA305, and the formed solder balls can adapt to a variety of reflow conditions. Therefore, both ordinary reflow soldering furnace and nitrogen-filled reflow oven can be used for this purpose.

Q-2
If SE105 chips can be "bonded/soldered" with an ordinary reflow furnace, can it be soldered under ambient pressure (e.g., atmospheric pressure: 1bar)?
A-2
All of our reflow ovens are operated in an atmospheric environment without pressure control.

Q-3
If it is not possible to solder under ambient pressure, what pressure is recommended in the reflow oven?
A-3
SE105 chips can be soldered under ambient pressure, for example, at atmospheric pressure.

Q-4
Can the solder balls implanted on the SE105 chip be melted in the reflow oven and form a firm "electrical connection and mechanical bond" with the pads on printed circuit board?
A-4
The solder balls on SE105 chips can be melted in the reflow oven and form a reliable electrical connection and firmly mechanical bonding with the solder pads on the printed circuit board.

Q-5
If it can, what temperature profile is recommended to use in the reflow oven?
A-5
The temperature profile of our reflow oven is as follows:

- 1st stage: preheating at 178°C for 150s;
- 2nd stage: heating rate at 0.5~1°C/s;
- 3rd stage: reflux 250°C for 90s;
- 4th stage: cooling rate at 1~2°C/s.

Because the "specific heat capacity" of different subjects is different, the profile of temperature versus time has to be optimized and adjusted with reference to the soldered result in order to form the most reliable electrical connection and firmly mechanical bonding.

Q-6
Is it recommended to apply "solder paste" on the printed circuit board on which SE105 chips will be bonded?
A-6
It is recommended to apply the same solder paste of SCA305 on the printed circuit board as what is used to implant the solder balls on SE105 chips.

Q-7
If the solder paste is required, is it recommended to use so-called “clean free” solder paste?
A-7
Yes, it is best to use the “clean free” or "no-clean" solder paste.

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Q-8
After SE105 chips are "bonded/soldered" on a PCB, is it necessary to clean the resultant assembly (e.g., a pressure sensor) with some chemical reagents?
A-8
If the “clean free” solder paste is used, cleaning is not required unless the cleaning is firmly required.

Q-9
If cleaning is required, what chemical reagents are recommended for the cleaning?
A-9
If the cleaning is specially required, it is recommended to use a chemical reagent of a neutral PH level for cleaning purpose.

For further engineering advice, one can contact BCM SENSOR.

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