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## 1996

### Mass production of CSPs having tape substrates starts

#### ~ Packaging ~

In 1996, area-array packages of wire bonding type were put into mass production by Sharp. They employed polyimide high-density wiring substrates. There were square-shape type and rectangular-shape type. The CSP outline was chip size + 1.2 mm, and the mounting height was 1.2 mm max, which was equivalent to TSOP. The ones with the ball pitches of 0.8mm (solder ball diameter: 0.35mm) and 1.0 mm (solder ball diameter: 0.45mm) were first put into mass-production. Square types of 6mm square (28-pin), 8mm square (80-pin), 10mm square (108-pin), 12mm square (100-pin, 120-pin, 160-pin), and rectangular types of 7x13mm<sup>2</sup> (32-pin) and 9x15mm<sup>2</sup> (64-pin) were first produced.

TAB tape substrate was used. Mold was multi plunger type, and biphenyl type epoxy resin was used. Vent holes were also applied for reflow.

Since this package was small with high area efficiency and with light weight, it was adopted in portable devices such as mobile phones, PHS, camera integrated VCRs and PDA.

The figures below show a schematic of CSP and the outline specifications. Around this time, CSP of the same type was also mass-produced by TI.

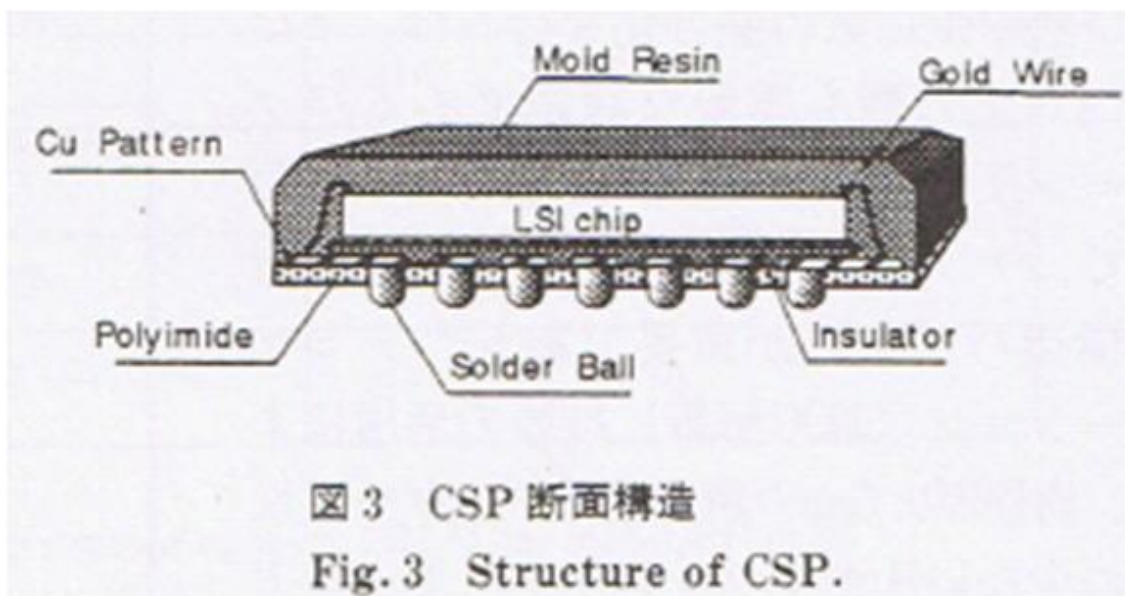


表 1 CSP 外形仕様  
Table 1 CSP outline specification.

Minimum package size	Chip size + 1.2mm
Applicable number of pins	Up to 304 pins
Terminal (ball) pitch and diameter	0.8mm pitch/0.35mmφ 1.0mm pitch/0.45mmφ
Mounting height	1.2mm max

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Version 2019/1/31