

# COS MODULE

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## Products & Designing

Ver. 1.0

24, Jul, 2001

Features:

- \* Display formats can be customized according to your request.
- \* Shorter lead time.
- \* Compact fabrication realized by COS which uses flexible cable between COG stick board and LCD.
- \* On the surface of In/Output FPC, we can mount condenser, resistor, etc..



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NANOX CORPORATION

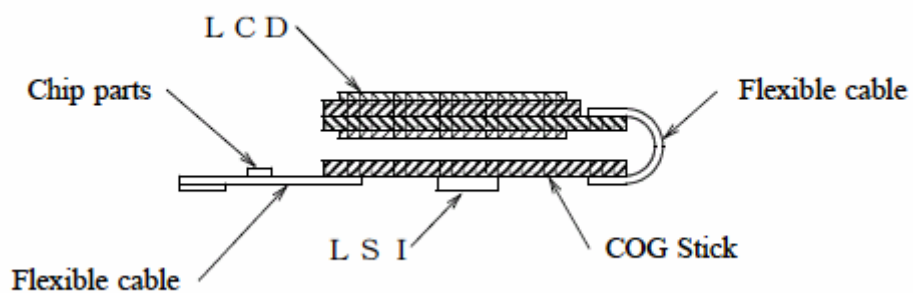
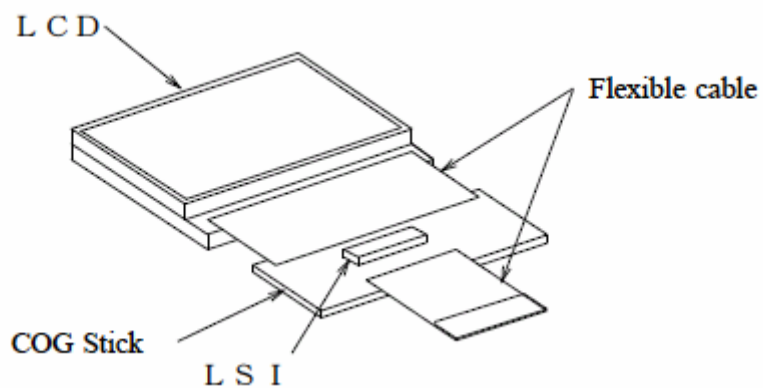
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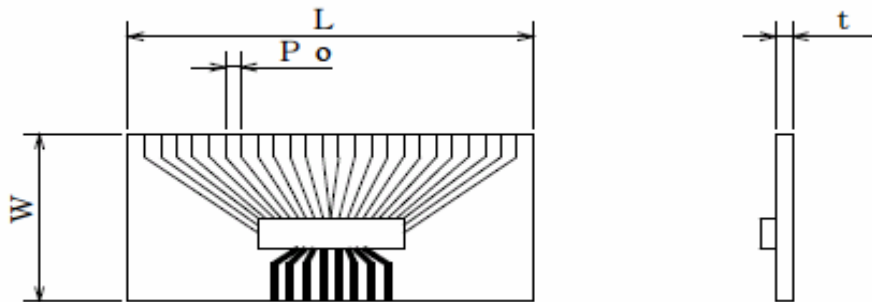
## 1, Reference of COS

COS (Chip On glass Stick) is our new proposal for sub displays of mobile telephones.

- 1) We combine high quality of COG module with compactness using flexible cable.  
With COS, we can provide smaller terminal area at lower price. It is especially suitable for sub displays of mobile telephones.
- 2) Based on customers' requirements, we can suggest preferable connection materials, such as FCP, heat seal, etc., for the flexible cables between the LCD and the COG stick, and for the In/Output materials.
- 3) One of the main advantages of COS is its simplicity of connection to CPU by reducing wiring of In/Output terminals because we can mount condenser, resistor and other chip parts on the surface of FPC.



## 2, Design limitation



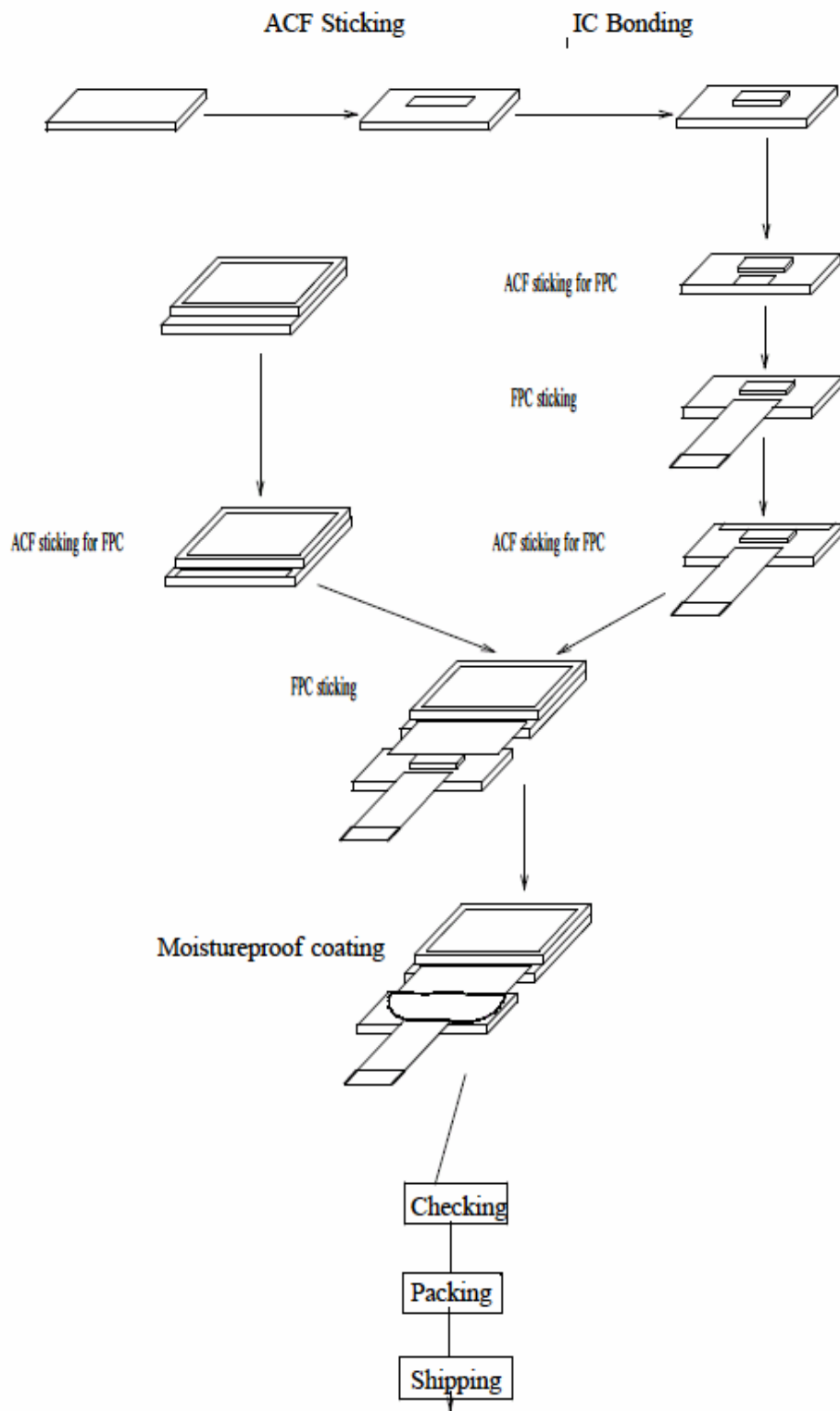
Notice) Outer dimension :MIN.  $18(L) \times 10(W) \times 0.5(t)$ mm  
MAX.  $120(L) \times 100(W) \times 1.1(t)$  mm  
Terminal Pitch :MIN.  $P_o = 0.15$ mm

### Wiring resistance

For COG stick, we use ITO wiring. On the other hand, for COF type and TAB type, we use copper wiring. While the wire resistance of the copper wiring can be ignored, the wiring resistance of ITO wiring will be several hundred to several thousand  $\Omega$ .

When the wiring resistance is too much, it may reduce the responsiveness of COG. Therefore, it is important to design so as to reduce the wiring resistance.

### 3, COS manufacturing Flow



#### 4, Manufacturing location

Fukushima Main Factory: From LCD to final products of COG.  
(COG MP starting from Apr.1995)

China Plant : Back-end process of COG.  
(COG MP starting from Sep.1997)

Philippines Plant : From LSI bonding to final products of COG  
(Established: Apr.2000)