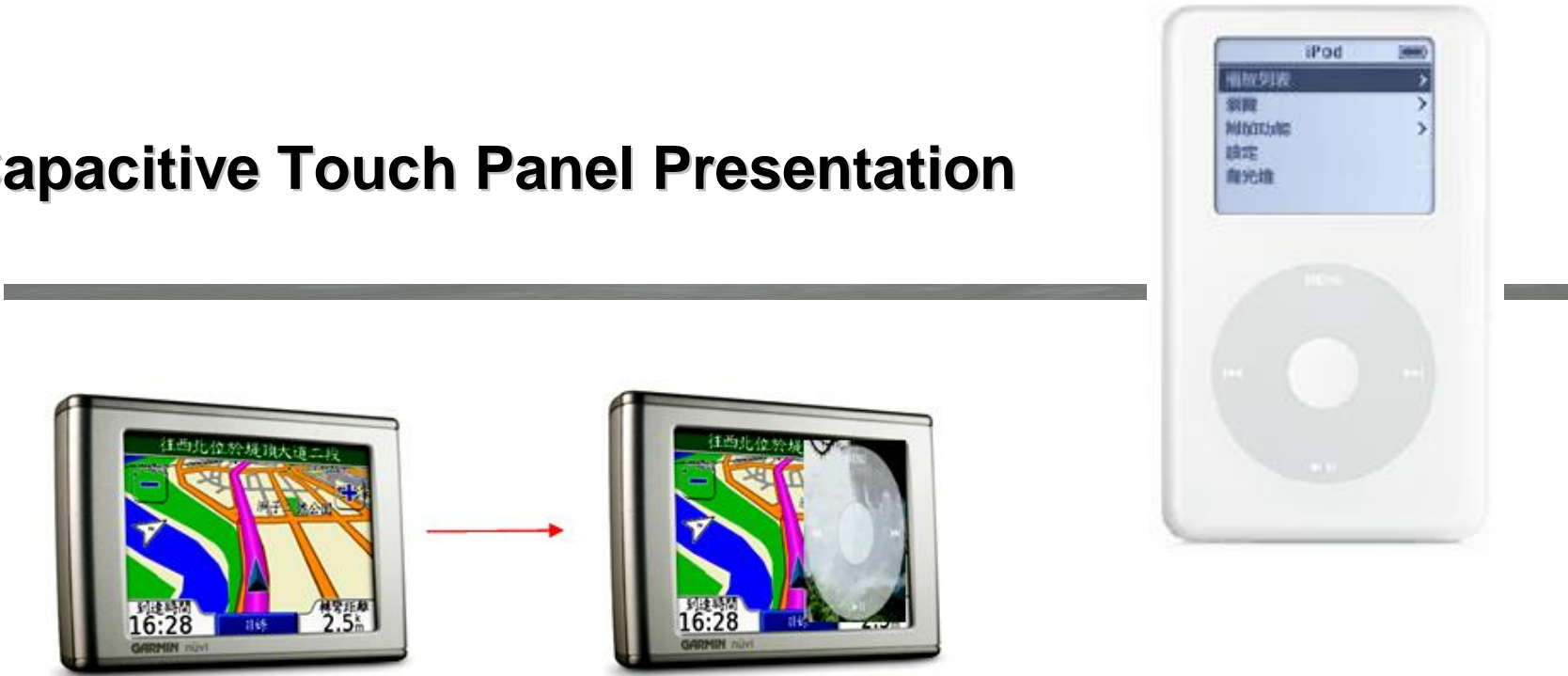


Capacitive Touch Panel Presentation

TRULY

Capacitive Touch Panel Presentation



Application

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small medium size



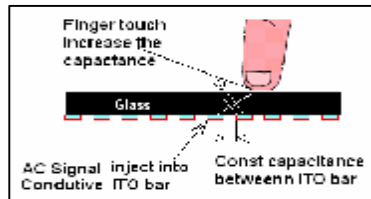
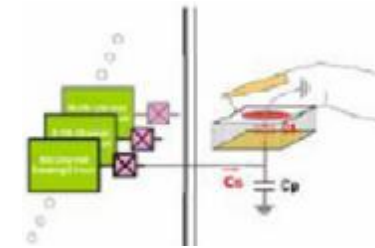
medium large size



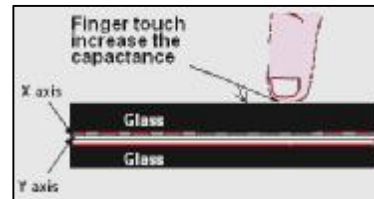
Principle

TRULY

- I Cp: parasitic capacitance
- I Cf: finger capacitance
- I When finger close to the touch panel the capacitance change: $C_s = C_p + C_f$
- I Detect the finger by measuring the change of capacitance



touch key design



matrix design

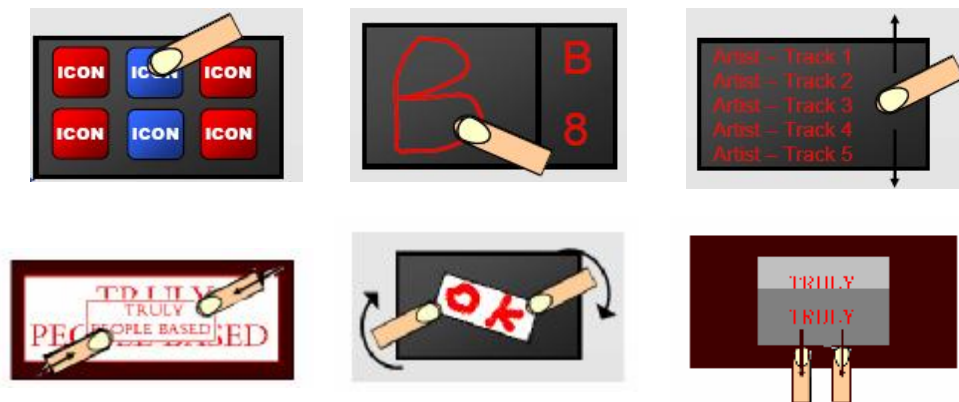
I Arm glass or plastic covering the CTP make it high reliability.

I Just approach without large force that make CTP work, which bring you totally new touch feeling.

Application of touch key design

| | | | | |
|-----------------|-----------------|-----------------|-----------------|----------------------------|
| | | | | |
| MP3 Key | Menu Key | MP3 + Menu Key | MP3 Key Slider | MP3 Slider/Hybrid Key |
| 3 Touch / 3 LED | 4 Touch / 4 LED | 7 Touch / 7 LED | 7 Touch / 7 LED | 12 Touch / 2 LED / 1 Mech. |

Function of matrix design

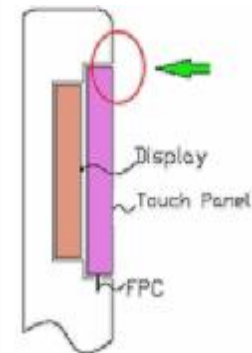
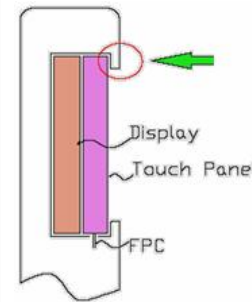


Characteristic

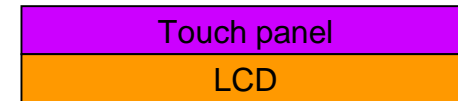
TRULY

Capacitive VS Resistive

| | Resistive TP | Capacitive TP |
|------------------------------|---------------------|---|
| Reliability-lifetime | Short | Long |
| Input | Need more pressure | No pressure |
| Transmissivity | >80% Typ. | >90% Typ. |
| Stylus | Needed | Not needed |
| Functions Using Finger Touch | Handwriting, button | Handwriting, Button, Slide, Scrolling, Cursor Control, Gesture, Multi-touch |
| Cost | Low | On the condition of the structure |
| Calibration | Needed | Not needed |
| Advantage | Low Cost | Long Life More Functions User friendly |



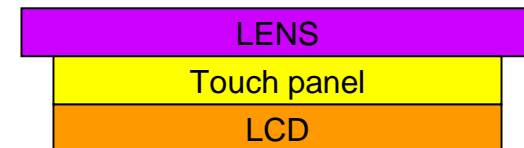
Assemble of resistive TP



Resistive Touch panel

- Requires pressure (stylus) for contact between two resistive/conductive layers
- Prone to wear & tear
- 2 ITO layers required (plus spacer layer)
- Lower transparency than capacitive
- High pointer precision

Assemble of capacitive TP



Capacitive Touch Panel

- Requires conductive object (finger)
- 1 or 2 ITO layers
- Excellent transparency possible (>90%)
- Low pointer precision

Major Product and Service

TRULY

Truly can supply:

- 1: Touch Sensor (Without Control IC、Cover Lens) .
- 2: Touch Module (With Control IC、Cover Lens) .
- 3: Total Module (Touch Module + LCM) .

Truly can supply capacitive touch panel based on requirement of customer, including:

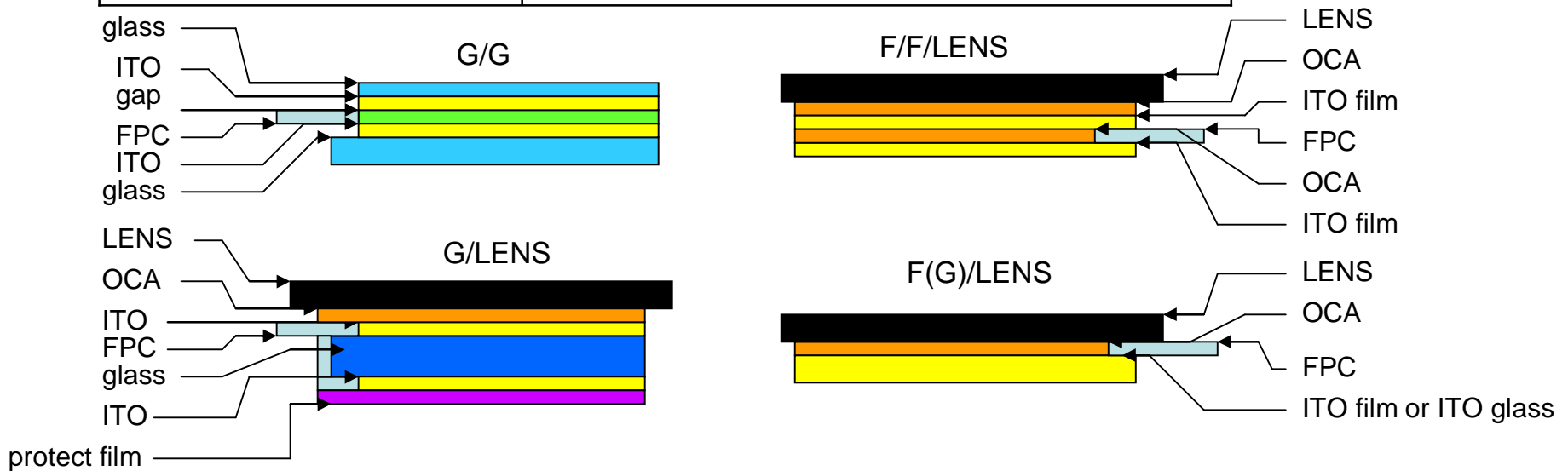
- 1: 1D、2D structure design (Single ITO layer、Double ITO layer) ;
- 2: Operation :
Click, Drawing/Handwriting, Drag, Scroll, Rotation, Room in/Room out (Grow/Shrink),
Gesture, Multi-touch, ...
- 3: Touch Sensor 、 Touch Module (Control IC indicated by customer, or Control IC recommended by Truly) .
- 4: Total Solution (Including Control IC, Cover Lens, material, design, software...) .
- 5: Total Module (Touch Module + LCM) .
- 6: Fully support of ID design , Prototype, Test/Tuning...
- 7: Abundant capacity support, can quickly expands for future development.

Product Structure

TRULY

| Structure | Characteristic | Transmissibility |
|------------------------------|------------------------------|------------------|
| G/G | High reliability | >90% |
| F/F/LENS | More thin | >90% |
| G/LENS | The same structure to Iphone | >90% |
| F(G)/LENS(single ITO layer) | More thin, lower cost | >90% |

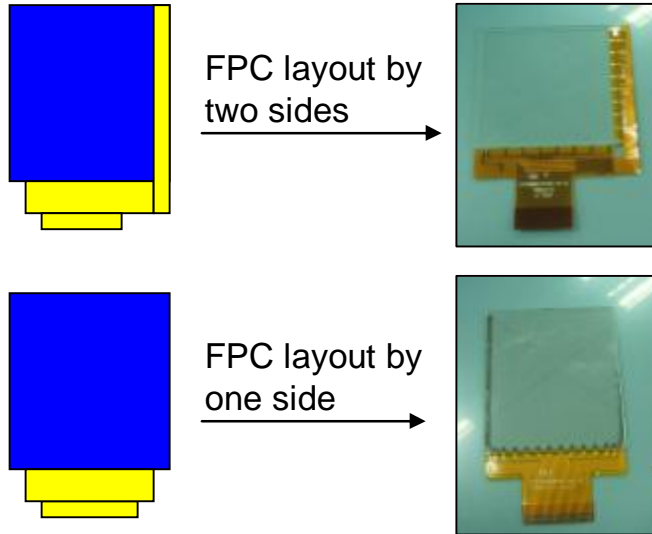
| Lens material | Thickness Spec. (Recommended) |
|-------------------------------|-------------------------------|
| Harden glass (Tempered glass) | 0.5mm,0.6mm,0.7mm,0.8mm,1.0mm |
| PMMA/PC | 0.65mm,0.8mm, |
| PET | 0.188mm, 0.125mm |



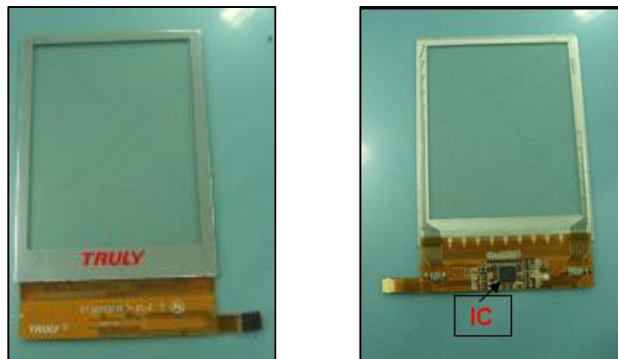
Product Structure (Conti.)

TRULY

I The same structure to Iphone with arm glass covering CTP



I Truly recommend to bond the IC on the FPC



I 7" CTP G/G structure

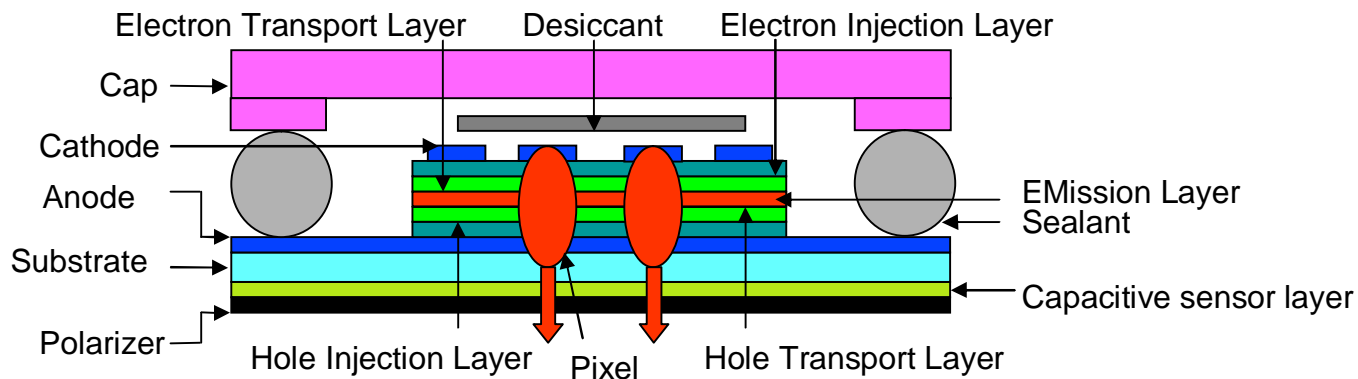


New technology

TRULY

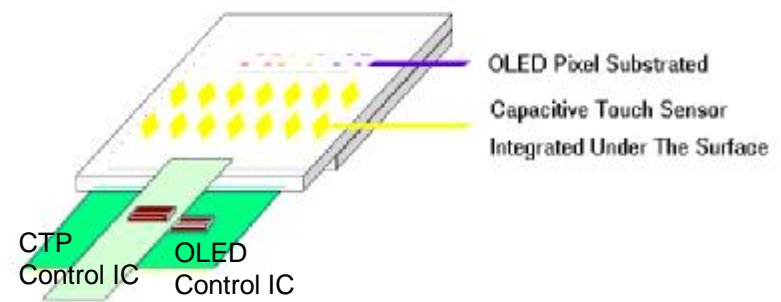
OLED+CTP

OLED In-cell Capacitive Touch Panel



Truly's PM-OLED production line was authorized by koda in 2003 and began to mass production focusing small size monochrome / area color OLED.

Products: monochrome: red, yellow, green,
white, blue Resolution 256*64 max
Area color Resolution 256*64 max
Full color Resolution 160*128 max
Sizes:0.67~2.7 (MP) 3.2 ~4.0 (Sample)

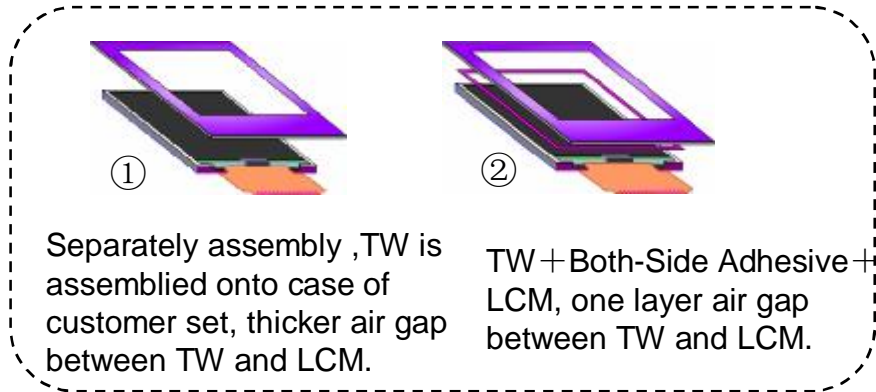


New tech.

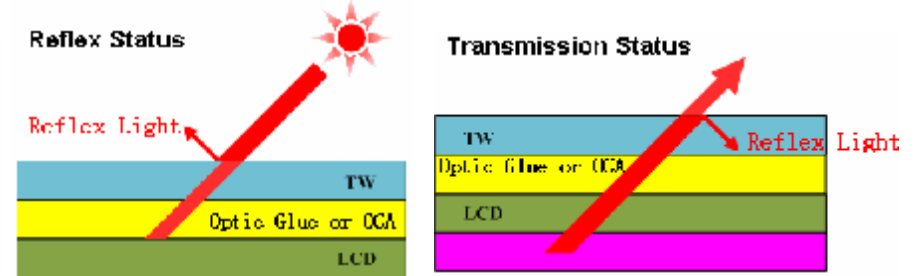
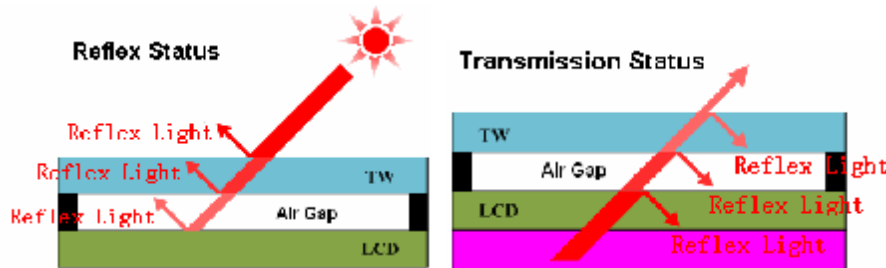
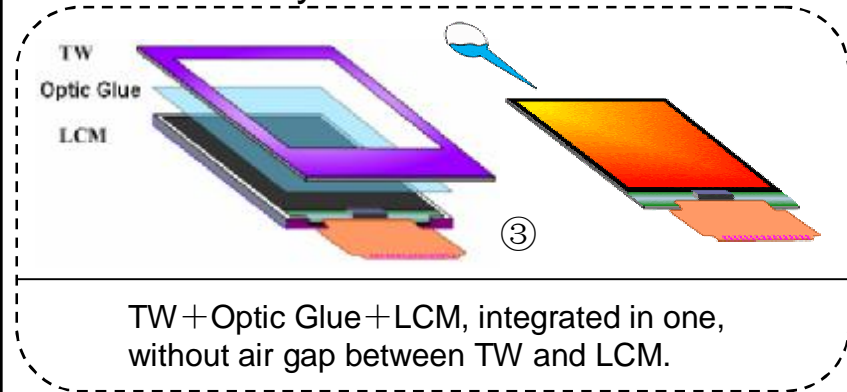
--- TLI (TOUCH WINDOW (CTP) Integrated with LCM)

TRULY

- Currently, assembly TW and LCM by means as:



- Truly "TLI" Tech.



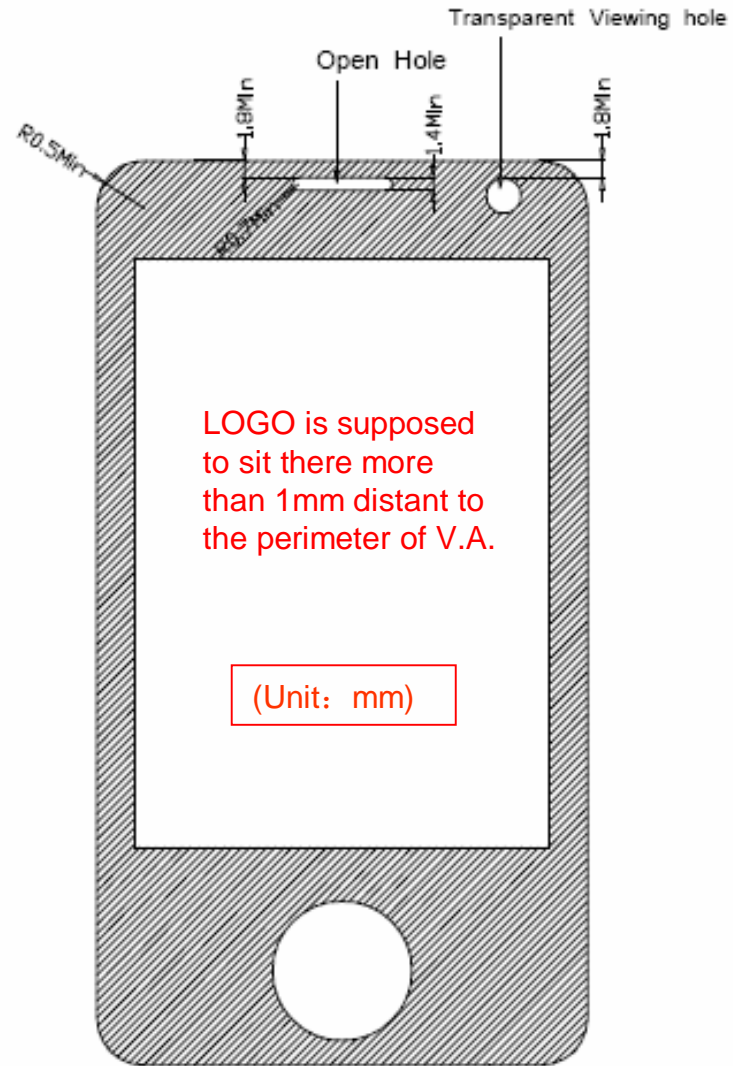
| Item | TLI TECH. Pros |
|---------------------|--|
| Light Transmission | 5% upgrade |
| Contrast | 22% upgrade (gorgeous picture ,wider viewing angle) |
| Surface brightness | 8% ~ 10% upgrade |
| Total set thickness | 0.1 ~ 0.7mm thinner |
| Dust, Stain... | Free from (Between TOUCH WINDOW and LCM) |

Remark: Testing dates for reference above, is not value guaranteed.

Design guide

TRULY

Lens Dimension

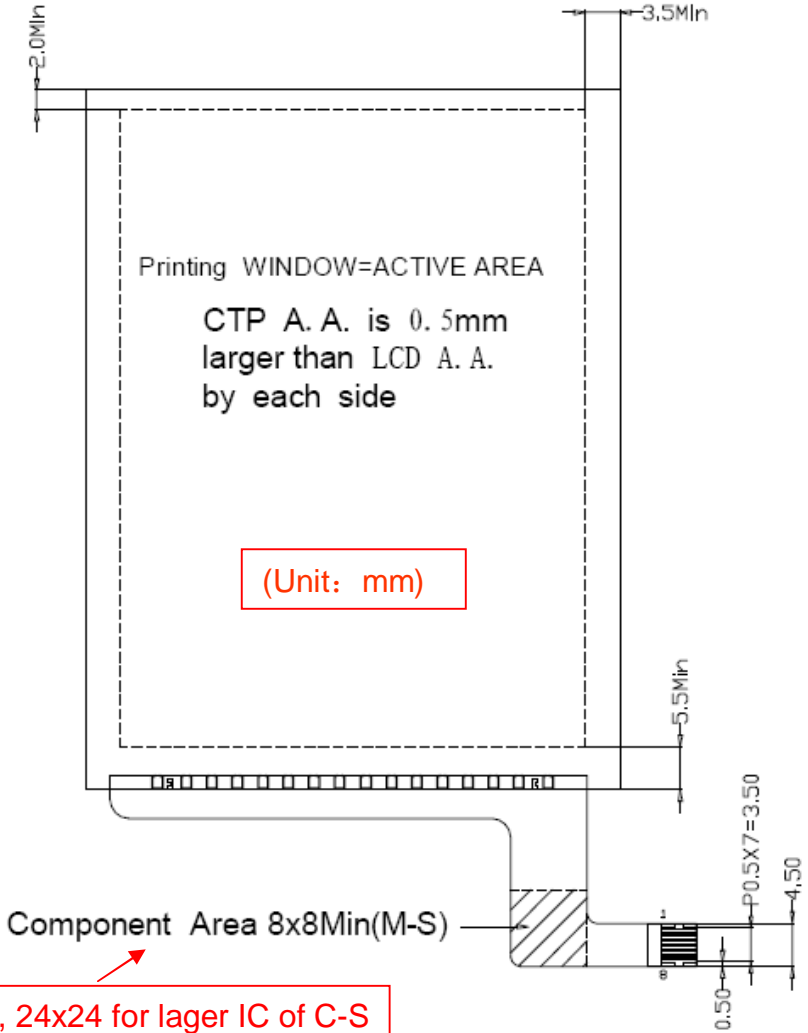


Design guide (Conti.)

TRULY

Sensor Panel (ITO Film) Size

Remark:
C-S: Cypress IC Solution
M-S: Melfas IC Solution



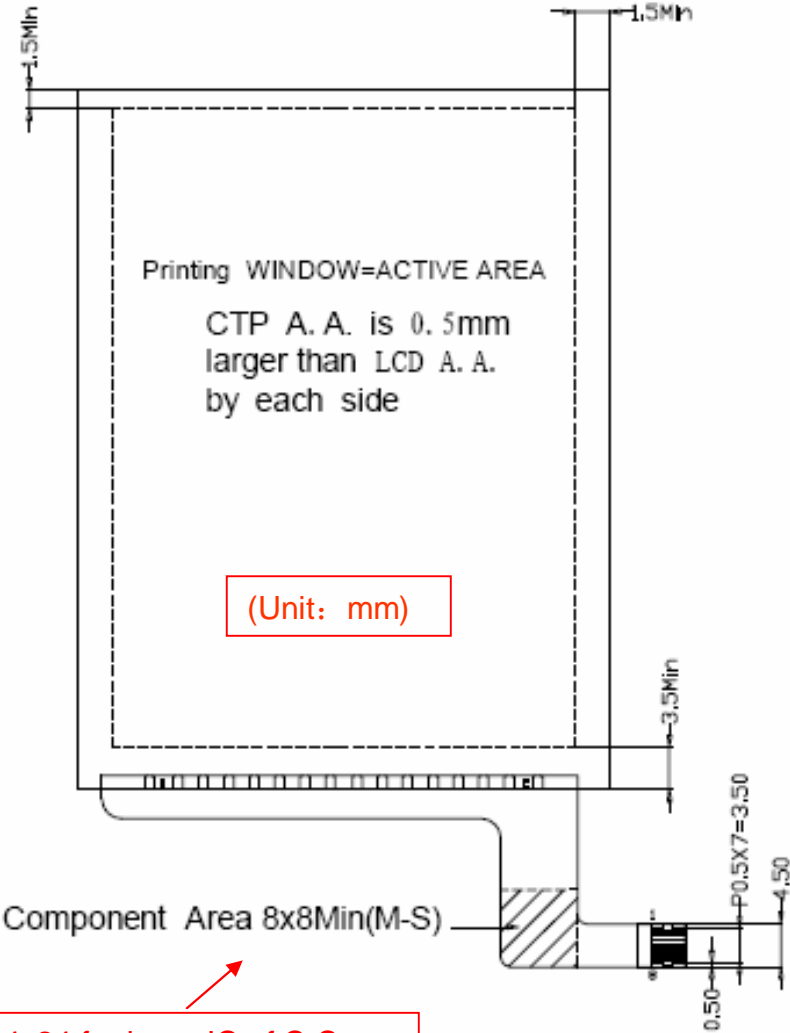
12x12 minimum for C-S, 24x24 for lager IC of C-S

Design guide (Conti.)

TRULY

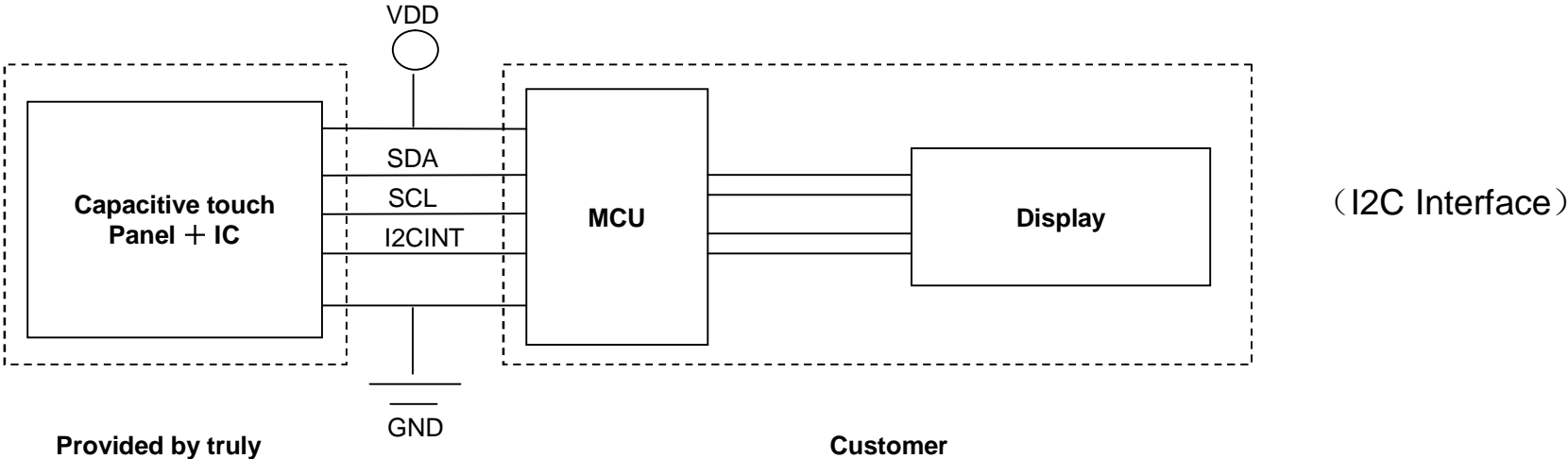
Sensor Panel (ITO Glass) Size

Remark:
C-S: Cypress IC Solution
M-S: Melfas IC Solution

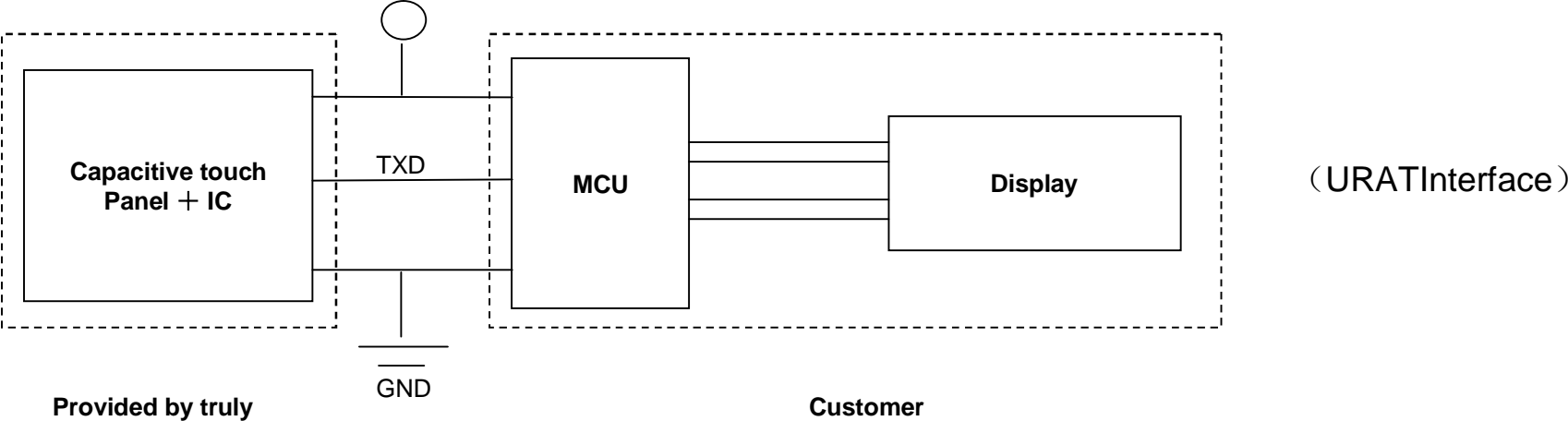


Block Diagram for C Control IC Solution

TRULY



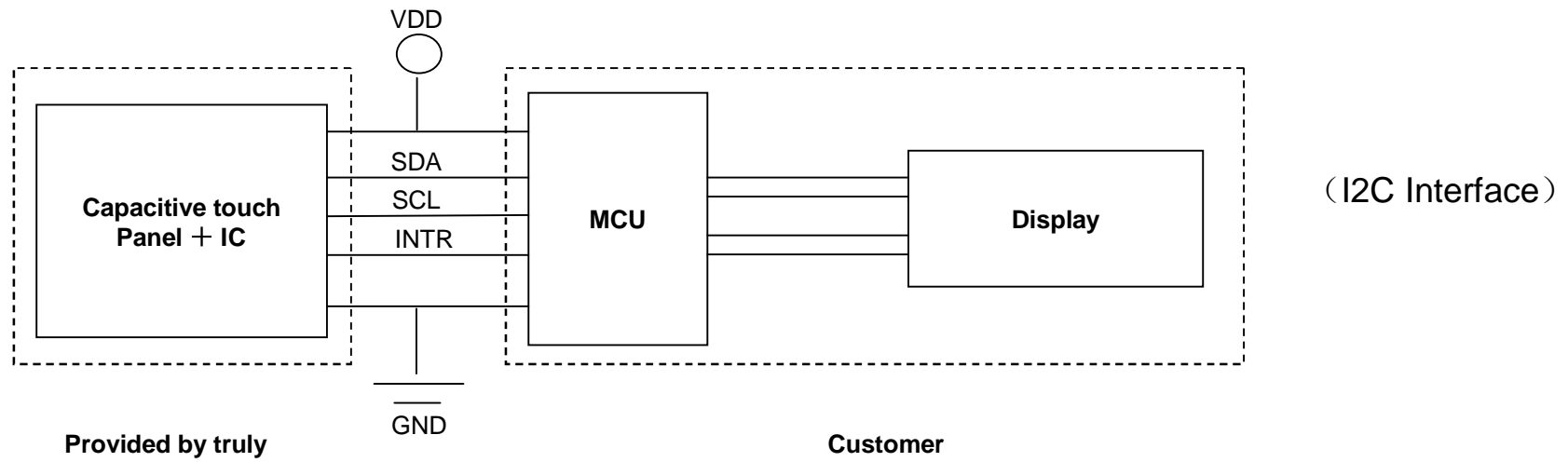
(I2C Interface)



(URAT Interface)

Block Diagram for M Control IC Solution

TRULY



Thank you for your attention.

