QTouch Lighting

For Atmel QTouch and QMatrix Technologies

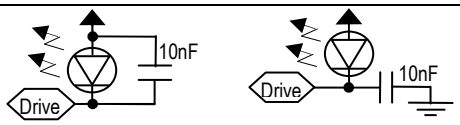
[QT_Lighting_v05_20091129.doc, Paul Russell, Atmel QRG FAE

- These are guidelines only. Actual requirements and performance may vary depending on panel construction, items behind panel, connection length, noise sources, etc.
- QT Electrodes often require lit indicators or backlighting. Here are shown several techniques that may be used. Some are untested.
- It is the customer's responsibility to check for any ownership, patent, or other conflicts when using any of these ideas. Atmel only provides the ICs.
- In all cases it is recommended that you thoroughly test your design to ensure there are no issues with Touch Detection or other design aspects.

A) LEDs near Electrode Signals may require decoupling capacitors.

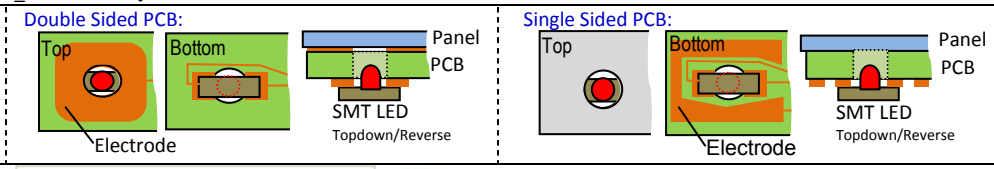
It is recommended to place a capacitor footprint on PCB for each LED, and determine if population is needed by testing effect of LED ON/OFF switching on Touch Detection.

Refer to QRG AppNote: [AN-KD02_103-TOUCH_SECRETS.PDF]



B) Direct View LED on Touch PCB

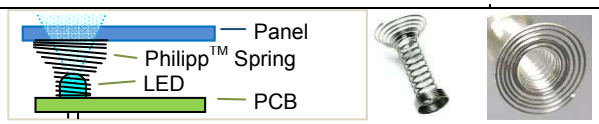
SMT LED is type Top Down / Reverse Mount



C) Philipp™ Spring

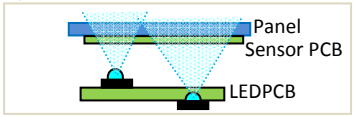
For additional info refer to QRG AppNote [AN-KD03_101-SPRINGS.PDF]

Philipp™ Spring is patented, but may be used free of charge with touch in AVR or QT ICs.

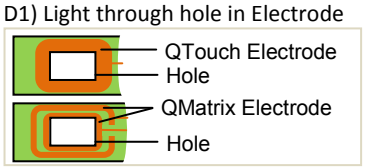


Philipp™ Spring compressed onto clear Panel

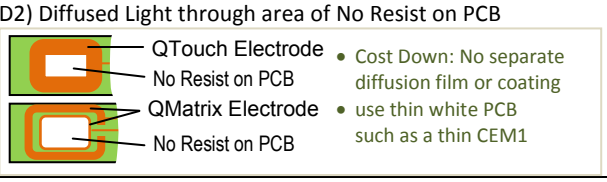
D) LEDs behind QT PCB



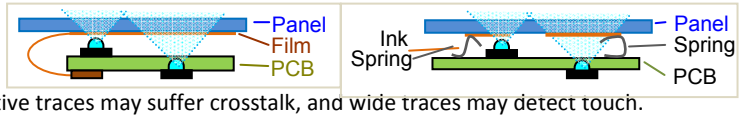
D1) Light through hole in Electrode



D2) Diffused Light through area of No Resist on PCB



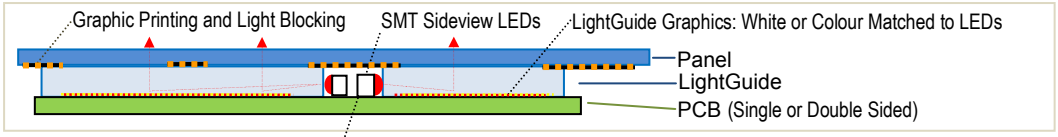
E) QT with Film Electrodes or Electrodes Printed on Inside of Panel



- Transparent Electrodes using ITO, PEDOT, etc.
- May also be used over displays (LCD, OLED…)
- Longer connections should be narrow silver traces, as long resistive traces may suffer crosstalk, and wide traces may detect touch.
- To connect to PCB: FPC Tail, Zebra Strip, spring contacts, etc. For flexible inks like Silver and PEDOT the tail may be integral part of film.

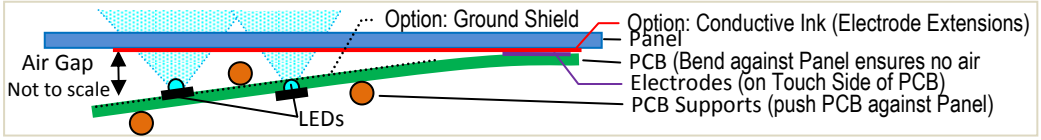
F) QT with LightGuides

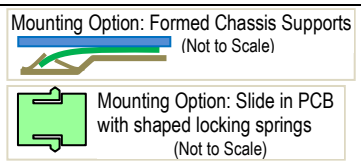
- Option: Multicolour Enhancement: Refer to Japan Patent 2005-189722



G) QT Angle Mounting

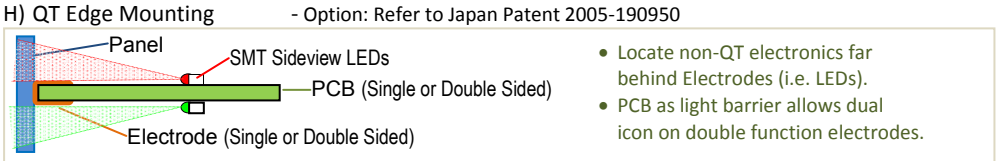
- For additional info refer to QRG Design Note [QT_AngleMounting_v00a.pdf]

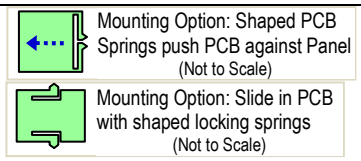




H) QT Edge Mounting

- Option: Refer to Japan Patent 2005-190950

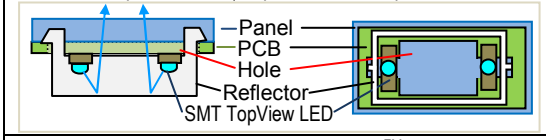




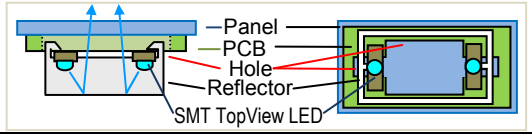
I) Cup Reflectors

- Provides diffuse illumination, use with Electrode Patterns as in above item (D)

• Reflector clips onto PCB (Requires notches in panel for Reflector Hooks)



• Reflector clips behind LEDs allowing smooth Panel



J) EL Backlighting

- SegmEL™ Segmented EL Backlighting by Sekonic www.h-sekonic.co.jp , use with Electrode Patterns as in above item (E)

EL provides thin smooth backlighting

K) Many more options, experiment with new styles and variations of above.