0.075 widths and 0.075 spacing can be bonded to the glass substrate using insulating PSA **1612** that can be 0.025 thick. FIG. **16***b* shows the ACF-side top view **1618** of the FPC traces that can connect to the drive rows, including traces **1604** that can have 0.075 widths and 0.075 spacing, covered by insulating PSA **1608**, 0.025 thick. FIG. **16***c* shows ITO pattern registration **1620** with visual alignment mark **1614** separating ITO row patterns **1616**.

[0089] FIG. **17***a* illustrates an exemplary partially fabricated cover for a touch screen sensor panel according to one embodiment of this invention. FIG. **17***a* shows plastic top housing **1700** (e.g., injection molded polycarbonate or acrylic of 0.80 thickness) for an individual part with a corner, with hard coat/anti-glare coating **1704** that can be formed on top and black mask **1706** that can be selectively applied to the inside of housing **1702**.

[0090] FIG. **17***b* illustrates an exemplary top PET film according to one embodiment of this invention. First, ITO **1712** (e.g., having a resistivity of 40 to 500 ohms per square) can be sputtered onto PET film **1710** (e.g. PET or polymer having a dielectric constant of 3 to 4 and a thickness of about 25 to 75 microns) and patterned (e.g. into 100 micron lines and spaces) using standard photolithography and etching techniques, or laser oblation. Next, a layer of metal (silk-screened silver ink) **1714** (e.g., silver ink having a resistivity of 1 ohm per square max) can be applied over the ITO and patterned (e.g. into 200 micron lines and spaces). A protective sheet of black carbon **1716** (e.g. having 0.25 lines and spaces) can then be printed over the silver ink traces to serve as a protective coating for connector contacts. A tail coverlay **1718** (e.g., PET having a thickness of 25 to 75 microns) can then be formed over the silver ink traces for protection. A sheet of PSA **1720** (e.g., having a thickness of 25 microns) and a sacrificial liner can then be formed over the PET film and ITO. A bottom PET film can be formed using the same process.

[0091] FIG. **17***c* illustrates an exemplary touch screen sensor panel stackup with columns and rows that can be formed on two separate top and bottom PET films **1708** and **1724** according to one embodiment of this invention. Optically clear adhesive **1726** can be used to bond the top and bottom PET films between a cover **1700** and an LCD module that can include LCD polarizer **1728**, LCD top glass **1730**, and LCD bottom glass **1732**.

[0092] FIG. **18** illustrates exemplary computing system **1800** operable with the touchscreen stackups described above according to embodiments of this invention. Touchscreen **1842**, which can include sensor panel **1824** and display device **1840**, can be connected to other components in computing system **1800** through connectors integrally formed on the sensor panel, or using flex circuits. Computing system **1800** can include one or more panel processors **1802** and peripherals **1804**, and panel subsystem **1806**. The one or more processors **1802** can include, for example, ARM968 processors or other processors with similar functionality and capabilities. However, in other embodiments, the panel processor functionality can be implemented instead by dedicated logic such as a state machine. Peripherals **1804** can include, but are not limited to, random access memory (RAM) or other types of memory or storage, watchdog timers and the like.

[0093] Panel subsystem **1806** can include, but is not limited to, one or more analog channels **1808**, channel scan logic **1810** and driver logic **1814**. Channel scan logic **1810** can access RAM **1812**, autonomously read data from the analog channels and provide control for the analog channels. This control can include multiplexing columns of multi-touch panel **1824** to analog channels **1808**. In addition, channel scan logic **1810** can control the driver logic and stimulation signals being selectively applied to rows of multi-touch panel **1824**. In some embodiments, panel subsystem **1806**, panel processor **1802** and peripherals **1804** can be integrated into a single application specific integrated circuit (ASIC).

[0094] Driver logic **1814** can provide multiple panel subsystem outputs **1816** and can present a proprietary interface that drives high voltage driver **1818**. High voltage driver **1818** can provide level shifting from a low voltage level (e.g. complementary metal oxide semiconductor (CMOS) levels) to a higher voltage level, providing a better signal-to-noise (S/N) ratio for noise reduction purposes. Panel subsystem outputs **1816** can be sent to decoder **1820** and level shifter/driver **1838**, which can selectively connect one or more high voltage driver outputs to one or more panel row inputs **1822** through a proprietary interface and enable the use of fewer high voltage driver circuits in the high voltage driver **1818**. Each panel row input **1822** can drive one or more rows in a multi-touch panel **1824**. In some embodiments, high voltage driver **1818** and decoder **1820** can be integrated into a single ASIC. However, in other embodiments high voltage driver **1818** and decoder **1820** can be integrated into driver logic **1814**, and in still other embodiments high voltage driver **1818** and decoder **1820** can be eliminated entirely.

[0095] Computing system **1800** can also include host processor **1828** for receiving outputs from panel processor **1802** and performing actions based on the outputs that can include, but are not limited to, moving an object such as a cursor or pointer, scrolling or panning, adjusting control settings, opening a file or document, viewing a menu, making a selection, executing instructions, operating a peripheral device connected to the host device, answering a telephone call, placing a telephone call, terminating a telephone call, changing the volume or audio settings, storing information related to telephone communications such as addresses, frequently dialed numbers, received calls, missed calls, logging onto a computer or a computer network, permitting authorized individuals access to restricted areas of the computer or computer network, loading a user profile associated with a user's preferred arrangement of the computer desktop, permitting access to web content, launching a particular program, encrypting or decoding a message, and/or the like. Host processor **1828** can also perform additional functions that may not be related to panel processing, and can be coupled to program storage **1832** and display device **1840** such as an LCD for providing a user interface (UI) to a user of the device.

[0096] As mentioned above, multi-touch panel **1824** can in some embodiments include a capacitive sensing medium that can have a plurality of row traces or driving lines and a plurality of column traces or sensing lines separated by a dielectric. In some embodiments, the dielectric material can be transparent, such as PET or glass. The row and column traces can be formed from a transparent conductive medium such as ITO or antimony tin oxide (ATO), although other non-transparent materials such as copper can also be used. In some embodiments, the row and column traces can be perpendicular to each other, although in other embodiments other non-orthogonal orientations are possible. For example, in a polar coordinate system, the sensing lines can be concentric circles and the driving lines can be radially extending lines (or vice versa). It should be understood, therefore, that