

# Portable touch screen essay



**ASSIGN  
BUSTER**

Thus the product will be conducive to ransom any screen or surface to a touch screen and hence the name ' Portable Touch Screen'. The underlying technology used is surface acoustic waves (SAW). The wave propagates on the surface and gets readily attenuated if interfered by soft objects.

All parts of the system includes two transmitting and two receiving transducers placed for X and Y axis. The electrical signal sent by the processing unit is converted to acoustic wave by the transmitting transducers and emitted to reflectors that are lined up as arrays.

The waves are reflected to array of portable piezoelectric transducers, mounted properly, where they are converted back to electric signal and sent to processing unit. When a touch interferes the path of waves, the waves are attenuated causing a touch event to be detected at that point. General Terms Consumer electronics, Touch technology, Portable devices, embedded systems.

Keywords Surface Acoustic Wave, Transducers. Reflecting arrays.

Attenuation. 1. INTRODUCTION Methods for interaction with digital world have developed into a wide and sophisticated field.

The domain spreads in a vast area starting from basic keyboard and mouse to sixth sense technology and augmented reality. A basic peripheral to interact with digital world like mouse or keyboard is portable and can be attached to the system when required. But for making a screen ' touch' It has to be manufactured as a touch screen'. It is this thought which inspired the authors to design a portable touch screen which can be attached to any screen or projected surface to use it as touch screen. 1 .

1.

Technical Background In the present scenario, there exists ' Interactive Whiteboard' that serves the purpose of controlling the system using stylus, which is not very handy. Another similar product is Bluetooth mouse which assists us only to change slides. Apart from these there exists touch screen technologies. There exist basically four screen technologies: Resistive, Capacitive, Infrared and Surface Acoustic Wave (SAW).

The technology SAW. The existing SAW touch screens have two transducers placed along X and Y axis on the touch panel and the reflector, namely glass.

When compared to resistive and capacitive touch screen technologies, SAW is more effective in terms of accuracy, clarity, sensibility, resolution and higher light transmission [1] [2]. The hardware used in such a touch screen is two transmitting transducers which are affixed perpendicular to each other which transmit SAW, which are reflected by array of glasses placed at an angle of 45°. These reflected waves are detected by the receiving transducers placed diagonally opposite to each other as shown. (See figure 1). Fig 1: Existing SAW Touch Screen 1.

. Proposed Solution Fig 2: Block Diagram of Proposed Solution The top level block diagram of proposed solution is as shown in figure. (See figure 2). The MINESWEEPER emulation board is used to emit surface acoustic wave of required frequency.

The wave gets reflected and reaches receivers. The values are converted to digital using ADC module of the processor. Digital values are transmitted to PC

via Bluetooth module. When touch occurs attenuation happens and as a result the received values are lower than the expected values.

They are processed in PC to set the mouse arrow in the required position.

2. DESIGN The proposed solution aims at the design of a portable touch screen in a nut shell. Unlike the existing touch screens, it is aimed at mounting the touch screen wherever the user wants. For e. G.

On a projected screen or desktop display or mobile screen. The design includes mainly 3 parts : 1. The array of SAW reflectors (positioned at 45° to direction of wave travel) [3] which can be mounted in a rectangular fashion.

2. Two SAW transmitters, two receivers and related control units..

Attached to array on sides. ( See figure 3). 3. PC Interfacing circuit. Fig 3:

Block Diagram of Proposed SAW Transmitting array Fig 4: Block Diagram of

Proposed SAW Receiving array The transmitter array and reflector array can be designed as a strip that can be mounted on wall or desktop screen. The transmitter circuit is 2.

1 Transmitter Unit Transmitter Design should meet the following

specifications : It should have two SAW It should have array of reflectors (fig

3) Should be portable Design requires a Power Supply.

It requires a 230V – 0 – 230V transformer. Then the AC has to be rectified, filtered and regulated. Hence a proposed power supply circuitry is as shown in figure

5. Transmitter side the requires the SAW Transmitter.

The signal from board has to be doubled by a voltage doublers circuit using ICC HCF40106BE. Figure 5: Circuit Diagram of Power Supply Unit Transmitter side the requires the SAW Transmitter. The signal from board has to be doubled by a voltage doubled circuit using ICC HCF40106BE. Figure 6: Circuit Diagram SAW Transmitter 2. Receiver Circuit Receiver design should meet the following specifications : It should have a reflecting array consisting of two receivers.

Each receiver should have an amplifier circuit associated with it. The received signal have to be converted to 8 bit DC value. The value has to be fed to Bluetooth Module. The Bluetooth module should send it to reception Bluetooth module in PC interfacing unit. The data received from serial port is processed in a Visual Basic Application developed.

The application compares the value of received digital signal with standard values and screen resolution executes mouse click there. MSP430F247 Processor is used to convert the amplified signal value to 8 Bit digital value. It then sends digital decimal values to Bluetooth module ABOUT 20. Figure 7: Circuit Diagram of Receiver Amplifier Circuit The digital output from the processor is fed to Bluetooth Module BATHTUB. The design of circuitry is as follows Figure 8: Circuit Diagram of Bluetooth Module C.

PC Interfacing Unit The design this unit should be done to meet : It should have Bluetooth reception Module. It should have Serial Communication Driver MAX 232 to communicate to PC via serial communication. The power supply to this unit is same as before. The Bluetooth reception module is ABOUT 20. Maxima uses RESTS protocol.

Meeting the specifications the circuit is designed as Figure 9: Circuit Diagram of Serial Communication. The system designed is expected to function as a portable touch screen. The product if designed commercially does find an inevitable position in digital market.