



B6TS touch sensor



Capacitive Touch Sensing

The key to designing flexible, responsive and reliable capacitive touch controls

Home Appliances

Coffee Machine
TV
Hi-Fi
Portable Devices
Lamp Switch
Climate Controls
Cooker
Kitchen Hood
Microwave

Medical

Automated Door Switch
General Medical Devices

Industrial

Process Control HMI
Vending Machine
Ticket Machine
ATM Machines
Touch Screen LCD
Keyboards

and many more...



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Touch Control for modern living

Our new touch sensor IC family, B6TS, is the key to designing flexible, responsive and reliable capacitive touch controls in the new generation of consumer brown and white goods and AV equipment as well as vending machines, lift controls and security access. The B6TS is a durable replacement to any type of tactile switch.

Capacitive touch sensing is growing in popularity as an easy to implement, flexible and reliable control interface for a wide range of applications. We are focused on increasing our research and development efforts in this market and will continue to expand our product range.

- B6TS-04LT 4 channel sensor
- B6TS-08NF 8 channel sensor
- B6TS-12NF 12 channel sensor*
- Design Tool B6TWorkbench (B6TW) - with incircuit calibration, realtime capacitance measurement and circuit simulator features
 - B6TW-S04LT incl. 4 channel demo panel
 - B6TW-S08NF incl. 8 channel demo panel

*Available September 2006



responsive

Freedom to design

With the exception of a few rules of thumb you are limited only by your imagination.



Imagin

In consumer electrical goods, the controls are normally designed to match the cosmetic appearance of the unit, and the B6TS offers customers a great deal of freedom to build their own circuits around the sensor chip using their own defined electrode configuration - size, shape, spacing, cover material etc



To minimise the cost of the finished system, cost-effective commercial single-sided PCB materials such as FR-2 or CEM-1 can be used. For non-flat user interfaces, FPCs (Flexible Printed Circuit) can be used to build unique design touch panel solutions. Touch keys can be produced using any non-conducting panel material including plastic, rubber, glass, marble and wood.

The B6TS sensor chips allow you to create exciting solutions with various materials, graphics and special lighting effects that will let your product stand out. Create backlighting and clear sensing solutions with ITO and other clear materials to create backlight touch keys for special effects. Touch switches over LCD and LED backlighting and cost-effective multi-key solutions are all within your grasp.

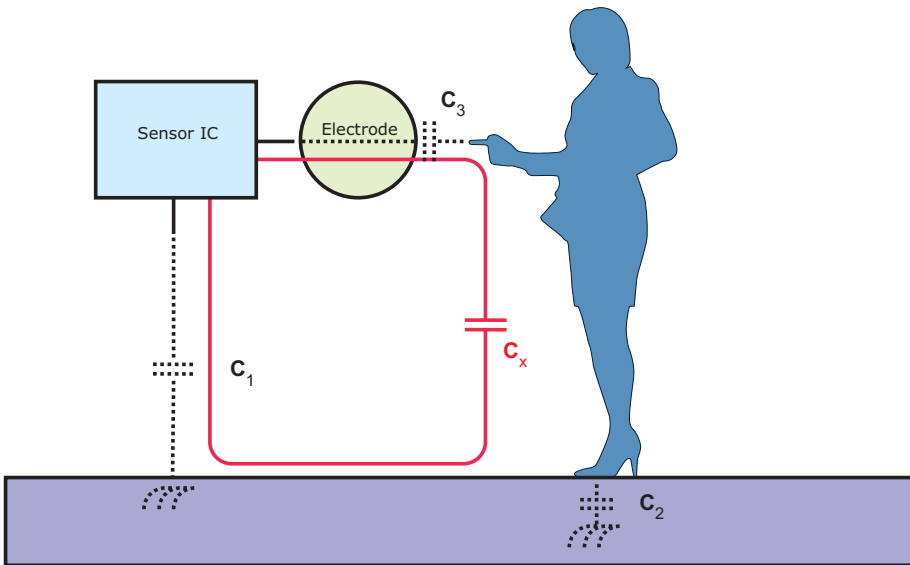
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The B6TS Detection Principle



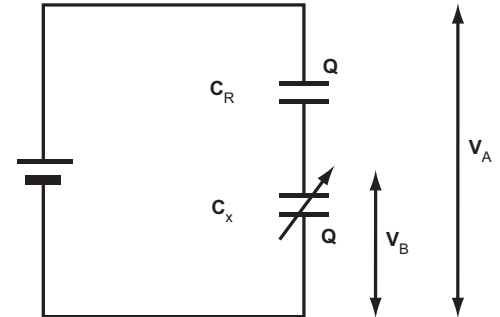
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Detection Principle



- Detect the capacitance of C_x
- $C_x =$ (combined capacity of C_1 , C_2 and C_3)
- C_x is dominated by C_3 , since $C_3 \ll C_1$ and C_2

Capacitance Sensing Method

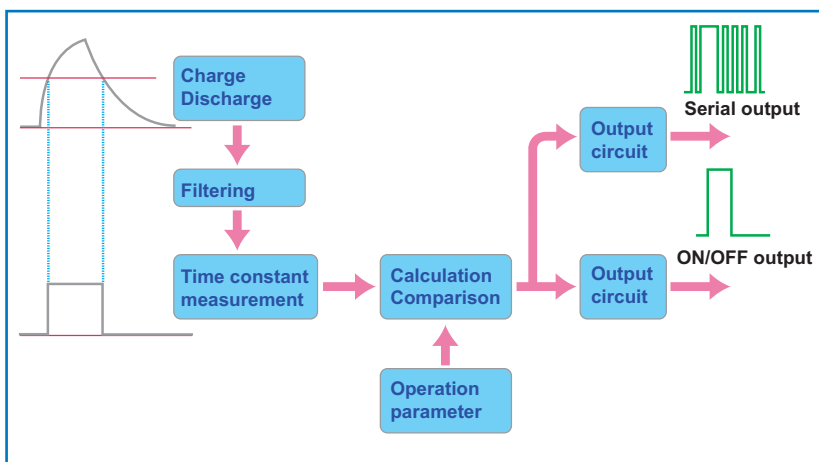


$$V_B = V_A \times \frac{C_R}{C_R \times C_x}$$

$$C_x = \frac{C_R \times (V_A - V_B)}{V_B}$$

- Connect fixed capacitor (C_R) and unknown capacitor (C_x) serially
- C_x is known by measuring V_B and V_A

Sampling Data



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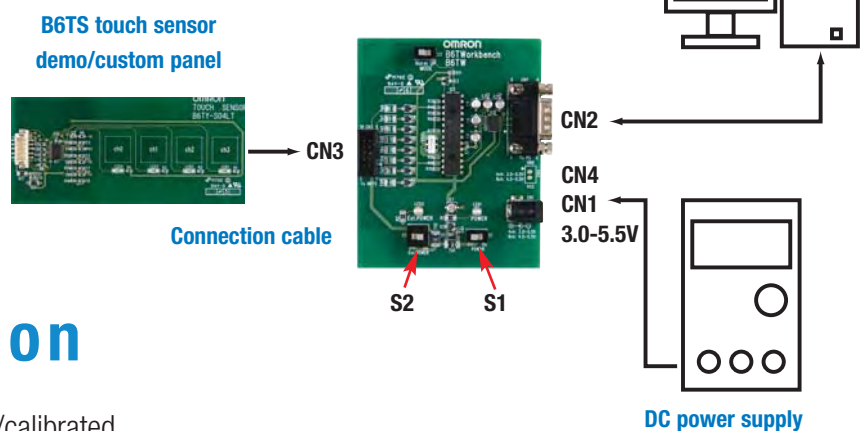
Application Ready

The B6TS has been developed to be highly tolerant of its working environment with features such as semi-self teaching, auto threshold and intelligent filtering to meet the demands of most applications today. It compensates continuously for long term drift, to help ensure a long service life, and is designed to be tolerant of EMC interference.

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Design Tool

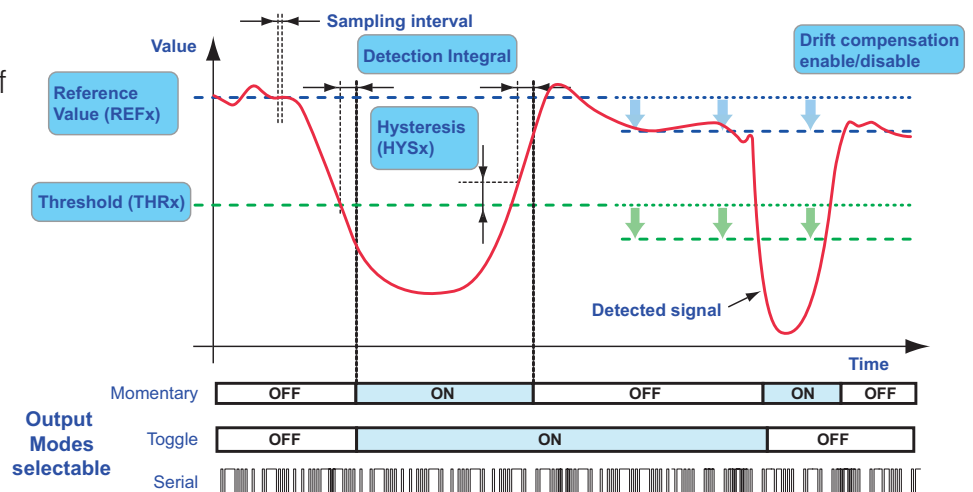
The Design Tool B6TWorkbench (B6TW) allows touch panel prototype builds in hours rather than days and therefore speeds up time to market. The B6TW allows designers to experiment with user-definable settings to achieve desired sensing performance and accommodate anticipated environment changes in the custom specific touch panel (Man-Machine-Interface MMI)



Easy Calibration

Only 5 parameters need to be selected/calibrated

- 1 Reference Capacitance
- 2 Threshold (for sensitivity)
- 3 Hysteresis
- 4 Detection Integral
- 5 Drift Compensation On/Off



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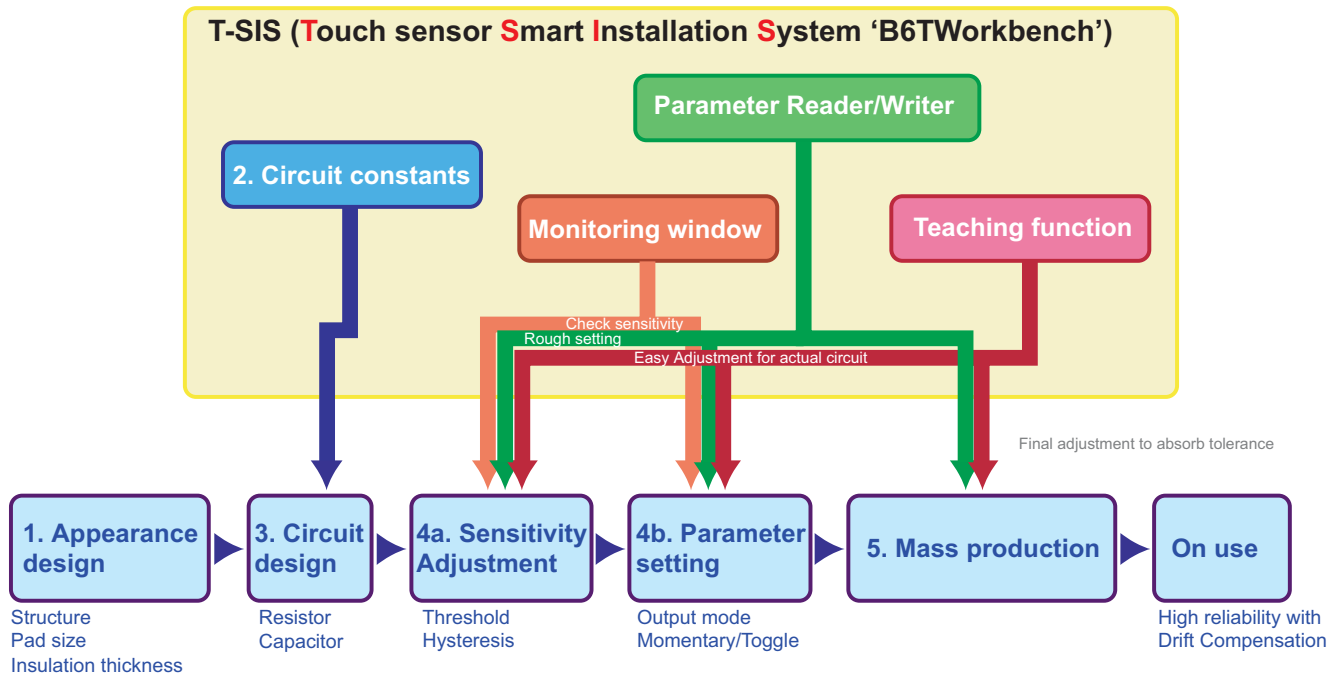
Freedom to manufacture



We don't make your final PCBs, your or your chosen CEM does that. We provide you the chips and offer support.



Development / Mass Production Process



- 1) Customer decides on panel appearance
- 2) Check appearance design in B6TWorkbench Circuit Constants simulator - resulting in a decision about feasibility of design without investment cost for prototype build.
- 3) A panel can be built - circuit design with recommended R and C values from the Circuit Constants simulator
- 4) Connect the panel to the B6TWorkbench and set
 - a) operation parameters:
 - 1 Reference Capacitance
 - 2 Threshold (for sensitivity)
 - 3 Hysteresis
 - 4 Detection Integral
 - 5 Drift Compensation On/Off
 - b) output mode:
 - Switching: momentary or latching
 - Serial: data stream via SPI
- 5) Mass production:
 - a) programming of the user defined parameters in Omron Fab or
 - b) programming in customer production environment



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