

Field Effect™ Switches and Sensors

Benefits for Automotive Applications

Styling Flexibility

- **Materials** - TouchCells™ can be used directly behind surfaces made of plastic, glass, wood, fabric, or pleather. Conventional switches are typically limited to some type of moving plastic button through a plastic substrate with an actuating spring.
- **Shapes** – TouchCells™ can be placed behind boldly shaped or contoured surfaces. Conventional switches are typically limited to use on flat or slightly curved surfaces and the motion to activate them must be perpendicular to the surface.

Uniformity

- All touch controls can have the same look and feel.
- No plug buttons are required for missing optional switches.
- Tactile feedback, audible feedback, or illumination feedback, if desired, can be the same for all TouchCells™.
- Touch controls can easily match the design and color theme of the interior.

Improved Form and Fit

- Fewer part to part interfaces.
- Styling lines are more consistent.
- No separate bezels needed to hide mounting features of the parts.
- No mismatch of button color, lighting, or decoration because all first surface input features are created at the same time in the same process.

Product Line Vehicle Differentiation

- Styling differentiation can be achieved for low end vehicles to high end vehicles with the change of an insert molded appliqué or paint and laser etch change.
- No holes are required for moving buttons so one tool can be used to capture the differences from high end to low end vehicles. With a different Class A surface and a circuit board on the back side, features can be added and deleted.

Reduced Package Space

- A packaged TouchCell™ depth is 10-20 mm including the bezel compared to a conventional switch depth of 35 to 100mm.
- Opens up the possibility for a center stack storage bin because reduced package space is a feature of the TouchCell™ touch controls.
- Enables center mounted HVAC because of the thin touch control profile.

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Weight Reduction

- An integrated touch control system design could result in a total weight reduction of approximately 10%.

Reliability / Durability

- No moving parts or electrical contacts to wear out.
- Dust and dirt contamination of the TouchCell™ does not reduce its reliability (Work / Off Road Truck Benefit)
- TouchCell™ electronics are isolated from the user – the electronics are behind a 3mm piece of plastic for example. All forces interact with the plastic only.
- No knobs that can fall off or break off.

Improved Cleanability

- No buttons, so no Q-tips are required to clean around buttons.
- No crevices to trap dirt or food particles.
- No problems with soft drinks or other liquids spilled on the dash or instrument panel.

Cost Reduction

- Integration of all required parts (fewer parts are required) and touch controls into a single integrated unit could result in an overall system cost reduction.

Other Features

- TouchCells™ are easier to actuate than conventional switches – no force required to actuate (a “coolness” feature for younger drivers and a benefit for older drivers).
- Fewer part interfaces and no moving parts result in lower potential for BSR.
- Typically, 30 to 50 individual parts are integrated into 5 to 10 parts.

TouchSensor™ Automotive Sales

24585 Evergreen Road • Southfield, MI 48075

Phone: 248.603.2124 • Fax: 248.354.6667

Email: thomas.beshke@methode.com

www.touchsensor.com

TouchSensor™ Technologies

A Methode Electronics Company

