POWER PLAY SOLUTIONS™

# Success Story: Meeting ISO 16750 Test Requirements in USB Charging Port of Scooter Design

## ISO 16750 Load Dump Test Solution

## Solution Products

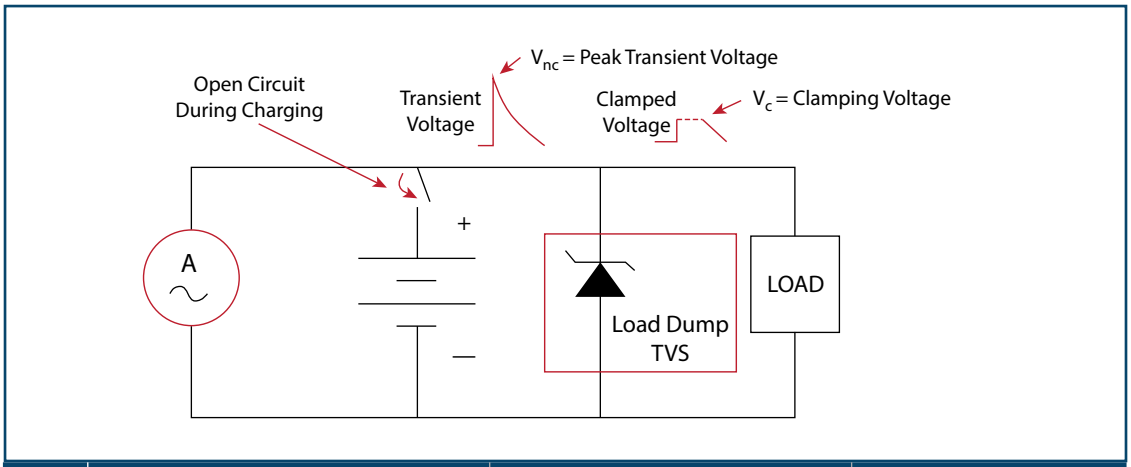
SM8S24CA-Q

## Bourns® Power Play Solution™

Load dump tests are typically mandated by various automotive standards organizations and regulatory bodies to ensure the safety and reliability of vehicles. Manufacturers usually schedule these tests during the development and validation of their vehicles to ensure compliance with safety regulations and to guarantee the robustness of the electrical systems. These tests also help identify potential vulnerabilities and allow engineers to design and implement appropriate protection measures to mitigate the risks associated with load dump events.

To ensure safety during the disconnection of automotive generators, the latest ISO 16750 testing requirements call for larger surge voltage protection that provides the ability to handle longer duration events with smaller internal resistance. These requirements make it challenging for traditional varistor solutions to pass testing standards. This customer was not able to pass the most recent ISO tests with the Metal Oxide Varistor (MOV) it had used in the past, and came to Bourns for a more powerful Transient Voltage Suppression (TVS) Diode. Bourns® dual channel TVS Diode delivered an effective protection solution against very high energy load dump transients when the vehicle battery is disconnected and helped eliminate the threat of an open circuit from the charging element.

The circuit shown below illustrates the clamping voltage capabilities of Bourns® TVS Diodes during a load dump event.




| Qty. | Component Description | Part Number & Data Sheet Link | Distributor Inventory |
|---|---|---|---|
| 1 | TVS Diode | Model SM8S24CA-Q TVS Diode | Check Stock |

POWER PLAY SOLUTIONS™

# Success Story: Meeting ISO 16750 Test Requirements in USB Charging Port of Scooter Design

## ISO 16750 Load Dump Test Solution

## Solution Products

SM8S24CA-Q

## Summary

**Customer:** Tiny Wheel electric scooter accessory manufacturer

**Industry:** Vehicle

**Application:** USB charging port

**Bourns® Product:** TVS Diode: Model SM8S24CA-Q

**Benefits:** Accurate and cost-effective voltage clamping solution that safeguards sensitive electronics

## Compliance

This Bourns® Power Play Solution™ helps designers meet ISO 16750 test requirements.

## Additional Benefits

The Bourns® Power Play Solution™ also offered the customer a decrease in their component count and a more economically viable solution tailored to their requirements.

## Situation

A Tiny Wheel (TW) electric scooter accessory manufacturer required an enhanced protection solution for its USB charging port. They came to Bourns because our component technology would allow them to meet mandated ISO 16750 test requirements which are important to protect the circuitry from load dump transients to ensure reliable operation and prevent damage. One way to do this is to use load dump protection devices, such as TVS Diodes or MOVs.. These devices are connected across the input power supply, providing the ability to clamp the voltage to a safe level during a load dump event. In the USB charging port of this customer's TW scooter, they also needed an elevated level of protection in order to safeguard the USB controller and other components from overvoltage damage.

This Bourns® Power Play Solution™ Success Story details how Bourns® Model SM8S18CA-Q TVS Diodes enabled the customer to pass several required ISO safety tests for its USB charging port. It also highlights the need to include an effective protection solution in applications that experience a very high energy load dump transient when the battery is disconnected, causing an open circuit from the charging circuit.

## Additional Resources

Other helpful technical resources available from Bourns:

- Bourns® Power Play Solutions™

www.bourns.com

BOURNS®

**Americas:** *Tel* +1-951 781-5500
*Email* americus@bourns.com

**EMEA:** *Tel* +36 88 520 390
*Email* eurocus@bourns.com

**Asia-Pacific:** *Tel* +886-2 256 241 17
*Email* asiacus@bourns.com