



# Solving High Performance Circuit Protection Needs in Space-constrained, High Density Electronics

## WHITE PAPER

### NEED FOR GDT DESIGN INNOVATION

Smaller, more sensitive electronics applications are the result of continued demands for higher density and higher performance designs. While the features and capabilities of increasingly integrated applications have advanced substantially, these compact, and thus more sensitive designs, are now more susceptible to damage and unscheduled downtime from transient threats such as lightning and other high voltage surges.

And as equipment shrinks, the reality is that there is a finite amount of space on the printed circuit board (PCB). This means designers must constantly seek circuit solutions that provide the effective overvoltage protection they need to maintain the highest reliability, but this protection cannot be at the cost of valuable PCB space. To help OEMs overcome their shrinking application space challenges while still maintaining superior protection capabilities, Bourns engineers took an innovative approach to gas discharge tube (GDT) design.

This white paper will cover the basics of conventional GDT technology that include how its size and dimensions are critical to its handling of surge energy. Its overall size, however, many times is an obstacle in meeting smaller design requirements. It will then present a breakthrough design methodology to squeeze the GDT to significantly reduce the GDT's height, weight and overall volume. Also highlighted will be the various space-saving advantages designers can achieve with Bourns' new extremely compact GDT devices.

### CONVENTIONAL GAS DISCHARGE TUBE TECHNOLOGY

Gas Discharge Tube (GDT) devices have gained popularity as overvoltage protection devices due to their extremely low capacitance and low leakage characteristics, along with their high surge current handling capabilities. These characteristics make GDT devices ideal for use in a wide array of telecommunications, industrial and medical equipment designs requiring robust overvoltage protection.

A GDT device is an arrangement of electrodes and gas contained within a ceramic envelope.



2015-xx-A  
2017-xx-A  
No Leads



2015-xx-SMH  
2017-xx-SMH  
Horizontal Mount



2015-xx-SMC  
2017-xx-SMC  
Vertical Mount



Figure 1. | 2-Electrode GDT



Figure 2. | 3-Electrode GDT