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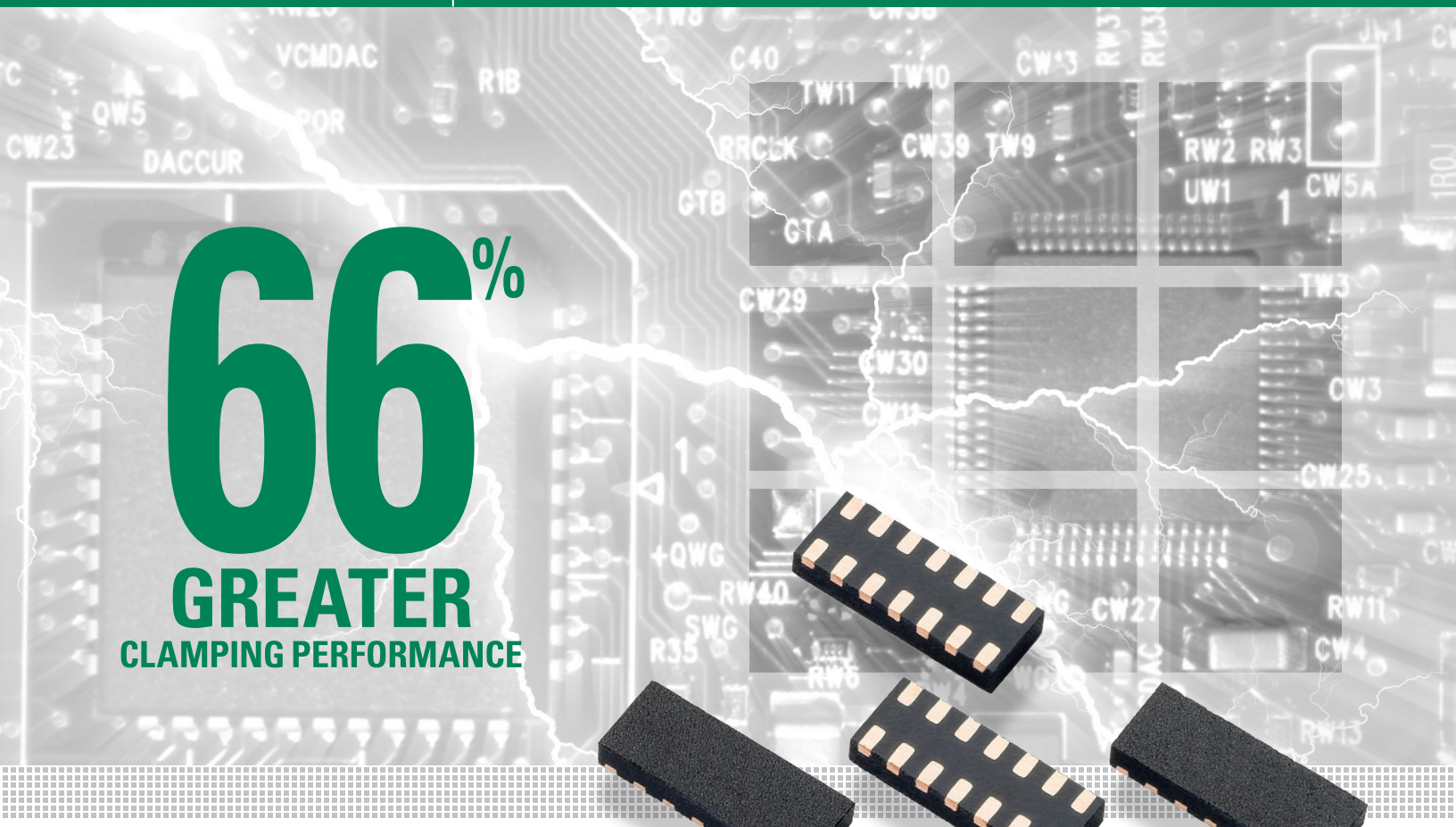
SP3012-06UTG Low Capacitance TVS Diode Array



66%
GREATER
CLAMPING PERFORMANCE

Enhanced ESD Protection for High Speed USB 3.0 and HDMI Chipsets

Unique electrostatic discharge (ESD) protection with 66% greater clamping performance now available in a 6-channel, compact package unmatched in the industry

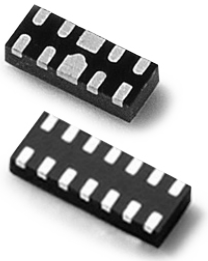
SP3012-06UTG offers extremely low dynamic resistance, which provides a low clamping voltage to ensure chipset reliability. It provides 6 channels of superior ESD protection with an ultra-low capacitance, making it ideal for high speed applications such as HDMI 1.3/1.4 and USB 3.0. Superior performance in the small uDFN-14 package yields an industry-best size/performance ratio.

Applications

- Handheld - Smartphones, Tablets, Digital Cameras
- Computing - Notebooks/Ultrabooks, Desktops, Servers, HDD
- Entertainment - LCD/PDP TVs, Set Top Boxes, Blu-ray Players, MP3/PMP Players

Datasheet **Resources** **Samples**

Enhanced ESD protection for high speed USB 3.0 and HDMI chipsets with up to 66% greater clamping performance



Features

- Ultra-low capacitance of 0.5pF
- Market-leading dynamic resistance of 0.4Ω
- ESD, IEC61000-4-2, ±12kV contact discharge, ±25kV air discharge
- Small form factor µDFN-14 package (3.5 x 1.35 x 0.5mm) allows straight-through routing

Benefits

- Minimizes signal degradation to preserve system performance while providing robust ESD protection; reduces designer's dependency on accurate trace impedance simulators
- Extremely low dynamic resistance provides 66% better clamping performance than competitive devices, ensuring chipset reliability
- Allows manufacturers to claim ESD protection above the maximum rating in the IEC standard and ensures product reliability in the field
- Reduces PCB footprint by 50% compared to other fully integrated, six-channel protection devices; allows the PCB traces to run directly underneath the device, minimizing trace discontinuities

66%
GREATER
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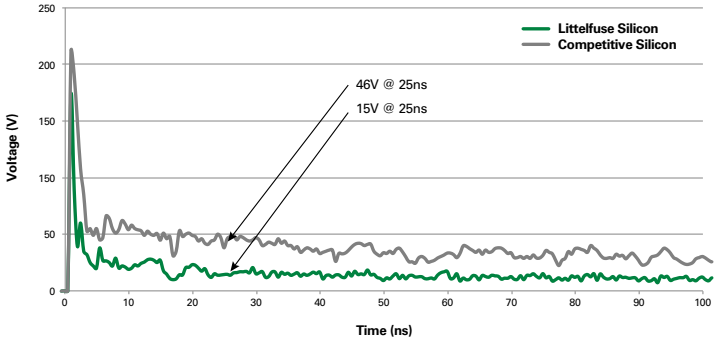
ESD protection for HDMI 1.3/1.4 and USB 3.0 chipsets

The SP3012-06UTG delivers enhanced ESD protection with ultra-low capacitance. Its extremely low dynamic resistance provides a clamping voltage that is 66% lower than competitive devices. The SP3012 is ideal for protecting high-speed applications, ensuring greater chipset reliability.

Dramatic reduction in transient energy passed

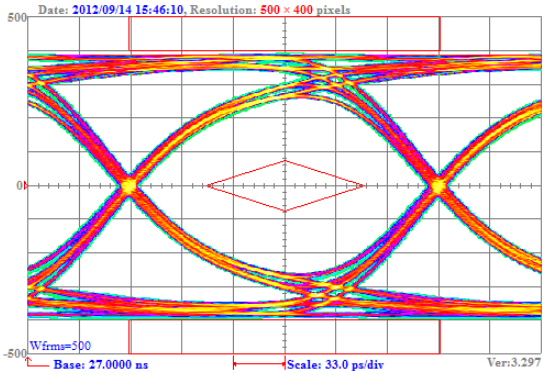
The clamping performance waveform shows the dramatic improvement made possible when a competitive diode array is replaced by a SP3012-06UTG. The area between the two curves indicates how much transient energy did not reach the chipset protected by the SP3012; this reduction in transient energy allows sensitive, small geometry chipsets to survive severe ESD events.



Waveform resulting from an 8kV contact discharge (per IEC 61000-4-2)

Low capacitance for higher signal integrity

Added capacitance, even at small levels, can cause signal degradation in high-speed applications. Eye-diagram testing, which involves repetitively sampling a digital signal and displaying the resulting eye pattern on an oscilloscope, is one way to characterize the effect of an ESD suppressor's parasitic capacitance on signal integrity. A mask defines acceptable signal qualities and compliance, and in this case, demonstrates the SP3012-06UTG's minimal impact on signal integrity.



Eye-diagram created using a 5Gbps USB 3.0 compliance test pattern & mask

Compact PCB footprint

The SP3012-06UTG has a small form factor µDFN-14 package with straight-through routing. Its PCB footprint is less than half the size of other fully integrated, 6-channel protection devices. PCB traces can run directly underneath it, minimizing trace discontinuities.