



## **Ultra-Compact TVS from Diodes Incorporated Provides Protection for USB 3.1/3.2 and Thunderbolt 3 Interfaces**

**Plano, Texas – February 8, 2018** – Diodes Incorporated (Nasdaq: DIOD), a leading global manufacturer and supplier of high-quality application specific standard products within the broad discrete, logic, analog and mixed-signal semiconductor markets, today announced its most advanced dataline transient voltage suppressor (TVS) ever, the DESD3V3Z1BCSF-7. Designed to provide exceptional TVS/ESD protection to the high-speed input/output ports of advanced systems-on-chips (SoCs) featuring differential signal line running at 5 GHz and beyond, the DESD3V3Z1BCSF-7 is indispensable for high-speed interfaces like USB 3.1/3.2, Thunderbolt™ 3, PCI Express® 3.0/4.0, HDMI 2.0a, and DisplayPort™ 1.4.

Modern SoCs are typically manufactured on advanced CMOS process nodes, which can make them more susceptible to transient voltages and electro-static discharges appearing at the input/output ports. Due to the higher than desired input channel capacitance, traditional TVS devices can degrade high-speed signals as they travel between connectors at the boundary of the adopting system and the input/output ports of SoCs. The DESD3V3Z1BCSF-7 has been developed using Diodes' advanced in-house processes to achieve ultra-low input channel capacitance (0.175pF typical), low dynamic resistance, low trigger/holding/clamping voltages, and is assembled in a state-of-the-art package with ultra-low capacitance. Meticulous design results in exceptionally low insertion loss, meeting the signal integrity requirement of high-speed interface standards like USB 3.1/3.2 and Thunderbolt 3.

“As advanced interfaces like USB Type-C become widely adopted, protecting the ports of advanced SoCs with multi-gigahertz bandwidth will become more imperative. To ensure reliable operation of these SoCs and the USB Type-C ports, the need for an incredibly low profile TVS able to provide a high level of protection without impacting the integrity of the high-speed signals is now paramount,” commented Dr. Timothy Chen, Division Director, Diodes Incorporated.

In addition to its ultra-low input capacitance, the DESD3V3Z1BCSF-7 offers exceptional ESD protection that meets IEC61000-4-2 requirements of up to  $\pm 8$ kV air and contact. It leads the industry by offering the best combination of clamping voltage ( $V_{CL} = 4.5$ V typical for  $I_{PP} = 3$ A), breakdown voltage ( $V_{BR} = 9$ V maximum), and reverse standoff voltage ( $V_{RWM} = 3.3$ V maximum), while peak-pulse power dissipation ( $P_{PP}$ ) is 25W over the short-circuit waveform of 8/20 $\mu$ s.

The DESD3V3Z1BCSF-7 is supplied in the ultra-compact chip-scale X2-DSN0603-2 package, measuring just 0.6mm x 0.3mm and only 0.3mm high, and is priced at \$0.056 each for a 10k reeled quantity. Further information is available at [www.diodes.com](http://www.diodes.com).

*Thunderbolt is a trademark of Intel Corporation or its subsidiaries in the U.S. and/or other countries.*

*PCIe is a registered trademark of PCI-SIG.*

*DisplayPort is a trademark owned by the Video Electronics Standards Association in the United States and other countries.*

## **About Diodes Incorporated**

Diodes Incorporated (Nasdaq: DIOD), a Standard and Poor's SmallCap 600 and Russell 3000 Index company, is a leading global manufacturer and supplier of high-quality application specific standard products within the broad discrete, logic, analog and mixed-signal semiconductor markets. Diodes serves the consumer electronics, computing, communications, industrial, and automotive markets. Diodes' products include diodes, rectifiers, transistors, MOSFETs, protection devices, function-specific arrays, single gate logic, amplifiers and comparators, Hall-effect and temperature sensors, power management devices, including LED drivers, AC-DC converters and controllers, DC-DC switching and linear voltage regulators, and voltage references along with special function devices, such as USB power switches, load switches, voltage supervisors, and motor controllers. Diodes' corporate headquarters and Americas' sales office are located in Plano, Texas and Milpitas, California. Design, marketing, and engineering centers are located in Plano; Milpitas; Taipei, Taiwan; Taoyuan City, Taiwan; Zhubei City, Taiwan; Manchester, England; and Neuhaus, Germany. Diodes' wafer fabrication facilities are located in Manchester and Shanghai, China. Diodes has assembly and test facilities located in Neuhaus, Shanghai, Jinan, Chengdu, and Yangzhou, China. Additional engineering, sales, warehouse, and logistics offices are located in Taipei; Hong Kong; Manchester; Shanghai; Shenzhen, China; Seongnam-si, South Korea; and Munich, Germany, with support offices throughout the world.

Recent news releases, annual reports and SEC filings are available at the Company's website: <http://www.diodes.com>. Written requests may be sent directly to the Company, or they may be e-mailed to: [diodes-fin@diodes.com](mailto:diodes-fin@diodes.com).

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