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Snapback TVS Delivers Improved Overvoltage Protection

Taiwan Semiconductor's LTD7524CAH is the first product in the new series of SUPER CLAMP Snapback TVS devices. SUPER CLAMP TVS diodes have snapback characteristics featuring a superior 1.0 to 1.05 clamping ratio between the designated breakdown voltage and clamping voltage. The lower clamping voltage of the optimized snapback TVS protects the circuit at a much higher peak pulse current than conventional TVS diodes. This enables designers to use lower-working-voltage and less costly components (capacitors, switching MOSFETs, reverse polarity protection diodes and regulators) while still maintaining proper design margins.

The 24-V LTD7524CAH provides a peak power rating of 7700 W and is designed to clamp repetitive (10/1000-µs) transients of up to 300 A peak, which is nearly twice that of comparable standard TVSs, according to the vendor (see the figure). Smaller, lower-power, traditional SMB and SMC AEC-Q-qualified devices will follow in Q2/2025.

With a temperature rating of -55°C to 175°C, the DO-218AB-packaged SUPER CLAMP diodes meet AEC-Q101 automotive qualification and ISO7637. Suitable for any transient protection application working at 24 V or greater, the SUPER CLAMP snapback TVS is well suited for hybrid electric vehicle 48-V buses, battery management systems and chargers, alternators, lighting protection, telecom/datacom/networking 36-V to 72-V rails, EMP protection systems, industrial process controls and avionics.

SUPER CLAMP snapback TVS diodes provide the flexibility to combine with conventional TVS diodes in series, allowing for different working voltages while delivering high peak surge current and enhanced protection. Moreover, as a bidirectional device, they are suitable for dc or ac applications.

For a more in-depth explanation on the characteristics and benefits of this device, see Kevin Parmenter's article, "Snapback TVSs Deliver More Accurate And Robust Circuit Protection," which was published in the February 2025 issue of How2Power Today.

Samples of the LTD7524CAH are available from stock while production quantities are available with 8-week leadtimes (ARO). For a datasheet. SPICE models and other information on the LTD7524CAH, see this page.

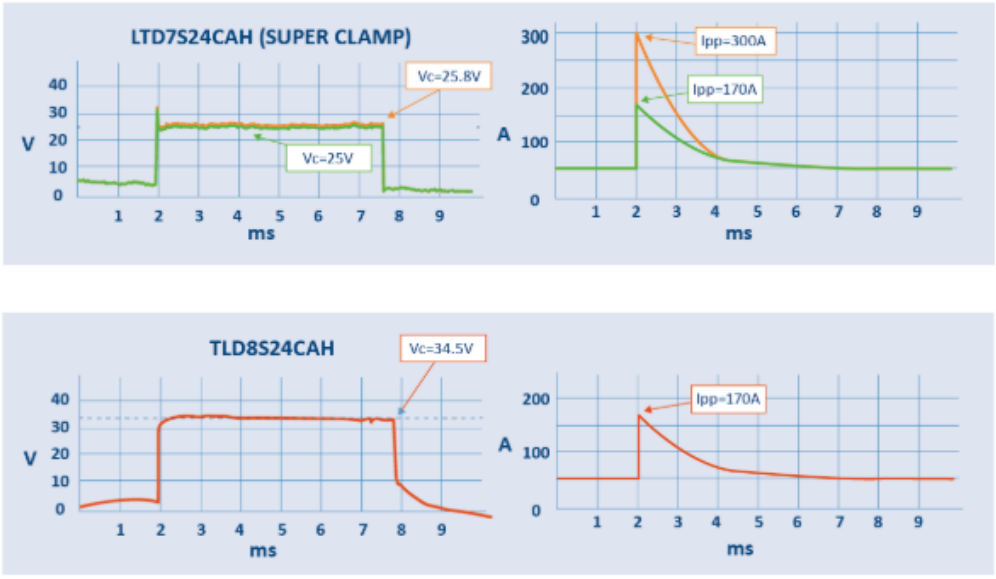

Figure. The SUPER CLAMP series TVS delivers significantly lower clamping voltage compared to a conventional TVS such as the TLD8S24CAH under the same pulse current conditions.