CASE STUDY

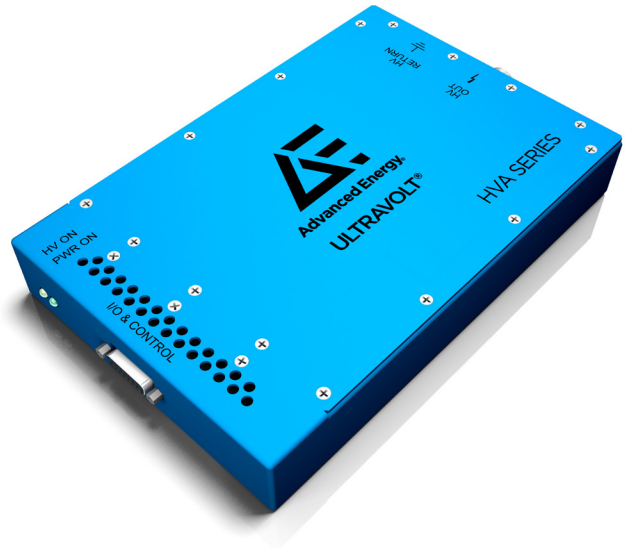
Transforming Semiconductor Testing with Advanced Energy 's Cutting-Edge High Voltage Amplifier

INDUSTRY	SOLUTION	APPLICATION
Commercial Component Testing	Fast-Reversing +/-5 kV / 1 W High Voltage Amplifier	Leakage & Breakdown Testing of Isolated Gate Drivers

CHALLENGE

The customer faced a significant challenge: they needed a high voltage DC-DC power supply that could vary from -4.5 kV to +4.5 kV without any zero-crossing noise, and it had to reverse at a rate of 1 kHz. The ripple had to be minimal since excessive high frequency noise on the high voltage mode can create a false failure mode of the device under test.

Additionally, the system was sensitive to micro discharges, which could also trigger false failure indications. Therefore, the standard silicone high voltage cable used on the HVA module had to be replaced with a coaxial cable and a shielded coaxial connector to minimize ionization of the surrounding air. To fully characterize their extensive library of test profiles, the customer required detailed technical information about the HVA's distributed output capacitance.



SOLUTION

Advanced Energy's (AE) engineering team proposed the 5HVA24-BP1-F-25PPM-SHV, a standard 5kV bipolar HVA series product equipped with an internal filter and a reduced temperature coefficient option. Coupled with the already high performance level of the HVA, this solution was ideal for the application due to several key attributes:

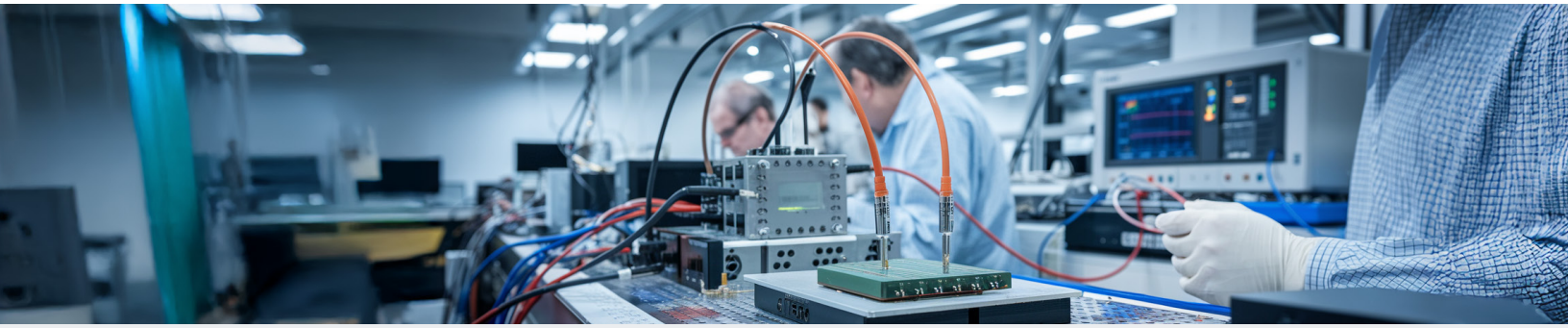
- The HVA series is a unique fast-reversing, compact, low ripple high voltage amplifier with seamless zero-crossing performance.
- The addition of the F option reduced the maximum high voltage ripple from 0.03% V pk-pk to just 0.0075% V pk-pk, minimizing testing false failures.
- The shielded SHV high voltage output connector and the use of coaxial high voltage cable eliminated nuisance microdischarges in the system.
- The temperature coefficient was reduced by 50% with the additional 25PPM option, enabling the customer to maintain tight voltage control during normal system temperature fluctuations.

These attributes significantly influenced the customer's decision to choose AE's solution. However, there were additional factors and benefits that were crucial for the customer:

- AE provided detailed technical information about the HVA's high voltage output capacitance, enabling the customer to fully characterize their system for a known high voltage DC-DC energy storage value.
- AE's rapid response to numerous technical questions about various aspects of the HVA's performance characteristics, beyond what is published on data sheets, was highly valued by the customer.
- The excellent track record of the HVA series being used in fast-reversing applications.
- AE's reputation as a leading company in custom and modular power supplies.

RESULT

The customer received a fully effective high voltage DC-DC solution that met all their requirements, allowing them to proceed with their system development without delay. They were impressed not only by AE's technical expertise and extensive experience in high voltage applications, particularly in the high-performance segment of compact high voltage amplifiers, but they also valued the excellent customer service and product support they received from product conceptualization through to full production of their semiconductor testing system.



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