

# High Voltage Power Supply Required for Einzel Lens in Mass Spec TOF System

## INDUSTRY

**Life Sciences:  
Analytical  
Instrumentation**

## SOLUTION

**+20 kV Low Ripple, High  
Stability High Voltage  
DC-DC Power Supply**

## APPLICATION

**Time-of-Flight (TOF)  
Mass Spectrometer**

## CHALLENGE

The customer required a 20 kV high voltage DC-DC power supply with low output ripple to power an einzel lens placed ahead of the TOF (Time-of-Flight) tube in their mass spectrometer. The power supply was needed to focus on the ion beam prior to entering the TOF to improve mass resolution and increase their instrument's sensitivity. At this time, they require 10 kV but actually preferred a 20 kV supply since the system was still being developed and the final voltage had not been determined. The customer highly preferred that the module be as small as possible while still retaining low ripple and high stability features. However, they were willing to trade compactness for a significant reduction in ripple. In addition, micro discharges must be kept to a minimum, requiring a reduction in exposure of non-insulated cabling to surrounding air.

## SOLUTION

After careful review of their requirements, Advanced Energy (AE) team determined that the best solution would be the 20LE24-N4 (20 kV / 4 W). While larger than the 20A Series (which they had considered initially), the customer still had sufficient room to package this product into the space available and reap the additional benefit of markedly lower ripple.

This LE series is normally equipped with a silicone wire. While this is very well-suited for nearly all applications, in this case the exposure of the cable to air might have lead to microdischarges. This is not

a factor in most applications but was considered problematic for this customer. To address this, AE modified the power supply to include a coaxial high voltage connector. By mating this connector with the customer's shielded coaxial cable, microdischarges were eliminated.



In summary, the LE series met all of the customer's demands for a low-ripple and low-microdischarge power supply. However, there were other factors and benefits of choosing this product beyond superior electrical performance, such as:

- AE's willingness to modify the LE series to incorporate this customer's requirements.
- The coaxial cable enabled the customer to connect directly to their application without them having to resort to time-consuming, costly and potentially hazardous field modification of the standard silicone cable.
- AE's expertise and long history of engaging with life sciences applications.
- The use of the LE series successful adoption by several other analytical applications customers requiring high stability and purity of the high voltage DC output, increasing the customer's confidence in this product line.

## RESULT

Selecting the LE series provided the customer with a product that exceeded their technical requirements. Along with a well-established case history of the LE series in similar low-noise, high-stability applications, its excellent specifications and objectively proven technical superiority to the competition, the customer felt confident with their choice. Additionally, the customer was impressed by AE's product portfolio, long-standing experience in life sciences applications and strong customer support throughout the entire customer experience.



For international contact information,  
visit [advancedenergy.com](https://advancedenergy.com).

[powersales@aei.com](mailto:powersales@aei.com)  
[productsupport.ep@aei.com](mailto:productsupport.ep@aei.com)  
+1 888 412 7832

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