CASE STUDY

Reliable Power for Delicate Procedures: Advanced Energy's MINT1275 Series Transformed Ultrasonic Surgery

INDUSTRY	SOLUTION	APPLICATION
Electrosurgery	SL Power MINT1275 Series	Ultrasonic Knife

BACKGROUND

Ultrasonic devices utilize high-frequency mechanical vibrations to cut and coagulate tissues simultaneously. The mechanical motion generates localized frictional heat, which denatures proteins and seals small vessels (typically up to 3 mm). The main advantage of ultrasonic technology is its precise and controlled heat generation, resulting in minimal thermal spread and less smoke. It is widely used in laparoscopic and thyroid surgeries where delicate tissue handling is critical.

CHALLENGE

A major medical device company was designing an advanced ultrasonic energy surgical knife generator.

They required:

- 275 W / 24 V output
- Outstanding EMC performance
- 2 x MOPP input to output isolation

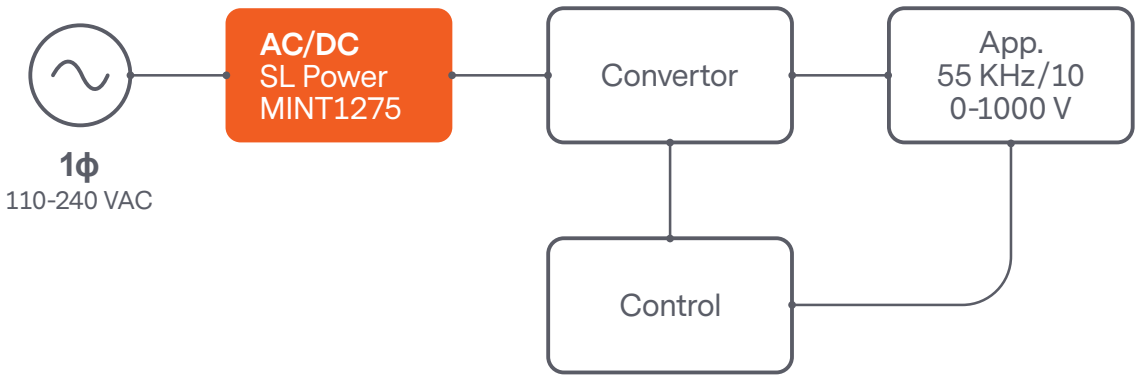


Figure 1. Ultrasonic Knife Block Diagram

They were seeking a company with a broad portfolio of medically certified power supplies and strong technical support.

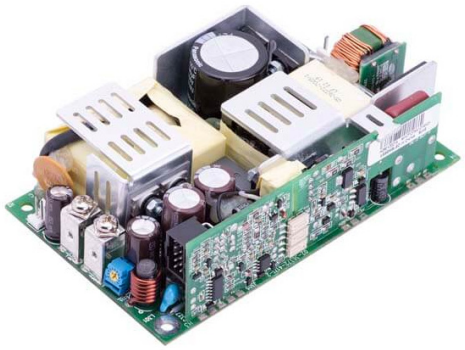
SOLUTION

Advanced Energy's (AE) SL Power MINT1275 series is 275 W single output with output voltage range from 12 V to 56 V. It is approved to EN/IEC/UL 60601-1, 3rd edition, with isolation levels which satisfy the 2 x MOPP input to output isolation requirements. It features 275 W output and 12 V to 56 V output. The MINT1275 series is ideal for portable medical devices, and many other applications where medical certifications, power density and cost are critical. The MINT1275 series operates at universal input range of 90 to 264 VAC and wide temperature range -10 to 70 °C, delivering full rated output power up to +50 °C. It has 5 V standby and 12 V fan output. In addition, these models feature Power Good and DC OK signals.

EMI/EMC COMPLIANCE

Conducted emissions	EN55011/22 Class B, FCC Part 15, Subpart B, Class B
Radiated emissions	EN55011/22 Class A, FCC Part 15, Subpart B, Class A w/6dB margin
Static discharge immunity	EN61000-4-2, 6 kV contact discharge, 8 kV air discharge, criteria A1
Radiated RF immunity	EN61000-4-3, 3 V/m, criteria A1
EFT/Burst immunity	EN61000-4-4, 2kV/5 kHz, criteria A1
Line surge immunity	EN61000-4-5, 1 kV differential, 2 kV common mode, criteria A1
Conducted RF immunity	EN61000-4-6, 3 Vrms, criteria A1
Power freq. magnetic field immunity	EN61000-4-8, 3 A/m, criteria A1
Voltage dip immunity	EN61000-4-11, 0% Vin, 0.5 cycs; 40% Vin, 5 cycs; 70% Vin, 25 cycs; criteria A1
Line harmonic emissions	EN61000-3-2, class A, B, C & D
Flicker test	EN61000-3-3, Complies (dmax < 6%)

Notes: 1. According to the standards, performance criteria are decoded as following: A. Normal performance during and after the test; B. Temporary degradation, self-recoverable; C. Temporary degradation, operator intervention required to recover the operation; D. Permanent damage.



RESULTS

By choosing AE's SL Power MINT1275 Series, the customer satisfied their requirements for medical grade highly reliable ac/dc power supplies and isolation, with high power density and best in class quality. They were particularly impressed with the EMC performance (see table). As a result of the exceptional technical support and fast delivery of samples, the customer was able to accelerate their development cycle.

CONCLUSION

AE has devoted more than four decades to perfecting power for its global customers. AE's power solutions enable customer innovation in complex electrosurgery applications.

The SL Power MINT1275 series is designed to meet the demanding medical grade specifications of ultrasonic knife applications utilizing state-of-the-art power conversion topology.

With AE's broad portfolio of highly reliable medical solutions, our engineering team are well equipped to meet all high and low voltage application requirements for electrosurgery devices. With deep medical applications knowledge and responsive service and support across the globe, AE builds collaborative partnerships to power the future of electrosurgery.

Advanced Energy

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