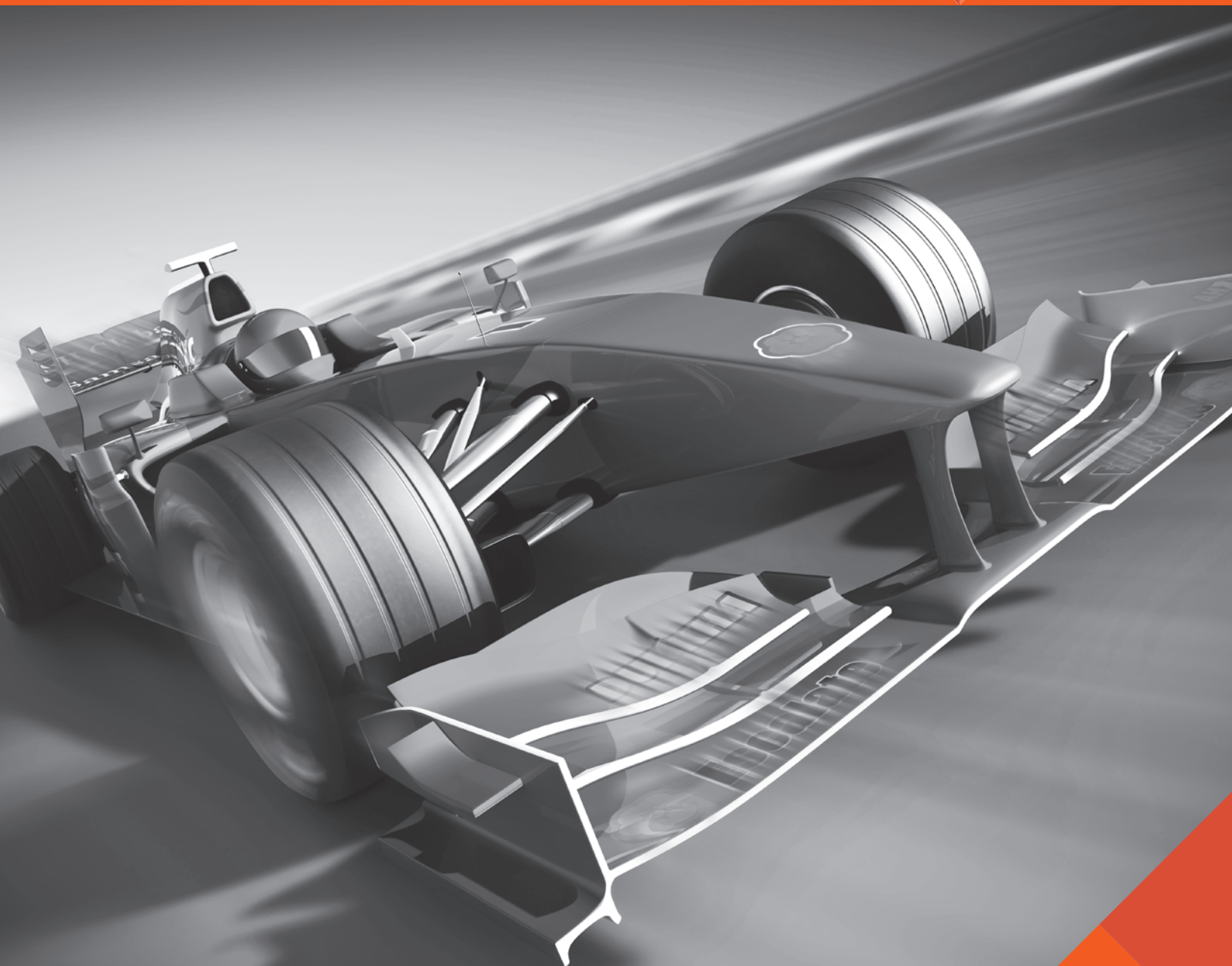


RAPID MODIFICATION & VALUE-ADDED ENGINEERING SOLUTIONS

QUICKLY GO TO MARKET WITH POWER PLATFORMS THAT KEEP YOU
AHEAD OF THE CURVE



PRECISION | POWER | PERFORMANCE



Rapid Modification & Value-Added Engineering Solutions

Come in on schedule and on budget with Advanced Energy's proven Rapid Modification & Value-Added Engineering Solutions. We'll help you get to the finish line first!

Why use a Modified Standard Power Supply?

Time-to-market, reliability and costs have the greatest impact on your ROI. Fully custom solutions can delay your time-to-market and undermine your competitive advantage. Avoid paying custom development costs with an Advanced Energy modified standard power supply.

Advanced Energy has you Covered

No matter what type of power supply you need, Advanced Energy has you covered.

While Advanced Energy's Artesyn, Excelsys and UltraVolt product lines offer a broad range of standard products with output power from 3 W to 24 kW and output voltage of up to 60 kV that address the needs of many industries, there are occasions

when a standard product does not address all your application requirements. A custom solution may not be economical or meet scheduling needs. By using proven standard platforms as building blocks, Advanced Energy can develop cost-effective turnkey power solutions that meet your exact needs.

Why Advanced Energy

Advanced Energy is committed to providing you with power supply solutions that offer the lowest total cost of ownership in the industry. We achieve this through:

- Over 40 years of experience in developing standard, modified, and custom power supplies
- Broad product line of over 3,000 power supplies to choose from
- Advanced technology
- Superior design
- Leading-edge product performance
- Unsurpassed technical support

Modified Advantage

What you will get from Advanced Energy modified power supplies:

- Broad portfolio of power supplies to leverage from
- Quick time-to-market vs. custom solutions
- Low risk – using proven reliable platforms as building blocks
- Cost effective (lower development cost)
- Quality, high reliability products
- Gain a competitive advantage

Embedded Power Selector Guide

AC-DC

MODULAR

UltiMod
Up to 1200 W
1 to 12 Outputs



iMP Series
Up to 1500 W
1 to 21 Outputs



uMP Series
Up to 1800 W
Up to 12 Outputs



**CoolX1800,
CoolX3000**
Up to 3000 W
Up to 12 Outputs



iVS Series
Up to 4920 W
1 to 24 Outputs



**iHP Series,
iTS Series**
Up to 24000 W
Up to 8 Outputs



BULK/DISTRIBUTED/ENCLOSED

LCM Series
300, 600, 1000,
1500, 3000 W
85 to 264 VAC
12 to 72
VDC



Xsolo Series
500, 1000 W
85 to 264 VAC
120 to 380 VDC



DS Series
450 to 3000 W
90 to 264 VAC
12, 24, 48 VDC



CSU Series
550, 800, 1300,
1800, 2000, 2400 W
90 to 264 VAC
12 VDC



CSV Series
1100, 1300, 1600,
2000 W
90 to 264 VAC
12 VDC



UFE Series
1300 to 2000 W
85 to 264 VAC
24, 48 VDC



HPS Series
1 to 3000 W
90 to 264 VAC
48 VDC



BENCH

iLS Series
600 W,
1500 W



FANLESS/ CONDUCTION COOLED

LCC250
250 W



LCC600
600 W



CoolX600
600 W



CoolX1000
1000 W

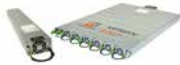


CS1000
1000 W



RACKS

**Open Rack
Power Shelf and
Rectifier**
1U,
18 kW



**Open Rack
Power Shelf and
Rectifier**
2U
36 kW



**Open Rack Power
Shelf and Rectifier
with ATS**
2U
36 kW



DSR1
1U, 6 kW
Accepts 5 DS units



UFR
1U, 6 kW
Accepts 3 UFE units



HPR1
1U, 12 kW
Accepts 4 HPS3000



OPEN FRAME

2x4
NPS20-M
25 to 40 W
NPS40-M
45 to 60 W
NPT40-M
45 to 55 W
NPS60-M
60 W
LPT100-M
130 W
LPS100-M
100 to 150 W
CPS250-M
150 to 250 W



3x5
LPS40/40-M
40 to 55 W
LPT60
60 to 80 W
LPS60/60-M
60 to 80 W
TLP150
100 to 150 W
LPQ200-M
100 to 200 W
LPS200-M
125 to 250 W
LPS360-M
240 to 360 W



4x6
CNS650-MU
400 to 650 W



4x7
NLP250
175 to 250 W



ADAPTERS

**AD, DA, DP
Series**
10 to 100 W



SPECIAL

ADN-C Series
120 to 960 W
Single & 3-phase
Approved for
UL508 &
Hazardous
Locations



LOW VOLTAGE

PFC

Full Brick; *AIF*
 3/4 Brick; *AIT*
 1/4 Brick; *AIQ*

**High Power**

Full Brick; *AIF*
 3/4 Brick; *AIT*
 1/2 Brick; *AIH*
 1/4 Brick; *BDQ/BCQ*

**Telecom DC-DC**

1/16th brick 35 to 120 W; *ALD/AVD*
 1/8th brick 50 to 300 W; *AVO/ADO*
 1/4 brick 50 to 800 W; *AVQ/ADQ*
 1/2 brick 300 to 700 W; *AVE/ADH*
 Full brick 500 to 800 W; *AGF*

**Industrial DC-DC**

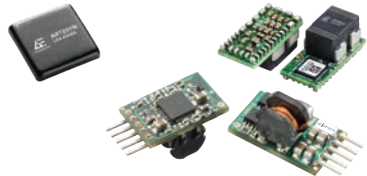
0.5 by 0.5 DIP 3 W; *AYA*
 0.9 by 0.5 DIP 3 W; *ATA*
 1.2 by 0.8 DIP 24 6 W, 10 W; *ASA*
 1 by 1; 10 W, 20 W, 25 W; *AXA*
 1 by 2; 15 W, 40 W, 50 W; *AEE*
 1.6 by 2; 25 W, 30 W; *AET*

**Direct Conversion -
PSA Series**

100 A; *ADC*

**Non-isolated DC-DC**

C2 Class 3 to 60 A; *LDO, SMT, SIL*
 LGA package 3 to 20 A; *LGA*
 LGA50D, LGA80D, LGA110D 25 to
 110 A; *LGA50D, LGA80D, LGA110D*
 POLA package 6 to 60 A; *PTH*

**Medical DC-DC**

0.8 by 1.2;
 Medical 6 W; *ASA*
 1 by 2;
 Medical 10 W, 15 W,
 20 W; *AEE*

Railway DC-DC

1 by 2; Railway
 10 W, 20 W; *ERM*
 1/4 brick Railway
 50 W, 75 W; *ERM*



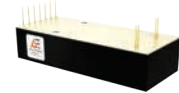
HIGH VOLTAGE

High Power C

Output voltage
 125 V to 60 kV
 Output power
 60, 125, or 250 W

**A**

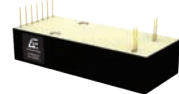
Output voltage
 62 V to 40 kV
 Output power
 4, 15, 20, and 30 W

**LE**

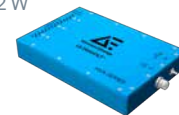
Output voltage
 1 to 30 kV
 Output power
 4, 20, and 30 W

**AA**

Output voltage
 62 V to 6 kV
 Output power
 4, 20, and 30 W

**HVA**

Output voltage
 1 to 20 kV
 Max output power
 2 W

**US**

Output voltage
 200 to 500 V
 Max output power
 0.1 W



Modified Solutions

Advanced Energy provides modified standard products and value-added solutions in varying degrees of complexity. These meet specific customer needs in a wide range of applications, such as:



Communications

- Access solutions
- Enterprise networking
- Wireless
- Wireline
- Optical



Medical

- Imaging
- Life science
- Lasers
- Electrosurgery



Industrial

- Test & measurement
- Semiconductor
- Robotics
- Indoor horticulture



Lighting & Signage

- Displays
- Illuminated signs



Aero

- Avionics
- In-flight entertainment



Capabilities

The exact specifications you require that's within your budget and reliability standards.



Electrical Parameters

- Factory out preset
- Low noise
- Power & efficiency upgrades
- Hot swap control
- Inrush current control
- Integrated PDU assemblies
- Compliance to industry standards



Packaging

- Conformal coating
- Custom chassis/sled
- Ruggedization for shock, vibration, and hazardous locations
- Shielding for high magnetic environment
- Sealed/IP rated enclosures
- Customized print/marketing/labels



Connectivity

- Cable wire assemblies
- Connector changes
- Busbar design
- Overmoulding
- Interposer boards



Communications & Control

- Logic signal/timing changes
- Adaptive fan control
- Output sequencing
- Peak load/efficiency optimization

Rapid Modification and Value-Added Engineering Solutions Examples

AC-DC



- Application: Networking - Routers
- Base Supply: NPS42-M
- Modifications:
 - Factory preset of output voltage to 5.1 V



- Application: Computing
- Base Supply: NLP250N-48S12J
- Modifications:
 - Replace input connector with cable wire assembly terminated with customer-specified connector



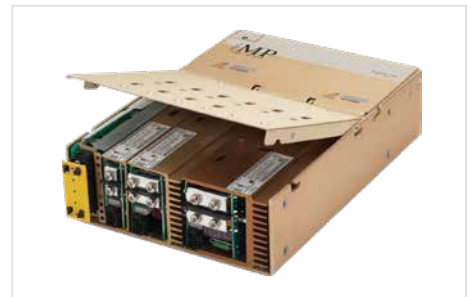
- Application: Laboratory Equipment
- Base Supply: iVS1
- Modifications:
 - Configured iVS1 supply mounted on customized chassis with special connectors and accessories



- Application: ATM
- Base Supply: LCM600U-4
- Modifications:
 - Output connector change
 - Firmware changes for load adaptive fan speed, logic signal, and timing changes
 - Additional safety standard certification



- Application: Network Switch
- Base Supply: LPS203-M
- Modifications:
 - Output connector change
 - Custom slide enclosure with fans, AC inlet, switch, and output connector
 - Safety approvals on finished product



- Application: CT Scanner
- Base Supply: iMP8
- Modifications:
 - Output connector change
 - Customer-specified enclosure, connectors, and accessories
 - Ruggedization for shock and vibration



- Application: In-flight Entertainment
- Base Supply: LCC250-48U-7P
- Value-Add:
 - Output connector change
 - Customer-specified enclosure and accessories
 - Value-Add design for RTCA DO-160F compliance



- Application: Precision Heating and Bias Supply for RF Amplifiers used in Plasma Generation
- Base Supply: iHP12H3A and iHP24SH3A
- Value-Add:
 - Special chassis and connector systems
 - Special isolation for use with electrostatic chuck
 - Application specific interlocks and EtherCAT implementation



- Application: SEMI Process Chambers
- Base Supply: iMP1 Config
- Value-Add:
 - 19" rack enclosure with multiple output voltages at rated current
 - Customized circuit breakers and connectors
 - Front panel with test points, power LEDs, and a silkscreen indicating each function

Rapid Modification and Value-Added Engineering Solutions Examples

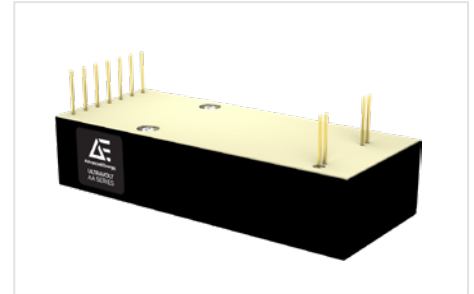
DC-DC



- Application: Super-compute DCDC
- Base Supply: BDQ1300
- Modifications:
 - Change of baseplate
 - Change of protection features to tune the product to the application



- Application: Electrophoresis Instrument
- Base Supply: 15HVA24-BP1.5
- Modifications:
 - Addition of large O.D. HV cable to eliminate cable microdischarges and corona/ozone production
 - Special HV output connector and customer-specified mounting flange



- Application: Metrology
- Base Supply: 1AA24-N30-I5
- Modifications:
 - Modified output stages to withstand frequent and severe output arcs
 - Modified feedback with open loop transient limit
 - Changed SMT interconnect to thru-hole header for increased reliability



- Application: Aerospace (Aircraft Wing De-Icing System)
- Base Supply: 1/2C24-N250-I5
- Modifications:
 - Increased output power from 250 to 275 W
 - Changed I/O connector to Molex
 - Added top-mounted unit mounting stud
 - Customer notification of any changes and copies of all test results sent to customer



- Application: Shockwave Lithotripsy
- Base Supply: 25C24-N250-I10
- Modifications:
 - Output cable replaced with 20" HV wire
 - Added reverse output voltage protection clamp diodes
 - I/O logic signals changed to reverse logic to accommodate customer's communication protocols



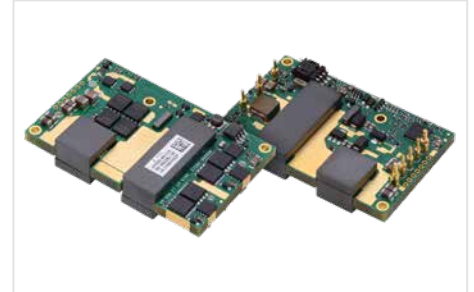
- Application: E-Beam Wafer Inspection System
- Base Supply: FIL-5V-3A-M
- Modifications:
 - Output current re-ranged to 2.6 A with 10 V current programming
 - Filament center-tap isolated from ground
 - Added integrated precision shunt resistor for filament current measurement



- Application: In-Flight Entertainment
- Base Supply: AIT00ZPFCx-x, AIT04RF300L
- Value-Add:
 - PCB assembly with bricks, EMI filter, and Hold-Up caps
 - Special connectors and sealed enclosure
 - RTCA-DO160 compliance



- Application: CT Scanner
- Base Supply: AIF-PFC and AIF-DCDC
- Value-Add:
 - Full PSU with multiple outputs developed based on standard products that are optimized for contact-cooling



- Application: RFPA stand-alone DCDC
- Base Supply: ADQ500-48S12B-6LI
- Value-Add:
 - DCDC product integrated into a case with required external components resulting in a stand-alone contact-cooled 48 Vin, 12 Vout PMBus controlled unit



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ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than four decades to perfecting power for its global customers. We design and manufacture highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

Our products enable customer innovation in complex applications for a wide range of industries including semiconductor equipment, industrial, manufacturing, telecommunications, data center computing, and medical. With deep applications know-how and responsive service and support across the globe, we build collaborative partnerships to meet rapid technological developments, propel growth for our customers, and innovate the future of power.

PRECISION | POWER | PERFORMANCE

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