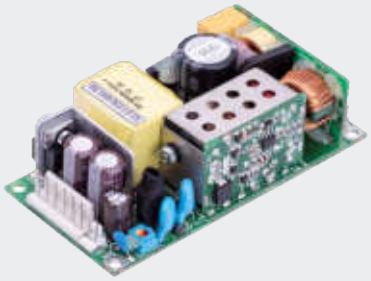
SL POWER
MINT1150 Series

150 Watts Single Output
Medical Grade



Medical

Advanced Energy's SL Power MINT1150 series is a high power density for a power supply in a 2"x4" size. Approved to EN/IEC/UL 60601-1, 3rd edition, with isolation levels which satisfy the 2MOPP requirements. The MINT1150 series is ideal for portable medical devices, and many other applications where medical certifications, power density and cost are critical. The MINT1150 series operates at universal input range of 90 to 264Vac and wide temperature range -10 °C to 70 °C, delivering full rated output power up to +50 °C. In addition, these models feature Power Fail and DC OK signals.

AT A GLANCE

Total Power

150 Watts

Input Voltage

90 to 264 VAC

# of Outputs

Single

SPECIAL FEATURES

- 2" x 4" x 1.3" Package
- 150 W with air, 100 W Convection Cooled
- Universal Input 90 to 264 VAC
- Efficiency 89% Typical
- Suitable for 1U Applications
- 2 x MOPP Input to Output Isolation
- Power Fail Signal
- DC OK Signal
- 3 Year Warranty
- RoHS Compliant

SAFETY

- CSA/IEC/EN/UL60601-1, 3rd Edtion
- CE Mark

ELECTRICAL SPECIFICATIONS

Input	
Input range	90 to 264 VAC, 47 to 63 Hz, 1Ø; 120 to 370 VDC
Input current	2 A @ 115 VAC, 1 A @ 230 VAC
Inrush current	50 A max., cold start @ 264 VAC input
Input fuses	4 A, 250 VAC fuses provided in both line & neutral
Turn on input voltage	82.7 VAC nom
Turn off input voltage	67 VAC nom
Power Factor	0.9 min
Earth Leakage current	<300 µA @ 264 VAC, 60 Hz, NC
Efficiency	89% typical @ 115 VAC
Isolation voltage	Input/Ground: 1800 VAC (1 x MOPP) Input/Output: 4000 VAC (2 x MOPP) Output/Ground: 500 VAC
Output	
Output power	150 W continuous with 200 LFM airflow, 100 W convection cooled
Ripple and noise	See "Ordering Information"
Total regulation	See "Ordering Information"
Output voltage	See "Ordering Information"
Switching Frequency	PFC: Variable 30-400kHz. Main Converter: Variable 35-180kHz, 65-70kHz at full load
Adjustment range	+/-5% from nominal
Turn on time	< 2 s @ 115 VAC (inversely proportional to input voltage and thermistor temperature)
Hold-up time	12 mS min @ full load, 120 Vac input
Minimum load	Not required
Dynamic load regulation	< 3% of nominal output voltage @ 50% load change, di/dt = 0.2 A/µS
Reliability	
MTBF	640,000 hrs @ 100W convection 1,500,000 hrs @ 150W with 200LFM air
Protection	
Input fuses	4 A, 250 VAC fuses provided in both line & neutral
Input transient protection	2kV (CM) and 1kV (DM) surge
Short circuit protection	Provided - no damage will occur if the output is shorted. Hiccup mode.
Overload protection	150% to 300% above rating for V2, V3, 110% to 200% for V1. Hiccup mode.
Overvoltage protection	Latching type, recycle AC input to reset. OVP firing reduces otuput voltage to <50% of nominal in <50 mS. See "Ordering Information" for trip ranges.
Overtemperature protection	Automatic power shutdown at T_C = 155°C
Auxiliary Signals	
AC power fail	Stays HIGH during normal operation. Signal will go LOW with at least 5 mS warning before loss of DC output from AC failure.
DC OK	Open collector logic signal goes and stays HIGH, 100mS to 500mS after main output reaches regulation.

ENVIRONMENTAL SPECIFICATIONS

Weight	183 grams
Dimensions	2.0" x 4.0" x 1.3" (W x L x H)
Vibration Operating Non-operating	 0.003 g^2/Hz, 1.5 grms overall, 3 axes, 10 min/axis 0.026 g^2/Hz, 5.0 grms overall, 3 axes, 1 hr/axis
Shock Operating Non-operating	 Half-sine, 20 gpk, 10 mS, 3 axes, 6 shocks total Half-sine, 40 gpk, 10 mS, 3 axes, 6 shocks total
Operating temperature	-10°C to +70°C
Temperature derating	Derate output power linearly above 50°C to 50% at 70°C
Storage temperature	-40°C to +85°C
Altitude Operating Non-operating	 -500 to 10,000 ft -500 to 40,000 ft
Relative humidity	5% to 95%, non-condensing

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 A[1]
Radiated RF immunity	EN61000-4-3, 3 V/m, criteria A[1]
EFT/Burst immunity	EN61000-4-4, 2kV/5kHz, criteria A[1]
Line surge immunity	EN61000-4-5, 1 kV differential, 2 kV common mode, criteria A[1]
Conducted RF immunity	EN61000-4-6, 3 Vrms, criteria A[1]
Power frequency magnetic field immunity	EN61000-4-8, 3 A/m, criteria A[1]
Voltage dip immunity	EN61000-4-11, 0% Vin, 0.5 cycle; 40% Vin, 5 cycles; 70% Vin, 25 cycles; criteria A[1]
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

ORDERING INFORMATION

Model Number	Output Voltage	Maximum Load with Convection Cooling	Maximum Load with 200LFM Forced Air	Total Regulation	Ripple & Noise[2]	OVP Threshold
MINT1150A1206K01	12 V	8.33 A	12.5 A	± 5%	1.2% pk-pk, 0.5% RMS	14.0 ± 1.1 V
MINT1150A1506K01	15 V	6.67 A	10.0 A	± 5%	1.0% pk-pk, 0.5% RMS	18.0 ± 1.5 V
MINT1150A2406K01	24 V	4.17 A	6.25 A	± 5%	1.0% pk-pk, 0.5% RMS	28.0 ± 2.5 V
MINT1150A4806K01	48 V	2.08 A	3.13 A	± 5%	1.0% pk-pk, 0.5% RMS	55.0 ± 4.0 V
MINT1150A5606K01	56 V	1.79 A	2.68 A	± 5%	1.0% pk-pk, 0.5% RMS	< 59.9 V

Notes:
1. Maximum output power is 95 watts for input voltage of 90 to 105 Vac at 50°C convection. For input voltage of 105 Vac or more, the total power is 100 watts at 50°C convection.
2. Measured with noise probe directly across output terminals, and load terminated with 0.1 µF ceramic and 10 µF low ESR capacitors. All specifications are typical at 230 Vac, full load, at 25°C ambient unless noted.

PIN ASSIGNMENTS

Connector	MINT1150	
J100 (Input connector)	PIN 1	AC Neutral
	PIN 2	SPARE
	PIN 3	AC Line
J200 (DC output connector)	PIN 1	+Vo
	PIN 2	+Vo
	PIN 3	+Vo
	PIN 4	-Vo
	PIN 5	-Vo
	PIN 6	-Vo
J300 (Signal connector)	PIN 1	Power Fail/DC_OK
	PIN 2	Common

CONNECTORS

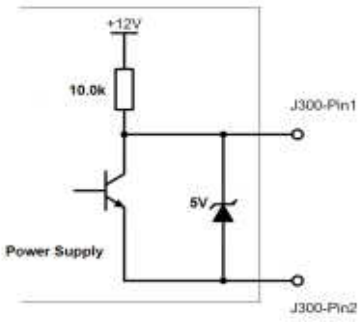
	Connector	Mating Connector
J100 (Input connector)	/	MOLEX 09-50-3031. Pins = 08-52-0072
J102 (DC output connector)	/	AMP #640250-6. Pin = Amp #640252-1
J300 (Signal connector)	/	AMP #1375820-2. Pin = Amp #1375819
J101 (Ground)	0.187" FASTON TAB	MOLEX 01-90020005

CONNECTORS

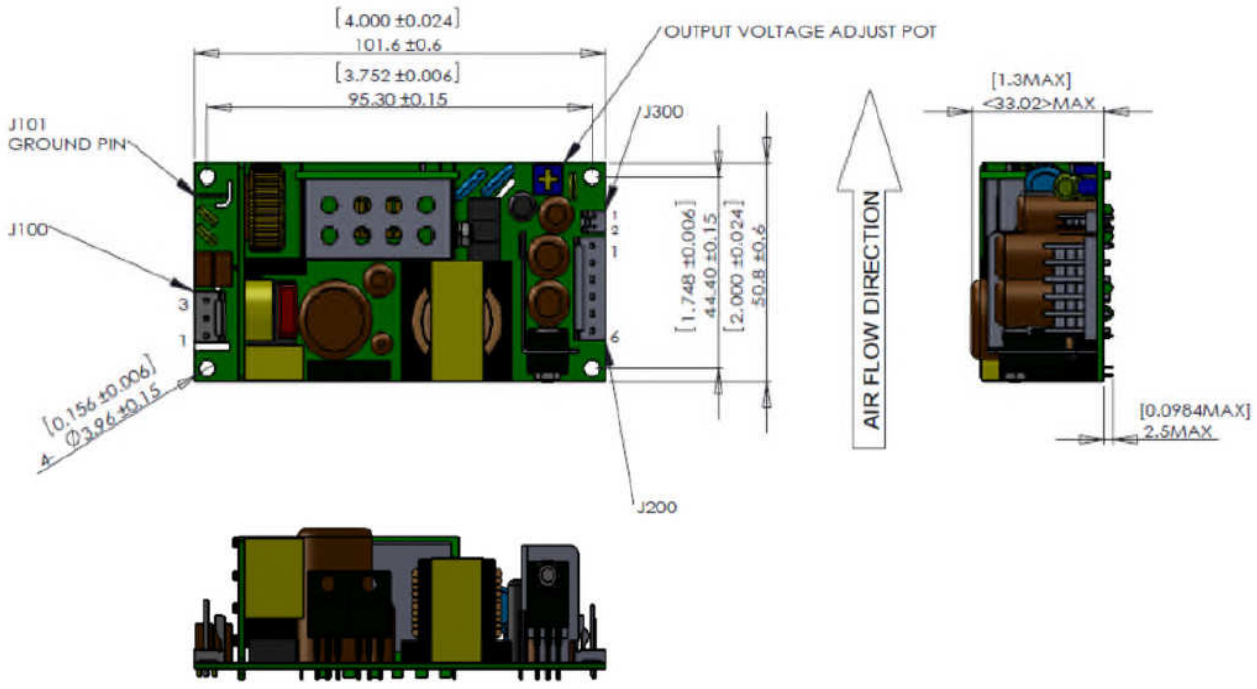
Power Fail/DC OK Signals - J300:

During normal operation stays HIGH - goes HIGH, 100-500 mS after main output.

- goes LOW, with 5 mS warning before loss of output from AC failure.



MECHANICAL DRAWING

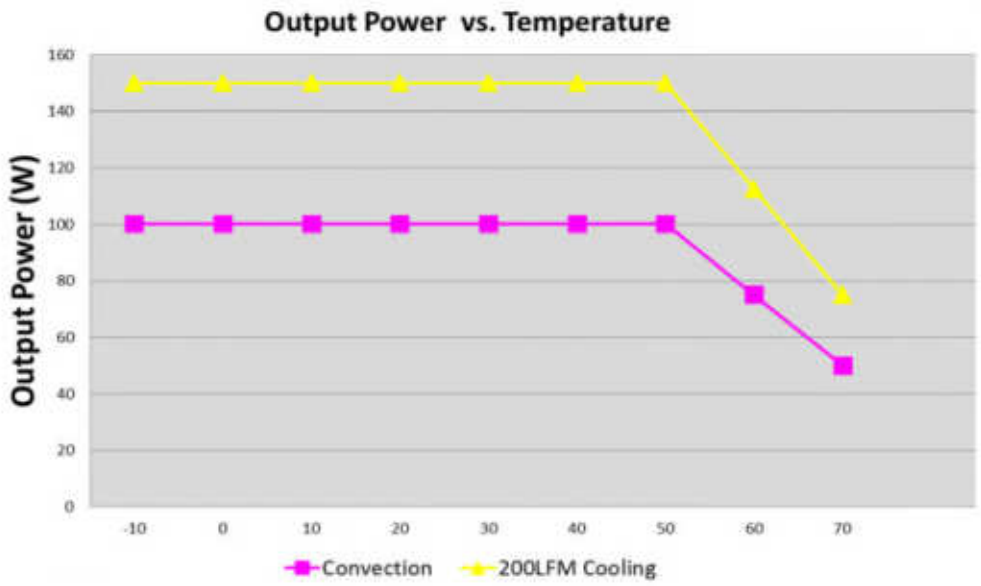


Notes:

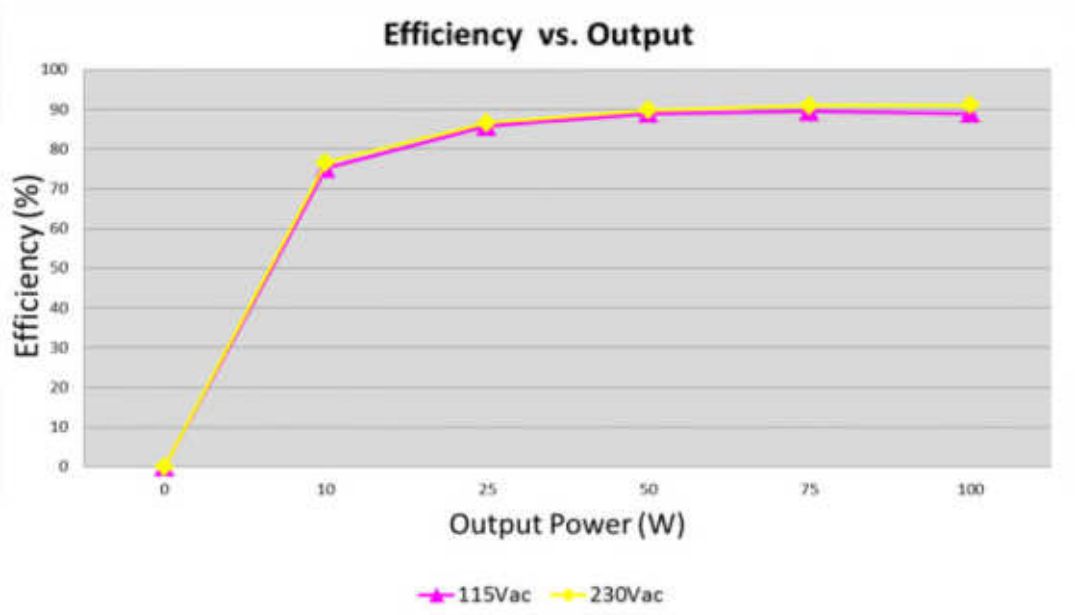
1. All dimensions in inches (mm), tolerance is ±0.02".
2. Mounting holes should be grounded for EMI purpose.
3. Mounting J101 is safety ground connection.

CHARACTERISTIC CURVES

Output vs. Temperature:
100 W convection cooled and 150 W continuous with 200 LFM airflow. Derate output power to 50% at 70°C.



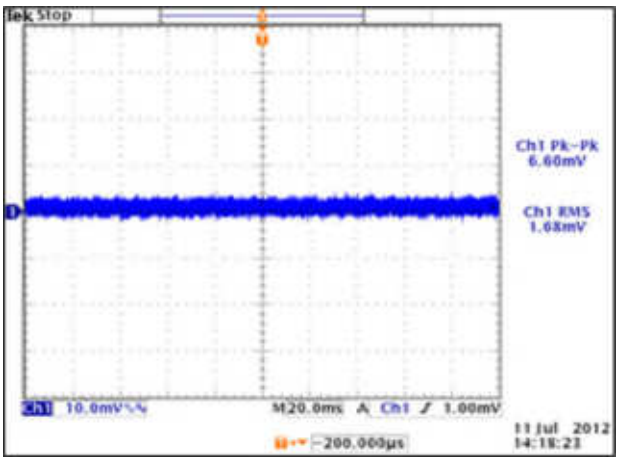
Efficiency vs. Loading:
The high efficiency is achieved by using LLC technology, PFC topology minimizing switching losses. Synchronous MOSFET or SCHOTTY diode is used as rectifier in MINT1150 series.



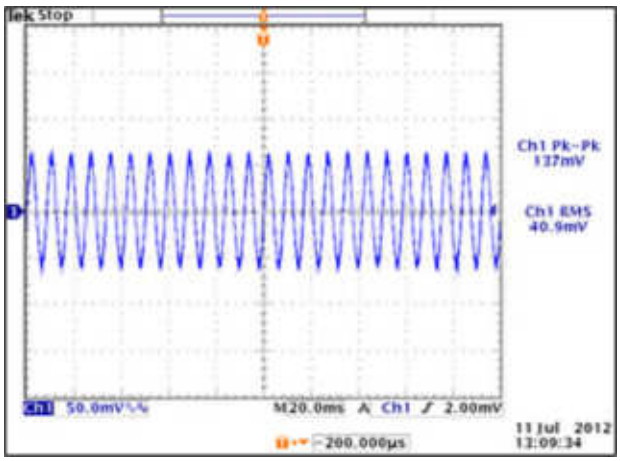
CHARACTERISTIC CURVES

Ripple vs. Noise:
To verify that the output ripple and noise does not exceed the level specified in the product specification. Measured using a scope probe socket with 0.1µF ceramic and a 10µF electrolytic capacitor connected in parallel across it, BW limit with 20MHz.

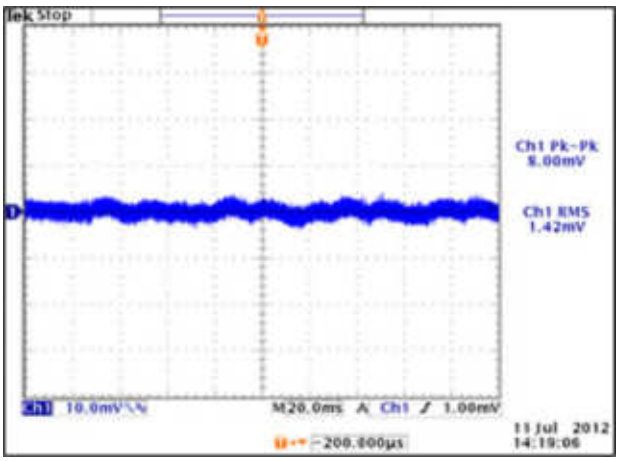
90Vac 60Hz Input, 24V Output, No Load



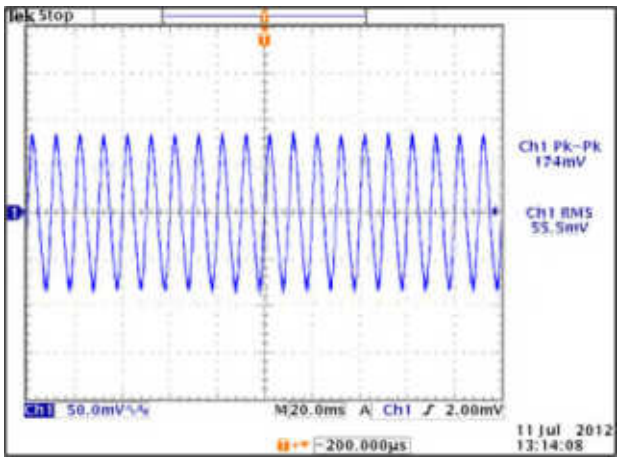
90Vac 60Hz Input, 24V Output, Full Load



264Vac 50Hz Input, 24V Output, No Load



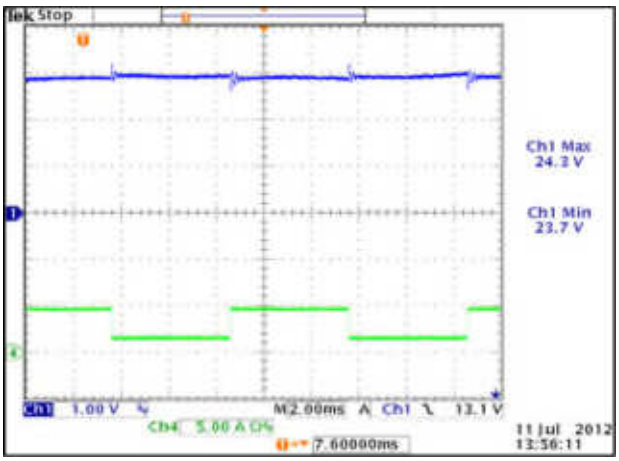
264Vac 50Hz Input, 24V Output, Full Load



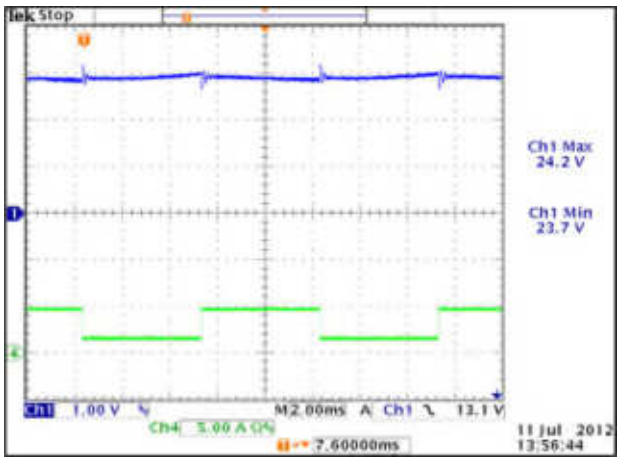
CHARACTERISTIC CURVES

Output Transient Response:
50% load step within the regulation limits of minimum and maximum load, di/dt < 0.2 A/µS. Recovery time not specified as there is no laps in regulation with a 50% Load Step. Maximum voltage deviation is 3%.

120Vac Input, 24V Output, 25% to 75% Load Step

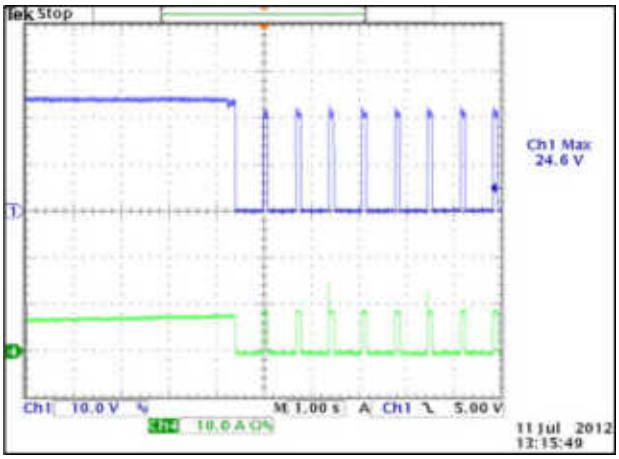


240Vac Input, 24V Output, 25% to 75% Load Step

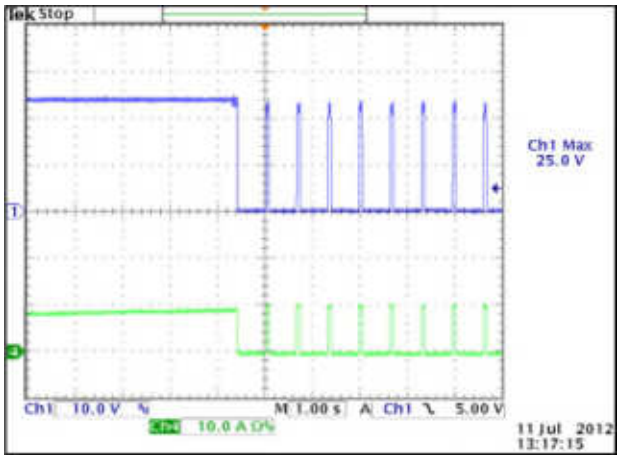


Output Overload Characteristic:
Supply shall protect itself against overload condition. The power supply shall recover from overload conditions without operator intervention.

90Vac Input, 24V Output



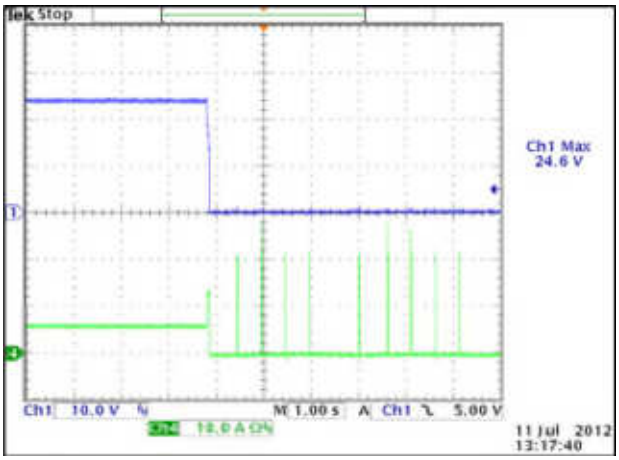
264Vac Input, 24V Output



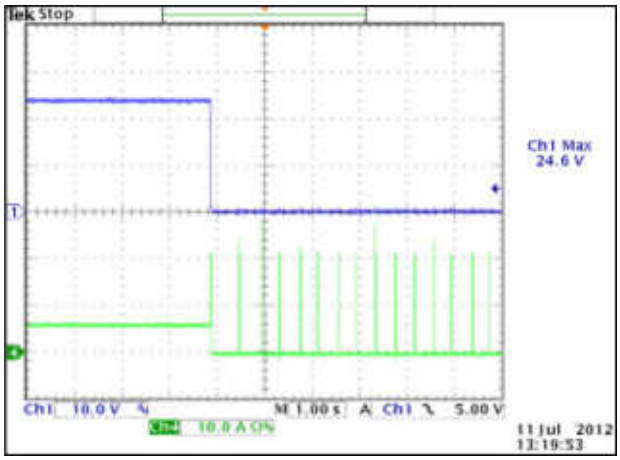
CHARACTERISTIC CURVES

Short Circuit Protection:
Power supply shall protect itself against short circuit conditions. No damage will occur if the output is shorted.

90Vac Input, 24V Output

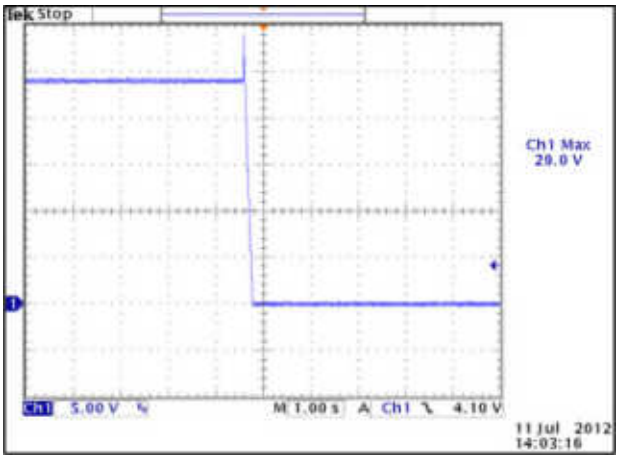


264Vac Input, 24V Output



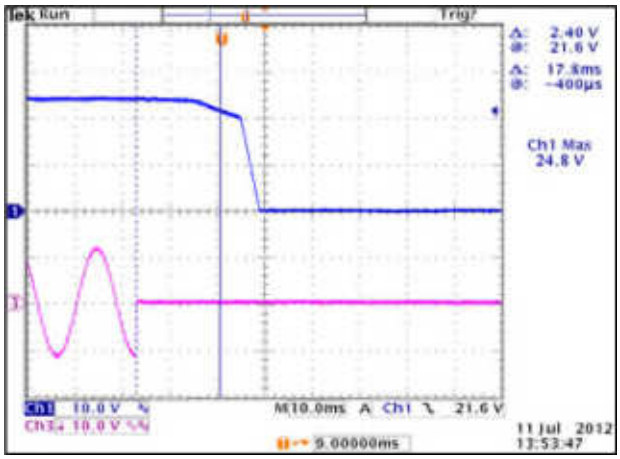
Overvoltage Protection:
OVP firing reduces output voltage to <50% of nominal in <50mS. See models chart for trip ranges.

24V Output, No load



Hold Up Time:

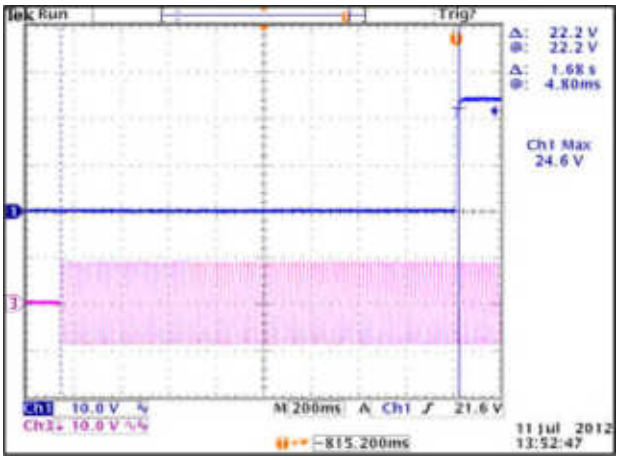
120Vac Input, Full Load



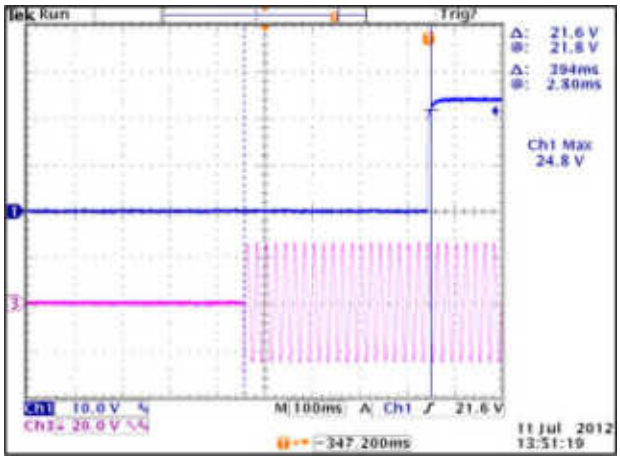
CHARACTERISTIC CURVES

Turn On Delay:

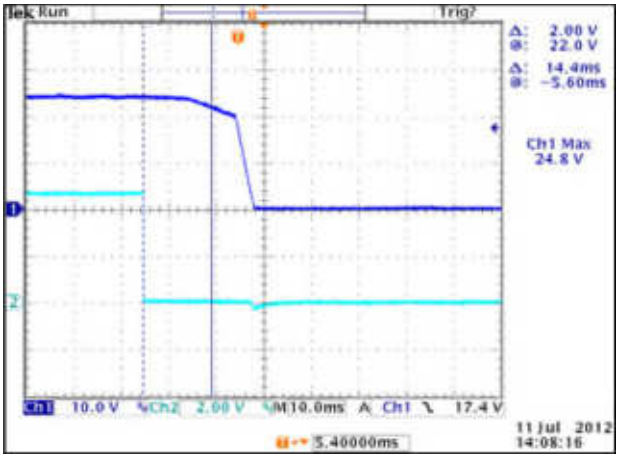
90Vac Input, Full Load



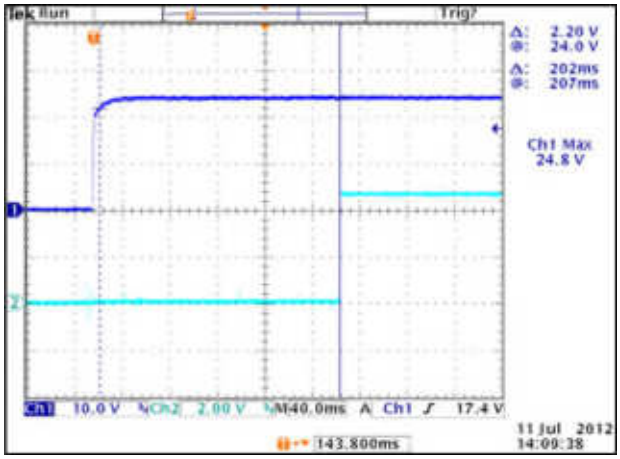
264Vac Input, Full Load



AC Power Fail Signal:



DC OK Signal:



ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. AE designs and manufactures 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 | TRUST

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