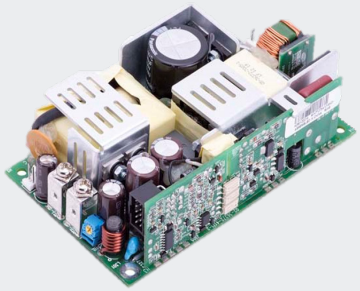
SL POWER MINT1275 Series

275 Watts Single Output
Medical Grade



Medical

Advanced Energy's SL Power MINT1275 series is approved to EN/IEC/UL 60601-1, 3rd edition, with isolation levels which satisfy the 2MOPP requirements. 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 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 Good and DC OK signals.

AT A GLANCE

Total Power

275 Watts

Input Voltage

90 to 264 VAC

# of Outputs

Single

SPECIAL FEATURES

- 3" x 5" x 1.4" Package
- 275 W with air, 180 W Convection Cooled
- Universal Input 90 to 264 VAC
- Efficiency 92% Typical
- Forced Current Share
- Suitable for 1U Applications
- 2 x MOPP Input to Output Isolation
- Class I and Class II Versions
- 5V Standby
- 12V Fan Output
- Power Fail Signal
- DC OK Signal
- Inhibit Signal
- 3 Year Warranty
- RoHS Compliant

SAFETY

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

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ELECTRICAL SPECIFICATIONS

Input	
Input range	90 to 264 VAC, 47 to 63 Hz, 1Ø; 120 to 370 VDC
Input current	3 A @ 115 VAC, 1.5 A @ 230 VAC, 3.7A max at 90VAC
Inrush current	50 A max, cold start @ 264 VAC input
Input fuses	5 A, 275 VAC fuses provided in both line & neutral
Turn on input voltage	80 VAC nom
Turn off input voltage	75 VAC nom
Power Factor	0.9 min
Earth Leakage current	<275 µA @ 264 VAC, 60 Hz, NC <400 µA @ 264 VAC, 60 Hz, SFC
Efficiency	92% typical
Isolation voltage	Input/Ground: 1800 VAC (1 x MOPP) Input/Output: 4000 VAC (2 x MOPP) Output/Ground: 1500 VAC
Output	
Output power	275 W continuous with 200 LFM airflow, 180 W convection cooled
Ripple and noise	See "Ordering Information"
Total regulation	See "Ordering Information"
Output voltage	See "Ordering Information"
Switching Frequency	PFC: Variable, 30 kHz to 400 kHz. Main Converter: Variable 30-250 kHz, 65-70 kHz 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	16 mS min @ 120 VAC with 250 W
Minimum load	Not required
Dynamic load regulation	500 µS typ. for return to within 0.5% of nominal, <= 3% of nominal output voltage @ 50% load change, di/dt = 0.2 A/µS
Reliability	
MTBF	465,000 hrs @ 110 VAC Input, 275W load, 25°C Ambient
Protection	
Input fuses	5 A, 275 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	120% to 150% of rating. Hiccup mode
Overvoltage protection	OVP latch at 110% to 130% of rated output voltage. See "Ordering Information" for trip ranges.
Overtemperature protection	Automatic power shutdown at T_C = 135°C
Auxiliary Signals	
Standby Output	5 V @ 200 mA
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.
Inhibit	Connect to inhibit pin (J201 pin 5) to output common to inhibit the DC output
Fan Output	12 V @ 1 A
Current Share	Forced Current Sharing provided for up to 5 units connected in parallel
Remote Sense	Compensates for up to 250 mV drop in load lines

ENVIRONMENTAL SPECIFICATIONS

Weight	325 grams
Dimensions	3.0" x 5.0" x 1.4" (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. Start up at -40°C, full load
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	Fan Output	Total Regulation	Ripple & Noise[2]	OVP Threshold
MINT1275A1214K01	12 V	15.0 A	21.8 A	12 V/1.0 A	± 3%	120mV pk-pk	14.0 ± 1.1 V
MINT1275A1514K01	15 V	12.0 A	18.3 A	12 V/1.0 A	± 3%	150mV pk-pk	19.5 ± 1.5 V
MINT1275A2414K01	24 V	7.50 A	10.9 A	12 V/1.0 A	± 3%	240mV pk-pk	28.0 ± 2.5 V
MINT1275A4814K01	48 V	3.75 A	5.46 A	12 V/1.0 A	± 3%	480mV pk-pk	55.0 ± 4.0 V
MINT1275A5614K01	56 V	3.21 A	4.68 A	12 V/1.0 A	± 3%	560mV pk-pk	59.0 ± 1.0 V

Notes:
1. Total convection power is 180 Watts.
2. Measured with noise probe directly across output terminals, and load terminated with 0.1 µF ceramic and 10 µF low ESR capacitors.
3. No output adjustment on 56V model.

PIN ASSIGNMENTS

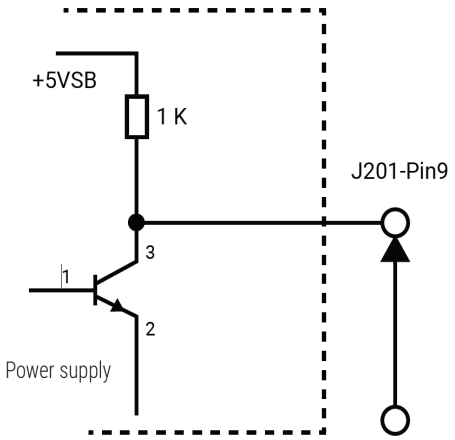
Connector	MINT1275	
Input connector	PIN 1	AC Line
	PIN 2	SPARE
	PIN 3	AC Neutral
DC output connector	J302	+Vo
	J303	-Vo
J301 (Fan output connector)	PIN 1	+12V Fan RTN
	PIN 2	+12V Fan
J201 (Signal connector)	PIN 1	Remote Sense +
	PIN 2	Common
	PIN 3	Remote Sense -
	PIN 4	Current Share
	PIN 5	Inhibit
	PIN 6	Common
	PIN 7	Power Good
	PIN 8	+5 V Standby
	PIN 9	DC OK
	PIN 10	+5 V Standby RTN

CONNECTORS

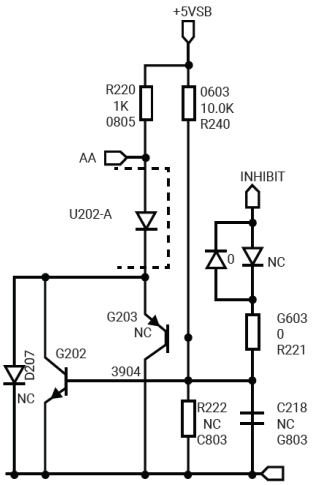
	Connector	Mating Connector
Input connector	/	MOLEX 09-50-3031. Pins = 08-52-0072
DC output connector	/	MOLEX 19141-0058/0063/0083
J301 (Fan Output Connector)	/	MOLEX 22-01-3027. Pins = 08-40-0114
J201 (Signal connector)	/	MOLEX 90142-0010. Pins = 90119-2109 or 2120
FG (Ground)	0.250" FASTON TAB	MOLEX 01-90020001

SIGNAL CONNECTOR - J201

1. Power Fail/DC OK
DC OK signal: during normal operation stays HIGH - goes HIGH, 100-500 mS after main output.



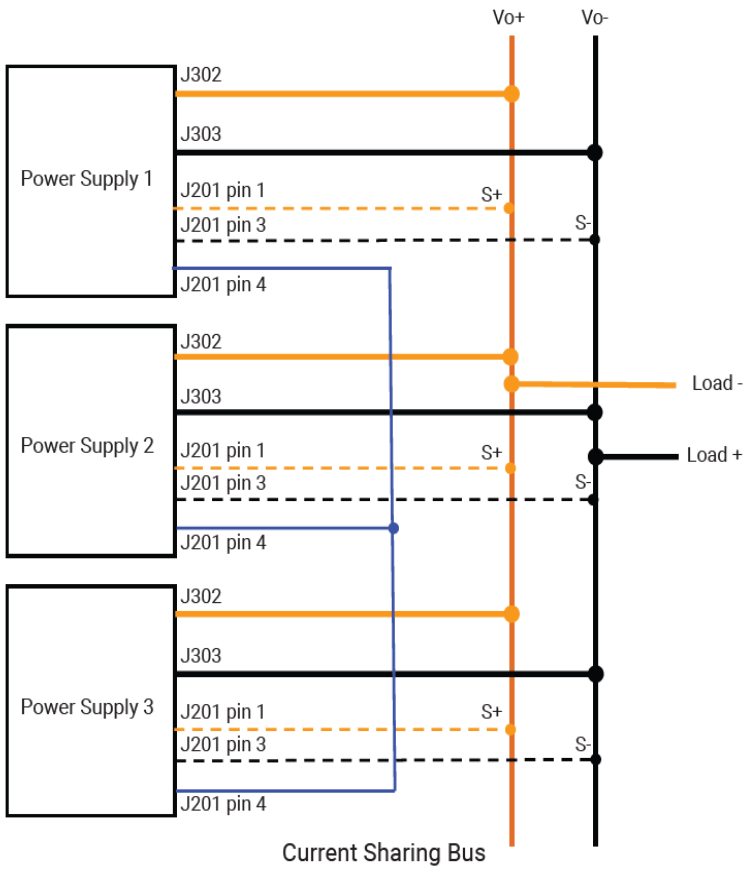
2. Inhibit
Remote inhibit control of the DC output
Disable: J201 pin 5 LOW or GND
Enable: J201 pin 5 open



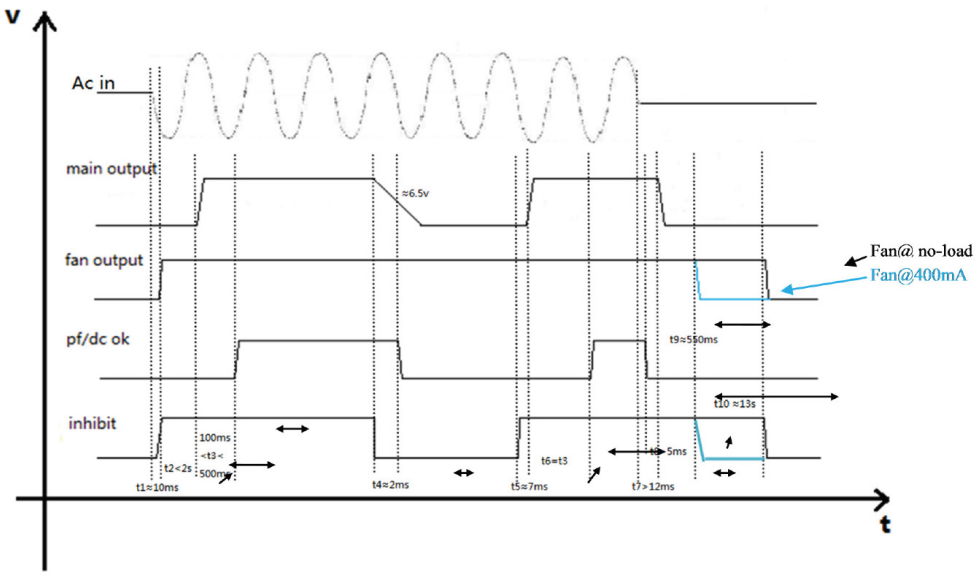
SIGNAL CONNECTOR - J201

3. Current Sharing/Remote Sense
The output of N+1 (N = 1, 2 ... 5) models can be shared. It is shown in Figure 3, one load-share controller is required for each model and circuits are identical when N+1 indentical models are used.
Terminals J302 and J303 are connected to the Vo+ and Vo-, respectively, of the first power model. THe Vo+ and Vo- correspond to the other models positive and negative output bus to the load. The J201 pin 1 and pin 3 connects to the S+ and S-, respectively, of the first power models. The S+ and S- correspond to the other models J201 pin 1 and pin 3. The S+ connects to positive output bus and S- connects to negative output bus.

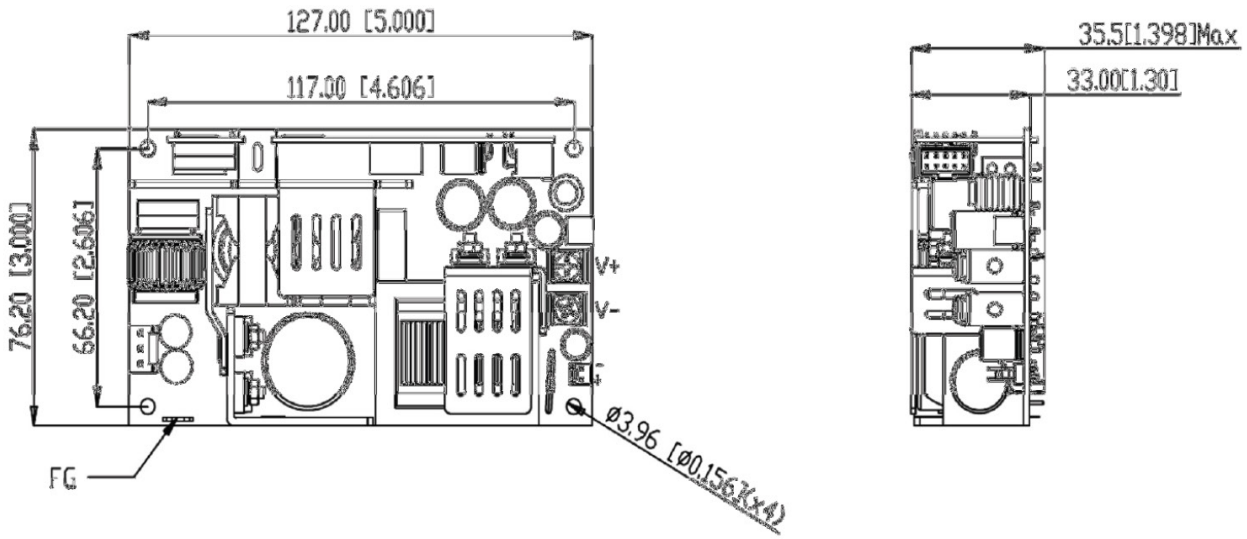
Remote Sense< 250mV drop compensation:
The J201 Pin 4 connects to current sharing bus that it connects to other models J201 pin 4.



TIMING SEQUENCE



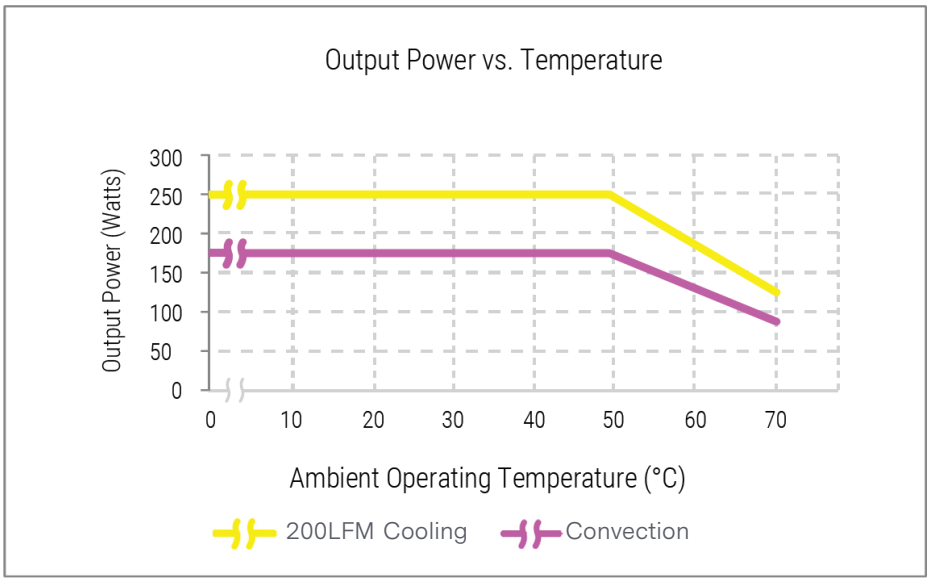
MECHANICAL DRAWING



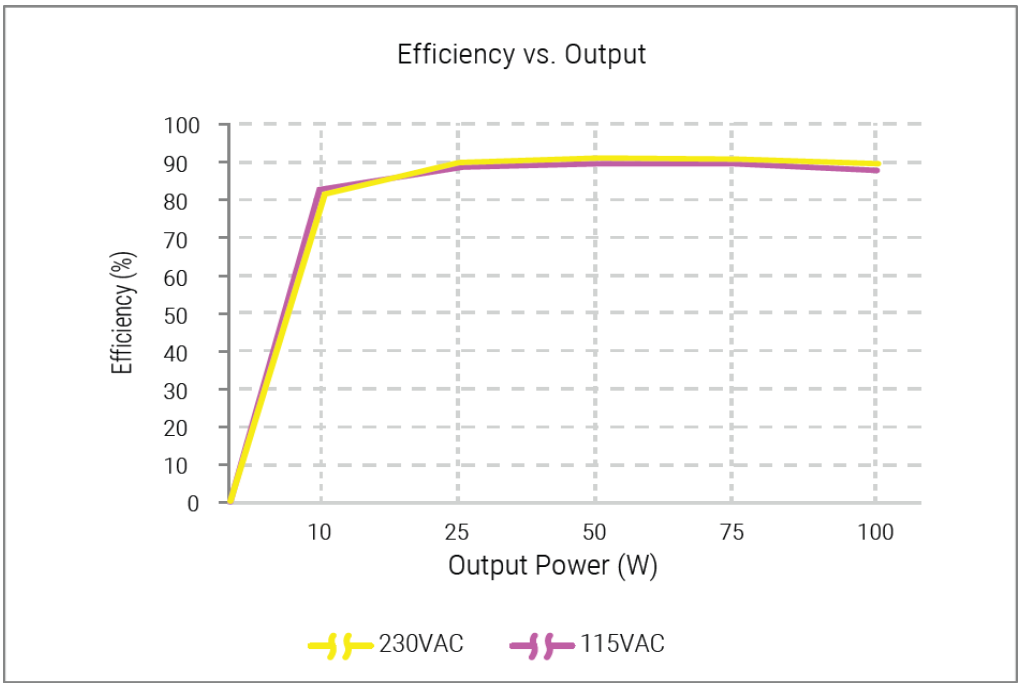
Notes:
1. All dimensions in inches (mm), tolerance is ±0.02".
2. Mounting holes should be grounded for EMI purpose.
3. FG is safety ground connection.
4. The power supply requires mounting on metal standoffs 0.2" (5 mm) in height, min.

CHARACTERISTIC CURVES

Output vs. Temperature:
180 W convection cooled and 275 W continuous with 200 LFM airflow. Derate output power to 50% at 70°C.



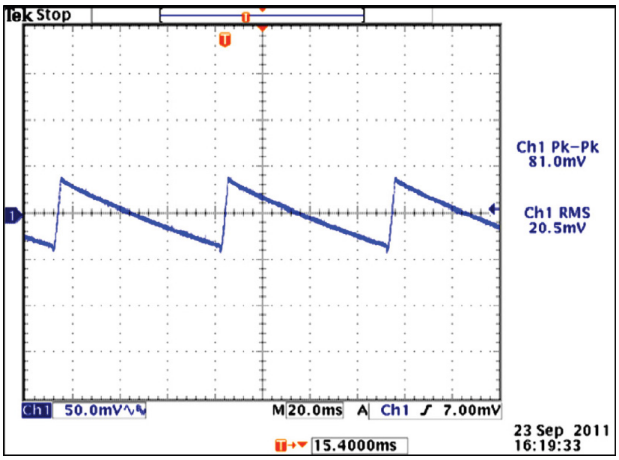
Efficiency vs. Loading:
The high efficiency is achieved by using LLC technology, PFC topology minimizing switching losses. Synchronous MOSFET or SCHOTTY diode is used as rectifier in MINT1275 series because of high output voltage level.



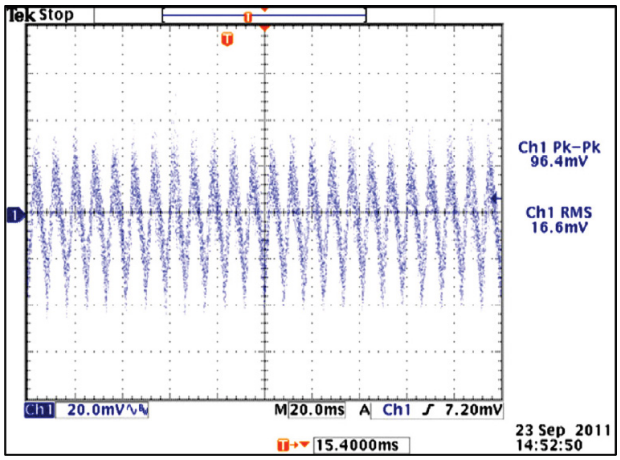
CHARACTERISTIC CURVES

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.

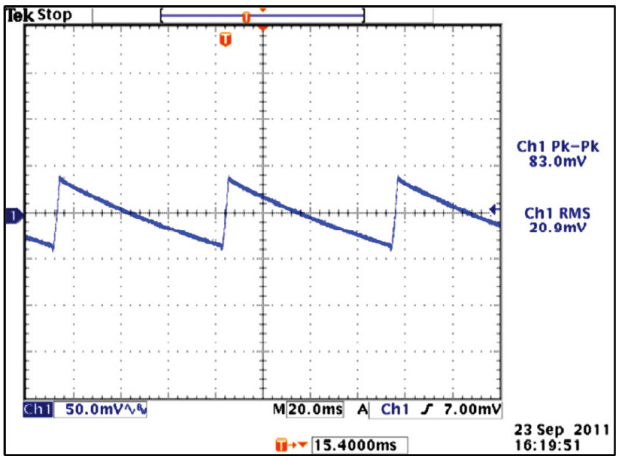
115Vac 60Hz input, 12V output, no load



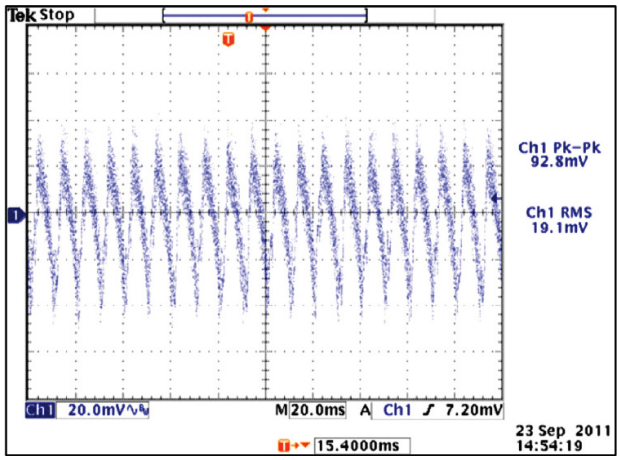
115Vac 60Hz input, 12V output, full load



230Vac 60Hz input, 12V output, no load



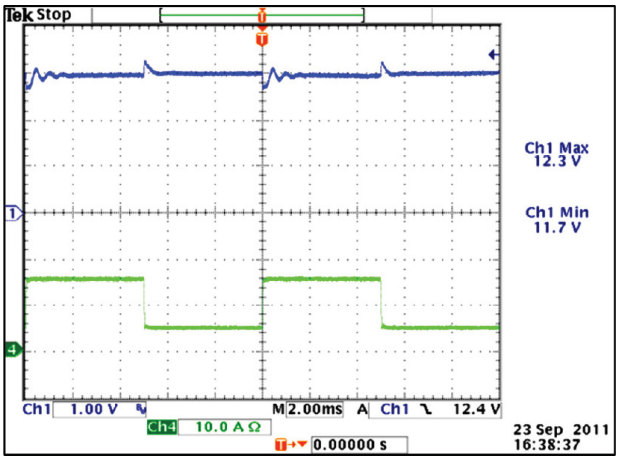
230Vac 60Hz input, 12V output, full load



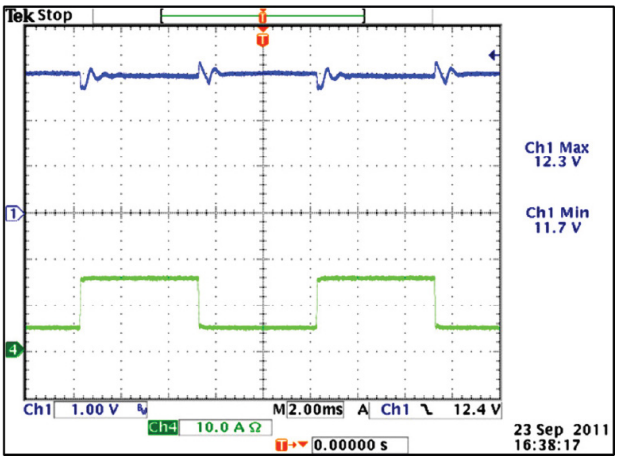
CHARACTERISTIC CURVES

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%.

115Vac input, 12V output, 25% to 75% load step

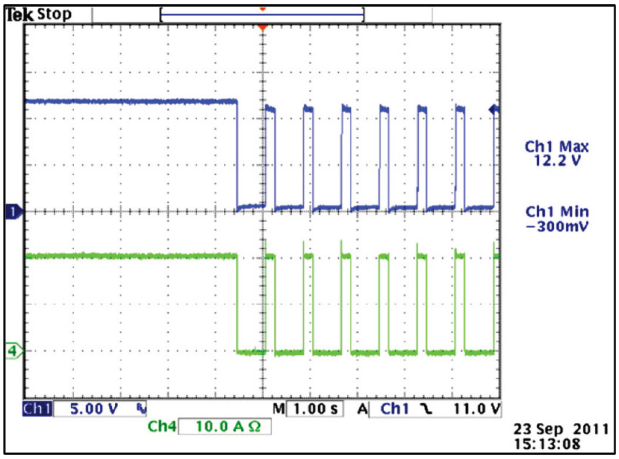


230Vac input, 12V output, 25% to 75% load step

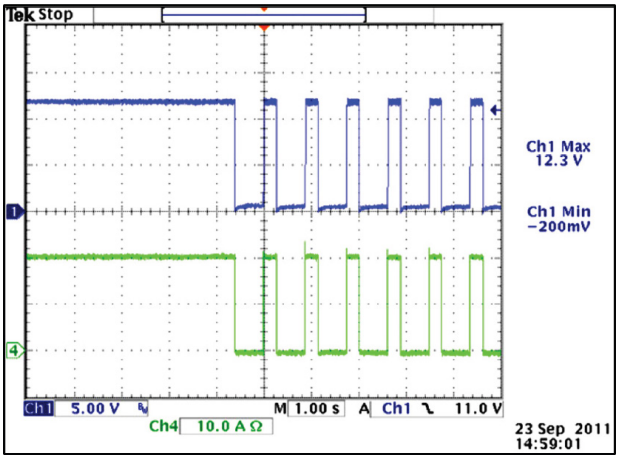


Output Overload Characteristic:
Supply shall protect itself against overload condition. The power supply shall recover from overload conditions without operator intervention.

90Vac input, 12V output



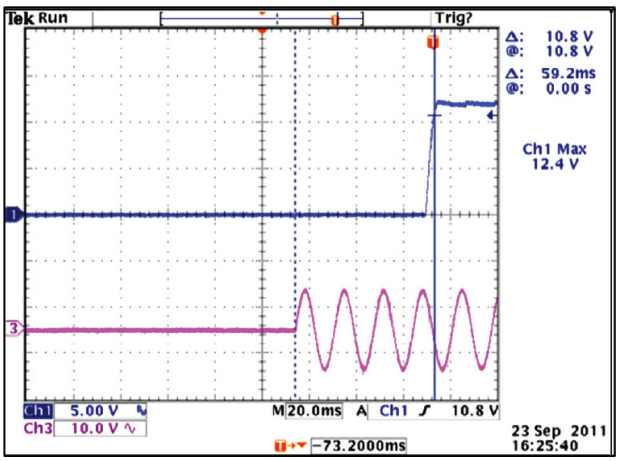
264Vac input, 12V output



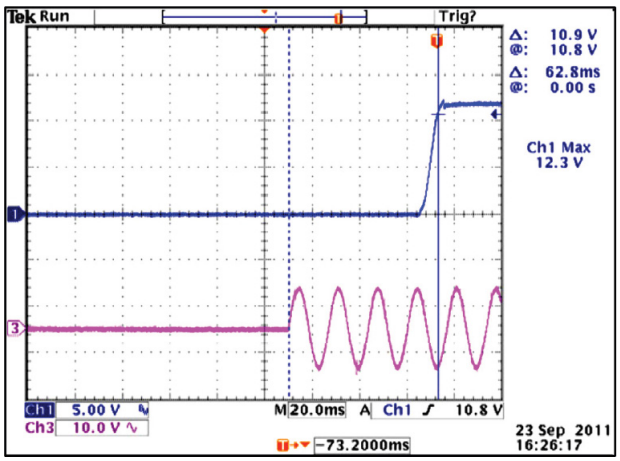
CHARACTERISTIC CURVES

Turn On Time:

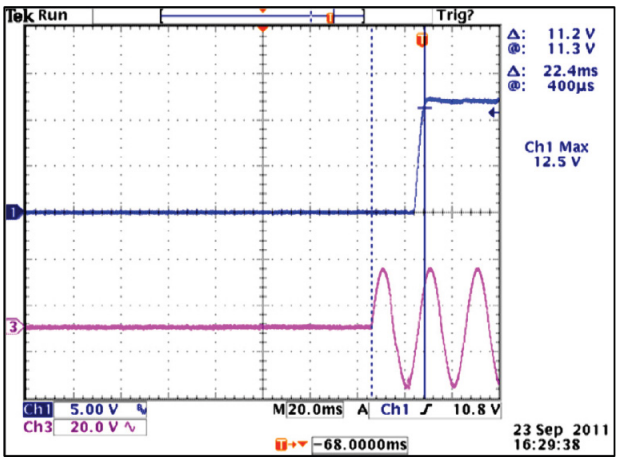
90Vac input, 12V output, no load



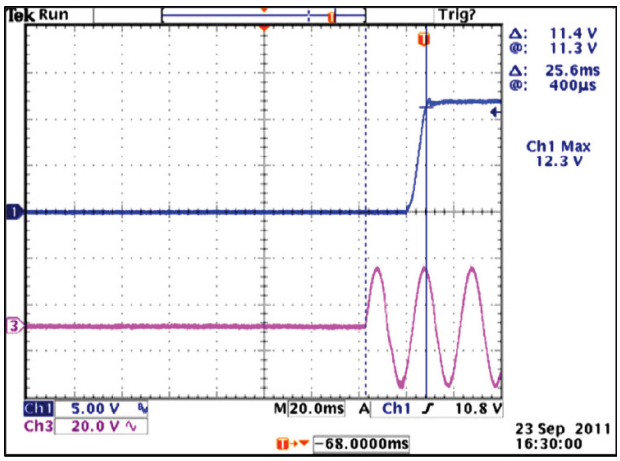
90Vac input, 12V output, full load



264Vac input, 12V output, no load



264Vac input, 12V output, full



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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