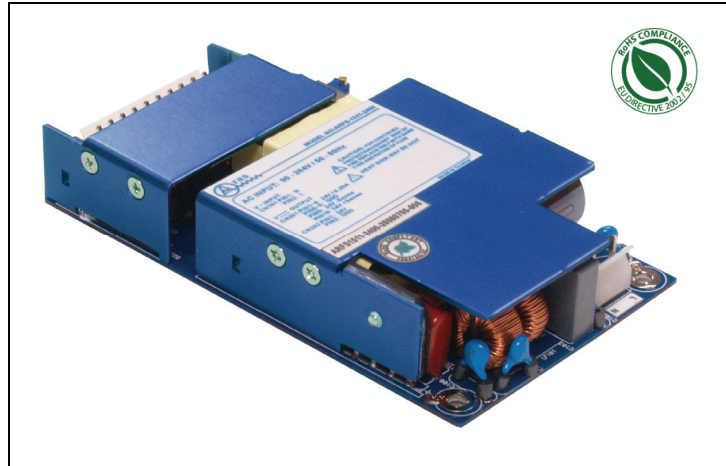


## Switching Power Supply

### 150 Watt / Single Output

#### Key Features:

- 150 Watts output Power
- 12 / 24 VDC Single Output Models
- Open Frame Package measuring only 3 x 5 x 1.08"
- High Density in excess of 9W/in<sup>3</sup>
- >90% Efficiency
- High Reliability in excess of 220,000 Hours
- 1+1 Redundant Operation with Integrated OR'ng Diodes
- International Safety Approvals
- Class B Emissions
- 3 Year Warranty



#### Design Standards:



The ARFS-1511 series of AC/DC Power Supplies are intended for general use in ITE Applications. Designed with Universal Input and qualified to meet International Safety Approval and Emission Standards, these supplies can be utilized in a wide array of applications around the globe.

The high efficiency operation of these supplies allow for full-load convection-cooled operation, substantially reducing system costs.

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## 1.0: General Specifications

Characteristic	Min	Typ	Max.	Units	Note
Temperature					
Operating	0		+70	°C	Derate 2.5% per °C above 50°C
Storage	-40		+85	°C	
Cooling	10			cfm	For Full Load Power
Humidity					
Operating	0		95	%	Non-Condensing
Storage	0		95	%	Non-Condensing
Shock					
Operating	10			G	11msec, half-sine wave pulse, in both directions, on three mutually perpendicular axes
Storage	40			G	
Vibration	0.25			G	10-250hz, 1 octave/min, 15 min dwell, 3 axes
Efficiency		90%			
Temperature Coefficient					
Reliability	200			kHrs	MIL-HBK-217D (Full Load, 110V AC Input; Ground Benign; 25°C ambient)
Isolation (Hi-Pot)	1500			VAC	Primary to ground: 1500Vac/50Hz, 3 sec, Cut-off current:10mA

## 2.0: Input Specifications

(TA = +25C Unless otherwise specified)

Characteristic	Min	Typ	Max.	Units	Note
Input Voltage	90	-	264	VAC	
Input Frequency	47	-	63	Hz	
Inrush Current	-	-	30	A	115 VAC Operation
			50	A	230 VAC operation
Input Current	-	-	3.0	A	90 VAC Operation
Input Protection	-		5,00	A	Single Fused Input Protection
			250	VAC	
Leakage Current	-	-	300	µA	264 VAC
Turn-On Voltage	85	-	-	VAC	
Turn-Off Voltage			80	VAC	
Lightning Surge / Transients	-	-	±2k	VAC	Line-Earth (EN61000-4-5)
			±1k	VAC	Line-Line (EN61000-4-5)
Voltage Dips	-	-	95	%	10ms (per EN61000-4-10)
			30	%	500ms (per EN61000-4-10)
Fluctuations / Flicker	-	-	-	-	Per EN61000-3-3
Voltage Interruptions	-	-	-	-	Per EN61000-4-11
Harmonics	0.95	-	-	pf	Per EN6100-3-2 Class D
Hold-Up Time	16	-	-	ms	90~264 VAC / Full Load (See figure 1)

### 3.0: Output Specifications

(TA = +25C Unless otherwise specified)

Characteristic	Min	Typ	Max.	Units	Note
Voltage Setpoint: ARFS-1511-1200 ARFS-1511-2400	11.40 23.76	12.00 24.00	12.60 24.24	VDC VDC	
Output Current: ARFS-1511-1200 ARFS-1511-2400	0.5 0.5	- -	12.50 6.25	Amps Amps	
Adjustment Range: ARFS-1511-1200 ARFS-1511-2400	11.40 22.80	- -	12.60 25.20	VDC VDC	
Ripple / Noise			1	%	Pk-pk max, 20MHz, measured at output connectors
Regulation	-	-	1	%	Max Line, Load & Temp
Dynamic Load: Deviation Recovery			5 10	% ms	20% Step Load
Output Rise Time			10	ms	10~90% of Rated VDC, Full Load (See figure 1)
Turn-On Delay			10	ms	(See figure 1)
Over-Voltage Protection	1		150	%	of Rated Voltage, Latching (Recycle input to reset)
Over-Current Protection	215		250	W	Total Power limited (Auto-Recovery)
Short Circuit Protection	-	-	-		Continuous (auto-recovery). An output short circuit is defined as any load impedance of less than 0.1 ohms
Current Share Accuracy	-20		+20	%	Droop Method. If a power supply fails the output voltage dip should be less than 100mV.
Redundant Operation					All power supplies have an O-Ring diode to prevent one power supply failure from bringing down the system
Remote Sense			250	mV	

### 4.0: Electromagnetic Compatibility:

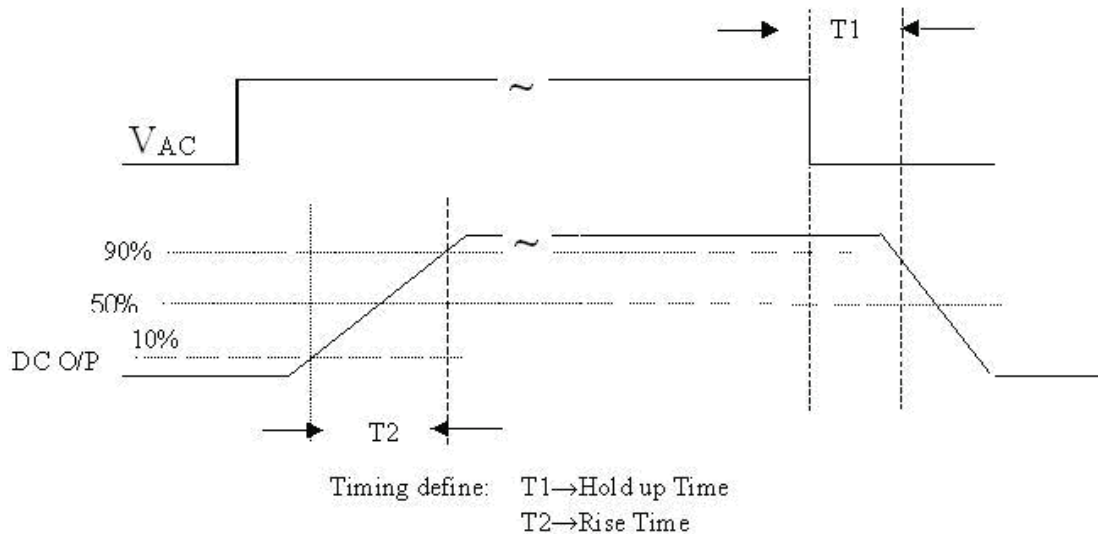
Characteristic	Description
Line Conducted EMI	FCC Class B / EN55022 Class B under all rated input and load conditions
Electrostatic Discharge	EN61000-4-2: Contact Discharge- Contact discharge in 2kV increments to 6kV for metallic surfaces including connector bodies. 10 discharges pretest point at each voltage: 5 positive polarity and 5 negative polarity. Air discharge – Air discharge in 2kV increments to 8kV for seams and non-metallic user accessible surfaces. 10 discharges pretest point at each voltage: 5 positive polarity and 5 negative polarity.
Radiated Susceptibility	EN61000-4-3: Electromagnetic Field Strength 3V/m
EFT / Bursts	EN61000-4-4: Direct Coupling Line to Ground Reference Plane: 1kV increments up to 2kv for a minimum of 1 min. at each voltage. Direct Coupling Neutral to Ground Reference Plane: 1kV increments up to 2kV for a minimum of 1 min. at each voltage. Direct Coupling Ground to Ground Reference Plane: 1kV increments up to 2kV for a minimum of 1 min. at each voltage
Surges	EN61000-4-5: The peak value of the bi-directional surge waveform shall be 2kV for common mode and 1kV for differential modes of transient surge injection. No unsafe operation or no user noticeable degradation is allowed under any condition.
Conducted Immunity	EN61000-4-6: 0.15~800MHz, 10V, 80% AM
Voltage Dips	EN61000-4-10: 95% Dip & 10ms, 30% Dip & 500mS
Voltage Interruptions	EN61000-4-11, 95% reduction, 5s
Fluctuations & Flicker	EN61000-3-3
Harmonic Distortion	EN61000-3-2 Class D



### 5.0: Safety Standards:

- UL/cUL 60950-1, (pending)
- TUV EN60950-1, (pending)
- CB Report IEC60950-1, (pending)
- CE Mark (Low Voltage Directive) (pending)

### 6.0: Turn-On / Turn Off Characteristics:



### 7.0: Voltage Regulation & Efficiency (before OR'ng Diode:

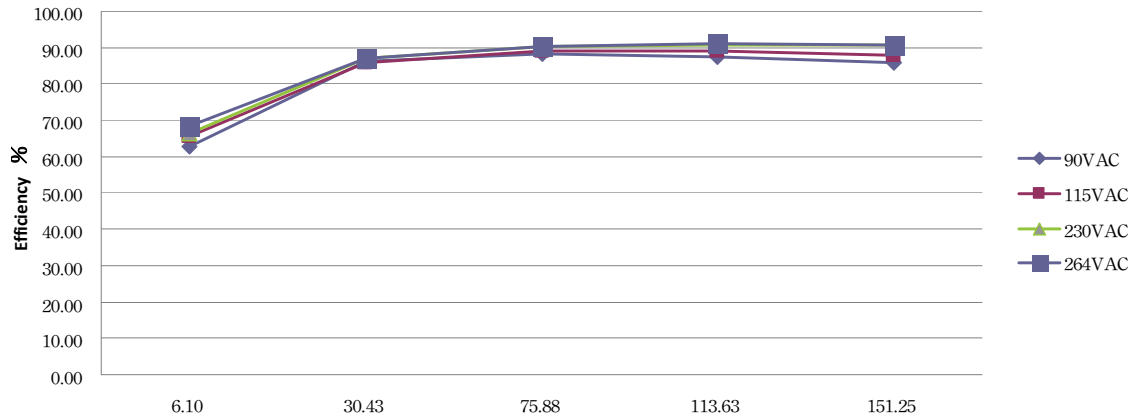
12V MODEL :

AC Input		Measured Results						Output Voltage Spec.		
Vin	Frequency	Iin	Pin	Io	Vo	Po	Efficiency	nom.	max.	min.
90	60	1.98	176.3	12.5	12.1	151.25	85.79	12V	12.6V	11.4V
115	60	1.51	172	12.5	12.1	151.25	87.94			
230	60	0.73	167	12.5	12.1	151.25	90.57			
264	60	0.66	167	12.5	12.1	151.25	90.57			

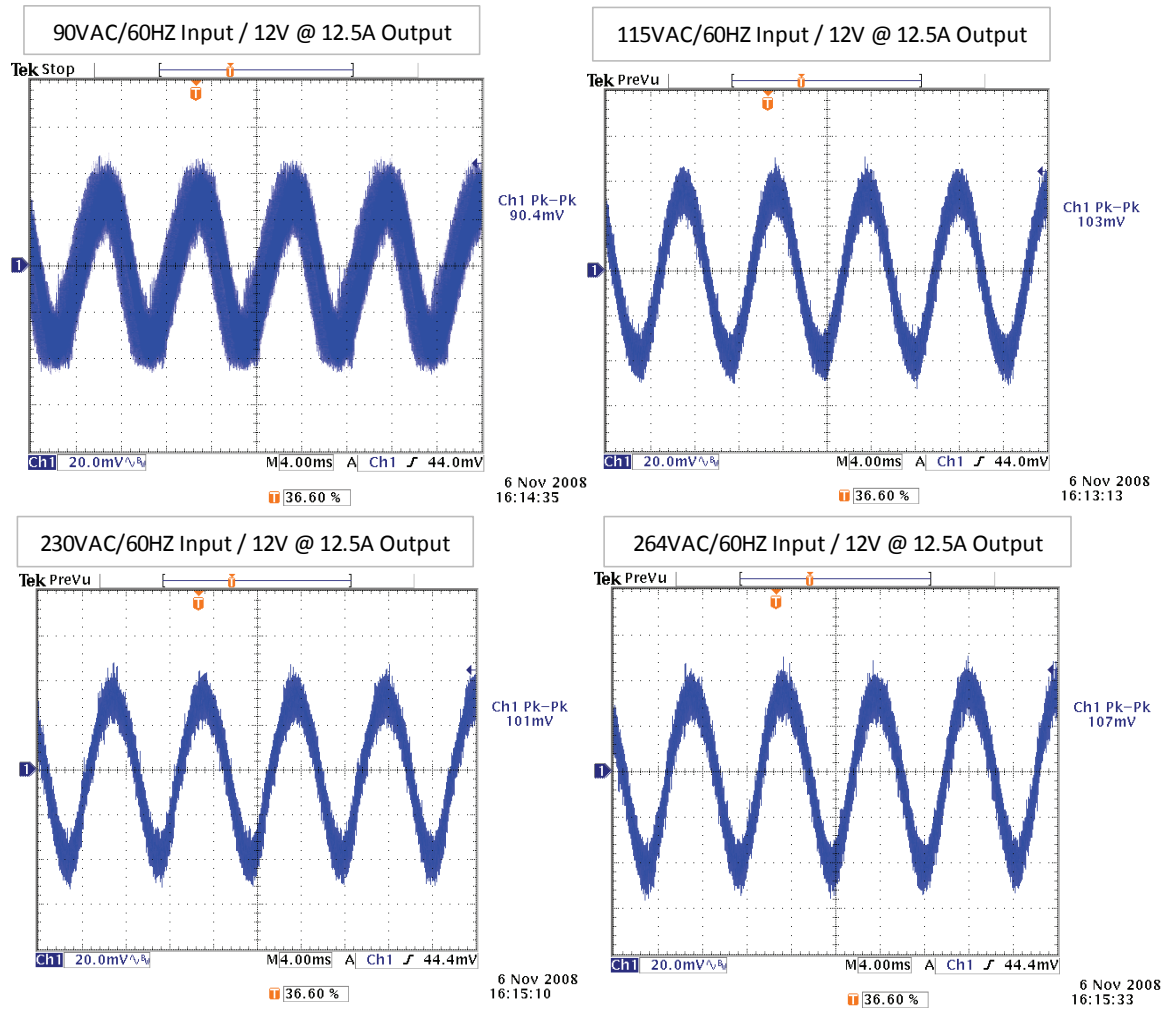
24v MODEL:

AC Input		Measured Results						Output Voltage Spec.		
Vin	Frequency	Iin	Pin	Io	Vo	Po	Efficiency	nom.	max.	min.
90	60	1.98	178.8	6.25	24.046	150.29	84.05	24V	25.2 V	22.8V
115	60	1.52	174.3	6.25	24.058	150.36	86.27			
230	60	0.76	169	6.25	24.055	150.34	88.96			
264	60	0.67	168.2	6.25	24.06	150.38	89.40			

### 8.0: Efficiency VS. Output Power (12Vout):

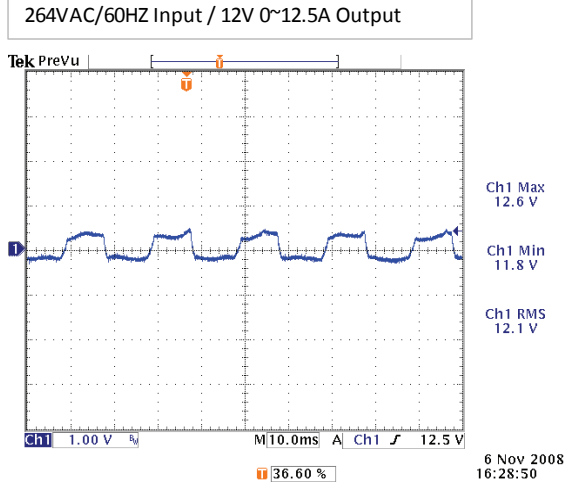
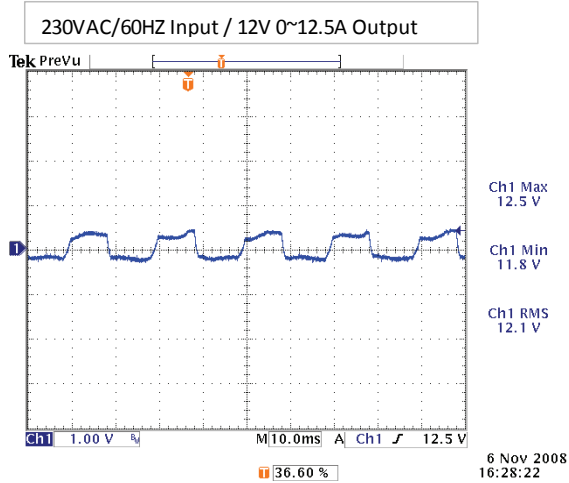
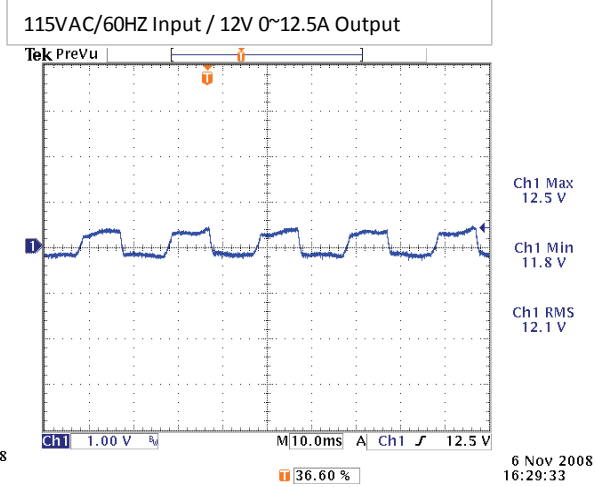
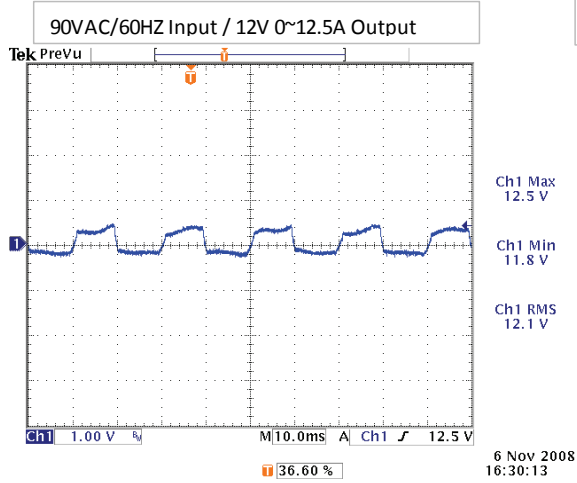


### 9.0: Output Noise / Ripple (12Vout):

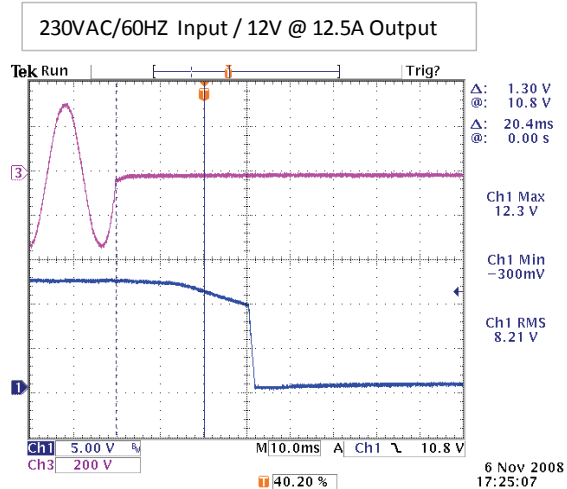
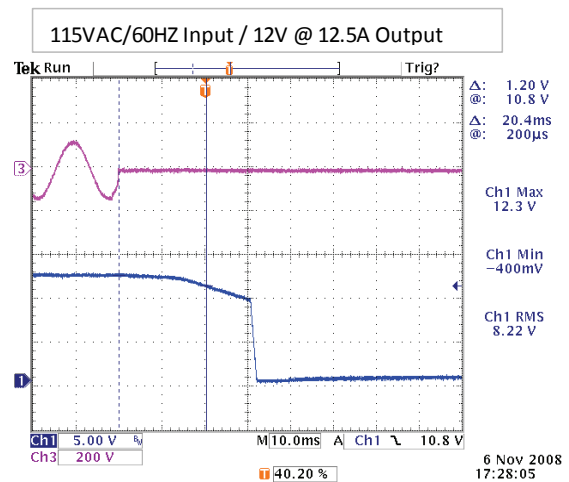


### 10.0: Dynamic Load:

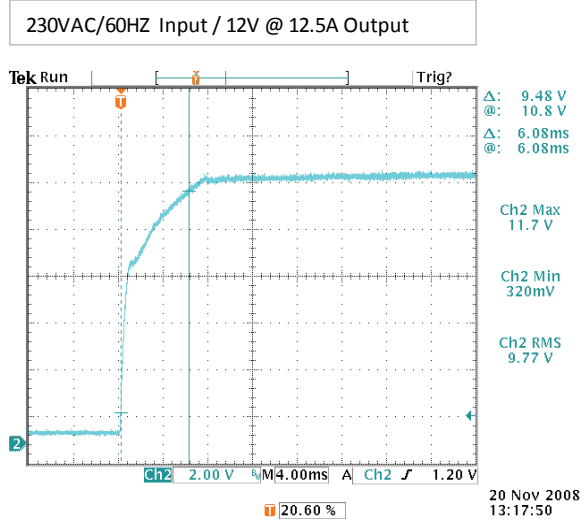
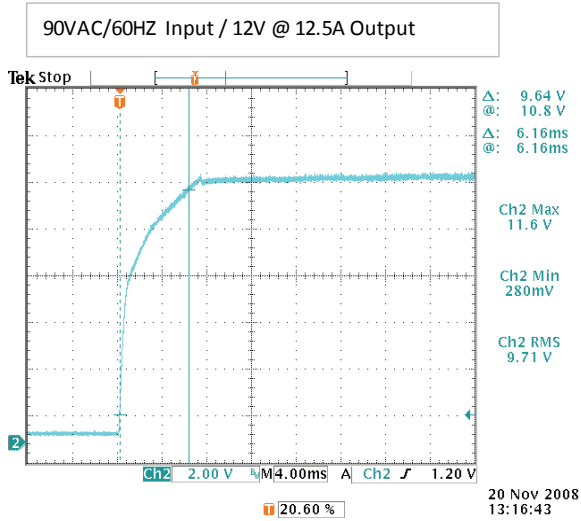
12V Models with 0~100% Load (worst case) step load



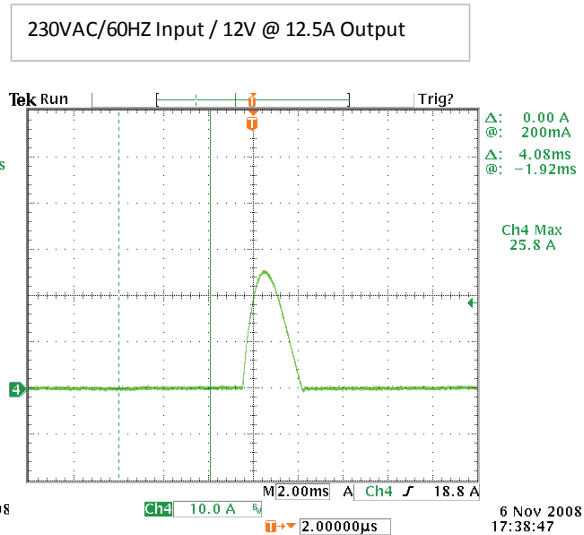
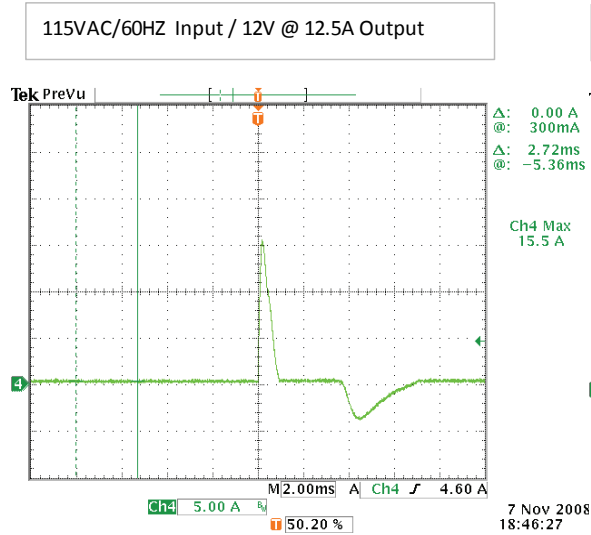
### 11.0: Hold-Up Time:



### 12.0: Turn-On Rise Time:



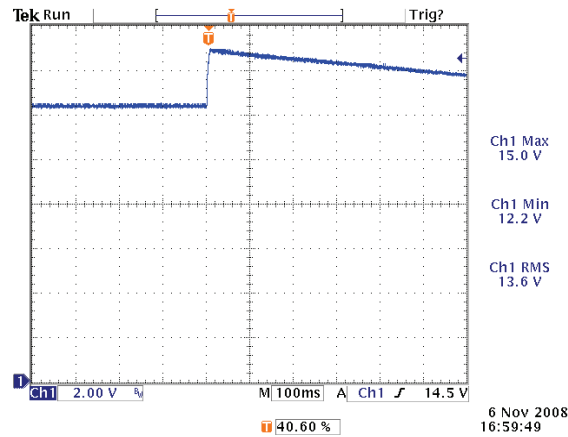
### 13.0: Inrush Current:



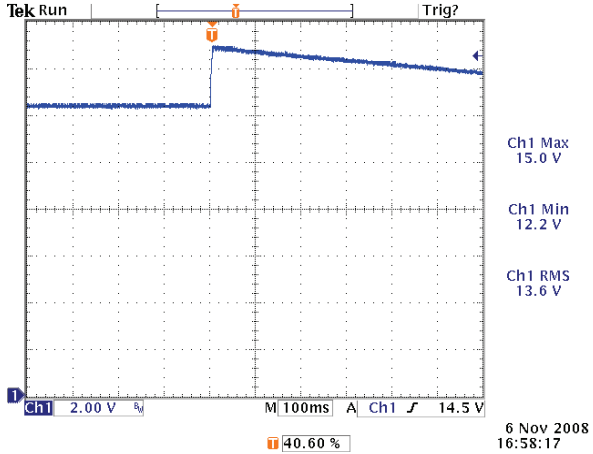
### 14.0: Over Voltage Protection:

12V Model, 115~150% of Vnom

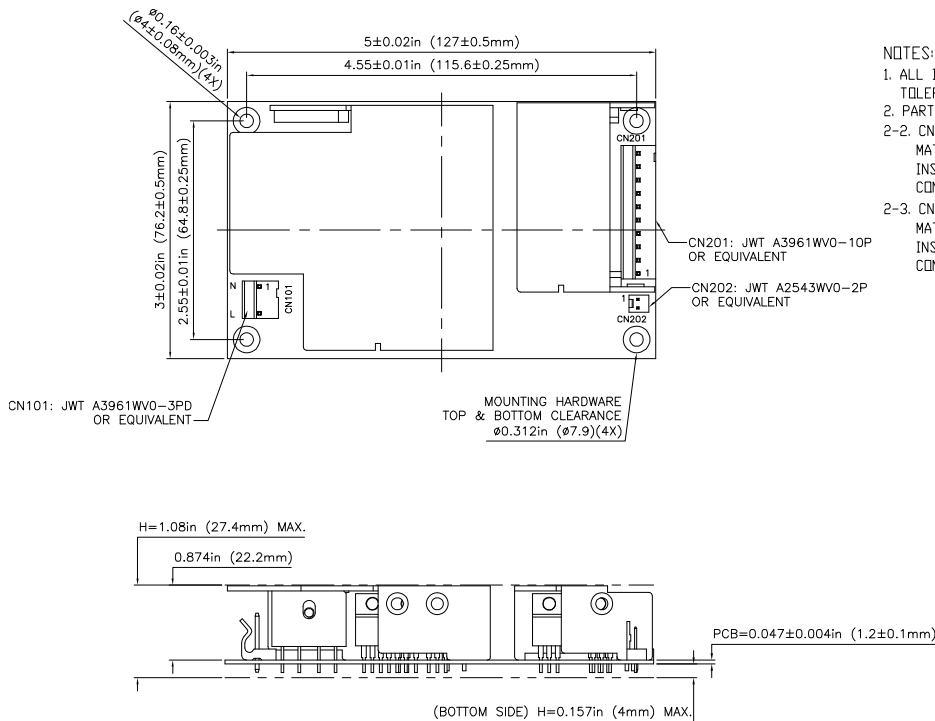
115VAC/60HZ Input / 12V @ 12.5A Output



230VAC/60HZ Input / 12V @ 12.5A Output



### 15.0: Outline Drawing:



NOTES: UNLESS OTHERWISE SPECIFIED.

1. ALL DIMENSION ARE IN mm. TOLERANCES TO BE ±0.5 mm
2. PARTS SPECIFIED AS FOLLOWS:  
 2-2. CN101, CN201 SOCKET:  
 MATERIAL:  
 INSULATOR: NYLON 66 UL 94V-0  
 CONTACT: 1.14mm SQUARE PIN, BRASS, TIN PLATED  
 2-3. CN202 SOCKET:  
 MATERIAL:  
 INSULATOR: NYLON 66 UL 94V-0  
 CONTACT: 0.64mm SQUARE PIN, BRASS, TIN PLATED

CN101	
PIN1	AC Neutral
PIN2	AC Line

CN201	
PIN1~4	24V/6.25A
PIN5~8	GND
PIN9	24V -Sense
PIN10	24V +Sense

CN202	
PIN1	24V
PIN2	GND