



Industrial



LED

### FEATURES AND BENEFITS

2" X 3" X 1.063" Package	Approved To CSA/EN/IEC/UL62368-1
For 1U Applications	Level V Efficiency Compliant Models
60W Convection Cooled	<0.5W No-Load Power Consumption
Universal Input 90VAC-264VAC	3 Years Warranty
Optional Power On LED	RoHS Compliant



### MODEL SELECTION

Model Number*	Volts	Output Current Convection Cooled	Output Power Convection Cooled	Ripple & Noise**	Total Regulation	Total Threshold
GB60S12K	12V	4.58A	55W	120mV pk-pk	±2%	14.4VDC-18VDC
GB60S15K	15V	4.00A	60W	150mV pk-pk	±2%	18VDC-22.5VDC
GB60S24K	24V	2.50A	60W	240mV pk-pk	±2%	28.8VDC-36VDC
GB60S48K	48V	1.25A	60W	480mV pk-pk	±2%	57.6VDC-72VDC
GB60S12C	12V	4.58A	55W	120mV pk-pk	±2%	14.4VDC-18VDC
GB60S15C	15V	4.00A	60W	150mV pk-pk	±2%	18VDC-22.5VDC
GB60S24C	24V	2.50A	60W	240mV pk-pk	±2%	28.8VDC-36VDC
GB60S48C	48V	1.25A	60W	480mV pk-pk	±2%	57.6VDC-72VDC

Notes:

- \* Models with 24V or higher output voltage meet efficiency requirements of Level V.
- \*\* Measured with noise probe directly across output terminals, and load terminated with 0.1µF ceramic and 10µF low ESR capacitors.



### INPUT

Input Voltage and Frequency	100VAC–240VAC, 47Hz–63Hz, 1Ø rated 80VAC–270VAC, 47Hz–440Hz operational
Input Current	120VAC: 1.4A, 240VAC: 0.75A
Inrush Current	240VAC, cold start: will not exceed 40A
Input Fuses	4A, 250VAC fuse provided on all models
Earth Leakage Current	<1mA@240VAC, NC
Efficiency	88% typical (83% for 12V & 85% for 15V)

### ISOLATION

Isolation Safety Rating	Input-Output: 4000VAC Input-Ground: 1800VAC Output-Ground: 500VAC
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### PROTECTION

Overload Protection	Hiccup Mode, 120%–180%, typical
Overvoltage Protection	Self-recovering
Short circuit Protection	Hiccup Mode

### ENVIRONMENT

Operating Temperature	-10°C to +70°C, -40°C start up
Relative Humidity	5% to 95%, non-condensing
Weight	126 grams
Dimensions	2.0" x 3.0" x 1.063" 50.8mm x 76.2mm x 27mm
Altitude	Operating: 3000 meters Non-operating: 40,000ft
Storage Temperature	-40°C to +85°C
Vibration	Random Vibration per MIL-STD-810E, Method 514.4, Cat. 1, Figure 514.4.1, 1 hour in each of 3 axes
Shock	Half-sine, 40gpk, 10mS duration, ± in each of 3 axes, 6 shocks total

#### Notes:

1. Specifications subject to change without notice.
2. All dimensions in inches (mm), tolerance is ±.02".
3. Mounting holes should be grounded for EMI purpose.
4. FG is safety ground connection.
5. Specifications are for convection rating at factory settings with 115VAC input and 25°C ambient unless otherwise stated.
6. This power supply requires mounting on metal standoffs 0.20" (5mm) in height.
7. For Class II (no earth ground) applications, all mounting hardware must be non-conductive.

### OUTPUT

Output Voltage	See models chart
Output Power	60W continuous (55W for 12V models)
Turn On Time	<2 sec.@115VAC (inversely proportional to input voltage and thermistor temperature)
Hold-up Time	16mS min.@60W load, 120VAC input
Ripple and Noise	See models chart
Total Load Regulation	±2%
Minimum Load	Not required
Switching Frequency	65kHz, typical
Power Factor	Not applicable

### EMI/EMC COMPLIANCE

Conducted Emissions	EN55011/22 Class B, FCC Part 15 Class B
Radiated Emissions	EN55011/22 Class A, FCC Part 15 Class A with 6dB margin
Electro-Static Discharge (ESD) Immunity on Power Ports	EN61000-4-2, 6kV contact discharge, 8kV air discharge
Radiated RF EM Fields Susceptibility <sup>3</sup>	EN61000-4-3, 3V/m
Electrical Fast Transients (EFT)/Bursts	EN61000-4-4, 2kV/5kHz
Surges, Line to Line (DM) and Line to Ground (CM)	EN61000-4-5, 1kV differential, 2kV common-mode
Conducted RF Immunity	EN61000-4-6, 3Vrms
Power Frequency Magnetic Field Immunity	EN61000-4-8, 3A/m
Voltage Dip Immunity	EN61000-4-11 100VAC, 95% dip/0.5 cycle (Criteria A), 60%/5cycles (Criteria B), 30%/25 cycles (Criteria A)
Harmonic Current Emissions	EN61000-3-2 Class A
Flicker Test	EN61000-3-3, Complies (dmax<6%)

### SAFETY

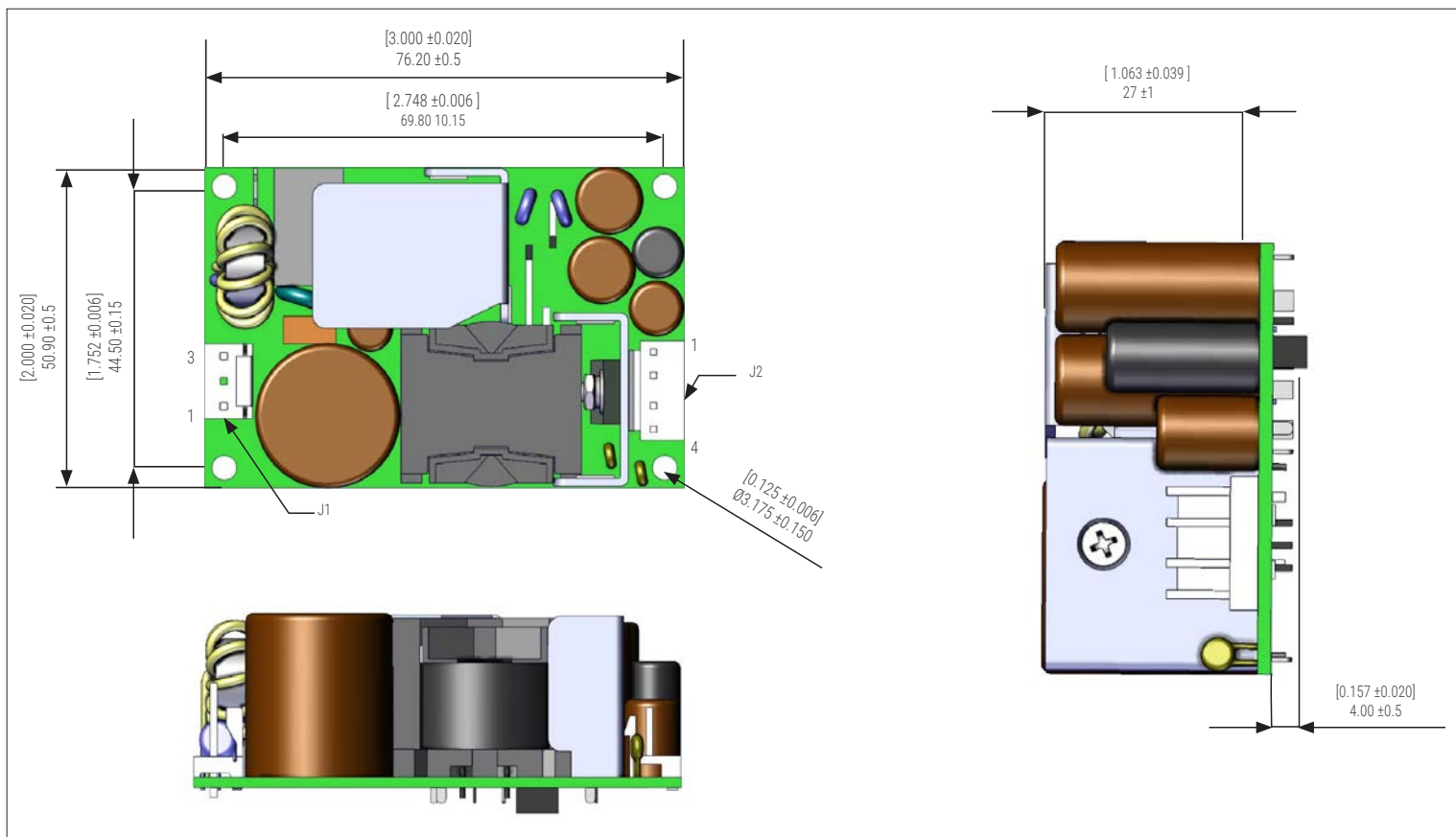
Safety Standards	EN/CSA/IEC/UL62368-1
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### RELIABILITY

MTBF	Over 300,000 hours per Telcordia
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## MECHANICAL DRAWING



## CONNECTOR INFORMATION

Input Connector J100	DC Output Connector J2	Ground
PIN 1) AC LINE PIN 2) EMPTY PIN 3) AC NEUTRAL	PIN 1) +Vout PIN 3) -Vout PIN 2) +Vout PIN 4) -Vout	19-30258-0187 (Keystone 1285) (Zierick 895)(.187*0.020)
Mating Connector: Tyco/AMP 640250-3 Pins = 770461-1	Mating Connector: AMP 640250-4 Pins = 770461-1	Molex 01-90020005



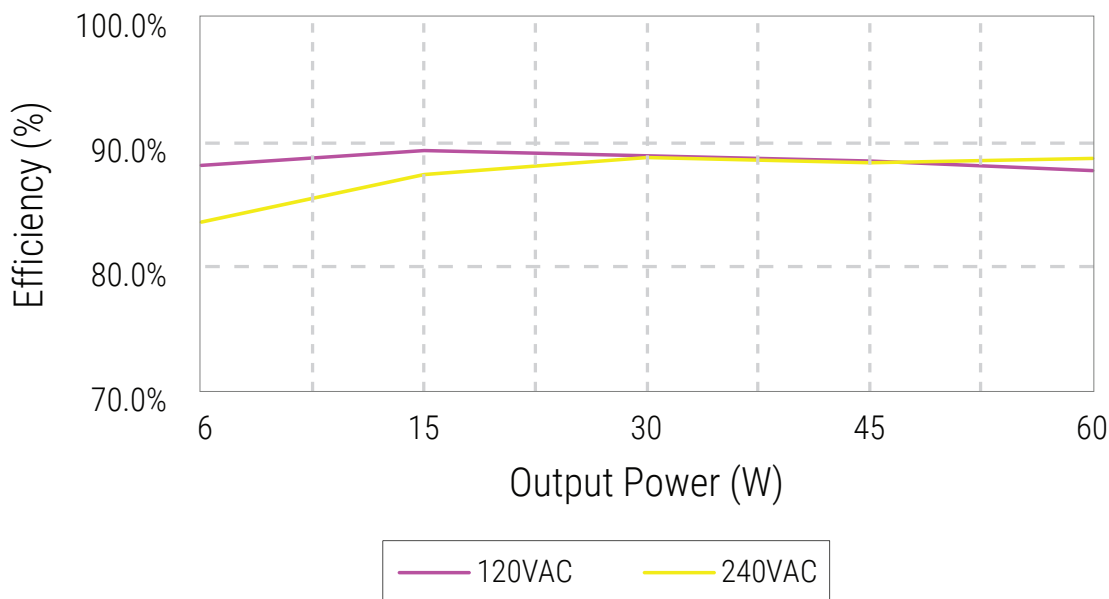
## CHARACTERISTIC CURVES

### Output vs. Temperature

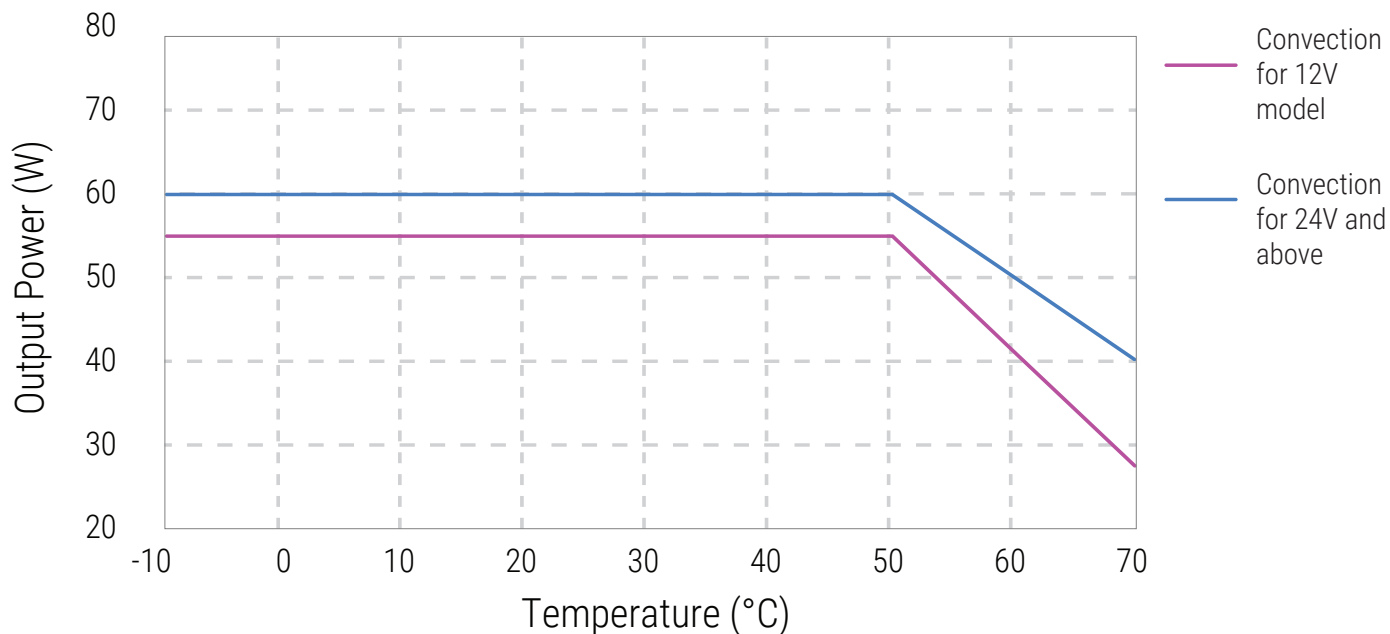
55W convection cooled, derating output power to 50% at 70°C for 12V.

60W convection cooled, derating output power: 50% at 60°C and 40% at 70°C for Output Voltages 24V.

### Efficiency vs. Output Power



### Output Power vs. Temperature

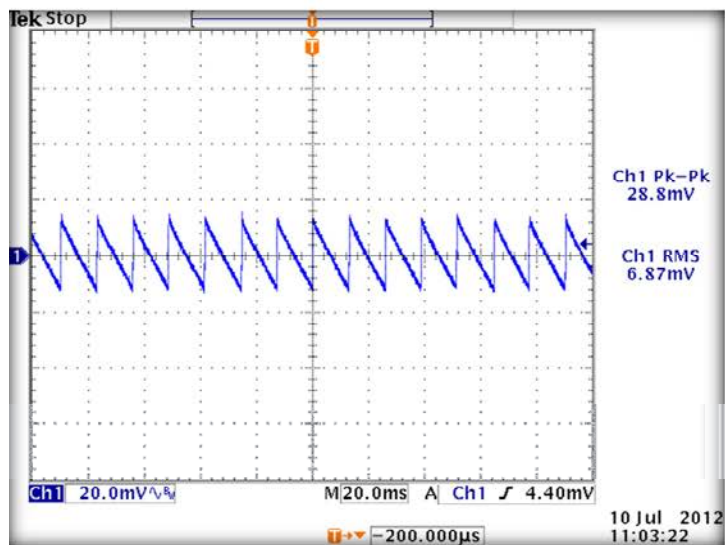




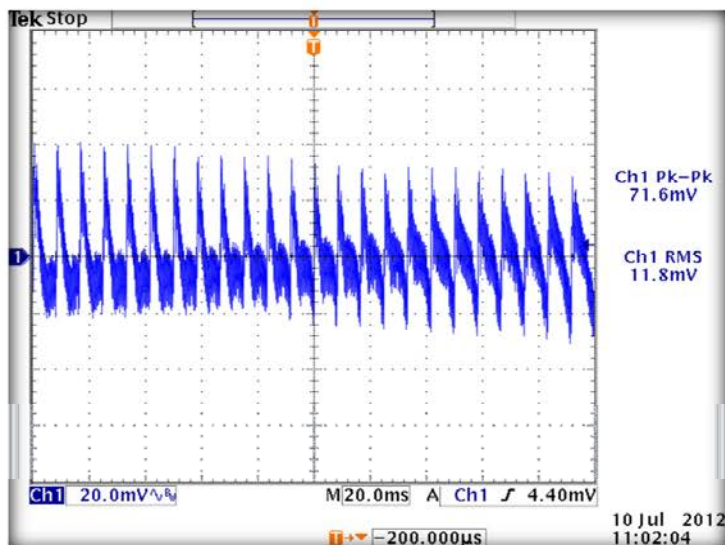
### Ripple & Noise

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 a 0.1 $\mu$ F ceramic and a 10 $\mu$ F electrolytic capacitor connected in parallel across it, 20MHz BW.

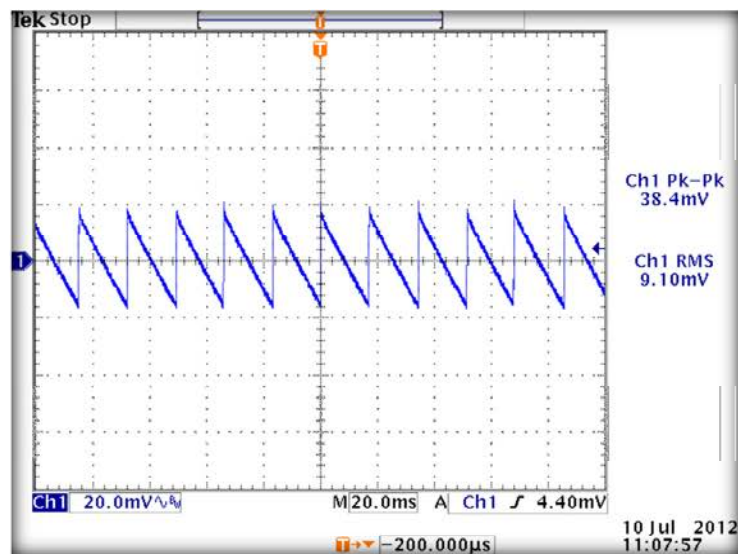
24V OUT, NO LOAD, 90VAC, 60Hz



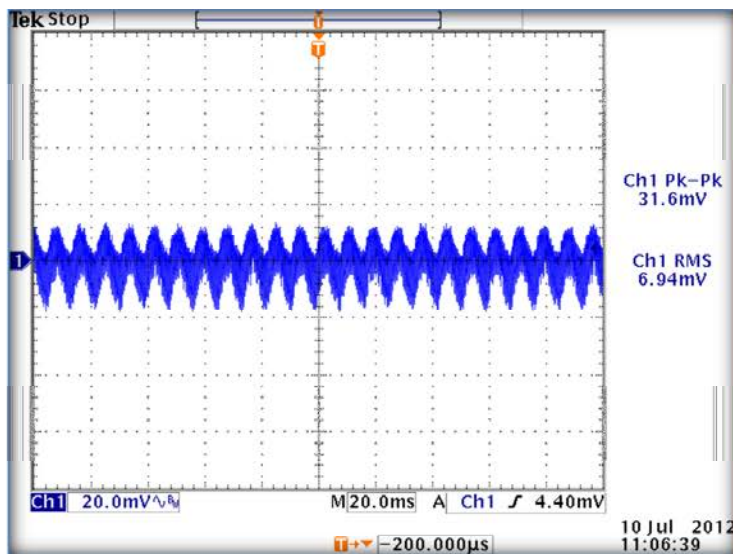
24V OUT, FULL LOAD, 90VAC, 60Hz



24V OUT, NO LOAD, 264VAC, 50Hz



24V OUT, FULL LOAD, 264VAC, 50Hz

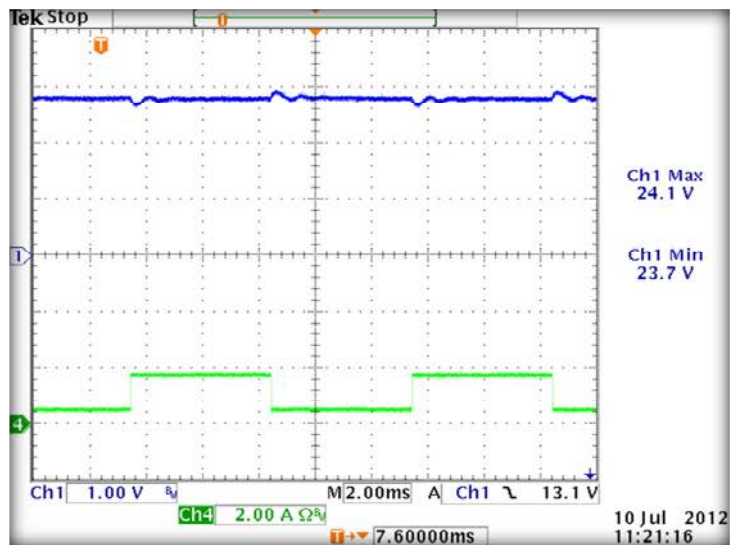




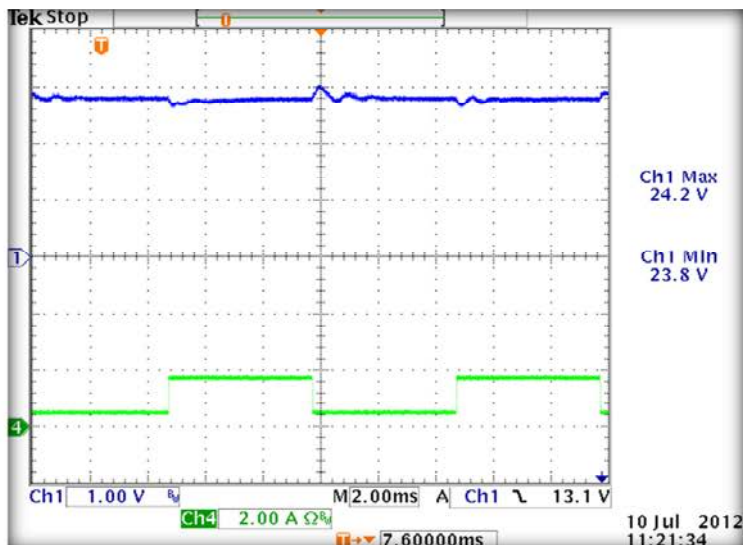
### Output Transient Response

50% load step within the regulation limits of minimum and maximum load,  $di/dt < 0.2A/\mu\text{Sec}$ . Recovery time not specified as there is no laps in regulation with a 50% Load Step. Maximum voltage deviation is 3.5%.

24V OUT, 120VAC, 25% TO 75% LOAD STEP

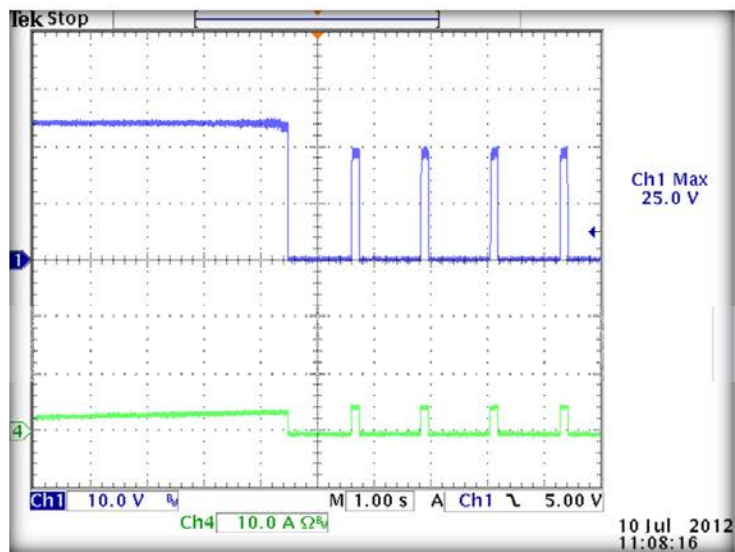


24V OUT, 240VAC, 25% TO 75% LOAD STEP

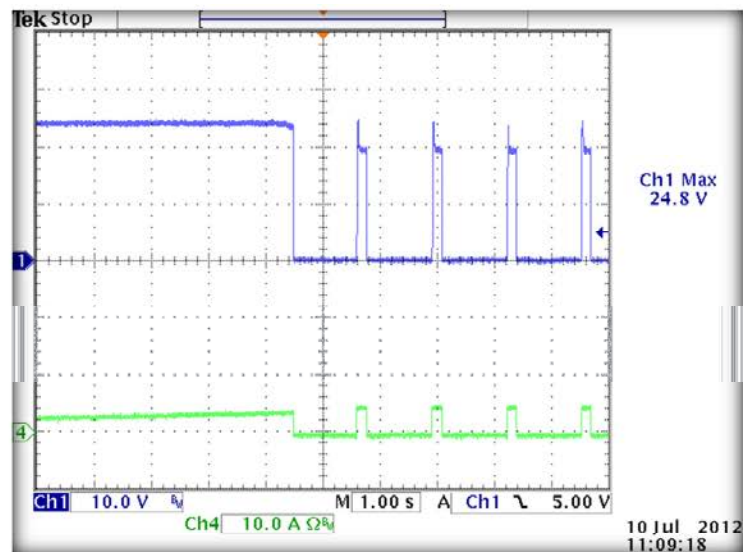


### Output Overload Characteristic

24V OUT, 90VAC



24V OUT, 264VAC

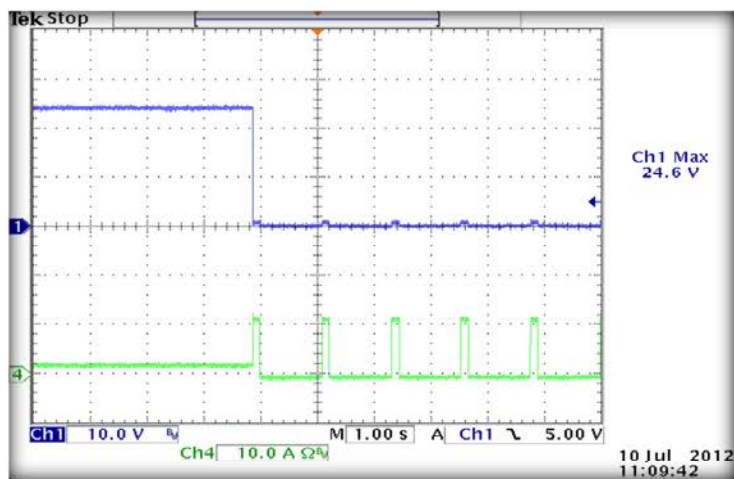




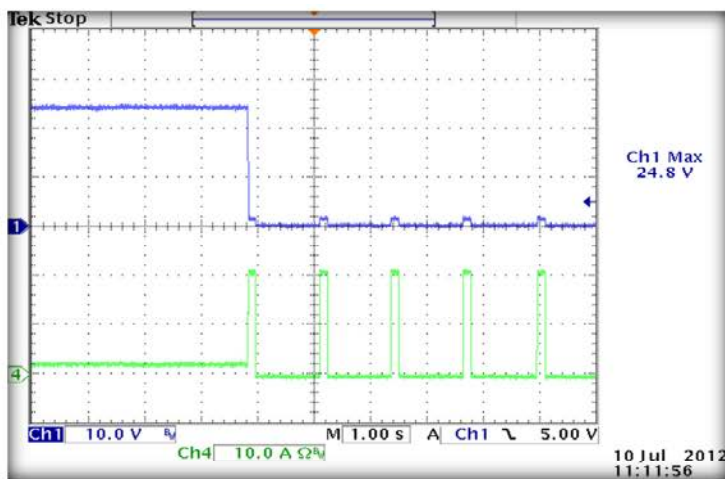
### Short Circuit Protection

Supply shall protect itself against Short Circuit conditions. No damage will occur if the output is shorted.

24V OUT, 90VAC



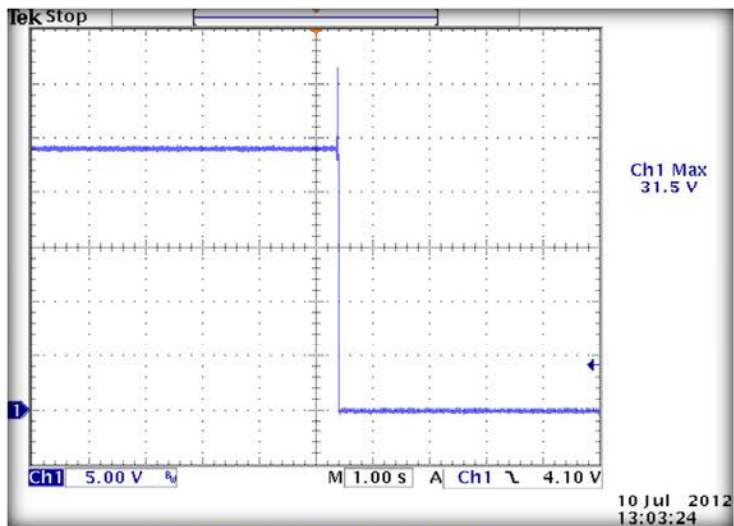
24V OUT, 264VAC



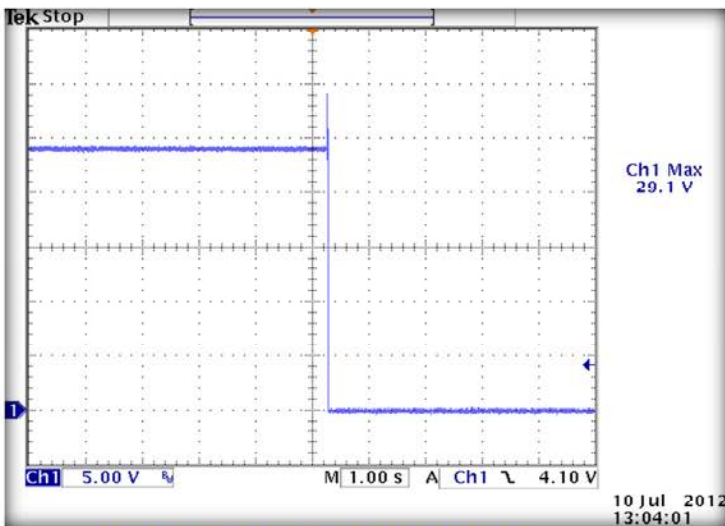
### Overvoltage Protection

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

24V OUT, FULL LOAD, 90VAC, 60Hz



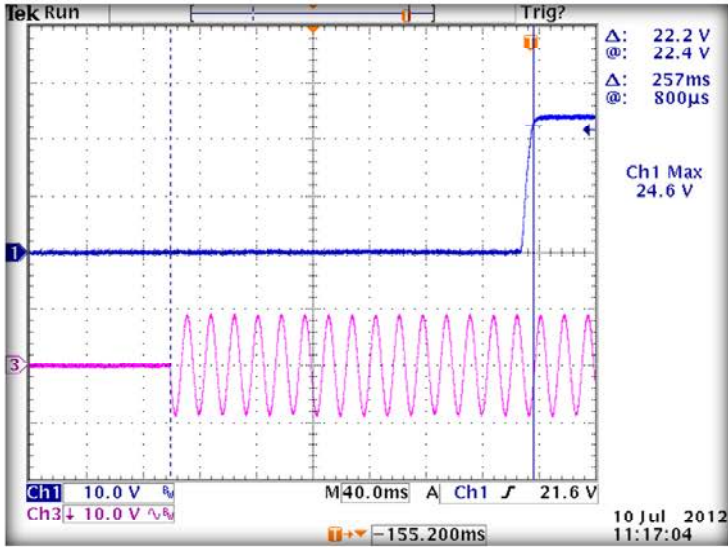
24V OUT, FULL LOAD, 264VAC, 50Hz



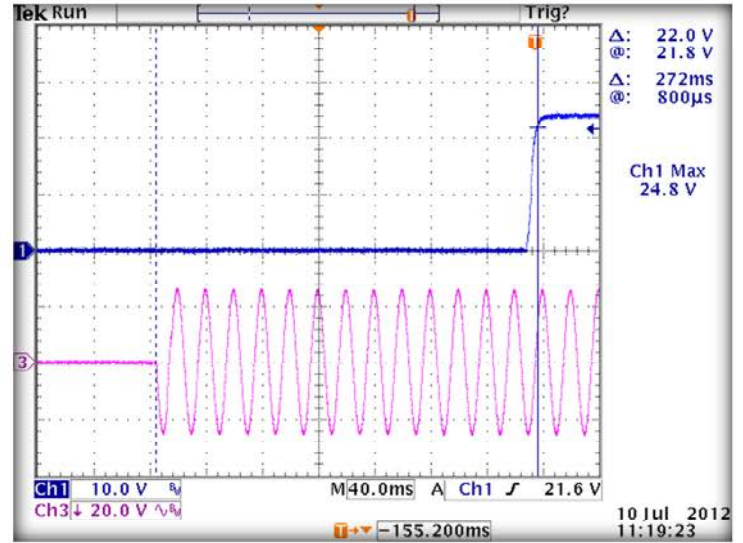


### Turn On Time

24V OUT, FULL LOAD, 90VAC, 60Hz

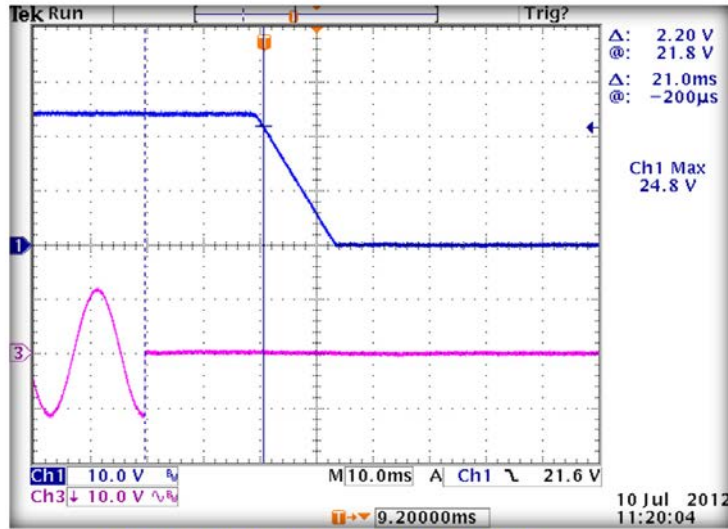


24V OUT, FULL LOAD, 264VAC, 60Hz



### Hold Up Time

24V OUT, FULL LOAD, 120VAC, 60Hz



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