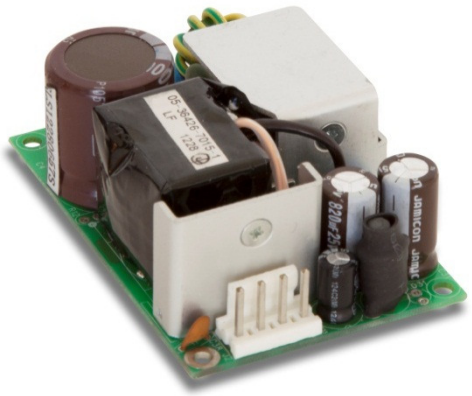
GB60S

60W Single Output

General Purpose



Features

- 2” x 3” x 1.0” Package
- For 1U Applications
- 60W convection cooled
- Universal Input 90-264Vac
- Optional Power ON LED
- Approved to CSA/EN/IEC/UL60950-1, 2nd Edition
- Level V Efficiency Compliant Models
- Less than 0.5W no-load Power Consumption
- 3 Year Warranty
- RoHS Compliant

Description

The GB60S Series models provide a highly reliable power source in high density 2” x 3” x 1.0” package. Fully compliant to the applicable safety and EMC standards, these models will allow easy integration into many industrial and ITE applications. All 4 models are CE marked to low voltage directive and approved to ITE standards of EN60950, 2nd edition.

Model Selection

Model Number*	Volts	Output Current Convection Cooled	Output Power Convection Cooled	Ripple & Noise**	Total Regulation	OVP Threshold
GB60S12K	12V	4.58A	55W	120mV pk-pk	±2%	14.4-18Vdc
GB60S15K	15V	4.00A	60W	150mV pk-pk	±2%	18-22.5Vdc
GB60S24K	24V	2.50A	60W	240mV pk-pk	±2%	28.8-36Vdc
GB60S36K	**36V**	**1.67A**	**60W**	**360mV pk-pk**	**±2%**	**43.2-54Vdc**
GB60S48K	48V	1.25A	60W	480mV pk-pk	±2%	57.6-72Vdc

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. At -20C, the noise and ripple is 2% of the output.

General Specifications

AC Input	100-240Vac, 47-63Hz, 1∅ rated 80–270Vac, 47-440Hz operational	**Turn On Time**	2 sec. max. @120Vac
Input Current	120Vac: 1.4A, 240Vac: 0.75A	**Hold-up Time**	16mS min. @ 60W load, 120Vac input
Inrush Current	240Vac, cold start: will not exceed 40A	**Signals**	Optional Power ON LED
Input Fuses	4A, 250VAC fuse provided on all models	**Overload Protection**	Hiccup Mode, 120% to 180%, typical

General Specifications (continued)

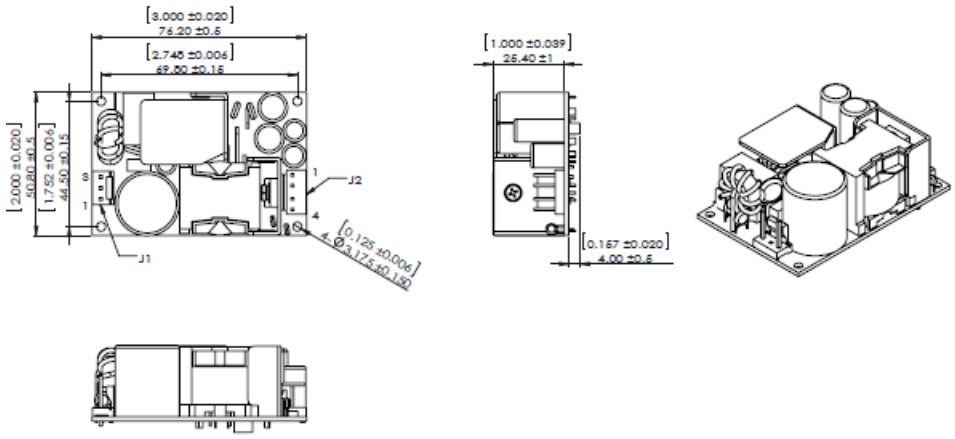
Earth Leakage Current	<1mA@240Vac, NC	**Short Circuit Protection**	Hiccup Mode
Power Factor	Not Applicable	**Overtemperature Protection**	Self-recovering
Efficiency	88% typical (83% for 12V& 85% for 15V)	**Safety Standards**	CSA/EN/IEC/UL60950-1, 2nd Edition. See below for detailed standards information.
Output Power	60W continuous (55W for 12V models)	**Isolation**	Input-Output: 4000Vac Input-Ground: 1800Vac Output-Ground: 500Vac
Peak Output Power	Not Applicable	**Operating Temperature**	-40C start up. -20C to 80C with derating specified in Fig.1
Ripple and Noise	See chart above	**Output Power Derating**	See Fig.1 on page 4
Output Voltage	See chart	**Storage Temperature**	-40℃ to +85℃
Voltage Adjustability	Fixed	**Relative Humidity**	5% to 95%, non-condensing
Minimum Load	Not required	**Altitude**	Operating: 3000 meters Non-operating: 40,000 ft.
Total Regulation	+/- 2%. See chart	**MTBF**	Over 600,000 hours per Telcordia
Transient Response	500µS max. to 1%, 50% load step. 0.2A/µS, 3.5% deviation typical	**Vibration**	Random Vibration per MIL-STD-810E, Method 514.4, Cat. 1, Figure 514.4.1, 1 hour in each of 3 axes.
Switching Frequency	65kHz, typical	**Shock**	Half-sine, 40 gpk, 10 mS duration, +/- in each of 3 axes, 6 shocks total
Dimensions	2.0" x 3.0" x 1.0" 50.8 x 76.2 x 25.4mm	**Weight**	126g

Notes:
1. Specifications subject to change without notice.
2. All dimensions in inches (mm), tolerance is ±.02".
3. Mounting holes should be connected together for EMI purpose
4. FG is safety ground connection
5. Specifications are for convection rating at factory settings with 115Vac input and 25℃ ambient unless otherwise stated.
6. This power supply requires mounting on metal standoffs 0.20" (5mm) in height.

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
Static Discharge Immunity	EN61000-4-2, 6kV Contact Discharge, 8kV air discharge
Radiated RF Immunity	EN61000-4-3, 3V/m
EFT/Burst Immunity	EN61000-4-4, 2kV/5kHz
Line Surge Immunity	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).
Line Harmonic Emissions	EN61000-3-2 Class A
Flicker Test	EN61000-3-3, Complies (dmax<6%)

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

-40C start up. At -20C, the supply meet its full spec except ripple & noise might be increased from 1% to 2% of the output voltage
55W convection cooled, derating output power to 30W at 70°C for outputs 12V and 15V
60W convection cooled, derating output power to 50W at 60°C and 40W at 70°C for Output Voltages ≥ 24V
20W convection cooled at 80C

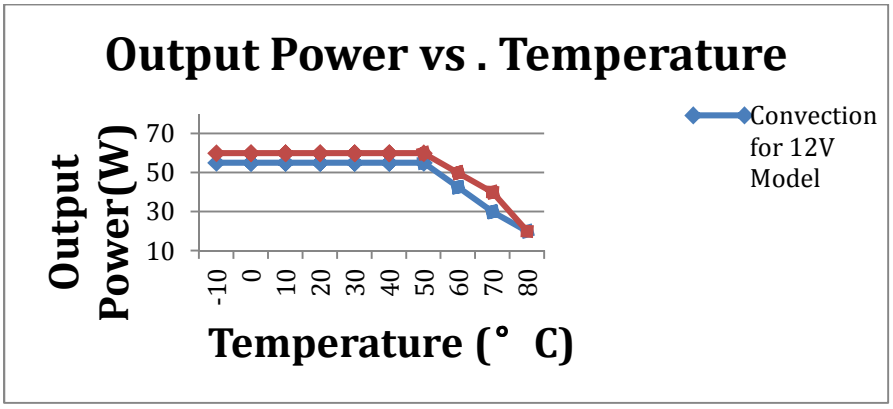


Fig.1

Efficiency vs. Loading

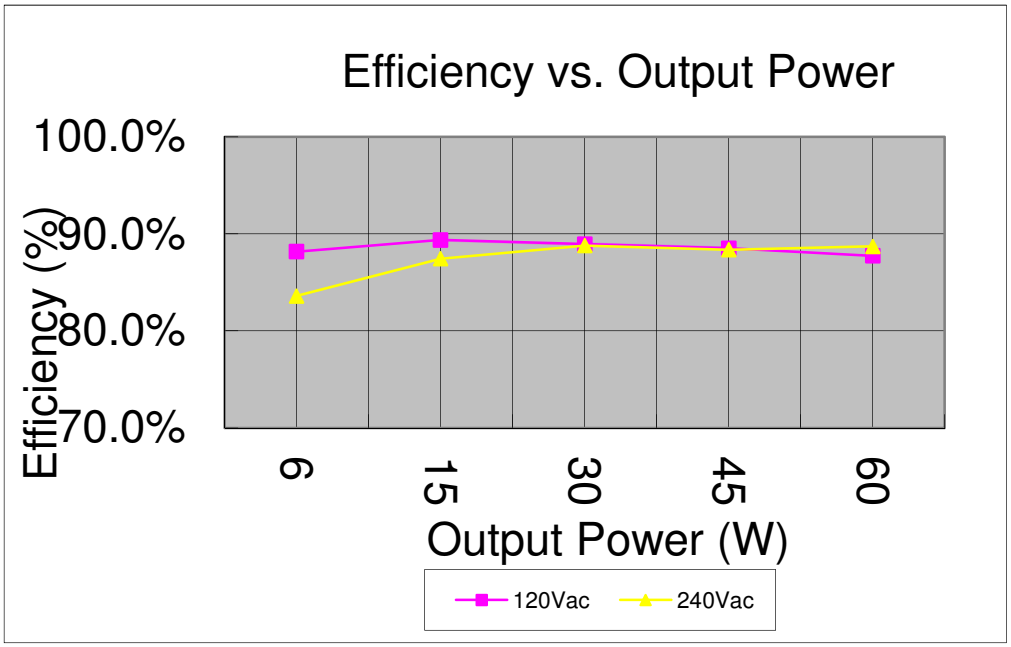
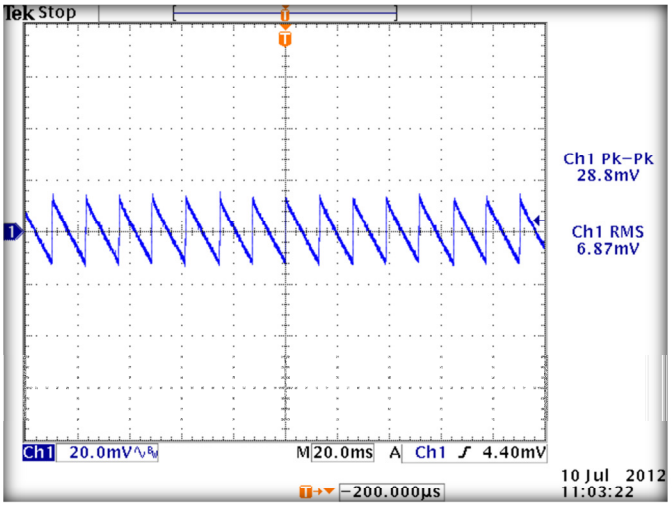


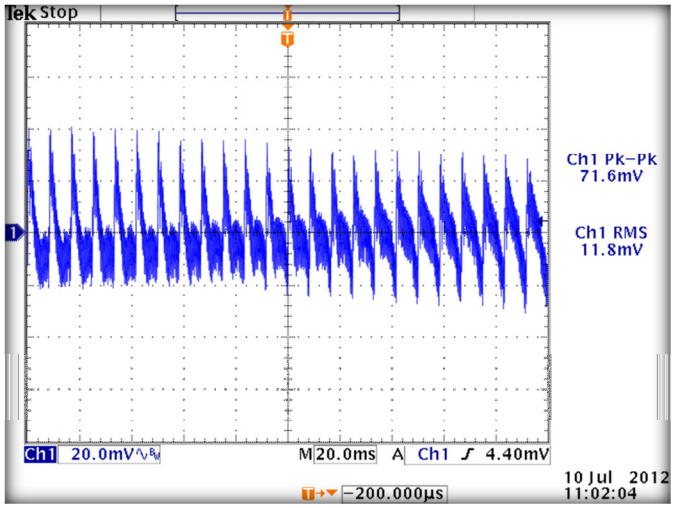
Fig.2

Ripple & Noise

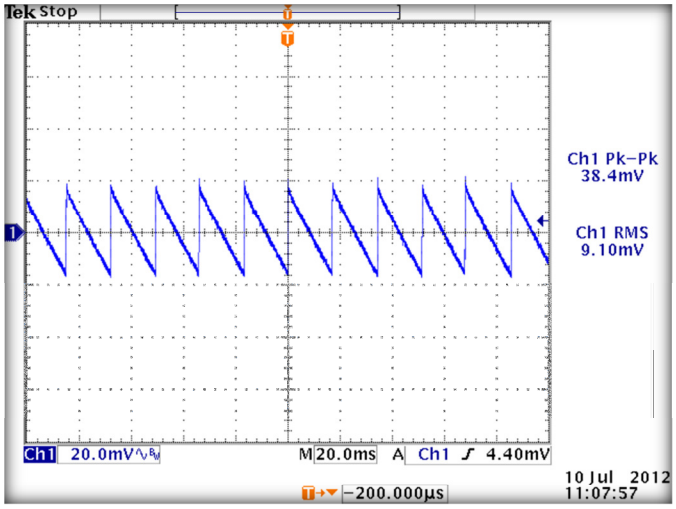
To verify that the output ripple and noise does not exceed the level specified in the product specification, measured using a scope probe socket with 0.1uF ceramic and a 10uF electrolytic capacitor connected in parallel across it, 20MHz BW.



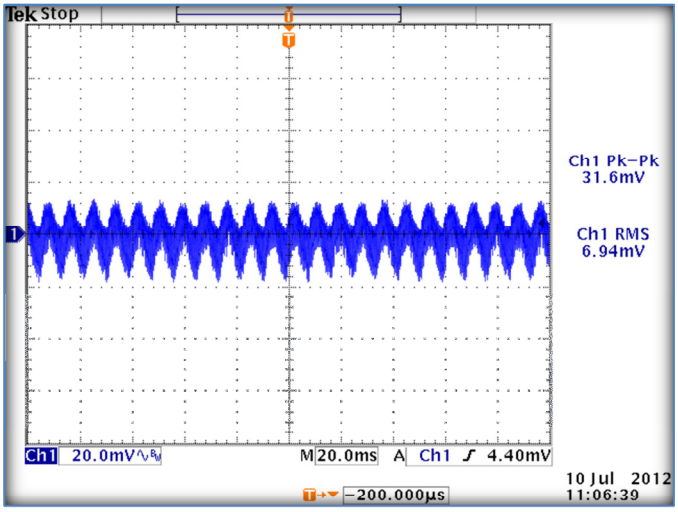
24V OUT, NO LOAD, 90VAC, 60HZ



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



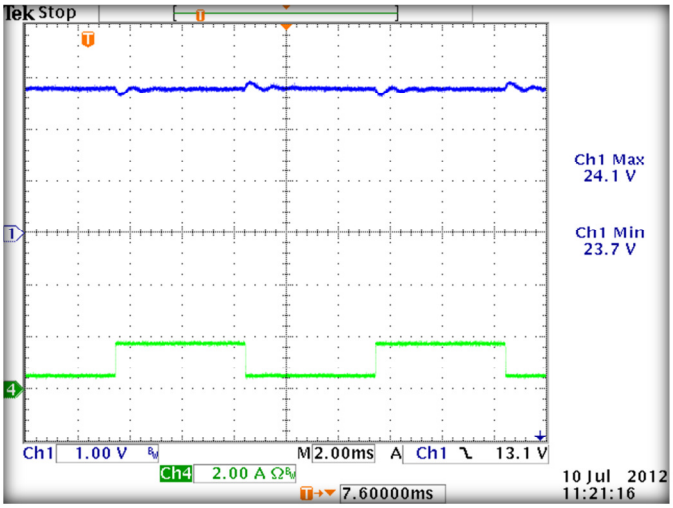
24V OUT, NO LOAD, 264VAC, 50HZ



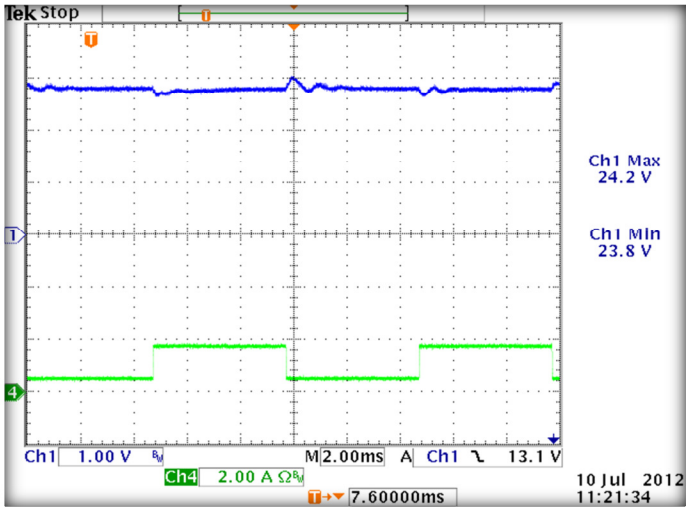
24V OUT, FULL LOAD, 264VAC, 50HZ

Output Transient Response

50% load step within the regulation limits of minimum and maximum load, dI/dt≤ 0.2A/µSec. Recovery time not specified as there is no laps in regulation with a 50% Load Step. Maximum voltage deviation is 3.5%

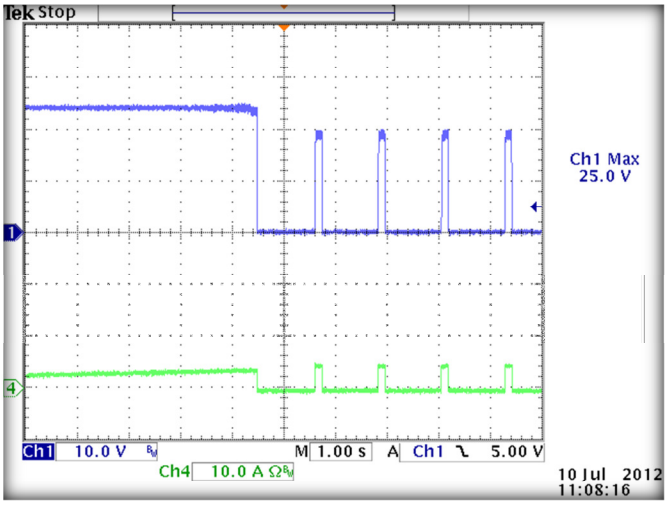


24V OUT, 120VAC, 25% TO 75% LOAD STEP

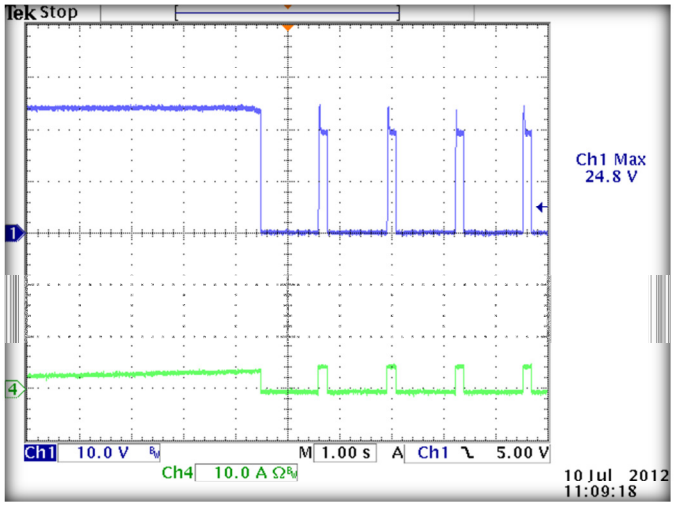


24V OUT, 240VAC, 25% TO 75% LOAD STEP

Output Overload Characteristic



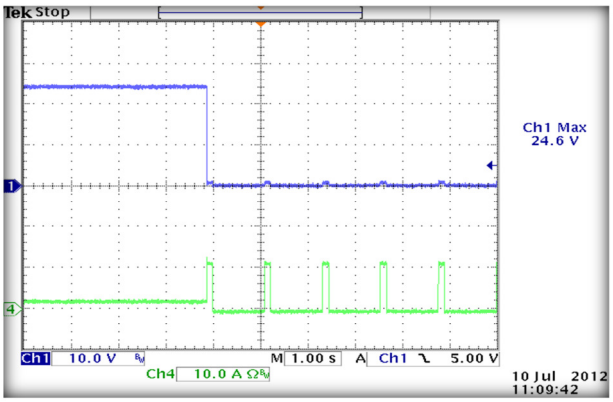
24V OUT, 90VAC



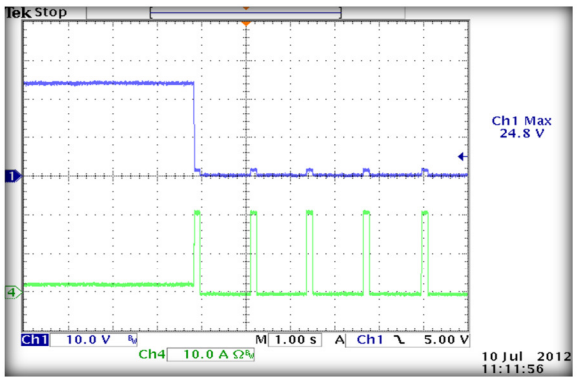
24V OUT, 264VAC

Short Circuit Protection

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



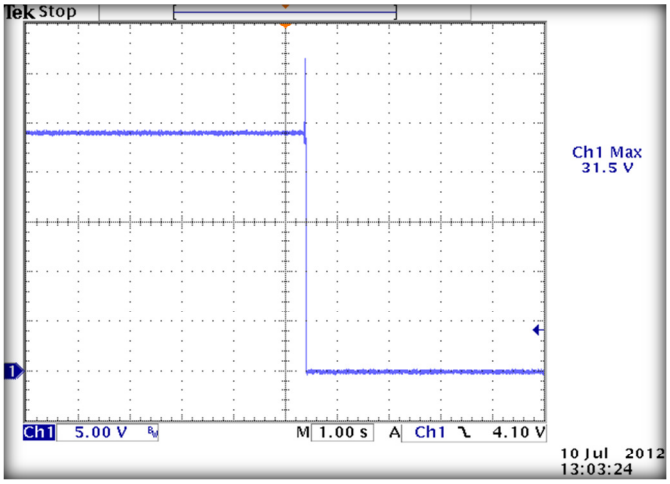
24V OUT, 264VAC



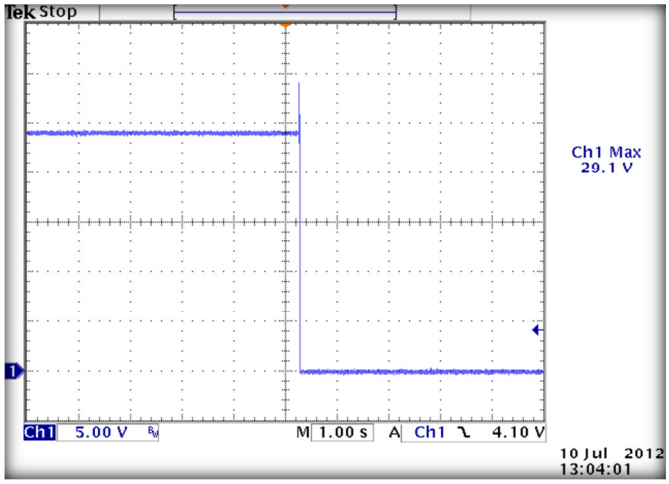
24V OUT, 90VAC

Overvoltage Protection

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

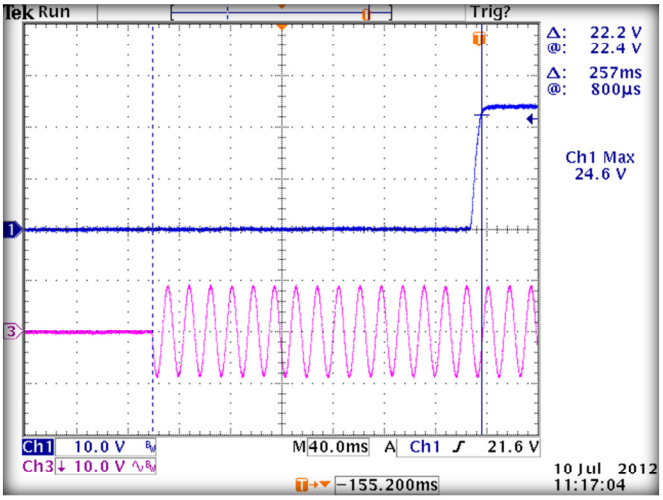


24V OUT, FULL LOAD, 90VAC, 60HZ

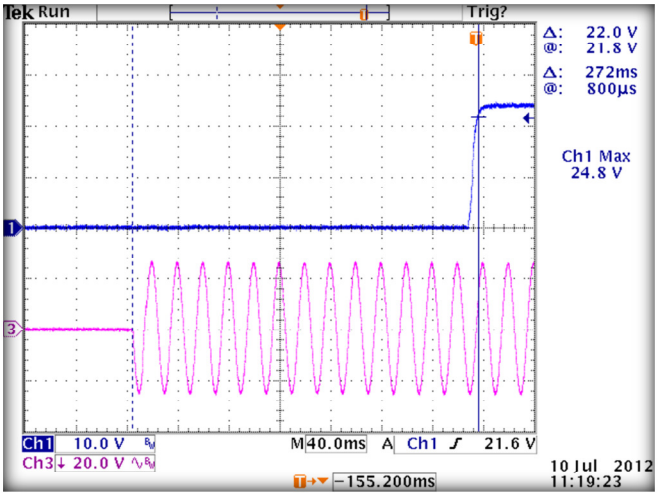


24V OUT, FULL LOAD, 264VAC, 50HZ

Turn On Time

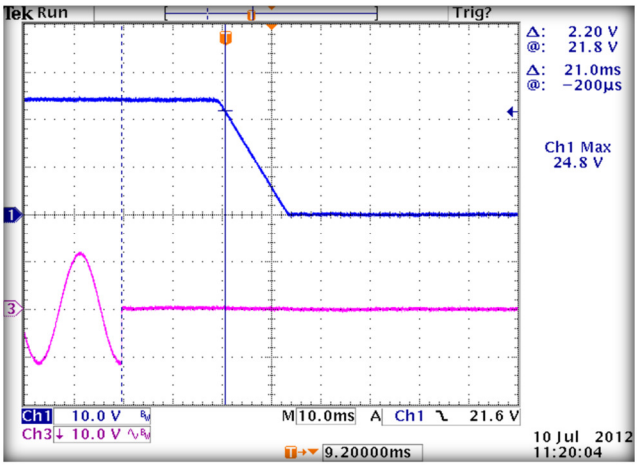


24V OUT, FULL LOAD, 90VAC, 60HZ



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

Hold Up Time



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

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