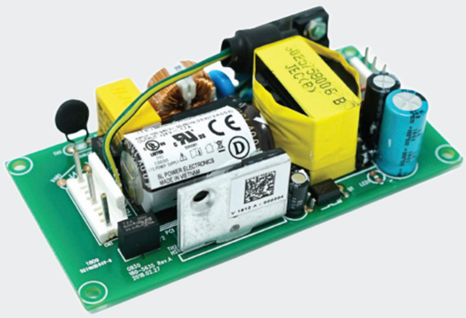
SL POWER GB30 SERIES

30 Watts Single Output
Medical & Industrial Grade



Medical

Industrial

Advanced Energy's SL Power GB30 is a superior performance 30 Watts AC to DC converter, designed for medical/industrial applications. It is highly efficient (meets DOE level VI) and can effortlessly integrate in any system that requires 30 Watts of convection cooled power. All models are CE marked to low voltage directive and approved to CSA/EN/IEC/UL62368-1 and CSA/EN/IEC/UL60601-1 3.1 Edition. It meets Heavy Industrial and IEC60601-1-2 4th Edition Levels of EMC and meets Class B Radiated & Conducted Emissions with margin. The GB30 is offered in both Class I and Class II input.

This application note will explain the features, benefits and considerations while using GB30 in medical/industrial devices or systems.

AT A GLANCE

Total Power

30 Watts

Input Voltage

90 to 264 VAC

# of Outputs

Single

ORDERING INFORMATION

Model Number	Output Voltage	Maximum Load (Convection)	Maximum Power	Efficiency	OVP Threshold
GB30S05K01	5.0 V	4.0 A	20.0 W	86%	6.7V ± 0.7V
GB30S07K01	7.5 V	3.0 A	22.5 W	88%	10.1V ± 1.1V
GB30S09K01	9.0 V	3.0 A	27.0 W	88%	12.1V ± 1.3V
GB30S12K01	12.0 V	2.5 A	30.0 W	88%	16.2V ± 1.8V
GB30S15K01	15.0 V	2.0 A	30.0 W	88%	20.2V ± 2.2V
GB30S18K01	18.0 V	1.67 A	30.0 W	88%	24.3V ± 2.7V
GB30S24K01	24.0 V	1.33 A	30.0 W	89%	32.4V ± 3.6V
GB30S48K01	48.0 V	0.63 A	30.0 W	88%	56.8V ± 2.1V

Notes:
1. Change “K” to “C” for Class II input.
2. Efficiency is Typical at 230 VAC, 25°C. See Charts in datasheet for load conditions.
3. Check datasheet for latest model information.

FEATURES

Size

GB30 is a single output AC/DC power supply designed to fit into the 1U chassis. 1U is a rack unit or unit of measure defined as 1.75 inches (45 mm) height. While designing a system with a power supply, the engineer must consider the heat dissipations from integrated components and ensure enough clearance between the system components and the chassis or enclosure parts. The small dimensions of the GB30 1.9” x 3.6” x 1.0” package (48.2mm x 91.9mm x 25.4mm) allow to easily integrate it into the 1U chassis with enough space for airflow or convection cooling from top and bottom surfaces.

Power vs. Temperature

The GB30 series power supplies are capable to provide up to 30 Watts of power in a convection-cooled environment up to 50°C ambient. At higher operating temperatures, refer to the power derating curve to avoid the internal over temperature protection (OTP) shutting down the power supply during excessive temperature excursions. The over temperature protection is based on an auto-recovery principle with the hysteresis of 30°C. See the Proper Use and Thermal Considerations sections of this application note.

Premium Electrolytic Capacitors

The life time of the power supply is mostly dependent on life limiting components such as electrolytic capacitors. This is particularly the case for convection cooled applications. AC ripple currents in these capacitors create additional heat, but the main cause of temperature rise is from operating ambient and adjacent heat sources. The higher the long-term temperature the electrolytic capacitors exposure, the shorter the life of the capacitor. GB30 series were designed to keep the temperature of critical electrolytic capacitors as low as possible but also fitted with premium electrolytic capacitors to benefit from best technologies of capacitor manufacturers. This approach allows GB30 life cycle of over 5 years (24/7 operation) at ambient temperature of 50°C.

Class B Conducted and Radiated EMI Performance Margins

GB30 series was designed to pass EN55032 Class B and FCC part 15 Class B with typical margin of 6 db for conducted emissions and 3 db for radiated emissions.

Safety and Isolation Type Rated

GB30 series provides 2 x MOPP (Means of Patient Protection) in accordance with the IEC60601-1 medical standard. All models are CE marked to the EU Low Voltage Directive. Please contact the application engineering team for CE/UL certificates or CB reports if not found on the www.slpower.com website for this product.

Leakage Current

Because of the lower values of allowable leakage current in medical power supplies, it is important to control the capacitances that cause leakage currents. Reducing their value can severely reduce the EMI filter’s effectiveness. SL Power’s EMI filtering design techniques have overcome this barrier. Patient Leakage Current (Output to Earth) of GB30 is <90 µA @ 264 VAC, 60 Hz input, NC. The model is suitable for BF Type applications.

FEATURES

Designed to Meet New IEC 60601-1-2 4th Edition EMC Requirements

The new 4th edition of standard IEC60601-1-2 for EMC requirements was lately released. The most significant change of the standard is harmonization with IEC60601-1-11 to classify medical devices into main groups, professional healthcare facility environment and home healthcare environment which is more stringent and requires more attention of the system designers. The key differences are listed in the application note AN-G010.
Even though the certification is given at the system level, some of the tests are directly related to the functionality of the power supply. The GB30 design takes into consideration the new IEC 60601-1-2 4th edition EMC requirements.

Common Mode Noise

Common mode noise on the output of the power supply is rarely specified. In some applications, it is not an issue. However in some Telecom and Network application, there are limits for common mode disturbances per EN55103-1 and EN55022/CISPR22. The GB30 series are designed with very low common mode noise, which easily meet the standard requirement.

PROPER USE

- The GB30 power supplies have high power conversion efficiency, however they do rely on convection cooling in the surrounding environment (air) to prevent overheating or excessive component temperatures. Therefore, there needs to be adequate access to ambient air to ensure proper thermal performance of the power supply.
- Do not exceed the power rating of the product.
- Mounting standoff height should be ≥ 0.2 inch, for more information please refers to the product datasheet.
- A non-conductive insulator should be placed between the bottom of the unit and any conductive surface to ensure minimal creepage and clearance distances complying to the safety standard. If an insulator is not possible, increase standoffs to 0.3 inch to the bottom components or leads to keep safety clearance. Verify the safety requires for your application.
- The GB30 is designed for both Class I and Class II AC input applications. Using the GB30 earth terminal for the end-product protective earthing is not recommended. A separate dedicated bonding conductor and suitable termination should be used to connect the chassis to the end-product protective earth.
- Use a proper mating connector for connection to the input and output connectors of the power supply. Refer to the GB30 datasheet for connector information.
- For better EMI performance, avoid cable routing close to power supply especially near magnetics or switching components. If that is not possible, consider shielding cables or the power supply. Contact your local SLPE application engineer for support.

If the system requires an additional EMI filter, carefully consider properly selecting system EMI filters. Power Entry Modules (PEM) could cause resonance due to its inductive and capacitive reactance interfering with the power supply EMI filter. Choosing an appropriate Power Entry Module with the right capacitance and inductance to use with the power supply is critical. For proper performance, it is needed to place the PEM near the intended power supply with the interconnect wires as short and close to the chassis as possible. On the other hand, the interconnect wires between the power supply output and system board, power converter modules and so on are acting as antenna which are susceptible to electric and magnetic field couplings. They often need to be twisted and/or shielded and keep them short.

THERMAL CONSIDERATIONS

The following table lists the main components of GB30 series and their maximum allowed temperature. Monitoring and keeping these parts below the limits helps to extend the service life of the power supply. Take proper precautions when measuring component temperatures as some components are located on the hazardous voltage (mains) side of the power supply. Thermal couples need to be electrically isolated.

Description	Hazardous Voltage	Reference Designator	Max. Allowed Temperature
Capacitor X-Type	Yes	CX1	100°C
Input Bulk Capacitor	Yes	PC1	105°C
Output Capacitors	-	SC1, SC2, SC6	105°C
Electrolytic Capacitor	-	PC2	105°C
Power Transformer	Yes	T1	145°C
Inductors	Yes	LF1	130°C

THERMAL CONSIDERATIONS

- As already mentioned, life of electrolytic capacitors are significantly affected by temperature. It is strongly recommended to keep their temperature 5°C to 10°C below the max allowed values in the table under worst case condition.
- Even if the transformer and inductors offer enough thermal margins from maximum allowed temperature, their temperature can reach 110°C. System designers must consider carefully while placing other system components near it.
- For proper worst-case verification, use low line input voltage of 90 VAC with the highest load at 50°C. Place thermocouples on the listed components on a non-conductive area to measure excessive temperatures and to determine correct thermal design.
- Caution! Almost all components are located on primary side of the AC-DC power supply! Use appropriate safety measures as these components are at hazardous voltage levels. Only qualified personnel should attempt to make these measurements.

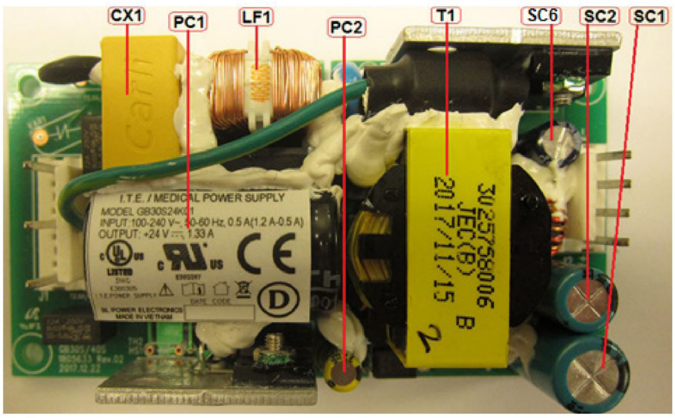


Fig. 01: Chassis Mount Type

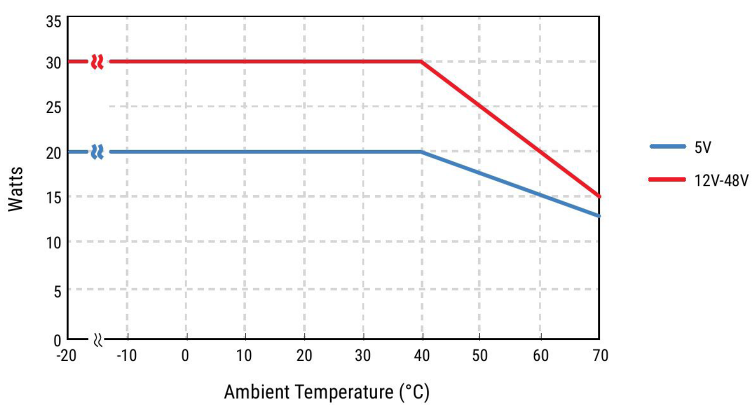


Fig. 02: GB30 Series Derating Curve

PERFORMANCE DATA

Inrush Current

GB30S05K01

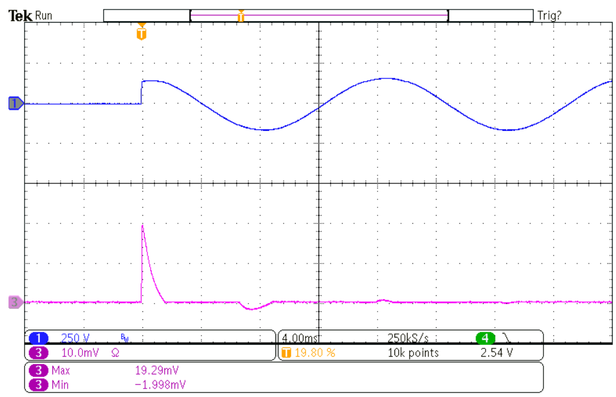


Fig. 03: INRUSH CURRENT AT 115VAC 5V/4A – CH3: 10A/Div.
I(inrush) = 19.29A peak.
I^2t = 0.30A^2s.

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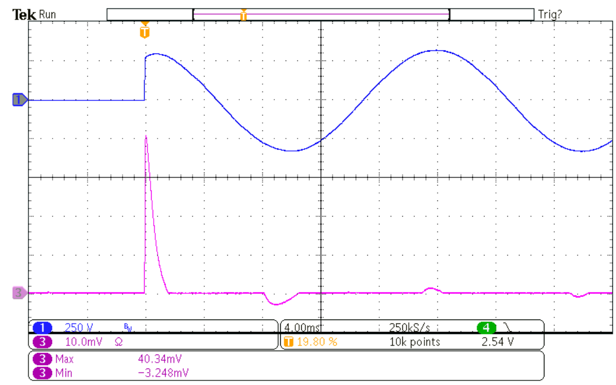

Fig. 04: INRUSH CURRENT AT 230VAC 5V/4A – CH3: 10A/Div.
I(inrush) = 40.34A peak.
I^2t = 1.31A^2s.

GB30S12K01

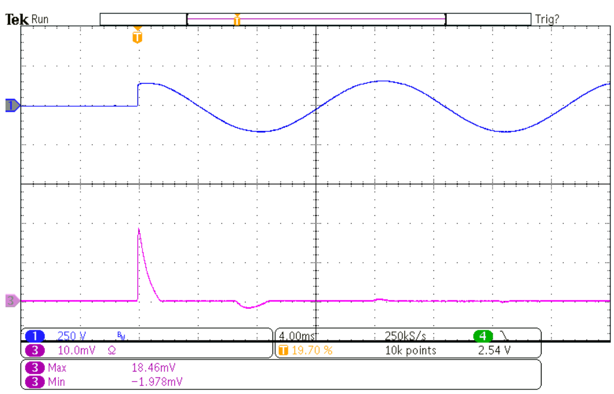

Fig. 05: INRUSH CURRENT AT 115VAC 12V/2.5A – CH3: 10A/Div.
I(inrush) = 18.46A peak.
I^2t = 0.27A^2s.

GB30S12K01

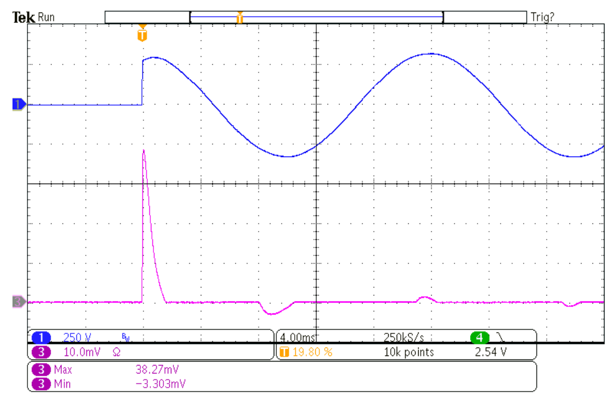

Fig. 06: INRUSH CURRENT AT 230VAC 12V/2.5A – CH3: 10A/Div.
I(inrush) = 38.27A peak.
I^2t = 1.30A^2s.

GB30S24K01

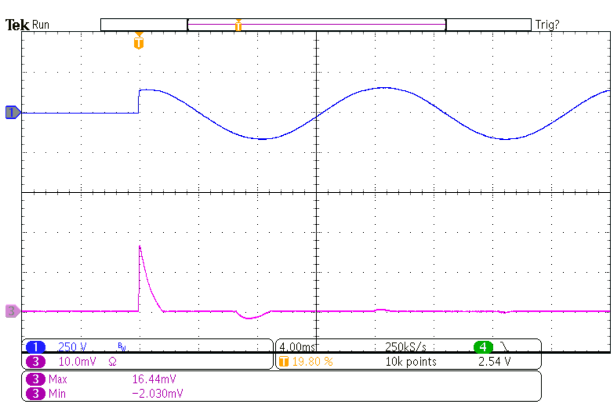

Fig. 07: INRUSH CURRENT AT 115VAC 24V/1.33A – CH3: 10A/Div.
I(inrush) = 16.44A peak.
I^2t = 0.22A^2s.

GB30S24K01

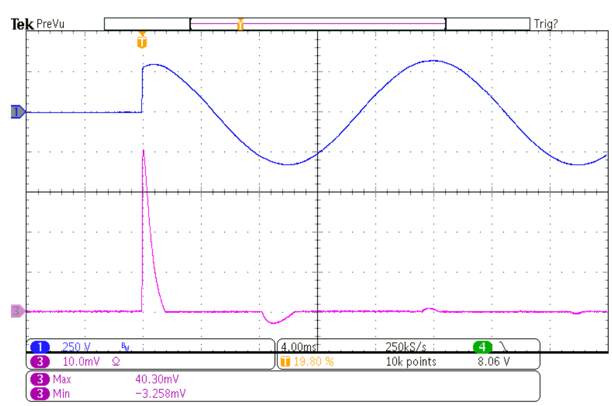

Fig. 08: INRUSH CURRENT AT 230VAC 24V/1.33A – CH3: 10A/Div.
I(inrush) = 40.30A peak.
I^2t = 1.40A^2s.

PERFORMANCE DATA

GB30S48K01

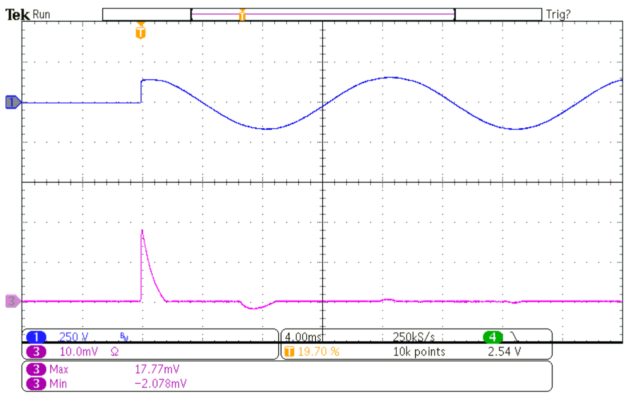

Fig. 09: INRUSH CURRENT AT 115VAC 48V/0.63A – CH3: 10A/Div.
I(inrush) = 17.77A peak.
I^2t = 0.26A^2s.

GB30S48K01

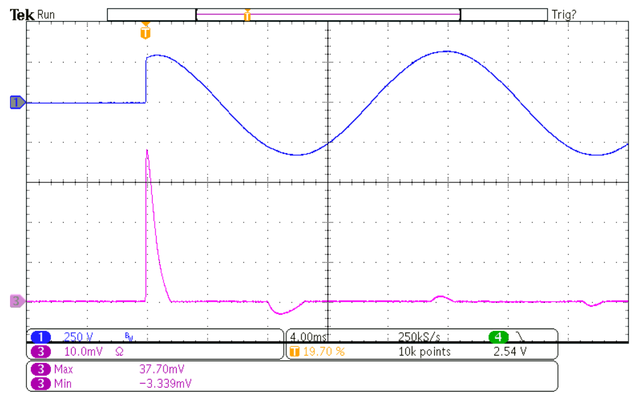

Fig. 10: INRUSH CURRENT AT 230VAC 48V/0.63A – CH3: 10A/Div.
I(inrush) = 37.70A peak.
I^2t = 1.23A^2s.

Output Turn-On Delay Time

GB30S05K01

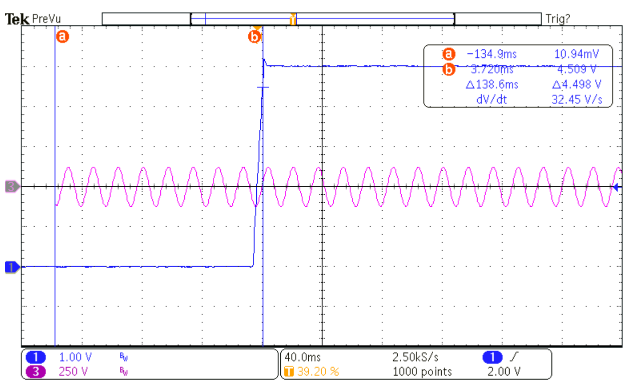

Fig. 11: TURN-ON DELAY AT 90VAC – 4A LOAD.

GB30S05K01

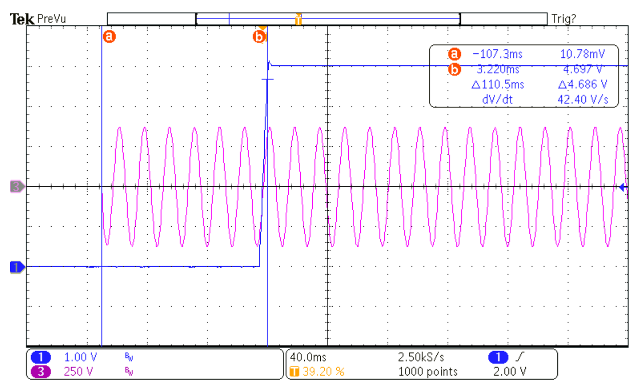

Fig. 12: TURN-ON DELAY AT 264VAC – 4A LOAD.

GB30S12K01

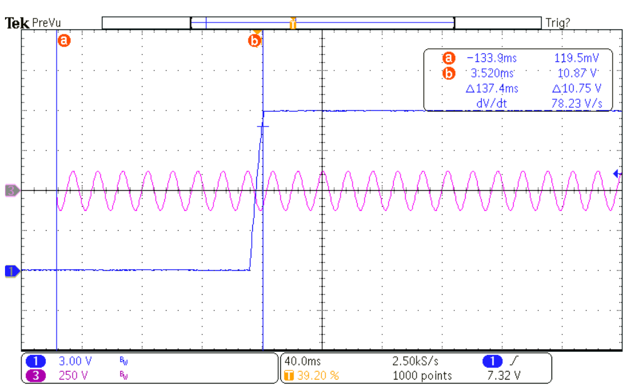

Fig. 13: TURN-ON DELAY AT 90VAC – 2.5A LOAD.

GB30S12K01

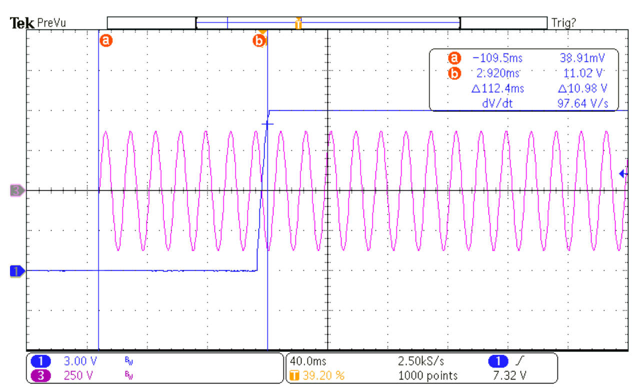

Fig. 14: TURN-ON DELAY AT 264VAC – 2.5A LOAD.

PERFORMANCE DATA

GB30S24K01

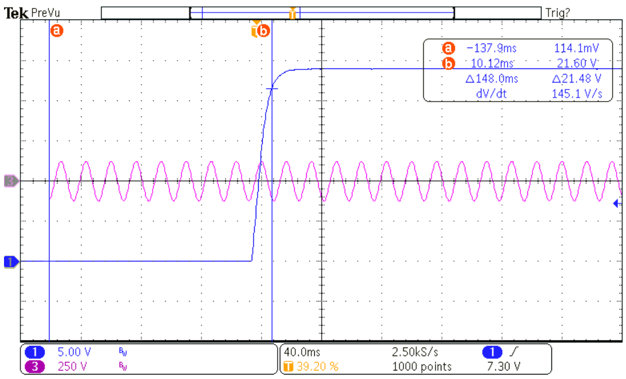

Fig. 15: TURN-ON DELAY AT 90VAC – 1.33A LOAD

GB30S24K01

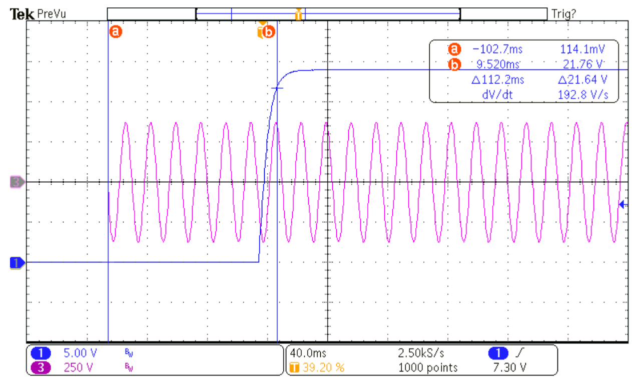

Fig. 16: TURN-ON DELAY AT 264VAC – 1.33A LOAD.

GB30S48K01

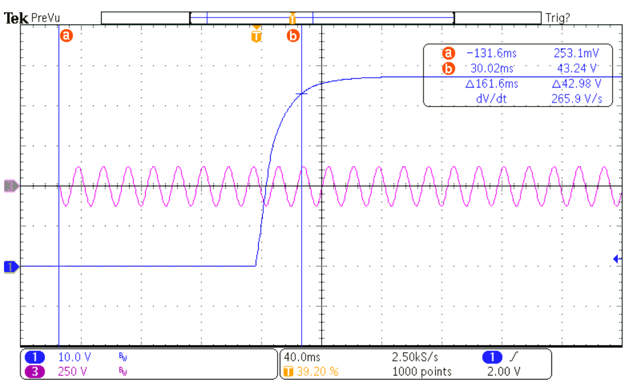

Fig. 17: TURN-ON DELAY AT 90VAC – 0.63A LOAD.

GB30S48K01

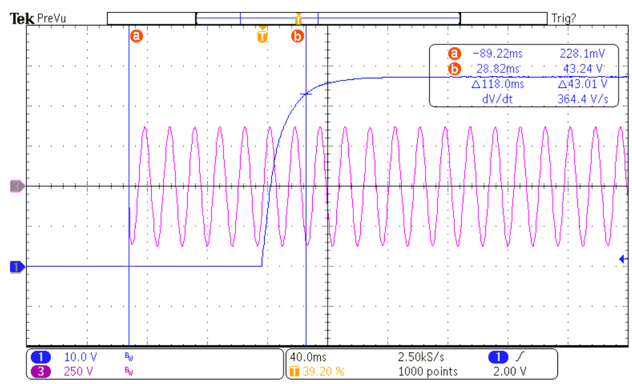

Fig. 18: TURN-ON DELAY AT 264VAC – 0.63A LOAD.

Output Turn-On Rise Time

GB30S05K01

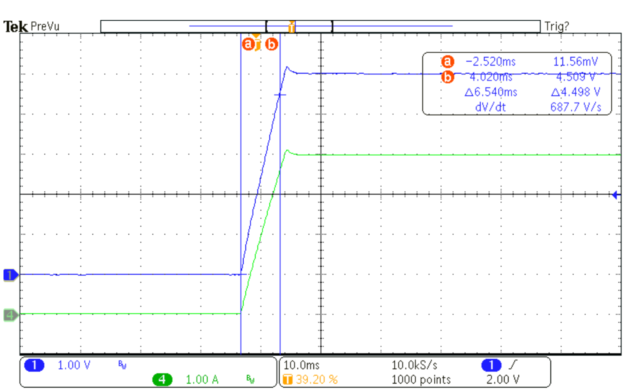

Fig. 19: TURN-ON RISE TIME AT 90VAC – 4A LOAD.
CH1: Vout, CH4: Load Current.

GB30S05K01

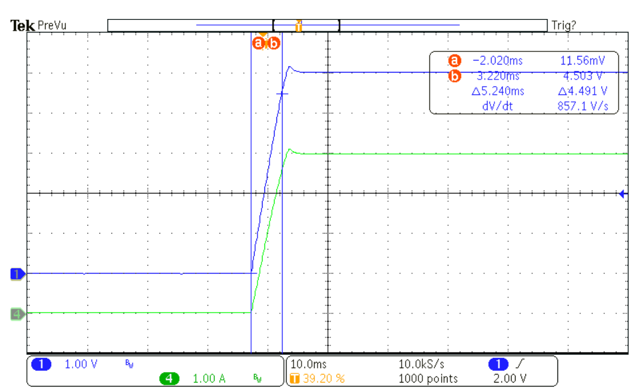

Fig. 20: TURN-ON RISE TIME AT 264VAC – 4A LOAD.
CH1: Vout, CH4: Load Current.

PERFORMANCE DATA

GB30S12K01

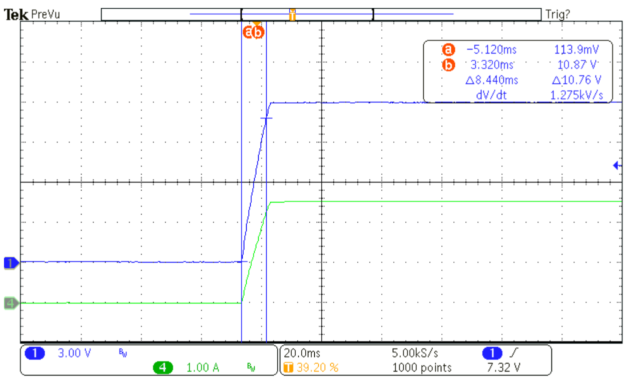

Fig. 21: TURN-ON RISE TIME AT 90VAC – 2.5A LOAD.
CH1: Vout, CH4: Load Current.

GB30S12K01

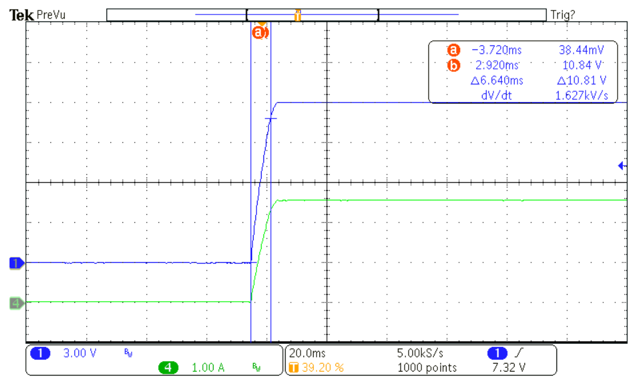

Fig. 22: TURN-ON RISE TIME AT 264VAC – 2.5A LOAD.
CH1: Vout, CH4: Load Current.

GB30S24K01

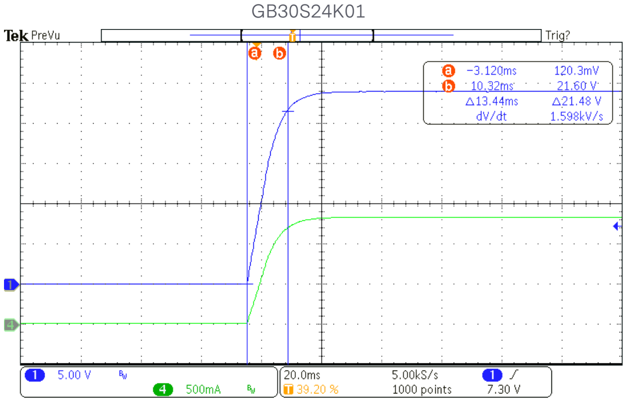

Fig. 23: TURN-ON RISE TIME AT 90VAC – 1.33A LOAD.
CH1: Vout, CH4: Load Current.

GB30S24K01

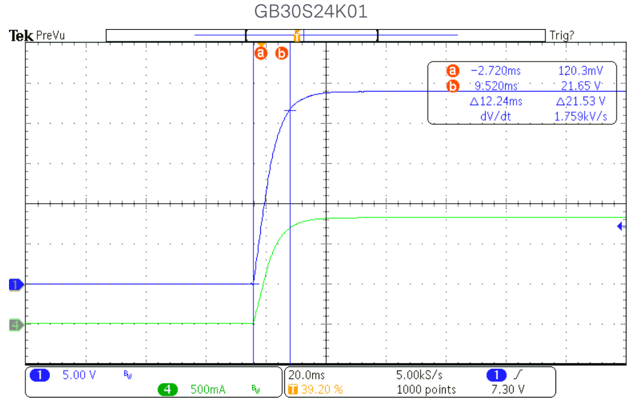

Fig. 24: TURN-ON RISE TIME AT 264VAC – 1.33A LOAD.
CH1: Vout, CH4: Load Current.

GB30S48K01

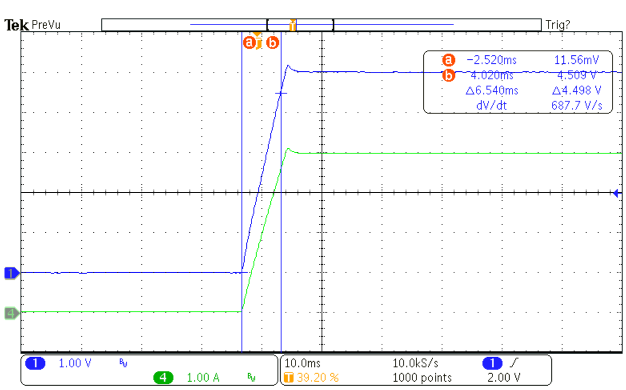

Fig. 25: TURN-ON RISE TIME AT 90VAC – 0.63A LOAD.
CH1: Vout, CH4: Load Current.

GB30S48K01

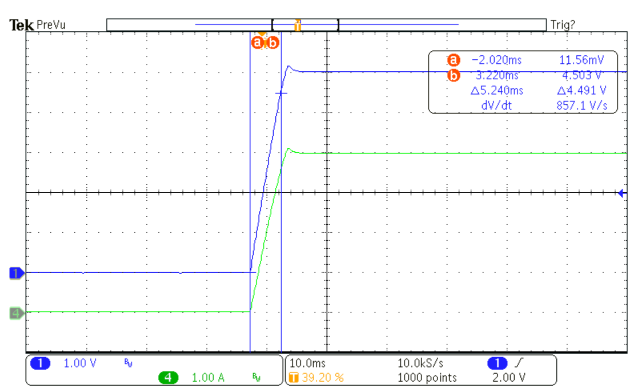

Fig. 26: TURN-ON RISE TIME AT 264VAC – 0.63A LOAD.
CH1: Vout, CH4: Load Current.

PERFORMANCE DATA

Hold-up Time

GB30S05K01

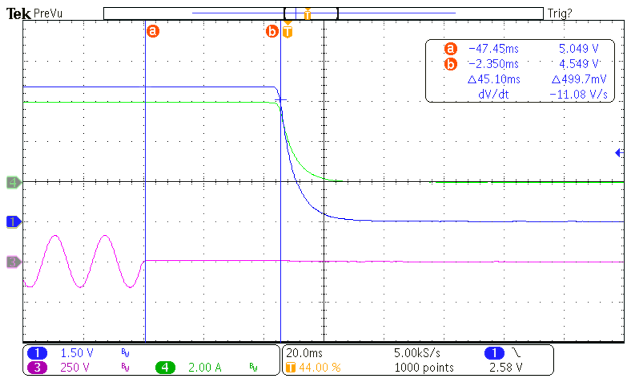

Fig. 27: HOLD-UP TIME AT 115VAC – 4A LOAD.

GB30S05K01

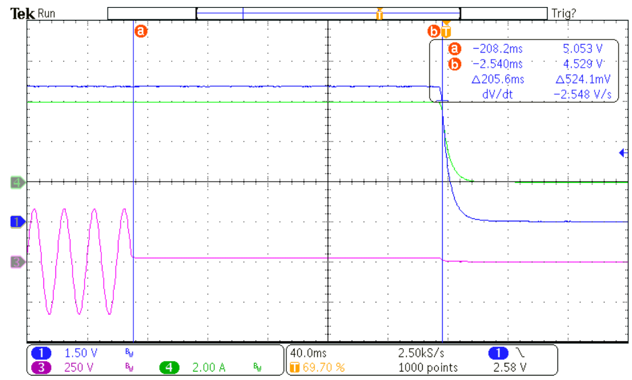

Fig. 28: HOLD-UP TIME AT 230VAC – 4A LOAD.

GB30S12K01

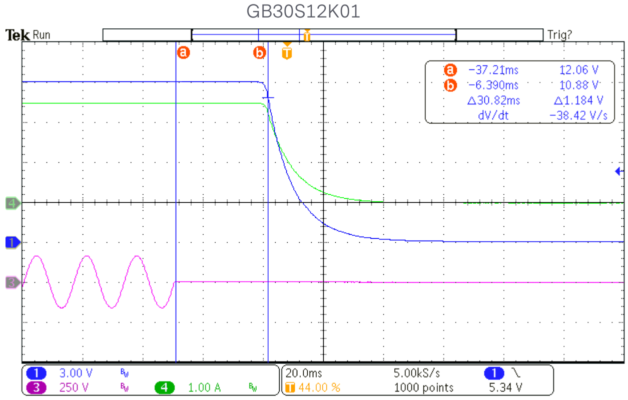

Fig. 29: HOLD-UP TIME AT 115VAC – 2.5A LOAD.

GB30S12K01

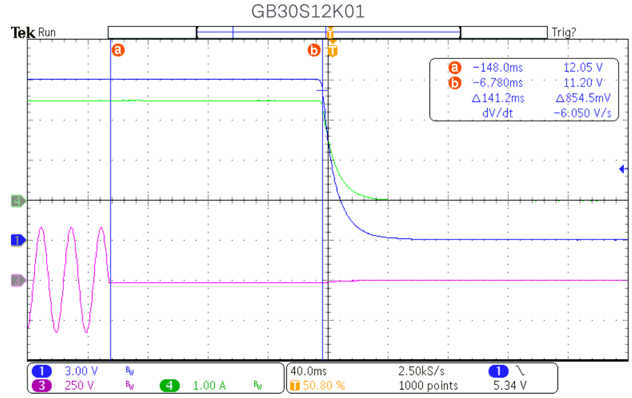

Fig. 30: HOLD-UP TIME AT 230VAC – 2.5A LOAD.

GB30S24K01

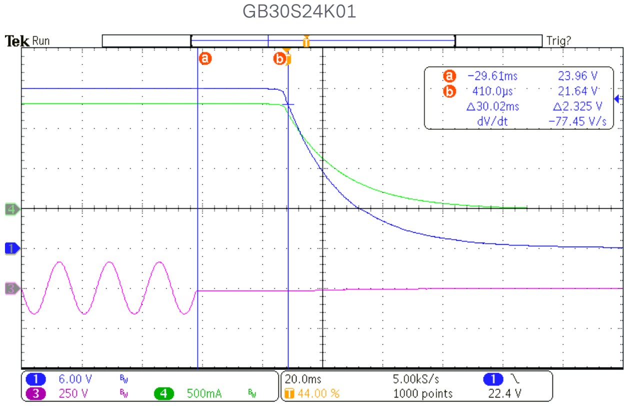

Fig. 31: HOLD-UP TIME AT 115VAC – 1.33A LOAD.

GB30S24K01

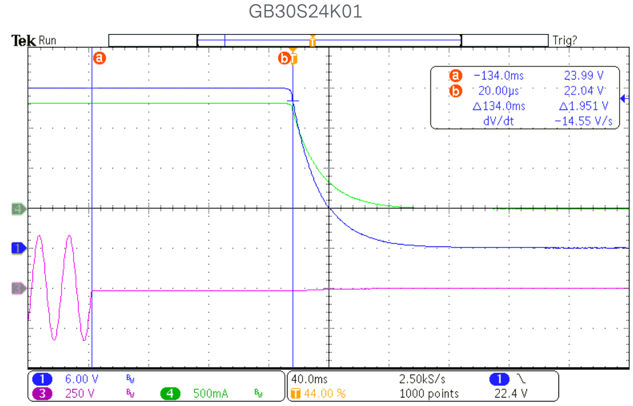

Fig. 32: HOLD-UP TIME TIME AT 230VAC – 1.33A LOAD.

PERFORMANCE DATA

GB30S48K01

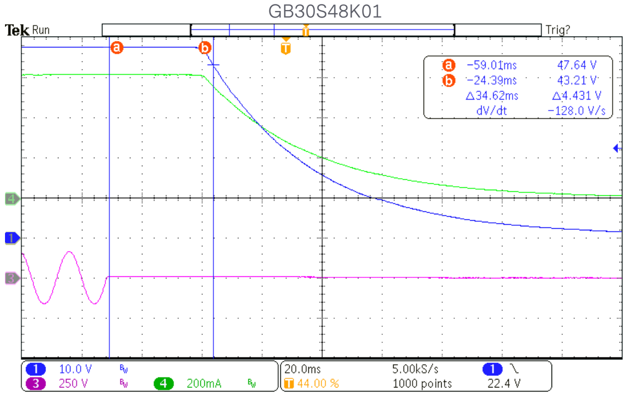

Fig. 33: HOLD-UP TIME AT 115VAC – 0.63A LOAD.

GB30S48K01

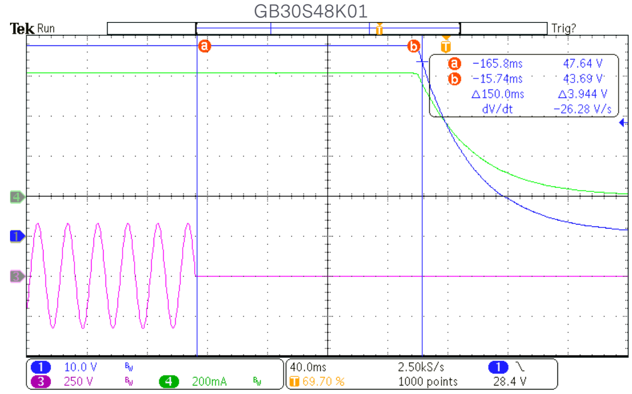

Fig. 34: HOLD-UP TIME AT 230VAC – 0.63A LOAD.

Output Over-Load Protection

GB30S05K01

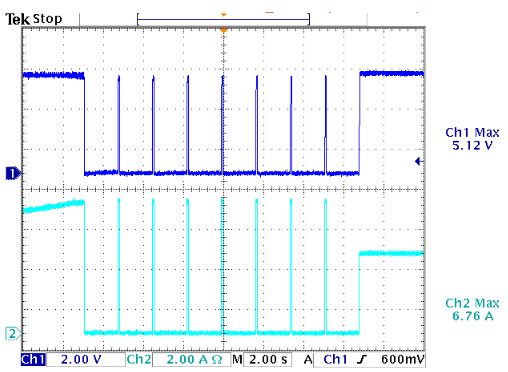

Fig. 35: OUTPUT OVER LOAD AT 115VAC.
CH1: Vout, CH2: Over Load Current.

GB30S05K01

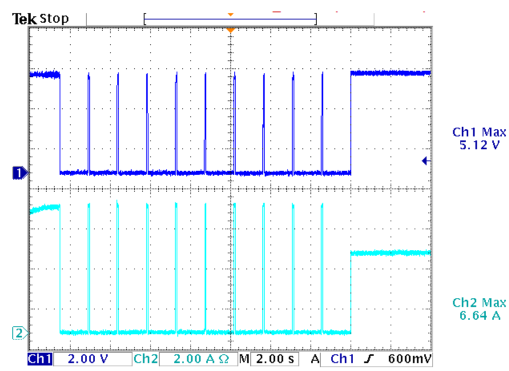

Fig. 36: OUTPUT OVER LOAD AT 230VAC
CH1: Vout, CH2: Over Load Current.

GB30S12K01

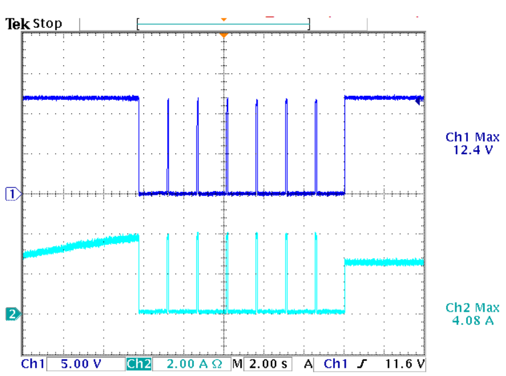

Fig. 37: OUTPUT OVER LOAD AT 115VAC.
CH1: Vout, CH2: Over Load Current.

GB30S12K01

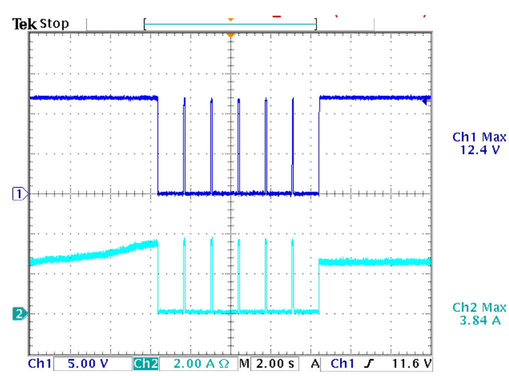

Fig. 38: OUTPUT OVER LOAD AT 230VAC
CH1: Vout, CH2: Over Load Current.

PERFORMANCE DATA

GB30S24K01

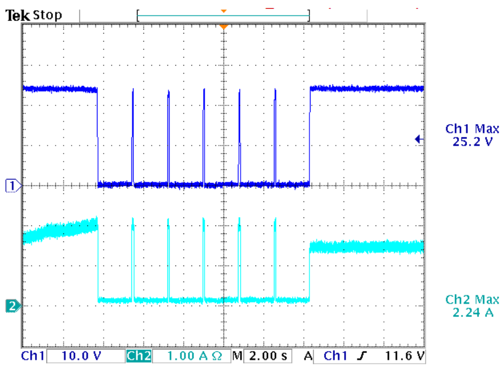

Fig. 39: OUTPUT OVER LOAD AT 115VAC.
CH1: Vout, CH2: Over Load Current.

GB30S24K01

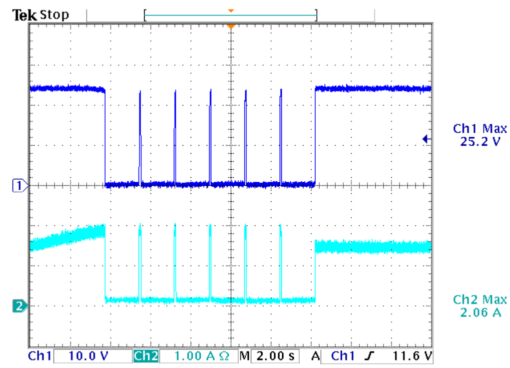

Fig. 40: OUTPUT OVER LOAD AT 230VAC.
CH1: Vout, CH2: Over Load Current.

GB30S48K01

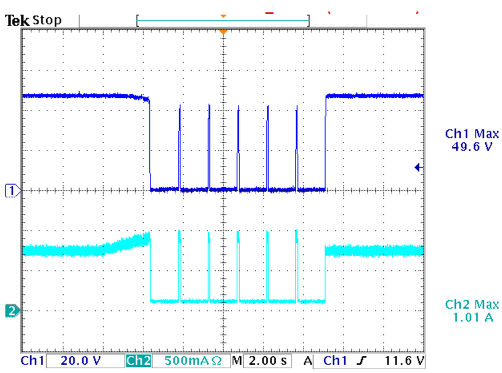

Fig. 41: OUTPUT OVER LOAD AT 115VAC.
CH1: Vout, CH2: Over Load Current.

GB30S48K01

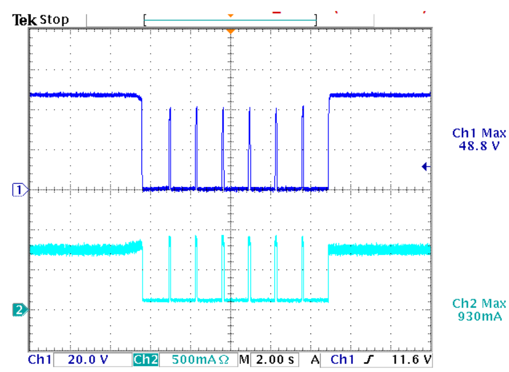

Fig. 42: OUTPUT OVER LOAD AT 230VAC.
CH1: Vout, CH2: Over Load Current.

Output Short Circuit Protection

GB30S05K01

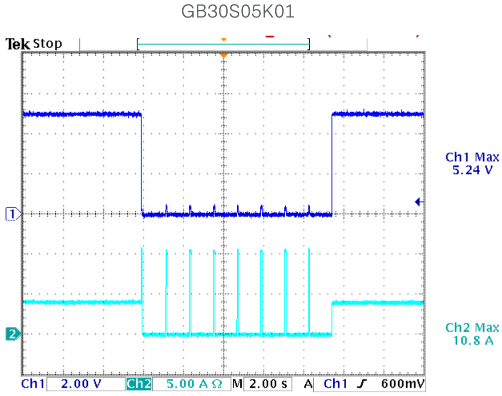

Fig. 43: OUTPUT SHORT CIRCUIT AT 115VAC.
CH1: Vout, CH2: Short Circuit Current.

GB30S05K01

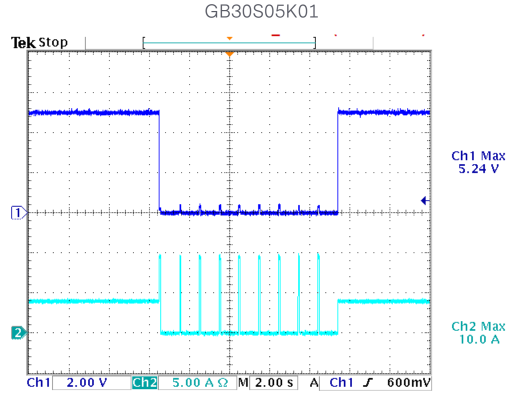

Fig. 44: OUTPUT SHORT CIRCUIT AT 230VAC.
CH1: Vout, CH2: Short Circuit Current.

PERFORMANCE DATA

GB30S12K01

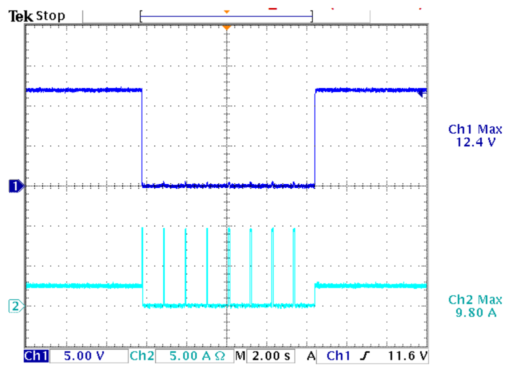

Fig. 45: OUTPUT SHORT CIRCUIT AT 115VAC.
CH1: Vout, CH2: Short Circuit Current.

GB30S12K01

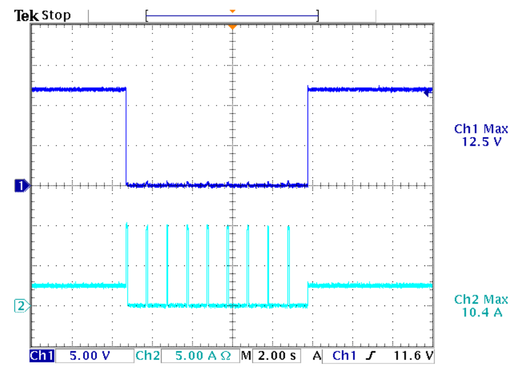

Fig. 46: HOUTPUT SHORT CIRCUIT AT 230VAC.
CH1: Vout, CH2: Short Circuit Current.

GB30S24K01

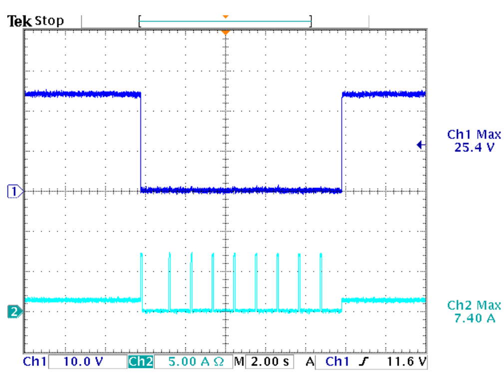

Fig. 47: OUTPUT SHORT CIRCUIT AT 115VAC.
CH1: Vout, CH2: Short Circuit Current.

GB30S24K01

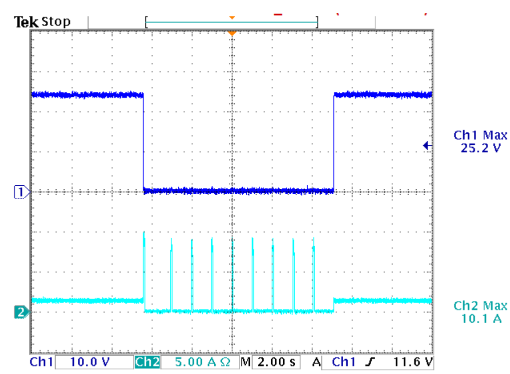

Fig. 48: OUTPUT SHORT CIRCUIT AT 230VAC.
CH1: Vout, CH2: Short Circuit Current.

GB30S48K01

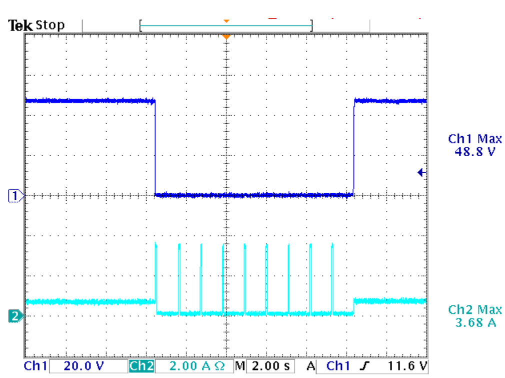

Fig. 49: OUTPUT SHORT CIRCUIT AT 115VAC.
CH1: Vout, CH2: Short Circuit Current.

GB30S48K01

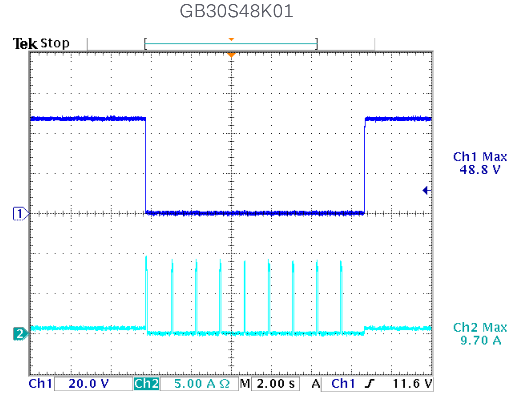

Fig. 50: OUTPUT SHORT CIRCUIT AT 230VAC.
CH1: Vout, CH2: Short Circuit Current.

PERFORMANCE DATA

Transient Response

GB30S05K01

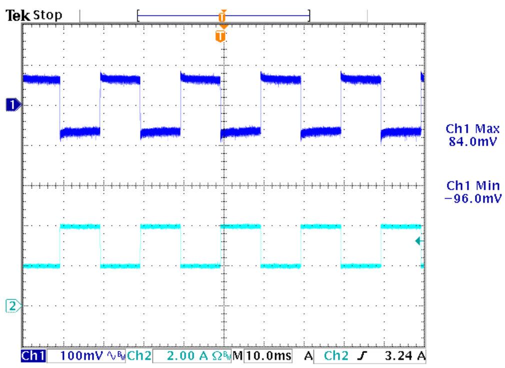

Fig. 51: TRANSIENT RESPONSE AT 115VAC, 50%-100% STEP LOAD.
CH1: Vout, CH2: Load Current.

GB30S05K01

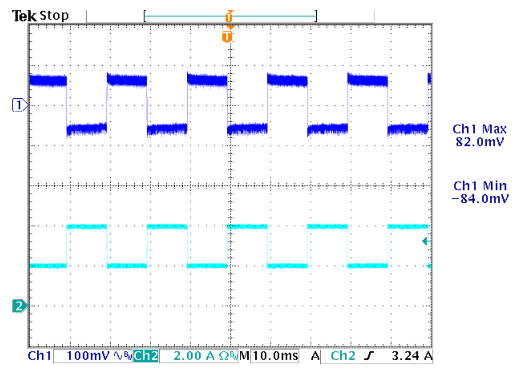

Fig. 52: TRANSIENT RESPONSE AT 230VAC, 50%-100% STEP LOAD.
CH1: Vout, CH2: Load Current.

GB30S12K01

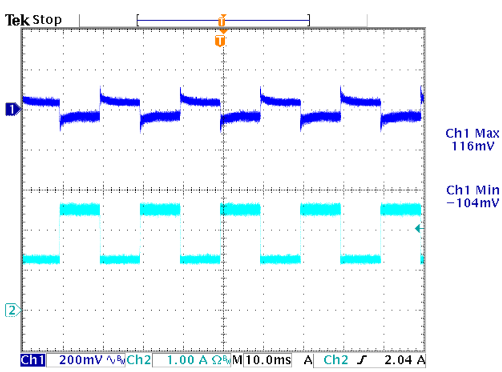

Fig. 53: TRANSIENT RESPONSE AT 115VAC, 50%-100% STEP LOAD.
CH1: Vout, CH2: Load Current.

GB30S12K01

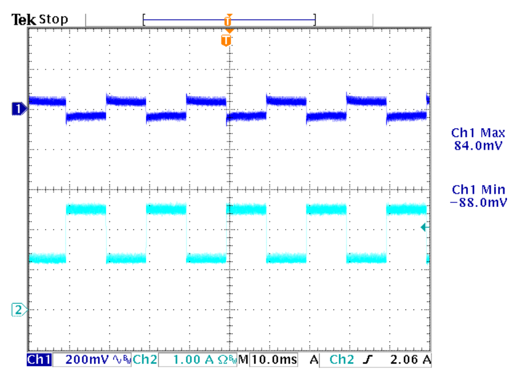

Fig. 54: TRANSIENT RESPONSE AT 230VAC, 50%-100% STEP LOAD.
CH1: Vout, CH2: Load Current.

GB30S24K01

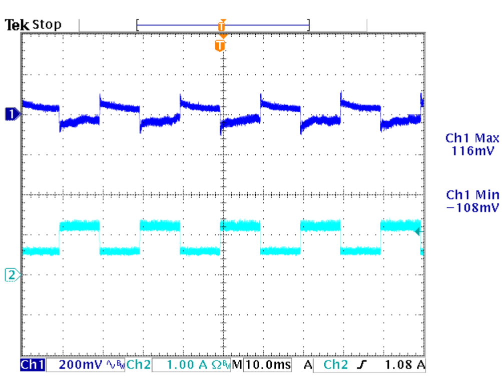

Fig. 55: TRANSIENT RESPONSE AT 115VAC, 50%-100% STEP LOAD.
CH1: Vout, CH2: Load Current.

GB30S24K01

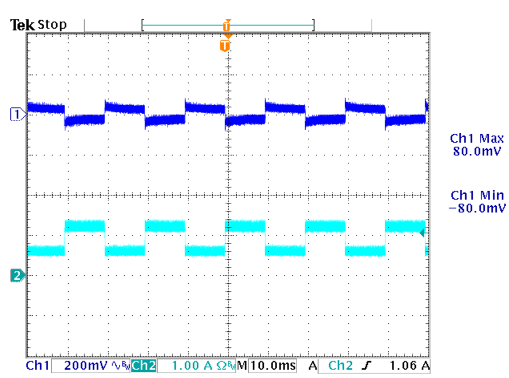

Fig. 56: TRANSIENT RESPONSE AT 230VAC, 50%-100% STEP LOAD.
CH1: Vout, CH2: Load Current.

PERFORMANCE DATA

GB30S48K01

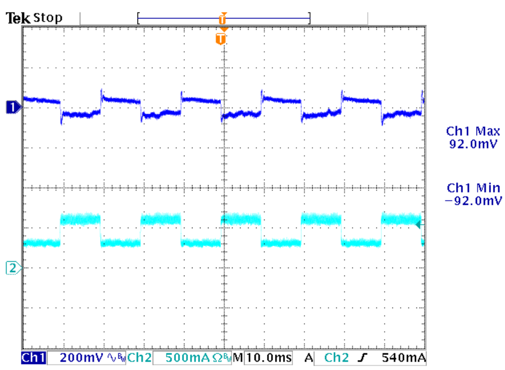

Fig. 57: TRANSIENT RESPONSE AT 115VAC, 50%-100% STEP LOAD.
CH1: Vout, CH2: Load Current.

GB30S48K01

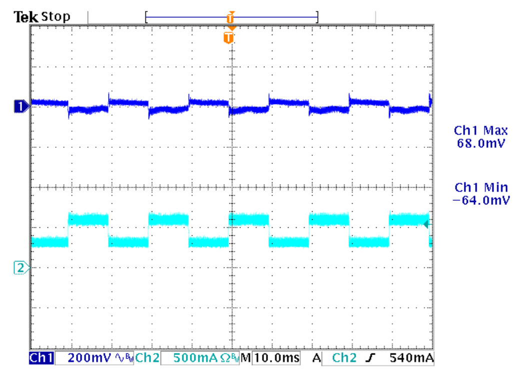

Fig. 58: TRANSIENT RESPONSE AT 230VAC, 50%-100% STEP LOAD.
CH1: Vout, CH2: Load Current.

Output Return Shorted to Ground Common Mode Current

GB30S05K01

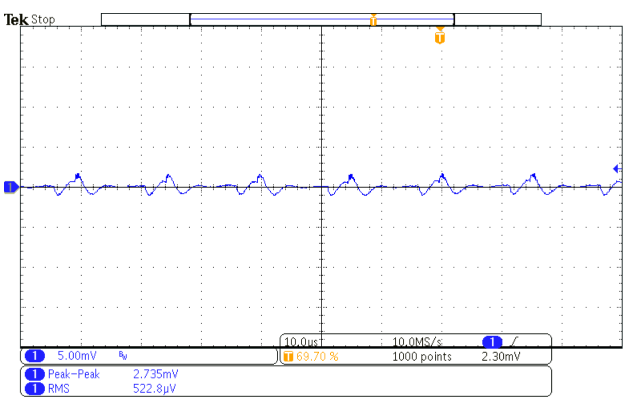

Fig. 59: COMMON MODE CURRENT AT 115VAC.
CURRENT PROBE: 1mA/mV

GB30S05K01

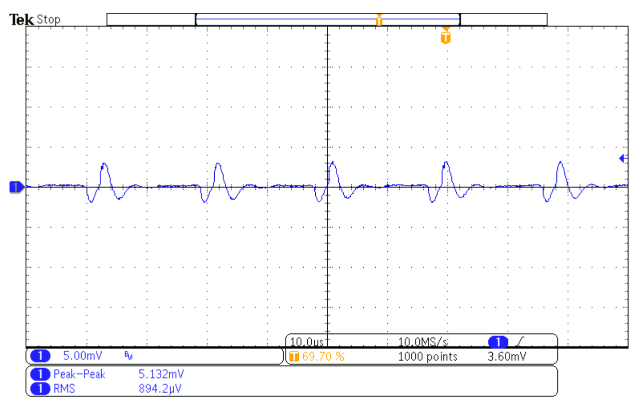

Fig. 60: COMMON MODE CURRENT AT 230VAC.
CURRENT PROBE: 1mA/mV

GB30S12K01

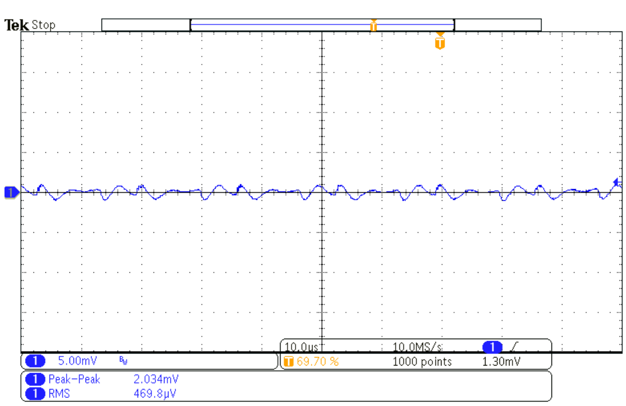

Fig. 61: COMMON MODE CURRENT AT 115VAC.
CURRENT PROBE: 1mA/mV

GB30S12K01

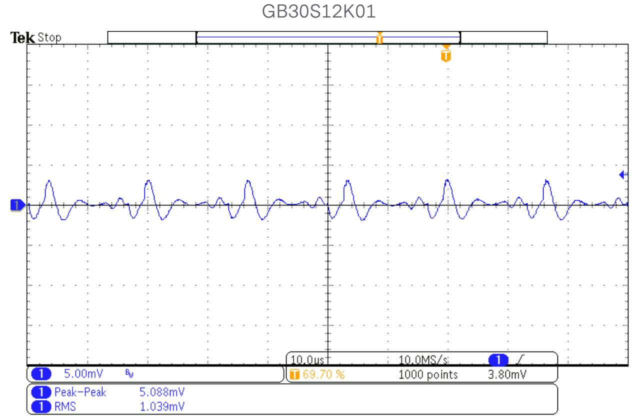

Fig. 62: COMMON MODE CURRENT AT 230VAC.
CURRENT PROBE: 1mA/mV

PERFORMANCE DATA

GB30S24K01

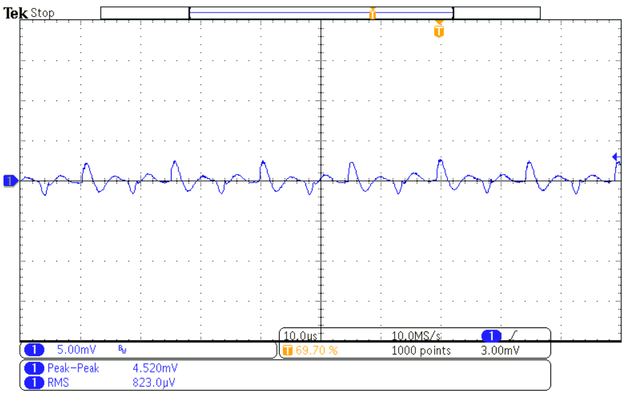

Fig. 63: COMMON MODE CURRENT AT 115VAC.
CURRENT PROBE: 1mA/mV

GB30S24K01

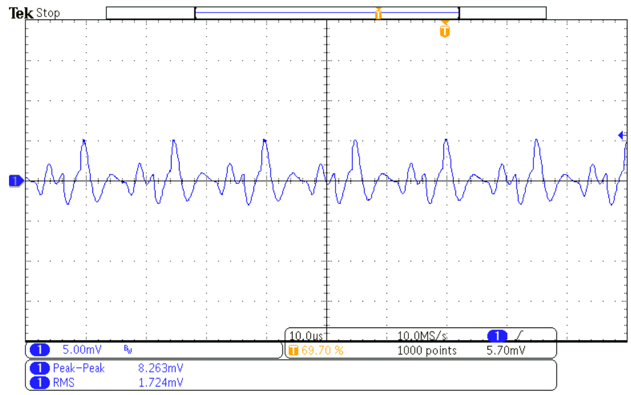

Fig. 64: COMMON MODE CURRENT AT 230VAC.
CURRENT PROBE: 1mA/mV

GB30S48K01

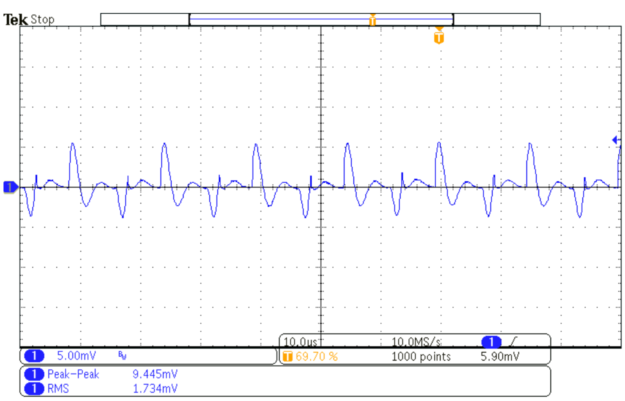

Fig. 65: COMMON MODE CURRENT AT 115VAC.
CURRENT PROBE: 1mA/mV

GB30S48K01

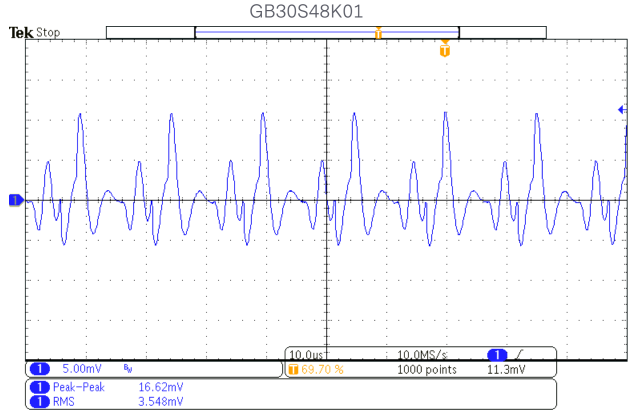

Fig. 66: COMMON MODE CURRENT AT 230VAC.
CURRENT PROBE: 1mA/mV

PERFORMANCE DATA

Conducted Emissions

GB30S05K01

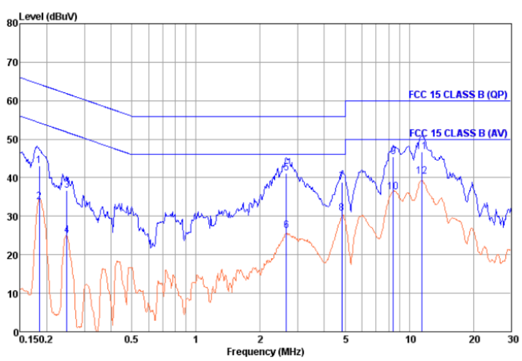

Fig. 67: EN55032 CLASS B – 120V/60Hz 100% LOAD MARGIN: >9 dB.
Blue Plot: Quasi-Peak. Red Plot: Average.

GB30S05K01

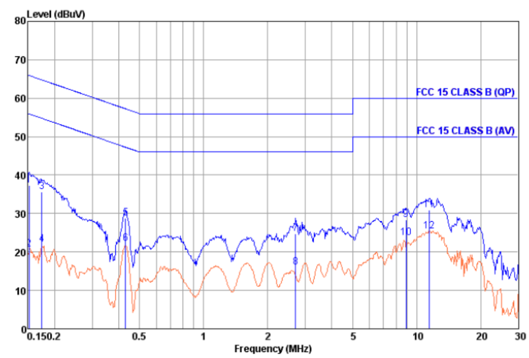

Fig. 68: EN55032 CLASS B – 120V/60Hz 10% LOAD MARGIN: >10 dB.
Blue Plot: Quasi-Peak. Red Plot: Average.

GB30S05K01

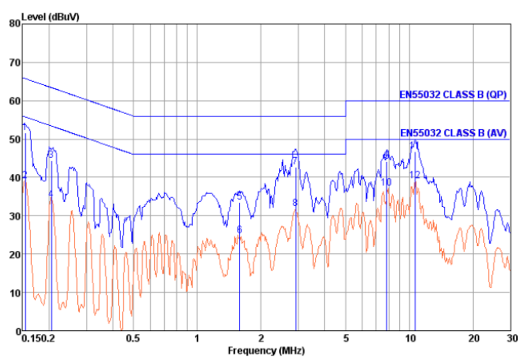

Fig. 69: EN55032 CLASS B – 230V/50Hz 100% LOAD MARGIN: >10 dB.
Blue Plot: Quasi-Peak. Red Plot: Average.

GB30S05K01

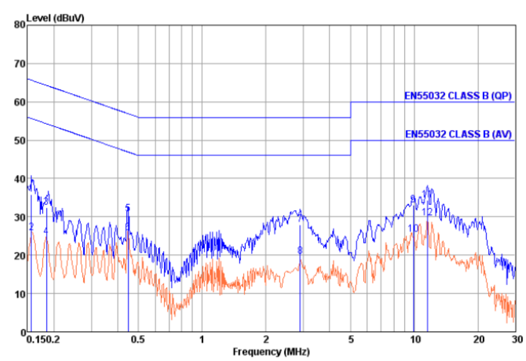

Fig. 70: EN55032 CLASS B – 230V/50Hz 10% LOAD MARGIN: >10 dB.
Blue Plot: Quasi-Peak. Red Plot: Average.

GB30S12K01

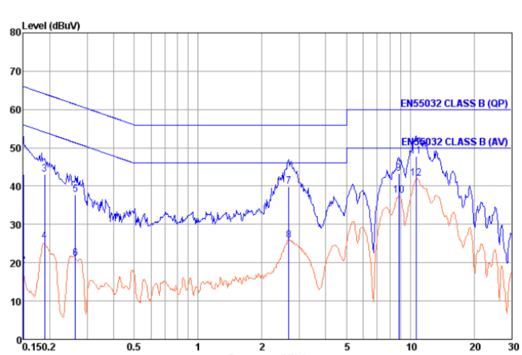

Fig. 71: EN55032 CLASS B – 120V/60Hz 100% LOAD MARGIN: >8 dB.
Blue Plot: Quasi-Peak. Red Plot: Average.

GB30S12K01

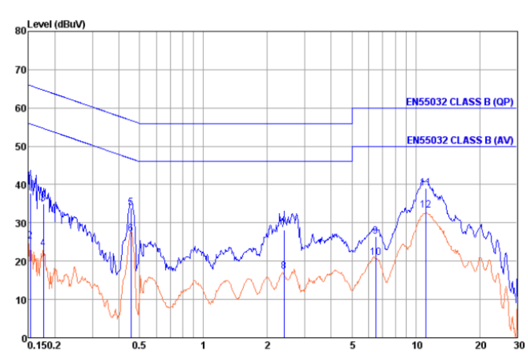

Fig. 72: EN55032 CLASS B – 120V/60Hz 10% LOAD MARGIN: >10 dB.
Blue Plot: Quasi-Peak. Red Plot: Average.

PERFORMANCE DATA

GB30S12K01

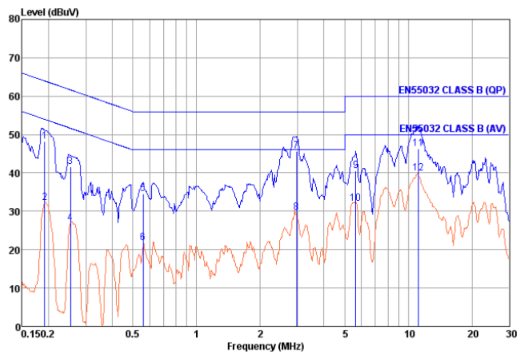

Fig. 73: EN55032 CLASS B – 230V/50Hz 100% LOAD MARGIN: >10 dB.
Blue Plot: Quasi-Peak. Red Plot: Average.

GB30S12K01

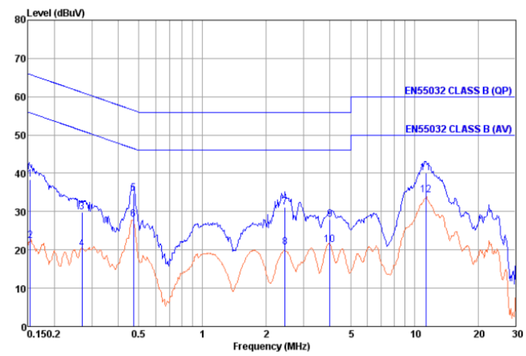

Fig. 74: EN55032 CLASS B – 230V/50Hz 10% LOAD MARGIN: >10 dB.
Blue Plot: Quasi-Peak. Red Plot: Average.

GB30S24K01

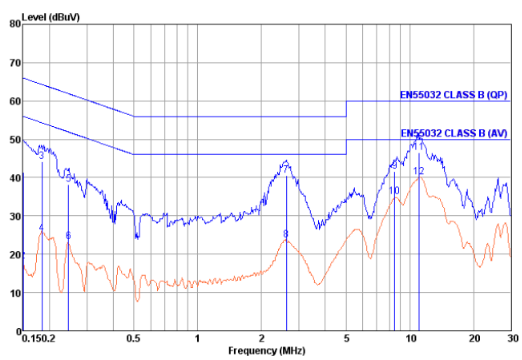

Fig. 75: EN55032 CLASS B – 120V/60Hz 100% LOAD MARGIN: >9 dB.
Blue Plot: Quasi-Peak. Red Plot: Average.

GB30S24K01

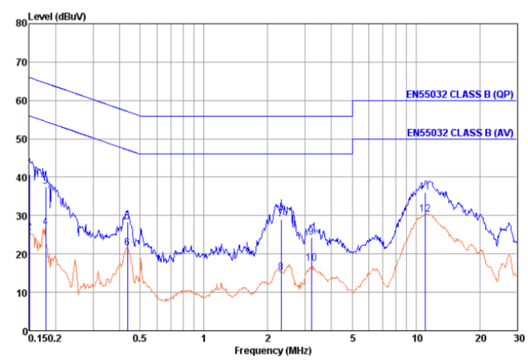

Fig. 76: EN55032 CLASS B – 120V/60Hz 10% LOAD MARGIN: >10 dB.
Blue Plot: Quasi-Peak. Red Plot: Average.

GB30S24K01

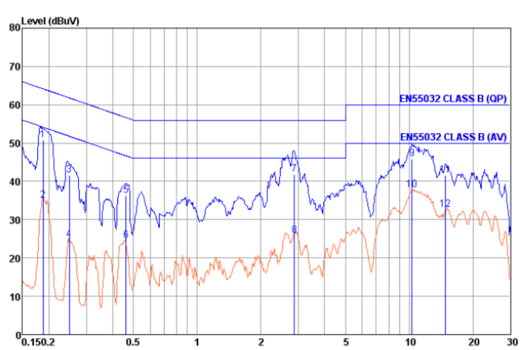

Fig. 77: EN55032 CLASS B – 230V/50Hz 100% LOAD MARGIN: >10 dB.
Blue Plot: Quasi-Peak. Red Plot: Average.

GB30S24K01

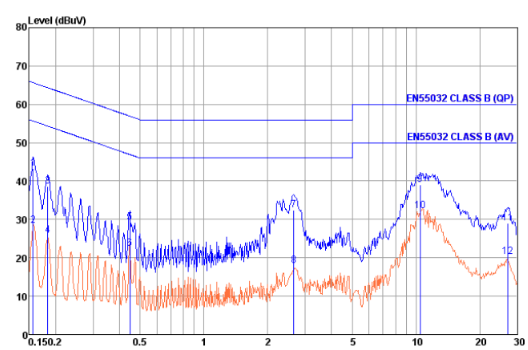

Fig. 78: EN55032 CLASS B – 230V/50Hz 10% LOAD MARGIN: >10 dB.
Blue Plot: Quasi-Peak. Red Plot: Average.

PERFORMANCE DATA

GB30S48K01

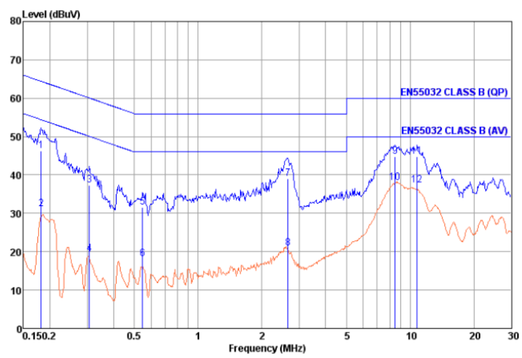

Fig. 79: EN55032 CLASS B – 120V/60Hz 100% LOAD MARGIN: >10 dB.
Blue Plot: Quasi-Peak. Red Plot: Average.

GB30S48K01

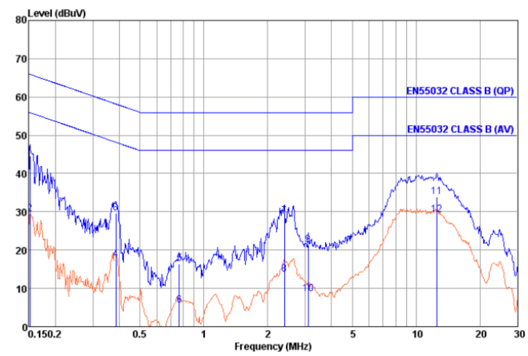

Fig. 80: EN55032 CLASS B – 120V/60Hz 10% LOAD MARGIN: >10 dB.
Blue Plot: Quasi-Peak. Red Plot: Average.

GB30S48K01

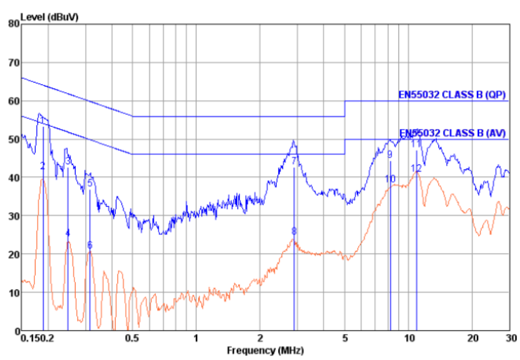

Fig. 81: EN55032 CLASS B – 230V/50Hz 100% LOAD MARGIN: >9 dB.
Blue Plot: Quasi-Peak. Red Plot: Average.

GB30S48K01

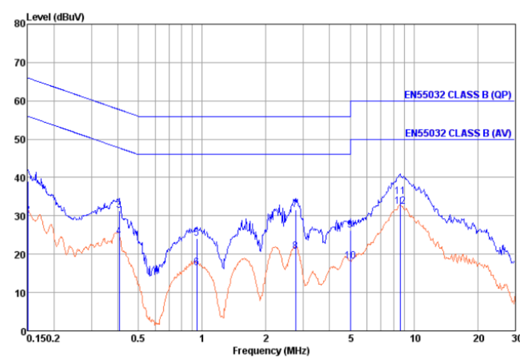

Fig. 82: EN55032 CLASS B – 230V/50Hz 10% LOAD MARGIN: >10 dB.
Blue Plot: Quasi-Peak. Red Plot: Average.

PERFORMANCE DATA

Load Capacitance

Model Number	Recommended Max Load Capacitance (µF)
GB30S05K01	70,000
GB30S07K01	40,000
GB30S09K01	40,000
GB30S12K01	27,000
GB30S15K01	21,000
GB30S18K01	14,000
GB30S24K01	10,000
GB30S48K01	2,500

Consult with AE Field Application Engineer if higher load capacitance level is required.

Efficiency Curves

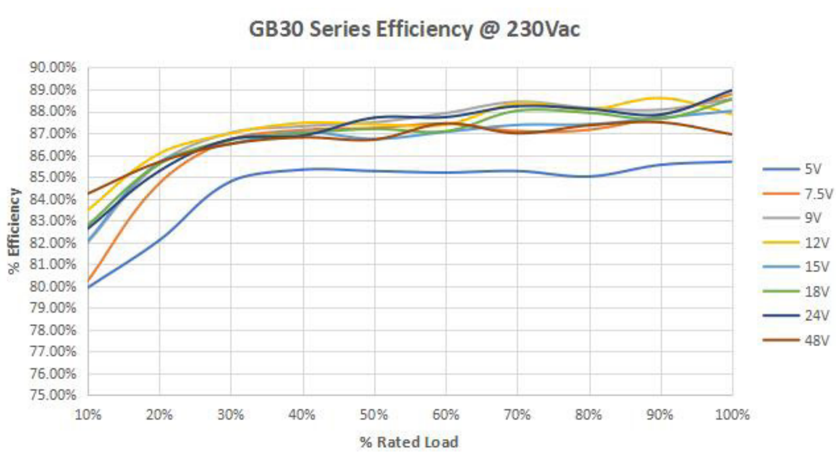

Fig. 83: GB30 Series Efficiency Curves

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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