
# TF800 Family
# Industrial Power Supplies
## Single Output 800 Watt
## AN-P025

## OVERVIEW

Power supplies from the TF800 Family offer single output AC to DC converters for industrial use. Beside the wide AC input voltage range 90VAC–264VAC it supports also DC input voltage 127VDC–370VDC. Intelligent fan control based on load and temperature monitoring allows to reduce audible noise whenever the power level is low. Integration of latest technologies enables users to benefit from two most required features for power control in one unit: full range output voltage and/or full range output current control, which offers great flexibility and user customization in many applications.

TF800 series power supplies support RS 232/RS 485 UART control interface based on RXD/TXD TTL signals or I²C interface based on serial clock (SCL) and serial data (SDA) signals. Both allow to control functions such as ON/OFF control, output current limit and output voltage settings. With same communication interfaces user can read out actual output voltage, output current, internal temperature, status of the unit and manufacturing related data such as model name, serial number etc. To simplify digital communication with the unit a graphical user interface (GUI) among with user control interface board CT-251 can be used.
For users without a host PC or for quick indication an intelligent 3 color LED reports the global status of the unit such as power OK in remote or local mode, standby, failure signals for overvoltage, overcurrent or overtemperature, fan failure and power failure. Exact LED indication is listed in datasheets.

To achieve higher output power a synchronized array of several power supplies from TF800 family may be connected in parallel. More detailed information is described in "proper use" section of this document and in datasheet.

TF800 family is certified to EN 60950-1 and UL 60950-1 safety standards and complies with IEC61000-x EMI/EMC directives to allow final equipment to meet industrial requirements. Contact your field application support for other standards.

This application note provides guidance for proper use, system design considerations and key performance data of TF800 series power supplies. Additional performance data is available upon request.

Data provided in the application note is for reference purposes and may not represent worst case conditions.

## MODEL SELECTION

| Model Number[2] | Output Voltage | Current Range | Ripple & Noise[2] | Efficiency |
|---|---|---|---|---|
| TF800A12K | 12.0V | 66.7A | 150mV pk-pk | 89% |
| TF800A15K | 15.0V | 53.4A | 150mV pk-pk | 90% |
| TF800A24K | 24.0V | 33.5A | 240mV pk-pk | 92% |
| TF800A48K | 48.0V | 16.7A | 480mV pk-pk | 92% |
| TF800A60K | 60.0V | 13.4A | 600mV pk-pk | 93% |

*All models are rated with 800 Watt output power, ±1% line regulation and ±1% load regulation.
*Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uF & 47uF parallel capacitor.
*Other output voltages available, consult your local technical support.

## PROPER USE

The TF800 AC-DC power supplies offer complete solution with intelligent fan control however users must consider proper installation of the units. Pay attention to following specifications and design requirements to ensure correct operation of your TF800 series power supply.

### Temperature

TF800 series operating temperature is rated between -25°C–+60°C, this range is given for power supply itself. Installation of power unit in an enclosed system may limit cooling which means the environment air temperature limits are narrower. Consult the datasheet for recommended distances of the power supply within a system for correct airflow.

### Remote Sense vs. Local Sense

The power supply comes by default with jumpers on local sense pins VS+ and VS- to corresponding output pins VO+ and VO-. To use remote sense feature, remove these jumpers and connect VS+/VS- pins with wires to the load +/- where regulation is desired. Leaving pins VS+ and VS- open degrade voltage regulation.
While using remote sense operation avoid loops between the power and sense lines. Poor wiring may cause remote lines to act as antennas which affect electromagnetic compatibility of the power supply. One technique is to route remote sense line in parallel to output power line. If not possible, another method is to use twisted pair for remote sense cables to reduce differential mode noise.
Remote sense operation compensates up to 500mV total voltage drop on the output cables. Consider the wire gage of the cable and it`s resistance to avoid fault power management.

Following table shows maximum allowed length of 2-wire cable to maintain within 500mV voltage drop dependent on output current and wire gauge.

| Output Cable Gauge (2 wire) | Max. allowed output cable length @500mV voltage drop | | | | | |
|---|---|---|---|---|---|---|
| | Output Current = 33.33A | | Output Current = 62.5A | | Output Current = 125A | |
| 12A WG | 144.0 cm | 56.7" | 76.8 cm | 30.2" | 38.4 cm | 15.1" |
| 14A WG | 90.5 cm | 35.6" | 48.3 cm | 19.0" | 24.1 cm | 9.5" |
| 16A WG | 56.8 cm | 22.4" | 30.3 cm | 11.9" | 15.2 cm | 6.0" |
| 18A WG | 35.7 cm | 14.1" | 19.0 cm | 7.5" | 9.5 cm | 3.7" |

### Safety

- Do not exceed the power rating of the product.
- Switch off the main AC power before connecting the power supply.
- TF800 series are defined as Class I equipment. Use input wire compliant to the local electrical code for the AC input for this model rating. The rating is listed on the product nameplate label.
- Do not exceed rated power of 0.5A @5V and 0.3A @9V setting on auxiliary output.

## Grounding

TF1500 series have three types of accessible grounds. Each of these ground connections has dedicated purpose to maintain within safety requirements or electrical characteristics stated in datasheet. Do not mix usage of these electrical contacts.

- Protective Earth (PE), marked as GND on AC input.
- The enclosure of power supply is directly connected to this electrical potential. Floating PE of the power supply may affect electromagnetic characteristics of the unit.
- Output Return, marked as (-) on DC output. Isolated from AC input, rated as SELV. This electrical potential is floating with respect to protective earth. Contact local field applications support to verify usage of arrays within your application.
- Signal Return, marked as GND on the CN2 connector (Pins 6,10), used for control signals on CN2 connector only. This electrical potential is a reference voltage for digital signals and control features on the power supply such as POK, AUX, ACI, VCI etc. Shorting of this node to other ground may feed common mode noise into the control system and distort the functionality of digital control or feedback loop.

## Mechanical Mounting

Use proper mating connectors for connection to the input, output and signal connectors of the power supply. Use the provided screws for AC and DC connection. If custom screws are to be used, pay attention to their length especially on AC side not to damage the mounting. The recommendation is to use cable lugs for proper and secured connection.
TF800 series power supply offer mounting options from the bottom and/or long sides of enclosure. Refer to the mechanical drawing in the datasheet for detailed dimensions. Use M4 screws with maximum penetration of 3mm measured from the enclosure surface. Ensure at least 50mm clearance at front and back side for proper ventilation.

## Communication Setup I²C Bus Interface Option

Serial Clock (SCL): This input signal is used to strobe all data in and out of the unit. It should be connected to +5V via a pull-up resistor of 2KΩ. The I²C interface is designed to run with a serial clock speed of 100KHz.

Serial Data (SDA): This bi-directional signal is used to transfer data in or out of the unit. It is an open drain output that may be wired with other open drain or open collector signal on the bus. A pull-up 2KΩ resistor must be connected from Serial Data (SDA) to +5V.

## Communication Setup RS 232/RS 485 Interface Option

The UART Communication Interface is based on 3-wire connection where two signals RXD and TXD are used with a host PC and reference both to control ground. The UART communication protocol invariably uses 4800 Baud rate, no parity check, 8 bit data and 1 stop bit (4800,N,8,1). This setting cannot be changed.

## Output Ripple Measurement Method

- Output noise and ripple limits are defined in the product datasheet and may vary depending on the output voltage. Consult the product datasheet prior to assessing the output ripple and noise measurement results.
- Noise measurements are made with noise probe directly at the end of 1.8m twisted pair wires terminated with a 0.1uF ceramic and 10uF electrolytic low ESR capacitors. Use a short tip oscilloscope voltage probe when making the measurement. This is required to eliminate measurement error due to impedance imbalance errors introduced by the scope probe ground lead length.

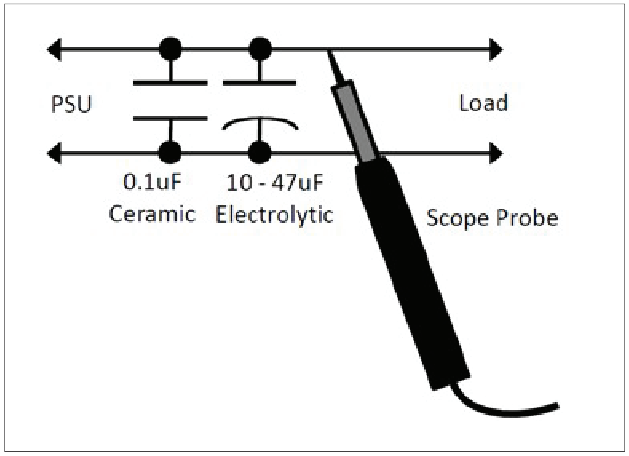


Fig. 01: Noise measurement caps and probe diagram.

## GUI Example

For the graphical user interface with the power supply a CT-201 module or similar can be used. Contact your local SLPE field applications support for GUI user manual and for more details.

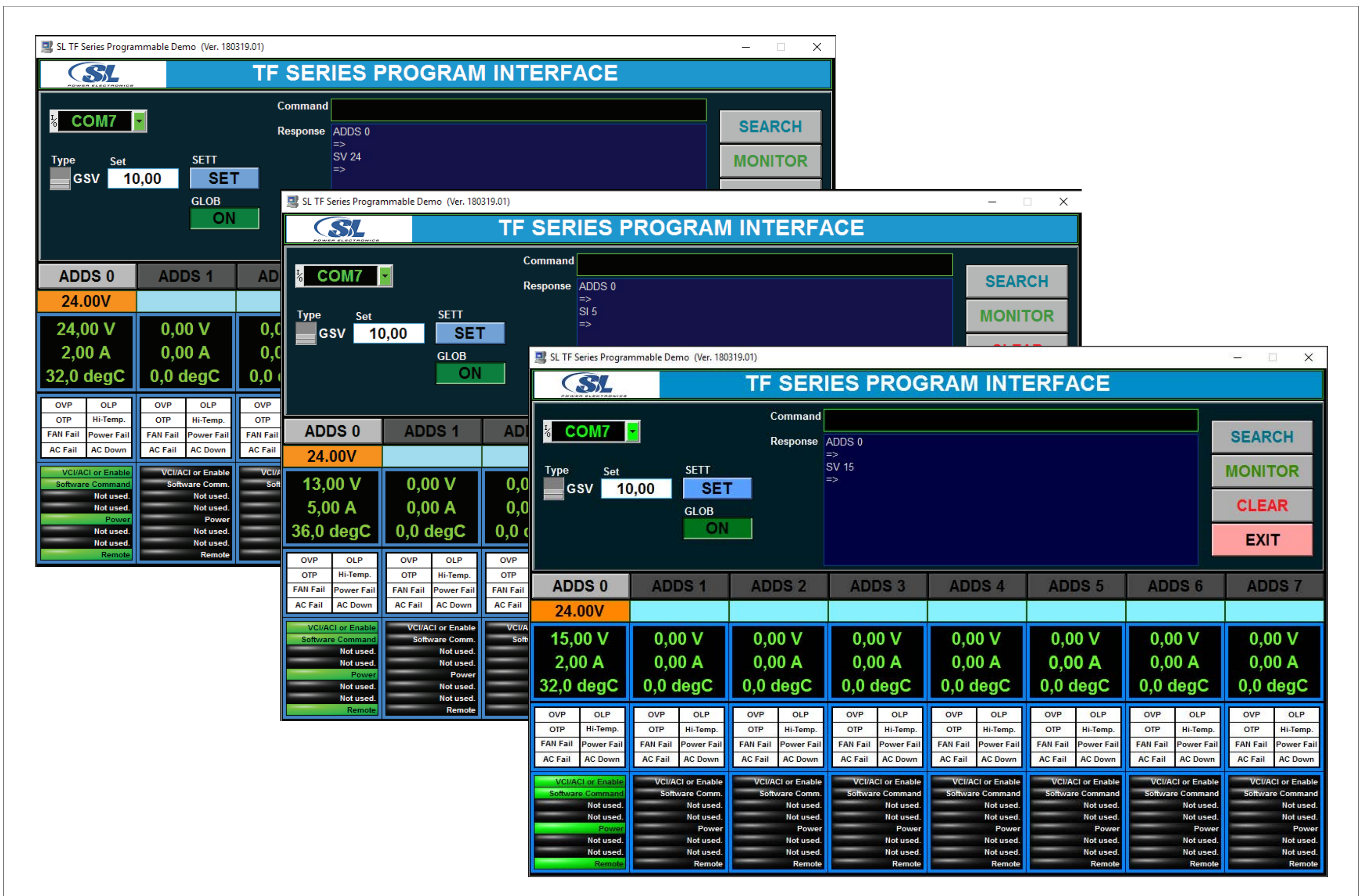


Fig. 02: GUI Example.

## General Information and Precautions

- It is not recommended to connect TF series power supplies in series for higher output voltage. Contact your local application team for higher voltage models.
- The TF series power supplies use 8-bit microcontroller. Therefore, the possible readout of output voltage and output current are limited approximately to one decimal digit. For example, while reading with the tool the output voltage of 50.23V it will be reported as 50.2V.

The feedback loop of TF series power supplies is implemented with 10-Bit A/D converters where 1-bit is reserved for factory parameter adjustment. The remaining 9-bits are defining voltage and current resolution of the power supply. For easy calculation of minimum output voltage or current steps use the following formula:

$$Voltage\ Resolution = \frac{Max.\ Rated\ Output\ Voltage}{512}$$

$$Current\ Resolution = \frac{Max.\ Rated\ Output\ Current}{512}$$

Calculation example for TF800A24K (800 Watt, 24V Model)

$$Voltage\ Resolution = \frac{24}{512} \cong 47\ mV$$

$$Current\ Resolution = \frac{33.5}{512} \cong 65\ mA$$

## PERFORMANCE DATA

The following data is provided to aid in proper selection and system design of TF800A24K.
Additional performance data is available upon request.

### Efficiency

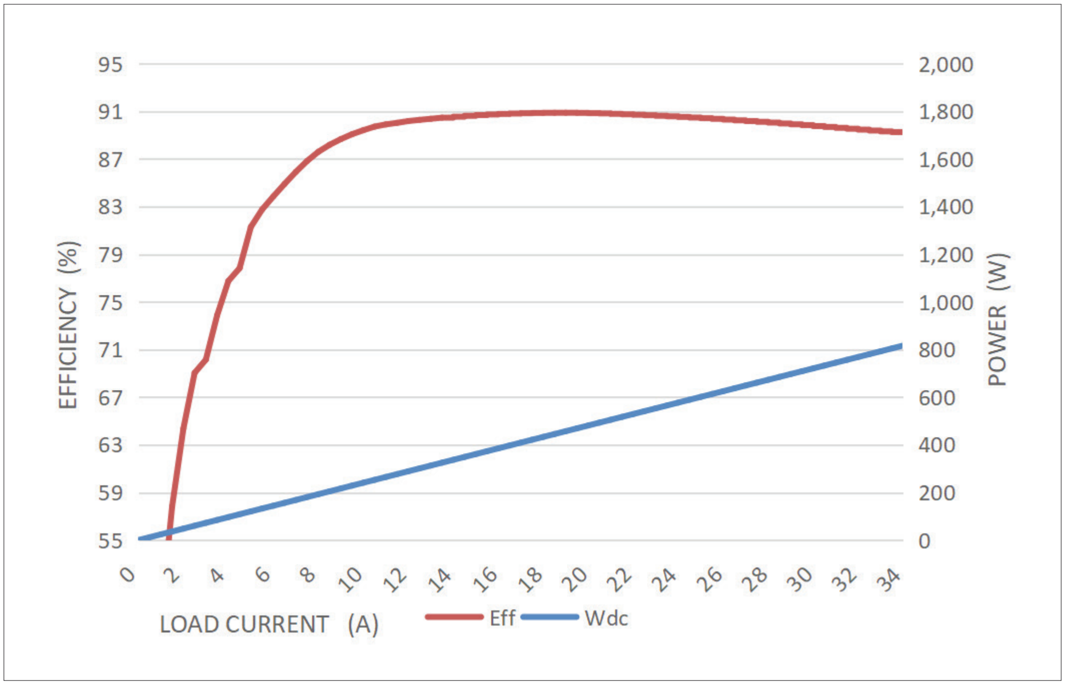


Fig. 03: TF800 series 24V model efficiency @115VAC.

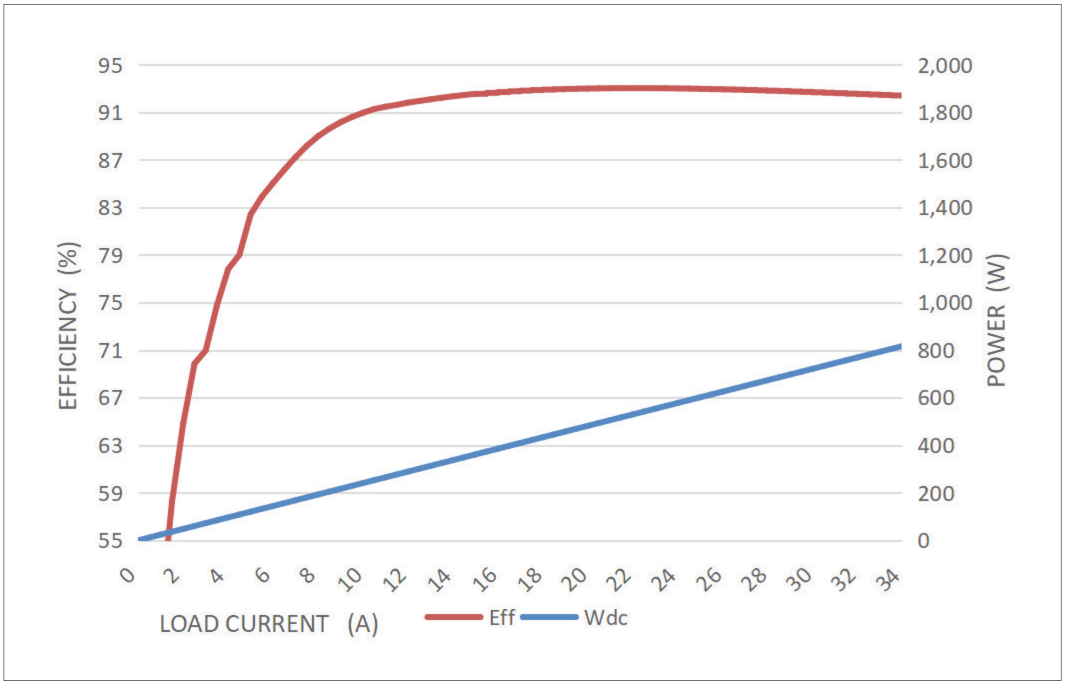


Fig. 04: TF800 series 24V model efficiency @230VAC.

## AC Inrush Current: 115VAC and 230VAC for 24V

The AC Input Inrush Current (cold start power on) is shown in the oscillograms below. Select the correct circuit breakers to avoid nuisance tripping while turning on one or more power supplies. On the input of each power supply EMI filtering X-Capacitors are used for better EMC performance. During power-up of the unit these capacitors are been charged and so cause short current spikes. The energy amount of this impulse is however very low and can be negligible.

**TF800A24K01**

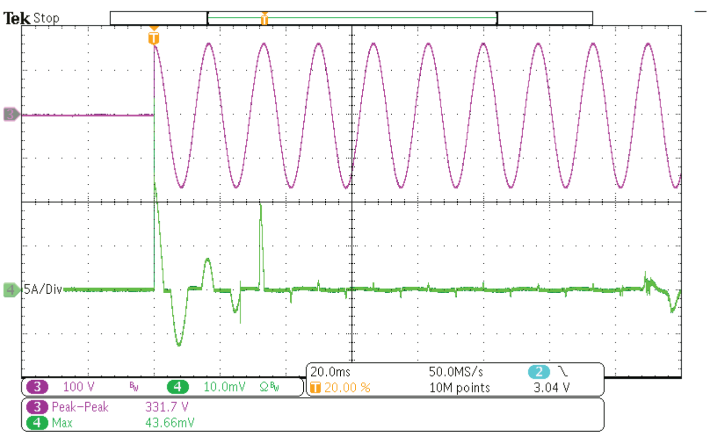


Fig. 05: INRUSH CURRENT AT 115VAC 800W.

CH3: Input Voltage.
CH4: Output Current.

**TF800A24K01**

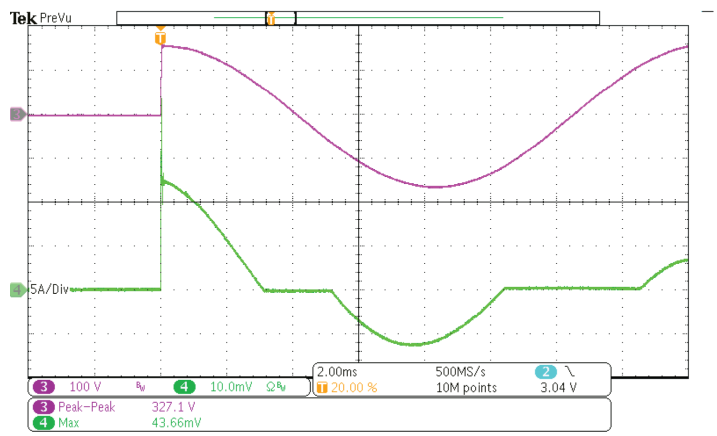


Fig. 06: INRUSH CURRENT AT 115VAC 800W.

CH3: Input Voltage.
CH4: Output Current.

**TF800A24K01**

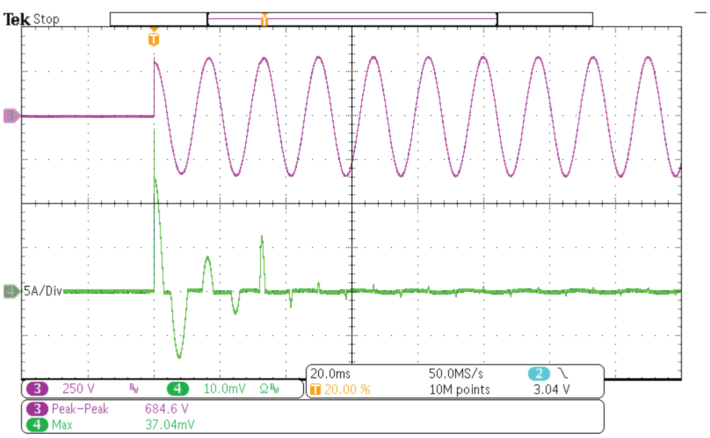


Fig. 07: INRUSH CURRENT AT 230VAC 800W.

CH3: Input Voltage.
CH4: Output Current.

**TF800A24K01**

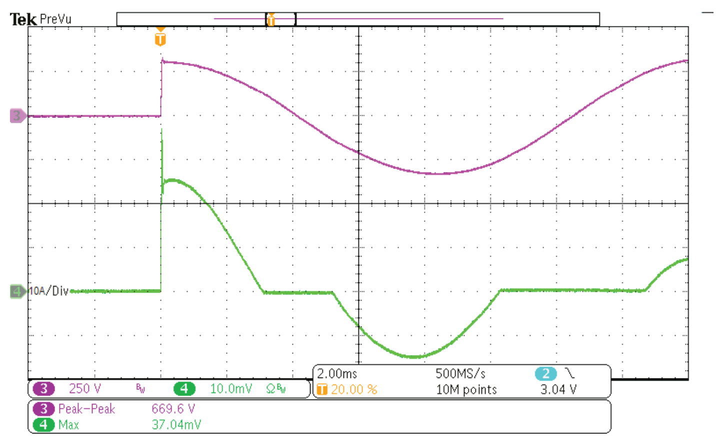


Fig. 08: INRUSH CURRENT AT 230VAC 800W.

CH3: Input Voltage.
CH4: Output Current.

## Turn-On Delay Time: 115VAC and 230VAC

### Constant Current Mode

At start-up a load current oscillation at near zero output voltage can occur. This anomaly is observed with electronic load operated in constant current mode rising across very low voltage. The load is trying to get adjusted output current as soon as any voltage on output of the power supply is present, ideally 100% of required current. Unlike a typical load the electronic loads are powered from external power source which affect the load characteristic during turn-on and so create oscillation as seen below. This phenomenon is not seen in constant resistance mode or in actual system loads where some voltage is developed before current starts to flow.

**TF800A24K01**

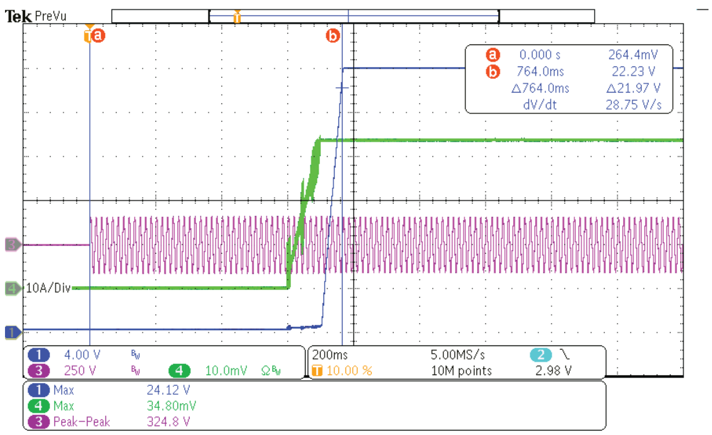


Fig. 09: TURN ON DELAY AT 115VAC 800W.

CH1: Output Voltage.
CH3: Input Voltage.
CH4: Output Current.

**TF800A24K01**

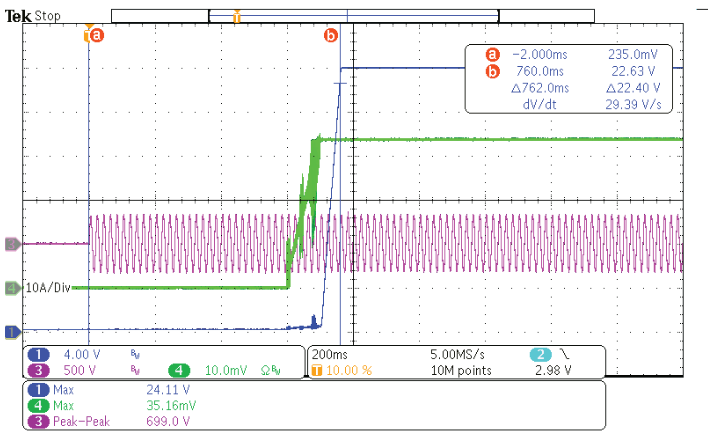


Fig. 10: TURN ON DELAY AT 230VAC 800W.

CH1: Output Voltage.
CH3: Input Voltage.
CH4: Output Current.

## Output Turn-On Rise Time: 115VAC and 230VAC No Load/Full Load

## Constant Current Mode

**TF800A24K01**

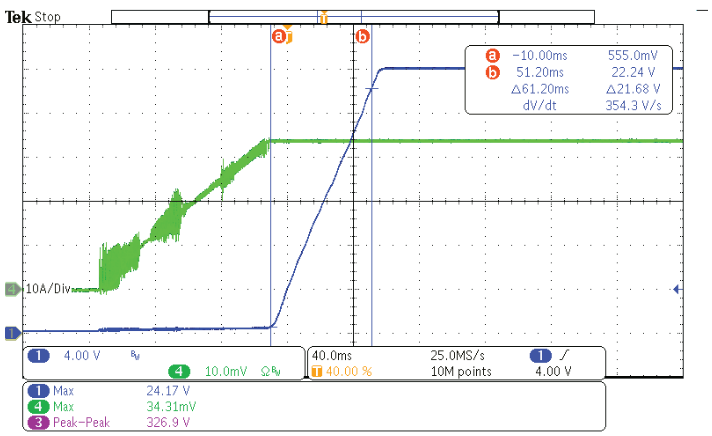


Fig. 11: TURN ON RISE TIME AT 115VAC 800W.

CH1: Output Voltage.
CH4: Output Current.

**TF800A24K01**

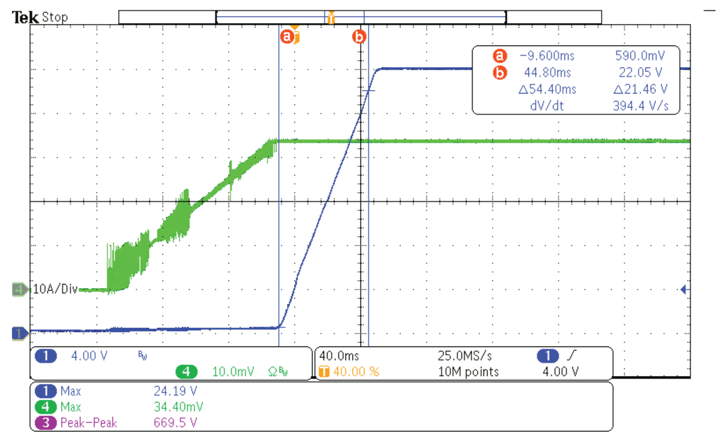


Fig. 12: TURN ON RISE TIME AT 230VAC 800W.

CH1: Output Voltage.
CH4: Output Current.

## Output Turn-On Rise Time: 115VAC and 230VAC No Load/Full Load

## Constant Resistance Mode

**TF800A24K01**

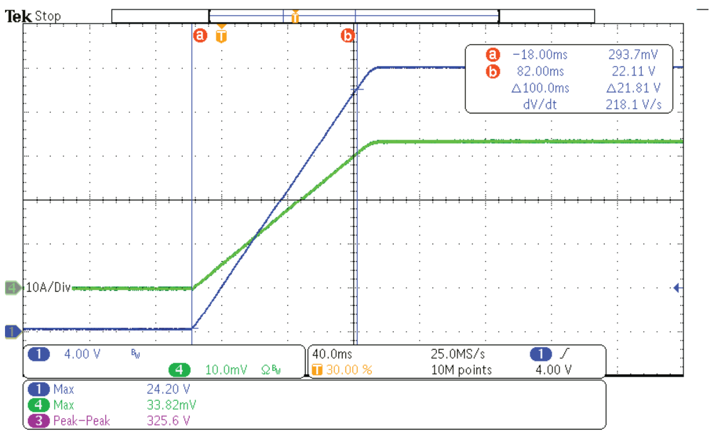


Fig. 13: TURN ON RISE TIME AT 115VAC 800W.

CH1: Output Voltage.
CH4: Output Current.

**TF800A24K01**

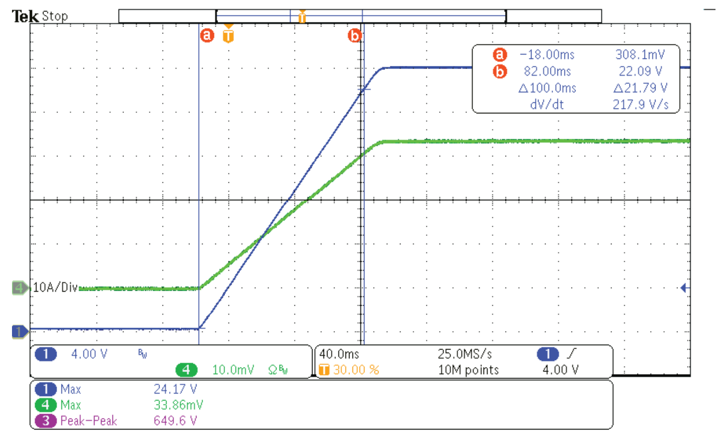


Fig. 14: TURN ON RISE TIME AT 230VAC 800W.

CH3: Output Voltage.
CH4: Output Current.

## Output Hold-Up Time: 100VAC, 115VAC & 230VAC

## Constant Current Mode (time to Vout drops to 90% rated)

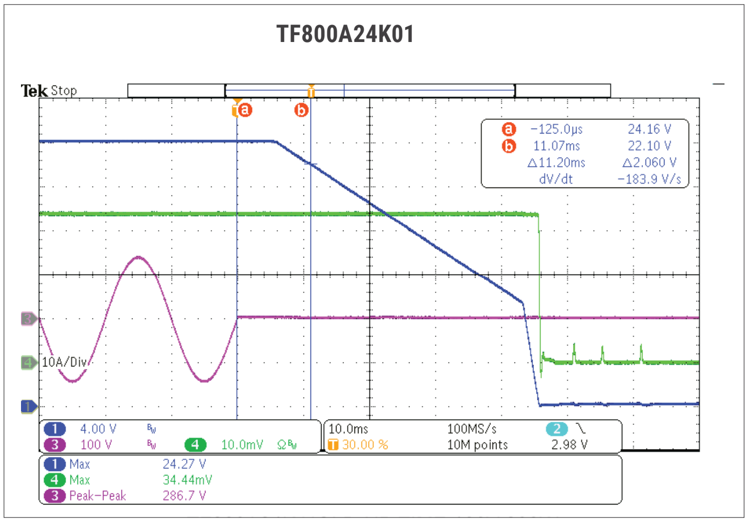


Fig. 15: HOLD-UP TIME AT 100VAC 800W.

CH1: Output Voltage.
CH3: Input Voltage.
CH4: Output Current.

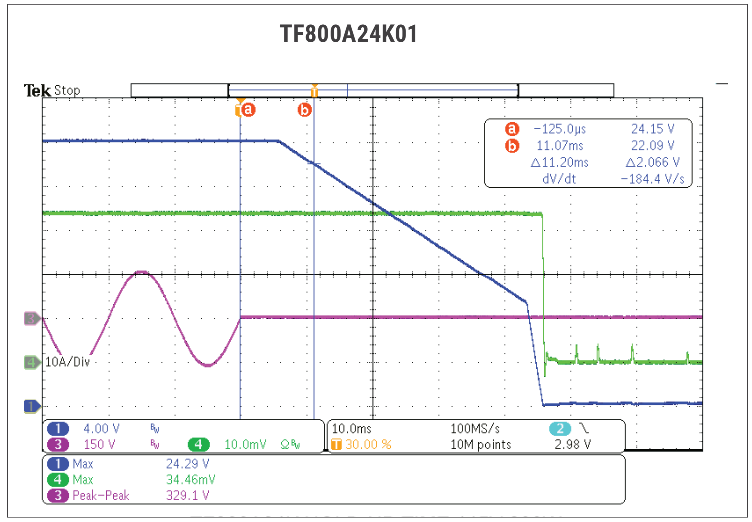


Fig. 16: HOLD-UP TIME AT 115VAC 800W.

CH1: Output Voltage.
CH3: Input Voltage.
CH4: Output Current.

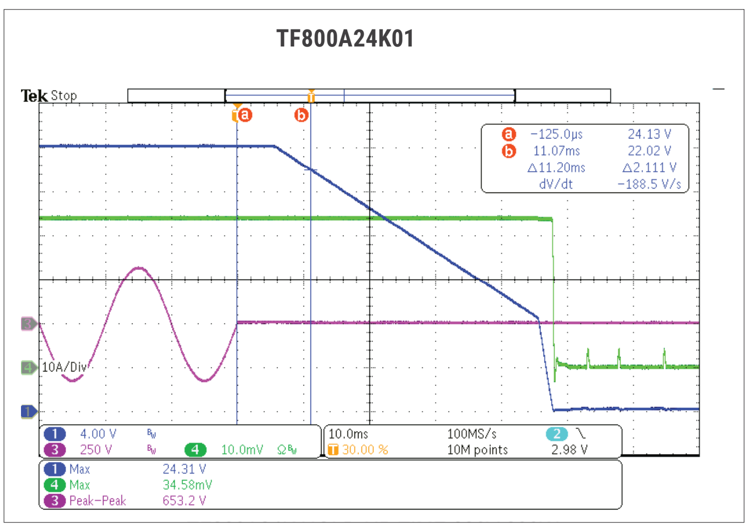


Fig. 17: HOLD-UP TIME AT 230VAC 800W.

CH1: Output Voltage.
CH3: Input Voltage.
CH4: Output Current.

## Overload Protection 115VAC and 230VAC

## Constant Current Mode

**TF800A24K01**

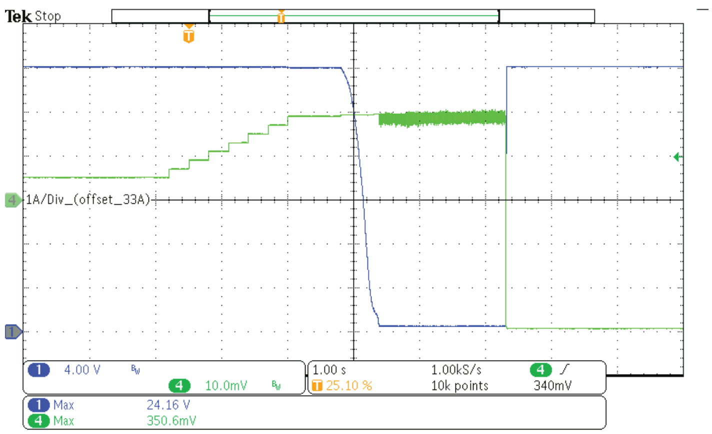


Fig. 18: OUTPUT OVERLOAD AT 115VAC.

CH1: Output Voltage.
CH4: Output Current.

**TF800A24K01**

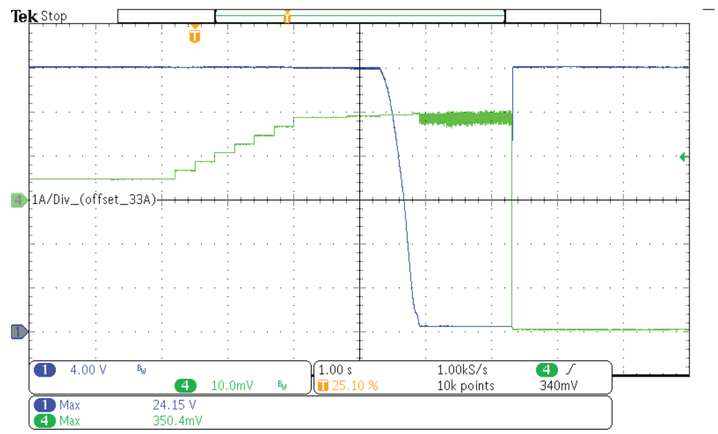


Fig. 19: OUTPUT OVERLOAD AT 230VAC.

CH1: Output Voltage.
CH4: Output Current.

For better visualization the power supply unit was preloaded with current of 33A.

## Short-Circuit Protection 115VAC and 230VAC

**TF800A24K01**

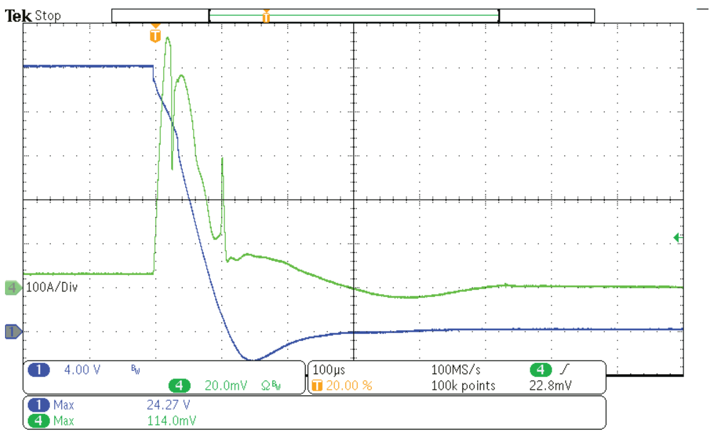


Fig. 20: SHORT CIRCUIT INITIAL EVENT AT 115VAC.

CH1: Output Voltage.
CH4: Output Current.

**TF800A24K01**

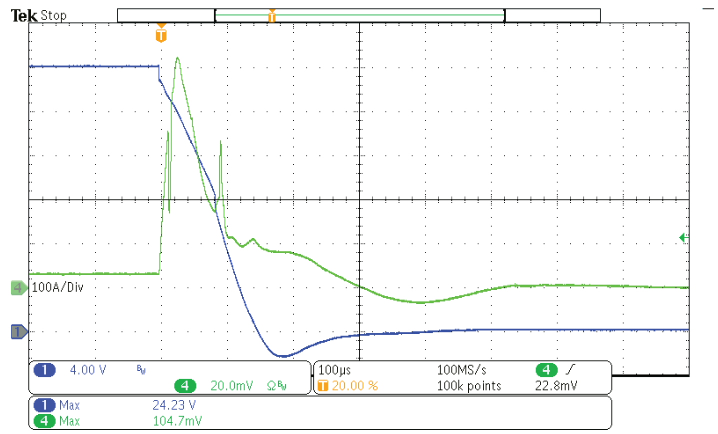


Fig. 21: SHORT CIRCUIT INITIAL EVENT AT 230VAC.

CH1: Output Voltage.
CH4: Output Current.

**TF800A24K01**

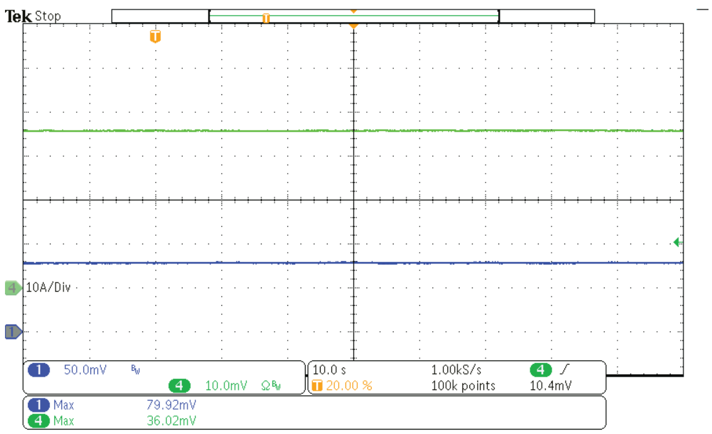


Fig. 22: SHORT CIRCUIT NO HCC-UP 115VAC.

CH1: Output Voltage.
CH4: Output Current.

**TF800A24K01**

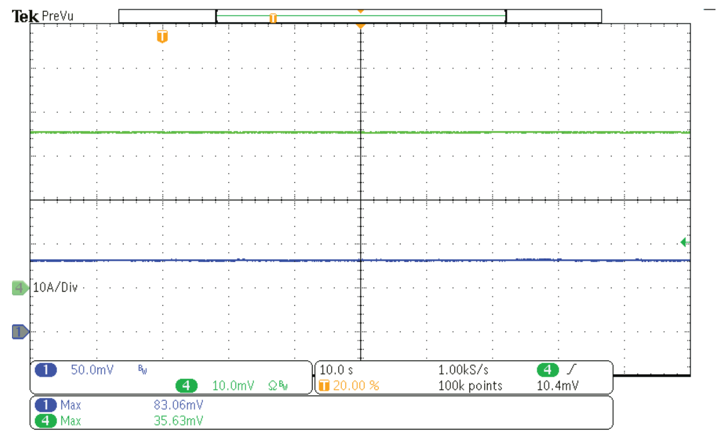


Fig. 23: SHORT CIRCUIT NO HCC-UP 230VAC.

CH1: Output Voltage.
CH4: Output Current.

**TF800A24K01**

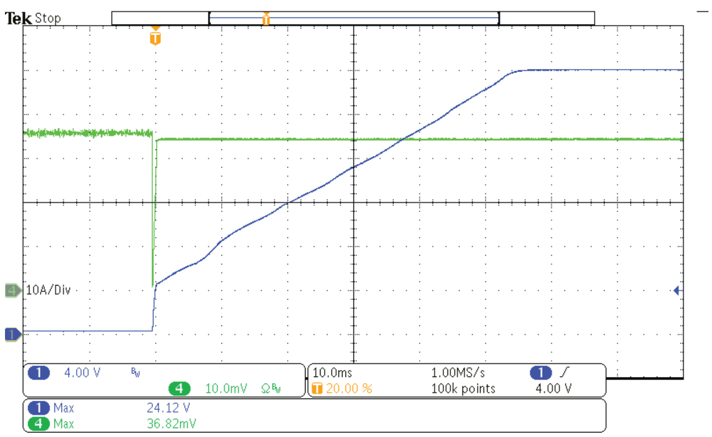


Fig. 24: SHORT  RECOVERY 115VAC.

CH1: Output Voltage.
CH4: Output Current.

**TF800A24K01**

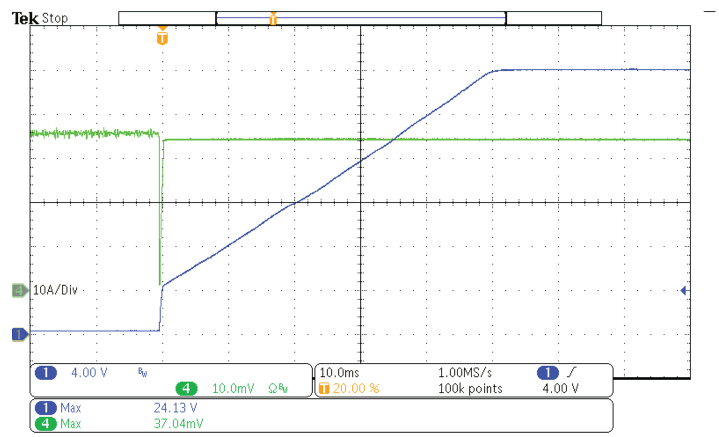


Fig. 25: SHORT CIRCUIT RECOVERY 230VAC.

CH1: Output Voltage.
CH4: Output Current.

## Transient Response 10%-50% 115VAC and 230VAC

TF800A24K01

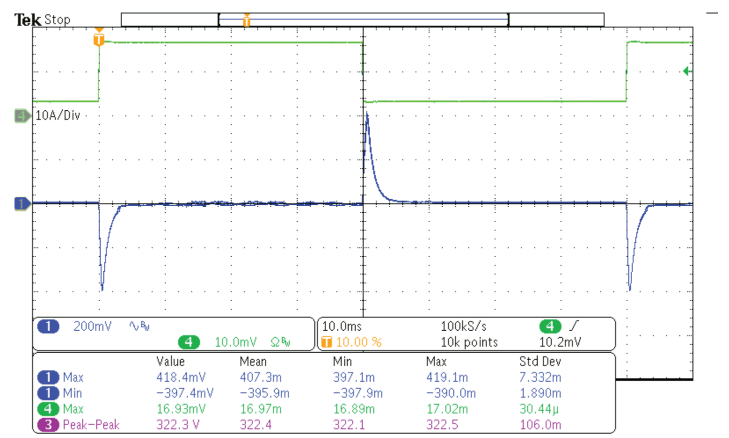


Fig. 26: TRANSIENT RESPONSE AT 115VAC, 10%-50% STEP LOAD.

CH1: Output Voltage.
CH4: Output Current.

TF800A24K01

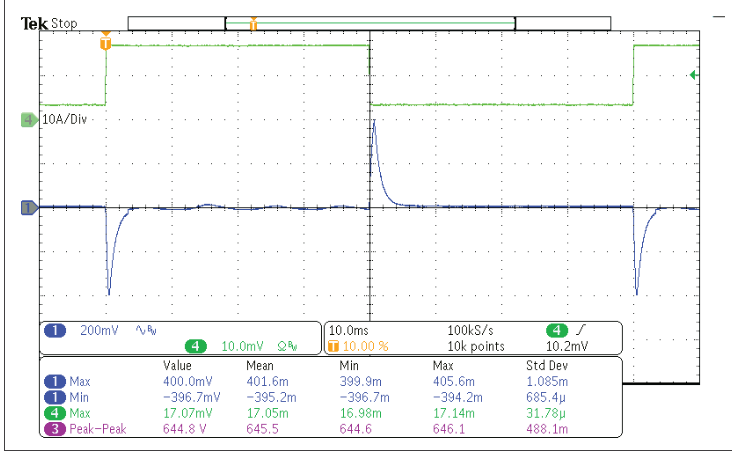


Fig. 27: TRANSIENT RESPONSE AT 230VAC, 10%-50% STEP LOAD.

CH1: Output Voltage.
CH4: Output Current.

## Full Cycle

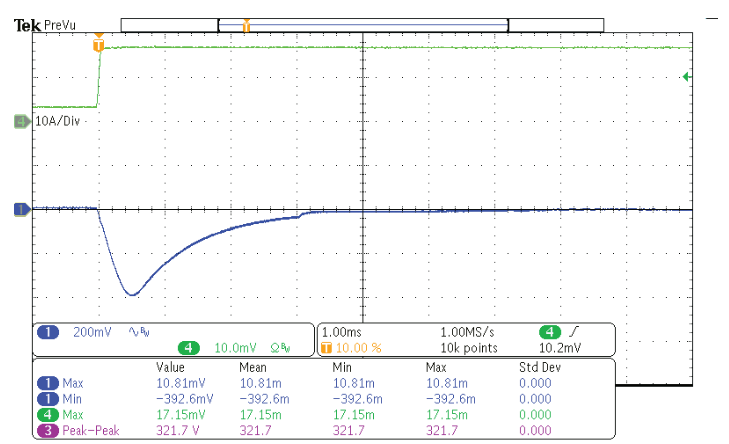


Fig. 28: TRANSIENT RESPONSE AT 115VAC, 10%-50% STEP LOAD.

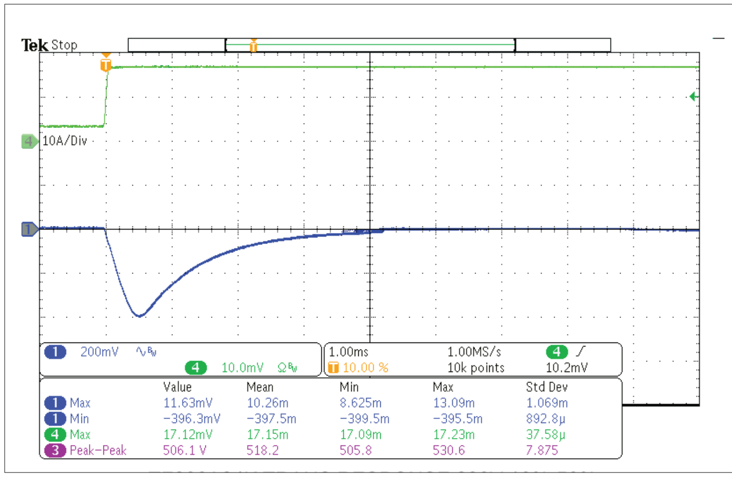


Fig. 29: TRANSIENT RESPONSE AT 230VAC, 10%-50% STEP LOAD.

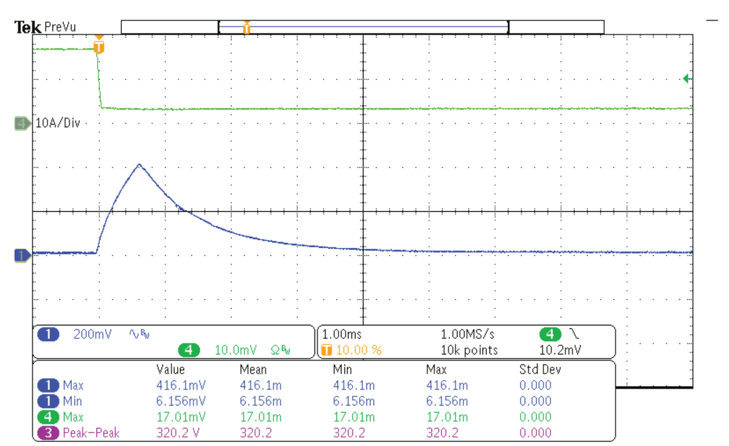


Fig. 30: TRANSIENT RESPONSE AT 115VAC, 10%-50% STEP LOAD.

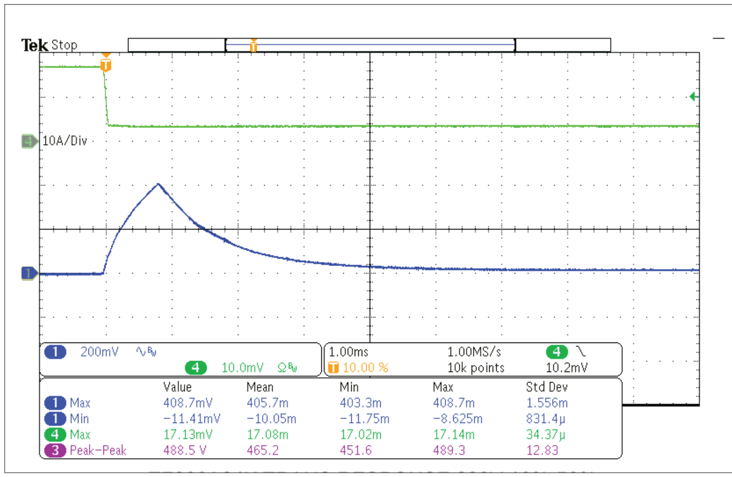


Fig. 31: TRANSIENT RESPONSE AT 230VAC, 10%-50% STEP LOAD.

## Transient Response 50%-100% 115VAC and 230VAC

**TF800A24K01**

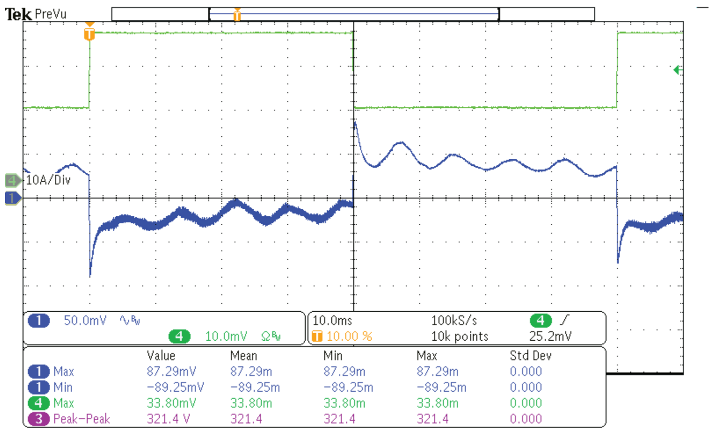


Fig. 32: TRANSIENT RESPONSE AT 115VAC, 50%-100% STEP LOAD.

CH1: Output Voltage.
CH4: Output Current.

**TF800A24K01**

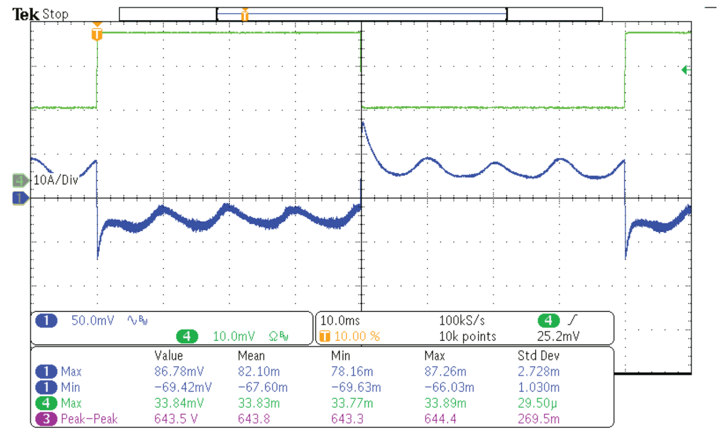


Fig. 33: TRANSIENT RESPONSE AT 230VAC, 50%-100% STEP LOAD.

CH1: Output Voltage.
CH4: Output Current.

## Full Cycle

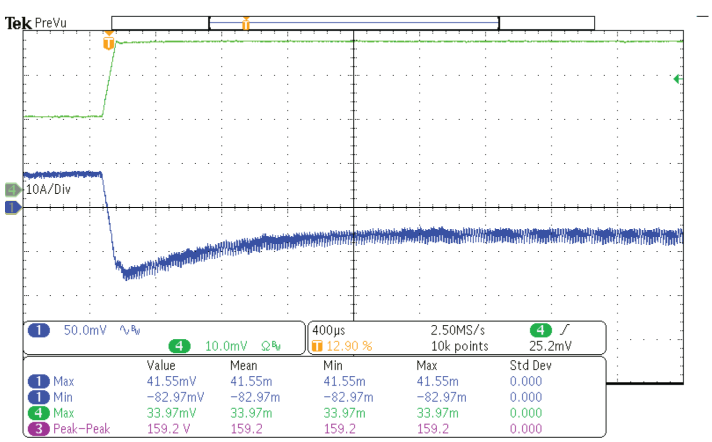


Fig. 34: TRANSIENT RESPONSE AT 115VAC, 50%-100% STEP LOAD.

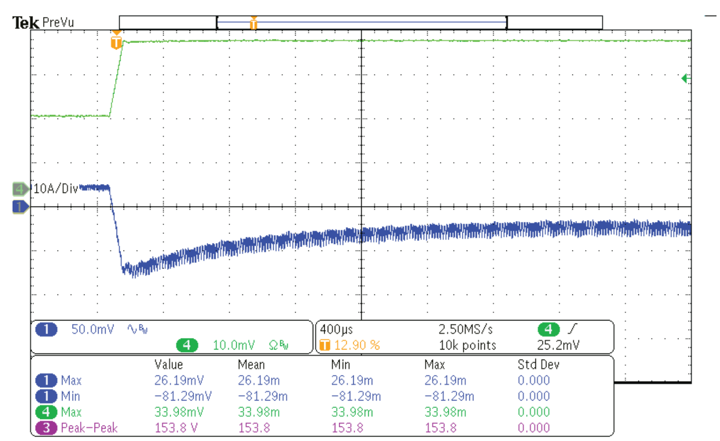


Fig. 35: TRANSIENT RESPONSE AT 230VAC, 50%-100% STEP LOAD.

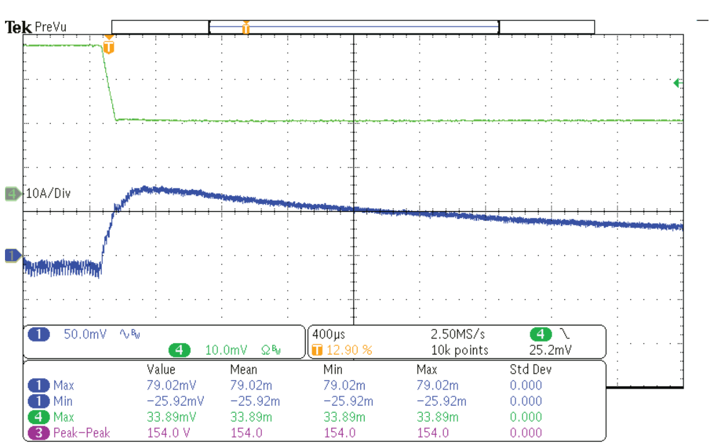


Fig. 36: TRANSIENT RESPONSE AT 115VAC, 50%-100% STEP LOAD.

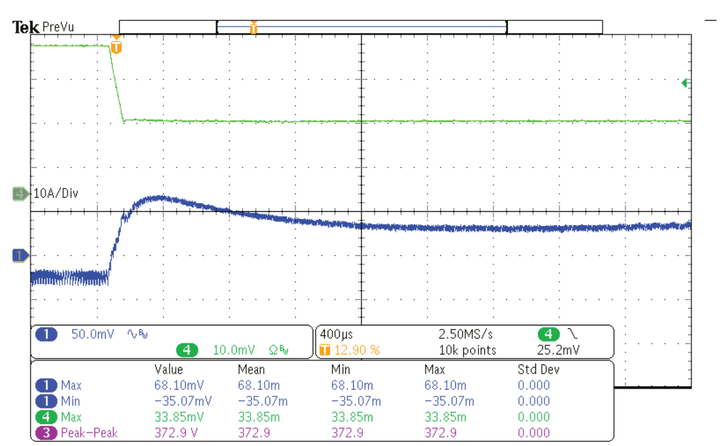


Fig. 37: TRANSIENT RESPONSE AT 230VAC, 50%-100% STEP LOAD.

## SIGNAL WAVEFORMS

### Local Current Program (ACI) 115VAC and 230VAC

The Local Mode Current Program (ACI) signal was monotonically controlled using an external DC source. This external source was remotely voltage controlled by charging RC circuit (4.7mF & 6.2K). This (ACI) signal programs the current limit at a desired level by tuning the ACI signal voltage to the desired level.

### Constant Current Mode

On the Constant Current Mode (CCM) scope plots, the UUT output is loaded at 0.8KW/33.3A. It shows how the load current follows the ACI signal and that the output voltage only comes up when the ACI signal has reached a programable level for a current limit above the load current level being applied to the UUT.

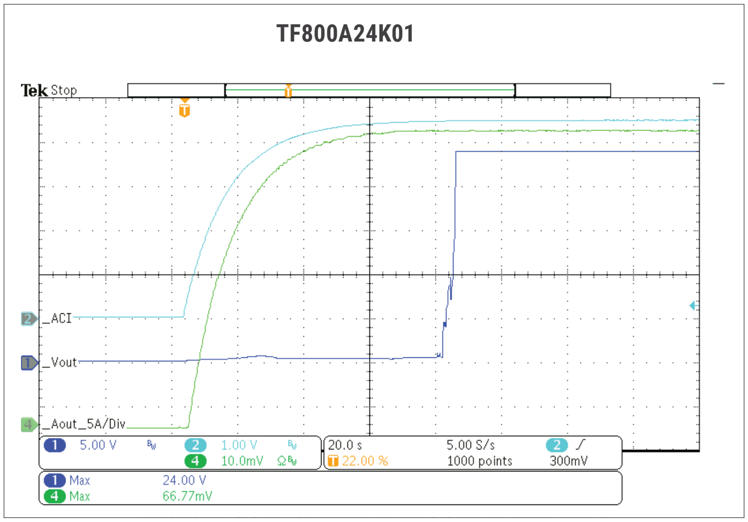


Fig. 38: LOCAL CURRENT PROGRAM (ACI) 115VAC.

CH1: Output Voltage.
CH2: Current Program (ACI).
CH4: Output Load Current (Aout) 0.8KW/33.3A (5A/Div).
Input Voltage: 115VAC.

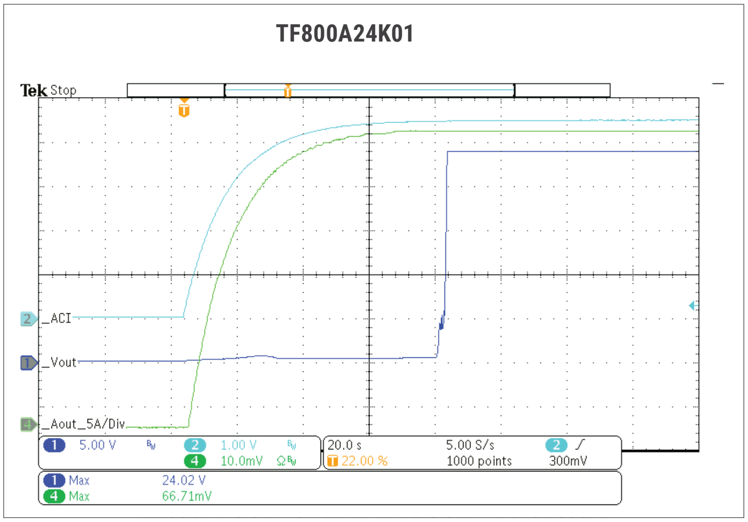


Fig. 39: LOCAL CURRENT PROGRAM (ACI) 230VAC.

CH1: Output Voltage.
CH2: Current Program (ACI).
CH4: Output Load Current (Aout) 0.8KW/33.3A (5A/Div).
Input Voltage: 230VAC.

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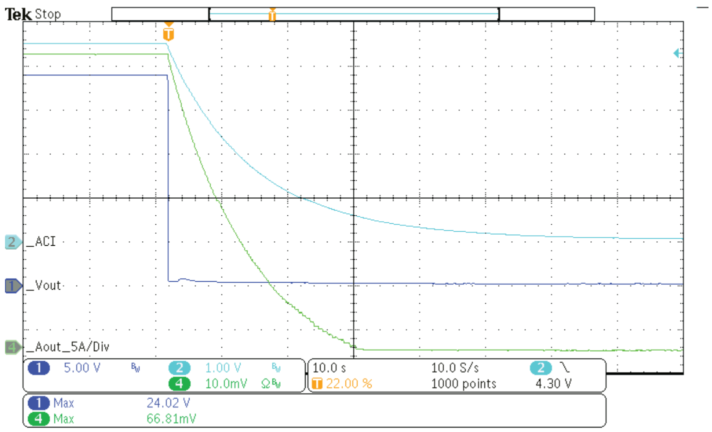


Fig. 40: LOCAL CURRENT PROGRAM (ACI) 115VAC.

CH1: Output Voltage.
CH2: Current Program (ACI).
CH4: Output Load Current (Aout) 0.8KW/33.3A (5A/Div).
Input Voltage: 115VAC.

TF800A24K01

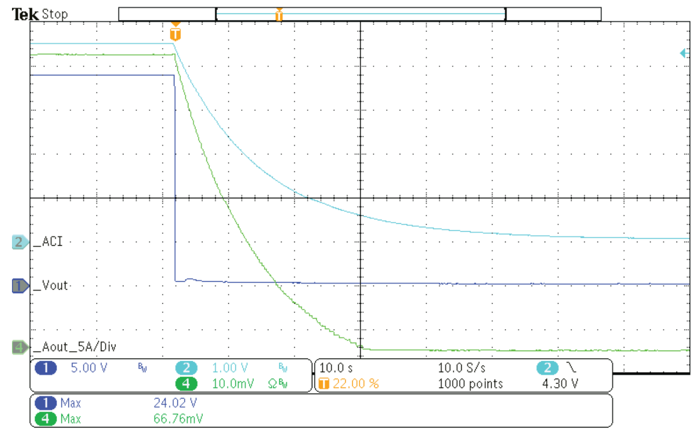


Fig. 41: LOCAL CURRENT PROGRAM (ACI) 230VAC.

CH1: Output Voltage.
CH2: Current Program (ACI).
CH4: Output Load Current (Aout) 0.8KW/33.3A (5A/Div).
Input Voltage: 230VAC.

## Constant Resistance Mode

On the Constant Resistance Mode scope plots, the UUT output is loaded with fixed resistance. It also shows how the load current follows the ACI signal and that the output voltage follows the load current all the way to when the ACI signal has reached the programable level for a current limit above the load resistance level being applied to the UUT.

TF800A24K01

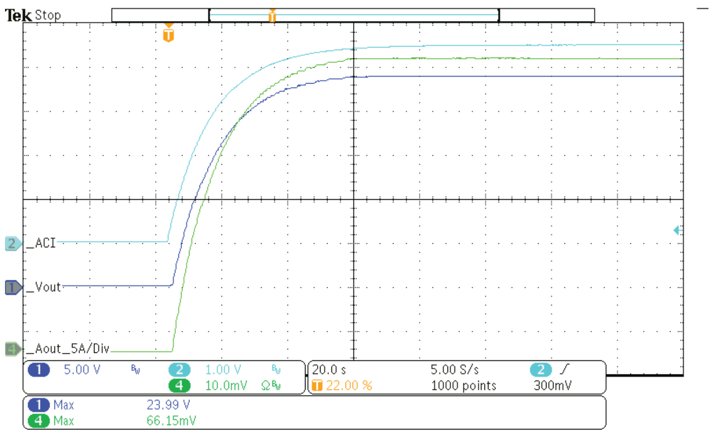


Fig. 42: LOCAL CURRENT PROGRAM (ACI) 115VAC.

CH1: Output Voltage.
CH2: Current Program (ACI).
CH4: Output Load Current (Aout) 0.8KW/33.3A (5A/Div).
Input Voltage: 115VAC.

TF800A24K01

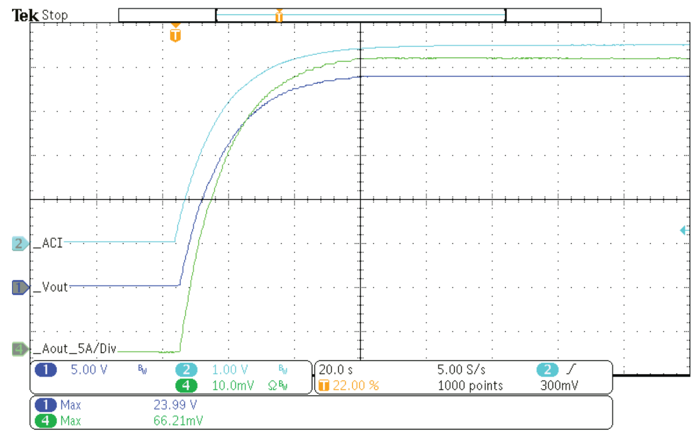


Fig. 43: LOCAL CURRENT PROGRAM (ACI) 230VAC.

CH1: Output Voltage.
CH2: Current Program (ACI).
CH4: Output Load Current (Aout) 0.8KW/33.3A (5A/Div).
Input Voltage: 230VAC.

TF800A24K01

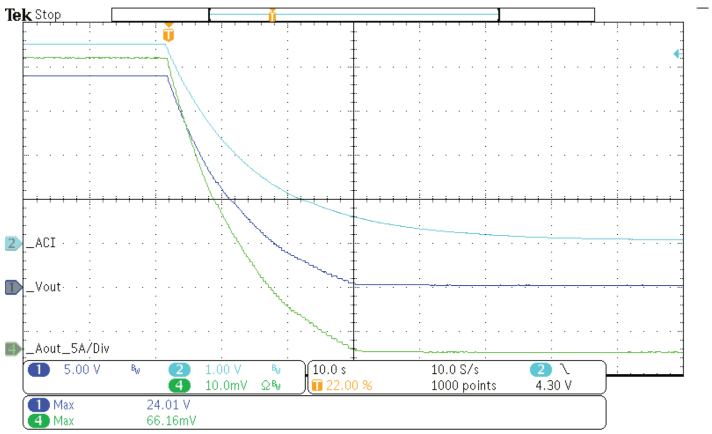


Fig. 44: LOCAL CURRENT PROGRAM (ACI) 115VAC.

CH1: Output Voltage.
CH2: Current Program (ACI).
CH4: Output Load Current (Aout) 0.8KW/33.3A (5A/Div).
Input Voltage: 115VAC.

TF800A24K01

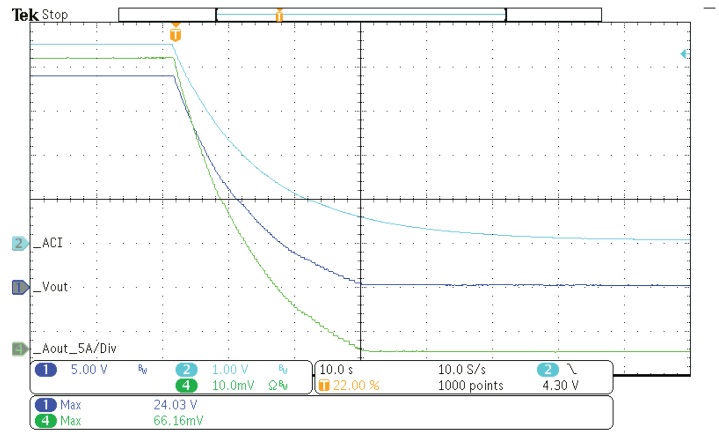


Fig. 45: LOCAL CURRENT PROGRAM (ACI) 230VAC.

CH1: Output Voltage.
CH2: Current Program (ACI).
CH4: Output Load Current (Aout) 0.8KW/33.3A (5A/Div).
Input Voltage: 230VAC.

## Local Mode Voltage Programing (VCI) 115VAC and 230VAC

The Local Mode Voltage program (VCI) signal was monotonically controlled using an external DC source.
This external source was remotely voltage controlled by charging RC circuit (4.7mF & 6.2K).

TF800A24K01

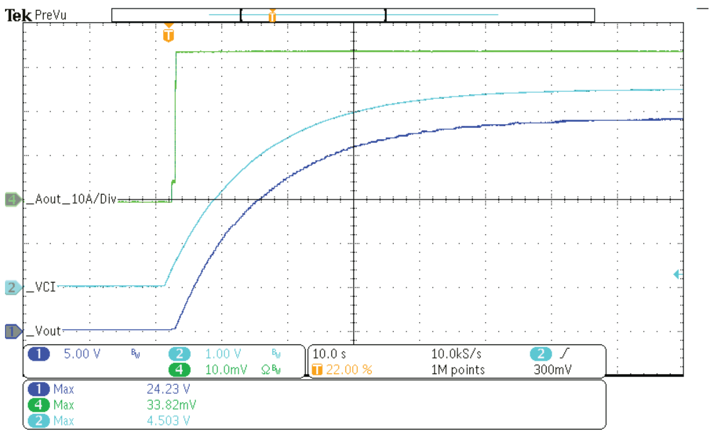


Fig. 46: LOCAL VOLTS PROGRAM (ACI) 115VAC.

CH1: Output Voltage.
CH2: Voltage Program (ACI).
CH4: Output Load Current (Aout) 0.8KW/33.3A (5A/Div).
Input Voltage: 115VAC.

TF800A24K01

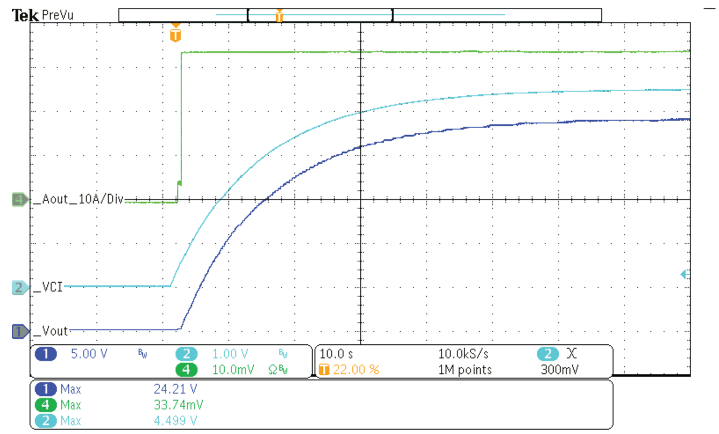


Fig. 47: LOCAL VOLTS PROGRAM (ACI) 230VAC.

CH1: Output Voltage.
CH2: Voltage Program (ACI).
CH4: Output Load Current (Aout) 0.8KW/33.3A (5A/Div).
Input Voltage: 230VAC.

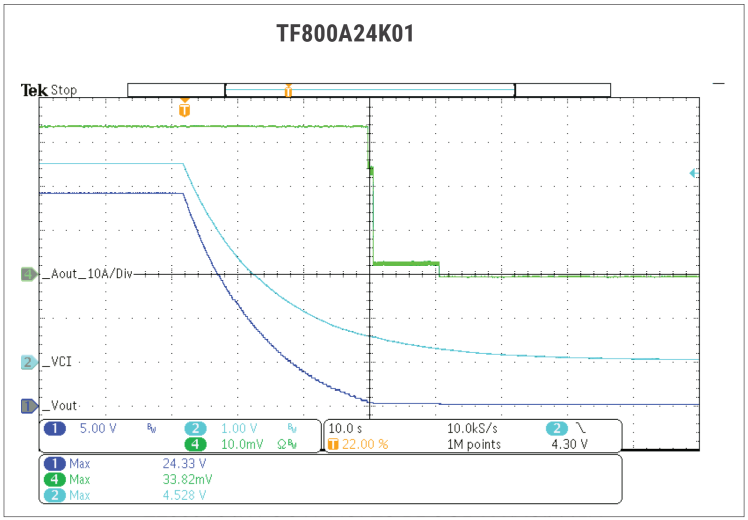


Fig. 48: LOCAL CURRENT PROGRAM (ACI) 115VAC.

CH1: Output Voltage.
CH2: Voltage Program (ACI).
CH4: Output Load Current (Aout) 0.8KW/33.3A (5A/Div).
Input Voltage: 115VAC.

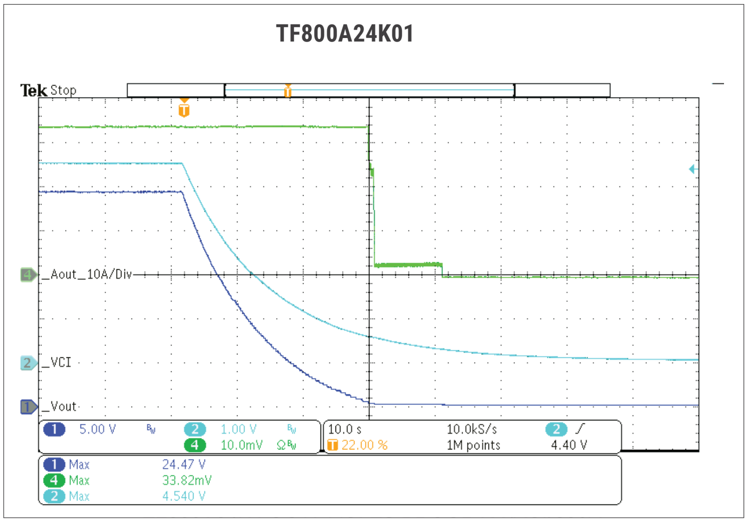


Fig. 49: LOCAL CURRENT PROGRAM (ACI) 230VAC.

CH1: Output Voltage.
CH2: Voltage Program (ACI).
CH4: Output Load Current (Aout) 0.8KW/33.3A (5A/Div).
Input Voltage: 230VAC.

## Inhibit (EN+ & EN-) 115VAC and 230VAC

The remote on/off control (inhibit) was tested using the auxiliary power source (AUX) and a toggle switch for either end (+/-) of "EN" for inhibit control. The reason of oscillation is same as described in section "Performance Data/Turn-On Delay Time".

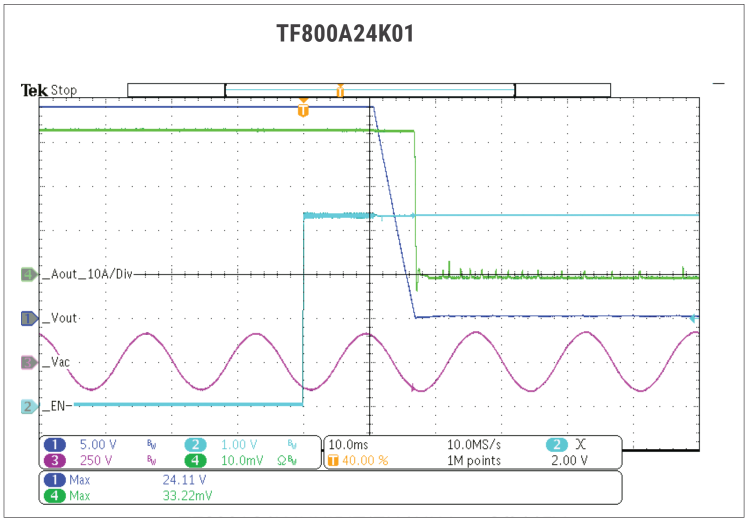


Fig. 50: INHIBIT (EN-)Hi Vout Off 115VAC.

CH1: Output Voltage.
CH2: Inhibit On/Off (EN-).
CH3: Input AC Line Voltage.
CH4: Output Load Current (Aout) 800W/33.3A (10A/Div).
Input Voltage 115VAC.

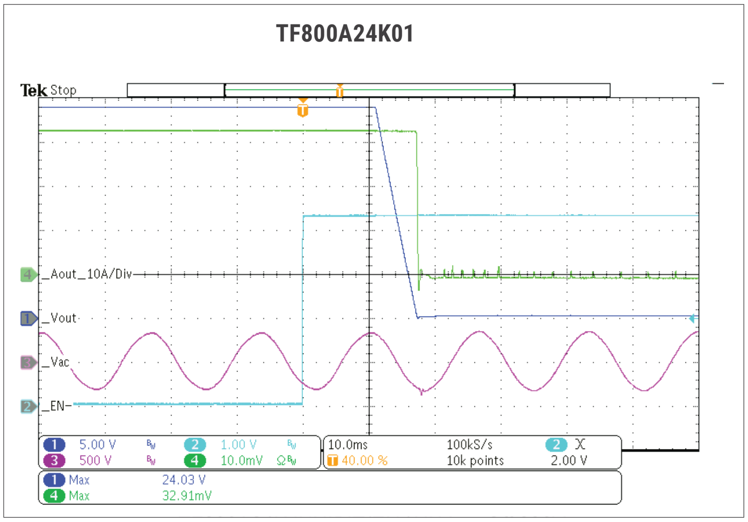


Fig. 51: INHIBIT (EN-)Hi Vout Off 230VAC.

CH1: Output Voltage.
CH2: Inhibit On/Off (EN-).
CH3: Input AC Line Voltage.
CH4: Output Load Current (Aout) 800W/33.3A (10A/Div).
Input Voltage 230VAC.

TF800A24K01

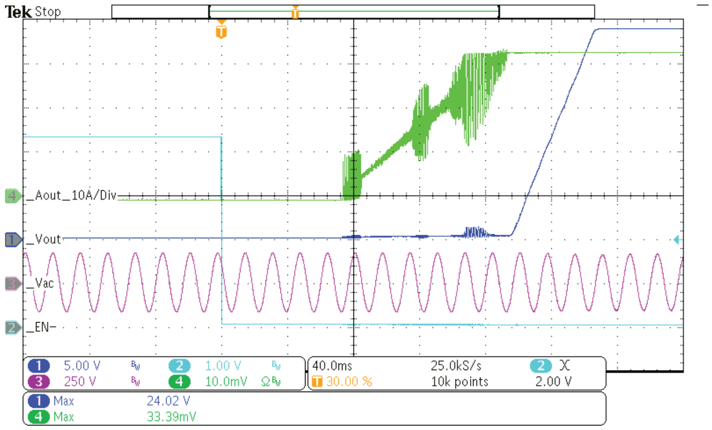


Fig. 52: INHIBIT (EN-)Lo Vout On 115VAC.

CH1: Output Voltage.
CH2: Inhibit On/Off (EN-).
CH3: Input AC Line Voltage.
CH4: Output Load Current (Aout) 800W/33.3A (10A/Div).
Input Voltage 115VAC.

TF800A24K01

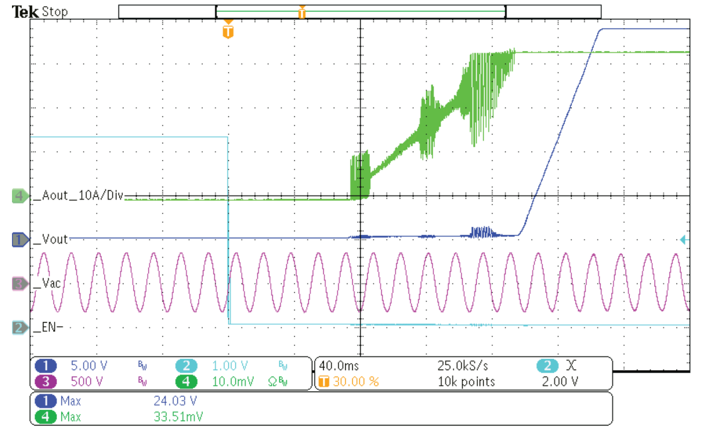


Fig. 53: INHIBIT (EN-)Lo Vout On 230VAC.

CH1: Output Voltage.
CH2: Inhibit On/Off (EN-).
CH3: Input AC Line Voltage.
CH4: Output Load Current (Aout) 800W/33.3A (10A/Div).
Input Voltage 230VAC.

Note: The load current oscillation is an anomaly of the electronic load occurring while the power supply output current ramps up to equal the constant current setting of the load.

TF800A24K01

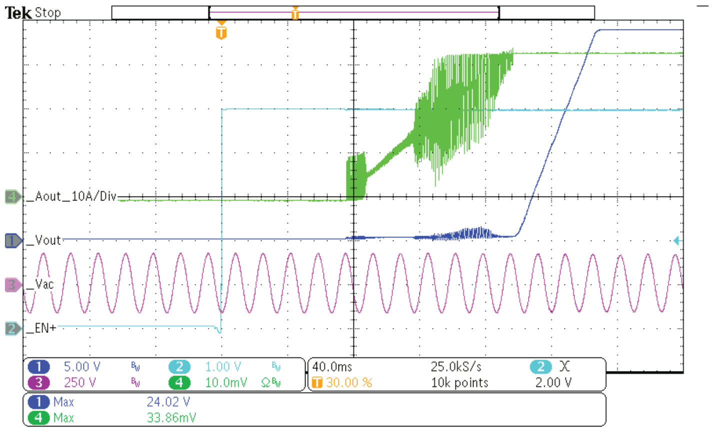


Fig. 54: INHIBIT (EN+)Hi Vout On 115VAC.

CH1: Output Voltage.
CH2: Inhibit On/Off (EN+).
CH3: Input AC Line Voltage.
CH4: Output Load Current (Aout) 840W/35A (10A/Div) Input.
Input Voltage 115VAC.

TF800A24K01

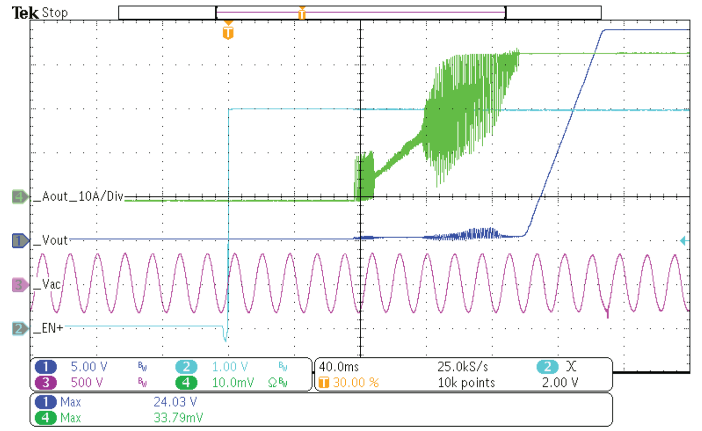


Fig. 55: INHIBIT (EN+)Hi Vout On 230VAC.

CH1: Output Voltage.
CH2: Inhibit On/Off (EN+).
CH3: Input AC Line Voltage.
CH4: Output Load Current (Aout) 840W/35A (10A/Div).
Input Voltage 230VAC.

**TF800A24K01**

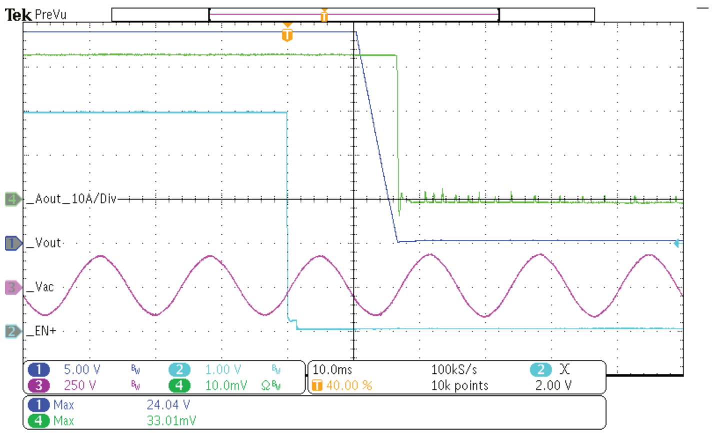


Fig. 56: INHIBIT (EN+)Lo Vout Off 115VAC.

CH1: Output Voltage.
CH2: Inhibit On/Off (EN+).
CH3: Input AC Line Voltage.
CH4: Output Load Current (Aout) 840W/35A (10A/Div).
Input Voltage 115VAC.

**TF800A24K01**

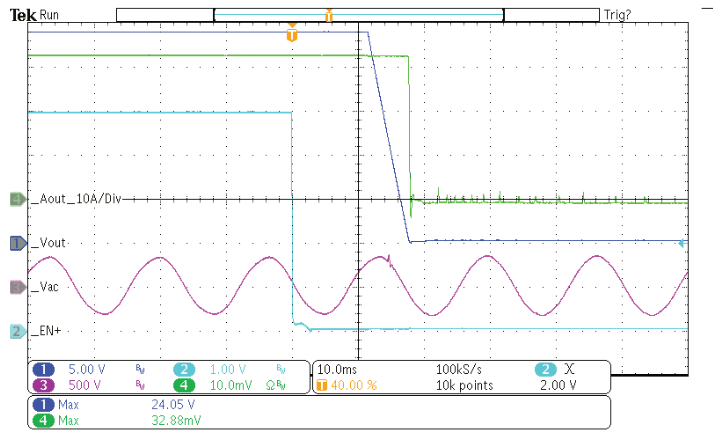


Fig. 57: INHIBIT (EN+)Lo Vout Off 230VAC.

CH1: Output Voltage.
CH2: Inhibit On/Off (EN+).
CH3: Input AC Line Voltage.
CH4: Output Load Current (Aout) 840W/35A (10A/Div).
Input Voltage 230VAC.

## Auxiliary Power and Setting (AUX, SET)

**TF800A24K01**

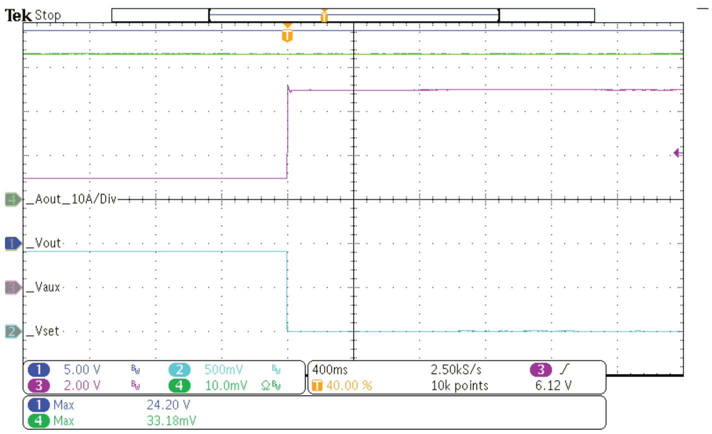


Fig. 58: (Vset Hi-Lo)(Vaux 9V-5V) 115VAC.

CH1: Output Voltage.
CH2: Aux Output Voltage Setting (Vset).
CH3: Aux Output Voltage (Vaux or Aux).
CH4: Output Load Current (Aout) 800W/33.3A (10A/Div).
Input Voltage 115VAC.

**TF800A24K01**

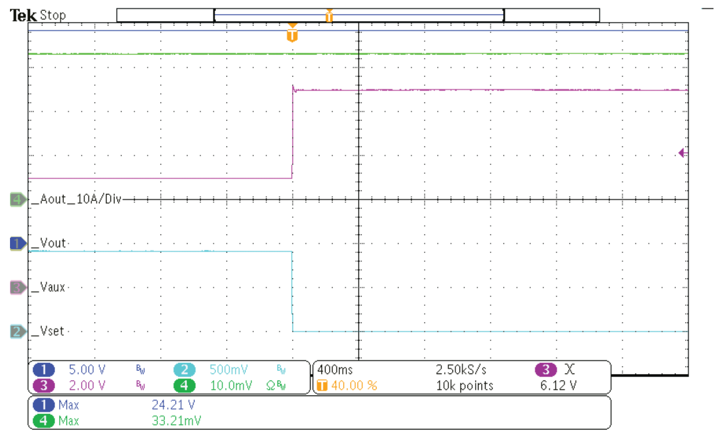


Fig. 59: (Vset Hi-Lo)(Vaux 9V-5V) 115VAC.

CH1: Output Voltage.
CH2: Aux Output Voltage Setting (Vset).
CH3: Aux Output Voltage (Vaux or Aux).
CH4: Output Load Current (Aout) 800W/33.3A (10A/Div).
Input Voltage 230VAC.

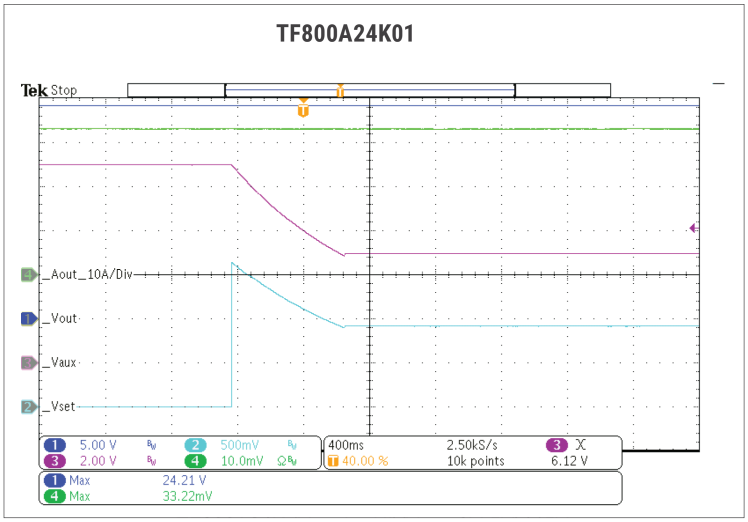


Fig. 60: (Vset Lo-Hi)(Vaux 9V-5V) 115VAC.

CH1: Output Voltage.
CH2: Aux Output Voltage Setting (Vset).
CH3: Aux Output Voltage (Vaux or Aux).
CH4: Output Load Current (Aout) 800W/33.3A (10A/Div).
Input Voltage 115VAC.

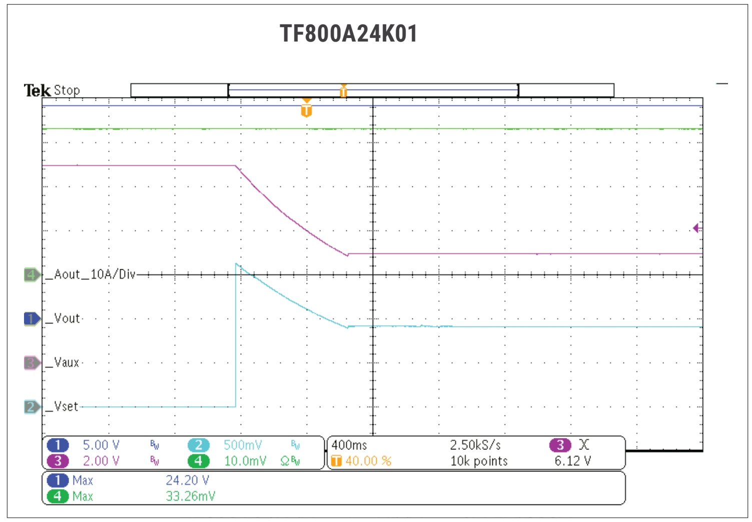


Fig. 61: (Vset Lo-Hi)(Vaux 9V-5V) 230VAC.

CH1: Output Voltage.
CH2: Aux Output Voltage Setting (Vset).
CH3: Aux Output Voltage (Vaux or Aux).
CH4: Output Load Current (Aout) 800W/33.3A (10A/Div).
Input Voltage 230VAC.

## Power OK (POK)

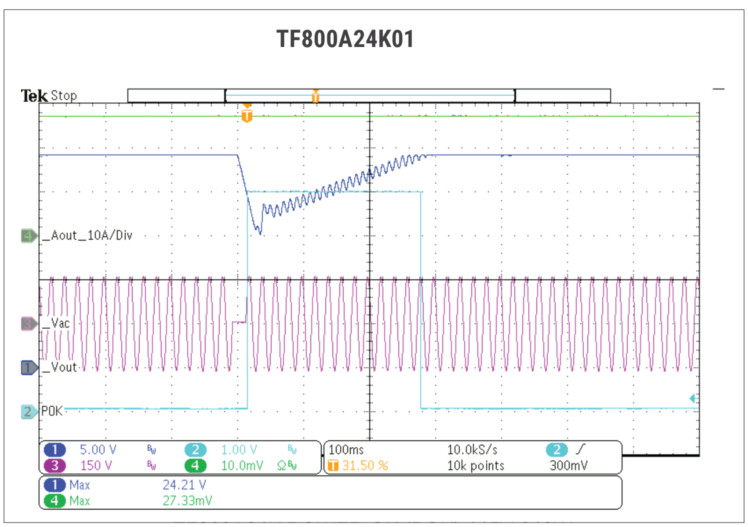


Fig. 62: POWER OK (POK) 115VAC 640W.

CH1: Output Voltage.
CH2: Power OK Signal (POK).
CH3: Input AC Line Voltage.
CH4: Output Load Current (Aout) 640W/26.6A (10A/Div).
Input Voltage 115VAC.

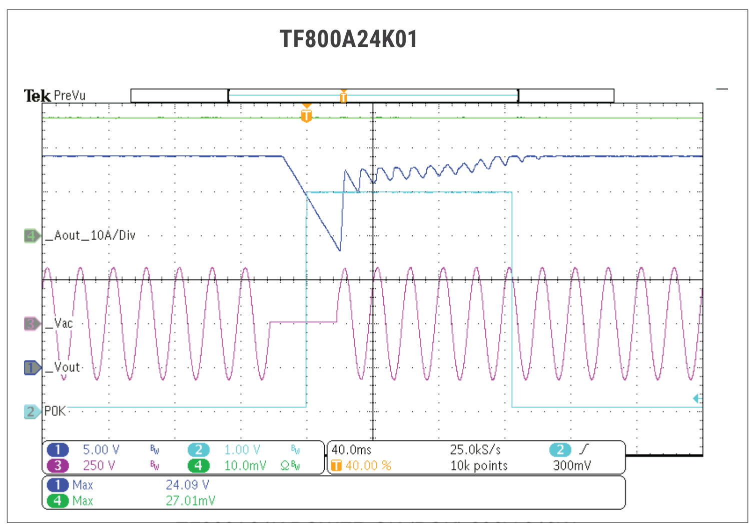


Fig. 63: POWER OK (POK) 230VAC 640W.

CH1: Output Voltage.
CH2: Power OK Signal (POK).
CH3: Input AC Line Voltage.
CH4: Output Load Current (Aout) 640W/26.6A (10A/Div).
Input Voltage 230VAC.

TF800A24K01

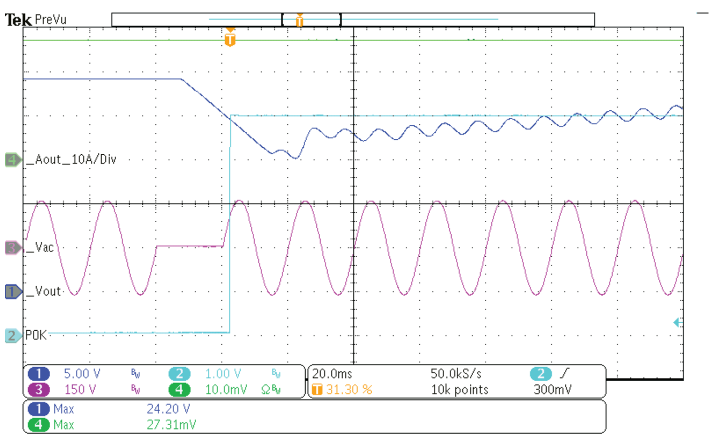


Fig. 64: POWER OK (POK) 115VAC 640W.

CH1: Output Voltage.
CH2: Power OK Signal (POK).
CH3: Input AC Line Voltage.
CH4: Output Load Current (Aout) 640W/26.6A (10A/Div).
Input Voltage 115VAC.

TF800A24K01

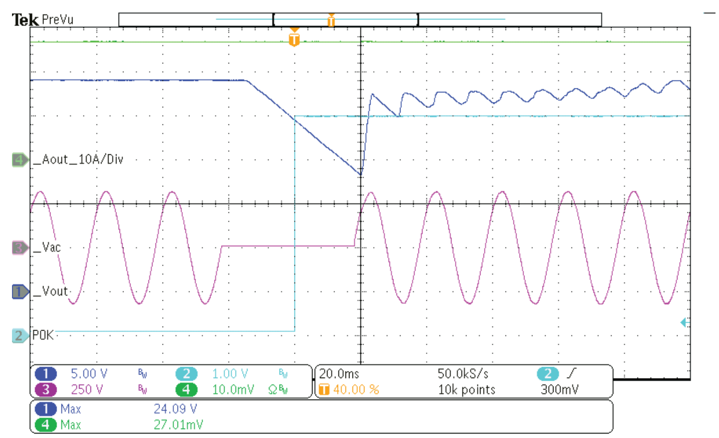


Fig. 65: POWER OK (POK) 230VAC 640W.

CH1: Output Voltage.
CH2: Power OK Signal (POK).
CH3: Input AC Line Voltage.
CH4: Output Load Current (Aout) 640W/26.6A (10A/Div).
Input Voltage 230VAC.

## Common Mode Noise

Common Mode Noise is electrical signal that appears between either output and earth ground or chassis ground. This comes about due to parasitic capacitance and inductive coupling in the power supply that couple electrical energy from the primary to the secondary or from the secondary to earth ground. Although the coupling is minimized by design and construction, it cannot easily be eliminated. The plots below show the common mode current measured through a shorting conductor from the output return to chassis.

TF800A24K01

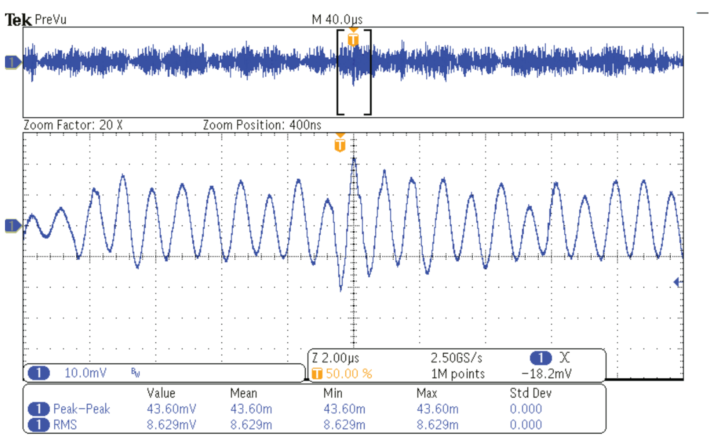


Fig. 66: CURRENT CM NOISE 115VAC 000W.

CH1: Common Mode current (1mA/mV) Load 0W.
Input Voltage 115VAC.

TF800A24K01

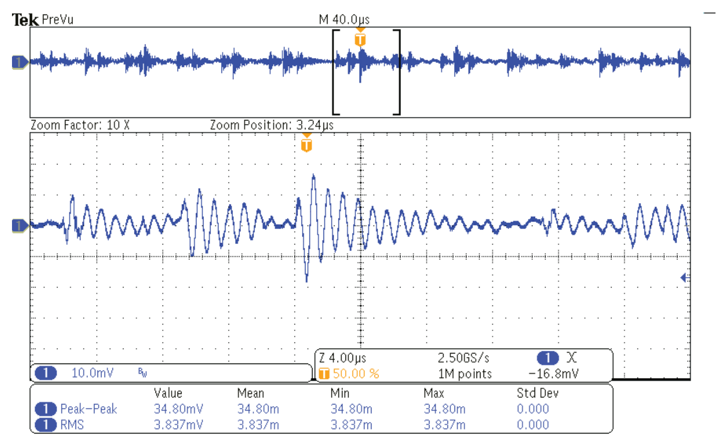


Fig. 67: CURRENT CM NOISE 230VAC 000W.

CH1: Common Mode current (1mA/mV) Load 0W.
Input Voltage 230VAC.

TF800A24K01

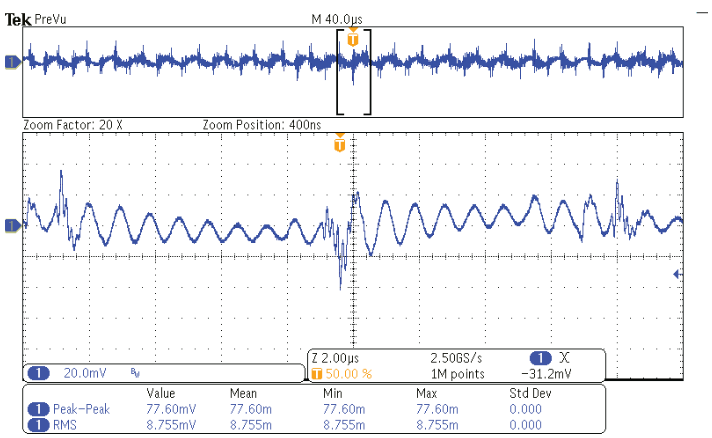


Fig. 68: CURRENT CM NOISE 115VAC 800W.

CH1: Common Mode current (1mA/mV) Load 800W.
Input Voltage 115VAC.

TF800A24K01

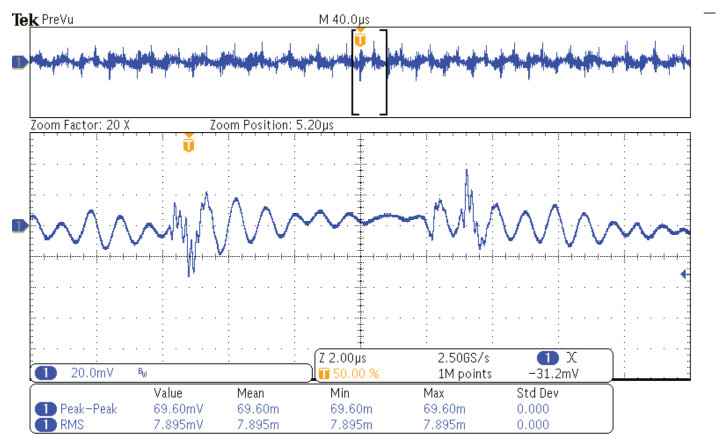


Fig. 69: CURRENT CM NOISE 230VAC 800W.

CH1: Common Mode current (1mA/mV) Load 800W.
Input Voltage 230VAC.

## Conducted Emission

EMI Plots were collected at 10% and 100% loads, 120VAC/60Hz and 240VAC/50Hz. The Curves are Quasi-peak (QP) and Average measurements. The QP and Average value point data is not shown in these plots, but detailed EMI reports are available upon request.

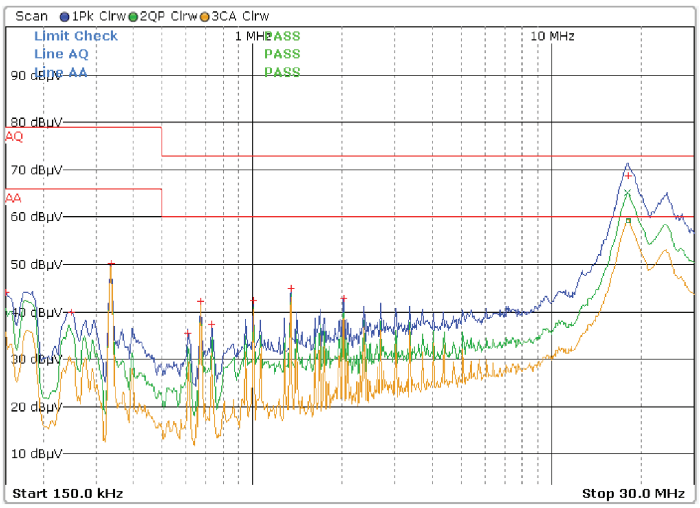


Fig. 66: CE Quasi Peak & Average 100% Load. 120V/60Hz Line.

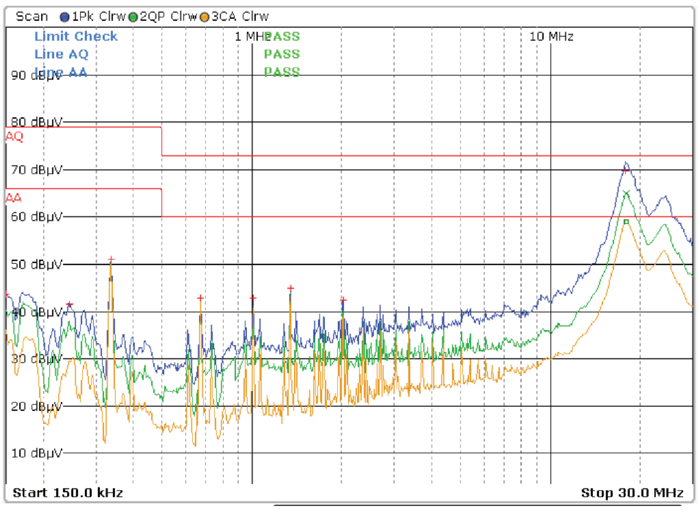


Fig. 67: CE Quasi Peak & Average 100% Load. 240V/60Hz Line.

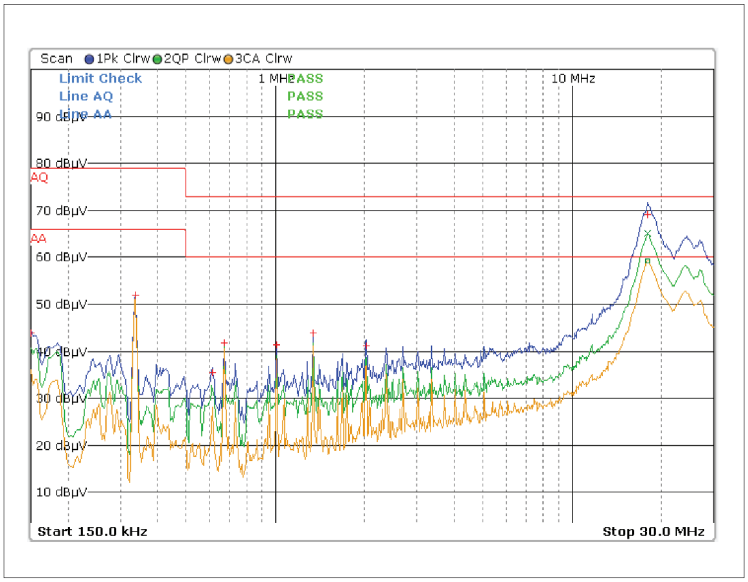


Fig. 68: CE Quasi Peak & Average 100% Load. 120V/60Hz Neutral.

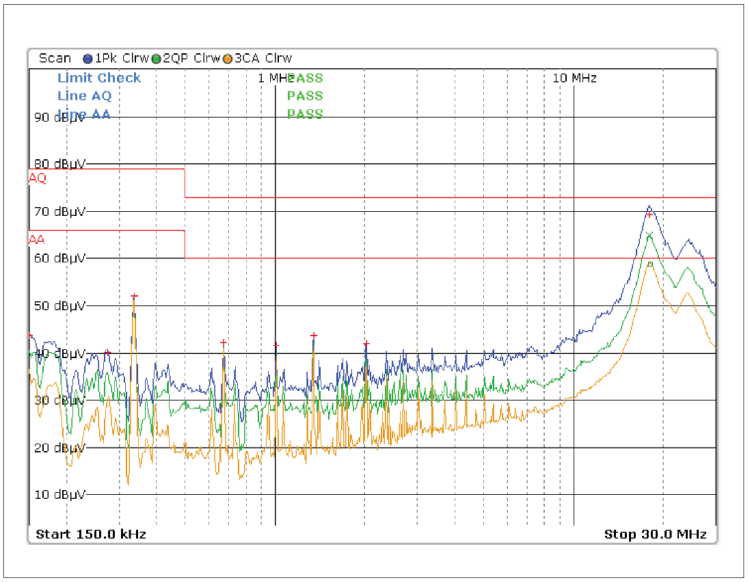


Fig. 69: CE Quasi Peak & Average 100% Load. 240V/60Hz Neutral.

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