ANALOG DEVICES

ADP1047 300 Watt Evaluation Kit

ADP1047-300-EVALZ
PRD 1334

FEATURES

Boost PFC topology providing high power factor and low THD
Protection features for AC line input and high voltage output
High efficiency
I2C serial interface to PC
Software GUI
Programmable digital filters
Programmable response to faults
Programmable inrush control
Accurate AC power metering
Digital Calibration and trimming

CAUTION

This evaluation board uses high voltages whenever it is powered up. The output capacitor has high level of energy stored and it must be discharged before the load is disconnected. Extreme caution must be taken to ensure safety for the user. It is strongly advised to power down the evaluation board when not in use.

ADP1047 EVALUATION BOARD OVERVIEW

This evaluation board features the ADP1047 in a switching power supply application. With the evaluation board and software, the ADP1047 can be interfaced to any PC running Windows 2000/XP/Vista/NT via the computer's USB port. The software allows control and monitoring of the ADP1047 internal registers. The board is set up for the ADP1047 to act as boost power factor correction circuit with a rated load of 300W from an input voltage ranging from a 85 V_{RMS} to 265 V_{RMS}.

EVALUATION SYSTEM CONTENTS

The evaluation system package contains the following items:

• Application note EVAL-ADP1047 (order code: ADP1047-300-EVALZ)
• ADP1047 evaluation board

The USB/I2C dongle for serial communication and software CD need to be ordered separately.

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DEMO BOARD SPECIFICATIONS

Specification	MIN	TYP	MAX	Units	Notes
V_{IN}	85	115 or 230	265	V_{RMS}	
V_{OUT}		385		V	
P_{OUT}	0.0		300	W	
$T_{AMBIENT}$	0	30	65	ºC	
Efficiency		95		%	
Switching frequency		97.7		KHz	

Table 1 - Target Specifications

TOPOLOGY AND CIRCUIT DESCRIPTION

This evaluation board features the ADP1047 in a typical AC/DC switching power supply in a boost power factor correction (PFC) topology. The circuit is designed to provide a rated load of 385V/300W from an AC input voltage source of 85 V_{RMS} to 265 V_{RMS} AC. The ADP1047 provides functions all the functions necessary for active PFC circuit plus accurate AC power metering. It achieves near-unity power factor, low distortion of the input current, the output voltage regulation, over current protection, AC line fault detection and protection, over temperature protection, and power supply shutdown. It also can optimize light load efficiency performance using output voltage adjustment and frequency reduction.

Please refer to the appendix for the detailed schematic. The AC input side consists of the input terminals, EMI filter, inrush relay and its control circuit. The D1 is the rectifier bridge for main power transmission. The D4 is used for input voltage sensing. The boost circuit consists boost inductor (L2), boost switch (Q1) and diode (D2). The gate signal for the boost switch comes from the ADP1047 through the ADP3634 gate driver. The ADP1047 (U1, on daughter card) can be powered either via the USB 5V via an ADP3303 LDO (U2, on daughter card) present on the same daughter card, or via the auxiliary power supply on the board. Thermistor (RTD1) is placed close to the MOSFET on the board allowing over temperature protection functionality to be implemented.

CONNECTORS

The connections to the evaluation board are shown below.

Connector	Evaluation Board Function
J1	AC Input
J9, J10	AC Input
J4	385V DC Voltage Output
J5	Ground Return for 385 V DC Voltage Output
J8, J11	I2C Connector
J6	Daughter card

Table 2 - Evaluation board connectors

There is a 4 pin connector for I2C communication. This allows the software to communicate with the evaluation board through the USB port of the PC. Connectors (J8 and J11) are identical and are connected in parallel to each other to allow multiple boards to be connected to the same I2C bus in a daisy chain configuration.

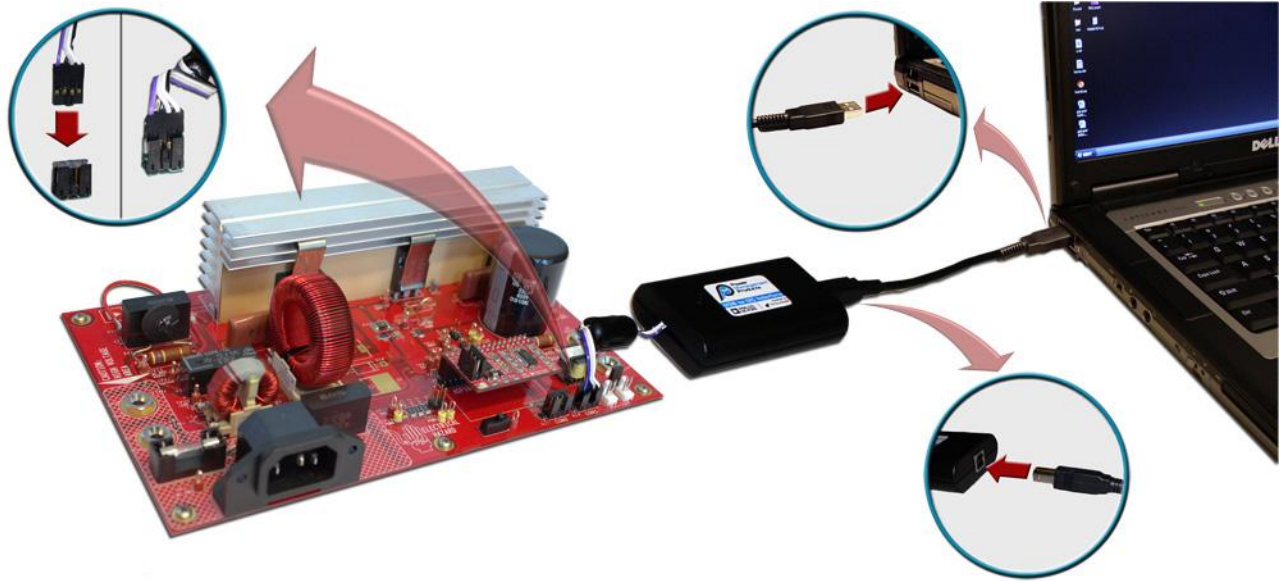*Figure 1 - Evaluation Board Setup*

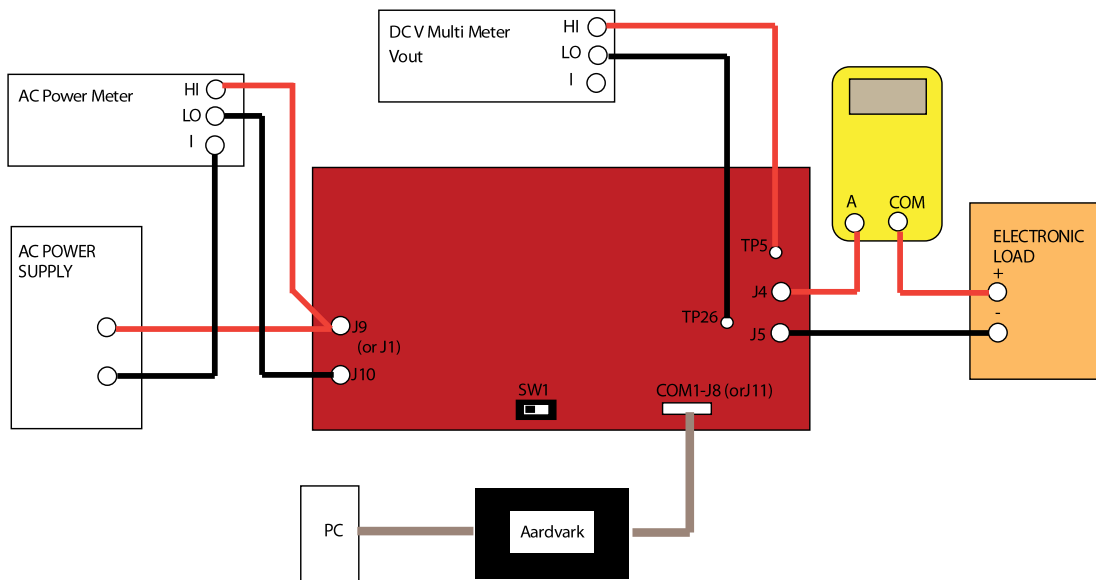| Pin	Evaluation Board Function
1	5V
2	SCL
3	SDA
4	Ground

Table 3 - J8, J11 connections

Figure 2 - Test configuration for the Evaluation Board

SETTING FILES AND EEPROM

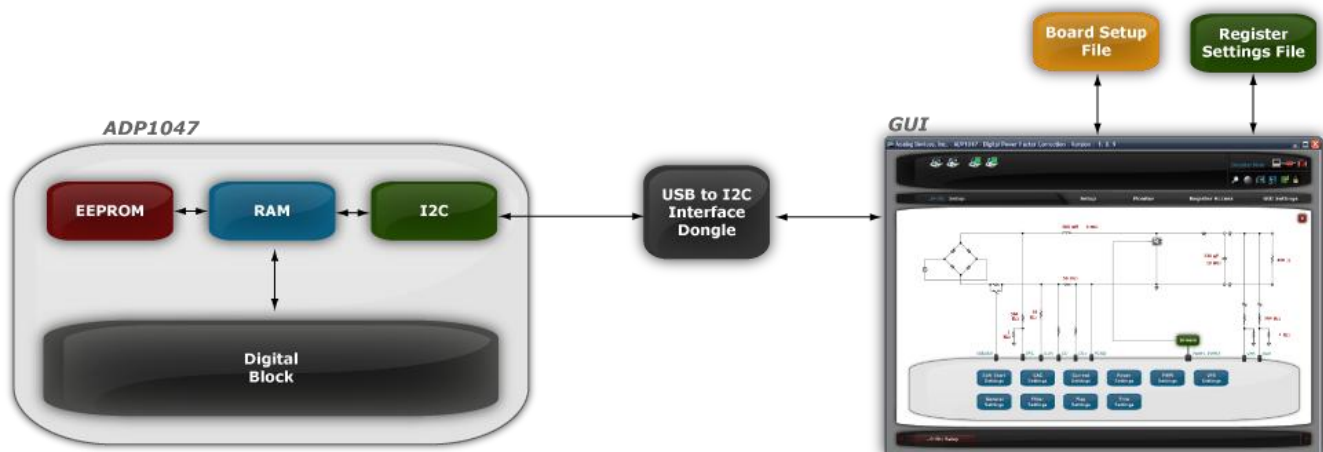The ADP1047 communicates with the GUI software using the I2C bus.

Figure 3 - ADP1047 and GUI interaction

The register settings (having extension .47r) and the board settings (having extension .47b) are two files that are associated with the ADP1047 software. The register settings file contains information that govern the functionality of the part such as the over voltage and over current limits, softstart timing, PWM settings etc. The ADP1047 stores all its settings in the EEPROM. When the ADP1047 is connected to the USB dongle the LDO powers the I.C. and the GUI downloads the settings from the registers of the ADP1047 so that the state of the part is known. It is possible to save these settings in a file for later use. Older register settings are overwritten when new files are loaded.

The EEPROM on the ADP1047 can contain the information about the board, such as current sense resistor, output inductor and capacitor values. This information is also stored in board setup file (extension .47b) and is necessary for the GUI to display the correct information in the 'Monitor' tab as well as 'Filter Settings' window. Always make sure that the correct board file has been loaded for the board currently in use.

Each ADP1047 chip has trim registers for the temperature, input current and the output voltage and input voltage. These can be configured during production and are not overwritten whenever a new register settings file is loaded. This is done in order to retain the trimming of all the ADCs for that corresponding environmental and circuit condition (component tolerances, thermal drift, etc.).

BOARD EVALUATION

EQUIPMENT

• AC Power Supply

• Electronic Load

• Oscilloscope with differential probes

• PC with ADP1047 GUI installed

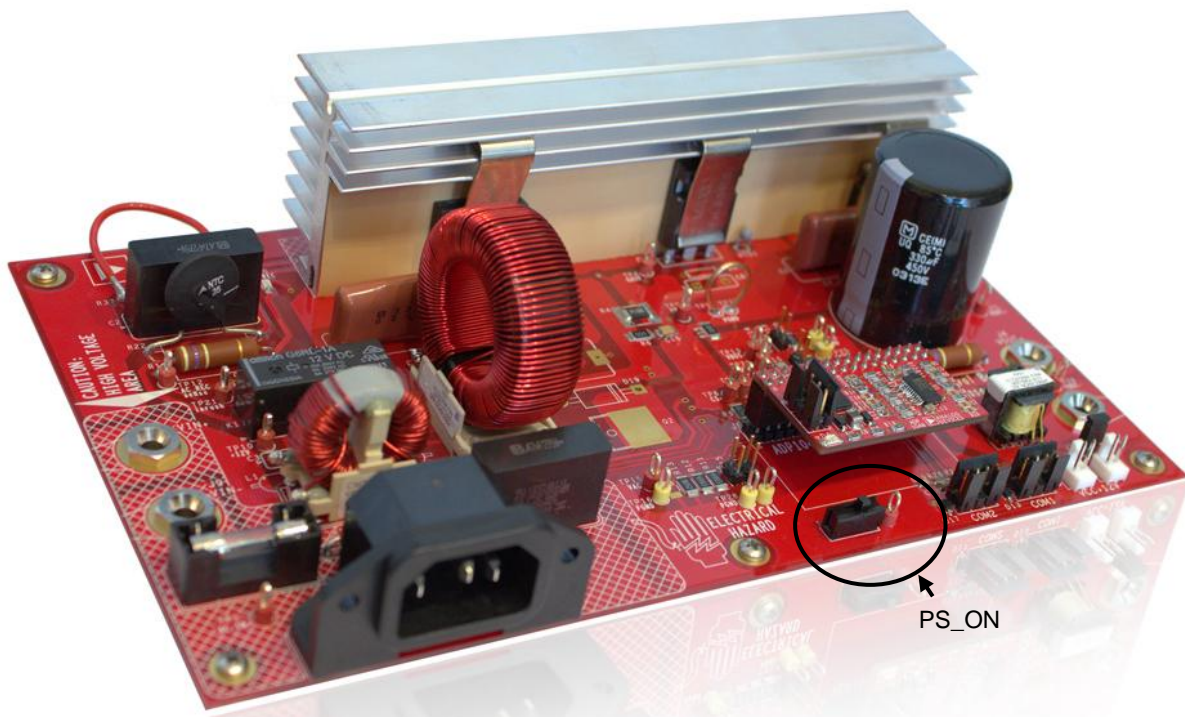• Precision Digital Multimeters (HP34401or equivalent - 6 digits) for measuring DC current and voltage

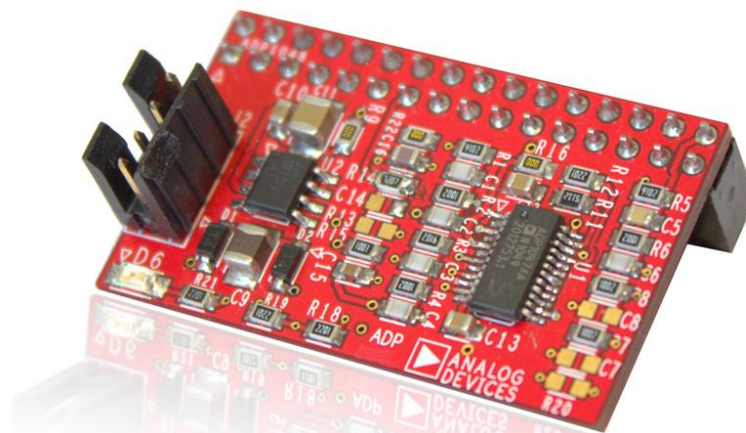*Figure 4 - 300W evaluation board showing PS_ON hardware switch*

Figure 5 - ADP1047 daughter card

SETUP

NOTE: **DO NOT CONNECT THE USB CABLE TO THE EVALUATION BOARD UNTIL THE SOFTWARE HAS FINISHED INSTALLING**

1) Install the ADP1047 software by inserting the installation CD. The software setup will start automatically and a guided process will install the software as well as the USB drivers for communication of the GUI with the IC using the USB dongle.

2) Insert the daughter card in connector J6 as shown in Figure 4.

3) Ensure that the PS_ON switch (SW1 on schematic) is turned to the on position. It is located on the bottom left half of the board (Figure 4).

4) Connect the evaluation board to the USB port on the PC using the "USB to I2C interface" dongle as shown in Figure 1.

5) The software should report that the ADP1047 has been located on the board. Click "Finish" to proceed to the Main Software Interface Window. The serial number reported on the side of the checkbox indicates the USB dongle serial number. The windows also displays the device I2C address.

Figure 6 - ADP1047 address in the GUI

6) If the software does not detect the part it enters into simulation mode. Ensure that the connector is connected to J8/J11 (on main board) Click on 'Scan for ADP1047A now' icon (magnifying glass) located on the top right hand corner of the screen.

Figure 7 - "Scan for ADP1047 Now' icon

7) **The board setting is store in the IC and this step is optional.** Click on the "Load Board Settings" icon (fourth button from the left) and select the ADI default**.47b** file. This file contains all the board information including values of shunt and voltage dividers. Note: All board setting files have an extension of .47b

Figure 8 - Different icons on dashboard for loading and saving .47r and .47b files

8) **The IC on the evaluation board comes preprogrammed and this step is optional.** The original register configuration is stored in the ADP1047**.47r** register file. Note: All register files have an extension of .47r. The file can be loaded using the second icon from the left in Figure .

9) Connect a resistive or electronic load to the output connections of Vout+ and Vout-. Note that the load should be connected before the input power is supplied to the evaluation board for safety concerns.

10) Connect a 50 or 60 Hz ac power source, which has to be turned off, to ac plug J1 or terminals J9 and J10.

11) Turn on AC power source and increase the input voltage within the range from 85Vrms to 265Vrms.

12) The evaluation board should now up and running, and ready for evaluation. The output should now read about 385 VDC.

13) Click on the 'MONITOR' tab and then on the Flags and readings icon. This window provides a snapshot of the entire state of the PSU in a single user friendly window.
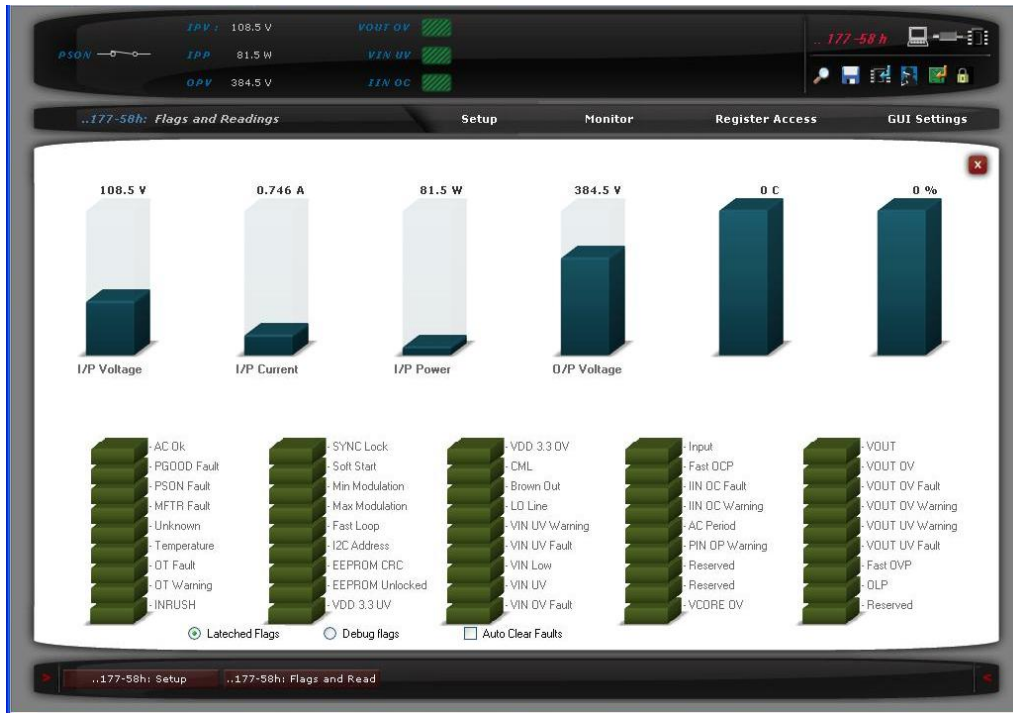

Figure 9 - Monitor window in GUI

During power up, the ADP1047 is connected to the USB port (5V) and the LDO powers the IC. It takes 20μsec for VCORE (pin 26) to reach an internal voltage of 2.5V. After this, the I.C. downloads the contents of the registers into the EEPROM. After this the softstart ramp begins.

After successful startup and in steady state condition, 5 LEDs on the board to provide to the user the status of the board. All the LEDs will be turned ON indicating that there are no faults detected such as over voltage or over current. In case of a fault the PGOOD or AC_OK LEDs will be turned OFF indicating that some flag has tripped due to an out of bounds condition. The monitor window will display the appropriate state of the PSU.

| LED	Location	Description
D7	Bottom left	Inrush signal
D8	Bottom right	PGOOD signal (active high)
D9	Bottom right	AC_OK signal (active high)
D10	Bottom right	Indicates input voltage is present
D11	Top right	Indicates 12V or USB5V is present

Table 4 – List of LEDs on the evaluation board

ADP1047 PROGRAMMING SOFTWARE

The goal of this evaluation kit is to allow the user to get an insight into the flexibility offered by the extensive programming options offered by the ADP1047. Several test points on the board allow easy monitoring of the various signals. The user can also use the software to program multiple responses (such as disable power supply or disable the PWM) for various fault conditions. There are several main windows where the user can use to program and evaluate the PSU. They can be accessed from the Setup window in the GUI. The ADP1047 can be easily programmed to modify the behavior of the PSU under different fault and load conditions without any hardware changes. All the changes are purely through software and do not require desoldering components and replacing them with new values to specify a different operating condition

APPENDIX I – SCHEMATIC (MAIN BOARD)
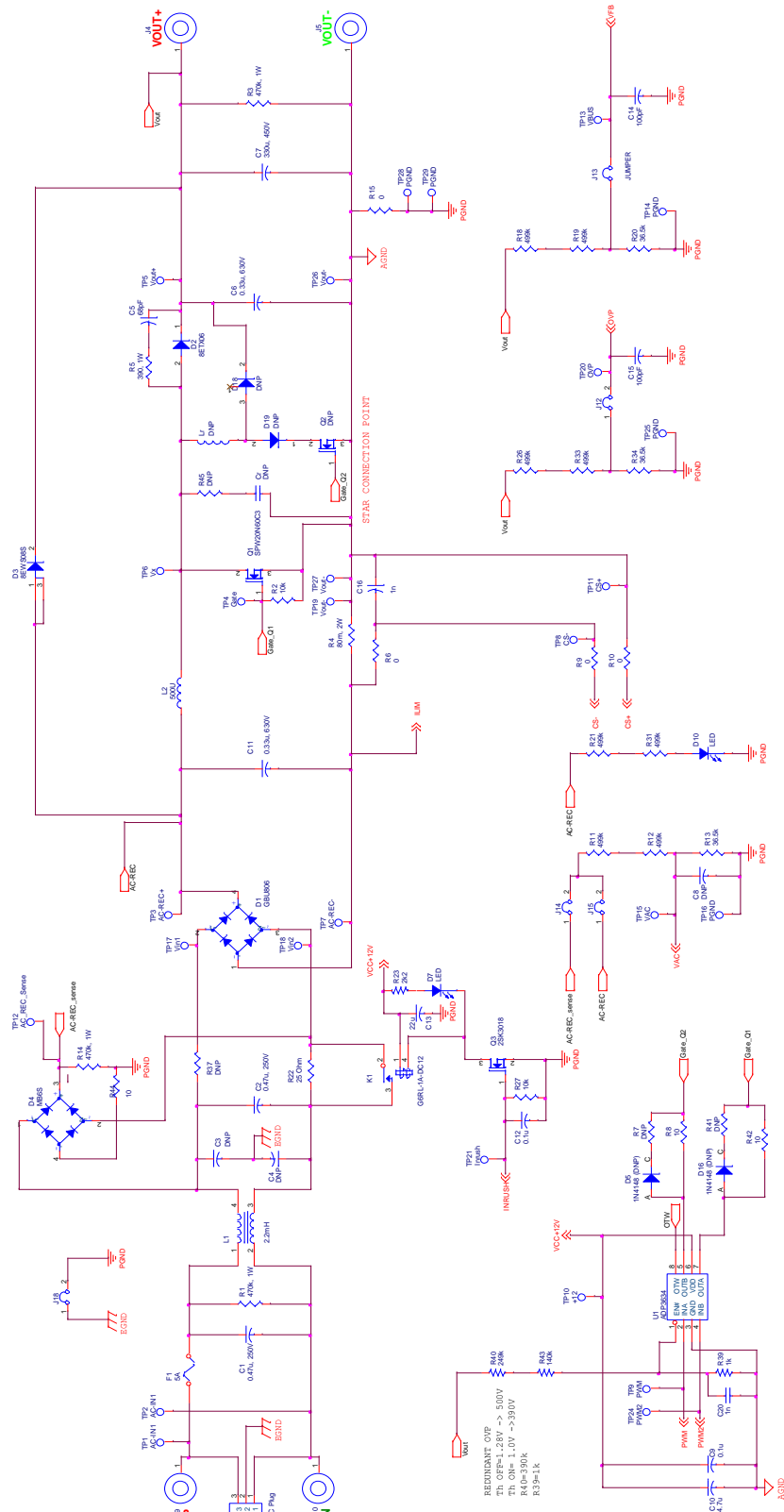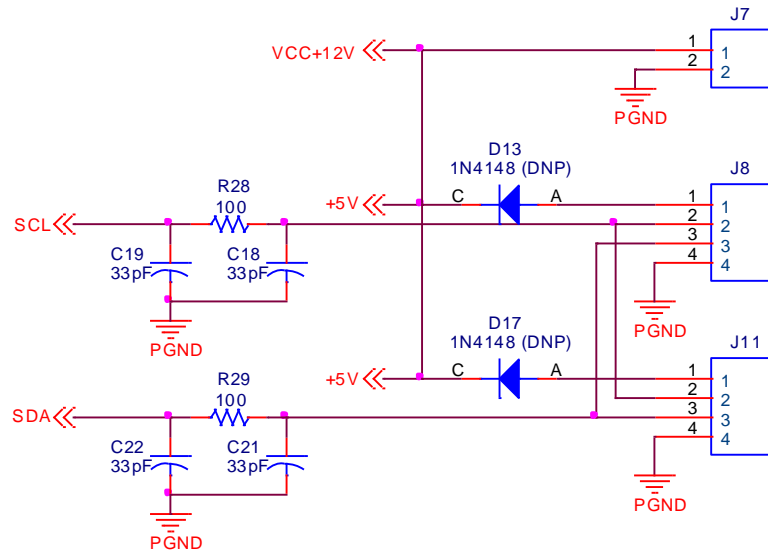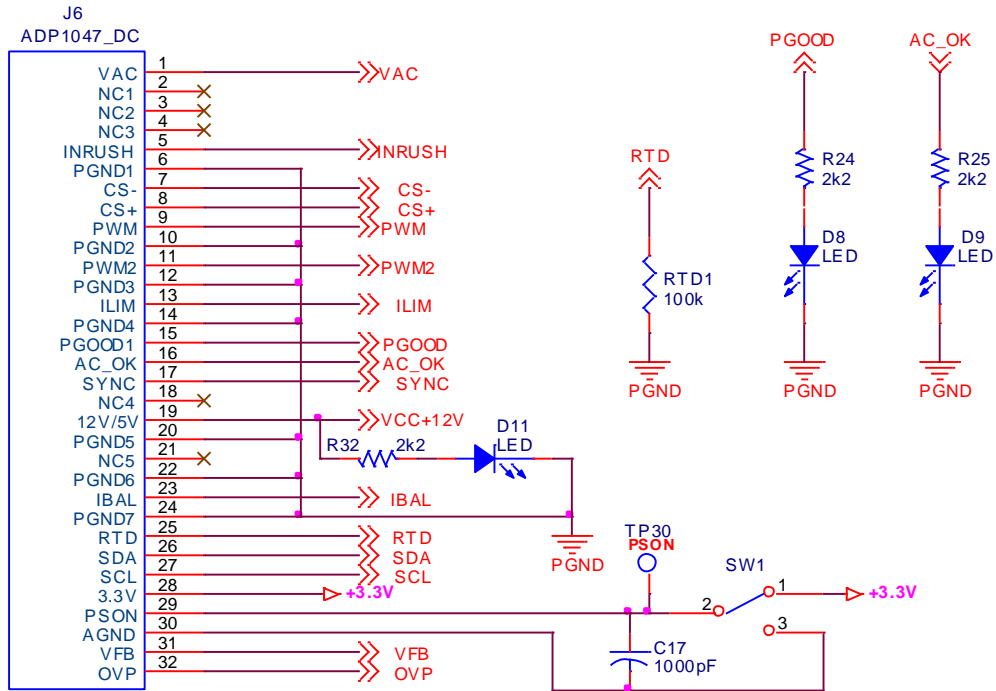
APPENDIX II – SCHEMATIC (DAUGHTER CARD)
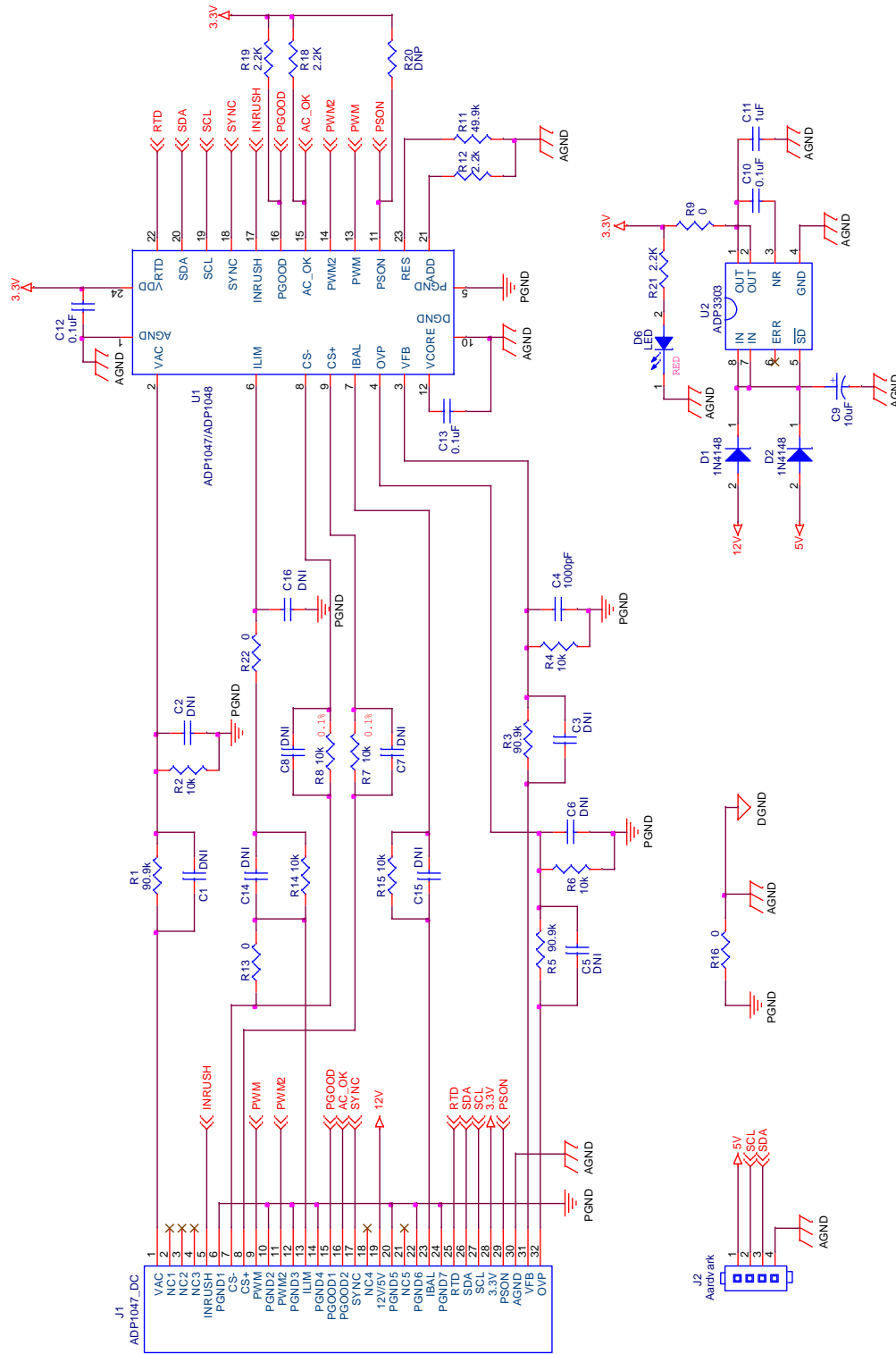
APPENDIX III – LAYOUT (MAIN BOARD)
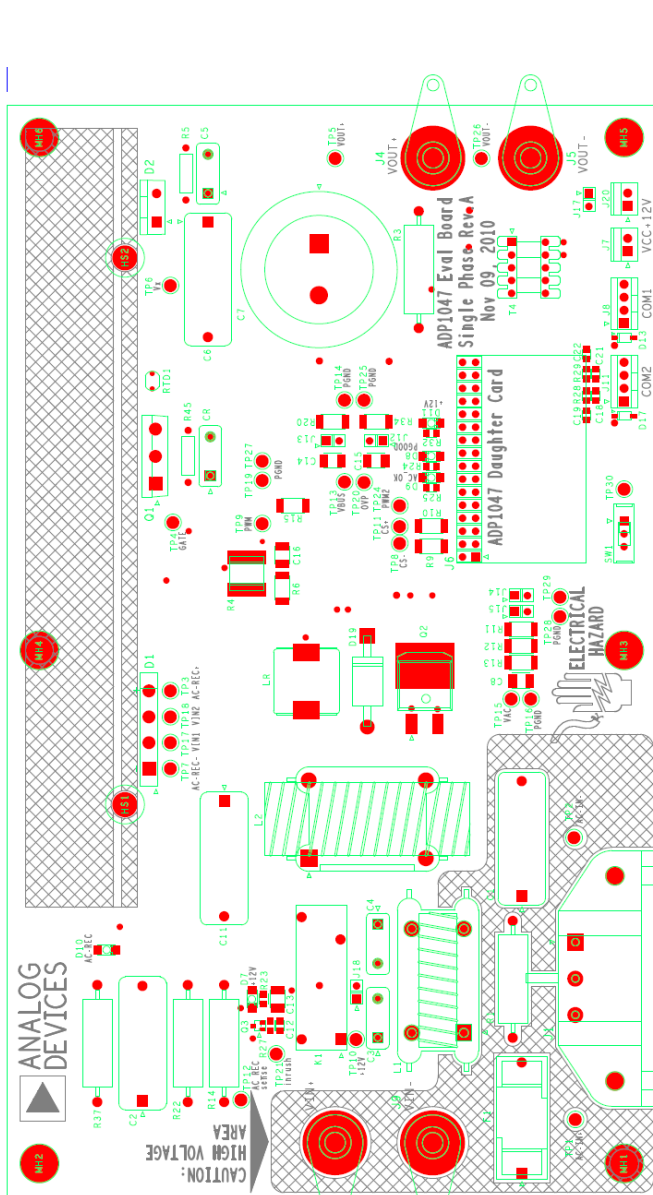

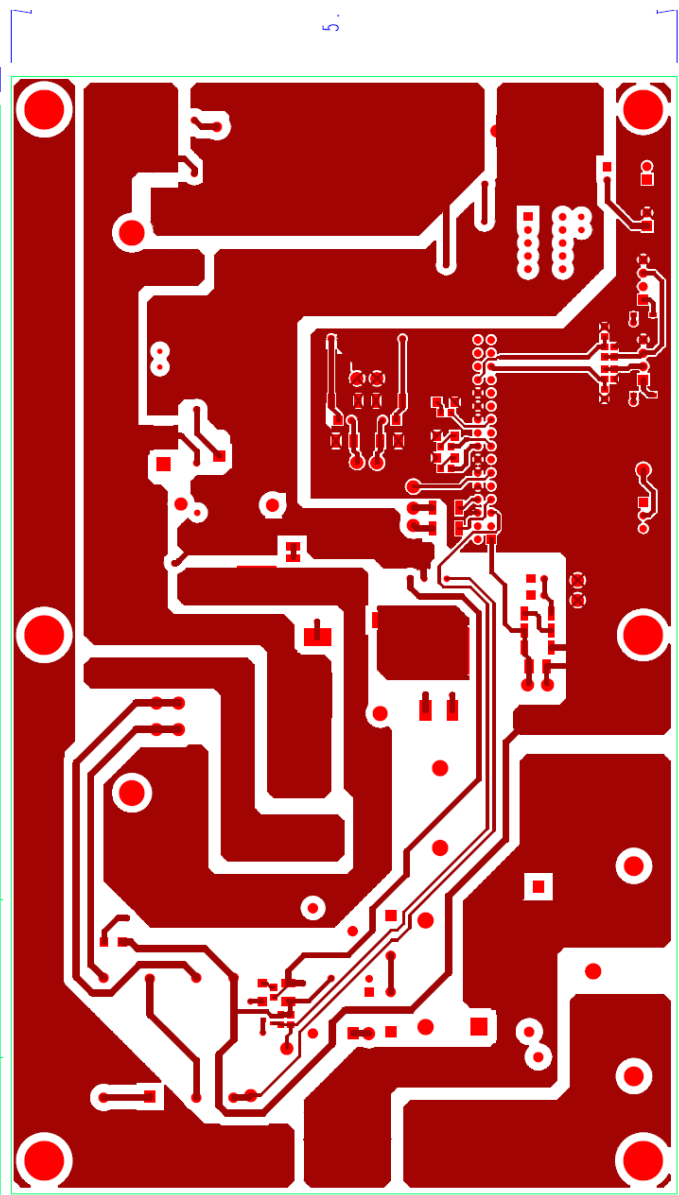*Figure 10 – Layout, Top Silkscreen*

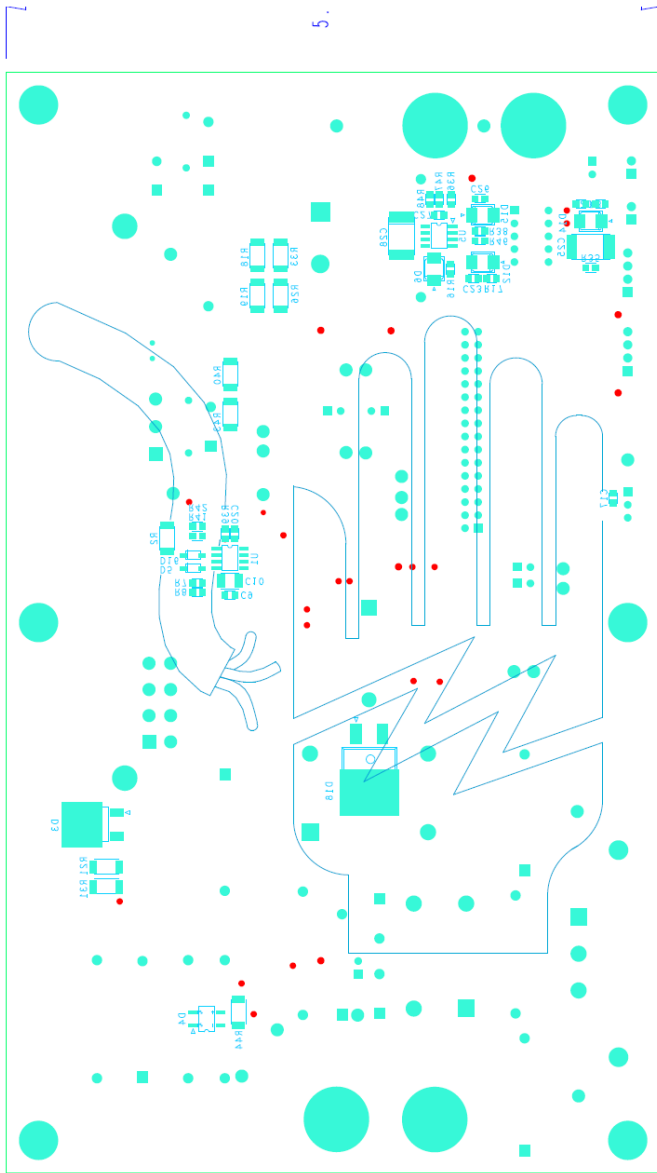*Figure 11 - Layout, Top layer*

Figure 12 - Layout, Bottom silkscreen
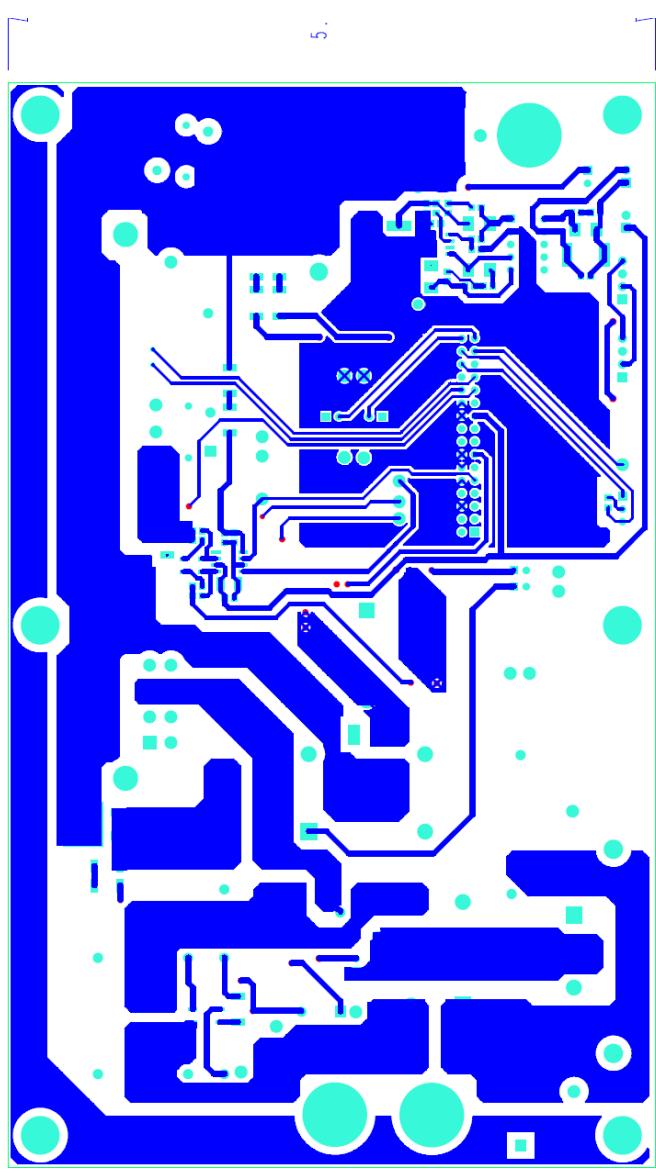
Figure 13 - Layout, Bottom layer

APPENDIX IV – LAYOUT (DAUGHTER CARD)
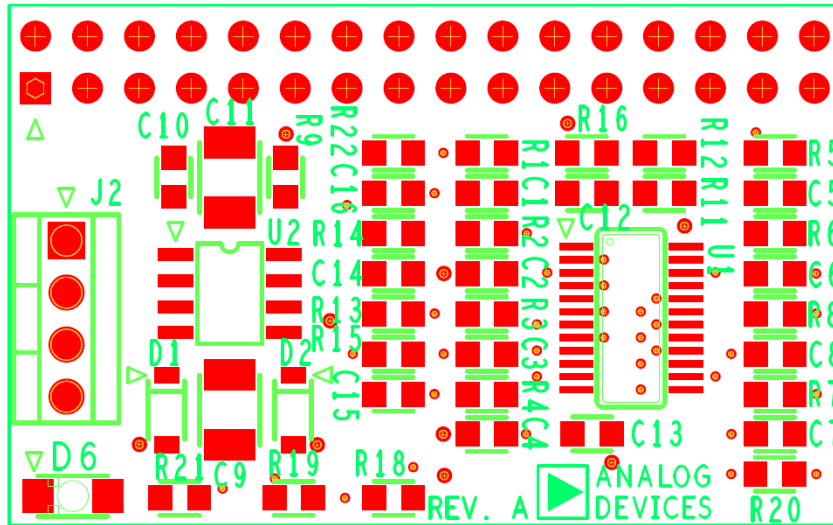
Figure 14 – Top silkscreen
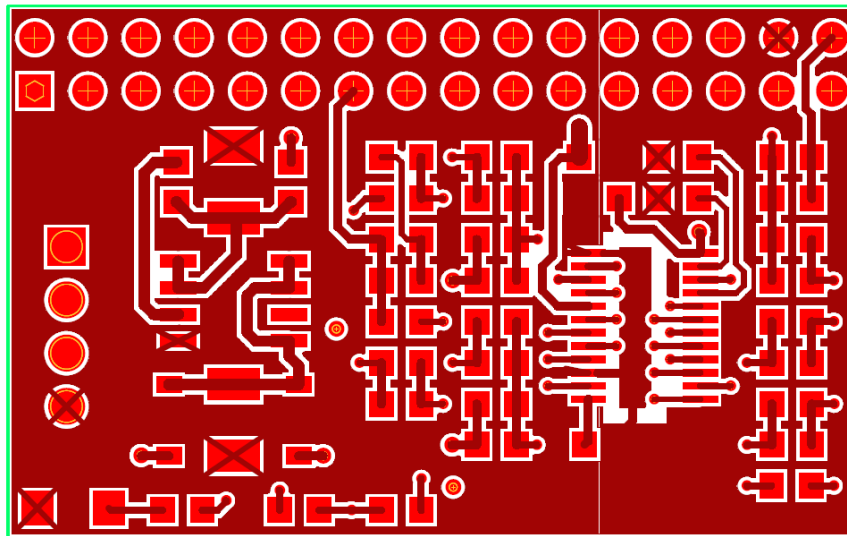
Figure 15 - Top Layer,
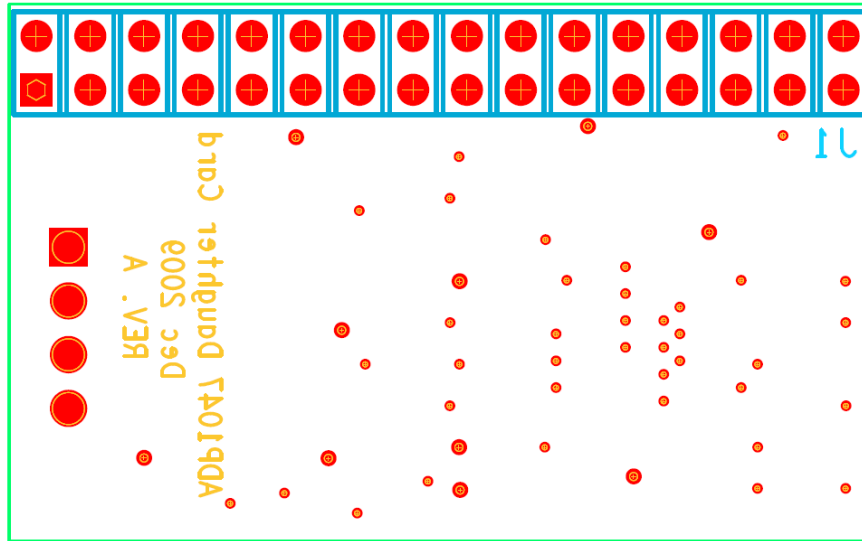
Figure 16 –Bottom Silkscreen
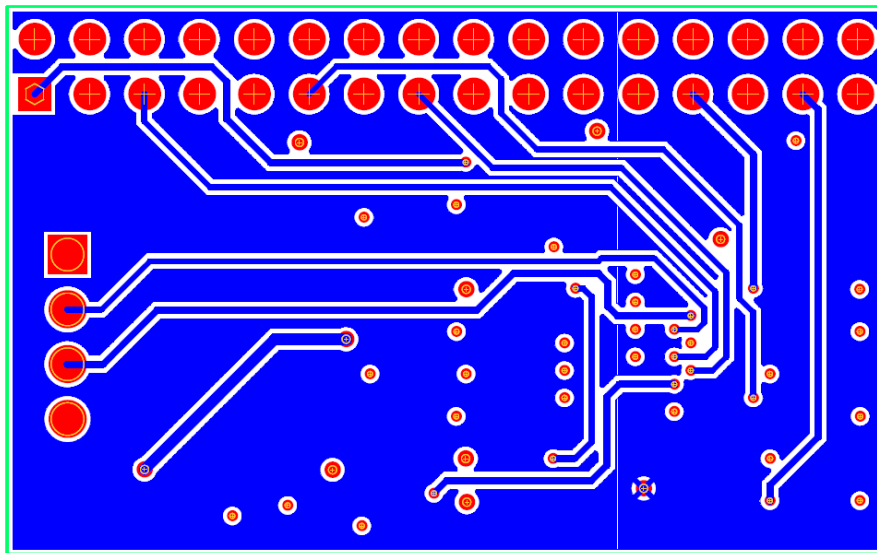
Figure 17 – Bottom layer
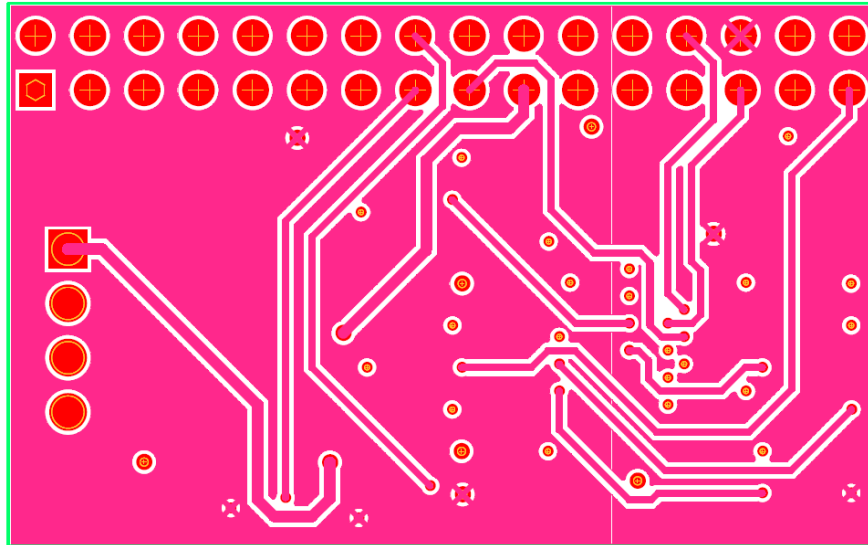
Figure 3 – Inner layer1 layout
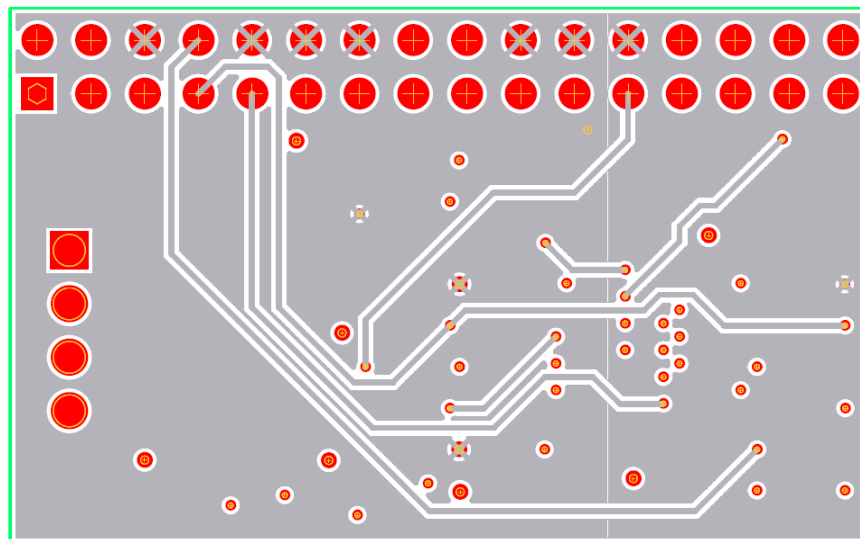
Figure 19 – inner layer2 layout

APPENDIX VIII – TEST WAVEFORMS
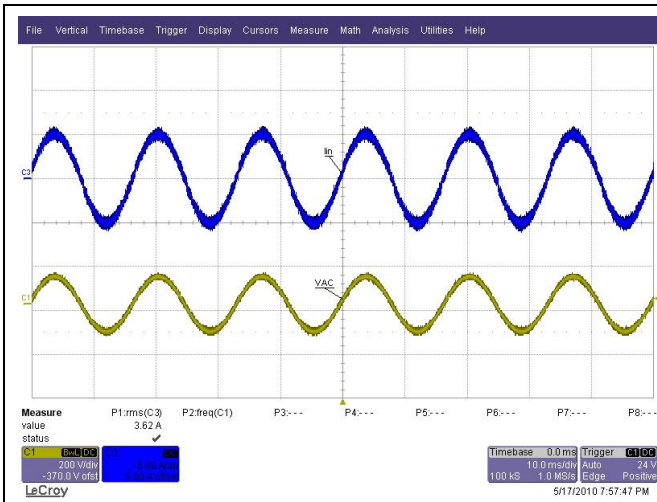
Figure 4 – Input voltage and current under 300W, 90VAC

Ch3: Iin, 5A/div, Ch1:VAC,200V/div
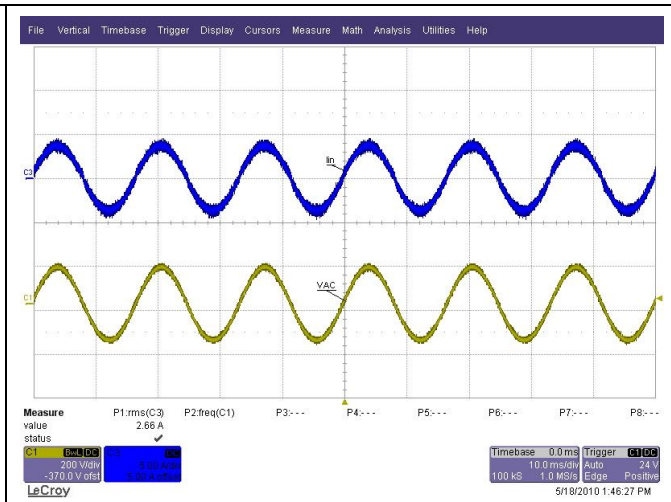
Figure 5 - Input voltage and current under 300W, 120VAC

Ch3: Iin, 5A/div, Ch1:VAC,200V/div
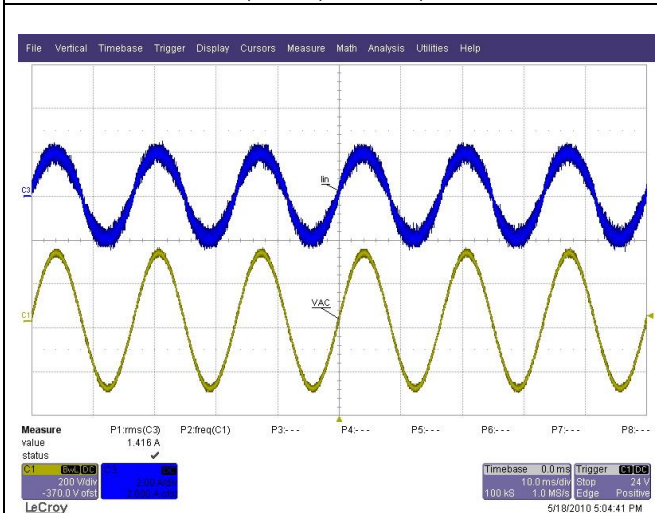
Figure 6 - Input voltage and current under 300W, 220VAC

Ch3: Iin, 2A/div, Ch1:VAC,200V/div
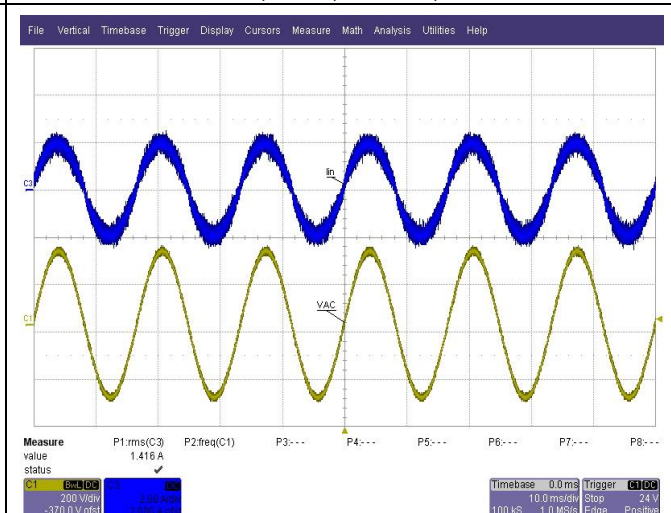
Figure 7 - Input voltage and current under 300W, 260VAC

Ch3: Iin, 2A/div, Ch1:VAC,200V/div
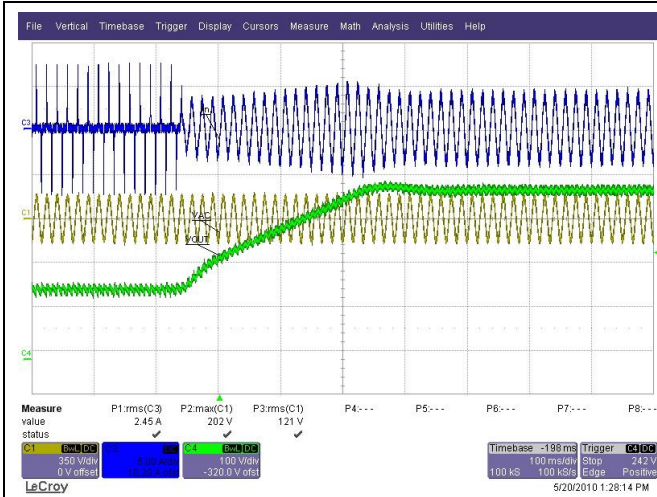
Figure 8 - Output voltage start up at 120VAC, 300W load

Ch3: Iin, 5A/div, Ch1:Vac,200V/div,Ch4:Vout,100V/div
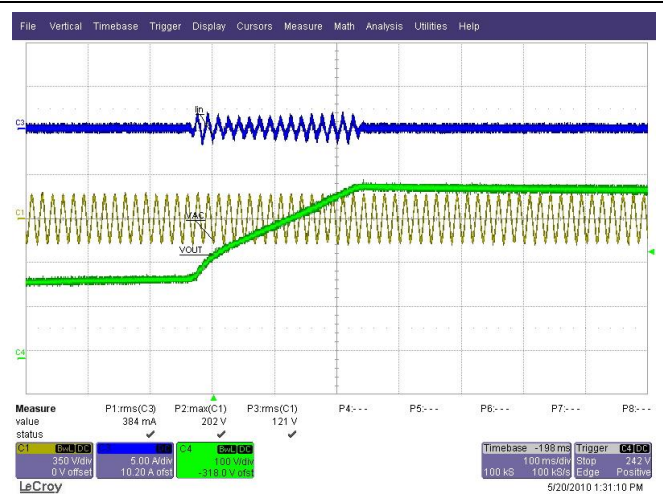
Figure 9 - Output voltage start up at 120VAC, 0W load

Ch3: Iin, 5A/div, Ch1:Vac,200V/div, Ch4:Vout,100V/div
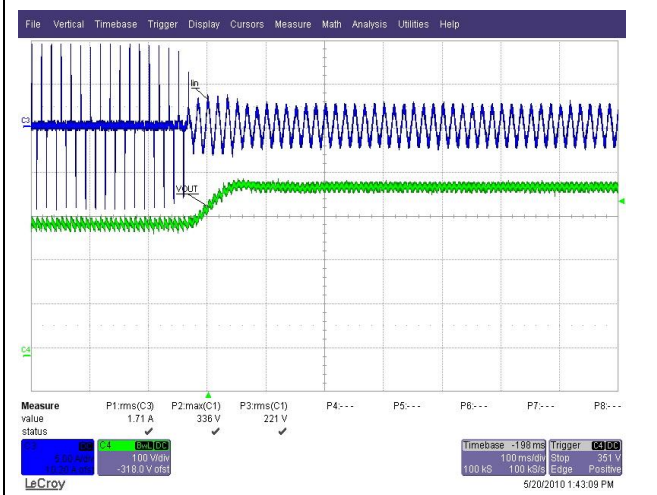
Figure 10 - Output voltage start up at 220VAC, 300W load

Ch3: Iin, 5A/div, Ch4:Vout,100V/div
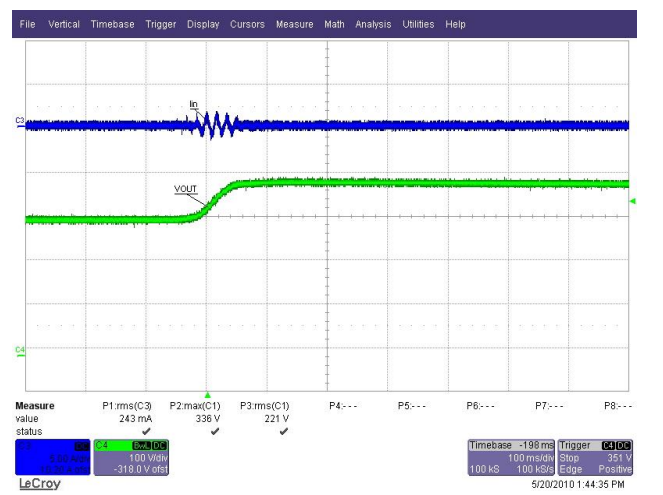
Figure 11 - Output voltage start up at 220VAC, 0W load

Ch3: Iin, 5A/div, Ch4:Vout,100V/div

APPENDIX IX – POWER FACTOR AT DIFFERENT LINE AND LOAD
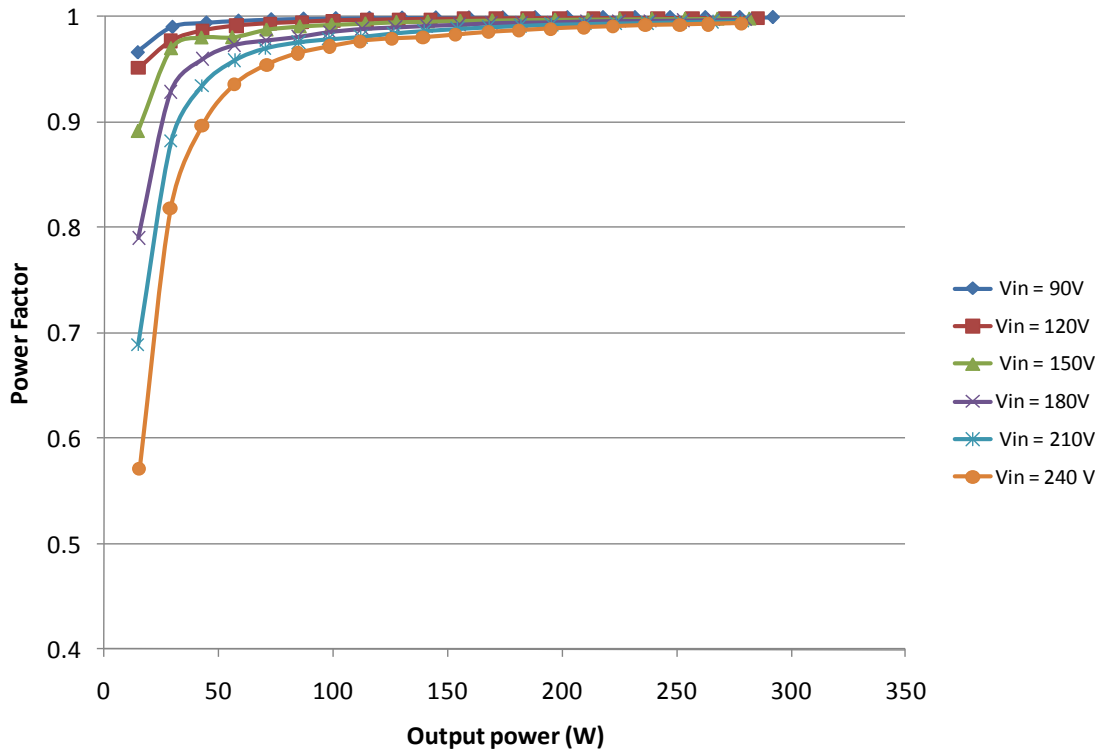
Figure 12 – Power factor vs load and line input

APPENDIX X – POWER METERING AT DIFFERENT LINE AND LOAD
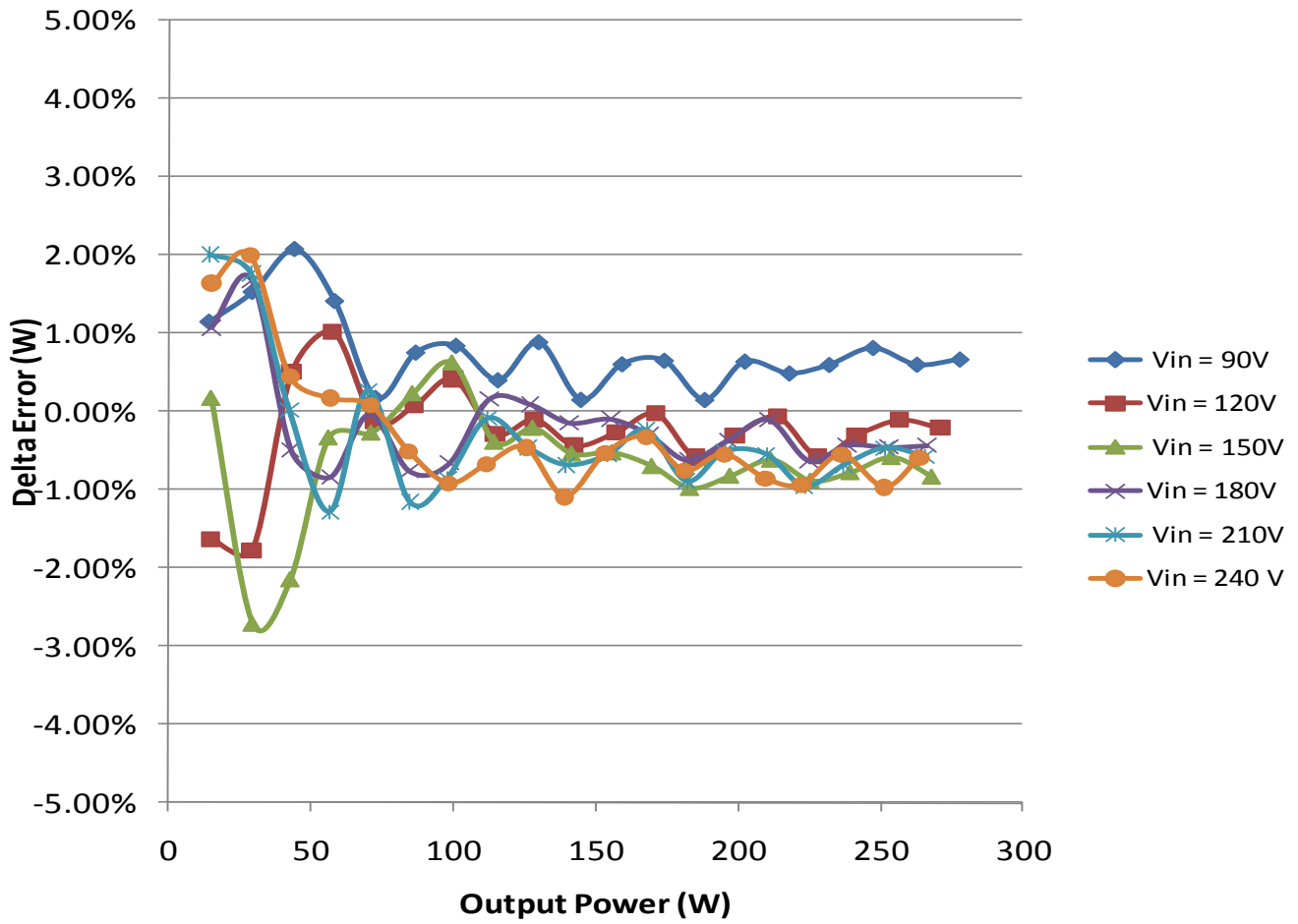
Figure 13 - Power metering accuracy vs load and line input

APPENDIX X – BILL OF MATERIALS (MAIN BOARD)

| Part Reference	Part Description	Manufacture	Mfg Part Number
C1	CAP 0.47uF 250/275 VAC	Panasonic - ECG	ECQ-U2A474ML
C2	CAP 0.47uF 250/275 VAC	Panasonic - ECG	ECQ-U2A474ML
C3	DNI		
C4	DNI		
C5	CAP CER DISC 68pF 1KV SL 5% RAD	TDK Corporation	CC45SL3AD680JYNN
C6	CAP METAL POLY 0.33uF 630 VDC	Panasonic - ECG	ECQ-E6334KF
C7	CAP 330uF 450V ELECT	Panasonic - ECG	EET-UQ2W331DA
C8	DNI		
C9	CAP 0.1uF 50V 10% X7R SMD	Murata Electronics	GRM21BR71H104KA01L
C10	CAP 4.7uF 25V CERAMIC X5R SMD	Panasonic - ECG	ECJ-4YB1E475K
C11	CAP 0.33uF 630VDC METAL POLY	Panasonic - ECG	ECQ-E6334KF
C12	CAP 0.1uF 50V 10% X7R	Murata Electronics	GRM21BR71H104KA01L
C13	CAP 22uF Y5V SMD	Taiyo Yuden	EMK325F226ZN-T
C14	CAP CER 100pF 630V COG 5%	Murata Electronics	GRM31A5C2J101JW01D
C15	CAP CER 100pF 630V COG 5%	Murata Electronics	GRM31A5C2J101JW01D
C16	CAP CER 1000pF 10% 100V X7R SMD	AVX	12101C102KAT2A
C17	CAP 1000pF 50V 10% X7R	Panasonic - ECG	ECJ-2VB1H102K
C18	CAP 33pF 50V +/-5% NPO	Panasonic - ECG	ECJ-2VC1H330J
C19	CAP 33pF 50V +/-5% NPO	Panasonic - ECG	ECJ-2VC1H330J
C20	CAP CER 1000pF 50V X7R SMD	Panasonic - ECG	ECJ-2VB1H102K
C21	CAP 33pF 50V +/-5% NPO	Panasonic - ECG	ECJ-2VC1H330J
C22	CAP 33pF 50V +/-5% NPO	Panasonic - ECG	ECJ-2VC1H330J
C23	CAP CER 1000PF 1000V X7R	Kemet	C0805C102KDRACTU
C24	CAP 470PF 200V CERAMIC X7R	Panasonic - ECG	ECJ-2VB2D471K
C25	CAP TANT 100uF 25V 10%	Kemet	T491X107K025ZT
C26	CAP 470PF 200V CERAMIC X7R	Panasonic - ECG	ECJ-2VB2D471K
C27	CAP CER 1uF 50V X5R 10%	AVX	08055D105KAT2A
C28	CAP TANT 100uF 25V 10%	Kemet	T491X107K025ZT
D1	RECT BRIDGE GPP 600V 8A GBU	Diodes Inc	GBU806
D2	DIODE HYPERFAST 600V 8A	Vishay/Semiconductors	8ETX06PBF
D3	DIODE STD REC 800V 8A SMD	Vishay/Semiconductors	8EWS08S
D4	IC RECT BRIDGE 0.5A 600V MBS-1	Micro Commercial	LMB6S-TP
D5	DNI		
D6	RECT PASSIVATD 1A 1000V SMD	Micro Commercial	DL4007

D9	LED GREEN CLEAR 75mA 2.1V SMD	CHICAGO MINIATURE LIGHTING	CMD15-21VGC/TR8
D10	LED SUPPER RED CLEAR 75mA 1.7V SMD	CHICAGO MINIATURE LIGHTING	CMD15-21SRC/TR8
D11	LED SUPPER RED CLEAR 75mA 1.7V SMD	CHICAGO MINIATURE LIGHTING	CMD15-21SRC/TR8
D12	RECT PASSIVATD 1A 1000V SMD	Micro Commercial	DL4007
D13	DIODE SWITCH 100V 150MA	Micro Commercial	1N4148WTPMSCT-ND
D14	DIODE ULTRA FAST SW 200V 1A	Diodes Inc	US1D-13-F
D15	DIODE ULTRA FAST SW 200V 1A	Diodes Inc	US1D-13-F
D16	DNI		
D17	DIODE SWITCH 100V 150MA	Micro Commercial	1N4148WTPMSCT-ND
D18	DNI		
D19	DNI		
F1	HOLDER PC FUSE 5mm LOW PROFILE	Keystone Electronics	4527
K1	RELAY PWR SPST-NO 8A 12VDC PCB	Omron Electronics Inc-EMC Div	G6RL-1A DC12
Lr	DNI		
L1	COMMON MODE LINE CHOKES 1.9mH	Coilcraft	CMT1-2.1-4L
L2	BOOST CHOKE 500UHY	Precision	019-4120-00
Q1	MOSFET N-CH 650V 20.7A	Infineon Technologies	SPW20N60C3
Q2	DNI		
Q3	MOSFET N-CH 30V 0.1A SOT-323	Rohm Semiconductor	2SK3018T106
RTD1	THERMISTER NTC 33K OHM 5% RAD	EPCOS Inc	B57891M0333J000
R1	RES 470K OHM METAL FILM 3W 5%	Any	
R2	SMD RES 10K OHM 1/2W 5%	Any	
R3	RES 470K OHM METAL FILM 3W 5%	Any	
R4	SMD RES 0.08 OHM 2W 1% +/-75PPM	Vishay/Dale	WSL2816R0800FEH
R5	RES 390 OHM METAL FILM 1W 5%	Any	
R6	SMD RES 0.0 OHM 1/2W 5%	Any	
R7	DNI		
R8	RES 10.0 OHM 1/8W 1% SMD	Any	
R9	SMD RES 0.0 OHM 1/2W 5%	Any	
R10	SMD RES 0.0 OHM 1/2W 5%	Any	
R11	SMD RES 499K OHM 1/2W 1%	Any	
R12	SMD RES 499K OHM 1/2W 1%	Any	
R13	SMD RES 36.5K OHM 1/2W 1%	Any	
R14	RES 470K OHM METAL FILM 3W 5%	Any	
R15	SMD RES 0.0 OHM 1/2W 5%	Any	
R16	SMD RES 470K OHM 1/8W 1%	Any	
R17	SMD RES 300 OHM 1/8W 1%	Any	
R18	SMD RES 499K OHM 1/2W 1%	Any	
R19	SMD RES 499K OHM 1/2W 1%	Any	
R20	SMD RES 36.5K OHM 1/2W 1%	Any	
R21	SMD RES 499K OHM 1/2W 1%	Any	

R31	SMD RES 499K OHM 1/2W 1%	Any	
R32	RES 2.20K OHM 1/8W 1% SMD	Any	
R33	SMD RES 499K OHM 1/2W 1%	Any	
R34	SMD RES 36.5K OHM 1/2W 1%	Any	
R35	SMD RES 5.10K 1/8W 1%	Any	
R36	SMD RES 47.0 OHM 1/8W 1%	Any	
R37	DNI		
R38	SMD RES 48.7K OHM 1/8W 1%	Any	
R39	RES 1.00K OHM 1/8W 1% SMD	Any	
R40	RES 249K OHM 1/2W 1% SMD	Any	
R41	DNI	Any	
R42	RES 10.0 OHM 1/8W 1% SMD	Any	
R43	RES 140K OHM 1/2W 1% SMD	Any	
R44	SMD RES 100 OHM 3/4W 5%	Any	
R45	RES 480K OHM METAL FILM 3W 5%	Any	
R46	SMD RES 8.06K OHM 1/8W 1%	Any	
R47	SMD RES 5.10K 1/8W 1%	Any	
R48	SMD RES 5.10K 1/8W 1%	Any	
SW1	SW SLIDE SPDT 30V 0.2A PC MNT	Keystone Electronics	5010
T4	TRANSFORMER	Precision	019-7086-00R
U1	IC DRIVER DUAL 4A NONINV	Analog Devices Inc.	ADP3634ARDZ-ND
U5	DC-DC 5.5W 85-265VAC	POWER INTEEGRATIONS	LNK606DG

APPENDIX XI – BILL OF MATERIALS (DAUGHTER CARD)

Part Reference	Part Description	Manufacture	Mfg Part No
C1	DNI		
C2	DNI		
C3	DNI		
C4	CAP CER 1000pF 50V 5% COG	Murata Electronics	GRM2165C1H102JA01D
C5	DNI		
C6	DNI		
C7	DNI		
C8	DNI		
C9	CAP CER 10uF 25V +/-20% X5R	Panasonic - ECG	ECJ-4YB1E106M
C10	CAP CER 0.1uF 50V 10% X7R	Murata Electronics	GRM21BR71H104KA01L
C11	CAP CER 1.0uF 50V 10% X7R	Murata Electronics	GRM32RR71H105KA01L
C12	CAP CER 0.1uF 50V 10% X7R	Murata Electronics	GRM21BR71H104KA01L
C13	CAP CER 0.1uF 50V 10% X7R	Murata Electronics	GRM21BR71H104KA01L
C14	DNI		
C15	DNI		
C16	DNI		
D1	DIODE SWITCH 100V 150MA	Micro Commercial	1N4148WTPMSCT-ND
D2	DIODE SWITCH 100V 150MA	Micro Commercial	1N4148WTPMSCT-ND
D6	LED SUPER RED CLEAR 75MA 1.7V SMD	CHICAGO MINIATURE LIGHTING	CMD15-21SRC/TR8
R1	RES 90.9K OHM 1/8W 1% SMD	Any	
R2	RES 10K OHM 1/8W 1% SMD	Any	
R3	RES 90.9K OHM 1/8W 1% SMD	Any	
R4	RES 10K OHM 1/8W 1% SMD	Any	
R5	RES 90.9K OHM 1/8W 1% SMD	Any	
R6	RES 10K OHM 1/8W 1% SMD	Any	
R7	RES 10K OHM 1/8W 0.1% SMD	Any	
R8	RES 10K OHM 1/8W 0.1% SMD	Any	
R9	RES 0.0 OHM 1/8W 5% SMD	Any	
R11	RES 49.9K OHM 1/8W 0.1% SMD	Any	
R12	RES 2.20K OHM 1/8W 1% SMD	Any	
R13	RES 0.0 OHM 1/8W 5% SMD	Any	
R14	RES 10K OHM 1/8W 1% SMD	Any	
R15	RES 10K OHM 1/8W 1% SMD	Any	
R16	RES 0.0 OHM 1/8W 5% SMD	Any	
R18	RES 2.20K OHM 1/8W 1% SMD	Any	
R19	RES 2.20K OHM 1/8W 1% SMD	Any	
R20	RES 2.20K OHM 1/8W 1% SMD	Any	
R21	RES 2.20K OHM 1/8W 1% SMD	Any	
R22	RES 0.0 OHM 1/8W 5% SMD	Any	
U1	Digital PFC Controller	Analog Devices	ADP1047
U2	Low Dropout Regulators	Analog Devices	ADP3303

APPENDIX XII – REGISTER FILE (REVA_IC REVISED-0408.47R)

Reg(1 h) = 4h - OPERATION

Reg(2 h) = 17h - ON_OFF_CONFIG

Reg(10 h) = 0h - WRITE_PROTECT

Reg(20 h) = 6h - VOUT_MODE

Reg(21 h) = 604h - VOUT_COMMAND

Reg(29 h) = 80AAh - VOUT_SCALE_LOOP

Reg(2A h) = FB02h - VOUT_SCALE_MONITOR

Reg(35 h) = F154h - VIN_ON

Reg(36 h) = F118h - VIN_OFF

Reg(40 h) = F708h - VOUT_OV_FAULT_Limit

Reg(41 h) = C0h - VOUT_OV_FAULT_RESPONSE

Reg(42 h) = F690h - VOUT_OV_WARN_LIMIT

Reg(43 h) = F500h - VOUT_UV_WARN_LIMIT

Reg(44 h) = F320h - VOUT_UV_FAULT_LIMIT

Reg(45 h) = 58h - VOUT_UV_FAULT_RESPONSE

Reg(50 h) = 0h - OT_FAULT_RESPONSE

Reg(55 h) = F434h - VIN_OV_FAULT_LIMIT

Reg(56 h) = 0h - VIN_OV_FAULT_RESPONSE

Reg(58 h) = F140h - VIN_UV_WARN_LIMIT

Reg(59 h) = F118h - VIN_UV_FAULT_LIMIT

Reg(5A h) = 78h - VIN_UV_FAULT_RESPONSE

Reg(5B h) = CA2Ah - IIN_OC_FAULT_LIMIT

Reg(5C h) = 0h - IIN_OC_FAULT_RESPONSE

Reg(5D h) = CA5Fh - IIN_OC_WARN_LIMIT_ADC

Reg(6B h) = F550h - PIN_OP_WARN_LIMIT

Reg(FE00 h) = 0h - CS_Fast_OCP_Response

Reg(FE01 h) = 80h - VFB_Fast_OVP_Response

Reg(FE02 h) = 0h - OLP_Response

Reg(FE03 h) = 0h - VDD3P3_SET

Reg(FE04 h) = 0h - VCORE_SET

Reg(FE05 h) = 0h - PGOOD_AC_OK_DEBOUNCE_SET

Reg(FE06 h) = 0h - PS_ON_SET

Reg(FE07 h) = 0h - Flag_Fault_ID

Reg(FE08 h) = 1Bh - SoftStart_Flags_Blank_1

Reg(FE09 h) = 0h - SoftStart_Flags_Blank_2

Reg(FE0A h) = 0h - PGOOD_FLAGS_LIST

Reg(FE0B h) = 0h - AC_OK_FLAGS_LIST

Reg(FE0C h) = 0h - PWM1_1

Reg(FE0D h) = 0h - PWM1_2

Reg(FE0E h) = 20h - PWM1_3

Reg(FE0F h) = 3h - PWM1_4

Reg(FE10 h) = 0h - PWM2_1

Reg(FE11 h) = 0h - PWM2_2

Reg(FE12 h) = 20h - PWM2_3

Reg(FE13 h) = 3h - PWM2_4

Reg(FE14 h) = 1h - PWM_Set

Reg(FE15 h) = 33h - PWM_Limit

Reg(FE18 h) = 83h - RTD_ADC_gain_Trim

Reg(FE19 h) = 0h - Temperature_Fault_Limit

Reg(FE1A h) = 0h - Temperature_Warning_Limit

Reg(FE1B h) = Dh - FREQUENCY SET

Reg(FE1C h) = 0h - LOW_SW_FREQ

Reg(FE1D h) = 3h - Dither_Set

Reg(FE1E h) = 0h - Frequency_Sync_Set

Reg(FE20 h) = 28h - Voltage_Loop_Filter_Gain

Reg(FE21 h) = C0h - Voltage_Loop_Filter_Zero

Reg(FE22 h) = 58h - Fast_Loop_Filter_Gain

Reg(FE23 h) = F8h - Fast_Loop_Filter_Zero

Reg(FE24 h) = BBh - Fast_Loop_Enable

Reg(FE25 h) = 4Ah - VAC_threshold_set

Reg(FE27 h) = 4Bh - Min_Period_Set

Reg(FE28 h) = 8Ah - Max_Period_Set

Reg(FE29 h) = 32h - Current_Loop_Filter_Gain

Reg(FE2A h) = D7h - Current_Loop_Filter_Zero

Reg(FE2B h) = 5Ah - Current_Loop_Filter_Gain_2

Reg(FE2C h) = AAh - Current_Loop_Filter_zero_2

Reg(FE2D h) = 1Eh - Soft_Start_Set

Reg(FE2E h) = 1h - INRUSH_Set

Reg(FE2F h) = 32h - VFB_OV_FAULT_RISE

Reg(FE30 h) = 3h - VFB_OV_FAULT_FALL

Reg(FE31 h) = 2h - FAST_OVP_OLP_debounce

Reg(FE32 h) = 0h - LOW_POWER_TH

Reg(FE35 h) = 4Dh - HIGH LINE LIMIT

Reg(FE36 h) = 41h - LOW LINE LIMIT

Reg(FE37 h) = 11h - Ilim_trim

Reg(FE39 h) = 676h - EXPONENT

Reg(FE3A h) = 4h - READ_UPD_RATE

Reg(FE3B h) = FB02h - VIN_SCALE_MONITOR

Reg(FE3C h) = D320h - IIN_RSENSE

Reg(FE3D h) = 1Fh - FAST_OCP_BLANK

Reg(FE3E h) = E0h - CS_Fast_OCP_set

Reg(FE3F h) = 0h - TEMP_HYS

Reg(FE40 h) = Fh - VAC_ADC_gain_Trim

Reg(FE41 h) = 85h - VFB_ADC_gain_Trim

Reg(FE42 h) = 98h - CS_ADC_gain_Trim
Reg(FE43 h) = 0h - Ibal gain
Reg(FE44 h) = 1Ah - SMTVOUT_LOW_POWER_THRES
Reg(FE45 h) = C0h - SMTVOUT_HIGH_POWER_THRES
Reg(FE46 h) = 457h - SMTVOUT_LOW_LINE_VO1
Reg(FE47 h) = 4ACh - SMTVOUT_LOW_LINE_VO2
Reg(FE48 h) = 4A0h - SMTVOUT_High_LINE_VO1
Reg(FE49 h) = 4FEh - SMTVOUT_High_LINE_VO2
Reg(FE4A h) = 4FEh - SMTVOUT_UPLIMIT_VOH
Reg(FE4B h) = 66Ah - SMTVOUT_VAC_240V
Reg(FE4C h) = 0h - SYNC_DELAY
Reg(FE4D h) = 5Dh - SMTVOUT_VAC_240V_HYS
Reg(FE4E h) = 8h - Power_HYS
Reg(FE4F h) = 40h - ADV_FUNCTION_EN
Reg(FE51 h) = 3Ch - VIN_UV_FAULT_HYST
Reg(FE52 h) = 40h - VAC_OS_sel
Reg(FE53 h) = 0h - VAC_ADC_offset_Trim
Reg(FE54 h) = 0h - CS_ADC_offset_Trim
Reg(FE55 h) = 62h - CS_OS_sel
Reg(FE7E h) = 20h - CS_GAIN_TRIM_HRANGE
Reg(FE7F h) = 0h - CS_OFFSET_TRIM_HRANGE
Reg(FE83 h) = 0h - RESTART_SET
Reg(FE90 h) = 50h - CLF_GAIN_LIGHTLOAD
Reg(FE91 h) = B4h - CLF_ZERO_LIGHTLOAD
Reg(FE92 h) = 50h - HLINE_CLF_GAIN_LIGHTLOAD
Reg(FE93 h) = B4h - HLINE_CLF_zero_LIGHTLOAD
Reg(FE94 h) = 0h - SMTOUT_POWER_AVE

NOTES

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