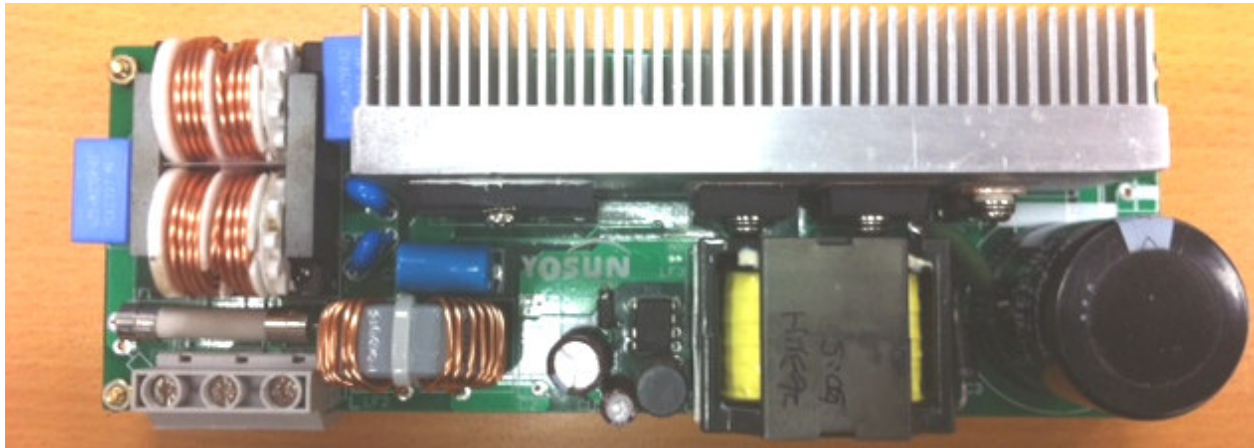


600W L4984 CCM PFC Application



1. Summary

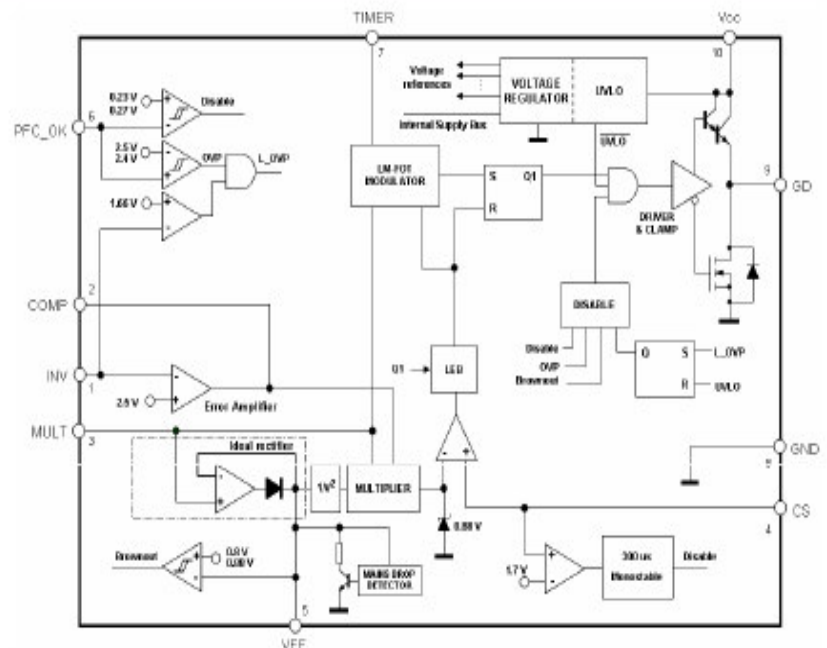
L4984: Features and Block Diagram



10 pin FOT-CCM PFC CONTROLLER

- LINE-MODULATED FIXED-OFF-TIME (LM-FOT) CONTROL OF CCM-OPERATED PFC PRE-REGULATORS
- PROPRIETARY LM-FOT MODULATOR FOR NEARLY FIXED-FREQUENCY OPERATION
- FAST INPUT VOLTAGE FEEDFORWARD ($1/V^2$ CORRECTION)
- AC BROWNOUT DETECTION
- PROTECTION AGAINST FEEDBACK LOOP FAILURE (LATCHED SHUTDOWN)
- INDUCTOR SATURATION PROTECTION
- PROPRIETARY MULTIPLIER DESIGN FOR MINIMUM THD OF AC INPUT CURRENT
- ACCURATE ADJUSTABLE OUTPUT OVERVOLTAGE PROTECTION
- DIGITAL LEADING-EDGE BLANKING ON CURRENT SENSE
- 1.8% OVERALL ACCURACY INTERNAL REFERENCE VOLTAGE
- -600/+800 mA TOTEM POLE GATE DRIVER WITH ACTIVE PULL-DOWN DURING UVLO AND VOLTAGE CLAMP
- SSOP10 PACKAGE

➤ **QUALIFIED IN Q2 2011**



APPLICATIONS:

PFC PRE-REGULATORS FOR:

- IEC61000-3-2 AND JEIDA-MITI COMPLIANT SMPS, IN EXCESS OF 1kW
- HI POWER AC-DC ADAPTER
- LARGE SCREEN FLAT-TV
- INDUSTRIAL SMPS

2.Main characteristics and circuit description

The main features of the SMPS are:

- Input mains range: 90 to 264 Vac
- Minimum line freq : 47Hz
- Rated output power : 600W
- Output voltage: 400 V at 1.5 A continuous operation

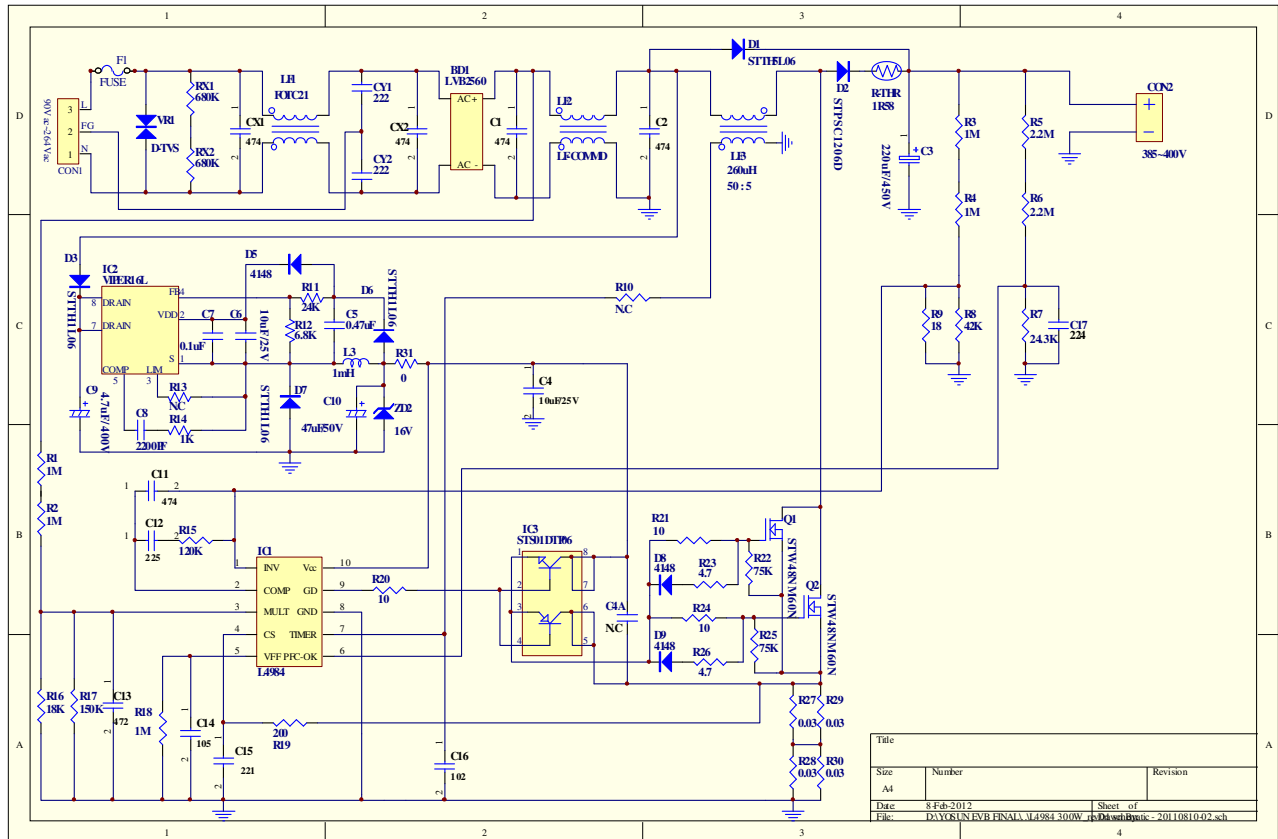


Figure 1. Application Circuit

3. Demo Board Spec.

Application	Yosun Device			Input Volatage Range	Rated Output Power	Output Volatage (Rated Current)
	ST	LITEON	VISHAY			
PFC	STTH5L06	4148	LVB2560	90~264VAC	600W	400V / 1.5A
	STPSC1206D					
	STTH1L06					
	VIPER16L					
	L4984					
	STS01DTP06					
	STW48NM60N					

4. Efficiency measurement

.Test condition :

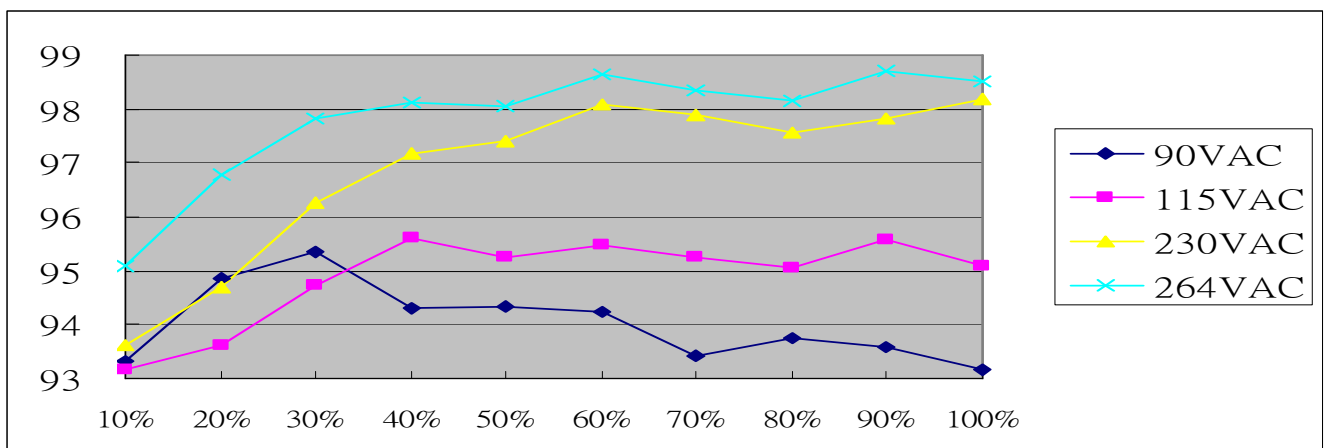
90V.Eff			
Pout(W)	Pin(W)	PF	Eff(%)
60	64.3	0.963	93.31
120	126.5	0.992	94.86
180	188.8	0.996	95.34
240	254.5	0.998	94.30
300	318	0.999	94.34
360	382	0.999	94.24
420	449.5	0.999	93.44
480	512	0.999	93.75
540	577	0.999	93.59
600	644	0.999	93.17

115V.Eff			
Pout(W)	Pin(W)	PF	Eff(%)
60	64.4	0.942	93.17
120	128.2	0.983	93.60
180	190	0.993	94.74
240	251	0.996	95.62
300	315	0.997	95.24
360	377	0.999	95.49
420	441	0.999	95.24
480	505	0.999	95.05
540	565	0.999	95.58
600	631	0.999	95.09

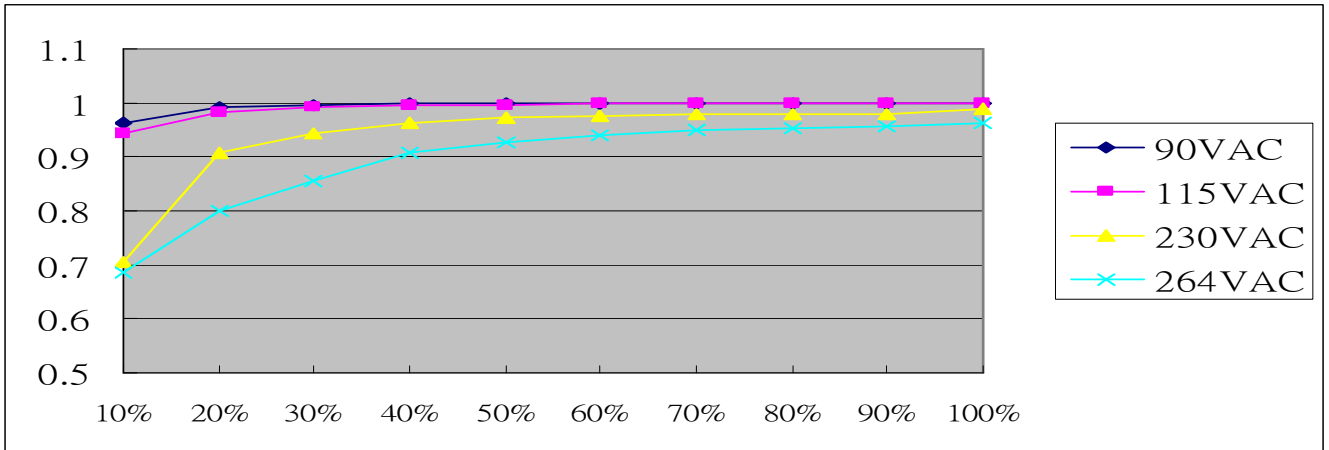
230V.Eff			
Pout(W)	Pin(W)	PF	Eff(%)
60	64.1	0.705	93.60
120	126.7	0.906	94.71
180	187	0.943	96.26
240	247	0.962	97.17
300	308	0.972	97.40
360	367	0.976	98.09
420	429	0.979	97.90
480	492	0.978	97.56
540	552	0.98	97.83
600	611	0.99	98.20

264V.Eff			
Pout(W)	Pin(W)	PF	Eff(%)
60	63.1	0.686	95.09
120	124	0.799	96.77
180	184	0.856	97.83
240	244.6	0.908	98.12
300	306	0.927	98.04
360	365	0.941	98.63
420	427	0.95	98.36
480	489	0.952	98.16
540	547	0.958	98.72
600	609	0.963	98.52

4.1 Efficiency vs Output power



4.2 PF vs Output power



4.3 THD vs Output power

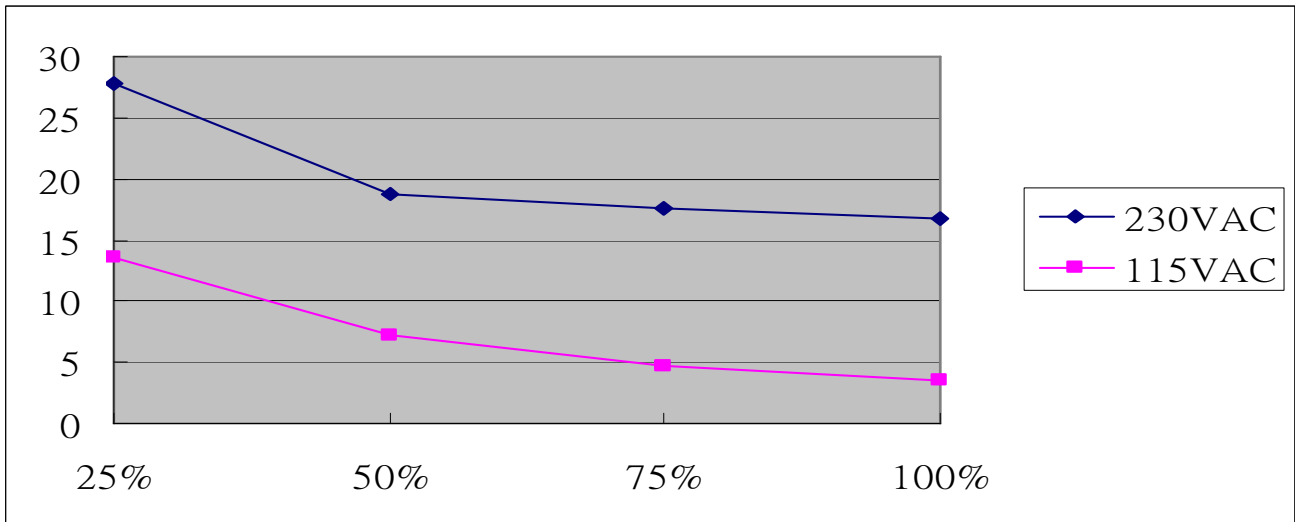
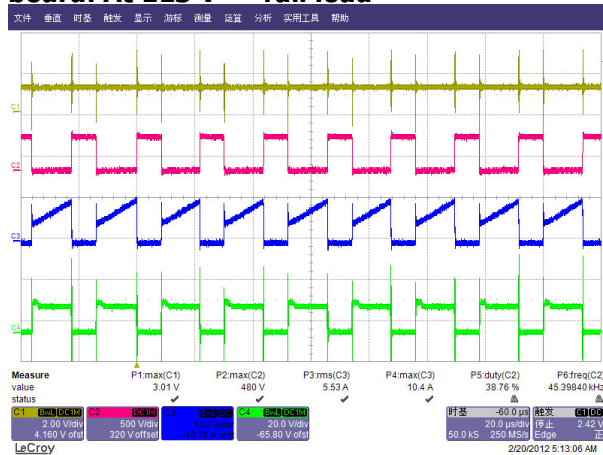


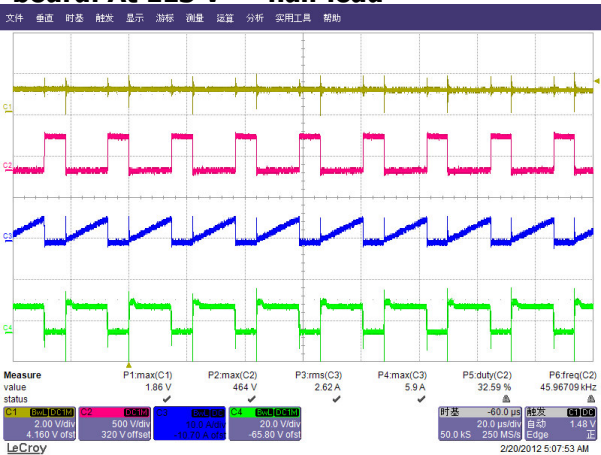
Figure 2. 600W L4984 CCM PFC demonstration

board: At 115 V - full load



CH2 : VDS=480V

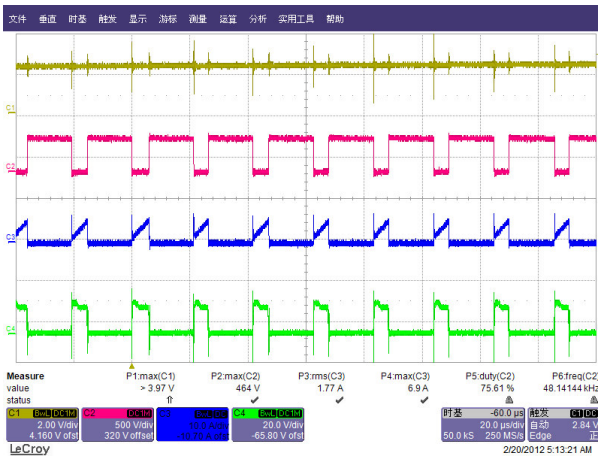
board: At 115 V - half load



CH2 : VDS=465V

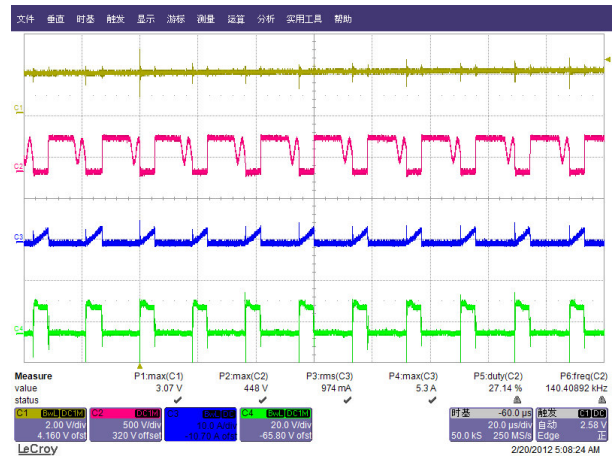
CH3: IDS=10.4A

Figure 3. 600W L4984 CCM PFC demonstration board: At 230 V - full load



CH3: IDS=5.9A

board: At 230 V - half load



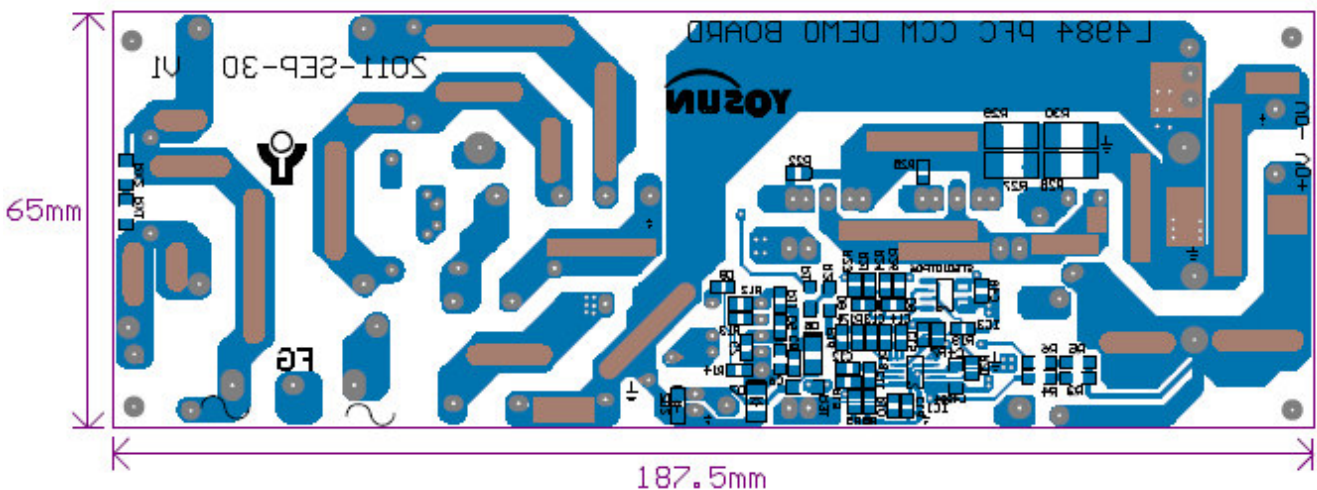
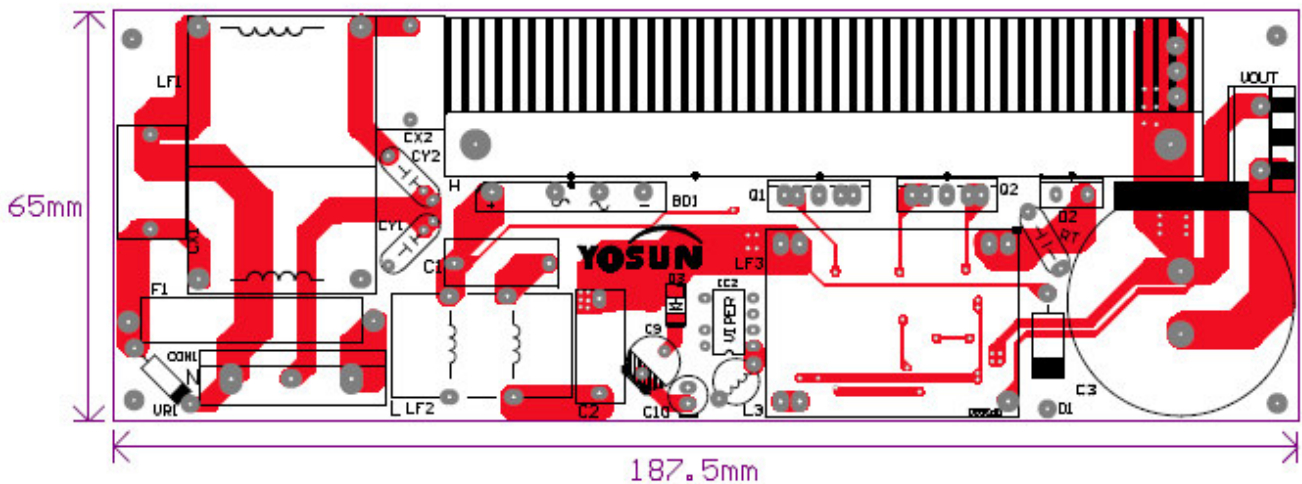
CH2 : VDS=464V

CH3: IDS=6.9A

Figure4. PCB layout of the demo board

CH2 : VDS=448V

CH3: IDS=5.3A



5. BOM List

No	Locate	Spec	Ventor	No	Locate	Spec	Ventor	No	Locate	Spec	Ventor
1	R1	1M		31	R31	0		61	D1	STTH5L06	ST
2	R2	1M		32	RX1	680K		62	D2	STPSC1206D	ST
3	R3	1M		33	RX2	680K		63	D3	STTH1L06	ST
4	R4	1M		34	C1	474/450V		64	D5	4148	
5	R5	2.2M		35	C2	474/450V		65	D6	STTH1L06	ST
6	R6	2.2M		36	C3	220uF/450V		66	D7	STTH1L06	ST
7	R7	24.3K		37	C4	10uF/25V		67	D8	4148	
8	R8	42.2K		38	C5	0.47		68	D9	4148	
9	R9	18K		39	C6	10uF/25V		69	IC1	L4984	ST
10	R10	N.C		40	C7	104		70	IC2	VIPER16L	ST
11	R11	24K		41	C8	102		71	IC3	STS01DTP06	ST
12	R12	6.8K		42	C9	4.7uF/400V		72	Q1	STW48NM60N	ST
13	R13	N.C		43	C10	47uF/50V		73	Q2	STW48NM60N	ST
14	R14	1K		44	C11	224		74	BD1	LVB2560	VISHAY
15	R15	120K		45	C12	225		75	F1	8A/600V	
16	R16	18K		46	C13	472		76	LF1	FOTC21	YUJING
17	R17	150K		47	C14	105		77	LF2	LF	YUJING
18	R18	1M		48	C15	221		78	LF3	QP3930	YUJING
19	R19	200		49	C16	102		79	RT	1R58	
20	R20	10		50	C17	224					
21	R21	10		51	C13	472					
22	R22	75K		52	C14	105					
23	R23	4.7		53	C15	221					
24	R24	10		54	C16	102					
25	R25	75K		55	C17	224					
26	R26	4.7		56	CX1	474					
27	R27	0.03	VISHAY	57	CX2	474					
28	R28	0.03	VISHAY	58	CY1	222 / Y2					
29	R29	0.03	VISHAY	59	CY2	222 / Y2					
30	R30	0.03	VISHAY	60	D1	STTH5L06	ST				

6.PFC coil specification

Electrical characteristics

- Converter Topology: Boost, Transition Mode
- Core Type: Q3930-PC44 or equivalent
- Min. Operating Frequency: 40kHz
- Primary Inductance: $380\mu\text{H} \pm 10\%$ at 1kHz-0.25V

YUJING Technology Co .Ltd

<http://www.yujingtech.com.tw/>

