

PMP4336: 12V1A Adapter _China Power Reference design

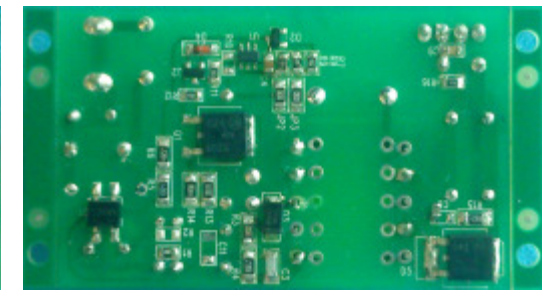
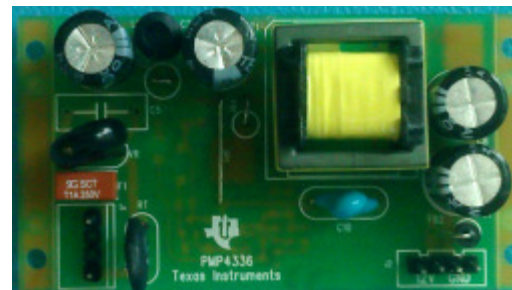
Reference Design	TI Parts	V_{in}	P_o	V_o I_o	Topology	Protection	Eff.
<u>Universal Input AC/DC mobile phone charger</u>	UCC28700	85~ 264 Vac	12W	12V, 1A	Isolated Flyback with Primary Side CC/CV Regulation	OVP, OCP SCP, Input UVP, OTP	86.7% at 115Vac 83.9% at 230Vac

Features

- Isolated Flyback with Primary Side Control
- QR operation with valley switching
- low component count
- Low standby power(<80mW in universal)
- Low Vcc capacitance
- Precise CC and CV control
- output OCP and Short Circuit Protection
- output Over Voltage Protection
- Input brown-out
- Pass EMI conduction test

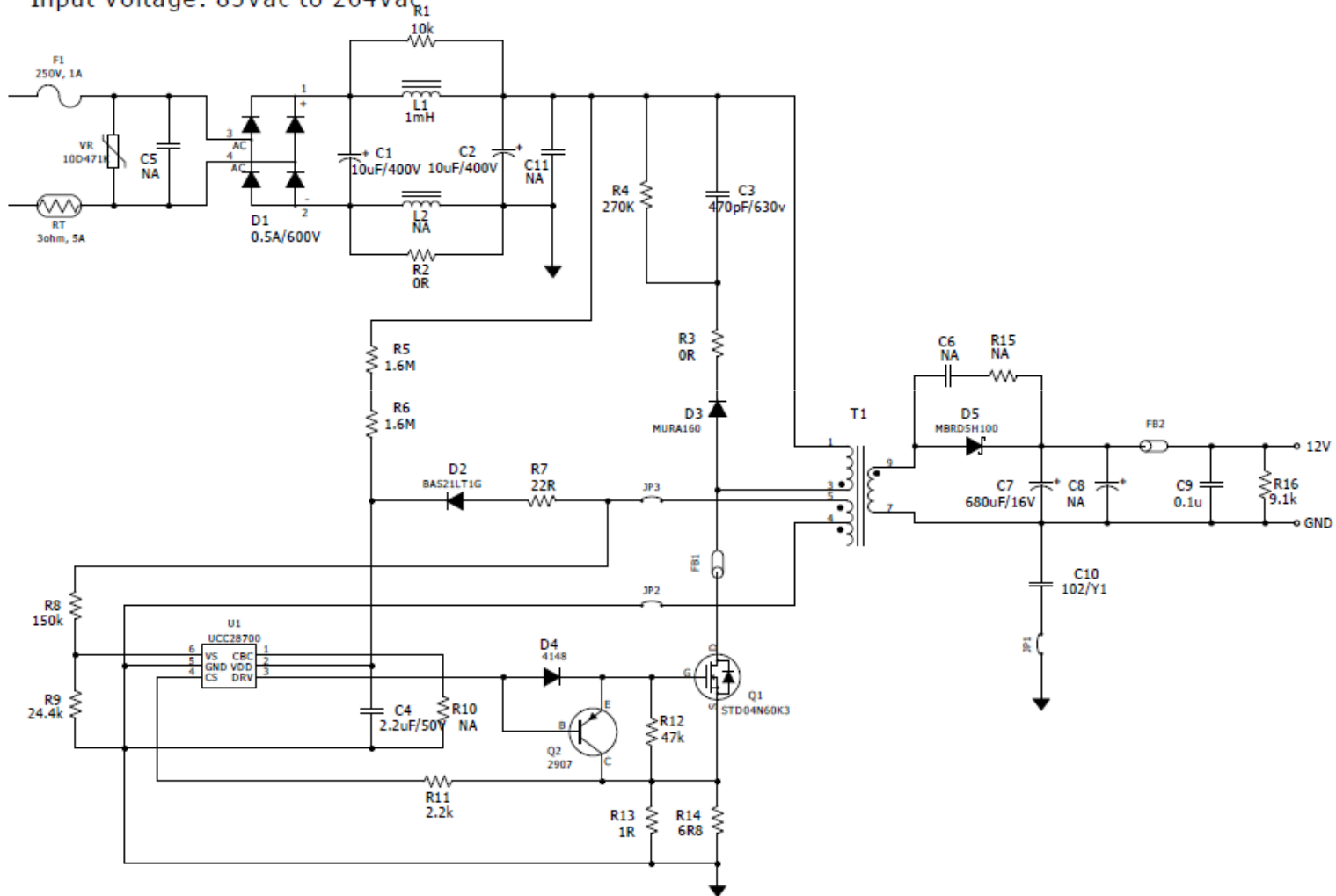
Applications

- Small power adapter
- White good applications
- Other small power applications

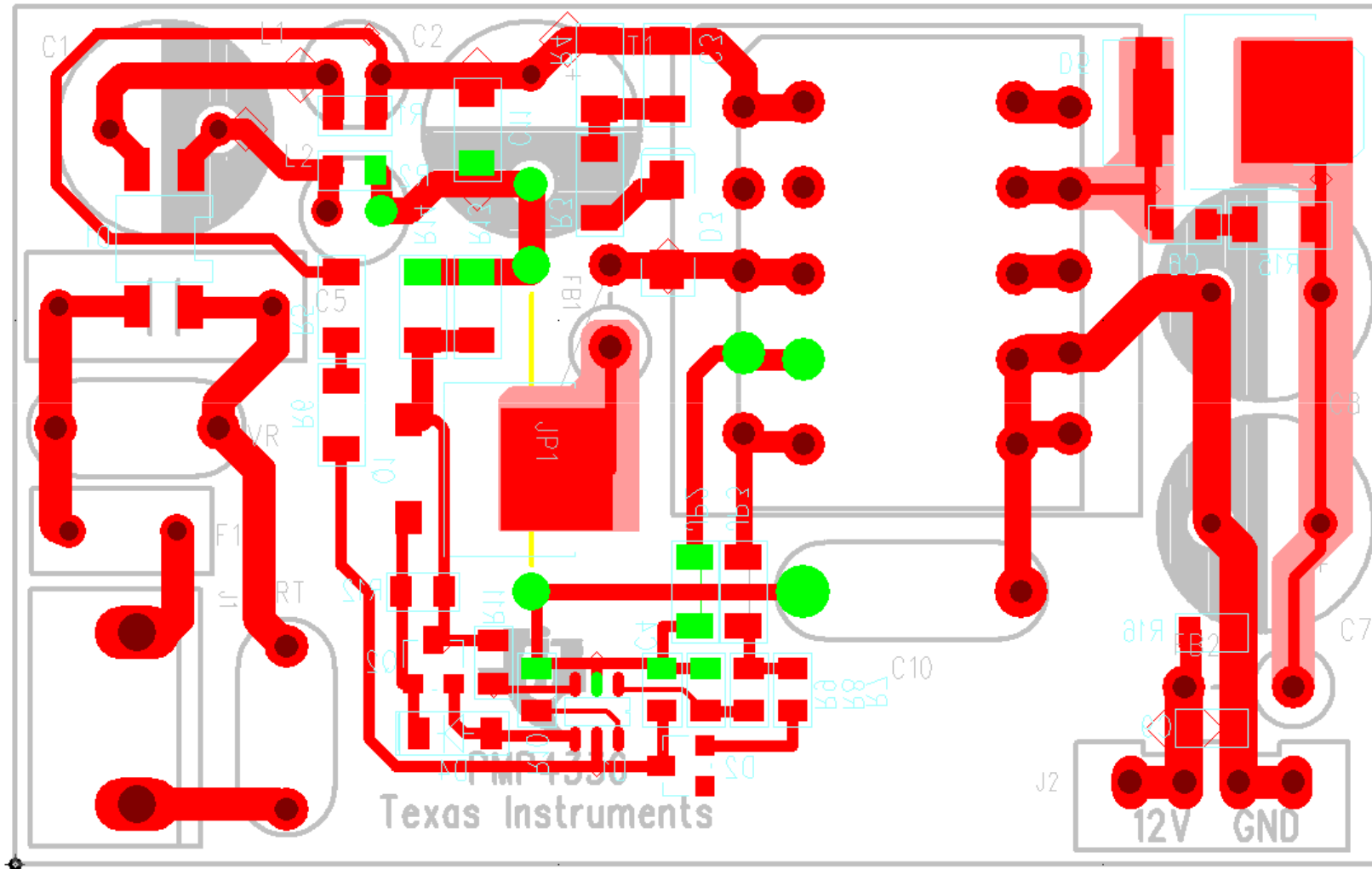


Schematic

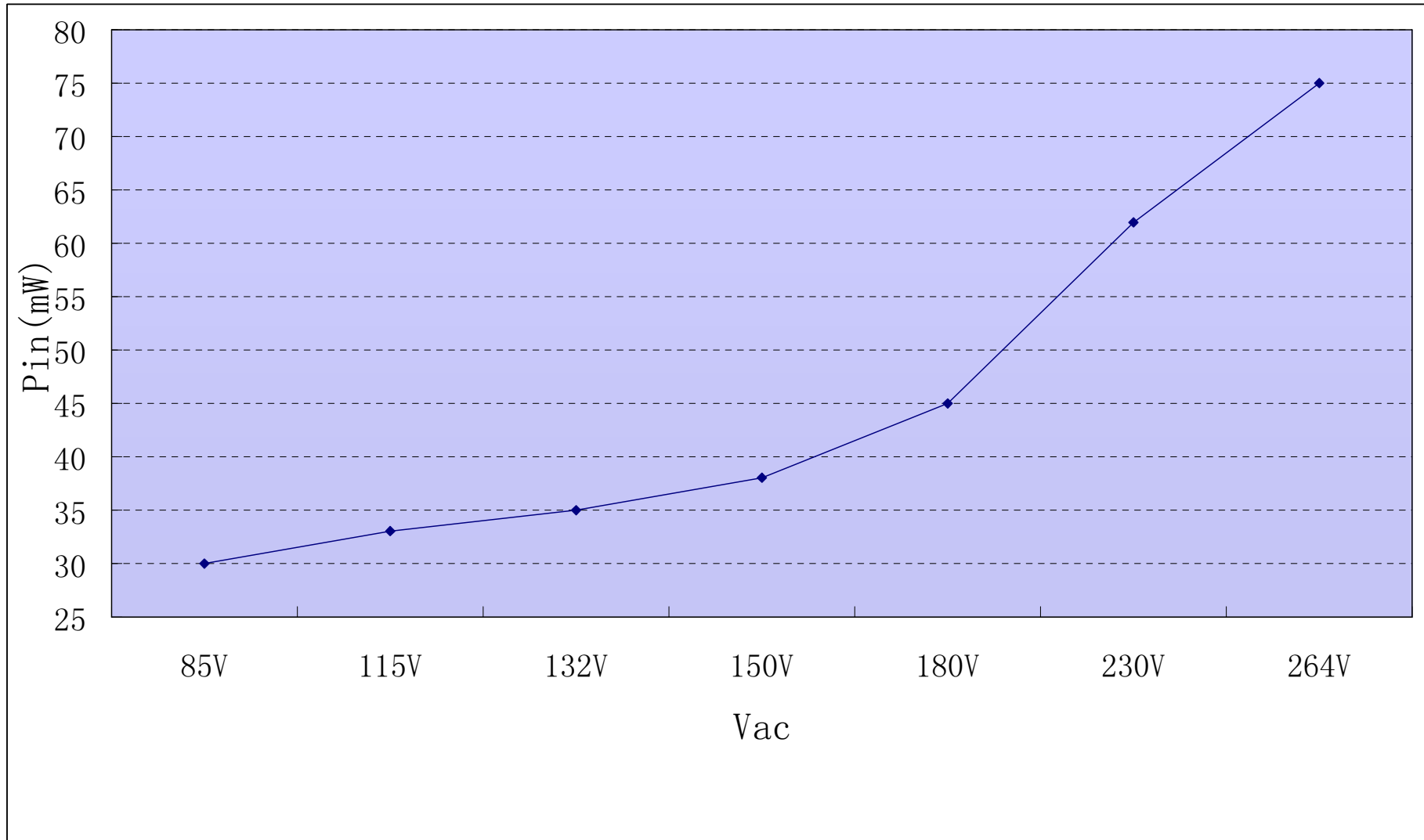
Input Voltage: 85Vac to 264Vac



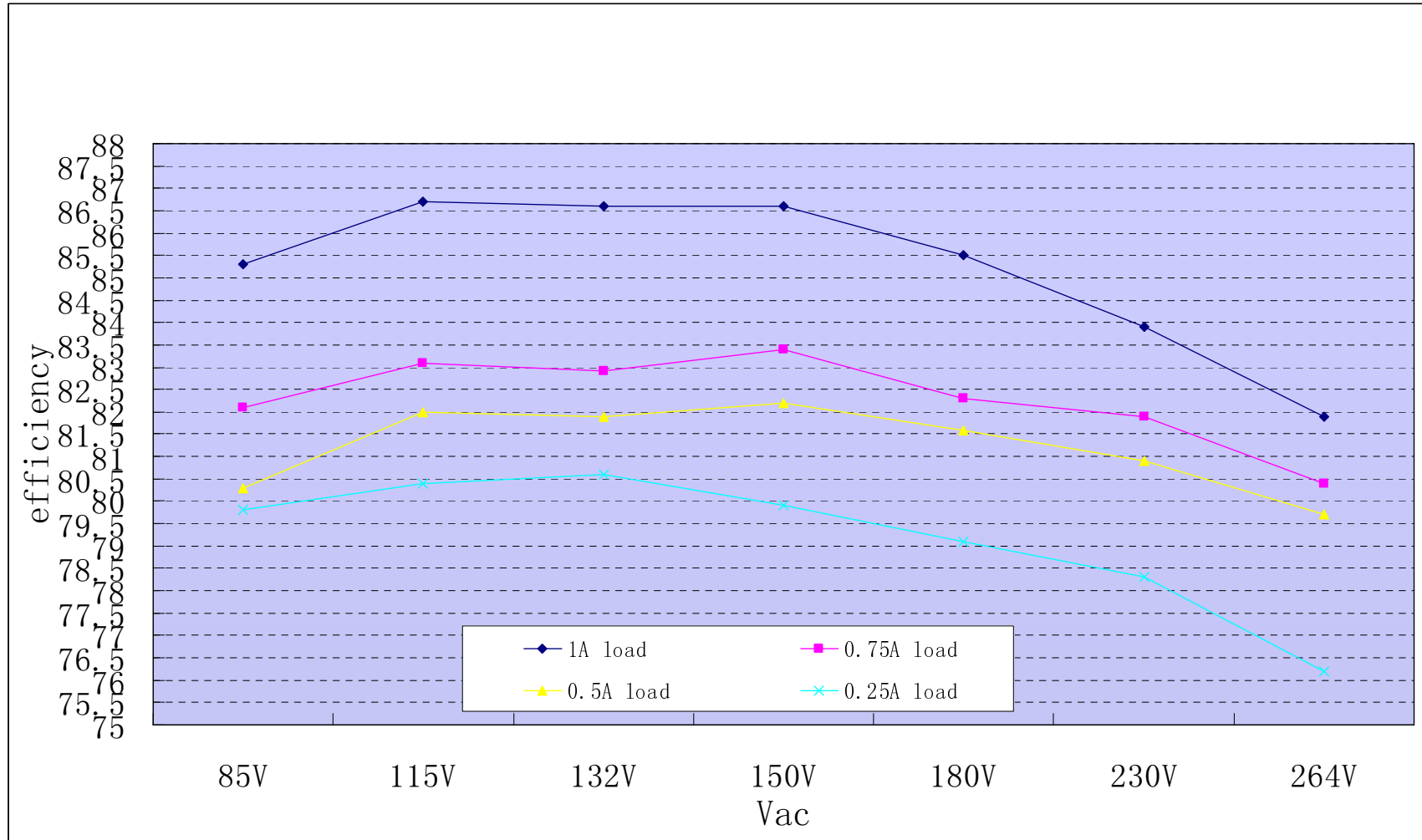
PCB Layout



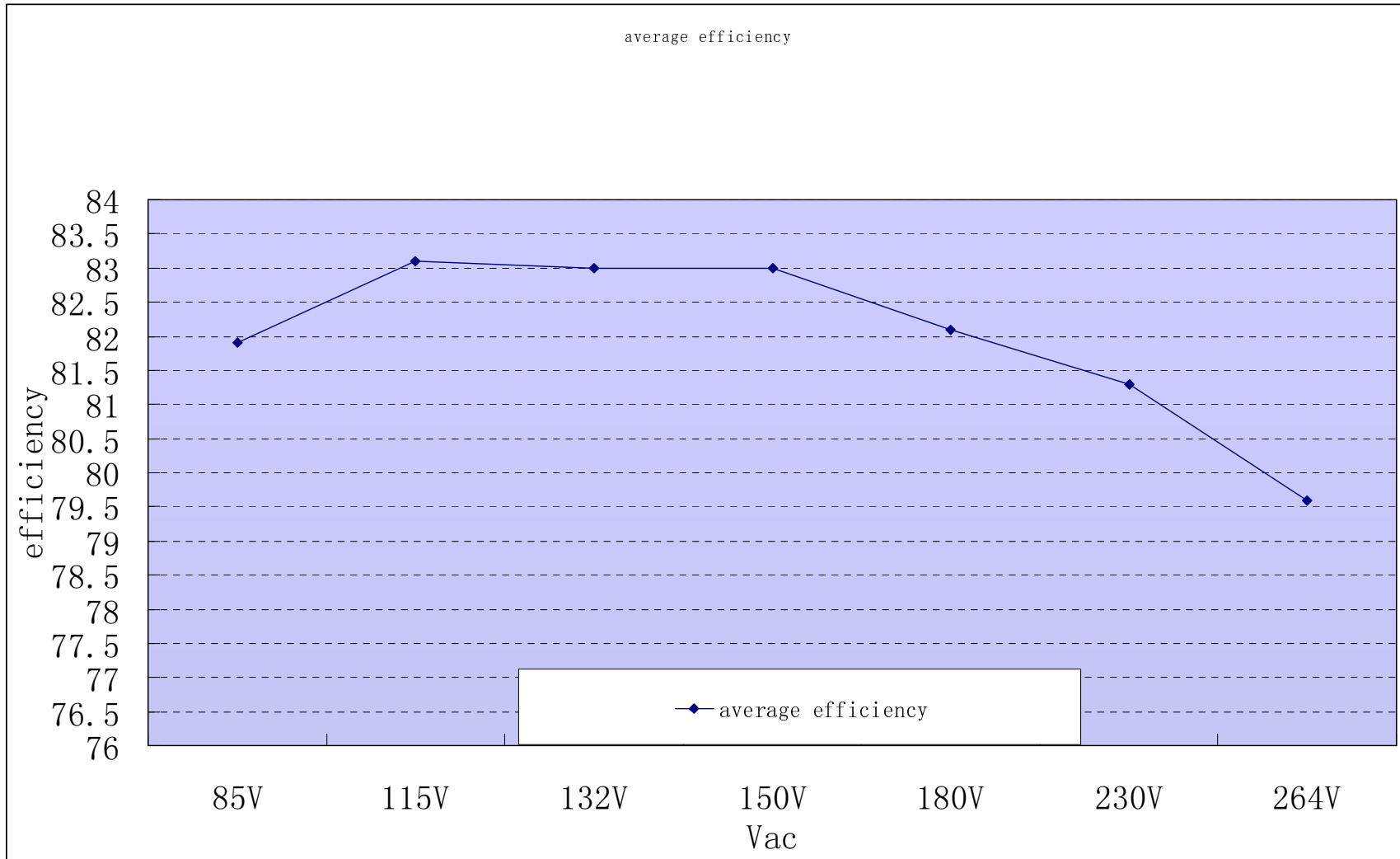
Standby Power



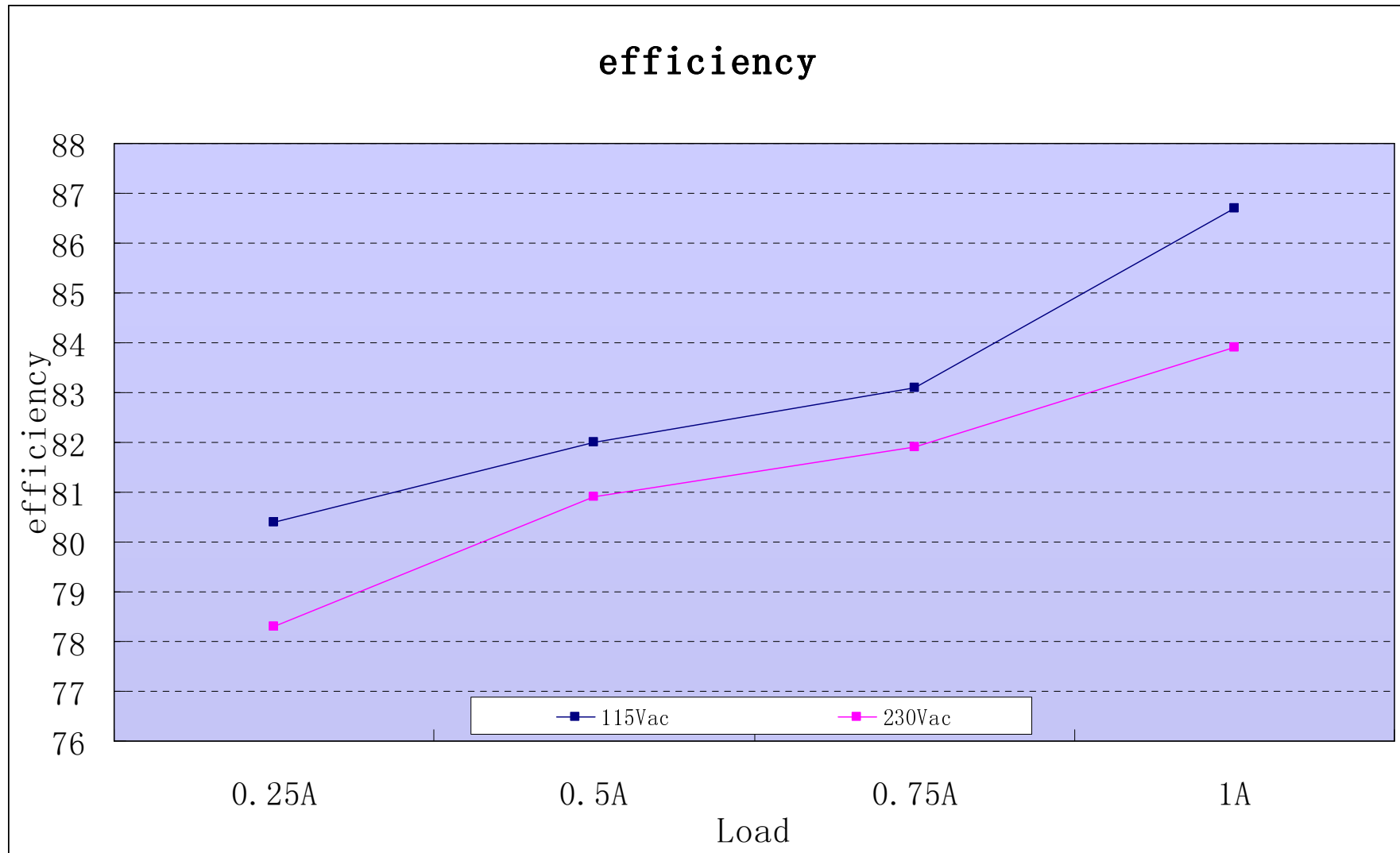
Load And Input Voltage Vs Efficiency



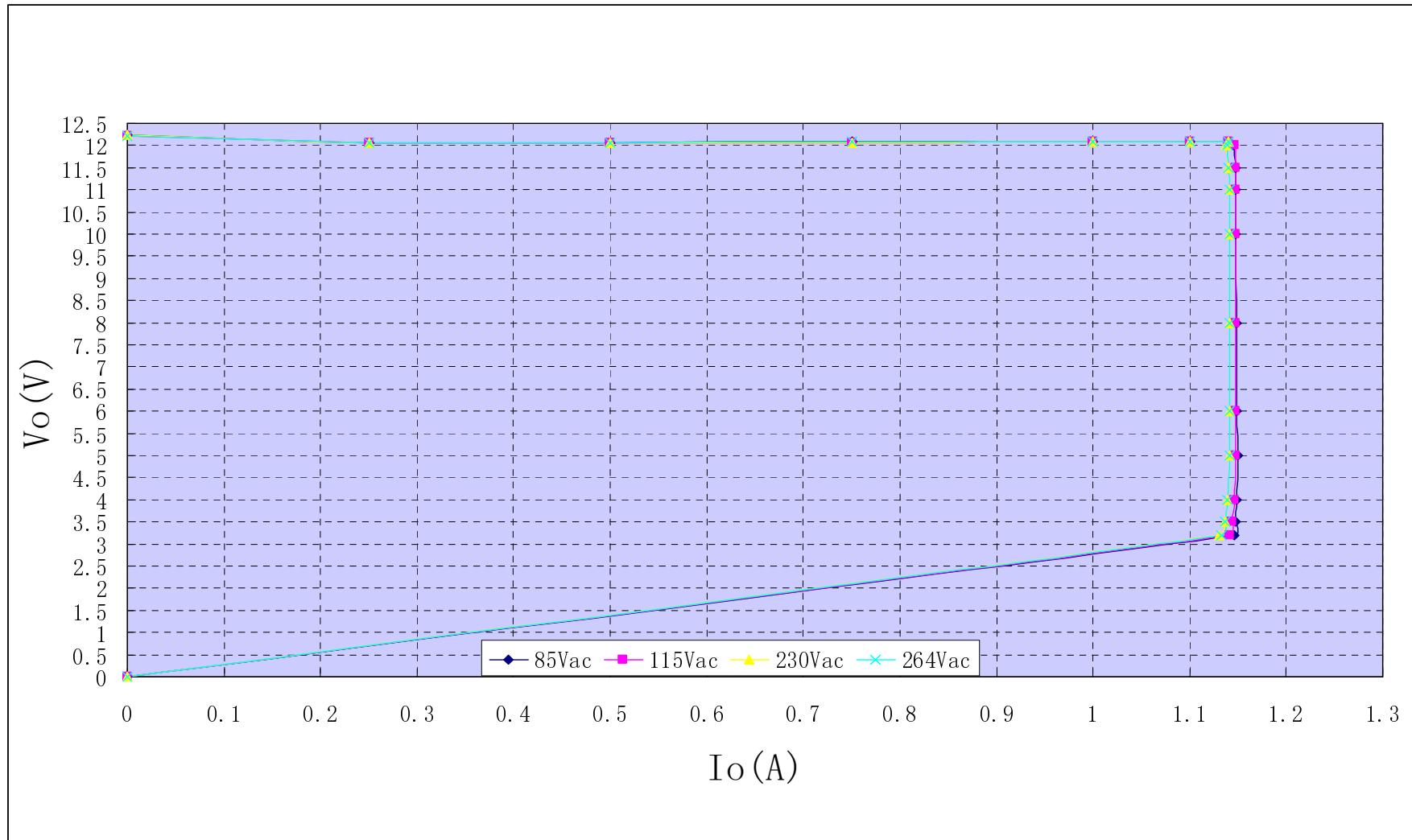
Average Efficiency Between 0.25A,0.5A,0.75A And 1A



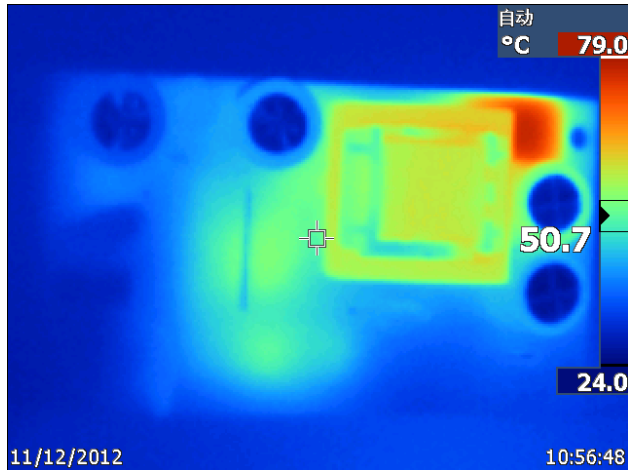
Efficiency Vs Load Curve



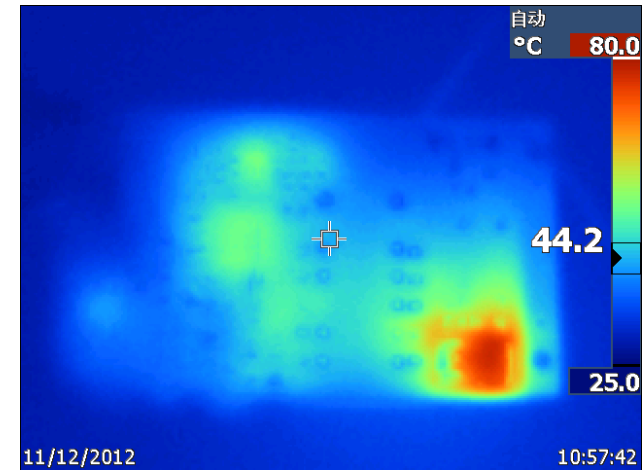
IV Curve Without CBC



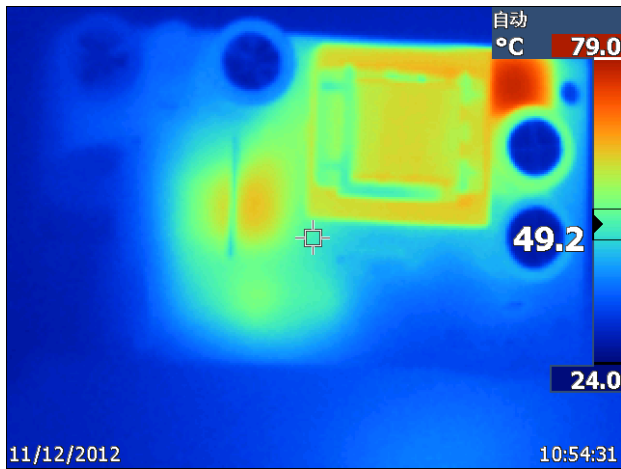
Thermal Image



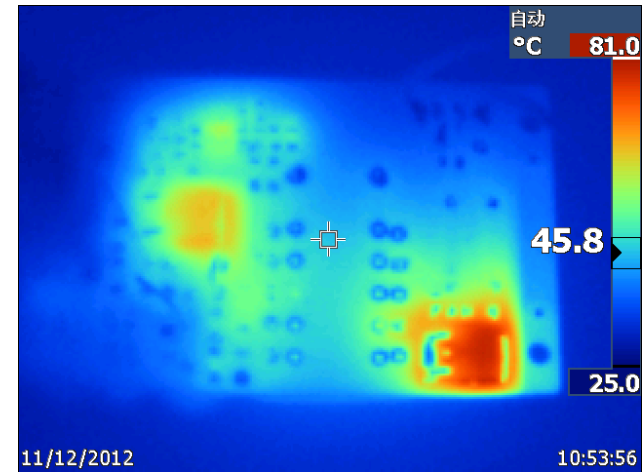
Component side, 115Vac and 1A load



Soldering side, 115Vac and 1A load



Component side, 230Vac and 1A load



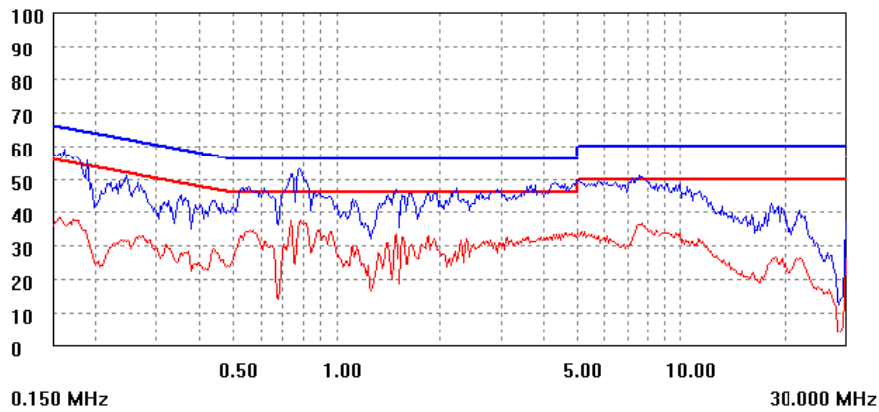
Soldering side, 230Vac and 1A load

EMI Test At 115Vac

Start(MHz)	End(MHz)	Step(MHz)
0.150	2.000	0.002
2.000	10.000	0.010
10.000	30.000	0.025

freq, step

scan result

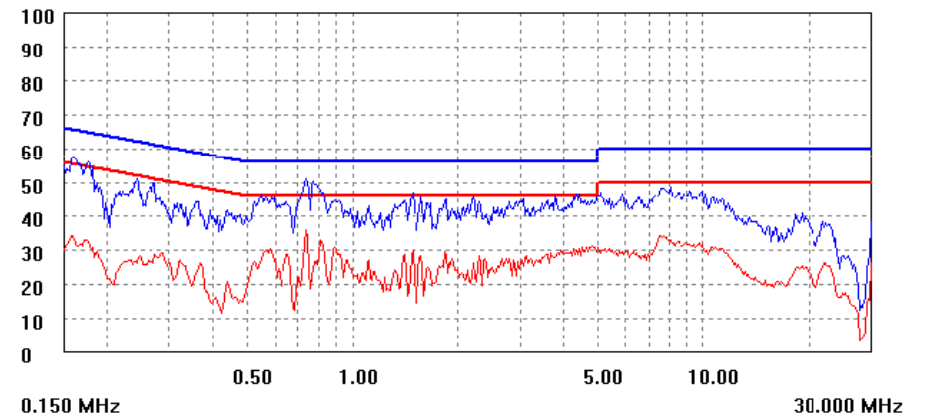


Test condition: 1A load

Start(MHz)	End(MHz)	Step(MHz)
0.150	2.000	0.002
2.000	10.000	0.010
10.000	30.000	0.025

freq, step

scan result



Test condition: 1A load

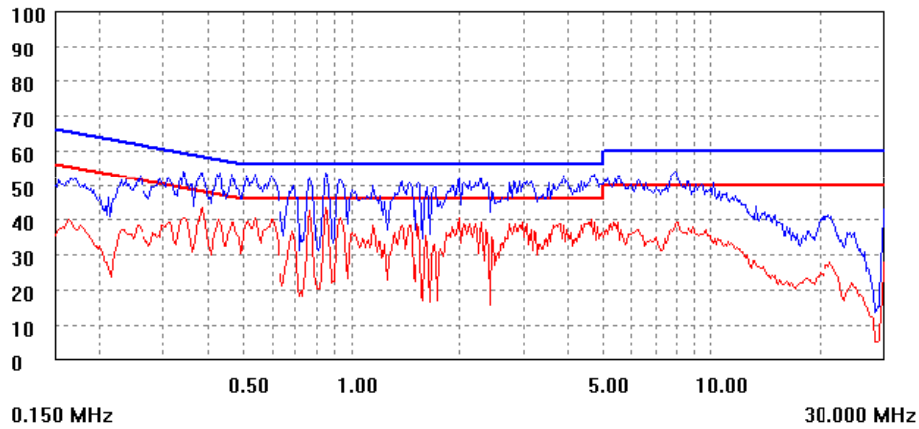
EMI Test At 230Vac

Start(MHz)	End(MHz)	Step(MHz)
0.150	2.000	0.002
2.000	10.000	0.010
10.000	30.000	0.025

freq, step

dBuV

scan result



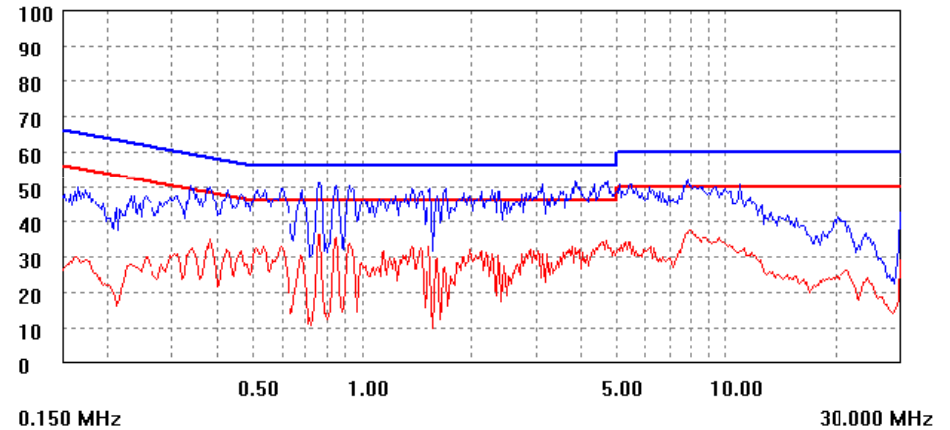
Test condition: 1A load

Start(MHz)	End(MHz)	Step(MHz)
0.150	2.000	0.002
2.000	10.000	0.010
10.000	30.000	0.025

freq, step

dBuV

scan result



Test condition: 1A load

Key Design Specifications

No.	Description	Symbol	Min	Type	Max	Unit	Test condition
1	Rated Input Voltage	Vin	100	---	240	Vac	
2	Input Voltage Range	Vin(min/max)	85		264	Vac	
3	Input Current	Irms			0.292	A	85Vac and 1A load
4	Rated Input Frequency	fin	50		60	Hz	
5	Input Frequency Range	Fin(min/max)	47		63	Hz	
6	Inrush Current	Irush			3.08	A	264V and 1.1A
7	Average Efficiency	η	80			%	
8	Standby Power	Pst			33 62	mW mW	@115Vac @230Vac
9	Output Voltage	Vout	11.4		12.6	V	Ok
10	Output Current	Iout	1	1.14		A	115Vac and 230Vac
11	Rated Output Power	Pout	5			W	
12	Ripple and Noise	Vripple			116	mVp_p	230Vac and 1A
13	Rising Time	Rtime			44	mS	230Vac and 1A
14	Startup time	Rstart			896	mS	115Vac and 1A
14	Over Shoot	Vover			1	%	
15	Dynamic response	Vmin_dyna	11.1			V	0-0.5A, 0.1A/us, 10ms cycle

Protection

No	Item	Test result
1	Input UVP	Start at 80Vac, Stop at 70Vac
2	Output over current protection	Ok, 1.15A maximum
3	Output short-circuit protection	Ok, hiccup mode
4	Output over voltage protection	Ok, 13.8V maximum
5	Over Temperature protection	OK