



Universal AC 40 W Programmable Output

Device	Application	Input Voltage	Output Power	Topology	I/O Isolation
NCP1217	Programmable AC-DC Adapter	Universal 88-269 Vac	40 Watt	Flyback	3 kV

Other Specifications

	Output 1	Output 2	Output 3	Output 4
Output Voltage (4 Possible Configurations)	+9 Vdc $\pm 5\%$	+12 Vdc $\pm 5\%$	+16 Vdc $\pm 5\%$	+24 Vdc $\pm 5\%$
Ripple (50 MHz BW)	<90 mVpp	<120 mVpp	<160 mVpp	<240 mVpp
Nominal Current	4.0 A	3.33 A	2.5 A	1.70 A
Max Current	4.5 A	3.38 A	3.0 A	1.70 A
Min Current	0	0	0	0

PFC (Yes/No)	NO
Minimum Efficiency	80% Target
Inrush Limiting / Fuse	80 A max / 1 A fuse
Operating Temp. Range	0 to +40° C
Cooling Method/Supply Orientation	Case Convection
Output Voltage Control	Adapter Program Plug

Others	Leakage Current: <3.5mA at 115VAC/60Hz and at 230VAC/50Hz (refer to EN60950)
	OVP: 25% above the Output Voltage specified. OCP: The Max Current is short circuit current trip point. The unit must be capable of supplying up to and including the Max Current for 10 minutes. The Nominal Current is the maximum continuous operating current.

Circuit Description

This programmable output voltage adapter is designed around the NCP1217 PWM switcher. This flyback converter operated in the DCM for the full range of output to 44 watts. This permits the primary current limit to function as the secondary power limit.

The adapter is designed to provide an output of 9 Vdc nominal with no jumper connections. This gives the system the security of a low voltage default output. A single jumper may be installed in only one of the three positions shown to program the output.

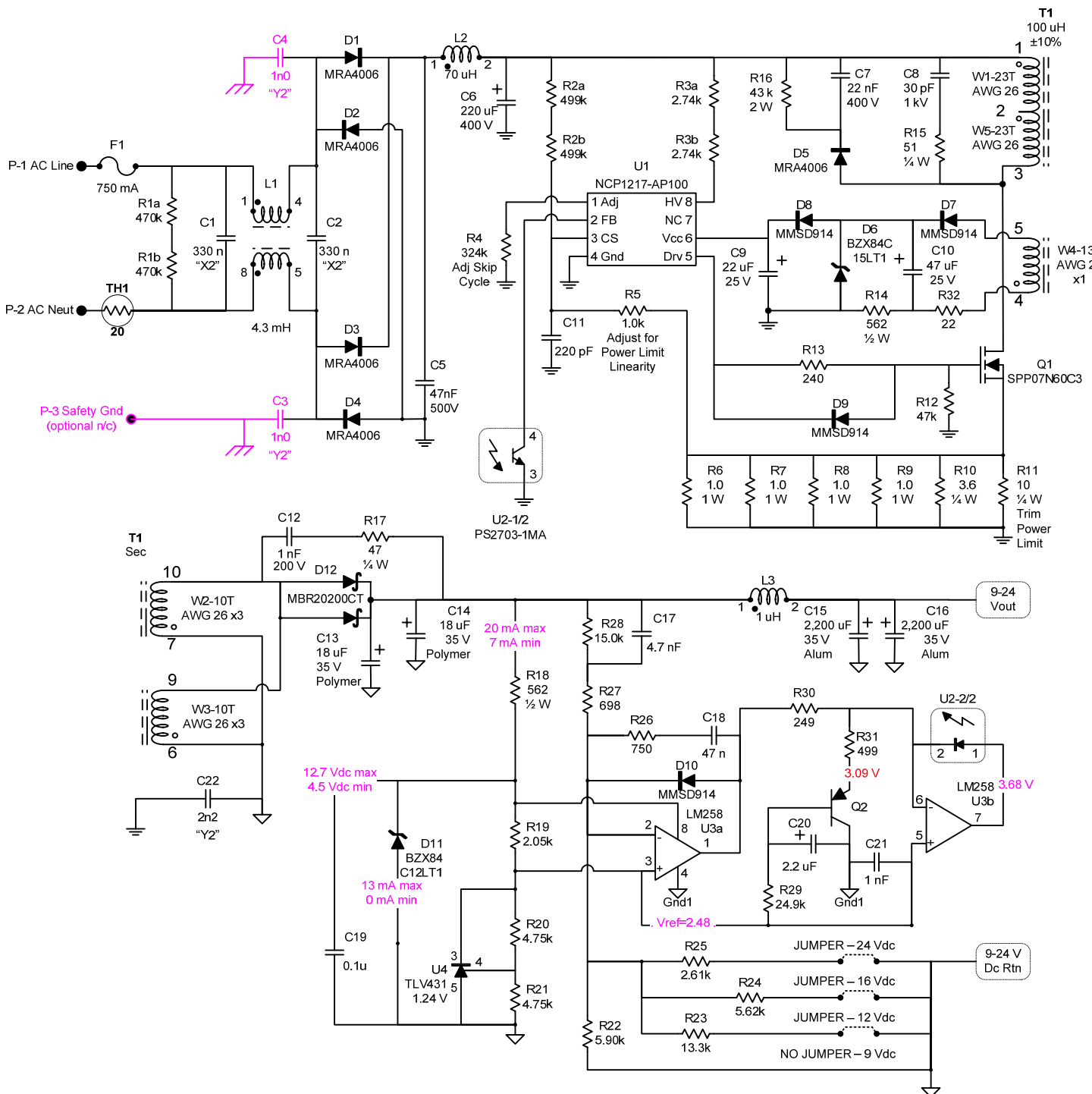
The current/power sense resistor section has resistors R10 and R11 to permit "break-off" trimming options.

The schematic shows optional Y caps in pink for systems with a three-wire power cord. The earth return provides additional margin for applications that require more EMI filtering or earth ground safety connection.

Key Features

- Constant power limit of 44 watts.
- Output voltage is programmed with jumpers
- 100 kHz Switchmode controller.
- Frequency dithering reduces EMI signature.
- Low standby power consumption.

Schematic

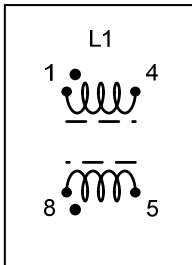


Magnetics Design Data sheet

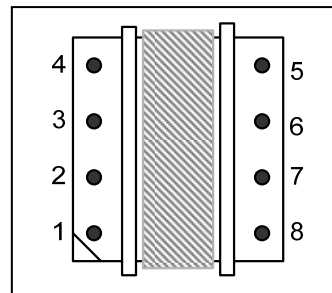
Project / Customer	40 Watt Adapter			
Description:	Differential Mode Inductor			
Schematic Ref. Des:	L1			
Bobbin:	Vertical 8-Pin			
Core:	EE4-2211 J	Magnetics Inc.		
Core Gap:	none			
Inductance Magnetizing:	4.3 mH	±5%	100 kHz	Pin 1-4, 5-8
Inductance Leakage:	50 uH	±5%	100 kHz	Pin 1-4, 5-8 shorted.

Windings (in order) Layer	Winding	Turns	Size	No of Wires	Material
W1		35			
1	W1	7	22 awg	1	Isonol180
2	W1	7	22 awg	1	Isonol180
3	W1	7	22 awg	1	Isonol180
4	W1	7	22 awg	1	Isonol180
5	W1	7	22 awg	1	Isonol180
W2		35			
1	W2	7	22 awg	1	Isonol180
2	W2	7	22 awg	1	Isonol180
3	W2	7	22 awg	1	Isonol180
4	W2	7	22 awg	1	Isonol180
5	W2	7	22 awg	1	Isonol180
HiPot:					
P-S		4 kVac	1 s.		

Schematic



Lead Pin-out



Magnetics Design Data sheet

Magnetics Design Data sheet				
Project / Customer	40 Watt Adapter			
Description:	Common Mode Inductor			
Schematic Ref. Des:	L2			
Bobbin:	none			
Core:	T44D	MicroMetals		
Core Gap:	none			
Inductance Magnetizing:	70 uH	±5%	100 kHz	Pin 1-2
Inductance Leakage:	NA	±5%	100 kHz	-.

Windings (in order) Layer	Winding	Turns	Size	No of Wires	Material
W1		30			
1	W1	30	29 awg	5	Isonol180

Magnetics Design Data sheet

Magnetics Design Data sheet				
Project / Customer	40 Watt Adapter			
Description:	Output filter Inductor			
Schematic Ref. Des:	L3			
Bobbin:	none			
Core:	T44C	MicroMetals		
Core Gap:	none			
Inductance Magnetizing:	1 uH	±5%	100 kHz	Pin 1-2
Inductance Leakage:	NA	±5%	100 kHz	-.

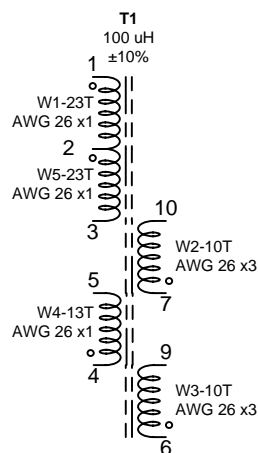
Windings (in order) Layer	Winding	Turns	Size	No of Wires	Material
W1					
1	W1	4	20 awg	5	Isonol180

Magnetics Design Data sheet

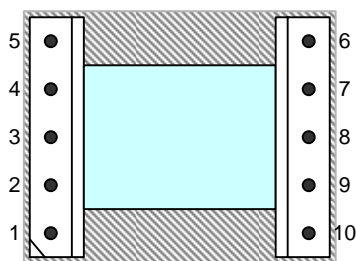
Magnetics Design Data sheet				
Project / Customer	40 Watt Adapter			
Description:	Transformer			
Schematic Ref Des:	T1			
Bobbin:	Horizontal 10-Pin			
Core:	EE-4 2530 P	Magnetics Inc.		
Core Gap:	Approx. 2 mm			
Inductance Magnetizing:	100 uH	±5%	100 kHz	Pin 1-3.
Inductance Leakage:	1.24 uH	±5%	100 kHz	Pin 1-3, with 4-5, 6-10 shorted.

Windings (in order) Layer	Winding	Turns	Size	No of Wires	Material
W1					
1	W1	23	26 awg	1	Isonol180
2	Tape	3	0.05		PVC
W2					
3	W2	10	26 awg	3	Isonol180
4	Tape	1	0.05		PVC
W3					
5	W3	10	26 awg	3	Isonol180
6	Tape	3	0.05		PVC
W4					
7	W4	13	26 awg	1	Isonol180
8	Tape	1	0.05		
W5					
9	W5	23	26 awg	1	Isonol180
10	Tape	3	0.05		PVC
HiPot:					
P-S		4 kVac	1 s.		
P-Core		4 kVac	1 s.		
S-Core		4 kVac	1 s.		

Schematic



Lead Pin-out



Bottom View

© 2007 ON Semiconductor.

Disclaimer: ON Semiconductor is providing this design note "AS IS" and does not assume any liability arising from its use; nor does ON Semiconductor convey any license to its or any third party's intellectual property rights. This document is provided only to assist customers in evaluation of the referenced circuit implementation and the recipient assumes all liability and risk associated with its use, including, but not limited to, compliance with all regulatory standards. ON Semiconductor may change any of its products at any time, without notice.

Design note created by Dale Tittensor, e-mail: dale.tittensor@onsemi.com