

NCP1083 (draft)

Compact, high efficient, 30W Reference platform with the NCP1083

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ON Semiconductor



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APPLICATION NOTE

Evaluation Board Specifications

Characteristic	Min	Typ	Max	Unit	Comments
Input Voltage, PoE input	36		57	V	
Input Voltage, Auxiliary input	24		57	V	
Output Voltage		12		V	
Output Current			2.5	A	
Oscillator Frequency		250		kHz	
Output Ripple			170	mV	
Efficiency			88	%	

Table 1 EVB Characteristics

Board Details

The NCP1083QBCEVB implements a PoE module that converts the power from the Ethernet cable to a lower voltage. The board also supports getting its power from an auxiliary input, in case PoE network is not available.

Warnings

Close to the switching MOSFET voltages on the board may exceed 200V (@250kHz). Temperature of board and its components may exceed 85°C during normal operation. The Evaluation board was designed to operate correctly under these conditions.

The input voltage should never exceed 57V nor should the evaluation board be loaded with loads higher than the specified 30W. Exceeding the specified input and output values could permanently damage the board.

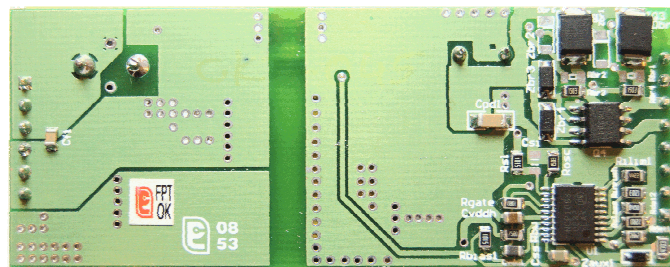


Figure 2 Back side of EVB

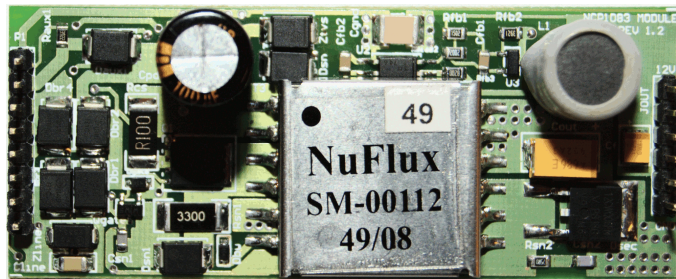


Figure 1 Front side of EVB

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Board Connector Description

Connector	Pin	Description
P1	1	nClassAT, notification towards external processor that IEEE802.3at, 2 nd event classification has completed
	2	Not Connected
	3	Vin, PoE, pair1
	4	Vin, PoE, pair1
	5	Vin, PoE, pair 2
	6	Vin, PoE, pair 2
	7	Vaux, Positive auxiliary input supply
	8	Vaux_gnd, Auxiliary input supply ground
Jout	1	12V regulated output
	2	12V regulated output
	3	12V regulated output
	4	GND regulated output
	5	GND regulated output
	6	GND regulated output

Table 2 Pinout

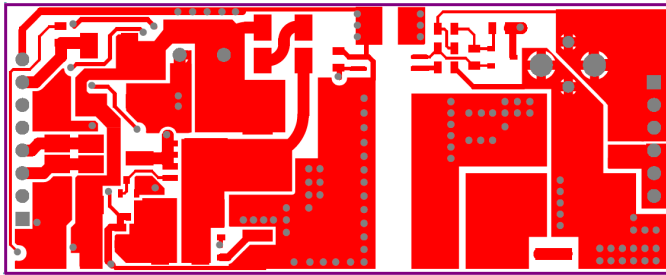


Figure 3 Layout Front

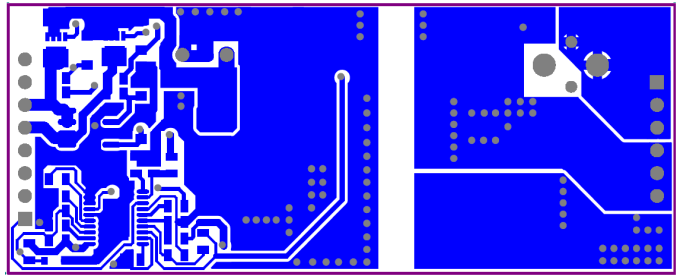


Figure 4 Layout Back

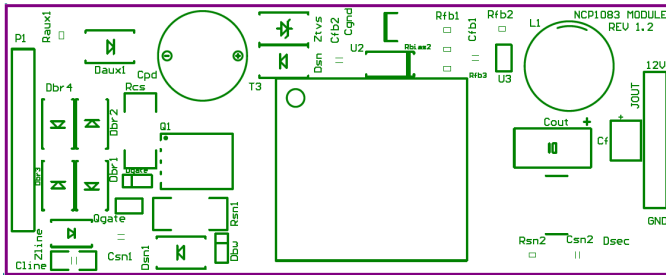


Figure 5 Silkscreen Front



Figure 6 Silkscreen Back

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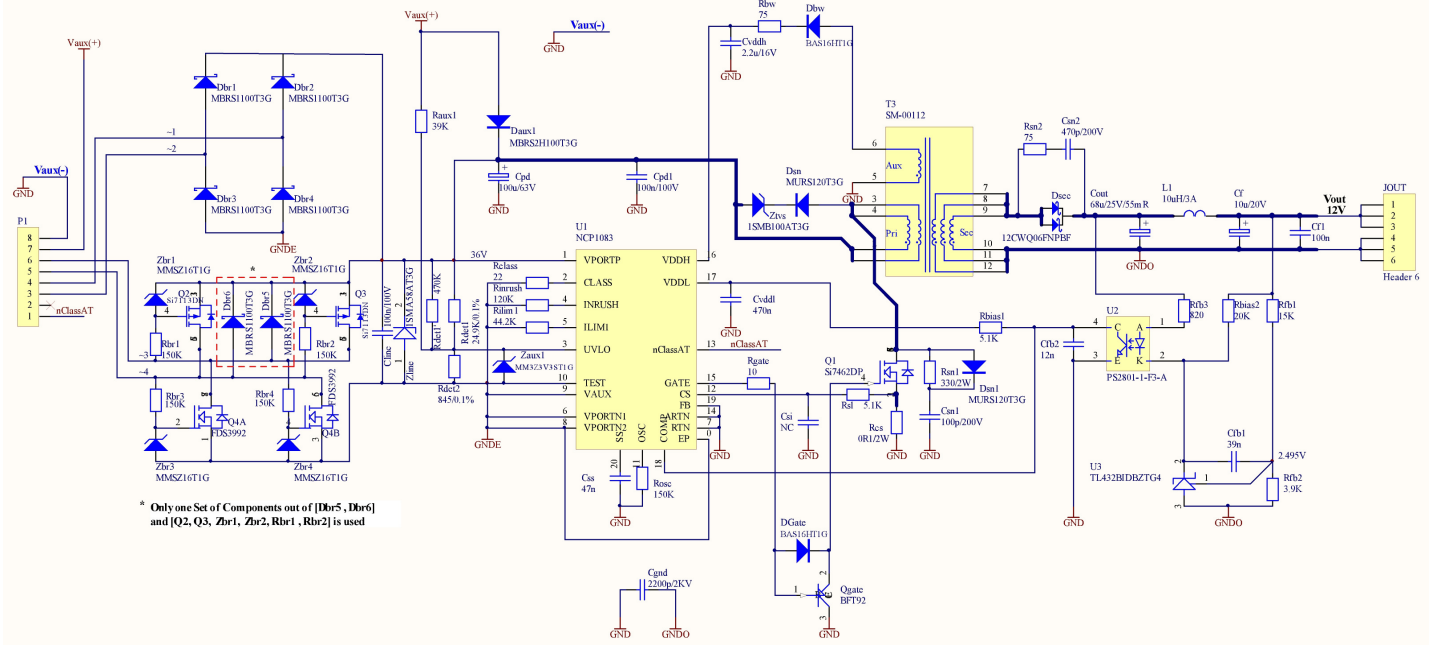


Figure 7 Schematic

Bill of Materials

Designator	Quantity	Description	Comment	Footprint
U1	1	Power over Ethernet controller	NCP1083	TSSOPEP20
Cf1	1	Capacitor	100n	0805-C-S
Cline, Cpd1	2	Capacitor	100n/100V	1206-C
Csn1	1	Capacitor	100p/200V	0805-C-S
Cfb2	1	Capacitor	12n	0805-C-S
Cvddh	1	Capacitor	2.2u/16V	0805-C-S
Cgnd	1	Capacitor	2200p/2KV	1812
Cfb1	1	Capacitor	39n	0805-C-S
Cvddl	1	Capacitor	470n	0805-C-S
Csn2	1	Capacitor	470p/200V	0805-C-S
Css	1	Capacitor	47n	0805-C-S
Csi	1	Capacitor	NC	0805-C-S
Cpd	1	Capacitor Elec Polar	100u/63V	CRD10.0L17.0RM5.0
Cf	1	Capacitor Tant Polar	10u/20V	C-TANT-B
Cout	1	Capacitor Tant Polar	68u/25V/55mR	C-TANT-E
T3	1	PoE Plus Transformer	SM-00112	NUFLUX
Dbw, DGate	2	Diode	BAS16HT1G	SOD323
Daux1	1	Diode Schottky	MBRS2H100T3G	403A-03
Dsn, Dsn1	2	Diode	MURS120T3G	403A-03
Ztvs	1	Diode TVS 100V	1SMB100AT3G	403A-03
Zaux1	1	Diode Zener 3.3V	MM3Z3V3ST1G	SOD323
Dsec	1	Diode Schottky	12CWQ06FNPBF	DPAK
JOUT	1	Header, 6-Pin	Header 6	HDR1X6
P1	1	Header, 8-Pin	Header 8	HDR1X8
L1	1	Secondary Filter	10uH/3A	10x12
Q1	1	MOSFET N-CHANNEL	Si7462DP	SOPP8
Q4	1	MOSFET N-CHANNEL	FDS3992	SO-8

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Qgate	1	Transistor PNP	BFT92	SOT23
U2	1	HIGH ISOLATION VOLTAGE SSOP PHOTOCOUPLER	PS2801-1-F3-A	SSOP4
Rcs	1	Resistor	0R1/2W	2512-S
Rgate	1	Resistor	10	0805-R-S
Rinrush	1	Resistor	120K	0805-R-S
Rfb1	1	Resistor	15K	0805-R-S
Rbias2	1	Resistor	20K	0805-R-S
Rclass	1	Resistor	22	0805-R-S
Rdet1	1	Resistor	24.9K/0.1%	0805-R-S
Rfb2	1	Resistor	3.9K	0805-R-S
Rsn1	1	Resistor	330/2W	2512-S
Raux1	1	Resistor	39K	0805-R-S
Rilim1	1	Resistor	44.2K	0805-R-S
Rdet1'	1	Resistor	470K	0805-R-S
Rbias1, Rsl	2	Resistor	5.1K	0805-R-S
Rbw, Rsn2	2	Resistor	75	0805-R-S
Rfb3	1	Resistor	820	0805-R-S
Rdet2	1	Resistor	845/0.1%	0805-R-S
Zline	1	Diode TVS 58V	1SMA58AT3G	SMA
U3	1	Programmable Shunt Voltage Reference	TL432BIDBZTG4	SOT23
Q2, Q3	2	MOSFET P-Channel	Si7113DN	POWERPACK 1212-8
Dbr1, Dbr2, Dbr3, Dbr4	4	Diode Schottky	MBRS1100T3G	403A-03
Dbr5, Dbr6	2	Diode Schottky	MBRS1100T3G	403A-03_D
Zbr1, Zbr2, Zbr3, Zbr4	4	Diode Zener 16V	MMSZ16T1G	SOD123
Rbr1, Rbr2, Rbr3, Rbr4, RosC	5	Resistor	150K	0805-R-S

Table 3 Bill Of Materials

Note: Only one set of components out of (Dbr5, Dbr6) and (Q2,Q3,Zbr1,Zbr2,Rbr1,Rbr2) is used

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