

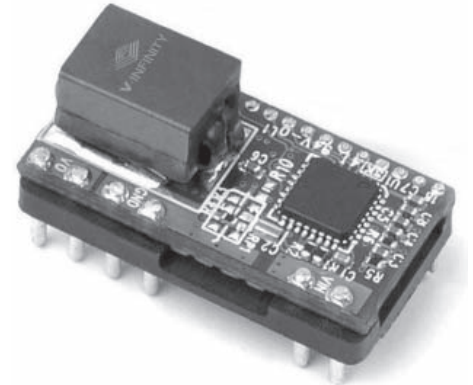


SERIES: NDM1-12

DESCRIPTION: DIGITAL DC-DC POL CONVERTER

SPECS

System Vin	8.5 ~ 14 V
Vout	0.6 ~ 2.5 V
Iout	12 A
Footprint (w x l x h)	0.5" x 0.925" x 0.46"
Efficiency	95%



FEATURES

Auto-control™ technology

- Automatic adjustment of control loop compensation (adapts to changes in external output capacitance)
- Guaranteed stability
- Superior transient response

Precise power conversion

- 8.5 ~ 14 V dc input
- Programmable output
- Differential voltage sense
- 10 mV set point accuracy

PMBus compliant

- On-board digital communication bus

Fully licensed digital module

Monitoring

- Precise current monitoring
- Temperature sensing

Power management

- Voltage sequencing
- Voltage margining
- Synchronize controllers for multiphase operation
- Programmable soft start and soft stop
- Pre-bias startup
- High reliability non-volatile OTP memory to 125°C
- Low current (<2 μA) disable state

Protection features

- Input under voltage lockout
- Output over voltage protection
- Output over current protection
- Fast over current protection
- Over temperature protection

Mounting

- Through hole
- Modules are footprint compatible



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INPUT / SUPPLY

parameter	conditions/description	min	nom	max	units
voltage		8.5	12	14	V
idle current	sysgood, no output, $V_{IN} = 12\text{ V}$			50	mA
UVLO turn-on threshold		7.5	8.7		V
UVLO turn-off threshold		7.5	8.1		V
voltage monitoring accuracy		-50		50	mV
current monitoring accuracy		-8		8	%

OUTPUT

parameter	conditions/description	min	nom	max	units
voltage adjustment range ¹	set using PMBus	0.6		2.5	V
voltage accuracy			1		%nom
current range		0		12	A
line regulation	$V_{IN} = 8.5 \sim 14\text{ V}$	-1		1	%
load regulation	$V_{IN} = 12\text{ V}$	-1		1	%
voltage monitoring accuracy		-1		1	%
temp. monitoring accuracy		-5		5	°C
SENSE+ input bias current	SENSE+ = 4V	864	1,000	1,185	µA
SENSE- input bias current	SENSE- = 0.1V	20	25	30	µA
ramp-up time		0.5		147.5	ms
ON time delay range		0		1,000	ms
start-up time				50	ms
load transient voltage deviation			-45/33		mV
load transient recovery time	$V_{IN} = 12\text{ V}$, $C_O = 470\text{ }\mu\text{F}$, $V_O = 1\text{ V}$		150		µs
recommended minimum output capacitor		470			µF
voltage ripple			8	25	mVp-p
voltage margin range ¹		-20	5	20	%

1. Voltage absolute maximum of 2.8 V

GENERAL / POWER / EFFICIENCY

parameter	conditions/description	min	nom	max	units
output power		0		30	W
efficiency	$V_{IN} = 12\text{ V}$, $V_O = 1\text{ V}$, 50% of maximum I_O		92.2		%
	$V_{IN} = 12\text{ V}$, $V_O = 1\text{ V}$, maximum I_O		89.0		%
	$V_{IN} = 12\text{ V}$, $V_O = 2.5\text{ V}$, 50% of maximum I_O		94.9		%
	$V_{IN} = 12\text{ V}$, $V_O = 2.5\text{ V}$, maximum I_O		93.4		%
idle power	sysgood, no output, $V_{IN} = 12\text{ V}$			0.6	W
switching frequency ²		375		500	kHz

2. Factory default set to 500 kHz

Preliminary: Specifications subject to change
For a detailed specification, please contact CUI

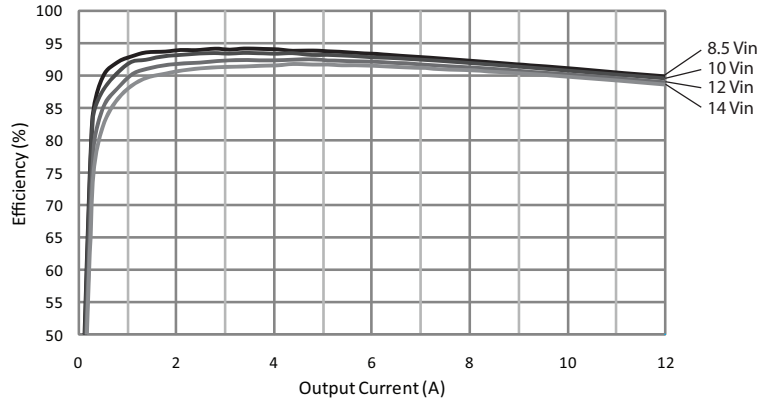


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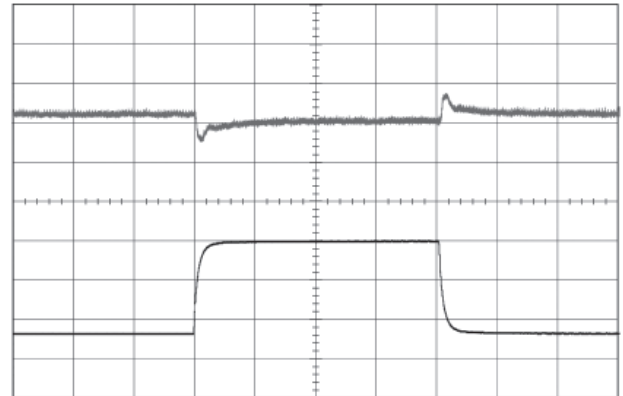
DESCRIPTION: DIGITAL DC-DC POL CONVERTER

1.0V / 12A TYPICAL CHARACTERISTICS

Efficiency

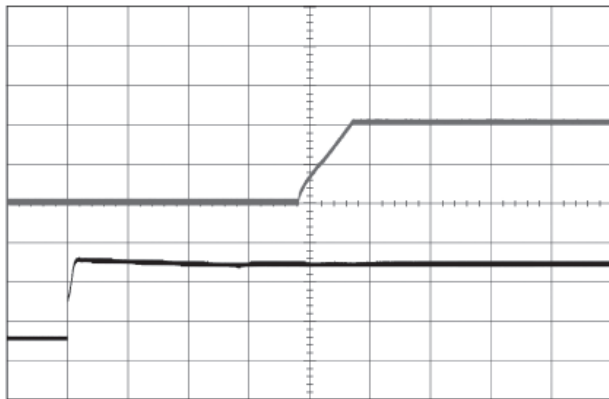


Output Load Transient Response



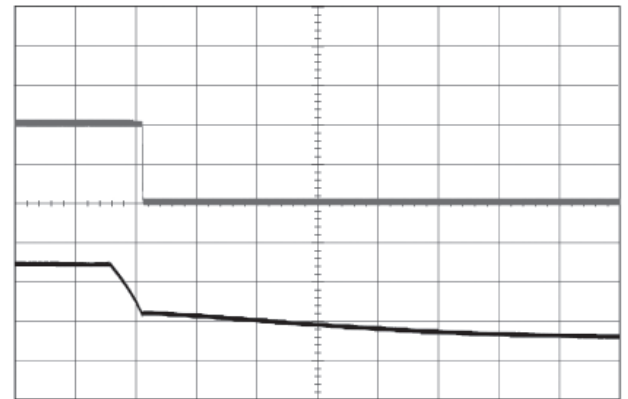
Output Voltage Response to Load Current step-change (3-12-3 A)
Top Trace: Output Voltage
Bottom Trace: Load Current

Start-up



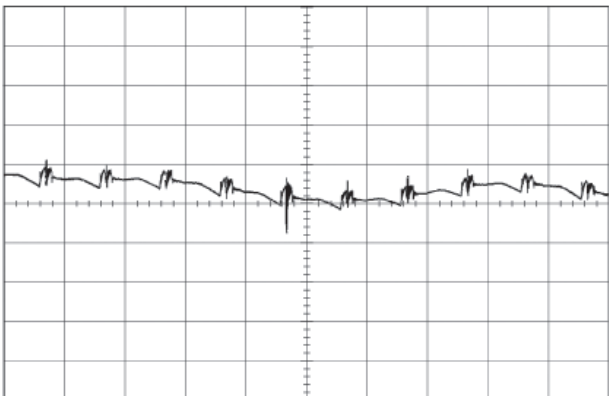
Top Trace: Output Voltage (0.5 V / div) Time Scale: (10 ms / div)
Bottom Trace: Input Voltage (5 V / div)

Shut-down



Top Trace: Output Voltage (0.5 V / div) Time Scale: (20 ms / div)
Bottom Trace: Input Voltage (5 V / div)

Output Ripple and Noise



Trace: Output Voltage (2 mV / div) Time Scale: (2 μs / div)

Conditions (applies to all graphs unless stated otherwise):

$V_i = 12\text{ V}$
 $I_o = 12\text{ A load}$
 $C_o = 1,500\text{ }\mu\text{F}$

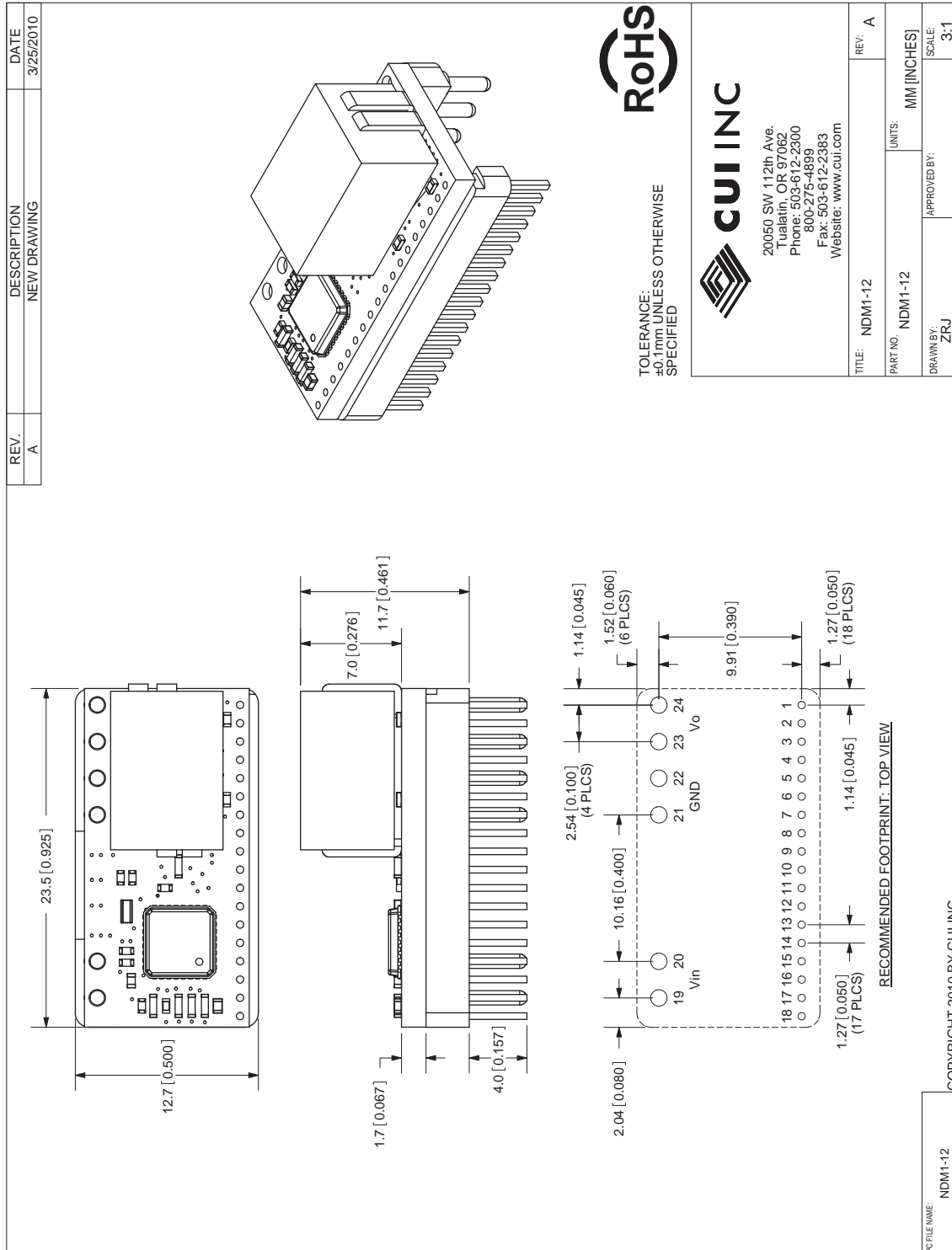
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MECHANICAL DRAWING (THROUGH-HOLE)



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