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PRELIMINARY

Release 0.B P/N 38520110000

NGL16.5 - W48V3.3V

16.5W DC-DC Converter

Features

- **Wide Input Voltage Range (19.2 – 72 Vdc)**
- **Output 3.3V 5A**
- **Size 2.0”L x 2.0”W x 0.5”H**
- **High Efficiency, typically 85% at 3.3V Output**
- **Adjustable Output Voltage**
- **Low Ripple and Noise**
- **Input to Output Isolation at 1500Vdc**
- **Metal Baseplate**
- **Fixed Frequency (270 KHz)**
- **Synchronization to External Secondary Clock**
- **Undervoltage Lockout (UVLO)**
- **Operating Amb.Temperature -40/+85°C with no derating**
- **No Forced Cooling Needed**
- **UL, CSA, CE Approvals Pending**

Description and Applications

The NGL 16.5W dc-dc Converter is part of NG Series, which rapresents the Magnetek’s Family of High Efficiency Low Power DC-DC Converters. These modules feature high reliability, high efficiency and a widely varying range of input voltages (from 19.2 to 72 Vdc) with the possibility of a careful regulation of output voltage, so they are ideally suited for Telecommunications, Industrial and Computer applications.
The compact size of these units make them ideal for inclusion in original design of systems which demand small size, low cost and high reliability. The standard feature set includes output trim allowing the user to adjust the output voltage to a value within ±10% of the nominal output voltage, and the clock input for synchronization to an external secondary clock, while the case ground pin is optional.

Specifications

(Typical value standard at nominal input line, full load, 25°C ambient temperature unless otherwise specified)

Electrical Specifications	Table 1. Output Specifications	Conditions	Value
	Output Voltage (Vo)		3.3V
	Output Voltage Trimming	See Note 1	+/-10%
	Voltage Accuracy		+/-0.5%
	Start-up Overshoot		1% max
	Load Regulation	Low Load to Full Load	+/-1.0%
	Line Regulation	Low Line to High Line	+/-0.5%
	Admissible Capacitive Load		2000µF
	Ripple and Noise Voltage	Vimin…Vimax; Io=Ionom (20MHz BW) See Note 2	50mVpk-pk
	Temperature Coefficient (Tc)	ΔVo/ΔT	< 0.02%/°C
	Switching Frequency	Fixed	270kHz
	Transient Response Deviation Settling Time	Io=1A to 4A to 1A dIo/dt= 1A/µs, Vi=48V (response within +/-1% Vo) See Note 3	 +/- 100mV max 100µs max

Electrical Specifications	Table 2. Input Specifications	Conditions	Value
	Nominal Input Voltage (Vinom)		48V
	Input Voltage Range	Io=0…Ionom See Note 4	19.2-72V
	Maximum Input Current (Iimax)	Vi=19.2V; Io=Iomax See Note 5	1A
	Input Reflected Ripple Current	Io=0…Ionom	30mApk-pk
	Inrush Current		< $1A^2$sec
	No Load Input Current	Vimin…..Vimax., Io=0	40mA
	Rise Time	Vinom, Io=Ionom Resistive Load Capacitive Load (2000µF)	 5ms 12ms

Electrical Specifications	Table 3. Isolation Specifications	Conditions	Value
	Isolation Voltage	In/Out In/Case Out/Case See Note 6	1500Vdc 1500Vdc 500Vdc
	Isolation Capacitance		1500pF
	Isolation Resistence		> 10MΩ
	Operating Range Temperature	Maximum Rating	-40/+85°C
	Storage Temperature	Maximum Rating	-50/+115°C

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General Specifications		Conditions	Value
	Efficiency		85%
	Cooling	Free Air Convection	
	Thermal Resistance (θ_{jc})		< 5°C/W
	Case Material	metal five-sided case	
	Weight		60g
	MTBF	BELLCORE 332 (40°C case)	1500000 hr.
	Approvals and Homologations	Pending	EN60955 UL1950 CSA950, CE
	Relative Humidity	Non condensing	5% to 95% RH

Protections			
	Current Protection		hiccup mode
	Overcurrent Protection Threshold	Vinom	5.5A +/- 10%
	Input Undervoltage Protection	See Note 7	

NOTES:

1 Output voltage trim allows the user to adjust the output voltage to a pre-defined value within ±10% of the nominal output voltage.
If an external resistor (R_{Tdown}) is connected between the Trim and -Vout pins, the output voltage decreases (see wiring * in Figure 3).
If an external resistor (R_{Tup}) is connected between the Trim and +V pins, the output voltage increases (see wiring ** in Figure 3).

2 Measured with capacitance an external capacitance C = C_1+C_2 = 100nF(ceramic) + 10µF (tantalum)

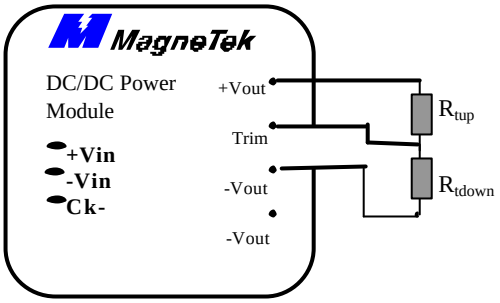
3 No external output capacitance.

4 The module is provided with hysteretic control of input line between 19.2V - 72V.

5 CAUTION: To preserve the module's flexibility, internal fusing is not included; however, to achieve the maximum system protection, input fusing is always highly recommended based on inrush current and maximum input current.

6 1500Vdc between input and output pins both in short circuit state
1500Vdc between input short circuited pins and the case
500Vdc between output short circuited pins and the case

7 The lockout circuitry turns the module off when the input voltage is below 17.5V



– Basic wiring for external output Trimming

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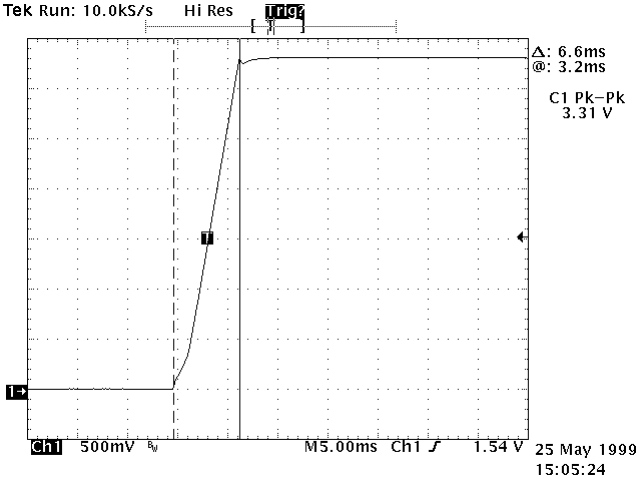
Characteristic Curves

This section provides typical characteristics for NGL Converter module as Input/Output Characteristics, Efficiency, Rise Time, Output Ripple Voltage and Transient Response to load variation from 50% to 75% of Full Load.

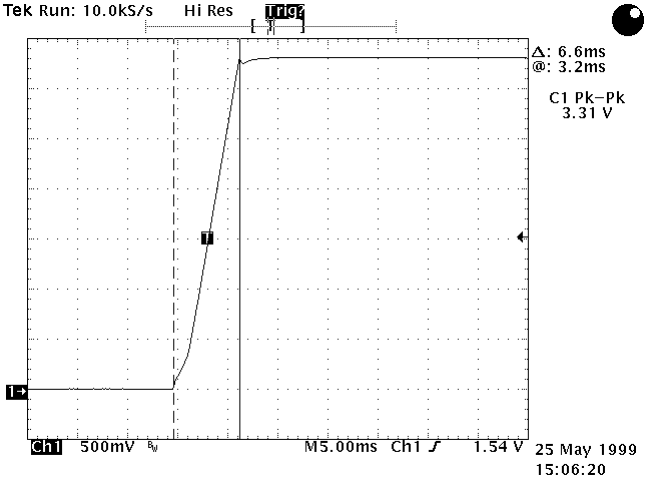
Rise Time

Conditions: Clock = open, Vin = 48V, Io =5A,Ta =25°C

Resistive Load

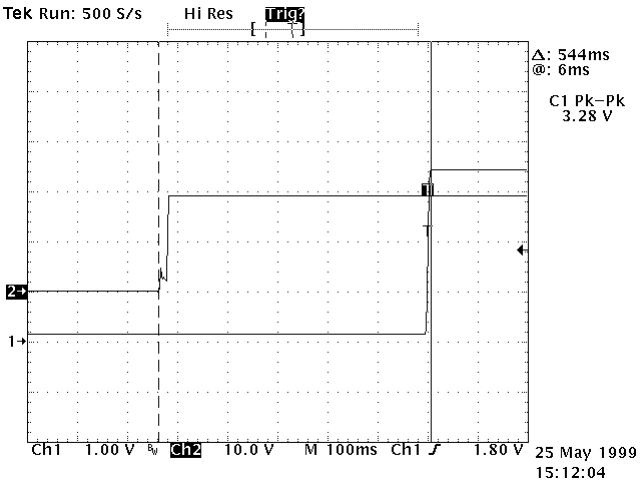


Capacitive Load = 2000µF



Converter start up time

Conditions: Clock=open Vin=19.2V Io=5A Ta=25°C



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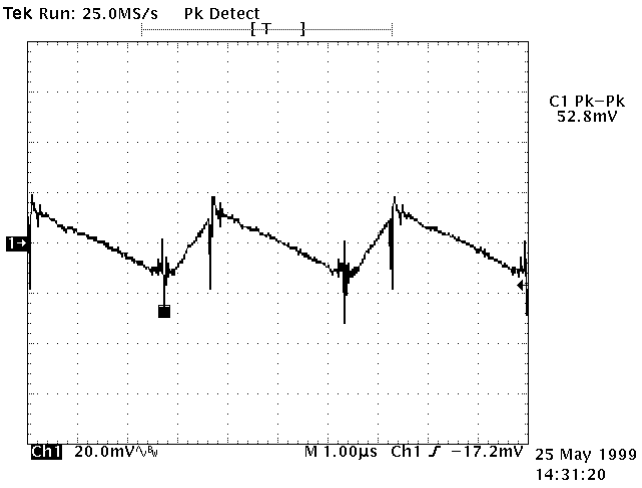
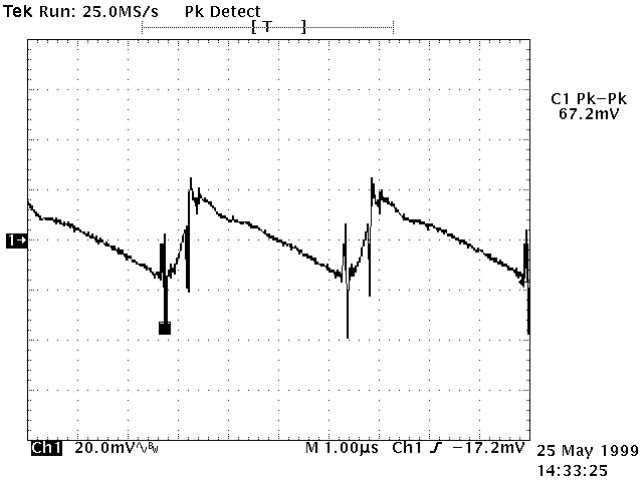
Ripple and Noise

Conditions: Clock=open
Vin=19.2V Io=5A Ta=25°C



Conditions: Clock=open
Vin=72V Io=5A Ta=25°C



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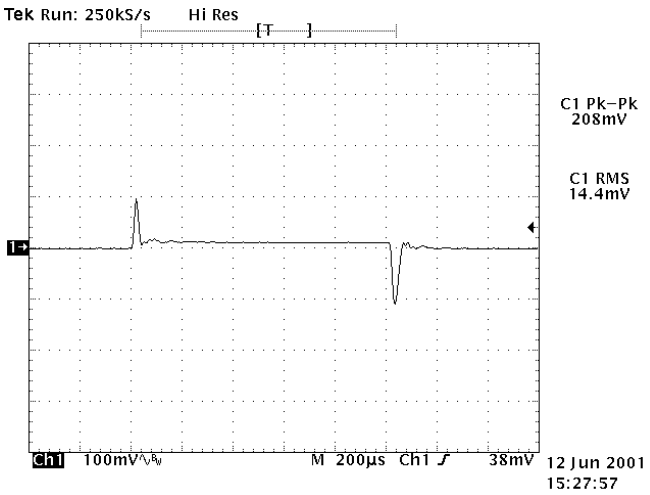
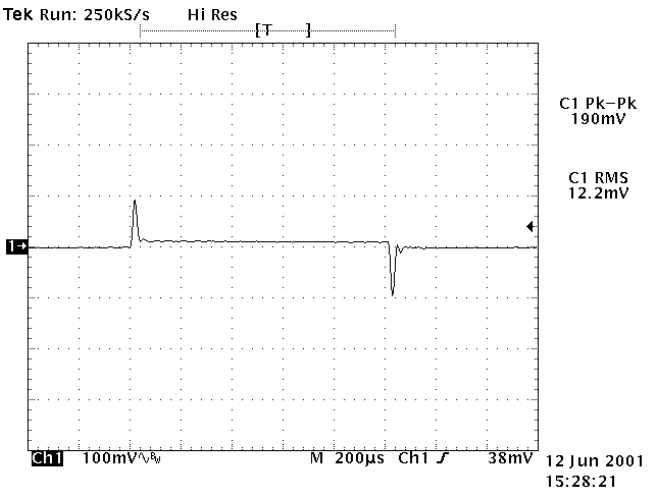
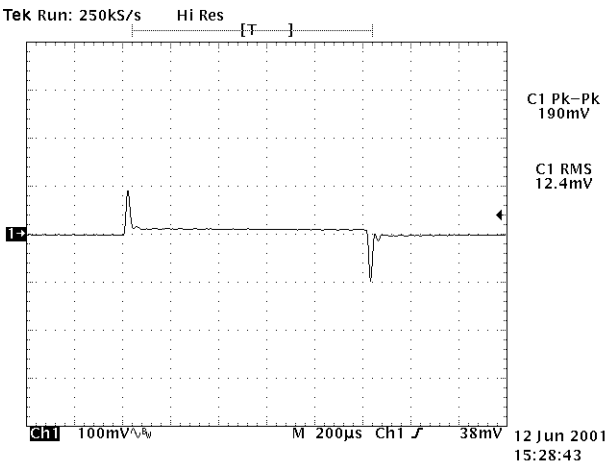
Transient Response



Output voltage response to step change in load current.
Io= 2.5A to 5A to 2.5A Freq.=500Hz Vin=19.2V
Ta=25°C



Output voltage response to step change in load current.
Io=2.5A to 5A to 2.5A Freq.=500Hz Vin=19.2V Ta=25°C



Output voltage response to step change in load current.
Io= 2.5A to 5A to 2.5A Freq.=500Hz Vin=19.2V
Ta=25°C

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Feature Descriptions

Current Limit

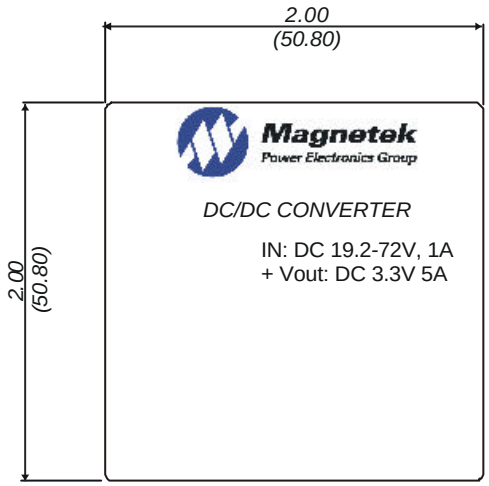
For protection in a output overload condition, the unit is equipped with an hiccup current limit protection so that it is able to work on short circuit condition for an undefinite time on all operating temperature range.
The unit operates normally once the output current is brought back into its specified range.

Syncronization

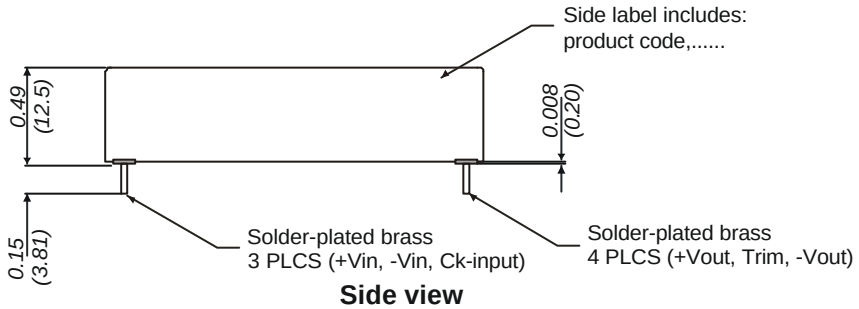
The Ck_Input Pin allows the synchronization of the fixed switching frequency to an external clock. This function is compatible with a 3.3Vpp signal, coupled through a 1nF capacitor on a impedance ≥3kohm.
However the power supplier start-up even without any sync. clock.

MECHANICAL DRAWINGS

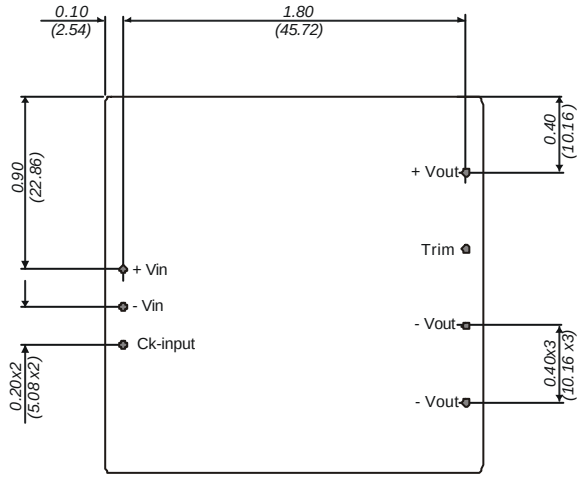
Dimensions are in inches and (millimeters)
Tolerances: x.xx ± 0.02 in. (0.5mm), x.xxx in.(0.25mm).
Pins: 0.04 in. (1.00mm) Dia



Top view



Side view



Bottom view

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We reserve the right to amend specifications and designs at any time under our policy of constant product improvement.

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