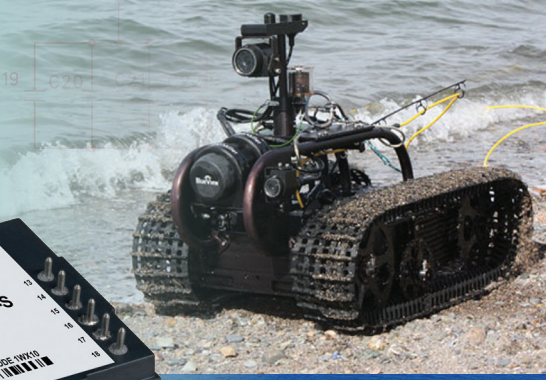
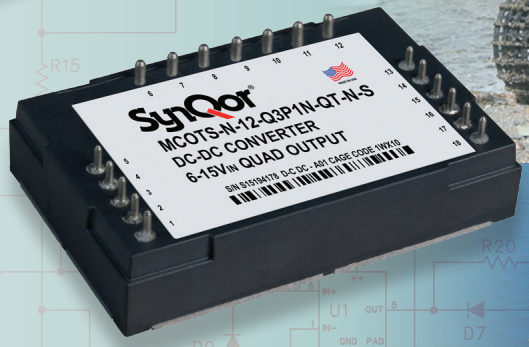
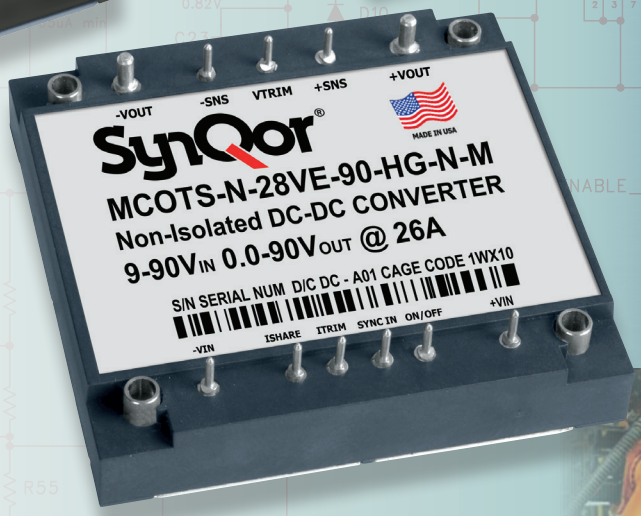
# NiQor®








Made in USA

# Non-Isolated DC-DC Converters

SynQor®

Rev C 006-0006713 - 09-20-2024

# High voltage, non-isolated DC-DC converters for industrial & military applications

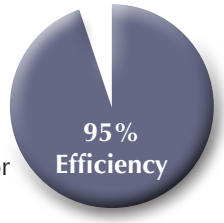
The high input voltage NiQor family of DC-DC converters offers unique solutions for converting high-powered, variable voltages to a wide range of output voltages. The converter is a non-isolated buck-boost regulator, which employs synchronous rectification to achieve extremely high conversion efficiency. They can 'buck' the input voltage down or 'boost' the input voltage up. These products are suitable to provide a regulated non-isolated output voltage from a variable voltage source such as a battery.

| *NQ*20 | Series | 0-20V |
|---|---|---|
| 9-20Vdc Input Range | | |
| Quarter | QG | 40A |
| Eighth | ET | 20A |
| | EG | 10A |

| *NQ*40 | Series | 0-40V |
|---|---|---|
| 9-40Vdc Input Range | | |
| Half | HG | 55 A |
| Quarter | QT | 35A |
| | QG | 30A |
| Eighth | EP | 20A |
| | ET | 15A |
| | EG | 8A |

| *NQ*60 | Series | 0-60V |
|---|---|---|
| 9-60Vdc Input Range | | |
| Half | HG | 40A |
| Quarter | QT | 25A |
| | QG | 20A |
| Eighth | EP | 15A |
| | ET | 10A |
| | EG | 5A |

| *NQ*90 | Series | 0-90V |
|---|---|---|
| 9-90Vdc Input Range | | |
| Half | HG | 26A |
| Quarter | QT | 18A |
| Eighth | EP | 10A |




## Operational features

- Ultra-high efficiency up to 95%
- Wide input voltage ranges:
  9-20V (NQ20); 9-40V (NQ40); 9-60V (NQ60); 9-90V (NQ90)
- Buck or Buck/Boost topologies available
- Maximum input/output currents up to 55A
- Suitable for use in Intermediate Bus Architecture
- On-board input and output filtering
- No minimum load requirement
- -40 °C to +100 °C Operating Temperature
- Remote sense and wide output voltage trim

## Protection/control features

- Input under-voltage lockout (UVLO)
- Output current limit (OCP) and short circuit protection
- Output over-voltage protection (OVP)
- Thermal shutdown (OTP)
- Output voltage trim

## Battery charging

- Provides the power conversion platform for battery charging
- Output current limit is externally controlled for constant-current charging
- Current can be set with an external resistor or an active circuit
- Current analog signal provided for instrumentation and control functions
- Ideal diode output stage with zero back-drive currents prevents discharge of battery when not charging
- Output voltage set-point is independently controlled through trim pin
- Unit will smoothly transition between current and voltage modes as charging cycle needs charge

### Industrial *Hi-Voltage* Non-Isolated Part Numbering

| Family | Input Voltage | Topology | Output Voltage | Package Size | Performance Series | Thermal Design | Max Current | Options Description: | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Enable Logic | Pin Length | Feature Set |
| NQ | **20:** 9-20V<br>**40:** 9-40V<br>**60:** 9-60V<br>**90:** 9-90V | **T:** Buck Only (⅛ and ¼)<br>**W:** Buck/Boost | **20:** 0-20V<br>**40:** 0-40V<br>**60:** 0-60V<br>**90:** 0-90V | **E:** Eighth Brick<br>**Q:** Quarter Brick<br>**H:** Half Brick | **G:** Giga<br>**P:** Peta<br>**T:** Tera | **C:** Encased<br>**D:** Encased Non-threaded Baseplate<br>**V:** Encased Flanged Baseplate | **05:** 5.0A<br>**08:** 8.0A<br>**10:** 10A<br>**15:** 15A<br>**20:** 20A<br>**26:** 26A<br>**30:** 30A<br>**40:** 40A<br>**55:** 55A | **N:** Neg. | **K:** 0.110"<br>**N:** 0.145"<br>**R:** 0.180"<br>**Y:** 0.250" | **S:** Standard (⅛ and ¼ only)<br>**C:** Current monitor output/ trimmable current limit (⅛ and ¼ only)<br>**F:** Current share/ trimmable current limit (half brick only) |

*Part Numbering Example: NQ20W20ETC20NRS*

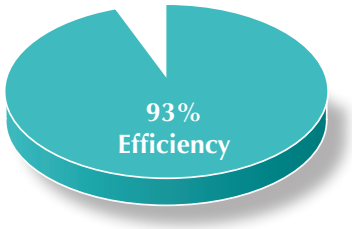
### MCOTS *Hi-Voltage* Non-Isolated Part Numbering

| Family | Product | Input Voltage | Output Voltage | Package | Heatsink Option | Screening |
|---|---|---|---|---|---|---|
| MCOTS | **N:** Non-Isolated | **28V:** 9-60V<br>**28VE:** 9-90V | **60:** 0-60V<br>**90:** 0-90V | **EP:** Eighth Brick Peta<br>**QT:** Quarter Brick Tera<br>**HG:** Half Brick Giga | **N:** Normal Threaded<br>**F:** Flanged | **S:** S-Grade<br>**M:** M-Grade |

*Part Numbering Example: MCOTS-N-28V-60-HG-F-M*

# Quad Output, non-isolated DC-DC converters

The MCOTS-N QUAD Output non-isolated dc-dc converter employs synchronous rectification to achieve extremely high conversion efficiency in a quarter brick package. The module generates three positive output voltages, and one negative output voltage. The MCOTS QUAD Output Brick converter can be used in traditional DPA (distributed power architecture) systems that require a more rugged design. All four outputs have a wide output trim range, creating a high degree of flexibility for the user.


## Operational Features

- Input voltage range: 6.0V ~ 15.0V, 12V nominal
- Four non-isolated outputs including three high current positive outputs, up to 30A each; one auxiliary negative output, up to 1A
- Positive outputs range: 0.8V to 5.0V
- Negative output range: -3.0V to -13.5V
- Common Input and Output Grounds
- High efficiency, up to 93% at full rated load current

## Protection/Control Features

- Over-current shutdown (All outputs)
- Thermal shutdown (All outputs)
- Over-voltage shutdown (Positive outputs only)
- Input under-voltage lockout (Positive outputs only)

## Control Features

- On/Off control for each output
- Output voltage trim for each permits custom voltages
- Remote Sense (Positive outputs only)

## Output Voltage Features

The TRIM input permits the user to adjust the output voltage according to the trim range specifications by using an external resistor connected between the TRIM pin and the Ground pin.

- For positive outputs:
  Rtrim = 1200/(Vout-0.8) – 100 (Ω)
  e.g. Vout = 5V Rtrim = 185.7Ω
  Vout = 0.8V Rtrim = OPEN
- For negative outputs:
  Rtrim = (-100Vout-122.5)/(Vout+13.475) (kΩ)
  e.g. Vout = -12V Rtrim = 730.5kΩ
  Vout = -13.475V Rtrim = OPEN

### MCOTS *Quad Output* Non-Isolated Part Numbering

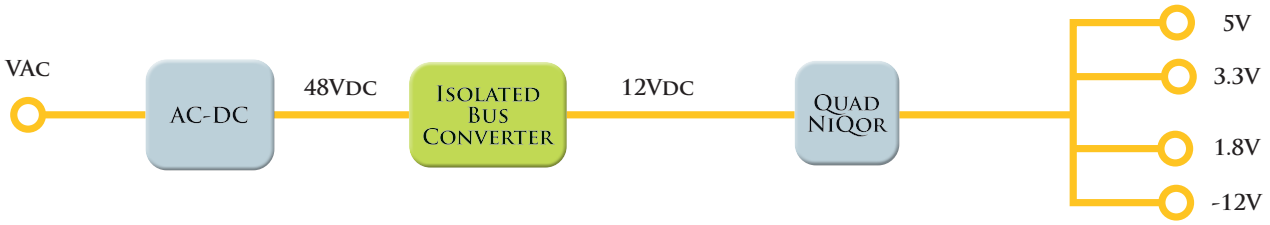
| Family | Product | Input Voltage | Output Voltage | Package | Heatsink Option | Screening |
|---|---|---|---|---|---|---|
| **MCOTS** | **N:** Non-Isolated | **12:** 6-15V | **Q3P1N:** Quad Output 3 Positive, 1 Negative | **QT:** Quarter Brick Tera | **N:** Normal Threaded<br>**F:** Flanged | **S:** S-Grade<br>**M:** M-Grade |

*Part Numbering Example: MCOTS-N-12-Q3P1N-QT-N-M*

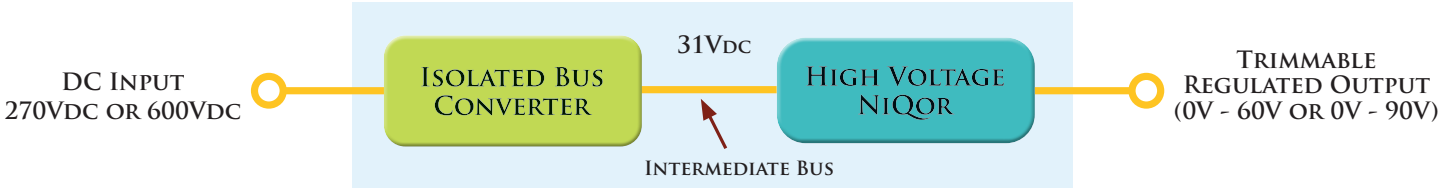
| Model Number | Package Size | Input Voltage | Output Voltage |
|---|---|---|---|
| **MCOTS-N-12-Q3P1N-QT** | **Quarter-brick** | **6-15 V** | **30 A Positive Outputs, 1 A Negative Output** |

# NiQor® Applications

## Intermediate Bus Architechture




## High Input Voltage / High Power / Adjustable Output




~1000W in 2 x Half-Brick Size

## Battery Charging


- Constant Current Charging (Trimmable)
- Trimmable Float Voltage
- Zero Back-drive Current Prevents Energizing a Disconnected Input Bus
- Applicable to All Batteries and Fuel Cells


**SynQor Headquarters**
155 Swanson Road
Boxborough, MA 01719-1316
Phone: 978-849-0600
Fax: 978-849-0602
E-mail: mqnbofae@synqor.com
www.SynQor.com


**Advancing The Power Curve®**

Headquartered in Boxborough, Massachusetts, at the location of its manufacturing operations, SynQor is a privately owned U.S. AS9100 and ISO9001 company. SynQor's converters feature a patented two-stage power topology that greatly improves efficiency and optimizes the power dissipated by the converter. With a design center in Dallas, Texas, and sales/marketing offices throughout the World, SynQor is the technology, quality and service leader for power conversion modules and systems.

SynQor's rugged DC-DC converters, AC-DC converters, filters and systems are designed for a wide range of industrial and military applications including those required to withstand harsh environments: railway and transportation systems, industrial motion control, information displays, factory automation, critical military and power generation systems.