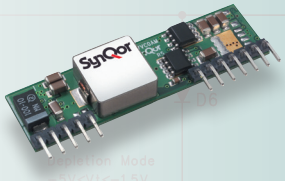
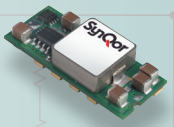
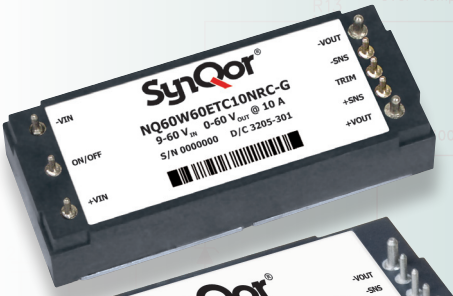
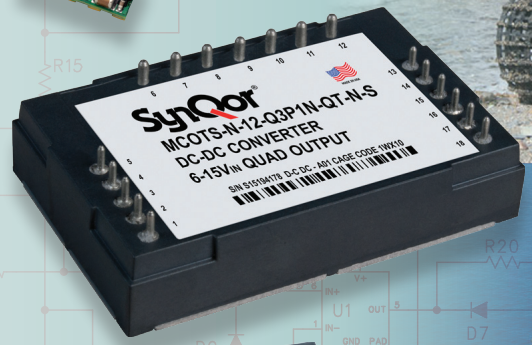
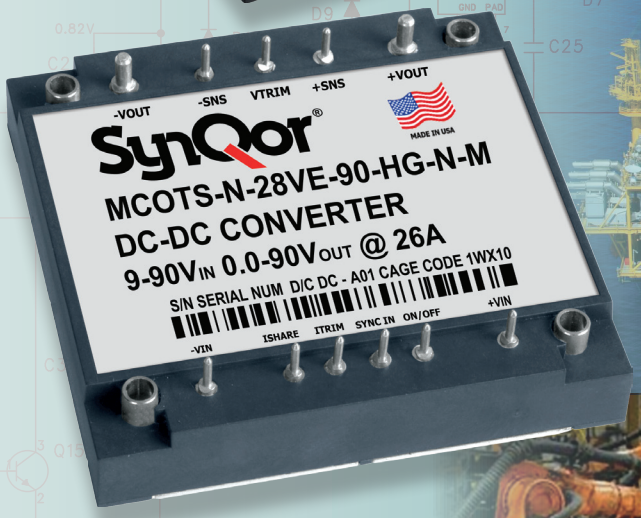
NiQor®











Non-Isolated DC-DC Converters

SynQor®

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.

NiQor® *Hi-Voltage* listed by Package Size and Output Voltage

NQ20	Series	0-20V
9-20Vdc Input Range		
Quarter	QG	40A
Eighth	ET	20A
	EG	10A

NQ40	Series	0-40V
9-40Vdc Input Range		
Quarter	QT	35A
	QG	30A
Eighth	EP	20A
	ET	15A
	EG	8A

NQ60	Series	0-60V
9-60Vdc Input Range		
Half	HG	40A
Quarter	QT	25A
	QG	20A
Eighth	EP	15A
	ET	10A
	EG	5A

NQ90	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)
- Non-isolated
- Buck or Buck/Boost topologies available
- Maximum input/output currents up to 40A
- On-board input and output filtering
- No minimum load requirement
- 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 **40:** 9-40V **60:** 9-60V **90:** 9-90V	**T:** Buck Only (⅛ and ¼) **W:** Buck/Boost	**20:** 0-20V **40:** 0-40V **60:** 0-60V **90:** 0-90V	**E:** Eighth Brick **Q:** Quarter Brick **H:** Half Brick	**G:** Giga **P:** Peta **T:** Tera	**C:** Encased **D:** Encased Non-threaded Baseplate **V:** Encased Flanged Baseplate	**05:** 5.0A **08:** 8.0A **10:** 10A **15:** 15A **20:** 20A **26:** 26A **30:** 30A **40:** 40A	**N:** Neg.	**K:** 0.110" **N:** 0.145" **R:** 0.180" **Y:** 0.250"	**S:** Standard (⅛ and ¼ only) **C:** Current monitor output/ trimmable current limit (⅛ and ¼ only) **F:** Current share/ trimmable current limit (half brick only)

Part Numbering Example: NQ20W20ETC20NRS

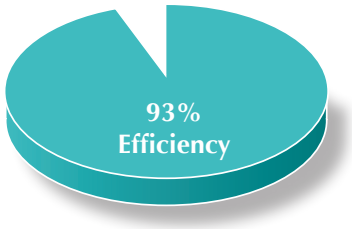
MCOTS *Hi-Voltage* Non-Isolated Part Numbering

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

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

Quad Output, non-isolated DC-DC converters for Military applications

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. 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 for positive outputs

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 **F:** Flanged	**S:** S-Grade **M:** M-Grade

Part Numbering Example: MCOTS-N-12-Q3P1N-QT-N-S

Non-isolated, Ultra-High Efficiency DC-DC converters for Telecom, Industrial and Medical Applications

The NiQor DC-DC converter is a non-isolated buck regulator, which employs synchronous rectification to achieve extremely high conversion efficiency. The NiQor family of converters are used predominately in IBA systems using a front end DC-DC high power bus convertor (48Vin to an intermediate bus voltage). The non-isolated NiQor converters are then used at the point of load to create the low voltage outputs required by the load. The wide trim module can be programmed to a variety of output voltages through the use of a single external resistor.

NiQor listed by Package Size and Output Voltage

NQ04	Package	0.75-3.6V	0.9-3.3V
2.4-6.0Vin	SMT	10A 36W 16A 58W	
3.0-5.5Vin	SIP		10A 36W 16A 58W
3.0-6.0Vin	SIP	10A 36W 16A 58W	

NQ15, NQ16	Package	0.75-5.0V	0.8-5.0V
6.0-15Vin	SMT		30A 150W
6.0-16Vin	SIP	10A 50W 16A 80W	
	SMT	10A 50W 16A 80W	

OPERATIONAL FEATURES

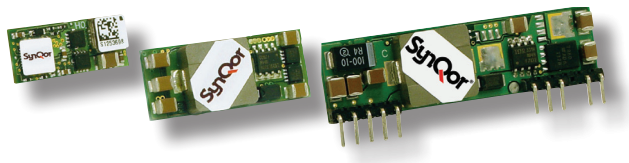
- Ultra-high efficiency up to 96%
- Wide input voltage ranges:
  - 2.4-6.0Vin (NQ04W33 SMT) 0.75-3.6Vout @10A/16A
  - 3.0-6.0Vin (NQ04W33 SIP) 0.75-3.6Vout @10A/16A
  - 3.0-5.5Vin (NQ04T33 SIP) 0.9-3.3Vout @10A/16A
  - 6.0-15Vin (NQ15W50 SMT) 0.8-5.0Vout @30A
  - 6.0-16Vin (NQ16W50 SIP) 0.75-5.0Vout @10A/16A
  - 6.0-16Vin (NQ16W50 SMT) 0.75-5.0Vout @10A/16A
- Wide Trimmable Output Voltage Ranges:
  - 0.75-5.0V (W50)
  - 0.75-3.6V (W33)
  - 0.9 -3.3V (T33)
- Output Voltage Trim Range 0.7 - 5.5V
- Suitable for use in Intermediate Bus Architectures
- On-board input and output filtering
- No minimum load requirement
- Optional features include remote sense, wide output voltage trim, and output current sharing
- Follows DOSA standard pinout and footprint

GENERAL SPECIFICATIONS

- Operating Temperature -40ºC to +105ºC
- Output Voltage Set Point ±0.7 - 2.0%
- Output Voltage Ripple <1.5% of Vout (typ.)
- Input Ref. Ripple Current <5% of Iin (typ.)
- Switching Frequency 300 - 390kHz
- Transient Response ±40 - 100mV

PROTECTION/CONTROL FEATURES

- Input under-voltage lockout (UVLO)
- Output current limit (OCP) and short circuit protection
- Output over-voltage protection (OVP)
- Thermal shutdown (OTP)
- On/Off control referenced to input side
- Output voltage trim (industry std. trim equations)



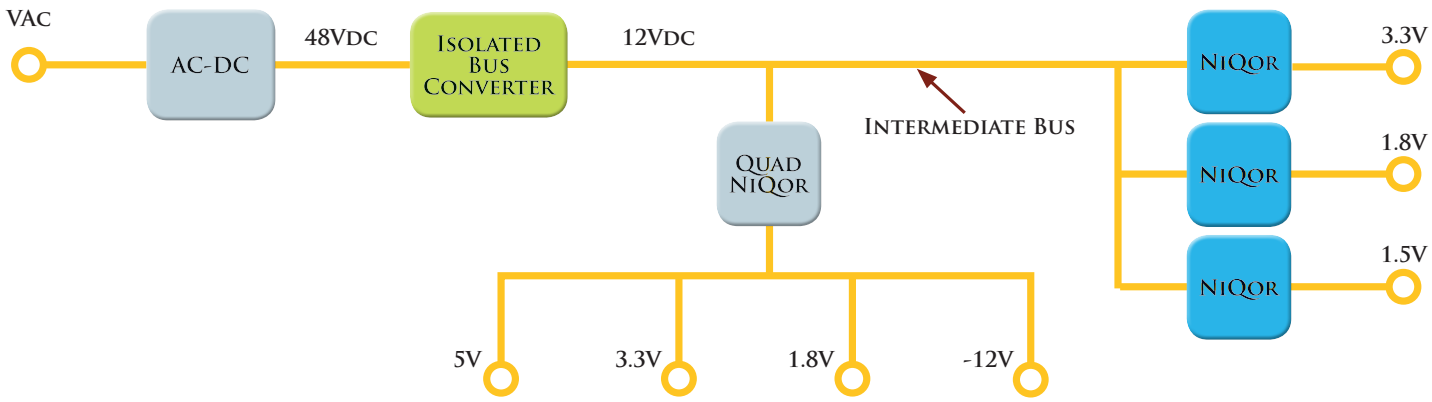
NiQor Non-Isolated Part Numbering

Family	Input Voltage	Output Voltage	Package Type	Performance Series	Thermal Design	Max Current	Options Description		
							Enable Logic	Pin Style	Feature Set
NQ	**04:** 2.4-6V **15:** 6-15V **16:** 6-16V	**W50:** 0.75-5.0V **W33:** 0.75-3.6V **T33:** 0.9-3.3V	**V:** Vert. SIP **H:** Horiz. SIP **S:** Surface-Mount	**K:** Kilo **M:** Mega **G:** Giga	**A:** Open frame	**07:** 7A **10:** 10A **15:** 15A **16:** 16A **30:** 30A	**P:** Pos./Open **O:** Neg./Open **N:** Negative	**R:** 0.160" SIP Std **V:** 0.160" Rev. Vert. **S:** SMT Std.	**N:** None **S:** Sense **D:** Sense & Share **G:** Sense, Share & Gnd Pins

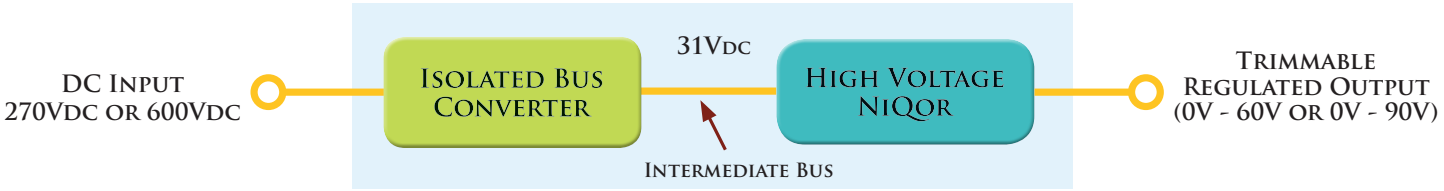
Part Numbering Example: NQ04W33SMA16PSS

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®

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.

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