

NDQ SERIES DIGITAL DC-DC CONVERTER MODULE



Overview

The NDQ family of DC-DC converters convert 50 to 12 V as a bus converter. It supplies power to down-stream power-conversion stages in the most challenging of applications. These units' high efficiency and standard ¼ brick footprints provide the granularity of power ratings between 900 W, 1300 W, 1600 W, and 1800 W.

These modules are digitally controlled via the industry standard PMBus™ protocol and fully regulated. Ideal for high-power computing and storage applications, they provide the 12 V power rail in +48 V-input ecosystems, where 40 to 60 V input range (in alignment with ORv3 specifications), is required but isolation from the power converter is not. They also fulfill the need for fully regulated output voltage, as well as digital control and monitoring.

The family consists of four base models:

- The NDQ900 non-isolated, single-output, digitally controlled DC-DC converter delivers up to 900 W at 12.25 VDC, reaching an ultra-high peak efficiency of 96.7%.
- The NDQ1300 series provides a single regulated, low-noise output and delivers up to 1300 W with 12 VDC output voltage at 97.7% peak efficiency.
- NDQ1600 series provides a single regulated, low-noise output and delivers up to 1600 W with 12 VDC output voltage at 97.7% peak efficiency.
- The NDQ1800-54S12B-3LIC (TBD) provides a stair-case regulated, low-noise output and delivers up to 1800 W with 9.9 to 12.9 VDC output voltage at 97.7% peak efficiency.

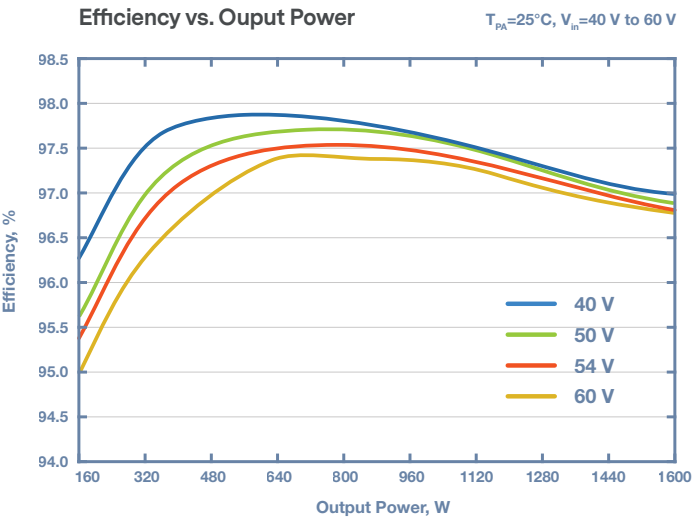
Features

- Up to 98% peak efficiency
- Digital or analog control features
- Versions to support either remote sense or current share
- Standard ¼ brick form factor
- Manufactured in the Philippines

Part Number	Output	Efficiency	Power Level
NDQ900-48S12	12 V at 75 A	96.5%	900 W
NDQ1300-48S12	12 V at 107 A	97.7%	1300 W
NDQ1600-48S12	12 V at 133 A	97.7%	1600 W
NDQ1800-48S12	12 V at 150 A	97.3%	1800 W

Efficiency

Efficiency of paramount importance in the creation of a thermally viable module and for the performance of the application. As seen in the efficiency curve, peak efficiency exceeds 98% where power converters are used the most—at around 50% load, which benefits the system's operational efficiency.



Benefits

- Fully regulated output under all conditions of load and/or input voltage, providing a fundamentally stable and precise preset voltage
- Resilient to load-transients
- Allows standard inrush-limiting design approaches
- Can be used in parallel (with current-share function) with no problems surrounding possible output voltage pre-bias on start-up
- Inherently safe design with no possibility of a fault condition allowing input voltage to appear on the output of the product
- IPC9592B compliant design
- Designed to meet 62368

The standard universal ¼ brick footprint of 1.45 by 2.3 in with two orderable variants where Pin 14 changes function to the active-current share function instead of the positive remote-sense function. As this family follows the standard mechanical form-factor, they can accommodate industry standard finned heatsinks or water-cooled heatsinks to be mounted onto the baseplate.

Pin	Function	Function
1	Vin+	Positive Input Voltage
2	CNT	Remote ON/OFF Control
3	Vin-	Negative Input Voltage
4	Vo-	Negative Output Sense (Optional-Fit)
5	Vo-	Negative Output Sense
6	Vo+	Positive Output Voltage
7	Vo+	Positive Output Voltage (Optional-Fit)
8	PG	Power Good
9	Sig_gnd	PMBus GND
10	DATA	PMBus Data Signal
11	SMBAalert	PMBus Interface
12	CLK	PMBus Clock Signal
13	Addr	PMBus Address
14	Ishare	Positive remote sense/current share

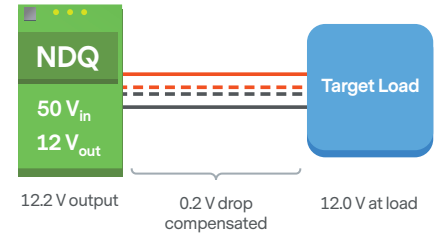


Different versions available for different tasks.

Two versions are available, one with remote sense function, the other with current sense function.

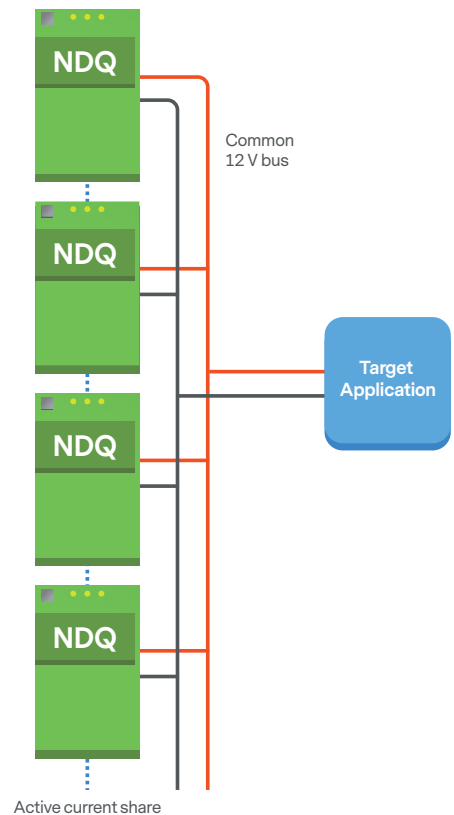
1 Remote-sense version

Where the target “load” is required to have a fixed and stable voltage supplying it. This unit will maintain the precise voltage at the point of where the voltage is being used.



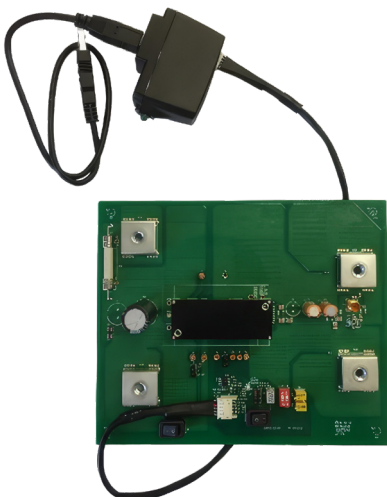
2 Current-sense version

Used when multiple units are required to share with the objective of supplying a total power greater than any one unit can provide. The current-share function forces all of the units that supply voltage to the common output bus voltage to contribute the same power to that bus. This can enable higher reliability and thermal management. When multiple units are used to supply the common output, it allows element of redundancy in the contributing power modules.



Comparison: current-share and remote-sense versions

When multiple units contribute power to a common bus voltage, the voltage should be sensed and maintained at a fixed level. Even if a sense function is integrated into the module, it must be connected locally at the module's output terminations. Since AEI modules already perform this function, having both functions on the same unit is redundant.



Evaluation boards are available to test the products on the bench as needed. These are equipped with sockets for the modules and all terminations to communicate, control, monitor, and measure the products under test.



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