NE040DC48A 24 V_{DC} to 48 V_{DC} Converter

OmniOn Energy's NE040DC48 24 V_{DC} to 48 V_{DC} Converter is designed to efficiently transform energy from a 24 Volt DC source into the 48 Volt DC power needed for newer LTE wireless base station equipment. This means that existing 24 V DC power and batteries supporting todays cellular traffic can be leveraged to support future 48V LTE deployments – without having to add an additional battery string.

Available in 1U shelves for mounting in 19 and 23 inch rack rails, the NE040DC48 can be used to make 48 Volts DC from any 24 Volt DC source.

Or if the existing battery system is supported by an Infinity M plant, 24 to 48 V converters can be added with no need for additional shelf hardware.

The NE040DC48 offers a powerful combination of efficiency, network simplicity and reliability for customers who have 24 Volts DC and need 48Volts DC.

Solar Applications

The NE040DC48 24 to 48 converter compliments our ECO Priority rectifiers for use in off grid solar applications where the served equipment may be a collection of equipment, some of which requires 48 Volts DC and some of which requires 24 Volts DC.

Features and Advantages

- Compact - 1RU form factor provides high power density.
- Efficient - Peak efficiency of 92 % occurs at less than 50% load matching sweet spots with customer use patterns.
- Flexibly provides 40 Amps of 48 Volt power from any 24 Volt DC source.
- Starts and runs at any DC voltage from 21 to 30 V_{DC}.
- Operates over a broad temperature range (-40°C through +75°C).
- Fail safe performance – hot insertion capabilities allow for converter replacement without system shutdown; inrush current protection prevents nuisance tripping of upstream breakers; coordinated start up assures that even large loads start.
- Extended service life – parallel operation with automatic load sharing ensures that units are not unduly stressed.

A True System Solution

NE040DC48 converters and ECO Priority Rectifiers are part of the proven Infinity Power System specifically designed for wireless sites.

- Monitoring / control – the built in microprocessor controls and monitors all critical converter functions and communicates with the system controller using the built in Galaxy Protocol serial interface.
- Dual Voltage Compatible - unique connector pin designation allows the 24 to 48 Volt converter to be used in a "Universal" power shelf, along side ECO Rectifiers supporting loads and batteries at 24 Volts DC.
- Plug and Play – installation of the converter in a shelf connected to a compatible system controller initializes all set up parameters automatically. No adjustments are needed. Product identifications, serial numbers and software versions are provided in the embedded inventory report page.

Technical Specifications

Electrical Specifications

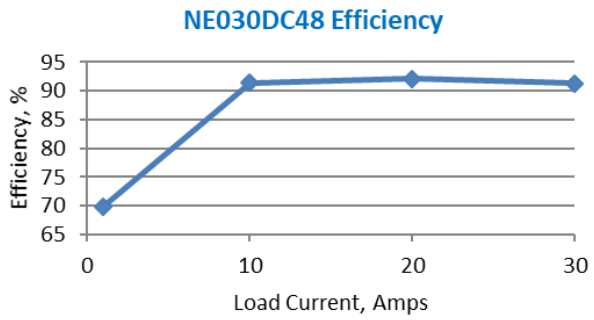
Input Voltage & Output Power

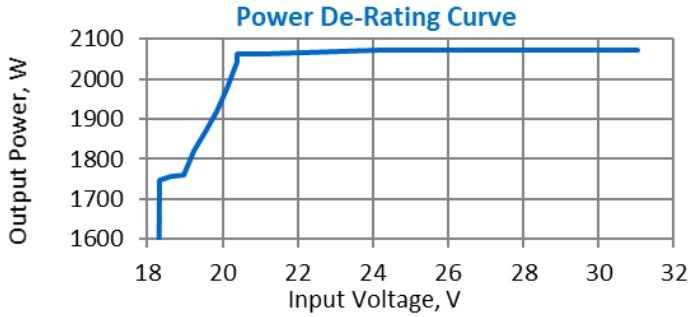
Parameter	Symbol	Min	Typ	Max	Unit
Operating Voltage	V_{IN}	21		30	V_{DC}
Absolute Limits (shut down<18V, no damage over range)		0		31	V_{DC}
Minimum Turn on Voltage	V_{IN}	20			V_{DC}
Nominal DC input current @ 27V			85		A
Max DC input current @ 21V in and 40 amps output	I_{IN}		115		A
Inrush Current @ 31V input	I_{IN}		120		A
Holdover	2.5 milliseconds, with Output droop from 52V to 46 V				

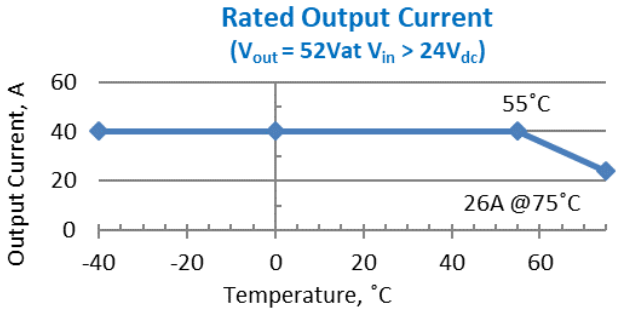
OUTPUT

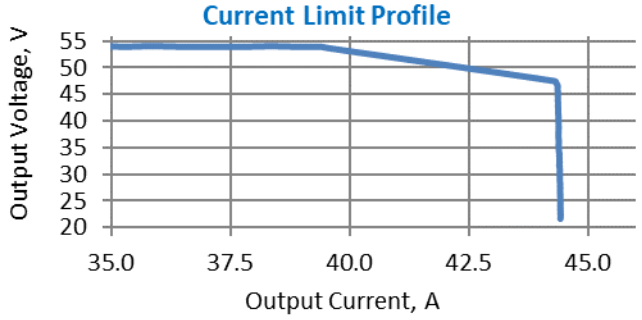
Parameter	Symbol	Min	Typ	Max	Unit
Output Voltage Setpoint	V_{OUT}		54.5		V_{DC}
Output Voltage Range	V_{OUT}	46		54.5	V_{DC}
Output Current @ in older shelves @ In shelves configured for input current	I_{OUT}		 30 40		A
Voltage Regulation	V_{OUT}		± 0.5		% w/ controller
Current Limit Setpoint (Full load)		30		100	%
Power Limit	W		2080		Watts
Monotonic Start-up (Compare to overshoot)			<1.5		%
Ripple	V_{OUT}		100 250		mV_{RMS} mV_{p-p}
Capacitive Load Start		2			Farad
Capacitive Load Switched	Recovers from a 68,000µF switched load in less than 75 ms.				
Efficiency at 50% load	η		92		%

Characteristic Curves









Technical Specifications (Continued)

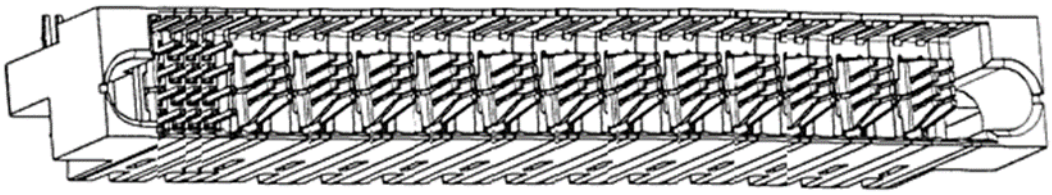
Environmental, Compliance & Physical

Operating Ambient Temperature Range	-40°C to +75°C (Output derates at 2%/°C beginning at 55°C)
Cooling Method	Front to back airflow with onboard temperature controlled fans
Operating Relative Humidity	0 - 95% (non-condensing) for use in a controlled environment
Electromagnetic Compatibility	FCC Part 15, EN 55032 (CISPR32), EN 55024, Level A, GR-1089
Agency Certifications* planned	UL1950, EN62368, CSA*234/950, NEBS GR-1089, GR-63-CORE
Heat Release	283 Watts, or 966 BTU/hr at full load of 2080 Watts
Mean Time Between Failure (MTBF)	300k Hours @ 25°C per Telcordia SR-332, Method 1, Case 3
Height x Width x Depth, Weight, Packaged weight	1.63x5.23x13.85in (42x133x352mm), 5.05 lbs (2.2 kg), 5.95 lbs (2.7 kg)

Power Unit and Power Unit Shelf Connectors

Power Unit PWB this side														
A4	A3	A2	A1	-48V	-48V	RTN[1] (-48 / +24V)	RTN[1] (-48 / +24V)	RTN[1] (-48 / +24V)	RTN[1] (-48 / +24V)	+24V	+24V	+24V	PE/GND (ACEG)	L2/N[2]	L1[2]
B4	B3	B2	B1												
C4	C3	C2	C1												
D4	D3	D2	D1												
				P12	P11	P10	P9	P8	P7	P6	P5	P4	P3	P2	P1
4x Pins	4x Pins	4x Pins	4x Pins	Blade	Blade	Blade MFBL (long)	Blade MFBL (long)	Blade MFBL (long)	Blade MFBL (long)	Blade	Blade	Blade	Blade MFBL (long)	Blade	Blade

Shown looking into the rear of the power unit



Power Unit Connector - AMP Multi-Beam XL (FCI # 51939-234LF or Tyco # 1900948-1)

Signals and Signal Pins

Pin	Length	Signal	Description	
A1	Long	RS-485–	non-Inverting RS-485 signal line (RS-485 A)	
B1	Long	RS-485+	Inverting RS-485 signal line (RS-485 B)	
C1	Long	Factory Programming & Converter Shelf	Reserved for Factory Programming - Open Circuit in the system shelf	
D1	Long	Return	• Signal Return for PSIDn, SIDn, & Interlock • Power Units Connect Return to NE Common Return internally. • Power Units diode isolate the Return signals from each Power Slot.	
A2	Long	PSID0	Power Slot Address 0	• Logic 1 = Open Circuit (~3.3V). Logic 0 = Connection to the Return signal (~0.7V). • Left slot (front view) is Power Slot 1 and has address 000B. • Power Slot ID signals are connected directly to the Return signal at each Power Slot or left open.
B2	Long	PSID1	Power Slot Address 1	
C2	Long	PSID2	Power Slot Address 2	

Technical Specifications (Continued)

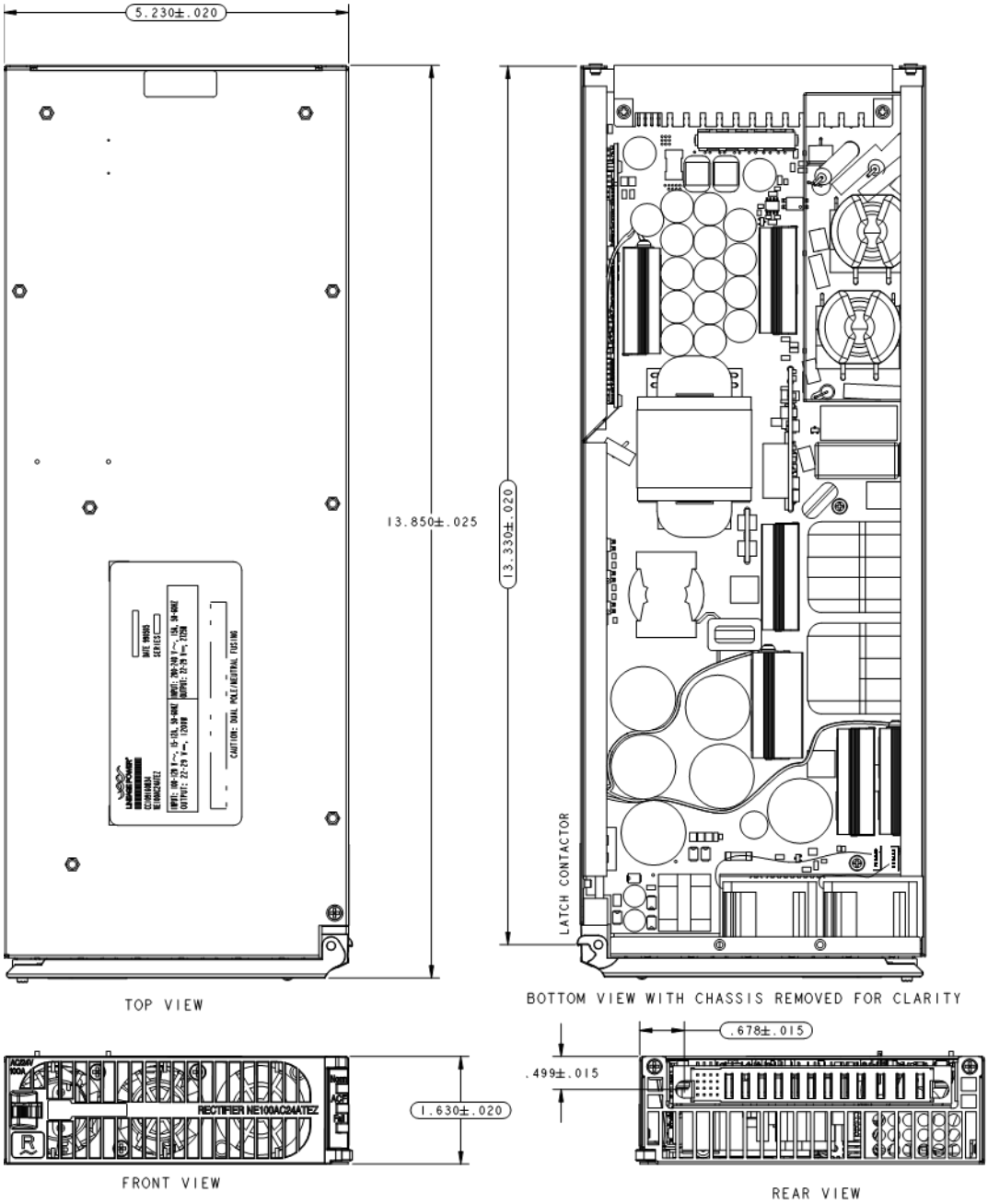
Signals and Signal Pins

Pin	Length	Signal	Description	Description
D2	Long	SID3	Shelf Address 3	• Logic 1 = Connection to Return signal (~0.7V). Logic 0 = Open Circuit (~3.3V). • Shelf addresses 1 (00001B) through 31 (11111B) are valid. Shelf address 0 (00000B) is invalid. Address 31 (11111B) disables comm. fail LED • Power Unit Shelf ID signals connect to Shelf Return left open
A3	Long	SID4	Shelf Address 4	
B3	Long	SID5	Shelf Address 5	
C3	Long	SID6	Shelf Address 6	
D3	Long	SID7	Shelf Address 7	
A4	Short	Interlock	• Disables power conversion within a Power Unit when not connected to the Return signal • Power Unit Shelves connect Interlock directly to the Return signal at each Power Slot.	
B4	Long	Factory Programming	Reserved for Factory Programming – Open Circuit in the system shelf.	
C4	Long			
D4	Long			

Note: The NE040DC48 behaves as an NE030DC48 when provided with slot addresses 1-4. Slot addresses 5-8 obtain the performance detailed in this data sheet.

Technical Specifications (Continued)

Physical Interface Dimensions



Change History (excludes grammar & clarifications)

Revision	Date	Description of the change
1.1	07/15/2021	Initial Release
1.2	10/23/2023	Updated as per OmniOn template
1.5	01/04/2024	Update to change FS to DS

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