

# 40 WATT NCM CHASSIS MOUNT DC/DC CONVERTERS



## Features

- Chassis Mount design for excellent thermal performance
- High Efficiency
- 2:1 Wide Input Range
- Over Voltage Protection
- Short Circuit Protection
- Six Sided Shielding
- Remote On/Off Control
- RoHS Compliant
- Optional Din Mount
- 5 Year Warranty

## Description

The 40 Watt single NCM series of DC/DC Converters provide precisely regulated dc outputs. All outputs are fully isolated from the inputs, allowing the output to be used with positive or negative polarity and various grounding options.

The NCM Series meets the most rigorous requirements in a ruggedized chassis mount enclosure with recessed barrier strips for added protection. Standard features include output trim, and remote on/off. Integrated terminal blocks allow for easy connectivity. An optional DIN Rail Adapter is available for DIN Rail Mounting the NCM. See Selection Chart for ordering information.

Selection Chart					
Model	Input Range VDC		lin ADC	Vout VDC	Iout ADC
	Min	Max	TYP		
12S3R3.8000NCM	9	18	2.47	3.3	8
12S5.8000NCM	9	18	3.75	5	8
12S12.3333NCM	9	18	3.75	12	3.33
12S15.2666NCM	9	18	3.70	15	2.67
24S3R3.8000NCM	18	36	1.22	3.3	8
24S5.8000NCM	18	36	1.83	5	8
24S12.3333NCM	18	36	1.83	12	3.33
24S15.2666NCM	18	36	1.83	15	2.67
48S3R3.8000NCM	36	75	0.611	3.3	8
48S5.8000NCM	36	75	0.916	5	8
48S12.3333NCM	36	75	0.906	12	3.33
48S15.2666NCM	36	75	0.906	15	2.67

To order with optional DIN Rail Mount specify part number followed by -DIN. i.e 24S5.8000NCM-DIN



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Unless otherwise stated, these specifications apply for ambient temperature  $T_A=25^{\circ}\text{C}$ , nominal input voltage, and rated full load. (1)

Input Parameters							
Model		12S3R3.8000NCM	12S5.8000NCM	12S12.3333NCM	12S15.2666NCM	Units	
Voltage Range	MIN	9				VDC	
	TYP	12					
	MAX	18					
Input Overvoltage (100 ms)	MAX	25				VDC	
Input Current	No Load	TYP	120	160	160	150	mA
	100% Load	TYP	2.47	3.75	3.75	3.70	A
Reflected Ripple, 12 $\mu\text{H}$ Source Impedance (3)	TYP	50				mA	
Efficiency	TYP	89	89	89	90	%	
Switching Frequency	TYP	320				kHz	
Recommended Fuse (2)		8 A Slow-Blow					

Input Parameters							
Model		24S3R3.8000NCM	24S5.8000NCM	24S12.3333NCM	24S15.2666NCM	Units	
Voltage Range	MIN	18				VDC	
	TYP	24					
	MAX	36					
Input Overvoltage (100 ms)	MAX	50				VDC	
Input Current	No Load	TYP	75	80	85	75	mA
	100% Load	TYP	1.22	1.83	1.83	1.83	A
Reflected Ripple, 12 $\mu\text{H}$ Source Impedance (3)	TYP	30				mA	
Efficiency	TYP	90	91	91	91	%	
Switching Frequency	TYP	320				kHz	
Recommended Fuse (2)		4 A Slow-Blow					

Input Parameters							
Model		48S3R3.8000NCM	48S5.8000NCM	48S12.3333NCM	48S15.2666NCM	Units	
Voltage Range	MIN	36				VDC	
	TYP	48					
	MAX	75					
Input Overvoltage (100 ms)	MAX	100				VDC	
Input Current	No Load	TYP	40	50	50	50	mA
	100% Load	TYP	0.611	0.916	0.906	0.906	A
Reflected Ripple, 12 $\mu\text{H}$ Source Impedance (3)	TYP	20				mA	
Efficiency	TYP	90	91	92	92	%	
Switching Frequency	TYP	320				kHz	
Recommended Fuse (2)		2 A Slow-Blow					

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Output Parameters						
Model		12S3R3.8000NCM 24S3R3.8000NCM 48S3R3.8000NCM	12S5.8000NCM 24S5.8000NCM 48S5.8000NCM	12S12.3333NCM 24S12.3333NCM 48S12.3333NCM	12S15.2666NCM 24S15.2666NCM 48S15.2666NCM	Units
Output Voltage		3.3	5	12	15	V
Output Voltage Setpoint Accuracy	MAX	±1				%
Temperature Coefficient	TYP MAX	±0.02				%/°C
Ripple & Noise (6)	TYP	100	100	150	150	mV P-P
Load Current	MIN MAX	0 8	0 8	0 3.33	0 2.67	A
Load Transient Recovery Time (5)	TYP	250				µs
Load Regulation (4) Min-Max Load	MAX	±0.5				%
Line Regulation Vin = Min-Max	MAX	±0.5				%
Output Current Limit	TYP	Current Limitation at 150% typ. of I <sub>out</sub> max.				%
Short Circuit Protection	TYP	Hiccup Automatic Recovery				%

## Notes:

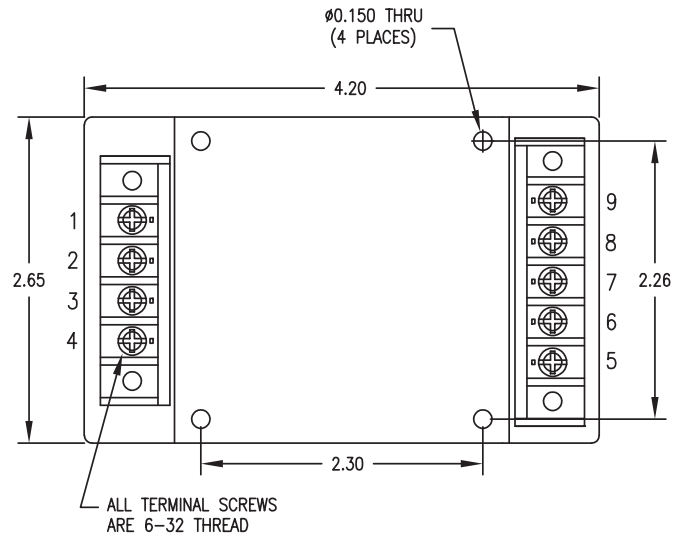
- (1) Refer to the CALEX Application Notes for the definition of terms, measurement circuits, and other information.
- (2) Refer to the CALEX Application Notes for information on fusing.
- (3) 33 µF capacitor connected between the two "Input" terminals. Then insert current sensor in series with 12 µH inductor between 33 µF and the source. The reflected ripple current is measured over a 5 Hz to 20 MHz bandwidth (current sensor is located between the converter input terminal and the 12 µH inductor).
- (4) Load regulation is defined as the output voltage change when changing load current from a maximum to minimum. The voltage is measured at the output terminal.
- (5) Load Transient Recovery Time is defined as the time for the output to settle from a 50% to 75% or 25% step load change to a 1% error band of output voltage (rise time of step = 2 µs).
- (6) Noise is measured per the CALEX Application Notes. Output noise is measured with a 10 µF tantalum capacitor in parallel with a 0.1 µF ceramic capacitor connected across the output terminals. Measurement bandwidth is 0-20 MHz.
- (7) When an external ON/OFF switch is used, such as open collector switch, logic high requires the switch to be high-impedance. Switch leakage currents greater than 10µA may be sufficient to trigger the ON/OFF to the logic-low state.
- (8) Specifications subject to change without notice.
- (9) RoHS Compliance:  
See Calex Website [www.calex.com/RoHS.html](http://www.calex.com/RoHS.html) for the complete RoHS Compliance statement.  
The RoHS marking is as follows.



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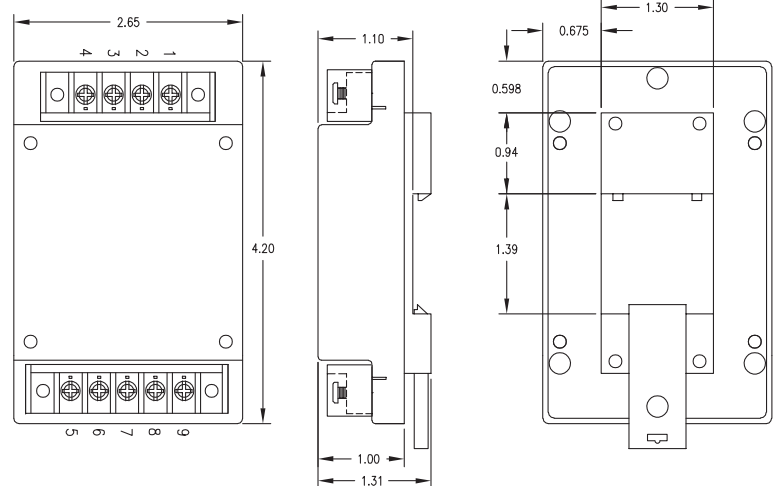


General Specifications			
All Models			Units
Isolation			
Input to Output Isolation	MAX	1500	VDC
Remote On/Off			
DC/DC On	3.5V - 12V or Open Circuit		
DC/DC Off	0V - 1.2V or Short Circuit		
Control Input Current (On) Vctrl = 5.0v	TYP	0.5	mA
Control Input Current (Off) Vctrl = 0V	TYP	-0.5	mA
Control Common	Referenced to Negative Input		
Standby Input Current Nominal Vin	TYP	2.5	mA
Trim			
Trim Up/Down Range % of nominal output voltage	MIN	±10	%
Environmental			
MTBF - MIL-HDBK 217F @ 25°C	328,000		h
Baseplate Operating Temperature Range	MIN MAX	-40 +100	°C
Storage Temperature	MIN MAX	-55 125	°C
General			
Case Dimension	2.65" x 4.20" x 1.00"		
Unit Weight	345		g
Agency Approvals - Designed to Meet	UL/CUL 60950		



Pin	Name
1	ON/OFF
2	N/U
3	-INPUT
4	+INPUT
5	N/U
6	+OUTPUT
7	-OUTPUT
8	TRIM
9	N/C

TOLERANCE: ALL DIMENSIONS ARE TYPICAL IN INCHES UNLESS OTHERWISE NOTED:	
X.XX	±0.020
X.XXX	±0.005



**Optional Din Mount**

