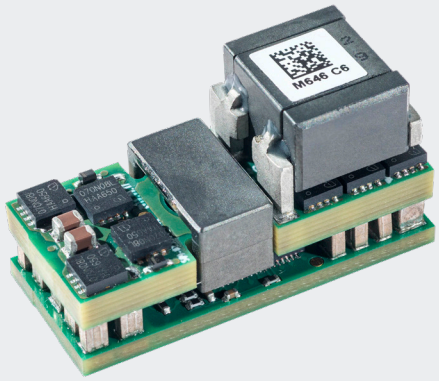
ARTESYN ADC100M SERIES

100 A & 120 A PSA Main DC/DC Converter



Advanced Energy's Artesyn ADC100M-04 is a Direct Conversion PSA main unit. With the ever increasing power demands of server processors and associated memory devices, new power conversion design approaches need to be considered both at system and server level. The solution to achieve the high power required is to move to a 48 V system with the power conversion design approaches of either distributed power conversion, or direct power conversion employed in the server. ADC100 series follow Power Stamp Alliance's standard product footprint and functions that provide a standard modular board-mounted solution for power conversion for 48 Vin / 54 Vin to low voltage, high current applications.

AT A GLANCE

Total Power

1.0 V @ 120 A
1.8 V @ 100 A

Input Voltage

40 to 60 VDC

Single Output Versions

0.8 to 1.1 V
1.6 to 2.0 V

SPECIAL FEATURES

- Up to 120 A peak current
- PSA compliant
- Up to 91% efficient
- Low ripple and noise
- Data center 48 VDC input range
- Open frame optimized for air cooling
- Surface mount termination
- Fixed switching frequency
- High capacitive load capability
- Pre-bias startup capability
- High reliability
- RoHS 3.0 (2011/65/EU) compliant
- UL94 V-0 materials
- Two year warranty (consult factory for extended terms)

SAFETY

- TUV/CE 62368-1
- UL/cUL 62368-1

©2021 Advanced Energy Industries, Inc.

ELECTRICAL SPECIFICATIONS

Input	
Input voltage	40 to 60 VDC
Input undervoltage shutdown/startup	38 VDC Latch protection, configurable
Efficiency	91%
I/O insulation	Functional insulation
I/O isolation	500 VDC
Output	
Output voltage	1.0 V nominal (-04J variant) 1.8 V nominal (-04Y variant)
Output voltage adjustment	0.8 V to 1.1 V (-04J variant) 1.6 V to 2.0 V (-04Y variant)
Output current maximum	1.0 V at 120 A (-04J variant) 1.8 V at 100 A (-04Y variant)
Noise and ripple	±22 mV (04Y variant) TBD (04J variant)
Overtemperature protection (Open frame)	125 °C hot spot Latch protection, configurable
Overvoltage protection method/OVP operation	400 mV above Vout (-04Y variant) TBD (-04J variant) Latch protection, configurable
Overcurrent protection method/OCP operation	Latch protection, configurable
Control	
Enable	Positive enable
Control	AVSBus commands supported SVID control supported
Remote sense	Provided
Columbus™ communication	All control provided for up to 5 satellite stamps supported
Switching frequency	TBD

ORDERING INFORMATION

Model Number	Input Voltage	Output Voltage	Output Current	Structure
ADC100M-04J	40 - 60 VDC	1.0 VDC	120 A	Open frame, surface mount
ADC100M-04Y	40 - 60 VDC	1.8 VDC	100 A	Open frame,surface mount

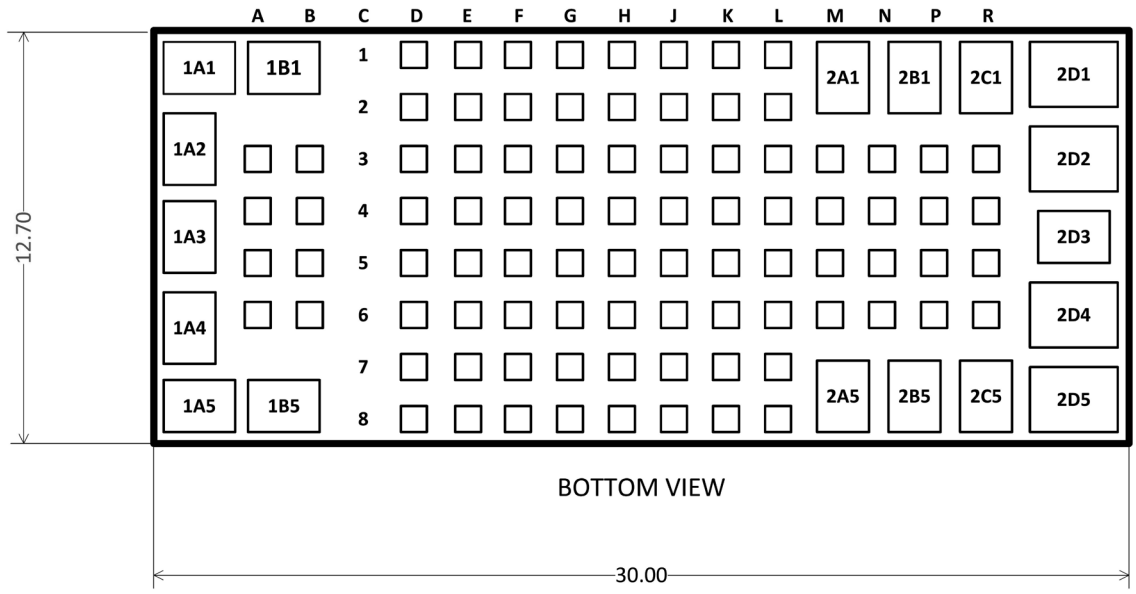
ADC = Artesyn Direct Conversion
100 = 100/120 A peak current
04 = 40-60 Vin

J = 1.0 V output version
Y = 1.8 V output version

ENVIRONMENTAL SPECIFICATIONS

Storage temperature	-40 to +125 °C
Ambient operating temperature	0 to +55 °C
MTBF	>3800 k hours at 25 °C, nominal input / rated output, TDC load, Telcordia, SR332 Method 1 Case 3

TERMINATION DESCRIPTIONS



Pin 1-18 Functions					
Pad #	Pin Name	Pin Function	Pad #	Pin Name	Pin Function
1A1	+IN	Positive Input voltage supply connection	2B1	No connection	Pad present, no connection made
1A2	PWM_Y	PWM input Y connection	2B5	VCC	Secondary side Auxiliary voltage supply
1A3	VDD	Primary Auxiliary voltage supply	2C1	No connection	Pad present, no connection made
1A4	PWM_X	PWM input X connection	2C5	No connection	Pad present, no connection made
1A5	+IN	Positive input voltage supply connection	2D1	GND	Secondary side ground connection
1B1	-IN	Primary side ground connection	2D2	VOUT	Positive output voltage connection
1B5	-IN	Primary side ground connection	2D3	No connection	Pad present, no connection made
2A1	No connection	Pad present, no connection made	2D4	VOUT	Positive output voltage connection
2A5	No connection	Pad present, no connection made	2D5	GND	Secondary side ground connection

SIGNAL LOCATION IDENTIFICATION

	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	
1	N/A	N/A	N/A	PFAULT _IN#	PUC DTO	PUCDTI	PWM1Y	PWM2Y	PWM3Y	PWM4Y	PWM5Y	N/A	N/A	N/A	N/A	1
2	N/A	N/A	N/A	VSR MON	PUCCS	PUCCK	PWM1X	PWM2X	PWM3X	PWM4X	PWM5X	N/A	N/A	N/A	N/A	2
3	-IN	-IN	N/A	TMP5	CSP5	CSN5	GND	GND	GND	GND	PWM6X	PWM6Y	START5	GND	GND	3
4	-IN	-IN	N/A	TMP3	CSP3	CSN3	GND	GND	GND	GND	FAULT#	START6	START3	GND	GND	4
5	-IN	-IN	N/A	TMP2	CSP2	CSN2	GND	GND	GND	GND	VR_RDY	VREG	START2	GND	GND	5
6	-IN	-IN	N/A	TMP4	CSP4	CSN4	GND	GND	GND	GND	EN	VCTRL	START4	GND	GND	6
7	N/A	N/A	N/A	TMP6	CSP6	CSN6	SALERT	SDA	SVDAT/ AVSAMDAT	VR_HOT#	VCCIO_ OK	N/A	N/A	N/A	N/A	7
8	N/A	N/A	N/A	TMN	+S	-S	SADDR	SCL	SVCLK/ AVSCLK	SV_ALRT/ AVSSDAT	PAD_ ALERT#	N/A	N/A	N/A	N/A	8
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	

1. The areas for 0 V connection through the center line of the module.
2. The relative groupadg of similar signals (by color in the grid-matrix above).
3. The groupadg of -In and GND pads.
4. The grid above does NOT include the power connections.

Signal Pin Assignments

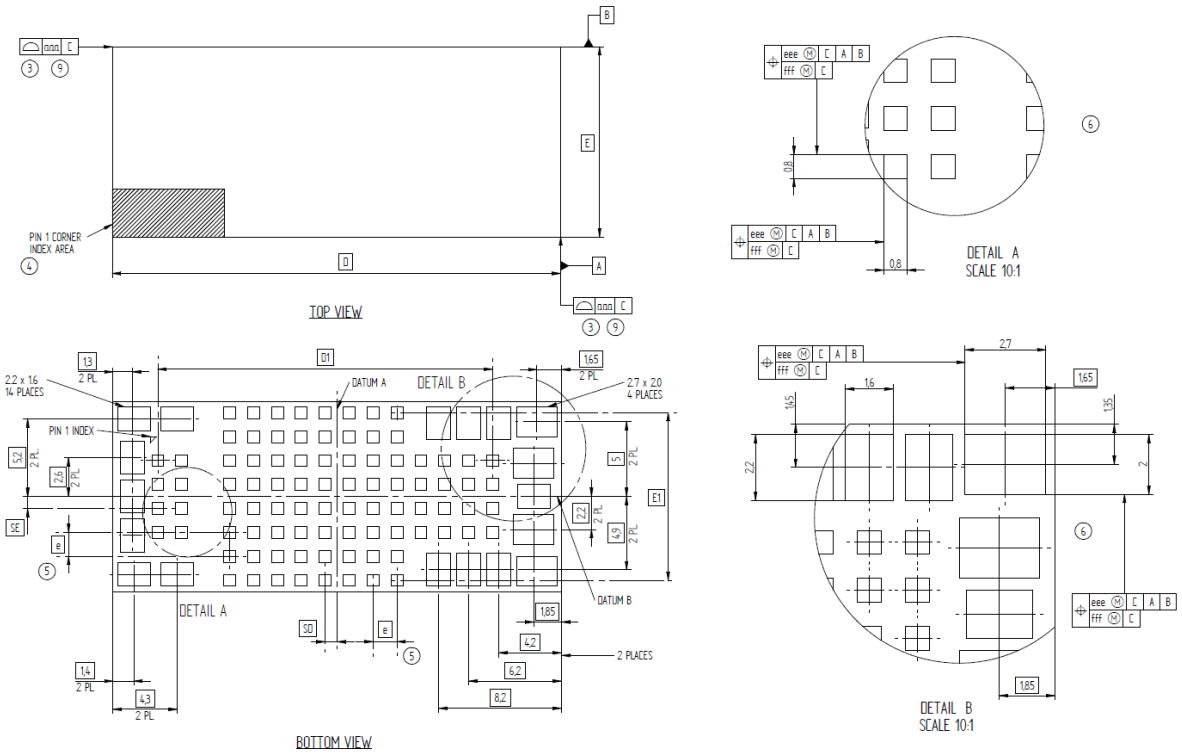
Pad #	Pad Name	Pad Function	Pad #	Pad Name	Pad Function
A1	N/A	No Pad present	A4	N/C (-In)	Primary side ground
B1	N/A	No Pad present	B4	N/C (-In)	Primary side ground
C1	N/A	No Pad present	C4	N/A	No Pad present
D1	PFAULT_IN#	Primary side fault indicator	D4	TMP3	Temperature sense Satellite 3
E1	PUCDTO	Primary side microcontroller data output	E4	CSP3	Current sense +ve Satellite 3
F1	PUCDTI	Primary side microcontroller data input	F4	CSN3	Current sense -ve Satellite 3
G1	PWM1Y	PWM signal for Satellite 1	G4	GND	Secondary side ground
H1	PWM2Y	PWM signal for Satellite 2	H4	GND	Secondary side ground
J1	PWM3Y	PWM signal for Satellite 3	J4	GND	Secondary side ground
K1	PWM4Y	PWM signal for Satellite 4	K4	GND	Secondary side ground
L1	PWM5Y	PWM signal for Satellite 5	L4	FAULT#	Programable fault indicator
M1	N/A	No Pad present	M4	START6	Start for Satellite 6
N1	N/A	No Pad present	N4	START3	Start for Satellite 3
P1	N/A	No Pad present	P4	GND	Secondary side ground
R1	N/A	No Pad present	R4	GND	Secondary side ground
A2	N/A	No Pad present	A5	N/C (-In)	Primary side ground
B2	N/A	No Pad present	B5	N/C (-In)	Primary side ground
C2	N/A	No Pad present	C5	N/A	No Pad present
D2	VSRMON	Feed-forward sensor input	D5	TMP2	Temperature sense Satellite 2
E2	PUCCS	Primary side microcontroller chip-select	E5	CSP2	Current sense +ve Satellite 2
F2	PUCCK	Primary side u-controller clk	F5	CSN2	Current sense -ve Satellite 2
G2	PWM1X	PWM signal for Satellite 1	G5	GND	Secondary side ground
H2	PWM2X	PWM signal for Satellite 2	H5	GND	Secondary side ground
J2	PWM3X	PWM signal for Satellite 3	J5	GND	Secondary side ground
K2	PWM4X	PWM signal for Satellite 4	K5	GND	Secondary side ground
L2	PWM5X	PWM signal for Satellite 5	L5	VR_RDY	Voltage regulator ready signal
M2	N/A	No Pad present	M5	VREG	Optional regulator input
N2	N/A	No Pad present	N5	START2	Start for Satellite 3

SIGNAL LOCATION IDENTIFICATION (CONTINUED)

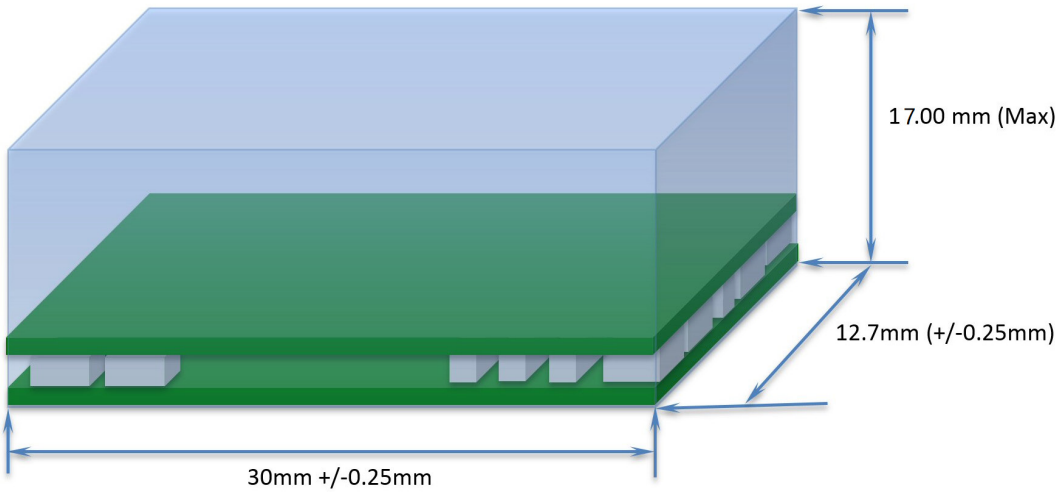
Signal Pin Assignments - Continued					
Pin #	Pin Name	Termination Pin Function	Pin #	Pin Name	Pin Function
P2	N/A	No Pad present	P5	GND	Secondary side ground
R2	N/A	No Pad present	R5	GND	Secondary side ground
A3	N/C (-In)	Primary side ground	A6	N/C (-In)	Primary side ground
B3	N/C (-In)	Primary side ground	B6	N/C (-In)	Primary side ground
C3	N/A	No Pad present	C6	N/A	No Pad present
D3	TMP5	Temperature sense Satellite 5	D6	TMP4	Temperature sense Satellite 4
E3	CSP5	Current sense +ve Satellite 5	E6	CSP4	Current sense +ve Satellite 4
F3	CSN5	Current sense -ve Satellite 5	F6	CSN4	Current sense -ve Satellite 4
G3	GND	Secondary side ground	G6	GND	Secondary side ground
H3	GND	Secondary side ground	H6	GND	Secondary side ground
J3	GND	Secondary side ground	J6	GND	Secondary side ground
K3	GND	Secondary side ground	K6	GND	Secondary side ground
L3	PWM6X	PWM signal for Satellite 6	L6	EN	Enable Pad
M3	PWM6Y	PWM signal for Satellite 6	M6	VCTRL	Controller supply voltage
N3	START5	Start for Satellite 5	N6	START4	Start for Satellite 4
P3	GND	Secondary side ground	P6	GND	Secondary side ground
R3	GND	Secondary side ground	R6	GND	Secondary side ground
A7	N/A	No Pad present	A8	N/A	No Pad present
B7	N/A	No Pad present	B8	N/A	No Pad present
C7	N/A	No Pad present	C8	N/A	No Pad present
D7	TMP6	Temperature sense Satellite 6	D8	TMN	Temp sense -ve common for TMN of all Satellites.
E7	CSP6	Current sense +ve Satellite 6	E8	+S	Remote sense +ve
F7	CSN6	Current sense -ve Satellite 6	F8	-S	Remote sense -ve
G7	SALERT	PMBus Alert	G8	SADDR	PMBus address setting
H7	SDA	PMBus data	H8	SCL	PMBus clock
J7	SVDAT / AVSMDAT	SVID data / AVS MData	J8	SVCLK / AVSCLK	SVID clock / AVS clock
K7	VR_HOT#	SVI VR hot	K8	SVALRT / AVSSDAT	SVID alert / AVS SData
L7	VCCIO_OK	VCC fault shutdown – immediate unit shutdown	L8	PAD_ALERT#	SVI Pad Alert #
M7	N/A	No Pad present	M8	N/A	No Pad present
N7	N/A	No Pad present	N8	N/A	No Pad present
P7	N/A	No Pad present	P8	N/A	No Pad present
R7	N/A	No Pad present	R8	N/A	No Pad present

1. VSRMON; should have a local pull down resistor (perhaps in parallell with a capacitor) to GND, also connected to Vin via a resistor in non-isolated applications.
2. All CSP* and CSN*; As an option it should be possible to mount a capacitor between the CSxP and the CSxN pads. If not used CSxP should be shorted to CSxN and then to Vout.
3. PM_ADDR; Should have a local pull-down resistor to GND
4. VDAT and SVCLK; Should have a local pull-up resistor to 5V

MECHANICAL OUTLINE, PIN LOCATIONS AND DIMENSIONS



PSA STANDARD PRODUCT ENVELOP DEFINITION



MODULE ADDRESS SETTINGS

	Resistor_down (on the Host board)		Resistor_up (inside the Main unit)	
PMBus Address	Resistor Series	Pin Function	Resistor Series	Pin Name
B8	E12	OPEN	E12	10,000
B4	E12	220,000	E12	10,000
B2	E12	120,000	E12	10,000
B0	E12	82,000	E12	10,000
E8	E24	62,000	E12	10,000
E4	E96	48,700	E12	10,000
E2	E12	39,000	E12	10,000
E0	E12	33,000	E12	10,000
D8	E48	27,400	E12	10,000
D4	E48	23,700	E12	10,000
D2	E96	20,500	E12	10,000
D0	E48	17,800	E12	10,000
C8	E96	15,800	E12	10,000
C4	E96	13,700	E12	10,000
C2	E48	12,100	E12	10,000
C0	E96	10,700	E12	10,000

ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. AE designs and manufactures highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

Our products enable customer innovation in complex applications for a wide range of industries including semiconductor equipment, industrial, manufacturing, telecommunications, data center computing, and medical. With deep applications know-how and responsive service and support across the globe, we build collaborative partnerships to meet rapid technological developments, propel growth for our customers, and innovate the future of power.

PRECISION | POWER | PERFORMANCE

For international contact information,
visit advancedenergy.com.

powersales@aei.com (Sales Support)
productsupport.ep@aei.com (Technical Support)
+1 888 412 7832

Specifications are subject to change without notice. Not responsible for errors or omissions. ©2021 Advanced Energy Industries, Inc. All rights reserved. Advanced Energy®, AE® and Artesyn™ are U.S. trademarks of Advanced Energy Industries, Inc.

ENG-ADC100M-235-01.08.31.21