ARTESYN DS1100TDC

1100 Watts Distributed Power System



Advanced Energy's Artesyn DS1100TDC series bulk front end DC-DC power supply accepts a wide range -40 to -72 Vdc input and provides a main 12 V output plus a 3.3 V standby output. Housed in an industry standard 1U x 2.1 inch rack-mounting package and able to deliver 1,100W, the power supply is ideal for space-constrained applications. This series comes in two airflow versions – output-connector to input-connector and vice versa.

DATA SHEET

Front-end Bulk Power

Total Output Power:

1100 W continuous

Wide Input Voltage:

-40 to -72 Vdc

SPECIAL FEATURES

- 1100 W output power
- High-power and short form factor
- 1U power supply
- High density design: 26 W/in^3
- Inrush current control
- N+1 or N+N Redundant
- Hot-pluggable
- Active current sharing
- Full digital control
- PMBus compliant
- Compatible with Artesyn's Universal PMBus GUI
- Reverse airflow option
- Two-year warranty

COMPLIANCE

- EMI Conducted/Radiated Class A Limits + 6 dB margin
- EN61000-4 Electro-magnetic Compatibility
- RoHS 6/6

SAFETY

- UL/cUL 60950
- DEMKO+ CB Report
- CE Mark
- China CCC

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ELECTRICAL SPECIFICATIONS

Input						
Input range	-40 to -72 Vdc					
Efficiency	90.0% typical					
Max input current	37.0 Arms					
Inrush current	ETSI EN 300 132-2 Limits					
Conducted EMI	Class A +6 dB margin					
Radiated EMI	Class A +6 dB margin					
Hold-up time	1 ms at full load					
Output						
	Main DC Output			Standby DC Output		
	MIN	NOM	MAX	MIN	NOM	MAX
Nominal setting	-1%	12	+1%	-2.5%	3.3	2.5%
Total output regulation range	11.4 V	12	12.6 V	3.14 V	3.3	3.46 V
Dynamic load regulation range	11.4 V		12.6 V	3.14 V		3.46 V
Output ripple			180 mVp-p			45 mVp-p
Output current	0.5 A[1]		91.6 A	0.1 A		3.0 A
Current sharing	Within ±5.625A of each other from 25% to 100% load			N/A		
Capacitive loading	500 µF		11,000 µF	100 µF		680 µF
Start-up from AC to output			3000 ms			2500 ms
Output rise time	5		100 ms			100 ms

Note: Outputs shall be isolated from the chassis ground by at least 50 V

1 Minimum starting current for transient load response testing only. Unit is designed to operate and be within output regulation at zero load.

Protections			
Main Output	MIN	NOM	MAX
Overcurrent protection[2]	107%		130%
Overvoltage protection[1]	13.5 V		14.5 V
Overtemperature protection	Yes, autorecovery		
Fan fault protection		Yes	
Standby Output			
Overcurrent protection[3]	107%		150%
Over-oltage protection[1]	3.6 V		4.1V

1 Latch mode
2 Autorecovery for 5s then latch
3 Autorecovery

CONTROL AND STATUS SIGNALS

Input Signals			
PSON_L			
Active LOW signal which enables/disables the main output. Pulling this signal LOW will turn-on the main output. Recommended pull-up resistor to VSB is 5.1 kohms. A 100 pF decoupling capacitor is also recommended.			
		MIN	MAX
V_{IL}	Input logic level LOW		0.8 V
V_{IH}	Input logic level HIGH	2.0 V	3.6 V
I_{SOURCE}	Current that may be sourced by this pin		4 mA
I_{SINK}	Current that may be sunk by this pin at low state		4 mA
PSKILL_H			
First break/last mate active HIGH signal which enables/disables the main output. This signal will have to be pulled to ground at the system side with a 100 ohm resistor. A 100 pF decoupling capacitor is also recommended.			
		MIN	MAX
V_{IL}	Input logic level LOW		0.8 V
V_{IH}	Input logic level HIGH	2.0 V	3.6 V
I_{SOURCE}	Current that may be sourced by this pin		4 mA
I_{SINK}	Current that may be sunk by this pin at low state		4 mA
VSENSE+, VSENSE-			
VSENSE+ and VSENSE- lines are the remote sense lines for regulation. Each line will compensate for a maximum of 200 mV.			

I²C ADDRESSING

A1 Pin	A0 Pin	PMBus (w/r)
0	0	B0/B1
0	1	B2/B3
1	0	B4/B5
1	1	B6/B7

* For additional addressing options, please contact techsupport

ORDERING INFORMATION

Model Number	Nominal Main Output	Standby Output	Airflow Direction
DS1100TDC-3	12 V	3.3 V @ 3 A	Std (forward)
DS1100TDC-3-001	12 V	3.3 V @ 3 A	Reverse

CONTROL AND STATUS SIGNALS (CONTINUED)

Output Signals			
INPUT_OK			
Signal used to indicate the presence of DC input to the power supply. A logic level HIGH will indicate that the DC input to the power supply is within the operating range while a logic level LOW will indicate that input has been lost. This is an open collector/drain output. This pin is pulled high by a 1 kohm resistor connected to 3.3 V inside the power supply. It is recommended that this pin be connected to a 200 pF decoupling capacitor and pulled down by a 100 kohm resistor.			
		MIN	MAX
V_{OH}	Output high voltage	2.4 V	3.6 V
V_{OL}	Output low voltage		0.4 V
I_{SOURCE}	Output signal source current		2 mA
I_{SINK}	Output signal sink current		4 mA
PWR_GOOD / PWOK			
Signal used to indicate that main output voltage is within regulation range. The PWR_GOOD signal will be driven HIGH when the output voltage is valid and will be driven LOW when the output falls below the under-voltage threshold. This signal also gives an advance warning when there is an impending power loss due to loss of DC input or system shutdown request. More details in the Timing Section. This is an open collector/drain output. This pin is pulled high by a 1 kohm resistor connected to 3.3 V inside the power supply. It is recommended that this pin be connected to a 100 pF decoupling capacitor and pulled down by a 100 kohm resistor.			
		MIN	MAX
V_{OH}	Output high voltage	2.4 V	3.6 V
V_{OL}	Output low voltage		0.4 V
I_{SOURCE}	Output signal source current		2 mA
I_{SINK}	Output signal sink current		4 mA
PS_PRESENT			
Signal used to indicate to the system that a power supply is inserted in the power bay. This pin is connected via a 220 ohm resistor to the standby return in the power supply. Recommended pull-up resistor to VSB is 5.1 kohms. A 100 pF decoupling capacitor is also recommended.			
PS_INTERRUPT			
Active low signal used by the power supply to indicate to the system that a change in power supply status has occurred. This event can be triggered by faults such as OVP, OCP, OTP, and fan fault. This signal can be cleared by a CLEAR_FAULT command. Recommended pull-up resistor to VSB is 5.1 kohms. A 100 pF decoupling capacitor is also recommended.			
		MIN	MAX
V_{OH}	Output high voltage	2.4 V	3.6 V
V_{OL}	Output low voltage		0.4 V
I_{SOURCE}	Current that may be sourced by this pin		4 mA
I_{SINK}	Current that may be sunk by this pin at low state		4 mA

BUS Signals			
ISHARE			
Bus signal used by the power supply for active current sharing. All power supplies configured in the system for n+n sharing will refer to this bus voltage inorder to load share.			
Voltage Range	The range of this signal for active sharing will be up to 8.0 V, which corresponds to the maximum output current.		
		MIN	MAX
I_{SHARE} Voltage	Input logic level LOW	7.75	8.25
	Voltage at 50% load, stand-alone unit	3.85	4.15
	Voltage at 0% load, stand-alone unit	0	1.0
I_{SOURCE}	Current that may be sourced by this pin		4.0 mA
SCL, SDA			
Clock and data signals defined as per I^2C requirements. These pins are pulled high internally to 3.3V by a 100kohm resistor. It is recommended that these pins be pulled-up to a 2.2 kohm resistor to 3.3 V and a 200 pF decoupling capacitor at the system side.			
VL	Input logic level LOW		0.8 V
VH	Input logic level HIGH	2.0 V	3.6 V

Note: All signal noise levels are below 400 mVpk-pk from 0 - 100 MHz.

ELECTRICAL SPECIFICATIONS

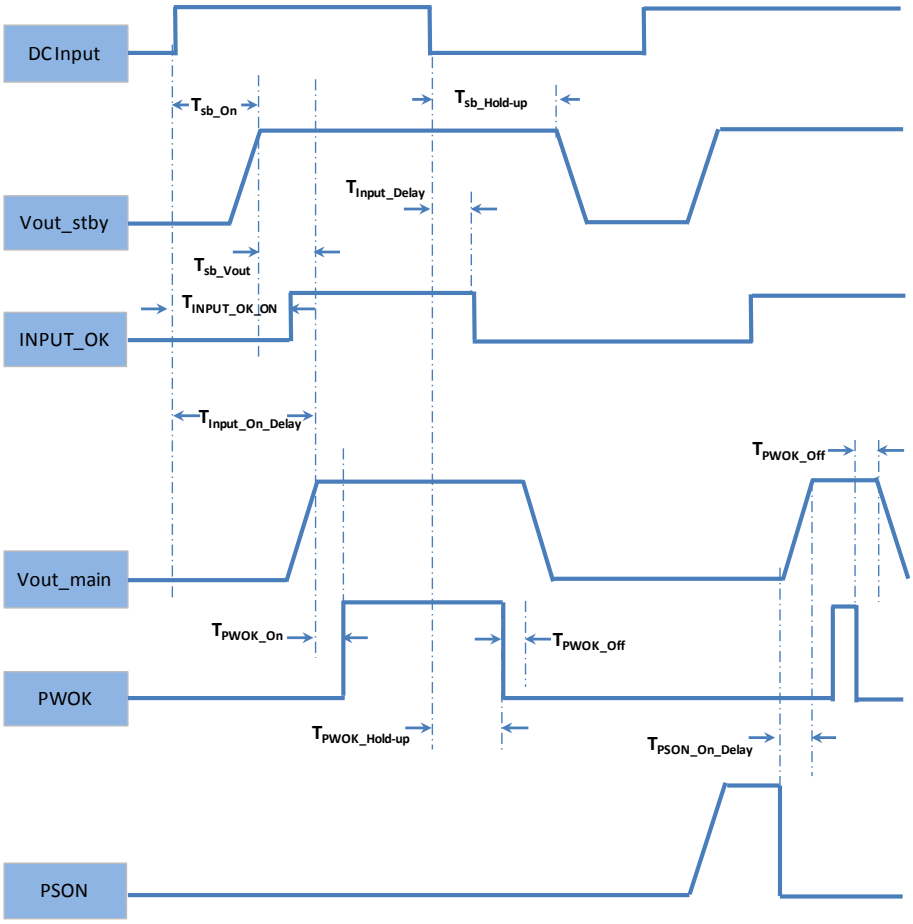
LED Indicators		
Two LEDs are used to indicate the power supply status.		
	Input LED	Fail LED
Color	Green	Amber/Green
No input to PSU	Off	Off
Input present, STBY ON, main output OFF	On	Blinking Amber, at least 1 Hz
Main output ON	On	Green
Power supply warning (hi-temp)	On	Blinking Amber/Green, at 2:1 ratio, at least 1 Hz
Power supply warning (slow fan)	On	Blinking Amber/Green, at 1:1 ratio, at least 1 Hz
Power supply failure (OVP, OTP, FAN FAULT)	On	Amber

Firmware Reporting And Monitoring			
	Accuracy Range		
Output loading	5% to 20%	20% to 50%	50% to 100%
Input voltage	±5%		
Input current	±0.55 A fixed error	±4%	
Input power	±5 W fixed error up to 120 W input	±4%	
Output voltage	±2%		
Output current	±0.8 A fixed error	±5%	±2%
Temperature	±5 °C across operating range		
Fan speed	±250 RPM		

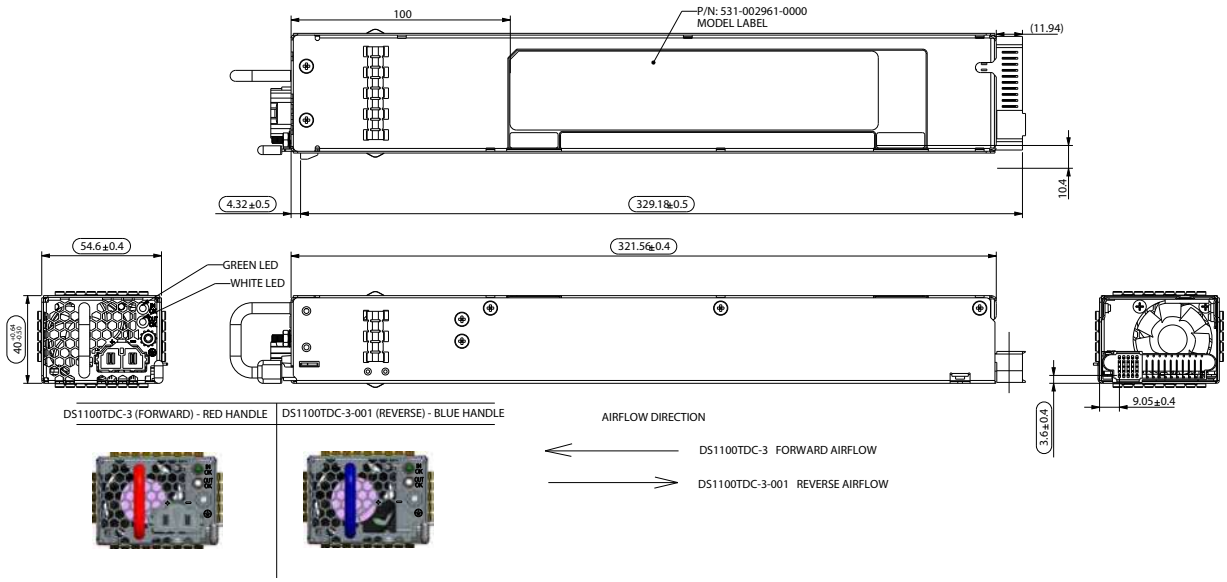
PMBus	YES
Remote ON/OFF	YES

Timing Specifications				
	Description	Min	Max	Unit
T_{sb_On}	Delay from input being applied to standby output being within regulation		2500	ms
$T_{INPUT_OK_ON}$	Delay from input being applied to INPUT_OK assertion		1500	ms
T_{sb_Vout}	Delay from standby output to main output voltage being within regulation		1000	ms
$T_{INPUT_On_Delay}$	Delay from input being applied to main output being within regulation		3000	ms
T_{PWOK_On}	Delay from output voltages within regulation limits to PWOK asserted	100	1000	ms
$T_{INPUT_OK_Delay}$	Delay from loss of input to assertion of INPUT_OK		20	ms
$T_{PWOK_Hold\text{-}up}$	Delay from loss of input to deassertion of PWOK	PWOK may deassert as soon as input loss is detected		ms
$T_{Vout_Hold\text{-}up}$	Delay from loss of input to main output falling out of regulation	1		ms
$T_{sb_Hold\text{-}up}$	Delay from loss of input to standby output falling out of regulation	25		ms
$T_{PWR_GOOD_Off}$	Delay from deassertion of PWOK to output falling out of regulation	1	700	ms
$T_{PSON_On_Delay}$	Delay from PSON assertion to output being within regulation		400	ms

TIMING DIAGRAM

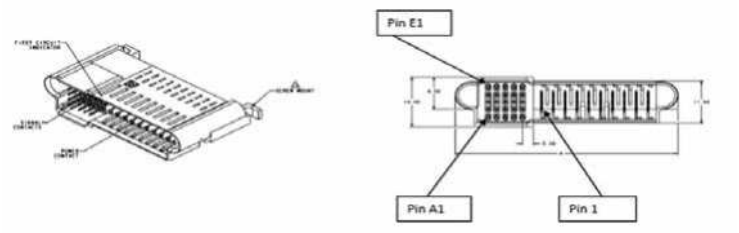


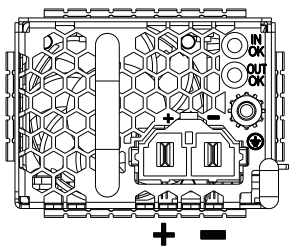
MECHANICAL OUTLINE



INPUT AND OUTPUT CONNECTORS

Output Connector Part Number	TEI 1926736-3
Output Mating Connector Part Number	TEI 2-1926739-5, 1892787-6 or equivalent
Input Mating Connector Part Number	Molex 42816-0212 or equivalent





INPUT AND OUTPUT CONNECTORS (CONTINUED)

Output Connector Pin Configuration		
A1	3.3 VSB	Standby Output
B1	3.3 VSB	Standby Output
C1	3.3 VSB	Standby Output
D1	3.3 VSB	Standby Output
E1	3.3 VSB	Standby Output
A2	SGND	Signal Ground
B2	SGND	Signal Ground
C2	Reserved	
D2	Reserved	
E2	Reserved	
A3	A2/ A_Select	Optional address line
B3	A0	I^2C address
C3	SDA	I^2C Data
D3	-Remote_Sense	Wire drop compensation
E3	+Remote_Sense	Wire drop compensation
A4	SCL	I^2C Clock
B4	PSON_L	Enable/Inhibit
C4	PS_INTERRUPT_L	Alert for failure
D4	A1	I^2C address
E4	INPUT_OK	Input indicator
A5	PSKILL_H	First break/last mate pin
B5	ISHARE	Current share bus
C5	PWOK	Output indicator
D5	Reserved	
E5	PS_PRESENT_L	Power supply present
P1-P5	+12 V Return	Main output power contact
P6-P10	12 V	Main output return contact

ENVIRONMENTAL SPECIFICATIONS

Operating temperature	DS1100TDC-3: Full power at -5 to 50 °C, derate to 660 W at 65 °C DS1100TDC-3-001: Full power at -5 to 45 °C, derate to 660 W at 55 °C
Operating altitude	up to 10,000 feet
Operating relative humidity	+5% to +95% non-condensing
Non-operating temperature	-40 to +70 °C
Non-operating relative humidity	+5% to +95% non-condensing
Non-operating altitude	up to 50,000 feet
Vibration and shock	Standard operating/non-operating random shock and vibration
RoHS compliance	Yes
MTBF	>300,000 hours.
Operating life	Minimum of 7 years at typical operating conditions
Reliability	All electronic component derating analysis and capacitor life calculation is done at 40 °C ambient, 80% of maximum rated load, nominal input line voltage.

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.

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For international contact information,
visit advancedenergy.com.

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

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ENG-DS1100TDC-235-01 12.14