75 Watt ASD-Q Single Series DC/DC Converters

Description

The 75 Watt single ASD-Q 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 ASD-Q Series utilizes an insulated metal substrate design in an industry standard 1/4 brick case size to meet the most rigorous requirements of COTS and thermally challenging industrial applications.

Standard features include remote sensing, output trim, and remote on/off. Threaded-through holes are provided to allow easy mounting or add a heat sink for extended temperature use.

Features

- Small size 1.45"x2.28"x0.52", industry standard 1/4 brick
- Excellent thermal performance with metal baseplate
- High Efficiency
- Fast over voltage protection
- Pulse-by-pulse current limiting, dead short current limiting
- Over-temperature protection
- Auto-softstart
- Very Low noise
- Low profile magnetics run cooler
- Constant frequency for normal operation
- Wide input voltage range
- Remote Sense with high regulation
- Remote ON/OFF
- Super energy saving, 6 mA input idle current
- Output trim with very low temperature coefficient
- Water Washable, wide humidity applications
- Good shock and vibration damping

Selection Chart					
Model	Input Range VDC		I in ADC @ nom	V out VDC	I out ADC
	Min	Max	Typ		
ASD75-24S3.3Q	18	36	3.31	3.3	20
ASD75-24S5Q	18	36	3.63	5	15
ASD75-24S12Q	18	36	3.59	12	6.25
ASD75-24S15Q	18	36	3.55	15	5
ASD75-24S24Q	18	36	3.55	24	3.13
ASD75-48S3.3Q	36	75	1.65	3.3	20
ASD75-48S5Q	36	75	1.80	5	15
ASD75-48S12Q	36	75	1.78	12	6.25
ASD75-48S15Q	36	75	1.76	15	5
ASD75-48S24Q	36	75	1.76	24	3.13

Default ON/OFF logic is positive.
Add -N to the model number to order negative ON/OFF logic.

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Unless otherwise stated, these specifications apply for ambient temperature T_A=23 ±2°C, nominal input voltage, and rated full load. (1)

Input Parameters							
Model		ASD75-24S3.3Q	ASD75-24S5Q	ASD75-24S12Q	ASD75-24S15Q	ASD75-24S24Q	Units
Voltage Range	MIN TYP MAX	18 24 36					VDC
Input Overvoltage* 100 mSec	MAX	50					VDC
Input Ripple Rejection (120Hz)	TYP	60					dB
Undervoltage Lockout		Yes					
Input Reverse Voltage Protection		Yes					
Input Current No Load 100% Load	TYP TYP	50 3.3	50 3.6	50 3.6	50 3.6	50 3.6	mA A
Inrush Current	MAX	0.2					A^2S
Reflected Ripple, 12µH Source Impedance (3)	TYP	10					mA P-P
Efficiency	TYP	82	84	86	87	87	%
Switching Frequency	TYP	360					kHz
Recommended Fuse		(2)					AMPS

Input Parameters							
Model		ASD75-48S3.3Q	ASD75-48S5Q	ASD75-48S12Q	ASD75-48S15Q	ASD75-48S24Q	Units
Voltage Range	MIN TYP MAX	36 48 75					VDC
Input Overvoltage* 100 mSec	MAX	85					VDC
Input Ripple Rejection (120Hz)	TYP	60					dB
Undervoltage Lockout		Yes					
Input Reverse Voltage Protection		Yes					
Input Current No Load 100% Load	TYP TYP	80 1.7	80 1.8	80 1.8	80 1.8	80 1.8	mA A
Inrush Current	MAX	0.2					A^2S
Reflected Ripple, 12µH Source Impedance (3)	TYP	10					mA P-P
Efficiency	TYP	82	84	86	87	87	%
Switching Frequency	TYP	360					kHz
Recommended Fuse		(2)					AMPS

* Absolute Maximum Ratings. Caution: Stresses in excess of the Absolute Maximum Ratings can cause permanent damage to the device (see Note 1).

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Unless otherwise stated, these specifications apply for ambient temperature T_A=23 ±2°C, nominal input voltage, and rated full load. (1)

Output Parameters							
Model		ASD75-24S3.3Q ASD75-48S3.3Q	ASD75-24S5Q ASD75-48S5Q	ASD75-24S12Q ASD75-48S12Q	ASD75-24S15Q ASD75-48S15Q	ASD75-24S24Q ASD75-48S24Q	Units
Output Voltage		3.3	5	12	15	24	VDC
Output Voltage Setpoint Accuracy	MAX	±1					%
Turn On Overshoot	TYP	0					%
Temperature Coefficient	TYP MAX	0.005 0.01	0.003 0.005				%/°C
Noise (8)	TYP	20	20	40	50	70	mV RMS
Ripple	TYP	30	30	75	100	150	mV P-P
Load Current (4)	MIN MAX	5 100					%
Load Transient Overshoot (7)	TYP	2					%
Load Transient Recovery Time (6)	TYP	0.8					mSec
Load Regulation (5) Min-Max Load	TYP MAX	0.02 0.2					%
Line Regulation Vin = Min-Max	TYP MAX	0.01 0.1					%
Overvoltage Protection (OVP) Threshhold OVP Type - Non-latching Open Loop Overvoltage Clamp	MIN MAX	115 135					%
Output Current Limit V out=90% of V out-nom	TYP	120					%
Output Short Circuit Current V out = 0.1 V	TYP MAX	150 160					%

NOTES:

(1) Refer to the Astrodyne Application Notes for the definition of terms, measurement circuits, and other information.

(2) Refer to the Astrodyne Application Notes for information on fusing. For inrush current, refer to the specifications above.

(3) 33 µF capacitor connected to two "Input" pins. Then place current sensor in series with 12 µH inductor between 33 µF and the source. The reflected ripple current is measured over 5 Hz to 20 MHz bandwidth (current sensor is located between the converter input pin and the 12 µH inductor).

(4) Optimum performance is obtained when this power supply is operated within the minimum to maximum load specifications. No damage to module will occur when the output is operated at less than minimum load, but the output voltage may contain a low frequency component that may exceed output noise specifications.

(5) Load regulation is defined as the output voltage change when changing load current from maximum to minimum. The voltage is measured at the output pin.

(6) 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 = 2µ Sec).

(7) Load Transient Overshoot is defined as the peak overshoot during a transient as defined in the Note 6 above.

(8) Noise is measured per the Astrodyne 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 to CMN. Measurement bandwidth is 0-20 MHz.

(9) 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 20 µA may be sufficient to trigger the On/Off to the logic-low state.

(10) Most switches would be suitable for logic On/Off control, in case there is a problem, you can make following estimation and then leave some margin.

When open collector is used for logic high, "Open Circuit Voltage at On/Off Pin", "Output Resistance" and "External Leakage Current Allowed for Logic High" are used to estimate the high impedance requirement of open collector.

When switch is used for logic low, "Open Circuit Voltage at On/Off Pin", "Output Resistance" and "LOW Logic Level" are used to estimate the low impedance requirement of switch.

(11) Thermal impedance is tested with the converter mounted vertically and facing another printed circuit board 1/2 inch away. If converter is mounted horizontally with no obstructions, thermal impedance is approximately 10 °C/W.

If heat sink is needed, apply a very thin layer of thermally conductive grease on the metal base of converter, then properly tighten the screws.

(12) Water Washability - These DC/DC converters are designed to withstand most solder/wash processes. Careful attention should be used when assessing the applicability in your specific manufacturing process. Converters are not hermetically sealed.

(13) Torque fasteners into threaded mounting inserts at 12 in. oz. or less. Greater torque may result in damage to unit and void the warranty.

Astrodyne

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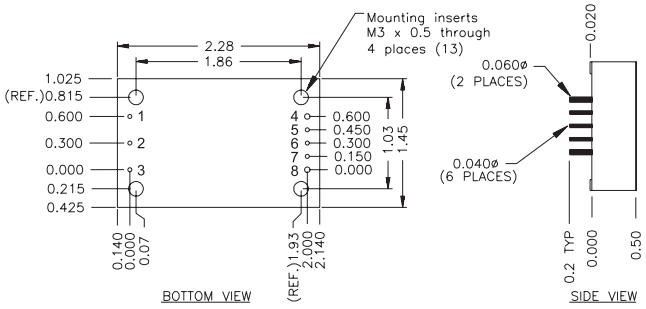
General Specifications			
All Models			Units
Remote ON/OFF Function			
HIGH Logic Level or Leave ON/OFF Pin Open	MIN	3.0	VDC
External Leakage Current Allowed for Logic High (9)	MAX	20	µA
Input Diode Protection Voltage	MAX	50	VDC
LOW Logic Level or Tie ON/OFF Pin to -Input	MAX	1.0	VDC
Sinking Current for Logic Low	MAX	1	mA
Open Circuit Voltage at Primary ON/OFF Pin (10) Positive Logic Negative Logic	 TYP TYP	 5.6 1.5	 VDC VDC
Idle Current (Module is OFF)	TYP	6	mADC
Turn-on Time to 1% error	TYP	8	mSec
Positive Logic Option	HIGH - Module ON LOW - Module OFF		
Negative Logic Option	HIGH - Module OFF LOW - Module ON		
Output Voltage Trim			
Trim Range	MIN MAX	±10	% of Vout
Input Resistance	TYP	10	k Ohm
Open Circuit Voltage	TYP	2.5	V
Output Voltage Remote Sensing			
Maximum Voltage Drops on Lead	MAX	0.5	VDC
Line Regulation under remote sensing	TYP MAX	0.02 0.1	%
Load Regulation under remote sensing	TYP MAX	0.05 0.2	%
Sense and Trim Limit			
Maximum Output Voltage	MAX	110	% of Vout
Isolation			
Input to Output Isolation* 10µA Leakage Vnom = 24 V models Vnom = 48 V models	 MAX MAX	 700 1544	 VDC VDC
Environmental			
Calculated MTBF, Bellcore Method 1, Case 1	>1,000,000		Hr
Baseplate Operating Temperature Range	MIN MAX	-40 100	°C
Storage Temperature	MIN MAX	-40 120	°C
Thermal Impedance (11)	TYP	9	°C/W
Thermal Shutdown Baseplate Temperature (Auto Restart)	MIN TYP	100 110	°C
General			
Case Dimension	2.28" x 1.45" x 0.50"		
Agency Approvals Pending	UL/CUL 60950		
Chassis Mounting Kit	MS18		
Torque on Mounting Inserts	MAX	12 in. oz.	



Mechanical tolerances unless otherwise noted:

X.XX dimensions: ±0.020 inches

X.XXX dimensions: ±0.005 inches

Pin	Function
1	-INPUT
2	ON/OFF
3	+INPUT
4	-OUTPUT
5	-SENSE
6	TRIM
7	+SENSE
8	+OUTPUT

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