75 Watt QH Single Series DC/DC Converters

Description

The 75 Watt single QH 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 QH Series meets the most rigorous requirments in an industry standard case size for industrial process control and telecom 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.

Selection Chart

Model	Input Range VDC		I in ADC @ nom	V out VDC	I out ADC
	Min	Max	Typ		
24S3.20QH	18	36	3.31	3.3	20
24S5.15QH	18	36	3.63	5	15
24S12.6QH	18	36	3.59	12	6.25
24S15.5QH	18	36	3.55	15	5
24S24.3QH	18	36	3.55	24	3.13
48S3.20QH	36	75	1.65	3.3	20
48S5.15QH	36	75	1.80	5	15
48S12.6QH	36	75	1.78	12	6.25
48S15.5QH	36	75	1.76	15	5
48S24.3QH	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.

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
- More than 2:1 input voltage range
- Remote Sense with high regulations
- 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
- Low cost
- 5 Year Warranty

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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		**24S3.20QH**	**24S5.15QH**	**24S12.6QH**	**24S15.5QH**	**24S24.3QH**	**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	15 3.3	15 3.6	15 3.6	15 3.6	15 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		**48S3.20QH**	**48S5.15QH**	**48S12.6QH**	**48S15.5QH**	**48S24.3QH**	**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	15 1.7	15 1.8	15 1.8	15 1.8	15 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		**24S3.20QH 48S3.20QH**	**24S5.15QH 48S5.15QH**	**24S12.6QH 48S12.6QH**	**24S15.5QH 48S15.5QH**	**24S24.3QH 48S24.3QH**	**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 CALEX Application Notes for the definition of terms, measurement circuits, and other information.

(2) Refer to the CALEX 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 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 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.

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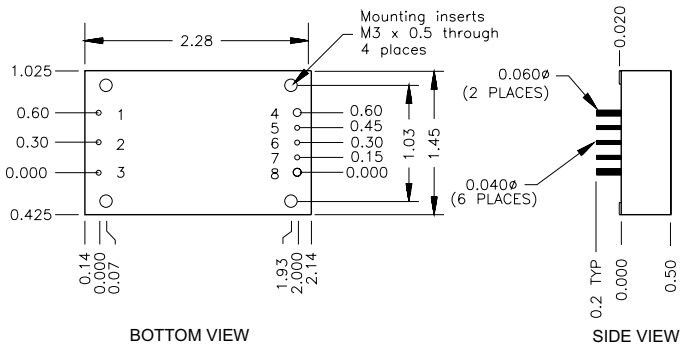
General Specifications			
All Models			**Units**
Remote ON/OFF Function			
HIGH Logic Level or Leave ON/OFF Pin Open	MAX	3.0	VDC
External Leakage Current Allowed for Logic High (9)	MAX	20	µA
Input Diode Protection Voltage	MAX	50	VDC
LOW Logic Level or Tie ON/OFF Pin to -Input	TYP	1.0	VDC
Sinking Current 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	

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



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