

Size: 0.77in x 0.39in x 0.50in (19.5mm x 12.5mm x 9.8mm)

OPTIONS

- Output Voltage
- Input Voltage
- Single or Dual Output
- 8KVDC I/O Isolation

FEATURES

- 5, 12, 15, & 24VDC Nominal Input Voltages
- 2 Watts of Output Power
- RoHS Compliant
- UL94V-0 Compliant
- No Minimum Load Requirement
- Non-Regulated Single and Dual Outputs
- 7-Pin SIP Package: 0.77” x 0.39” x 0.50”
- High Efficiency up to 85%
- -40ºC to +85ºC Operating Temperature Range
- 6.4KVDC I/O Isolation
- Optional 8KVDC I/O Isolation Available (Suffix “H8”)
- MTBF: 2,000,000 hours
- EN 60950-1, IEC 60950-1, EN 60601-1, IEC 60601-1 Medical Approvals

APPLICATIONS

- Battery Operated Equipment
- Measurement Equipment
- Telecom
- Wireless Networks
- Industry Control Systems

DESCRIPTION

The DCHBA2 series of isolated medical DC/DC power converters provides 2 Watts of continuous output power in a 0.77” x 0.39” x 0.50” 7-pin SIP package. This series consists of non-regulated single and dual output models with 5, 12, 15, and 24VDC nominal input voltages. Some features include high efficiency up to 85%, 6.4KVDC I/O isolation (8KVDC optional), -40°C to +85°C operating temperature range, and no minimum load requirement. The DCHBA2 series is RoHS and UL94V-0 compliant. These converters have EN 60950-1, IEC 60950-1, EN 60601-1 and IEC 60601-1 medical approvals and are best suited for use in battery operated equipment, measurement equipment, telecom, wireless networks, industry control systems, and anywhere where isolated and compact size are required.

MODEL SELECTION TABLE

Single Output Models

Model Number[1]	Input Voltage Range	Output Voltage	Input Current		Ripple & Noise	Output Current @Full Load	Output Power	Maximum Capacitive Load[2]	Efficiency[3]
			No Load	Full Load					
DCHBA2-5S33H6	5VDC (4.5~5.5VDC)	3.3VDC	70mA	550mA	200mVp-p	600mA	2W Max.	3300µF	76%
DCHBA2-5S05H6		5VDC		541mA		400mA		1200µF	78%
DCHBA2-5S72H6		7.2VDC		526mA		278mA		1200µF	80%
DCHBA2-5S09H6		9VDC		513mA		222mA		1200µF	82%
DCHBA2-5S12H6		12VDC		513mA		167mA		680µF	82%
DCHBA2-5S15H6		15VDC		513mA		132mA		680µF	82%
DCHBA2-12S33H6	12VDC (10.8-13.2VDC)	3.3VDC	30mA	223mA	200mVp-p	600mA	2W Max.	3300µF	78%
DCHBA2-12S05H6		5VDC		219mA		400mA		1200µF	80%
DCHBA2-12S72H6		7.2VDC		213mA		278mA		1200µF	82%
DCHBA2-12S09H6		9VDC		211mA		222mA		1200µF	83%
DCHBA2-12S12H6		12VDC		211mA		167mA		680µF	83%
DCHBA2-12S15H6		15VDC		211mA		132mA		680µF	83%

DCHBA2-15S33H6	15VDC (13.5~16.5VDC)	3.3VDC	25mA	178mA	200mVp-p	600mA	2W	3300µF	78%
DCHBA2-15S05H6		5VDC		175mA		400mA		1200µF	80%
DCHBA2-15S72H6		7.2VDC		171mA		278mA		1200µF	82%
DCHBA2-15S09H6		9VDC		169mA		222mA		1200µF	83%
DCHBA2-15S12H6		12VDC		167mA		167mA		680µF	84%
DCHBA2-15S15H6		15VDC		165mA		132mA		680µF	85%
DCHBA2-24S33H6	24VDC (21.6~26.4VDC)	3.3VDC	20mA	111mA	200mVp-p	600mA	2W	3300µF	78%
DCHBA2-24S05H6		5VDC		110mA		400mA		1200µF	80%
DCHBA2-24S72H6		7.2VDC		113mA		278mA		1200µF	78%
DCHBA2-24S09H6		9VDC		113mA		222mA		1200µF	78%
DCHBA2-24S12H6		12VDC		113mA		167mA		680µF	78%
DCHBA2-24S15H6		15VDC		111mA		132mA		680µF	79%

MODEL SELECTION TABLE

Dual Output Models

Model Number	Input Voltage Range	Output Voltage	Output Current		Ripple & Noise	Output Current @Full Load	Output Power	Maximum Capacitive Load	Efficiency
			Min Load	Max Load					
DCHBA2-5D33H6	5VDC (4.5~5.5VDC)	±3.3VDC	70mA	535mA	200mVp-p	±300mA	2W	±1500µF	78%
DCHBA2-5D05H6		±5VDC		526mA		±200mA		±470µF	80%
DCHBA2-5D72H6		±7.2VDC		526mA		±139mA		±470µF	80%
DCHBA2-5D09H6		±9VDC		519mA		±111mA		±470µF	81%
DCHBA2-5D12H6		±12VDC		519mA		±85mA		±330µF	81%
DCHBA2-5D15H6		±15VDC		513mA		±66mA		±330µF	82%
DCHBA2-12D33H6	12VDC (10.8-13.2VDC)	±3.3VDC	30mA	217mA	200mVp-p	±300mA	2W	±1500µF	80%
DCHBA2-12D05H6		±5VDC		213mA		±200mA		±470µF	82%
DCHBA2-12D72H6		±7.2VDC		211mA		±139mA		±470µF	83%
DCHBA2-12D09H6		±9VDC		208mA		±111mA		±470µF	84%
DCHBA2-12D12H6		±12VDC		208mA		±85mA		±330µF	84%
DCHBA2-12D15H6		±15VDC		206mA		±66mA		±330µF	85%
DCHBA2-15D33H6	15VDC (13.5~16.5VDC)	±3.3VDC	25mA	174mA	200mVp-p	±300mA	2W	±1500µF	80%
DCHBA2-15D05H6		±5VDC		171mA		±200mA		±470µF	82%
DCHBA2-15D72H6		±7.2VDC		169mA		±139mA		±470µF	83%
DCHBA2-15D09H6		±9VDC		167mA		±111mA		±470µF	84%
DCHBA2-15D12H6		±12VDC		167mA		±85mA		±330µF	84%
DCHBA2-15D15H6		±15VDC		165mA		±66mA		±330µF	85%
DCHBA2-24D33H6	24VDC (21.6~26.4VDC)	±3.3VDC	20mA	113mA	200mVp-p	±300mA	2W	±1500µF	77%
DCHBA2-24D05H6		±5VDC		110mA		±200mA		±470µF	80%
DCHBA2-24D72H6		±7.2VDC		114mA		±139mA		±470µF	77%
DCHBA2-24D09H6		±9VDC		113mA		±111mA		±470µF	78%
DCHBA2-24D12H6		±12VDC		110mA		±85mA		±330µF	80%
DCHBA2-24D15H6		±15VDC		111mA		±66mA		±330µF	79%

SPECIFICATIONS

All specifications are based on 25°C, Nominal Input Voltage, and Maximum Output Current unless otherwise noted.
We reserve the right to change specifications based on technological advances.

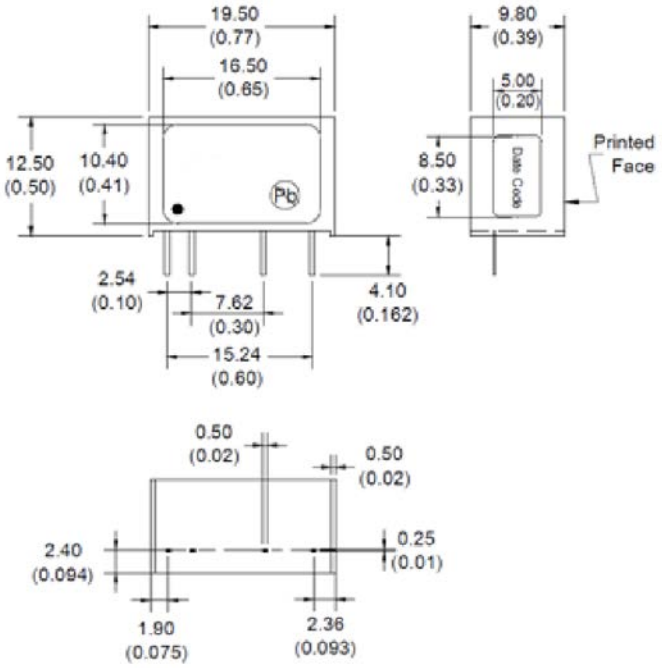
SPECIFICATION	TEST CONDITIONS		Min	Typ	Max	Unit
INPUT SPECIFICATIONS						
Input Voltage Range	5VDC nominal input models		4.5	5	5.5	VDC
	12VDC nominal input models		10.8	12	13.2	
	15VDC nominal input models		13.5	15	16.5	
	24VDC nominal input models		21.6	24	26.4	
Input Filter			Capacitor			
OUTPUT SPECIFICATIONS						
Output Voltage			See Table			
Voltage Accuracy	Nominal Vin and Full Load				±5	%
Line Regulation	For Vin change of 1%				±1.5	%
Load Regulation	10% Load to Full Load	3.3V models			20	%
		5V models			15	
		All other models			10	
Output Power					2	W
Output Current			See Table			
Minimum Load			0			A
Maximum Capacitive Load			See Table			
Ripple & Noise (20MHz bandwidth)					200	mVp-p
Voltage Balance	Dual Output				±1	%
PROTECTION						
Short Circuit Protection			1 Second			
ENVIRONMENTAL SPECIFICATIONS						
Operating Ambient Temperature			-40		+85	ºC
Storage Temperature			-55		+125	ºC
Maximum Case Temperature					+95	ºC
Relative Humidity					95	% RH
Reliability, calculated MTBF				2,000,000		hours
GENERAL SPECIFICATIONS						
Efficiency	Nominal Input and Full Load		See Table			
Switching Frequency					80	kHz
Isolation Voltage	Input to Output	Test duration 1 second	6400			VDC
Isolation Resistance	500VDC		10			GΩ
Isolation Capacitance					10	pF
PHYSICAL SPECIFICATIONS						
Weight			0.15oz (4.3g) typ.			
Dimensions (L x W x H)			0.77in x 0.50in x 0.39in (19.5mm x 12.5mm x 9.8mm)			
Case Material			Plastic (UL94 V-0)			
Potting Material			Epoxy (UL94 V-0)			
SAFETY & EMC CHARACTERISTICS						
Safety Approvals	IEC 60950-1 EN 60950-1 IEC 60601-1 EN 60601-1					

NOTES

(1) For 8KVDC I/0 isolation replace the “H6” suffix in the model number with “H8” (Ex. DCHBA2-12S12H8)
(2) For each output.
(3) Typical value tested at nominal input and full load.

MECHANICAL DRAWINGS

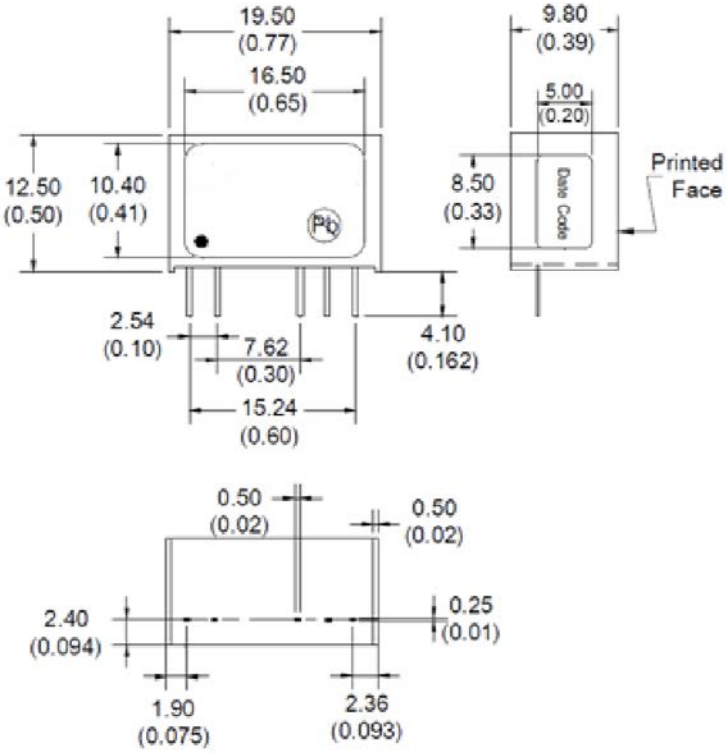
Single Output Models



Pin Assignment		
Pin	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
5	-Vout	-Vout
6	No Pin	Common
7	+Vout	+Vout

Unit: mm (inch)
Tolerance: XX.XX ±0.25 (±0.01)

Dual Output

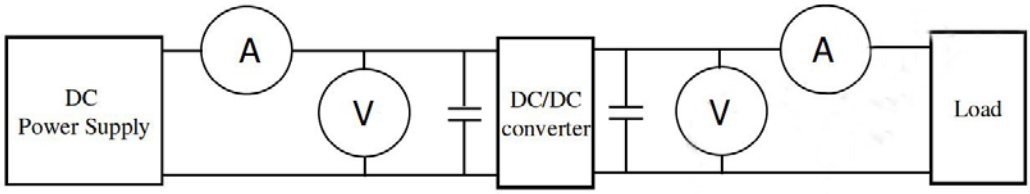


Pin Assignment		
Pin	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
5	-Vout	-Vout
6	No Pin	Common
7	+Vout	+Vout

Unit: mm (inch)
Tolerance: XX.XX ±0.25 (±0.01)

TEST CONFIGURATIONS

All specifications are based on 25°C, Nominal Input Voltage, and Maximum Output Current unless otherwise noted.
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DC Power Supply: offers a wide voltage and current range precisely.
Current Meter (A): Accuracy → 200µA~200mA 4 ranges ±(0.2% rdg + 2 digits)
2000mA~20A 2 ranges ±(0.3% rdg + 2 digits)
Voltage Meter (V): Accuracy → ±(0.3% rdg + 4 digits)
Load: At Full Load
Wires: The resistance of the wires must be small.

1. Input Voltage Range: Narrow input voltage range (±10%); Wide input voltage range (2:1 and 4:1)

Ex: Narrow input voltage range (±10%)
5VDC nominal input → 4.5~5.5VDC
12VDC nominal input → 10.8~13.2VDC
24VDC nominal input → 21.6~26.4VDC

Wide input voltage range 2:1
5VDC nominal input → 4.5~9VDC
12VDC nominal input→ 9~18VDC
24VDC nominal input → 18~36VDC
48VDC nominal input → 36~75VDC

Wide input voltage range 4:1 (W)
24VDC nominal input → 9~36VDC
48VDC nominal input → 18~75VDC

2. Input Power:

$Pin = Vin \times Iin$

Vin: Input voltage
Iin: Input current

3. Output Power:

$Pout = Vout \times Iout$

Vout: Output Voltage
Iout: Output Current

4. Efficiency:

$$Efficiency = \frac{Pout}{Pin} \times 100\%$$

Pout: Output Power
Pin: Input Power

5. Voltage Accuracy:

$$\frac{|Vout - Vout(Nominal)|}{Vout} \times 100\%$$

Vout: Output Voltage
Vout (nominal): Nominal output voltage

6. Line Regulation:

(1) Wide input voltage range and regulated output voltage series

$$\frac{|\ Vout(LL) - Vout(HL)\ |}{Vout(LL)} \times 100\%$$

LL: Low Line Input Voltage
HL: High Line Input Voltage

(2) Narrow input voltage range (±10%) and unregulated output voltage series

$$\text{Line Regulation} = \left| \frac{\Delta Vout}{\Delta Vin} \right|$$

$$\Delta Vout = \frac{Vin(+10\%) - Vin(-10\%)}{Vin(Nominal)} \times 100\%$$

Vout(+10%): Output Voltage at Vin=1.1 x Vin(nominal) & Full Load
Vout(-10%): Output Voltage at Vin= 0.9 x Vin(nominal) & Full Load
Vout: Output Voltage at Vin= Vin(nominal) & Full Load

$$\Delta Vin = \frac{Vin(+10\%)-Vout(-10\%)}{Vin(nominal)} \times 100\%$$

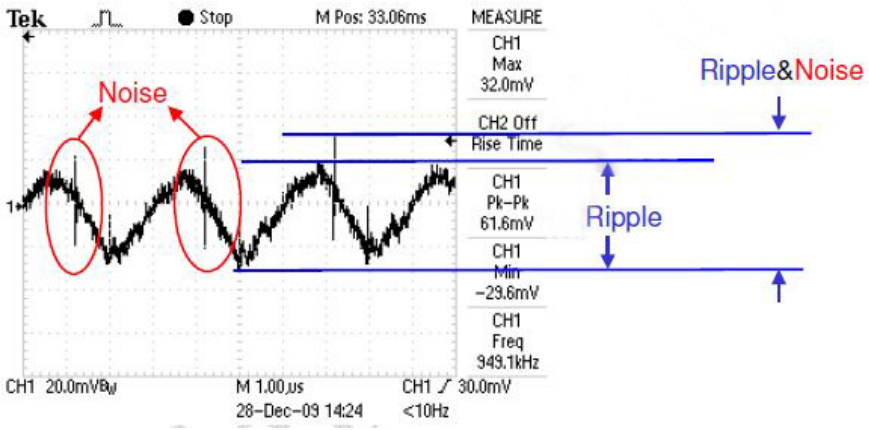
Vin(+10%): Input Voltage=1.1 x Vin(nominal)
Vin(-10%): Input Voltage=0.9 x Vin(nominal)
Vin(nominal): Nominal Input Voltage

7. Load Regulation:

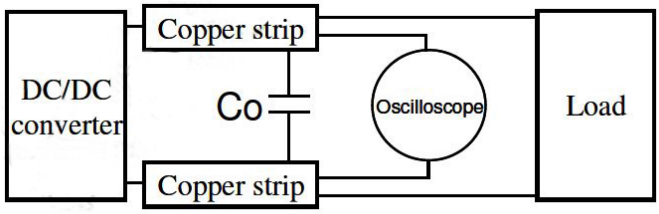
$$\frac{|\ Vout(FL)-Vout(NL)\ |}{Vout(FL)} \times 100\%$$

Vout(FL): Output voltage at Full Load
Vout(NL): Output voltage at 25% Full Load or 10% Full Load

8. Ripple and Noise: as shown below. The bandwidth is 0-2MHz

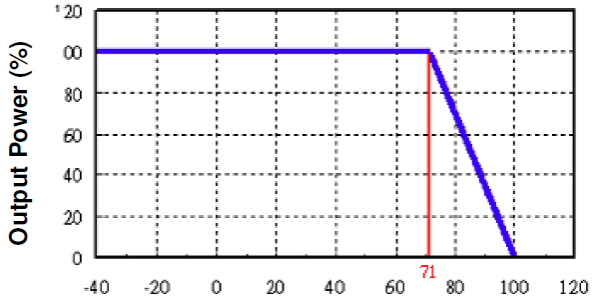


Output Ripple & Noise measurement test circuit: as shown below



Co: usually 0.47uF.

9. Temperature Derating Curve: The DC/DC converter will operate over a wider temperature range if less power is drawn from the output and the device is already running. The temperature derating curve shows the operating power-temperature range. As shown below.



10. Switching Frequency: The nominal operating frequency of the DC/DC converters.

11. Input to Output Isolation: The dielectric breakdown strength test between input and output circuits. This is the isolation voltage the device is capable of withstanding for a specified time, usually 1 second or 1 minute.

COMPANY INFORMATION

Wall Industries, Inc. has created custom and modified units for over 50 years. Our in-house research and development engineers will provide a solution that exceeds your performance requirements on-time and on budget. Our ISO9001-2008 certification is just one example of our commitment to producing a high quality, well-documented product for our customers.

Our past projects demonstrate our commitment to you, our customer. Wall Industries, Inc. has a reputation for working closely with its customers to ensure each solution meets or exceeds form, fit and function requirements. We will continue to provide ongoing support for your project above and beyond the design and production phases. Give us a call today to discuss your future projects.

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