WALL
Wall Industries, Inc.

FEATURES
● Soft-Start
● No Minimum Load
● Under Voltage Lockout
● Input Reverse Protection
● High Efficiency up to 93%
● Output Current up to 20A
● Adjustable Output Voltage
● Bus Terminal Block Option
● Six Sided Continuous Shield
● 2:1 Wide Input Voltage Range
● Input to Output Basic Insulation
● Industry Standard Half-Brick Footprint

APPLICATIONS
● Wireless Network
● Telecom/Datacom
● Industry Control System
● Semiconductor Equipment
● Distributed Power Architectures

OPTIONS
● Negative Logic Remote ON/OFF
● Terminal Block
● Pin Length
● Heatsink

DESCRIPTION
The DC100 Series of DC/DC converters provides up to 100 watts of output power in an industry standard half-brick package and footprint. All models feature a wide input range, adjustable output voltage, and a 20A current rating.

SPECIFICATIONS: *DC100 Series*
All specifications apply @ 25°C ambient unless otherwise noted

INPUT SPECIFICATIONS

Input Voltage Range............ 24V nominal input .... 18 - 36VDC
48V nominal input .... 36 - 75VDC

Input Filter .... Pi type

Input Voltage Variation .... dv/dt .... 5V/ms max
(Complies with ETS300 132 part 4.4)

Input Surge Voltage (100ms max) .... 24V input 50VDC
48V input 100VDC

Start Up Time (nominal Vin and constant resistive load)
Power Up..25ms typ.
Remote ON/OFF ....25ms typ.

Start-Up Voltage .... 24V input ....17.5VDC typ.
48V input ....35.5VDC typ.

Shutdown Voltage .... 24V input ....16VDC typ.
48V input ....34VDC typ.

Remote ON/OFF (See Note 6)
Positive Logic .... DC-DC ON ....Open or 3V < Vr < 12V
(standard)   DC-DC OFF .... Short or 0V < Vr < 1.2V

Negative Logic................ DC-DC ON ....Short or 0V < Vr < 1.2V
(option)   DC-DC OFF ....Open or 3V < Vr < 12V

Input Current of Remote Control Pin (nominal Vin) .... -0.5mA ~ 1mA

Remote Off Input Current (nominal Vin)..................................... 3mA max.

OUTPUT SPECIFICATIONS

Output Voltage ....see table

Voltage Accuracy (full load and nominal Vin)...................................... ±1%

Voltage Adjustability (See Note 7)............................+10%, -20%

Output Current ....see table

Output Power .... 100 watts max.

Remote Sense (See Note 8).................................... 10% of nominal Vout

Line Regulation (LL to HL at FL) ....±0.2%

Load Regulation (no load to full load) ....see table

Minimum Load 0%

Ripple/Noise (20 MHz BW)..see table

Temperature Coefficient................................... ±0.02% / °C max.

Transient Response Recovery Time (25% load step)....................... 200µs

PROTECTION SPECIFICATIONS

Input Reverse Protection (See Note 9) ....Parallel Diode

Over Voltage Protection Threshold ....Hiccup, 115%~130% of nom Vout

Over Current Protection Threshold ....110%~140% of rated Iout

Over Temperature Protection...115°C

Short Circuit Protection ....Hiccup, automatic recovery

GENERAL SPECIFICATIONS

Efficiency ....see table

Switching Frequency ....300KHz typ.

Isolation Voltage
Input to Output (Basic Insulation) .... 2250VDC min.
Input (Output) to Case .... 1600VDC min.

Isolation Resistance .... $10^9\Omega$ min.

Isolation Capacitance .... 2500pF max.

ENVIRONMENTAL SPECIFICATIONS

Operating Ambient Temperature (See Note 10)
Without Heatsink.................................... -40°C ~ +45°C (without derating)
+45°C ~ +79°C (with derating)
With Heatsink (0.24" height) .... -40°C ~ +55°C (without derating)
+55°C ~ +84°C (with derating)

Maximum Case Temperature .... 105°C

Storage Temperature Range ....-55°C ~ +125°C

Thermal Impedance (Note 11)
Without Heat sink...6.7°C/watt
With 0.24" Height Heatsink ....5.4°C/watt
With 0.45" Height Heatsink ....4.7°C/watt

Relative Humidity..5% to 95% RH

Thermal Shock MIL-STD-810F

Vibration .... 10~55Hz, 10G, 30 min along X, Y, and Z

MTBF (See Note 1)
BELLCORE TR-NWT-000332 .... 1.010×10^6 hrs
MIL-HDBK-217F .... 7.416×10^4 hrs

PHYSICAL SPECIFICATIONS

Weight .... 97g (3.42 oz)

Dimensions.................... 2.28 x 2.40 x 0.50 inches (57.9 x 61.0 x 12.7 mm)

Case Material ....Metal

Base Material... FR4 PCB

Potting Material.. Silicon (UL94-V0)

SAFETY & EMC

Design Meets Safety Standards IEC60950-1, UL60950-1, EN60950-1

EMI (See Note 12)....................EN55022 .... Class A

ESD ....EN61000-4-2………..   Air   ± 8KV   .Perf. Criteria A
Contact   ± 6KV

Radiated Immunity....................EN61000-4-3......... 10V/m   Perf. Criteria A

Fast Transient (Note 13)...........EN61000-4-4 ....±2KV   Perf. Criteria A

Surge (Note 13)........................EN61000-4-5...........±1KV   Perf. Criteria A

Conducted Immunity.................EN61000-4-6...... 10 Vrms   Perf. Criteria A

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OUTPUT VOLTAGE / CURRENT RATING CHART

| Model Number	Input Range	Output Voltage	Output Current		Line Regulation	Load Regulation	Output (4) (5) Ripple & Noise	Input Current		Eff (4)
			Min. load	Full load				No Load (3)	Full Load (2)	
DC100-24S05	18 - 36 VDC	5 VDC	0mA	20A	10mV	15mV	75mVp-p	185mA	4.554A	93%
DC100-24S12		12 VDC	0mA	8.4A	24mV	30mV	100mVp-p	185mA	4.590A	93%
DC100-24S15		15 VDC	0mA	6.7A	30mV	38mV	100mVp-p	185mA	4.577A	93%
DC100-24S24		24 VDC	0mA	4.2A	48mV	48mV	200mVp-p	85mA	4.641A	92%
DC100-24S28		28 VDC	0mA	3.6A	56mV	56mV	200mVp-p	85mA	4.641A	92%
DC100-24S48		48 VDC	0mA	2.1A	96mV	72mV	300mVp-p	85mA	4.641A	92%
DC100-48S05	36 - 75 VDC	5 VDC	0mA	20A	10mV	15mV	75mVp-p	90mA	2.277A	93%
DC100-48S12		12 VDC	0mA	8.4A	24mV	30mV	100mVp-p	90mA	2.295A	93%
DC100-48S15		15 VDC	0mA	6.7A	30mV	38mV	100mVp-p	90mA	2.288A	93%
DC100-48S24		24 VDC	0mA	4.2A	48mV	48mV	200mVp-p	40mA	2.320A	92%
DC100-48S28		28 VDC	0mA	3.6A	56mV	56mV	200mVp-p	40mA	2.320A	92%
DC100-48S48		48 VDC	0mA	2.1A	96mV	72mV	300mVp-p	40mA	2.320A	92%
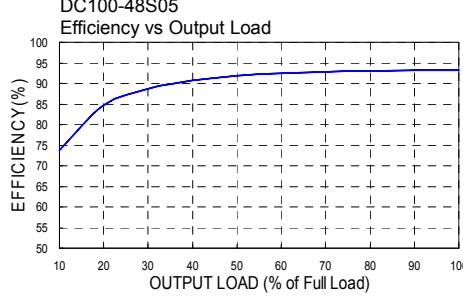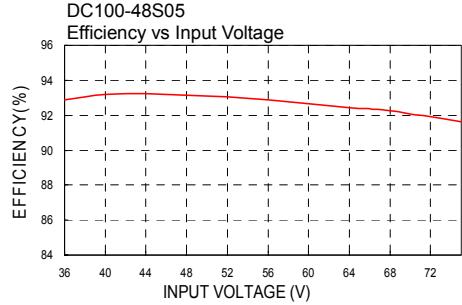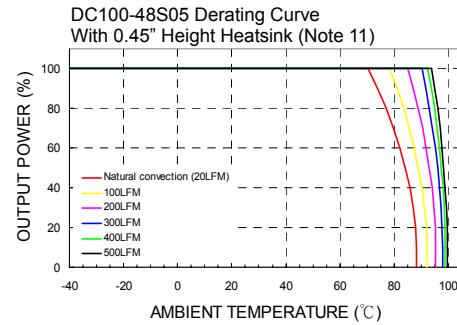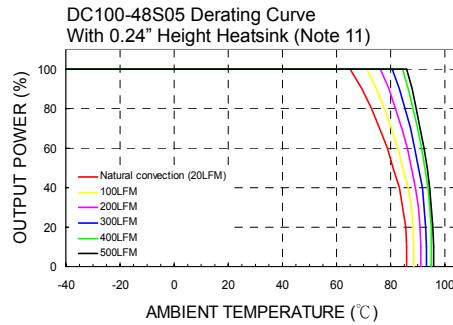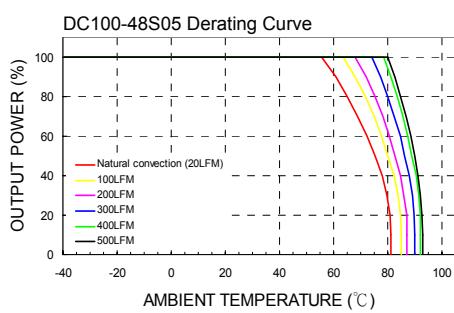
NOTES
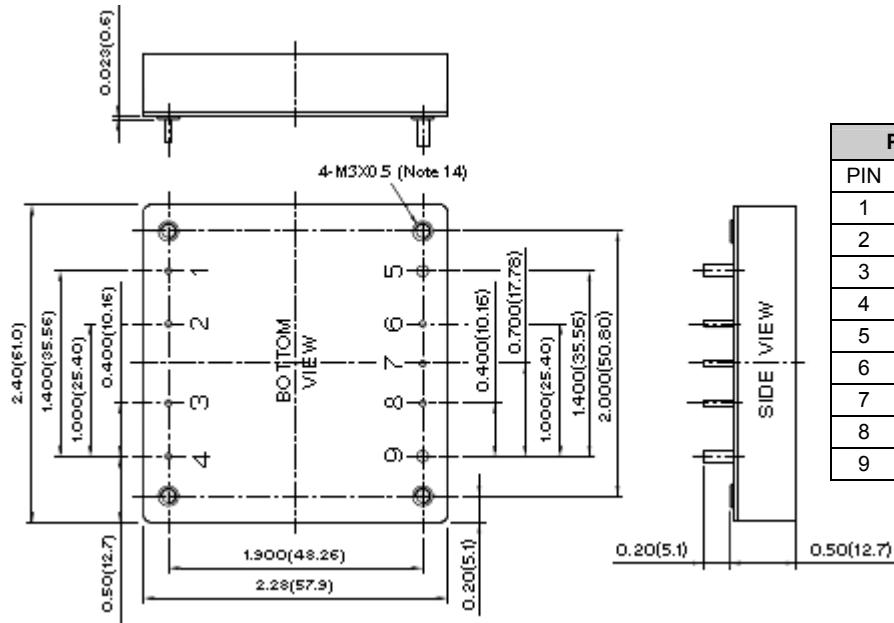
1. BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40°C.
   MIL-HDBK-217F Notice2 @Ta=25°C, Full load (Ground, Benign, controlled environment).
2. Maximum value at nominal input voltage and full load.
3. Typical value at nominal input voltage and no load.
4. Typical value at nominal input voltage and full load.
5. The ripple and noise of output voltage 48V is measured with a 2.2µF/100V X7R MLCC;
   The ripple and noise of the other output voltage is measured with a 4.7µF/50V X7R MLCC.
6. The remote ON/OFF control pin voltage is referenced to –Vin. The negative logic and pin length (DIM.) are optional.
   To order negative logic ON-OFF control add the suffix R (Ex: DC100-48S05R).
7. Output voltage is adjustable for 10% trim up or -20% trim down of nominal output voltage by connecting a single resistor between TRIM and +SENSE
   pins for trim up or between TRIM and –SENSE pins for trim down. To calculate the value of the resistor R_U and R_D for a particular output voltage uses
   the following equation:

$$R_U = \left(\frac{V_{OUT}\,(100 + \Delta\%)}{1.225\,\Delta\%} - \frac{(100 + 2\Delta\%)}{\Delta\%} \right) K\Omega$$

$$R_D = \left(\frac{100}{\Delta\%} - 2 \right) K\Omega$$
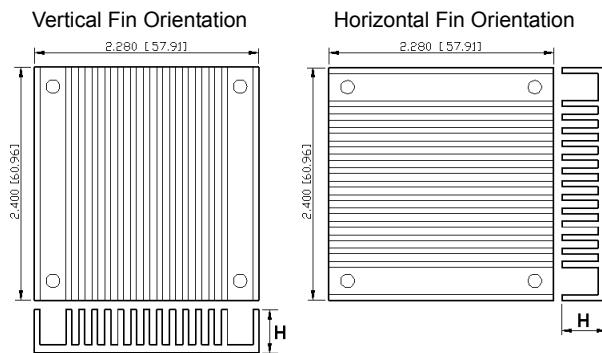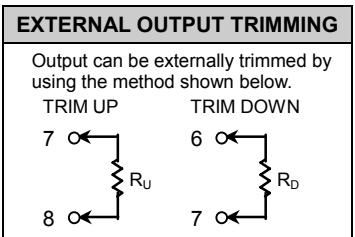
8. Maximum output deviation is +10% inclusive of remote sense. If remote sense is not being used the +SENSE should be connected to its
   corresponding +OUTPUT and likewise the -SENSE should be connected to its corresponding –OUTPUT.
9. Internal fusing is not included so we suggest using an input line fuse.
10. Test conditions with vertical direction by natural convection (20LFM).
11. Heatsink is optional. Please consult factory for ordering details.
12. The DC100 series meets EN55022 Class A only with external components connected before the input pin to the converter.
13. An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5.
    The filter capacitor suggested is Nippon chemi-con KY series, 220µF /100V, ESR 48mΩ.
14. CASE GROUNDING: EMI can be reduced when you connect the case pin and the four screw bolts to ground.

DERATING CURVES AND EFFICIENCY GRAPHS

DC100-48S05 Derating Curve

DC100-48S05 Derating Curve
With 0.24" Height Heatsink (Note 11)

DC100-48S05 Derating Curve
With 0.45" Height Heatsink (Note 11)

DC100-48S05
Efficiency vs Input Voltage

DC100-48S05
Efficiency vs Output Load

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MECHANICAL DRAWING

PIN CONNECTION

PIN	Define	Diameter
1	- INPUT	0.04 in.
2	CASE	0.04 in.
3	CTRL	0.04 in.
4	+ INPUT	0.04 in.
5	- OUTPUT	0.08 in.
6	- SENSE	0.04 in.
7	TRIM	0.04 in.
8	+ SENSE	0.04 in.
9	+ OUTPUT	0.08 in.

PRODUCT STANDARD TABLE

Option	Suffix
Negative Remote ON/OFF logic 0.20" pin length (standard)	R
Negative remote ON/OFF logic 0.145" pin length	RL
Negative remote ON/OFF logic 0.11" pin length	RK
Positive remote ON/OFF logic 0.20" pin length	None
Positive remote ON/OFF logic 0.145" pin length	S
Positive remote ON/OFF logic 0.11" pin length	M

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method shown below.

TRIM UP   TRIM DOWN

Vertical Fin Orientation   Horizontal Fin Orientation

FIN ORIENTATION		P / N
Vertical	H=0.240(6.10)	7G-0023A-F
Vertical	H=0.450(11.43)	7G-0021A-F
Horizontal	H=0.240(6.10)	7G-0022A-F
Horizontal	H=0.450(11.43)	7G-0024A-F

Option: Terminal Block (Suffix-T)