Size: 2.40in x 2.28in x 0.5in
(61mm x 57.9mm x 12.7mm)

FEATURES

- Wide 4:1 Input Voltage Range
- 1500VDC I/O Isolation
- Up to 88% High Efficiency
- Lead Free Design, RoHS Compliant
- Operating Temperature Range: -55°C to +95°C (with derating)
- Remote ON/OFF
- Standard Half-Brick Package
- Short Circuit, Over Voltage, Over Load, and Over Temperature Protection
- Custom Design Available
- RoHS Compliant
- Five-Sided Shielded Metal Case
- Adjustable Output Voltage
- Optional Heatsink Available (Suffix “HS”)
- Meets Safety Standard IEC/EN6095-1

APPLICATIONS

- Battery Operated Equipment
- Measurement Equipment
- Telecom
- Wireless Networks
- Industry Control Systems
- Military/Defense Applications

DESCRIPTION

The DCMCW60 series of isolated DC/DC power converters provides 60 Watts of continuous output power in a standard 2.40” x 2.28” x 0.5” half-brick package. This series consists of 5V, 12V, and 24VDC single output models with 4:1 input voltage ranges of 9-36VDC or 18~75VDC. Some features include high efficiency up to 88%, remote on/off, adjustable output voltage, 1500VDC I/O isolation, -55°C~+95°C operating temperature range (with derating), and five-sided shielding. The DCMCW60 series is RoHS compliant and has short circuit, over load, over voltage, and over temperature protection. These converters are best suited for use in battery operated equipment, measurement equipment, telecom, wireless networks, industry control systems, military/defense applications and anywhere where isolated, tightly regulated voltages and compact size are required.

MODEL SELECTION TABLE

Model Number	Input Voltage Range	Output Voltage[1]	Output Current		Input Current		Output Power	Maximum Capacitive Load	Efficiency[2]
			Min. Load	Full Load	No Load	Full Load			
DCMCW60-24S05	24 VDC (9 – 36 VDC)	5 VDC	80mA	12000mA	50mA	3289mA	60W	470µF	80%
DCMCW60-24S12		12 VDC	90mA	5000mA	15mA	3086mA	60W	100µF	85%
DCMCW60-24S24		24 VDC	20mA	2500mA	100mA	3086mA	60W	100µF	85%
DCMCW60-48S05	48 VDC (18 – 75 VDC)	5 VDC	50mA	12000mA	50mA	1582mA	60W	470µF	83%
DCMCW60-48S12		12 VDC	50mA	5000mA	50mA	1524mA	60W	100µF	88%
DCMCW60-48S24		24 VDC	90mA	2500mA	50mA	1524mA	60W	100µF	88%

SPECIFICATIONS

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

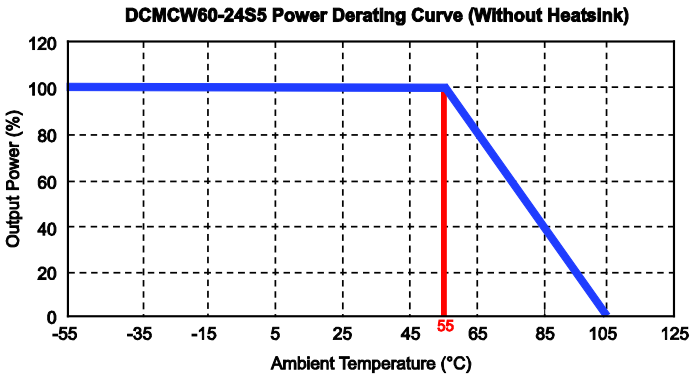
SPECIFICATION	TEST CONDITIONS		Min	Typ	Max	Unit
INPUT SPECIFICATIONS						
Input Voltage Range	24VDC nominal input models		9	24	36	VDC
	48VDC nominal input models		18	48	75	
Input Surge Voltage	24VDC nominal input models	100ms max.			50	VDC
	48VDC nominal input models				100	
Input Reflected Ripple Current	Nominal Vin and full load			1.5		Ap-p
Input Current			See Table			
Input Filter			Pi Type			
OUTPUT SPECIFICATIONS						
Output Voltage			See Table			
Voltage Accuracy	Full Load and Nominal Vin			±1		%
Line Regulation	LL to HL at full load			±1		%
Load Regulation	25% load to full load			±1		%
Remote Sense						
Output Power			See Table			
Output Current			See Table			
Minimum Load			See Table			
Maximum Capacitive Load			See Table			
Ripple & Noise (20MHz bandwidth)	5VDC Models				130	mVp-p
	12VDC Models				170	
	24VDC Models				200	
Transient Response Settling Time	50% Load Step Change			3.6		mS
Transient Response Overshoot	di/dt=0.8A/µF			≤±8		%Vo
Start-Up Time	Nominal Vin and Constant Resistive Load			200		ms
Temperature Coefficient				±0.02		%/°C
REMOTE ON/OFF CONTROL						
Converter: ON			Open of 3.5V < Vr <12V			
Converter: OFF			Short (to -Vin (Pin 2))or 0V < Vr < 1.2V			
Sourcing Current of Remove Control Pin	Nominal Vin				0.2	mA
Idle Input Current (at Remote OFF State)	Nominal Vin				20	mA
PROTECTION						
Short Circuit Protection	Hiccup		Automatic Recovery			
Over Load Protection	% of Full Load at Nominal Input		110			%
Over Voltage Protection	Zener Diode Clamp	5VDC Models			6.2	VDC
		12VDC Models			15	
		24VDC Models			27	
Thermal Shutdown				110		°C
ENVIRONMENTAL SPECIFICATIONS						
Operating Ambient Temperature	With Derating		-55		+95	°C
Storage Temperature Range			-55		+125	°C
Maximum Case Temperature					+105	°C
Relative Humidity					95	%RH
Cooling	Forced Air Cooling		1.5m/s (300LFM)			
Soldering Temperature	Lead Free Wave Soldering		260°C/10sec Maximum.			
MTBF				718,000		Hrs
GENERAL SPECIFICATIONS						
Efficiency	Nominal Input		See Table			
Isolation Voltage	Input to Output		1500			VDC
Isolation Resistance	500VDC		10^9			Ω
Isolation Capacitance				250		pF
Switching Frequency (Fixed)	Pulse width modulation (PWM)			300		kHz
PHYSICAL SPECIFICATIONS						
Weight			3.42oz (97g)			
Dimensions (L x W x H)			2.40in x 2.28in x 0.50in (61mm x 57.9mm x 12.7mm)			
Case Material			Aluminum			
Potting Material			Silicon Rubber (UL94V-0)			
SAFETY CHARACTERISTICS						
Safety Approvals	IEC/EN60950-1					

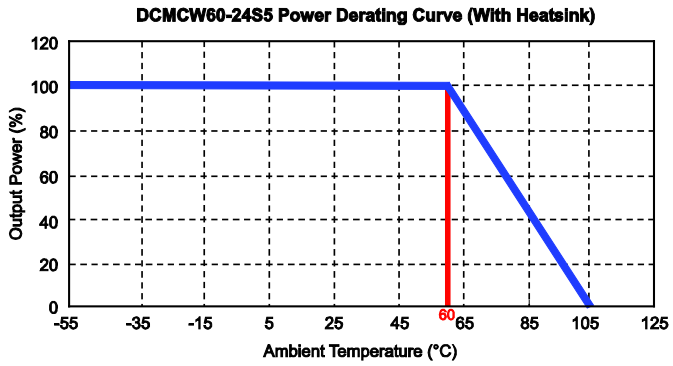
NOTES

1. Output current below this value will not damage these converters, however they may not meet all listed specifications.
2. Typical value tested at nominal input and full load.
3. For heatsink option, add "HS" to model number.

**Due to advances in technology, specifications subject to change without notice.*

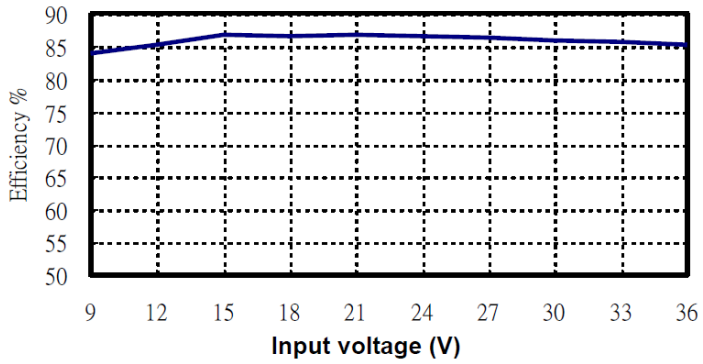
DERATING CURVES



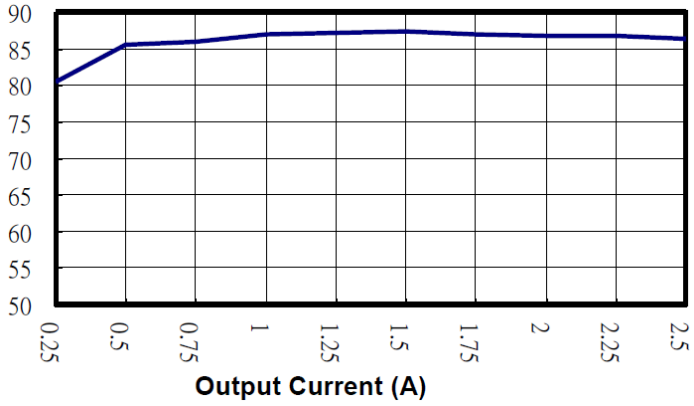


EFFICIENCY GRAPHS

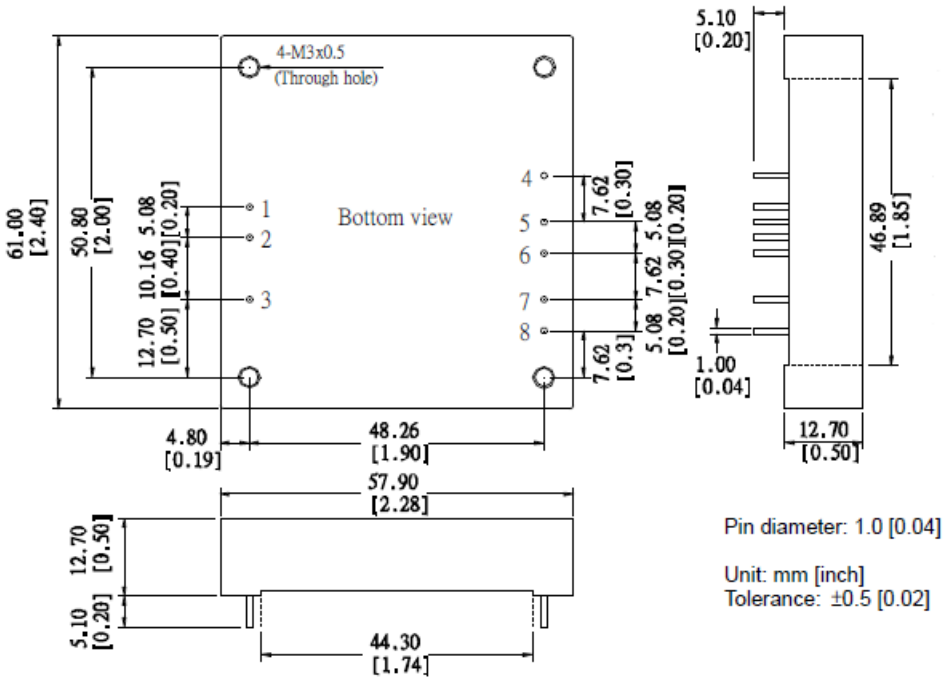
DCMCW60-24S5 Input Voltage vs. Efficiency



DCMCW60-24S5 Output Current vs. Efficiency



MECHANICAL DRAWINGS



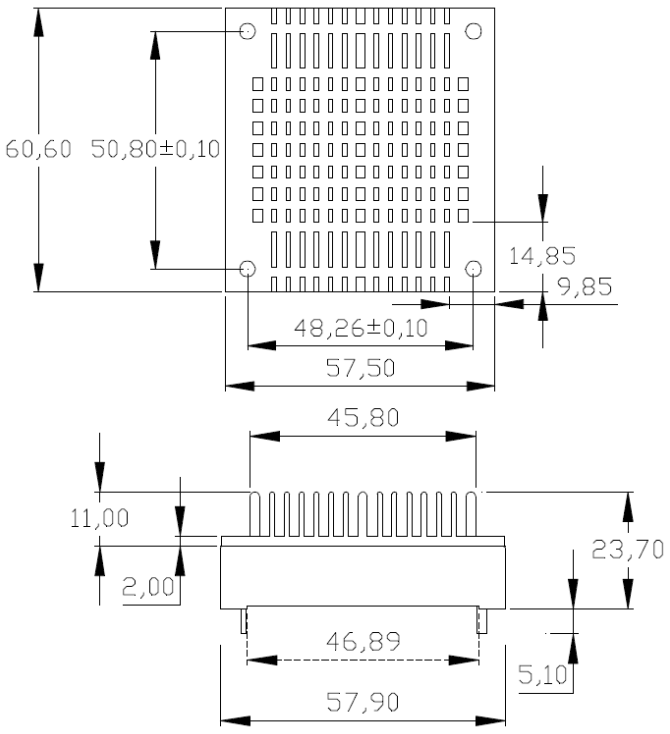
Pin diameter: 1.0 [0.04]

Unit: mm [inch]
Tolerance: ±0.5 [0.02]

Pin Assignment

Pin	Single
1	+Vin
2	-Vin
3	Remote On/Off
4	-Sense
5	+Sense
6	+Vout
7	-Vout
8	Trim

Heatsink Option (“HS” Suffix)

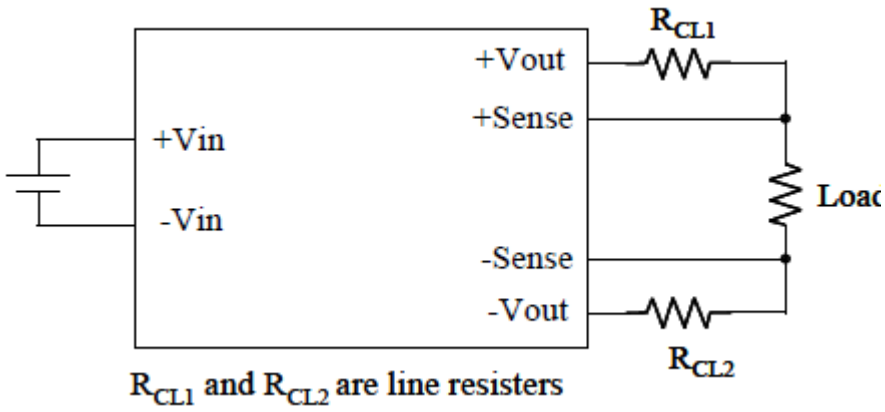


Material: Aluminum
Weight: 1.23oz (35g) (without converter)

REMOTE SENSE APPLICATION CIRCUIT

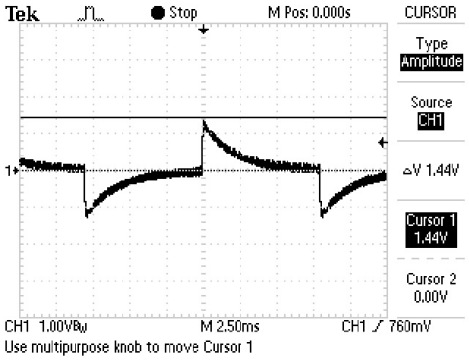
The Remote Sense function is used to compensate for the voltage drop incurred when the load is located physically far away from the DC/DC converter providing its power. The remote sense pins are connected as close to the load as possible. The DC/DC converter's regulation specifications are maintained across the points where the remote sense wires are connected at the load. This will remove the effect of the voltage drop caused by the resistance of the wires used to conduct the power from the DC/DC converter to the load. This is represented by R_{CL1} and R_{CL2}. With the use of remote sense, the effects of R_{CL1} and R_{CL2} are eliminated.

If the Remote Sense function is not used, the **+Sense** has to be connected to **+Vout** and the **-Sense** has to be connected to **-Vout** as close to the DC/DC converter as possible.



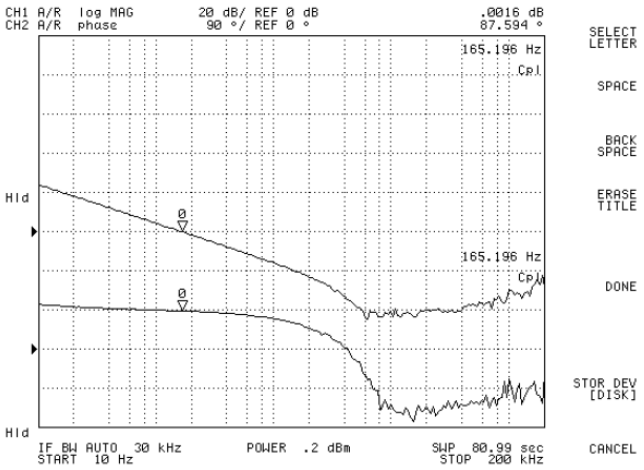
TRANSIENT RESPONSE

DCMCW60-24S5, At 50%~100% Max Load



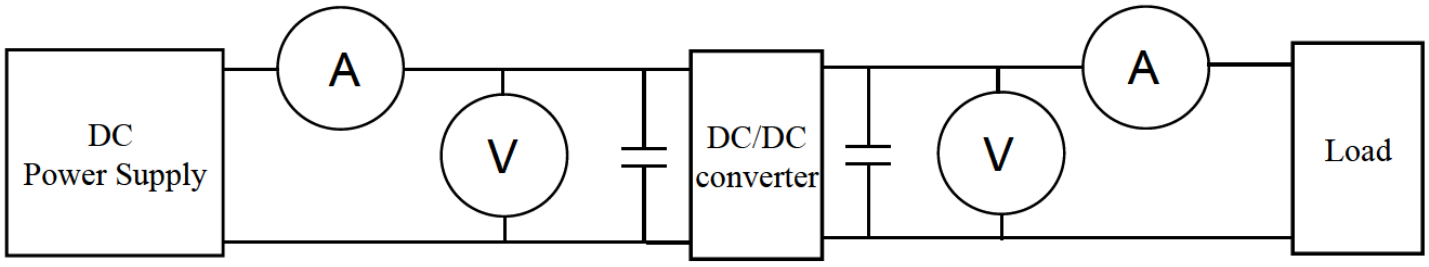
LOOP GAIN & PHASE

DCMCW60-24S5, At Vi=24V, Full Load



TEST CONFIGURATIONS

All specifications are typical at nominal input, full load and 25°C unless otherwise stated.



◎ DC Power Supply: It 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□ +(0.03% 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%）
   5V nominal input → 4.5~5.5V
   12V nominal input → 10.8~13.2V
   24V nominal input → 21.6~26.4V

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

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

2. Input Power

   Pin = Vin x Iin

   Vin：Input voltage
   Iin：Input current

3. Output Power

   Pout = Vout x Iout

   Vout：Output voltage
   Iout：Output current

4. Efficiency

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

   Pout: Output power
   Pin: Input power

5. Voltage Accuracy

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

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

6. Line Regulation: Wide input voltage range and regulated output votlage series.

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

   LL: Low Line input voltage
   HL: High Line input voltage

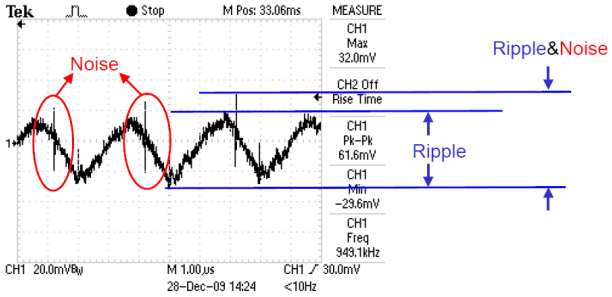
7. Load Regulation

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

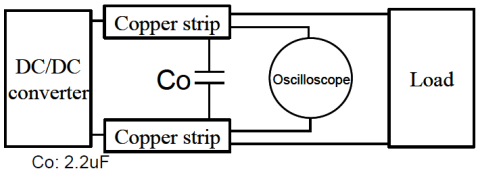
   Vout(FL): Output voltage at full load

   Vout(NL): Output voltage at 25% full load or 10% full load

8. Ripple and Noise: As shown below. The bandwidth is 0-20MHz

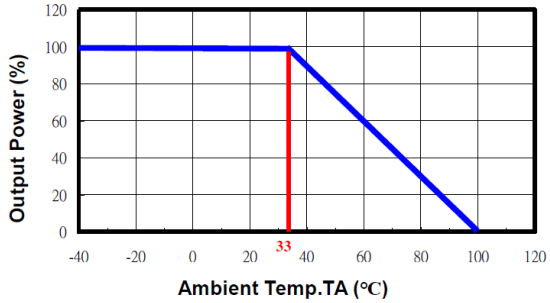


Output Ripple&Noise measurement test circuit: as shown below.



Co: 2.2uF

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 frequecny 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: 2015 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.

Contact **Wall Industries** for further information:

Phone: ☎(603)778-2300
Toll Free: ☎(888)597-9255
Fax: ☎(603)778-9797
E-mail: sales@wallindustries.com
Web: www.wallindustries.com
Address: 37 Industrial Drive
Exeter, NH 03833