



Size: 2.40in x 2.28in x 0.5in
(61.0mm x 57.9mm x 12.10mm)

FEATURES

- Wide 2:1 Input Voltage Range
- High Power Density
- High Efficiency
- Input/Output Isolation 1500VDC
- Lead Free Design, RoHS Compliant
- Short Circuit, Over Voltage, and Over Temperature Protection
- Cooling by Free Air Convection
- Industry Standard Pinout
- Adjustable Output Voltage

APPLICATIONS

- Distributed Power System
- Telecommunication Application
- Battery Powered Equipment
- Industrial Applications
- Process Control Equipment
- Transportation Equipment

DESCRIPTION

The DCBYB100 series of isolated DC/DC converters offer 100 watts of output power in a 2.40" x 2.28" x 0.5" package with standard pinout case. This series consists of single output models with a wide 4:1 input voltage range. Each model in this series has high power density, high efficiency, and short circuit, over voltage, and over temperature protection. Please call factory for order details.

MODEL SELECTION TABLE

Model Number	Input Voltage Range	Output Voltage	Output Current		Ripple & Noise	No Load Input Current	Maximum Capacitive Load	Efficiency	Output Power
			Min Load	Max Load					
DCBYB100-12S24	9~18V	24V	0A	4.2A	200mVp-p	-	-	-	100W
DCBYB100-48S12	48V (36~75V)	12V	0A	8.33A	100mVp-p	95mA	10000µF	92%	
DCBYB100-48S24		24V	0A	4.2A	200mVp-p	58mA	3300µF	91%	
DCBYB100-48S28		28V	0A	3.6A	200mVp-p	69mA	2000µF	91%	
DCBYB100-48S48		48V	0A	2.1A	300mVp-p	57mA	1000µF	92%	

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	48V Nominal Input	9	12	18	V
Input Surge Voltage (100ms Max.)	48V Nominal Input	36	48	75	V
Full Load Input Current	48V Nominal Input Models			2367	mA
				2395	
				2395	
				2367	
Input Filter	48V Nominal Input		Pi Type		
Input Reflected Ripple Current	48V Models, Nominal Vin and Full Load		600		mAp-p
OUTPUT SPECIFICATIONS					
Output Voltage		See Table			
Voltage Accuracy	Full Load and Nominal Vin		±1		%
Line Regulation	48V Nominal Input Models		±1		%
Load Regulation	48V Nominal Input Models		±1		%
Output Power		See Table			
Output Current		See Table			
Minimum Load		0			A
Maximum Capacitive Load		See Table			
Ripple & Noise (20MHz bandwidth)		See Table			
Transient Response Setting Time	48V Nominal Input Models; 50% load step change		480		µs
Transient Response Over Shoot	48V Nominal Input Models; di/dt=0.8A/µs		≤ ±5		% of Vo
Start-Up Time	48V Nominal Input Models; Nominal Vin and Constant Resistive Load		68		mSec
Temperature Coefficient				±0.02	%/°C
REMOTE ON/OFF CONTROL					
Converter ON		Open or 3.5V < Vr < 12V			
Converter OFF		Short ⁽¹⁾ or 0V < Vr < 1.2			
Sourcing Current of Remote CTRL Pin	Nominal Vin			0.2	mA
Idle Input Current (at Remote Off State)	Nominal Vin			20	mA

SPECIFICATIONS

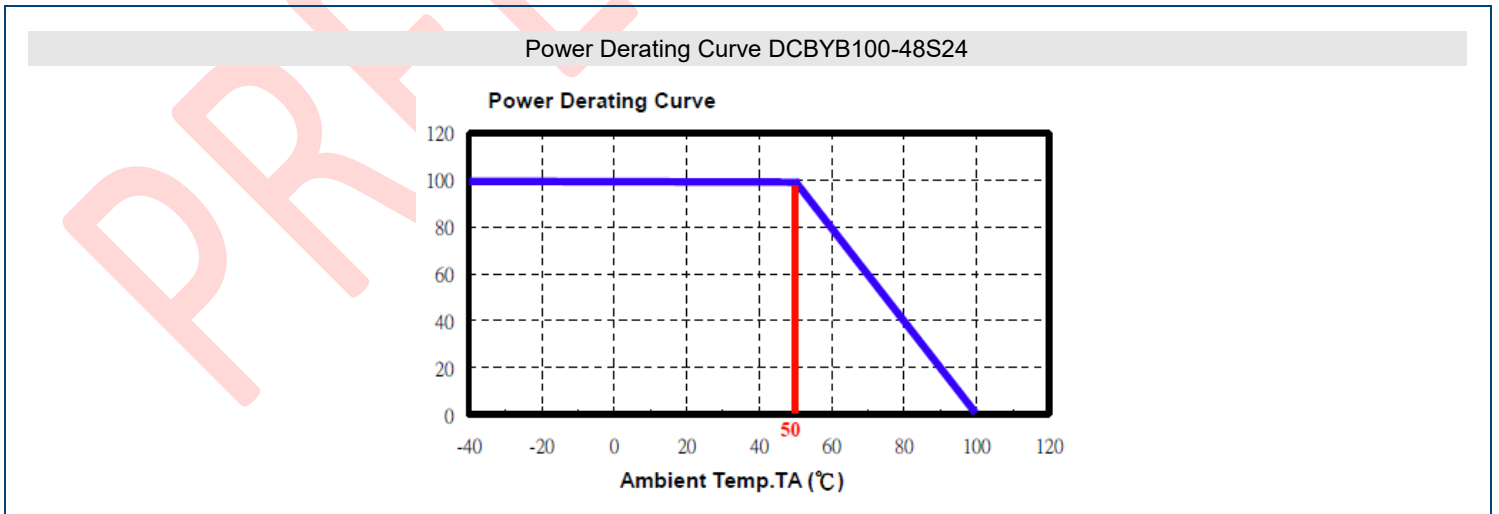
All specifications are based on 25°C, Nominal Input Voltage, and Maximum Output Current unless otherwise noted.
We reserve the right to change specifications based on technological advances.

SPECIFICATION	TEST CONDITIONS	Min	Typ	Max	Unit
PROTECTION					
Short Circuit Protection	Automatic Recovery	Hiccup, Continuous			
Over Voltage Protection (Zener Diode Clamp)	12V Output Model		15		V
	24V Output Models	24V Nominal Input Models	27		
	28V Output Models	48V Nominal Input Models	33		
	48V Output Models		36		
Thermal Shutdown			110		°C
ENVIRONMENTAL SPECIFICATIONS					
Operating Ambient Temperature	With Derating	-40		+85	°C
Storage Temperature	24V Nominal Input Models	-55		+125	°C
	48V Nominal Input Models	-40		+105	
Maximum Case Surface Temperature Thermal Shutdown			110	105	°C
Relative Humidity				95	% RH
Soldering Temperature	Lead-Free Wave Soldering			260	°C/10Sec
Cooling	24V Nominal Input Models	Natural Convection			
MTBF	48V Nominal Input Models		450,000		Hours
GENERAL SPECIFICATIONS					
Efficiency	Nominal Input	See table			
Switching Frequency (Fixed)	48V Nominal Input Models, Pulse Width Modulation (PWM)		300		kHz
Isolation Voltage	Input to Output	24V Nominal Input Models	15000		VDC
		48V Nominal Input Models	1500		
Isolation Resistance	Input to Output (500VDC)	10 ⁹			Ω
Isolation Capacitance	Input to Output		1200		pF
PHYSICAL SPECIFICATIONS					
Weight		3.42oz (97g)			
Dimensions (L x W x H)		2.40in x 2.28in x 0.5in (61.0mm x 57.9mm x 12.7mm)			
Case Material		Aluminum			
Potting Material		Silicon Rubber (UL94V-0)			

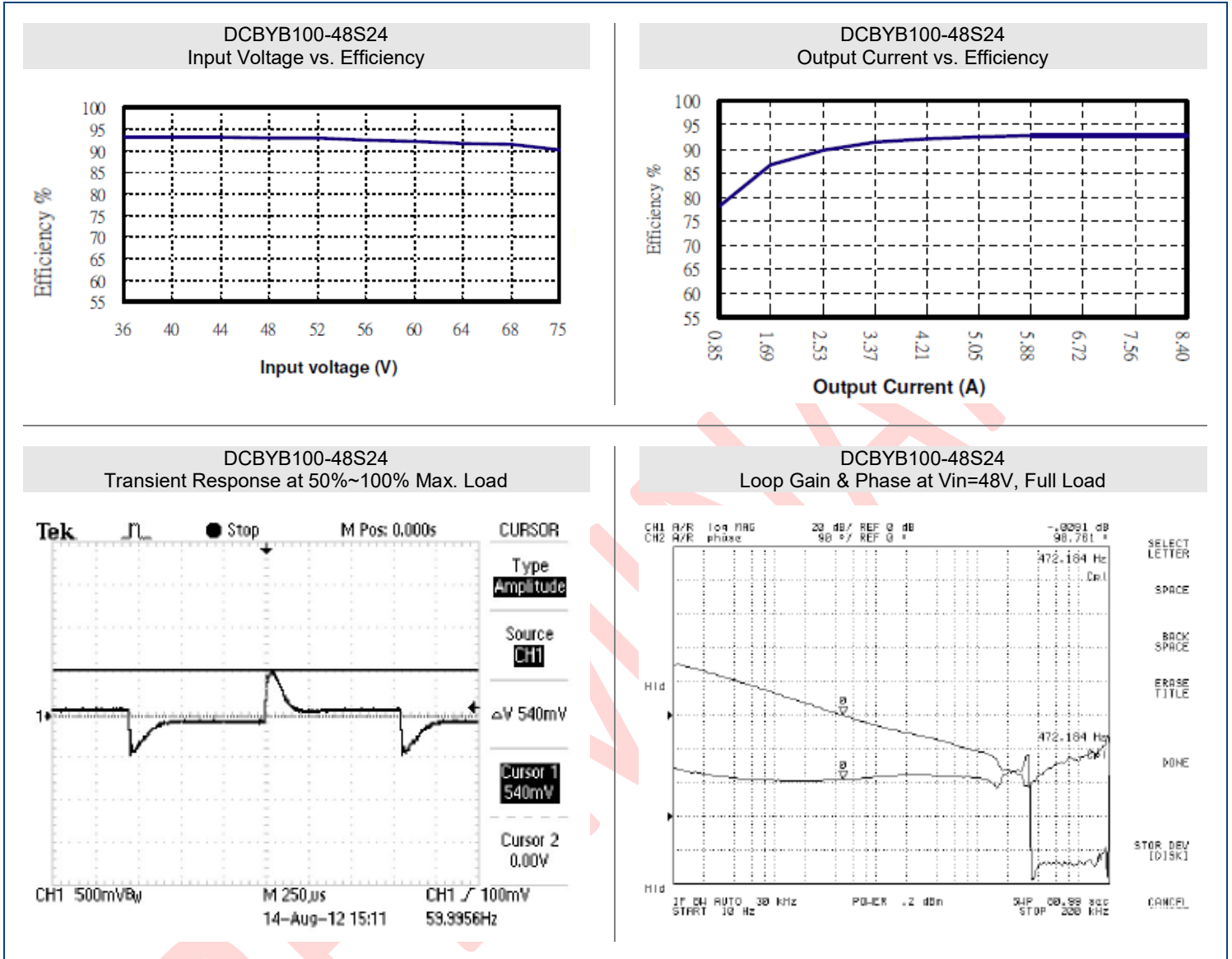
NOTES

- Short to -Vin (Pin 2)
- Please note that this is a preliminary specification.
**Due to advances in technology, specifications subject to change without notice.*

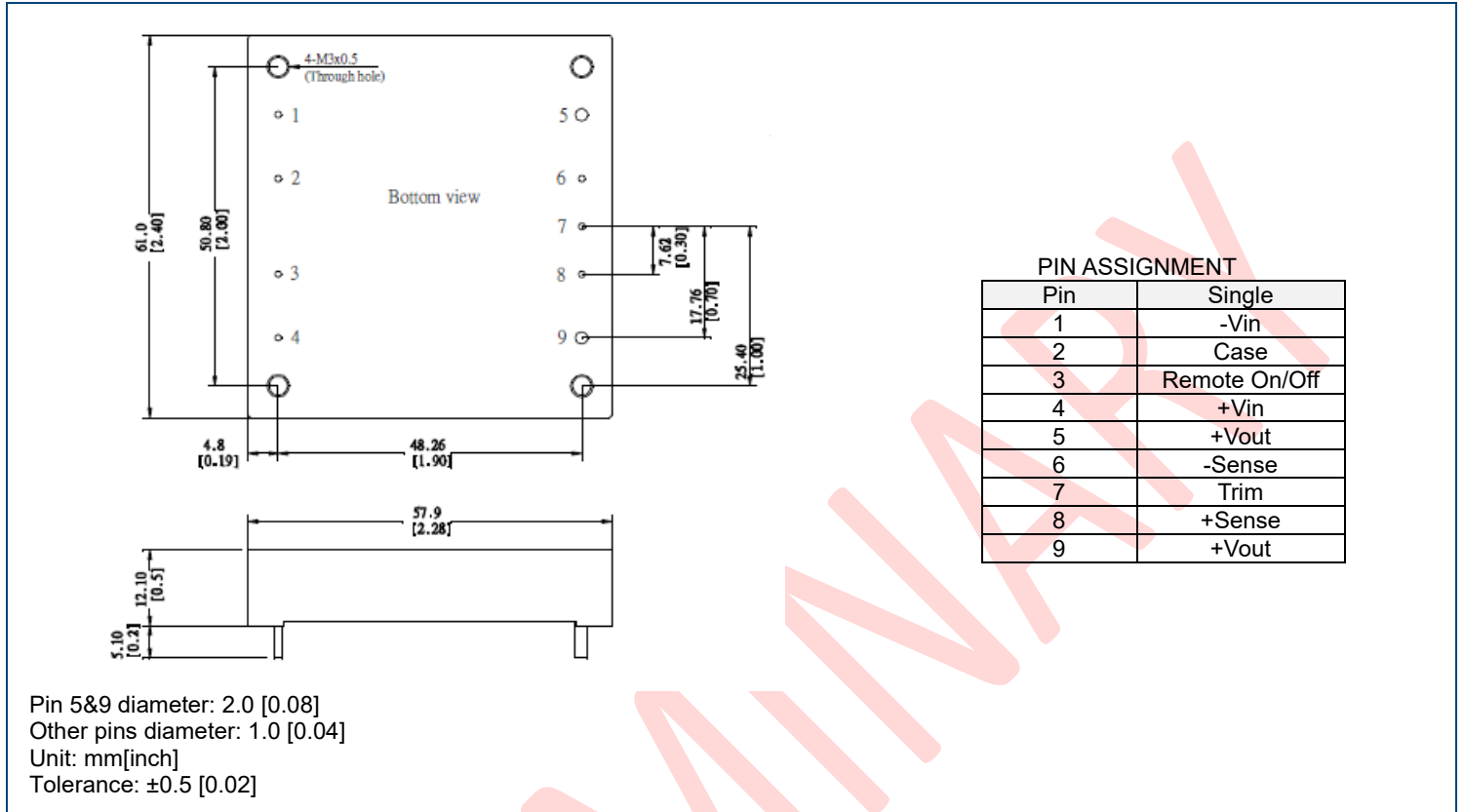
DERATING CURVES



EFFICIENCY CURVES



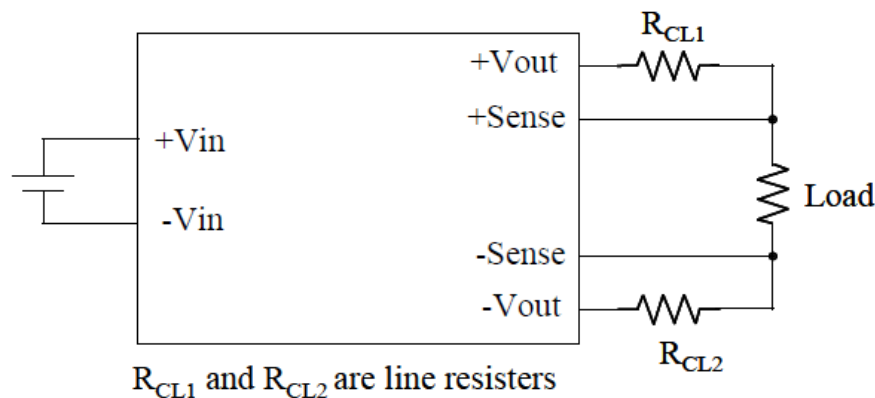
MECHANICAL DRAWINGS



REMOTE SENSE APPLICATION CIRCUIT

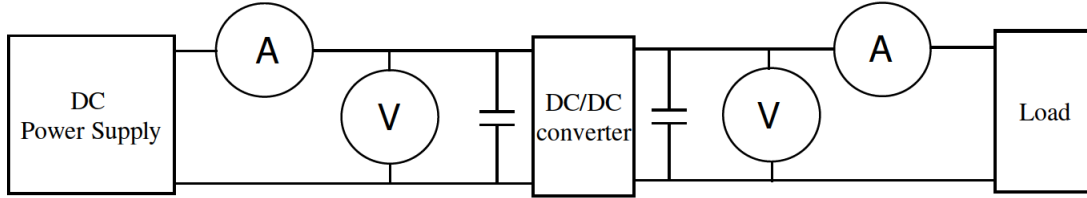
The Remote Sense function is used to compensate for the voltage drop incurred when the load is located physical far away from the DC/DC converter providing its power. The Remote Sense pins are connected as close to the load as possible. The DC/DC converter's regulation specification is maintained across 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 Remote Sense function is not used, the **+Sense** has to be connected to the **+Vout** and the **-Sense** has to be connected to **-Vout** as close to the DC/DC converter as possible



TEST CONFIGURATIONS

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



DC Power Supply: Offers a Wide Voltage and Current Range Precisely
 Current Meter (A): Accuracy → 200μA~200mA 4 Ranges ±(0.2% rdg + 2 digits)
 200mA~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:

$$P_{in} = V_{in} \times I_{in}$$

V_{in} : Input Voltage
 I_{in} : Input Current

3. Output Power

$$P_{out} = V_{out} \times I_{out}$$

V_{out} : Output Voltage
 I_{out} : Output Current

4. Efficiency:

$$\text{Efficiency} = \frac{P_{out}}{P_{in}} \times 100\%$$

P_{out} : Output Power
 P_{in} : Input Power

5. Voltage Accuracy:

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

V_{out} : Output Voltage
 $V_{out(\text{nominal})}$: Nominal Output Voltage

6. Line Regulation: (1) Wide Input Voltage Range and Regulated Output Voltage Series

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

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

(2) Narrow Input Voltage Range (±10) and unregulated output voltage series.

$$\text{Line Regulation} = \left| \frac{\Delta V_{out}}{\Delta V_{in}} \right|$$

$$\Delta V_{out} = \frac{V_{out(+10\%)} - V_{out(-10\%)}}{V_{out}} \times 100\%$$

Vout (+10%): Output Voltage at Vin=1.1xVin(nominal)&full load
 Vout (-10%): Output voltage at Vin=0.9xVin(nominal) &full load
 Vout: Output voltage at Vin = Vin(nominal) &full load

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

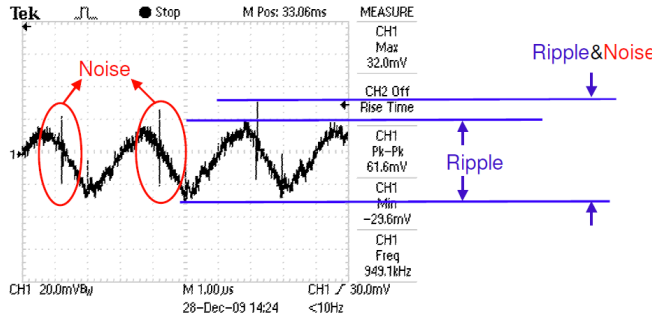
Vin(+10%): Input Voltage=1.1xVin(nominal)
 Vin(-10%): Input Voltage=0.9xVin(nominal)
 Vin(nominal): Nominal Input Voltage

7. Load Regulation

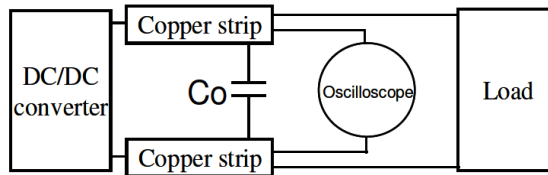
$$\frac{|V_{out(FL)} - V_{out(NL)}|}{V_{out(FL)}} \times 100\%$$

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

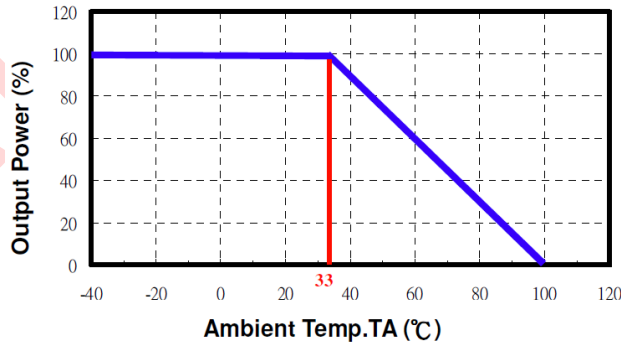


Output Ripple & Noise measurement test circuit: as shown below.



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 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 certification is just one example of our commitment to producing a high quality, well-documented product for our customers.

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