

CYNB60 SERIES DC-DC Converter 60Watt

1600Vdc Isolated 4:1 Input Voltage Range



FEATURES :

- 60W DIL Package
- 4:1 Wide Input Voltage Range
- High Efficiency Up To 92%
- Regulated Output Types
- No Minimum Load Required
- Over Power and Short Circuit Protection
- Over Temperature Protection
- Operating Temperature: -40°C To +76°C
- UL94V-0 Package Material
- 100% Burned In
- 3 Years Warranty



Specifications typical at TA=25°C, nominal input voltage and rated output current unless otherwise specified

Selection Guide

Part Number	Input Voltage Range	Input Current (typ)		Output Voltage	Output Current	Efficiency	Maximum capacitor Load
		No-Load	Full Load				
	Vdc	mA	mA	Vdc	mA (typ)	% (typ)	μF
CYNB60-24S05	9-36	15	2747	5	12000	91	20400
CYNB60-24S12	9-36	15	2717	12	5000	92	3600
CYNB60-24S15	9-36	15	2717	15	4000	92	2400
CYNB60-24S24	9-36	15	2747	24	2500	91	900
CYNB60-48S05	18-75	10	1374	5	12000	91	20400
CYNB60-48S12	18-75	10	1359	12	5000	92	3600
CYNB60-48S15	18-75	10	1359	15	4000	92	2400
CYNB60-48S24	18-75	10	1374	24	2500	91	900

Part Number

CYNB	60	-	24	S	05	HS
A	B		C	D	E	F

- A: Series
B: Output Power
C: Input Voltage
D: Single Output
E: Output Voltage
F: Heatsink (Option)

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Input Specifications

Parameters	Conditions	Min	Typ	Max	Units
Input Voltage	24V Models	9		36	Vdc
	48V Models	18		75	Vdc
Input Surge Voltage (100 ms max.)	24V Models	-0.7		50	
	48V Models	-0.7		100	
Start-up Voltage	24V Models			9	Vdc
	48V Models			18	Vdc
Under Voltage Shutdown	24V Models		7.5		Vdc
	48V Models		16		Vdc
Start-up Time	Constant Resistive Load, Nominal Vin	Power-up		30	ms
		Remote ON/OFF		30	ms
Input Filter	All Models	Internal Pi type			
Remote ON/OFF (Ctrl PIN Refer To -Vin PIN)	Positive Logic	DC/DC ON	Open or 3.5 Vdc – 12 Vdc		
		DC/DC OFF	Short or 0 Vdc – 1.2 Vdc		
	Input Current of Ctrl PIN		-0.5	0.5	mA
	Remote Off Input Current		3		mA

Output Specifications

Parameters	Conditions	Min	Typ	Max	Units
Voltage Tolerance	100% Load	-2		+2	%
Line Regulation	Vin(min) to Vin(max) @100% Load	-0.2		+0.2	%
Load Regulation	0% Load to 100% Load	-0.5		+0.5	%
Ripple & Noise (BW=20MHz)	With an 1uF MLCC and a 10uF tantalum Capacitor	5Vout		100	mVp-p
		12Vout		150	mVp-p
		15Vout		150	mVp-p
		24Vout		150	mVp-p
Transient Response Setting Time	25% Load Step Change		350	500	us
Transient Response Deviation	25% Load Step Change	-5	±3	+5	%
Temperature Coefficient		-0.02		+0.02	%/°C
Voltage Adjustability	% of Vout	-10		+10	%
Output Power Protection	% of Io, Hiccup mode, Auto-recovery	120	150	180	%
Short Circuit Protection	Continuous [Hiccup Mode], Auto-Recovery				
Over Voltage Protection	5Vout		6.2		Vdc
	12Vout		15		Vdc
	15Vout		18		Vdc
	24Vout		30		Vdc

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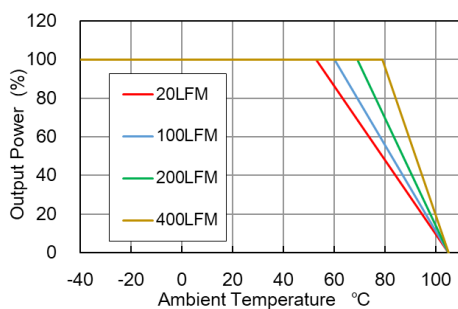
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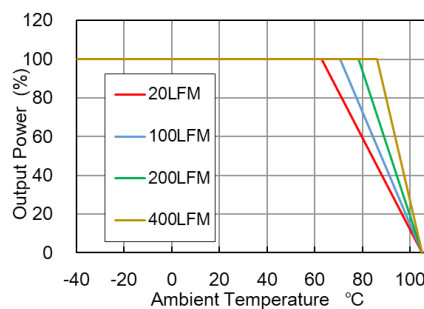
General Specifications

Parameters	Conditions	Min	Typ	Max	Units
Isolation Voltage	Input To Output (60 sec.)	1600			Vdc
	Input (Output) To Case (60 sec.)	1000			Vdc
Isolation Resistance	500Vdc	1000			MΩ
Isolation Capacitance	100kHz, 1V			2200	pF
Switching Frequency	Full Load, Nominal Input		280		KHz
Operating Ambient Temperature (Power Derating See Derating Graph)	Nominal Vin, 100% Load	CYNB60-24S05, CYNB60-24S24 CYNB60-48S05, CYNB60-48S24	-40	45.7	°C
				52.8	
	Nominal Vin, 100% Load (With HS Heatsink)	CYNB60-24S05HS, CYNB60-24S24HS CYNB60-48S05HS, CYNB60-48S24HS	-40	56.9	°C
				62.7	
	Nominal Vin, 100% Load (With HS1 Heatsink)	CYNB60-24S05HS1, CYNB60-24S24HS1 CYNB60-48S05HS1, CYNB60-48S24HS1	-40	68.2	°C
				72.7	
Maximum Case Temperature				105	°C
Over Temperature Protection	Case temperature		115		°C
Storage Temperature		-55		125	°C
Humidity	Non-Condensing	5		95	%
Cooling	Natural Convection				
Case Material	Copper				
Potting Material	Silicone (UL94-V0)				
MTBF	MIL-HDBK-217F@25°C (calculated)		2.59X10 ⁵		Hours
Weight			48		g
Dimensions			50.8 x 25.4 x 11.6		mm

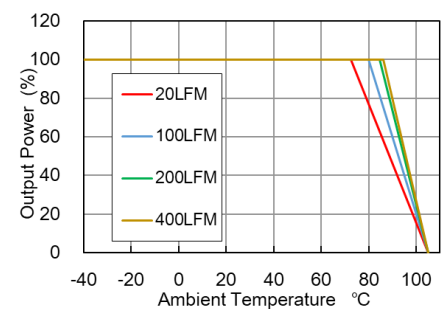
Temperature Derating Graph



CYNB60-24S15



CYNB60-24S15HS



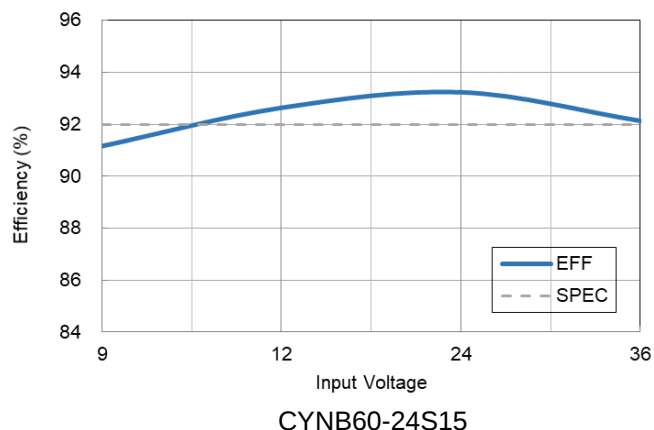
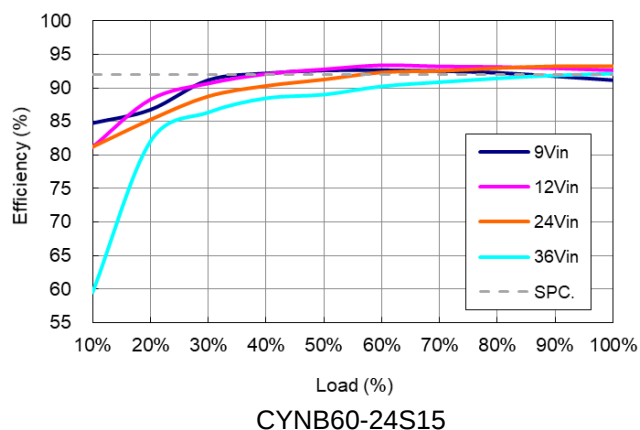
CYNB60-24S15HS1

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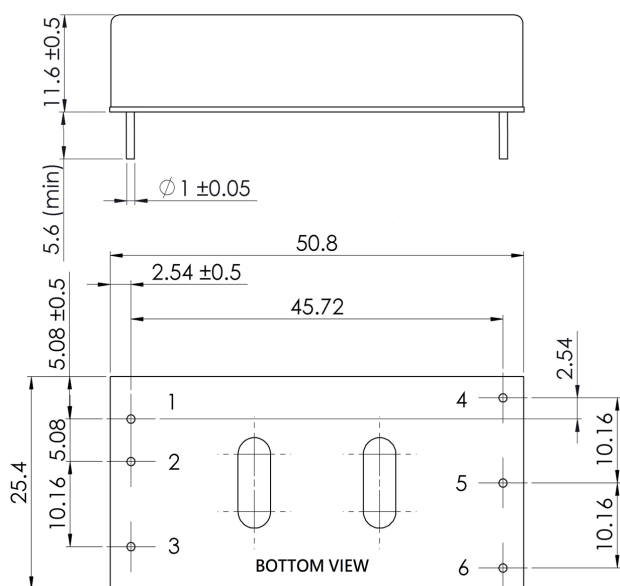
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Characteristic Curve

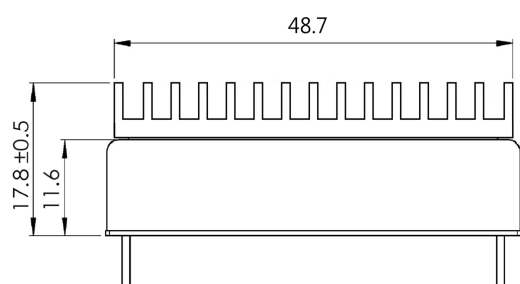


Dimensions

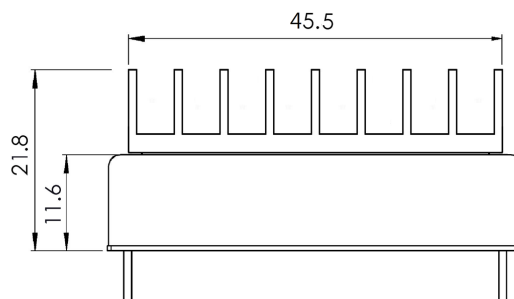


PIN Assignment

Pin	Define	Diameter
1	+Vin	1.0mm[0.04"]
2	-Vin	1.0mm[0.04"]
3	Ctrl	1.0mm[0.04"]
4	+Vout	1.0mm[0.04"]
5	-Vout	1.0mm[0.04"]
6	Trim	1.0mm[0.04"]



CYNB60-XXSXXHS



CYNB60-XXSXXHS1

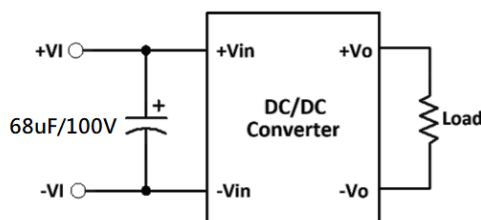
Unit: mm Tolerance: XX.X ±0.5; XX.XX ±0.25

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Application Examples

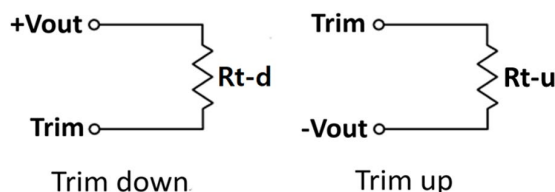


It is necessary to parallel a capacitor across the input pins under normal operation.

Minimum Capacitance: 68μF/100V.

External Output Trimming

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



CYNB60-□□S05

Trim	Vout	Vo*99%	Vo*98%	Vo*97%	Vo*96%	Vo*95%	Vo*94%	Vo*93%	Vo*92%	Vo*91%	Vo*90%
down	Rt-d =	138.88KΩ	62.41KΩ	36.92KΩ	24.18KΩ	16.53KΩ	11.44KΩ	7.79KΩ	5.06KΩ	2.94KΩ	1.24KΩ
Trim	Vout	Vo*101%	Vo*102%	Vo*103%	Vo*104%	Vo*105%	Vo*106%	Vo*107%	Vo*108%	Vo*109%	Vo*110%
up	Rt-u =	106.87KΩ	47.76KΩ	28.06KΩ	18.21KΩ	12.30KΩ	8.36KΩ	5.55KΩ	3.44KΩ	1.79KΩ	0.48KΩ

CYNB60-□□S12

Trim	Vout	Vo*99%	Vo*98%	Vo*97%	Vo*96%	Vo*95%	Vo*94%	Vo*93%	Vo*92%	Vo*91%	Vo*90%
down	Rt-d =	280.90KΩ	125.65KΩ	73.90KΩ	48.02KΩ	32.50KΩ	22.15KΩ	14.76KΩ	9.21KΩ	4.90KΩ	1.45KΩ
Trim	Vout	Vo*101%	Vo*102%	Vo*103%	Vo*104%	Vo*105%	Vo*106%	Vo*107%	Vo*108%	Vo*109%	Vo*110%
up	Rt-u =	225.50KΩ	100.75KΩ	59.17KΩ	38.38KΩ	25.90KΩ	17.58KΩ	11.64KΩ	7.19KΩ	3.72KΩ	0.95KΩ

CYNB60-□□S15

Trim	Vout	Vo*99%	Vo*98%	Vo*97%	Vo*96%	Vo*95%	Vo*94%	Vo*93%	Vo*92%	Vo*91%	Vo*90%
down	Rt-d =	499.18KΩ	223.09KΩ	131.06KΩ	85.05KΩ	57.44KΩ	39.03KΩ	25.88KΩ	16.02KΩ	8.35KΩ	2.22KΩ
Trim	Vout	Vo*101%	Vo*102%	Vo*103%	Vo*104%	Vo*105%	Vo*106%	Vo*107%	Vo*108%	Vo*109%	Vo*110%
up	Rt-u =	404.82KΩ	180.91KΩ	106.27KΩ	68.95KΩ	46.56KΩ	31.64KΩ	20.97KΩ	12.98KΩ	6.76KΩ	1.78KΩ

CYNB60-□□S24

Trim	Vout	Vo*99%	Vo*98%	Vo*97%	Vo*96%	Vo*95%	Vo*94%	Vo*93%	Vo*92%	Vo*91%	Vo*90%
down	Rt-d =	598.97KΩ	267.93KΩ	157.59KΩ	102.42KΩ	69.31KΩ	47.24KΩ	31.48KΩ	19.66KΩ	10.46KΩ	3.11KΩ
Trim	Vout	Vo*101%	Vo*102%	Vo*103%	Vo*104%	Vo*105%	Vo*106%	Vo*107%	Vo*108%	Vo*109%	Vo*110%
up	Rt-u =	486.83KΩ	217.87KΩ	128.21KΩ	83.38KΩ	56.49KΩ	38.56KΩ	25.75KΩ	16.14KΩ	8.67KΩ	2.69KΩ

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Recommended Boardpads

The best overall performance is achieved by using the recommended PCB layout, as shown in the figure below.

