Technical Specification

EUC1D Series

1Watts, 1.5KVDC Isolated DC/DC Converters (SIP8)

FEATURES

- 2:1 standard input range: 4.5-9, 9-18, 18-36, 36-75VDC
- Single and bipolar outputs: 3.3, 5, 12, 15, 24, ±5, ±12, ±15VDC
- Efficiency up to 84% @ full load
- 1.5KVDC isolation
- Industrial standard footprint: SIP8
- OCP and output short circuit protection
- Operating temperature range: -40°C to 85°C
- All material compliance with UL94V-0
- Fully encapsulated, high reliability
- MTBF ⩾ 1M hours

PRODUCT OVERVIEW

The EUC1D modules are highly reliable, and efficient isolated DC/DC converter with industrial potted module technology. Wide temperature range and encapsulated package is ideal for industrial applications. Intended target markets include industrial control, power electronics, instrumentations, medical systems, transportation where power modules must meet rugged environmental requirements, impact size and isolated output voltages are required.

The EUC1D modules provide voltage isolation from input to output up to 1.5KVDC. The operation temperature range is -40℃ to +85℃ . These modules are ideal for applications that do not require any heat-sink or forced air cooling.

The EUC1D series are designed to safety standards UL62368-1.

Models Selections

Basic Models	Input Voltage [VDC]	Input Voltage Range [VDC]	Output Voltage [VDC]	Output Current [mA]	Ripple & Noise [Typ./Max.] [mVp-p] ①	Efficiency Typ. [%]	Capacitive Load Max. [μF]	Package [inch]
EUC1D05S03	5	4.5-9	3.3	303	70/100	68	1800	SIP8
EUC1D05S05	5	4.5-9	5	200		73	2200	
EUC1D05S12	5	4.5-9	12	83		77	681	
EUC1D05S15	5	4.5-9	15	67		74	470	
EUC1D05S24	5	4.5-9	24	42		76	330	
EUC1D05B05	5	4.5-9	±5	±100		74	±1000	
EUC1D05B12	5	4.5-9	±12	±42		77	±470	
EUC1D05B15	5	4.5-9	±15	±33		77	±330	
EUC1D12S03	12	9-18	3.3	303	100/150	75	2700	
EUC1D12S05	12	9-18	5	200		76	2200	
EUC1D12S12	12	9-18	12	83		82	680	
EUC1D12S15	12	9-18	15	67		83	471	
EUC1D12S24	12	9-18	24	42		81	330	
EUC1D12B05	12	9-18	±5	±100		78	±1000	
EUC1D12B12	12	9-18	±12	±42		79	±470	
EUC1D12B15	12	9-18	±15	±33		80	±330	

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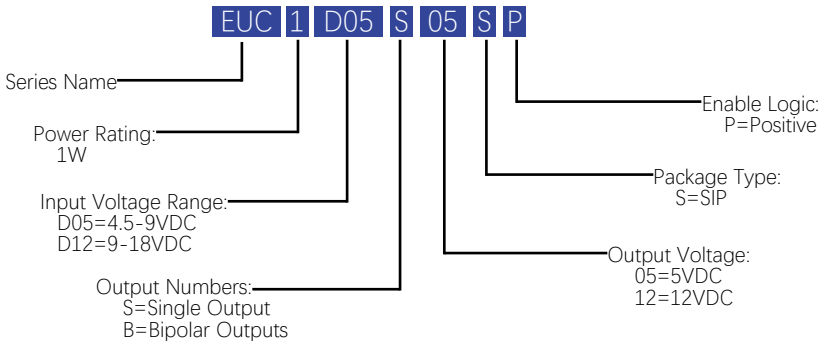
EUC1D24S03	24	18-36	3.3	303	70/100	74	2700	SIP8
EUC1D24S05	24	18-36	5	200		81	2200	
EUC1D24S12	24	18-36	12	83		83	680	
EUC1D24S15	24	18-36	15	67		83	470	
EUC1D24S24	24	18-36	24	42		83	330	
EUC1D24B05	24	18-36	±5	±100		79	±1000	
EUC1D24B12	24	18-36	±12	±42		83	±470	
EUC1D24B15	24	18-36	±15	±33		83	±330	
EUC1D48S03	48	36-75	3.3	303	100/150	75	2700	
EUC1D48S05	48	36-75	5	200		76	2200	
EUC1D48S12	48	36-75	12	83		80	680	
EUC1D48S15	48	36-75	15	67		84	470	
EUC1D48B05	48	36-75	±5	±100		79	±1000	
EUC1D48B12	48	36-75	±12	±42		82	±470	
EUC1D48B15	48	36-75	±15	±33		82	±330	

Note:

① For output ripple & noise test conditions, please see output ripple & noise in technical notes on page 7 for details.

Model Numbering



Absolute Maximum Ratings					
Parameters	Conditions	Min.	Typ.	Max.	Units
Input Voltage (<100mS)	5 Vin type	-0.7		12	VDC
	12 Vin type	-0.7		25	VDC
	24 Vin type	-0.7		50	VDC
	48 Vin type	-0.7		100	VDC
Operating Environment Temperature		-40		85	°C
Storage Temperature Range		-55		105	°C
Soldering Temperature	Wave soldering < 10s			300	°C
Relative Humidity				95	%RH

General Specifications					
Parameters	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	Input to output, 1mA, 1 minute	1500			VDC
Isolation Resistance	Input to output, Viso=500VDC	1000			MΩ
Isolation Capacitance	Input to output, 100KHz/0.1V		120		pF
Remote On/Off Control	Positive Logic, ON state	Open or 3.5 ≤ Vr ≤ 12			VDC
	Positive Logic, OFF state	Short or 0 ≤ Vr ≤ 0.7			VDC
Switching Frequency		150	208	300	KHz
Cooling	Free air convection				

Input Specifications					
Parameters	Conditions	Min.	Typ.	Max.	Units
Input Voltage Range	As shown in the "Models Selections"				
Input Current @ No Load	5V input type		40	60	mA
	12V input type		15	30	mA
	24V input type		6	10	mA
	48V input type		4	6	mA
Input Current @ Min. Line	5V input type		281		mA
	12V input type		111		mA
	24V input type		55		mA
	48V input type		27		mA
Reflected Ripple Current	5V input type		30		mA
	12V input type		40		mA
	24V input type		55		mA
	48V input type		4		mA

Output Specifications					
Parameters	Conditions	Min.	Typ.	Max.	Units
Vout Accuracy	5% to 100% load, min. line to max. line	-3.0		+3.0	%
Vout Accuracy @ No Load	Min. line to max. line	-5.0		+5.0	%
Line Regulation		-0.5		+0.5	%
Load Regulation	5% to 100% load	-1.0		+1.0	%
Temperature Coefficient		-0.03		+0.03	% of Vout /°C
Over Current Protection		110	140		%
Output Short Protection	Continuous, auto-recover				
Dynamic Load Peak Deviation ①		-5.0		+5.0	%
Dynamic Load Response			0.5	2	ms
Minimum Load ②		0			%

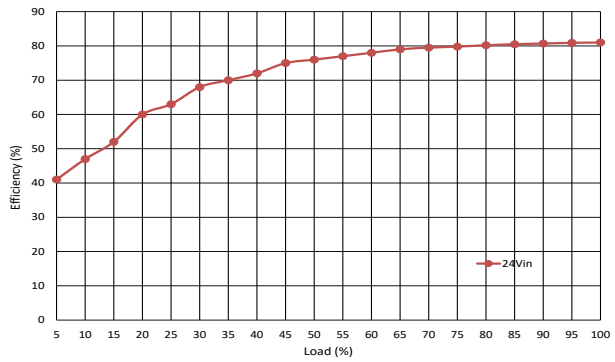
Notes
① Load is set from 50%-75%-50% of full load, di/dt=0.1A/μS.
② Operating below 5% load will not harm the converter, but specifications may not be met, such as the output voltage may be higher than rated output voltage.

All specifications are tested at 25 ℃ ambient temperature, nominal input voltage, rated output current conditions unless otherwise specified.

Performance Data

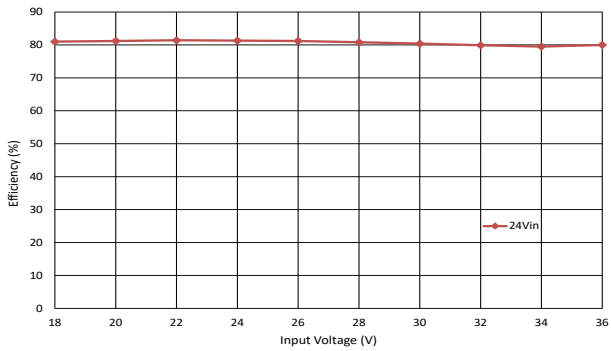
EFFICIENCY VS LOAD

EUC1D24S05 Module

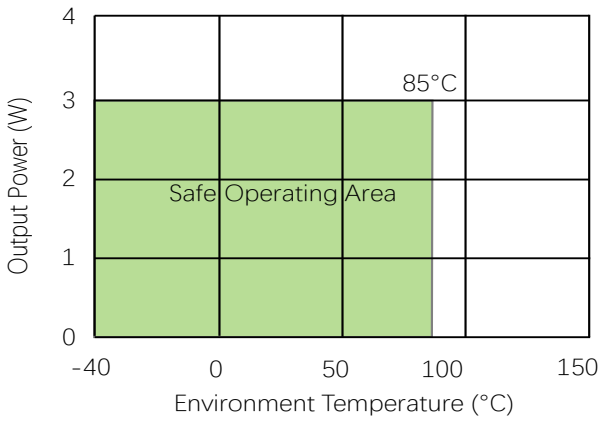


EFFICIENCY VS INPUT VOLTAGE

EUC1D24S05 Module

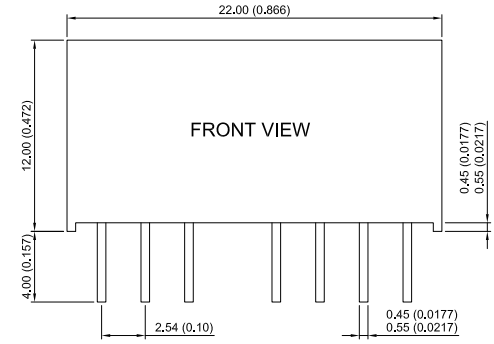


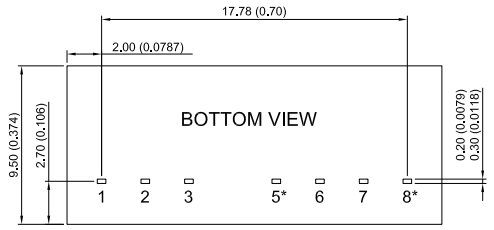
TEMPERATURE DERATING



Mechanical Specifications

MECHANICAL DIMENSIONS

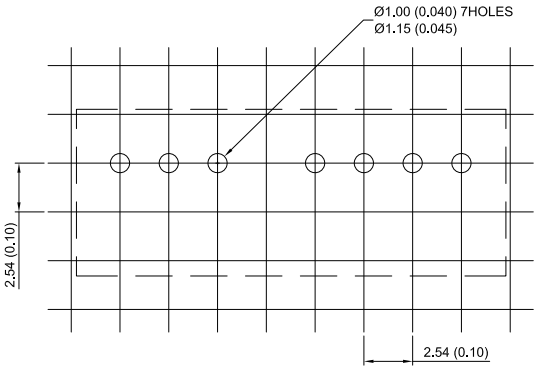




*Pin can not connect with any external circuit.
Unless otherwise specified, all dimensions are in mm±0.25 (inches ±0.01).
Pin:
Material: Copper alloy
Finish: Tin 3μm (min.) over nickel 1μm (min.)

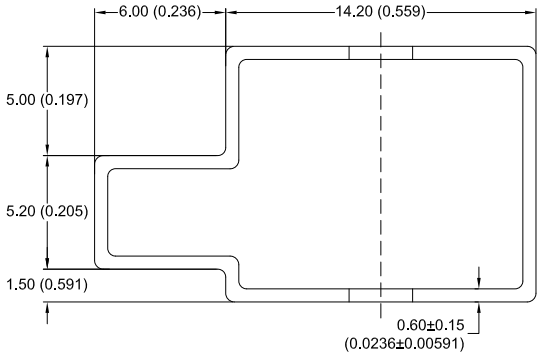
PIN Connections			
Single Output		Bipolar Outputs	
Pin	Function	Pin	Function
1	GND	1	GND
2	Vin	2	Vin
3	CTRL	3	CTRL
5*	NC	5*	NC
6	+Vout	6	+Vout
7	-Vout	7	Common
8*	NC	8	-Vout

RECOMMENDED FOOTPRINT DETAILS



Unless otherwise specified, all dimensions are in mm ±0.5 (inches±0.02).

TUBE OUTLINE DIMENSIONS



Tube length: 520mm±2mm (20.47)
Tube quantity: 23pcs
Unless otherwise specified, all dimensions are in mm ±0.5 (inches±0.02).

Technical Notes

INPUT FUSING

Certain applications may require fuse at the inputs of power conversion components. Fuses should also be used when there is possibility of sustained input voltage reversal which is not current limited. The EUC1D modules are not internally fused. We strongly recommend a fast blow fuse to be used in the ungrounded input supply line.
For safety agency approvals, the installer must install the converter in compliance with the end user safety standard.

OUTPUT RIPPLE & NOISE

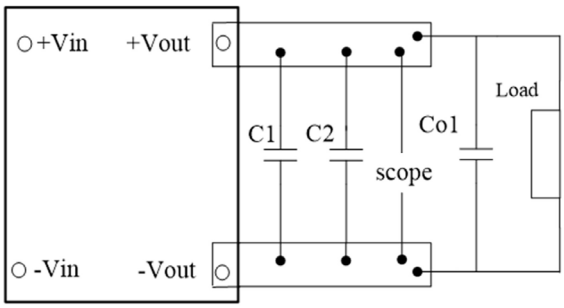


Figure 1· Single Output Type

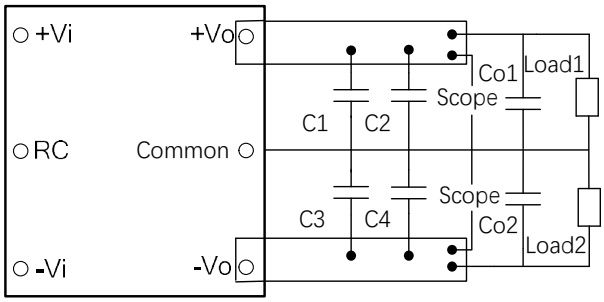


Figure 2· Bipolar Outputs Type

These EUC1D modules output ripple and noise is measured at the rated input voltage and output current, along with 10uF and 0.1uF MLCC are used in parallel with appropriate voltage ratings. The oscilloscope bandwidth is set to 20MHz.
External output capacitors are required to reduce the ripple & noise. The output capacitors should be low ESR and appropriate frequency response with appropriate voltage ratings, and must be located as close to the converters as possible, also particular load and layout must be taken into consideration.

ISOLATION VOLTAGE

EUC1D modules are 100% production tested at their specified isolation voltage. Parts can be expected to withstand the specified test voltage several times. But it is well known that repeated high-voltage isolation testing will degrade isolation capability which is depending on materials, construction and environment. Thus, the number of tests should be strictly limited and we strongly advise against repeated high voltage isolation testing.

PIN 3 (CTRL)

Module Power Remote Control or called ON/ OFF pin is for the user to control the power output. EUC1D series adpot positive logic control. Recommend to use optocoupler to control remote pin as below.

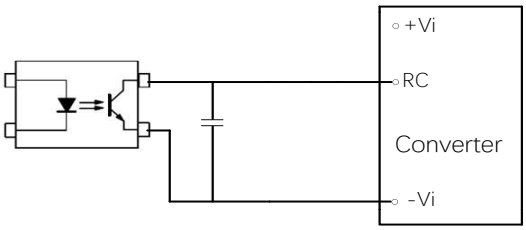


Figure 3· Remote Control Circuit

Remote Control Pin can be connected in parallel for multiple converters which with the same Remote Control characters. However, when several converters share the same remote control circuit, the total sink and source current must be taken into consideration, and make sure that the optocoupler has enough drive capability.
To reduce external PCB trace interference, it is

Technical Notes

recommended to add high frequency bypass capacitor between RC pin and -Vi, recommended capacitor value is 100-1000pF.