

Size: 0.77in x 0.24in x 0.4in
(19.65mm x 6mm x 10.16mm)

FEATURES

- Fixed Input Voltage
- Unregulated Outputs
- High Efficiency
- Industry Standard Pin-Out
- No Load Input Current as Low as 8mA
- Continuous Short Circuit Protection
- I/O Isolation Test Voltage: 3KVDC
- RoHS Compliant
- IEC62368-1, UL62368-1, EN62368-1, and BS EN 62365-1 Safety Approvals

DESCRIPTION

The LANM series of isolated DC/DC converters offers 1 watt of output power in a compact 0.77" x 0.24" x 0.4" through hole package. This series consists of unregulated single and dual output models with a fixed input voltage. Each model features high efficiency, industry standard pin-out, and continuous short circuit protection. This series is also RoHS compliant and has IEC62368-1, UL62368-1, EN62368-1, and BS EN 62365-1 safety approvals.

MODEL SELECTION TABLE

Single Output Models

Model Number	Input Voltage Range	Output Voltage	Output Current		Efficiency		Output Power	Maximum Capacitive Load	Certification
			Min.	Max.	Min.	Typ.			
LANM0303NSH	3.3VDC (2.97-3.63VDC)	3.3VDC	30mA	303mA	75%	79%	1W	2400µF	-
LANM0305NSH		5VDC	20mA	200mA	78%	82%		2400µF	
LANM0309NSH		9VDC	11mA	111mA	81%	85%		1000µF	
LANM0312NSH		12VDC	8mA	83mA	78%	82%		560µF	
LANM0315NSH		15VDC	7mA	67mA	78%	82%		560µF	
LANM0324NSH		24VDC	4mA	42mA	80%	84%		220µF	
LANM0503NSH	5VDC (4.5-5.5VDC)	3.3VDC	30mA	303mA	70%	74%	1W	2400µF	UL/EN/BS EN/IEC
LANM0505NSH		5VDC	20mA	200mA	78%	82%		2400µF	
LANM0509NSH		9VDC	12mA	111mA	79%	83%		1000µF	
LANM0512NSH		12VDC	9mA	84mA	79%	83%		560µF	
LANM0515NSH		15VDC	7mA	67mA	79%	83%		560µF	
LANM0524NSH		24VDC	4mA	42mA	81%	85%		220µF	
LANM0909NSH	9VDC (8.1-9.9VDC)	9VDC	12mA	111mA	77%	81%	1W	470µF	-
LANM1203NSH	12VDC (10.8-13.2VDC)	3.3VDC	30mA	303mA	71%	75%	1W	2400µF	UL/EN/BS EN/IEC
LANM1205NSH		5VDC	20mA	200mA	76%	80%		2400µF	
LANM1209NSH		9VDC	12mA	111mA	76%	80%		1000µF	
LANM1212NSH		12VDC	9mA	83mA	76%	80%		560µF	
LANM1215NSH		15VDC	7mA	67mA	77%	81%		560µF	
LANM1224NSH		24VDC	5mA	42mA	77%	81%		220µF	
LANM1505NSH	15VDC (13.5-16.5VDC)	5VDC	20mA	200mA	76%	80%	1W	2400µF	UL/EN/BS EN/IEC
LANM1509NSH		9VDC	12mA	111mA	76%	80%		1000µF	
LANM1512NSH		12VDC	9mA	83mA	76%	80%		560µF	
LANM1515NSH		15VDC	7mA	67mA	77%	81%		560µF	
LANM1524NSH		24VDC	5mA	42mA	77%	81%		220µF	
LANM2403NSH	24VDC (21.6-26.4VDC)	3.3VDC	30mA	303mA	69%	75%	1W	2400µF	UL/EN/BS EN/IEC
LANM2405NSH		5VDC	20mA	200mA	73%	79%		2400µF	
LANM2472NSH		7.2VDC	13mA	139mA	74%	80%		1000µF	-
LANM2409NSH		9VDC	12mA	111mA	74%	80%		1000µF	
LANM2412NSH		12VDC	9mA	83mA	75%	81%		560µF	UL/EN/BS EN/IEC
LANM2415NSH		15VDC	7mA	67mA	75%	81%		560µF	
LANM2424NSH		24VDC	5mA	42mA	75%	81%		220µF	

MODEL SELECTION TABLE
Dual Output Models

Model Number	Input Voltage Range	Output Voltage	Output Current		Efficiency		Output Power	Maximum Capacitive Load ⁽¹⁾	Certification
			Min.	Max.	Min.	Typ.			
LANM0303NDH	3.3VDC (2.97-3.63VDC)	±3.3VDC	±15mA	±150mA	74%	78%	1W	1200µF	-
LANM0305NDH		±5VDC	±10mA	±100mA	78%	82%		1200µF	
LANM0309NDH		±9VDC	±6mA	±56mA	81%	85%		470µF	
LANM0312NDH		±12VDC	±5mA	±42mA	78%	82%		220µF	
LANM0315NDH		±15VDC	±4mA	±34mA	78%	82%		220µF	
LANM0324NDH		±24VDC	±2mA	±21mA	80%	84%		100µF	
LANM0503NDH	5VDC (4.5-5.5VDC)	±3.3VDC	±15mA	±150mA	70%	74%	1W	1200µF	EN/BS EN
LANM0505NDH		±5VDC	±10mA	±100mA	78%	82%		1200µF	
LANM0509NDH		±9VDC	±6mA	±56mA	79%	83%		470µF	UL/EN/BS EN/IEC
LANM0512NDH		±12VDC	±5mA	±42mA	79%	83%		220µF	
LANM0515NDH		±15VDC	±4mA	±34mA	79%	83%		220µF	
LANM0524NDH		±24VDC	±3mA	±21mA	81%	85%		100µF	
LANM0303NDH	12VDC (10.8-13.2VDC)	±3.3VDC	±15mA	±152mA	71%	75%	1W	1200µF	UL/EN/BS EN/IEC
LANM1205NDH		±5VDC	±10mA	±100mA	76%	80%		1200µF	
LANM1209NDH		±9VDC	±5mA	±56mA	76%	80%		470µF	-
LANM1212NDH		±12VDC	±5mA	±42mA	77%	81%		220µF	
LANM1215NDH		±15VDC	±4mA	±34mA	77%	81%		220µF	UL/EN/BS EN/IEC
LANM1224NDH		±24VDC	±2mA	±21mA	76%	80%		100µF	
LANM1505NDH	15VDC (13.5-16.5VDC)	±5VDC	±10mA	±100mA	76%	80%	1W	1200µF	UL/EN/BS EN/IEC
LANM1509NDH		±9VDC	±5mA	±56mA	76%	80%		470µF	
LANM1512NDH		±12VDC	±5mA	±42mA	76%	80%		220µF	UL/EN/BS EN/IEC
LANM1515NDH		±15VDC	±4mA	±34mA	77%	81%		220µF	
LANM1524NDH		±24VDC	±2mA	±21mA	77%	81%		100µF	-
LANM2403NDH	24VDC (21.6-26.4VDC)	±3.3VDC	±15mA	±150mA	72%	76%	1W	1200µF	-
LANM2405NDH		±5VDC	±10mA	±100mA	74%	80%		1200µF	UL/EN/BS EN/IEC
LANM2409NDH		±9VDC	±5mA	±56mA	74%	80%		470µF	
LANM2412NDH		±12VDC	±5mA	±42mA	75%	81%		220µF	UL/EN/BS EN/IEC
LANM2415NDH		±15VDC	±4mA	±34mA	73%	79%		220µF	
LANM2424NDH		±24VDC	±2mA	±21mA	74%	80%		100µF	

SPECIFICATIONS

All specifications are based on Ta=25°C, Humidity <75%RH, Nominal Input Voltage, and Rated Output 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				See Table					
Input Current	No Load	3.3V Input	3.3V Output		10		mA		
			Other Outputs		18				
		5V Input	3.3V/5V Output		8				
			9V/12V Output		12				
			15V/24V Output		18				
		9V Input		8					
		12V Input	3.3V Output		8				
			5V/9V Output		8				
			12V/15V Output		8				
			24V Output		8				
		15V Input	5V/9V/12V Output		8				
			15V/24V Output		8				
		24V Input	3.3V Output		8				
			5V/9V/24V Output		88				
			12V Output		8				
			15V Output		8				
		Full Load	3.3V Input	3.3V Output		384		405	mA
				Other Outputs		370		389	
	5V Input		3.3V/5V Output		270	286			
			9V/12V Output		241	254			
			15V/24V Output		241	254			
	9V Input			137	144				
	12V Input		3.3V Output		112	118			
			5V/9V Output		105	110			
			12V/15V Output		103	109			
			24V Output		105	110			
	15V Input		5V/9V/12V Output		84	88			
			15V/24V Output		83	87			
	24V Input		3.3V Output		55	58			
			5V/9V/24V Output		53	57			
			12V Output		53	56			
		15V Output		53	58				
	Reflected Ripple Current ⁽²⁾					15		mA	
Surge Voltage (1 sec. Max.)	3.3V Input			-0.7		5	VDC		
	5V Input			-0.7		9			
	9V Input			-0.7		12			
	12V Input			-0.7		18			
	15V Input			-0.7		21			
	24V Input			-0.7		30			
Input Filter				Capacitance Filter					
Hot Plug				Unavailable					
OUTPUT SPECIFICATIONS									
Output Voltage				See Table					
Voltage Accuracy				See Output Regulation Curves (Fig. 1)					
Line Regulation	Input Voltage Change: ±1%	3.3V Output				1.5	-		
		Others				1.2			
Load Regulation	3.3V Input, 10% - 100%	3.3V Output			12	18	%		
		Others			8	15			
	5V Input, 10% - 100%	3.3V Output			15	20			
		5V Output			10	15			
		9V Output			8	10			
		12V Output			7	10			
		15V Output			6	10			
		24V Output			5	10			
		3.3V Output			15	20			
	9/12/15/24V Input, 10% - 100%	5V Output			10	15			
Others				8	10				
Output Power				See Table					
Output Current				See Table					

SPECIFICATIONS

All specifications are based on Ta=25°C, Humidity <75%RH, Nominal Input Voltage, and Rated Output Load unless otherwise noted.
We reserve the right to change specifications based on technological advances.

SPECIFICATION		TEST CONDITIONS		Min	Typ	Max	Unit
OUTPUT SPECIFICATIONS (Cont.)							
Maximum Capacitive Load	Tested at input voltage range and full load			See Table			
Ripple & Noise ⁽³⁾	20MHz bandwidth	24V Output		50	100	mVp-p	
		Others		30	75		
Temperature Coefficient	Full Load			±0.02		%/°C	
PROTECTION							
Short Circuit Protection				Continuous, Self-Recovery			
ENVIRONMENTAL SPECIFICATIONS							
Operating Temperature	5VDC Input	Derating when operating temperature ≥85°C (See Fig. 2)		-40		105	°C
	Other Inputs	Derating when operating temperature ≥100°C (See Fig. 2)		-40		105	
Storage Temperature				-55		125	°C
Case Temperature Rise	Ta=25°C				25		°C
Storage Humidity	Non-Condensing	3.3V/5V Input				95	%RH
		Other Input		5		95	
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds					300	°C
Vibration	9/12/15/24V Input			10-150Hz, 5G, 0.75mm, along X, Y, and Z			
MTBF	MIL-HDBK-217F@25°C			3500			kHours
GENERAL SPECIFICATIONS							
Efficiency				See Table			
Switching Frequency	Full Load, Nominal Input Voltage	3.3V Input			220		kHz
		5V Input			270		
		9/12/15/24V Input			260		
Isolation	Input-Output electric strength test for 1 minute with a leakage current of 1mA max.			3000			VDC
Insulation Resistance	Input-Output resistance at 500VDC			1000			MΩ
Isolation Capacitance	Input-Output Capacitance at 100kHz/0.1V				20		pF
PHYSICAL SPECIFICATIONS							
Weight				0.07oz (2.1g) Typ.			
Dimensions (L x W x H)				0.77in x 0.24in x 0.4in (19.65mm x 6mm x 10.16mm)			
Case Material	Black Plastic			Flame Retardant & Heat Resistant (UL94 V-0)			
Cooling Method				Free Air Convection			
SAFETY CHARACTERISTICS							
Safety Approvals ⁽⁴⁾				IEC62368-1, UL62368-1, EN62368-1, EN 62365-1			
Emissions ⁽⁵⁾	CE	CISPR32/EN55032		Class B			
	RE	CISPR32/EN55032		Class B			
Immunity ⁽⁵⁾	ESD	IEC/EN61000-4-2	Air ±8kV, Contact ±6kV	Perf. Criteria B			

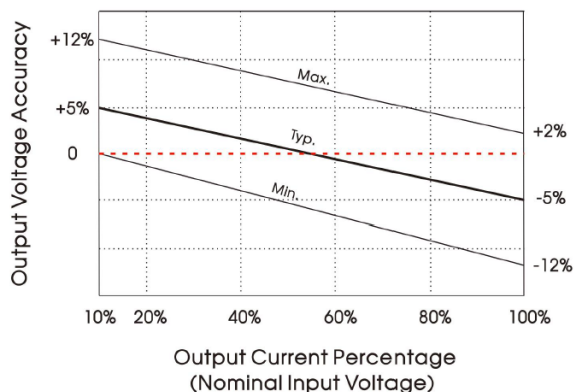
NOTES

- The specified maximum capacitive load for positive and negative output is identical.
- For reflected ripple current testing method and specific operation, please contact factory.
- Parallel Cable method is used for ripple and noise test, please contact factory for more information.
- This product is Listed to applicable standards and requirements by UL.
- Refer to Fig. 4 for recommended Circuit Test.
- If the product is not operated within the required load range, product performance cannot be guaranteed to comply with all parameters in the datasheet.
- Product customization is available, contact factory for more information.
- Product should be classified according to ISO14001 and related environmental laws and regulations and should be handled by qualified units.

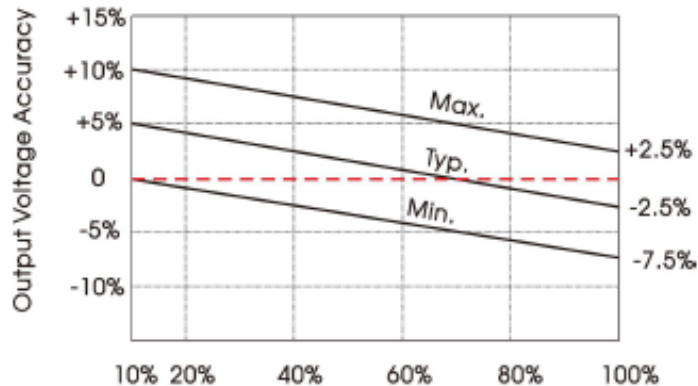
*Due to advances in technology, specifications subject to change without notice.

TYPICAL PERFORMANCE CURVES

3.3VDC Output
Output Regulation Curve



5VDC Input, Other Outputs
Output Regulation Curve



.3/9/12/15/24V Input, Other Outputs
Output Regulation Curve

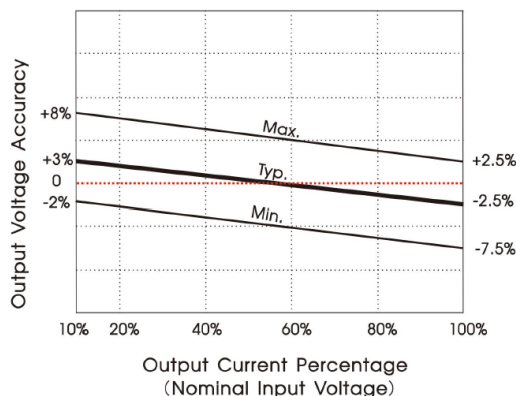
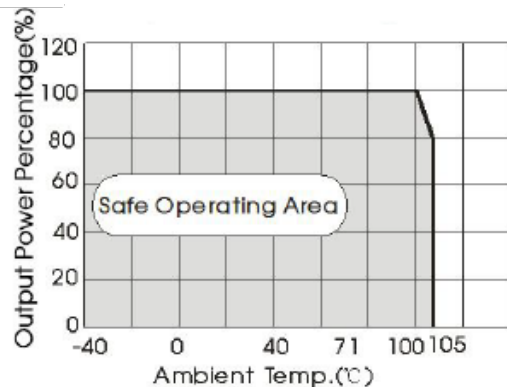


Fig. 1

3.3/9/12/15/24VDC Input Temperature Derating Curve



5VDC Input
Temperature Derating Curve

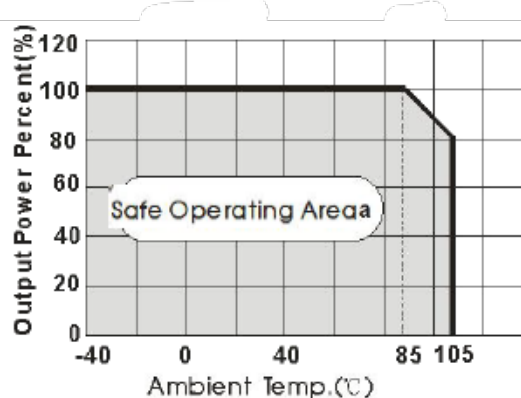
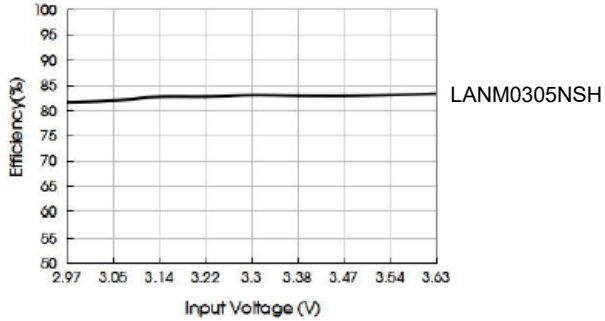


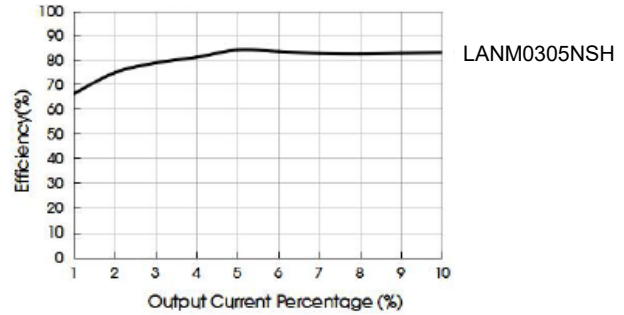
Fig. 2

EFFICIENCY GRAPHS

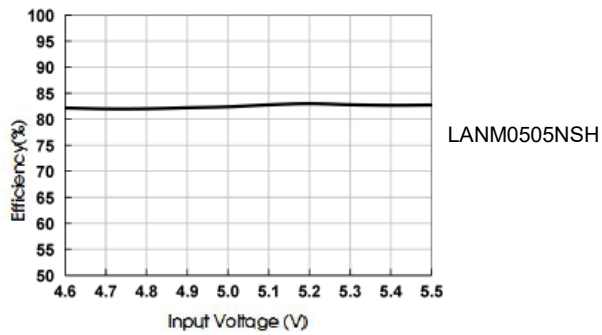
Efficiency vs. Input Voltage (Full Load)



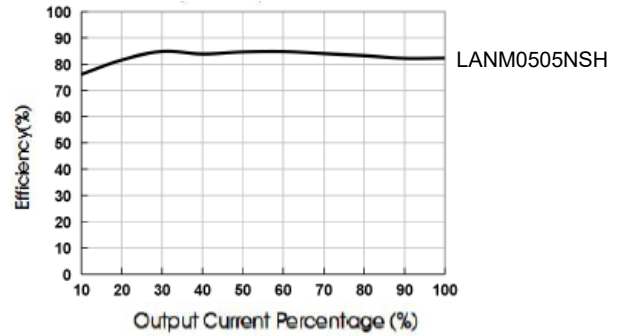
Efficiency vs. Output Load (Vin=3.3V)



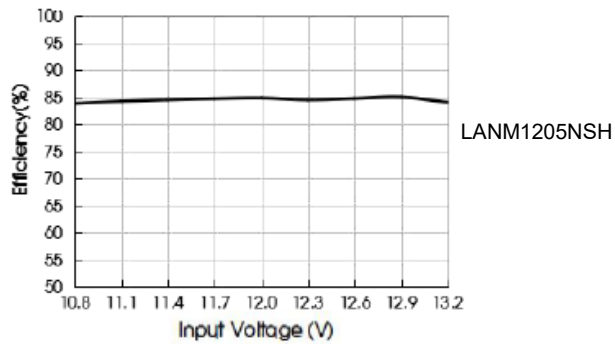
Efficiency vs. Input Voltage (Full Load)



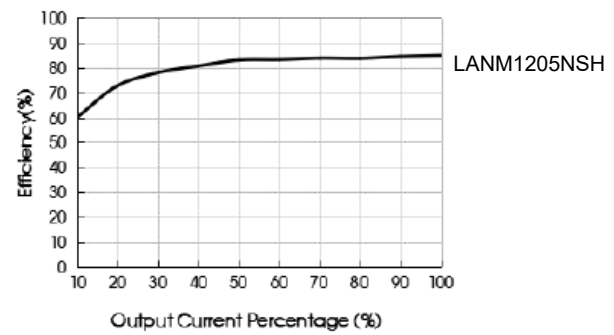
Efficiency vs. Output Load (Vin=5V)



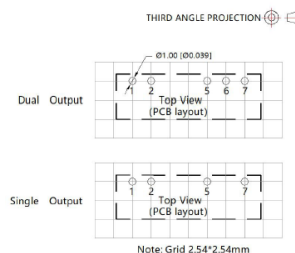
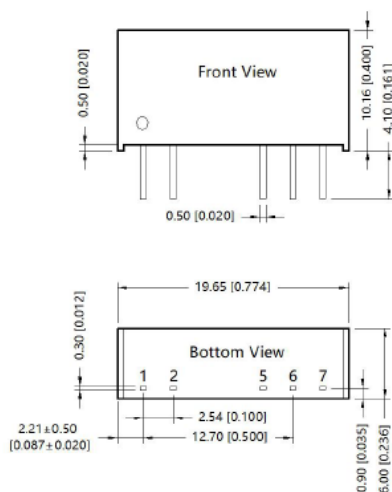
Efficiency vs. Input Voltage (Full Load)



Efficiency vs. Output Load (Vin=12V)



MECHANICAL DRAWINGS



Pin-Out		
Pin	Single	Dual
1	Vin	Vin
2	GND	GND
5	0V	-Vo
6	No Pin	0V
7	+Vo	+Vo

Note:
Unit: mm[inch]
Pin Section Tolerances: ±0.10 [±0.004]
General Tolerances: ±0.25 [±0.010]

DESIGN REFERENCE

1. Typical Application

Input and/or output ripple can be further reduced by connecting a filter capacitor from the input and/or output terminal to ground as shown in Fig. 3.

Choosing suitable filter capacitor values is very important for a smooth operation of the modules, particularly to avoid start-up problems caused by capacitor values that are too high. For recommended input and output capacitor values, refer to Table 1.

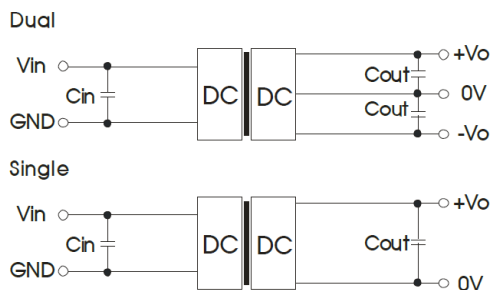


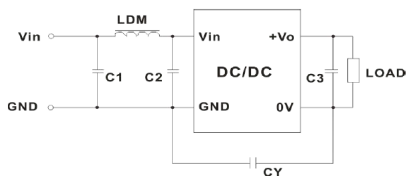
Fig. 3

Table 1: Recommended Input and Output Capacitor Values

Vin	Cin	Single Output	Cout	Dual Output	Cout
3.3VDC	10μF/16V	3.3VDC	10μF/16V	±3.3VDC	4.7μF/16V
5VDC	4.7μF/16V	5VDC	10μF/16V	±5VDC	4.7μF/16V
9VDC	2.2μF/25V	7.2VDC	2.2μF/16V	±9VDC	1μF/16V
12VDC	2.2μF/25V	9VDC	2.2μF/16V	±12VDC	1μF/16V
15VDC	2.2μF/25V	12VDC	2.2μF/25V	±15VDC	0.47μF/25V
24VDC	1μF/50V	15VDC	1μF/25V	±24VDC	0.47μF/25V
-	-	24VDC	1μF/50V	-	-

2. EMC Compliance Circuit

Single



Dual

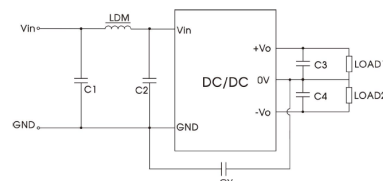


Fig. 4

Table 2: EMC Recommended Circuit Value Table

Input Voltage		3.3VDC		5VDC		Other Input
Output Voltage		3.3/5VDC	9/12/15/24VDC	3.3/5/9VDC	12/15/24VDC	-
EMI	C1/C2	4.7μF/16V	4.7μF/16V	4.7μF/25V	4.7μF/25V	4.7μF/50V
	CY	-	270pF/4kVDC, VISHAY HZ102MBP, TDK CD45-E2GA102M-GKA	100pF/4kV	1000pF/4kV	270pF/3kVDC
	C3/C4	Refer to COUT in Table 1				
	LDM	6.8μH				

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

©2023 Wall Industries, Inc. Specifications subject to change without notice. Wall Industries is not responsible for typographical errors. The information contained herein is for informational purposes only. This information is provided by Wall Industries and we make no representations or warranties of any kind, express or implied, about the completeness, accuracy, reliability, suitability or availability with respect to the information contained in this document for any purpose. All product and manufacturer names are trademarks or registered trademarks of their respective companies.