1W SMD
Unregulated DC/DC Converter

LCA1W Series

Learn More

Description

The LCA1W series is a compact 1W isolated DC-DC converter housed in a SMD package, supporting wide nominal input voltages of 3.3V, 5V, 12V, 15V and 24V DC. It provides stable single outputs from 3.3V to 15V with efficiencies up to 85.5%, high isolation up to 6kVDC, and reliable operation from −40°C to +105°C. Designed to meet UL62368-1, IEC62368-1, and EN55032 standards, it is ideal for industrial control and battery management system applications.

Features

- 1 Watt output power
- 8/10 pin SMD package
- 1:1 input voltage range
- -40˚C to +105˚C operating temperature
- Efficiency up to 85.5%
- 1KVDC, 2KVDC, and 3KVDC Isolation

Applications

- Industry Control
- Cost Effective Solution

Model Numbering

LCA 1W- 05 33 - D H3 P - R

- R → Packing: Tape and Reel
- P → Short circuit Protection
- H3 → Isolation: 3KVDC
- D → Output Voltage: (±) output voltage
- 33 → Output Voltage: 3.3V / 5V / 12V
- 05 → Input Voltage: 5V / 12V / 24V
- 1W → Wattage: 1 W
- LCA → Series Name

No. 90, Jian 1st Rd., Zhonghe Dist., New Taipei City 23545, Taiwan

Model Selection Guide

Part No.	Input Voltage	Output Voltage	Output Current @ Full Load	Efficiency (1) (Typ.)		Capacitor Load (2) (Max.)	
				No suffix "P"	Add suffix "P"	No suffix "P"	Add suffix "P"
LCA1W-3.33.3	3.3 VDC	3.3 VDC	303 mA	73.0%	73.0%	1000μF	470μF
LCA1W-3.305		5 VDC	200 mA	78.9%	75.9%	1000μF	470μF
LCA1W-3.312		12 VDC	84 mA	82.5%	79.5%	220μF	100μF
LCA1W-3.315		15 VDC	57 mA	85.5%	80.0%	220μF	100μF
LCA1W-3.33.3D		±3.3 VDC	±152 mA	77.0%	74.0%	±470μF	±150μF
LCA1W-3.305D		±5 VDC	±100 mA	79.0%	76.0%	±470μF	±150μF
LCA1W-3.309D		±9 VDC	±56 mA	79.0%	76.0%	±220μF	±100μF
LCA1W-3.312D		±12 VDC	±42 mA	79.0%	76.0%	±100μF	±47μF
LCA1W-3.315D		±15 VDC	±34 mA	79.0%	76.0%	±100μF	±47μF
LCA1W-053.3	5 VDC	3.3 VDC	303 mA	77.0%	74.0%	1000μF	470μF
LCA1W-0505		5 VDC	200 mA	77.8%	74.8%	1000μF	470μF
LCA1W-3.309		9 VDC	112 mA	78.0%	75.5%	470μF	220μF
LCA1W-0512		12 VDC	84 mA	78.5%	75.5%	220μF	100μF
LCA1W-0515		15 VDC	57 mA	79.4%	76.4%	220μF	100μF
LCA1W-053.3D		±3.3 VDC	±152 mA	77.0%	74.0%	±470μF	±150μF
LCA1W-0505D		±5 VDC	±100 mA	78.0%	75.0%	±470μF	±150μF
LCA1W-0509D		±9 VDC	±56 mA	78.0%	75.0%	±220μF	±100μF
LCA1W-0512D		±12 VDC	±42 mA	79.0%	76.0%	±100μF	±47μF
LCA1W-0515D		±15 VDC	±34 mA	77.0%	74.0%	±100μF	±47μF
LCA1W-123.3	12 VDC	3.3 VDC	303 mA	74.0%	74.0%	1000μF	470μF
LCA1W-1205		5 VDC	200 mA	73.5%	80.0%	1000μF	470μF
LCA1W-1209		9 VDC	112 mA	78.5%	75.5%	470μF	220μF
LCA1W-1212		12 VDC	84 mA	80.0%	77.0%	220μF	100μF
LCA1W-1215		15 VDC	57 mA	83.0%	80.0%	220μF	100μF
LCA1W-123.3D		±3.3 VDC	±152 mA	74.0%	71.0%	±470μF	±150μF

LCA1W-1205D		±5 VDC	±100 mA	75.0%	72.0%	±470μF	±150μF
LCA1W-1209D		±9 VDC	±56 mA	80.0%	77.0%	±220μF	±100μF
LCA1W-1212D		±12 VDC	±42 mA	84.0%	81.0%	±100μF	±47μF
LCA1W-1215D		±15 VDC	±34 mA	80.0%	77.0%	±100μF	±47μF
LCA1W-1505	15 VDC	5 VDC	200 mA	74.1%	71.1%	1000μF	470μF
LCA1W-1512		12 VDC	84 mA	81.0%	78.0%	220μF	100μF
LCA1W-2405	24 VDC	5 VDC	200 mA	73.5%	70.5%	1000μF	470μF
LCA1W-2412		12 VDC	84 mA	80.0%	77.0%	220μF	100μF
LCA1W-2415		15VDC	67 mA	81.5%	78.5%	220μF	100μF
LCA1W-243.3D		±3.3 VDC	±152 mA	79.0%	76.0%	±470μF	±150μF
LCA1W-2405D		±5 VDC	±100 mA	74.0%	71.0%	±470μF	±150μF
LCA1W-2409D		±9 VDC	±56 mA	79.0%	76.0%	±220μF	±100μF
LCA1W-2412D		±12 VDC	±42 mA	82.0%	79.0%	±100μF	±47μF
LCA1W-2415D		±15 VDC	±34 mA	82.0%	79.0%	±100μF	±47μF

Notes

#1: The efficiency is test by nominal input and max. full load @ 25˚C, the efficiency tolerance is ±3%.

#2: The capacitive load is test by minimum input and constant resistive load.

#3: Add suffix “8” for 8 pins out of 8 fitted, e.g, C1SC8-0512.

#4: Add suffix “H” for isolation 2KVdc, e.g, C1SC-0512H.

Add suffix “H3” for isolation 3KVdc, e.g, C1SC-0512H3.

#5: Add suffix “P” for continuous short circuit protection.

#6: Add suffix “-R” for tape and reel packing.

Electrical Specification

Model Number		LCA1W-☐☐
Input		
Filter		Internal capacitors
Input Voltage Range		+10%
No Load Current	Vin = 3V	60mA (@ others output voltage) 75mA (@ Vo= ±12V / ±15V)
	Vin = 5V	40mA
	Vin = 12V	20mA
	Vin = 15V	15mA
	Vin = 24V	20mA
Output		
Voltage Accuracy		± 5% max.
Minimum Load		0%
Line Regulation		1.2% typ. @1% of Vin
Load Regulation (10% to 100% Load)		15% @ Vo = 3.3V / 5V / ±3.3V / ±5V 10% @ Vo = 9V / 12V / 15V / ±9V / ±12V / ±15V
Ripple & Noise		100 mVp-p @ 20MHz BW (@ nominal Vin)
Operating Frequency		20KHz @ 100% load at nominal Vin
Environment		
Operating Temperature		-40-+105 ˚C
Storage Temperature		-55-+125 ˚C
Max. Case Temperature		120˚C
Relative Humidity		5%-95% RH
Temperature Coefficient		±0.02%/ ˚C
Function		
Isolation Voltage		1 KVDC 1min. Input to Output
		2 KVDC 1min. Add suffix “H”
		3 KVDC 1min. Add suffix “H3”

Isolation Resistance	1GΩ
Isolation Capacitance	75 pF for Single
	80 pF for Dual
	20 pF for Add Suffix “P”
Short Circuit Protection Add Suffix ”P” (Option)	Continuous
MTBF (MIL-HDBK-217F)	2992K Hours (25˚C) for Single
	21.4*10^6 Hours (25˚C) for Dual
	955K Hours (85˚C) for Single
	7.8*10^6 Hours (85˚C) for Dual
Vibration	MIL-STD-202G
Safety Approvals	UL62368-1/ IEC62368-1/ EN55032&35
Physical	
Case Material	UL94V-0 black plastic
Dimension	12.75 (L) x 10.70 (W) x 7.00 (H) mm
	15.24 (L) x 10.70 (W) x 7.00 (H) mm
Weight	1.0 g for Single
	1.2 g for Dual
Electromagnetic Compatibility	
Electromagnetic Interference	EN 55032 (Class A/B)
Electrostatic Discharge	IEC 61000-4-2, Air±8kV; Contact±6kV (Criteria A)
Radiated immunity	IEC 61000-4-3, 3V/m (Criteria A)
Electrical Fast Transient	IEC 61000-4-4, ±1kV (Criteria A)
Surge Immunity	IEC 61000-4-5, ±0.5kV (Criteria A)
Conducted immunity	IEC 61000-4-6, 3Vrms (Criteria A)
Magnetic field immunity	IEC 61000-4-8, 1A/3m@50Hz (Criteria A)

Notes

#1: All specifications valid at nominal input voltage, full load and 25°C unless otherwise stated.

#2: The product information and specifications are subject to change without prior notice.

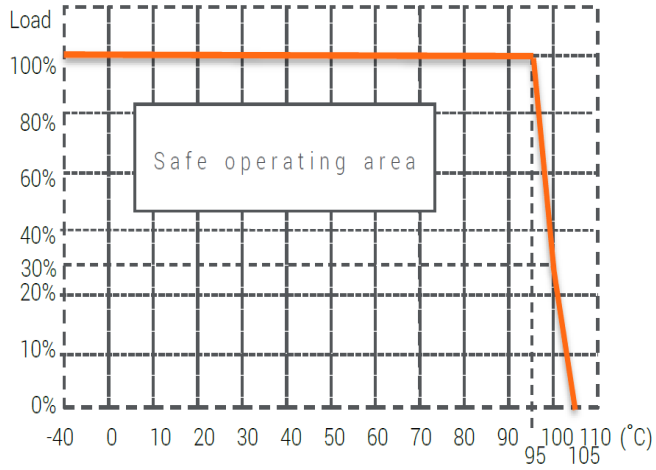
#3: In this datasheet, all test methods are based on our corporate standards.

#4. All characteristics are for listed models, and non-standard models may perform differently.
Please contact our technical support for more detail.

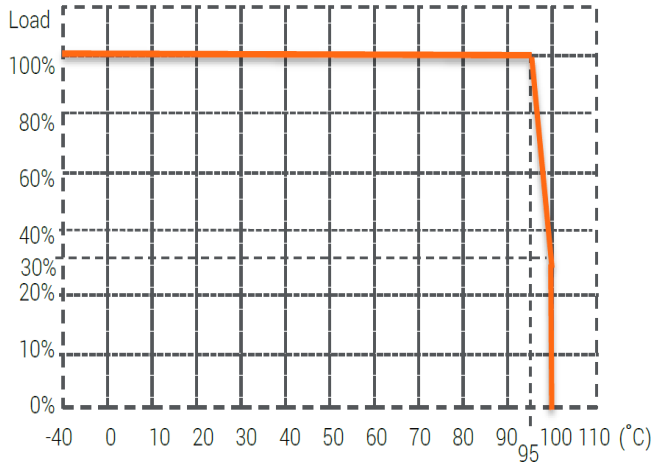
Mechanical Specification

Derating Curve

Others

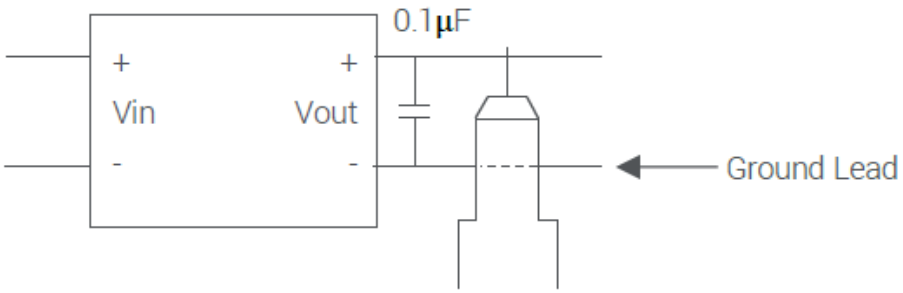


LCA1W-3.312P / LCA1W-3.315P



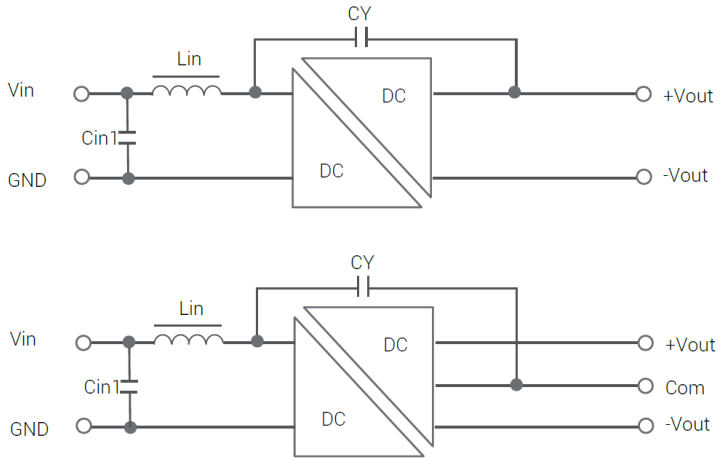
*The derating curve was measured at nominal Vin in chamber with natural convection (20LFM).

Ripple & Noise Measure Method



Measured with 20MHz bandwidth and 0.1μF ceramic capacitor

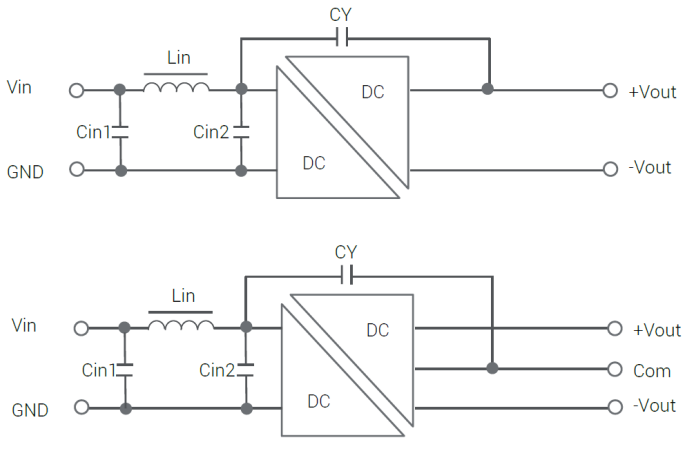
EMI Filtering-Suggestion for Class A



*The external filter for meet EN55032 class A.

Part No.	Input Voltage	Inductance / Capacitance (Lin / Cin1)	CY
LCA1W(D)	3.3V	22 µH / 4.7 µF	NA
	Others	22 µH / 4.7 µF	220P

EMI Filtering-Suggestion for Class B

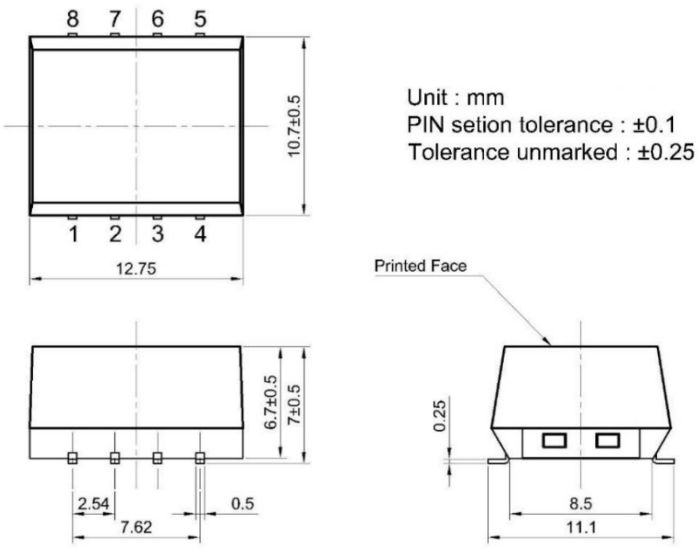


*The external filter for meet EN55032 class B.

Part No.	Input Voltage	Inductance / Capacitance (Lin / Cin1 / Cin2)	CY
LCA1W(D)	3.3V	22 µH / 4.7 µF / 4.7 µF	NA
	Others	22 µH / 4.7 µF / 4.7 µF	220P

Mechanical Dimension & Pinning

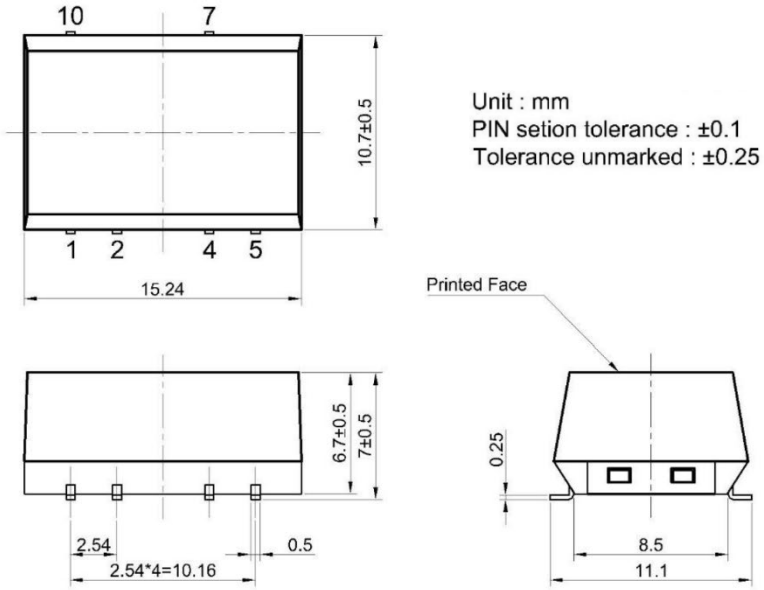
Single



Unit : mm
PIN setion tolerance : ±0.1
Tolerance unmarked : ±0.25

Pin	LCA	C1SC8
1	–Vin	–Vin
2	+Vin	+Vin
3	No Pin	NC
4	–Vout	–Vout
5	+Vout	+Vout
6	No Pin	NC
7	No Pin	NC
8	NC	NC

Dual



Unit : mm
PIN setion tolerance : ±0.1
Tolerance unmarked : ±0.25

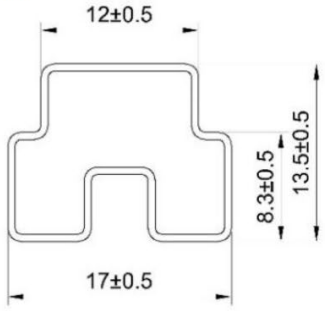
Pin	LCA(D)
1	–Vin
2	+Vin
4	COM
5	-Vout
7	+Vout
10	NC

Package

Anti-static liquid tube

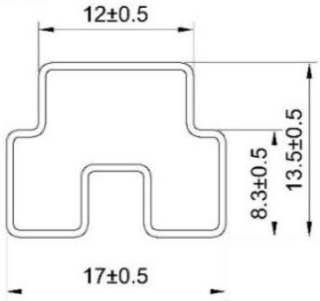
Tube

Single



UNIT:mm
1 Tube = 40 pcs
Length:530±2mm

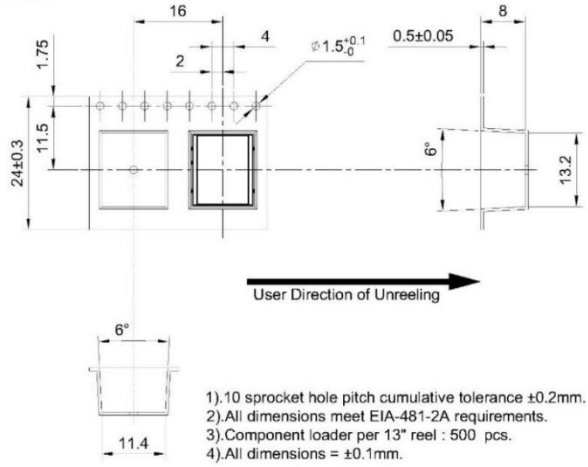
Dual



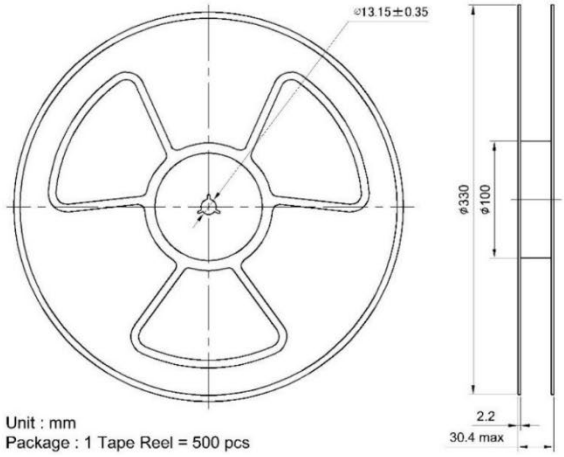
UNIT:mm
1 Tube = 33 pcs
Length:530±2mm

Tape Reel

Single

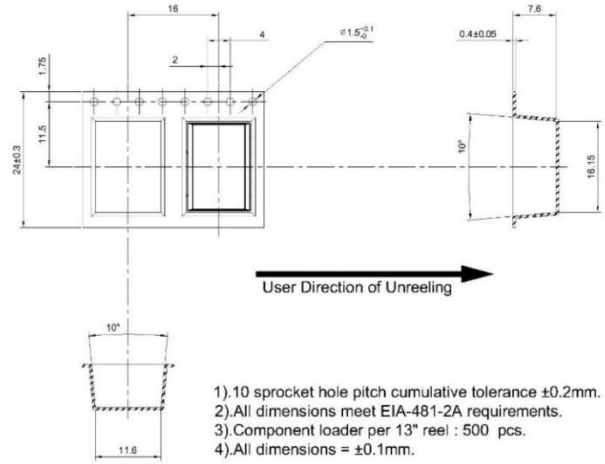


1).10 sprocket hole pitch cumulative tolerance ±0.2mm.
2).All dimensions meet EIA-481-2A requirements.
3).Component loader per 13" reel : 500 pcs.
4).All dimensions = ±0.1mm.

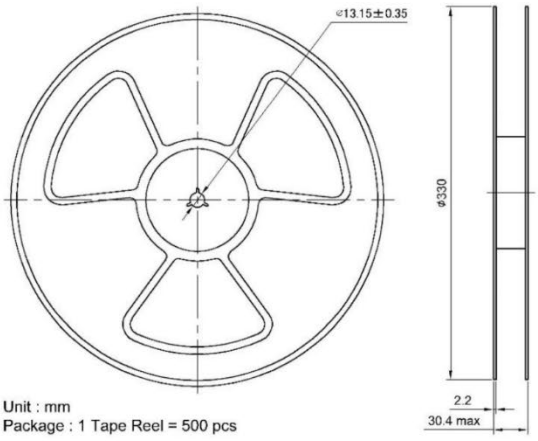


Unit : mm
Package : 1 Tape Reel = 500 pcs

Dual



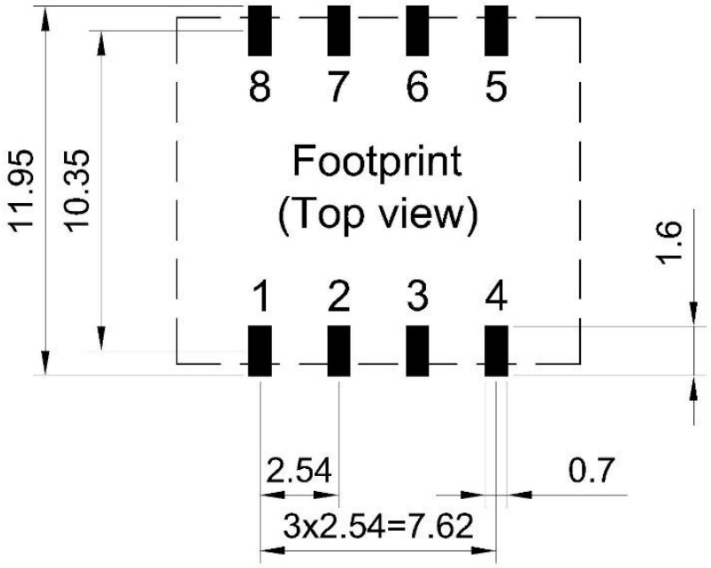
1).10 sprocket hole pitch cumulative tolerance ±0.2mm.
2).All dimensions meet EIA-481-2A requirements.
3).Component loader per 13" reel : 500 pcs.
4).All dimensions = ±0.1mm.



Unit : mm
Package : 1 Tape Reel = 500 pcs

Recommended Footprint

Single



Dual