2D14B1_3UP series

2W - Single/Dual Output DC-DC Converter - Fixed Input - Isolated & Unregulated

DC-DC Converter 2 Watt

- Continuous short-circuit protection
- No-load input current as low as 8mA
- Operating ambient temp. range: -40°C to +105°C
- High efficiency up to 86%
- High power density
- I/O isolation test voltage: 3kVDC
- Industry standard pin-out
- EN62368 approved
- Meets UL62368

The 2D14B1_3UP series are specially designed for applications where an (two) solated voltage is required in a distributed power supply system. They are suitable for: pure digital circuits, low frequency analog circuits, relay-driven circuits and data switching circuits.

Common specifications

Short circuit protection:	Continuous, self-recovery (Derating when operating temperature≥85°C, see Fig. 2)
Operation temperature range:	-40°C~+105°C
Storage temperature range:	-55°C ~+125°C
Storage humidity range:	5 ~ 95%RH (Non-condensing)
Case temperature rise:	25°C TYP (Ta = 25°C)
Lead temperature:	300°C MAX, 1.5mm away from case for 10 sec
Vibration:	10-150Hz, 5G, 0.75mm, along X, Y and Z
MTBF:	>3500 Khours (MIL-HDBK-217F@25°C)
Package material:	Black plastic; flame-retardant and heat-resistant (UL94 V-0)
Cooling:	Free air convection
Dimensions:	20.32 x 10.16 x 8.20 mm
Weight:	2.4g typ.

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input Current (full load / no-load)	• 12V input • 15V input • 24V input		208/8 169/8 104/8	219 178 113	mA mA mA
Reflected Ripple Current			30		mA
Surge voltage (1S max)	• 12V input • 15V input • 24V input	-0.7 -0.7 -0.7		18 21 30	VDC VDC VDC
Input Filter	Capacitance Filter				
Hot Plug	Unavailable				

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Input-output electric strength test for 1 minute with a leakage current of 1mA max.	3000			VDC
Isolation resistance	Input-output resistance at 500VDC	1000			MΩ
Isolation capacitance	Input-output capacitance at 100kHz/0.1V		20		pF

Output specifications

Item	Test condition	Min	Typ	Max	Units
Voltage accuracy	See output regulation curve (Fig. 1)				
Line regulation	For Vin change of ±1% • 3.3VDC output • Others			±1.5 ±1.2	% %
Load regulation	10% to 100% load • 3.3VDC output • 5VDC output • 9VDC output • 12VDC output • 15VDC output • 24VDC output		15 7 5 5 4 3	20 15 10 10 10 10	% % % % % %
Ripple & Noise*	20MHz Bandwidth • Others • 24VDC output		75 75	180 200	mVp-p mVp-p
Temperature Coefficient	Full load		±0.02		%/°C
Switching frequency	100% load, nominal input voltage		260		kHz

*The "parallel cable" method is used for ripple and noise test, please refer to DC-DC Converter Application Notes for specific information.

EMC specifications

Emission	CE	CISPR32/EN55032 CLASS B
Emission	RE	CISPR32/EN55032 CLASS B
Immunity	ESD	IEC/EN61000-4-2 Air ±8kV ,Contact ±6kV perf. Criteria B

Example:
2D14B1_1205D3UP
2 = 2Watt; D14 = DIP14; B1 = Pinning; 12 = 12Vin; 05 = 5Vout; D = Dual Output; 3 = 3kVDC; U = Unregulated Output; P = Short Circuit Protection

Note:
1. Operation under minimum load will not damage the converter; However, they may not meet all specification listed, and that will reduce the life of product.
2. All specifications measured at Ta = 25°C, humidity <75%, nominal input voltage and rated output load unless otherwise specified.
3. In this datasheet, all the test methods of indications are based on corporate standards.
4. Only typical models listed, other models may be different, please contact our technical person for more details.

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Product Selection Guide

Part Number	Input Voltage [V]	Output Voltage [VDC]	Output Current [mA, max/min]	Efficiency [%, typ @max load]	Capacitive load [µF, max]
2D14B1_1205S3UP	12	5	400/40	78/82	2400
2D14B1_1209S3UP	12	9	222/23	78/82	1200
2D14B1_1212S3UP	12	12	167/17	80/84	560
2D14B1_1515S3UP	12	15	133/13	81/85	560
2D14B1_2424S3UP	12	24	83/8	82/86	220
2D14B1_1505S3UP	15	5	400/40	75/79	2400
2D14B1_1509S3UP	15	9	222/23	78/82	1200
2D14B1_1512S3UP	15	15	133/13	75/79	560
2D14B1_2405S3UP	24	5	400/40	76/80	2400
2D14B1_2409S3UP	24	9	222/23	76/80	1200
2D14B1_2412S3UP	24	12	167/17	80/84	560
2D14B1_2415S3UP	24	15	133/13	82/86	560
2D14B1_2424S3UP	24	24	83/8	82/86	220

Part Number	Input Voltage [V]	Output Voltage [VDC]	Output Current [mA, max/min]	Efficiency [%, typ @max load]	Capacitive load [µF, max]
2D14B1_1203D3UP	12	±3.3	±303/±30	71/75	1200
2D14B1_1205D3UP	12	±5	±200/±20	76/80	1200
2D14B1_1212D3UP	12	±12	±83/±8	79/83	220
2D14B1_1215D3UP	12	±15	±67/±7	79/83	220
2D14B1_1224D3UP	12	±24	±42/±4	81/85	100
2D14B1_1509D3UP	15	±9	±111/±11	77/81	560
2D14B1_1512D3UP	15	±12	±83/±8	77/81	220
2D14B1_1515D3UP	15	±15	±67/±7	77/81	220
2D14B1_2405D3UP	24	±5	±200/±20	74/80	1200
2D14B1_2412D3UP	24	±12	±83/±8	79/83	220
2D14B1_2415D3UP	24	±15	±67/±7	77/83	220
2D14B1_2424D3UP	24	±24	±42/±4	80/84	100

Note: * The specified maximum capacitive load for positive and negative output is identical.

Typical characteristics

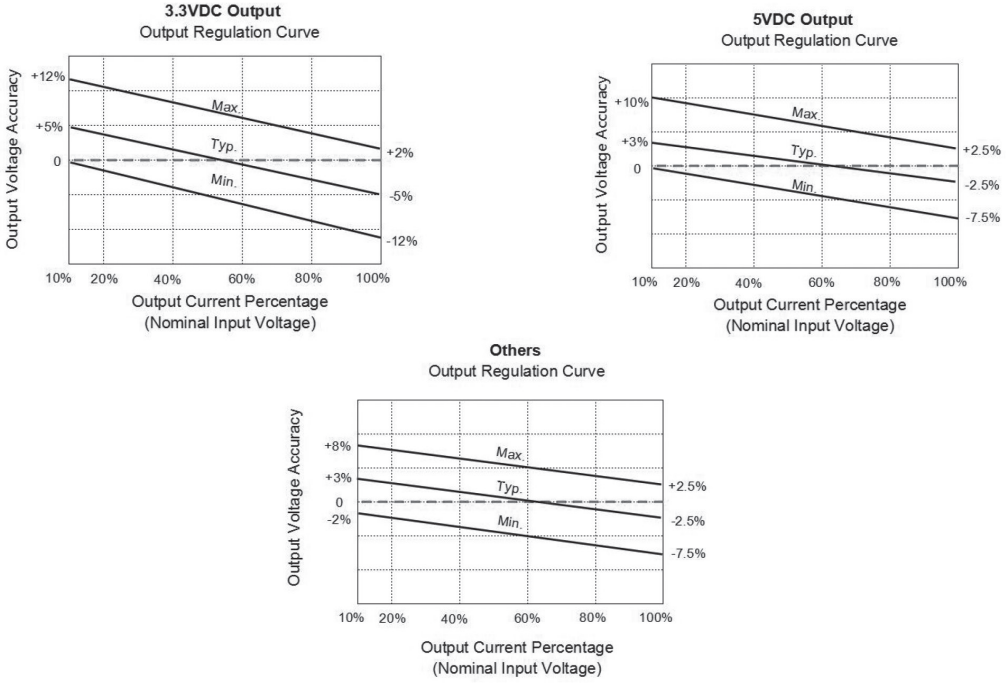


Fig. 1

Typical characteristics

Temperature Derating Curve

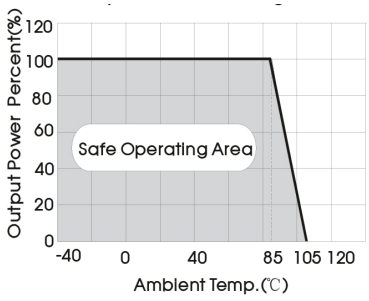


Fig. 2

Typical application

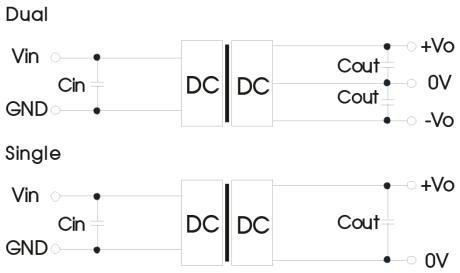


Fig.3

Input and/or output ripple can be further reduced, by connecting a filter capacitor from the input and/or output terminals 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.

Table 1: Recommended input and output capacitor values

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

*The capacitor value of the positive and the negative output is identical.

EMC compliance circuit

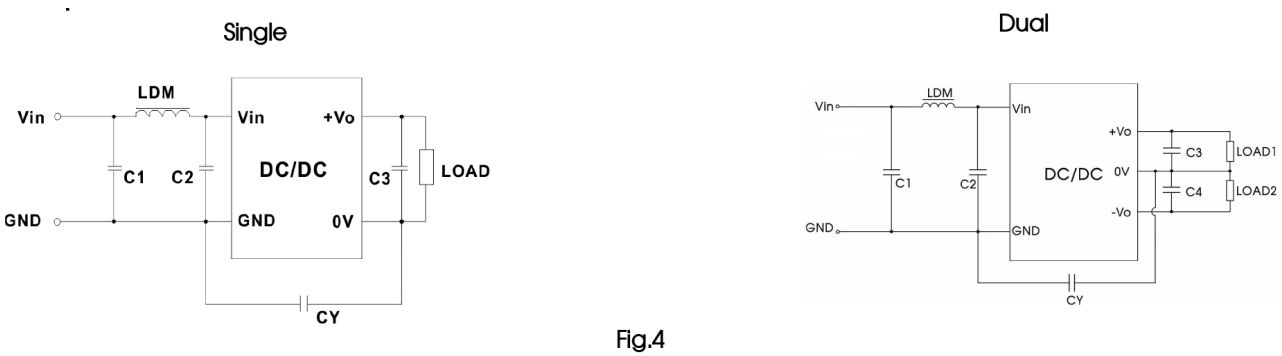
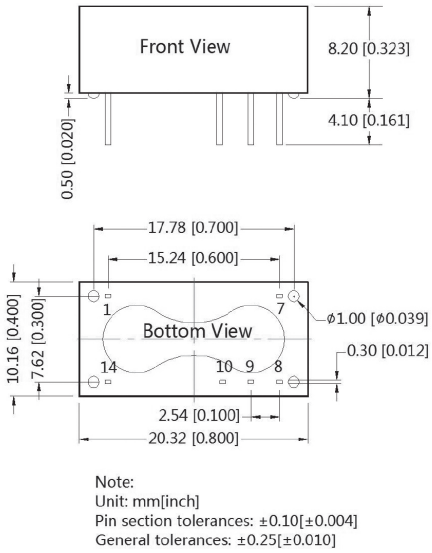


Fig.4

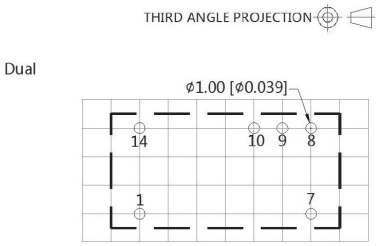
EMC recommended circuit value table

Input voltage		12/15/24VDC
Emissions	C1,C2	4.7µF /50V
	CY	270pF/2kV
	C3,C4	Recommended Test Circuit
	LDM	6.8µH

Mechanical dimensions



Note:
Unit: mm[inch]
Pin section tolerances: ±0.10[±0.004]
General tolerances: ±0.25[±0.010]



Note: Grid 2.54*2.54mm

Pin-Out		
Pin	Single	Dual
1	GND	GND
7	NC	NC
8	+Vo	+Vo
9	No Pin	0V
10	0V	-Vo
14	Vin	Vin

NC: Pin to be isolated circuitry