THIS SERIES IS NOT recommended for new design-ins and this series is discontinued

Recommended alternative: 2D14B1_1.5UP series

Please click here for the datasheet.

2D14B_S & 2D14B_D Series

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

DC-DC Converter 2 Watt

- High Efficiency up to 86%
- 1.5kVDC Isolation
- Miniature DIP Package
- Internal SMD Construction
- Short Circuit Protection (SCP)
- High power density
- Temperature Range: -40°C to +85°C
- No external component
- required
- Industry Standard Pinout RoHS Compliance

UL-60950-1 (E347551)

The 2D14B_S & 2D14B_D Series are specially designed for applications where a group of polar power supplies are isolated from the input power supply in a distributed power supply system on a circuit board.

These products apply to:
1) Where the voltage of the input power supply is fixed (voltage variation ≤ ±10%);
2) Where isolation is necessary between input and output (isolation voltage ≤1500VDC)
3) Where the regulation of the output voltage and the output ripple noise are not demanding. Such as: purely digital circuits, ordinary low frequency analog circuits, and IGBT power device driving circuits.

Common specifications

Short circuit protection*:	• Continuous, Auto-recovery • 1s for products with 9V and 24V Input Voltage and 2D14B_0512D1.5U,2D14B_0515D1.5U,2D14B_0524D1.5U
Temperature rise at full load:	25°C TYP
Cooling:	Free air convection
Operation temperature range:	-40°C~+105°C
Storage temperature range:	-55°C ~+125°C
Lead temperature:	300°C MAX, 1.5mm from case for 10 sec
Storage humidity range:	< 95%
Package material:	Plastic [UL94-V0]
Switching frequency	Full load, nominal input 100KHz TYP, 300KHz MAX
MTBF:	>3500 Khours
Weight:	2.4g

*For the products of 9V and 24V Input Voltage and 2D14B_0512D1.5U,2D14B_0515D1.5U,2D14B_0524D1.5U, supply voltage must be discontinued at the end of short circuit duration.

Input specifications

Item	Test condition	Min	Typ	Max	Units
Surge voltage (1S max)	• 3.3V input	-0.7		5	VDC
	• 5V input	-0.7		9	VDC
	• 9V input	-0.7		12	VDC
	• 12V input	-0.7		18	VDC
	• 15V input	-0.7		21	VDC
	• 24V input	-0.7		30	VDC
Filter	Capacitance Filter				

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute and 1mA max	1500			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation Capacitance	Input/output, 100KHz/0.1V		20		pF

Output specifications

Item	Test condition	Min	Typ	Max	Units
Line regulation	For Vin change of ±1%			±1.2	%
Load regulation	10% to 100% load				
	• 3.3V input		15		%
	• 5V input		12		%
	• 9V input		9		%
	• 12V input		8		%
	• 15V input		7		%
	• 24V input		6		%
Output voltage accuracy	Follow the tolerance envelope graph				
Temperature drift	100% full load			±0.03	%/°C
Ripple & Noise*	20MHz Bandwidth		60		
	• Output voltage ≤12V				mVp-p
	• Output voltage 15V, 24V				

*Test ripple and noise by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.

EMC specifications

EMI	CE	CISPR22/EN55022 CLASS B (External Circuit Refer to EMC recommended circuit)	
EMI	RE	CISPR22/EN55022 CLASS B (External Circuit Refer to EMC recommended circuit)	
EMS	ESD	2D14B_D: IEC/EN61000-4-2 perf. Criteria B 2D14B_S: IEC/EN61000-4-2 perf. Criteria B	Contact ±6KV Contact ±8KV

Example:
2D14B_0505S1.5UP
2 = 2Watt; D14 = DIP14; B = Pinning; 5Vin; 5Vout; S = Single Output; 1.5 = 1.5kVDC; U = Unregulated Output; P = Short Circuit Protection (SCP)

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

Part Number	Input Voltage [V]	Output Voltage [VDC]	Output Current [mA, max]	Input Current [mA, typ @max load]	Reflected ripple current [µF, max]	Capacitive load [µF, max]	Efficiency [%, typ @max load]
2D14B_0305S1.5UP	3.3	5	400	797	15	220	76
2D14B_0503S1.5UP	5	3.3	400	335	15	220	79
2D14B_0505S1.5UP	5	5	400	506	15	220	79
2D14B_0509S1.5UP	5	9	222	476	15	220	84
2D14B_0512S1.5UP	5	12	167	476	15	220	84
2D14B_0515S1.5UP	5	15	133	476	15	220	84
2D14B_0524S1.5UP	5	24	83	476	15	220	84
2D14B_0905S1.5U	9	5	400	278	15	220	80
2D14B_0909S1.5U	9	9	222	271	15	220	82
2D14B_0912S1.5U	9	12	167	274	15	220	81
2D14B_0915S1.5U	9	15	133	268	15	220	83
2D14B_0924S1.5U	9	24	83	268	15	220	83
2D14B_1205S1.5UP	12	5	400	203	15	220	82
2D14B_1209S1.5UP	12	9	222	196	15	220	85
2D14B_1212S1.5UP	12	12	167	203	15	220	82
2D14B_1215S1.5UP	12	15	133	198	15	220	84
2D14B_1224S1.5UP	12	24	83	194	15	220	86
2D14B_1505S1.5UP	15	5	400	167	15	220	80
2D14B_1509S1.5UP	15	9	222	159	15	220	84
2D14B_1512S1.5UP	15	12	167	165	15	220	81
2D14B_1515S1.5UP	15	15	133	157	15	220	85
2D14B_1524S1.5UP	15	24	83	157	15	220	85
2D14B_2405S1.5U	24	5	400	104	15	220	80
2D14B_2409S1.5U	24	9	222	99	15	220	84
2D14B_2412S1.5U	24	12	167	100	15	220	83
2D14B_2415S1.5U	24	15	133	99	15	220	84
2D14B_2424S1.5U	24	24	83	100	15	220	83
2D14B_0505D1.5UP	5	±5	±200	500	15	100	80
2D14B_0509D1.5UP	5	±9	±111	476	15	100	84
2D14B_0512D1.5U	5	±12	±83	476	15	100	84
2D14B_0515D1.5U	5	±15	±67	476	15	100	84
2D14B_0524D1.5U	5	±24	±42	476	15	100	84
2D14B_0905D1.5U	9	±5	±200	278	15	100	80
2D14B_0909D1.5U	9	±9	±111	271	15	100	82
2D14B_0912D1.5U	9	±12	±83	274	15	100	81
2D14B_0915D1.5U	9	±15	±67	268	15	100	83
2D14B_0924D1.5U	9	±24	±42	268	15	100	83
2D14B_1205D1.5UP	12	±5	±200	208	15	100	80
2D14B_1209D1.5UP	12	±9	±111	194	15	100	86
2D14B_1212D1.5UP	12	±12	±83	201	15	100	83
2D14B_1215D1.5UP	12	±15	±67	196	15	100	85
2D14B_1224D1.5UP	12	±24	±42	196	15	100	85

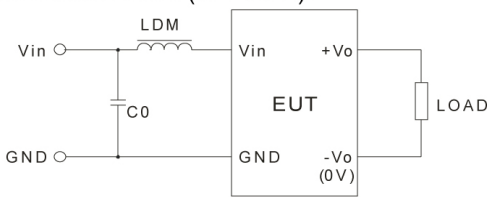
For the products of 9V and 24V Input Voltage and 2D14B_0512D1.5U,2D14B_0515D1.5U,2D14B_0524D1.5U, supply voltage must be discontinued at the end of short circuit duration.

Part Number	Input Voltage [V]	Output Voltage [VDC]	Output Current [mA, max]	Input Current [mA, typ @max load]	Reflected ripple current [µF, max]	Capacitive load [µF, max]	Efficiency [%, max]
2D14B_1505D1.5UP	15	±5	±200	167	15	100	80
2D14B_1509D1.5UP	15	±9	±111	159	15	100	84
2D14B_1512D1.5UP	15	±12	±83	165	15	100	81
2D14B_1515D1.5UP	15	±15	±67	157	15	100	85
2D14B_1524D1.5UP	15	±24	±42	157	15	100	85
2D14B_2405D1.5U	24	±5	±200	104	15	100	80
2D14B_2409D1.5U	24	±9	±111	98	15	100	85
2D14B_2412D1.5U	24	±12	±83	100	15	100	83
2D14B_2415D1.5U	24	±15	±67	99	15	100	84
2D14B_2424D1.5U	24	±24	±42	100	15	100	83

For the products of 9V and 24V Input Voltage and 2D14B_0512D1.5U,2D14B_0515D1.5U,2D14B_0524D1.5U, supply voltage must be discontinued at the end of short circuit duration.

EMC recommended circuit

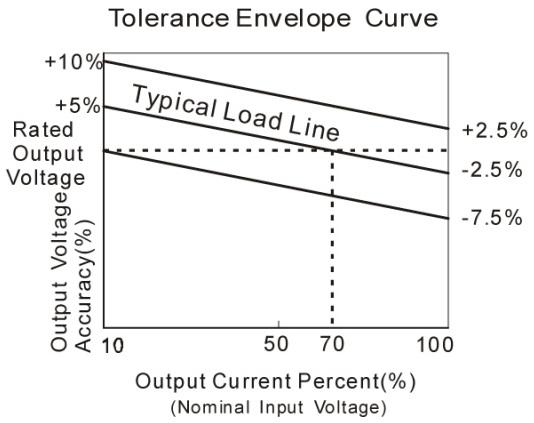
EMI Typical Recommended Circuit (CLASS B):

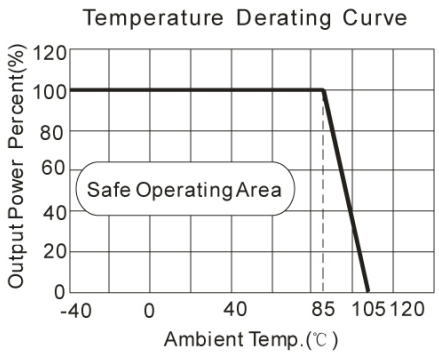


Recommended external circuit parameters:

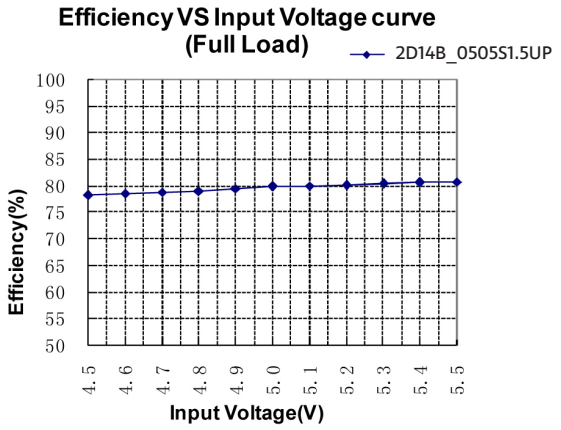
Vin(V)		3.3 / 5 / 9 / 12 / 15 / 24
EMI	C0	4.7µF/50V
EMI	LDM	6.8µH

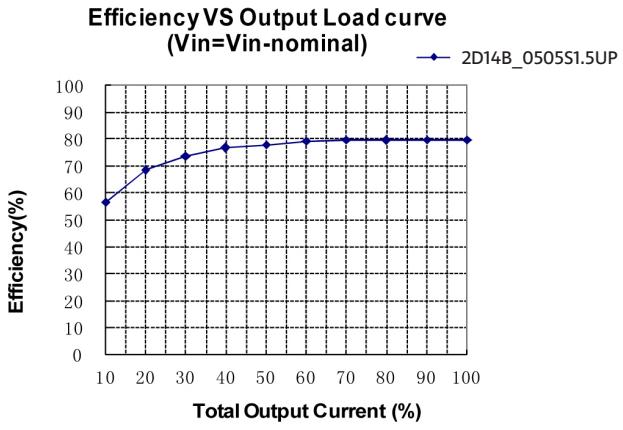
Typical characteristics

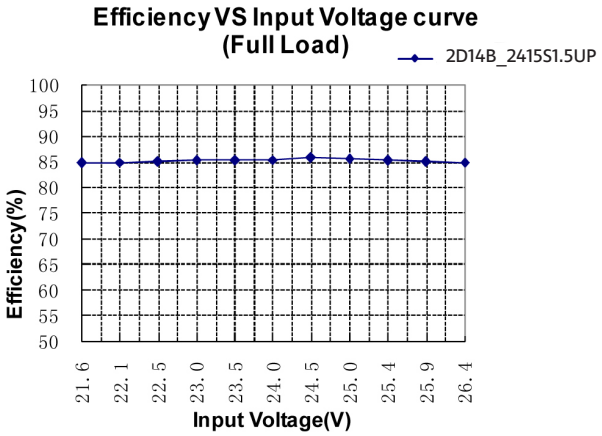


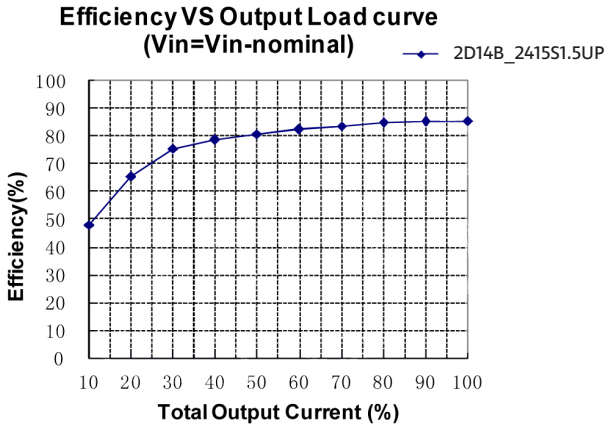


Typical characteristics

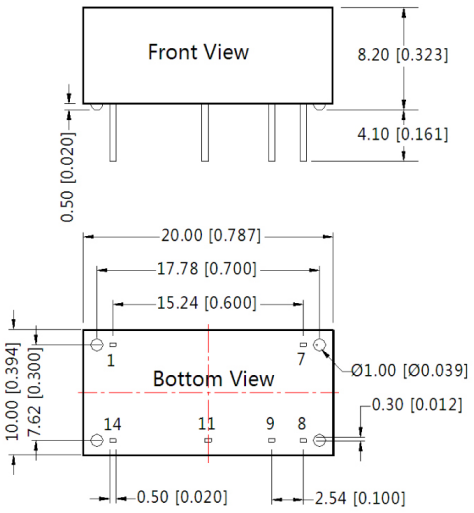








Mechanical dimensions

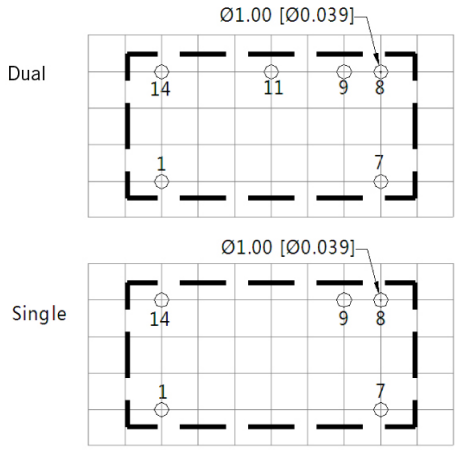


PIN CONNECTION		
Pin	Single	Duals
1	GND	GND
7	NC	NC
8	0V	0V
9	+Vo	+Vo
11	No Pin	-Vo
14	Vin	Vin

NC:No connection

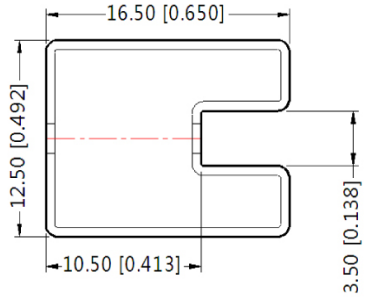
Note:
Unit: mm[inch]
Pin section tolerances: ± 0.10mm[± 0.004inch]
General tolerances: ± 0.25mm[± 0.010inch]

Recommended footprint



Note : grid : 2.54*2.54mm

Tube outline dimensions



Note:
Unit: mm[inch]
General tolerances: ± 0.5mm[± 0.020inch]

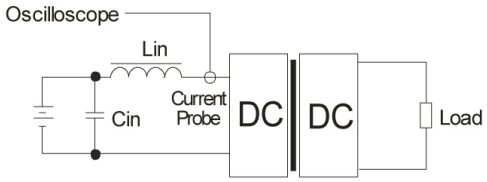
L=530mm[20.866inch]
Devices per tube quantity: 25pcs

L=220mm[8.661inch]
Devices per tube quantity: 10pcs

Test configurations

Input Reflected-Ripple Current Test Setup

Input reflected-ripple current is measured with an inductor Lin and Capacitor Cin to simulate source impedance.



Lin(4.7μH) Cin(220μF, ESR < 1.0Ω at 100 KHz)

Application note

1) Requirement on output load
To ensure this module can operate efficiently and reliably, During operation, the minimum output load is not less than 10% of the full load. If the
actual output power is very small, please connect a resistor with proper resistance at the output end in parallel to increase the load, or use our company's products with a lower rated output power.

2) Recommended testing circuit
If you want to further decrease the input/output ripple, a capacitor filtering network may be connected to the input and output ends of the DC/DC converter, see (Figure 1).

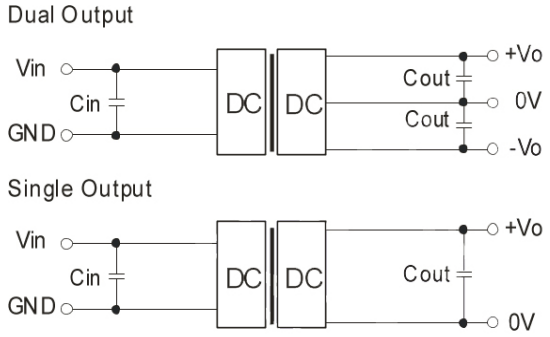


Figure 1

It should also be noted that the capacitance of filter capacitor must be proper. If the capacitance is too big, a startup problem might arise. For every channel of output, provided the safe and reliable operation is ensured, the recommended capacitance of its filter capacitor sees (Table 1).

Vin (VDC)	Cin (μF)	Single Vout (VDC)	Cout (μF)	Dual Vout (VDC)	Cout* (μF)
3.3	4.7	3.3	10	±5	4.7
5	4.7	5	10	±9	2.2
9	2.2	9	4.7	±12	1
12	2.2	12	2.2	±15	0.47
15/24	1	15/24	1	±24	0.47

Table 1

*For each output.
It's not recommended to connect any external capacitor in the application field with less than 0.5 watt output.

3) Overload protection
Under normal operating conditions, the output circuit of these products has no protection against overload. The simplest method is to add a
circuit breaker to the circuit.

4) The input and the output of the product are recommended to be connected to ceramic capacitor or electrolytic capacitor. Using tantalum capacitor may cause risk of failure.

5) It is not recommended to increase the output power capability by connecting two or more converters in parallel. The product is not hot-swappable