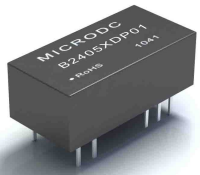
MICRODC
Professional Power Module

B-XDP01 Series

Isolated 1W Single Output DC/DC Converters



FEATURES

- RoHS compliant
- I/O isolation voltage 1000VDC
- Operating Temperature: -40℃～+85℃
- High efficiency up to 81%
- Fully encapsulated toroidal magnetics
- Internal SMD construction
- Power density up to 0.85W/cm^3
- No electrolytic or tantalum capacitors
- 5V,9V,12Vand 15V output
- No heatsink required
- UL 94V-0 package material
- No external components required
- Industry standard pinout
- Power sharing on output
- MTTF up to 3.4 million hours

MODEL SELECTION

B①05②05③X④ D⑤P01⑥

①Product Series ②Input Voltage
③Output Voltage ④Fixed Input
⑤DIP14 Package Style ⑥Rated Power 1W

APPLICATIONS

The B-XDP01 series of industrial temperature range DC/DC converters are the standard building blocks for on-board distributed power systems.They are ideally suited for providing single rail supplies on primarily digital boards with the added benefit of galvanic isolation to reduce switching noise. Surface mount technology and advanced packaging materials produce rugged reliable performance over an extended temperature range from -40°C to 85°C.

RoHS MICRODC Green Technology

CE REACH

MICRODC RESERVES THE COPYRIGHT

SELECTION GUIDE

Order code	Input Voltage (V)	Output Voltage (V)	Output Current (MA)	Input Current (Rated Load) (MA)	Efficiency (%)	Isolation Capacitance (PF)	MTTF[1] (KHRS)
B0505XDP01	5	5	200	290	69	28	1847
B0509XDP01	5	9	111	285	70	29	1548
B0512XDP01	5	12	83	260	77	33	981
B0515XDP01	5	15	67	253	79	40	667
B1205XDP01	12	5	200	121	69	36	1485
B1209XDP01	12	9	111	263	76	29	1358
B1212XDP01	12	12	83	110	76	58	869
B1215XDP01	12	15	67	110	76	56	613
B1505XDP01	15	5	200	93	69	27	2110
B1509XDP01	15	9	111	277	72	29	1850
B1512XDP01	15	12	83	85	77	58	1790
B1515XDP01	15	15	67	84	78	67	1560
B2405XDP01	24	5	200	60	70	61	1253
B2409XDP01	24	9	111	263	76	29	1120
B2412XDP01	24	12	83	53	78	98	784
B2415XDP01	24	15	67	52	80	122	566

Input Characteristics

Parameter	Conditions	Min	Typ.	Max.	Units
Voltage range	Continuous operation,5V input types	4.5	5	5.5	V
	Continuous operation,12V input types	10.8	12	13.2	
	Continuous operation,15V input types	13.5	15	16.5	
	Continuous operation,24V input types	21.6	24	26.4	
Reflected ripple current	5V&12V input types		1.6	2.0	mA p-p
	15V&24V input types		5	10.0	

Absolute Maximum Ratings

Lead temperature 1.5mm from case for 10 seconds	300°C
Internal power dissipation	550mW
Input voltage VIN,B0505XDP01,B0512XDP01,B0515XDP01 types	7V
Input voltage VIN,B1205XDP01,B1212XDP01,B1215XDP01 types	15V
Input voltage VIN,B1505XDP01,B1512XDP01,B1515XDP01 types	18V
Input voltage	28V

1.Calculated using MIL-HDBK-217FN2 calculation model with nominal input voltage at full load.

OUTPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Rated Power	TA=-40°C to 120°C	0.1		1	W
Voltage Set Point Accuracy	See tolerance envelope				
Line regulation	High VIN to low VIN		1.0	1.2	%%

Isolation Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation test voltage	Flash tested for 1 second	1000			VDC
Resistance	Viso= 1000VDC	10			GΩ

General Characteristics

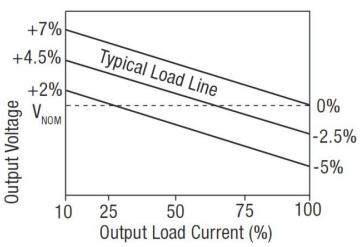
Parameter	Conditions	Min.	Typ.	Max.	Units
Switching frequency	5V input types		110		kHz
	12V input types		160		
	15V input types		90		
	24V input types		80		

Temperature Characteristics

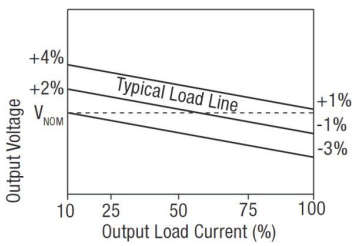
Parameter	Conditions	Min.	Typ.	Max.	Units
Specification	All output types	-40		85	℃
Storage		-50		130	
Case temperature above ambient	5V output types		23		
	All other output types		28		

TOLERANCE ENVELOPE

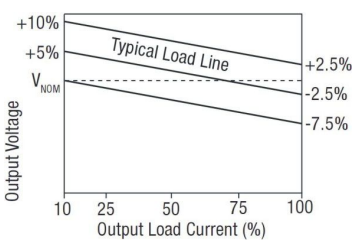
B2405XDP01



B1512XDP01,B1515XDP01,B2412XDP01,B2415XDP01



All other types



All specifications typical at TA=25°C, nominal input voltage and rated output current unless otherwise specified.Another 24V& 48V products, please inquire Our technical department!

Technical notes

ISOLATION VOLTAGE

"Hi Pot Test","Flash Tested","Withstand Voltage","Dielectric Withstand Voltage"&" Isolation Test Voltage" are all terms that relate to the same thing, a test voltage. Applied for a specified time, across a component designed to provide electrical isolation, to verify the integrity of that isolation.
Professional Power Module B_XDP01 series of DC/DC converters are all 100% production tested at their stated isolation voltage. This is 1KVDC for 1 second.

A question commonly asked is,"What is the continuous voltage that can be applied across the part in normal operation?"

For a part holding no specific agency approvals, such as the B_XDP01 series ,both input and output should normally be maintained within SELV limits i.e. less than 42.4V peak, or 60VDC.The isolation test voltage represents a measure of immunity to transient voltages and the part should never be used as an element of a safety isolation system. The part could be expected to function correctly with several hundred volts offset applied continuously across the isolation barrier, but then the circuitry on both sides of the barrier must be regarded as operating at an unsafe voltage and further isolation/insulation systems must form a barrier between these circuits and any user-acssible circuitry according to safety standard requirements.

REPEATED HIGH-VOLTAGE ISOLATION TESTING

It is well known that repeated high-voltage isolation testing of a barrier component can actually degrade isolation capability, to a lesser or greater degree depending on materials. Construction and environment. The B_XDP01 series has toroidal isolation transformers, with no additional insulation between primary and secondary windings of enameled wire. While parts can be expected to withstand several times the stated test voltage, the isolation capability does depend on the wire insulation. Any material, including this enamel (typically polyurethane) is susceptible to eventual chemical degradation when subject to very high applied voltages thus implying that the number of tests should be strictly limited. We therefore strongly advise against repeated high voltage isolation testing. but if it is absolutely required, that the voltage be reduced by 20% from specified test voltage.

This consideration equally applies to agency recognized parts for better than functional isolation where the wire enamel insulation is always supplemented by a further insulation system of physical spacing or barriers.

OUTPUT RIPPLE REDUCTION

Output ripple reduction

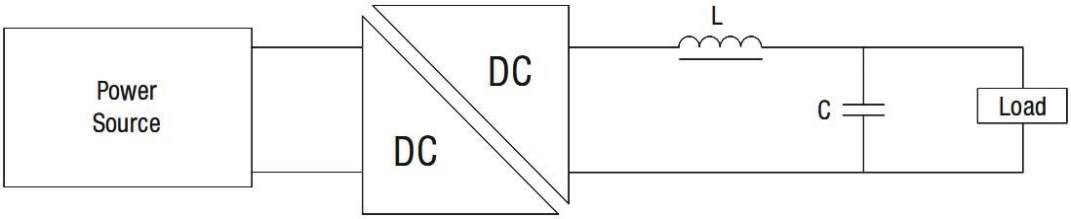
By using the values of inductance and capacitance stated, the output ripple at the rated load is lowered to 5mV p-p max.

Component selection

Capacitor: Ceramic chip capacitors are recommended. It is required that the ESR(Equivalent Series Resistance)should be as low as possible.X7R types are recommended.

The voltage rating should be at least twice(except for 15V output),the rated output voltage of the DC/DC converter.

Inductor: The rated current of the inductor should not be less than of the output of the DC/DC converter. At the rated current, the DC resistance of the inductor should be such that the voltage drop across the inductor is <2% of the rated voltage of the DC/DC converter. The SRF(Self Resonant Frequency) should be >20MHz.



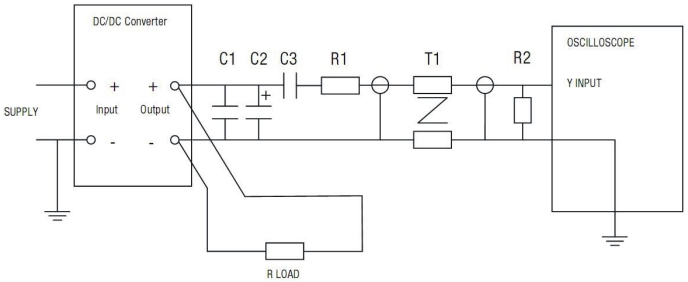
CHARACTERISATION TEST METHODS

Ripple & Noise Characterization Method

Ripple and noise measurements are performed with the following test configuration.

C1	1μF X7R multilayer ceramic capacitor, voltage rating to be a minimum of 3 times the output voltage of the DC/DC converter
C2	10μF tantalum capacitor, voltage rating to be a minimum of 1.5 times the output voltage of the DC/DC converter with an ESR of less than 100mΩ at 100 KHz
C3	100nF multilayer ceramic capacitor, general purpose
R1	450Ω resistor, carbon film, ±1% tolerance
R2	50Ω BNC termination
T1	3T of the coax cable through a ferrite toroid
RLOAD	Resistive load to the maximum power rating of the DC/DC converter. Connections should be made via twisted wires
Measured values are multiplied by 10 to obtain the speciffied values.	

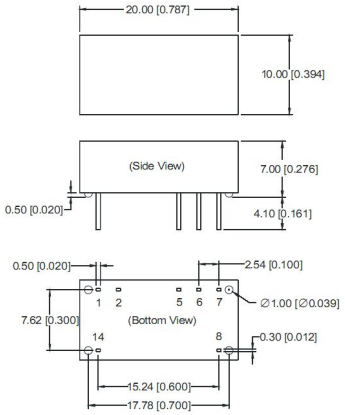
Differential Mode Noise Test Schematic



PACKAGE SPECIFICATIONS

MECHANICAL DIMENSIONS

14 Pin DIP package



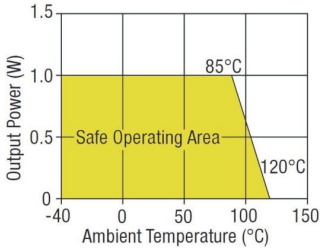
Unit:mm[inch]
Pin section tolerances:±0.10mm[±0.004inch]
General tolerances:±0.25mm[±0.010inch]

FOOTPRINT

14 Pin DIP

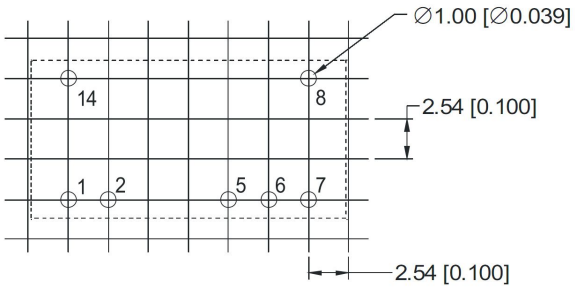
Pin	Function
1	Vin
2	GND
5	-Vout
6	+Vout
7	No Connect
Others	No Connect

TEMPERATURE DERATING GRAPHS



RECOMMENDED FOOTPRINT DETAILS

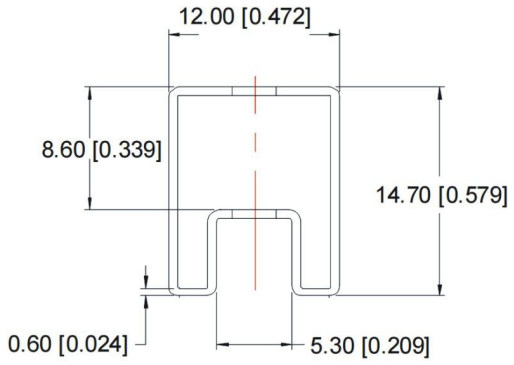
14 Pin DIP Package



Grid:2.54×2.54mm[0.1×0.1inch]
Diameter:1.00mm[0.039inch]

TUBE OUTLINE DIMENSIONS

14 Pin DIP Tube



Unless otherwise stated all dimensions in inches (mm) ±0.5mm.
Tube length (14 Pin DIP) : 20.47 (520mm ±2mm). Tube Quantity :25

MICRODC Professional Power Module

Microdc Professional Power Module, Inc.

Tel:0086-20-86000646 E-mail:tech@microdc.cn

Website:http://www.microdc.cn

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RoHS COMPLIANT INFORMATION

This series is compatible with RoHS soldering systems with a peak wave solder temperature of 300°C for 10 seconds. The pin termination finish on the SIP package type is Tin Plate, Hot Dipped over Matte Tin with Nickel Preplate. The DIP types are Matte Tin over Nickel Preplate. Both types in this series are backward compatible with Sn/Pb soldering systems.

REACH COMPLIANT INFORMATION

This series has proven that this product does not contain harmful chemicals, it also has harmful chemical substances through the registration, inspection and approval.