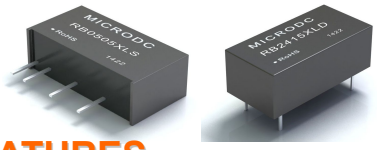
MICRODC
Industry Power Family

RB-XLS&RB-XLD Series

Isolated 0.5W 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,12Vand 15V output
- No heatsink required
- Dual output from a single input rail
- 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

RB①05②05③X④ LS(D)⑤

①Product Series ②Input Voltage
③Output Voltage ④Fixed Input
⑤Package Style

APPLICATIONS

The RB-XLS(D) 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)
RB0303XLS	3.3	3.3	150	210	72	26	1987
RB0305XLS	3.3	5	100	204.5	74	26	1979
RB0505XLS	5	5	100	145	69	28	1847
RB0505XLD	5	5	100	145	69	28	1847
RB0512XLS	5	12	41.5	130	77	33	981
RB0512XLD	5	12	41.5	130	77	33	981
RB0515XLS	5	15	33.5	126.5	79	40	667
RB0515XLD	5	15	33.5	126.5	79	40	667
RB1205XLS	12	5	100	60.5	69	36	1485
RB1205XLD	12	5	100	60.5	69	36	1485
RB1212XLS	12	12	41.5	55	76	58	869
RB1212XLD	12	12	41.5	55	76	58	869
RB1215XLS	12	15	33.5	55	76	56	613
RB1215XLD	12	15	33.5	55	76	56	613
RB1505XLS	15	5	100	46.5	69	27	2110
RB1505XLD	15	5	100	46.5	69	27	2110
RB1512XLS	15	12	41.5	42.5	77	58	1790
RB1512XLD	15	12	41.5	42.5	77	58	1790
RB1515XLS	15	15	33.5	42	78	67	1560
RB1515XLD	15	15	33.5	42	78	67	1560
RB2405XLS	24	5	100	30	70	61	1253
RB2405XLD	24	5	100	30	70	61	1253
RB2412XLS	24	12	41.5	26.5	78	98	784
RB2412XLD	24	12	41.5	26.5	78	98	784
RB2415XLS	24	15	33.5	26	80	122	566
RB2415XLD	24	15	33.5	26	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,RB0505XLS,RB0512XLS,RB0515XLS	7V
Input voltage VIN,RB1205XLS,RB1212XLS,RB1215XLS	15V
Input voltage VIN,RB1505XLS,RB151XLS,RB1515XLS	18V
Input voltage VIN,RB2405XLS,RB2412XLS,RB2415XLS	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			0.5	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

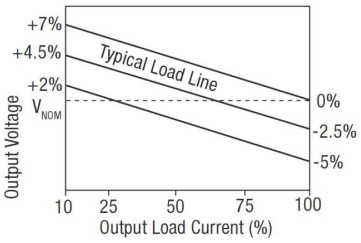
Parameter	Conditions	Min.	Typ.	Max.	Units
Switching frequency	5V input types		110		kHz
	12V input types		160		
	15V input types		90		
	24V input types		80		

Temperature Characteristics

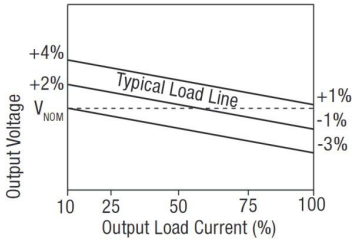
Parameter	Conditions	Min.	Typ.	Max.	Units
Specification	All output types	-40		85	℃
Storage		-50		130	
Case temperature above ambient	5V output types		23		
	All other output types		28		

TOLERANCE ENVELOPE

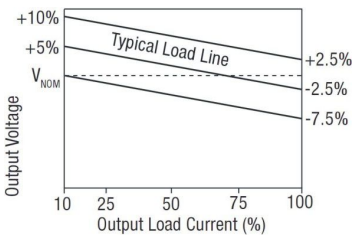
RB2405XLS



RB1512XLS,RB1515XLS,RB2412XLS,RB2415XLS



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_XLS 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_XLS 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_XLS 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

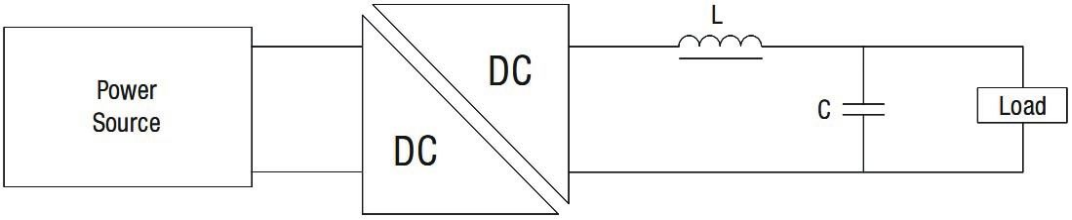
Output ripple reduction

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.



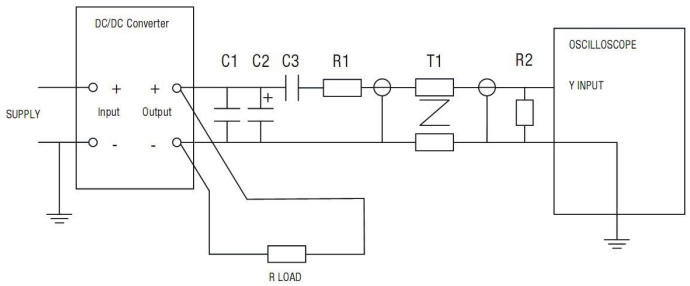
CHARACTERISATION TEST METHODS

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.	

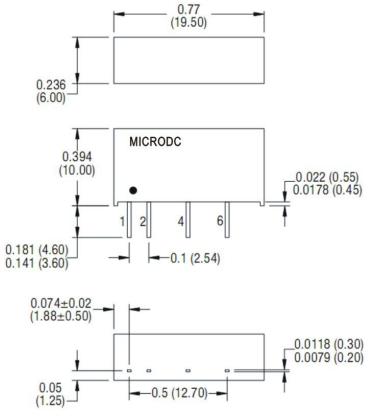
Differential Mode Noise Test Schematic

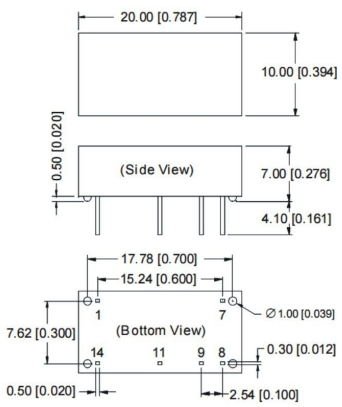


PACKAGE SPECIFICATIONS

MECHANICAL DIMENSIONS

7 Pin SIP package	14 Pin DIP package





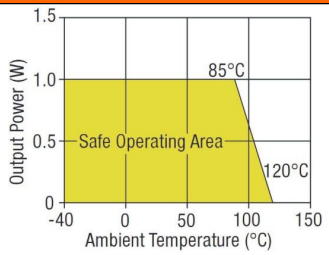
All dimensions in inches ±0.01(mm±0.25mm).

All pins on a 0.1(2.54) pitch and within ±0.01(0.25)of true position.

FOOTPRINT DETAILS

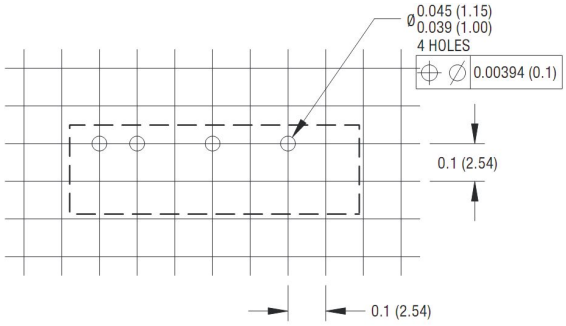
-7 PIN SIP		-14 PIN DIP	
Pin	Function	Pin	Function
1	+Vin	1	-Vin
2	-Vin	7	NC
4	-Vout	8	-Vout
6	+Vout	9	+Vout
		11	No Pin
		14	+Vin

TEMPERATURE DERATING GRAPHS



RECOMMENDED FOOTPRINT DETAILS

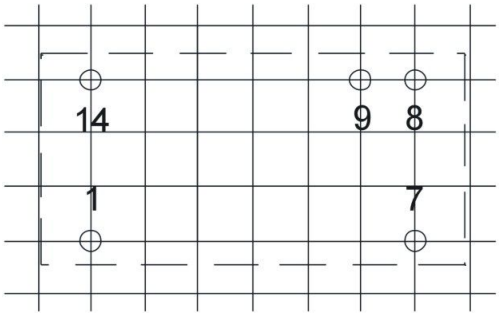
7 Pin SIP Package



All dimensions in inches ±0.01 (mm± 0.25mm).

RECOMMENDED FOOTPRINT DETAILS

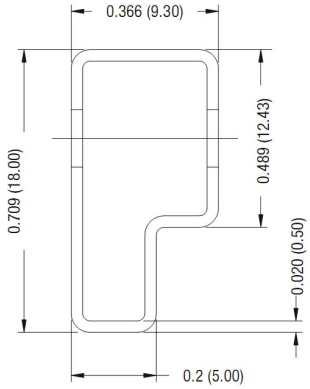
14 Pin SIP Package



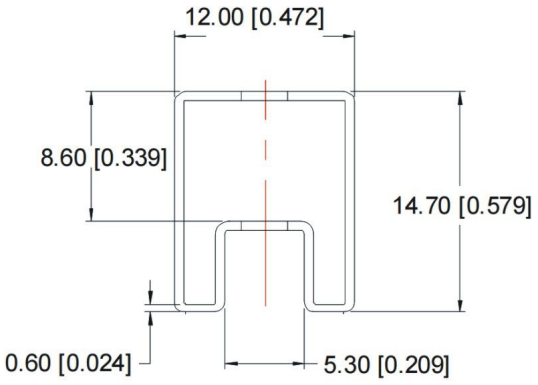
All dimensions in inches ±0.01 (mm± 0.25mm).

TUBE OUTLINE DIMENSIONS

7 PIN SIP Tube



14 PIN SIP Tube



Unless otherwise stated all dimensions in inches (mm) ±0.5mm. Tube length (14 Pin DIP) : 20.47 (520mm ±2mm). Tube length (7 Pin SIP) : 20.47 (520mm ±2mm). Tube Quantity :25