

1W, Fixed input voltage, isolated & unregulated single output



Patent Protection RoHS

FEATURES

- Operating temperature range: -40°C to +85°C
- High power density
- Compact DIP package
- Isolation voltage: 1.5K VDC
- Meet automobile electronic standard: EMC specifications requirements
- No external component required
- International standard pin-out
- Meets EN62368

B0550LD-1WR2 & B0560LD-1WR2 are specially designed for applications where an isolated voltage is required in a distributed power supply system. They are suitable for:

1. Where the voltage of the input power supply is stable (voltage variation: $\pm 10\%V_{in}$);
2. Where isolation between input and output is necessary (isolation voltage $\leq 1500VDC$);
3. Where the output voltage regulation is not strictly required;
4. Typical application: digit circuit, normal low-frequency artificial circuit, data switching circuit and battery management system (BMS) with balance control scheme of power supply circuit condition, etc.

Selection Guide

Part No.	Input Voltage (VDC)	Output		Efficiency (%,Min./Typ.) @ Full Load	Max. Capacitive Load(μF)
	Nominal (Range)	Output Voltage (VDC)	Output Current (mA) (Max./Min.)		
B0550LD-1WR2	5 (4.5-5.5)	50	20/2	75/79	10
B0560LD-1WR2		60	17/2	73/77	

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)		--	50/260	75/--	mA
Reflected Ripple Current		--	100	--	mA
Surge Voltage (1sec. max.)		-0.7	--	9	VDC
Input Filter		Filter capacitor			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		See output regulation curve (Fig. 1)			
Line Regulation	Input voltage change: $\pm 1\%$	--	--	± 1.2	--
Load Regulation	10%-100% load	--	--	15	%
Ripple & Noise*	20MHz bandwidth	--	60	200	mVp-p
Temperature Drift Coefficient	100% load	--	--	± 0.03	%/°C
Short Circuit Protection**		--	--	1	s

Note: *Ripple and noise tested with "parallel cable" method, please see *DC-DC Converter Application Notes* for specific operation methods.

** Supply voltage must be discontinued at the end of short circuit duration.

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation	Input-output, with the test time of 1 minute and the leak current lower than 1mA	1500	--	--	VDC
Insulation Resistance	Input-output, insulation voltage 500VDC	1000	--	--	M Ω
Isolation Capacitance	Input-output, 100kHz/0.1V	--	10	--	pF

Operating Temperature	Derating if the temperature $\geq 85^{\circ}\text{C}$ (see Fig. 2)	-40	--	85	$^{\circ}\text{C}$
Storage Temperature		-55	--	125	$^{\circ}\text{C}$
Casing Temperature Rise	$T_a=25^{\circ}\text{C}$	--	25	--	
Pin Welding Resistance Temperature	Welding spot is 1.5mm away from the case, 10 seconds	--	--	300	
Storage Humidity	Non-condensing	--	--	95	%RH
Switching Frequency	100% load, nominal input voltage	--	200	--	kHz
MTBF	MIL-HDBK-217F@25 $^{\circ}\text{C}$	3500	--	--	k hours

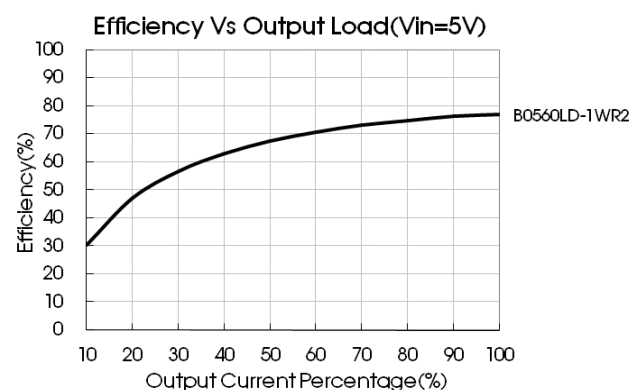
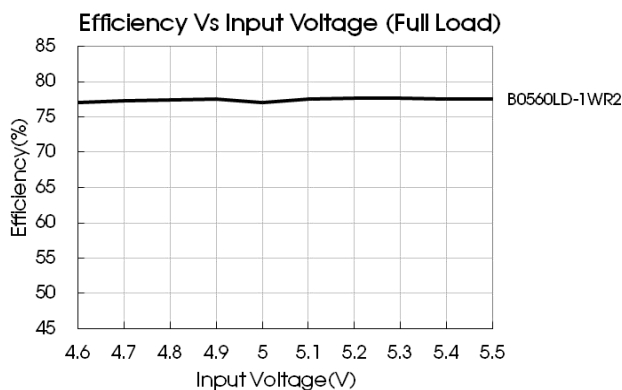
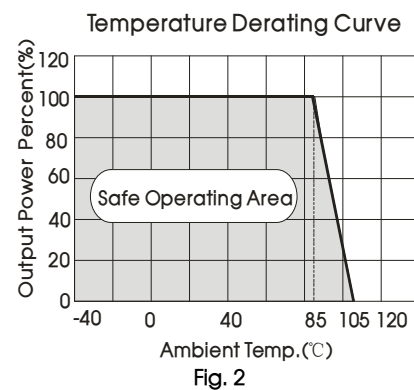
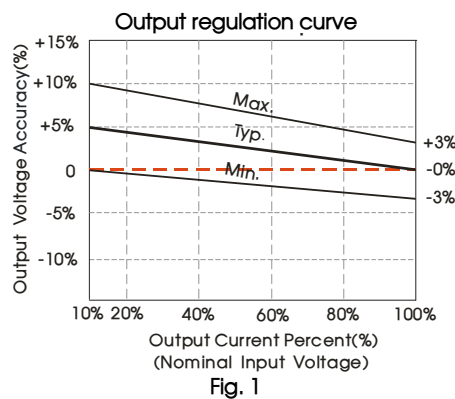
Physical Specifications

Case Material	Black flame-retardant and heat-resistant plastic (UL94 V-0)
Dimensions	20.32*10.16*8.20mm
Weight	2.8g(Typ.)
Cooling Method	Free air convection

EMC Specifications

EMI	CE	CISPR25 CLASS 3 (see Fig. 4 for recommended circuit)
	RE	CISPR25 CLASS 3 (see Fig. 4 for recommended circuit)
EMS	ESD	ISO 10605 Contact $\pm 8\text{kV}$ perf. Criteria B

Product Characteristic Curve



Design Reference

1. Typical application

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.



Fig.3

Recommended capacitive load value table (Table 1)

Vin (VDC)	Cin (μF)	Single Vout(VDC)	Cout (μF)
5	4.7	50/60	10

2. EMC solution-recommended circuit

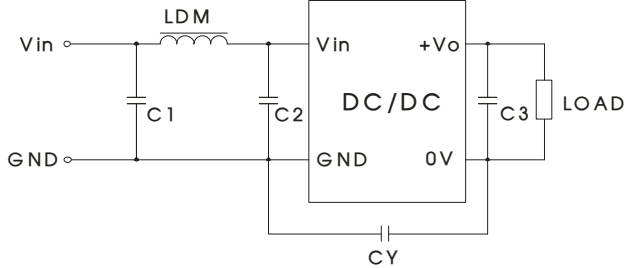


Fig.4

Input voltage (VDC)		5
EMI	C1	4.7μF /25V
	C2	100pF/50V
	C3	Refer to the Cout in Fig.3
	LDM	6.8μH
	CY	100pF/2000V

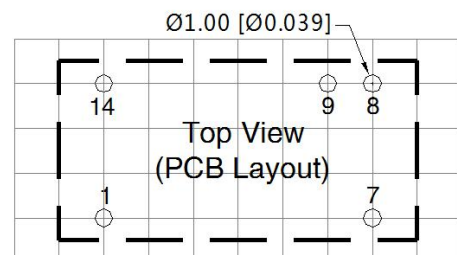
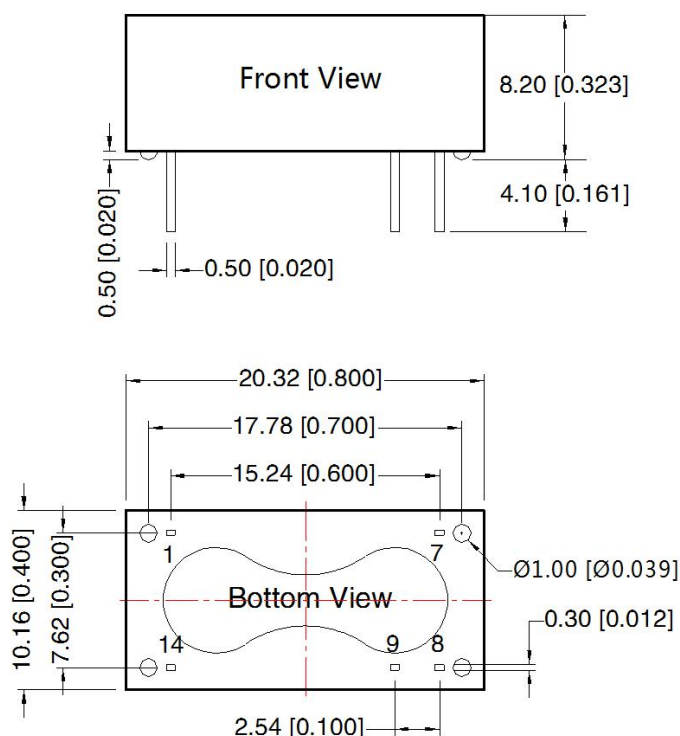
3. Output load requirements

In order to ensure the converter can work reliably with high efficiency, the minimum load should not less than 10% rated load when it is used. If the needed power is indeed small, please parallel a resistor on the output side (The sum of the efficient power and resistor consumption power is not less than 10%).

4. For more information please find the application notes on www.mornsun-power.com

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



Note: Grid 2.54*2.54mm

Pin-Out	
Pin	Mark
1	GND
7	NC
8	0V
9	+Vo
14	Vin

NC: Pin to be isolated circuitry

Note:
Unit: mm[inch]
Pin section tolerances: $\pm 0.10 [\pm 0.004]$
General tolerances: $\pm 0.25 [\pm 0.010]$

Notes:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58200009;
2. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
3. The maximum capacitive load offered were tested at input voltage range and full load;
4. Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a=25^{\circ}\text{C}$, humidity<75%RH with nominal input voltage and rated output load;
5. All index testing methods in this datasheet are based on our company corporate standards;
6. We can provide product customization service, please contact our technicians directly for specific information;
7. Products are related to laws and regulations: see "Features" and "EMC";
8. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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