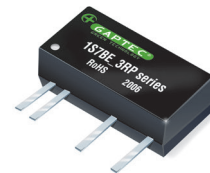


## 1S7BE\_3RP series

1 Watt, Fixed input voltage, isolated & regulated single output



### DC-DC Converter

1 Watt

- Continuous short-circuit protection (SPC)
- No-load input current as low as 5mA
- Operating temperature range: -40°C up to +85°C
- SIP7 package
- Up to 75% efficiency
- Isolation voltage: 3kVDC
- Industry standard pin-out

Introducing our highly reliable 1S7BE\_3RP series, designed to deliver outstanding performance in a compact SIP7 package. With continuous short-circuit protection (SPC) built in, this module ensures safe and uninterrupted operation in various applications. The no-load input current is as low as 5mA, making it an energy-efficient choice. Operating efficiently within a temperature range of -40°C to +85°C, this module is ready to perform in diverse environmental conditions.

Offering up to 75% efficiency and an isolation voltage of 3kVDC, this module ensures both power optimization and safety. The industry-standard pin-out simplifies integration, providing a seamless solution for your design needs.



#### Common specifications

Item	Operating condition
Short circuit protection:	Continuous, self-recovery
Operating Temperature	-40 ~ +85°C (with derating)
Case Temperature (Ta=25°C)	<ul style="list-style-type: none"> <li>3.3VDC output 30°C typ.</li> <li>others 25°C typ.</li> </ul>
Storage Temperature	-55 ~ +125°C
Storage Humidity	5 ~ 95 %RH
Pin Welding Resistance Temperature	300°C max., welding spot is 1.5mm away from the casing, 10 seconds
Vibration (5vin)	10-150Hz, 5G, 30 Min. along X, Y and Z
Vibration (others)	10-150Hz, 5G, 0.75mm. along X, Y and Z
MTBF(MIL-HDBK-217F@25°C)	> 3500 khrs
Cooling:	Free air convection
Case Material	Black plastic; flame-retardant and heat-resistant (UL94 V-0)
Weight	2.1g typ.
Dimensions	19.65 x 6.00 x 10.16mm

#### Input specifications

Item	Test condition	Min	Typ	Max	Units
Input current (no-load/full load)	<b>3.3/5V Input</b>	286/5	303/-		mA
	<b>12V input</b>	115/8	121/-		mA
	• 5/9/12VDC output	112/8	118/-		mA
	• 15VDC output				
<b>15V input</b>	• 5VDC output	92/8	97/-		mA
	• 15VDC output	89/8	94/-		mA
	• 15VDC output				
<b>24V input</b>	• 3.3VDC output	59/8	65/-		mA
	• 3.3VDC output	58/8	63/-		mA
	• 5/9/12/15VDC output				
Reflected ripple current*			15		mA
Input filter	Capacitance filter				
Hot plug	Unavailable				

\* Refer to DC-DC Converter Application Notes for detailed description of reflected ripple current test method.

#### EMC specifications

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

\*Refer to Fig.3 for recommended circuit test.

#### Output specifications

Item	Test condition	Min	Typ	Max	Units
Output Voltage Accuracy				±3	%
Line Regulation	Input voltage change: ±1			±0.25	%
Load regulation	10%-100% load			±3	%
	• 3.3VDC output			±2	%
	• 5/9/12/15VDC output				
Temperature coefficient	100% load		±0.02		%/°C
Ripple & noise*	20MHz Bandwidth (5vin)	30	70		mVp-p
Ripple & noise*	20MHz Bandwidth				
	• 3.3/5/9/12VDC output	30	100		mVp-p
	• 15VDC output	80	150		mVp-p
Switching frequency	100% load, nominal input voltage				
	• 5VDC input	300			kHz
	• others	250			kHz

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

#### Isolation specifications

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

#### Example:

**1S7BE\_050S53RP**

1 = 1Watt; S7 = SIP7; BE = Pinning; 05 = 5Vin; 05 = 5Vout; S = Single Output; 3 = 3kVDC; R = Regulated output; P = Short circuit protection

#### Note:

- 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;
- The maximum capacitive load offered were tested at input voltage range and full load;
- Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta = 25°C, humidity <75%RH with nominal input voltage and rated output load;
- All index testing methods in this datasheet are based on our company's corporate standards;
- Products are related to laws and regulations: see "Features" and "EMC";
- Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

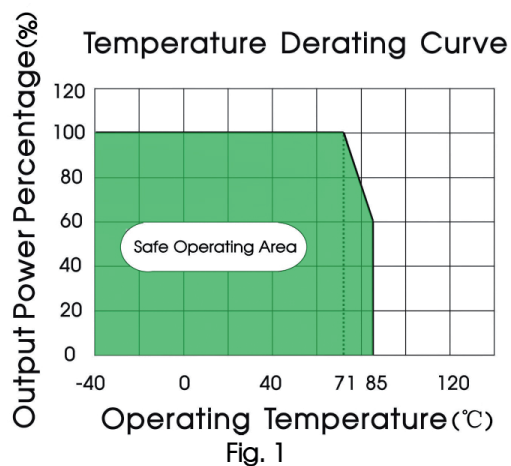
## 1S7BE\_3RP series

1 Watt, Fixed input voltage, isolated & regulated single output

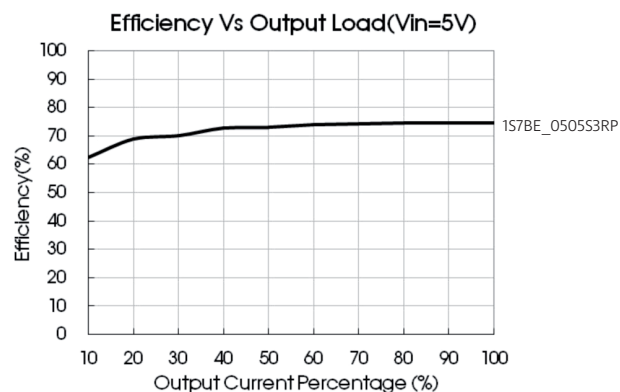
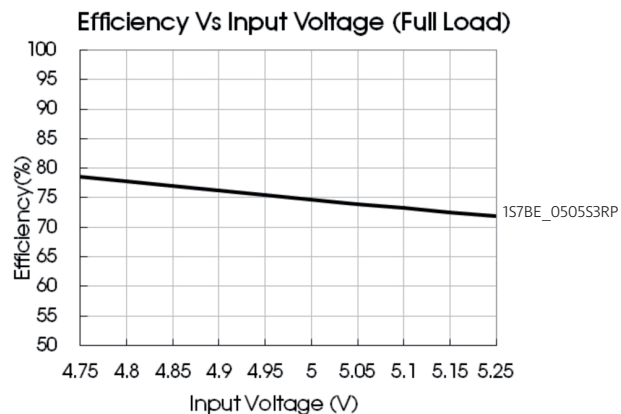
### Product Selection Guide

Part Number	Input Voltage [V]	Output Voltage [VDC]	Output current [mA, max./min]	Efficiency [%, min./typ.]	Capacitive load [μF, max]	Certification
1S7BE_0503S3RP	5	3.3	250/25	63/67	2400	
1S7BE_0505S3RP	5	5	200/20	66/70	2400	
1S7BE_1205S3RP	12	5	200/20	69/73	2400	
1S7BE_1209S3RP	12	9	111/12	69/73	1000	
1S7BE_1212S3RP	12	12	83/9	69/73	560	
1S7BE_1215S3RP	12	15	67/7	71/75	560	
1S7BE_1505S3RP	15	5	200/20	69/73	2400	
1S7BE_1515S3RP	15	15	67/7	71/75	560	
1S7BE_2403S3RP	24	3.3	250/25	65/71	2400	
1S7BE_2405S3RP	24	5	200/20	67/73	2400	
1S7BE_2409S3RP	24	9	111/12	67/73	1000	
1S7BE_2412S3RP	24	12	83/9	67/73	560	
1S7BE_2415S3RP	24	15	67/7	67/73	560	

### Typical characteristics



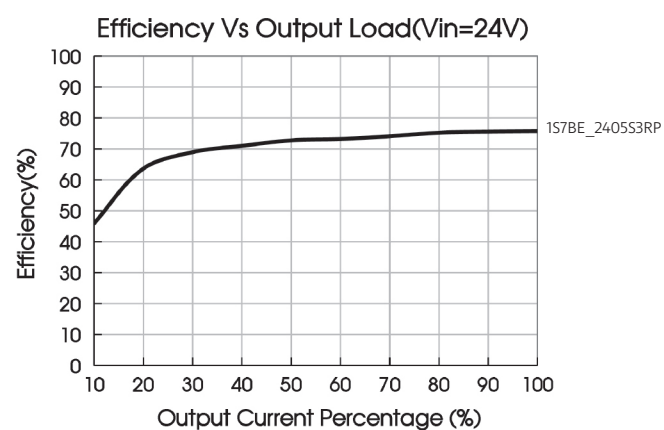
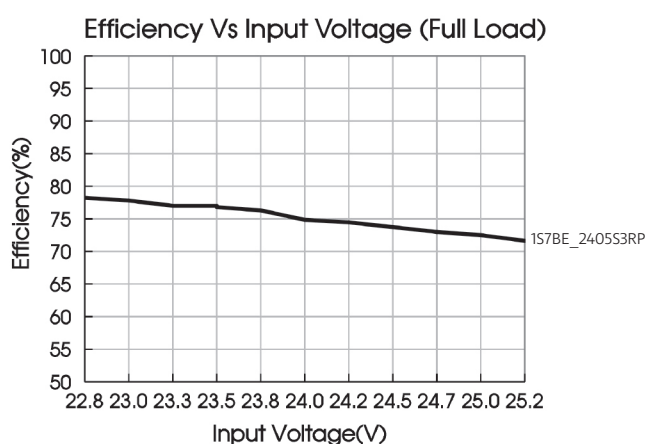
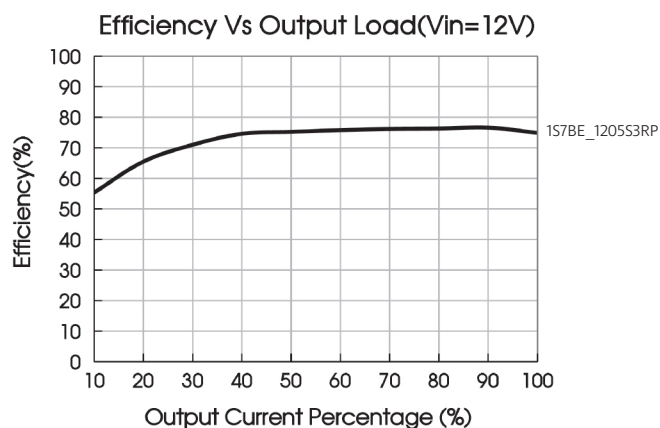
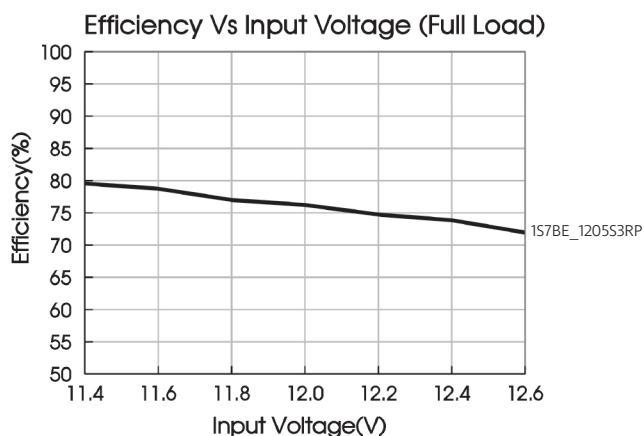
### Efficiency



## 1S7BE\_3RP series

1 Watt, Fixed input voltage, isolated & regulated single output

### Efficiency



### Typical application circuit

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.2. 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.

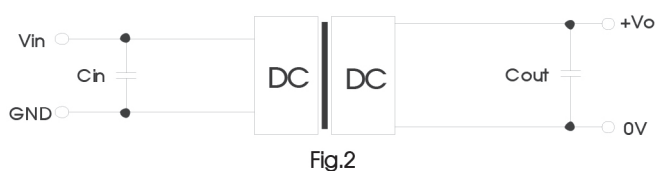


Table 1.1: Recommended input and output capacitor values

Vin	Cin	Vo	Cout
5VDC	4.7μF/16V	3.3/5VDC	10μF/16V

Table1.2: Recommended input and output capacitor values

Vin	Cin	Vo	Cout
12VDC	2.2μF/25V	3.3VDC	10μF/16V
15VDC	2.2μF/25V	5VDC	10μF/16V
24VDC	1μF/50V	9VDC	2.2μF/16V
–	–	12VDC	2.2μF/25V
–	–	15VDC	1μF/25V

1S7BE\_3RP series

1 Watt, Fixed input voltage, isolated & regulated single output

EMC solution-recommended circuit

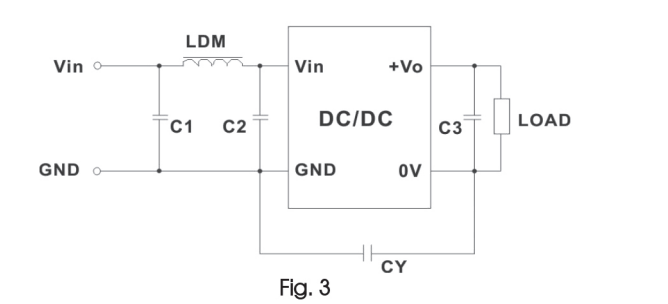


Table 2.1: EMC recommended circuit value table

5Vin	Vout		3.3/5VDC
	Emissions	C1/C2	4.7μF /50V
		CY	100pF/4kV
		C3	Refer to the Cout in table 1.1
		LDM	6.8μH

Table 2.2: EMC recommended circuit value table (others Vin)

Emissions	C1	4.7μF /50V
	C2	4.7μF /50V
	CY	270pF/3kV
	C3	Refer to the Cout in table 1.2
	LDM	6.8μH

Mechanical dimensions

