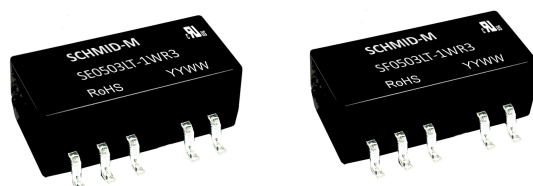


1W isolated DC-DC converter  
Fixed input voltage, unregulated dual/single output



**UL** **CE** **CB** Patent Protection RoHS



## FEATURES

- Continuous short-circuit protection
- No-load input current as low as 5mA
- Operating ambient temperature range: -40°C ~ +105°C
- High efficiency up to 85%
- Compact SMD package
- I/O isolation test voltage 3k VDC
- Industry standard pin-out
- IEC62368, UL62368, EN62368 approved

SE05\_LT-1WR3 & SF05\_LT-1WR3 series are specially designed for applications where an isolated (two isolated) voltage is required in a distributed power supply system. They are suitable for: pure digital circuits, low frequency analog circuits, relay-driven circuits and data switching circuits.

## Selection Guide

Certification	Part No.	Input Voltage (VDC)	Output		Full Load Efficiency (%) Min./Typ.	Capacitive Load(μF) Max.
		Nominal (Range)	Voltage (VDC)	Current(mA) Max./Min.		
UL/CE/CB	SE0503LT-1WR3	5 (4.5-5.5)	±3.3	±151/±15	70/74	1200
	SE0505LT-1WR3		±5	±100/±10	78/82	1200
	SE0509LT-1WR3		±9	±56/±6	79/83	470
	SE0512LT-1WR3		±12	±42/±5	79/83	220
	SE0515LT-1WR3		±15	±34/±4	79/83	220
	SE0524LT-1WR3		±24	±21/±2	81/85	100
	SF0503LT-1WR3		3.3	303/30	70/74	2400
	SF0505LT-1WR3		5	200/20	78/82	2400
	SF0509LT-1WR3		9	111/12	79/83	1000
	SF0512LT-1WR3		12	84/9	79/83	560
	SF0515LT-1WR3		15	67/7	79/83	560
	SF0524LT-1WR3		24	42/4	81/85	220

## Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	5VDC input	3.3VDC/5VDC output	--	270/5	286/10	mA
		9VDC/12VDC output	--	241/12	254/20	
		15VDC/24VDC output	--	241/18	254/30	
Reflected Ripple Current*			--	15	--	mA
Surge Voltage (1sec. max.)	5VDC input		-0.7	--	9	VDC
Input Filter			Capacitance filter			
Hot Plug			Unavailable			

Note: \* Reflected ripple current testing method please see DC-DC Converter Application Notes for specific operation.

## Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Voltage Accuracy			See output regulation curve(Fig. 1)			
Linear Regulation	Input voltage change: ±1%	3.3VDC output	--	--	1.5	%/%
		Other outputs	--	--	1.2	

# DC/DC Converter

## SE05\_LT-1WR3 & SF05\_LT-1WR3 Series

Load Regulation	10%-100% load	3.3VDC output	--	15	20	%
		5VDC output	--	10	15	
		9VDC output	--	8	10	
		12VDC output	--	7	10	
		15VDC output	--	6	10	
		24VDC output	--	5	10	
Ripple & Noise*	20MHz bandwidth	Other outputs	--	30	75	mVp-p
		24VDC output	---	50	100	
Temperature Coefficient	Full load		--	±0.02	--	%/°C
Short-circuit Protection		Continuous, self-recovery				

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

## General Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Isolation	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
Operating Temperature	Derating when operating temperature ≥ 100°C, (see Fig. 2)		-40	--	105	°C
Storage Temperature			-55	--	125	
Case Temperature Rise	Ta=25°C	3.3VDC output	--	25	--	
		Other outputs	--	15	--	
Storage Humidity	Non-condensing		--	--	95	%RH
Reflow Soldering Temperature*			Peak temp. ≤ 245°C, maximum duration time ≤ 60s over 217°C			
Switching Frequency	Full load, nominal input voltage		--	270	--	KHz
MTBF	MIL-HDBK-217F@25°C		3500	--	--	K hours
Moisture Sensitivity Level (MSL)	IPC/JEDEC J-STD-020D.1		Level 1			

Note: \* For actual application, please refer to IPC/JEDEC J-STD-020D.1.

## Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94-V0)
Dimensions	15.24 x 11.40 x 7.25 mm
Weight	1.3g(Typ.)
Cooling Method	Free air convection

## Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS B (see Fig. 4 for recommended circuit)
	RE	CISPR32/EN55032	CLASS B (see Fig. 4 for recommended circuit)
Immunity	ESD	IEC/EN61000-4-2	Air ±8kV, Contact ±4kV perf. Criteria B

# DC/DC Converter

## SE05\_LT-1WR3 & SF05\_LT-1WR3 Series

### Typical Characteristic Curves

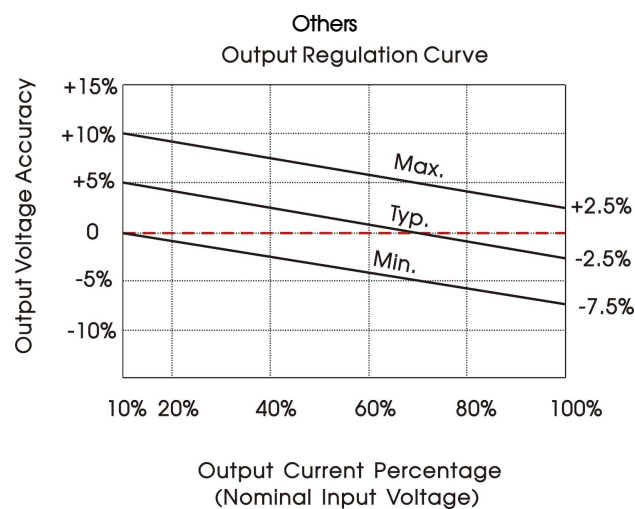
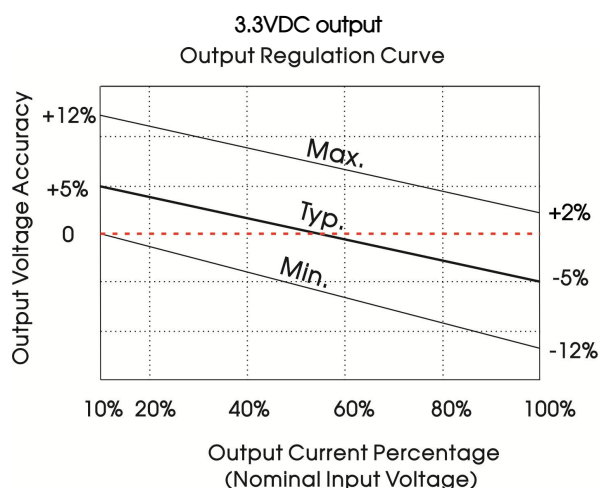
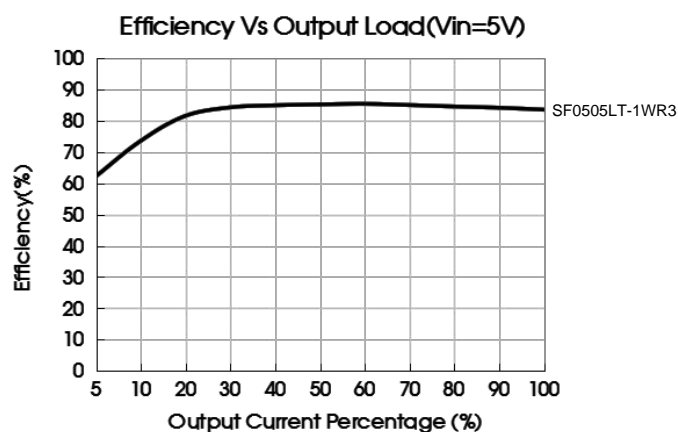
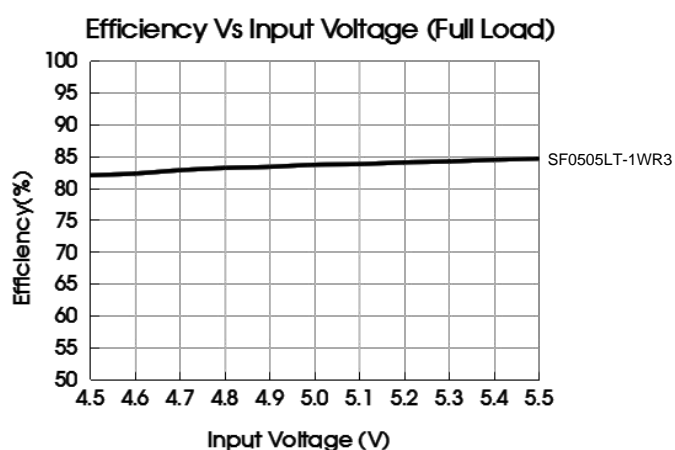
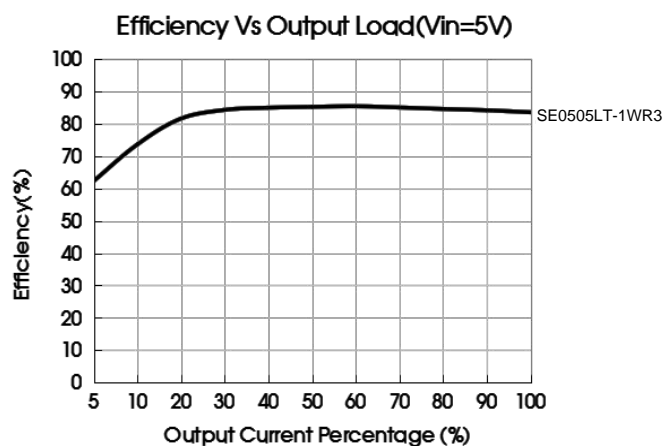
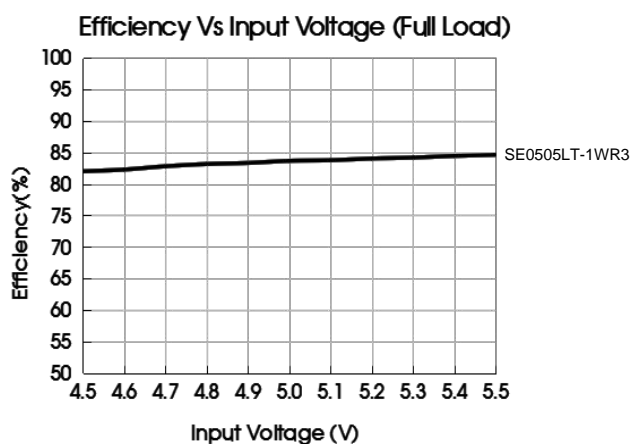


Fig. 1



# DC/DC Converter

## SE05\_LT-1WR3 & SF05\_LT-1WR3 Series

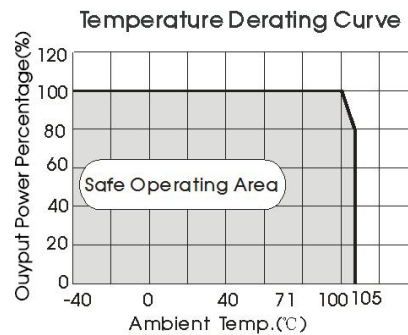


Fig. 2

## Design Reference

### 1. 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.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)	Vo (VDC)	Cout(μF)
5	4.7	3.3/5	10
		9	4.7
		12	2.2
		15	1
		24	0.47

### 2. EMC (CLASS B) compliance circuit

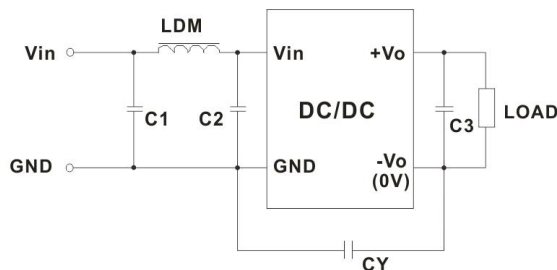


Fig. 4

EMC recommended circuit value table (Table 2)

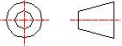
Output voltage(VDC)		3.3/5/9	12/15/24
EMI	C1/C2	4.7μF /25V	4.7μF /25V
	CY	--	1nF/4KVDC VISHAY HGZ102MBP TDK CD45-E2GA102M-GKA
	C3	Refer to the Cout in table 1	
	LDM	6.8μH	6.8μH

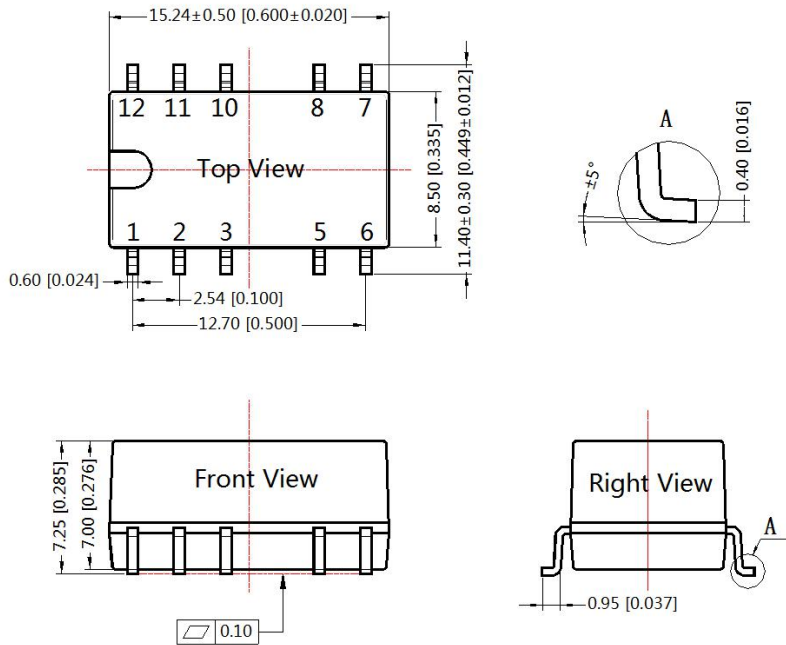
Note: In the case of actual use, the requirements for EMI are high, it is subject to CY.

# DC/DC Converter

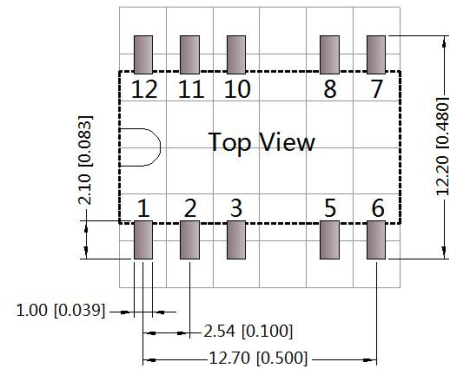
## SE05\_LT-1WR3 & SF05\_LT-1WR3 Series

### Dimensions and Recommended Layout

THIRD ANGLE PROJECTION 



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



Note: Grid 2.54\*2.54mm

Pin-Out		
Pin	SF_LT-1-WR3	SE_LT-1-WR3
1	GND	GND
2	V <sub>in</sub>	V <sub>in</sub>
5	0V	0V
6	NC	-V <sub>o</sub>
8	+V <sub>o</sub>	+V <sub>o</sub>
Other	NC	NC

NC: Pin to be isolated from circuitry

#### Notes:

1. 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;
2. The maximum capacitive load offered were tested at input voltage range and full load;
3. Unless otherwise specified, parameters in this datasheet were measured under the conditions of T<sub>a</sub>=25°C, humidity<75%RH with nominal input voltage and rated output load;
4. All index testing methods in this datasheet are based on our company corporate standards;
5. We can provide product customization service, please contact our technicians directly for specific information;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.