

FEATURES

1. Continuous short-circuit protection
2. No-load input current as low as 8mA
3. Operating ambient temperature range:-40°C to +105°C
4. High efficiency up to 85%
5. I/O isolation test voltage: 1.5k VDC
6. Industry standard pin-out



**3 years
Warranty**

Selection Guide

Part No.	Input Voltage (VDC)	Output		Full Load Efficiency (%) Min./Typ.	Capacitive Load(μF)* Max.
	Nominal (Range)	Voltage (VDC)	Current (mA) Max./Min.		
A0303S-1WR3	3.3 (2.97-3.63)	±3.3	±152/±15	74/78	1200
A0305S-1WR3		±5	±100/±10	78/82	1200
A0309S-1WR3		±9	±56/±6	81/85	470
A0312S-1WR3		±12	±42/±5	78/82	220
A0315S-1WR3		±15	±34/±4	78/82	220
A0324S-1WR3		±24	±21/±2	80/84	100
B0303LS-1WR3		3.3	303/30	75/79	2400
B0305LS-1WR3		5	200/20	78/82	2400
B0309LS-1WR3		9	111/11	81/85	1000
B0312LS-1WR3		12	83/8	78/82	560
B0315LS-1WR3		15	67/7	78/82	560
B0324LS-1WR3		24	42/4	80/84	220
A0503S-1WR3		5 (4.5-5.5)	±3.3	±152/±15	70/74
A0505S-1WR3	±5		±100/±10	78/82	1200
A0509S-1WR3	±9		±56/±6	79/83	470
A0512S-1WR3	±12		±42/±5	79/83	220
A0515S-1WR3	±15		±34/±4	79/83	220
A0524S-1WR3	±24		±21/±3	81/85	100
B0503LS-1WR3	3.3		303/30	70/74	2400
B0505LS-1WR3	5		200/20	78/82	2400
B0509LS-1WR3	9		111/12	79/83	1000
B0512LS-1WR3	12		84/9	79/83	560
B0515LS-1WR3	15		67/7	79/83	560
B0524LS-1WR3	24		42/4	81/85	220
A1203S-1WR3	12 (10.8-13.2)		±3.3	±152/±15	71/75
A1205S-1WR3		±5	±100/±10	76/80	1200
A1209S-1WR3		±9	±56/±5	76/80	470
A1212S-1WR3		±12	±42/±5	77/81	220
A1215S-1WR3		±15	±34/±4	77/81	220
A1224S-1WR3		±24	±21/±3	76/80	100

B1203LS-1WR3	12 (10.8-13.2)	3.3	303/30	71/75	2400
B1205LS-1WR3		5	200/20	76/80	2400
B1209LS-1WR3		9	111/12	76/80	1000
B1212LS-1WR3		12	83/9	76/80	560
B1215LS-1WR3		15	67/7	77/81	560
B1224LS-1WR3		24	42/4	77/81	220
A1505S-1WR3	15 (13.5-16.5)	±5	±100/±10	76/80	1200
A1509S-1WR3		±9	±56/±5	76/80	470
A1512S-1WR3		±12	±42/±5	76/80	220
A1515S-1WR3		±15	±34/±4	77/81	220
A1524S-1WR3		±24	±21/±2	77/81	100
B1505LS-1WR3		5	200/20	76/80	2400
B1509LS-1WR3		9	111/12	76/80	1000
B1512LS-1WR3		12	83/9	76/80	560
B1515LS-1WR3		15	67/7	77/81	560
B1524LS-1WR3		24	42/5	77/81	220
A2405S-1WR3	24 (21.6-26.4)	±5	±100/±10	74/80	1200
A2409S-1WR3		±9	±56/±5	74/80	470
A2412S-1WR3		±12	±42/±5	75/81	220
A2415S-1WR3		±15	±34/±4	73/79	220
A2424S-1WR3		±24	±21/±3	74/80	100
B2403LS-1WR3		3.3	303/30	69/75	2400
B2405LS-1WR3		5	200/20	73/79	2400
B2407LS-1WR3		7.2	139/13	74/80	1000
B2409LS-1WR3		9	111/12	74/80	1000
B2412LS-1WR3		12	83/9	75/81	560
B2415LS-1WR3		15	67/7	75/81	560
B2424LS-1WR3		24	42/4	75/81	220

Note: * The specified maximum capacitive load for positive and negative output is identical.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Input Current (full load / no-load)	3.3VDC input	3.3VDC output	-	384/10	405/-	mA
		Other output	-	370/18	389/-	
	5VDC input	3.3VDC/5VDC output	-	270/8	286/-	
		9VDC/12VDC output	-	241/12	254/-	
		15VDC/24VDC output	-	241/18	254/-	
	12VDC input	-	105/8	110/-		
	15VDC input	-	84/8	88/-		
24VDC input	-	56/8	61/-			
Reflected Ripple Current*		-	15	-		
Surge Voltage(1sec. max.)	3.3VDC input	-0.7	-	5	VDC	
Surge Voltage(1sec. max.)	5VDC input	-0.7	-	9	VDC	
	12VDC input	-0.7	-	18		
	15VDC input	-0.7	-	21		
	24VDC input	-0.7	-	30		
Input Filter			Capacitance filter			
Hot Plug			Unavailable			

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

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit		
Voltage Accuracy			See output regulation curves (Fig. 1)					
Linear Regulation	Input voltage change: ±1%	3.3VDC output	-	-	1.5	-		
		Other output	-	-	1.2			
Load Regulation	3.3VDC input 10% -100% load	3.3VDC output	-	12	18	%		
		Other output	-	8	15			
		5VDC input 10% -100% load	3.3VDC output	-	15		20	
			5VDC output	-	10		15	
	9VDC output		-	8	10			
	12VDC output		-	7	10			
	12/15/24VDC input 10% -100% load	15VDC output	-	6	10			
		24VDC output	-	5	10			
		3.3VDC output	-	8	20			
		5VDC output	-	5	15			
		9VDC output	-	3	10			
		12VDC output	-	3	10			
	Ripple & Noise*	20MHz bandwidth	Other output	-	30		75	mVp-p
			24VDC output	-	50		100	
Temperature Coefficient			100% 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.		1500	-	-	VDC
Insulation Resistance	Input-output resistance at 500VDC		1000	-	-	MΩ
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V		-	20	-	pF
Operating Temperature	5VDC input	Derating when operating temperature ≥ 85°C, (see Fig. 2)	-40	-	105	°C
	3.3/12/15/24VDC input	Derating when operating temperature ≥ 100°C, (see Fig. 2)				
Storage Temperature			-55	-	125	
Case Temperature Rise	Ta=25°C		-	25	-	
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds		-	-	300	
Storage Humidity	Non-condensing	3.3/12/15/24VDC input	5	-	95	
Storage Humidity	Non-condensing	5VDC input	-	-	95	%RH
Vibration	12/15/24VDC input		10-150Hz, 5G, 0.75mm. along X, Y and Z			
Switching Frequency	Full load, nominal input voltage	3.3VDC input	-	220	-	kHz
		5VDC input	-	270	-	
		12/15/24VDC input	-	260	-	
MTBF	MIL-HDBK-217F@25°C		3500	-	-	k hours

Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)
Dimensions	19.65 x 6.00 x 10.16mm

Weight	2.1g(Typ.)
Cooling Method	Free air convection

EMC Specifications

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

Note: Refer to Fig. 4 for recommended circuit test.

Typical Characteristic Curves

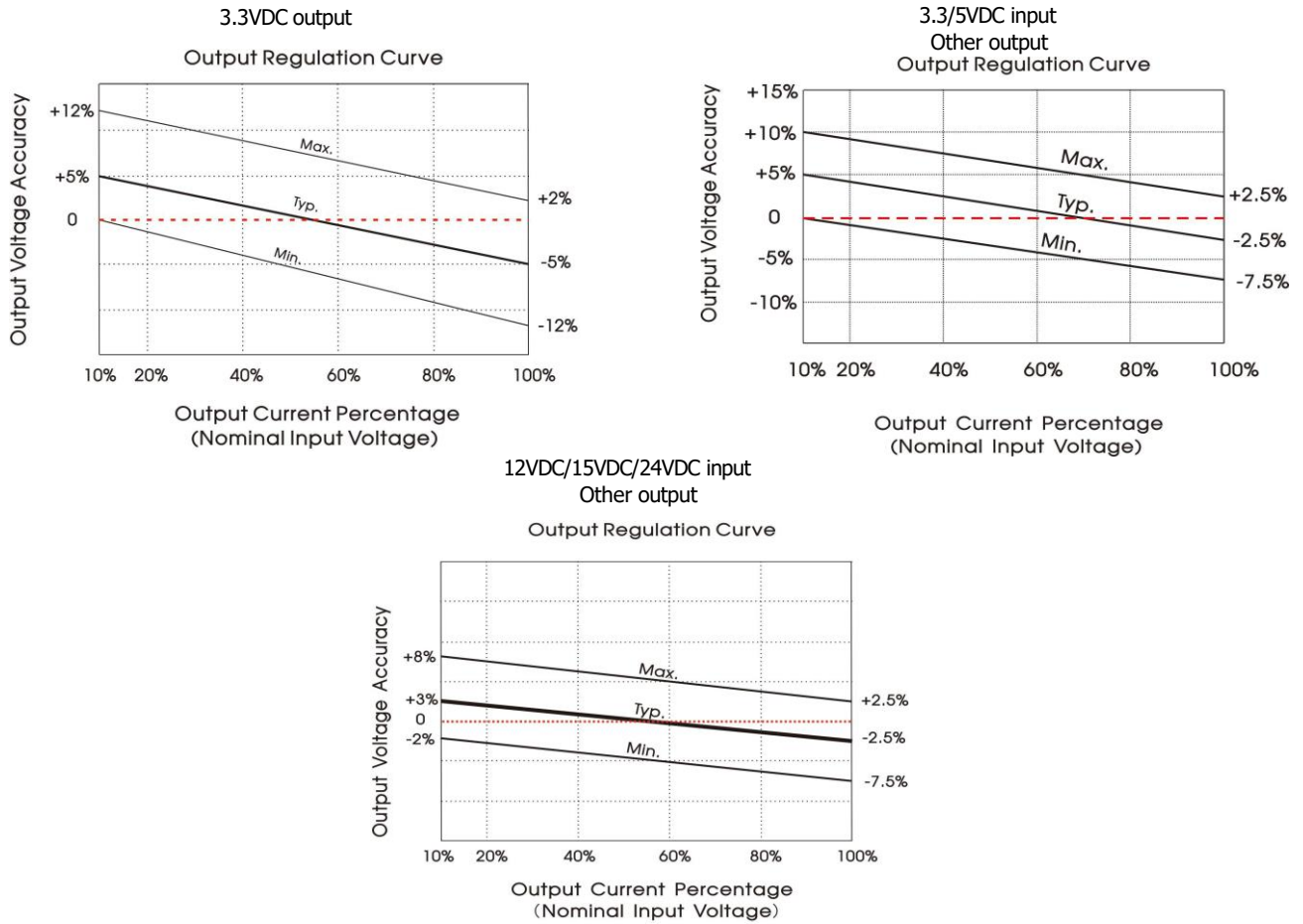


Fig. 1

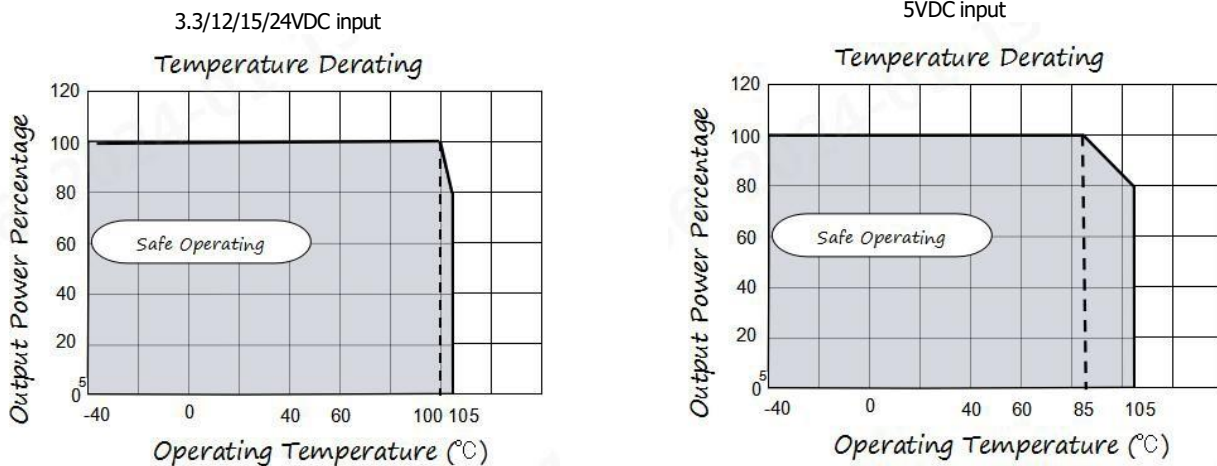
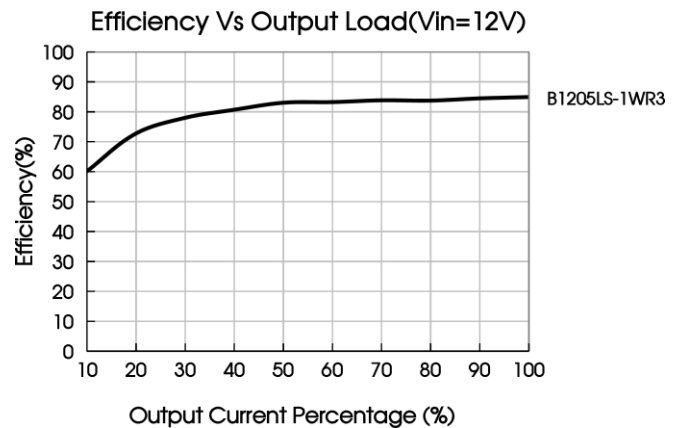
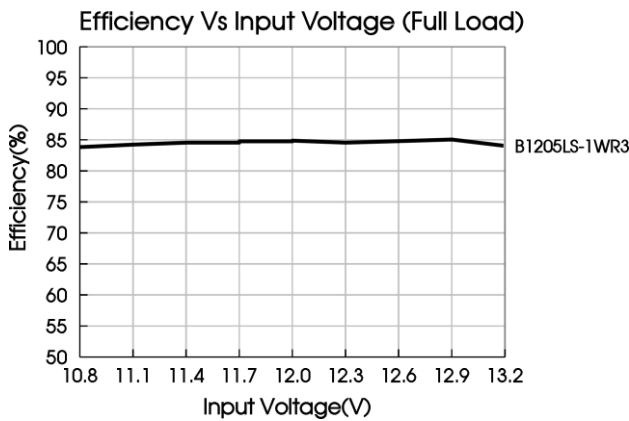
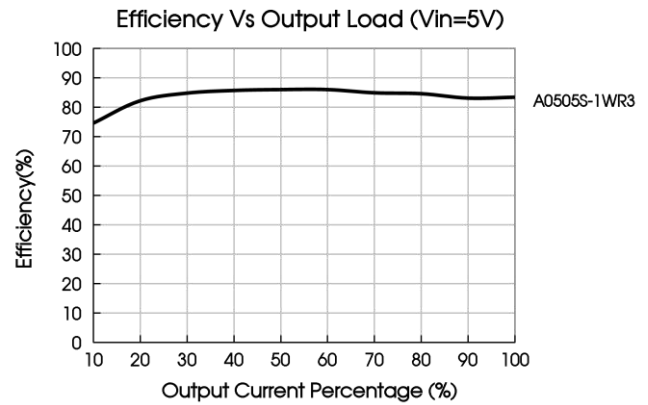
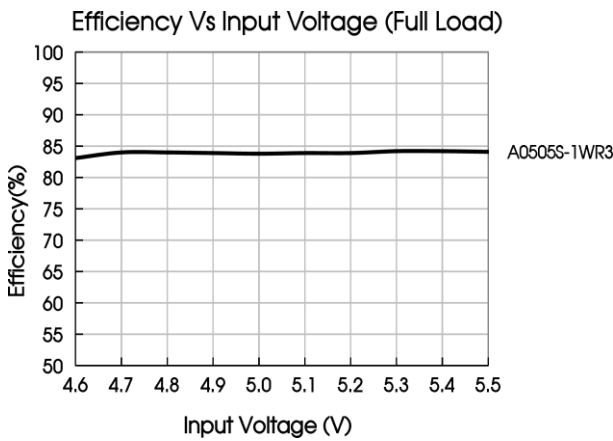
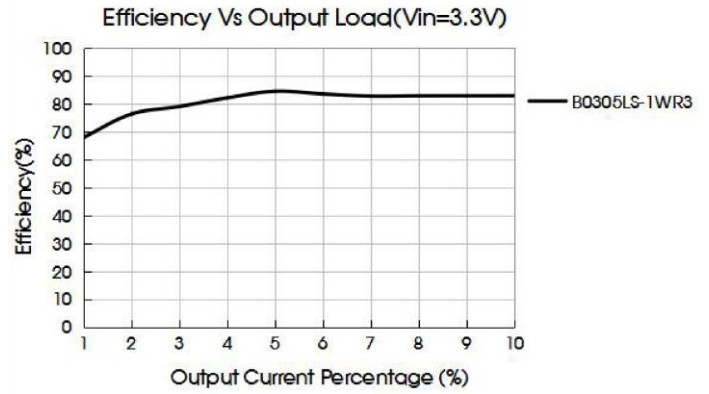
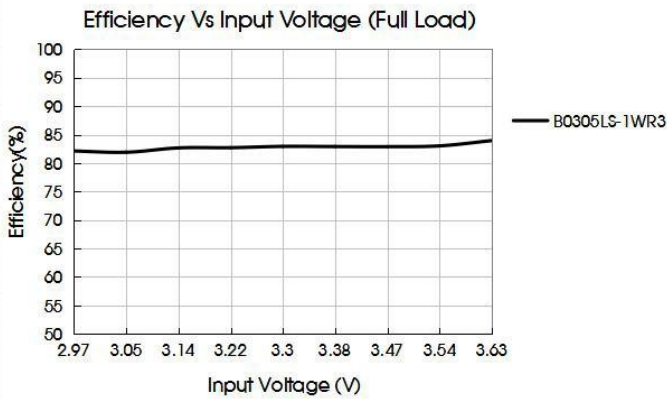


Fig. 2



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.

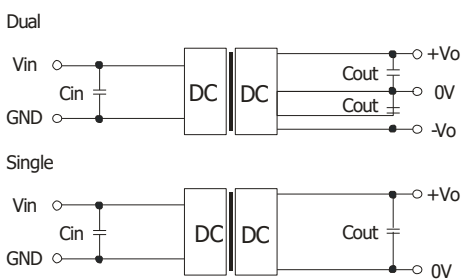


Fig. 3

Table 1: Recommended input and output capacitor values

	Vin	Cin	Single Vout	Cout	Dual Vout	Cout
3.3V	3.3VDC	10uF/16V	3.3/5VDC	10uF/16V	±3.3/±5VDC	10uF/16V
	-	-	9/12VDC	2.2uF/25V	±9/±12VDC	2.2uF/25V
	-	-	15/24VDC	1uF/50V	±15/±24VDC	1uF/50V
other	5VDC	4.7uF/16V	3.3/5VDC	10uF/16V	±3.3/5VDC	4.7uF/16V
	12VDC	2.2uF/25V	7.2/9VDC	2.2uF/16V	±9VDC	1uF/16V
	15VDC	2.2uF/25V	12VDC	2.2uF/25V	±12VDC	1uF/25V
	24VDC	1uF/50V	15VDC	1uF/25V	±15VDC	0.47uF/25V
	-	-	24VDC	1uF/50V	±24VDC	0.47uF/50V

2. EMC (CLASS B) compliance circuit

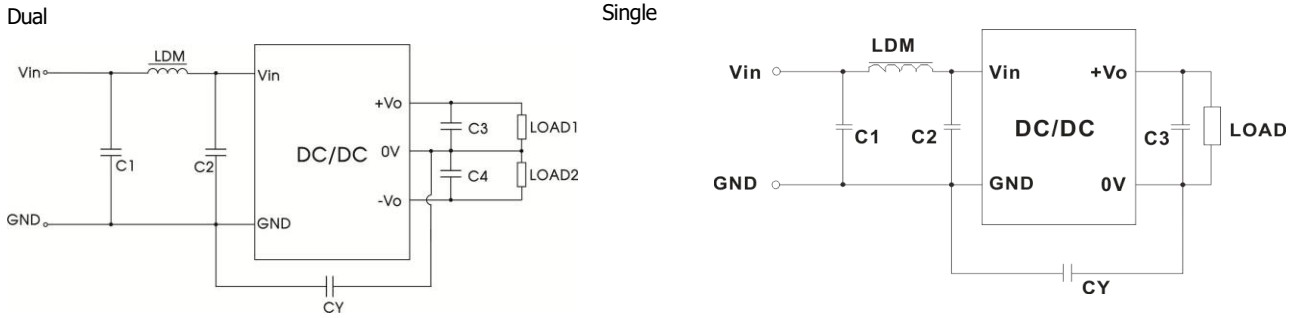
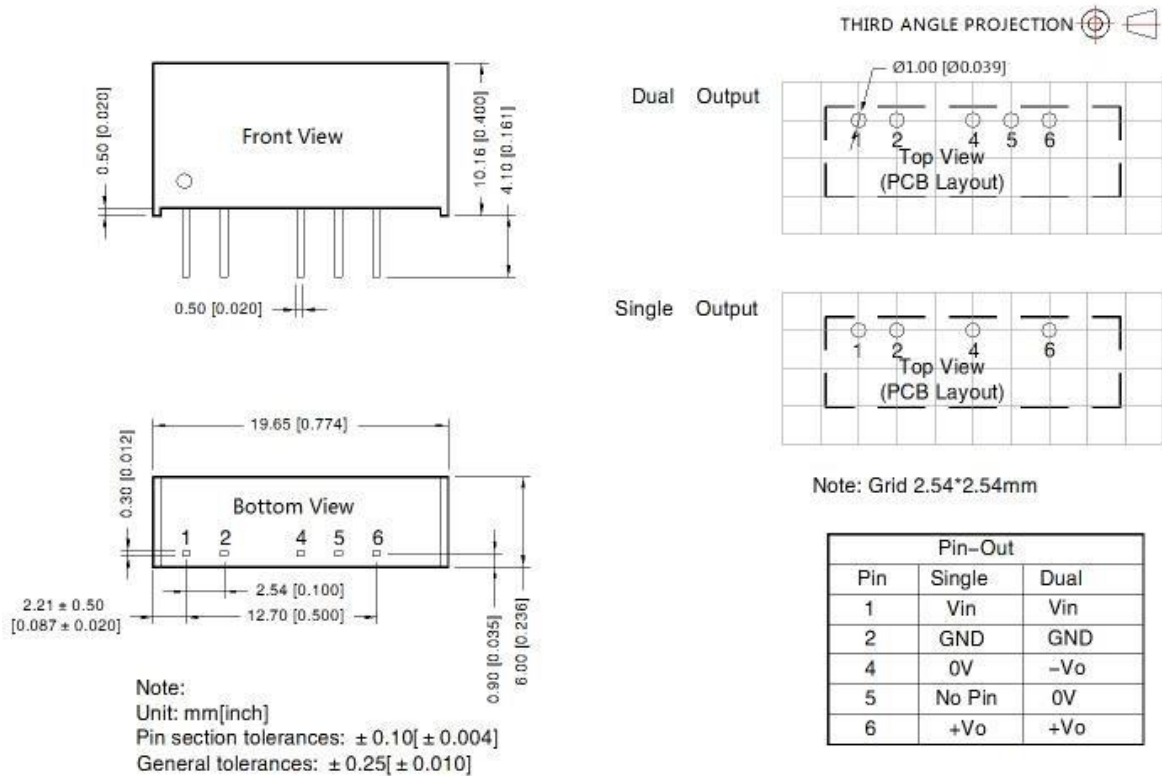


Fig. 4

Table 2: EMC recommended circuit value table

Input Voltage		3.3VDC		5VDC		Other input
Output Voltage		3.3/5VDC	3.3/5VDC	3.3/5/9VDC	12/15/24VDC	-
Emissions	C1/C2	4.7μF /16V	4.7μF /16V	4.7μF /25V	4.7μF /25V	4.7μF /50V
	CY	-	270pF /4kVDC VISHAY HGZ102MBP TDK CD45-E2GA102M-GKA	100pF/2kV	1000pF/2kV	270pF /2kV
	C3/C4	Refer to the Cout in table 1				
	LDM	6.8μH				

Dimensions and Recommended Layout



Notes & Instructions

1. If the product works under the minimum required load, it cannot guarantee that the performance of the product complies with all the performance indicators in this manual;
2. The maximum capacitive load is tested under the input voltage range and full load condition;
3. Unless otherwise stated, all indexes in this manual are measured at Ta=25°C, humidity <75%RH, nominal input voltage and rated output load;
4. All index testing methods in this manual are based on the enterprise standards of the company;
5. Our company can provide product customization, specific needs can directly contact our technical staff;