

FEATURES

- ◆ Continuous short-circuit protection
- ◆ No-load input current as low as 8mA
- ◆ Operating ambient temperature range:-40℃to +85℃
- ◆ High efficiency up to 85%
- ◆ I/O isolation test voltage 1500V_{DC}
- ◆ Industry standard pin-out
- ◆ SIP package
- ◆ Three year warranty period

1W isolated DC-DC converter

Fixed input voltage, unregulated dual/single output



Selection Guide

Certification	Part No.	Input Voltage(V _{DC})	Output		Full Load Efficiency(%) Min./Typ.	Capacitive Load(μF)* Max.
		Nominal (Range)	Voltage (V _{DC})	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	1200
	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	1200
	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	15 (13.5-16.5)	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	24 (21.6-26.4)	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)	3.3V _{DC} input	3.3V _{DC} output	--	384/10	405/ --	mA
		Other output	--	370/18	389/ --	
	5V _{DC} input	3.3V _{DC} /5V _{DC} output	--	270/8	286/ --	
		9V _{DC} /12V _{DC} output	--	241/12	254/ --	
		15V _{DC} /24V _{DC} output	--	241/18	254/ --	
	12V _{DC} input		--	105/8	110/ --	
	15V _{DC} input		--	84/8	88/ --	
	24V _{DC} input		--	56/8	61/ --	
Reflected Ripple Current *			--	15	--	
Surge Voltage(1sec.max.)	3.3V _{DC} input		-0.7	--	5	V _{DC}
Surge Voltage(1sec.max.)	5V _{DC} input		-0.7	--	9	V _{DC}
	12V _{DC} input		-0.7	--	18	
	15V _{DC} input		-0.7	--	21	
	24V _{DC} 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	
		15Vdc output	--	6	10	
		24Vdc output	--	5	10	
	12/15/24Vdc input 10%-100% load	3.3Vdc output	--	8	20	
		5Vdc output	--	5	15	
		9Vdc output	--	3	10	
		12Vdc output	--	3	10	
		15Vdc output	--	3	10	
		24Vdc output	--	2	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 elec tric 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? , (see Fig. 2)	-40	--	+85	°C
	3.3/12/15/24Vdc input	Derating when operating temperature≥ 100? , (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	%RH
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

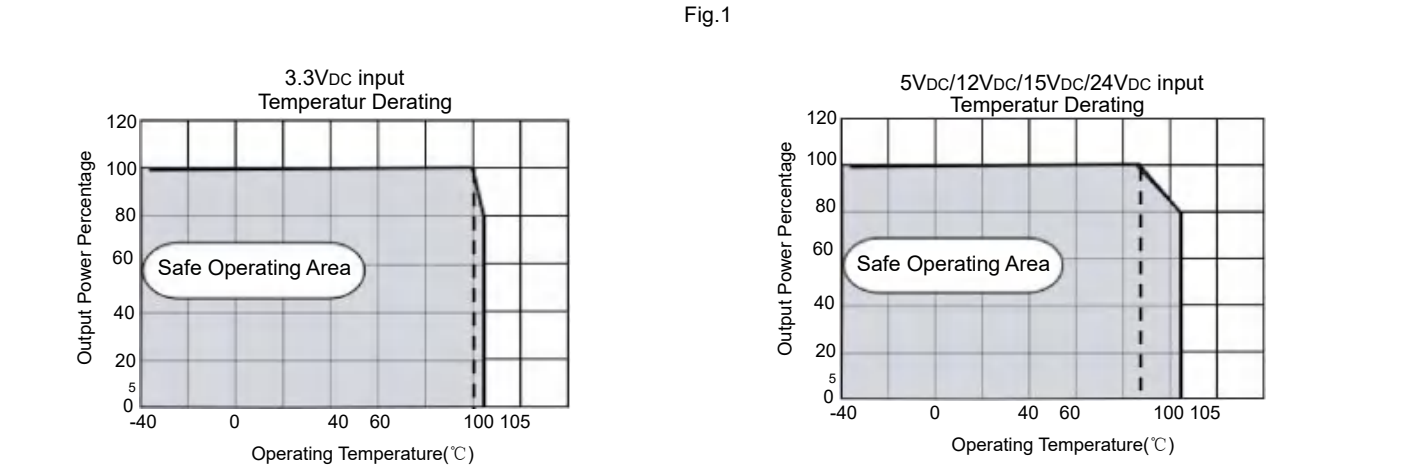
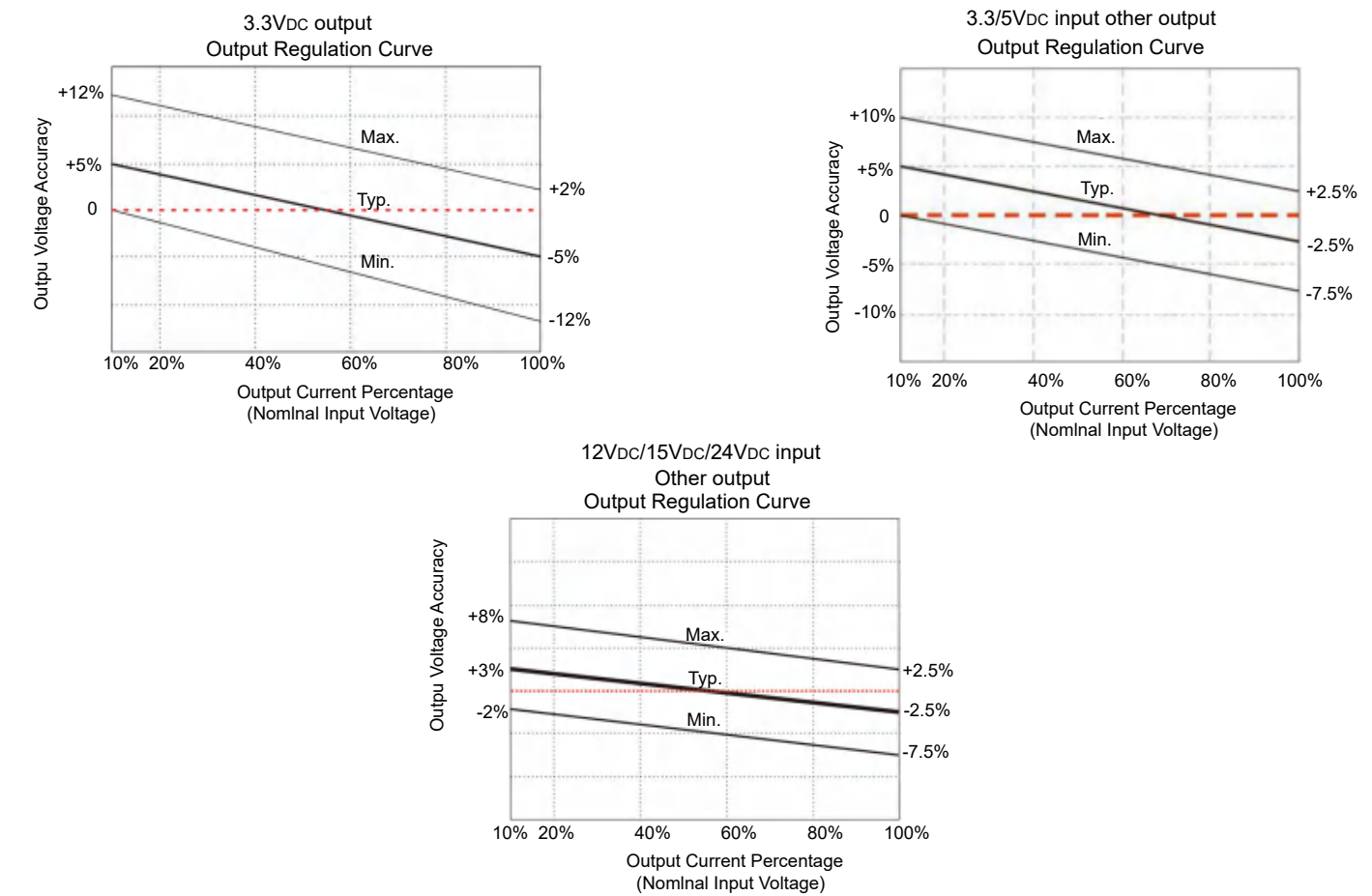
Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)
Dimensions	19.65x6.0x10.16mm

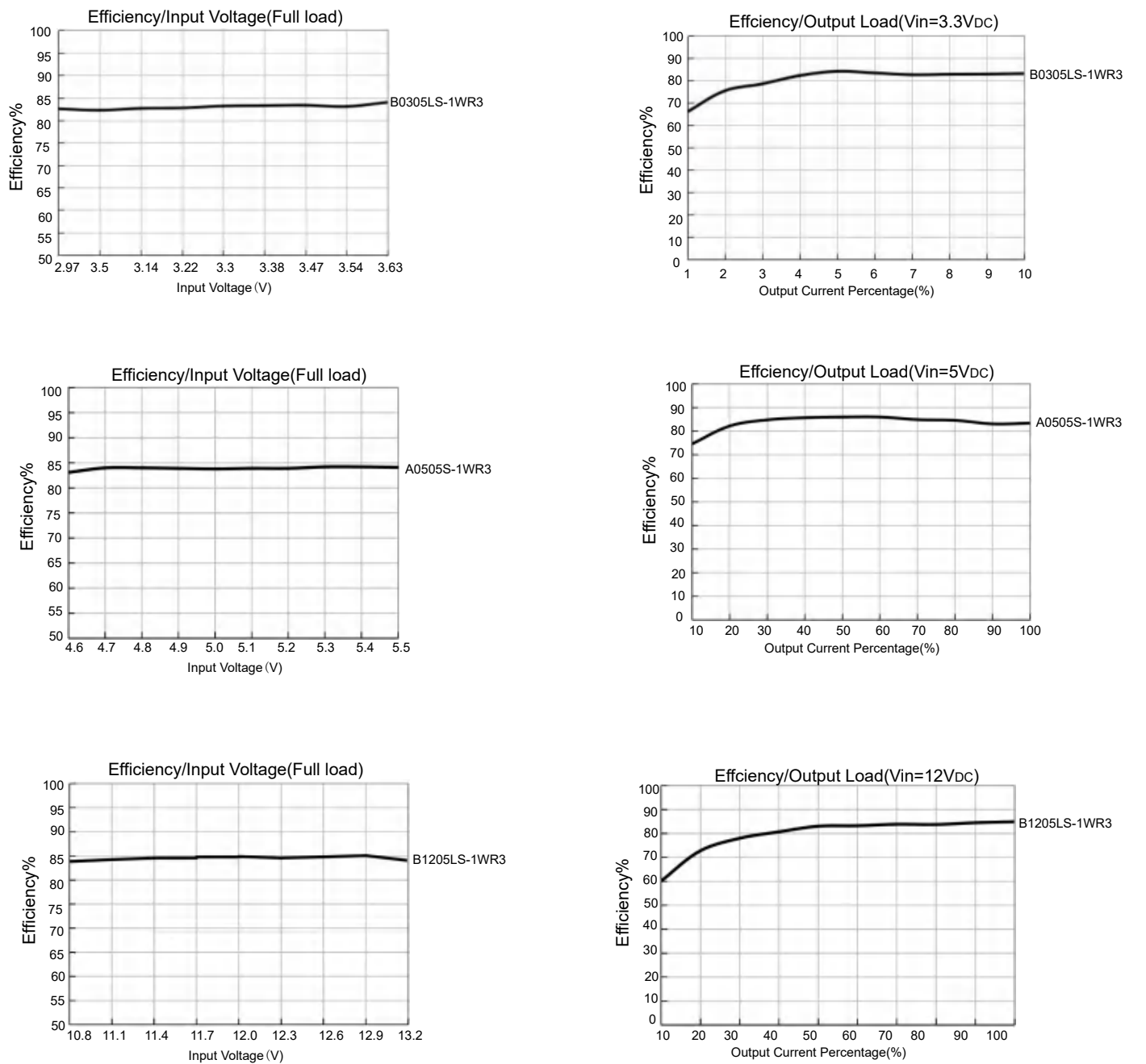
Weight	2.1g(Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility(EMC)

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 Performance Curves





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.

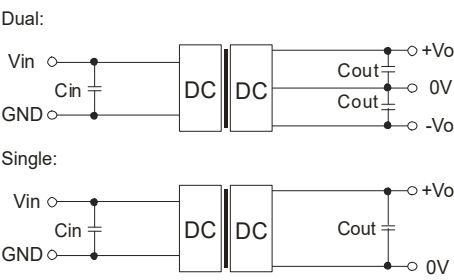


Fig.3

Table 1: Recommended input and output capacitor values

	Vin	Cin	Single Vout	Cout	Dual Vout	Cout
3.3V	3.3V _{DC}	10μF/16V	3.3/5V _{DC}	10μF/16V	±3.3/±5V _{DC}	10μF/16V
	--	--	9/12V _{DC}	2.2μF/25V	±9/±12V _{DC}	2.2μF/25V
	--	--	15/24V _{DC}	1μF/50V	±15/±24V _{DC}	1μF/50V
other	5V _{DC}	4.7μF/16V	3.3/5V _{DC}	10μF/16V	±3.3/5V _{DC}	4.7μF/16V
	12V _{DC}	2.2μF/25V	7.2/9V _{DC}	2.2μF/16V	±9V _{DC}	1μF/16V
	15V _{DC}	2.2μF/25V	12V _{DC}	2.2μF/25V	±12V _{DC}	1μF/25V
	24V _{DC}	1μF/50V	15V _{DC}	1μF/25V	±15V _{DC}	0.47μF/25V
	--	--	24V _{DC}	1μF/50V	±24V _{DC}	0.47μF/50V

2. EMC (CLASS B) compliance circuit

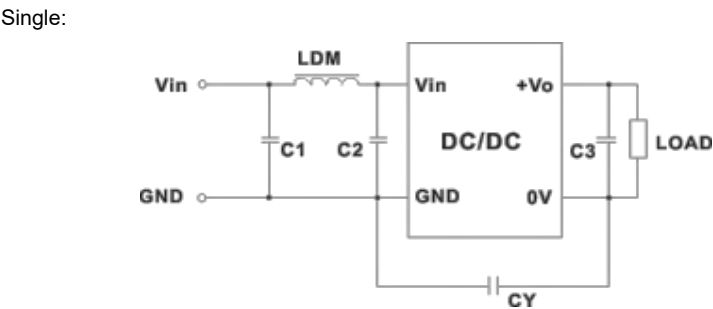
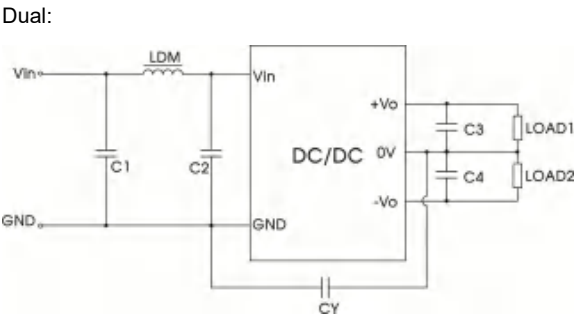


Fig.4

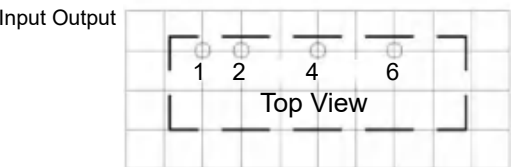
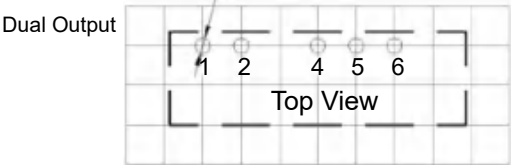
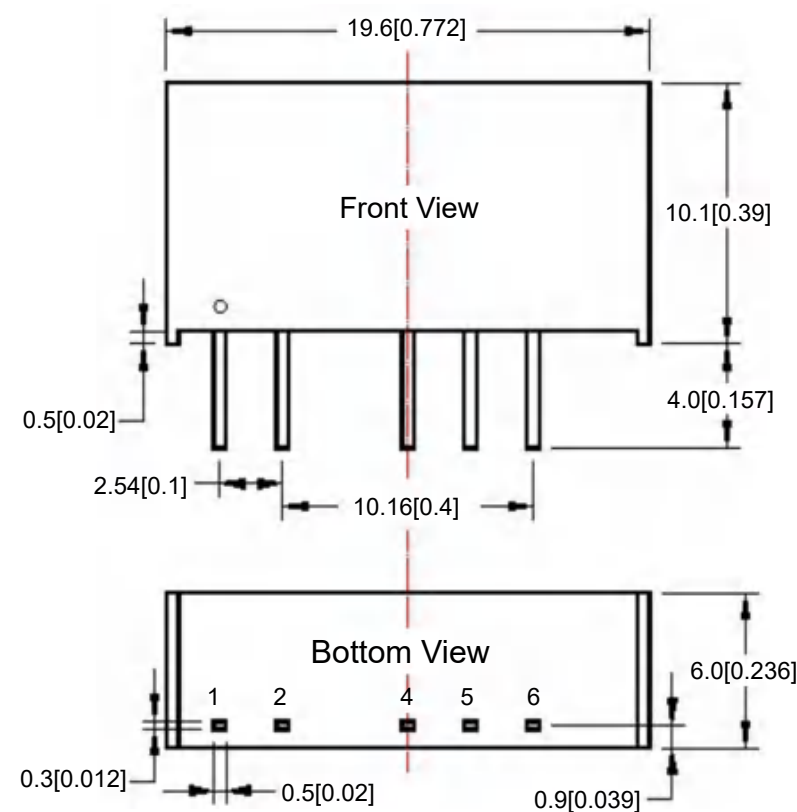
Table 2: EMC recommended circuit value table

Input Voltage		3.3V _{DC}		5V _{DC}		Other input
Output Voltage		3.3/5V _{DC}	3.3/5V _{DC}	3.3/5/9V _{DC}	12/15/24V _{DC}	--
Emissions	C1/C2	4.7μF/16V	4.7μF/16V	4.7μF/25V	4.7μF/25V	4.7μF/50V
	CY	--	270pF/4kV _{DC} VISHAY HGZ102MBP TDKCD45-E2GA102M-GKA	100pF/2kV	1000pF/2kV	270pF/2kV
	C3/C4	Refer to the Cout in table 1				
	LDM	6.8μH				

3. For additional information please refer to DC-DC converter application notes on WWW.CHAWENS.COM

Dimensions and Recommended Layout

Third angle projection 



Note: Grid 2.54*2.54mm

Pin	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
4	-Vo	-Vo
5	No Pin	COM
6	+Vo	+Vo

Note:
Unit:mm[inch]
Pin diameter tolerances:±0.1[±0.004]
General tolerances:±0.5[±0.02]



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