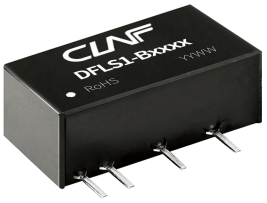
DESCRIPTIONS

DC-DC converters, 1W, flexed input, unregulated single output



Report Report CB RoHS

UL62368-1 EN62368-1 BS EN62368-1 IEC62368-1

Features

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

Applications

- Pure digital circuits
- Low frequency analog circuits
- Relay-driven circuits
- 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.		
EN/BS EN	DFLS1-B0303	3.3 (2.97-3.63)	3.3	303/30	75/79	2400
	DFLS1-B0305		5	200/20	78/82	2400
	DFLS1-B0309		9	111/11	81/85	1000
	DFLS1-B0312		12	83/8	78/82	560
	DFLS1-B0315		15	67/7	78/82	560
	DFLS1-B0324		24	42/4	80/84	220
UL/EN/ BS EN/IEC	DFLS1-B0503	5 (4.5-5.5)	3.3	303/30	70/74	2400
	DFLS1-B0505		5	200/20	78/82	2400
EN/BS EN	DFLS1-B0509		9	111/12	79/83	1000
	DFLS1-B0512		12	84/9	79/83	560

	DFLS1-B0515		15	67/7	79/83	560
	DFLS1-B0524		24	42/4	81/85	220
EN/BS EN	DFLS1-B1203	12 (10.8-13.2)	3.3	303/30	71/75	2400
	DFLS1-B1205		5	200/20	76/80	2400
	DFLS1-B1209		9	111/12	76/80	1000
	DFLS1-B1212		12	83/9	76/80	560
	DFLS1-B1215		15	67/7	77/81	560
	DFLS1-B1224		24	42/4	77/81	220
EN/BS EN	DFLS1-B1505	15 (13.5-16.5)	5	200/20	76/80	2400
	DFLS1-B1509		9	111/12	76/80	1000
	DFLS1-B1512		12	83/9	76/80	560
	DFLS1-B1515		15	67/7	77/81	560
	DFLS1-B1524		24	42/5	77/81	220
EN/BS EN	DFLS1-B2403	24 (21.6-26.4)	3.3	303/30	69/75	2400
	DFLS1-B2405		5	200/20	73/79	2400
	DFLS1-B2407		7.2	139/13	74/80	1000
	DFLS1-B2409		9	111/12	74/80	1000
	DFLS1-B2412		12	83/9	75/81	560
	DFLS1-B2415		15	67/7	75/81	560
	DFLS1-B2424		24	42/4	75/81	220

Specifications

Characteristic	Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Specifications	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
		5VDC input		-0.7	--	9	
		12VDC input		-0.7	--	18	
		15VDC input		-0.7	--	21	
		24VDC input		-0.7	--	30	
	Input Filter			Capacitance filter			
	Hot Plug			Unavailable			

Output Specifications	Voltage Accuracy			See output regulation curve(Fig. 1)			
	Linear Regulation	Input voltage change: ±1%	3.3VDC output	--	--	±1.5	--
			Others	--	--	±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	Full load		--	±0.02	--	%/℃
	Short-circuit Protection			Continuous, self-recovery			
General Specifications	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℃, (see Fig. 2)	-40	--	105	℃
		3.3/12/15/24 VDC input	Derating when operating temperature≥100℃, (see Fig. 2)				
	Storage Temperature			-55	--	125	
	Case Temperature Rise	Ta=25℃		--	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
			5VDC input	--	--	95	
	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℃		3500	--	--	k hours

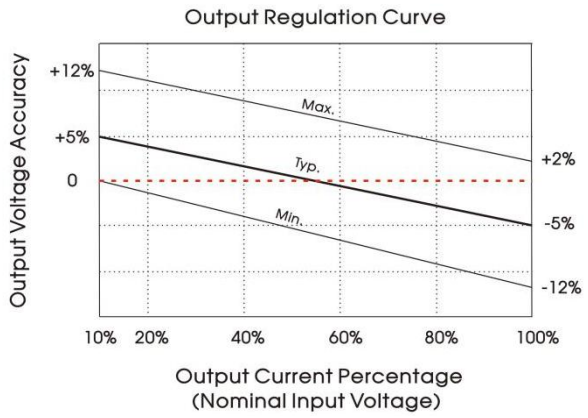
Mechanical Specifications	Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)
	Dimensions	19.65 x 6.00 x 10.16mm
	Weight	2.1g(Typ.)
	Cooling Method	Free air convection
Note:*The "parallel cable" method is used for Ripple and Noise test.		

Electromagnetic Compatibility (EMC)

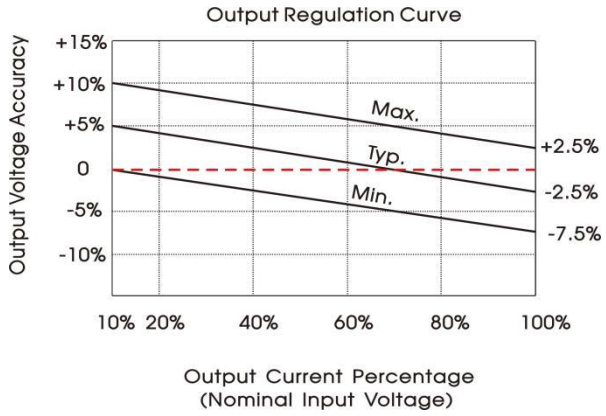
Emissions	CE	CISPR32/EN55032 CLASS B
	RE	CISPR32/EN55032 CLASS B
Immunity	ESD	IEC/EN61000-4-2 Air ±8kV, Contact ±6kV perf. Criteria B
Note: Refer to Fig. 4 for recommended circuit test.		

Typical Performance Curves

3.3VDC output



3.3/5VDC input, Other output



12VDC/15VDC/24VDC input

Other output

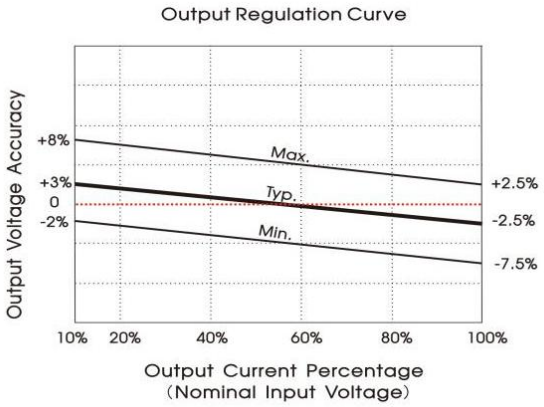
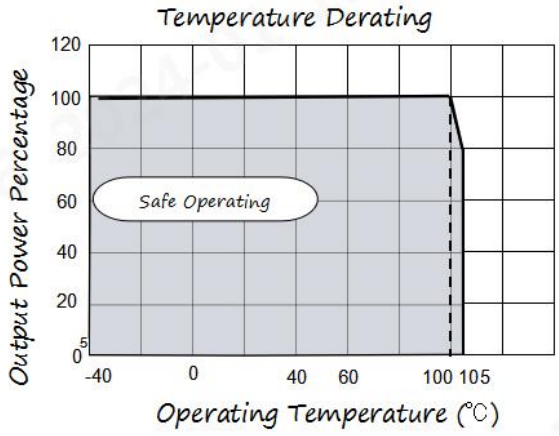


Fig. 1

3.3/12/15/24VDC input

5VDC input



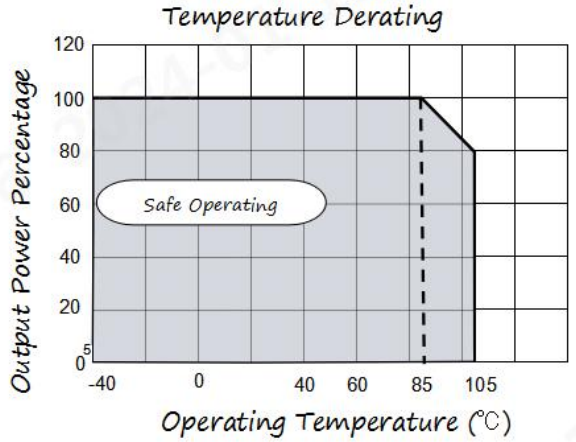
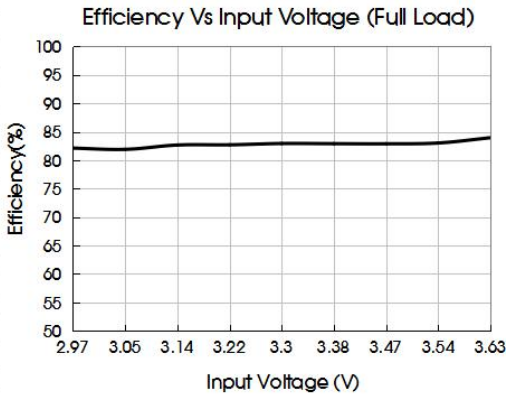
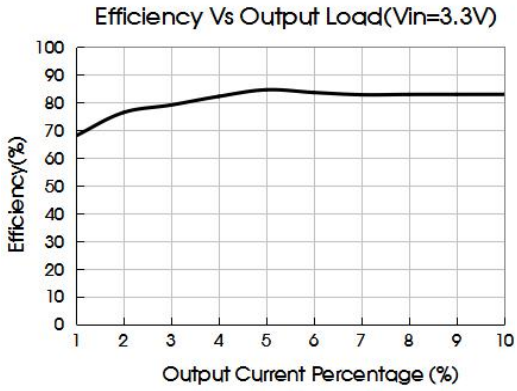


Fig. 2



DFLS1-B03



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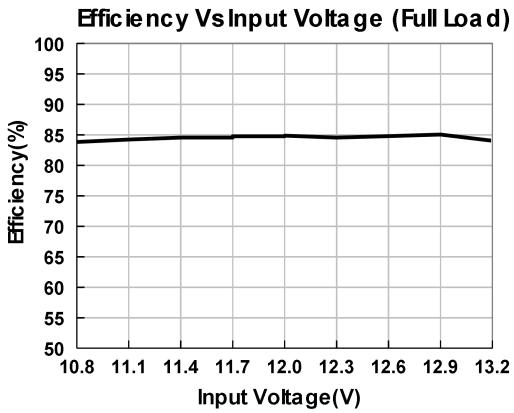
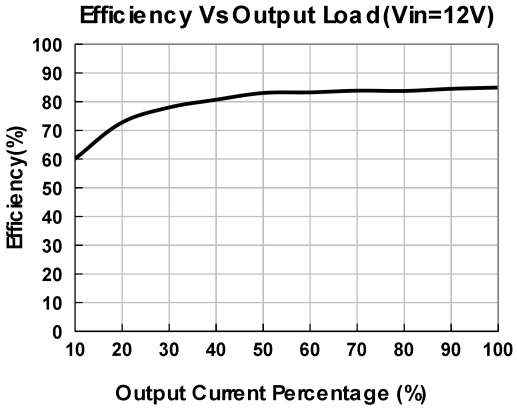


DFLS1-B12



DFLS1-B12

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.

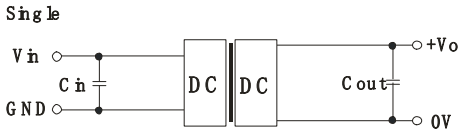


Fig. 3

Table 1: Recommended input and output capacitor values

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

2. EMC compliance circuit

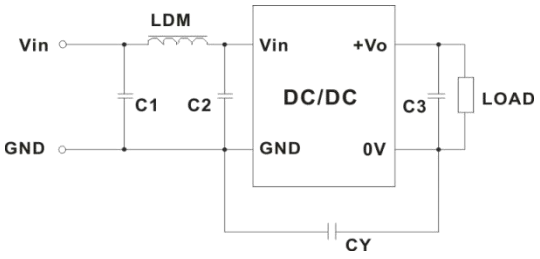
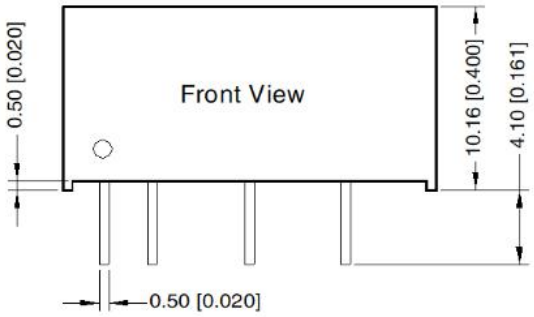


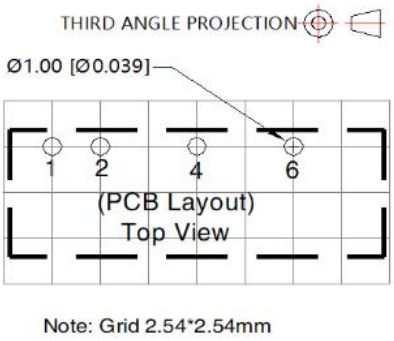
Fig. 4

Table 2: EMC recommended circuit value table

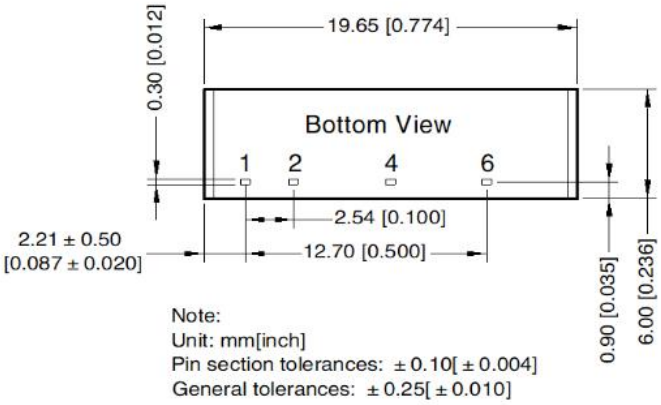
Input Voltage		3.3VDC		5VDC		Other input
Output Voltage		3.3/5VDC	3.3/5VDC	3.3/5/9VDC	12/15/24VDC	--
Emissions	C1/C2	4.7μF/16V	4.7μF/16V	4.7μF/25V	4.7μF/25V	4.7μF/50V
	CY	--	270pF/4kVDC	100pF/2kV	1000pF/2kV	270pF/2kV
	C3/C4	Refer to the Cout in table 1				
	LDM	6.8μH				

Dimensions and Recommended Layout





Note: Grid 2.54*2.54mm



Pin–Out	
Pin	Mark
1	Vin
2	GND
4	0V
6	+Vo

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 Ta=25℃, 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. Products are related to laws and regulations: see "Features" and "EMC";
6. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.