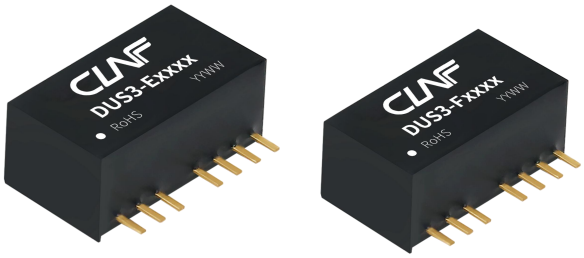
DUS3-E12xx& DUS3-F12xx series

Descriptions

3W isolated, DC/DC Converter



RoHS

UL62368-1 EN62368-1 BS EN62368-1

Features

- Ultra-wide 8:1 input voltage range
- High efficiency up to 79%
- No-load power consumption as low as 0.12W
- I/O isolation test voltage 3k VDC
- Input under-voltage protection, output short-circuit, over-current protection
- Operating ambient temperature range: -40℃ to +105℃
- Industry standard pin-out

Applications

- Medical care
- Industrial control
- Electric power
- Instruments
- Communication

Selection Guide

Certification	Part No.	Input Voltage (VDC)		Output		Full Load Efficiency②(%) Min./Typ.	Capacitive Load③ (μF)Max.
		Nominal (Range)	Max.①	Voltage (VDC)	Current (mA) Max./Min.		
EN/BS EN	DUS3-E1205	12 (4.5-36)	40	±5	±300	75/77	470
EN/BS EN	DUS3-E1212			±12	±125	77/79	220
EN/BS EN	DUS3-E1215			±15	±100	77/79	100
UL/EN/BS EN	DUS3-F1205			5	600	75/77	1000
UL/EN/BS EN	DUS3-F1212			12	250	77/79	330
UL/EN/BS EN	DUS3-F1215			15	200	77/79	220

Notes:
① Exceeding the maximum input voltage may cause permanent damage;
② Efficiency is measured at nominal input voltage and rated output load;
③ The specified maximum capacitive load for positive and negative output is identical.

Specifications

Product Specifications	Item	Operating Conditions			Min.	Typ.	Max.	Unit
Input Specifications	Input Current (full load / no-load)	5V/±5V output			--	325/8	334/16	mA
		Others			--	317/8	325/16	
	Reflected Ripple Current				--	50	--	
	Surge Voltage (1sec. max.)				-0.7	--	50	VDC
	Start-up Voltage				--	--	4.5	
	Input Under-voltage Protection				2.5	3.5	--	
	Input Filter				Capacitance Filter			
	Hot Plug				Unavailable			
Output Specifications	Voltage Accuracy	0% -100% load			--	±1	±3	%
	Linear Regulation	Input voltage variation from low to high at full load	Vo1	DUS3-E	--	--	±1	
				DUS3-F	--	--	±0.5	
			Vo2		--	--	±1	
	Load Regulation	5% -100% load	Vo1		--	--	±1	
			Vo2		--	--	±1.5	
	Cross Regulation	Dual output, Vo1 load at 50%, Vo2 load at range of 25%-100%			--	--	±5	
	Transient Recovery Time	25% load step change, nominal input voltag			--	300	500	μs
	Transient Response Deviation	25% load step change, nominal input voltage	5V/±5V output		--	±5	±8	%
			Others		--	±3	±5	
	Temperature Coefficient	Full load			--	--	±0.03	%/℃
	Ripple & Noise①	20MHz bandwidth, 5% -100% load			--	60	100	mV p-p
	Over-current Protection	Input voltage range			110	--	300	%Io
	Short-circuit Protection				Continuous, self-recovery			
General Specifications	Isolation	Input-output Electric Strength test for 1 minute with a leakage current of 1mA max.			3000	--	--	VDC
	Insulation Resistance	Input-output insulation at 500VDC			1000	--	--	MΩ
	Isolation Capacitance	Input-output capacitance at 100kHz/0.1V			--	40	--	pF
	Operating Temperature	See Fig. 1			-40	--	+105	℃
	Storage Humidity	Without condensation			5	--	95	%RH
	Storage Temperature				-55	--	+125	℃
	Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds			--	--	+300	
	Vibration				10-150Hz, 5G, 0.75mm. along X, Y and Z			
	Switching Frequency②	PWM mode			--	300	--	kHz
	MTBF	MIL-HDBK-217F@25℃			1000	--	--	k hours
Mechanical Specifications	Case Material	Black plastic; flame-retardant and heat-resistant (UL94-V0)						
	Dimensions	22.00 × 9.50 × 12.00 mm						
	Weight	4.5g (Typ.)						
	Cooling method	Free air convection						

Note:

①Under 0% -5% load conditions, ripple & noise does not exceed 5%Vo. The "parallel cable" method is used for ripple and noise test;

②Switching frequency is measured at full load. The module reduces the switching frequency for light load (below 50%) efficiency improvement.

Electromagnetic Compatibility (EMC)

Electromagnetic Compatibility (EMC)	Emissions (EMI)	CE	CISPR32/EN55032 CLASS B (see Fig.3-② for recommended circuit)/CLASS A(see Fig.4 for recommended circuit)	
		RE	CISPR32/EN55032 CLASS B (see Fig.3-② for recommended circuit)/CLASS A (see Fig.4 for recommended circuit)	
	Immunity (EMS)	ESD	IEC/EN61000-4-2	Contact ±4kV perf. Criteria B
		RS	IEC/EN61000-4-3	10V/m perf. Criteria A
		EFT	IEC/EN61000-4-4	±2kV (see Fig.3-① for recommended circuit) perf. Criteria B
		Surge	IEC/EN61000-4-5	line to line ±2kV (see Fig.3-① for recommended circuit) perf. Criteria B
		CS	IEC/EN61000-4-6	3 Vr.m.s perf. Criteria A

Characteristic Curve

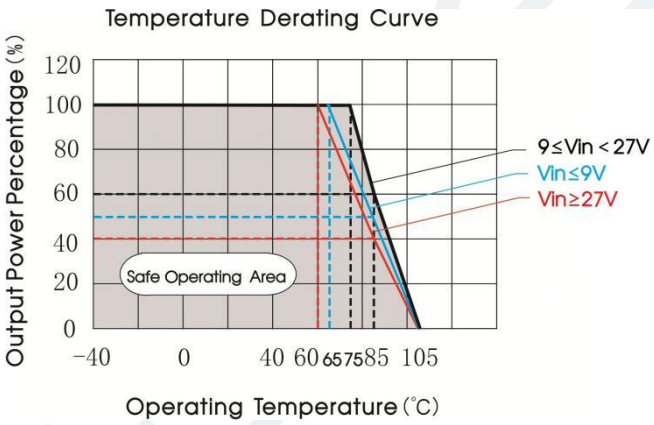


Fig. 1

Design Reference

1.Typical application

All the DC/DC converters of this series are tested before delivery using the recommended circuit shown in Fig. 2.

Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values Cin and Cout and/or by selecting capacitors with a low ESR (equivalent series resistance). Also make sure that the capacitance is not exceeding the specified max. capacitive load value of the product.

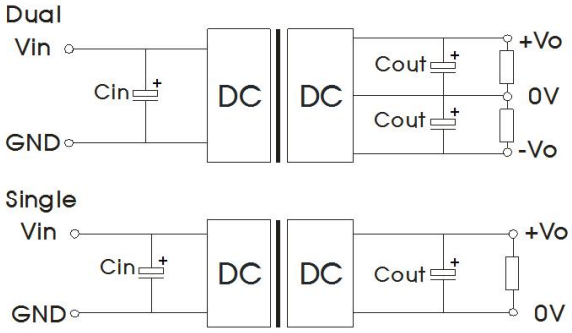


Fig. 2

Parameter description:

Single Vout (VDC)	Cout (μF)	Cin (μF)	Dual Vout (VDC)	Cout (μF)	Cin (μF)
5/12/15	22 (25V)	100 (50V)	±5/±12/±15	22 (25V)	100 (50V)

2.EMC compliance circuit

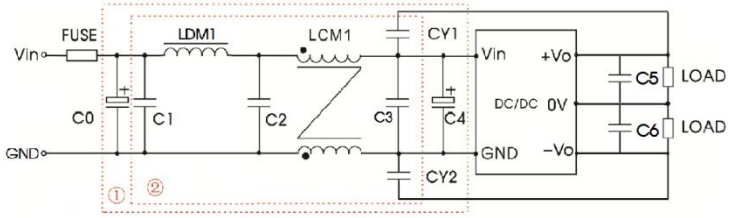


Fig. 3

Notes: For EMC tests we use Part ① in Fig. 3 for immunity and part ② for emissions test. Selecting based on needs

Parameter description:

Components	Vin: 12VDC
FUSE	Choose according to actual input current
C0	1000μF/50V
C4	330μF/50V
C1/C2/C3	10μF/50V
LCM1	3.3mH
LDM1	4.7μH
CY1/CY2	1nF/3kV
C5/C6	Refer to the Cout in Fig.2

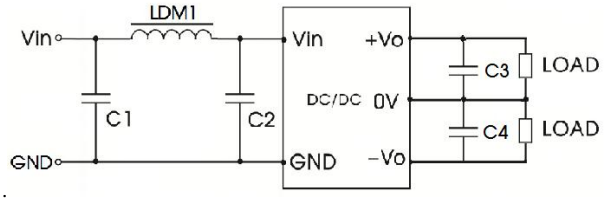


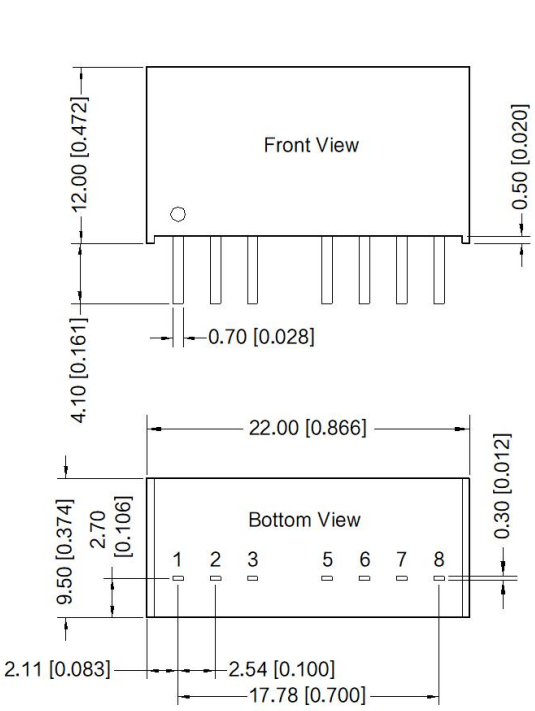
Fig. 4

Parameter description:

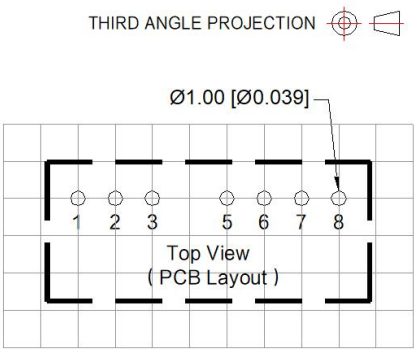
Components	Vin: 12VDC
FUSE	Choose according to actual input current
C1/C2	10μF/50V
LDM1	22μH
C3/C4	Refer to the Cout in Fig.2

3.The products do not support parallel connection of their output

DUS3-E12xx Dimensions and Recommended



Note:
Unit: mm[inch]
Pin section tolerances: ± 0.10[± 0.004]
General tolerances: ± 0.50[± 0.020]

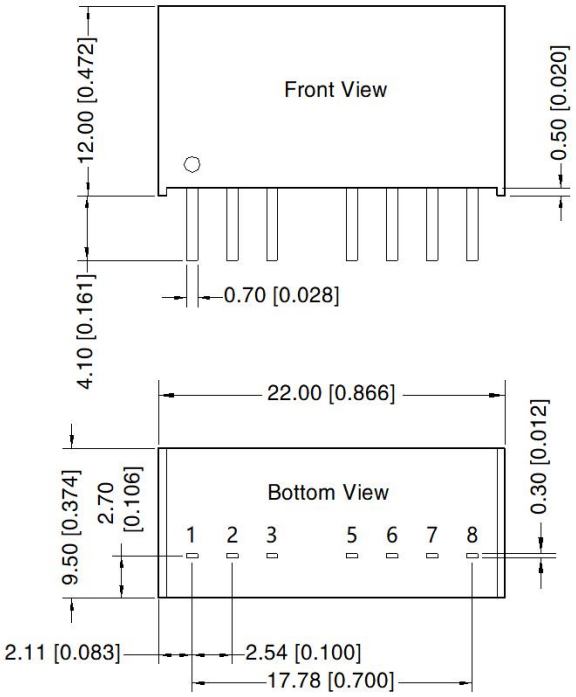


Note: Grid 2.54*2.54mm

Pin-Out	
Pin	Mark
1	GND
2	Vin
3	NC
5	NC
6	+Vo
7	0V
8	-Vo

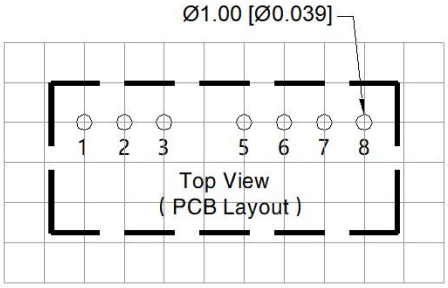
NC: Not available for electrical connection

Dimensions and Recommended



Note:
Unit: mm[inch]
Pin section tolerances: ± 0.10[± 0.004]
General tolerances: ± 0.50[± 0.020]

THIRD ANGLE PROJECTION



Note: Grid 2.54*2.54mm

Pin–Out	
Pin	Mark
1	GND
2	Vin
3	NC
5	NC
6	+Vo
7	0V
8	NC

NC: Not available for electrical connection

Note:
1.The maximum capacitive load offered were tested at input voltage range and full load;
2.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;
3.All index testing methods in this datasheet are based on company corporate standards;
4.Products are related to laws and regulations: see "Features" and "EMC";
5.Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.