DESCRIPTIONS 3W isolated DC-DC converter in SIP package

RoHS

CE Report EN62368-1

UKCA Report 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 3kVDC
- Input under-voltage protection, output short-circuit, over-current protection
- Operating ambient temperature range: -40℃ to +105℃
- Industry standard pin-out

APPLICATIONS

- Industrial control
- Electric power
- Home appliances
- Instrumentation
- Communication
- Civil applications

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.		
Pending	DUS3-E1205	12 (4.5-36)	40	±5	±300	75/77	470
	DUS3-E1212			±12	±125	77/79	220
	DUS3-E1215			±15	±100	77/79	100
	DUS3-F1205			5	600	75/77	1000
	DUS3-F1212			12	250	77/79	330
	DUS3-F1215			15	200	77/79	220

Notes : ①Exceeding the maximum input voltage may cause permanent damage;
②Efficiency is measured at nominal input voltage and rated output load;
③The 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)	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

Item	Operating Conditions			Min.	Typ.	Max.	Unit
Voltage Accuracy	0% - 100% load			--	±1	±3	%
Linear Regulation	Input voltage variation from low to high at full load	Vo1	DUS3-F Series	--	--	±1	
			DUS3-F Series	--	--	±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 voltage		--	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	Input voltage range		Continuous, self-recovery			

Note:

①Under 0% -5% load conditions, ripple & noise does not exceed 5%Vo. The "parallel cable" method is used for ripple and noise test, please refer to *DC-DC ConverterApplication Notes* for specific information.

General Specification

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 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 Frequency *	PWM mode	--	300	--	kHz
MTBF	MIL-HDBK-217F@25℃	1000	--	--	k hours
Note: *Switching frequency is measured at full load. The module reduces the switching frequency for light load (below 50%) efficiency improvement.					

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

Electromagnetic Compatibility (EMC)

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

Typical Characteristic Curves

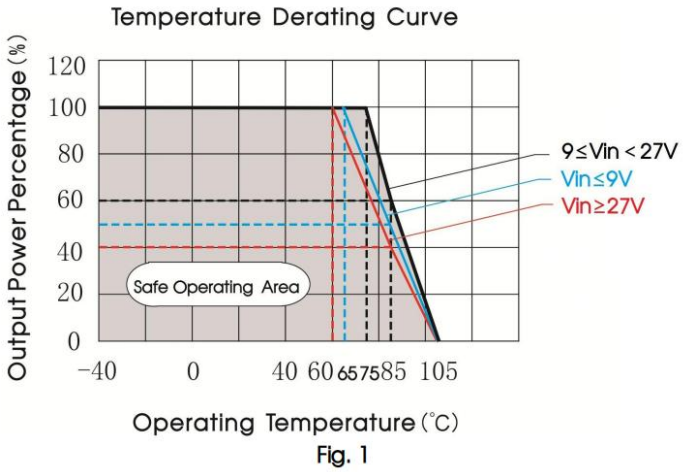


Fig. 1

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.

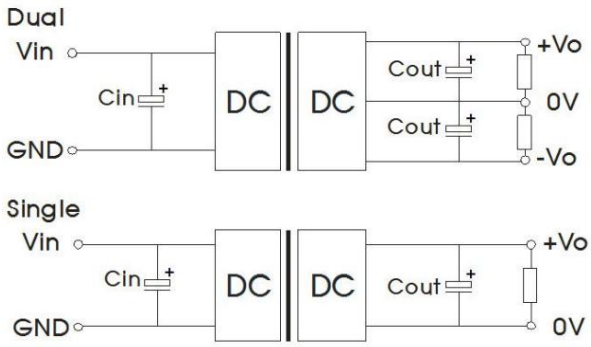


Fig. 2

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

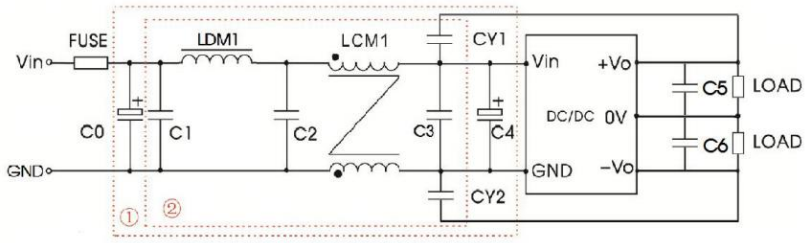


Fig. 3

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

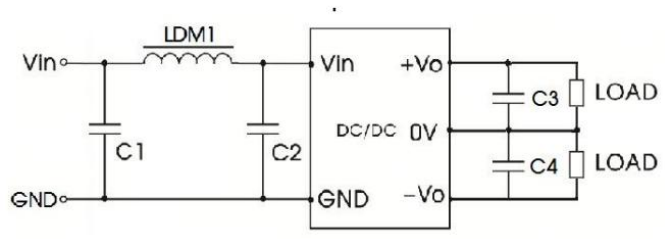


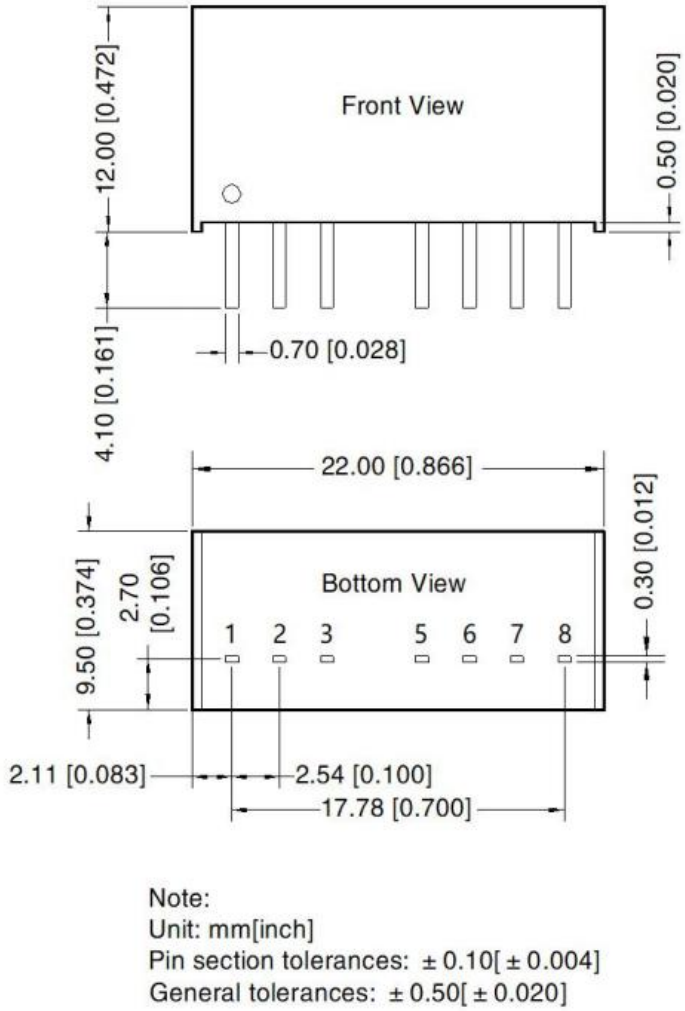
Fig. 4

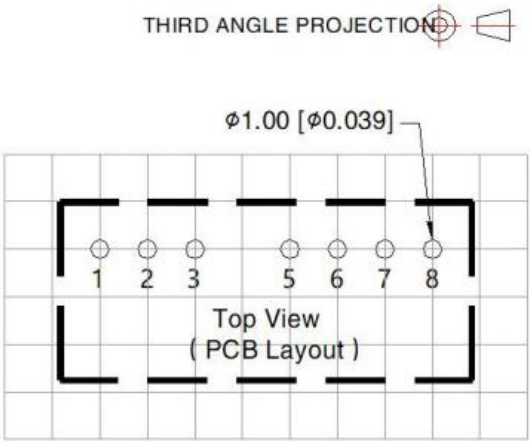
Parameter description:

Components	Vin: 12V
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

Dimensions and Recommended Layout





Note: Grid 2.54*2.54mm

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

NC: Not available for electrical connection

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

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. We can provide product customization service, please contact our technicians directly for specific information;
   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.