

## Descriptions

1W isolated, DC/DC Converter



EN62368-1



BS EN62368-1

RoHS



## Features

- Ultra-wide input voltage range (8:1)
- High efficiency up to 74%
- No-load power consumption as low as 0.12W
- I/O isolation test voltage 3k VDC
- Operating ambient temperature range: -40°C to +105°C
- Input under-voltage protection, output short-circuit, over-current protection
- Industry standard pin-out

## Applications

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

## Selection Guide

Certification	Part No.	Input Voltage (VDC)		Output		Full Load Efficiency <sup>②</sup> (%) Min./Typ.	Capacitive Load (μF)Max.
		Nominal (Range)	Max. <sup>①</sup>	Voltage(VDC)	Current(mA) Max.		
EN/BS EN	DUS1-F1205	12 (4.5-36)	40	5	200	69/71	470
	DUS1-F1209			9	111	69/72	220
	DUS1-F1212			12	83	72/74	330
	DUS1-F1215			15	67	72/74	220

Note:

① Exceeding the maximum input voltage may cause permanent damage;

② Efficiency is measured at nominal input voltage and rated output load.

## Specifications

Product Specifications	Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Specifications	Input Current (full load / no-load)	5V output		--	117/10	121/15	mA
		Others		--	116/10	121/15	
	Reflected Ripple Current		--	50	--	VDC	
	Surge Voltage (1sec. max.)		-0.7	--	50		
	Start-up Voltage		--	--	4.5		
	Input Under-voltage Protection		2.5	3.5	--		
	Input Filter		Capacitance Filter				
	Hot Plug		Unavailable				
Output Specifications	Output Voltage Accuracy	0% -100% load		--	±1	±3	%
	Line Regulation	Full load, the input voltage is from low to high		--	--	±0.5	
	Load Regulation	5% -100% load		--	--	±1	
	Transient Recovery Time	25% load step change, nominal input voltage		--	300	500	μs
	Transient Response Deviation	25% load step change, nominal input voltage	5V output	--	±5	±8	%
			Others	--	±3	±5	
	Temperature Coefficient	Full load		--	--	±0.03	%/°C
	Ripple & Noise <sup>①</sup>	20MHz bandwidth, 5% -100% load		--	60	100	mVp-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	°C
	Storage Humidity	Without condensation		5	--	95	%RH
	Storage Temperature			-55	--	+125	°C
	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 <sup>②</sup>	PWM mode		--	300	--	kHz
	MTBF	MIL-HDBK-217F@25°C		1000	--	--	k hours
Physical Specifications	Case Material	Black plastic; flame-retardant and heat-resistant (UL94-V0)					
	Package Dimensions	22.00 × 9.50 ×12.00 mm					
	Weight	4.6g (Typ.)					
	Cooling Method	Free air convection					

Note:

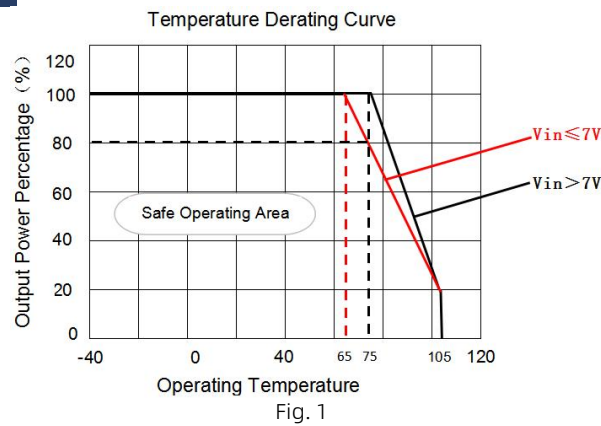
①Under 0% -5% load conditions, ripple &amp; noise does not exceed 5%Vo. The "parallel cable" method is used for ripple and noise test;

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

## Characteristic Curve



## Design Reference

### 1. Typical application

All the DC/DC converters of this series are tested according to the recommended circuit (see Fig. 2) before delivery.

If it is required to further reduce input and output ripple, properly increase the input & output of additional capacitors  $C_{in}$  and  $C_{out}$  or select capacitors of low equivalent impedance provided that the capacitance is no larger than the max. capacitive load of the product.



Fig. 2

Parameter description:

Vout (VDC)	Cout	Cin
5/9/12/15	22 $\mu\text{F}$ /25V	100 $\mu\text{F}$ /50V

### 2. EMC compliance circuit

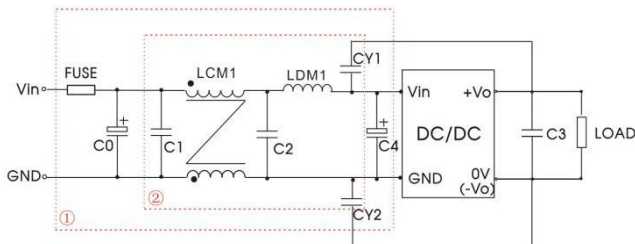


Fig. 3

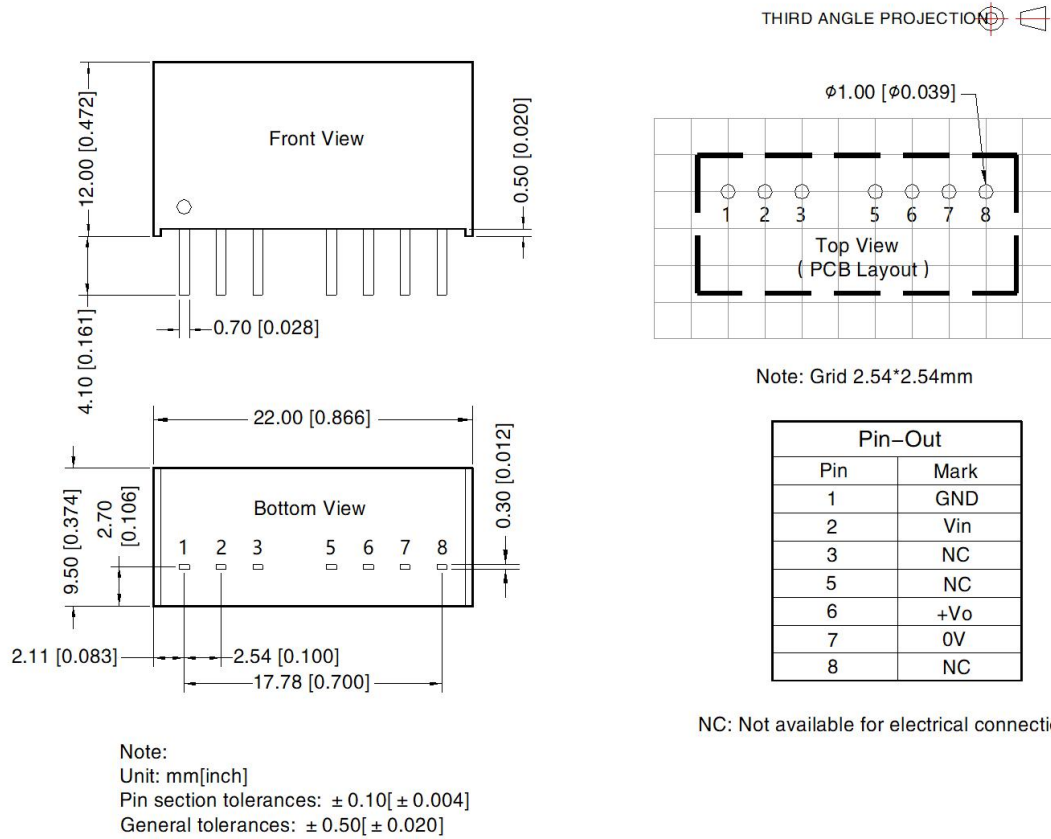
Notes: For EMC tests we use Part ① in Fig. 3 for immunity and part ② for emissions test. Selecting based on needs.

Parameter description:

Model	Vin: 12VDC
FUSE	Select fuse value according to actual input current
C0	1000 $\mu\text{F}$ /50V
C4	100 $\mu\text{F}$ /50V
C1/C2	4.7 $\mu\text{F}$ /50V
C3	22 $\mu\text{F}$ /50V
LCM1	2.2mH
LDM2	4.7 $\mu\text{H}$
CY1/CY2	1nF/3kV

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

## Dimensions and Recommended



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  $T_a=25^\circ\text{C}$ , 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.