

DESCRIPTIONS

DC-DC Converter, Non-isolated and regulated single output



RoHS



Report
 Report

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

FEATURES

- No-load input current as low as 0.1mA
- Operating ambient temperature range: -40°C to +85°C
- Up to 96% efficiency
- Support the negative output
- Output short-circuit protection

APPLICATIONS

- Industrial control
- Electric power
- Instrumentation

Selection Guide

Certification	Part No.	Input Voltage (VDC)*	Output		Full Load Efficiency (%) Vin Min. / Vin Max.	Capacitive Load (μF) Max.
		Nominal (Range)	Voltage (VDC)	Current (mA) Max.		
EN/BS EN	DNKS1-7803 (L)	24 (6-36)	3.3	1000	90/81	680
UL/EN/ BS EN/IEC	DNKS1-7805 (L)	24 (8-36)	5	1000	93/86	680
		12 (8-27)	-5	-500	86/82	330
EN/BS EN	DNKS1-78X6 (L)	24 (10-36)	6.5	1000	93/87	680
EN/BS EN/IEC	DNKS1-7809 (L)	24 (13-36)	9	1000	95/90	680
EN/BS EN	DNKS1-7812 (L)	24 (16-36)	12	1000	96/93	680
		12 (8-20)	-12	-300	89/88	330
EN/BS EN	DNKS1-7815 (L)	24 (20-36)	15	1000	96/94	680
		12 (8-18)	-15	-300	89/89	330

Note:

① For input voltage exceeding 30 VDC, an input capacitor of 22μF/50V is required;

② L-suffix: Add L-suffix for horizontal mount with 90 degree angled Pins(DNKS1-78XXL)

Specifications

Product Specifications	Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Specifications	No-load Input Current	Positive output		--	0.1	1	mA
	Reverse Polarity Input	Forbidden					
	Input Filter	Capacitance filter					
Output Specifications	Voltage Accuracy	Full load, input voltage range	DNKS1-7803(L)	--	±2	±4	%
			Other output	--	±2	±3	
	Linear Regulation	Full load, input voltage range		--	±0.2	±0.4	
	Load Regulation	Nominal input, 10% -100% load		--	±0.4	±0.6	
	Ripple & Noise*	20MHz bandwidth, nominal input, 20% -100% load		--	20	75	mVp-p
	Temperature Coefficient	Operating ambient temperature -40°C to +85°C		--	--	±0.03	%/°C
	Transient Response Deviation	Nominal input voltage, 25% load step change		--	50	300	mV
	Transient Recovery Time			--	0.1	1	ms
General Specifications	Short-circuit Protection	Nominal input		Continuous, self-recovery			
	Operating Temperature	Derating if the temperature ≥71°C (see Fig. 1)		-40	--	85	°C
	Storage Temperature			-55	--	125	
	Pin Soldering Resistance Temperature	Soldering time: 10 seconds		--	--	260	
	Storage Humidity	Non-condensing		5	--	95	%RH
	Switching Frequency	100% load, input voltage range	DNKS1-7803(L) DNKS1-7805(L) DNKS1-78X6(L)	420	520	620	kHz
			Other output	580	680	780	
Mechanical Specifications	MTBF	MIL-HDBK-217F@25°C		2000	--	--	k hours
	Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)					
	Dimensions	11.50 x 9.00 x 17.50 mm 19.00 x 11.50 x 9.00 mm (L version)					
	Weight	3.8g (Typ.)					
	Cooling Method	Free air convection					

Note:

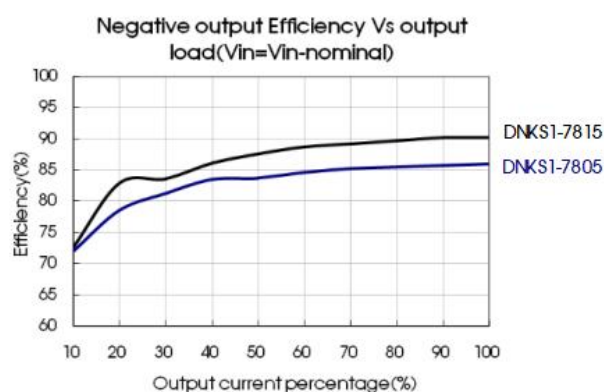
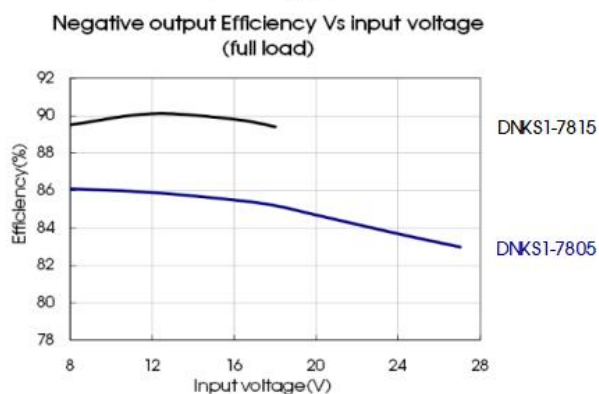
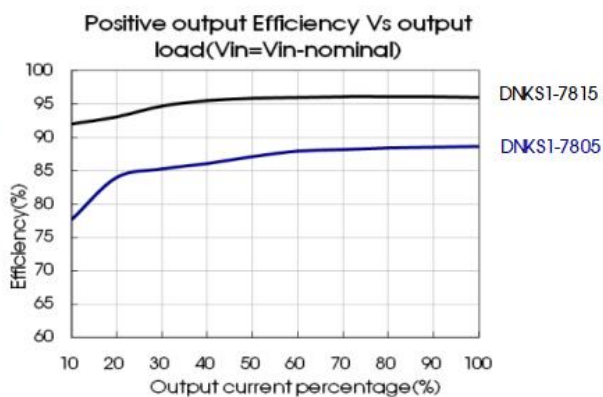
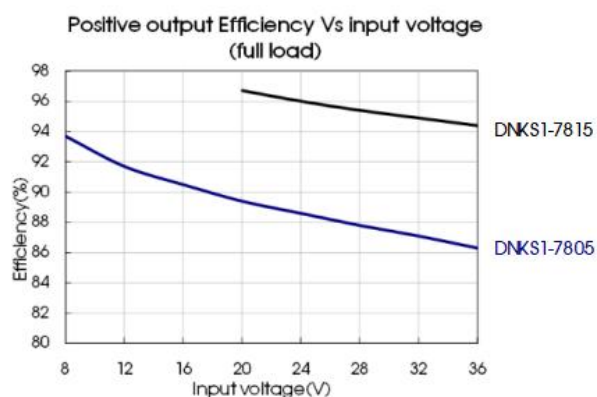
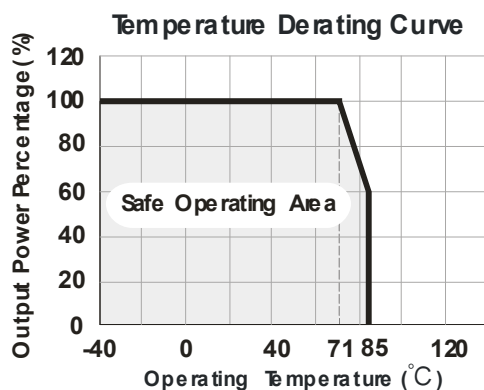
1. The "parallel cable" method is used for Ripple and Noise test, please refer to DC-DC Converter Application Notes for specific information;
2. With light loads at or below 20%, Ripple & Noise for 3.3/5V output parts increases to 100mVp-p max, and for 9V/12V/15V output parts to 2%Vo max.

Electromagnetic Compatibility (EMC)

Electromagnetic Compatibility (EMC)	Emissions	CE	CISPR32/EN55032	CLASS B (see Fig. 4-② for recommended circuit)		
		RE	CISPR32/EN55032	CLASS B (see Fig. 4-② for recommended circuit)		
	Immunity	ESD	IEC/EN 61000-4-2	Contact ±4kV		perf. Criteria B
		RS	IEC/EN 61000-4-3	10V/m		perf. Criteria A
		EFT	IEC/EN 61000-4-4	±1kV (see Fig. 4-① for recommended circuit)		perf. Criteria B

		Surge	IEC/EN 61000-4-5 line to line $\pm 1\text{kV}$ (see Fig. 4-① for recommended circuit)	perf. Criteria B
		CS	IEC/EN 61000-4-6 3Vr.m.s	perf. Criteria A

Characteristic Curve



Design Reference

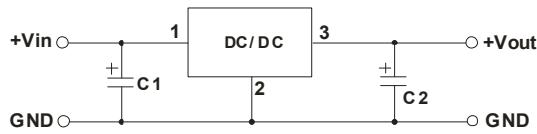


Fig1. Positive output application circuit

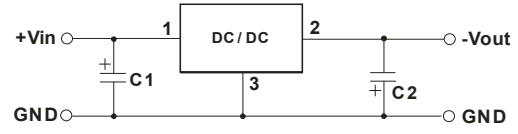


Fig2. Negative output application circuit

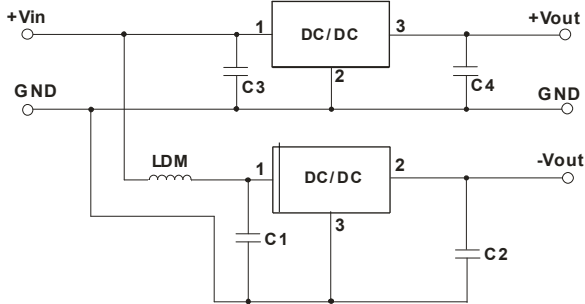


Fig. 3 Positive and Negative output application circuit

Note:

- 1.The required capacitors C1 and C2 (C3 and C4) must be connected as close as possible to the terminals of the module;
- 2.Refer to Table 1 for C1 and C2 (C3 and C4) capacitor values.
- 3.For certain applications, increased values for C2 and C4 and/or tantalum or low ESR electrolytic capacitors may also be used instead;
- 4.When using configurations as shown in figure 3, we recommended to add an inductor (LDM) with a value of up to 10 μ H which helps reducing mutual interference;
5. Converter cannot be used for hot swap and with output in parallel.

2. EMC compliance recommended circuit

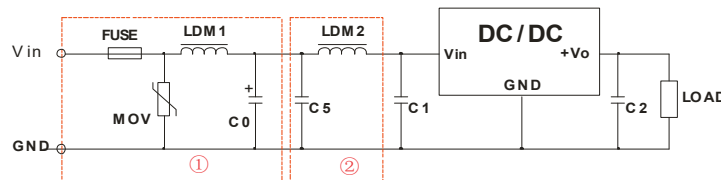
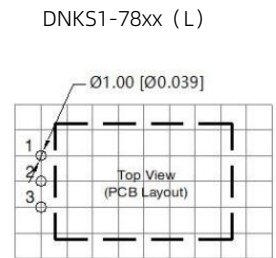
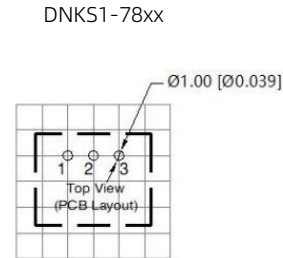
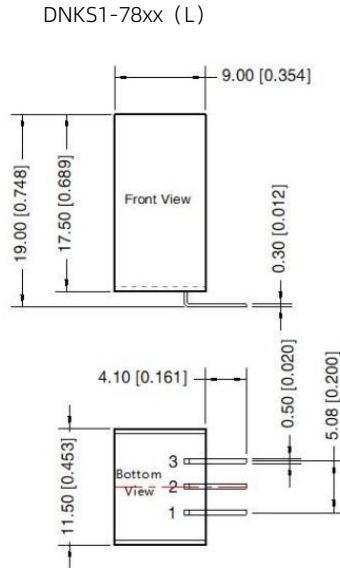
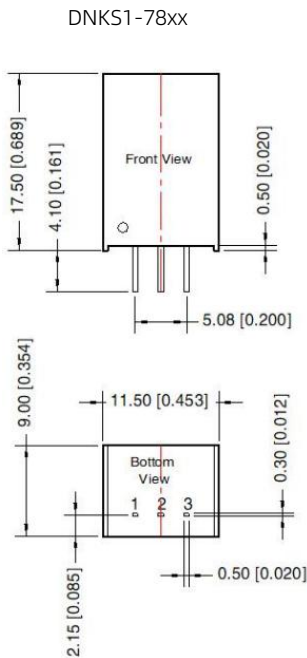


Fig. 4 EMC recommended circuit

FUSE	MOV	LDM1	C0	C1/C2	C5	LDM2
Select fuse value according to actual input current	S20K30	82 μ H	680 μ F /50V	Refer to table 1	4.7 μ F /50V	12 μ H

Note:1.in Fig. 4 shows EMS compliance filter and part ② filter for EMI compliance; depending on requirement both filters ① and ② can be used in series as shown.

Dimensions and Recommended



Note: Grid 2.54*2.54mm

Pin-Out		
Pin	Positive Output	Negative Output
1	V _{in}	V _{in}
2	GND	-V _o
3	+V _o	GND

Note:
Unit: mm[inch]
Pin diameter tolerances: $\pm 0.10 [\pm 0.004]$
General tolerances: $\pm 0.50 [\pm 0.020]$

Note:

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. Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a=25^\circ\text{C}$, humidity<75% with nominal input voltage and rated output load;
3. All index testing methods in this datasheet are based on our 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.