DNKS0.5-78xx Series

Descriptions

0.5A Non-isolated Regulator

RoHS

3 Years Warranty

c UL us UL62368-1

CE Report EN62368-1

UKCA Report BS EN62368-1

Features

- No-load input current as low as 0.2mA
- Operating ambient temperature range: -40℃ to +85℃
- Up to 95% efficiency
- Output short-circuit protection
- Support the negative output
- Pin compatible with LM78xx series

Applications

- Industrial control
- Electric power
- Instruments and meters

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.		
UL/EN/BS EN	DNKS0.5-7803	24 (4.75-36)	3.3	500	86/80	680
	DNKS0.5-7805	24 (6.5-36)	5.0	500	90/84	680
		12 (7-31)	-5.0	-300	80/81	330
UL/EN/BS EN	DNKS0.5-7809	24 (12-36)	9	500	93/90	680
UL/EN/BS EN	DNKS0.5-7812	24 (15-36)	12	500	94/91	680
		12 (8-24)	-12	-150	84/85	330
	DNKS0.5-7815	24 (19-36)	15	500	95/93	680
		12 (8-21)	-15	-150	85/87	330

Note: For input voltage exceeding 30 VDC, an input capacitor of 22uF/50V is required.

Specifications

Characteristic	Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Specifications	No-load Input Current	Positive output		--	0.2	1.5	mA
	Reverse Polarity at Input			Avoid / Not protected			
	Input Filter			Capacitance filter			
Output Specifications	Voltage Accuracy	Full load, input voltage range	3.3VDC output	--	±2	±4	%
			Others	--	±2	±3	
	Linear Regulation	Full load, input voltage range		--	±0.2	±0.4	
	Load Regulation	Nominal input voltage,10% -100% load	3.3/5 VDC output	--	±0.6	--	
			Others	--	±0.3	--	
	Ripple & Noise①	20MHz bandwidth, nominal input voltage, 10% -100% load		--	20	75	mVp-p
	Temperature Coefficient	Operating ambient temperature -40℃ to +85℃		--	--	±0.03	%/℃
	Transient Response Deviation	Nominal input voltage, 25% load step change		--	50	250	mV
	Transient Recovery Time			--	0.2	1	ms
	Short-circuit Protection	Nominal input voltage		Continuous, self-recovery			
General Specifications	Operating Temperature②	See Fig. 1		-40	--	+85	℃
	Storage Temperature			-55	--	+125	
	Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds		--	--	+260	
	Storage Humidity	Non-condensing		5	--	95	%RH
	Switching Frequency	Full load, nominal input voltage		550	--	850	kHz
	MTBF	MIL-HDBK-217F@25℃		2000	--	--	k hours
Mechanical Specifications	Case Material	Black plastic; flame-retardant and heat-resistant (UL94 V-0)					
	Dimensions	11.60 x 7.55 x 10.16 mm					
	Weight	1.8g (Typ.)					
	Cooling Method	Free air convection					

Note:

①The "parallel cable" method is used for ripple and noise test,

②With light loads at or below 10%, Ripple & Noise for 3.3V/5V output parts increases to 150mVp-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. 5-② for recommended circuit)	
		RE	CISPR32/EN55032 CLASS B (see Fig. 5-② 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. 5-① for recommended circuit)	perf. Criteria B
		Surge	IEC/EN 61000-4-5 line to line ±1KV (see Fig. 5-① for recommended circuit)	perf. Criteria B
		CS	IEC/EN 61000-4-6 3Vr.m.s	perf. Criteria A

Characteristic Curve

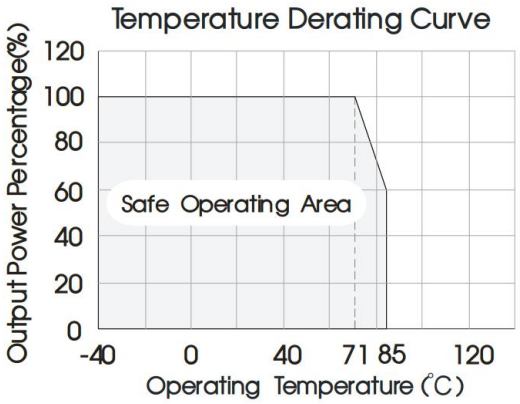
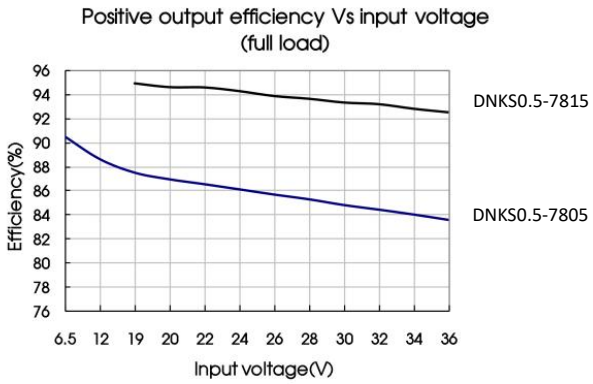
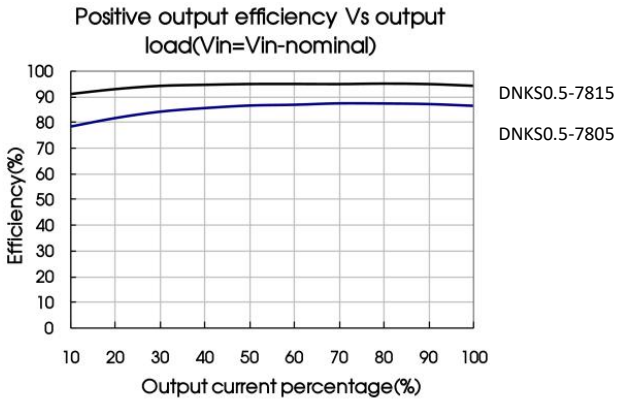
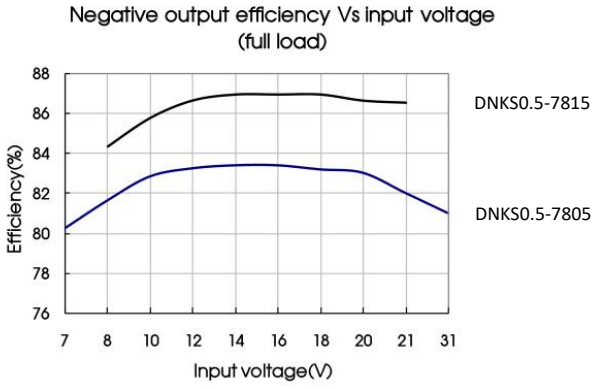
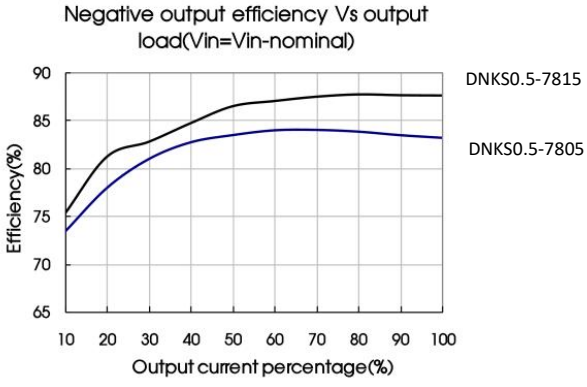


Fig. 1

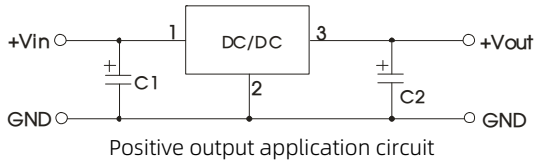




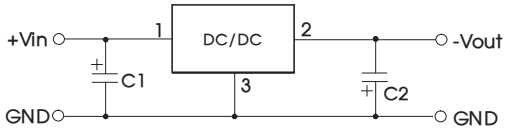




Design Reference



Positive output application circuit



Negative output application circuit

Fig. 2 Typical application circuit

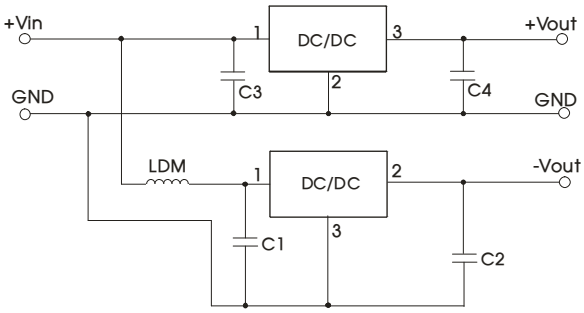


Fig. 3 Positive and Negative output application circuit

Table 1

Part No.	C1/C3 (ceramic capacitor)	C2/C4 (ceramic capacitor)
DNKS0.5-7803	10μF/50V	22μF/10V
DNKS0.5-7805		22μF/10V
DNKS0.5-7809		22μF/16V
DNKS0.5-7812		22μF/25V
DNKS0.5-7815		22μF/25V

Note:

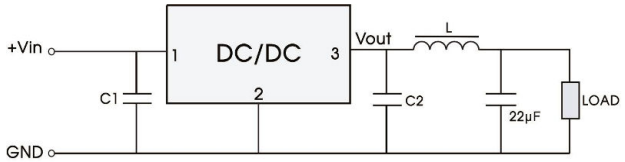
1.The required capacitors C1 and C2 (C3 and C4) must be connected as close as possible to the terminals of the module;

2.Refer to Table 1 for C1 and C2 (C3 and C4) capacitor values. For certain applications, increased values and/or tantalum or low ESR electrolytic capacitors may also be used instead;

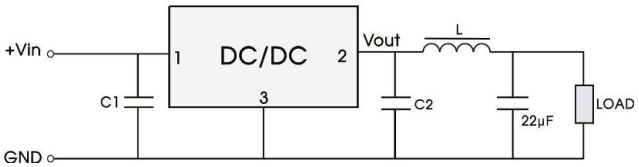
3.When using configurations as shown in figure 3, we recommended to add an inductor (LDM) with a value of up to 10μH which helps reducing mutual interference;

4.Converter cannot be used for hot swap and with output in parallel;

5.To further reduce the output ripple and noise, we suggested the use of a “LC” filter at the output terminals, with an inductor value (L) of 10μH-47μH.



Positive output



Negative output

Fig. 4 Using the “LC” output filter application

2. EMC compliance recommended circuit

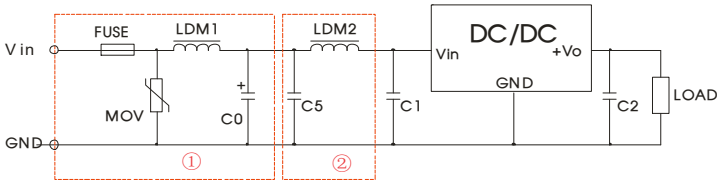


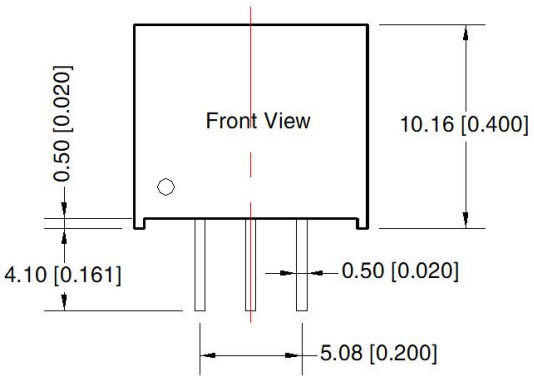
Fig. 5 EMC recommended circuit

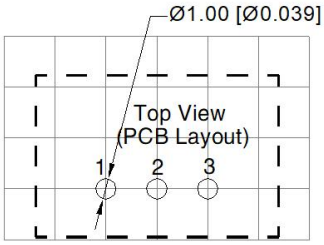
FUSE	MOV	LDM1	C0	C1/C2	C5	LDM2
Select fuse value according to actual input current	S20K30	82μH	680μF /50V	Refer to table 1	4.7μF /50V	12μH

Note:For EMC tests we use Part ① in Fig. 5 for immunity and part ② for emissions test.Selecting based on needs.

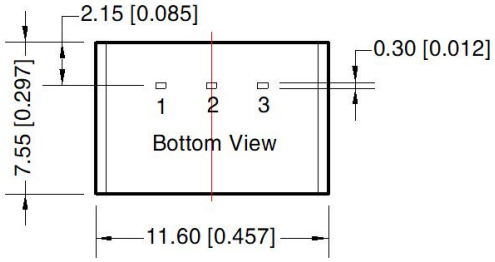
Dimensions and Recommended Layout

THIRD ANGLE PROJECTION





Note：Grid 2.54*2.54mm



Pin-Out		
Pin	Positive Output	Nagetive Output
1	Vin	Vin
2	GND	-Vo
3	+Vo	GND

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

Note:

1. If the product is not operated within the required output 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 Ta=25℃, 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.