Descriptions 0.5A Non-isolated Regulator



RoHS

UL62368-1 EN62368-1 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)①	Output		Vin Min. / Vin Max. Full Load Efficiency (%)Typ.	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
	DNKS0.5-7809	24 (12-36)	9	500	93/90	680
	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:
①For input voltage exceeding 30 VDC, an input capacitor of 22uF/50V is required;
②Product images are for reference only; the actual product shall prevail.

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 Temperature③	Soldering spot is 1.5mm away from the case, 10 seconds max.		--	--	+300	
		Wave soldering, maximum 10 seconds		255	260	265	
	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;
③The pin soldering temperature tolerance is not the actual temperature set by the soldering iron but the temperature required for proper solder joints. The actual temperature set by the customer should be determined comprehensively based on factors such as PCB thickness, copper coverage, soldering iron power, and soldering iron tip selection.

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

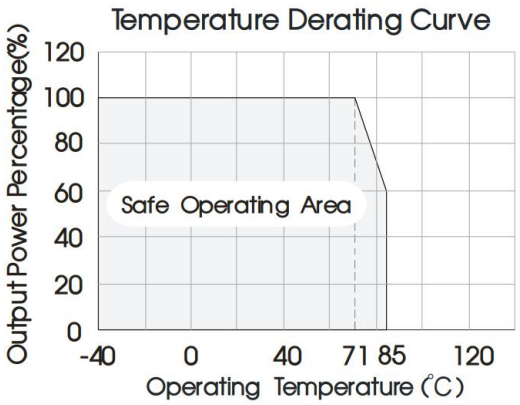
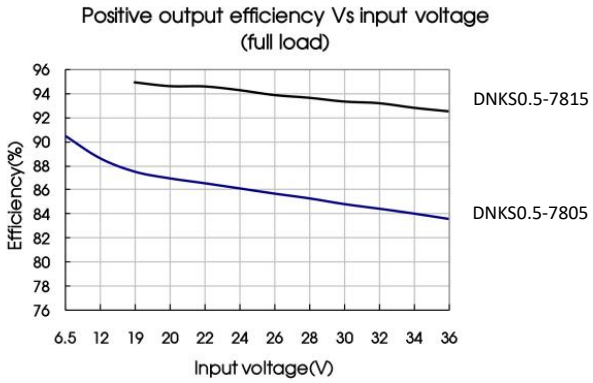
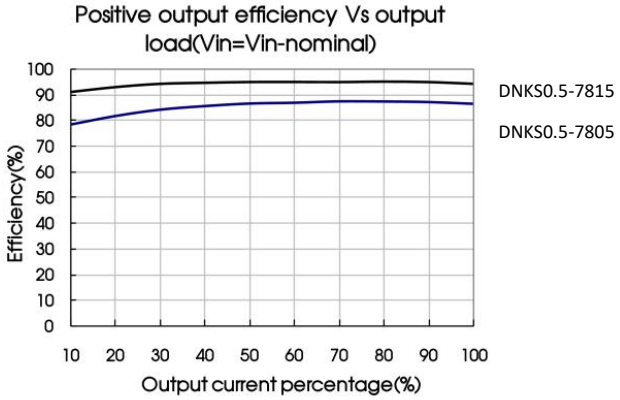
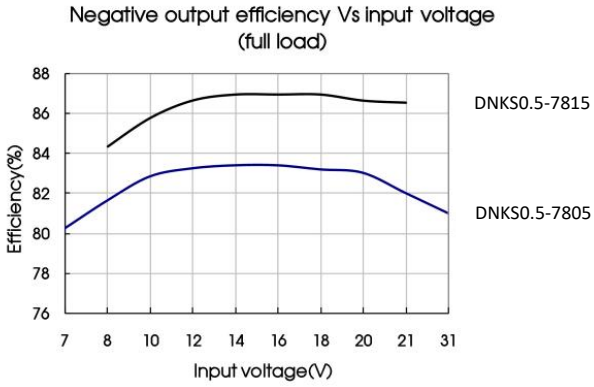
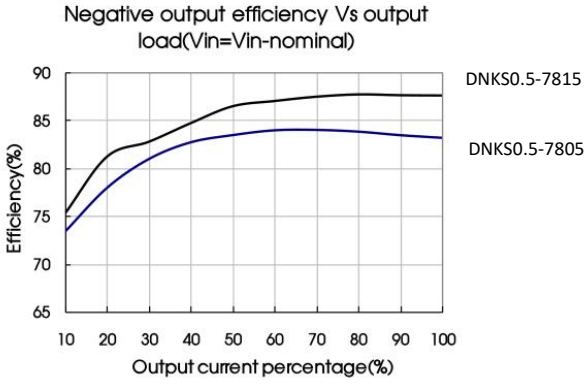


Fig. 1



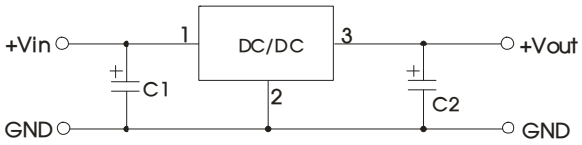




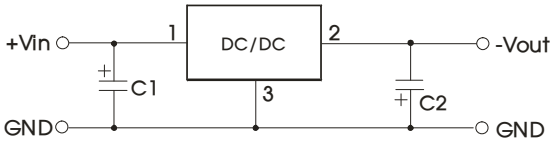


Design Reference

1. Typical Application



Positive output application circuit



Negative output application circuit

Fig. 2 Typical application circuit

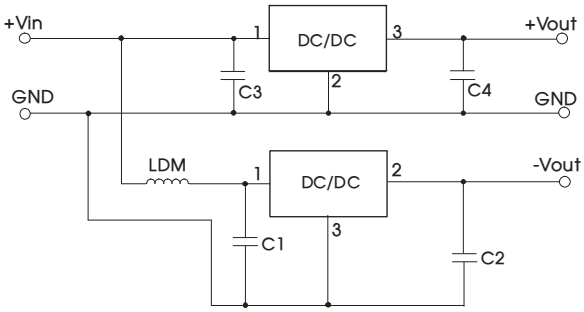


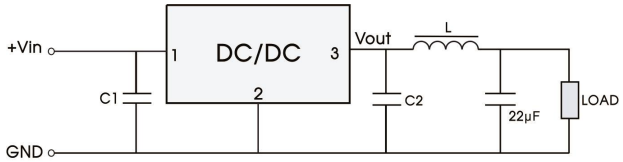
Fig. 3 Positive and Negative output application circuit

Table 1

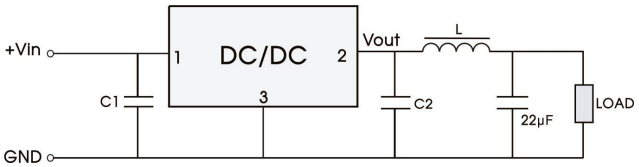
Part No.	C1/C3 (ceramic capacitor)	C2/C4 (ceramic capacitor)
DNKS0.5-7803	10μF/50V	22μF/10V
DNKS0.5-7805		22μF/10V
DNKS0.5-7809		22μF/16V
DNKS0.5-7812		22μF/25V
DNKS0.5-7815		22μF/25V

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

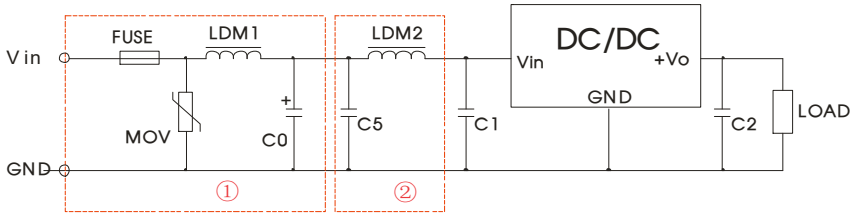


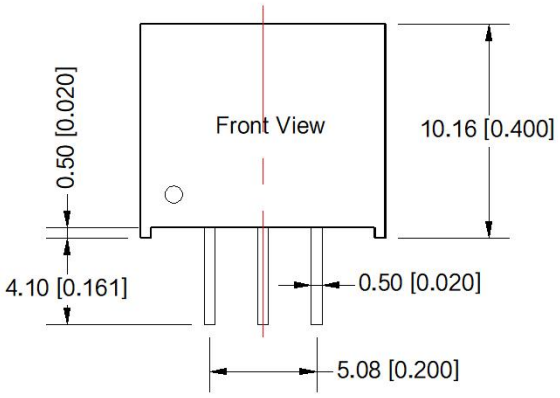
Fig. 5 EMC recommended circuit

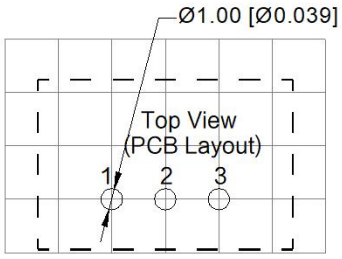
FUSE	MOV	LDM1	C0	C1/C2	C5	LDM2
Select fuse value according to actual input current	S20K30	82μH	680μF /50V	Refer to table 1	4.7μF /50V	12μH

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

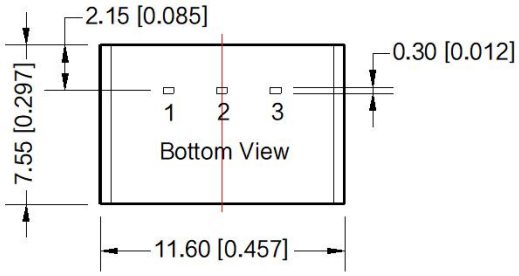
Dimensions and Recommended Layout

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: ± 0.25[± 0.010]

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;
6. The image certification marks are for reference only; please refer to the selection table for actual specifications. Certification is based on the physical mark or packaging label.