

Descriptions

1A Non-Isolated Regulator



UL62368-1



EN62368-1



BS EN62368-1

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	DNKS1-7805(L)	24 (8-36)	5	1000	93/86	680
		12 (8-27)	-5	-500	86/82	330
EN/BS EN	DNKS1-78X6	24 (10-36)	6.5	1000	93/87	680
--	DNKS1-78X6L	24 (10-36)	6.5	1000	93/87	680
EN/BS EN	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:
 ①When the input voltage exceeds 30VDC, an external 22 μ F/50V electrolytic capacitor is required to prevent voltage spikes from damaging the module;
 ②L-suffix: Add L-suffix for horizontal mount with 90 degree angled pins (DNKS1-78xxL)

Specifications

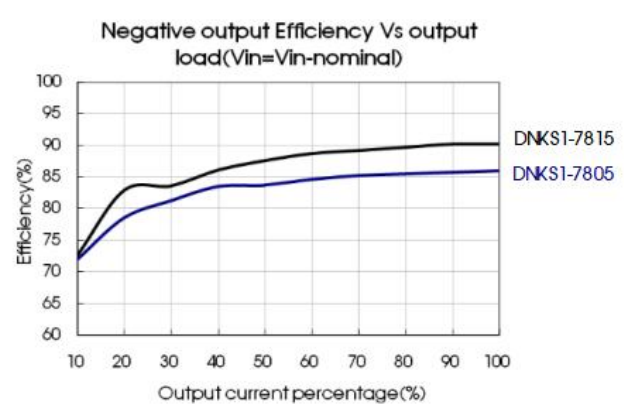
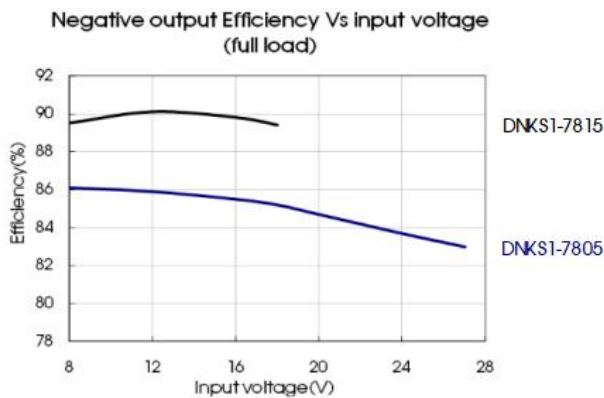
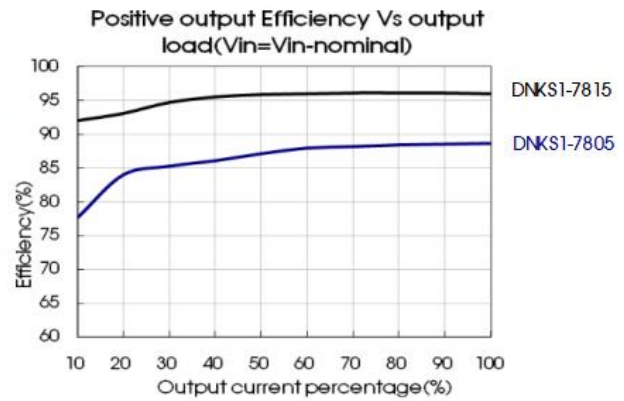
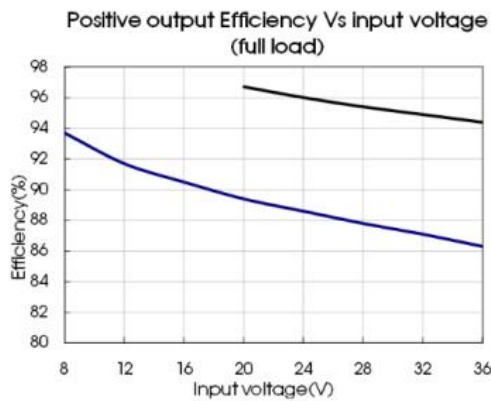
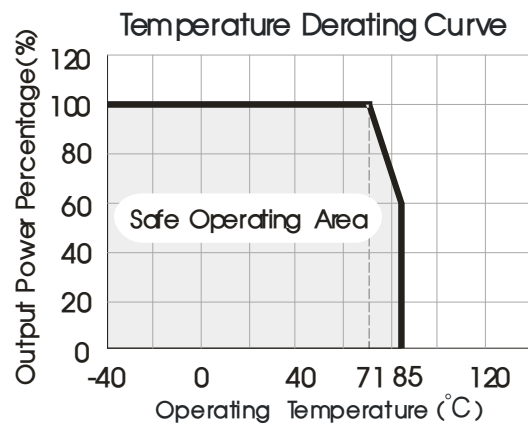
Product Specifications	Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Input Specifications	No-load Input Current	Positive output	--	0.1	1	mA	
	Reverse Polarity Input		Forbidden				
	Input Filter		Capacitance filter				
Output Specifications	Voltage Accuracy	Full load, input voltage range	DNKS1-7803(L)	--	± 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 ^①	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 ^②	Nominal input voltage, 25% load step change	--	50	300	mV	
	Transient Recovery Time		--	0.1	1	ms	
	Short-circuit Protection	Nominal input	Continuous, self-recovery				
General Specifications	Operating Temperature	Derating if the temperature $\geq 71^\circ\text{C}$ (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	
	MTBF	MIL-HDBK-217F@25°C	2000	--	--	k hours	
Mechanical Specifications	Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)					
	Dimensions	DNKS1-78xx	11.50 x 9.00 x 17.50 mm				
		DNKS1-78xxL	19.00 x 11.50 x 9.00 mm				
	Weight	3.8g (Typ.)					
Cooling Method	Free air convection						

Note:
 ①The "parallel cable" method is used for Ripple and Noise test, please refer to DC-DC Converter Application Notes for specific information;
 ②With 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 ±1kV(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

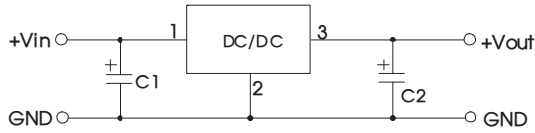


Fig1. Positive output application circuit

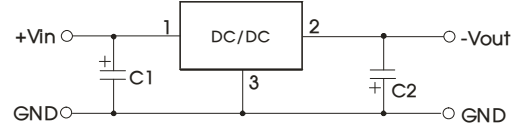


Fig2. Negative output application circuit

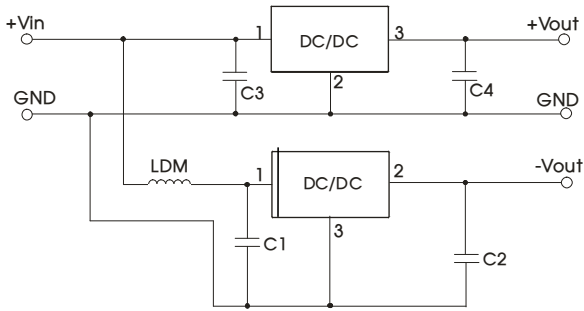


Fig. 3 Positive and Negative output application circuit

Table1

Part No.	C1/C3 (ceramic capacitor)	C2/C4 (ceramic capacitor)
DNKS1-7803(L)	10μF/50V	22μF/10V
DNKS1-7805(L)		22μF/10V
DNKS1-78X6(L)		22μF/10V
DNKS1-7809(L)		22μF/16V
DNKS1-7812(L)		22μF/25V
DNKS1-7815(L)		22μF/25V

Note:

- The required capacitors C1 and C2 (C3 and C4) must be connected as close as possible to the terminals of the module;
 - Refer to Table 1 for C1 and C2 (C3 and C4) capacitor values.
 - For certain applications, increased values for C2 and C4 and/or tantalum or low ESR electrolytic capacitors may also be used instead;
 - 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;
 - Converter cannot be used for hot swap and with output in parallel.
2. EMC compliance recommended circuit

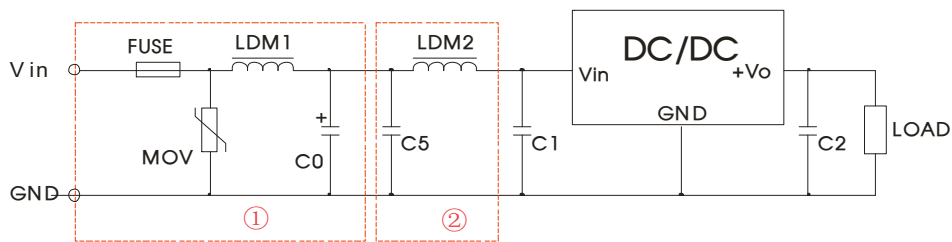


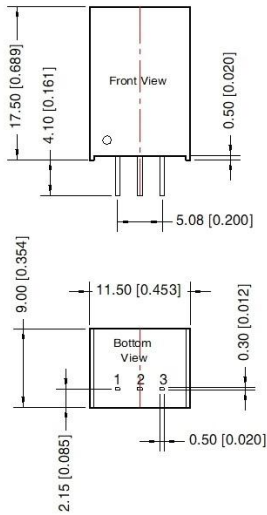
Fig. 4 EMC recommended circuit

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

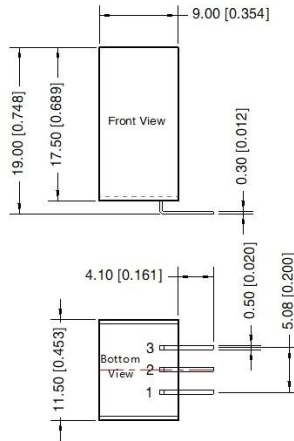
Note: 1. in Fig. 4 shows EMS compliance filter and part ② filter for EMI compliance; depending on requirement both filters ① and ② can be used in series as shown.

Dimensions and Recommended

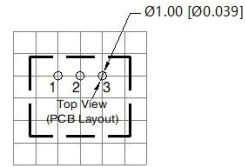
DNKS1-78xx



DNKS-78xxL

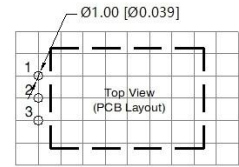


DNKS1-78xx



THIRD ANGLE PROJECTION

DNKS1-78xxL



Note: Grid 2.54*2.54mm

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