

## Descriptions

### 2A Non-Isolated Regulator



**CE** Report  
EN62368-1

**UK CA** Report  
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
- 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	DNKS2-7803(L)	24 (6-36)	3.3	2000	89/85	1800
		12 (8-31)	-3.3	1000	85/83	1000
EN/BS EN	DNKS2-7805(L)	24 (8-36)	5	2000	92/89	1000
		12 (8-30)	-5	1000	86/84	680
EN/BS EN	DNKS2-7809	24 (13-36)	9	2000	95/92	680
		12 (8-26)	-9	800	86/81	330
--	DNKS2-7809L	24 (13-36)	9	2000	95/92	680
--		12 (8-26)	-9	800	86/81	330
EN/BS EN	DNKS2-7812(L)	24 (16-36)	12	2000	96/94	470
		12 (8-23)	-12	600	87/85	220
EN/BS EN	DNKS2-7815	24 (18-36)	15	2000	96/94	470
		12 (8-20)	-15	600	87/87	220
--	DNKS2-7815L	24 (18-36)	15	2000	96/94	470
		12 (8-20)	-15	600	87/87	220

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

## Specifications

Product Specifications	Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Specifications	No-load Input Current	Positive output, nominal input voltage		--	0.1	1	mA
		Negative output, nominal input voltage	-3.3V/-5V output	--	--	1	
			-9V/-12V/-15V output	--	--	2	
	Reverse Polarity at Input			Avoid / Not protected			
	Input Filter			Capacitance filter			
Output Specifications	Voltage Accuracy	Full load, input voltage range	±3.3V output	--	±2	±4	%
			Other positive and negative output	--	±2	±3	
	Linear Regulation	Full load, input voltage range		--	±0.4	±0.8	
	Load Regulation	10% -100% load step; nominal input voltage		--	±0.5	±1.5	
	Ripple & Noise <sup>①</sup>	Positive output, 20MHz bandwidth, nominal input voltage, 100% load		--	30	75	mVp-p
		Negative output, 20MHz bandwidth, nominal input voltage, 100% load		--	--	150	
	Temperature Coefficient	Operating temperature -40°C to +85°C		--	--	±0.03	%/°C
	Transient Response Deviation <sup>②</sup>	Nominal input, 25% load step(25%-50%-25%, 50%-75%-50% step)	Positive output	--	±50	±150	mV
Negative output			--	±100	±150		
Transient Recovery Time <sup>③</sup>	Nominal input, 25% load step (25%-50%-25%, 50%-75%-50% step)		--	0.2	1	ms	
Short-circuit Protection	Nominal input		Continuous, self-recovery				
General Specifications	Operating Temperature	See Fig. 1		-40	--	85	°C
	Storage Temperature			-55	--	125	
	Pin Soldering Resistance Temperature	Soldering time: 10s (Max.)		--	--	260	
	Storage Humidity	Non-condensing		5	--	95	%RH
	Switching Frequency	Full load, nominal input		--	400	--	kHz
	MTBF	MIL-HDBK-217F@25°C		2000	--	--	k hours
Mechanical Specifications	Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)					
	Dimensions	DNKS2-78xx	11.50 × 9.00 × 17.50 mm				
		DNKS2-78xxL	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;

②Positive output: Input voltage range, 20%-100% load ripple & noise is less than 100mVp-p, 0%-20% load ripple & noise is less than 180mVp-p;

③Negative output: Input voltage range, 20%-100% load ripple & noise is less than 150mVp-p, 0%-20% load ripple & noise is less than 180mVp-p.

## Electromagnetic Compatibility (EMC)

Electromagnetic Compatibility (EMC)	Emissions	CE	CISPR32/EN55032	CLASS B (see Fig. 3-② for recommended circuit)	
		RE	CISPR32/EN55032	CLASS B (Positive output see Fig. 3-② for recommended circuit, Negative output see Fig. 3-③ for recommended circuit)	
	Immunity	ESD	IEC/EN 61000-4-2	Contact ±6kV	perf. Criteria B
		RS	IEC/EN 61000-4-3	10V/m	perf. Criteria A
		EFT	IEC/EN 61000-4-4	±1kV (see Fig. 3-① for recommended circuit)	perf. Criteria B
		Surge	IEC/EN 61000-4-5	line to line ±1kV(see Fig. 3-① for recommended circuit)	perf. Criteria B
		CS	IEC/EN 61000-4-6	3Vr.m.s	perf. Criteria A

## Characteristic Curve

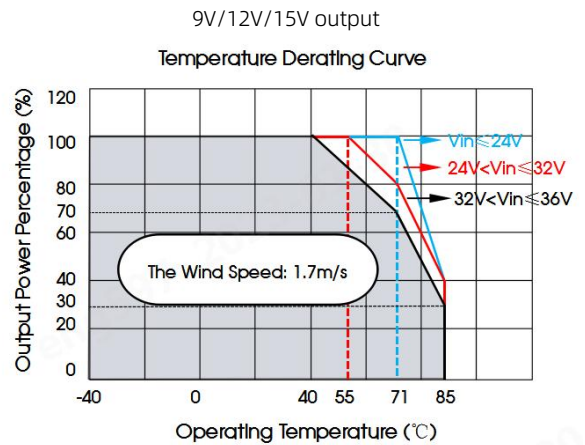
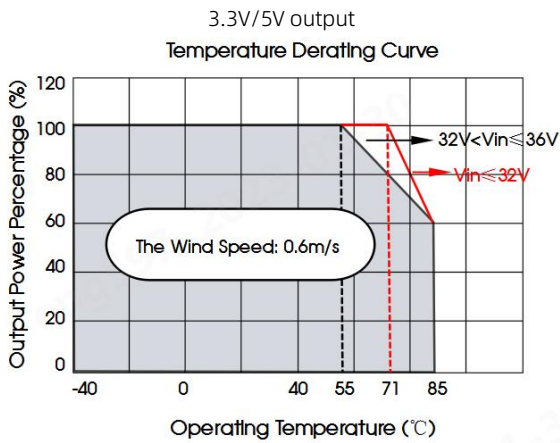


Fig. 1-① Forced convection curve (Positive output)

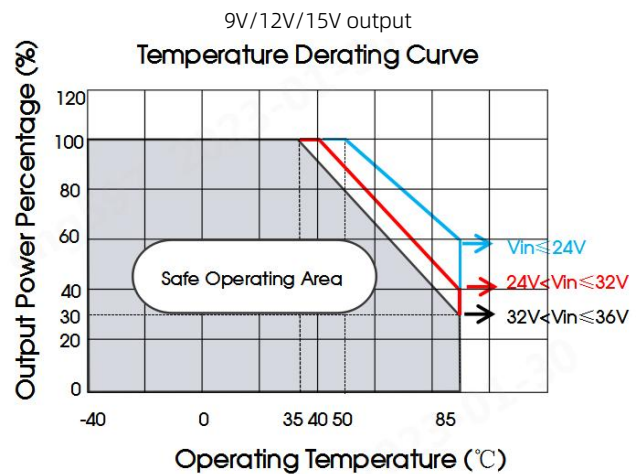
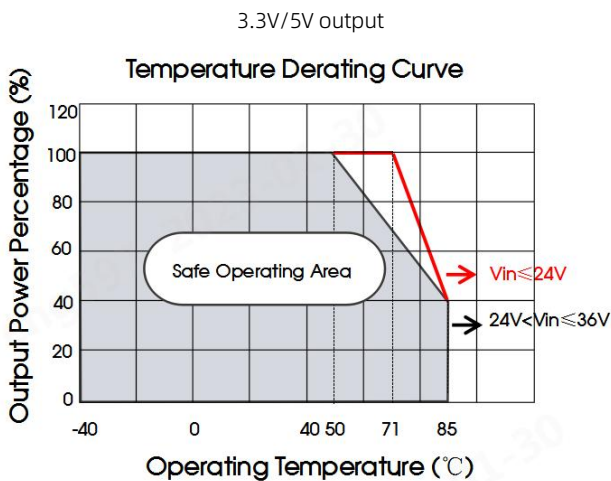


Fig. 1-② Free air convection curve (Positive output)

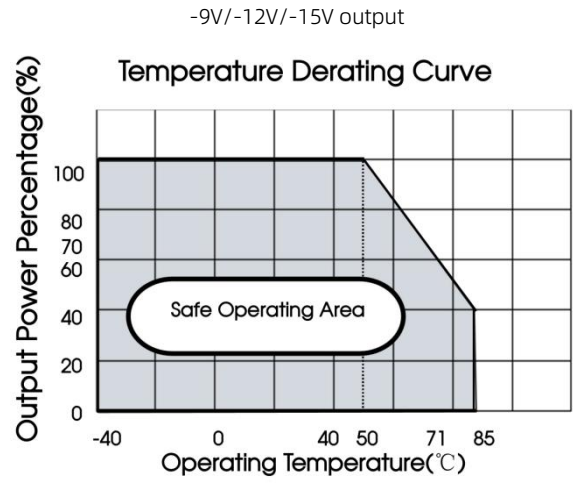
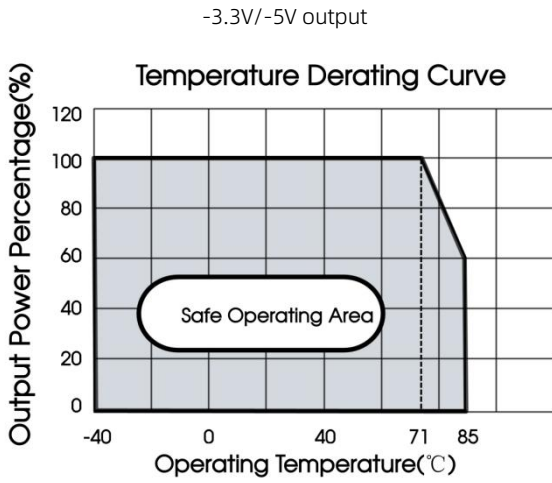
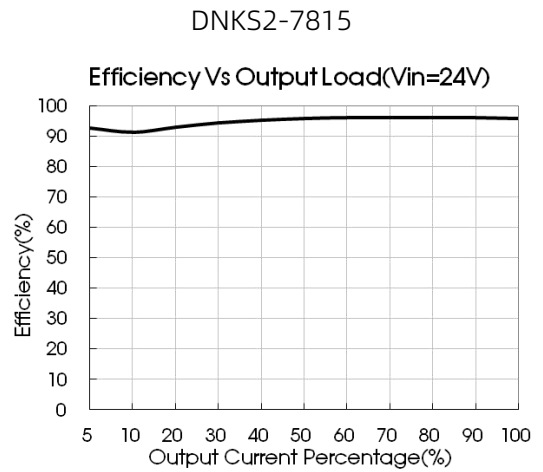
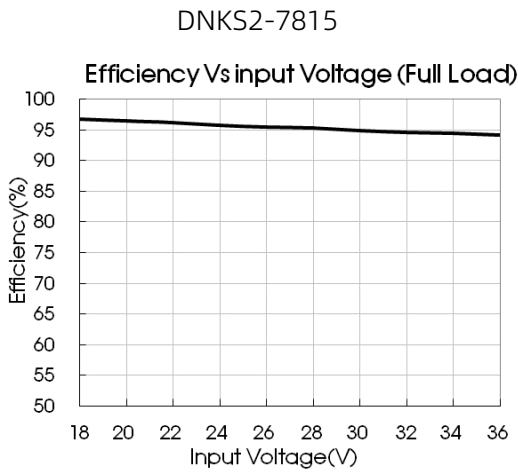
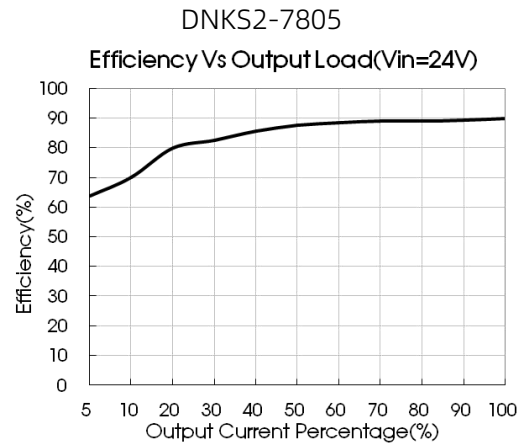
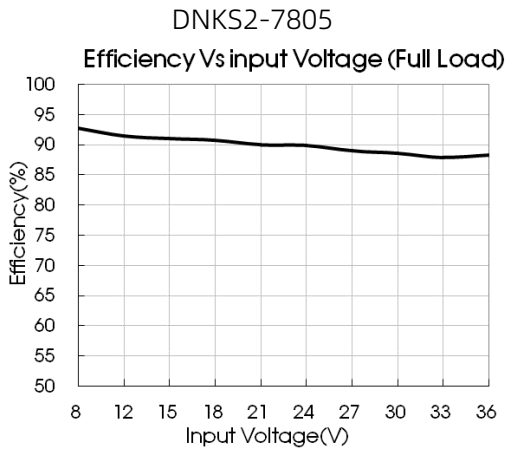


Fig. 1-③ Free air convection curve (Negative output)



## Design Reference

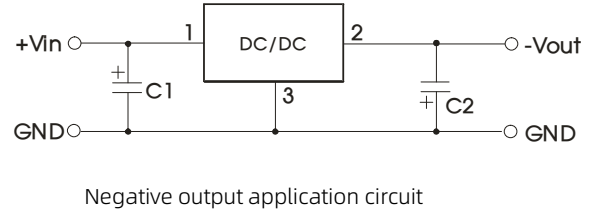
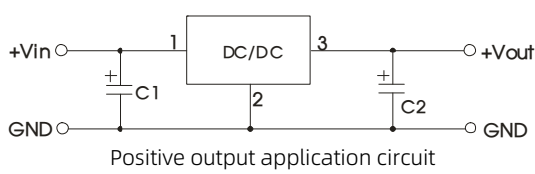


Fig. 2 Typical application circuit Table 1

Part No.	C1 (ceramic capacitor)	C2 (ceramic capacitor)
DNKS2-7803(L)	22 $\mu$ F/50V	22 $\mu$ F/10V
DNKS2-7805(L)		22 $\mu$ F/10V
DNKS2-7809(L)		22 $\mu$ F/16V
DNKS2-7812(L)		22 $\mu$ F/25V
DNKS2-7815(L)		22 $\mu$ F/25V

Note:

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

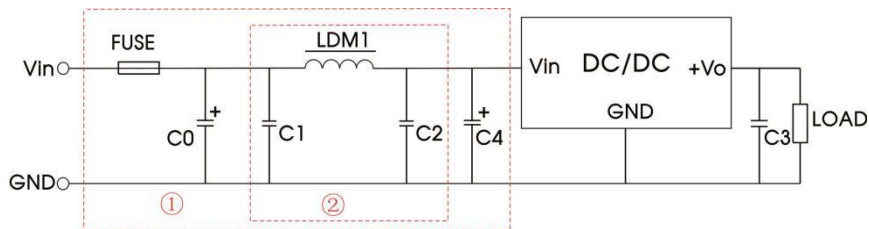


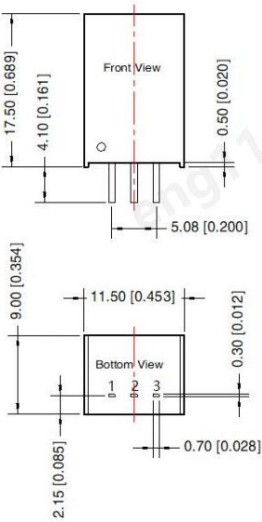
Fig. 3 EMC recommended circuit

FUSE	C0	LDM1	C4	C1/C2	C5
Select fuse value according to actual input current	100 $\mu$ F / 100V	22 $\mu$ H	680 $\mu$ F / 50V	10 $\mu$ F / 50V	22 $\mu$ F / 25V

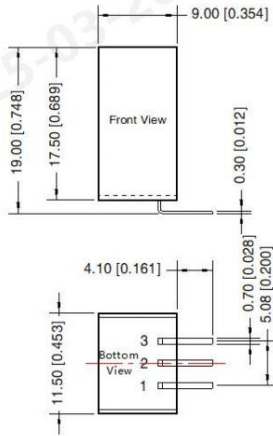
Note: For EMC tests we use Part ① in Fig. 3 for immunity and part ② for emissions test. Selecting based on needs.

## Dimensions and Recommended Layout

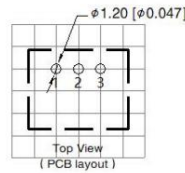
DNKS2-78xx



DNKS2-78xxL

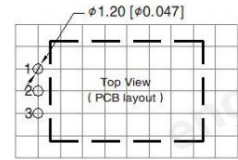


DNKS2-78xx



THIRD ANGLE PROJECTION

DNKS2-78xxL



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.