Descriptions

2A Non-Isolated Regulator





RoHS

CE Report EN62368-1

UKCA Report BS EN62368-1

Features

- No-load input current as low as 0.1mA
- Operating ambient temperature range: -40℃ to +85℃
- Up to 96% efficiency
- Output short-circuit protection

Applications

- Industrial control
- Electric power
- Instrumentation

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.		
EN/BS EN	DNKS2-7803(L)	24 (6-36)	3.3	2000	89/85	1800
		12 (8-31)	-3.3	1000	85/83	1000
	DNKS2-7805(L)	24 (8-36)	5	2000	92/89	1000
		12 (8-30)	-5	1000	86/84	680
	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
	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:
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

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/-5Voutput	--	--	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 & Noise①	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℃ to +85℃		--	--	±0.03	%/℃
	Transient Response Deviation②	Nominal input, 25% load step(25%-50%-25%, 50%-75%-50% step)	Positive output	--	±50	±150	mV
			Negative output	--	±100	±150	
	Transient Recovery Time③	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	℃
	Storage Temperature			-55	--	125	
	Pin Soldering Resistance Temperature④	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		--	400	--	kHz
	MTBF	MIL-HDBK-217F@25℃		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					

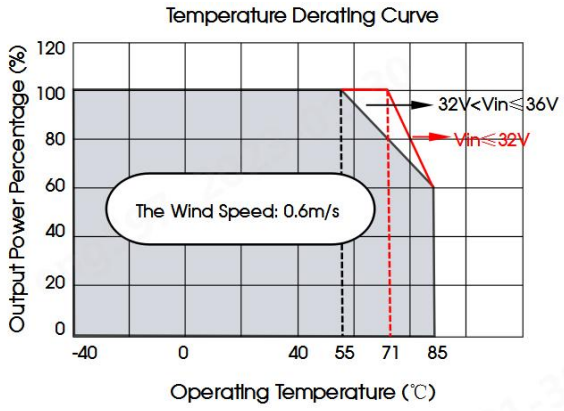
Note:
①The "parallel cable" method is used for ripple and noise test;
②Positive output: Input voltage range, 20%-100% load ripple & noise is less than 100mVp-p, 0%-20% load ripple & noise is less than 180mVp-p;
③Negative output: Input voltage range, 20%-100% load ripple & noise is less than 150mVp-p, 0%-20% load ripple & noise is less than 180mVp-p;
④The 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. 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

3.3V/5V output



9V/12V/15V output

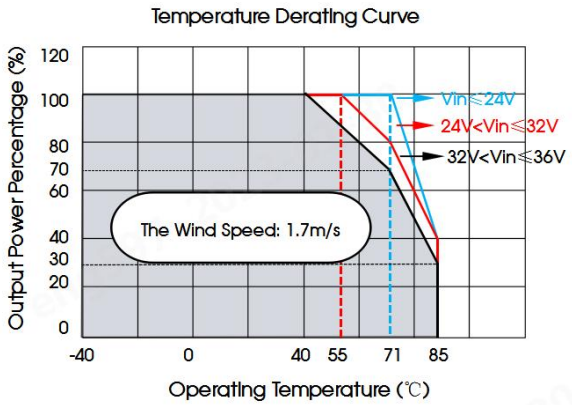
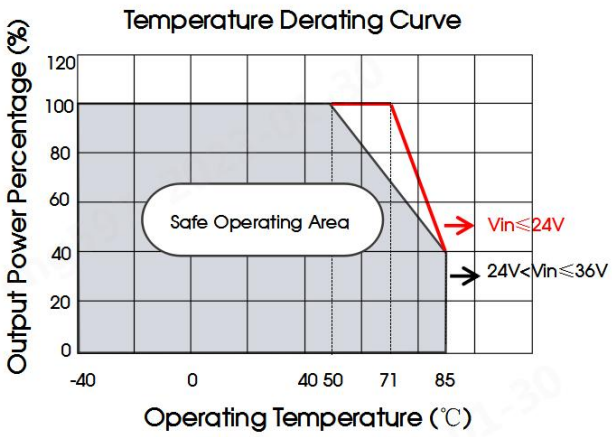


Fig. 1-① Forced convection curve （Positive output）

3.3V/5V output



9V/12V/15V output

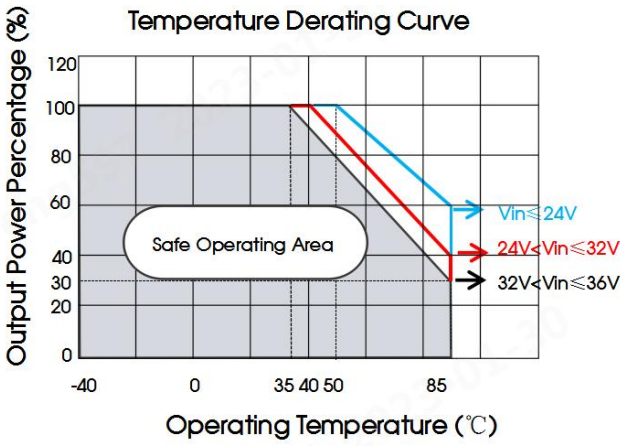
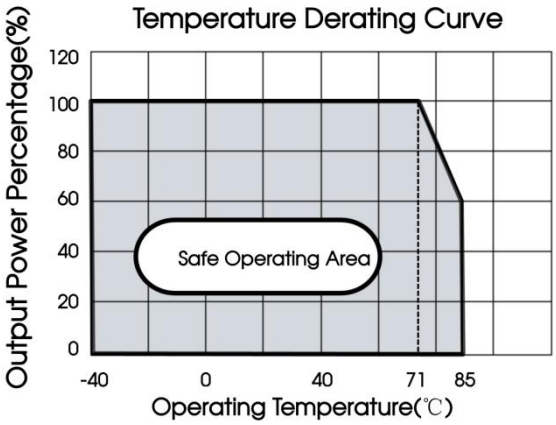


Fig. 1-② Free air convection curve（Positive output）

-3.3V/-5V output



-9V/-12V/-15V output

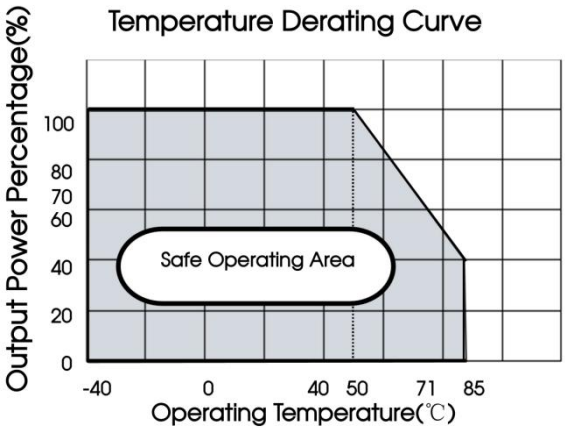
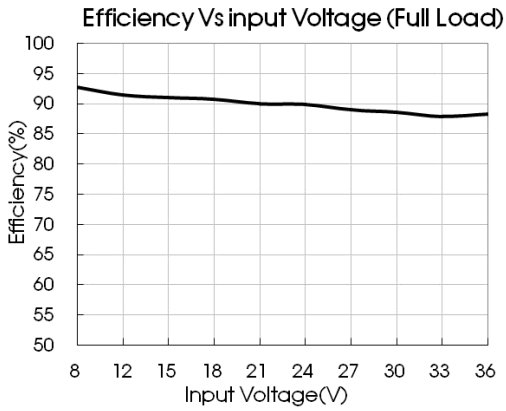
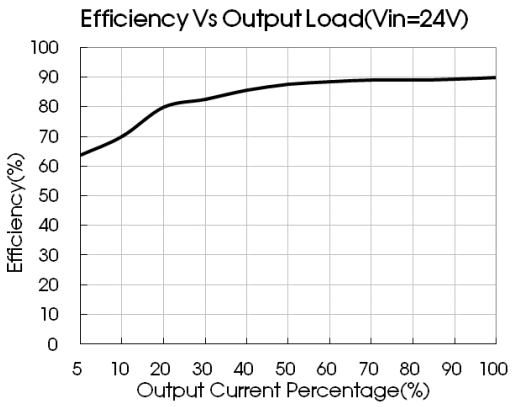


Fig. 1-③ Free air convection curve（Negative output）

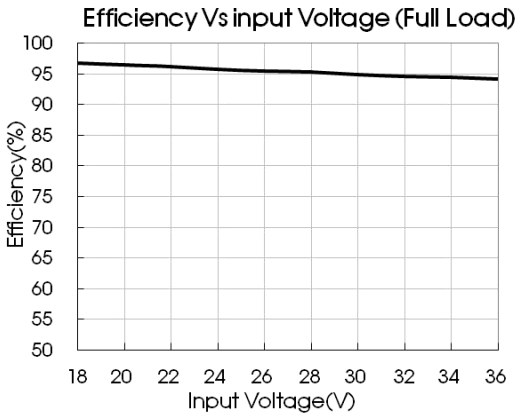
DNKS2-7805



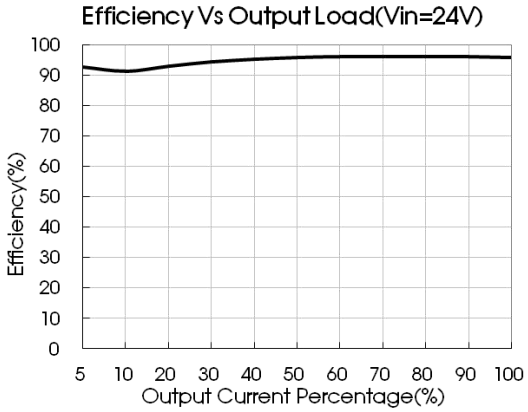
DNKS2-7805



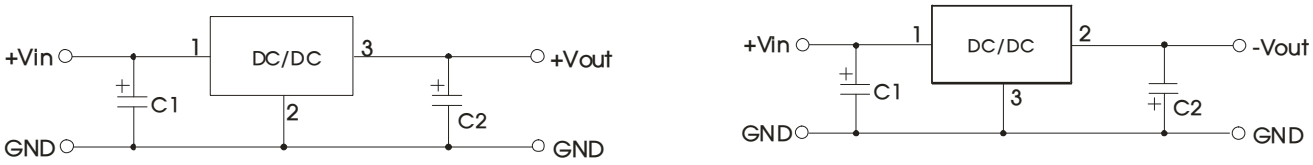
DNKS2-7815



DNKS2-7815



Design Reference



Positive output application circuit

Negative output application circuit

Fig. 2 Typical application circuit

Table 1

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

Note:

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

2. EMC compliance recommended circuit

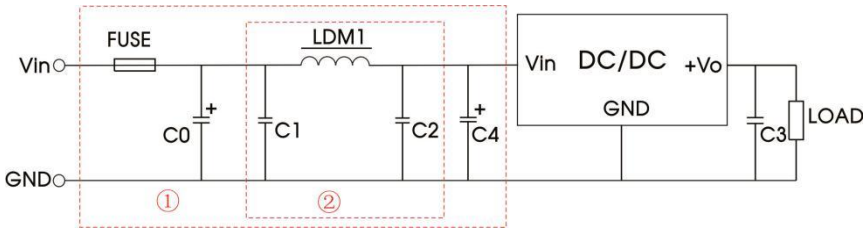


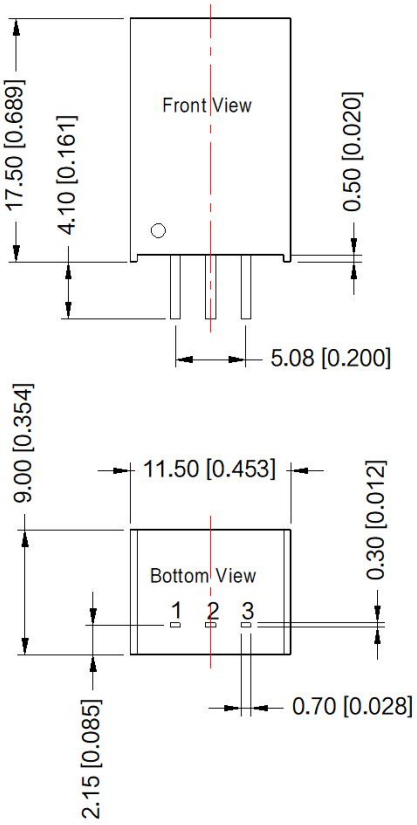
Fig. 3 EMC recommended circuit

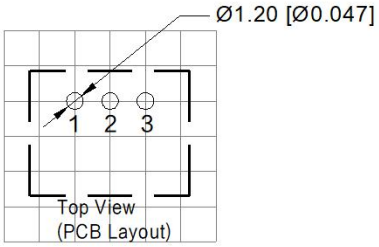
FUSE	C0	LDM1	C4	C1/C2	C5
Select fuse value according to actual input current	100μF /100V	22μH	680μF /50V	10μF /50V	22μF /25V

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

DNKS2-78xx Dimensions and Recommended Layout

THIRD ANGLE PROJECTION





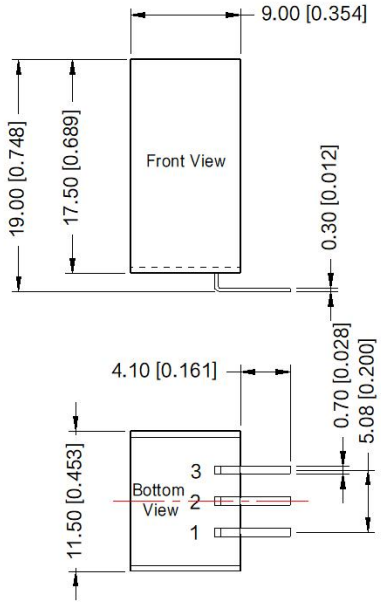
Note: Grid 2.54*2.54mm

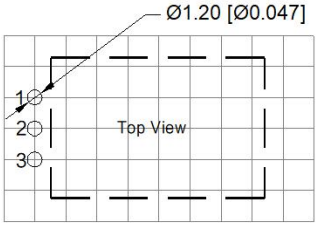
Pin-Out	
Pin	Function
1	Vin
2	GND
3	+Vo

Note:
Unit: mm[inch]
Pin diameter tolerances: ± 0.10[± 0.004]
General tolerances: ± 0.25[± 0.010]

DNKS2-78xxL Dimensions and Recommended Layout

THIRD ANGLE PROJECTION





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: ± 0.10[± 0.004]
General tolerances: ± 0.25[± 0.010]

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 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.