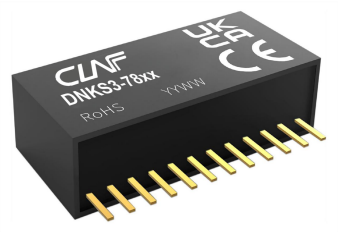
Descriptions

3A Non-isolated Regulator



RoHS

3 Years Warranty

CE Report EN62368-1

UKCA Report BS EN62368-1

Features

- High efficiency up to 97%
- No-load input current as low as 2mA
- Operating ambient temperature range: -40℃ to +85℃
- Output short-circuit protection

Applications

- Industrial control
- Electricity
- 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./Min.		
EN/BS EN	DNKS3-7803	24 (8-36)	3.3	3000	90/83	1000
	DNKS3-7805	24 (8-36)	5	3000	93/89	680
	DNKS3-78X6	24 (10-36)	6.5	3000	94/90	330
	DNKS3-7809	24 (13-36)	9	3000	95/91	330
	DNKS3-7812	24 (16-36)	12	3000	97/93	330
	DNKS3-7815	24 (19-36)	15	3000	97/94	330

Note:
①For input voltages exceeding 30 VDC, an input capacitor of 22μF/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			--	2	4	mA
	Reverse Polarity at Input			Avoid / Not protected			
	Input Filter			Capacitance filter			
	Ctrl①	Module on		Ctrl pin open or pulled high (TTL 4.5-14VDC)			
		Module off		Ctrl pin pulled low to GND (0-0.8VDC)			
		Input current when off		--	--	4	mA
Output Specifications	Voltage Accuracy	0%-100% load, input voltage range		--	±2	±3	%
	Linear Regulation	Full load, input voltage range		--	±0.5	±1	
	Load Regulation	Nominal input voltage, 10% -100% load		--	±0.5	±1	
	Ripple & Noise②	20MHz bandwidth, nominal input voltage, 100% load	3.3V/5V/6.5V/9V output	--	40	70	mVp-p
			12V/15V output	--	50	100	
	Temperature Coefficient	Operating ambient temperature -40℃ to +85℃		--	--	±0.03	%/℃
	Transient Response Deviation	Nominal input voltage, 50% load step change	3.3V output	--	--	5	%Vo
			5V/6.5V output	--	--	4	
			9V/12V output	--	--	3	
			15V output	--	--	2	
	Transient Recovery Time	Nominal input voltage, 50% load step change		--	0.1	0.2	ms
	Short-circuit Protection	Nominal input voltage		Continuous, self-recovery			
General Specifications	Operating Temperature	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 Frequency④	PWM mode		100	250	400	kHz
	MTBF	MIL-HDBK-217F@25℃		2000	--	--	k hours
Mechanical Specifications	Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)					
	Dimensions	32.15 x 14.85 x 9.05 mm					
	Weight	9.3g(Typ.)					
	Cooling Method	Free air convection					

Note:
①The Ctrl pin voltage is referenced to input GND;
②The "parallel cable" method is used for Ripple and Noise test;
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;
④Different switching frequencies of different output voltages.

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 CLASS B (see Fig. 3 for recommended circuit)	
	RE	CISPR32/EN55032 CLASS B (see Fig. 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 for recommended circuit)	perf. Criteria B
	Surge	IEC/EN 61000-4-5	line to line ±1kV (see Fig. 3 for recommended circuit)	perf. Criteria B
	CS	IEC/EN 61000-4-6	3Vr.m.s	perf. Criteria A

Characteristic Curve

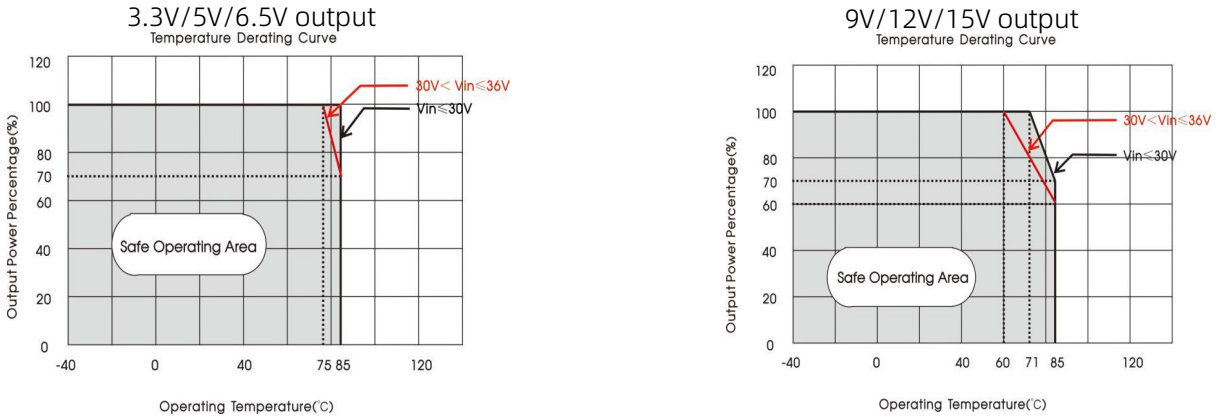


Fig. 1

Design Reference

1. Typical application

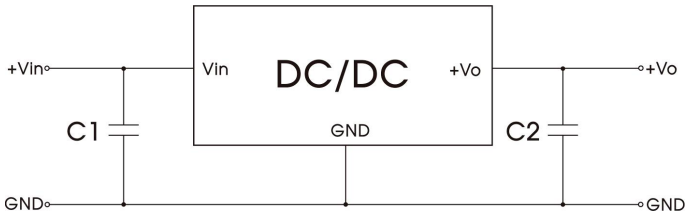


Fig. 2

Table 1

Part No.	C1 (ceramic capacitor)	C2 (ceramic capacitor)
DNKS3-7803	10μF/50V	22μF/10V
DNKS3-7805		22μF/10V
DNKS3-78X6		22μF/10V
DNKS3-7809		22μF/16V
DNKS3-7812		22μF/25V
DNKS3-7815		22μF/25V

Notes:

①The required capacitors C1 and C2 must be connected as close as possible to the terminals of the module;

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

③Converter cannot be used for hot swap and with output in parallel

2. EMC compliance circuit

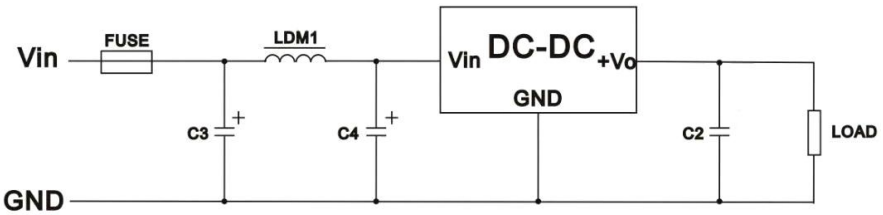


Fig.3 EMC compliance circuit

	FUSE	C3	LDM1	C4	C2
Emissions	Select fuse value according to actual input current	100μF /50V	22μH	100μF /50V	Refer to the C2 in Fig. 2
Immunity				680μF /50V	

3. Trim Function for Output Voltage Adjustment (open if unused)

application: connect trim resistor to GND/Vo respectively for adjusting up/down.

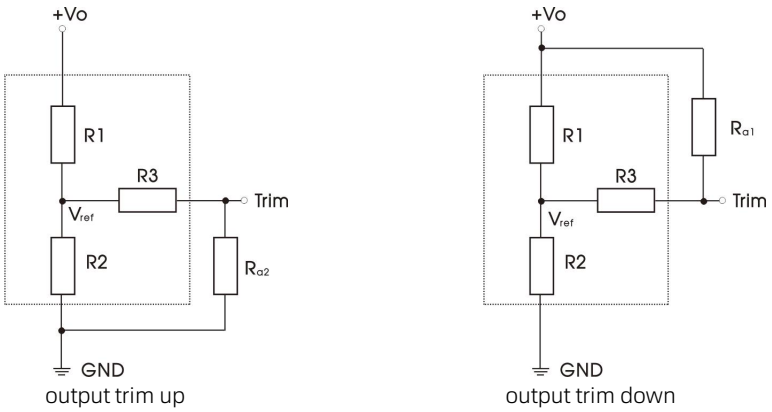


Fig. 4 Circuit diagram of Vtrim up and down (dashed line shows internal part of module)

Calculating Trim resistor values:

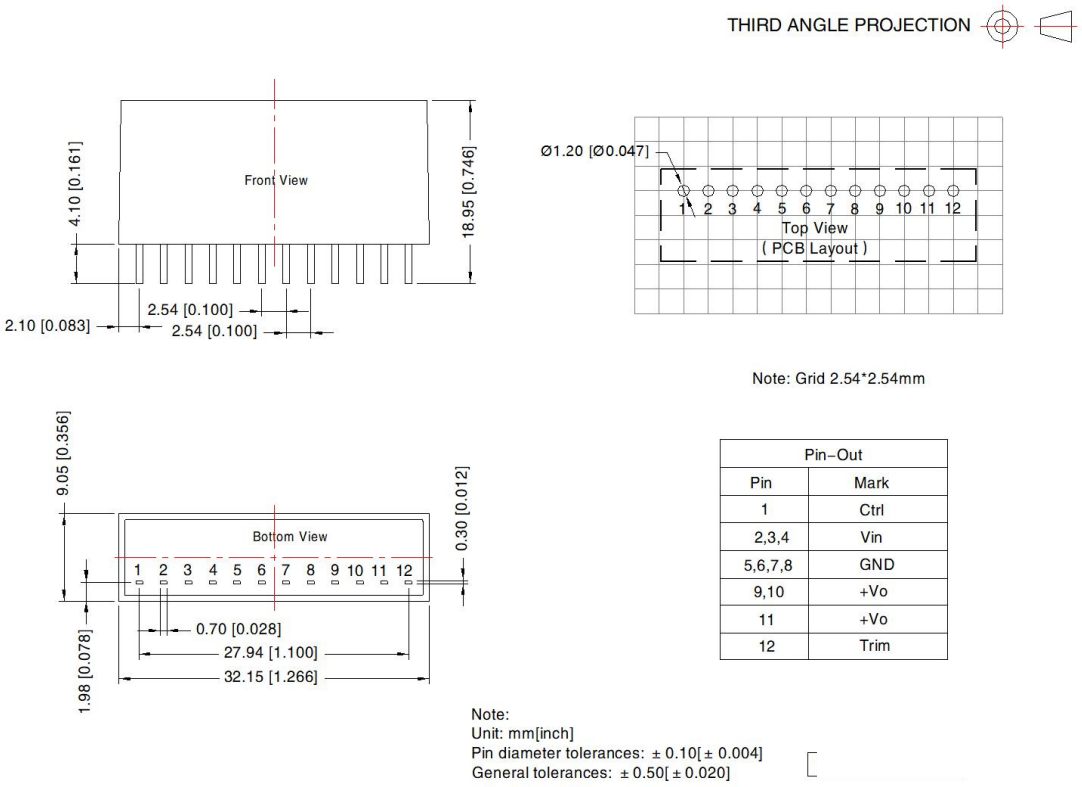
Trim up: $$R_{a2}=\frac{aR_2}{R_2-a}-R_3,\quad a=R_2//(R_3+R_{a2})=\frac{V_{ref}}{V_o'-V_{ref}}R_1$$

Trim down: $$R_{a1}=\frac{aR_1}{R_1-a}-R_3,\quad a=R_1//(R_3+R_{a1})=\frac{V_o'-V_{ref}}{V_{ref}}R_2$$

Vo(V)	R1(kΩ)	R2(kΩ)	R3(kΩ)	Vref(V)
3.3	75	32.68	10	1
5	68	17.01	10	1
6.5	75	13.64	10	1
9	75	9.38	10	1
12	120	10.91	10	1
15	100	7.14	10	1

Vout nom(Vo)	3.3VDC		5.0VDC		6.5VDC		9.0VDC		12VDC		15VDC	
Vout adj(Vo')	R_{a1}	R_{a2}	R_{a1}	R_{a2}	R_{a1}	R_{a2}	R_{a1}	R_{a2}	R_{a1}	R_{a2}	R_{a1}	R_{a2}
3	498.5k	--	--	--	--	--	--	--	--	--	--	--
3.3	--	--	--	--	--	--	--	--	--	--	--	--
4	--	96.4k	194.5k	--	--	--	--	--	--	--	--	--
4.5	--	52.2k	468.2k	--	--	--	--	--	--	--	--	--
5	--	--	--	--	--	--	--	--	--	--	--	--
5.5	--	--	--	125.4k	328.0k	--	--	--	--	--	--	--
6	--	--	--	57.8k	742.2k	--	--	--	--	--	--	--
6.5	--	--	--	--	--	--	--	--	--	--	--	--
7	--	--	--	--	--	139.6k	215.5k	--	--	--	--	--
8	--	--	--	--	--	40.0k	517.2k	--	--	--	--	--
9	--	--	--	--	--	--	--	--	--	--	--	--
10	--	--	--	--	--	--	--	64.7k	530.2k	--	--	--
11	--	--	--	--	--	--	--	27.4k	1191.1k	--	--	--
12	--	--	--	--	--	--	--	--	--	--	--	--
13	--	--	--	--	--	--	--	--	--	109.9k	588.3k	--
14	--	--	--	--	--	--	--	--	--	50.0k	1282.8k	--
15	--	--	--	--	--	--	--	--	--	--	--	--
16	--	--	--	--	--	--	--	--	--	--	--	90.6k
17	--	--	--	--	--	--	--	--	--	--	--	40.1k

Dimensions and Recommended



Pin–Out	
Pin	Mark
1	Ctrl
2,3,4	Vin
5,6,7,8	GND
9,10	+Vo
11	+Vo
12	Trim

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

Notes:

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. The maximum capacitive load offered were tested at input voltage range and full load;
3. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75%RH with nominal input voltage and rated output load;
4. All index testing methods in this datasheet are based on our company corporate standards;
5. Products are related to laws and regulations: see "Features" and "EMC";
6. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
7. 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.