Descriptions

0.5A Non-isolated Regulator

RoHS

CE Report EN62368-1

UKCA Report BS EN62368-1

Features

- Input voltage range up to 10:1
- High efficiency up to 93%
- No-load input current as low as 1.5 mA
- Operating ambient temperature range: -40℃ to 85℃
- Output short-circuit protection
- International standard pin package

Applications

- industrial control
- instrumentation
- electric power

Selection Guide

Certification	Part No.	Input Voltage (VDC)*	Output		Full Load Efficiency (%) Min./Typ.	Capacitive Load (μF)Max.
		Nominal (Range)	Voltage (VDC)	Current (mA) Max./Min.		
EN/BS EN	DNKU0.5-7803(L)	48 (9-90)	3.3	500	82/69	100
EN/BS EN	DNKU0.5-7805(L)	48 (9-90)	5	500	87/75	
EN/BS EN	DNKU0.5-78X6(L)	48 (9-90)	6.5	500	91/78	
EN/BS EN	DNKU0.5-7809(L)	48 (14-90)	9	500	91/80	
EN/BS EN	DNKU0.5-7812(L)	48 (18-90)	12	500	91/83	
EN/BS EN	DNKU0.5-7815(L)	48 (20-90)	15	500	93/84	
EN/BS EN	DNKU0.3-7824(L)	48 (36-90)	24	300	93/85	

Note: * For input voltage exceeding 80 VDC, an input capacitor of 22uF/100V is required.

Specifications

Product characteristics	Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Specifications	No-load Input Current	Nominal input voltage		--	--	1.5	mA
	Reverse Polarity at Input			Avoid / Not protected			
	Input Filter			Capacitance filter			
Output Specifications	Voltage Accuracy	10%-100%, input voltage range	3.3V output	--	±3.5	±4.5	%
			Others	--	±2	±3	
	Linear Regulation	Full load, input voltage range	DNKU0.5-7803/05/X6	--	±0.6	±1.5	
			DNKU0.5-7809/12/15	-	±0.6	±2.0	
			DNKU0.3-7824	-	±1.2	±2.5	
	Load Regulation	Nominal input voltage,10% -100% load		--	±1.0	±2.0	
	Ripple & Noise①	20MHz bandwidth, nominal input voltage, full load		--	40	80	mVp-p
	Temperature Coefficient	Operating temperature -40℃ to +85℃		--	--	±0.03	%/℃
	Transient Response Deviation	Nominal input voltage, 25% load step change		--	±0.4	±1.5	%
	Transient Recovery Time	Nominal input voltage, 25% load step change		--	0.2	1	ms
	Short-circuit Protection	Nominal input voltage		Continuous, self-recovery			
General Specifications	Operating Temperature	See Fig.1, Fig.2.		-40	--	+85	℃
	Storage Temperature			-55	--	+125	
	Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds		--	--	+300	
	Storage Humidity	Non-condensing		5	--	95	%RH
	Switching Frequency②	Full load, nominal input voltage		--	300	--	kHz
	MTBF	MIL-HDBK-217F@25℃		2000	--	--	k hours
Mechanical Specifications	Case Material	Black plastic; flame-retardant and heat-resistant (UL94 V-0)					
	Dimensions	DNKU0.5-78xx、DNKU0.3-7824		11.50 x 9.00 x 17.50 mm			
		DNKU0.5-78xxL、DNKU0.3-7824L		19.00 x 11.50 x 9.00 mm			
	Weight	3.8g(typ.)					
	Cooling Method	Free air convection					

Notes:

①The "parallel cable" method is used for ripple and noise test;

②Different output voltage with different switching frequency.

Electromagnetic Compatibility (EMC)

Electromagnetic Compatibility (EMC)	Emissions	CE	CISPR32/EN55032 CLASS B (see Fig. 6-② for recommended circuit)	
		RE	CISPR32/EN55032 CLASS B (see Fig. 6-② 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 B
		EFT	IEC/EN 61000-4-4 100kHz ±1kV (see Fig. 6-① for recommended circuit)	perf. Criteria B
		Surge	IEC/EN 61000-4-5 line to line ±1kV (see Fig. 6-① for recommended circuit)	perf. Criteria B
		CS	IEC/EN 61000-4-6 3Vr.m.s	perf. Criteria B

Characteristic Curve

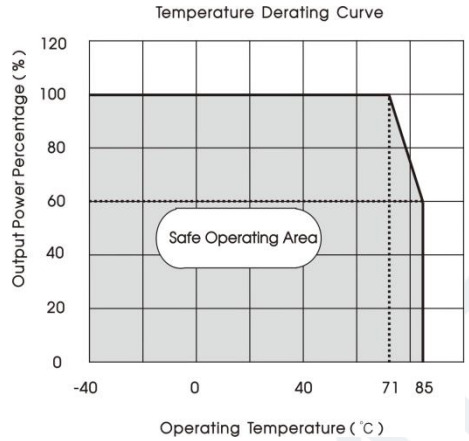


Fig.1 DNKU0.5-78xx(L)

DNKU0.5-7824(L) (Vin=36V~60V)

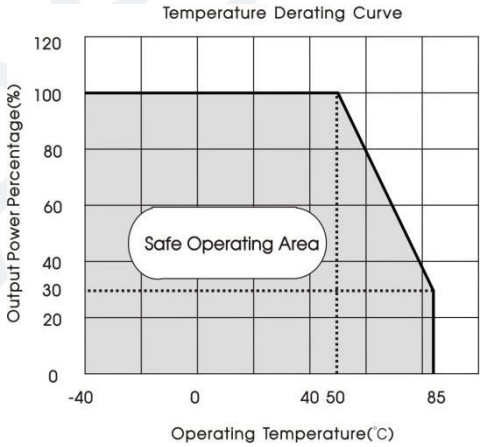


Fig.2 DNKU0.5-7824(L) (Vin≥60V)

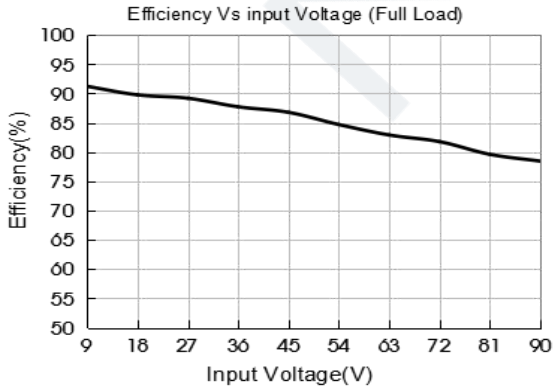


Fig.3 DNKU0.5-7805(L)

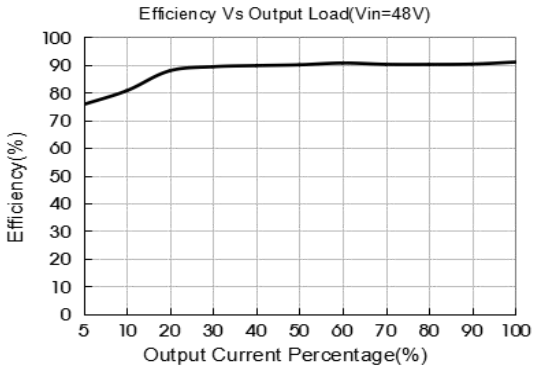


Fig.4 DNKU0.5-7805(L)

Design Reference

1. Typical application

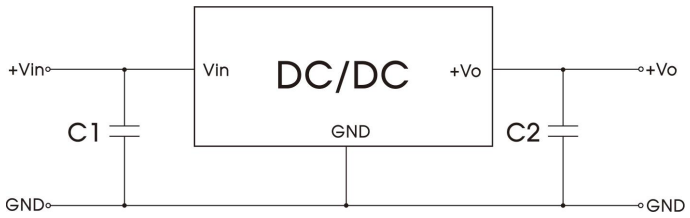


Fig. 5

Part No.	C1 (ceramic capacitor)	C2 (ceramic capacitor)
DNKU0.5-7803(L)	10μF/100V	22μF/10V
DNKU0.5-7805(L)		22μF/10V
DNKU0.5-78X6(L)		22μF/10V
DNKU0.5-7809(L)		22μF/16V
DNKU0.5-7812(L)		22μF/25V
DNKU0.5-7815(L)		22μF/25V
DNKU0.3-7824(L)		10μF/50V

Table 1

Notes:

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. For certain applications, increased values and/or tantalum or low ESR electrolytic capacitors may also be used instead;
3. Converter cannot be used for hot swap and with output in parallel.

2. EMC compliance circuit

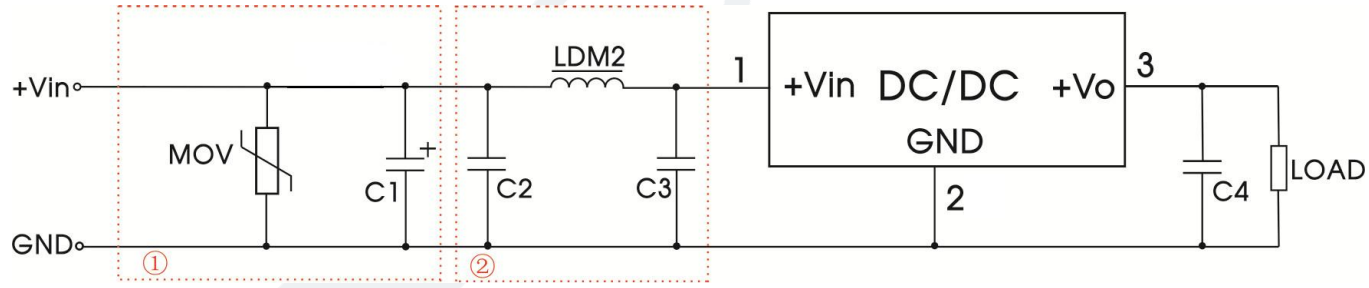
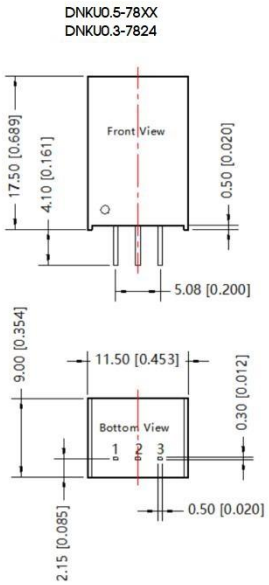


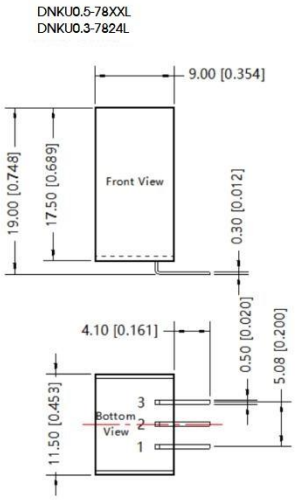
Fig.6

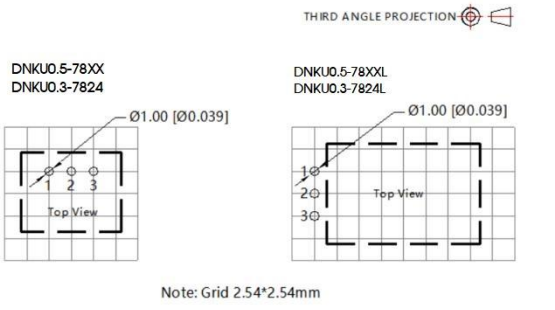
Part No.	MOV	C1	C2	LDM2	C3	C4
DNKU0.5-78xx(L) DNKU0.3-7824(L)	S20K30	680μF /100V	4.7μF/100V	120μH	4.7μF/100V	10μF/50V

Table.2

Dimensions and Recommended







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

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

Notes:

1. The maximum capacitive load offered were tested at input voltage range and full load;
2. 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;
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.