

Wide input voltage, non-isolated & regulated single output



 Report EN 62368-1
  Report BS EN 62368-1
 

FEATURES

- Economical open frame power supply
- High efficiency up to 95%
- No-load input current as low as 0.2mA
- Operating ambient temperature range: -40°C to +85°C
- Output short-circuit protection

K78_JT-500R3-LB series are high efficiency switching regulators. The converters feature high efficiency, low loss and short-circuit protection in a compact SMD package. These products are widely used in applications such as industrial control, instrumentation and electric power.

Selection Guide

Certification	Part No.	Input Voltage (VDC)*	Output		Full Load Efficiency (%) Typ. Vin Min. / Vin Max.	Capacitive Load(μF) Max.
		Nominal (Range)	Voltage (VDC)	Current (mA) Max.		
EN/BS EN	K7803JT-500R3-LB	24 (4.75-36)	3.3	500	85/76	680
	K7805JT-500R3-LB	24 (6.5-36)	5	500	90/81	680
	K78X6JT-500R3-LB	24 (8-36)	6.5	500	91/83	680
	K7809JT-500R3-LB	24 (12-36)	9	500	93/87	680
	K7812JT-500R3-LB	24 (15-36)	12	500	94/88	680
	K7815JT-500R3-LB	24 (19-36)	15	500	95/90	680

Note: *For input voltage exceeding 30 VDC, an input electrolytic capacitor of 22μF/50V is required to prevent the module from being damaged by voltage spikes.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
No-load Input Current		--	0.2	1.5	mA
Reverse Polarity at Input		Avoid / Not protected			
Input Filter		Capacitance filter			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Voltage Accuracy	Full load, input voltage range	3.3 VDC output	--	±2	±4	%
		Others	--	±2	±3	
Linear Regulation	Full load, input voltage range	--	±0.3	±0.5		
Load Regulation	Nominal input voltage, 10% -100% load	--	±0.6	±1.0		
Ripple & Noise*	20MHz bandwidth, nominal input voltage	3.3 VDC output, 30% -100% load	--	50	100	mVp-p
		Others, 20% -100% load	--	50	100	
Temperature Coefficient	Full load	--	±0.02	--	%/°C	
Transient Response Deviation	Nominal input voltage, 25% load step change	--	±50	±250	mV	
Transient Recovery Time		--	0.2	1	ms	

Short-circuit Protection	Input voltage range	Continuous, self-recovery
Notes: * 1. The "parallel cable" method is used for Ripple and Noise test, please refer to DC-DC Converter Application Notes for specific information; 2. With light loads at or below 30%, Ripple & Noise for 3.3V output parts increase to 200mVp-p max, and a load below 20% for 5V/6.5V/9V/12V/15V output parts levels increase to 250mVp-p max.		

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Operating Temperature	See Fig. 1	-40	--	+85	°C
Storage Temperature		-55	--	+125	
Storage Humidity	Non-condensing	5	--	95	%RH
Reflow Soldering Temperature		Peak temp. ≤245°C, maximum duration time ≤60s over 217°C. For actual application, please refer to IPC/JEDEC J-STD-020D.1.			
Switching Frequency	Full load, nominal input	--	700	--	kHz
MTBF	MIL-HDBK-217F@25°C	2000	--	--	k hours
Moisture Sensitivity Level (MSL)*	IPC/JEDEC J-STD-020D.1	Level 1			

Note: * For actual application, please refer to IPC/JEDEC J-STD-020D.1.

Mechanical Specifications

Dimensions	12 x 12 x 4.5mm
Weight	0.75g (Typ.)
Cooling Method	Free air convection

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 B
	EFT	IEC/EN 61000-4-4	100kHz ±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 B

Typical Characteristic Curves

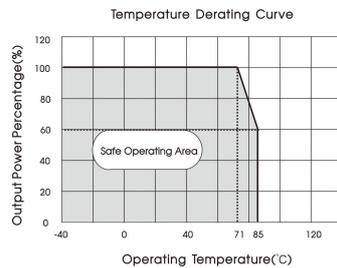
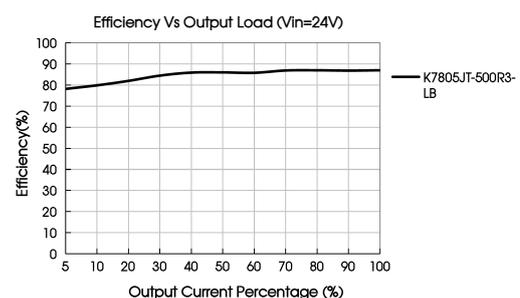
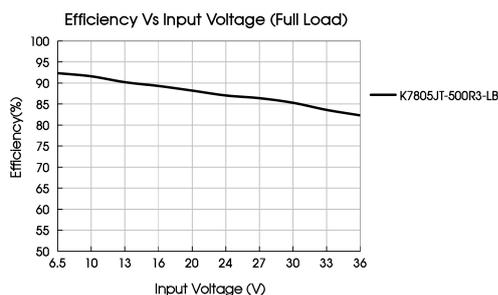
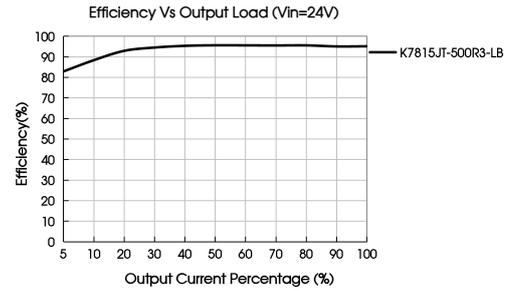
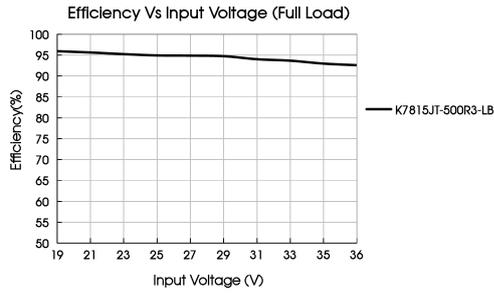


Fig. 1





Design Reference

1. Typical application

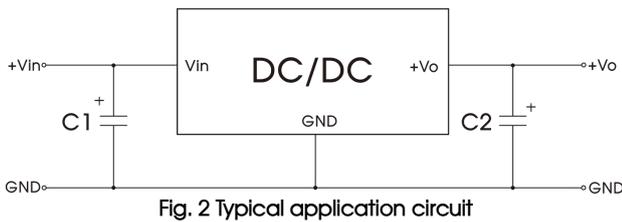


Fig. 2 Typical application circuit

Part No.	C1 (ceramic capacitor)	C2 (ceramic capacitor)
K7803JT-500R3-LB	10μF/50V	22μF/10V
K7805JT-500R3-LB		22μF/10V
K78X6JT-500R3-LB		22μF/16V
K7809JT-500R3-LB		22μF/16V
K7812JT-500R3-LB		22μF/25V
K7815JT-500R3-LB		22μF/25V

Notes:

- 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 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;
- To further reduce the output ripple and noise, we suggested the use of a "LC" filter at the output terminals, with an inductor value (L) of 10μH-47μH, see Fig. 3

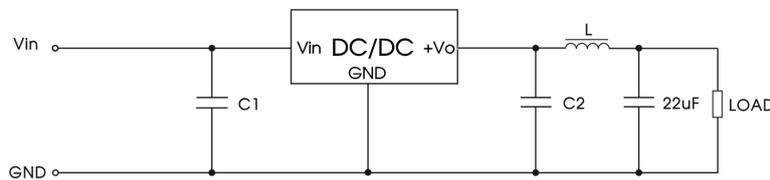


Fig. 3 External "LC" output filter circuit diagram

2. EMC Compliance circuit

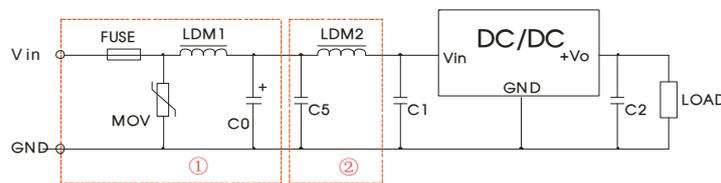


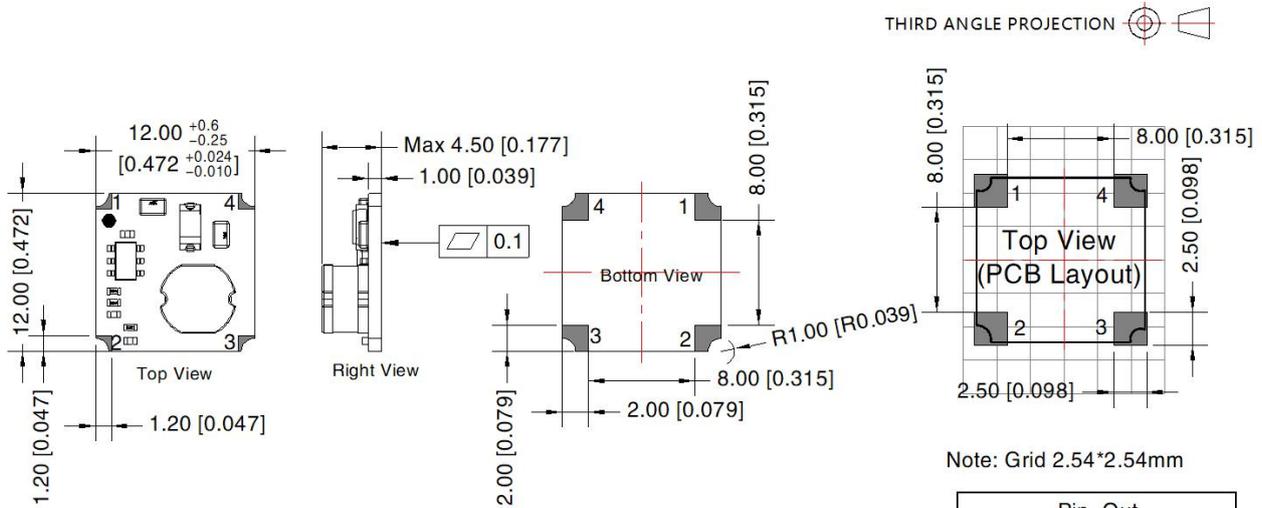
Fig.4 Recommended compliance circuit

FUSE	MOV	LDM1	C0	C1/C2	C5	LDM2
Selecting based on the actual input current in application	S20K30	82μH	680μF /50V	Refer to table 1	4.7μF /50V	22μH

Note: For EMC tests we use Part ① in Fig. 4 for immunity and part ② for emissions test. Selecting based on needs.

3. For additional information please refer to DC-DC converter application notes on www.mornsun-power.com

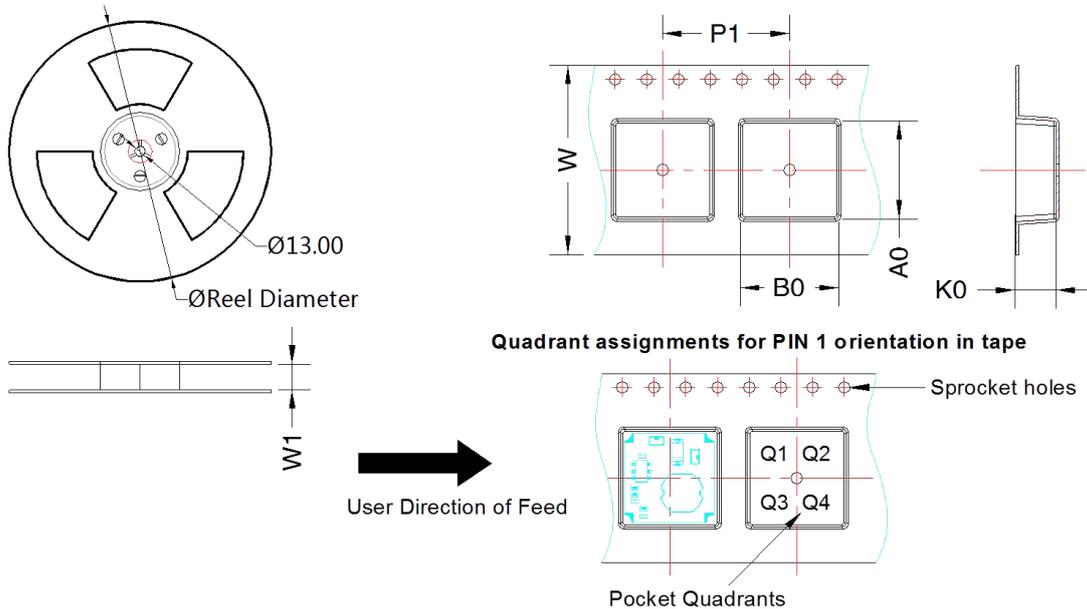
Dimensions and Recommended Layout



Note:
Unit: mm[inch]
General tolerances: $\pm 0.25[\pm 0.010]$
The layout of the device is for reference only,
please refer to the actual product

Pin-Out	
Pin	Mark
1	+Vin
2	NC
3	+Vo
4	GND

Tape and Reel Info



Device	Package Type	Pin	MPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
K78_JT-500R3-LB	SMD	4	700	330.0	24.4	12.47	12.47	5.1	16	24.0	Q1

Notes:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58210140;
2. The maximum capacitive load offered were tested at nominal input voltage and full load;
3. Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a=25^{\circ}\text{C}$, humidity<75%RH with nominal input voltage and rated output load;
4. All index testing methods in this datatable are based on our company corporate standards;
5. We can provide product customization service, please contact our technicians directly for specific information;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

MORNSUN Guangzhou Science & Technology Co., Ltd.

Address: No. 5, Kehui St. 1, Kehui Development Center, Science Ave., Guangzhou Science City, Huangpu District, Guangzhou, P. R. China
Tel: 86-20-38601850 Fax: 86-20-38601272 E-mail: info@mornsun.cn www.mornsun-power.com