DC/DC Converter

K78_JT-500R3 Series

MORNSUN®

Wide input voltage, non-isolated & regulated single output

CE RoHS 3 years Warranty

FEATURES

- Ultra-thin SMD Package, thickness≤3.5mm
- High efficiency up to 95%
- No-load input current as low as 0.2mA
- Operating ambient temperature range: -40℃ ~ +85℃
- Output short-circuit protection
- EN62368 approved

K78_JT-500R3 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	Capacitive
		Nominal (Range)	Voltage (VDC)	Current (mA) Max.	Efficiency (%) Typ. Vin Min. / Vin Max.	Load(μF) Max.
CE	K7803JT-500R3	24 (4.75-36)	3.3	500	86/80	680
	K7805JT-500R3	24 (6.5-36)	5	500	90/84	680
	K7809JT-500R3	24 (12-36)	9	500	93/90	680
	K7812JT-500R3	24 (15-36)	12	500	94/91	680
	K7815JT-500R3	24 (19-36)	15	500	95/93	680

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

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			
Ctrl*	Module on	Ctrl pin open or pulled high (TTL 3.2-8VDC)			
	Module off	Ctrl pin pulled low to GND (0-0.8VDC)			
	Input current when off	--	30	100	μA

Note: * The Ctrl pin voltage is referenced to input GND.

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		--	±0.2	±0.4	
Load Regulation	Nominal input voltage, 10% -100% load	3.3/5VDC output	--	±0.6	--	%
		Others	--	±0.3	--	
Ripple & Noise*	20MHz bandwidth, nominal input voltage	3.3 VDC output, 20% -100% load	--	20	50	mVp-p
		Others, 10% -100% load	--	20	50	

Temperature Coefficient	Full load	--	--	±0.03	%/℃
Transient Response Deviation	Nominal input voltage, 25% load step change	--	±50	±200	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 20%, Ripple & Noise for 3.3V output parts increase to 100mVp-p max, and a load below 10% for 5V/9V/12V/15V output parts levels increase to 150mVp-p max.

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Operating Temperature	See Fig. 1	-40	--	+85	℃
Storage Temperature		-55	--	+125	
Storage Humidity	Non-condensing	5	--	95	%RH
Reflow Soldering Temperature		Peak temp.≤245℃, maximum duration time≤60s over 217℃. 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℃	2000	--	--	K hours

Mechanical Specifications

Dimensions	12.50 x 13.50 x 3.50mm
Weight	0.9g (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 A
	EFT	IEC/EN 61000-4-4	±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 A

Typical Characteristic Curves

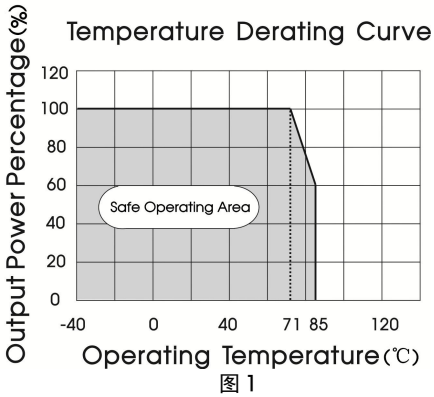
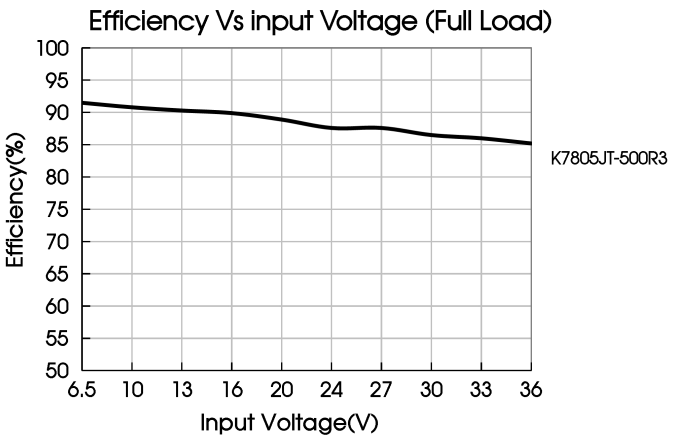
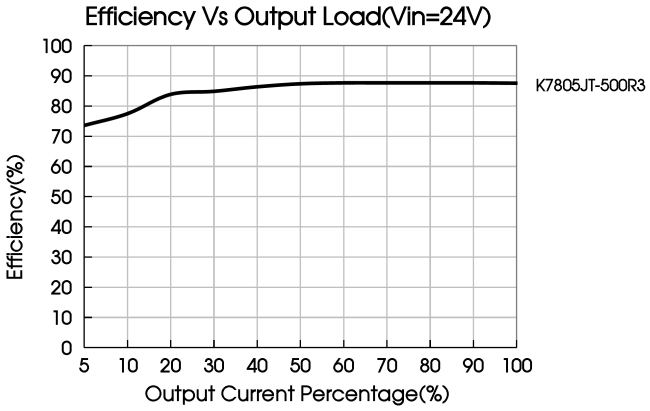
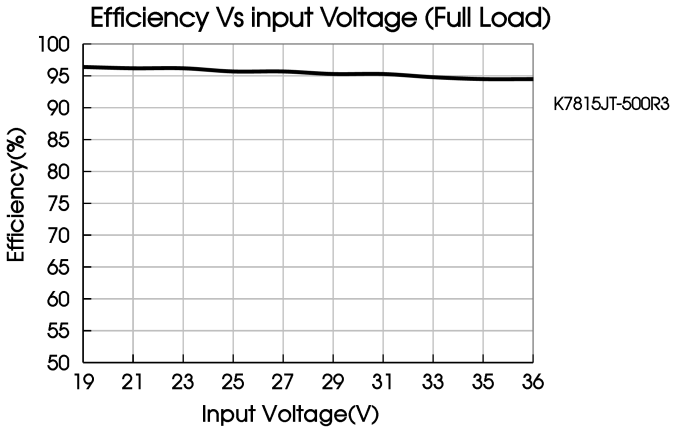
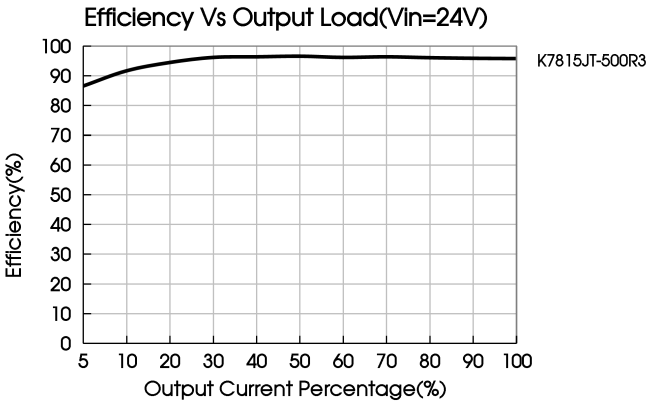


图 1









Design Reference

1. Typical application

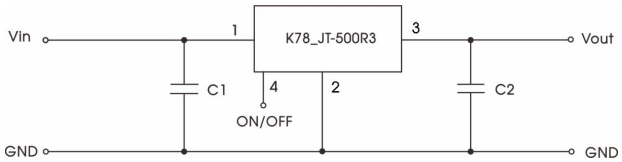


Fig. 2 Typical application circuit

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

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;
4. 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.

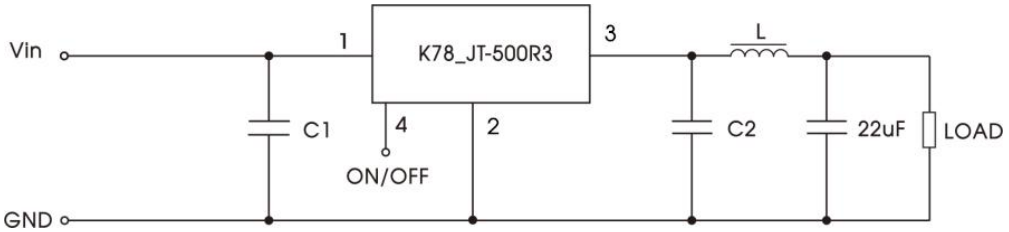


Fig. 3 External "LC" output filter circuit diagram

2. EMC Compliance circuit

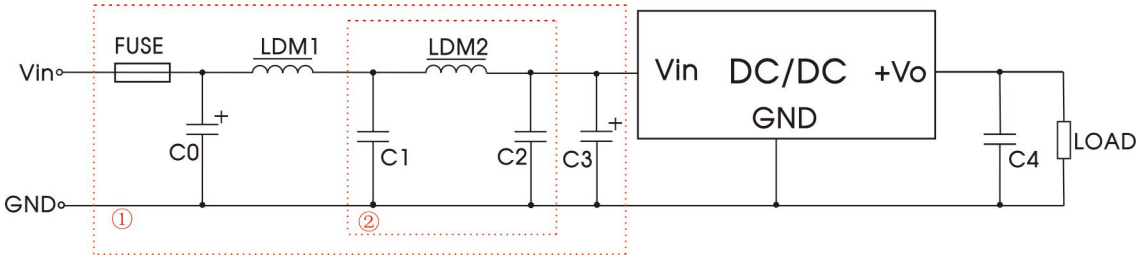


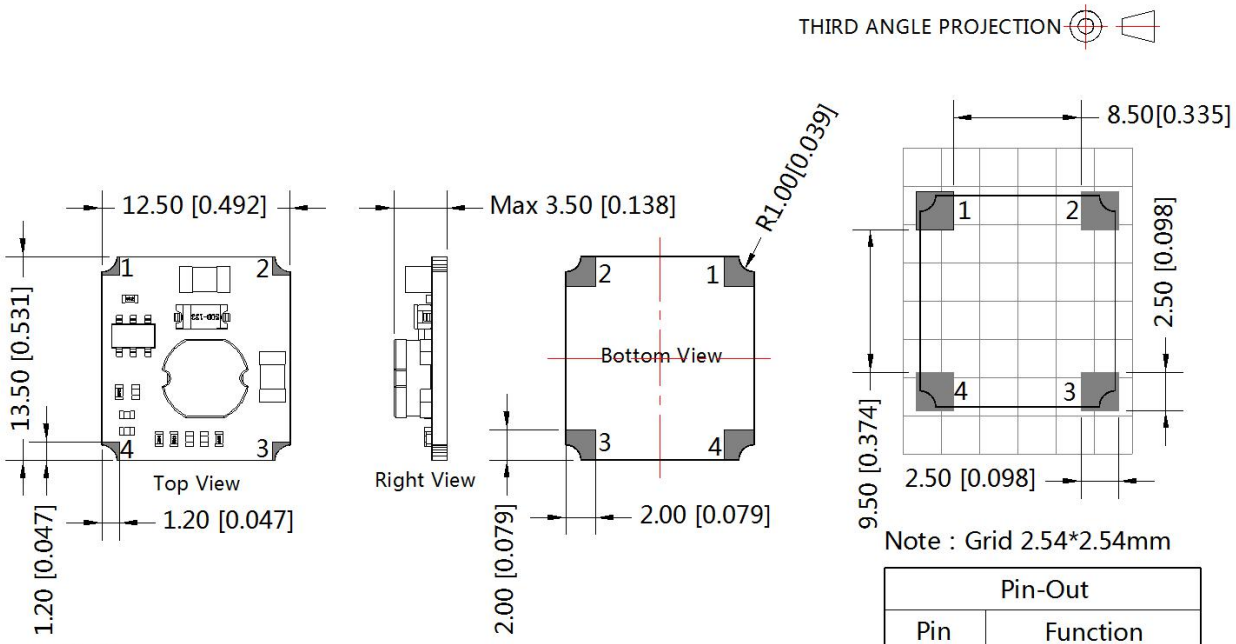
Fig.4 Recommended compliance circuit

FUSE	LDM1	C0/C3	C4	C1/C2	LDM2
Selecting based on the actual input current in application	82μH	330μF /50V	Refer to table 1	10μF /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: ±0.25[±0.010]
The layout of the device is for reference only, please refer to the actual product

Note : Grid 2.54*2.54mm

Pin-Out	
Pin	Function
1	+Vin
2	GND
3	+Vo
4	Remote On/Off

Notes:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58210078;
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 Ta=25℃, humidity<75% 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.

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