

SB XT-2WR4



Product Feature

- ◆ Package Type: SMD
- ◆ Operating temperature range: -40°C - +105°C
- ◆ Isolation voltage: 1500VDC
- ◆ High efficiency up to: 84% (Type)
- ◆ No-load input current as low as 5mA
- ◆ Fields of application: Electricity, Industrial control, Communication, Internet of Things, Automotive.



Selection Guide

Part No.	Input Voltage (VDC)	Output			Full Load Efficiency % (Typ.)	Capacitive Load(μF) Max.
	Nominal (Range)	Voltage (VDC)	Current Min.(mA)	Current Max.(mA)		
SB 0503 XT-2WR4	5 (4.5-5.5)	3.3	40	400	82	2400
SB 0505 XT-2WR4	5 (4.5-5.5)	5	40	400	83	2400
SB 0512 XT-2WR4	5 (4.5-5.5)	12	17	167	84	560
SB 0515 XT-2WR4	5 (4.5-5.5)	15	13	133	84	560
SB 0524 XT-2WR4	5 (4.5-5.5)	24	8	84	84	220
SB 1203 XT-2WR4	12 (10.8-13.2)	3.3	40	400	80	2400
SB 1205 XT-2WR4	12 (10.8-13.2)	5	40	400	83	2400
SB 1212 XT-2WR4	12 (10.8-13.2)	12	17	167	84	560
SB 1215 XT-2WR4	12 (10.8-13.2)	15	13	133	84	560
SB 1224 XT-2WR4	12 (10.8-13.2)	24	8	84	84	220
SB 1503 XT-2WR4	15 (13.5-16.5)	3.3	40	400	82	2400
SB 1505 XT-2WR4	15 (13.5-16.5)	5	40	400	83	2400
SB 1512 XT-2WR4	15 (13.5-16.5)	12	17	167	84	560
SB 1515 XT-2WR4	15 (13.5-16.5)	15	13	133	84	560
SB 1524 XT-2WR4	15 (13.5-16.5)	24	8	84	84	220
SB 2403 XT-2WR4	24(21.6-26.4)	3.3	40	400	82	2400
SB 2405 XT-2WR4	24(21.6-26.4)	5	40	400	83	2400
SB 2412 XT-2WR4	24(21.6-26.4)	12	17	167	84	560
SB 2415 XT-2WR4	24(21.6-26.4)	15	13	133	84	560
SB 2424 XT-2WR4	24(21.6-26.4)	24	8	84	84	220

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Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current(full load/no load)	5VDC Input	--	482/6	--	mA
	12VDC Input	--	208/4	--	
	15VDC Input	--	167/3	--	
	24VDC Input	--	104/3	--	
Reflected Ripple Current		--	15	--	
Impulse Voltage	5VDC Input	-0.7	--	9	VDC
	12VDC Input	-0.7	--	18	
	15VDC Input	-0.7	--	20	
	24VDC Input	-0.7	--	30	
Input Filter		Capacitance Filter			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Output Voltage Accuracy		See Envelope Curve Figure 1				
Linear Regulation	Input Voltage Variation $\pm 1\%$	3.3VDC output	--	± 1.5	--	%
		Others output	--	± 1.2	--	
Load Regulation	10% - 100% Load	3.3/5VDC output	--	8	15	%
		12VDC output	--	5	10	
		15VDC output	--	4	10	
		24VDC output	--	4	10	
Ripple & Noise	20MHz Bandwidth(peak-peak)	--	60	150	mV	
Temperature Coefficient	Full Load	--	--	± 0.03	%/°C	
Short-circuit Protection		Continuous, Self-Recovery				

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General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Insulation Voltage	Input-output, test time 1 minute, leakage current less than 1mA	1500	--	--	VDC
Insulation Resistance	Input-output, insulated voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	--	20	--	pF
Operating Temperature	Derating when operating temperature ≥ 85°C (See Figure 2)	-40	--	105	°C
Storage Temperature		-55	--	125	°C
Case Temperature Rise	Ta=25°C, nominal input, output load	--	25	--	°C
Storage Humidity	Non-condensing	--	--	95	%RH
Reflow Soldering Temperature	Peak temp. ≤ 245°C, maximum duration time ≤ 60s over 217°C				
Switching Frequency	Full Load, Nominal Input Voltage	--	220	--	KHz
MTBF	MIL-HDBK-217F@25°C	>3500Kh			

Mechanical Specification

Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0 rated)
Package Dimensions	13.50 x 11.10 x 7.25 mm
Weight	1.7g(Typ.)
Cooling Method	Free air convection

EMC Specifications

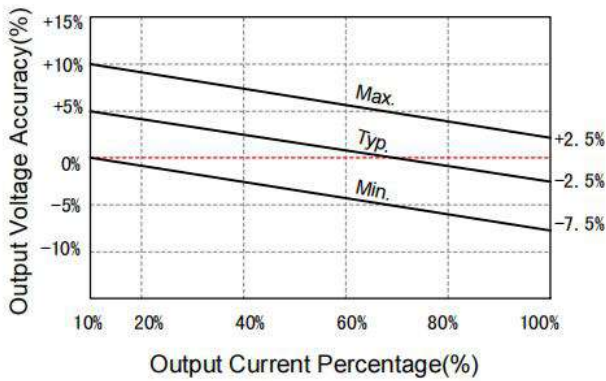
EMI	CE	CISPR32/EN55032 CLASS B (The recommended circuit is shown in Figure 4)
	RE	CISPR32/EN55032 CLASS B (The recommended circuit is shown in Figure 4)
EMS	ESD	IEC/EN61000-4-2 Air ±8KV, Contact ±4KV perf. Criteria B

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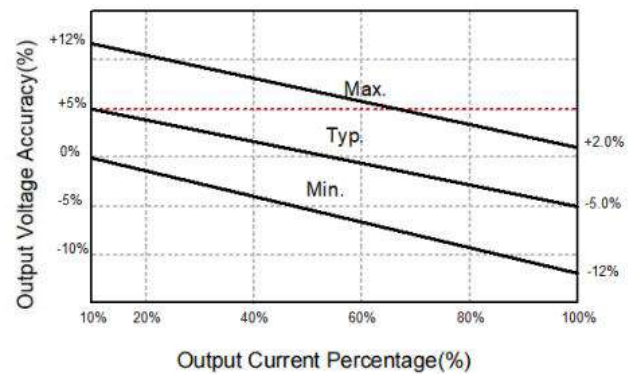


Typical Characteristic Curves

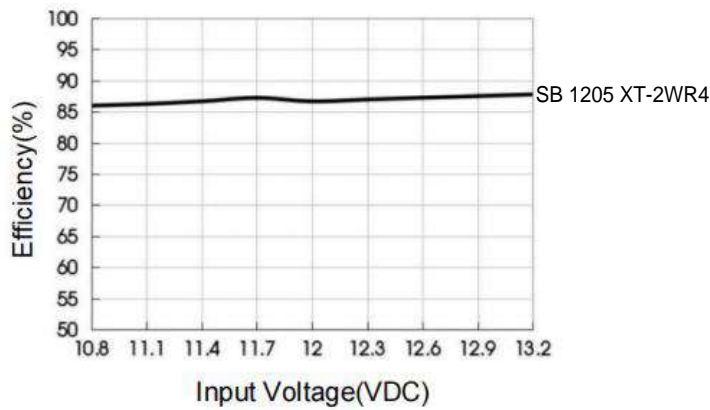
Output Regulation Curve (other Output) Figure 1-1



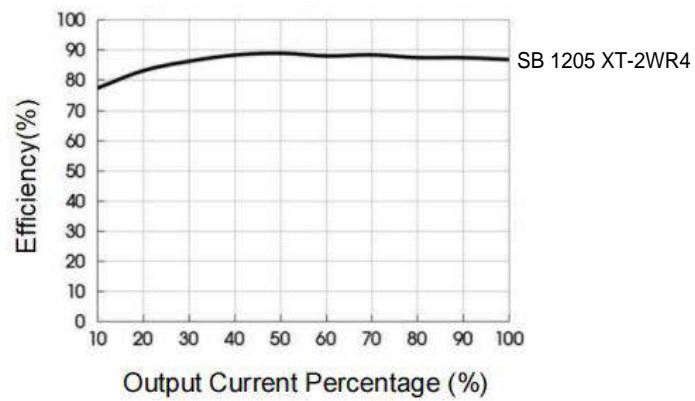
Output Regulation Curve (3.3VDC Output) Figure 1-2



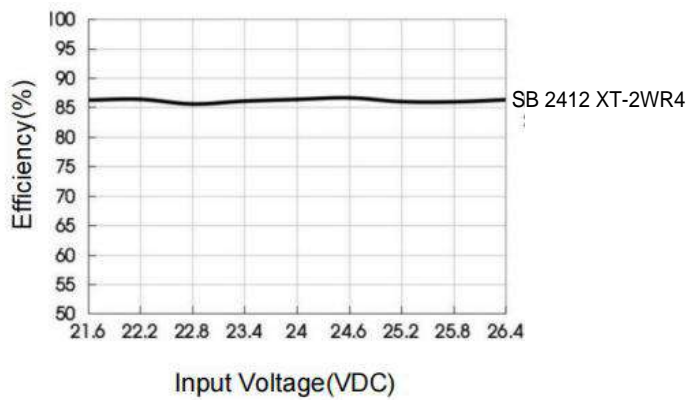
Efficiency VS Input Voltage Curve(full load)



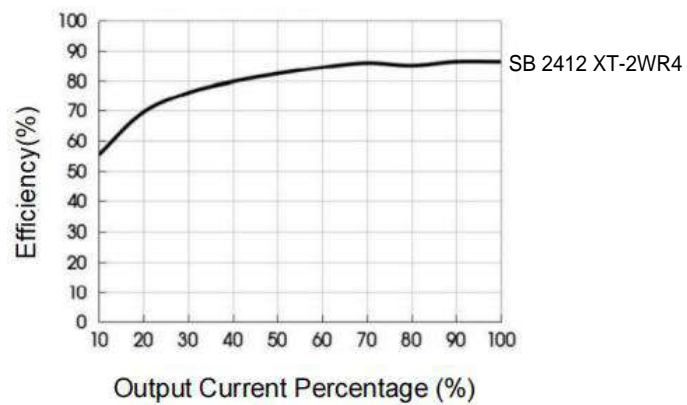
Efficiency VS Output Load (Vin=12V)



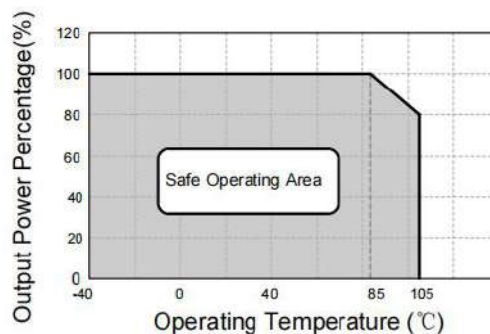
Efficiency VS Input Voltage Curve(full load)



Efficiency VS Output Load (Vin=24V)



Temperature Derating Curve (Figure 2)



Typical Circuit Design and Application

Application circuit (Figure 3)		Recommended Capacitive Load Value Table																							
		<table border="1"> <thead> <tr> <th>Vin(VDC)</th> <th>Cin(μF)</th> <th>Vo(VDC)</th> <th>Cout(μF)</th> </tr> </thead> <tbody> <tr> <td>5VDC</td> <td>10μF/10V</td> <td>3.3/5VDC</td> <td>10μF/10V</td> </tr> <tr> <td>12VDC</td> <td>4.7μF/25V</td> <td>12VDC</td> <td>2.2μF/25V</td> </tr> <tr> <td>15VDC</td> <td>2.2μF/25V</td> <td>15VDC</td> <td>1μF/50V</td> </tr> <tr> <td>24VDC</td> <td>1μF/50V</td> <td>--</td> <td>--</td> </tr> </tbody> </table>	Vin(VDC)	Cin(μ F)	Vo(VDC)	Cout(μ F)	5VDC	10 μ F/10V	3.3/5VDC	10 μ F/10V	12VDC	4.7 μ F/25V	12VDC	2.2 μ F/25V	15VDC	2.2 μ F/25V	15VDC	1 μ F/50V	24VDC	1 μ F/50V	--	--			
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Application circuit (Figure 4)		EMI Recommended Parameter Table																							
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1. Typical applications

To further reduce input and output ripple, a capacitor filtering network can be connected at the input and output terminals. The application circuit is shown in Figure 3. However, care should be taken to select a suitable filter capacitor. If the capacitance is too large, it is likely to cause start-up problems. For each output, the recommended capacitive load values are shown in "Recommended Capacitive Load Value Table" for safe and reliable operation.

2. EMC typical recommended circuit See Figure 4

3. Output load requirements

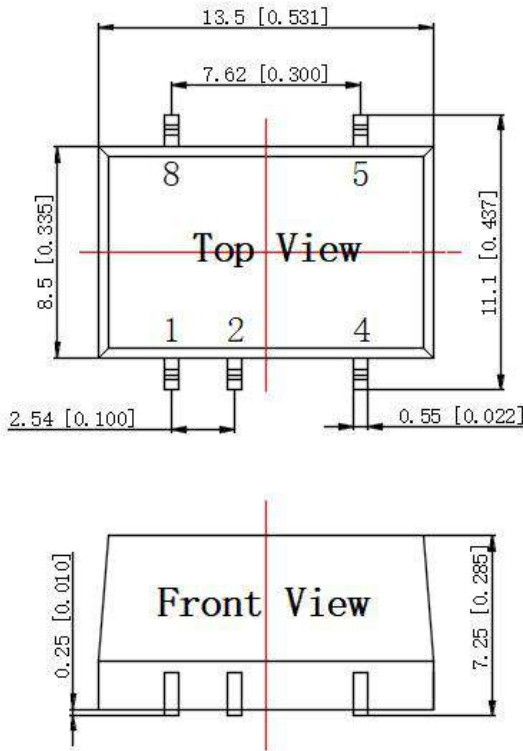
In order to ensure that the module can work efficiently and reliably, the minimum output load should not be less than 10% of the rated load when used. If the power required is really small, connect a resistor in parallel to the output end (the sum of the power consumed by the resistance and the power actually used is greater than or equal to 10% of the rated power).

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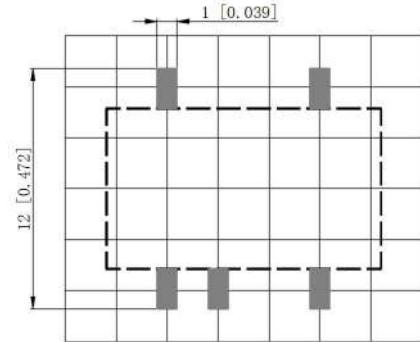
Dimensions and Recommended Layout



Dimensions



PCB Printing Layout



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

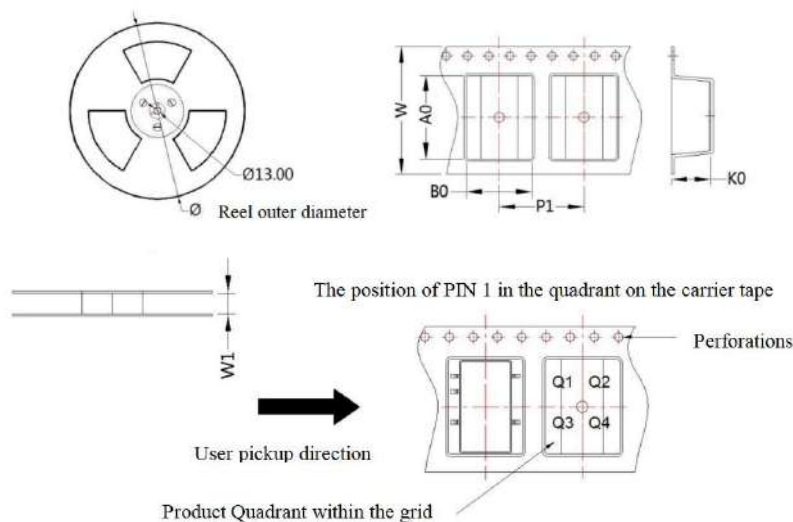
Pin Definition Table

Pin	Function
1	GND
2	Vin
4	-Vo
5	+Vo
8	NC

NC: cannot be connected to any external circuit

Packing diagram

Carrier tape packaging diagram



Part number	package type	Pin	MPQ	Reel outer diameter(mm)	Reel width W1(mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 quadrant
SB XT-2WR4	SMD	5	500	330.0	24.5	13.9	11.7	7.5	16.0	24.0	Q1

Note:

- ✧ The input voltage should not exceed the specified range value, otherwise it may cause permanent and irreparable damage;
- ✧ It is recommended to use at a load of over 5%. If the load is below 5%, the ripple index of the product may exceed the specifications, but it does not affect the reliability of the product;
- ✧ The maximum capacitive load is tested within the input voltage range and under full load conditions;
- ✧ Unless otherwise specified, all indicators in this manual are measured at $T_a=25\text{ }^\circ\text{C}$, humidity < 75% RH, nominal input voltage, and output rated load;
- ✧ All indicator testing methods in this manual are based on our company's corporate standards;
- ✧ Our company can provide product customization, and specific requirements can be directly contacted by our technical personnel;
- ✧ Product specifications are subject to change without prior notice.