

IB_LS-1W Series DataSheet

1W,DC-DC module power supply with isolated voltage stabilizing single output of constant voltage input



- ◆ **Sustainable short-circuit protection**
- ◆ **Isolation voltage: 1500VDC**
- ◆ **Small SIP package, high power density**
- ◆ **Low ripple noise**
- ◆ **High efficiency and low loss**

This series of module power supply is suitable for occasions where the input voltage is stable, the output load varies widely, and the stability of the output voltage is highly required.

Selection List

Model	Input	Output		Full load efficiency (%_ Typ)	Maximum capacitive load(uF)
	Voltage rating (VDC)	Output voltage (Typ)	Output current (Max)		
	(Range value)	(VDC)	(mA)		
IB0505LS-1W	4.75-5.25 (5VDC)	5.0	200	73	220
IB0512LS-1W		12	83	76	100
IB1205LS-1W	11.40-12.60 (12VDC)	5.0	200	75	220
IB1212LS-1W		12	83	76	100
IB2405LS-1W	22.80-25.20 (24VDC)	5.0	200	75	220
IB2412LS-1W		12	83	78	100

Input Characteristic

Item	Operating Conditions		Min	Typ	Max	Unit
Input current (Full load/No load)	5V Input	5V Output	--	273/5	282/10	mA
		12V Output	--	263/10	271/15	
	12V Input	5V Output	--	111/5	115/10	
		12V Output	--	109/5	113/10	
	24V Input	5V Output	--	55/5	57/10	
		12V Output	--	53/5	55/10	
Input impulse voltage (1Sec)	5V Input		-0.3	--	8	Vdc
	12V Input		-0.3	--	20	
	24V Input		-0.3	--	30	
Input filter	/		Capacitor filter			
Hot swap	/		Nonsupport			

Output Characteristic

Item	Operating conditions		Min	Typ	Max	Unit
Output voltage accuracy	Rated input @ full load	5V Output	-3	--	+3	%
		12V Output	-2	--	+2	
Linear adjustment rate	Full load, Input voltage from lowest to highest	5V Output	-1	--	1	
		12V Output	-0.75	--	0.75	
Load adjustment rate	10%-100%Load	5V Output	-3	--	3	
		12V Output	-2	--	2	
Ripple & Noise	20MHz Bandwidth @Vin_nom,100%Load		--	50	100	mVp-p
Short circuit protection	/		Sustainable, Self-healing			

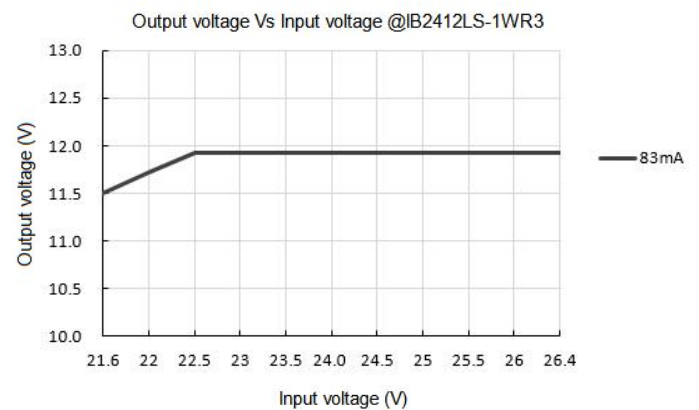
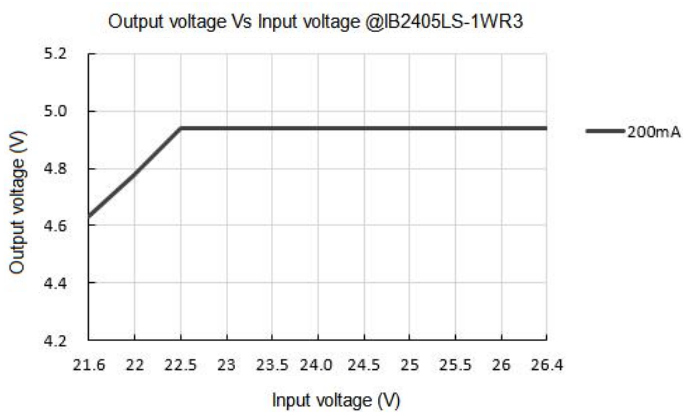
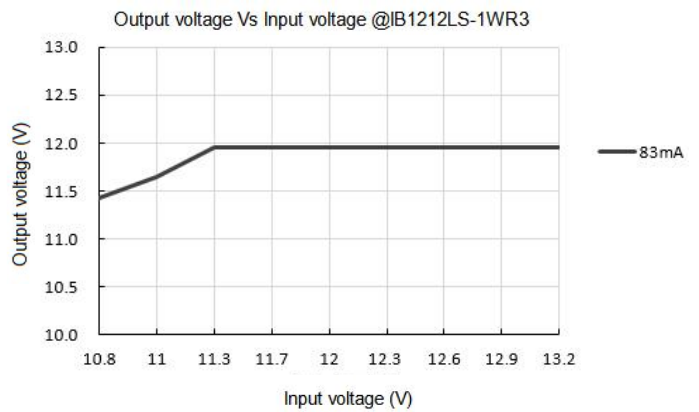
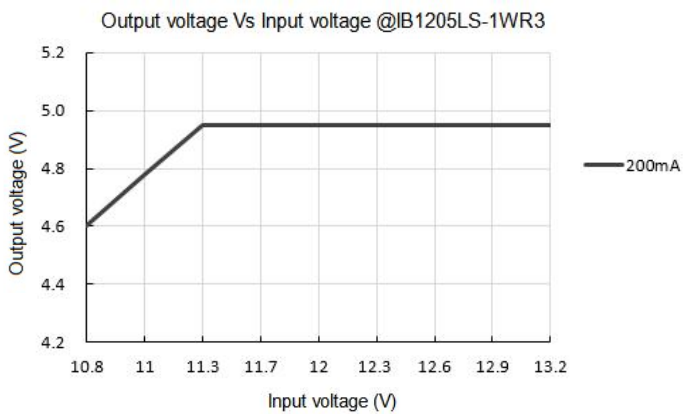
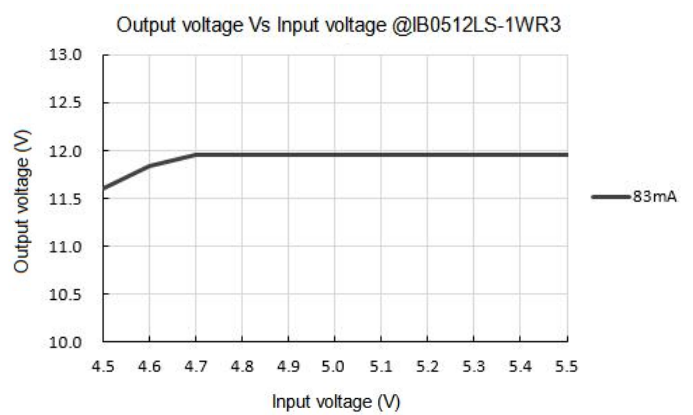
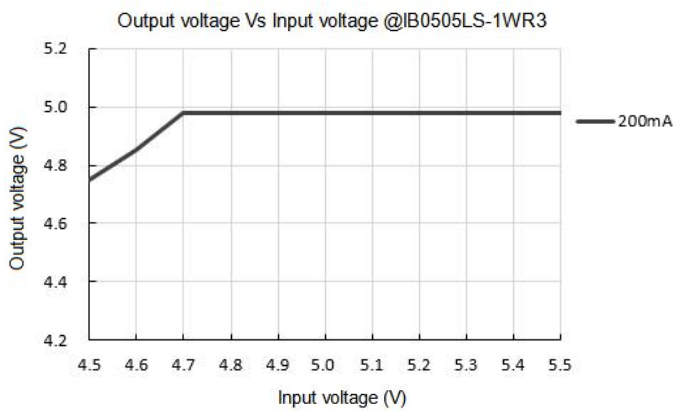
Other Characteristics

Item	Operating Conditions	Min	Typ	Max	单位
Insulation Voltage	Input-Output, 60s @ Leakage current ≤ 1mA	1500	--	1700	Vdc
Insulation resistance	Input-Output, Test voltage 500VDC	1000	--	--	MΩ
Isolation capacitance	Input-Output, 100KHz/0.1V	--	30	--	pF
Switching frequency	100%Load @Vin_nom	200	--	400	kHz
Working ambient temperature	Meet the product characteristic curve (四)	-40	--	+85	°C
Product operating temperature Rise	100%Load@Vin_nom,Ta=25°C	--	25	--	
Storage temperature		-55	--	+125	
Storage humidity	Non condensing	5	--	95	%RH
Temperature coefficient	Nominal input@100%load	--	±0.03	--	%/°C
Welding temperature	Manual welding	370±10°C@3~5Sec			
	Wave soldering	260±10°C@5~10Sec			
MTBF	MIL-HDBK-217F@25°C	2000	--	--	Kh
Shell material	Black flame-retardant plastic shell				
Outline dimension	19.6*6*10.10mm (L*W*H)				
Weight	2.0g(Typ)				
Cooling mode	Natural air cooling				

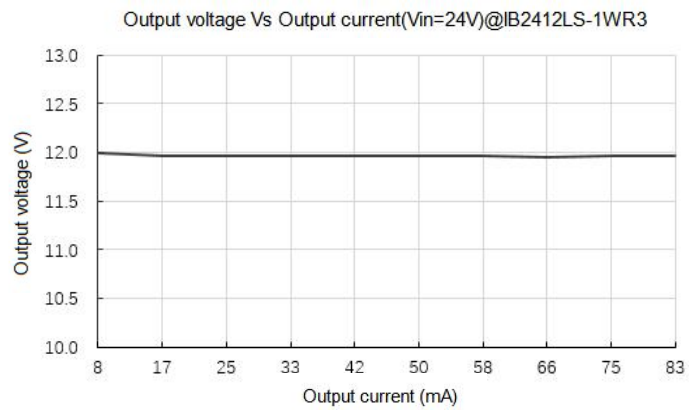
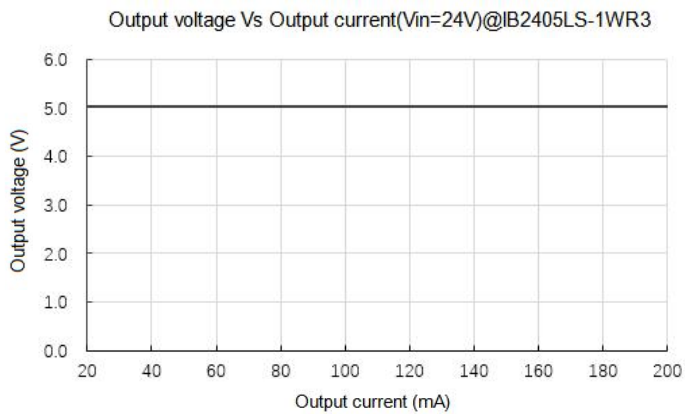
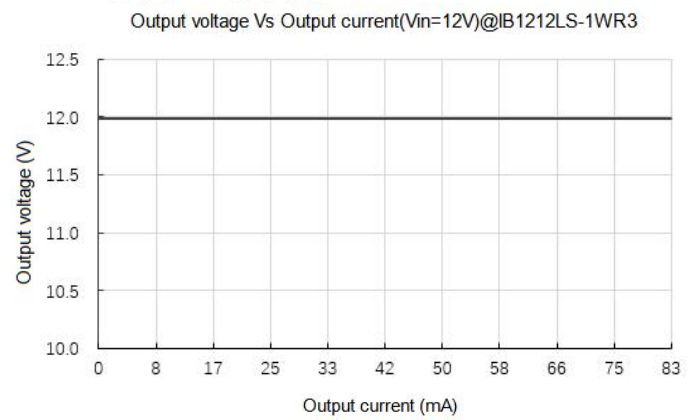
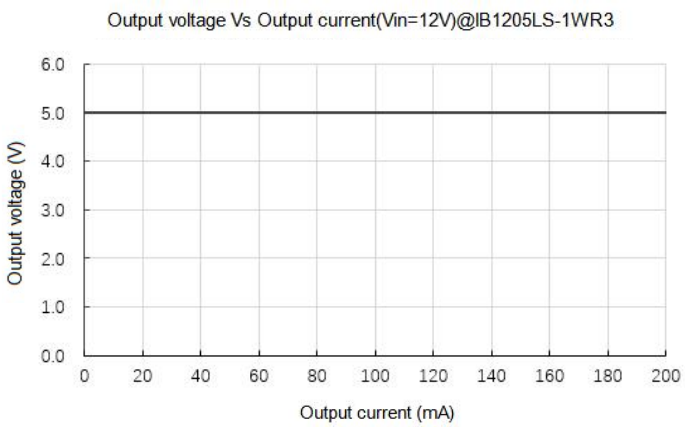
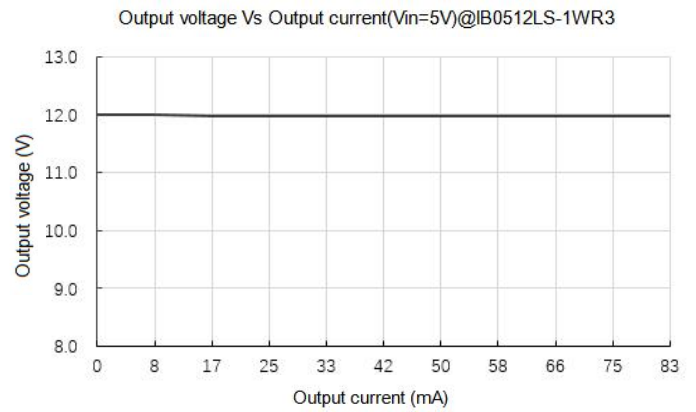
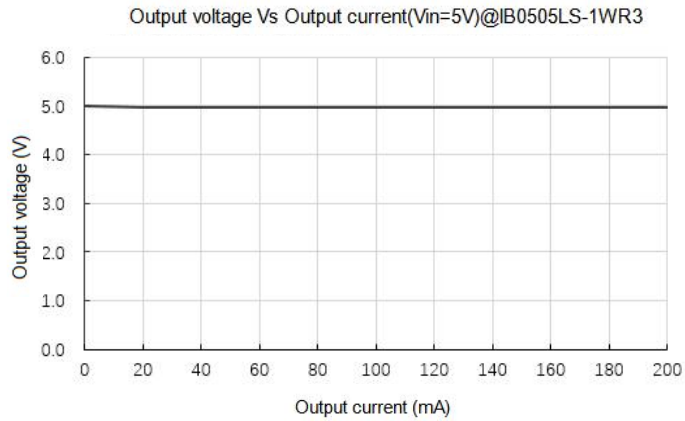
EMC Characteristic

EMI	Conducted Emission	CISPR32/EN55032 CLASS B
	Radiated Emission	CISPR32/EN55032 CLASS B
EMS	Electrostatic Discharge	IEC/EN61000-4-2 Ari: $\pm 8kV$, Contact: $\pm 6kV$ perf.criteria B
Note: Refer to EMC recommended circuit test.		

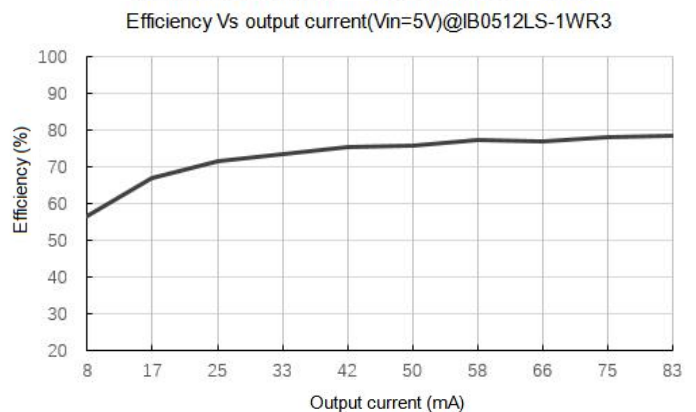
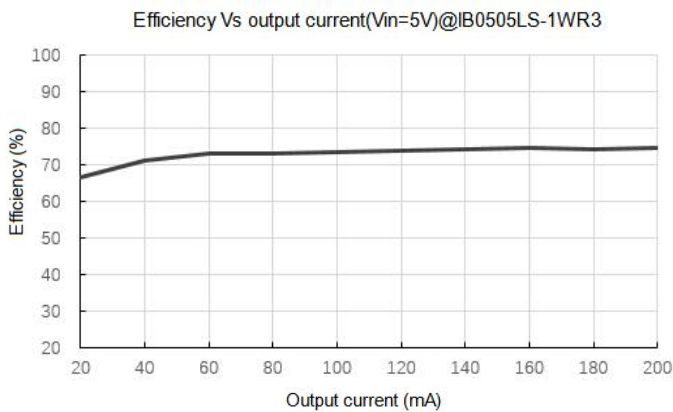
Product characteristic curve (—) : Relation curve between output voltage and input voltage



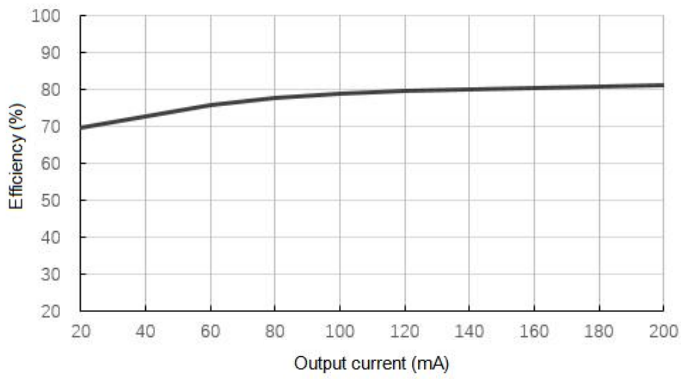
Product characteristic curve (二) : Relation curve between output voltage and load



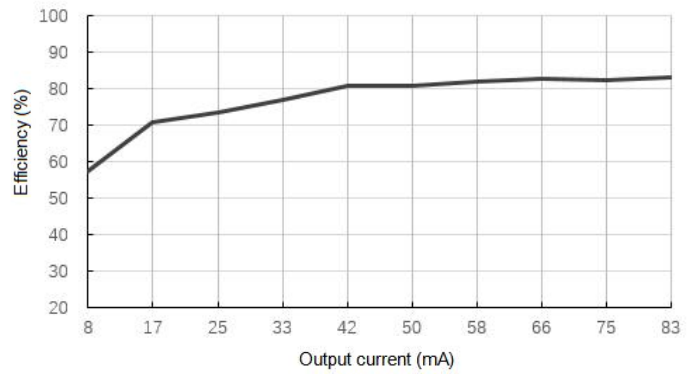
Product characteristic curve (三) : Efficiency versus load curve



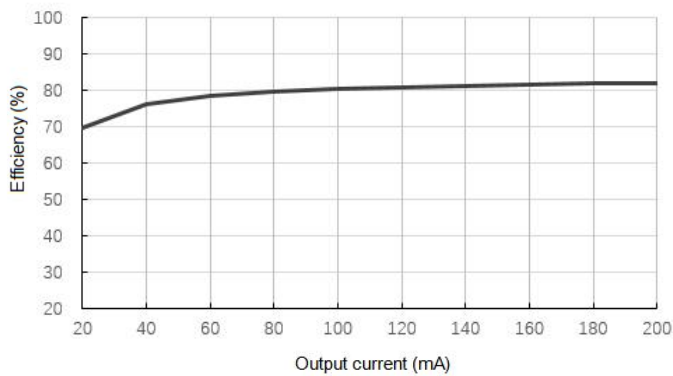
Efficiency Vs output current(Vin=12V)@IB1205LS-1WR3



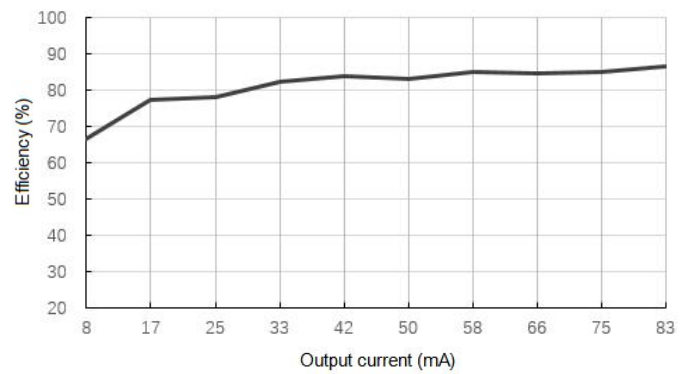
Efficiency Vs output current(Vin=12V)@IB1212LS-1WR3



Efficiency Vs output current(Vin=24V)@IB2405LS-1WR3

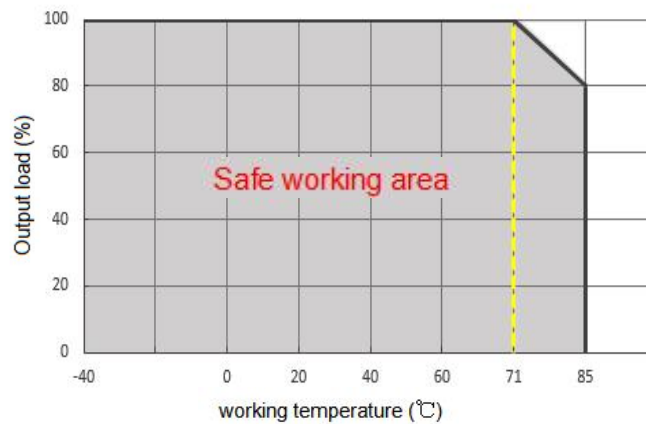


Efficiency Vs output current(Vin=24V)@IB2412LS-1WR3

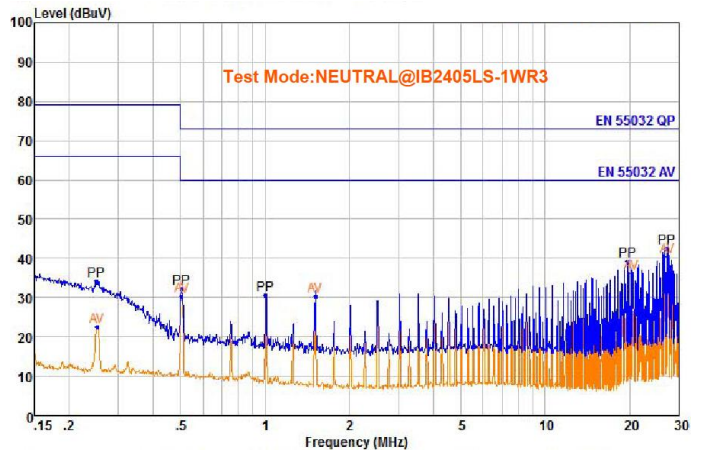
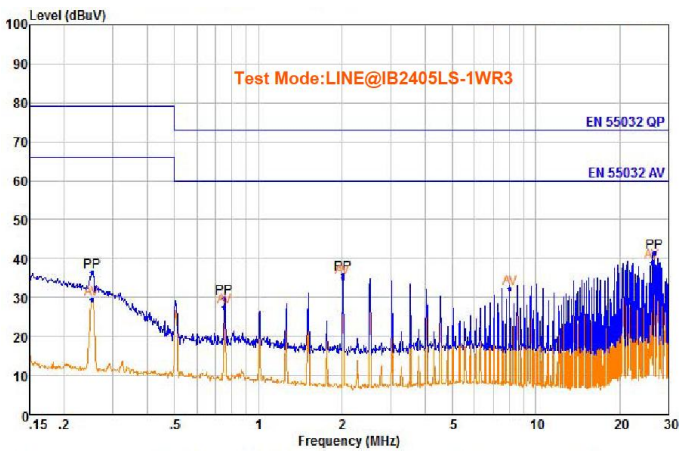
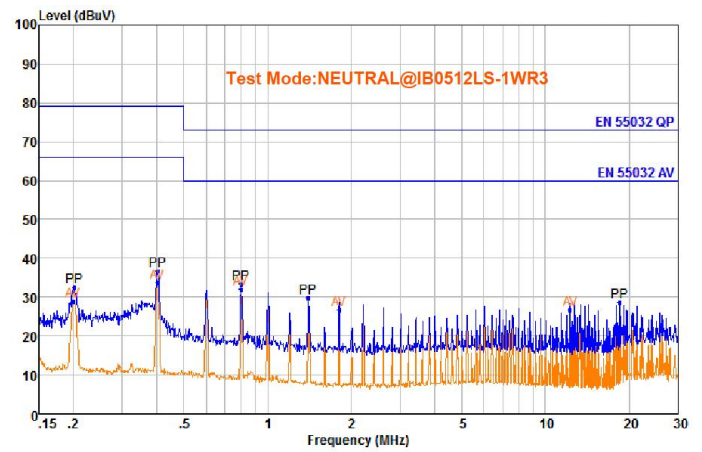
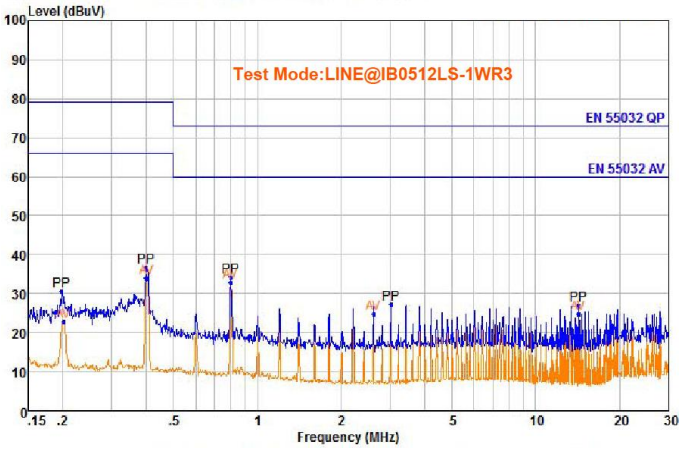
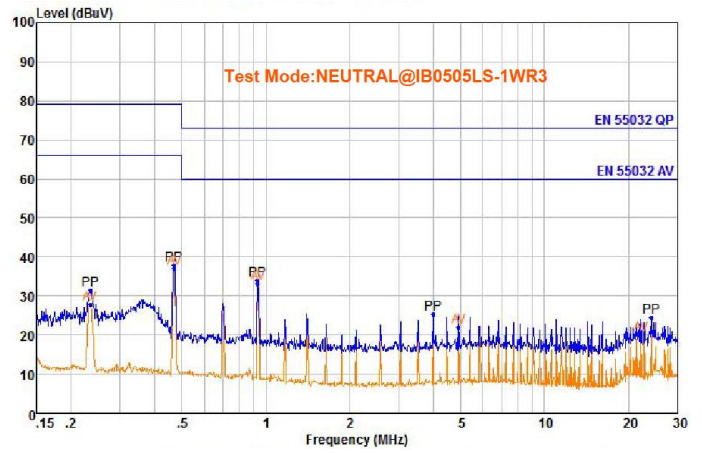
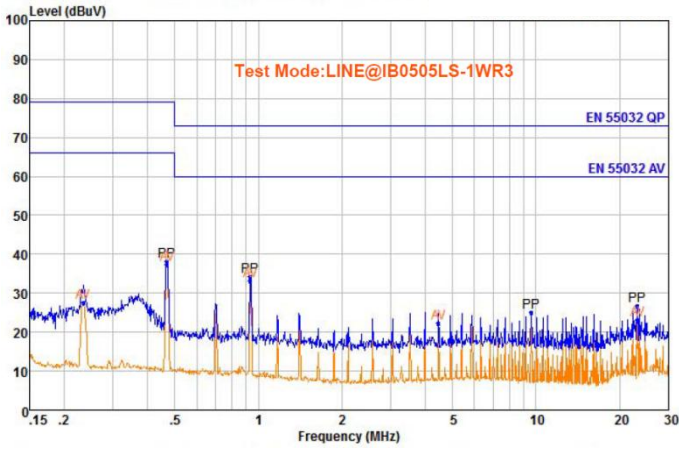


Product characteristic curve (四) : Temperature derate curve

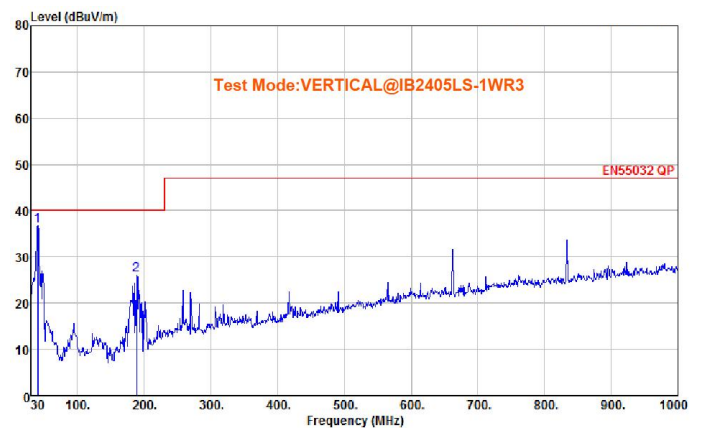
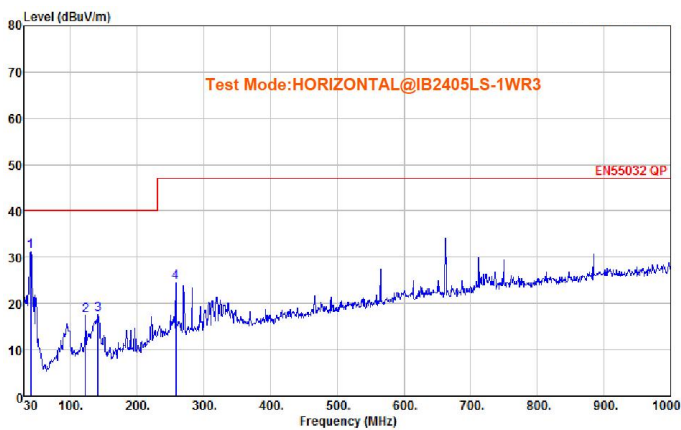
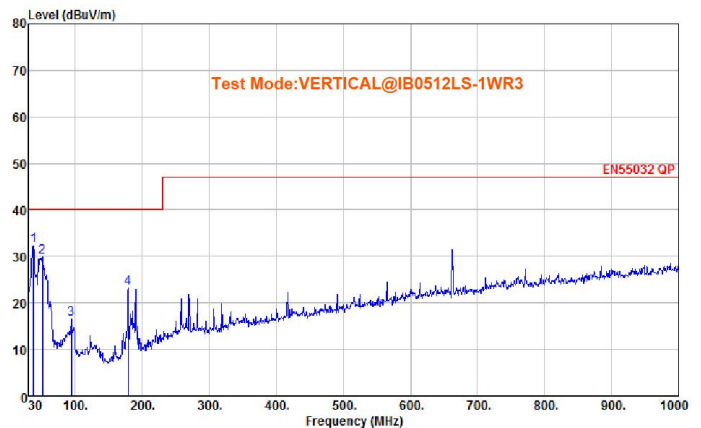
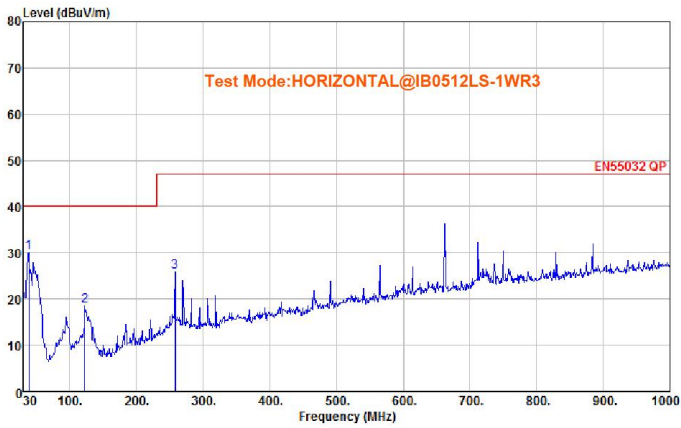
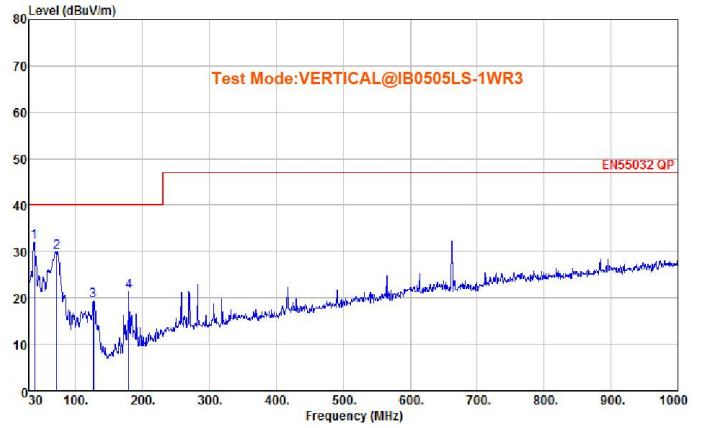
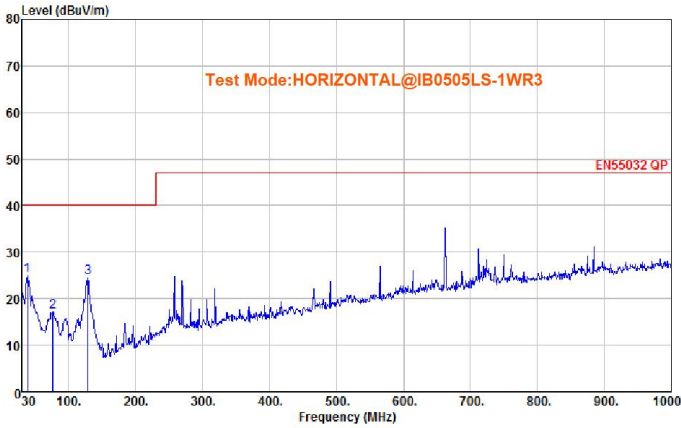
Temperature derating curve



Product characteristic curve (五) : EMC (Conducted Emission)



Product characteristic curve (六) : EMC (radiated emission)



Precautions for product use

1、 Consideration of input voltage stability:

The input voltage of the product shall be stable when it is used. If the input voltage is lower than the minimum value of the input range, the output voltage will be unstable or even the product will be damaged; If the input voltage is higher than the maximum value of the input range, the product will be damaged. Therefore, the input voltage must be within the required range of the product in actual use.

2、 Consideration of output load constancy:

During the use of the product, within the rated output power range, the change of output load will not cause a large change in the output voltage, and the output voltage is basically unchanged.

3、 Output ripple and noise suppression/selection of output filter capacitor:

When the product is in use, the output terminal can be used normally without additional capacitance. To further reduce the output ripple and noise of the product, a filter capacitor can be added to the output of the product. However, it must be noted that the output terminal cannot increase the capacity of the electrolytic capacitor, and excessive capacity of the electrolytic capacitor may cause the output voltage of the module cannot be established, or even lead to product damage; The output terminals of different models have the requirements of "maximum capacitive load". In order to ensure the safe and reliable operation of the product, the capacity of the output capacitor should be reduced as much as possible on the premise that the output ripple and noise meet the requirements. Refer to the design reference section for typical application circuits.

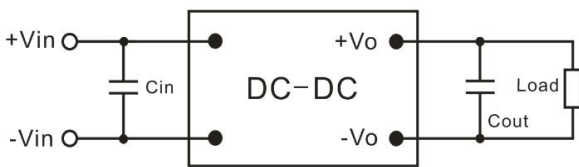
4、 Prevent hot plug test or use of products:

Hot plug usually refers to inserting or removing the product from the circuit without disconnecting the power supply. The product does not support hot plug operation during use or testing. Because in the hot plug process, due to the sudden change of current, there will be a high-voltage spike, which may lead to product damage. In another case, a mechanical switch is inserted between the power supply and the product input terminal to control the power supply. High voltage spikes may also occur during the on-off operation of mechanical switches, which may also lead to product damage. During the test or use of the product, any operation that will produce high voltage spikes cannot be ignored. Measures should be taken to prevent high voltage spikes from being directly added to the input end of the product. Please refer to the design reference section.

Design reference

1、 Typical application circuit:

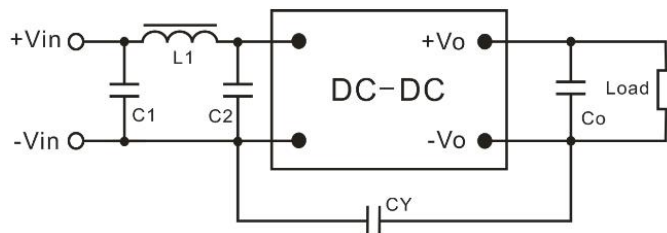
In the practical application circuit, due to the existence of various interference noises, in order to make the product work stably and reliably, it is usually necessary to add a suitable absorption capacitor to the input end of the product; To further reduce the output ripple, a filter capacitor can be added at the output terminal, but the capacitance value cannot be too large. Please refer to the chapter "Precautions for product use". We recommend to use MLCC capacitor. To ensure the safe and reliable operation of the product, its capacitance value can refer to the following table.



Vin	Cin (MLCC)	Vo	Cout (MLCC)
5.0V	10uF/16V	5.0V	10uF/10V
12V	4.7uF/50V	12V	4.7uF/25V
24V	4.7uF/50V	24V	2.2uF/50V

Note: In the application circuit, the input and output filter capacitors shall be as close to the product pins as possible; The 33uF/35V high-frequency low resistance electrolytic capacitor can be added at the input end to absorb the surge voltage spike from the power supply end.

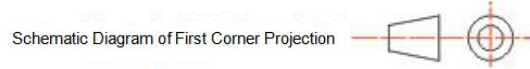
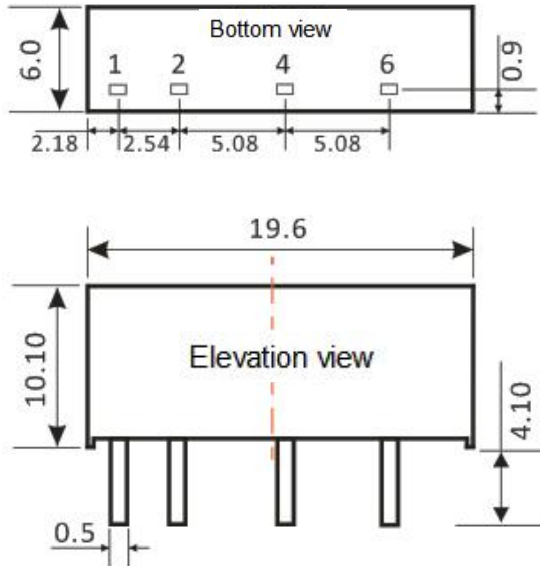
2、 EMC Recommended circuit (CLASS B) :



Vin	C1(MLCC)	L1	C2(MLCC)	Co(MLCC)	CY
5.0V	10uF/16V	33uH	10uF/16V	10uF/16V	470pF/2KV
12V	4.7uF/50V	33uH	4.7uF/50V	4.7uF/50V	
24V	4.7uF/50V	33uH	4.7uF/50V	4.7uF/50V	1nF/2KV

External dimensions and pin functions

IB_LS-1WR3 Series



Pin function

PIN	Function
1	+Vin
2	GND
4	-Vo
6	+Vo

Notes : Dimension unit : mm
 Terminal diameter : 0.5mm*0.3mm
 Terminal diameter tolerance : ± 0.1 mm
 Other dimensional tolerances : ± 0.5 mm

Notes:

1. Please refer to our specific packaging information: «Instructions for shipment packaging of Dexu products» ;
2. If the working load of the product is lower than the minimum load requirements, our company cannot guarantee that the product performance can meet all performance indicators;
3. The maximum capacitive load is tested under the input voltage range and full load condition;
4. Unless otherwise specified, all indicators in this manual are measured when TA= 25 °C, humidity < 75% RH, nominal input voltage and output rated load;
5. All index test methods in this manual are based on the company's enterprise standards;
6. Our company can provide customized products. For specific conditions, please contact our technicians directly;
7. Laws and regulations related to products: see "product features" and "EMC features";
8. After scrapping our products, they shall be stored according to ISO14001 and relevant environmental laws and regulations, and handed over to qualified units for disposal.

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