

BSTHF28 Series

Product Features

- High reliability
- Wide input voltage range: 15V ~ 50V, nominal input DC voltage 28V
- High Input Transient Voltage: 80V, 1s
- Output power PO: 20W
- Operating temperature range Tc: -55°C~+125°C
- Low starting current
- Small output overshoot
- Has a prohibited function
- Input under-voltage lockout and output short-circuit protection
- Maximum power density: 38W/in³
- Metal hermetically sealed package

Product Category

Single channel	Dual channel	Multiplex
3.3V,5V,5.2V,5.7V	±5V	5V/±12V
8V,12V,15V,18V,28V	±12V,±15V	5V/±15V

Application

Aviation, aerospace and other high-reliability electronic systems, as well as some occasions that require high power surge resistance.

Product Overview

This series of products is a DC/DC converter with high reliability and anti-surge capability (80V, 1s). The product adopts the single-ended flyback circuit topology and the principle of pulse width modulation. After the sampling signal of the output voltage is isolated by the optocoupler, it modulates the pulse width of the controller simultaneously with the current sampling signal of the input loop, forming a double-loop closed-loop control, which makes the product Has a stable voltage output. This series of products are produced by thick film hybrid integration process and packaged in metal hermetically sealed shell. Product design and manufacturing meet the requirements of GJB2438A-2002 "General Specification for Hybrid Integrated Circuits" and product detailed specifications. The input end is connected to the matching power filter, which can improve the electromagnetic compatibility performance of the product.

Technical performance

Table 1. BSTHF28 Series Rated Conditions

Absolute Maximum Ratings	
Input voltage (continuous): 50V	Mechanical shock: 1500g
Input voltage (transient, 1s): 80V	Lead resistance soldering temperature: 300°C (15s)
Output power: 20W	Weight (without flange/with flange): 31g/34g
Storage temperature: -65°C~150°C	Antistatic strength: 2000V

Table 2. Electrical Characteristics of BSTHF28 Series Products

N O.	Characteristi c	Condition (Unless otherwise specified, -55°C≤T _c ≤125°C, V _{IN} =28V±0.5V)	BSTHF28S3R3 BSTHF28S3R3F		BSTHF28S05 BSTHF28S05F		BSTHF28S05R 2 BSTHF28S05R 2F		BSTHF28S05R 7 BSTHF28S05R 7F		BSTHF28S08 BSTHF28S08F		BSTHF28S12 BSTHF28S12F	
			Minimum value	Maximum value	Minimum value	Maximum value	Minimum value	Maximum value	Minimum value	Maximum value	Minimum value	Minimum value	Minimum value	Maximum value

1	Input voltage/V	Normal temperature, high and low temperature	15	50	15	50	15	50	15	50	15	50	15	50
2	Output voltage/V	Normal temperature, full load	3.27	3.34	4.95	5.05	5.148	5.252	5.643	5.757	7.92	8.08	11.88	12.12
		High and low temperature, full load	3.25	3.35	4.925	5.075	5.122	5.278	5.615	5.786	7.88	8.12	11.82	12.18
3	Output current/A	$V_{IN}=15V\sim 50V$	—	3	—	3	—	3	-	2.63	-	2.50	-	1.67
4	Output Power/W		0	10	0	15	0	15.6	0	15	0	20	0	20
5	Output ripple voltage/mV	BW=6MHz, full load	—	40	—	40	—	40	—	40	—	40	—	40
6	Voltage regulation/mV	$V_{IN}=15V\sim 50V$, full load	—	20	—	20	—	20	—	20	—	20	—	20
7	Load adjustment degree/mV	No load $\rightarrow$ full load	—	50	—	50	—	50	—	50	—	50	—	50
8	Input current/mA	Prohibited	—	6	—	6	—	6	—	6	—	6	—	6
		No load	—	65	—	65	—	65	—	65	—	65	—	65
9	Input ripple	BW $\leq$ 20MHz, full load	—	80	—	80	—	80	—	80	—	80	—	80

	current/mA													
10	Efficiency/%	Full load	65	-	72	-	72	-	72	—	76	—	77	—
11	Insulation resistance/MΩ	Add 500V between input and output or between package, T _c =25°C	100	—	100	-	100	-	100	—	100	—	100	—
12	Prohibit voltage		0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5
13	Inhibit terminal open circuit voltage /V	full load	10	14	10	14	10	14	10	14	10	14	10	14
14	Undervoltage turn-on voltage /V	full load	12.0	14.8	12.0	14.8	12.0	14.8	12.0	14.8	12.0	14.8	12	14.8
15	Undervoltage shutdown voltage /V	full load	11.0	14.5	11.0	14.5	11.0	14.5	11.0	14.5	11.0	14.5	11	14.5
16	Short circuit protection function		Reduced flow type		Reduced flow type		Reduced flow type		Reduced flow type		Reduced flow type		Reduced flow type	
17	Capacitive	T _c =25°C	—	1000	—	1000	—	1000	-	1000	-	500	—	500

	load / μ F													
18	Switching frequency /kHz	full load	350	500	350	500	350	500	350	500	350	500	350	500
19	Output voltage change (peak) during load transient /mV	50% load $\rightarrow$ full load Or full load $\rightarrow$ 50% load	-400	400	-600	600	-600	600	-500	500	-500	500	-500	500
20	Recovery time of output voltage during load transient / μ s	50% load $\rightarrow$ full load Or full load $\rightarrow$ 50% load	—	500	—	600	-	600	-	500	-	500	-	500
21	Output voltage change (peak) during input voltage transient /mV	Input voltage V_{IN} : 16V $\rightarrow$ 40V, full load and Input voltage V_{IN} : 40V $\rightarrow$ 16V, full load	-700	700	-800	800	-800	800	-800	800	-900	900	-900	900
22	Recovery	Input voltage V_{IN} :	—	600	—	700	-	700	-	700	-	600	-	500

	time of output voltage in case of input voltage transient / μ s	16V $\rightarrow$ 40V, full load and Input voltage V_{IN} : 40V $\rightarrow$ 16V, full load												
23	Start overshoot (peak) /mV	Input voltage V_{IN} : 0 $\rightarrow$ 28V, full load	—	15	—	25	—	25	-	25	-	50	-	50
24	Startup delay /ms	Input voltage V_{IN} : 0 $\rightarrow$ 28V,full load	—	20	—	20	—	20	-	20	-	20	-	20

Table 3. Electrical Characteristics of BSTHF28S series products

No.	Characteristic	Condition (Unless otherwise specified, -55°C $\leq$ T _c $\leq$ 125°C, V_{IN} =28V $\pm$ 5%)	BSTHF28S15 BSTHF28S15F		BSTHF28S18 BSTHF28S18F		BSTHF28S28 BSTHF28S28F	
			Minimum value	Maximum value	Minimum value	Maximum value	Minimum value	Maximum value
1	Input voltage/V	Normal temperature, high and low temperature	15	50	15	50	15	50
2	Output voltage/V	Normal temperature, full load	14.85	15.15	17.82	18.18	27.72	28.28
		High and low temperature, full load	14.77	15.23	17.73	18.27	27.16	28.84

3	Output current/A	$V_{IN}=15V\sim 50V$	—	1.33	—	1.11	-	714
4	Output Power/W		0	20	0	20	0	20
5	Output ripple voltage/mV	$BW\leq 20MHz$, full load	—	50	—	50	-	150
6	Voltage regulation/mV	$V_{IN}=15V\sim 50V$, full load	—	20	—	20	-	100
7	Load adjustment degree/mV	No load $\rightarrow$ full load	—	50	—	50	-	100
8	Input current/mA	Prohibited	—	6	—	6	-	6
		No load	—	65	—	65	-	65
9	Input ripple current/mA	$BW\leq 20MHz$, full load	—	80	—	80	-	100
10	Efficiency/%	full load	78	—	78	—	77	-
11	Insulation resistance/M Ω	Add 500V between input and output or between package, $T_c=25^{\circ}C$	100	—	100	—	100	-
12	Prohibit voltage		0	0.7	0	0.7	0	0.7
13	Inhibit terminal open circuit voltage /V	full load	10	14	10	14	10	14

14	Undervoltage turn-on voltage /V	full load	12.0	14.8	12.0	14.8	12.0	14.8
15	Undervoltage shutdown voltage /V	full load	11.0	14.5	11.0	14.5	11.0	14.5
16	Short circuit protection function		Reduced flow type		Reduced flow type		Reduced flow type	
17	Capacitive load /μF	T _c =25°C	—	500	—	500	-	250
18	Switching frequency /kHz	full load	350	500	350	500	350	500
19	Output voltage change (peak) during load transient /mV	50% load → full load Or full load → 50% load	-500	500	-700	700	-1000	1000
20	Recovery time of output voltage during load transient /μs	50% load → full load Or full load → 50% load	—	500	-	500	-	500
21	Output voltage change (peak)	Input voltage V _{IN} : 16V→40V, full load and Input voltage	-900	900	-1400	1400	-1300	1300

	during input voltage transient /mV	$V_{IN} : 40V \rightarrow 16V$, full load						
22	Recovery time of output voltage in case of input voltage transient / μs	Input voltage $V_{IN} : 16V \rightarrow 40V$, full load and Input voltage $V_{IN} : 40V \rightarrow 16V$, full load	—	500	-	800	-	700
23	Start overshoot (peak) /mV	Input voltage $V_{IN} : 0 \rightarrow 28V$, full load	—	50	-	50	-	100
24	Startup delay /ms	Input voltage $V_{IN} : 0 \rightarrow 28V$, full load	—	20	-	20	-	20

Table 4. Electrical Characteristics of BSTHF28 series products

No.	Characteristic	Condition (Unless otherwise specified, -55℃≤T _c ≤125℃, V _{IN} =28V±5%)		BSTHF28D05		BSTHF28D12		BSTHF28D15	
				BSTHF28D05F		BSTHF28D12F		BSTHF28D15F	
				Minimum value	Maximum value	Minimum value	Maximum value	Minimum value	Maximum value
1	Input voltage/V	Normal temperature, high and low temperature		15	50	15	50	15	50
2	Output voltage/V	Positive	Normal temperature, full load	4.95	5.05	11.88	12.12	14.85	15.15
		Negative		-5.20	-4.80	-12.20	-11.80	-15.20	-14.80
		Positive	High and low temperature, full load	4.925	5.075	11.82	12.18	14.775	15.225
		Negative		-5.25	-4.75	-12.48	-11.52	-15.60	-14.40
3	Output current/A	V _{IN} =15V~50V		—	1.5	—	0.833	—	0.666
4	Output Power/W			0	15	0	20	0	20
5	Output ripple voltage/mV	BW≤20MHz, full load		—	60	—	50	—	60
6	Voltage regulation/mV	Positive	V _{IN} =16V~40V, full load	—	50	—	50	—	50
		Negative		—	50	—	50	—	50
7	Load adjustment degree/mV	Positive	No load → full load	—	50	—	50	—	50
		Negative		—	50	—	50	—	50

8	Input current/mA	Prohibited	—	6	—	6	—	6
		No load	—	65	—	65	—	65
9	Input ripple current/mA	BW≤20MHz, full load	—	60	—	60	—	60
10	Efficiency/%	full load	73	—	78	—	79	—
11	Insulation resistance/MΩ	Add 500V between input and output or between package, T _c =25°C	100	—	100	—	100	—
12	Prohibit voltage	No load, connection of inhibit terminal to input ground terminal	-	6	-	6	-	6
13	Inhibit terminal open circuit voltage /V	full load	10	14	10	14	10	14
14	Undervoltage turn-on voltage /V	full load	12.0	14.8	12.0	14.8	12	14.8
15	Undervoltage shutdown voltage /V	full load	11.0	14.5	11.0	14.5	11	14.5
16	Short circuit protection function		Reduced flow type		Reduced flow type		Reduced flow type	
17	Capacitive load /μF	T _c =25°C	—	500	—	500	—	500
18	Switching frequency /kHz	full load	350	500	350	500	350	500
19	Cross adjustment	30% load on one way, 30% to 70% on another	—	500	—	500	—	500

	degree/mV	way						
20	Change in output voltage during load transient(Peak)/mV	50% load → full load Or full load → 50% load	-400	400	-400	400	-400	400
21	Recovery time of output voltage during load transient /μs	50% load → full load Or full load → 50% load	—	500	—	500	—	500
22	Output voltage change (peak) during input voltage transient /mV	Input voltage V_{IN} : 16V→40V, full load and Input voltage V_{IN} : 40V→16V, full load	-800	800	-900	900	-900	900
23	Recovery time of output voltage in case of input voltage transient /μs	Input voltage V_{IN} : 16V→40V, full load and Input voltage V_{IN} : 40V→16V, full load	—	700	—	500	—	500
24	Start overshoot (peak) /mV	Input voltage V_{IN} : 0→28V, full load	—	25	—	50	—	50
25	Startup delay /ms	Input voltage V_{IN} : 0→28V,full load	—	20	—	20	—	20

Table 5. Electrical Characteristics of BSTHF28 series products

NO.	Characteristic	Condition(Unless otherwise specified, -55℃≤T _c ≤125℃, V _{IN} =28V±5%)		BSTHF28T0512 BSTHF28T0512F		BSTHF28T0515 BSTHF28T0515F	
				Minimum alue	Maximum value	Minimum value	Maximum value
1	Input voltage/V	Normal temperature, high and low temperature		15	50	15	50
2	Output voltage/V	V _{O1}	Normal temperature, full load	4.95	5.05	4.95	5.05
				4.85	5.15	4.85	5.15
		V _{O2}	High and low temperature, full load	11.88	12.12	14.85	15.15
				11.64	12.36	14.55	15.45
		V _{O3}	Normal temperature, full load	-12.24	-11.76	-15.30	-14.70
				-12.48	-11.52	-15.60	-14.40
3	Output current/A	I _{O1}	High and low temperature, full load	-	1.5	-	1.5
		I _{O2}		-	0.313	-	0.25
		I _{O3}		-	0.313	-	0.25
4	Output Power/W			0	15	0	15
5	Output ripple voltage/mV	V _{RIP1}	BW=6MHz, full load	-	50	-	60
		V _{RIP2}		-	100	-	80
		V _{RIP3}		-	100	-	80
6	Voltage regulation/mV	S _{V1}	V _{IN} =15V~50V, full load	-	50	-	50
		S _{V2}		-	100	-	50

		S_{V3}		-	100	-	50
7	Load adjustment degree/mV	S_{I1}	$I_{O1}=0 \rightarrow$ full load, $I_{O2}=I_{O3}$ full load	-	50	-	50
		S_{I2}	$I_{O2}=I_{O3}=0 \rightarrow$ full load(Both outputs change simultaneously), I_{O1} full load	-	100	-	50
		S_{I3}		-	100	-	200
8	Input current/mA	Prohibited		-	8	-	8
		No load		-	60	-	60
9	Input ripple current/mA	BW≤20MHz, full load		—	80	—	80
10	Efficiency/%	full load		72	—	72	—
11	Insulation resistance/MΩ	Add 500V between input and output or between package, T _c =25℃		100	—	100	—
12	Inhibit terminal open circuit voltage /V	full load		10	14	10	14
13	Undervoltage turn-on voltage /V	full load		—	—	12.0	14.8
14	Undervoltage shutdown voltage /V	full load		—	—	11.0	14.5
15	Short circuit protection function	T _A =25℃, Three output terminals are shorted at the same time		Reduced flow type		Reduced flow type	
16	Capacitive load /μF	C _{L1}	T _c =25℃	—	500	—	500
		C _{L2}		—	500	—	500
		C _{L3}		—	500	—	500
17	Switching frequency /kHz	full load		250	350	250	350

18	Frequency range of external synchronization /kHz	$T_A=25^{\circ}\text{C}$, I_{O1} full load, $I_{O2}=I_{O3}$ full load, 9 pin connection TTL level ($V_{IH}\geq 4.5\text{V}$, $0\leq V_{IL}\leq 0.8\text{V}$, $V_{IH}-V_{IL}=5\text{V}$, Duty cycle 50%)		—	—	650	750
19	Cross adjustment degree /mV	$T_A=25^{\circ}\text{C}$ I_{O1} full load, $I_{O2}=70\%$ load, $I_{O3}=30\%$ load; I_{O1} full load, $I_{O2}=30\%$ load, $I_{O3}=70\%$ load		—	550	—	550
20	Change in output voltage during load transient(Peak)/mV	V_{LT1}	$I_{O2}=I_{O3}$ full load, I_{O1} : 50% load→full load or full load→50% load	-500	500	-500	500
	Recovery time of output voltage during load transient / μs	V_{LT2}	I_{O1} full load, $I_{O2}=I_{O3}$: 50% load→full load or full load→50% load	-700	700	-600	600
		V_{LT3}		-700	700	-600	600
21	Recovery time of output voltage during load transient/ μs	t_{LT1}	$I_{O2}=I_{O3}$ full load, I_{O1} : 50% load→full load or full load→50% load	-	700	-	700
		t_{LT2}	I_{O1} full load, $I_{O2}=I_{O3}$: 50% load→full load or full load→50% load	-	700	-	500
		t_{LT3}		-	700	-	500
22	Output voltage changes during input voltage transient C (peak)/mV	V_{VT1}	$V_i:16\text{V}\rightarrow 40\text{V}$, full load	-500	500	-800	800
			$V_i:40\text{V}\rightarrow 16\text{V}$, full load				
		V_{VT2}	$V_i:16\text{V}\rightarrow 40\text{V}$, full load	-700	700	-900	900
			$V_i:40\text{V}\rightarrow 16\text{V}$, full load				
		V_{VT3}	$V_i:16\text{V}\rightarrow 40\text{V}$, full load	-700	700	-900	900
			$V_i:40\text{V}\rightarrow 16\text{V}$, full load				
23	Recovery time of output	t_{VT1}	$V_i:16\text{V}\rightarrow 40\text{V}$, full load	-	700	-	800

	voltage in case of input voltage transient/ μ s		$V_i:40V \rightarrow 16V$, full load				
		t_{VT2}	$V_i:16V \rightarrow 40V$, full load	-	900	-	600
			$V_i:40V \rightarrow 16V$, full load				
		t_{VT3}	$V_i:16V \rightarrow 40V$, full load	-	900	-	600
			$V_i:40V \rightarrow 16V$, full load				
24	Start overshoot (peak) /mV	V_{TO1}	$V_i:0 \rightarrow 28V$, full load	-	50	-	100
		V_{TO2}		-	50	-	100
		V_{TO3}		-	50	-	100
25	Startup delay /ms	t_{d1}	$V_i:0 \rightarrow 28V$, full load	—	20	—	30
		t_{d2}					
		t_{d3}					

Circuit block diagram

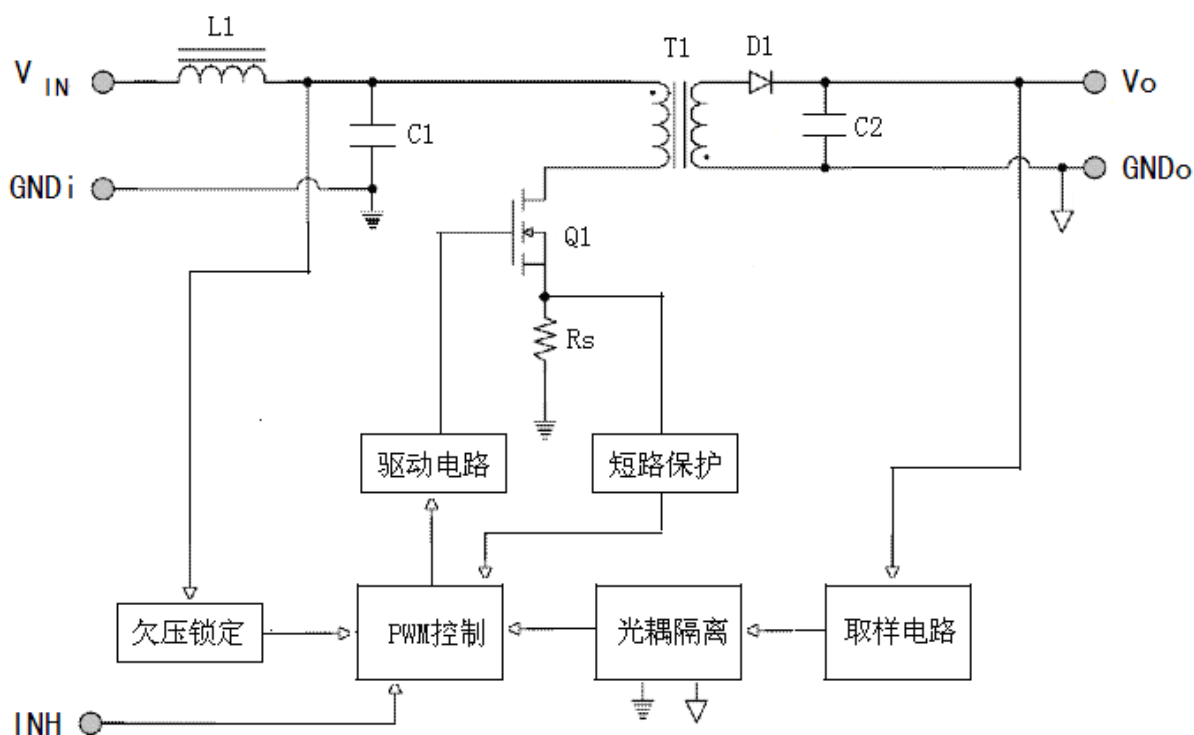


Figure 1. BSTHF28 Series Circuit Block Diagram

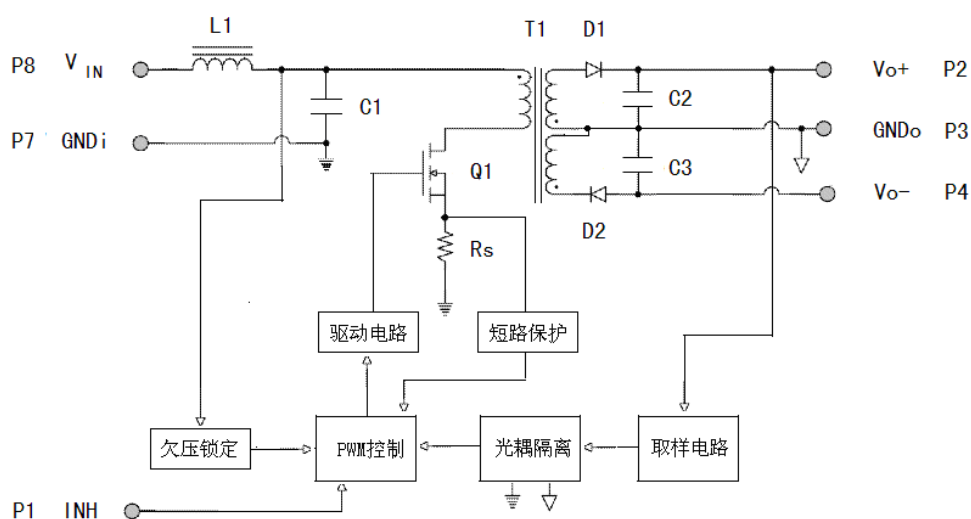


Figure 2. BSTHF28 Series Circuit Block Diagram

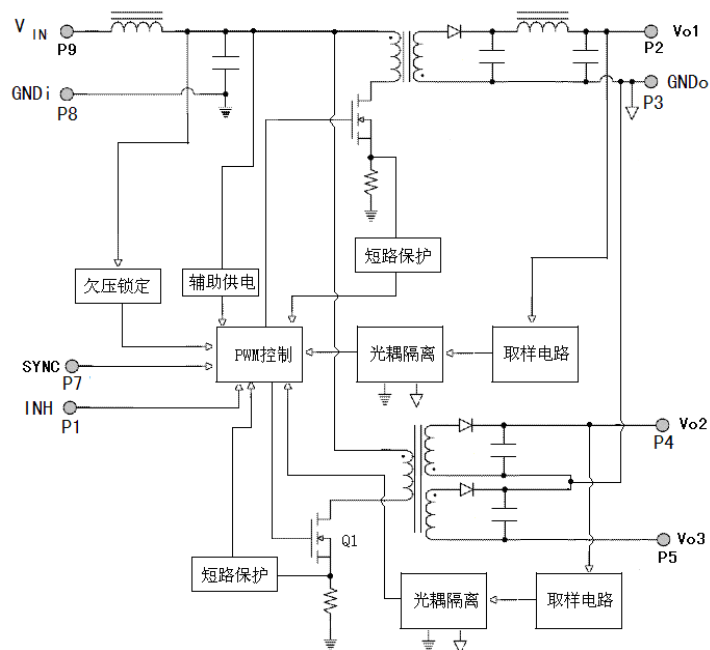


Figure 3. BSTHF28 Series Circuit Block Diagram

Typical characteristic curve

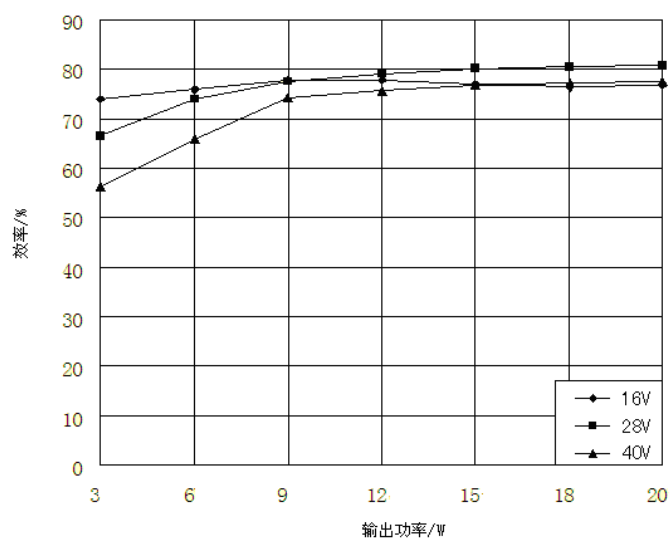


Figure 4. Efficiency curve of BSTHF28

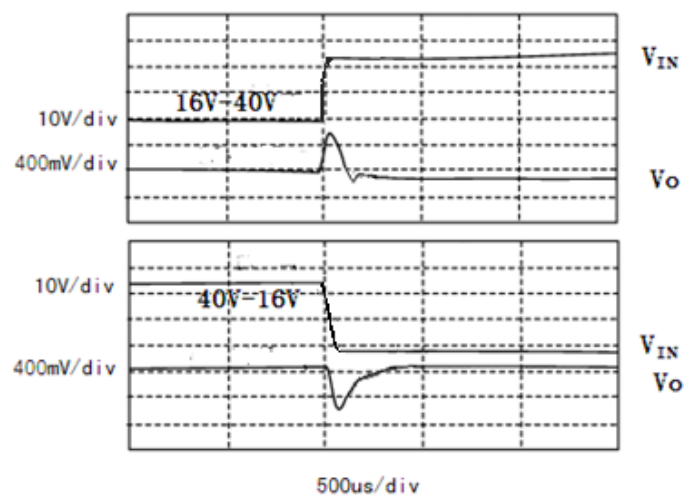


Figure 5. Input step curve of BSTHF28

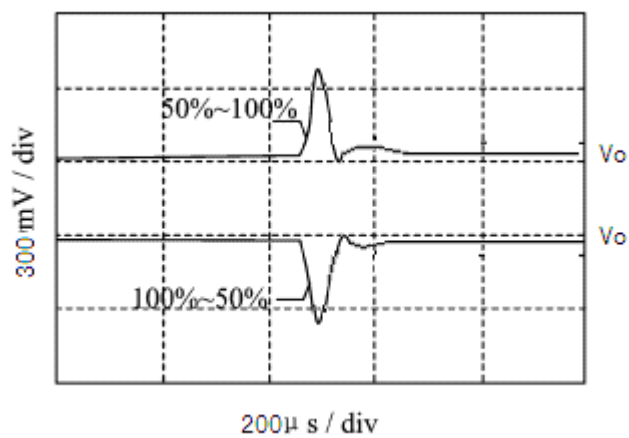


Figure 6. BSTHF28 Load Step Curve

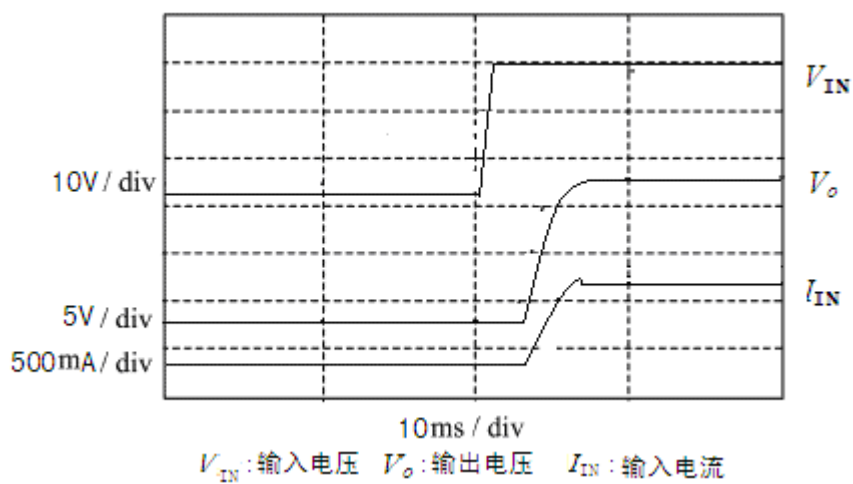


Figure 7. BSTHF28 Start Delay Overshoot/Start Peak Current Curve

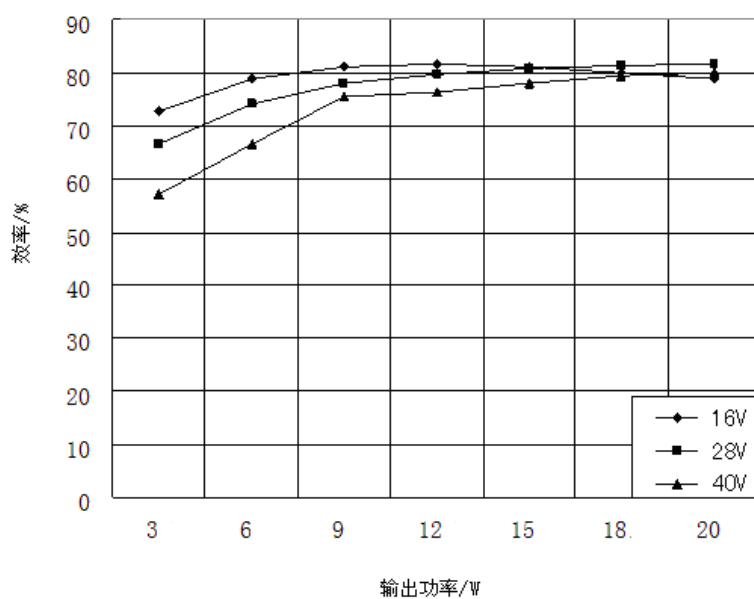


Figure 8 Efficiency curve of BSTHF28

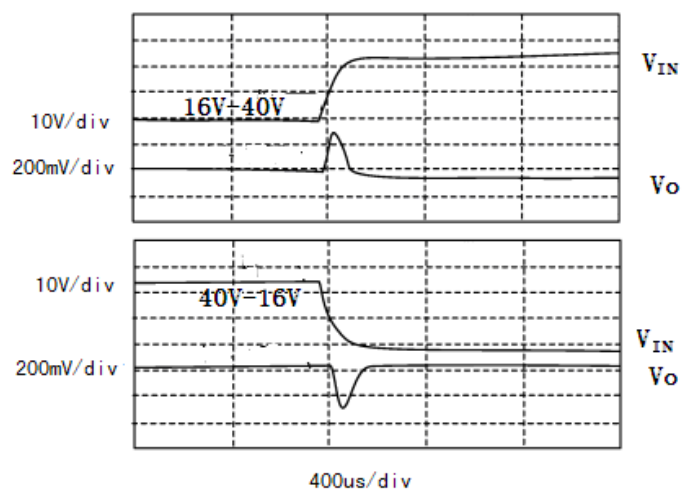


Figure 9. BSTHF28 Input Step Response

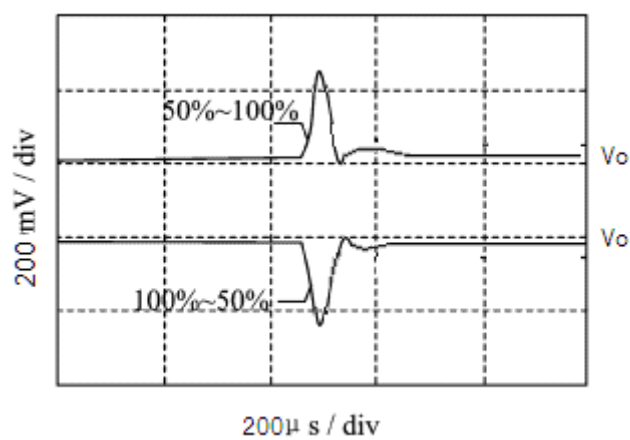


Figure 10. BSTHF28 Load Step Response

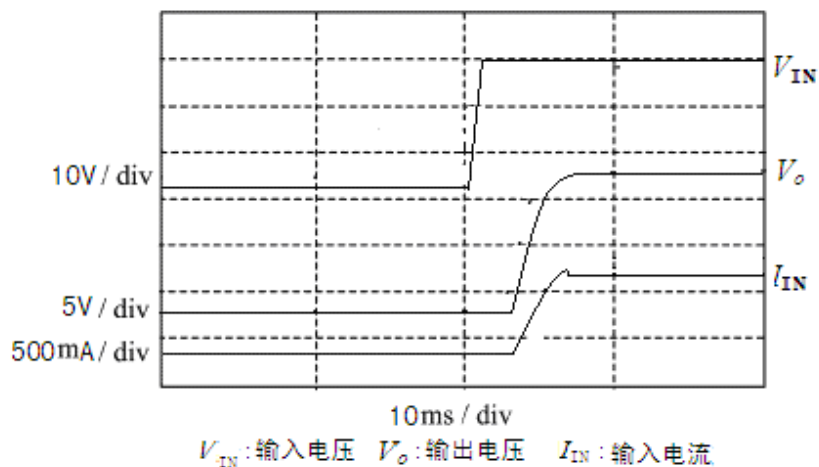


Figure 11. BSTHF28 Startup Overshoot/Delay and Startup Current

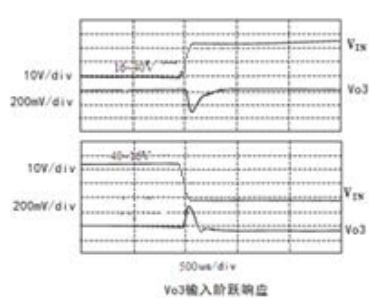
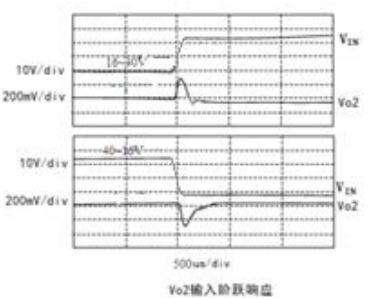
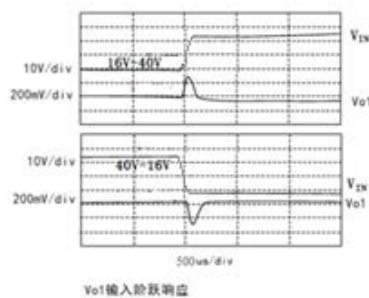
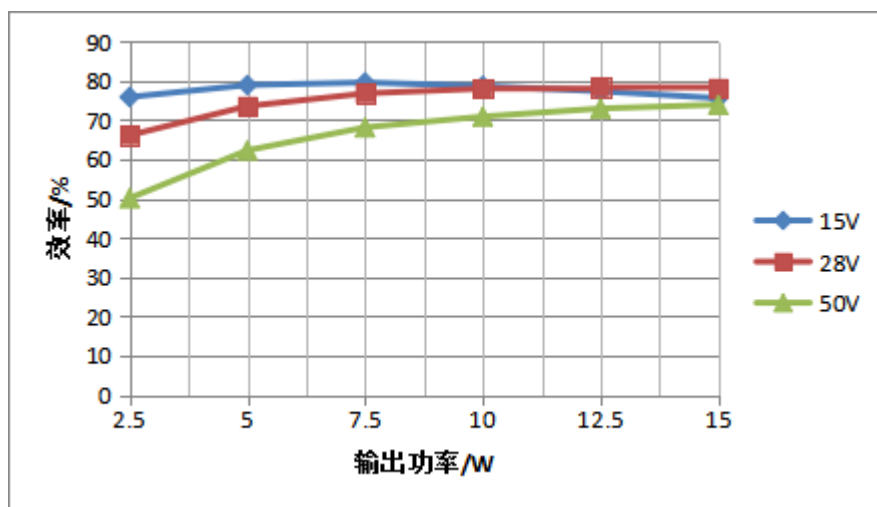


Figure 12. Efficiency curve of BSTHF28

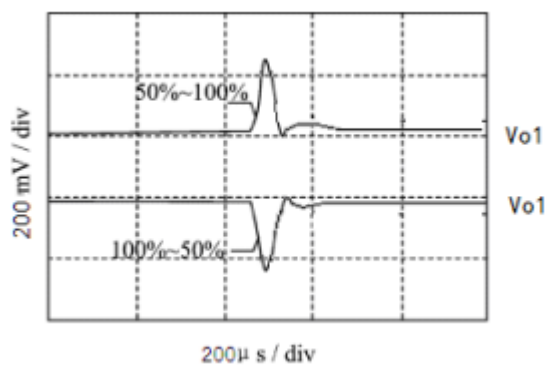


Figure 13.. BSTHF28 Input Step Response

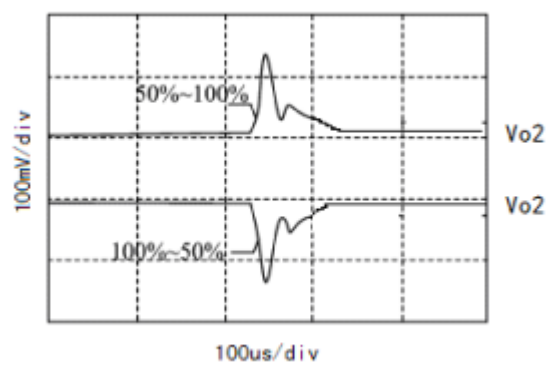


Figure 14. BSTHF28 Load Step Response

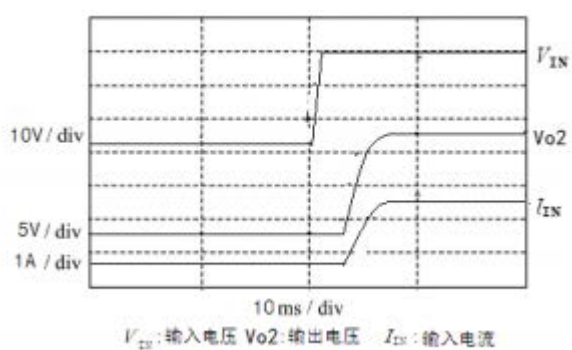
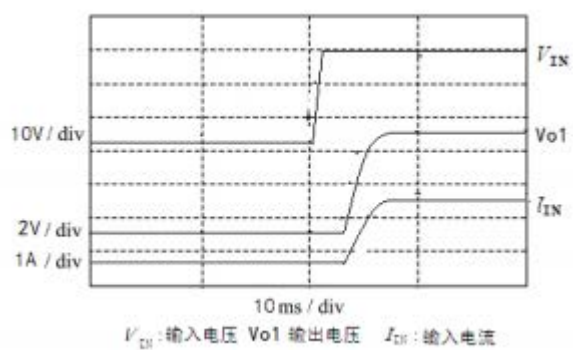
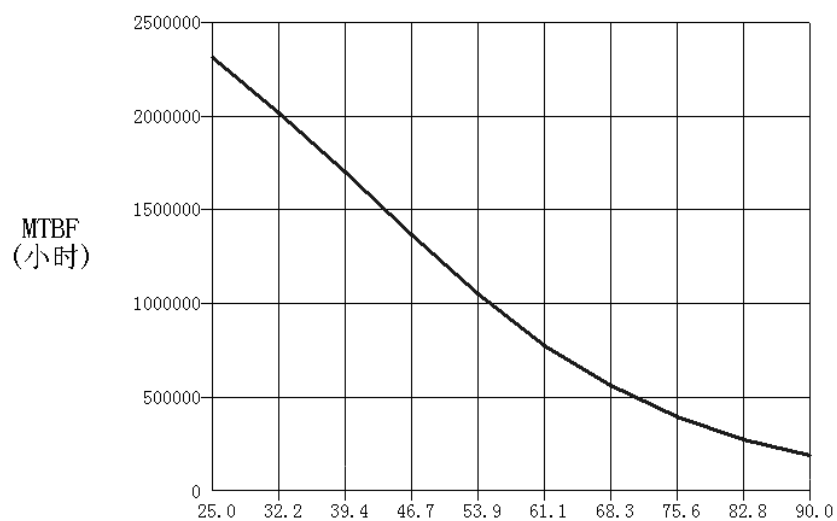
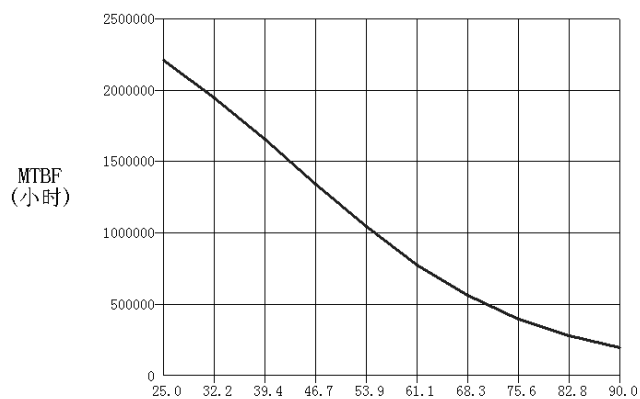


Figure 15. BSTHF28 Startup Overshoot/Delay and Startup Current

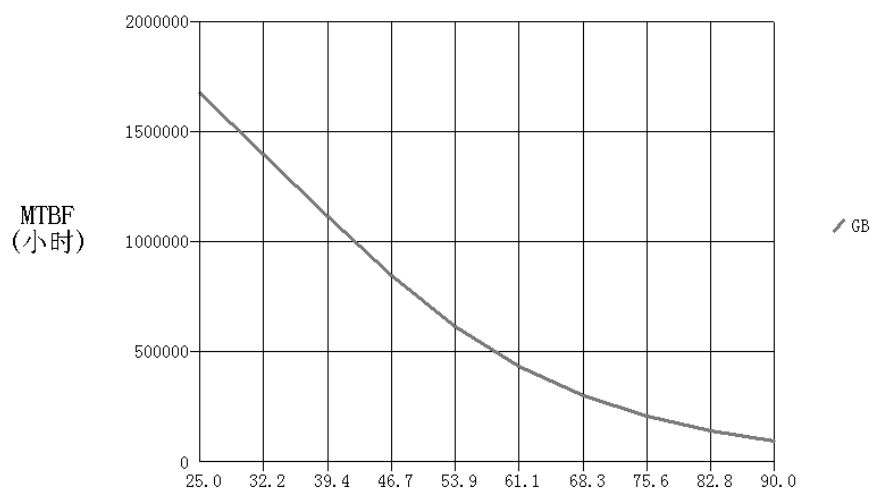
MTBF curve



MTBF Temperature Curve (BSTHF28)

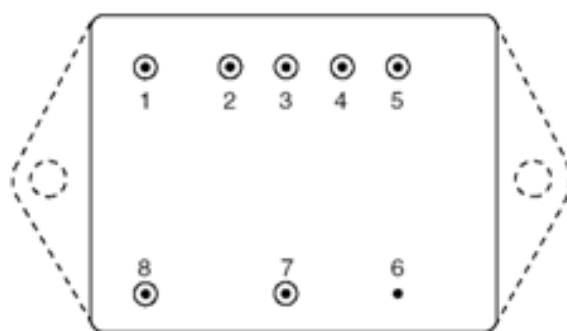


MTBF Temperature Curve (BSTHF28)



MTBF Temperature Curve (BSTHF28)

Functional description of the lead-out terminal



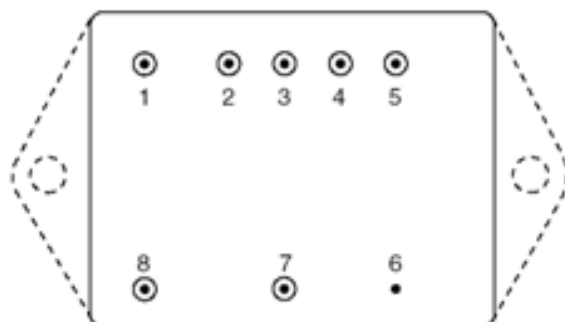
BSTHF28S Series Enclosure Bottom View

BSTHF28S series pin function description (excluding BSTHF28S28)

No.	Symbol	Function
1	INH	Forbidden end
2	NC	Empty end
3	GND _O	Output ground
4	V _O	Output terminal
5	NC	Empty end
6	GND _C	Package ground
7	GND _I	Input ground
8	V _{IN}	Enter the positive terminal

BSTHF28S28 pin function description

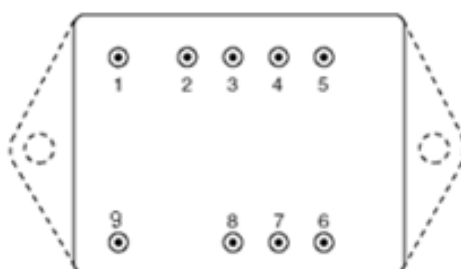
No.	Symbol	Function
1	INH	Forbidden end
2	V _O	Output terminal
3	NC	Empty end
4	GND _O	Output ground
5	NC	Empty end
6	GND _C	Package ground
7	GND _I	Input ground
8	V _{IN}	Enter the positive terminal



BSTHF28S Series Enclosure Bottom View

BSTHF28D Series Pin Function Description

No.	Symbol	Function
1	INH	Forbidden end
2	V_{O+}	Output positive terminal
3	GND_O	Output ground
4	V_{O-}	Output negative terminal
5	NC	Empty end
6	GND_C	Package ground
7	GND_I	Input ground
8	V_{IN}	Enter the positive terminal



BSTHF28T Series Enclosure Bottom View

BSTHF28T0512 pin function description

No.	Symbol	Function
1	INH	Forbidden end
2	V _{O1}	+5V output
3	GND _O	Output ground
4	V _{O2}	+12V output
5	V _{O3}	-12V output
6	GND _C	Package ground
7	SYNC	Synchronization terminal
8	GND _{IN}	Enter the negative terminal
9	V _{IN}	Enter the positive terminal

BSTHF28T0515 pin function description

No.	Symbol	Function
1	INH	Forbidden end
2	V _{O1}	+ 5V output
3	GND _O	Output ground
4	V _{O2}	+15 Output
5	V _{O3}	-15 Output
6	GND _C	Package ground
7	SYNC	Synchronization terminal
8	GND _{IN}	Enter the negative terminal
9	V _{IN}	Enter the positive terminal

Typical application connection

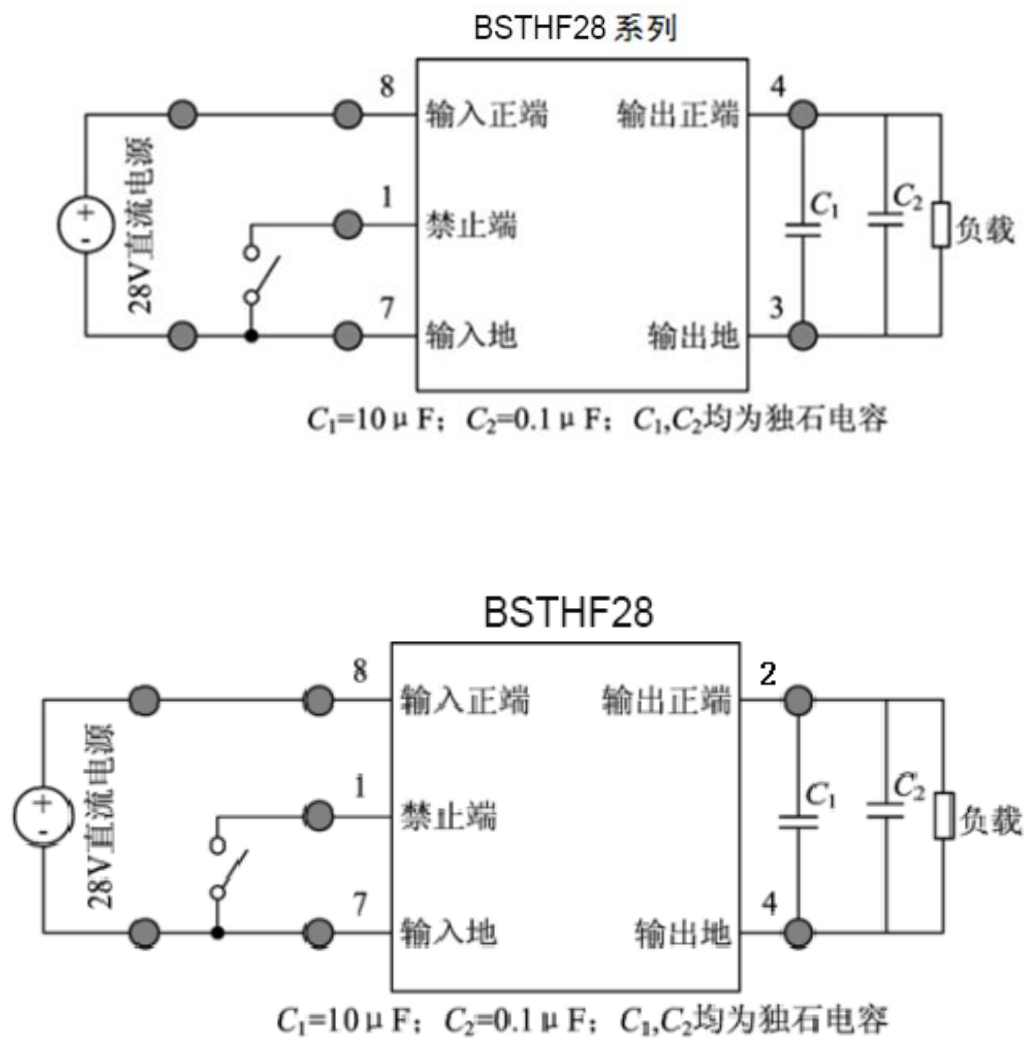


Figure 8. Connection diagram of BSTHF28 series products (excluding BSTHF28S28)

Figure 9. BSTHF28 product connection diagram

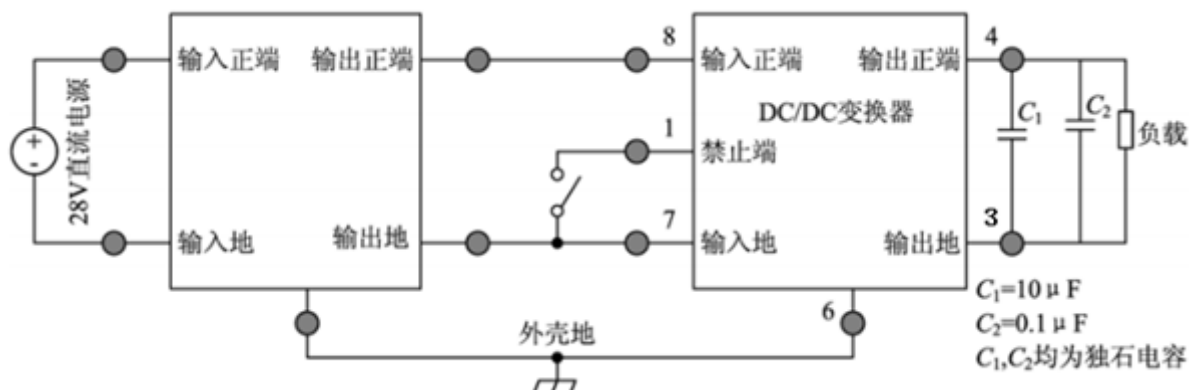


Figure 10. Connection diagram of BSTHF28 series EMI filter (excluding BSTHF28S28)

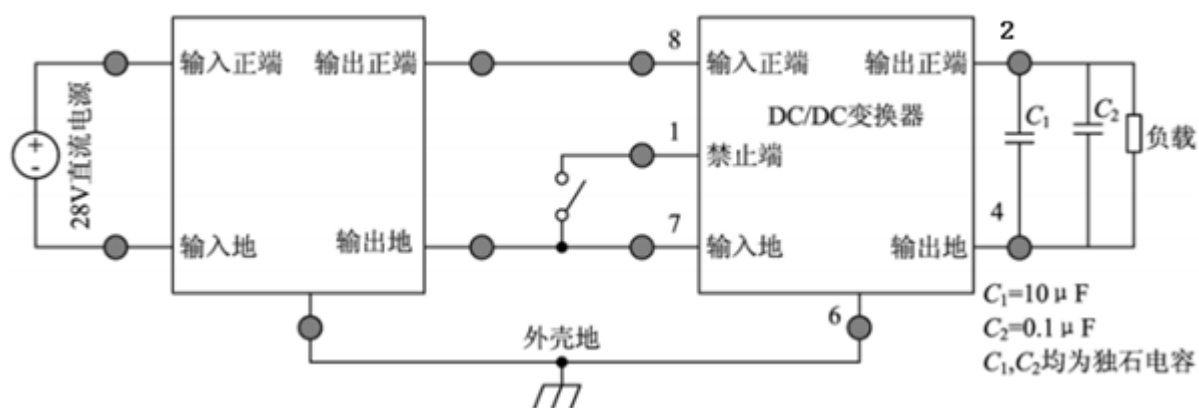


Figure 11. EMI Filter Connection Diagram (BSTHF28S28)

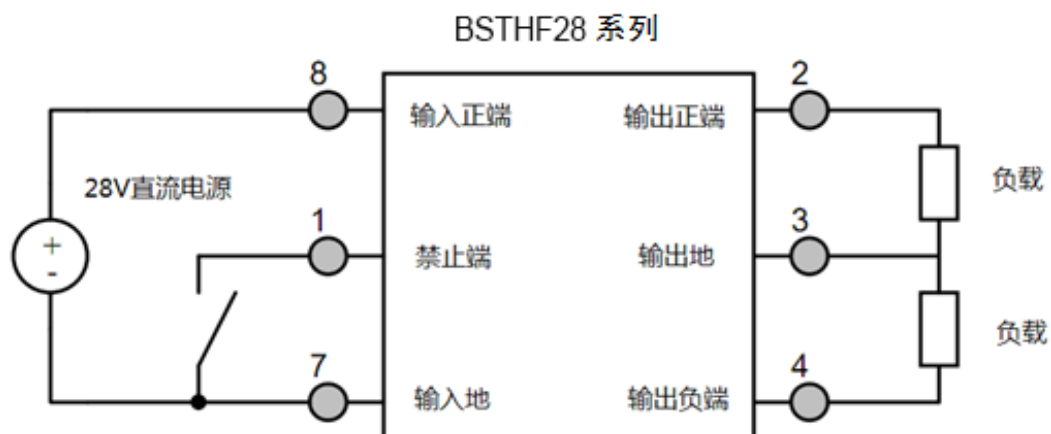


Figure 8. Connection diagram of BSTHF28 series products

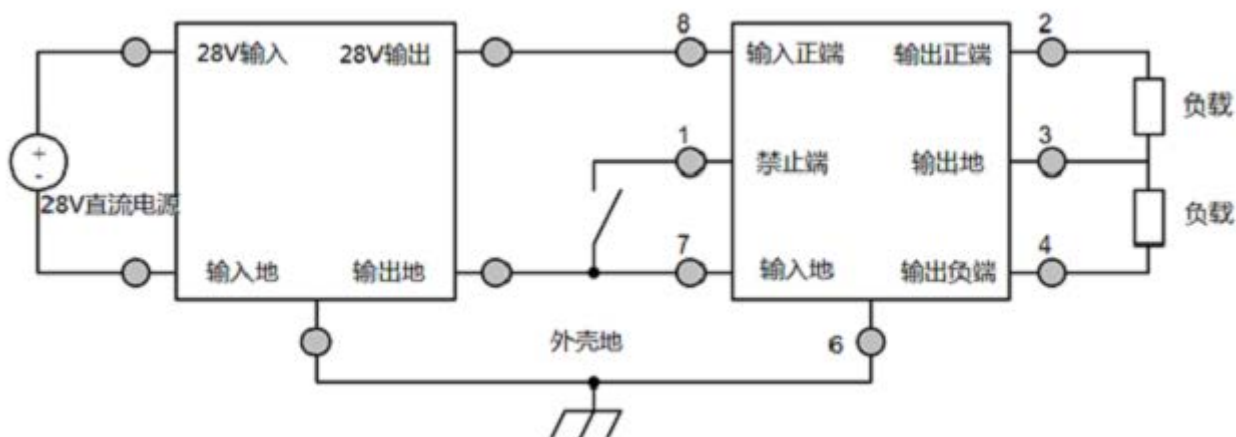


Figure 9. BSTHF28 Series EMI Filter Connection Diagram

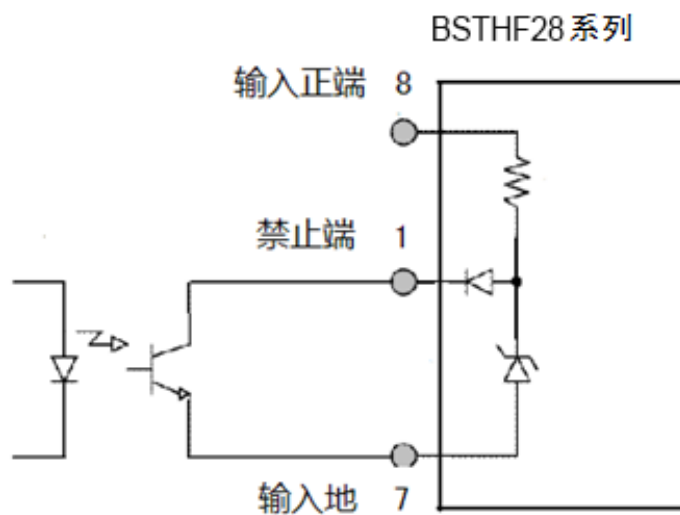


Figure 10. BSTHF28 Series Inhibit Drive Circuit



Figure 8. Connection diagram of BSTHF28 series products

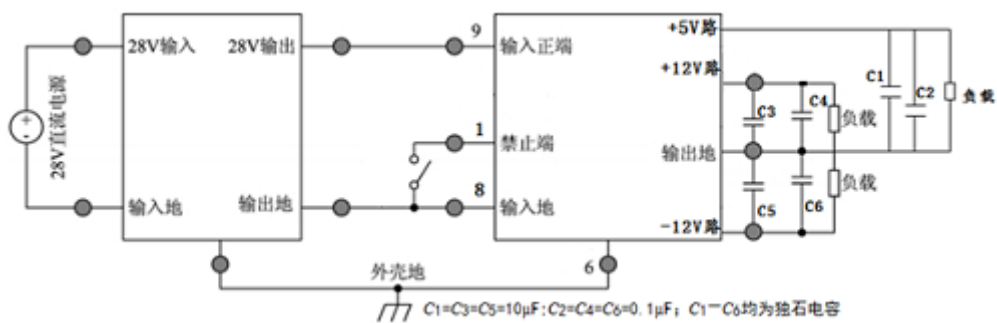


Figure 9. Connection diagram of BSTHF28 series EMI filter

Dimensions and description of package outline drawings BSTHF28 Series Package Outline

1. Package outline drawing without flange

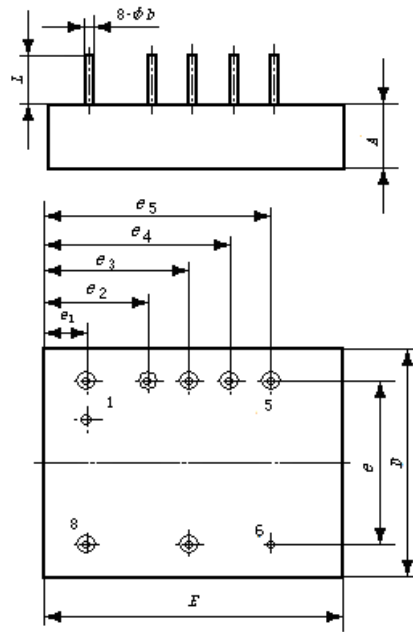
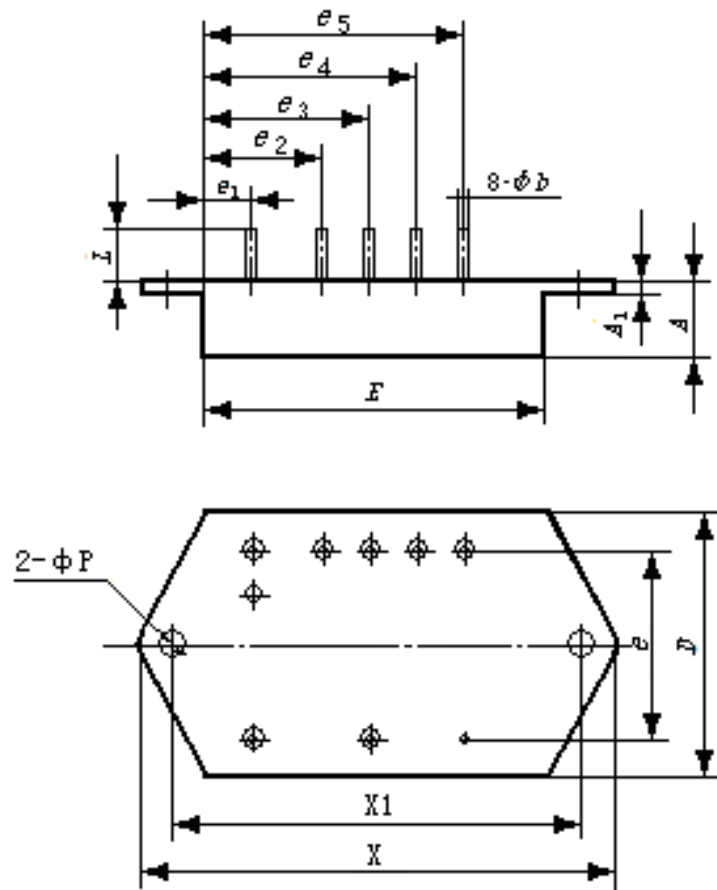


Figure 10. Bottom and side view of BSTHF28D series products (without flange)

- Package outline drawing with flange



Bottom and side view of BSTHF28 series (with flange)

Package size parameter table

Dimension symbol	value (mm)		
	Min	Nominal	Max
A	-	-	8.90
A1	1.20	-	1.80
ϕb	0.63	-	0.89
D	-	-	28.94

E	-	-	37.33
e	-	20.32	-
e1	-	5.21	-
e2	-	12.83	-
e3	-	17.91	-
e4		22.99	-
e5	-	28.07	-
X	-	-	51.30
X1	43.45	-	44.45
φP	3.00	-	3.60
L	5.35	-	-
Note: e, e1, e2, e3, e4 and e5 are interchangeable dimensions, which are guaranteed by package manufacturing and inspection, and no assessment requirements are made in this specification.			

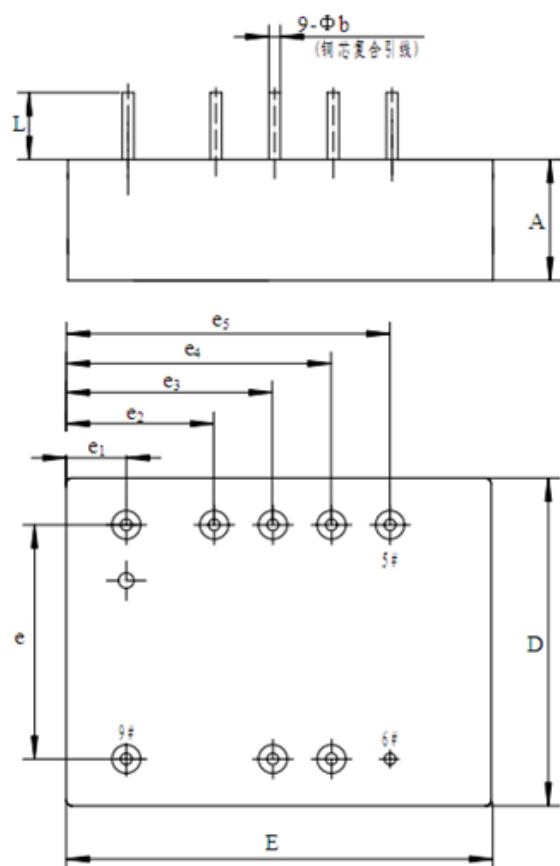
Description of the package housing

Model	Base Material	Plating	Cover plate of (cap) material	Cover plate of (cap) plating	Lead Material	Lead plating	Seal method	Note
UPP3728-08t (With flange)	Cold rolled steel (0#)	Ni	Iron-nickel alloy (4J42)	Ni	Copper core composite	Ni/Au	Parallel seam welding	The grounding pin is plated with Ni.
UPP3728-08j	Cold	Ni	Iron-nickel	Ni	Copper	Ni/Au	Parallel	The

(Without flange)	rolled steel (10#)		alloy (4J42)		core composite		seam welding	grounding pin is plated with Ni.
------------------	-----------------------	--	-----------------	--	----------------	--	--------------	----------------------------------

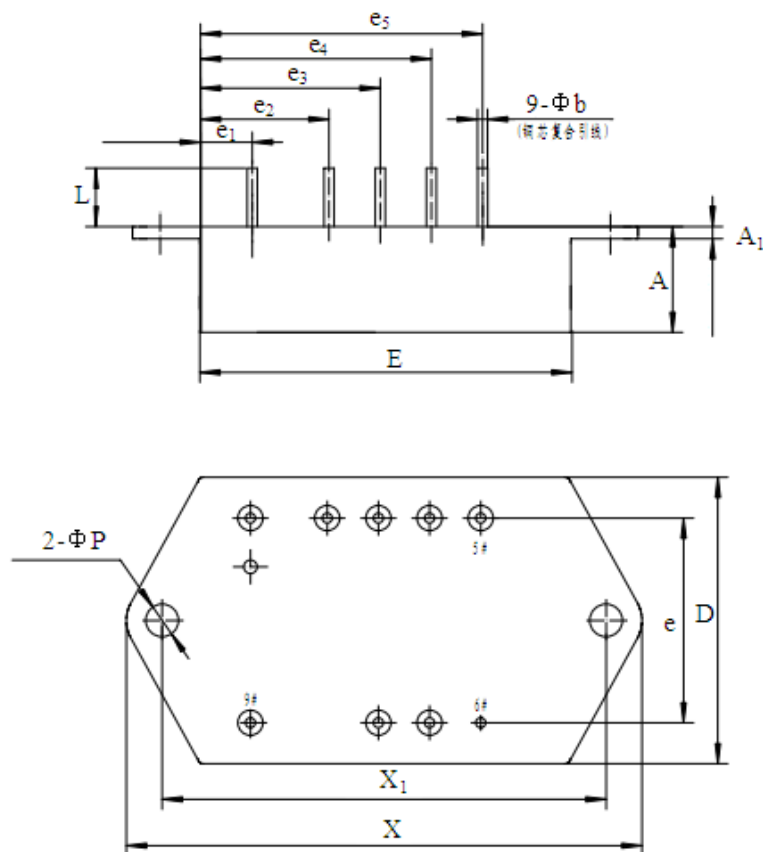
BSTHF28 Series Package Outline

- Package outline drawing without flange



BSTHF28T0515 Dimensions

- Package outline drawing with flange



BSTHF28 Dimensions

Unit:mm

Dimension symbol	value (mm)		
	Min	Nominal	Max
A	-	-	9.50
A1	1.20	1.50-	1.80
ϕb	0.63	0.76	0.89

D	-	-	28.94
E	-	-	37.33
e	-	20.32	-
e1	-	5.21	-
e2	-	12.83	-
e3	-	17.91	-
e4		22.99	-
e5	-	28.07	-
X	-	-	51.30
X1	43.45	43.95	44.45
φP	3.00	3.30	3.60
L	5.35	-	-
Note: e, e1, e2, e3, e4 and e5 are interchangeable dimensions, which are guaranteed by package manufacturing and inspection, and no assessment requirements are made in this specification.			

Description of the package housing

Model	Base Material	Plating	Cover plate of (cap) material	Cover plate of (cap) plating	Lead Material	Lead plating	Seal method	Note
UPP3728-09a (Without flange)	Cold rolled steel (0#)	Ni	Iron-nickel alloy (4J42)	Ni	Copper core composite	Ni/Au	Parallel seam welding	The grounding pin is plated with Ni.
UPP3728-09 (With flange)	Cold rolled steel (10#)	Ni	Iron-nickel alloy (4J42)	Ni	Copper core composite	Ni/Au	Parallel seam welding	The grounding pin is plated with Ni.