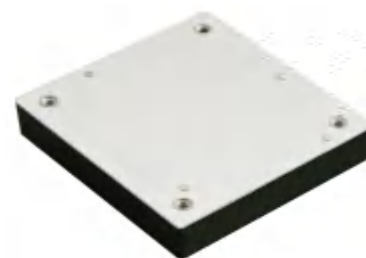


FEATURES:

- ◆ Ultra-wide 85-305V_{AC} and 120-430V_{DC} input voltage range
- ◆ Typical efficiency up to 92%, power factor up to 0.99
- ◆ International standard half brick package
- ◆ Compact size, high power density
- ◆ Over temperature protection, input reverse polarity protection, over-voltage/over-current/output short circuit protection
- ◆ Designed to meet UL/IEC62368 standards
- ◆ Three year warranty period



Selection Guide

Certification	Part No.	Output Power(W)	Nominal Output Voltage and Current(Vo/Io)	Efficiency at 230V _{AC} (%)Typ.	Capacitive Load (uF)Max.
	CFAH300S12	300	12V/25A	92	4000
	CFAH300S24		24V/12.5A	92	2000
	CFAH300S28		28V/10.72A	92	2000
	CFAH300S48*		48V/6.25A	92	1000
	CFAH300S54*		54V/5.6A	92	1000

Note: 1. *48V/54V under development; for more details, please consult the CHEWINS FAE.

2. The product picture is for reference only. For details, please refer to the actual product

Input Specifications

Input Specifications					
Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	AC input	85	--	305	VAC
	DC input	120	--	430	VDC
Input Frequency		47	--	63	Hz
Power Factor *	50/60Hz, 115VAC/230VAC, Pout=300W	--	0.99	--	--
Input Current	115VAC	--	--	4	A
	230VAC	--	--	2	
Inrush Current	230VAC, Ta=25℃	--	--	40	
THD*	Ta=25℃, Vin=115V, Pout=300W	--	8	--	%
	Ta=25℃, Vin=230V, Pout=300W	--	5	--	%
Input Under-voltage Protection	Under-voltage protection start (Input voltage drops from high to low)	60	--	75	VAC
	Under-voltage protection start (Input voltage rises from low to high)	75	--	85	
Hot Plug		Unavailable			
Grounded Mode	PE is required for AI-Substrate application				
Note:*The power factor and THD test result are based on recommended circuit 1.					

Note: *The power factor and THD test result are based on recommended circuit 1.

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		--	±2	--	%
Line Regulation	Full load	--	±0.5	--	
Load Regulation		--	±1	--	

Ripple/Noise *		20MHz bandwidth (peak-to-peak value) Load at room temperature 30%-100%	12V	--	150	--	mV
			24V	--	240	--	
			28V	--	240	--	
			48V	--	400	--	
			54V	--	400	--	
Load Dynamic Response	Overshoot amplitude	25%-50%-25%load,50%-75%-50% load, slopes of 0.1A/us	--	--	5	%	
	Recovery time		--	--	200	us	
Stand-by Power Consumption			--	1.5	3	W	
Minimum Load			0	--	--	%	
Hold-up Time			--	10	--	ms	
Short Circuit Protection			Hiccup,continuous,self-recover				
Over-current Protection			120% Io,self-recover after fault disappear				
Over-voltage Protection		12Vdc output	≤16Vdc(Hiccup or clamp)				
		24Vdc output	≤35Vdc(Hiccup or clamp)				
		28Vdc output	≤35Vdc(Hiccup or clamp)				
		48Vdc output	≤60Vdc(Hiccup or clamp)				
		54Vdc output	≤63Vdc(Hiccup or clamp)				
No-load Output OfAuxiliary Source		Maximum pulling current about 10mA, take HU-as for reference ground	10	12	15	V	
Over Temperature Protection		Over-temperature protection start (AI-Substrate temperature) until power off	105	--	115	℃	
		Over-temperature protection recovery	Reset input				
ENA Remote ControlON/OFF **		Enable controlpin	ENA connect to HU- or Low-level (0-0.1Vdc), output is normal				
			ENA disconnect or High-level (10-15Vdc), output turn off				
Note:1. *The "Tip and barrel" method is used for ripple and noise test, please refer to AC-DC Converter Application Notes for specific information. 2. **If an optocoupler is used to control the ENA pin, please refer to the recommended solution in Instructions 1 (Page 3).							

General Specifications

Item		Operating Conditions		Min.	Typ.	Max.	Unit
Isolation	Input-Output	Electric Strength Testfor 1min., leakage current<5mA		3000	--	--	VAC
	Input-PE			1500	--	--	
	Output-PE			1500	--	--	
Insulation Resistance	Input-Output	Test Voltage:500Vdc,Ta=25℃		100	--	--	MΩ
	Input-PE			100	--	--	
	Output-PE			100	--	--	
Operating Temperature		AI-Substrate temperature		-40	--	+100	℃
Storage Temperature				-40	--	+100	
Storage Humidity				--	--	95	%RH
Soldering Temperature		Wave-soldering,Max.10 seconds		255	260	265	℃
		Manual-welding,Max.5 seconds		350	360	370	
Power Derating	AI-Substrate temperature	-40℃ to +100℃		--	--	--	%/℃
	Input voltage	85VAC-110VAC		0.32	--	--	%/VAC
	Altitude	2000m-5000m		6.67	--	--	%/Km
Safety Standard		12V/24V/28V	BS EN/EN62368-1(Report) safety approved; Design refer to UL/IEC62368-1				
		48V/54V	Design refer to UL/EN/IEC62368-1				
Safety Class			CLASS I				
MTBF		MIL-HDBK-217F@25℃	≥500,000h				

Mechanical Specifications

Case Material	Black plastic, flame-retardant and heat-resistant (UL94V-0)	
Dimension	Horizontal package	63.14x60.6x12.7mm
Weight	Horizontal package	155g(Typ.)
Cooling method	Conduction heat dissipation, it is necessary to ensure that the product aluminum substrate surface temperature lower than 100℃.	

Electromagnetic Compatibility (EMC) (Based on recommended circuit)*

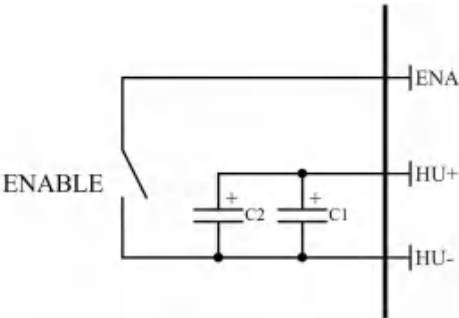
Emissions	CE	CISPR32/EN55032 CLASS A	
		CE102 GJB151B (Recommended circuit 2)	
	RE	CISPR32/EN55032 CLASS A	
	Harmonics	IEC/EN6100-3-2	perf.Criteria A
EMS	ESD	IEC/EN61000-4-2 Contact ±6KV/Air ±8KV	perf.Criteria A
	RS	IEC/EN61000-4-3 10V/m	perf.Criteria A
	EFT	IEC/EN61000-4-4 ±4KV	perf.Criteria A
	Surge	IEC/EN61000-4-5 Line to line ±2KV/line to PE ±4KV	perf.Criteria A
	CS	IEC/EN61000-4-6 10Vr.m.s	perf.Criteria A
	Voltage dip, short interruption and voltage variation	IEC/EN61000-4-11 0%,70%	perf.Criteria B

Note: *Except for CE102 of the CE, other EMC test results are based on recommended circuit 1.

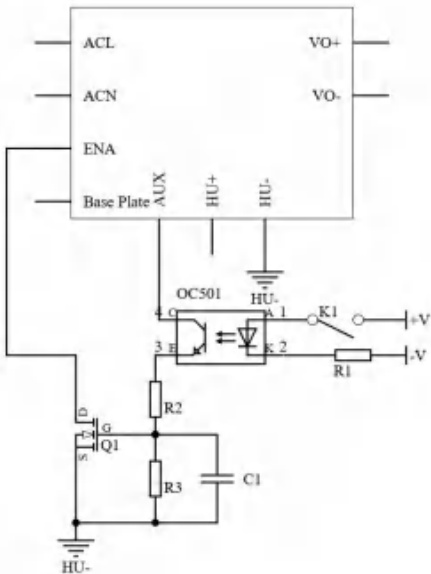
Instructions

1.ENA Remote Control Switch

The module has built-in ENA remote control switch function.This function can control ON/OFF of the output voltage when the input voltage is turned on. Short circuit ENA and HU-, and the output voltage is normal; ENA disconnect to HU-,and the output voltage turn off. The wiring diagram circuit is as follows:

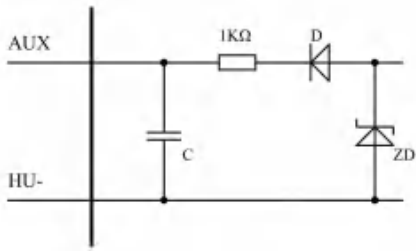


It can also be enabled by controlling whether the ENA pin is connected to a low level (0-0.1V) through an optocoupler. The wiring diagram is as follows:

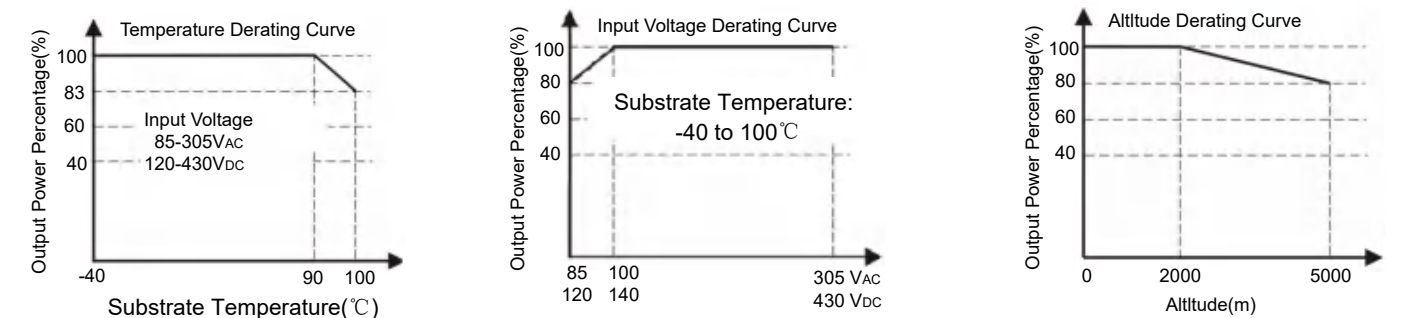


Part No.	Recommended value
R1	10kΩ
R2/R3	20kΩ
C1	100nF
Q1	Recommended NCE 0102A of NCEPOWER
OC501	Recommended OR-1008-TP-G-(GK) of Orient
U(External DC source)	10-15V

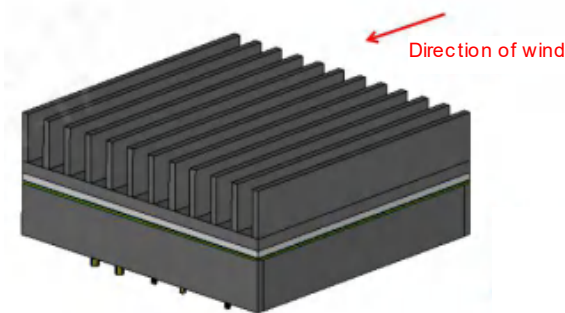
2.Auxiliary Power Supply For External Signals (AUX Terminal)
The module additionally provides 12V auxiliary source output, the reference ground is HU- and provides an auxiliary control power supply for the primary side control circuit.No load voltage10-15V (Internal resistor in series 1 kΩ,maximum pull-up current about 10mA).



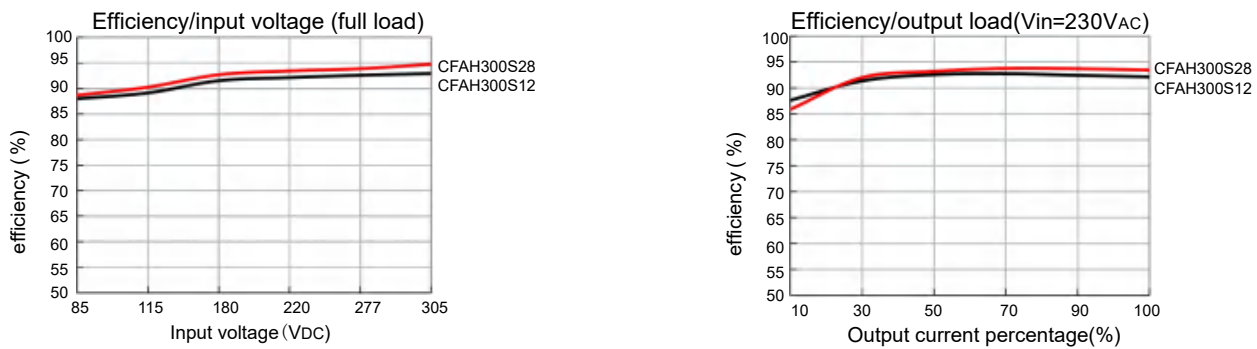
Product Characteristic Curve



- Note:
- ①With an AC input voltage between 85-100VAc/120-140Vdc the output power must be derated as per the temperature derating curves;
 - ②This product is suitable for applications using natural air cooling; for applications in closed environment please consult CHEWINS FAE.



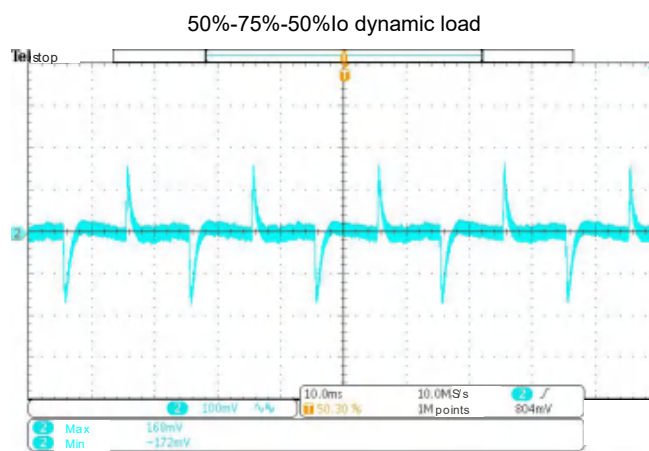
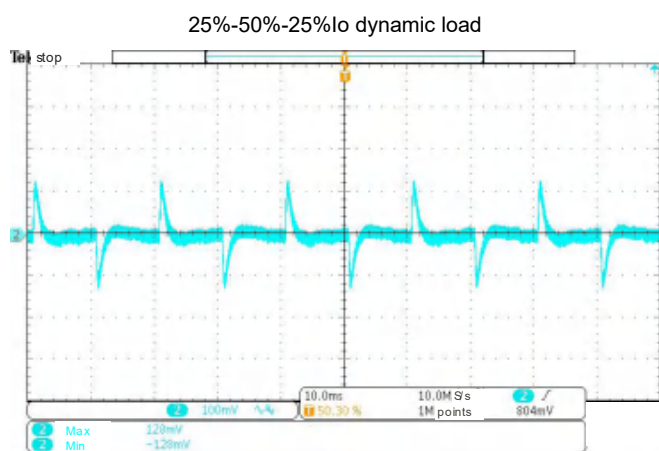
- Note:
- ① Under ambient temperature of 25℃, input voltage of 115V, add heat sink and 1.2m/swind blowing, when the surface temperature of the Al-Substrate is 100℃, the device temperature rise meets the requirement of temperature derating.
 - ② Under ambient temperature of 25℃, input voltage of 230V, add heat sink and 0.6m/swind blowing, when the surface temperature of the Al-Substrate is 100℃, the device temperature rise meets the requirement of temperature derating.



Product Characteristic Curve

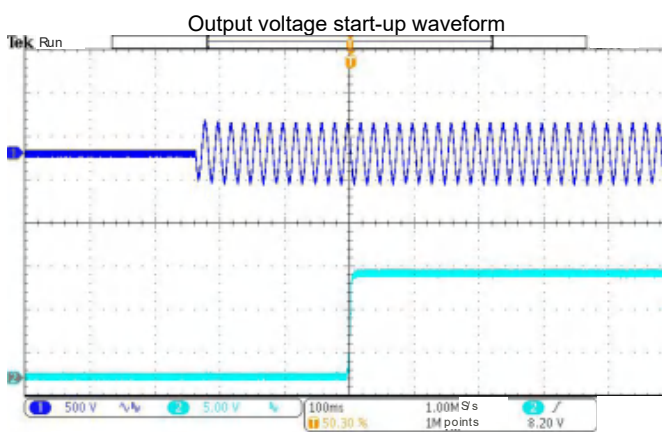
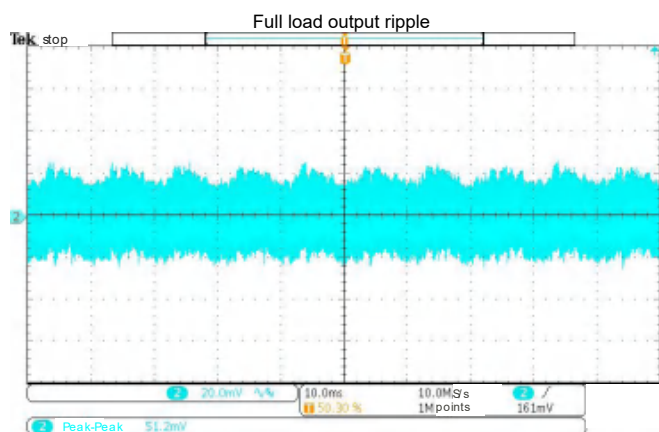
1. Dynamic Response

Test conditions: $T_c=25^{\circ}\text{C}$, $V_{in}=230\text{VAC}$, $V_{out}=12\text{V}$, tip with 20MHz bandwidth. Products are tested based on recommended circuit 1 and the "Tip and barrel method" is used for test, output parallel 10uF electrolytic capacitor and 1uF ceramic capacitor.



2. Output Ripple And Start-up Waveform

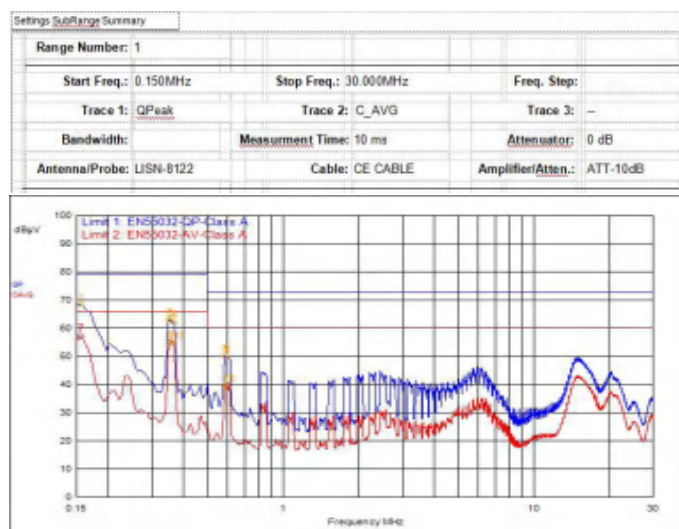
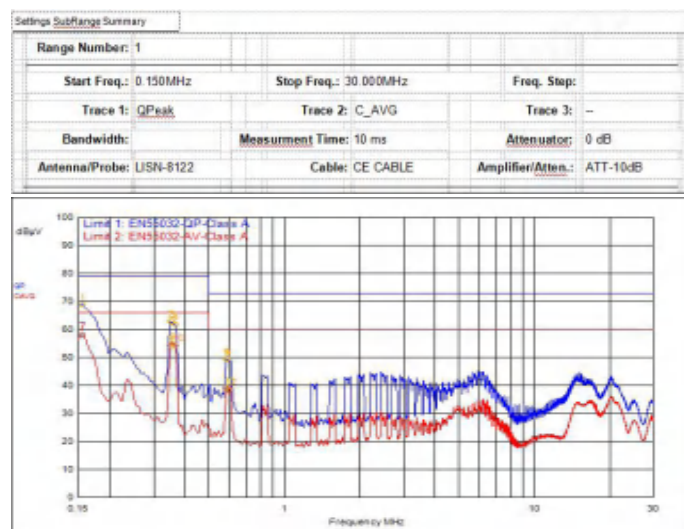
Test conditions: $T_c=25^{\circ}\text{C}$, $V_{in}=230\text{VAC}$, $V_{out}=12\text{V}$, tip with 20MHz bandwidth. Products are tested based on recommended circuit 1 and the "Tip and barrel method" is used for test, output parallel 10uF electrolytic capacitor and 1uF ceramic capacitor.



3. Conductive Waveform

(1) Safety specifications: CISPR32/EN55032 CLASS A

Test conditions: $T_c=25^{\circ}\text{C}$, $V_{in}=230\text{VAC}$, $V_{out}=12\text{V}$, products are tested based on recommended circuit 1.



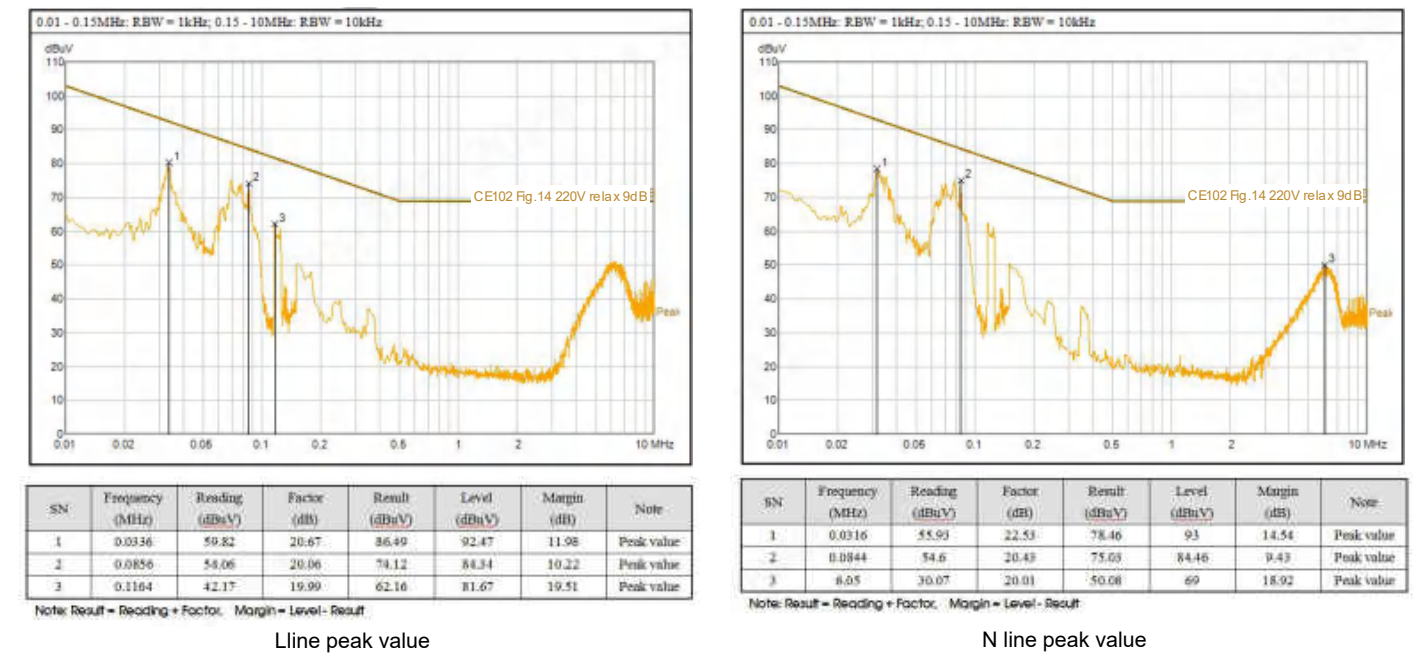
ID	Frequency	Probe	Cable	Atten.	Detector	Meter Read	Meas Level	Limit	Limit Dist.
7	156.000kHz	0.1	0.2	10.0	C_AVG	47.7	58.1	66.0	-7.9
1	156.000kHz	0.1	0.2	10.0	QPeak	58.7	69.0	79.0	-10.0
9	357.000kHz	0.2	0.2	10.0	C_AVG	44.5	54.9	66.0	-11.1
10	366.000kHz	0.2	0.2	10.0	C_AVG	44.0	54.4	66.0	-11.6

L line peak value and average value

ID	Frequency	Probe	Cable	Atten.	Detector	Meter Read	Meas Level	Limit	Limit Dist.
7	156.000kHz	0.1	0.2	10.0	C_AVG	46.9	57.1	66.0	-8.9
1	156.000kHz	0.1	0.2	10.0	QPeak	58.3	68.6	79.0	-10.4
9	357.000kHz	0.2	0.2	10.0	C_AVG	44.9	55.3	66.0	-10.7
10	366.000kHz	0.2	0.2	10.0	C_AVG	44.4	54.8	66.0	-11.2

N line peak value and average value

(2) Safety specifications:CE102 GJB151B
Test conditions:Tc=25℃,Vin= 230VAc, Vout=12V, products are tested based on recommended circuit 2.



Additional Circuits Design Reference

1. Typical application

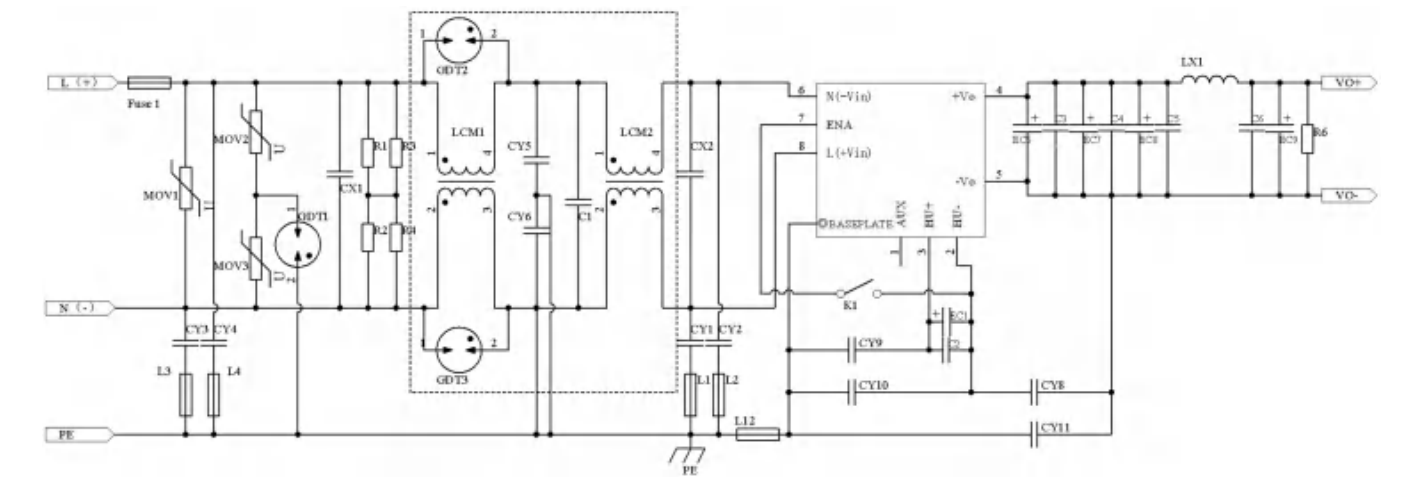


Fig.1:Recommended circuit1

Component	Recommended value
Fuse 1	300VAc/6.3A,show-blow
MOV1/MOV2/MOV3	S10K350/3500A
R1/R2/R3/R4	510KΩ/1206
CX1	155K/310VAc
CX2	225K/310VAc

	C1	Y2/103M/300VAC
	CY5/CY6	Y1/222M/400VAC
	LCM1	5mH
	LCM2	100uH
GDT1		3600V/3KA
GDT2/GDT3		90V/500A/ 3216
L1/L2/L3/L4/L12		4x3.1x2.6/47Ω/DCR0.004ΩMax (Suppressing high frequency bead)
CY8/CY10/CY11		Y1/102M/400VAC
CY1/CY2/CY3/CY4/CY9		Y1/222M/400VAC
EC1	85VAC-264VAC input	300uF/450V (Aluminum electrolytic capacitor)
	85VAC-305VAC input	470uF/450V (Aluminum electrolytic capacitor)
C2		683K/630V
LX1		0615/0.8uH/1.8mΩ Max/60A
EC6/EC7/EC8/EC9	12V	1500uF/25V (Solid-state capacitor)
	24V/28V	680uF/35V (Solid-state capacitor)
	48V/54V	330uF/63V (Aluminum electrolytic capacitor)
C3/C4/C5/C6	12V/24V/28V	106K/50V/1206
	48V/54V	105K/100V/1206
R6**	12V	240Ω/2W
	24V	1kΩ/2W
	28V	1.5kΩ/2W
	48V	2kΩ/2W
	54V	3kΩ/2W

2.Conducted Emission(CE102)Recommended Circuit

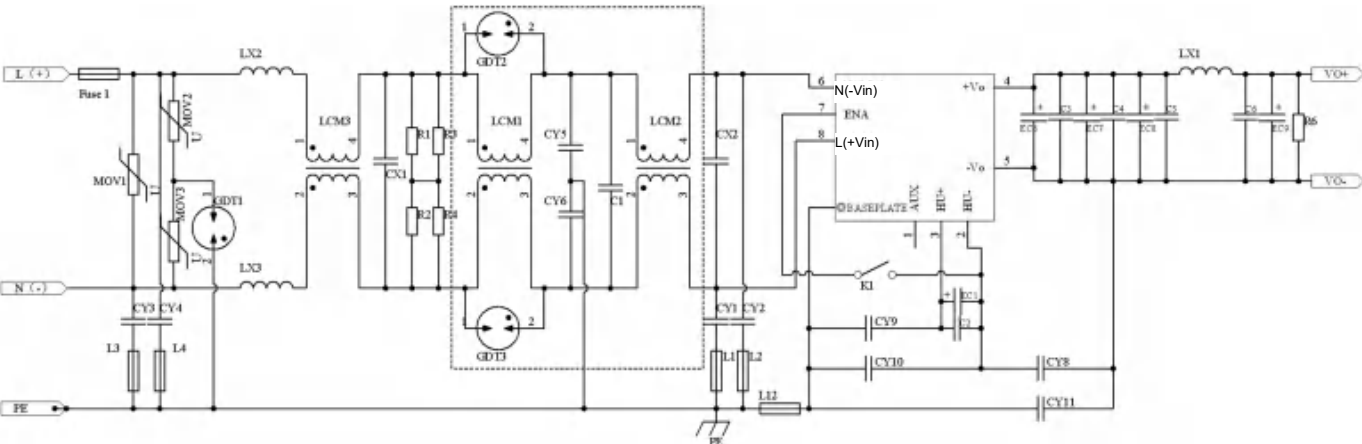
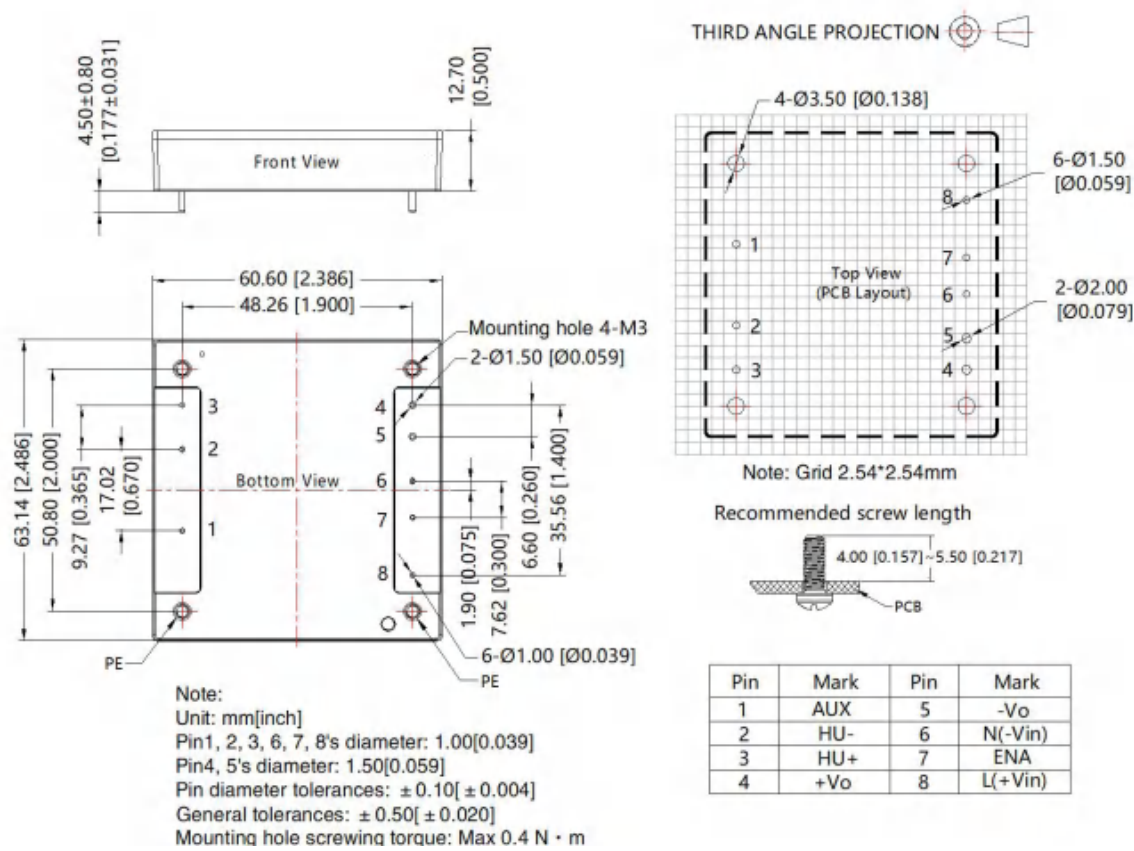


Fig.2:Recommended circuit 2

Component	Recommended value
LX2/LX3	300uH/Min:2A,recommend
LCM3	10mH/Min:2A,recommend
Note: 1. The external circuit component parameters are the same as those of the above recommended circuit 1.	

3. For additional information please refer to application notes on WWW.CHAWENS.COM

Dimensions and Recommended Layout



Pin description					
1	AUX	Output of auxiliary source, reference HU-	5	-Vo	Negative DC output
2	HU-	Keep the capacitor voltage negative	6	N(-Vin)	AC input Neutral/Negative DC input
3	HU+	Keep the capacitor voltage positive	7	ENA	Switch enable pin
4	+Vo	Positive DC output	8	L(+Vin)	AC input line/Positive DC input



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