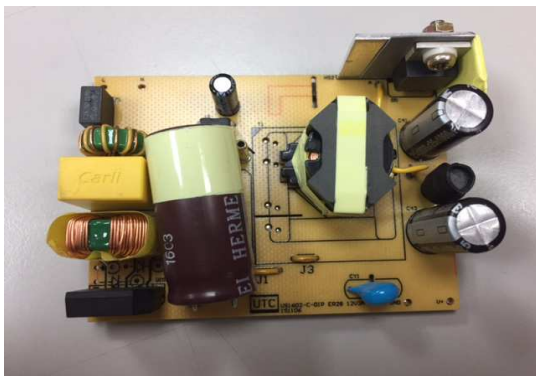




36W Open Frame Module Using UCS1655S

UCS1655S 36W / 12V_3A Demo Board Manual



Key features:

- AC Input Full Range 90Vac~264Vac
- DC Output 12Vdc 3A
- Average Efficiency >87.4% (meet level 6)
- No load Power <100mW (meet level 6)
- OCP/OVP/OLP/SCP Protection

Revision History

Revise Date	Version	Reason/Issue
2017/1/17	B	



36W Open Frame Module Using UCS1655S

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36W Open Frame Module Using UCS1655S

1. Adapter Module Specification

1.1. Input Characteristics

● AC input voltage rating	100Vac ~ 240Vac
● AC input voltage range	90Vac ~ 264Vac
● AC input frequency range	47Hz ~ 63Hz
● Input current	1A (rms)max. @ 90Vac/60Hz

1.2. Output Characteristics

● Output Voltage	12V
● Output Tolerance	< ±5%
● Min. load current	0A
● Max. load current	3A

1.3. Performance Specifications

● Maximum Output Power	36W
● Standby Power	<100mW (meet level 6)
● Average Efficiency	>87.4% (meet level 6)
● Line Regulation	<1%
● Ripple & Noise	< 120mV

1.4. Protection Function

● Short Circuit Protection	Shut down and auto recovery
● Over Voltage Protection	Shut down and auto recovery
● Over Load Protection	Shut down and auto recovery

1.5. Environment

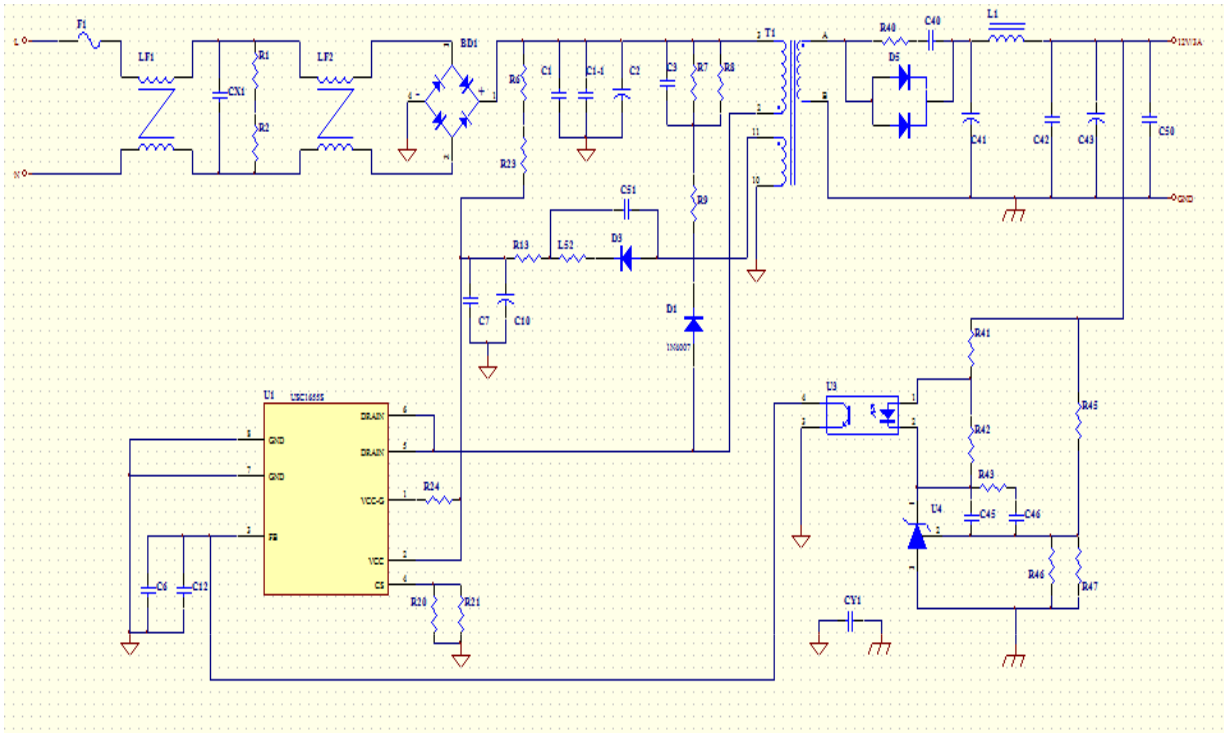
● Operation Temperature	0°C to 40 °C
● Operation Humidity	20% to 90% R.H
● Storage Temperature	-40°C to 60 °C
● Storage Humidity	0% to 90% R.H



36W Open Frame Module Using UCS1655S

2. Open Frame Module Information

2.1. Schematic



2.2. BOM

1	BD1	KBP208, 2A_800V	1
2	C1,C1-1	Capacitor, chip 10nF/1KV, NPO, SMD1206	2
3	C2	Capacitor, aluminum electrolytic, 47uF/400V, 105°C,±20%	1
4	C3	Capacitor, chip, 1nF/1KV, NPO, SMD1206	1
5	C6,C12	Capacitor, chip, 1nF/50V, X7R, SMD 0805	2
6	C7	Capacitor, chip, 0.1uF/50V, X7R, SMD 1206	1
7	C10	Capacitor, aluminum electrolytic,10uF/50V; 105°C,±20%	1
8	C40	Capacitor,chip, 220pF/1KV, NPO, SMD 1206	1
9	C41	Capacitor, aluminum electrolytic 1000uF/25V,105°C,±20%	1
10	C43	Capacitor, aluminum electrolytic 1000uF/25V,105°C,±20%	1
11	C45	Capacitor, chip, 10nF/50V, X7R, SMD 0603	1
12	C46	Capacitor,chip, 0.22uF/25V, X7R, SMD 0603	1
13	CX1	Capacitor, X2, 0.33uF/275VAC, 105°C ,±20%	1
14	CY1	Capacitor, Y1, 1000pF/400V, 105°C,±20%	1
15	D1	Diode ,standard recovery, M7, 1.0A/1000V SMA	1
16	D3	Diode ,fast recovery, BAV20WG ,1A/200V SOD-123	1
17	D5	Diode, dual Schottky, TGBR20U100CG, 20A/100V,TO-220	1
18	F1	2.0A / 250V MST TIME-LAG RADIAL LEAD MICRO FUSE (Conquer)	1
19	LF1,LF2	choke	2



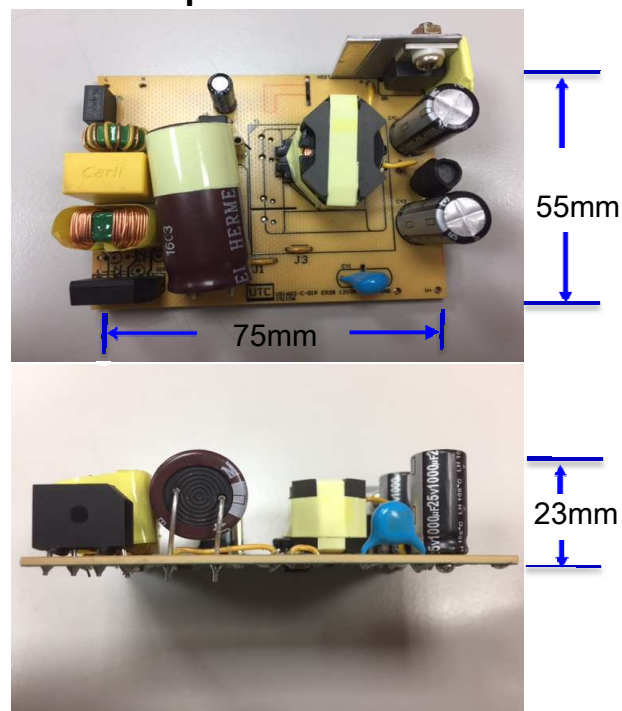
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20	T1	Transformer, RM-8, L=800uH	1
21	J1,J3	Jump wire $\phi 0.8$	2
22	R1,R2	Resistor, chip,1.5M, 1/4W, $\pm 1\%$, SMD 1206	2
23	R7,R8	Resistor, chip,1M, 1/4W, $\pm 1\%$, SMD 1206	2
24	R9,R24,J2	Resistor, chip,0 Ω , 1/4W, $\pm 1\%$, SMD 1206	3
25	R13	Resistor, chip,1 Ω , 1/4W, $\pm 1\%$, SMD 1206	1
26	R20,R21	Resistor, chip, 2.2 Ω , 1/4W, $\pm 1\%$, SMD 1206	4
27	R40	Resistor, chip, 365 Ω , 1/4W, $\pm 1\%$, SMD 1206	3
28	R41	Resistor, chip,820 Ω , 1/10W, $\pm 1\%$, SMD 0603	1
29	R42	Resistor, chip,2.2K, 1/10W, $\pm 1\%$, SMD 0603	1
30	R43	Resistor, chip,680 Ω , 1/10W, $\pm 1\%$, SMD 0603	1
31	R45	Resistor, chip,39K, 1/10W, $\pm 1\%$, SMD 0603	1
32	R47	Resistor, chip,10K, 1/10W, $\pm 1\%$, SMD 0603	1
33	L1	R core, 0.5uH	1
34	L52	Resistor, chip,0 Ω , 1/8W, $\pm 1\%$, SMD 0805	1
35	U1	IC, PWM controller, UTC UCS1655S, DIP-7A	1
36	U3	IC, Opto-Coupler, LTV-357-T-C , SMD , LITE-ON	1
37	U4	IC, TL431 2.495V $\pm 0.5\%$ SOT-23	1
38	No Component	R6,R23,R46,C42,C50,C51	-
		: The Yellow color block means the parts that UTC can provide.	

2.3. Open frame Module Snapshot



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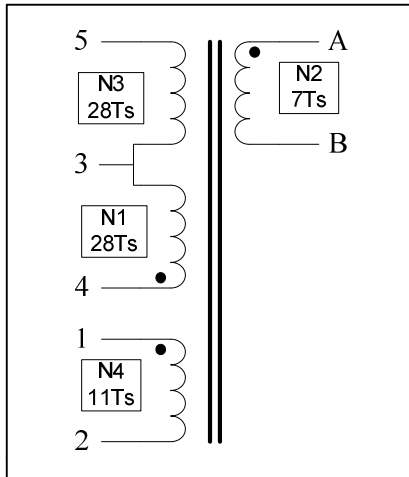
36W Open Frame Module Using UCS1655S

2.4. Transformer Design

2.4.1. Transformer Specification

- 1) Bobbin: RM-8
- 2) Core material : PC40 (TDK) or equivalent.
- 3) Lm: 800uH,±10% (65KHz)

2.4.2. Transformer Diagram



●	N4(1-2)=0.15Φ X 2 X 11Ts	○	3T Tape
●	N3(3-5)=0.29Φ X 2 X 28Ts	○	2T Tape
●	N2(A-B)=0.9Φ X 1 X 7Ts	○	2T Tape
●	N1(4-3)=0.29Φ X 2 X 28Ts	○	

Bottom

Transformer Winding Data

Layer No.	Winding	Material	Start	Turns	Finish	Note
1	N1	0.29ΦX2 2 UEW	4	28	3	
2	Tape	Tape		2		
3	N2	Triple Insulated Wire 0.9Φ	A	7	B	
4	Tape	Tape		2		
5	N3	0.29ΦX2 2 UEW	3	28	5	
6	Tape	Tape		2		
7	N4	0.15ΦX2 2 UEW	1	11	2	中間密繞
8	Tape	Tape		3		



36W Open Frame Module Using UCS1655S

3. Performance Evaluation

This document presented here is to describe the open frame Module performance.

The Summarized Result :

Item	Test result
1. Input Characteristics	
Input Current (90V/60Hz, full load)	851mA
Standby Power at No Load	<100mW (meet level 6)
Averaged Efficiency (@115/230Vac, 25%~100% Load ,On PCB End)	89% Meet level 6 >86.2% @115VAC 89.58% Meet level 6 >86.2% @230VAC
2. Output characteristics	
Output Tolerance	<5%
Line Regulation	≅ 1%
Ripple & Noise	<120mV
Overshoot	≤ 5%
Ripple of DynamicTest	<300mVp-p
3. Protection	
Short Circuit Protection	Shut Down and Auto Recovery
Over Voltage Protection	Shut Down and Auto Recovery
Over Load Protection	Shut Down and Auto Recovery

Test Equipment:

Item	Vendor	Model No:
1.AC Source	Chroma	61602
2.Digital Power meter	Chroma	66202
3.Electronic Load	Chroma	63102
4.Digital Oscilloscope	Tektronics	DPO3014
5.Multi-meter	Keithley	2000
6.Thermal meter	Opex	PT-3S



36W Open Frame Module Using UCS1655S

3.1. Input Characteristics

3.1.1 Full Load Efficiency :

Table 1 Full Load Efficiency :

Input	I _{rms} (mA)	P _{in} (W)	V _o (V)	I _o (A)	Eff(%)
90Vac/60Hz	851	42.24	12.3	3	87.36
115Vac/60Hz	729	41.41	12.3		89.11
230Vac/50Hz	483	41	12.3		90.00
264Vac/50Hz	436	41.36	12.3		89.22

3.1.2 Efficiency:

BVO : PCB side measured 12V output. B.Eff :PCB side measured Efficiency.

Table 3 Efficiency(**Test On PCB END**) :

Input Voltage	10%(0.3A)			50%(1.5A)		
	P _i (W)	B.V _o (V)	B.Eff(%)	P _i (W)	B.V _o (V)	B.Eff(%)
115Vac/60Hz	4.15	12.313	89.01			
230Vac/50Hz	4.22	12.313	87.53			
Input Voltage	25%(0.75A)			100%(3A)		
	P _i (W)	B.V _o (V)	B.Eff(%)	P _i (W)	B.V _o (V)	B.Eff(%)
115Vac/60Hz	10.25	12.31	90.07	20.53	12.31	89.94
230Vac/50Hz	10.38	12.31	88.95	20.6	12.31	89.64
Input Voltage	75%(2.25A)			100%(3A)		
	P _i (W)	B.V _o (V)	B.Eff(%)	P _i (W)	B.V _o (V)	B.Eff(%)
115Vac/60Hz	30.85	12.3	89.71	41.41	12.3	89.11
230Vac/50Hz	30.79	12.3	89.88	41	12.3	90.00

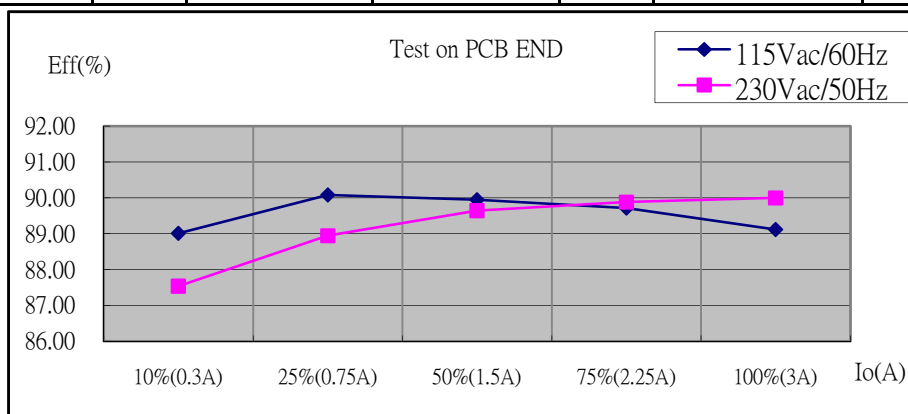


Fig.1 Efficiency VS Load



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Table 3 Efficiency(Calculate On Cable END_18AWG/ 1.5m) :

Input Voltage	10%(0.3A)					
	Pi(W)	Cable.Vo(V)	Cable.Eff(%)			
115Vac/60Hz	4.15	12.29	88.84			
230Vac/50Hz	4.22	12.29	87.37			
Input Voltage	25%(0.75A)			50%(1.5A)		
	Pi(W)	Cable.Vo(V)	Cable.Eff(%)	Pi(W)	Cable.Vo(V)	Cable.Eff(%)
115Vac/60Hz	10.25	12.25	89.63	20.53	12.18	88.99
230Vac/50Hz	10.38	12.25	88.51	20.6	12.18	88.69
Input Voltage	75%(2.25A)			100%(3A)		
	Pi(W)	Cable.Vo(V)	Cable.Eff(%)	Pi(W)	Cable.Vo(V)	Cable.Eff(%)
115Vac/60Hz	30.85	12.11	88.32	41.41	12.05	87.30
230Vac/50Hz	30.79	12.11	88.49	41	12.05	88.17

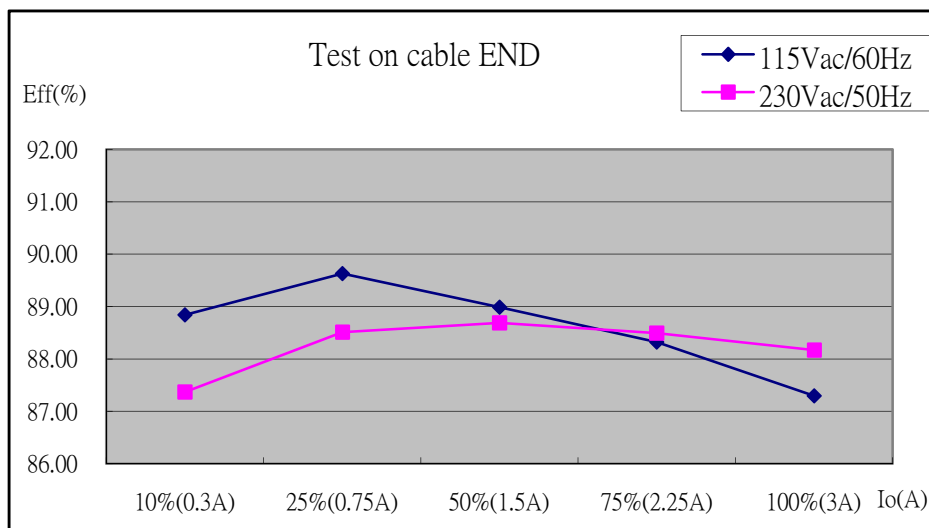


Fig.1 -1 Efficiency VS Load



36W Open Frame Module Using UCS1655S

Table 4 Average Efficiency (PCB End) :

Input Voltage	Average	Remark	Result
	B.Aver. Eff.(%)		
115Vac/60Hz	89.71	Level 6 >87.4%	PASS
230Vac/50Hz	89.62		

Table 5 Average Efficiency(Calculate On Cable_18AWG/ 1.5m) :

Input Voltage	Average	Remark	Result
	Cable.Aver. Eff.(%)		
115Vac/60Hz	88.56	Level 6 >87.4%	PASS
230Vac/50Hz	88.47		



36W Open Frame Module Using UCS1655S

3.1.3 Standby power

3.1.3.1

Table 5 Standby Power Test Data

Input Voltage	Stand by power			
	Pin(mW)	Vo(V)	Remark	Result
90Vac/60Hz	29	12.31	DOE LV6 <100mW	PASS
115Vac/60Hz	32	12.32		
230Vac/50Hz	49	12.32		
240Vac/50Hz	53	12.31		
264Vac/50Hz	78	12.31		



36W Open Frame Module Using UCS1655S

3.2 Output Characteristics

3.2.1 Line Regulation & Load Regulation

Table 6 Line Regulation & Load Regulation

Input Voltage	Load			Load Regulation%	Remark	Result
	No Load (V)	Half Load	Full Load			
90Vac/60Hz	12.31	12.31	12.3	0.08%		PASS
115Vac/60Hz	12.31	12.31	12.3	0.08%		
Line Regulation%	0.00%	0.00%	0.00%			
Input Voltage	Load			Load Regulation%	Remark	Result
	No Load (V)	Half Load	Full Load			
230Vac/50Hz	12.31	12.31	12.3	0.08%		PASS
264Vac/50Hz	12.31	12.31	12.3	0.08%		
Line Regulation%	0.00%	0.00%	0.00%			

3.2.2 Ripple & Noise

Table 8 Ripple & Noise

Input Voltage	Ripple & Noise(mV)				Remark	Result
	No. Load		Full Load			
90Vac/60Hz	29.6	Fig 4	75.2	Fig 5	<120mV	PASS
115Vac/60Hz	41.6	—	62.4	—		PASS
230Vac/50Hz	36.0	—	48.0	—		PASS
264Vac/50Hz	34.4	Fig 6	50.4	Fig 7		PASS

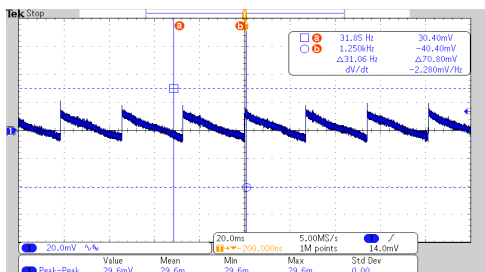


Fig.4 90Vac/60Hz@ No Load

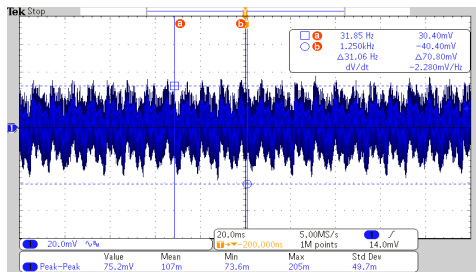


Fig.5 90Vac/60Hz@Full Load

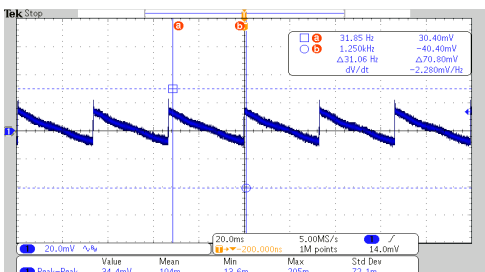


Fig.6 264Vac/50Hz@ No Load

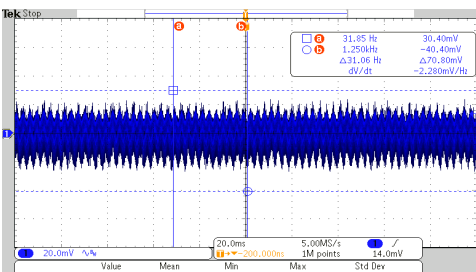


Fig.7 264Vac/50Hz@Full Load



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3.2.3 Overshoot

AC Power switch ON for overshoot, and switch OFF for undershoot.

Table 9 Overshoot

Input Voltage	Load Condition	Over shoot / Under shoot	Data	Remark
90Vac/60Hz	Full Load	Overshoot	12.36V	Fig.9
		Undershoot	133.7mV	Fig. 11
	No Load	Overshoot	12.37V	Fig. 8
		Undershoot	—	—
264Vac/50Hz	Full Load	OverShoot	12.36V	Fig.10
		Undershoot	133.7mV	Fig.12

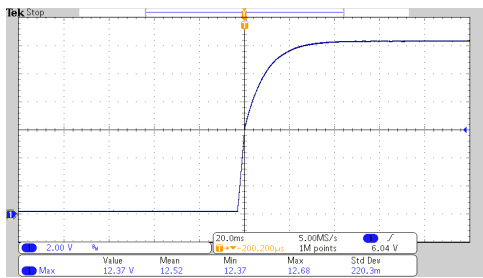


Fig.8 90Vac / 60Hz, Overshoot @ No Load

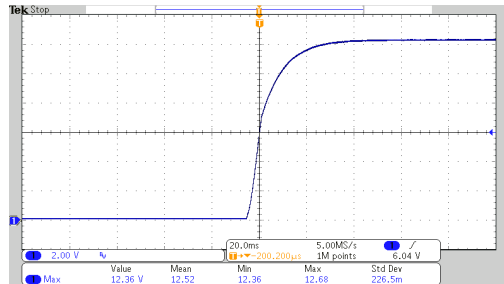


Fig.9 90Vac / 60Hz, Overshoot @ Full Load

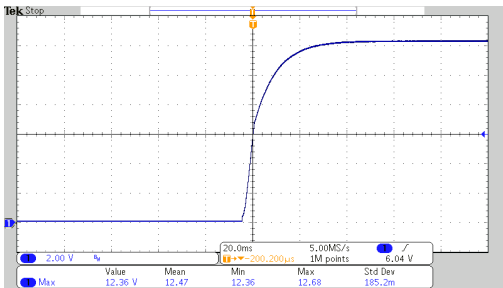


Fig.10 264Vac/50Hz, Overshoot @ Full Load

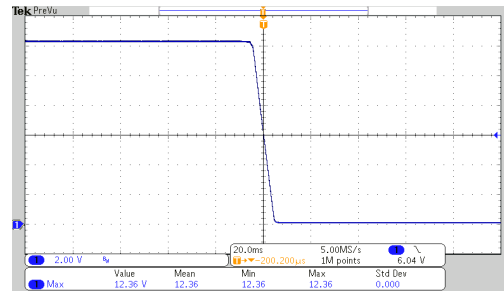


Fig.11 90Vac/60Hz, Under shoot @ Full Load

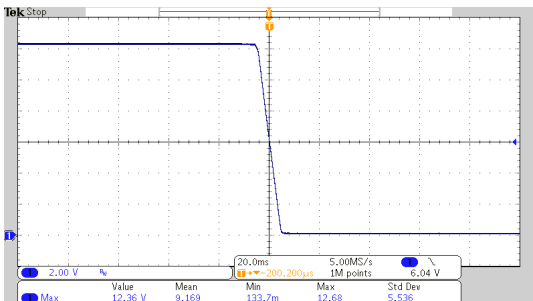


Fig.12 264Vac/50Hz, Undershoot @ Full Load



36W Open Frame Module Using UCS1655S

3.2.4 Dynamic Test

The High Level ;Low level switching time is set to 50ms each.

Table 10 Dynamic Test

Input Voltage	Output (mV)	Io(A):Low-High	Remark
90Vac/60Hz	202	0-1.5	Fig.13
90Vac/60Hz	220	1.5-3	Fig.14
264Vac/50Hz	194	0-1.5	Fig.15
264Vac/50Hz	184	1.5-3	Fig.16

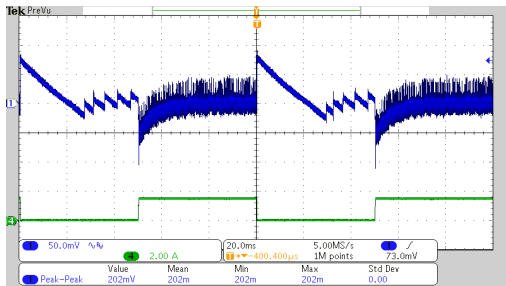


Fig. 13 90Vac / 60Hz Dynamic Test
CH1:Vo(AC), CH4:I_o

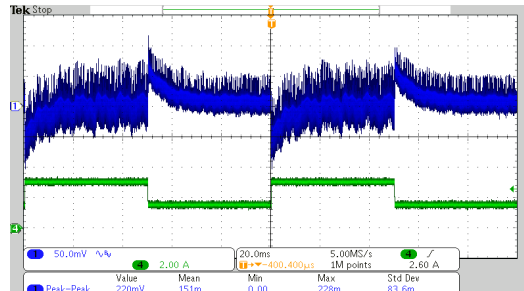


Fig. 14 90Vac / 60Hz Dynamic Test
CH1:Vo(AC), CH4:I_o

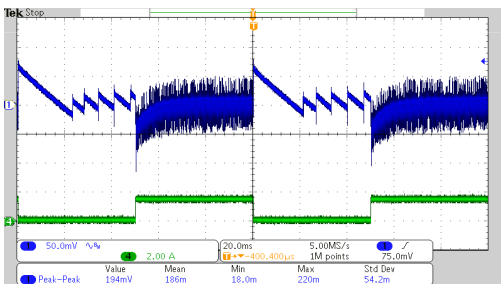


Fig. 15 264Vac / 50Hz Dynamic Test
CH1:Vo(AC), CH4:I_o

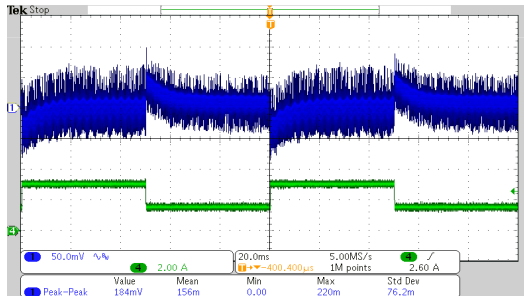


Fig. 16 264Vac / 50Hz Dynamic Test
CH1:Vo(AC), CH4:I_o

3.2.5 Time Sequence

Table 11 Time Sequence (Test at full load)

Item	Input Voltage	Meas. Data	Remark	Result
Turn on Delay Time	100Vac/60Hz	664ms	Fig. 15	Ref
	240Vac/50Hz	660ms	Fig. 16	Ref
Hold-UpTime	100Vac/60Hz	9.6ms	Fig. 17	Ref
	240Vac/50Hz	848ms	Fig. 18	Ref
Rise Time	100Vac/60Hz	16.07ms	Fig. 19	Ref
	240Vac/50Hz	15.98ms	Fig. 20	Ref
Falling Time	100Vac/60Hz	7.245ms	Fig. 21	Ref
	240Vac/50Hz	7.321ms	Fig. 22	Ref



36W Open Frame Module Using UCS1655S

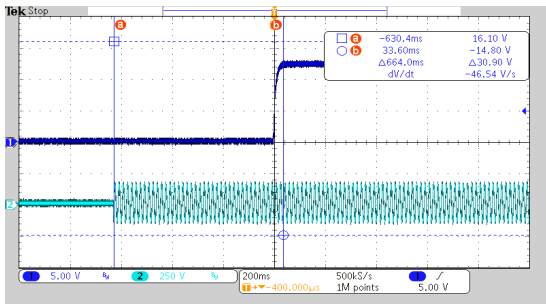


Fig. 15 100Vac/60Hz, Full Load Turn-on Delay Time
CH1=Vout, CH2=AC Input

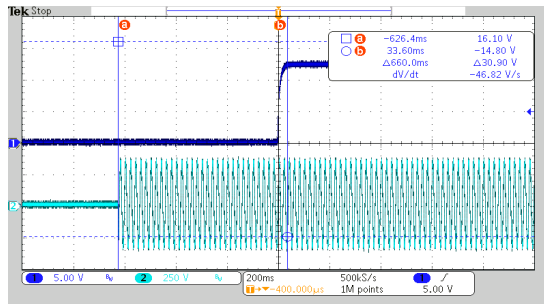


Fig. 16 180Vac/50Hz, Full load Turn-on Delay Time
CH1=Vout, CH2=AC Input

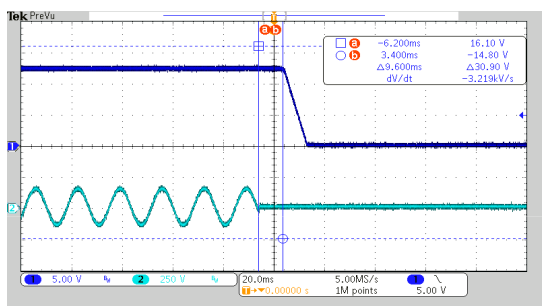


Fig. 17 100Vac / 60Hz, Full Load Hold-Up Time
CH1=Vout, CH2=AC Input

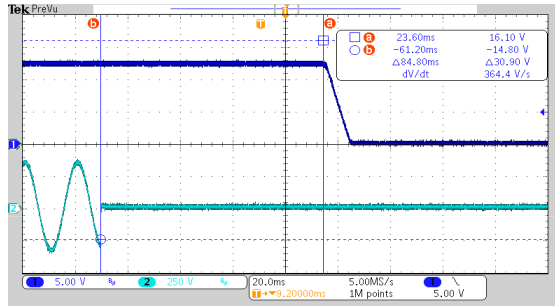


Fig. 18 240Vac / 50Hz, Full Load Hold-Up Time
CH1=Vout, CH2=AC Input

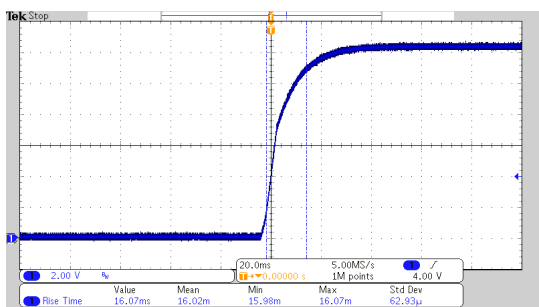


Fig. 19 100Vac/60Hz, Full Load Rising Time

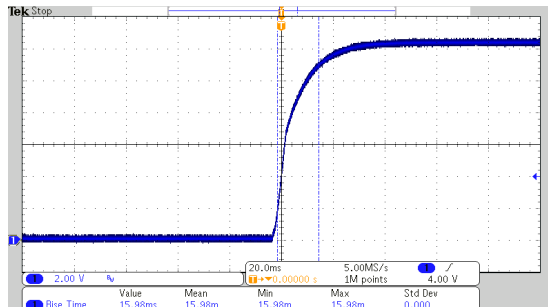


Fig. 20 240Vac/50Hz, Full load Rising Time



36W Open Frame Module Using UCS165S

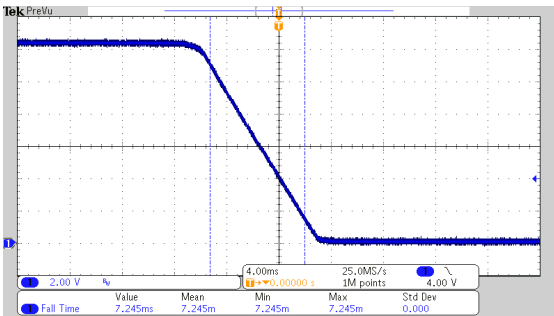


Fig. 21 100Vac/60Hz Full load FallingTime

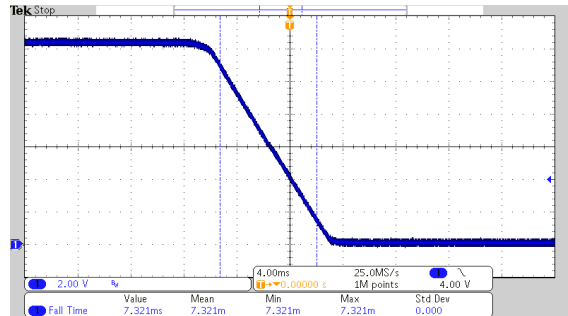


Fig. 22 240Vac/50Hz Full load Falling Time

3.3 Protection

3.3.1 Short Circuit Protection

When short the output voltage, and no parts are damaged. Once Short Circuit condition is removed and the power should recover automatically.

Table 12 Short Circuit Protection

Input Voltage	Protection Mode	Result
90Vac/60Hz	Auto Recovery	PASS
264Vac/50Hz	Auto Recovery	PASS

3.3.2. Over Voltage Protection (OVP)

When Over Voltage Protection condition is removed and the power automatically recover.

Table 13 OVP

Input Voltage	Protection Mode	Vo	Remark	Test condition
115Vac/60Hz	Auto Recovery	15V	Fig. 23	U3(Pin1-Pin2) to short
230Vac/50Hz	Auto Recovery	15.4V	Fig. 24	

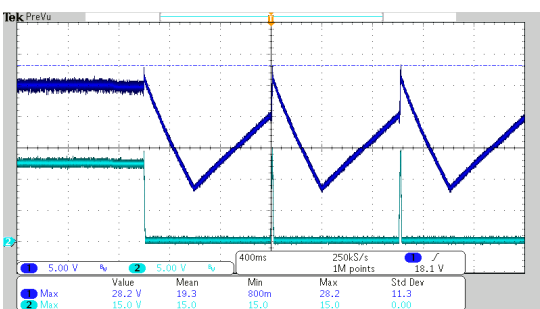


Fig 23. 115Vac/60Hz OVP (Full Load)
CH1: Vcc, CH2: Vo

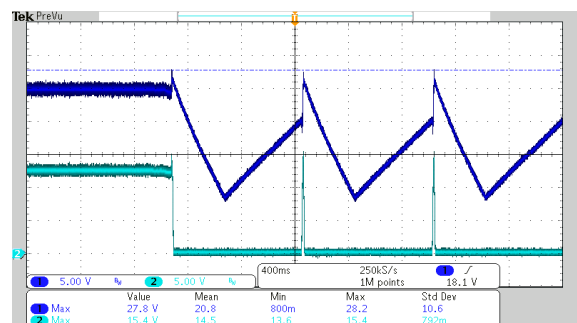


Fig 24 230Vac/50Hz OVP (Full load)
CH1: Vcc, CH2: Vo



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3.3.3 Over load Protection

When over load condition is removed and the power automatically recover.

3.3.3.1 Over load Protection

Table 14 OLP

Input Voltage	OLP(A)	Over Rating	Remark
90Vac/60Hz	3.38	113%	
115Vac/60Hz	3.64	121%	
180Vac/50Hz	3.82	127%	
230Vac/50Hz	3.95	132%	
264Vac/50Hz	3.97	132%	

3.3.4 Thermal Testing

Table 15 Thermal Testing

Input Voltage	AMB	U1(°C)	T1 Wire(°C)	T1 Core(°C)	D5(°C)
90Vac/60Hz	25°C	72.5	57.8	52.5	78.6
115Vac/60Hz		62.4	56.5	53.4	79.9
230Vac/50Hz		53.5	60.2	59.2	84.1
264Vac/50Hz		56.7	60.8	59.3	84.1



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4. Other Important Waveforms

4.1.1. Waveform from Top to Bottom :Vds;Vcc;Vfb@90Vac/60Hz, No Load

Measuring Data:Vds=272Vmax;Vcc=17.7V;Vfb=1.79V; Frequency:27.62KHz(burst mode)

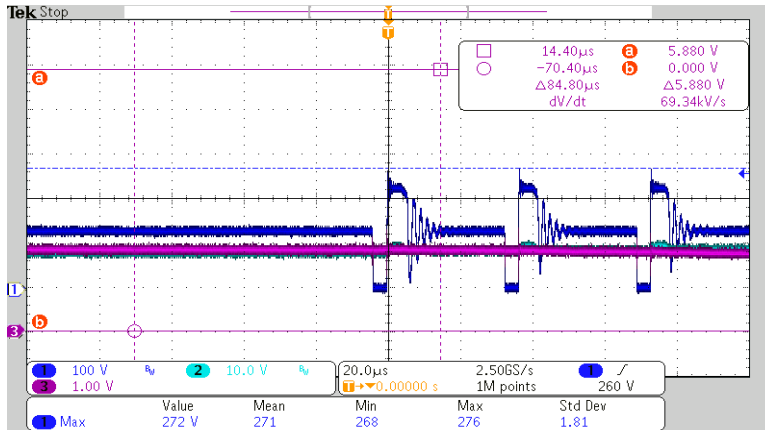


Fig.25 Vds;Vcc;Vfb @90Vac/60Hz, No Load

4.1.2. Waveform from Top to Bottom :Vds;Vcc;Vfb @90Vac/60Hz,Full Load

Measuring Data:Vds=296Vmax; Vcc=25.6V;Vfb=3.07V; Frequency:66.67KHz

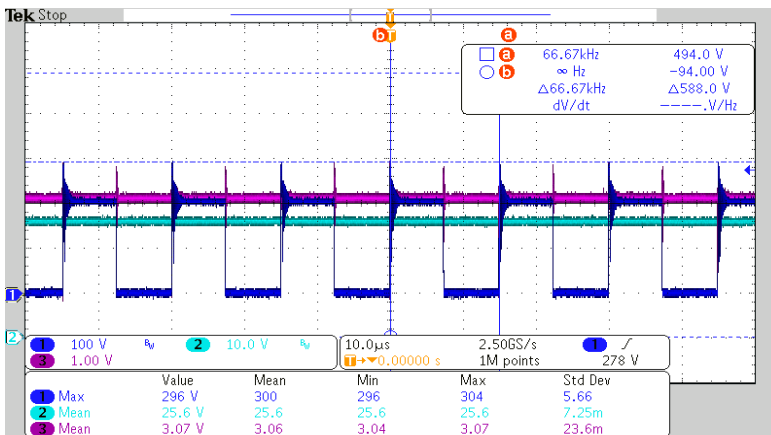


Fig. 26 Vds;Vcc;Vfb @90Vac/60Hz,Full Load

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4.1.3. Waveform from Top to Bottom :Vds;Vcc;Vfb@264Vac/50Hz,No Load

Measuring Data:Vds=528Vmax;Vcc=17.6V;Vfb=1.78V; Frequency:28.41KHz(burst mode)

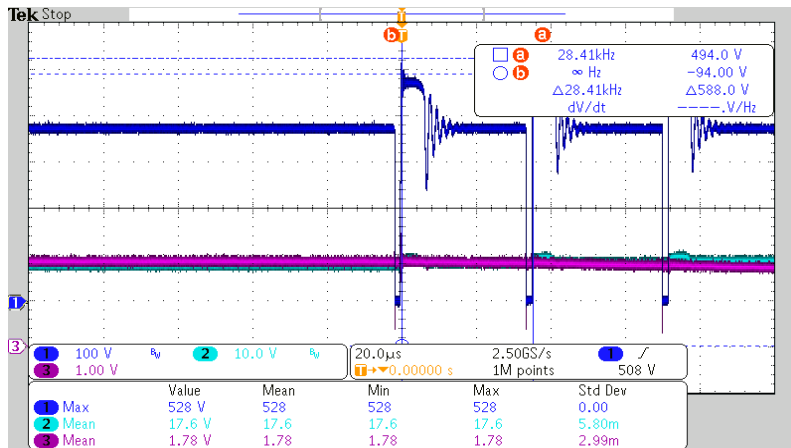


Fig.27 Vds;Vcc;Vfb 264Vac/50Hz, No load

4.1.4 Waveform fromTop to Bottom :Vds;Vcc;Vfb@ 264Vac/50Hz, Full Load

Measuring Data:Vds=552Vmax;Vcc=25.3V;Vfb=2.67V; Frequency:65.36KHz

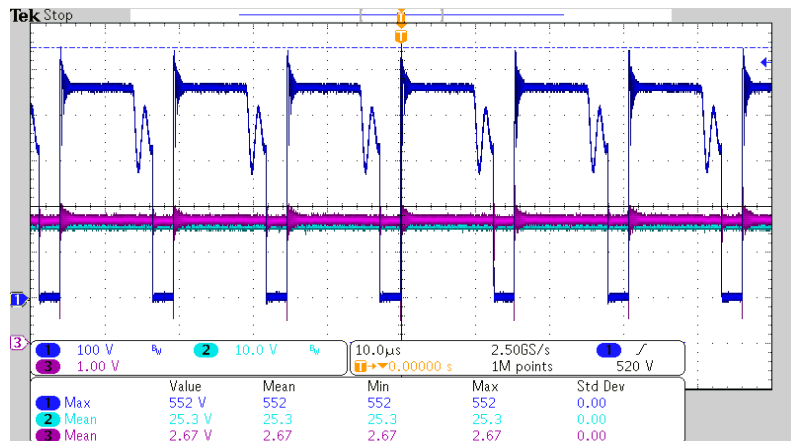


Fig.29 Vds;Vcc;Vfb 264Vac/50Hz, Full Load



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4.2. Waveform at Full Load, Operating Start / Normal / Output Short to Ground .

Table 26 Measuring Data at Full Load, Operating Start/ Normal / Output Short Test.

Test Item	Input voltage	U1,Vds(Max)	D5(Max)	Remark
Start at full load	264V/50HZ	556	66.2	Fig 30
Normal at full load	264V/50HZ	560	65.4	Fig 31
Short at full load	264V/50HZ	484	65.2	Fig 32

4.2.1. Start up at Full Load Waveform from Top to Bottom :U1,Vds(Max);D5,(Max)

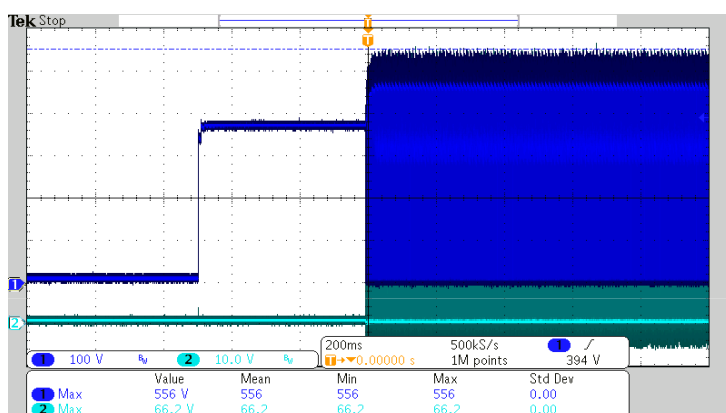


Fig.30 264Vac / 50Hz, Start up at Full load. U1,Vds(max);D5(Vmax)

4.2.2. Normal Full Load Waveform from Top to Bottom: U1,Vds(Max);D5,(Max)

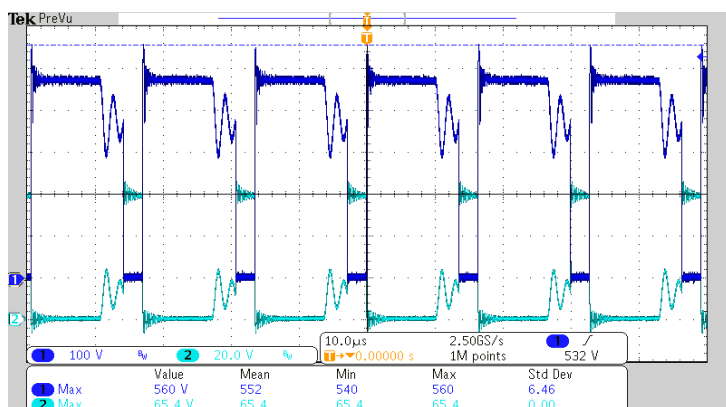


Fig.31 264Vac / 50Hz, Normal Full Load. U1,Vds(max);D5(Vmax)



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4.2.3 Output Short to Ground Waveform from Top to Bottom: U1, Vds(Max); D5,(Max)

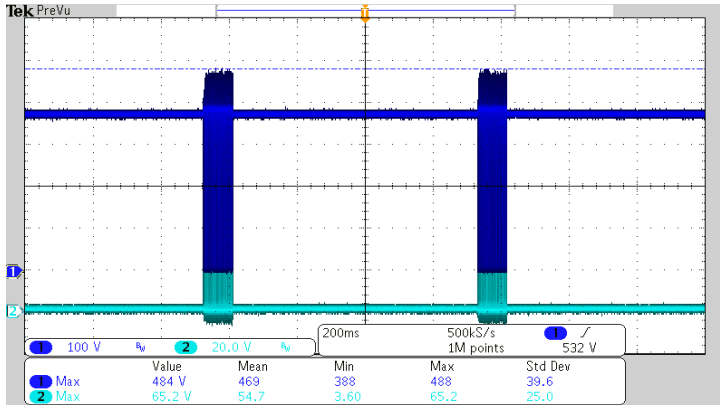


Fig.32 264Vac / 50Hz, Output Short to Ground at Full Load. U1, Vds(Max); D5,(Max)

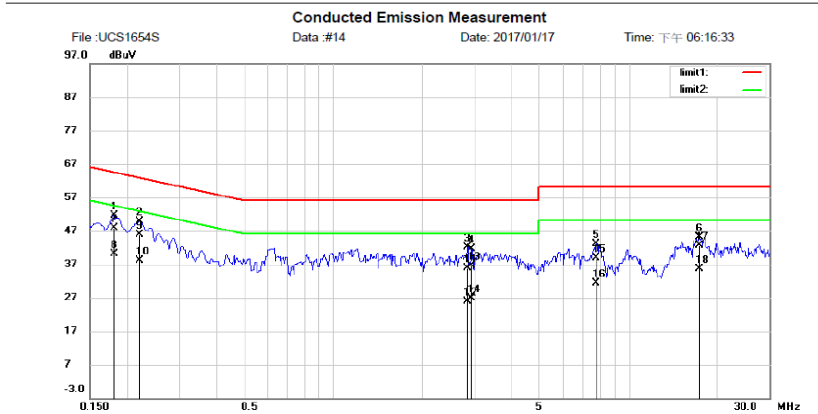
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5. EMI test

5.1 Conduction

5.1.1 input 110VAC/60HZ Line

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File : UCS1654S Data : #14 Date : 2017/01/17 Time : 下午 06:16:33

Site Site #1 Phase: **L1** Temperature: 25 °C
 Limit: EN55022 Class B Conduction(QP) Power: AC 110V/60Hz Humidity: 54 %
 EUT:
 M/N:
 Mode:
 Note:

No.	Mk.	Freq. (MHz)	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1797	49.90	1.79	51.69	64.50	-12.81	peak	
2		0.2208	48.00	1.79	49.79	62.79	-13.00	peak	
3		2.8478	32.03	10.20	42.23	56.00	-13.77	peak	
4		2.9261	31.50	10.20	41.70	56.00	-14.30	peak	
5		7.7717	32.09	11.05	43.14	60.00	-16.86	peak	
6		17.3370	30.31	14.80	45.11	60.00	-14.89	peak	
7		0.1797	46.11	1.79	47.90	64.50	-16.60	QP	
8		0.1797	38.31	1.79	40.10	54.50	-14.40	AVG	
9		0.2208	44.01	1.79	45.80	62.79	-16.99	QP	
10		0.2208	36.21	1.79	38.00	52.79	-14.79	AVG	
11		2.8478	25.60	10.20	35.80	56.00	-20.20	QP	
12		2.8478	15.60	10.20	25.80	46.00	-20.20	AVG	

*:Maximum data x:Over limit !:over margin •Reference Only
 Receiver: Spectrum Analyzer: N9320B
 L.I.S.N: 192.168.1.5 Engineer Signature:
 Pulse limiter:
 File : UCS1654S\Data : #14 Page : 1

Site Site #1 Phase: **L1** Temperature: 25 °C
 Limit: EN55022 Class B Conduction(QP) Power: AC 110V/60Hz Humidity: 54 %
 EUT:
 M/N:
 Mode:
 Note:

No.	Mk.	Freq. (MHz)	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
13		2.9261	26.50	10.20	36.70	56.00	-19.30	QP	
14		2.9261	16.60	10.20	26.80	46.00	-19.20	AVG	
15		7.7717	27.85	11.05	38.90	60.00	-21.10	QP	
16		7.7717	20.25	11.05	31.30	50.00	-18.70	AVG	
17		17.3370	27.00	14.00	42.00	60.00	-17.40	QP	
18		17.3370	20.70	14.80	35.50	50.00	-14.50	AVG	

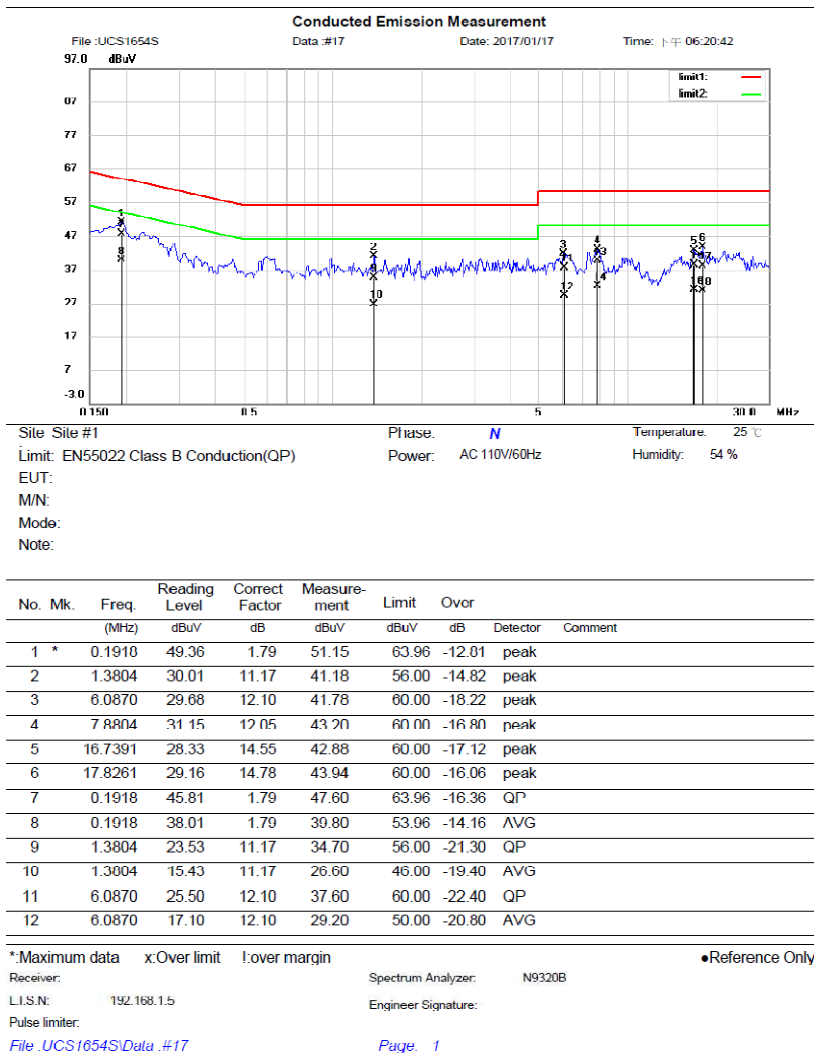


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36W Open Frame Module Using UCS1655S

5.1.2 input 110VAC/60HZ Neutral

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Site: Site #1 Phase: **N** Temperature: 25 °C
 Limit: EN55022 Class B Conduction(QP) Power: AC 110V/60Hz Humidity: 54 %
 EUT:
 M/N:
 Mode:
 Note:

No.	Mk.	Freq. (MHz)	Reading Level (dBuV)	Correct Factor (dB)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector	Comment
13		7.8804	27.45	12.05	39.50	60.00	-20.50	QP	
14		7.8804	20.15	12.05	32.20	50.00	-17.80	AVG	
15		16.7391	23.85	14.55	38.40	60.00	-21.60	QP	
16		16.7391	16.35	14.55	30.90	50.00	-19.10	AVG	
17		17.8261	23.22	14.78	38.00	60.00	-22.00	QP	
18		17.8261	15.72	14.78	30.50	50.00	-19.50	AVG	

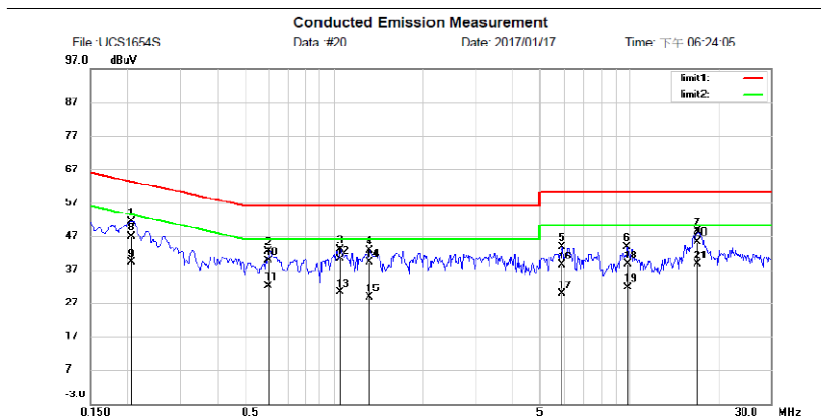


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36W Open Frame Module Using UCS1655S

5.1.3 input 220VAC/60HZ Line

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File: UCS1654S Data: #20 Date: 2017/01/17 Time: 下午 06:24:05
 Site: Site #1 Phase: **L1** Temperature: 25 ℃
 Limit: EN55022 Class B Conduction(QP) Power: AC 220V/60Hz Humidity: 54 %
 EUT:
 M/N:
 Mode:
 Note:

No.	Mk.	Freq. (MHz)	Reading Level (dBuV)	Correct Factor (dB)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector	Comment
1		0.2055	49.63	1.79	51.42	63.38	-11.96	peak	
2		0.6076	37.32	5.24	42.56	56.00	-13.44	peak	
3		1.0478	31.40	11.68	43.08	56.00	-12.92	peak	
4		1.3217	31.70	11.27	42.97	56.00	-13.03	peak	
5		5.9239	32.66	11.11	43.77	60.00	-16.23	peak	
6		9.8370	32.86	10.99	43.85	60.00	-16.15	peak	
7		17.0652	33.66	14.80	48.46	60.00	-11.54	peak	
8		0.2055	45.01	1.79	46.80	63.39	-16.59	QP	
9		0.2055	37.21	1.79	39.00	53.39	-14.39	AVG	
10		0.6076	34.46	5.24	39.70	56.00	-16.30	QP	
11		0.6076	26.76	5.24	32.00	46.00	14.00	AVG	
12		1.0478	28.42	11.68	40.10	56.00	-15.90	QP	

*:Maximum data x:Over limit !:over margin •Reference Only
 Receiver: Spectrum Analyzer: N9320B
 L.I.S.N.: 192.168.1.6 Engineer Signature:
 Pulse limiter:
 File: UCS1654S\Data :#20 Page: 1

Site: Site #1 Phase: **L1** Temperature: 25 ℃
 Limit: EN55022 Class B Conduction(QP) Power: AC 220V/60Hz Humidity: 54 %
 EUT:
 M/N:
 Mode:
 Note:

No.	Mk.	Freq. (MHz)	Reading Level (dBuV)	Correct Factor (dB)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector	Comment
13		1.0478	18.52	11.68	30.20	46.00	-15.80	AVG	
14		1.3217	27.73	11.27	39.00	56.00	17.00	QP	
15		1.3217	17.43	11.27	28.70	46.00	-17.30	AVG	
16		5.9239	27.29	11.11	38.40	60.00	-21.60	QP	
17		5.9239	18.39	11.11	29.50	50.00	-20.50	AVG	
18		9.8370	27.61	10.99	38.60	60.00	-21.40	QP	
19		9.8370	20.61	10.99	31.60	50.00	18.40	AVG	
20		17.0652	30.60	14.80	45.40	60.00	-14.60	QP	
21	*	17.0652	23.90	14.80	38.70	50.00	-11.30	AVG	



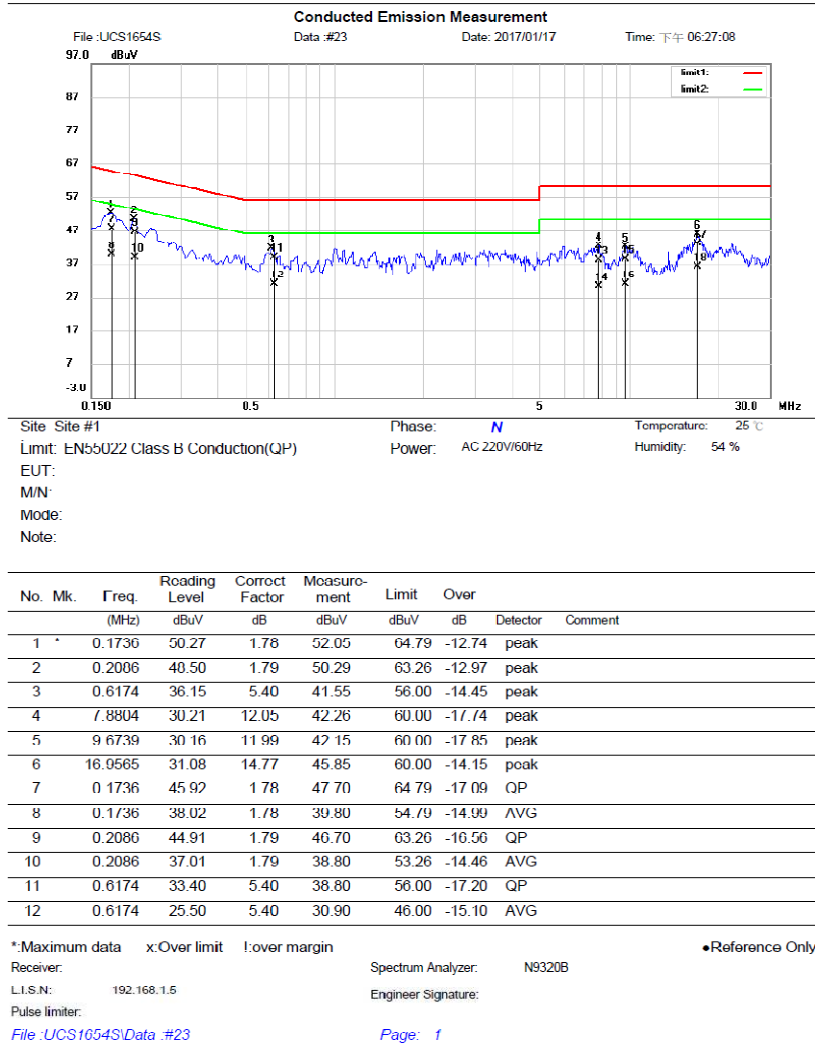
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36W Open Frame Module Using UCS1655S

5.1.4 input 220VAC/60HZ Neutral

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Site Site #1 Phase: **N** Temperature: 25 °C
Limit: EN55022 Class B Conduction(QP) Power: AC 220V/60Hz Humidity: 54 %
EUT:
M/N:
Mode:
Note:

No.	Mk.	Freq. (MHz)	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
13		7.8804	26.05	12.05	38.10	60.00	-21.90	QP	
14		7.8804	17.95	12.05	30.00	50.00	-20.00	AVG	
15		9.6739	26.31	11.99	38.30	60.00	-21.70	QP	
16		9.6739	18.91	11.99	30.90	50.00	-19.10	AVG	
17		16.9565	28.23	14.77	43.00	60.00	-17.00	QP	
18		16.9565	21.33	14.77	36.10	50.00	-13.90	AVG	