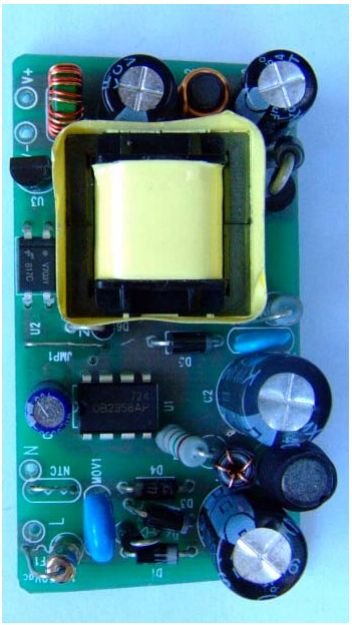
Subject

OB2358 Demo Board Manual

Board Model: AD12V1A2358.00

Doc. No.: OB_DOC_DBM_2358A2



Key features:

- Standby Power ＜ 0.30W
- Soft start to relax external component rating requirement
- OCP with line compensation
- Frequency shuffling technology for improved EMI performance
- OCP/OVP/OLP/ SCP Protection Features
- Audio noise free operation
- Passed EN55022 Class B & FCC Part Class B

Revision History

Revise Date	Version	Reason/Issue
2007-09-28	A0	First issue
2008-03-03	A1	Update schematic, Bill of material
2008-05-22	A2	Update Bill of material（LF1 or Cancel）and EMI report Page10：CEC test report in Lin END.

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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

1.2. Output Characteristics

■Output Voltage	12V
■Output Tolerance	5%
■Min. load current	0A
■Max. load current	1.0A

1.3. Performance Specifications

■Max. Output Power	12W
■Standby Power	<0.3W @ 264V/50Hz, no load, 25℃
■Efficiency	>75% @Ave. 25/50/75/100%Load, normal line, 25℃
■Line Regulation	1% Max
■Load Regulation	5% Max
■Ripple & Noise	100 mV Max
■Hold up Time	10m Sec. Min. @100Vac with full load
■Turn on Delay Time	2 Sec. Max. @100Vac with full load

1.4. Protection Features

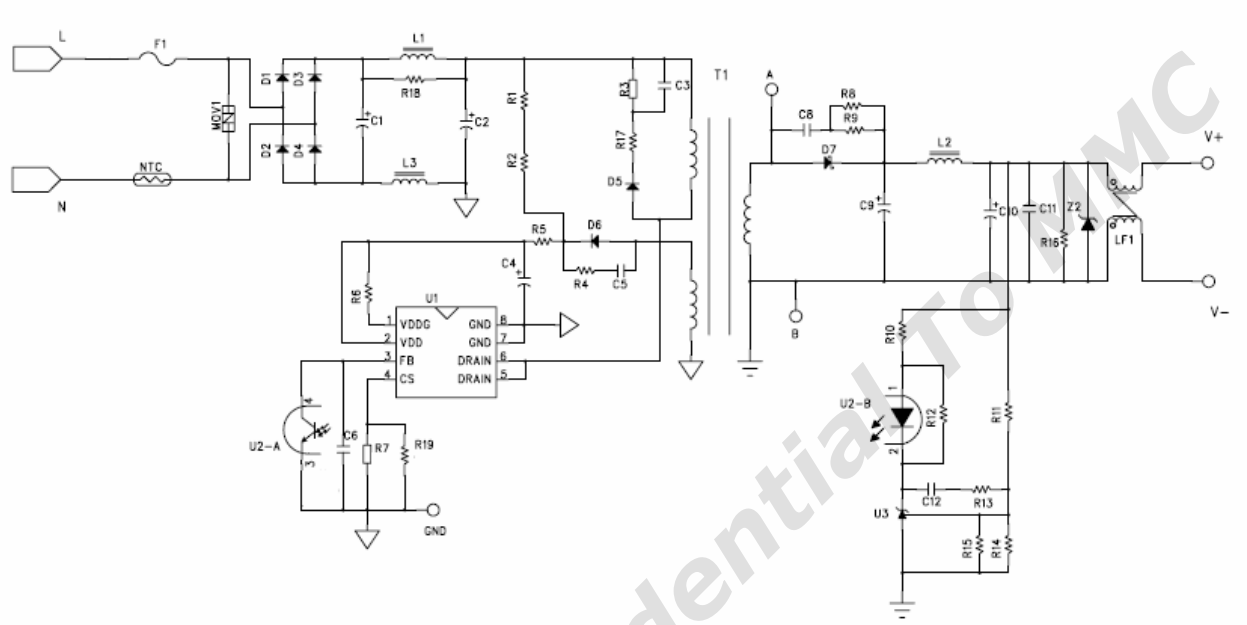
■Short circuit Protection	Output shut down with automatic recovery
■Over Voltage Protection	Output shut down with automatic recovery
■Over Load Protection	Output shut down with automatic recovery

1.5. Environments

■Operating Temperature	0℃ to +40℃
■Operating Humidity	20% to 90% R.H.
■ Storage Temperature	-40℃ to +60℃
■ Storage Humidity	0% to 95% R.H.

2. Adapter Module Information

2.1.Schematic

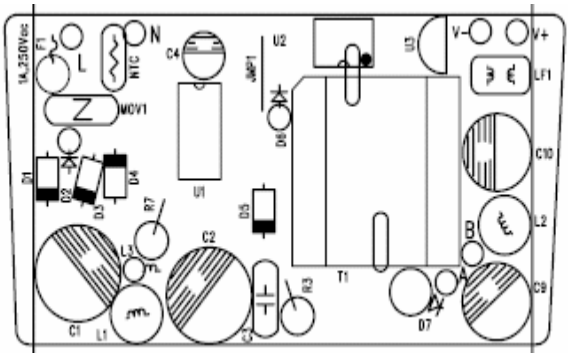


2.2.Bill of material

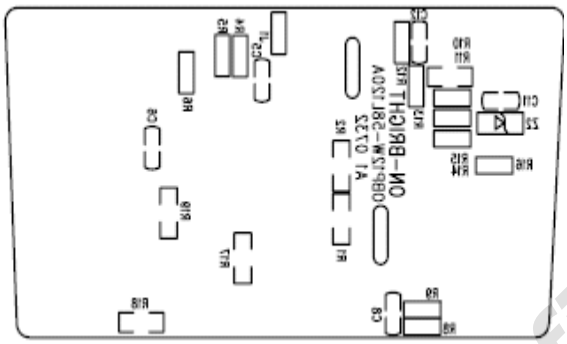
No.	Position	Description	Quantity	Remark
1	L,N	IEC-6 2Pin Socket	1	
2	V+,V-	Output cable 22AWG 1.2M	1	
3	F1	FUSE,T1AH/250V	1	
4	MOV1	MOVR 07D471K	1	
5	T1	Transformer EF20 132:18:23　2.4mH	1	
6	LF1	Filter;od:6.1/id:2.8/h:3.3 Φ0.45*2/9T, L=180uH Min Or N.C. （Or Cancel---JUMP 2pcs）	1	
7	L1	Chock, DR6*8, Φ0.20x170T,600uH MIN	1	
8	L2	Chock,Φ0.7x10.5T,1.7uH MIN	1	
9	L3	Bead core（gap）：Φ0.25x4T	1	
10	C1,C2	E.C 10uF 400V	2	
12	C3	C.C 222P 1KV DIP	1	
12	C4	E.C 10uF 50V DIP	1	
13	C5	SMD 360pF 50V 0805	1	
14	C6	SMD 10nF 50V 0805	1	
15	C8	SMD 102P 50V 0805	1	
16	C9,C10	E.C 470uF 16V Low ESR	2	
17	C12	SMD 22nF 50V 0805	1	
18	R1,R2	SMD 1M 5% 1206	2	

19	R3	CFR 100K 5% 1W	1	
20	R4	SMD 62Ω 5% 0805	1	
21	R5	SMD 5Ω1 5% 0805	1	
22	R6	SMD 1K 5% 0805	1	
23	R7	CFR 1.5Ω 5% 1W	1	
24	R19	SMD 10Ω 5% 1206	1	
25	R9	SMD 10Ω 5% 0805	1	
26	R10	SMD 270Ω 5% 1206	1	
27	R11	SMD 39K 5% 0805	1	
28	R12	SMD 2K 5% 0805	1	
29	R13,R14	SMD 10K 5% 0805	2	
30	R17	SMD 0R 5% 1206	1	
31	R18	SMD 2.4K 5% 1206	1	
32	R8,R15,R16,C11,Z2	NC	0	
31	D1-D6	Diode 1N4007	6	
32	D7	SB diode SB3100（for D7 bead core）	1	
33	U1	PWM OB2358 DIP	1	
34	U2	Photo coupler 817C	1	
35	U3	TL431	1	
36	NTC,JMP1	JUMP	2	
37	J1	SMD 0R 5% 0805	1	
38	PCB	OBPD12W-58L120A A1 FR-4,	1	

2.3.PCB Gerber File



Top



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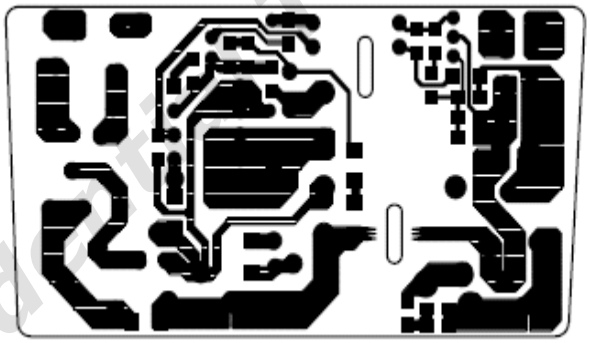
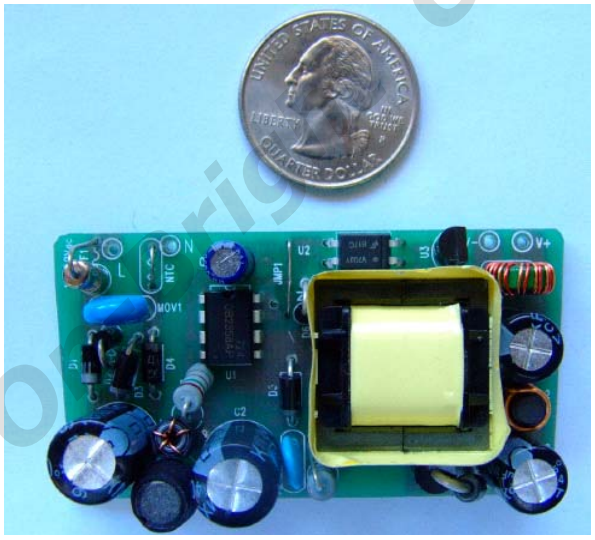
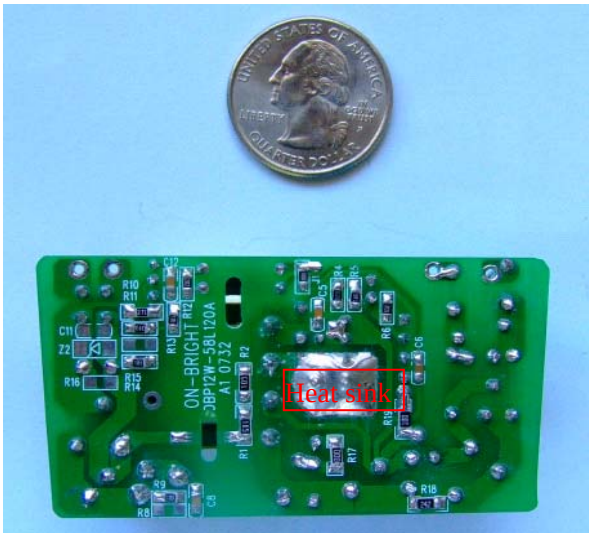


Copper

2.4.Adapter Module Snapshot





2.5.Transformer design

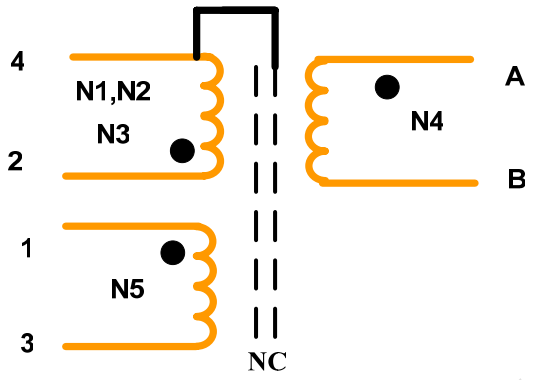
2.5.1.Transformer Specification

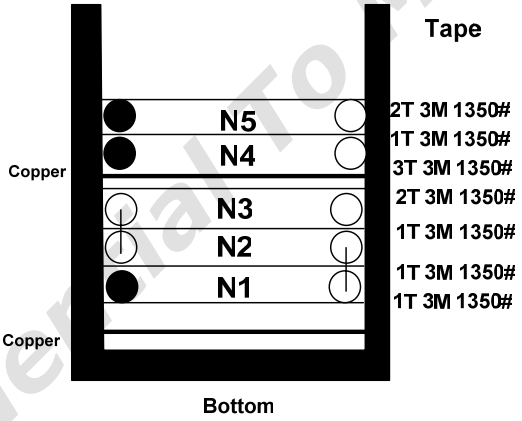
1) Bobbin: EF20 (8Pin)

2) Core material: PC40 (TDK).

3) L(2-4) = 2.4mH+/-3% (10KHz,1V,25℃)

2.5.2.Structure/Material





Winging	Material	Start	Turns	Finish
COPPER	W=12mm	4		
TAPE	TAPE W=12mm (Y)		1	
N1	0.23Φ*1 2UEW	2	44	C
TAPE	TAPE W=12mm (Y)		1	
N2	0.23Φ*1 2UEW	C	44	D
TAPE	TAPE W=12mm (Y)		1	
N3	0.23Φ*1 2UEW	D	44	4
TAPE	TAPE W=12mm (Y)		2	
COPPER	W=12mm	4		
TAPE	TAPE W=12mm (Y)		3	
N4	0.45Φ*1 三层绝缘线	A	18	B
TAPE	TAPE W=12mm (Y)		1	
N5	0.21Φ*2 2UEW	1	23	3
TAPE	TAPE W=12mm (Y)		2	

3. Performance Evaluation

This session presents the test results of OBPD12W module up to date. Results on inrush current and safety test are not included and will be added when they become available.

Overall, the module meets design specifications. All data was measured at board Lin（AWG22# 1.5m）end.

Performance Highlights

- The standby power is about 0.23W @ 264Vac/50HZ no load.
- The average efficiency more than 75% @25/50/75/100% load, normal line.
- EMI passed EN55022 and FCC15 Class B test with more than 6dB margin.

Characterization Results Summary

Test Item	Test result
1. Input characteristics	
Input current (90V/60Hz, full load)	0.32A Max
Standby power at no load (264Vac,)	0.23W
Average Efficiency (264Vac, 25%/50%/75%/100%)	80%
2 .Output characteristics	
Line regulation	1%
Load regulation	5%
Ripple & noise	100mV Max
Over shoot	5% Max
Under shoot	
Dynamic test	415mV
3. Time sequence (100Vac with Full load)	
Turn on delay time	907.7mS
Hold up time	23.33mS
Rise time	7.90mS
Fall time	11.20mS

Test Equipments

Item	Vender	Module
AC Source	WEST	WEW1010
Digital Power Meter	YOKOGAWA	WT210
Electrical Load	Prodigit	3315C
Oscilloscope	LeCroy	WS424
Multimeter	VICTORY	VC9807A

3.1. Input Characteristics

3.1.1.Standby power

Table. 1 Standby power

Input voltage	Pin(mW)	Vo(V)	Specification	Test result
90Vac/60HZ	100	12.19	<300mW	Pass
115Vac/60HZ	130	12.19		
230Vac/50HZ	190	12.19		
264Vac/50HZ	228	12.19		

3.1.2.Efficiency

Table. 2 Efficiency

Input voltage	25%	50%	75%	100%	Aver. Eff.	EPS2.0
90Vac/60HZ	79.49	80.60	80.26	79.42	79.94	>77.76%
115Vac/60HZ	78.48	81.65	81.55	80.61	80.57	
230Vac/50HZ	74.41	79.07	80.67	80.40	78.64	
264Vac/50HZ	73.55	78.17	79.38	79.09	77.55	

3.2.Output Characteristics

3.2.1.Line Regulation & Load Regulation

Table. 3 Line Regulation & Load Regulation

Input voltage	No load	Half load	Full load	Specification	Test result
90Vac/60HZ	12.186	12.156	12.138		
115Vac/60HZ	12.186	12.156	12.138		
230Vac/50HZ	12.186	12.156	12.138		
264Vac/50HZ	12.186	12.156	12.138		
Line Regulation	0.000%			<1%	
Load Regulation	0.001%			<5%	

3.2.2.Ripple & Noise

Table. 4 Ripple & Noise

Input voltage	R&N (mV)		
	No load	Full load	Remark
90Vac/60HZ	11.9mV	38mV	Fig. 1,2
115Vac/60HZ	11.2mV	42mV	
180Vac/50HZ	13mV	35mV	
264Vac/50HZ	13mV	36mV	Fig. 3,4

Note: Ripple& noise was measured at board end without probe cap and ground clip. Measurement bandwidth was limited to 20MHZ.

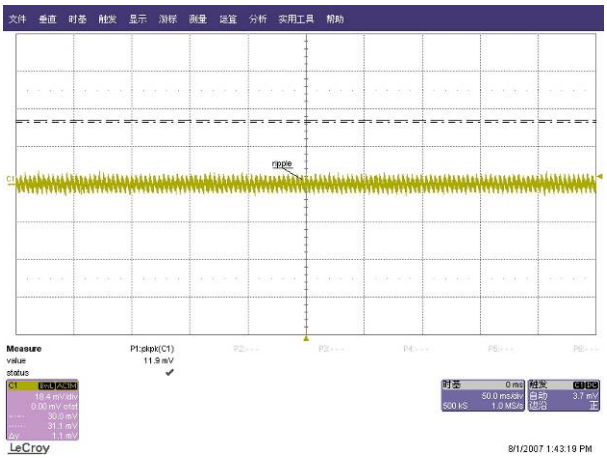


Fig. 1 Measured ripple& noise waveform@90Vac/60HZ, no load.

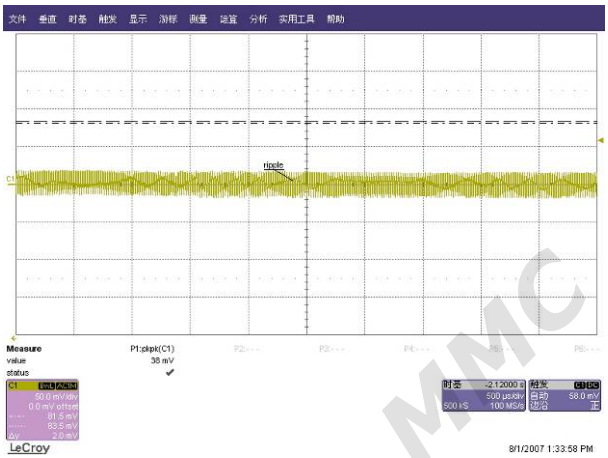


Fig. 2 Measured ripple& noise waveform@90Vac/60HZ, full load.

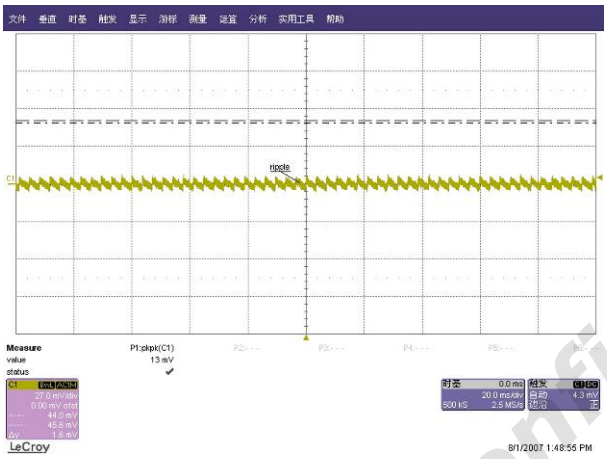


Fig. 3 Measured ripple& noise waveform@264Vac/50HZ, no load

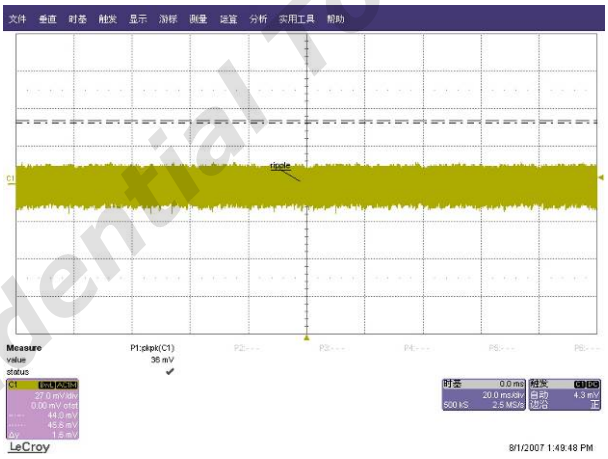


Fig. 4 Measured ripple& noise waveform@264Vac/50HZ, full load

3.2.3.Over shoot & Under shoot

Over shoot and under shoot were measured under below conditions.

a. AC input switch on for over shoot and off for under shoot.

b. Input voltage ranges from 90Vac/60HZ~264Vac/50HZ.

Table. 5 Over shoot & Under shoot measurement results

Input	load		Remark
90V/60HZ	Full load	over shoot	Fig. 5
		under shoot	
	No load	over shoot	Fig. 6
		under shoot	
264V/50HZ	Full load	over shoot	Fig. 7
		under shoot	
	No load	over shoot	Fig. 8
		under shoot	

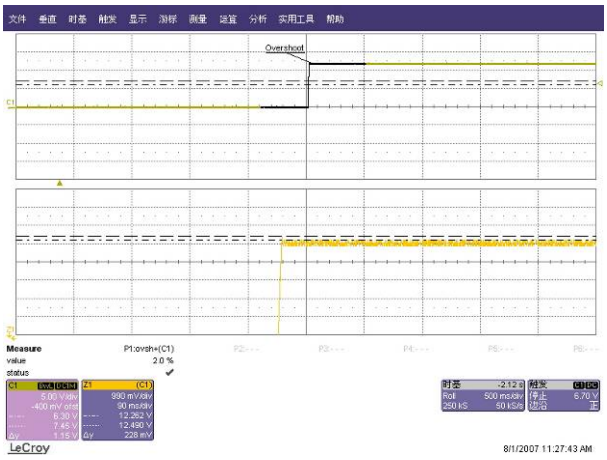


Fig. 5 Measured overshoot waveform@90Vac/60HZ, full load

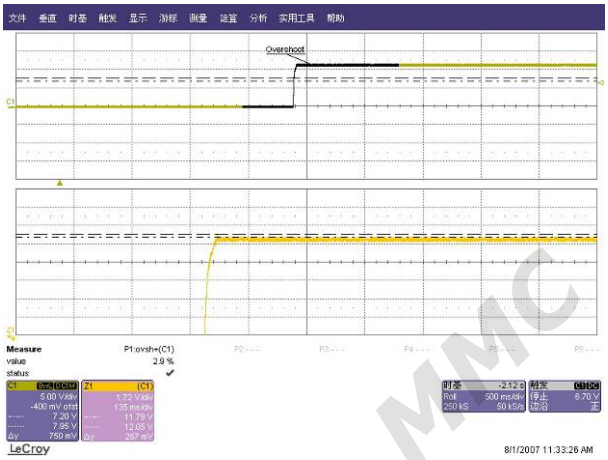


Fig. 6 Measured overshoot waveform@90Vac/60HZ, no load

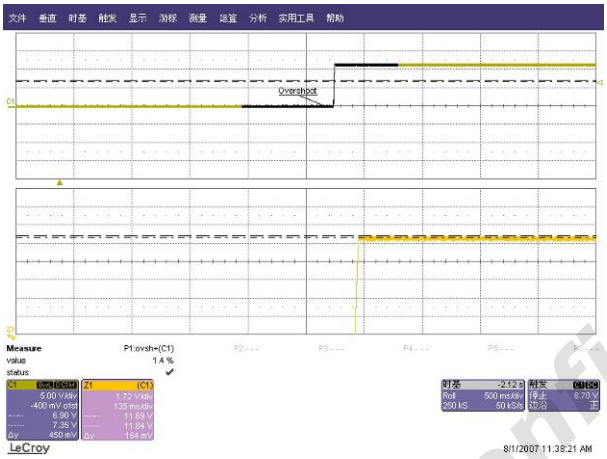


Fig. 7 Measured overshoot waveform@264Vac/50HZ, full load

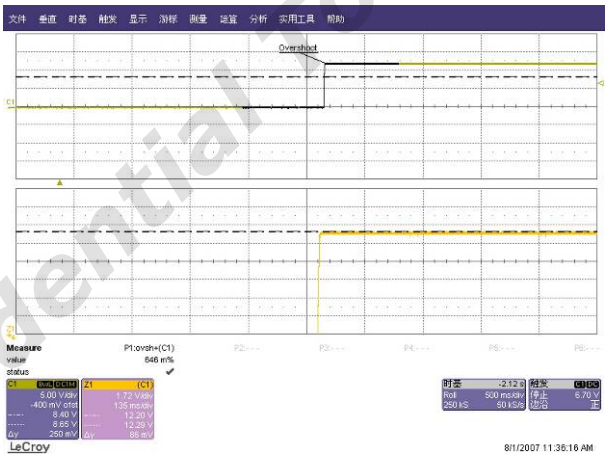


Fig. 8 Measured overshoot waveform@264Vac/50HZ, no load

3.2.4.Dynamic Test

A dynamic loading with low set at 20% load lasting for 50ms and high set at 80% load lasting for 50mS is added to output. The ramp is set at 0.25A/us at transient. Measurement was taken at Board end(Same as R&N measurement)

Table. 6 Output voltage under dynamic test

Input	Output (mV)	Remark
264V/50HZ	469mV	Fig. 9
180V/50HZ	470mV	
115V/60HZ	476mV	
90V/60HZ	484mV	Fig.10

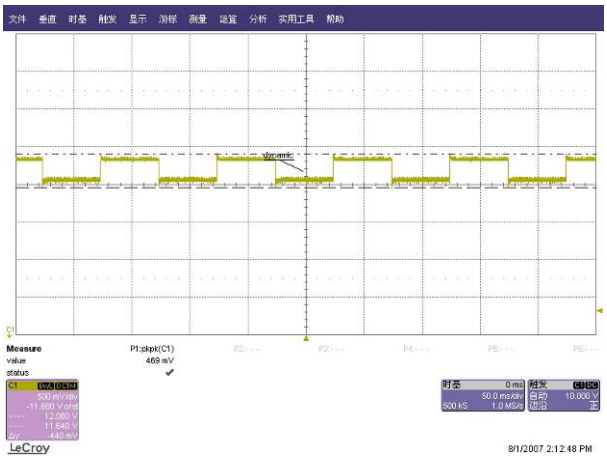


Fig. 9 Output voltage waveform under Dynamic test@264Vac/50HZ

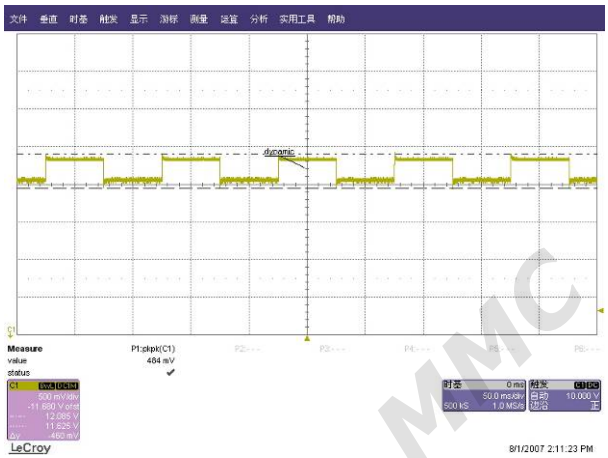


Fig. 10 Output voltage waveform under Dynamic test@90Vac/60HZ

3.2.5.Time Sequence (Full load)

Table. 7 Turn-on delay/hold-up/rise/fall time measurement results

Item	Input voltage	Meas. Data	Test spec.	Test results	Remark
Turn-on delay time	100V/60HZ	907.7mS	<2S	**Pass**	Fig. 11
	240V/50HZ	223.2mS		**Pass**	Fig. 12
Hold-up time	100V/60HZ	23.33mS	>10mS	**Pass**	Fig. 13
	240V/50HZ	75.98mS			
Rise Time	100V/60HZ	12.42mS		**Pass**	Fig. 14
	240V/50HZ	7.90mS		**Pass**	Fig. 15
Fall Time	100V/60HZ	11.21mS		**Pass**	Fig. 16
	240V/50HZ	11.08mS		**Pass**	Fig. 17

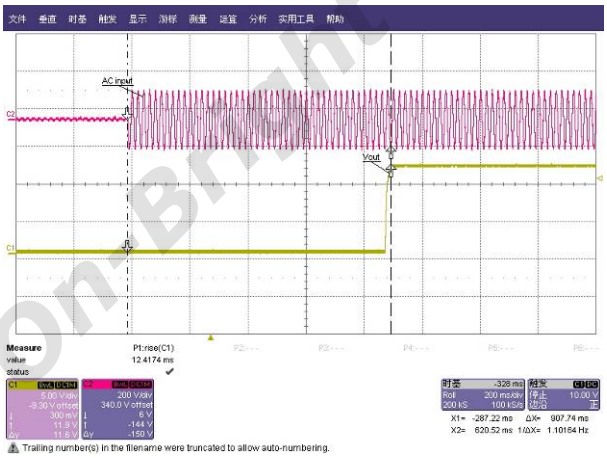


Fig. 11 Turn on delay time measured waveform@100Vac/60HZ,full load

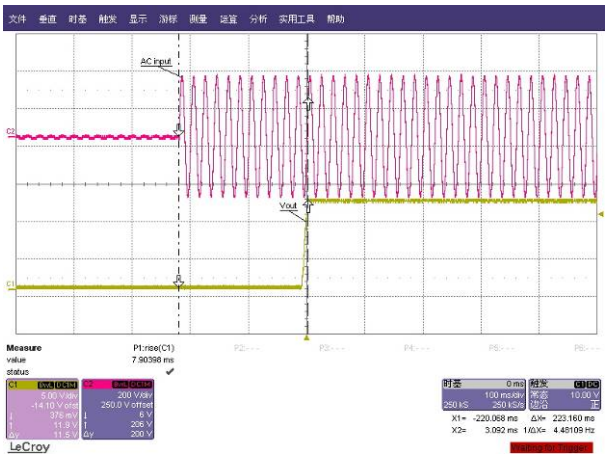


Fig. 12 Turn on delay time measured waveform@240Vac/50HZ,full load

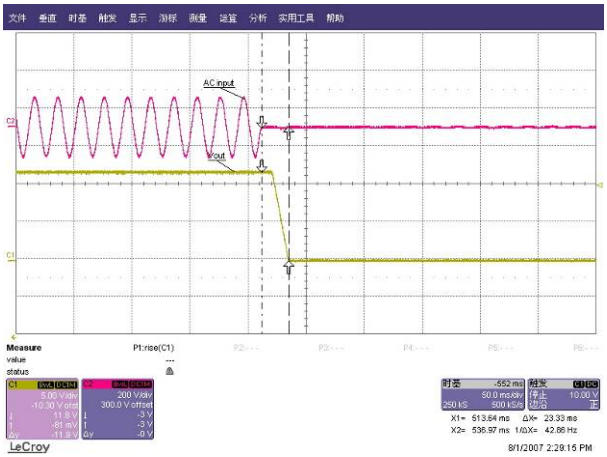


Fig. 13 Hold-up time measured waveform@100Vac/60HZ,full load

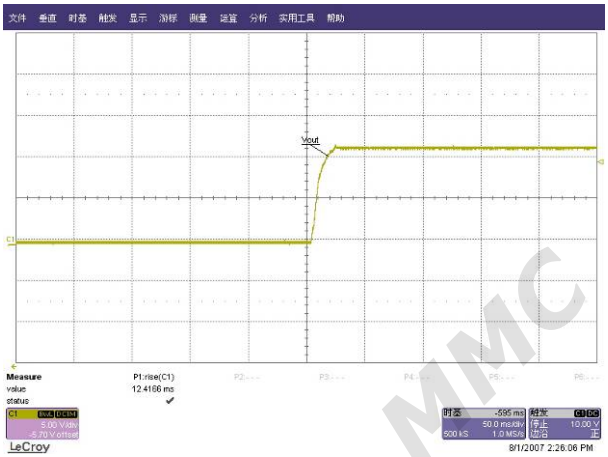


Fig. 14 Rise time measured waveform@100Vac/60HZ,full load

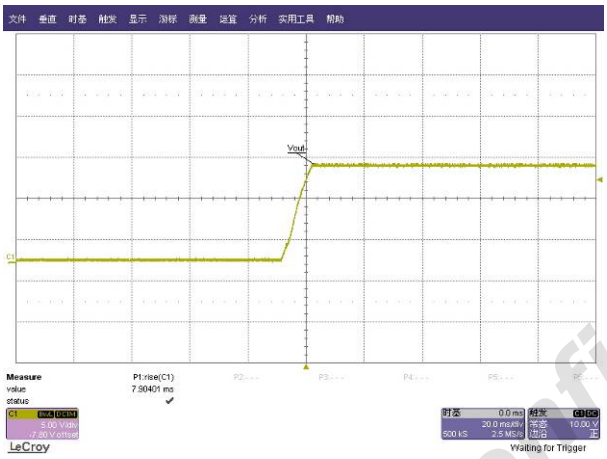


Fig. 15 Rise time measured waveform@240Vac/50HZ,full load

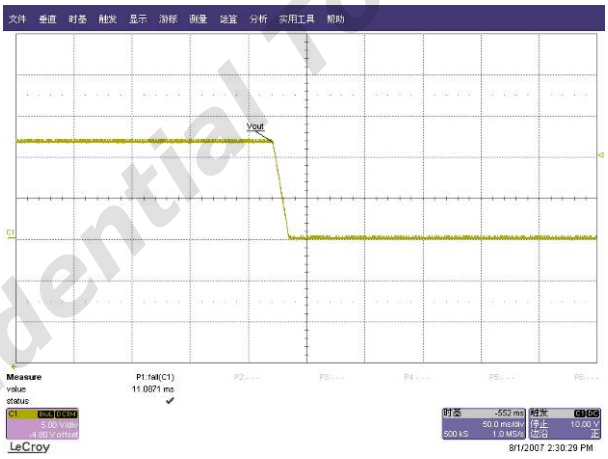


Fig. 16 Fall time measured waveform@100Vac/60HZ,full load

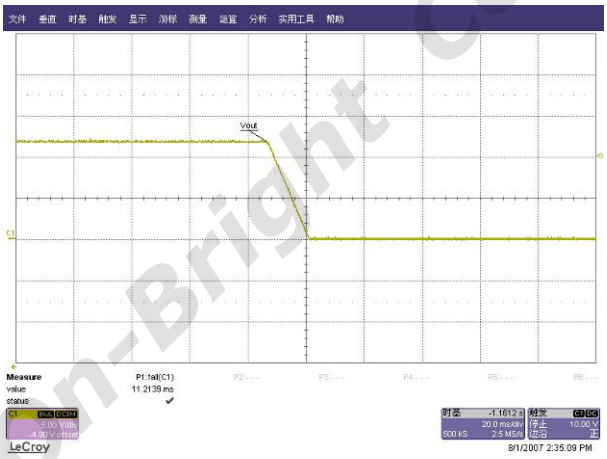


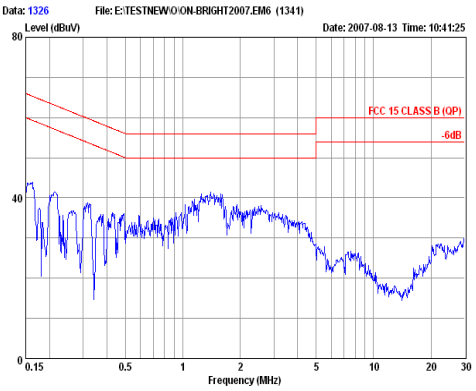
Fig. 17 Fall time measured waveform@240Vac/50HZ,full load

3.3.EMI Test

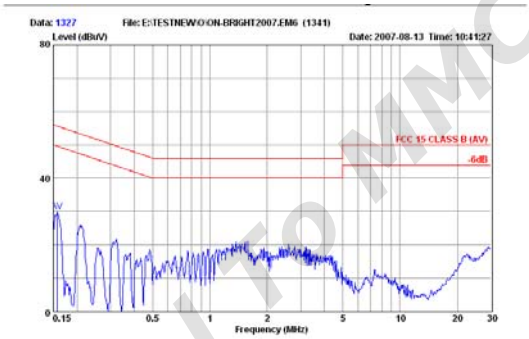
The Power supply passed EN55022 Class B EMI requirement with more than 6dB margin

3.3.1. Conducted EMI Test （LF1 exist）

3.3.1.1 EN55022 CLASS B @ full load report



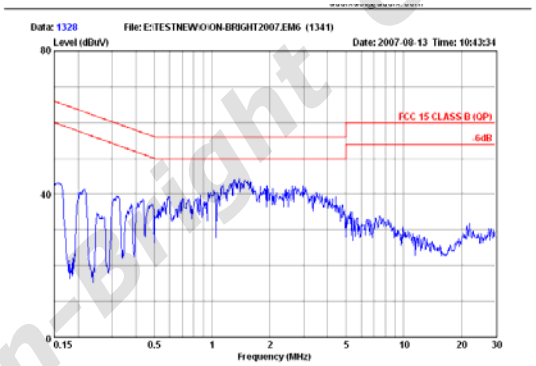
Site	: Audix ACI(Conducted Emission)
Condition	: FCC 15 CLASS B (QP) KNW407-4-07.04.06 VA
Project No.	:
Applicant	:
EUT	: POWER SUPPLY
M/N	: OB2358
S/N	: 12W
Power Supply	: 120V/60Hz
Ambient	: 25℃ 55%RH
Test line	: VA
Test Mode	: FULL LOAD
Test Engineer	: Raven
Memo	:
Memo	:



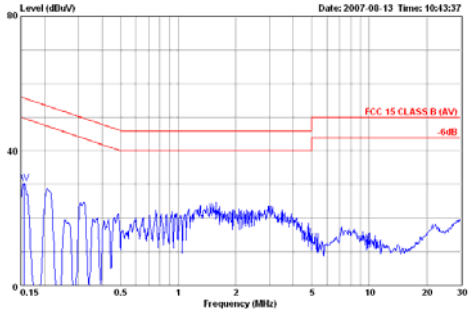
Site	: Audix ACI(Conducted Emission)
Condition	: FCC 15 CLASS B (AV) KNW407-4-07.04.06 VA
Project No.	:
Applicant	:
EUT	: POWER SUPPLY
M/N	: OB2358
S/N	: 12W
Power Supply	: 120V/60Hz
Ambient	: 25℃ 55%RH
Test line	: VA
Test Mode	: FULL LOAD
Test Engineer	: Raven
Memo	:
Memo	:

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	dB	
1	0.16	29.76	-25.84	55.60	29.07	0.69	0.60	0.01	Average

3.3.1.2 FCC CLASS B @ full load report



Site	: Audix ACI(Conducted Emission)
Condition	: FCC 15 CLASS B (QP) KNW407-4-07.04.06 VB
Project No.	:
Applicant	:
EUT	: POWER SUPPLY
M/N	: OB2358
S/N	: 12W
Power Supply	: 120V/60Hz
Ambient	: 25℃ 55%RH
Test line	: VB
Test Mode	: FULL LOAD
Test Engineer	: Raven
Memo	:
Memo	:

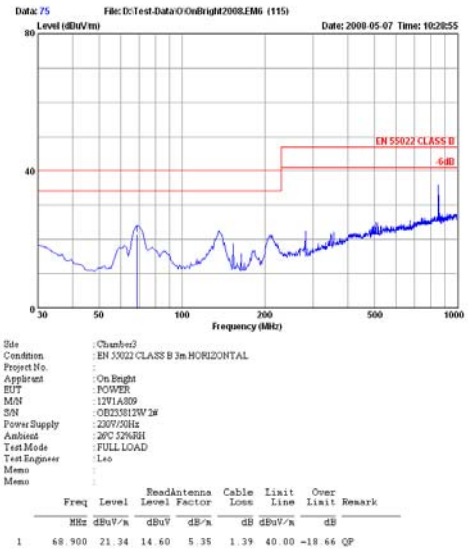


Site	: Audix ACI(Conducted Emission)
Condition	: FCC 15 CLASS B (AV) KNW407-4-07.04.06 VB
Project No.	:
Applicant	:
EUT	: POWER SUPPLY
M/N	: OB2358
S/N	: 12W
Power Supply	: 120V/60Hz
Ambient	: 25℃ 55%RH
Test line	: VB
Test Mode	: FULL LOAD
Test Engineer	: Raven
Memo	:
Memo	:

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	dB	
1	0.16	30.23	-25.46	55.69	29.52	0.71	0.70	0.01	Average

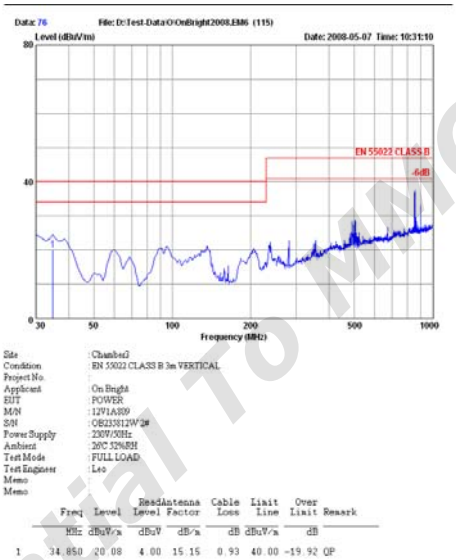
3.3.2. Radiation EMI Test （LF1 exist）

3.3.2.1.EN55022 CLASS B @ full load report



Site	: Chamber3
Condition	: EN 55022 CLASS B 3m HORIZONTAL
Project No.	:
Applicant	: On Bright
EUT	: POWER
M/N	: 12V1A809
S/N	: OB235812W 2#
Power Supply	: 230V/50Hz
Ambient	: 26C 52%RH
Test Mode	: FULL LOAD
Test Engineer	: Leo
Memo	:
Memo	:

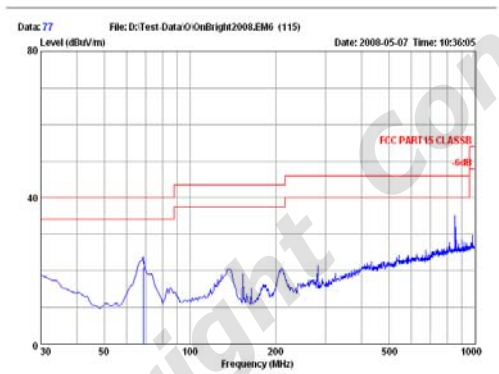
	Freq	Level	ReadAntenna Level	Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV/m	dBuV	dB/m	dB	dBuV/m	dB	
1	68.900	21.34	14.60	5.35	1.39	40.00	-18.66	QP



Site	: Chamber3
Condition	: EN 55022 CLASS B 3m VERTICAL
Project No.	:
Applicant	: On Bright
EUT	: POWER
M/N	: 12V1A809
S/N	: OB235812W 2#
Power Supply	: 230V/50Hz
Ambient	: 26C 52%RH
Test Mode	: FULL LOAD
Test Engineer	: Leo
Memo	:
Memo	:

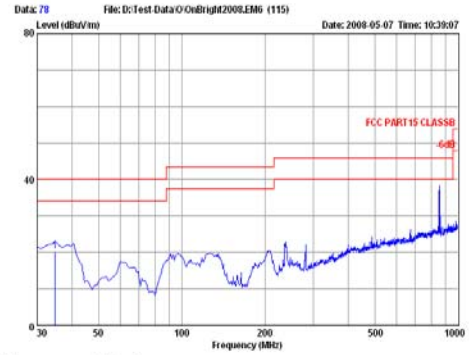
	Freq	Level	ReadAntenna Level	Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV/m	dBuV	dB/m	dB	dBuV/m	dB	
1	34.850	20.08	4.00	15.15	0.93	40.00	-19.92	QP

3.3.2.2.FCC CLASS B @ full load report



Site	: Chamber3
Condition	: FCC PART15 CLASSB 3m HORIZONTAL
Project No.	:
Applicant	: On Bright
EUT	: POWER
M/N	: 12V1A809
S/N	: OB235812W 2#
Power Supply	: 120V/60Hz
Ambient	: 26C 52%RH
Test Mode	: FULL LOAD
Test Engineer	: Leo
Memo	:
Memo	:

	Freq	Level	ReadAntenna Level	Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV/m	dBuV	dB/m	dB	dBuV/m	dB	
1	68.800	21.14	14.40	5.35	1.39	40.00	-18.86	QP

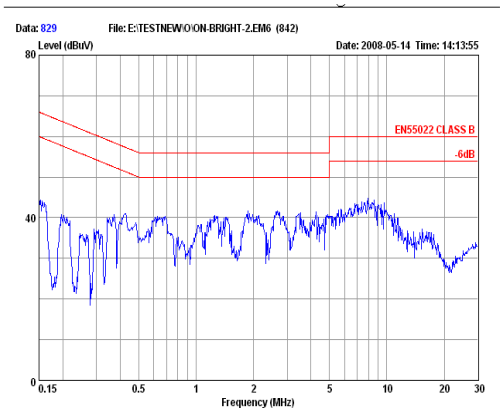


Site	: Chamber3
Condition	: FCC PART15 CLASSB 3m VERTICAL
Project No.	:
Applicant	: On Bright
EUT	: POWER
M/N	: 12V1A809
S/N	: OB235812W 2#
Power Supply	: 120V/60Hz
Ambient	: 26C 52%RH
Test Mode	: FULL LOAD
Test Engineer	: Leo
Memo	:
Memo	:

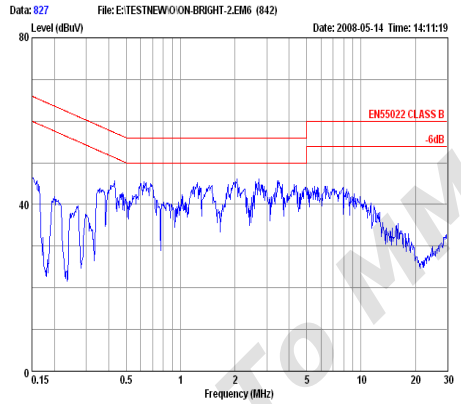
	Freq	Level	ReadAntenna Level	Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV/m	dBuV	dB/m	dB	dBuV/m	dB	
1	34.850	20.18	4.10	15.15	0.93	40.00	-19.82	QP

3.3.3. Conducted EMI Test （NO LF1）

3.3.3.1 EN55022 CLASS B @ full load report

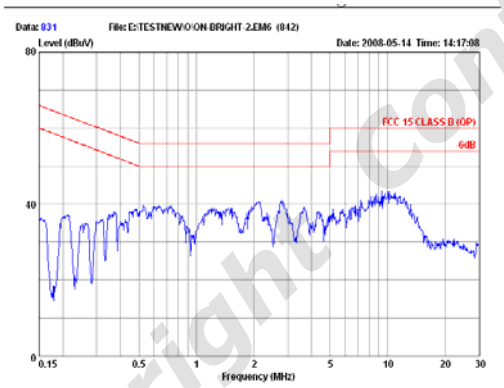


Site	: Audix ACI(Conducted Emission)
Condition	: EN55022 CLASS B ESH3-Z5-08.04.06 NEUTRAL
Project No.	:
Applicant	:
EUT	:
M/N	: OB2358
S/N	: 12V 1A
Power Supply	: 230V/50Hz
Ambient	: 25'C 55%RH
Test line	: N
Test Mode	: Full Load
Test Engineer	: Tom
Memo	:

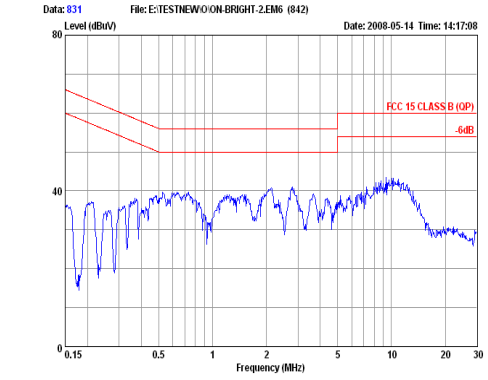


Site	: Audix ACI(Conducted Emission)
Condition	: EN55022 CLASS B ESH3-Z5-08.04.06 LINE
Project No.	:
Applicant	:
EUT	:
M/N	: OB2358
S/N	: 12V 1A
Power Supply	: 230V/50Hz
Ambient	: 25'C 55%RH
Test line	: L
Test Mode	: Full Load
Test Engineer	: Tom
Memo	:

3.3.3.2 FCC CLASS B @ full load report



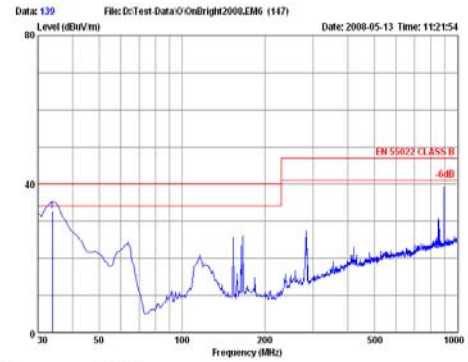
Site	: Audix ACI(Conducted Emission)
Condition	: FCC 15 CLASS B (QP) ESH3-Z5-08.04.06 NEUTRAL
Project No.	:
Applicant	:
EUT	:
M/N	: OB2358
S/N	: 12V 1A
Power Supply	: 120V/60Hz
Ambient	: 25'C 55%RH
Test line	: N
Test Mode	: Full Load
Test Engineer	: Tom
Memo	:



Site	: Audix ACI(Conducted Emission)
Condition	: FCC 15 CLASS B (QP) ESH3-Z5-08.04.06 NEUTRAL
Project No.	:
Applicant	:
EUT	:
M/N	: OB2358
S/N	: 12V 1A
Power Supply	: 120V/60Hz
Ambient	: 25'C 55%RH
Test line	: N
Test Mode	: Full Load
Test Engineer	: Tom
Memo	:

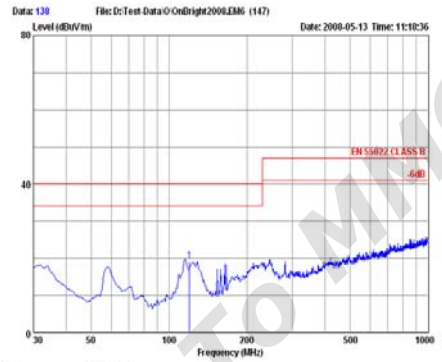
3.3.4. Radiation EMI Test （NO LF1）

3.3.4.1 EN55022 CLASS B @ full load report



Site	: Chamber3
Condition	: EN 55022 CLASS B 3m VERTICAL
Project No.	:
Applicant	: On Bright
EUT	: POWER
M/N	: 12V 1A
S/N	: OB2358 NO COMCHECK
Power Supply	: 230V/50Hz
Ambient	: 26C 32%RH
Test Mode	: FULL LOAD
Test Engineer	: Leo
Memo	:
Memo	:

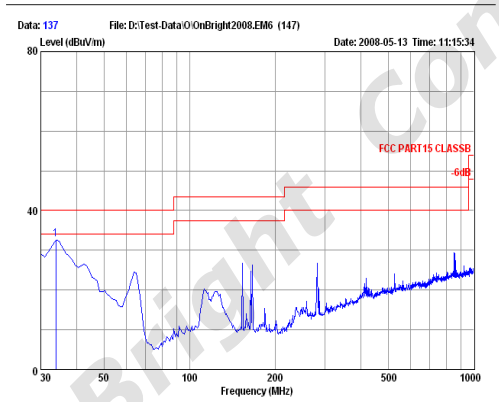
	Freq	Level	ReadAntenna Level	Antenna Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV/m	dBuV	dB/m	dB	dBuV/m	dB	
1	33.880	32.80	16.10	15.77	0.93	40.00	-7.20	QP



Site	: Chamber3
Condition	: EN 55022 CLASS B 3m HORIZONTAL
Project No.	:
Applicant	: On Bright
EUT	: POWER
M/N	: 12V 1A
S/N	: OB2358 NO COMCHECK
Power Supply	: 230V/50Hz
Ambient	: 26C 32%RH
Test Mode	: FULL LOAD
Test Engineer	: Leo
Memo	:
Memo	:

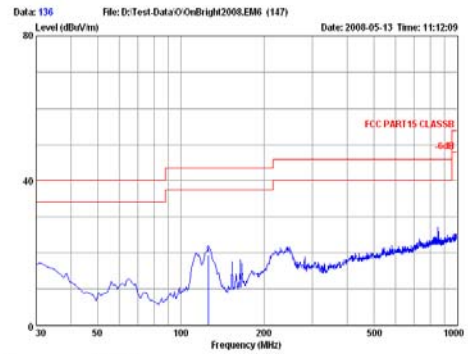
	Freq	Level	ReadAntenna Level	Antenna Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV/m	dBuV	dB/m	dB	dBuV/m	dB	
1	120.000	19.16	6.00	11.30	1.86	40.00	-20.84	QP

3.3.4.2 FCC CLASS B @ full load report



Site	: Chamber3
Condition	: FCC PART15 CLASSB 3m VERTICAL
Project No.	:
Applicant	: On Bright
EUT	: POWER
M/N	: 12V 1A
S/N	: OB2358 NO COMCHECK
Power Supply	: 120V/60Hz
Ambient	: 26C 32%RH
Test Mode	: FULL LOAD
Test Engineer	: Leo
Memo	:
Memo	:

	Freq	Level	ReadAntenna Level	Antenna Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV/m	dBuV	dB/m	dB	dBuV/m	dB	
1	33.880	32.80	16.10	15.77	0.93	40.00	-7.20	QP



Site	: Chamber3
Condition	: FCC PART15 CLASSB 3m HORIZONTAL
Project No.	:
Applicant	: On Bright
EUT	: POWER
M/N	: 12V 1A
S/N	: OB2358 NO COMCHECK
Power Supply	: 120V/60Hz
Ambient	: 26C 32%RH
Test Mode	: FULL LOAD
Test Engineer	: Leo
Memo	:
Memo	:

	Freq	Level	ReadAntenna Level	Antenna Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV/m	dBuV	dB/m	dB	dBuV/m	dB	
1	126.000	19.38	5.99	11.48	1.91	43.50	-24.12	QP

4. Protection

4.1. Over voltage protection

Table. 8 OVP @ no load

Input	OVP Protection
115Vac/60Hz	OK
230Vac/50Hz	OK

4.2. Short circuit protection

The system is protected during output short circuit condition and recovered when short circuit condition is removed.

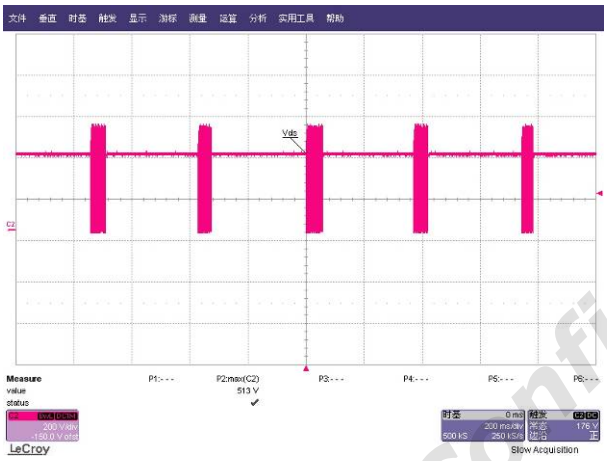


Fig. 18 Output short, Vds waveform@264 Vac/50Hz, full load

4.3. Over Load Protection

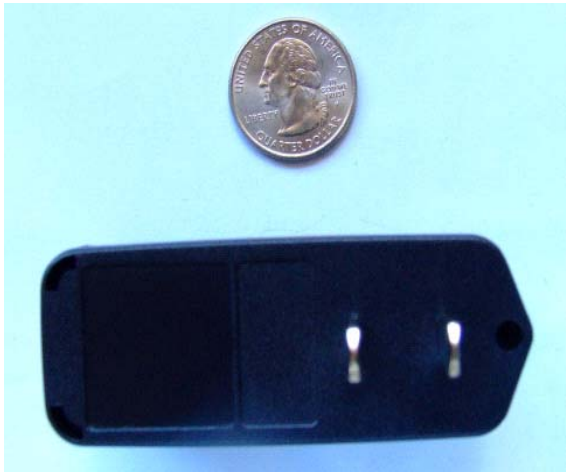
Table. 9 OLP @ Full load

Input	OLP Protection
115Vac/60Hz	OK
230Vac/50Hz	OK

5. Thermal Testing

Vin	Po	Environment	IC	Transformer (winding)
85Vac	12W（load1A）	40℃	96.1℃	85.2℃

Case: Φ72.5mmX27.3mmX42mm



6. Other Important Waveform

6.1. Vdd, Sense& FB&Vds wave form @ no load /full load

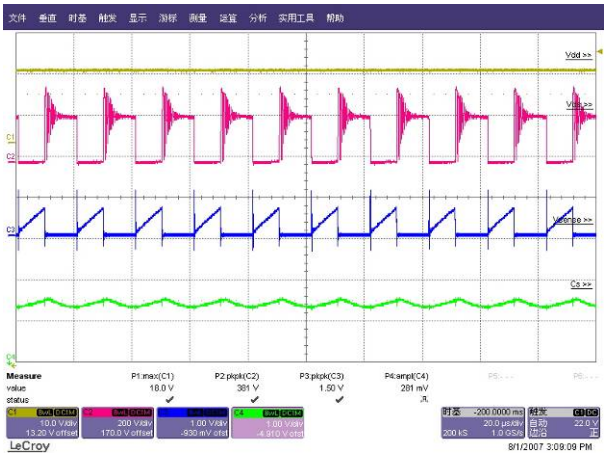


Fig. 19 Vdd, Sense&FB&Vds waveform@90Vac/60Hz, ,full load

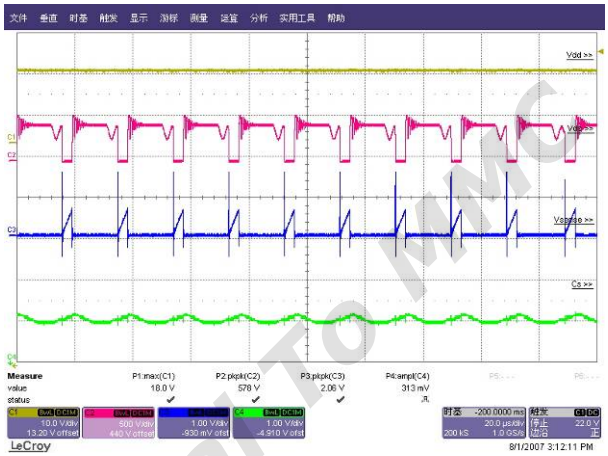


Fig. 20 Vdd,Sense &FB&Vds waveform @264Vac/50Hz, full load

6.2. MOSFET Vds waveform @ start/normal/output short

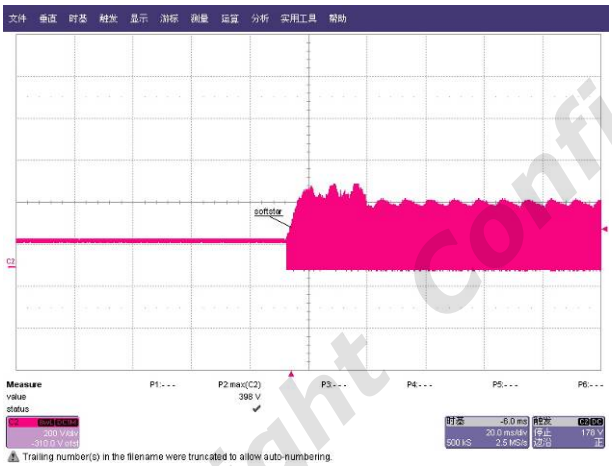


Fig. 21 Start, Vds waveform@90 Vac/60Hz, full load

Fig. 22 Start, Vds waveform@264 Vac/50Hz, full load

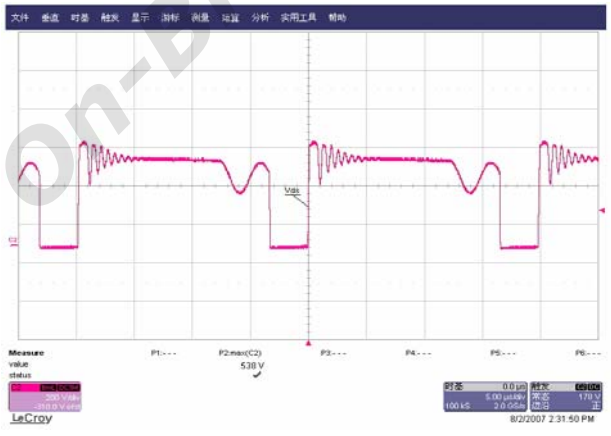


Fig. 23 Normal, Vds waveform@264 Vac/50Hz, full load

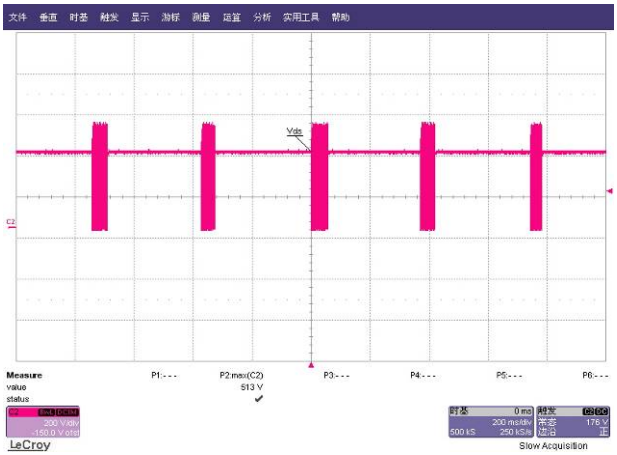


Fig. 24 Output short, Vds waveform@264 Vac/50Hz,

Table. 10 Vds_max @ Full load / Output short

Input	Vds_max(V)
264Vac/50Hz @No load	563
264Vac/50Hz @ Full load	538
264Vac/50Hz @ Output short	513

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