

Subject**OB6683 Demo Board Manual**

Board Model: AD19V4.73A6683 1924

Doc. No.: OB_DOC_DBM_668301

**Key features:**

- Single chip integrated Transition Mode (TM) PFC controller and Quasi-Resonant (QR) PWM controller
- Built-in dual output PFC control
- Adjustable PFC Go-to-Standby power level
- Average efficiency meet COC V tier2
- Standby power less than 75mW @230V input
- Quick startup and enhanced dynamic response for PFC stage
- High performance Quasi-Resonant control
- High precision OVP
- Meet EN55032 EMI

Revision History

Revise Date	Version	Reason/Issue
2019-06-22	00	First Issue
2019-11-07	01	Update BOM, PFC transformer and EFF.

Contents Index

1.	Adapter Module Specification	4
1.1.	Input Characteristics	4
1.2.	Output Characteristics.....	4
1.3.	Performance Specifications	4
1.4.	Protection Features.....	4
1.5.	Environments	4
2.	Adapter Module Information	5
2.1.	Schematic	5
2.2.	Bill of material.....	5
2.3.	PCB Gerber File.....	7
2.4.	Adapter Module Snapshot	8
2.4.1.	Transformer Specification	8
2.4.2.	Transformer Winding Data	8
2.4.3.	Boost inductor Specification.....	9
2.4.4.	Boost inductor Winding Characteristics	9
2.5.	Adapter Module Snapshot	10
3.	Performance Evaluation	11
3.1.	Input Characteristics	12
3.1.1.	Standby Power/PF/THD	12
3.1.2.	Efficiency	12
3.2.	Output Characteristics.....	13
3.2.1.	Line Regulation & Load Regulation	13
3.2.2.	Ripple & Noise	13
3.2.3.	Over Shoot & Under Shoot	14
3.2.4.	Dynamic Test.....	15
3.2.5.	Time Sequence (Full load).....	15
3.3.	EMI Test	17
3.3.1.	Conducted EMI Test.....	17
3.3.2.	Radiation EMI Test.....	19
3.3.3.	Temperature Test	20
4.	Protection	20
4.1.	Over Current Protection	20
4.2.	Over Voltage Protection	20
4.3.	Short Circuit Protection	21
5.	Other Waveform	21
5.1.	Vdd, FB, PFC&QR-Gate Waveform.....	21
5.2.	MOSFET Vds Waveform.....	22

Figures Index

Fig. 1	No-load Input Power vs. Input Line Voltage	12
Fig. 2	Efficiency vs. Percent of Rated Output Power	12
Fig. 3	Measured ripple& noise waveform@90Vac/60Hz, no load	13
Fig. 4	Measured ripple& noise waveform@90Vac/60Hz, full load	13
Fig. 5	Measured ripple& noise waveform@264Vac/50Hz, no load	13
Fig. 6	Measured ripple& noise waveform@264Vac/50Hz, full load	13
Fig. 7	Measured overshoot waveform@90Vac/60Hz, full load	14
Fig. 8	Measured overshoot waveform@90Vac/60Hz, no load	14
Fig. 9	Measured overshoot waveform@264Vac/50Hz, full load	14
Fig. 10	Measured overshoot waveform@264Vac/50Hz, no load	14
Fig. 11	Output voltage waveform under Dynamic test @264Vac/50Hz	15
Fig. 12	Output voltage waveform under Dynamic test @90Vac/60Hz	15
Fig. 13	Turn on delay time measured waveform @90Vac/60Hz,full load	15
Fig. 14	Turn on delay time measured waveform @264Vac/50Hz,full load	15
Fig. 15	Hold-up time measured waveform@90Vac/60Hz,full load	16
Fig. 16	Hold-up time measured waveform@264Vac/50Hz,full load	16
Fig. 17	Rise time measured waveform@90Vac/60Hz,full	16
Fig. 18	Rise time measured waveform@264Vac/50Hz,full load	16
Fig. 19	Fall time measured waveform@90Vac/60Hz,full load	16
Fig. 20	Fall time measured waveform@264Vac/50Hz,full load	16
Fig. 21	Output short, Vds waveform@90 Vac/60Hz	21
Fig. 22	Output short, Vds waveform@264 Vac/50Hz	21
Fig. 23	Vdd,FB, PFC&QR-Gate waveform@90Vac/60Hz,no load	21
Fig. 24	Vdd,FB, PFC&QR-Gate waveform@90Vac/60Hz, full load	21
Fig. 25	Vdd,FB, PFC&QR-Gate waveform @264Vac/50Hz, no load	21
Fig. 26	Vdd,FB, PFC&QR-Gate waveform@264Vac/50Hz,full load	21
Fig. 27	Start, PFC&QR-Vds waveform@90 Vac/60Hz, full load	22
Fig. 28	Start, PFC&QR-Vds waveform@264 Vac/50Hz, full load	22
Fig. 29	Normal, PFC&QR-Vds waveform@90 Vac/60Hz, 25% load	22
Fig. 30	Normal,PFC&QR-Vds waveform@264 Vac/50Hz, 25% load	22
Fig. 31	Normal, PFC&QR-Vds waveform@90 Vac/60Hz, 50% load	22
Fig. 32	Normal,PFC&QR-Vds waveform@264 Vac/50Hz,50% load	22
Fig. 33	Normal, PFC&QR-Vds waveform@90 Vac/60Hz, 75% load	22
Fig. 34	Normal,PFC&QR-Vds waveform@264Vac/50Hz, 75% load	22
Fig. 35	Normal, PFC&QR-Vds waveform@90 Vac/60Hz, full load	23
Fig. 36	Normal, PFC&QR-Vds waveform@264 Vac/50Hz, full load	23

Tables Index

Table. 1	Standby Power(No load)	12
Table. 2	PF/THD(Full load)	12
Table. 3	Efficiency	12
Table. 4	Line Regulation & Load Regulation	13
Table. 5	Ripple & Noise	13
Table. 6	Over Shoot & Under Shoot Measurement Results	14
Table. 7	Output Voltage Under Dynamic Test	15
Table. 8	Turn-on Delay/Hold-up/Rise/Fall Time Measurement Results	15
Table. 9	Temperature Test Result	20
Table. 10	OCP @ Full load	20
Table. 11	OVP @ No load/Full load	20
Table. 12	Vds_max & Vak_max @ Start/Normal/Output Short	23

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 19.0V
- Output Tolerance $\pm 5\%$
- Min. load current 0A
- Max. load current 4.73A

1.3. Performance Specifications

- Max. Output Power 90W
- Standby Power <75mW @ 230V/50Hz, no load, 25°C
- Efficiency >89% @ Averaged. 25/50/75/100%Load, normal line, 25°C
- Line Regulation $\pm 2\%$ Max
- Load Regulation $\pm 5\%$ Max
- Ripple & Noise 380mVpp 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

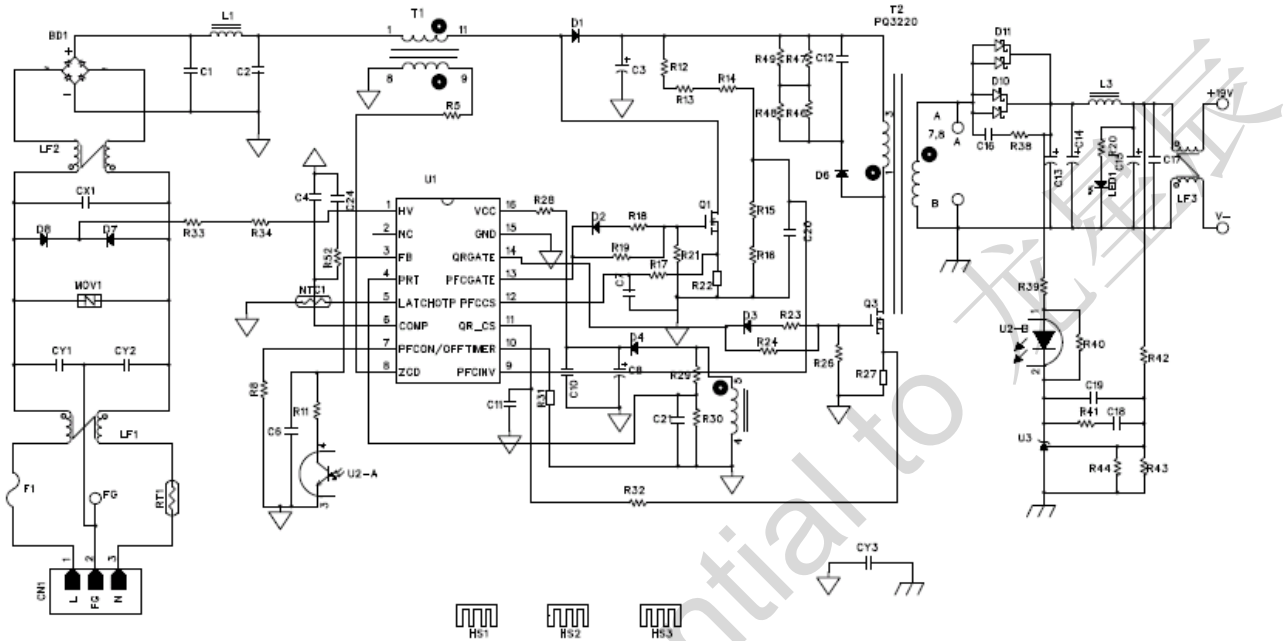
- Short circuit Protection Output shut down with automatic recovery
- Over Voltage Protection Output shut down without automatic recovery
- Over Current Protection Output shut down with automatic recovery

1.5. Environments

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

2. Adapter Module Information

2.1. Schematic



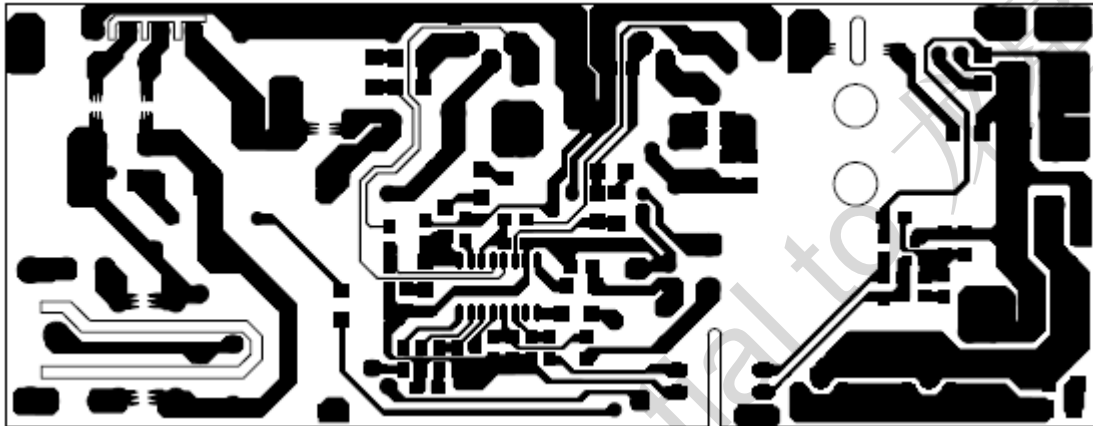
2.2. Bill of material

Position	Description	Qty
BD1	Diode, bridge recovery, GBP306, 3A/ 600V	1
C1,C2	Capacitor, metal poly, 0.47U/400V, -40/105℃,±20%	2
C3	Capacitor, aluminum electrolytic, 120uF/450V, -40/105℃,±20%,Φ18*30mm	1
C4,C18	Capacitor, ceramic,220nF/50V, X7R, ±10%,SMD0805	2
C6	Capacitor, ceramic,1nF/50V, X7R, ±10%,SMD0805	1
C7,C20	Capacitor, ceramic,470pF/50V, X7R, ±10%,SMD0805	2
C8	Capacitor, aluminum electrolytic, 22uF/50V, -40/105℃,±20%	1
C10,C17	Capacitor, ceramic,100nF/50V, X7R, ±10%,SMD0805	2
C11	Capacitor, ceramic,360pF/50V, X7R, ±10%,SMD0805	1
C12	Capacitor, metal poly, 3.3nF/630V, -40/105℃,±20%	1
C13,C14	Capacitor, aluminum electrolytic, 680uF/25V, -40/105℃,±20%,Φ10*20mm	2
C15	Capacitor, aluminum electrolytic, 470uF/25V, -40/105℃,±20%,Φ8*10mm	1
C16	Capacitor, ceramic, 470pF /200V, SMD1206	1
C19	Capacitor, ceramic,100pF/50V, X7R, ±10%,SMD0805	1
C24	Capacitor, ceramic,470nF/50V, X7R, ±10%,SMD0805	1
CX1	Capacitor,X2, 0.33uF/275VAC, -40/105℃,±20%	1
CY1.CY2.	Capacitor,Y2,disk,2.2nF/250VAC, -40/105℃,±20%	2
CY3	Capacitor,Y1,disk,2.2nF/250VAC, -40/105℃,±20%	1
D1	Diode, ultra fast recovery,MUR460, 4A/600V, DO-201	1
D2,D3	Diode ,fast recovery, 1N4148, 0.1A /100V,SMD1206	2
D4	Diode ,fast recovery,PR1007, 1A/1KV,DO-401	1

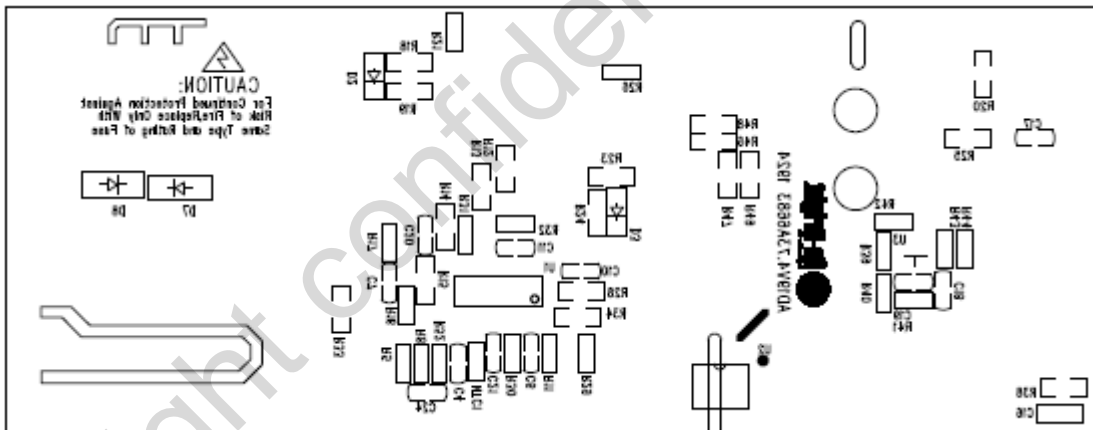
D6	Diode ,fast recovery,1N4007, 1A/1KV,DO-401	1
D7,D8	Diode , M7, 1A /1KV,SMD1206	2
D10,D11	Diode,dual schottky, V40120C, 2*20A/120V,TO-220AB	2
Bead core	For D1 and D4	2
F1	Slow Fuse, 3A/250V, $\Phi 4 \times 10$ mm	1
L1	Inductor, choke,580uH min, core15.5*11.5*6.5mm, $\Phi 0.60$ mm*100Ts	1
LF1	Inductor, choke,dual winding,5mH min, core13.8*7.5*7.5mm, $\Phi 0.50$ mm*2P*34Ts	1
LF2	Inductor, choke,dual winding,18mH min, core18.5*9.5*7.5mm, $\Phi 0.55$ mm*42Ts*2	1
LF3	Inductor, choke,dual winding, 80uH min, core10.5*5.5*4.5mm, $\Phi 0.90$ mm*2*3Ts	1
MOV1	Varistor ,disk, 7D471,300Vac rms max,385Vdc rms max, 600Amax, $\Phi 7$ mm	1
Q1	MOSFET,MOS power N-channel, TK12A60U, 12A/600V,TO-220	1
Q3	MOSFET,MOS power N-channel, SM65R380DEQ, 11A/650V,TO-220	1
JMP1~ JMP4,JMP9,JMP10, L3,RT1	JUMP(tuber)	8
R5	Resistor, chip, 33K ,1/8W,±1%,SMD0805	1
R8	Resistor, chip, 16K ,1/8W,±1%,SMD0805	1
R11	Resistor, chip, 0R,1/4W,±5%,SMD0805	1
R12,R13.	Resistor, chip, 10M ,1/4W,±5%,SMD1206	2
R14	Resistor, chip, 5.1M ,1/4W,±5%,SMD1206	1
R15	Resistor, chip, 150K ,1/8W,±5%,SMD1206	1
R16	Resistor, chip, 12K ,1/8W,±5%,SMD0805	1
R17,R39	Resistor, chip, 510R,1/8W,±5%,SMD0805	2
R18,R23	Resistor, chip, 15R,1/8W,±5%,SMD1206	2
R19,R24	Resistor, chip, 30R,1/4W,±5%,SMD1206	2
R21,R26	Resistor, chip, 10K,1/8W,±5%,SMD0805	2
R22	Resistor, metal film,axial,RN55,0R12, 2W, ±1%	1
R25	Resistor, chip, 0R,1/4W,±5%,SMD1206	1
R27	Resistor, metal film,axial,RN55,0R15, 2W, ±1%	1
R28	Resistor, chip, 1R,1/4W,±5%,SMD1206	1
R29	Resistor, chip, 150K ,1/8W,±5%,SMD0805	1
R30	Resistor, chip, 22K,1/8W,±5%,SMD0805	1
R31	Resistor, chip, 51K ,1/8W,±5%,SMD0805	1
R32	Resistor, chip, 560R,1/8W,±5%,SMD0805	1
R33,R34	Resistor, chip, 10K ,1/8W,±5%,SMD1206	2
R38	Resistor, chip, 47R,1/4W,±5%,SMD1206	1
R40	Resistor, chip, 2K,1/8W,±5%,SMD0805	1
R41	Resistor, chip, 1K,1/8W,±5%,SMD0805	1
R42	Resistor, chip, 180K,1/8W,±5%,SMD0805	1
R43	Resistor, chip, 30K,1/8W,±5%,SMD0805	1
R44	Resistor, chip, 270K ,1/8W,±5%,SMD0805	1
R46.R47.R48.R49.	Resistor, chip, 200K ,1/4W,±5%,SMD1206	4
R52	Resistor, chip, 33K ,1/8W,±5%,SMD0805	1
T1	boost inductor,580uH,10KHz/0.3V,RM10	1
T2	Transformer, 477uH,10KHz/0.3V,PQ3220	1

U1	IC, OB6683,SOT-16	1
U2	IC, Photo coupler , PC817C, SOP4	1
U3	IC, Precision Adjustable Shunt Regulator ,AZ431,SOT-23	1
PCB	AD19V4.73A6683 1924,49.2*125.9mm	1
LED,R20,C21,NTC1	NC	4

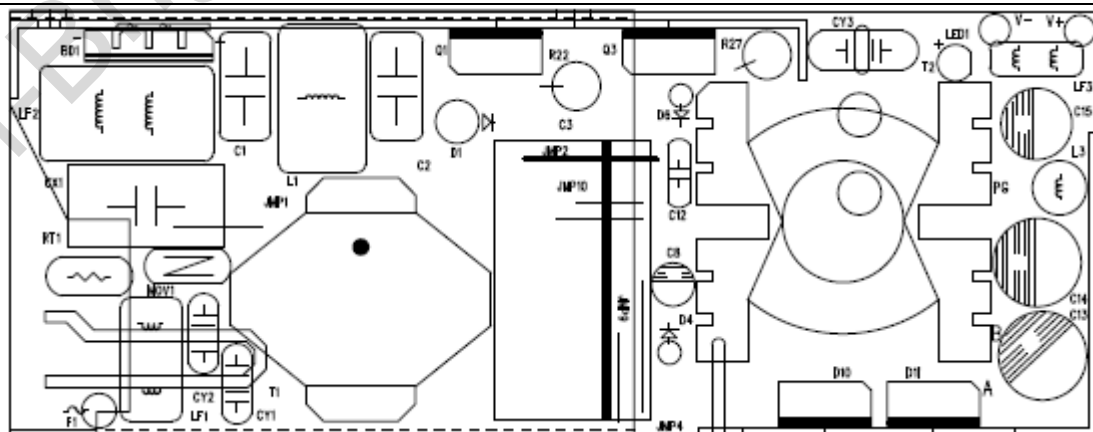
2.3. PCB Gerber File



Bottom



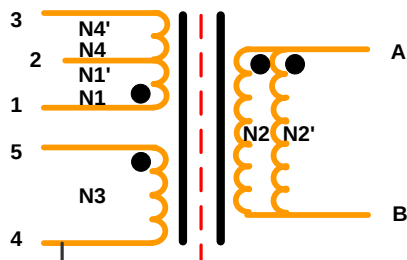
Bottom



Top

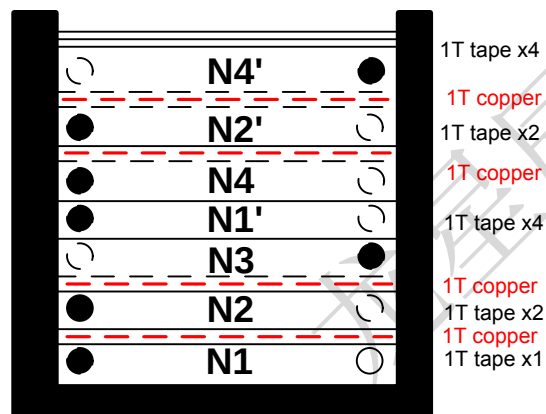
2.4. Adapter Module Snapshot

2.4.1. Transformer Specification



Note:

1. Bobbin: PQ3220 (12 Pin) ; Pin6.9~12 cut off
2. Core : TDK PC 40~44.
3. L1-3=460u H +/- 5%. (at: 10 K Hz, 0.3 V)
4. HI-POT: (60 Hz/5 m A/2 SET)
Pri to Sec 3750 Vac; Pri to core 1800Vac

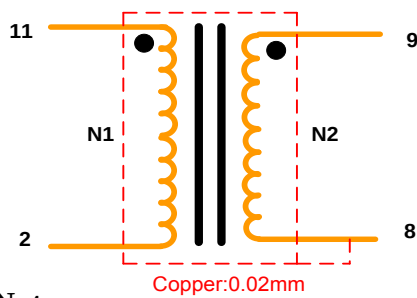


Bottom

2.4.2. Transformer Winding Data

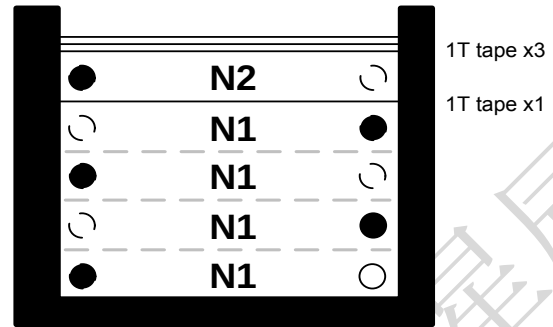
c	Winding	Material	Start	Turns	Finish	Remark
1	N1	Φ0.45*2 2UEW	1	9	→	
2	TAPE	TAPE W=10mm (Y)		1.3		
3	Copper	Copper W=9mm P=0.02mm		1.1	4	
4	TAPE	TAPE W=10mm (Y)		3		
5	N2	Φ0.55*2 triple insulated wire	A	6	B	
6	TAPE	TAPE W=10mm (Y)		3		
7	Copper	Copper W=9mm P=0.02mm		1.1	4	
8	TAPE	TAPE W=10mm (Y)		1.3		
9	N3	Φ0.12*3 2UEW	5	6	4	
10	TAPE	TAPE W=10mm (Y)		1.3		
11	N1'	Φ0.45*2 2UEW	→	8	2	
12	TAPE	TAPE W=10mm (Y)		1.3		
13	N4	Φ0.45*2 2UEW	2	9	→	
14	TAPE	TAPE W=10mm (Y)		1.3		
15	Copper	Copper W=9mm P=0.02mm		1.1	4	
16	TAPE	TAPE W=10mm (Y)		3		
17	N2'	Φ0.55*2 triple insulated wire	A	6	B	
18	TAPE	TAPE W=10mm (Y)		3		
19	Copper	Copper W=9mm P=0.02mm		1.1	4	
20	TAPE	TAPE W=10mm (Y)		1.3		
21	N4'	Φ0.45*2 2UEW	→	8	3	
22	TAPE	TAPE W=10mm (Y)		3		

2.4.3. Boost inductor Specification



Note:

1. Bobbin: RM10 (12 Pin) ; Pin3,4,5,7,10,12 cut off
2. Core : TDK PC40/ 44.
3. L2-11=580u H +/- 5%. (at: 10 K Hz, 0.3 V)

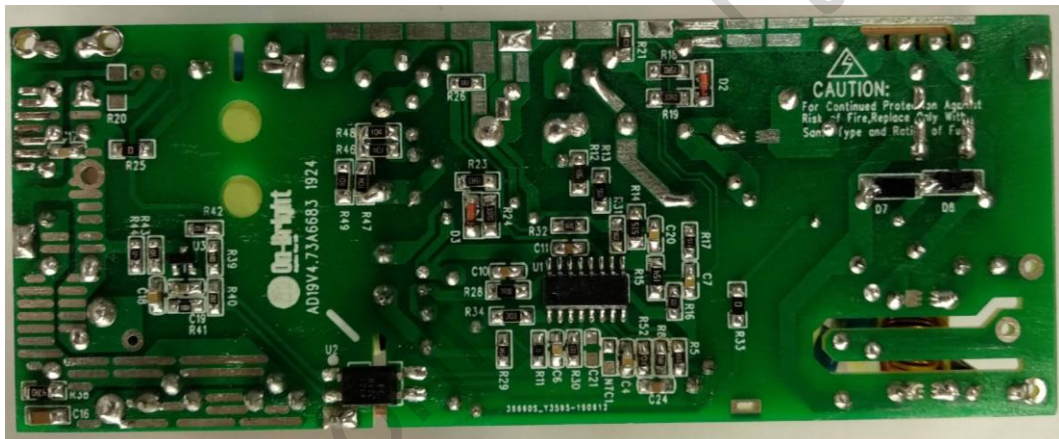


Bottom

2.4.4. Boost inductor Winding Characteristics

c	Winding	Material	Start	Turns	Finish	Remark
1	N1	$\Phi 0.20 \times 10$	11	70	2	
2	TAPE	TAPE W=10mm (Y)		1.3		
3	N2	$\Phi 0.20 \times 2$ 2UEW	9	9	8	
4	TAPE	TAPE W=10mm (Y)		3		

2.5. Adapter Module Snapshot



3. Performance Evaluation

This session presents the test results of OB6683 90W adapter demo 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 measurement at AWG16 CABLE end.

Performance Highlights

- No load standby power: 63mW@230VAC
- Averaged efficiency: 90.15%@115VAC & 90.63% @230VAC
- EMI passed EN55032 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)	1.15A Max
Standby power at no load without LED (230Vac)	63mW
Average Efficiency (115Vac, 25%/50%/75%/100% load)	90.15%
2. Output characteristics	
Line regulation	0.16%
Load regulation	1.63%
Ripple & noise	140mV
Over shoot	2.6% Max
Under shoot	2.2% Max
Dynamic test	±360mV
3. Time sequence (90Vac with Full load)	
Turn on delay time	350mS
Hold up time	22.5mS
Rise time	17.64mS
Fall time	5.51mS

Test Equipments

Item	Vender	Module
AC Source	WEST	WEW1010
Digital Power Meter	YOKOGAWA	WT210
Electrical Load	Prodigit	3315C
Oscilloscope	LeCroy	WS424
Multimeter	VICTORY	VC9807A
Thermal	FLUKE	HS 2

3.1. Input Characteristics

3.1.1. Standby Power/PF/THD

Table. 1 Standby Power(No load)

Input voltage	Standby power(mW)	Vo(V)
90Vac/60Hz	52	19.32
115Vac/60Hz	55	19.32
230Vac/50Hz	63	19.32
264Vac/50Hz	68	19.32

Table. 2 PF/THD(Full load)

Input voltage	PF	THD(%)
90Vac/60Hz	0.98	12
115Vac/60Hz	0.98	12
230Vac/50Hz	0.97	13
264Vac/50Hz	0.96	14

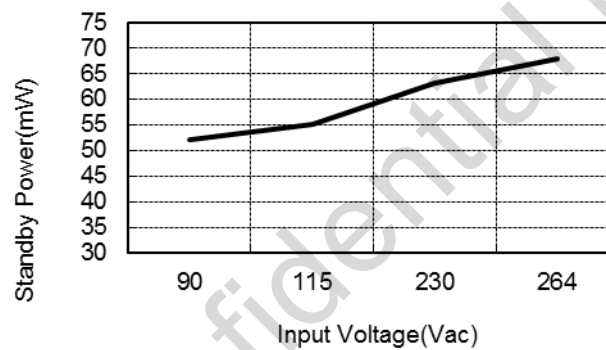


Fig. 1 No-load Input Power vs. Input Line Voltage

3.1.2. Efficiency

Table. 3 Efficiency

Input voltage	100%	75%	50%	25%	Aver. Eff.	DoE VI
115Vac/60Hz	89.52%	90.01%	90.17%	90.83%	90.13%	Ave Efficiency >89%
230Vac/50Hz	90.16%	89.85%	91.32%	90.37%	90.42%	

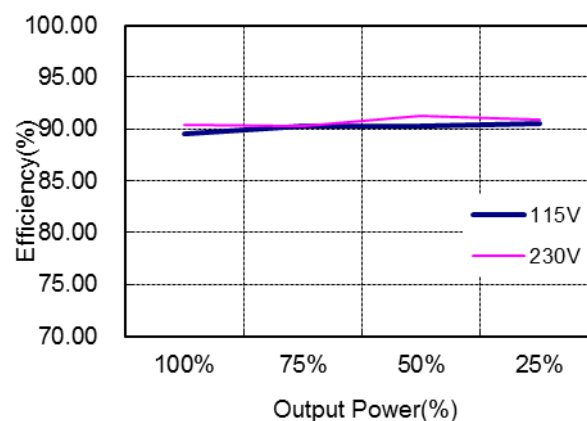


Fig. 2 Efficiency vs. Percent of Rated Output Power

3.2. Output Characteristics

3.2.1. Line Regulation & Load Regulation

Table. 4 Line Regulation & Load Regulation

Input voltage	No load	Half load	Full load	Specification	Test result
90Vac/60Hz	19.16	19.01	18.86		
115Vac/60Hz	19.16	19.01	18.86		
230Vac/50Hz	19.16	19.00	18.86		
264Vac/50Hz	19.14	18.98	18.85		
Line Regulation	0.16%			2%	Pass
Load Regulation	1.63%			5%	Pass

3.2.2. Ripple & Noise

Table. 5 Ripple & Noise

Input voltage	R&N (mV)		
	No load	Full load	Remark
90Vac/60Hz	43mV	140mV	Fig. 3,4
115Vac/60Hz	43mV	125mV	
230Vac/50Hz	38mV	110mV	
264Vac/50Hz	38mV	100mV	Fig. 5,6

Note: Ripple & noise were measured at DC CABLE end with a 0.1uF/100V ceramic cap connected in parallel with a 10uF/50V Electrolytic cap. Bandwidth was limited to 20MHz.

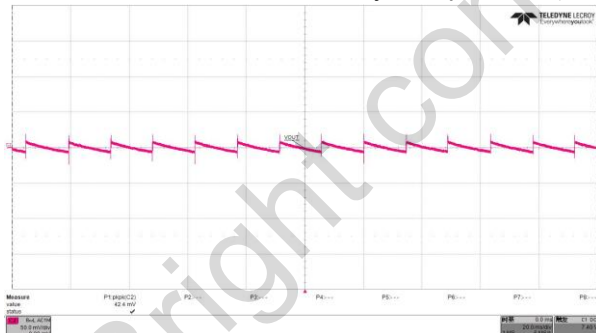


Fig. 3 Measured ripple & noise waveform@90Vac/60Hz, no load

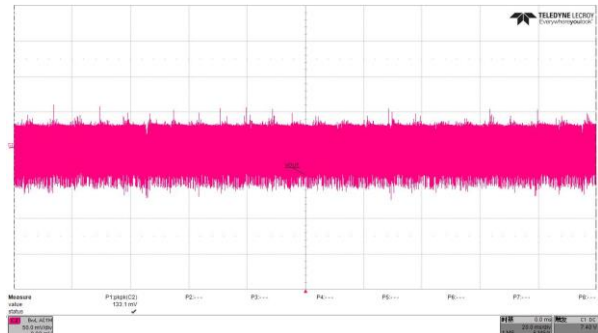


Fig. 4 Measured ripple & noise waveform@90Vac/60Hz, full load

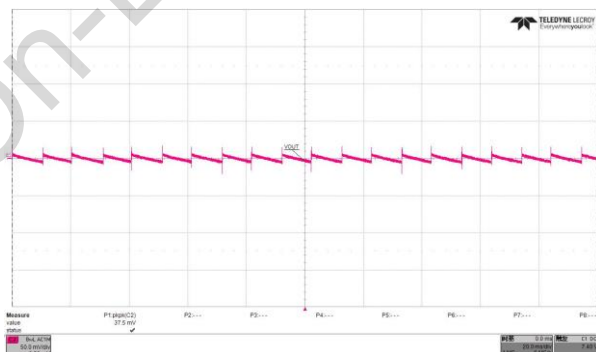


Fig. 5 Measured ripple & noise waveform@264Vac/50Hz, no load

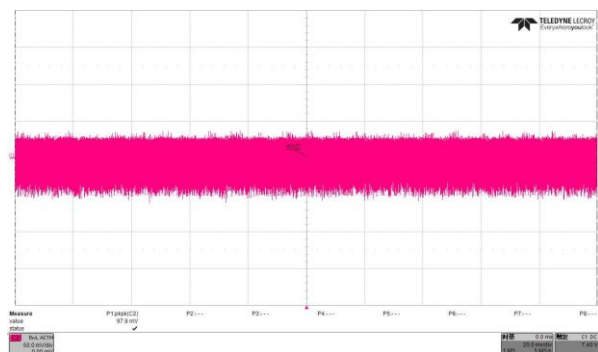


Fig. 6 Measured ripple & noise waveform@264Vac/50Hz, full load

3.2.3. Over Shoot & Under Shoot

Over shoot and under shoot were measured under below conditions.

- AC input switch on for over shoot and off for under shoot.
- Input voltage ranges from 90Vac/60Hz~264Vac/50Hz.

Table. 6 Over Shoot & Under Shoot Measurement Results

Input	load		Remark
90V/60HZ	Full load	over shoot	Fig. 7
		under shoot	
	No load	over shoot	Fig. 8
		under shoot	
264V/50HZ	Full load	over shoot	Fig. 9
		under shoot	
	No load	over shoot	Fig. 10
		under shoot	

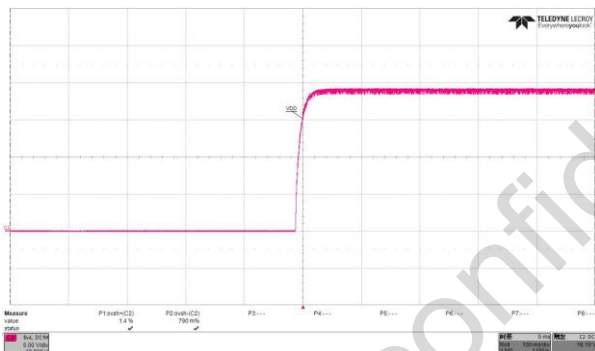


Fig. 7 Measured overshoot waveform@90Vac/60Hz, full load

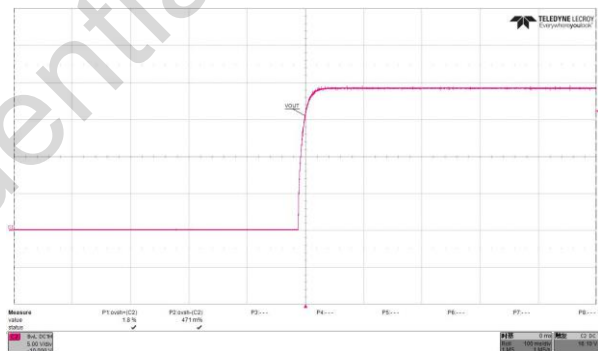


Fig. 8 Measured overshoot waveform@90Vac/60Hz, no load



Fig. 9 Measured overshoot waveform@264Vac/50Hz, full load

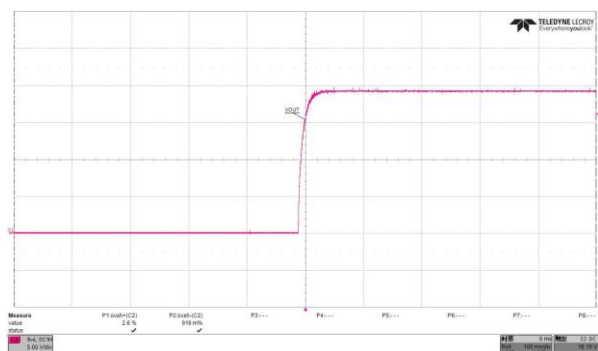


Fig. 10 Measured overshoot waveform@264Vac/50Hz, no load

3.2.4. Dynamic Test

A dynamic loading with low set at 10% load lasting for 10ms and high set at 100% load lasting for 10ms is added to output. The ramp is set at 0.25A/us at transient. Measurement was taken at CABLE end(Same as R&N measurement)

Table. 7 Output Voltage Under Dynamic Test

Input	Output (mV)	Remark
264V/50HZ	±350mV	Fig. 11
230V/50HZ	±350mV	
115V/60HZ	±360mV	
90V/60HZ	±360mV	Fig. 12

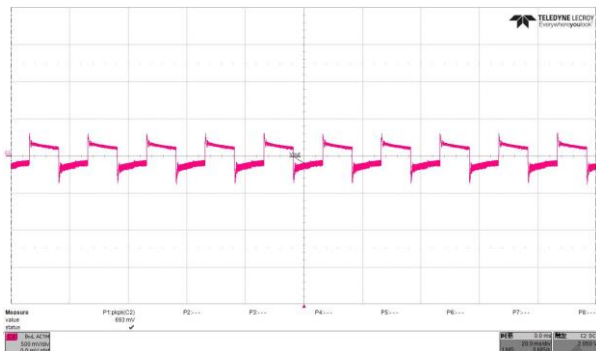


Fig. 11 Output voltage waveform under Dynamic test @264Vac/50Hz

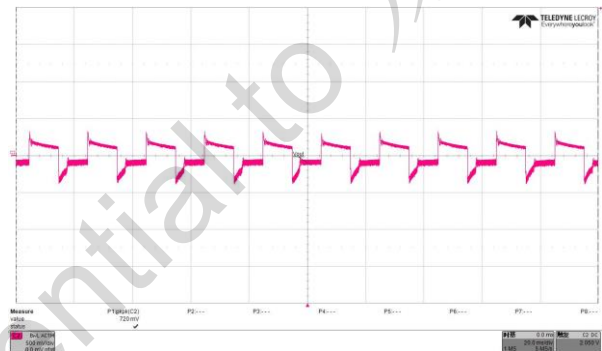


Fig. 12 Output voltage waveform under Dynamic test @90Vac/60Hz

3.2.5. Time Sequence (Full load)

Table. 8 Turn-on Delay/Hold-up/Rise/Fall Time Measurement Results

Item	Input voltage	Meas. Data	Test spec.	Test results	Remark
Turn-on delay time	90V/60Hz	350mS	<2S	Pass	Fig. 13
	264V/50Hz	198mS		Pass	Fig. 14
Hold-up time	90V/60Hz	22.5 mS	>10mS	Pass	Fig. 15
	264V/50Hz	23.4 mS		Pass	Fig. 16
Rise Time	90V/60Hz	17.64 mS	<30mS	Pass	Fig. 17
	264V/50Hz	17.61 mS		Pass	Fig. 18
Fall Time	90V/60Hz	5.51 mS		Pass	Fig. 19
	264V/50Hz	5.48 mS		Pass	Fig. 20

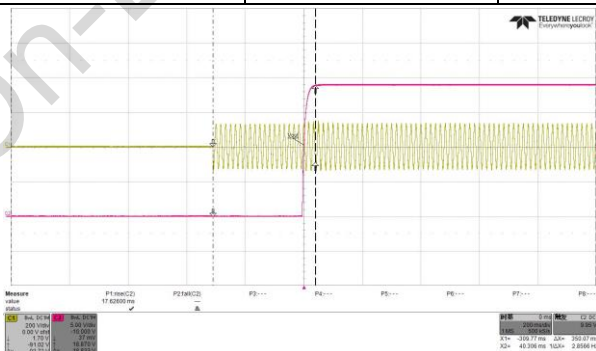


Fig. 13 Turn on delay time measured waveform @90Vac/60Hz,full load

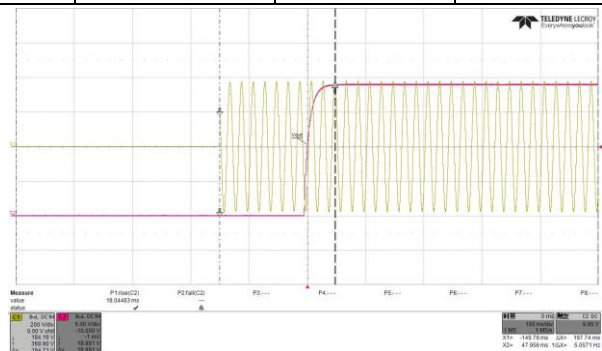


Fig. 14 Turn on delay time measured waveform @264Vac/50Hz,full load

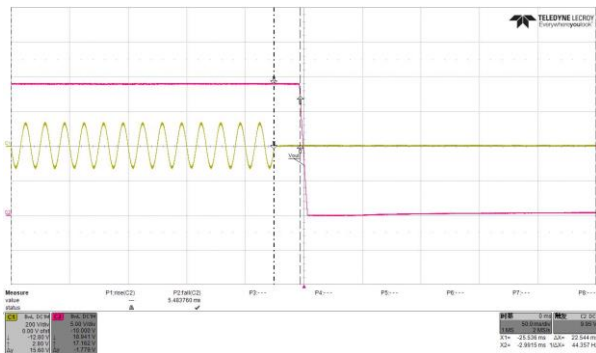


Fig. 15 Hold-up time measured waveform@90Vac/60Hz,full load

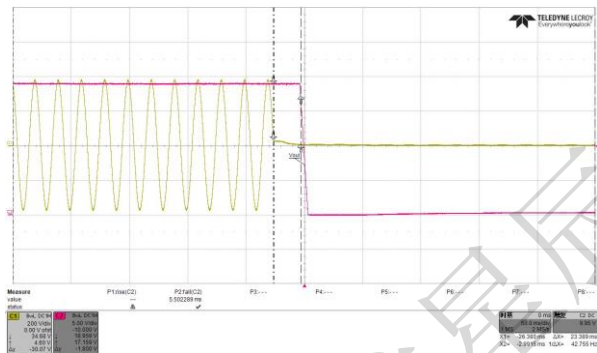


Fig. 16 Hold-up time measured waveform@264Vac/50Hz,full load

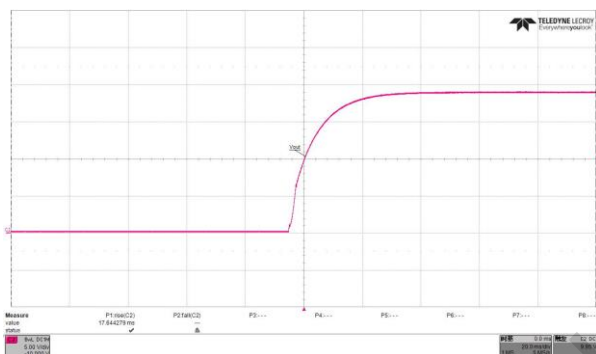


Fig. 17 Rise time measured waveform@90Vac/60Hz,full load

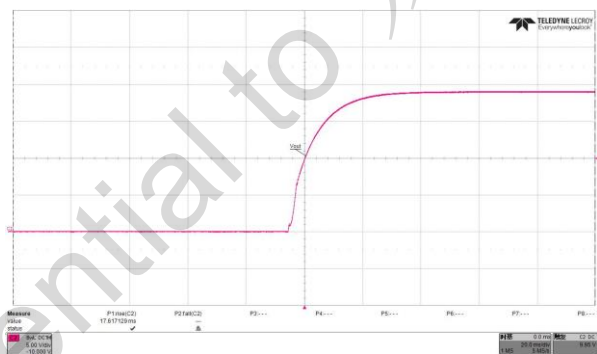


Fig. 18 Rise time measured waveform@264Vac/50Hz,full load

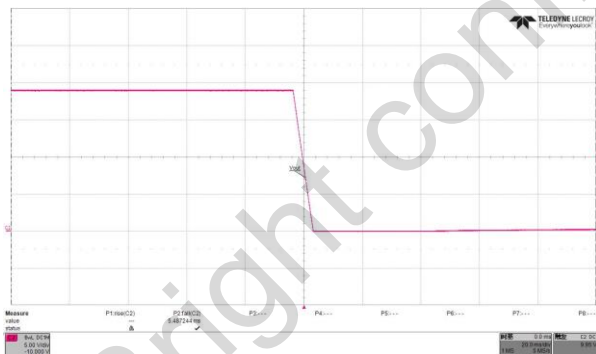


Fig. 19 Fall time measured waveform@90Vac/60Hz,full load

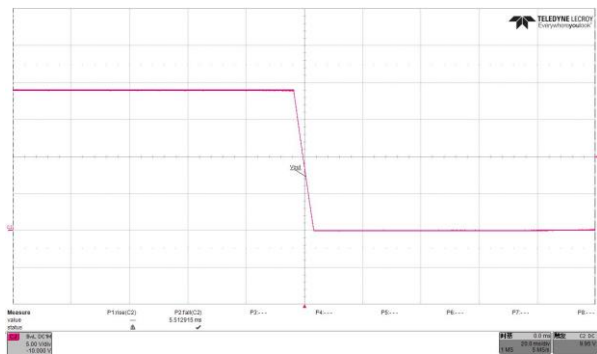


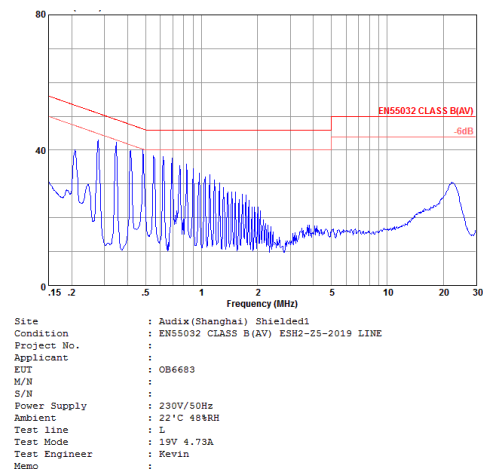
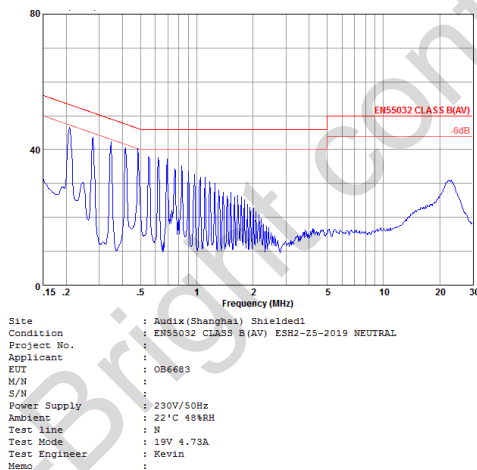
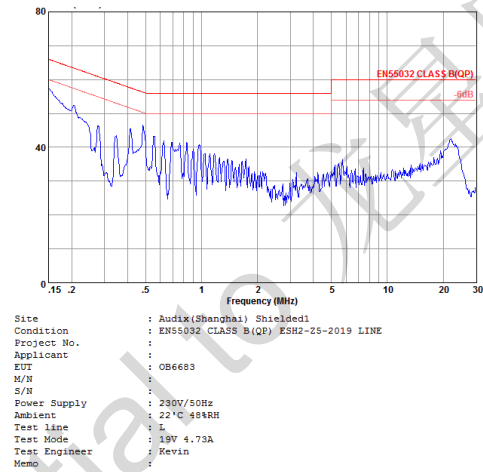
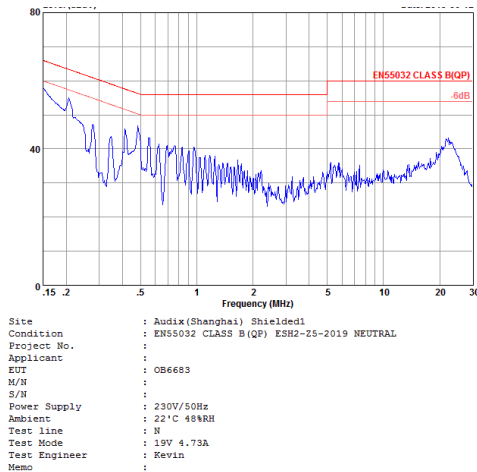
Fig. 20 Fall time measured waveform@264Vac/50Hz,full load

3.3. EMI Test

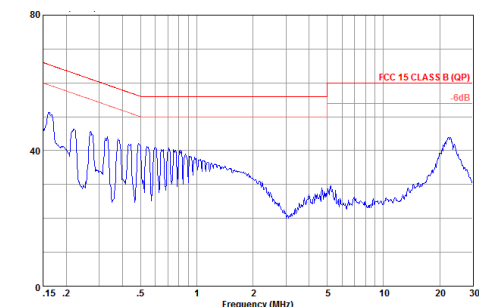
The Power supply passed EN55032 Class B & FCC class B EMI requirement with more than 6dB margin

3.3.1. Conducted EMI Test

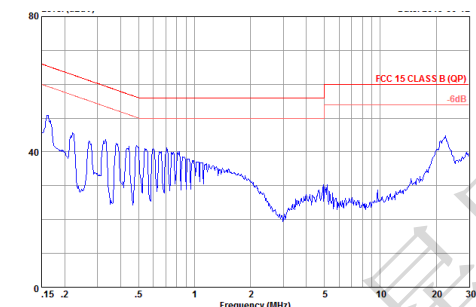
EN55032 CLASS B @ Full load Report



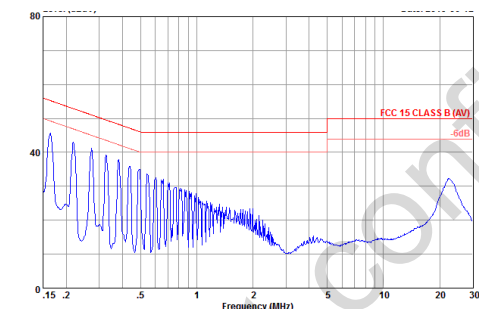
FCC CLASS B @ Full load Report



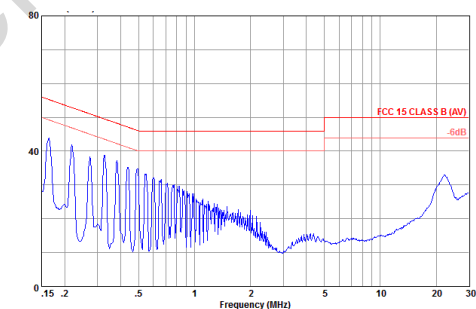
Site : Audix(Shanghai) Shielded1
 Condition : FCC 15 CLASS B (QP) ESH2-Z5-2019 NEUTRAL
 Project No. :
 Applicant :
 EUT : OB6683
 M/N :
 S/N :
 Power Supply : 120V/60Hz
 Ambient : 22°C 48%RH
 Test line : N
 Test Mode : 19V 4.73A
 Test Engineer : Kevin
 Memo :



Site : Audix(Shanghai) Shielded1
 Condition : FCC 15 CLASS B (QP) ESH2-Z5-2019 LINE
 Project No. :
 Applicant :
 EUT : OB6683
 M/N :
 S/N :
 Power Supply : 120V/60Hz
 Ambient : 22°C 48%RH
 Test line : L
 Test Mode : 19V 4.73A
 Test Engineer : Kevin
 Memo :



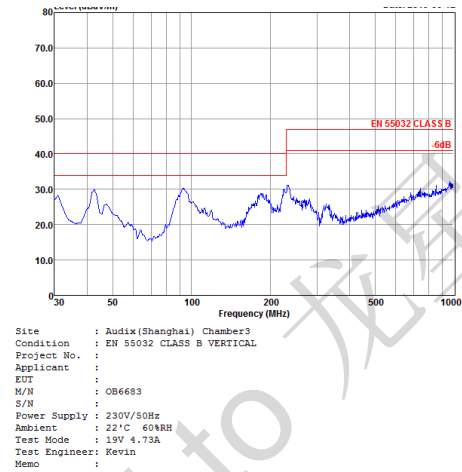
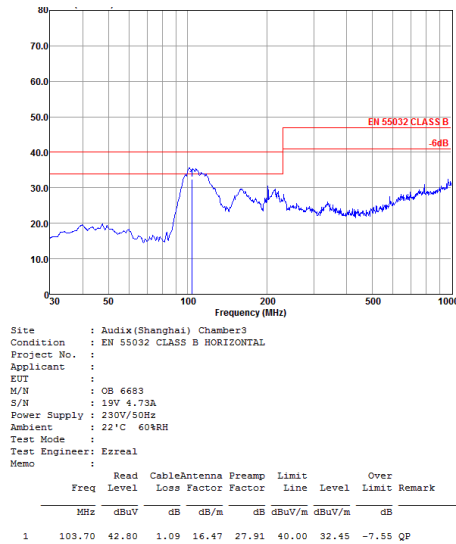
Site : Audix(Shanghai) Shielded1
 Condition : FCC 15 CLASS B (AV) ESH2-Z5-2019 NEUTRAL
 Project No. :
 Applicant :
 EUT : OB6683
 M/N :
 S/N :
 Power Supply : 120V/60Hz
 Ambient : 22°C 48%RH
 Test line : N
 Test Mode : 19V 4.73A
 Test Engineer : Kevin
 Memo :



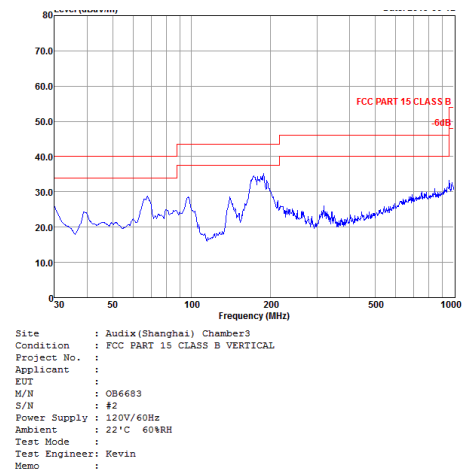
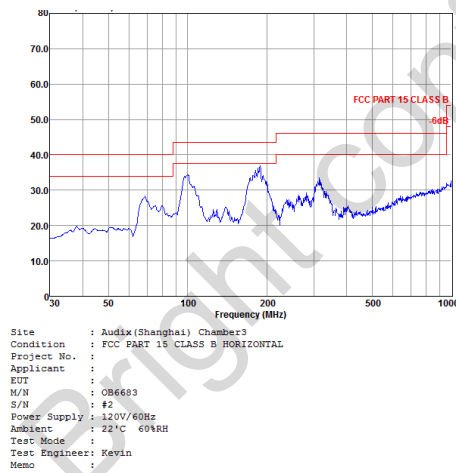
Site : Audix(Shanghai) Shielded1
 Condition : FCC 15 CLASS B (AV) ESH2-Z5-2019 LINE
 Project No. :
 Applicant :
 EUT : OB6683
 M/N :
 S/N :
 Power Supply : 120V/60Hz
 Ambient : 22°C 48%RH
 Test line : L
 Test Mode : 19V 4.73A
 Test Engineer : Kevin
 Memo :

3.3.2. Radiation EMI Test

EN55032 CLASS B @ Full load Report



FCC CLASS B @ Full load Report



3.3.3. Temperature Test

The thermal test is under 40°C ambience after 4hour full load running with 90VAC input.

Case: 132mm*28mm*31mm

Table. 9 Temperature Test Result

Position	Description	Value
BD1	Commute diode	115.0°C
T2	PFC boost inductor	100.6°C
Q1	PFC mosfet	109.7°C
D1	PFC boost diode	116.8°C
Q5	QR mosfet	110.6°C
T1	QR transformer	102.2°C
D8	Commute diode	112.7°C
Case	Exterior temperature	72.3°C

4. Protection

4.1. Over Current Protection

Table. 10 OCP @ Full load

Input Voltage	OCP Trigger Current (A)
90V/60Hz	5.81
115V/60Hz	5.82
132V/60Hz	5.84
180V/50Hz	5.86
230V/50Hz	5.88
264V/50Hz	5.88

4.2. Over Voltage Protection

Table. 11 OVP @ No load/Full load

Input Voltage	Output OVP Trigger Voltage (V)	
	No load	Full load
90V/60Hz	22.7	22.1
115V/60Hz	22.7	22.1
230V/50Hz	22.8	22.2
264V/50Hz	22.8	22.2

4.3. Short Circuit Protection

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

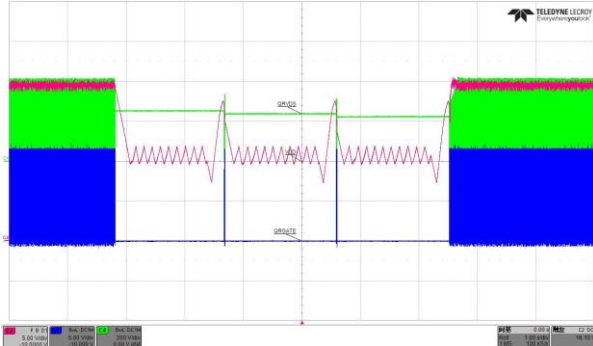


Fig. 21 Output short, Vds waveform@90 Vac/60Hz

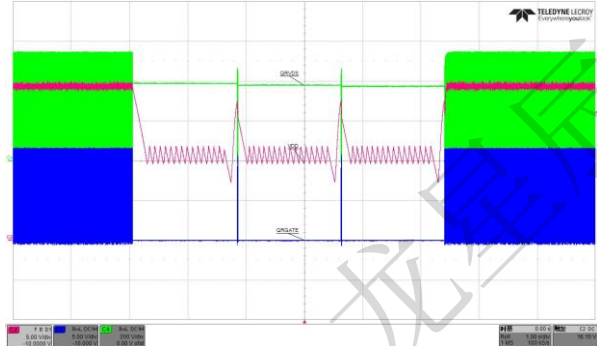


Fig. 22 Output short, Vds waveform@264 Vac/50Hz

5. Other Waveform

5.1. Vdd, FB, PFC&QR-Gate Waveform

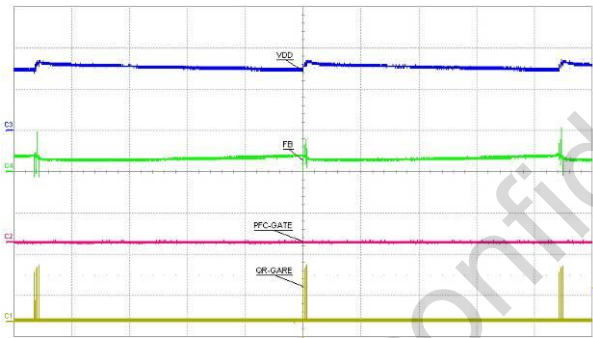


Fig. 23 Vdd,FB, PFC&QR-Gate waveform@90Vac/60Hz, no load

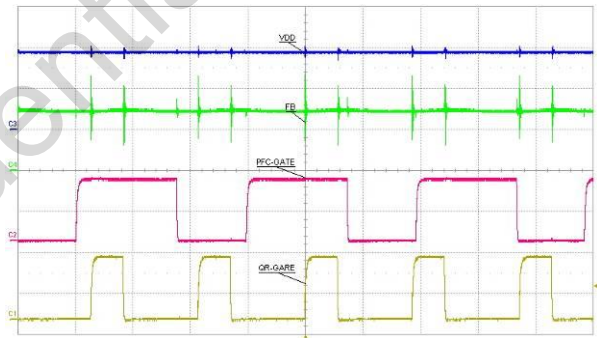


Fig. 24 Vdd,FB, PFC&QR-Gate waveform@90Vac/60Hz, full load

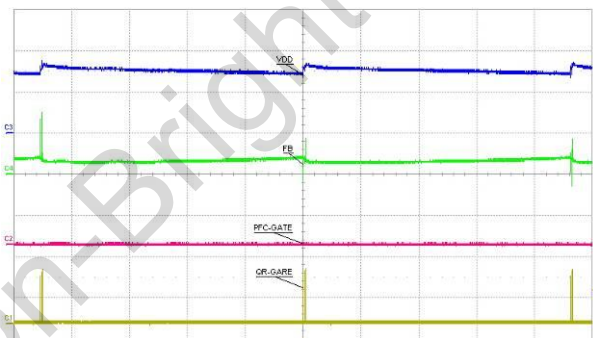


Fig. 25 Vdd,FB, PFC&QR-Gate waveform @264Vac/50Hz, no load

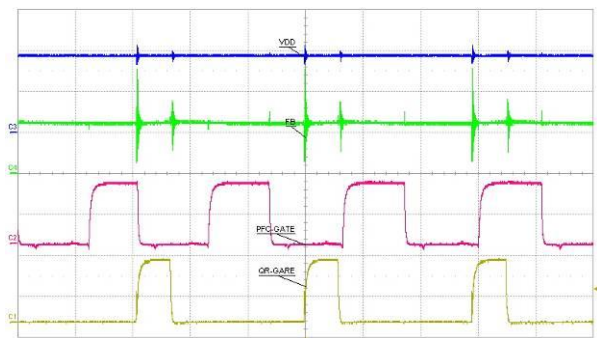


Fig. 26 Vdd,FB, PFC&QR-Gate waveform@264Vac/50Hz, full load

5.2. MOSFET Vds Waveform

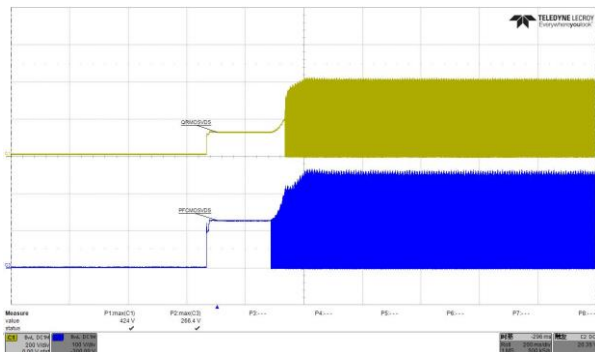


Fig. 27 Start, PFC&QR-Vds waveform@90 Vac/60Hz, full load

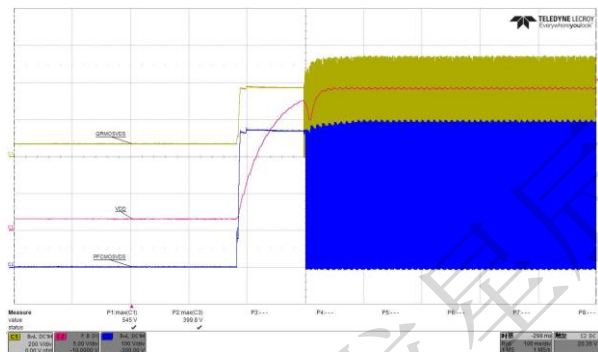


Fig. 28 Start, PFC&QR-Vds waveform@264 Vac/50Hz, full load

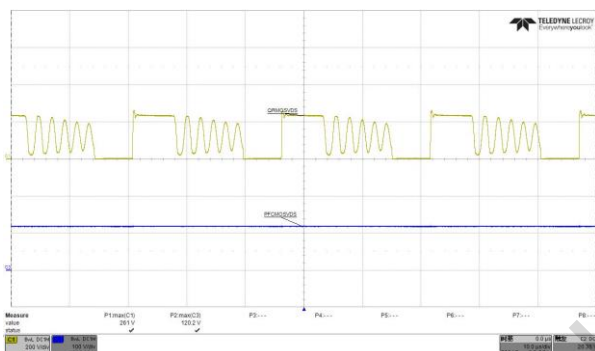


Fig. 29 Normal, PFC&QR-Vds waveform@90 Vac/60Hz, 25% load

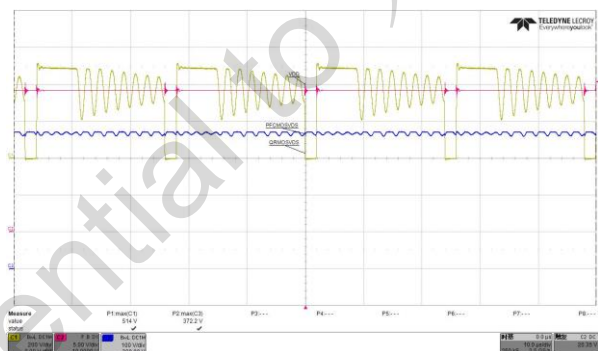


Fig. 30 Normal, PFC&QR-Vds waveform@264 Vac/50Hz, 25% load

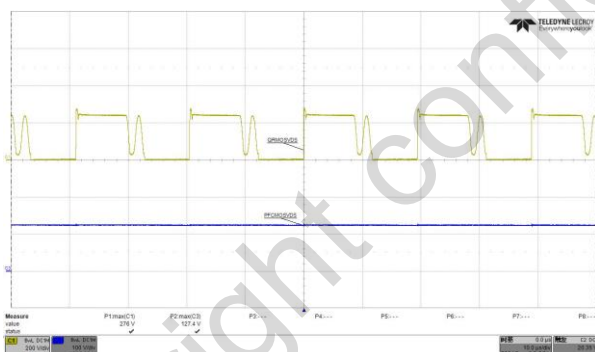


Fig. 31 Normal, PFC&QR-Vds waveform@90 Vac/60Hz, 50% load

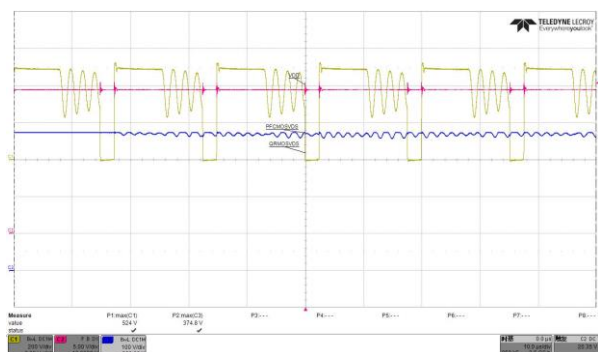


Fig. 32 Normal, PFC&QR-Vds waveform@264 Vac/50Hz, 50% load



Fig. 33 Normal, PFC&QR-Vds waveform@90 Vac/60Hz, 75% load

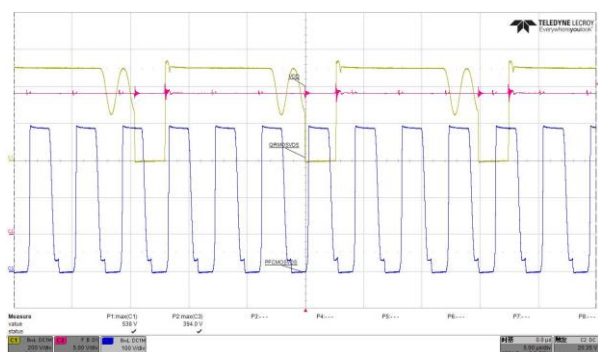


Fig. 34 Normal, PFC&QR-Vds waveform@264 Vac/50Hz, 75% load

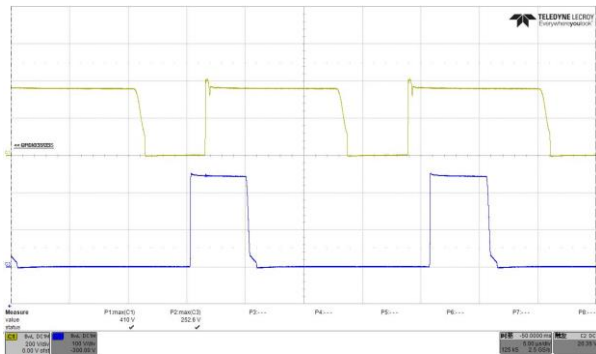


Fig. 35 Normal, PFC&QR-Vds waveform@90 Vac/60Hz, full load

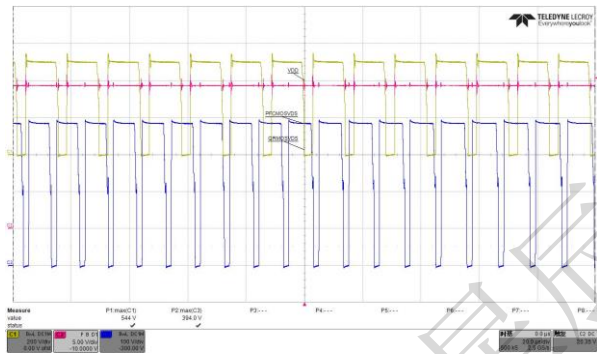


Fig. 36 Normal, PFC&QR-Vds waveform@264 Vac/50Hz, full load

Table. 12 Vds_max & Vak_max @ Start/Normal/Output Short

Input	Vds_max(V)	Vak_max(V)
264Vac/50Hz @Start	574	102
264Vac/50Hz @ Normal (Full load)	574	102
264Vac/50Hz @ Output Short	578	101

Disclaimer

On-Bright Electronics reserves the right to make corrections, modifications, enhancements, improvements, and other changes to its documents, products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete.

This document is under copy right protection. Non of any part of document could be reproduced, modified without prior written approval from On-Bright Electronics.