

**100W USB PD Adaptor with
3.3V ~ 21V PPS
Using WT7162RHUG24A
/WT7131A/WT6633P**

Test Report

Rev. 0.4

April 2024

Table of Contents

1	Features	3
2	Demo Board Photographs.....	4
3	Test Facilities	5
4	Demo Board Specification	5
5	Demo Board Test Items	6
6	Performance Measurements	7
6.1	Standby Power	7
6.2	Brown-in/Brown-Out	7
6.3	Average Efficiency and Efficiency at 10% Load (PCB Side)	7
6.4	Output Voltage Ripple (Cable End)	9
6.5	Line Regulation and Load Regulation (Cable End)	11
6.6	Dynamic Load Response (Cable End)	12
6.7	Output Over-shoot (Cable End)	14
6.8	Start Up Time and Hold Up Time	15
6.9	Voltage Stress on Primary GaN_FET and SR MOSFET	16
6.10	Secondary Side Over Current Protection	17
6.11	Primary Side Over Load Protection	18
6.12	Over Voltage Protection	19
6.13	ESD Test	21
6.14	SURGE Test	22
6.15	Thermal Test	23
7	Schematic	24
8	Bill of Materials	25
9	Conducted EMI under 6db margin (2-Pin Test)	30
10	Radiated EMI under 6db margin (2-Pin Test)	34
11	Shielding case	38
12	Revision History	39

Table of Figures

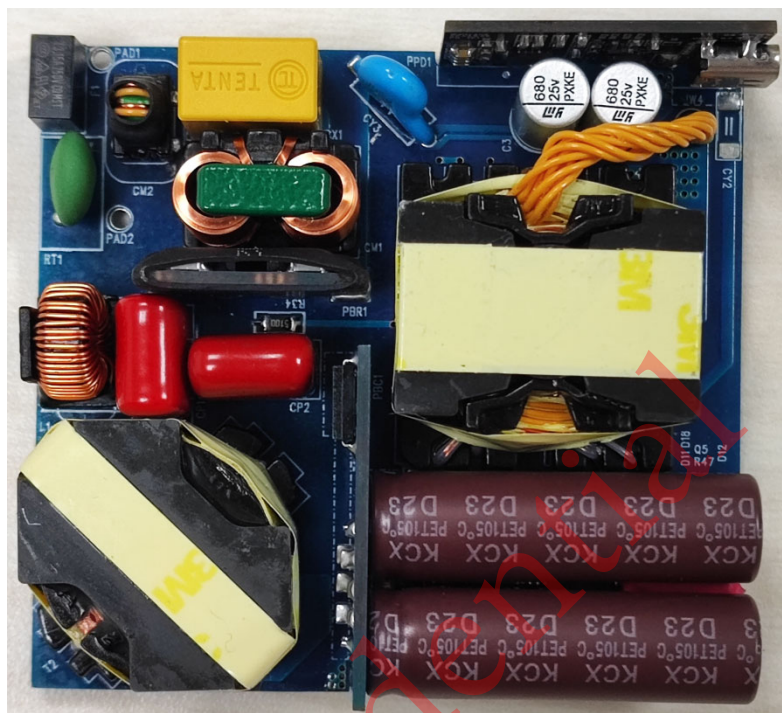
Figure 1	Ripple & Noise at Vin = 90Vac/47Hz 20VNo load.....	10
Figure 2	Ripple & Noise at Vin =90Vac/47Hz 20V5A.....	10
Figure 3	Ripple & Noise at Vin = 264Vac/50Hz 20VNo load.....	10
Figure 4	Ripple & Noise at Vin = 264Vac/50Hz 20V5A.....	10
Figure 5	Dynamic Response at Vin = 90Vac/60Hz, 5V0.3A to 3A load step.....	13
Figure 6	Dynamic Response at Vin = 264Vac/50Hz, 5V0.3A to 3A load step.....	13
Figure 7	Dynamic Response at Vin = 90Vac/60Hz, 20V0.5A to 5A load step.....	13
Figure 8	Dynamic Response at Vin = 264Vac/50Hz, 20V0.5A to 5A load step.....	13
Figure 9	The start up waveform of Output at Vin = 90Vac/60Hz, 5VNo-load.....	14
Figure 10	The start up waveform of Output at Vin = 90Vac/60Hz, 5V3A.....	14
Figure 11	The start up waveform of Output at Vin = 264Vac/50Hz, 5VNo-load.....	14
Figure 12	The start up waveform of Output at Vin = 264Vac/50Hz, 5V3A.....	14
Figure 13	Start Up time at Vin=90Vac/47Hz 5V3A, where Vin (CH3) and Vout (CH1).	15
Figure 14	Hold Up time at Vin = 100Vac/60Hz 20V5A, where Vin (CH3) and Vout (CH1).....	15
Figure 15	The waveform of Drain at Vin = 264Vac/50Hz, 20V5A.....	16
Figure 16	The waveform of Drain at Vin = 264Vac/50Hz, 5V3A Start up.....	16
Figure 17	The waveform of rectifier at Vin = 264Vac/50Hz, 20V5A.....	16
Figure 18	The waveform of rectifier at Vin = 264Vac/50Hz, 5V3A Start up.....	16
Figure 19	The waveform of OVP at Vin = 90Vac/60Hz, 5VNo-load.....	19
Figure 20	The waveform of OVP at Vin = 90Vac/60Hz, 5V3A.....	19
Figure 21	The waveform of OVP at Vin = 264Vac/50Hz, 5VNo-load.....	20
Figure 22	The waveform of OVP at Vin = 264Vac/50Hz, 5V3A.....	20
Figure 23	The waveform of OVP at Vin = 90Vac/60Hz, 20VNo-load.....	20
Figure 24	The waveform of OVP at Vin = 90Vac/60Hz, 20V5A.....	20
Figure 25	The waveform of OVP at Vin = 264Vac/50Hz, 20VNo-load.....	20
Figure 26	The waveform of OVP at Vin = 264Vac/50Hz, 20V5A.....	20

1 Features

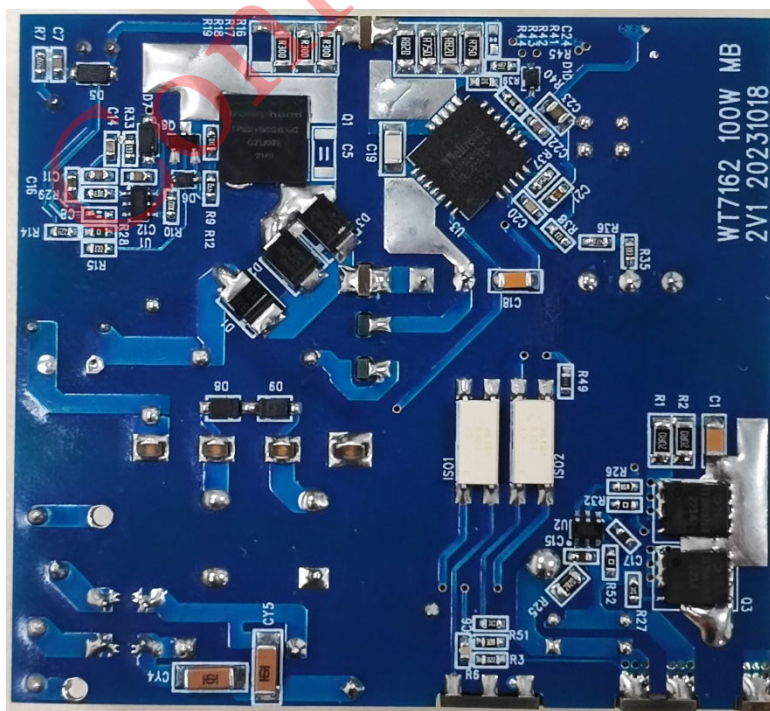
- Small Factor: 69mm x 63mm x 23.8mm.
- Topology:
Boundary Mode PFC + Flyback QR mode/valley-switching multi-mode operation.
- WT7162RHUG24A SiP IC and WT7131A SR controller work with WT6633P USB PD controller to be a total solution with cost effectiveness and high performance.
- Peak power efficiency: > 92.7%@264VAC
- Power density: 15.8W/in³
- Wide output voltage operation: USB-C PD3.0 and PPS 3.3V~21V
- No load input power < 50mW@264Vac.

Confidential

2 Demo Board Photographs



A. Top-view



B. Bottom-view

3 Test Facilities

Name	Mark
AC Source	Chroma 61601
Oscilloscope	RIGOL DS1104
Power Meter	Chroma 66202
Electronic Load	Chroma 63630
True RMS Multimeter	Picotest M3500A

4 Demo Board Specification

Parameter	Specification
Input Voltage	90Vac to 264Vac
Input Frequency	47Hz to 63Hz
Output Voltage and Current	5V/3A; 9V/3A; 12V/3A; 15V/3A; 20V/5A PPS: 3.3V~21V/5A
Output Power	15W@ 5V/3A 27W@9V/3A 36W@12V/3A 45W@15V/3A 100W@20V/5A
Output Ripple & Noise	150mV @5V/9V 200mV @12/15V/20V
Efficiency Measured On the Board (CoC V5 Tier2)	> 81.84% @5V/3A > 87.30% @9V/3A > 88.3% @12V3A > 88.85% @15V/3A > 89% @20V/5A

5 Demo Board Test Items

All test conditions are at the ambient temperature 25°C.

Test item	Specification	Result
Standby power measured at 90V/47Hz, 115V/60Hz, 230V/50Hz, 264V/50Hz.	< 75mW@ Detaching Type-c Connector	PASS
Brown-in	75Vac to 85Vac	PASS
Brown-out	68Vac to 78Vac	PASS
Average Efficiency (CoC V5 Tier 2)	> 81.84% @5V/3A > 87.30% @9V/3A > 88.3% @12V/3A > 88.85% @15V/3A > 89% @20V/5A	PASS
Ripple & Noise	< 150mV@5V/9V < 200mV@12/15V/20V	PASS
Line regulation	< 1%	PASS
Load regulation	< 5%	PASS
Dynamic (Peak-Peak, I _{load} =10%-100%)	< 10% @5V/9V < 5% @12/15V/20V	PASS
Overshoot	< 5%	PASS
Turn on time	< 0.5s	PASS
Hold up time	> 8.3ms	PASS
Voltage stress on GaN_FET	< 650V	PASS
Voltage stress on secondary rectifiers	< 120V	PASS
Over voltage protection	< 27V	PASS
Current limit	< 130%	PASS
ESD	±16KV by Air Discharge ±8.8KV by Contact Discharge Class A	PASS
SURGE	L to N ±1kV/ 2Ω; L to GND & N to GND ±2kV/12Ω; (0°/90°/270°) 3 Times, Class A	PASS

6 Performance Measurements

6.1 Standby Power

AC IN	Pout (W)	Vout (V)	Iin (mA)	Pin (mW)	Spec.	Result
90V _{AC} /60Hz	0	5	15.35	22.7	< 75mW	PASS
115V _{AC} /60Hz	0	5	19.58	24.2		
230V _{AC} /50Hz	0	5	32.61	36.1		
264V _{ac} /50Hz	0	5	37.44	43.1		

6.2 Brown-in/Brown-Out

Item	AC-In	Spec.	Result
Brown-In (Vac)	81.5	75Vac to 85Vac	PASS
Brown-Out (Vac)	74.2	68Vac to 78Vac	

6.3 Average Efficiency and Efficiency at 10% Load (PCB Side)

5V3A

AC IN \ I _{Load}	10%	25%	50%	75%	100%	AVG (%)	Spec.	Result
90V _{AC} /60Hz	90.21%	82.29%	89.63%	91.42%	91.38%	88.68%	81.84%	PASS
115V _{AC} /60Hz	89.23%	83.48%	91.60%	91.81%	91.85%	89.68%		PASS
230V _{AC} /50Hz	85.01%	77.78%	86.97%	90.27%	90.89%	86.48%		PASS
264V _{AC} /50Hz	84.01%	78.36%	85.12%	89.24%	90.24%	85.74%		PASS

9V3A

AC IN \ I _{Load}	10%	25%	50%	75%	100%	AVG (%)	Spec.	Result
90V _{AC} /60Hz	84.50%	86.37%	91.98%	91.83%	91.58%	90.44%	87.3%	PASS
115V _{AC} /60Hz	83.92%	86.51%	92.37%	92.47%	92.43%	90.95%		PASS
230V _{AC} /50Hz	76.25%	83.43%	91.36%	91.93%	92.24%	89.74%		PASS
264V _{AC} /50Hz	77.29%	81.92%	90.57%	91.31%	91.68%	88.87%		PASS

12V3A

$\frac{I_{Load}}{AC\ IN}$	10%	25%	50%	75%	100%	AVG (%)	Spec.	Result
90V _{AC} /60Hz	85.95%	91.66%	92.01%	91.78%	91.47%	91.73%	88.3%	PASS
115V _{AC} /60Hz	85.48%	92.12%	92.67%	92.69%	92.54%	92.50%		PASS
230V _{AC} /50Hz	79.40%	88.24%	91.97%	92.36%	92.55%	91.28%		PASS
264V _{AC} /50Hz	76.95%	86.63%	91.40%	91.92%	92.26%	90.56%		PASS

15V3A

$\frac{I_{Load}}{AC\ IN}$	10%	25%	50%	75%	100%	AVG (%)	Spec.	Result
90V _{AC} /60Hz	86.95%	91.65%	91.78%	91.59%	91.20%	91.55%	88.85%	PASS
115V _{AC} /60Hz	89.17%	92.04%	92.61%	92.60%	92.56%	92.45%		PASS
230V _{AC} /50Hz	82.38%	90.72%	92.22%	92.62%	92.82%	92.09%		PASS
264V _{AC} /50Hz	81.80%	89.87%	91.76%	92.32%	92.64%	91.65%		PASS

20V5A

$\frac{I_{Load}}{AC\ IN}$	10%	25%	50%	75%	100%	AVG (%)	Spec.	PF	Result
90V _{AC} /60Hz	85.21%	89.69%	91.43%	91.73%	91.44%	91.07%	89%	0.99	PASS
115V _{AC} /60Hz	87.09%	90.70%	92.11%	92.56%	92.57%	91.98%		0.98	PASS
230V _{AC} /50Hz	83.42%	88.39%	90.67%	91.74%	92.26%	90.76%		0.93	PASS
264V _{AC} /50Hz	84.85%	89.38%	91.24%	92.15%	92.75%	91.38%		0.89	PASS

6.4 Output Voltage Ripple (Cable End)

Test Condition:

The oscilloscope uses 20 MHz bandwidth limited.

The oscilloscope probe connects two capacitors in parallel. One is 10 μ F aluminum electrolytic and the other is 0.1 μ F ceramic type.

AC IN	Load		mV (p-p)	Spec.	Note	Result
	Vout	Iout				
90V _{AC} /47Hz	5V	No Load	30	< 150mV	-	PASS
		Full Load	70		-	
264V _{AC} /50Hz		No Load	52		-	
		Full Load	116		-	
90V _{AC} /47Hz	9V	No Load	34	< 150mV	-	PASS
		Full Load	62		-	
264V _{AC} /50Hz		No Load	38		-	
		Full Load	96		-	
90V _{AC} /47Hz	12V	No Load	34	< 200mV	-	PASS
		Full Load	62		-	
264V _{AC} /50Hz		No Load	42		-	
		Full Load	86		-	
90V _{AC} /47Hz	15V	No Load	36	< 200mV	-	PASS
		Full Load	78		-	
264V _{AC} /50Hz		No Load	38		-	
		Full Load	88		-	
90V _{AC} /47Hz	20V	No Load	38	< 200mV	Figure 1	PASS
		Full Load	84		Figure 2	
264V _{AC} /50Hz		No Load	42		Figure 3	
		Full Load	108		Figure 4	

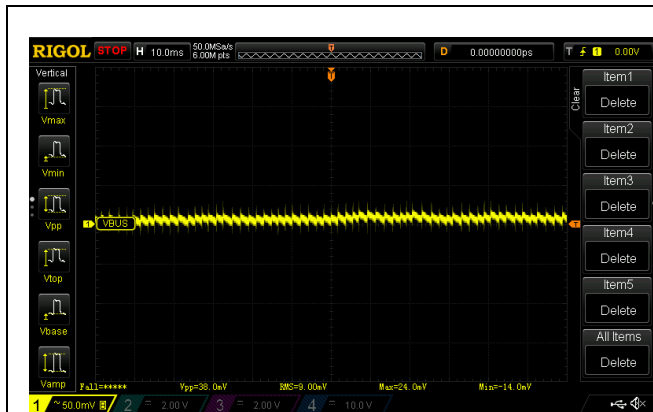


Figure 1 Ripple & Noise at Vin = 90Vac/47Hz
20V No load

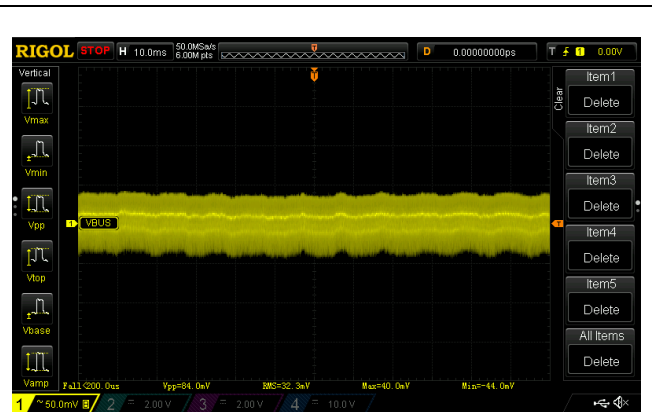


Figure 2 Ripple & Noise at Vin = 90Vac/47Hz
20V5A

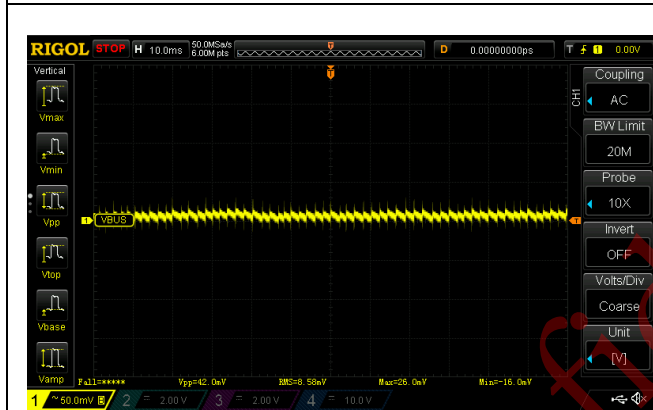


Figure 3 Ripple & Noise at Vin = 264Vac/50Hz
20V No load



Figure 4 Ripple & Noise at Vin = 264Vac/50Hz
20V5A

6.5 Line Regulation and Load Regulation (Cable End)

AC IN	Vo (V) no load	Vo (V) 25% load	Vo (V) 50% load	Vo (V) 100% load	Spec.	Result
90V _{AC} /60Hz	5.03	5.02	5.01	5.01	4.75V to 5.25V	PASS
115V _{AC} /60Hz	5.03	5.02	5.01	5.01		
230V _{AC} /50Hz	5.03	5.02	5.02	5.01		
264V _{AC} /50Hz	5.03	5.02	5.02	5.01		
90V _{AC} /60Hz	9.06	9.05	9.05	9.04	8.55V to 9.45V	PASS
115V _{AC} /60Hz	9.06	9.05	9.05	9.04		
230V _{AC} /50Hz	9.06	9.05	9.05	9.04		
264V _{AC} /50Hz	9.06	9.05	9.05	9.04		
90V _{AC} /60Hz	12.05	12.04	12.04	12.04	11.4V to 12.6V	PASS
115V _{AC} /60Hz	12.05	12.04	12.04	12.04		
230V _{AC} /50Hz	12.05	12.04	12.04	12.04		
264V _{AC} /50Hz	12.05	12.04	12.04	12.03		
90V _{AC} /60Hz	15.06	15.06	15.06	15.05	14.25V to 15.75V	PASS
115V _{AC} /60Hz	15.06	15.05	15.05	15.04		
230V _{AC} /50Hz	15.06	15.05	15.05	15.04		
264V _{AC} /50Hz	15.06	15.05	15.05	15.04		
90V _{AC} /60Hz	20.05	20.04	20.04	20.03	19.0V to 21.0V	PASS
115V _{AC} /60Hz	20.05	20.04	20.03	20.02		
230V _{AC} /50Hz	20.05	20.04	20.04	20.03		
264V _{AC} /50Hz	20.05	20.04	20.03	20.02		
Line Regulation	%				1%	PASS
Load Regulation	%				5%	PASS

Note: R Cable=0.126Ω.

6.6 Dynamic Load Response (Cable End)

Test Condition:

Load Change is 10%-100% load step with the slew rate=1A/ μ s and the period is 20ms and the duty is 50%.

R_Cable: 0.126 Ω .

AC IN	Vo (max)	Vo (min)	Spec.	Note	Result
90V _{AC} /60Hz	5.48	4.64	<10%	Figure 5	PASS
264V _{AC} /50Hz	5.48	4.64		Figure 6	
90V _{AC} /60Hz	9.48	8.68	<10%	-	PASS
264V _{AC} /50Hz	9.52	8.64		-	
90V _{AC} /60Hz	12.5	11.7	<5%	-	PASS
264V _{AC} /50Hz	12.5	11.6		-	
90V _{AC} /60Hz	15.5	14.8	<5%	-	PASS
264V _{AC} /50Hz	15.6	14.7		-	
90V _{AC} /60Hz	20.8	19.5	<5%	Figure 7	PASS
264V _{AC} /50Hz	20.7	19.5		Figure 8	

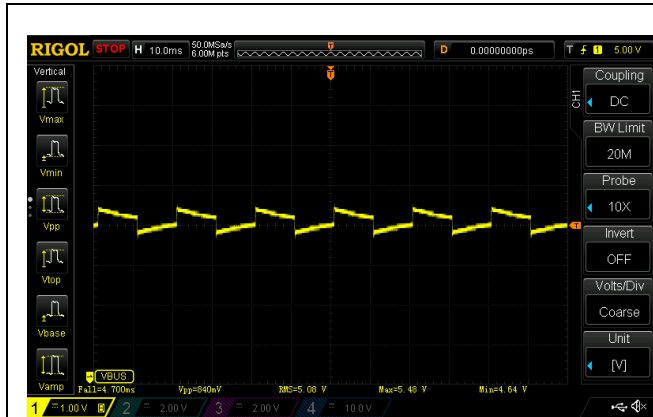


Figure 5 Dynamic Response at $V_{in} = 90\text{Vac}/60\text{Hz}$, 5V0.3A to 3A load step.

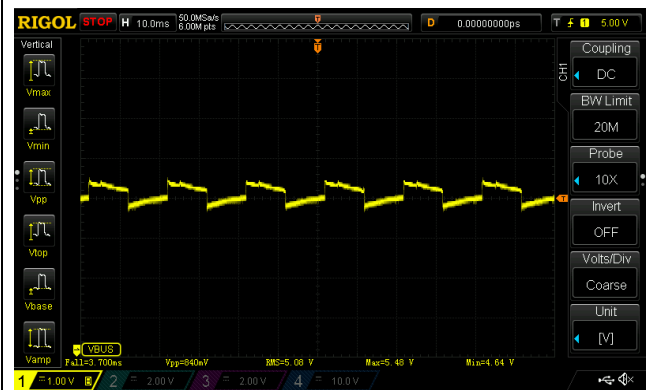


Figure 6 Dynamic Response at $V_{in} = 264\text{Vac}/50\text{Hz}$, 5V0.3A to 3A load step.

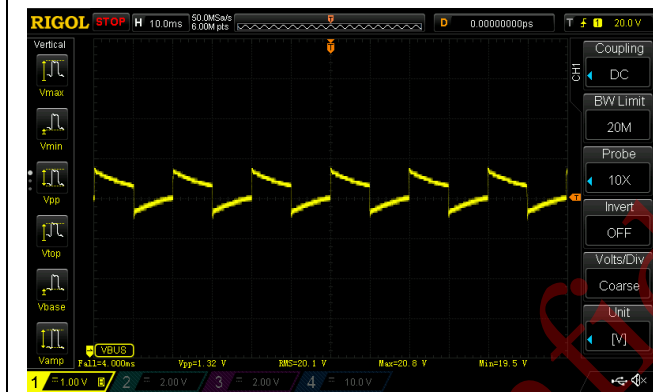


Figure 7 Dynamic Response at $V_{in} = 90\text{Vac}/60\text{Hz}$, 20V0.5A to 5A load step.

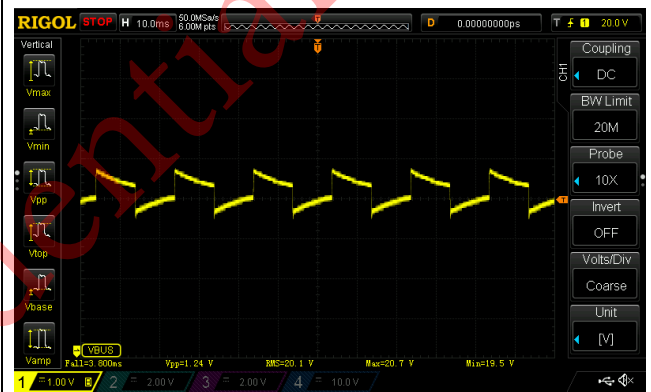


Figure 8 Dynamic Response at $V_{in} = 264\text{Vac}/50\text{Hz}$, 20V0.5A to 5A load step.

6.7 Output Over-shoot (Cable End)

AC IN	Load	Test Data (%)	Spec.	Note	Result
90V _{AC} /60Hz	No Load	0	< 5%	Figure 9	PASS
	Full Load	0		Figure 10	
264V _{AC} /50Hz	No Load	0		Figure 11	
	Full Load	0		Figure 12	

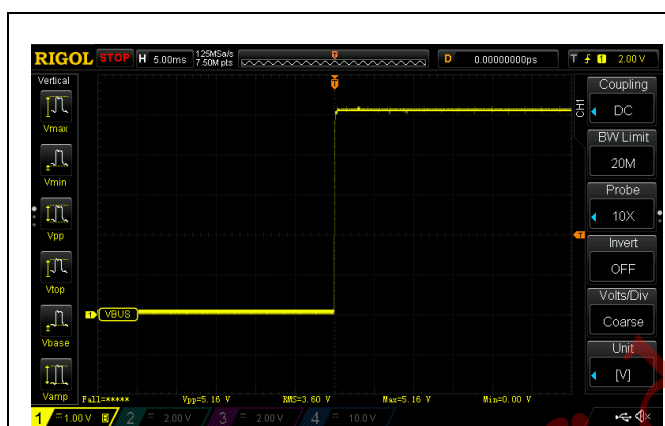


Figure 9 The start up waveform of Output at Vin = 90Vac/60Hz, 5V No-load



Figure 10 The start up waveform of Output at Vin = 90Vac/60Hz, 5V3A

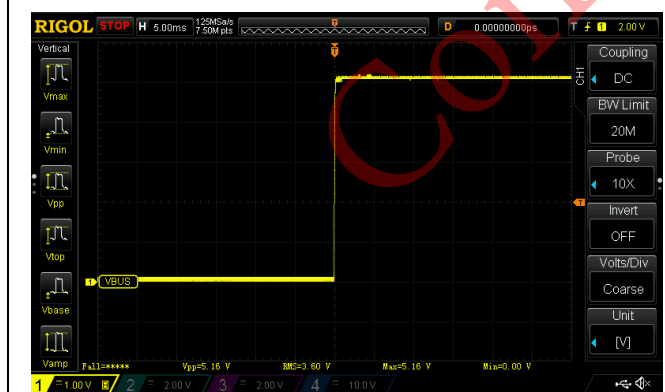


Figure 11 The start up waveform of Output at Vin = 264Vac/50Hz, 5V No-load

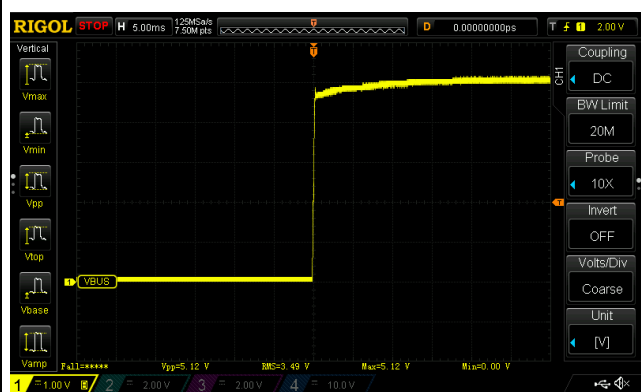


Figure 12 The start up waveform of Output at Vin = 264Vac/50Hz, 5V3A

6.8 Start Up Time and Hold Up Time

Test Condition:

Start Up time and Hold Up time are measured at full load.

Item	AC IN	Time	Spec.	Note	Result
Start Up time	90V _{AC} /47Hz	147ms	<0.5s	Figure 13	PASS
Hold Up time	100V _{AC} /60Hz	20.2ms	>8.3ms	Figure 14	

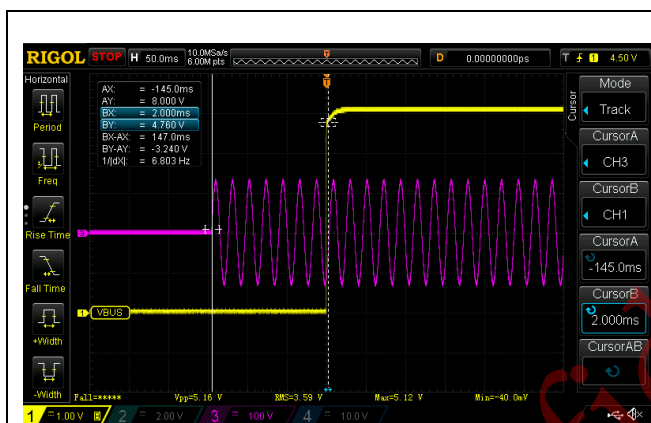


Figure 13 Start Up time at Vin=90Vac/47Hz 5V3A, where Vin (CH3) and Vout (CH1).

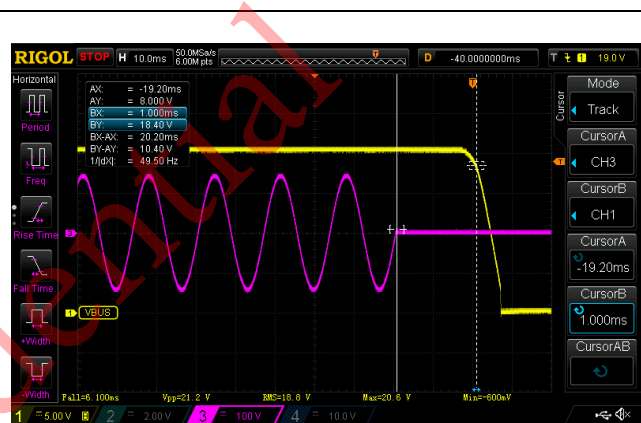


Figure 14 Hold Up time at Vin = 100Vac/60Hz 20V5A, where Vin (CH3) and Vout (CH1).

6.9 Voltage Stress on Primary GaN_FET and SR MOSFET

Test Condition:

Primary GaN FET's Drain Voltage (Oscilloscope Probe: Sapphire Instruments SI-9010)

AC IN	State	Stress on GaN_FET	Spec.	Note	Result
264V _{AC} /50Hz	Normal (20V)	592V	<650V	Figure 15	PASS
264V _{AC} /50Hz	Start Up (5V)	496V		Figure 16	

SR MOSFET Voltage: (Oscilloscope Probe: Sapphire Instruments SI-9010)

AC IN	State	Stress on Rectifier	Spec.	Note	Result
264V _{AC} /50Hz	Normal (20V)	118V	<120V	Figure 17	PASS
264V _{AC} /50Hz	Start Up (5V)	111V		Figure 18	

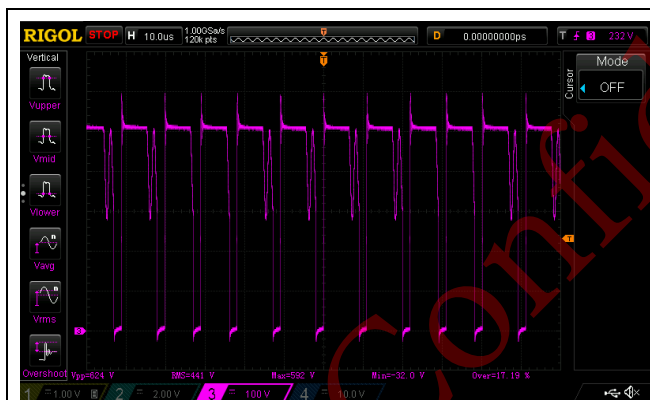


Figure 15 The waveform of Drain at Vin = 264Vac/50Hz, 20V5A



Figure 16 The waveform of Drain at Vin = 264Vac/50Hz, 5V3A Start up

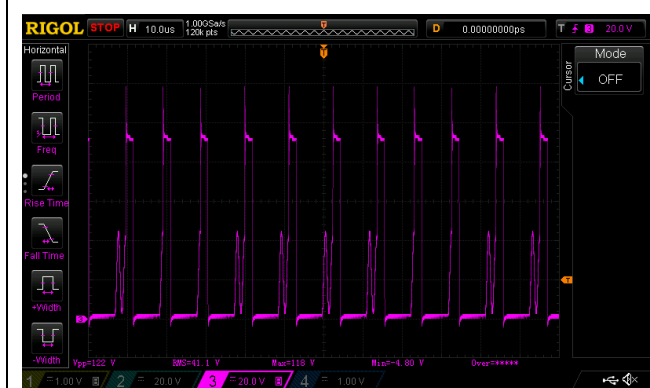


Figure 17 The waveform of rectifier at Vin = 264Vac/50Hz, 20V5A

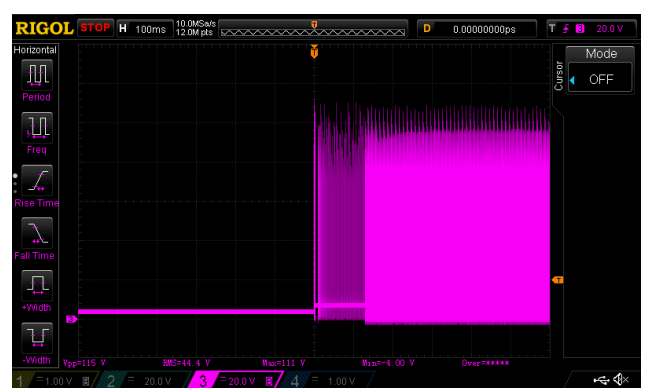


Figure 18 The waveform of rectifier at Vin = 264Vac/50Hz, 5V3A Start up

6.10 Secondary Side Over Current Protection

AC IN	Vout	Current Limit Value (A)	Spec.	Result
90V _{AC} /60Hz	5V	3.34	< 3.9A	PASS
115V _{AC} /60Hz		3.33		
230V _{AC} /50Hz		3.33		
264V _{AC} /50Hz		3.33		
90V _{AC} /60Hz	9V	3.34	< 3.9A	PASS
115V _{AC} /60Hz		3.33		
230V _{AC} /50Hz		3.33		
264V _{AC} /50Hz		3.33		
90V _{AC} /60Hz	12V	3.34	< 3.9A	PASS
115V _{AC} /60Hz		3.33		
230V _{AC} /50Hz		3.33		
264V _{AC} /50Hz		3.33		
90V _{AC} /60Hz	15V	3.34	< 3.9A	PASS
115V _{AC} /60Hz		3.33		
230V _{AC} /50Hz		3.33		
264V _{AC} /50Hz		3.33		
90V _{AC} /60Hz	20V	5.55	< 6.5A	PASS
115V _{AC} /60Hz		5.54		
230V _{AC} /50Hz		5.54		
264V _{AC} /50Hz		5.54		

6.11 Primary Side Over Load Protection

AC IN	Vout	Current Limit Value (A)	Note
90V _{AC} /60Hz	5V	7.07	<8A, <100W
115V _{AC} /60Hz		6.89	
230V _{AC} /50Hz		6.99	
264V _{AC} /50Hz		6.97	
90V _{AC} /60Hz	9V	6.32	<8A, <100W
115V _{AC} /60Hz		6.71	
230V _{AC} /50Hz		7.33	
264V _{AC} /50Hz		7.35	
90V _{AC} /60Hz	12V	5.63	<8A, <100W
115V _{AC} /60Hz		6.10	
230V _{AC} /50Hz		6.90	
264V _{AC} /50Hz		6.96	
90V _{AC} /60Hz	15V	4.98	<100W
115V _{AC} /60Hz		5.56	
230V _{AC} /50Hz		6.51	
264V _{AC} /50Hz		6.59	
90V _{AC} /60Hz	20V	5.69	NA
115V _{AC} /60Hz		5.70	
230V _{AC} /50Hz		6.17	
264V _{AC} /50Hz		6.16	

6.12 Over Voltage Protection

AC IN	Vout	No load (V)		Full load (V)		Spec.	Note		Result
		E-Cap.	V _{BUS}	E-Cap.	V _{BUS}		No load	Full load	
90V _{AC} /60Hz	5V	25.6	6.72	25.6	6.48	<27V	Figure 22	Figure 23	PASS
264V _{AC} /50Hz		25.8	6.8	25.8	6.48		Figure 24	Figure 25	
90V _{AC} /60Hz	9V	25.6	11.1	25.6	10.9	<27V	-	-	PASS
264V _{AC} /50Hz		26.0	11.0	25.8	10.9		-	-	
90V _{AC} /60Hz	12V	25.6	14.8	25.6	14.6	<27V	-	-	PASS
264V _{AC} /50Hz		25.8	14.8	25.8	14.6		-	-	
90V _{AC} /60Hz	15V	25.6	18.6	25.6	18.4	<27V	-	-	PASS
264V _{AC} /50Hz		25.6	18.6	25.8	18.4		-	-	
90V _{AC} /60Hz	20V	25.8	24.6	25.8	24.4	<27V	Figure 26	Figure 27	PASS
264V _{AC} /50Hz		26.0	24.6	25.6	24.4		Figure 28	Figure 29	



Figure 19 The waveform of OVP at Vin = 90Vac/60Hz, 5V No-load

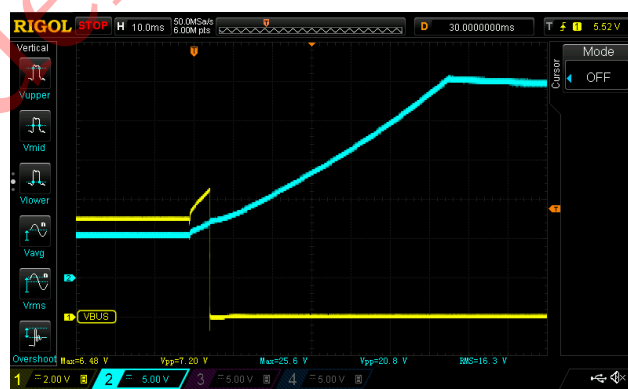


Figure 20 The waveform of OVP at Vin = 90Vac/60Hz, 5V 3A

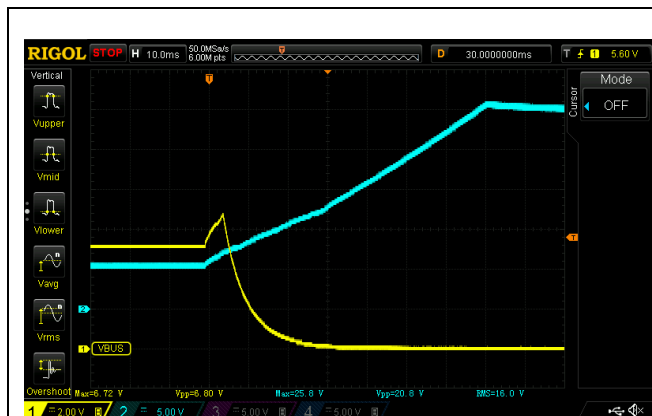


Figure 21 The waveform of OVP at Vin = 264Vac/50Hz, 5VNo-load

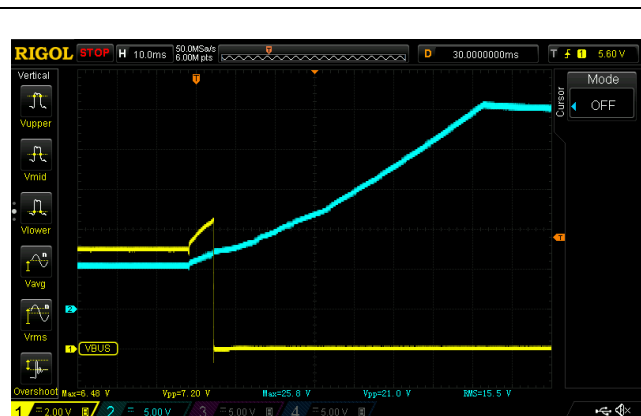


Figure 22 The waveform of OVP at Vin = 264Vac/50Hz, 5V3A



Figure 23 The waveform of OVP at Vin = 90Vac/60Hz, 20VNo-load

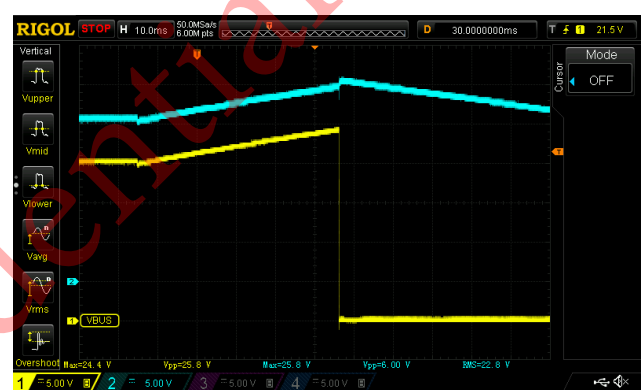


Figure 24 The waveform of OVP at Vin = 90Vac/60Hz, 20V5A



Figure 25 The waveform of OVP at Vin = 264Vac/50Hz, 20VNo-load

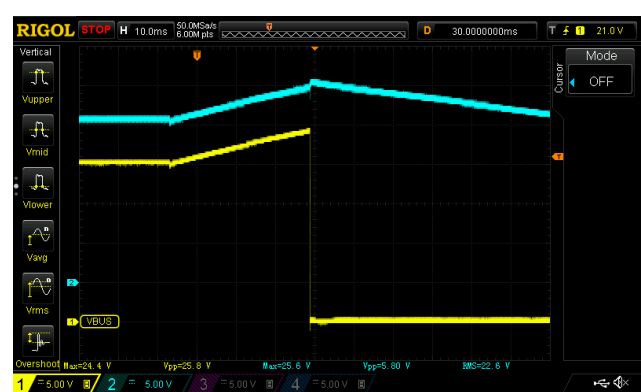


Figure 26 The waveform of OVP at Vin = 264Vac/50Hz, 20V5A

6.13 ESD Test

(Tested with shielding case)

Test Conditions: $V_{in}=230V_{ac}$; 5V3A, 20V5A

Air Discharge: $\pm 16KV$

Sample	Number of Strikes	Test Result
No. G1	20	PASS
No. G2		

Contact Discharge: $\pm 8.8KV$

Sample	Number of Strikes	Test Result
No. G1	20	PASS
No. G2		

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6.14 SURGE Test

(Tested with shielding case)

Test Conditions: $V_{in}=230V_{ac}$; 20V5A

L to N $\pm 1KV/2\Omega$ ($0^\circ/90^\circ/270^\circ$) 3 Times

Sample	Number of Strikes	Test Result
No. G1	18	PASS
No. G2		

L to GND $\pm 2KV/12\Omega$ ($0^\circ/90^\circ/270^\circ$) 3 Times

Sample	Number of Strikes	Test Result
No. G1	18	PASS
No. G2		

N to GND $\pm 2KV/12\Omega$ ($0^\circ/90^\circ/270^\circ$) 3 Times

Sample	Number of Strikes	Test Result
No. G1	18	PASS
No. G2		

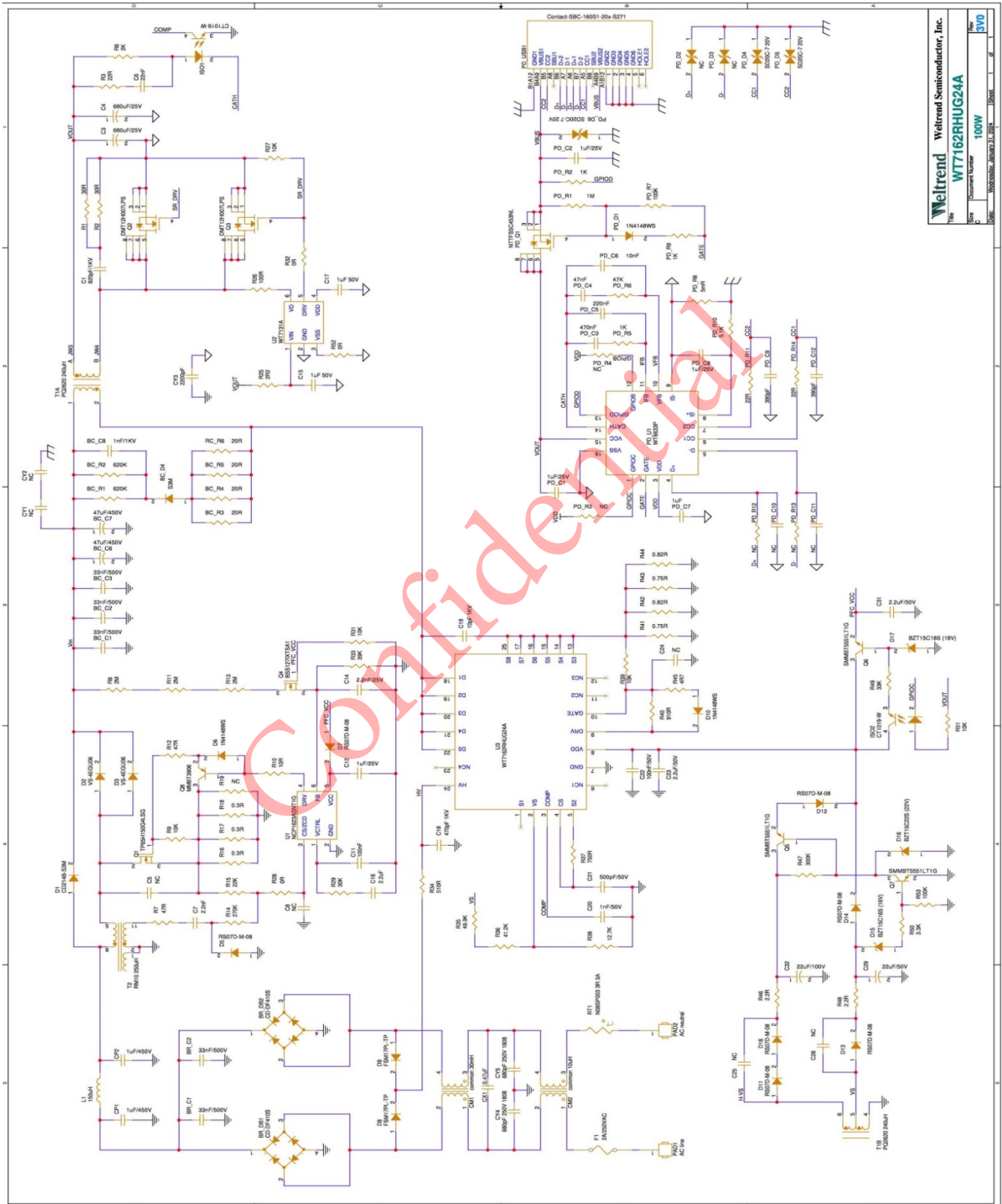
6.15 Thermal Test

Item	90Vac/60Hz 20V5A Open frame (°C)	264Vac/50Hz 20V5A Open frame (°C)
WT7162RHUG24A	89	97
WT7131A	76	82
SR Mosfet	84	95
Transformer (T1)	60	61
Inductor (T2)	74	82
Ambient temperature	25	25

Note: burn In 30 mins.

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7 Schematic



8 Bill of Materials

Location	Description	Q'ty	Vendor	Remark
BR_C1,BC_C1,BR_C2,BC_C2,BC_C3	33nF/500V	5		
BC_C6,BC_C7	47uF/450V	2		
BC_C8	1nF/1KV	1		
BC_D4	S3M	1		
BC_R1,BC_R2	620K	2		
BC_R3,BC_R4,BC_R5,RC_R6	20R	4		
BR_DB1,BR_DB2	CD-DF410S	2	Bourns	
CM1	common 30mH	1		
CM2	common 10uH	1		
CP1,CP2	1uF/450V	2	Yming	
CX1	0.47uF 275V	1		
CY1,CY2	NC	2		
CY3	2200pF	1		
CY4,CY5	680pF 250V 1808	2	Holy Stone	
C1	820pF/1KV	1		
C3,C4	680uF/25V	2		
C5	NC	1		
C6	22nF	1		
C7	2.2nF	1		
C8,C24,C25,C28	NC	4		
C11	100nF	1		
C12	1uF/25V	1		
C14	2.2nF/25V	1		
C15,C17	1uF 50V	2		
C16	2.2uF	1		

Location	Description	Q'ty	Vendor	Remark
C18	470pF 1KV	1		
C19	10pF 1KV	1		
C20	1nF/50V	1		
C21	500pF/50V	1		
C22	100nF/50V	1		
C23	2.2uF/50V	1		
C29	22uF/50V	1		
C31	2.2uF/50V	1		
C32	22uF/100V	1		
D1	CD214B-S3M	1	Bourns	S3M
D2,D3	VS-4EGU06	2	Vishay	4U6-V24M
D5,D7,D11,D12,D13,D14,D18	RS07D-M-08	7	Vishay	TD
PD_D1,D6,D10	1N4148WS	3	Onsemi	TD
D8,D9	FSM17PL-TP	2	MCC	F7
D15	BZT15C16S (16V)	1	JECT	WK
D16	BZT15C22S (22V)	1	JECT	WL
D17	BZT15C18S (18V)	1	JECT	WN
F1	2A/250VAC	1	CONQUIRE	2A 250VAC
ISO1,ISO2	CT1019-W	2	CT MICRO	CT1019W
JW3	Jump_Wire_A	1		
JW4	Jump_Wire_B	1		
L1	150uH	1		
PAD1	AC line	1		
PAD2	AC neutral	1		
PD_C1,PD_C2,PD_C8	1uF/25V	3		

Location	Description	Q'ty	Vendor	Remark
PD_C3	470nF	1		
PD_C4	47nF	1		
PD_C5	220nF	1		
PD_C6	10nF	1		
PD_C7	1uF	1		
PD_C9,PD_C12	390pF	2		
PD_C10,PD_C11	NC	2		
PD_D2,PD_D3	NC	2		
PD_D4,PD_D5,PD_D6	SD20C-7 20V	3	Diodes	D/D
PD_Q1	NTTFS5C453NLTAG	1	Onsemi	453L
PD_R1	1M	1		
PD_R2,PD_R5,PD_R9	1K	3		
PD_R3,PD_R4,PD_R12,PD_R13	NC	4		
PD_R6	47K	1		
PD_R7,R53	100K	2		
PD_R8	5mR	1		
PD_R10	5.1K	1		
R3,PD_R11,PD_R14	22R	3		
PD_USB1	SBC-160S1-20x-S271	1	Contact	
PD_U1	WT6633P	1	Weltrend	

Location	Description	Q'ty	Vendor	Remark
Q1	TP65H150G4LSG	1	Transphorm	65H150G4LS
Q2,Q3	DMT12H007LPS	2	Diodes	T12H007LS
Q4	BSS127IXTSA1	1	Infineon	IIS
Q5,Q6,Q7	SMMBT5551LT1G	3	Onsemi	G1
Q8	MMBT3906	1	Taiwan Semi	
RT1	N08SP003 3R 3A	1	YAGEO	08SP003
R1,R2	30R	2		
R6	2K	1		
R7,R12	47R	2		
R8,R11,R13	2M	3		
R9,R27,R31,R39,R51	10K	5		
R10	10R	1		
R14	270K	1		
R15	22K	1		
R16,R17,R18	0.3R	3		
R19	NC	1		
R25	2R2	1		
R26	100R	1		
R28,R32,R52	0R	3		
R29	30K	1		
R33	39K	1		
R34	510R	1		
R35	49.9K	1		

Location	Description	Q'ty	Vendor	Remark
R36	41.2K	1		
R37	750R	1		
R38	12.7K	1		
R40	910R	1		
R41,R43	0.75R	2		
R42,R44	0.82R	2		
R45	4R7	1		
R46,R48	2.2R	2		
R47	300K	1		
R49	33K	1		
R50	3.3K	1		
T1	PQ2620 240uH	1		
T2	RM10 250uH	1		
U1	NCP1623ASNT1G	1	Onsemi	UPTRD1
U2	WT7131A	1	Weltrend	
U3	WT7162RHUG24A	1	Weltrend	

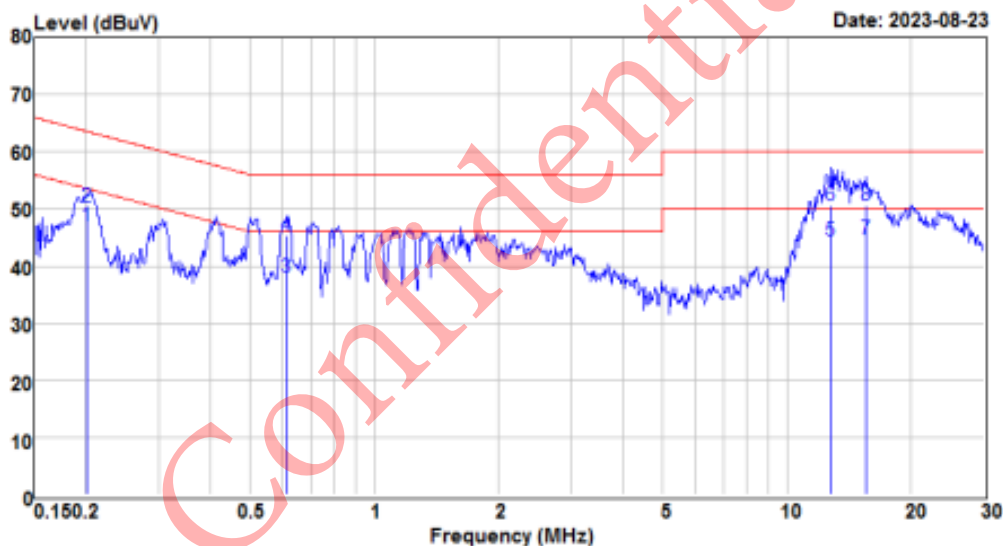
9 Conducted EMI under 6db margin (2-Pin Test)

(Tested with shielding case)

110Vac/60Hz 20V5A (Neutral)

Site: CON 1 Test Voltage: 110Vac/60Hz
M/N: 100W 20V Mode: Full Load
POL: NEUTRAL Engineer: Jeremy.Zhong Temp: 25.1 Humidity: 55%
REMARK: NO.2 2.2 -CY1 +680

Data: 31 File: C:\Users\Weici_Lo.TWPCCTP0001224\Desktop\31 Test Data\客戶\ITE\偉詮\100W 20V.EM6 Date: 2023-08-23



Freq	Reading	C.F	Result	Limit	Over	Detector
MHz	Level		dBuV	dBuV	Limit	
	dBuV	dB			dB	
0.202	36.64	10.35	46.99	53.54	-6.55	Average
0.202	40.07	10.35	50.42	63.54	-13.12	QP
0.611	27.47	10.47	37.94	46.00	-8.06	Average
0.611	34.78	10.47	45.25	56.00	-10.75	QP
12.784	31.47	12.89	44.36	50.00	-5.64	Average
12.784	37.68	12.89	50.57	60.00	-9.43	QP
15.552	31.00	13.56	44.56	50.00	-5.44	Average
15.552	37.00	13.56	50.56	60.00	-9.44	QP

110Vac/60Hz 20V5A (Line)

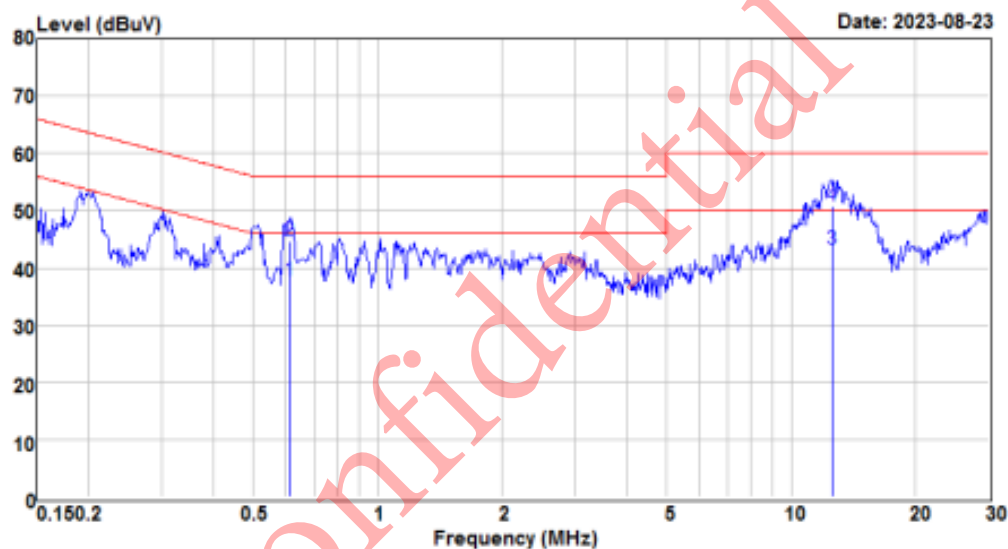
Site: CON 1 Test Voltage: 110Vac/60Hz

M/N: 100W 20V Mode: Full Load

POL: LINE Engineer: Jeremy.Zhong Temp: 25.1 Humidity: 55%

REMARK: NO.2 2.2 -CY1 +680

Data: 32 File: C:\Users\Weici_Lo.TW\PCCTP0001224\Desktop\3\Test Data\客戶\ITE\偉詮\100W 20V.EM6

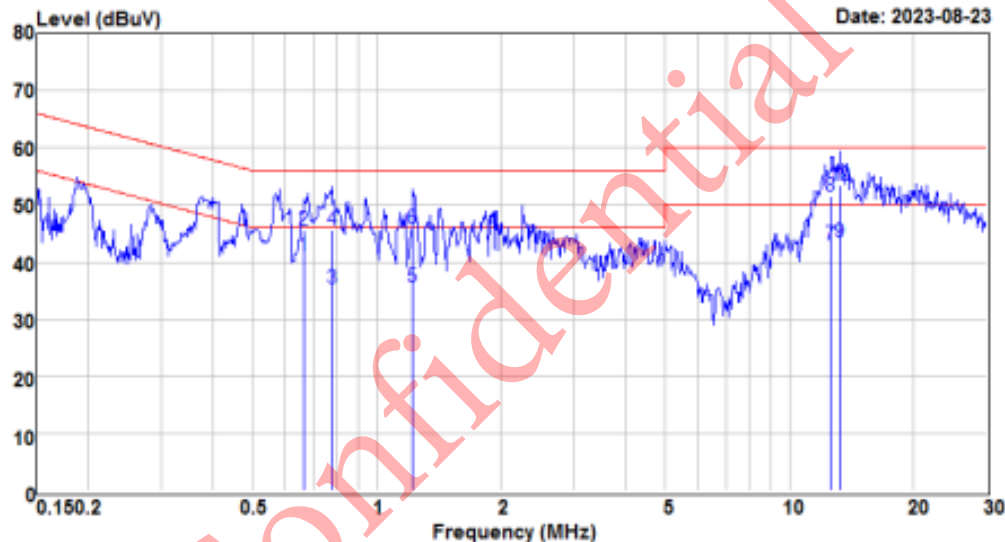


Freq MHz	Reading Level dBuV	C.F dB	Result dBuV	Limit dBuV	Over Limit dB	Detector
0.614	27.30	10.43	37.73	46.00	-8.27	Average
0.614	34.10	10.43	44.53	56.00	-11.47	QP
12.516	30.56	12.67	43.23	50.00	-6.77	Average
12.516	38.23	12.67	50.90	60.00	-9.10	QP

230Vac/50Hz 20V5A (Neutral)

Site: CON 1 Test Voltage: 230Vac/50Hz
M/N: 100W 20V Mode: Full Load
POL: NEUTRAL Engineer: Jeremy.Zhong Temp: 25.1 Humidity: 55%
REMARK: NO.2 2.2 -CY1 +680

Data: 30 File: C:\Users\WeiLo.TW\PCCTP0001224\Desktop\3\Test Data\客戶\ITE\偉詮\100W 20V.EM6 Date: 2023-08-23

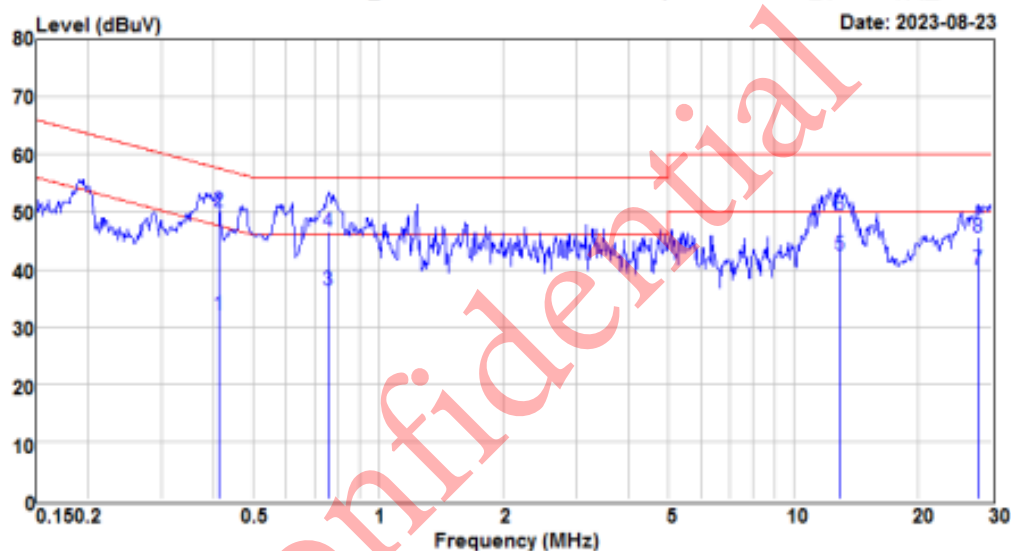


Freq	Reading	C.F	Result	Limit	Over	Detector
MHz	Level				Limit	
	dBuV	dB	dBuV	dBuV	dB	
0.666	30.53	10.47	41.00	46.00	-5.00	Average
0.666	35.09	10.47	45.56	56.00	-10.44	QP
0.779	24.95	10.48	35.43	46.00	-10.57	Average
0.779	35.09	10.48	45.57	56.00	-10.43	QP
1.223	25.11	10.51	35.62	46.00	-10.38	Average
1.223	35.28	10.51	45.79	56.00	-10.21	QP
12.582	30.04	12.83	42.87	50.00	-7.13	Average
12.582	38.77	12.83	51.60	60.00	-8.40	QP
13.197	30.40	13.00	43.40	50.00	-6.60	Average
13.197	40.36	13.00	53.36	60.00	-6.64	QP

230Vac/50Hz 20V5A (Line)

Site: CON 1 Test Voltage: 230Vac/50Hz
M/N: 100W 20V Mode: Full Load
POL: LINE Engineer: Jeremy.Zhong Temp: 25.1 Humidity: 55%
REMARK: NO.2 2.2 -CY1 +680

Data: 29 File: C:\Users\WeiLo.TW\PCCTP0001224\Desktop\ie3\Test Data\客戶\ITE\偉詮\100W 20V.EM6



Freq	Reading	C.F	Result	Limit	Over	Detector
MHz	Level				Limit	
	dBuV	dB	dBuV	dBuV	dB	
0.413	21.71	10.33	32.04	47.59	-15.55	Average
0.413	39.88	10.33	50.21	57.59	-7.38	QP
0.759	25.93	10.44	36.37	46.00	-9.63	Average
0.759	36.05	10.44	46.49	56.00	-9.51	QP
12.988	29.77	12.80	42.57	50.00	-7.43	Average
12.988	36.50	12.80	49.30	60.00	-10.70	QP
27.855	23.16	16.65	39.81	50.00	-10.19	Average
27.855	28.89	16.65	45.54	60.00	-14.46	QP

10 Radiated EMI under 6db margin (2-Pin Test)

(Tested with shielding case)

110Vac/60Hz 20V5A (Vertical)

Site : CB1166

Test voltage : 110 Vac/ 60 Hz

M/N : 100W

Test Mode : Full Load

Polarity : VERTICAL

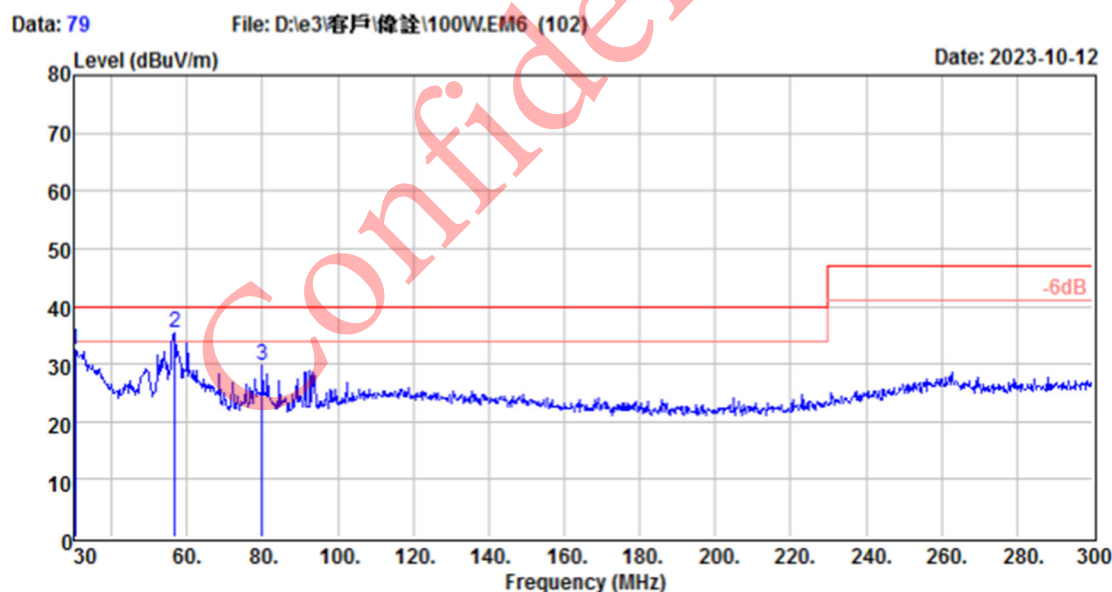
Engineer : Peter.Chu

Temp : 25

Humidity : 54%

Remark1 : 20V,NO.2

Remark2 :



Freq	Reading	C.F	Result	Limit	Margin	Detector
MHz	dBuV	dB	PK dBuV/m	dBuV/m	dB	
30.270	7.54	24.88	32.42	40.00	-7.58	Peak
56.730	22.33	13.18	35.51	40.00	-4.49	Peak
79.950	15.67	14.08	29.75	40.00	-10.25	Peak

110Vac/60Hz 20V5A (Horizontal)

Site : CB1166

Test voltage : 110 Vac/ 60 Hz

M/N : 100W

Test Mode : Full Load

Polarity : HORIZONTAL

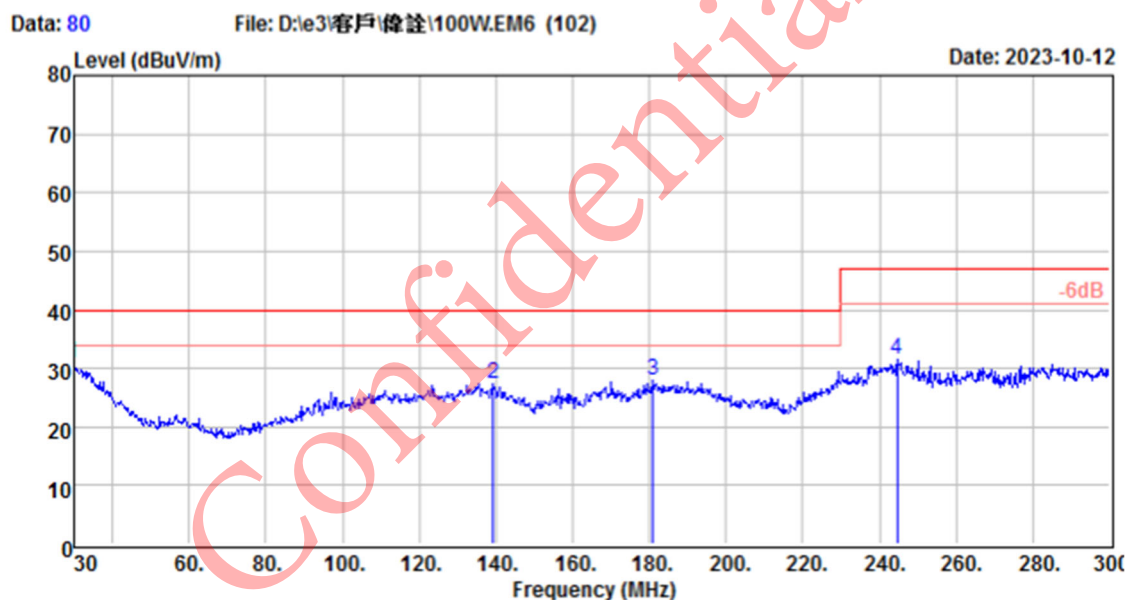
Engineer : Peter.Chu

Temp : 25

Humidity : 54%

Remark1 : 20V,NO.2

Remark2 :



Freq	Reading	C.F	Result	Limit	Margin	Detector
MHz	dBuV	dB	PK dBuV/m	dBuV/m	dB	
30.000	5.96	25.03	30.99	40.00	-9.01	Peak
139.350	8.65	18.66	27.31	40.00	-12.69	Peak
180.930	11.32	16.61	27.93	40.00	-12.07	Peak
244.650	11.67	19.78	31.45	47.00	-15.55	Peak

230Vac/50Hz 20V5A (Vertical)

Site : CB1166

Test voltage : 230 Vac/ 50 Hz

M/N : 100W

Test Mode : Full Load

Polarity : VERTICAL

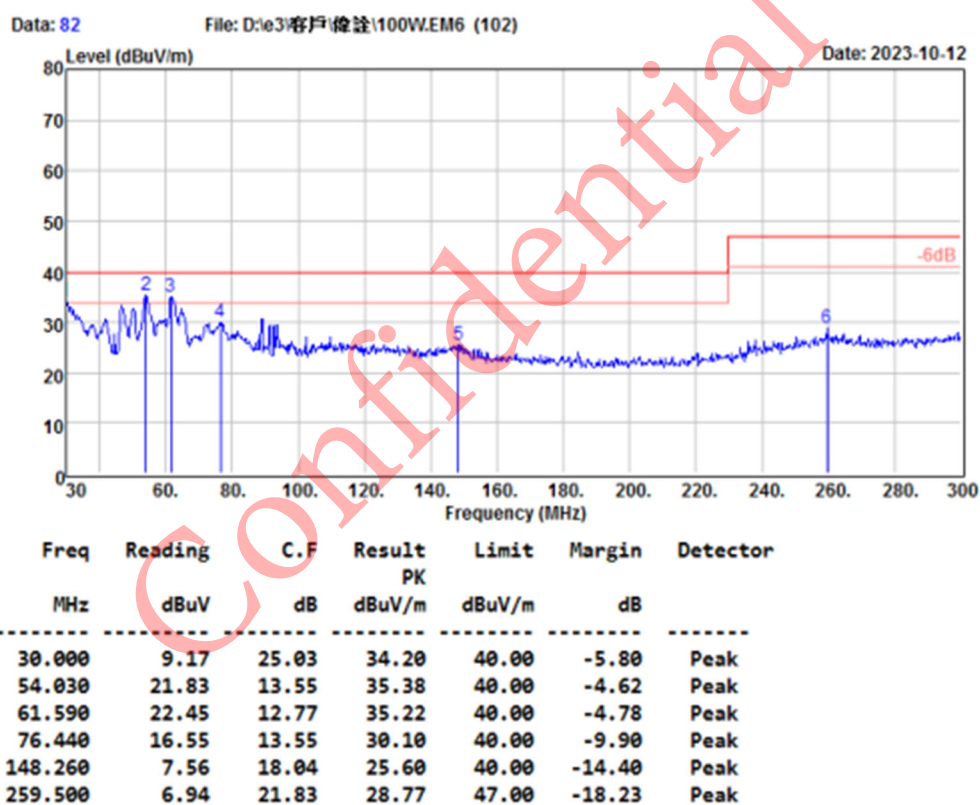
Engineer : Peter.Chu

Temp : 25

Humidity : 54%

Remark1 : 20V,NO.2

Remark2 :



230Vac/50Hz 20V5A (Horizontal)

Site : CB1166

Test voltage : 230 Vac/ 50 Hz

M/N : 100W

Test Mode : Full Load

Polarity : HORIZONTAL

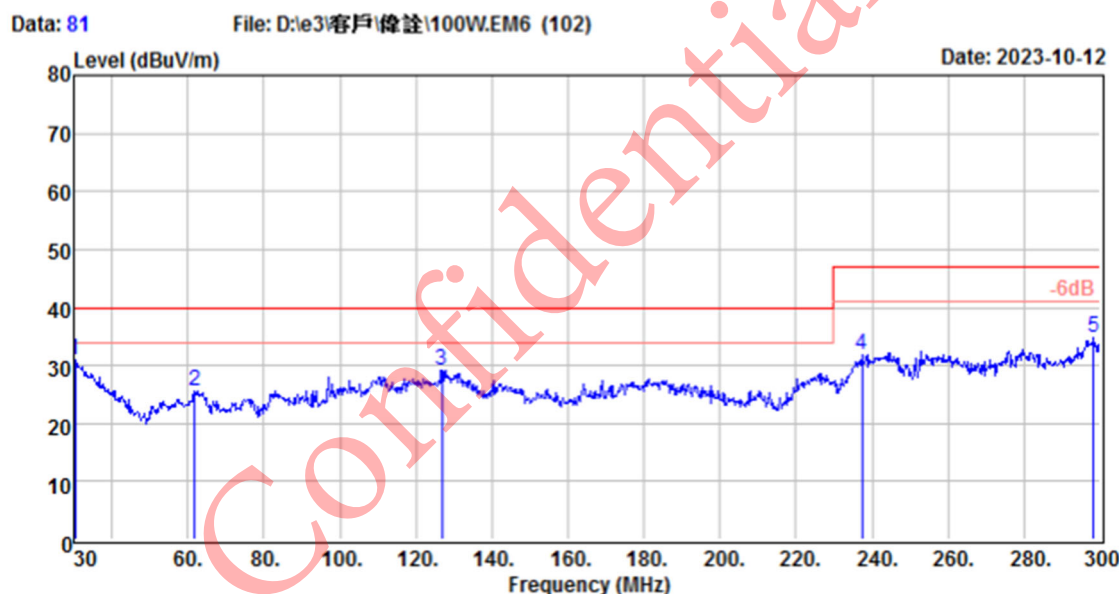
Engineer : Peter.Chu

Temp : 25

Humidity : 54%

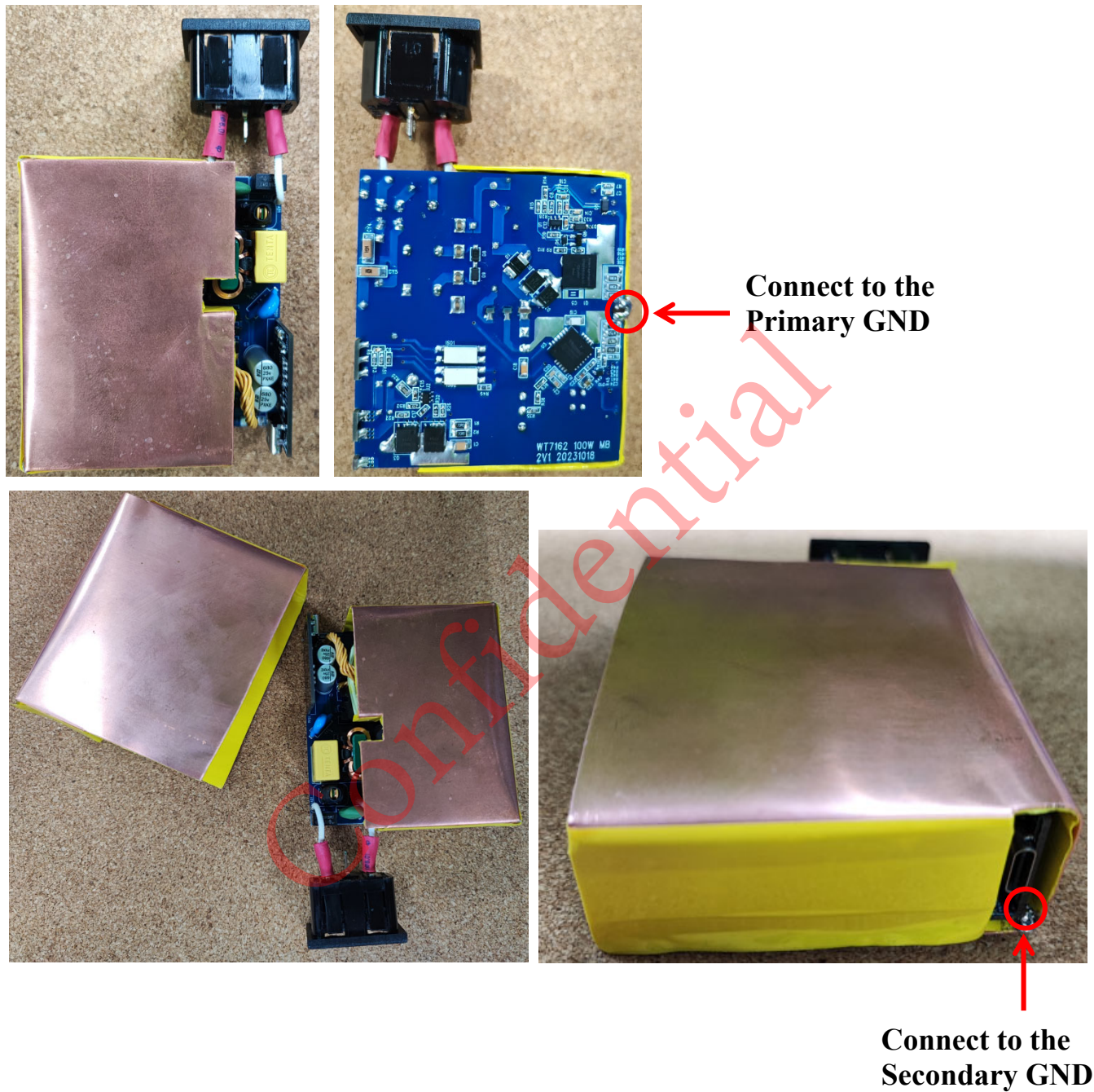
Remark1 : 20V,NO.2

Remark2 :



Freq	Reading	C.F	Result	Limit	Margin	Detector
MHz	dBuV	dB	PK dBUV/m	dBuV/m	dB	
30.270	6.05	24.88	30.93	40.00	-9.07	Peak
61.860	12.77	12.78	25.55	40.00	-14.45	Peak
126.930	10.12	19.14	29.26	40.00	-10.74	Peak
237.360	12.94	18.95	31.89	47.00	-15.11	Peak
298.380	13.31	21.42	34.73	47.00	-12.27	Peak

11 Shielding case



12 Revision History

Version	History	Date
0.1	Initial Issue.	January 08, 2024
0.2	Contents Update	February 02, 2024
0.3	Add shielding case	February 21, 2024
0.4	Update Thermal Test	April 11, 2024

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