

**Evaluation Board for RS2030
--- 12.5W (5V, 2.5A) Adapter**

Contents

. Schematic..... 3

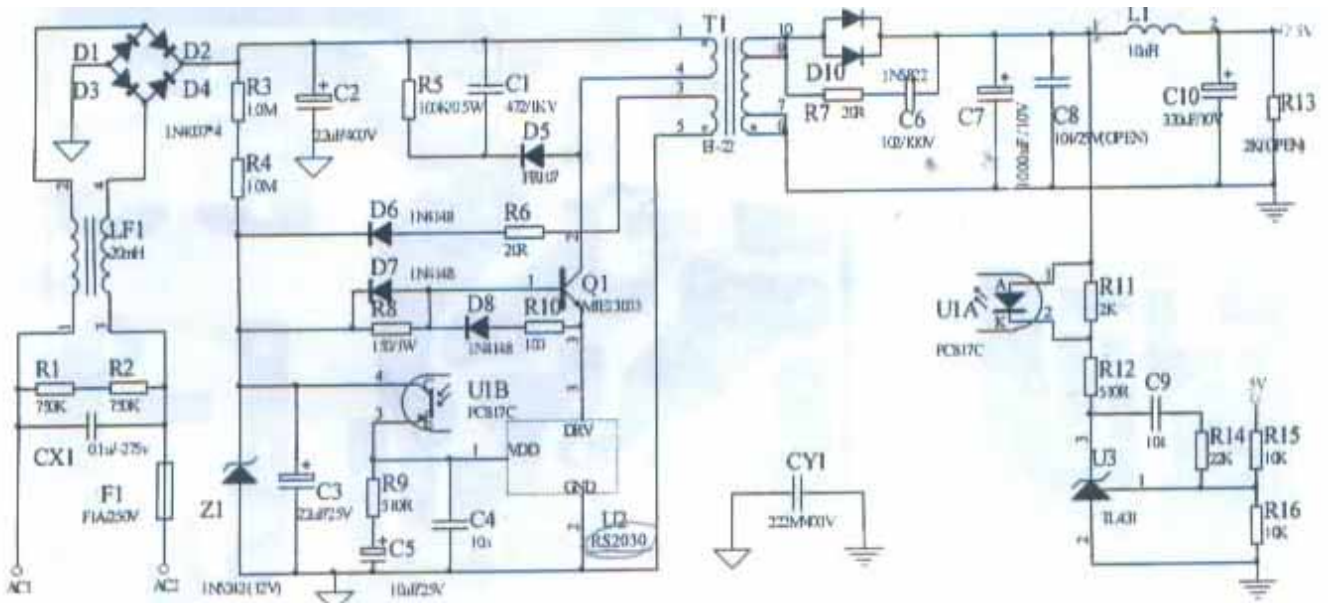
.BOM..... 4

. Gerber file 5

. Transformer specification..... 7

. Test Report..... 8

. Schematic

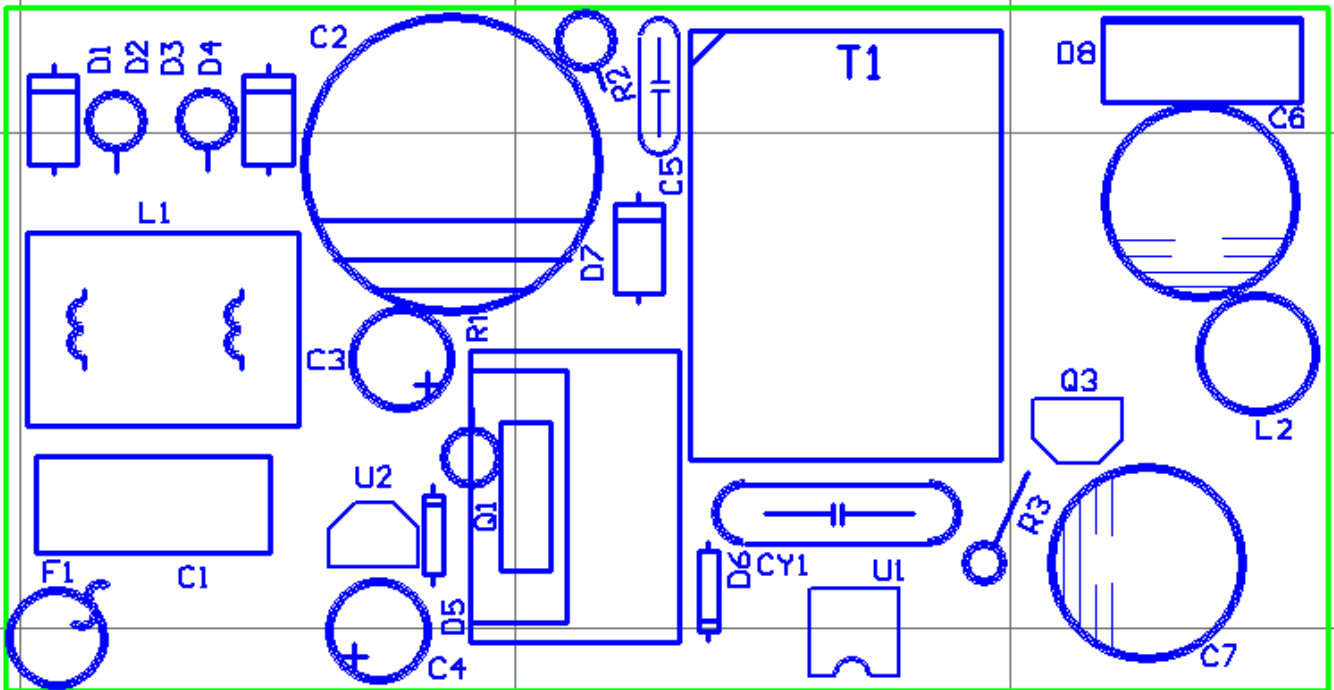


. BOM

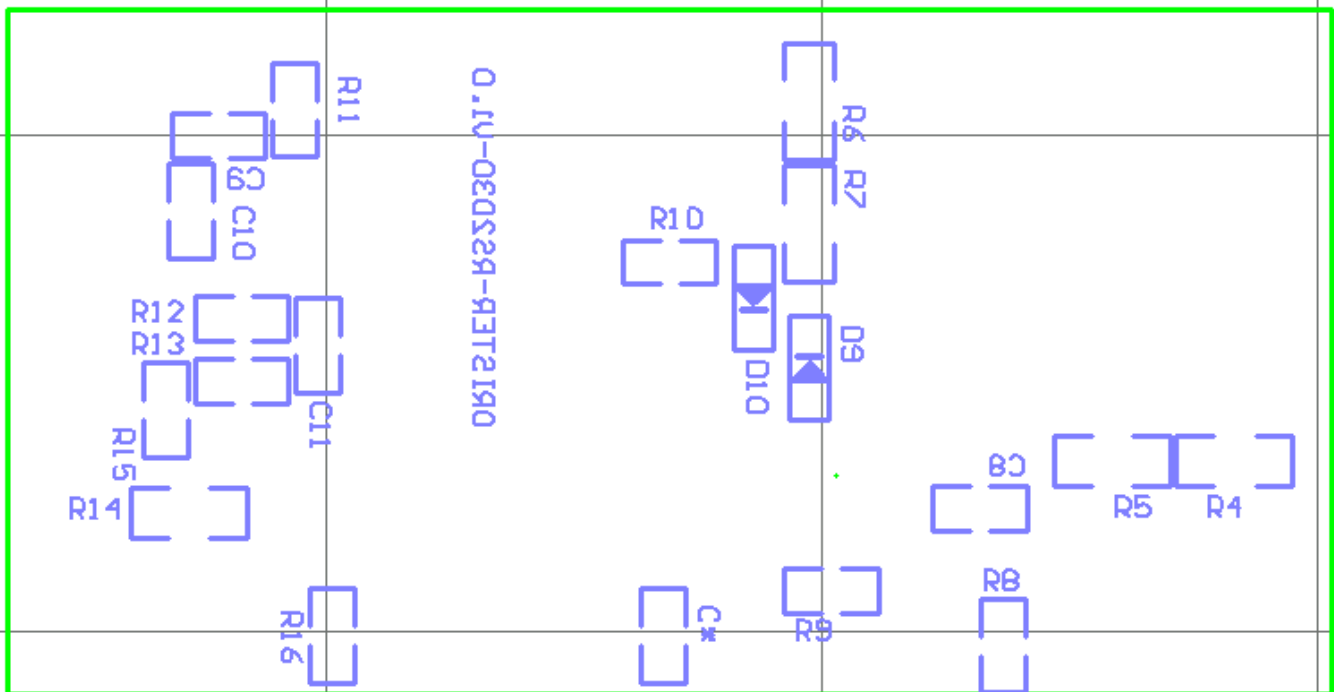
S/N	Description	PartType	S/N	Description	PartType
C1	C/X1;+/-20%;Pintch=10mm	0.33u/~275V	R16	RES;SMD; +/-5%; 0805	2K
CY1	C/Y1;+/-20%;Pintch=10mm	222/400V	R8	RES;SMD; +/-5%; 0805	510R
C5	C/C;DIP;+/-20%;Pintch=5mm	472/1KV	R15	RES;SMD; +/-5%; 0806	10K
C9	C/C;SMD;+/-20%; 0805	102/100V	R12	RES;SMD; +/-5%; 0807	39K
C6	C/E;Φ10*12.5;105 ;+/-20%;Pintch=5mm	1000u/16V	R13	RES;SMD; +/-5%; 0808	10K
C10	C/C;SMD;+/-20%;0805	104	D1-D4	Rectifying DIODE; 1A;1000V; DO-41 ; Pintch=149mil	1N4007
C11	C/C;SMD;+/-20%;0805	104	D8	Schottky Barrier Rectifiers;DIP;3A;60V;Pintch=210mil	1045CT
C7	C/E;Φ10*12.5;105 ;+/-20% ; Pintch=5mm	330u/16V	D9	Fast Switching DIODE;SMT;0805	1N4148
C2	C/E;Φ16*20;105 ;+/-20%; Pintch=8mm	33u/400V	D10	Fast Switching DIODE;SMT;0806	1N4148
C3	C/E;Φ5*11;105 ;+/-20%; Pintch=80mil	22u/50V	D7	Fast Recovery Rectifier;1A;1000V;	FR107
C4	C/E;Φ5*11;105 ;+/-20%; Pintch=80mil	22u/25V	D9	Fast Switching DIODE;DIP	1N4148
C8	C/C;SMD;+/-20%;0805	10n	D6	Z-DIODE;DIP;	1N5242B
R6	RES;DIP; +/-5%; 1206	1.5M	Q1	TO126	13003
R7	RES;DIP; +/-5%; 1206	750K	F1	FUSE,T3AL/250V;4.5*14.5L;Glass	F2A/250V
R2	RES;DIP; +/-5%; Pintch=200mil	100K/0.5W	L1	FILTER;UU9.8	25mH
R14	RES;SMD; +/-5%;1206	4.7K	L2	Φ6*15; 2 A	10uH
R1	RES;DIP; +/-5%; Pintch=300mil	150R/0.5W	U2	TO-92	RS2030
R9	RES;SMD; +/-5%; 0805	100R	U1	DIP4	PC817B
R10	RES;SMD; +/-5%; 0805	20R	Q3	TO-92	TL431
R11	RES;SMD; +/-5%; 0805	20R	T1	TRANSFORMER;EI-2220	EI-22
R3	RES;DIP; +/-5%;	820R/0.25W			

. Gerber file:

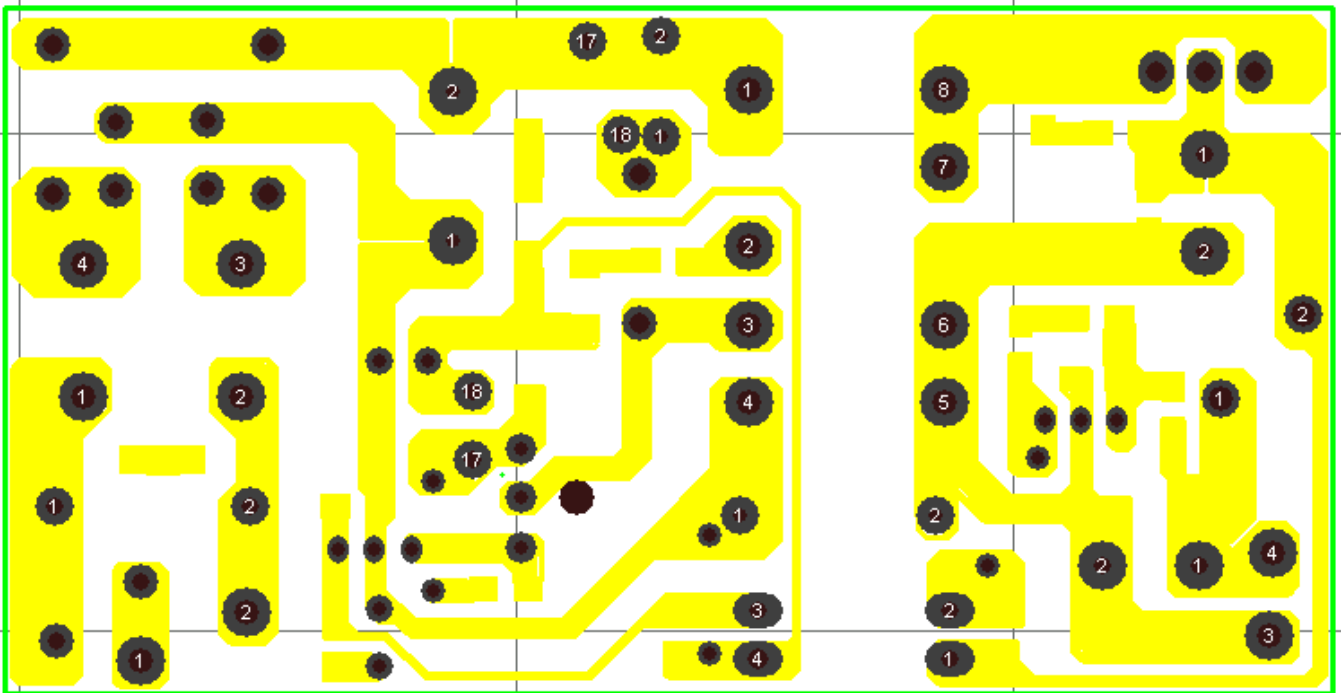
Silkscreen Top



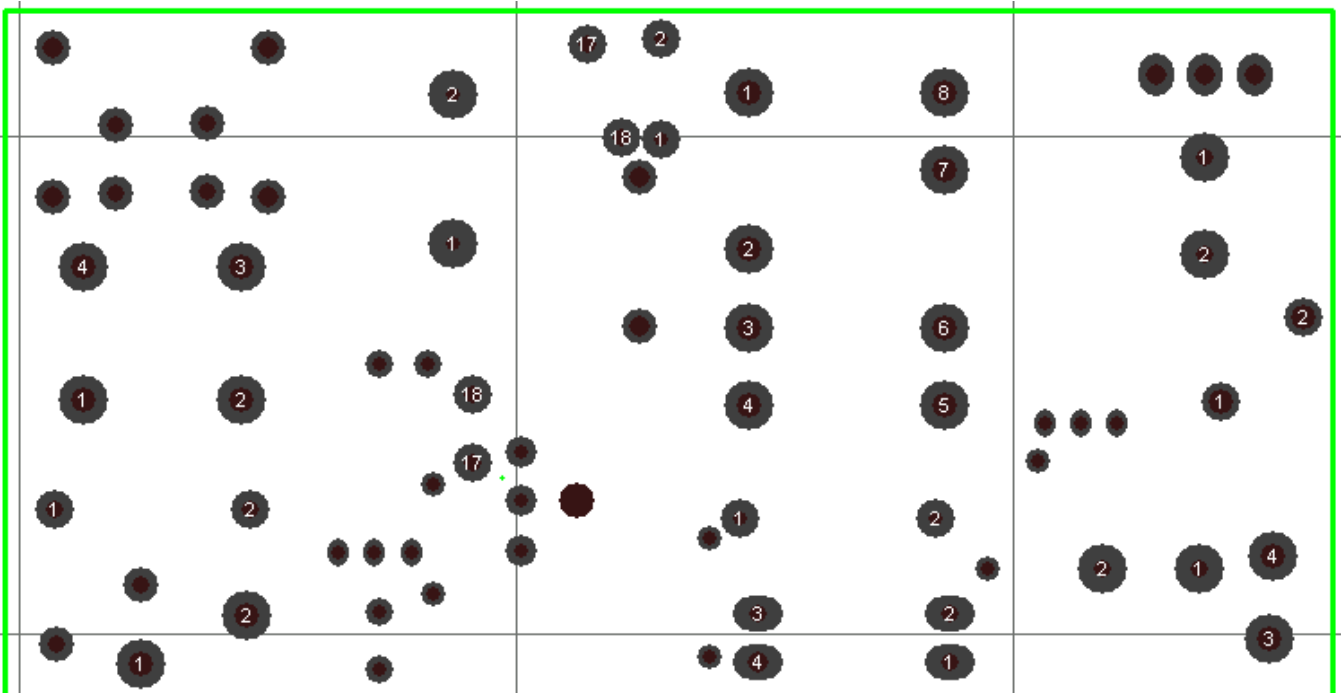
Silkscreen Bottom



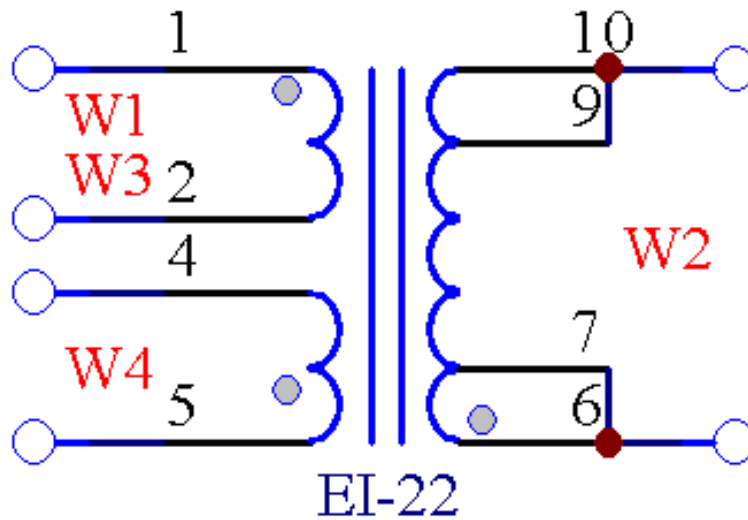
Bottom Layer



Solder mask Bottom



. Transformer specification:



Core & Bobbin	WINDING	WIRE GAUGE(MM)	TURNS
EI22	W1	0.27*1	74
	W2	0.51*2	12
	W3	0.27*1	74
	W4	0.18*1	25

NOTE: $N1(W1+W3)$ inductance=2500uH

. EXECUTIVE SUMMARY.....	9
1. INPUT VOLTAGE & FREQUENCY	10
2. OUTPUT LOADS.....	10
3. TURN ON DELAY TIME.....	10
4. GREEN MODE CONSUMPTION	11
5. OPERATING EFFICIENCY.....	11
6. LINE/LOAD REGULATION	11
7. OUTPUT DYNAMIC RESPONSE	12
8. PEAK TO PEAK OUTPUT RIPPLE AND NOISE.....	13
9. OVER CURRENT PROTECTION.....	15
10. OUTPUT SHORT PROTECTION.....	16
11.EMI	16
12. Surroundings Test.....	18

. EXECUTIVE SUMMARY

TEST	Result	Comments
Turn On Delay Time	Pass	
Green Mode Power Consumption	Pass	
Operating Efficiency	Pass	
Line/Load Regulation	Pass	
Output Dynamic Response	Pass	
Peak to Peak Output Ripple and Noise	Pass	
Over Current Protection	Pass	
Output Short Protection	Pass	
EMI	Pass	
Surroundings Test	Pass	

1. Input Voltage & Frequency

The unit shall be capable of operating as a universal AC input power supply accepting AC inputs. The power supply shall operate between the following two voltages (85V to 264V). The supply will be designed to operate for a Table 1.

Minimum	Normal	Maximum
85Vac	110Vac	264Vac

Table 1

2. Output Loads

The loads and regulation for each of the outputs are shown in Table. 2.

Parameter	Output Voltage			Output Current	
	Minimum	Normal	Maximum	Minimum	Maximum
+5V	4.75V	5.0V	5.25	0A	2.5A
Load Regulation	/	/	±1%	0A	2.5A
Load Dynamic	4.75V	5.0V	5.25	/	0~100%

3. Turn On Delay Time

Turn on delay time will be less than 4 seconds at full load. Turn on delay time is measured as the delay between input voltage being applied at 0° phase angle and when the outputs arrive within 10% of their operating value. Turn on delay time is measured using an input voltage of 85VAC(rms) and input frequency of 60Hz.

Test Conditions:

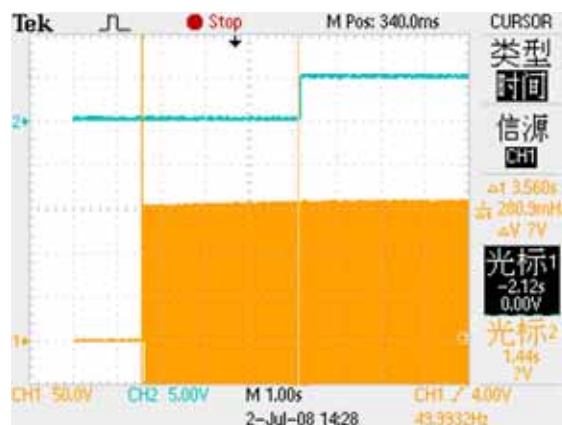
Input: 85Vac

Output: 2.5A

Ambient Temperature : 25

Test Result: PASS

Input	T _{turn on delay} (s)
85Vac	3.56



4. Green Mode Consumption

The input power of power supply shall remain less than 300mW under output at no load conditions.

Test Condition:

Input : 85Vac/264Vac

Output : No Load

Ambient Temperature: 25

Test Result: PASS

V _{in} (Vac)	P _{in} (mW)	V _o (Vdc)
85	108	5.011
264	210	5.011

Table 4

5. Operating Efficiency

The operating efficiency is defined to be the percent ratio of the output power to the input power when the input and output (voltage and current) are within the min and max values as specified in tables 1 and table 2. Operating efficiency shall be calculated by measuring the output power of the supply and remain minimum 75%.

Test Condition:

Input: 85~264Vac

Output: 2.5A

Ambient Temperature: 25

Test Result: PASS

V _{in} (Vac)	P _{in} (W)	V _o (Vdc)	I _o (A)	P _o (W)	Efficiency(%)
85	16.25	4.978	2.5	12.44	76.6
110	16.17	4.975	2.5	12.44	76.9
220	15.98	4.973	2.5	12.43	77.8
264	15.93	4.971	2.5	12.43	78.0

6. Line/Load Regulation

Line/Load regulation is defined to be the percent change in output voltage versus the nominal voltage due to a change in DC load within Hi/Lo line operating range. Line/Load regulation to be measured at Min. Typical and Max output voltages.

Test Conditions:

Input: 85Vac/264Vac (60Hz)

Output: +5V=0A/1A/2A

Ambient Temperature : 25

Test Result: PASS

Output load(A)		Vo(Vdc) Reading	
		85Vac	264Vac
0		5.011	5.011
0.625		5.008	5.010
1.25		4.989	4.981
1.875		4.981	4.977
2.5		4.978	4.971
Reading Variation(%)	Max	0.033	0.14
	Min		
Spec		±2.8%	

7. Output Dynamic Response

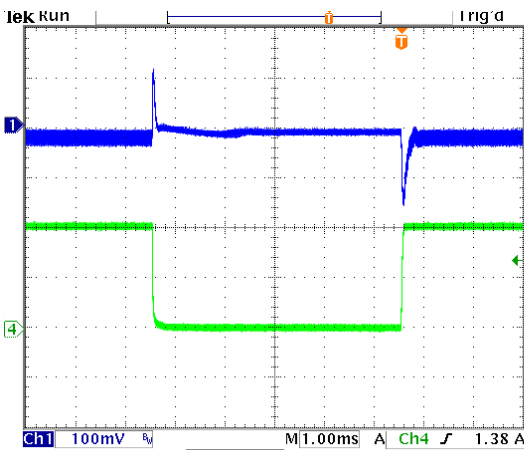
The dynamic of the output response refers to the change in output voltage to a step increase in the current of 50% & 100% load shall maintain the specified regulation. The current slew rate under output load dynamic shall be 1A/ μ s.

Test Conditions:

Input: 90Vac / 264Vac (60Hz)

Ambient Temperature : 25

Test Result: PASS



Ch1 Max
5.11 V

Ch1 Min
4.84 V

Ch1 100mV Ch4 1.00 A Ω M 1.00ms A Ch4 1.38 A

15:32:32

Output Load Dynamic Response

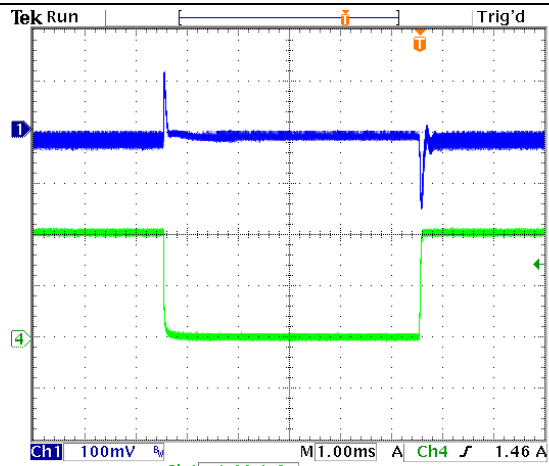
Vin : 90Vac

O/P : +5V= 0.5A 2.5A

CH1 : VO_+5V (offset 5V)

CH4 : IO_+5V

Reading : +5V_{Max}=**5.11V** +5V_{Min}=**4.85V**



Ch1 Max
5.11 V

Ch1 Min
4.85 V

Ch1 100mV Ch4 1.00 A Ω M 1.00ms A Ch4 1.46 A

15:36:58

Output Load Dynamic Response

Vin : 264Vac

O/P : +5V= 0.5A 2.5A

CH1 : VO_+5V (offset 5V)

CH4 : IO_+5V

Reading : +5V_{Max}=**5.11V** +5V_{Min}=**4.85V**

8. Peak to Peak Output Ripple and Noise

This refers to the peak-to-peak residual AC that remains on the DC power line after passing through all the filtering processes conducted within the power supply. The peak to peak output ripple and noise shall be considered to comprise of the complex envelope of the low frequency saw tooth voltage ripple and the high frequency switching noise. It shall be within 100mV and measured across output terminals using a single ended measurement with an oscilloscope (bandwidth limited to 20 MHz) and a high persistence display. Readings shall be made through the range of minimum to maximum load current.

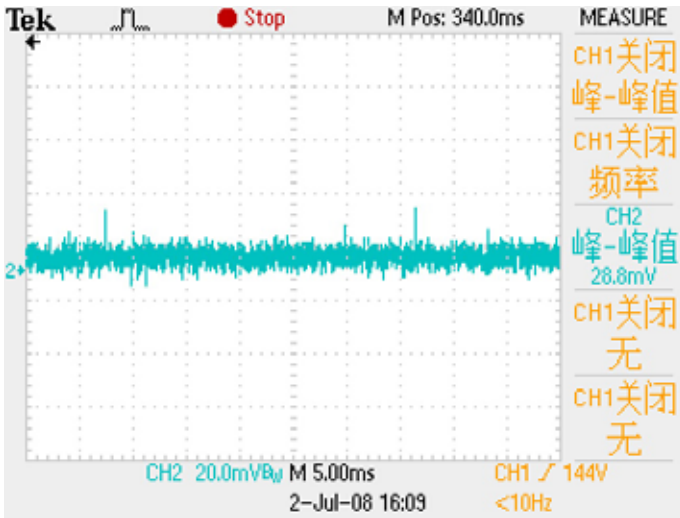
Test Condition:

Input : 85Vac/264Vac (60Hz)

Output : Max/Min Load

Ambient Temperature : 25

Test Result: PASS



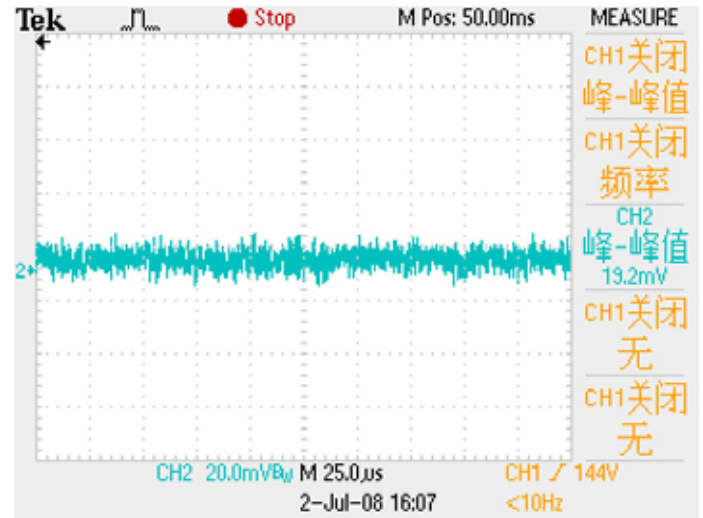
Output Ripple/Noise Test

Vin : 85Vac

O/P: +5V=0A

CH1 : V_{P-P}+5V

Reading : **28.80mV**



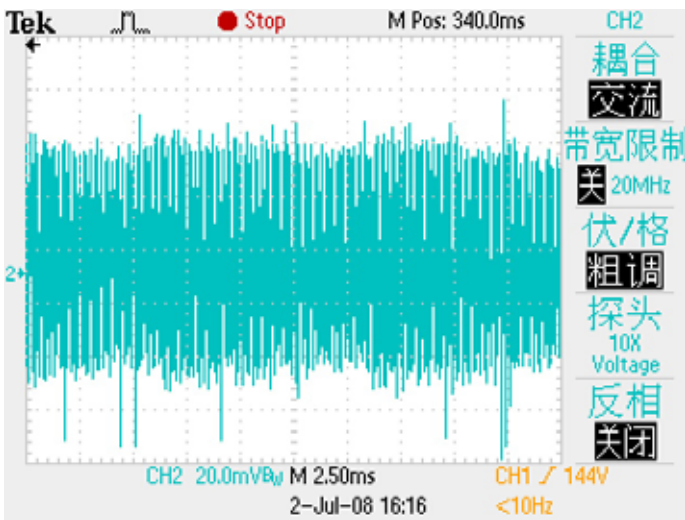
Output Noise Test

Vin : 85Vac

O/P: +5V=0A

CH1 : V_{P-P}+5V

Reading : **19.20mV**



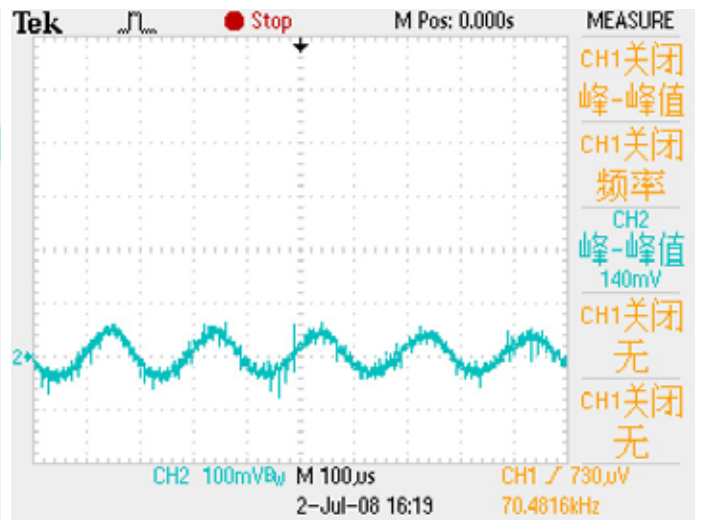
Output Ripple/Noise Test

Vin : 85Vac

O/P: +5V=2.5A

CH1 : V_{P-P}+5V

Reading : **140mV**



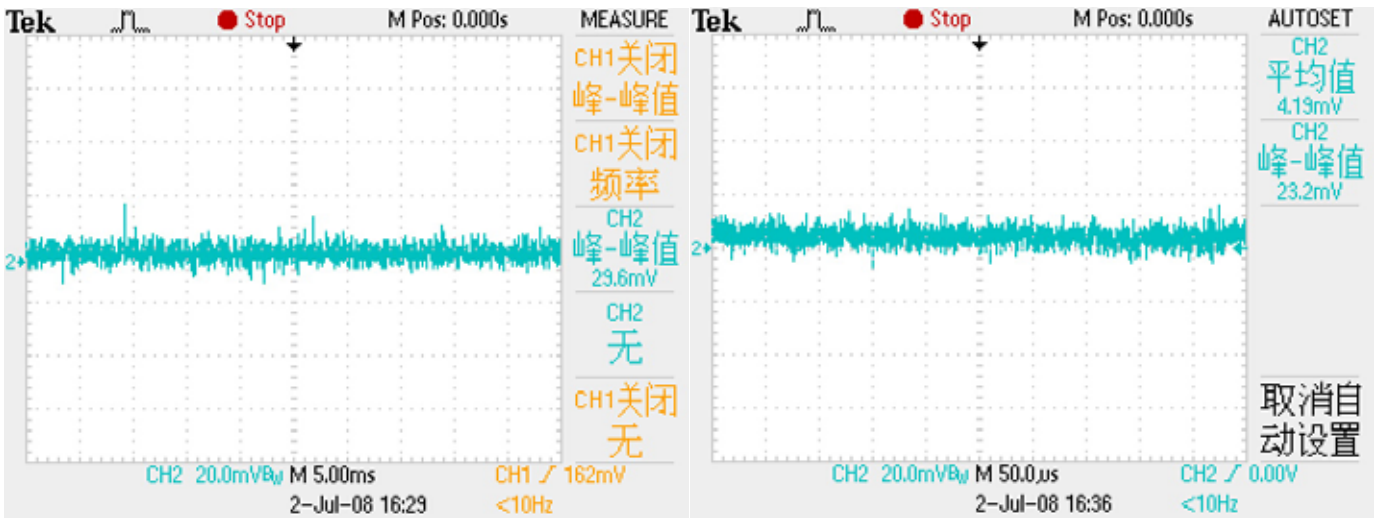
Output Noise Test

Vin : 85Vac

O/P: +5V=2.5A

CH1 : V_{P-P}+5V

Reading : **140mV**



Output Ripple/Noise Test

Vin : 264Vac

O/P: +5V=0A

CH1 : VP-P_+5V

Reading : **29.6mV**

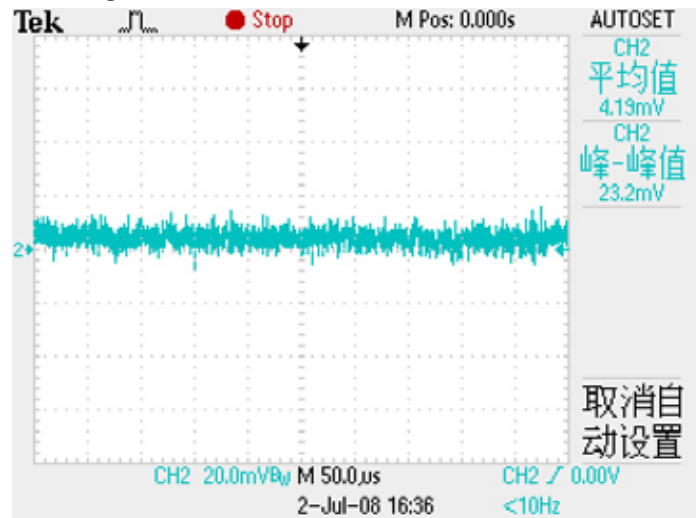
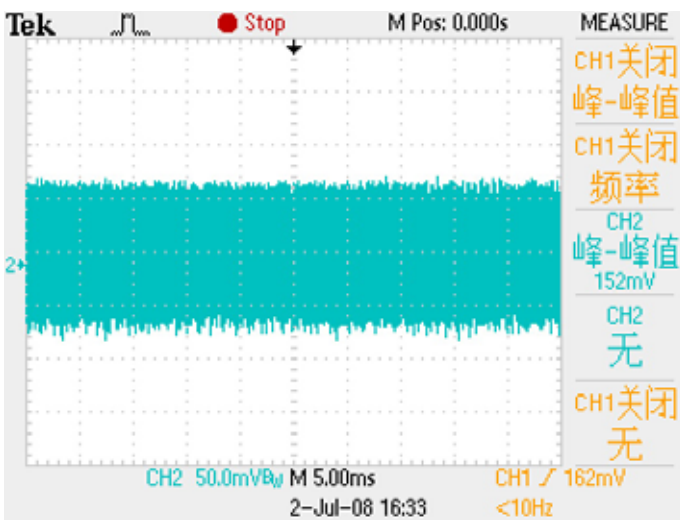
Output Noise Test

Vin : 264Vac

O/P: +5V=0A

CH1 : VP-P_+5V

Reading : **23.3mV**



Output Ripple/Noise Test

Vin : 264Vac

O/P: +5V=2.5A

CH1 : VP-P_+5V

Reading : **23.4mV**

Output Noise Test

Vin : 264Vac

O/P: +5V=2.5A

CH1 : VP-P_+5V

Reading : **152mV**

9. Over Current Protection

The supply shall be designed with appropriate output over current protection. This protection shall be activated in the event of a short or long-term condition during which one or more of the output current load increases such that the primary current exceeds a predetermined limit. The primary shall limit the total power without inflicting any damage to any internal supply components

and shall be reversible pending removal of the cause of the condition and without any user intervention.

Test Conditions:

Input: 85Vac/265Vac (60Hz)

Ambient Temperature : 25

Test Result : PASS

Input	Result (A)
85Vac	3.3
264Vac	4.3

10. Output Short Protection

The supply shall be designed with appropriate output short circuit protection. This protection shall be activated in the event of a short or long-term condition happened. The primary shall limit the total power without inflicting any damage to any internal supply components and shall be reversible pending removal of the cause of the condition and without any user intervention.

Test Conditions:

Input: 85Vac/264Vac (60Hz)

Ambient Temperature : 25

Test Result: PASS

11.EMI

Test Conditions:

Input: 220Vac (50Hz)

Output:5V/2.5A

Ambient Temperature : 25

Test Result: Margin 7.63dB

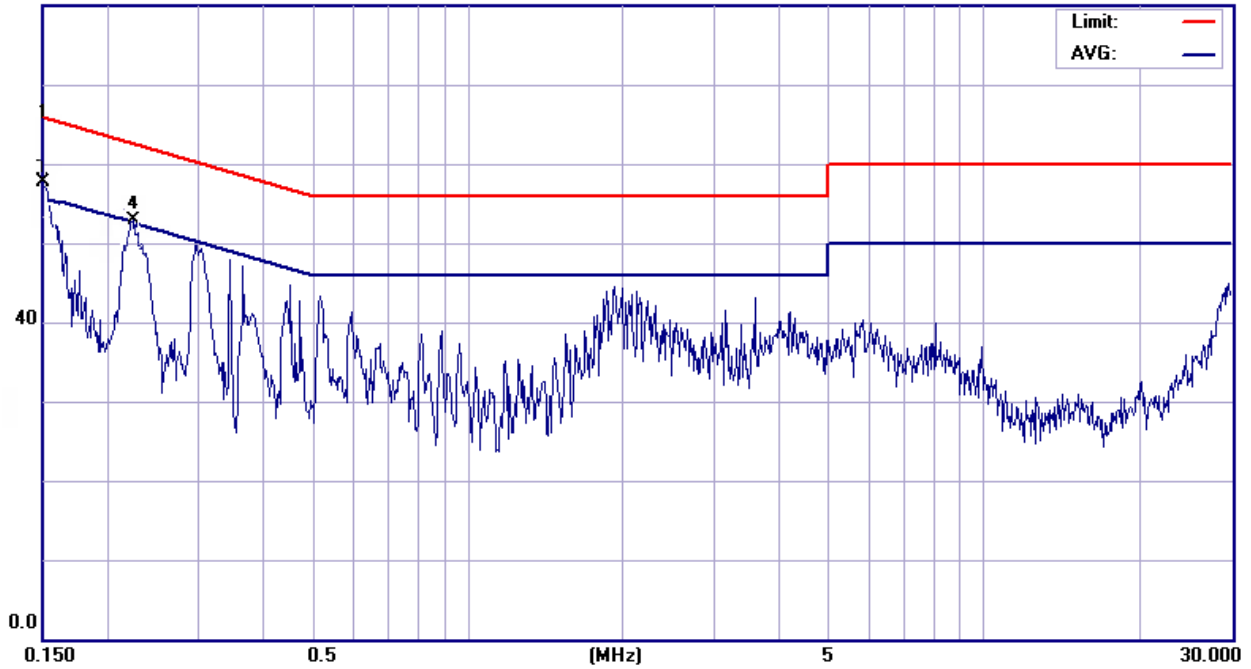
Conducted Emission Measurement

File :欣緯0717
80.0 dBuV

Data :#5

Date: 2008/07/17

Time: 下午 03:47:45



Site :ATT Conducted Emission Test Site

Phase: **L1**

Temperature: 25 °C

Limit: (CE)CISPR22 class B_QP

Power: AC 230V/50Hz

Humidity: 60 %

EUT: 5V/2.5A

Distance:

Air Pressure: 999 hpa

M/N: RS2030

Note: FULL LOAD

No.	Mk.	Freq. MHz	Reading Level dBuV	Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	61.37	3.00	64.37	66.00	-7.63	peak	
2		0.1500	59.23	3.00	62.23	66.00	-8.77	QP	
3		0.1500	49.11	3.00	52.11	56.00	-8.89	AVG	
4		0.2244	55.59	3.00	58.59	62.65	-8.56	peak	
5		0.2244	53.63	3.00	56.63	62.65	-9.02	QP	
6		0.2244	46.48	3.00	49.48	52.65	-8.17	AVG	

*:Maximum data x:Over limit !:over margin

●Reference Only

12. Surroundings Test

Test Conditions:

Input: 220Vac (50Hz)

Output: 5V/2.5A

Ambient Temperature : 60

Test Result: OK

测试报告

产品名称：RS2030 Demo Board

型号：---

报告编号：WT086001151

实验室名称 : 深圳市计量质量检测研究院电子及电器产品检测中心
环境与可靠性实验室

地址 : 深圳市南山区龙珠大道中段计量质检大楼

电话 : 0086-755-26941511, 26941554, 26941720

传真 : 0086-755-26001813

网址 : www.smq.com.cn

邮箱 : env@smq.com.cn

目 录

测试报告描述	2
1. 测试结果.....	3
2. 测试描述.....	3
2.1. 样品信息	3
2.2. 测试环境	3
3. 测试设备.....	3
3.1. 气候类测试设备	3
4. 初始检查.....	4
5. 高温工作试验.....	4
5.1. 测试方法	4
5.2. 判定依据	4
5.3. 测试结果	4
5.4. 测试结论	4

测试报告描述

委托单位 : 奥士特半导体股份有限公司
委托单位地址 : 福田区深南中路 2043 号核电大厦 908
生产厂名称 : ---
生产厂地址 : ---
产品名称 : RS2030 Demo Board
型号规格 : ---
商标 : ---

测试依据: 委托方测试要求

声明:

本测试报告仅对上述样品有效。任何未加盖测试实验室公章的报告复印件均无效。

测试: _____ 日期: _____

审核: _____ 日期: _____

批准: _____ 日期: _____

1. 测试结果

测试项目	测试结论	测试日期
高温工作试验	/	2008.07.15~2008.07.16

2. 测试描述

2.1. 样品信息

样品名称 : RS2030 Demo Board
 商标 : ---
 型号规格 : ---
 样品系列号 : ---
 生产日期 : ---
 样品数量 : 1 件
 样品状态 : 正常
 收样日期 : 2008.07.15

2.2. 测试环境

环境温度: 23°C ~ 24°C
 相对湿度: 53% ~ 62%
 环境大气压: 86kPa ~ 106kPa

3. 测试设备

3.1. 气候类测试设备

设备编号	设备名称	制造厂名	型号规格	最近校准日期	校准周期
SB3732	恒温恒湿箱	台湾庆声	THS-C7C±100	2007.09.17	1 年

4. 初始检查

试验前，样品外观检查正常。

5. 高温工作试验

5.1. 测试方法

样品状态：通电工作

试验温度：(60±2)℃

试验时间：24h

5.2. 判定依据

试验后，样品由委托方自行检查。

5.3. 测试结果

样品按委托方要求进行试验。

5.4. 测试结论

/

(以下空白)