ATX 12V Power Supply Test Report

Macron MPT-400
400 Watts

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1. Introduction

The data compiled in this report is for your reference to facilitate in designing your power supply so that it meets the mechanical and electrical requirements of the relevant design guides and specifications.

The importance of compliant power supplies lies in the fact that it makes system integration easier and better for everyone . Design guides promote interchangeability , which makes integration and assembly of computer systems easier. Overall, this results in lower integration and system cost and also reduce support cost for you. As you can see , compliant power supplies benefit everyone!

2. References

- ATX12V v1.1 Power Supply Design Guide
- ATX v2.03 Specification
- SFX Power Supply Design Guide

All design guides available at http://www.formfactors.org/

3. Power Supply Testing Equipment

Chroma Power Supply Test System, Cal Date: 3/01
- Timing / Noise Analyzer, Model Chroma 6011.
- Four Channel Load Mainframes, Model Chroma 6314
- 300W/60A/1-80VDC Electronic Loads, Model Chroma 63103
- 100W20A/1-80VDC Dual Channel Load Modules, Model Chroma 63102
- PROGRAMMABLE AC POWER SUPPLY, 2000VA/0-300VAC, Model Chroma 6520
- Power Analyzer with Harmonic readback & flicker capability, Model Chroma 6630-1N
- Tektronix TDS3014 Digital Phosphor Oscilloscope with 100Mhz at 1.25Gs/s.

4. Test Configuration

The power supply was placed on a lab bench top at an ambient room temperature of ~22°C. The UUT (Unit Under Test) was connected to the Chroma power supply test system that provides automated control of the AC input mains and dynamic DC loading. This testing is not considered exhaustive or complete in terms of the ATX12V Power Supply Design Guide.The tests conducted are considered to be the MINIMUM performance required of an ATX12V power supply.

5. Interpreting the Test Results

You will see that within this test report the power supply may fail some tests and yet still pass the overall testing. There are some tests that are considered critical and other non-critical tests that we perform are to provide feedback for your power supply design. The power supply must pass all of the critical tests to pass the overall test. The critical tests include: Noise, Cross Regulation, Power On Timing (nominal input voltage), Power OK Signal Timing (nominal input voltage), Risetime (nominal input voltage), Line Regulation, Load Regulation (nominal input voltage) , and Dynamic Loading. We perform many other tests as seen in this report. We recommend that you review these resultsand incorporate any needed changes into your power supply Design

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==========115VAC Testing==========
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----Energy Star +5VSB Test----

PASS

AC Input Setup		DC Load Setup		Test Results		
Name	Value	Load Name	Loading	Name	Max Spec.	Reading
Vin (VAC)=	115.00	+5VSB (A)	1.00	Iinrms (A)	0.52	0.20
Fin (Hz) =	60.00					

----+5VSB Voltage Regulation Test----

PASS

AC Input Setup			DC Load Setup		Test Results			
Name	Value		Load Name	Loading	Name	Min Spec.	Max Spec.	Reading
Vin (VAC)=	115.00	Loading 1	+5VSB (A)	0.20	+5VSB (V)	4.65	5.35	5.08
Fin (Hz) =	60.00	Loading 2	+5VSB (A)	1.00	+5VSB (V)	4.65	5.35	5.05

----Power OK (T3) Timing Test 115V----

PASS

AC Input Setup		DC Load Setup			Test Results			
Name	Value	Load Name		Loading	Name	Min Spec.	Max Spec.	Reading
Vin (VAC)=	115.00	+5V	(A)	20.00	5VTon (ms)	100.00	600.00	292.07
Fin (Hz) =	60.00	+12V	(A)	7.50	12VTon(ms)	100.00	600.00	292.48
		+3.3V	(A)	7.00	33VTon(ms)	100.00	600.00	296.07

----Power OK (T3) Timing Test 90V----

PASS

AC Input Setup		DC Load Setup			Test Results			
Name	Value	Load Name		Loading	Name	Min Spec.	Max Spec.	Reading
Vin (VAC)=	90.00	+5V	(A)	20.00	5VTon (ms)	100.00	600.00	281.90
Fin (Hz) =	60.00	+12V	(A)	7.50	12VTon(ms)	100.00	600.00	282.12
		+3.3V	(A)	7.00	33VTon(ms)	100.00	600.00	289.95

----Power OK (T3) Timing Test 135V----

PASS

AC Input Setup		DC Load Setup			Test Results			
Name	Value	Load Name		Loading	Name	Min Spec.	Max Spec.	Reading
Vin (VAC)=	135.00	+5V	(A)	20.00	5VTon (ms)	100.00	600.00	291.95
Fin (Hz) =	60.00	+12V	(A)	7.50	12VTon(ms)	100.00	600.00	292.14
		+3.3V	(A)	7.00	33VTon(ms)	100.00	600.00	294.95

----Power ON (T1) Timing Test 115V----

PASS

AC Input Setup		DC Load Setup			Test Results			
Name	Value	Load Name		Loading	Name	Min Spec.	Max Spec.	Reading
Vin (VAC)=	115.00	+5V	(A)	20.00	5VTon (ms)	0.00	600.00	31.51

Fin (Hz) =	60.00	+12V (A)	7.50	12VTon(ms)	0.00	600.00	31.13
		+3.3V (A)	7.00	33VTon(ms)	0.00	600.00	27.62

----Power ON (T1) Timing Test 90V----

PASS

AC Input Setup		DC Load Setup		Test Results			
Name	Value	Load Name	Loading	Name	Min Spec.	Max Spec.	Reading
Vin (VAC)=	90.00	+5V (A)	20.00	5VTon (ms)	0.00	600.00	43.27
Fin (Hz) =	60.00	+12V (A)	7.50	12VTon(ms)	0.00	600.00	43.06
		+3.3V (A)	7.00	33VTon(ms)	0.00	600.00	35.39

----Power ON (T1) Timing Test 135V----

PASS

AC Input Setup		DC Load Setup		Test Results			
Name	Value	Load Name	Loading	Name	Min Spec.	Max Spec.	Reading
Vin (VAC)=	135.00	+5V (A)	20.00	5VTon (ms)	0.00	600.00	29.13
Fin (Hz) =	60.00	+12V (A)	7.50	12VTon(ms)	0.00	600.00	29.00
		+3.3V (A)	7.00	33VTon(ms)	0.00	600.00	26.19

----Risetime (T2) Timing Test 115V----

PASS

AC Input Setup		DC Load Setup		Test Results			
Name	Value	Load Name	Loading	Name	Min Spec.	Max Spec.	Reading
Vin (VAC)=	115.00	+5V (A)	20.00	5VTon (ms)	0.10	30.00	12.07
Fin (Hz) =	60.00	+12V (A)	7.50	12VTon(ms)	0.10	30.00	10.95
		+3.3V (A)	7.00	33VTon(ms)	0.10	20.00	8.46

----Risetime (T2) Timing Test 90V----

PASS

AC Input Setup		DC Load Setup		Test Results			
Name	Value	Load Name	Loading	Name	Min Spec.	Max Spec.	Reading
Vin (VAC)=	90.00	+5V (A)	20.00	5VTon (ms)	0.10	30.00	23.48
Fin (Hz) =	60.00	+12V (A)	7.50	12VTon(ms)	0.10	30.00	20.06
		+3.3V (A)	7.00	33VTon(ms)	0.10	20.00	13.05

----Risetime (T2) Timing Test 135V----

PASS

AC Input Setup		DC Load Setup		Test Results			
Name	Value	Load Name	Loading	Name	Min Spec.	Max Spec.	Reading
Vin (VAC)=	135.00	+5V (A)	20.00	5VTon (ms)	0.10	30.00	9.54
Fin (Hz) =	60.00	+12V (A)	7.50	12VTon(ms)	0.10	30.00	8.06
		+3.3V (A)	7.00	33VTon(ms)	0.10	20.00	6.56

----Power Efficiency Test 115V----

PASS

AC Input Setup		DC Load Setup		Test Results			
Name	Value	Load Name	Loading	Name	Min Spec.	Max Spec.	Reading
Vin (VAC)=	115.000	+5V (A)	20.00	Eff %	68.00	100	76.02
Fin (Hz) =	60.000	+12V (A)	7.50				
		-5V (A)	0.15				
		-12V (A)	0.40				
		+3.3V (A)	7.00				
		+5VSB (A)	1.00				

----Line Regulation Test 115V----

PASS

AC Input Setup		DC Load Setup		
Name	Value	Load Name	Load1	Load2
V1(VAC)	90.00	+5V (A)	20.00	20.00
V2(VAC)	135.00	+12V (A)	7.50	7.50
Fin (Hz)	60.00	-5V (A)	0.15	0.15
		-12V A)	0.40	0.40
		+3.3V A)	7.00	7.00
		+5Vsb A)	1.00	1.00

Test Results

Name	MinSpec	MaxSpec	Result1	Result2
5V (V)	4.550	5.450	4.929	4.931
12V (V)	11.200	12.800	12.225	12.201
-5V (V)	-4.300	-5.700	-5.034	-5.038
-12V (V)	-10.600	-13.400	-11.887	-11.859
3.3V(V)	2.940	3.670	3.293	3.293
5Vsb(V)	4.550	5.450	5.021	5.021

----Load Regulation Test 115V----

PASS

AC Input Setup		DC Load Setup		
Name	Value	Load Name	Load1	Load2
V1(VAC)	115.00	+5V (A)	2.00	20.00
V2(VAC)	115.00	+12V (A)	1.00	7.50
Fin (Hz)	60.00	-5V (A)	0.10	0.15
		-12V A)	0.20	0.40
		+3.3V A)	1.00	7.00
		+5Vsb A)	0.20	1.00

Test Results

Name	MinSpec	MaxSpec	Result1	Result2
5V (V)	4.550	5.450	5.113	4.930
12V (V)	11.200	12.800	12.004	12.215
-5V (V)	-4.300	-5.700	-4.702	-5.036
-12V (V)	-10.600	-13.400	-11.194	-11.870
3.3V(V)	2.940	3.670	3.329	3.293
5Vsb(V)	4.550	5.450	5.079	5.021

----Load Regulation Test 90V----

PASS

AC Input Setup	
Name	Value
V1(VAC)	90.00
V2(VAC)	90.00
Fin (Hz)	60.00

DC Load Setup		
Load Name	Load1	Load2
+5V (A)	2.00	20.00
+12V (A)	1.00	7.50
-5V (A)	0.10	0.15
-12V A)	0.20	0.40
+3.3V A)	1.00	7.00
+5Vsb A)	0.20	1.00

Test Results

Name	MinSpec	MaxSpec	Result1	Result2
5V (V)	4.550	5.450	5.113	4.927
12V (V)	11.200	12.800	12.005	12.225
-5V (V)	-4.300	-5.700	-4.699	-5.033
-12V (V)	-10.600	-13.400	-11.195	-11.884
3.3V(V)	2.940	3.670	3.329	3.293
5Vsb(V)	4.550	5.450	5.078	5.021

----Load Regulation Test 135V----

PASS

AC Input Setup	
Name	Value
V1(VAC)	135.00
V2(VAC)	135.00
Fin (Hz)	60.00

DC Load Setup		
Load Name	Load1	Load2
+5V (A)	2.00	20.00
+12V (A)	1.00	7.50
-5V (A)	0.10	0.15
-12V A)	0.20	0.40
+3.3V A)	1.00	7.00
+5Vsb A)	0.20	1.00

Test Results

Name	MinSpec	MaxSpec	Result1	Result2
5V (V)	4.550	5.450	5.113	4.932
12V (V)	11.200	12.800	12.003	12.203
-5V (V)	-4.300	-5.700	-4.706	-5.040
-12V (V)	-10.600	-13.400	-11.196	-11.866
3.3V(V)	2.940	3.670	3.329	3.293
5Vsb(V)	4.550	5.450	5.079	5.021

---- +5V Cross Regulation Test 115V ----

PASS

AC Input Setup	
Name	Value
V1(VAC)	115.00
V2(VAC)	115.00
Fin (Hz)	60.00

DC Load Setup		
Load Name	Load1	Load2
+5V (A)	20.00	20.00
+12V (A)	1.00	7.50
-5V (A)	0.10	0.15
-12V A)	0.20	0.40
+3.3V A)	1.00	7.00
+5Vsb A)	0.20	1.00

Test Results

Name	MinSpec	MaxSpec	Result1	Result2
5V (V)	4.550	5.450	4.909	4.930
12V (V)	11.200	12.800	12.523	12.208
-5V (V)	-4.300	-5.700	-4.969	-5.037
-12V (V)	-10.600	-13.400	-11.819	-11.866
3.3V(V)	2.940	3.670	3.319	3.293
5Vsb(V)	4.550	5.450	5.069	5.021

---- +12V Cross Regulation Test 115V ----

PASS

AC Input Setup

Name	Value
V1(VAC)	115.00
V2(VAC)	115.00
Fin (Hz)	60.00

DC Load Setup

Load Name	Load1	Load2
+5V (A)	2.00	20.00
+12V (A)	7.50	7.50
-5V (A)	0.10	0.15
-12V A)	0.20	0.40
+3.3V A)	1.00	7.00
+5Vsb A)	0.20	1.00

Test Results

Name	MinSpec	MaxSpec	Result1	Result2
5V (V)	4.550	5.450	5.155	4.930
12V (V)	11.200	12.800	11.698	12.209
-5V (V)	-4.300	-5.700	-4.786	-5.038
-12V (V)	-10.600	-13.400	-11.366	-11.866
3.3V(V)	2.940	3.670	3.325	3.293
5Vsb(V)	4.550	5.450	5.075	5.021

---- +3.3V Cross Regulation Test 115V ----

PASS

AC Input Setup

Name	Value
V1(VAC)	115.00
V2(VAC)	115.00
Fin (Hz)	60.00

DC Load Setup

Load Name	Load1	Load2
+5V (A)	2.00	20.00
+12V (A)	1.00	7.50
-5V (A)	0.10	0.15
-12V (A)	0.20	0.40
+3.3V (A)	7.00	7.00
+5Vsb (A)	0.20	1.00

Test Results

Name	MinSpec	MaxSpec	Result1	Result2
5V (V)	4.550	5.450	5.096	4.929
12V (V)	11.200	12.800	12.041	12.209
-5V (V)	-4.300	-5.700	-4.714	-5.037
-12V (V)	-10.600	-13.400	-11.264	-11.868
3.3V(V)	2.940	3.670	3.309	3.293
5Vsb(V)	4.550	5.450	5.070	5.021

----Voltage Accuracy Min Load Test 115V----

PASS

AC Input Setup

DC Load Setup

Name	Value
V1(VAC)	115.00
V2(VAC)	115.00
Fin (Hz)	60.00

Load Name	Load1	Load2
+5V (A)	2.00	2.00
+12V (A)	1.00	1.00
-5V (A)	0.10	0.10
-12V (A)	0.20	0.20
+3.3V (A)	1.00	1.00
+5Vsb (A)	0.20	0.20

Test Results

Name	MinSpec	MaxSpec	Result1	Result2
5V (V)	4.550	5.450	5.113	5.113
12V (V)	11.200	12.800	12.003	12.003
-5V (V)	-4.300	-5.700	-4.704	-4.705
-12V (V)	-10.600	-13.400	-11.196	-11.198
3.3V(V)	2.940	3.670	3.329	3.329
5Vsb(V)	4.550	5.450	5.079	5.079

----Voltage Accuracy 50% Load Test 115V----

PASS

AC Input Setup

Name	Value
V1(VAC)	115.00
V2(VAC)	115.00
Fin (Hz)	60.00

DC Load Setup

Load Name	Load1	Load2
+5V (A)	20.00	20.00
+12V (A)	7.50	7.50
-5V (A)	0.15	0.15
-12V (A)	0.40	0.40
+3.3V (A)	7.00	7.00
+5Vsb (A)	1.00	1.00

Test Results

Name	MinSpec	MaxSpec	Result1	Result2
5V (V)	4.550	5.450	4.929	4.929
12V (V)	11.200	12.800	12.209	12.215
-5V (V)	-4.300	-5.700	-5.038	-5.037
-12V (V)	-10.600	-13.400	-11.868	-11.873
3.3V(V)	2.940	3.670	3.293	3.293
5Vsb(V)	4.550	5.450	5.021	5.021

----Noise Test 115V----

PASS

AC Input Setup

Name	Value	
V1(VAC)	115.00	
Fin (Hz)	60.000	
BW	20.00	MHz

DC Load Setup

Load Name	Loading
+5V (A)	20.00
+12V (A)	7.50
-5V (A)	0.15
-12V (A)	0.40
+3.3V (A)	7.00
+5Vsb (A)	1.00

Test Results

Name	MaxSpec	Result	Units
5V	0.075	0.042	Vpp
12V	0.15	0.083	Vpp
-5V	0.125	0.017	Vpp
-12V	0.15	0.041	Vpp
3.3V	0.075	0.017	Vpp

5Vsb	0.075	0.025	Vpp

----+5V Overshoot Voltage Test 115V----

PASS

AC Input Setup

Name	Value
V1(VAC)	115.00
Fin (Hz)	60.000

DC Load Setup

Load Name		Loading
+5V	(A)	20.00
+12V	(A)	7.50
-5V	(A)	0.15
-12V	(A)	0.40
+3.3V	(A)	7.00
+5Vsb	(A)	1.00

Test Results

Name	MinSpec	MaxSpec	Result1
5V (V)	4.5	5.5	5.059

----+12V Overshoot Voltage Test 115V----

PASS

AC Input Setup

Name	Value
V1(VAC)	115.00
Fin (Hz)	60.000

DC Load Setup

Load Name		Loading
+5V	(A)	20.00
+12V	(A)	7.50
-5V	(A)	0.15
-12V	(A)	0.40
+3.3V	(A)	7.00
+5Vsb	(A)	1.00

Test Results

Name	MinSpec	MaxSpec	Result1
12V (V)	10.8	13.2	12.401

----+3-3V Overshoot Voltage Test 115V----

PASS

AC Input Setup

Name	Value
V1(VAC)	115.00
Fin (Hz)	60.000

DC Load Setup

Load Name		Loading
+5V	(A)	20.00
+12V	(A)	7.50
-5V	(A)	0.15
-12V	(A)	0.40
+3.3V	(A)	7.00
+5Vsb	(A)	1.00

Test Results

Name	MinSpec	MaxSpec	Result1
3.3V (V)	2.97	3.63	3.286

----+5V Dynamic Loading Test 115V----

PASS

AC Input Setup

Name	Value	
V1(VAC)	115.00	
Fin (Hz)	60.000	
Slew-R	0.500	A/us
Slew-F	0.500	A/us
Time1	0.100	ms
Time2	0.100	ms

DC Load Setup

Load Name		Loading1	Loading2
+5V	(A)	5.00	10.000
+12V	(A)	7.50	
-5V	(A)	0.15	
-12V	(A)	0.40	
+3.3V	(A)	7.00	
+5Vsb	(A)	1.00	

Test Results

Name	MaxSpec	Result1
5V (Vpp)	0.750	0.184

----+12V Dynamic Loading Test 115V----

PASS

AC Input Setup

Name	Value	
V1(VAC)	115.00	
Fin (Hz)	60.000	
Slew-R	0.500	A/us
Slew-F	0.500	A/us
Time1	0.100	ms
Time2	0.100	ms

DC Load Setup

Load Name		Loading1	Loading2
+5V	(A)	20.00	
+12V	(A)	5.00	10.000
-5V	(A)	0.15	
-12V	(A)	0.40	
+3.3V	(A)	7.00	
+5Vsb	(A)	1.00	

Test Results

Name	MaxSpec	Result
12V(Vpp)	1.800	0.208

----+3.3V Dynamic Loading Test 115V----

PASS

AC Input Setup

Name	Value	
V1(VAC)	115.00	
Fin (Hz)	60.000	
Slew-R	0.500	A/us
Slew-F	0.500	A/us
Time1	0.100	ms
Time2	0.100	ms

DC Load Setup

Load Name		Loading1	Loading2
+5V	(A)	20.00	
+12V	(A)	7.50	
-5V	(A)	0.15	
-12V	(A)	0.40	
+3.3V	(A)	5.000	10.000
+5Vsb	(A)	1.00	

Test Results

Name	MaxSpec	Result1
3.3V(Vpp)	0.500	0.252

----No Load Operation Test 115V----

PASS

AC Input Setup

Name	Value
V1(VAC)	115.00
Fin (Hz)	60.00

DC Load Setup

Load Name		Load
+5V	(A)	0
+12V	(A)	0
-5V	(A)	0
-12V	(A)	0
+3.3V	(A)	0

+5Vsb (A) 0

Test Results

Name	MinSpec	MaxSpec	Result
5V (V)	0	6	5.157
12V (V)	0	14	11.763
-5V (V)	0	-6.00	-3.695
-12V (V)	0	-14.00	-10.569
3.3V(V)	0	4.3	3.175
5Vsb(V)	0	6	5.093

---- +5VSB Short Circuit Test 115V----

PASS

AC Input Setup

Name	Value
V1(VAC)	115.00
Fin (Hz)	60.00

DC Load Setup

Load Name	Load
+5V (A)	20.000
+12V (A)	7.500
-5V (A)	0.150
-12V (A)	0.400
+3.3V (A)	7.000
+5Vsb (A)	Short

Test Results

Name	MinSpec	MaxSpec	Result
5V (V)	4.550	5.450	4.926
12V (V)	11.200	12.800	12.207
-5V (V)	-4.300	-5.700	-5.018
-12V (V)	-10.600	-13.400	-11.887
3.3V(V)	2.940	3.670	3.293
5Vsb(V)	4.550	5.450	5.021

----Cap Loading Power OK Timing Test 115V----

PASS

AC Input Setup

Name	Value
Vin (VAC)=	115.00
Fin (Hz) =	60.00

DC Load Setup / Test Results

Load Name	Loading	Name	Min Spec.	Max Spec.	Reading
+5V (A)	20.00	5VTon (ms)	100.00	600.00	293.58
+12V (A)	7.50	12VTon(ms)	100.00	600.00	293.53
+3.3V (A)	7.00	33VTon(ms)	100.00	600.00	298.95

==========

==========230VAC Testing==========

==========

----Cap Loading Power OK Timing Test 230V----

PASS

AC Input Setup DC Load Setup Test Results

Name	Value	Load Name	Loading	Name	Min Spec.	Max Spec.	Reading
Vin (VAC)=	230.00	+5V (A)	20.00	5VTon (ms)	100.00	600.00	293.66
Fin (Hz) =	50.00	+12V (A)	7.50	12VTon(ms)	100.00	600.00	293.91
		+3.3V (A)	7.00	33VTon(ms)	100.00	600.00	299.48

----+5VSB Energy Star Test 230V----

PASS

AC Input Setup		DC Load Setup		Test Results		
Name	Value	Load Name	Loading	Name	Max Spec.	Reading
Vin (VAC)=	230.00	+5VSB (A)	1.00	Iinrms (A)	0.26	0.13
Fin (Hz) =	50.00					

----+5VSB Voltage Regulation Test 230V----

PASS

AC Input Setup			DC Load Setup		Test Results		
Name	Value		Load Name	Loading	Name	Min Spec.	Max Spec.	Reading
Vin (VAC)=	230.00	Loading 1	+5VSB (A)	0.20	+5VSB (V)	4.65	5.35	5.08
Fin (Hz) =	50.00	Loading 2	+5VSB (A)	1.00	+5VSB (V)	4.65	5.35	5.02

----Power OK (T3) Timing Test 180V----

PASS

AC Input Setup		DC Load Setup			Test Results		
Name	Value	Load Name	Loading		Name	Min Spec.	Max Spec.	Reading
Vin (VAC)=	180.00	+5V (A)	20.00		5VTon (ms)	100.00	600.00	286.45
Fin (Hz) =	50.00	+12V (A)	7.50		12VTon(ms)	100.00	600.00	286.58
		+3.3V (A)	7.00		33VTon(ms)	100.00	600.00	291.60

----Power OK (T3) Timing Test 230V----

PASS

AC Input Setup		DC Load Setup			Test Results		
Name	Value	Load Name	Loading		Name	Min Spec.	Max Spec.	Reading
Vin (VAC)=	230.00	+5V (A)	20.00		5VTon (ms)	100.00	600.00	290.47
Fin (Hz) =	50.00	+12V (A)	7.50		12VTon(ms)	100.00	600.00	290.56
		+3.3V (A)	7.00		33VTon(ms)	100.00	600.00	293.52

----Power OK (T3) Timing Test 265V----

PASS

AC Input Setup		DC Load Setup			Test Results		
Name	Value	Load Name	Loading		Name	Min Spec.	Max Spec.	Reading
Vin (VAC)=	265.00	+5V (A)	20.00		5VTon (ms)	100.00	600.00	296.53
Fin (Hz) =	50.00	+12V (A)	7.50		12VTon(ms)	100.00	600.00	296.68
		+3.3V (A)	7.00		33VTon(ms)	100.00	600.00	299.32

----Power ON (T1) Timing Test 180V----

PASS

AC Input Setup		DC Load Setup			Test Results		
Name	Value	Load Name	Loading	Name	Min Spec.	Max Spec.	Reading
Vin (VAC)=	180.00	+5V (A)	20.00	5VTon (ms)	0.00	600.00	38.77
Fin (Hz) =	50.00	+12V (A)	7.50	12VTon(ms)	0.00	600.00	38.66
		+3.3V (A)	7.00	33VTon(ms)	0.00	600.00	33.84

----Power ON (T1) Timing Test 230V----

PASS

AC Input Setup		DC Load Setup			Test Results		
Name	Value	Load Name	Loading	Name	Min Spec.	Max Spec.	Reading
Vin (VAC)=	230.00	+5V (A)	20.00	5VTon (ms)	0.00	600.00	30.14
Fin (Hz) =	50.00	+12V (A)	7.50	12VTon(ms)	0.00	600.00	29.54
		+3.3V (A)	7.00	33VTon(ms)	0.00	600.00	25.72

----Power ON (T1) Timing Test 265V----

PASS

AC Input Setup		DC Load Setup			Test Results		
Name	Value	Load Name	Loading	Name	Min Spec.	Max Spec.	Reading
Vin (VAC)=	265.00	+5V (A)	20.00	5VTon (ms)	0.00	600.00	30.41
Fin (Hz) =	50.00	+12V (A)	7.50	12VTon(ms)	0.00	600.00	30.37
		+3.3V (A)	7.00	33VTon(ms)	0.00	600.00	27.73

----Risetime (T2) Timing Test 180V----

PASS

AC Input Setup		DC Load Setup			Test Results		
Name	Value	Load Name	Loading	Name	Min Spec.	Max Spec.	Reading
Vin (VAC)=	180.00	+5V (A)	20.00	5VTon (ms)	0.10	30.00	19.31
Fin (Hz) =	50.00	+12V (A)	7.50	12VTon(ms)	0.10	30.00	18.94
		+3.3V (A)	7.00	33VTon(ms)	0.10	20.00	11.71

----Risetime (T2) Timing Test 230V----

PASS

AC Input Setup		DC Load Setup			Test Results		
Name	Value	Load Name	Loading	Name	Min Spec.	Max Spec.	Reading
Vin (VAC)=	230.00	+5V (A)	20.00	5VTon (ms)	0.10	30.00	10.79
Fin (Hz) =	50.00	+12V (A)	7.50	12VTon(ms)	0.10	30.00	10.21
		+3.3V (A)	7.00	33VTon(ms)	0.10	20.00	8.23

----Risetime (T2) Timing Test 265V----

PASS

AC Input Setup		DC Load Setup		Test Results			
Name	Value	Load Name	Loading	Name	Min Spec.	Max Spec.	Reading
Vin (VAC)=	265.00	+5V (A)	20.00	5VTon (ms)	0.10	30.00	8.80
Fin (Hz) =	50.00	+12V (A)	7.50	12VTon(ms)	0.10	30.00	8.54
		+3.3V (A)	7.00	33VTon(ms)	0.10	20.00	6.25

----Power Efficiency Test 230V----

PASS

AC Input Setup		DC Load Setup		Test Results			
Name	Value	Load Name	Loading	Name	Min Spec.	Max Spec.	Reading
Vin (VAC)=	230.000	+5V (A)	20.00	Eff %	68.00	100	77.91
Fin (Hz) =	50.000	+12V (A)	7.50				
		-5V (A)	0.15				
		-12V (A)	0.40				
		+3.3V (A)	7.00				
		+5VSB (A)	1.00				

----Line Regulation Test 230V----

PASS

AC Input Setup		DC Load Setup	
Name	Value	Load Name	Loading
V1(VAC)	180.00	+5V (A)	20.00
V2(VAC)	265.00	+12V (A)	7.50
Fin (Hz)	50.00	-5V (A)	0.15
		-12V A)	0.40
		+3.3V A)	7.00
		+5Vsb A)	1.00

Test Results

Name	MinSpec	MaxSpec	Result1	Result2
5V (V)	4.550	5.450	4.917	4.923
12V (V)	11.200	12.800	12.213	12.196
-5V (V)	-4.300	-5.700	-5.043	-5.048
-12V (V)	-10.600	-13.400	-11.896	-11.878
3.3V(V)	2.940	3.670	3.282	3.282
5Vsb(V)	4.550	5.450	4.992	4.992

----Load Regulation Test 180V----

PASS

AC Input Setup		DC Load Setup		
Name	Value	Load Name	Load1	Load2
V1(VAC)	180.00	+5V (A)	2.00	20.00
V2(VAC)	180.00	+12V (A)	1.00	7.50
Fin (Hz)	50.00	-5V (A)	0.10	0.15
		-12V A)	0.20	0.40
		+3.3V A)	1.00	7.00
		+5Vsb A)	0.20	1.00

Test Results

Name	MinSpec	MaxSpec	Result1	Result2
5V (V)	4.550	5.450	5.110	4.919
12V (V)	11.200	12.800	11.997	12.217
-5V (V)	-4.300	-5.700	-4.695	-5.043
-12V (V)	-10.600	-13.400	-11.199	-11.887
3.3V(V)	2.940	3.670	3.328	3.282
5Vsb(V)	4.550	5.450	5.075	4.992

----Load Regulation Test230V----

PASS

AC Input Setup

Name	Value
V1(VAC)	230.00
V2(VAC)	230.00
Fin (Hz)	50.00

DC Load Setup

Load Name	Load1	Load2
+5V (A)	2.00	20.00
+12V (A)	1.00	7.50
-5V (A)	0.10	0.15
-12V A)	0.20	0.40
+3.3V A)	1.00	7.00
+5Vsb A)	0.20	1.00

Test Results

Name	MinSpec	MaxSpec	Result1	Result2
5V (V)	4.550	5.450	5.111	4.922
12V (V)	11.200	12.800	11.995	12.201
-5V (V)	-4.300	-5.700	-4.699	-5.045
-12V (V)	-10.600	-13.400	-11.200	-11.887
3.3V(V)	2.940	3.670	3.328	3.282
5Vsb(V)	4.550	5.450	5.076	4.992

----Load Regulation Test 265V----

PASS

AC Input Setup

Name	Value
V1(VAC)	265.00
V2(VAC)	265.00
Fin (Hz)	50.00

DC Load Setup

Load Name	Load1	Load2
+5V (A)	2.00	20.00
+12V (A)	1.00	7.50
-5V (A)	0.10	0.15
-12V A)	0.20	0.40
+3.3V A)	1.00	7.00
+5Vsb A)	0.20	1.00

Test Results

Name	MinSpec	MaxSpec	Result1	Result2
5V (V)	4.550	5.450	5.111	4.922
12V (V)	11.200	12.800	11.995	12.194
-5V (V)	-4.300	-5.700	-4.701	-5.046
-12V (V)	-10.600	-13.400	-11.201	-11.882
3.3V(V)	2.940	3.670	3.327	3.282
5Vsb(V)	4.550	5.450	5.076	4.992

---- +5V Cross Regulation Test 230V ----

PASS

AC Input Setup

DC Load Setup

Name	Value
V1(VAC)	230.00
V2(VAC)	230.00
Fin (Hz)	50.00

Load Name	Load1	Load2
+5V (A)	20.00	20.00
+12V (A)	1.00	7.50
-5V (A)	0.10	0.15
-12V A)	0.20	0.40
+3.3V A)	1.00	7.00
+5Vsb A)	0.20	1.00

Test Results

Name	MinSpec	MaxSpec	Result1	Result2
5V (V)	4.550	5.450	4.900	4.920
12V (V)	11.200	12.800	12.520	12.198
-5V (V)	-4.300	-5.700	-4.969	-5.043
-12V (V)	-10.600	-13.400	-11.834	-11.887
3.3V(V)	2.940	3.670	3.316	3.282
5Vsb(V)	4.550	5.450	5.063	4.992

---- +3.3V Cross Regulation Test 230V ----

PASS

AC Input Setup

Name	Value
V1(VAC)	230.00
V2(VAC)	230.00
Fin (Hz)	50.00

DC Load Setup

Load Name	Load1	Load2
+5V (A)	2.00	20.00
+12V (A)	1.00	7.50
-5V (A)	0.10	0.15
-12V A)	0.20	0.40
+3.3V A)	7.00	7.00
+5Vsb A)	0.20	1.00

Test Results

Name	MinSpec	MaxSpec	Result1	Result2
5V (V)	4.550	5.450	5.094	4.920
12V (V)	11.200	12.800	12.033	12.200
-5V (V)	-4.300	-5.700	-4.707	-5.043
-12V (V)	-10.600	-13.400	-11.269	-11.887
3.3V(V)	2.940	3.670	3.302	3.282
5Vsb(V)	4.550	5.450	5.067	4.992

---- +12V Cross Regulation Test 230V ----

PASS

AC Input Setup

Name	Value
V1(VAC)	230.00
V2(VAC)	230.00
Fin (Hz)	50.00

DC Load Setup

Load Name	Load1	Load2
+5V (A)	2.00	20.00
+12V (A)	7.50	7.50
-5V (A)	0.10	0.15
-12V A)	0.20	0.40
+3.3V A)	1.00	7.00
+5Vsb A)	0.20	1.00

Test Results

Name	MinSpec	MaxSpec	Result1	Result2
5V (V)	4.550	5.450	5.154	4.920
12V (V)	11.200	12.800	11.684	12.200
-5V (V)	-4.300	-5.700	-4.786	-5.043
-12V (V)	-10.600	-13.400	-11.375	-11.887
3.3V(V)	2.940	3.670	3.323	3.282

5Vsb(V)	4.550	5.450	5.071	4.992

----Voltage Accuracy Min Load Test 230V----

PASS

AC Input Setup

Name	Value
V1(VAC)	230.00
V2(VAC)	230.00
Fin (Hz)	50.00

DC Load Setup

Load Name	Load1	Load2
+5V (A)	2.00	2.00
+12V (A)	1.00	1.00
-5V (A)	0.10	0.10
-12V (A)	0.20	0.20
+3.3V (A)	1.00	1.00
+5Vsb (A)	0.20	0.20

Test Results

Name	MinSpec	MaxSpec	Result1	Result2
5V (V)	4.550	5.450	5.110	5.111
12V (V)	11.200	12.800	11.995	11.995
-5V (V)	-4.300	-5.700	-4.695	-4.696
-12V (V)	-10.600	-13.400	-11.203	-11.204
3.3V(V)	2.940	3.670	3.328	3.327
5Vsb(V)	4.550	5.450	5.076	5.076

----Voltage Accuracy 50% Load Test 230V----

PASS

AC Input Setup

Name	Value
V1(VAC)	230.00
V2(VAC)	230.00
Fin (Hz)	50.00

DC Load Setup

Load Name	Load1	Load2
+5V (A)	20.00	20.00
+12V (A)	7.50	7.50
-5V (A)	0.15	0.15
-12V (A)	0.40	0.40
+3.3V (A)	7.00	7.00
+5Vsb (A)	1.00	1.00

Test Results

Name	MinSpec	MaxSpec	Result1	Result2
5V (V)	4.550	5.450	4.920	4.920
12V (V)	11.200	12.800	12.200	12.198
-5V (V)	-4.300	-5.700	-5.043	-5.042
-12V (V)	-10.600	-13.400	-11.887	-11.887
3.3V(V)	2.940	3.670	3.282	3.282
5Vsb(V)	4.550	5.450	4.992	4.992

----Noise Test 230V----

PASS

AC Input Setup

Name	Value	
V1(VAC)	230.00	
Fin (Hz)	50.00	
BW	20.00	MHz

DC Load Setup

Load Name	Loading
+5V (A)	20.00
+12V (A)	7.50
-5V (A)	0.15
-12V (A)	0.40
+3.3V (A)	7.00

+5Vsb (A)	1.00

Test Results

Name	MaxSpec	Result	Units
5V	0.075	0.040	Vpp
12V	0.15	0.072	Vpp
-5V	0.125	0.024	Vpp
-12V	0.15	0.028	Vpp
3.3V	0.075	0.023	Vpp
5Vsb	0.075	0.031	Vpp

----+5V Overshoot Voltage Test 230V----

PASS

AC Input Setup

Name	Value
V1(VAC)	230.00
Fin (Hz)	50.000

DC Load Setup

Load Name		Loading
+5V	(A)	20.00
+12V	(A)	7.50
-5V	(A)	0.15
-12V	(A)	0.40
+3.3V	(A)	7.00
+5Vsb	(A)	1.00

Test Results

Name	MinSpec	MaxSpec	Result1
5V (V)	4.5	5.5	5.098

----+12V Overshoot Voltage Test 230V----

PASS

AC Input Setup

Name	Value
V1(VAC)	230.00
Fin (Hz)	50.000

DC Load Setup

Load Name		Loading
+5V	(A)	20.00
+12V	(A)	7.50
-5V	(A)	0.15
-12V	(A)	0.40
+3.3V	(A)	7.00
+5Vsb	(A)	1.00

Test Results

Name	MinSpec	MaxSpec	Result1
12V (V)	10.8	13.2	12.382

----+3.3V Overshoot Voltage Test 230V----

PASS

AC Input Setup

Name	Value
V1(VAC)	230.00
Fin (Hz)	50.000

DC Load Setup

Load Name		Loading
+5V	(A)	20.00
+12V	(A)	7.50
-5V	(A)	0.15
-12V	(A)	0.40
+3.3V	(A)	7.00
+5Vsb	(A)	1.00

Test Results

Name	MinSpec	MaxSpec	Result1
3.3V (V)	2.97	3.63	3.286

----+5V Dynamic Loading Test 230V----

PASS

AC Input Setup

Name	Value	
V1(VAC)	230.00	
Fin (Hz)	50.000	
Slew-R	0.500	A/us
Slew-F	0.500	A/us
Time1	0.100	ms
Time2	0.100	ms

DC Load Setup

Load Name		Loading1	Loading2
+5V	(A)	5.00	10.000
+12V	(A)	7.50	
-5V	(A)	0.15	
-12V	(A)	0.40	
+3.3V	(A)	7.00	
+5Vsb	(A)	1.00	

Test Results

Name	MaxSpec	Result1
5V (Vpp)	0.750	0.156

----+12V Dynamic Loading Test 230V----

PASS

AC Input Setup

Name	Value	
V1(VAC)	230.00	
Fin (Hz)	50.000	
Slew-R	0.500	A/us
Slew-F	0.500	A/us
Time1	0.100	ms
Time2	0.100	ms

DC Load Setup

Load Name		Loading1	Loading2
+5V	(A)	20.00	
+12V	(A)	5.00	10.000
-5V	(A)	0.15	
-12V	(A)	0.40	
+3.3V	(A)	7.00	
+5Vsb	(A)	1.00	

Test Results

Name	MaxSpec	Result1
12V (Vpp)	1.800	0.196

----+3.3V Dynamic Loading Test 230V----

PASS

AC Input Setup

Name	Value	
V1(VAC)	230.00	
Fin (Hz)	50.000	
Slew-R	0.500	A/us
Slew-F	0.500	A/us
Time1	0.100	ms
Time2	0.100	ms

DC Load Setup

Load Name		Loading1	Loading2
+5V	(A)	20.00	
+12V	(A)	7.50	
-5V	(A)	0.15	
-12V	(A)	0.40	
+3.3V	(A)	5.00	10.000
+5Vsb	(A)	1.00	

Test Results

Name	MaxSpec	Result1	
3.3V	0.500	0.248	Vpp

----No Load Operation Test 230V----

PASS

AC Input Setup	
Name	Value
V1(VAC)	230.00
Fin (Hz)	50.00

DC Load Setup	
Load Name	Load
+5V (A)	0
+12V (A)	0
-5V (A)	0
-12V (A)	0
+3.3V (A)	0
+5Vsb (A)	0

Test Results

Name	MinSpec	MaxSpec	Result
5V (V)	0	6	5.152
12V (V)	0	14	11.879
-5V (V)	0	-6.00	-4.482
-12V (V)	0	-14.00	-11.064
3.3V(V)	0	4.3	3.335
5Vsb(V)	0	6	5.094

---- +5VSB Short Circuit Test 230V----

PASS

AC Input Setup	
Name	Value
V1(VAC)	230.00
Fin (Hz)	50.00

DC Load Setup	
Load Name	Load
+5V (A)	20.000
+12V (A)	7.500
-5V (A)	0.150
-12V (A)	0.400
+3.3V (A)	7.000
+5Vsb (A)	Short

Test Results

Name	MinSpec	MaxSpec	Result
5V (V)	4.550	5.450	4.924
12V (V)	11.200	12.800	12.205
-5V (V)	-4.300	-5.700	-5.006
-12V (V)	-10.600	-13.400	-11.896
3.3V(V)	2.940	3.670	3.291
5Vsb(V)	4.550	5.450	5.019

Test Results:

Congratulations , the above power supply passed all electrical testing.

Please reference the relevant power supply design guideline for any other design guidance.

Thank you once again for your participation in this program.

Product Safety Notice:

The thermal, mechanical, and electrical testing conducted on this power supply did not evaluate product safety requirements. It is the manufacturer's responsibility to assure the power supply complies with all national and local safety requirements within the country sold. Contact your National Certification Body (NCB) or a third party certifier , like Underwriters Laboratories http://www.ul.com, for further guidance.