PI ELECTRONICS

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AD2081020110-2LF APPROVAL PACKAGE (Rev. 1)

CUSTOMER NAME	: ASUS
CUSTOMER PART NO.	:
PI MODEL NO.	: AD2081020110-2LF
REV.	: 1
DATE	: 26-Apr-2018

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PI ELECTRONICS (H.K.) Ltd.

AD2081020110-2LF APPROVAL PACKAGE (Rev. 1)

Customer Part No./Model Name and PI Model List :

PI Model No.	Customer Part No.	Customer Model Name
AD2081020110-2LF		

PI ELECTRONICS (H.K.) Ltd.
AD2081020110-2LF APPROVAL PACKAGE (Rev. 1)

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Section 1 - History of Changes

History of Changes :

Date	Rev	Remarks
26-Apr-2018	1	Preliminary release.

Section 2 - Specification

1. DESCRIPTION

This is a general purpose AC/DC adaptor which converts 100Vac~240Vac to a stabilized DC voltage of 5.0V/2.0A .

2. ELECTRICAL SPECIFICATION

2.1. TYPE

- Switching regulator type.

2.2. INPUT

2.2.1	Rated Input Voltage	: 100~240Vac, @ 50/60Hz.
2.2.2	Operating Input Voltage	: 90~264Vac, 47~ 63Hz.
2.2.3	Input Current	: < 0.3A.
2.2.4	Inrush Current	: The inrush current of the power supply shall be less than the rating of its critical components (include bridge diode, surge limiting device) for all condition of line voltage of 2.2.1. The I^2t shall less than 22% of the fuse, surge limiting device and bridge diode rating. No component damaged.
2.2.5	Standby power	: <0.075W @ 230Vac/50Hz and 115Vac/60Hz. Off Mode: Pout=0.25W,Pin<0.45W
2.2.6	Efficiency	: ≥ 79% Under the active mode and input voltage 115Vac/60Hz&230Vac/50Hz. The power supply efficiency shall be more than 77.5% measure at the normal voltage maximum load as specified with the AC input set at the nominal voltage. The 10% efficiency shall be more than 69.8% measure at 115V/60Hz and 230Vac/50Hz

Notes :

- The average efficiency shall comply with the DOE VI / COC v5 Tier 2 request.
- The UUT shall be operated at 100% of nameplate current output for at least 30 minutes immediately prior to conducting efficiency measurements.
- The ambient temperature shall be maintained at 23°C ± 5°C throughout the test.
- (The measure point is end of DC cable , the cable impedance is 180m ohm)

2.3. OUTPUT

2.3.1	Rated Output Voltage	: Vo=5.0Vdc
2.3.2	Output Voltage Regulation	: Vo=4.85~5.25V@(0A-0.49A) Load Vo=5.0~5.25V@(0.5A-Full) Load
2.3.3	Output Ripple and noise	: <200mVp-p.The output Ripple & Noise voltage shall be less than 100mV at load 0.5A.

Notes :
- Ripple voltage is measured using oscilloscope with bandwidth limited to 20MHz.
- A 10uF electrolytic capacitor and a 0.1uF ceramic capacitor shall be connected to the connector in parallel.

2.3.4	Output Load Current	: Rating current: 2.0A Operating Max current: =2.0A Operating Min current: =0A Ripple current:<100mA(pk-pk)
2.3.5	Overshoot/Undershoot	: 10% of nominal voltage
2.3.6	Hold up time	: >5ms@Full load/100Vac
2.3.7	Rise time	: <40ms.
2.3.8	ID Function	: 1. D+ and D- short to follow BC 1.2 2. Add another ID resister from short point (D+ & D-) to Ground 3. ID resister is 750Kohm

2.4. OTHERS

2.4.1	Turn-on Delay	: < 3 seconds.The input voltage measure at 100/240Vac and at maximum output load.
2.4.2	Over Voltage Protection	: Vo<7.5V, the recover voltage < 3.3V at auto recovery mode.
2.4.3	Over Current Protection	: (2.1-2.45)A,Auto-recovery.
2.4.4	Short Circuit Protection	: Shorting of output will not cause power supply to damage, or any safety hazard. Auto-recovery.
2.4.5	Power on/off repeat	: Set the output at maximum load and switch AC ON/OFF at 264Vac/63Hz for 10000 cycles. AC ON 4 sec and OFF 1 sec for each cycle. No any component damage or fault condition during the test.
2.4.6	Dynamic Load	: Under resistive load conditions, any change in output current at a rate of 1A/μs, Condition 1: 0.5A@5ms,0A@295ms Condition 2: 2.0A@5ms,0.5A@25ms Output voltage range:Max.6V ,Min.4.6V If output drop less than 4.6V,the during shall be less than 3ms @ condition 1.

2.4.7	Case Temperature rise	:	The case temperature rise shall be less 35deg C at 25deg C Ambient on bakelite (Not including the bottom surface)without airflow.
2.4.8	Acoustic Noise	:	1.Microphone at a distance of 10cm from the surface and noise level is less than 20dB@static load (from 0A to Full Load, 0.05A pre step)& dynamic load as item 2.4.6. 2.Microphone at a distance of 3cm from the surface and noise level is less than 25dB@static load (from 0A to Full Load, 0.05A pre step)& dynamic load as item 2.4.6.
2.4.9	Common Mode Noise	:	Test Equipment and Environment : Follow EN61000-4-6 Test voltage Condition :3V Test Frequency :150K ~ 600KHz Specification :CMN Max.:0.8V@150K~600K

3. RELIABILITY

3.1	MTBF	:	> 150K Hours at 25 degree C.
3.2	Life/Power On Hours	:	The power supply must be designed to operate for 13,140 power on hours. AC input voltage: 100 and 240Vrms Ambient Temp. : 25°C
3.3	Burn-in Test Condition	:	More than 4 hours at 40°C, normal input voltage. AC on/off must be tested.
3.4	AC Plug Pull/Push Test	:	>30kg, the AC plug can't separated from the main body and case can't deformation.
3.5	DC Connector Salt Spray Test	:	- Follow EIA Spec. - Salt Solution : Density 5%, PH value 6.5~7.2 - Chamber Temp. and Corrosion Time : 35°C for 48hrs - Without excessive corrosion or crack in appearance.

4. ENVIRONMENTAL

4.1. CLIMATIC SPECIFICATIONS

4.1.1	Operating Temperature	: 0degC ~ 40degC
4.1.2	Operating Humidity	: 5% ~90 % (Non-condensing)
4.1.3	Storage Temperature	: -30degC ~80degC
4.1.4	Storage Humidity	: 5% ~90% (Non-condensing)

4.2. DYNAMIC SPECIFICATIONS

4.2.1 Vibration Test - Non-Operating : 1.5mm, 10-50-10Hz / sine wave.

4.2.2 Pass Criterion : Normal functional test should be satisfied after the test.

5. SAFETY AND EMC

5.1. DIELECTRIC WITHSTANDING VOLTAGE

5.1.1 Primary to Secondary : 3.0KVac , 1 minute, 5mA for type test, 2 seconds for production.

5.1.2 Leakage Current : The total combined leakage current shall be <20uA when tested at 240Vrms, 50Hz in normal operating condition.

5.1.3 Insulation Resistance : 30Mohm check at DC 500V.

5.2. SAFETY STANDARD

Type	Country/Region	Standard
CB	EU	IEC60950/EN60950
CE	EU	IEC60950

5.3. EMC SPECIFICATION

5.3.1. Noise-suppressed according to EN55032 Class B and FCC 15 Class B for both Radiated and Conducted Emissions.

5.3.2. Immunity to Electrostatic Discharge (ESD) according to EN 61000-4-2.

Discharge Characteristic	Test Level	Acceptance Criteria *1
Air Discharge	±15KV, 10 times	B
	±12KV, 10 times	A
Contact Discharge	±8KV, 10 times	A

Note *1: For the test result, please refer to (5.3.8) Assessment criteria.

5.3.3. Immunity to Radiated Electromagnetic Field (RS) according to EN 61000-4-3.

- Test characteristic: 80 - 1000MHz, 80% AM (1kHz)

Test Level	Acceptance Criteria
3V/m	A

5.3.4. Immunity to Electrical Fast Transients / Burst (EFT) according to EN 61000-4-4.

Coupling	Test level	Acceptance Criteria
AC-input	1KV	A
AC-input	2KV	B

5.3.5. Lightning Surge capability according to EN 61000-4-5.

Surge voltage	Acceptance Criteria
Common mode +/-4KV 12R, 10 times	A
Differential mode +/-2KV 2R, 5 times	A

5.3.6. Immunity to Conducted disturbances, induced by radio frequent fields according to EN 61000-4-6.

- Test characteristic 0.15- 80MHz, 80% AM(1kHz)

Test level	Acceptance Criteria
3V	A

5.3.7. Immunity to Voltage dips, short interruptions and voltage variations.

- Test according to EN 61000-4-11.
- Test performed at Vin =120Vac/60Hz.
- Note : Test with resistive load at rated loading.

Test Level % Vin	Voltage Dips and Short Interruptions % Vin	Duration Time of Voltage Dips (in half-sine cycles)	Acceptance Criteria
			120Vac/60Hz
0	100	1	B
		2	B
		5	B
		10	B
		25	B

5.3.8. Assessment criteria

Acceptance Criteria	Performance
A	Agreed operational behavior within the specified limits.
B	Time limited functional diminishment or malfunction during the tests is permitted. The function is self- reactivated by the unit following completion of the tests.
C	Malfunction is permitted. The function can be reactivated either by reconnection to the mains or by operator intervention.

6. MECHANICAL SPECIFICATIONS

6.1	**Weight**	:	43g ±5%
6.2	**Input Connector**	:	Refer to attached drawing
6.3	**Output Cable**	:	Refer to attached drawing
6.4	**Output Connector**	:	Refer to attached drawing
6.5	**Drop Test**	:	Drop 30 times(5 times on each face) on each cycles from a height of 36 inches onto a hardwood surface. There must be no function damage after testing.

Section 3 - Outline Drawing

TBD

Section 4 - DC Cable Drawing

N/A

Section 5 - Rating and S/N Label Drawing

RATING LABEL DRAWING

TBD

2D BAR CODE LABEL DRAWING

TBD

LABEL LOCATION DRAWING

TBD

Section 6 - Packaging Drawing

OPP FILM LOCATION DRAWING

TBD

ASSY-CARTON

TBD

ASSY-PALLET

TBD

Section 7 - Bill Of Material (BOM)

TBD

Section 8 - Schematic

TBD

Section 9 - PCB Layout

TBD

Section 10 - Safety Certificates

TBD

*** END ***