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1 SCOPE

This document describes basic electrical characteristics and mechanical characteristic of 12W class II power adapter.

2 ELECTRICAL SPECIFICATION

2.1 INPUT REQUIREMENT

2.1.1 INPUT VOLTAGE RANGE

Power adapter shall operate within input specification from 90Vac to 264Vac or provide automatic switching between high line and low line input ranges. The table below shows common input voltage range.

Input Range	Minimum	Nominal	Maximum	Unit
	90	100-240	264	Vac, rms

Table 1 - Input Voltage Range

2.1.2 INPUT FREQUENCY RANGE

The power adapter shall operate within specification from 47 to 63 Hz.

2.1.3 AC INRUSH CURRENT

Peak inrush current should not exceed 110 A at 110Vac ,and 220 A at 230Vac 50Hz, 25 degrees C, cold start. It should not interrupt line fuse or cause damage to the power adapter either at cold or warm start.

2.1.4 INPUT CURRENT

Maximum steady state input current shall not exceed 0.35 A for any line voltage specified in 2.1.1.

2.1.5 LEAKAGE CURRENT

0.25 mA max. at 230Vac 50Hz.

2.1.6 INSULATION RESISTANCE

Insulation resistance shall be more than 50M ohm between primary and secondary.

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2.1.7 LOW POWER CONSUMPTION

Vin	Load	Power consumption
230Vac/50Hz 115Vac/60Hz	0A	≤ 0.3 W

2.1.8 HI-POT TEST

PRIMARY TO SECOND DC 4242V / 3 Sec.

2.2 INPUT PROTECTION

2.2.1 INPUT CURRENT PROTECTION

A fuse with rating of 1.25 A / 250 V (Time Lag type) or a 3.3Ω 1W fuse resistor shall be installed on the input line side near the input connector and no any electrical components before.

2.3 OUTPUT REQUIREMENT

2.3.1 OUTPUT POWER

Unit total output power, under steady state conditions, shall not exceed 12 W.

2.3.2 OUTPUT VOLTAGE AND CURRENT

Under any combination of line and load variation and environmental conditions, all outputs shall remain within tolerance as defined in Table 2. Output voltage(s) shall be measured at the load side of output connector.

Output Voltage	Voltage Range		Current Range	
	Lower Limit	Upper Limit	Minimum Load	Full rated load
+12.0V	11.40V	12.6V	0A	1.0A

Table 2 - Output Voltage and Current

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2.3.3 RIPPLE AND NOISE

Measurements shall be made with an oscilloscope with minimum of 20MHz bandwidth. Output shall be bypassed at the connector with a 0.1 μ F ceramic disk capacitor and a 47 μ F electrolytic capacitor for general testing purpose.

Output Voltage	Maximum Ripple & Noise (Vp-p)
+12.0V	120mV

Table 3 – Ripple and Noise

2.3.4 OVER VOLTAGE PROTECTION

The power adapter shall provide with over voltage protection by 15V zener diode

2.3.5 OVER CURRENT PROTECTION

After the supply at rated output reaches temperature equilibrium, over current protection shall be operated within specify 2.5A, after one hour burn-in and reached temperature equilibrium, defined in section 2.3.1 at 100~240Vac line input conditions.

2.3.6 OVER TEMPERATURE PROTECTION

N/A

2.3.7 OVERSHOOT AND UNDERSHOOT

During turn on or turn off, the output overshoot shall not exceed nominal output voltage by more than 10%, and output shall not change its polarity with respect to its return line.

2.3.8 SHORT CIRCUIT PROTECTION

Power adapter shall have self-limiting protection to protect against short circuit or overload conditions. No damage to the power adapter shall result from a continuous or intermittent short circuit condition. It will be auto-recovered when the failure is removed.

2.3.9 AUDIBLE NOISE

There is no audible noise can be hear when it work with rated spec.

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2.3.10 LIMITED POWER SOURCE

The power supply shall comply with the limited power source requirement as defined in IEC 60950-1 Edition for output independently.

2.4 PERFORMANCE REQUIREMENT

2.4.1 EFFICIENCY

Efficiency (watt out / watt in) shall be a minimum of 77.76 % at active average mode.

2.4.2 TURN ON DELAY TIME

Output shall reach steady state within 5 seconds of turn on at 90Vac or greater.

2.4.3 HOLD-UP TIME

Hold-up time shall be a minimum of 8 mS at 115Vac / 60Hz input.

Hold-up time shall be a minimum of 16 mS at 230Vac / 50Hz input.

2.4.4 DYNAMIC LOAD

Power adapter shall operate within regulation defined in section 2.3.2 at following conditions:

Step load change: from 0.2 A to 0.8A Load on the output.

Dwell Time: 5ms duty.

Slew rate: 0.1A/usec

the output overshoot or undershoots: $\leq \pm 10\%$ output voltage

3 ENVIRONMENTAL SPECIFICATION

3.1 TEMPERATURE

Operation within specification: 0 to 40 degrees C.

Storage: -20 to 85 degrees C

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3.2 HUMIDITY

Operation: 10% to 90% relative humidity, non-condensation.

Storage: 5% to 95% relative humidity, non-condensation.

3.3 VIBRATION AND SHOCK

The power adapter shall withstand forces of 2G at variable recurrent frequencies of 10 to 55Hz and a simulated transportation test. Transportation test will consist of a 1/2G vibration force at the resonant frequencies of the board or components.

The test will last for 15 min. The power adapter will be tested in a configuration representative of the intended application with shipping cartons. The power adapter must survive a 50G force for duration of 20mS in all 3 orthogonal planes from normal mounting points.

3.4 CALCULATED MEAN TIME BETWEEN FAILURES (MTBF)

The MTBF for the power adapter shall equal or exceed 50,000 hours when operated at full rated load in an ambient temperature of 25 degree C by MIL-STD-217F

4 APPLICATION STANDARD & RELATED SPECIFICATION

4.1 STANDARD & SAFETY CERTIFICATION

4.1.1 SAFETY STANDARD

Meet
Certification
CEC
CB
GS-TUV
UL/C-UL

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4.1.2 EMI

FCC 15(Class-B, 115Vac operation)

CISPR 22(Class-B, 230Vac operation)

EN55022(Class-B)

4.1.3 EMS

Refer IEC61000-4-2

Energy Storage Capacitor 150pF Discharge resistor 330Ω.

(Air Discharge: ± 8KV min. Contact Discharge: ± 4KV min.)

Refer IEC61000-4-4 level 3

Impulse: ±1kV applied to L, N and chassis, pulse frequency 5kHz,
period 5 min. input voltage 110Vac and full load.

Refer IEC61000-4-5 level 3

±1kV applied between line and line, pulse rise time 1.2us and duty
time 50uS, 5 times test each one.

4.1.4 LPS

Meet IEC60950-1

4.1.5 ENVIRONMENT STANDARDS

RoHS regulation

4.1.6 ENERGY SAVING

California standards Level 5 (2009 standards)

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5 MECHANICAL

5.1 INPUT AND OUTPUT CABLE

5.1.1 INPUT CABLE

See mechanical drawing

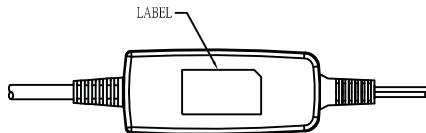
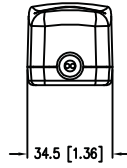
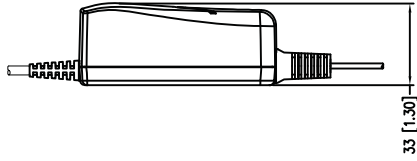
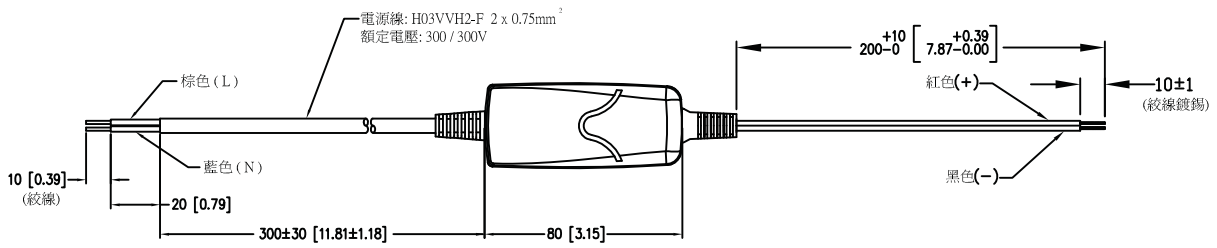
5.1.2 OUTPUT CABLE

See mechanical drawing

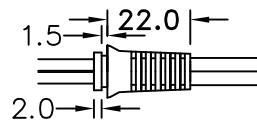
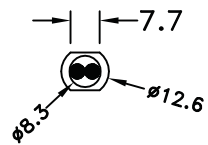
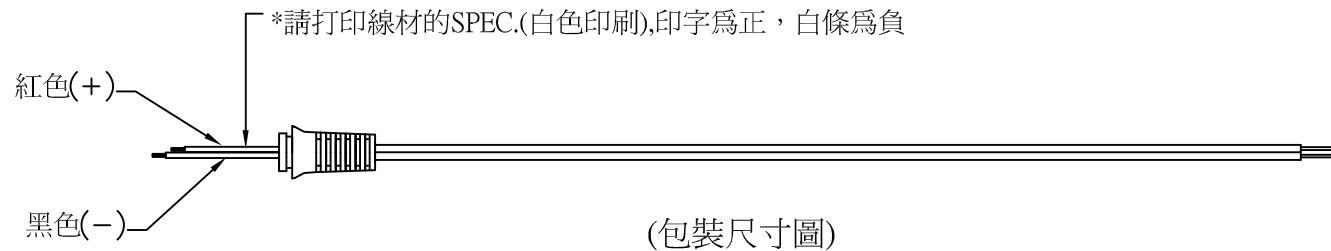
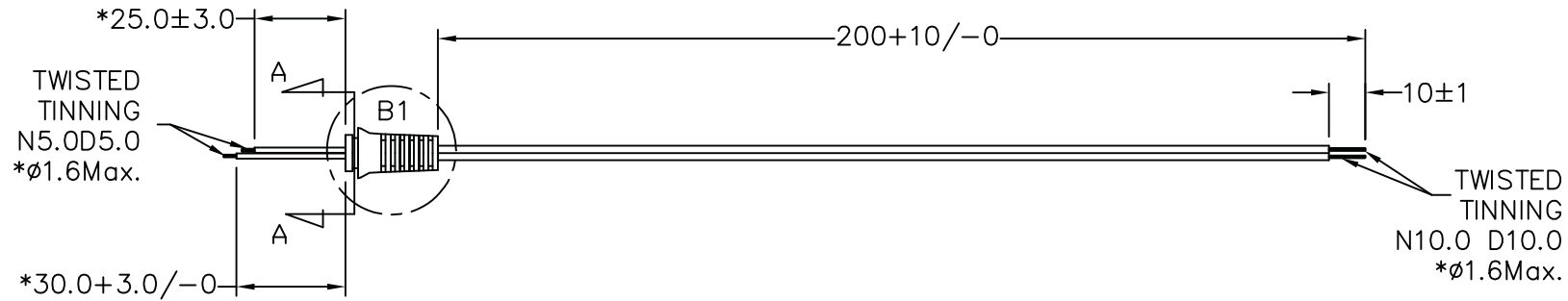
5.2 AC ADAPTER EXTERNAL DIMENSION

See mechanical drawing

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	APPROVED Tiger	DATE Sept. 24, 2012	DRAWING NO. 2012OTL032	UNIT MM (INCH)	REV. 0.1
TITLE	DESIGNED <i>JASON</i>	DRAWING	MODEL NO. CAL012121 / CAL012181	TOLERANCES: .XX = ± .10 .XXX = ± .010	SHEET 1/1



NOTES:

- 1.WIRE SPEC.:UL 2468 SINGLE CONDUCTOR SHIELDED WIRE 20AWG 2芯 80°C 300V.
- 2.THE WIRE COLOR IS "BLACK".
- 3.標示 "*" 為重點檢查尺寸.

環保材料標準:

No	有害物質名稱	含量標準	SHEET METAL TOLERANCE (UNLESS OTHERWISE SPECIFIED)				D01 新製		
			DIMENSION	PIERCING	BENDING	ANGULAR	REV.	DESCRIPTION	
1	鎘 (Cd)	<75ppm						UNIT: mm	MODEL NO.: CAL012121 / CAL012181
2	鉛 (Pb)	<800ppm						MATERIAL	PART NO.:
3	汞 (Hg)	<800ppm	X < 8	±0.1	±0.15	±0.3°		*****	DRAWING NO.: 2012CBL064
4	六價鉻 (Cr ⁶⁺)	<800ppm	8 ≤ X < 25	±0.1	±0.2	±0.5°		APPROVED	DESIGNED
5	多溴聯苯 (PBB)	<800ppm	25 ≤ X < 100	±0.15	±0.25	±0.5°	TIGER	CHECKED	DC WIRE
6	多溴二苯醚 (PBDE)	<800ppm	100 ≤ X < 300	±0.2	±0.3	±1°		JASON	SCALE:
7	鎳鉻系六價鉻(包裝材料)	總含量<100ppm	300 < X < 800	±0.3	±0.5	±1.5°	DATE: Sept. 24, 2012	DATE:	DATE: Sept. 24, 2012

DATE: Sept. 24, 2012	DATE:	DATE: Sept. 24, 2012	THIRD ANGLE PROJECTION	SHEET 1 OF 1	M/A4
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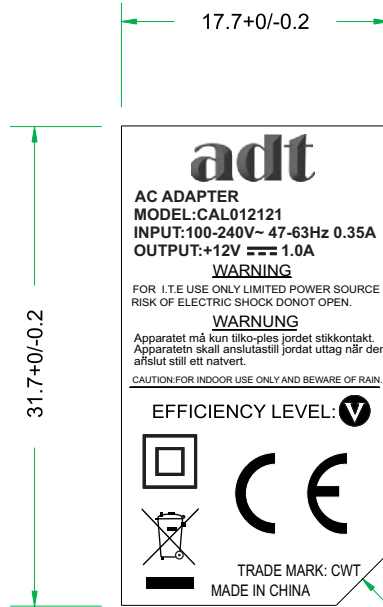
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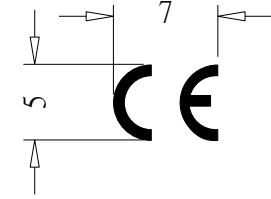
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31.7+0/-0.2

17.7+0/-0.2

C3.5



安規標誌最小尺寸

備註:

- 1.材質:50#消銀龍+OPP,背膠(壓克力膠).(UL安規)
- 2.顏色:銀底黑字,LOGO為灰階印刷.
- 3.總厚度:0.2~0.3mm.
- 4.高溫測試:須耐溫100度C 24小時,不可翹皮或皺摺.
- 5.安規標誌請按安規標準來製作.

環保材料標準:

No	有害物質名稱	含量標準	SHEET METAL TOLERANCE (UNLESS OTHERWISE SPECIFIED)				D01 新製				
			DIMENSION	PIERCING	BENDING	ANGULAR	REV.	DESCRIPTION			
1	銅 (Cd)	< 75 ppm								UNIT: mm	MODEL NO.: CAL012121
2	鉛 (Pb)	< 800 ppm								MATERIAL	PART NO.:
3	汞 (Hg)	< 800 ppm	X < 8	± 0.1	± 0.15	± 0.3°					DRAWING NO.: LABEL-CAL012121 (adt)
4	六價鉻 (Cr ⁶⁺)	< 800 ppm	8 ≤ X < 20	± 0.1	± 0.2	± 0.5°					NAME PLATE
5	多環聯苯 (PBB)	< 800 ppm	25 ≤ X < 100	± 0.15	± 0.25	± 0.5°	APPROVED	SAFETY	CHECKED	DESIGNED	
6	多環二苯醌 (PBDE)	< 800 ppm	100 ≤ X < 300	± 0.2	± 0.3	± 1°	TIGER	MICKY		JASON	SCALE: 1 : 1
7	鎘,鉛,汞,六價鉻,(包裝材料)	總含量 < 100 ppm	300 ≤ X < 800	± 0.3	± 0.5	± 1.5°	DATE: Oct. 4, 2012	DATE: Oct. 4, 2012	DATE:	DATE: Oct. 4, 2012	THIRD ANGLE PROJECTION

SHEET 1 OF 1
M/A4 L

1 | 2 | 3 | 4

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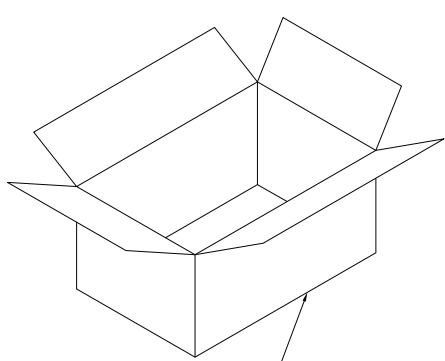
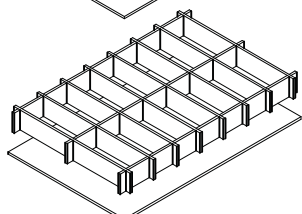
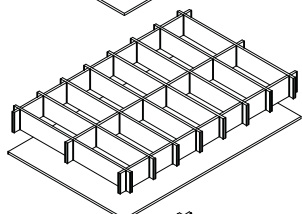
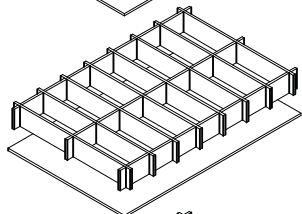
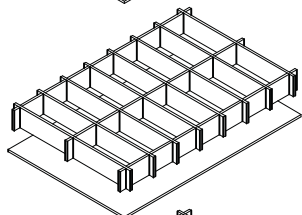
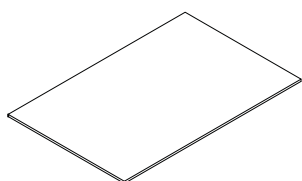
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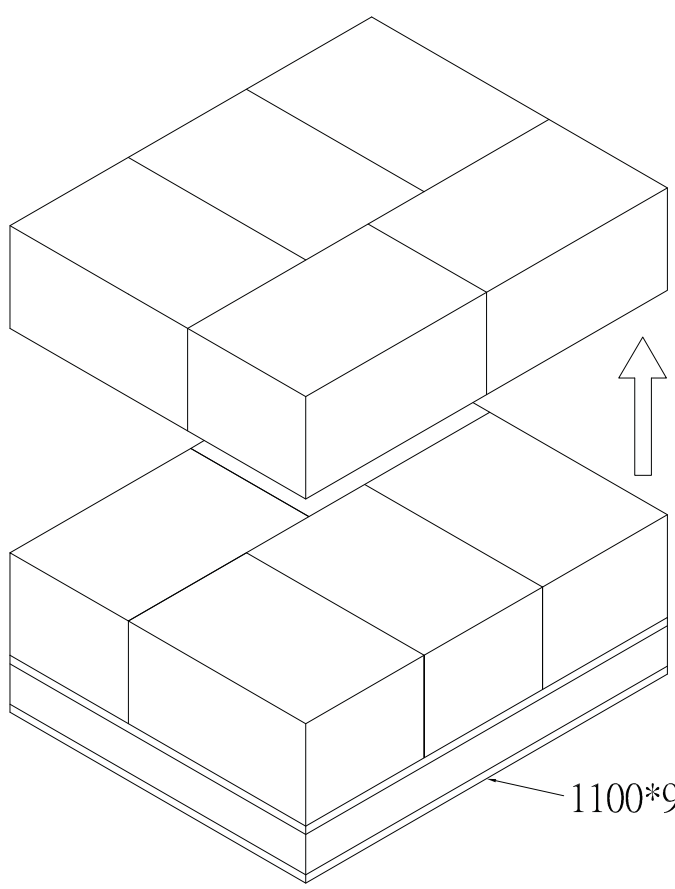
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CARTON

56 PCS/CARTON

7 Max



1100*900 棧板

0.1			DESCRIPTION		
REV.	DATE	APPROVED	UNIT: mm	MODEL NO.: CAL012121	
			MATERIAL	DRAWING NO.: 2012INS004	
			INSTRUCTION OF PACKING & STACKING		
APPROVED	CHECKED	DESIGNED	SCALE:	SHEET	M
<i>JASON</i>		<i>JASON</i>		1 OF 1	
DATE: Oct. 26, 2012	DATE:	DATE: Oct. 26, 2012	THIRD ANGLE PROJECTION		

