PART SPECIFICATION FOR APPROVAL

CUSTOMER	**Aruba Networks**
MODEL	**EMSA120300-P5RP-SZ-C2**
DESCRIPTION	**switching power supply**
DATE	**05/26/2016**
# OF PAGES	**26**

rev.	description	date
1.0	initial release	07/25/2014
1.01	updated to show CUI logo	08/06/2014
1.02	changed dc plug, updated part number	08/15/2014
1.03	added MTBF data	09/18/2014
1.04	increased operating temperature, decreased output current	10/14/2014
1.05	updated max output information	11/03/2014
1.06	updated safety labels	05/12/2015
1.07	updated safety and packaging labels	07/17/2015
1.08	added dc plug specification details	09/01/2015
1.09	updated PSE mark on safety label	11/04/2015
1.10	updated label	05/26/2016

The revision history provided is for informational purposes only and is believed to be accurate.

Please sign below.

approved by _____
(please print)

signature _____

date _____

Specification sign-off verifies that you have reviewed the entire specification and tested this product and that it meets your requirements. This specification reflects the part as it is to be ordered. Orders will not be processed until the specification approval page has been signed and returned to CUI Inc. This specification is confidential and is not to be distributed without prior approval from CUI Inc.

MODEL	output voltage typ (Vdc)	output current[1] max (A)	output power[1] max (W)	ripple and noise[2] max (mVp-p)	efficiency level
EMSA120300-P5RP-SZ-C2	12	3.0	36	290	V

Notes: 1. Output is 2.5A max at 50°C
2. At full load, 100 ~ 240 Vac input, 20 MHz bandwidth oscilloscope
3. CX1: 0.33μF/275V (334) ±10% 13X14X8.0mm P=10mm
BD1: KBP206G 2A/600V KBP LITEON
CS8: SMD 1206 0.01 μF/630V (103)X7R

INPUT

parameter	conditions/description	min	typ	max	units
voltage		90		264	Vac
frequency		47		63	Hz
input current				1.0	A
leakage current				0.25	mA
no load power consumption				0.3	W

OUTPUT

parameter	conditions/description	min	typ	max	units
line regulation			±1		%
load regulation			±5		%

PROTECTIONS

parameter	conditions/description	min	typ	max	units
over voltage protection	output voltage clamped by internal protection zener				
short circuit protection	output shut down and auto restart				

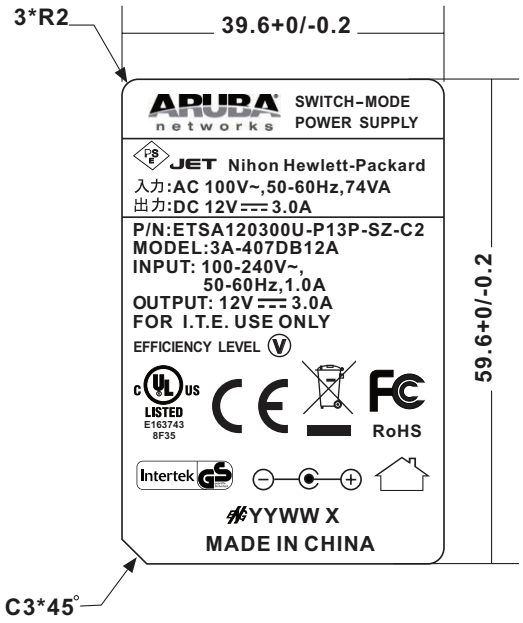
SAFETY & COMPLIANCE

parameter	conditions/description	min	typ	max	units
isolation voltage	input to output for 1 minute at 10mA			3,000 4,242	Vac Vdc
insulation resistance	input to output at 500 Vdc	100			MΩ
safety approvals	UL/cUL, GS, RCM, CCC, PSE, Korea, Argentina, Brazil, Israel, Malaysia, Mexico, Russia, Saudi Arabia, Singapore, Taiwan, Ukraine, South Africa				
EMI/EMC	FCC class B, CE, VCCI				
RoHS	2011/65/EU				

ENVIRONMENTAL

parameter	conditions/description	min	typ	max	units
operating temperature	derates from full load at 40°C to 2.5A at 50°C	0		50	°C
storage temperature		-10		70	°C
operating humidity		20		80	%
storage humidity		10		90	%

LABEL

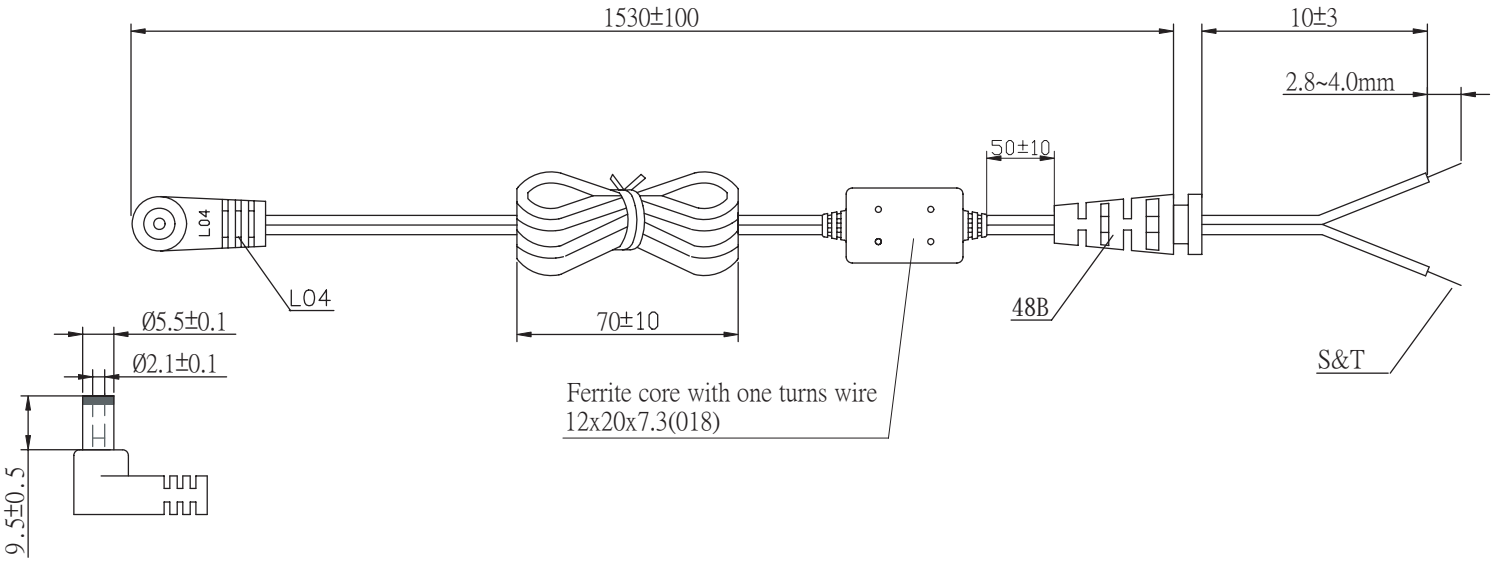


material: metalized polyester
color: silver on black base

remarks: YYWW X
YY=production year
WW=production week
X=production location

engraved

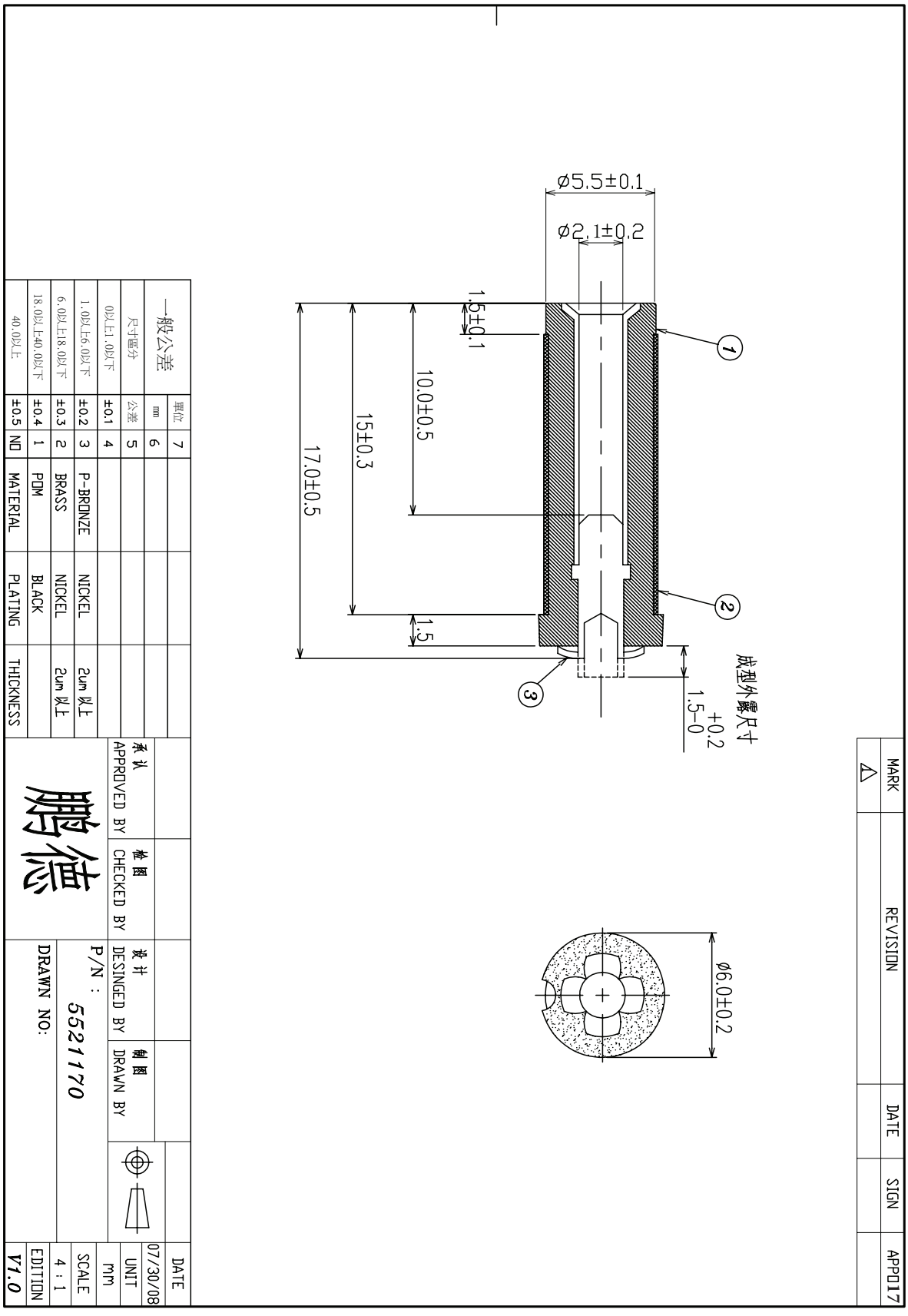
DC CORD



#18AWGX2C UL2468 WORDING ON WIRE (-), NO WORDING ON WIRE (+)

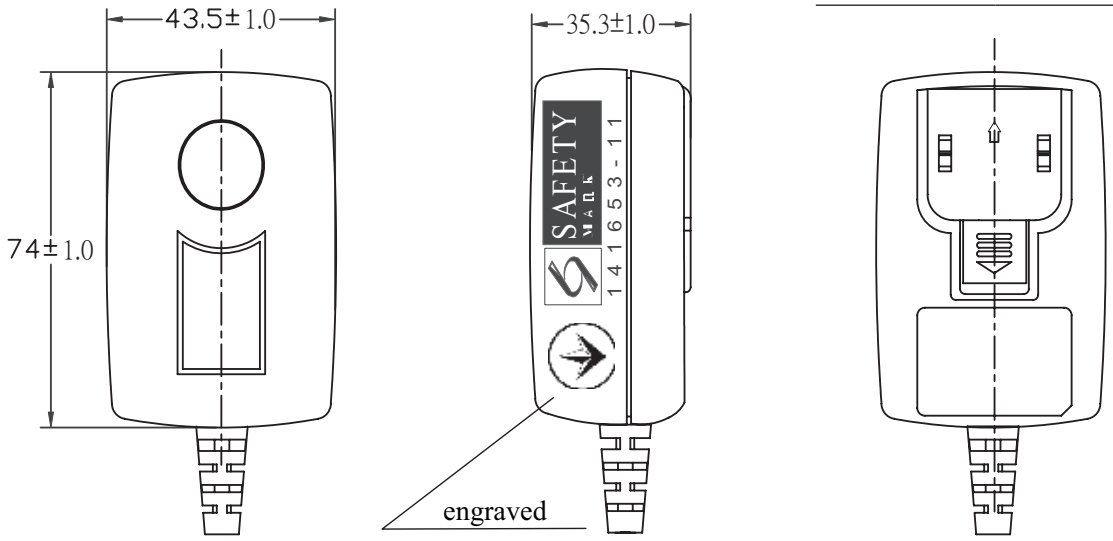
OD: Ø2.2*4.4

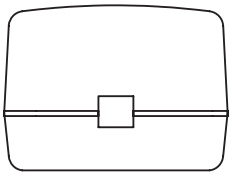
DC PLUG

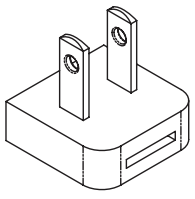

MARK
REVISION
DATE
SIGN
APP017
ø5.5±0.1
ø2.1±0.2
1.5±0.1
10.0±0.5
15±0.3
17.0±0.5
1.5
成型外露尺寸
1.5 +0.2 -0
ø6.0±0.2
一般公差
尺寸區分
公差
0以上1.0以下 ±0.1
1.0以上6.0以下 ±0.2
6.0以上18.0以下 ±0.3
18.0以上40.0以下 ±0.4
40.0以上 ±0.5
單位 mm
NO MATERIAL PLATING THICKNESS
1 PDM BLACK
2 BRASS NICKEL 2um 以上
3 P-BRONZE NICKEL 2um 以上
4
5
6
7
承认 APPROVED BY
檢圖 CHECKED BY
設計 DESINGED BY
繪圖 DRAWN BY
P/N : 5521170
DRAWN NO:
DATE 07/30/08
UNIT mm
SCALE 4 : 1
EDITION V1.0

MECHANICAL DRAWING

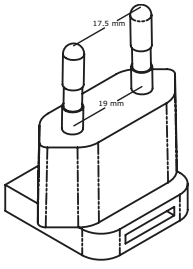
input plug	interchangeable blade: US, EU, UK, Australia, China, Korea, Brazil, Argentina
weight	272.4 g w/ blades
case size	74 L x 43.5 W x 35.3 H mm tolerance: ±1 mm



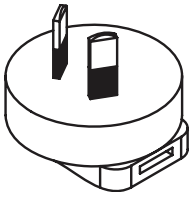




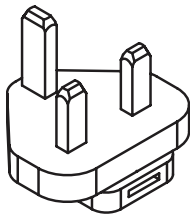
N. AMERICA



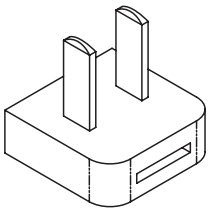
EU
Ø4.0 mm



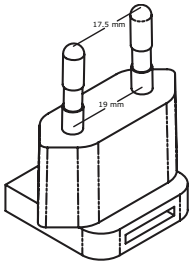
AUSTRALIA/
NEW ZEALAND



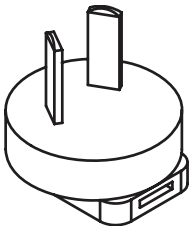
UK



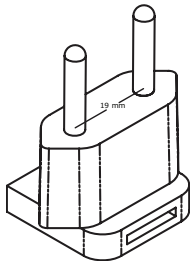
CHINA



KOREA
Ø4.8 mm



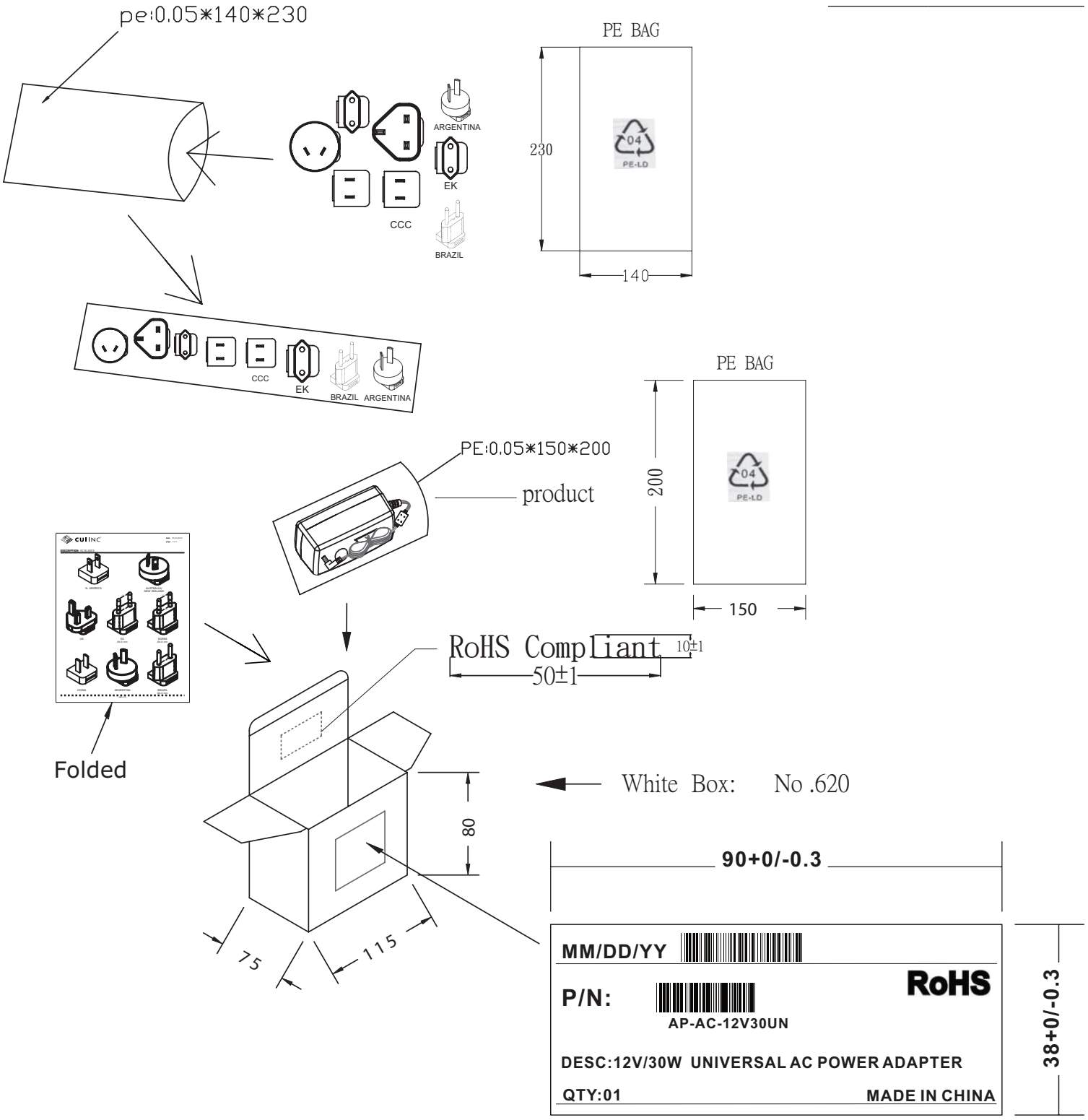
ARGENTINA



BRAZIL
Ø4.0 mm

IND PACKAGING

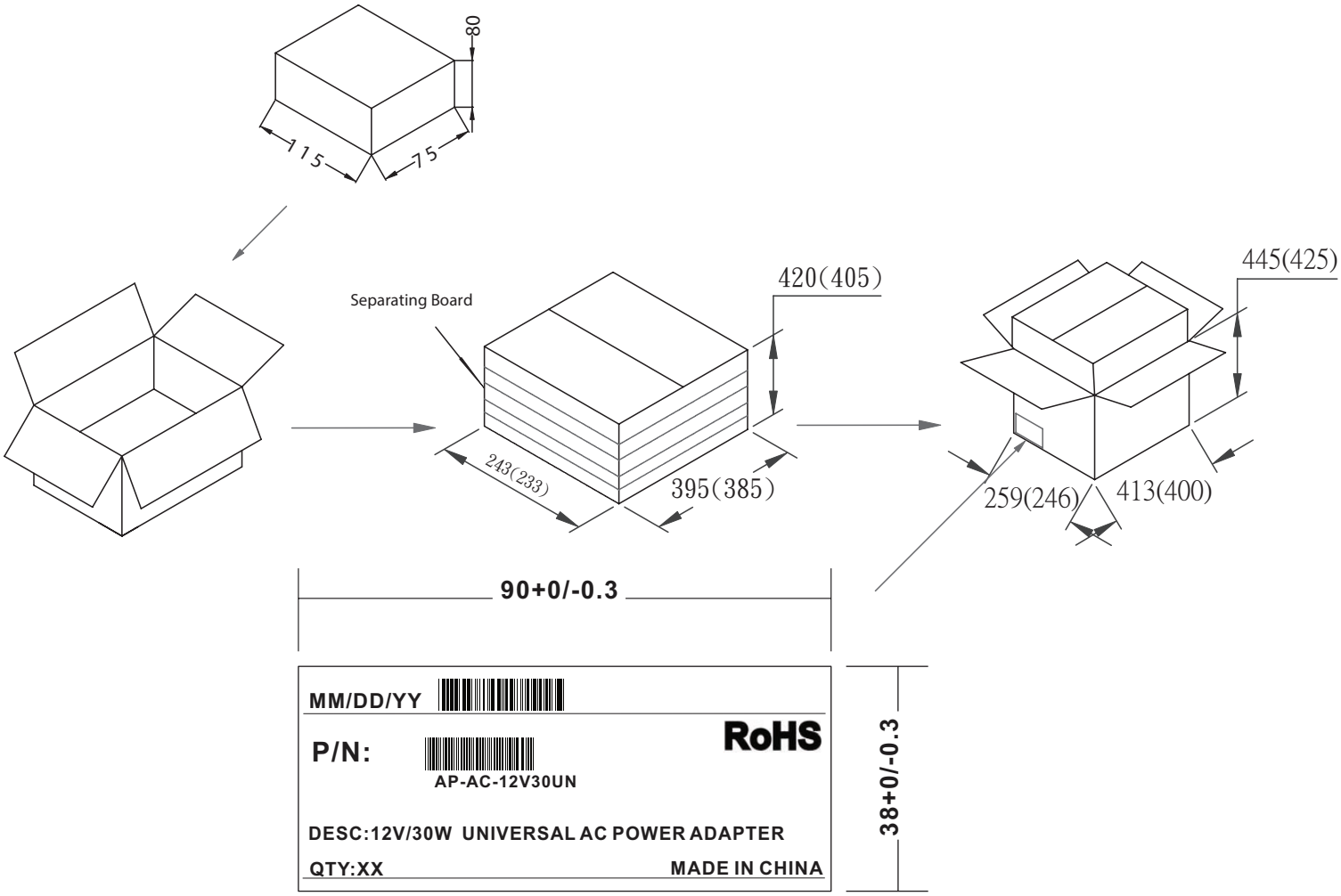
tolerance	±1 mm



PACKAGING

tolerance	+7/-0 mm

External Carton Material: A=B (6mm)
Internal Carton Material: B3B (3mm)
Carton Size: 413 x 259 x 445mm
QTY: 50 pcs (10 x 5)
N.W: 13.62 KGS
G.W: 15.12 KGS
G.W: 15.62 KGS



MTBF (90 VAC, 50 °C)

TYPE : *MTBF* ***REV :***

TEST CONDITION

AC INPUT : 90V ***ROOM TEMPERATURE : 50 ℃***

DC OUTPUT : 12V/2.5A

TYPE	***π p***
RESISTOR	0.893873667
CERAMIC	0.024192688
PLASTIC CAPACITOR	0.010684965
CAPACITOR(ALUMINUM)	5.584212958
DIODE	1.479169536
MOSFET	1.067799075
IC	1.442706021
CHOKE	0.286458913
TRANSFORMER	1.455022943
FUSE NTC	0.02
PCB	0.32
LED PHOTO	0.161542033

TOTAL π p =	**12.7456628**		
MTBF =	**78458 Hours**	8.9564	Year

MTBF (90 VAC, 50 °C)

TYPE : Resister
TEST CONDITION
AC INPUT : 90V
DC OUTPUT : 12V/2.5A

SPECIFICATION:

ROOM TEMPERATURE : 50 ℃

P / N	Item	ohm	(W)	Vm	π m	S	T	π b	π R	π Q	π E	π P	
	R2	1000000	0.5	90	0.0081	0.0162	90.78	0.001570733	1.1	5	2	0.017278059	DIP
	RS1	1	0.25	0.173	0.0299	0.119716	118.98	0.005412105	1	5	2	0.054121047	SMD
	RS2	1	0.25	0.173	0.0299	0.119716	121.35	0.005890175	1	5	2	0.058901747	SMD
	RS3	4.7	0.25	0.173	0.0064	0.025471489	120.29	0.004522847	1	5	2	0.045228474	SMD
	RS4	750000	0.25	42.16	0.0024	0.009479817	109.4	0.002971669	1.1	3	2	0.019613013	SMD
	RS8	750000	0.25	42.16	0.0024	0.009479817	110.54	0.003092788	1.1	5	2	0.03402067	SMD
	RS5	82000	0.25	57.38	0.0402	0.16060802	108.73	0.004128208	1	5	2	0.041282082	SMD
	RS6	82000	0.25	57.26	0.0400	0.159936956	109.98	0.004311267	1	5	2	0.043112672	SMD
	RS9	82000	0.25	57.26	0.0400	0.159936956	109.18	0.004189002	1	5	2	0.041890015	SMD
	RS10	82000	0.25	57.26	0.0400	0.159936956	110.17	0.004340826	1	5	2	0.043408259	SMD
	RS7	22	0.25	0.33	0.0050	0.0198	109.03	0.003004849	1	5	2	0.030048491	SMD
	RS17	82	0.25	0.142	0.0002	0.00098361	102.67	0.002302042	1	5	2	0.023020418	SMD
	RS18	82	0.25	0.142	0.0002	0.00098361	102.28	0.00227084	1	5	2	0.0227084	SMD
	RS14	2	0.25	0.012	0.0001	0.000288	104.23	0.002427304	1	5	2	0.024273039	SMD
	RS11	470	0.125	0.034	0.0000	0.0000196766	102.78	0.002305815	1	5	2	0.023058149	SMD
	RS12	100000	0.125	0.4	0.0000	0.0000128	103.83	0.002392056	1	5	2	0.023920557	SMD
	RS15	150	0.125	0.63	0.0026	0.021168	100.78	0.00225629	1	5	2	0.022562904	SMD
	RS16	100000	0.125	7.48	0.0006	0.004476032	100.4	0.002143258	1	5	2	0.021432584	SMD
	RS19	1000	0.125	0.986	0.0010	0.007777568	102.97	0.002362896	1	5	2	0.023628962	SMD
	RS24	1000	0.125	12.15	0.1476	1.18098	88.33	0.018821489	1	5	2	0.188214887	SMD
	RS20	430	0.125	0.569	0.0008	0.00602346	104.41	0.002475132	1	5	2	0.024751323	SMD
	RS21	18000	0.125	9.25	0.0048	0.038027778	104.97	0.00271762	1	5	2	0.027176201	SMD
	RS29	4650	0.125	2.45	0.0013	0.010326882	98.29	0.002017205	1	5	2	0.020172046	SMD
	RS28	4700	0.125	0.216	0.0000	0.0000794145	98.78	0.002004967	1	5	2	0.020049669	SMD
Total π P =						***0.893873667***							

π m :Operating Power
S : Ratio of Operating Power to Rated Power
(S=Pm/P)
T : Component Temperature
π b : Base Failure Rate
(π b = $4.5 \times 10^{-9} \exp(12((T+273)/343))\exp(S/0.6((T+273)/273)$)

π R : Resistance Factor
π Q : Quality Factor
π E : Environment Factor
π p = AbPRPQPE Failures / 10^6 Hours

MTBF (90 VAC, 50 °C)

TYPE : Ceramic
TEST CONDITION
AC INPUT : 90V
DC OUTPUT : 12V/2.5A

SPECIFICATION:

ROOM TEMPERATURE : 50 ℃

P / N	Item	(pF)	(V)	Vp	S	T	Ab	π CV	π Q	π E	π P	
	CY1	1000	400	31.4	0.0785	100	0.000866	0.876564	3	1	0.002278	DIP
	CS7	470	50	7.48	0.1496	99.2	0.000954	0.806705	3	1	0.002308	SMD
	CS1	2200	500	113	0.2255	106	0.001232	0.955983	3	1	0.003534	SMD
	CS4	100000	50	19.1	0.3816	103	0.002622	1.454735	3	1	0.011442	SMD
	CS6	220000	50	8.05	0.161	98	0.000976	1.586538	3	1	0.004647	SMD
	CS5	1000	200	12.2	0.0609	101	0.00086	0.876564	3	1	0.002261	SMD
Total π P =		0.024192688										

Vp :Peak Voltage
S : Ratio of Peak to rated Voltage
(S=Vp/V)
T : Component Temperature
Ab : Base Failure Rate
Ab = $(0.0003((S/0.3)^3 \exp((T+273)/358)$
π cv : Capacitance Factor
π E : Environment Factor
π p = AbPcvPQPE Failures / 10^6 Hours
π Q : Quality Factor

MTBF (90 VAC, 50 °C)

TYPE : Plastic Capacitor ***SPECIFICATION:***
TEST CONDITION
AC INPUT : 90V ***ROOM TEMPERATURE : 50 ℃***
DC OUTPUT : 12V/2.5A

P / N	Item	(uF)	(V)	Vp	S	T	Ab	π CV	π Q	π E	π P	
	CX1	220000	270	90	0.3333333	94.3	0.001985	1.794215	3	1	0.010685	DIP

Total π P = 0.010684965

Vp :Peak Voltage
S : Ratio of Peak to rated Voltage
(S=Vp/V)
T : Component Temperature
Ab : Base Failure Rate
Ab = $(0.0003((S/0.3)^3 \exp((T+273)/358)$
π cv : Capacitance Factor

π Q : Quality Factor
π E : Environment Factor
π p = AbPcvPQPE Failures / 10^6 Hours

MTBF (90 VAC, 50 °C)

TYPE : Aluminum Capacitor ***SPECIFICATION:***

TEST CONDITION

AC INPUT : 90V ***ROOM TEMPERATURE : 50 ℃***

DC OUTPUT : 12V/2.5A

P / N	Item	(uF)	(V)	Vrip	V_p	S	T	π b	π CV	π Q	π E	π P	
	C1	68	400	39.4	111	0.41605	100	0.699911	0.726659	3	1	1.5258	*105 ^{0}C*
	C2	10	35	0.38	19.1	0.56066	101	0.863162	0.514611	3	1	1.3326	*105 ^{0}C*
	C3	470	25	0.71	12.2	0.52645	96.6	0.521068	1.029098	3	1	1.6087	*105 ^{0}C*
	C4	470	25	0.2	12.2	0.49709	92	0.361856	1.029098	3	1	1.1172	*105 ^{0}C*
Total π P =						***5.584212958***							

VP :Peak Voltage

S : Ratio of Peak to rated Voltage

T : Component Temperature

π b : Base Failure Rate (85 °C)

π b = $(0.00254((S/0.5)^3+1)\exp(5.09((T+273)/378)^5$

π cv : Capacitance Factor

π Q : Quality Factor

π E : Environment Factor

π p = π bPcvPQPE Failures / 10^6 Hours

π b : Base Failure Rate (105 °C)

π b = $(0.00254((S/0.5)^3+1)\exp(5.09((T+273)/378)^5$

MTBF (90 VAC, 50 °C)

TYPE : Diode
TEST CONDITION
AC INPUT : 90V ***ROOM TEMPERATURE : 50 ℃***
DC OUTPUT : 12V/2.5A

P / N	Item	(V)	(A)	VP	S	T_j	π b	π T	π S	π C	π Q	π E	π P	
	BD1	600	2	140	0.233333	112	0.003	4.30201	0.0291	2	5.5	6	0.0248	
	D1	1000	1.5	266	0.266	110	0.069	4.19386	0.04	2	5.5	6	0.76466	
	D2	200	1	37.8	0.189	107	0.069	4.01354	0.0175	2	5.5	6	0.31895	
	D3	60	20	31.4	0.523333	102	0.003	3.75045	0.2073	2	5.5	6	0.15395	
	DS1	75	0.15	12.4	0.165333	102	0.069	3.77622	0.0126	2	5.5	6	0.2168	

Total π P = ***1.479169536***

Vm : Voltage Applied
S : Stress = Vm/V
T : Component Temperature
π b : Base Failure Rate
π T : Temperature Factor
=exp(-1925((1/(T+273))-(1/298)))
SCR PT : Temperature Factor
=exp(-3082((1/(T+273))-(1/298)))

π S : Electrical Stress Factor
π c : Contact Construction Factor
π Q : Quality Factor
π E : Environment Factor
π p = AbPTPSPCPQPE Failures / 10^6 Hours

SCR PR(Pc) : Current Rating Factor
= (Irms)^0.40

MTBF (90 VAC, 50 °C)

TYPE : MOSFET ***SPECIFICATION:***

TEST CONDITION

AC INPUT : 90V ***ROOM TEMPERATURE : 50℃***

DC OUTPUT : 12V/2.5A

P / N	Item	V	Vop	S	T	π b	π T	π A	π Q	π E	π P	
	Q1	600	317	0.528333	107	0.012	4.04469	4	5.5	1	1.067799	DIP
Total π P =						***1.067799075***						

Vm :Max Voltage

T : Component Temperature

π b : Base Failure Rate

π T : Temperature Facto

=exp(-1925((1/(T+273))-(1/298)))

π A : Application Factor

π Q : Quality Factor

π E : Environment Factor

π p = AbPTPAPQPE Failures / 10^6 Hours

MTBF (90 VAC, 50 °C)

TYPE : IC ***SPECIFICATION:***
TEST CONDITION
AC INPUT : 90V ***ROOM TEMPERATURE : 50 ℃***
DC OUTPUT : 12V/2.5A

P / N	Item	Part type	pin	S	T	C_1	C_2	π_T	π_E	π_Q	π_L	π_P	
	QS1		3		97.09	0.02	0.0030	13.85	2	2	1	0.566	
	US1		8		105.36	0.02	0.0030	21.62	2	2	1	0.877	

Total π_P = ***1.442706021***

T : Component Temperature
C1 : Die Complexity Failure Rates
C2 : Package Failure Rate for all Microcircuits
π T : Temperature Factor
π E : Environment Factor
π Q : Quality Factor
π L : Learning Factor
π p =(C1PT + C2PE)PLPQ Failures / 10^6 Hours

TYPE : Choke ***SPECIFICATION:***
TEST CONDITION
AC INPUT : 90V ***ROOM TEMPERATURE : 50 ℃***
DC OUTPUT : 12V/2.5A

P / N	Item	Spec	P_m	S	T	π_b	π_C	π_Q	π_E	π_P	
	LF1				98.61	0.0011	1	30	4	0.1267	DIP
	LF2				106.23	0.0013	1	30	4	0.1597	DIP

Total π_P = ***0.286458913***

T : Component Temperature
π b : Base Failure Rate
(Ab = 0.000319exp(((T+273)/364)^8.7)
π c : Construction Factor
π Q : Quality Factor
π E : Environment Factor
π p : AbPCPQPE Failures / 10^6 Hours

MTBF (90 VAC, 50 °C)

TYPE : Transformer *SPECIFICATION:*
TEST CONDITION
AC INPUT : 90V ***ROOM TEMPERATURE : 50℃***
DC OUTPUT : 12V/2.5A

P / N	Item	Spec	π m	S	T	π b	π Q	π E	π P	
	T1				105.25	0.008083	30	6	1.4550229	DIP
Total π P =	***1.455022943***									

T : Component Temperature
π b : Base Failure Rate
π Q : Quality Factor
π E : Environment Factor
π p : AbPQPE Failures / 10^6 Hours

TYPE : Fuse *SPECIFICATION:*
TEST CONDITION
AC INPUT : 90V ***ROOM TEMPERATURE : 50℃***
DC OUTPUT : 12V/2.5A

P / N	Item	V	A	π m	S	π Q	π b	π E	π P	
	FS1	250	2				0.01	2	0.02	DIP
Total π P =	***0.02***									

T : Component Temperature
π b : Base Failure Rate
π E : Environment Factor
π p : AbPE Failures / 10^6 Hours

MTBF (90 VAC, 50 °C)

TYPE : PCB ***SPECIFICATION:***
TEST CONDITION
AC INPUT : 90V ***ROOM TEMPERATURE : 50℃***
DC OUTPUT : 12V/2.5A

P / N	Item	Spec	T	π b	N1	N2	π C	π Q	π E	π P	
	PCB	94-V0	107.96	0.0008	200	0	1	2	1	0.32	

Total π P = ***0.32***

π b : Base Failure Rate
N1,N2 : Number of PTHS Factor
π c : Complexity Factor
π Q : Quality Factor
π E : Environment Factor
π p = π b((N1XPC+N2(PC+13))PQPE Failures / 10^6 Hours

TYPE : LED PHOTO ***SPECIFICATION:***
TEST CONDITION
AC INPUT : 90V ***ROOM TEMPERATURE : 50℃***
DC OUTPUT : 12V/2.5A

P / N	Item	Spec	T	π b	π T	π Q	π E	π P		
	U1		94.5	0.0025	5.8743	5.5	2	0.1615	SMD	

Total π P = ***0.161542033***

π b : Base Failure Rate
π T: Complexity Factor
π Q : Quality Factor
π E : Environment Factor
π p = π b* π T* π Q* π E* π P Failures / 10^6 Hours

MTBF (264 VAC, 50 °C)

TYPE : *MTBF* ***REV :***

TEST CONDITION

AC INPUT : 264V ***ROOM TEMPERATURE : 50 ℃***

DC OUTPUT : 12V/2.5A

TYPE	***π p***
RESISTOR	0.89468301
CERAMIC	0.023815667
PLASTIC CAPACITOR	0.158717373
CAPACITOR(ALUMINUM)	10.10915038
DIODE	3.831811368
MOSFET	1.046323846
IC	1.540940061
CHOKE	0.210586034
TRANSFORMER	1.768622927
FUSE NTC	0.02
PCB	0.32
LED PHOTO	0.17371219
TOTAL π p =	**20.09836285**
MTBF =	**49755 Hours** 5.679828 Year

MTBF (264 VAC, 50 °C)

TYPE : Resister
TEST CONDITION
AC INPUT : 264V
DC OUTPUT : 12V/2.5A

SPECIFICATION:

ROOM TEMPERATURE : 50 ℃

P / N	Item	ohm	(W)	Vm	π m	S	T	π b	π R	π Q	π E	π P	
	R2	1000000	0.5	264	0.0697	0.139392	89.37	0.001963262	1.1	5	2	0.021595882	DIP
	RS1	1	0.25	0.051	0.0026	0.010404	114.13	0.003515081	1	5	2	0.035150814	SMD
	RS2	1	0.25	0.051	0.0026	0.010404	116.44	0.003811511	1	5	2	0.038115111	SMD
	RS3	4.7	0.25	0.051	0.0006	0.002213617	114.98	0.003551799	1	5	2	0.035517995	SMD
	RS4	750000	0.25	167.03	0.0372	0.148794778	106.97	0.003770245	1.1	3	2	0.024883618	SMD
	RS8	750000	0.25	167.1	0.0372	0.14891952	109.12	0.004073908	1.1	5	2	0.044812987	SMD
	RS5	82000	0.25	55.96	0.0382	0.152757151	107.33	0.00385458	1	5	2	0.038545802	SMD
	RS6	82000	0.25	55.96	0.0382	0.152757151	108.23	0.00398122	1	5	2	0.0398122	SMD
	RS9	82000	0.25	55.96	0.0382	0.152757151	107.43	0.00386845	1	5	2	0.038684499	SMD
	RS10	82000	0.25	55.26	0.0372	0.148959395	109.58	0.004142118	1	5	2	0.041421185	SMD
	RS7	22	0.25	0.34	0.0053	0.021018182	108.21	0.00292787	1	5	2	0.029278701	SMD
	RS17	82	0.25	0.49	0.0029	0.011712195	112	0.003272268	1	5	2	0.032722678	SMD
	RS18	82	0.25	0.49	0.0029	0.011712195	110.81	0.003138564	1	5	2	0.031385645	SMD
	RS14	2	0.25	0.012	0.0001	0.000288	105.54	0.002541144	1	5	2	0.025411439	SMD
	RS11	470	0.125	0.035	0.0000	0.00002085106	102.43	0.002277759	1	5	2	0.022777586	SMD
	RS12	100000	0.125	2.11	0.0000	0.000356168	102.23	0.002263615	1	5	2	0.022636146	SMD
	RS15	150	0.125	0.587	0.0023	0.018377013	102.08	0.00234663	1	5	2	0.023466296	SMD
	RS16	100000	0.125	1.83	0.0000	0.000267912	100.78	0.002151208	1	5	2	0.021512079	SMD
	RS19	1000	0.125	0.99	0.0010	0.0078408	106.2	0.002646375	1	5	2	0.026463749	SMD
	RS24	1000	0.125	12.15	0.1476	1.18098	89.64	0.019891154	1	5	2	0.198911536	SMD
	RS20	430	0.125	0.603	0.0008	0.006764819	106.79	0.002694912	1	5	2	0.026949121	SMD
	RS21	18000	0.125	9.24	0.0047	0.0379456	106.11	0.002828409	1	5	2	0.02828409	SMD
	RS29	4650	0.125	2.45	0.0013	0.010326882	101.97	0.002294904	1	5	2	0.022949041	SMD
	RS28	4700	0.125	0.224	0.0000	0.00008540596	103.19	0.002339481	1	5	2	0.023394811	SMD

Total π P ***0.89468301***

π m :Operating Power
S : Ratio of Operating Power to Rated Power
(S=Pm/P)
T : Component Temperature
π b : Base Failure Rate
(π b = 4.5×10^{-9}exp(12((T+273)/343))exp(S/0.6((T+273)/273)

π R : Resistance Factor
π Q : Quality Factor
π E : Environment Factor
π p = AbPRPQPE Failures / 10^6 Hours

MTBF (264 VAC, 50 °C)

TYPE : Ceramic *SPECIFICATION:*

TEST CONDITION

AC INPUT : 264V ***ROOM TEMPERATURE : 50 ℃***

DC OUTPUT : 12V/2.5A

P / N	Item	(pF)	(V)	V_P	S	T	A_b	π_{CV}	π_Q	π_E	π_P	
	CY1	1000	400	80.5	0.20125	100	0.001108	0.876564	3	1	0.002913	DIP
	CS7	470	50	1.83	0.0366	100	0.000852	0.806705	3	1	0.002062	SMD
	CS1	2200	500	111	0.2225	106	0.001216	0.955983	3	1	0.003489	SMD
	CS4	100000	50	18.9	0.378	104	0.002581	1.454735	3	1	0.011263	SMD
	CS6	220000	50	8.01	0.1602	101	0.000984	1.586538	3	1	0.004682	SMD
	CS5	1000	200	12.2	0.06085	110	0.000882	0.876564	3	1	0.00232	SMD
Total π_P =					0.023815667							

Vp :Peak Voltage

S : Ratio of Peak to rated Voltage

(S=Vp/V)

T : Component Temperature

Ab : Base Failure Rate

Ab = $(0.0003((S/0.3)^3 \exp((T+273)/358)$

π cv : Capacitance Factor

π E : Environment Factor

π p = AbPcvPQPE Failures / 10^6 Hours

π Q : Quality Factor

MTBF (264 VAC, 50 °C)

TYPE : Plastic Capacitor ***SPECIFICATION:***
TEST CONDITION
AC INPUT : 264V ***ROOM TEMPERATURE : 50 ℃***
DC OUTPUT : 12V/2.5A

P / N	Item	(uF)	(V)	Vp	S	T	Ab	π CV	π Q	π E	π P	
	CX1	220000	270	264	0.977778	90.4	0.029487	1.794215	3	1	0.158717	DIP

Total π P = 0.158717373

Vp :Peak Voltage
S : Ratio of Peak to rated Voltage
(S=Vp/V)
T : Component Temperature
Ab : Base Failure Rate
Ab = $(0.0003((S/0.3)^3\exp((T+273)/358)$
π cv : Capacitance Factor

π Q : Quality Factor
π E : Environment Factor
π p = AbPcvPQPE Failures / 10^6 Hours

TYPE : Aluminum Capacitor ***SPECIFICATION:***
TEST CONDITION
AC INPUT : 264V ***ROOM TEMPERATURE : 50 ℃***
DC OUTPUT : 12V/2.5A

P / N	Item	(uF)	(V)	Vrip	Vp	S	T	π b	π CV	π Q	π E	π P	
	C1	68	400	11.6	370	0.96576	99.8	2.545583	0.726659	3	1	5.5493	*105 ^0C*
	C2	10	35	0.37	18.9	0.55487	101	0.992772	0.514611	3	1	1.5327	*105 ^0C*
	C3	470	25	0.4	12.2	0.50925	99.6	0.595777	1.029098	3	1	1.8393	*105 ^0C*
	C4	470	25	0.15	12.2	0.49454	93.2	0.384748	1.029098	3	1	1.1878	*105 ^0C*

Total π P = ***10.10915038***

VP :Peak Voltage
S : Ratio of Peak to rated Voltage
T : Component Temperature
π b : Base Failure Rate (85 °C)
π b = $(0.00254((S/0.5)^3+1)\exp(5.09((T+273)/378)^5$
π cv : Capacitance Factor

π Q : Quality Factor
π E : Environment Factor
π p = π bPcvPQPE Failures / 10^6 Hours
π b : Base Failure Rate (105 °C)
π b = $(0.00254((S/0.5)^3+1)\exp(5.09((T+273)/378)^5$

MTBF (264 VAC, 50 °C)

TYPE : Diode
TEST CONDITION
AC INPUT : 264V ***ROOM TEMPERATURE : 50 ℃***
DC OUTPUT : 12V/2.5A

P / N	Item	(V)	(A)	VP	S	T_j	π b	π T	π S	π C	π Q	π E	π P	
	BD1	600	2	408	0.68	100	0.003	3.68396	0.392	2	5.5	6	0.28574	
	D1	1000	1.5	300	0.3	108	0.069	4.06951	0.054	2	5.5	6	0.99389	
	D2	200	1	74.4	0.372	106	0.069	3.98199	0.09	2	5.5	6	1.64026	
	D3	60	20	56.8	0.946667	104	0.003	3.89246	0.875	2	5.5	6	0.6746	
	DS1	75	0.15	12.8	0.170667	103	0.069	3.82652	0.014	2	5.5	6	0.23731	

Total π P = ***3.831811368***

Vm : Voltage Applied
S : Stress = Vm/V
T : Component Temperature
π b : Base Failure Rate
π T : Temperature Factor
=exp(-1925((1/(T+273))-(1/298)))
SCR PT : Temperature Factor
=exp(-3082((1/(T+273))-(1/298)))

π S : Electrical Stress Factor
π c : Contact Construction Factor
π Q : Quality Factor
π E : Environment Factor
π p = AbPTPSPCPQPE Failures / 10^6 Hours

SCR PR(Pc) : Current Rating Factor
= (Irms)^0.40

TYPE : MOSFET ***SPECIFICATION:***
TEST CONDITION
AC INPUT : 264V ***ROOM TEMPERATURE : 50 ℃***
DC OUTPUT : 12V/2.5A

P / N	Item	V	V_{op}	S	T	π b	π T	π A	π Q	π E	π P	
	Q1	600	576	0.96	106	0.012	3.96335	4	5.5	1	1.04632	DIP

Total π P = ***1.046323846***

Vm :Max Voltage
T : Component Temperature
π b : Base Failure Rate
π T : Temperature Facto
=exp(-1925((1/(T+273))-(1/298)))
π A : Application Factor

π Q : Quality Factor
π E : Environment Factor
π p = AbPTPAPQPE Failures / 10^6 Hours

MTBF (264 VAC, 50 °C)

TYPE : IC ***SPECIFICATION:***
TEST CONDITION
AC INPUT : 264V ***ROOM TEMPERATURE : 50 ℃***
DC OUTPUT : 12V/2.5A

P / N	Item	Part type	pin	S	T	C_1	C_2	π_T	π_E	π_Q	π_L	π_P	
	QS1		3		101.09	0.02	0.0030	17.22	2	2	1	0.701	
	US1		8		104.54	0.02	0.0030	20.7	2	2	1	0.84	

Total π_P = ***1.540940061***

T : Component Temperature
C1 : Die Complexity Failure Rates
C2 : Package Failure Rate for all Microcircuits
π T : Temperature Factor
π E : Environment Factor
π Q : Quality Factor
π L : Learning Factor
π p =(C1PT + C2PE)PLPQ Failures / 10^6 Hours

TYPE : Choke ***SPECIFICATION:***
TEST CONDITION
AC INPUT : 264V ***ROOM TEMPERATURE : 50 ℃***
DC OUTPUT : 12V/2.5A

P / N	Item	Spec	P_m	S	T	π_b	π_C	π_Q	π_E	π_P	
	LF1				88.47	0.0008	1	30	4	0.0981	DIP
	LF2				94.15	0.0009	1	30	4	0.1125	DIP

Total π_P = ***0.210586034***

T : Component Temperature
π b : Base Failure Rate
(Ab = 0.000319exp(((T+273)/364)^8.7)
π c : Construction Factor
π Q : Quality Factor
π E : Environment Factor
π p : AbPCPQPE Failures / 10^6 Hours

MTBF (264 VAC, 50 °C)

TYPE : Transformer ***SPECIFICATION:***
TEST CONDITION
AC INPUT : 264V ***ROOM TEMPERATURE : 50 ℃***
DC OUTPUT : 12V/2.5A

P / N	Item	Spec	π m	S	T	π b	π Q	π E	π P	
	T1				110.98	0.009826	30	6	1.768623	DIP

Total π P = ***1.768622927***

T : Component Temperature
π b : Base Failure Rate
π Q : Quality Factor
π E : Environment Factor
π p : AbPQPE Failures / 10^6 Hours

TYPE : Fuse ***SPECIFICATION:***
TEST CONDITION
AC INPUT : 264V ***ROOM TEMPERATURE : 50 ℃***
DC OUTPUT : 12V/2.5A

P / N	Item	V	A	π m	S	π Q	π b	π E	π P	
	FS1	250	2				0.01	2	0.02	DIP

Total π P = ***0.02***

T : Component Temperature
π b : Base Failure Rate
π E : Environment Factor
π p : AbPE Failures / 10^6 Hours

MTBF (264 VAC, 50 °C)

TYPE : PCB ***SPECIFICATION:***
TEST CONDITION
AC INPUT : 264V ***ROOM TEMPERATURE : 50 ℃***
DC OUTPUT : 12V/2.5A

P / N	Item	Spec	T	π b	N1	N2	π C	π Q	π E	π P	
	PCB	94-V0	107.84	0.0008	200	0	1	2	1	0.32	

Total π P = ***0.32***

π b : Base Failure Rate
N1,N2 : Number of PTHS Factor
π c : Complexity Factor
π Q : Quality Factor
π E : Environment Factor
π p = π b((N1XPC+N2(PC+13))PQPE Failures / 10^6 Hours

TYPE : LED PHOTO ***SPECIFICATION:***
TEST CONDITION
AC INPUT : 264V ***ROOM TEMPERATURE : 50 ℃***
DC OUTPUT : 12V/2.5A

P / N	Item	Spec	T	π b	π T	π Q	π E	π P		
	U1		98.05	0.0025	6.3168	5.5	2	0.1737	SMD	

Total π P = ***0.17371219***

π b : Base Failure Rate
π T: Complexity Factor
π Q : Quality Factor
π E : Environment Factor
π p = π b* π T* π Q* π E* π P Failures / 10^6 Hours

REVISION HISTORY

rev.	description	date
1.0	initial release	07/25/2014
1.01	updated to show CUI logo	08/06/2014
1.02	changed dc plug, updated part number	08/15/2014
1.03	added MTBF data	09/18/2014
1.04	increased operating temperature, decreased output current	10/14/2014
1.05	updated max output information	11/03/2014
1.06	updated safety labels	05/12/2015
1.07	updated safety and packaging labels	07/17/2015
1.08	added dc plug specification details	09/01/2015
1.09	updated PSE mark on safety label	11/04/2015
1.10	updated label	05/26/2016

The revision history provided is for informational purposes only and is believed to be accurate.

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