Nemko

APPLICATION FORM

We hereby order examination by Nemko as specified below. When the order is received, Nemko will provide an Order Confirmation which, together with the signed Application Form, will constitue a binding agreement between the applicant and NEMKO. The appropriate conditions are described overleaf.

APPLICANT	Name and address Cameo Communications, Inc No. 42, Min Chuan East Road, Section 6, Taipei 114, Taiwan	Our reference./ contact person: Mr. Jason Chang Possible other invoice reference: TRAINING RESEARCH CO., LTD. Phone: 886-2-2693-5155 ext.32 Fax/E-mail: 886-2-2693-4440 / jack@trclab.com.tw
MANU-FACTURER (if different from the applicant)	Name and address Cameo Communications, Inc 6F, NO. 22, Chung Shin Rd., Hsi-Chih, Taipei 221, Taiwan	
FACTORY/ PROD. SITE (if different from the manufacturer)	Name and address	
PRODUCT CATEGORY	802.11g Wireless PCI Adapter	
MARKING ON THE PRODUCT	Model/type: WLG-1202, WNC-0300, LWS5410P, NWP-0108G, ALL0281A Data: Other specification: 802.11g Wireless PCI Adapter Name/trade mark/logo *) CAMEO, Level One, LG, Etherwan, Allnet GmbH	
THE ORDER COMPRISES	☒ New order ☐ Repeated examination, please indicate previous Nemko Order No.: ..... ☐ Complete Nemko product certificate *) ☐ Nordic Certification Service *) for: ☐ Denmark ☐ Finland ☐ Sweden ☐ Iceland *) ☐ Testing for European certification (CCA), relevant countries: *) ☐ Testing for international certification (CB), relevant countries: *) ☐ Statement of conformity with standard for one product sample *) ☐ Test report according to the following standards/specifications: ☐ Attestation of conformity with: ☐ The EMC-Directive ☐ Other relevant Directives *) ☒ Other: *) Conformity assessment for letter of opinion R&TTE Directive	
SUBMITTED/ ENCLOSED	☐ Test sample(s) ☐ Extra components ☒ Declaration of Identity *) ☒ Test report(s) from others ☒ Wiring/circuit diagram(s) ☒ Part list ☒ Drawing(s) ☐ Certificate(s) from others ☒ User's instruction ☐ Mounting instruction ☒ EMC test report ☐ Self declaration (conformity with the EMC Directive) ☐ List of applicant(s)/contact(s) in secondary countries for Nordic Certification Service *) ☒ Other: See attached TCF	
SPECIAL INFORMATION	Test sample(s) after examination:: ☐ Collected by applicant 1) ☐ To be discarded by Nemko ☐ Returned at applicant's cost Completed Questionnaire on Production surveillance *) ☐ Enclosed ☐ Submitted previously ☐ Will be forwarded Power of Attorny *) ☐ Enclosed ☐ Submitted previously ☐ Will be forwarded Certificate desired in: ☐ English ☐ Norwegian ☐ Other * Delivery of result: ☐ By mail ☐ Preliminary by fax *) ☐ By courier express service * Remarks:	

We recognize and accept the technical, commercial and legal conditions described overleaf, as far as these are applicable to the specified assignment.
The undersigned is authorized to sign on behalf of the applicant.

Jason Chang

2005/4/27 — Date

Cameo Communications, Inc (Jason Chang / Wireless Comm. R&D Dept. Manager) — Binding on the applicant

*) Confer separate Guidance

1) Will be discarded by Nemko if not collected or notice given within 4 weeks after dispatch of the Return Notice. The same applies if not ticked in any of the boxes for "Test sample(s) after examination".

APPLICATION FORM - R&TTE APPENDIX

We hereby order Notified Body assessment by Nemko as specified below. When the order is received, Nemko will provide an Order Confirmation, which together with the signed Application Form, will constitue a binding agreement between the applicant and Nemko.

APPLICANT	Name and address Cameo Communications, Inc No. 42, Min Chuan East Road, Section 6, Taipei 114, Taiwan		
PRODUCT	Category 802.11g Wireless PCI Adapter	Model/type WLG-1202, WNC-0300, LWS5410P, NWP-0108G, ALL0281A	
RADIO TECHINCAL	Frequency range	Range 2412 to 2472 MHz	Harmonized YES
	Channels	Number 13	Separation 5
	Output power	802.11b: 93.33mW ; 802.11g: 94.62mW (e.i.r.p.)	
	Modulation	DBPSK / DQPSK / CCK / OFDM	
	Type of antenna	Dipole	
TCAM (if applicable)	Category		
USAGE	Intended use	Operating environment RESIDENTIAL	Portability PORTABLE
THE ORDER COMPRISES	☐ R&TTE Directive – Module Aa (Annex III) – Radio test suite assessment (NB issues a radio test suite proposal)		
	☐ R&TTE Directive – Module Aa+ (Annex IV) – TCF assessment (NB issues an opinion based on examination of the technical construction file (TCF) presented by the applicant)		
	☐ R&TTE Directive – Module H (Annex V) – Full quality assessment (NB verifies the quality system and the requirements for periodic control of test suites)		
	Remarks:		
OTHER	☐ Similar applications have been submitted to other Notified Bodies (must be listed on separate letter) ☐ Nemko is supposed to do assessments of the quality system ☐ Nemko is supposed to do annual production surveillance		
SUBMITTED DOCUMENTS	☐ Safety test report (3.1a) ☐ MPE calculation (3.1a) ☐ EMC test report (3.1b) ☐ Radio test report (3.2) ☐ CEPT radio application ☐ List of standards ☐ Declaration of Conformity	☐ Technical specifications ☐ Principle diagrams ☐ Block diagrams ☐ Circuit diagrams ☐ Part lists ☐ Component lists ☐ Sample of the product	☐ User documentation ☐ Service documentation ☐ ISO 9000 certificates ☐ Quality manual ☐ Methods for periodic control

STANDARDS APPLIED	Art.3.1a	Art.3.1b	Art.3.2	Art.3.3
	EN60950-1: 2001	EN 301 489-1 V1.4.1 EN 301 489-17 V1.2.1	EN 300 328-2 V1.2.1	

REMARKS	

This appendix supports the information given in the Nemko application form. The same conditions apply. The undersigned is authorized to sign on behalf of the applicant.

2005/4/27 Date	Jason Chang Cameo Communications, Inc (Jason Chang / Wireless Comm. R&D Dept. Manager) Binding on the applicant

Nemko's general terms of agreement for testing and certification of equipment

1.1 The terms of this agreement govern the relation between the party applying for testing/evaluation and/or certification of equipment (the Applicant), the party responsible for design, production and quality assurance of the equipment or marks the equipment as its (the Manufacturer) and Nemko performing the services.

1.1.1 If the order is to lead to certification, then part 1., 2. and 3. of these terms shall apply. The Applicant to be the Manufacturer or a physical or juridical person appointed by the Manufacturer.
Should the Applicant not be identical with the Manufacturer in such cases, the order shall be carried out only if the Manufacturer, on a form set by Nemko (Power of Attorny), declares that he is aware of and agrees that the Applicant gives Nemko the task of carrying out the certification of the equipment in question and that he accepts the obligations that these terms impose on the Manufacturer. (items 1.2, 3.2.1, 3.2.4, 3.2.6, 3.2.7, 3.3, 3.4.2).

1.1.2 If the order is to lead to issuing of a test report or another document only giving statement concerning the tested sample, part 1., 2. of these terms shall apply. Nemko is carrying such orders regardless of who the Applicant is, and shall in this connection solely cooperate with the Applicant concerned.
The general terms are as follows:

1.2 The Applicant is obliged to pay Nemko for the performing of the agreed order in accordance with the at all times current Nemko prices. For certificates this also includes payment of an annual licence fee for the right to use the certificate and for the right to use Nemko's name or certification mark. The Applicant is obliged to pay for for the work performed with the purpose of issuing a certificate, even if such document cannot be issued, whether being due to the tested sample, the Manufacturer or the Applicant.

Regarding orders which are to result in issuing of a certificate, Nemko may permit that the obligation to pay totally or partly is transferred from the Applicant to the Manufacturer, provided this is satisfactory documented towards Nemko.
Payment to take place in accordance with invoices and their terms of payment. Nemko may require payment in advance. I such case the balance will be settled upon completion of the order. Other terms of delivery will be as described in connection with confirmation for the individual order.

1.3 The Nemko staff is bound to observe professional secrecy, not disclosing any confidential information received in connection with the order. According to Norwegian law, the professional secrecy may be set aside in case of lawsuit in Norwegian Court. Nemko is also obliged to ensure that other co-operating bodies that might deal with the order, instruct their staff to observe the equivalent professional secrecy.

1.4 Nemko's decision may be appealed to Nemko's Appeal Committee, which deals with the appeal in accordance with Nemko's appeal procedure. An appeal in writing must be received by Nemko within 3 weeks from the time the Applicant has received Nemko's written decision.
Any dispute that might occur regarding these terms, one should primarily try to resolve by negotiations between the parties. If this fail to succeed, the dispute should be decided by the ordinary courts, unless the parties agree to arbitration. Any dispute to be settled in accordance with Norwegian law. Legal venue is City of Oslo Stipendiary Magistrate's Court.

1.5 Nemko's Board has at any time the right to revise the present terms. Alterations of the terms are only applicable for orders commenced 3 - three - weeks after Nemko's Board having approved the alterations concerned.

1.6 The rights to a certificate devolve on the Manufacturer, provided that the Applicant does not produce evidence that it is agreed with the Manufacturer that such rights are to pass to the Applicant.
The rights to a test report or any other document concerning the tested sample only, devolve on the Applicant.

1.7 Nemko has no liability for errors made in connection with the performance of the order except for errors due to purpose or gross negligence on Nemko's side. Nor has Nemko any liability for indirect losses, cfr. Norwegian Sale of Goods Act § 67 (2).

1.8 The present terms are binding on the Applicant as from the moment he has signed the Application form,and when appliable, for the Manufacturer when a Power of Attorny as mentioned under item 1.1.1 is signed.

1.9 These terms are issued in an English and a Norwegian version. In case of differencies in the wording, the Norwegian version shall apply and the Norwegian version will supersede the English version.

2. TESTING/EVALUATION

2.1 Nemko carries out testing/evaluation of equipment according to valid standard or other agreed specification. Nemko reserves the right, in exceptional cases, to subcontract parts of the testing to an other competent laboratory.

2.2 As a basis for the testing, the Applicant is to submit, free of all costs to Nemko, test sample(s), installation and user's instruction, other technical documentation, extra components etc. to the extent found necessary by Nemko for the order in question.

2.3 Nemko undertakes no responsibility whatsoever for damages that might occur

3.1 GENERAL

3.1.1 Based on performed testing or other examination, Nemko certifies equipment found to comply with current standard or other agreed specification, and which otherwise is considered suitable for its purpose. Nemko also issues documentation as a basis for certification in other countries in accordance with i.a. Nordic EMKO agreement, European CCA agreement or international CB agreement (primary orders). Correspondingly, Nemko issues national certificates, based on documentation from other certification bodies according to the above mentioned agreements (secondary orders).

3.1.2 As a basis for the application, the Applicant is to submit the material and information found necessary by Nemko for issuing and maintainance of such a certificate. Documentation in accordance with the EMKO-, CCA-, CB agreement or equivalent, to be a basis for the certification by Nemko, must not exceed 3 years of age.

3.1.3 Unless otherwise agreed upon, Nemko has the proprietary right to Nemko's own original documents. These documents are filed by Nemko during their period of validity, cfr. item 3.4.1.

3.2 FURTHER RIGHTS, RESPONSIBILITIES AND OBLIGATIONS

3.2.1 In connection with marketing, sales etc., the Manufacturer and the Applicant have the right to inform that the products are certified by Nemko. The Manufacturer and the Applicant are obliged to ensure that Nemko's name or certification mark are affixed to the certified products in accordance with current instructions, and that Nemko's name and certification mark are not misused.

3.2.2 Nemko's certificate, test report etc. does not exempt the Applicant, the Manufacturer nor a third party for liability according to Norwegian or foreign product liability legislation.

3.2.3 The certificate may be pleaded as documentation only for products that are manufactured in total conformity with the certified design.

3.2.4 The Manufacturer is obliged to conform to the rules applying for Nemko's production surveillance. If required by Nemko, representatives from Nemko or from other bodies acting on Nemko's behalf, are given admittance to the production sites, in order to ensure that the conditions associated with the certificates issued by Nemko, are maintained. Nemko is entitled to invoice the Manufacturer for the costs related to consumption of work hours, travel- and daily allowances, in accordance with item 1.2.

3.2.5 In cases required by Nemko, the Applicant shall, free of all costs to Nemko, provide a sample of the certified product for re-examination in order to ensure that it remains in conformity with the certified design. The Applicant is obliged to pay for Nemko' s costs in connection with such re-examination.

3.2.6 Nemko to be notified by the Manufacturer with regard to complaints covering the equipment and possibly affecting the certificate.

3.2.7 The Manufacturer and the Applicant are obliged to conform to Nemko's possible directions, as a consequence of the above items 3.2.4 - 3.2.6.

3.3 CHANGES TO THE PRODUCT

The manufacturer shall notify Nemko in writing of any proposed product alteration. Nemko is to evaluate whether the certificate may be maintained or whether the equipment has to be re-certified, if necessary after repeated testing.

3.4 DURATION, TERMINATION AND WITHDRAWAL

3.4.1 Rights and obligations according to these terms attaching to an issued certificate, do no longer apply after expiry period of the certificate, i.e. maximum 10 years, unless otherwise is stated in the certificate. (Not applicable to Ex-equipment).

3.4.2 If production and/or marketing of certified equipment should terminate, and obligations according to the present terms should be required terminated, the Manufacturer or the Applicant must immediately give Nemko a written request to be released from the obligations. If Nemko agrees to the release, the rights of the persons or companies concerned according to the certificate simultaneously shall no longer apply.

3.4.3 Nemko may withdraw the certificate if the Manufacturer or the Applicant do not fulfil their obligations in accordance with the present terms. Notice of withdrawal is to be sent in writing, stating the reason for the withdrawal and the appointed time of conclusion. Withdrawal of a certificate will normally take effect between 1 and 6 months upon Nemko's dispatch of their notice of withdrawal. In case of fundamental breach, the withdrawal may have immediate effect. If a certificate should be withdrawn, each and every right in accordance with the certificate and the present terms shall no longer apply, hereunder the right to use Nemko's name and certification mark.

3.5 TRANSFER OF CERTIFICATE

The certificate may only be transferred when it is documented towards Nemko that the present and future owner of the certificate agree to that. The product may, however, be re-certified under a different company name, as long as documentation is produced showing that the holder of the certificate permits this. Should the Manufacturer in such cases approve a new Applicant, a new Power of Attorny as mentiond under item 1.1.1 above must be submitted. Agreements made between the former Applicant(s) and the Manufacturer is outside the concern of Nemko.

necessary, the Applicant himself is to provide for insurance covering all submitted material, cfr. item 2.2. Test samples not collected within 4 - four - weeks from Nemko dispatching a Return Notice will be discarded. The same applies if none of the boxes of the Application Form for "Test sample(s) after examination" are ticked off.

3.6 For maintenance of the certificate, hereunder the use of Nemko's name or certification mark on certified products and in connection with marketing and sales, an annual fee per each certified type/model shall be paid, according to item 1.2. In case of termination or withdrawal of a certificate, the annual fee will not be refunded.

R&TTE
Technical Construction File

Product description:

802.11g Wireless PCI Adapter

Applicant:

CAMEO COMMUNICATIONS, INC.

Manufacture:

CAMEO COMMUNICATIONS, INC.

Brand and Type/model number:

Brand Name	***Model Name***
Cameo	WLG-1202
Level One	WNC-0300
LG	LWS5410P
Etherwan	NWP-0108-G
Allnet GmbH	ALL0281A

Technical Construction file in accordance with R&TTE Annex IV

Under the provisions if Annex IV point 4 of the **R&TTE directive 1999/5/EC** of the European Parliament and of the council of 9 March on Radio equipment and Telecommunications Terminal Equipment (R&TTE directive) and the mutual recognition of their conformity,

We, the undersigned,

Company	CAMEO COMMUNICATIONS, INC.
Address, City	No. 42, Min Chuan East Road, Section 6, Taipei 114,
Country	Taiwan
Phone number	886-2-27908998
Fax number	886-2-27909463
E-mail	Jason_Chang@mail.cameo.com.tw

Have established a Technical Construction File as specified below to be presented to the Notified Body for his opinion and to be kept available to the relevant national authorities of any Member State for inspection purpose:

Item number	**Technical Document description**
01	Technical File in accordance with R&TTE directive Annex II point 4
02	Declaration of conformity to specific test suites described in R&TTE directive Annex III

For the following product:

Product Description / Supplementary Info	802.11g Wireless PCI Adapter
Manufacturer	CAMEO COMMUNICATIONS, INC.
Brand	CAMEO, Level One, LG, Etherwan, Allnet GmbH
Type	WLG-1202, WNC-0300, LWS5410P, NWP-0108G, ALL0281A

The Technical Construction File as specified above will be kept for a period ending at least 10 years after the last product has been manufactured at the disposal of the relevant national authorities of any Member State for inspection purpose,

CE

Draw up in	TAIWAN, R.O.C.
Date	2005/4/27
	CAMEO COMMUNICATIONS, INC. No. 42, Min Chuan East Road, Section 6, Taipei 114, Taiwan
Signature & company stamp	Jason Chang / Wireless Comm. R&D Dept. Manager

Technical Construction file in accordance with R&TTE Annex II Point 4

Under the provisions if Annex II point 4 of the **R&TTE directive 1999/5/EC** of the European Parliament and of the council of 9 March on Radio equipment and Telecommunications Terminal Equipment (R&TTE directive) and the mutual recognition of their conformity,

We, the undersigned,

Company	CAMEO COMMUNICATIONS, INC.
Address, City	No. 42, Min Chuan East Road, Section 6, Taipei 114,
Country	Taiwan
Phone number	886-2-27908998
Fax number	886-2-27909463
E-mail	Jason_Chang@mail.cameo.com.tw

Have established a Technical Construction File as specified below to enable assessment of the product conformity with the essential requirements of the R&TTE directive:

Item number	Technical Document description
01	Block diagram
02a	Circuit diagram
02b	PCB layout
02c	Part list
02d	Exterior photographs
02e	Interior photographs
02f	Label information
03a	Technical description
03b	User manual
04	R&TTE standard list
05	RF-EMC-LVD test report and corresponding annexes
06	Copy of the R&TTE Declaration of Conformity (DOC)
07	Product Quality Assurance documents

For the following product:

Product Description / Supplementary Info	802.11g Wireless PCI Adapter
Manufacturer	CAMEO COMMUNICATIONS, INC.
Brand	CAMEO, Level One, LG, Etherwan, Allnet GmbH
Type	WLG-1202, WNC-0300, LWS5410P, NWP-0108G, ALL0281A

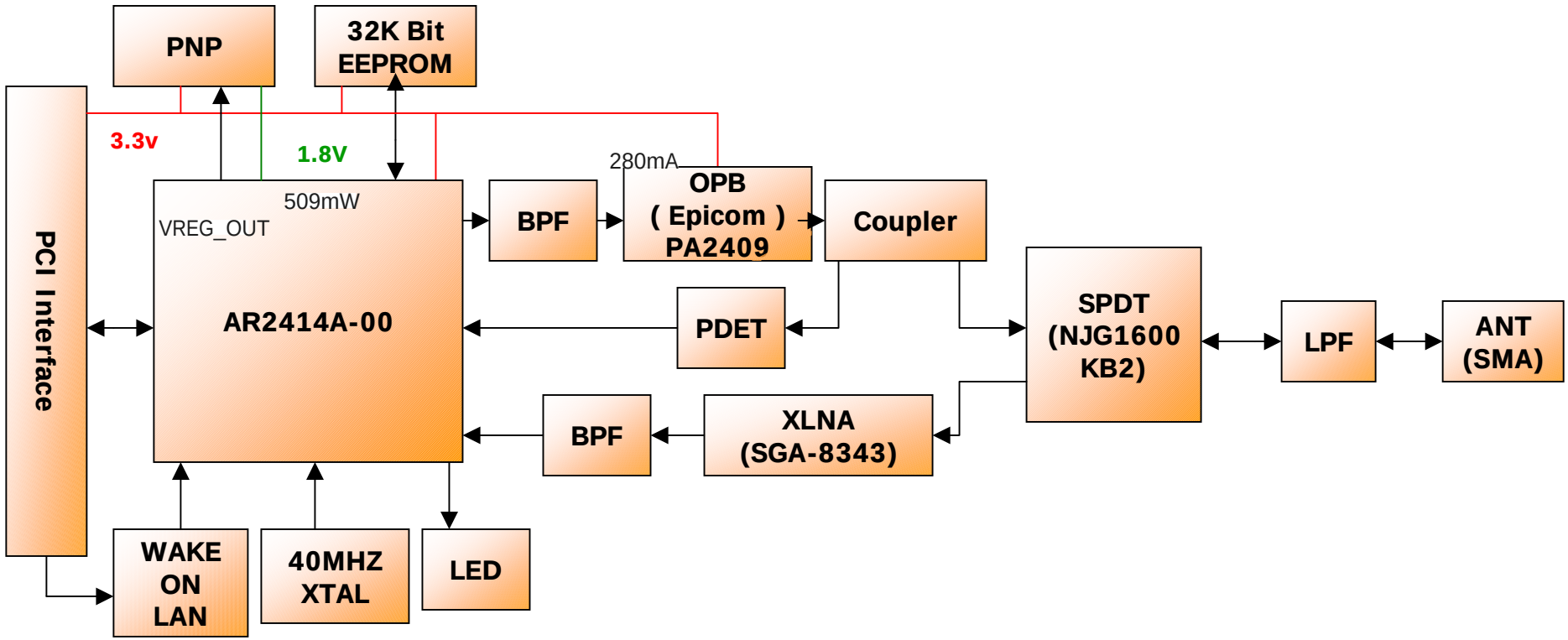
The Technical File as specified above will be kept for a period ending at least 10 years after the last product has been manufactured at the disposal of the relevant national authorities of any Member State for inspection purpose,

CE

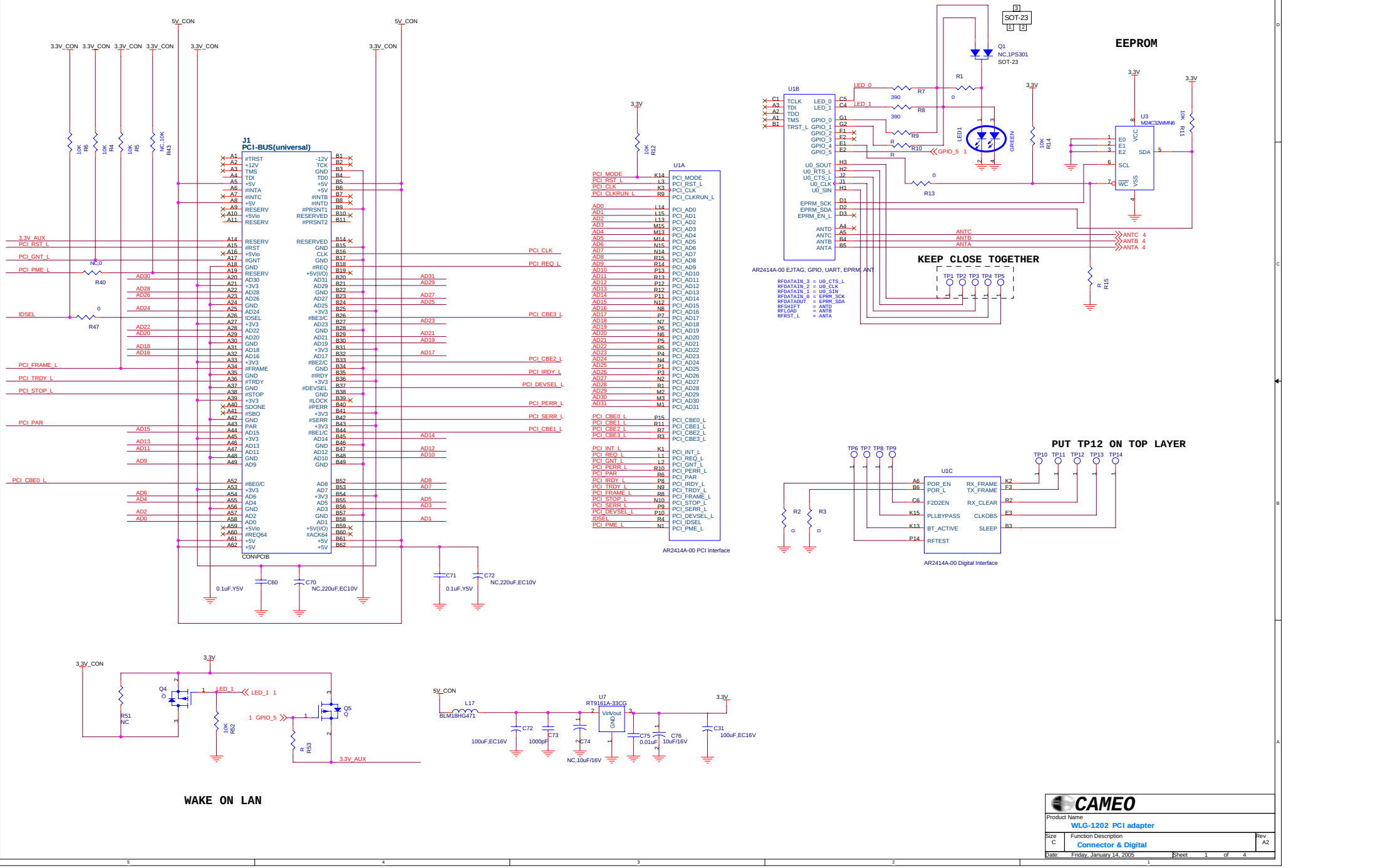
Draw up in	TAIWAN, R.O.C.
Date	2005/4/27
	CAMEO COMMUNICATIONS, INC. No. 42, Min Chuan East Road, Section 6, Taipei 114, Taiwan
Signature & company stamp	Jason Chang / Wireless Comm. R&D Dept. Manager

Block Diagram

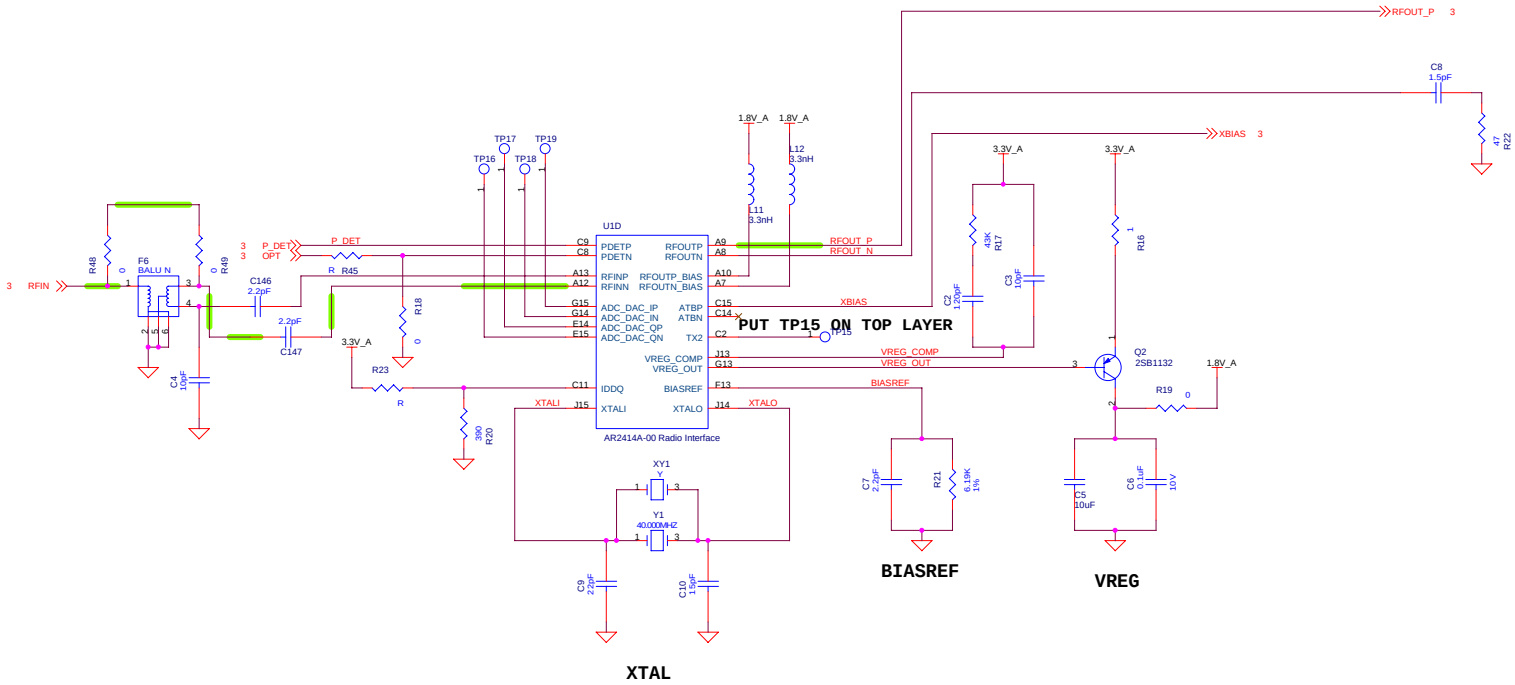
Block Diagram



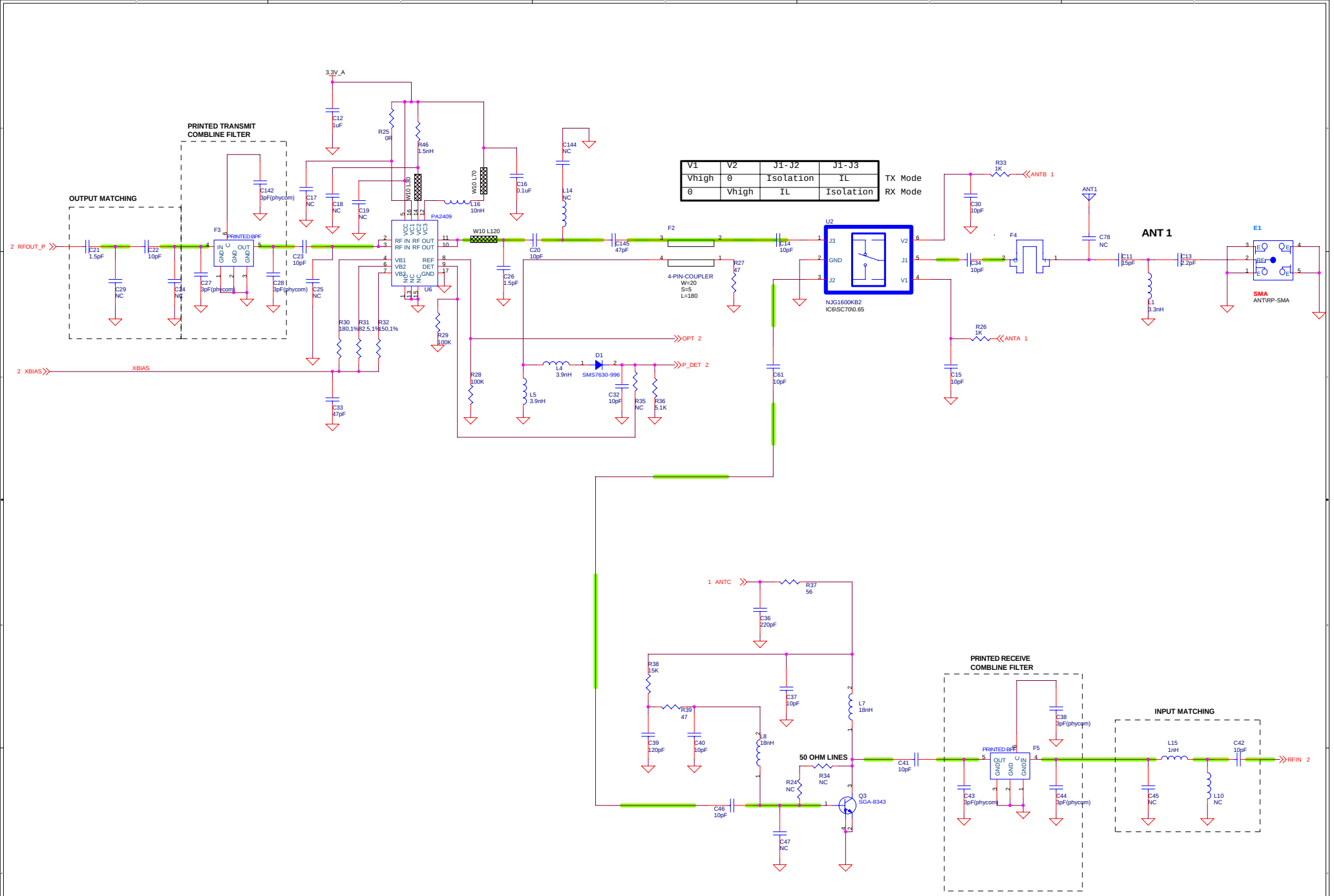
Circuit Diagram



CAMEO			
Product Name	WLG-1202 PCI adapter		
Size C	Function Description Connector & Digital		Rev A2
Date: Friday, January 14, 2005	Sheet 1 of 4		



CAMEO		
Product Name	WLG-1202 PCI adapter	
Size C	Function Description Radio_Interface	Rev A2
Date: Friday, January 14, 2005	Sheet 2 of 4	



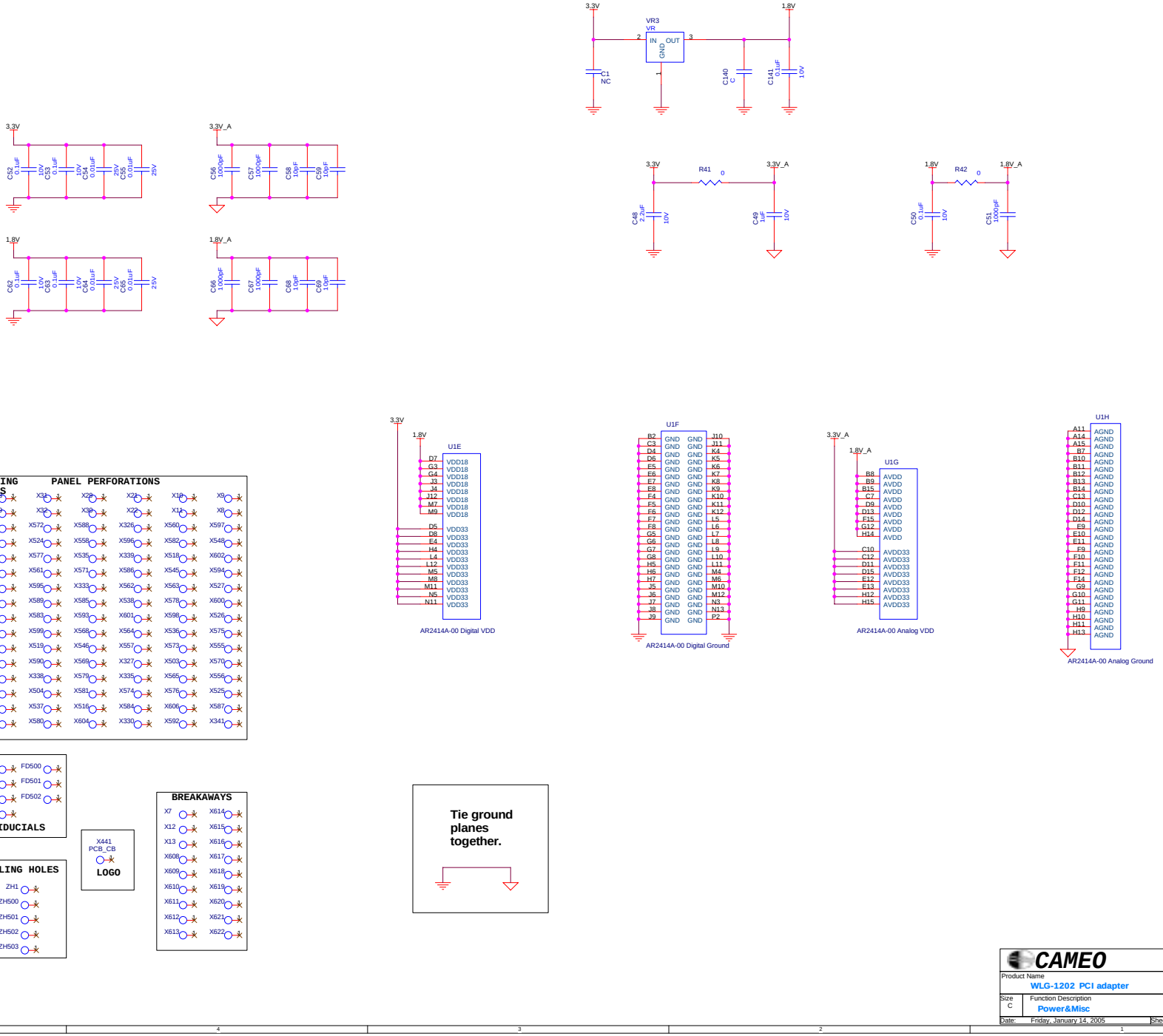
V1	V2	J1-J2	J1-J3	
Vhigh	0	Isolation	IL	TX Mode
0	Vhigh	IL	Isolation	RX Mode

CAMEO

Product Name: WLG-1202 PCI adapter

Size: C | Function Description: Front_End | Rev: A2

Date: Friday, January 14, 2005 | Sheet 3 of 4



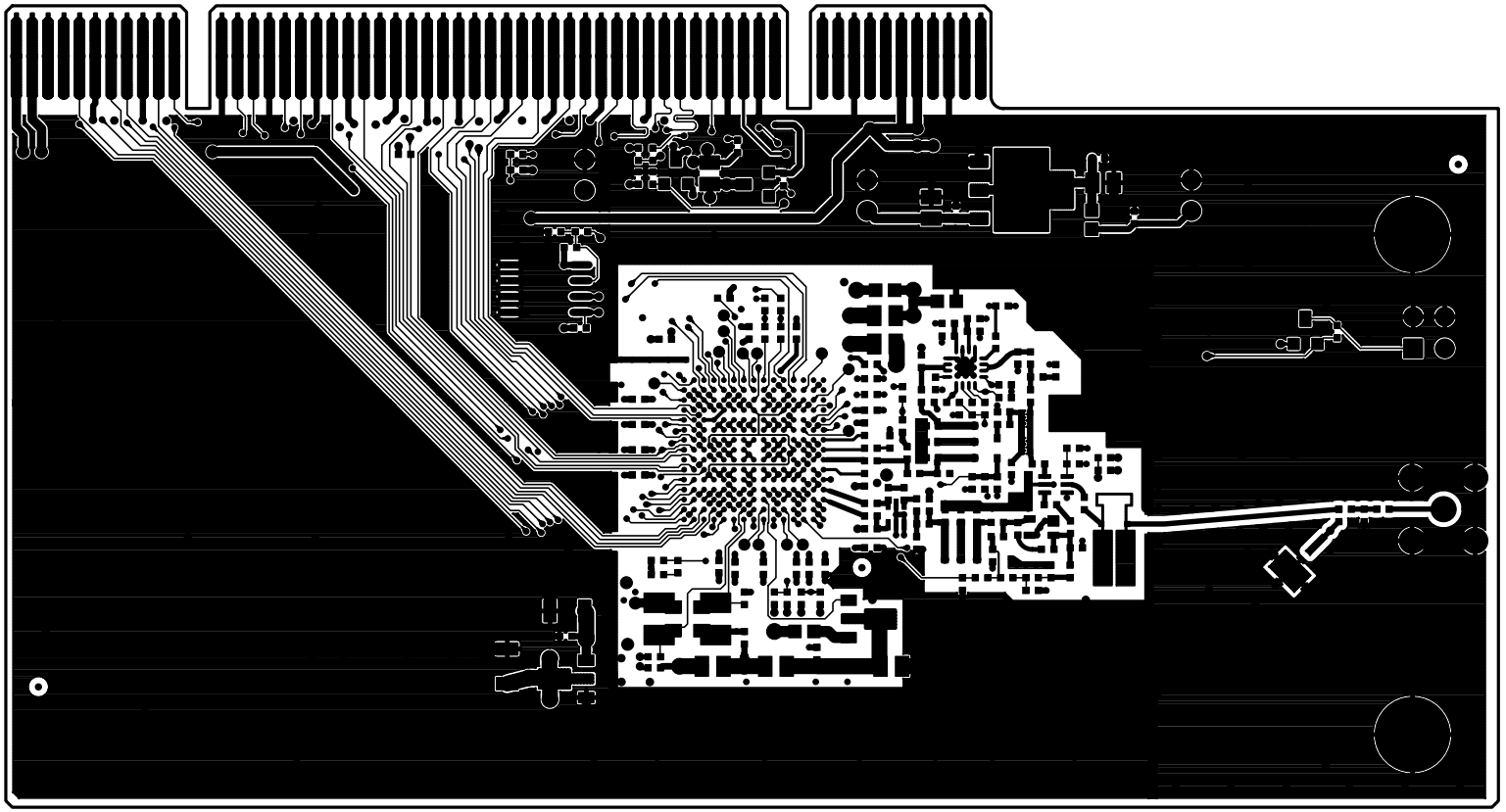
CAMEO

Product Name
WLG-1202 PCI adapter

Size	Function Description	Rev
C	Power&Misc	A2

Date: Friday, January 14, 2005 Sheet 4 of 4

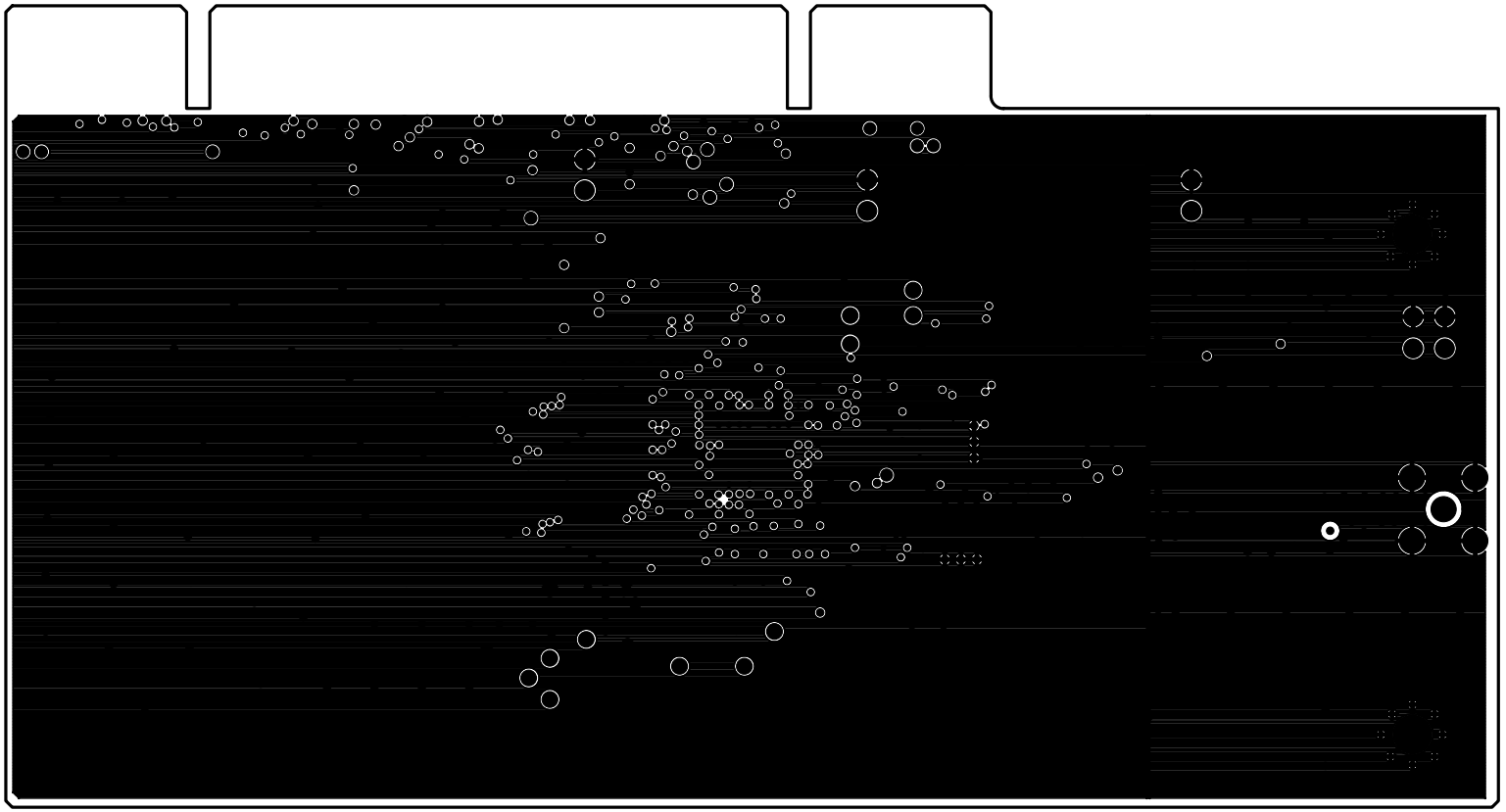
PCB Layout



TOP SIDE LAYER 1

WLG1202 REV:A2

2004/12/17 Aaron

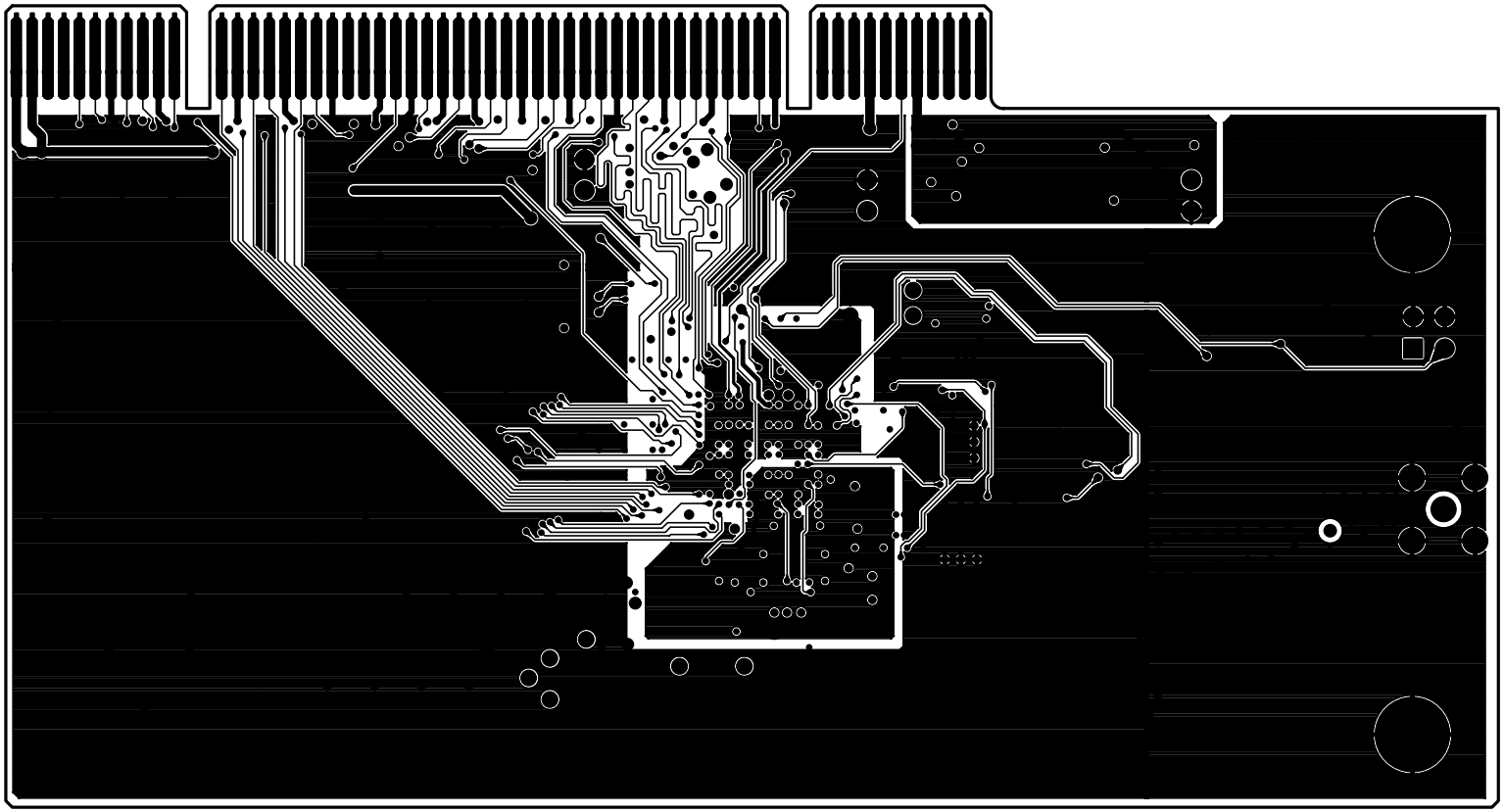


GROUND PLANE LAYER 2

WLG1202 REV:A2
2004/12/17 Aaron

POWER PLANE LAYER 3

WLG1202 REV:A2
2004/12/17 Aaron



BOTTOM SIDE LAYER 4

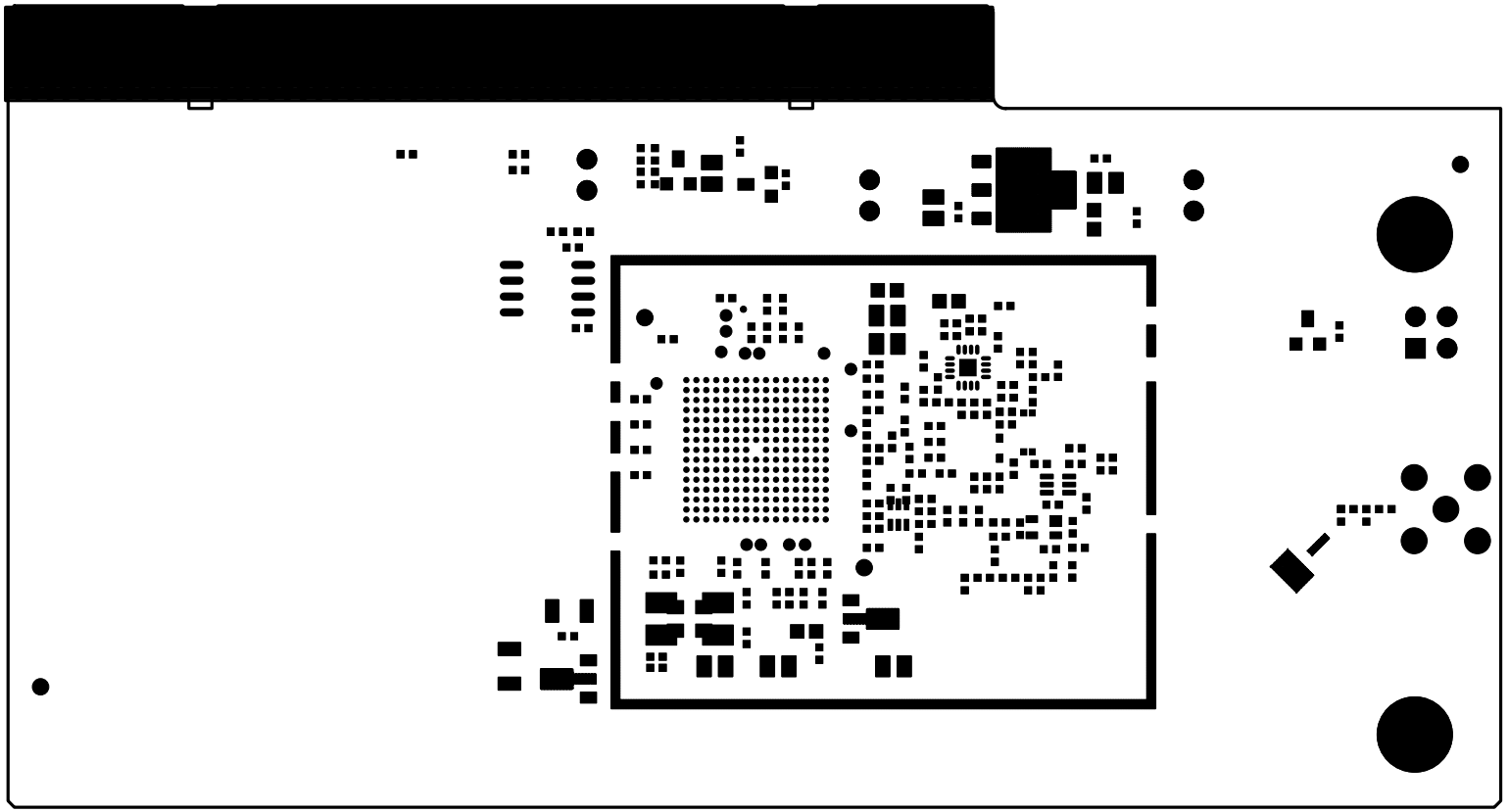
WLG1202 REV:A2

2004/12/17 Aaron

TOP SIDE SILKSCREEN

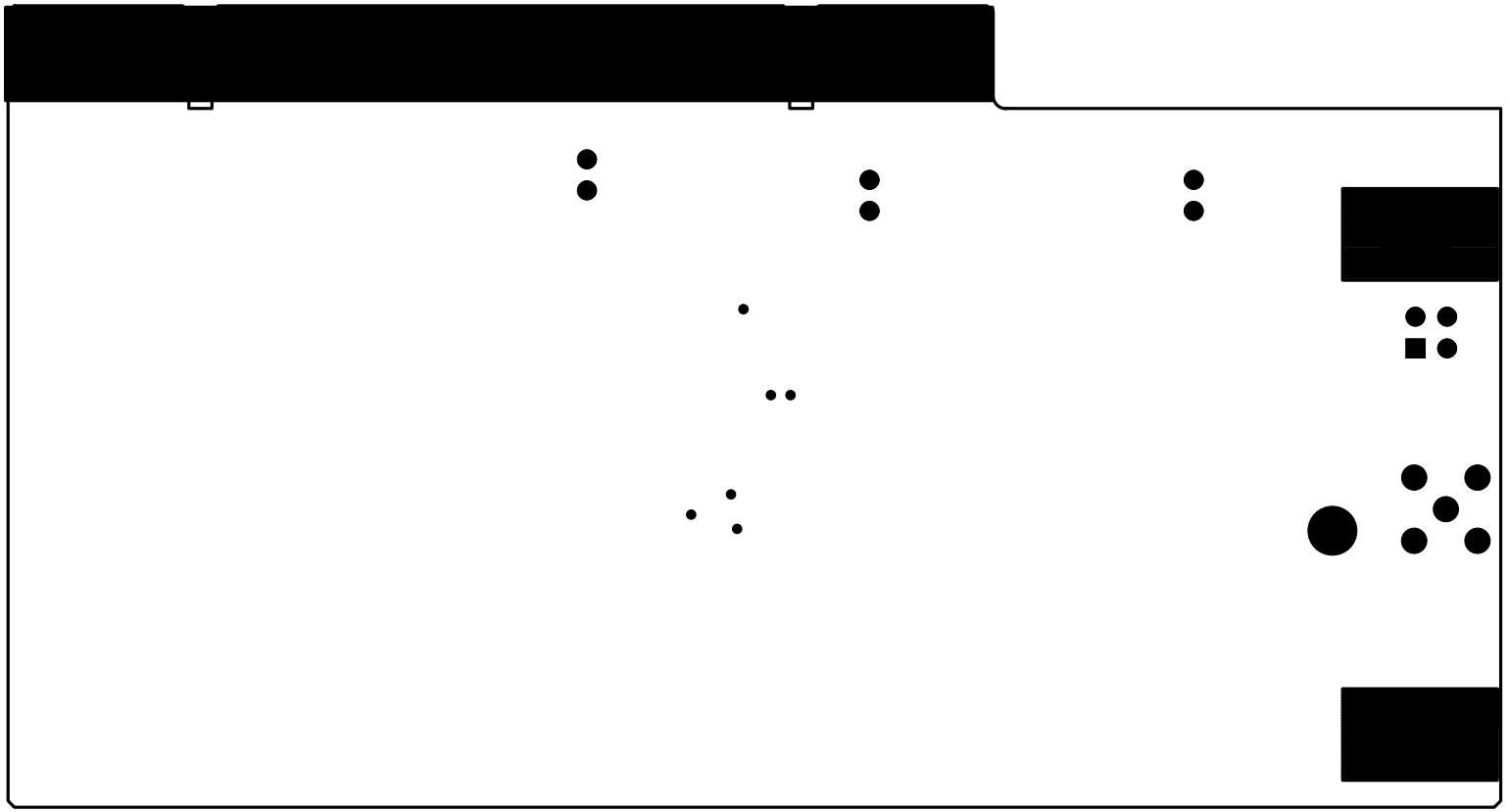
WLG1202 REV:A2

2004/12/17 Aaron



TOP SIDE SOLDERMASK

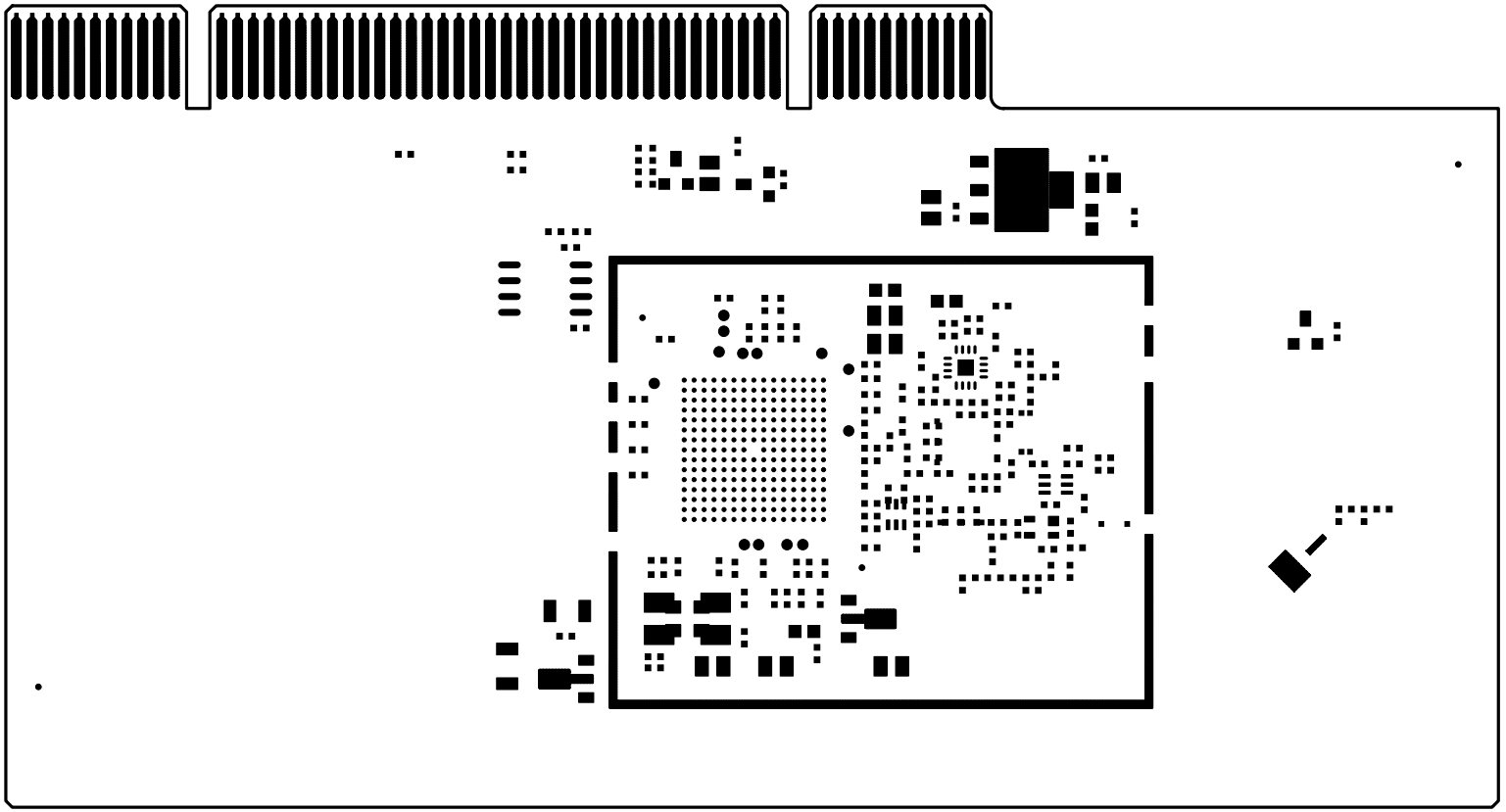
WLG1202 REV:A2
2004/12/17 Aaron



BOTTOM SIDE SOLDERMASK

WLG1202 REV:A2

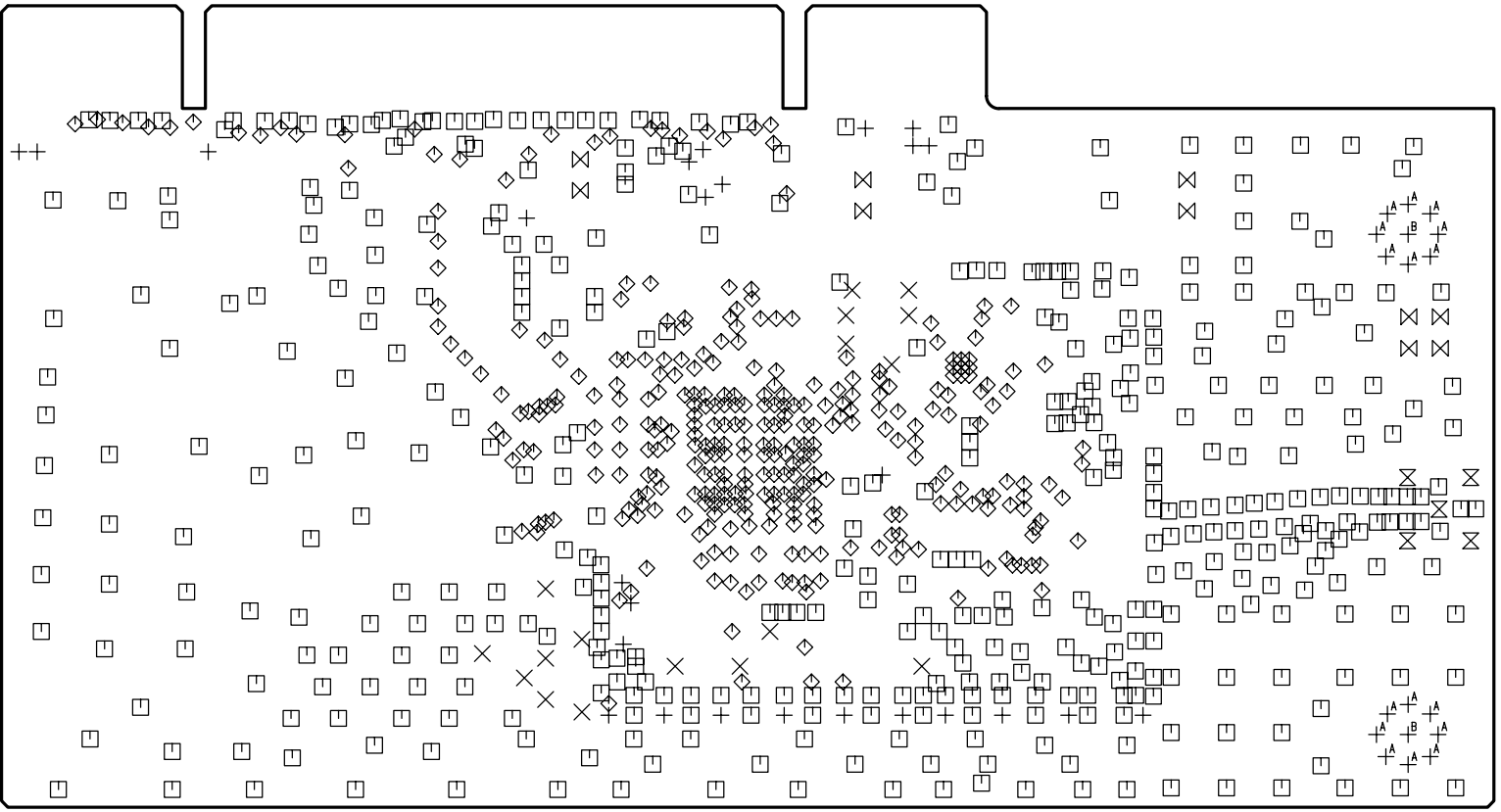
2004/12/17 Aaron



TOP SIDE SOLDERPASTE

WLG1202 REV:A2

2004/12/17 Aaron



SIZE	QTY	SYM	PLTD
18	26	+	PLTD
28	17	X	PLTD
12	434	□	PLTD
8	328	◇	PLTD
60	5	⧖	PLTD
40	10	⋈	PLTD
10	16	A	PLTD
125.98	2	B	NPLTD

Drill Drawing

WLG1202 REV:A2

2004/12/17 Aaron

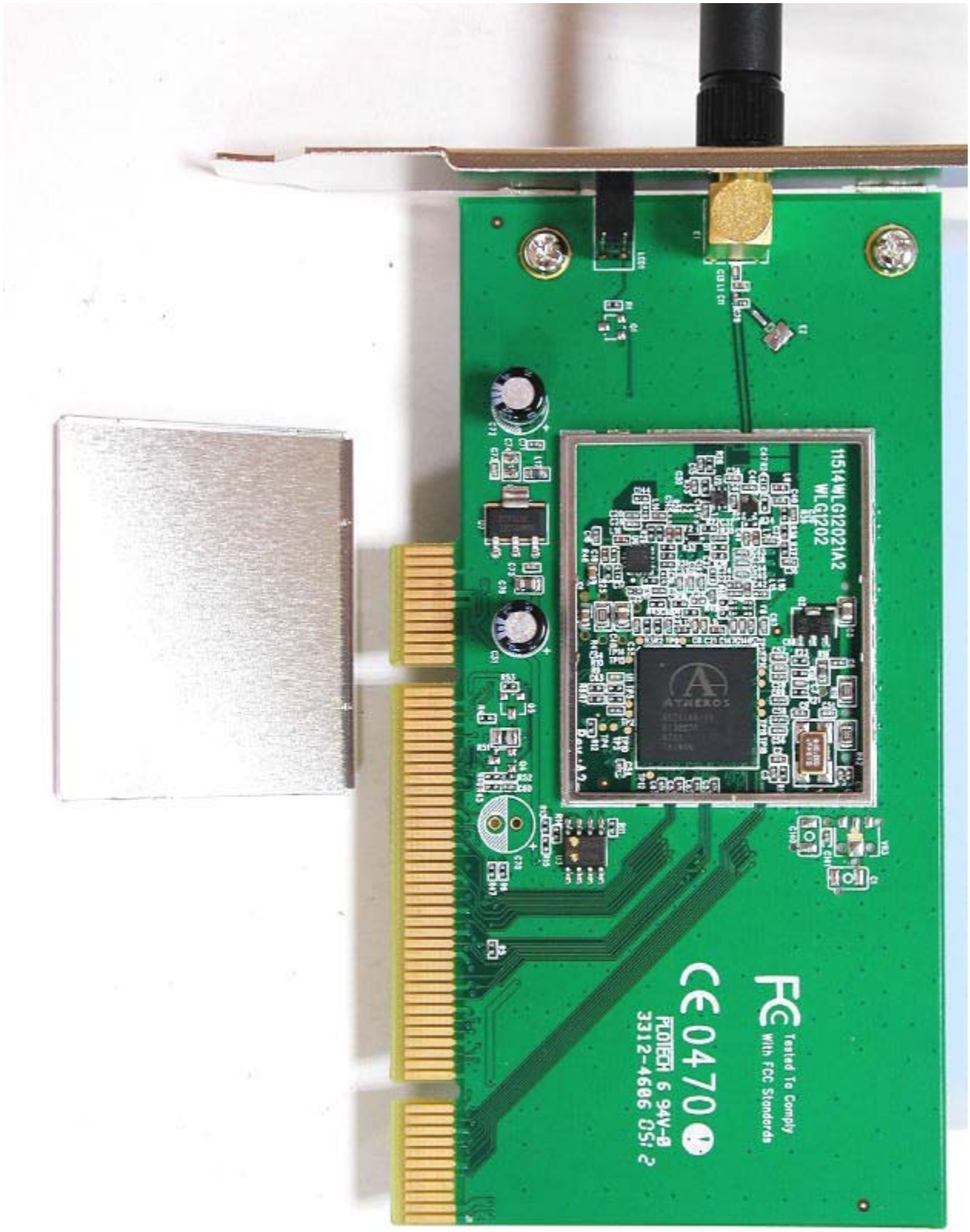
Bill of Materials (Part List)

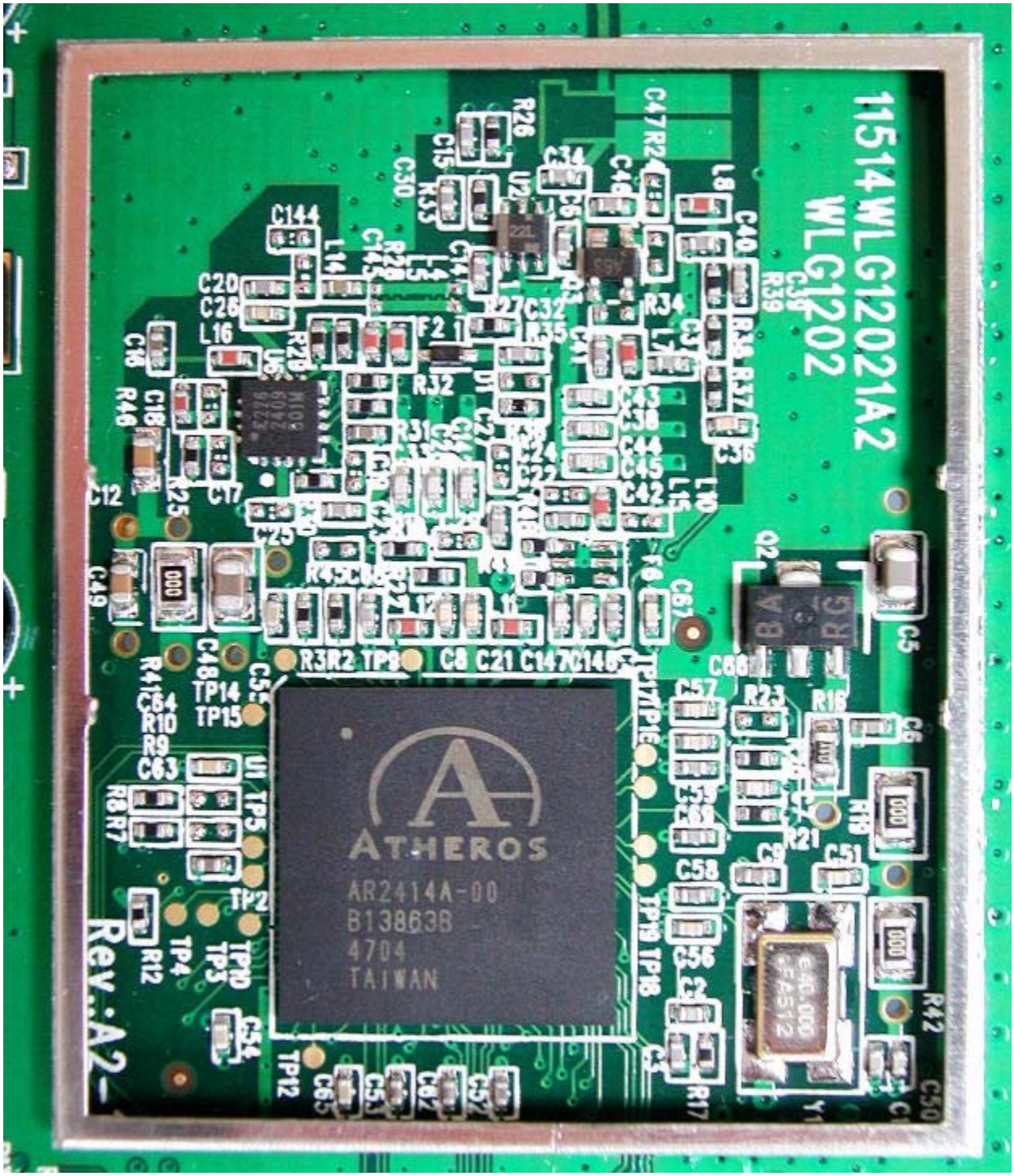
WLG-1202 PCI adapter Bill of material				
Item	Quantity	Reference	Part	PCB Footprint
Capacitance				
1	3	C8,C21,C26	1.5pF	CAP-0402
2	4	C7,C13,C146,C147	2.2pF	CAP-0402
3	6	C27,C28,C38,C43,C44,C142	3pF+/-0.1P**(phycom)**	CAP-0402
4	20	C3,C4,C14,C15,C20,C22,C23 C30,C32,C34,C37,C40,C41, C42,C46,C58,C59,C61,C68, C69	10pF	CAP-0402
5	2	C10,C11	15pF	CAP-0402
6	1	C9	22pF	CAP-0402
7	2	C33,C145	47pF	CAP-0402
8	2	C2,C39	120pF	CAP-0402
9	1	C36	220pF	CAP-0402
10	6	C51,C56,C57,C66,C67,C73	1000pF	CAP-0402
11	5	C54,C55,C64,C65,C75	0.01uF	CAP-0402
12	10	C6,C16,C50,C52,C53,C60,C62,C63, C71,C141	0.1uF	CAP-0402
13	2	C12,C49	1uF	CAP-0603
14	2	C48	2.2uF	CAP-0805
15	2	C5,C76	10uF	CAP-0805
16	1	L15	1nH	IND-0402
17	1	R46	1.5nH	IND-0402
18	3	L1,L11,L12	3.3nH	IND-0402
19	2	L4,L5	3.9nH	IND-0402
20	1	L16	10nH	IND-0402
21	2	L7,L8	18nH	IND-0402
22	1	L17	BEAD, 60O,500mA	RES-0603
23	9	R1,R2,R3,R13,R18,R25,R47,R48, R49	0	RES-0402
24	3	R19,R41,R42	0	RES-0805
25	1	R16	1	RES-0603
26	3	R22,R27,R39	47	RES-0402
27	1	R37	56	RES-0402
28	1	R31	82.5,1%	RES-0402
29	1	R32	150,1%	RES-0402
30	1	R30	180,1%	RES-0402
31	3	R7,R8,R20	390	RES-0402
32	2	R26,R33	1K	RES-0402
33	1	R36	5.1K	RES-0402
34	1	R21	6.19K,1%	RES-0402
35	7	R4,R5,R6,R11,R12,R14 R52	10K	RES-0402
36	1	R38	15K	RES-0402
37	1	R17	43K	RES-0402
38	2	R28,R29	100K	RES-0402
39	1	D1	SMS7630-996	DIO-SC-70
40	1	Q2	2SB1132	SOT89-MIRRORED

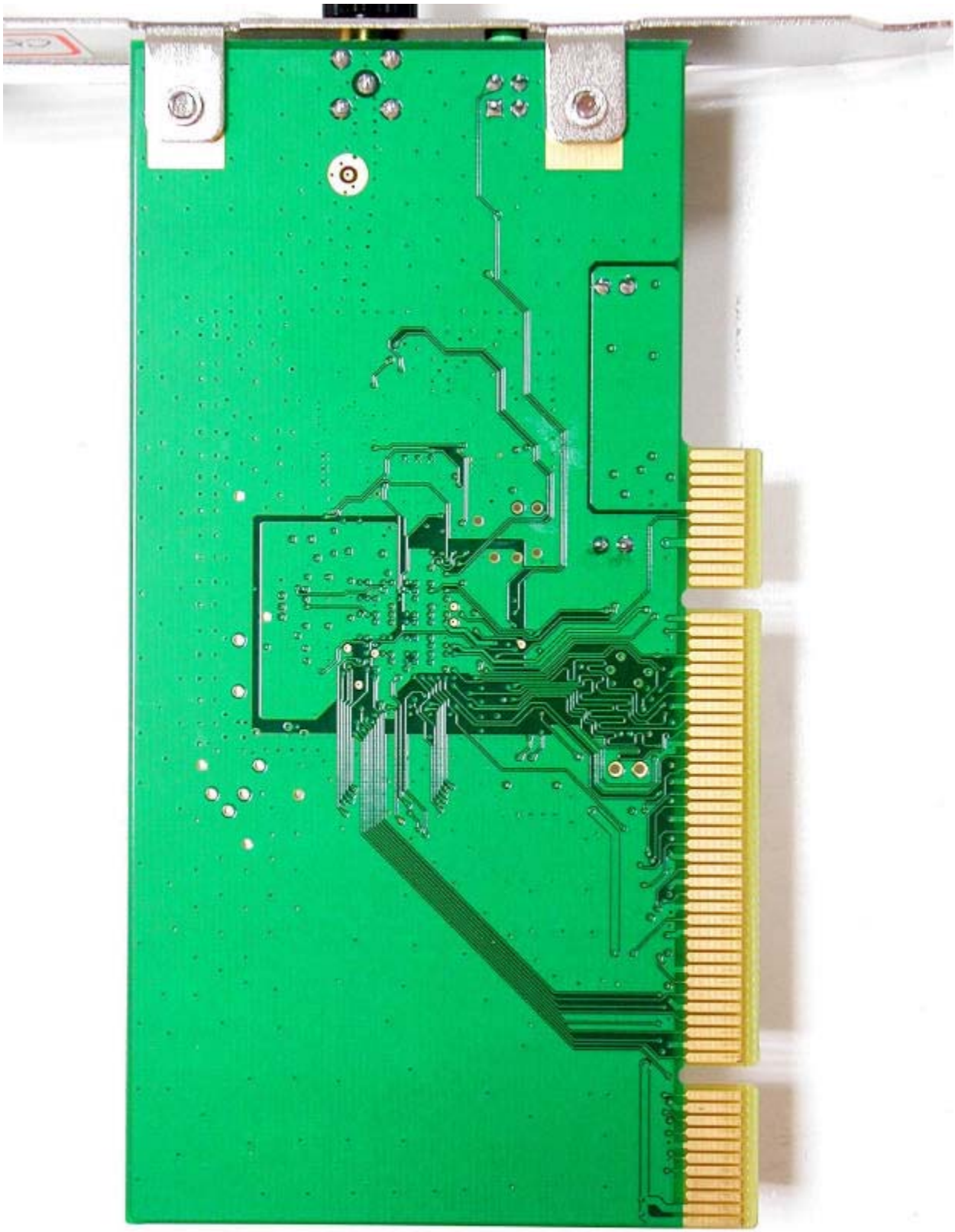
41	1	Q3	LNA-2.4GHZ-SGA-8343	SOT-343
42	1	U1	AR2414A-00 Digital VDD	BGA-224-15X15
43	1	U2	NJG1600KB2	IC6\SC70\0.65
44	1	U3	SO8	M24C32WMN6
45	1	U6	Epicom	PA-2409
46	1	Y1	FY4000041	CRY-SMD4-40MHz
47	1	U7	RT9161A-33CG	SOT-223
48	1	PCB 4層, Netgaear, WG311Tv1h3主板, REV.A1		
49	1	Shielding Box-Frame, 無色		
50	2	螺絲 圓頭 +字 無頸下物 公制牙(粗牙) 鍍鎳		
51	1	BRACKET, PCI, 上折邊, 鍍鎳, 打字,SMA頭		
52	1	E1	SMA	ANT\RP-SMA
53	1	LED1	LED-GREEN-(2)	Holder 90° 3? 5mm
54	2	C31,C72	EC-100uF	
55	1	Shielding Box-Cover, 無色		
56	1	分離式天線,2dbi		

Exterior and Interior Photographs


PWR
ACT

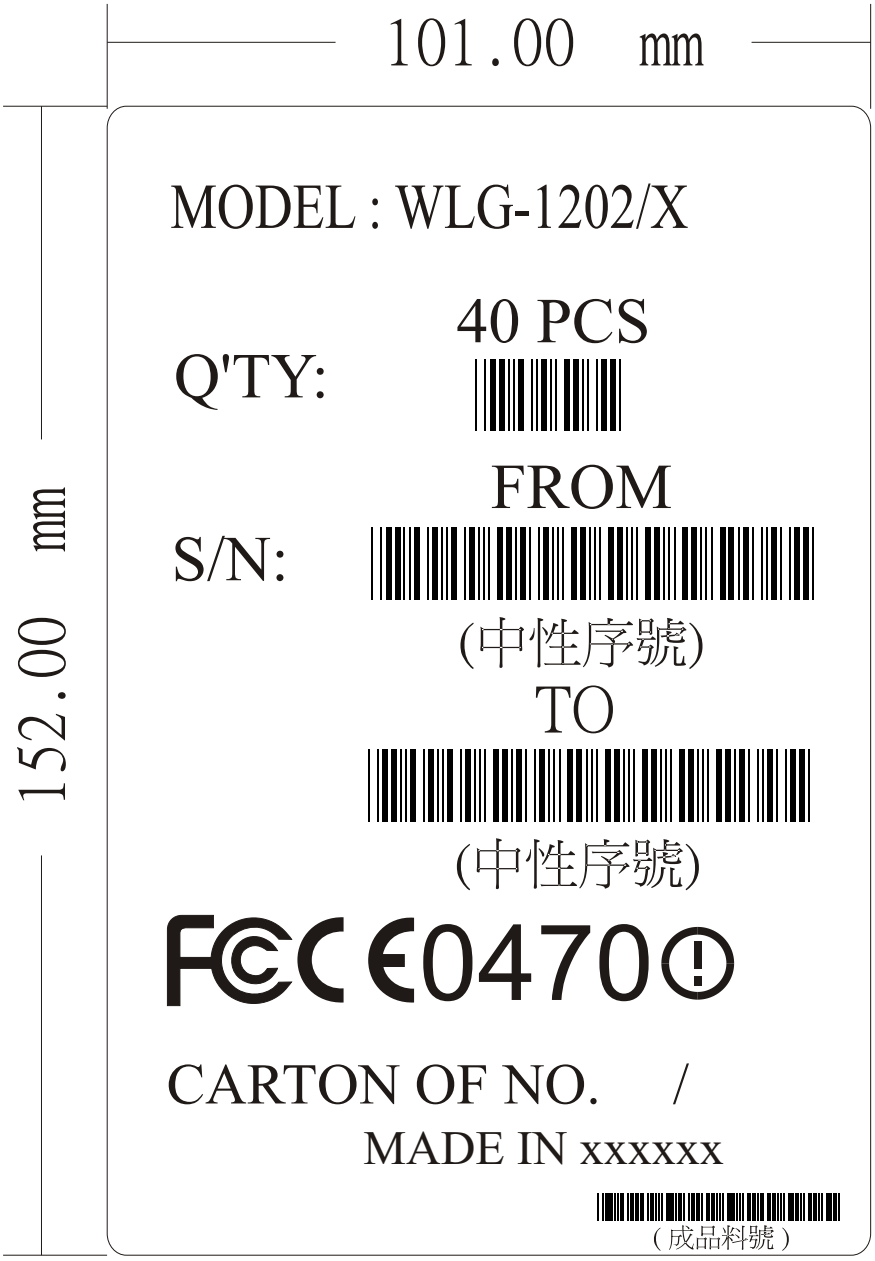

11514WLG12021A2
WLG1202
ATHEROS
CE 0470
FC
Tested To Comply
With FCC Standards
FLOTECH 6 94V-0
3312-4606 OSi 2


11514WLG12021A2
WLG1202
ATHEROS
AR2414A-00
B13863B
4704
TAIWAN
Rev:A2-

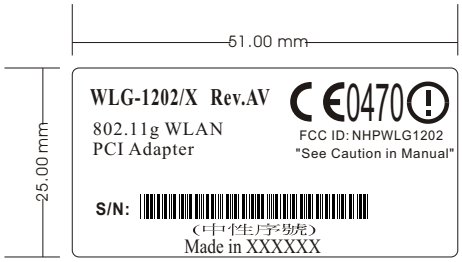


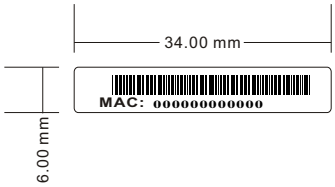
Label Information

日期	產品機種	產品料號	客戶名稱	申請者	設計者
94.04.12	WLG-1202/X	9500WLG12020XAV	CAMEO	Joseph Liu	Grace Chen
備註	X爲規格，AV 爲版本				



白盒貼紙





台灣製爲"MADE IN TAIWAN"
大陸製爲"MADE IN CHINA"

確認簽名	

Technical Description

TECHNICAL SPECIFICATIONS

General	
Radio Technology	IEEE 802.11b Direct Sequence Spread Spectrum (DSSS) IEEE 802.11g Orthogonal Frequency Division Multiplexing (OFDM)
Interface	32-bit PCI 2.1, 2.2. Bus Master
Data Transfer Rate	1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, 54Mbps (auto sense)
Receiver Sensitivity	54Mbps: Typical -73dBm @ 10% PER (Packet Error Rate) 11Mbps: Typical -85dBm @ 8% PER (Packet Error Rate)
Transmit Rate	802.11g: 14dBm typically 802.11b: 18dBm typically
Frequency Range	2412 ~ 2484 MHz ISM band (channels 1 ~ 14)
Modulation Schemes	DBPSK/DQPSK/CCK/OFDM
Channels	1~11 channels (FCC), 1~13 channels (ETSI), 1~14 channels (MKK-Japan)
Media Access Protocol	CSMA/CA with ACK
Security	64/128-bits WEP Encryption, WPA
Diagnostic LED	LNK (Link status), ACT (Activity status)
Antenna	1.8 dBi Dipole Antenna
Physical and Environmental	
Driver Support	Windows 98se, Windows 2000, Windows ME, Windows XP
Continuous Current Consumption	250mA typ. for receive mode, 350mA typ. for transmit mode
Temperature	Operating: 0° ~ 40° C, Storage: -10° ~ 70° C
Humidity	10% ~ 95% RH, no condensation
Dimensions	133 x 121 x 21.6 mm (without antenna)
Certifications	FCC Part 15.247 for US, ETS 300 328 for Europe,

User Manual

IEEE 802.11g
PCI Adapter

User’s Guide

Regulatory notes and statements

Wireless LAN, Health and Authorization for use

Radio frequency electromagnetic energy is emitted from Wireless LAN devices. The energy levels of these emissions however are far much less than the electromagnetic energy emissions from wireless devices like for example mobile phones. Wireless LAN devices are safe for use frequency safety standards and recommendations. The use of Wireless LAN devices may be restricted in some situations or environments for example:

·On board of airplanes, or

·In an explosive environment, or

·In case the interference risk to other devices or services is perceived or identified as harmful

In case the policy regarding the use of Wireless LAN devices in specific organizations or environments (e.g. airports, hospitals, chemical/oil/gas industrial plants, private buildings etc.) is not clear, please ask for authorization to use these devices prior to operating the equipment.

Regulatory Information/disclaimers

Installation and use of this Wireless LAN device must be in strict accordance with the instructions included in the user documentation provided with the product. Any changes or modifications made to this device that are not expressly approved by the manufacturer may void the user's authority to operate the equipment. The Manufacturer is not responsible for any radio or television interference caused by unauthorized modification of this device, of the substitution or attachment. Manufacturer and its authorized resellers or distributors will assume no liability for any damage or violation of government regulations arising from failing to comply with these guidelines.

USA-FCC (Federal Communications Commission) statement

This device complies with Part 15 of FCC Rules.

Operation is subject to the following two conditions:

1. This device may not cause interference, and

2. This device must accept any interference, including interference that may cause undesired operation of this device.

FCC Radio Frequency Exposure statement

This Wireless LAN radio device has been evaluated under FCC Bulletin OET 65 and found compliant to the requirements as set forth in CFR 47 Sections 2.1091, 2.1093, and 15.247 (b) (4) addressing RF Exposure from radio frequency devices.

The radiated output power of this Wireless LAN device is far below the FCC radio frequency exposure limits. Nevertheless, this device shall be used in such a manner that the potential for human contact during normal operation is minimized.

When nearby persons has to be kept to ensure RF exposure compliance, in order to comply with RF exposure limits established in the ANSI C95.1 standards, the distance between the antennas and the user should not be less than 20 cm.

FCC Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions, it may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the distance between the equipment and the receiver.
3. Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio/TV technician for help.

Export restrictions

This product or software contains encryption code that may not be exported or transferred from the US of Canada without an approved US Department of Commerce export license.

Safety Information

Your device contains a low power transmitter. When device is transmitted it sends out radio frequency (RF) signal.

CAUTION: To maintain compliance with FCC's RF exposure guidelines, this equipment should be installed and operated with minimum distance 20cm between the radiator and your body. Use on the supplied antenna. Unauthorized antenna, modification, or attachments could damage the transmitter and may violate FCC regulations.

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

CE Mark Warning

This is a Class B product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

Protection requirements for health and safety – Article 3.1a

Testing for electric safety according to EN 60950 has been conducted. These are considered relevant and sufficient.

Protection requirements for electromagnetic compatibility – Article 3.1b

Testing for electromagnetic compatibility according to EN 301 489-1, EN 301 489-17 and EN 55024 has been conducted. These are considered relevant and sufficient.

Effective use of the radio spectrum – Article 3.2

Testing for radio test suites according to EN 300 328-2 has been conducted. These are considered relevant and sufficient.

CE in which Countries where the product may be used freely:

Germany, UK, Italy, Spain, Belgium, Netherlands, Portugal, Greece, Ireland, Denmark, Luxembourg, Austria, Finland, Sweden, Norway and Iceland.

France: except the channel 10 through 13, law prohibits the use of other channels.

TABLE OF CONTENT

INTRODUCTION

Congratulations on your purchase of this IEEE 802.11g Wireless PCI Adapter.

This manual helps to get familiar with the Wireless PCI Adapter. This manual contains detailed instructions in operation of this product. Please keep this manual for future reference.

With a Wireless (IEEE 802.11g) PCI Adapter, a computer or a station can communicate with another computer in a wireless way. Easy-to-use utilities are bundled with Wireless PCI Adapter for configuration, monitoring, and diagnosis purposes.

Wireless PCI Adapter can wirelessly transmit and receive data, minimizing the need for wired connections, at a speed of up to fifty-four megabit per second. With Wireless PCI Adapter, you can locate your PC or station wherever you want without wires and cables.

Wireless PCI Adapter provides users with an access to real-time information anywhere in their organization. The mobility provides productivity and service, which are not available under wired networks. The Wireless PCI Adapter configuration is easy to change from peer-to-peer networks, suitable for a small number of users, to full infrastructure networks of thousands of users that allow roaming around a broad area.

Overview of this User's Guide

Introduction. Describes the Wireless PCI Adapter.

Unpacking and Setup. Helps you get started with the basic installation of the Wireless PCI Adapter.

Hardware Installation. Describes the LED indicators of the Adapter.

Software Installation. Tells how to setup the driver and the utility setting.

Technical Specifications. Lists the technical (general, physical and environmental) specifications of the Wireless PCI Adapter.

UNPACKING AND SETUP

This chapter provides unpacking and setup information for the Wireless PCI Adapter.

Unpacking

Open the box of the Wireless PCI Adapter and carefully unpack it. The box should contain the following items:

- One 802.11g Wireless PCI Adapter
- One Driver & Utility CD-ROM

If any item is found missing or damaged, please contact your local reseller for replacement.

Setup

The setup of the Wireless PCI Adapter can be performed using the following steps:

- Visually inspect the PCI Adapter and make sure that it is fully plugged in to the PC's PCI slot.
- Make sure that there is a well environment that there is no much intrusion to have a better connection.

HARDWARE INSTALLATION

LED Indicator

LNK (Link)

The LNK indicator indicates green when the Wireless PCI Adapter is connected to a network successfully.

ACT (Activity)

The ACT indicator blinks green continuously whiles the Wireless PCI Adapter is transmitting data.

Check the installation

1. Shut down the computer, unplugs its power cord, and remove the chassis cover.
2. Insert the contact edge of the Wireless PCI Adapter into the connector of any available PCI Bus Master Expansion slot. Press the card firmly into the connector such that the card' s contacts are fully seated in the PCI slot connector.
3. Install the bracket screw and secure the card to the computer chassis.
4. Cover the computer' s chassis.
5. Switch computer power on. The computer will automatically activate the newly installed driver and utility the Wireless PCI Adapter.

SOFTWARE INSTALLATION

This section will lead you to install the driver and utility of the Wireless Cardbus Adapter.

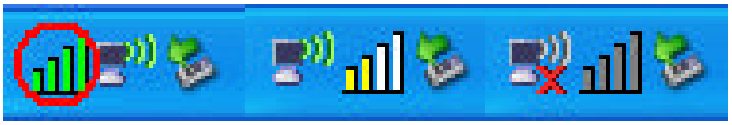
Windows 98se/ME/2000/XP Utility and Driver Installation

1. Insert the Wireless Cardbus Adapter Driver & Utility CD-ROM into computer' s CD-ROM Drive and it will automatically run a setup menu and install the driver and the utility. In some specific setting on Windows system, you may need to proceed the software manually, go to your Windows Start menu and choose ***Run***, type "D:\Utility\Setup.exe" in the dialog box (D:\ will depend on where your CD-ROM drive is located) and click **OK**.
2. If you need to install the driver manually, refer each Windows OS to the following CD-Rom directory path: D:\Driver\<Windows OS>\net5211.inf.

   Note: (D:\ will depends on where the CD-ROM drive is located and <Windows OS> will depend on the Windows OS you are using).

3. The Install Shield Wizard screen will appear. Click "**Next**" to continue.
4. The installation program will help you to setup the Wireless Cardbus utility.

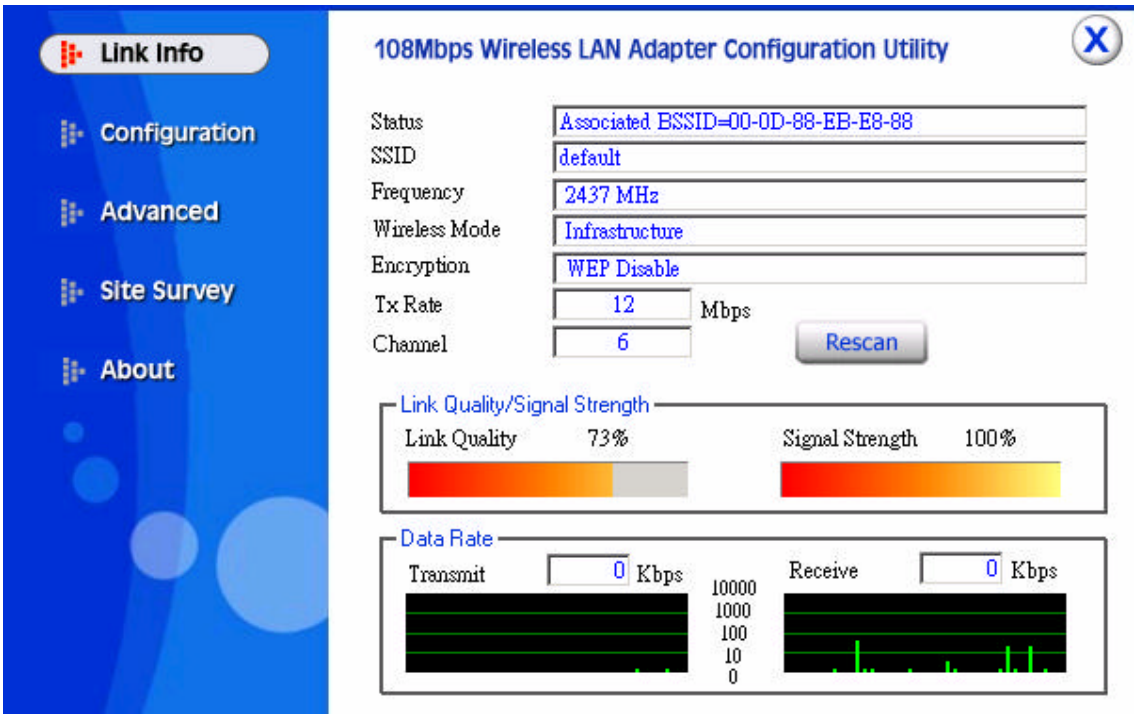
   Be noted that the Windows XP have its own Wireless Utility; you can either use the utility of Windows XP or the provided utility.
5. When the Wireless Cardbus Adapter was installed, you will see the icon on the Windows task bar.



When the icon in the toolbar represents in full green color then the signal strength has an excellent performance with the AP, if it represents in yellow color then the signal strength has a fair performance with the AP, and if the icon represents no color, then the signal strength has a worst performance with the wireless station.

I. Link Information

The default page is as below after launching the Utility program.



Status: Shows the BSSID associated, which can be used to identify the wireless network.

SSID: Shows current SSID, which must be the same for the wireless client and AP in order for communication to be established.

Frequency: Shows the current frequency used for wireless network.

Wireless Mode: Shows the current wireless mode used for wireless communication.

Encryption: Shows the current encryption mode used for wireless network.

TxRate: Shows the current data rate used for transmitting.

Channel: Shows the current channel for communication.

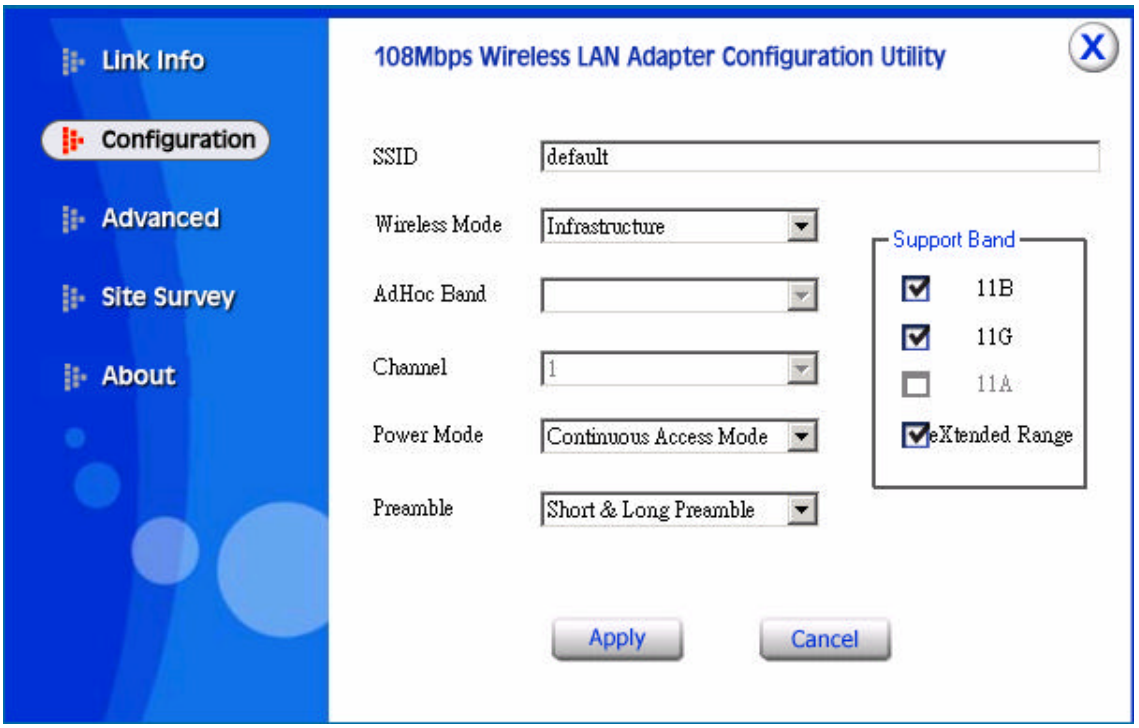
Link Quality: Shows the link quality of the 108Mbps wireless LAN PC card with the Access Point when operating under Infrastructure mode.

Signal Strength: Shows the wireless signal strength of the connection between the 108Mbps wireless LAN PC card with the Access Point.

Data Rate: Shows the statistics of data transfer, and the calculation is based on the number of packets transmitted and received.

II. Configuration

This is the page where changes the basic settings of the PC card with the minimum amount of effort to implement a secure wireless network environment.



SSID: Service Set Identifier, which is a unique name shared among all clients and nodes in a wireless network. The SSID must be identical for each clients and nodes in the wireless network.

Wireless Mode: There are two types available for selection

?Infrastructure – to establish wireless communication with LAN and other wireless clients through the use the Access Points.

?Ad-Hoc – to establish point-to-point wireless communication directly with other wireless client devices such as wireless network PCI Adapter.

AdHoc Band: There are two bands available for selection- 11B and 11G

Channel: The value of channel that AP will operate in. User can select the channel range of 1 to 11 for North America (FCC) domain and 1 to 13 for European (ETSI) domain and 1 to 14 for Japanese domain.

Tx Rate: Select the data rate for data transmission.

Power Mode: There are 3 modes to choose.

?Continuous Access Mode (default) – the PC card is constantly operating with full power and it consumes the most power.

? Maximum Power Save – the PC card consumes the least power and only operates when there is wireless network activity.

?Power Save – the PC card consumes the moderate level of power.

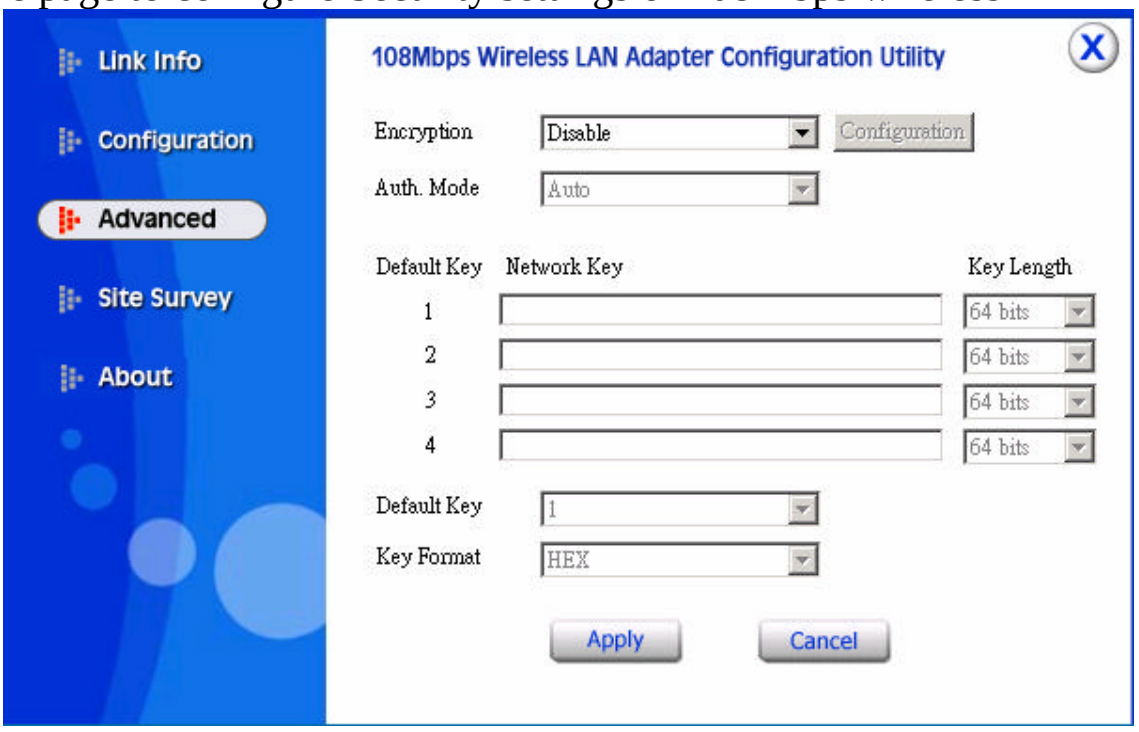
Preamble: Select Long or Short Preamble type. Preamble is a sequence of bits transmitted at 1Mbps that allows the PHY circuitry to reach steady-state demodulation and synchronization of bit clock and frame start. Two different preambles and headers are defined: the mandatory supported Long Preamble and header, which interoperate with the 1 Mbit/s and 2 Mbit/s DSSS specification (as described in IEEE Std 802.11), and an optional Short Preamble and header (as described in IEEE Std 802.11b). At the receiver, the Preamble and header are processed to aid in demodulation and delivery of the PSDU. The Short Preamble and header may be used to minimize overhead and, thus, maximize the network data throughput. However, the Short Preamble is supported only from the IEEE 802.11b (High- Rate) standard and not from the original IEEE 802.11. That means that stations using Short-Preamble cannot communicate with stations implementing the original version of the protocol. Click "Apply" for the changes to take effect.

Support Band: There are three functions for users select, including 11B, 11G and eXtended Range. The default setting is 11B, 11G and eXtended Range enable, which is interoperable with both 11B and 11G devices, and provide more than 500m connection ability.

Note: user must select one of 11B or 11G at least, otherwise the wireless connection will not function.

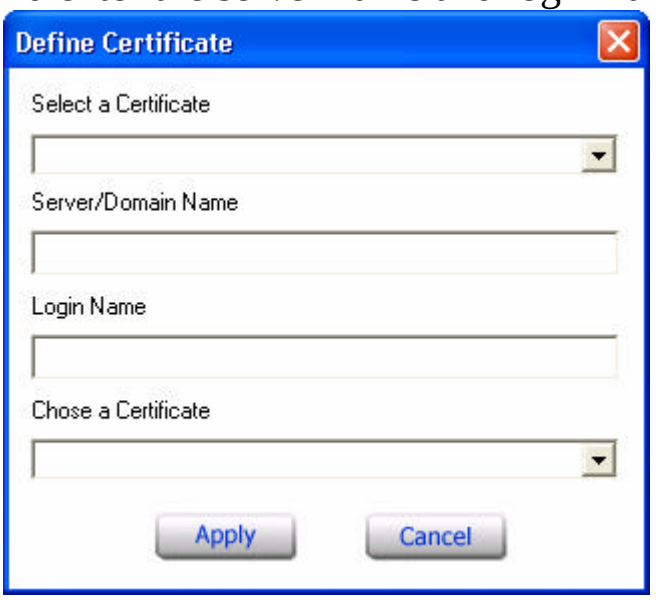
III. Advanced

This is the page to configure Security settings of 108Mbps wireless LAN PC card.

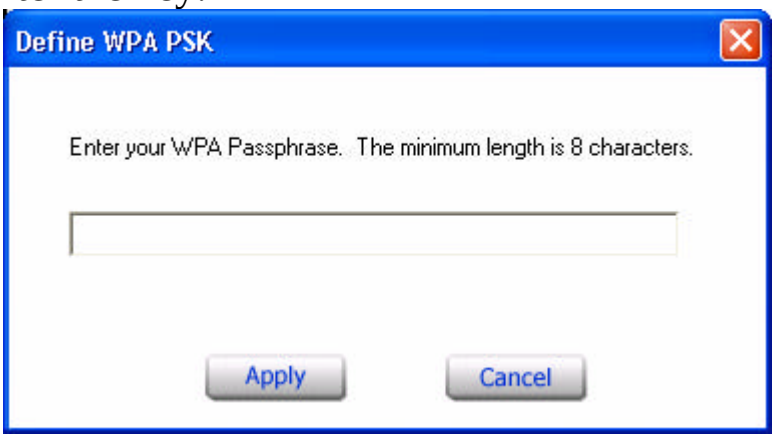


Encryption: 4 options are available: **Disable**, **Enable**, **WPA** and **WPA-PSK**. Select **Enable** or **Disable** for WEP data encryption feature. If one of the two

options is selected, it is required to select the **Authentication mode** from the next dropping list. If **WPA** is selected, configuration is enabled. Please click the "**configuration"**. The below window is pop up. Then, please select the certificate that user wants to use and enter the server name and login name



If WPA-PSK is selected, click the configuration button. The popping window is as the below. Please enter the key.



Auth. Mode: There are three modes available to choose.

Open Authentication – the sender and receiver do not share secret Key for communication. Instead, each party generates its own key-pairs and asks the other party to accept it. The key is regenerated when the connection is established every time.

Shared Authentication – the sender and receiver shares the common key for data communication, and the key is used for extended length of time.

Auto – depend on the communication to establish, and automatically use the proper authentication mode.

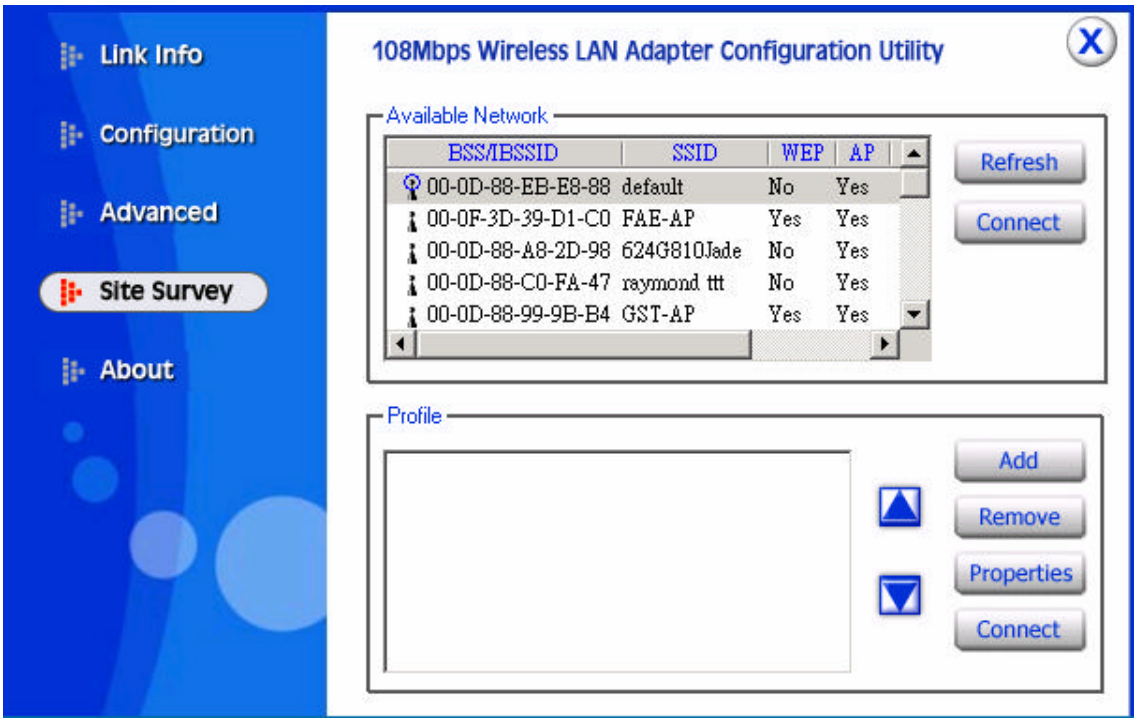
The following will only be activated to allow for configuration when **Encryption** is enabled.

Default Key: select one of the 4 keys to use.

Network Key: choose the encryption way, either in HEX or ASCII formats, and enter the password in the blank space.
Key Length: select 64 or 128 bits as the length of the keys
Key Format: ASCII or **HEX**

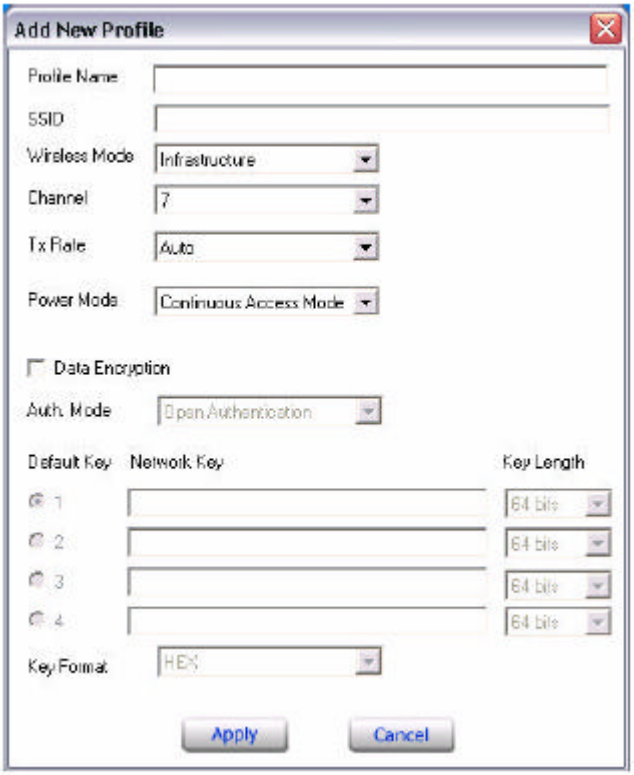
IV. Site Survey

This page allows user to enable the Site Survey function to scan for the available wireless network (wireless clients and Access Points) and establish wireless communications with one.



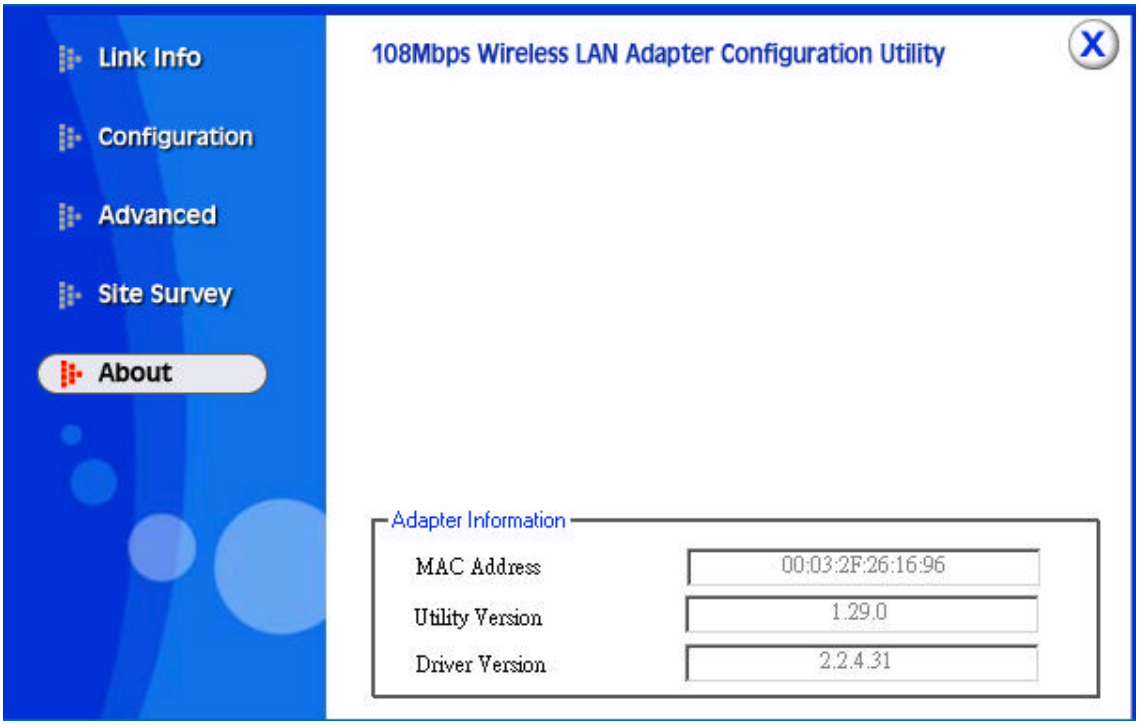
Available Network – displays the wireless networks (wireless clients and Access Points) that are in signal range.
Select any one of them to establish communications by simply mouse **double-click** or click on the "**Connect**" button.
Click "**Refresh**" button to start scanning for available network again.
Profile – User can create and manage the created profiles for Home, offices or public areas. By double-clicking on one of the created profile, the setting will adapt to the configuration such as SSID, channel, and WEP settings saved by that particular profile.
Remove: To remove the selected the profile
Properties: To view and change its settings of the profile.

Add: To add a profile. Then, the following screen would appear. User can enter the necessary information required for accessing Access Points or Wireless Router.



V. About

This page displays some information about the 108Mpbs wireless LAN PC card utility, which includes the version numbers for Driver, Firmware and Utility. When there is new version of software available for upgrade, users will be able to identify by version numbers.



R&TTE Standards List

R&TTE List of Standard

With referring to the article of the directive of **R&TTE 1999/5/EC**, the following equipment:

Product Description / Supplementary Info	802.11g Wireless PCI Adapter
Manufacturer	CAMEO COMMUNICATIONS, INC.
Brand	CAMEO, Level One, LG, Etherwan, Allnet GmbH
Type	WLG-1202, WNC-0300, LWS5410P, NWP-0108G, ALL0281A

has been tested to and conforms with the following ***List of R&TTE Harmonized standards:***

Standard	**Issue date**
ETSI EN 300 328-2 ETSI RF Specification	V1.2.1 Dec. 2001 *Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband Transmission systems; Data transmission equipment operating in the 2,4GHz ISM band and using spread spectrum modulation techniques; Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive.* Meets R&TTE directive art. 3.2.a on effective use of radio frequency spectrum so as to avoid harmful interference.
ETSI EN 301 489-1 ETSI EN 301 489-17 ETSI EMC Specification	V1.4.1 Aug. 2002 V1.2.1 Apr. 2002 *Electromagnetic compatibility and Radio spectrum Matters(ERM); Electro Magnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common Technical requirements; Part 17: Specific conditions for Wideband data and HIPERLAN equipment.* Meets R&TTE directive art. 3.1.b of essential requirements on protection with respect to Electro Magnetic Compatibility.

As such standards referred to tin Article 5 of the directive have not been applied or do not exist, the following ***Adopted solutions with descriptions and explanations*** as listed below, have been applied in full or in part, to meet the essential requirements of the directive:

Standard	**Issue date**
EN 60950-1 LVD specification	2001 *Safety of information technology equipment, including electrical business equipment.* Meets R&TTE directive art. 3.1.a of essential requirements on protection of the health and safety of the user.

CE

Draw up in	TAIWAN, R.O.C.
Date	2005/4/27
	CAMEO COMMUNICATIONS, INC. No. 42, Min Chuan East Road, Section 6, Taipei 114, Taiwan
Signature & company stamp	Jason Chang / Wireless Comm. R&D Dept. Manager

RF & EMC Test Reports and Corresponding Annexes

Report No.	C51ET050304
Specifications	ETSI EN 300 328-1 (V.1.3.1) / December, 2001 ETSI EN 300 328-2 (V.1.2.1) / December, 2001
Applicant	CAMEO COMMUNICATIONS, INC.
Applicant address	No. 42, Min Chuan East Road, Section 6, Taipei 114, Taiwan
Items tested Model No.	802.11g Wireless PCI Adapter W LG-1202, WNC- 0300, LWS5410P, NWP-0108G, ALL0281A
EUT Condition	☒Engineering sample; ☐Pre-production; ☐Final production (Sample # N10415)
Results	**Compliance** (As detailed within this report)
Date	12/01/2004 (month / day / year) (Sample received) 12/14/2004 (month / day / year) (Test)
Prepared by	Project Engineer (Jack Tsai)
Authorized by	General Manager (Frank Tsai)
Issue date	*December 16, 2004* (month / day / year)
Modifications	**None**
Tested by	Training Research Co., Ltd.
Office at	No. 255, Nan Yang Street, Shijr City, Taipei Hsien 221, Taiwan
Laboratory at	1F, No. 255, Nan Yang Street, Shijr City, Taipei Hsien 221, Taiwan
Open site at	No. 15, Lane 530, Balian Rd., Sec. 1, Shijr City, Taipei Hsien 221, Taiwan

Conditions of issue:

This test report shall not be reproduced except in full, without written approval of TRC. And the test result contained within this report only relate to the sample submitted for testing.

★ ***Aut. No. ELA 131***

We here by verify that:

The test data, data evaluation, test procedures and equipment configurations shown in this report were made mainly in accordance with the procedures given in ETSI EN 300328-2 (V.1.2.1) as a reference. All test were conducted by ***Training Research Co., Ltd.***, 255 Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C. Also, we attest to the accuracy of each.

We further submit that the energy emitted by the sample EUT tested as described in the report is **in compliance with** the technical requirements set second edition in the European Telecommunication Standard ETSI EN 300328-2 (V.1.2.1).

Reservation:

The test results herein refer only to the tested sample. Training Research Co., Ltd. is not responsible for any generalizations or conclusions draw from these test results and concerning further samples. Any modification of the tested samples is prohibited and leads to the invalidity of this test report.

Test by :

Training Research Co., Ltd.

TEL: 886-2-26935155 FAX: 886-2-26934440

No. 255, Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C.

Tables of Contents

I. GENERAL

1.1. Introduction

The following measurement report is submitted on behalf of Applicant in support of a wireless LAN measurement in accordance with ETSI EN 300328-2 (V.1.2.1) (Dec. 2001) of the European Telecommunication Standard.

1.2. Description of EUT

Product Name	**:**	802.11g Wireless PCI Adapter
Model No.	**:**	WLG-1202, WNC-0300, LWS5410P, NWP-0108G, ALL0281A
Frequency Range	**:**	2.400GHz ~ 2.4835GHz
Operating Frequency	**:**	2.412GHz ~ 2.472GHz
Support Channel	**:**	13 Channels
Modulation Skill	**:**	DBPSK, DQPSK, CCK, OFDM
Power Type	**:**	Power by PCI of client' s device
Power Cable	**:**	None
Data Cable	**:**	None

1.3. Test Method

1. Put the EUT into a personal computer' s PCI bus and fix it.
2. Using the notebook computer and software provided by the manufacturer to control the EUT. The test is performed under those specific conditions.
3. Set different channel [CH1/CH7/CH13/Super 802.11g (only CH7)] and data rate being tested, and then making EUT to the following modes:
   a) The mode of continuous transmission.
   b) The receive mode.
   c) The standby mode.

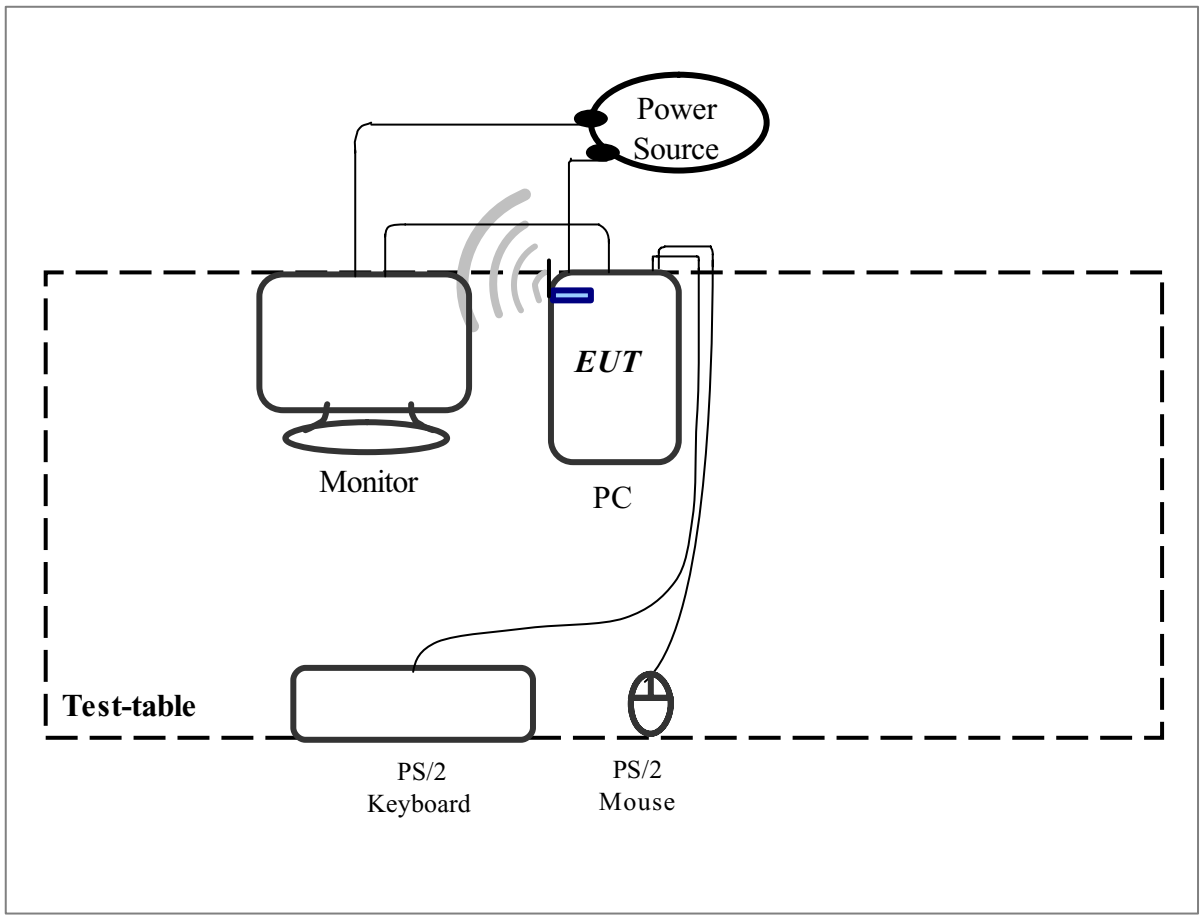
1.4. Description of Support Equipment

In order to construct the minimum testing, following equipment were used as the support units.

PC	**:**	**IBM 6840**
Model No.	:	6840MJV
Serial No.	:	96CC 0BT
FCC ID	:	DoC Approved
檢磁	:	3892I279
Power type	:	100 ~ 127/ 200 ~ 240VAC, 4A/2A 50/60 Hz, Switching
Power cord	:	Non-shielded, 182cm length, Plastic hood, No ferrite core
Monitor	**:**	**HP 15' Color Monitor**
Model No.	:	D2827A
Serial No.	:	KR91161716
FCC ID	:	C5F7NFCMC1518X
檢磁	:	3872B039
Power type	:	110 ~ 240 VAC / 50 ~ 60 Hz, Switching
Power cord	:	Shielded, 1.83m long, No ferrite core
Data cable	:	Shielded, 1.46m long, with two ferrite cores
PS/2 Keyboard	**:**	**HP**
Model No.	:	5181
Serial No.	:	BE21700405
FCC ID	:	DoC Approved
檢磁	:	3892C981
Power type	:	By PC
Data cable	:	Shielded, 1.70m length, with ferrite core
PS/2 Mouse	**:**	**HP**
Model No.	:	M-S34
Serial No.	:	LZB90714106
FCC ID	:	DZL211029
檢磁	:	4862A011
Power type	:	By PC
Power cord	:	Non-shielded, 1.88m long, No ferrite core

Notebook	**:**	**IBM Think Pad X20**
Model No.	:	2662-11T
Serial No.	:	FX-1192200/09
FCC ID	:	N/A, DoC Approved
檢磁	:	3892B565
Adaptor	**:**	**IBM**
Model No.	:	PA2450U
Serial No.	:	02K6654
FCC ID	:	N/A, DoC Approved
Power type	:	I/P: 100 ~ 240vac, 50 ~ 60 Hz, 0.5A ~ 1.2A; O/P: 16Vdc, 4.5A
Power cord	:	Non-shielded, 1.80m length, Plastic, with ferrite core
WLAN Card	**:**	**Gemtek Technology Co., Ltd.**
Model No.	:	C911003
FCC ID	:	MXF-C911003

1.5. Configuration of System Under Test



The tests below are carried with the EUT transmitter set at high power in TDD mode. The EUT is forced to select of output power level and channel number by PC.

1.6. Verify the Frequency and Channel

CH	1	2	3	4	5	6	7	8	9	10
0	2412	2417	2422	2427	2432	2437	2442	2447	2452	2457
1	2462	2467	2472	---	---	---	---	---	---	---

Note:

(1) This is for sure that all frequencies are in 2.4GHz – 2.4835 GHz.

(2) After test, the EUT operating frequencies are in 2.412GHz to 2.472GHz. So all the item as followed in testing report are need to test these three frequencies:
channel 1, channel 7, and channel 13.

(3) E.T.S.I (2400MHz ~ 2483.5MHz),
FRANCE outdoor use limited to 10mW e.i.r.p. within the band (2454MHz ~ 2483.5MHz)

1.7. Test Procedure

All measurements performed in this report were performed mainly according to the techniques described in ETSI EN 300328-2 (Dec., 2001) and the pre-setup was written on 1.4 test method, the detail setup was written on each test item.

1.8. Location of the Test Site

The radiated emissions measurements required by the rules were performed on the **three-meter**, **Anechoic Chamber (Registration Number: 93906)** maintained by *Training Research Co., Ltd.* 1F., No. 255 Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C. Complete description and measurement data have been placed on file with the commission. The conducted power line emissions tests and other test items were performed in a anechoic chamber also located at Training Research Co., Ltd.

No. 255 Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C. *Training Research Co., Ltd.* is listed by the FCC as a facility available to do measurement work for others on a contract basis.

1.9. General Test Condition

The test condition shall be as follows: (See Clause 6)

The NORMAL temperature and humidity conditions for tests shall be any convenient combination of temperature and humidity within the following ranges:

-temperature: +15℃ to +35℃;

-relative humidity: 20% to 75%.

The normal test voltage for equipment to be connected to the main shall be the nominal mains voltage.

For purpose of this ETS, the normal voltage shall be the declared voltage or any of the declared voltages for which the equipment was designed.

The frequency of the test power source corresponding to the AC mains shall be between 49Hz and 51Hz. When radio equipment is intended for operation from the usual, alternator fed lead-acid battery power source used on vehicles, then the normal test voltage shall be 1.1 times the nominal voltage of the battery (6V, 12V, etc.)

For operation from other power sources or types of battery (primary or secondary), the nominal test voltage shall be as declared by the equipment manufacturer. This shall be recorded in the test report.

For tests at EXTREME temperatures, measurements shall be made in accordance with the procedures specified in subclause 6.4.3, at the upper and lower temperatures of the range as follows:

temperature: -20℃ to +55℃;

Where the manufacturer's declared operating range does not include the range of -20℃ to +55℃, the equipment shall be tested over the following temperature ranges:

a) 0℃ to +35℃ for equipment intended for INDOOR use only, or intended for use in areas where the temperature is controlled within this range;

b) Over the extremes of the operating temperature range(s) of the declared host equipment(s) in case of plug-in radio devices.

The frequency range as in subclause 5.2.3 and the e.i.r.p. Limit in subclause5.2.1 shall not be exceeded.

Tests at extreme power source voltages specified below are not required when the equipment under test is designed for operation as part of and powered by another system or piece of equipment. Where this is the case, the limit values of the host system or host equipment shall apply. The appropriate limit values shall be declared by the manufacturer and recorded in the test report.

The EXTREME TEST VOLTAGE for equipment to be connected to an AC mains source shall be the nominal mains voltage ±10%.

When radio equipment is intended for operation from the usual type of alternator fed lead-acid battery power source used on vehicles, then extreme test voltage shall be 1.3 and 0.9 times the nominal voltage of the battery (6V, 12V, …etc.).

The lower extreme test voltage for equipment with power source using the following type of battery, shall be:

-for the Leclanche' or lithium type battery: 0.85 times the nominal voltage of the battery;

-for the mercury or nickel-cadmium type of battery: 0.9 times the nominal voltage of the battery.

In both cases, the upper extreme test voltage shall be 1.15 times the nominal voltage of the battery.

For equipment using other power sources, or capable of being operated from a variety of power sources (primary or secondary), the extreme test voltages shall be those declared by the manufacturer; these shall be recorded in the test report. Before measurements are made the equipment shall have reached thermal balance in the test chamber.

II. Section 5.2.1: Effective Radiated Power

2.1 Test Result of Effective Radiated Power for IEEE 802.11b

Power level at which the measurement has been performed 93.33 **mW**

TEST CONDITION		TRANSMITTER PEAK POWER		
		Tx Peak (dBm)	Tx Ave. (dBm)	Cable Loss (dB)
Channel 1	25 °C	10.93	8.82	5.80
	0 °C	12.10	9.75	
	35 °C	10.52	8.41	
Channel 7	25 °C	11.13	9.07	5.80
	0 °C	12.10	9.92	
	35 °C	10.41	8.35	
Channel 13	25 °C	10.80	8.74	5.80
	0 °C	11.92	9.58	
	35 °C	9.98	7.96	
Limit		Tx Peak : 23dBm / -7dBW Tx Ave. : 20dBm / -10dBW		

NOTE:

(1) The E.U.T is a stand-alone radio device (see the clause 6.2.2). The powered by the adaptor. So, the AC power is used as the extreme voltage source. (See clause 6.3.2.1)

(2) The value of table is worst case during test condition, includes different combinations of transmitter rate antenna polarity and temperature

(3) TX PEAK: Max Peak Power, TX Ave.: Average Peak.
Actually Power = Max Peak Power + Cable Loss,
E.I.R.P. = Actually Power + Antenna Gain
= 17.90 dBm + 1.80dBi
= 19.70 dBm

(4) ETSI (2400MHz ~ 2483.5MHz),
FRANCE outdoor use limited to 10mW e.i.r.p. within the band (2454MHz ~ 2483.5MHz)

2.2 Test Result of Effective Radiated Power for IEEE 802.11g

Power level at which the measurement has been performed 94.62 **mW**

TEST CONDITION		TRANSMITTER PEAK POWER		
		Tx Peak (dBm)	Tx Ave. (dBm)	Cable Loss (dB)
Channel 1	25 °C	11.04	1.78	5.80
	0 °C	12.16	2.98	
	35 °C	10.44	1.01	
Channel 7	25 °C	10.88	1.60	5.80
	0 °C	12.05	2.84	
	35 °C	10.12	0.73	
Channel 13	25 °C	11.19	1.66	5.80
	0 °C	12.14	2.71	
	35 °C	10.33	0.63	
Limit		Tx Peak : 23dBm / -7dBW Tx Ave. : 20dBm / -10dBW		

NOTE:

(1) TX PEAK: Max Peak Power, TX Ave.: Average Peak.

Actually Power = Max Peak Power + Cable Loss,

E.I.R.P. = Actually Power + Antenna Gain

= 17.96 dBm + 1.80 dBi

= 19.76 dBm

2.3 Test Result of Effective Radiated Power for Super 802.11g

Power level at which the measurement has been performed 91.62 mW

TEST CONDITION		TRANSMITTER PEAK POWER		
		Tx Peak (dBm)	Tx Ave. (dBm)	Cable Loss (dB)
Channel 7	25 °C	10.66	1.60	5.80
	0 °C	12.02	3.04	
	35 °C	9.90	0.69	
Limit		Tx Peak : 23dBm / -7dBW Tx Ave. : 20dBm / -10dBW		

NOTE:

(1) TX PEAK: Max Peak Power, TX Ave.: Average Peak.

Actually Power = Max Peak Power + Cable Loss,

E.I.R.P. = Actually Power + Antenna Gain

= 17.82 dBm + 1.80 dBi

= 19.62 dBm

III. Section 5.2.2: Peak Power Density

3.1 Test Result of Peak Power Density for IEEE 802.11b

Channel	Frequency (MHz)	Ppr (dBm)	CF (dB)	Ant. Gain (dB)	Ppq (dBm)	Limit (dBm)	Margin (dB)
CH 01	2412	-2.54	6.60	1.80	5.86	10.00	-4.14
CH 07	2442	-1.79	6.60	1.80	6.61	10.00	-3.39
CH 13	2472	-2.81	6.70	1.80	5.69	10.00	-4.31

3.2 Test Result of Peak Power Density for IEEE 802.11g

Channel	Frequency (MHz)	Ppr (dBm)	CF (dB)	Ant. Gain (dB)	Ppq (dBm)	Limit (dBm)	Margin (dB)
CH 01	2412	0.23	6.60	1.80	8.63	10.00	-1.37
CH 07	2442	-0.23	6.60	1.80	8.17	10.00	-1.83
CH 13	2472	-1.38	6.70	1.80	7.12	10.00	-2.88

3.3 Test Result of Peak Power Density for Super 802.11g

Channel	Frequency (MHz)	Ppr (dBm)	CF (dB)	Ant. Gain (dB)	Ppq (dBm)	Limit (dBm)	Margin (dB)
CH 07	2442	-4.42	6.60	1.80	3.98	10.00	-6.02

NOTE:

(1) For equipment using FHSS modulation, the peak power density shall be limit to –10dBW(100mW) per 100kHz E.I.R.P.

(2) For equipment using other types modulation, the peak power density shall be limit –20dBW(10mW) per MHz E.I.R.P.

(3) Ppr: spectrum read power density (using peak search mode), CF: correct factor,
CF: Correct Factor, AG: Antenna Gain
Ppq: actual peak power density in the spread spectrum band. Ppq = Ppr + CF + AG

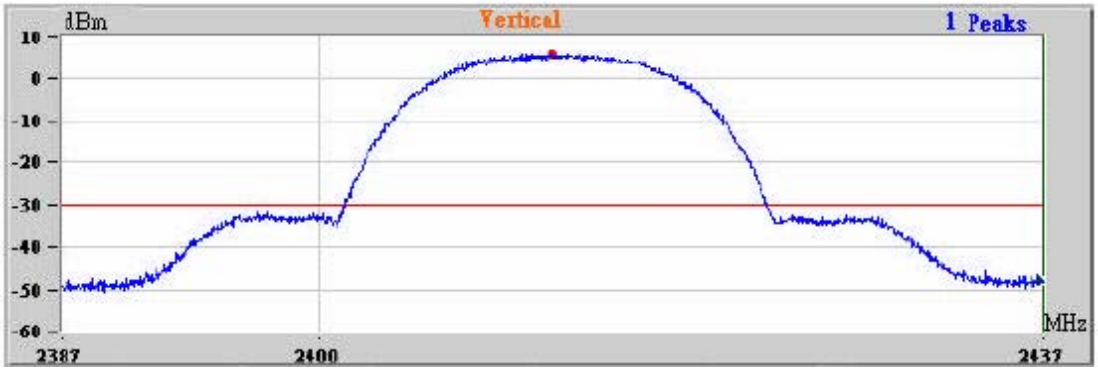
(4) The value of table is worst case during test condition, includes different combination s of transmitter rate, antenna polarity and temperature

(5) The data in the above table are summarizing the following attachment spectrum analyzer hard copy.

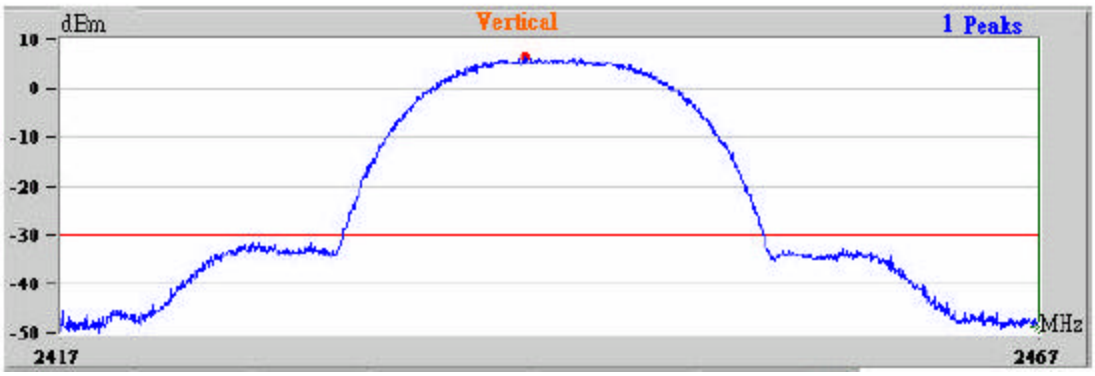
(6) ETSI (2400MHz ~ 2483.5MHz),
FRANCE outdoor use limited to 10mW e.i.r.p. within the band (2454MHz ~ 2483.5MHz)

IEEE 802.11b

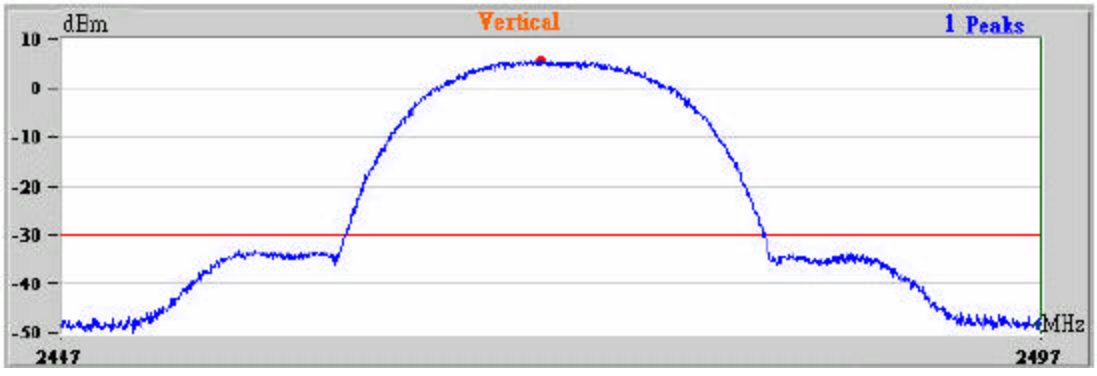
CH01



CH07

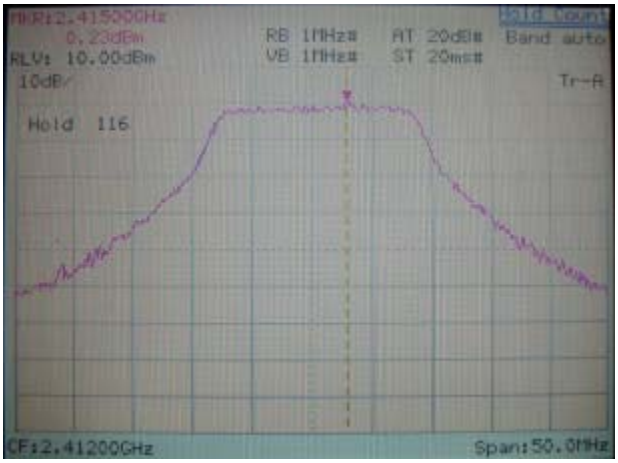


CH13

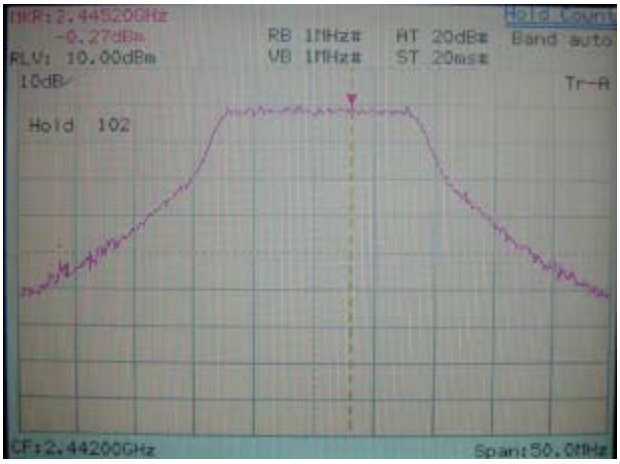


IEEE 802.11g

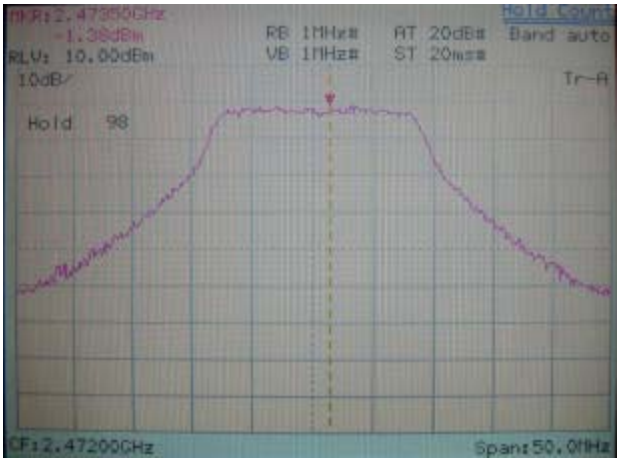
CH01



CH07

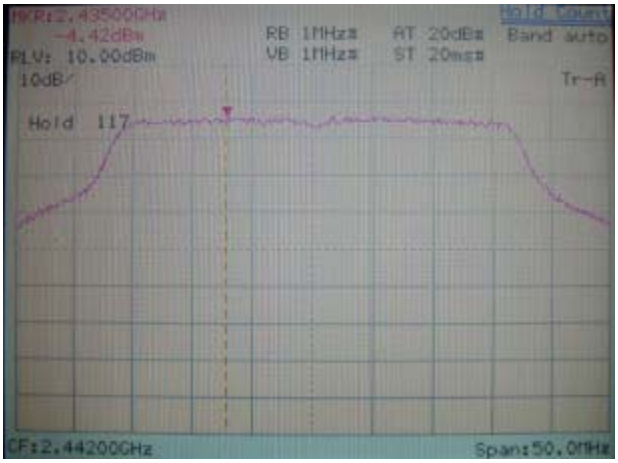


CH13



Super 802.11g

CH07



IV. Section 5.2.3 : Frequency Range

4.1 Test Result of Frequency Range for IEEE 802.11b

Transmitter Frequency Range – DSSS Equipment

TEST CONDITION		FREQUENCY(MHz)			
		Lowest Channel		Highest Channel	
		Channel 1		Channel 13	
		Frequency	Rate (Mbps)	Frequency	Rate (Mbps)
0℃	207 V	2402.70	11	2482.10	11
	253 V	2402.80	11	2482.10	11
25℃	230 V	2402.30	11	2482.60	11
35℃	207 V	2402.30	11	2482.50	11
	253 V	2402.30	11	2482.50	11
Measured frequencies (lowest and highest)		FL = 2402.30 MHz		FH = 2482.60 MHz	
Limit		FL > 2400MHz		FH < 2483.5MHz	

Note:

(1) The E.U.T is a stand-alone radio device (see the clause 6.2.2). This is powered by the main. So, the AC power is used as the extreme voltage source. (see clause 6.3.2.1).

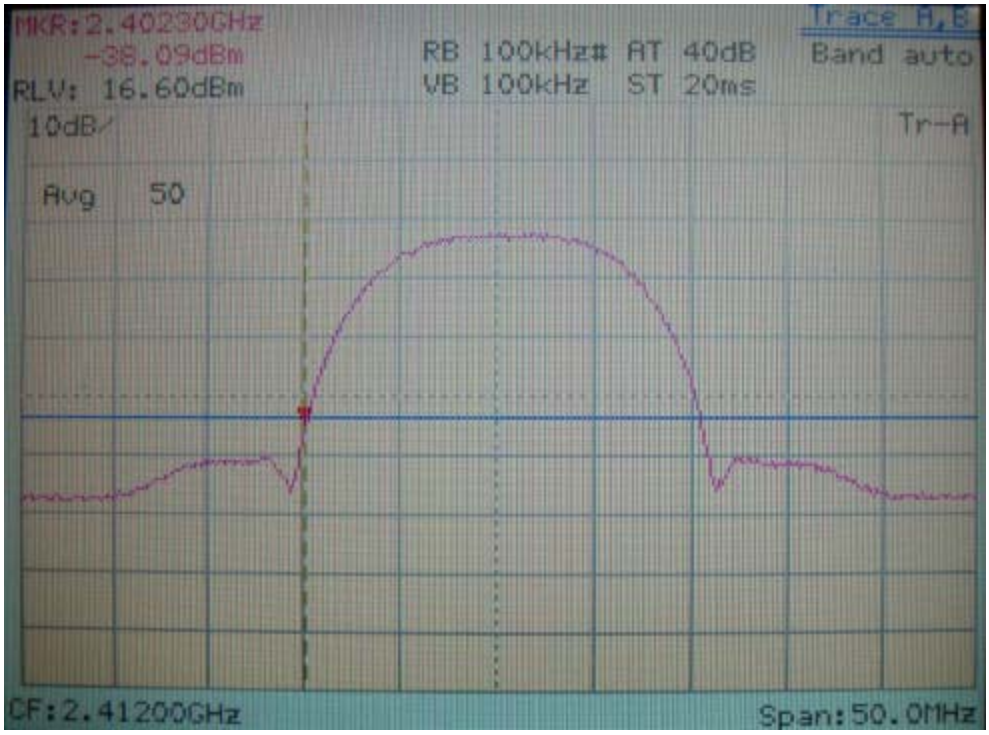
(2) B: Battery, AC: AC Source, Rate: Transmitter Rate.

(3) The value of table is worst case during test condition, includes different combinations of transmitter rate, antenna polarity and temperature.

(4) The data in the above table are summarizing the following attachment spectrum analyzer hard copy.

(5) ETSI (2400MHz ~ 2483.5MHz),
FRANCE outdoor use limited to 10mW e.i.r.p. within the band (2454MHz ~ 2483.5MHz)

Channel 1 (The lowest one in the frequency range)



Channel 13 (The greatest one in the frequency range)

4.2 Test Result of Frequency Range for IEEE 802.11g

Transmitter Frequency Range – DSSS Equipment

TEST CONDITION		FREQUENCY(MHz)			
		Lowest Channel		Highest Channel	
		Channel 1		Channel 13	
		Frequency	Rate (Mbps)	Frequency	Rate (Mbps)
0℃	207 V	2403.60	54	2481.20	54
	253 V	2403.70	54	2481.20	54
25℃	230 V	2402.80	54	2481.90	54
35℃	207 V	2402.80	54	2481.80	54
	253 V	2402.90	54	2481.80	54
Measured frequencies (lowest and highest)		FL = 2402.80 MHz		FH = 2481.90 MHz	
Limit		FL > 2400MHz		FH < 2483.5MHz	

Note:

(1) The E.U.T is a stand-alone radio device (see the clause 6.2.2). This is powered by the main. So, the AC power is used as the extreme voltage source. (see clause 6.3.2.1).

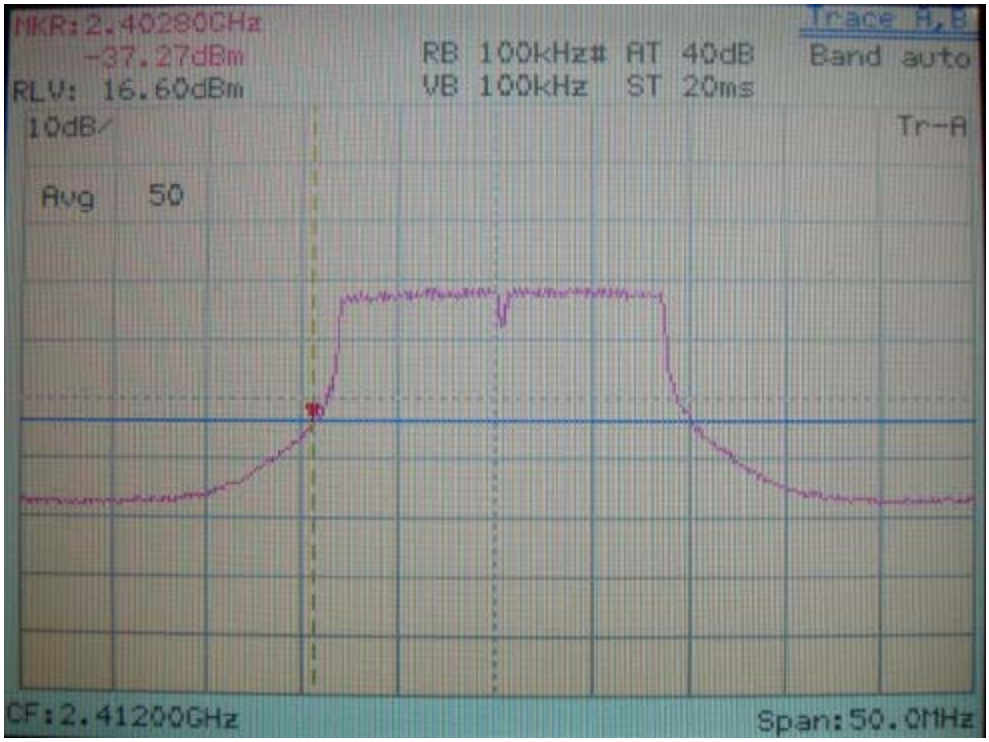
(2) B: Battery, AC: AC Source, Rate: Transmitter Rate.

(3) The value of table is worst case during test condition, includes different combinations of transmitter rate, antenna polarity and temperature.

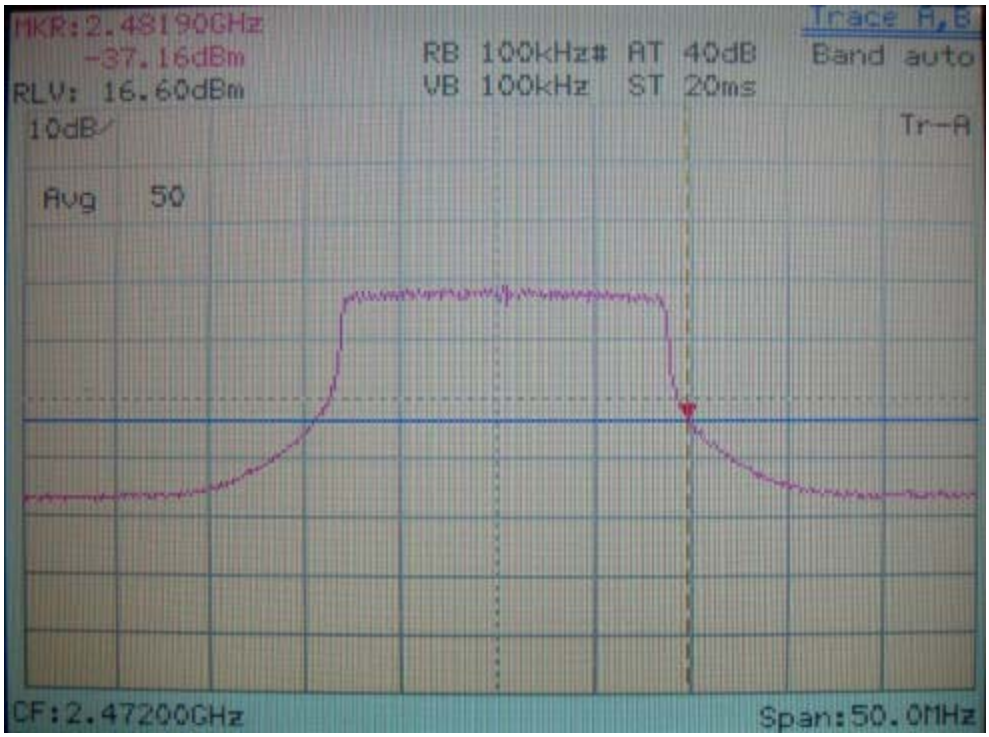
(4) The data in the above table are summarizing the following attachment spectrum analyzer hard copy.

(5) ETSI (2400MHz ~ 2483.5MHz),
FRANCE outdoor use limited to 10mW e.i.r.p. within the band (2454MHz ~ 2483.5MHz)

Channel 1 (The lowest one in the frequency range)



Channel 13 (The greatest one in the frequency range)



4.3 Test Result of Frequency Range for Super 802.11g

Transmitter Frequency Range – DSSS Equipment

TEST CONDITION		FREQUENCY(MHz)			
		Lowest Frequency		Highest Frequency	
		Channel 7		Channel 7	
		Frequency	Rate (Mbps)	Frequency	Rate (Mbps)
0℃	207 V	2425.10	108	2459.70	108
	253 V	2425.10	108	2459.70	108
25℃	230 V	2424.10	108	2460.30	108
35℃	207 V	2424.60	108	2460.20	108
	253 V	2424.50	108	2460.20	108
Measured frequencies (lowest and highest)		FL = 2424.10 MHz		FH = 2459.70 MHz	
Limit		FL > 2400MHz		FH < 2483.5MHz	

Note:

(6) The E.U.T is a stand-alone radio device (see the clause 6.2.2). This is powered by the main. So, the AC power is used as the extreme voltage source. (see clause 6.3.2.1).

(7) B: Battery, AC: AC Source, Rate: Transmitter Rate.

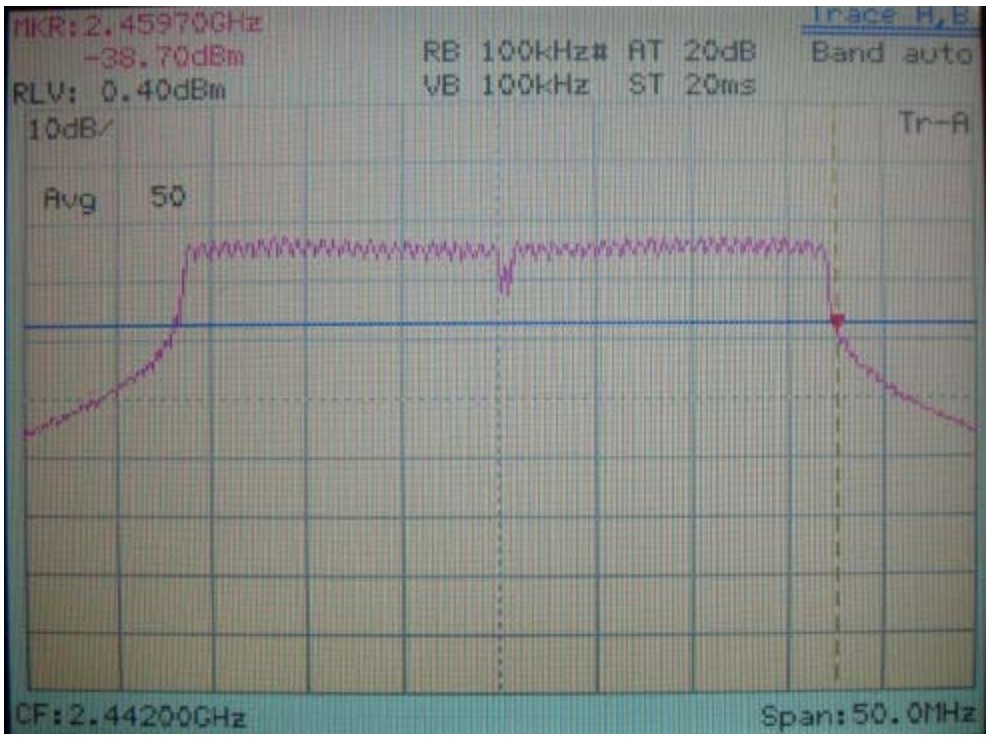
(8) The value of table is worst case during test condition, includes different combinations of transmitter rate, antenna polarity and temperature.

(9) The data in the above table are summarizing the following attachment spectrum analyzer hard copy.

(10) ETSI (2400MHz ~ 2483.5MHz),
FRANCE outdoor use limited to 10mW e.i.r.p. within the band (2454MHz ~ 2483.5MHz)

Channel 1 (The lowest one in the frequency range)

Channel 13 (The greatest one in the frequency range)



V. Section 5.2.4: Transmitter Spurious Emissions (Radiated)

5.1 Test Result for IEEE 802.11b

Channel 1 (30MHz to 1GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
302.81	H	-75.98	-36.00	-39.98	11
436.19	H	-67.80	-36.00	-31.80	11
502.87	H	-67.46	-36.00	-31.46	11
564.71	H	-64.01	-36.00	-28.01	11
598.66	H	-63.42	-36.00	-27.42	11
700.51	H	-66.12	-36.00	-30.12	11
367.07	V	-71.12	-36.00	-35.12	11
437.40	V	-71.30	-36.00	-35.30	11
468.92	V	-70.49	-36.00	-34.49	11
500.45	V	-64.31	-36.00	-28.31	11
564.71	V	-66.79	-36.00	-30.79	11
598.66	V	-61.24	-36.00	-25.24	11

Note:

(1) A. P. means antenna polarization, horizontal and vertical.
Amplitude means the fundamental emission measured
C F. means Correct Factor, Rate means transmitter rate
Corrected Factor (C. F.) = Cable Loss + Antenna Factor – Amplified Gain
LEVEL = Amplitude + Corrected Factor

(2) The margin is minus that means under limit.

(3) The value of table is the worst case during test condition. This is including different combinations of transmitter rate antenna polarity and temperature.

(4) ETSI (2400MHz ~ 2483.5MHz),
FRANCE outdoor use limited to 10mW e.i.r.p. within the band (2454MHz ~ 2483.5MHz)

Channel 13 (30MHz to 1GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
339.19	H	-66.11	-36.00	-30.11	11
386.47	H	-71.27	-36.00	-35.27	11
436.19	H	-67.34	-36.00	-31.34	11
502.87	H	-68.16	-36.00	-32.16	11
564.71	H	-64.38	-36.00	-28.38	11
598.66	H	-63.60	-36.00	-27.60	11
369.50	V	-71.31	-36.00	-35.31	11
434.97	V	-70.60	-36.00	-34.60	11
468.92	V	-70.56	-36.00	-34.56	11
501.66	V	-63.92	-36.00	-27.92	11
564.71	V	-66.81	-36.00	-30.81	11
598.66	V	-60.79	-36.00	-24.79	11

Channel 1 (1GHz to 12.75GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
2158.33	H	-52.58	-30.00	-22.58	11
2637.50	H	-55.03	-30.00	-25.03	11
7234.69	H	-59.19	-30.00	-29.19	11
9647.40	H	-56.41	-30.00	-26.41	11
12060.10	H	-57.37	-30.00	-27.37	11
2362.50	V	-52.21	-30.00	-22.21	11
2639.58	V	-50.36	-30.00	-20.36	11
7234.69	V	-60.03	-30.00	-30.03	11
9647.40	V	-58.74	-30.00	-28.74	11
12060.10	V	-57.04	-30.00	-27.04	11

Channel 13 (1GHz to 12.75GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
2158.33	H	-54.42	-30.00	-24.42	11
2637.50	H	-55.37	-30.00	-25.37	11
7415.83	H	-59.30	-30.00	-29.30	11
9886.35	H	-57.01	-30.00	-27.01	11
12360.73	H	-57.69	-30.00	-27.69	11
1820.83	V	-54.97	-47.00	-7.97	11
2637.50	V	-52.20	-30.00	-22.20	11
4945.31	V	-63.16	-30.00	-33.16	11
7415.83	V	-59.96	-30.00	-29.96	11
9886.35	V	-58.01	-30.00	-28.01	11
12360.73	V	-58.36	-30.00	-28.36	11

5.2 Test Result for IEEE 802.11g

Channel 1 (30MHz to 1GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
434.97	H	-67.17	-36.00	-31.17	54
500.45	H	-69.21	-36.00	-33.21	54
564.71	H	-64.64	-36.00	-28.64	54
598.66	H	-64.41	-36.00	-28.41	54
698.09	H	-66.84	-36.00	-30.84	54
369.50	V	-71.04	-36.00	-35.04	54
434.97	V	-71.07	-36.00	-35.07	54
468.92	V	-70.56	-36.00	-34.56	54
501.66	V	-64.43	-36.00	-28.43	54
565.92	V	-66.01	-36.00	-30.01	54
597.45	V	-60.32	-36.00	-24.32	54

Channel 13 (30MHz to 1GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
436.19	H	-66.76	-36.00	-30.76	54
501.66	H	-69.37	-36.00	-33.37	54
564.71	H	-64.82	-36.00	-28.82	54
598.66	H	-64.30	-36.00	-28.30	54
699.30	H	-66.71	-36.00	-30.71	54
369.50	V	-71.36	-36.00	-35.36	54
468.92	V	-70.72	-36.00	-34.72	54
501.66	V	-64.24	-36.00	-28.24	54
565.92	V	-66.39	-36.00	-30.39	54
597.45	V	-60.81	-36.00	-24.81	54

Channel 1 (1GHz to 12.75GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
2158.33	H	-52.25	-30.00	-22.25	54
2637.50	H	-53.53	-30.00	-23.53	54
7234.69	H	-59.69	-30.00	-29.69	54
9647.40	H	-58.74	-30.00	-28.74	54
12060.10	H	-56.71	-30.00	-26.71	54
2237.50	V	-55.76	-30.00	-25.76	54
2639.58	V	-49.86	-30.00	-19.86	54
7234.69	V	-61.03	-30.00	-31.03	54
9647.40	V	-58.91	-30.00	-28.91	54
12060.10	V	-57.21	-30.00	-27.21	54

Channel 13 (1GHz to 12.75GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
2158.33	H	-52.75	-30.00	-22.75	54
2637.50	H	-54.20	-30.00	-24.20	54
4945.31	H	-61.66	-30.00	-31.66	54
7415.83	H	-59.63	-30.00	-29.63	54
9886.35	H	-58.01	-30.00	-28.01	54
12360.73	H	-57.86	-30.00	-27.86	54
2358.33	V	-53.41	-30.00	-23.41	54
2637.50	V	-50.20	-30.00	-20.20	54
7415.83	V	-59.80	-30.00	-29.80	54
9886.35	V	-57.01	-30.00	-27.01	54
12360.73	V	-57.69	-30.00	-27.69	54

5.3 Test Result for Super 802.11g

Channel 7 (30MHz to 1GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
301.60	H	-74.70	-36.00	-38.70	108
434.97	H	-68.63	-36.00	-32.63	108
500.45	H	-69.49	-36.00	-33.49	108
565.92	H	-64.69	-36.00	-28.69	108
598.66	H	-64.62	-36.00	-28.62	108
287.05	V	-74.68	-36.00	-38.68	108
401.02	V	-72.83	-36.00	-36.83	108
434.97	V	-70.43	-36.00	-34.43	108
531.98	V	-67.20	-36.00	-31.20	108
598.66	V	-66.19	-36.00	-30.19	108
700.51	V	-66.78	-36.00	-30.78	108

Channel 7 (1GHz to 12.75GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
2237.50	H	-54.09	-30.00	-24.09	108
2518.75	H	-56.35	-30.00	-26.35	108
7327.19	H	-58.62	-30.00	-28.62	108
9766.87	H	-57.91	-30.00	-27.91	108
12210.42	H	-56.43	-30.00	-26.43	108
1820.83	V	-58.31	-30.00	-28.31	108
2518.75	V	-52.68	-30.00	-22.68	108
7327.19	V	-60.95	-30.00	-30.95	108
9766.87	V	-58.41	-30.00	-28.41	108
12210.42	V	-55.43	-30.00	-25.43	108

VI. Section 5.3.2: Receiver Spurious Emissions (Radiated)

6.1 Test Result for IEEE 802.11b

Channel 1 (30MHz to 1GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
403.45	H	-71.81	-57.00	-14.81	11
433.76	H	-65.07	-57.00	-8.07	11
501.66	H	-63.05	-57.00	-6.05	11
564.71	H	-63.57	-57.00	-6.57	11
597.45	H	-62.20	-57.00	-5.20	11
631.40	H	-67.21	-57.00	-10.21	11
302.81	V	-72.75	-57.00	-15.75	11
369.50	V	-70.81	-57.00	-13.81	11
436.19	V	-70.26	-57.00	-13.26	11
502.87	V	-63.93	-57.00	-6.93	11
564.71	V	-65.71	-57.00	-8.71	11
598.66	V	-60.32	-57.00	-3.32	11

Note:

(1) A. P. means antenna polarization, horizontal and vertical.
Amplitude means the fundamental emission measured.
C F. means Correct Factor, Rate means transmitter rate
Corrected Factor (C. F.) = Cable Loss + Antenna Factor – Amplified Gain
LEVEL = Amplitude + Corrected Factor

(2) The value of table is worst case during test condition, includes different combinations of transmitter rate antenna polarity and temperature

(3) ETSI (2400MHz ~ 2483.5MHz),
FRANCE outdoor use limited to 10mW e.i.r.p. within the band (2454MHz ~ 2483.5MHz)

Channel 13 (30MHz to 1GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
401.02	H	-72.24	-57.00	-15.24	11
434.97	H	-64.62	-57.00	-7.62	11
500.45	H	-62.50	-57.00	-5.50	11
564.71	H	-63.02	-57.00	-6.02	11
598.66	H	-62.49	-57.00	-5.49	11
700.51	H	-67.21	-57.00	-10.21	11
369.50	V	-71.48	-57.00	-14.48	11
436.19	V	-70.31	-57.00	-13.31	11
468.92	V	-69.45	-57.00	-12.45	11
504.09	V	-64.03	-57.00	-7.03	11
564.71	V	-66.22	-57.00	-9.22	11
598.66	V	-59.74	-57.00	-2.74	11

Channel 1 (1GHz to 12.75GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
1499.37	H	-63.82	-47.00	-16.82	11
3957.08	H	-62.36	-47.00	-15.36	11
5670.62	H	-60.95	-47.00	-13.95	11
9964.27	H	-56.36	-47.00	-9.36	11
2096.67	V	-59.48	-47.00	-12.48	11
3942.40	V	-62.43	-47.00	-15.43	11
5611.87	V	-60.23	-47.00	-13.23	11
9425.73	V	-57.28	-47.00	-10.28	11

Channel 13 (1GHz to 12.75GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
1499.37	H	-63.15	-47.00	-16.15	11
3315.73	H	-63.58	-47.00	-16.58	11
5176.15	H	-60.86	-47.00	-13.86	11
9734.17	H	-58.32	-47.00	-11.32	11
1499.37	V	-59.32	-47.00	-12.32	11
3315.73	V	-61.98	-47.00	-14.98	11
5176.15	V	-58.62	-47.00	-11.62	11
9734.17	V	-56.82	-47.00	-9.82	11

6.2 Test Result for IEEE 802.11g

Channel 1 (30MHz to 1GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
402.24	H	-72.16	-57.00	-15.16	54
434.97	H	-63.76	-57.00	-6.76	54
501.66	H	-62.79	-57.00	-5.79	54
564.71	H	-63.09	-57.00	-6.09	54
598.66	H	-62.24	-57.00	-5.24	54
632.61	H	-67.30	-57.00	-10.30	54
331.91	V	-69.91	-57.00	-12.91	54
434.97	V	-70.63	-57.00	-13.63	54
501.66	V	-64.39	-57.00	-7.39	54
565.92	V	-66.48	-57.00	-9.48	54
598.66	V	-60.25	-57.00	-3.25	54

Channel 13 (30MHz to 1GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
437.40	H	-63.94	-57.00	-6.94	54
500.45	H	-63.00	-57.00	-6.00	54
531.98	H	-68.24	-57.00	-11.24	54
565.92	H	-63.65	-57.00	-6.65	54
597.45	H	-62.47	-57.00	-5.47	54
369.50	V	-70.58	-57.00	-13.58	54
436.19	V	-70.24	-57.00	-13.24	54
501.66	V	-64.08	-57.00	-7.08	54
565.92	V	-66.32	-57.00	-9.32	54
598.66	V	-60.18	-57.00	-3.18	54

Channel 1 (1GHz to 12.75GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
1499.37	H	-62.82	-47.00	-15.82	11
2096.67	H	-65.98	-47.00	-18.98	11
3991.35	H	-61.36	-47.00	-14.36	11
9533.44	H	-56.36	-47.00	-9.36	11
1499.37	V	-57.99	-47.00	-10.99	11
2096.67	V	-59.32	-47.00	-12.32	11
5043.96	V	-61.49	-47.00	-14.49	11
9753.75	V	-56.29	-47.00	-9.29	11

Channel 13 (1GHz to 12.75GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
1499.37	H	-65.49	-47.00	-18.49	11
2738.02	H	-65.31	-47.00	-18.31	11
5695.10	H	-60.58	-47.00	-13.58	11
9504.06	H	-56.94	-47.00	-9.94	11
1499.37	V	-57.15	-47.00	-10.15	11
2096.67	V	-59.32	-47.00	-12.32	11
4941.15	V	-60.84	-47.00	-13.84	11
8999.79	V	-58.29	-47.00	-11.29	11

6.3 Test Result for Super 802.11g

Channel 7 (30MHz to 1GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
142.76	H	-76.10	-57.00	-19.10	108
301.60	H	-77.07	-57.00	-20.07	108
434.97	H	-69.16	-57.00	-12.16	108
501.66	H	-68.59	-57.00	-11.59	108
565.92	H	-64.23	-57.00	-7.23	108
598.66	H	-60.33	-57.00	-3.33	108
214.30	V	-75.58	-57.00	-18.58	108
313.72	V	-70.86	-57.00	-13.86	108
434.97	V	-73.98	-57.00	-16.98	108
500.45	V	-69.01	-57.00	-12.01	108
598.66	V	-63.30	-57.00	-6.30	108
850.86	V	-64.52	-57.00	-7.52	108

Channel 7 (1GHz to 12.75GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
1592.40	H	-63.86	-47.00	-16.86	108
3203.12	H	-63.03	-47.00	-16.03	108
4843.23	H	-61.14	-47.00	-14.14	108
9504.06	H	-58.44	-47.00	-11.44	108
1499.37	V	-57.65	-47.00	-10.65	108
2096.67	V	-60.32	-47.00	-13.32	108
4711.04	V	-61.41	-47.00	-14.41	108
8285.00	V	-58.04	-47.00	-11.04	108

6.4 Test Result for Standby mode

(30MHz to 12.5GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
168.22	H	-77.06	-57.00	-20.06	---
234.91	H	-74.83	-57.00	-17.83	---
369.50	H	-73.91	-57.00	-16.91	---
402.24	H	-72.37	-57.00	-15.37	---
434.97	H	-64.39	-57.00	-7.39	---
501.66	H	-62.96	-57.00	-5.96	---
564.71	H	-63.30	-57.00	-6.30	---
598.66	H	-62.35	-57.00	-5.35	---
1592.40	H	-65.69	-47.00	-18.69	---
3070.94	H	-63.95	-47.00	-16.95	---
3991.35	H	-62.20	-47.00	-15.20	---
8363.33	H	-59.85	-47.00	-12.85	---
301.60	V	-72.14	-57.00	-15.14	---
328.27	V	-66.98	-57.00	-9.98	---
365.86	V	-71.04	-57.00	-14.04	---
436.19	V	-70.21	-57.00	-13.21	---
502.87	V	-64.33	-57.00	-7.33	---
567.14	V	-66.82	-57.00	-9.82	---
598.66	V	-61.22	-57.00	-4.22	---
1499.37	V	-57.99	-47.00	-10.99	---
2096.67	V	-58.82	-47.00	-11.82	---
3971.77	V	-60.29	-47.00	-13.29	---
8363.33	V	-58.18	-47.00	-11.18	---

VII. Instrument and Ancillaries Equipment of List

				Calibration Date
Instrument Name	**Model**	**Brand**	**Serial No.**	**Next time**
EMI Receiver	8546A	HP	3520A00242	08/05/05
RF Filter Section	85460A	HP	3448A00217	08/05/05
Small Biconical Antenna	UBAA9114 & BBVU9135	SCHWARZECK	127	10/11/05
Pre-amplifier	PA1F	TRC	1FAC	05/20/05
Auto Switch Box (>30MHz)	ASB-01	TRC	9904-01	05/20/05
Coaxial Cable (Double shielded, 15 meter)	A30A30-0058-50FS-15M	JYEBAO	SMA-01	05/20/05
Coaxial Cable (1.1 meter)	A30A30-0058-50FS-1M	JYEBAO	SMA-02	05/20/05
Spectrum Analyzer	8564E	HP	3720A00840	08/13/05
Microwave Preamplifier	84125C	HP	US36433002	08/13/05
Horn Antenna	3115	EMCO	9104-3668	12/18/04
Standard Guide Horn Antenna	84125-80008	HP	18-26.5GHz	12/18/04
Standard Guide Horn Antenna	84125-80001	HP	26.5-40GHz	12/18/04
Horn Antenna	1196E (3115)	HP (EMCO)	9704-5178	12/12/04
Pre-amplifier	PA2F	TRC	2F1GZ	03/20/05
Coaxial Cable (3 miter)	A30A30-0058-50FST118	JYEBAO	MSA-05	03/20/05
Coaxial Cable (1 meter)	A30A30-0058-50FST118	JYEBAO	MSA-04	03/20/05

The level of confidence of 95% , the uncertainty of measurement of radiated emission is +3.05dB / -3.84dB .

Appendix A

Antenna Specification

WHA YU INDUSTRIAL CO., LTD. (HEAD OFFICE)

TAI HWA ELECTRONIC CO., LTD.(CHINA)

SHANGHAI HUA YU ELECTRONIC CO., LTD.(CHINA)

SPECIFICATION FOR APPROVAL

CUSTOMER: *友勁科技股份有限公司*

PART NAME: *2.4G RF Antenna Assembly*

PART NO: *11723B02*317*00*

W. Y. P/NO.: *C056-510131-A* *REV.: X1*

	MANUFACTURER SIGNATURE	CUSTOMER SIGNATURE
APPROVED BY :		
DATE :		

WHA YU GROUP

WHA YU INDUSTRIAL CO., LTD.(HEAD OFFICE)

譁裕實業股份有限公司

Tel:+886-3-5714225(REP.)

Fax:+ 886-3-5713853 · + 886-3-5723600

TAI HWA ELECTRONC CO., LTD. (CHINA)

台樺電業制品廠

Address: Pak Ho District, Hiu Street Town, Dong Guan City, Guangdong, China

Tel: + 86-769-5599375 · + 86-769-5912375

Fax: + 86-769-5599376

SHANGHAI HUA YU ELECTRONIC CO., LTD. (CHINA)

上海譁裕電子有限公司

Address: Lian Ho Village Bai Ho Town, Qing Pu Country Shanghai, China

Tel: + 86-21-59741348 · + 86-21-59743624

Fax: + 86-21-59741347

RF Antenna Cable Assembly

Specification

1. Electrical Properties :

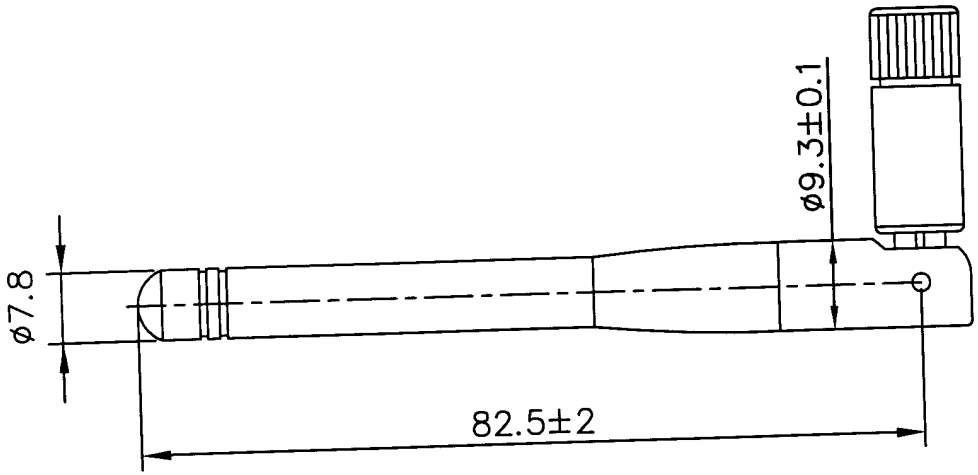
1.1 Frequency Rang..... 2.4GHz ~ 2.5GHz
1.2 Impedance ..... 50Ω Nominal
1.3 VSWR ..... 1.92 Max.
1.4 Return Loss..... -10dB Maximum
1.5 Electrical Wave..... 1/2 λ Diople
1.6 Gain..... 1.8 dBi
1.7 Admitted Power..... 1W

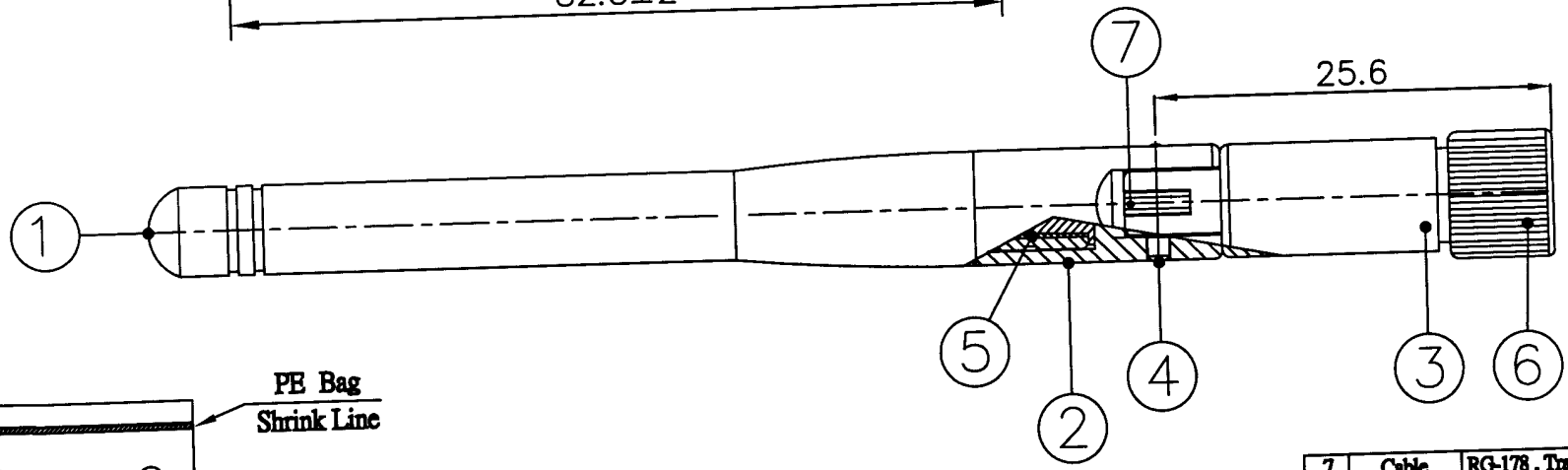
2. Physical Properties :

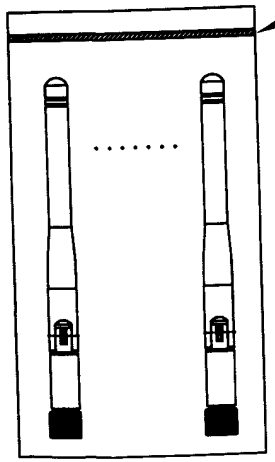
2.1 Cable..... RG-178 Cable
2.2 Antenna Cover..... TPE
2.3 Antenna Base..... PC
2.4 Operating Temp. .....-20℃ ~ +65℃
2.5 Storage Temp. .....-30℃ ~ +75℃
2.6 Color .....Black
2.7 Connector..... SMA Plug Reverse

REV	DATE	DESCRIPTION
X1	11/17-2003	New Issue

CG-







Packing : 25 pcs/bag

NO	DESCRIPTION		QTY	REMARK
7	Cable	RG-178 , Translucent Brown ; 50 Ω	1	
6	Connector	SMA Straight Plug/Reverse	1	
5	Ground Tube	Brass , Ni plated	1	
4	Rivet	Brass , Cr Plated (Black)	2	
3	Antenna Base	PC ; Color : Black	1	
2	Antenna Base	PC ; Color : Black	1	
1	Antenna Cover	TPE ; Color : Black	1	

CUSTOMER'S SINGATURE

XX.	±3.0
X.	±2.0
.X	±1.0
.XX	±0.5
.XXX	±0.1

APPROVED: Winston KF 11/19

CHECKED

DRAWING: Jane

CUSTOMER: 友勤科技股份有限公司

PART NO : 11723B02*317*00

PARTNAME: RF Antenna Assembly

W.Y P/NO : C056-510131-A

REV	UNIT	FILE :
X1	m/m	SHEET : 1/1

Wha Yu
INDUSTRIAL CO.,LTD.
譁裕實業股份有限公司

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Report No.	C51ET050304
Specifications	ETSI EN 301 489-1 V1.4.1 (August, 2002) ETSI EN 301 489-17 V1.2.1 (April, 2002)
Applicant	CAMEO COMMUNICATIONS, INC.
Applicant address	No. 42, Min Chuan East Road, Section 6, Taipei 114, Taiwan
Items tested	802.11g Wireless PCI Adapter
Model No.	W LG-1202, WNC- 0300, LWS5410P, NWP-0108G, ALL0281A
EUT Condition	☒Engineering sample; ☐Pre-production; ☐Final production (Sample # N10415)
Results	**Compliance** (As detailed within this report)
Date	12/01/2004 (month / day / year) (Sample received) 12/14/2004 (month / day / year) (Test)
Prepared by	Project Engineer (Jack Tsai)
Authorized by	General Manager (Frank Tsai)
Issue date	*December 16, 2004* (month / day / year)
Modifications	**None**
Tested by	Training Research Co., Ltd.
Office at	No. 255, Nan Yang Street, Shijr City, Taipei Hsien 221, Taiwan
Laboratory at	1F, No. 255, Nan Yang Street, Shijr City, Taipei Hsien 221, Taiwan
Open site at	No. 15, Lane 530, Balian Rd., Sec. 1, Shijr City, Taipei Hsien 221, Taiwan

Conditions of issue:

This test report shall not be reproduced except in full, without written approval of TRC. And the test result contained within this report only relate to the sample submitted for testing.

★ ***Aut. No. ELA 131***

Generally Statement:

The results appear in the following order:

Electromagnetic compatibility and radio spectrum matters (ERM); Electro Magnetic Compatibility (EMC) standard for radio equipment and services;

Part 1: Common Technical requirements

Part 17: Specific conditions for Wideband data and HIPERLAN equipment.

The results exhibits below only apply to particular samples tested and to the specific tests carried out, as detailed in this Test Report. The issue of this Test Report does not indicate any measure of Approval, Certification, Supervision, Control or Surveillance by Training Research Co., Ltd. of any product. No extract, abridgement or abstraction from a Test Report may be published or used to advertise a product without the written consent of the Director, Training Research Co., Ltd. who reserves the absolute right to agree or reject all or any of the details of any item of publicity for which consent may be sought.

Contents

Chapter 0 Emission and Susceptibility Standards

Emission Standards

Emission Standard	European Standard	International Standard
( )	EN 61000-6-3/2001	IEC 61000-6-3/1996
( )	EN 61000-6-4/2001	IEC 61000-6-4/1997
( )	EN 50081-1/1992	
( )	EN 50081-1/8.93	
( )	EN 55014/4.93	CISPR 14: 1993
( )	EN 55015/12.93	CISPR 15: 1992
( )	EN 55011/91	CISPR 11: 1990
(X)	EN 55022/98	CISPR 22: 1997
(X)	EN 61000-3-2/2000	IEC 61000-3-2: 2000
(X)	EN 61000-3-3/1995 +A1/2001	IEC 61000-3-3: 1994 +A1/2001

Susceptibility Standards

Susceptibility Standard	European Standard	International Standard
( )	EN 61000-6-1/2001	IEC 61000-6-1/1997
( )	EN 61000-6-2/2001	IEC 61000-6-2/1999
( )	EN 50082-1/1997	
( )	EN 50082-2/1994	
( )	EN 55024/1998	CISPR 24/1997
( )	EN 55020/2002	CISPR 20/2002
(X)	EN 61000-4-2:1995	IEC 61000-4-2:1995
(X)	EN 61000-4-3:1996	IEC 61000-4-3:1995
(X)	EN 61000-4-4:1995	IEC 61000-4-4:1995
(X)	EN 61000-4-5:1995	IEC 61000-4-5:1995
(X)	EN 61000-4-6:1996	IEC 61000-4-6:1996
( )	EN 61000-4-8:1993	IEC 61000-4-8:1993
(X)	EN 61000-4-11:1994	IEC 61000-4-11:1994
( )	EN 55014-2:1993	CISPR/F (Sec) 159

Chapter 1 Introduction

Description of EUT

Product Name	**:**	802.11g Wireless PCI Adapter
Model Name	**:**	W LG-1202, WNC- 0300, LWS5410P, NWP-0108G, ALL0281A
Frequency Range	**:**	2.400GHz ~ 2.4835GHz
Operating Frequency	**:**	2.412GHz ~ 2.472GHz
Support Channel	**:**	13 Channels
Modulation Skill	**:**	DBPSK, DQPSK, CCK, OFDM
Power Type	**:**	Power by PCI of client' s device
Power Cable	**:**	None
Data Cable	**:**	None

Test Method

1. Put the EUT into a personal computer' s PCI bus and fix it.
2. Using the notebook computer and software provided by the manufacturer to control EUT, the test is performed under the specific conditions.
3. Then making EUT to the following mode.

   (a) EMI testing: During test, making EUT to the linking mode with support equipments

   (b) EMS testing: same as above

List of Support Equipment

In order to construct the minimum testing, following equipment were used as the support units.

PC	**:**	**IBM 6840; HP Pavilion; HP d330 uT**
Model No.	:	6840MJV; P8574A; d338 uT
Serial No.	:	96CC 0C1; TW21920435; SGH41508NP
FCC ID	:	N/A, DoC
檢磁	:	3892I279; 3902H097, R33001
Power type	:	100 ~ 127VAC / 4A, 200 ~ 240VAC/2A, 50 ~ 60Hz, 5A, Switching
Power cord	:	Non-shielded, 2.33 m length, Plastic hood, No ferrite core
Fax/Modem	**:**	**Aceex**
Model No.	:	DM-1414
Serial No.	:	9010582
FCC ID	:	IFAXDM1414
Power type	:	110 VAC / 50 ~ 60 Hz, Switching
Power Cord	:	Non-shielded, 1.90m long, Plastic hoods, and no ferrite bead
Data Cable	:	RS-232→Shielded, 1.30m long, Metal hoods , No bead RJ-11Cx2→Non-shielded, 7’ long, Plastic hoods, No bead
Printer	**:**	**HP**
Model No.	:	C6464A, C2642A
Serial No.	:	TH16LEB5PK, SG69A196GV
FCC ID	:	None (DoC Approved), B94C2642X
檢磁	:	3892H381, None
Power type	:	Switching adaptor
Power cord	:	Non-shielded, 173cm length, No ferrite core (between adaptor and AC source) Non-shielded, 180cm length, with ferrite core (between printer and adaptor)
Data cable	:	Shielded, 1.70m length, No ferrite core

Monitor	**:**	**HP 15' Color Monitor, HP pavilion mx70**
Model No.	:	D2827A, P1283A
Serial No.	:	KR91379759, TWTBQ00397
FCC ID	:	C5F7NFCMC1518X
BSMI	:	3872B039
Power type	:	110 ~ 240 VAC / 50 ~ 60 Hz, Switching
Power cord	:	Shielded, 1.83m length, No ferrite core
Data cable	:	Shielded, 1.46m length, with two ferrite cores

USB Gamepad	**:**	**Rockfire**
Model No.	:	QF-337uv
Serial No.	:	10600545, KR91379759
FCC ID	:	None (CE approval)
BSMI	:	3862A574
Power type	:	By computer
Data Cable	:	Shielded, 1.81m long, Plastic, with ferrite core

PS/2 Keyboard	**:**	**HP**
Model No.	:	5187-0343, SK-2501K
Serial No.	:	BE21700404, M981216213
FCC ID	:	DoC Approved, GYUR38SK
BSMI	:	3892C981, 3862A621
Power type	:	By PC
Data cable	:	Shielded, 1.73m length, Plastic hood, No ferrite core

Mouse	**:**	**HP**
Model No.	:	M-UR89, M-S34
Serial No.	:	LZS21750238, LZC84446151
FCC ID	:	DoC Approved, DZL211029
BSMI	:	3892D767, 4862A011
Power type	:	By PC
Power cord	:	Shielded, 1.80m length, No ferrite core

Notebook	**:**	**ASUS**
Model No.	:	M2400E
FCC ID	:	N/A, DoC Approved
Adaptor	**:**	**DELTA ELECTRONICS, INC.**
Model No.	:	ADP-65DB REV.B
Serial No.	:	Q3W0311044403
FCC ID	:	N/A, CE Approved
BSMI	:	3882B596
Power type	:	I/P: 100 ~ 240vac, 50 ~ 60 Hz, 1.5A ; O/P: 19Vdc, 3.42A
Power cable	:	Non-shielded, 1.85m length, Plastic hood, No ferrite core (Between power adaptor and AC power source)
Power cable	:	Non-Shielded, 1.70m length, with ferrite core (Between power adaptor and notebook)

WLAN Card	**:**	**Gemtek Technology Co., Ltd.**
Model No.	:	C911003
FCC ID	:	MXF-C911003

Chapter 2 Emission and Immunity Requirements Overview

Emission (ETSI EN 301 489-1)

Phenomenon	Application	Equipment test requirement			Reference Subclause in the present document
		Radio and ancillary equipment for fixed use (base station equipment)	Radio and ancillary equipment for vehicular use (mobile equipment)	Radio and ancillary equipment for portable use (portable equipment)	
Radiated emission	Enclosure of ancillary equipment	Applicable for stand alone testing	Applicable for stand alone testing	Applicable for stand alone testing	8.2
Conducted emission	DC power input/output port	Applicable	Applicable	Not applicable	8.3
Conducted emission	AC mains input/output port	Applicable	Not applicable	Not applicable	8.4
Harmonic current emissions	AC mains input port	Applicable	Not applicable	Not applicable	8.5
Voltage fluctuations and flicker	AC mains input port	Applicable	Not applicable	Not applicable	8.6

Immunity (ETSI EN 301 489-1)

Phenomenon	Application	Equipment test requirement			Reference Subclause in the present document
		Radio and ancillary equipment for fixed use (base station equipment)	Radio and ancillary equipment for vehicular use (mobile equipment)	Radio and ancillary equipment for portable use (portable equipment)	
RF electromagnetic field (80MHz to 1GHz)	Enclosure	Applicable	Applicable	Applicable	9.2
Electrostatic discharge	Enclosure	Applicable	Applicable	Applicable	9.3
Fast transients common mode	Signal, telecommunication and control ports, DC and AC power ports	Applicable	Not applicable	Not applicable	9.4
RF common mode 0.15 MHz to 80MHz	Signal, telecommunication and control ports, DC and AC power ports	Applicable	Applicable	Not applicable	9.5
Transients and surges	DC power input ports	Not applicable	Applicable	Not applicable	9.6
Voltage dips and interruptions	AC mains power input ports	Applicable	Not applicable	Not applicable	9.7
Surges, line to line and line ground	AC mains power input ports, telecommunication ports	Applicable	Not applicable	Not applicable	9.8

Chapter 3 Performance Criteria

ETSI EN 301 489-17, Subclause 6.2

Table 1 Performance criteria		
Criteria	**During test**	**After test**
A	Shall operate as intended May show degradation of performance (**NOTE 1**) Shall be no loss of function Shall be no unintentional transmissions	Shall operate as intended Shall be no degradation of performance **(NOTE 2)** Shall be no loss of function Shall be no loss of stored data or user programmable functions
B	May show loss of function (one or more) May show degradation of performance **(NOTE 1)** No unintentional transmissions	Function shall be self-recoverable Shall operate as intended after recovering Shall be no degradation of performance **(NOTE 2)** Shall be no loss of stored data or user programmable functions
C	May be loss of function (one or more)	Functions shall be recoverable by the operator Shall operate as intended after recovering Shall be no degradation of performance **(NOTE 2)**

NOTE 1:

Degradation of performance during the test is understood as a degradation to a level not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance.

If the minimum performance level or the permissible performance degradation in not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect form the apparatus if used as intended.

NOTE 2:

No degradation of performance after the test is understood as no degradation below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. After the test no change of actual operating data or user retrievable data is allowed.

If the minimum performance level or the permissible performance degradation in not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect form the apparatus if used as intended.

ETSI EN 301 489-1

Performance criteria for Continuous phenomena applied Transmitters (CT)

If no further details are given in the relevant part of the present document dealing with the particular type of radio equipment, the following *general performance criteria for continuous phenomena* shall apply.

During and after the test:

The apparatus shall continue to operate as intended. No *degradation of performance* or *loss of function* is allowed below a permissible performance level specified by the manufacturer when the apparatus is used as intends. In some cases this permissible performance level may be replaced by a permissible loss of performance.

During the test:

The EUT shall not unintentionally transmit or change its actual operating state and stored data. If the *minimum performance level* or the *permissible loss* is not specified by the manufacturer, then either of these may be deduced from the product description and documentation and what the user may reasonably expect form the apparatus if used as intended.

For ancillary equipment the pass/failure criteria supplied by the manufacturer (see subclause 6.4) shall apply, unless the ancillary equipment is tested in connection with a receiver or transmitter in which case the corresponding performance criteria above shall apply.

Performance criteria for Transient phenomena applied Transmitters (TT)

If no further details are given in the relevant part of the present document dealing with the particular type of radio equipment, the following *general performance* criteria for transient phenomena shall apply.

After the test:

The apparatus shall continue to operate as intended. No *degradation of performance* or *loss of function* is allowed below a permissible performance level specified by the manufacturer when the apparatus is used as intends. In some cases this permissible performance level may be replaced by a permissible loss of performance.

During the test:

The EMC exposure to an electromagnetic phenomenon, a *degradation of performance* is, however, allowed. No change of the actual mode of operation (e.g. unintended transmission) or stored data is allowed.

If the minimum performance level or the permissible loss is not specified by the manufacturer, Then either of these may be deduced from the product description and documentation and what the user may reasonably expect form the apparatus if used as intended.

For ancillary equipment the pass/failure criteria supplied by the manufacturer (see subclause 6.4) shall apply, unless the ancillary equipment is tested in connection with a receiver or transmitter in which case the corresponding performance criteria above shall apply.

Performance criteria for Continuous phenomena applied Receivers (CR)

If no further details are given in the relevant part of the present document dealing with the particular type of radio equipment, the following *general performance* criteria for continuous phenomena shall apply.

During and after the test:

The apparatus shall continue to operate as intended. No *degradation of performance* or *loss of function* is allowed below a permissible performance level specified by the manufacturer when the apparatus is used as intends. In some cases this permissible performance level may be replaced by a permissible loss of performance.

During the test:

The EUT shall not unintentionally transmit or change its actual operating state and stored data. If the minimum performance level or the permissible loss is not specified by the manufacturer, then either of these may be deduced from the product description and documentation and what the user may reasonably expect form the apparatus if used as intended.

For ancillary equipment the pass/failure criteria supplied by the manufacturer (see subclause 6.4) shall apply, unless the ancillary equipment is tested in connection with a receiver or transmitter in which case the corresponding performance criteria above shall apply.

Performance criteria for Transient phenomena applied Receivers (TR)

If no further details are given in the relevant part of the present document dealing with the particular type of radio equipment, the following *general performance* criteria for transient phenomena shall apply.

After the test:

The apparatus shall continue to operate as intended. No *degradation of performance* or *loss of function* is allowed below a permissible performance level specified by the manufacturer when the apparatus is used as intends. In some cases this permissible performance level may be replaced by a permissible loss of performance.

During the test:

The EMC exposure to an electromagnetic phenomenon, a degradation of performance is, however, allowed. No change of the actual mode of operation (e.g. unintended transmission) or stored data is allowed.

If the minimum performance level or the permissible loss is not specified by the manufacturer, then either of these may be deduced from the product description and documentation and what the user may reasonably expect form the apparatus if used as intended.

For ancillary equipment the pass/failure criteria supplied by the manufacturer (see subclause 6.4) shall apply, unless the ancillary equipment is tested in connection with a receiver or transmitter in which case the corresponding performance criteria above shall apply.

ETSI EN 301 489-17

Performance criteria for Continuous phenomena applied Transmitters (CT)

The performance criteria A shall apply.

Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an ACKnowledgement (ACK) or Not ACKnowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

Performance criteria for Transient phenomena applied Transmitters (TT)

The performance criteria B shall apply, except for voltage dips of 100ms and voltage interruptions of 5000 ms duration, for which performance criteria C shall apply.

Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In system using acknowledgement signals, it is recognized that an acknowledgement (ACK) or not-acknowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

Performance criteria for Continuous phenomena applied Receivers (CR)

The performance criteria A shall apply.

Where the EUT is a *transceiver*, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of test is correctly interpreted.

Performance criteria for Transient phenomena applied Receivers (TR)

The performance criteria B shall apply, except for voltage dips of 100ms and voltage interruptions of 5000 ms duration, for which performance criteria C shall apply.

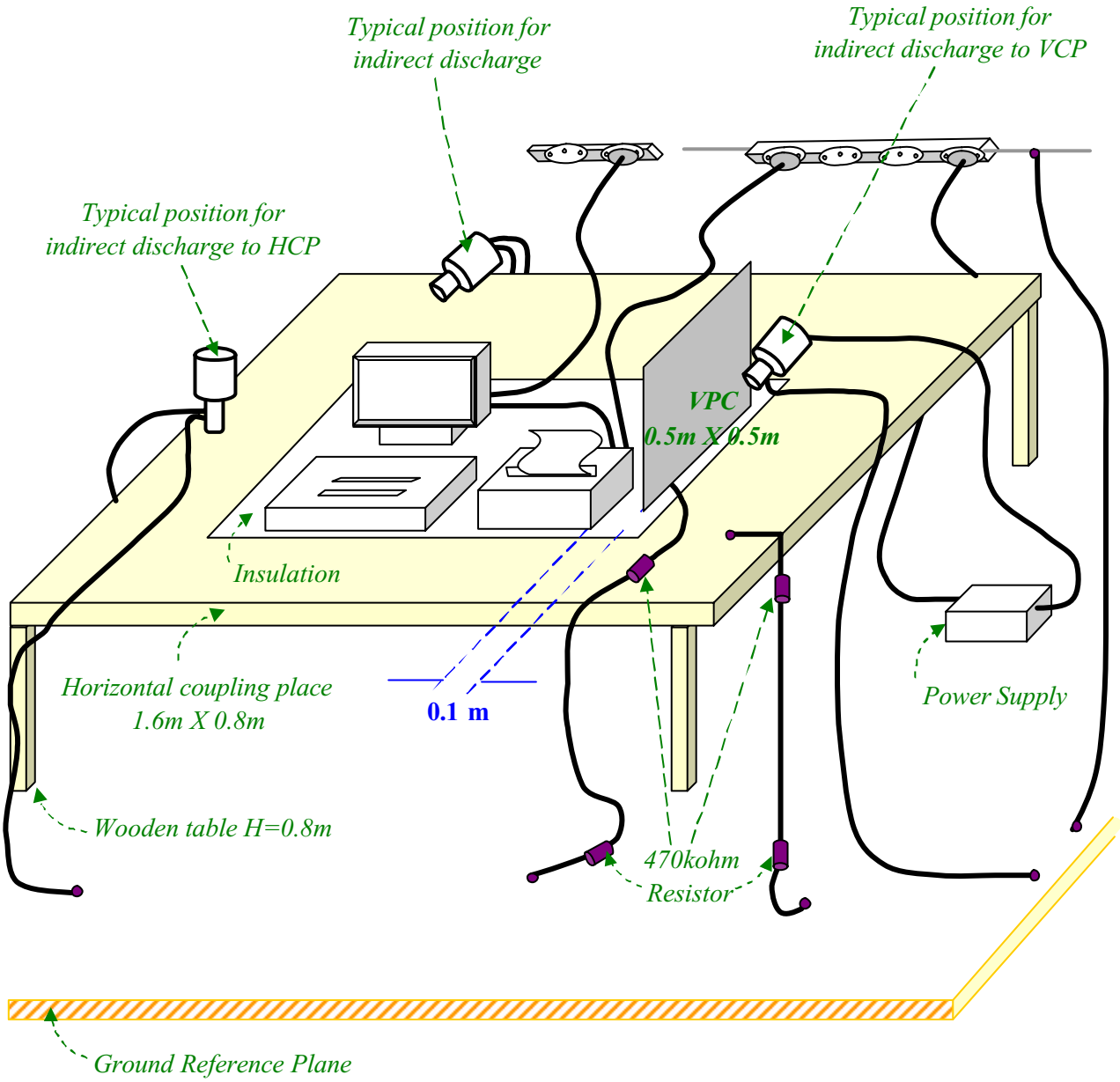
Where the EUT is a *transceiver*, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of test is correctly interpreted.

Chapter 4 Electrostatic Discharges Immunity Test

ESD Test information:

Test setup: Shielded room, According to EN 61000-4-2

Test setup for table-top equipment at laboratory tests:



Test levels: (Apply Level 2 and Level 3)

1a — Contact discharge		1b — Air discharge	
Level	Test voltage (kV)	Level	Test voltage (kV)
1	2	1	2
2	4	2	4
3	6	3	8
4	8	4	15
X	Special	X	Special
NOTE: "X" is an open level. The level has to be specified in the dedicated equipment specification. If higher voltages than those shown are specified, special test equipment may be needed.			

Test Voltage: (X) 4KV contact discharge (X) 8KV air discharge

Indirect Discharges: (X) HCP (X) VCP

Polarity: (X) Positive (X) Negative

Test mode: Refer to Test method of Chapter 1

Test points: Chassis of EUT.

Test instruments:

Name	Model Number	Serial Number	Selected
Best Plus BURST ESD SURGE TRANSIENTS	Best Plus V6.2	199749-019SC	
BEST EMC Test Instrument	BEST EMC V2.3 (-8, -9)	199918-006SC	
KeyTek Instrument ESD Test system	Series 2000	9204303/9204310 9209226/9301395	X
NoiseKen Electrostatic Discharge Simulator	ESS-100L(A)	2100C03605	
NoiseKen Electrostatic Discharge Gun	TC-815P	2100C03566	

Comment:

Performance Criteria: **(According to ETSI EN 301 489-1)**

(X) Enclosure	( )CT	(X)TT	( ) CR	(X)TR
( ) Signal and control ports	( )CT	( )TT	( ) CR	( )TR

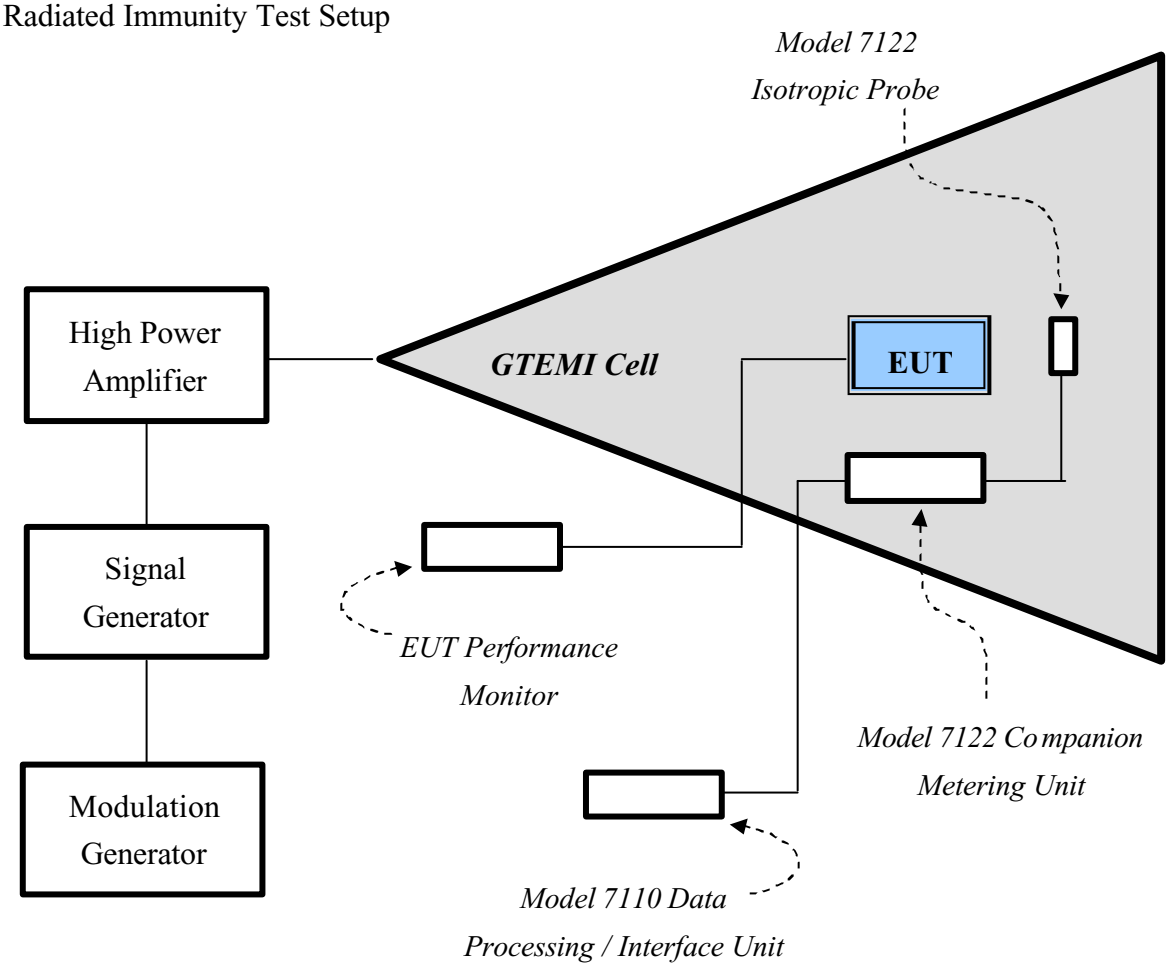
EN 61000-4-2 PHOTO OF TEST SET-UP

Chapter 5 Radio Frequency Immunity Test (RS)

RS Test information:

Test setup: GTEM cell

Radiated Immunity Test Setup



Test levels: **(Apply Level 2)**

Level	Test Field Strength (V/m)
1	1
2	3
3	10
X	Special
NOTE: the "X" is an open test level. This level may be given in the product specification.	

Field strength: (X) 3V/m at 80 ~ 1000 MHz
(X) 3V/m at 1400 ~ 2000 MHz
Modulation: ( ) FM %
(X) 80% AM Modulation with 1KHz
( ) 80% AM Modulation with 400Hz when signal is modulated at 1kHz
( ) 900 KHz±5 KHz with PM 200 Hz and 100% depth
Step size: (X) 1% step size
Sweep time: (X) 2.5 Second

Test mode: Ref. Test method of Chapter 1

Test instruments:

Name	Model Number	Serial Number	Selected
EMCO GTEM	5317	9411-1123	X
EMCO Probe	7122	9406-1194	X
EMCO METERING UNIT	7122	9406-1194	X
EMCO data interface	7110	9410-1273	X
HP Personal Computer	D3178A	3438S00486	X
HP Signal Generator	8657B	2928U00286	X
HP Signal Generator	83711A	3429A00434	X
IFI Wideband Amplifier	SMX50	467-0795	X
Min-circuit Amplifier	GFL-2500VH	N/A	X
WG radiation meters	EMC-20	BN2244129	X
WG E-filed	2244 / 90.20	Z-0001	X
HP Transmission Test Set	4935A	3115A24046	X
B & K Precision Sound Level Meter	Type 2232	1810564	X

Comment:

Performance Criteria: **(According to ETSI EN 301 489-1)**

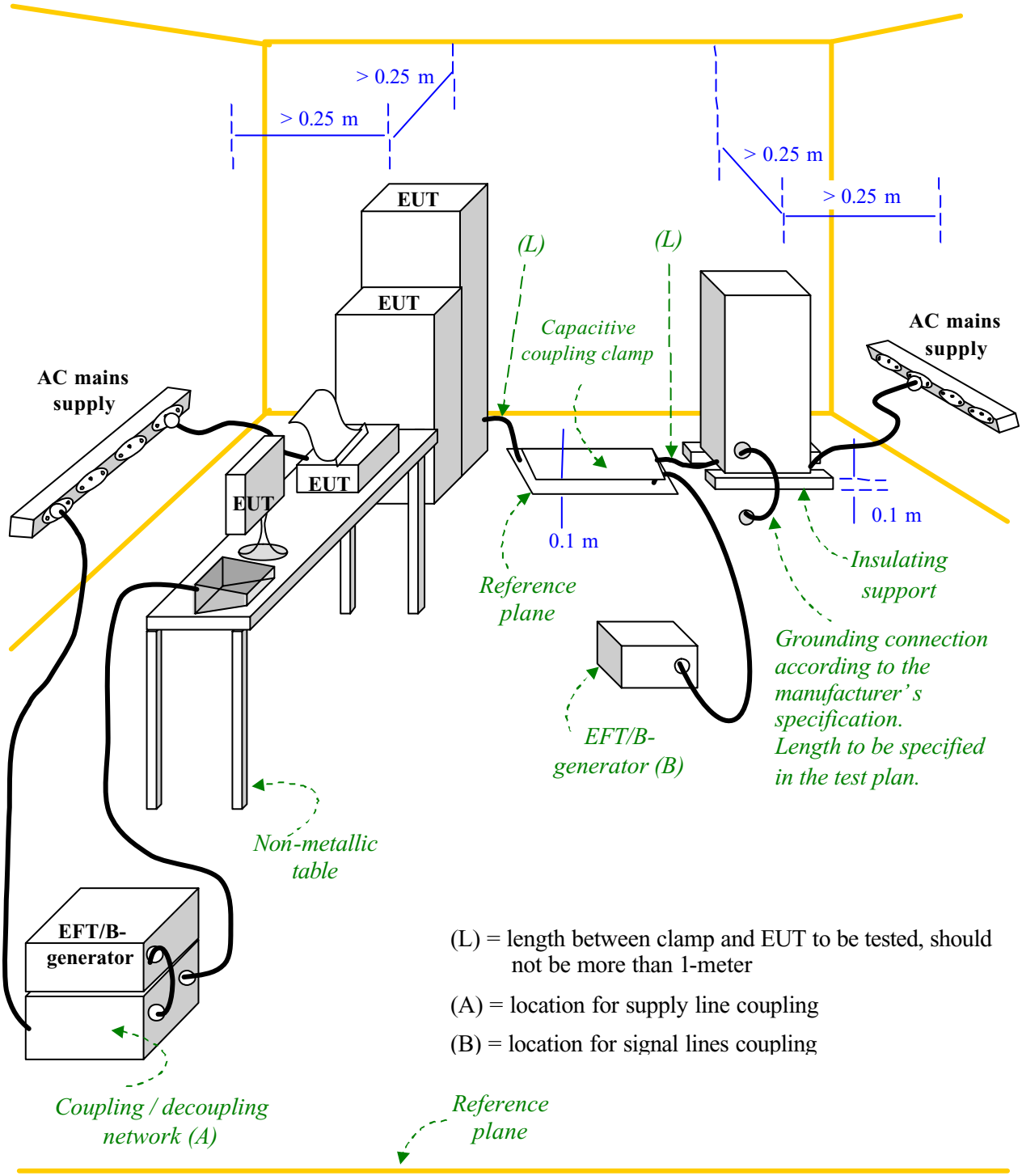
(X) Enclosure (X)CT ( )TT (X) CR ( )TR

EN 61000-4-3 PHOTO OF TEST SET-UP

Chapter 6 Electric Fast Transient/Burst Requirements Test

EFT Test information:

General test set-up for laboratory type tests:



Test levels: **(Apply Level 2)**

Open-circuit output test voltage (±10%) and repetition rate of the impulses (±20%)				
Level	On power supply port, PE		On input/output signal, data and control ports	
	Voltage peak kV	Repetition rate kHz	Voltage peak kV	Repetition rate kHz
1	0.5	5	0.25	5
2	1	5	0.5	5
3	2	5	1	5
4	4	2.5	2	5
X	Special	Special	Special	Special
NOTE: the "X" is an open level. The level has to be specified in the dedicated equipment specification				

Test setup: According to EN 61000-4-4

Test Voltage: DC Power line ( ) 0.5 KV, 5 KH
AC Power line (X) 1 KV, 5 KHz
Signal & Control line ( ) 0.5 KV, 5 KHz; ( ) 1 KV, 5 KHz

Polarity: (X) Positive (X) Negative

Test Duration: (X) 1 minute ( ) 3 minutes

Connected lines: ( ) Power line shielded (X) Power line non-shielded
( ) Signal & Control line non-shielded
( ) Signal & Control line shielded

Test mode: Ref. Test method of Chapter 1.

Test instrument:

Name	Model Number	Serial Number	Selected
Best Plus BURST ESD SURGE TRANSIENTS	Best Plus V6.2	199749-019SC	
BEST EMC Test Instrument	BEST EMC V2.3 (-8, -9)	199918-006SC	
KeyTek Instrument EFT Test system	E412	9505206/505207	X

Comment:

Performance Criteria: **(According to ETSI EN 301 489-1)**

( ) Signal and control ports	( )CT	( )TT	( ) CR	( )TR
( ) DC power input ports	( )CT	( )TT	( ) CR	( )TR
(X) AC mains input ports	( )CT	(X)TT	( ) CR	(X)TR

EN 61000-4-4 PHOTO OF TEST SET-UP

Chapter 7 Surge Immunity Test

Surge Test information:

Test setup: According to *EN 61000-4-5*

Test levels: **(Apply Level 2 and Level 3)**

Level	Test Field Strength (kV)
1	0.5
2	1.0
3	2.0
4	4.0
X	Special
NOTE: the "X" is an open class. This level may be specified in the product specification.	

Test Voltage: DC Power line ( ) 0.5 KV
AC Power line ( ) Line – Line: 1KV
( ) Line – Ground: 2KV
(X) Line – Line: 0.5KV
(X) Line – Ground: 1KV
Control line ( ) 0.5 KV
Signal ( ) 1 KV, ( ) 0.5KV

Time: (X) 1.2/50μs [8/20μs]

Polarity: (X) Positive (X) Negative

Connected lines: ( ) Power line shielded
(X) Power line non-shielded
( ) Signal & Control line non-shielded
( ) Signal & Control line shielded

Test mode: Ref. Test method of Chapter 1.

Test instrument:

Name	Model Number	Serial Number	Selected
Best Plus BURST ESD SURGE TRANSIENTS	Best Plus V6.2	199749-019SC	
BEST EMC Test Instrument	BEST EMC V2.3 (-8, -9)	199918-006SC	
KeyTek Pulsed-EMI Test System	E103, 501B, E502B, E503, E505A, E4552A	0008260 ~0008264, 0008254	X

Comment:

Performance Criteria: **(According to ETSI EN 301 489-1)**

(X) AC mains input ports	( )CT	(X)TT	( ) CR	(X)TR
( ) Signal and control ports	( )CT	( )TT	( ) CR	( )TR

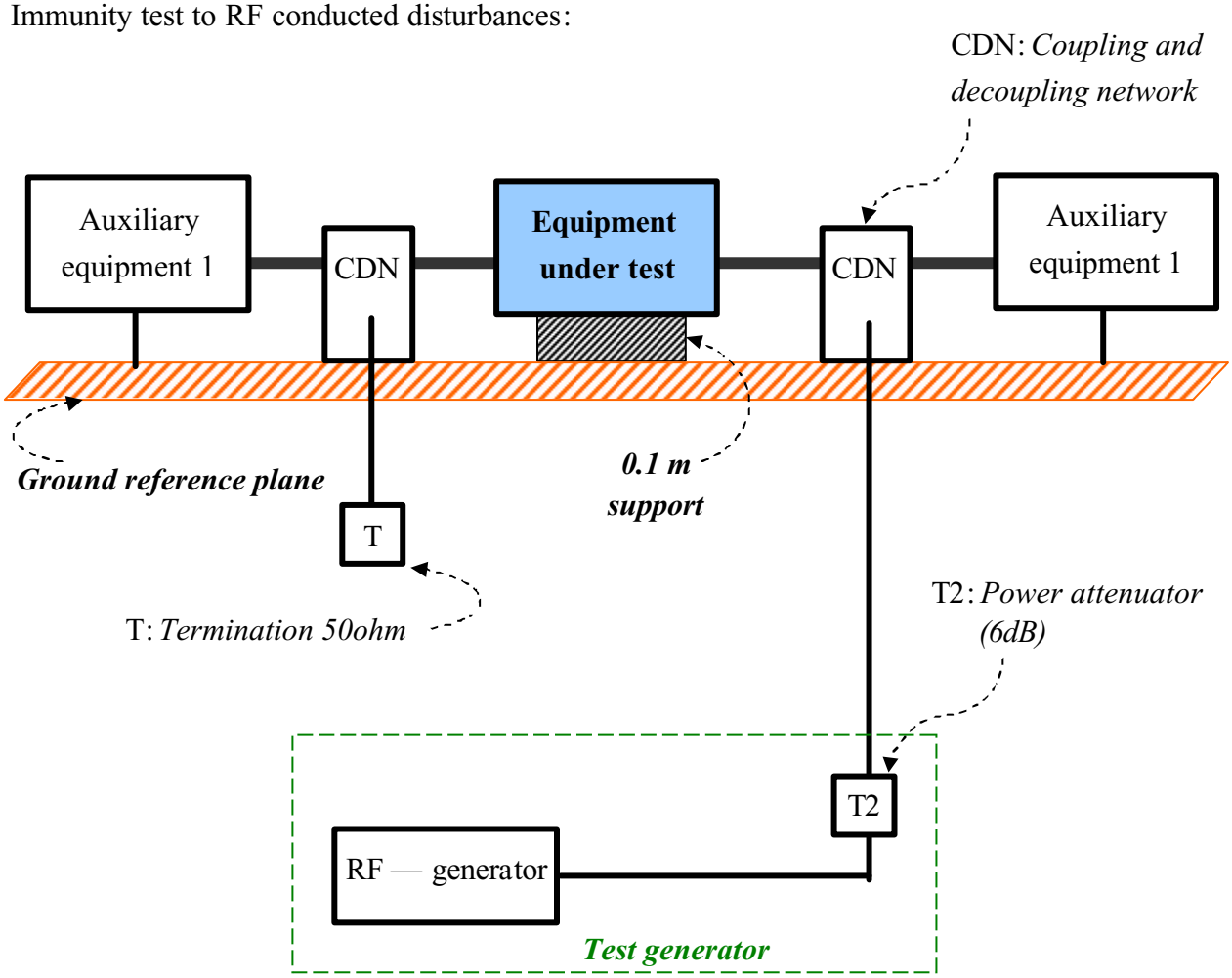
EN 61000-4-5 PHOTO OF TEST SET-UP

Chapter 8 Continuous Wave Voltage Immunity Test

CS Test information:

Test setup: According to EN 61000-4-6

Immunity test to RF conducted disturbances:



Test levels: **(Apply Level 2)**

Frequency range 150kHz to 80MHz		
Level	Voltage level (e.m.f.)	
	Uo [dB(μv)]	*Uo* [V]
1	120	1
2	130	3
3	140	10
X	Special	
NOTE: the "X" is an open test level.		

Test Frequency: (X) 0.15 ~ 80MHz

Modulation: ( ) FM %
(X) 80% AM Modulation with 1kHz
( ) 80% AM Modulation with 400Hz when signal is modulated at 1kHz
( ) 900 MHz±5 MHz with PM 200 Hz and 50% duty cycle

Step size: ( ) Performed over the frequency range 150kHz to 80MHz with the exception of an exclusion band for transmitters, and for receivers and duplex transceivers
(X) For receivers and transmitters the stepped frequency increments shall be 1% frequency increment of the momentary frequency in the frequency range 150kHz to 80MHz, unless specified otherwise in the part of EN 301 489 dealing with the particular type of radio equipment

Field strength: ( ) 1Vrms (X) 3Vrms ( ) 10Vrms

Connected lines: ( ) Power line shielded
(X) Power line non-shielded
( ) Signal & Control line non-shielded
( ) Signal & Control line shielded

Test mode: Ref. Test method of Chapter 1

Test instruments:

Name	Model Number	Serial Number	Selected
FRANKONIA EMV–Mess–System	CIT-10	103A3113	X
FRANKONIA CDN	M2+M3	A3011015	X
FRANKONIA CDN	T2-801	A3010002	
FRANKONIA CDN	T4-801	A3015004	
FRANKONIA CDN	S1-801	A3005002	
SCHAFFNER FM-Koppelzange	KEMZ 801	17045	
SCHAFFNER RF-SYNTHE SIZERIAMP21FIER	NSG 2070-1	1020	
SCHAFFNER CDN	M325	13773	
SCHAFFNER CDN	M216	15604	
SCHAFFNER CDN	T004	15230	
SCHAFFNER CDN	S501	15167	
SCHAFFNER FM-Koppelzange	KEMZ 801	14301	
HP Transmission Test Set	4935A	3115A24046	
B & K Precision Sound Level Meter	Type 2232	1810564	

Comment:

Performance Criteria: *(According to ETSI EN 301 489-1)*

( ) Antenna port	( )CT	( )TT	( ) CR	( )TR
( ) Signal and control ports	( )CT	( )TT	( ) CR	( )TR
( ) DC power input ports	( )CT	( )TT	( ) CR	( )TR
(X) AC mains input ports	(X)CT	( )TT	(X) CR	( )TR

EN 61000-4-6 PHOTO OF TEST SET-UP

Chapter 9 Voltage DIP / Interruption Test

DIP Test information:

Test setup: According to *EN 61000-4-11*

Voltage dips: (X) 30%, 0.01 Second
(X) 60%, 0.1 Second

Voltage interruptions: (X) > 95%, 5 Seconds

Test mode: Ref. Test method of Chapter 1

Test instruments:

Name	Model Number	Serial Number	Selected
Best Plus BURST ESD SURGE TRANSIENTS	Best Plus V6.2	199749-019SC	
BEST EMC Test Instrument	BEST EMC V2.3 (-8, -9)	199918-006SC	
Partner EMS Tester	Transienter-1000	PIO	X

Comment:

Performance Criteria: (According to ETSI EN 301 489-1)

Dips 30%:	(X) CT	( ) TT	(X) CR	( ) TR
Dips 60%:	( ) CT	( ) TT	( ) CR	( ) TR
Interruptions >95%:	( ) CT	( ) TT	( ) CR	( ) TR

No unintentional responses shall occur at the end of the test;

( )Event of loss of function(s) ( )Event of loss of user stored data

Performance Criteria: (According to ETSI EN 301 489-17)

Dips 60%, 100 ms :	( ) A	( ) B	(X) C
Interruptions >95%, 5 000 ms:	( ) A	( ) B	(X) C

EN 61000-4-11 PHOTO OF TEST SET-UP

Chapter 10 Harmonics Test

Test information:

Test setup: According to EN 61000-3-2

Test item: Quasi – stationary & Fluctuating Current Harmonics Test.

Test mode: Ref. Test method of Chapter 1

Test instrument:

Name	Model Number	Serial Number	Selected
Harmonic/Flicker Test System	HP 6842A	3531A-00102	X

Test Equipment Settings:	Quasi-stationary Current Harmonics Test	Fluctuating Current Harmonics Test
Line Voltage	230VAC	230VAC
Line Frequency	50Hz	50Hz
Device Class	D	D
Test Limit Overrides	None	None
Total Number of Failures:	None	None
Total Number of Errors:	None	None

Test Result: Pass

Chapter 11 Voltage Fluctuation and Flicker Test

Test information:

Test setup: According to *EN 61000-3-3*

Test mode: Ref. Test method of Chapter 1

Test instrument:

Name	Model Number	Serial Number	Selected
Harmonic/Flicker Test System	HP 6842A	3531A-00102	X

Test Equipment Settings:

Line Voltage	230VAC
Line Frequency	50Hz
Test Limit Overrides	None
Total Number of Failures:	Pst: (0), Plt: (0)
	Dc: (0), Dmax (0), Dt (0)
Total Number of Errors:	None

Test Result: Pass

Chapter 12 Conducted Emission Test

Test condition and setup

All the equipment is placed and setup according to *EN 55022*.

Mains power:

The EUT is assembled on a wooden table, which is 80 cm high and placed 40 cm from the back-wall, which is a vertical conducting plane. One LISN is for EUT, the other LISN is for support equipment. They are all placed on the conductive ground. The EUT' s LISN connect a line switch box for selecting L1 or L2, then connect to a preamplifier and spectrum.

The spectrum scans from 150KHz to 30MHz. Conducted emission levels are detected at *maximum peak mode*. But if the maximum peak mode failed or over *average limit*, it will be measured by *average detection mode*.

While testing the worst-emission plot printed in the *peak detection mode*, and there are up to 6 highest emissions to be recorded. The plot is kept as the original data and not included in the test report.

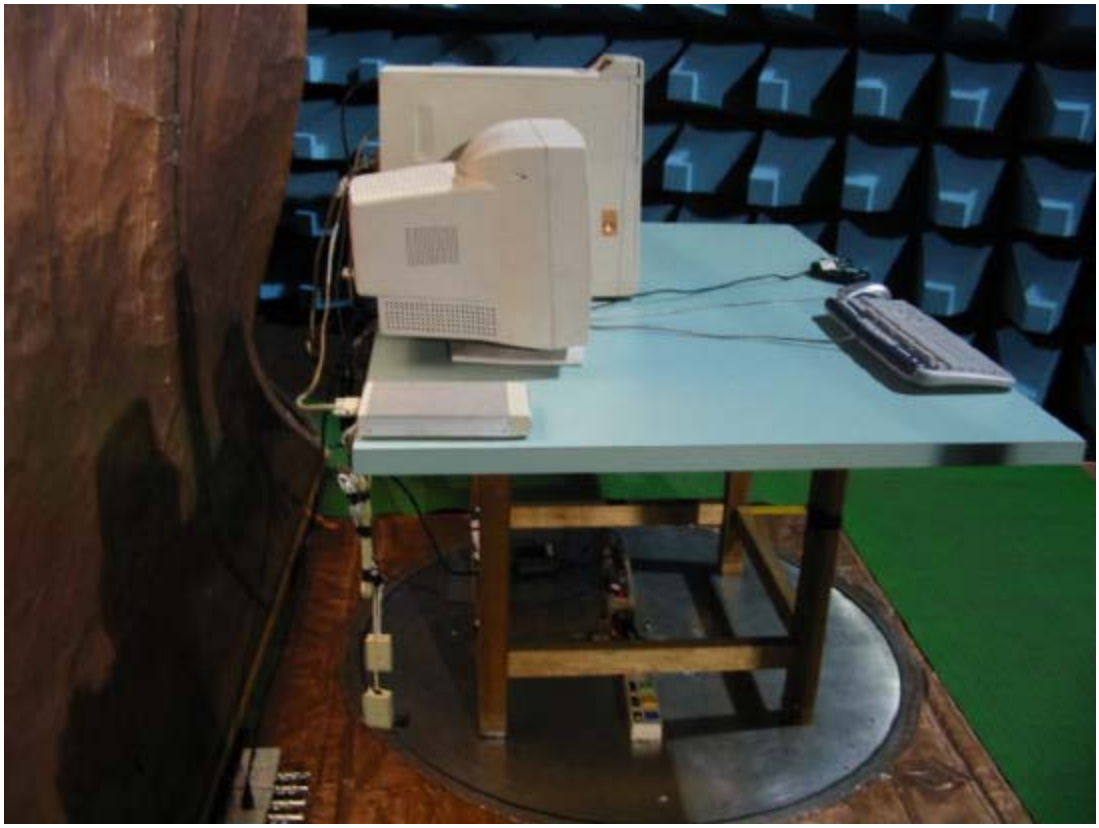
List of test Instrument

Calibration Date

Instrument Name	Model	Brand	Serial No.	Next time
EMI Receiver	8546A	HP	3520A00242	08/05/05
RF Filter Section	85460A	HP	3448A00217	08/05/05
LISN (EUT)	LISN-01	TRC	99-05	10/07/05
LISN (Support E.)	LISN-01	TRC	9912-03, 04	11/04/05
Pre-amplifier	15542 ZFL-500	Mini – Circuits	0 0117	05/20/05
6dB Attenuator	MCL BW-S6W2	Mini – Circuits	9915 – Conducted	05/20/05
10dB Attenuator	A5542 VAT010	Mini – Circuits	0215 – Conducted	05/20/05
Coaxial Cable (2 meter)	A30A30-0058-50FS-2M	Jyebao	SMA-08	05/20/05
Coaxial Cable (1.1 meter)	A30A30-0058-50FS-1M	Jyebao	SMA-09	05/20/05
Coaxial Cable (20 meter)	RG-214/U	Jyebao	NP-01	05/20/05
Coaxial Cable (20 meter)	RG-214/U	Jyebao	NP-02	05/20/05
Auto Switch Box (< 30MHz)	ASB-01	TRC	9904-01	05/20/05

The level of confidence of 95%, the uncertainty of measurement of conducted emission is +2.43dB / -2.53dB.

Conducted Test Placement (Front view and Side view)



Test Result of Conducted Emissions for Mains power

Test Conditions: Temperature : 25 °C Humidity : 73 % RH

Power Connected Emissions					*Class B*		
Conductor	*Frequency (KHz)*	*Peak (dBμV)*	*QP (dBμV)*	*Average (dBμV)*	*QP-limit (dBμV)*	*AVG-limit (dBμV)*	*Margin (dB)*
Line 1	197.000	32.95	---	---	64.66	54.66	-21.71
	331.000	29.21	---	---	60.83	50.83	-21.62
	528.000	29.79	---	---	56.00	46.00	-16.21
	788.000	28.02	---	---	56.00	46.00	-17.98
	4406.000	32.88	---	---	56.00	46.00	-13.12
	5940.000	29.86	---	---	60.00	50.00	-20.14
	6000.000	29.09	---	---	60.00	50.00	-20.91
	6140.000	29.49	---	---	60.00	50.00	-20.51
Line 2	262.000	30.37	---	---	62.80	52.80	-22.43
	329.000	33.12	---	---	60.89	50.89	-17.77
	533.000	33.19	---	---	56.00	46.00	-12.81
	788.000	31.05	---	---	56.00	46.00	-14.95
	4406.000	32.37	---	---	56.00	46.00	-13.63
	4762.000	30.47	---	---	56.00	46.00	-15.53
	6460.000	30.91	---	---	60.00	50.00	-19.09
	6670.000	30.53	---	---	60.00	50.00	-19.47

Note:

1. The reading amplitudes are all under limit.
2. Testing result = Amplitude reading + Correction factor (Insertion loss of LISN, Cable loss, Attenuator, Amplifier and so on)

Chapter 13 Radiated Emission Test

Test condition and setup

Pretest: Prior to the final test (OATS test), the EUT is placed in a shielded enclosure, and scan from 30MHz to 1GHz. This is done to ensure the radiation is exactly emitted from the EUT.

Final test: Final radiation measurements are made on a **10 – meter,** open-field test site. The EUT is placed on a nonconductive table, which is 0.8m height, the top surface is 1.0 x 1.5 meter. The entire placement is according to *EN 55022*.

The whole range antenna is used to measure frequency from 30 MHz to 1GHz. The final test is used the spectrum analyzer (EMI Receiver). Measure more than six top marked frequencies generated form pretest by computer step by step at each frequency.

The EUT is rotated 360 degrees, and antenna is raised and lowered from 1 to 4 meters to find the maximum emission levels. The antenna is used with both horizontal and vertical polarization.

Appropriated preamplifier which is made by TRC is used for improving sensitivity and precautions is taken to avoid overloading .The spectrum analyzer' s 6dB bandwidth is set to 120 kHz, and the EUT is measured at quasi-peak (below 1GHz) mode.

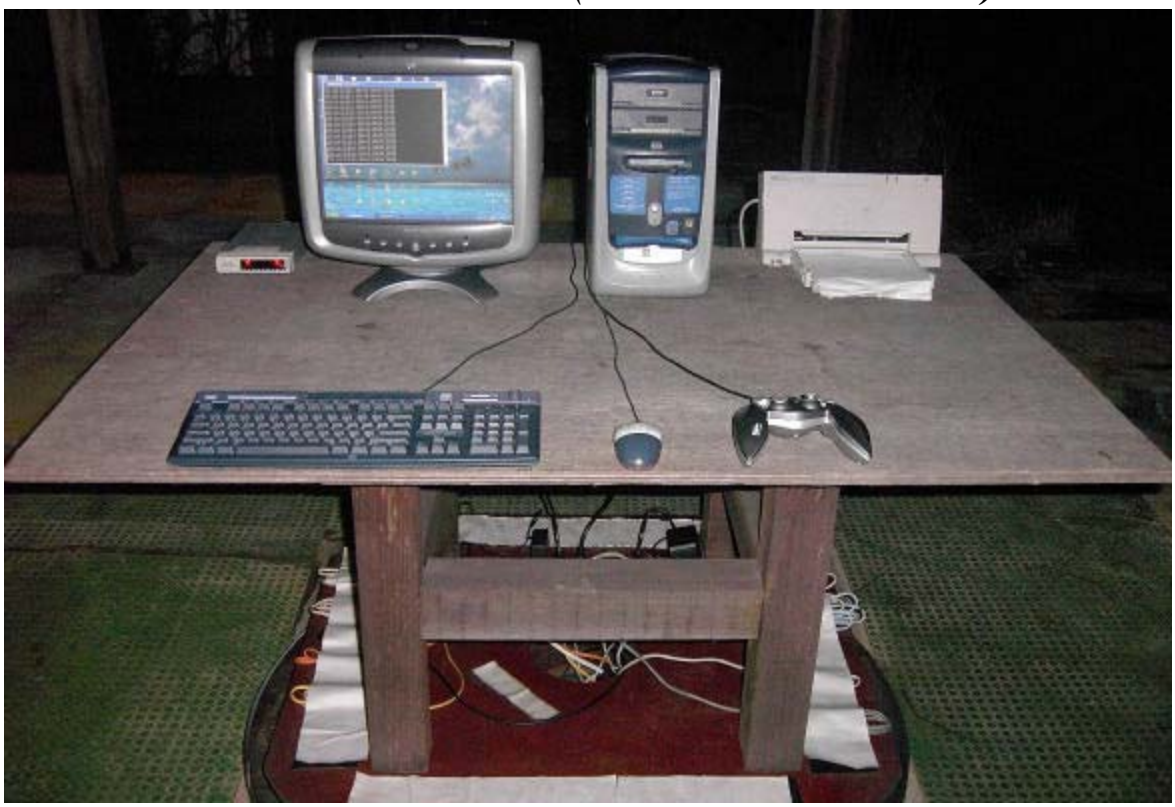
If the emission is close to the frequency band of ambient, the tester will recheck the data and the corrected data will be written in the test data sheet. If the emission is just within the ambient, the data from shielded room will be taken as the final data.

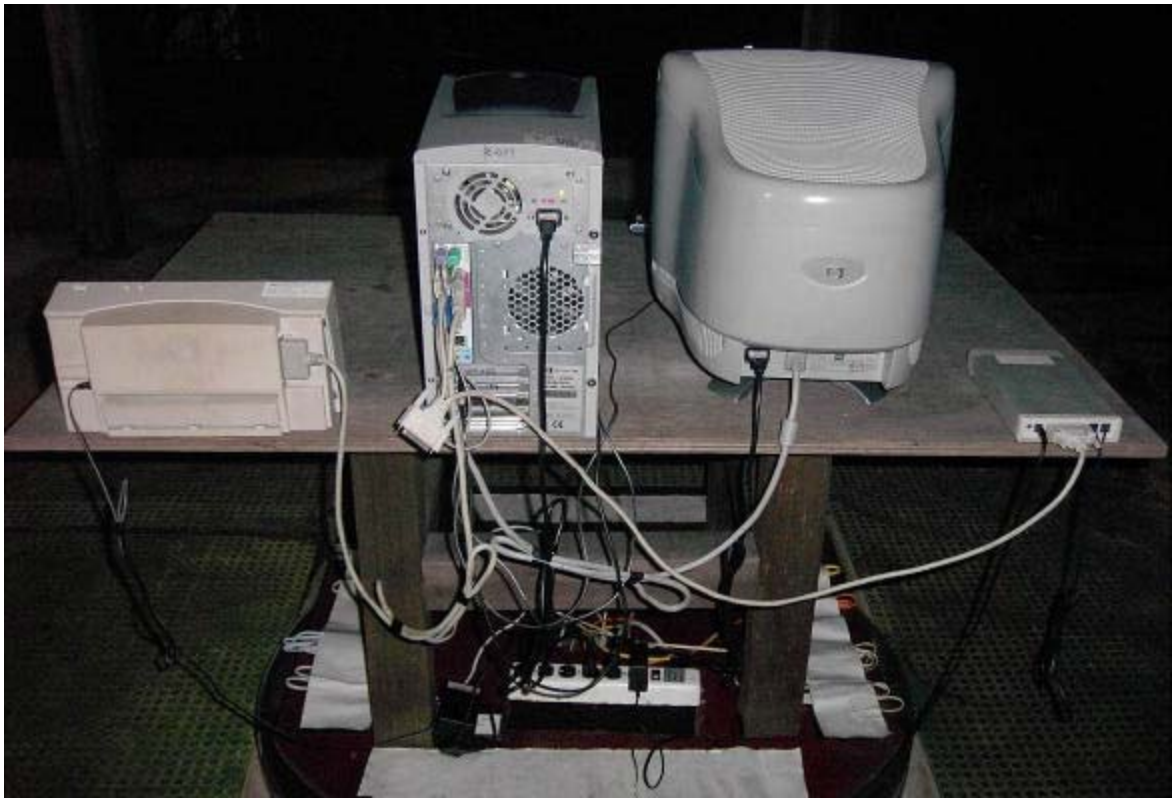
List of test Instrument

				Calibration Date
Instrument Name	**Model**	**Brand**	**Serial No.**	**Next time**
EMI Receiver	8546A	HP	3520A00242	08/05/05
RF Filter Section	85460A	HP	3448A00217	08/05/05
Small Biconical Antenna	UBAA9114 & BBVU9135	SCHWARZECK	127	10/11/05
Pre-amplifier	PA1F	TRC	1FAC	05/20/05
Auto Switch Box (>30MHz)	ASB-01	TRC	9904-01	05/20/05
Coaxial Cable (Double shielded, 15 meter)	A30A30-0058-50FS-15M	JYEBAO	SMA-08	05/20/05
Coaxial Cable (1.1 meter)	A30A30-0058-50FS-1M	JYEBAO	SMA-02	05/20/05
Receiver	SCR3102	SCHAFFNER	012	05/13/05
Control Box	TWR95-4	TRC	C9001-2	N/A
Antenna	CBL6141A	SCHAFFNER	4206	05/26/05
Pre-amplifier	TRC-CB-2	TRC	CB-002	05/28/05
Coaxial cable (20 meter)	RG-214/U	JYEBAO	Cl-002	05/28/05
Coaxial Cable (50 cm)	BNC31VB-0316	JYEBAO	SMA-02	05/28/05
Coaxial Cable (1.1 meter)	BNC31VB-0318	JYEBAO	SMA-02	05/28/05
Coaxial Cable (1.1 meter)	BNC31VB-0316	JYEBAO	SMA-02	05/28/05
Coaxial Cable (1.1 meter)	BNC31VB-0316	JYEBAO	SMA-02	05/28/05

The level of confidence of 95% , the uncertainty of measurement of radiated emission is +2.85dB / -2.77dB .

Radiated Test Placement (Front view and Rear view)





Test Result of Spurious Radiated Emissions

Test Conditions:

Testing room : Temperature : 25 ° C Humidity : 73 % RH

Testing site : Temperature : 22 ° C Humidity : 65 % RH

Test Result of Spurious Radiated Emissions for 30MHz to 1GHz [Horizontal]

Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Class B Limit	Margin
MHz	dBμV	m	degree	dB/m	dBμV/m	dBμV/m	dB
75.7728	31.57	2.29	270	-10.17	21.40	30.00	-8.60
355.8113	16.48	1.00	156	2.04	18.52	37.00	-18.48
552.0938	12.11	1.88	47	8.17	20.28	37.00	-16.72
753.7826	11.47	1.00	156	14.28	25.75	37.00	-11.25

Test Result of Spurious Radiated Emissions for 30MHz to 1GHz [Vertical]

Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Class B Limit	Margin
MHz	dBμV	m	degree	dB/m	dBμV/m	dBμV/m	dB
39.4230	24.17	2.48	308	-0.47	23.70	30.00	-6.30
54.9095	22.98	1.00	43	-6.52	16.46	30.00	-13.54
76.9673	32.50	1.00	30	-10.12	22.38	30.00	-7.62
169.3797	27.12	1.00	359	-5.88	21.24	30.00	-8.76
338.7602	20.98	1.00	9	0.98	21.96	37.00	-15.04
432.0596	17.70	2.47	63	5.24	22.94	37.00	-14.06

Note:

1. Margin = Amplitude – limit, *if margin is minus means under limit.*
2. Corrected Amplitude = Reading Amplitude + Correction Factors
3. Correction factor = Antenna factor + (Cable Loss – Amplitude gain) + Switching Box Loss

Copy of the R&TTE Declaration of Conformity (DoC)

Declaration of Conformity

We, the under signed,

Company	CAMEO COMMUNICATIONS, INC.
Address, City	No. 42, Min Chuan East Road, Section 6, Taipei 114,
Country	Taiwan
Phone number	886-2-27908998
Fax number	886-2-27909463
E-mail	Jason_Chang@mail.cameo.com.tw

certify and declare under our sole responsibility that the following equipment:

Product Description / Supplementary Info	802.11g Wireless PCI Adapter
Manufacturer	CAMEO COMMUNICATIONS, INC.
Brand	CAMEO, Level One, LG, Etherwan, Allnet GmbH
Type	WLG-1202, WNC-0300, LWS5410P, NWP-0108G, ALL0281A

is tested to and conforms with the essential radio test suites included in the following standards:

Standard	**Issue date**
ETSI EN 300 328-2	V1.2.1 Dec. 2001
ETSI EN 301 489-1	V1.4.1 Aug. 2002
ETSI EN 301 489-17	V1.2.1 Apr. 2002
EN 60950-1	2001

and therefore complies with the essential requirements and provisions of the **R&TTE directive 1999/5/EC** of the European Parliament and of the council of 9March 1999 on radio equipment and Telecommunications Terminal Equipment and the mutual recognition of their conformity and the requirements of Annex IV (conformity Assessment procedure referred to in article 10(4)).

The following Notified Bodies have been consulted in the Conformity Assessment procedure:

Notified Body number	**Name and address**
0470	Nemko, PO Box 73, Blindern N-0314 Oslo, Norway

The technical documentation as required by the Conformity Assessment procedure is kept at the following address:

Company	CAMEO COMMUNICATIONS, INC.
Address, City	No. 42, Min Chuan East Road, Section 6, Taipei 114,
Country	Taiwan
Phone number	886-2-27908998
Fax number	886-2-27909463
E-mail	Jason_Chang@mail.cameo.com.tw

CE

Draw up in	TAIWAN, R.O.C.
Date	2005/4/27
	CAMEO COMMUNICATIONS, INC. No. 42, Min Chuan East Road, Section 6, Taipei 114, Taiwan
Signature & company stamp	Jason Chang / Wireless Comm. R&D Dept. Manager

Product Quality
Assurance Documents

Declaration of Product Quality Assurance

In accordance with the Conformity Assessment procedure referred to in article 10(3) of R&TTE Directive 1999/5/EC of the European Parliament and the council of 9 march 1999 on the Radio equipment and Telecommunication Terminal Equipment and their mutual recognition of their conformity (R&TTE directive) the following manufacture:

Company	CAMEO COMMUNICATIONS, INC.
Address, City	6F, NO. 22, Chung Shin Rd., Hsi-Chih,
Country	Taipei 221, Taiwan
Phone number	886-2-26499800
Fax number	886-2-26499984
E-mail	Jason_Chang@mail.cameo.com.tw

declares under its sole responsibility that it had taken the following measures in order to achieve that the manufacturing process ensures compliance of the manufactured products with the technical documentation as established by ***CAMEO COMMUNICATIONS, INC.***. under the requirements of the R&TTE directive and with the requirements of R&TTE directive that apply to them:

Number	**Measures taken in order to achieve that the manufacturing process ensures compliance of the manufactured products**
01	Manufacturing of the equipment is subcontracted by ***CAMEO COMMUNICATIONS, INC.*** to ***CAMEO COMMUNICATIONS, INC.*** located at *6F, NO. 22, Chung Shin Rd., Hsi-Chih, Taipei 221, Taiwan*. who is ISO 9001 certified for development, production and distribution of radio products. (See copy of ISO 9001 certification attached)

CE

Draw up in	TAIWAN, R.O.C.
Date	2005/4/27
	CAMEO COMMUNICATIONS, INC. No. 42, Min Chuan East Road, Section 6, Taipei 114, Taiwan
Signature & company stamp	Jason Chang / Wireless Comm. R&D Dept. Manager

DET NORSKE VERITAS

MANAGEMENT SYSTEM CERTIFICATE

Certificate No. 0083-2001-AQ-RGC-RvA

This is to certify that
the Quality Management System
of

CAMEO COMMUNICATIONS, INC.

at
6-7F, No. 22, Chung Shin Rd., Hsi-Chih, Taipei, Taiwan, R.O.C.

has been found to conform to the Quality Management System Standard:
ISO 9001:1994

This Certificate is valid for the following product or service ranges:

DESIGN AND MANUFACTURE OF DATA COMMUNICATION PRODUCTS

Original Certification date:
April 28th, 1995

This Certificate is valid until:
December 15th, 2003

Accredited by the RvA

Place and date:
Hong Kong, July 27th, 2001

for the Accredited Unit:
DNV CERTIFICATION B.V.,
THE NETHERLANDS

mpliance to the Standard in respect to the indicated scope is verified by the DNV approved registered Team Leader:

Patrick Wang
Lead Auditor

K. S. Cheung
Management Representative

91. 12. 04

Lack of fulfilment of conditions as set out in the Appendix may render this Certificate invalid.