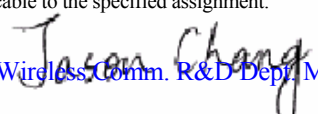




APPLICATION FORM

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 constitute 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
MANUFACTURER (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 PC Card	
MARKING ON THE PRODUCT	Model/type: WLG-1103, WPC-0300, LWS5410N, NWP-0208-G, ALL0282A Data: Other specification: 802.11g Wireless PC Card Name/trade mark/logo *) CAMEO, Level One, LG, Etherwan, Allnet GmbH	
THE ORDER COMPRISES	<input checked="" type="checkbox"/> New order <input type="checkbox"/> Repeated examination, please indicate previous Nemko Order No.: <input type="checkbox"/> Complete Nemko product certificate *) <input type="checkbox"/> Nordic Certification Service *) for: <input type="checkbox"/> Denmark <input type="checkbox"/> Finland <input type="checkbox"/> Sweden <input type="checkbox"/> Iceland *) <input type="checkbox"/> Testing for European certification (CCA), relevant countries: *) <input type="checkbox"/> Testing for international certification (CB), relevant countries: *) <input type="checkbox"/> Statement of conformity with standard for one product sample *) <input type="checkbox"/> Test report according to the following standards/specifications: <input type="checkbox"/> Attestation of conformity with: <input type="checkbox"/> The EMC-Directive <input type="checkbox"/> Other relevant Directives *) <input checked="" type="checkbox"/> Other: *) Conformity assessment for letter of opinion R&TTE Directive	
SUBMITTED/ ENCLOSED	<input type="checkbox"/> Test sample(s) <input type="checkbox"/> Extra components <input checked="" type="checkbox"/> Declaration of Identity *) <input checked="" type="checkbox"/> Test report(s) from others <input checked="" type="checkbox"/> Wiring/circuit diagram(s) <input checked="" type="checkbox"/> Part list <input checked="" type="checkbox"/> Drawing(s) <input type="checkbox"/> Certificate(s) from others <input checked="" type="checkbox"/> User's instruction <input type="checkbox"/> Mounting instruction <input checked="" type="checkbox"/> EMC test report <input type="checkbox"/> Self declaration (conformity with the EMC Directive) <input type="checkbox"/> List of applicant(s)/contact(s) in secondary countries for Nordic Certification Service *) <input checked="" type="checkbox"/> Other: See attached TCF	
SPECIAL INFORMATION	Test sample(s) after examination.: <input type="checkbox"/> Collected by applicant 1) <input type="checkbox"/> To be discarded by Nemko <input type="checkbox"/> Returned at applicant's cost Completed Questionnaire on Production surveillance *) <input type="checkbox"/> Enclosed <input type="checkbox"/> Submitted previously <input type="checkbox"/> Will be forwarded Power of Attorney *) <input type="checkbox"/> Enclosed <input type="checkbox"/> Submitted previously <input type="checkbox"/> Will be forwarded Certificate desired in: <input type="checkbox"/> English <input type="checkbox"/> Norwegian <input type="checkbox"/> Other * Delivery of result: <input type="checkbox"/> By mail <input type="checkbox"/> Preliminary by fax *) <input type="checkbox"/> 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.		
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 constitute 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 PC Card	Model/type WLG-1103, WPC-0300, LWS5410N, NWP-0208-G, ALL0282A		
RADIO TECHINCAL	Frequency range	Range 2412 to 2472 MHz	Harmonized YES	
	Channels	Number 13	Separation 5MHz	
	Output power	802.11b: 78.01 mW (e.i.r.p.) 802.11g: 40.30 mW (e.i.r.p.)		
	Modulation	DBPSK / DQPSK / CCK / OFDM		
	Type of antenna	Patch		
TCAM (if applicable)	Category			
USAGE	Intended use	Operating environment RESIDENTIAL	Portability PORTABLE	
THE ORDER COMPRISES	<input type="checkbox"/> R&TTE Directive – Module Aa (Annex III) – Radio test suite assessment (NB issues a radio test suite proposal)			
	<input type="checkbox"/> 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)			
	<input type="checkbox"/> 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	<input type="checkbox"/> Similar applications have been submitted to other Notified Bodies (must be listed on separate letter) <input type="checkbox"/> Nemko is supposed to do assessments of the quality system <input type="checkbox"/> Nemko is supposed to do annual production surveillance			
SUBMITTED DOCUMENTS	<input type="checkbox"/> Safety test report (3.1a)	<input type="checkbox"/> Technical specifications	<input type="checkbox"/> User documentation	
	<input type="checkbox"/> MPE calculation (3.1a)	<input type="checkbox"/> Principle diagrams	<input type="checkbox"/> Service documentation	
	<input type="checkbox"/> EMC test report (3.1b)	<input type="checkbox"/> Block diagrams	<input type="checkbox"/> ISO 9000 certificates	
	<input type="checkbox"/> Radio test report (3.2)	<input type="checkbox"/> Circuit diagrams	<input type="checkbox"/> Quality manual	
	<input type="checkbox"/> CEPT radio application	<input type="checkbox"/> Part lists	<input type="checkbox"/> Methods for periodic control	
	<input type="checkbox"/> List of standards	<input type="checkbox"/> Component lists		
	<input type="checkbox"/> Declaration of Conformity	<input type="checkbox"/> Sample of the product		
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 V1.4.1	
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 <i>Jason Chang</i> 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. GENERAL

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 Attorney), 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 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 applicable, for the Manufacturer when a Power of Attorney 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 differences 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.

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.

2.2 Nemko undertakes no responsibility whatsoever for damages that might occur to the test sample(s) during testing, storage or transport. As deemed 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. CERTIFICATION AND LICENSING

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 maintenance 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 Attorney as mentioned 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.

3.6 MAINTENANCE OF CERTIFICATE

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 PC Card

Application:

CAMEO COMMUNICATIONS, INC.

Manufacture:

CAMEO COMMUNICATIONS, INC.

Brand and Type/model number:

<i>Brand Name</i>	<i>Model Name</i>
CAMEO	WLG-1103
Level One	WPC-0300
LG	LWS5410N
Etherwan	NWP-0208-G
Allnet GmbH	ALL0282A

Technical Construction file in accordance with R&TTE Annex IV

Under the provisions of 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:

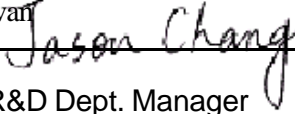
Item number	Technical Document description
01	Technical File in accordance with R&TTE directive Annex II point 4
02	Declaration of conformity to specific test suites described in R&TTE directive Annex III

For the following product:

Product Description / Supplementary Info	802.11g Wireless PC Card
Manufacturer	CAMEO COMMUNICATIONS, INC.
Brand	CAMEO, Level One, LG, Etherwan, Allnet GmbH
Type	WLG-1103, WPC-0300, LWS5410N, NWP-0208-G, ALL0282A

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,



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 of 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:

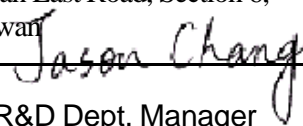
Item number	Technical Document description
01	Block diagram
02a	Circuit diagram
02b	PCB layout
02c	Part list
02d	Exterior photographs
02e	Interior photographs
02f	Label information
03a	Technical description
03b	User manual
04	R&TTE standard list
05	RF-EMC-LVD test report and corresponding annexes
06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

For the following product:

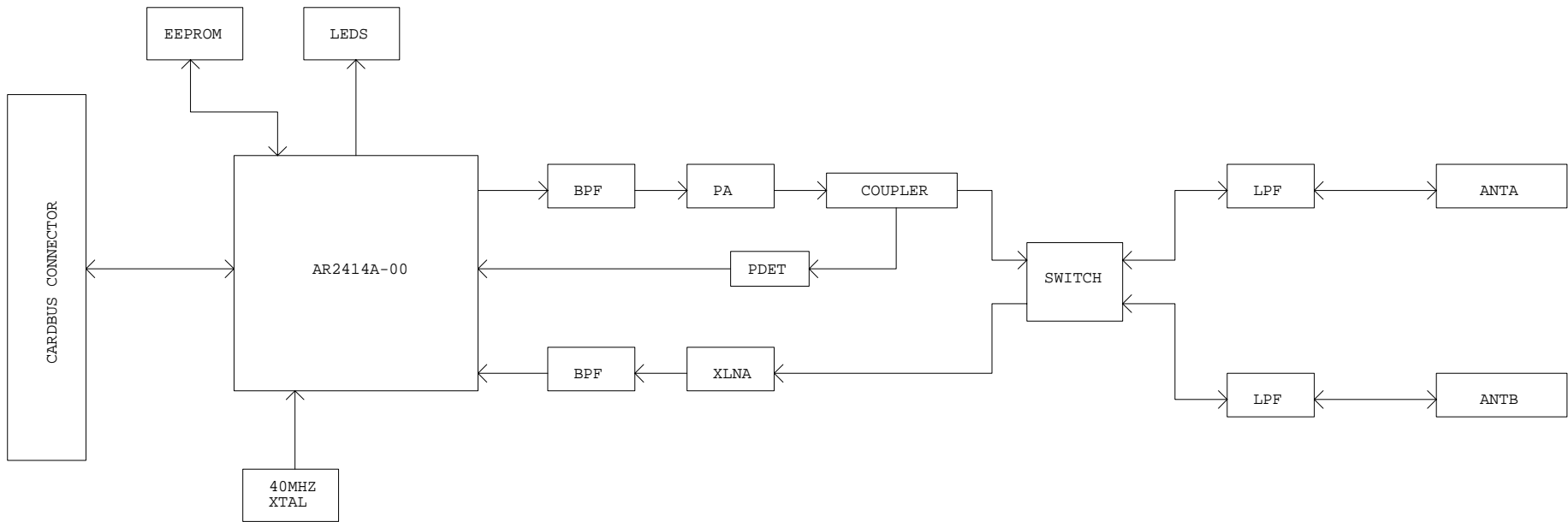
Product Description / Supplementary Info	802.11g Wireless PC Card
Manufacturer	CAMEO COMMUNICATIONS, INC.
Brand	CAMEO, Level One, LG, Etherwan, Allnet GmbH
Type	WLG-1103, WPC-0300, LWS5410N, NWP-0208-G, ALL0282A

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,

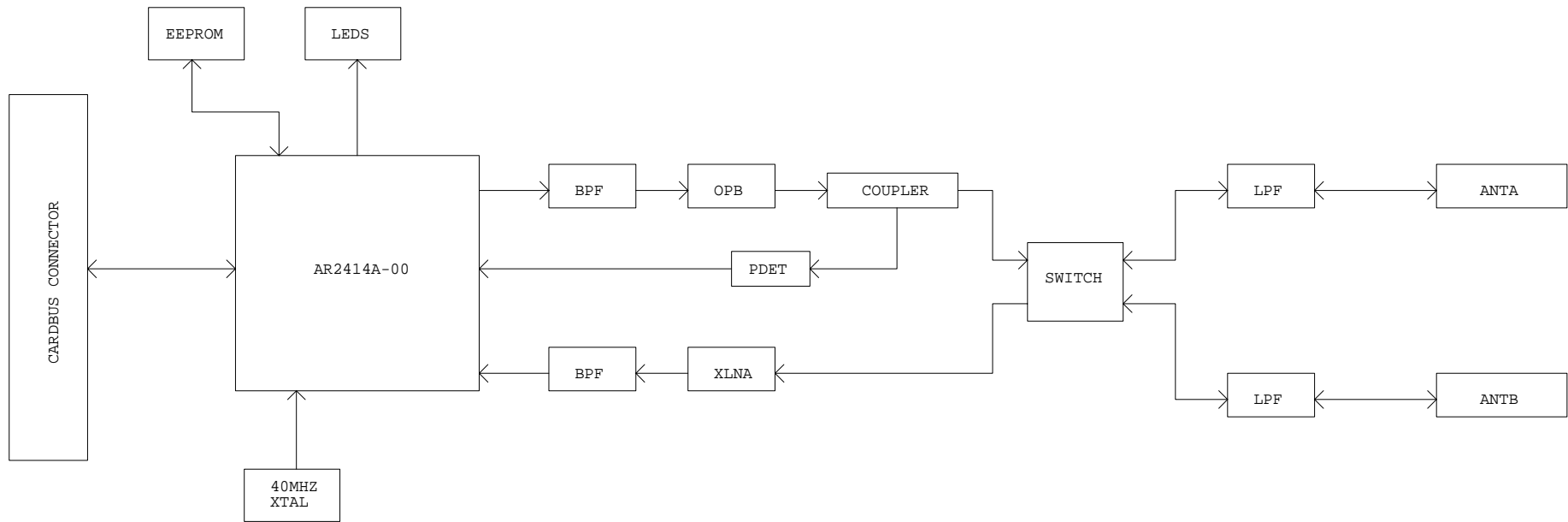


Draw up in	TAIWAN, R.O.C.
Date	2005/4/27
	CAMEO COMMUNICATIONS, INC. No. 42, Min Chuan East Road, Section 6, Taipei 114, Taiwan
Signature & company stamp	Jason Chang /  Wireless Comm. R&D Dept. Manager

Block Diagram

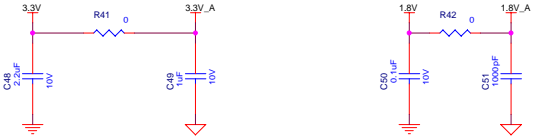
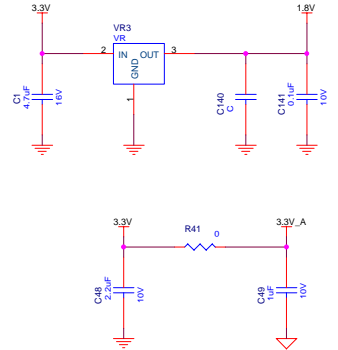
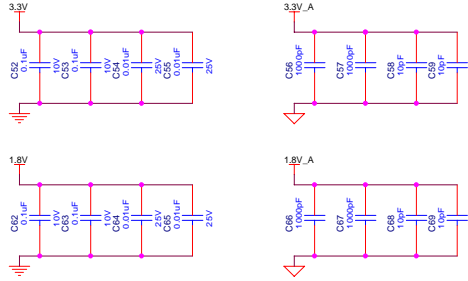


PA : PA 2409
 BPF : BAND PASS FILTER
 PDET : POWER DETECTOR
 LPF : LOW PASS FILTER
 ANTA : ANTENNA A
 ANTB : ANTENNA B
 XLNA : EXTERNAL LOW NOISE AMPLIFIER

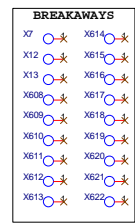
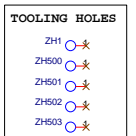
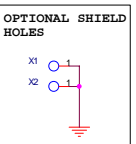
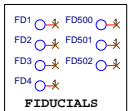
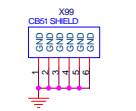
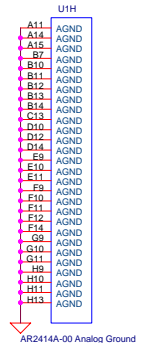
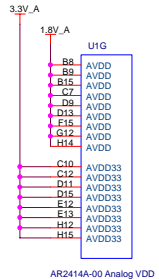
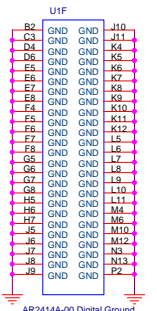
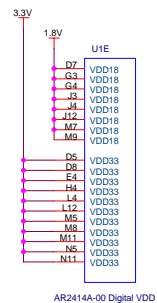


OPB : OUTPUT POWER BOOSTER
 BPF : BAND PASS FILTER
 PDET : POWER DETECTOR
 LPF : LOW PASS FILTER
 ANTA : ANTENNA A
 ANTB : ANTENNA B
 XLNA : EXTERNAL LOW NOISE AMPLIFIER

Circuit Diagram

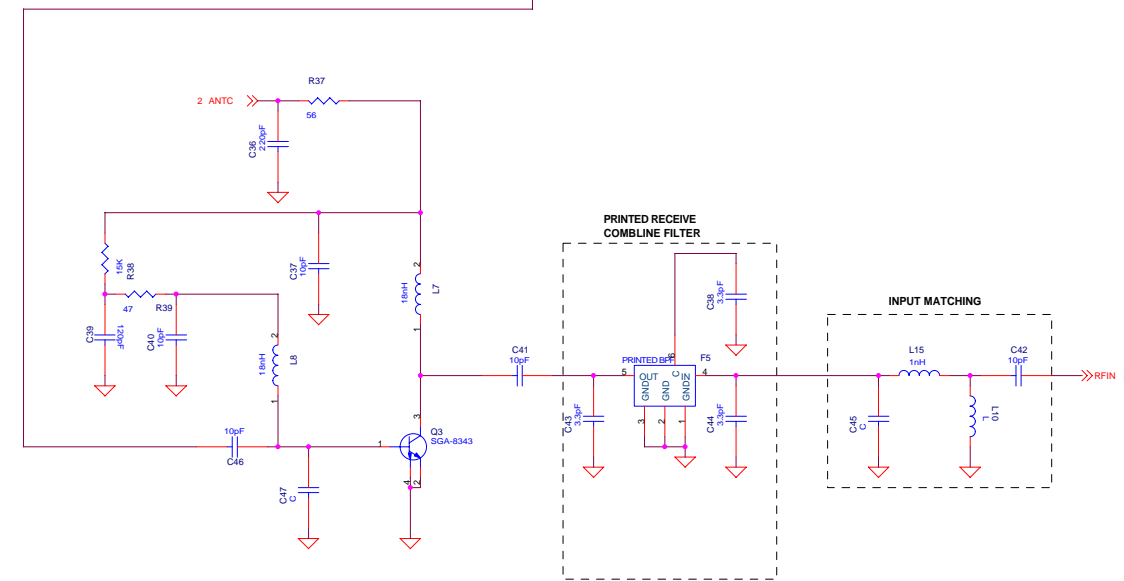
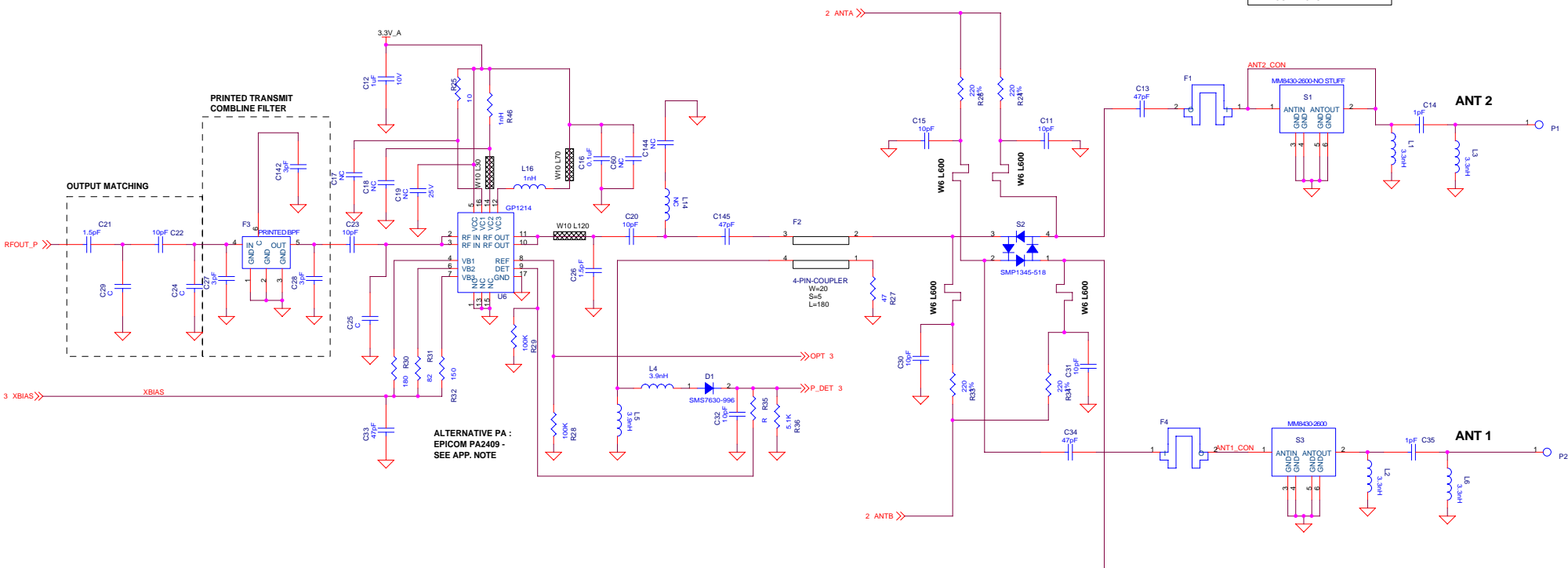


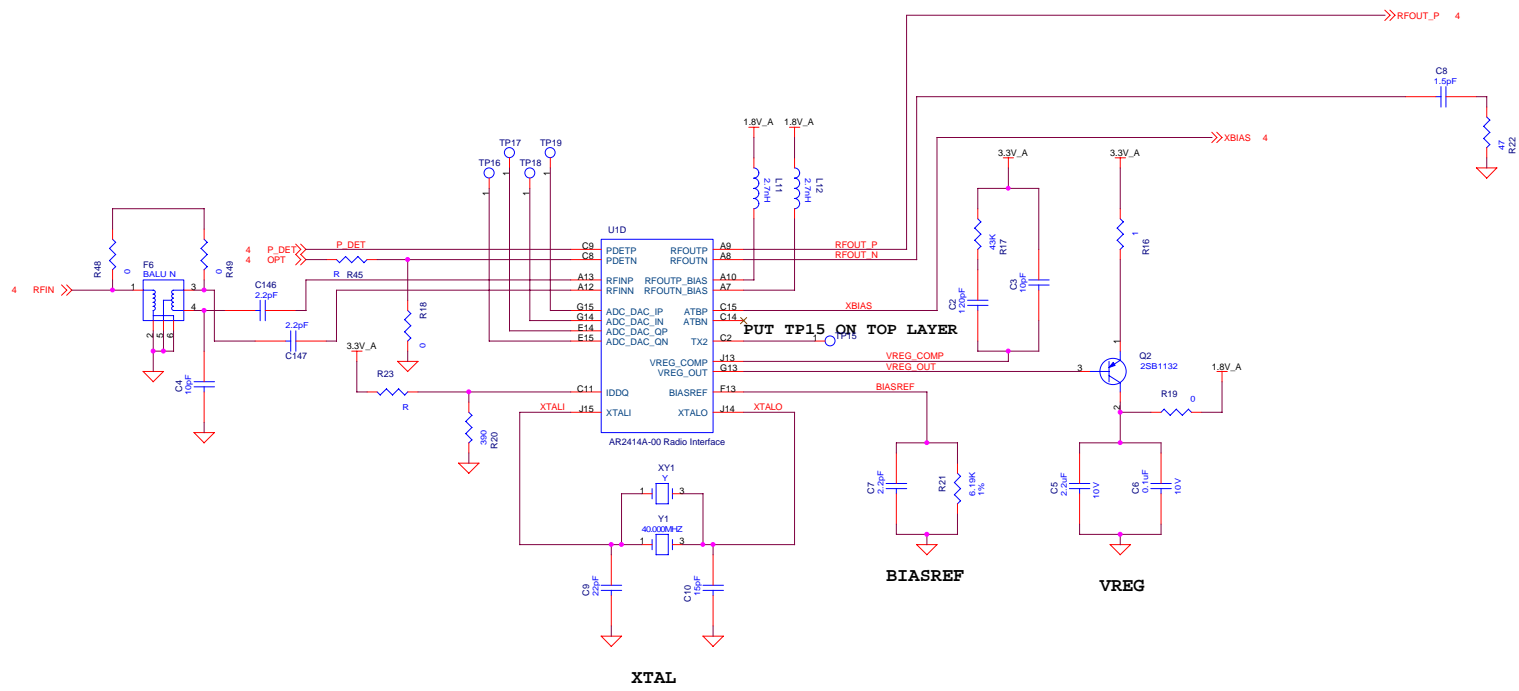
TOOLING HOLES		PANEL PERFORATIONS	
X38	X39	X32	X28
X14	X572	X588	X326
X28	X524	X558	X582
X338	X577	X535	X339
X500	X561	X571	X586
X603	X595	X333	X562
X342	X585	X585	X538
X547	X583	X593	X601
X517	X595	X568	X564
X332	X515	X546	X557
X329	X590	X569	X327
X591	X330	X579	X335
X605	X504	X581	X574
X607	X537	X516	X584
X505	X590	X604	X330
X10	X11	X8	X9
X12	X13	X14	X15
X16	X17	X18	X19
X20	X21	X22	X23
X24	X25	X26	X27
X29	X30	X31	X34
X35	X36	X37	X40
X41	X42	X43	X44
X45	X46	X47	X48
X49	X50	X51	X52
X53	X54	X55	X56
X58	X59	X60	X62
X64	X65	X66	X67
X68	X69	X70	X71
X72	X73	X74	X75
X76	X77	X78	X79
X81	X82	X83	X84
X86	X87	X88	X89
X91	X92	X93	X94
X96	X97	X98	X99



Tie ground planes together.

S1 SHORTED AS THE DEFAULT.
CUT THE TRACE TO TEST AT
THE CONNECTOR.





PUT TP15 ON TOP LAYER

XTAL

BIASREF

VREG

RFOUT_P 4

XBIAS 4

VREG_COMP

VREG_OUT

BIASREF

XTALO

XTALI

IDDO

BIASREF

VREG_OUT

VREG_COMP

TX2

ADC_DAC_ON

ADC_DAC_OP

ADC_DAC_IN

ATBN

ATBP

RFOUTN_BIAS

RFOUTP_BIAS

PDET7N

PDET7P

1.8V_A

1.8V_A

3.3V_A

3.3V_A

3.3V_A

1.8V_A

300

R20

2.2nF

C147

2.2nF

C146

2.7nH

L11

2.7nH

L12

40k

R17

100nF

C3

100nF

C2

100nF

G13

J13

VREG_OUT

VREG_COMP

F13

BIASREF

J14

XTALO

XTALI

IDDO

BIASREF

VREG_OUT

VREG_COMP

TX2

ADC_DAC_ON

ADC_DAC_OP

ADC_DAC_IN

ATBN

ATBP

RFOUTN_BIAS

RFOUTP_BIAS

PDET7N

PDET7P

1.8V_A

1.8V_A

3.3V_A

3.3V_A

3.3V_A

1.8V_A

300

R20

2.2nF

C147

2.2nF

C146

2.7nH

L11

2.7nH

L12

40k

R17

100nF

C3

100nF

C2

100nF

G13

J13

VREG_OUT

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XTALO

XTALI

IDDO

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VREG_COMP

TX2

ADC_DAC_ON

ADC_DAC_OP

ADC_DAC_IN

ATBN

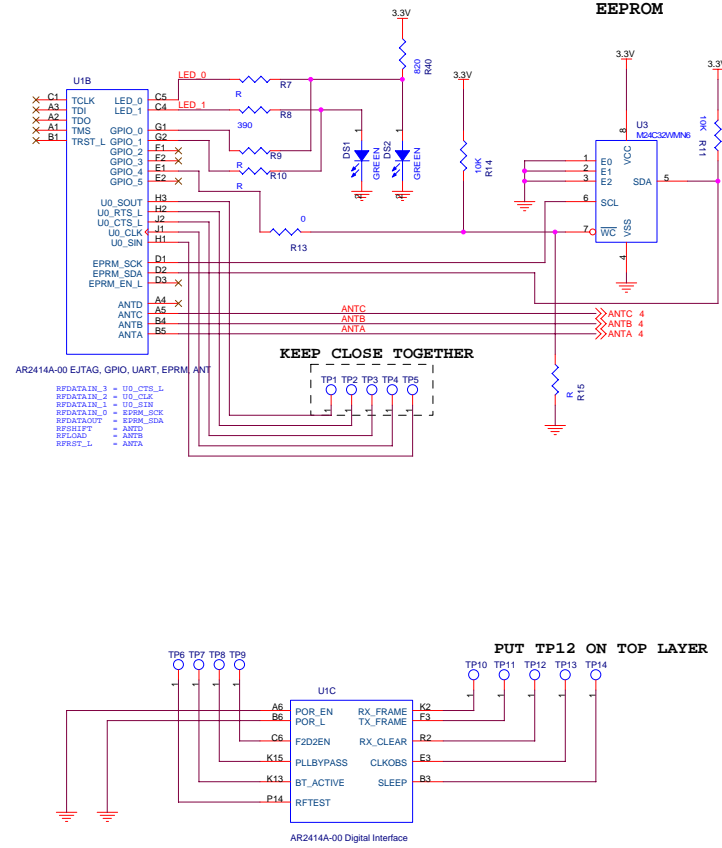
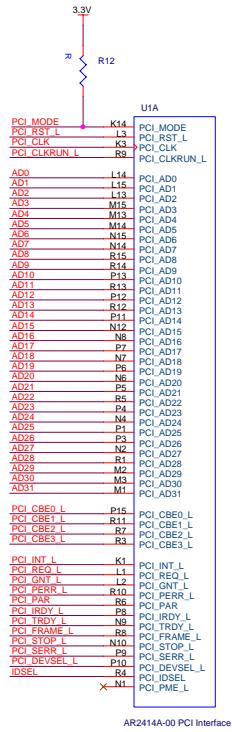
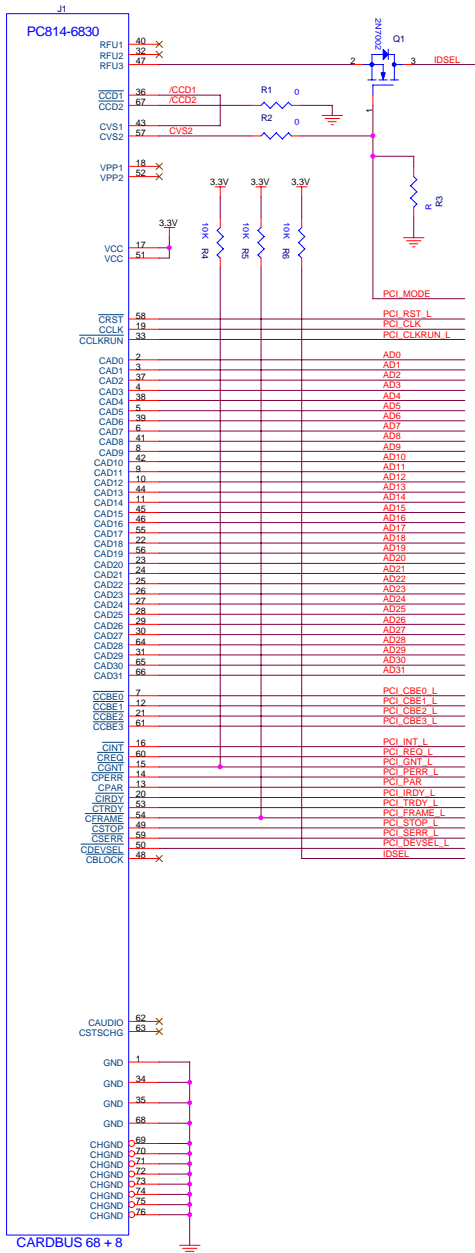
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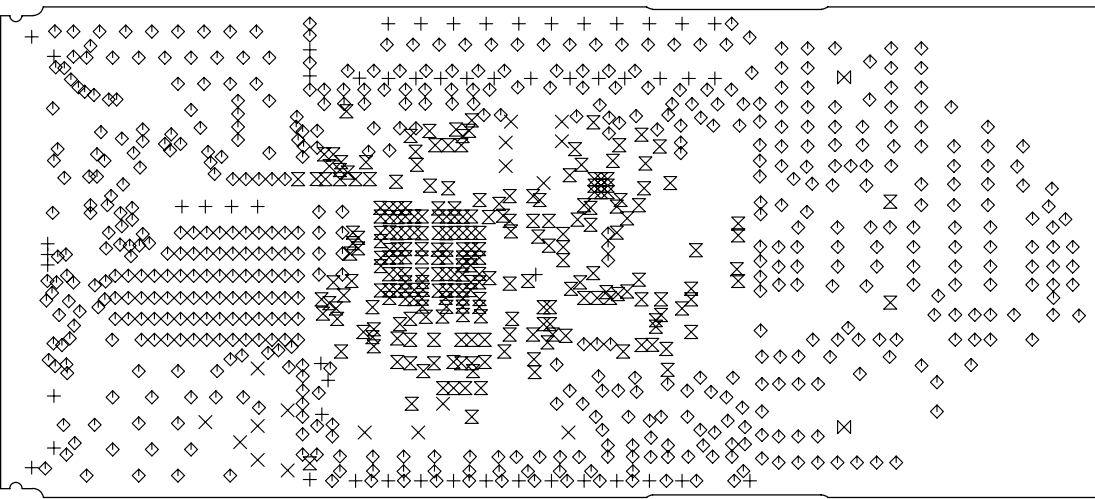
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PDET7N

PDET7P



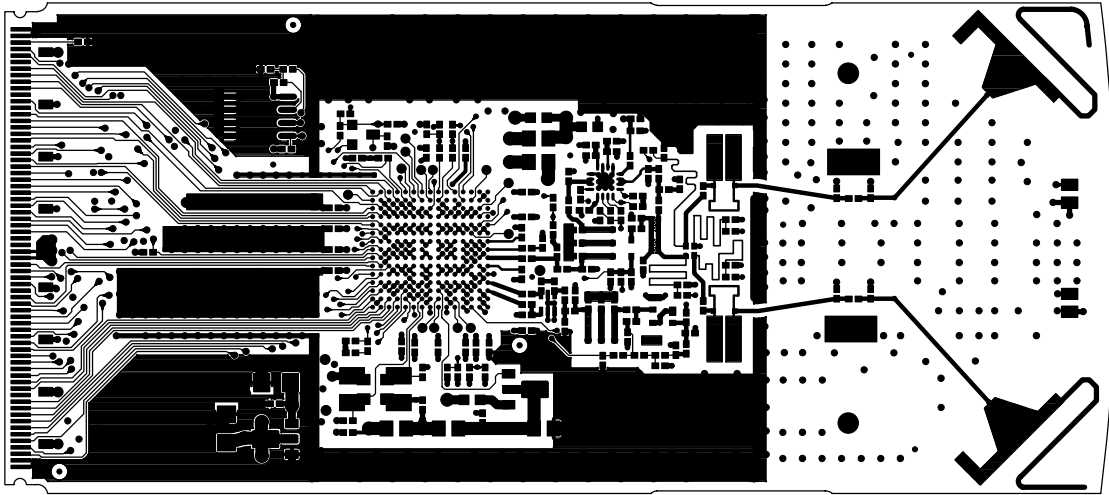
PCB Layout



SIZE	QTY	SYM	PLTD
18	55	+	PLTD
28	17	×	PLTD
12	565	◇	PLTD
8	254	⊗	PLTD
78.74	2	⊗	NPLTD

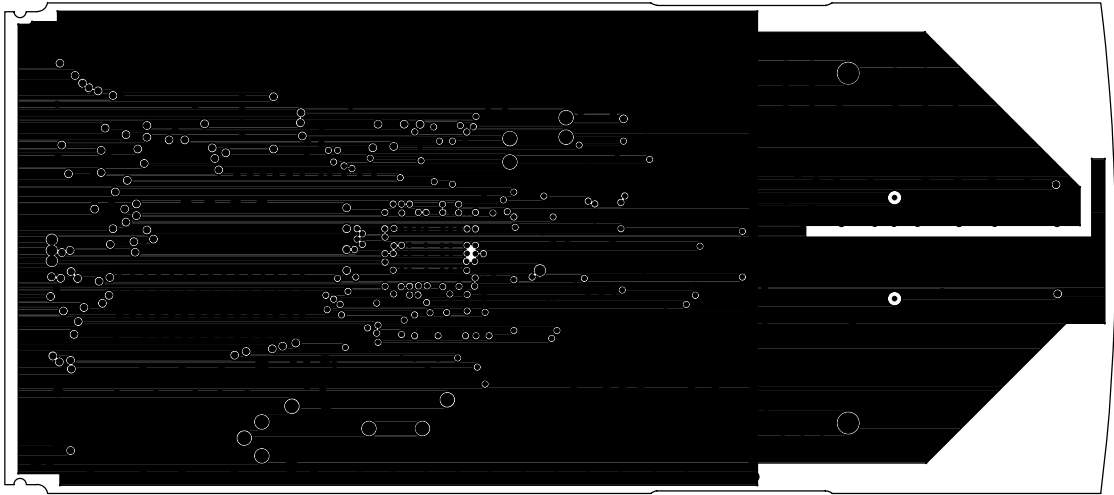
DRILL DRAWING

WLG-1103



TOP SIDE LAYER 1

WLG-1103



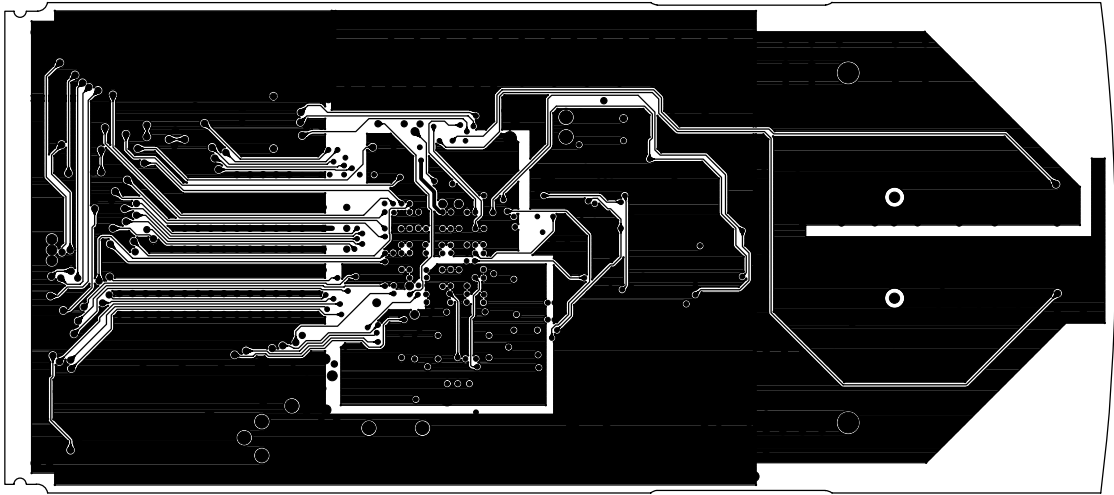
GROUND PLANE LAYER 2

WLG-1103



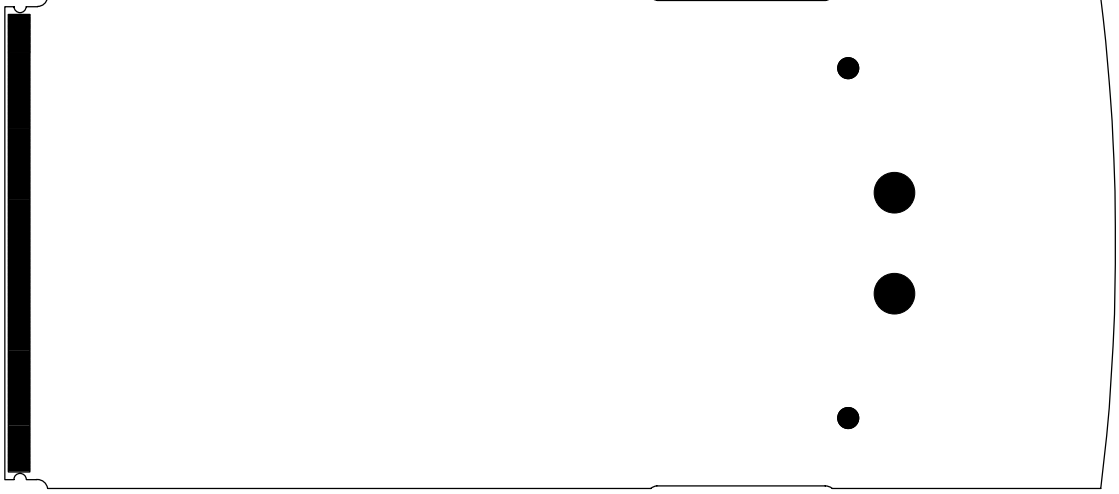
POWER PLANE LAYER 3

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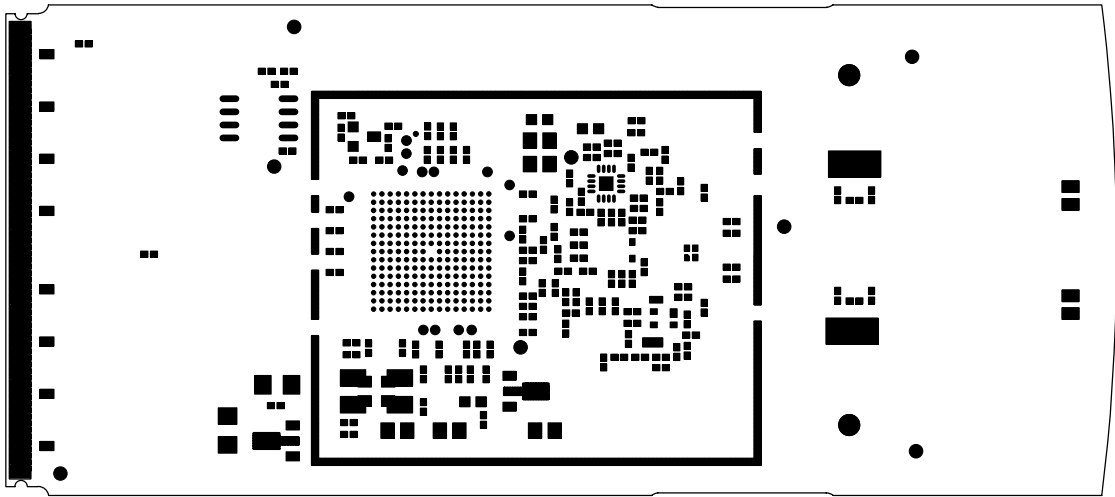


4 BOTTOM SIDE LAYER 4

WLG-1103

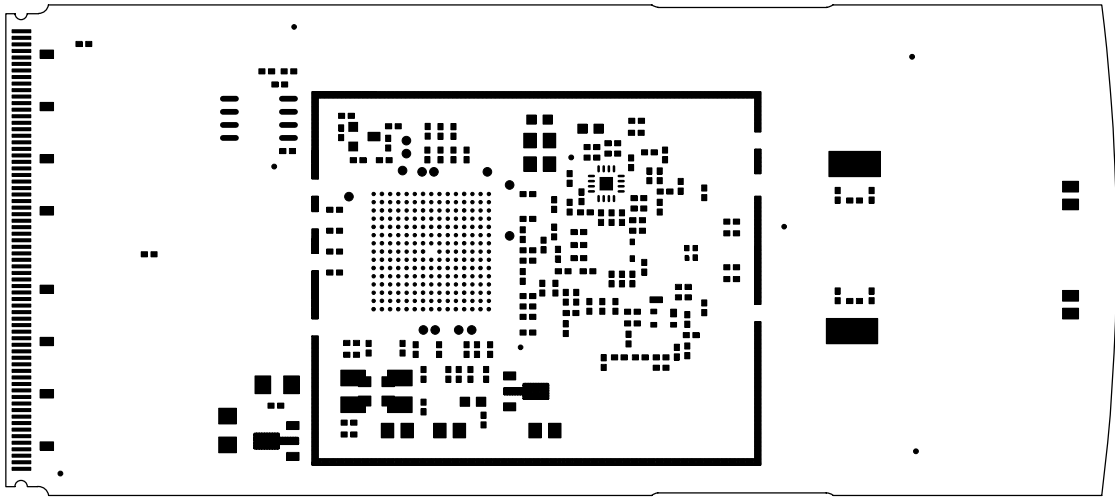


WLG-1103
BOTTOM SIDE SOLDERMASK



TOP SIDE SOLDERMASK

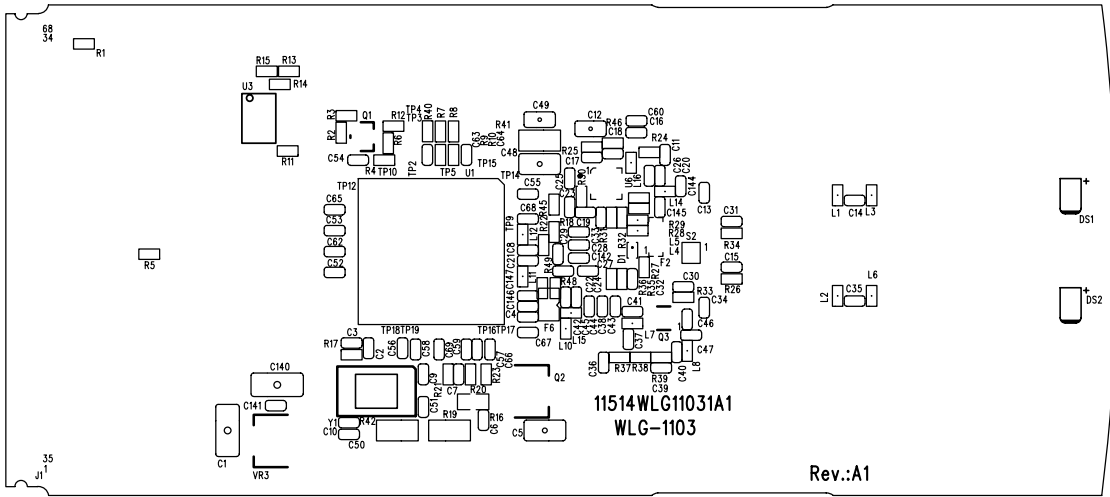
WLG-1103



TOP SIDE SOLDERPASTE

WLG-1103RA1.PCB

2005/3/2 Aaron



TOP SIDE SILKSCREEN

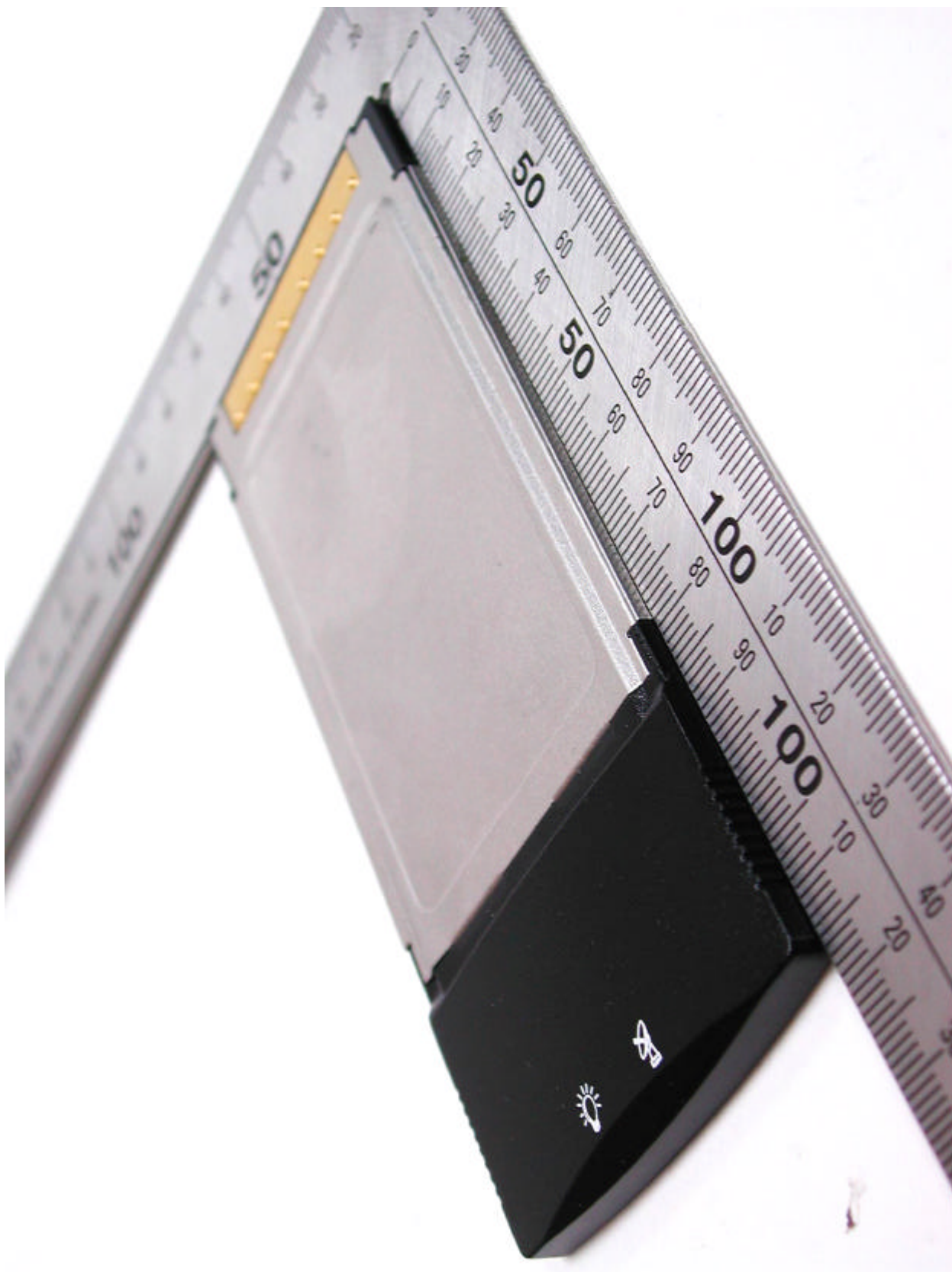
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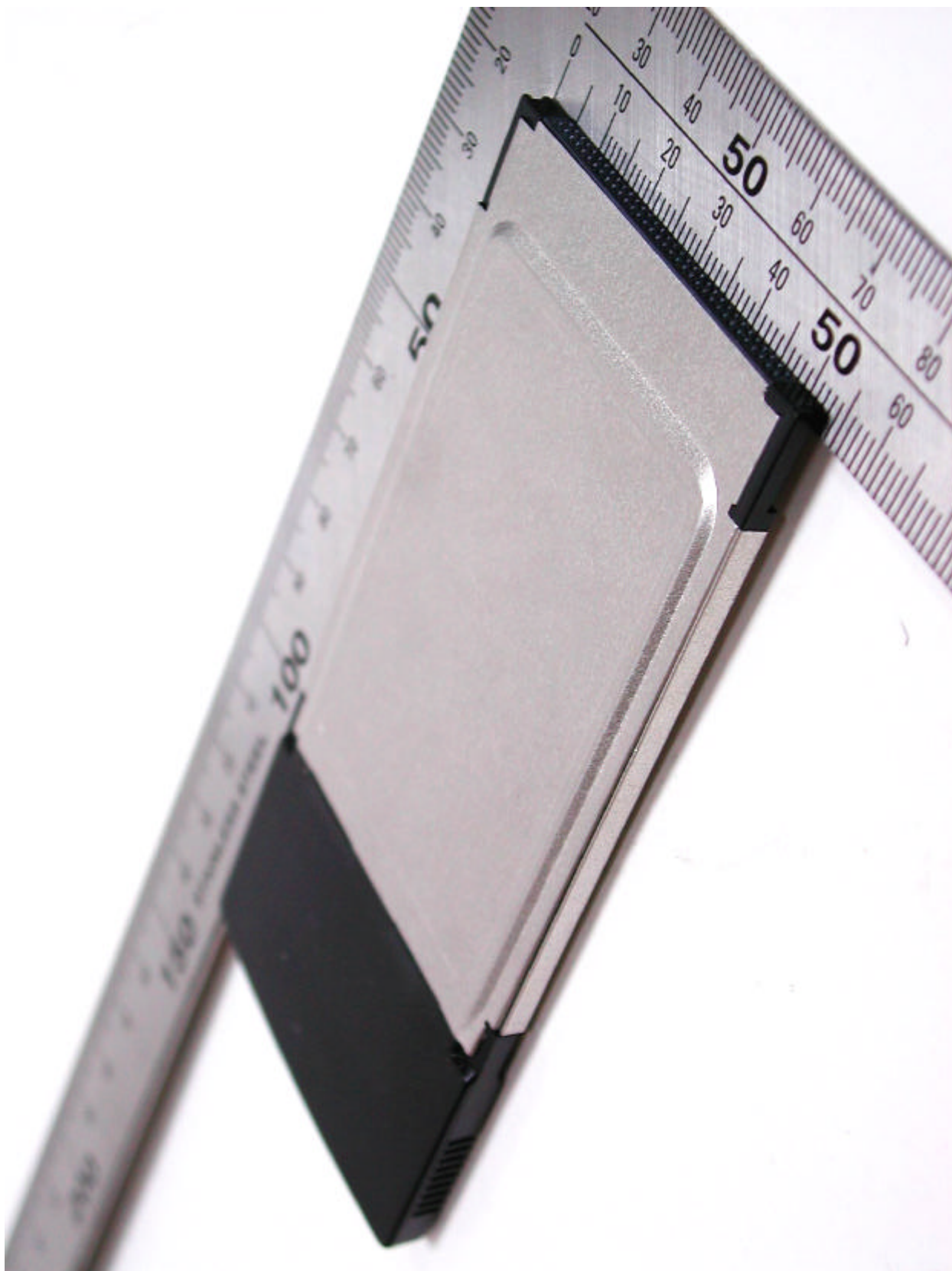
Bill of Materials (Part List)

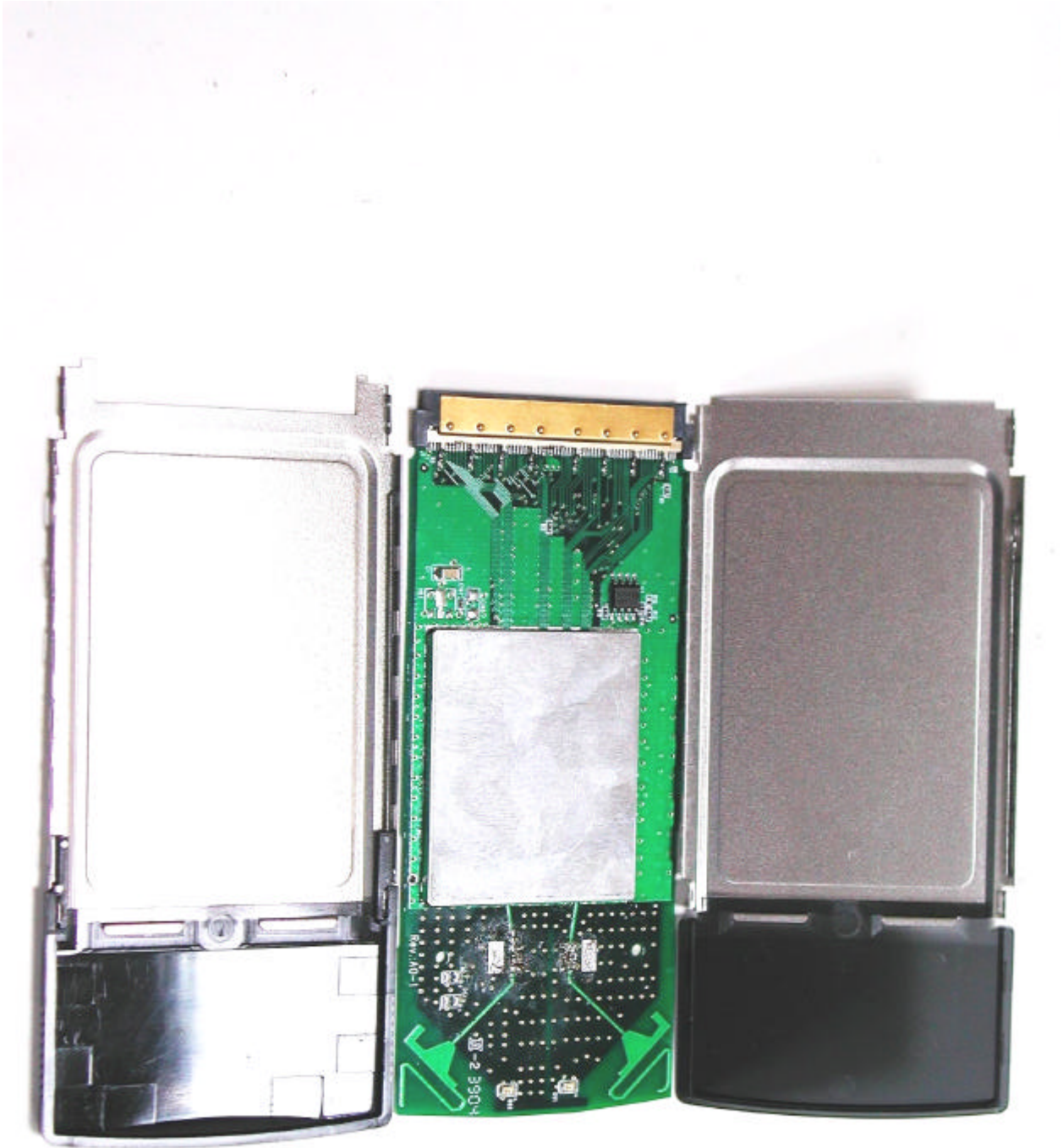
Item	Quantity	Reference Designator	Description	Footprint	
1	1	C1	4.7uF,X5R, 16V	C1206	1102475Z4532**4
2	2	C39, C2	120pF,NPO, 50V	C0402	1108121J2*216**
3	21	C3, C4, C11, C14, C15, C22, C30, C31, C32, C35, C37, C40, C41, C42, C46, C58, C59, C68, C69, C20, C23	10pF,NPO, 50V	C0402	110810PJ2*216**
4	2	C48	2.2uF,X5R, 10V	C0805	1102225Z4433***
5	8	C6, C50, C52, C53, C62, C63, C141, C16	0.1uF,X5R, 10V	C0402	1108104Z2*233**
6	3	C7, C146, C147	2.2pF,NPO, 50V	C0402	11082P2C2*216**
7	3	C21, C8, C26	1.5pF,NPO, 50V	C0402	11081P5C2*216**
8	1	C9	22pF,NPO, 50V	C0402	110822PJ2*216**
9	1	C10	15pF,NPO, 50V	C0402	110815PJ2*216**
10	2	C49, C12	1uF,X5R, 10V	C0603	1102105Z4332***
11	4	C13, C33, C34, C145	47pF,NPO, 50V	C0402	110847PJ2*216**
12	4	C54, C55, C64, C65	10nF,X7R, 25V	C0402	1108103Z2*223**
13	6	C27, C28, C38, C43, C44, C142	3pF,NPO, 50V	C0402	11083P042*216**
14	1	C36	220pF,X7R, 50V	C0402	1108221K2*226**
15	5	C51, C56, C57, C66, C67	1nF,X7R, 50V	C0402	1108102K2*226**
16	2	DS2, DS1	LED GREEN SMD	LED0805	11061*141300001
17	1	D1	SMS7630_SCHO TTY DETECTOR	SC-79	1105SM763029MF*
18	1	J1	CON,SMD,68pin,C ardbus Connector		1141192*344*0*0
19	2	L4, L5	3.9nH,+/- 0.1nH	L0402	11083N911*****
20	2	L8, L7	18nH,+/- 5%	L0402	110818NJ1*****
21	2	L12, L11	2.7nH,+/- 0.1nH	L0402	11082N711*****
23	3	L15, R46, L16	1nH,+/- 0.1nH	L0402	11081N011*****
24	1	Q1	2N7002_60V N- CH. FET_ 7.5	SOT-23	11042N7002*34**
25	1	Q2	2SB1132, SOT- 89, PNP	SOT-89	11042SB113225**
26	1	Q3	SGA8343, LNA,2.4GHz	SOT-343	1104SG8343AJ***
27	1	R30	180 OHMS	R0402	11011800F521***
28	1	R40	820 OHMS	R0402	11018200J521***
29	1	R38	15K OHMS, +/- 5%, 1/16W	R0402	11011502J521***
30	6	R1, R2, R13, R18, R48, R49	0 OHMS, +/- 5%, 1/16W	R0402	11010000J521***
31	5	R4, R5, R6, R11, R14	10K OHMS, +/- 5%, 1/16 W	R0402	11011002J521***
32	2	R8, R20	390 OHMS,+/- 5%, 1/16 W	R0402	11013900J521***

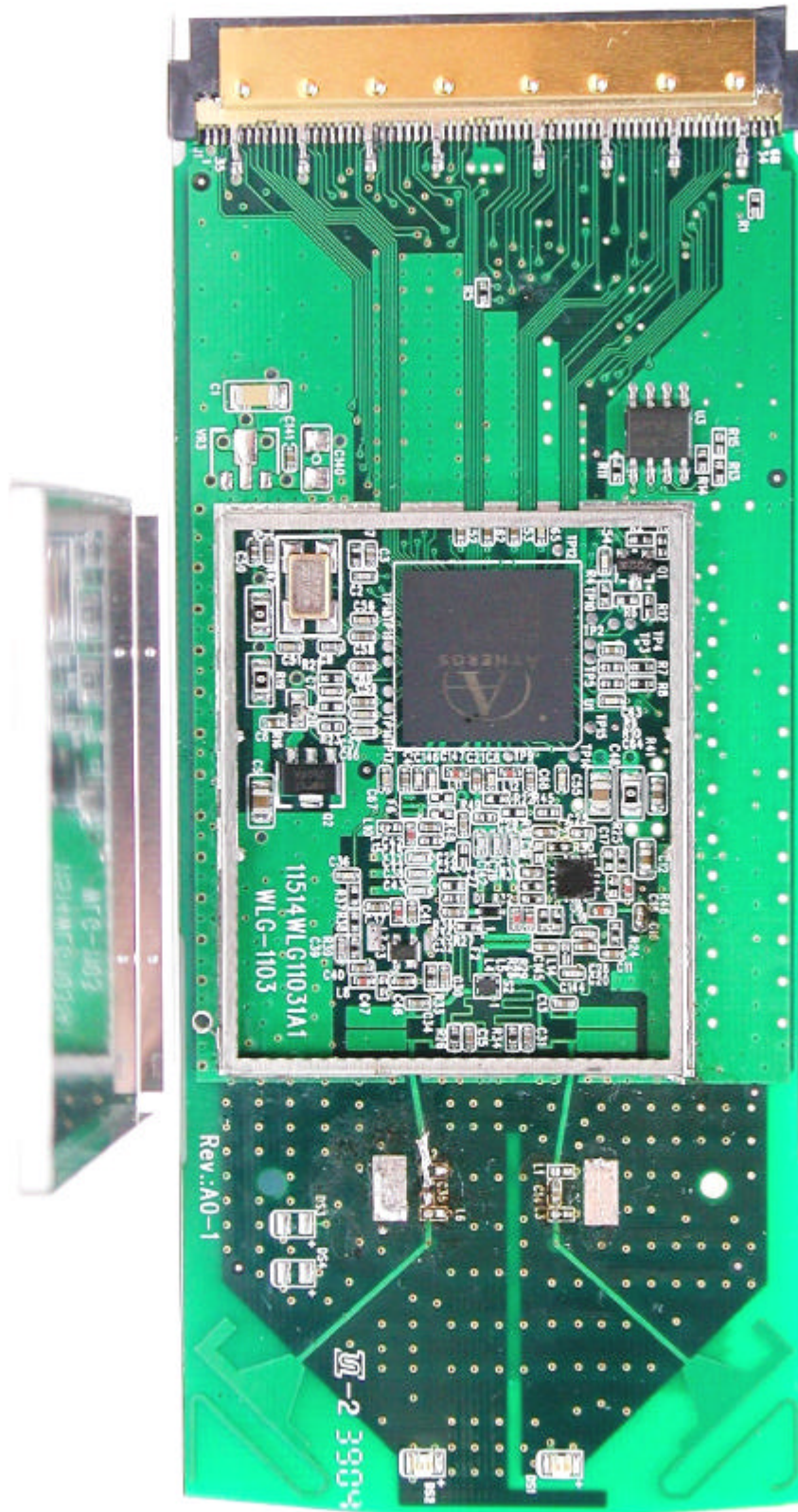
34	1	R17	43K OHMS,+/- 5%, 1/16 W	R0402	11014302J521***
35	3	R19, R41, R42	0 OHMS, +/- 5%, 1/8W	R0805	11010000J542***
36	1	R21	6.19K OHMS, +/- 1%, 1/16 W	R0402	11016191F521***
37	3	R22, R27, R39	47 OHMS, +/- 5%, 1/16 W	R0402	11010470J521***
38	4	R24, R26, R33, R34	220 OHMS, +/- 1%, 1/16W	R0402	11012200F521***
39	1	R25	10 OHMS, +/- 5%, 1/16W	R0402	11010100J521***
40	2	R28, R29	100K OHMS, +/- 5%, 1/16W	R0402	11011003J521***
41	1	R31	82.5 OHMS, +/- 1%, 1/16W	R0402	110182R5F521***
42	1	R32	150 OHMS, +/- 1%, 1/16W	R0402	11011500F521***
43	1	R36	5.1K OHMS, +/- 5%, 1/16 W	R0402	11015101J521***
44	1	R37	56 OHMS, +/- 5%, 1/16W	R0402	11010560J521***
45	1	X99	RF Shield for CP51		151104040200200
46	1	S2	SMP1345,SWITCHING PIN DIODE	SWI-4P-LGA	1105SM13457A4K*
47	1	U1	AR2414A,BGA 224,AnalogAndDigital	BGA-224	1111AR2414A00**
48	1	U3	24C32,S08,Serial 32Kbit EEPROM	S08	11143M24C32*32*
49	1	U6	Epicom,PA2409		1111PA2409*****
51	1	Y1	XTAL,SMD,40MHz,4pin,+/- 18PPM_LEADLESS CRYSTAL (CL=15pF)		110704000071811
52	1	C5	10uF	C0805	1102106Z*433***
53	1	PCB			11514WLG11031A1

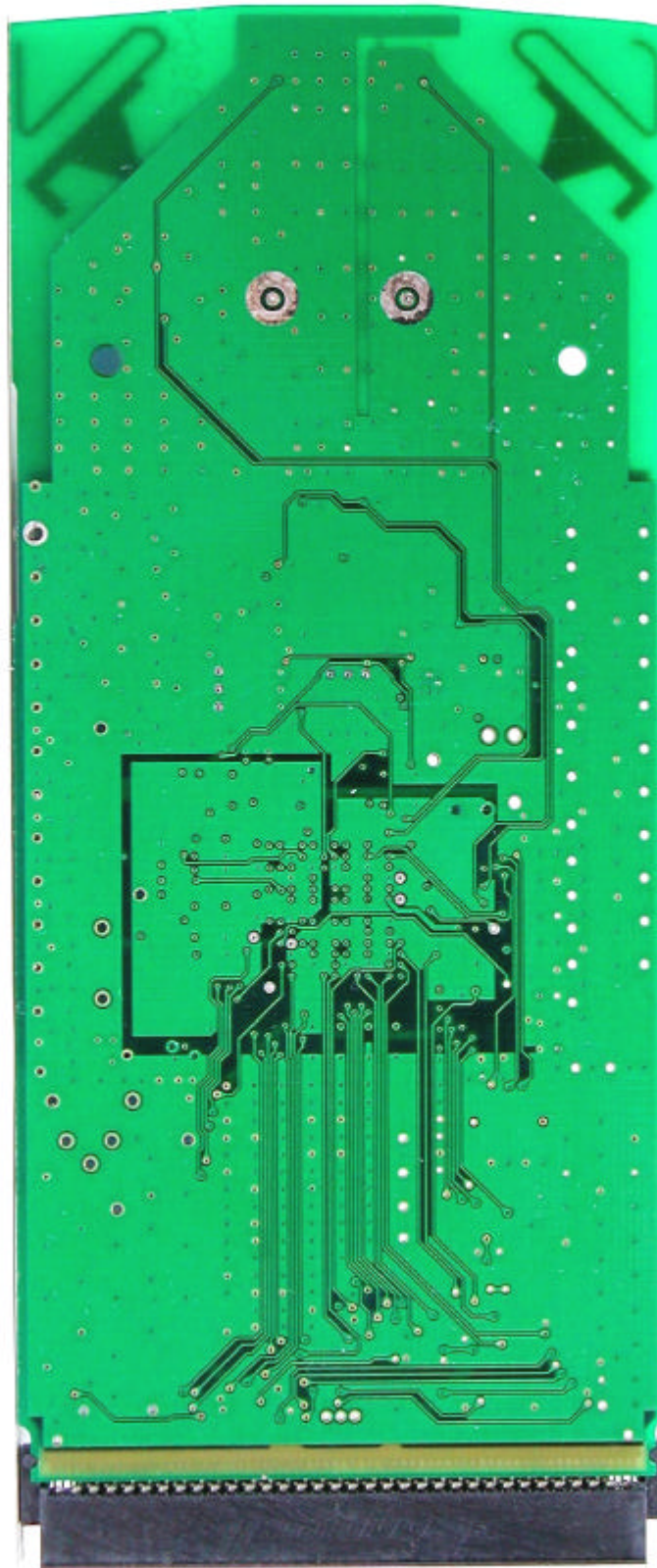
Exterior and Interior Photographs





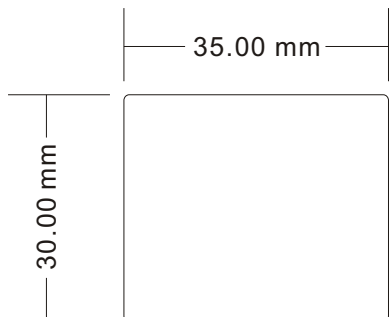
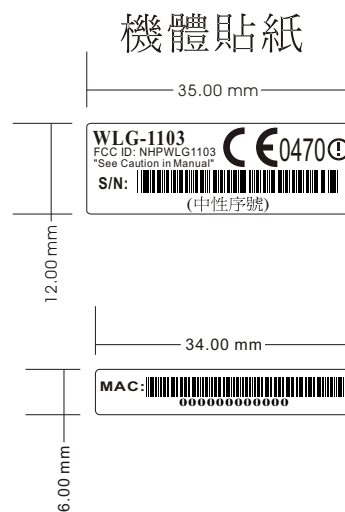
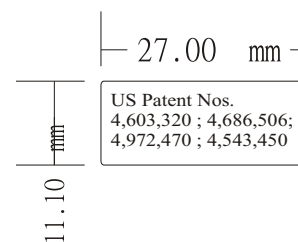
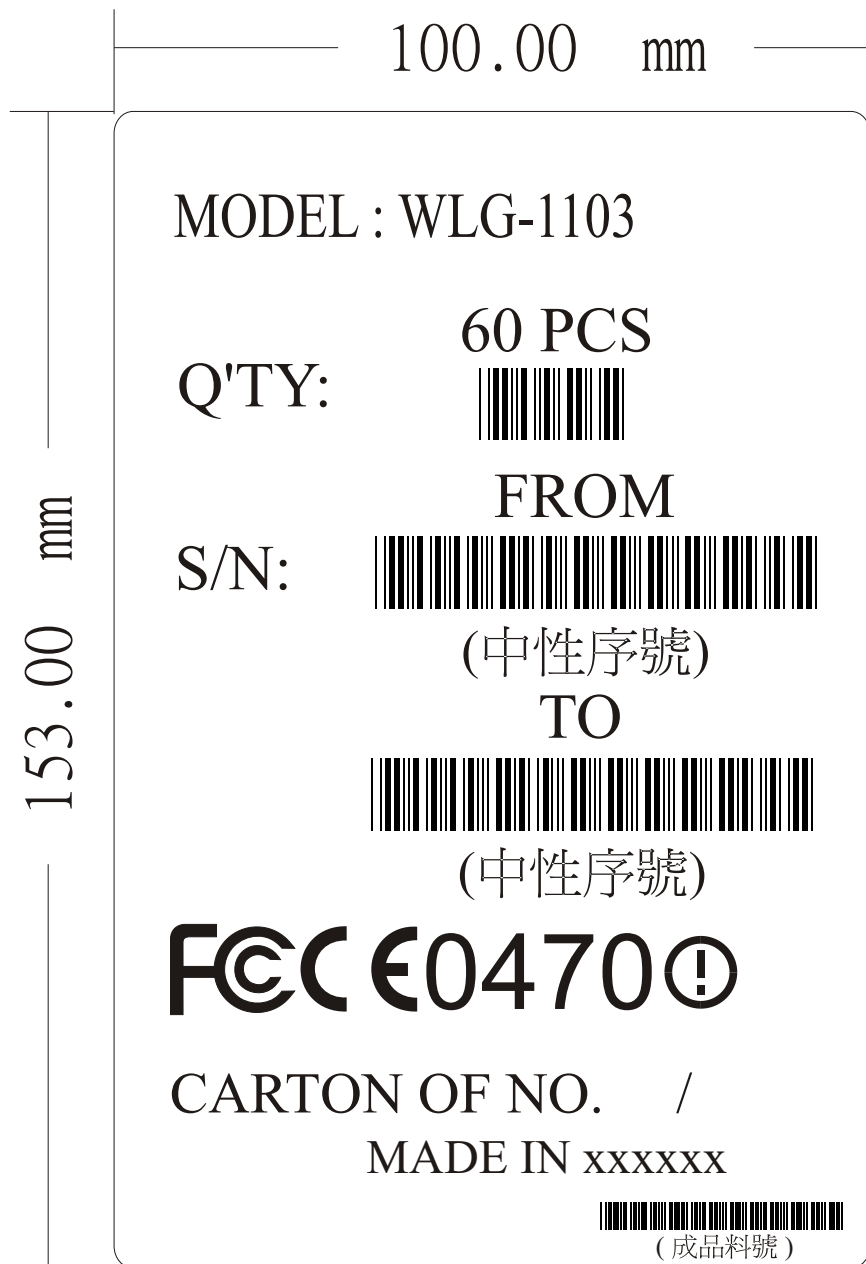






Label Information

日期	產品機種	產品料號	客戶名稱	申請者	設計者
94.4.06	WLG-1103	9500WLG11030XAV	CAMEO	Grace Chen	Grace Chen
備註	X為規格，AV 為版本				



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

架在F1上PCB 貼紙

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	CardBus Type II specification 32bit data bus
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: 17dBm 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 (MCK-Japan)
Media Access Protocol	CSMA/CA with ACK
Security	64/128-bits WEP Encryption, WPA
Diagnostic LED	PWR (Power) & LNK (Link status)
Antenna	Integrated Microstrip dual diversity antennas

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	118 x 54 x 7 mm (W x H x D)
Certifications	FCC Part 15.247 for US, ETS 300 328 for Europe,

User Manual

IEEE 802.11g
CardBus 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 2.5cm.

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 2.5cm 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 2.5cm 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 EN60950-1 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 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.



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INTRODUCTION

Congratulations on your purchase of this 108Mbps IEEE 802.11g Wireless Cardbus Adapter.

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

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

Wireless Cardbus 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 Cardbus Adapter, you can locate your Notebook PC or station wherever you want without wires and cables.

Wireless Cardbus 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 Cardbus 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 Cardbus Adapter.

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

UNPACKING AND SETUP

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

Unpacking

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

- ◆ One 108Mbps IEEE 802.11g Wireless Cardbus Adapter
- ◆ One Driver & Utility with User's Guide CD-ROM

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

Setup

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

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

HARDWARE INSTALLATION

LED Indicator

Power (PWR)

The PWR indicator lights green while the Wireless Cardbus adapter is connecting to the Cardbus or PCMCIA slot, otherwise, it is off.

ACT (Activity)

The ACT indicator blinks green when the Wireless Cardbus Adapter is connected to a network successfully and transmitting data. Otherwise the indicator is off while the Wireless LAN is stand by.

Check the installation

The LEDs of the Wireless Cardbus Adapter are clearly visible and the status of the network link can be seen instantly:

1. Once the device is plugged to the station's Cardbus slot, the PWR LED of the Wireless Cardbus Adapter will light up indicating a normal status.
2. When the device plugged to the station's Cardbus slot and the driver was installed, the ACT and PWR LED will start alternate blinking, it means that the device is starting to scan the wireless devices near the Wireless Cardbus Adapter.
3. While the Wireless Cardbus Adapter linked up and transmitting data to the Access Point or to other Wireless LAN station, the ACT LED will start blinking.

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.

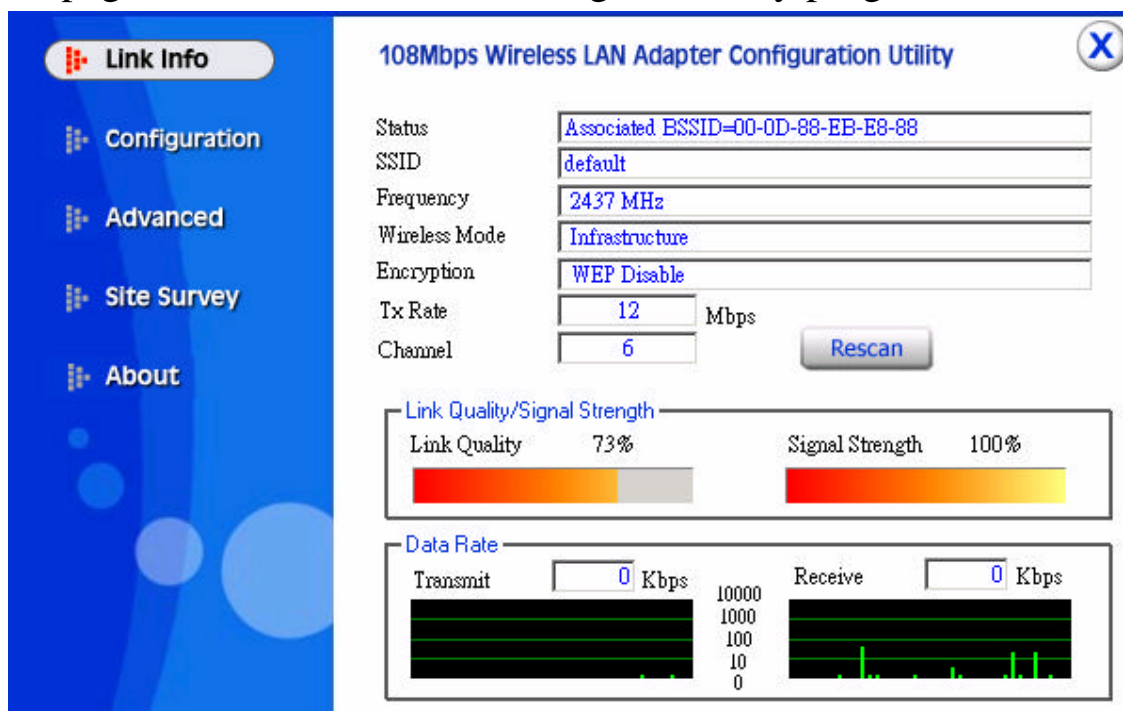


When the icon in the toolbar represents in full green color then the signal strength has an excellent performance with the AP, if it represents in yellow color then the signal strength has a fair performance with the AP, and if the icon represents no color, then the signal strength has a worst performance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

Wireless Utility Setting

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.

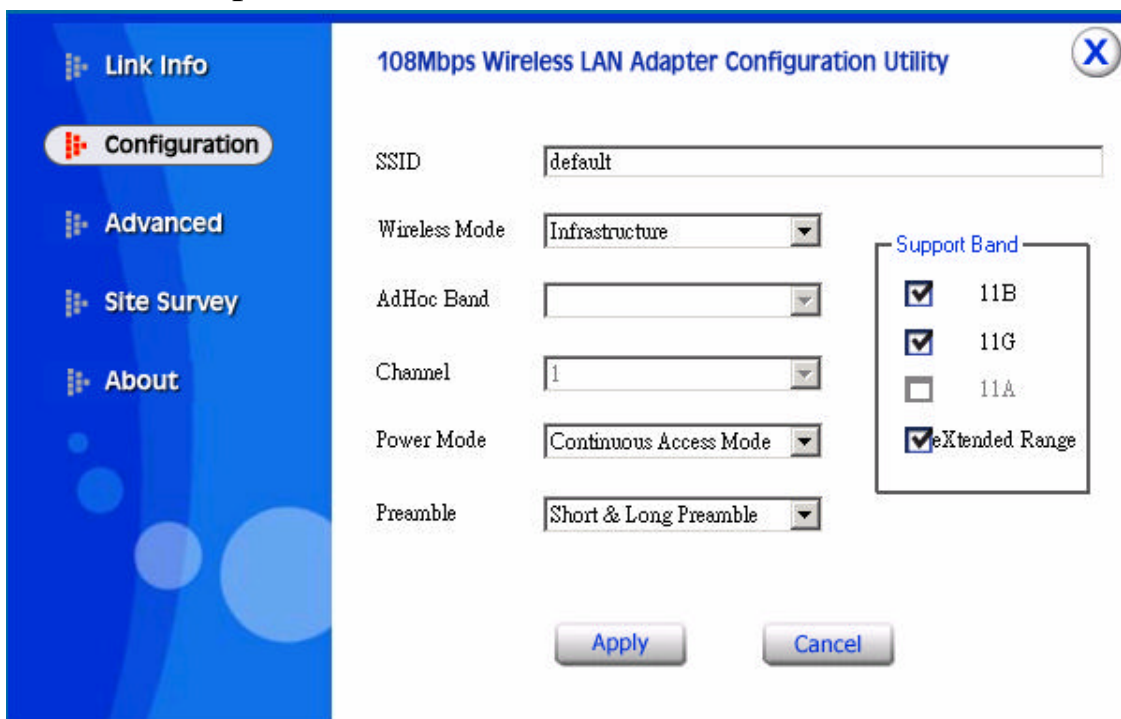
Link Quality: Shows the link quality of the 108Mbps wireless LAN PC card with the Access Point when operating under Infrastructure mode.

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.

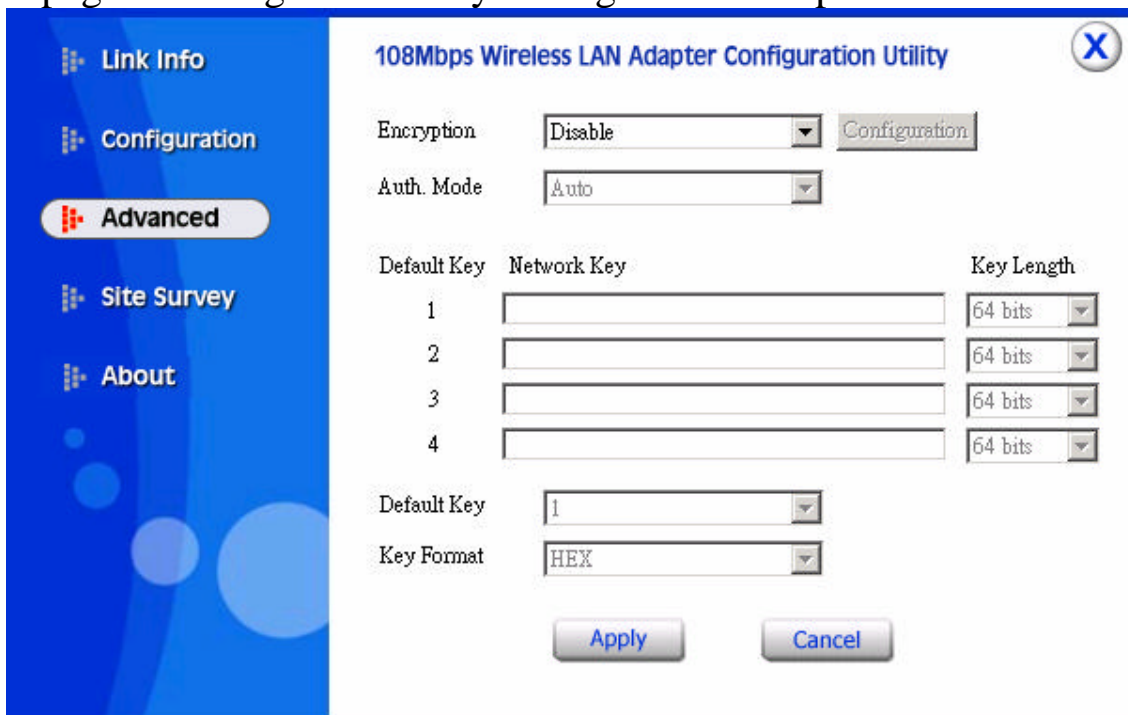
Preamble: Select Long or Short Preamble type. Preamble is a sequence of bits transmitted at 1Mbps that allows the PHY circuitry to reach steady-state demodulation and synchronization of bit clock and frame start. Two different preambles and headers are defined: the mandatory supported Long Preamble and 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.

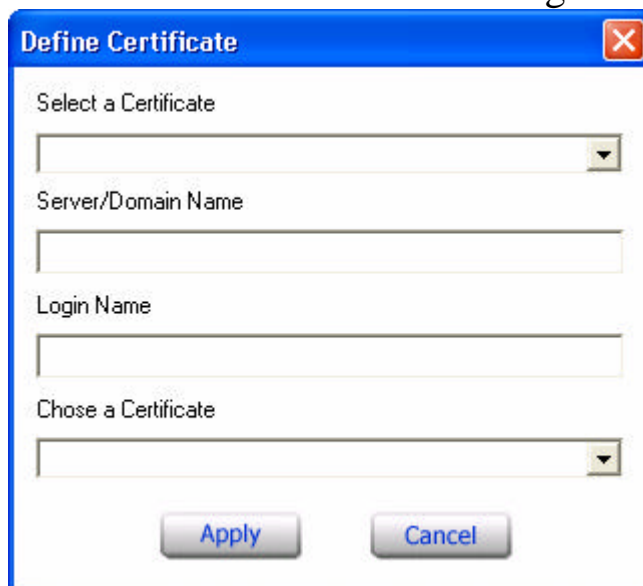
III. Advanced

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



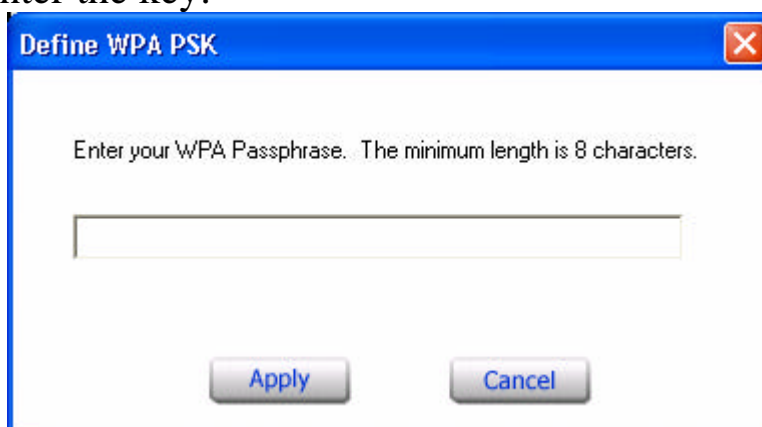
Encryption: 4 options are available: **Disable**, **Enable**, **WPA** and **WPA-PSK**. Select **Enable** or **Disable** for WEP data encryption feature. If one of the two

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



The 'Define Certificate' dialog box features a blue title bar with a close button. It contains four input fields: a dropdown menu for 'Select a Certificate', a text box for 'Server/Domain Name', a text box for 'Login Name', and another dropdown menu for 'Chose a Certificate'. At the bottom, there are 'Apply' and 'Cancel' buttons.

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



The 'Define WPA PSK' dialog box has a blue title bar with a close button. It contains a text box for entering the WPA passphrase, with the instruction 'Enter your WPA Passphrase. The minimum length is 8 characters.' Below the text box are 'Apply' and 'Cancel' buttons.

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.

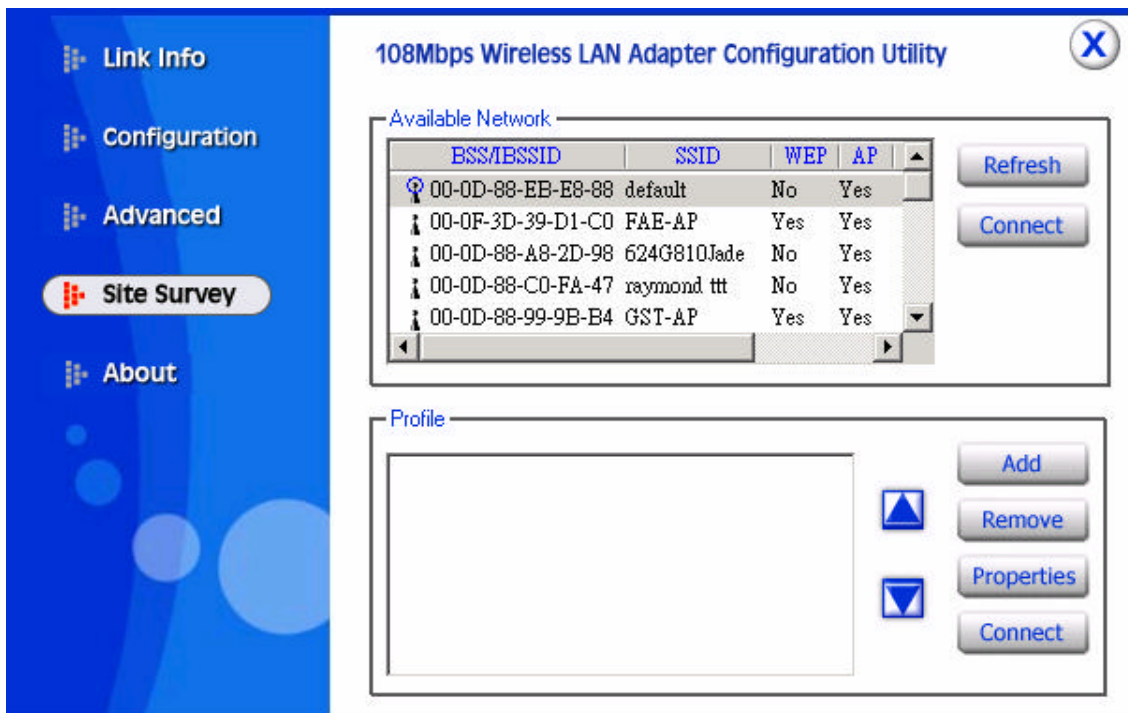
Network Key: choose the encryption way, either in HEX or ASCII formats, and enter the password in the blank space.

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.

Default Key	Network Key	Key Length
<input checked="" type="radio"/> 1	<input type="text"/>	64 bits
<input type="radio"/> 2	<input type="text"/>	64 bits
<input type="radio"/> 3	<input type="text"/>	64 bits
<input type="radio"/> 4	<input type="text"/>	64 bits

V. About

This page displays some information about the 108Mbps 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.

Adapter Information	
MAC Address	00:03:2F:26:16:96
Utility Version	1.29.0
Driver Version	2.2.4.31

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 PC Card
Manufacturer	CAMEO COMMUNICATIONS, INC.
Brand	CAMEO, Level One, LG, Etherwan, Allnet GmbH
Type	WLG-1103, WPC-0300, LWS5410N, NWP-0208-G, ALL0282A

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

Standard	Issue date
ETSI EN 300 328 ETSI RF Specification	V1.4.1 Apr. 2003 <i>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.</i> 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 <i>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.</i> Meets R&TTE directive art. 3.1.b of essential requirements on protection with respect to Electro Magnetic Compatibility.

As such standards referred to in 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 <i>Safety of information technology equipment, including electrical business equipment.</i> Meets R&TTE directive art. 3.1.a of essential requirements on protection of the health and safety of the user.



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 / <i>Jason Chang</i> Wireless Comm. R&D Dept. Manager

RF-EMC Test Reports and Corresponding Annexes

Report No.	C51ET050252
Specifications	ETSI EN 300 328 V.1.4.1 (2003-04)
Applicant	CAMEO COMMUNICATIONS, INC.
Applicant address	No. 42, Min Chuan East Road, Section 6, Taipei 114, Taiwan
Items tested	802.11g Wireless PC Card
Model No.	WLG-1103, WPC-0300, LWS5410N, NWP-0208-G, ALL0282A
EUT Condition	<input checked="" type="checkbox"/> Engineering sample; <input type="checkbox"/> Pre-production; <input type="checkbox"/> Final production (Sample # C51050252)
Results	Compliance (As detailed within this report)
Date	03/30/2005 (month / day / year) (Sample received) 04/06/2005 to 04/18/2005 (Test)
Prepared by	 Project Engineer (Jack Tsai)
Authorized by	 General Manager (Frank Tsai)
Issue date	April 21, 2005 (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 300 328 (V.1.4.1) 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 300 328 (V.1.4.1).

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.

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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 300 328-2 V.1.4.1 (April 2003) of the European Telecommunication Standard.

1.2 Description of EUT

Product Name	: 802.11g Wireless PC Card
Model No.	: WLG-1103, WPC-0300, LWS5410N, NWP-0208-G, ALL0282A
Frequency Range	: 2.400GHz ~ 2.4835GHz
Operating Frequency	: 2.412GHz ~ 2.472GHz
Support Channel	: 13 Channels
Modulation Skill	: DBPSK, DQPSK, CCK, OFDM
Power Type	: Powered by PCMCIA interface of client's device
Power Cable	: None
Data Cable	: None

1.3 Test Method

1. The EUT connected with PC:
Insert the EUT into the PCMCIA bus of the notebook computer
2. Using the notebook computer and software provided by the manufacturer to control the EUT. The test is performed under the specific conditions.
3. Set different channel 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.

Notebook : IBM Think Pad X20

Model No. : 2662-11T
Serial No. : FX-1192200/09
FCC ID : DoC Approved
BSMI : 3892B565

Adaptor : IBM

Model No. : PA2450U
Serial No. : 02K6654
FCC ID : 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

Notebook : ASUSTek Computer

Model No. : AB00F
Serial No. : 24NP016361
FCC ID : DoC Approved
BSMI : 41016012
Power type : 100 ~ 240VAC, 1A 50/60 Hz, Switching

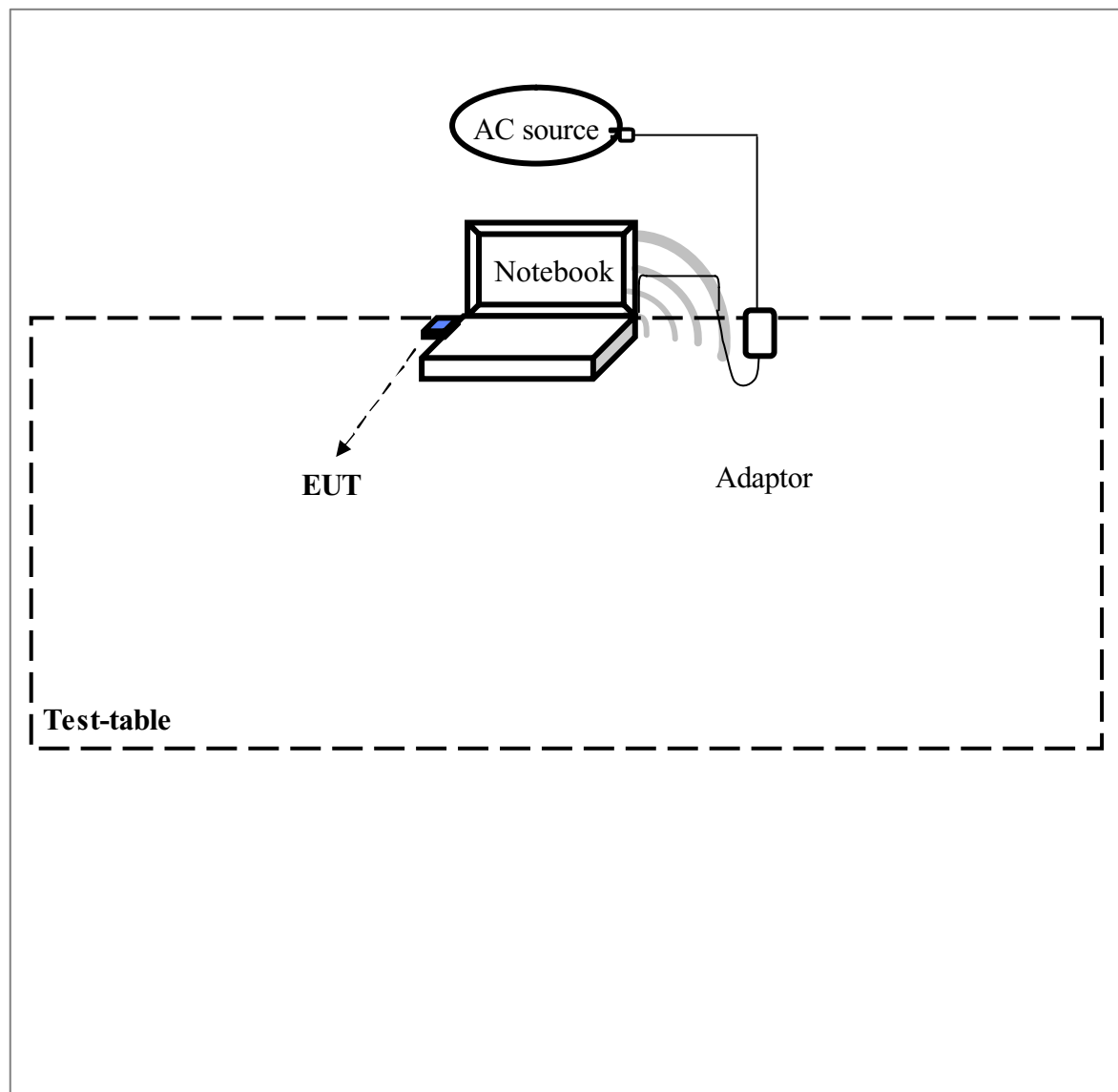
Adaptor of PC : LITE-ON Electronics, Inc.

Model No. : PA-1530-01
Serial No. : 00151184
FCC ID : DoC Approved
BSMI : 3882B259
Power cable : Non-shielded, 1.72m length, Plastic hood, No ferrite core
(Between power adaptor and AC power source)
Power cable : Shielded, 1.48m length, Plastic hood, with ferrite core
(Between power adaptor and notebook)

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 computer.

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 (April, 2003) 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°C to +35°C;

-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°C to +55°C;

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

a) 0°C to +35°C 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 subclause 5.2.1 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 $\pm 10\%$.

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 802.11b

Power level at which the measurement has been performed **78.705** mW

TEST CONDITION		TRANSMITTER PEAK POWER		
		Tx Peak (dBm)	Tx Ave. (dBm)	Cable Loss (dB)
Channel 1	25 °C	10.08	7.62	6.25
	0 °C	10.58	7.90	
	35 °C	9.96	7.51	
Channel 7	25 °C	10.13	7.60	6.20
	0 °C	10.43	7.85	
	35 °C	10.04	7.51	
Channel 13	25 °C	10.39	7.63	6.30
	0 °C	10.68	8.01	
	35 °C	10.23	7.62	
Limit		Tx Peak : 23dBm / -7dBW Tx Ave. : 20dBm / -10dBW		
Uncertainty		± 0.56dB		

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
= 16.98dBm + 1.98dBi
= 18.96dBm
- (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 802.11g

Power level at which the measurement has been performed **40.299** mW

TEST CONDITION		TRANSMITTER PEAK POWER		
		Tx Peak (dBm)	Tx Ave. (dBm)	Cable Loss (dB)
Channel 1	25 °C	13.42	3.65	6.25
	0 °C	14.02	3.98	
	35 °C	13.68	3.46	
Channel 7	25 °C	13.57	3.90	6.20
	0 °C	14.23	4.14	
	35 °C	13.14	3.54	
Channel 13	25 °C	13.55	3.81	6.30
	0 °C	14.18	4.11	
	35 °C	13.42	3.63	
Limit		Tx Peak : 23dBm / -7dBW Tx Ave. : 20dBm / -10dBW		
Uncertainty		± 0.56dB		

NOTE:

(5) Duty cycle (X):

Tx on = 296uS, Tx on + Tx off = 688uS

Average power = Tx Ave. + Cable Loss = 10.41 dBm

Peak power = Tx Peak. + Cable Loss = 20.48 dBm

Antenna Gain = 1.98 dBi

E.I.R.P. = Average power + Antenna Gain +10 log(1/X)

= 10.41 + 1.98 + 3.66

= 16.05 dBm

III. Section 5.2.2: Peak Power Density

3.1 Test Result of Peak Power Density for 802.11b

Channel	Frequency (MHz)	Ppr (dBm)	CF (dB)	Ant. Gain (dB)	Ppq (dBm)	Limit (dBm)	Margin (dB)
CH 01	2412	-0.42	6.57	1.98	8.13	10.00	-1.87
CH 07	2442	-0.26	6.53	1.98	8.25	10.00	-1.75
CH 13	2472	-0.55	6.74	1.98	8.17	10.00	-1.83
Uncertainty		± 1.50dB					

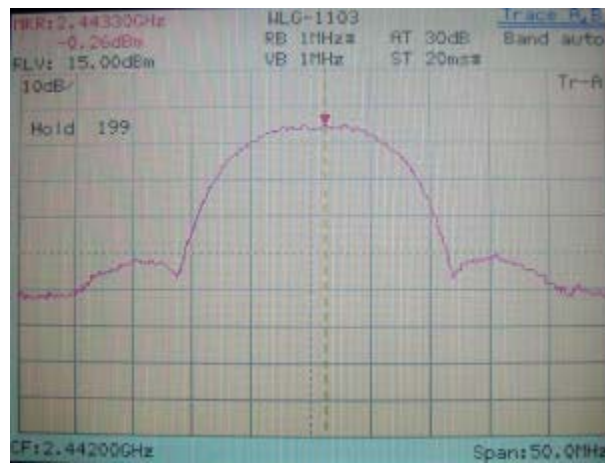
3.2 Test Result of Peak Power Density for 802.11g

Channel	Frequency (MHz)	Ppr (dBm)	CF (dB)	Ant. Gain (dB)	Ppq (dBm)	Limit (dBm)	Margin (dB)
CH 01	2412	-0.88	6.57	1.98	7.67	10.00	-2.33
CH 07	2442	-0.73	6.53	1.98	7.78	10.00	-2.22
CH 13	2472	-0.94	6.74	1.98	7.78	10.00	-2.22
Uncertainty		± 1.50dB					

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



IEEE 802.11g

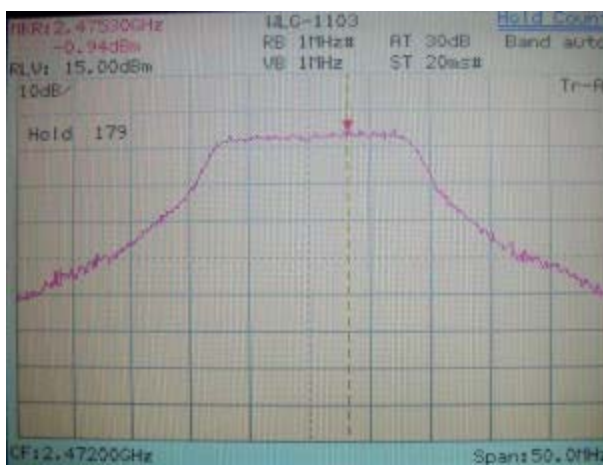
CH01



CH07



CH13



IV. Section 5.2.3 : Frequency Range

4.1 Test Result of Frequency Range for 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)
25°C	230 V	2402.30	11	2482.70	11
0°C	207 V	2402.20	11	2482.70	11
	253 V	2402.20	11	2482.70	11
35°C	207 V	2402.30	11	2482.70	11
	253 V	2402.30	11	2482.70	11
Measured frequencies (lowest and highest)		FL = 2402.20 MHz		FH = 2482.70 MHz	
Limit		FL > 2400MHz		FH < 2483.5MHz	
Uncertainty		± 1837Hz			

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 01 (The lowest one in the frequency range)



Channel 13 (The greatest one in the frequency range)



4.2 Test Result of Frequency Range for 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)
25°C	230 V	2402.40	54	2482.70	54
0°C	207 V	2402.20	54	2482.90	54
	253 V	2402.20	54	2482.90	54
35°C	207 V	2402.50	54	2482.60	54
	253 V	2402.50	54	2482.60	54
Measured frequencies (lowest and highest)		FL = 2402.20 MHz		FH = 2482.90 MHz	
Limit		FL > 2400MHz		FH < 2483.5MHz	
Uncertainty		± 1837Hz			

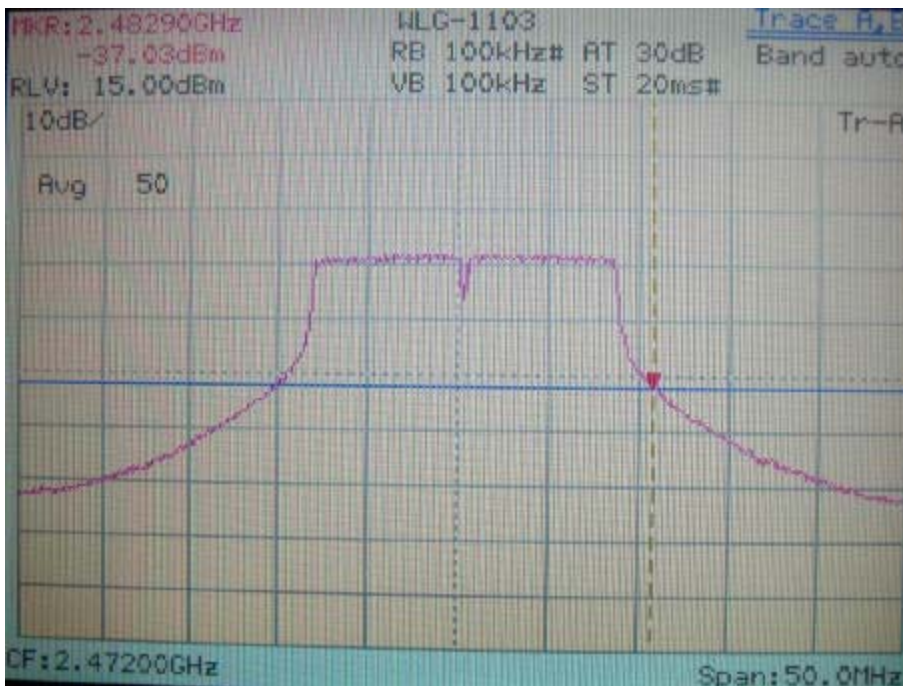
Note:

- (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 01 (The lowest one in the frequency range)



Channel 13 (The greatest one in the frequency range)



V. Section 5.2.4: Transmitter Spurious Emissions

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)
733.67	H	-71.40	-36.00	-35.40	11
234.91	H	-65.47	-36.00	-29.47	11
261.59	H	-63.07	-36.00	-27.07	11
300.39	H	-63.57	-36.00	-27.57	11
325.85	H	-66.11	-36.00	-30.11	11
390.72	H	-62.52	-36.00	-26.52	11
233.09	V	-62.66	-36.00	-26.66	11
261.59	V	-65.20	-36.00	-29.20	11
300.39	V	-64.06	-36.00	-28.06	11
325.85	V	-64.65	-36.00	-28.65	11
391.32	V	-62.29	-36.00	-26.29	11
565.92	V	-65.87	-36.00	-29.87	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)
- (5) The level of confidence of 95% , the uncertainty of measurement of radiated emission is +2.85dB / -2.77dB

Channel 13 (30MHz to 1GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
234.31	H	-65.69	-36.00	-29.69	11
260.98	H	-63.16	-36.00	-27.16	11
300.39	H	-62.79	-36.00	-26.79	11
325.85	H	-65.43	-36.00	-29.43	11
390.72	H	-64.34	-36.00	-28.34	11
500.45	H	-67.16	-36.00	-31.16	11
234.31	V	-62.63	-36.00	-26.63	11
298.57	V	-64.46	-36.00	-28.46	11
325.24	V	-65.29	-36.00	-29.29	11
390.72	V	-65.11	-36.00	-29.11	11
433.76	V	-66.09	-36.00	-30.09	11
565.32	V	-66.03	-36.00	-30.03	11

Channel 1 (1GHz to 12.75GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
1608.33	H	-56.94	-30.00	-26.94	11
2287.50	H	-51.17	-30.00	-21.17	11
2462.50	H	-50.21	-30.00	-20.21	11
2637.50	H	-56.37	-30.00	-26.37	11
9647.40	H	-50.29	-30.00	-20.29	11
1608.33	V	-64.78	-30.00	-34.78	11
2287.50	V	-62.84	-30.00	-32.84	11
2462.50	V	-60.88	-30.00	-30.88	11
2595.83	V	-63.65	-30.00	-33.65	11
2639.58	V	-63.36	-30.00	-33.36	11
9647.40	V	-50.45	-30.00	-20.45	11

Channel 13 (1GHz to 12.75GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
1647.92	H	-50.93	-30.00	-20.93	11
2264.58	H	-54.20	-30.00	-24.20	11
2287.50	H	-50.67	-30.00	-20.67	11
2358.33	H	-54.25	-30.00	-24.25	11
9890.21	H	-51.21	-30.00	-21.21	11
1647.92	V	-59.59	-30.00	-29.59	11
2279.17	V	-63.24	-30.00	-33.24	11
2400.00	V	-63.90	-30.00	-33.90	11
2597.92	V	-61.97	-30.00	-31.97	11
2639.58	V	-60.53	-30.00	-30.53	11
9890.21	V	-51.04	-30.00	-21.04	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)
233.70	H	-64.71	-36.00	-28.71	54
260.98	H	-61.73	-36.00	-25.73	54
300.39	H	-63.83	-36.00	-27.83	54
325.85	H	-65.73	-36.00	-29.73	54
390.72	H	-63.97	-36.00	-27.97	54
233.09	V	-62.73	-36.00	-26.73	54
300.39	V	-63.52	-36.00	-27.52	54
325.24	V	-63.82	-36.00	-27.82	54
390.72	V	-63.15	-36.00	-27.15	54
564.11	V	-65.37	-36.00	-29.37	54

Channel 13 (30MHz to 1GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
234.91	H	-65.14	-36.00	-29.14	54
261.59	H	-62.29	-36.00	-26.29	54
300.39	H	-63.50	-36.00	-27.50	54
325.85	H	-65.03	-36.00	-29.03	54
391.32	H	-62.59	-36.00	-26.59	54
233.09	V	-62.51	-36.00	-26.51	54
260.98	V	-63.44	-36.00	-27.44	54
300.39	V	-63.57	-36.00	-27.57	54
324.64	V	-65.54	-36.00	-29.54	54
390.72	V	-62.45	-36.00	-26.45	54

Channel 1 (1GHz to 12.75GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
1608.33	H	-53.61	-30.00	-23.61	54
2208.33	H	-52.83	-30.00	-22.83	54
2279.17	H	-49.24	-30.00	-19.24	54
2358.33	H	-51.08	-30.00	-21.08	54
2464.58	H	-48.53	-30.00	-18.53	54
1608.33	V	-60.11	-30.00	-30.11	54
2287.50	V	-64.17	-30.00	-34.17	54
2464.58	V	-63.03	-30.00	-33.03	54
2639.58	V	-62.03	-30.00	-32.03	54
12060.10	V	-54.74	-30.00	-24.74	54

Channel 13 (1GHz to 12.75GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
1647.92	H	-47.76	-30.00	-17.76	54
2264.58	H	-49.20	-30.00	-19.20	54
2287.50	H	-48.84	-30.00	-18.84	54
2400.00	H	-50.57	-30.00	-20.57	54
2558.33	H	-55.41	-30.00	-25.41	54
12060.10	H	-55.74	-30.00	-25.74	54
1647.92	V	-56.76	-30.00	-26.76	54
2266.67	V	-63.01	-30.00	-33.01	54
2287.50	V	-64.84	-30.00	-34.84	54
2560.42	V	-61.41	-30.00	-31.41	54
2639.58	V	-59.70	-30.00	-29.70	54
12360.73	V	-57.12	-30.00	-27.12	54

VI. Section 5.3.2: Receiver Spurious Emissions

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)
233.09	H	-64.84	-57.00	-7.84	11
261.59	H	-60.83	-57.00	-3.83	11
299.78	H	-63.53	-57.00	-6.53	11
325.85	H	-66.24	-57.00	-9.24	11
390.72	H	-62.76	-57.00	-5.76	11
501.06	H	-66.28	-57.00	-9.28	11
233.09	V	-62.64	-57.00	-5.64	11
261.59	V	-64.54	-57.00	-7.54	11
300.39	V	-63.29	-57.00	-6.29	11
325.24	V	-65.67	-57.00	-8.67	11
391.32	V	-64.93	-57.00	-7.93	11
565.92	V	-64.85	-57.00	-7.85	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)
- (4) The level of confidence of 95% , the uncertainty of measurement of radiated emission is +2.85dB / -2.77dB

Channel 13 (30MHz to 1GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
234.31	H	-65.06	-57.00	-8.06	11
261.59	H	-63.07	-57.00	-6.07	11
300.39	H	-63.52	-57.00	-6.52	11
325.24	H	-64.50	-57.00	-7.50	11
390.72	H	-63.08	-57.00	-6.08	11
501.06	H	-66.91	-57.00	-9.91	11
234.31	V	-62.45	-57.00	-5.45	11
300.39	V	-64.20	-57.00	-7.20	11
325.24	V	-66.02	-57.00	-9.02	11
390.72	V	-66.17	-57.00	-9.17	11
562.89	V	-65.80	-57.00	-8.80	11
721.12	V	-66.04	-57.00	-9.04	11

Channel 1 (1GHz to 12.75GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
2189.69	H	-65.56	-47.00	-18.56	11
3653.54	H	-62.31	-47.00	-15.31	11
5112.50	H	-60.21	-47.00	-13.21	11
9415.94	H	-56.49	-47.00	-9.49	11
2106.46	V	-66.59	-47.00	-19.59	11
3340.21	V	-63.00	-47.00	-16.00	11
5274.06	V	-60.53	-47.00	-13.53	11
9680.31	V	-56.23	-47.00	-9.23	11

Channel 13 (1GHz to 12.75GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
2091.77	H	-66.51	-47.00	-19.51	11
3301.04	H	-61.63	-47.00	-14.63	11
5401.35	H	-60.25	-47.00	-13.25	11
8813.75	H	-56.49	-47.00	-9.49	11
1817.60	V	-67.71	-47.00	-20.71	11
2968.12	V	-64.20	-47.00	-17.20	11
4975.42	V	-60.84	-47.00	-13.84	11
8035.31	V	-57.67	-47.00	-10.67	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)
234.31	H	-65.36	-57.00	-8.36	54
261.59	H	-63.40	-57.00	-6.40	54
300.39	H	-62.60	-57.00	-5.60	54
391.32	H	-63.62	-57.00	-6.62	54
501.06	H	-66.24	-57.00	-9.24	54
233.09	V	-62.76	-57.00	-5.76	54
261.59	V	-65.78	-57.00	-8.78	54
299.78	V	-63.63	-57.00	-6.63	54
390.72	V	-66.17	-57.00	-9.17	54
667.17	V	-66.05	-57.00	-9.05	54

Channel 13 (30MHz to 1GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
233.70	H	-64.73	-57.00	-7.73	54
261.59	H	-60.69	-57.00	-3.69	54
300.39	H	-63.17	-57.00	-6.17	54
390.72	H	-63.97	-57.00	-6.97	54
501.06	H	-64.87	-57.00	-7.87	54
234.91	V	-62.83	-57.00	-5.83	54
299.78	V	-63.06	-57.00	-6.06	54
390.72	V	-64.00	-57.00	-7.00	54
564.11	V	-66.25	-57.00	-9.25	54
721.12	V	-65.50	-57.00	-8.50	54

Channel 1 (1GHz to 12.75GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
2101.56	H	-65.79	-47.00	-18.79	54
3002.40	H	-63.62	-47.00	-16.62	54
4632.71	H	-61.56	-47.00	-14.56	54
8025.52	H	-57.70	-47.00	-10.70	54
2003.65	V	-65.84	-47.00	-18.84	54
3208.02	V	-63.52	-47.00	-16.52	54
4892.19	V	-60.57	-47.00	-13.57	54
7991.25	V	-57.94	-47.00	-10.94	54

Channel 13 (1GHz to 12.75GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
1724.58	H	-68.52	-47.00	-21.52	54
2733.12	H	-65.34	-47.00	-18.34	54
3820.00	H	-61.64	-47.00	-14.64	54
6150.42	H	-60.01	-47.00	-13.01	54
1891.04	V	-67.25	-47.00	-20.25	54
3002.40	V	-64.12	-47.00	-17.12	54
4813.85	V	-60.78	-47.00	-13.78	54
8015.73	V	-55.72	-47.00	-8.72	54

6.3 Test Result for Standby mode

(30MHz to 12.5GHz)

Frequency (MHz)	A. P. (H/V)	LEVEL (dBm)	Limit (dBm)	Margin (dB)	Rate (Mbps)
74.26	H	-70.96	-57.00	-13.96	---
133.67	H	-70.66	-57.00	-13.66	---
233.70	H	-64.85	-57.00	-7.85	---
261.59	H	-63.16	-57.00	-6.16	---
300.39	H	-62.13	-57.00	-5.13	---
325.24	H	-64.48	-57.00	-7.48	---
390.72	H	-61.96	-57.00	-4.96	---
501.06	H	-66.96	-57.00	-9.96	---
4206.77	H	-61.66	-47.00	-14.66	---
7364.58	H	-57.55	-47.00	-10.55	---
233.09	V	-62.66	-57.00	-5.66	---
260.98	V	-64.57	-57.00	-7.57	---
300.39	V	-64.13	-57.00	-7.13	---
325.85	V	-66.69	-57.00	-9.69	---
390.72	V	-66.48	-57.00	-9.48	---
434.37	V	-67.72	-57.00	-10.72	---
567.14	V	-65.96	-57.00	-8.96	---
666.56	V	-65.77	-57.00	-8.77	---
5690.21	V	-59.25	-47.00	-12.25	---
8769.69	V	-56.69	-47.00	-9.69	---

VII. Instrument and Ancillaries Equipment of List

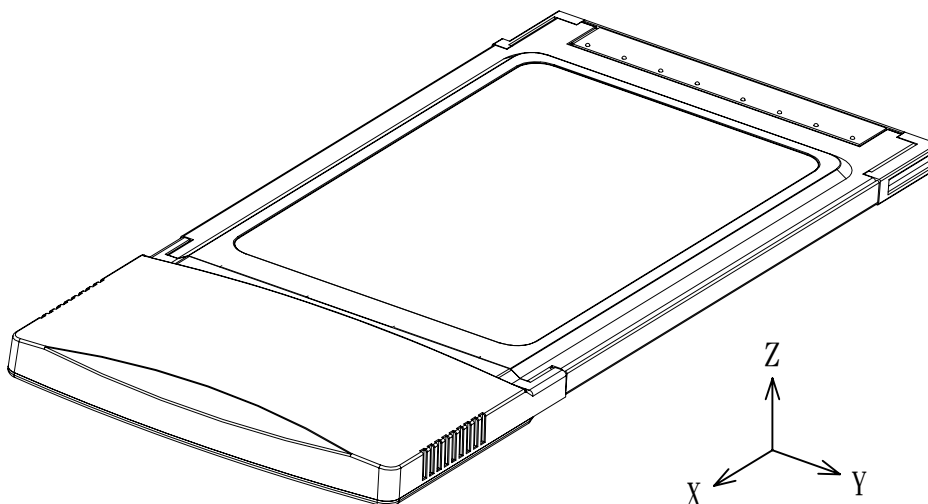
Instrument Name	Model	Brand	Serial No.	Calibration Date
				Next time
EMI Receiver	8546A	HP	3520A00242	08/05/05
RF Filter Section	85460A	HP	3448A00217	08/05/05
Small Biconical Antenna	UBAA9114 & BBVU9135	SCHWARZECK	127	10/11/05
Pre-amplifier	PA1F	TRC	1FAC	05/20/05
Auto Switch Box (>30MHz)	ASB-01	TRC	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 Preampifier	84125C	HP	US36433002	08/13/05
Horn Antenna	3115	EMCO	9104-3668	12/27/05
Standard Guide Horn Antenna	84125-80008	HP	18-26.5GHz	10/15/05
Standard Guide Horn Antenna	84125-80001	HP	26.5-40GHz	10/15/05
Horn Antenna	1196E (3115)	HP (EMCO)	9704-5178	01/11/06
Pre-amplifier	PA2F	TRC	2F1GZ	06/20/05
Coaxial Cable (3 miter)	A30A30-0058-50FST118	JYEBAO	MSA-05	06/20/05
Coaxial Cable (1 meter)	A30A30-0058-50FST118	JYEBAO	MSA-04	06/20/05

Appendix A

Antenna Specification

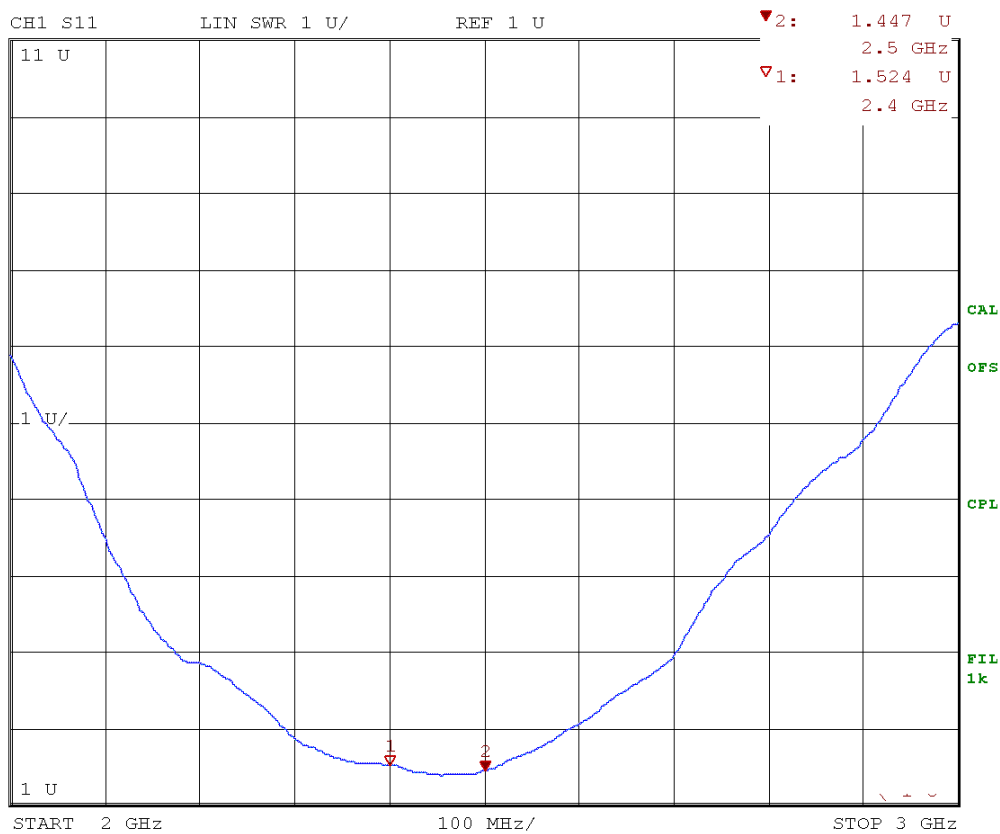
Measurement result of WLG-1103 Printed Antenna

Orientation of DUT measured in chamber



Measurement Result

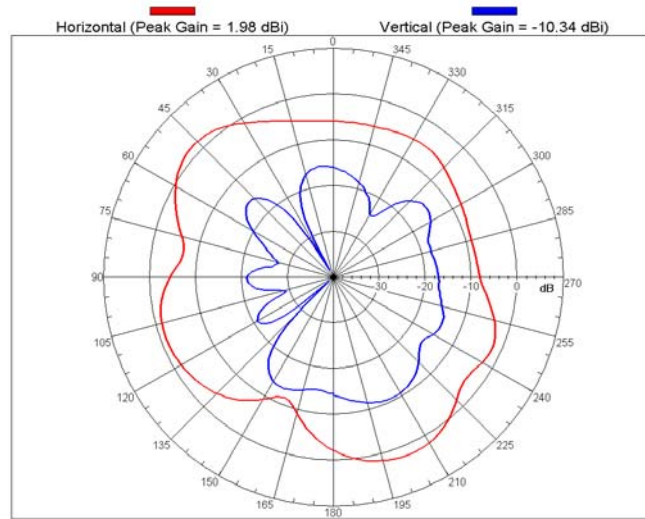
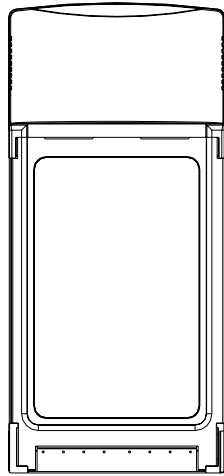
VSWR



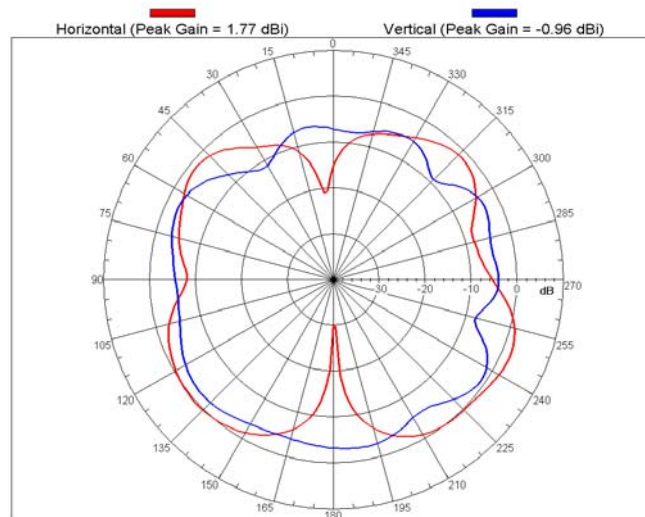
Date: 2.NOV.04 11:08:37

Radiation Pattern

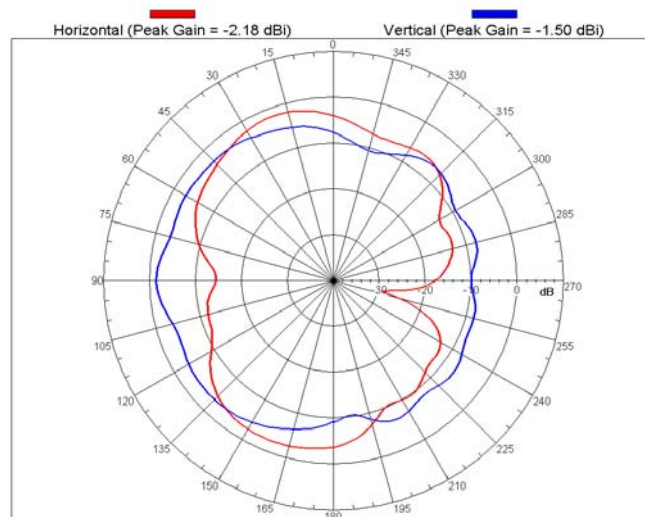
1. XY-plane


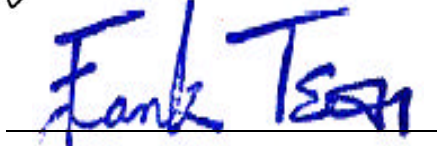


2. XZ-plane



3. YZ-plane



Report No.	C51ET050252
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 PC Card
Model No.	WLG-1103, WPC-0300, LWS5410N, NWP-0208-G, ALL0282A
EUT Condition	<input checked="" type="checkbox"/> Engineering sample; <input type="checkbox"/> Pre-production; <input type="checkbox"/> Final production (Sample # C51050252)
Results	Compliance (As detailed within this report)
Date	03/30/2005 (month / day / year) (Sample received) 04/06/2005 to 04/18/2005 (Test)
Prepared by	 Project Engineer (Jack Tsai)
Authorized by	 General Manager (Frank Tsai)
Issue date	April 21, 2005 (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.

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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 55013/2001	CISPR 13: 2001
(X)	EN 55022/98 +A1/2000 +A2/2003	CISPR 22: 2002
(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 +A1/2001+A2/2003	CISPR 24/1997
()	EN 55020/2002	CISPR 20/2002
(X)	EN 61000-4-2:2001	IEC 61000-4-2:2001
(X)	EN 61000-4-3:2002 +A1/2002	IEC 61000-4-3:2002 +A1/2002
(X)	EN 61000-4-4:1995 +A1/2000 +A2/2001	IEC 61000-4-4:1995 +A1/2000+A2/2001
(X)	EN 61000-4-5:2001	IEC 61000-4-5:2001
(X)	EN 61000-4-6:2003	IEC 61000-4-6:2003
()	EN 61000-4-8:2001	IEC 61000-4-8:2001
(X)	EN 61000-4-11:2001	IEC 61000-4-11:2001

Chapter 1 Introduction

Description of EUT

Product Name	: 802.11g Wireless PC Card
Model No.	: WLG-1103, WPC-0300, LWS5410N, NWP-0208-G, ALL0282A
Frequency Range	: 2.400GHz ~ 2.4835GHz
Operating Frequency	: 2.412GHz ~ 2.472GHz
Support Channel	: 13 Channels
Modulation Skill	: DBPSK, DQPSK, CCK, OFDM
Power Type	: Powered by PCMCIA interface of client' s device
Power Cable	: None
Data Cable	: None

Test Method

1. Insert the EUT into the PCMCIA bus of the notebook computer.
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.

Notebook	:	IBM Think Pad X20
Model No.	:	2662-11T
Serial No.	:	FX-1192200/09
FCC ID	:	N/A, DoC (Declaration of Confirmation) Approved
BSMI	:	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
Fax/Modem	:	Aceex
Model No.	:	DM-1414
Serial No.	:	9010582, 9010583
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	:	EPSON; HP
Model No.	:	B241A, C2642A
Serial No.	:	FAPY155090, SG69A196GV
FCC ID	:	None (DoC Approved), B94C2642X
BSMI	:	R33126, 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

USB Game pad : Padix, Rockfire
Model No. : QF-305u, QF-337uv
Serial No. : 81100848, KR91379759
FCC ID : DoC Approved, None (CE approval)
BSMI : None, 3862A574
Power type : By PC
Data cable : Shielded, 1.76m length no ferrite core (1.81m with 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 PC : Twinhead
Model No. : N222S
Serial No. : SY3261000988
FCC ID : DoC (Declaration of Confirmation) Approved
BSMI : 71001018

Power adaptor : LI Shin International Enterprise Corp.
Model No. : LSE9802A2060
Serial No. : A20231065818
FCC ID : DoC Approved
BSMI : 3882B381
Power type : 100 ~ 240VAC / 50 ~ 60Hz, 1.5A, Switching
Power cord : Non-shielded, 1.0m length, Plastic hood, No ferrite core
(Main power to adaptor)
Shielded, 1.5m length, Plastic hood, ferrite core
(DC plug to adaptor)

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 is 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 from 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 is 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 from 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.

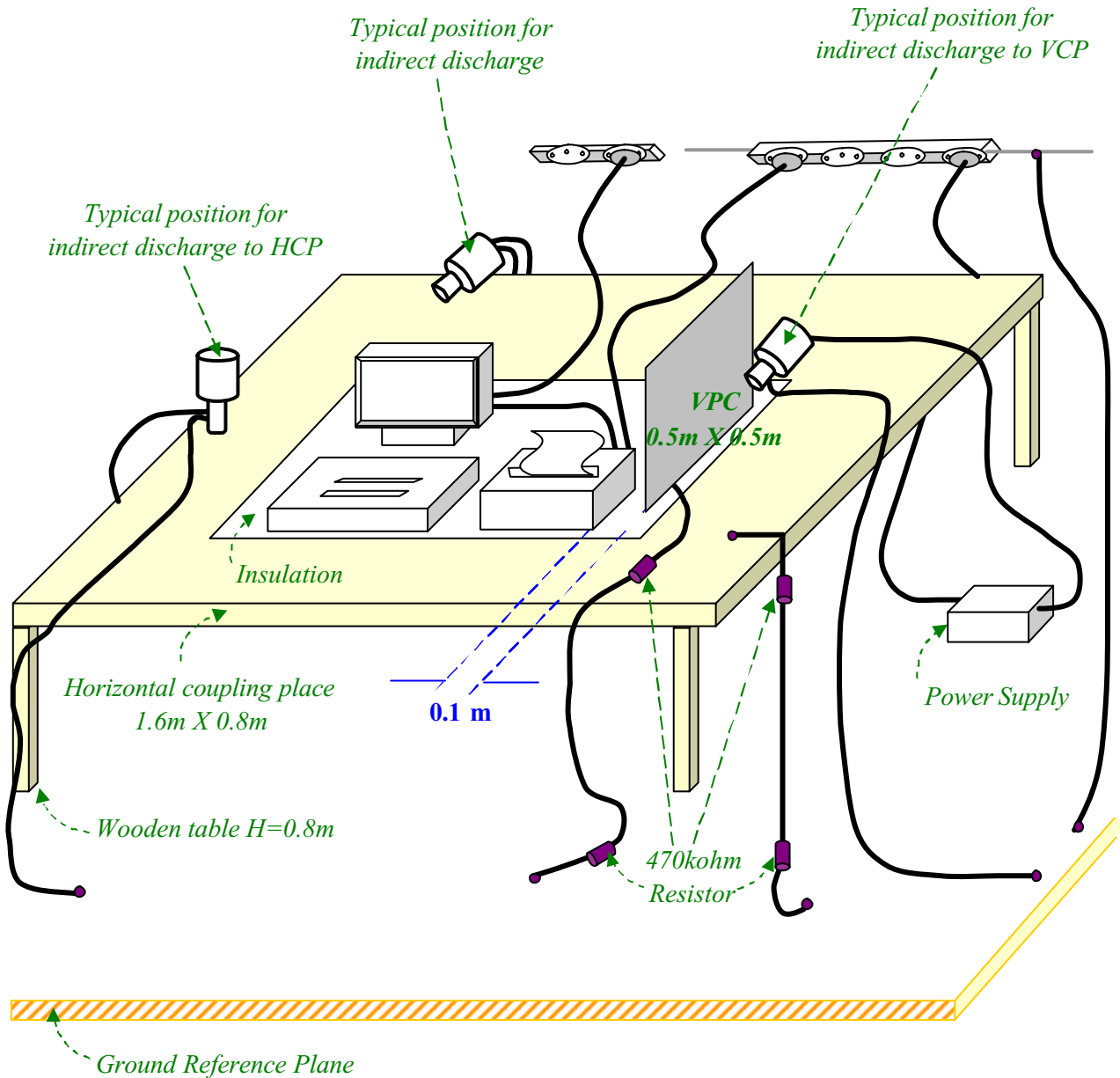
Where the EUT is a *transceiver*, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the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

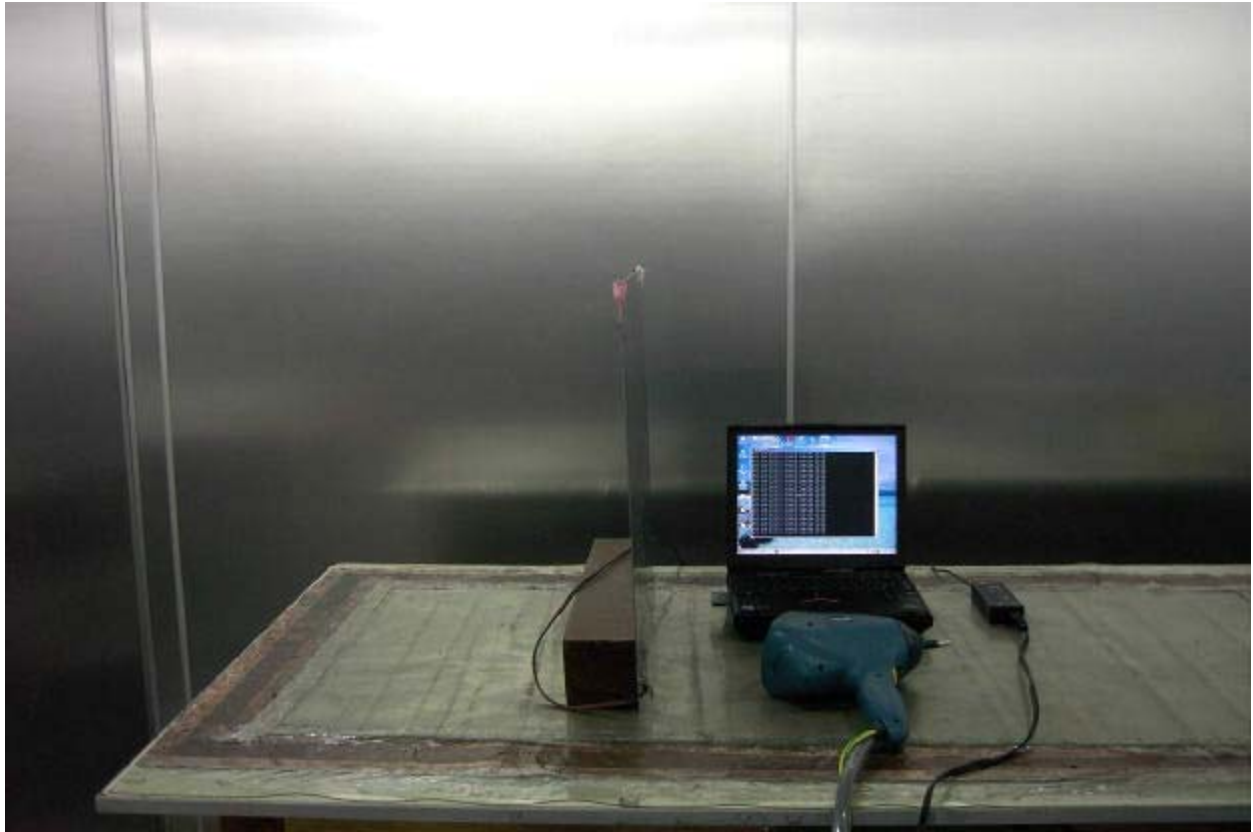
Name	Model Number	Serial Number	Selected
Best Plus BURST ESD SURGE TRANSIENTS	Best Plus V6.2	199749-019SC	
BEST EMC Test Instrument	BEST EMC V2.3 (-8, -9)	199918-006SC	
SCHAFFNER EMV AG	NSG 438 INA 4380	253	X

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

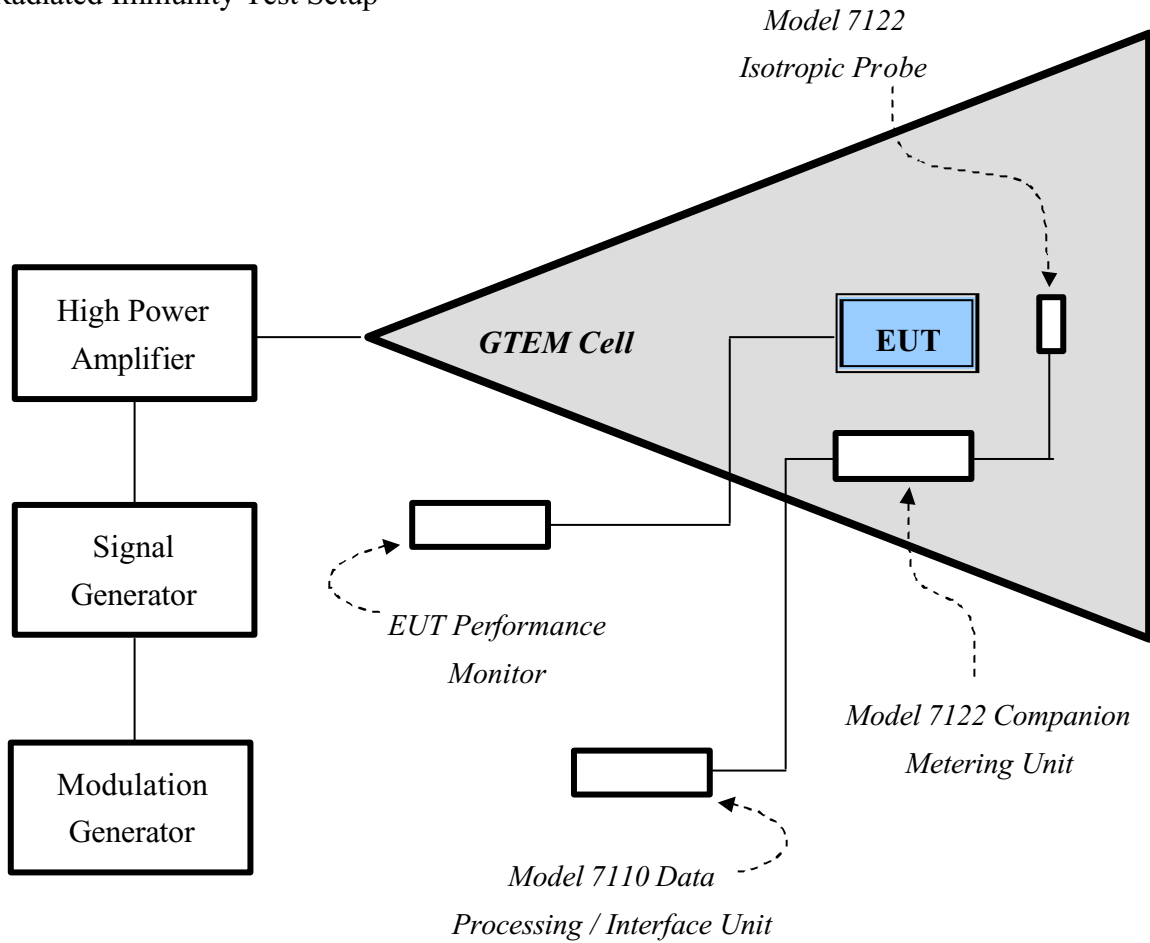


Chapter 5 Radio Frequency Immunity Test (RS)

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:

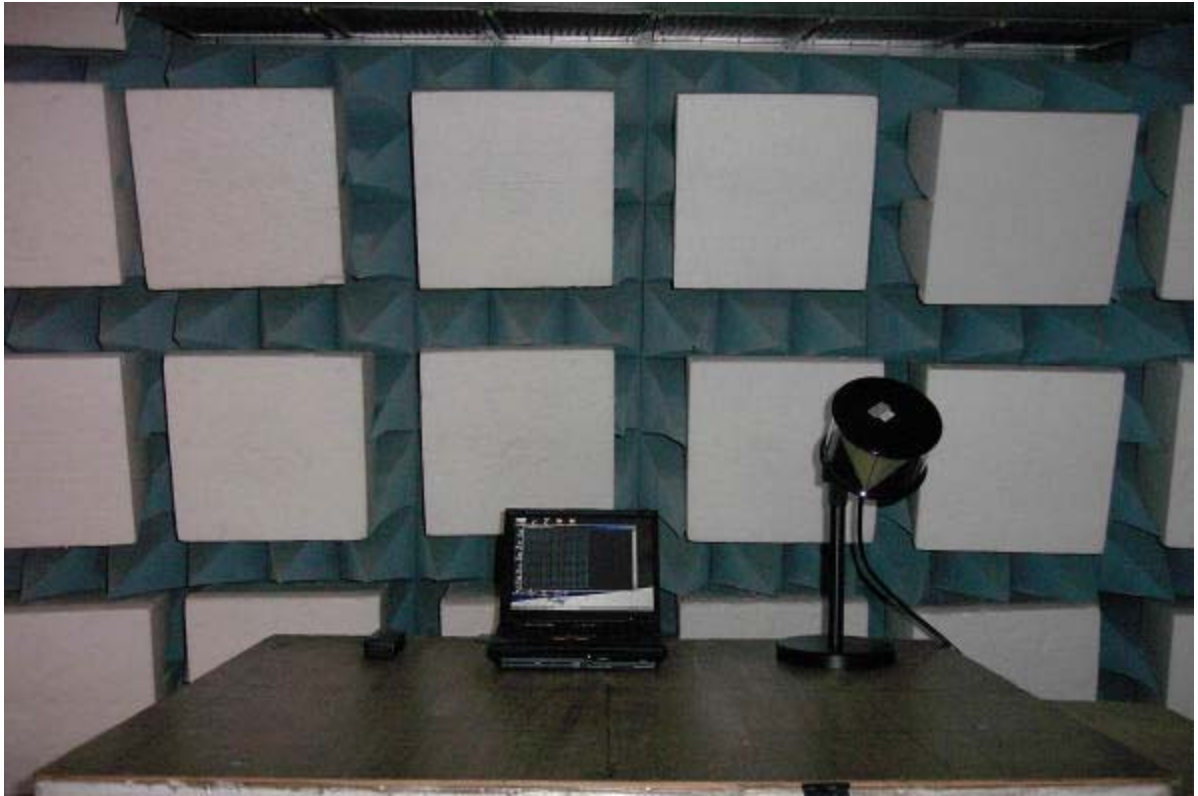
Name	Model Number	Serial Number	Selected
EMCO GTEM	5317	9411-1123	X
EMCO Probe	7122	9406-1194	X
EMCO METERING UNIT	7122	9406-1194	X
EMCO data interface	7110	9410-1273	X
HP Personal Computer	D3178A	3438S00486	X
HP Signal Generator	8657B	2928U00286	X
HP Signal Generator	83711A	3429A00434	X
IFI Wideband 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

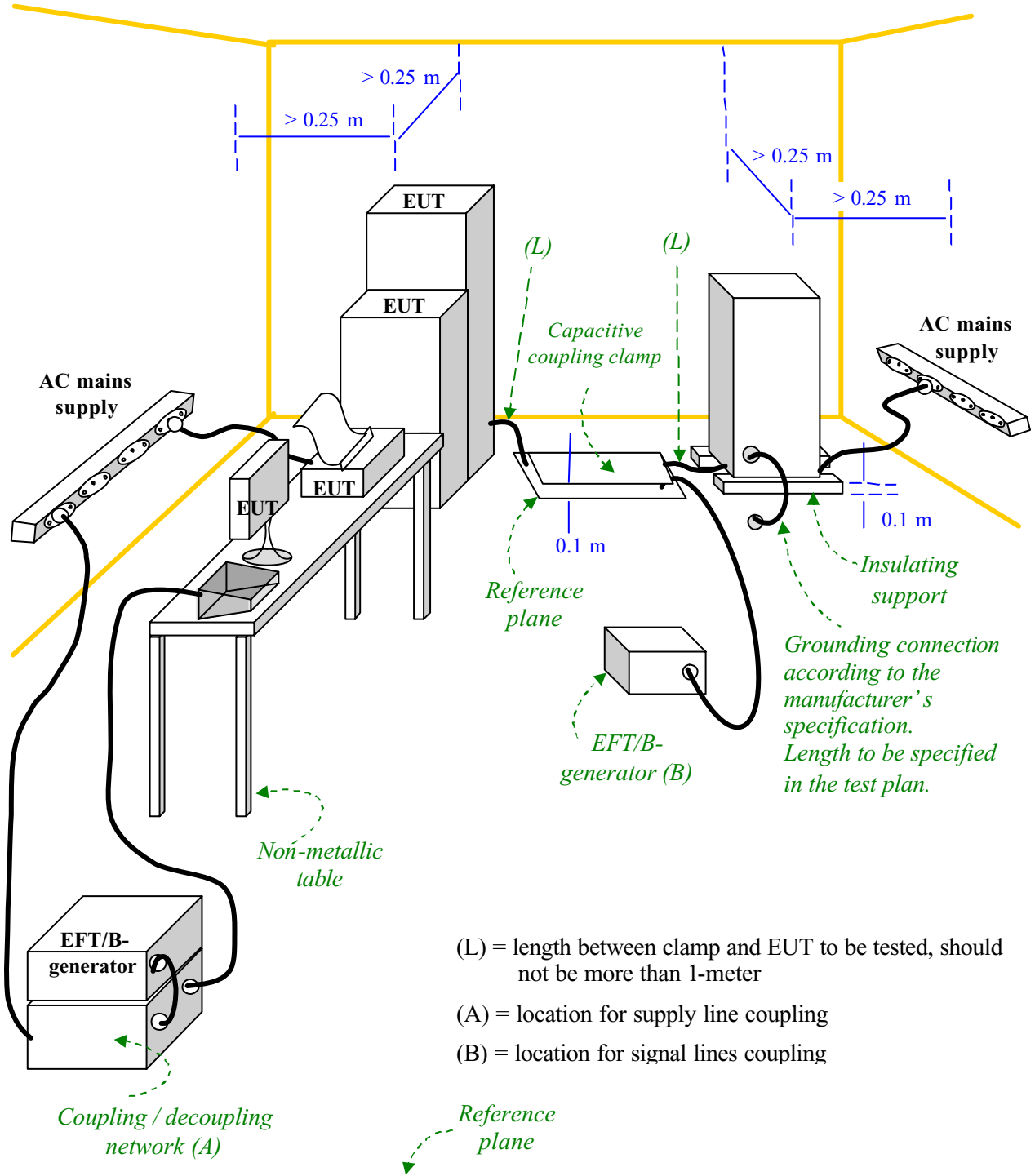
EN 61000-4-3 PHOTO OF TEST SET-UP



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 ($\pm 10\%$) and repetition rate of the impulses ($\pm 20\%$)				
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)**

<input type="checkbox"/> Signal and control ports	<input type="checkbox"/> CT	<input type="checkbox"/> TT	<input type="checkbox"/> CR	<input type="checkbox"/> TR
<input type="checkbox"/> DC power input ports	<input type="checkbox"/> CT	<input type="checkbox"/> TT	<input type="checkbox"/> CR	<input type="checkbox"/> TR
<input checked="" type="checkbox"/> AC mains input ports	<input type="checkbox"/> CT	<input checked="" type="checkbox"/> TT	<input type="checkbox"/> CR	<input checked="" type="checkbox"/> TR

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



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)**

<input checked="" type="checkbox"/> AC mains input ports	<input type="checkbox"/> CT	<input checked="" type="checkbox"/> TT	<input type="checkbox"/> CR	<input checked="" type="checkbox"/> TR
<input type="checkbox"/> Signal and control ports	<input type="checkbox"/> CT	<input type="checkbox"/> TT	<input type="checkbox"/> CR	<input type="checkbox"/> TR

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

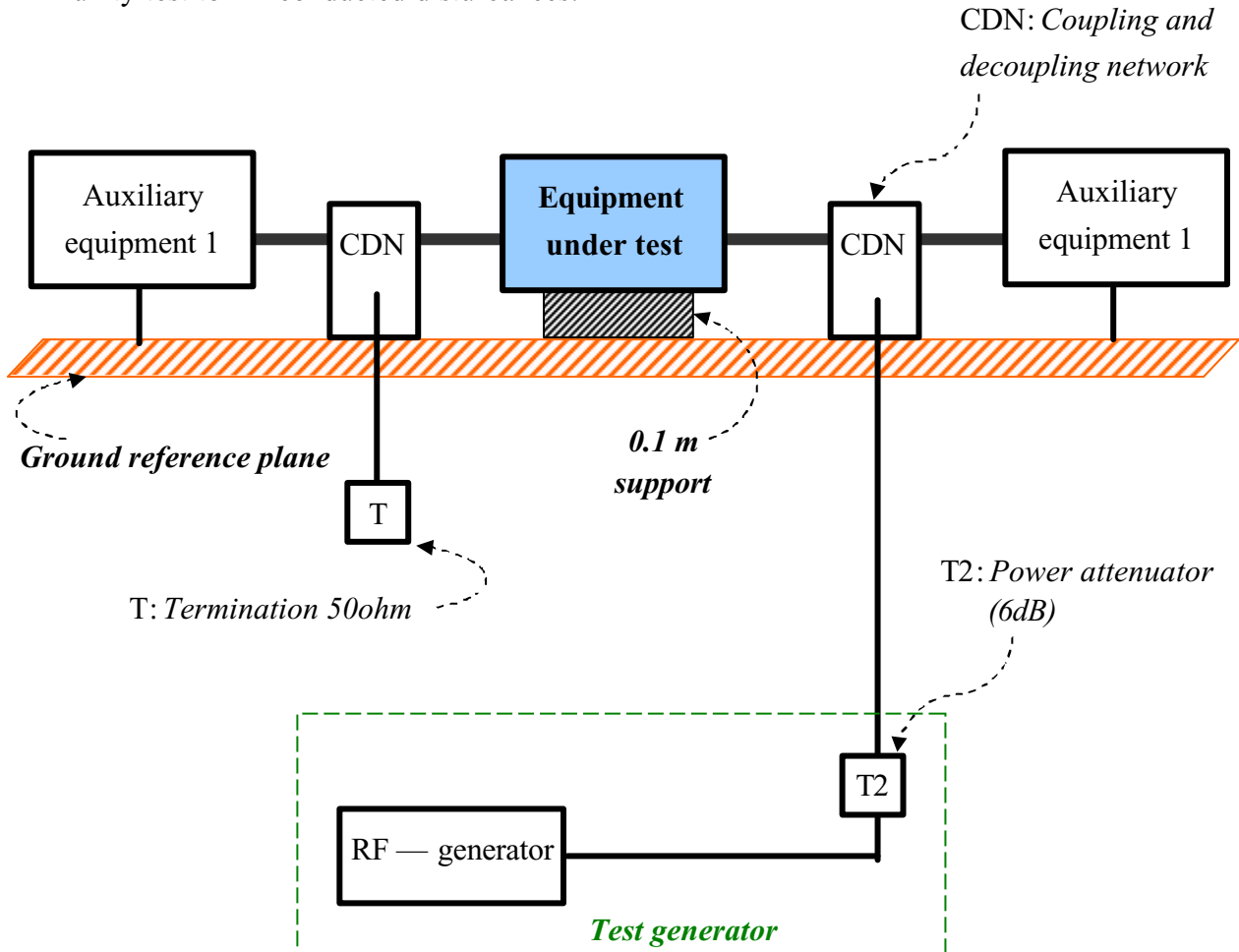


Chapter 8 Continuous Wave Voltage Immunity Test

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.)	
	U_0 [dB(μ v)]	U_0 [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 \pm 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-SYNTHESIZERIAMP21FIER	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)

<input type="checkbox"/> Antenna port	<input type="checkbox"/> CT	<input type="checkbox"/> TT	<input type="checkbox"/> CR	<input type="checkbox"/> TR
<input type="checkbox"/> Signal and control ports	<input type="checkbox"/> CT	<input type="checkbox"/> TT	<input type="checkbox"/> CR	<input type="checkbox"/> TR
<input type="checkbox"/> DC power input ports	<input type="checkbox"/> CT	<input type="checkbox"/> TT	<input type="checkbox"/> CR	<input type="checkbox"/> TR
<input checked="" type="checkbox"/> AC mains input ports	<input checked="" type="checkbox"/> CT	<input type="checkbox"/> TT	<input checked="" type="checkbox"/> CR	<input type="checkbox"/> 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*.

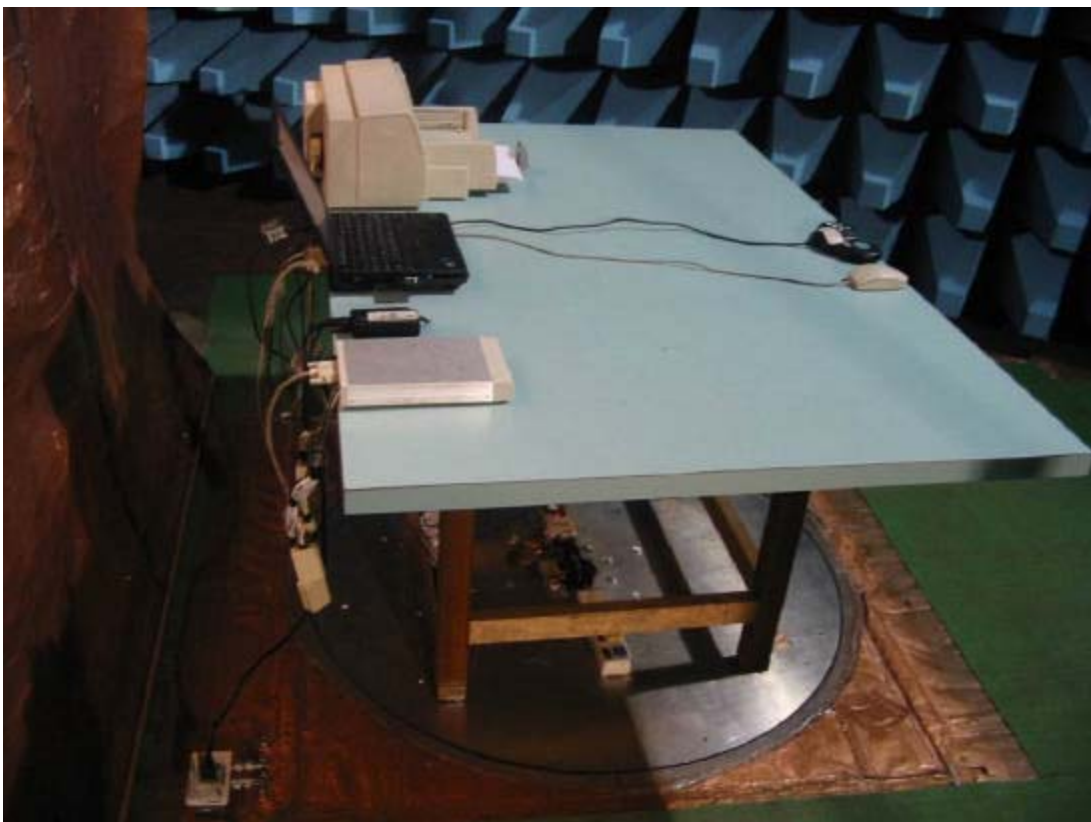
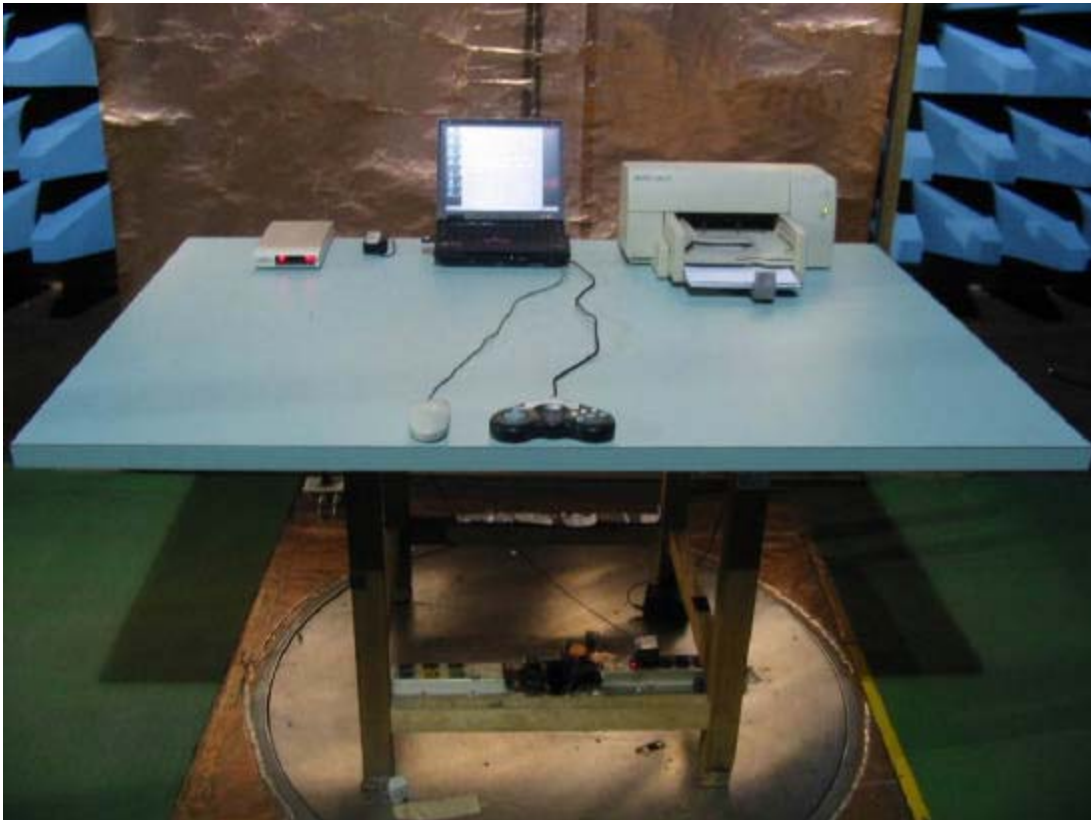
While testing the worst-emission plot printed in the *peak detection mode*, and there are up to 6 highest emissions to be recorded. The plot is kept as the original data and not included in the test report.

List of test Instrument

Instrument Name	Model	Brand	Serial No.	Calibration Date
				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

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

Line 1

Frequency (kHz)	READING AMPLITUDE			LIMIT		Margin (dB)
	Peak (dBµV)	Quasi-Peak (dBµV)	Average (dBµV)	Quasi-Peak (dBµV)	Average (dBµV)	
220.000	43.68	---	---	64.00	54.00	-10.32
884.000	42.16	---	---	56.00	46.00	-3.84
1208.000	39.52	---	---	56.00	46.00	-6.48
1766.000	42.16	---	---	56.00	46.00	-3.84
2094.000	40.79	---	---	56.00	46.00	-5.21
2741.000	41.75	---	---	56.00	46.00	-4.25
3304.000	43.39	36.99	32.58	56.00	46.00	-13.42
4131.000	41.37	---	---	56.00	46.00	-4.63
6170.000	40.13	---	---	60.00	50.00	-9.87
7610.000	39.66	---	---	60.00	50.00	-10.34

Line 2

Frequency (kHz)	READING AMPLITUDE			LIMIT		Margin (dB)
	Peak (dBµV)	Quasi-Peak (dBµV)	Average (dBµV)	Quasi-Peak (dBµV)	Average (dBµV)	
329.000	42.41	---	---	60.89	50.89	-8.48
884.000	41.47	---	---	56.00	46.00	-4.53
1219.000	40.22	---	---	56.00	46.00	-5.78
1766.000	42.07	---	---	56.00	46.00	-3.93
1977.000	40.96	---	---	56.00	46.00	-5.04
2820.000	40.33	---	---	56.00	46.00	-5.67
4288.000	40.72	---	---	56.00	46.00	-5.28
6270.000	42.64	---	---	60.00	50.00	-7.36

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 from 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.

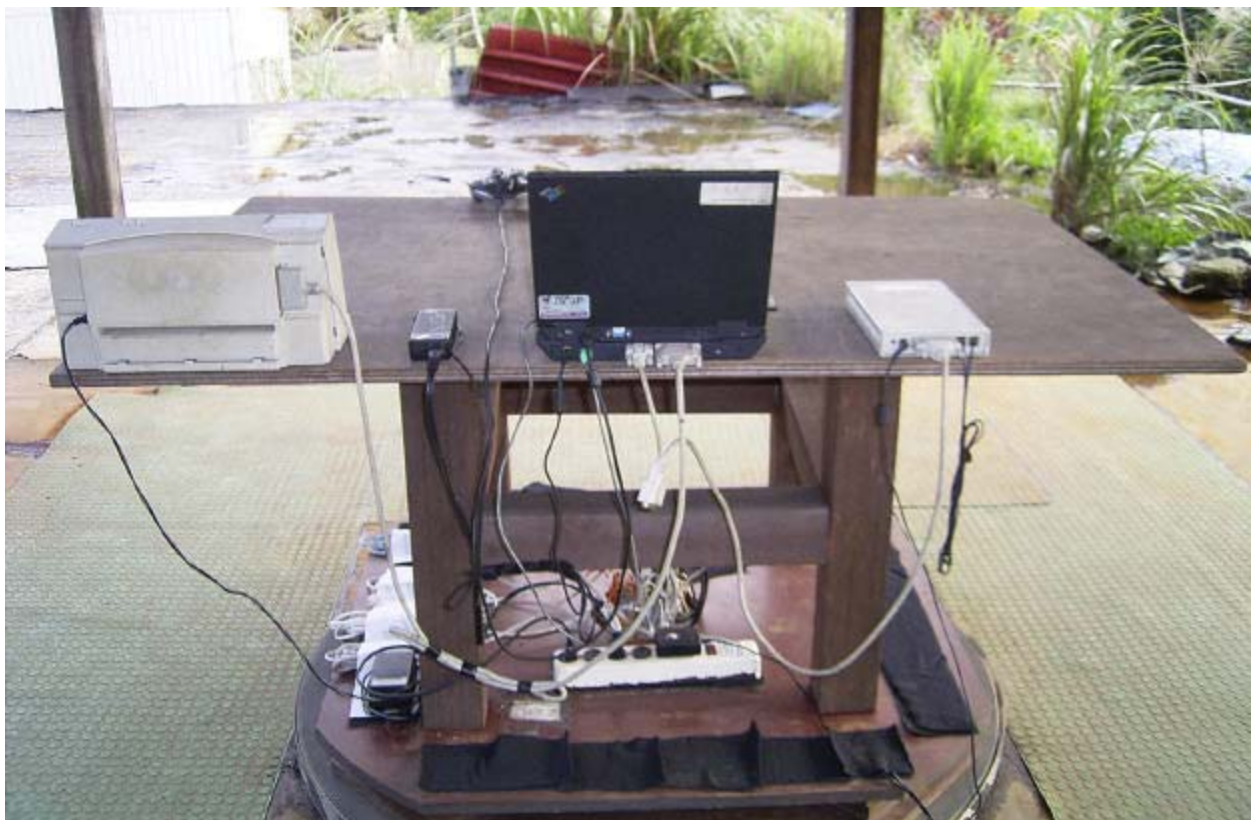
If the emission is close to the frequency band of ambient, the tester will recheck the data and the corrected data will be written in the test data sheet. If the emission is just within the ambient, the data from shielded room will be taken as the final data.

List of test Instrument

Instrument Name	Model	Brand	Serial No.	Calibration Date
				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	CI-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 : 25 ° C Humidity : 73 % RH

Radiated Emissions for 30MHz to 1GHz [Horizontal]

Radiated Emission				Correction Factors (dB)	Corrected Amplitude (dBµV/m)	Class B (10 m)	
Frequency (MHz)	Amplitude (dBµV)	Ant. H. (m)	Table (°)			Limit (dBµV/m)	Margin (dB)
122.8825	26.90	3.57	0	-6.74	20.16	30.00	-9.84
259.9863	35.61	1.38	245	-5.00	30.61	37.00	-6.39
298.4240	33.65	3.06	93	-3.45	30.20	37.00	-6.80
324.9250	36.07	3.15	0	-2.65	33.42	37.00	-3.58
912.8125	23.24	1.95	132	9.85	33.09	37.00	-3.91

Radiated Emissions for 30MHz to 1GHz [Vertical]

Radiated Emission				Correction Factors (dB)	Corrected Amplitude (dBµV/m)	Class B (10 m)	
Frequency (MHz)	Amplitude (dBµV)	Ant. H. (m)	Table (°)			Limit (dBµV/m)	Margin (dB)
73.9025	32.39	1.00	93	-9.68	22.71	30.00	-7.29
232.8825	29.42	1.00	327	-6.37	23.05	37.00	-13.95
565.8613	19.28	1.00	334	4.45	23.73	37.00	-13.27
649.9663	18.27	2.15	183	4.40	22.67	37.00	-14.33

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	4F, No. 42, Min Chuan E. Rd., Sec. 6, Taipei
Country	Taiwan, R.O.C.
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 PC Card
Manufacturer	CAMEO COMMUNICATIONS, INC.
Brand	CAMEO, Level One, LG, Etherwan, Allnet GmbH
Type	WLG-1103, WPC-0300, LWS5410N, NWP-0208-G, ALL0282A

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

Standard	Issue date
ETSI EN 300 328	V1.4.1 Apr. 2003
ETSI EN 301 489-1	V1.4.1 Aug. 2002
ETSI EN 301 489-17	V1.2.1 Apr. 2002
EN 60950-1	2001

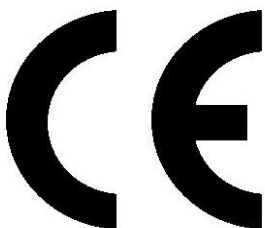
and therefore complies with the essential requirements and provisions of the **R&TTE directive 1999/5/EC** of the European Parliament and of the council of 9 March 1999 on radio equipment and Telecommunications Terminal Equipment and the mutual recognition of their conformity and the requirements of 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



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

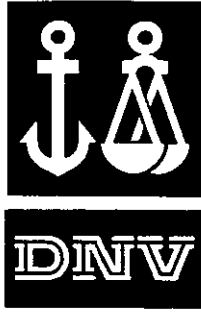
Company	CAMEO COMMUNICATIONS, INC.
Address, City	6F, NO. 22, Chung Shin Rd., Hsi-Chih,
Country	Taipei 221, Taiwan
Phone number	886-2-26499800
Fax number	886-2-26499984
E-mail	Jason_Chang@mail.cameo.com.tw

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 <i>6F, NO. 22, Chung Shin Rd., Hsi-Chih, Taipei 221, Taiwan.</i> who is ISO 9001 certified for development, production and distribution of radio products. (See copy of ISO 9001 certification attached)



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 / <i>Jason Chang</i> 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*

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

*This Certificate is valid until:
December 15th, 2003*



Accredited
by the RvA

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

*K. S. Cheung
Management Representative*

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

Patrick Wang
Lead Auditor



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