Washington Laboratories, Ltd.

Regulations for Global Compliance

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Schedule

8:00-8:30: Registration

8:30-9:15 Introduction and Overview of Worldwide Approvals

- Mike Violette, Washington Laboratories

9:15-10:15 Global Product Approvals

- Dan Sullivan, TUV Rheinland
- **10:15-10:30 Break**

10:30-11:15: US and North American Safety Approvals

- Berri Remenick, Washington Labs

11:15-12:00: Wireless Testing and Regulations

- Greg Snyder, Washington Labs

12:00-1:00: Lunch

AFTERNOON SESSION

1:00-3:00 Laboratory Demonstrations

Regulations for Global Compliance

- Market Information
- Technology Growth
- FCC Regulations
- UL Regulations
- European Regulations

Hi Tech US Imports and Exports: 2000-2002

Year	Exports $B US	Imports	Balance
2000	$223	$271	-$48
2001	$188	$222	-$33
2002	$166	$220	-$54

Key Markets for US

Imports $220B

- $141B from Asia
- Computers and Office Equipment
  - $77B

US High Tech Imports by Country 2000-2002

Country	2000	2002
China	$26	$35
Mexico	$37	$34
Japan	$48	$29
EU	$28	$26
Malaysia	$20	$19
Taiwan	$22	$16
South Korea	$21	$15
Singapore	$15	$11
Canada	$21	$10
Philippines	$9	$7

What the US Buys:
US Imports 2002

Type of Equipment	$Billion
Computers and Office Equipment	$77.5
Communications Equipment	$40.1
Consumer Electronics	$28.4
Semiconductors	$26.0
Industrial Electronics	$18.1
Electronic Components	$16.6
Electromedical	$8.4
Photonics	$4.9

Chinese Exports

- China is number one supplier of High-Tech to US in 2002
- Chinese exports to US increased 32% from 2000 to 2002
  - $35 Billion
- WTO reduced tariffs to zero for most information technology products

New Technologies
Wireless Growth in US

- More than 300 new Wireless products are approved every month
- LANs
- Bluetooth
- Alarm Systems

Wireless Broadband

Market Access Estimates

- Frost & Sullivan's North American Broadband Wireless Access Services Market
  - 2000: Wireless broadband service $842.3M
  - 2007: >$10B(?)

Wireless LAN Market Size

- VDC, (Natick, MA):

  Global Market for Wireless LAN related equipment INICs, bridges, residential gateways)

  - 2001: $923M
  - 2002: $1,050M
  - 2003: $1,426.3M
  - 2004: $1,906M
  - 2005: $2,384M

Communications and Imaging

New wider bandwidth technologies necessary to implement short range communication devices

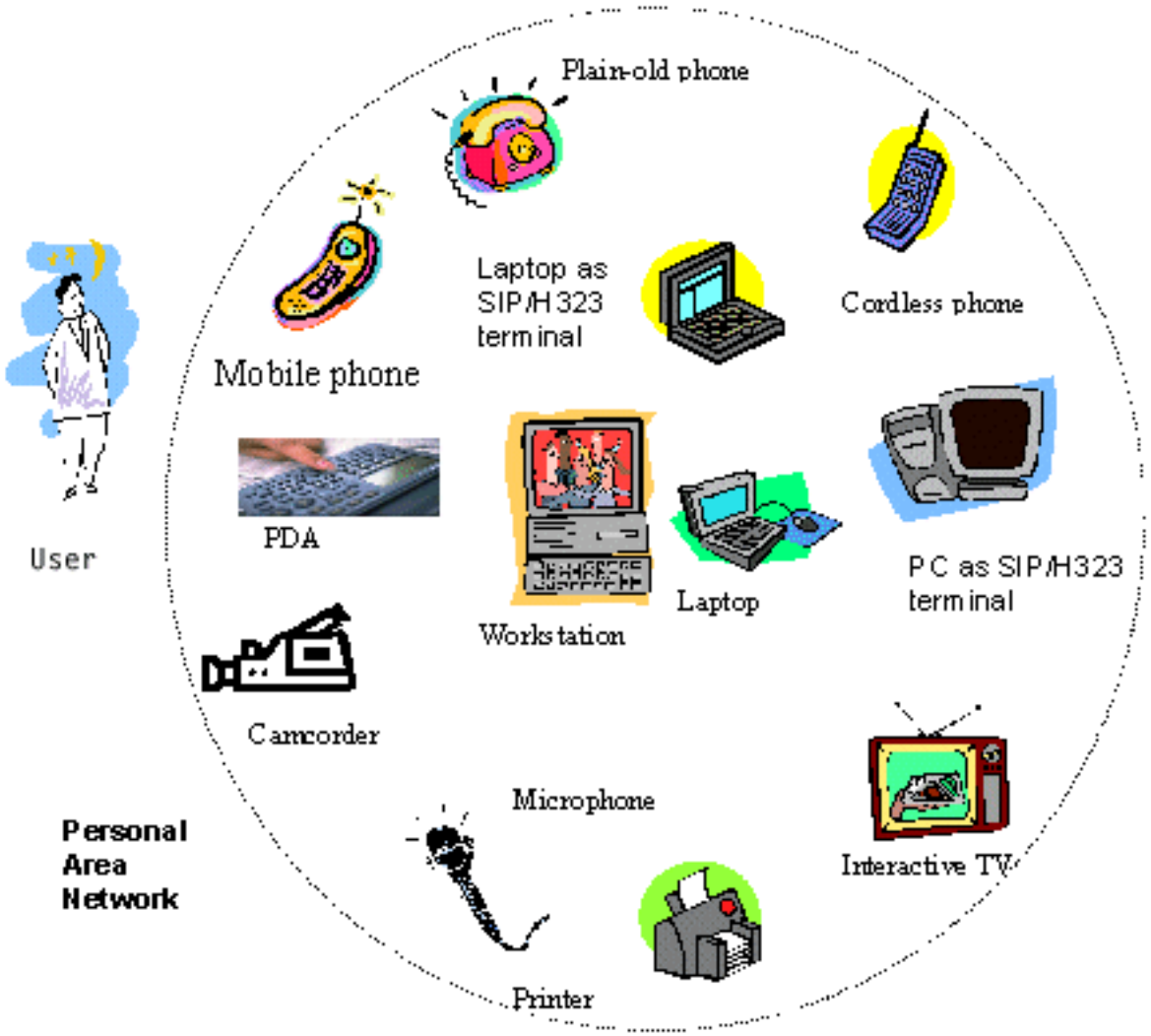
- IEEE 802.11 for LANS
- IEEE 802.15.3a (TG3a) for PANs
  - Devices worn on or located near the body
  - PDAs
  - HPCs (Handheld Personal Computers)

Collision Avoidance

Current and Emerging Wireless Technologies

- Bluetooth: 2.4 GHz
- Wi-Fi: IEEE 802.11
- WCDMA: Cellular 3G; GSM Migration
  - 1920-1980 MHz & 2110-2170 MHz
- CDMA-2000: Cellular 3G

Personal Area Networks



ELECTRONIC PRODUCTS

FCC Rules control electromagnetic noise, protect radio frequency spectrum and telecommunications

http://www.fcc.gov

UL standards protect people from danger from electrical shock, fire and injury

Laser Devices

- CD ROMs
- DVD

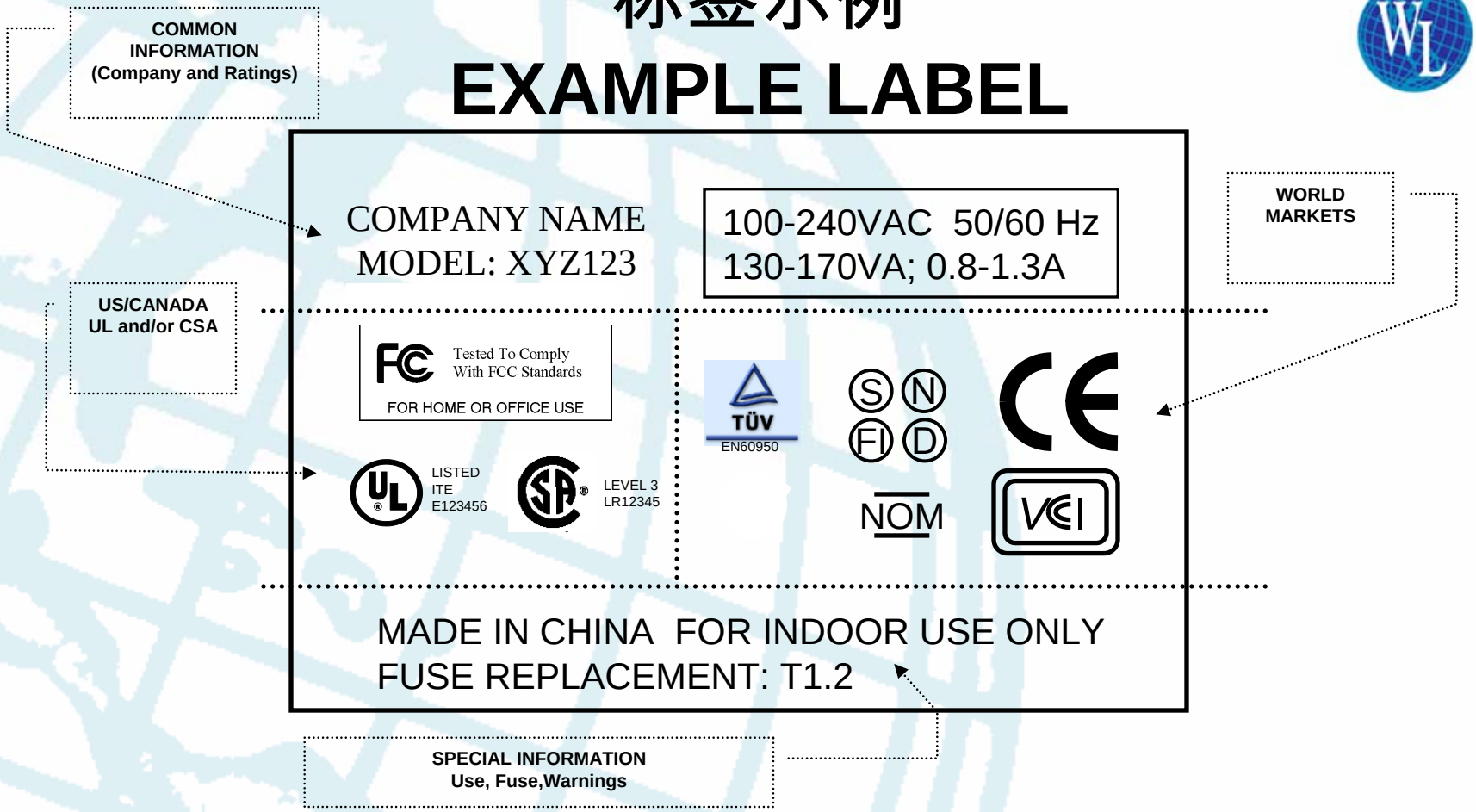
- FDA
- CDRH

Types of Approvals

Type of Equipment	Standard
Information Technology Equipment • Personal Computers • Printers • Fax machines • Electronic games	FCC Part 15 UL 1950
Telecommunications Equipment	FCC Part 15, ACTA Part 68, UL 1950
Home Appliances	FCC Part 18 (only for microwaves) UL
Medical Equipment	UL 2601
Lights	UL
Industrial Equipment	UL
Radio Transmitters Remote control devices	FCC Part 15, 22, 24, 90
Radio-controls for games (airplanes)	FCC Part 95
Calculators and Watches	NONE
Battery-powered electronics	Maybe FCC Part 15

标签示例

EXAMPLE LABEL



VCI Japan

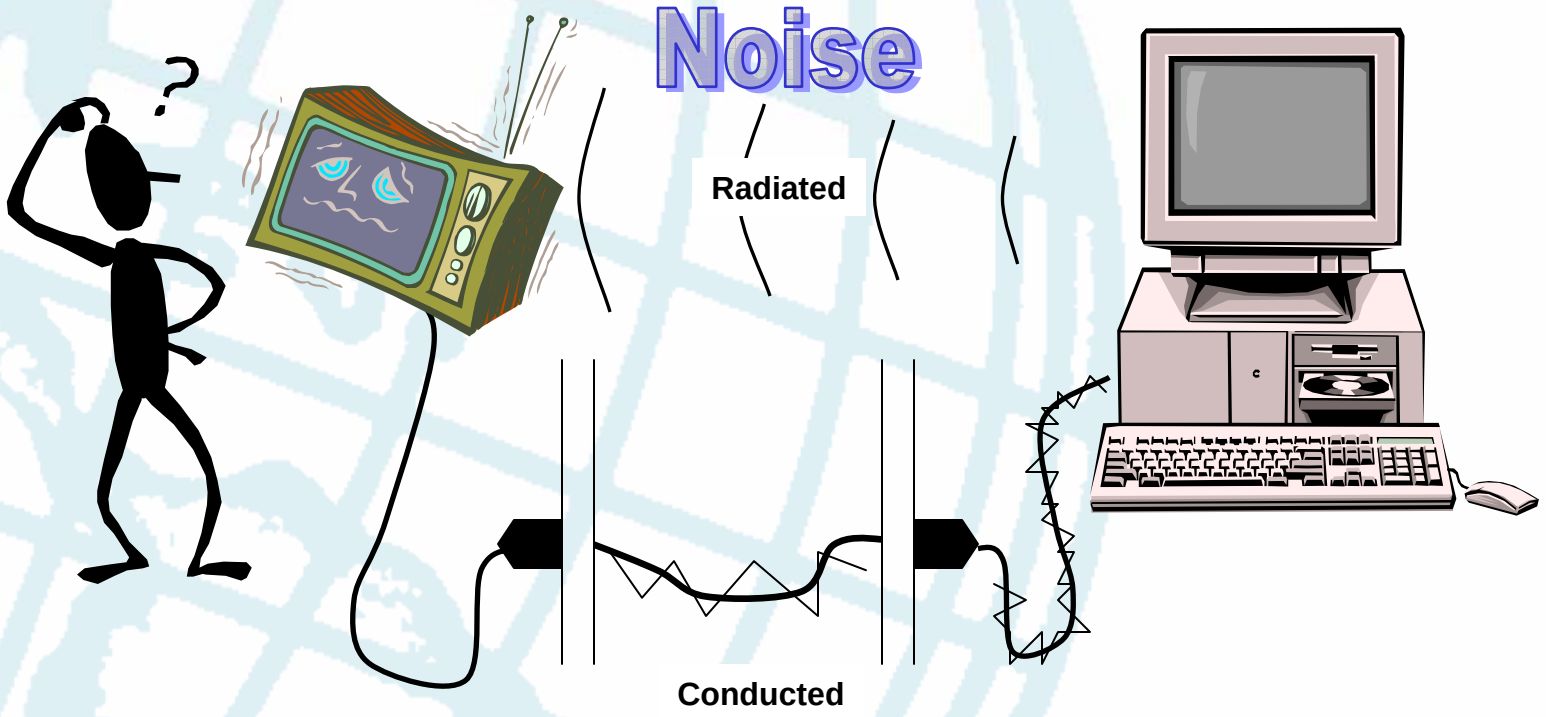
TÜV EN60950 Germany

Australia

S N FI D Sweden, Norway Finland, Denmark

NOM Mexico

FCC RULES REDUCE ELECTROMAGNETIC INTERFERENCE



FCC CONTROLS AND PROTECTS FREQUENCY SPECTRUM

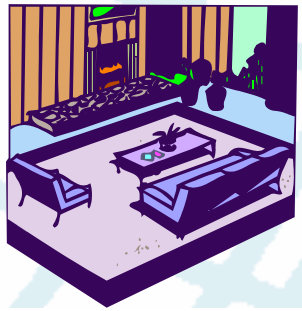
- Unlicensed Devices
- Licensed
- Broadcast Transmitters
- Cellular Phones
- WAPs

Canada has the same or very similar Technical Specifications

CLASS A and CLASS B

- Commercial/Industrial: Class A

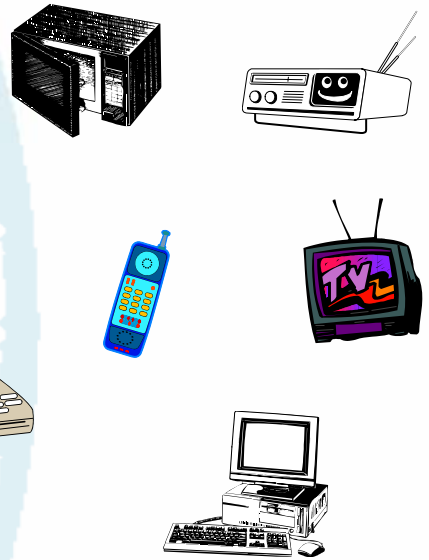
- Residential: Class B



ELECTRONIC PRODUCTS MUST MEET FCC RULES

Examples

Personal Computers
CD Players
Copying machines
Radio Receivers
Fax machines
Video Games
Office machines
Electronic toys
TVs
Microwave ovens



Class A Products

- Test and Report

Class B Products: Two Ways

- Method #1: Declaration of Conformity
- Method #2: Certification

FCC APPROVALS

Certification

- Transmitters and some computers

Certification or DOC

- Telecommunications

DOC

- Computers and radio receivers

Verification

- Commercial computers other “digital devices”

FCC
Important FCC Rule Parts

- FCC Part 2: Main requirements, spectrum allocations
- FCC Part 15: Radio Frequency Devices
- FCC Part 18: ISM
- FCC Part 22 & 24: Cellular
- FCC Part 25: Satellite
- FCC Part 90: Land Mobiles

EXEMPTIONS to Part 15

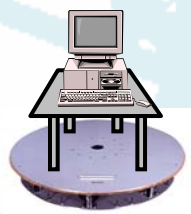
NO FCC NECESSARY FOR THESE PRODUCTS

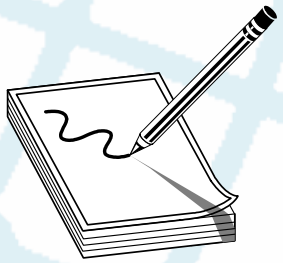
- Motor vehicles, aircraft and watercraft
- Electronic control systems by public utilities or in industrial plants
- Industrial, commercial or medical test equipment.
- Appliances (except microwave ovens)
- Specialized medical digital devices
- Medical diathermy equipment and ultrasonic equipment, while exempt from the Part 15 digital device standards, are subject to the regulations in Part 18
- Digital devices that have a power consumption of 6 nanowatts or less, digital watches and solar calculators
- Joystick or mouse controllers

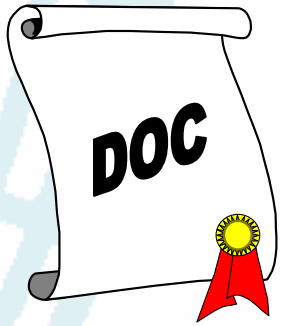
PERSONAL COMPUTERS, PRINTERS & PERIPHERALS

Declaration of Conformity. Does not go to the FCC

Test Product at approved Laboratory → **Report with Technical Information** → **Declaration of Conformity** → **Sell Product**







RADIO TRANSMITTERS

Examples

Cordless Phones, Radio Transmitters, CB Radios, Wireless Products

CERTIFICATION:

Test Product → Report with Technical Information → Send Report and Application to FCC or TCB → GRANT with FCC ID Number

www.atcb.com

Sell Product $

TELECOMMUNICATIONS

Devices that connect to the phone system

Examples

Telephones, Fax Machines, Caller-ID, Modems, ADSL Devices

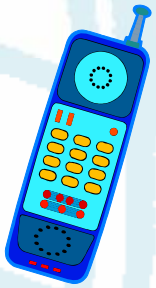
Test Product → Report with Technical Information → Send Report and ACTA → Registration Number

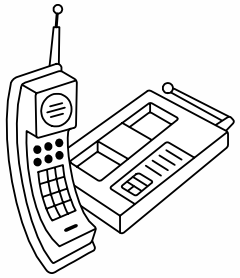
Sell Product $

Radio Transmitters

Some radio transmitters must also comply with radiation hazard levels

- Cell Phones
- Hand-held radios
- Low power radios

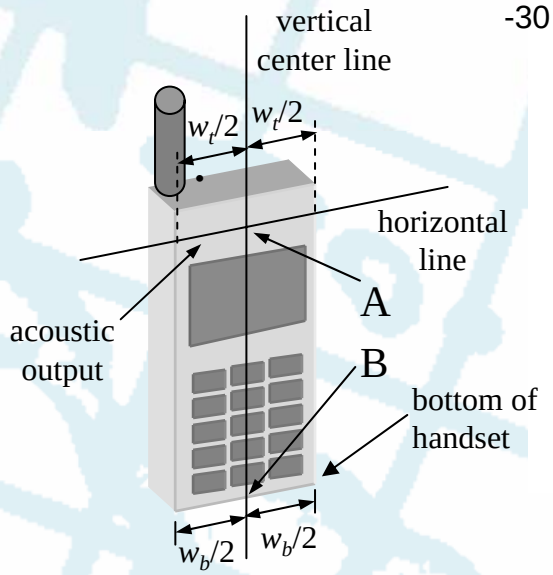


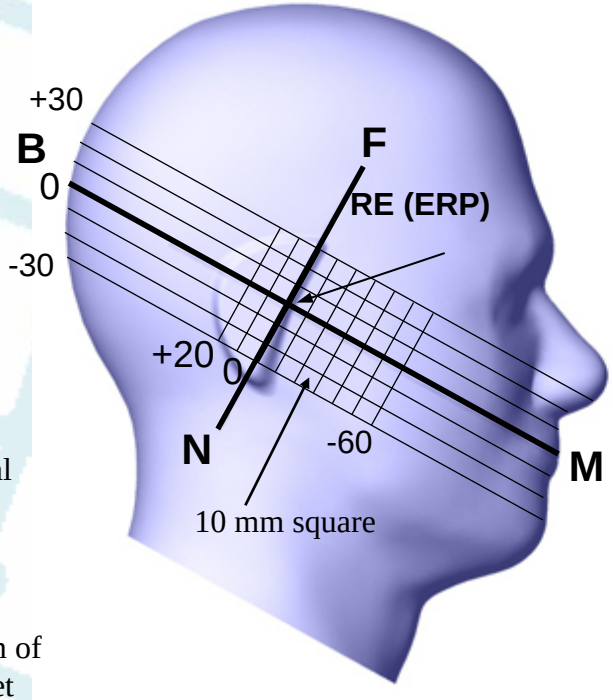


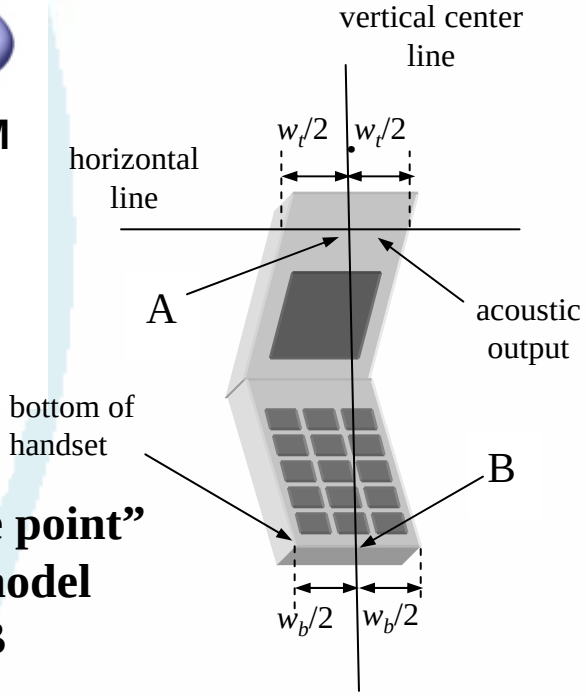
"SAR" testing. How much does radio wave affect human tissue

Expensive: $5,000 - $10,000

SAR Test Positions







- **point A is “test device reference point”**
- **align point A to ERP on head model**
- **align vertical center line to M-B**
- **align horizontal line to N-F**

FCC Approvals

Determine Equipment type

Is an “FCC Certification” Necessary?

- Only required for:
  - Transmitters
  - Telephones and modems
  - Some types of Radio Receivers
    - “scanning receivers”

This requires submission of FCC paperwork

- Test report and application form

FCC Identifier Number (FCC ID)

DECLARATION OF CONFORMITY (DOC)

MAJOR PROVISIONS

Applies to Class B personal computers and peripherals, TV Interface Devices and Radio Receivers

Alternative to Certification. No submission to the FCC

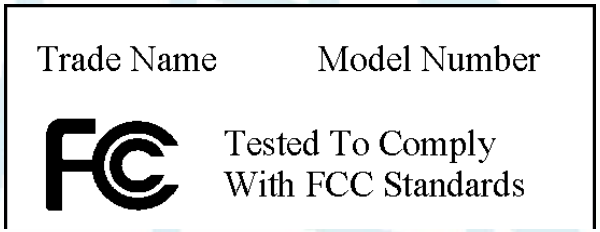
PROCEDURE

Compliance testing at accredited laboratory.

TESTING LABORATORY must be accredited

RESPONSIBLE PARTY must be listed on the form (US resident)

DOC LABEL and STATEMENT



This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The label shall not be a stick-on, paper label. The label shall be permanently affixed to the product and shall be readily visible to the purchaser at the time of purchase. "Permanently affixed" means that the label is etched, engraved, stamped, silkscreened, indelibly printed or otherwise permanently marked on a permanent attached part of the equipment or on a nameplate of metal, plastic, or other material fastened to the equipment by welding, riveting or a permanent adhesive. The label must be designed to last the expected lifetime of the equipment in the environment in which the equipment may be operated and must not be readily detachable.

FCC TRANSMITTER CERTIFICATION CHECKLIST

The Following is needed for testing:

- **TEST UNITS (one or more)**
- **DRAWING OF ANTENNA**
- **DOCUMENTATION**
- **LABELLING INFORMATION**

CERTIFICATION APPLICATION

Cover Letters:
- Request for Confidentiality (if desired)
- Modifications

Test Report from Lab
User's Manual
Schematics
Block Diagram
Test Setup Photographs from Lab
Internal/External Photographs by Lab
FCC ID Label Artwork:
FCC Label Position on Device
Operational Description:
Attestation Statements (for Transmitters)

FCC ID

FCC ID: AAAnnnnnnnnnnnn

AAA: is Grantee Code from FCC. Need to get the Grantee Code from FCC:

nnnnnnnnnnnnn: is from Manufacturer

Get grantee code from web site

"https://gullfoss2.fcc.gov/prod/oet/cf/eas/forms/GranteeRegistration.cfm"

Cost: $50 (one time only)

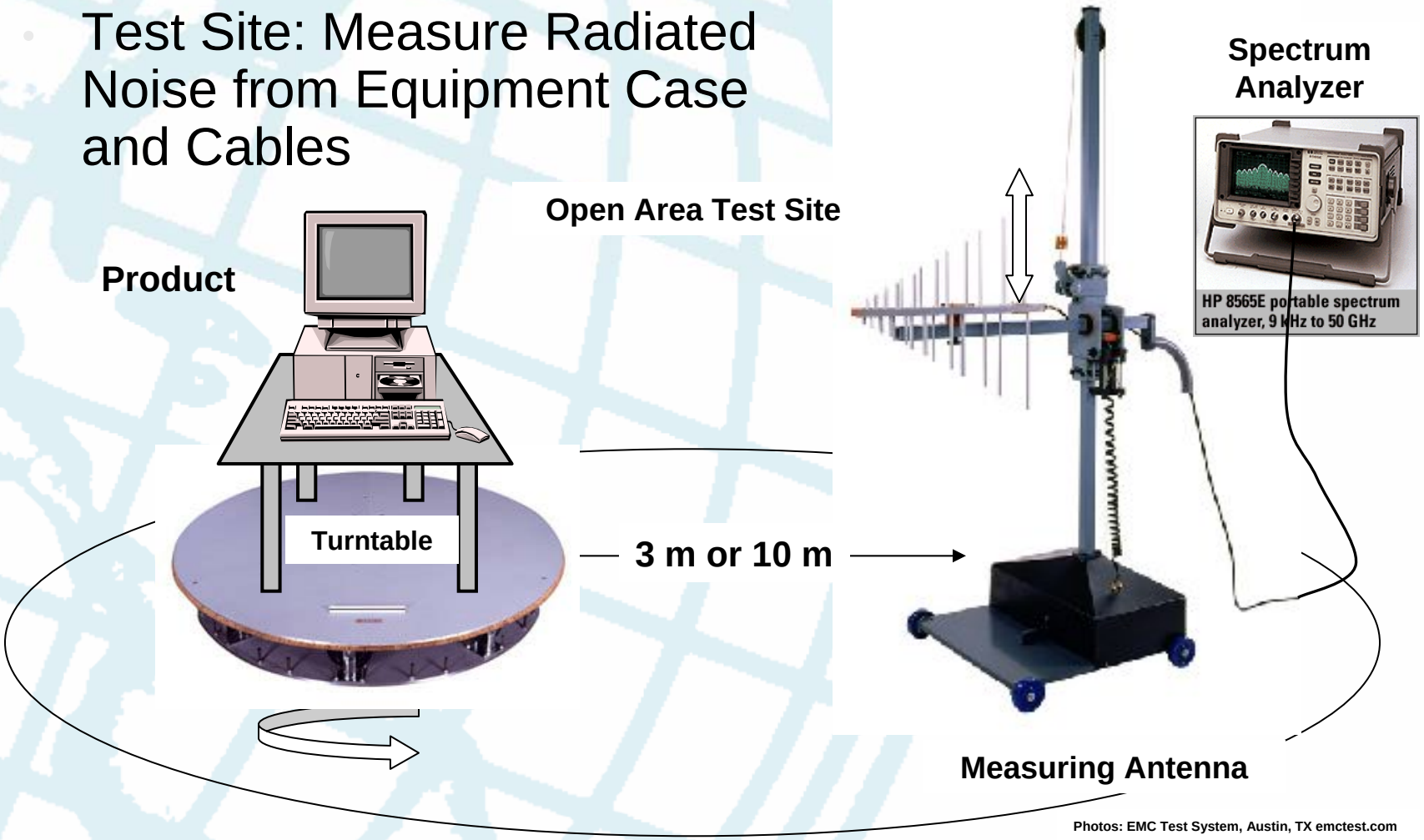
The FCC ID number must be on all Certified Devices

Testing Summary

FCC Testing for Computers and Wireless Devices

RADIATED EMISSIONS TESTING

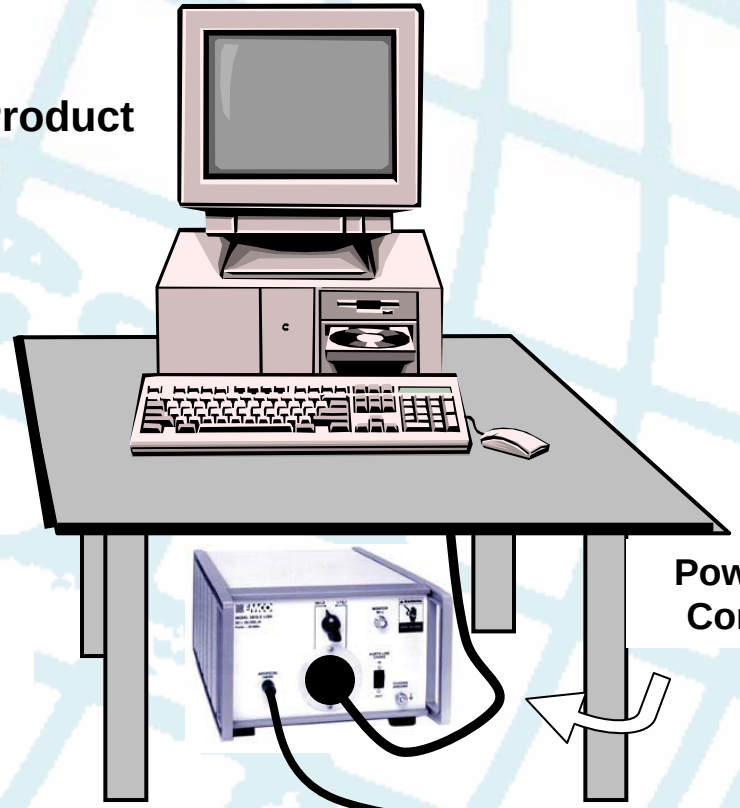
- Test Site: Measure Radiated Noise from Equipment Case and Cables



Photos: EMC Test System, Austin, TX emctest.com

CONDUCTED EMISSIONS TESTING

- Measure Noise on Power Line



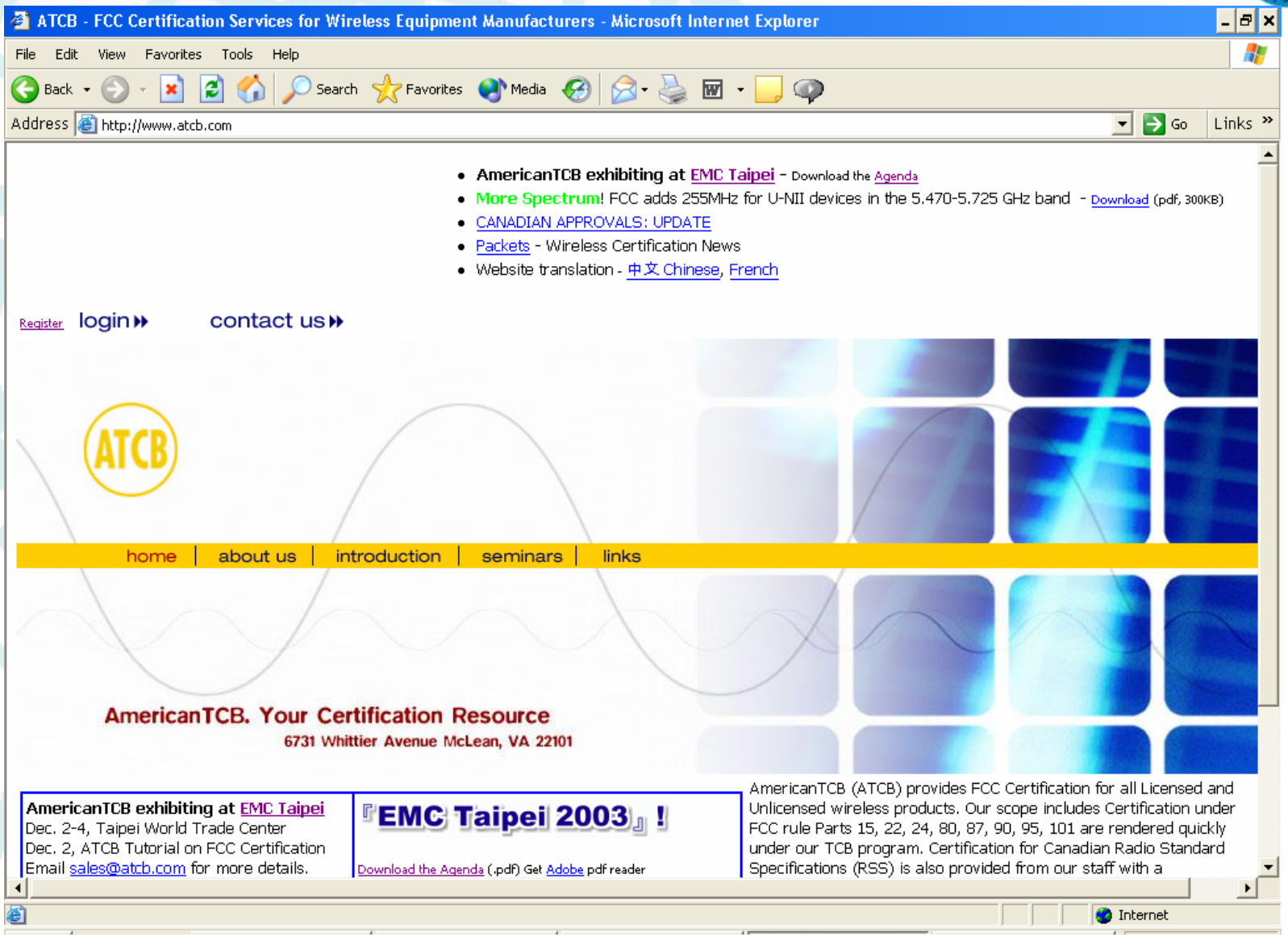
Spectrum Analyzer

FCC RULE CHANGES

- Telecommunications Certification Bodies (TCBs)
- Electronic Filing with Internet
- www.ATCB.com

Private Companies
=increased response and competition

Approvals over the Internet: www.atcb.com



IMPORTATION OF EQUIPMENT

- FCC Form 740 required for importing electronic equipment:
  - "Statement Regarding the Importation of Radio Frequency Devices Capable of Causing Harmful Interference"
- Download from:
  - **http://www.fcc.gov/formpage.html**

FCC Form 740

The completed form must accompany each such entry

- Include with Customs Papers

Typical examples of devices that require the use of FCC Form 740:

- radio and TV receivers
- transmitters, transmitting devices, radio frequency amplifiers,
- microwave ovens
- industrial heaters, ultrasonic equipment, transceivers
- computers

Equipment imported for test, evaluation or display may not be marketed (sold or leased, offered for sale or lease, advertised, etc.). See 47 C.F.R. 2.803 for

tories, Ltd.

FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

Approved by OMB
3060-0329
Expires 08-31-2005

STATEMENT REGARDING THE IMPORTATION OF RADIO FREQUENCY DEVICES CAPABLE OF CAUSING HARMFUL INTERFERENCE

(Read instructions before completing form. Please type or print clearly in ink.)

Part I - All Blocks **MUST** Be Completed				
Date of Entry	Entry Number	Port of Entry[1]	Harmonized Tariff Number[2]	Quantity of Item (not number of containers)[3]

Device Model/Type Name or #	Trade Name	FCC ID	Description of Equipment

Manufacturer's Name and Address	Consignee's Name and Address	Importer's Name and Address

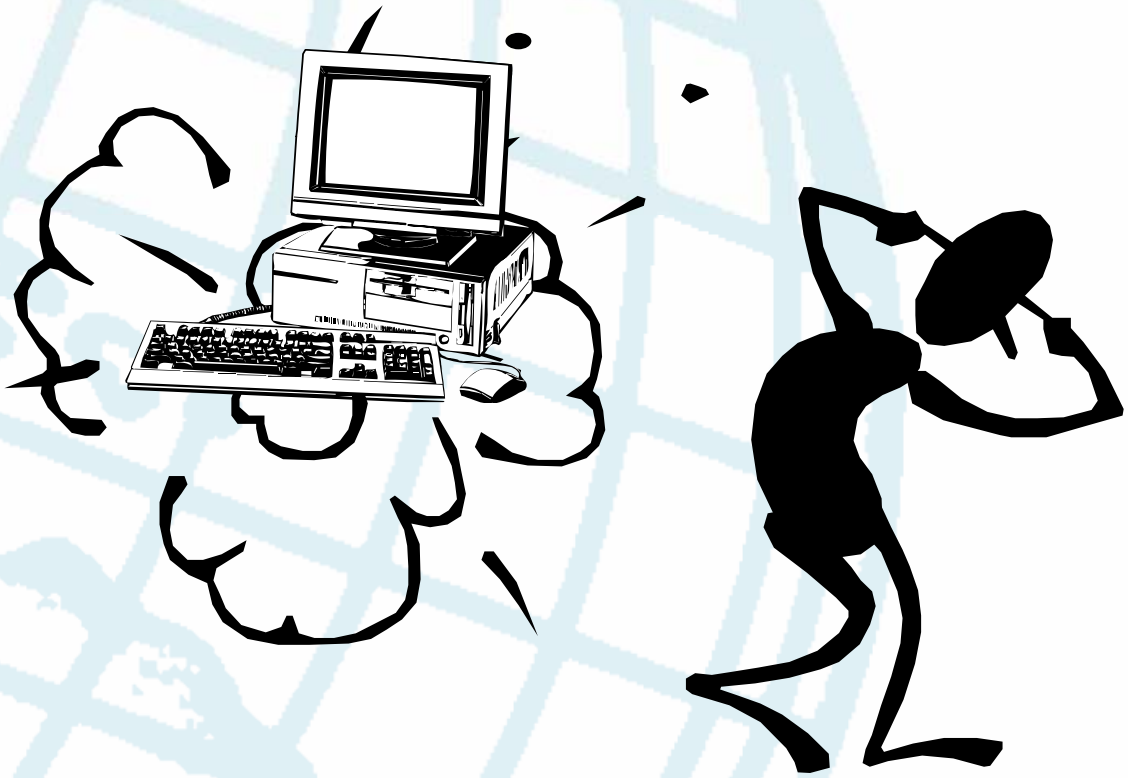
Printed or Typed Name of Importer or Consignee	Signature of Importer or Consignee	Date (Month/Day/Year)

Warning: Any person who knowingly makes a false declaration may be fined not more than $250,000 or imprisoned not more than 5 years, or both, pursuant to 18 U.S.C. § 1001.

Part II - With Regard to the Importation of the Described Radio Frequency Device(s), **I DECLARE THAT:** **(Place an "X" in only one box)**	
	1. The FCC has issued a grant of equipment authorization for the FCC ID listed above.
	2. An FCC grant of equipment authorization and an FCC ID are not required, but the equipment complies with FCC technical requirements.
	3. The described equipment is being imported in limited quantities for testing and evaluation for compliance with technical requirements or marketing suitability. The equipment will not be offered for sale or otherwise marketed. (See Instructions)
	4. The described equipment is being imported in limited quantities for demonstration at industry trade shows and will not be offered for sale or otherwise marketed. (See Instructions)
	5. The described equipment is being imported solely for export. It will not be offered for sale or otherwise marketed in the U.S.
	5(a). The described equipment is a non-U.S. standard cellular phone that can only function outside of the U.S. (See Instructions)
	6. The described equipment is being imported for use exclusively by the U.S. Government.
	7. Three or fewer radio receivers, computers, or other unintentional radiators as defined in Part 15 of the FCC Rules, are being imported for an individual's personal use and are not intended for sale.
	8. The described equipment is being imported for repair and will not be offered for sale or otherwise marketed.

1. Port of Entry Use Schedule D – Classification of U.S. Customs Districts and Ports for U.S. Foreign Trade Statistics – a four digit code i.e., New York City, NY 1001.
2. Harmonized Tariff Number – Harmonized Tariff Schedule of the United States.
3. This quantity must be total number of items, not number of containers.

SAFETY TESTING



PRODUCT SAFETY IN US

WHY?

- Product Liability
- Customer demands
- Legal requirements

SAFETY TESTING IN US

- Underwriter's Laboratories, Inc.
- NRTLs: Nationally Recognized Testing Laboratories
  - CSA, ETL, MET, DS&G, WYLE - "Nationally Recognized Testing Laboratories" accredited by OSHA
- UL Mark is Accepted in Canada

SAFETY MARKS

LISTED

"LISTED": Reserved for end-use products that have been approved under a specific UL standard

UL "RECOGNIZED": Designation for components, sub-assemblies that meet certain criteria, but are generally not end-use products. Will be investigated for suitability in end product

UL Mark for Canada: Accepted by all Canadian provinces

NRTL

CSA$_{NRTL}$ Symbol

- Accepted by OSHA in the United States as safe.
- One symbol for acceptance in Canada as well as the US

UL STANDARDS (EXAMPLES)

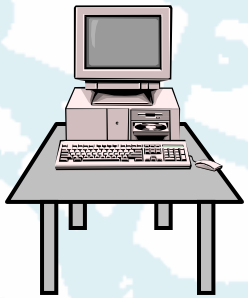
- UL 60950:
- UL 1026:
- UL 2601-1:
- UL 508:

TEST PROCEDURE

UL Testing

LISTING:

Test Product → UL Prepares Report → Factory Inspection at Manufacturer → Manufactuer Labels Products



Sell Product $

General Requirements

- Labeling and marking
- Language
- User Instructions
- Service Information
- Design requirements
- Thermal and electrical characteristics
- Abnormal operation
- Connection to the supply
- Construction details / physical requirements

Abnormal Operation

"None of the following conditions shall create a hazard within the meaning of the Standard:"

- Fan Fail
- Transformer Overload
- Component Short- and Open-circuits
- Failure of unapproved Thermal Limiting device.
- Locked Rotor.
- and others, depending upon equipment.

Labeling and Marking

- Rated voltage or voltage range:

115/230V~ or 100-240V~ or 230V~ or 400V 3~

- Rated frequency:

50-60Hz or 50/60Hz

- Rated current or power:

10/5A or 10-5A; 200W or 200VA

NOTE:

230/ 400V~ are the harmonized voltages for the European Union.

Labeling and Marking

- Manufacturer's name or registered trademark.
- Model or type number.
- Fuse replacement info (if applicable).
- IEC symbols wherever possible.
- Warnings and Cautions appropriate for the particular equipment.

Language

- ‘Safety-related’ information to be in appropriate language.
- Service Instructions may be in English.
- Many times, the entire User Manual must be translated (for specific market areas, dependent on intended end-user, etc).

User Instructions

- Installation Instructions - information regarding mounting, connection to the supply, ventilation, etc.
- All information regarding use, cleaning, maintenance (if necessary).
- All safety warnings and cautions.

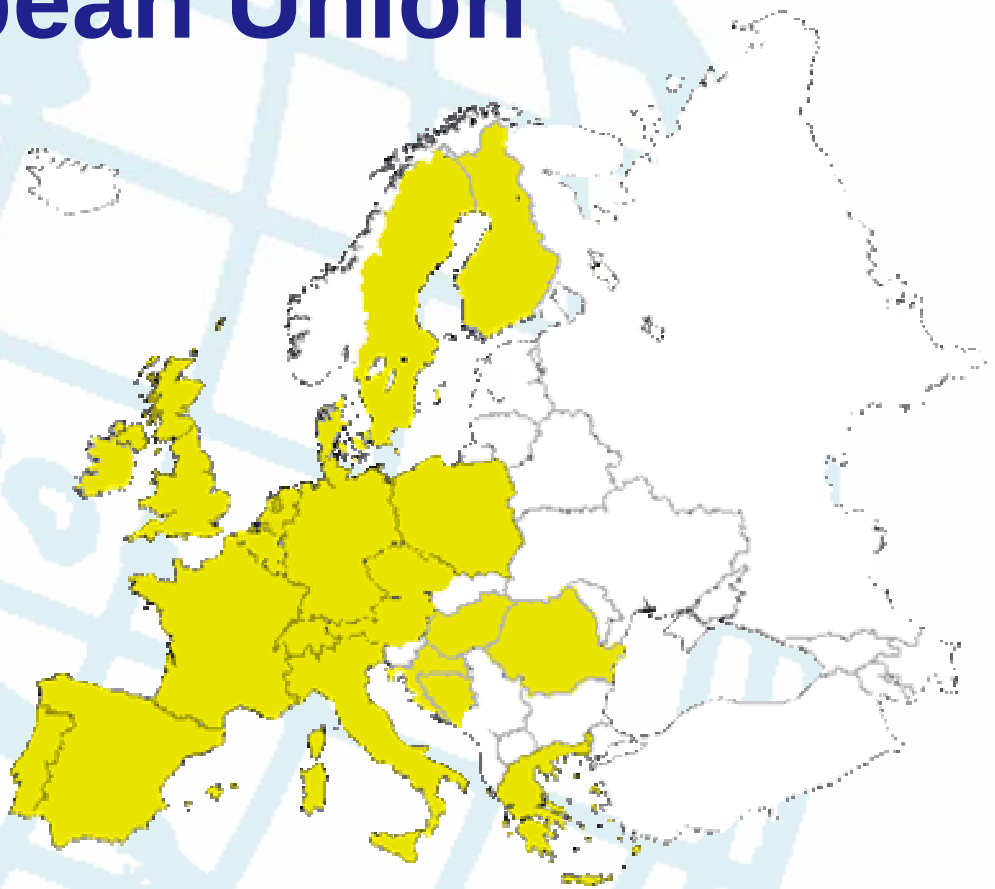
Service Information

- Fuse and component replacement information.
- Special instructions to avoid hazards.
- Schematics, wiring diagrams.
- Special field installation and/or supply connection information.

OTHER MARKETS

- Europe: EU Directive approach to compliance
- Non-EU Europe: May accept CE Marking
- Australia: C-Tick Mark for EMC (CISPR emissions now)
- Japan: VCCI- Voluntary Control Council for Interference (CISPR emissions only)
- South Africa: Emissions requirements only
- Mexico: NOM Certification

European Union



CE
CE MARKING

CE Marking is for European Union

- EMC Directive
- Low Voltage Directive (Safety)
- Machinery Directive (Safety)
- Radio and Telecommunications Terminal Equipment Directive (R&TTE)

Self-Declaration allowed for many products

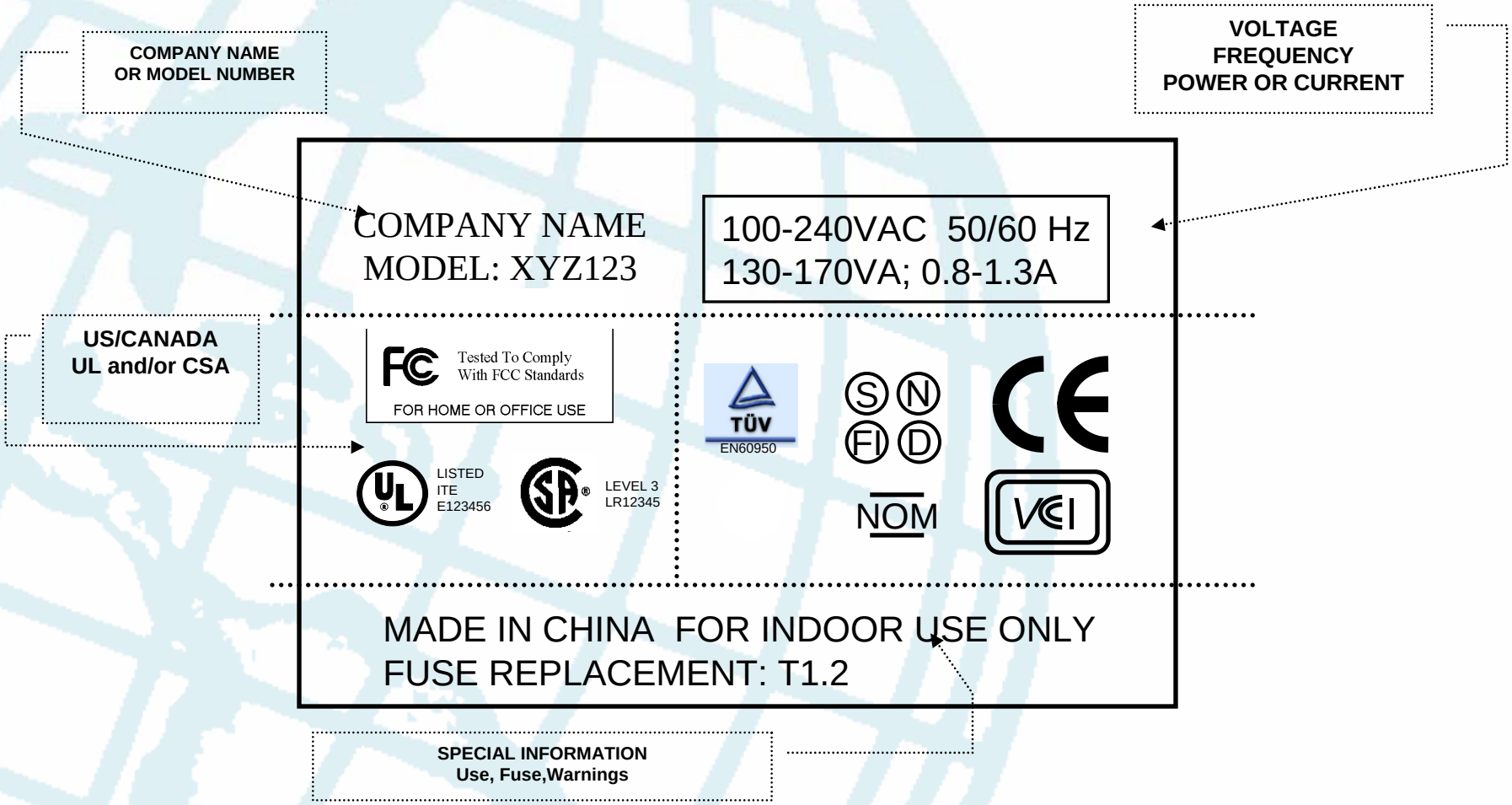
European Market

- Sector covered by EMC Directive 250 b€
- R&TTE equipment: 58 b € /year in the EU in 1998
  - Machinery market: >250 b € /year
  - Telecommunication Services: 200 b € /year in 1999
- Diverse industry
  - (Nokia, Ericsson, Motorola, Siemens, Philips, Alcatel, Nortel)
  - Many SMEs in e.g. Short Range Radio markets
- Before R&TTE Directive: highly fragmented
  - > 1000 national regulations, around 30 harmonised EU regulations
  - fragmentation of spectrum
- After R&TTE Directive: less fragmented
  - fragmentation of spectrum

Approval Process

- CE Marking by manufacturer is allowed
- Self-Declaration for many products
- Reduced approval procedures and processes
- Harmonized standards developed
- Faster, cheaper, more market coverage for SME

EXAMPLE LABEL



UL & CSA allow manufacturers to use “E” number or “LR” number instead of Manufacturer’s Name