

Commentary from a Certification Body

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Your Certification Resource

American Certification Body, Inc.

Background

- iNARTE-Certified EMC Engineer
- Professional Engineer (Virginia)
 - Founder, Washington Laboratories (1989)
 - Founder, American Certification Body (1999)



ACIL

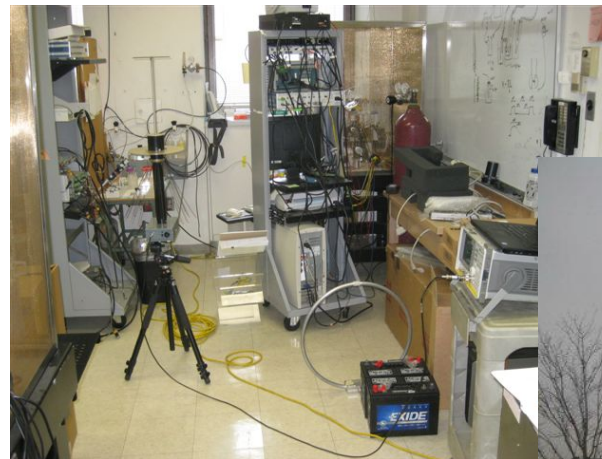
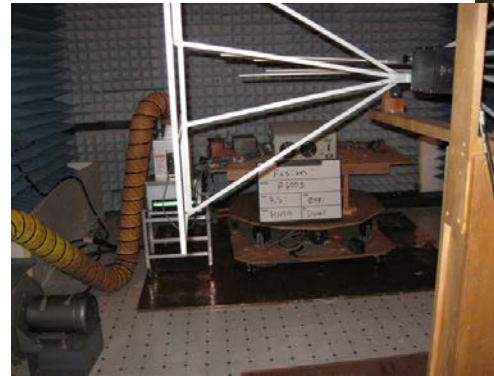
TCBC



Project Experience

Over 20,000 projects since 1989

- Wireless Certifications
- NASA
- Raytheon
- US Army, Air Force & Navy
- General Electric
- Westinghouse
- Hughes Network System
- Applied Physics Laboratory
- Exelon
- 35+ Nuclear Power Plants
- Research Universities
- Over 500 individual clients



Presentation for Today

3 Themes

- Services for a booming wireless industry
- Some statistics
- Delivering what the customer needs

Standards and Regulations

- Compatibility and Spectrum Protection
- Health and Safety
- Functional
- Performance

Compatibility & Spectrum Protection

- Regulatory
 - FCC in US
 - ISED in Canada
 - CE Marking in EU
 - MIC Japan
- Country specific

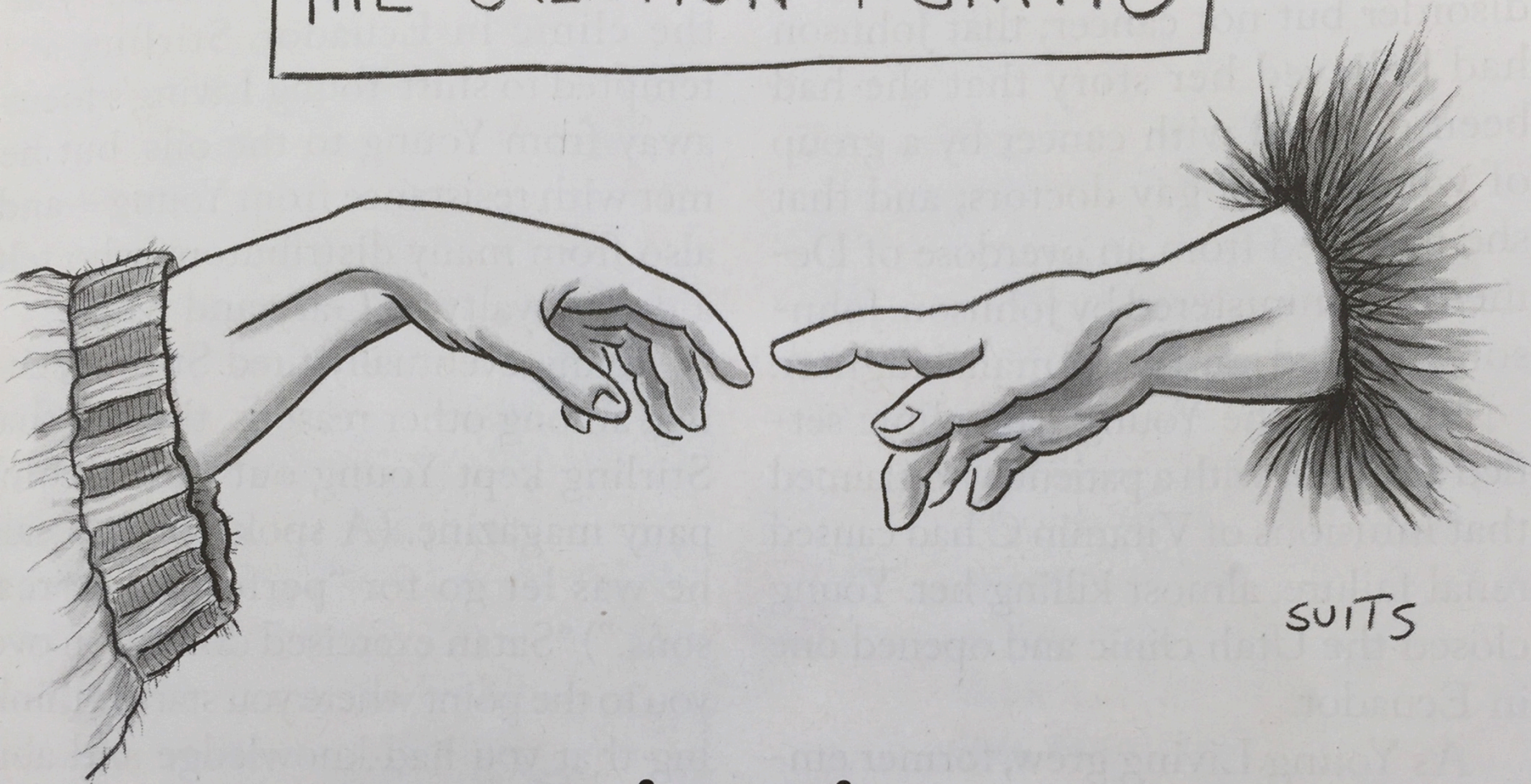


Health & Safety Standards

- IEC: International Electro-technical Commission
- EN: European Norm
- UL: Underwriters Laboratories
- CSA: Canadian Standards



THE CREATION of STATIC



Functional

- Communications Protocols
 - IEEE 802.11, etc
 - CTIA
- Size, weight, form and fit
 - Role for Inspection Body
 - ISO 17020



ZigBee[®]

Control your world



- Phy
- Ele
- Env
- Eng
- O

Toad soup medicine does not work



A 53-year-old man in Suzhou had to receive emergency medical treatment after drinking soup made from toads. His daughter cooked the soup for



U.S. REGULATORY AUTHORITIES

- Federal Communications Commission (FCC)
 - Control use and protection of Radio Frequency Services for Public



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RF Safety Issues Human Exposure - SAR

- ANSI C95.1
- OET 65
- OET 65-C
- FCC Part 1.1037
- FCC Part 2.1091 Mobile Devices
- FCC Part 2.1093 Portable Devices
- FCC Part 15.247 (b) (4)



Accreditation in Our Industry

- ISO 17065 for Certification Bodies
- ISO 17025 for Laboratory Operations
- Accreditation by third-party accreditors



Accreditation Bodies

- International Laboratory Accreditation Program (ILAC)
 - Since 1996
 - 66 Accreditation Bodies



Accreditation Process

- Audit
 - Management System
 - Records
 - Calibration
 - Incoming sample control
 - Reports
 - Methods
 - Complaints and Corrective Actions



Certificate and Scopes

CERTIFICATE of ACCREDITATION

PRODUCT CERTIFICATION

The American National Standards Institute hereby affirms that

ACB, Inc.

6731 Whittier Avenue, Suite C110, McLean, VA 22101, USA

ACCREDITATION ID# 1014

meets the ANSI accreditation program requirements and those set forth in ISO/IEC 17065:2012 Conformity assessment – Requirements for bodies certifying products, processes and services

LIST OF CERTIFICATION SCHEME(S)

Telecommunication Certification Bodies (TCBs)

Innovation, Science and Economic Development Canada (ISED) – CB-02 Recognition Criteria and Administrative and Operational Requirements Applicable to Certification Bodies (CBs) for the Certification of Radio Apparatus

EMC Directive 2014/30/EU - Annex III – Part A (Module B: EU-Type Examination)

Radio Equipment Directive (RED) 2014/53/EU - Annex III (Module B: EU-Type Examination) only

Criteria and Requirements Applicable to Foreign Testing Laboratories and Certification Bodies

Seeking Recognition by OFCA as Conformity Assessment Bodies

Ordinance for Enforcement of the Act for Implementation of the Mutual Recognition between Japan and Foreign States in Relation to Results of Conformity Assessment Procedures of Specified Equipment (MIC/METI Ordinance No. 3 of 2001)

for programs within the following

SCOPE OF ACCREDITATION

(Please see following pages)

Lance Hollerbach

ANSI VICE PRESIDENT, ACCREDITATION SERVICES

2019-12-01
VALID THROUGH



PRODUCT CERTIFICATION

ACB, Inc.
ACCREDITATION ID# 1014
SCOPE OF ACCREDITATION

GRANTED 2015-09-23:
FCC (A7) Unlicensed Radio Frequency Devices
FCC (A3) Unlicensed Radio Frequency Devices
FCC (A2) Unlicensed Radio Frequency Devices
FCC (A4) Unlicensed Radio Frequency Devices
FCC (B1) Unlicensed Radio Frequency Devices
FCC (B3) Unlicensed Radio Frequency Devices
FCC (B4) Unlicensed Radio Frequency Devices

GRANTED 2015-09-23:
ISED Radio Scope 1 – License exempt Radio Frequency Devices
ISED Radio Scope 2 – Licensed Personal Mobile Radio Services
ISED Radio Scope 3 – Licensed General Mobile and Fixed Radio Services
ISED Radio Scope 4 – Licensed Maritime and Aeronautics Radio Services
ISED Radio Scope 5 – Licensed Fixed Microwave Radio Services

GRANTED 2016-06-21:
EU Radio Equipment Directive (RED)
Radio equipment (including equipment as stipulated in Article 1.2 and Article 1.3)

GRANTED 2016-06-21:
EU Electromagnetic Compatibility (EMC) Directive
Electrical and electronic equipment
(including equipment as stipulated in Article 2.2)

PRODUCT CERTIFICATION

ACB, Inc.
ACCREDITATION ID# 1014
SCOPE OF ACCREDITATION

- 2 -

See www.ansi.org

GRANTED 2016-07-05:
OFCA Radio Equipment Specifications (HCCA 1000)
HCCA 1005
HCCA 1007
HCCA 1008
HCCA 1020
HCCA 1033
HCCA 1035
HCCA 1038
HCCA 1042
HCCA 1043
HCCA 1048
HCCA 1053
HCCA 1054
HCCA 1055
HCCA 1057
HCCA 1061
HCCA 1065
HCCA 1072
HCCA 1073

GRANTED 2015-09-23:
S. Japan MIC Radio Law
B1. Specified Radio Equipment specified in Article 30-2-2, paragraph 1, Item 1 of the Radio Law
B2. Specified Radio Equipment specified in Article 30-2-2, paragraph 1, Item 2 of the Radio Law
B3. Specified Radio Equipment specified in Article 30-2-2, paragraph 1, Item 3 of the Radio Law

GRANTED 2017-06-30:
OFCA Radio Equipment Specifications (HCCA 1000)
HCCA 1014
HCCA 1075
HCCA 1076

American Certification

- 3 -

See www.ansi.org

Testing and Evaluation



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EMC Compliance - US

- FCC
 - Applies to
 - Devices that can harm communications
 - Regulates emissions (not immunity)
 - CFR 47
 - Many Rule Parts
 - Radios
 - FCC OET Bulletin 65, Supplement C
 - RF Exposure Levels to Humans (SAR)



EMC Compliance - Canada

- Innovation Science and Economic Development (ISED)
 - ICES-003 – unintentional emitters (US Part 15 harmonized)
 - CS03 – telecommunications products
 - RSS-210 – non-licensed RF products
 - RSS-119 – Land Mobile and Fixed Radio



Two Routes to Authorization

Recent Changes

- **sDoC and Certification**
- 1. sDoC: Supplier Declaration of Conformity
 - Testing done by any lab, regardless of accreditation
- 2. Certification
 - Testing at approved laboratory
 - TCB Certifies device with FCC Guidance



RADIO TRANSMITTERS

- FCC ID NXXXXnnnnnnnnnnnnnnnnnn



CERTIFICATION:

Test Product



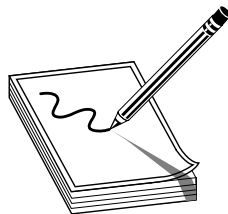
Report with
Technical
Information



Send Report and
Application TCB



FCC GRANT
with FCC ID
Number



Your Certification Resource

Sell
Product



TCB

**GRANT OF EQUIPMENT
AUTHORIZATION**

TCB

Certification

**Issued Under the Authority of the
Federal Communications Commission**

By:

**American TCB, Inc.
6731 Whittier Avenue Suite C110
McLean, VA 22101**

Date of Grant: 12/01/2009

Application Dated: 11/30/2009

**ZTE Corporation
ZTE Plaza, Hi-tech Park, Nanshan District,
Shenzhen, Guangdong, 518057
China**

**Attention: Royce Wang , Product Certification
Manager**

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

**FCC
IDENTIFIER:**

Q78-VDF545

Name of Grantee: ZTE Corporation

Equipment Class: PCS Licensed Transmitter held to ear

Notes: GSM Quad_band digital mobile phone

Grant Notes

**BC
BC**

FCC Rule Parts

**22H
24E**

**Frequency
Range (MHZ)**

**824.2 - 848.8
1850.2 - 1909.8**

**Output
Watts**

**0.805
1.18**

**Frequency
Tolerance**

**0.1 PM
0.1 PM**

**Emission
Designator**

**300KGXW
300KGXW**



Major Regional Requirements Electronic Devices

- US: FCC, Product Safety, Environmental
 - Toys: Consumer Product Safety Commission
- Europe: CE Marking “easy”
- Brazil, China:
 - Compulsory testing in-country for telecom
- MRA Countries (Mutual Recognition)

Many Changes in ~20 Years



World View: 1990

- Small and Medium Size Enterprise (SME' s) World View



NOW: 2017

- SME's World View



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Wireless – Some Statistics



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FCC Certification

- All Wireless Devices are certified by Telecommunications Certification Bodies
- TCBs
 - Private companies
 - About 30 in the world
 - ACB Issued 2700 Original Grants in past year
 - ~18%



TCB Program

- Post-market surveillance
 - 5% of all devices must be tested by TCB
- FCC performs market Surveillance
- Example:
 - Big tablet manufacturer
 - Complaint by competitor
 - FCC tested the device
 - Power over the limit
 - Compliance program required



FCC Certifications: 2004-2014

Certifications (Original and Changes to Devices)

Region	2004	2014	Growth Factor
N. America	2988	15145	5.1
Europe	479	3034	6.3
Asia	3163	14800	4.7

5X Growth Rate Globally!



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FCC Certifications: 2004-2014

Asia:

Asia	2004	2014	Growth Factor
Japan	417	816	2.0
Taiwan	1238	3105	2.5
South Korea	578	635	1.1
China	327	8463	25.9
Hong Kong	603	1781	3.0
ALL ASIA	3163	14800	4.7



Market Distribution

Number of Devices Certified in 2015

Certifications by Grantee

USA	6815	35.1%
China	5839	30.1%
Taiwan	1604	8.3%
EU	1399	7.2%
All Else	1384	7.1%
Hong Kong	1175	6.1%
South Korea	602	3.1%
Japan	574	3.0%
Total	19392	



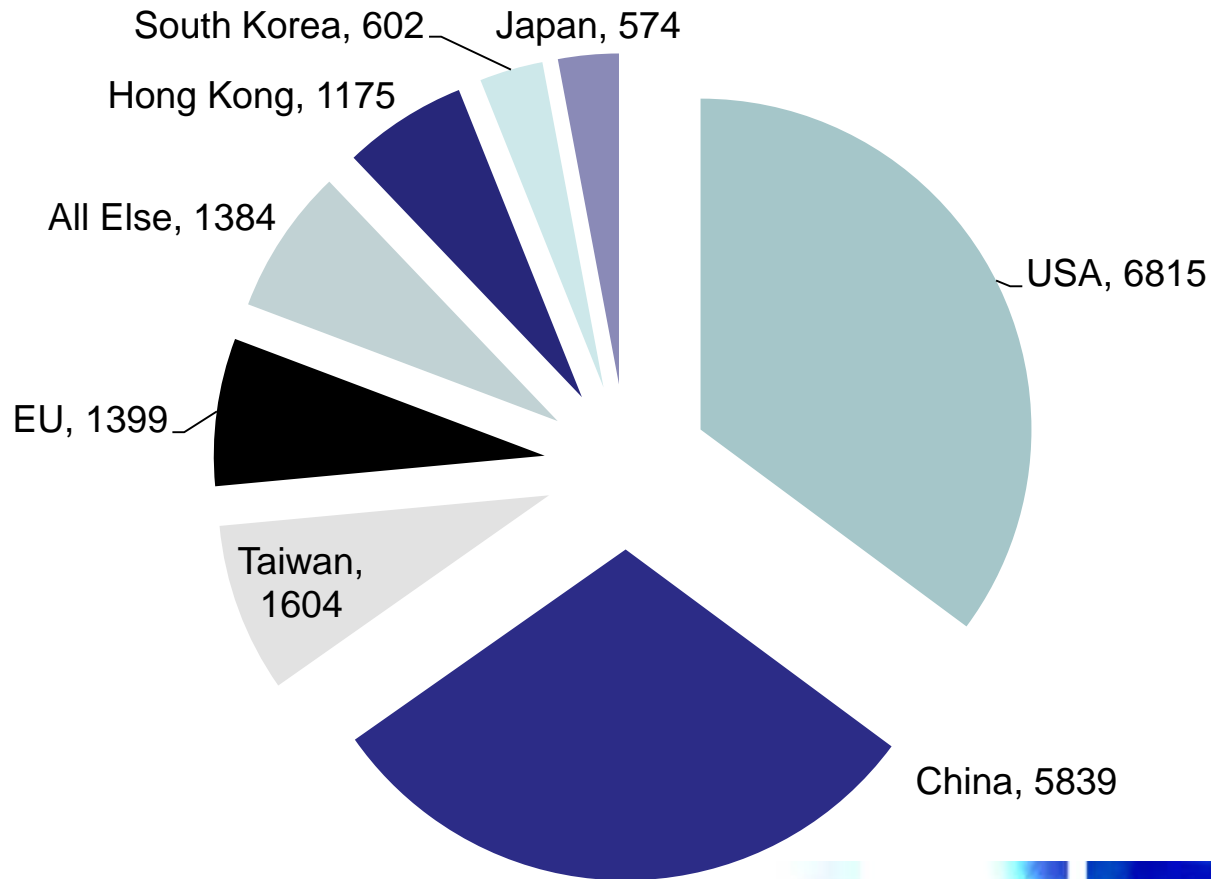
Modular Transmitters

- Make it easier to put modular transmitters in products
- Faster for products to reach market
- IoT
 - Integrators' challenges



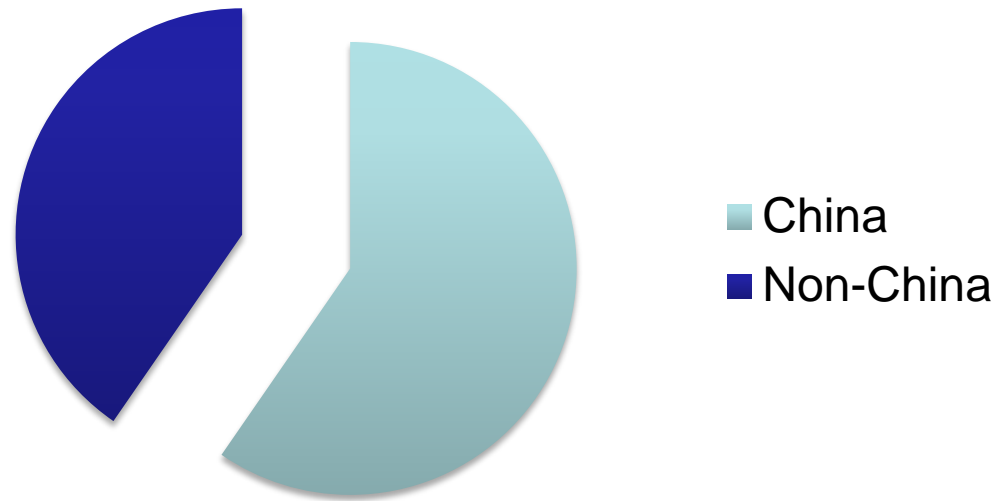
Market Distribution Global

Source of Grantees for Original FCC IDs



Market Distribution Asia

Asia Certifications



■ China
■ Non-China



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MRAAs have been good to us

- A mutual recognition agreement (MRA) is an international agreement by which two or more countries/economies agree to recognize each other's **conformity assessments**
 - Can also be used for other purposes (accreditation, law enforcement, security, finance, standards)
- To facilitate TRADE



US MRAs

- US-EU
- US-EAA EFTA (non EU Europe)
- APEC TEL MRA
 - Multi-Lateral (multiple countries)
 - Signed in 1998
- US-Japan MRA
- US-Israel MRA
- CITEC (South America, not operational)



Testing Laboratories

- Listed and Accredited Labs by Country
 - May be same company (with different test locations)
 - FCC Test Lab Resources Before July 13, 2016 (**at least 595**)

FCC Status	US	China	Taiwan	Korea	Japan	Germany	UK	Other
2,948 Listed	95	150	68	39	99	31	19	94
Accredited	116	0	46	32	66	10	9	49



Testing Laboratories in non-MRA Countries

- Test Firms in non MRA countries
 - New initiative recognizes labs in non-MRA countries
 - FCC recognized US Test Firm Accreditation bodies (TFAB's) are permitted to designate domestic accredited test firms to the FCC



Supplier's Declaration of Conformity

- Combine two separate product approval programs – Declaration of Conformity and Verification – into one product self-approval program:
 - Verification and DoC are used for equipment that has a strong record of compliance and for which there is minimal risk of harmful interference
 - FCC Logo
 - Labeling of products



MRA Definitions

- Phase 1: Confidence Building
 - Accept Test Reports
- Phase 2: Full Implementation
 - Can Certify
- Conformity Assessment Body (CAB)
 - Recognized to perform “Certification” activity
 - TCB in US
 - Notified Body in EU



US APEC TEL MRAs

Economy	Regulatory Authority	Phase I	Phase II
Australia	Australian Communications Media Authority (ACMA) 	Yes	
Canada	Industry Canada (IC) 	Yes	Yes
Chinese Taipei	The Bureau of Standards, Metrology and Inspection (BSMI) 	Yes	
Chinese Taipei	National Communications Commission (NCC) 	Yes	
Hong Kong	Office of Communications Authority (OFCA) 	Yes	Yes
Republic of Korea	Radio Research Agency (RRA) 	Yes	
Singapore	Infocomm Development Authority of Singapore (IDA) 	Yes	Yes
Vietnam	Ministry of Information and Communication (MIC) 	Yes	

FCC Rule changes essentially eliminated incentives for some economies to participate



Changes

- Benefits to consumers
- Accessibility to communications
- “Always on”
- Security and infrastructure issues
- More to come



Services Needed?



Worldwide System for
Conformity Testing and Certification
of Electrical Equipment (IECEE)

Definition of Product Consultancy, Independence and Impartiality for Certification Bodies and Testing Laboratories



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Product Consultancy

- We are asked for solutions to CA issues constantly
- ISO 17025 and ISO 17065 preclude “consultancy” as a risk to impartiality
- This situation creates inherent conflict
 - Serve customer?
 - Effectively compete
 - Feed my people



This happens frequently

1. It is not a unique method of solving a problem but rather one of a number of well-known solutions.
2. It is not based on someone else's proprietary information, such as a unique construction seen in a product of another customer.
3. The same type of advice is given to all customers, as may be applicable. There may be a printed list of alternative methods of overcoming common problems; and, such a list is provided to all customers.
4. The customer must understand that it is the customer who is responsible for choosing any specific design and ensuring that it complies with the requirements.



Tricky Issue

- It is particularly important for an NCB or CBTL not to suggest actual design changes that might bring the product in compliance with the IEC Standard's requirements.
- If an NCB or CBTL/ACTL makes an error in suggesting a change when, in fact, by test it could prove to be unacceptable, a gross mistake has been made and the NCB or CBTL/ACTL can be put in an uncomfortable position.
- It is not the NCB's or CBTL's/ACTLs job to redesign products to comply with the IEC Standard's requirements (i.e. "commercial design consultancy").

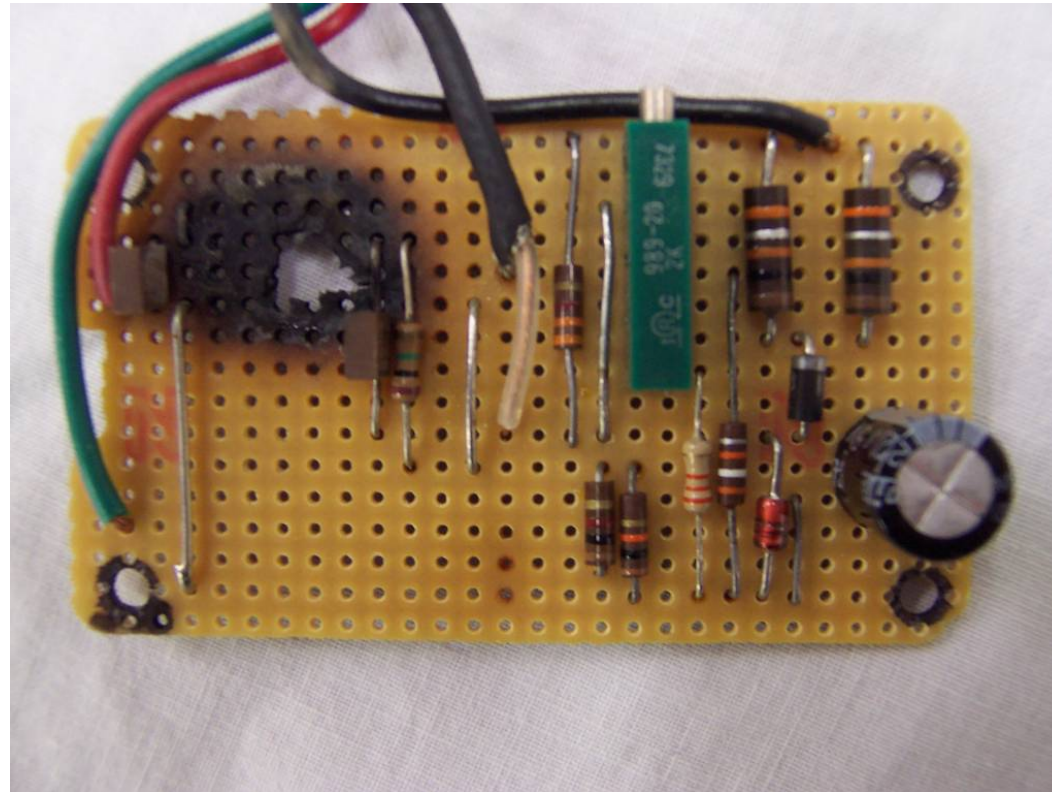


“Not Consultancy”

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Example: Resistor Gets a Little Hot



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Alternative Approaches

- Either a printed wiring board with a temperature rating according to the test results needs to be provided, or
- the resistor should be sufficiently elevated from the printed wiring board to ensure that the adhesive bond between the conductor foils and base material is not subjected to this temperature.





An Example for Suggesting Appropriate Alternatives

- **Either a printed wiring board with a temperature rating according to the test results needs to be provided, or**
- **the resistor should be sufficiently elevated from the printed wiring board to ensure that the adhesive bond between the conductor foils and base material is not subjected to this temperature.**



Pragmatic Approach

- Balance between supporting client product development and impartiality
- Must have internal controls
- Transparency in providing solutions



Questions?

- Contact:
 - mikev@acbcert.com
 - www.acbcert.com

