CERT C&I activities and key challenges

www.cert.tn
Cité Technologique des Communications,
Route de Raoued Km 3.5 BP N° 111 2088
el Ghazala Ariana Tunisie

Testing, certification and qualification of electronic & electrical products

- Proximity
- Advice
- Reactivity
- Availability

Testing, certification and qualification of electronic & electrical products

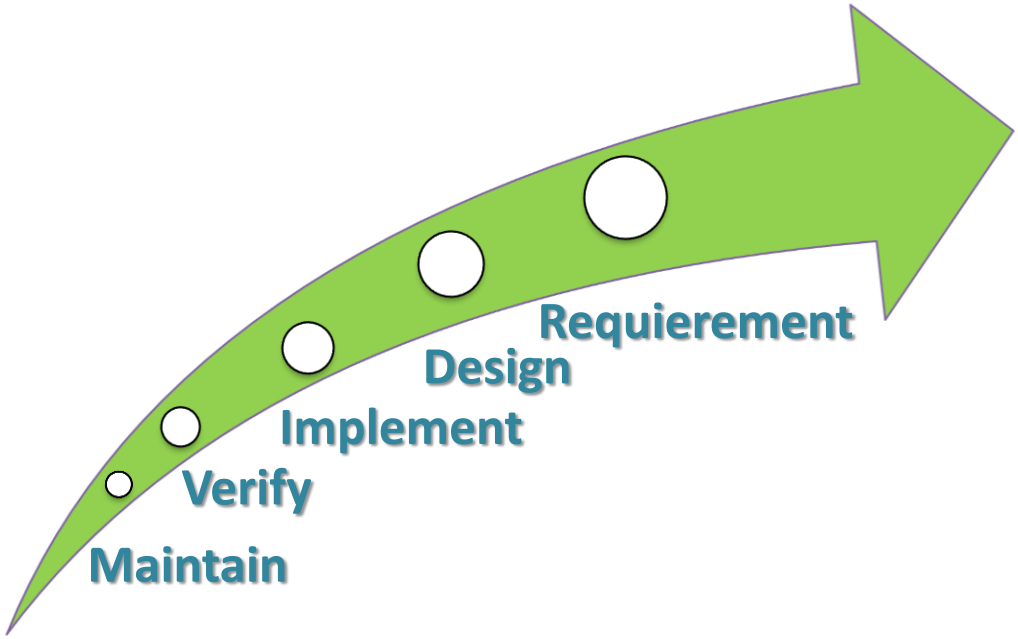
- Engineering, Testing
- Electromagnetic compatibility
- electrical safety
- Climate and Mechanics
- Radio

CERT has built its new laboratories for EMC and of Electrical safety testing that are compliant with the international standards, this project was conducted in partnership with the European Union, these unique laboratories in Africa can position themselves to the export of high value-added services of compliance services for companies of the region and the continent in the civil and industrial fields.

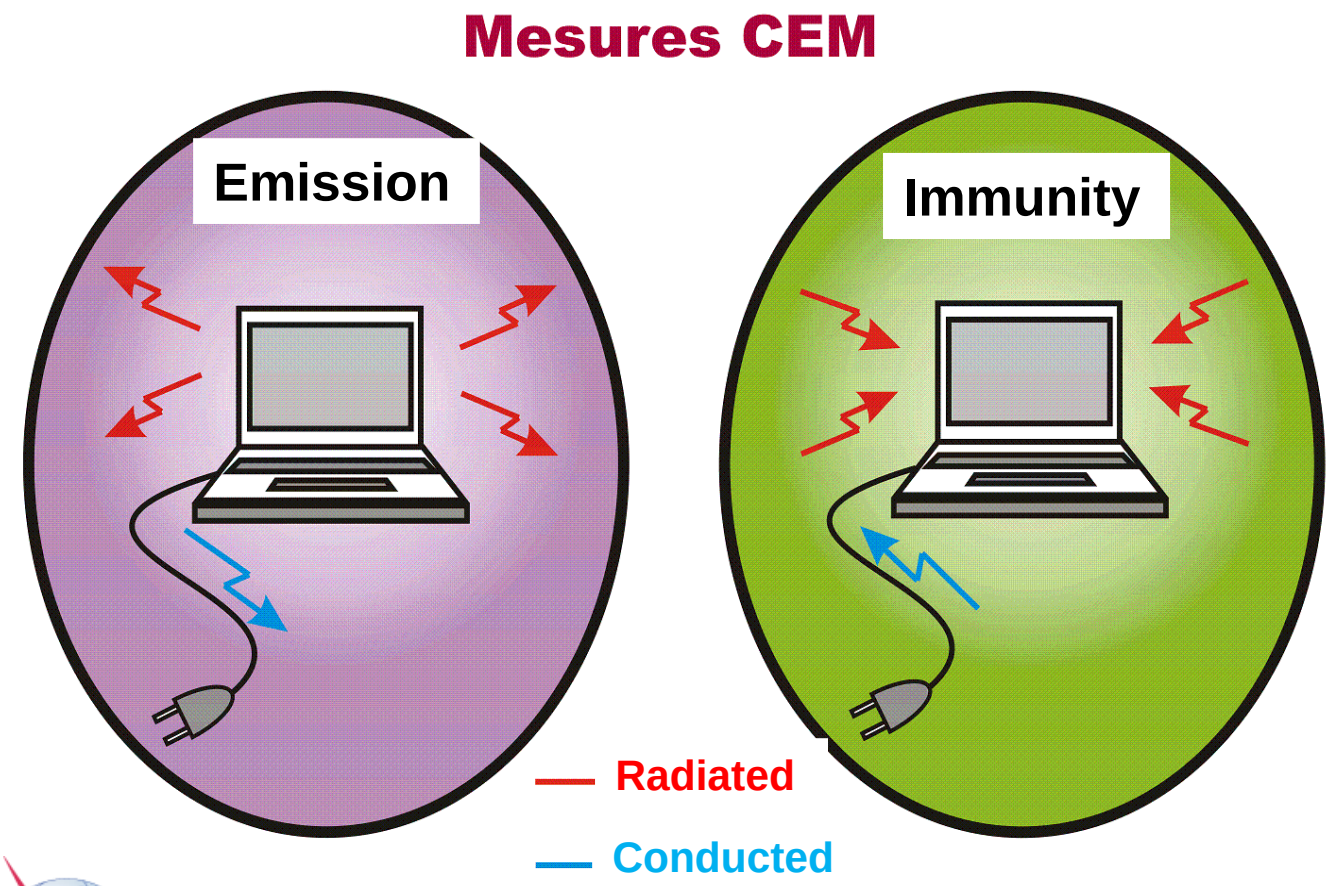
The CERTLabs may intervene at each stage of project as:

✓**Expert : To assess the performance and reliability of client products.**

✓ **Engineering: for identify the best solutions for each project and help our customers.**



Types of EMC measures

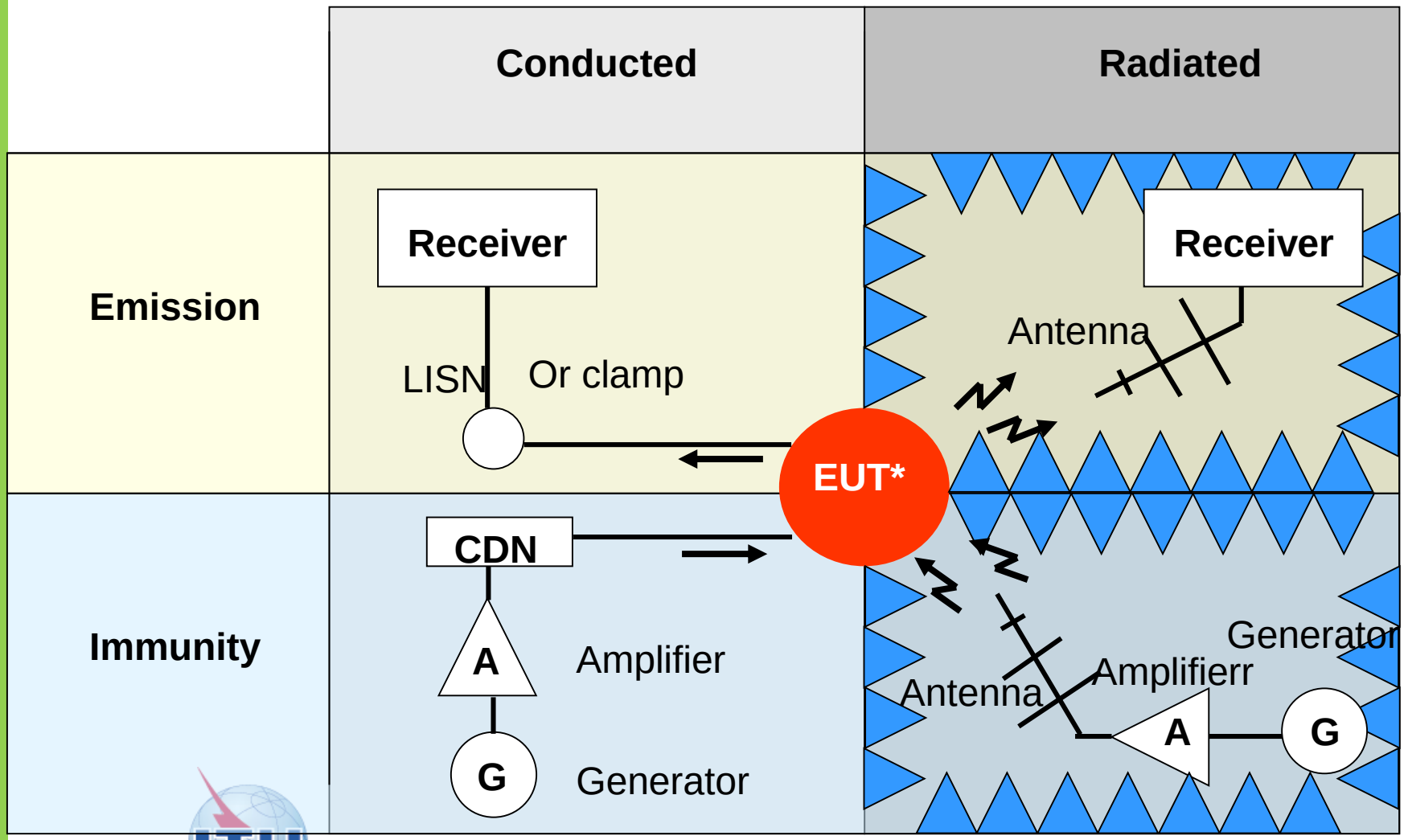


EMC

According to the european directive 2014/30/UE, EMC refers to:

- the ability of an equipment or a system to perform satisfactorily in its electromagnetic environment
- without introducing intolerable interference into any thing in that environment.

EMC



*EUT = Equipement Under Test

Radio requirements

- Terminal access requirements have been removed: fixed network terminal equipment therefore only needs to comply with
  - ✓ Health and Safety requirements:
    - Health : as per EMF recommandation 1999/519/CE
    - Safety : as per Directive 2006/95/CE (LVD) but with the lower limit removed. (Article 3.1)
  - ✓ EMC requirements: as per Directive 2004/108/CE (Article 3.1)
  - ✓ Radio equipment needs to effectively use the spectrum and not cause harmful interference. (Article 3.2)

Radio equipment compliance
An example

Applied standards

- **Radio** : EN 300 328 + ERC 70-03 recommandation
- **EMC** : EN 301 489-17 & EN 301 489-01
- **Safety** : EN 60950
- **Health** : EN 50364

Testing, certification and qualification of electronic & electrical products

CERT Labs provides comprehensive services both in the field of certification and qualification.

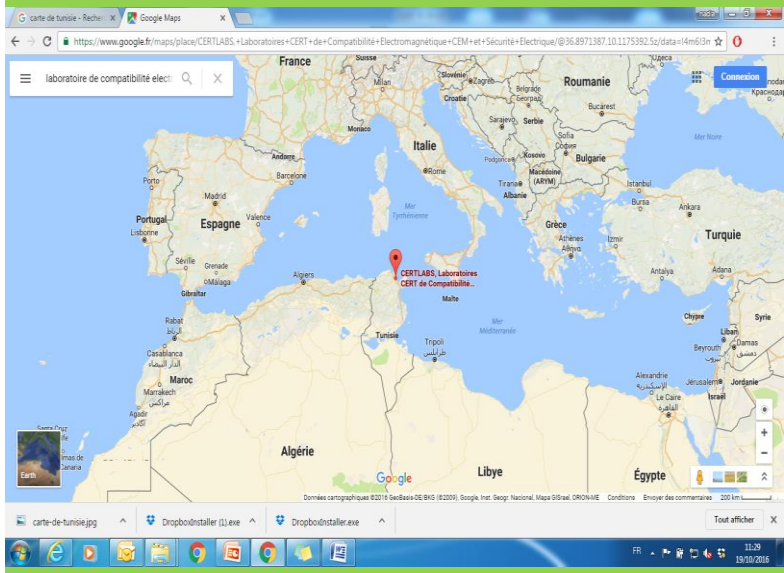
Our instrumentation available in our laboratories makes us apt to treat globally the specifications.

- **The expertise of our laboratories allows us to propose an upstream assistance.**

Why Laboratories CERTLabs?

Proximity

- **Unique in Africa.**
- **Avoids the use of multiple laboratories that can cause additional delays and costs by combining EMC tests with other tests or compliance requirements (EMC testing, electrical safety testing, climate testing, IP code, ...).**
- **Optimize costs.**



Why Laboratories CERTLabs?

Availability

The reception capacity of our laboratories involved in planning tests in line with client expectation.

Reactivity

Our organization areas activity allows us to meet our customer requests in the shortest time.

Quality

A quality policy is established according to the ISO 17025 requirements .

Our strengths

A administrative management simplified

- A single contact centralizes the applications
- The treatment procedure of Customer requests are simplified (Real time)

Easy planning

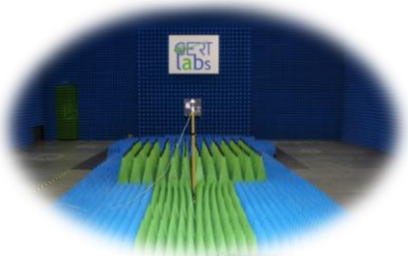
- response time optimized with respect to customer requirements

optimized services

- take into account your technical requirements
- Technical assistance during the product development cycle
- Conform to the initial quote unless justified derogation

Our business areas

- Electromagnetic Compatibility (EMC)
- ELECTRICAL SAFETY
- RADIO TESTS
- CLIMATE TESTS
- IP CODE



Our business areas

ELECTROMAGNETIC COMPATIBILITY (EMC)

EMC tests verify compliance of a device with respect to standards. Witch include testing a product in a reference environment, in which product will be used.

These tests include:

–radiated and conducted emission

–radiated and conducted immunity

– transient immunity testing (EFT, surge, ESD)

Our business areas

ELECTRICAL SAFETY

Electrical and electronic products potentially pose risks to their users and their environment with mainly hazards and fire & electrical risks

These tests include:

- **Isolation Measurements**
- **dielectric strength**
- **Electrical shock**
- **dangers linked to energy**
- **Fire**
- **thermal hazards**
- **mechanical hazards**

Our business areas

CLIMATE TEST ACCORDING

Climate tests consist of reproducing the atmospheric environmental conditions encountered on land and at sea level. This is to simulate the same conditions, often extreme, to measure the reaction materials.

- **Variation temperature,**
- **Robustness testing,**
- **dry heat**
- **Cold test**
- **moist heat**

Our business areas

RADIO TESTS

The radio test designed primarily to check the features in broadcast radio transmitters.

- **IRP/EIRP**
- **SPURIOUS transmitter**
- **SPURIOUS receiver**
- **Bandwidth**
- **adjacent channel**

Our business areas associated

TRAINING

our training sessions take place in sessions intercompany or intra-company courses for the realization of customized programs, custom and dedicated to our customers.

ADVICE & ENGINEERING

- **Definition of regulatory requirements**
- **Drafting of qualification plan (QTP)**
- **Design review and anticipating technological choices**
- **Management projects**
- **Analyse of failure proposal of solutions and corrective**

Our test facilities

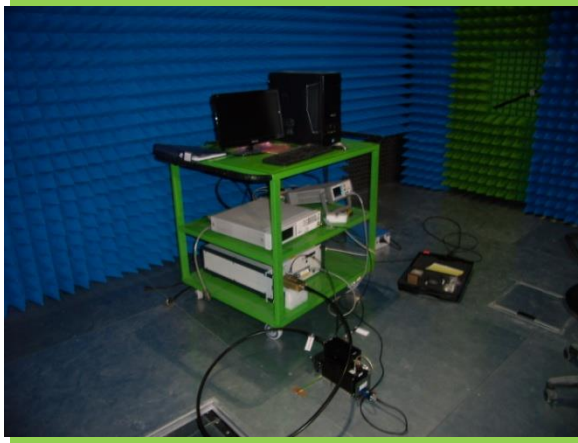
- semi-anechoic room for 10 m tests
- Turntable of diameter 5m and supporting 10 tons (possibility of testing vehicle)
- antenna mast (1 - 4 m)
- Automatic Door 4x4 m
- Possibility of absorbent ground for Radio tests

Our test facilities

- Reverberating chamber
- Faraday cages
  - 02 control cages
  - 02 amplifier cages
  - 01 Engineering cage
  - 01 cages for test bench and DES
  - 01 cage for conducted tests

Our test facilities

- Two measurement receivers CISPR-16 compliant (Rohde& Schwarz + PMM)
- emission and immunity antennas
- RSILs
- RF generators
- Amplifiers (up to 1 kW)
- couplers
- Power Meters
- Firldmeters
- generators burst/surge/ Magnetic Fields / power fail
- generators
- CDNs
- flicker/ harmonics
- automotive test bench ISO compliant 7637

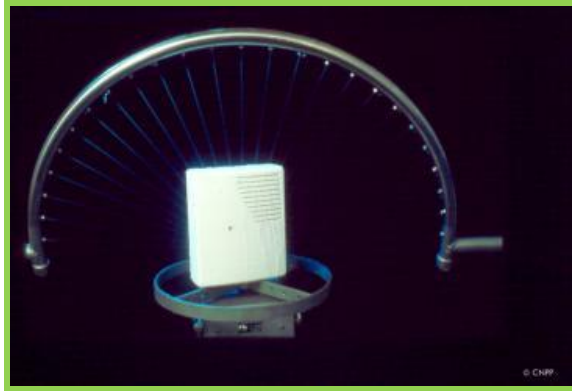


Our test facilities

- environmental chamber from -40 ° C to 180 ° C and a humidity range up to 98%,
- Stabilized power supplies,
- Oscilloscopes,
- generating residual Lightning pulse
- testing materials for glow-wire,
- Materials for flammability testing
- Materials for testing IP
- Talc chamber

Our test facilities

- templates test
- Box drops to
- oscillating tubes
- Jet water
- fingers test,
- Dynamometer digital,
- Power stations measurement acquisition heating
- Apparatus dielectric strength tests, insulation resistance and continuity Earth
- Apparatus leakage current tests,



normative scope - 1

- **civil EMC standards**
  - CISPR 22 / EN 55022; CISPR 11 / EN 55011; CISPR 14 / EN 55014;
  - EN / IEC 61000-6-x
  - CISPR 16
  - EN / IEC 61000-3-2 / 3-phase ≤ 16 A
  - EN / IEC 61000-4-2; up to 30 kV
  - EN / IEC 61000-4-3;
  - EN / IEC 61000-4-4; up to 5.5 kV power lines (single and three phase) and data
  - EN / IEC 61000-4-5; up to 5 kV power lines (single and three phase) and data with the possibility of waveform 10/700
  - EN / IEC 61000-4-6;
  - EN / IEC 61000-4-8; up to 30 A / m
  - EN / IEC 61000-4-11; monophase

normative scope - 2

- **automotive EMC standards**
  - CISPR 25 - Class 5
  - ISO 11452-2 specifications and manufacturer up to 150 V / m
  - ISO 11452-4 specifications and manufacturer up to 200 mA
  - ISO 7637-2 and manufacturer specifications for non-standard forms of waves
  - ISO 7637-3 and manufacturer specifications
  - ISO 10605 and manufacturer specifications; with 150pF / 330ohm network. Other types of RC networks are in the acquisition phase

normative scope - 3

- **Radio Radio and EMC standards**
  - EN 301 489-x
  - EN 300 328, EN 300 220, EN 300 330, EN 300 440

normative scope - 4

- **Electrical safety standards**
  - IEC / EN 60950
  - IEC / EN 60335
  - IEC / EN 60065
  - IEC 60695-2-10; IEC 60695-2-11
  - IEC 60068-2-1
  - IEC 60068-2-2
  - IEC 60068-2-30
  - IEC 60529

ITU-T CASC Appontment Team to assess application of candidate on ITU-T Recommendations K.48, K.116

Candidate requesting recognition as ITU-T Technical expert

Name	Country	Company	Recommendations	Application received
			ITU-T K.48 (09/2006)	
			ITU-T M.116 (11/2015)	

ITU-T Recommendation K.48 :
EMC requirements for telecommunication equipment
– Product family Recommendation

Recommendation ITU-T K.116
Electromagnetic compatibility requirements and test methods for radio telecommunication terminal equipment

ITU-T Recommendations K.48

Annex A

Immunity test levels

Table A.1/K.48 – Equipment for telecommunication centre

Environmental phenomena	Test levels	Units	Basic standard	Performance criteria	Remarks
Enclosure port					
Radio-frequency electro-magnetic field	3 10 3 10	V/m	IEC 61000-4-3 [36]	A	80-800 MHz 800-960 MHz 960-1000 MHz 1400-2000 MHz (Note 1)
Electrostatic discharge	4	kV	IEC 61000-4-2 [35]	B	Contact and air discharge
Outdoor telecommunication ports					
Radio-frequency conducted continuous	3	V	IEC 61000-4-6 [39]	A	0.15-80 MHz (Notes 2, 3 and 5)
Surges	0.5 (line to line) 1 (line to ground)	kV	IEC 61000-4-5 [38]	B	10/700 µs (Notes 4 and 13)
Fast transients	0.5	kV	IEC 61000-4-4 [37]	B	(Note 12)
Indoor telecommunication ports					
Radio-frequency conducted continuous	3	V	IEC 61000-4-6 [39]	A	0.15-80 MHz (Notes 2, 3 and 5)
Surges	0.5 (line to ground)	kV	IEC 61000-4-5 [38]	B	1.2/50 (8/20) µs (Note 4)
Fast transients	0.5	kV	IEC 61000-4-4 [37]	B	(Note 12)
DC power ports					
Radio-frequency conducted continuous	3	V	IEC 61000-4-6 [39]	A	0.15-80 MHz (Notes 2, 3 and 5)
Fast transients	0.5	kV	IEC 61000-4-4 [37]	B	(Note 12)

ITU-T Recommendations K.116

Table 2 – Emission applicability

Phenomenon	Application	Equipment test requirement			Reference clause in this Recommendation	Reference standard
		Radio and ancillary equipment for fixed use	Radio and ancillary equipment for vehicular use (connected to vehicular DC supplies)	Radio and ancillary equipment for portable use (powered by integral battery)		
Radiated emission	Enclosure of ancillary equipment	applicable for standalone testing	applicable for standalone testing	applicable for standalone testing	10.2	IEC CISPR 32
Conducted emission	DC power input/output port	applicable	applicable	not applicable	10.3	IEC CISPR 32
Conducted emission	AC mains input/output port	applicable	not applicable	not applicable	10.4	IEC CISPR 32
Harmonic current emissions	AC mains input port	applicable	not applicable	not applicable	10.5	IEC 61000-3-2
Voltage fluctuations and flicker	AC mains input port	applicable	not applicable	not applicable	10.6	IEC 61000-3-3
Conducted emission	Telecommunication port	applicable	not applicable	not applicable	10.7	IEC CISPR 32

ITU-T Recommendations K.116

Table 3 – Immunity applicability

Phenomenon	Application	Equipment test requirement			Reference clause in this Recommendation	Reference standard
		Radio and ancillary equipment for fixed use	Radio and ancillary equipment for vehicular use (connected to vehicular DC supplies)	Radio and ancillary equipment for portable use (powered by integral battery)		
RF electro-magnetic field (80 MHz to 1 000 MHz and 1 400 MHz to 2 700 MHz)	Enclosure	applicable	applicable	applicable	11.2	IEC 61000-4-3
Electrostatic discharge	Enclosure	applicable	applicable	applicable	11.3	IEC 61000-4-2
Fast transients common mode	Signal, telecommunication and control ports, DC and AC power input ports	applicable	not applicable	not applicable	11.4	IEC 61000-4-4
RF common mode 0.15 MHz to 80 MHz	Signal, telecommunication and control ports, DC and AC power input ports	applicable	applicable	not applicable	11.5	IEC 61000-4-6
Transients and surges, vehicular environment	DC power input ports	not applicable	applicable	not applicable	11.6	ISO 7637-2
Voltage dips and interruptions	AC mains power input ports	applicable	not applicable	not applicable	11.7	IEC 61000-4-11
Surges, common and differential mode	AC power input ports, telecommunication ports	applicable	not applicable	not applicable	11.8	IEC 61000-4-5

Relations with ITU

- CERT LABs is qualified by the International Telecommunications Union (ITU) to be a C&I regional lab for African and Arab regions.
- Many training actions have been undertaken for Arab and African delegates

Training actions by CERT Labs

http://www.itu.int/en/ITU-D/Technology/Pages/Events.aspx

- Conformity and Interoperability Training for Africa Region, 30 May-3 June 2016, Tunis, Tunisia
- Conformity and Interoperability Training for Arab Region ,Tunis (Tunisia), 11-15 April 2016
- ITU Forum on Conformance and Interoperability for the Arab and African Regions, 5-7 November 2012 and Training Course on Conformance and Interoperability Testing, 8-10 November 2012, Tunis (Tunisia)
- Training Course on Conformance and Interoperability Testing for the Arab Region, 2-6 April 2013, Tunis (Tunisia)
- Training Course on Conformance and Interoperability Testing for the Africa Region, 28 October-1st November 2013, Tunis (Tunisia)
- Training Course on Conformity and Interoperability Testing for the Arab Region, 17-22 March 2014, Tunis (Tunisia)
- Training Course on Conformance and Interoperability Testing for the Africa Region, 23-27 June 2014, Tunis (Tunisia)
- Workshop for Maghreb Countries to promote the Development and Implementation of Conformity Assessment Programmes, 9-11 December 2014, Tunis (Tunisia)
- Conformity and Interoperability Training for Arab Region on Type Approval testing for Mobile Terminals, Homologation Procedures and Market Surveillance, 20-24 April 2015, Tunis (Tunisia) - Organized in collaboration with the Centre d'Etudes et de Recherche des Télécommunications (CERT)
- ITU-UMA Experts Meeting on C&I in the Maghreb Countries, Rabat-Morocco, 23-25 Nov. 2015
- Conformity and Interoperability Training for Africa Region on Type Approval Testing for Mobile Terminals, Homologation Procedures and Market Surveillance, 14-18 December 2015, Tunis, Tunisia

Contact

Director of Laboratories: Karim Loukil

karim.wakil@cert.mincom.tn

Technical manager: Kais Siala

kais.siala@cert.mincom.tn

laboratory responsible electrical safety: Ines Ayari

Ines.Ayari@cert.mincom.tn

laboratory responsible Radio:

engineering laboratory responsible

Quality Manager: Sameh Ben Abedallah

Technical Sales Manager: Nadia Tabarki

Nadia.tabarki@cert.mincom.tn