



**TECHNICAL STANDARD AND SPECIFICATION
FOR
GSM 900 & 1800 MHz MOBILE TERMINAL EQUIPMENTS**

Document Ref. 1214.01

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Part 1. Introduction

- 1.1 This technical document *Ref: 1214.01* is developed consequently to provide general Standard and Specification for Mobile Terminals to be used on the Public Cellular Mobile Telephone Service (PCMTS), which employ the Global System for Mobile Communications Technology (GSM).
- 1.2 The document outlines the minimum requirements for the Mobile terminals for use in the Public Cellular Mobile Telephone Service (PCMTS) operating in the 900 MHz and 1800 MHz frequency bands. In this document the mobile terminal can be a **handheld, portable mobile phone, mobile phone handset or vehicle mounted equipment.**
- 1.3 The technical standards in respect of ICT equipment are enforceable under PART XI of the NICT Act 2009. NICTA has a legislative role under the Act to promote an open and technically interoperable network accommodating a varied but compliant range of customer premises equipment that is capable of supporting the required standards of service for public benefit.
- 1.4 All suppliers and dealers of GSM mobile terminals are required to comply with this technical standard. This is to ensure that GSM Mobile terminals imported for use in PNG comply with internationally accepted standards.
- 1.5 Mobile Terminals which are brought into the country from individuals are also subject to compliance by this technical standard.

Part 2. Scope

- 2.1 This technical document specifies the technical standards and requirements for GSM Mobile terminals that is designed or intended for use in connection with a GSM public mobile telecommunications service (PMTS). The document is intended for **GSM operators, Mobile phone users, Mobile phone suppliers or dealers , general telecommunication carriers, and the general public.**
- 2.2 The standard and specification cover the following areas;
 - Electrical safety requirement,
 - Electromagnetic compatibility,
 - Radiation safety standards,
 - Type approval specification,
 - Operating Frequencies,
 - Terminal support for High-Speed Wireless Data Service,
 - Technical compliances,
 - Other administrative issues

Part 3. Objective

- 3.1 The principal objectives of this document are;
 - to ensure that individual mobile terminal can be interconnected to obtain the desired end-to-end performance,
 - to ensure that performance standards are met,
 - to define non-propriety interfaces between GSM mobile terminals that may themselves involve proprietary technology, so as to ensure that such

proprietary ownership by particular vendors does not prevent unnecessarily prevent the supply of their complementary GSM mobile equipment,

- to prevent or minimize harmful radio interference,
- to protect the health and safety of users,
- to provide a basis for widespread acceptance of specific handsets for ease of circulation between countries especially in the case of international and national roaming.
- facilitate access to emergency services, and
- to protect the integrity of public networks.

Part 4. References

Australian Standards

AS ISO 1000:1998 The International System of Unit (SI) and its application

AS/ACIF Standards

AS/ACIF S042 Requirements for connection to an air interface of a telecommunications network

AS/ACIF S042.1:1999 Part 1: General

ACIF Guidelines

ACIF G548:1999 Supporting arrangements for AS/ACIF S042 Requirements for connection to an air interface of a telecommunications network

ETSI Standards

ETSI TS 151 010-1 V4.9.0 Digital cellular telecommunications system (Phase 2+); Mobile Station (MS) conformance specification; Part 1: Conformance specification (3GPP TS 51.010-1 version 4.9.0 Release 4)

ETSI TS 151 010-1 V6.2.1 Digital cellular telecommunications system (Phase 2+); Mobile Station (MS) conformance specification; Part 1: Conformance specification (3GPP TS 51.010-1 version 6.2.1 Release 6)

ETSI EN 301 511 V9.0.2 Global System for Mobile communications (GSM); Harmonized EN for mobile stations in the GSM 900 and GSM 1800 bands covering essential requirements under article 3.2 of the R&TTE directive (1999/5/EC)

Part 5. Definitions and Abbreviation

Carrier means, the holder of a valid carrier license.

Customer means, any person or company that agrees to purchase telecommunication services.

Commission means Independent Consumer and Competition Commission (ICCC).

Condition means, in relation to a license, a condition or restriction to which the license is subject to, or will be subject to, as the case requires.

Customer Equipment means equipment that is or is intended to be connected to a telecommunications PSTN operated by a carrier other than equipment that is used or intended for use within the boundaries of such a PSTN.

Dealer means a person who manufacture, imports for sale, let hire, sells, or offers or possesses for sale any equipment which is capable of being used for the purpose of communication.

EMC means Electromagnetic Compatibility.

End User means, the most general class of individual users of telecommunication services.

EQUIPMENT means, any apparatus or equipment used or intended for use in or in connection with a telecommunications network but does not include a line.

ETSI means European Telecommunications Standards Institute

GSM means the Global System for Mobile Communications (GSM) as specified by ETSI

Harmful Interference means Interference which endangers the functioning of a radio navigation service or other safety services which otherwise seriously degrades, obstructs or repeatedly interrupts a radiocommunications service operating in accordance with the applicable PNG Economic Area or National regulations.

IEC means International Electro technical Commission

IMEI means International Mobile Equipment Identity

Interoperability means the ability of two or more mobile terminals to exchange information and to use the information that has been exchanged.

ITU-T (formerly CCITT) means International Telecommunications Union – Telecommunication Standardization Sector

License means, a license granted under the Telecommunications Act 1996 to authorise operation of a telecommunications service.

Licensee means, a person who is the holder of a license issued under the Telecommunications Act 1996 and, for the avoidance of doubt, this includes a carrier.

Market means, the market for telecommunications service.

Mobile carrier means the holder of a public mobile license.

Mobile Terminal Equipment means mobile phone (or handset) or other mobile communication devices such as handheld, portable mobile phone or vehicle mounted equipment which is capable of communication by means of emission

and/or reception of radio waves utilising the spectrum allocated to terrestrial/space radiocommunication.

Network means, a telecommunications network to supply services between places within PNG, and from places within PNG to places outside PNG.

NICTA means **National Information and Communications Technology Authority**

NICT Act 2009 means, **National Information and Communications Technology Act 2009**

NISIT means, National Institute of Standards and Industrial Technology

Terminal Equipment means Any equipment used by a subscriber which is directly or indirectly connected to a terminal point of the telecommunications network for the purpose of effecting communications.

User means any person or legal entity making use of public telecommunication services.

Part 6. General Requirement

6.1 Power Supply Requirements

- 6.1.1 Ac adaptor for GSM Mobile Terminal shall not affect the capability of the equipment to meet this specification. The operating voltage shall be 240V + - 10% and frequency 50Hz \pm 1% or 230 V + 10% and frequency 50Hz \pm 1 %.
- 6.1.2 Adaptor must be pre-approved by the relevant regulatory body such as PNG Power or NISIT before it can be used with the equipment.

6.2 Power Supply cord and mains plug requirements

- 6.2.1 The equipment shall be fitted with a suitable and appropriate approved power supply cord and mains plug. Both are regulated products and must be pre-approved by the relevant regulatory body before it can be used with the equipment.

6.3 Interoperability and connectivity requirements

6.3.1 Interoperability

The GSM Mobile terminals shall have the ability to exchange information and use the information that has been exchange between two or more systems or components on the GSM network.

6.3.2 Connectivity

The GSM Mobile terminals shall have the ability to link with other programs and devices to allow interoperability.

6.4 Electrical Safety Requirements.

- 6.4.1 GSM Mobile terminals operating with mains power supply shall comply with internationally accepted electrical safety standards including but not limited to the following and other electrical safety standards that may be adopted in the country from time to time;
1. IEC 60950: 2001 – Safety of Information Technology Equipment,
 2. UL 60950 – Information Technology Equipment including Electrical Business Equipment, and
 3. EN 60950 – International Safety Standard for Information Technology Equipment.
- 6.4.2 Where provision is made for the connection of any class of mobile station (mobile handset) to supply units or battery chargers using voltages in excess of 50V rms ac or 75 dc, user handbooks shall specify the power unit(s) or battery charger(s) approved for use with the mobile station/mobile handset and shall include the following statement:
- The Mobile equipment is intended for use when supplied with power from identification of battery charger(s) and/or power supply units(s). Other usage will invalidate any approval given to the apparatus and may be dangerous.
- 6.4.3 Compliance with the radiation safety standards specified in clause 7.2 does not by itself confer immunity from legal obligations and requirements imposed by national health or safety authorities such as NISIT. NICTA may invalidate the equipment registration if so requested by the relevant authority for reasons of safety or hazards that would likely be caused to users.

- 6.4.4 Furthermore, the supplier shall provide each unit of the respective approved mobile handset with advisory information pertaining to electrical Safety and non-ionizing radiation hazards and on the safe operation.

Part 7. Technical Requirements

7.1 Electromagnetic Compatibility Requirements (EMC)

7.1.1 The equipment should be constructed in such a way that:

- i The electromagnetic disturbance it generates does not exceed a level allowing the mobile equipment to operate as intended and;
- ii. The equipment has an adequate level of intrinsic immunity of electromagnetic disturbance to enable it to operate as intended.

*Note: "To operate as **intended** means using the equipment in accordance with the manufacturer's instruction and using it in the electromagnetic environment determined by standards chosen by the manufacturer".*

7.1.2 Mobile Terminal Equipment must show compliance with internationally accepted standards for EMC including but not limited to the following and other EMC standards applicable to such equipment that may be adopted:

1. CISPR22: Information Technology Equipment.
2. EN55022: Information Technology Equipment – Radio disturbance Characteristic
3. EN50082-1: Electromagnetic Compatibility – Generic immunity Standards
4. EN50081-1: Electromagnetic Compatibility – General Emission Standards and;
5. EN6100-3-2/3: Electromagnetic Compatibility – Limits of harmonics.

7.2 RF Radiation Safety Standards Requirements.

7.2.1 All mobile terminals shall comply with the following Radiation Safety Standards and any other adopted international standard in the future,

- i. Mobile Terminals to be used in Public Digital Cellular Networks shall be successfully tested and complied with the general public exposure SAR limit of 2 Watts per kilogram (W/kg) averaged over ten grams of tissue as specified in the ICNIRP (International Commission on Non-Ionizing Radiation Protection) Guidelines.
- ii. ICNIRP: International Commission on Non-Ionizing Radiation Protection Guidelines for limiting exposure to time varying electric, magnetic and electromagnetic fields (up to 300 GHz)
- iii. EN 50360: Product standard to demonstrate the compliance of mobile phones with the basic restrictions related to human exposure to electromagnetic fields (300 MHz – 3 GHz)
- iv. EN 50361: Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz– 3 GHz).
- v. 1999/519/EC: Council recommendation on the limitation of exposure of the general public to electromagnetic fields (0 to 300 GHz).
- vi. ES 59005: Evaluation of Human Exposure, Specific Absorption Rate.

7.3 IMEI Security

7.3.1 GSM Mobile equipment shall comply with IMEI security requirements of ETSI 151 010-1[5].

Part 8. Operational Requirements

8.1 Operating Frequency

8.1.1 In PNG the following bands have been allocated for Fixed Mobile Service as per the PNG Frequency Allocation Table.

| | GSM 900 MHz | GSM 1800 MHz |
|--------------------------|------------------|--------------------|
| Mobile Terminal Receive | 925 MHz– 960 MHz | 1805MHz- 1880 MHz |
| Mobile Terminal Transmit | 880 MHz–915 MHz | 1710MHz – 1785 MHz |

These specifications therefore do not include provisions for Mobile terminals designed to operate in bands outside of those currently allocated for the use of Public Digital Cellular Mobile Services in PNG.

8.1.2 The mobile equipment for use with GSM 900 system shall be able to transmit and receive in the following frequency ranges and channel spacing:

Mobile Transmit: 880 – 915 MHz

Mobile Receive: 925 – 960 MHz

Channel Spacing: 200 kHz

8.1.3 The mobile equipment for use with GSM 1800 system shall be able to transmit and receive in the following frequency ranges and channel spacing;

Mobile Transmit: 1710 – 1785 MHz

Mobile Receive: 1805 – 1880 MHz

Channel Spacing: 200 kHz

8.1.4 Mobile equipment designed to operate on more than one Frequency band (e.g. dual band or tri-band terminals) shall be able to transmit and receive in the above mentioned frequency ranges as a minimum requirement.

8.2 Essential Requirement

8.2.1 Mobile terminal shall be so constructed that it effectively uses the spectrum allocated so as to avoid harmful interference.

Part 9. Type Approval Requirements

9.1 Technical Requirement

9.1.1 Conformance with International Standards and Specifications for GSM Cellular Mobile Telephone Systems, the GSM 900 and/or GSM 1800 mobile terminals shall meet the technical requirements as defined in one of the following standards:

| Reference | Description |
|--------------------------------------|---|
| I-ETS 300 020-1 (currently TS 11.10) | European Digital Cellular Telecommunication System (Phase 1); Mobile Station Conformance Test System; Part 1: Mobile Station Conformance Specification, issued by the European Telecommunications Standards |

| | |
|---|---|
| <p>I-ETS 300 020-3 (currently TS 11.10)</p> | <p>Institute (ETSI). Digital Cellular Telecommunications System (Phase 1); Mobile Station Conformance Test System; and Part 3: DCS 1800 Mobile Station Conformance Specification (GSM 11.10-DCS) issued by the ETSI.</p> |
| <p>ETS 300 607-1</p> | <p>Digital Cellular Telecommunications System (Phase 2) (GSM); Mobile Station (MS) Conformance Specification; Part 1: Conformance Specification (GSM 11.10-1), issued by the ETSI</p> |
| <p>TS 100 607-1</p> | <p>Digital Cellular Telecommunications System (Phase 2+) (GSM); Mobile Station Conformance Specification; Part 1: Conformance Specification (GSM 11.10-1/3GPP TS 11.10-1), issued by the ETSI</p> |
| <p>EN 300 607-1</p> | <p>Digital Cellular Telecommunications System (Phase 2+) (GSM); Mobile Station (MS) Conformance Specification; Part 1: Conformance Specification (GSM 11.10-1), issued by the ETSI</p> |
| <p>TS 151 010-1</p> | <p>Digital Cellular Telecommunications System (Phase 2+); Mobile Station (MS) Conformance Specification; Part 1: Conformance Specification (3GPP TS 51.010-1), issued by the ETSI</p> |

9.1.2 The technical requirements for the supplementary services established in the above standards under reference are applicable only when the terminal equipment and the public network support the relevant supplementary services.

9.1.3 For the purpose of Clause 9.1.1 appropriate documentary evidence confirming conformance to the relevant standard (s) shall be made available and/or submitted to NICTA as part of the Type Approval process.

9.2 Keypad

9.2.1 Terminals utilizing keypads shall provide alphanumeric keypads based on ITU-T Rec. E.161 which defines the relationship between letters of the English alphabets and digits. And the relationships between the letters and the digits shall comply with ITU-T Rec E.161 as shown in figure 1.

| | | |
|-----------|----------|-----------|
| 1 | 2 ABC | 3 DEF |
| 4 GHI | 5 JKL | 6 MNO |
| 7 PQRS | 8 TUV | 9 WXYZ |

Figure 1 Keypad layout

9.2.2 The safety requirements shall be included in user handbook for GSM mobile equipment.

9.3 Marking requirements

9.3.1 The equipment shall be marked with the following information:

- a) supplier/manufacturer's name or identification mark;
- b) supplier/manufacturer's model or type reference; and
- c) other markings as required by the relevant standards.

The markings shall be legible, indelible and readily visible.

9.3.2 Language

All markings and related documents shall be in English language.

9.4 Acoustic Safety Requirements

Acoustic safety requirement shall be in accordance to the ITU-T Rec.P.57

9.5 Typed Approval Conditions & Registration of Equipment

9.5.1 Typed approval and registration of GSM Mobile terminal shall be in accordance with NICTA's document REF. 1138.10 titled "Guide for Approval of Telecommunication and Radiocommunication Equipment".

9.5.2 NICTA reserves the right to prescribe any additional requirements from time to time for compliance.

Part 10. Emergency Calls

10.1 All mobile phone must be capable of dialling emergency service even if the handset is locked.

Part 11. Conformance Requirements

11.1 Mobile Terminals must comply with the technical requirements of paragraphs 6.1 and 6.2.

11.2 Mobile terminals to be used in public digital cellular networks must be successfully tested against the requirements as stipulated in the latest edition of the ETSI Standards TS 301 511 "Global System for Mobile Communications (GSM), Harmonized Standard for Mobile Stations in the GSM 900 and DCS 1800 Bands covering Essential Requirements under Article 3.2 of the R&TTE Directive (1999/5/EC) (GSM 13.114), issued by ETSI.

11.3 Suppliers must ensure that mobile terminals intended for use in Papua New Guinea has been successfully tested for conformity with the mandatory EMC requirement as stipulated in this document.

11.4 The equipment may be placed on the market for sale or to be taken into service only if it complies fully with;

- i. the NICTA Type Approval Specification relevant to the equipment, and

ii. the mandatory EMC requirement as specified in this document.

11.5 NICTA reserves the right to conduct further tests on the equipment, as and when required after type approval has been granted.

11.6 Individuals who bring in mobile terminals from overseas for personal use must ensure that the equipment is safe and do not cause any harm or interference to the existing Mobile networks.

Part 12. Technical Compliance

12.1 Where compatibility or any other technical problem arises in connection with the use of the approved equipment, the supplier shall resolve such problem within one month after being formally notified by NICTA in writing.

12.2 If required, the supplier shall make all necessary modifications, alterations or substitutions to the mobile equipment at no additional cost to the customer.

12.3 NICTA reserves the right to conduct further evaluation on the equipment, as and when required after approval has been granted

Part 13. Validity And Automatic Recall of Type Approval Certification

13.1 All Mobile Terminals currently in use at the time of the implementation of these standards are considered as Type Approved provided however that,

i. These mobile terminals have not been declared by its manufacturer as obsolete;

ii. These mobile terminals are no longer being manufactured or declared by manufacturer as having reached the End of Product Life and therefore are no longer supported by their manufacturer;

iii. The use of these mobile equipment in the Public Digital Mobile Cellular networks causes undue interference or fail to perform in satisfactory manner or interfere with the normal operation of the network; and

iv. The use of these mobile terminals poses a hazard to consumers.

13.2 Mobile Terminals falling under the conditions cited in paragraphs i & ii of section 13 of this document are declared no longer for use in the Public Digital Cellular Network and their continued sale, distribution, and use will be discouraged. In which case, any previous Type Approval Certification (TAC) issued for such equipment will be automatically recalled or cancelled.

13.3 For purposes of this provision, all mobile terminal suppliers must submit to NICTA a complete listing of mobile terminal models currently still in distribution. Individuals are also encouraged to comply with set standards and specification as outlined.

Part 14. Responsibilities of Suppliers/Dealers/Licenses

14.1 A supplier or dealer who wishes to import, sell or offer for sale any mobile terminal equipment must comply with Division 3 –Apparatus Licensing of the NICTA Radio Spectrum Regulation Act 2010.

14.2 Suppliers and dealers must before selling the equipment ensure that the equipment meets NICTA's type approval and EMC standards and specifications.

14.3 Suppliers and dealers must ensure that the Mobile terminal equipment offered for sale or use is clearly marked or affixed with the following:

- i. the trade name, model name and serial number,
- ii. manufacturer's/ supplier's name and,
- iii. type approval label for equipment approval by NICTA or compliance marking for equipment offered for sale under the General Approval Scheme.

Part 15. Document Administration

15.1 Document Approval

The original document was approved by PANGTEL Board, as the technical standard and specification for the Cellular Mobile equipments used and/or intended to be used in Papua New Guinea. Under section 297 of the NICT Act 2009 this version now superseded the original version.

15.2 Document Amendments

NICTA from time to time, shall alter, update or modify these technical performance requirements to meet international and/or national requirements as necessary.

15.3 Document Enforcement

This document is in force and effective from the date it was approved by the board and is subject to the appropriate provisions of the NICTA Act 2009.

15.4 Document Publication and/or Distribution

This document is published on the NICTA website www.nicta.gov.pg for public information.

15.5 Complaints and Inquiries

Complaints or inquiries maybe lodged in writing to the: Director Licensing and Enforcement, PO BOX 8227, BOROKO, NCD. Phone: 325 8633, Facsimile: 3004829.