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PERFORMANCE SPECIFICATION
FOR CORDLESS TELEPHONE
OPERATING IN THE 254 MHz AND 380 MHz BANDS



TELECOMMUNICATIONS AUTHORITY
HONG KONG

FOREWORD

1. This specification is prescribed under section 32D of the Telecommunications Ordinance (Cap 106) (“the Ordinance”) to set out the technical and evaluation requirements for cordless telephone operating in the 254 MHz and 380 MHz bands, as covered by the Telecommunications (Telecommunications Apparatus)(Exemption from Licensing) Order (“the Order”).
2. Under section 39 of the Ordinance, a person is exempted from the obligation to hold a licence under the Ordinance so long as the conditions set out in the Order are satisfied. Radiocommunications apparatus falling into the scope of this specification shall meet the requirements stipulated to fulfil the conditions of the Order.
3. At present, the Office of the Telecommunications Authority (OFTA) operates a **Hong Kong Telecommunications Equipment Evaluation and Certification (HKTEC) Scheme**. Details of the HKTEC Scheme can be found in the information note OFTA I 421. Under the Scheme, suppliers or manufacturers of the radiocommunications apparatus may apply to OFTA for certification of their apparatus against this specification. The application procedures for certification of radiocommunications apparatus can be found in the information note OFTA I 401. A prescribed label may be affixed to the equipment which has been certified by the Telecommunications Authority (TA). Details of the labelling arrangement can be found in the Standardisation Guide HKTA 3211.
4. In addition to this specification, radiocommunications apparatus capable of being used for connection as customer premises equipment (CPE) to the public telecommunications networks (PTNs) in Hong Kong should comply with the relevant network connection specification(s) issued by the TA. Manufacturers or suppliers may also apply for a separate certification by the TA to verify conformity of the apparatus with the relevant specification(s) before it is connected to the PTNs. Details concerning the application procedure for certification of CPE by the TA can be found in the information note OFTA I 412.
5. Cordless telephones operating in the 254 MHz and 380 MHz bands are required to operate on a “no-interference no-protection” basis, i.e. they may not cause radio interference and cannot claim protection from interference. Manufacturers or suppliers of such cordless telephones are advised to consider the potentiality of interference due to the shared use of the frequencies.
6. The TA reserves the right to give separate certification to models he considers to be technical variants and the performance of which may differ between models.
7. The TA may amend any part of this specification as and when he deems necessary.
8. In case of doubt about the interpretation of this specification, the methods of carrying out the test and the validity of statements made by the equipment manufacturers or suppliers about the equipment, the decision of the TA shall be final.

9. The HKTA specifications and information notes are issued by the TA. The documents can be obtained through one of the following methods :-

- downloading direct through the OFTA's Internet Home Page. The Home Page address is <http://www.ofta.gov.hk>;
- making a request for hard copies to :-

Radio Laboratory, Standards Section
Office of the Telecommunications Authority,
29/F Wu Chung House,
213 Queen's Road East, Wanchai, Hong Kong.

Fax : +852 2343 5824
Email : radiolab@ofta.gov.hk

10. Enquiries about this specification may be directed to :-

Radio Laboratory, Standards Section,
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1. GENERAL

1.1 SCOPE OF SPECIFICATION

This specification covers the minimum performance requirements for radio equipment, comprising base and handset units, for use in the cordless telephone service. The equipment shall employ frequency modulation, and operate in 254 MHz and 380 MHz bands for duplex transmission between the base and portable units.

1.2 OPERATING FREQUENCIES

The equipment shall operate on channels of 12.5 kHz separation with carrier frequencies as stated below:

Base unit

	Speech channel	Control channel
Frequency	380.2125 MHz and higher frequencies in increments of 12.5 kHz in the band 380.2125 – 381.30 MHz except 380.775 MHz	380.775 MHz, 381.3125 MHz
Number of channels	87	2

Handset unit

	Speech channel	Control channel
Frequency	253.8625 MHz and higher frequencies in increments of 12.5 kHz in the band 253.8625 – 254.950 MHz except 254.425 MHz	254.425 MHz, 254.9625 MHz
Number of channels	87	2

1.3 PROTECTION AGAINST UNINTENTIONAL ACCESS

Cordless telephone shall incorporate circuitry which makes use of a digital security code or identification code of at least 25 bits to provide access protection from the handset to the base unit and vice versa. When the handset is switched on, it shall transmit the code to the base unit which will respond and give access to the telephone line only if the code matches with the base unit. Similarly, ringing of the handset unit shall occur only if the code transmitted by the base unit matches the code set in the handset unit.

1.4 ANTENNA REQUIREMENT

The apparatus shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the equipment.

1.5 TYPE NUMBER

The type number and brand name of the cordless telephone shall be clearly indicated on the casing of the handset and the base unit. Each type number shall be unique. The manufacturer who first submits to use a type number will have the priority to use that type number.

1.6 CONTROLS

Controls, which if maladjusted might increase the interfering potentialities of the equipment, shall not be made accessible to the end user.

1.7 ELECTRICAL SAFETY REQUIREMENTS

The apparatus shall comply with the electrical safety requirements set out in HKTA 2001 titled "Compliance Test Specification Safety and Electrical Protection Requirements for Subscriber Equipment Connected to the Public Telecommunications Networks in Hong Kong" issued by the Telecommunications Authority (TA).

1.8 DECLARATIONS BY THE MANUFACTURER

When submitting an equipment for type testing, the following information shall be supplied :-

- a. Transmitters
 - i. crystal frequency and carrier generation formula or, technique of frequency generation
 - ii. crystal type where applicable
- b. Receivers
 - i. crystal frequency and local oscillator generation formula
 - ii. crystal type
- c. Power supply
 - i. nominal supply voltage
 - ii. type of battery where applicable
 - iii. battery end point voltage where applicable

2. GENERAL TEST CONDITIONS

2.1. GENERAL

Tests shall be made under normal test conditions (Clause 2.2) and also, where stated, under extreme test conditions (Clause 2.3).

2.2 NORMAL TEST CONDITIONS

2.2.1 *Atmospheric testing conditions*

The atmospheric conditions of the test site shall be maintained at any convenient combination of temperature, relative humidity and air pressure within the following ranges :

- | | | | |
|----|-------------------|---|-----------------|
| 1. | Temperature | : | 15°C to 35°C |
| 2. | Relative humidity | : | 10% to 80% |
| 3. | Air pressure | : | 860 to 1060 hPa |

When it is impracticable to carry out the tests under these conditions, a note to this effect, stating the ambient temperature and relative humidity during the tests, shall be added to the test report.

2.2.2 *Test power source*

2.2.2.1 *General*

The power supply for the equipment under test may be replaced by a test power source, capable of producing normal and extreme test source voltages as specified below and in clauses 2.3.2 and 2.3.3.

The supply voltage shall be measured at the input terminals of the equipment.

2.2.2.2 *Mains test source voltage*

For equipment powered by AC mains, 220V \pm 6% at frequency 50 Hz \pm 1 Hz shall be designated as the normal test voltage.

2.2.2.3 *DC test source voltage*

For equipment supplied from self-contained primary cells or batteries or any other DC sources, the normal test source voltage shall be the nominal supply voltage declared by the manufacturer.

2.3 EXTREME TEST CONDITIONS

2.3.1 *Extreme temperatures*

For tests of extreme temperatures, measurements shall be made in accordance with procedures specified in clause 2.4 at an upper value of +55°C and at lower value of 0°C.

2.3.2 *Extreme mains test source voltage*

The extreme mains test source voltage shall be $\pm 10\%$ of 220V at a frequency of 50 Hz ± 1 Hz.

2.3.3 *Extreme DC test source voltage*

The extreme DC test source voltage shall be as follows :

1. Regulated lead-acid battery power sources

When the equipment is intended for operation from regulated lead-acid power source, the extreme test source voltages shall be +30% and -10% of the nominal voltage of the battery.

2. Other power sources

When the equipment is intended for operation from power sources using primary batteries, the extreme test source voltage shall be as follows :

- a. For Leclanche or Lithium type of battery it shall be 15% below the nominal voltage.
- b. For Mercury or Nickel-Cadmium type of battery it shall be 10% below the nominal voltage.
- c. For other types of battery it shall be the end point voltage declared by the equipment manufacturer.

No upper extreme test voltage shall apply for radio equipment designed for battery-only use.

For equipment using other power sources, or capable of being operated from a variety of power sources, the extreme test source voltages shall be those agreed between the equipment manufacturer and testing authority and shall be recorded with the test results.

2.4 PROCEDURES FOR TESTS AT EXTREME TEMPERATURES

2.4.1 *General*

Before making measurements, the equipment, which is switched off, shall be placed in a temperature controlled chamber for a period of one hour for temperature stabilization. The humidity content in the test chamber shall be controlled so that excessive condensation does not occur.

2.4.2 *Test procedure*

For test at the upper temperature, after thermal balance has been attained (clause 2.4.1), the equipment shall be switched on in the transmit condition for half an hour, after which the appropriate tests shall be carried out. For tests at the lower temperature, after thermal balance has been attained (clause 2.4.1), the equipment shall be switched on in the receive or transmit condition for one minute, after which the appropriate tests shall be carried out. (Note : If the equipment contains temperature stabilization circuits designed to operate continuously, the equipment shall be switched on for 15 minutes before measurements are made).

3. ELECTRICAL TEST CONDITIONS

3.1. GENERAL REQUIREMENTS FOR MEASUREMENTS INVOLVING THE USE OF RADIATED FIELDS

All radiated measurement should be carried out at a test site as specified in CISPR 16-1, "Specification for radio disturbance and immunity measuring apparatus and methods – Part 1: Radio disturbance and immunity measuring apparatus" issued by the International Electrotechnical Commission. Test sites including fully Anechoic Chamber, Anechoic Chamber with ground plate and Open Area Test Site (OATS) shall be considered acceptable if the horizontal and vertical site attenuation measurements are within ± 4 dB of the theoretical site attenuation for an ideal free field test site. The performance of the test site shall be verified before conducting any radiated measurement at the test site.

If the radiated measurement is carried at a fully Anechoic Chamber or Anechoic Chamber with ground plate, the separation distance between the centre of the vertical projection of the equipment under test (EUT) (i.e. the test sample) in the horizontal plane and the centre of the test antenna shall be at least 3 m and adequate to allow for radiated measurement in the far field of the EUT.

3.2 METHOD OF MEASUREMENT

Unless otherwise indicated, all measurements should follow the general arrangements and methods as specified in relevant clause of ETSI EN 300 296-1 issued by the European Telecommunications Standards Institute (ETSI).

4. TRANSMITTER TEST

4.1 GENERAL

Both the transmitters of the base unit and the portable unit shall comply with the requirements specified in clauses 4.2 - 4.6 below.

4.2 EFFECTIVE RADIATED POWER

For transmission from either the handset or the base unit, the maximum effective radiated power (e.r.p) shall not exceed 12 mW.

The measurement shall be made under normal test conditions (Clause 2.2) and repeated under extreme conditions (Clause 2.3).

4.3 FREQUENCY ERROR

The frequency error shall be within 4 PPM.

The measurement shall be made under normal test conditions (Clause 2.2) and repeated under extreme conditions (Clause 2.3).

4.4 ADJACENT CHANNEL POWER

For the purpose of this specification, the adjacent channel power is that part of the total power output of a transmitter modulated with a 1250 Hz tone at a level which is 10 dB higher than that required to produce a frequency deviation of 1.5 kHz, which falls within a 8.5 kHz band centred on the nominal frequency of the adjacent channels.

The adjacent channel power shall not exceed a value of 60 dB below the effective radiated power measured in Clause 4.2 .

4.5 SPURIOUS EMISSION

The effective radiated power of any spurious emission shall not exceed 2.5 μ W over the frequency range 9 kHz to 3 GHz except for the channel on which the transmitter is intended to operate and the adjacent channels.

4.6 MAXIMUM PERMISSIBLE FREQUENCY DEVIATION

The maximum permissible frequency deviation shall not exceed 2.5 kHz.

5 ACCURACY OF MEASUREMENT

Absolute measurement uncertainties:

RF frequency	$< \pm 1 \times 10^{-7}$
Radiated RF power	$< \pm 6 \text{ dB}$
Frequency deviation	$< \pm 5 \%$

6. REFERENCE

ETSI EN 300 296-1 “*Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service; Radio equipment using integral antennas intended primarily for analogue speech; Part 1: Technical characteristics and methods of measurement*” issued by the European Telecommunications Standards Institute (ETSI)

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