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PERFORMANCE SPECIFICATION FOR FOR RADIOCOMMUNICATIONS APPARATUS OPERATING IN THE 409 MHz BAND AS SHORT-RANGE PORTABLE RADIO

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 Short-Range Portable Radio (SRPR) operating in the 409 MHz band, 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 **H**ong **K**ong **T**elecommunications Equipment **E**valuation and **C**ertification (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. SRPR 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 equipment are advised to consider the potentiality of interference due to the shared use of the frequencies.

5. 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.

6. The TA may amend any part of this specification as and when he deems necessary.

7. 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.

8. 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

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

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

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1. GENERAL

1.1 SCOPE OF SPECIFICATION

This specification covers the minimum performance requirements for Short-Range Portable Radio (SRPR) operating in the 409 MHz band. The SRPR shall employ frequency modulation technique for voice communications.

1.2 OPERATING FREQUENCY RANGE

The equipment shall operate on channels of 12.5 kHz separation with the following frequencies:

Channel	Carrier Frequency	Channel	Carrier Frequency
1	409.7500 MHz	11	409.8750 MHz
2	409.7625 MHz	12	409.8875 MHz
3	409.7750 MHz	13	409.9000 MHz
4	409.7875 MHz	14	409.9125 MHz
5	409.8000 MHz	15	409.9250 MHz
6	409.8125 MHz	16	409.9375 MHz
7	409.8250 MHz	17	409.9500 MHz
8	409.8375 MHz	18	409.9625 MHz
9	409.8500 MHz	19	409.9750 MHz
10	409.8625 MHz	20	409.9875 MHz

1.3 TRANSMITTER RF POWER

The effective radiated power (e.r.p.) of the equipment shall not exceed 500 mW.

1.4 ANTENNA REQUIREMENT

The equipment 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 SRPR shall be clearly indicated on the casing of the equipment. 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 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. type of battery
  ii. battery end point voltage

2. GENERAL TEST CONDITIONS

2.1 ATMOSPHERIC TEST 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 :

(a)	Temperature	:	15°C to 35°C
(b)	Relative humidity	:	10% to 80%
(c)	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 TEST POWER SOURCE

The power supply for the equipment under test may be replaced by a test power source capable of producing the nominal supply voltage as declared by the manufacturer.

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

3. ELECTRICAL TEST CONDITIONS

3.1 GENERAL REQUIREMENTS FOR MEASUREMENT 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 $\pm$ 4dB 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 an 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 a 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

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 REQUIREMENT

4.1 EFFECTIVE RADIATED POWER

4.1.1 *Definition*

For the purpose of this specification, the maximum effective radiated power is defined as the effective radiated power in the direction of maximum field strength in the absence of modulation.

4.1.2 *Limit*

The maximum effective radiated power shall not exceed 500 mW.

4.2 FREQUENCY ERROR

4.2.1 *Definition*

The frequency error of the transmitter is the difference between the measured carrier frequency in the absence of modulation and the nominal frequency of the carrier.

4.2.2 *Limit*

The frequency error shall not exceed 2 kHz.

4.3 ADJACENT CHANNEL POWER

4.3.1 *Definition*

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 20 dB higher than that required to produce a frequency deviation of 1.5 kHz, which falls within a specified passband centred on the nominal frequency of the adjacent channels.

4.3.2 *Limit*

The adjacent channel power shall not exceed a value of 55 dB below the effective radiated power measured in Clause 4.1, without the need to be below 0.2 μW.

4.4 SPURIOUS EMISSION

4.4.1 *Definition*

Spurious emissions are emissions at frequencies other than those of the carrier and sidebands associated with normal modulation resulting from signals generated within the equipment. The level of spurious emissions shall be measured as their effective radiated power when radiated by integral antenna and cabinet of the equipment.

4.4.2 *Limit*

The level of any spurious emission shall not exceed 50 μW over the frequency range of 30 MHz to 3 GHz except for the channel on which the transmitter is intended to operate and the adjacent channels.

5. RECEIVER REQUIREMENT

5.1 RECEIVER SPURIOUS EMISSION

5.5.1 *Definition*

Spurious emissions from receiver are any emissions present at the antenna terminals of the equipment or radiated from the cabinet and structure of the receiver. The level of spurious emissions shall be measured as their effective radiated power.

5.5.2 *Limit*

The level of any receiver spurious emission shall not exceed 20 nW over the frequency range of 30 MHz to 3 GHz.

6 ACCURACY OF MEASUREMENT

Absolute measurement uncertainties:

RF frequency	$< \pm 1 \times 10^{-7}$
Radiated RF power	$< \pm 6$ dB

7 . REFERENCE

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

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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