

## **Unofficial Translation**

### **Notification of the National Telecommunications Commission**

#### **On Technical Standards for Telecommunication Equipment**

#### **Re: Radiocommunication Equipment Used in Land Mobile Service in**

#### **VHF/UHF Bands for Speech and/or Data Communications**

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Whereas it is deemed appropriate to prescribe technical standards for the radiocommunication equipment used in land mobile service in the VHF/UHF bands for speech and/or data communications to keep pace with the advancement of radiocommunication technologies and comply with the radio regulations of the International Telecommunication Union, which are the international principles under which Thailand, as a member country, shall be obliged and follow to prevent frequency interference among businesses, and hence respond to efficient use of radio frequencies;

Pursuant to Section 51 (6) and Section 78, paragraph one, of the Act on Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunication Services, B.E. 2543 (2000) which contains certain provisions regarding the restriction of the rights and freedom of an individual as permitted to be done under the law by Article 29, in conjunction with Article 35, Article 36, Article 43, Article 45, Article 46, Article 47, Article 61 and Article 64 of the Constitution of the Kingdom of Thailand; and pursuant to Section 32 of the Telecommunications Business Act B.E. 2544 (2001) which contains certain provisions regarding the restriction of the rights and freedom of an individual as permitted to be done under the law by Article 29, in conjunction with Article 35, Article 36, Article 41, Article 43 and Article 45 of the Constitution of the Kingdom of Thailand; together with Section 29 (4) of the Radiocommunications Act B.E. 2498 (1955) which contains certain provisions regarding the restriction of the rights and freedom of an individual as permitted to be done under the law by Article 29, in conjunction with Article 35, Article 36, Article 41, Article 43, Article 45, Article 46, Article 47 and Article 61 of the Constitution of the Kingdom of Thailand; the National Telecommunications Commission hereby specifies the Technical Standards for Telecommunication Equipment Re: Radiocommunication Equipment Used in Land Mobile Service in the VHF/UHF Bands for Speech and/or Data Communications, as detailed in the Technical Standard No. NTC TS 1024-2552 appended hereto.

## **Unofficial Translation**

This Notification shall come into force as from the day following the date of its publication in the Government Gazette.

Announced on the 8<sup>th</sup> day of December B.E. 2552 (2009)

General Choochart Promphasid

Chairman of the National Telecommunications Commission

This English version is prepared by International Organizations Bureau with the sole purpose of facilitating the comprehension of foreign participants in the telecommunication rules and regulations and shall not in any event be construed or interpreted as having effect in substitution for or supplementary to the Thai version thereof.

Please note that the translation has not been subjected to an official review by the Office of the National Telecommunications Commission. The Office of NTC, accordingly, cannot undertake any responsibility for its accuracy, nor be held liable for any loss or damages arising out of or in connection with its use.



# **TECHNICAL STANDARDS FOR TELECOMMUNICATION EQUIPMENT**

**NTC TS 1024-2552**

## **Radiocommunication Equipment Used in Land Mobile Service In the VHF/UHF Frequency Band For Speech and/or Data Communications**

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**Technical Standards for Telecommunication Equipment**  
**NTC TS 1024-2552**  
**Radiocommunication Equipment for Land Mobile Service in the VHF/UHF Bands**  
**For Speech and/or Data Communications**

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# Technical Standards for Telecommunication Equipment

## NTC TS 1024-2552

### Radiocommunication Equipment for Land Mobile Service in the VHF/UHF Bands

#### For Speech and/or Data Communications

#### 1. Scope

This technical standard specifies the minimum technical characteristics of radiocommunication equipment for land mobile service in the VHF/UHF bands for data and/or digitized speech communications in the 30-960 MHz frequency band with channel spacing of 12.5 kHz or 25.0 kHz, which is the radiocommunication equipment used for base station, mobile station and hand portable station; as follows:

**1) Base station** is a radiocommunication transmitter, receiver, or transceiver fitted with an antenna socket for use with an external antenna, and intended for use at certain, fixed locations.

**2) Mobile station** is a radiocommunication transmitter, receiver, or transceiver fitted with an antenna socket for use with an external antenna, normally used in a vehicle or as a transportable station.

**3) Hand portable station** is a radiocommunication transmitter, receiver, or transceiver either with an integral antenna or fitted with an antenna socket for use with an external antenna, or both, and intended for use as being carried on a person or held in the hand.

For radiocommunication equipment with the combination of analog and digitized speech, the analog speech shall have the technical characteristics according to the Technical Standard NTC TS 001-2548 [1] or its amendment.

In case the radiocommunication equipment has no antenna socket for use with an external antenna, it shall have 50 ohm output socket for the transmitter and 50 ohm input socket for the receiver installed within the equipment.

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## 2. Requirements for Transmitter

### 2.1 Rated carrier power

**Definition** **Rated carrier power** is the carrier power of the equipment declared by the manufacturer in its technical documents. The carrier power is the average power delivered to the artificial antenna during a radio frequency cycle, in the absence of modulation. The carrier power measured shall be within  $\pm 1.5$  dB of the rated carrier power.

**Limit** The rated carrier power shall not exceed the maximum values given in the table below:

Type of transmitter	Rated carrier power (watt)
Base station	60
Mobile station	30
Hand portable station	5

**Note** The National Telecommunications Commission (NTC) may authorize the rated carrier power beyond the limits shown in the table above on a case -by-case basis.

### 2.2 Conducted spurious emissions

**Definition** **Conducted spurious emissions** are emissions at the antenna connector to the artificial antenna at frequencies other than those of the carrier and associated sidebands under defined conditions of modulation.

**Limit** The power levels of conducted spurious emissions within the frequency range of 9 kHz - 3 GHz shall be attenuated below the carrier power in the absence of modulation at least  $43 + 10 \log P$  (dB) or 70 dBc, whichever is less stringent, where P is mean power in watt (W).

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### 2.3 Frequency error

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

**Limit** The frequency error shall not exceed the values given in the table below:

Channel spacing (kHz)	Frequency error (kHz)			
	30-47 MHz Frequency band	47-137 MHz Frequency band	137-500 MHz Frequency band	500-960 MHz Frequency band
12.5	±0.60	±1.00	±1.00 (base station) ±1.50 (mobile station, hand portable)	N/A
25	±0.60	±1.35	±2.00	±2.50

### 2.4 Adjacent channel power

**Definition** **Adjacent channel power** is that part of the total output power of a transmitter under defined conditions of modulation, which falls within a specified passband centered on the nominal frequency of either of the adjacent channels. This power is the sum of the mean power produced by the modulation, hum and noise of the transmitter.

**Limit** The adjacent channel power levels shall have the values at least 60 dB below the carrier power.

### 2.5 Intermodulation attenuation

**Definition** **Intermodulation attenuation** is the capability of a transmitter to stop a signal generated in non-linear components due to the signals of the transmitter and the interference thereof passing into the transmitter through the antenna. It is applicable only to radiocommunication equipment of base station.

**Limit** The intermodulation attenuation shall not be less than 40 dB.

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### 3. Requirements for Receiver

#### 3.1 Maximum usable sensitivity

**Definition** **Maximum usable sensitivity** is the minimum signal level at the receiver input at a specified frequency, modulated with the test signal of pseudo-random sequence of 511 bits, which will, without interference, produce a data signal with the bit error rate of  $10^{-2}$ .

**Limit** The maximum usable sensitivity shall have electromotive force (emf) of not exceeding +3 dB $\mu$ V.

#### 3.2 Error behavior at high input levels

**Definition** **Error behavior at high input levels (without interference)** is the bit rate ratio when the level of the wanted signal is significantly above the maximum wanted sensitivity.

**Limit** The bit error ratio shall not exceed  $10^{-4}$  when the level of input signal is 33 dB higher than the maximum sensitivity.

#### 3.3 Adjacent channel selectivity

**Definition** **Adjacent channel selectivity** is a measure of the capability of a receiver to receive a wanted signal with specified modulation in the presence of an unwanted signal in the adjacent channel.

**Limit** The adjacent channel selectivity must not be less than the values given in the table below:

Channel spacing (kHz)	Difference of signal levels between the adjacent channel and the specified channel
12.5	60 dB
25	70 dB



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### **4. Safety Requirements**

#### **4.1 Electrical safety requirements**

The electrical safety requirements for radiocommunication equipment used in land mobile service in the VHF/UHF frequency bands for speech and/or data communications shall comply with one or more of the following standards:

4.2.1 IEC 60950-1 : Information Technology Equipment – Safety – Part 1:  
General Requirements

4.2.2 TIS 1561—2548 : Information Technology Equipment - Safety: General  
Requirements

#### **4.2 Radiation exposure requirements**

The installation of radiocommunication station and the use of radiocommunication equipment for the land mobile service in the VHF/UHF frequency bands for speech and/or data communications shall comply with the safety standard for the use of radiocommunication equipment on human health and safety criteria and measures for the use of radiocommunication equipment on human health prescribed by the National Telecommunications Commission.

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## **5. Methods of Measurement**

### **5.1 Transmitter**

#### **5.1.1 Rated carrier power**

The testing method shall follow ETSI EN 300 113-1 [2], or any other equivalent method.

#### **5.1.2 Conducted spurious emissions**

The testing method shall follow ITU-R SM. 329-10 [3], ETSI EN 300 113-1, or any other equivalent method.

#### **5.1.3 Frequency error**

The testing method shall follow ETSI EN 300 113-1, or any other equivalent method.

#### **5.1.4 Adjacent channel power**

The testing method shall follow ETSI EN 300 113-1, or any other equivalent method.

#### **5.1.5 Intermodulation attenuation**

The testing method shall follow ETSI EN 300 113-1, or any other equivalent method.

### **5.2 Receiver**

#### **5.2.1 Maximum usable sensitivity**

The testing method shall follow ETSI EN 300 113-1, or any other equivalent method.

#### **5.2.2 Error behavior at high input levels**

The testing method shall follow ETSI EN 300 113-1, or any other equivalent method.

#### **5.2.3 Adjacent channel selectivity**

The testing method shall follow ETSI EN 300 113-1, or any other equivalent method.

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### **5.3 Duplexer**

For radiocommunication equipment with duplexer and/or filter, the measurement shall be conducted at the antenna socket.

### **6. Conformity with the Standard**

The radiocommunication equipment used in land mobile service in the VHF/UHF frequency bands for speech and/or data communications shall present its conformity with this Standard. It shall be regarded as telecommunication equipment Type B prescribed in the Notification of the National Telecommunications Commission Re: Conformity Assessment of Telecommunication Equipment.

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**References**

- [1] NTC TS 001-2548, Notification of the National Telecommunications Commission on Technical Standards for Telecommunication Equipment Re: Radiocommunication Equipment Used in Land Mobile Service in the VHF/UHF Bands
  - [2] ETSI EN 300 113-1 v1.6.1: Electromagnetic compatibility and Radio spectrum Matters (ERM); Land mobile service; Radio equipment intended for the transmission of data (and/or speech) using constant or non-constant envelope modulation and having an antenna connector; Part 1: Technical characteristics and methods of measurement
  - [3] ITU-R Recommendation SM. 329-10: Unwanted emissions in the spurious domain
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