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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 Communications B.E. 2553 (2010)

Whereas the National Telecommunications Commission has a policy to revise technical standards for the radiocommunication equipment and accessories widely in use to keep pace with the changing technologies and comply with the international requirements without causing undue burden on the operators as well as to eliminate problems of frequency interference and increase 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 repeals the Notification of the National Telecommunications Commission on the Technical Standards for Telecommunication Equipment Re: Radiocommunication Equipment Used in Land Mobile Service in the VHF/UHF Bands which was issued on 29 August B.E. 2548 (2005) and prescribes Technical Standards for Telecommunication Equipment Re: Radiocommunication Equipment Used in Land Mobile Service in the VHF/UHF Bands for Speech Communications, as detailed in the Technical Standards No. NTC TS 1001 – 2553 appended hereto.

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

Announced on the 7th day of May B.E. 2553 (2010)

Professor Prasit Prapinmongkolkarn

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 1001 - 2553

**Radiocommunication Equipment Used in Land Mobile
Service in VHF/UHF Bands for Speech Communications**

**Office of the National Telecommunications Commission
87 Phahon Yothin 8 Road, Samsennai, Phayathai, Bangkok 10400
Tel. 0 2271 0151-60 Website: www.ntc.or.th**

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Technical Standards for Telecommunication Equipment
NTC TS 1001 - 2553
Radiocommunication Equipment for Land Mobile Service in the VHF/UHF Bands
For Speech Communications

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NTC TS 1001 - 2553
Radiocommunication Equipment for Land Mobile Service in the VHF/UHF Bands
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1. Scope

This technical standard specifies the minimum technical characteristics of radiocommunication equipment for land mobile service in analogue speech communications, using frequency modulation (FM) or phase modulation (PM) 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, and 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 being carried on a person or held in the hand.

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 ± 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 on a frequency or frequencies which are outside the necessary bandwidth and the level of which

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may be reduced without affecting the corresponding transmission of information. Spurious emissions include harmonic emissions, parasitic emissions, intermodulation products, and frequency conversion products, but exclude out-of-band emissions.

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).

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	68-87 MHz Frequency band	137-174 MHz, 230-510 MHz Frequency band	790-960 MHz Frequency band
12.5	±0.60	±1.00	±1.00 (base station) ±1.50 (mobile station, hand portable)	±2.50
25	±0.60	±1.35	±2.00	±2.50

2.4 Frequency deviation

Definition **Frequency deviation** is the maximum difference between the instantaneous frequency of the modulated radio frequency signal and the carrier frequency in the absence of modulation.

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

Channel spacing (kHz)	Frequency deviation (kHz)
12.5	± 2.5 kHz
25	± 5 kHz

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2.5 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 as given in the table below:

Channel spacing (kHz)	Adjacent channel power
12.5	at least 60 dB below the carrier power
25	at least 70 dB below the carrier power

3. Requirements for Receiver

3.1 Reference sensitivity

Definition **Reference sensitivity** is the lowest level of receiver input signal at a nominal frequency with specified modulation that will result in the standard SINAD at the output of the receiver.

Limit The maximum input signal level shall not exceed 0.50 μ V (microvolt) at 12 dB SINAD.

3.2 Adjacent channel selectivity

Definition **Adjacent channel selectivity** is the capability of a receiver to receive a wanted modulated signal at the nominal frequency in the presence of an unwanted modulated signal in the adjacent channel.

Limit The difference of signal levels between the adjacent channel and the nominal channel 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

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 analogue speech communications shall comply with any of the following standards:

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

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4.1.2 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 analogue speech communications shall comply with the safety standard for the use of radiocommunication equipment on human health as well as safety criteria and measures for the use of radiocommunication equipment on human health as prescribed by the National Telecommunications Commission.

5. Methods of Measurement

5.1 Transmitter

5.1.1 Rated carrier power

The testing method shall follow IEC 60489-2 [1], ETSI EN 300 086-1 [2], ANSI/TIA/EIA-603-B [3], or any other equivalent method.

5.1.2 Conducted spurious emissions

The testing method shall follow ANSI/TIA/EIA-603-B, ITU-R Rec. SM. 329-10 [4], or any other equivalent method.

5.1.3 Frequency error

The testing method shall follow IEC 60489-2, ETSI EN 300 086-1, ANSI/TIA/EIA-603-B (Topic: Carrier frequency stability), or any other equivalent method.

5.1.4 Frequency deviation

The testing method shall follow IEC 60489-2, ETSI EN 300 086-1, ANSI/TIA/EIA-603-B (Topic: Modulation limiting), or any other equivalent method.

5.1.5 Adjacent channel power

The testing method shall follow IEC 60489-2, ETSI EN 300 086-1, ANSI/TIA/EIA-603-B, or any other equivalent method.

5.2 Receiver

5.2.1 Reference sensitivity

The testing method shall follow IEC 60489-3 [5], ANSI/TIA/EIA-603-B, or any other equivalent method.

5.2.2 Adjacent channel selectivity

The testing method shall follow IEC 60489-3, ETSI EN 300 086-1, ANSI/TIA/EIA-603-B, or any other equivalent method.

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6. Conformity with the Standard

The radiocommunication equipment used in land mobile service in the VHF/UHF frequency bands for analogue speech 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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Reference

- [1] IEC 60489-2: Methods of measurement for radio equipment used in the mobile services - Part 2: Transmitters employing A3E, F3E or G3E emissions
 - [2] ETSI EN 300 086-1 V1.2.: Electromagnetic compatibility and radio spectrum matters (ERM); Land mobile service; Radio equipment with an internal or external RF connector intended primarily for analogue speech; Part 1: Technical characteristics and methods of measurement
 - [3] ANSI/TIA/EIA-603-B: Land mobile FM or PM communications equipment; Measurement and performance standards
 - [4] ITU-R Rec. SM. 329-10: Unwanted emissions in the spurious domain
 - [5] IEC 60489-3: Methods of measurement for radio equipment used in the mobile services. Part 3: Receivers for A3E or F3E emissions
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