

ICS 33.060.20

CCS M36



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 12572-2008

Replacing GB/T 12572-1990

**Universal requirements and measurement methods of
parameters for radio transmitting equipment**

无线电发射设备参数通用要求和测量方法

Issued on: June 30, 2008

Implemented on: January 1, 2009

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of the People's Republic of China;
Standardization Administration of China**

Table of Contents

1	Scope
2	Normative References
3	Terms, Definitions, Symbols and Abbreviations
3.1	Terms and Definitions
4	Frequency Tolerance of Transmitting Equipment...
4.1	Basic Requirements and Ultimate Design Goals...
4.2	Measurement Methods...
5	Determination of Necessary Bandwidth of Transmitting
5.1	AM Emission Signal...
5.2	FM Emission Signal...
5.3	Pulse Modulated Emission Signal...
6	Requirements for Spurious Domain Emission Power Limits of Transmitting Equipment...
6.1	Applicable Range of Limits...
6.2	Requirements for Spurious Domain Emission Power Limits...
7	Measurement Methods for Spurious Domain Emission
7.1	Measurement Receiver...
7.2	Measurement Requirements
7.2.1	Resolution bandwidth requirements In accordance with the provisions of
7.3	Measurement Methods
7.3.1	Measurement method 1
8	Measurement Methods for Spurious Emission Power of
8.1	Overview...
8.2	Measurement System Resolution Bandwidth and Detection Parameter Settings...
8.3	Direct Measurement Method
	Appendix A

1 Scope

GB/T 12572-2008 is the Chinese national standard on universal requirements and measurement methods of parameters for radio transmitting equipment, in the field of telecommunications and audio-video engineering. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers

meet it. It was issued on 30 June 2008 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 January 2009. Classification: ICS 33.060.20, CCS M36. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This Standard specifies the frequency tolerance, spurious domain emission power limit requirements and general measurement methods for radio transmitting equipment in the frequency band 9 kHz ~ 300 GHz. Meanwhile, it also determines the calculation formulas for the necessary bandwidths of different radio emission categories. This Standard is applicable to radio transmitting equipment of different power levels and categories in the frequency band 9 kHz ~ 300 GHz. However, it does not apply to the detection of spurious domain emission indicators of safety services and special services, for example, survival craft stations or floating transmitters.

2 Normative References

The clauses in the following documents become clauses of this Standard through reference in this Standard. In terms of references with a specified date, all subsequent amendments (excluding corrigenda) or revisions do not apply to this Standard. However, parties to an agreement based on this Standard are encouraged to explore the possibility of adopting the latest versions of these documents. In terms of references without a specified date, the latest version applies to this Standard.

GB 9254-1998 Information Technology Equipment - Radio Disturbance Characteristics - Limits and Methods of Measurement

GB/T 6113.1-1995 Specifications for Radio Disturbance and Immunity Measuring Apparatus

3 Terms, Definitions, Symbols and Abbreviations

The following terms, definitions, symbols and abbreviations are applicable to this Standard.

3.1 Terms and Definitions

3.1.1 frequency tolerance The maximum allowable deviation of the center frequency of the frequency band occupied by the emission from the assigned frequency, or the characteristic frequency of the emission from the reference frequency. The frequency tolerance is expressed in (106) or hertz.

3.1.2 assigned frequency the frequency meter or spectrum analyzer through an attenuator or appropriate coupling device (the spectrum analyzer or frequency meter shall have

sufficient frequency accuracy);

---Set the operating frequency of the transmitter and set the transmitter to operate in continuous wave (CW) state;

---On the premise that the transmitter maintains normal operating status, read the frequency value as f . In accordance with the following formula, calculate the frequency deviation: Deviation = $(f - f_0) / f_0$, in which, f_0 is the nominal transmission frequency;

---For systems like TDMA, if the system cannot output a single carrier, a vector signal analyzer with a high-stable time base shall be used for testing through the modulation domain.

5 Determination of Necessary Bandwidth of Transmitting

Equipment The following provisions clarify the calculation formulas, calculation examples and corresponding emission identification of necessary bandwidths for various emission categories.

5.1 AM Emission Signal The calculation formula, calculation example and corresponding emission identification of the necessary bandwidth of AM emission signal are shown in Table 3.

5.2 FM Emission Signal The calculation formula, calculation example and corresponding emission identification of the necessary bandwidth of FM emission signal are shown in Table 4. In the multi-channel emission signal of FM frequency division multiplexing (FM / FDM), the calculation and determination of the multiplication factor used for the D value (peak frequency deviation) are shown in Table 5.

5.3 Pulse Modulated Emission Signal The calculation formula, calculation example and corresponding emission identification of the necessary bandwidth of pulse modulated emission signal are shown in Table 6.

7 Measurement Methods for Spurious Domain Emission

7.1 Measurement Receiver During the test, a measurement receiver or spectrum analyzer that satisfies the requirements of this test may be selected for the measurement of the spurious emission power of the transmitter. The basic requirements that shall be satisfied are:

- a) All measurement receivers must have r.m.s and peak detection modes.
- b) Provide multiple resolution bandwidth selection modes. During measurement, the resolution bandwidth of the measurement receiver (referring to the intermediate frequency final stage 3 dB bandwidth) shall be as close as possible to the reference measurement bandwidth recommended in 6.2.1. For measurement of emissions close to the operating

frequency, a narrower resolution bandwidth needs to be selected. When the selected resolution bandwidth is much smaller than the reference measurement bandwidth, the power measurement result is the integrated power within the reference measurement bandwidth. When the selected resolution bandwidth is much larger than the reference measurement bandwidth, the broadband spurious emission power measurement result is the normalized power corresponding to the bandwidth ratio. However, the above principles are not suitable for spurious domain emission power measurement of discrete spectrum signals. In addition, the resolution bandwidth calibration factor must be provided based on the specific resolution bandwidth type of the measurement receiver (i.e., 6 dB resolution bandwidth) and the specific measurement spurious emission signal category (i.e., pulse signal or Gaussian noise).

c) The video bandwidth cannot be smaller than the resolution bandwidth, and the video bandwidth is usually selected to be 3 ~ 5 times the resolution bandwidth.

d) Provide a suitable filter waveform factor. The size of the filter waveform factor is mainly determined by the filter category selected by the receiver. In principle, try to use a highly selective filter. Generally, the typical range of the filter waveform factor (60 dB/3 dB ratio) of the spectrum analyzer using a 4-stage or 5-stage analog filter circuit is 5 : 1 to 15 : 1, and the typical value of the Gaussian digital filter waveform factor is 4.6.

7.2.1 Resolution bandwidth requirements In accordance with the provisions of

6.1 in this Standard, usually, the spurious emission power measurement starts at a frequency beyond the necessary bandwidth of the emission that is separated by 250% from the emission operating frequency. However, in some cases, measurement using this frequency limit will include non-spurious emission signals, resulting in erroneous measurement results, and it will be necessary to re-determine this frequency limit. The measurement bandwidth adopts the reference measurement bandwidth of spurious emission, and it is necessary to adjust and re-determine the frequency measurement limit that is different from the necessary emission bandwidth of 250%. To adopt the frequency limit of the necessary bandwidth of the emission that is separated by 250% from the emission operating frequency, it is necessary to select a smaller measurement resolution bandwidth. The correlation between the measurement resolution bandwidth and the spurious domain emission measurement frequency limit (out-of-band domain limit) is shown in Formula (1): Measurement resolution bandwidth (RBW) (filter waveform factor 1) 2 (out-of-band limit necessary bandwidth/2) (1)

It can be seen from Formula (1) that if the measurement resolution bandwidth has been determined, then, calculate and determine the spurious domain emission measurement frequency limit; and vice versa. For example, for a measurement signal with a necessary bandwidth of 16 kHz, the frequency limit (i.e., 40 kHz) of the necessary emission bandwidth of 250% does not change, and the measured intermediate-frequency filter waveform factor (60 dB/3 dB) is equal to 15 : 1. Utilize Formula (1) to calculate and obtain that the