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General Specification for Digital Terrestrial Television Receiver

地面数字电视接收机通用规范

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Table of Contents

Foreword

This Standard was drafted according to the rules specified in GB/T 1.1-2009.

This Standard was proposed by the Ministry of Industry and Information Technology of the People's Republic of China.

This Standard shall be under the jurisdiction of National Standardization Technical Committee on Audio, Video and Multimedia System & Equipment (SAC/TC 242).

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Introduction

"Framing Structure, Channel Coding and Modulation for Digital Television Terrestrial Broadcasting System" (GB 20600-2006) was issued on August 1, 2006 and has been implemented since August 1, 2007. In order to normalize the digital terrestrial television receiver products and market, this Standard is formulated.

The issuing organization of this Standard does not propose any perspective for the scope, effectiveness and proof data of the patents involved.

The patents' holders have already guaranteed to the issuing organization of this Standard that he would like to negotiate with any applicant about the application authorization license under the reasonable and non-discrimination provisions and conditions. In this respect, the statement of this patents' holders have already been submitted to the issuing organization of this Standard. The relevant information may be obtained from the following address:

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Please note that except the above-mentioned identified patents, some contents of this Standard may involve other patents; the issuing organization of this Standard does not undertake the responsibility of identifying these patents.

General Specification for Digital Terrestrial Television Receiver

1 Scope

This Standard specifies the functions and performance requirements, inspection rules, marking, packing, transport and storage of digital terrestrial television receiver which supports the receiving function of the digital terrestrial television in GB 20600-2006 (hereinafter referred to as receiver).

This Standard is applicable to digital terrestrial television receivers above 66 cm (26 inch) and serves as the main base for product design, production finalization and inspection. This Standard may be implemented by reference for receivers under 66 cm (26 inch).

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated normative references, only the dated edition applies. For undated references, the latest edition of the normative document (including all the amendments) referred to applies.

GB/T 191 Packaging-Pictorial Marking for Handling of Goods

GB/T 2828.1-2003 Sampling Procedures for Inspection by Attributes - Part 1: Sampling Schemes Indexed by Acceptance Quality Limit (AQL) for Lot-by-lot Inspection

GB/T 2829-2002 Sampling Procedures and Tables for Periodic Inspection by Attributes (Apply to Inspection of Stability for Productive Process)

GB/T 5465.2 Graphical Symbols for Use on Electrical Equipment - Part 2: Graphical Symbols

GB 8898 Audio, Video and Similar Electronic Apparatus - Safety Requirements

GB/T 9383 Sound and Television Broadcast Receivers and Associated Equipment-immunity Characteristics - Limits and Methods of Measurement

GB 13000-2010 Information Technology Universal Multiple Octet Coded Character Set (UCS) (ISO/IEC 10646:2003 IDT)

GB 13837 Sound and Television Broadcast Receivers and Associated Equipment - Radio Disturbance Characteristics-limits and Methods of Measurement

GB/T 14960-1994 Technical Requirements and Methods of Measurement of Infrared Remote Control Radiation Unit for Television Broadcast Receivers

GB 17625.1 Electromagnetic compatibility – Limits - Limits for Harmonic Current Emissions (Equipment Input Current≤16A per Phase)

GB/T 17975.1 Information Technology - Generic Coding of Moving Pictures and Associated Audio Information - Part 1: Systems (GB/T 17975.12000, ISO/IEC 13818-1:2007, MOD)

GB/T 17975.2-2000 Information Technology - Generic Coding of Moving Picture and Associated Audio Information - Part 2: Video (ITU-TH.262:1995, IDT)

GB/T 17975.3-2002 Information Technology - Generic Coding of Moving Picture and Associated Audio Information - Part 3: Audio (ISO/IEC 13818-3:1998, IDT)

GB/T 20090.2-2006 Information Technology - Advanced Coding of Audio and Video - Part 2: Video

GB 20600-2006 Framing Structure, Channel Coding and Modulation for Digital Television Terrestrial Broadcasting System

GB/T 22122-2008 Methods of Measurement of Surround Audio for Digital TV

GB/T 22726-2008 Specification for Multichannel Digital Audio Coding Technology

GB/T 26685-2011 Methods of Measurement for Digital Terrestrial Television Receiver

SJ/T 10514-1994 Technical Requirements and Methods of Measurement on Infrared Remote Control Unit for Television Broadcast Receivers

SJ/T 10919-1996 Packaging of Colour Broadcasting TV Receivers

SJ/T 11324-2006 Terminology of Digital Television Receiving Equipment

SJ/T 11325-2006 Reliability Test Methods for Digital Television Receiver and Display Equipment

SJ/T 11326-2006 Environmental Testing Methods for Digital Television Receiver and Display Equipment

SJ/T 11327-2006 Specification for Interfaces for Digital Television Receiving Equipment - Part 1: Interface of Radio Frequency

SJ/T 11329-2006 Specification of Interfaces for Digital Television Receiving Equipment - Part 3: Video Interface of Composite Video Blanking Synchronization

SJ/T 11330-2006 Specification of Interfaces for Digital Television Receiving Equipment - Part 4: Video Interface of S-Video

SJ/T 11331-2006 Specification of Interfaces for Digital Television Receiving Equipment - Part 5: Analog Audio Interface

SJ/T 11332-2006 Specification of Interfaces for Digital Television Receiving Equipment - Part 6: Analog Video Interface of RGB

SJ/T 11333-2006 Specification of Interfaces for Digital Television Receiving Equipment - Part 7: Interface of Video Component YPBPR

SJ/T 11336-2006 Interface Specification For Conditional Access of Digital Television Receiver - Part 1-1: DT-CI Technical Specification

SJ/T 11337-2006 Interface Specification for Conditional Access of Digital Television Receiver - Part 1-1: DTV-CI Test Specification

SJ/T 11376-2007 Interface Specification for Conditional Access of Digital Television Receiver - Part 2-1: UTI Technical Specification

SJ/T 11377-2007 Interface Specification for Conditional Access of Digital Television Receiver - Part 2-2: UTI Test Specification

GY/Z 175-2001 Specifications of Conditional Access System for Digital Television Broadcasting

GY/T 230-2008 Specification of Service Information for Digital Television Broadcasting

GY/T 231-2008 Specification of Electronic Programme Guide for Digital Television Broadcasting

ETSI ETR 154 Digital Video Broadcasting (DVB); Implementation guidelines for the use of MPEG-2 systems, video and audio in satellite and cable broadcasting applications

ETSI TS 102 366 V1.2.1 Digital Audio Compression (AC-3, Enhanced AC-3) Standard

3 Terms and Abbreviations

3.1 Terms

Terms and definitions established in SJ/T 11324-2006 AND the following ones are applicable to this document.

3.1.1

Acceptable error free [Translator: abbreviated as error-free**]**

The uncorrected error code event within the specified time less than certain threshold when receiving signal.

3.2 Abbreviations

AEF - Acceptable Error-free;

CA - Conditional Access;

CAT - Conditional Access Table;

C/N - Carrier-Noise ratio;

ECM - Entitlement Control Message;

EIT - Event Information Table;

EIT p/f - EIT present/following;

EMM - Entitlement Management Message;

EPG - Electronic Program Guide;

ES - Elementary Stream;

FS - Full Scale;

HDTV - High Definition Television;

ID - Identification;

LFE - Low Frequency Enhancement;

MPEG - Moving Picture Experts Group;

MP@HL - Main Profile at High Level;

MP@ML - Main Profile at Main Level;

NIT - Network Information Table;

PAT - Program Association Table;

PCM - Pulse Coded Modulation;

PCR - Program Clock Reference;

PEs - Packetized Elementary Stream;

PID - Packet Identifier;

PMT - Program Map Table;

PSI - Program Specific Information;

PTS - Presentation Time Stamp;

QAM - Quadrature Amplitude Modulation;

RF - Radio Frequency;

SDT - Service Description Table;

SDTV - Standard Definition Television;

SI - Services Information;

STC - System Time Clock;

TDT - Time and Date Table;

TOT - Time Offset Table;

UHF - Ultra High Frequency;

UTC - Universal Time Co-ordinated;

VHF - Very High Frequency;

Y/C - Luminance/Chrominance.

4 General Requirements

4.1 Normal Service Conditions

Ambient temperature: 5°C~35°C;

Relative humidity: 25%~80%;

Atmosphere pressure: 86kPa~106kPa;

Power supply: 220V (+10%, -20%), 50× (1± 2%) Hz.

searched, the receiver may empty the original channel list and prepare a new channel list according to the searched programs.

Searching progress indication shall be available during the search process.

The same program shall appear only once in the program list.

The treatment for the condition that different PIDs are broadcasted in turns is to be determined.

Note: In order to improve the searching speed during the automatic searching, it is suggested to inspect the frame header mode and carrier number first during the mode inspection and then obtain FEC rate, symbol interleaving option, symbol constellation mapping mode and other information in modulation parameters from the frame body system information, and then conduct demodulation at last.

5.2.4.4 Manual searching

The receiver shall provide manual searching function while supporting the automatic searching function. This function enables the user to search programs by manually input channel number or frequency. If the searched program has existed in the program list, it may suggest the user to replace the original one.

5.2.4.5 Change of modulation parameters

If the modulation parameters at the transmitting terminal changes (the transmitting frequency remains constant), the receiver shall be able to automatically detect the change of the modulation mode and automatically change to the new operating mode.

5.2.5 RF port

5.2.5.1 RF input port

The receiver shall possess at least one RF input port which meets the technical requirements of RF input interface in VHF/UHF frequency band of SJ/T 11327-2006. The impedance of coupler at the input end is 75Ω and the reflection loss shall be larger than 8dB.

If the RF input port of the receiver supplies direct current to the exterior antenna amplifier at the same time, this function shall not deteriorate other performances of the receiver significantly. The d.c. power supply circuit shall be provided with protection against short circuit. If the receiver has the function of d.c. power supply, an option shall be available in the menu to switch the function of d.c. power supply. In the first initialization and restore the factory setting, the d.c. switch shall be off.

5.2.5.2 RF loop output port

5.3.3 System time clock (STC) restore

The audio and video shall be set at silent status (the audio maintain mute and the video maintains static or blank screen. Namely the state of the receiver shall be switched steadily when the user changes channels.) in the capture process of STC. As for each service, the demultiplexer receives program clock reference (PCR) through extraction and transmits it to the phase locked loop to restore the source clock.

The receiver shall be able to restore STC with PCR and the shaking of PCR shall not be less than ± 500ns.

5.3.4 Error control

The receiver shall realize a king of appropriate error concealment or error recovery mechanism to handle the error of the receiving and transmitting packets.

5.3.5 PID filtering

The receiver shall be able to conduct demultiplexing for transport stream which contains at least 32 different PIDs and receive the data packet indicated by any PID.

5.3.6 Multi-component program treatment

5.3.6.1 Compatible view

Where one program in the program map table (PMT) carried several audio or video basic streams, the receiver may provide alternative and compatible views to the same kind of program. The receiver shall provide options to the viewer and have the ability to respectively decode several video or audio components.

Note: The view shall include video and audio.

5.3.6.2 Incompatible view

The receiver may process one king of optional incompatible view existing in the transport stream. The receiver shall process it as one absolute program or service instead of an optional view in same kind of program.

5.4 Transport Stream Decoding Requirements

5.4.1 Service and program information

The receiver shall be able to identify and process some vital SI and PSI information and correctly work. See GY/T 230-2008 for the specific requirements.

When the RF signal is too weak, the receiver shall provide warning information.

5.4.1.1 Basic requirements

The receiver shall be able to receive and process four kinds of event information table EIT:

EIT p/f actual: the event information table describes the current/subsequent events in the current transport stream, where, table_id=0x4E;

EIT p/f other: the event information table describes current/subsequent events in other transport streams, where, table_id=0x4F;

EIT schedule actual: the event information table describes the event time in current transport stream, where table_id=0x50~5F;

EIT schedule other: the event information table describes the event time in other transport streams, where, table_id=0x60~6F.

When the receiver is set at certain channel, it is not only able to receive and process the service event information in the current channel transport stream but also those in other transport stream provided in the network without changing the channel.

The receiver shall be able to identify and process the EIT descriptors as described in Table 16.

Table 16

Short_event_descriptor
Extended_event_descriptor
Component_descriptor
Content_descriptor

5.4.1.1.4 Time and date table

The receiver shall display the correct event time on basis of TDT and TOT; it may also adjust the display time by virtue of the offset transmitted by TDT and provided by TOT. The TDT contains UTC time but does not contain descriptor.

5.4.1.2 Establishing service list by using NIT and SDT

The receiver shall be able to establish service list through NIT and SDT.

The establishment of service list is based on the service_list_descriptor carried in NIT and the service_descriptor carried in SDT. The Service_ID carried in all transport streams of a specific network are provided in the setvice_list_descriptor but no service_name is provided, therefore, the receiver needs to search the corresponding service name in the seivice_descriptor carried in SDT. Due to only the service name carried in the current transport stream is available in the SDT_actual, the receiver shall search all services designated by SI in the specific network, it also must analyze the SDT_other in current transport stream to find out all services designated by the SI in the specific network.

Service list consists of the service items of the digital terrestrial television existing in the network; these service items have two sources:

a) Digital terrestrial television service of the present network indicated in the NIT service list;

b) Digital terrestrial television service existing in the network but not in the NIT service list.

As for a), receiver searches channels according to the frequency provided by NIT and combines information of the service_list_descriptor of NTT and the service_name_descriptor of SDT for the service meeting receiver signal acquisition condition, and put it into the service list.

As for b), the user shall search such terrestrial digital service through channels (NIT mode shall not be used) and add it into the service list.

The function requirements of service list are as follows:

- Service list shall cover the transmission digital service items existing in the network and meeting the requirements of GY/T 230-2008;

- Service list shall be able to classify digital service, for example, video service, audio service and data service;

- Service list shall cover digital service name and corresponding name of the network providing such service. Where only one network provides service, the name of the network may not be displayed;

- The service storage quantity of the service list shall not be less than 150.

5.7.4.2 Service list editing

Users shall be able to edit the service list, such as sequencing. If the network operator change the part of the service list, it is recommended that the receiver add new items at the end of the service list.

5.7.4.3 Service list updating

Receiver shall be able to follow the variation of service data in the network, i.e. when the network operator make adjustment on the broadcasting service, the service list shall be able to timely reflect such variation to update the service list. But such SI service variation updating is only for those digital service items designated by the NIT service list. In this case, the service list updating shall not affect the existence of those digital service items not designated by NIT in the service list.

Service list updating shall occur at least in the following situations:

Interference characteristic limit shall meet the relevant requirements of GB 13837; immunity limit shall meet the relevant requirements of GB/T 9383; harmonic current limit shall meet the relevant requirements of GB 17625.1.

5.10 Safety Requirements

The safety requirements of receiver shall meet the relevant requirements of GB 8898.

5.11 Reliability Requirements

The lower limit of average failure interval shall not be less than 15 000 h.

5.12 Environmental Test Requirements

Environmental test shall meet relevant requirements of SJ/T 11157-1998.

5.13 Unpacking Inspection Requirements

The content of unpacking inspection and nonconformity criteria shall meet the requirements of Appendix E.

5.14 Process Assembly Inspection Requirements

The content of process assembly inspection requirements and nonconformity criteria shall meet the requirements of Appendix F.

6 Inspection Method

6.1 Inspection Method of Graphic symbols for Equipment, Appearance and Structure, interface

Graphic symbols for equipment and interface shall be inspected by visual observation.

Appearance and structure shall be by visual observation or feeling by hands.

6.2 Radio Frequency Demodulation and Channel Decoding Measurement Method

See Table 30 for radio frequency demodulation and channel decoding measurement method.

Table 30

No.	Item	Measurement method
1	Frequency range	5.2.1 in GB/T 26685-2011
2	Frequency capture range	5.2.2 in GB/T 26685-2011
3	Operating mode	5.3.1 in GB/T 26685-2011

3	Ambient light interference	5.14 in SJ/T 10514-1994
4	External electrical equipment interference resistance	5.15 in SJ/T 10514-1994

6.8.2 Measurement method for remote emitter performance

The performance measurement of remote emitter used for receiver shall be carried out according to the relevant requirements of GB/T 14960-1994.

6.9 Measurement Method for Limit of Electromagnetic Compatibility Characteristic

The measurement of interference characteristic limit, immunity limit and harmonic current limit shall be respectively carried out according to the relevant requirements GB 13837, GB/T 9383 and GB 17625.1.

6.10 Safety Inspection Method

It shall be in accordance with the relevant requirements of GB 8898.

6.11 Reliability Test Method

It shall be in accordance with the relevant requirements of SJ/T 11325-2006; electric performance inspection before and after reliability test shall be carried out according to the relevant requirements GB/T 26685-2011.

6.12 Environmental Test Method

It shall be in accordance with the relevant requirements of SJ/T 11326-2006; electric performance inspection before and after environmental test shall be carried out according to the relevant requirements GB/T 26685-2011.

6.13 Unpacking Inspection Method

Use subjective method to inspect set by set under service conditions.

Image and sound quality shall be inspected using the corresponding signal generator as the signal source.

Electric strength and insulation resistance shall be inspected according to the method specified in 6.10.

6.14 Process Assembly Inspection

The sample passing unpacking inspection shall be inspected by using visual observation after the rear cover is opened.

7 Inspection Rules

7.1.3.2 Nonconforming product classification

Unit product with one or more nonconforming item (s) is referred to as nonconforming product. According to nonconformity types, the products are classified into safety nonconformity, Class A, B and C nonconformity.

7.1.3.3 Nonconformity criteria

a) Appearance and structure interface: in accordance with the requirements of E4 and E7 in Appendix E;

b) Normal temperature performance: in accordance with the requirements of Appendix H;

c) Remote emitter: in accordance with the requirements of E6 in Appendix E;

d) Safety: the products failing to meet the requirements of 5.10 are judged as safety nonconformity;

e) Limit of electromagnetic compatibility characteristic: in accordance with the requirements of 5.9;

f) Environmental test: in accordance with the requirements of Appendix G;

g) Reliability: in accordance with the requirements of 5.11 and 6.11.

7.1.4 Conformity and nonconformity judgment

7.1.4.1 Appearance and structure

According to those specified in E4 of Appendix E, the inspection result is judged as qualified if Class Z and A nonconforming products are not contained, Class B nonconformity products not more than 3, Class C nonconformity products not more than 4; otherwise, it is judged as unqualified.

7.1.4.2 Normal temperature performance

The inspection result is judged as qualified if both the following two articles are met; otherwise it is unqualified.

a) All the 3 sets of the Group I pass the test;

b) Nonconforming products are found in Group I, after the retest for Group II, the quantity of total Class A nonconforming products of two groups is not more than 1 and Class B nonconforming products is not more than 3.

7.1.4.3 Interface

In the test, Class A nonconforming product is not more than 1.

7.1.4.4 Environmental test

The inspection result is judged as qualified if the following two articles are met; otherwise it is unqualified.

a) All the 3 sets of the first group passed the test;

b) Nonconforming products are contained in Group I, after the retest for Group II, the quantity of total Class A nonconforming products of two groups is not more than 1, Class B nonconforming products is not more than 3 and Class C nonconforming products is not more than 4.

7.1.4.5 Limit of electromagnetic compatibility characteristic

The sample quantity is 3. They are judged as unqualified if one or more item (s) is (are) not met.

7.1.4.6 Inspection result processing

For the item resulting in nonconformity of qualification inspection, the reasons shall be found out timely, improvement measures be proposed and retest be carried out on that item and the related items until conformity is reached.

If the inspection items are qualified, then the qualification inspection is judged as qualified.

7.2 Acceptance Inspection

7.2.1 Inspection items

7.2.1.1 Unpacking inspection

Inspection content and method shall be in accordance with 5.13 and 6.13.

7.2.1.2 Process assembly inspection

Inspection content and method shall be in accordance with 5.14 and 6.14.

7.2.1.3 Main normal temperature performance inspection

a) Frequency range;

b) Minimum received signal level;

c) Reflection loss;

d) Carrier-noise ratio threshold;

e) Luminance;

f) Contrast;

g) Coverage ratio of color gamut;

h) Definition;

i) Audio output level;

j) Audio signal to noise ratio;

k) Receiving range of remote control;

l) Controlled angle.

7.2.2 Sampling scheme

Single sampling scheme is adopted according to GB/T 2828.1-2003 while double sampling scheme may be selected for unpacking inspection. See Table 41 for specific requirements.

Table 41

No.	Inspection item	Inspection level	Acceptance quality limit		
			Class A nonconforming product	Class B nonconforming product	Class C nonconforming product
1	Unpacking inspection	General inspection level 1	1.5	2.5	6.5
2	Process assembling inspection	Special inspection level S-I	4.0	4.0	6.5
3	Main normal temperature performance	Special inspection level S-I	4.0	—	—

7.2.3 Nonconformity classification and criteria

7.2.3.1 Classification of nonconformities and nonconforming products

In accordance with 7.1.3.1 and 7.1.3.2.

7.2.3.2 Nonconformity criteria

a) Unpacking inspection: in accordance with the requirements of Appendix E;

b) Process assembling inspection: in accordance with the requirements of Appendix F;

c) Main normal temperature performance inspection: any nonconformity will be judged as Class A nonconformity.

7.2.4 Judgment of acceptance inspection

The inspection batch is judged as qualified if all the items of its acceptance inspection are qualified according to the specified sampling scheme. Otherwise, it is judged as unqualified.

7.2.5 Inspection result processing

7.2.5.1 Qualified batch

Receiver shall accept the batch which is inspected as qualified.

7.2.5.2 Unqualified batch

Receiver shall reject the batch which is judged as unqualified owing to safety nonconformity. Deliverer shall rework that batch of products, inspect all of them and then submit them for batch inspection over again. The inspection shall be suspended if safety nonconformity still presents and recovered only if the deliverer takes effective measures

Receiver may reject the batch which is judged as unqualified owing to other nonconformities. Deliverer shall rework this batch of products and then resubmit for random inspection. If it is still rejected, then reworking shall be carried out again until it is qualified and accepted.

7.3 Routine Inspection

7.3.1 Inspection period

For the continuously produced products, the inspection period of each inspection item shall not be less than once a year and the specific period is detailed in product specification.

For the intermittently produced products with the interval time more than half a year, the routine inspection shall be carried out when production recovers.

Where the main design, process and raw material of the products are changed, the inspection of related items in Table 42 shall be carried out.

7.3.2 Inspection items

Routine inspection items are detailed in Table 42.

Table 42

No.	Inspection item	Requirement and test method
1	Interface	In accordance with 4.4 and 6.1
2	Normal temperature performance	In accordance with 5.2~5.8 and 6.2~6.8
3	Safety	In accordance with the relevant requirements of GB 8898
4	Limit of electromagnetic compatibility characteristic	In accordance with 5.9 and 6.9

The batch which passed the routine inspection.

7.3.7.2 Unqualified batch

Acceptance inspection shall be suspended on the products not passing the routine inspection; the produced products and delivered products are disposed according to the agreement of delivering and receiving parties.

Improvement measures shall be taken by the Deliverer immediately. After that, samples are retaken from new products to inspect the unqualified items and relevant inspection items. Normal production and inspection may be recovered only if the items are qualified

8 Marking, Packing, Transport and Storage

8.1 Marking

8.1.1 Marking for principal part

The principal part of the receiver shall be marked with manufacturer name, trademark, model and product number.

Principal part of the receiver shall be provided with marks of power supply property, rated voltage, supply frequency, power dissipation as well as caution to warn the user of electric shock, etc.

The principal part of receiver shall be marked with China Compulsory Certification (CCC).

8.1.2 Marking for packing container

The packing container shall be set with the following marks:

a) Product name, model, manufacturer name and address;

b) Brand name and registered pictorial trade mark;

c) Production date: year, month, day;

d) Package quality: kg;

e) Product standard number;

f) Maximum external dimension of package: l×b×h, cm;

g) Enclosure color mark;

h) The marks expressing "keep away from rain", "this way up", "fragile" and "stacking limit by number" shall be in accordance with those specified in GB/T 191.

8.2 Packing

Complying with SJ/T 10919-1996.

8.3 Transport

Well-packaged receivers may be transported via land, sea and air transportation vehicles. It shall be protected from snow and rain according to the requirements of package marking.

8.4 Storage

Well-packaged receivers shall be stored in warehouses where ambient temperature is within -25°C~+55°C, relative humidity is not more than 93%, and there is no harmful objects such as acid, alkali and other corrosive gases as well as pollutants. The storage period is 1 a. The products, which have passed the period 1 a, shall be unpacked for inspection. It may enter into circulation only after re-inspection is judged as qualified.

Appendix A

(Normative)

Acceptable Error-free

Acceptable error-free refers to: Within the specified test time, when observing the vide image on display screen that is outputted from the video decoding, there is no observable error on the video.

For the performance test, the subjective measurement period is 60s.

For the function test, the subjective measurement period is 15s.

Appendix B

(Informative)

Multipath Channel Model

B.1 Rayleigh Channel Model

Rayleigh channel model (static) is shown in Table B.1.

Table B.1

Path	Amplitude /dB	Time delay /μs	Phase /(°)
Echo 1	−7.8	0.518650	336.0
Echo 2	−24.8	1.003019	278.2
Echo 3	−15.0	5.422091	195.9
Echo 4	−10.4	2.751772	127.0
Echo 5	−11.7	0.602895	215.3
Echo 6	−24.2	1.016585	311.1
Echo 7	−16.5	0.143556	226.4
Echo 8	−25.8	0.153832	62.7
Echo 9	−14.7	3.324886	330.9
Echo 10	−7.9	1.935570	8.8
Echo 11	−10.6	0.429948	339.7
Echo 12	−9.1	3.228872	174.9
Echo 13	−11.6	0.848831	36.0
Echo 14	−12.9	0.073883	122.0
Echo 15	−15.3	0.203952	63.0
Echo 16	−16.5	0.194207	198.4
Echo 17	−12.4	0, 924450	210.0
Echo 18	−18.7	1.381320	162.4
Echo 19	−13.1	0.640512	191.0
Echo 20	−11.7	1.368671	22.6

B.2 Rice Channel Model

Rice channel model (static) is shown in Table B.2.

Table B.2

Path	Amplitude /dB	Time delay /μs	Phase /(°)
Main path	0	0	0
Echo 1	−19.2	0.518650	336.0
Echo 2	−36.2	1.003019	278.2
Echo 3	−26.1	5.422091	195.9

Appendix C

(Informative)

Conditional Access Interface

C.1 Application of conditional access general interface

General interface for conditional access is used for the user to control channel receiving.

Technical requirements of general interface for conditional access are given in SJ/T 11336-2006 or SJ/T 11376-2007.

C.2 Application of smart card reader

Smart card hardware with built-in CA software module may be used for conditional access and other purposes, and only the former is considered in this chapter.

The receiver shall be provided with at least one smart card reader, interface and descrambling hardware / software module, as well as filtering and program interfaces of ECM/EMM (Entitlement Control Message/Entitlement Management Message) data stream which is used for conditional access

C.3 Interface of software application layer for conditional access

Smart card interface of software application layer for conditional access is specialized for CA system dealer. Definition of application layer interface is restricted to the information obtained from the relevant CA system dealer. It may be possible to provide support for the additional conditional access application interface through software upgrading of receiver.

C.4 ECM and EMM filtering

Receiver shall realize acquisition of ECM and EMM and shall be in compliance with the specifications of conditional access for digital television broadcasting (GY/Z 175-2001).

Receiver shall be capable of obtaining at least two ECM data streams simultaneously and filter the ECMs based on PID, TID and toggle bit.

Receiver shall be capable of obtaining EMMs from at least one EMM data stream (one PID). And shall filter the EMMs based on PID, TID and section address field. Section address field is the part specialized for CA system and described as smart card application interface.

Appendix D

(Informative)

Function of Remote Emitter

Remote emitter of receiver shall cover the following functions.

D.1 Numeric key

Remote emitter of receiver shall cover ten numeric keys with numbers 0 ~ 9.

D.2 Basic TV function

Remote emitter of receiver shall cover the following keys of basic TV functions (these keys shall always retain the original functions, namely, they are not recommended to be configured to any data application for other purposes):

a) Power on / off - energize/disconnect the receiver;

b) Program forward / backward - switching between programs;

c) Volume up / down - adjusting volume output level;

d) TV - making the receiver directly enters into common TV status, namely, only audio, video and subtitle present.

D.3 Digital TV function

Remote emitter of receiver shall be provided with the following keys of digital TV functions:

a) Menu: entering into Chinese operation interface;

b) Confirmation (OK) - selecting or confirming the currently selected function;

c) Electronic program guide (EPG) - entering into EPG operation interface;

d) Return - exiting from the current menu or "page" and returning to the former status.

Appendix E

(Normative)

Unpacking Inspection Content and Nonconformity Criteria

E.1 Unpacking inspection content and nonconformity criteria

Unpacking inspection content and nonconformity criteria are detailed in Table E.1.

Table E.1

No.	Inspection contents	Unqualified class
E1	Marks	
E1.1	Packing container mark	
E1.1.1	Product name, model and manufacturer name; one of which is lacking or wrong.	A
E1.1.2	Brand name or pictorial trade is lacking or wrong.	A
E1.1.3	Adopted product standard number is lacking, wrong, or illegible.	A
E1.1.4	One of the storage marks (keep away from rain, this way up, fragile and stacking limit by number, maximum external dimension of packing container and enclosure color) is lacking or wrong.	
E1.1.4.1	- possible to result in damage of products	B
E1.1.4.2	- impossible to result in damage of products	C
E1.1.5	Production date is lacking or wrong.	B
E1.1.6	Production address is lacking or wrong.	B
E1.1.7	The above marks may be recognized though unclear.	C
E1.2	Product marks	
E1.2.1	Without mark of China Compulsory Certification (CCC) or one of the corresponding factory codes of the products is lacking or wrong.	A
E1.2.2	Production number is lacking or wrong	A
E1.2.3	Product trademark, model, name and manufacturer name; one of which is lacking or wrong.	A
E1.2.4	Mark of warning the user of safe usage is lacking or wrong.	A
E1.2.5	The marks mentioned above are recognizable though not firmly fixed or unclear.	C
E1.2.6	Functional symbols are not normatively marked.	C
E2	Packing container	
E2.1	Packing container is damaged, wetted, or its adhesive tape or nailing is of poor quality; either of the above conditions	
E2.1.1	- may result in damage of products.	B
E2.1.2	- will not result in damage of products.	C
E2.2	Undesired scribbling on packing container	C

Appendix F

(Normative)

Process Assembly Inspection Content and Nonconformity Criteria

F.1 Process assembly inspection content and nonconformity criteria

Process assembly inspection content and nonconformity criteria are detailed in Table F.1.

Table F.1

No.	Inspection contents	Unqualified class
F1	Assembly process	
F1.1	Loose assembly or absent fastening screw	B
F2	Supporting structures are absent but do not influence normal operation.	C
F3	Panel and mask are loose or fastening piece absent.	B
F4	Bottom plate is loose or lacks fastening piece; fitting gap is wide.	B
F5	Power transformer is loose and lacks fastening piece.	A
F6	Printed wiring board	
F6.1	Fracture	A
F6.2	Insecure installation	B
F7	Foreign bodies	
F7.1	Metallic foreign bodies exist in the equipment.	A
F7.2	Non-metallic foreign bodies exist in the equipment.	B
F8	Conducting wire and sleeve	
F8.1	Binding wires do not meet the requirements of process and assembly is not fixed.	B
F8.2	Necessary sleeves are absent.	C
F9	False welding or welding not in conformity with process requirements	A
F10	Surface treatment	
F10.1	Movement structural members are seriously rusted.	B
F10.2	Movement structural members are not seriously rusted.	C

Appendix G

(Normative)

Environmental Test Content and Nonconformity Criteria

G.1 Environmental test content and nonconformity criteria

Environmental test content and nonconformity criteria are detailed in Table G.1.

Table G.1

No.	Inspection contents	Unqualified class
G1	Appearance	
G1.1	Enclosure is severely sunk, distorted and up-warped; screen surface has obvious scratch.	A
G1.2	Exterior paint layer cracks: ≥100 mm	B
G1.3	Shedding area of exterior paint layer (size on any direction): ≥100 mm^2.	B
G1.4	Enclosure deforms slightly; a small part of exterior paint layer is obviously discolored.	C
G1.5	Finishing components and plates are obviously discolored, deformed, cracked, loosened or fallen; marks on the plate are blurred and illegible.	B
G2	Surface treatment	
G2.1	Metal treatment surface of structural member is severely rusted.	B
G2.2	Metal treatment surface of structural member is slightly rusted.	C
G3	Structural members, components	
G3.1	Printed plate has fallen off and fractured.	A
G3.2	Fallen power transformer.	A
G3.3	Function control piece fails.	A
G3.4	Component containing liquid leaks / overflows.	A
G3.5	Potting substance in components overflows.	A
G3.6	Fuse cover / box, shielding box cover, rotary / push button sheds.	B
G3.7	Fastening piece, structural members have shed or fractured.	A
G3.8	Metal shedding in the equipment (size on any direction): ≥3mm.	A
G3.9	Metal shedding in the equipment (size on any direction): <3mm.	B
G3.10	Conducting wire in the equipment has fractured, sealed off or the components' legs are broken.	A
G3.11	Transformer is seriously immersed and peeled off.	B
G3.12	Demountable pieces, such as connector, have fallen off.	B
G3.13	Pins of small-scale components which do not affect video and audio are sealed off and fallen.	B
G4	Remote performance and remote emitter	Same as E6 of Appendix E and H8

H5.1	Audio output level	A
H5.2	Audio amplitude-frequency response	A
H5.3	Audio signal to noise ratio	A
H5.4	Audio frequency ratio response range	A
H5.5	Audio decoding	A
H5.6	Others	B
H6	Adaptability of the power supply	
H6.1	Supply voltage change	A
H6.2	Consumed power of complete machine	A
H6.3	Standby consumed power	A
H6.4	Others	B
H7	Others	
H7.1	Chinese graphic operation interface	A
H7.2	Service list	A
H7.3	Program searching and tuning	A
H7.4	Status bar	A
H7.5	User parameter setting and storage	A
H7.6	Others	B
H8	Remote performance	
H8.1	Receiving distance of remote control	A
H8.2	Remote controlling angle	A
H8.3	Others	B

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