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DRAFT IN WIDE CIRCULATION	DOCUMENT DESPATCH ADVICE	
	Ref	Date
Technical Committee : LITD 07	LITD 07/T-155	15-03-2013

ADDRESSED TO:

1. All members of Audio, Video and Multimedia Systems & Equipments Sectional Committee, LITD 07
2. All Principal Members of Electronics and Information Technology Department, LITDC
3. All others interested

Dear Sir(s),

Please find enclosed the following document:

DOC NO.: LITD 07(3247)
TITLE :Set Top Box for Digital Terrestrial HDTV/SDTV reception- Specifications

Kindly examine this draft standard and forward your views stating any difficulties which you are likely to experience in your business or profession, if this is finally adopted as National Standard.

Last date for comments: 15-04-2013

Comments if any, may please be made in the format indicated and mailed to the undersigned at the above address.

Thanking you,

Yours faithfully,

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Encl: As above

व्यपाक परिचालन मसौदा

तकनीकी समिति : एलआईटीडी 07

प्रलेख प्रेक्षण संज्ञापन	
संदर्भ	दिनांक
एलआईटीडी 07/टी-155	15-03-2013

पाने वाले का नामः

1) ऑडियो वीडिय़ो और मल्टीमिडिया तंत्र एवं उपस्कर विषय समिति, एल आई टी डी 07

2) इलैक्ट्रॉनिकी एवं सूचना प्रौद्यौगिकी विभाग परिषद के प्रधान सदस्य

3) रुचि रखने वाले अन्य

महोदय(यों)

निम्नलिखित प्रलेख संलग्न हैः

प्रलेख संख्या : एलआईटीडी 07(3247)

शीर्षकः   एमपेग-4 डिजिटल केबल टी वी सेवाओं के लिए डिजिटल सैट टॉप बॉक्स - विशिष्टि

कृपया इस मसौदे का अवलोकन करें और अपनी सम्मतियाँ, यह बताते हुए कि यदि यह भारतीय मानक प्रकाशित हों तो अमल करने में आप के व्यवसाय में क्या कठिनाईयाँ आ सकती हैं, भेजें 1

सम्मतियाँ भेजने की अंतिम तिथि 15**-04-2013**

यदि कोई सम्मतियाँ हो तो कृपया अधोहस्ताक्षरी को उपरिलिखित पते पर संलग्न फोर्मेट में भेज दें …

धन्यवाद

भवदीय

- Sd/-

(पी राधाकृष्णा)

संलग्नक : उपरोक्त

वै. एफ एवं निदेशक (इलैक्ट्रॉनिकी व आई टी)

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FORMAT FOR SENDING COMMENTS ON BIS DOCUMENTS

[Comments on each clause/subclause be stated on a fresh box. Information in column 3 should include reasons for the comments and suggestions for modified wording of the clause when the existing text is found not acceptable. Adherence to this format facilitates Secretariat's work.]

NAME OF THE COMMENTATOR/ORGANIZATION _____

DOC NUMBER_____

TITLE_____

CLAUSE SUBCLAUSE PARA NO. COMMENTED	COMMENTATOR ORGN. (ABBREVIATION)	COMMENTS	DECISIONS
(1)	(2)	(3)	(4)'
		(BOX)	
		(BOX)	
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BUREAU OF INDIAN STANDARDS
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Draft *Indian Standard*

DIGITAL SET TOP BOX FOR MPEG-4 DIGITAL CABLE TV SERVICES – SPECIFICATIONS

Last date of receipt of comments is 15**-04-2013**

Audio, Video and Multimedia Systems and Equipments Sectional Committee LITD 07

 FOREWORD
(Formal clauses will be added later)

Cross References

The concerned Technical Committee responsible for the preparation of this standard has reviewed the provisions of the following International Standard and has decided they are acceptable for use in conjunction with this standard.

1.EN 300 429 V1.2.1 "Framing structure channel coding and modulation for cable systems (DVB-C) "
2.EN 302 769 V1.2.1 "Framing structure channel coding and modulation for a second generation digital transmission system for cable systems (DVB-C2) "

 3. TS 102 991 V1.2.1 "DVB C2 Implemetation Guidelines"**.**

4. ISO/IEC 13818 -1 "Information technology - Generic coding of moving pictures and associated audio information" Part 1: Systems (MPEG 2)

5. ISO/ IEC 13818-2:2000 'Information technology - Generic coding of moving pictures and associated audio information Part 2 Video Coding'

6. ISO/IEC 14496-3:2005 'Information technology - Coding of audio-visual objects : Part 3 Audio'

7. ISO/IEC 14496-10:2008 Information technology - Coding of audio -visual objects : Part 10 Advanced Video Coding' (MPEG-4 Part 10 AVC)

8..ISO/ IEC 11172-3:1993 'Information technology - Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s : Part 3 Audio': MPEG-1 Audio Layer II .

9. ISO / IEC 7816 (all Parts) Specifications for smart cards.

10.ETSI TS 101 154 V1.10.1 "Digital Video Broadcasting (DVB); Specification for the use of Video and Audio Coding in Broadcasting Applications based on the MPEG-2 Transport Stream."

11. ETSI EN 301 192 V1.4.2 "Digital Video Broadcasting (DVB); DVB specification for data broadcasting".

12. TR 101 202 V1.2.1" Specification for data broadcasting: Guidelines for the use of EN 301 192".

13. EN 50221 V1 "Common Interface Specification for Conditional Access and other Digital Video Broadcasting Decoder Applications"
&ETR 289 V1 "Support for use of scrambling and Conditional Access (CA) within digital broadcasting systems"

14. TS 101 699 V1.1.1 Extensions to the Common Interface Specification

15. TS 102 006 V1.3.2 Specification for System Software Update in DVB Systems

16 ETSI EN 300 468 V1.12.1 Specifications for Service Information (SI) in DVB systems

17. TS 101 211 V1.10.1 Guidelines on implementation and usage of Service Information (SI) in DVB systems.

18. ETSI EN 300 743 V1.3.1 Subtitling Systems

19. TS 101 197 V1.2.1 DVB SimulCrypt Part -1 Head end –Architecture/Synchronisation

20.TS 103 197 V1.5.1 Head-end Implementaion : DVB SimulCrypt

21. ETSI TS 102 366 v.1.2.1 Digital Audio Compression (AC-3, Enhanced AC-3) Standard

Draft *Indian Standard*

DIGITAL SET TOP BOX FOR MPEG-4 DIGITAL CABLE TV SERVICES – SPECIFICATIONS

1   SCOPE

This Standard specifies the requirements for a Digital Set Top Box (STB) to be used by subscribers to receive multichannel television programmes which are compressed using the MPEG-4 standard and channel coded and modulated using the DVB-C standard and delivered over a coaxial cable network to subscriber homes.

2   REFERENCES

The Standards listed in Annex A contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreement based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A.

3   REQUIREMENTS

3.1   General requirements

3.1.1   The STB shall be based on an open architecture (non proprietary) and shall ensure technical compatibility and effective interoperability amongst different Digital Cable TV service providers in the country. The interoperability shall be achieved by using a common interface conforming to EN 50221 "Common interface specification for conditional access and other digital video broadcast decoder applications" including "TS 101699 Extensions" to DVB-CI specification. and via software download where the software download mechanism shall be transparent, interoperable and available in the public domain complying with ETSI TS 102006.

3.1.2 The manufacturer shall ensure compatibility/interfacing with consumer electronic equipments such as televisions, audio and video systems and VCRs etc in the country.

3.1.3 Specifications

Clause	Specification	Mandatory	Optional
3.1.3.0	Demodulation and Forward Error Correction (FEC) Decoding	Capability to demodulate and decode digital signals channel coded and modulated in accordance with the DVB-C standard (Ref 1)	Capability to demodulate and decode signals channel coded and modulated in accordance with the DVB-C2 standard (Ref 2,3)
3.1.3.1	Decompression /Decoding -Video	The STB should be capable of decompressing and decoding **SDTV** video signals which are compressed and coded in accordance with: 1) ISO/IEC14496-10:2008 'Information technology - Coding of audio -visual objects : Part 10 Advanced VideoCoding': MainProfile @level 3 (Ref 7)	The STB should be capable of decompressing and decoding **HDTV** video signals compressed and coded in accordance with: 1) ISO/IEC14496-10:2008 'Information technology - Coding of audio -visual objects : Part 10 Advanced VideoCoding': HighProfile @L4 (Ref 7) 2) It should be capable of decoding both 1080i and 720p HDTV formats
3.1.3.2	Decompression /Decoding -Audio	Capability to decompress/decode Audio compressed in accordance to ISO/ IEC 11172-3:1993 'Information technology - Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s : Part 3 Audio': MPEG-1 Audio Layer II .(Ref 8)	Capability to **a) decompress, decode** according to metadata and down-mix to Stereo for Multichannel audio, all of the following formats: **1**.MPEG-1 Layer 2 **2**. E-AC-3 (Ref 21) **3**. AC-3 (Ref 21) **4**. MPEG-4 HE AAC stereo. **b) Pass through** all of the following multi-channel formats. **1**. E-AC-3. (Ref 21) **2**. AC-3. (Ref 21) **3**. MPEG-4 HE AAC 5.1 4. MPEG2 5.1 5. DTS (Digital Theatre Sound) **c) transcode** all of the following input formats to AC-3: 1) E-AC-3 (Ref 21) 2) MPEG-4 HE AAC
3.1.3.3	Data Services	Capability to receive and process Data streams compliant to EN 301192 and TR 101202 (Ref 11,12)	
3.1.3.4	Subtitle streams	Capability to receive and process Subtitle streams compliant to EN 300 743 (Ref 18)	
Clause	**Specification**	**Mandatory**	**Optional**

3.1.3.5	Service Demulti--plexing	Capability to receive and process SI (Service Information) as laid down in EN 300 468 & TR 101211 (Ref 16, 17)	
3.1.3.7	Conditional Access / Scrambling	1)Capability to descramble services scrambled in accordance with DVB-CSA (ETR 289) including decryption of signals which have been SimulCrypt in accordance with ETSI TS 103 197.V1.5.1(Ref 19,20) 2) STB may have provision for smart card operation. If smart card is provided it shall be in accordance with IS 14202 (Parts1,2&3)	
3.1.3.8	Upstream Communi--cation		'Bidirectional interactive services may be deployed through the return channel"
3.1.3.9	Interfaces/ Connectors	1. RF Input - 75 ohms impedance, Female connector (as per IEC 60169 -24) 2. Composite Video – RCA type (Yellow) 3Output Audio RCA type Stereo/mono RCA type (L- White, R-Red) 3. DVB-CI (Common Interface) as per EN 50221 & TS 101699 (Ref 13,14)	1. HDMI, As specified in TS 102201 2. USB 2.0 Ports 3. RJ 11 (for PSTN modem) 4. RJ45 for Ethernet connection 5. Digital Audio SPDIF 5.1 Optical 5.2 Coaxial
3.1.3..10	Software updation mechanism	As per TS 102 006 (Ref 15)	RS 232C port for uploading control software and additional service.
3.1.3.11	PVR Functionality		The PVR functionality: This may be provided as an option enabling the recording of live A/V programs to the STB hard drive/USB Storage media and the ability to play back video with VCR like controls.

3.2 Performance Requirements

The requirements for various performance parameters for the STB shall be as given in Table 1.

3.3 Safety Requirements

The safety requirements of Receiver shall conform to IS 13252.

3.4 Electromagnetic Compatibility (EMC) Requirements

The EMC requirements of the STB shall conform to IS 6873(Part3).

4. MARKING

4.1　Each STB shall be legibly and indelibly marked with at least the following information:

a) Manufacturer's name or trade mark(if any);
b) Model designation and Serial No.;
c) Country of manufacture;
d) Input supply voltage and frequency;
e) Power consumption ;
f) Cable input terminal and Cable output terminal; and
g) All Connectors

4.2　BIS Certification Marking
The STB may also be marked with the Standard Mark.

4.2.1　The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulation made there under. Details of conditions under which a license for the use of Standard Mark may be granted to manufacturers and producers may be obtained from the Bureau of Indian Standards.

5 ENVIRONMENTAL TESTS

5.1 Bump Test
The STB shall be subjected to bump test carried out in accordance with IS 9000(Part 7/Sec 2), the number of bumps being 500+10 and acceleration being 400m/s2. After this test the Receiver shall conform to the performance requirements specified in 5.6. This test shall be carried out under packed condition.

5.2 Drop Test
The STB shall withstand drop test as given in IS 13252. After this test the STB shall conform to the performance requirements specified in 5.6.

5.3 Dry Heat Test
The STB shall be subjected to dry heat test of severity + 55oC for 16 hours, carried out in accordance with IS 9000 (Part 3/Sec 5). After recovery, the STB shall conform to the performance requirements specified in 5.6. The duration of the recovery shall be 2 hours.

5.4 Damp Heat Test
The STB shall be subjected to damp heat cyclic test in accordance with IS 9000 (Part 5/Sec 1). After recovery the STB shall conform to the performance requirements specified in 5.6. The duration of the recovery shall be 24 hours.

5.5 Cold test

The STB shall withstand, a cold test of severity – 10oC for 2 hours carried out in accordance with IS 9000(Part 2/Sec 4). After recovery, the Receiver shall conform to the performance requirements specified in 5.6. The duration of the recovery shall be 2 hours.

5.6 Post measurement after each environmental test

After each environmental test (5.1 to 5.5), the STB shall meet the safety requirements of 3.3 and the requirements specified in Table 1 for the following parameters:

a) RF output level [S1 No. 4.of Table 1],   (Optional)
b) Carrier to noise ratio [S1 No.4 of Table 1],   (Optional)
c) Reception of service
d) For STBs where the RF output option is not available, tests in items a & b above should be replaced by the testing of the "video output for compliance to the International standard ITU-R BT 470-7 'Conventional analogue television systems'

6. OPERATING LIFE TEST

The STB shall be subjected to operating life test consisting of 5 hours operation and one hour rest period for a total operating period of 1000 hours at rated voltage and at ambient temperature. At the end of the operating life duration, the requirements specified in 3.3 and Table 1 shall be met with.

Table -1 Performance Requirements
(Clauses 3.2, 5.6 and 6)

Sl.No.	Specifications / Parameters	Mandatory Values	Optional
1.	Electrical specifications a) Input voltage range b) Frequency	a) 90-270 V AC b) 50 Hz ±2%	
2	RF characteristics to be supported by the Receiver a) System. b) Modulation c) RF Carrier Signal Level d) Carrier level difference between distributed TV channels(47- 862 MHz range) e) Amplitude respose within a TV channel	As per DVB-C standard 32QAM,64QAM,128QAM,256QAM 47 dBμV Min for 64 QAM 67 dBμV Max for 64 QAM Ref 4.10.3 of IS 13420(part 1) 3dB max for 64 QAM for adjacent channel 13dB max for 64 QAM for adjacent channel to AM VSB channel Variation (pp): 8dB Max Slope of variation :1.5 dB/MHz Max	As per DVB-C2 standard

	f)Lowest Carrier to Interference Ratio g)Cross Modulation h)Dig Video RF characteristics h) C/N ratio	Ref 4.2 of IS 13420(part 1) 35 dB Min for 64 QAM >46 + 10 lg (N - 1) N=No of chanls Constellations of 16QAM,64 QAM And 256 QAM are desirable.Other constellations (32QAM and 128 QAM) may also be used .The constellation used shall be automatically detected. 31 dB Min for 64 QAM	
3	Channel tuner performance characteristics a) RF Input level b) Input frequency range c) RF input channel bandwidth d) RF input impedance e) RF input return loss f) Frequency assignment download	a) Same as mentioned in 2 above b) 47 to 862 MHz c) 7 MHz for VHF and 8Mhz for UHF d) 75 Ohms. 6 dB, Min. Ref 4.1.1 of IS 14231(Part 3) Optional	As per DVB-C2 depending upon selected operation mode
4	RF Remodulator:		a)Modulation Format: PAL B/G (VHF/UHF b)RF output channel VHF channel 3/4; Agile UHF c)RF output level : 60 dBμV Min : 80 dBμV Max d)C/N :44 dBμV Min Ref: 4.7 & 4.5 of IS 13420 (Part 1)
5	Remote control	Mandatory	
6	Operating ambient temperature range	5°C to 50°C	
7	Operating humidity range	5% to 95% (non-condensing)	
8	Finger printing	Mandatory: but service provider free to choose mechanism	

Annex A

(Clause 2.1)

LIST OF REFFERED INDIAN STANDARDS

IS NO.	Title
6873(Part 3):1999	Limits and methods of measurement of radio disturbance characteristics: Part 3 Sound and television broadcast receivers and associated equipment (first revision)
9000(Part 2/Sec 4):1977	Basic environmental testing procedures for electronic and electrical items: Part 2 Cold test, Section 4 Cold test for heat dissipating items with gradual change of temperature
9000 (Part 3/Sec 5): 1977	Basic environmental testing procedures for electronic and electrical items: Part 3 Dry heat test, Section 5 Dry heat test for heat dissipating items with gradual change of temperature
9000 (Part 5/Sec 1): 1981	Basic environmental testing procedures for electronic and electrical items: Part 5 Damp heat cyclic test, Section 1 16 + 8 h cycle
9000(Part 7/Sec 2):1979	Basic environmental testing procedures for electronic and electrical items: Part 7 Impact test, Section 2 Bump
13252:1992 electrical business	Safety of information technology equipment including equipment
13420 (Part 1):2002 and system	Cabled distribution systems: Part 1 Methods of measurement performance
14202 (Part 1) :2003 Part 1	Identification cards - Integrated circuit(s) - Cards with contacts: Physical characteristics(First revision)
14202 (Part 2) :2003	Identification cards - Integrated circuit(s) - Cards with contacts: Part 2 Dimensions and location of the contacts (First revision)
14202 (Part 3): 2002	Identification cards - Integrated circuit(s) cards with contacts – Part 3 :Electronic signals and transmission protocols
14231	Cabled distribution system for television and sound signals – Specs
(Part 3):1995	Active coaxial wideband distribution components
(part 8) :2002	System performance of return path.