

HKTA 1104
ISSUE 6
December 2011

PERFORMANCE REQUIREMENTS
FOR
IN-BUILDING COAXIAL CABLE DISTRIBUTION SYSTEM
(IBCCDS)



TELECOMMUNICATIONS AUTHORITY
HONG KONG

FOREWORD

1. This specification sets out the performance requirements for the In-Building Coaxial Cable Distribution System (IBCCDS) which refers to the coaxial cable systems in buildings for the distribution and relaying of signals for telecommunications, broadcasting and security services. The IBCCDS may include Communal Aerial Broadcast Distribution (CABD) Systems, Satellite Master Antenna Television (SMATV) Systems, Closed Circuit Television (CCTV) Systems, Cable Television (CTV) Systems or any combination of these systems.
2. The Telecommunications Authority (TA) issued the TA Statement on 15 July 1999 on the Frequency Layout Plan of In-Building Coaxial Cable Distribution Systems. The TA Statement specifies a number of technical requirements of IBCCDS. The Statement may be downloaded in the web site of the Office of the Telecommunications Authority (OFTA) at <http://www.ofta.gov.hk>.
3. The technical requirements prescribed in this specification are applicable to the IBCCDS installed in Hong Kong for distributing and relaying broadcasting and telecommunications signals. For the IBCCDS which are required to be upgraded in accordance with the TA Statement, they should comply with all the relevant requirements set out in this specification.
4. The TA reserves the right to revise the contents of this specification without prior notice. Amendments or re-issues of this specification may not be distributed automatically to the parties concerned and it will be the responsibility of the parties concerned to ensure that their systems/equipment conform to the latest requirements.
5. In case of any doubt about the interpretation of this specification and the methods of carrying out the tests, the decision of the TA shall be final.
6. The HKTA series specifications are issued by the TA. The documents can be downloaded direct through OFTA's Internet Home Page at <http://www.ofta.gov.hk>.
7. The publications from the European Committee for Electrotechnical Standardisation (CENELEC) can be obtained from

European Committee for Electrotechnical Standardization
17, Avenue Marnix
B-1000 Brussels
Belgium
Tel: +32 2 519 68 71
Fax: +32 2 519 69 19

8. The publications from the Electronic Industries Alliance / Telecommunications Industry Association (EIA/TIA) can be obtained from

Telecommunications Industry Association
2500 Wilson Boulevard, Suite 300
Arlington, VA 22201
USA
Tel: +1 703 907 7700
Fax: +1 703 907 7727

9. The publications from the International Electrotechnical Commission (IEC) can be obtained from

International Electrotechnical Commission (IEC)
3, rue de Varembe
P.O. Box 131
CH-1211 Geneva 20
Switzerland
Tel: +41 22 919 02 11
Fax: +41 22 919 03 00

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1. GENERAL

- 1.1 The In-Building Coaxial Cable Distribution System (IBCCDS) refers to the coaxial cable systems installed inside buildings for distributing and relaying signals for telecommunications, broadcasting and security services to a number of users. The IBCCDS may include Communal Aerial Broadcast Distribution (CABD) System, Satellite Master Antenna Television (SMATV) System, Closed Circuit Television (CCTV) System, Cable Television (CTV) System or any combination of these systems.
- 1.2 The provisions of the latest edition of **IEC 60728-1** “Cable networks for television signals, sound signals and interactive services - Part 1: System performance of forward paths” published by the International Electrotechnical Commission (IEC) will apply for those measurement methods not specifically given in this document.

2. CHANNEL PLAN AND FREQUENCY ALLOCATION

2.1 Channel Plan

- 2.1.1 The following frequency bands within the IBCCDS shall be allocated for distributing or relaying television and telecommunication services:-
- (a) 5 MHz to 50 MHz for upstream signals;
 - (b) 50 MHz to 53.275 MHz as the guard band to separate the upstream and downstream signals; and
 - (c) 53.275 MHz to 862 MHz for downstream signals.
- 2.1.2 The frequency band intended for downstream signals shall be segmented primarily into 8 MHz channels.
- 2.1.3 The IBCCDS shall at all times be operated and maintained in such a manner that signals in the IBCCDS do not interfere with each other.

2.2 Frequency Allocation

- 2.2.1 The frequency channels within the IBCCDS shall be allocated in accordance with the plans given in the latest edition of HKTA 1105. The plans will be updated and published by the TA from time to time to reflect the latest changes to the frequency allocation in the IBCCDS.
- 2.2.2 Some of the vacant frequency bands in 54 - 470 MHz with bandwidths less than 8 MHz will be allocated to downstream signals for digital telecommunication and broadcasting services.

3. PERFORMANCE REQUIREMENTS FOR DISTRIBUTING ANALOGUE TELEVISION AND SOUND SIGNALS IN THE IBCCDS

- 3.1 For distributing Phase Alternation Line (PAL) television and sound signals [including FM radio and Digital Audio Broadcasting (DAB) signals], the IBCCDS shall meet all the relevant technical requirements stipulated in the latest edition of: -

IEC 60728-1, “Cable networks for television signals, sound signals and interactive services - Part 1: System performance of forward paths”, published by the IEC.

3.2 For distributing National Television Systems Committee (NTSC) television and sound signals, the signals and the IBCCDS shall meet the following requirements:-

- (a) all the relevant technical requirements stipulated in the latest edition of **EIA/TIA-250-C**, “Electrical Performance for Television Transmission Systems”, published by the Electronic Industries Alliance / Telecommunications Industry Association (EIA/TIA); and
- (b) the signals shall be carried within an 8 MHz channel as shown in the latest edition of HKTA 1105 and shall have the vision carriers be positioned in agreement with HKTA 1105.

3.3 For the distribution of other analogue television signals, it shall meet the relevant technical performance standards and it shall not affect or cause interference to other signals and services in the IBCCDS. The spacing of the vision carriers shall be 8 MHz and shall be aligned with the other television signals of 8 MHz channel bandwidth. The wanted and unwanted signal levels and the spurious emissions outside the 8 MHz channel bandwidth shall be controlled such that other signals and services being distributed or relayed in the IBCCDS will not be affected.

4. PERFORMANCE REQUIREMENTS FOR DISTRIBUTING DIGITAL TELEVISION SIGNALS IN THE IBCCDS

4.1 The distribution of digital television signals shall not affect or interfere with other services in the IBCCDS. The wanted and unwanted signal levels and the spurious emissions outside the 8 MHz channel bandwidth shall be controlled such that other signals and services being distributed in the IBCCDS will not be affected.

4.2 For distributing digital terrestrial television broadcast signals, the signals and IBCCDS shall meet the following technical requirements:-

4.2.1 Impedance

The nominal impedance of the system including all coaxial feeder cables and system outlets shall be 75 Ω .

4.2.2 Signal level

At any system outlet, the carrier level in the digital terrestrial television signals shall be:

Frequency range (MHz)	Minimum signal level (dB μ V)	Maximum signal level (dB μ V)
470 – 862	50	74

4.2.3 Minimum carrier-to-noise ratio

The carrier-to-noise ratio at any system outlet shall be equal to or greater than 34 dB, with the test signal applied to the system input at a level equal to that normally available at that point. The carrier-to-noise ratio is the ratio of the total power of the channel carrying the digital modulated signal to the total power of the noise in the same channel and measured using the nominal bandwidth of 7.56 MHz.

4.2.4 Bit error rate

The bit error rate (BER) of the signal after error correction shall be better than 3×10^{-6} .

4.2.5 Modulation error ratio

The modulation error ratio (MER) shall be not less than 30 dB.

4.2.6 Level difference between adjacent channels

4.2.6.1 The maximum level difference at any system outlet between any two distributed digital terrestrial television broadcast channels shall be 3 dB.

4.2.6.2 The signal level of a distributed digital terrestrial television broadcast channel shall be at least 5 dB lower than that of a wanted adjacent analogue television channel.

4.2.7 Mutual isolation between system outlets

The mutual isolation between outlets connected separately to a spur feeder shall be equal to or greater than 33 dB.

5. PERFORMANCE REQUIREMENTS FOR RELAYING SIGNALS FOR TELECOMMUNICATIONS SERVICES BY THE IBCCDS

5.1 All the telecommunications signals and services to be conveyed in the IBCCDS shall occupy a bandwidth of 8 MHz or less and adopt the frequency allocation and channel plan as shown in the latest edition of HKTA 1105.

5.2 The transport of signals for telecommunications services shall not affect or cause interference to other services in the IBCCDS. The wanted and unwanted signal levels and the spurious emissions outside the 8 MHz channel bandwidth shall be controlled at such a level that other signals and services being distributed or relayed in the IBCCDS will not be affected.

6. PREVENTION OF INTERFERENCE

6.1 The IBCCDS shall at all times be operated and maintained in such a manner that it does not cause interference with any other authorized telecommunications services including the reception of off-air broadcast sound and television signals.

6.2 Radiation leakage from IBCCDS

The level of radiation emitted from the IBCCDS shall not exceed the limits as specified in the latest edition of HKTA 1102.

6.3 Immunity to ingress noise

The immunity of IBCCDS shall be properly designed such that the performance of the distributed broadcasting or telecommunication services is not affected. A list of the maximum permissible effective radiated power of authorized radiocommunication services in Hong Kong and in the neighbouring territories is given in the latest edition of HKTA 1105.

6.4 Out-of-channel components within IBCCDS

The out-of-band signal generated or emitted from a system in a IBCCDS channel shall not degrade the lowest carrier-to-single-frequency-interference ratio of any other system in the same IBCCDS to less than:-

- 57 dB if the other system is a television channel of Amplitude Modulation (AM) signals;
- 35 dB if the other system is a Digital Video Broadcasting (DVB) television channel of 64-Quadrature Amplitude Modulation (64-QAM) signals; and
- 13 dB if the other system is a Digital Video Broadcasting (DVB) television channel of Quaternary Phase Shift Keying (QPSK) signals.

7. SAFETY REQUIREMENTS

Equipment or apparatus comprising the IBCCDS shall comply with the latest editions of the following specifications and regulation:-

- (a) **IEC 60950-1**, “Information technology equipment – Safety – Part 1: General requirements” issued by the IEC

or

EN 60950-1, “Information technology equipment – Safety – Part 1: General requirements” issued by CENELEC

or

UL 60950-1, “Information technology equipment – Safety – Part 1: General requirements” issued by Underwriters Laboratories Inc.

and

- (b) **EN 60065**, “Audio, video and similar electronic apparatus – Safety requirements”, published by CENELEC

and

- (c) Electrical Products (Safety) Regulation of the Electricity Ordinance (Cap. 406), Hong Kong Law