Presentation 4

ISDB-T Applications

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Contents

- Features of ISDB-T
- Applications for Stationary Reception
  - HDTV or Multi Channel SDTV Program
  - Data Broadcasting
  - Advanced Caption
  - EPG (Electric Program Guide)
  - Interactive service
- Applications for Mobile Reception
  - One-Seg Service
  - HDTV Mobile Reception
Features of ISDB-T system

**Support three reception types within one channel**

- **6MHz**
  - 13 Segments

- **Mobile Reception**
  - 1 segment

- **HD Mobile Reception**
  - 12 or 1 segment

- **Stationary Reception**
  - 12 segments

- **TV station**

- **Handheld terminal**

- **Receiver in Vehicle**
  - (diversity reception)

- **Home Receiver**
  - HDTV
Powerful applications

**HDTV**
- High quality image on wide screen and CD quality sound.

**Data broadcasting**
- Local news and weather forecast for viewers at any time.

**Mobile accesses**
- Transmission service to Mobile accesses

**Multi-channel program**
- Standard quality multi-channel service

**Interactive TV**
- Offers Interactive service
Stationary Reception

- HDTV
- Multi-Channel Programs
- Data Broadcasting
- Interactive Services
- Advanced Caption
- EPG (Electric Program Guide)
High Definition Television Program

- The high quality images on a 16x9 wide screen and CD-quality sound make you feel as if you were at the theater. 5.1 multi channel audio can be transmitted.
- European broadcasters have opted for “multi-channel” strategy, but Japanese broadcasters have chosen to take advantages of “high definition” pictures.
- HDTV is a killer application.
Multi channel program

- ISDB-T can transmit multiple SDTV programs simultaneously on a single digital spectrum.

SD-1  SD-2  SD-3
Flexible Programming

![Diagram showing flexible programming times for SDTV1, SDTV2, SDTV3, and HDTV]

- **Prime Time** (19:00 - 23:00)
- **Midnight** (23:00 - 07:00)
- **07:00**

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Data broadcasting - additional service.

By clicking on d-button of a remote control unit, you can access your requested information such as local weather forecast, 24H news and traffic information, etc.

Local weather forecast  Local news  Traffic Information
**Data broadcasting (2)**

**Basic page format**

- Present time and date
- Buttons to select contents
- Local weather information
- TV station ad banner
- News banner
- Traffic Information banner
Data broadcasting (3)

- 2 types of data services:
  - Program-linked contents
    - Information service linked to on-air programs
    - Accessible during on-air
  - Non-linked contents
    - Information service not linked to on-air programs
    - Accessible any time
**Data broadcasting (4)**

- **Program-linked data contents**

  - On-air program
  - Linked data page format

  ![On-air program](image)

  ![Linked data page format](image)

  - Click on d-button
  - Click on Menu button

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**DiBEG**

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Data broadcasting (5)

Program-linked data contents

Linked data top page

Cast

Story
Data broadcasting (6)

- Non-linked contents

Today's recommendation
Program Information
Weather forecast
News
**Program-linked interactive contents**

On-air program: Interactive Quiz Program

Click a correct answer with these colored button!!

Linked data page

Answering Button
Interactive Services

Interactive services is to realize the interactive communications via internet line.

TV program system
Data program system

MUX
MOD

Communication Contents Platform
Encrypt Server
Contents Server
Clients Management Server

Transmitter
Receiver Storage
Internet
Receiver
BML/Video

TCP/IP or Analog modem
Interactive internet contents (1)

Interactive Shopping Contents

On-air program

The button to connect to the internet contents

data broadcasting content
Interactive internet contents (2)

Interactive Shopping Contents

On-air program

Internet Contents

goods
Advanced Caption

- Closed Caption can be realized more flexible manner.
  Caption of several languages can be sent to receiver.
An Electronic Program Guide (EPG) is an interactive schedule of current and upcoming programs that a viewer can display on-screen simply by pressing a button on his remote control unit.
EPG(2)

- EPG provides a lot of program information, and you can book recording programs with remote easily.
EPG(3)

- Broadcaster sends program-info data as SI (Service Information) data.
- How to display program data is up to receivers.
Mobile Reception

- One-Seg Services
- HDTV Mobile Reception
7.4 million One-Seg Mobile Phones were Shipped (by the end of Apr. 2007).
One-Seg Service (2)

- The One-Seg service is transmitting moving images to cell phones, car TVs, personal computers etc., so that you can enjoy One-Seg programs anytime anywhere.

- Merits
  - Stable reception in a mobile environment.
  - High quality video & audio in a mobile environment.
  - Robustness against noise and multi-pass.
One-Seg Service (3)

Example parameter
Modulation      QPSK
Code Ratio      2/3
Guard Interval  1/8
Bit Rate        416 Kb/s

On-air program

Data service

Display Image
One-Seg Service (4)

- Video (H.264)  
  approx. 180-256 kbps

- Audio (AAC-SBR)  
  approx. 32-64 kbps

- Data-cast (BML)  
  approx. 20-80 kbps
Example of Applications

- **TV shopping**
  The service enables viewers to purchase commercial goods shown on shopping program.

- **Local service**
  The service can provide local information such as emergency alerts, local events, notice from local government or hospital.

- **Coupon ticket**
  Service enables to get coupon tickets such as grommet, movie, book.

- **Additional information service**
  The additional information linked to on-air programs are supplement service such as information on athletes and celebrities, recipes, questionnaire and answer to a quiz.
One-Seg service (6)

TOP

Current Program Information

Fuji TV EPG

Program Information

Top Recommendation

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One-Seg Service (7)

< Fountain of trivia TOP >

< Voting of “Hee” >

< Voting done >

Contribution a seed of Trivia in secondary link web site

Voting the number of “Hee”

To see Voting result in secondary link web server
One-Seg Service (8)

No subscription fee
and
Powerful terrestrial television contents

Unique & Unparalleled Feature in the world!
HDTV Mobile Reception

HDTV can be watched even in a moving vehicle by using space diversity technology.
Diversity reception system

Maximal Ratio Combining with carrier by carrier of OFDM signal

Tuner → FFT

Branch #1

Branch #2

Branch #3

Branch #4

Diversity combiner

Channel estimate → Weight

Stable output signal
Comparison between Digital and Analog

Comparison experiment between digital and analog TV on a mobile environment.

Digital Broadcasting  Analog Broadcasting
Conclusion

ISDB-T is filled with leading-edge technologies to make your dreams come true!
ISDB-T seminar in Venezuela

Thank you for your attention!

END