

March 26, 2013

Product Specifications of the New Middleware

<Attachment 1>

- Main Specifications of ISDB-TB (One-Segment) Middleware for Digital Terrestrial Television Broadcasting

1. Product specifications

Video decode	H.264/AVC
Video output	<ul style="list-style-type: none"> • Output format: Maximum size (1280 × 800) • YCbCr422, RGB888, RGB565 format output • Dual output capability • Output rate: Depending on video stream • 5 fps, 10 fps, 12 fps, 15 fps, 24 fps, 25 fps, 30 fps
Audio decode	MPEG-4 HE-AAC V2 <ul style="list-style-type: none"> • Sampling frequency: 48 kHz, 44.1 kHz, 32 kHz • Output channel: Monaural, stereo, dual monaural
Audio output	PCM (48 kHz/2 ch)

2. Overview of function

MPEG-2 TS demultiplexing	<ul style="list-style-type: none"> • PES filtering • Section filtering • Detect suspension of specific PID
Audio	<ul style="list-style-type: none"> • Decode audio PES • Audio output controlled by upper layer software <ul style="list-style-type: none"> ○ Channel select (monaural/stereo/main-sub switch) ○ Volume select ○ Audio output muting • Audio stream information report

Video	<ul style="list-style-type: none"> • Video PES decode • Video stream information report
Private PES	Extracting PES format data
Section processing	Extracting section format data

<Attachment 2>

- Main Specifications of ISDB-T (Full-Segment) Middleware for Digital Terrestrial Television Broadcasting with Content Protection System

1. Product specifications

Video decode	<ul style="list-style-type: none"> • MPEG-1 video (For full segment stream) • MPEG-2 video (For full segment stream) • H.264 (For one segment stream)
Video output	<ul style="list-style-type: none"> • Output format: Maximum size (1280 x 800) • YCbCr422, RGB888, RGB565 format output • Output rate: 30 fps, 60 fps
Audio decode	<ul style="list-style-type: none"> • MPEG-2 AAC <ul style="list-style-type: none"> ○ Sampling frequency: 48 kHz, 32 kHz, 24 kHz (For one segment) ○ Output channel: Monaural, stereo, dual monaural, multiple channel stereo ○ SBR for one segment • PCM (For storage/built-in sound/breaking news) <ul style="list-style-type: none"> ○ Sampling frequency: 12 kHz ○ Output channel: One channel
Audio output	PCM (48 kHz/2 ch)

2. Overview of function: Full segment

MPEG-2 TS demultiplexing	<ul style="list-style-type: none"> • MULTI2 descramble • PES filtering • Section filtering • Detect suspension of specific PID
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	<ul style="list-style-type: none"> • Detect video/audio PID change
CA control	B-CAS card control/content protection system (selectable)
Card control	CAS card initialization/information acquisition/command processing Report of CAS card status change/insertion-extraction
Descramble control	MULTI2 descramble by ECM
Audio	<ul style="list-style-type: none"> • Audio PES decode • Audio output controlled by upper layer software • Channel select (monaural/stereo/main-sub switch) • Volume select (dual volume control of main volume and stored contents/beep/breaking news audio) • Audio output muting • Playback function for stored ES • Downmix output for multiple channel stereo • Audio multiplex output of selected PCM data file (storage/built-in sound/breaking news) • Report main audio stream information
Video	<ul style="list-style-type: none"> • Video PES decode • Report video stream information
Caption/closed caption	<ul style="list-style-type: none"> • PES decode of caption/closed caption and output to caption plane • DRCS, PNG • Effects for caption/closed caption (character color, flashing, and superimpose, etc.) based on ARIB specification
Section processing	Extracting section format data
Data broadcasting support	Extracting section format data

3. Overview of function: One segment

MPEG-2 TS demultiplexing	<ul style="list-style-type: none">• PES filtering• Section filtering• Detect suspension of specific PID
Audio	<ul style="list-style-type: none">• Audio PES decode• Audio output controlled by upper layer software• Channel select (monaural/stereo/main-sub switch)• Report audio stream information
Video	<ul style="list-style-type: none">• Video PES decode• Report video stream information
Caption	<ul style="list-style-type: none">• Caption PES decode• Output to caption frame
Section processing	Extracting section format data

Remarks)

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