User's Manual

OMX Media Component

User's Manual aacPlus V2 Decoder Part

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1. Overview

1.1. Overview of This Document

This document is the User's Manual for the OMX Media Component and specifications of the aacPlus V2 Decoder Media Component are described.
Please read this document with related document [1] and [2].

1.2. Overview of aacPlus V2 Decoder Media Component and Scope of This Document

Figure 1-1shows the software configuration of the aacPlus V2 Decoder Media Component and scope. The aacPlus V2 Decoder Media Component consists of the OMX Media Component Common Library which provides common functions of OpenMAX IL, the OMX Media Component Audio Common Library which provides common functions of audio processing, and the OMX Media Component aacPlus V2 Decoder Library which realizes functions of aacPlus V2 Decoder. The OMX Media Component aacPlus V2 Decoder Library controls ARM 5.1ch aacPlus V2 Decode Middleware and realizes codec processing.

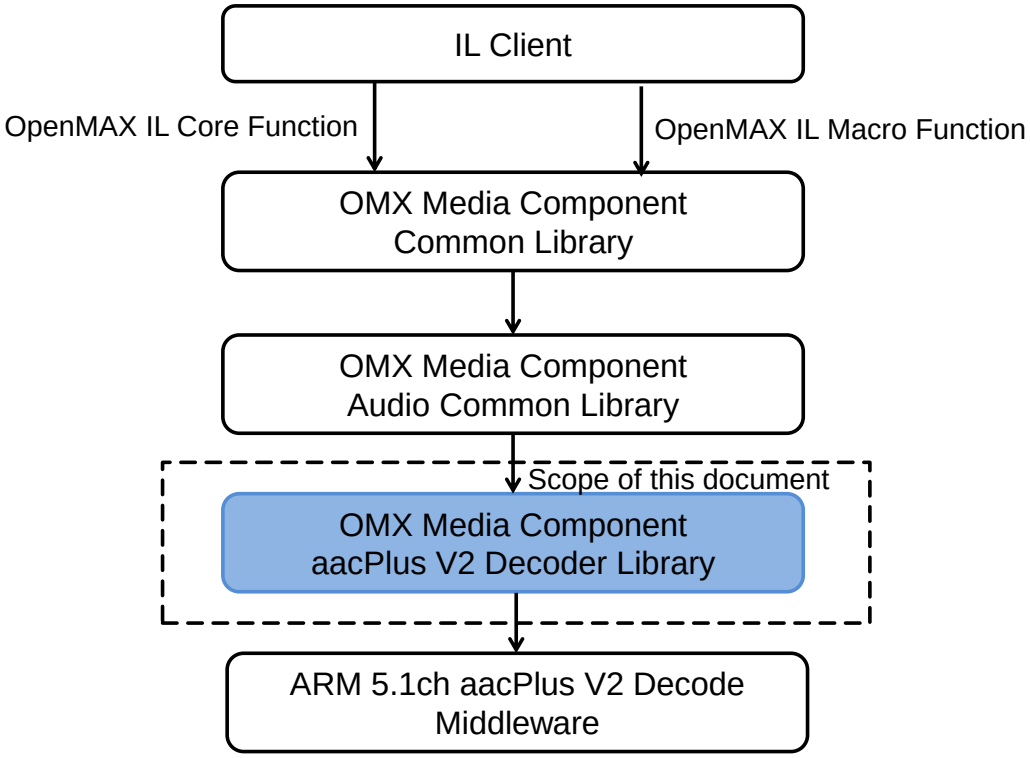

Figure 1-1 Software Configuration of aacPlus V2 Decoder Media Component and Scope

1.3. Related Documents

Table 1-1 shows the reference documents and related documents.

Table 1-1 List of Related Documents

No	Document Name	Description
[1]	OMX Media Component User's Manual Common Part	
[2]	OMX Media Component User's Manual Audio Common Part	
[3]	OpenMAX Integration Layer Application Programming Interface Specification Version 1.1.2, September 1, 2008	http://www.khronos.org/registry/omxil/specs/OpenMAX_IL_1_1_2_Specification.pdf

1.4. Terminology

Table 1-2 shows the terminology used in this document.

Table 1-2 Terminology

Term	Abbreviation	Description
Audio Port Base	APB	The base value of the port index of the Audio Media Component. The port index values of the input and output ports are obtained by adding offset values to this base value.
OpenMAX IL	-	Open API specified by the Khronos Group. It standardizes accesses to primitive media processing which is commonly used in graphics, audio, and image libraries.
Component	-	Refers to a component that is defined in OpenMAX IL Specification.
Media Component	MC	A component that performs multimedia processing. It corresponds to the Component that is defined in OpenMAX IL.
IL Client	-	Refers to software that uses functions of OpenMAX IL Core and Component.

1.5. Role Name and Component Name

Table 1-3 shows the role name and component name of aacPlus V2 Decoder Media Component.

Table 1-3 Role Name and Component Name

Role Name	Component Name
audio_decoder.aac	OMX.RENESAS.AUDIO.DECODER.AAC

2. Functions

The aacPlus V2 Decoder Media Component is the component that provided functions to decode data compressed by MPEG-2/MPEG-4 AAC standard.

The aacPlus V2 Decoder Media Component performs decode processing when compressed data is stored in the input buffer and stores resulted linear PCM data to the output buffer.

2.1. Function Details

2.1.1. Decode Function

The supported standards and functions by the aacPlus V2 Decoder Media Component are shown as below.

Table 2-1 Supported Standards and Functions

Coding Method	Compliant Standard	ISO/IEC 14496-3:2009 Fourth edition
		ISO/IEC 13818-7:2006 Fourth edition
	Supported Profile	AAC-LC
		HE-AAC V1(aacPlus V1)
		HE-AAC V2(aacPlus V2)
Input Format	RAW format / ADTS format	
Input Channel	1 channel 2 channels (stereo, dual monaural) 3 channels (3/0,2/1) 4 channels (3/1,2/2) 5 channels (3/2) 5.1 channels (3/2 + LFE) (Note 1)	
Input Sampling Frequency	AAC-LC	8 / 11.025 / 12 / 16 / 22.05 / 24 / 32 / 44.1 / 48 / 64 / 88.2 / 96 kHz
	HE-AAC V1 HE-AAC V2	8 / 11.025 / 12 / 16 / 22.05 / 24 / 32 / 44.1 / 48 kHz
Input Bit Rate	AAC-LC	8 to 576[kbits/sec]
	HE-AAC V1 HE-AAC V2	8 to 128[kbits/sec]
Output Format	16 bit linear PCM (channel interleaved format)	
Output Channel	1 channel 2 channels 6 channels (Note 2)	
Output Sampling Frequency	AAC-LC	8 / 11.025 / 12 / 16 / 22.05 / 24 / 32 / 44.1 / 48 / 64 /88.2 / 96 kHz
	HE-AAC V1 HE-AAC V2	16 / 22.05 / 24 / 32 / 44.1 / 48 kHz
Down Mixing	3 channels (3/0, 2/1), 4 channels (3/1, 2/2), 5 channels (3/2), 5.1 channel (3/2 + LFE) can be down mixed to stereo. Compliant with ISO/IEC 13818-7, ISO/IEC 14496-3.	

(Note 1) “/” denotes the number of channels for the front and rear speakers.
(Note 2) Data from 3 to 5.1 channels is outputted as 6 channels.

2.1.2. Channel Configuration

Table 2-2 shows channel configuration corresponding to every audio mode supported by the aacPlus V2 Decoder Media Component.

Table 2-2 Channel configuration

Input channel	Element appearance order			
	1	2	3	4
1 channel	SCE	-	-	-
2 channels(stereo)	CPE	-	-	-
2 channels (dual monaural)	SCE	SCE	-	-
3 channels (3/0)	SCE	CPE	-	-
3 channels (2/1)	CPE	SCE	-	-
4 channels (3/1)	SCE	CPE	SCE	-
4 channels (2/2)	CPE	CPE	-	-
5 channels (3/2)	SCE	CPE	CPE	-
5.1 channels (3/2 + LFE)	SCE	CPE	CPE	LFE

In a channel configuration other than those defined in Table 2-2, OMX_BUFFERFLAG_DATACORRUPT is set to nFlags of the OMX_BUFFERHEADERTYPE structure and PCM data is output, if the aacPlus V2 Decoder Media Component can decode the input stream. Down Mixing is supporting only a channel configuration defined in Table 2-2. When decoding or down mixing is impossible, the aacPlus V2 Decoder Media Component generates error event (OMX_ErrorStreamCorrupt).

2.1.3. Notification Function of Port Information Change

The aacPlus V2 Decoder Media Component sends event when the information of “Output Sampling Frequency”, “Output Channel Number”, and “Output Channel Mapping” is changed. Please refer to section 7, for details.

2.2. Port

The aacPlus V2 Decoder Media Component has one input port and one output port.

The input port has input buffers to store compressed data, and the output port has output buffers to store PCM data.

Table 2-3 Ports of aacPlus V2 Decoder Media Component

Component	Port Index	Type
aacPlus V2 decoder Media Component	APB+0	Input Port
	APB+1	Output Port

3. I/O Data Format

3.1. Buffer Payload

Figure 3-1 shows the data storage format of input buffers for aacPlus V2 Decoder Media Component. "fn" in the figure denotes the sequence number (frame number) of compressed data. Compressed data is input to aacPlus V2 Decoder Media Component in frame units. An arbitrary number of frames can be stored in a single input buffer if data is input in frame units. However, one frame data cannot be split into two or more input buffers.

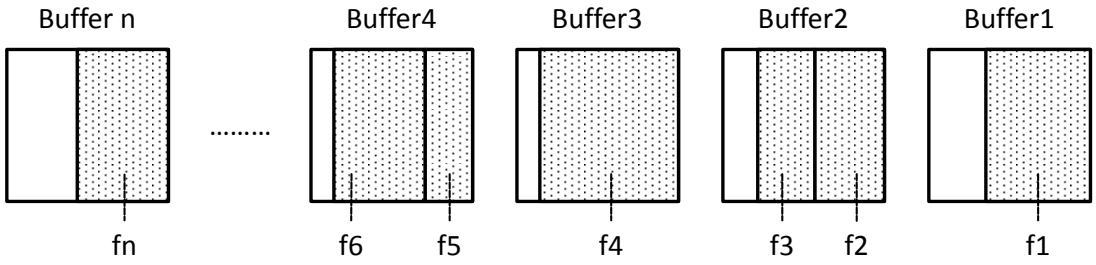

Figure 3-1 Data Storage Format of Input Buffers

Figure 3-2 and Figure 3-3 show the data storage format of output buffers for aacPlus V2 Decoder Media Component. PCM data decoded by aacPlus V2 Decoder Media Component can be stored in the output buffers in one frame unit or sequentially. However, equal-time linear PCM samples (for all channels) are stored to same buffer.

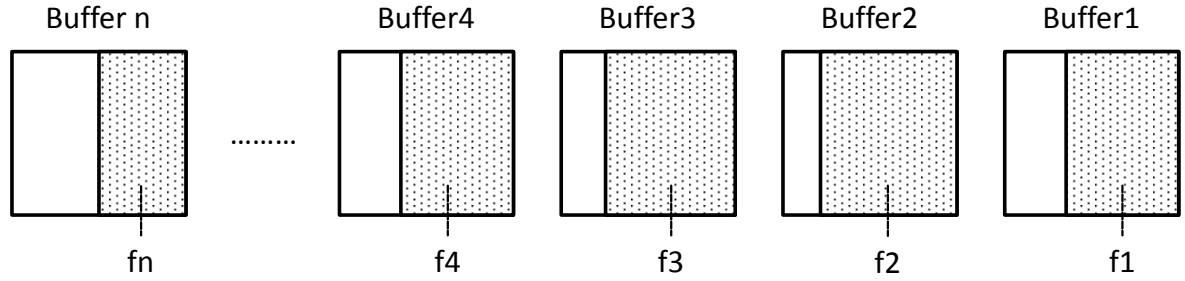

Figure 3-2 Data Storage Format of Output Buffer (1 Frame Unit)

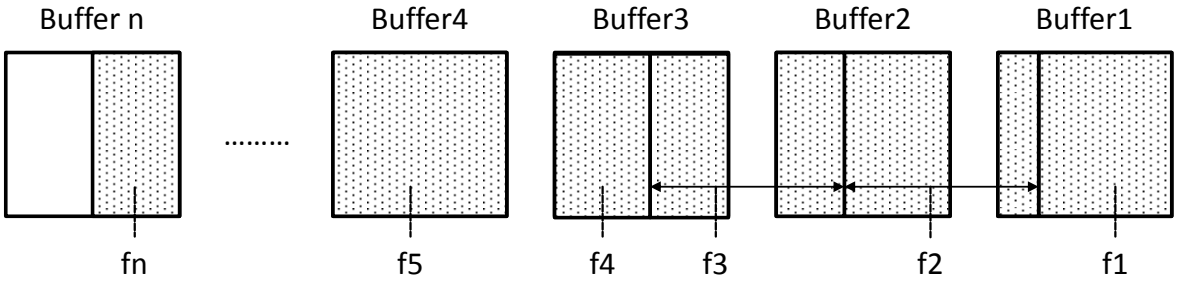

Figure 3-3 Data Storage Format of Output Buffer (Continuation)

3.2. Data Format of Input Buffer

Figure 3-4 shows input buffer format. A stream data is stored to the input buffer and the data size is set to nFilledLen in the OMX_BUFFERHEADERTYPE structure.

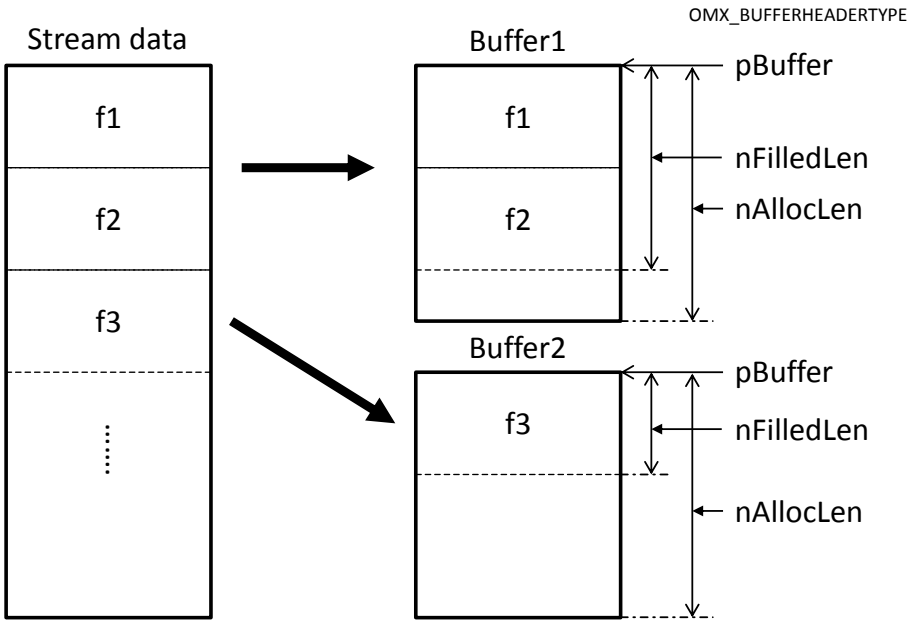

Figure 3-4 Data Format of Input Buffer

Figure 3-5 shows input buffer format when input data format is OMX_AUDIO_AACStreamFormatMP4FF. The AudioSpecificConfig data in MP4 data is stored to the input buffer and OMX_BUFFERFLAG_CODECCONFIG is set to nFlags in the OMX_BUFFERHEADERTYPE structure. Then, frame data is input from next buffer. However, any data other than channelConfiguration, samplingFrequencyIndex, and samplingFrequency in the AudioSpecificConfig data is skipped.

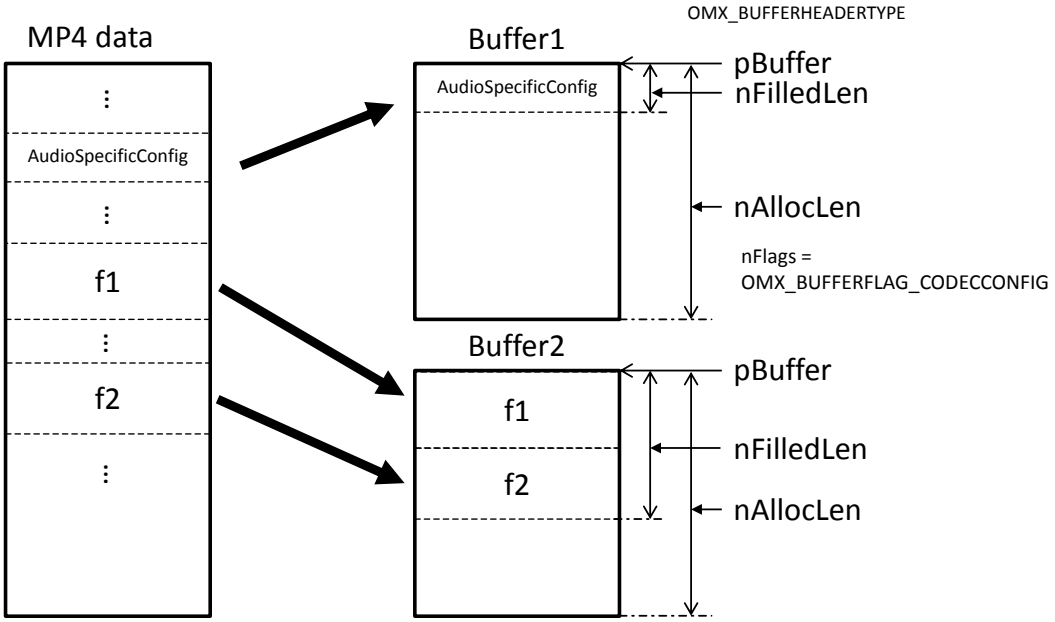

Figure 3-5 Input data Format of MP4 File Format

3.3. Data Format of Output Buffer

aacPlus V2 Decoder Media Component stores the volume of output data specified by nFilledLen in the OMX_BUFFERHEADERTYPE structure from the address specified by a member of that structure as shown in Figure 3-6.

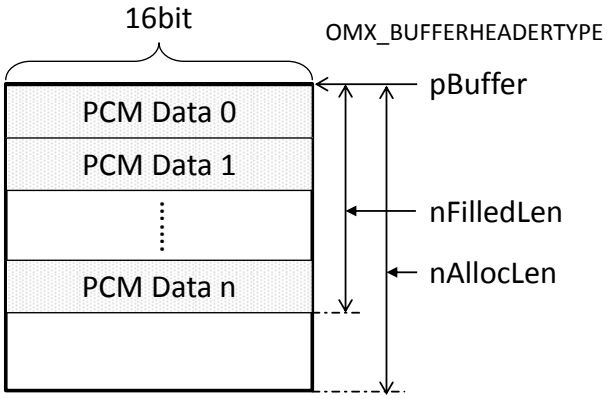

Figure 3-6 Data Format of Output Buffer

In aacPlus V2 Decoder Media Component, layout of PCM data is different for each output channel. Figure 3-7 shows formats of each output channel. When data from 3 to 5.1 channels is input, output is 6 channels and silent data is stored for void channel. And, when down mixing is effective, output format is 2 channels (Stereo) and value 2 is set to nChannels in the OMX_AUDIO_PARAM_PCMMODETYPE structure.

If a parametric stereo data in a HE-AAC V2 (aacPlus V2) stream is decoded, output is 2 channels (Stereo).

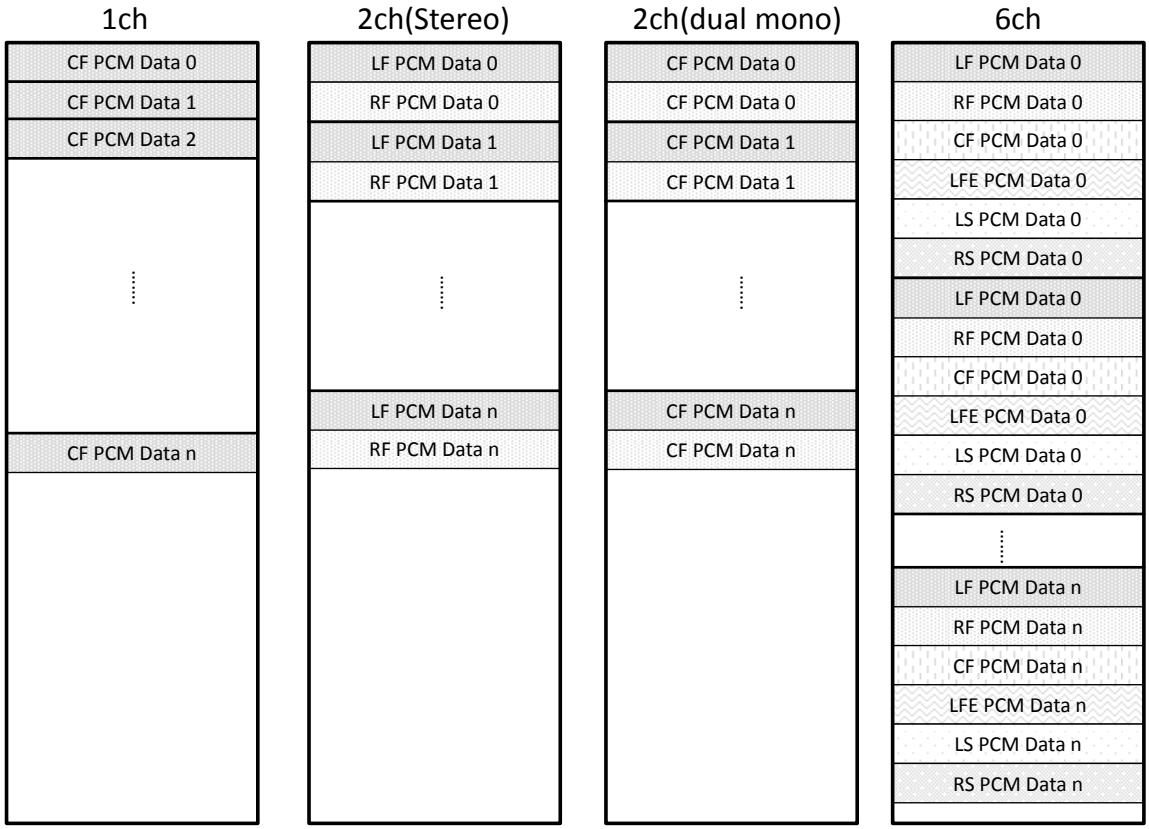

Figure 3-7 Data Format of each Output Channel

4. API Reference

Please refer to the related document [2].

5. Indexes

5.1. Standard Indexes of aacPlus V2 Decoder Media Component

Table 5-1 shows the list of standard indexes that are available for aacPlus V2 Decoder Media Component.

Table 5-1 List of Indexes available for aacPlus V2 Decoder Media Component

Index	Corresponding Strucure Name
Description	
OMX_IndexParamAudioInit	OMX_PORT_PARAM_TYPE Structure
Please refer to the related document [1].	
OMX_IndexParamVideoInit	OMX_PORT_PARAM_TYPE Structure
Please refer to the related document [1].	
OMX_IndexParamImageInit	OMX_PORT_PARAM_TYPE Structure
Please refer to the related document [1].	
OMX_IndexParamOtherInit	OMX_PORT_PARAM_TYPE Structure
Please refer to the related document [1].	
OMX_IndexParamStandardComponentRole	OMX_PARAM_COMPONENTROLETYPE Structure
Please refer to the related document [1].	
OMX_IndexParamCompBufferSupplier	OMX_PARAM_BUFFERSUPPLIERTYPE Structure
Please refer to the related document [1].	
OMX_IndexParamPortDefinition	OMX_PORTDEFINITIONTYPE Structure
Please refer to the related document [1] and [2].	
OMX_IndexParamAudioPortFormat	OMX_AUDIO_PARAM_PORTFORMATTYPE Structure
Please refer to the related document [2].	
OMX_IndexParamAudioAac	OMX_AUDIO_PARAM_AACPROFILETYPE Structure
To set or get information regarding AAC.	
OMX_IndexParamAudioPcm	OMX_AUDIO_PARAM_PCMMODETYPE Structure
To set or get information regarding PCM.	

5.2. Expanded Indexes of aacPlus V2 Decoder Media Component

Table 5-2 shows the list of expanded indexes that are available for aacPlus V2 Decoder Media Component.

Table 5-2 List of Expanded Indexes available for aacPlus V2 Decoder Media Component

Index (Expanded Index Name)	Corresponding Strucure Name
Description	
OMXR_MC_IndexParamAudioOutputUnit (OMX.RENESAS.INDEX.PARAM.AUDIO.OUTPUTUNIT)	OMXR_MC_AUDIO_PARAM_OUTPUTUNITTYPE Structure
Please refer to the related document [2].	
OMXR_MC_IndexParamAudioPortSettingMask (OMX.RENESAS.INDEX.PARAM.AUDIO. PORTSETTINGSEVENTMASK)	OMXR_MC_AUDIO_PARAM_PORTSETTINGSEVENTMASK TYPE Structure
Please refer to the related document [2].	
OMXR_MC_IndexParamAacDownMix (OMX.RENESAS.INDEX.PARAM.AAC.DOWNMIX)	OMXR_MC_AUDIO_PARAM_AACDOWNMIXTYPE Structure
To set or get information regarding Down Mixing of AAC.	

5.3. Indexes Specified by OpenMAX IL Macro Functions

Table 5-3 shows indexes which can be specified by OpenMAX IL Macro functions and available port index for aacPlus V2 Decoder Media Component.

Table 5-3 Indexes Specified by OpenMAX IL Macro Functions

Index	Get/SetParameter		Get/SetConfig		Port Index	
	Get	Set	Get	Set	APB+0	APB+1
OMX_IndexParamAudioInit	x	x	-	-	-	-
OMX_IndexParamVideoInit	x	x	-	-	-	-
OMX_IndexParamImageInit	x	x	-	-	-	-
OMX_IndexParamOtherInit	x	x	-	-	-	-
OMX_IndexParamStandardComponentRole	x	x	-	-	-	-
OMX_IndexParamCompBufferSupplier	x	x	-	-	x	x
OMX_IndexParamPortDefinition	x	x	-	-	x	x
OMX_IndexParamAudioPortFormat	x	x	-	-	x	x
OMX_IndexParamAudioAac	x	x	-	-	x	-
OMX_IndexParamAudioPcm	x	x	-	-	-	x
OMXR_MC_IndexParamAudioOutputUnit	x	x	-	-	-	x
OMXR_MC_IndexParamAudioPortSettingMask	x	x	-	-	-	x
OMXR_MC_IndexParamAacDownMix	x	x	-	-	-	x

x : Effective
- : Ineffective

6. Structures

Table 6-1 shows the list of structures of aacPlus V2 Decoder Media Component.

Table 6-1 Structures of aacPlus V2 Decoder Media Component

Structure Name	Reference
OMX_AUDIO_PORTDEFINITIONTYPE	Section 6.1
OMX_PARAM_COMPONENTROLETYPE	Related Document [1]
OMX_PARAM_BUFFERSUPPLIERTYPE	Related Document [1]
OMX_AUDIO_PARAM_PORTFORMATTYPE	Section 6.2
OMX_AUDIO_PARAM_AACPROFILETYPE	Section 6.3
OMX_AUDIO_PARAM_PCMMODETYPE	Section 6.4
OMXR_MC_AUDIO_PARAM_OUTPUT_UNITTYPE	Related Document [2]
OMXR_MC_AUDIO_PARAM_PORTSETTINGSEVENTMASKTYPE	Related Document [2]
OMXR_MC_AUDIO_PARAM_DOWNMIXTYPE	Section 6.5

Given below is an explanation of how to interpret the member of the structures described in this section.

- ✓ Description of a member of a structure corresponded to index

[Member]

Member Name	Get	Set
Indicates the member name	Indicates the attribute of the member specified in the OMX_GetParameter () or OMX_GetConfig () function. If "R" is written, the value of this member can be obtained. If "W" is written, please specify a value in this member.	Indicates the attributes of the member specified in the OMX_SetParameter () or OMX_SetConfig () function. If "W" is written, please specify a value in this member. If “-” is written, the value of this member is ignored. Any value specified in this member is not reflected.

6.1. OMX_AUDIO_PORTDEFINITIONTYPE

[Structure] Please refer to section 4.1.5 in the related document [3].

[Function] Please refer to section 4.1.5 in the related document [3].

[Members]

Member Name	Get	Set
cMIMEType	R	-
pNativeRender	R	-
bFlagErrorConcealment	R	-
eEncoding	R	-

[Details]

cMIMEType

Configurable value	-
Acquirable value	NULL
Initial value	NULL
Remarks	Not supported.

pNativeRender

Configurable value	-
Acquirable value	NULL
Initial value	NULL
Remarks	Not supported.

bFlagErrorConcealment

Configurable value	-
Acquirable value	OMX_FLASE
Initial value	OMX_FLASE
Remarks	Not supported.

eEncoding

Configurable value	-	
Acquirable value	**nPortIndex**	**Value**
	APB+0	OMX_AUDIO_CodingAAC
	APB+1	OMX_AUDIO_CodingPCM
Initial value	**nPortIndex**	**Value**
	APB+0	OMX_AUDIO_CodingAAC
	APB+1	OMX_AUDIO_CodingPCM
Remarks	-	

6.2. OMX_AUDIO_PARAM_PORTFORMATTYPE

[Structure] Please refer to section 4.1.6 in the related document [3].

[Function] Please refer to section 4.1.6 in the related document [3].

[Members]

Member Name	Get	Set
nSize	W	W
nVersion	R	-
nPortIndex	W	W
nIndex	W	-
eEncoding	R	-

[Details]

nSize

Configurable value	Specify the size (in bytes) of the OMX_AUDIO_PARAM_PORTFORMATTYPE structure.
Acquirable value	-
Initial value	-
Remarks	-

nVersion

Configurable value	-
Acquirable value	Specification version of OpenMAX IL (1.1.2).
Initial value	Specification version of OpenMAX IL (1.1.2).
Remarks	-

nPortIndex

Configurable value	APB+0 APB+1
Acquirable value	-
Initial value	-
Remarks	-

nIndex

Configurable value	**nPortIndex**	**Value**
	APB+0	0
	APB+1	0
Acquirable value	-	
Initial value	-	
Remarks	-	

eEncoding

Configurable value	-		
Acquirable value	**nPortIndex**	**nIndex**	**Value**
	APB+0	0	OMX_AUDIO_CodingAAC
	APB+1	0	OMX_AUDIO_CodingPCM
Initial value	**nPortIndex**	**nIndex**	**Value**
	APB+0	0	OMX_AUDIO_CodingAAC
	APB+1	0	OMX_AUDIO_CodingPCM
Remarks	-		

6.3. OMX_AUDIO_PARAM_AACPROFILETYPE

[Structure] Please refer to section 4.1.9 in the related document [3].

[Function] Please refer to section 4.1.9 in the related document [3].

[Members]

Member Name	Get	Set
nSize	W	W
nVersion	R	-
nPortIndex	W	W
nChannels	R	W
nSampleRate	R	W
nBitRate	R	-
nAudioBandWidth	R	-
nFrameLength	R	-
nAACtools	R	-
nAACERtools	R	-
eAACProfile	R	W
eAACStreamFormat	R	W
eChannelMode	R	W

[Details]

nSize

Configurable value	Specify the size (in bytes) of the OMX_AUDIO_PARAM_AACPROFILETYPE structure.
Acquirable value	-
Initial value	-
Remarks	-

nVersion

Configurable value	-
Acquirable value	Specification version of OpenMAX IL (1.1.2).
Initial value	Specification version of OpenMAX IL (1.1.2).
Remarks	-

nPortIndex

Configurable value	APB+0
Acquirable value	-
Initial value	-
Remarks	-

nChannels

Configurable value	1-6	
Acquirable value	Setting value or decoded result.	
Initial value	2	
Remarks	**Value**	**Description**
	1	1Channel (monaural/ parametric stereo)
	2	2Channels (stereo, Dual monaural)
	3	3Channles (3/0, 2/1, 2/0+LFE)
	4	4Channels (3/1, 2/2)
	5	5Channels (3/2)
	6	6Channels (3/2+LFE)
	This parameter is used when stream format (eAACStreamFormat) is OMX_AUDIO_AACStreamFormatRAW. After decoding, decoded result is stored.	

nSampleRate

Configurable value	8000, 11025, 12000, 16000, 22050, 24000, 32000, 44100, 48000, 64000, 88200, 96000
Acquirable value	Setting value or decoded result.
Initial value	48000
Remarks	This parameter is used when stream format (eAACStreamFormat) is OMX_AUDIO_AACStreamFormatRAW. When eAACStreamFormat is not OMX_AUDIO_AACStreamFormatRAW, the decoded result is stored.

nBitRate

Configurable value	-
Acquirable value	0
Initial value	0
Remarks	Not supported.

nAudioBandWidth

Configurable value	-
Acquirable value	0
Initial value	0
Remarks	Not supported.

nFrameLength

Configurable value	-
Acquirable value	1024
Initial value	1024
Remarks	Not supported.

nAACtools

Configurable value	-
Acquirable value	0x0000000F
Initial value	0x0000000F
Remarks	Not supported.

nAACERtools

Configurable value	-
Acquirable value	OMX_AUDIO_AACERNone
Initial value	OMX_AUDIO_AACERNone
Remarks	Not supported.

eAACProfile

Configurable value	OMX_AUDIO_AACObjectLC OMX_AUDIO_AACObjectHE_PS	
Acquirable value	Setting value.	
Initial value	OMX_AUDIO_AACObjectHE_PS	
Remarks	**Value**	**Description**
	OMX_AUDIO_AACObjectLC	AAC mode. (Only the LC Profile is decoded. Any SBR and PS parts in the input stream are ignored.)
	OMX_AUDIO_AACObjectHE_PS	HE-AAC v2 mode. (The LC Profile, SBR, and PS parts are decoded.)
	-	

eAACStreamFormat

Configurable value	OMX_AUDIO_AACStreamFormatMP2ADTS OMX_AUDIO_AACStreamFormatMP4ADTS OMX_AUDIO_AACStreamFormatADIF OMX_AUDIO_AACStreamFormatMP4FF OMX_AUDIO_AACStreamFormatRAW	
Acquirable value	Setting value.	
Initial value	OMX_AUDIO_AACStreamFormatMP2ADTS	
Remarks	**Value**	**Description**
	OMX_AUDIO_AACStreamFormatMP2ADTS (*1)	MPEG-2 AAC ADTS format
	OMX_AUDIO_AACStreamFormatMP4ADTS (*1)	MPEG-4 AAC ADTS format
	OMX_AUDIO_AACStreamFormatADIF (*2)	AAC ADIF format
	OMX_AUDIO_AACStreamFormatMP4FF	MPEG-4/ISO File Format
	OMX_AUDIO_AACStreamFormatRAW	AAC RAW format
	*1 : Specify OMX_AUDIO_AACStreamFormatMP2ADTS or OMX_AUDIO_AACStreamFormatMP4ADTS for the ADTS format. *2 : This value can be specified but does not affect the actual behavior. If OMX_AUDIO_AACStreamFormatADIF is specified, this software runs as OMX_AUDIO_AACStreamFormatMP2ADTS is specified.	

eChannelMode

Configurable value	OMX_AUDIO_ChannelModeStereo OMX_AUDIO_ChannelModeDual OMX_AUDIO_ChannelModeMono	
Acquirable value	Setting value or decoded result.	
Initial value	OMX_AUDIO_ChannelModeStereo	
Remarks	**Value**	**Description**
	OMX_AUDIO_ChannelModeStereo	Stereo 2 channels
	OMX_AUDIO_ChannelModeDual	Main/sub audio 2 channels
	OMX_AUDIO_ChannelModeMono	Monaural 1 channel
	This parameter can be set but does not affect the actual behavior. After decoding, decoded result is stored. If a parametric stereo data is decoded and the number of channels is 3 or greater, OMX_AUDIO_ChannelModeStereo is set.	

6.4. OMX_AUDIO_PARAM_PCMMODETYPE

[Structure] Please refer to section 4.1.7 in the related document [3].

[Function] Please refer to section 4.1.7 in the related document [3].

[Members]

Member Name	Get	Set
nSize	W	W
nVersion	R	-
nPortIndex	W	W
nChannels	R	W
eNumData	R	-
eEndian	R	-
bInterleaved	R	-
nBitPerSample	R	-
nSamplingRate	R	W
ePCMMode	R	-
eChannelMapping	R	W

[Details]

nSize

Configurable value	Specify the size (in bytes) of the OMX_AUDIO_PARAM_PCMMODETYPE structure.
Acquirable value	-
Initial value	-
Remarks	-

nVersion

Configurable value	-
Acquirable value	Specification version of OpenMAX IL (1.1.2).
Initial value	Specification version of OpenMAX IL (1.1.2).
Remarks	-

nPortIndex

Configurable value	APB+1
Acquirable value	-
Initial value	-
Remarks	-

nChannels

Configurable value	1, 2, 6
Acquirable value	Setting value or decoded result.
Initial value	2
Remarks	This value does not affect decoding process. When data from 3 to 5.1 channels is input, this value is set 6.

eNumData

Configurable value	-
Acquirable value	OMX_NumericalDataSigned
Initial value	OMX_NumericalDataSigned
Remarks	Not supported.

eEndian

Configurable value	-
Acquirable value	OMX_EndianLittle
Initial value	OMX_EndianLittle
Remarks	Not supported.

bInterleaved

Configurable value	-
Acquirable value	OMX_TRUE
Initial value	OMX_TRUE
Remarks	Not supported.

nBitPerSample

Configurable value	-
Acquirable value	16
Initial value	16
Remarks	Not supported.

nSamplingRate

Configurable value	8000, 11025, 12000, 16000, 22050, 24000, 32000, 44100, 48000, 64000, 88200, 96000
Acquirable value	Setting value or decoded result.
Initial value	48000
Remarks	This value does not affect decoding process.

ePCMMode

Configurable value	-
Acquirable value	OMX_AUDIO_PCMModeLinear
Initial value	OMX_AUDIO_PCMModeLinear
Remarks	Not supported.

eChannelMapping

Configurable value	OMX_AUDIO_ChannelNone OMX_AUDIO_ChannelLF OMX_AUDIO_ChannelRF OMX_AUDIO_ChannelCF OMX_AUDIO_ChannelLFE OMX_AUDIO_ChannelLS OMX_AUDIO_ChannelRS
Acquirable value	Setting value or decoded result.
Initial value	eChannelMapping[0]= OMX_AUDIO_ChannelLF eChannelMapping[1]= OMX_AUDIO_ChannelRF
Remarks	This value does not affect decoding process. The relation among channel of input data, nChannels and eChannelMapping is shown as below.

Channel of input data	**nChannles**	**eChannelMapping**
1(monaural)	1	eChannelMapping[0]= OMX_AUDIO_ChannelCF
2(stereo, downmix)	2	eChannelMapping[0]= OMX_AUDIO_ChannelLF eChannelMapping[1]= OMX_AUDIO_ChannelRF
2(dual monaural)	2	eChannelMapping[0]= OMX_AUDIO_ChannelCF eChannelMapping[1]= OMX_AUDIO_ChannelCF
3(3/0)	6	eChannelMapping[0]= OMX_AUDIO_ChannelLF eChannelMapping[1]= OMX_AUDIO_ChannelRF

			eChannelMapping[2]= OMX_AUDIO_ChannelCF eChannelMapping[3]= OMX_AUDIO_ChannelNone eChannelMapping[4]= OMX_AUDIO_ChannelNone eChannelMapping[5]= OMX_AUDIO_ChannelNone
	3(2/1)	6	eChannelMapping[0]= OMX_AUDIO_ChannelLF eChannelMapping[1]= OMX_AUDIO_ChannelRF eChannelMapping[2]= OMX_AUDIO_ChannelNone eChannelMapping[3]= OMX_AUDIO_ChannelNone eChannelMapping[4]= OMX_AUDIO_ChannelLS eChannelMapping[5]= OMX_AUDIO_ChannelNone
	4(3/1)	6	eChannelMapping[0]= OMX_AUDIO_ChannelLF eChannelMapping[1]= OMX_AUDIO_ChannelRF eChannelMapping[2]= OMX_AUDIO_ChannelCF eChannelMapping[3]= OMX_AUDIO_ChannelNone eChannelMapping[4]= OMX_AUDIO_ChannelLS eChannelMapping[5]= OMX_AUDIO_ChannelNone
	4(2/2)	6	eChannelMapping[0]= OMX_AUDIO_ChannelLF eChannelMapping[1]= OMX_AUDIO_ChannelRF eChannelMapping[2]= OMX_AUDIO_ChannelNone eChannelMapping[3]= OMX_AUDIO_ChannelNone eChannelMapping[4]= OMX_AUDIO_ChannelLS eChannelMapping[5]= OMX_AUDIO_ChannelRS
	5(3/2)	6	eChannelMapping[0]= OMX_AUDIO_ChannelLF eChannelMapping[1]= OMX_AUDIO_ChannelRF eChannelMapping[2]= OMX_AUDIO_ChannelCF eChannelMapping[3]= OMX_AUDIO_ChannelNone eChannelMapping[4]= OMX_AUDIO_ChannelLS eChannelMapping[5]= OMX_AUDIO_ChannelRS
	5.1(3/2+LSE)	6	eChannelMapping[0]= OMX_AUDIO_ChannelLF eChannelMapping[1]= OMX_AUDIO_ChannelRF eChannelMapping[2]= OMX_AUDIO_ChannelCF eChannelMapping[3]= OMX_AUDIO_ChannelLFE eChannelMapping[4]= OMX_AUDIO_ChannelLS eChannelMapping[5]= OMX_AUDIO_ChannelRS

6.5. OMXR_MC_AUDIO_PARAM_AACDOWNMIXTYPE

[Structure]
```
typedef struct OMXR_MC_AUDIO_PARAM_AACDOWNMIXTYPE {
    OMX_U32             nSize;
    OMX_VERSIONTYPE     nVersion;
    OMX_U32             nPortIndex;
    OMX_BOOL            bDownmix;
} OMXR_MC_AUDIO_PARAM_AACDOWNMIXTYPE;
```

[Function] Down mixing information structure

[Members]

Member Name	Get	Set
nSize	W	W
nVersion	R	-
nPortIndex	R	W
bDownmix	R	W

[Details]

nSize

Configurable value	Specify the size (in bytes) of the OMXR_MC_AUDIO_PARAM_AACDOWNMIXTYPE structure.
Acquirable value	-
Initial value	-
Remarks	-

nVersion

Configurable value	-
Acquirable value	Specification version of OpenMAX IL (1.1.2).
Initial value	Specification version of OpenMAX IL (1.1.2).
Remarks	-

nPortIndex

Configurable value	APB+1
Acquirable value	-
Initial value	-
Remarks	-

bDownmix

Configurable value	OMX_TRUE (Do down mixing) OMX_FALSE (Do not down mixing)
Acquirable value	Setting value.
Initial value	OMX_TRUE
Remarks	If this value is OMX_TRUE, down mixing is done and output is 2 channels (stereo). When the input stream is 1ch, the same PCM data is copied to L/R.

6.6. Structure Members Used in a Unique Manner

Table 6-2 shows structure members used in a unique manner for aacPlus V2 Decoder Media Component.

Table 6-2 Structure Members Used in a Unique Manner

Structure Name	Member	Usage
OMX_BUFFERHEADERTYPE (refer to section 5.1.1 in the related document [1])	nOffset	Not supported. Specify 0.
	nTickCount	Any value can be specified to the OMX_BUFFERHEADERTYPE structure which is input by the OMX_EmptyThisbuffer( ) function. The value specified in this member is copied into a member of the OMX_BUFFERHEADERTYPE structure which is returned by the (*FillBufferDone)( ) callback function.
	nTimeStamp	Any value can be specified to the OMX_BUFFERHEADERTYPE structure which is input by the OMX_EmptyThisbuffer( ) function. The value specified in this member is used for calculating the output value of corresponding member of the OMX_BUFFERHEADERTYPE structure which is returned by the (*FillBufferDone)( ) callback function.
	nFlags	Please refer to section 6.6.1.

6.6.1. Buffer Flag (nFlags)

The buffer flag (nFlags in the OMX_BUFFERHEADERTYPE structure) for aacPlus V2 Decoder Media Component is shown as below.

Table 6-3 Buffer Flag for I/O Port

Flag Name (nFlags)	Description for support
OMX_BUFFERFLAG_EOS	This flag can be used as described in the related document [2].
OMX_BUFFERFLAG_STARTTIME	These flags do not affect the processing of Media Component but the flag set to input buffer is transferred to related output buffer.
OMX_BUFFERFLAG_DECODEONLY	
OMX_BUFFERFLAG_DATACORRUPT	This flag is set to output buffer if input stream has an error. If this flag is set, silent data may be stored to output buffer.
OMX_BUFFERFLAG_ENDOFFRAME	These flags do not affect the processing of Media Component but the flag set to input buffer is transferred to related output buffer.
OMX_BUFFERFLAG_SYNCFRAME	
OMX_BUFFERFLAG_EXTRADATA	
OMX_BUFFERFLAG_CODECCONFIG	Add this flag when the AudioSpecificConfig information of MP4 is input.

7. Events

Table 7-1 shows events having a unique condition for aacPlus V2 Decoder Media Component.

Table 7-1 Events Generation Conditions

Event Type	Port	Condition
OMX_EventPortSettingsChanged	APB+0	Event is not generated.
	APB+1	Event is generated when the member nChannels, nSamplingRate, eChannelMapping in the OMX_AUDIO_PARAM_PCMMODETYPE structure are changed internally by decoding.

If OMXR_MC_AUDIO_UnitFull is set in the OMXR_MC_IndexParamAudioOutputUnit index and nChannels, nSamplingRate, eChannelMapping in the OMX_AUDIO_PARAM_PCMMODETYPE structure is changed in aacPlus V2 Decoder Media Component, a buffer whose size is less than the size of the buffer may be returned.

For the OMX_EventPortSettingChenged event, it is possible to suppress event generation by masking event.Table 7-2 shows maskable information for aacPlus V2 Decoder Media Component.

Table 7-2List of Maskable Information

Information	Masking Value
nSamplingRate	OMXR_MC_AUDIO_EVENTMASK_SAMPLINGRATE
nChannels	OMXR_MC_AUDIO_EVENTMASK_CHANNELS
eChannelMapping	OMXR_MC_AUDIO_EVENTMASK_CHANNELMAPPING

8. Memory Size

Table 8-1 shows size, purpose of main memory areas used in aacPlus V2 Decoder Media Component and the value of nBufferSize, nBufferCountAcutal, nBufferCountMin in the OMX_PARAM_PORTDEFINITONTYPE structure.

Table 8-1 Main Memory Areas used in aacPlus V2 Decoder Media Component

Memory Area Name	Memory Size (byte)			Description
Input Buffer (APB + 0)	**OMX_PARAM_PORTDEFINITIONTYPE**		**Value**	Buffer to store input stream data. This is the size of memory area allocated by the OMX_AllocateBuffer() function.
	nBufferSize	Minimum Size	8192	
		Default Size	8192	
		Maximum Size	40960	
	nBufferCountActual	Minimum Count (= nBufferCountMin)	1	
		Default Count	4	
		Maximum Count	4	
Output Buffer (APB + 1)	**OMX_PARAM_PORTDEFINITIONTYPE**		**Value**	Buffer to store output PCM data. This is the size of memory area allocated by the OMX_AllocateBuffer() function.
	nBufferSize	Minimum Size	24576	
		Default Size	32768	
		Maximum Size	32768	
	nBufferCountActual	Minimum Count (= nBufferCountMin)	1	
		Default Count	8	
		Maximum Count	8	

- Additionally, areas for such as context, task communication and internal work are need.

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Rev.	Date	Description	
		Page	Summary
0.01	Aug. 30, 2013	-	Newly created.
0.02	Sep. 20, 2013	-	Modified structure explanation in Section 6. Added Memory Size in Section 8
0.03	Nov. 26,2013	-	Added Channel Configuration in Section 2.1.2 Added explanation for 1 channel in Section 6.5
0.04	Jan. 15, 2014	-	Correct errors.
0.05	Feb. 20, 2014	27	Add explanation of OMX_PARAM_PORTDEFINITIONTYPE structure in Section 8
0.06	Jun. 3, 2014	- 27	Correct errors. Delete the line of an internal work buffer.
0.10	Jul. 18, 2014	-	Correction of errors.
0.11	Aug. 18, 2014	27	Change Maximum Size of Input Buffer.
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Colophon 3.0

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