RENESAS

OMX Media Component

User's Manual: Video Encoder Common Part

— Preliminary —

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1. Overview

1.1. About This Document

This document is the User's Manual for OMX Media Component. It describes the specifications that are common to Video Encoder Media Components. For the specifications that are common to all the OMX Media Components, see related documents [1].

1.2. Video Encoder Media Component Overview and Scope

Figure 1-1 illustrates the software stacks for the Video Encoder Media Component and shows the scope of this document. OMX Media Component Video Encoder Library is a library that provides functions that are common to all video encoders.
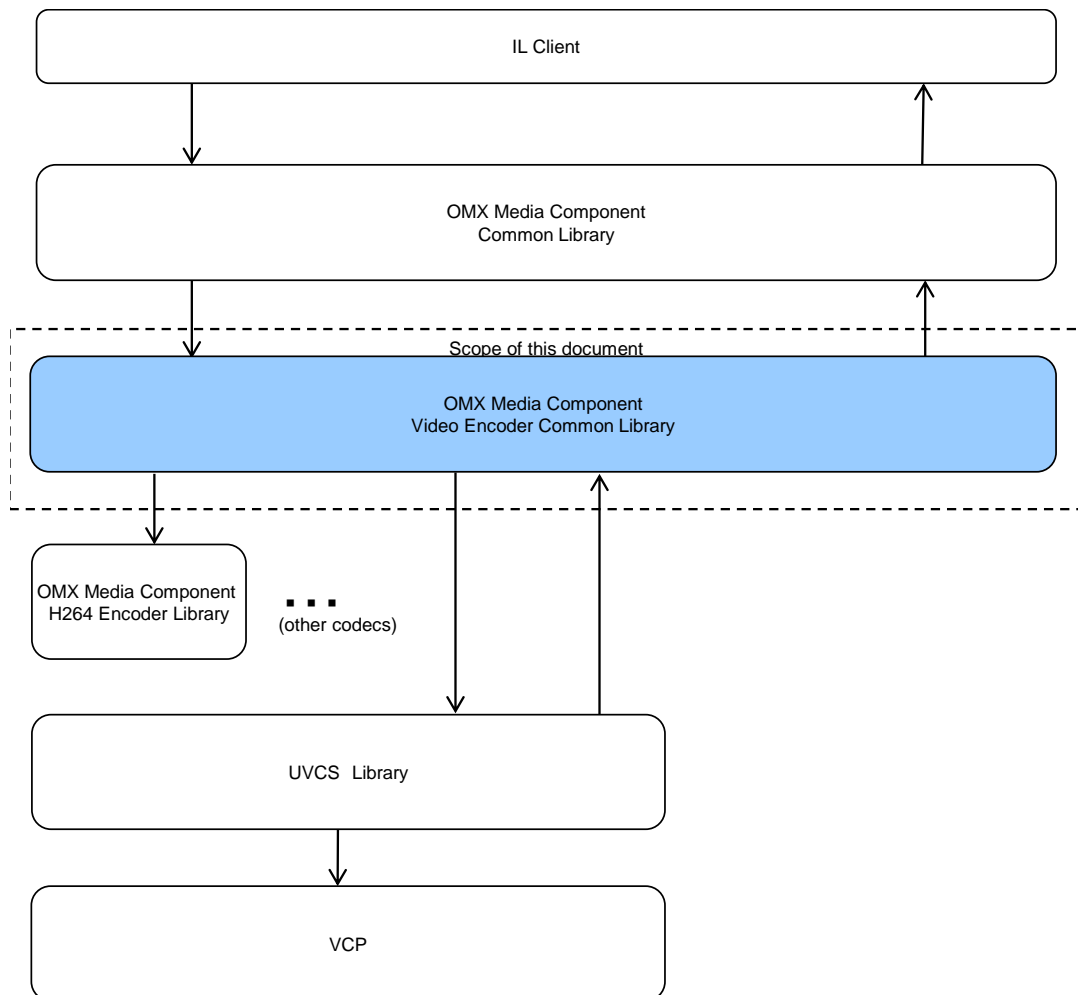
Figure 1-1 Software Stacks and Scope

This document describes the specifications of the OMX Media Component Video Encoder Library part. For the specifications of the OMX Media Component Common Library, see related documents [1]. For the specifications of individual Video Encoder Media Component Libraries, see the corresponding User's Manual.

1.3. Required Header Files

Table 1-1 lists the header files that are required to use the OMX extended indexes and structures that are described in this document. Regarding the other header files, see related documents [1].

Table 1-1 Required Header Files

File name	Remarks
OMXR_Extension_video.h	-
OMXR_Extension_vecmn.h	-

1.4. Related Documents

Table 1-2 lists the related documents.

Table 1-2 List of Related Documents

No.	Document Name	Remarks
[1]	OMX Media Component User's Manual Common Part	The common specifications for OMX Media Component
[2]	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
[3]	OMX Integration Guide for <OS >	Integration guide for OMX Media Component. Substitute <OS> with your target operating system name.

1.5. Terminology

Table 1-3 lists the terms that are used in this document.

Table 1-3 Terminology

Term	Abbreviation	Description
Video Port Base	VPB	The base value of the port index of the Video Media Component. The port index values of the input and output ports are obtained by adding offset values to this base value.
UVCS	-	Renesas proprietary video codec software module that provides multi-processing function for video decoding and encoding. OMX Video Codec products contain UVCS library.
VCP	-	The abbreviation for Video Coding Processor. The VCP is the Renesas Hardware IP and provides video decoding and encoding functions for compressed video stream.
Hardware Address	-	A memory address that is accessible from Hardware IPs.

2. Functions

Video Encoder Media Component is a media component which provides functions to encode raw video to compressed stream according to each codec standard. Video Encoder Media Component receives raw video data on the input port and emits the encoded video data on the output ports.

2.1. Function Details

2.1.1. Multi Stream Encoding

OMX Video Decoder and OMX Video Encoder provide simultaneous multi stream processing. The maximum number of streams that OMX Video Decoder and OMX Video Encoder guarantee to process simultaneously is 2 per a VCP hardware instance. For example, the maximum number of streams for a LSI which has 2 VCP hardware instances is 4. When the total number of streams exceeds the maximum number, the performance must be checked by user to ensure the system requirement.

2.1.2. Error Handling

When Video Encoder Media Component detects an error that affects continuous processing, Video Encoder Media Component notifies an error event (OMX_ErrorStreamCorrupt) to the IL client. Once an error event notified, Video Encoder Media Component stops the encode operation and the state transition to OMX_StateIdle state is required to restart the encode operation. For the details of the error handling, see section 7.1.

In the case where the IL client specifies unsupported combination of the encoding parameters, Video Encoder Media Component adjusts the parameters automatically to start the encode operation. The IL client can confirm the result of the adjustment via OMX_GetParameter and OMX_GetConfig, if the encoded stream data is not as expected.

2.2. Port

2.2.1. Port

Table 2-1 lists the ports of Video Encoder Media Component.

Table 2-1 Ports of Video Encoder Media Component

Port Index	Domain	Direction
VPB+0	video	input
VPB+1	video	output

For the available indexes of each port, see section 5.3.

2.3. Data Flow

Figure 2-1 illustrates the data flow of Video Encoder Media Component.
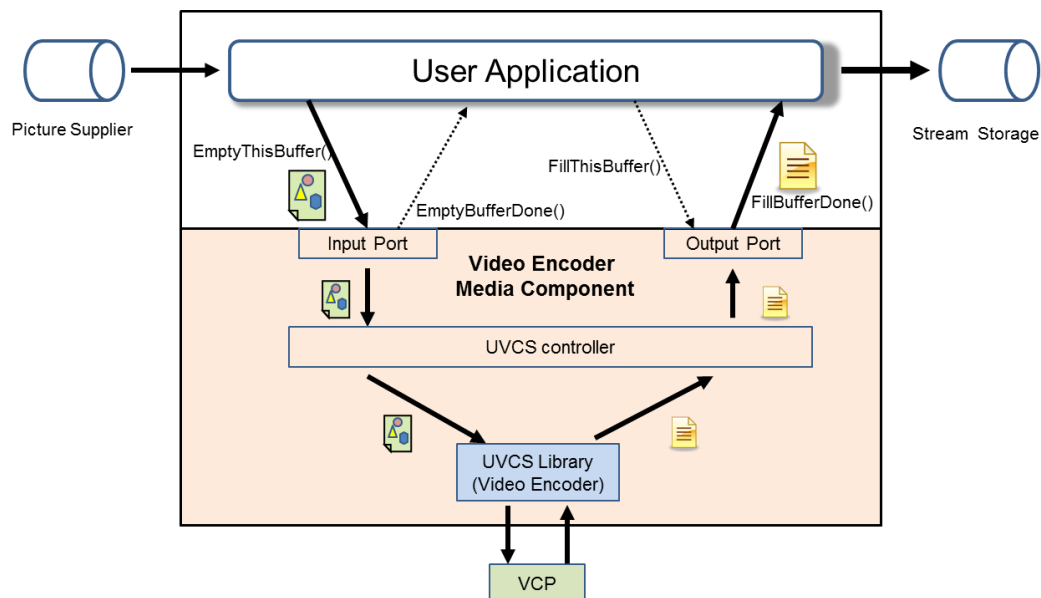
Figure 2-1 Data Flow of Video Encoder Media Component

3. I/O Data Format

3.1. Buffer Payload

3.1.1. Input Buffer Payload

Figure 3-1 illustrates the input buffer sequence of Video Encoder Media Component. One input picture data is stored in a single buffer.
Regarding the end of stream, see section 6.9.1.
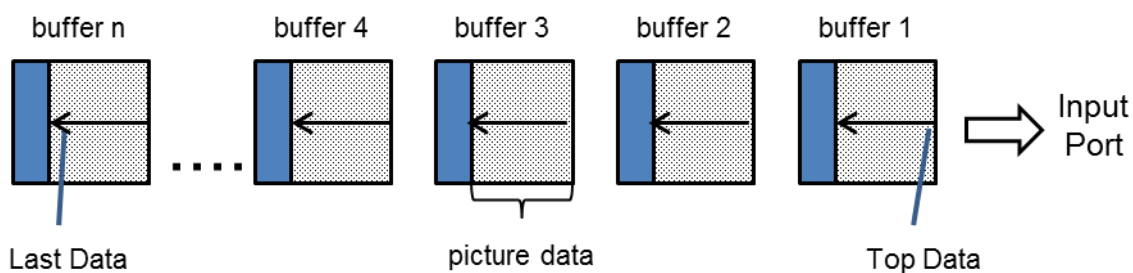
Figure 3-1 Input Buffer Sequence

3.1.2. Output Buffer Payload

The output buffer payload depends on the codec component. See Media Component User's Manual for each codec component.

3.2.   Input Picture Data Format

Video Encoder Media Component supports the four input formats: YUV420 Planar (I420, YV12) and YUV420 Semi Planar (NV12 and NV21). The input format can be specified via the OMX_IndexParamPortDefinition index and the OMX_IndexParamVideoPortFormat index. For the detail of the picture formats, see 6.1. For the details of the indexes, see 5.1.1 and 5.1.2.

Video Encoder Media Component supports the progressive encoding and the interlace encoding. The encoding mode is specified by the OMXR_MC_IndexParamVideoPictureMemoryAlloc index. For the details of the index and the memory arrangement for each setting, see section 6.8.

3.3. Output Stream Data Format

The format of output stream data depends on the specifications of each codec component. See Media Component User's Manual for each codec component.

4. API Reference

Video Encoder Media Component inherits the API specifications from related document [1]. This section describes only the difference that depends on Video Encoder Media Component.

4.1. OpenMAX IL Macro Functions

4.1.1. OMX_UseBuffer

[Reference]   Related document [1]

[Description]
- OMX_UseBuffer is supported for the input port.
- The *nSizeBytes* parameter must be set the same value with the *nBufferSize* member of the OMX_PARAM_PORTDEFINITIONTYPE structure that is obtained via OMX_GetParameter().
- The *pBuffer* parameter must be an address that is accessible from the Hardware IP (i.e. "hardware address", for the detail of this, see related document [3]). When input color format is YUV Planar format (e.g. OMX_COLOR_FormatYUV420Planar or OMX_COLOR_FormatYVU420Planar), the setting value of pBuffer must be 1024 byte-aligned address, otherwise 128 byte-aligned address.

[Notes]   None

5. Indexes

5.1. Standard Indexes of Video Encoder Media Component

Table 5-1 lists the OpenMAX IL standard indexes that are available for Video Encoder Media Component.

Table 5-1 Available Standard Indexes for Video Encoder Media Component

Index	Description
OMX_IndexParamPortDefinition	See section 5.1.1
OMX_IndexParamVideoPortFormat	See section 5.1.2
OMX_IndexParamVideoBitrate	See section 5.1.3
OMX_IndexParamVideoProfileLevelQuerySupported	See section 5.1.4
OMX_IndexParamVideoProfileLevelCurrent	See section 5.1.5
OMX_IndexConfigVideoBitrate	See section 5.1.6
OMX_IndexConfigVideoFramerate	See section 5.1.7
OMX_IndexConfigVideoIntraVOPRefresh	See section 5.1.8

5.1.1. OMX_IndexParamPortDefinition

[Description]   The index to access the video port information such as picture size and the color format for both the input port and the output port.

[Corresponding Structure]   OMX_VIDEO_PORTDEFINITIONTYPE structure

[Notes]   None

5.1.2. OMX_IndexParamVideoPortFormat

[Description]   The index to query the supported formats.

[Corresponding Structure]   OMX_VIDEO_PARAM_PORTFORMATTYPE structure

[Notes]   None

5.1.3. OMX_IndexParamVideoBitrate

[Description]   The index to specify the type of the bit rate control for the encoding.

[Corresponding Structure]   OMX_VIDEO_PARAM_BITRATETYPE structure

[Notes]   None

5.1.4. OMX_IndexParamVideoProfileLevelQuerySupported

[Description]   The index to query the profiles and the levels that are supported by the Video
                                     Encoder Media Component.

[Corresponding Structure]   OMX_VIDEO_PARAM_PROFILELEVELTYPE structure

[Notes]   None

5.1.5. OMX_IndexParamVideoProfileLevelCurrent

[Description]   The index to get the profiles and the levels of the stream that is processing by
                                     the Video Encoder Media Component.

[Corresponding Structure]   OMX_VIDEO_PARAM_PROFILELEVELTYPE structure

[Notes]   None

5.1.6. OMX_IndexConfigVideoBitrate

[Description]   The index to access the target bit rate for the video encoding.

[Corresponding Structure]   OMX_VIDEO_CONFIG_BITRATETYPE structure

[Notes]   None

5.1.7. OMX_IndexConfigVideoFramerate

[Description]   The index to access the frame rate for the video encoding.

[Corresponding Structure]   OMX_CONFIG_FRAMERATETYPE structure

[Notes]   None

5.1.8. OMX_IndexConfigVideoIntraVOPRefresh

[Description]   The index to force the next video frame to be encoded as an I-VOP.

[Corresponding Structure]   OMX_CONFIG_INTRAREFRESHVOPTYPE structure

[Notes]   None

5.2. Extended Indexes of Video Encoder Media Component

Table 5-2 lists the OMX extended indexes that are available for Video Encoder Media Component.

Table 5-2 Available extended indexes for Video Encoder Media Component

Index	Description
OMXR_MC_IndexParamVideoPictureMemoryAlloc	See section 5.2.1

5.2.1. OMXR_MC_IndexParamVideoPictureMemoryAlloc

[Description]   The index to specify the type of the memory arrangement of the input picture data.

[String]   "OMX.RENESAS.INDEX.PARAM.VIDEO.PICTURE.MEMORY.ALLOC"

[Corresponding Structure] OMXR_MC_VIDEO_PARAM_PICTURE_MEMORY_ALLOCTYPE structure

[Notes]   None

5.3. Valid Indexes for OpenMAX IL Macro Functions

Table 5-3 shows which index is available for each port and which OpenMAX IL Macro function can be called to access the index.

Table 5-3 Valid Indexes and OpenMAX IL Macro Function

PortIndex	Index	Get/SetParameter		Get/SetConfig	
		Get	Set	Get	Set
VPB+0	OMX_IndexParamPortDefinition	X	X	-	-
	OMX_IndexParamVideoPortFormat	X	X	-	-
	OMX_IndexConfigVideoFramerate	-	-	X	X
	OMXR_MC_IndexParamVideoPictureMemoryAlloc	X	X	-	-
VPB+1	OMX_IndexParamPortDefinition	X	X	-	-
	OMX_IndexParamVideoPortFormat	X	X	-	-
	OMX_IndexParamVideoBitrate	X	X	-	-
	OMX_IndexParamVideoProfileLevelQuerySupported	X	-	-	-
	OMX_IndexParamVideoProfileLevelCurrent	X	X	-	-
	OMX_IndexConfigVideoBitrate	-	-	X	X
	OMX_IndexConfigVideoFramerate	-	-	X	-
	OMX_IndexConfigVideoIntraVOPRefresh	-	-	X	X

X :   Valid
- :   Invalid

6.   Structures

Table 6-1 lists Video Encoder Media Component specific structures.

Table 6-1 Video Encoder Media Component Specific Structures

Structure Name	Description
OMX_VIDEO_PORTDEFINITIONTYPE	See section 6.1
OMX_VIDEO_PARAM_PORTFORMATTYPE	See section 6.2
OMX_VIDEO_PARAM_BITRATETYPE	See section 6.3
OMX_VIDEO_PARAM_PROFILELEVELTYPE	See section 6.4
OMX_VIDEO_CONFIG_BITRATETYPE	See section 6.5
OMX_CONFIG_FRAMERATETYPE	See section 6.6
OMX_CONFIG_INTRAREFRESHVOPTYPE	See section 6.7
OMXR_MC_VIDEO_PARAM_PICTURE_MEMORY_ALLOCTYPE	See section 6.8

Table 6-2 shows the notation for the access attribute of a structure member described in this section.

Table 6-2 Notation for the access attribute of a structure member

Member Name	Get	Set
Indicates the member name	Indicates the access attribute of the member in the OMX_GetParameter() or OMX_GetConfig(). "R" means IL client can get a value from the member. "W" means IL client must specify a value for the member.	Indicates the access attribute of the member in the OMX_SetParameter() or OMX_SetConfig(). "W" means IL client must/can specify a value for the member. "-" means a specified value is ignored and not reflected.

6.1. OMX_VIDEO_PORTDEFINITIONTYPE

6.1.1. OMX_VIDEO_PORTDEFINITIONTYPE (Input Port)

[Definition]   See related document [2] 4.3.4.

[Index]   OMX_IndexParamPortDefinition

[Member]

Member Name	Get	Set
cMIMEType	R	-
pNativeRender	R	-
nFrameWidth	R	W
nFrameHeight	R	W
nStride	R	W
nSliceHeight	R	W
nBitrate	R	-
xFramerate	R	W
bFlagErrorConcealment	R	-
eCompressionFormat	R	-
eColorFormat	R	W
pNativeWindow	R	-

[Notes]   None.

[Details]

cMIMEType

Write Value	-
Read Value	NULL
Initial Value	NULL
Notes	-

pNativeRender

Write Value	-
Read Value	NULL
Initial Value	NULL
Notes	-

nFrameWidth

Write Value	80 - 1920
Read Value	(Current setting)
Initial Value	176
Notes	– It is in units of pixels and must be multiple of 8. Otherwise OMX_SetParameter returns an error. – An odd value is rounded down to the closest even value.

nFrameHeight

Write Value	80 - 1080
Read Value	(Current setting)
Initial Value	144
Notes	– It is in units of pixels and must be multiple of 8. Otherwise OMX_SetParameter returns an error. – An odd value is rounded down to the closest even value.

nStride

Write Value	96 – 2048
Read Value	(Current setting)
Initial Value	192
Notes	– When input color format is YUV Planar format (e.g. OMX_COLOR_FormatYUV420Planar or OMX_COLOR_FormatYVU420Planar), the setting value must be 256, 512, 1024 or 2048. Otherwise, the setting value must be multiple of 128. For a detail of color format, see description about eColorFormat member in OMX_VIDEO_PORTDEFINITIONTYPE. – It is in units of pixels and must be multiple of 32. Otherwise OMX_SetParameter returns an error. – An odd value is rounded down to the closest even value. – If the *nFrameWidth* exceeds the *nStride*, OMX_SetParameter returns an error.

nSliceHeight

Write Value	80 - 1088
Read Value	(Current setting)
Initial Value	144
Notes	– It is in units of pixels and must be multiple of 2. Otherwise OMX_SetParameter returns an error. – An odd value is rounded down to the closest even value. – If the *nFrameHeight* exceeds the *nSliceHeight*, OMX_SetParameter returns an error.

nBitrate

Write Value	-
Read Value	0
Initial Value	0
Notes	– The *nBitrate* for the input port is fixed to 0. To set the target bit rate for the video encoding, set the *nBitrate* member for the output port.

xFramerate

– See each Media Component User's Manual.
– This parameter is the same as the *xFramerate* member of OMX_VIDEO_PARAM_PORTFORMATTYPE(InputPort) structure and the *xEncodeFramerate* of OMX_VIDEO_CONFIG_FRAMERATETYPE(InputPort). When either is updated, the others are updated with the same value.

bFlagErrorConcealment

Write Value	-
Read Value	OMX_FALSE
Initial Value	OMX_FALSE
Notes	This member is not supported.

eCompressionFormat

Write Value	-
Read Value	OMX_VIDEO_CodingUnused
Initial Value	OMX_VIDEO_CodingUnused
Notes	-

eColorFormat

Write Value	OMX_COLOR_FormatYUV420SemiPlanar
	OMX_COLOR_FormatYVU420SemiPlanar
	OMX_COLOR_FormatYUV420Planar
	OMX_COLOR_FormatYVU420Planar
Read Value	(Current setting)
Initial Value	OMX_COLOR_FormatYUV420SemiPlanar
Notes	– For the byte and the plane order of each format, see Figure 6-1 and Figure 6-2.
	– The memory arrangement of the input picture is determined by the combination of this member and the OMXR_MC_VIDEO_PARAM_PICTURE_MEMORY_ALLOCTYPE structure. For the details, see section 6.8.

pNativeWindow

Write Value	-
Read Value	NULL
Initial Value	NULL
Notes	This member is not supported.
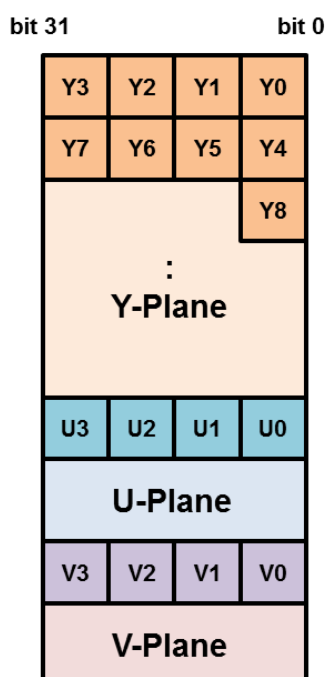
YUV420 Planar
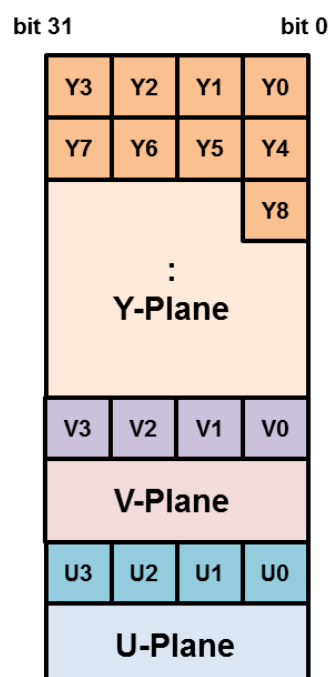
YVU420 Planar

Figure 6-1 Byte and Plane Order: YUV420 Planar and YVU 420 Planar
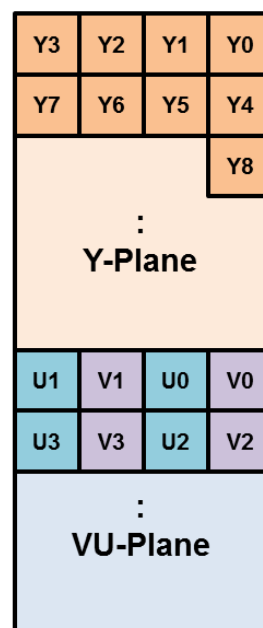
YUV420 SemiPlanar   YVU420 SemiPlanar

Figure 6-2 Byte and Plane Order: YUV420 SemiPlanar and YVU 420 SemiPlanar

6.1.2. OMX_VIDEO_PORTDEFINITIONTYPE (Output Port)

[Definition]   See related document [2] 4.3.4.

[Index]   OMX_IndexParamPortDefinition

[Member]

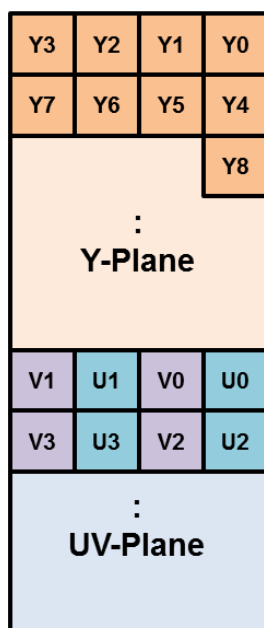| Member Name	Get	Set
cMIMEType	R	-
pNativeRender	R	-
nFrameWidth	R	W
nFrameHeight	R	W
nStride	R	W
nSliceHeight	R	W
nBitrate	R	W
xFramerate	R	-
bFlagErrorConcealment	R	-
eCompressionFormat	R	W
eColorFormat	R	-
pNativeWindow	R	-

[Notes]   None.

[Details]

cMIMEType

Write Value	-
Read Value	NULL
Initial Value	NULL
Notes	-

pNativeRender

Write Value	-
Read Value	NULL
Initial Value	NULL
Notes	-

nFrameWidth

Write Value	80 - 1920
Read Value	(Current setting)
Initial Value	176
Notes	− An odd value is rounded down to the closest even value. − No effects on the encode processing.

nFrameHeight

Write Value	80 - 1920
Read Value	(Current setting)
Initial Value	144
Notes	− An odd value is rounded down to the closest even value. − No effects on the encode processing.

nStride

Write Value	80 - 2048
Read Value	(Current setting)
Initial Value	192
Notes	– An odd value is rounded down to the closest even value. – No effects on the encode processing. – This member must be multiple of 32.

nSliceHeight

Write Value	80 - 1088
Read Value	(Current setting)
Initial Value	144
Notes	– An odd value is rounded down to the closest even value. – No effects on the encode processing.

nBitrate
– See each Media Component User's Manual.
– This parameter is the same as the *nTargetBitrate* member of OMX_VIDEO_PARAM_BITRATETYPE structure. When either is updated, the other is updated with the same value.

xFramerate
– See each Media Component User's Manual.
– This member is updated based on the frame rate of the stream that is currently encoding.

bFlagErrorConcealment

Write Value	-
Read Value	OMX_FALSE
Initial Value	OMX_FALSE
Notes	-

eCompressionFormat
– See each Media Component User's Manual.
– This parameter is the same as the *eComporessionFormat* member of OMX_VIDEO_PARAM_PORTFORMATTYPE(InputPort) structure. When either is updated, the other is updated with the same value.

eColorFormat

Write Value	-
Read Value	OMX_COLOR_FormatUnused
Initial Value	OMX_COLOR_FormatUnused
Notes	-

pNativeWindow

Write Value	-
Read Value	NULL
Initial Value	NULL
Notes	-

6.2. OMX_VIDEO_PARAM_PORTFORMATTYPE

6.2.1. OMX_VIDEO_PARAM_PORTFORMATTYPE (Input Port)

[Definition]   See related document [2] 4.3.5.

[Index]   OMX_IndexParamVideoPortFormat

[Member]

Member Name	Get	Set
nSize	W	W
nVersion	W	W
nPortIndex	W	W
nIndex	W	-
eCompressionFormat	R	-
eColorFormat	R	W
xFramerate	R	W

[Notes]   None.

[Details]

nSize

Write Value	The size of the structure in bytes.
Read Value	-
Initial Value	-
Notes	-

nVersion

Write Value	The version number of OpenMAX IL specifications 1.1.2
Read Value	-
Initial Value	-
Notes	-

nPortIndex

Write Value	VPB + 0
Read Value	-
Initial Value	-
Notes	-

nIndex

Write Value	0 - 3
Read Value	-
Initial Value	-
Notes	-

eCompressionFormat

Write Value	-
Read Value	OMX_VIDEO_CodingUnused
Initial Value	OMX_VIDEO_CodingUnused
Notes	-

eColorFormat

Write Value	OMX_COLOR_FormatYUV420SemiPlanar
	OMX_COLOR_FormatYUV420Planar
	OMX_COLOR_FormatYVU420SemiPlanar
	OMX_COLOR_FormatYVU420Planar
Read Value	OMX_COLOR_FormatYUV420SemiPlanar (nIndex = 0)
	OMX_COLOR_FormatYUV420Planar (nIndex = 1)
	OMX_COLOR_FormatYVU420SemiPlanar (nIndex = 2)
	OMX_COLOR_FormatYVU420Planar (nIndex = 3)
Initial Value	OMX_COLOR_FormatYUV420SemiPlanar
Notes	– On OMX_SetParameter, the value of the *eColorFormat* member is reflected in the *eColorFormat* member of the OMX_VIDEO_PORTDEFINITIONTYPE structure for the input port.

xFramerate

– See each Media Component User's Manual.
– This parameter is the same as the *xFramerate* member of OMX_VIDEO_PARAM_PORTDEFINITIONTYPE(InputPort) structure and the *xEncodeFramerate* of the OMX_VIDEO_CONFIG_FRAMERATETYPE(InputPort) structure. When either is updated, the others are updated with the same value.

6.2.2. OMX_VIDEO_PARAM_PORTFORMATTYPE (Output Port)

[Definition]   See related document [2] 4.3.5.

[Index]   OMX_IndexParamVideoPortFormat

[Member]

Member Name	Get	Set
nSize	W	W
nVersion	W	W
nPortIndex	W	W
nIndex	W	-
eCompressionFormat	R	W
eColorFormat	R	-
xFramerate	R	-

[Notes]   None.

[Details]

nSize

Write Value	The size of the structure in bytes.
Read Value	-
Initial Value	-
Notes	-

nVersion

Write Value	The version number of OpenMAX IL specifications 1.1.2
Read Value	-
Initial Value	-
Notes	-

nPortIndex

Write Value	VPB + 1
Read Value	-
Initial Value	-
Notes	-

nIndex
- See each Media Component User's Manual.

eCompressionFormat
- See each Media Component User's Manual.
- This parameter is the same as the *eComporessionFormat* member of OMX_VIDEO_PARAM_PORTDEFINITIONTYPE(InputPort) structure. When either is updated, the other is updated with the same value.

eColorFormat

Write Value	-
Read Value	OMX_COLOR_FormatUnused
Initial Value	OMX_COLOR_FormatUnused
Notes	-

xFramerate
- See each Media Component User's Manual.

6.3. OMX_VIDEO_PARAM_BITRATETYPE

[Definition]   See related document [2] 4.3.4.

[Index]   OMX_IndexParamVideoBitrate

[Member]

Member Name	Get	Set
nSize	W	W
nVersion	W	W
nPortIndex	W	W
eControlRate	R	W
nTargetBitrate	R	W

[Notes]   None.

[Details]

nSize

Write Value	The size of the structure in bytes.
Read Value	-
Initial Value	-
Notes	-

nVersion

Write Value	The version number of OpenMAX IL specifications 1.1.2
Read Value	-
Initial Value	-
Notes	-

nPortIndex

Write Value	VPB + 1
Read Value	-
Initial Value	-
Notes	-

eControlRate
  – See each Media Component User's Manual.

nTargetBitrate
  – See each Media Component User's Manual.
  – This parameter is the same as the *xBitrate* member of
    OMX_VIDEO_PARAM_PORTDEFINITIONTYPE(OutputPort) structure. When either
    is updated, the other is updated with the same value.
  – In the case of VBR, the maximum value of nTargetBitrate is half the CBR.
  – This parameter defines the peak bitrate and the initial target bitrate for encoding. In
    the case of CBR, the peak bitrate is set as *nTargetBitrate.*In the case of VBR, the peak
    bitrate is set to twice as large as *nTargetBitrate.*

6.4. OMX_VIDEO_PARAM_PROFILELEVELTYPE

[Definition]   See related document [2] 4.3.25.

[Index]   OMX_IndexParamVideoProfileLevelQuerySupported
   OMX_IndexParamVideoProfileLevelCurrent

[Member]

Member Name	Get	Set
nSize	W	W
nVersion	W	W
nPortIndex	W	W
eProfile	R	-
eLevel	R	-
nProfileIndex	W	-

[Notes]   None.

[Details]

nSize

Write Value	The size of the structure in bytes.
Read Value	-
Initial Value	-
Notes	-

nVersion

Write Value	The version number of OpenMAX IL specifications 1.1.2
Read Value	-
Initial Value	-
Notes	-

nPortIndex

Write Value	VPB + 1
Read Value	-
Initial Value	-
Notes	-

eProfile
- See each Media Component User's Manual.

eLevel
- See each Media Component User's Manual.

nProfileIndex
- See each Media Component User's Manual.

6.5. OMX_VIDEO_CONFIG_BITRATETYPE

[Definition]   See related document [2] 4.3.19.

[Index]   OMX_IndexConfigVideoBitrate

[Member]

Member Name	Get	Set
nSize	W	W
nVersion	W	W
nPortIndex	W	W
nEncodeBitrate	R	W

[Notes]   None.

[Details]

nSize

Write Value	The size of the structure in bytes.
Read Value	-
Initial Value	-
Notes	-

nVersion

Write Value	The version number of OpenMAX IL specifications 1.1.2
Read Value	-
Initial Value	-
Notes	-

nPortIndex

Write Value	VPB + 1
Read Value	-
Initial Value	-
Notes	-

nEncodeBitrate
− See each Media Component User's Manual.
− The range of the write value depends on the *nTargetBitrate* member of the
OMX_VIDEO_PARAM_BITRATETYPE structure.
The minimum is (*nTargetBitrate* / 4) and the maximum is *nTargetBitrate*.
− The value larger than the maximum is rounded down to the maximum.
− The value smaller than the minimum is rounded up to the minimum.

6.6.   OMX_CONFIG_FRAMERATETYPE

6.6.1.   OMX_CONFIG_FRAMERATETYPE (Input Port)

[Definition]   See related document [2] 4.3.20.

[Index]   OMX_IndexConfigVideoFramerate

[Member]

Member Name	Get	Set
nSize	W	W
nVersion	W	W
nPortIndex	W	W
xEncodeFramerate	R	W

[Notes]   If the OMX_CONFIG_FRAMERATETYPE structure is updated during
OMX_StateExecuting state or OMX_StatePause state via OMX_SetConfig function, the
updated setting is not applied until the Video Encoder Media Component transits to
OMX_StateIdle state.

[Details]

nSize

Write Value	The size of the structure in bytes.
Read Value	-
Initial Value	-
Notes	-

nVersion

Write Value	The version number of OpenMAX IL specifications 1.1.2
Read Value	-
Initial Value	-
Notes	-

nPortIndex

Write Value	VPB + 0
Read Value	-
Initial Value	-
Notes	-

xEncodeFramerate
–   See each Media Component User's Manual.
–   This parameter is the same as the *xFramerate* member of
OMX_VIDEO_PARAM_PORTDEFINITIONTYPE(InputPort) structure and the
xFramerate of OMX_VIDEO_PARAM_PORTFORMATTYPE(InputPort). When either
is updated, the others are updated with the same value.

6.6.2. OMX_CONFIG_FRAMERATETYPE (Output Port)

[Definition]   See related document [2] 4.3.20.

[Index]   OMX_IndexConfigVideoFramerate

[Member]

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

[Notes]   None.

[Details]

nSize

Write Value	The size of the structure in bytes.
Read Value	-
Initial Value	-
Notes	-

nVersion

Write Value	The version number of OpenMAX IL specifications 1.1.2
Read Value	-
Initial Value	-
Notes	-

nPortIndex

Write Value	VPB + 1
Read Value	-
Initial Value	-
Notes	-

xEncodeFramerate
– See each Media Component User's Manual.
– This member is updated based on the frame rate of the stream that is currently encoding.

6.7. OMX_CONFIG_INTRAREFRESHVOPTYPE

[Definition]   See related document [2] 4.3.21.

[Index]   OMX_IndexConfigVideoIntraVOPRefresh

[Member]

Member Name	Get	Set
nSize	W	W
nVersion	W	W
nPortIndex	W	W
IntraRefreshVOP	R	W

[Notes]   None.

[Details]

nSize

Write Value	The size of the structure in bytes.
Read Value	-
Initial Value	-
Notes	-

nVersion

Write Value	The version number of OpenMAX IL specifications 1.1.2
Read Value	-
Initial Value	-
Notes	-

nPortIndex

Write Value	VPB + 1
Read Value	-
Initial Value	-
Notes	-

IntraRefreshVOP

| Write Value	OMX_FALSE OMX_TRUE
Read Value	OMX_FALSE
Initial Value	OMX_FALSE
Notes	− If *IntraRefreshVOP* is set to OMX_TRUE, the Video Encoder Media Component tries to reset the input data immediately following the OMX_SetConfig call. − If *IntraRefreshVOP* is set to OMX_FALSE, the setting is ignored. − Figure 6-3 and Figure 6-4 are examples of the encoded buffer sequence with the intra refresh.
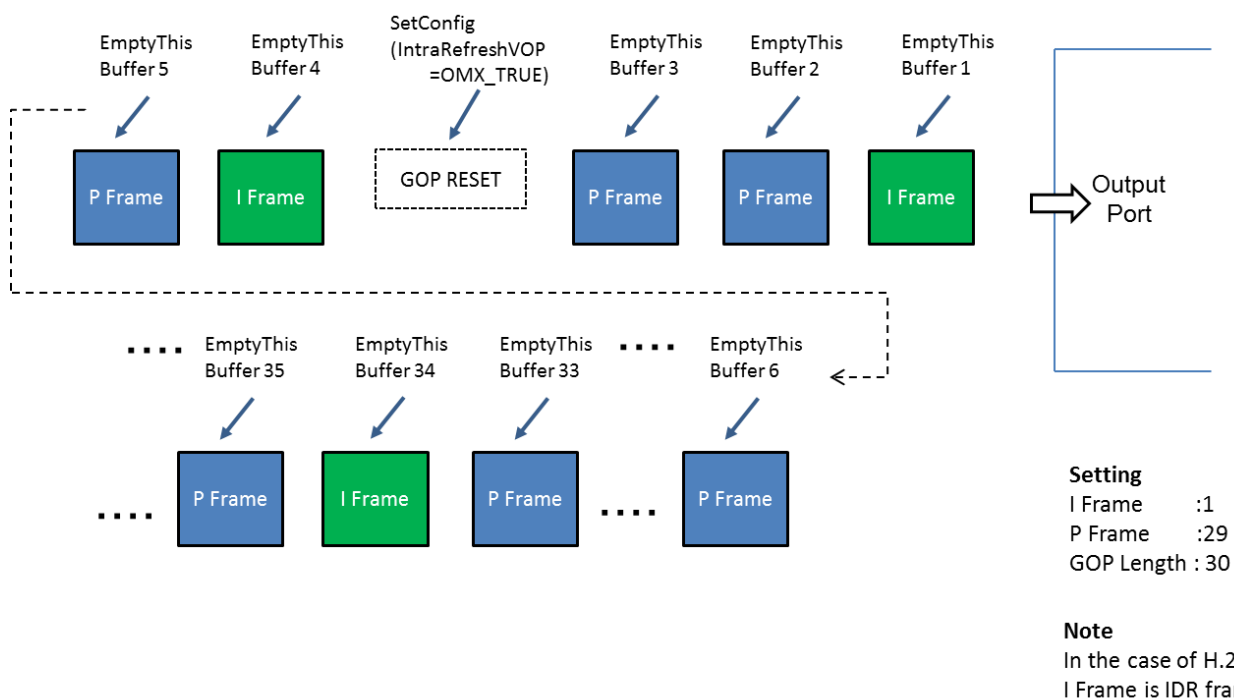
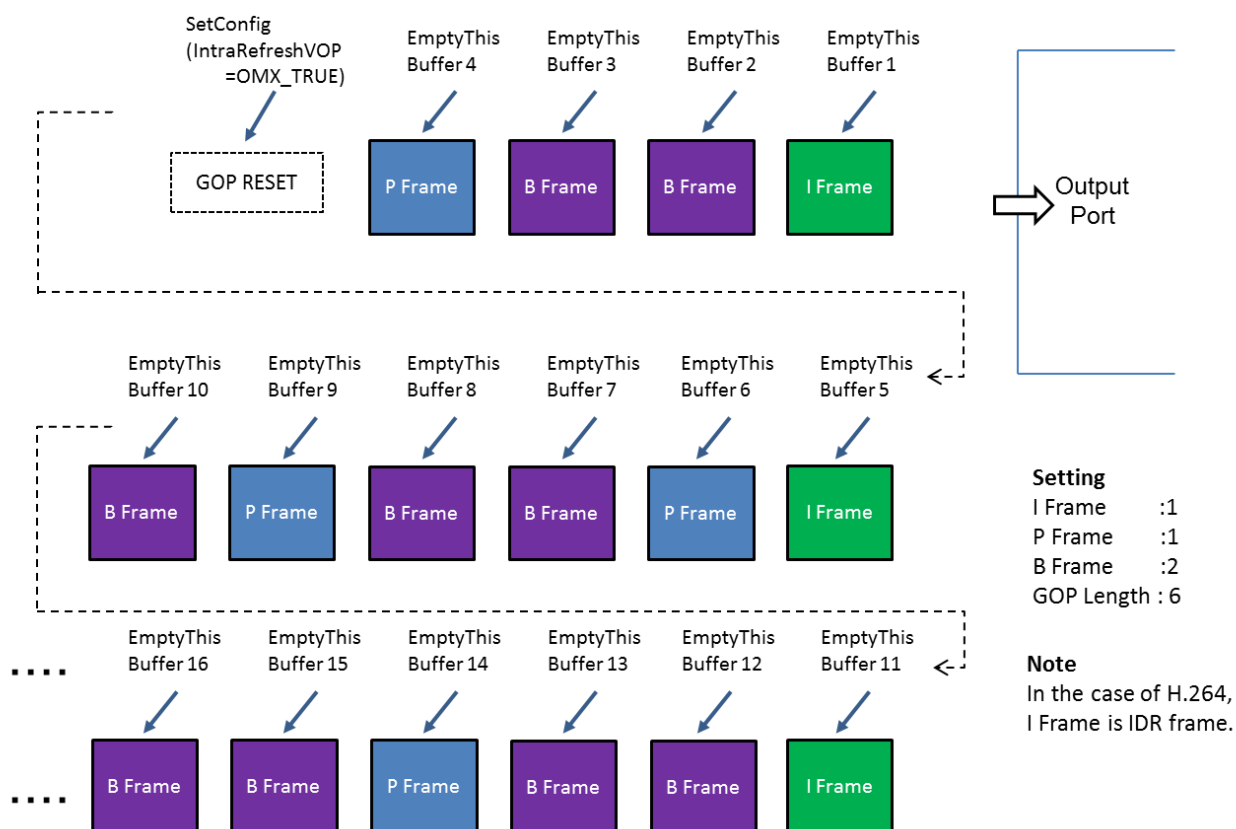Figure 6-3 Buffer Sequence Example with Intra Refresh (I/P Frame Case)

Figure 6-4 Buffer Sequence Example with Intra Refresh (I/P/B Frame Case)

6.8. OMXR_MC_VIDEO_PARAM_PICTURE_MEMORY_ALLOCTYPE

[Definition]   typedef struct tagOMXR_MC_VIDEO_PARAM_PICTURE_MEMORY_ALLOCTYPE {
        OMX_U32   *nSize*;
        OMX_VERSIONTYPE   *nVersion*;
        OMX_U32   *nPortIndex*;
        OMXR_MC_VIDEO_MEMORYALLOCTYPE *eMemoryAlloc*;
        OMX_BOOL   *bIPConvert*;
        OMX_BOOL   *bTLConvert*;
    } OMXR_MC_VIDEO_PARAM_PICTURE_MEMORY_ALLOCTYPE;

[Index]   OMXR_MC_IndexParamVideoPictureMemoryAlloc

[Member]

Member Name	Get	Set
nSize	W	W
nVersion	W	W
nPortIndex	W	W
eMemoryAlloc	R	W
bIPConvert	R	-
bTLConvert	R	-

[Notes]   This index is used to specify the arrangement and the field order of the input picture data.

[Details]

nSize

Write Value	The size of the structure in bytes.
Read Value	-
Initial Value	-
Notes	-

nVersion

Write Value	The version number of OpenMAX IL specifications 1.1.2
Read Value	-
Initial Value	-
Notes	-

nPortIndex

Write Value	VPB + 1
Read Value	-
Initial Value	-
Notes	-

eMemoryAlloc

Write Value	OMXR_MC_VIDEO_MemAllocFrame: Frame Arrangement OMXR_MC_VIDEO_MemAllocFieldTff: Field Arrangement and the field order is top field first. OMXR_MC_VIDEO_MemAllocFieldBff: Field Arrangement and the field order is bottom field first.
Read Value	(Current setting)
Initial Value	OMXR_MC_VIDEO_MemAllocFrame
Notes	– To encode the progressive stream, set to OMXR_MC_VIDEO_MemAllocFrame. For the details of the memory arrangement, see Figure 6-5 and Figure 6-6. – To encode the interlaced stream, set to OMXR_MC_VIDEO_MemAllocFieldTff or OMXR_MC_VIDEO_MemAllocFieldBff. For the details of the memory arrangement, see Figure 6-7 and Figure 6-8.

bIPConvert

Write Value	-
Read Value	OMX_FALSE
Initial Value	OMX_FALSE
Notes	This member is not supported.

bTLConvert

Write Value	-
Read Value	OMX_FALSE
Initial Value	OMX_FALSE
Notes	This member is not supported.
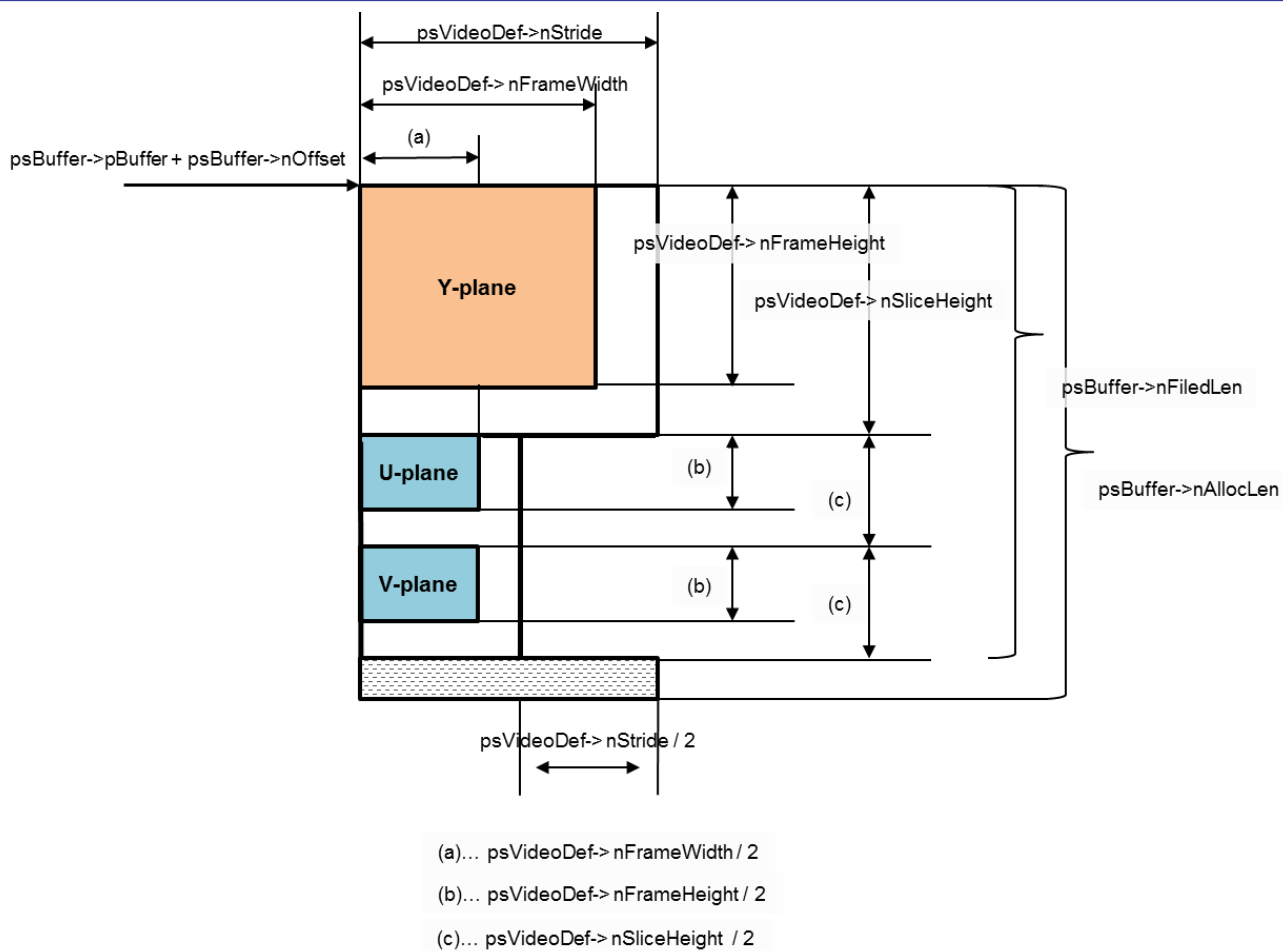
Figure 6-5 Picture Format and Parameters: YUV420 Planar – Frame Arrangement
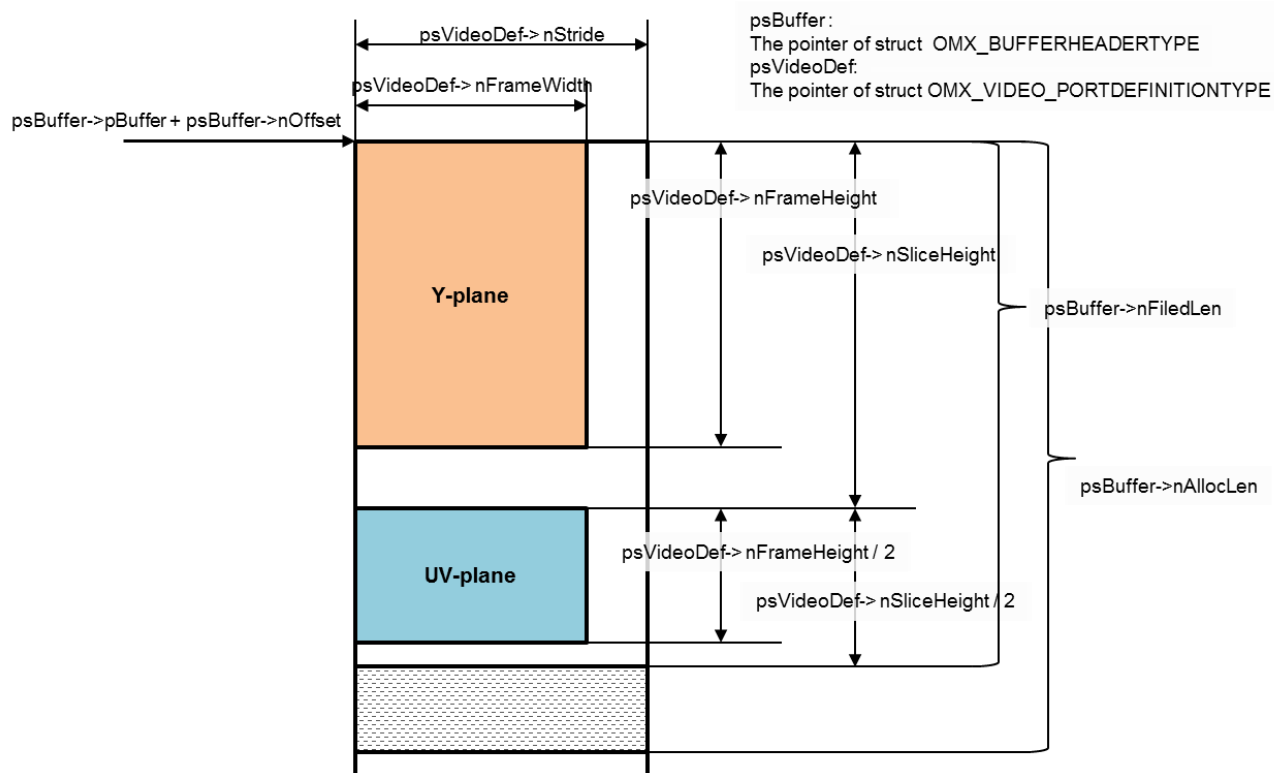
Figure 6-6 Picture Format and Parameters: YUV420 SemiPlanar – Frame Arrangement
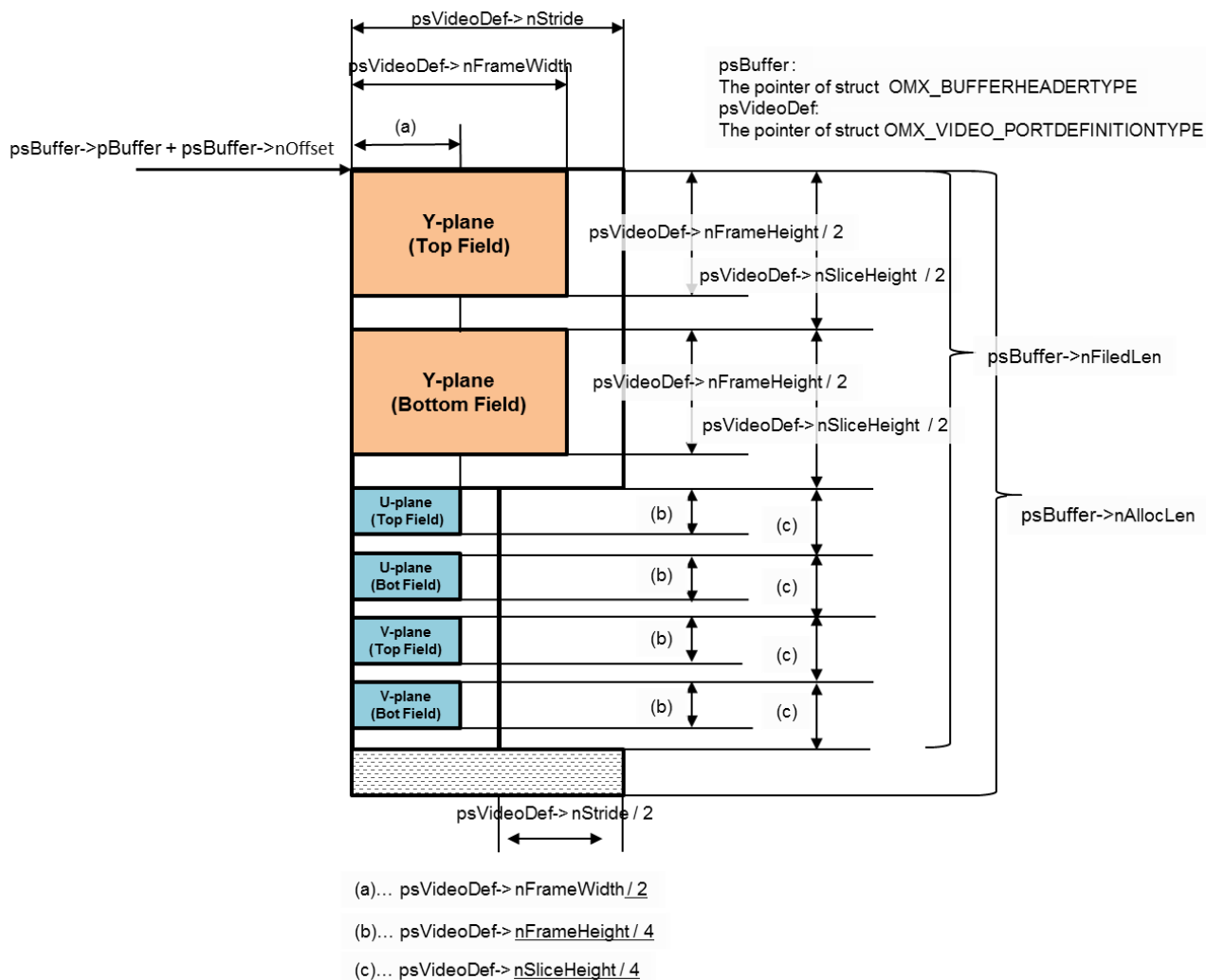
Figure 6-7 Picture Format and Parameters: YUV420 Planar – Field Arrangement
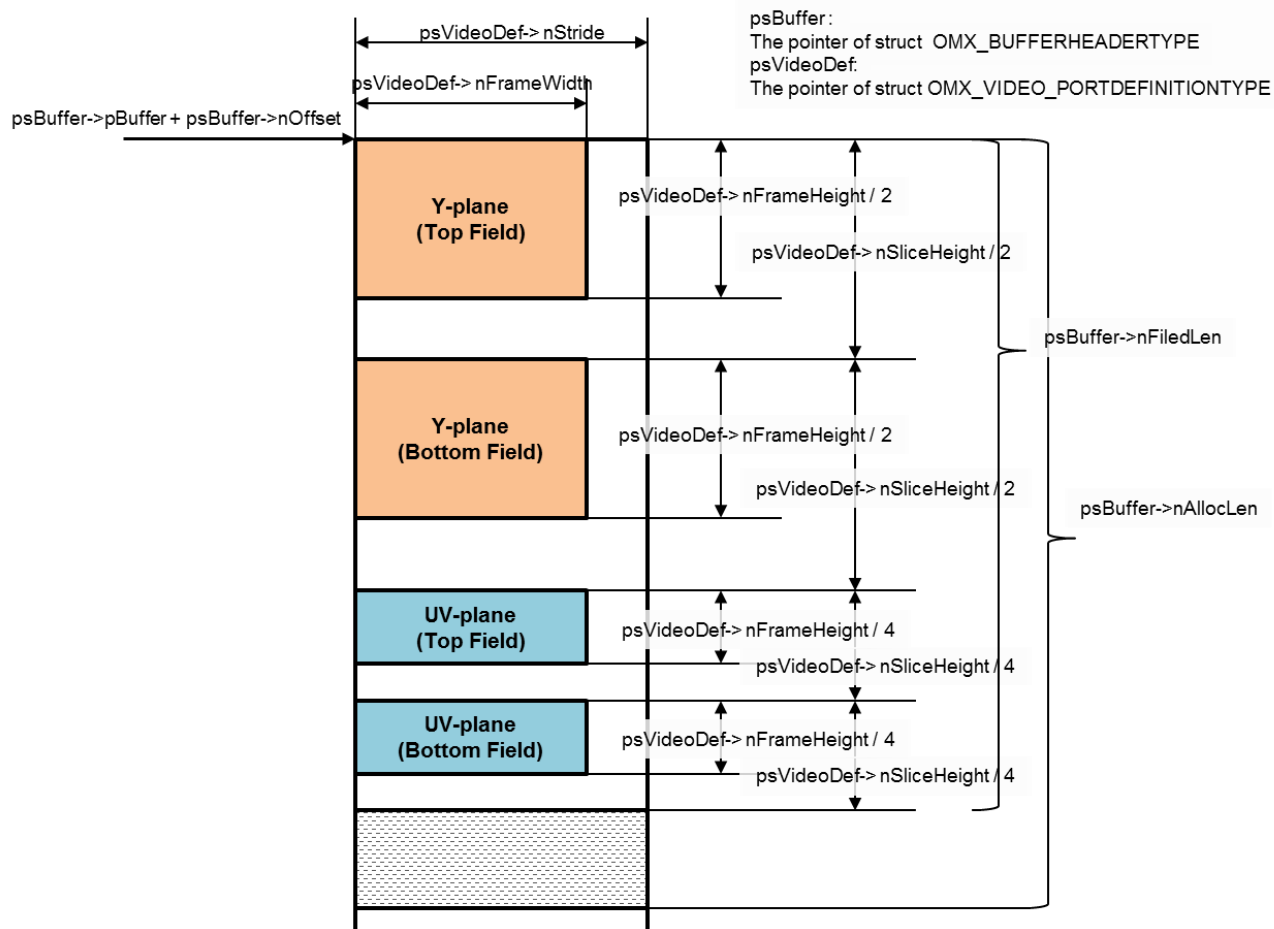
Figure 6-8 Picture Format and Parameters: YUV420 SemiPlanar – Field Arrangement

6.9. Specific Usage on Common Structure Members

Table 6-3 describes Video Encoder Media Component specific usage of the structures that are described in related document [1].

Table 6-3 Specific Usage on Common Structure Members

| Structure	Member	Description
OMX_BUFFERHEADER TYPE	nTickCount	The nTickCount member of the input buffer can be set to any value. Video Encoder Media Component propagates the value to its associated output buffer.
	nTimeStamp	The nTimeStamp member of the input buffer can be set to any value. Video Encoder Media Component propagates the value to its associated output buffer.
	pInputPortPrivate	For the input port, the "hardware address" of the pBuffer is stored. For the detail of "hardware address", see related document [3].
	pOutputPortPrivate	This member must not be modified by the IL client.
	nFlags	For the details, see section 6.9.1.
	nOffset	The nOffset member is ignored and updated by zero on (*EmptyBufferDone) and (*FillBufferDone) callbacks.
OMX_PARAM_ PORTDEFINITIONTYPE	nBufferCoutActual	It can be set in the range nBufferCountMin to 32. [input port] The default value is 5. The maximum setting value for the operation guarantee is 5. [output port] The default value is 2. The maximum setting value for the operation guarantee is 5.
	nBufferCountMin	[input port] 2 (read only) 2 is the minimum number in the case where the B frame is not used for the video encoding. The required number of the buffers depends on the number of the B frames. For the details of the B frame setting, see each Media Component User's Manual. [output port] 2 (read only)
	nBufferSize	[input port] nBufferSize is calculated by using the nStride member and the nSliceHeight member of the OMX_VIDEO_PORTDEFINITIONTYPE structure as follows: $nBufferSize = (nStride \times nSliceHeight \times 3) / 2$ [output port] 3,110,400 (maximum)
	format	See section 6.1.1 and 6.1.2.

6.9.1. Buffer Flags (*nFlags*)

Table 6-4 shows the usage of the *nFlags* member of the OMX_BUFFERHEADERTYPE structure. For the basic definition of these flags, see related document [2].

Table 6-4 Specific Usage on Buffer Flags

flag	Description
OMX_BUFFERFLAG_EOS	[Input Buffer] The IL client can select the two patterns of EOS buffer sequence as illustrated in Figure 6-9. [Output Buffer] The Video Encoder Media Component returns the buffer with this flag after the buffer contains the last output picture data as illustrated in Figure 6-10.
OMX_BUFFERFLAG_STARTTIME	Video Encoder Media Component propagates the flag of an input buffer to the output buffer without any operations.
OMX_BUFFERFLAG_DECODEONLY	
OMX_BUFFERFLAG_DATACORRUPT	
OMX_BUFFERFLAG_ENDOFFRAME	Since the IL client must store one input picture data into a single buffer for Video Encoder Media Component, all the input buffers must have this flag. For the buffer sequence, see Figure 6-11.
OMX_BUFFERFLAG_SYNCFRAME	This flag is set when the output buffer is an intra-frame.
OMX_BUFFERFLAG_EXTRADATA	Video Encoder Media Component propagates the flag of an input buffer to the output buffer without any operations.
OMX_BUFFERFLAG_CODECCONFIG	See each Media Component User's Manual.

<u>DATA+EOS case</u>: Set EOS flag to the last data buffer.
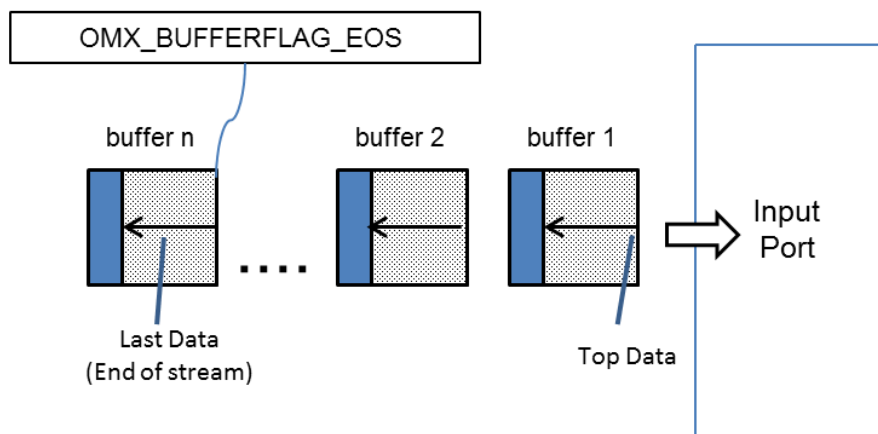
<u>0+EOS case</u>: Set EOS flag to the next buffer(with no data) after last data buffer.
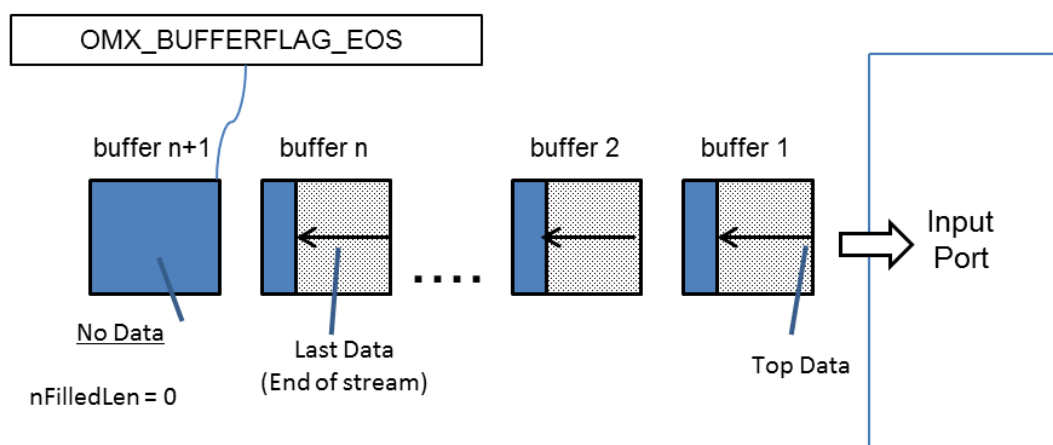
Figure 6-9 Input Buffer Sequence: OMX_BUFFERFLAG_EOS Flag Usage
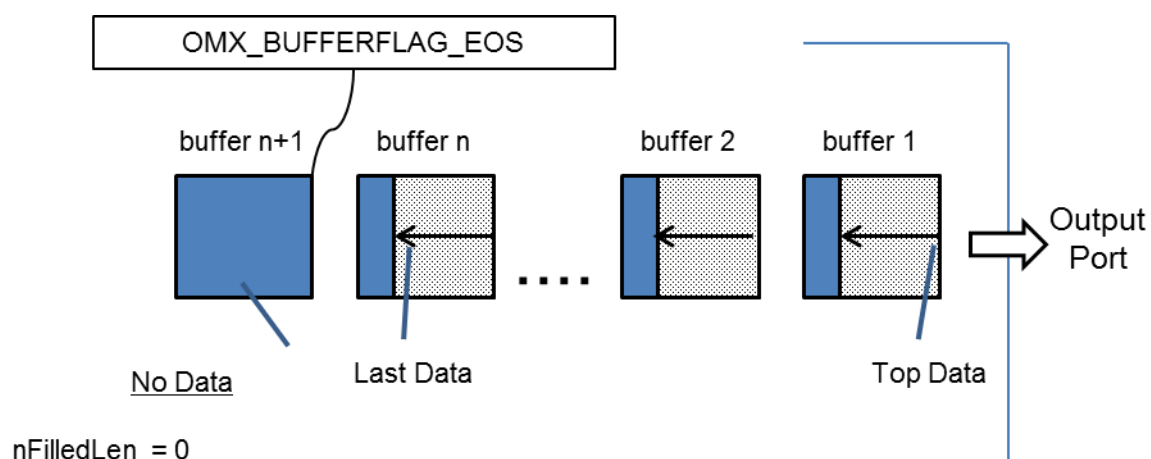
Figure 6-10 Output Buffer Sequence: OMX_BUFFERFLAG_EOS Flag Usage
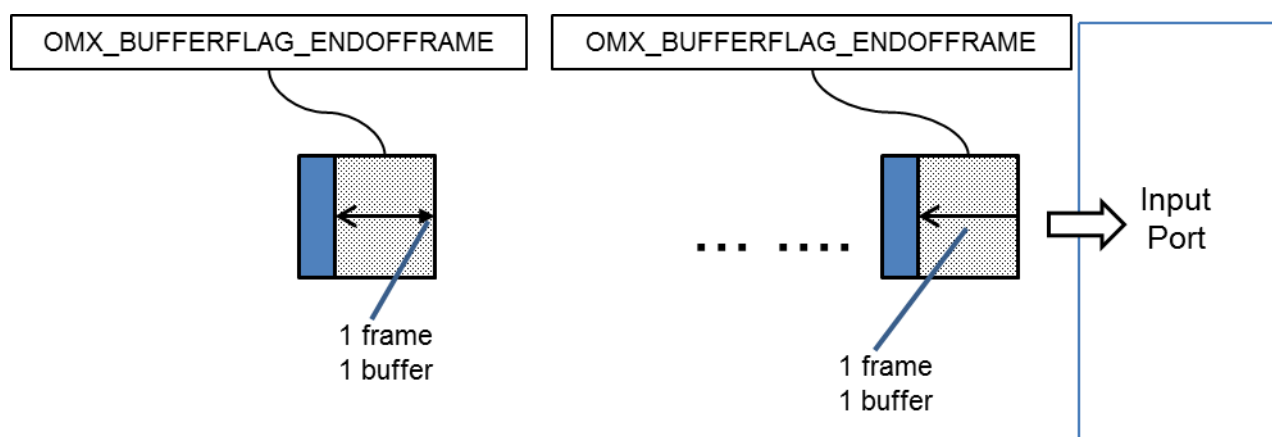
Figure 6-11 Input Buffer Sequence: OMX_BUFFERFLAG_ENDOFFRAME Flag Usage

7. Appendix

7.1. Errors and Error Handling

Table 7-1 shows the description for the flow control and stream errors and how to handle the errors.

Table 7-1 Errors and Error Handling

Error Code	Description
OMX_ErrorStreamCorrupt	[Reason] This error is reported via event callback when an error is detected that Video Encoder Media Component cannot continue the operation. [Error Handling] To resume the encode operation it requires the state transition to OMX_StateIdle state.
OMX_ErrorOverflow	[Reason] The Video Encoder Media Component receives a buffer that is already received from the IL client via OMX_EmptyThisBuffer or OMX_FillThisBuffer. [Error Handling] Although it is possible to continue the encode operation, make sure that the buffer management and the API sequence are correct in the IL client side.
OMX_ErrorUnderflow	[Reason] Video Encoder Media Component does not return this error code. [Error Handling] None.

7.2. Attentions on Port Flush Operation

Regarding the port flush and the port disable operation for Video Encoder Media Component the following items should be noticed:

- When the IL client flushes or disables a port of Video Encoder Media Component, all the ports should be flushed or disabled.

7.3. Restrictions and workarounds

7.3.1. nBufferSize parameter in OMX_PARAM_PORTDEFINITIONTYPE

Restriction:
If OMX_PARAM_PORTDEFINITIONTYPE.nBufferSize is greater than 3,133,440 and
OMX_PARAM_PORTDEFINITIONTYPE.nPortIndex is 0, OMX_SetParameter returns error.

Workaround:
OMX_PARAM_PORTDEFINITIONTYPE.nBufferSize must be equal to 3,133,440 when you call
OMX_SetParameter with OMX_PARAM_PORTDEFINITIONTYPE.nPortIndex=0.
OMX_PARAM_PORTDEFINITIONTYPE.nBufferSize is updated according to the equation shown in Table 6-3 if
OMX_SetParameter returns OMX_ErrorNone.

REVISION HISTORY	OMX Media Component User's Manual : Video Encoder Common Part

Rev.	Date	Description	
		Page	Summary
0.02	Feb. 7, 2014	—	Draft revision based on Japanese User's Manual Rev.0.02.
0.03	Mar. 26, 2014	—	- Add the description about the member relation between several structures. - Add the description about target bitrate and peak bitrate in 6.3. 　OMX_VIDEO_PARAM_BITRATETYPE. - Add the description about the range of the bitrate setting in 6.5. 　OMX_VIDEO_CONFIG_BITRATETYPE - Correct the description about the default value of the nBufferCoutActual 　member.
0.04	May. 22, 2014	—	- Correct the description about the max bitrate value in 6.3. 　OMX_VIDEO_PARAM_BITRATETYPE. - Correct the description about the max bitrate value in 6.3.6.5. 　OMX_VIDEO_CONFIG_BITRATETYPE. - Remove the description about the operation of the after flush or port disable in 　7.2.Attentions on Port Flush Operation.
0.0.5	Jul.24.2014	21	- Add description about restriction of nStride in 6.1.1. OMX_VIDEO_PORTDEFINITIONTYPE (Input Port). - Change maximum setting value of nStride to 2048.
		14	- Add description about restriction of pBuffer in 4.1.1.OMX_UseBuffer.
1.0.0	Aug. 21, 2014	14	- Fixed section 4.1.1.OMX_UseBuffer.
	Aug. 21, 2014	43	- Fixed Table 0-1.
	Aug. 26, 2014	25	Change "80 – 1920" of nStride to "80 – 2048".
		30	Change eProfileIndex to nProfileIndex.
		31	Change eEncodeBitrate to nEncodeBitrate.
		34	Change xEncodeFramerate to IntraRefreshVOP.
		5	Change "all video decoders" to "all video encoders".
		40	Change "the decode operation" to "the encode operation".
	Aug. 27, 2014	45	Fixed Figure 0-1
1.01	Dec. 15. 2014	42	Change the description of nBufferCountActual.
1.02	Jan. 15, 2015	48	Add Section 7.3

RENESAS

OMX Media Component

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