|  |  |
| --- | --- |
| **Joint Collaborative Team on Video Coding (JCT-VC)**  **of ITU-T SG 16 WP 3 and ISO/IEC JTC 1/SC 29/WG 11**  10th Meeting: Stockholm, Sweden, 11– 20 July 2012 | Document: JCTVC-J0366 |

|  |  |  |  |
| --- | --- | --- | --- |
| *Title:* | **Cross-check of J0218 on Bi-pred merge restriction for small PUs** | | |
| *Status:* | Input Document to JCT-VC | | |
| *Purpose:* | Information | | |
| *Author(s) or Contact(s):* | Patrice Onno  Canon Research Centre France Rue de la Touche Lambert  35510 CESSON-SEVIGNE, FRANCE | Tel: Email: | +33(0)299876800 [patrice.onno@crf.canon.fr](mailto:patrice.onno@crf.canon.fr) |
| *Source:* | Canon Research Centre France | | |

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Abstract

This document is a crosscheck report of the contribution JCTVC-J0218 about the Bi-pred merge restriction for small PUs. This document confirms the results of the three proposals described by Samsung.

# Introduction

In current HM7.0 design, bi-pred restriction for small PUs has been adopted where bi-predictive motion information for 8x4 and 4x8 is converted to uni-predictive List0 motion after motion information construction.

In the JCTVC-J0218 contribution, it is proposed that bi-predictive motion vector predictor candidates for the merge mode are restricted during merge candidate derivation process. Three different proposals are described in JCTVC-J0218.

* P1: Uni-predictive merge candidate generation for temporal, combined and zero merge candidates.
* P2: Exclusion of bi-predictive spatial merge candidate.
* P3: Conversion of bi-predictive spatial merge candidate.

# Results

## P1 results

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Random Access Main** | | | **Random Access HE10** | | |
|  | Y | U | V | Y | U | V |
| Class A | 0,0% | -0,1% | -0,1% | 0,0% | 0,1% | 0,2% |
| Class B | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% |
| Class C | 0,0% | 0,0% | 0,1% | 0,0% | 0,1% | -0,1% |
| Class D | 0,0% | 0,0% | -0,1% | 0,0% | -0,1% | -0,2% |
| Class E |  |  |  |  |  |  |
| **Overall** | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% |
|  | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% |
| Class F | 0,0% | 0,1% | 0,1% | 0,0% | 0,0% | 0,0% |
| Enc Time[%] | 99% | | | 101% | | |
| Dec Time[%] | 105% | | | 102% | | |
|  |  |  |  |  |  |  |
|  | **Low delay B Main** | | | **Low delay B HE10** | | |
|  | Y | U | V | Y | U | V |
| Class A |  |  |  |  |  |  |
| Class B | 0,0% | 0,1% | 0,1% | 0,0% | 0,0% | 0,2% |
| Class C | 0,0% | -0,1% | -0,1% | 0,0% | -0,1% | 0,0% |
| Class D | -0,1% | -0,1% | 0,2% | -0,1% | 0,1% | -0,2% |
| Class E | -0,1% | 0,0% | -0,3% | 0,1% | -0,3% | 0,2% |
| **Overall** | -0,1% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% |
|  | -0,1% | 0,0% | 0,0% | 0,0% | 0,0% | 0,1% |
| Class F | -0,1% | 0,1% | -0,1% | 0,0% | 0,1% | 1,2% |
| Enc Time[%] | 100% | | | 101% | | |
| Dec Time[%] | 104\*% | | | 100\*% | | |

## P2 results

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Random Access Main** | | | **Random Access HE10** | | |
|  | Y | U | V | Y | U | V |
| Class A | 0,0% | -0,2% | -0,1% | 0,0% | -0,2% | 0,0% |
| Class B | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% |
| Class C | 0,0% | 0,1% | 0,1% | 0,0% | 0,0% | -0,1% |
| Class D | 0,0% | -0,1% | -0,1% | 0,0% | 0,0% | 0,0% |
| Class E |  |  |  |  |  |  |
| **Overall** | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% |
|  | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% |
| Class F | 0,0% | 0,1% | 0,0% | 0,0% | 0,1% | 0,0% |
| Enc Time[%] | 100% | | | 101% | | |
| Dec Time[%] | 105\*% | | | 102\*% | | |
|  |  |  |  |  |  |  |
|  | **Low delay B Main** | | | **Low delay B HE10** | | |
|  | Y | U | V | Y | U | V |
| Class A |  |  |  |  |  |  |
| Class B | 0,0% | 0,1% | -0,1% | 0,0% | 0,0% | 0,0% |
| Class C | 0,0% | 0,0% | 0,1% | 0,0% | -0,1% | 0,0% |
| Class D | 0,0% | -0,1% | 0,2% | -0,1% | 0,1% | -0,3% |
| Class E | -0,1% | 0,0% | -0,3% | 0,0% | -0,5% | -0,1% |
| **Overall** | 0,0% | 0,0% | 0,0% | 0,0% | -0,1% | -0,1% |
|  | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% |
| Class F | -0,1% | -0,3% | 0,5% | 0,1% | 0,4% | 0,7% |
| Enc Time[%] | 100% | | | 102% | | |
| Dec Time[%] | 104\*% | | | 99\*% | | |

## P3 results

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Random Access Main** | | | **Random Access HE10** | | |
|  | Y | U | V | Y | U | V |
| Class A | 0,0% | -0,1% | -0,1% | 0,0% | 0,1% | 0,2% |
| Class B | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% |
| Class C | 0,0% | 0,0% | 0,1% | 0,0% | 0,1% | -0,1% |
| Class D | 0,0% | 0,0% | -0,1% | 0,0% | -0,1% | -0,2% |
| Class E |  |  |  |  |  |  |
| **Overall** | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% |
|  | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% |
| Class F | 0,0% | 0,1% | 0,1% | 0,0% | 0,0% | 0,0% |
| Enc Time[%] | 100% | | | 101% | | |
| Dec Time[%] | 105\*% | | | 101\*% | | |
|  |  |  |  |  |  |  |
|  | **Low delay B Main** | | | **Low delay B HE10** | | |
|  | Y | U | V | Y | U | V |
| Class A |  |  |  |  |  |  |
| Class B | 0,0% | 0,1% | 0,1% | 0,0% | 0,0% | 0,2% |
| Class C | 0,0% | -0,1% | -0,1% | 0,0% | -0,1% | 0,0% |
| Class D | -0,1% | -0,1% | 0,2% | -0,1% | 0,1% | -0,2% |
| Class E | -0,1% | 0,0% | -0,3% | 0,1% | -0,3% | 0,2% |
| **Overall** | -0,1% | 0,0% | 0,0% | 0,0% | 0,0% | 0,0% |
|  | -0,1% | 0,0% | 0,0% | 0,0% | 0,0% | 0,1% |
| Class F | -0,1% | 0,1% | -0,1% | 0,0% | 0,1% | 1,2% |
| Enc Time[%] | 100% | | | 101% | | |
| Dec Time[%] | 104\*% | | | 101\*% | | |

\*: Decoding time variations are not related to the modifications proposed by these changes.

# Conclusion

The BD-rate results provided by Samsung for the three proposals are confirmed with respectively 0.0% loss for the three components under the common test conditions of HM7.0. The Chroma component of Slideshow sequence (class F) in LBHE is systematically affected by the 3 proposed changes.