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| **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, SE, 11-20 July 2012 | Document: JCTVC-J0388 |

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| --- | --- | --- | --- |
| *Title:* | **Cross-check of simplification 3 of JCTVC-J0129** | | |
| *Status:* | Input Document to JCT-VC | | |
| *Purpose:* | Proposal | | |
| *Author(s) or Contact(s):* | Kemal Ugur |  | [kemal.ugur@nokia.com](mailto:kemal.ugur@nokia.com) |
| *Source:* | Nokia | | |

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# Abstract

This contribution presents the cross-check results by Nokia on “Simplification 3” of JCTVC-J0129. Simplification 3 of JCTVC-J0129 proposes to use DST for any transform size of 4x4, including chroma and inter TU’s. Compared to two simplifications tested in CE1, this variant removes the 4-point DCT and arguably simplifies the design. This simplification was independently implemented by Nokia and the results were verified.

# Results

## Common Conditions

The simplification 3 proposed in JCTVC-J0129 is tested in common conditions and also the CE1 test conditions. Results are shown below:

**Main, All Intra**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **All Intra Main** | | |
|  | Y | U | V |
| Class A | -0.1% | 0.8% | 0.9% |
| Class B | 0.0% | 1.2% | 1.3% |
| Class C | -0.1% | 1.0% | 1.1% |
| Class D | 0.0% | 1.3% | 1.3% |
| Class E | -0.2% | 2.0% | 0.9% |
| **Overall** | -0.1% | 1.2% | 1.1% |
|  | -0.1% | 1.2% | 1.1% |
| Class F | 0.3% | 1.2% | 1.0% |
| Enc Time[%] |  | | |
| Dec Time[%] |  | | |

**Main, Random Access**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Random Access Main** | | |
|  | Y | U | V |
| Class A | 0.0% | 0.6% | 1.0% |
| Class B | 0.0% | 1.9% | 1.8% |
| Class C | 0.1% | 1.3% | 1.6% |
| Class D | 0.2% | 1.9% | 2.0% |
| Class E |  |  |  |
| **Overall** | 0.1% | 1.4% | 1.6% |
|  | 0.1% | 1.4% | 1.5% |
| Class F | 0.5% | 1.2% | 0.7% |
| Enc Time[%] |  | | |
| Dec Time[%] |  | | |

**Main, Low Delay**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Low delay B Main** | | |
|  | Y | U | V |
| Class A |  |  |  |
| Class B | -0.1% | 1.3% | 1.4% |
| Class C | 0.0% | 0.8% | 1.0% |
| Class D | 0.1% | 1.7% | 1.9% |
| Class E | -0.1% | 2.9% | 0.9% |
| **Overall** | 0.0% | 1.6% | 1.3% |
|  | 0.0% | 1.5% | 1.2% |
| Class F | 0.3% | 1.0% | 1.0% |
| Enc Time[%] |  | | |
| Dec Time[%] |  | | |

## CE1 Test Conditions

In addition to above tests, simplification 3 is tested within the CE1 test conditions. Results are summarized below.

**Main All-Intra, Low QP (2, 7, 12, 17)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **All Intra Main** | | |
|  | Y | U | V |
| Class A | -0.1% | -0.4% | -0.4% |
| Class B | -0.1% | -0.3% | -0.3% |
| Class C | -0.1% | -0.2% | -0.2% |
| Class D | 0.0% | -0.1% | -0.1% |
| Class E | -0.1% | -0.5% | -0.6% |
| **Overall** | -0.1% | -0.3% | -0.3% |
|  | 0.0% | 0.0% | 0.2% |
| Class F | 0.6% | 0.3% | 0.4% |
| Enc Time[%] |  | | |
| Dec Time[%] |  | | |

**Main All Intra, Transform Skip Enabled (both for anchor and the test)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **All Intra Main** | | |
|  | Y | U | V |
| Class A | -0.1% | 0.7% | 0.9% |
| Class B | -0.1% | 1.2% | 1.3% |
| Class C | -0.1% | 1.0% | 1.2% |
| Class D | 0.0% | 1.3% | 1.3% |
| Class E | -0.2% | 2.0% | 0.9% |
| **Overall** | -0.1% | 1.2% | 1.1% |
|  | -0.1% | 1.1% | 1.1% |
| Class F | 0.2% | 1.3% | 1.3% |
| Enc Time[%] |  | | |
| Dec Time[%] |  | | |

# Patent rights declaration(s)

**Nokia may have current or pending patent rights relating to the technology described in this contribution and, conditioned on reciprocity, is prepared to grant licenses under reasonable and non-discriminatory terms as necessary for implementation of the resulting ITU-T Recommendation | ISO/IEC International Standard (per box 2 of the ITU-T/ITU-R/ISO/IEC patent statement and licensing declaration form).**