

JCTVC-G497

SIMD optimization of proposed HEVC core transforms

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Summary

- Stand-alone test program with inverse transforms
- Optimized SIMD implementation for Intel Sandy Bridge
- Full and partial transforms
- Combined with transform usage statistics from HM3.0
- Estimated CPU load from inverse transforms alone

Estimated cycle counts per 2D transform (Intel i7 Sandy Bridge, SSE4, Windows, 64-bit)

NxN	KxK	Column-row order	Row-column order
8x8	8x8	167	152
8x8	4x4	108	78
16x16	16x16	943	859
16x16	8x8	547	467
16x16	4x4	304	233
32x32	32x32	5720	5322
32x32	16x16	2764	2442
32x32	8x8	1732	1405
32x32	4x4	1167	836

Estimated cycle counts per 2D transform (Intel i7 Sandy Bridge, Linux, 64-bit)

NxN	KxK	SSE4	AVX
8x8	8x8	138	123
16x16	16x16	836	708
32x32	32x32	5329	4556

CPU load for Intel 3.5 GHz

Sequence	Bitrate (kbps)	CPU load	Bitrate (kbps)	CPU load
	QP=37		QP=22	
Kimono	560	0,6%	5325	2,5%
ParkScene	590	0,3%	8221	1,1%
Cactus	1308	0,8%	19693	3,9%
BasketballDrive	1572	1,2%	20049	5,6%
BQTerrace	799	0,4%	50211	4,6%