## Working Draft text

# Subtest A1

#### 9.3.3.9 Binarization process for coeff\_abs\_level\_remaining

…

The variable cRiceParam is derived from cLastAbsLevel and cLastRiceParam as follows:

* If fast\_rice\_adaptation\_enabled\_flag is equal to 0, the following applies:

cRiceParam = Min( cLastRiceParam + ( cLastAbsLevel > ( 3 \* ( 1  <<  cLastRiceParam ) ) ? 1 : 0 ), 4 ) (9‑13)

* Otherwise (fast\_rice\_adaptation\_enabled\_flag is equal to 1), the following applies:
* cRiceParam is initialized as follows:

cRiceParam = Min( cLastRiceParam + ( cLastAbsLevel  >>  ( 2  +  cLastRiceParam ) ), 7 ) (9‑13)

* When this process is invoked for the first time for the current sub-block scan index i, cRiceParam is modified as follows:

cRiceParam = Max( 0, cRiceParam −  (9‑13)  
 ( transform\_skip\_flag[ x0 ][ y0 ][ cIdx ] | | cu\_transquant\_bypass\_flag ? 1 : 2 ) )

The variable cRiceParamPrev is set to cRiceParam

…

#### 7.3.8.11 Residual coding syntax

|  |  |
| --- | --- |
| … |  |
| lastGreater1ScanPos = −1 |  |
| if( cRiceParamPrev < 4 ) { |  |
| for( n = 15; n >= 0; n− − ) { |  |
| xC = ( xS << 2 ) + ScanOrder[ 2 ][ scanIdx ][ n ][ 0 ] |  |
| yC = ( yS << 2 ) + ScanOrder[ 2 ][ scanIdx ][ n ][ 1 ] |  |
| if( sig\_coeff\_flag[ xC ][ yC ] ) { |  |
| if( numGreater1Flag < 8 ) { |  |
| **coeff\_abs\_level\_greater1\_flag**[ n ] | ae(v) |
| numGreater1Flag++ |  |
| if( coeff\_abs\_level\_greater1\_flag[ n ] && lastGreater1ScanPos = = −1 ) |  |
| lastGreater1ScanPos = n |  |
| } |  |
| if( lastSigScanPos = = −1 ) |  |
| lastSigScanPos = n |  |
| firstSigScanPos = n |  |
| } |  |
| } |  |
| if( cu\_transquant\_bypass\_flag  | | ( CuPredMode[ x0 ][ y0 ] = = MODE\_INTRA &&   implicit\_rdpcm\_enabled\_flag && transform\_skip\_flag[ x0 ][ y0 ][ cIdx ] &&   ( predModeIntra = = 10 | | predModeIntra = = 26 ) )  | | explicit\_rdpcm\_flag[ x0 ][ y0 ][ cIdx ] ) |  |
| signHidden = 0 |  |
| else |  |
| signHidden = ( lastSigScanPos − firstSigScanPos > 3 ) |  |
| if( lastGreater1ScanPos != −1 ) |  |
| **coeff\_abs\_level\_greater2\_flag**[ lastGreater1ScanPos ] | ae(v) |
| } |  |
| for( n = 15; n >= 0; n− − ) { |  |
| xC = ( xS << 2 ) + ScanOrder[ 2 ][ scanIdx ][ n ][ 0 ] |  |
| yC = ( yS << 2 ) + ScanOrder[ 2 ][ scanIdx ][ n ][ 1 ] |  |
| if( sig\_coeff\_flag[ xC ][ yC ] &&   ( !sign\_data\_hiding\_enabled\_flag | | !signHidden | | ( n != firstSigScanPos ) ) ) |  |
| **coeff\_sign\_flag**[ n ] | ae(v) |
| } |  |
| numSigCoeff = 0 |  |
| sumAbsLevel = 0 |  |
| for( n = 15; n >= 0; n− − ) { |  |
| xC = ( xS << 2 ) + ScanOrder[ 2 ][ scanIdx ][ n ][ 0 ] |  |
| yC = ( yS << 2 ) + ScanOrder[ 2 ][ scanIdx ][ n ][ 1 ] |  |
| if( sig\_coeff\_flag[ xC ][ yC ] ) { |  |
| baseLevel = 1 + coeff\_abs\_level\_greater1\_flag[ n ] +  coeff\_abs\_level\_greater2\_flag[ n ] |  |
| if( baseLevel = = ( ( numSigCoeff < 8 ) ?   ( (n = = lastGreater1ScanPos) ? 3 : 2 ) : 1 ) ||  cRiceParamPrev > = 4 ) |  |
| **coeff\_abs\_level\_remaining**[ n ] | ae(v) |
| TransCoeffLevel[ x0 ][ y0 ][ cIdx ][ xC ][ yC ] =   ( coeff\_abs\_level\_remaining[ n ] + baseLevel ) \* ( 1 − 2 \* coeff\_sign\_flag[ n ] ) |  |
| if( sign\_data\_hiding\_enabled\_flag && signHidden ) { |  |
| sumAbsLevel += ( coeff\_abs\_level\_remaining[ n ] + baseLevel ) |  |
| if( ( n = = firstSigScanPos ) && ( ( sumAbsLevel % 2 ) = = 1 ) ) |  |
| TransCoeffLevel[ x0 ][ y0 ][ cIdx ][ xC ][ yC ] =  −TransCoeffLevel[ x0 ][ y0 ][ cIdx ][ xC ][ yC ] |  |
| } |  |
| numSigCoeff++ |  |
| } |  |
| } |  |
| } |  |
| } |  |

# Subtest A2

#### 9.3.3.9 Binarization process for coeff\_abs\_level\_remaining

…

The variable cRiceParam is derived from cLastAbsLevel and cLastRiceParam as follows:

* If fast\_rice\_adaptation\_enabled\_flag is equal to 0, the following applies:

cRiceParam = Min( cLastRiceParam + ( cLastAbsLevel > ( 3 \* ( 1  <<  cLastRiceParam ) ) ? 1 : 0 ), 4 ) (9‑13)

* Otherwise (fast\_rice\_adaptation\_enabled\_flag is equal to 1), the following applies:
* cRiceParam is initialized as follows:

cRiceParam = Min( cLastRiceParam + ( cLastAbsLevel  >>  ( 2  +  cLastRiceParam ) ), 7 ) (9‑13)

* When this process is invoked for the first time for the current sub-block scan index i, cRiceParam is modified as follows:

cRiceParam = Max( 0, cRiceParam −  (9‑13)  
 ( transform\_skip\_flag[ x0 ][ y0 ][ cIdx ] | | cu\_transquant\_bypass\_flag ? 1 : 2 ) )

The variable cRiceParamPrev is set to cRiceParam

…

#### 7.3.8.11 Residual coding syntax

|  |  |
| --- | --- |
| residual\_coding( x0, y0, log2TrafoSize, cIdx ) { | Descriptor |
| … |  |
| for( i = lastSubBlock; i >= 0; i− − ) { |  |
| xS = ScanOrder[ log2TrafoSize − 2 ][ scanIdx ][ i ][ 0 ] |  |
| yS = ScanOrder[ log2TrafoSize − 2 ][ scanIdx ][ i ][ 1 ] |  |
| if( cRiceParamPrev < 4) { |  |
| inferSbDcSigCoeffFlag = 0 |  |
| if( ( i < lastSubBlock ) && ( i > 0 ) ) { |  |
| **coded\_sub\_block\_flag**[ xS ][ yS ] | ae(v) |
| inferSbDcSigCoeffFlag = 1 |  |
| } |  |
| for( n = ( i = = lastSubBlock ) ? lastScanPos − 1 : 15; n >= 0; n− − ) { |  |
| xC = ( xS << 2 ) + ScanOrder[ 2 ][ scanIdx ][ n ][ 0 ] |  |
| yC = ( yS << 2 ) + ScanOrder[ 2 ][ scanIdx ][ n ][ 1 ] |  |
| if( coded\_sub\_block\_flag[ xS ][ yS ] && ( n > 0 | | !inferSbDcSigCoeffFlag ) ) { |  |
| **sig\_coeff\_flag**[ xC ][ yC ] | ae(v) |
| if( sig\_coeff\_flag[ xC ][ yC ] ) |  |
| inferSbDcSigCoeffFlag = 0 |  |
| } |  |
| } |  |
| firstSigScanPos = 16 |  |
| lastSigScanPos = −1 |  |
| numGreater1Flag = 0 |  |
| lastGreater1ScanPos = −1 |  |
| for( n = 15; n >= 0; n− − ) { |  |
| xC = ( xS << 2 ) + ScanOrder[ 2 ][ scanIdx ][ n ][ 0 ] |  |
| yC = ( yS << 2 ) + ScanOrder[ 2 ][ scanIdx ][ n ][ 1 ] |  |
| if( sig\_coeff\_flag[ xC ][ yC ] ) { |  |
| if( numGreater1Flag < 8 ) { |  |
| **coeff\_abs\_level\_greater1\_flag**[ n ] | ae(v) |
| numGreater1Flag++ |  |
| if( coeff\_abs\_level\_greater1\_flag[ n ] && lastGreater1ScanPos = = −1 ) |  |
| lastGreater1ScanPos = n |  |
| } |  |
| if( lastSigScanPos = = −1 ) |  |
| lastSigScanPos = n |  |
| firstSigScanPos = n |  |
| } |  |
| } |  |
| if( cu\_transquant\_bypass\_flag  | | ( CuPredMode[ x0 ][ y0 ] = = MODE\_INTRA &&   implicit\_rdpcm\_enabled\_flag && transform\_skip\_flag[ x0 ][ y0 ][ cIdx ] &&   ( predModeIntra = = 10 | | predModeIntra = = 26 ) )  | | explicit\_rdpcm\_flag[ x0 ][ y0 ][ cIdx ] ) |  |
| signHidden = 0 |  |
| else |  |
| signHidden = ( lastSigScanPos − firstSigScanPos > 3 ) |  |
| if( lastGreater1ScanPos != −1 ) |  |
| **coeff\_abs\_level\_greater2\_flag**[ lastGreater1ScanPos ] | ae(v) |
| for( n = 15; n >= 0; n− − ) { |  |
| xC = ( xS << 2 ) + ScanOrder[ 2 ][ scanIdx ][ n ][ 0 ] |  |
| yC = ( yS << 2 ) + ScanOrder[ 2 ][ scanIdx ][ n ][ 1 ] |  |
| if( sig\_coeff\_flag[ xC ][ yC ] &&   ( !sign\_data\_hiding\_enabled\_flag | | !signHidden | | ( n != firstSigScanPos ) ) ) |  |
| **coeff\_sign\_flag**[ n ] | ae(v) |
| } |  |
| numSigCoeff = 0 |  |
| sumAbsLevel = 0 |  |
| for( n = 15; n >= 0; n− − ) { |  |
| xC = ( xS << 2 ) + ScanOrder[ 2 ][ scanIdx ][ n ][ 0 ] |  |
| yC = ( yS << 2 ) + ScanOrder[ 2 ][ scanIdx ][ n ][ 1 ] |  |
| if( sig\_coeff\_flag[ xC ][ yC ] ) { |  |
| baseLevel = 1 + coeff\_abs\_level\_greater1\_flag[ n ] +  coeff\_abs\_level\_greater2\_flag[ n ] |  |
| if( baseLevel = = ( ( numSigCoeff < 8 ) ?   ( (n = = lastGreater1ScanPos) ? 3 : 2 ) : 1 ) ) |  |
| **coeff\_abs\_level\_remaining**[ n ] | ae(v) |
| TransCoeffLevel[ x0 ][ y0 ][ cIdx ][ xC ][ yC ] =   ( coeff\_abs\_level\_remaining[ n ] + baseLevel ) \* ( 1 − 2 \* coeff\_sign\_flag[ n ] ) |  |
| if( sign\_data\_hiding\_enabled\_flag && signHidden ) { |  |
| sumAbsLevel += ( coeff\_abs\_level\_remaining[ n ] + baseLevel ) |  |
| if( ( n = = firstSigScanPos ) && ( ( sumAbsLevel % 2 ) = = 1 ) ) |  |
| TransCoeffLevel[ x0 ][ y0 ][ cIdx ][ xC ][ yC ] =  −TransCoeffLevel[ x0 ][ y0 ][ cIdx ][ xC ][ yC ] |  |
| } |  |
| numSigCoeff++ |  |
| } |  |
| } |  |
| } else { |  |
| firstSigScanPos = 16 |  |
| lastSigScanPos = −1 |  |
| for( n = ( i = = lastSubBlock ) ? lastScanPos − 1 : 15; n >= 0; n− − ) { |  |
| xC = ( xS << 2 ) + ScanOrder[ 2 ][ scanIdx ][ n ][ 0 ] |  |
| yC = ( yS << 2 ) + ScanOrder[ 2 ][ scanIdx ][ n ][ 1 ] |  |
| baseLevel = ( xC == LastSignificantCoeffX ) && ( yC == LastSignificantCoeffY ) |  |
| **coeff\_abs\_level\_remaining**[ n ] | ae(v) |
| coeff\_abs\_level\_remaining[ n ] += baseLevel |  |
| if( coeff\_abs\_level\_remaining[ n ] > 0 ) |  |
| sig\_coeff\_flag[ xC ][ yC ] = 1 |  |
| if( sig\_coeff\_flag[ xC ][ yC ] ) { |  |
| if( lastSigScanPos = = −1 ) |  |
| lastSigScanPos = n |  |
| firstSigScanPos = n |  |
| } |  |
| } |  |
| if( cu\_transquant\_bypass\_flag  | | ( CuPredMode[ x0 ][ y0 ] = = MODE\_INTRA &&   implicit\_rdpcm\_enabled\_flag && transform\_skip\_flag[ x0 ][ y0 ][ cIdx ] &&   ( predModeIntra = = 10 | | predModeIntra = = 26 ) )  | | explicit\_rdpcm\_flag[ x0 ][ y0 ][ cIdx ] ) |  |
| signHidden = 0 |  |
| else |  |
| signHidden = ( lastSigScanPos − firstSigScanPos > 3 ) |  |
| sumAbsLevel = 0 |  |
| for( n = 15; n >= 0; n− − ) { |  |
| xC = ( xS << 2 ) + ScanOrder[ 2 ][ scanIdx ][ n ][ 0 ] |  |
| yC = ( yS << 2 ) + ScanOrder[ 2 ][ scanIdx ][ n ][ 1 ] |  |
| if( sig\_coeff\_flag[ xC ][ yC ] &&   ( !sign\_data\_hiding\_enabled\_flag | | !signHidden | | ( n != firstSigScanPos ) ) ) |  |
| **coeff\_sign\_flag**[ n ] | ae(v) |
| TransCoeffLevel[ x0 ][ y0 ][ cIdx ][ xC ][ yC ] =   coeff\_abs\_level\_remaining[ n ] \* ( 1 − 2 \* coeff\_sign\_flag[ n ] ) |  |
| if( sign\_data\_hiding\_enabled\_flag && signHidden ) { |  |
| sumAbsLevel += coeff\_abs\_level\_remaining[ n ] |  |
| if( ( n = = firstSigScanPos ) && ( ( sumAbsLevel % 2 ) = = 1 ) ) |  |
| TransCoeffLevel[ x0 ][ y0 ][ cIdx ][ xC ][ yC ] =  −TransCoeffLevel[ x0 ][ y0 ][ cIdx ][ xC ][ yC ] |  |
| } |  |
| } |  |
| } |  |
| } |  |
| } |  |