CLAIMS

1. An apparatus of decoding an image, the apparatus comprising:

an intra prediction unit for generating a prediction block using an ultra prediction mode of a current prediction unit;

an inverse scanning unit for inversely scanning significant flags, coefficient signs and coefficient levels according to an inverse scan pattern which is selected based on the intra prediction mode and a size of a transform unit to generate a quantized block;

an inverse quantization unit for inversely quantizing the quantized block using a quantization parameter and a quantization matrix to generate a transform block;

an inverse transform unit for inversely transform the transform block to generate a residual block; and

an adder for adding the prediction block and the residual block to generate a reconstructed block,

wherein the quantization parameter is generated using a differential quantization parameter and a quantization parameter predictor,

the differential quantization parameter is restored using a bin string indicating an absolute value of the differential quantization parameter and a bin indicating a sign of the differential quantization parameter,

if two or more quantization parameters are available among a left quantization parameter, an above quantization parameter and a previous quantization parameter of a current coding unit, the quantization parameter predictor is generated

using two available quantization parameters determined according to a predetermined order,

the quantization parameter is restored per quantization unit, and a minimum size of the quantization unit is adjusted by a picture parameter set, and

if the quantization matrix is a user-defined quantization matrix, the quantization matrix is restored by using an inverse differential pulse code modulation (DPCM).

2. The apparatus of claim 1, wherein if only one quantization parameter is available, the available quantization parameter is set as the quantization parameter predictor.

3. The apparatus of claim 1, wherein the predetermined order is an order of the left quantization parameter, the above quantization parameter and the previous quantization parameter.

4. The apparatus of claim 1, wherein the size of the quantization unit is derived using a size of a Largest Coding Unit (LCU) and a parameter specifying depth of the minimum size of the quantization unit.

5. The apparatus of claim 1, wherein if the left and above quantization parameters are available, an average of the left and above quantization parameters is set as the quantization parameter predictor.

6. The apparatus of claim 1, wherein if the left quantization parameter is not available, an average of the above quantization parameter and the previous quantization parameter is set as the quantization parameter predictor.

7. The apparatus of claim 1, wherein if the size of the transform unit is equal to or larger than 8×8, the quantized block is generated using a last non-zero coefficient position and non-zero subset flags.