Scan Converter

Medical Imaging DSP Applications Team

1 Description

The scan converter unit (SCU) translates the scanned echo data or color flow data (velocity, turbulence or power) into a representation suitable for displaying the image on a monitor such as an LCD screen. The following features are supported:

- B-mode sector shape of up to 100° sector angle and linear shape
- Color-mode sector shape of up to 100° sector angle and linear shape
- 2x2 bilinear interpolation
- Tissue and flow decision
- Color mapping for tissue and flow
- 422 video format output.

Project collateral discussed in this document can be downloaded from the following URL: http://www-s.ti.com/sc/techlit/sprs619.zip.

2 Cycles

Because the performance, the scan conversion software depends on the input and output parameters; therefore, the performance is given for one example case on TMS320DM6437 EVM. The test of the scan converter can be used to find cycles of interest for any other valid configuration.

- Example Case:
  - 600 MHz DM6437, 32 KB L1D Cache, 48 KB L1D SRAM, 64 KB L2 Cache, 64KB L2 SRAM
  - Tissue: 256 beams, 512 samples/beam, 86 degrees sector angle
  - Flow: 64 beams, 128 samples/beam, 57.3 deg (1.0 radian) sector angle
  - Output window size: 640x480

Mode	Test Case	Process API DSP Cycles/Pixel	Process API Time (ms)	Config API Time (ms)
B-mode	bmode_9	7.70	3.9	123.2
B-mode with 422 video format	bmode422_11	8.22	4.2	123.2
Color	color_10	5.44	2.8	119.2
B-mode, color arbitration, mapping, 422 video format	bmodecolor422_12	18.21	9.3	242.8

3 Memory

Program Memory: ~14 KB

Data Memory in Kbytes (Output window size is x-pixels by y-pixels):

L1D SRAM	21.5 + 26 * x/1024
L2 SRAM	24
DDR	(x*y*8 +y*4)/1024
Stack	1.45

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