

MA35D1

H.264/JPEG Decoder

VC8000NanoD

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| Features

- H.264 decode
- JPEG decode
- Post Processing
- H.264 and JPEG decoder share the same registers.
- Post Processing has independent registers.

| H264 Decoder

- Support H.264 baseline, main profile, and high profile
- Support picture size from 48x48 to 1920x1080
- Input stream format
 - Byte stream
 - NAL unit stream
- Output picture format
 - YUV420 semi-planar (NV12)
 - YUV420 semi-planar raster-scan
 - YUV400 (monochrome)

| H264 Decoder (cont.)

- Maximum frame rate: 1920 x 1080 @ 30 fps (profile level 4.1)
- Maximum bit rate: H.264 HP level 5.1 (240,000 Kbit/s)
- Support PP pipeline

| JPEG Decoder

- Support JFIF file format 1.02
- Support compressed thumbnails
- Support picture formats YUV400, YUV440, YUV420SP, YUV422SP, YUV411SP, and YUV444SP
- Support picture size from 48x48 to 16368x16368
- Support slice mode decode (16M pixels at a time)
- Support PP pipeline

| Post Processing

- Input image source
 - H264/JPEG decode output (combined mode)
 - Image in DRAM (standalone mode)
- Support image up-scaling and down-scaling
- Support YUV to RGB color conversion
- Support image rotation
- Support picture in picture
- Support cropping and digital zoom
- Support dithering, alpha blending, and de-interlacing

| Linux driver

- Linux V4L2 M2M driver
- Release in form of kernel module: ma35d1_vc8000.ko
- Support multiple H264 instance decode
 - Three 720P H264 decode at the same time with 256MB DRAM
- Support JPEG decode
- Support up/down-scale and render to specified location of frame buffer
- Support rotation
- Support output RGB888, RGB565 and NV12

| Linux driver (cont.)

- GStreamer solution

- MP4

```
# gst-launch-1.0 filesrc location=/sample.mp4 ! qtdemux name=demux demux.audio_0 !  
decodebin ! audioconvert ! audioresample ! autoaudiosink demux.video_0 ! decodebin !  
nufbdevsink ! fakesink
```

- H.264

```
# gst-launch-1.0 filesrc location=/mnt/sample.264 ! h264parse ! v4l2h264dec ! nufbdevsink !  
fakesink sync=false
```

- Motion JPEG

```
# gst-launch-1.0 -v filesrc location=/mnt/sample.mjpeg ! jpegparse ! v4l2jpegdec ! nufbdevsink !  
fakesink
```


VC8000 H264 performance in Linux

- 1080P

	Baseline	Main Profile	High Profile
+ PP out 1920x1080	31.5 fps (CPU 3%)	22.2 fps (CPU 2%)	22.2 fps (CPU 2%)
+ PP out 1024x600	33.5 fps (CPU 3%)	23.5 FPS (CPU 2%)	23.5 FPS (CPU 2%)
+ PP out 1024x600 + Rotate (Right 90)	24.0 FPS (CPU 3%)	19.6 FPS (CPU 2%)	19.4 FPS (CPU 2%)

- 720P

	Baseline	Main Profile	High Profile
+ PP out 1920x1080	40.3 FPS (CPU 3%)	31.9 FPS (CPU 3%)	31.9 FPS (CPU 3%)
+ PP out 1024x600	66.3 fps (CPU 5%)	47.2 FPS (CPU 3%)	47.2 FPS (CPU 3%)
+ PP out 1024x600 + Rotate (HOR_FLIP)	57.3 FPS (CPU 4%)	46.2 FPS (CPU 3%)	46.0 FPS (CPU 3%)

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Thank You

Danke

Merci

ありがとう

Gracias

Kiitos

감사합니다

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