

# Box mode #1

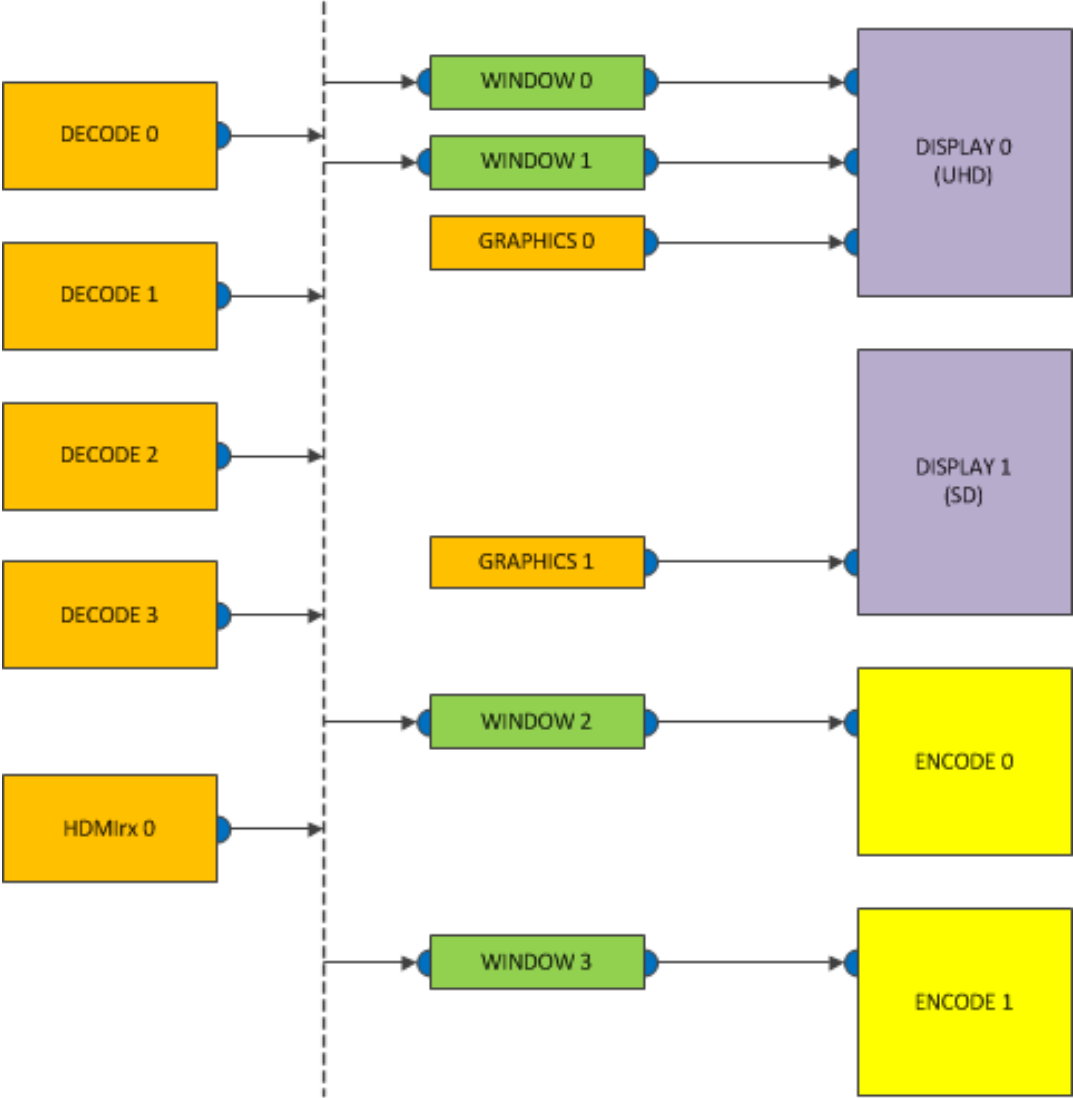
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## Box mode #1 – summary

- Required memory speed: 2x 32-bit LPDDR4-3200
  - No high-temperature refresh
- Features:
  - One 4kp60 capable decoder + three 1080p60 decoders
  - UHD with MAIN + PIP
  - SD (graphics only)
  - Multi-PIP support (3+1)
  - HDMI input
  - Two transcodes to 1080p30

# Possible video routings



# Source limitations

- Decode 0
  - 3840x2160p60 10-bit HEVC / VP9
  - 1920x1080p60 8-bit AVC / MPEG2
  - Multi-PIP (3x)
    - 1920x1080p60 10-bit HEVC / VP9
    - 1920x1080p60 8-bit AVC / MPEG2
  - No MTG support
  - Does not support VP9 super-frame
- Decode 0 / 1 / 2
  - 1920x1080p60 10-bit HEVC / VP9
  - 1920x1080p60 8-bit AVC / MPEG2
  - No MTG support
  - Does not support VP9 super-frame
- HDMIrx 0
  - Up to 3840x2160p60
- Graphics 0 (UHD)
  - 1080p60 32-bit ARGB
  - Requires graphics compression
- Graphics 1 (SD)
  - 480p60 32-bit ARGB
  - 576p50 32-bit ARGB

# HARDWARE RESOURCE MAPPING

Decoder	MFD	Hardware
Decode 0	MFD0	HVD0
Decode 1	MFD1	HVD1
Decode 2	MFD2	HVD1
Decode 3	MFD3	HVD1

# Window limitations

- Window 0 (MAIN / UHD)
  - Up to full-screen display (smooth scaling)
  - 1080i60 de-interlacing
  - Multi-PIP (3x)
    - Up to 480i60 de-interlacing
    - Each window is limited to 25% of the canvas
- Window 1 (PIP / UHD)
  - Depending on the size of the source, there are different display limits:
    - If the source is 1080p or less, then we support up to full-screen display.
    - If the source is larger, then we support up to  $\frac{1}{2}$  x  $\frac{1}{2}$  display
    - No smooth-scaling.
  - 1080i60 de-interlacing
- Window 2 (MAIN / Encode 0)
  - Full-screen only
  - 1080i60 de-interlacing
- Window 3 (MAIN / Encode 1)
  - Full-screen only
  - 1080i60 de-interlacing
- Only one CAP/VFD available for Window 2 or Window 3

# Display and encode limitations

- Display 0 (UHD)
  - 3840x2160p60
  - Can drive the SD CVBS output if the format is set to 480i60 or 576i50
- Display 1 (SD)
  - 480i60
  - 576i50
- Encode 0
  - Up to 1080p30 8-bit
- Encode 1
  - Up to 1080p30 8-bit