Key Specifications

Key Features
- 64-bit CPU
- High-performance multi-standard demodulation
- HDR10 processing
- 4K x 2K high-quality graphics processing engine
- 4K x 2K 10-bit@60 Hz HEVC/VP9 decoding
- 4K x 2K UI
- HDMI 2.0a
- Securely integrated digital television solution

High-Performance CPU
- 64-bit quad-core RISC
- Maximum frequency of 1.2 GHz, supporting intelligent applications smoothly
- Independent I-cache, D-cache, and L2 cache
- Integrated multimedia accelerator NEON
- Hardware half-precision, single-precision, and double-precision floating-point algorithms

Video Decoding
- ITU-T H.264 Main 10 Profile@level 5.1 high-tier (and lower levels), 4K x 2K@30 fps
- VP9 Profile 2 10-bit 4K x 2K@60 fps
- H.264 BP/MP@level 5.0, 4K x 2K@30 fps
- MVC, 1080p@60 fps
- MPEG1, 1080p@60 fps
- MPEG2 SP@ML, MP@HL, 1080p@60 fps
- MPEG4 SP@level 0−5, ASP@levels 0−5, GMC, 1080p@60 fps
- MPEG4 short header format (H.263 baseline), 1080p@60 fps
- DivX 3/4/5/6, 1080p@60 fps
- AVS baseline@level 6.0, AVS+(AVS-P16), 1080p@60 fps
- VC-1 SP@ML, MP@HL, and AP@levels 0−3, 1080p@60 fps
- VP6/8, 1080p@60 fps
- Low-latency decoding
- Multi-channel decoding

Image Decoding
- JPEG hardware decoding, a maximum of 64 megapixels
- Supported formats of I400, 420, 411, 422, 422T, and 444
- MJPEG baseline decoding
- PNG hardware decoding, maximum 64 megapixels
- Gray-scale image, true color image, indexed-color image, gray-scale image with alpha channel data, and true color image with alpha channel data

Video Encoding
- H.264 BP/MP@level 4.2 video encoding, 1x1080p@30 fps or 2x720p@30 fps encoding
- 1/4 pixel motion estimation, CABAC encoding
- Low-latency encoding
- Encoding of multiple ROIs
- VBR and CBR modes

2D Graphics Acceleration
- Hardware acceleration engine, supporting highly efficient 2D processing
- Data formats of ARGB, CLUT, and AYCbCr
- Copying, filling, pattern filling, resizing, clipping, alpha blending, colorkey, and clip mask
- NOP
- Anti-flicker, gamma correction, and contrast/luminance adjustment
- Programmable scanning mode
- Linked-list operation

3D GPU
- Hexa-core high-performance GPU
- 4K x 2K graphics rendering
- OpenGL ES 2.0/1.1/1.0 and OpenVG 1.1

Intermediate-Frequency Demodulation for Analog TV
- All analog TV standards, including M/N, B/G/H, D/K, 1, L, and 1:
- Tuner low- and intermediate-frequency inputs and configurable intermediate frequency
- External SAW not required
- Group delay compensation and equalization filter

Digital Demodulation
- Tuner low- and intermediate-frequency inputs and embedded 12-bit ADC
- One embedded DVB-C QAM demodulator
  - ITU-T J.83 Annex A/B/C
  - DVB-C 0.7−7 Mbps symbol rate and correctable carrier frequency deviation range of ±700 kHz
- One embedded DVB-T demodulator
  - Standard version 1.51
  - Low intermediate frequency (IF) and high IF (36 MHz) signal inputs
    - Rapid signal acquisition (less than 200 ms), reducing the wait time for switching the channel
    - Adaptive spectrum reverse recognition
    - Frequency error detecting range broader than ±600 kHz
  - Compliant with various test standards, including DTC7.0, NotDig-Unified Test Specification V2.2.1, and Digital
Hi3751 V730 Brief Data Sheet

Audio Encoding/Decoding
- Audio decoding formats
  - Dolby Digital, Dolby Digital Plus, Dolby TrueHD
  - DTS, DTS-HD
  - MPEG L1/L2
  - MP3
  - AAC_LC, HE_AAC, HE_AACV2
  - LPCM
  - APE
  - FLAC
  - OggVorbis
  - AMR-NB
  - AMR-WB
  - G.711 (u/a)
- AAC audio encoding format

Professional HiSilicon Graphics Engines (Hi-Imprex V Engines)
- Hi-HDR II processing engine
  - HDR processing of Dolby Vision®
  - HDR10 processing
- Hi-Imprex V scaling engine
  - High-order multi-phase filter with programmable coefficients
  - Various scaling modes including the non-linear scaling mode
  - Pre-emphasis for graphics scaling and de-ring
- Hi-Imprex V video processing engine
  - MC interlaced or progressive conversion processing
  - Automatic detection and restoration in 3:2, 2:2, or M: N film mode
  - MC noise reduction for 4K x 2K videos including network videos
  - MPEG noise reduction for 4K x 2K videos, de-blocking, and mosquito noise reduction
  - Global motion detection and scene change-detection for 4K x 2K videos
  - Color coring
- Hi-Imprex V image enhancement engine
  - 3D adaptive sharpening for the videos including 4K x 2K videos, and enhancement and shoot control for different directions and frequencies
  - LTI and CTI
  - 3D adaptive color management such as specified color management and automatic color copy
  - Wide color gamut processing
  - Dynamic contrast enhancement such as adaptive contrast adjustment and color compensation based on luminance variance
  - Blue level expansion
- Hi-SuperClear V processing, edge smoothing, and edge enhancement
- Programmable 12-bit gamma look-up table
- Automatic 3D format detection
- 2D-to-3D processing
- Local dimming

Security Processing Option
- Advanced CA feature
- TEE and SVP
- DRM
- AES, DES, and 3DES data encryption and decryption
- Hardware hash/RSA algorithm
- Downloadable CA option

Audio/Video Interfaces
- Audio interfaces
  - One I/S input, two I/S outputs, and one SPDIF output
  - One HDMI ARC channel
  - Three stereo inputs and two MIC inputs
  - Three stereo outputs
- YPbPr/RGB Interface
Hi3751 V730 Brief Data Sheet

Two analog channels, at most 1080p
- S-G
  Automatic format and mode detection
- Position and phase adjustment for the RGB channel
- Cable online detection for analog video channels
- HDMI
  - Three HDMI input interfaces (one supports HDMI 2.0a, one supports MHL 2.0/HDMI 1.4, and the other one supports HDMI 1.4/ARC)
  - 4K x 2K@60 Hz inputs
  - Rapid port switching
  - CEC
  - HDCP 2.2/1.3/1.1
- 8-lane 1/2 partition V byOne outputs
- One CVBS output

Memory Control Interfaces
- DDR3/DDR3L interface
  - Maximum 2 GB capacity
  - Maximum 64-bit interface
  - Maximum 1.6 Gbit/s frequency
- SPI flash interface
  - 1-, 2-, or 4-bit flash memory
  - Maximum capacity of 32 MB
- eMMC 5.0 interface

Peripherals Interfaces
- Three USB 2.0 host ports
- One USB 3.0 host port
- One SDIO 3.0 interface, supporting 3.3 V components
- One 10/100 Mbit/s adaptive Ethernet port
- One CI/CI+
- One IR receiver
- Four keypad interfaces
- Multiple I²C interfaces
- Three UART interfaces
- Multiple groups of GPIO interfaces
- Multiple PWM interfaces
- Integrated POR module

Others
- 2-layer PCB
- Various boot modes
- Boot program download and execution over a serial port or USB port
- Integrated and dedicated standby processor, supporting various low-power modes
- Low-power design using the technologies such as AVS and DVFS

Acronyms and Abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
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<tbody>
<tr>
<td>3DES</td>
<td>triple data encryption standard</td>
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<tr>
<td>ADC</td>
<td>analog-to-digital converter</td>
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<tr>
<td>AES</td>
<td>advanced encryption standard</td>
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<tr>
<td>ARC</td>
<td>audio return channel</td>
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<tr>
<td>AVS</td>
<td>adaptive voltage scaling</td>
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<tr>
<td>BER</td>
<td>bit error rate</td>
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<tr>
<td>CABAC</td>
<td>context-based adaptive binary arithmetic coding</td>
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<td>CBR</td>
<td>constant bit rate</td>
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<tr>
<td>CEC</td>
<td>consumer electronics control</td>
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<tr>
<td>CI</td>
<td>common interface</td>
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<tr>
<td>CTI</td>
<td>chroma transient improvement</td>
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<tr>
<td>CVBS</td>
<td>composite video broadcast signal</td>
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<tr>
<td>DES</td>
<td>data encryption standard</td>
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<tr>
<td>DRM</td>
<td>digital rights management</td>
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<tr>
<td>DTMB</td>
<td>digital terrestrial multimedia broadcasting</td>
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<td>DVFS</td>
<td>dynamic voltage frequency scaling</td>
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<td>ECC</td>
<td>error correcting code</td>
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<tr>
<td>eMMC</td>
<td>embedded multimedia card</td>
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<tr>
<td>GPIO</td>
<td>general-purpose input/output</td>
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<td>GPU</td>
<td>graphics processing unit</td>
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<td>HDCCP</td>
<td>high-bandwidth digital content protection</td>
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<td>HDMI</td>
<td>high-definition multimedia interface</td>
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<td>HDR</td>
<td>high dynamic range</td>
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<td>HEVC</td>
<td>high efficiency video coding</td>
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<td>I²C</td>
<td>inter-integrated circuit</td>
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<tr>
<td>IR</td>
<td>infrared</td>
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<tr>
<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>F^2S</td>
<td>inter-IC sound</td>
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<tr>
<td>LTI</td>
<td>luma transient improvement</td>
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<td>LVDS</td>
<td>low-voltage differential signaling</td>
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<td>MC</td>
<td>motion compensation</td>
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<td>MHL</td>
<td>mobile high-definition link</td>
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<td>MLC</td>
<td>multi-level cell</td>
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<tr>
<td>OSD</td>
<td>on-screen display</td>
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<td>PCB</td>
<td>printed circuit board</td>
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<td>POR</td>
<td>power-on reset</td>
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<td>PVR</td>
<td>personal video recorder</td>
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<tr>
<td>PWM</td>
<td>pulse-width modulation</td>
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<td>QAM</td>
<td>quadrature amplitude modulation</td>
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<td>RISC</td>
<td>reduced instruction set computing</td>
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<td>ROI</td>
<td>region of interest</td>
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<td>ROP</td>
<td>raster of operation</td>
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<td>SDIO</td>
<td>secure digital input/output</td>
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<td>SIF</td>
<td>sound intermediate frequency</td>
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<td>SLC</td>
<td>single-level cell</td>
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<td>SoG</td>
<td>sync on green</td>
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<td>SPDIF</td>
<td>Sony/Philips digital interface</td>
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<td>SPI</td>
<td>serial peripheral interface</td>
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<tr>
<td>SVP</td>
<td>secure video path</td>
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<tr>
<td>TEE</td>
<td>trusted execution environment</td>
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<tr>
<td>TS</td>
<td>transport stream</td>
</tr>
<tr>
<td>UART</td>
<td>universal asynchronous receiver transmitter</td>
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<tr>
<td>VBR</td>
<td>variable bit rate</td>
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