Hi3751 V730 Brief Data Sheet

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
- Comprehensive integrated digital television solution
- Security processing feature

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 acceleration engine NEON
- Hardware half-precision, single-precision, and double-precision floating-point algorithms

TS Demultiplexing/PVR

- A maximum of 96 hardware PID channels
- Full-service PVR
- Recording of scrambled and non-scrambled streams

Video Decoding

- ITU-T H.265 Main 10 Profile@level 5.1 high-tier (and lower levels), 4K x 2K@60 fps
- VP9 Profile 2 10-bit 4K x 2K@60 fps
- H.264 BP/MP/HP@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@levels 0−3, ASP@levels 0−5, GMC, 1080p@60 fps
- MPEG4 short header format (H.263 baseline), 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 400, 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
- ROP
- 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, I, L, and L'
- 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 Mbaud 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 DTG7.0, NorDig-Unified Test Specification V2.2.1, and Digital Europe Ebook

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- One embedded ATSC demodulator
  - -Standard version A.53/2011
  - Low IF and high IF (36 MHz) signal inputs
  - Adaptive spectrum reverse recognition
  - Frequency error detecting range broader than ±600 kHz
  - Compliance with the A74:2010 test specifications
- One embedded ISDBT demodulator
  - Standard version ARIB STD-B31v2_2-E1
  - Low intermediate frequency (IF) and high IF (36 MHz) signal inputs
  - Adaptive spectrum reverse recognition
  - Frequency error detecting range broader than ±600 kHz
  - Compliance with the ARIB STD-B21v5_4-E1 test standard
- External TS input

NTSC/PAL/SECAM Video Demodulation

- NTSC (NTSC-M, NTSC-J, NTSC-4.43), PAL (B, D, G, H, M, N, I, Nc), and SECAM standards
- Automatic standard detection
- Adaptive 3D comb filter
- 3xCVBS inputs or 1xY/C input

Multi-Format Audio Demodulation

- SIF demodulation
- NICAM, A2, EIA-J, BTSC[option], FM, and AM demodulation
- BTSC, mono, stereo, and SAP modes in the EIA-J standard
- NICAM, mono, stereo, and dual modes in the A2 standard
- Sound standard and automatic mode detection

Audio and Audio Effect Processing

- Conversion of the audio sampling rate
- Volume, equalization, and mute control
- Virtual stereo/surround and bass enhancement
- Dialog enhancement and intelligent volume
- Sound processing[option] such as SRS
- Remote pick-up for the microphone array[option]

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 DolbyVision[option]
  - 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(Trusted Execution Environment) and SVP(Secure Video Path)
- DRM
- AES, DES, and 3DES data encryption and decryption
- Hardware hash/RSA algorithm
- Downloadable CA[option]

Audio/Video Interfaces

- Audio interfaces
  - One I^2S input, two I^2S outputs, and one SPDIF output
  - One HDMI ARC channel
  - Three stereo inputs and two MIC inputs
  - Three stereo outputs
- YPbPr/RGB interface
  Two analog channels, at most 1080p
  -SoG

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 VbyOne 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

Peripheral 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 I^2C 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

3DES	triple data encryption standard
ADC	analog-to-digital converter
AES	advanced encryption standard
ARC	audio return channel
AVS	adaptive voltage scaling
BER	bit error rate
CABAC	context-based adaptive binary arithmetic coding
CBR	constant bit rate
CEC	consumer electronics control
CI	common interface
CTI	chroma transient improvement
CVBS	composite video broadcast signal
DES	data encryption standard
DRM	digital rights management
DTMB	digital terrestrial multimedia broadcasting
DVFS	dynamic voltage frequency scaling
ECC	error correcting code
eMMC	embedded multimedia card
GPIO	general-purpose input/output
GPU	graphics processing unit
HDCP	high-bandwidth digital content protection
HDMI	high-definition multimedia interface
HDR	high dynamic range
HEVC	high efficiency video coding
I^2C	inter-integrated circuit
IR	infrared
I^2S	inter-IC sound

LTI	luma transient improvement
LVDS	low-voltage differential signaling
MC	motion compensation
MHL	mobile high-definition link
MLC	multi-level cell
OSD	on-screen display
PCB	printed circuit board
POR	power-on reset
PVR	personal video recorder
PWM	pulse-width modulation
QAM	quadrature amplitude modulation
RISC	reduced instruction set computing
ROI	region of interest
ROP	raster of operation
SDIO	secure digital input/output
SIF	sound intermediate frequency
SLC	single-level cell
SoG	sync on green
SPDIF	Sony/Philips digital interface
SPI	serial peripheral interface
SVP	secure video path
TEE	trusted execution environment
TS	transport stream
UART	universal asynchronous receiver transmitter
VBR	variable bit rate