

Giayee Handheld Solution

- Low-cost Entertainment Smartphone



Advantages

High-end Multi-media D1@

30fps H.264/H.263/MPEG-4/VC1 Decoder.
Exclusive optimize for WM Media Player.
Rich graphics effects. High-performance
VGA(640X480) encoding(Mpeg4/H.264).

System-wide low-power design

High performance built-in
PMU customized for handheld applications.
IPPS (Intelligence Power Performance
Scaling). MTCMOS.

Perfect system performance

Deeply optimized driver for chip
micro-architecture. CPU, 2D Graphics, ASP,
Video Codec, Java multi-core design.

Low-input, low-cost Turnkey

delivery model(LTK Passed), Full-function
pre-integration of WM, communication,
media, and custom applications (FM,
Recorder etc.)

- High performance
- Low power-consume
- Rich interface
- High-end entertainment experience

Specifications

ARM Core

ARM926EJ 300/450MHz, 16KB+16KB I/D cache
Jazelle Java Accelerator

Memory

RawNand (SLC/MLC)/Nor/DoC Flash, Mobile DDR/SDR SDRAM
Nand Boot
OnChip Booting

Modem

GSM/GPRS/EDGE/CDMA/WCDMA/TD-SCDMA/HSPA
Dual-modem Dual-standby

Interface

1 X USB 2.0 HS OTG with PHY
1 X USB 2.0 FS Host/Device with PHY
1 X 18bit RGB/XCI WVGA LCD
1 X SD
1 X SDIO (WiFi)
4 X Highspeed UART (Modem/BT/GPS/IR)
3 X SPI (WiFi/Mobile TV/LCD)
2 X I2C (Camera/FM)
1 X 1-Wire
14 X 8bit GPIO

Graphic

HW 2D Graphic Accelerator: ROP2/3/4, Support Alpha
Blending/Color Key BLT
4 hardware overlay layers to support the inter-layer Colorkey
Overlay, Alpha Blending, Crop, Scaling, Rotate
On-chip Full Frame Buffer (200KByte)

Video

VGA@ 30fps H.263/MPEG-4 Video Encoder

D1@30fps H.264/ H.263/ MPEG-4/ VC-1 Decoder, HW

Scaling to Full-Screen

HW Crop, Scaling , Rotate, PIP, Mirror supported

Video

MP3, WMA, WMA Pro+, AAC, eAAC

HW Resample/Mixer, 10 Band EQ

72 Tone Wavetable MIDI

Smart Audio-Centric, support Digital / Analog data Exchange
and Mixing, low-power Bluetooth-call, Call Recorder,
Telephone Answering.

DRM

Janus and OMA DRM support

Entertainment

Support HEL based OpenGL 1.1/D3DM 3D, OpenVG, 3D
Game

Flash Media Player

Support Plug-In Mobile TV Module through SDIO/Camera

RGB IF

FM radio Mix, Recorder

Audio PA

Camera

8M Pixels AF Camera support

Security

Security Booting support

Encryption: RSA, 3DES, AES, SHA1, MD5 support

Software

Windows Mobile 6.1

Enhanced WM Media Player

Camera, MTV, FM, Recorder etc.



HW Video Accelerator

- Decoder (D1 30fps)
- H.264/MPEG4/H.263(3GPP)/VC1
- Coding (VGA 30fps)
- MPEG4/H.263(3GPP)
- JPEG codec
- Special effects &post-treatment

Audio

- MP3, WMA, AAC
- Hardware Resample, mixing
- 10 Band EQ
- 72 polyphonic MIDI
- Digital / Analog Mixing
- Call recording, automatic answering

HW Graphic Accelerator

- HW 2D graphic accelerator
- BLT/ROP2/3/4 supported
- 4 layers of HW overlay
- Graphics Colorkey Overlay
- HW Crop, Scaling, Rotate
- Onchip Full Frame Buffer

Customize

Giayee provides a custom re-design in both HW and Software development based on this solution.

Please contact us if you are interested.

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Effects contrast of graphic algorithms

De-blocking

- Image block is obvious
- Improve the image block by De-blocking algorithm



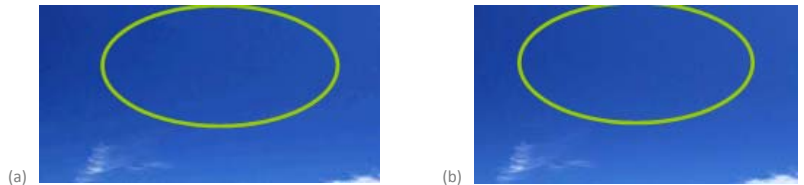
Linear interpolation

- Bilinear interpolation, have serrated edges
- Bicubic interpolation, the edge is not serrated

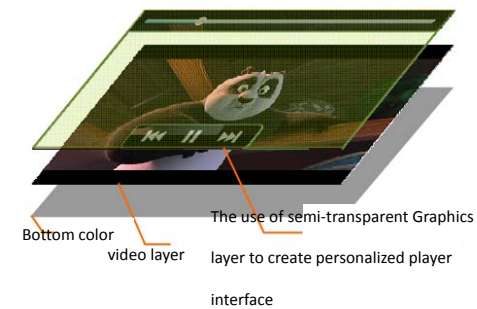
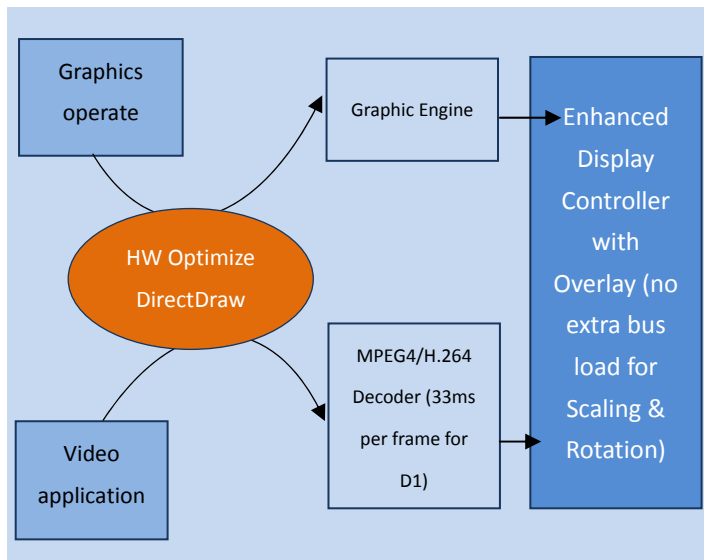


Jitter algorithm

- Jitter algorithm not added, the sky color uneven transition
- Add jitter algorithm, so the sky color transit evenly

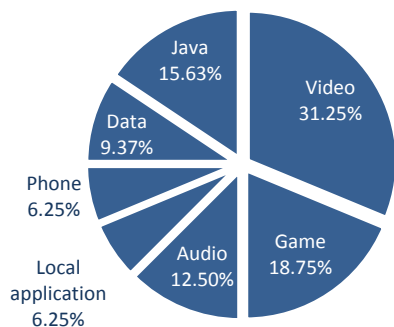


Rich Video & Graphic Effects





Multi-core micro-architecture design for Handheld application



5-Core Architecture Design

Application	HW Unit	Performance
Video	HW Video Codec	Smooth video playback, high-quality images, lowest CPU occupancy and power consumption
Game & 2D Graphics application	HW 2D Graphics	Get graphics acceleration while reducing the CPU load, make smoother Games, lower power consumption
Mixing	ASP	Excellent audio effects, does not occupy CPU resources
Java application	Jazelle Java Acceleratore	8 times Java performance than CPU
Local application	ARM Core 450MHz	CPU resources are biggest reservation for such applications

Powerful System Performance

System performance test data (Spb Benchmark v1.6)

	HI3611	One business model		HI3611	One business model
Spb Benchmark index	704	400	Write 1MB file (KB/S)	1179	1894
CUP index	1639	1560	Read 1MB file (MB/S)	33.3	21.3
File system index	329	166	Copy 1MB file(KB/S)	1192	1510
Graphics index	3784	3538	Write 10KB x 100 files (KB/S)	254	243
Compress 1MB file using ZIP (KB/S)	306	311	Read 10KB x 100 files (MB/S)	1.79	3.39
Decompress 1024x768 JPEG file (KB/S)	523	481	Copy 10KB x 100 files (KB/S)	382	245
Arkaball frames per second (fps)	195	155	Directory list of 2000 files (thousands of files/S)	3.8	1.28
CPU test: Whetstones MFLOPS (M/S)	0.061	0.074	Internal database read (records/S)	900	1053
CPU test: Whetstones MOPS (M/S)	52.9	43.4	Graphics test: DDB BitBit(frames/S)	542	457
CPU test: Whetstones MWIPS (W/S)	4.51	4.96	Graphics test: DIB BitBit (frames/S)	31.2	40.1
Memory test: copy 1MB using memcopy (MB/S)	78.6	70.5	Graphics test: GAPI BitBit (frame/S)	546	449

Specifications of our sample device

Chipset	Hi3611+NXP Modem
OS	Windows Mobile 6.1
Memory/Storage	
Flash ROM	256MB
RAM	128MB SDRAM
SD Card	SDHC supported
GSM/GPRS	
RF band	GSM/GPRS/EDGE 850/ 900/1800/1900
GSM	Y
EDGE	Y
GPS	AGPS supported
SIM	3V/1.8V SIM
Antenna	built-in
LCD/Touch Screen	
LCD	2.8", 240*320 / 480*640
Main LCD Backlight	Y
Touch Screen	Y
Battery	
Capability	1000mAh Li-Polymer battery
Operation time	
Standby	200hs
Talk time	4hs
Charging time	<3 hours
Camera	2 mega-pixels CMOS
Device to Device Connection	



Bluetooth	Y
WiFi	Y, 802.11b/g
Audio	
Handfree	Y
Bluetooth	Y
FM	Y
Record	Y
Interface	
Mini-USB connector	USB2.0
Audio Jack	Y
Character	
Dimensions	105 * 55 * 15
Cover case	Not available

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