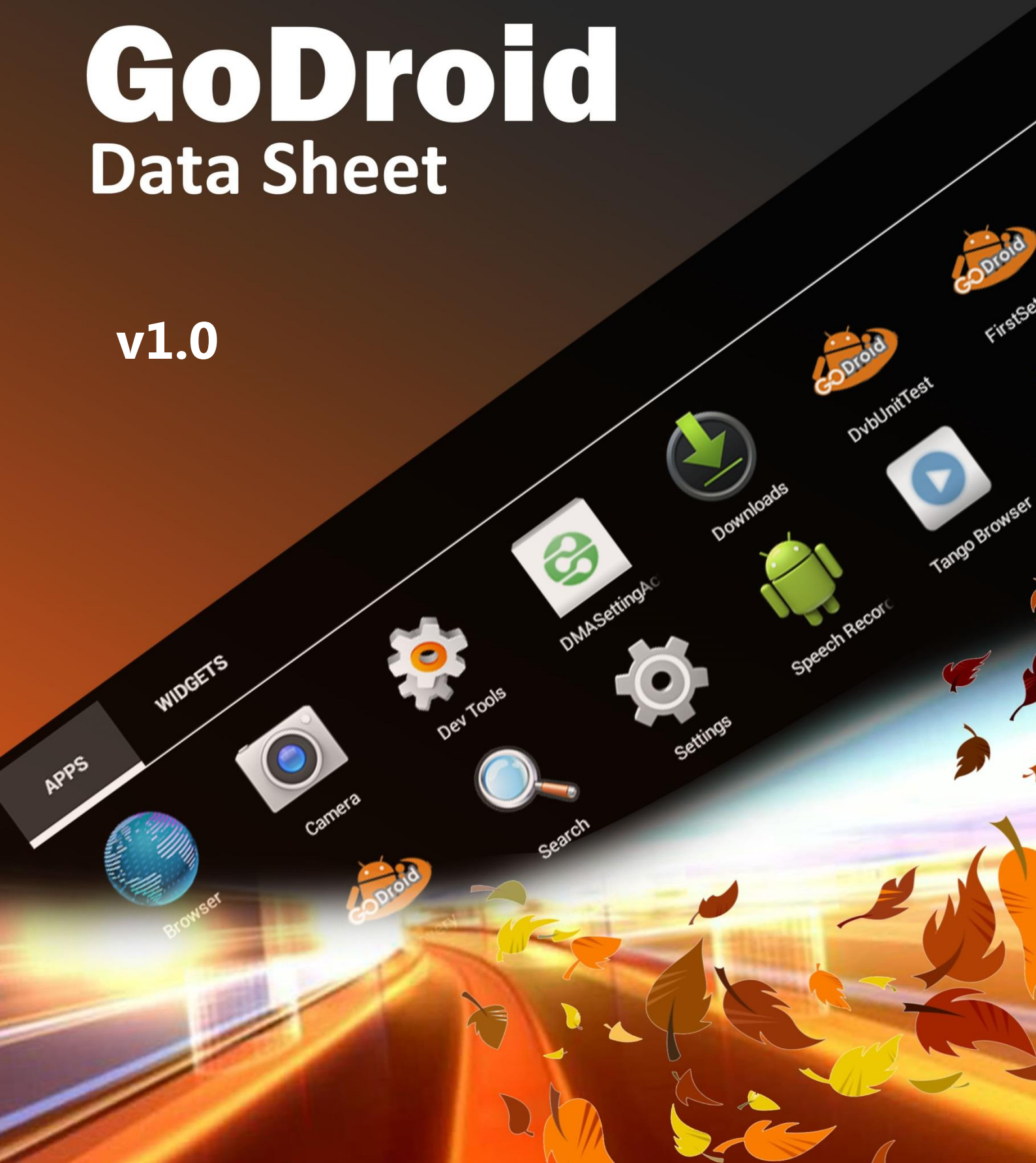
GOWARRIOR

GODroid

GoDroid
Data Sheet

v1.0



Overview

What is GoWarrior?

GoWarrior is a compact, open-source, community-supported embedded Android/Linux computing platform geared toward maker/ hacker/ entrepreneur/ dreamer/ artist/ student/ inventor/ hobbyist/ tinker. It brings together a rich feature set of innovative building blocks with cloud-driven back-end service deployment. It can be used to build complex applications that interact high-level software and low-level electronic circuits, helping you from idea through prototype to commercial mass production delivery.

It is also an ideal platform for prototyping to project and product design that take advantage of the power and freedom of Android/Linux ecosystem, combined with direct access to input/output pins and buses, allowing you to interface with electronics components, modules, and USB/Wi-Fi devices.

What is GoDroid?

GoDroid is the integral Android-based operating system of GoWarrior platform. There's a lot to understand about Android, but with GoDroid, this specially extended and optimized ease-of-use development kit, you can focus on bringing your creation to life without seeking for the accessibility to Android. Its specific advantages and features are displayed in the following sections.

Benefits

- **Reinvented OS**

Optimized and tailored OS kernel and AOSP components satisfy the real world demands of Maker application design.

- **Pre-Built Open Source Middleware and Library**

Off-the-shelf integrated and highly optimized open-source middleware and library allow for more focus on innovation itself.

- **Multimedia**

Replaces the Android native Media Engine, thus removes its limitations to provide support for various media formats, strong extension ability, and excellent performance.

- **High Security Infrastructure**

Built-in HW assisted SEH (Security Extension Hub) engine for safeguarding your application from being tampered.

- **Rich Extension of Interfacing Options**

Integrated services and extended JAVA API for GPIO/I2C/SPI/UART make peripheral extension an easy job. Pre-integrated Python library allows for minor efforts for Raspberry Pi and BeagleBone Black Python application porting. Also supports communication and inter-operation with Arduino Boards and Arduino Shields.

Features

- **Media Compatibility**

Supports various Audio/Video/Image formats and provides smooth playback experience for a large number of media applications, e.g. Kodi™.

- **Fast Boot**

It only takes 7 and 35 seconds with NAND Flash from powering on to displaying boot splash and Android homepage respectively.

- **Low-Power Sleep Mode**

Supports the ultra-power-saving sleep mode (PMU Standby), with the entire board power consumption as low as 0.35W

- **Multi-Screen Sharing**

Integrates DLNA and Miracast to fully support the multimedia sharing and multi-screen interaction

- **Recovery Mode**

Enhanced Android original Recovery improves development efficiency and meets customized requirements.

- **Programing Languages**

Supports
C/C++/JAVA/Python/JavaScript/Shell.

Diagram of GoDroid System Architecture

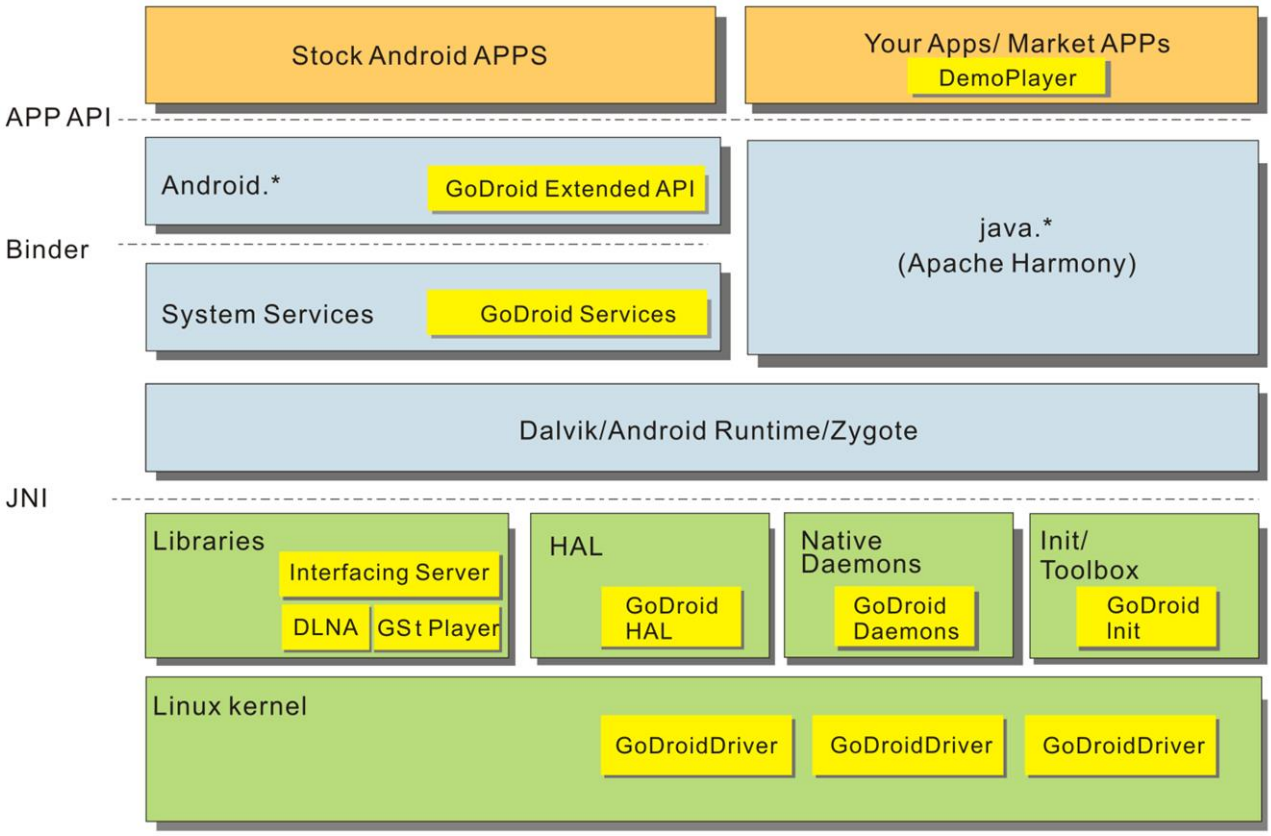


Diagram of GoDroid System Architecture

1. **GoDroid Extended API:** In addition to implementing functions not available on the official Android, it provides Java layer API extensions to implement Ethernet setting, display area adjusting, TV system setting, GPIO/I2C/SPI/UART access, etc.
2. **System Services**: Implements some functions not available on Android through system services, such as DLNA, Interfacing extension.
3. **Libraries/HAL/Native Daemons/Init**: The native codes implemented by system services include HAL, Daemon processes, GoDroid Initialization, etc.
4. **GoDroid Driver:** Hardware IP drivers of ALi SoC chipset, including Audio, Video, Demultiplexer, Demodulator, Descrambler, OpenGL, Frame buffer, HDMI, I2C, IR, NAND Flash, PMU, UART, MicroSD Card, USB, Ethernet, etc.

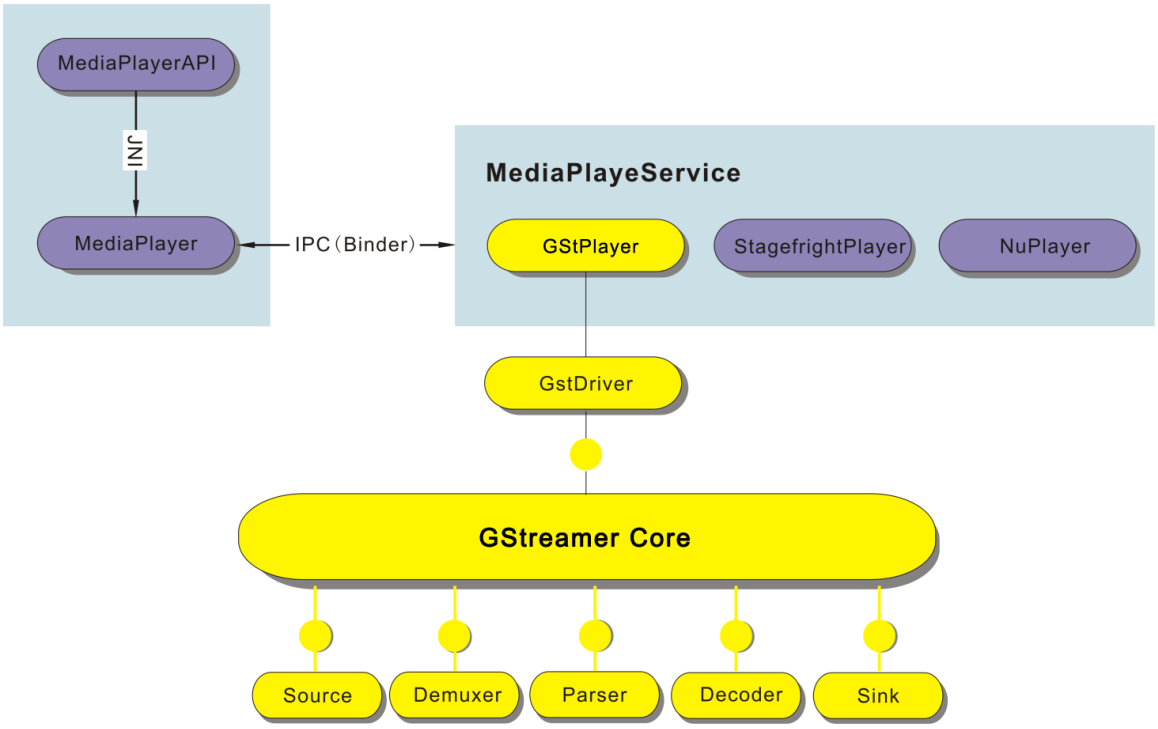


Diagram of GoDroid Media Engine Architecture

Above is the Diagram of GoDroid Media Engine Architecture. The yellow blocks are based on the GStreamer core.

Function List

GoDroid has the following functions based on Android 4.4.4.

Function	Description
Boot	Supports boot from NAND Flash or MicroSD card. 7 and 35 seconds with NAND Flash from powering on to displaying boot splash and Android homepage respectively. LED shows boot process; extended recovery mode supported.
1st configuration wizard	When GoDroid is powered-up for the first time, a friendly configuration wizard will run for setting items such as Network, Display setting, etc.
Recovery	Supports IP/OTA/USB upgrade using a uniform upgrade package. Supports full and incremental package upgrade. Supports upgrading partition table, bootloader, recovery, and kernel. Supports one-key recovery, force upgrade, and resetting factory settings.
Multimedia	Extended media engine based on the GStreamer, supports multiple network protocols, formats of audio & video container. Details are showed in Appendix A. Kodi 14.2 supported.
Input Device	Supports USB mouse and keyboard, remote controllers with simulated mouse function and standby wakeup.
Network Connection	**Ethernet:** 10/100Mbps Fast Ethernet (HW accelerated), IP DHCP/Static **Wi-Fi:** On-board RTL8723BU **PPPoE:** Supports wired dial-up internet connection
TV Setting	Supports TV system resolution setting, adjustment of display area size, brightness/saturation/contrast etc.

Function	Description
DLNA/Miracast	Supports multiple screens interaction. Detailed functions are showed in Appendix D.
AV output	Supports HDMI/RCA output simultaneously.
Bootable MicroSD Card	Supports MicroSD card boot and used as a secondary storage device. MicroSD card list is specified in appendix E.
Bluetooth	Supports Bluetooth input devices like mouse, keyboard and joystick, and support (audio only) Bluetooth output.
USB camera	Logitech USB camera (C920) is supported. This camera has the functions of JPEG shooting and H.264 video encoding.
Sensors	I2C Interface sensor (MP6050) and SPI interface sensor (MAX31855) are demonstrated.
PWM output	PWM output can be used as external motor drive.
Arduino support	Supports communication and inter-operation with Arduino through UART. Arduino Uno is demonstrated.
Extended interfacing	Extended JAVA API for GPIO/I2C/SPI/UART device access.
Debugging	Supports ADB debugging via local network and USB.
Pre-tested APK	A variety of APKs has been tested and can run smoothly on GoDroid. Detailed information is listed in appendix F. These APKs are pre-stored in "/data/app-user/" but not installed yet, you can install specific ones as needed.

Appendix A: Multimedia

Function	Description
Network streaming	Supports VOD (Video on Demand), live playback and seek.
Video preview window	Supports video preview and free switch between video preview window and full screen.
Local file playback	Supports USB local media file playback, Blu-Ray directory and Blu-Ray ISO file.

Appendix B: List of Network Protocols and Video, Audio, Container Formats

Parts of the following audio and video format need License support.

Classification	Subclass	Description
Network Protocol	HTTP	Protocol prefix: "http://", "https://"
	MMS	Protocol prefix: "mms://", "mmsh://", "mmst://", "mmsu://"
	RTMP	Protocol prefix: "rtmp://", "rtmpt://", "rtmps://", "rtmpe://", "rtmfp://", "rtmpte://", "rtmpts://"
	RTSP	Protocol prefix: "rtsp://", "rtspu://", "rtspt://", "rtsph://", "hw://"
Video Format	MPEG-4 Part 10 /AVC(H.264)	H.264 Baseline/Main/High Profile, level 1-4.1
	VP 6/7/8	——
	Xvid	——
	VC-1	VC1 Simple/Main/Advance Profile, level 0-3
	MPEG-1/2 (MP@HL)	——
	H.263 profile 0 (short header)	——
	MPEG	MPEG Audio I/II layer 1/2/3
Audio Format	AAC/HEAAC	——
	FLAC	——
	RealAudio	——
	Vorbis	——

Classification	Subclass	Description
Audio Format	PCM/ADPCM	——
	APE	——
Container Format	FLV	.flv, .f4v video
	MPEG-TS	.ts, .m2ts, .mts, .tp, .trp
	MP4	.mp4
	MPEG-PS	.dat, .mpg, .mpeg, .vob
	Ogg	——
	3GP	——
	ASF	——
	AVI	——
	WAV	Audio only
	Matroska	.mkv, .mka, .mks, .mov
	RealMedia	.ra, .ram,.rm,.rmvb ; License required
Picture Format	PNG	——
	GIF Static	——
	BMP	——
	JPEG	——
	WebP	——
Subtitle Format	ASS/SSA	.ass, .ssa
	MicroDVD	.sub

Classification	Subclass	Description
Subtitle Format	VOBsub	.sub+.idx
	SubRip	.str
	SMI	.smi
	PGS	——
Variable Bitrate Streaming Media (Adaptive Streaming)	Http Live Streaming, Smooth Streaming	——
Audio Encoding	AMR-NB, AMR-WB, AAC LC, HE AACv1, AAC ELD	——
Image Encoding	PNG	——

Appendix C: Supported Kodi Plug-in

Classification	Plug-in Name	Result
Video Plug-in	Filmikz	PASS
	FilmOn	PASS
	FilmOn.TV	PASS
	FliXanity	PASS
	Football Replays	PASS
	Genesis	PASS
	HowStuffWorks.com	PASS
	Husham Lists	PASS
	IPTV Stalker	PASS
	IPTVTR	PASS
	IPTVxtra Ukxtra	PASS
	KIDSIL	PASS
	Mikey's Karaoke	PASS
	Movies XK	PASS
	Movies4ME	PASS
	Much Movies HD	PASS
	One Click Watch	PASS
	Online HD Movies	PASS
	p2p-streams	PASS
	Pak India Live	PASS
	Phoenix	PASS

Classification	Plug-in Name	Result
Video Plug-in	Project Free TV	PASS
	S.P.O.P.T	PASS
	Supper Cartoons	PASS
	The GiddyUp Network	PASS
	World News Live	PASS
	World Tv Xunity Talk.com	PASS
	XMovies8	PASS
	ZemTV.com	PASS
Audio Plug-in	Hellenic TV	PASS
	Old Skool	PASS
	BBC Podcasts	PASS

Appendix D: DLNA/Miracast

Classification	Subclass	Description
DLNA	DMR	Service release, device discovery
		Media push and playback
		Playback control
		Playback status
		Error handling
	DMS	Service release
		List content
	DMP	Device detection
		Directory browsing
		Media play
Miracast	Sink	Device discovery
		Device connection
		Video & image push
		Device reconnection after disconnection
	HDCP	Protect transmission content

Appendix E: Supported MircoSD Cards

Classification	Kinds	Rate	Capacity	File system	Result
MicroSD	SanDisk Ultra	Class10 (SDHC I)	16G	FAT32	PASS
MicroSD	Kingston	Class4 (SDHC)	8G	FAT32	PASS
MicroSD	Team	Class4 (SDHC)	8G	FAT32	PASS
MicroSD	Samsung EVO	Class10 (SDHC I)	16G	FAT32	PASS
MicroSD	SanDisk	Class4 (SDHC I)	8G	FAT32	PASS
MicroSD	Sony	Class10 (SDHC I)	16G	FAT32	PASS
MicroSD	PNY	Class4 (SDHC I)	8G	FAT32	PASS
MicroSD	Samsung	Class4 (SDHC)	8G	FAT32	PASS
MicroSD	Pretec	Class0	1G	FAT32	PASS
MicroSD	Nokia	Class0	512M	FAT32	PASS
MicroSD	Toshiba	Class10 (SDHC I)	16G	FAT32	PASS
MicroSD	OV	Class10 (SDHC I)	16G	FAT32	PASS
MicroSD	Gigastone	Class4 (SDHC I)	8G	FAT32	PASS
MicroSD	KDATA	Class10	16G	FAT32	PASS
MicroSD	ADATA	Class10 (SDHC I)	64G	exFAT	PASS
MicroSD	Microflash	Class10 (SDHC I)	16G	FAT32	PASS
MicroSD	Transcend	Class10 (SDHC I)	32G	FAT32	PASS
MicroSD	Maxell	Class4	8G	FAT32	PASS

Appendix F: Compatibility List

Device	Description
HDMI	Uses standard HDMI cable to test, 24 TV sets passed test.
	Notes: 24 TV sets were tested in the use of unqualified HDMI cable. 2 TV sets hadn't output and resumed normal after replacement of the standard HDMI cable. 2 TV sets are as follows: Philips 220TS2L, Samsung LA22B350F2.
USB	12 USB storage devices passed test.
	Includes current mainstream brands in the market, such as KINGSTON/TOSHIBA/SanDisk/SONY/SSK/HP/PNY/Ydstar/WD/Hitachi/Seagate/ Zynet, etc.
Router	13 kinds of routers passed test.
	Includes current mainstream brands in the market, such as TPlink/Dlink/Linksys/Netgear/Tenda/Fast/Cisco/FULLRIVER/HiPER/MERCUR/ NETCOR, etc.

Appendix G: Tested APKs

Classification	Name	Result
APK	ES File Explorer v3.2.5.5.apk	Pass
APK	UCBrowser_TV v1.7.0.481.apk	Pass
APK	VST v2.6.7.3.apk	Pass
APK	AliLive_TV v4.3.5.apk	Pass
APK	BestTV 1.0.1.28.apk	Pass
APK	BevaErgeTV v2.2.0.apk	Pass
APK	TVlive_V2.0 v2.4.8.apk	Pass
APK	MoreTV v2.5.6.apk	Pass
APK	Riptide GP 2 v1.2.0.apk	Pass
APK	LongLong TV v5.5.1.apk	Pass
APK	Qipoyingyongshichang v4.5.1.apk	Pass
APK	TogicVideo v3.0.6.apk	Pass
APK	Youjoyddz v1.3.0.apk	Pass
APK	Netease_open v1.1.0.apk	Pass
APK	weiyoushoubingyouxiting_v3.2.0.7	Pass