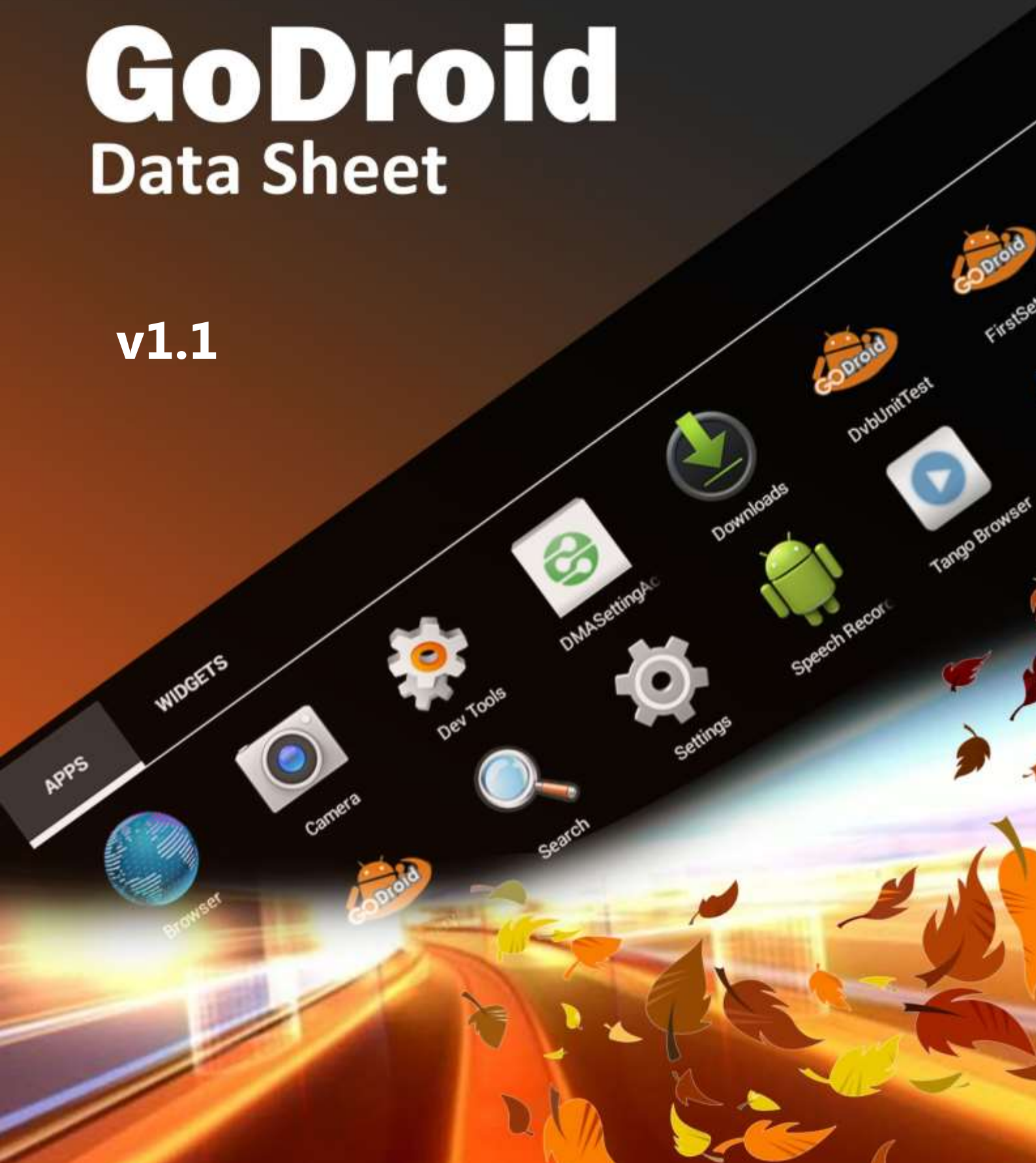
GOWARRIOR

GODroid

# GoDroid
## Data Sheet

**v1.1**



# 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

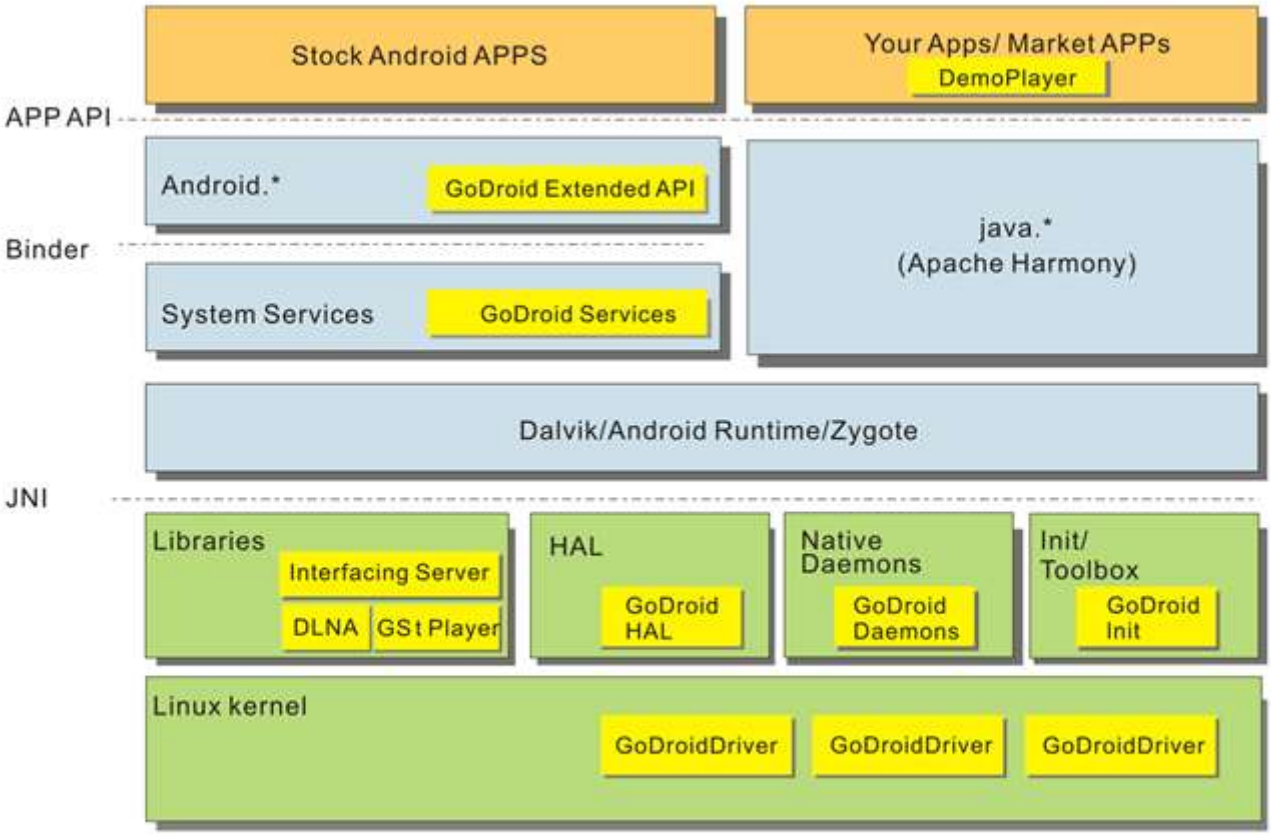



**Diagram of GoDroid System Architecture**

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.

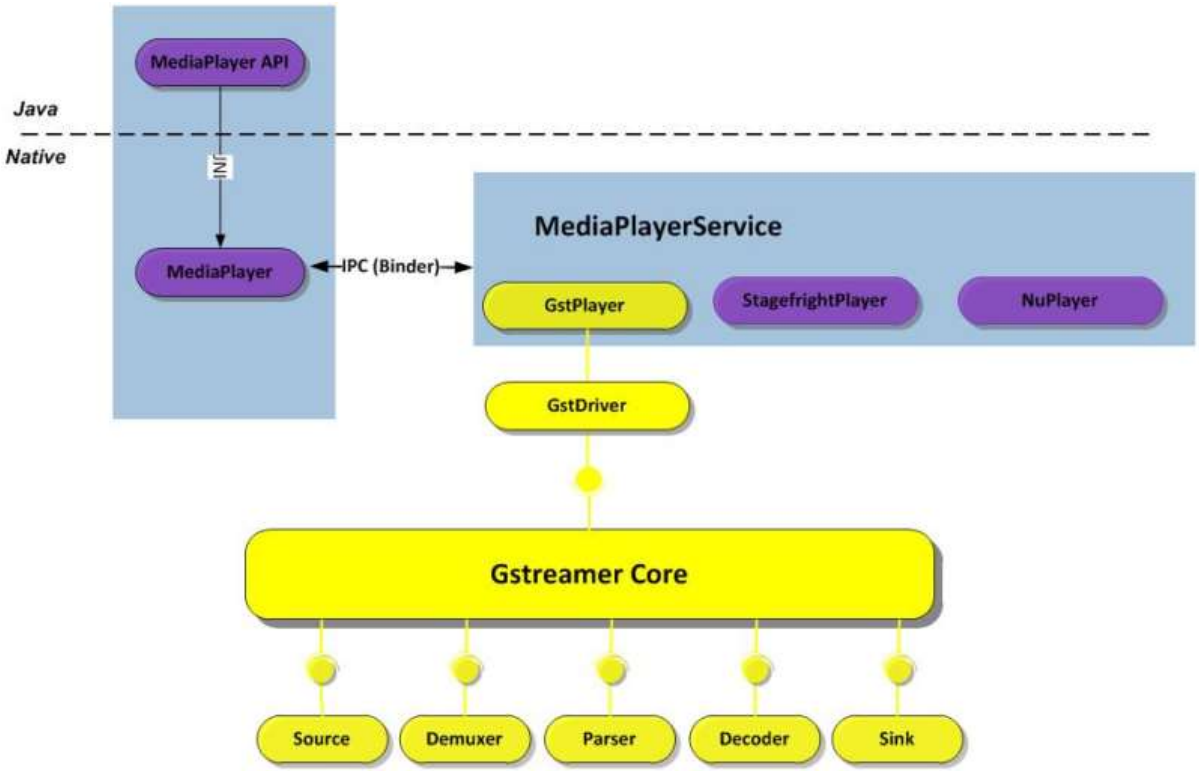



**Diagram of GoDroid Media Engine Architecture**

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.<br>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.<br>Supports full and incremental package upgrade.<br>Supports upgrading partition table, bootloader, recovery, and kernel.<br>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.<br>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<br>**Wi-Fi:** On-board RTL8723BU<br>**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 8 | —— |
| | Xvid | —— |
| | VC-1 | VC1 Simple/Main/Advance Profile, level 0-3 |
| | MPEG-1/2 (MP@HL) | —— |
| | H.263 profile 0 (short header) | —— |
| Audio Format | MPEG | MPEG I/II Audio layer 1/2/3 |
| | 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 MicroSD 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.<br>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 |