



# GS2011M Music Application Development Kit

## High Quality Streaming Music over WiFi

### PRODUCT OVERVIEW

GainSpan Music ADK is a development platform enabling customers to build high quality wireless music applications with GS2000 Wi-Fi modules. By integrating the major hardware and software components for a WiFi music streaming solution, this platform facilitates fast time to market in a customer development effort.

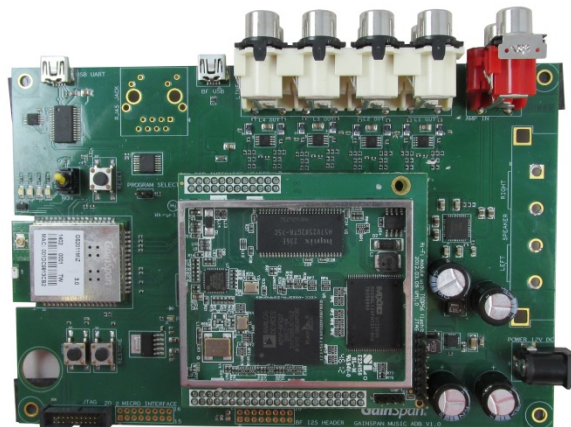
Targeted applications for this platform include wireless speakers, bookshelf / tabletop speakers, sound bars, and variety of other systems where customer would like to add music streaming functionality. In addition to support for major audio codecs, the platform also integrates DSP functionality and advanced audio post-processing functions providing excellent sound quality.

GainSpan's software stack establishes easy connectivity between mobile device and the wireless speaker. In addition, the platform also supports major streaming protocols such as WiFi Direct/Miracast, AirPlay, DLNA etc.

### MUSIC ADK FEATURES

The following Music ADK features include the following:

- Streaming of high bit rate uncompressed or compressed multichannel audio streams. 24-bit high resolution audio streams and sampling rates of up to 192kHz are supported with the development platform.
- Longer range than other wireless technologies for music streaming within the home.
- Ease of provisioning: ADK can be set up simply and easily from a Smartphone or Laptop through the innovative Limited AP mode or with WiFi Protected Setup (WPS 2.0).
- Integration of home networking protocols including WiFi Direct/Miracast, AirPlay, and DLNA.
- Planned support for implementation of multi-zone speakers.
- Planned support for connectivity to streaming cloud services including Pandora, Google Radio, etc.
- IEEE 802.11b/g/n compliant module and meeting worldwide regulatory and WiFi Alliance certification requirements.



### APPLICATIONS:

- Wireless Speakers
- Bookshelf/Tabletop Speakers
- Sound bars
- Wireless IoT – Music Streaming

### WIFI CONNECTIVITY:

- GS2011M module IEEE 802.11b/g/n connectivity with PHY rates up to 72Mbps
- Limited AP, WiFi Direct with concurrent mode, WPS2.0
- SPI and SDIO interface to audio processor
- Security: 802.11i, WPA/2-Personal and Enterprise, legacy WEP, TLS
- Fast boot up, low power operation and low standby current

### AUDIO STREAMING PROTOCOLS:

- WiFi Direct/Miracast, AirPlay, DLNA

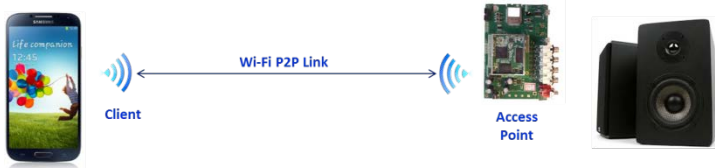
### AUDIO PROCESSING ON ANALOG DSP:

- Blackfin BF526 supports multiple codecs: MPEG2-Layer 3 (MP3), MPEG-4 AAC-LC, MPEG-4 HE AAC, Dolby 5.1, DTS 5.1, Windows Media (WMA), WAV, PCM, ALAC, FLAC
- Audio Post Processing DSP software from Analog Devices for virtual surround, dialog clarity, enhanced bass, compressed music restoration
- Supports for 3<sup>rd</sup> party algorithms from Dolby, SRS, and others

## USE CASES

GainSpan Music ADK enables multiple streaming use cases over WiFi technology.

### PEER-TO-PEER MUSIC STREAMING



### WHOLE HOME DISTRIBUTION VIA ACCESS POINT



### INTERNET CLOUD STREAMING



### DEVELOPMENT KIT SYSTEM COMPONENTS

GainSpan Music ADK comprises of the following components:

- **GS2011MIZ:** GainSpan GS2011MIZ features low power and all interfaces for music application.
- **Blackfin BF526:** The high performance embedded DSP from Analog Devices integrates audio codec functionality and DSP functionality.
- **AD1933:** This 8-channel DAC supports 24-bit resolution and up to 192KHz sampling rate.
- **SSM3302:** This filterless stereo Class D amplifier provides up to 2 x 10W into 4Ω. SSM3302 also features low EMI emissions and a 98dB signal-to-noise ratio (SNR).

### ANALOG BF526 ALTERNATIVES:

- Blackfin BF552, 523, 524, 525, 527
- SHARC processors

### HOSTED SYSTEMS:

- For addition of music streaming functionality to existing designs, GainSpan ADK implements simple AT commands and serial to WiFi connectivity

### EMBEDDED SOFTWARE:

- TCP/IP networking stack: GS2011M runs the full WiFi and TCP/IP networking stacks, offloading the audio processor. It also supports a complete suite of security protocols, including WPA/WPA2-Enterprise and Personal security modes, legacy WEP encryption, and upper layer security protocols such as TLS/SSL and HTTPS
- GS2011M also runs a DLNA (Digital Living Network Alliance) Media Renderer software stack. DLNA DMR allows Smartphone/Tablet DLNA Media Controller/Server to send music to be played on the wireless speaker

### MOBILE APPLICATION:

- Use a DLNA Controller/Server application on the Android Smartphone to browse playlist and send the music to the WiFi speaker. These applications are available on Google Play.

### AVAILABLE:

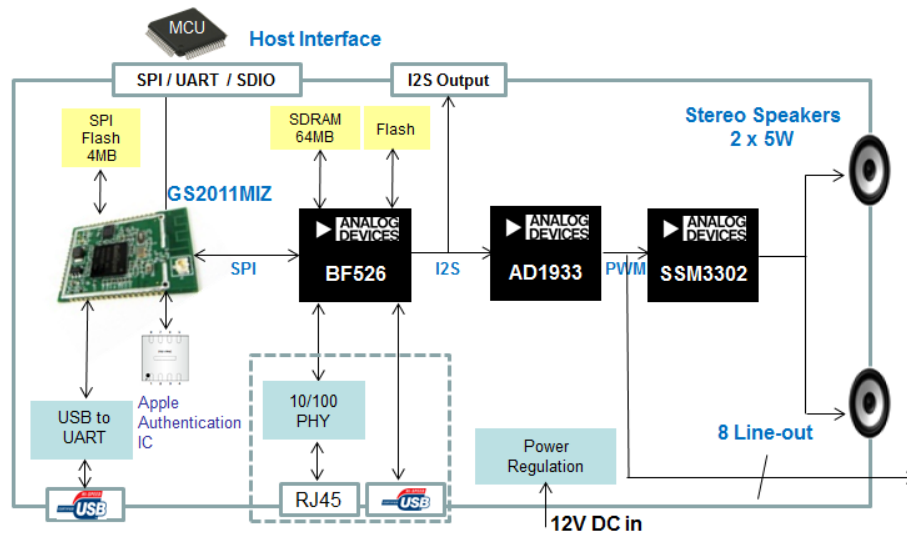
- DLNA 1.5 Media Renderer
- Support for 3<sup>rd</sup> party Media Controller (Bubble, PacketVideo)

### ROADMAP:

- AirPlay on iOS7
- Cloud Streaming services
- Miracast

### CERTIFICATIONS:

- US/Canada (FCC/IC)
- Europe (ETSI)
- Japan (TELEC) certified



**GAINSPAN GS2011MIZ/MIE MODULE SPECIFICATIONS**

Components	Description
Radio Protocol	IEEE 802.11b/g/n
Pin Count	49 pins
RF Output Power (Typical)	+15dBm (802.11b), +11dBm (802.11n)
Rx Sensitivity	-95dBm
Wake from Standby Time	1ms (1 millisecond)
RF Operating Frequency	2.4 – 2.495GHz
Supported Data Rates	72, 65, 58, 43, 29, 22, 14, 7 Mbps (802.11n), 54, 48, 36, 24, 18, 12, 9, 6 Mbps (802.11g) 11, 5.5, 2, 1 Mbps (802.11b)
Antenna Options	External antenna (u.FL connector) or Internal PCB trace antenna
Operating Temperature	-40° to +85°C
Security Protocols	WPA/WPA2-Personal, WPA/WPA2-Enterprise (PEAP, EAP-FAST, EAP-TLS, EAP-TTLS), WEP, TLS/SSL Client and Server, HTTPs
Networking Protocols	TCP, UDP, IPv4, IPv6, TLS Client/Server, SNMP client, DHCP Client/Server v4, DHCP Client/Server v6, DNS Client and Server, mDNS, DNS-SD, HTTP Client/Server, and XML Parser
Certifications and Compliance	FCC, IC, TELEC, ETSI, RoHS, WiFi Certified, WiFi Direct, WPS 2.0, SEP 2.0
I/O Interfaces	SPI, UART, SDIO, I <sup>2</sup> C, I <sup>2</sup> S, GPIO, ADC (12.bit), JTAG
Host Connections	SPI, UART, SDIO (typically to an external microcontroller)
Internal Flash	4MB
Outline Dimensions	22.8mm x 32.5mm x 3.63mm (shield)
I/O Voltage	2.7-3.6V
Operating Voltage	2.7-3.6V
V <sub>BAT</sub>	1.6-3.6V

**MUSIC ADK ORDERING INFORMATION**

ITEM	PART NUMBER	Description
<b>GainSpan Music ADK</b>	GS-ADK--Music	GainSpan Music Application Development Kit
<b>GainSpan Music AEK</b>	GS-AEK--Music	GainSpan Music Evaluation Kit