



Saankhya Labs, Saankhya Labs is a fabless semiconductor company providing innovative semiconductor solutions to consumer electronics, wireless communication and other emerging markets. Saankhya is recognized as one of the “Silicon 60 hot start-ups to watch” by EE Times. Powered by an award-winning software defined radio (SDR) technology, their programmable baseband communication ICs and modules are used in a wide range of communication applications, including low-bit rate satellite receivers, satellite modems, TV White space base station and Customer premises Equipment (CPE) modems, UHF/VHF modems, Tablet TV receivers, Set-top boxes, TV transmitters and cognitive radios.

Technology

Using its industry leading SDR architecture, Saankhya has developed cost effective SDR Chipsets and Modules to enable Wireless Communications using the unlicensed UHF (400 – 900 MHz) TV Channels, call the White Space Channels. This technology, based on IEEE 802.22/11af standards, provides long distance (over 2 km), Non Line of Sight (NLOS) Broadband connectivity (over 10Mbps) to households.

Company has built a strong IPR portfolio with over 25 Patent applications in India, USA, and Europe, with **15 patents granted** to date.

Saankhya Labs Communications Processors have been adopted and installed by Wireless Internet Service Providers (ISP) in the United States, Singapore, India and Philippines and have achieved broadband speeds of 10 Mbps at distances exceeding 10 km without line of sight requirements. Customers are also using the SDR chipsets in the emerging markets of GEO Satellite Broadband and for Security applications.

Team

Founded in 2007, the company has a strong team of over 50 engineers with full life cycle electronic product design, data communications, digital signal processing, Chip design, system design and embedded software expertise.

Management Team

Parag Naik: CEO & Co-Founder

Dr. Vishwa Kayargadde: Chief Scientist & Co-Founder

Hemant Mallapur: VP of Engineering & Co-Founder

Anindya Saha: Chief Technology Officer

TV Whitespace Communications

Last mile connectivity is a challenge in remote areas since few hundreds of households are spread over a large area. Operators find it a challenge to serve these households because of challenging terrains, lack of backhaul, high entry costs and poor ROIs.

TV Whitespace Channels, which are unused bands in the TV Spectrum released by Analog TV broadcasters has been adopted by IEEE 802.22/802.11af standards to bring broadband to rural areas. This spectrum is preferred over WiFi as it has better propagation characteristics (long distance, indoor/outdoor and in all weather conditions), is less crowded and works non-line of sight. As a result of the low capex/spectrum fee and high reliability, Wireless Internet Service Providers (WISP) have adopted TV whitespace as the best solution for last mile connectivity.

TV whitespace communications can also be used as a backhaul for connecting the Wifi network inside trains to the trackside optical fibre, for small cell backhaul, and for connecting the remote machines, smart utility meters to the cloud.

Number of Units	2016	2017	2018
Rural Broadband BS & CPE	113Mu	169Mu	184Mu

Table 1: Market Size (Source: Internal Data)

Key Products

Saankhya Labs specializes in the development of flexible, cost effective, cognitive SDR chips for the next generation wireless broadband systems including TV Whitespace. Cognitive SDR enables intelligent user environment sensing and re-programming the modulation standards based on user requirements for minimum interference while using the available bandwidth.

Cognitive SDR chipsets have been used in a number of applications from Rural Broadband base station/CPEs (IEEE 802.22) to Satellite broadband and Custom Military/Emergency Communications.

Saankhya Labs SDR chipsets enable feature upgrade, performance improvement and potentially support emerging standards by simple firmware upgrade. It also helps to debug and fix any field issues without the need to recall the product back to factory, saving precious time and cost.

Product	Features	Benefits
IC*: SL100x + SL900x	Multi-Standard Support; Flexibility to program the chip as the standards are formulated	Time to market Field Programmability, and hence low downtime
Module*: SLB802xx SLC802xx	TVWS Base Station, CPE Modem integrated with software stack	Complete Base Station and CPEs for Customer Evaluation
IC*: SL550x	Highly Integrated Solution for Rural Broadband (802.22/802.11af)	CPE for mass deployment

Table 2: Saankhya Labs Products (* available now; ** under development)

SL100x and SL900x chips are in production with customers using it in Terrestrial TV receivers, TVWS modems, Satellite receivers and Video distribution. Saankhya works closely with industry partners to optimise baseband solutions and deliver complete solutions to customers for rapid deployment.

Make In India

Saankhya Technology, products and IPR are 100% indigenous. Company's products are completely aligned with the **Make in India** strategy.

The Rural Broadband products from Saankhya enable last hop/mile wireless access. These products specifically play a significant role in **Digital India** project by providing the missing link in the National Optical Fibre Network (NOFN) project to reach to all corners of India.

Successful Delivery

Saankhya has successfully delivered several solutions, including, very low power satellite receiver terminals for remote education, highly agile TV receiver terminals and versatile multi-channel modulators.

A partial list of Saankhya's customers includes, Indian Space Research Organization (ISRO), Indian Defence Product Suppliers, and several OEM/ODM's in China, Taiwan and US. Saankhya is also working

with several fortune 500 companies to enable TV White Space solution for emerging markets including India.

Awards and Recognition



Saankhya Labs

EE Times Silicon 60: Hot Startups to Watch

2014 "Silicon 60 hot start-ups to watch" by EE Times
2010 TV Innovation award by IMS Research, USA
2010 ISA Start-up to watch
2009 Best Startup by Silicon India's Startup city

In Press

2012: Featured in Gartner's Cool Vendor in Semiconductor 2012 Report
2011: Times of India – Indian Company creates breakthrough in TV Technology
2009: Saankhya Labs on EE Times - Indian Startup tips SDR-based TV demodulation

For more information

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