## TVONICS USES ALTIUM DESIGNER TO DIFFERENTIATE BY DESIGN.

### The Need

Innovative UK manufacturer of digital TV set top boxes, TVonics, has made an impression in the market with its stylish, functional, nergy-efficient products. The company's (ex-Sony) design team cites PCB design as a key factor in its ability to bring innovative, reliable products to market quickly.

TVonics has successfully differentiated itself in a highly competitive market by offering, stylish, sleek products with great energy efficiency ratings. This means adhering to strict design criteria at the board level, particularly for form factor and power consumption. Products also offer class-leading signal reception, and are designed for cost-effective manufacture.

What is more, the company sets itself challenging development time scales. For example, the MDR-200 Digital TV Receiver – a significant re-design of an existing product – was taken from drawing board to manufacture in just four months.

**" Altium Designer is a functional tool that allows us to get on with the job of designing the board. "**

Mike Jones, Senior Designer, TVonics

### The Challenge

When TVonics was first starting up, three years ago, they were looking for a cost-effective design tool that would be easy to get up and running. As a small design team with limited resources, they wanted to be sure of good UK support.

### The Solution

Senior designer Mike Jones and his colleagues had been on an Altium Designer training course run by Premier EDA back in their Sony days, so it was an easy decision. "The technical support to get you up and running is very good, and so is the UK-based back up," says Jones.

The company now has two licences for Altium Designer and uses it in the development of all its products. Its PCBs are typically two or four layers, and range in size from about six by four inches to the latest 'match box sized' set box which has a PCB of just two-and-a-half by two inches.

### The Results

TVonics is able to meet its own ambitious design schedules through hard work and by making good use of the design tool. "The software helps us meet our goals because it does everything that we need without being over-complex," says Mike Jones. "It allows us to get on with the with job of designing the board."

For example, the team was able to reproduce entire sections of the design in other parts of the board, and this has specifically helped them to achieve very low power consumption. "We copied parts of the design that had already been power-optimised, then edited them as required. It probably saved us about two months in development time," says Jones. Design innovation requires flexibility in the design tool. TVonics' reputation for elegance and style in product design means that the team must pay careful attention to the placing of connectors and other components on the board. For example, they have made good use of space on one board by positioning a large integrated circuit at a 45° angle. On others, the team has been experimenting with placing components on both sides of the board. Whilst these techniques themselves are not unusual, the ease with which the designers have been able to do them means more time can be spent actually doing PCB design.

Powerful graphical manipulation allows the user to 'flip' the board so it can be seen clearly from the other side. "It is great sanity check," says Mike Jones. "We can make sure that things are round the right way and that the silk legend is legible – all before we move to prototype." 3D STEP can be imported directly from the mechanical design package (in this case SolidWorks) ensuring sub-assemblies such as connectors and keypads are correctly located first time. Furthermore, the 3D visualisation capabilities allow us to look at a virtual finished PCB.

A comprehensive set of design rules is supplied, but these can be edited very easily, and if required, back-applied to the design. The schematic can be back and forward annotated and every revision is automatically saved to the system and Engineering Change Orders (ECO) generated.

When it comes to 'design-for-manufacture' TVonics makes good use of the automatic panelisation features and pre-fabrication checks, saving time with the PCB vendor. The Polygon Manager saves a lot of time at the back-end stage of PCB design, the built-in design rule checker works intelligently, and the cross-probe feature allows for all violations to be quickly identified and fixed.

## Product Information

The TVonics design team is one of the most innovative at work in the UK today. The boards it is producing may not be the most complex on the market, but they are functional, adaptive, elegant designs that do exactly the job intended with no wastage or over-design. They meet ambitious lowpower consumption and form-factor targets, and in doing so, have established a significant market share in an impressively short time-scale.

One of the recent innovations from TVonics is the MDR-200 Digital TV Receiver – a compact, cost-effective, low-power digital receiver designed to meet a special UK Government specification, issued as part of the plans for a nationwide switchover from analogue signals to digital, due to be completed by 2012.

The specification, which is for set top boxes that will be provided free to the disabled, partially sighted and less well-off elderly people, is an energy efficient design, incorporating an audio commentary feature and RF modulator. In the event, TVonics was the only manufacturer to successfully design and build a product to meet the specification by the start of the first pilot project in October 2007. With the help of Altium Designer, the new product was developed in just four months.

## About TVonics

Formed in late 2004 and based in South Wales, UK, TVonics reunites a talented former Sony design team which collectively has more than 60 years of experience in the design and manufacture of digital set top boxes and televisions for the massmarket. The team brings together expertise in semiconductor device design and applications to ensure overall in-depth understanding of the entire system.

TVonics' success in shipping 280,000 units in just three years speaks for itself. The company has already carved out a significant share of the UK market for itself, and is making products for retailers including DSGi, Tesco, Argos and Marks & Spencer, as well as selling under its own brand.

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