Driving Next-Generation Medical Devices

Alix Paultre

Creating medical electronics that incorporate the latest technology is a challenging proposal today, as the application spaces served extend far beyond the simple diagnostic and electromechanical needs of the past. For example, older technologies gain new life with improved implementation, new technologies move from the fringe to the mainstream, and established tools gain new functionalities to extend their usefulness into other application spaces.

An example of this can be found in the expanding area of bone-healing electronic treatment devices. Electronic bone healing is a technology that has been around for a while but has increased in popularity as electronics technology enables increased functionality in significantly smaller form factors. The need to integrate advanced functionality into a small device also creates power-management issues for the designer, as a medical device not only needs quality power, but also regulatory compliance. Let’s look at the various issues and factors involved.

Aside from the products and procedures that previously did not have and are now being infused with electronics, there are many medical technologies that were always electrical in nature that are now being made more useful to both the physician and patient in medical care. In the case of bone-growth technology, the primary improvement in implementation involved the miniaturization of the circuitry, and the addition of battery power to untether the device from the wall.

GlobTek has had a long history creating medical power systems, and was approached because most manufacturers want Lithium batteries, and these present specific charging demands. In this example, GlobTek was one of four competitors for portable bone-healing systems. One type of unit uses pulsed electromagnetic field technology. A coil is made a part of the wound dressing or placed directly on the skin to deliver a fluctuating electromagnetic field to the fracture area. The other type uses capacitive coupling technology, and consists of a stimulator module and two electrodes that treat the fracture site(s) within the range of the generated field.

We delivered samples of our GTM41060-2512 25-W medical-grade wall plug-in power supply along with our BL1950P1034502S1PQPA Li-Ion Prismatic battery packs for a Class III FDA-compliant, non-invasive bone-growth stimulator, and our 6-W

medical interchangeable wall plug-in power supply GTM41076-0612 for a non-invasive spine fusion system. The samples exceeded their test requirements, and in the end, GlobTek was awarded three out of five products for both projects.

What set us apart was how fast and flexible we were in providing samples while remaining cost-efficient, but since this was for a medical application, quality was the primary criteria. Our quick turnaround on custom product development is partly due to having engineering centers in both China and the USA, and partly due to our ability to rapidly medically qualify our samples in each of their potential power iterations so that development time is kept to a minimum.

A very good reference for bone-fusion technology - www.orthopodsurgeon.com [1].

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