Corporate Backgrounder

Overview:
An Emerging Class of Analog Semiconductors

Virtually every electronic device that plugs into a wall socket requires a power supply to convert high-voltage, alternating current (AC) into a low voltage, direct current (DC). Power Integrations, Inc. has developed a patented high-voltage analog integrated circuit (IC) family called ***TOPSwitch***® that facilitates a highly integrated and cost effective power supply solution.

Power Integrations' ICs are used in numerous applications requiring 0.5 to 290 watts of power such as cell phones, cable and DBS set top boxes, personal computers, external peripherals, consumer video electronics, and home appliances. They are also used in high-voltage DC to DC power conversion applications such as telecom and network infrastructure equipment and DC-DC converter modules.

Limitations of Traditional Power Supplies

Discrete Switchers
Until the 1970s, power supplies used large and inefficient linear transformers to convert AC to DC. In the 1970s, the invention of high-voltage discrete semiconductors enabled the development of "Discrete Switchers," ushering in a new generation of AC to DC power supplies.

Despite the efficiency, size and weight advantages that Discrete Switchers offer over older technologies, they require numerous components and have not kept pace with the rapid integration of the electronic circuits in the products that they power

Changing Market Dynamics
The convergence of three important trends in electronics are accelerating the demand for smaller, more efficient power supplies.

Mobility
The proliferation of cellular phones and laptop computers has created a global market where consumers demand that new products be smaller and lighter.

Energy Efficiency
The financial and environmental costs of wasted energy have fostered new government guidelines designed to encourage energy efficient products.


Linear


TOPSwitch

Manufacturing (Cost & Time-to-Market)
Manufacturers are aggressively seeking ways to decrease component count and simplify system design to achieve cost reductions and quicker time-to-market.

The Solution: Cost-Effective Integration

An integrated, cost-effective solution that offers significant improvements in power supply efficiency, size and weight represents a major innovation for the market. Through its patented ***TOPSwitch*** IC products — Power Integrations delivers this breakthrough.

Since the introduction of the first ***TOPSwitch*** family in 1994, Power Integrations has shipped almost 1 billion ***TOPSwitch*** ICs. The ***TOPSwitch***, ***TinySwitch®,*** and ***DPA-Switch™*** products offer the following key benefits to engineers designing supplies and converters up to 290 Watts:

Fewer Components, Reduced Size, Enhanced Functionality

The highly integrated ***TOPSwitch*** ICs enable the design and production of cost-effective switchers that use up to 50% fewer components and have enhanced functionality compared to discrete-based solutions.For example, our ICs provide thermal and short circuit protection without increasing system cost, while discrete switchers must add additional compo-nents and cost to provide these functions.

Reduced Time-to-Market

TOPSwitch technology enables a less complex system architecture that greatly simplifies power supply system design. Power Integrations also provides a comprehensive set of design tools to its customers, which reduces time-to-market and lowers development risk.

Improved Efficiency

Power Integrations' patented low-loss, high-voltage device, combined with its control circuitry, improves the overall electrical efficiency during both full operation and standby modes. Advanced ***EcoSmart***® energy saving technology addresses the growing global demand to reduce energy waste in a wide range of electronic products.

Wide Power Range and Scalability

Products in current ***TOPSwitch*** families can address a wide power range from 0.5 Watts to 290 Watts. The scalable architecture of these ICs allows switcher designers to adapt their existing ***TOPSwitch***-based designs to a wide range of products, addressing many power supply markets.

PI Expert™ Power Supply Design Software

Design Accelerator Kits

Patents

Power Integrations' broad technology leadership is based on proprietary high-voltage silicon device structures, wafer fabrication processes and analog circuit designs. The company has a portfolio of 45 U.S. patents and 58 foreign patents.

Products

Power Integrations offers three main product families, ***TOPSwitch, TinySwitch*** and ***DPA-Switch***. Both ***TOPSwitch*** and ***TinySwitch*** integrate a high-voltage (700 V) Power MOSFET with switching and control circuitry onto a single silicon chip and operate from input voltages ranging from 85 to 265 VAC. The ***TOPSwitch*** family includes the ***TOPSwitch-GX*** product line that consists of 11 part types capable of supplying output power levels from 6 Watts to 290 Watts, the first monolithic high-voltage switching power IC capable of providing this level of power. The ***TinySwitch*** family includes the new ***TinySwitch-II*** product line, consisting of eight part types. It was specifically designed to address lower power applications below 23 Watts. The ***DPA-Switch*** integrates a 200 V Power MOSFET with switching and control circuitry onto a single silicon chip and was designed specifically to address DC to DC conversion applications with input voltages ranging from 16 VDC to 75 VDC. It consists of four part types with output power ratings up to 100 Watts.

Applications and Target Markets

Communications
- Cellular Phones
- Personal Digital Assistants
- Fax Machines
- Internet Appliances
- Telecom and Network Infrastructure

Computers
- Desktop Main Supply
- Desktop Standby Supply
- LCD Monitors
- Multimedia Audio
- Printers
- External Peripherals
- Cable Modems
- Notebook Adapter

Consumer Electronics
- TV Standby
- DVD Players
- VCRs
- Digital Cameras
- Camcorders
- Set-Top Decoders
- Audio Entertainment
- Video Games

Home Appliances
- Washing Machines
- Air Conditioners
- Dish Washers

Industrial
- DC-DC Converters
- Utility Meters
- Uninterruptible Power Supplies

Customers

TOPSwitch is used in products from some of the best known companies around the world - AcBel, Anam, American Power Conversion, Artesyn, Black & Decker, Bose, Braun, Compaq, Dell, Delta, Emerson Electronics, General Electric, Hewlett Packard, IBM, Intel, LG Electronics, Lite-On, Maytag, Miele, Mitsubishi, Motorola, Nokia, Nortel, Pace, Phihong, Philips, Samsung, Schlumberger, Scientific Atlanta, Siemens, Sony and Whirlpool.

Sales and Distribution

Power Integrations sells its products to original equipment manufacturers and power supply merchants worldwide through direct sales, sales representatives and distributors. The company has sales offices in the U.S., Japan, Singapore, Taiwan, Korea, China, India, Germany and the U.K. Power Integrations maintains field application engineering labs in the U.S., Japan, Korea, China, Taiwan, India, Germany, and the U.K. to provide comprehensive application design support.

Manufacturing and Strategic Relationships

Power Integrations has wafer manufacturing relationships and licensing arrangements with Matsushita Electronics (Panasonic) Corporation and Oki Electronics Corporation. The company also maintains a complete wafer sort and final test facility at its headquarters in San Jose, California.

POWER INTEGRATIONS, INC.®

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