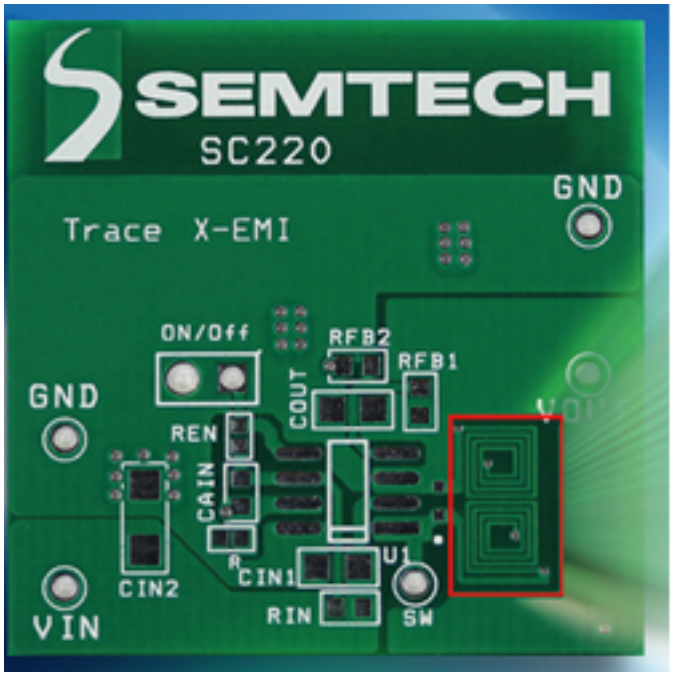
20MHz Buck Regulator Lets Designers Draw Their Own PC Board Inductors



Semtech Corporation today launched the first device in its innovative platform of high-frequency switchers. Semtech is introducing the SC220 at the IEEE APEC (The Applied Power Electronics Conference and Exposition) show in Orlando, Florida. The SC220 is the industry's first buck regulator that enables designers to draw their own inductors directly on the PC board (PCB). This device offers an ultra-fast, 20MHz switching frequency that, when used with Semtech's patented X-EMI inductor technology, for the first time allows PCB trace inductors to meet or exceed the EMI performance of chip inductors. Additionally, X-EMI technology eliminates the substantial cost and logistics issues associated with sourcing, qualifying and stocking discrete inductors. Achieving very low EMI with PCB trace inductors makes the SC220 an ideal solution for set top box, HDTV, automotive, industrial, and white goods power management applications.

"Semtech's groundbreaking X-EMI and SC220 combination slashes BOM (bill of materials) cost by as much as $0.20 and, for the first time, makes drawing inductors in standard, single, dual or multilayer PCB material a reality," said Athar Zaidi, Director of Marketing in Semtech's Power Management Group. "For example, in a highly EMI-sensitive automotive power management application, X-EMI technology combined with the SC220 enabled a non-shielded inductor to be used for the first time."

Conventional PCB trace inductors can be used with high-frequency switchers, but they exhibit significant EMI issues. X-EMI inductor technology solves these EMI problems and meets, or exceeds the EMI performance of chip inductors. X-EMI technology works by placing two small air-core inductors adjacent to one another in anti-phase position, where the magnetic fields of each inductor partially cancel one

another to reduce EMI.

Step-down regulators decrease voltages incoming from the main power source to meet the output voltage needed by the system components. The SC220 steps down input voltages ranging from 2.7V to 5.5V, making it ideal for low-voltage rails. High switching frequency and ultra-fast, hundreds of nanosecond transient response is achieved using Semtech’s unique constant frequency architecture.

The SC220 step-down regulator features an adjustable output voltage down to 1.0V and an output current of up to 650mA. At very light loads, the device maintains greater than 80% efficiency to help meet global eco regulations. Protection features include inrush protection, along with output current limit, short-circuit and thermal shutdown protection.

Key Features of SC220

· Enables PCB trace inductors in standard PC board material

· Patented X-EMI inductor technology meets, or exceeds EMI performance of chip inductors

· 20MHz switching frequency

· VIN range: 2.7V to 5.5V

· Adjustable output voltage down to 1.0V

· Output current up to 650mA

· High efficiency up to 90%

· >80% light-load efficiency

· Hundreds of ns transient response

· Packaging: SOIC, 8-pin

Applications

Set Top Box: Switching Regulators
HDTV: Switching Regulators
Game Consoles: Switching Regulators
Automotive: Switching Regulators (especially EMI-sensitive console applications)
Industrial Modules: Power Supplies
White Goods: Switching Regulators

Pricing and Availability

The SC220 is available immediately in production quantities and is priced at $0.78

each (order code SC220STRT) in 2,500-piece lots. Evaluation boards (order code SC220EVB) are also available. Semtech offers comprehensive design assistance, including field- and factory-based support. Data sheets, volume pricing, and delivery quotes, as well as evaluation kits and samples, are available at http://www.semtech.com/info [1].

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[1] http://www.semtech.com/info