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42V, Dual 4A (I_{OUT}), Synchronous Step-Down Silent Switcher 2 Delivers 94% Efficiency at 2MHz & Ultralow EMI Emissions

MILPITAS, CA & NORWOOD, MA – October 16, 2017 – Analog Devices, Inc., which recently acquired Linear Technology Corporation, announces the [LT8650S](#), a dual 4A, 42V input synchronous step-down switching regulator. It's unique Silent Switcher[®]2 architecture uses four internal input capacitors as well as two internal BST and a single $INTV_{CC}$ capacitor to minimize the area of the hot loops. Combined with very well controlled switching edges and an internal construction using copper pillars in lieu of bond wires and an integral ground plane, the LT8650S's design dramatically reduces EMI emissions. This improved EMI performance is not sensitive to PCB layout, simplifying design and reducing risk even when using two layer PC boards. The LT8650S can easily pass the automotive CISPR 25, Class 5 peak EMI limits with a 2MHz switching frequency over its entire load range. Spread spectrum frequency modulation is also available to lower EMI levels further.

The LT8650S's synchronous rectification delivers efficiency as high as 94.6% with a switching frequency of 2MHz. Its 3.0V to 42V input voltage range is ideal for automotive and industrial applications. The internal high efficiency switches can deliver up to 4A of continuous output current simultaneously and up to 6A peak loads on either channel to output voltages as low as 0.8V. The LT8650S's Burst Mode[®] operation ensures only 6.2 μ A of quiescent current (for both channels), well suited for applications such as automotive always-on systems, which require extended operating battery life. The LT8650S's fast minimum on-time of only 40ns enables 2MHz constant frequency switching from a 16V input to a 2V output, enabling designers to optimize efficiency while avoiding critical noise-sensitive frequency bands. The LT8650S's 32-lead 4mm x 6mm LQFN package and high switching frequency keeps external inductors and capacitors small, providing a compact, thermally efficient footprint.

The LT8650S utilizes internal top and bottom high efficiency power switches with the necessary boost diodes, oscillator, control and logic circuitry integrated into a single die. Low ripple Burst Mode operation maintains high efficiency at low output currents while keeping output ripple below 10mV_{P-P}. For applications requiring very fast transient response or current

sharing of the two channels, external VC pins are available. For the lowest noise operation, the LT8650S can be programmed to run in forced continuous mode over the entire load range with spread spectrum frequency modulation. Its switching frequency is programmable and synchronizable from 300kHz to 3MHz. Special design techniques and a new high speed process enable high efficiency over a wide input voltage range, and the LT8650S's current mode topology enables fast transient response and excellent loop stability. Other features include a die temperature monitor, power good flags, output soft-start/tracking and thermal protection.

The LT8650SEV is packaged in a 4mm x 6mm LQFN package. An industrial temperature version, the LT8650SIV, is tested and guaranteed to operate from a -40°C to 125°C operating junction temperature.

Photo Caption: The LT8650S Reduces EMI Emissions Well Below CISPR 25 Class 5 Limits

Summary of Features: LT8650S


- Wide Input Voltage Range: 3.0V to 42V
- 4A from Each Channel Simultaneously:
Up to 6A on Either Channel
- Silent Switcher[®] 2 Architecture:
Ultralow EMI Emissions on any PCB
Eliminates PCB Layout Sensitivity
Internal Capacitors for V_{IN} , BST, $INTV_{CC}$ Reduce Radiated EMI
Spread Spectrum Frequency Modulation
- Ultralow Quiescent Current Burst Mode[®] Operation:
6.2 μ A I_Q Regulating 12V $_{IN}$ to 5V $_{OUT1}$ & 3.3V $_{OUT2}$
Output Ripple <10mV $_{P-P}$
- Optional External VC Pin: Fast Transient Response & Current Sharing (Extra 50 μ A I_Q /Channel)
- Forced Continuous Mode
- High Efficiency Synchronous Operation:
94.6% Efficiency at 2A, 5V $_{OUT}$ from 12V $_{IN}$ at 2MHz
93.3% Efficiency at 4A, 5V $_{OUT}$ from 12V $_{IN}$ at 2MHz
- Fast Minimum Switch on Time: 40ns
- Die Temperature Monitor
- Adjustable & Synchronizable: 300kHz to 3MHz
- Output Soft-Start & Tracking
- Small Thermally Enhanced 4mm x 6mm 32-Lead LQFN Package

Pricing shown is for budgetary use only and may differ due to local duties, taxes, fees and exchange rates.

Analog Devices just got more Powerful. On March 10, Analog Devices acquired Linear Technology, creating the premier high-performance analog company. More info at <http://lt.linear.com/07c>

About Analog Devices

Analog Devices (NASDAQ: ADI) is the leading global high-performance analog technology company dedicated to solving the toughest engineering challenges. We enable our customers to interpret the world around us by intelligently bridging the physical and digital with unmatched technologies that sense, measure, power, connect and interpret. Visit <http://www.analog.com>

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