Main Stream Research Projects

• Fast-transient low-dropout regulators (LDOs)
• Output capacitor-less low-dropout regulators (LDOs)
• Single-inductor multiple-output (SIMO) switched-mode DC-DC converters
• High-efficiency charge pumps

Fast-transient low-dropout regulators (LDOs)

• Loop-bandwidth enhancement
• Loop-gain enhancement
• Channel-resistance-insensitive small-gain-stage
• No on-chip compensation capacitor
• 9.3 μA quiescent current

Output capacitor-less low-dropout regulators (LDOs)

• Single compensation capacitor for two-stage voltage flipped follower
• Dynamic biasing for slew rate enhancement
• Stable for capacitive load from 0 to 50 pF
• 100 mA load capability
• 6 μW under a 0.75V supply

Single-inductor multiple-output (SIMO) switched-mode DC-DC converters

• Single-inductor triple-output
• 83.5% power efficiency
• Proposed pre-sub-period inductor-current control
• Two buck subconverters and one boost subconverter configurable

High-efficiency charge pumps

• No reversion loss using first-level gate-control
• Supports 0.8V Minimum voltage
• Higher than 90% power efficiency
• No area-consuming resistors or extra power MOSFETs and buffers required

References