



Microsemi

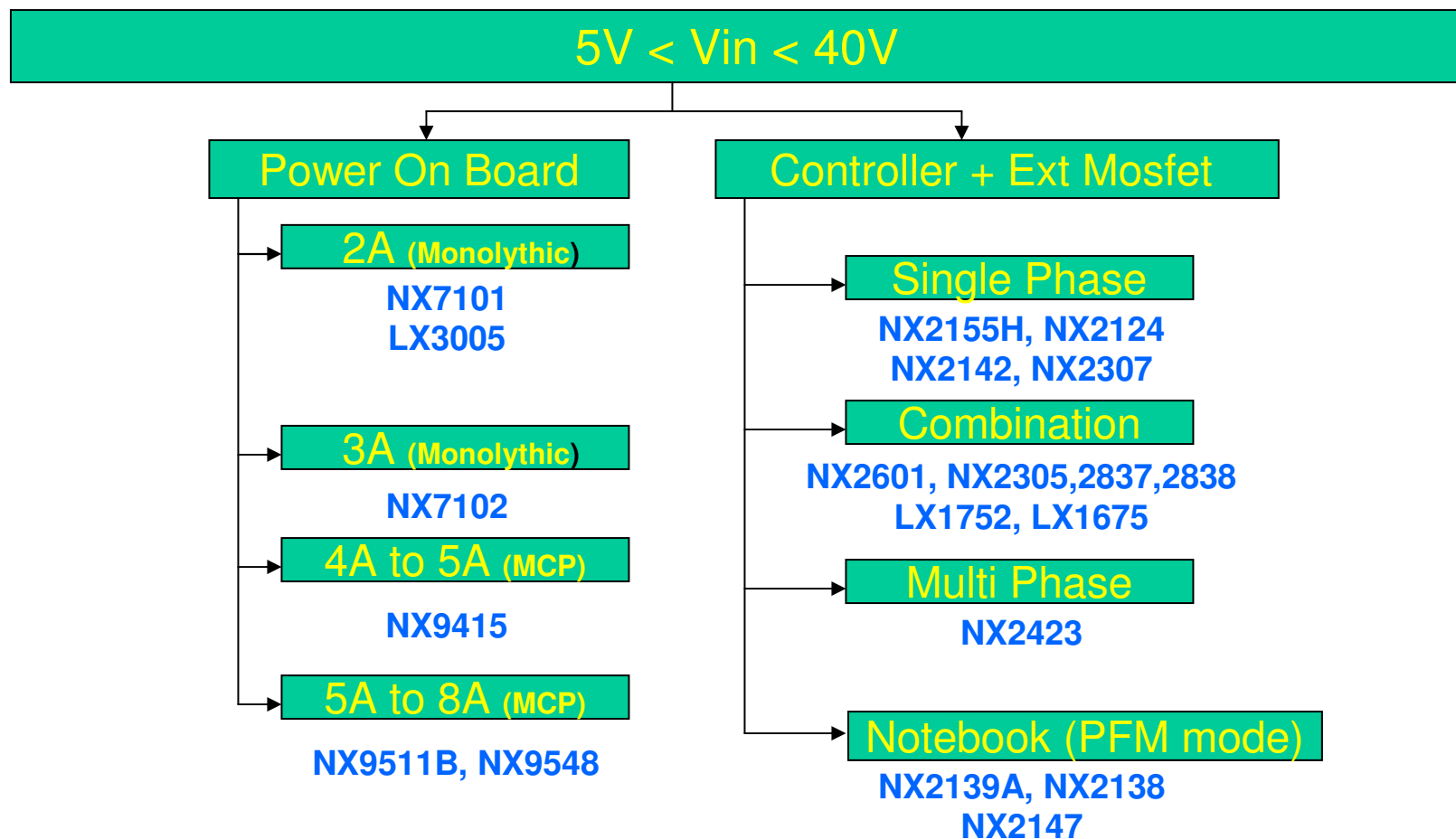
**DC-DC Product
Portfolio Introduction
Feb 2010**

Analog Mixed Signal Group



Microsemi Power Product Tree

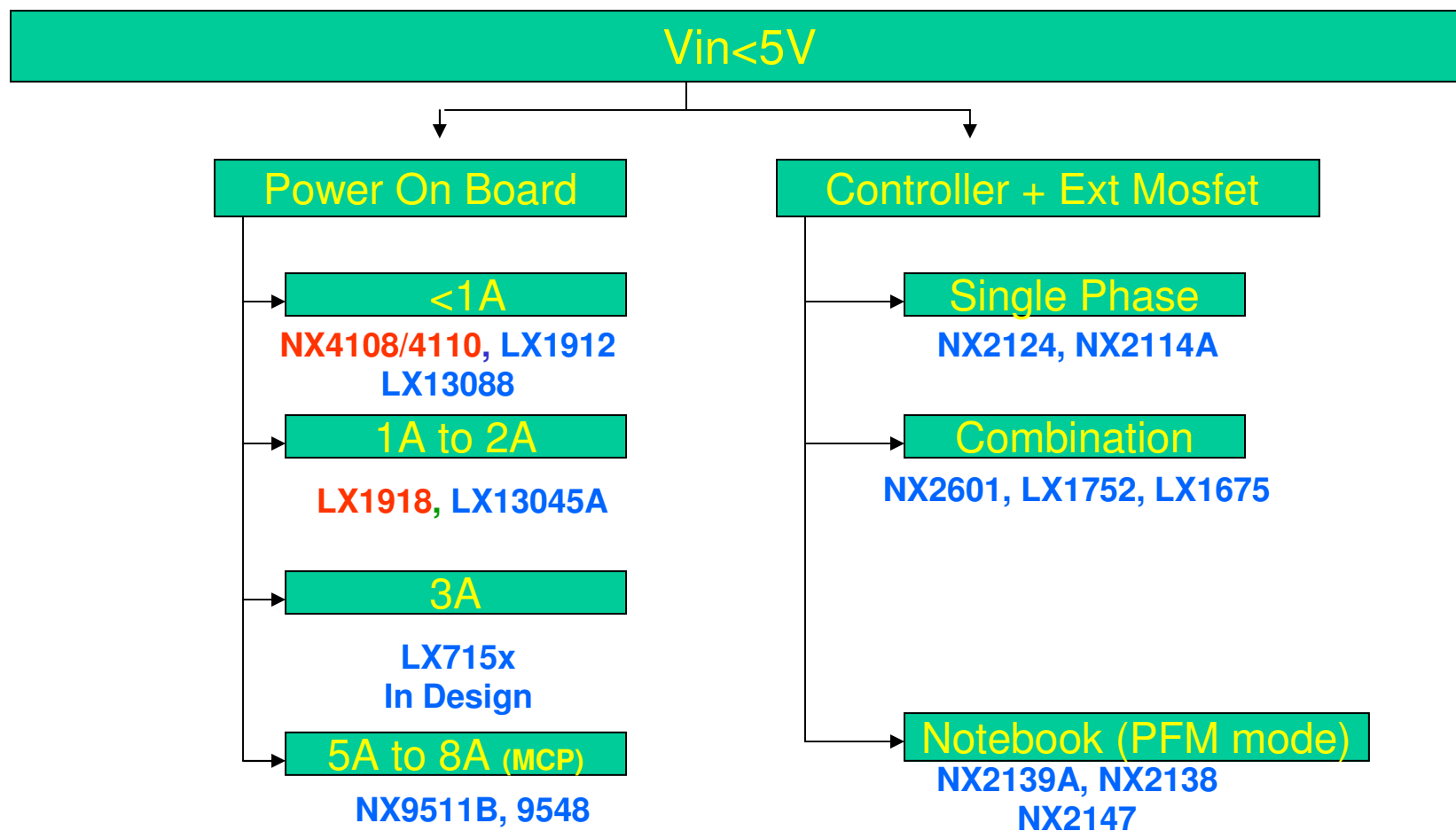
DC to DC Switching Product Line





Microsemi Power Product Tree

DC to DC Switching Product Line



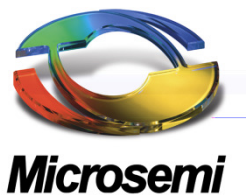
Products that are marked in red can operate with 3V input.
All other products need 5V input.



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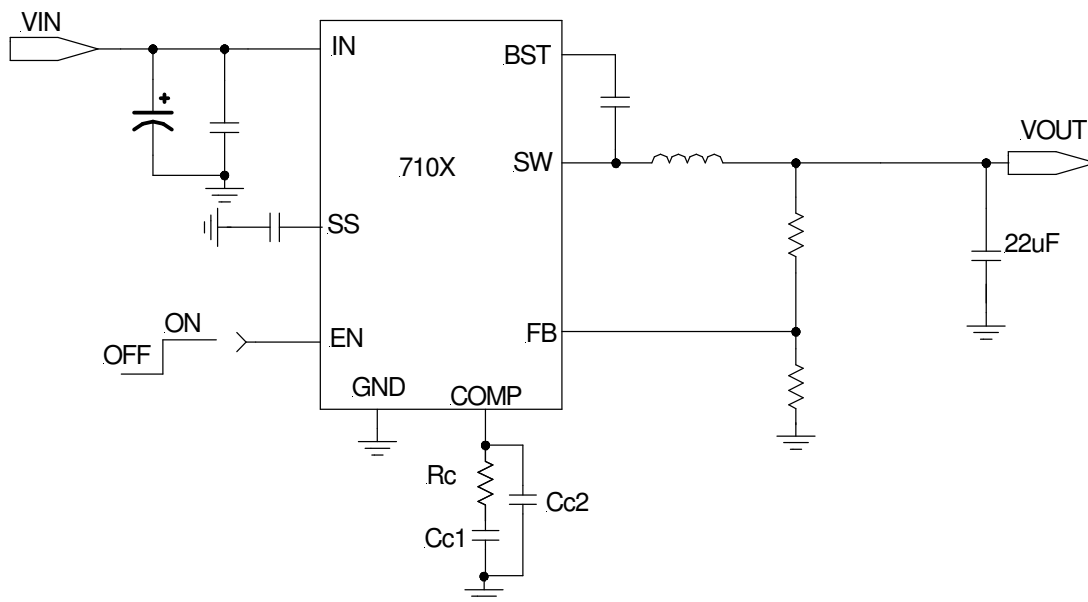
Microsemi LDO Product Line

Part Number	$I_{OUT,MAX}$ (A)	Number of Output	Adj	Fixed Voltages Available	Package	$V_{IN,MIN}$ (V)	$V_{IN,MAX}$ (V)	$V_{OUT,MIN}$ (V)	Dropout Voltage	Enable Pin	Shutdown Current	Soft Discharge	Quiescent Current
LX8213	0.3	1	Yes	1.2V, 3.3V	5 pin-SOT-23	2.5	6	1.2	170mV	Yes	0.1uA	Yes	70uA
LX13043	1	1	NO	3.3V	6 pin-MLPD, 3x3	4.5	10	3.3	1.3V	NO	NA	NO	2.6mA
LX8816	1	2	Yes (one Output)	One Output at 3.3V	5 pin-S-Pak	4.3	10	1.25	1.3	NO	NA	NO	3.5 mA
LX8820	1	1	NO	3.3V	6 pin-MLPD	4	10	3.3	0.45V	NO	NA	NO	550 uA



NX7101/7102

2A/3A, Single Supply High Voltage Synchronous Buck Switching Regulator



Sample available

- **Key features**
 - Single supply voltage from 5V to 18V
 - Internal 5V regulator
 - Fixed 340Khz Freq
 - External Soft Start
 - Internal boost schottky diode
 - Prebias Startup
 - Less than 1uA when Shutdown is activated
 - Current Mode
 - Available in low cost SO8 or exposed SO8 for better thermal Capability
- **Applications**
 - Set top box
 - LCD TV
 - Disk Drive
 - General point of load

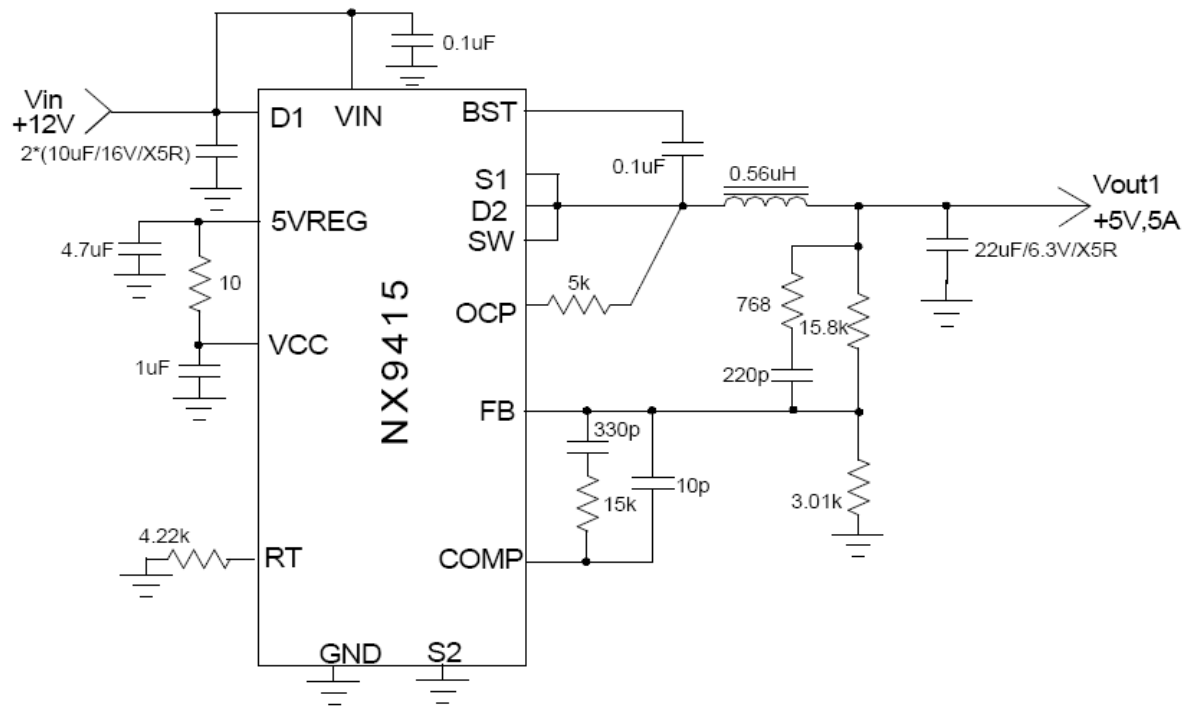


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NX9415

5A, High Frequency Single Supply High Voltage Synchronous Buck Switching Regulator

Typical application circuit



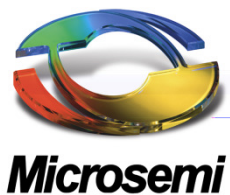
Status: Sample Available

Key features

- Smaller footprint due to co-pak of PWM controller and MOSFETs
- Single supply voltage from 8V to 22V
- Internal 5V regulator
- Programmable frequency up to 2.2MHz
- Internal Digital Soft Start Function
- Internal boost schottky diode
- Prebias Startup
- Less than 50 nS adaptive deadband
- Current limit triggers hiccup by sensing Rdson of Synchronous MOSFET

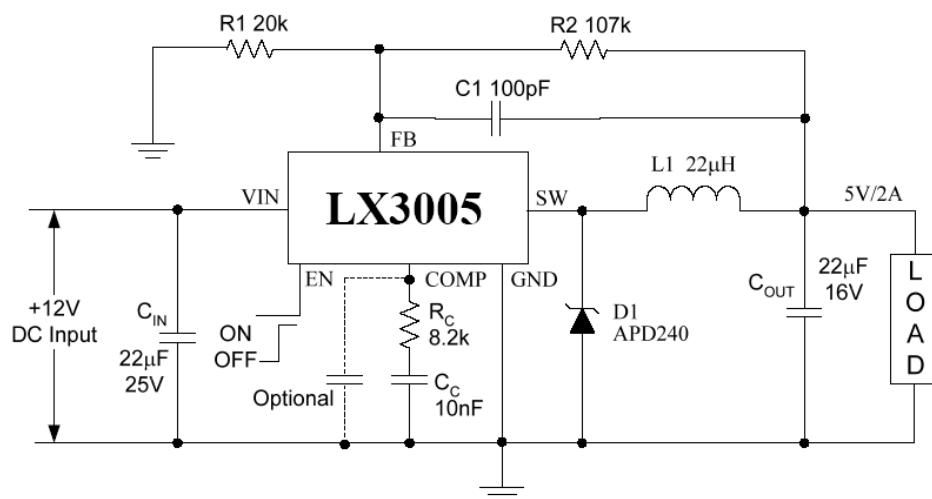
Applications

- LCD TV
- Set box
- Disk Drive



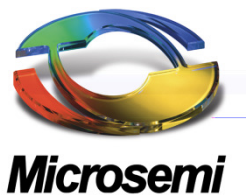
LX3005

2A, 25V Non Synchronous Step Down Regulator



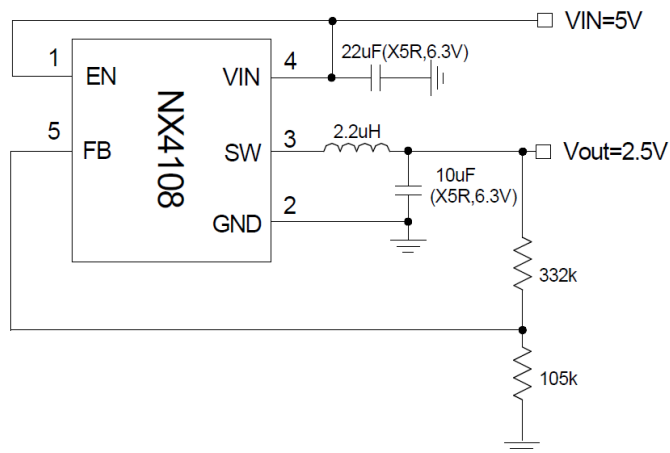
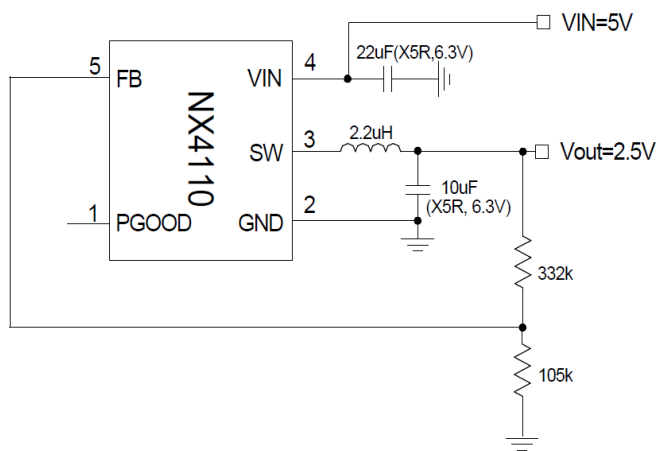
Status: Samples available

- **Key features**
 - 130 milohm Internal Rds-on
 - Single supply voltage from 4.75V to 25V
 - 100% Duty cycle allows for low Vin to Vout differential
 - Up to 94% Efficiency
 - Internal Fix Frequency, 420Khz Operation
 - Internal Soft Start function
 - Voltage mode Operation
 - Built in Short Circuit and Thermal Shut Down Protection
 - Supports Ceramic or Low Cost Electrolytic Output Capacitor
- **Applications**
 - LCD TV
 - Set box
 - Disk Drive



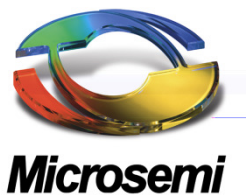
NX4108/NX4110

1.0A, 1.0MHz, 5V Synchronous buck switcher



- Key features
 - 1M Hz operation
 - Ceramic output
 - Minimum component numbers
 - PGOOD for NX4110 and Enable for NX4108
 - Vin from 2.7V to 5V
 - Small Low Cost SOT23-5L Package
- Applications
 - Portable application
 - Replace LDO for higher efficiency

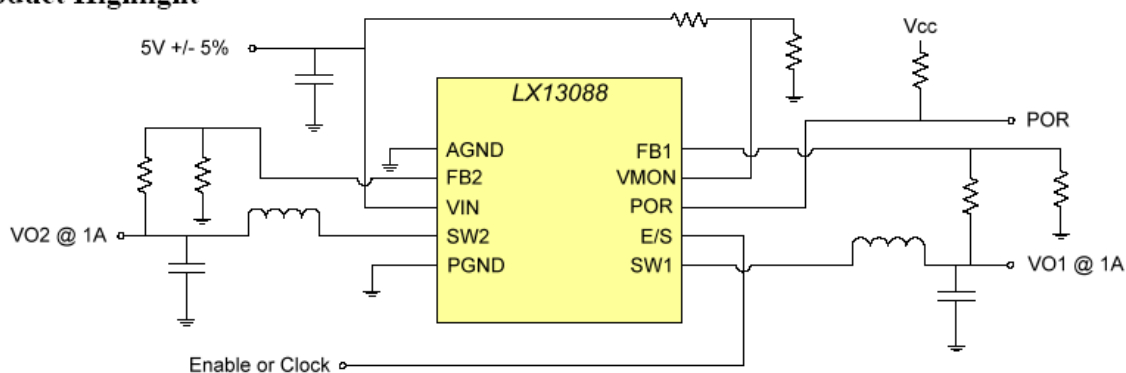
Status: Production



LX13088

Dual, 1A, 1.3Mhz 5V Synchronous Switcher

Product Highlight



- Key features
 - Out of Phase Operation reduces Input Cap and Cost
 - 1.3 MHz operation
 - Ceramic output
 - PGOOD monitors both Vin and Outputs
 - Available in small MLPD, 10L, 3x3 package
- Applications
 - Set Top Box
 - Small size DC to DC

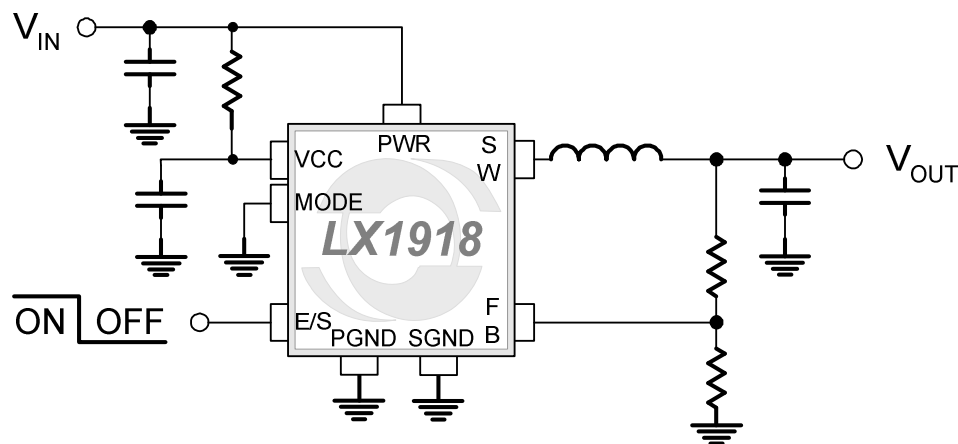
Status: Samples Available Now



LX1918

1.8A, High Frequency 5V Synchronous Step Down Converter

Typical Application Circuit:



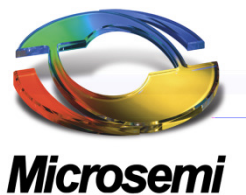
Status: In Production

FEATURES

- Internal Switching Mosfets and Compensation Components – Minimal External Parts Needed
- Input Voltage Range from 2.7V to 5.5V
- Output Voltage from 0.6V to V_{IN}
- Load Currents up to 1.8A
- Current Mode PWM with PFM Mode Under Light Load
- EMI Support with User-Selectable Forced PWM Mode Under Light Load
- Efficiency up to 95%
- Internal Oscillator can be Synchronized to an External 500kHz to 1.25MHz Clock
- Available in 8 pin 3x3mm MLP Package

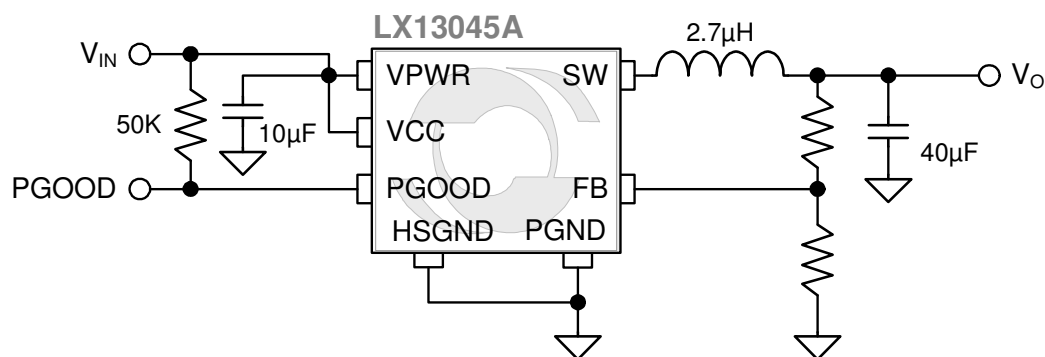
APPLICATIONS

- Set Top Box, Home Gateway
- Wireless Router
- Portable DVD Player, TV
- Disk Drive
- POL DC-DC Converter



LX13045A

2A , 5V Synchronous Step Down Converter



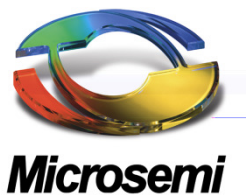
Status: In Production

Key Features

- Input Range Voltage 4.5V to 6V
- Maximum Output Current, 2A
- Output Voltage from 0.8V to 90% of V_{IN}
- PWM Fixed Frequency
- Power On Soft Start
- Efficiency up to 95%
- No External Schottky Diode
- Power Good Indicator
- Thermal Shutdown
- Cycle by Cycle Switch Current Limit
- UVLO
- OVP
- Short Circuit Protection
- 6 pin MLP, JEDEC MO-229

Applications

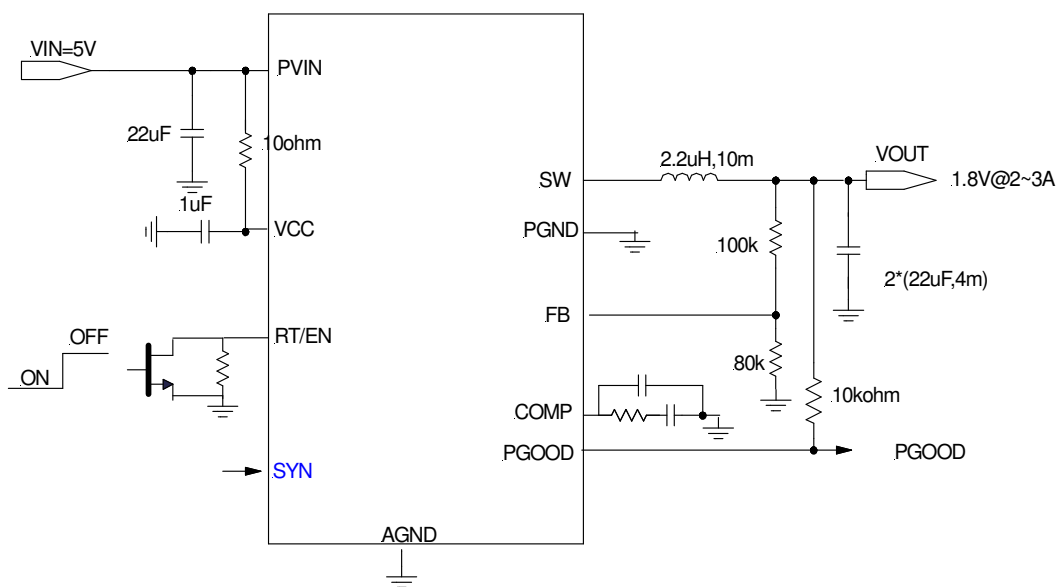
- Lower Power Embedded Applications
- WLAN Power System
- Portable Design with Single Cell Li-Ion or 3 Cell NiMH/NiCd
- Portable Storage Applications



LX7155 family

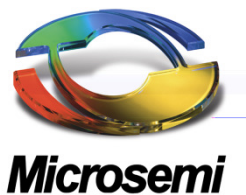
3A, 3Mhz 5V Synchronous Step Down Regulator

Typical Application Circuits



- Key features
 - Supply Voltage from 2.7V to 5V
 - Adjustable Frequency up to 3Mhz
 - Ceramic output
 - Power Good Output
 - External Sync Capability
- Applications
 - Set Top Box
 - Small size DC to DC

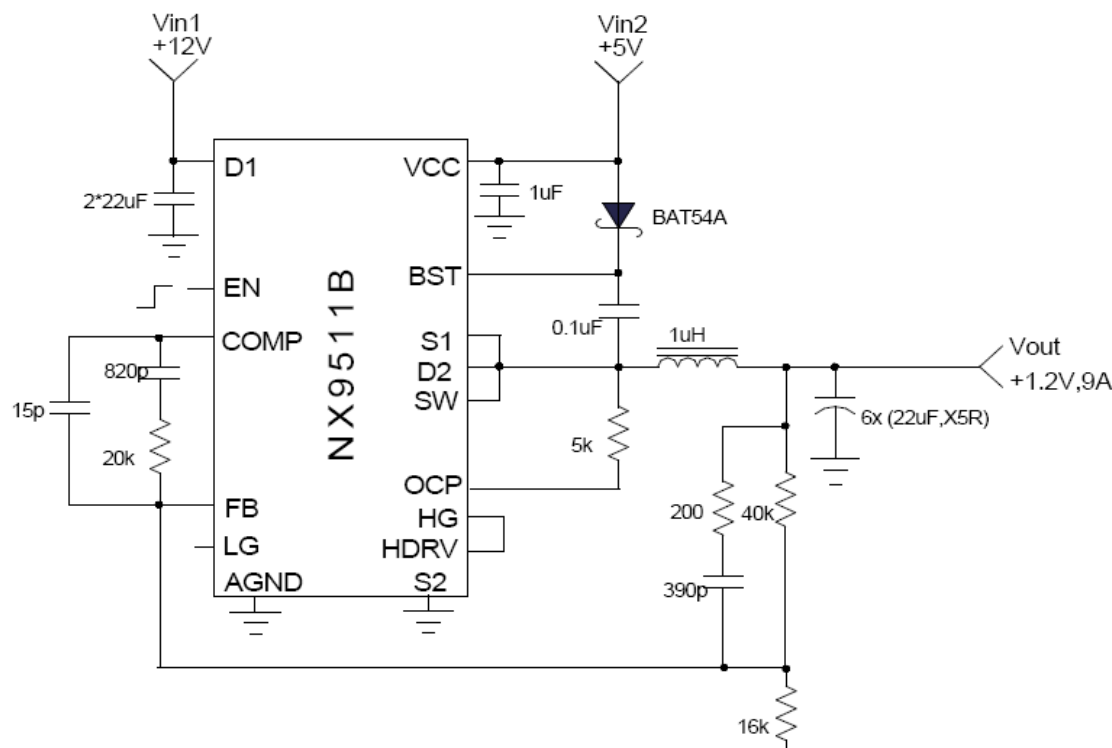
Status: In Design



NX9511B

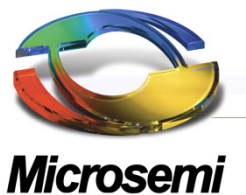
8A, 1MHz SYNCHRONOUS BUCK SWITCHING REGULATOR

Typical Application Circuit



Status: Production

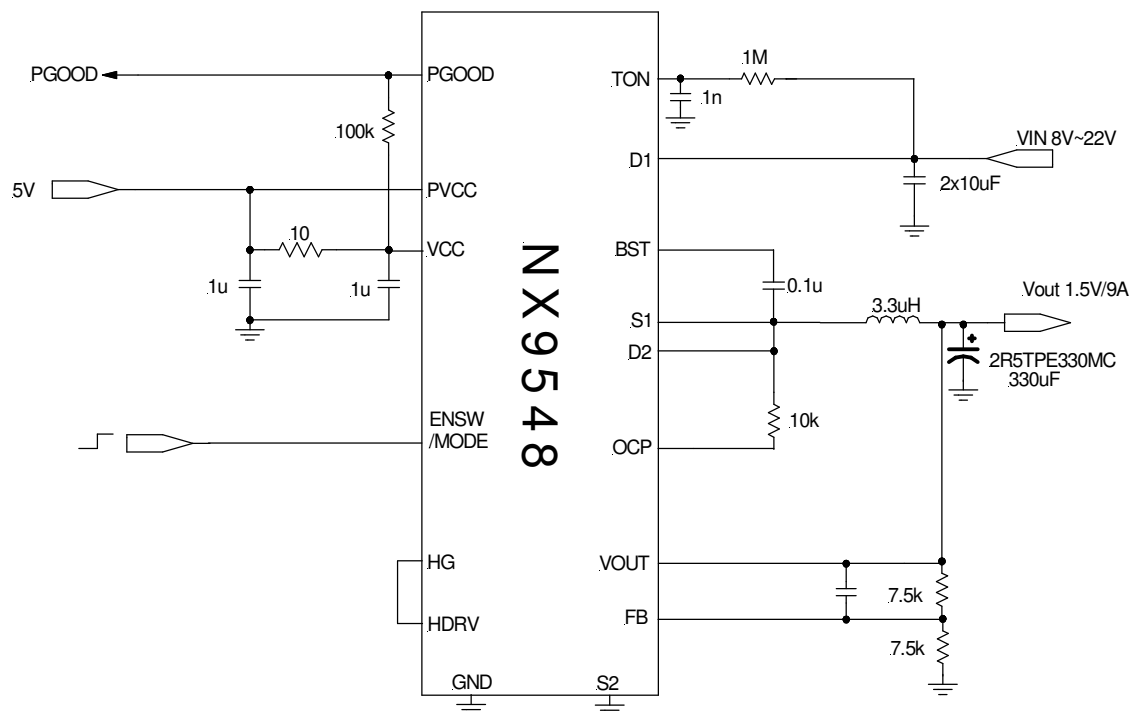
- Key features:
 - Switching Controller and MOSFETs in one package
 - Bus voltage operation from 2V to 25V
 - Fixed 1MHz
 - Internal Digital Soft Start Function
 - Output current up to 8A
 - Enable pin to program BUS UVLO
 - Programmable current limit triggers latch out by sensing R_{dson} of Synchronous MOSFET
 - No negative spike at V_{out} during startup and Shutdown
- Applications
 - Point of load Applications with limited space



NX9548

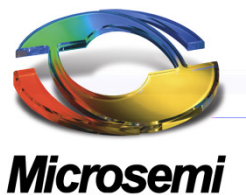
8A, PFM mode Synchronous Buck Switching Regulator

Typical application circuit



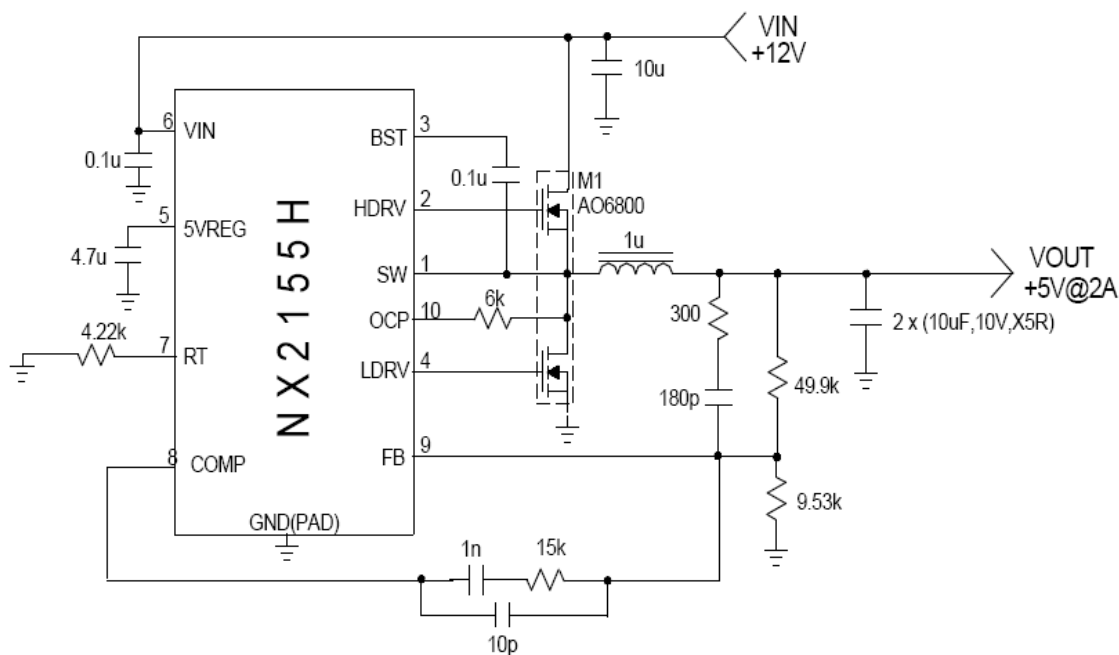
Status: Sample Available

- Key features:
 - Integrated MOS and notebook controller for great space saving
 - Excellent dynamic response with constant on time control
 - Selectable between Synchronous CCM mode and diode emulation mode to improve efficiency at light load
 - Internal Boost Schottky Diode
 - Ultrasonic mode operation available
 - Bus voltage operation from 4.5V to 24V
 - Less than 1uA shutdown current with Enable low
 - Programmable switching frequency
 - Current limit and FB UVLO with latch off
 - Over voltage protection with latch off
- Applications
 - Mobile Applications
 - Application with small space



NX2155H

Single Supply, High Frequency PWM Controller



Status: Production

- Key Features:
 - Single supply voltage from 8V to 22V
 - Internal 5V regulator
 - Programmable operational frequency of 2MHz
 - Internal Digital Soft Start Function
 - Less than 50 nS adaptive deadband
 - Current limit triggers hiccup by sensing R_{dson} of Synchronous MOSFET

Applications

- LCD TV
- Graphic Card on board converters
- Memory V_{ddq} Supply in mother board applications
- On board DC to DC such as 12V to 3.3V, 2.5V or 1.8V
- Hard Disk Drive
- Set Top Box

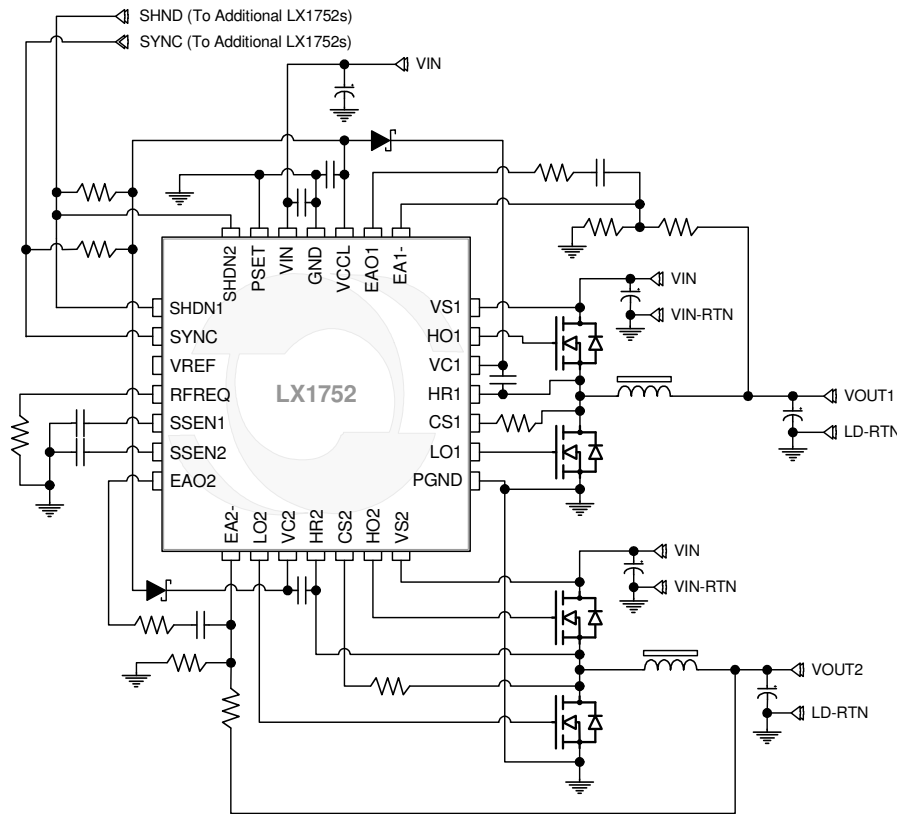


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LX1752

Dual Synchronous Step Down Interleaving PWM Controller

Typical Application Circuit



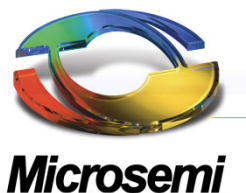
Status: Production

FEATURES

- Two Independent Synchronous Buck Regulators
- Adjustable Current Limit for each Output
- Output FET $R_{DS(ON)}$ Sensing for Current Limit
- Switching Frequency can be Synchronized Between Multiple LX1752s, or to an External Clock
- Switching Outputs may be Interleaved at 90° or 120° Intervals between 2 LX1752s
- User-Configurable Fault Share Mode Between Multiple LX1752s
- +/-1% Output Regulation over Load and Line
- Operates from 4.5V to 22V Supply
- Adjustable Output from 0.7V to $0.90 \cdot V_{IN}$
- Soft-Start Reduces In-Rush Supply Current
- 200kHz to 1.5MHz Adjustable Switching
- Compatible with Ceramic, Polymer and Electrolytic Output Capacitors
- Both Outputs can be Independently Enabled/Disabled for Applications Requiring Power-up Sequencing
- Available in 28 pin 4x5mm MLPQ Package

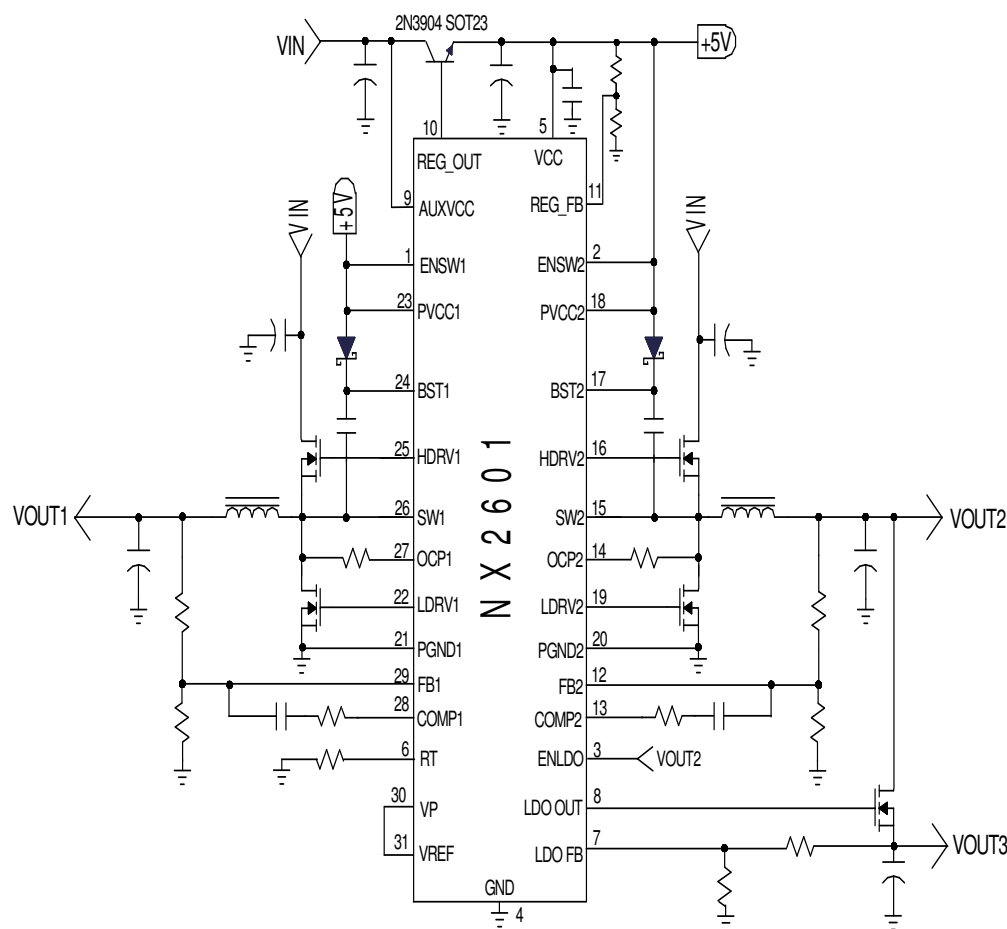
APPLICATIONS:

- Set-Top Box Applications
- Telecom/Networks Point Of Load Supplies
- Server and Workstations
- Multi-Output Power Supplies
- Video Card Power Supplies
- PC Peripherals



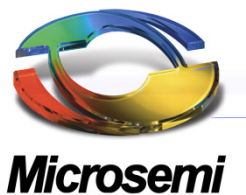
NX2601

DUAL SYNCHRONOUS PWM CONTROLLER WITH NMOS LDO CONTROLLER & 5V BIAS REGULATOR



- **Key Features:**
 - Two channel PWM with out of phase operation
 - Individual digital soft start for two PWM output and LDO controller
 - Bus voltage operation from 2V to 25V
 - Hiccup Current limit by sensing Rdson of MOSFET
 - Adjustable frequency up to 1Mhz per channel
 - Adaptive deadband time
 - Three enable pin available allows for independent power sequencing
 - MLPQ-32L package offers small size

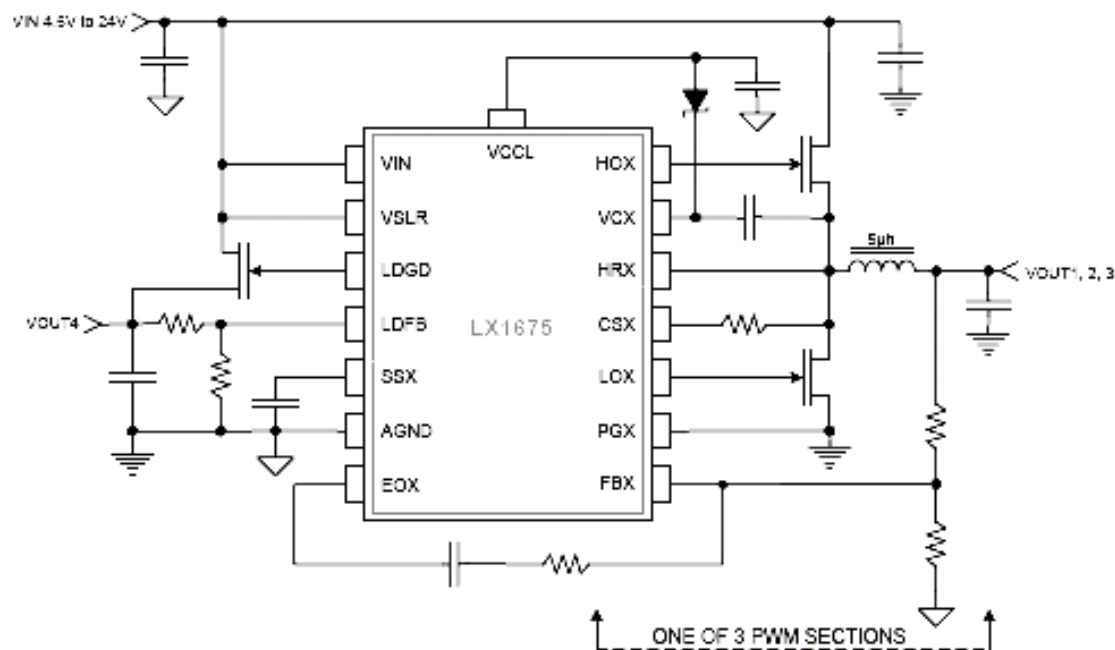
Status: Production



LX1675

Triple Synchronous Step Down PWM Controller + LDO Controller

Typical Application Circuit



Status: Production

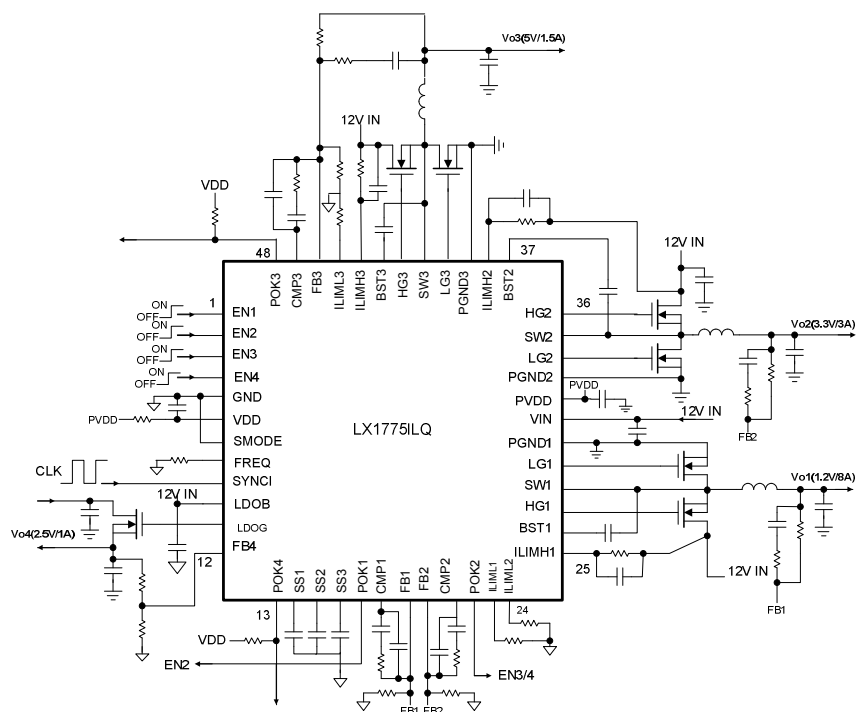
- **FEATURES**
- Four Independently Regulated Outputs
- Single Input Supply with Wide Voltage Range: 4.5-24V
- Outputs As Low As 0.8V
- Generated From a Precision Internal Reference
- Selectable PWM Frequency of 300KHz or 600KHz
- Buffered Reference Voltage Output
- Multiphase Output Reduces Need for Large Input Capacitance at High Currents
- Integrated High Current MOSFET Drivers
- Independent Soft-Start and Power Sequencing
- Adjustable Linear Regulator Driver Output
- No Current-Sense Resistors
- **APPLICATIONS**
- Set-Top-Box
- SOC and Portable Processor Core and IO Voltage Supplies



LX1775

Triple Synch Step Down and One LDO Controller

Typical Application Circuit

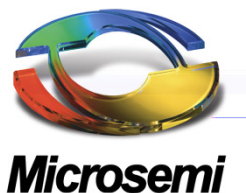


Features:

- Three Out of Phase Independent Buck Converters and LDO
- Adjustable HS and LS FETs Current Limit for the 3 Bucks With Hiccup Mode OCP and Short Circuit Protection
- Selectable Prebias Monotonic or Output Discharge Startup
- Output OVP for the 3 Buck Converters
- +/-1% Output Regulation over Load and Line
- Operates from 4.5V to 34V Supply
- Adjustable Output from 0.7V to 90% VIN
- Independent Enable and POK on all Four Outputs.
- Adjustable Softstart
- 200kHz to 2.5MHz Settable Switching Frequency
- Synchronizable to External Clock
- Compatible with Ceramic, Polymer and Electrolytic Output Capacitors
- Available in 48 pin 7x7mm MLPQ Package

Applications:

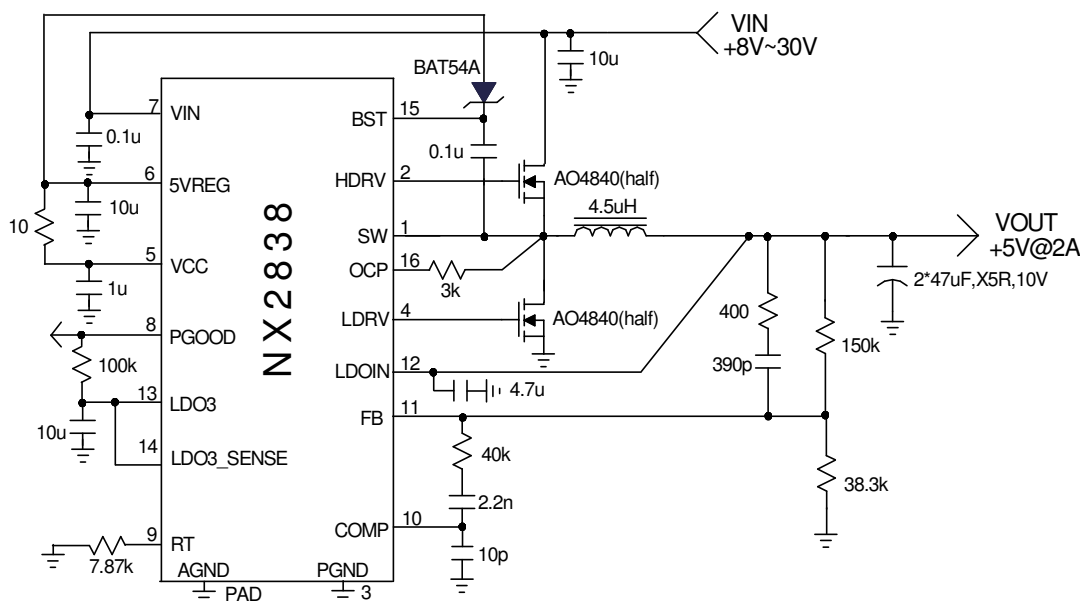
Status: 1st Silicon Sample Aug. 2010



NX2838

Single Supply, 30V, High Frequency Adjustable PWM Synchronous Controller + 3.3V LDO

Typical Application Circuit



- Single supply voltage from 8V to 30V
- Internal 5V regulator
- Programmable frequency up to 1MHz
- Internal Digital Soft Start Function
- Internal 700mA 3.3VLDO with Power Good indicator
- Prebias Startup
- Less than 50 nS adaptive deadband
- Current limit triggers hiccup by sensing Rdson of Synchronous MOSFET

Status: Production

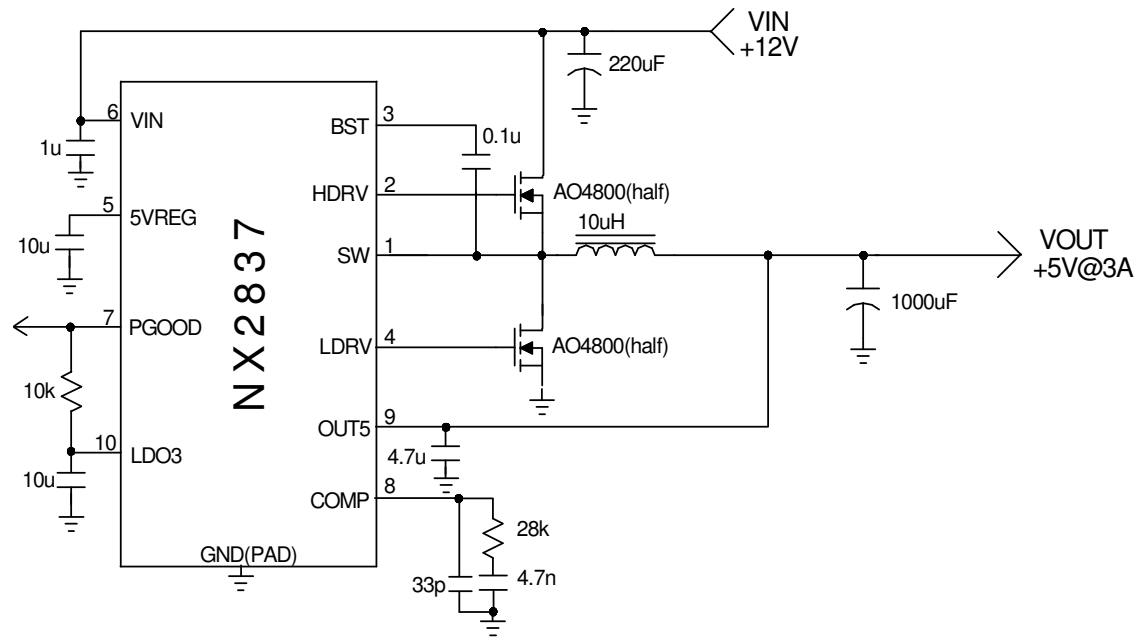


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NX2837

5V Fixed Output, 350KHz PWM Synchronous Controller + 3.3V/500mA LDO

Typical Application Circuit



- Single supply voltage from 9V to 22V
- Internal 5V regulator
- Fixed 350kHz working frequency
- Internal Digital Soft Start Function
- Fixed 5V switching output
- Internal 500mA 3.3VLDO with Power Good indicator
- Prebias Startup
- Less than 50 nS adaptive deadband
- Fixed current limit triggers hiccup by sensing R_{dson} of Synchronous MOSFET

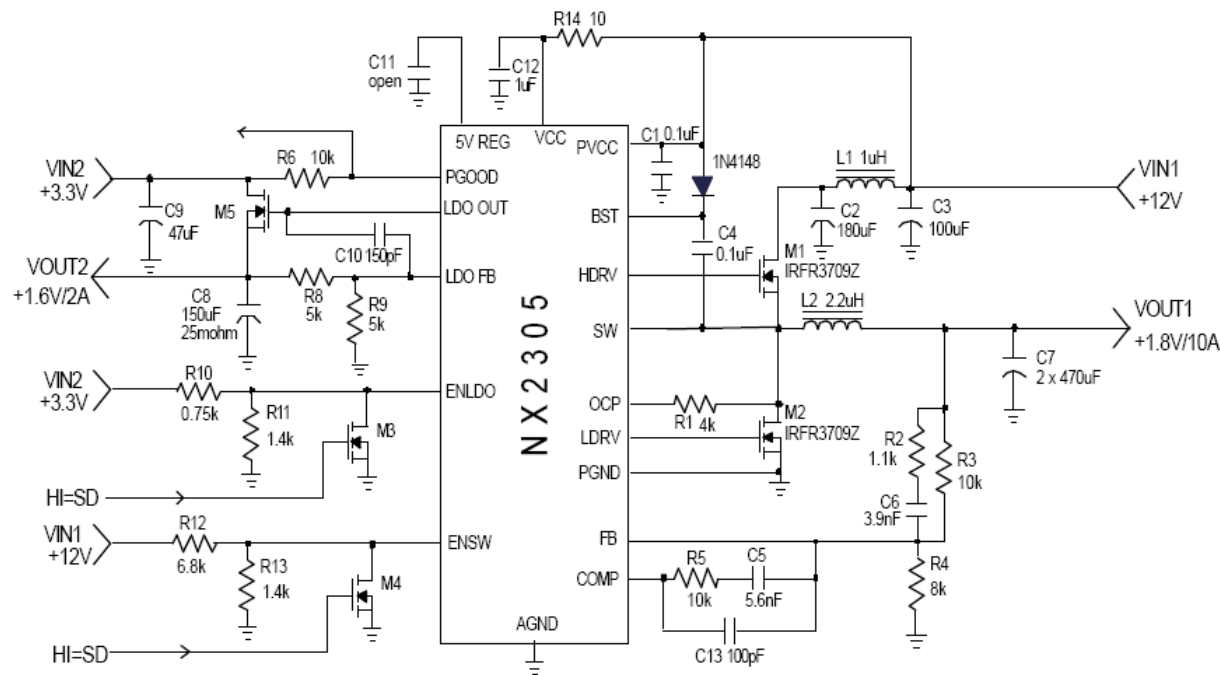
Status: Production



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NX2305 12V input single phase PWM+LDO controller with Independent Soft Start

Typical Application Circuit

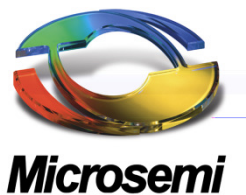


Status: production

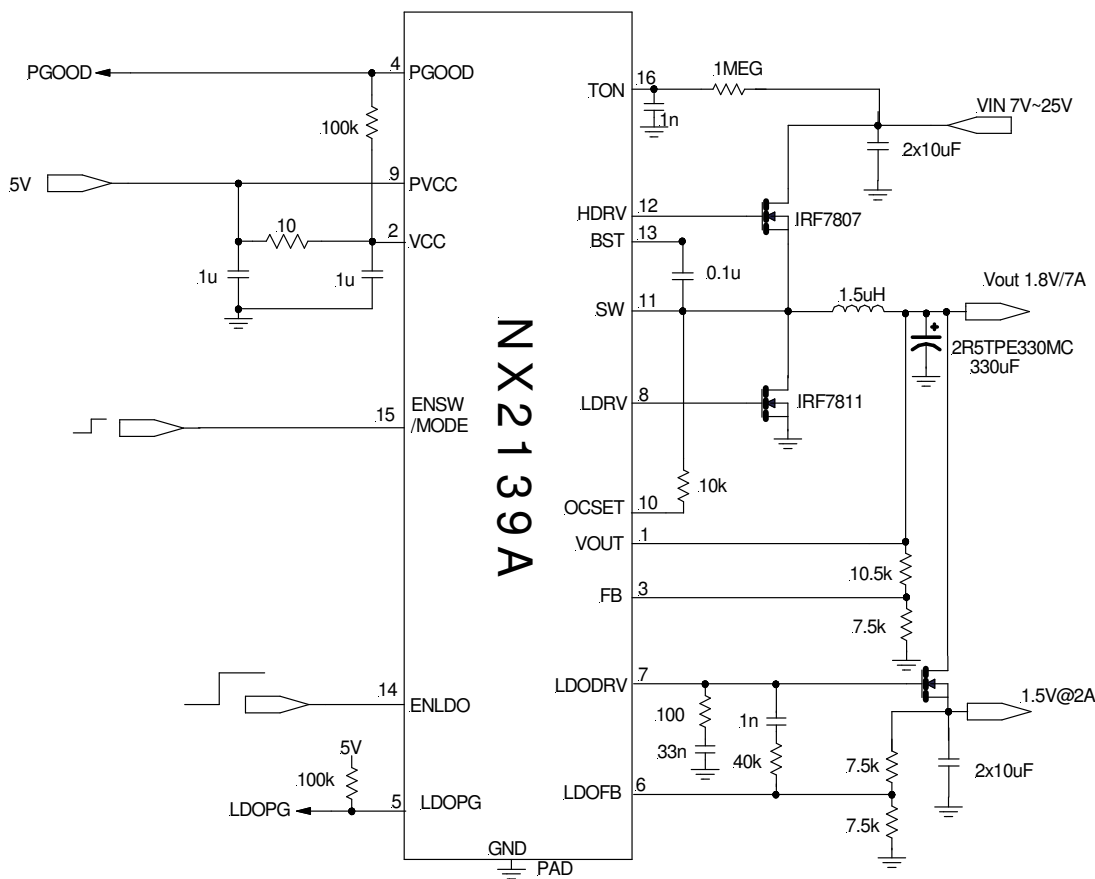
- Key features:
 - Single 12V Input PWM controller plus LDO controller
 - Hiccup current limit by sensing $R_{ds(on)}$ of MOSFET
 - 12V high side and low side driver
 - Fixed internal 300kHz for switching controller
 - Dual Independent Digital Soft Start Function
 - Adaptive Deadband Control
 - Enable pin available to program the Vbus UVLO
 - Shut Down switching and LDO via pulling down
 - EnSW or ENLDO pins

Applications

- PCI Graphic Card on board converters
- Mother board On board DC to DC applications
- On board Single Supply 12V DC to DC such as
- 12V to 3.3V, 2.5V or 1.8V
- Set Top Box and LCD Display



NX2139A SINGLE CHANNEL MOBILE PWM AND LDO CONTROLLER



Status: Production

• Key Features

- **Built-in Internal Boost Schottky Diode**
- **Ultrasonic mode operation available**
- **Bus voltage operation from 4.5V to 24V**
- **Less than 1uA shutdown current with Enable low**
- **Excellent dynamic response with constant on time control**
- **Selectable between Synchronous CCM mode and diode emulation mode to improve efficiency at light load**
- **Programmable switching frequency**
- **Current limit and FB UVLO with latch off**
- **Over voltage protection with latch off**
- **LDO controller with separate enable**
- **Two independent Power Good indicator available**

• Applications

- **Notebook /Netbook**
- **Portable**

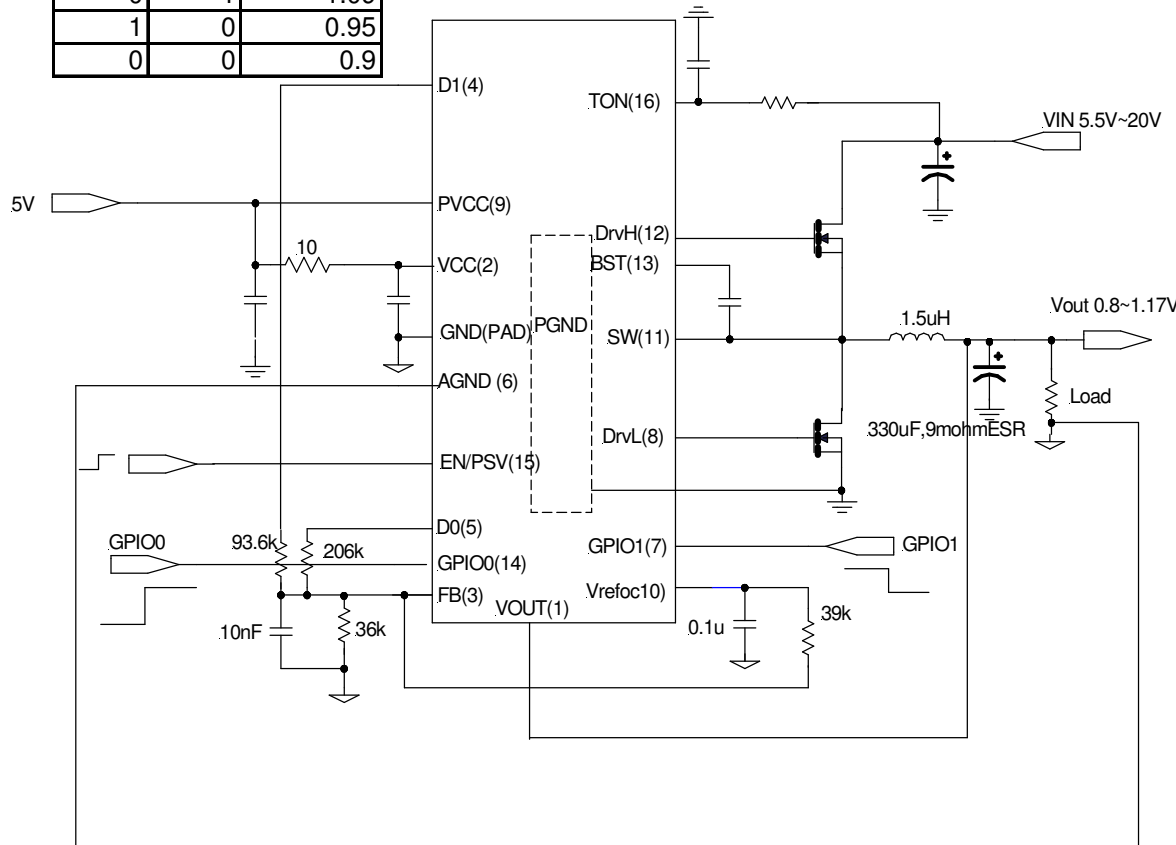


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NX2147

Single Channel Mobile PWM Controller with Dynamic Positioning

GPIO0	GPIO1	VOUT(V)
1	1	1.17
0	1	1.09
1	0	0.95
0	0	0.9



- Key features
 - Internal Boost Schottky Diode
 - Two built-in MOSFET for GPIO voltage positioning
 - Smooth transition when VOUT changes with GPIO due to external reference
 - Ultrasonic mode operation available
 - Bus voltage operation from 4.5V to 24V
 - Less than 1uA shutdown current with Enable low
 - Excellent dynamic response with constant on time control
 - Selectable between Synchronous CCM mode and diode emulation mode to improve efficiency at light load
 - Programmable switching frequency
 - Current limit and FB UVLO with latch off
 - Soft turn off
 - Over voltage protection with latch off
- Applications
 - Notebook

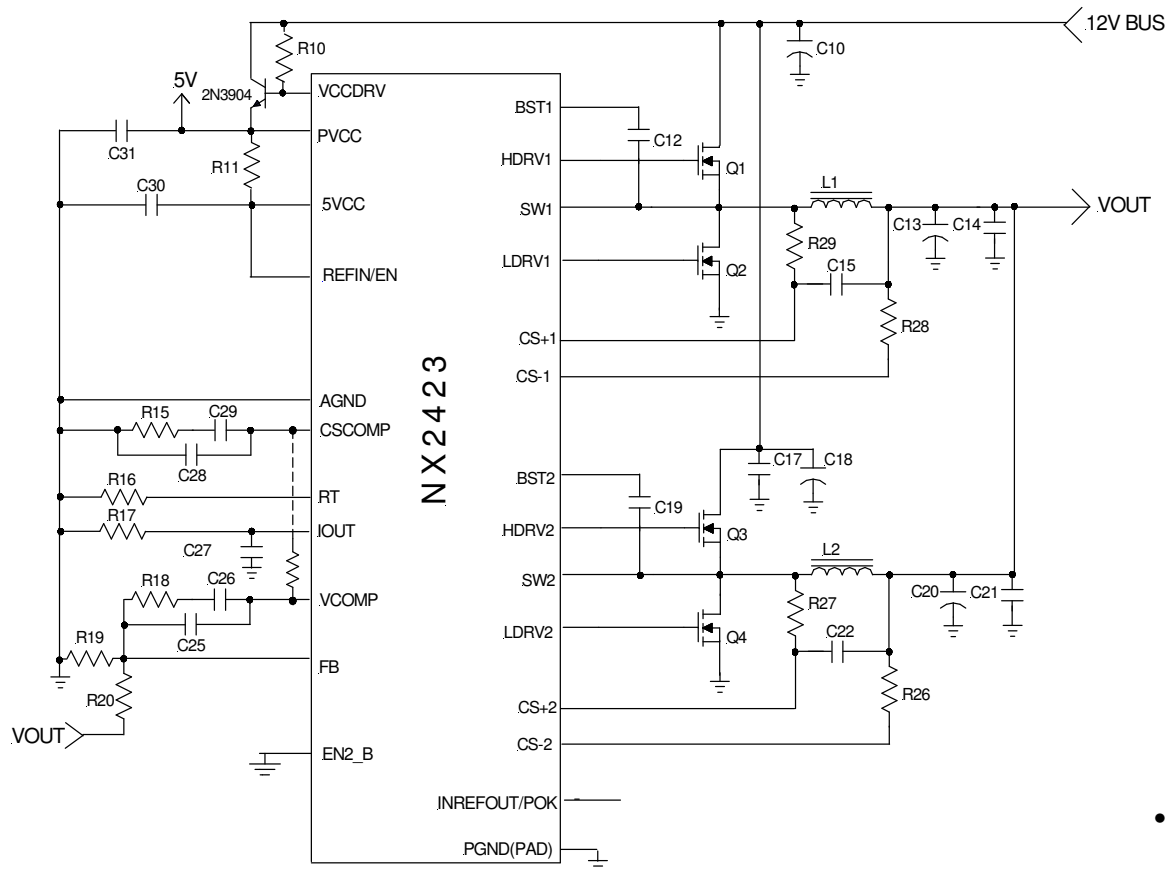
Status: Production



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NX2423

Two Phase High Frequency PWM Controller with Differential Inductor Sensing



Status: Production

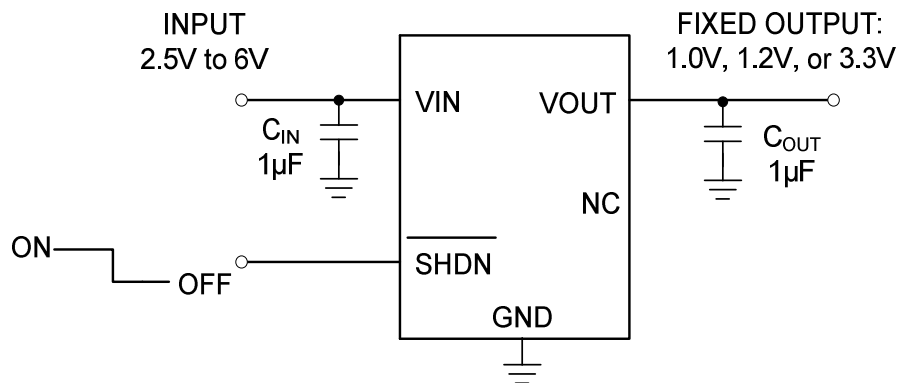
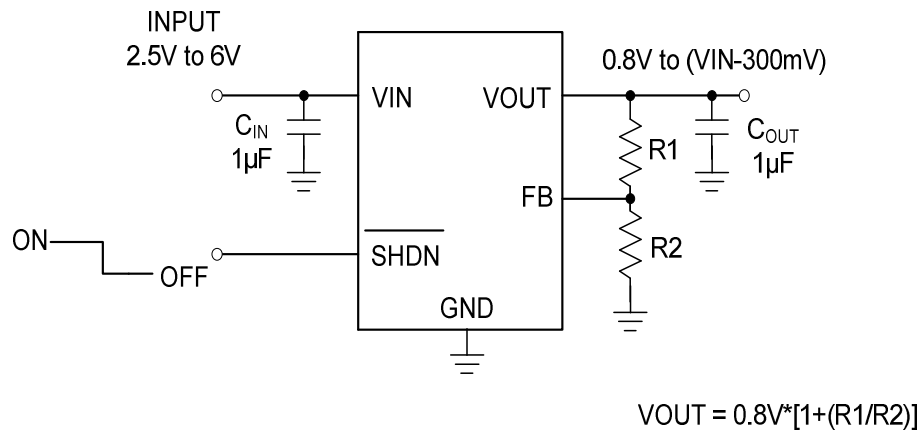
- Key features:
 - High Current, 40A DC to DC Applications
 - Differential inductor DCR sensing eliminates the problem with layout parasitic
 - 5V bias regulator available
 - Low Impedance On-board Drivers
 - Hiccup current limit and IOUT indication
 - Power Good for power sequencing
 - EN2_B pin allows the slave channel on and off while the master channel is working
 - Programmable frequency
 - Prebias start up
 - OVP without negative spike at output
 - Selectable between internal and external reference
 - Internal Schottky diode from PVCC to BST
- Applications
 - VGA Vcore
 - Other high current applications



LX8213

2.5V to 6V, 300mA Single LDO in SOT-23

Typical Application Circuits



Status: Production

FEATURES

- 2.5V to 6V Wide Input Voltage Range
- Fixed Output: 1.0V, 1.2V, 3.3V, or 0.8V to (Vin-300mV) Adjustable Output Voltage Range
- Low Quiescent Current of Typical 60uA
- Low Dropout Voltage of Typical 170mV at 3.3V 300mA
- Stable with Low ESR 1uF Input/Output Bypass Ceramic Capacitors
- Ultra Low Shutdown Current of Typical 0.1uA
- Fast Transient Response
- Shutdown Control Input
- Fold-back Current Limit
- 50mA Short Circuit Limit
- Standard 5 pin SOT-23 Package

APPLICATIONS

- Set-Top Box
- LCD TV's
- Battery Operated Systems
- Routers
- Video Cards
- Hand Held Instruments
-