

Features

- Hysteretic Constant On-Time (COT) synchronous buck regulator
- Maximum output current: Defined by selected device
1A=AmP8D1, 3A=AmP8D3, 6A=AmP8D6
- Vin: 3.0 to 13.3 V, Vout: 0.6V to 5.5V
- Best for transient response with load changes
- Adjustable output voltage with down to 1.2 mV resolution
- Integrated MOSFETs, $R_{DS(on)}$: 40mΩ
- Efficiency up to 95%
- Adjustable switching frequency
- Adjustable protection: Under-Voltage Lockout, (UVLO), Overcurrent (OCP), Overvoltage (OVP), and Over Temperature (OTP)
- Short-circuit protection (SCP)
- Power-good flag output and Enable input
- Soft start/stop, sequencing, pre-bias startup
- 52-, 58-, or 74-pin VQFN package
- -40°C to +125°C operating junction temperature
- Two SIM elements; integrate up to six C620 Power Components in one AmP platform

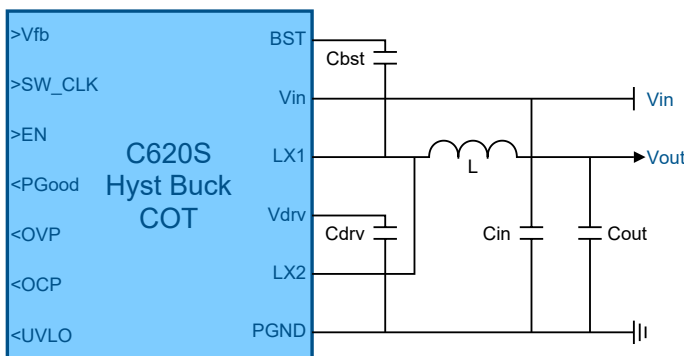
Applications

- On-demand power management, multi-rail power integration
- Powering server, processor, memory, storage, network switcher and router platforms
- FPGA, processor, SSD, subsystem power control & sequencing

Typical Application Circuit

Figure 1 provides a typical schematic for the C620 Power Component when integrated with other power rails in an AmP application.

Figure 1: C620 application schematic



Description

The C620 Power Component is a customizable Hysteretic Constant On-Time (COT) Synchronous Buck Switching Regulator. Combine the C620 component with other Power Components to create a custom-defined, AnDAPT AmP on-demand power management device.

The integrated, low-resistance switching Scalable Integrated MOSFETs (SIMs) provide up to 6A output current. The maximum current is defined by the AmP device selected.

The switching frequency is either generated internally via an oscillator with selectable frequencies or provided via an external pin.

The customizable output voltage is specified by the power engineer during customization using AnDAPT's cloud-based WebAmp development software. The C620 component has customizable control and status pins including an optional enable input, an optional power-good output, and optional output flags to signal when the system triggers an overvoltage (OVP), overcurrent (OCP), or undervoltage lockout (UVLO) condition. The threshold values are specified by the power engineer using the WebAmp tool.

The customizable soft-start and soft-stop slew rates plus ramp timing are also specified by the power engineer using the WebAmp tool.

Customizable Options

[Table 1](#) lists the various customizable options available for the C620 Power Component. These options are set graphically in the WebAmp development software.

Table 1: C620 Customizable Options

Option	Units
On time	ns
Input voltage	V
Output voltage	V
Ripple, % of output voltage*	%
Ripple, % of maximum output current*	%
Use optional En input to enable supply	On/Off
Use optional UVLO output to signal that output voltage is in under-voltage lockout condition	On/Off
Input voltage threshold for under-voltage lockout	V
Use optional OVP output to signal when over-voltage protection is triggered	On/Off
Over-voltage protection threshold	V
Use optional OCP output to signal when over-current protection is triggered	On/Off
Over-current protection threshold	A
Delay after enable to soft start	ms
Soft start rise time after enable	ms
Soft stop delay after disable	ms
Soft stop fall time after initial delay after disable	ms
Use optional PGood output to signal "power good"	On/Off
"Power good" threshold, percentage of output	%
Delay from "power good" until PGood asserted	ms

* to generate passive component recommendations

Package Options

[Table 2](#) lists the package options available for the C620 Power Component. Typically, multiple AnDAPT power components are integrated into a single package.

Table 2: Package Options for C620

Pins	Dimension	SIM Bonding	Part Number
52	6 x 6 mm	Paired	C620P
58	7 x 7 mm	Paired	C620P
74	8 x 8 mm	Single	C620S

Advanced Capabilities and Options

[Table 3](#) lists derivatives of the C620 component with additional capabilities plus other similar components potentially suitable for this application.

Table 3: C620 Advanced Capabilities Options

Description	Part Number
Standard Pro Series version (this component)	C620
Single-phase buck regulator, synchronous, PWM, voltage mode regulation	C200
Single-phase buck regulator, asynchronous, PWM, voltage mode regulation	C250
Multi-phase buck regulator, synchronous, PWM, current mode regulation	C510

System Characteristics

[Table 4](#) lists the system characteristics for the C620 Power Component when implemented in an AnDAPT AmP device.

Table 4: C620 System Characteristics

Parameters	Min	Typ	Max	Units
Power				
Bias Supply Voltage (V_{BIAS})	6		13.3	V
Input Drain Voltage (V_{IN})	3		13.3	V
Output Voltage (V_{OUT})	0.6		5.5	V
Output Current (I_{OUT})	D6		6	A
	D3		3	
	D1		1	
Switching frequency (F_{SW})			2000	kHz
Output MOSFET switch ($R_{DS(on)}$)		40		mΩ
Load regulation ($\Delta V_{OUT}/\Delta I_{OUT}$)		1.0		%/A
Line regulation ($\Delta V_{OUT}/\Delta V_{IN}$)		1.0		%/V
Peak efficiency ($V_{IN}=5V, V_{OUT}=3.3V, F_{SW}=500kHz$)		95		%
Constant on time	100			ns
Control				
Over-/under-shoot		±5		%
Dynamic MOSFET current per segment		0.37		A
Soft start/stop delay	2		10	ms
Current Limit – OCP	0.2		6	A
Overvoltage protection trip point range (OVP)	0		5.5	V
Undervoltage lockout start threshold range (UVLO)	0		5.5	V

For other device specifications, see the AnDAPT AmP Platform datasheet.

Additional Resources

- AnDAPT AmP Platform datasheet