Low-Dropout (LDO) Regulator

Power Component: C710_B

Product Description

The C710_B Power Component is a customizable Low-Dropout Voltage Regulator with standard source-side regulation. Combine the C710_B component with other Power Components to create a highly integrated, custom-defined, AnDAPT AmP™ on-demand power management device.

Features

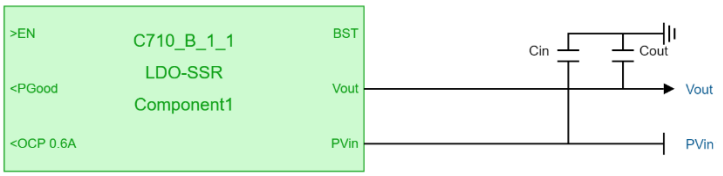
- Linear, constant voltage, low-dropout regulator
- Adjustable V_{OUT} from 0.6V to 3.3V
- Maximum output current: 1A with “Internal” feedback and 3A with “External” feedback
- 1% typical line and load regulation
- Very low dropout :100 mV dropout
- Short-circuit protection (SCP)
- Protection: Overcurrent (OCP), and Over Temperature (OTP)
- Power-good and OCP flag outputs and Enable input
- Soft start/stop
- –40°C to +125°C operating junction temperature
- Utilizes one SIM element of an AmP Platform
- Additional capabilities – see I710, P710

Applications

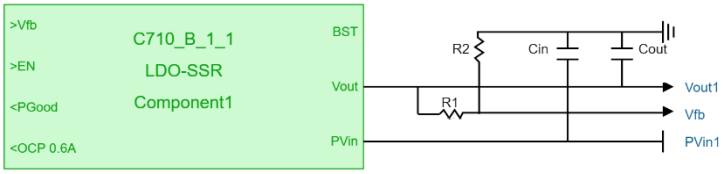
- Powering server, processor, memory, storage, network switcher and router platforms
- FPGA, processor, SSD, subsystem power control & sequencing
- Imaging: CMOS Sensors, Video ASICs
- Test and Measurement
- Regulated power noise sensitive, phase-locked loops (PLLs), voltage-controlled oscillators (VCOs), and PLLs with integrated VCOs

Figure 1: C710_B application schematic

Internal Feedback



External Feedback



Product Detail

The C710_B is a 3A general purpose low-dropout (LDO) regulator. The maximum current is defined by the AmP device selected. The integrated current sense provides over-current protection (OCP) and short circuit protection.

The C710_B is designed to cover the voltage range (0.6V to 3.3V).

The customizable output voltage is specified by the power engineer during customization using AnDAPT’s cloud-based WebAmp™ development software. The C710_B component has customizable control and status pins including an enable input, an optional power-good output, and optional output flag to signal when the system triggers an overcurrent (OCP) condition.

The C710_B also incorporates a soft start feature to mitigate against inrush current. Sequencing options are available when used in conjunction with the C420 customizable Sequencer, by interconnecting signals EN, PGood to provide dependencies and delays between each sequence step.

The C710_B has a minimum load requirement of 100uA

Part number	AmP Platform	IOUT Max	VOUT Max
C710 (Internal f/b)	AmPxD6	1A	3.3V
C710 (External f/b)	AmPxD6	3A	3.3V

Customizable Options

Table 1 lists the various customizable options available for the C710 Power Component.

These options are set in the WebAmp development software.

Table 1: C710 Customizable Options

Option	Units
Input voltage	V
Output voltage	V
Output Current	A
Enable OCP output to signal when overcurrent protection is triggered	On/Off
Use optional PGood output to signal “power good”	On/Off

System Characteristics

Table 2 lists the system characteristics for the C710_B Power Component when implemented in an AnDAPT AmP device. “Prog” column specifies parameters that are user selectable.

Table 2: C710_B System Characteristics

Parameters	Min	Typ	Max	Units
Input Drain Voltage (V_{IN}) *	V_{OUT}+ V_{DO}		17	V
Output Voltage (V_{OUT}) C710	0.6		3.3	V
Output Current (I_{OUT}) Internal F/B External B/B			 1 3	 A A
Dropout Voltage (V_{DO}) C710 @ V_{OUT} =1.8V I_{DS}=0.1A I_{DS}=1A		 20 100		 mV mV
Voltage regulation		0.5		%
Current Limit – OCP	1			A

Note: The maximum power dissipation for the C710_B, (V_{IN}-V_{OUT})I_{OUT}, is limited to 1.5W

Advanced Capabilities and Options

Table 3 lists derivatives of the C710_B component with additional capabilities plus other similar components potentially suitable for this application.

Table 3: C75x Advanced Capabilities Options

Description	Part Number
Standard Pro Series version (this component)	C710_B
Add external control via I^2C bus interface	I710
Add telemetry and dynamic voltage scaling via DVS interface	P710

Port Name Table

Port Name	Analog/ Digital	Input/ Output	Description
PV_{IN}	Analog	I/P	LDO Analog I/P
V_{OUT}	Analog	O/P	LDO O/P
Vfb	Analog	I/P	Feedback I/P from O/P resistor divider
BST	Analog	I/P	Bootstrap I/P. This pin should be left floating. [+refer to Figure 1]
EN	Digital	I/P	Enable I/P. HIGH => LDO Enabled LOW => LDO Disabled
Pgood	Digital	O/P	Power Good indicator. HIGH => Vout > Pgood level
OCP	Digital	O/P	Over Current Indicator HIGH => O/P Current exceeds OCP level