A2201V-21X

Dual-Channeling

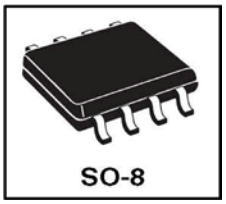
CC/CV Mode Switching Controller

Version 1.0
Mar. 18, 2012

Reversion History

Date	Reversion #	Description	Page
2012/05/18	1.0		

General Description



The A2201V is a dual-channeling CV/CC mode switching regulator. The A2201V is designed to allow for operating a wide supply voltage range from 8V to 36V and capable of delivering 5A output current.

The A2201V features a dual-channeling CV/CC mode control functions, the CV mode (Constant Voltage) function to provide a regulated voltage output and the dual-channeling CC mode (Constant Current) function provides dual-channeling current limitation function, it is suitable for the DC / DC switching power applications when requested the dual-channeling current limitation function.

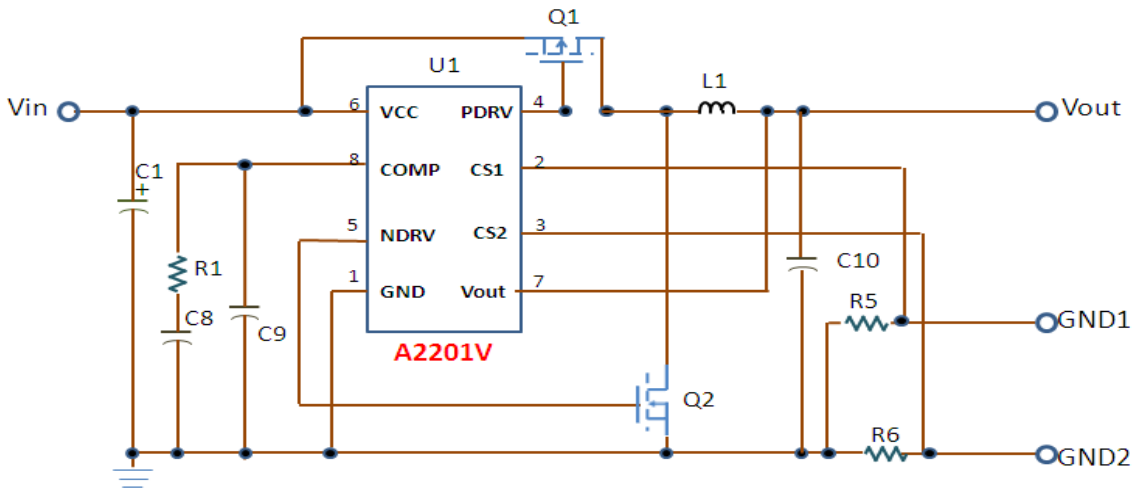
Features

- 8V~36V Input Voltage Range
- UVLO protection
- Fixed 100KHz operating Frequency
- Dual-Channeling CC/CV Mode Control
- +/- 1% Voltage Reference Accuracy
- +/- 4% Current Limit Accuracy
- Soft Start Function for Start-up
- Output Over-Voltage Protection
- Over Temperature Protection
- Fold Back Short-Circuit Protection
- Synchronization Rectification
- High Efficiency Operation
- SOP-8 Package
- ISO7637-2 Pulse 1~4 Compliant
- Spread Spectrum Clocking

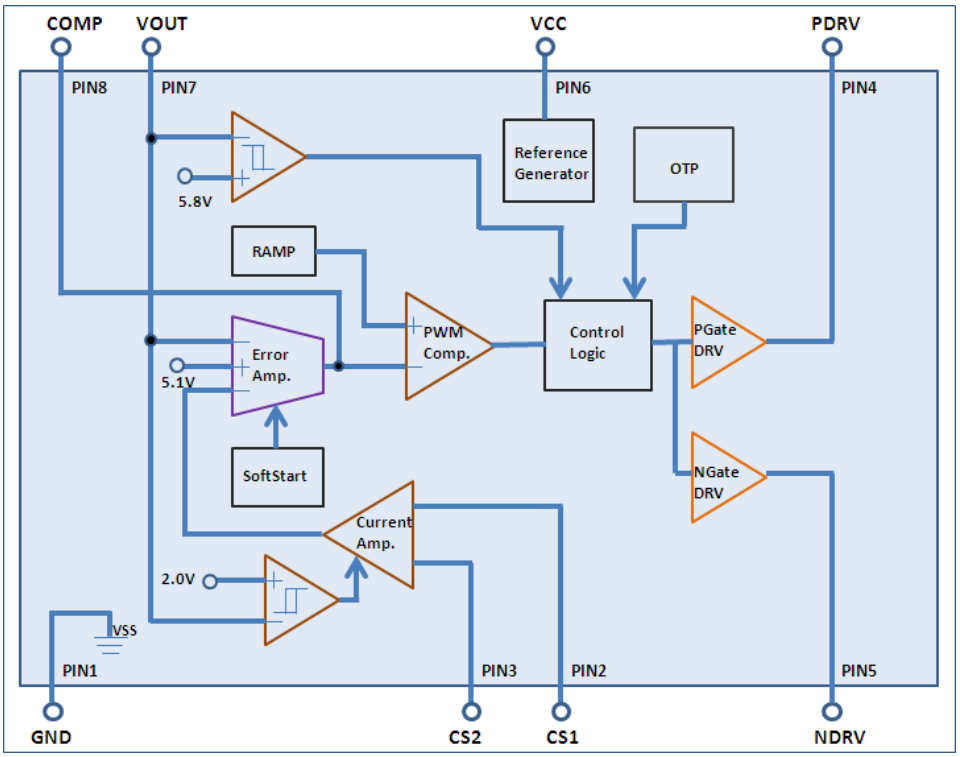
Applications

- Car Charger
- Automotive power applications
- DC/DC converters with current limited
- General Purpose CV/CC power supply

Typical Application Circuits



Block Diagram



Ordering and Marking Information

Order Information

A 2 2 01 V- X X X

- Cable Compensation: 0 : W/O Compensation; 1 : W/I Compensation
- Frequency Type: 2 : 100KHz
- Package type: V : SOP-8
- Serial number
- Assembly type: 1 : W/I MOS, 2 : W/O MOS
- Product Code: 2 : DC-DC

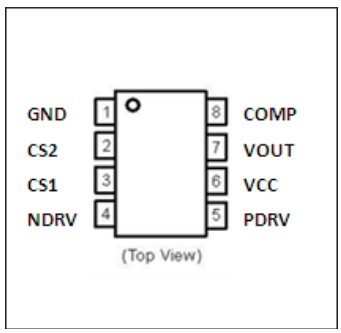
Marking Information

AVT
A2201V-XX → Part Name
XX XX X XX XX

- Sub. Lot
- Lot ID
- Year
- Week

Signal Descriptions

Pin Configurations



Pin Description

Pin No.	Symbol	Description
1	GND	Ground pin
2	CS1	1st channel current sense input pin
3	CS2	2Nd channel current sense input pin
4	PDRV	PMOSFET driver output pin
5	NDRV	NMOSFET driver output pin
6	VCC	Input supply voltage pin
7	VOUT	Output voltage regulation feedback pin
8	COMP	E/A output pin for compensation.

Functional Descriptions

Dual-Channeling CV/CC mode control

The A2201V provides dual channeling CV/CC function. The CV (constant voltage) function is implemented to deliver a regulated output voltage for the output terminal, and the dual-channeling CC (constant current) function is to limit dual-port output current to be a limited value to prevent the device damaged due to output short circuit or over current condition.

Soft Start function

The A2201V is composed of built-in internal soft start function to prevent a large surge current happening when during start-up period due to the surge current charging output filter capacitors.

Output Over-Voltage Protection

The A2201V provides built-in output over-voltage protection function. When output over-voltage happens, the A2201V shuts down and recovers to normal state automatically if output over-voltage is released.

Output Short-Circuit Protection

The A2201V provides output short-circuit protection function. When output over-voltage happens, the A2201V shuts down and recovers to normal state automatically if output short-circuit is released.

Electrical Specifications

Absolute Maximum Ratings

Parameter	Symbol	Limits	Units
VCC to GND	V_{cc}	−0.3 to +40	V
PDRV to VCC	PDRV	+0.3 to −40	V
NDRV to VCC	NDRV	+0.3 to −40	V
Vout to GND	VOUT	−0.3 to +7	V
CS1 to GND	CS1	−0.3 to +7	V
CS2 to GND	CS2	−0.3 to +7	V
COMP to GND	COMP	−0.3 to +7	V
Maximum Output Current	I_{cc}	6	A
Power Dissipation at Ta <60 °C	P_D	0.75	W
ESD	V_{HBM}	±2000	V
	V_{MM}	±200	V
Operation Junction Temperature	T_J	−40 to 150	°C
Storage Temperature	T_{STG}	−60 to 150	°C
Lead Temperature (Reflow)	T_{LEAD}	260	°C

Note: Stress beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those are indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Thermal Data

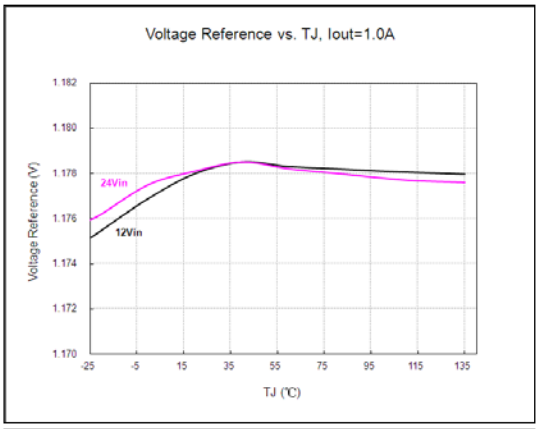
Parameter	Symbol	SOP- 8	Units
Thermal Resistance Junction to Ambient	θ_{ja}	100	°C /W
Thermal Resistance Junction to Case	θ_{jc}	15	°C /W

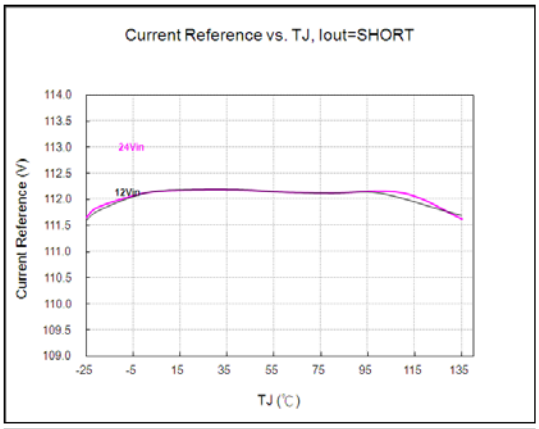
Electrical Characteristics

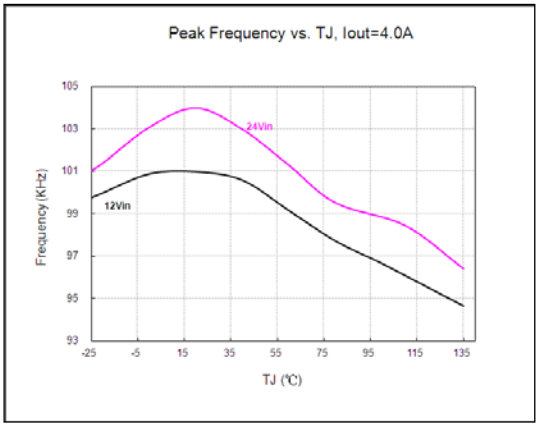
(Vin=12V, Ta=25℃, Io=4.0A, unless otherwise specified)

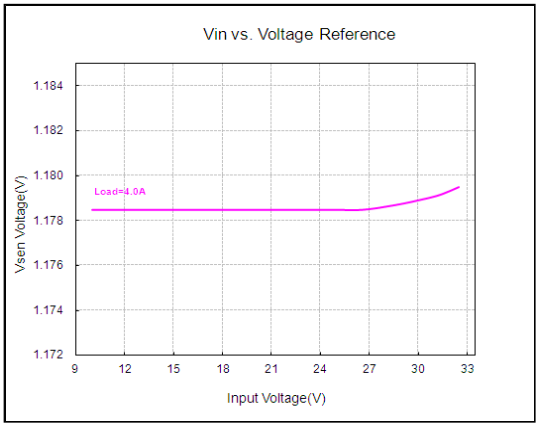
Parameter	Symbol	Conditions	Min	Type	Max	Units
Input Voltage Section						
Input Voltage	V_{IN}		8		36	V
Input No Load Current	$I_{no-load}$	Io=0A			10	mA
Oscillator Section						
Operating Frequency	F_{osc}		85		115	KHz
		Tj= -25 °C to 125 °C	80		120	KHz
Duty Cycle Range					95	%
Error Amplifier Section						
Reference Voltage of the Voltage Error Amplifier	V_{OUT}	Io=0.0A	5.05	5.1	5.15	V
		Tj= -25 °C to 125℃	4.89		5.21	V
Reference Voltage of the Current Error Amplifier	V_{CS1}		107.5	112	116.5	mV
	V_{CS2}	Tj= -25 °C to 125℃	105.5		118.5	mV
Tran conductance of Error Amplifier	G_{Merr}			150		uA/V
Output Over Voltage Protection Section						
Output Over Voltage Protection	V_{OVP}			5.8		V
Output Short Circuit Protection Section						
Short Circuit Fold back Voltage	V_{SCP}			2.0		V
Over Temperature Protection Section						
Thermal Shut-down Temperature	$T_{OTP,R}$	Temperature Rising		150		℃
	$T_{OTP,F}$	Temperature Falling		100		℃

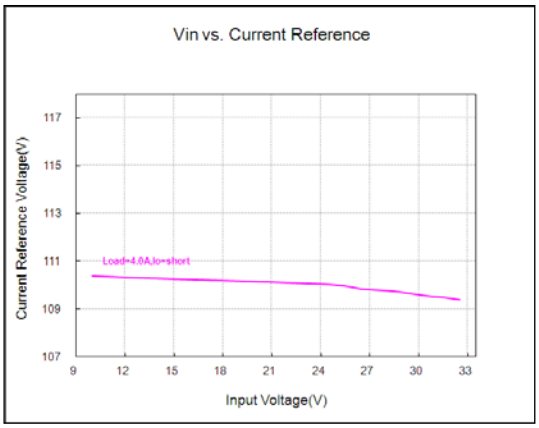
Typical Performance Characteristics

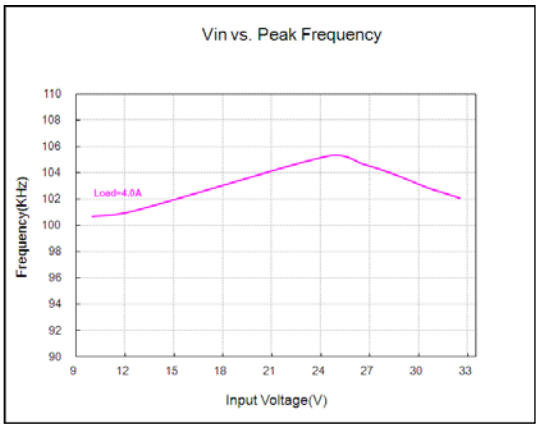


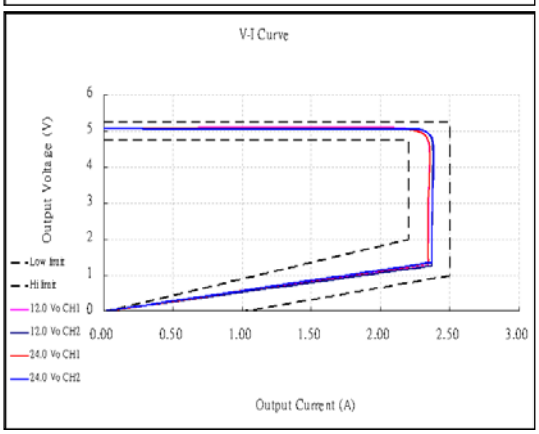


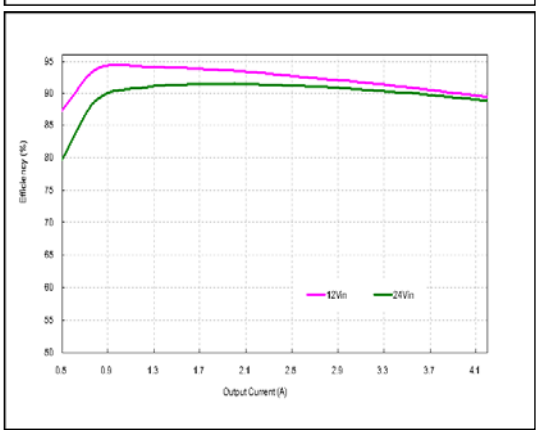










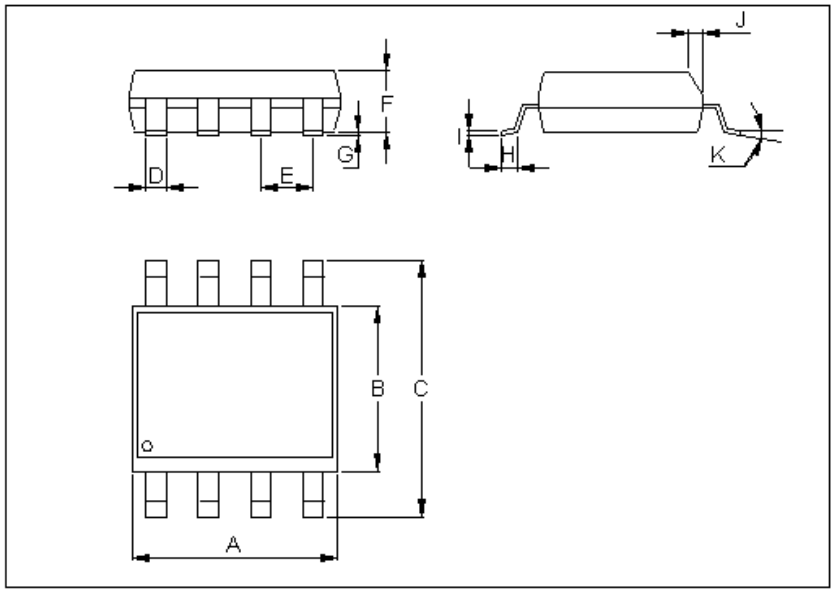


Package Information

Package Dimensions

SOP-8 Mechanical Data							
Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	4.7	4.9	5.1	H	0.4	0.715	0.83
B	3.7	3.9	4.1	I	0.19	0.22	0.26
C	5.8	6	6.2	J	0.25	0.375	0.5
D	0.33	0.445	0.51	K	0°	4°	8°
E		1.27		L			
F	1.2	1.375	1.62	M			
G	0.08	0.175	0.28	N			

Weight : 0.083 ∓ 0.003 g / pcs

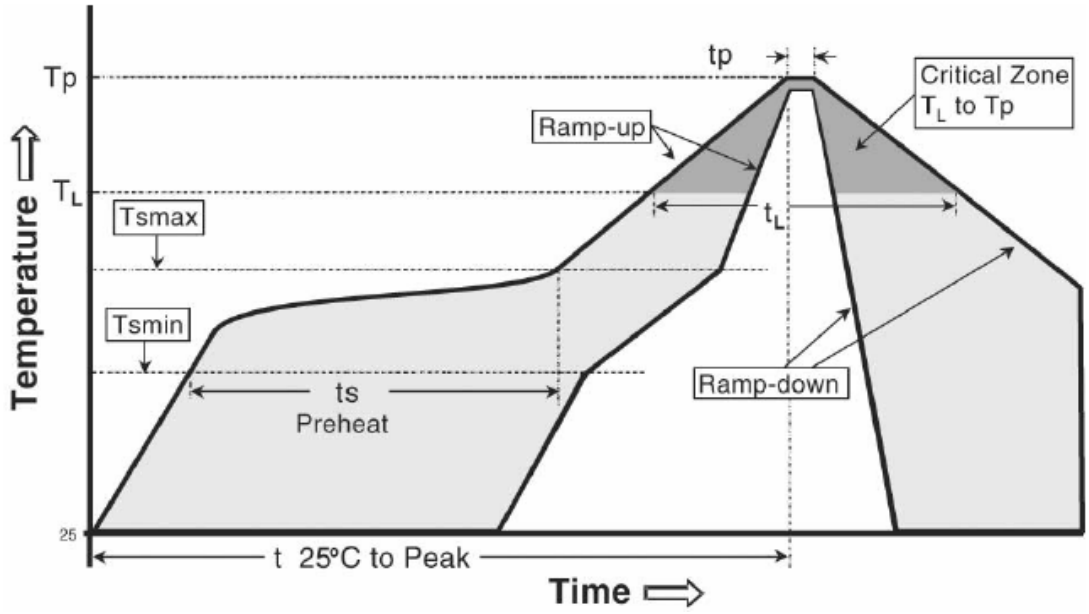


Storage Condition and Period for Package

Package	MSL	Max. Reflow Temp.	Floor Life Storage Condition	Dry Pack
SOP8	LEVEL 3	260 -5/+0 °C	168hrs @ ≦30 °C/60% RH	YES

NOTE: Please refer to IPC/JEDEC J-STD-020 standard.

Recommended SMT Temperature Profile



Source: JEDEC org. http://www.jedec.org/sites/default/files/docs/jstd020d-01.pdf

NOTE: For detailed information, please refer to J-STD-020 standard on JEDEC website.

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