



H234

Description

The H234 is a highly integrated solution for a constant voltage/constant current mode SMPS application.

The H234 contains one 1.21V voltage reference with $\pm 0.5\%$ accuracy, one current sensing circuit and two operational amplifiers. Combining the voltage reference with one operational amplifier makes H234 an ideal voltage

controller for use in adapters and battery chargers. The other low voltage reference combined with the other operational amplifier makes it an ideal current limiter for output low side current sensing.

The H234 is available in SOT-23-6L(TSOP-6) package.



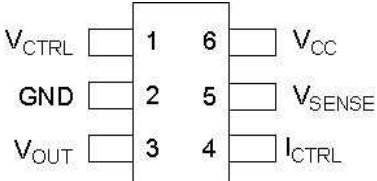
Features

- Constant Voltage and Constant Current Control
- Precision Internal Voltage Reference
- Few External Components
- Easy Compensation
- Low Supply Current
- Operating Temperature Range: -40 to 105°C

Applications

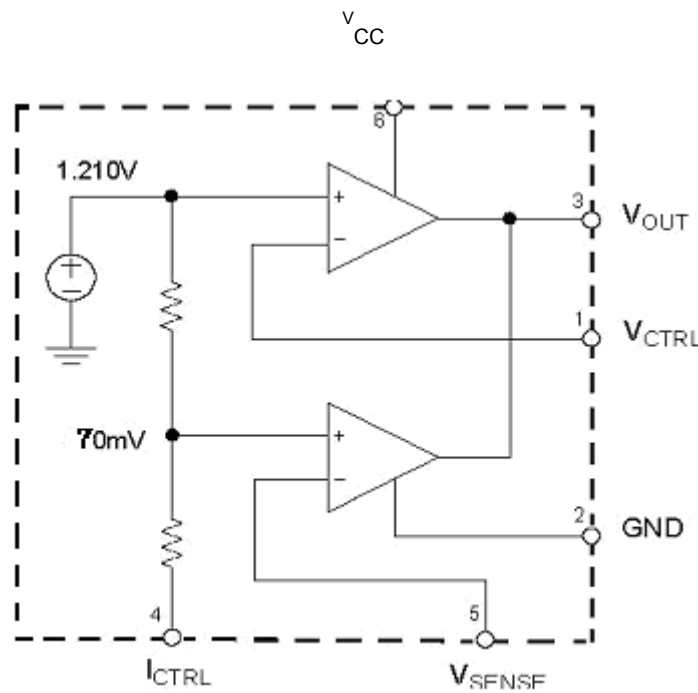
- Adapters
- Battery Chargers

Pin Configuration

	Pin Number	Pin Name	Function
	1	VCTRL	Input pin of the voltage control loop
	2	GND	Ground
	3	VOUT	Output pin. Sinking current only
	4	ICTRL	Input pin of the current control loop
	5	VSENSE	Input pin of the current control loop
	6	VCC	Power supply



Functional Block Diagram



Absolute Maximum Ratings (Note 1)

Parameter	Symbol	Value	Unit
Power Supply Voltage	V _{CC}	20	V
Input Voltage	V _{IN}	-0.3 to V _{CC}	V
Junction Temperature	T _J	150	°C
Storage Temperature	T _{STG}	-65 to 150	°C
Package Thermal Resistance (Junction to Case)	R _{θJC}	92	°C/W

Note 1: Stresses greater than 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 indicated under "Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

Recommended Operating Conditions

Parameter	Symbol	Min	Max	Unit
Power Supply Voltage	V _{CC}	2.5	18	V
Operating Temperature Range	T _A	-40	105	°C



Electrical Characteristics

($V_{CC}=5V$, $T_A=25^{\circ}C$, unless otherwise specified.)

Parameter	Symbol	Conditions	Min	Type	Max	Unit
TOTAL CURRENT CONSUMPTION						
Total Supply Current Not Including the Output Sinking Current	I _{CC}	T _A =25°C		0.9	1.3	mA
		-40°C < T _A < 105°C		1.0		
VOLTAGE CONTROL LOOP						
Transconductance Gain (V _{CTRL}). Sink Current Only	G _{mv}	T _A =25°C	1	3.5		mA/mV
		-40°C < T _A < 105°C		2.5		
Voltage Control Loop Reference	V _{REF}	T _A =25°C	1.204	1.21	1.216	V
		-40°C < T _A < 105°C	1.186		1.234	
Input Bias Current (V _{CTRL})	I _{IBV}	T _A =25°C		50		nA
		-40°C < T _A < 105°C		100		
CURRENT CONTROL LOOP						
Transconductance Gain (I _{CTRL}). Sink Current Only	G _{mi}	T _A =25°C	1.5	7		mA/mV
Current Control Loop Reference	V _{SENSE}	I _{OUT} =2.5mA, T _A =25°C	67	70	73	mV
		I _{OUT} =2.5mA, -40°C < T _A < 105°C	66	70	74	
Current Out of Pin I _{CTRL} at 200mV	I _{IBI}	T _A =25°C		25		μA
		-40°C < T _A < 105°C		50		
OUTPUT STAGE						
Low Output Voltage at 10mA Sinking Current	V _{OL}	T _A =25°C		200		mV
Output Short Circuit Current. Output to V _{CC} , Sink Current Only	I _{OS}	T _A =25°C		27	50	mA
		-40°C < T _A < 105°C		35		



Characteristics Curve

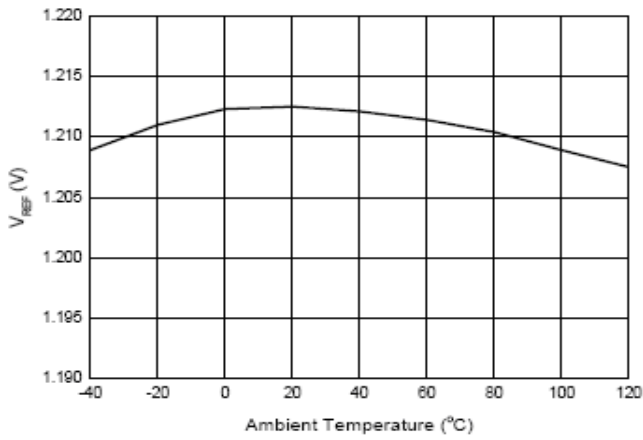


Figure 1. V_{REF} vs. Ambient Temperature

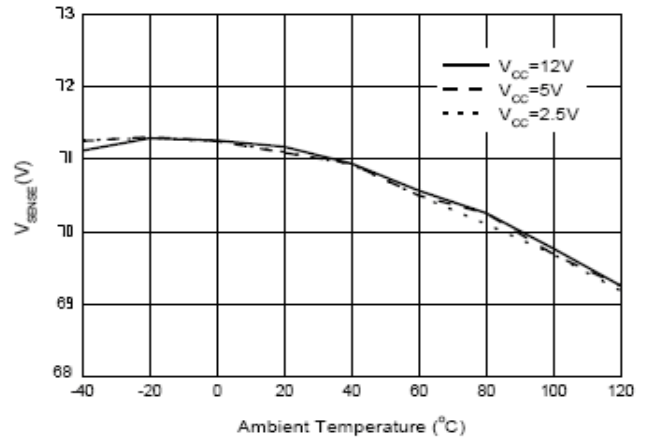


Figure 2. V_{SENSE} vs. Ambient Temperature

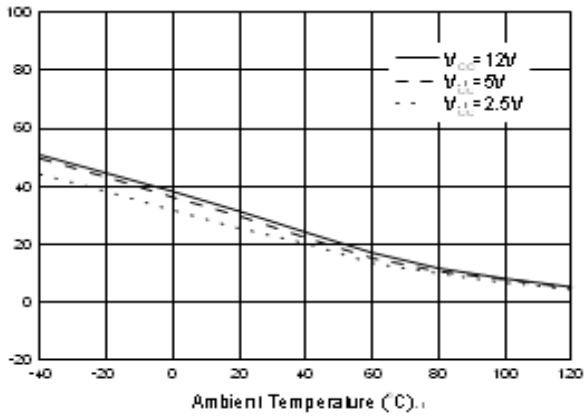


Figure 3. I_{BV} vs. Ambient Temperature

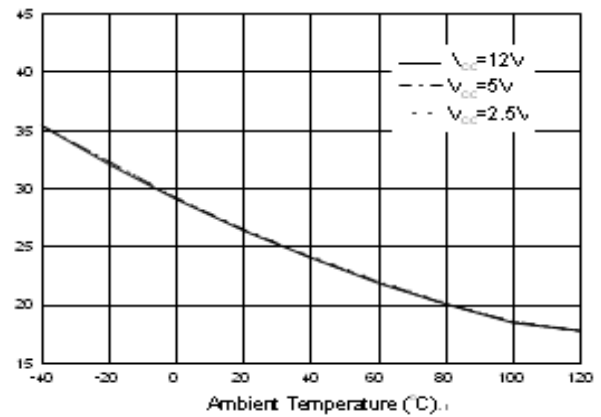


Figure 4. I_{BI} vs. Ambient Temperature

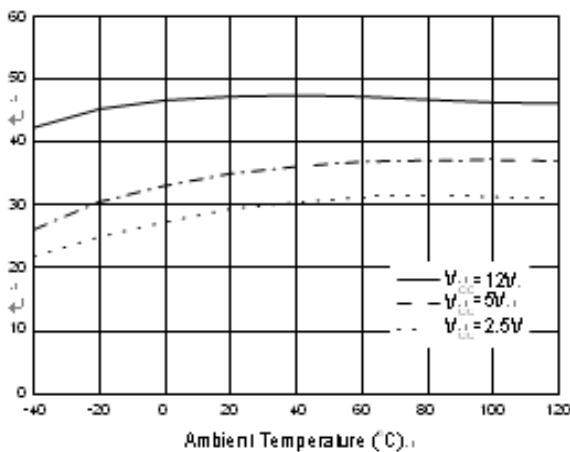


Figure 5. Output Short Circuit Current vs. Ambient Temperature

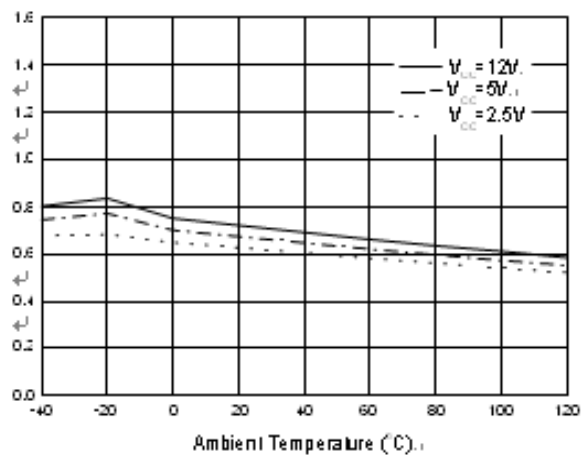
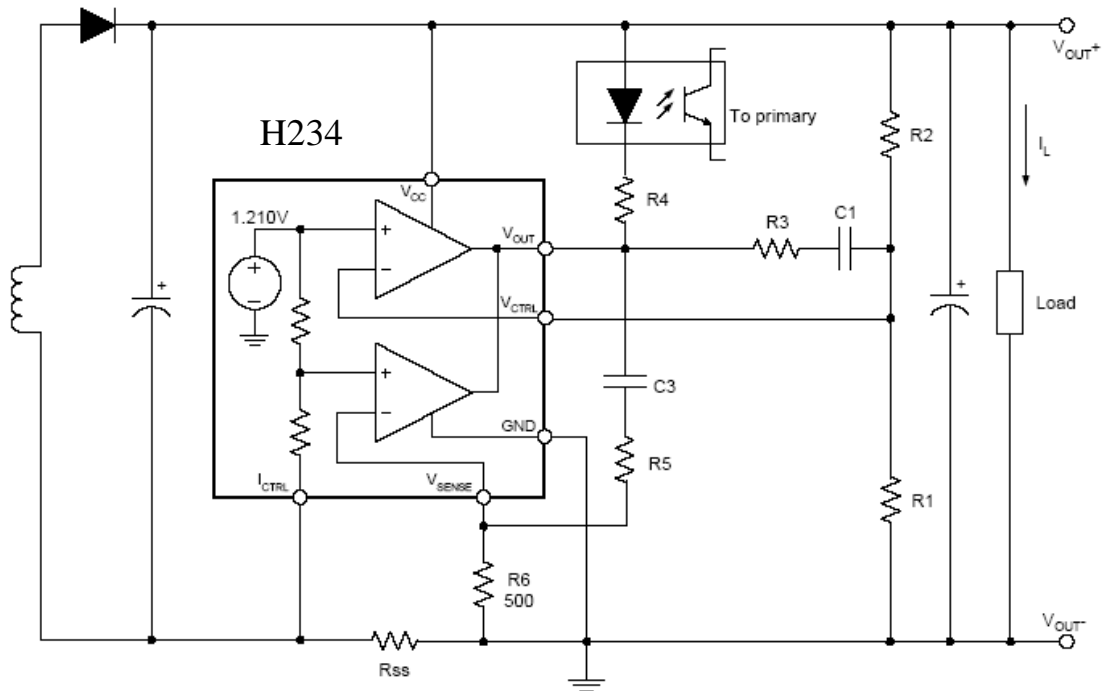


Figure 6. Supply Current vs. Ambient Temperature



Typical Application



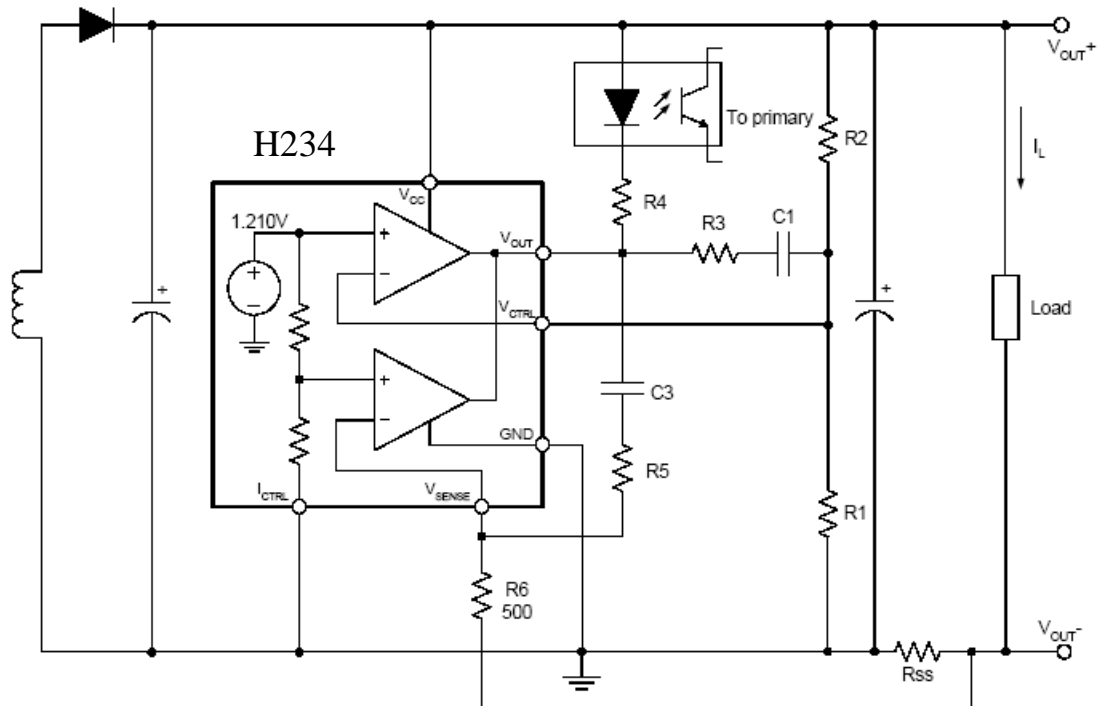
$$V_{OUT} = V_{REF} \times \frac{R1 + R2}{R1} \quad (V)$$

$$CurrentLimit = \frac{V_{SENSE}}{R_{SS}} \quad (A)$$

Figure 7. Typical Application 1 of H234



Typical Application



$$V_{OUT} = V_{REF} \times \frac{R1 + R2}{R1} - (I_L \times R_{SS}) \quad (V)$$

$$CurrentLimit = \frac{V_{SENSE} \times V_{REF}}{(V_{SENSE} + V_{REF}) \times R_{SS}} \quad (A)$$

Figure 9. Typical Application 3 of H234



SOT-23-6L (TSOP-6) Dimension

SOT-23-6L(TSOP-6) Surface Mounted Package

HSMC Package Code: N

Marking:

Pin Style: 1. Vctrl 2. GND 3. Vout
 4. Ictrl 5. Vsense 6. Vcc

Material:

- Lead solder plating: Pure-Tin (Pb-free)
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

DIM	Min.	Max.
A	2.70	3.12
B	2.60	3.00
C	1.40	1.80
D	0.30	0.55
E	0.00	0.10
F	0°	10°
G	1.80	2.00
H	-	1.30
I	0.10	0.21
J	0.30	0.60
K	0.6*	
L	0.95*	
M	0.25*	
N	1.00	1.20

*: Typical, Unit: mm

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