H234

6-Lead Plastic **SOT-23-6L（TSOP-6）**
Package Code: N

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 ± 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

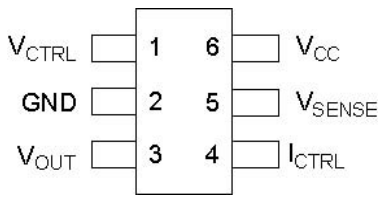
· Operating Temperature Range: -40 to 105℃

Applications

· Adapters

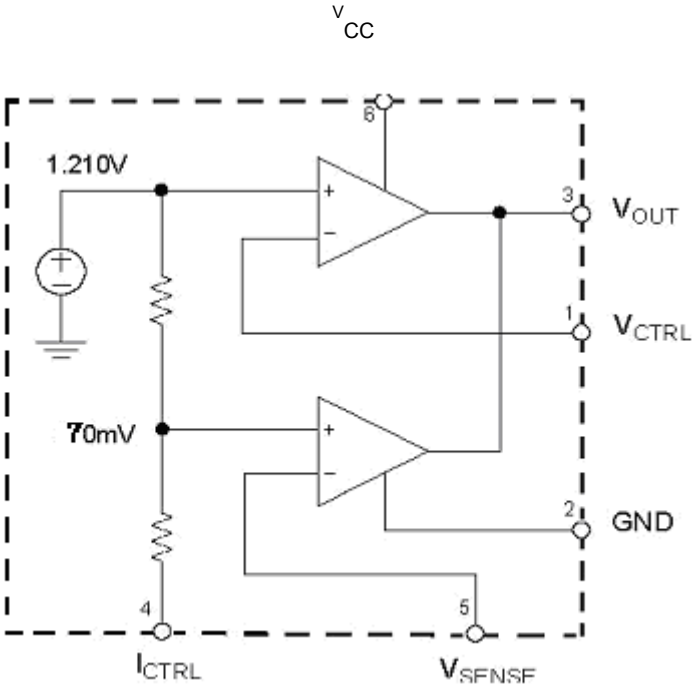
· Battery Chargers

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	℃
Storage Temperature	T_{STG}	-65 to 150	℃
Package Thermal Resistance (Junction to Case)	$R_{\theta JC}$	92	℃/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	℃

Electrical Characteristics

(V_{CC}=5V, T_A=25℃, unless otherwise specified.)

Parameter	Symbol	Conditions	Min	Type	Max	Unit
TOTAL CURRENT CONSUMPTION						
Total Supply Current Not Including the Output Sinking Current	ICC	TA=25℃		0.9	1.3	mA
		-40℃<TA<105℃		1.0		
VOLTAGE CONTROL LOOP						
Transconduction Gain (VCTRL). Sink Current Only	Gmv	TA=25℃	1	3.5		mA/mV
		-40℃<TA< 105℃		2.5		
Voltage Control Loop Reference	VREF	TA=25℃	1.204	1.21	1.216	V
		-40℃<TA< 105℃	1.186		1.234	
Input Bias Current (VCTRL)	IIBV	TA=25℃		50		nA
		-40℃<TA< 105℃		100		
CURRENT CONTROL LOOP						
Transconduction Gain (ICTRL). Sink Current Only	Gmi	TA=25℃	1.5	7		mA/mV
Current Control Loop Reference	VSENSE	IOUT=2.5mA, TA=25℃	67	70	73	mV
		IOUT=2.5mA, -40℃<TA< 105℃	66	70	74	
Current Out of Pin ICTRL at 200mV	IIBI	TA=25℃		25		μA
		-40℃<TA< 105℃		50		
OUTPUT STAGE						
Low Output Voltage at 10mA Sinking Current	VOL	TA=25℃		200		mV
Output Short Circuit Current. Output to VCC, Sink Current Only	IOS	TA=25℃		27	50	mA
		-40℃<TA< 105℃		35		

Characteristics Curve

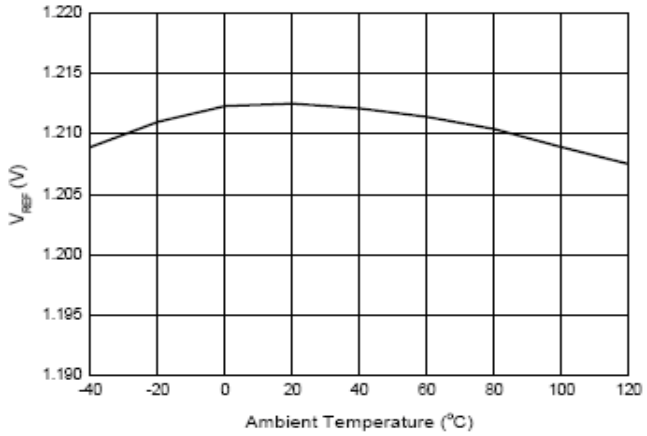


Figure 1. V_{REF} vs. Ambient Temperature

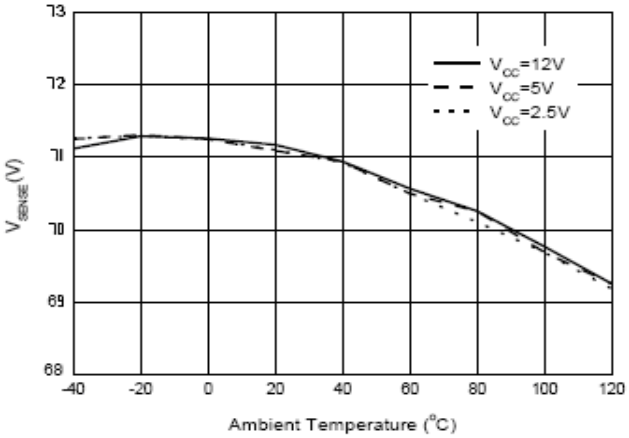


Figure 2. V_{SENSE} vs. Ambient Temperature

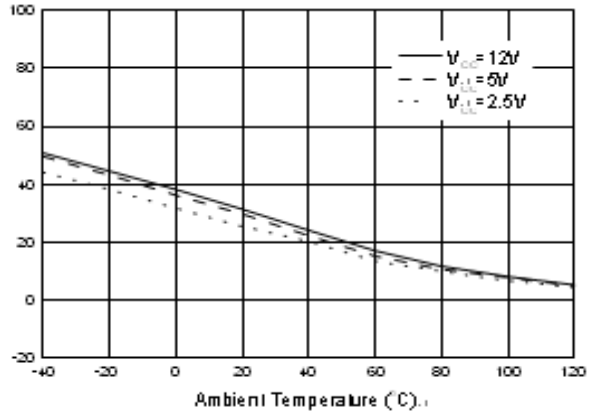


Figure 3. I_{IBV} vs. Ambient Temperature

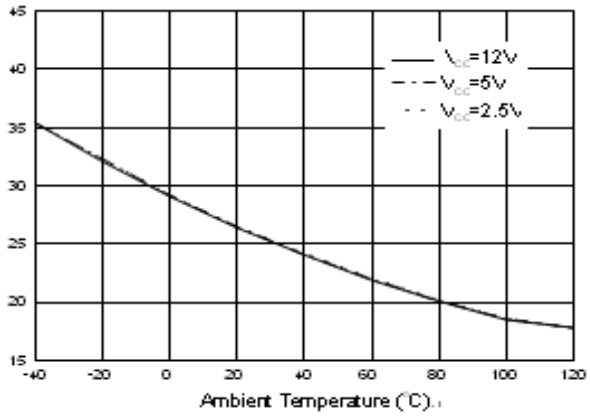


Figure 4. I_{IBI} vs. Ambient Temperature

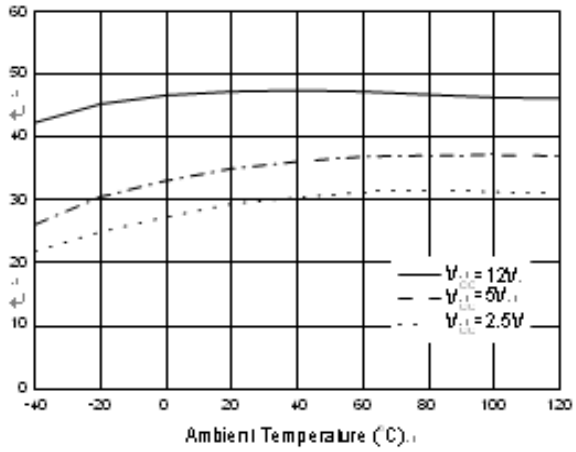


Figure 5. Output Short Circuit Current vs. Ambient Temperature

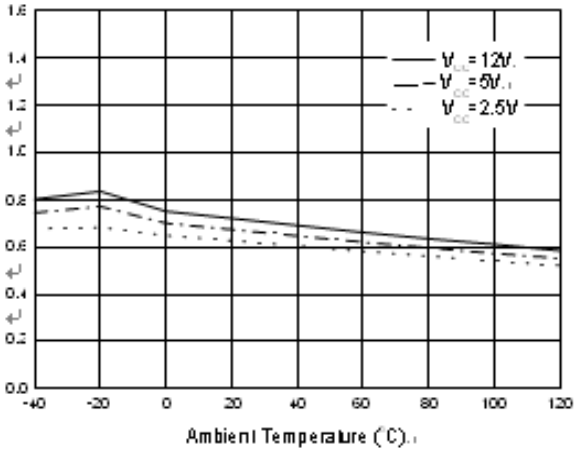
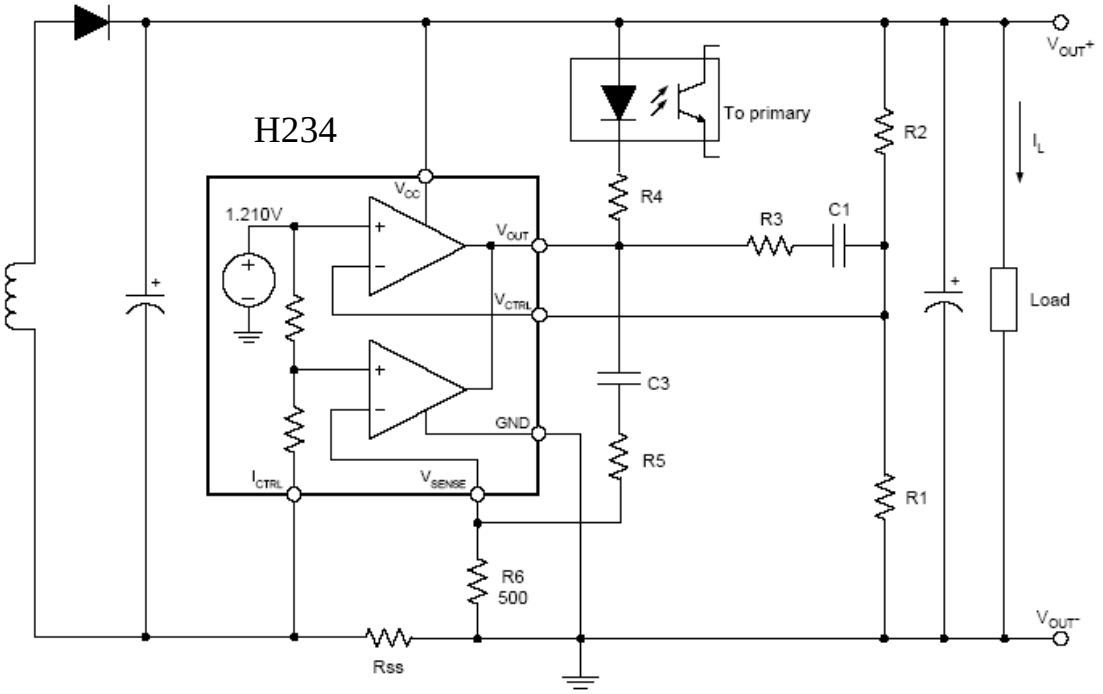


Figure 6. Supply Current vs. Ambient Temperature

Typical Application

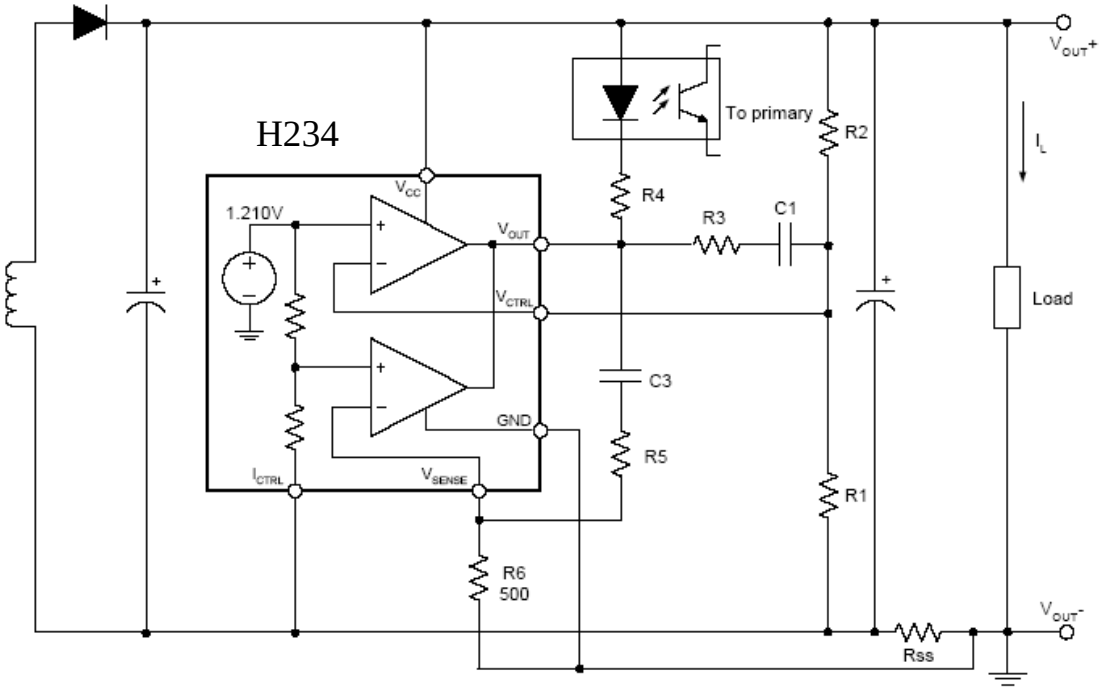


$$V_{OUT} = V_{REF} \times \frac{R1 + R2}{R1} \quad (V)$$

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

Figure 7. Typical Application 1 of H234

Typical Application

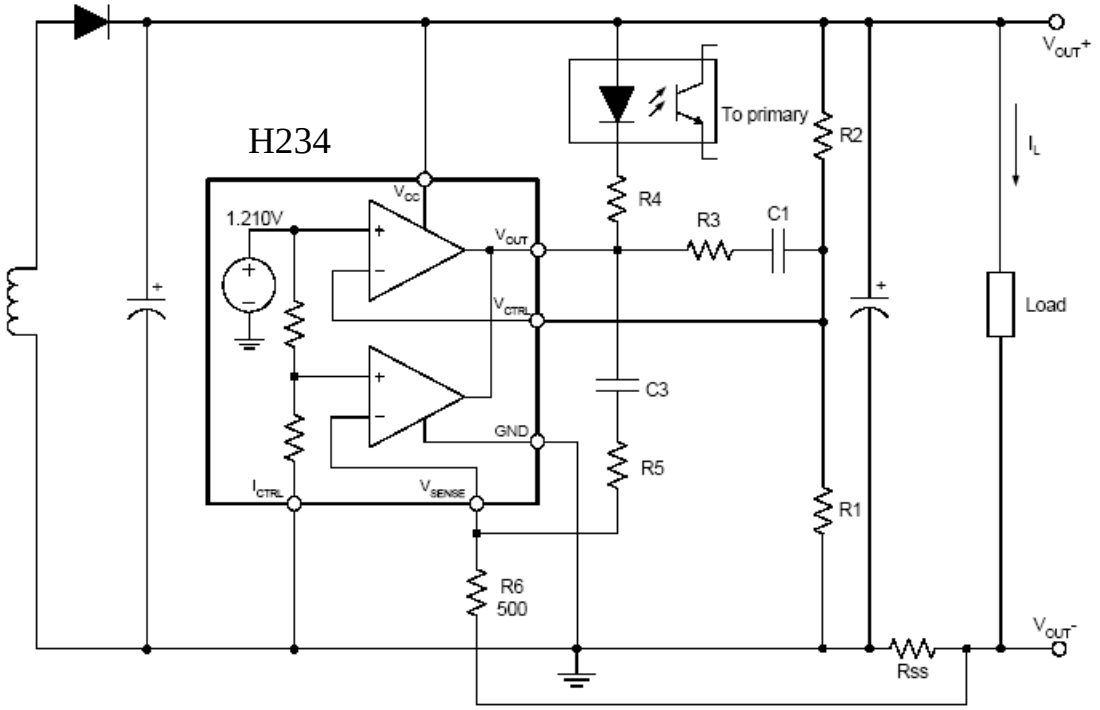


$$V_{OUT} = [V_{REF} + (I_L \times R_{SS})] \times \frac{R1 + R2}{R1} - (I_L \times R_{SS}) \quad (V)$$

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

Figure 8. Typical Application 2 of H234

Typical Application

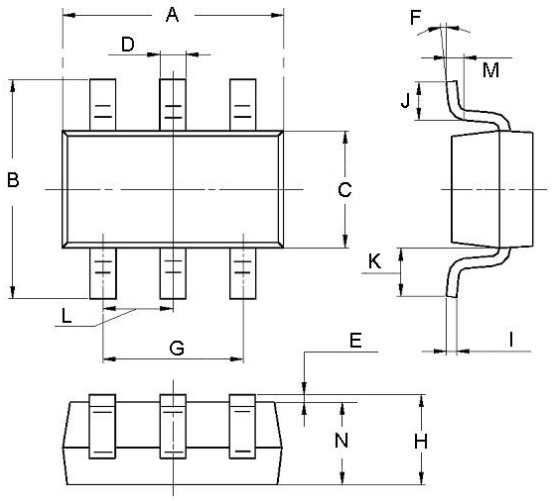


$$V_{OUT} = V_{REF} \times \frac{R1 + R2}{R1} - (I_L \times R_{SS}) \quad \text{(V)}$$

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

Figure 9. Typical Application 3 of H234

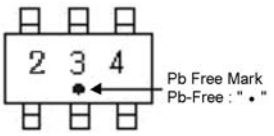
SOT-23-6L (TSOP-6) Dimension



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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