

MB3305

CONSTANT VOLTAGE AND CONSTANT CURRENT CONTROLLER



CBC Microelectronics
<http://www.cbcv.net>

General Description

The MB3305 is a highly integrated solution for a constant voltage/constant current mode SMPS application.

The MB3305 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 MB3305 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 MB3305 is available in SOT-23-6 package.



SOT-23-6

Figure 1: Package Type of MB3305

Features

- Constant Voltage and Constant Current Control.
- Precision Internal Voltage Reference.
- Few External Components.
- Easy Compensation.
- Low Supply Current: 0.5mA.
- Operating Temperature Range: -40 to 105°C

Applications

- Adapters.
- Battery Chargers

Pin Configuration

(SOT-23-6)

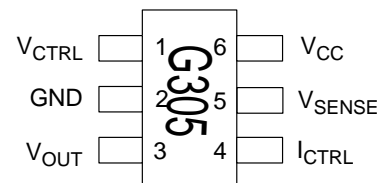


Figure 2: Pin Configuration of MB3305 (Top View)

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Ordering Information

	MB3305G □ □	
Circuit Type G: Halogen Free	└──┬──┘	
Package N: SOT-23-6	└──┬──┘	TR: Tape and Reel Blank: Tube

Package	Temperature Range	Part Number	Marking ID	Packing Type
SOT-23-6	-40 to 105°C	MB3305GNTR	G305	Tape & Reel

Typical Application

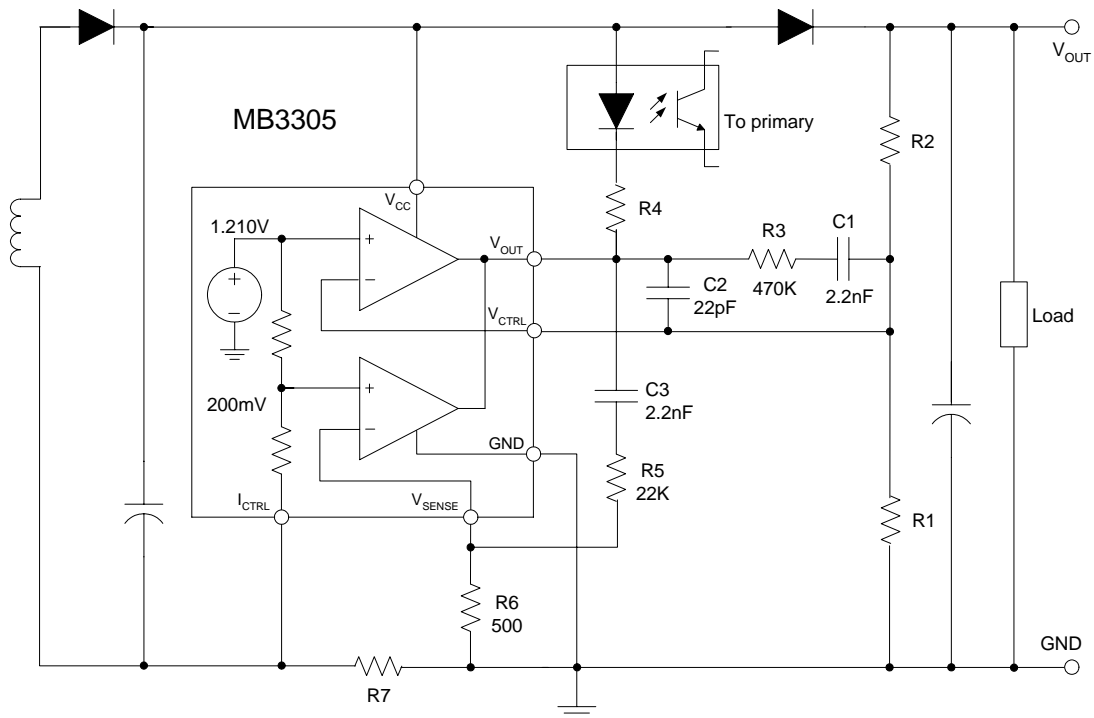


Figure3: Typical Application of MB3305

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Functional Block Diagram

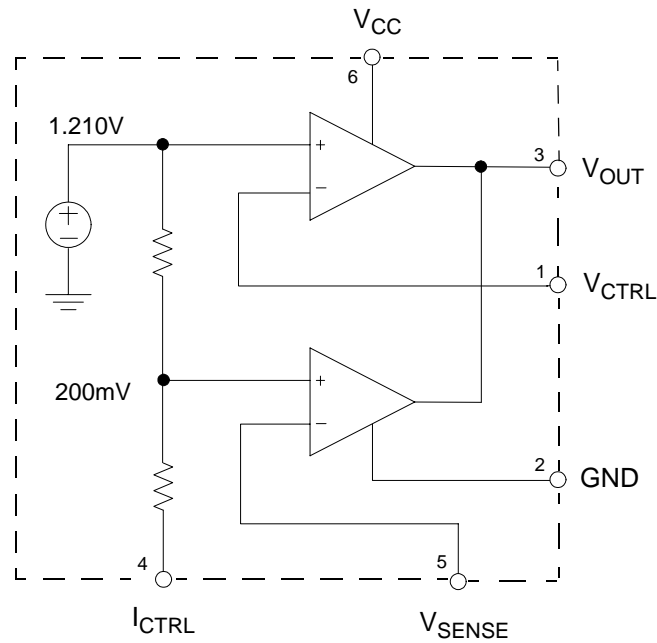


Figure4: Functional diagram of MB3305

Absolute Maximum Ratings (Note 1)

Parameter	Symbol	Value	Unit
Power Supply Voltage	VCC	20	V
Input Voltage	VIN	-0.3 to VCC	V
Junction Temperature	TJ	150	°C
Storage Temperature	TSTG	-65 to 150	°C
Lead Temperature (Soldering, 5sec)	TLEAD	260	°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.

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Recommended Operating Conditions

Parameter	Symbol	Min	Max	Unit
Power Supply Voltage	VCC	2.5	18	V
Operating Temperature Range	TA	-40	105	°C

Electrical Characteristics

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
TOTAL CURRENT CONSUMPTION						
Total Supply Current Not Including the Output Sinking Current	ICC	TA=25°C		0.5	1	mA
		-40°C<TA<105°C		0.6		
VOLTAGE CONTROL LOOP						
Transconduction Gain (VCTRL). Sink Current Only	Gmv	TA=25°C	1	3.5		mA/mV
		-40°C<TA< 105°C		2.5		
Voltage Control Loop Reference	VREF	TA=25°C	1.204	1.21	1.216	V
		-40°C<TA< 105°C	1.186		1.234	
Input Bias Current (VCTRL)	IIBV	TA=25°C		50		nA
		-40°C<TA< 105°C		100		
CURRENT CONTROL LOOP						
Transconduction Gain (ICTRL). Sink Current Only	Gmi	TA=25°C	1.5	7		mA/mV
Current Control Loop Reference	VSENSE	IOUT=2.5mA, TA=25°C	198	200	202	mV
		IOUT=2.5mA, -40°C<TA< 105°C	192		208	
Current Out of Pin ICTRL at 200mV	IIBI	TA=25°C		25		µA
		-40°C<TA< 105°C		50		
OUTPUT STAGE						
Low Output Voltage at 10mA Sinking Current	VOL	TA=25°C		200		mV
Output Short Circuit Current. Output to VCC, Sink Current Only	IOS	TA=25°C		27	50	mA
		-40°C<TA< 105°C		35		

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Typical Performance Characteristics

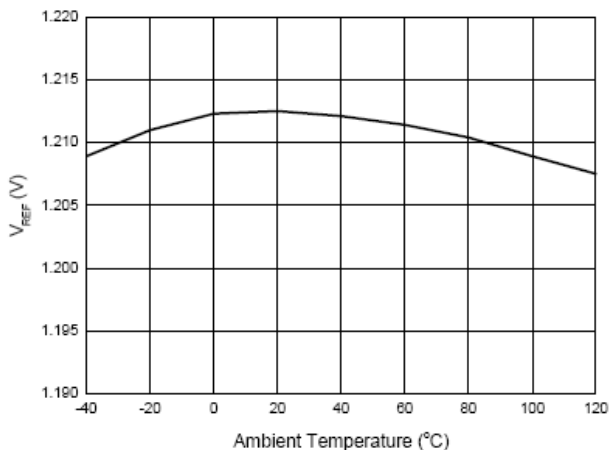


Figure 5: V_{REF} vs. Ambient Temperature

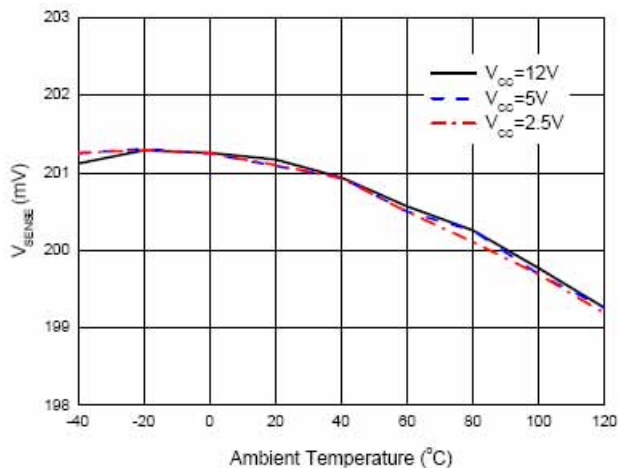


Figure 6: V_{SENSE} vs. Ambient Temperature

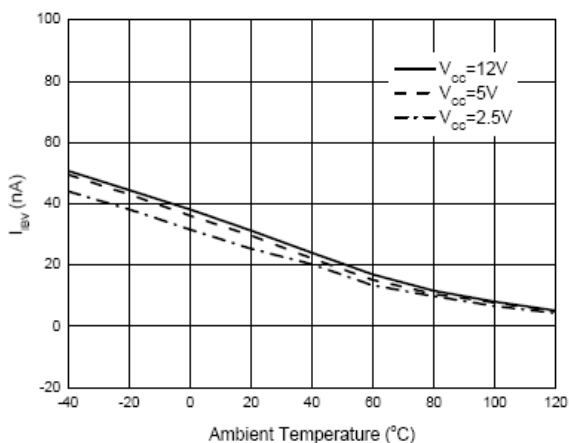


Figure 7: I_{IBV} vs. Ambient Temperature

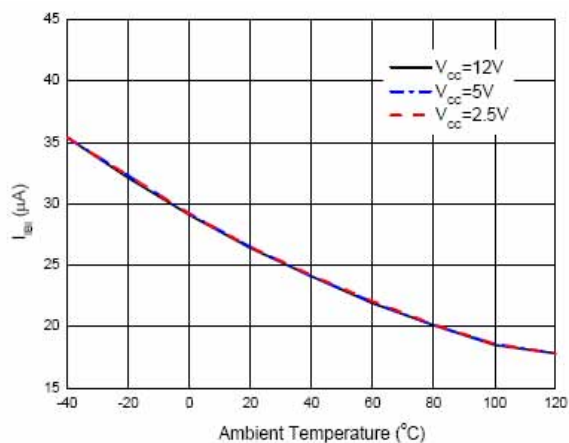


Figure 8: I_{IB1} vs. Ambient Temperature

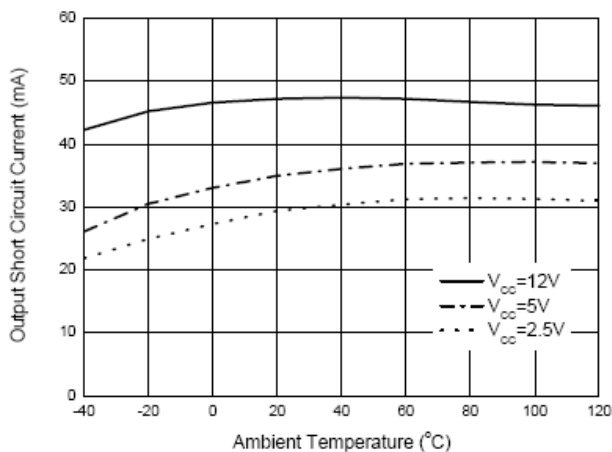


Figure 9: Output Short Circuit Current vs. Ambient Temperature

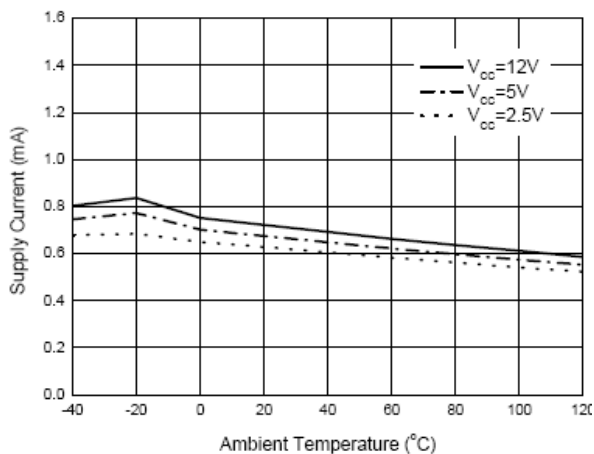


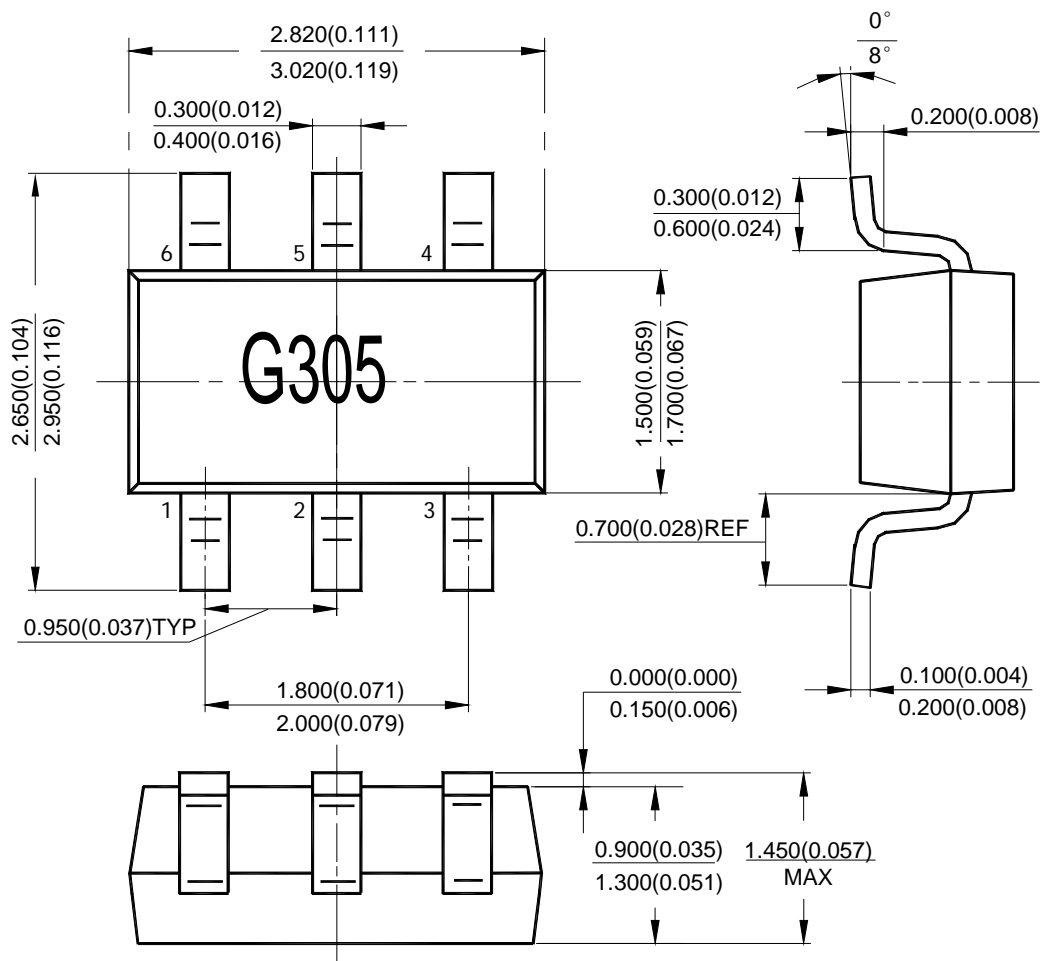
Figure 10: Supply Current vs. Ambient Temperature

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Mechanical Dimensions

SOT-23-6

Unit: mm(inch)



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