

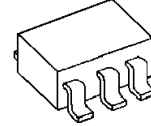
## Battery Charger IC

### ■ GENERAL DESCRIPTION

The NJM2337 is a voltage and current control IC which contains precision voltage reference.

It is suitable for battery charger, second controller of switching regulator systems, and other battery systems.

### ■ PACKAGE OUTLINE

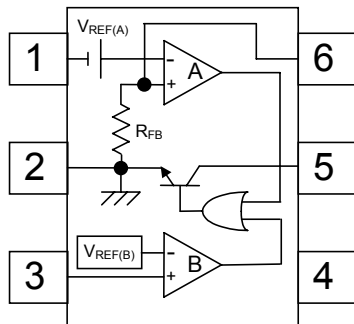


NJM2337AF/BF/CF

### ■ FEATURES

- Operating Voltage                             2.2V to 13V
- Internal Precision Voltage Reference  
  1.24V±1%
- PC Terminal Current                         20mA max.
- Operating Current                            280µA max.
- Bipolar Technology
- Package Outline                             MTP6

### ■ PIN CONFIGURATION



#### PIN FUNCTION

- 1 : A -INPUT
- 2 : GND
- 3 : B +INPUT
- 4 : V<sup>+</sup>
- 5 : PC
- 6 : A +INPUT

# NJM2337

## ■ ABUSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sup>+</sup>	+14	V
Differential Input Voltage	V <sub>ID</sub>	(Ach) 14V (Bch) 14V	V
Power Dissipation	P <sub>D</sub>	200	mW
PC Terminal Current	I <sub>PC</sub>	20	mA
Operating Temperature Range	Topr	-40 to +85	°C
Storage Temperature Range	Tstg	-50 to +150	°C

## ■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	RATINGS	UNIT
Operating Voltage	Vopr	2.2 to 13	V

## ■ ELECTRICAL CHARACTERISTICS

(V<sup>+</sup>=5V, Ta=25°C)

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Operating Current	I <sub>CC</sub>	I <sub>PC</sub> =off	-	200	280	μA
Leakage Current	I <sub>PCLEAK</sub>	V <sup>+</sup> =V <sub>PC</sub> =13V	-	-	1	μA
Saturation Voltage	V <sub>PC(SAT)</sub>	I <sub>PC</sub> =20mA	-	0.1	0.3	V
Feedback Resistance	R <sub>FB</sub>		0.7	1.0	1.3	Ω

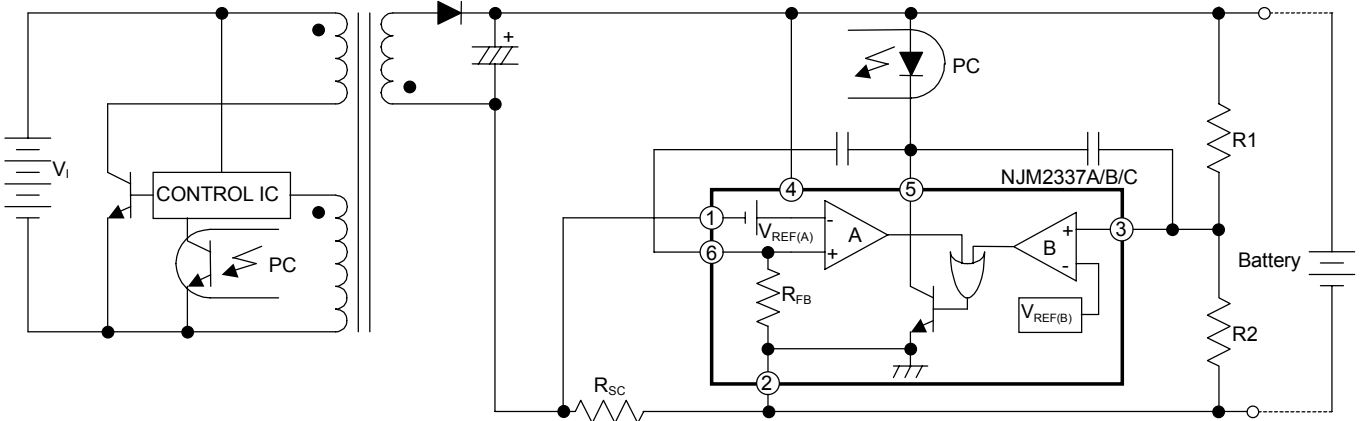
[Ach]

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Reference Voltage	V <sub>REF(A)</sub>	A version	69	72	75	mV
		B version	105	109	113	mV
		C version	145	151	157	mV
Input Bias Current	I <sub>B</sub>		-	40	160	nA
Large Signal Voltage Gain	A <sub>V</sub>		-	80	-	dB
Input Common Mode Voltage Range	V <sub>ICM</sub>		-	-0.2 to 3.0	-	V
Common Mode Rejection Ratio	CMR		-	70	-	dB
Supply Voltage Rejection Ratio	SVR		-	80	-	dB
Slew Rate	SR		-	0.5	-	V/μs
Gain Bandwidth Product	GB	f=10kHz	-	1	-	MHz

[Bch]

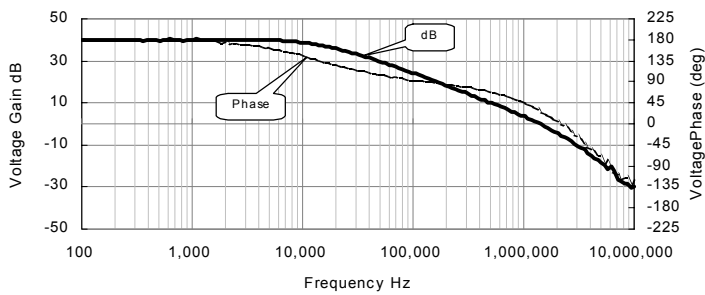
PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Reference Voltage	V <sub>REF(B)</sub>		1227	1240	1253	mV
Input Bias Current	I <sub>B</sub>		-	20	80	nA
Large Signal Voltage Gain	A <sub>V</sub>		-	80	-	dB
Input Common Mode Voltage Range	V <sub>ICM</sub>		-	0.5 to 4.0	-	V
Common Mode Rejection Ratio	CMR		-	80	-	dB
Supply Voltage Rejection Ratio	SVR		-	80	-	dB
Slew Rate	SR		-	0.5	-	V/μs
Gain Bandwidth Product	GB	f=10kHz	-	1	-	MHz

## TYPICAL APPLICATION

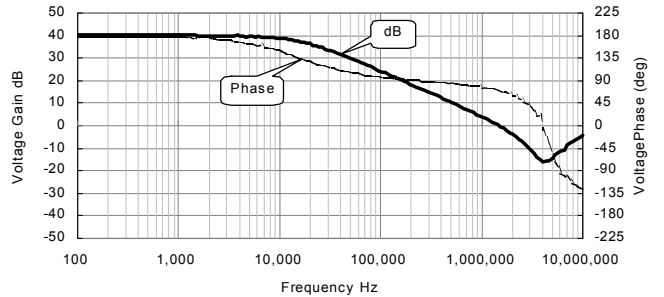


## TYPICAL CHARACTERISTICS

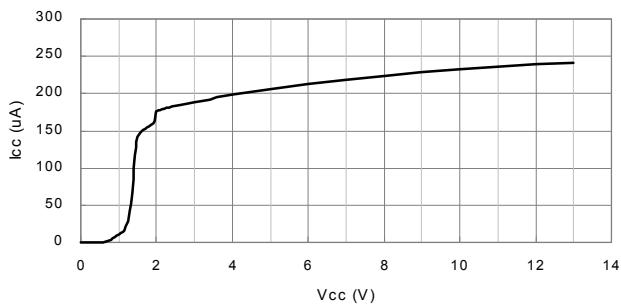
Ach Voltage Gain , Phase vs. Frequency Characteristic  
( $V_+ = 5V, T_a = 25^\circ C$ )



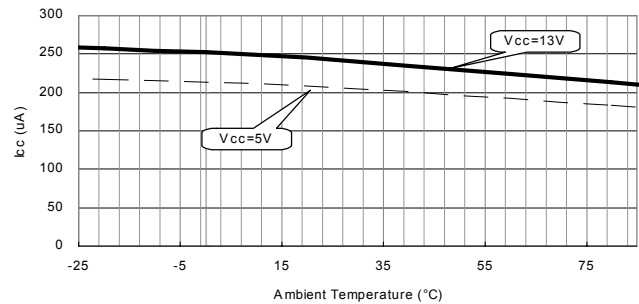
Bch Voltage Gain , Phase vs. Frequency Characteristic  
( $V_+ = 5V, T_a = 25^\circ C$ )



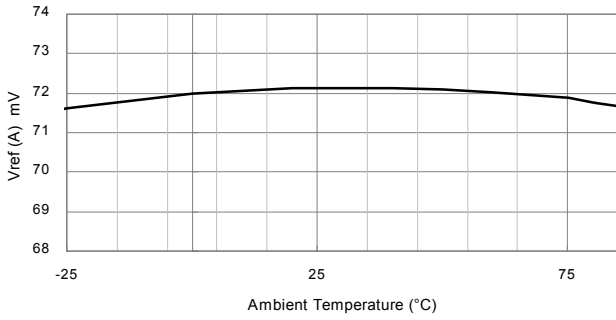
Supply Current(I<sub>cc</sub>) vs. Supply Voltage(V<sub>cc</sub>)



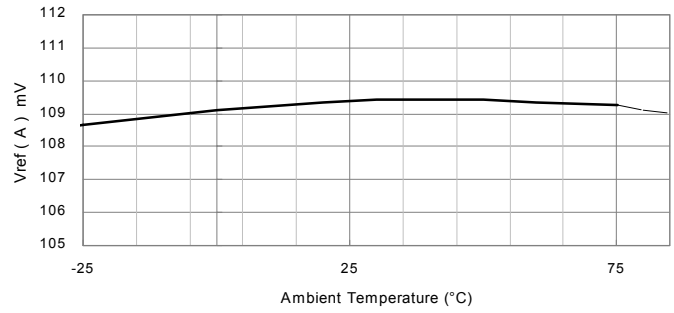
Supply Current(I<sub>cc</sub>) vs. Temperature



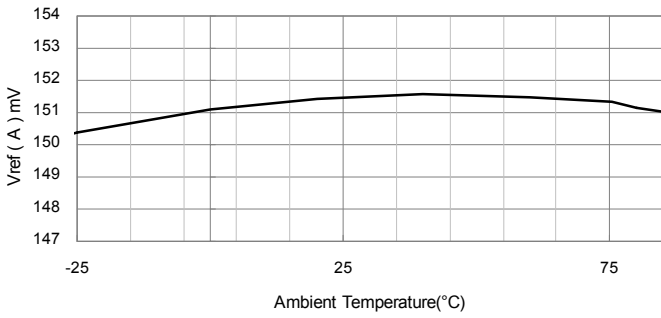
VOLTAGE REFERENCE  
(A Version)



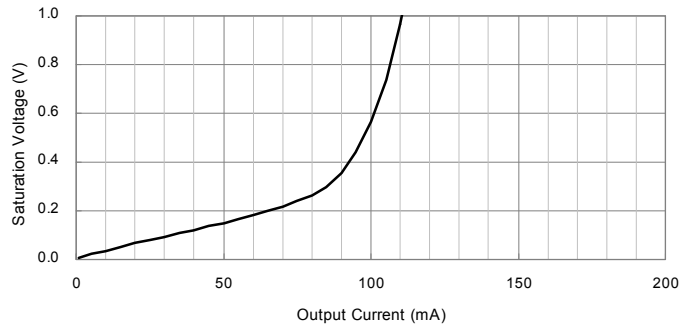
VOLTAGE REFERENCE  
(B Version)



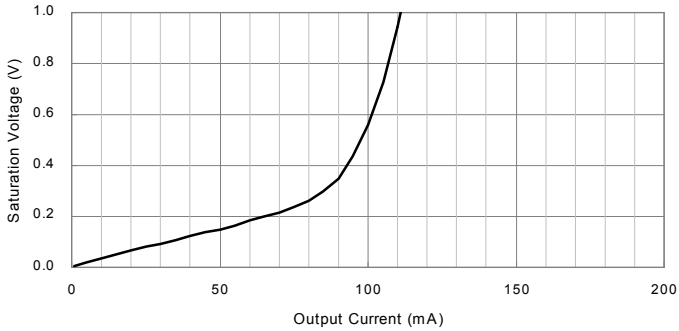
VOLTAGE REFERENCE  
(C Version)



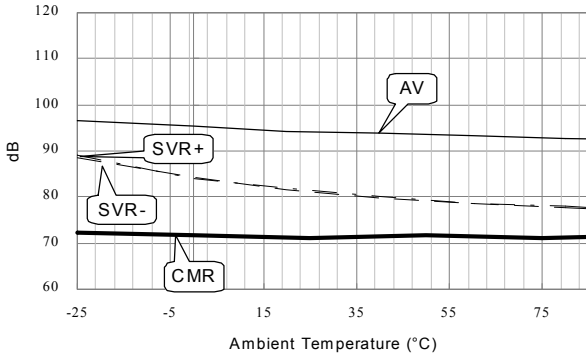
SATURATION VOLTAGE vs. OUTPUT CURRENT  
(Ach.)



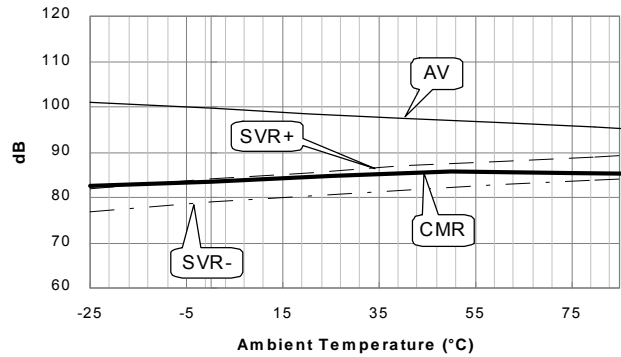
SATURATION VOLTAGE vs. OUTPUT CURRENT  
(Bch)



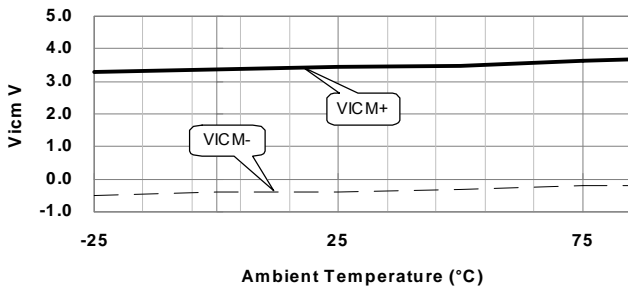
**Amp.Gain vs. Ambient Temperature (Ach)**



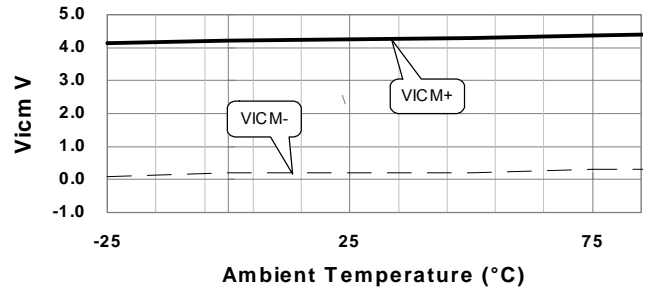
**Amp.Gain vs. Ambient Temperature (Bch)**



**Input Common Mode Voltage Range vs. Ambient Temperature (Ach)**  
Vcc=5V



**Input Common Mode Voltage Range vs. Ambient Temperature (Bch)**  
Vcc=5V



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