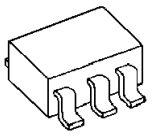
Battery Charger IC

■ 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

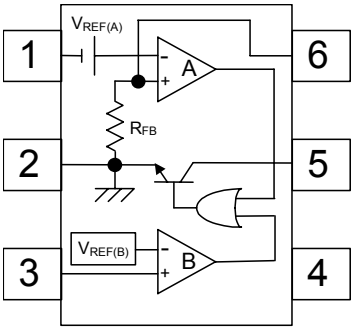


NJM2337AF/BF/CF

■ 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^+
5 : PC
6 : A +INPUT

■ ABUSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	+14	V
Differential Input Voltage	V_{ID}	(Ach) 14V (Bch) 14V	V
Power Dissipation	P_D	200	mW
PC Terminal Current	I_{PC}	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^+=5V, Ta=25°C)

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Operating Current	I_{CC}	I_{PC}=off	-	200	280	μA
Leakage Current	I_{PCLEAK}	V^+=V_{PC}=13V	-	-	1	μA
Saturation Voltage	$V_{PC(SAT)}$	I_{PC}=20mA	-	0.1	0.3	V
Feedback Resistance	R_{FB}		0.7	1.0	1.3	Ω

[Ach]

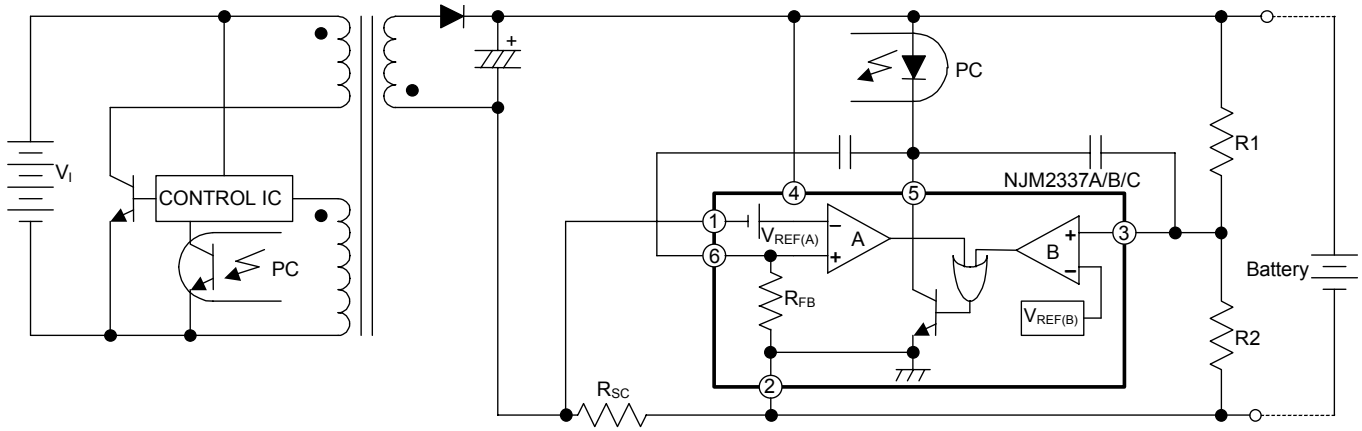
PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Reference Voltage	$V_{REF(A)}$	A version	69	72	75	mV
		B version	105	109	113	mV
		C version	145	151	157	mV
Input Bias Current	I_B		-	40	160	nA
Large Signal Voltage Gain	A_V		-	80	-	dB
Input Common Mode Voltage Range	V_{ICM}		-	-0.2 to 3.0	-	V
Common Mode 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	$V_{REF(B)}$		1227	1240	1253	mV
Input Bias Current	I_B		-	20	80	nA
Large Signal Voltage Gain	A_V		-	80	-	dB
Input Common Mode Voltage Range	V_{ICM}		-	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

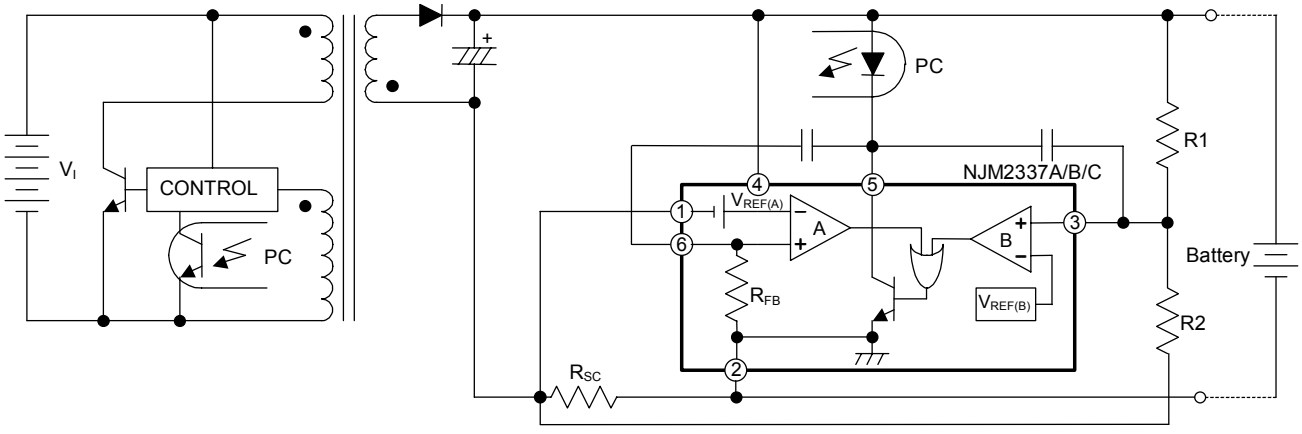
• TYPICAL APPLICATION1



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

$$CURRENT\ LIMIT = \frac{V_{REF(A)}}{RSC} \quad (A)$$

• TYPICAL APPLICATION2

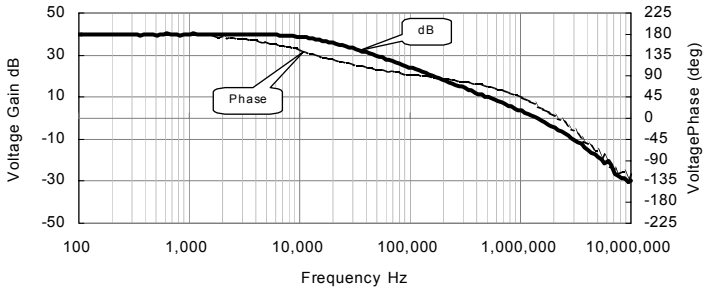


$$OUTPUT = \{ V_{REF(B)} + (I_L \times R_{SC}) \} \times \frac{R1+R2}{R2} - (I_L \times R_{SC}) \ (V)$$

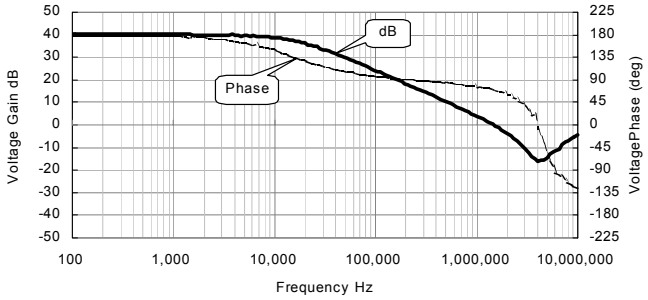
$$CURRENT\ LIMIT = \frac{V_{REF(A)}}{RSC} \quad (A)$$

■ TYPICAL CHARACTERISTICS

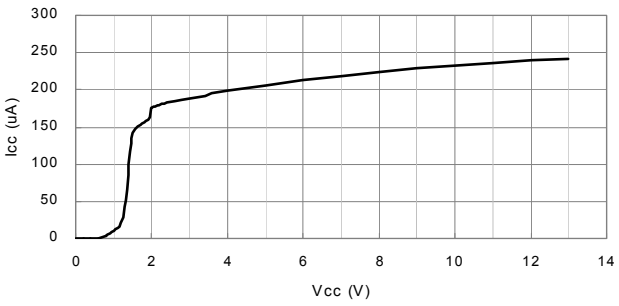
Ach Voltage Gain , Phase vs. Frequency Characteristic
(V+=5V ,Ta=25°C)



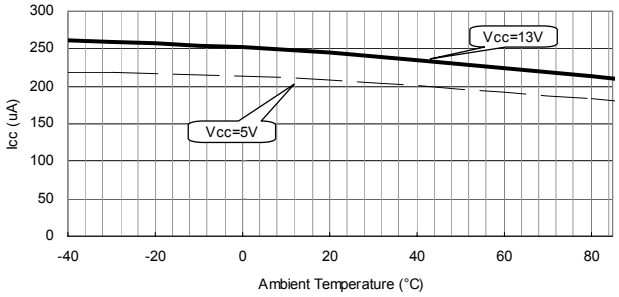
Bch Voltage Gain , Phase vs. Frequency Characteristic
(V+=5V ,Ta=25°C)



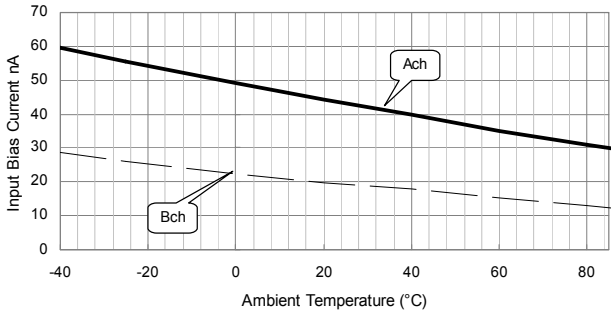
Supply Current(Icc) vs. Supply Voltage(Vcc)



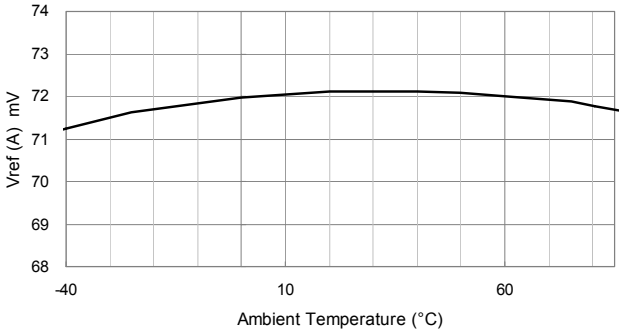
Supply Current(Icc) vs. Temperature



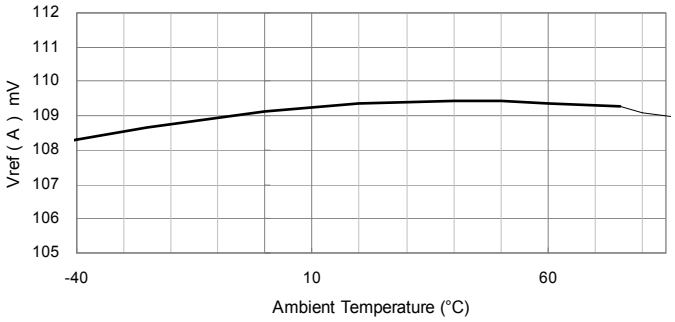
INPUT BIAS CURRENT



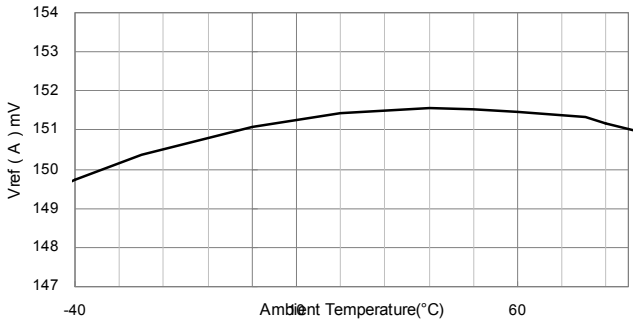
VOLTAGE REFERENCE
(A Version)



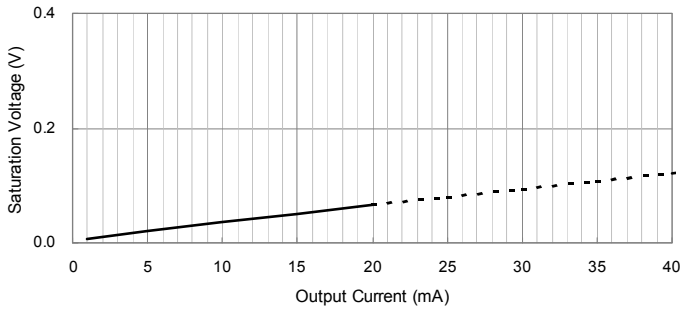
VOLTAGE REFERENCE
(B Version)



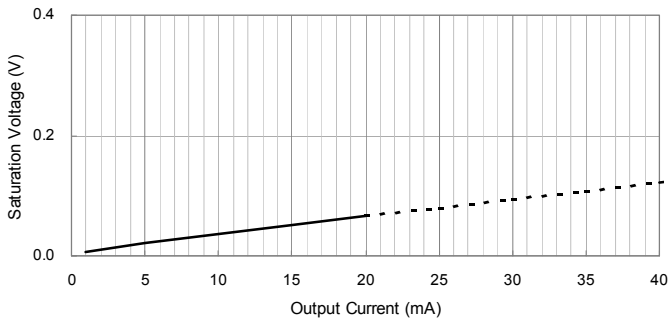
VOLTAGE REFERENCE
(C Version)



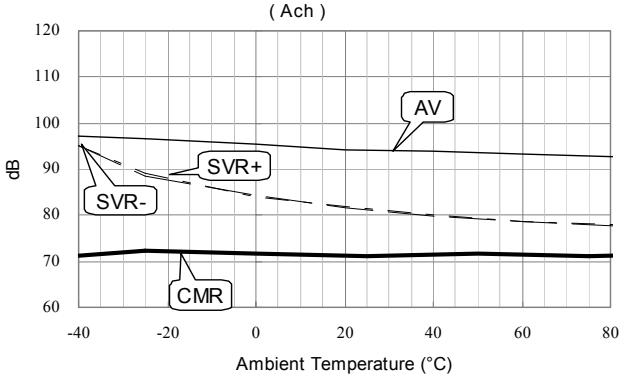
SATURATION VOLTAGE vs. OUTPUT CURRENT
(Ach.)



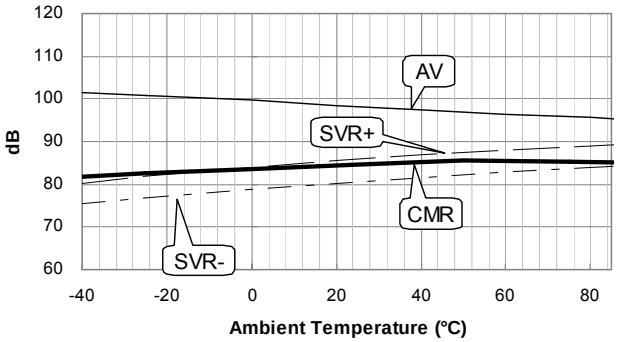
SATURATION VOLTAGE vs. OUTPUT CURRENT
(Bch)



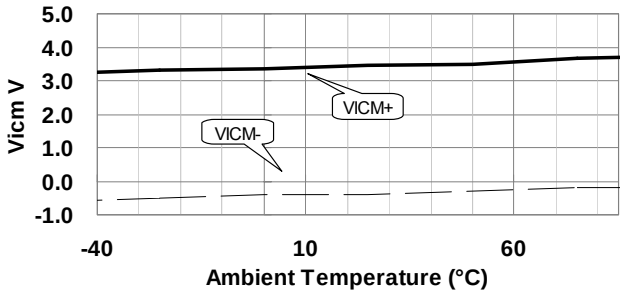
Amp.Gain vs. Ambient Temperature
(Ach)



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