

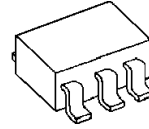
Battery Charger IC

■ GENERAL DESCRIPTION

The NJM2336 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

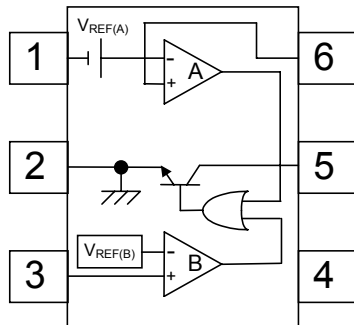


NJM2336AF/BF/CF

■ FEATURES

- | | |
|--|-------------|
| ● Operating Voltage | 2.2V to 13V |
| ● Internal Precision Voltage Reference | 1.24V±1% |
| ● Photo Coupler (PC) Drive Current | 20mA max. |
| ● Operating Current | 350μA max. |
| ● Bipolar Technology | |
| ● Package Outline | MTP6 |

■ PIN CONFIGURATION



- 1 : A -INPUT
- 2 : GND
- 3 : B +INPUT
- 4 : V⁺
- 5 : PC
- 6 : A +INPUT

NJM2336

■ ABUSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V ⁺	+14	V
Differential Input Voltage	V _{ID}	(Ach) 14 (Bch) 14	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	-	220	350	μA
Leakage Current	I _{PCLEAK}	V ⁺ =V _{PC} =13V	-	-	10	μA
Saturation Voltage	V _{PC(SAT)}	I _{PC} =20mA	-	0.5	0.7	V

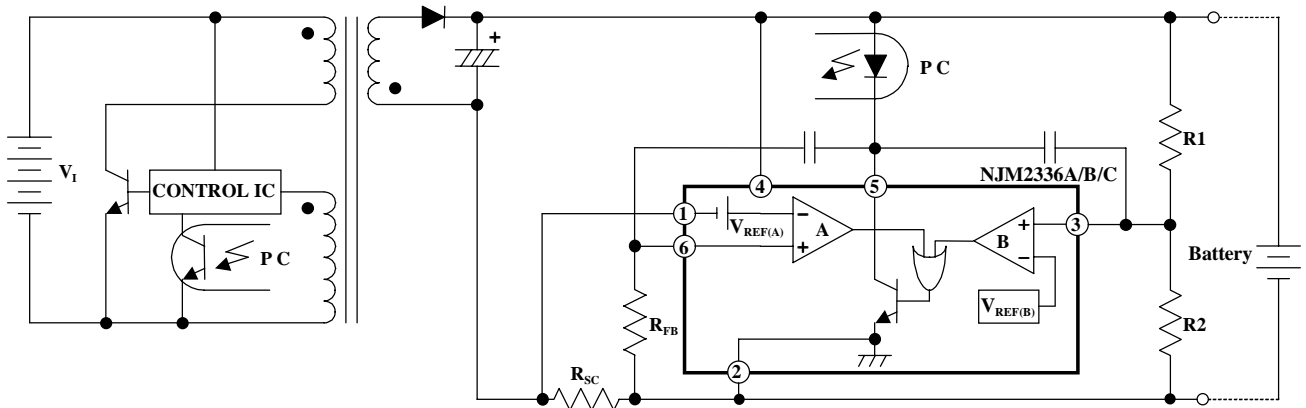
[Ach]

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		-	80	250	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	-	0.8	-	MHz

[Bch]

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Reference Voltage	V _{REF(B)}		1227	1240	1253	mV
Input Bias Current	I _B		-	80	250	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		-	70	-	dB
Supply Voltage Rejection Ratio	SVR		-	80	-	dB
Slew Rate	SR		-	0.5	-	V/μs
Gain Bandwidth Product	GB	f=10kHz	-	0.8	-	MHz

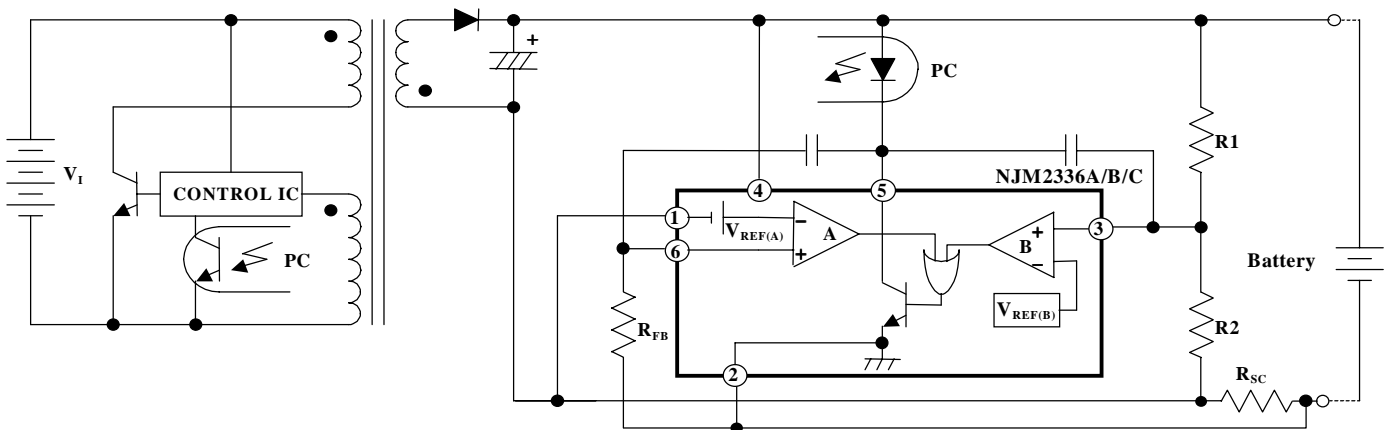
APPLICATION 1



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

$$\text{CURRENT LIMIT} = \frac{V_{\text{REF(A)}}}{R_{\text{sc}}} \text{ (A)}$$

APPLICATION 2

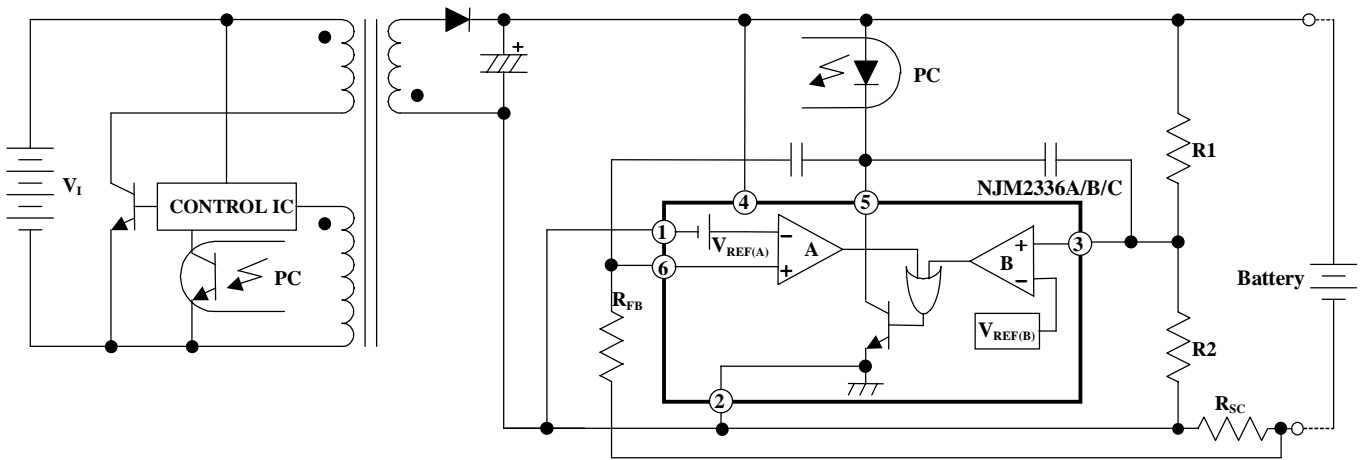


$$\text{OUTPUT} = \{ V_{\text{REF (B)}} + (I_L \times R_{\text{sc}}) \} \times \frac{R1 + R2}{R2} - (I_L \times R_{\text{sc}}) \text{ (V)}$$

$$\text{CURRENT LIMIT} = \frac{V_{\text{REF}}}{R_{\text{sc}}} \text{ (A)}$$

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APPLICATION 3

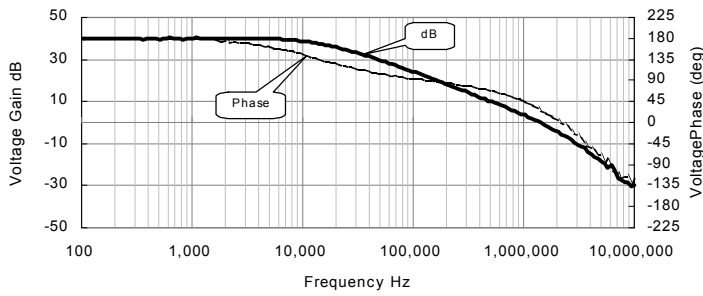


$$\text{OUTPUT} = V_{\text{REF (B)}} \frac{R1+R2}{R2} \times - (I_L \times R_{\text{sc}}) \text{ (V)}$$

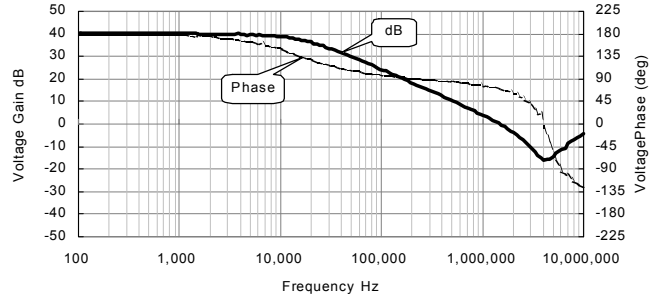
$$\text{CURRENT LIMIT} = \frac{V_{\text{REF (A)}}}{R_{\text{sc}}} \text{ (A)}$$

TYPICAL CHARACTERISTICS

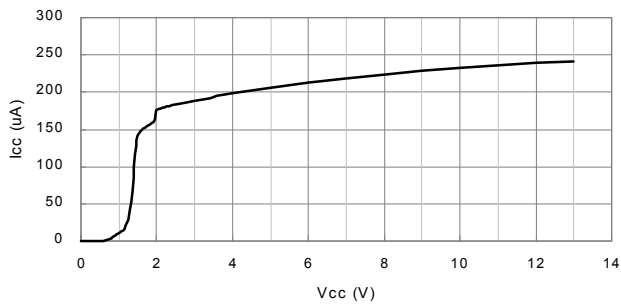
Ach Voltage Gain , Phase vs. Frequency
Characteristic
(V+=5V , Ta=25°C)



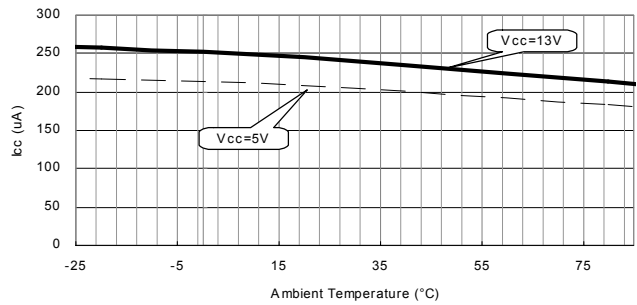
Bch Voltage Gain , Phase vs. Frequency Characteristic
(V+=5V , Ta=25°C)



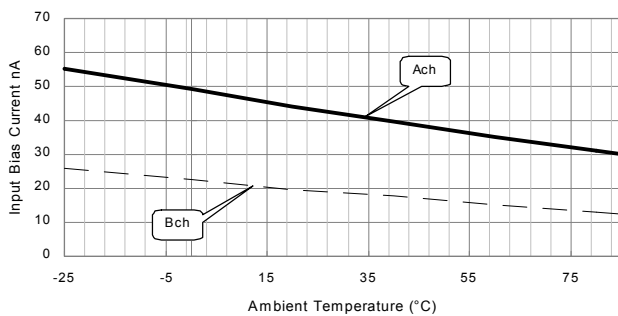
Supply Current(Icc) vs. Supply Voltage(Vcc)



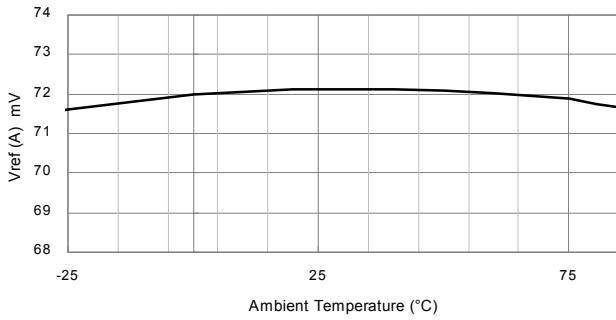
Supply Current(Icc) vs. Temperature



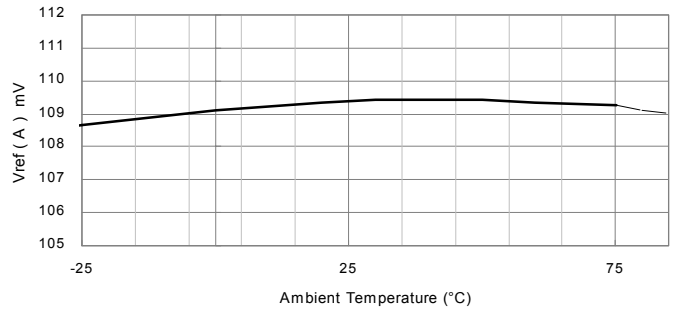
INPUT BIAS CURRENT



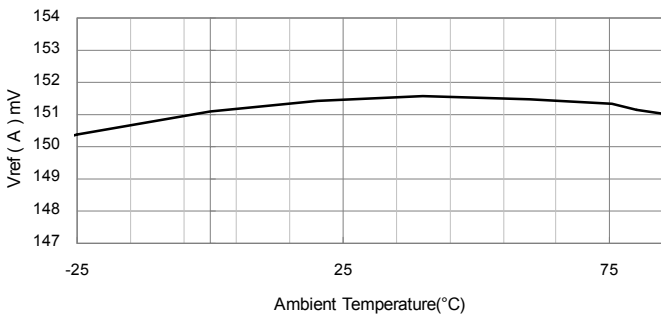
VOLTAGE REFERENCE
(A Version)



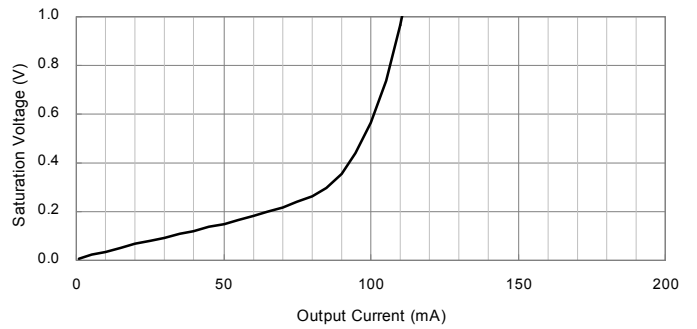
VOLTAGE REFERENCE
(B Version)



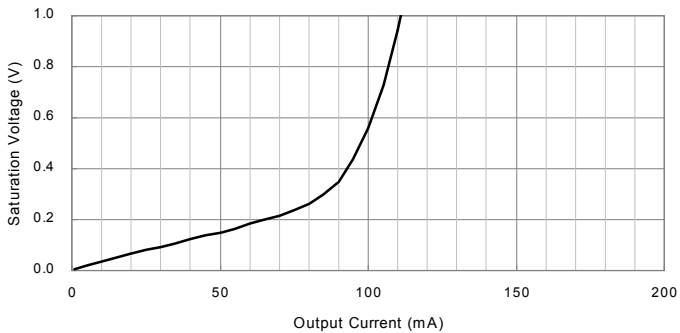
VOLTAGE REFERENCE
(C Version)



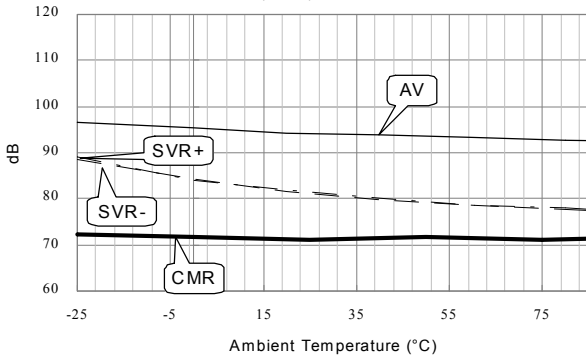
SATURATION VOLTAGE vs. OUTPUT CURRENT
(Ach.)



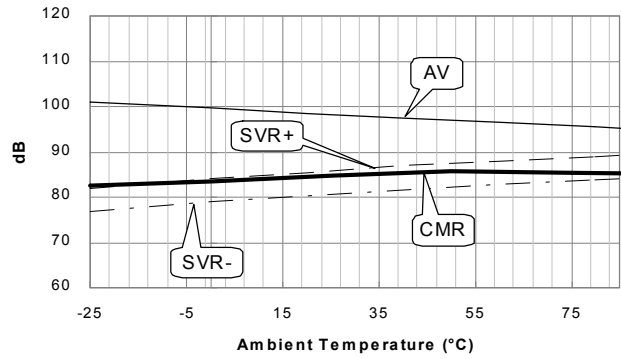
SATURATION VOLTAGE vs. OUTPUT CURRENT
(Bch)



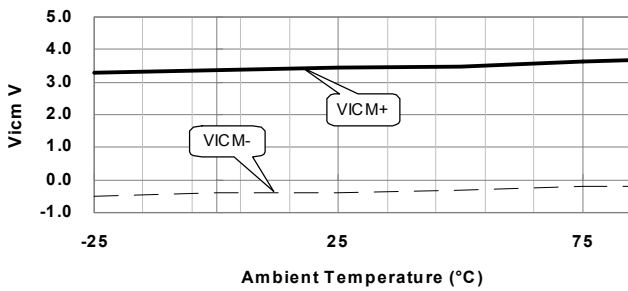
Amp.Gain vs. Ambient Temperature (Ach)



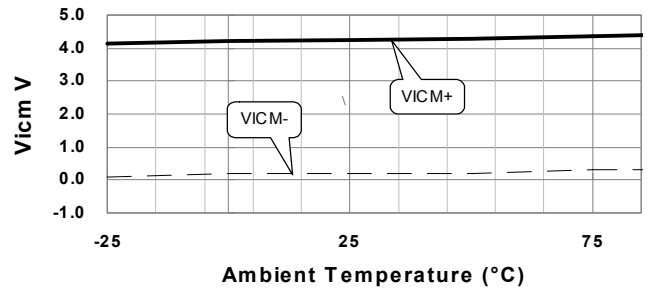
Amp.Gain vs. Ambient Temperature (Bch)



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



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



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