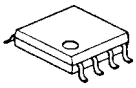
VOLTAGE AND CURRENT CONTROL IC

■GENERAL DESCRIPTION

The **NJM2346** is a low power operation battery charger IC.
It includes a voltage reference and two operational amplifiers for voltage and current control needed for a design of secondary circuit for battery chargers and switching regulators.

Low current consumption design contributes low standby power required for 1A class battery chargers.

■PACKAGE OUTLINE



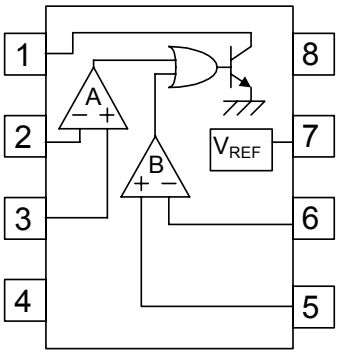
NJM2346M

NJM2346RB1

■FEATURES

- Low Quiescent Current 250uA typ.
- Precision AMP. Vio=0.5mV typ.
- Operating Voltage 2.2V to 13V
- Precision Voltage Reference 1.24V±1%
- PC pin Sink Current 20mA max.
- Bipolar Technology
- Package Outline DMP8, TVSP8

■PIN CONFIGURATION



PIN FUNCTION
1. PC
2. A -INPUT
3. A +INPUT
4. GND
5. B +INPUT
6. B -INPUT
7. V_{REF}
8. V^+

■ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	MAXIMUM RATINGS	UNIT
Supply Voltage	V^+	14	V
Differential Input Voltage	V_{ID}	(Ach) 14 (Bch) 14	V
Common Mode Input Voltage	V_{IC}	(Ach) -0.3 ~ 14 (note) (Bch) -0.3 ~ 14 (note)	V
PC Terminal Current	I_{PC}	20	mA
Power Dissipation	P_D	(DMP 8) 300 (TVSP 8) 320	mW
Operating Temperature Range	T_{OPR}	-40 ~ +85	°C
Storage Temperature Range	T_{STG}	-50 ~ +150	°C

(note) When the supply voltage is less than 14V,
the absolute maximum input voltage is equal to the supply voltage.

■RECOMMENDED OPERATING CONDITIONS (Ta=25°C)

PARAMETER	SYMBOL	MAXIMUM RATINGS	UNIT
Operating Voltage	Vopr	2.2 ~ 13	V

■ELECTRICAL CHARACTERISTICS (V^+=5V,Ta=25°C)

GENERAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current	I_{CC}	I_{PC}=off	–	250	350	uA
Leakage Current	I_{PCLEAK}	V^+=V_{PC}=13V	–	–	1	uA
Saturation Voltage	$V_{PC(SAT)}$	I_{PC}=20mA	–	0.1	0.3	V
Reference Voltage	V_{REF}	I_{REF}=0mA	1227	1240	1253	mV
Reference Voltage Load Regulation	$\Delta V_{REF}/\Delta I_{REF}$	I_{REF}=0mA ~ 1mA	–	–	10	mV

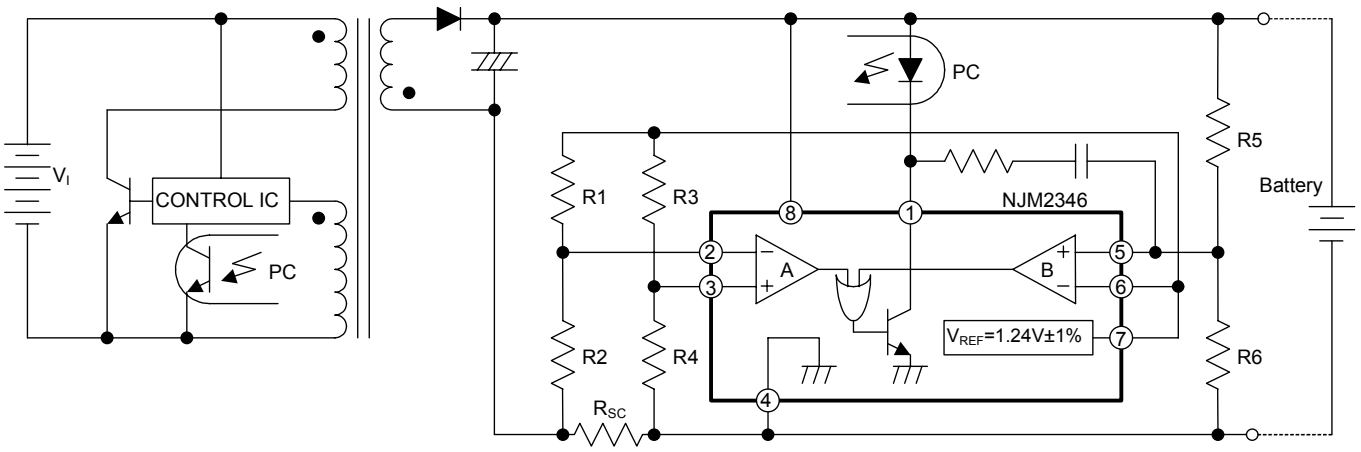
[Ach]

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V_{IO}		–	0.5	2	mV
Input Offset Current	I_{IO}		–	10	50	nA
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 ~ 3.0	–	–	V
Common Mode Rejection Ratio	CMR		–	80	–	dB
Supply Voltage Rejection Ratio	SVR		–	80	–	dB
Slew Rate	SR		–	0.5	–	V/uA
Gain Bandwidth Product	GB	f=10kHz	–	1	–	MHz

[Bch]

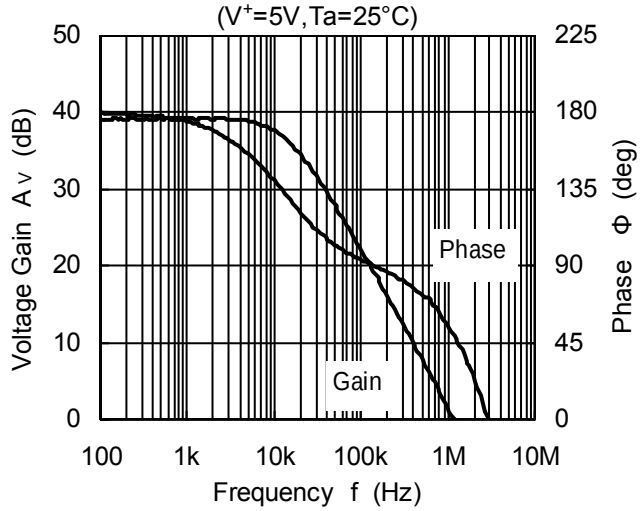
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V_{IO}		–	0.5	2	mV
Input Offset Current	I_{IO}		–	10	50	nA
Input Bias Current	I_B		–	20	80	nA
Large Signal Voltage Gain	A_V		–	80	–	dB
Input Common Mode Voltage Range	V_{ICM}		0.5 ~ 4.0	–	–	V
Common Mode Rejection Ratio	CMR		–	80	–	dB
Supply Voltage Rejection Ratio	SVR		–	80	–	dB
Slew Rate	SR		–	0.5	–	V/uA
Gain Bandwidth Product	GB	f=10kHz	–	1	–	MHz

■ TYPICAL APPLICATIONS

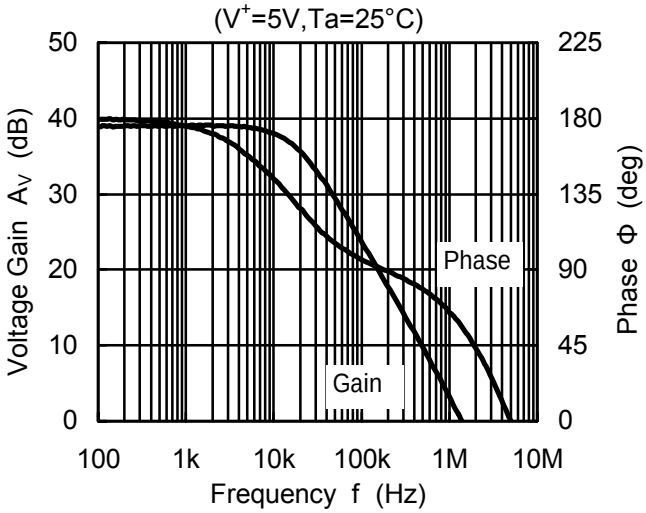


■TYPICAL CHARACTERISTICS

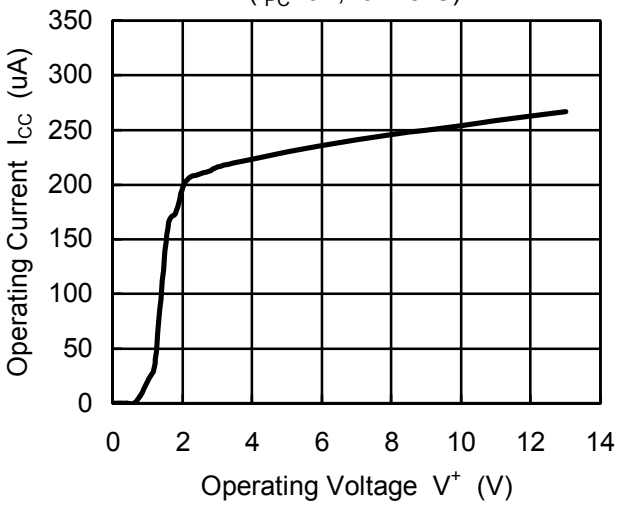
Ach Voltage Gain · Phase vs. Frequency
(V^+=5V,Ta=25°C)



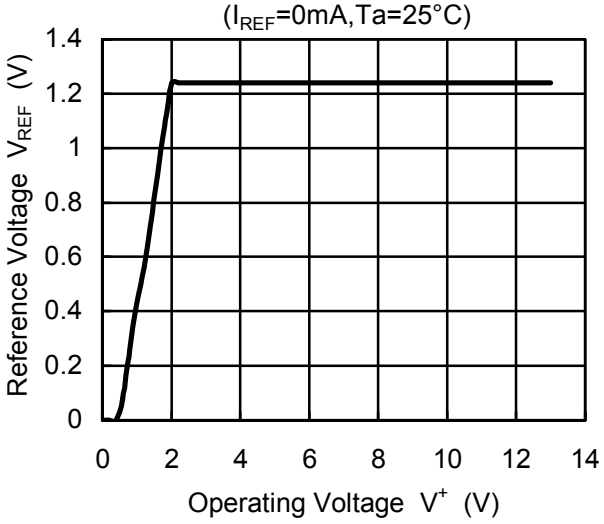
Bch Voltage Gain · Phase vs. Frequency
(V^+=5V,Ta=25°C)



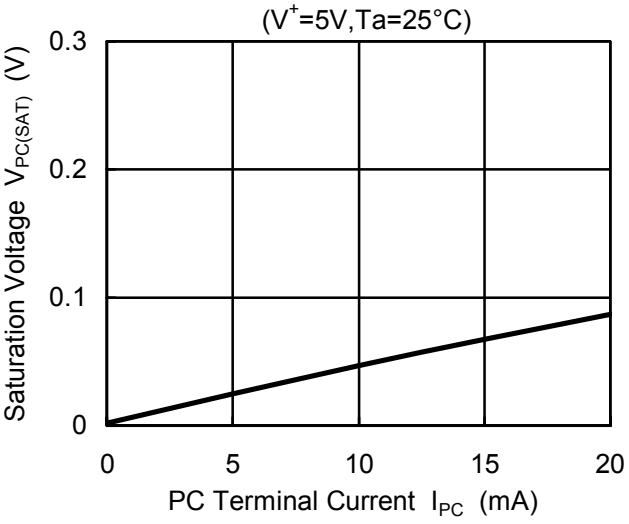
Operating Current vs. Operating Voltage
(I_{PC}=off,Ta=25°C)



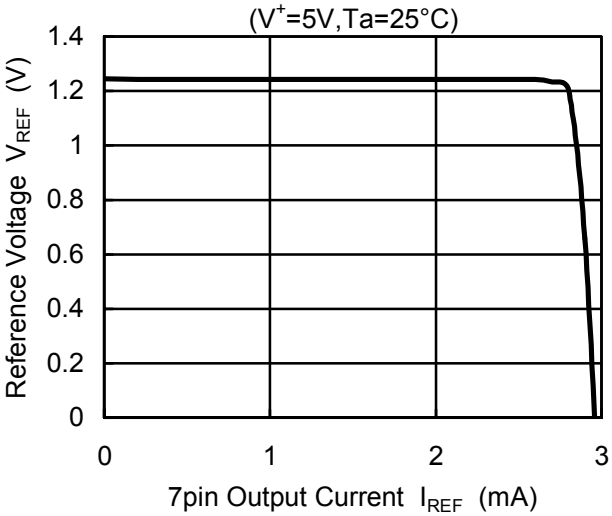
Reference Voltage vs. Operating Voltage
(I_{REF}=0mA,Ta=25°C)



Saturation Voltage vs. PC Terminal Current
(V^+=5V,Ta=25°C)

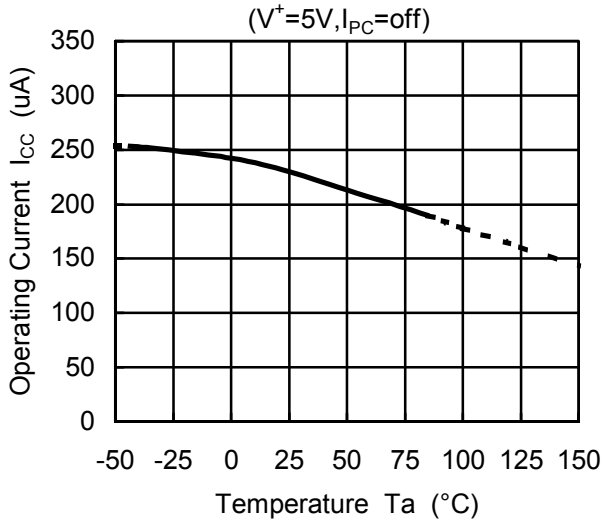


Reference Voltage vs. 7pin Output Current
(V^+=5V,Ta=25°C)

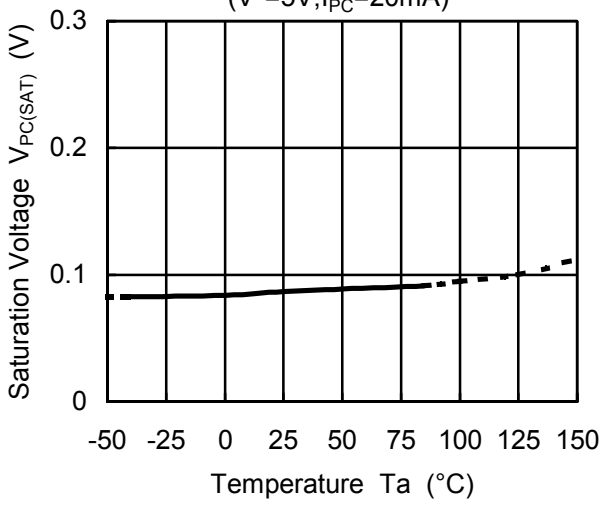


■TYPICAL CHARACTERISTICS

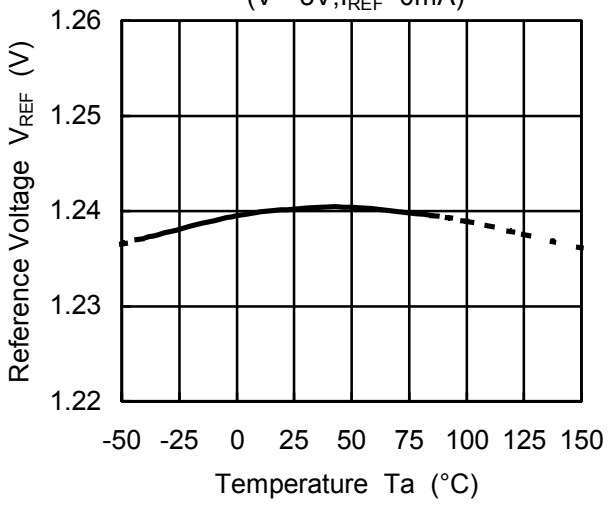
Operating Current vs. Temperature
(V^+=5V,I_{PC}=off)



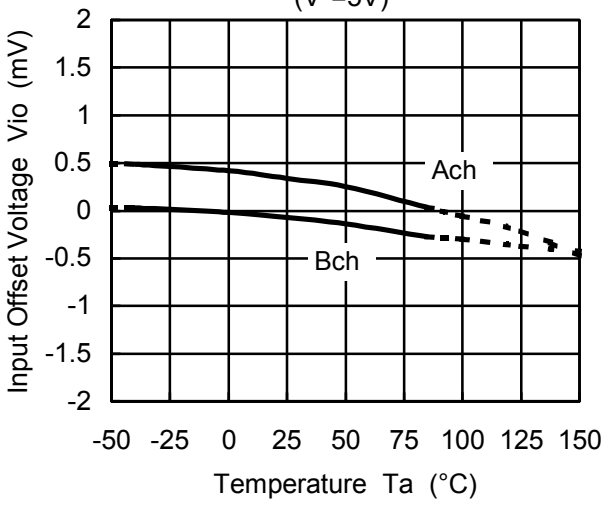
Saturation Voltage vs. Temperature
(V^+=5V,I_{PC}=20mA)



Reference Voltage vs. Temperature
(V^+=5V,I_{REF}=0mA)



Input Offset Voltage vs. Temperature
(V^+=5V)



Input Bias Voltage vs. Temperature
(V^+=5V)